Docket No: 50-277
50-278

PEACH BOTTOM ATOMIC POWER STATION
UNITS 2 and 3

Annual Radiological Environmental Operating Report

Report #53

1 January Through 31 December 1995

Prepared By

PECO Nuclear
a Unit of PECO Energy
965 Chesterbrook Blvd.
Wayne, PA 19087-5691

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I. Summary and Conclusions

This report on the Radiological Environmental Monitoring Program conducted for the Peach Bottom Atomic Power Station (PBAPS) by PECO Nuclear covers the period 1 January 1995 through 31 December 1995. During that time period, 966 analyses were performed on 863 samples.

Surface water samples were analyzed for concentrations tritium and gamma emitting nuclides. No fission or activation products were found. Tritium activities detected were consistent with those observed in other years.

Drinking (potable) water samples were analyzed for concentrations of gross beta (soluble and insoluble fractions), tritium, and gamma emitting nuclides. No fission or activation products were found. Gross beta and tritium activities detected were consistent with those observed in other years.

The remaining sample media representing the aquatic environment included fish and sediment samples. These media were analyzed for concentrations of gamma emitters. Fish samples showed no measurable effects from the operation of PBAPS. Sediment Location 4J, located below the discharge, showed the activation product Co-60 which was attributable to PBAPS operations. Cesium-137 activity was found at all locations and was consistent with data from previous years. The dose to a teenager's skin from the sediment pathway was calculated to be 1.37 E-03 mrem/yr which represents less than 0.01% of the allowable fraction of 10 CFR 50, Appendix I limits.

The atmospheric environment was divided into two parts for examination: airborne and terrestrial. Sample media for determining airborne effects included air particulates and air iodine samples. Analyses performed on air particulate samples included gross beta and gamma spectrometry. The results from both analyses were consistent with results from the previous years. Furthermore, no notable differences between control and indicator locations were observed. These findings indicate no measurable effects from the operation of PBAPS.

High sensitivity Iodine-131 analyses were performed on weekly air samples. All results were less than the minimum detectable activity.

Examination of the terrestrial environment was accomplished by analyzing milk samples for concentrations of Iodine-131 and gamma emitters. Results from all analyses were consistent with those from previous years and showed no indication of PBAPS effect.

Ambient gamma radiation levels were measured quarterly throughout the year. All measurements were below 10 mR/std. month and consistent with those measured in previous years.

The operation of the Station had no measurable effect on the environs surrounding Peach Bottom.

II. Introduction

Peach Bottom Atomic Power Station (PBAPS) is located along the Susquehanna River between Holtwood and Conowingo Dams in Peach Bottom Township, York County, Pennsylvania. The initial loading of fuel into Unit 1, a 40 MWe (net) high temperature, gas-cooled reactor, began on 5 February 1966, and initial criticality was achieved on 3 March 1966. Shutdown of Peach Bottom Unit 1 for decommissioning was on 31 October 1974. For the purposes of the monitoring program, the beginning of the operational period for Unit 1 was considered to be 5 February 1966. A summary of the Unit 1 preoperational monitoring program was presented in a previous report [1]. PBAPS Units 2 and 3 are boiling water reactors each with a power output of approximately 1102 MWe. The first fuel was loaded into Peach Bottom Unit 2 on 9 August 1973. Criticality was achieved on 16 September 1973, and full power was reached on 16 June 1974. The first fuel was loaded into Peach Bottom Unit 3 on 5 July 1974. Criticality was achieved on 7 August 1974, and full power was first reached on 21 December 1974. Preoperational summary reports [2][3] for Units 2 and 3 have been previously issued and summarize the results of all analyses performed on samples collected from 5 February 1966 through 8 August 1973.

A. Objectives

The objectives of the REMP are:

1. To identify, measure, and evaluate existing radionuclides in the environs of PBAPS site and any fluctuations in radioactivity levels which may occur.

2. To monitor and evaluate ambient radiation levels.

3. To determine within the scope of the program, any measurable quantity of radioactivity introduced to the environment by the operation of PBAPS.

B. Implementation

Implementation of the stated objectives is accomplished by identifying significant exposure pathways, establishing baseline radiological data of media within those pathways, and monitoring those media during plant operation to assess plant effects (if any) on man and the environment.

In order to achieve the stated objectives, the current programs include the following analyses on samples collected:

1. Concentrations of beta emitters in drinking (potable) water, and air particulates.

2. Concentrations of gamma emitters in surface and drinking (potable) water, air particulates, milk, fish, and sediment.

3. Concentrations of tritium in surface and drinking (potable) water.

4. Concentrations of I-131 in air and milk.

5. Ambient gamma radiation levels at various site environs.

III. Program Description

A. Sample Collection

This section describes the collection methods used to obtain environmental samples for the PBAPS REMP in 1995. Samples for the PBAPS REMP were collected for PECO by Normandeau Associates, RMC Environmental Services Division. (RMC). Sample locations and descriptions can be found in Table B-1 and Figures B-1 through B-3, Appendix B.

Aquatic Environment

The aquatic environment was examined by analyzing samples of surface water, drinking water, fish, and sediment. Surface water from two locations (1LL and 1MM) were collected weekly by automatic sampling equipment. Drinking water from two locations (4L and 6I) were collected weekly from a tank at each location Both surface and drinking water samples were each composited into separate monthly sample for analysis. Two quarts of water are removed from the tank each week and placed into a clean two-gallon polyethylene bottle to form a monthly composite. Control locations were 1LL and 6I.

Fish samples comprising the flesh from two groups, catfish (bottom feeder) and smallmouth bass, largemouth bass, or bass (predator) were collected semiannually at two locations: 4 (indicator) and 6 (control) using several methods such as trapnet, seine or electroshocking.

Sediment samples composed of recently deposited substrate were collected semiannually at three locations: 4J, 4T (indicators), and 6F (control) using one of two methods, determined by the depth from which the sediment was obtained. In water greater than 4 feet deep, sediment was collected by either a Ponar or Ekman Grab with a surface area of 81 square inches. In shallow water (1-4 feet), sediment was collected by scooping up mud with a plastic bucket.

Atmospheric Environment

The atmospheric environment was examined by analyzing airborne and terrestrial samples. These consisted of air particulates, airborne iodine, and milk. Air particulate and air iodine samples were collected and analyzed weekly from five locations (1B, 1Z, 2, 3A, and 22G1). The control location was 22G1. Air samples were obtained using a vacuum sampler, glass fiber and charcoal filters, respectively. The filters were replaced weekly and sent to the laboratory for analysis. The vacuum samplers were run continuously at approximately 1 cubic foot per minute.

Milk samples were collected from five locations (A, G, J, N, and O) monthly from December through March and biweekly April through November. Additionally, samples from six locations (B, C, D, E, L, and P) were collected quarterly. Locations A, B, C, and E were controls. Milk samples were obtained by removing two gallons from the dairyman's bulk tank after mixing. The sample from each location was therefore a composite of all the milk collected from the dairy herd (from 1 to 3 milkings). The milk was scooped from the agitated bulk tank and placed in new plastic containers.

Ambient Gamma Radiation

Direct radiation measurements were made using Panasonic 801 calcium sulfate ($CaSO_4$) thermoluminescent dosimeters (TLD). The TLD locations were placed on and around the LGS site as follows:

A site boundary ring consisting of thirteen locations (1L, 1A, 2, 1I, 1C, 1J, 1F, 40, 1NN, 1H, 1G, 1B, and 1E) near and within the site perimeter representing fencepost doses (i.e., at locations where the doses will be potentially greater than maximum annual off-site doses) from LGS release.

An intermediate distance ring consisting of nineteen locations (15, 22, 44, 32, 45, 14, 17, 31A, 4K, 23, 27, 48, 3A, 49, 50, 51, 26, 6B, and 42) extending to approximately 5 miles from the site designed to measure possible exposures to close-in population.

The balance of eight locations (43, 5, 16, 24, 46, 47, 18, and 19) representing control and special interests areas such as population centers, schools, etc.

The specific TLD locations were determined by the following criteria:

1. The presence of relatively dense population;

2. Site meteorological data taking into account distance and elevation for each of the 36 ten-degree sectors around the site, where estimated annual dose from PBAPS, if any, would be more significant;

3. On hills free from local obstructions and within sight of the vents (where practical);

4. Near the dwelling closest to the main stack in the prevailing down wind direction.

A TLD set was placed at each location in a locked formica "birdhouse" or polyethylene jar located approximately six feet above ground level. The TLD sets were exchanged monthly and quarterly, then sent to the laboratory for analysis.

B. Data Interpretation

Several factors are important in the interpretation of the data. These factors are discussed here to avoid undue repetition in the discussion of the results.

1. Minimum Detectable Level and Minimum Detectable Activity

The minimum detectable level (MDL) was defined as the smallest concentration of radioactive material in a sample that would yield a net count (above background) that would be detected with only a 5% probability of falsely concluding that a blank observation represents a "real" signal. The MDL was intended as a before the fact estimate of a system (including instrumentation, procedure and sample type) and not as an after the fact criteria for the presence of activity. All analyses were designed to achieve the required PBAPS detection capabilities for environmental sample analysis.

The minimum detectable activity (MDA) is defined above with the exception that the measurement is an after the fact estimate of the presence of activity.

2. Net Activity Calculation and Reporting of Results

Net activity for a sample was calculated by subtracting background activity from the sample activity. Since the REMP measures extremely small changes in radioactivity in the environment, background variations will result in sample activity being lower than the background activity effecting a negative number. For a more detailed description of the results calculation, see Appendix E.

Data reported in this report were generated using the convention of rounding the result to the same number of significant places as the first significant digit in the error term (i.e., 3.62 ± 1.23 rounds to 4 ± 1; 10.93 ± 0.96 rounds to 10.9 ± 1.0; -0.01 ± 0.1 rounds to 0.0 ± 0.1). Results for each type of sample were grouped according to the analyses performed. For gamma analyses, at least those nuclides required for each sample media and nuclides which had a significant positive occurrence were reported. Means and standard deviations of these results were calculated. These standard deviations represent the variability of measured results for different samples rather than single analysis uncertainty.

C. Program Exceptions

For 1995 the PBAPS REMP had a sample collection recovery rate of better than 99%. The exceptions to this program are listed below:

1. Air particulate and air iodine samples from location 1B were not available for week 36 (09/01/95 - 09/08/95) due to a combination electrical and mechanical problems.

2. Surface water sampler at location 1MM was out of service for the following dates: 03/08/95 to 03/20/95, 10/26/95 to 10/27/95, and 12/13/95 to 01/03/96 due to pump electrical, flow or weather problems. Daily grab samples were taken.

3. Surface water sampler at location 1LL was out of service for the following dates: 12/21/95 to 01/03/96 due to weather problems. Daily grab samples were taken.

4. The fourth quarter TLD from location 19 was found on the ground and its holder destroyed by vandalism. The TLD was not read.

5. Milk farm N went out of business beginning with the October 9, 1995 sampling. Farm G was substituted for the QC program.

Each program exception was reviewed to understand the causes of the program exception. Sampling and maintenance errors were reviewed with the personnel involved to prevent a recurrence. Occasional equipment breakdowns and power outages were unavoidable. The overall sample recovery rate indicates that the appropriate procedures and equipment are in place to assure reliable program implementation.

D. Program Changes

The following are the changes for the 1995 PBAPS REMP:

1. GPU Nuclear became the Primary Analytical Contract Laboratory, replacing Teledyne Brown Engineering (TBE). TBE replaced PSE&G as the QC Laboratory.

2. Surface Water:

   Gross beta analyses were discontinued on all samples.

3. Drinking Water:

   Iodine-131 analysis was discontinued.

4. Air Particulate and Air Iodine:

   The sampling program was reduced from seventeen locations to five locations. The Limerick Generating Station air particulate and air iodine station (22G1) was added to the REMP as a control location.

5. TLD:

   The program was changed from forty-seven TLD locations to forty. The monthly frequency was discontinued. The quarterly sampling frequency was maintained.

IV. Results and Discussion

A. Aquatic Environment

1. Surface Water

Samples were collected from two locations monthly (1LL and 1MM). 1LL served as the control location. The following analyses were performed.

Tritium

Samples from both locations were analyzed for concentrations of tritium (Table C-I.1, Appendix C). Results ranged from 70 to 140 pCi/1 and averaged 100 pCi/l at each location. The concentrations found were lower than those observed during the preoperational period.

Gamma Spectrometry

Samples from both locations were analyzed for concentrations of gamma emitters (Table C-I.2, Appendix C). Statistically significant activity for naturally occurring K-40 was found in 1 of 24 samples. Potassium-40 results ranged from -3 to 35 pCi/l. No statistically significant fission or activation products were found.

2. Drinking (Potable) Water

Samples were collected from two locations monthly (4L and 6I). 6I served as the control location. The following analyses were performed.

Gross Beta

Samples from both locations were analyzed for concentrations of gross beta activity in insoluble and soluble fractions (Tables C-II.1 and C-II.2 and Figures C-1 and C-2, Appendix C). Gross beta activity in the insoluble fraction ranged from -0.9 to 1.4 pCi/1. The values in the soluble fraction ranged from 1 to 4 pCi/1. No differences were observed between the means of the control and indicator stations. The values were generally below those seen in the preoperational period.

Tritium

Samples from both locations were analyzed for tritium concentration quarterly (Table C-II.3, Appendix C). The values for the indicator location (4L) ranged from 60 to 150 pCi/1 with a mean of 100 pCi/1. Control location (6I) values ranged from -10 to 170 pCi/1 with a mean of 60 pCi/1. The concentrations found were lower than those observed during the preoperational period.

Gamma Spectrometry

Samples from both locations were analyzed for concentrations of gamma emitters (Table C-II.4, Appendix C). No statistically significant activity was found for all nuclides searched for.

3. Fish

Samples were collected from two locations semi-annually (4 and 6). The control location was 6. The following analyses were performed.

Gamma Spectrometry

Statistically significant activity was observed only for the nuclide K-40 which ranged from 2400 to 4000 pCi/kg (wet) (Table C-III.1, Appendix C). No statistically significant fission or activation products were found. Figure C-3 illustrates the Cs-137 activity for indicator and control locations from the beginning of the operational period through the present.

4. Sediment

Samples were collected from three locations semi-annually (4J, 4T and 6F). The control location was 6F. The following analyses were performed.

Gamma Spectrometry

Samples from all locations were analyzed for concentrations of gamma emitters (Table C-IV.1, Appendix C). Statistically significant activity for Be-7, K-40, Ra-226 and Th-228 was found at all locations. K-40 results ranged from 12,000 to 22,000 pCi/kg (dry).

Statistically significant activity for the Plant produced nuclides Co-60 were found in both samples from the indicator location 4J located downstream of the discharge. The results ranged from 0 to 40 pCi/kg (dry) for the indicator locations and 2 to 10 pCi/kg (dry) for the control location. Statistically significant activity from Cs-137 was found at all locations with a mean value of 230 pCi/kg (dry) for the indicator locations and 200 pCi/kg (dry) for the control location. The calculated dose from this pathway to a teenager's skin was 1.37 E-03 mrem/yr. This value is based upon the assumption the maximum concentrations of Co-60 and Cs-137 at the downstream location (4J) were present the entire year. This dose represents less than 0.01% of the allowable fraction of 10 CFR 50, Appendix I limits. The results were consistent with those from previous years. Figure C-4, Appendix C illustrates the comparison of activities of Cs-137 detected at the control location and indicator locations from the preoperational period through the present.

B. Atmospheric Environment

1. Airborne

a. Air Particulates

Samples were collected from five locations (1B, 1Z, 2, 3A, and 22G1). Control location was 22G1. The following analyses were performed.

Gross Beta

Samples from all locations were analyzed for concentrations of gross beta (Tables C-V.1 and C-V.2 and Figures C-5 and C-6, Appendix C). Air particulate locations were divided into three groups: Group I, consisting of 1B, 1Z, and 2, located on site at PBAPS; Group II, comprised of 3A, located at an intermediate distance from PBAPS; and Group III, consisting of 22G1, located at a remote distance from PBAPS. Comparison of results among these three groups aids in determining the effects, if any, resulting from the operation of PBAPS. The results from site location samples ranged from 4 to 30 E-3 pCi/m^3, with a mean of 17 E-3 pCi/m^3. The results from intermediate distance location ranged from 5 to 27 E-3 pCi/m^3, with a mean of 16 E-3 pCi/m^3. The results from the distant location ranged from 5 to 24 E-3 pCi/m^3, with a mean of 15 E-3 pCi/m^3. Comparison of the values indicate no notable difference among the three groups suggesting no effects from operation of PBAPS (Figure C-5, Appendix C).

Gamma Spectrometry

Weekly samples from five locations (1B, 1Z, 2, 3A, and 22G1) were composited and analyzed quarterly for the presence of gamma emitters (Table C-V.3). Naturally occurring Be-7 was found in all samples with activity values similar to those from the preoperational years. No statistically significant activation or fission products were detected.

b. Airborne Iodine

Continuous air samples were collected weekly at five locations (1B, 1Z, 2, 3A, and 22G1) and analyzed for I-131 (Table C-VI.1, Appendix C). No statistically significant I-131 was found.

2. Terrestrial

a. Milk

Samples were collected from eleven locations (A, B, C, D, E, G, J, L, N, 0 and P). Farms A, B, C, and E were control locations. The following analyses were performed.

Iodine-131

Samples from all locations were analyzed for concentrations of I-131 (Tables C-VII.1, Appendix C). All results were less than the minimum detectable level and ranged from -0.3 to 0.2 pCi/l.

Gamma Spectrometry

Samples from five locations were analyzed quarterly for concentrations for gamma emitters (Table C-VII.2 and Figure C-7, Appendix C). Naturally occurring K-40 was found in all samples with values ranging from 1,300 to 1,500 pCi/l. All other nuclides searched for were less than the minimum detectable activity.

C. Ambient Gamma Radiation

Ambient gamma radiation levels were measured quarterly at forty locations (as described in the program description section) using Panasonic 801 ($CaSO_4$) thermoluminescent dosimeters (Tables C-VIII.1 through C-VIII.3 and Figures C-8 and C-9, Appendix C). All TLD readings were below 10 mR/std. month with a range of 3.3 to 7.0 mR/std. month.

V. References

1. Preoperational Environs Radioactivity Survey Summary Report, March, 1960 through January, 1966. (September 1967).

2. Interex Corporation, Peach Bottom Atomic Power Station Regional Environs Radiation Monitoring Program Preoperational Summary Report, Units 2 and 3, 5 February 1966 through 8 August 1973, June 1977, Natick, Massachusetts.

3. Radiation Management Corporation Publication, Peach Bottom Atomic Power Station Preoperational Radiological Monitoring Report for Unit 2 and 3, January, 1974, Philadelphia, Pennsylvania.

APPENDIX A

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT SUMMARY

APPENDIX A
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY

NAME OF FACILITY: PEACH BOTTOM ATOMIC POWER STATION DOCKET NO.: 50-277 & 50-278
LOCATION OF FACILITY: YORK COUNTY, PA REPORTING PERIOD: 1995

MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	TYPE OF ANALYSES PERFORMED	NUMBER OF ANALYSES PERFORMED	REQUIRED MINIMUM DETECTABLE LEVEL (MDL)	INDICATOR LOCATIONS MEAN (F) RANGE	CONTROL LOCATIONS MEAN (F) RANGE	LOCATION WITH HIGHEST ANNUAL MEAN: MEAN (F) RANGE	LOCATION WITH HIGHEST ANNUAL MEAN: STATION # NAME DISTANCE & DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
SURFACE WATER (PCI/LITER)	TRITIUM	8	1200	100 (4/4) (70/140)	100 (4/4) (70/120)	100 (4/4) (70/140)	1MM (INDICATOR) CANAL DISCHARGE 1.04 MILES SE OF SITE	0
	GAMMA	24						
	K-40		N/A	18 (12/12) (-3/35)	15 (12/12) (-3/25)	18 (12/12) (-3/35)	1MM (INDICATOR) CANAL DISCHARGE 1.04 MILES SE OF SITE	0
	MN-54		9	-0.2 (12/12) (-1.4/0.8)	-0.1 (12/12) (-1.1/0.6)	-0.1 (12/12) (-1.1/0.6)	1LL (CONTROL) UNITS 2 & 3 INTAKE 0.24 MILES ENE OF SITE	0
	CO-58		9	-0.5 (12/12) (-1.6/0.2)	-0.3 (12/12) (-1.4/0.9)	-0.3 (12/12) (-1.4/0.9)	1LL (CONTROL) UNITS 2 & 3 INTAKE 0.24 MILES ENE OF SITE	0
	FE-59		18	1 (12/12) (-1/4)	0 (12/12) (-2/2)	1 (12/12) (-1/4)	1MM (INDICATOR) CANAL DISCHARGE 1.04 MILES SE OF SITE	0
	CO-60		9	-0.1 (12/12) (-0.8/0.4)	-0.1 (12/12) (-0.5/0.8)	-0.1 (12/12) (-0.5/0.8)	1LL (CONTROL) UNITS 2 & 3 INTAKE 0.24 MILES ENE OF SITE	0
	ZN-65		18	-4 (12/12) (-9/0)	-3 (12/12) (-7/3)	-3 (12/12) (-7/3)	1LL (CONTROL) UNITS 2 & 3 INTAKE 0.24 MILES ENE OF SITE	0
	ZR-95		9	0 (12/12) (-1/1)	0 (12/12) (-2/1)	0 (12/12) (-1/1)	1MM (INDICATOR) CANAL DISCHARGE 1.04 MILES SE OF SITE	0
	NB-95		9	0.4 (12/12) (-2.2/3.1)	0.4 (12/12) (-0.5/1.8)	0.4 (12/12) (-0.5/1.8)	1LL (CONTROL) UNITS 2 & 3 INTAKE 0.24 MILES ENE OF SITE	0

FRACTION OF DETECTABLE MEASUREMENTS AT SPECIFIED LOCATIONS IS INDICATED IN PARENTHESES (F).

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NAME OF FACILITY: PEACH BOTTOM ATOMIC POWER STATION — DOCKET NO.: 50-277 & 50-278
LOCATION OF FACILITY: YORK COUNTY, PA — REPORTING PERIOD: 1995

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	CS-134		9	-1.7 (12/12) (-7.3/0.5)	-1.7 (12/12) (-6.7/0.9)	-1.7 (12/13) (-6.7/0.9)	1LL (CONTROL) UNITS 2 & 3 INTAKE 0.24 MILES ENE OF SITE	0
	CS-137		11	-0.3 (12/12) (-1.7/0.4)	0.0 (12/12) (-0.6/1.3)	0.0 (12/12) (-0.6/1.3)	1LL (CONTROL) UNITS 2 & 3 INTAKE 0.24 MILES ENE OF SITE	0
	BA-140		9	-1 (12/12) (-5/2)	-1 (12/12) (-4/5)	-1 (12/12) (-5/2)	1MM (INDICATOR) CANAL DISCHARGE 1.04 MILES SE OF SITE	0
	LA-140		9	-1 (12/12) (-5/2)	-0.1 (12/12) (-1.0/0.9)	-0.1 (12/12) (-1.0/0.9)	1LL (CONTROL) UNITS 2 & 3 INTAKE 0.24 MILES ENE OF SITE	0
DRINKING WATER (PCI/LITER)	GROSS BETA SOLUBLE	24	2.5	2.2 (12/12) (1.0/4.2)	2.4 (12/12) (0.8/4.5)	2.4 (12/12) (0.8/4.5)	6I (CONTROL) HOLTWOOD STATION INTAKE 5.74 MILES NW OF SITE	0
	GROSS BETA INSOLUBLE	24	2.5	0.2 (12/12) (-0.9/1.4)	0.3 (12/12) (-0.7/1.2)	0.3 (12/12) (-0.7/1.2)	6I (CONTROL) HOLTWOOD STATION INTAKE 5.74 MILES NW OF SITE	0
	TRITIUM	8	1200	100 (4/4) (60/150)	60 (4/4) (-10/170)	100 (4/4) (60/150)	4L (INDICATOR) CONOWINGO DAM EL 33FT. COMPOS 8.66 MILES SE OF SITE	0
	GAMMA	24						
	K-40		N/A	17 (12/12) (-20/38)	12 (12/12) (-6/31)	17 (12/12) (-20/38)	4L (INDICATOR) CONOWINGO DAM EL 33FT. COMPOS 8.66 MILES SE OF SITE	0
	MN-54		9	-0.2 (12/12) (-0.7/0.3)	-0.3 (12/12) (-2.2/0.5)	-0.2 (12/12) (-0.7/0.3)	4L (INDICATOR) CONOWINGO DAM EL 33FT. COMPOS 8.66 MILES SE OF SITE	0

FRACTION OF DETECTABLE MEASUREMENTS AT SPECIFIED LOCATIONS IS INDICATED IN PARENTHESES (F).

APPENDIX A
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY

NAME OF FACILITY: PEACH BOTTOM ATOMIC POWER STATION — DOCKET NO.: 50-277 & 50-278
LOCATION OF FACILITY: YORK COUNTY, PA — REPORTING PERIOD: 1995

MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	TYPE OF ANALYSES PERFORMED	NUMBER OF ANALYSES PERFORMED	REQUIRED MINIMUM DETECTABLE LEVEL (MDL)	INDICATOR LOCATIONS MEAN (F) RANGE	CONTROL LOCATIONS MEAN (F) RANGE	LOCATION WITH HIGHEST ANNUAL MEAN: MEAN (F) RANGE	LOCATION WITH HIGHEST ANNUAL MEAN: STATION # NAME DISTANCE & DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
	CO-58		9	-0.1 (12/12) (-0.9/0.7)	-0.1 (12/12) (-0.7/0.7)	-0.1 (12/12) (-0.9/0.7)	4L (INDICATOR) CONOWINGO DAM EL 33FT. COMPOS 8.66 MILES SE OF SITE	0
	FE-59		18	0 (12/12) (-1/3)	0 (12/12) (-2/2)	0 (12/12) (-2/2)	6I (CONTROL) HOLTWOOD STATION INTAKE 5.74 MILES NW OF SITE	0
	CO-60		9	0.1 (12/12) (-2.0/1.5)	0.3 (12/12) (-1.0/2.3)	0.3 (12/12) (-1.0/2.3)	6I (CONTROL) HOLTWOOD STATION INTAKE 5.74 MILES NW OF SITE	0
	ZN-65		18	-3 (12/12) (-5/2)	-2 (12/12) (-6/1)	-2 (12/12) (-6/1)	6I (CONTROL) HOLTWOOD STATION INTAKE 5.74 MILES NW OF SITE	0
	ZR-95		9	0 (12/12) (0/1)	1 (12/12) (-1/3)	1 (12/12) (-1/3)	6I (CONTROL) HOLTWOOD STATION INTAKE 5.74 MILES NW OF SITE	0
	NB-95		9	0.4 (12/12) (-1.3/3.9)	0.5 (12/12) (-0.5/2.2)	0.5 (12/12) (-0.5/2.2)	6I (CONTROL) HOLTWOOD STATION INTAKE 5.74 MILES NW OF SITE	0
	CS-134		9	-2.0 (12/12) (-8.8/0.5)	-1.7 (12/12) (-7.0/1.4)	-1.7 (12/12) (-7.0/1.4)	6I (CONTROL) HOLTWOOD STATION INTAKE 5.74 MILES NW OF SITE	0
	CS-137		11	0.0 (12/12) (-0.4/1.0)	-0.1 (12/12) (-0.7/0.7)	0.0 (12/12) (-0.4/1.0)	4L (INDICATOR) CONOWINGO DAM EL 33FT. COMPOS 8.66 MILES SE OF SITE	0
	BA-140		9	1 (12/12) (-4/4)	1 (12/12) (-2/3)	1 (12/12) (-2/3)	6I (CONTROL) HOLTWOOD STATION INTAKE 5.74 MILES NW OF SITE	0
	LA-140		9	0.1 (12/12) (-1.2/1.9)	0.1 (12/12) (-1.2/1.0)	0.1 (12/12) (-1.2/1.0)	6I (CONTROL) HOLTWOOD STATION INTAKE 5.74 MILES NW OF SITE	0

FRACTION OF DETECTABLE MEASUREMENTS AT SPECIFIED LOCATIONS IS INDICATED IN PARENTHESES (F).

APPENDIX A
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY

NAME OF FACILITY: PEACH BOTTOM ATOMIC POWER STATION DOCKET NO.: 50-277 & 50-278
LOCATION OF FACILITY: YORK COUNTY, PA REPORTING PERIOD: 1995

MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	TYPE OF ANALYSES PERFORMED	NUMBER OF ANALYSES PERFORMED	REQUIRED MINIMUM DETECTABLE LEVEL (MDL)	INDICATOR LOCATIONS MEAN (F) RANGE	CONTROL LOCATIONS MEAN (F) RANGE	LOCATION WITH HIGHEST ANNUAL MEAN MEAN (F) RANGE	STATION # NAME DISTANCE & DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
PREDATOR (FISH) (PCI/KG WET)	GAMMA	4						
	K-40		N/A	3700 (2/2) (3300/4000)	3500 (2/2) (3400/3600)	3700 (2/2) (3300/4000)	4 (INDICATOR) CONOWINGO POND BELOW DISCHARG CONOWINGO POND - BELOW DISCHA	0
	MN-54		80	0 (2/2) (-2/2)	1 (2/2) (-1/3)	1 (2/2) (-1/3)	6 (CONTROL) HOLTWOOD POND HOLTWOOD POND	0
	CO-58		80	-1 (2/2) (-3/0)	-1 (2/2) (-3/0)	-1 (2/2) (-3/0)	6 (CONTROL) HOLTWOOD POND HOLTWOOD POND	0
	FE-59		160	-1 (2/2) (-3/2)	0 (2/2) (0/10)	0 (2/2) (0/10)	6 (CONTROL) HOLTWOOD POND HOLTWOOD POND	0
	CO-60		80	1 (2/2) (0/2)	4 (2/2) (2/7)	4 (2/2) (2/7)	6 (CONTROL) HOLTWOOD POND HOLTWOOD POND	0
	ZN-65		160	-10 (2/2) (-20/0)	-30 (2/2) (-30/-20)	-10 (2/2) (-20/0)	4 (INDICATOR) CONOWINGO POND BELOW DISCHARG CONOWINGO POND - BELOW DISCHA	0
	CS-134		90	-5 (2/2) (-10/0)	2 (2/2) (2/2)	2 (2/2) (2/2)	6 (CONTROL) HOLTWOOD POND HOLTWOOD POND	0
	CS-137		90	3 (2/2) (3/3)	0 (2/2) (-4/4)	3 (2/2) (3/3)	4 (INDICATOR) CONOWINGO POND BELOW DISCHARG CONOWINGO POND - BELOW DISCHA	0
BOTTOM FEEDER (FISH) (PCI/KG WET)	GAMMA	4						
	K-40		N/A	2800 (2/2) (2500/3100)	2700 (2/2) (2400/2900)	2800 (2/2) (2500/3100)	4 (INDICATOR) CONOWINGO POND BELOW DISCHARG CONOWINGO POND - BELOW DISCHA	0

FRACTION OF DETECTABLE MEASUREMENTS AT SPECIFIED LOCATIONS IS INDICATED IN PARENTHESES (F).

NAME OF FACILITY: PEACH BOTTOM ATOMIC POWER STATION
LOCATION OF FACILITY: YORK COUNTY, PA

DOCKET NO.: 50-277 & 50-278
REPORTING PERIOD: 1995

MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	TYPE OF ANALYSES PERFORMED	NUMBER OF ANALYSES PERFORMED	REQUIRED MINIMUM DETECTABLE LEVEL (MDL)	INDICATOR LOCATIONS MEAN (F) RANGE	CONTROL LOCATIONS MEAN (F) RANGE	LOCATION WITH HIGHEST ANNUAL MEAN: MEAN (F) RANGE	LOCATION WITH HIGHEST ANNUAL MEAN: STATION # NAME DISTANCE & DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
	MN-54		80	1 (2/2) (0/1)	-1 (2/2) (-3/1)	1 (2/2) (0/1)	4 (INDICATOR) CONOWINGO POND BELOW DISCHARG CONOWINGO POND - BELOW DISCHA	0
	CO-58		80	-4 (2/2) (-4/-3)	0 (2/2) (0/0)	0 (2/2) (0/0)	6 (CONTROL) HOLTWOOD POND HOLTWOOD POND	0
	FE-59		160	10 (2/2) (0/10)	0 (2/2) (0/10)	10 (2/2) (0/10)	4 (INDICATOR) CONOWINGO POND BELOW DISCHARG CONOWINGO POND - BELOW DISCHA	0
	CO-60		80	-1 (2/2) (-1/-1)	0 (2/3) (-1/0)	0 (2/2) (-1/0)	6 (CONTROL) HOLTWOOD POND HOLTWOOD POND	0
	ZN-65		160	0 (2/2) (-10/0)	-10 (2/2) (-20/-10)	0 (2/2) (-10/0)	4 (INDICATOR) CONOWINGO POND BELOW DISCHARG CONOWINGO POND - BELOW DISCHA	0
	CS-134		90	4 (2/2) (3/4)	-18 (2/2) (-21/-15)	4 (2/2) (3/4)	4 (INDICATOR) CONOWINGO POND BELOW DISCHARG CONOWINGO POND - BELOW DISCHA	0
	CS-137		90	2 (2/2) (1/3)	6 (2/2) (4/8)	6 (2/2) (1/8)	6 (CONTROL) HOLTWOOD POND HOLTWOOD POND	0
SILT (PCI/KG DRY)	GAMMA BE-7	6	N/A	210 (4/4) (-50/670)	170 (2/2) (-10/350)	400 (2/2) (200/700)	4T (INDICATOR) CONOWINGO POND NEAR CONOWINGO 7.92 MILES SE OF SITE	0
	K-40		N/A	18000 (4/4) (12000/22000)	13000 (2/2) (11000/14000)	22000 (2/2) (21000/22000)	4T (INDICATOR) CONOWINGO POND NEAR CONOWINGO 7.92 MILES SE OF SITE	0

FRACTION OF DETECTABLE MEASUREMENTS AT SPECIFIED LOCATIONS IS INDICATED IN PARENTHESES (F).

APPENDIX A
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY

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DOCKET NO.: 50-277 & 50-278
REPORTING PERIOD: 1995

MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	TYPE OF ANALYSES PERFORMED	NUMBER OF ANALYSES PERFORMED	REQUIRED MINIMUM DETECTABLE LEVEL (MDL)	INDICATOR LOCATIONS MEAN (F) RANGE	CONTROL LOCATIONS MEAN (F) RANGE	LOCATION WITH HIGHEST ANNUAL MEAN: MEAN (F) RANGE	LOCATION WITH HIGHEST ANNUAL MEAN: STATION # NAME DISTANCE & DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
	CO-60		N/A	20 (4/4) (0/40)	4 (2/2) (2/6)	30 (2/2) (20/40)	4J (INDICATOR) CONOWINGO POND NET TRAP 15 1.39 MILES SE OF SITE	0
	CS-134		100	6 (4/4) (3/10)	5 (2/2) (5/5)	6 (2/2) (3/10)	4J (INDICATOR) CONOWINGO POND NET TRAP 15 1.39 MILES SE OF SITE	0
	CS-137		100	230 (4/4) (100/360)	200 (2/2) (100/310)	230 (2/2) (100/360)	4J (INDICATOR) CONOWINGO POND NET TRAP 15 1.39 MILES SE OF SITE	0
	RA-226		N/A	2200 (4/4) (1300/2600)	2700 (2/2) (2100/3200)	2700 (2/2) (2100/3200)	6F (CONTROL) HOLTWOOD DAM EAST SHORE UPSTR 5.96 MILES NW OF SITE	0
	TH-232		N/A	1200 (4/4) (680/1500)	1240 (2/2) (870/1600)	1500 (2/2) (1400/1500)	4T (INDICATOR) CONOWINGO POND NEAR CONOWINGO 7.92 MILES SE OF SITE	0
AIR PARTICULATE (E-3 PCI/CU. METER)	GROSS BETA	259	6	17 (207/207) (4/30)	15 (52/52) (5/24)	17 (51/51) (4/30)	1B (INDICATOR) WEATHER STATION NO.2 0.49 MILES NW OF SITE	0
	GAMMA	20						
	BE-7		N/A	70 (16/16) (40/110)	70 (4/4) (50/90)	80 (4/4) (70/110)	2 (INDICATOR) SITE, 130 DEGREE SECTOR HILL 0.89 MILES SE OF SITE	0
	K-40		N/A	5 (16/16) (-11/21)	10 (4/4) (10/20)	10 (4/4) (10/20)	22G1 (CONTROL) MANOR SUBSTATION 30.79 MILES NE OF SITE	0
	CS-134		40	-0.2 (16/16) (-3.1/0.9)	-0.4 (4/4) (-0.7/-0.1)	0.2 (4/4) (-0.8/0.9)	1Z (INDICATOR) WEATHER STATION 1 0.26 MILES SE OF SITE	0

FRACTION OF DETECTABLE MEASUREMENTS AT SPECIFIED LOCATIONS IS INDICATED IN PARENTHESES (F).

APPENDIX A
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY

NAME OF FACILITY: PEACH BOTTOM ATOMIC POWER STATION DOCKET NO.: 50-277 & 50-278
LOCATION OF FACILITY: YORK COUNTY, PA REPORTING PERIOD: 1995

MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	TYPE OF ANALYSES PERFORMED	NUMBER OF ANALYSES PERFORMED	REQUIRED MINIMUM DETECTABLE LEVEL (MDL)	INDICATOR LOCATIONS MEAN (F) RANGE	CONTROL LOCATIONS MEAN (F) RANGE	LOCATION WITH HIGHEST ANNUAL MEAN: MEAN (F) RANGE	LOCATION WITH HIGHEST ANNUAL MEAN: STATION # NAME DISTANCE & DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
	CS-137		40	-0.3 (16/16) (-1.2/0.6)	0.1 (4/4) (-0.5/0.7)	0.1 (4/4) (-0.5/0.7)	22G1 (CONTROL) MANOR SUBSTATION 30.79 MILES NE OF SITE	0
	RA-226		N/A	10 (16/16) (-20/30)	20 (4/4) (10/30)	20 (4/4) (10/30)	22G1 (CONTROL) MANOR SUBSTATION 30.79 MILES NE OF SITE	0
	TH-232		N/A	0 (16/16) (-2/3)	0 (4/4) (-3/2)	1 (4/4) (-2/3)	1Z (INDICATOR) WEATHER STATION 1 0.26 MILES SE OF SITE	0
AIR IODINE (E-3 PCI/CU. METER)	I-131	259	40	0 (207/207) (-21/23)	0 (52/52) (-11/15)	1 (52/52) (-11/21)	1Z (INDICATOR) WEATHER STATION 1 0.26 MILES SE OF SITE	0
MILK (PCI/LITER)	I-131	124	0.6	0.0 (91/91) (-0.3/0.3)	0.0 (33/33) (-0.2/0.2)	0.1 (4/4) (0.0/0.2)	P (INDICATOR) INTERMEDIATE DISTANCE FARM P 2.08 MILES ENE OF SITE	0
	GAMMA K-40	19	N/A	1400 (15/15) (1300/1500)	1400 (4/4) (1300/1400)	1400 (4/4) (1300/1500)	G (INDICATOR) NEARBY FARM G 1.49 MILES SSW OF SITE	0
	CS-134		10	-3.6 (15/15) (-8.3/0.8)	-3.3 (4/4) (-5.2/1.0)	-3 (4/4) (-8/1)	O (INDICATOR) NEARBY FARM O 2.32 MILES SW OF SITE	0
	CS-137		10	0.3 (15/15) (-1.2/1.8)	0.5 (4/4) (-0.3/1.8)	1.0 (4/4) (0.2/1.8)	J (INDICATOR) NEARBY FARM J 0.97 MILES W OF SITE	0
	BA-140		9	-1 (15/15) (-4/3)	3 (4/4) (0/5)	3 (4/4) (0/5)	A (CONTROL) DISTANCE FARM A 5.78 MILES WSW OF SITE	0

FRACTION OF DETECTABLE MEASUREMENTS AT SPECIFIED LOCATIONS IS INDICATED IN PARENTHESES (F).

APPENDIX A
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY

NAME OF FACILITY: PEACH BOTTOM ATOMIC POWER STATION
LOCATION OF FACILITY: YORK COUNTY, PA

DOCKET NO.: 50-277 & 50-278
REPORTING PERIOD: 1995

MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	TYPE OF ANALYSES PERFORMED	NUMBER OF ANALYSES PERFORMED	REQUIRED MINIMUM DETECTABLE LEVEL (MDL)	INDICATOR LOCATIONS MEAN (F) RANGE	CONTROL LOCATIONS MEAN (F) RANGE	LOCATION WITH HIGHEST ANNUAL MEAN: MEAN (F) RANGE	LOCATION WITH HIGHEST ANNUAL MEAN: STATION # NAME DISTANCE & DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
	LA-140		9	0.2 (15/15) (-1.8/1.8)	1.0 (4/4) (0.1/2.3)	1 (4/4) (0/2)	O (INDICATOR) NEARBY FARM O 2.32 MILES SW OF SITE	0
DIRECT RADIATION (MILLI-ROENTGEN / STD. MONTH)	TLD-QUARTERLY	159	N/A	5.32 (144/144) (3.30-7.00)	5.26 (15/15) (4.00-6.00)	6.65 (4/4) (6.40-7.00)	50 (INDICATOR) TRANSCO PUMPING STATION 4.99 MILES W OF SITE	0

FRACTION OF DETECTABLE MEASUREMENTS AT SPECIFIED LOCATIONS IS INDICATED IN PARENTHESES (F).

APPENDIX B

SAMPLE DESIGNATION AND LOCATIONS

APPENDIX B: SAMPLE DESIGNATION AND LOCATIONS

LIST OF TABLES AND FIGURES

TABLES

FIGURES

TABLE B-1: Sample Collection and Analysis Program for the Radiological Environmental Monitoring Program for Peach Bottom Atomic Power Station, 1995

Location	Location Description	Distance & Direction from PBAPS Vents	Collection Method and Frequency	Analysis & Frequency Performed--Consultant
A. Surface Water				
1LL	Peach Bottom Units 2 and 3 Intake - Composite (Control)	0.24 miles NE	Water is continuously collected in a 190 gallon tank. Each week 2 quarts are withdrawn from the tank prior to draining the tank and placed in a 2 gallon polyethylene bottle to form a monthly composite sample	Gamma Spec - monthly - GPU Tritium - quarterly - GPU
1MM	Peach Bottom Canal Discharge -Composite	1.04 miles SE	Same as location 1LL	Same as location 1LL
B. Drinking (Potable) Water				
4L	Conowingo Dam EL 33' MSL - Composite	8.66 miles SE	Water is continuously sampled from a header which draws pond water from elevation 33' MSL and is collected in a 175 gallon tank. Each week 2 quarts are withdrawn from the tank prior to draining the tank and placed in a 2 gallon polyethylene bottle to form a monthly composite sample.	Gross Beta (S&I) - monthly - GPU Gamma Spec - monthly - GPU Tritium - quarterly - GPU Gross Beta (S&I)- monthly - TBE* Gamma Spec - monthly - TBE*
6I	Holtwood Dam Hydroelectric Station - Composite (Control)	5.75 miles NW	Water is continuously sampled from the Holtwood Hydroelectric Station Intake and is collected in a 175 gallon tank. Each week 2 quarts are withdrawn from the tank and placed in a 2 gallon polyethene bottle to form a monthly composite.	Same as location 4L

TABLE B-1: Sample Collection and Analysis Program for the Radiological Environmental Monitoring Program for Peach Bottom Atomic Power Station, 1995

Location	Location Description	Distance & Direction from PBAPS Vents	Collection Method and Frequency	Analysis & Frequency Performed--Consultant
C. Fish				
4	Conowingo Pond	Located in Conowingo Pond below the discharge	Fish from two groups representing predator and bottom feeder species collected by electrofishing or other fishery gear semiannually	Gamma Spec - semiannually - GPU
6	Holtwood Pond (Control)	Located in Holtwood Pond	Same as location 4	Same as location 4
D. Sediment				
4J	Conowingo Pond near Berkins Run	1.39 miles SE	Recently deposited sediment collected below the waterline, semi-annually	Gamma Spec - semiannually - GPU
4T	Conowingo Pond near Conowingo Dam	7.92 miles SE	Same as location 4D	Same as location 4D
6F	Holtwood Dam (Control)	5.96 miles NW	Same as location 4D	Same as location 4D
E. Air Particulate - Air Iodine				
1B	Weather Station #2	0.49 miles NW	About 1 cfm continuous flow through glass fiber and charcoal filters (approx. 2" diameter) which are installed for a week and replaced	Gross beta - weekly - GPU Gamma Spec - quarterly - GPU I-131 - weekly - GPU
1Z	Weather Station #1	0.26 miles SE	Same as location 1B	Same as location 1B
1A	Weather Station #1	0.26 miles SE	Same as location 1B	Gross beta - weekly - TBE* Gamma Spec - quarterly - TBE*

TABLE B-1: Sample Collection and Analysis Program for the Radiological Environmental Monitoring Program for Peach Bottom Atomic Power Station, 1995

Location	Location Description	Distance & Direction from PBAPS Vents	Collection Method and Frequency	Analysis & Frequency Performed--Consultant
2	On-site - 130° Sector Hill	0.88 miles SE	Same as location 1B	Same as location 1B
3A	Delta, PA - Substation	3.62 miles SW	Same as location 1B	Same as location 1B
22G1	Manor Substation	30.79 miles NE	Same as location 1B	Same as location 1B
<u>F. Milk</u>				
A	(Control)	5.78 miles WSW	Two gallon grab sample is collected at each farm from a bulk tank containing milk biweekly while cows are on pasture, monthly other times	I-131 - biweekly, monthly** - GPU Gamma Spec - quarterly - GPU I-131 - quarterly - TBE* Gamma Spec - quarterly - TBE*
B	(Control)	10.58 miles S	Same as Farm A	I-131 - quarterly - GPU
C	(Control)	9.54 miles NW	Same as Farm A	Same as Farm B
D		3.51 miles NE	Same as Farm A	Same as Farm B
E	(Control)	8.74 miles N	Same as Farm A	Same as Farm B
G		1.49 miles SSW	Same as Farm A	I-131 - biweekly, monthly** - GPU Gamma Spec - quarterly - GPU
J		0.97 miles W	Same as Farm A	Same as Farm A
L		2.12 miles NE	Same as Farm A	Same as Farm B
N		3.03 miles ESE	Same as Farm A	Same as Farm A
O		2.32 miles SW	Same as Farm A	Same as Farm B

TABLE B-1: Sample Collection and Analysis Program for the Radiological Environmental Monitoring Program for Peach Bottom Atomic Power Station, 1995

Location	Location Description	Distance & Direction from PBAPS Vents	Collection Method and Frequency	Analysis & Frequency Performed--Consultant
P		2.08 miles ENE	Same as Farm A	Same as Farm B

G. Environmental Dosimetry - TLD

Site Boundary

Location	Location Description	Distance & Direction from PBAPS Vents	Collection Method and Frequency	Analysis & Frequency Performed--Consultant
1L	Peach Bottom Unit 3 Intake	0.24 miles NE	Collection method and frequency is described in placement procedure Section III, A.	TLD - quarterly - GPU
1A	Weather Station #1	0.26 miles SE		
2	Peach Bottom 130° Sector Hill	0.88 miles SE		Same as location 1L
1I	Peach Bottom South Substation	0.54 miles SSE		Same as location 1L
1C	Peach Bottom South Substation	0.85 miles SSE		Same as location 1L
1J	Peach Bottom 180° Sector Hill	0.71 miles S		Same as location 1L
1F	Peach Bottom 200° Sector Hill	0.51 miles SSW		Same as location 1L
40	Peach Bottom Site Area	1.46 miles SW		Same as location 1L
1NN	Peach Bottom Site	0.48 miles WSW		Same as location 1L
1H	Peach Bottom 270° Sector Hill	0.59 miles W		Same as location 1L

TABLE B-1: Sample Collection and Analysis Program for the Radiological Environmental Monitoring Program for Peach Bottom Atomic Power Station, 1995

Location	Location Description	Distance & Direction from PBAPS Vents	Collection Method and Frequency	Analysis & Frequency Performed--Consultant
1G	Peach Bottom North Substation	0.60 miles WNW		Same as location 1L
1B	Weather Station #2	0.49 miles NW		Same as location 1L
1E	Peach Bottom 350° Sector Hill	0.59 miles NNW		Same as location 1L
<u>Intermediate Distance</u>				
15	Silver Spring Rd	3.68 miles N		Same as location 1L
22	Eagle Road	2.39 miles NNE		Same as location 1L
44	Goshen Mill Rd	5.07 miles NE		Same as location 1L
32	Slate Hill Rd	2.75 miles ENE		Same as location 1L
45	PB-Keeney Line	3.38 miles ENE		Same as location 1L
14	Peters Creek	1.97 miles ESE		Same as location 1L
17	Riverview Rd	4.07 miles ESE		Same as location 1L
31A	Eckman Rd	4.57 miles SE		Same as location 1L
4K	Conowing Dam Power House Roof	8.61 miles SE		Same as location 1L
23	Peach Bottom 150° Sector Hill	1.01 miles SSE		Same as location 1L
27	N. Cooper Road	2.68 miles S		Same as location 1L

TABLE B-1: Sample Collection and Analysis Program for the Radiological Environmental Monitoring Program for Peach Bottom Atomic Power Station, 1995

Location	Location Description	Distance & Direction from PBAPS Vents	Collection Method and Frequency	Analysis & Frequency Performed--Consultant
48	Macton Substation	4.99 miles SSW		Same as location 1L
3A	Delta, PA Substation	3.62 miles SW		Same as location 1L
49	PB-Conastone Line	4.05 miles WSW		Same as location 1L
50	TRANSCO Pumping Station	4.99 miles W		Same as location 1L
51	Fin Substation	3.98 miles WNW		Same as location 1L
26	Slab Road	4.23 miles NW		Same as location 1L
6B	Holtwood Dam Power House Roof	5.78 miles NW		Same as location 1L
42	Muddy Run Envir. Laboratory	4.13 miles NNW		Same as location 1L
Distant and Special Interest				
43	Drumore Township School	5.00 miles NNE		Same as location 1L
5	Wakefield, PA	4.64 miles E		Same as location 1L
16	Nottingham, PA Substation (Control)	12.72 miles E		Same as location 1L
24	Harrisville, MD Substation (Control)	10.91 miles ESE		Same as location 1L
46	Broad Creek	4.48 miles SSE		Same as location 1L

TABLE B-1: Sample Collection and Analysis Program for the Radiological Environmental Monitoring Program for Peach Bottom Atomic Power Station, 1995

Location	Location Description	Distance & Direction from PBAPS Vents	Collection Method and Frequency	Analysis & Frequency Performed--Consultant
47	Broad Creek Scout Camp	4.26 miles S		Same as location 1L
18	Fawn Grove, PA	9.86 miles W		Same as location 1L
19	Red Lion, PA (Control)	20.21 miles WNW		Same as location 1L

* QC Laboratory

** Monthly from December through March when cows are off pasture.

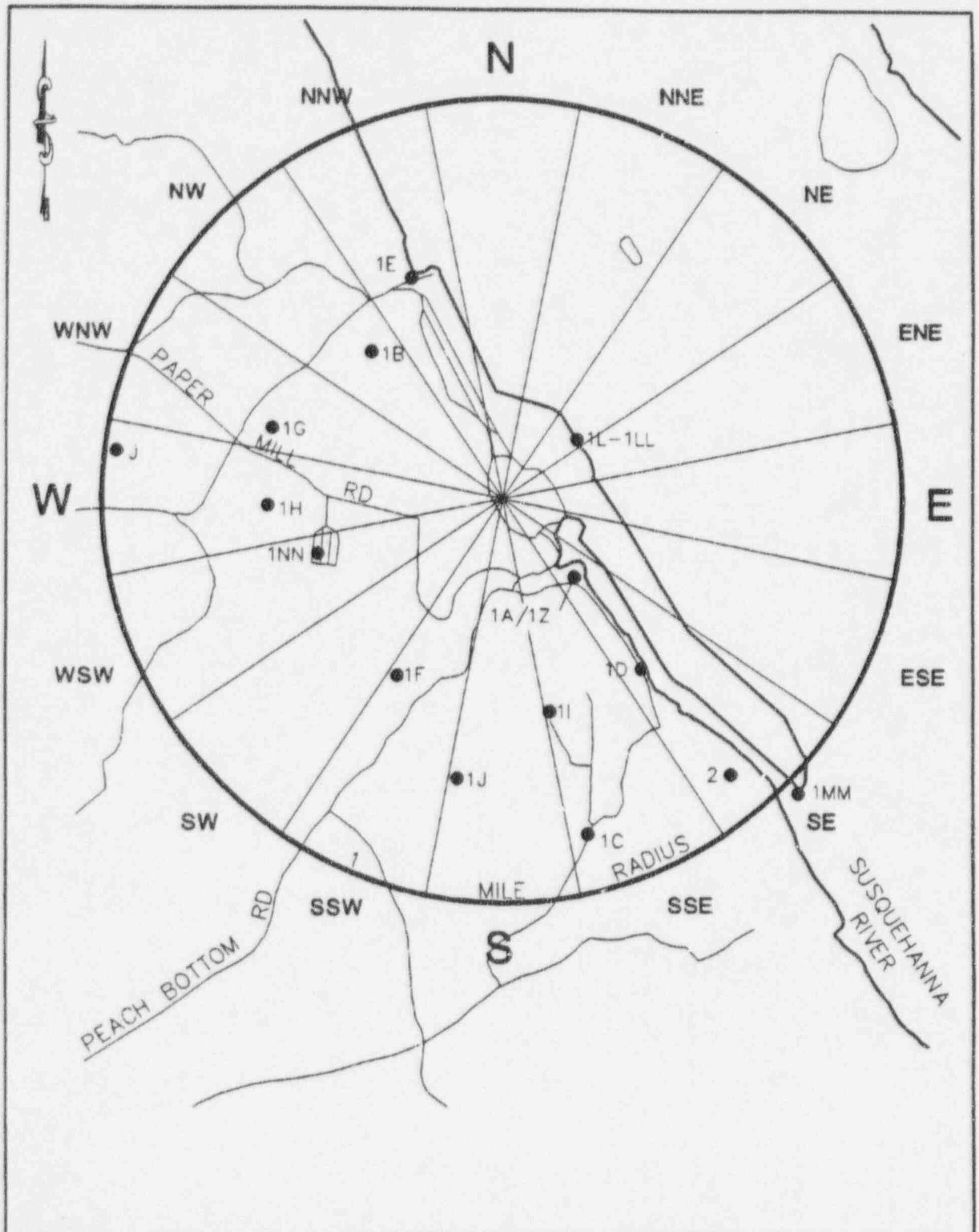


Figure B-1
Environmental Sampling Locations Within One
Mile of the Peach Bottom Atomic Power Station, 1995

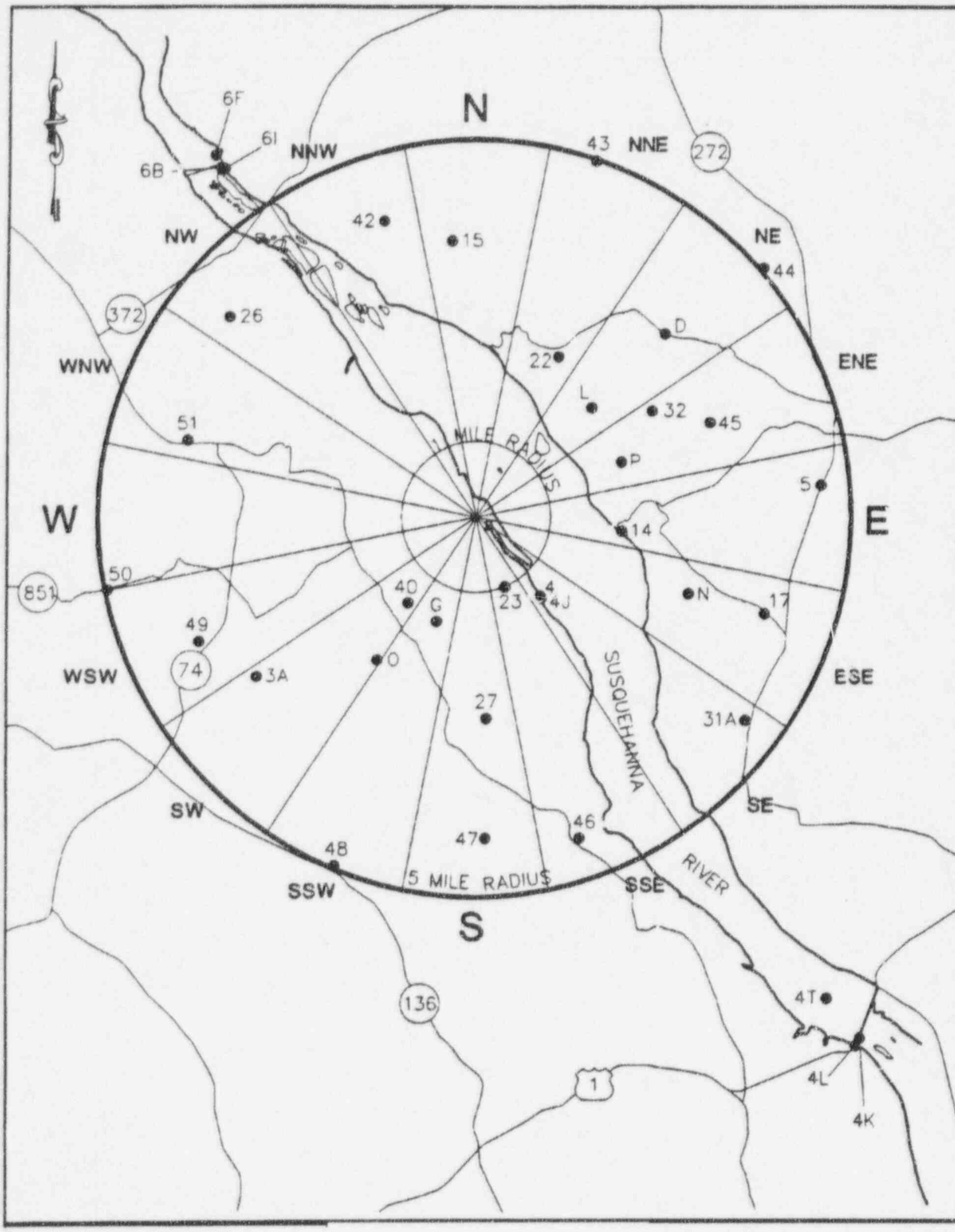


Figure B-2
Environmental Sampling Locations Between One and Approximately Five Miles from the Peach Bottom Atomic Power Station, 1995

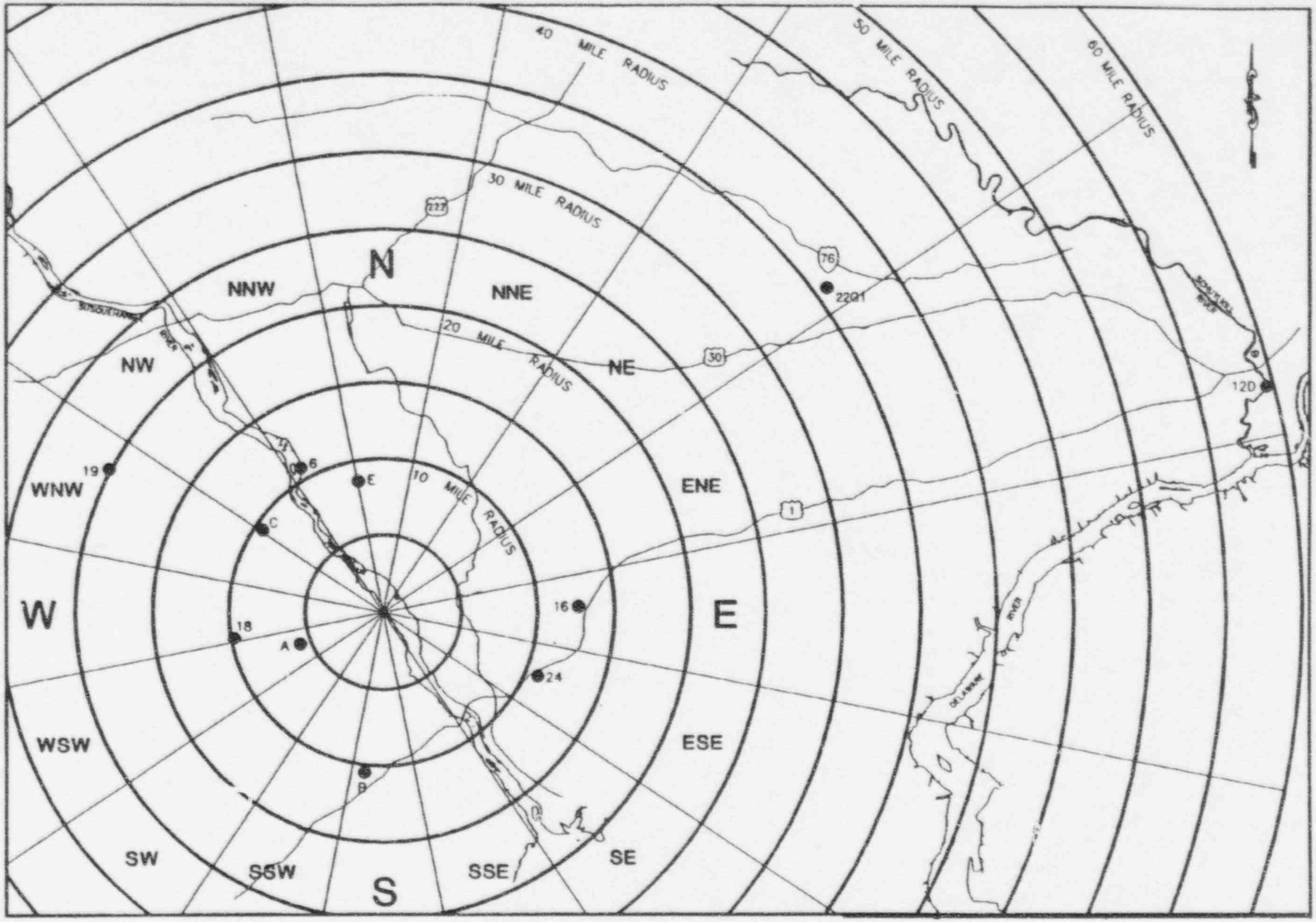


Figure B-3
Environmental Sampling Locations Greater Than
Five Miles from the Peach Bottom Atomic Power Station, 1995

APPENDIX C

DATA TABLES AND FIGURES
PRIMARY LABORATORY

APPENDIX C: DATA TABLES AND FIGURES - PRIMARY LABORATORY

TABLES

FIGURES

TABLE C-I.1 CONCENTRATIONS OF TRITIUM IN SURFACE WATER SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1995

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	1LL		1MM	
JAN-MAR 95	90	± 70	100	± 70
APR-JUN 95	70	± 70	80	± 70
JUL-SEP 95	110	± 70	140	± 70
OCT-DEC 95	120	± 70	70	± 70
MEAN	100	± 50	100	± 60

TABLE C-I.2 CONCENTRATIONS OF GAMMA EMITTERS IN SURFACE WATER SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1995

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

STC	COLLECTION PERIOD	K-40		MN-54		CO-58		FE-59		CO-60		ZN-65	
1LL	JAN 95	20	± 10	0.4	± 1.0	-0.8	± 0.9	0	± 2	-0.3	± 1.0	-4	± 2
	FEB 95	20	± 10	-0.1	± 0.7	0.1	± 0.6	0	± 1	0.1	± 0.7	-3	± 2
	MAR 95	23	± 8	-0.8	± 0.7	-0.5	± 0.7	0	± 1	0.3	± 0.7	0	± 2
	APR 95	20	± 10	-1	± 1	0.2	± 0.9	1	± 2	0.8	± 1.0	-4	± 2
	MAY 95	30	± 10	-0.5	± 0.9	-0.1	± 0.9	2	± 2	0	± 1	-1	± 2
	JUN 95	20	± 20	1	± 2	0	± 2	-2	± 4	-1	± 2	3	± 4
	JUL 95	20	± 10	0.5	± 0.9	0.9	± 0.9	1	± 2	-0.3	± 0.9	-1	± 2
	AUG 95	20	± 10	0.1	± 0.9	-0.6	± 0.8	-1	± 2	-0.1	± 0.8	-4	± 2
	SEP 95	21	± 9	-0.1	± 0.7	0.1	± 0.6	0	± 1	0.2	± 0.7	-2	± 1
	OCT 95	0	± 10	-0.5	± 0.7	-0.4	± 0.6	0	± 1	-0.2	± 0.7	-4	± 2
	NOV 95	0	± 10	-0.4	± 0.7	-0.4	± 0.6	0	± 1	-0.3	± 0.7	-7	± 2
	DEC 95	0	± 10	0.5	± 0.8	-1.4	± 0.9	2	± 2	-0.2	± 0.8	-6	± 2
	MEAN	15	± 21	-0.1	± 1.1	-0.3	± 1.1	0	± 2	-0.1	± 0.7	-3	± 5
1MM	JAN 95	20	± 20	-1	± 2	-1	± 2	1	± 3	0	± 2	-5	± 4
	FEB 95	20	± 10	-0.1	± 0.9	0.0	± 0.8	1	± 2	0.3	± 0.8	-5	± 2
	MAR 95	30	± 10	-0.4	± 0.9	-1.6	± 0.9	2	± 2	-0.8	± 0.9	0	± 2
	APR 95	20	± 10	0.0	± 0.8	-0.1	± 0.7	0	± 2	-0.2	± 0.7	-3	± 2
	MAY 95	20	± 10	0.5	± 0.8	0.0	± 0.7	1	± 1	-0.5	± 0.7	-2	± 2
	JUN 95	20	± 30	0	± 2	0	± 2	4	± 4	-1	± 2	-9	± 4
	JUL 95	29	± 8	-0.6	± 0.7	-0.5	± 0.6	0	± 1	-0.3	± 0.6	-3	± 1
	AUG 95	35	± 9	0.8	± 0.8	-1.1	± 0.8	2	± 2	0.3	± 0.8	-7	± 2
	SEP 95	20	± 10	-1	± 1	0.2	± 1.0	0	± 2	0	± 1	-5	± 2
	OCT 95	0	± 10	0.0	± 0.9	-0.5	± 0.9	0	± 2	0.4	± 0.9	-3	± 2
	NOV 95	10	± 10	0.0	± 0.8	-0.2	± 0.8	-1	± 2	0.3	± 0.9	-6	± 2
	DEC 95	-3	± 9	0.1	± 0.6	-0.6	± 0.6	1	± 1	0.0	± 0.7	-5	± 2
	MEAN	18	± 22	-0.2	± 1.2	-0.5	± 1.1	1	± 2	-0.1	± 0.8	-4	± 5

TABLE C-I.2 CONCENTRATIONS OF GAMMA EMITTERS IN SURFACE WATER SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1995

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

STC	COLLECTION PERIOD	ZR-95		NB-95		CS-134		CS-137		BA-140		LA-140	
1LL	JAN 95	1	± 2	0.2	± 1.0	0.2	± 1.0	1	± 1	0	± 4	-1	± 2
	FEB 95	0	± 1	-0.1	± 0.7	-3.7	± 0.8	0.1	± 0.7	-2	± 3	-1	± 1
	MAR 95	0	± 1	1.8	± 0.9	0.0	± 0.8	-0.3	± 0.7	-4	± 3	0	± 1
	APR 95	-1	± 2	0.8	± 1.0	-1	± 1	0	± 1	-3	± 4	0	± 2
	MAY 95	0	± 2	0.1	± 0.9	-5	± 1	-0.4	± 0.9	-1	± 4	0	± 2
	JUN 95	-2	± 3	1	± 2	-1	± 2	1	± 2	5	± 9	-1	± 4
	JUL 95	-2	± 1	0.9	± 0.9	0.3	± 0.9	0	± 1	-1	± 4	0	± 2
	AUG 95	1	± 2	-0.5	± 0.9	-0.4	± 0.9	-0.1	± 0.9	-1	± 5	1	± 2
	SEP 95	-1	± 1	-0.1	± 0.7	0.0	± 0.8	-0.4	± 0.8	0	± 3	1	± 1
	OCT 95	0	± 1	0.3	± 0.7	-4.3	± 0.9	-0.2	± 0.7	-2	± 3	-1.0	± 0.9
	NOV 95	0	± 1	0.5	± 0.7	-6.7	± 0.9	-0.3	± 0.7	-1	± 3	-0.8	± 1.0
	DEC 95	0	± 2	0.9	± 0.9	1	± 1	-0.6	± 0.8	-2	± 4	0	± 1
	MEAN	0	± 2	0.4	± 1.2	-1.7	± 5.1	0.0	± 1.1	-1	± 4	-0.1	± 1.2
1MM	JAN 95	1	± 3	1	± 2	0	± 2	-1	± 2	-5	± 7	-4	± 4
	FEB 95	0	± 2	0.2	± 0.8	-0.7	± 0.9	0.4	± 1.0	-1	± 3	0	± 2
	MAR 95	-1	± 2	3	± 1	0.2	± 1.0	-1.7	± 0.9	0	± 4	-1	± 2
	APR 95	1	± 1	0.8	± 0.7	-0.3	± 0.8	-0.6	± 0.8	0	± 3	-1	± 1
	MAY 95	0	± 1	0.2	± 0.7	-0.7	± 0.8	-0.3	± 0.9	-3	± 3	2	± 1
	JUN 95	0	± 3	-1	± 2	0	± 2	0	± 2	-3	± 8	-5	± 4
	JUL 95	0	± 1	0.9	± 0.7	0.1	± 0.7	-0.1	± 0.7	0	± 3	-1	± 1
	AUG 95	0	± 1	1	± 1	-0.8	± 0.9	-0.2	± 0.8	1	± 5	-1	± 2
	SEP 95	0	± 2	0	± 1	0	± 1	0	± 1	0	± 4	-1	± 2
	OCT 95	-1	± 2	-2	± 1	-6	± 1	0.0	± 0.9	1	± 3	0	± 1
	NOV 95	0	± 1	0.0	± 0.9	-7	± 1	0.4	± 0.9	2	± 4	0	± 1
	DEC 95	0	± 1	0.3	± 0.7	-5.3	± 0.8	-0.2	± 0.7	-1	± 3	-1	± 1
	MEAN	0	± 1	0.4	± 2.4	-1.7	± 5.4	-0.3	± 1.2	-1	± 4	-1	± 3

TABLE C-II.1 CONCENTRATIONS OF GROSS BETA INSOLUBLE IN DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1995

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	4L		6I	
JAN 95	0.4	± 0.7	0.5	± 0.7
FEB 95	-0.4	± 0.9	-0.7	± 0.9
MAR 95	-0.1	± 0.9	1.2	± 0.9
APR 95	-0.1	± 0.9	0.4	± 1.0
MAY 95	0.2	± 0.8	0.3	± 0.8
JUN 95	1.4	± 0.8	0.6	± 0.8
JUL 95	0.2	± 0.9	0.1	± 0.9
AUG 95	0.0	± 0.9	-0.6	± 0.8
SEP 95	-0.4	± 0.8	0.8	± 0.9
OCT 95	0.2	± 0.8	1.1	± 0.9
NOV 95	1	± 1	0.1	± 1.0
DEC 95	-0.9	± 0.9	-0.6	± 0.9
MEAN	0.2	± 1.4	0.3	± 1.3

TABLE C-II.2 CONCENTRATIONS OF GROSS BETA SOLUBLE IN DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1995

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	4L		6I	
JAN 95	2.2	± 0.9	1.7	± 0.9
FEB 95	1	± 1	1	± 1
MAR 95	1	± 1	2	± 1
APR 95	3	± 1	3	± 1
MAY 95	2	± 1	2	± 1
JUN 95	2	± 1	1	± 1
JUL 95	2	± 1	4	± 1
AUG 95	3	± 1	5	± 1
SEP 95	4	± 1	4	± 1
OCT 95	4	± 1	3	± 1
NOV 95	2	± 1	2	± 1
DEC 95	1	± 1	1	± 1
MEAN	2.2	± 2.1	2.4	± 2.3

TABLE C-II.3 CONCENTRATIONS OF TRITIUM IN DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1995

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	4L		6I	
JAN-MAR 95	90	± 70	170	± 70
APR-JUN 95	150	± 70	30	± 70
JUL-SEP 95	110	± 70	60	± 70
OCT-DEC 95	60	± 70	-10	± 70
MEAN	100	± 80	60	± 150

TABLE C-II.4 CONCENTRATIONS OF GAMMA EMITTERS IN DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1995

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

STC	COLLECTION PERIOD	K-40	MN-54	CO-58	FE-59	CO-60	ZN-65
4L	JAN 95	25 ± 9	0.3 ± 0.7	-0.2 ± 0.7	0 ± 1	-0.2 ± 0.7	-5 ± 2
	FEB 95	40 ± 10	-0.1 ± 0.9	-0.7 ± 0.8	-1 ± 2	-0.3 ± 0.8	-5 ± 2
	MAR 95	40 ± 10	-0.6 ± 0.9	0.7 ± 0.9	1 ± 2	0.9 ± 0.9	-5 ± 2
	APR 95	30 ± 10	0.1 ± 1.0	-0.9 ± 0.8	0 ± 2	-0.1 ± 0.9	2 ± 2
	MAY 95	30 ± 20	0 ± 2	0 ± 1	-1 ± 3	2 ± 2	-4 ± 2
	JUN 95	30 ± 10	0 ± 1	-1 ± 1	0 ± 2	0 ± 1	-4 ± 3
	JUL 95	22 ± 8	-0.2 ± 0.8	-0.4 ± 0.6	1 ± 1	-0.2 ± 0.7	-2 ± 2
	AUG 95	20 ± 10	-0.4 ± 0.9	0.1 ± 0.9	-1 ± 2	-0.1 ± 0.9	-3 ± 1
	SEP 95	0 ± 20	0 ± 2	0 ± 2	3 ± 4	-2 ± 2	-5 ± 2
	OCT 95	-10 ± 10	-0.5 ± 0.8	0.2 ± 0.8	3 ± 2	0.7 ± 0.8	-1 ± 4
	NOV 95	-20 ± 9	-0.7 ± 0.6	-0.3 ± 0.6	0 ± 1	-0.1 ± 0.7	-5 ± 2
	DEC 95	0 ± 10	-0.2 ± 0.9	0.4 ± 0.9	-1 ± 2	0.6 ± 1.0	-3 ± 2
	MEAN	17 ± 39	-0.2 ± 0.7	-0.1 ± 1.0	0 ± 3	0.1 ± 1.7	-3 ± 4
6I	JAN 95	0 ± 30	-2 ± 2	1 ± 2	2 ± 4	2 ± 2	0 ± 4
	FEB 95	15 ± 8	-0.6 ± 0.7	-0.2 ± 0.8	1 ± 1	0.4 ± 0.7	1 ± 2
	MAR 95	5 ± 8	0.3 ± 0.7	-0.7 ± 0.7	0 ± 1	-0.4 ± 0.7	0 ± 2
	APR 95	12 ± 9	0.5 ± 0.7	0.3 ± 0.7	0 ± 2	0.0 ± 0.8	0 ± 2
	MAY 95	30 ± 10	-0.4 ± 1.0	-0.1 ± 0.8	-2 ± 2	-0.6 ± 0.9	-6 ± 2
	JUN 95	10 ± 20	-1 ± 2	0 ± 1	1 ± 3	1 ± 2	-3 ± 3
	JUL 95	23 ± 9	0.1 ± 0.6	-0.1 ± 0.7	0 ± 1	0.3 ± 0.8	-2 ± 2
	AUG 95	16 ± 7	0.2 ± 0.6	-0.3 ± 0.7	0 ± 1	0.5 ± 0.6	-3 ± 1
	SEP 95	30 ± 10	-0.4 ± 1.0	0.1 ± 0.9	-1 ± 2	0.3 ± 0.9	-3 ± 2
	OCT 95	0 ± 10	0.1 ± 0.7	-0.1 ± 0.7	1 ± 1	-1.0 ± 0.7	-4 ± 2
	NOV 95	-10 ± 10	-0.5 ± 0.8	-0.2 ± 0.7	1 ± 2	0.6 ± 0.8	-6 ± 2
	DEC 95	10 ± 20	-0.2 ± 0.9	-0.6 ± 1.0	1 ± 2	0.4 ± 1.0	-3 ± 3
	MEAN	12 ± 22	-0.3 ± 1.4	-0.1 ± 0.7	0 ± 2	0.3 ± 1.6	-2 ± 5

TABLE C-II.4 CONCENTRATIONS OF GAMMA EMITTERS IN DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1995

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

STC	COLLECTION PERIOD	ZR-95		NB-95		CS-134		CS-137		BA-140		LA-140	
4L	JAN 95	0	± 1	0.5	± 0.8	-3.9	± 0.8	-0.1	± 0.7	0	± 3	1	± 1
	FEB 95	0	± 1	0.1	± 0.9	0.5	± 1.0	0	± 1	3	± 3	0	± 1
	MAR 95	0	± 2	4	± 1	0	± 1	-0.3	± 1.0	1	± 4	0	± 1
	APR 95	1	± 2	1.3	± 0.9	-1	± 1	0	± 1	3	± 4	-1	± 2
	MAY 95	1	± 2	-1	± 1	-1	± 2	0	± 1	-4	± 5	0	± 2
	JUN 95	0	± 2	1	± 1	-1	± 1	1	± 1	1	± 4	1	± 2
	JUL 95	0	± 1	0.0	± 0.7	0.2	± 0.7	-0.1	± 0.8	-1	± 3	0	± 1
	AUG 95	1	± 2	-1	± 1	0.5	± 0.9	0.6	± 0.9	4	± 5	-1	± 2
	SEP 95	0	± 3	1	± 2	0	± 2	1	± 2	0	± 7	2	± 3
	OCT 95	0	± 1	0.2	± 0.8	-9	± 1	-0.4	± 0.9	-3	± 3	-1	± 1
	NOV 95	1	± 1	0.0	± 0.6	-3.5	± 0.8	-0.1	± 0.6	1	± 2	-0.2	± 0.8
	DEC 95	1	± 2	-1	± 1	-6	± 1	-0.4	± 1.0	2	± 4	1	± 1
	MEAN	0	± 1	0.4	± 2.7	-2.0	± 6.0	0.0	± 1.0	1	± 5	0.1	± 1.8
6I	JAN 95	3	± 3	2	± 2	1	± 2	1	± 2	3	± 8	-1	± 4
	FEB 95	1	± 1	0.3	± 0.8	0.0	± 0.7	0.4	± 0.8	1	± 3	0	± 1
	MAR 95	0	± 1	0.5	± 0.8	0.2	± 0.8	-0.7	± 0.8	0	± 3	1	± 1
	APR 95	0	± 1	-0.1	± 0.7	-3.1	± 0.8	0.6	± 0.7	2	± 3	0	± 1
	MAY 95	-1	± 1	0.6	± 0.9	-1	± 1	-1	± 1	2	± 4	1	± 2
	JUN 95	2	± 2	-1	± 1	1	± 1	0	± 1	1	± 5	-1	± 3
	JUL 95	0	± 1	0.3	± 0.8	0.0	± 0.8	-0.1	± 0.8	0	± 3	0	± 1
	AUG 95	0	± 1	0.7	± 0.7	-0.2	± 0.7	-0.6	± 0.6	-1	± 4	1	± 1
	SEP 95	0	± 2	0.9	± 0.9	0.1	± 1.0	0	± 1	0	± 4	1	± 1
	OCT 95	0	± 1	0.3	± 0.7	-4.9	± 0.9	-0.7	± 0.7	3	± 3	-0.1	± 0.9
	NOV 95	1	± 1	0.3	± 0.8	-6.6	± 1.0	0.2	± 0.8	1	± 3	0.1	± 0.9
	DEC 95	1	± 2	0	± 1	-7	± 1	0	± 1	-2	± 4	0	± 2
	MEAN	1	± 2	0.5	± 1.3	-1.7	± 5.9	-0.1	± 1.0	1	± 3	0.1	± 1.3

TABLE C-III.1 CONCENTRATIONS OF GAMMA EMITTERS IN FISH SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1995

RESULTS IN UNITS OF PCI/KG WET ± 2 SIGMA

STC		COLLECTION PERIOD	K-40	MN-54	CO-58	FE-59	CO-60	ZN-65	CS-134	CS-137
4	PREDATOR	06/28-06/28/95	3300 ± 300	2 ± 5	-3 ± 5	0 ± 10	2 ± 6	0 ± 20	0 ± 6	3 ± 6
		11/08-11/08/95	4000 ± 400	-2 ± 4	0 ± 4	2 ± 9	0 ± 4	-20 ± 10	-10 ± 4	3 ± 4
		MEAN	3700 ± 1000	0 ± 4	-1 ± 5	-1 ± 8	1 ± 3	-10 ± 20	-5 ± 1	3 ± 0
	BOTTOM FEEDER	06/22-06/26/95	2500 ± 200	1 ± 5	-3 ± 5	10 ± 10	-1 ± 6	-10 ± 20	4 ± 5	1 ± 6
		11/08-11/16/95	3100 ± 300	0 ± 4	-4 ± 5	0 ± 10	-1 ± 5	0 ± 10	3 ± 5	3 ± 5
		MEAN	2800 ± 800	1 ± 1	-4 ± 1	10 ± 10	-1 ± 0	0 ± 10	4 ± 1	2 ± 3
6	PREDATOR	06/27-06/27/95	3400 ± 300	-1 ± 5	0 ± 5	0 ± 10	7 ± 6	-30 ± 20	2 ± 6	4 ± 5
		11/06-11/06/95	3600 ± 400	3 ± 5	-3 ± 5	10 ± 10	2 ± 5	-20 ± 10	2 ± 5	-4 ± 5
		MEAN	3500 ± 300	1 ± 5	-1 ± 5	0 ± 10	4 ± 7	-30 ± 10	2 ± 0	0 ± 1
	BOTTOM FEEDER	06/22-06/22/95	2400 ± 200	1 ± 4	0 ± 4	10 ± 10	0 ± 5	-10 ± 10	-15 ± 5	4 ± 4
		10/16-10/24/95	2900 ± 300	-3 ± 4	0 ± 4	0 ± 10	-1 ± 5	-20 ± 10	-21 ± 5	8 ± 5
		MEAN	2700 ± 700	-1 ± 6	0 ± 1	0 ± 10	0 ± 1	-10 ± 0	-18 ± 8	6 ± 6

TABLE C-IV.1 CONCENTRATIONS OF GAMMA EMITTERS IN SILT SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1995

RESULTS IN UNITS OF PCI/KG DRY ± 2 SIGMA

STC	COLLECTION PERIOD	BE-7	K-40	CO-60	CS-134	CS-137	RA-226	TH-232
4J	06/29-06/29/95	70 ± 70	12000 ± 1000	40 ± 20	3 ± 8	100 ± 10	1300 ± 300	680 ± 70
	11/16-11/16/95	-60 ± 80	18000 ± 2000	20 ± 20	10 ± 10	360 ± 40	2300 ± 400	1200 ± 100
	MEAN	0 ± 190	15000 ± 8000	30 ± 30	6 ± 9	230 ± 370	1800 ± 1400	940 ± 740
4T	06/29-06/29/95	700 ± 200	21000 ± 2000	0 ± 20	10 ± 20	240 ± 30	2600 ± 500	1500 ± 100
	11/16-11/16/95	200 ± 100	22000 ± 2000	30 ± 20	0 ± 10	220 ± 30	2400 ± 500	1400 ± 100
	MEAN	400 ± 700	22000 ± 1000	10 ± 40	10 ± 0	230 ± 30	2500 ± 300	1500 ± 100
6F	06/29-06/29/95	-10 ± 70	11000 ± 1000	2 ± 9	5 ± 10	100 ± 20	2100 ± 300	870 ± 90
	11/16-11/16/95	400 ± 100	14000 ± 1000	10 ± 10	0 ± 10	310 ± 30	3200 ± 500	1600 ± 200
	MEAN	170 ± 510	13000 ± 4000	4 ± 6	5 ± 0	200 ± 300	2700 ± 1600	1240 ± 1030

TABLE C-V.1 CONCENTRATIONS OF GROSS BETA IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1995

RESULTS IN UNITS OF E-3 PCI/CU METER ± 2 SIGMA

	GROUP I			GROUP II	GROUP III
WEEK	1B	1Z	2	3A	22G1
01	17 ± 4	18 ± 4	17 ± 4	15 ± 4	15 ± 4
02	26 ± 4	20 ± 4	29 ± 5	27 ± 4	13 ± 4
03	4 ± 3	4 ± 3	6 ± 3	5 ± 3	5 ± 3
04	13 ± 4	16 ± 4	16 ± 4	13 ± 4	12 ± 3
05	21 ± 4	17 ± 4	22 ± 4	19 ± 4	14 ± 4
06	22 ± 4	16 ± 4	19 ± 4	19 ± 4	21 ± 4
07	20 ± 4	18 ± 4	19 ± 4	19 ± 4	17 ± 4
08	24 ± 4	18 ± 4	19 ± 4	19 ± 4	11 ± 3
09	12 ± 4	10 ± 4	8 ± 4	10 ± 4	13 ± 4
10	15 ± 4	17 ± 4	14 ± 3	16 ± 4	15 ± 4
11	30 ± 5	25 ± 5	24 ± 4	23 ± 4	19 ± 4
12	12 ± 4	9 ± 3	7 ± 3	8 ± 4	11 ± 4
13	16 ± 4	18 ± 4	18 ± 4	18 ± 4	17 ± 4
14	21 ± 4	19 ± 3	19 ± 3	21 ± 4	18 ± 4
15	16 ± 4	11 ± 4	16 ± 4	15 ± 4	17 ± 4
16	16 ± 4	17 ± 4	15 ± 4	13 ± 4	13 ± 4
17	14 ± 3	14 ± 3	11 ± 3	12 ± 3	11 ± 3
18	12 ± 3	10 ± 2	13 ± 3	11 ± 3	12 ± 3
19	13 ± 3	9 ± 3	14 ± 3	10 ± 3	6 ± 3
20	10 ± 3	13 ± 3	9 ± 3	10 ± 3	14 ± 4
21	13 ± 4	16 ± 4	14 ± 4	13 ± 4	12 ± 4
22	11 ± 4	8 ± 4	12 ± 4	13 ± 4	13 ± 4
23	12 ± 4	12 ± 4	12 ± 4	11 ± 4	10 ± 4
24	14 ± 3	14 ± 3	10 ± 3	12 ± 3	16 ± 4
25	21 ± 4	21 ± 4	23 ± 4	25 ± 4	13 ± 4
26	9 ± 3	8 ± 3	9 ± 3	9 ± 3	12 ± 3
27	16 ± 5	15 ± 5	14 ± 4	14 ± 5	17 ± 4
28	16 ± 4	18 ± 4	20 ± 5	16 ± 4	24 ± 4
29	23 ± 5	20 ± 5	23 ± 5	23 ± 5	14 ± 4
30	21 ± 4	21 ± 4	22 ± 4	18 ± 4	24 ± 4
31	21 ± 4	24 ± 4	20 ± 4	25 ± 4	16 ± 4
32	12 ± 4	10 ± 4	11 ± 3	11 ± 4	11 ± 4
33	19 ± 4	21 ± 4	20 ± 4	18 ± 4	20 ± 4
34	17 ± 4	20 ± 4	18 ± 4	19 ± 4	12 ± 3
35	19 ± 4	19 ± 4	21 ± 4	20 ± 4	19 ± 3
36	(1)	25 ± 4	26 ± 4	26 ± 4	20 ± 5
37	22 ± 4	21 ± 4	19 ± 4	19 ± 4	13 ± 3
38	15 ± 4	11 ± 4	12 ± 4	11 ± 3	12 ± 4
39	17 ± 4	15 ± 4	22 ± 4	18 ± 4	16 ± 4
40	19 ± 5	20 ± 5	16 ± 5	18 ± 5	16 ± 5
41	19 ± 4	19 ± 4	19 ± 4	18 ± 4	21 ± 4
42	16 ± 5	19 ± 5	16 ± 5	14 ± 5	9 ± 4
43	17 ± 4	16 ± 4	16 ± 4	16 ± 4	19 ± 4
44	18 ± 5	16 ± 4	16 ± 4	15 ± 4	17 ± 4
45	15 ± 4	16 ± 4	20 ± 4	17 ± 4	20 ± 4
46	13 ± 4	11 ± 3	15 ± 3	12 ± 3	17 ± 4
47	22 ± 4	21 ± 4	20 ± 4	21 ± 4	17 ± 4
48	19 ± 2	20 ± 2	21 ± 2	19 ± 2	17 ± 2
49	23 ± 4	22 ± 4	24 ± 4	24 ± 4	18 ± 4
50	20 ± 5	20 ± 5	21 ± 5	25 ± 5	20 ± 4
51	19 ± 4	18 ± 4	19 ± 4	19 ± 4	13 ± 3
52	18 ± 4	14 ± 3	16 ± 4	14 ± 3	14 ± 4
MEAN	17 ± 9	16 ± 9	17 ± 10	16 ± 10	15 ± 8

(1) SEE PROGRAM EXCEPTIONS SECTION FOR EXPLANATION

TABLE C-V.3 CONCENTRATIONS OF GAMMA EMITTERS IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1995

RESULTS IN UNITS OF E-3 PCI/CU METER ± 2 SIGMA

STC	COLLECTION PERIOD	BE-7	K-40	CS-134	CS-137	RA-226	TH-232
1B	12/30-03/30/95	80 ± 20	0 ± 20	0 ± 1	0 ± 1	-20 ± 20	-2 ± 5
	03/30-07/02/95	100 ± 20	11 ± 8	-0.6 ± 0.8	0.4 ± 0.9	20 ± 20	2 ± 3
	07/02-09/29/95	60 ± 20	0 ± 20	0 ± 2	-1 ± 2	10 ± 20	-1 ± 5
	09/29-12/30/95	60 ± 10	0 ± 10	-2.3 ± 1.0	0.2 ± 0.7	0 ± 10	0 ± 3
	MEAN	70 ± 40	2 ± 13	-0.7 ± 2.3	0.0 ± 1.0	0 ± 30	0 ± 3
1Z	12/30-03/30/95	60 ± 10	10 ± 10	0.6 ± 0.7	0.6 ± 0.7	10 ± 20	3 ± 3
	03/30-07/02/95	70 ± 20	10 ± 10	0.9 ± 0.9	0.6 ± 0.8	20 ± 10	1 ± 3
	07/02-09/29/95	60 ± 20	10 ± 20	0 ± 1	-1 ± 1	20 ± 20	-2 ± 5
	09/29-12/30/95	60 ± 20	10 ± 10	-0.8 ± 0.9	-0.3 ± 0.9	-10 ± 20	2 ± 3
	MEAN	60 ± 10	10 ± 10	0.2 ± 1.5	0.0 ± 1.3	10 ± 30	1 ± 4
2	12/30-03/30/95	80 ± 20	20 ± 20	0.6 ± 0.9	-1 ± 1	20 ± 20	0 ± 6
	03/30-07/02/95	110 ± 30	0 ± 20	-1.1 ± 1.0	-0.5 ± 1	0 ± 20	1 ± 5
	07/02-09/29/95	80 ± 20	10 ± 10	0.3 ± 0.9	-0.1 ± 0.6	30 ± 10	0 ± 3
	09/29-12/30/95	70 ± 20	0 ± 10	0 ± 1	-1 ± 1	0 ± 10	0 ± 3
	MEAN	80 ± 40	10 ± 20	-0.1 ± 1.5	-0.4 ± 0.5	10 ± 30	0 ± 1
3A	12/30-03/30/95	70 ± 20	10 ± 10	0.7 ± 0.8	-0.4 ± 0.6	30 ± 20	-1 ± 3
	03/30-07/02/95	60 ± 20	-10 ± 20	0 ± 1	-0.6 ± 0.9	0 ± 20	2 ± 5
	07/02-09/29/95	70 ± 20	10 ± 20	1 ± 1	-1 ± 1	0 ± 20	0 ± 4
	09/29-12/30/95	40 ± 20	0 ± 20	-3 ± 2	-1 ± 1	0 ± 20	-1 ± 4
	MEAN	60 ± 30	0 ± 20	-0.3 ± 3.7	-0.8 ± 0.8	10 ± 30	0 ± 2
22G1	01/03-04/03/95	90 ± 30	10 ± 10	0 ± 1	1 ± 1	10 ± 20	-3 ± 6
	04/03-07/03/95	70 ± 20	10 ± 20	0 ± 1	-0.5 ± 1.0	30 ± 20	-2 ± 4
	07/03-10/02/95	80 ± 10	20 ± 10	-0.4 ± 0.7	0.1 ± 0.6	30 ± 20	2 ± 2
	10/02-01/02/96	50 ± 20	20 ± 20	-1 ± 1	0.1 ± 1.0	10 ± 20	2 ± 4
	MEAN	70 ± 30	10 ± 10	-0.4 ± 0.5	0.1 ± 0.9	20 ± 20	0 ± 5

TABLE C-VI.1 CONCENTRATIONS OF I-131 IN AIR IODINE SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1995

RESULTS IN UNITS OF E-3 PCI/CU METER ± 2 SIGMA

	GROUP I			GROUP II	GROUP III
WEEK	1B	1Z	2	3A	22G1
01	10 ± 20	-10 ± 10	0 ± 20	0 ± 10	0 ± 20
02	10 ± 20	0 ± 20	0 ± 20	-10 ± 20	10 ± 20
03	10 ± 10	-11 ± 10	0 ± 10	-10 ± 10	-10 ± 20
04	10 ± 20	0 ± 20	-10 ± 20	0 ± 10	-10 ± 10
05	-10 ± 20	5 ± 10	0 ± 20	0 ± 10	10 ± 10
06	-10 ± 10	20 ± 10	0 ± 20	20 ± 20	10 ± 10
07	10 ± 10	1 ± 10	0 ± 20	0 ± 10	10 ± 20
08	0 ± 10	1 ± 9	0 ± 10	0 ± 10	5 ± 6
09	-10 ± 10	0 ± 10	0 ± 20	0 ± 10	-2 ± 8
10	10 ± 10	0 ± 20	10 ± 10	10 ± 10	1 ± 9
11	-20 ± 10	0 ± 10	10 ± 20	0 ± 20	10 ± 10
12	0 ± 20	-10 ± 10	0 ± 20	0 ± 10	-10 ± 20
13	0 ± 20	0 ± 10	0 ± 20	0 ± 10	0 ± 20
14	0 ± 10	7 ± 10	0 ± 20	0 ± 10	-10 ± 20
15	10 ± 20	-10 ± 10	0 ± 10	10 ± 10	0 ± 10
16	0 ± 9	5 ± 10	-10 ± 20	10 ± 10	0 ± 10
17	0 ± 10	0 ± 20	-6 ± 9	0 ± 20	-1 ± 10
18	-10 ± 20	0 ± 10	0 ± 20	-10 ± 10	0 ± 10
19	10 ± 10	-10 ± 10	0 ± 20	-10 ± 20	2 ± 10
20	0 ± 10	-10 ± 10	-5 ± 10	0 ± 20	5 ± 9
21	0 ± 10	0 ± 20	-10 ± 20	0 ± 10	0 ± 10
22	0 ± 10	0 ± 10	0 ± 10	10 ± 20	4 ± 9
23	-10 ± 20	10 ± 10	0 ± 10	0 ± 10	1 ± 8
24	10 ± 10	0 ± 10	-2 ± 9	0 ± 10	10 ± 10
25	-10 ± 20	10 ± 10	10 ± 20	-10 ± 10	20 ± 10
26	1 ± 7	2 ± 7	-3 ± 7	0 ± 10	0 ± 10
27	10 ± 20	0 ± 10	-10 ± 20	-10 ± 20	7 ± 8
28	1 ± 10	20 ± 20	10 ± 20	0 ± 20	0 ± 10
29	-10 ± 20	-10 ± 10	0 ± 10	20 ± 20	-10 ± 10
30	0 ± 10	0 ± 10	0 ± 20	-4 ± 9	3 ± 7
31	-10 ± 20	1 ± 9	-10 ± 10	2 ± 9	-1 ± 7
32	-10 ± 20	20 ± 10	0 ± 20	10 ± 10	4 ± 9
33	10 ± 20	0 ± 20	10 ± 20	0 ± 20	-10 ± 10
34	0 ± 20	-8 ± 9	-10 ± 10	0 ± 10	-3 ± 8
35	-10 ± 10	4 ± 9	0 ± 20	0 ± 10	-10 ± 10
36	(1)	10 ± 10	0 ± 10	-20 ± 20	10 ± 20
37	20 ± 20	0 ± 10	10 ± 20	0 ± 20	0 ± 10
38	-10 ± 20	0 ± 10	10 ± 20	0 ± 20	0 ± 10
39	0 ± 20	-1 ± 8	0 ± 10	0 ± 10	12 ± 10
40	-10 ± 20	0 ± 10	0 ± 20	10 ± 20	-3 ± 10
41	0 ± 10	0 ± 10	0 ± 10	-10 ± 10	0 ± 10
42	0 ± 20	0 ± 10	0 ± 20	-10 ± 20	-5 ± 9
43	0 ± 20	-10 ± 20	10 ± 20	2 ± 9	-5 ± 10
44	0 ± 10	-4 ± 10	-10 ± 20	1 ± 9	-6 ± 9
45	10 ± 10	-2 ± 8	0 ± 10	-1 ± 7	10 ± 10
46	0 ± 10	10 ± 10	0 ± 20	10 ± 20	-7 ± 10
47	-10 ± 20	-10 ± 10	0 ± 10	10 ± 20	2 ± 8
48	-1 ± 8	1 ± 6	0 ± 10	2 ± 9	-2 ± 7
49	-20 ± 10	10 ± 20	10 ± 20	0 ± 20	-10 ± 10
50	-20 ± 20	0 ± 20	-10 ± 10	0 ± 30	-1 ± 8
51	10 ± 20	0 ± 10	-10 ± 10	0 ± 20	2 ± 7
52	0 ± 20	0 ± 20	0 ± 10	-10 ± 20	0 ± 10
MEAN	0 ± 17	1 ± 13	0 ± 11	0 ± 14	0 ± 12

(1) SEE PROGRAM EXCEPTIONS SECTION FOR EXPLANATION

TABLE C-VII.1 CONCENTRATIONS OF I-131 IN MILK SAMPLES COLLECTED
IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1995

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

	NEARBY FARMS			INTERMEDIATE DISTANCE FARMS				DISTANT FARMS			
COLLECTION DATE	G	J	O	D	L	N	P	A	B	C	E
01/23/95	-0.1 ± 0.2	0.0 ± 0.2	0.0 ± 0.2			-0.1 ± 0.2		0.1 ± 0.2			
02/13/95	0.1 ± 0.2	0.0 ± 0.2	0.1 ± 0.2	-0.1 ± 0.2	0.1 ± 0.2	0.1 ± 0.2	0.0 ± 0.3		0.0 ± 0.2	0.0 ± 0.2	0.0 ± 0.3
03/13/95	0.1 ± 0.2	0.0 ± 0.2	0.0 ± 0.2			0.0 ± 0.2		0.0 ± 0.2			
04/10/95	0.2 ± 0.2	-0.2 ± 0.3	-0.1 ± 0.3			0.1 ± 0.2		0.0 ± 0.2			
04/26/95	-0.1 ± 0.2	0.0 ± 0.2	-0.1 ± 0.3			0.1 ± 0.2		-0.1 ± 0.2			
05/08/95	0.1 ± 0.2	-0.2 ± 0.3	-0.3 ± 0.2			0.0 ± 0.2		0.0 ± 0.2			
05/22/95	-0.1 ± 0.3	0.0 ± 0.2	-0.2 ± 0.2	0.0 ± 0.2	-0.1 ± 0.3	-0.1 ± 0.2	0.2 ± 0.3	0.0 ± 0.2	0.1 ± 0.2	-0.1 ± 0.3	0.1 ± 0.3
06/05/95	0.1 ± 0.2	0.1 ± 0.2	0.1 ± 0.2			0.0 ± 0.3		-0.1 ± 0.2			
06/19/95	0.0 ± 0.2	-0.1 ± 0.2	0.1 ± 0.2			-0.1 ± 0.2		0.2 ± 0.2			
07/04/95	0.1 ± 0.2	0.0 ± 0.2	0.1 ± 0.2			0.1 ± 0.2		0.1 ± 0.2			
07/17/95	0.1 ± 0.2	-0.1 ± 0.2	0.0 ± 0.2			0.0 ± 0.2		-0.1 ± 0.2			
07/31/95	0.1 ± 0.2	0.0 ± 0.2	0.1 ± 0.2			0.0 ± 0.2		0.0 ± 0.2			
08/13/95	-0.1 ± 0.2	0.3 ± 0.3	0.0 ± 0.3					0.1 ± 0.2	0.1 ± 0.2		
08/14/95				0.1 ± 0.3	0.1 ± 0.2	0.1 ± 0.2	0.0 ± 0.3			0.2 ± 0.2	0.0 ± 0.2
08/28/95	0.0 ± 0.2	0.0 ± 0.3	0.3 ± 0.3			-0.1 ± 0.2		-0.1 ± 0.2			
09/11/95	0.0 ± 0.2	0.0 ± 0.3	0.2 ± 0.2			0.1 ± 0.2		0.1 ± 0.2			
09/24/95	0.0 ± 0.2	0.1 ± 0.2	0.0 ± 0.2			0.3 ± 0.3		-0.1 ± 0.2			
10/09/95	0.2 ± 0.2	0.1 ± 0.3	0.1 ± 0.3			(1)		-0.1 ± 0.2			
10/23/95	-0.1 ± 0.2	-0.1 ± 0.2	0.0 ± 0.3	0.0 ± 0.2	-0.1 ± 0.2		0.1 ± 0.2	0.1 ± 0.2	-0.2 ± 0.2	0.0 ± 0.2	0.1 ± 0.3
11/08/95	0.0 ± 0.2	-0.1 ± 0.2	0.2 ± 0.3					0.2 ± 0.2			
11/21/95	-0.2 ± 0.2	-0.3 ± 0.2	0.0 ± 0.2					0.1 ± 0.2			
12/11/95	0.1 ± 0.2	-0.1 ± 0.2	-0.2 ± 0.3					-0.2 ± 0.2			
MEAN	0.0 ± 0.2	0.0 ± 0.2	0.0 ± 0.3	0.0 ± 0.1	0.0 ± 0.2	0.0 ± 0.2	0.1 ± 0.2	0.0 ± 0.2	0.0 ± 0.3	0.0 ± 0.2	

(1) SEE PROGRAM EXCEPTION SECTION FOR EXPLANATION

TABLE C-VII.2 CONCENTRATIONS OF GAMMA EMITTERS IN MILK SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1995

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

STC	COLLECTION PERIOD	K-40		CS-134		CS-137		BA-140		LA-140	
A	02/13-02/13/95	1400	± 100	1	± 2	1	± 2	5	± 7	2	± 2
	05/22-05/22/95	1300	± 100	-5	± 1	2	± 1	3	± 4	0	± 1
	08/13-08/13/95	1400	± 100	-5	± 1	0	± 1	3	± 4	1	± 1
	10/23-10/23/95	1400	± 100	-3.8	± 0.9	0.0	± 0.8	0	± 3	0.6	± 0.8
	MEAN	1400	± 100	-3.3	± 5.8	0.5	± 1.8	3	± 5	1.0	± 1.9
G	02/13-02/13/95	1300	± 100	-1	± 1	-1	± 2	1	± 5	-2	± 2
	05/22-05/22/95	1400	± 100	-4	± 1	0	± 1	1	± 3	-1	± 1
	08/13-08/13/95	1500	± 100	-5	± 1	0	± 1	-2	± 4	0	± 1
	10/23-10/23/95	1400	± 100	-8	± 2	0	± 2	-4	± 6	-1	± 2
	MEAN	1400	± 200	-5	± 6	-1	± 1	-1	± 5	-1	± 2
J	02/13-02/13/95	1400	± 100	-3	± 2	1	± 2	-1	± 6	2	± 2
	05/22-05/22/95	1400	± 100	-3.2	± 0.9	0.2	± 0.8	0	± 3	0	± 1
	08/13-08/13/95	1300	± 100	-4	± 2	2	± 2	-1	± 6	0	± 3
	10/23-10/23/95	1400	± 100	-3	± 1	1	± 1	3	± 5	1	± 1
	MEAN	1400	± 100	-3.4	± 0.5	1.0	± 1.3	0	± 4	1	± 2
N	02/13-02/13/95	1300	± 100	1	± 1	-1	± 1	0	± 5	1	± 1
	05/22-05/22/95	1500	± 100	-7	± 1	0	± 1	-2	± 4	0	± 1
	08/14-08/14/95 (1)	1400	± 100	-4.1	± 0.9	1.4	± 0.8	0	± 3	-0.4	± 0.9
	MEAN	1400	± 200	-3.5	± 7.9	0.3	± 2.0	-1	± 2	0.1	± 1.4
O	02/13-02/13/95	1400	± 100	1	± 2	2	± 2	1	± 6	2	± 2
	05/22-05/22/95	1400	± 100	-8	± 1	0.6	± 0.9	-3	± 3	1	± 1
	08/13-08/13/95	1400	± 100	-5	± 2	0	± 2	-2	± 7	1	± 2
	10/23-10/23/95	1300	± 100	1	± 2	0	± 2	-1	± 6	0	± 2
	MEAN	1400	± 100	-3	± 9	0.5	± 1.7	-1	± 4	1	± 1

(1) SEE PROGRAM EXCEPTION SECTION FOR EXPLANATION

TABLE C-VIII.1 QUARTERLY TLD RESULTS FOR PEACH BOTTOM ATOMIC POWER STATION, 1995

RESULTS IN UNITS OF MILLI-ROENTGEN/STD. MO. ± 2 S.D.

STATION CODE	MEAN ± 2 S.D. (1)	JAN-MAR	APR-JUN	JUL-SEP	OCT-DEC
1A	5.0 ± 0.4	5.3 ± 0.4	5.1 ± 0.2	4.8 ± 0.4	4.9 ± 0.4
1B	4.5 ± 0.1	4.5 ± 0.3	4.5 ± 0.4	4.4 ± 0.3	4.5 ± 0.7
1C	5.6 ± 0.1	5.6 ± 0.6	5.6 ± 0.7	5.5 ± 0.7	5.6 ± 0.7
1E	5.0 ± 0.3	5.0 ± 0.5	5.1 ± 0.3	5.1 ± 0.4	4.8 ± 0.1
1F	6.4 ± 0.3	6.4 ± 1.0	6.5 ± 0.4	6.6 ± 0.5	6.2 ± 0.2
1G	3.8 ± 0.1	3.9 ± 0.5	3.8 ± 0.1	3.9 ± 0.1	3.8 ± 0.2
1H	5.5 ± 0.4	5.6 ± 0.9	5.5 ± 0.6	5.6 ± 0.5	5.2 ± 0.2
1I	4.3 ± 0.3	4.5 ± 0.5	4.2 ± 0.2	4.3 ± 0.5	4.2 ± 0.3
1J	6.3 ± 0.5	6.1 ± 0.5	6.2 ± 0.9	6.7 ± 0.4	6.3 ± 0.2
1L	4.0 ± 0.4	4.3 ± 0.3	4.1 ± 0.2	3.9 ± 0.6	3.8 ± 0.2
2	5.0 ± 0.5	5.1 ± 0.5	4.7 ± 0.3	5.3 ± 0.4	5.1 ± 0.9
3A	3.6 ± 0.3	3.7 ± 0.3	3.4 ± 0.3	3.7 ± 0.3	3.7 ± 0.2
4K	3.3 ± 0.2	3.5 ± 0.2	3.3 ± 0.2	3.3 ± 0.0	3.3 ± 0.2
5	5.1 ± 0.4	5.1 ± 0.7	5.3 ± 0.1	5.2 ± 0.1	4.8 ± 0.4
6B	4.2 ± 0.3	4.3 ± 0.3	4.1 ± 0.2	4.1 ± 0.2	4.4 ± 0.2
1NN	6.1 ± 0.5	6.4 ± 0.5	6.3 ± 0.3	6.1 ± 0.5	5.8 ± 0.5
14	5.3 ± 0.1	5.3 ± 0.8	5.3 ± 0.5	5.4 ± 0.2	5.3 ± 0.4
15	5.3 ± 0.3	5.0 ± 0.2	5.3 ± 0.4	5.3 ± 0.2	5.4 ± 0.9
16	5.6 ± 0.7	5.6 ± 0.7	5.2 ± 0.7	6.0 ± 0.7	5.5 ± 0.3
17	6.3 ± 0.7	6.8 ± 0.4	6.0 ± 0.6	6.3 ± 0.5	6.2 ± 0.3
18	5.8 ± 0.4	5.9 ± 0.4	5.6 ± 0.4	5.7 ± 0.5	6.0 ± 0.7
19	5.5 ± 0.6	5.8 ± 0.5	5.2 ± 0.4	5.6 ± 0.5	(2)
22	5.7 ± 0.4	6.0 ± 0.5	5.5 ± 0.4	5.6 ± 0.4	5.7 ± 0.9
23	5.6 ± 0.2	5.6 ± 0.5	5.5 ± 0.3	5.7 ± 0.3	5.7 ± 0.2
24	4.2 ± 0.3	4.2 ± 0.2	4.0 ± 0.2	4.3 ± 0.6	4.3 ± 0.2
26	6.2 ± 1.0	6.7 ± 0.1	5.6 ± 0.3	6.5 ± 0.7	6.0 ± 0.7
27	5.8 ± 0.5	6.1 ± 0.1	5.6 ± 0.[illegible]	5.6 ± 0.2	5.6 ± 0.4
32	5.9 ± 0.4	6.0 ± 0.3	5.8 ± 1.2	6.1 ± 0.5	5.7 ± 0.3
31A	4.3 ± 0.3	4.3 ± 0.3	4.3 ± 0.1	4.5 ± 0.3	4.2 ± 0.1
40	6.5 ± 1.2	7.0 ± 0.8	6.0 ± 0.5	7.0 ± 0.4	6.0 ± 0.2
42	4.4 ± 0.1	4.5 ± 0.3	4.4 ± 0.4	4.4 ± 0.2	4.5 ± 0.7
43	6.3 ± 0.4	6.4 ± 0.4	6.0 ± 0.4	6.4 ± 0.7	6.2 ± 0.3
44	5.1 ± 0.4	5.1 ± 0.4	4.9 ± 0.2	5.4 ± 0.3	5.0 ± 0.5
45	5.8 ± 0.6	5.7 ± 0.5	6.0 ± 0.4	6.1 ± 0.4	5.5 ± 0.4
46	5.3 ± 0.6	5.3 ± 0.4	4.9 ± 0.4	5.6 ± 0.3	5.2 ± 0.3
47	6.1 ± 0.8	6.0 ± 0.1	5.8 ± 0.7	6.7 ± 0.9	6.0 ± 0.8
48	5.5 ± 0.3	5.7 ± 0.5	5.4 ± 0.3	5.6 ± 0.4	5.4 ± 0.6
49	5.6 ± 0.3	5.8 ± 0.3	5.7 ± 0.5	5.6 ± 0.6	5.4 ± 0.7
50	6.6 ± 0.6	6.4 ± 0.4	6.8 ± 0.4	7.0 ± 0.4	6.4 ± 0.4
51	5.8 ± 0.4	5.7 ± 0.3	5.6 ± 0.3	6.1 ± 0.2	5.8 ± 0.7

1. MEAN AND TWO TIMES THE STANDARD DEVIATION OF THE QUARTERLY RESULTS.
2. SEE PROGRAM EXCEPTIONS SECTION FOR EXPLANATION.

TABLE C.VIII.2 1995 MEAN TLD RESULTS FROM PEACH BOTTOM ATOMIC POWER STATION FOR THE SITE BOUNDARY, MIDDLE, AND OUTER RINGS

RESULTS IN UNITS OF MILLI-ROENTGEN/STD. MO. ± 2 STANDARD DEVIATIONS OF THE STATION DATA

SAMPLE TYPE	EXPOSURE PERIOD	SITE	MIDDLE RING	OUTER RING
QUARTERLY	JAN-MAR 1995	5.4 ± 1.9	5.4 ± 1.8	5.4 ± 1.6
	APR-JUN 1995	5.2 ± 1.8	5.2 ± 1.7	5.0 ± 1.4
	JUL-SEP 1995	5.3 ± 2.1	5.5 ± 1.9	5.4 ± 1.5
	OCT-DEC 1995	5.1 ± 1.7	5.3 ± 1.6	5.3 ± 1.7

TABLE C-VIII.3 SUMMARY OF THE 1995 AMBIENT DOSIMETRY PROGRAM FOR PEACH BOTTOM ATOMIC POWER STATION

RESULTS IN UNITS OF MILLI-ROENTGEN/STD. MO.

SAMPLE TYPE	LOCATION	NO. OF SAMPLES ANALYZED	PERIOD MINIMUM	PERIOD MAXIMUM	PERIOD MEAN ± 2 S.D.	PRE-OP MEAN ± 2 S.D. (1)
QUARTERLY	SITE	52	3.8	7.0	5.2 ± 1.8	5.4 ± 1.7
	MIDDLE RING	92	3.3	7.0	5.4 ± 1.7	5.3 ± 1.3
	OUTER RING	15	4.0	6.0	5.3 ± 1.4	5.7 ± 1.8

(1) THE PRE-OPERATIONAL MEAN WAS CALCULATED FROM TLD READINGS 1/07/73 TO 8/05/73.

SITE BOUNDARY RING STATIONS - 1A, 1B, 1C, 1D, 1E, 1F, 1G, 1H, 1I, 1J, 1L, 1NN, 2, AND 40.

MIDDLE RING STATIONS - 3A, 4K, 5, 6B, 14, 15, 17, 22, 23, 26, 27, 31A, 32, 42, 43, 44, 45, 46, 47, 48, 49, 50, AND 51.

OUTER RING STATIONS - 16, 18, 19, AND 24.

TABLE C-IX.1 SUMMARY OF COLLECTION DATES FOR SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1995

SURFACE AND DRINKING WATER (TRITIUM)

COLLECTION PERIOD	1LL	1MM	4L	6I
JAN-MAR 95	12/28-03/29	12/28-03/29	12/30-03/30	12/30-03/31
APR-JUN 95	03/29-06/28	03/29-06/28	03/30-07/02	03/31-07/03
JUL-SEP 95	06/28-09/27	06/28-09/27	07/02-09/29	07/03-09/30
OCT-DEC 95	09/27-01/03	09/27-01/03	09/29-01/06	09/30-01/06

SURFACE AND DRINKING WATER (GAMMA AND GROSS BETA)

COLLECTION PERIOD	1LL	1MM	4L	6I
JAN 95	12/28-02/01/95	12/28-02/01/95	12/30-02/03	12/30-02/03
FEB 95	02/01-03/01/95	02/01-03/01/95	02/03-03/03	02/03-03/03
MAR 95	03/01-03/29/95	03/01-03/29/95	03/01-03/30	03/01-03/31
APR 95	03/29-05/03/95	03/29-05/03/95	03/30-05/05	03/31-05/05
MAY 95	05/03-05/31/95	05/03-05/31/95	05/05-06/02	05/05-06/02
JUN 95	05/31-06/28/95	05/31-06/28/95	06/02-07/02	06/02-07/03
JUL 95	06/28-08/02/95	06/28-08/02/95	07/02-08/04	07/03-08/04
AUG 95	08/02-08/30/95	08/02-08/30/95	08/04-09/01	08/04-09/01
SEP 95	08/30-09/27/95	08/30-09/27/95	09/01-09/29	09/01-09/30
OCT 95	09/27-11/01/95	09/27-11/01/95	09/29-11/02	09/30-11/02
NOV 95	11/01-11/29/95	11/01-11/29/95	11/02-12/03	11/02-12/03
DEC 95	11/29-01/03/96	11/29-01/03/96	12/03-01/06	12/03-01/06

TABLE C-IX.1 SUMMARY OF COLLECTION DATES FOR SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1995

AIR PARTICULATE AND AIR IODINE

WEEK	1B	1Z	2	3A	22G1
01	12/30-01/07	12/30-01/07	12/30-01/07	12/30-01/07	01/03-01/09
02	01/07-01/14	01/07-01/14	01/07-01/14	01/07-01/14	01/09-01/16
03	01/14-01/21	01/14-01/21	01/14-01/21	01/14-01/21	01/16-01/23
04	01/21-01/27	01/21-01/27	01/21-01/27	01/21-01/27	01/23-01/30
05	01/25-02/03	01/25-02/03	01/25-02/03	01/25-02/03	01/30-02/06
06	02/03-02/10	02/03-02/10	02/03-02/10	02/03-02/10	02/06-02/13
07	02/10-02/17	02/10-02/17	02/10-02/17	02/10-02/17	02/13-02/20
08	02/17-02/25	02/17-02/25	02/17-02/25	02/17-02/25	02/20-02/28
09	02/25-03/03	02/25-03/03	02/25-03/03	02/25-03/03	02/28-03/06
10	03/03-03/10	03/03-03/10	03/03-03/10	03/03-03/10	03/06-03/13
11	03/10-03/17	03/10-03/17	03/10-03/17	03/10-03/17	03/13-03/20
12	03/17-03/24	03/17-03/24	03/17-03/24	03/17-03/24	03/20-03/27
13	03/24-03/30	03/24-03/30	03/24-03/30	03/24-03/30	03/27-04/03
14	03/30-04/07	03/30-04/07	03/30-04/07	03/30-04/07	04/03-04/10
15	04/07-04/14	04/07-04/14	04/07-04/14	04/07-04/14	04/10-04/17
16	04/14-04/21	04/14-04/21	04/14-04/21	04/14-04/21	04/17-04/24
17	04/21-04/28	04/21-04/28	04/21-04/28	04/21-04/28	04/24-05/01
18	04/28-05/05	04/28-05/05	04/28-05/05	04/28-05/05	05/01-05/08
19	05/05-05/12	05/05-05/12	05/05-05/12	05/05-05/12	05/08-05/15
20	05/12-05/19	05/12-05/19	05/12-05/19	05/12-05/19	05/15-05/22
21	05/19-05/26	05/19-05/26	05/19-05/26	05/19-05/26	05/22-05/29
22	05/26-06/02	05/26-06/02	05/26-06/02	05/26-06/02	05/29-06/05
23	06/02-06/09	06/02-06/09	06/02-06/09	06/02-06/09	06/05-06/12
24	06/09-06/16	06/09-06/16	06/09-06/16	06/09-06/16	06/12-06/19
25	06/16-06/23	06/16-06/23	06/16-06/23	06/16-06/23	06/19-06/26
26	06/23-07/02	06/23-07/02	06/23-07/02	06/23-07/02	06/26-07/03
27	07/02-07/08	07/02-07/08	07/02-07/08	07/02-07/08	07/03-07/10
28	07/08-07/14	07/08-07/14	07/08-07/14	07/08-07/14	07/10-07/17
29	07/14-07/20	07/14-07/20	07/14-07/20	07/14-07/20	07/17-07/24
30	07/20-07/28	07/20-07/28	07/20-07/28	07/20-07/28	07/24-07/31
31	07/28-08/04	07/28-08/04	07/28-08/04	07/28-08/04	07/31-08/07
32	08/04-08/11	08/04-08/11	08/04-08/11	08/04-08/11	08/07-08/14
33	08/11-08/18	08/11-08/18	08/11-08/18	08/11-08/18	08/14-08/21
34	08/18-08/25	08/18-08/25	08/18-08/25	08/18-08/25	08/21-08/28
35	08/25-09/01	08/25-09/01	08/25-09/01	08/25-09/01	08/28-09/05
36		09/01-09/08	09/01-09/08	09/01-09/08	09/05-09/11
37	09/08-09/15	09/08-09/15	09/08-09/15	09/08-09/15	09/11-09/18
38	09/15-09/22	09/15-09/22	09/15-09/22	09/15-09/22	09/18-09/25
39	09/22-09/29	09/22-09/29	09/22-09/29	09/22-09/29	09/25-10/02
40	09/29-10/06	09/29-10/06	09/29-10/06	09/29-10/06	10/02-10/09
41	10/06-10/13	10/06-10/13	10/06-10/13	10/06-10/13	10/09-10/16
42	10/13-10/20	10/13-10/20	10/13-10/20	10/13-10/20	10/16-10/23
43	10/20-10/27	10/20-10/27	10/20-10/27	10/20-10/27	10/23-10/30
44	10/27-11/02	10/27-11/02	10/27-11/02	10/27-11/02	10/30-11/06
45	11/02-11/09	11/02-11/09	11/02-11/09	11/02-11/09	11/06-11/13
46	11/09-11/17	11/09-11/17	11/09-11/17	11/09-11/17	11/13-11/20
47	11/17-11/24	11/17-11/24	11/17-11/24	11/17-11/24	11/20-11/27
48	11/24-12/03	11/24-12/03	11/24-12/03	11/24-12/03	11/27-12/04
49	12/03-12/10	12/03-12/10	12/03-12/10	12/03-12/10	12/04-12/11
50	12/10-12/16	12/10-12/16	12/10-12/16	12/10-12/16	12/11-12/18
51	12/16-12/23	12/16-12/23	12/16-12/23	12/16-12/23	12/18-12/26
52	12/23-12/30	12/23-12/30	12/23-12/30	12/23-12/30	12/26-01/02

TABLE C-IX.1 SUMMARY OF COLLECTION DATES FOR SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1995

TLD - QUARTERLY

STATION CODE	JAN-MAR 1995	APR-JUN 1995	JUL-SEP 1995	OCT-DEC 1995
1A	01/04-03/30	03/30-07/02	07/02-09/29	09/29-01/06
1B	01/04-03/30	03/30-07/02	07/02-09/29	09/29-01/06
1C	01/04-03/30	03/30-07/02	07/02-09/29	09/29-01/06
1E	01/04-03/30	03/30-07/02	07/02-09/29	09/29-01/06
1F	01/04-03/30	03/30-07/02	07/02-09/29	09/29-01/06
1G	01/04-03/30	03/30-07/02	07/02-09/29	09/29-01/06
1H	01/04-03/30	03/30-07/02	07/02-09/29	09/29-01/06
1I	01/04-03/30	03/30-07/02	07/02-09/29	09/29-01/06
1J	01/04-03/30	03/30-07/02	07/02-09/29	09/29-01/06
1L	01/04-03/30	03/30-07/02	07/02-09/29	09/29-01/06
2	01/04-03/30	03/30-07/02	07/02-09/29	09/29-01/06
3A	01/03-03/30	03/30-07/02	07/02-09/29	09/29-01/06
4K	01/03-03/30	03/30-07/02	07/02-09/29	09/29-01/06
5	01/03-03/31	03/31-07/03	07/03-09/30	09/30-01/05
6B	01/03-03/31	03/31-07/03	07/03-09/30	09/30-01/06
1NN	01/04-03/30	03/30-07/02	07/02-09/29	09/29-01/06
14	01/03-03/31	03/31-07/03	07/03-09/30	09/30-01/05
15	01/03-03/31	03/31-07/03	07/03-09/30	09/30-01/05
16	01/03-03/31	03/31-07/03	07/03-09/30	09/30-01/05
17	01/03-03/31	03/31-07/03	07/03-09/30	09/30-01/05
18	01/04-03/31	03/31-07/02	07/02-09/30	09/30-01/05
19	01/03-03/31	03/31-07/02	07/02-09/30	
22	01/03-03/31	03/31-07/03	07/03-09/30	09/30-01/05
23	01/04-03/30	03/30-07/02	07/02-09/29	09/29-01/06
24	01/03-03/31	03/31-07/03	07/03-09/30	09/30-01/05
26	01/03-03/30	03/30-07/02	07/02-09/29	09/29-01/05
27	01/04-03/30	03/30-07/02	07/02-09/29	09/29-01/05
32	01/03-03/31	03/31-07/03	07/03-09/30	09/30-01/05
31A	01/03-03/31	03/31-07/03	07/03-09/30	09/30-01/05
40	01/04-03/30	03/30-07/02	07/02-09/29	09/29-01/06
42	01/03-03/31	03/31-07/03	07/03-09/30	09/30-01/05
43	01/03-03/31	03/31-07/03	07/03-09/30	09/30-01/05
44	01/03-03/31	03/31-07/03	07/03-09/30	09/30-01/05
45	01/03-03/31	03/31-07/03	07/03-09/30	09/30-01/05
46	01/03-03/30	03/30-07/02	07/02-09/29	09/29-01/05
47	01/03-03/30	03/30-07/02	07/02-09/29	09/29-01/05
48	01/03-03/30	03/30-07/02	07/02-09/29	09/29-01/05
49	01/03-03/30	03/30-07/02	07/02-09/29	09/29-01/05
50	01/03-03/30	03/30-07/02	07/02-09/29	09/29-01/05
51	01/03-03/30	03/30-07/02	07/02-09/29	09/29-01/05

FIGURE C-1
MONTHLY INSOLUBLE GROSS BETA CONCENTRATIONS IN DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF PBAPS, 1995

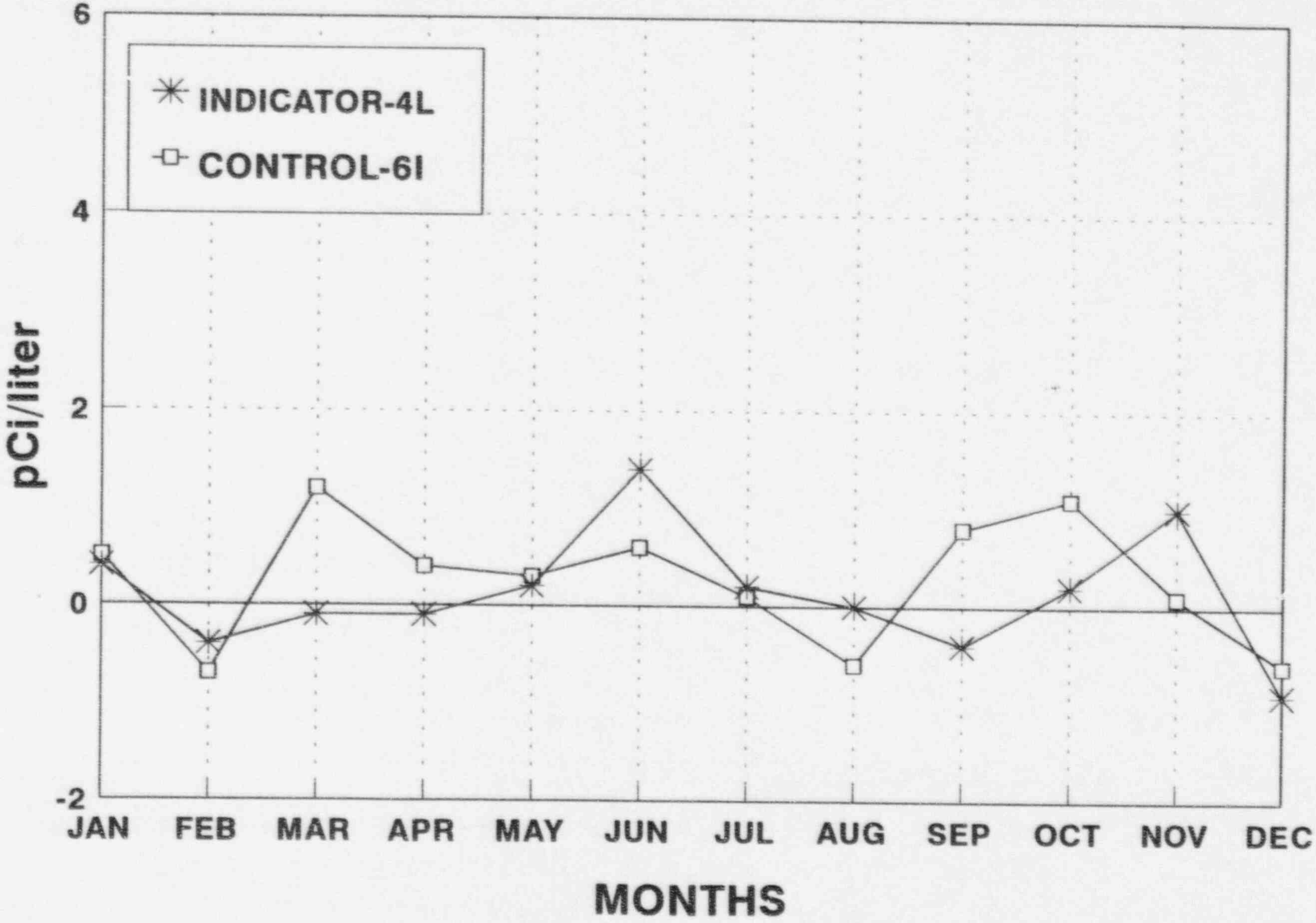


FIGURE C-2
MONTHLY SOLUBLE GROSS BETA CONCENTRATIONS IN DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF PBAPS, 1995

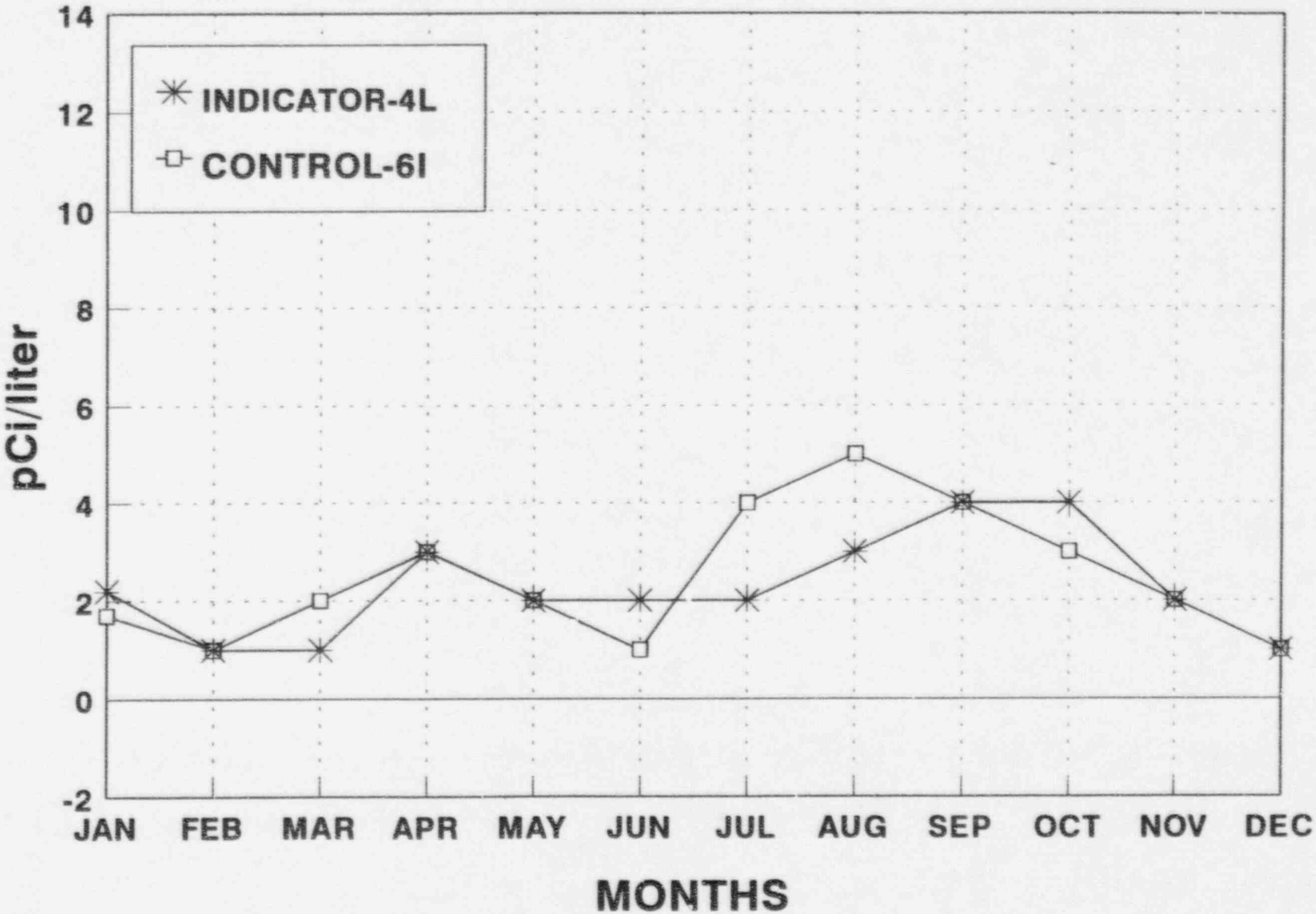


FIGURE C-3
MEAN ANNUAL CS-137 CONCENTRATIONS IN FISH SAMPLES COLLECTED IN THE VICINITY OF PBAPS, 1971 - 1995

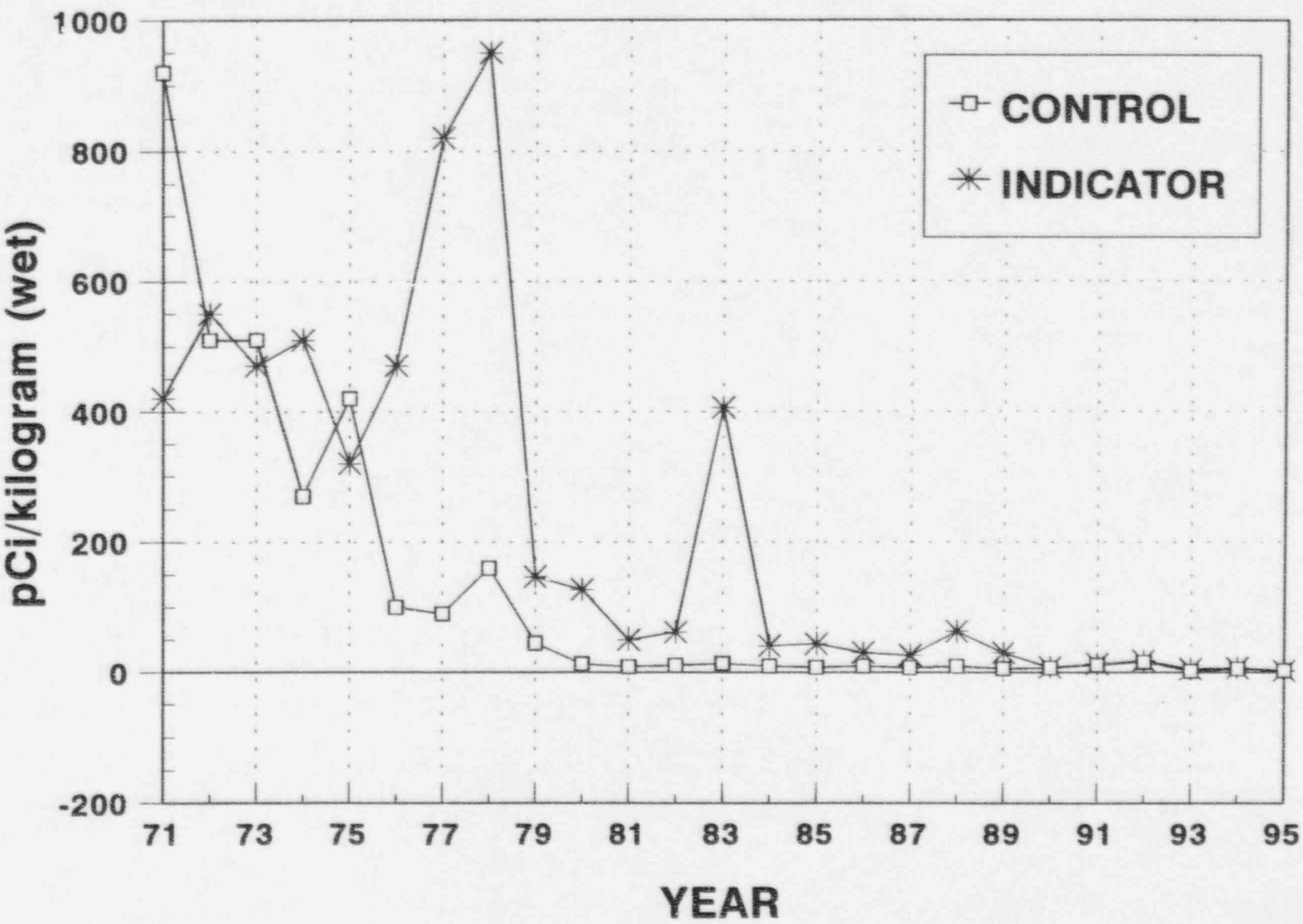
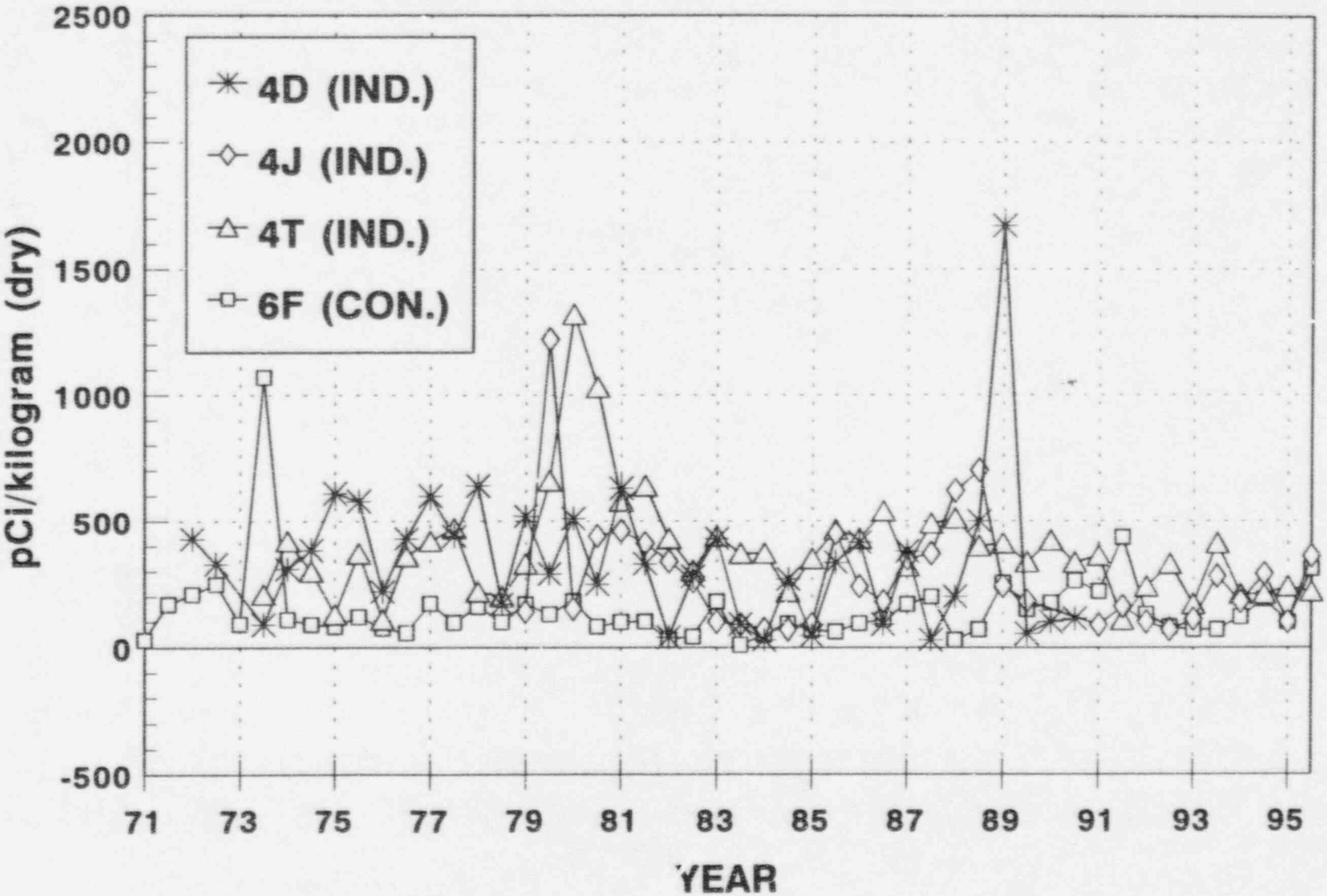


FIGURE C-4
SEMI-ANNUAL CS-137 CONCENTRATIONS IN SEDIMENT SAMPLES COLLECTED IN THE VICINITY OF PBAPS, 1971 - 1995



Station 4D discontinued beginning 1991, No sample collected from Station 4J in 1990

FIGURE C-5
MEAN WEEKLY GROSS BETA CONCENTRATIONS IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF PBAPS, 1995

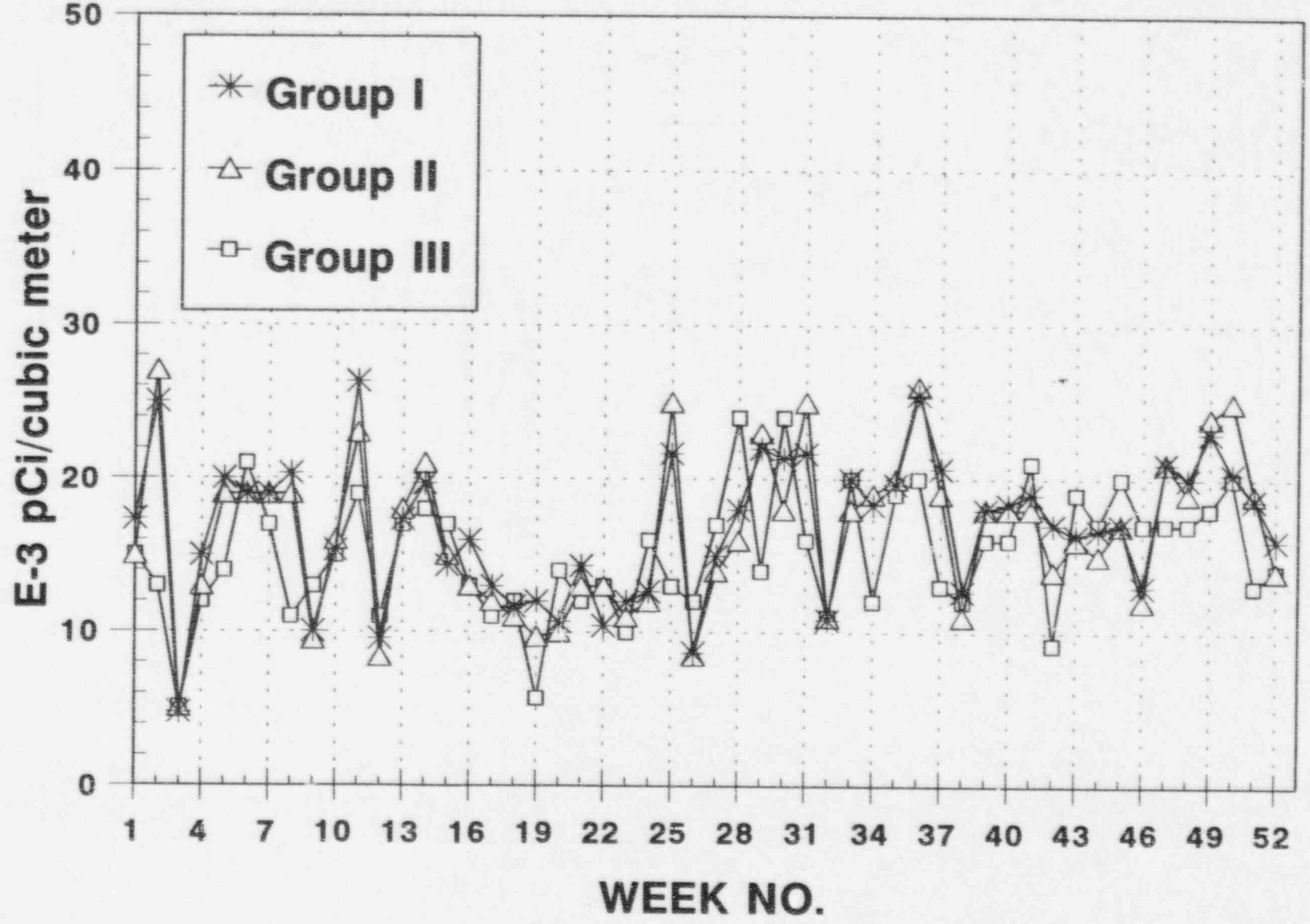


FIGURE C-6

MEAN MONTHLY GROSS BETA CONCENTRATIONS IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF PBAPS, 1970 - 1995

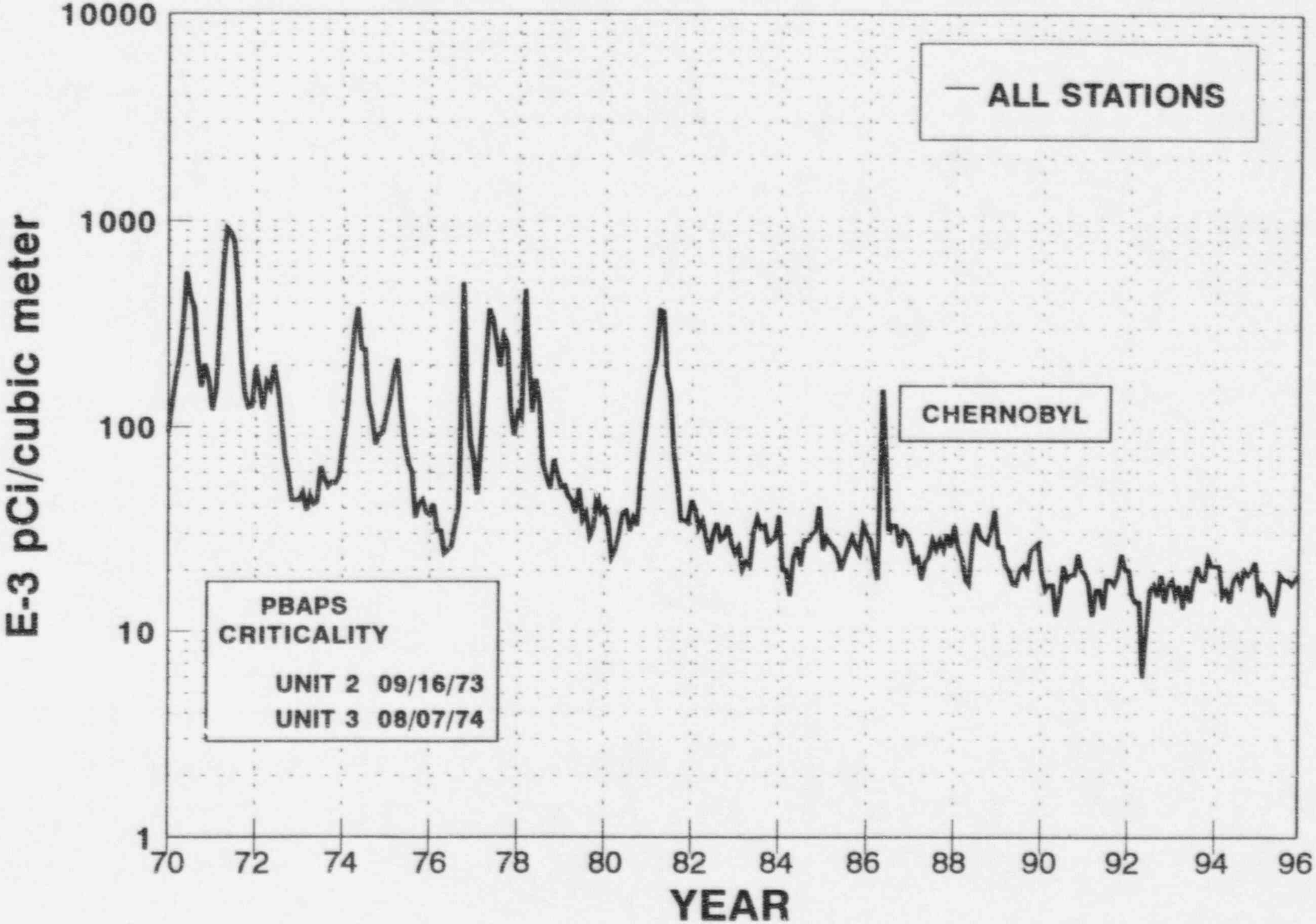


FIGURE C-7
MEAN ANNUAL CS-137 CONCENTRATIONS IN MILK SAMPLES COLLECTED IN THE VICINITY OF PBAPS, 1971 - 1995

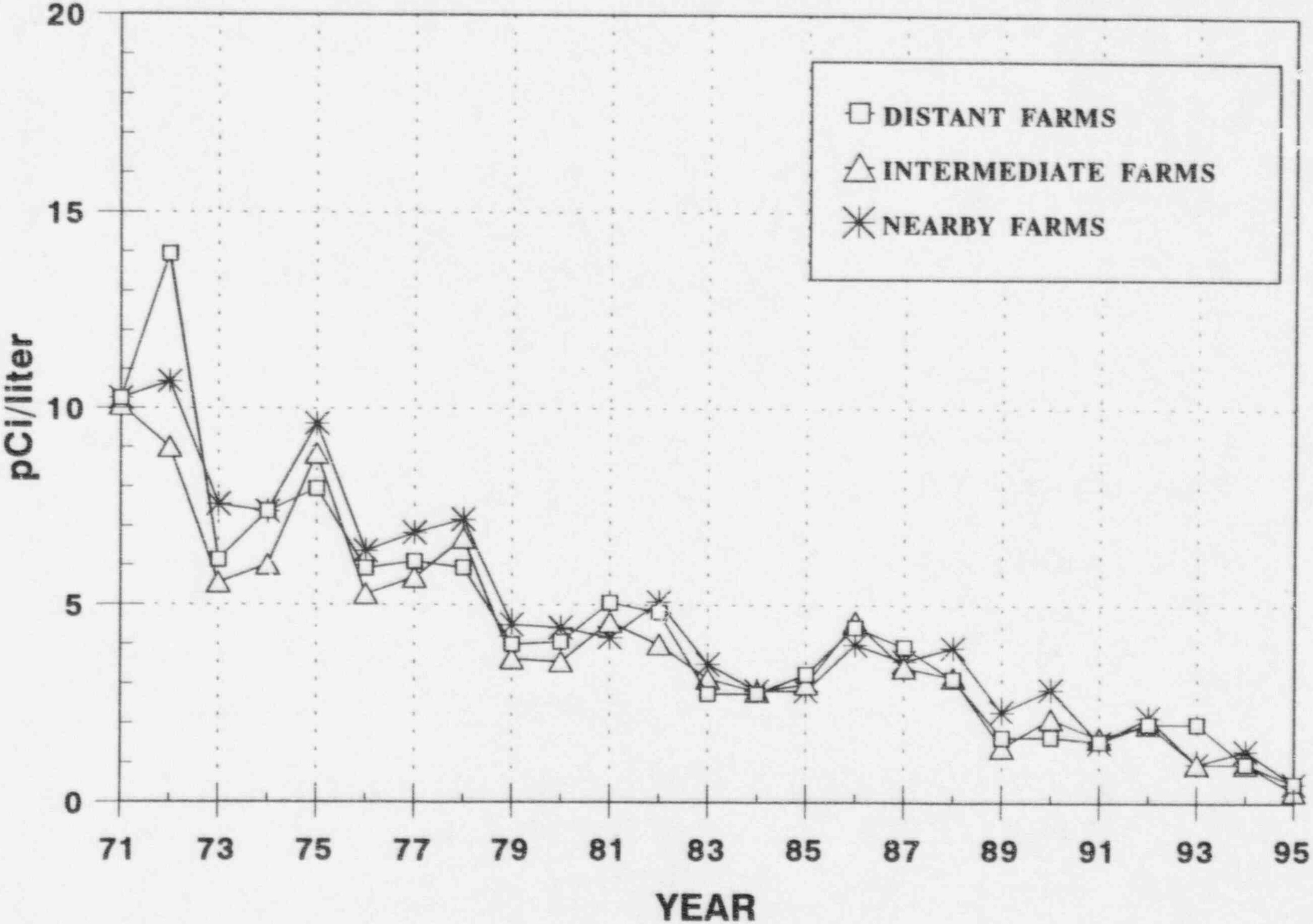
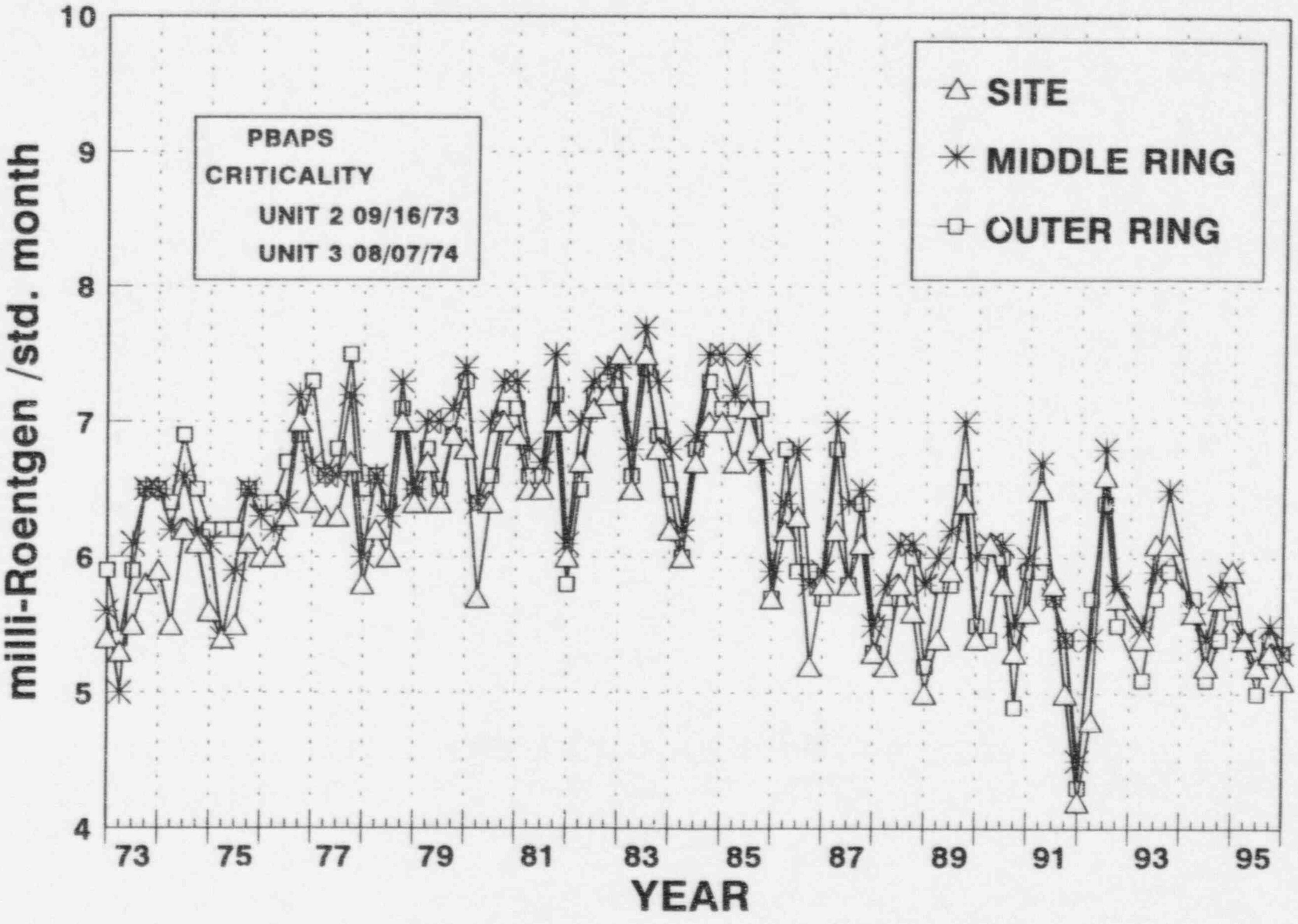


FIGURE C-8
MEAN QUARTERLY AMBIENT GAMMA RADIATION (TLD) LEVELS IN THE VICINITY OF PBAPS, 1973 - 1995



APPENDIX D

DATA TABLES AND FIGURES
COMPARISON LABORATORY

APPENDIX D: DATA TABLES AND FIGURES - COMPARISON LABORATORY

The following section contains data and figures illustrating the analyses performed by the quality control laboratory. Duplicate samples were obtained from several locations and media and split between the primary laboratory, GPU Nuclear and the quality control laboratory, Teledyne Brown Engineering (TBE). Comparison of the results for most media were within expected ranges, though occasional differences were seen:

TBE's results of gross beta insoluble and soluble in drinking water samples were slightly higher than the results from GPU (Figures D-1 and D-2, Appendix D). The differences were probably due to variations in the respective laboratory's analytical procedures. TBE counts the samples for 50 minutes, GPU counts for 100 minutes.

The gross beta results for air particulate samples collected at the co-located stations 1Z and 1A compared very well (Figure D-3, Appendix D). No significant diferences were noted. Both laboratories use Cs-137 as a calibration source.

TABLE D-I.1 CONCENTRATIONS OF GROSS BETA INSOLUBLE IN DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1995

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	4L	
JAN 95	0.4	± 1.0
FEB 95	0.1	± 0.5
MAR 95	0.0	± 0.9
APR 95	0.1	± 0.9
MAY 95	0.6	± 0.5
JUN 95	0.9	± 0.5
JUL 95	0.2	± 0.5
AUG 95	-0.1	± 0.5
SEP 95	0.3	± 0.5
OCT 95	0.4	± 0.5
NOV 95	0.7	± 0.5
DEC 95	-0.2	± 1.0
MEAN	0.3	± 0.7

TABLE D-I.2 CONCENTRATIONS OF GROSS BETA SOLUBLE IN DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1995

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	4L	
JAN 95	2	± 1
FEB 95	2.8	± 0.9
MAR 95	2	± 1
APR 95	1	± 1
MAY 95	2.6	± 0.9
JUN 95	2.3	± 0.8
JUL 95	3.2	± 0.9
AUG 95	2.9	± 0.9
SEP 95	5	± 1
OCT 95	5	± 1
NOV 95	2.7	± 0.9
DEC 95	1	± 1
MEAN	2.7	± 2.5

TABLE D-I.3 CONCENTRATIONS OF GAMMA EMITTERS IN DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1995

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

STC	COLLECTION PERIOD	K-40		MN-54		CO-58		FE-59		CO-60		ZN-65	
4L	FEB 95	10	± 10	0.6	± 0.8	0.4	± 0.9	1	± 2	0.1	± 0.8	0	± 2
	MAY 95	-10	± 10	-0.1	± 0.5	-0.3	± 0.6	0	± 1	0.4	± 0.5	1	± 1
	JUN 95	-10	± 20	-0.2	± 0.8	0.1	± 0.9	-1	± 2	-0.1	± 0.8	0	± 2
	JUL 95	-40	± 10	0.3	± 0.8	-0.1	± 0.9	-1	± 2	-0.1	± 0.7	0	± 2
	AUG 95	-10	± 10	0.9	± 0.9	0	± 1	0	± 2	-0.3	± 0.9	4	± 2
	SEP 95	-10	± 10	0.1	± 0.8	0	± 1	1	± 3	0.9	± 0.8	1	± 2
	OCT 95	-40	± 10	0.6	± 0.8	-1	± 1	-1	± 3	-0.5	± 0.7	1	± 2
	NOV 95	0	± 10	0.4	± 0.8	-0.1	± 0.8	0	± 2	0.4	± 0.8	0	± 2
	DEC 95	-1	± 6	0.0	± 0.5	0.0	± 0.6	0	± 1	0.7	± 0.6	1	± 1
4L	MEAN	-13	± 33	0.3	± 0.8	-0.1	± 0.6	0	± 1	0.2	± 0.9	1	± 3

STC	COLLECTION PERIOD	ZR-95		NB-95		CS-134		CS-137		BA-140		LA-140	
4L	FEB 95	1	± 2	1	± 1	0.4	± 0.8	0.7	± 0.8	1	± 6	-1	± 3
	MAY 95	2	± 1	0.5	± 0.6	-0.1	± 0.6	-0.2	± 0.6	3	± 3	0	± 1
	JUN 95	1	± 2	0.5	± 0.9	0.4	± 0.9	0.2	± 0.8	3	± 6	0	± 2
	JUL 95	0	± 2	0.7	± 0.9	-0.3	± 0.8	0.7	± 0.8	-1	± 7	1	± 3
	AUG 95	0	± 2	1	± 1	-1	± 1	1	± 1	-3	± 6	1	± 2
	SEP 95	3	± 2	0	± 1	0.3	± 0.8	-0.9	± 0.9	0	± 20	-5	± 8
	OCT 95	1	± 2	0	± 1	0.1	± 0.8	0.7	± 0.8	20	± 20	-10	± 10
	NOV 95	1	± 2	0.1	± 0.8	0.4	± 0.8	-0.6	± 0.9	-1	± 3	0	± 1
	DEC 95	-1	± 1	0.1	± 0.6	0.3	± 0.6	0.0	± 0.6	-2	± 3	0	± 1
4L	MEAN	1	± 2	0.5	± 0.7	0.1	± 0.8	0.2	± 1.3	2	± 14	-1	± 5

TABLE D-II.1 CONCENTRATIONS OF GROSS BETA IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1995

RESULTS IN UNITS OF E-3 PCI/CU METER ± 2 SIGMA

WEEK	1A	
01	19	± 3
02	28	± 4
03	1	± 3
04	16	± 4
05	21	± 3
06	21	± 3
07	18	± 3
08	23	± 3
09	15	± 3
10	16	± 3
11	27	± 4
12	10	± 3
13	16	± 4
14	19	± 3
15	15	± 3
16	17	± 3
17	15	± 3
18	14	± 3
19	11	± 3
20	10	± 3
21	14	± 3
22	14	± 3
23	14	± 3
24	16	± 3
25	22	± 3
26	9	± 2
27	18	± 4
28	19	± 4
29	27	± 4
30	24	± 3
31	26	± 4
32	15	± 3
33	29	± 4
34	17	± 3
35	22	± 3
36	26	± 3
37	21	± 3
38	18	± 3
39	20	± 3
40	21	± 3
41	20	± 3
42	23	± 3
43	16	± 3
44	18	± 4
45	19	± 3
46	17	± 3
47	21	± 3
48	23	± 3
49	24	± 4
50	28	± 4
51	22	± 3
52	15	± 3
MEAN	19	± 11

TABLE D-II.2 CONCENTRATIONS OF GAMMA EMITTERS IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1995

RESULTS IN UNITS OF E-3 PCI/CU METER ± 2 SIGMA

STC	COLLECTION PERIOD	BE-7		K-40		CS-134		CS-137		RA-226		TH-228	
1A	12/30-03/30/95	73	± 7	10	± 5	0.2	± 0.3	-0.2	± 0.3	1	± 5	0.4	± 0.5
	03/30-07/02/95	89	± 9	0	± 3	0.0	± 0.2	0.0	± 0.2	1	± 3	-0.5	± 0.3
	07/02-09/29/95	74	± 7	65	± 8	0.2	± 0.4	0.0	± 0.4	-4	± 5	0.6	± 0.4
	09/29-12/30/95	51	± 6	-2	± 7	-0.3	± 0.4	0.0	± 0.3	2	± 5	-0.1	± 0.4
	MEAN	72	± 31	18	± 63	0.0	± 0.5	-0.1	± 0.2	0	± 5	0.1	± 1.0

TABLE D-III.1 CONCENTRATIONS OF I-131 BY CHEMICAL SEPARATION AND GAMMA EMITTERS IN MILK SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1995

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

STC	COLLECTION PERIOD	I-131		K-40		CS-134		CS-137		BA-140		LA-140	
A	02/13-02/13/95	-0.05	± 0.04	1300	± 100	2	± 2	2	± 3	1	± 9	0	± 4
	05/22-05/22/95	-0.05	± 0.04	1600	± 200	0	± 3	1	± 3	3	± 8	1	± 3
	08/13-08/13/95	-0.01	± 0.07	1500	± 100	1	± 2	0	± 2	0	± 6	-1	± 2
	10/23-10/23/95	0.03	± 0.05	1400	± 100	-1	± 2	1	± 2	2	± 5	-1	± 2
	MEAN	-0.02	± 0.07	1500	± 300	1	± 2	1	± 2	1	± 3	0	± 1
G	10/23-10/23/95	-0.06	± 0.06	1500	± 100	1	± 3	2	± 3	-5	± 8	2	± 3
J	02/13-02/13/95	-0.04	± 0.05	1500	± 100	0	± 2	2	± 2	-1	± 6	-1	± 2
	05/22-05/22/95	-0.01	± 0.04	1500	± 200	1	± 2	-1	± 2	2	± 7	1	± 3
	08/13-08/13/95	-0.06	± 0.05	1500	± 100	1	± 3	2	± 3	1	± 7	0	± 3
	10/23-10/23/95	0.03	± 0.06	1400	± 100	-1	± 3	2	± 3	0	± 8	-2	± 3
	MEAN	-0.02	± 0.07	1500	± 200	0	± 2	1	± 3	0	± 3	-1	± 2
N	02/13-02/13/95	0.01	± 0.05	1300	± 100	-1	± 3	2	± 3	6	± 8	0	± 3
	05/22-05/22/95	-0.15	± 0.05	1500	± 100	-1	± 2	3	± 2	1	± 7	1	± 3
	08/14-08/14/95	-0.04	± 0.08	1300	± 100	0	± 2	1	± 2	0	± 8	1	± 3
	MEAN	-0.06	± 0.16	1400	± 200	-1	± 1	2	± 2	2	± 6	1	± 1

TABLE D-IV.1 SUMMARY OF COLLECTION DATES FOR SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1995

COLLECTION PERIOD	4L
JAN 95	12/30-02/03
FEB 95	02/03-03/03
MAR 95	03/03-03/30
APR 95	03/30-05/05
MAY 95	05/05-06/02
JUN 95	06/02-07/02
JUL 95	07/02-08/04
AUG 95	08/04-09/01
SEP 95	09/01-09/29
OCT 95	09/29-11/02
NOV 95	11/02-12/03
DEC 95	12/03-01/06

WEEK	1A	WEEK	1A
01	12/30-01/07	27	07/02-07/08
02	01/07-01/14	28	07/08-07/14
03	01/14-01/21	29	07/14-07/20
04	01/21-01/27	30	07/20-07/28
05	01/27-02/03	31	07/28-08/04
06	02/03-02/10	32	08/04-08/11
07	02/10-02/17	33	08/11-08/18
08	02/17-02/25	34	08/18-08/25
09	02/25-03/03	35	08/25-09/01
10	03/03-03/10	36	09/01-09/08
11	03/10-03/17	37	09/08-09/15
12	03/17-03/24	38	09/15-09/22
13	03/24-03/30	39	09/22-09/29
14	03/30-04/07	40	09/29-10/06
15	04/07-04/14	41	10/06-10/13
16	04/14-04/21	42	10/13-10/20
17	04/21-04/28	43	10/20-10/27
18	04/28-05/05	44	10/27-11/02
19	05/05-05/12	45	11/02-11/09
20	05/12-05/19	46	11/09-11/17
21	05/19-05/26	47	11/17-11/24
22	05/26-06/02	48	11/24-12/03
23	06/02-06/09	49	12/03-12/10
24	06/09-06/16	50	12/10-12/16
25	06/16-06/23	51	12/16-12/23
26	06/23-07/02	52	12/23-12/30

FIGURE D-1
COMPARISON OF MONTHLY INSOLUBLE GROSS BETA CONCENTRATIONS IN DRINKING WATER SAMPLES (4L) SPLIT BETWEEN GPU AND TBE, 1995

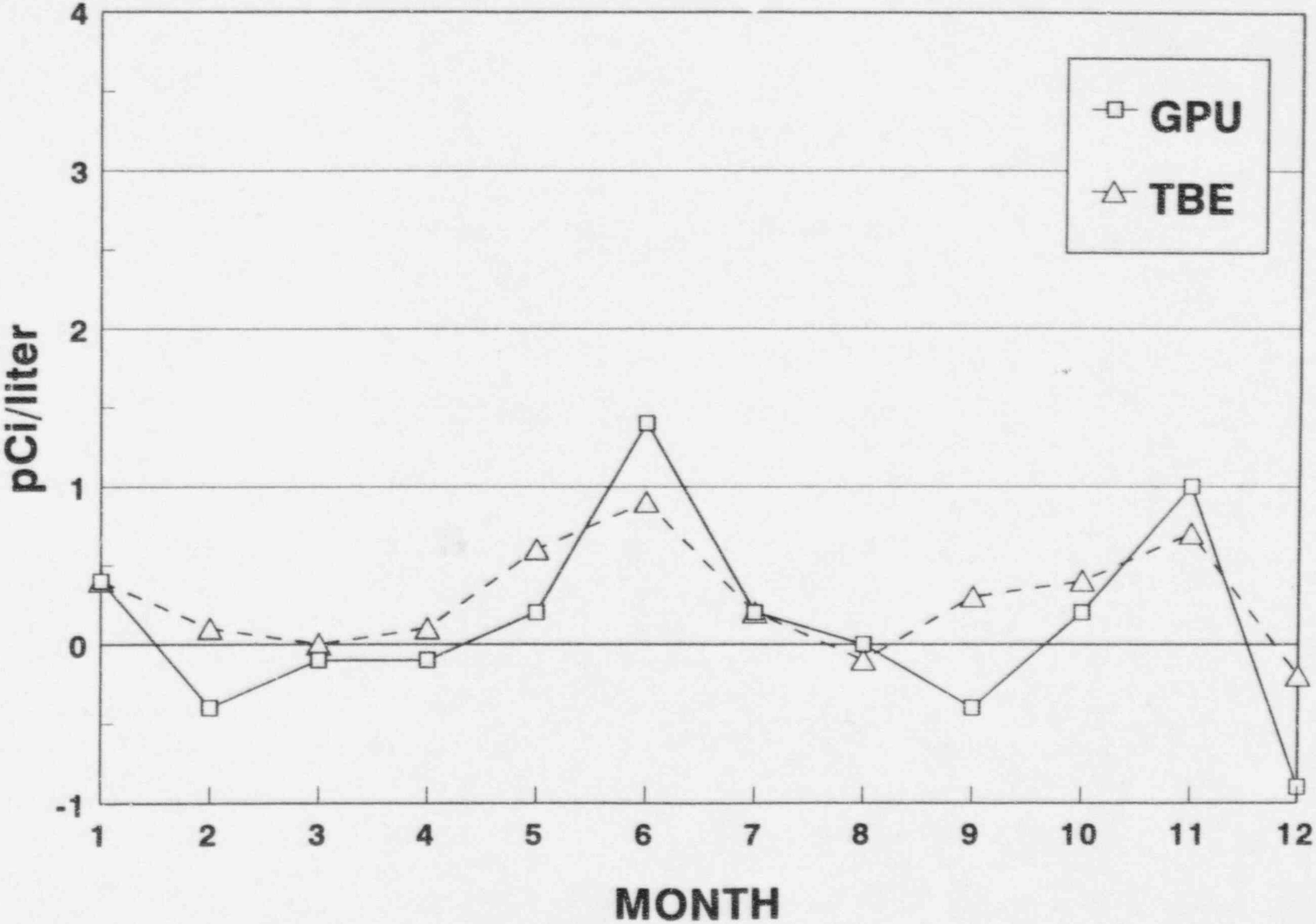


FIGURE D-2
COMPARISON OF MONTHLY SOLUBLE GROSS BETA CONCENTRATIONS IN DRINKING WATER SAMPLES (4L) SPLIT BETWEEN GPU AND TBE, 1995

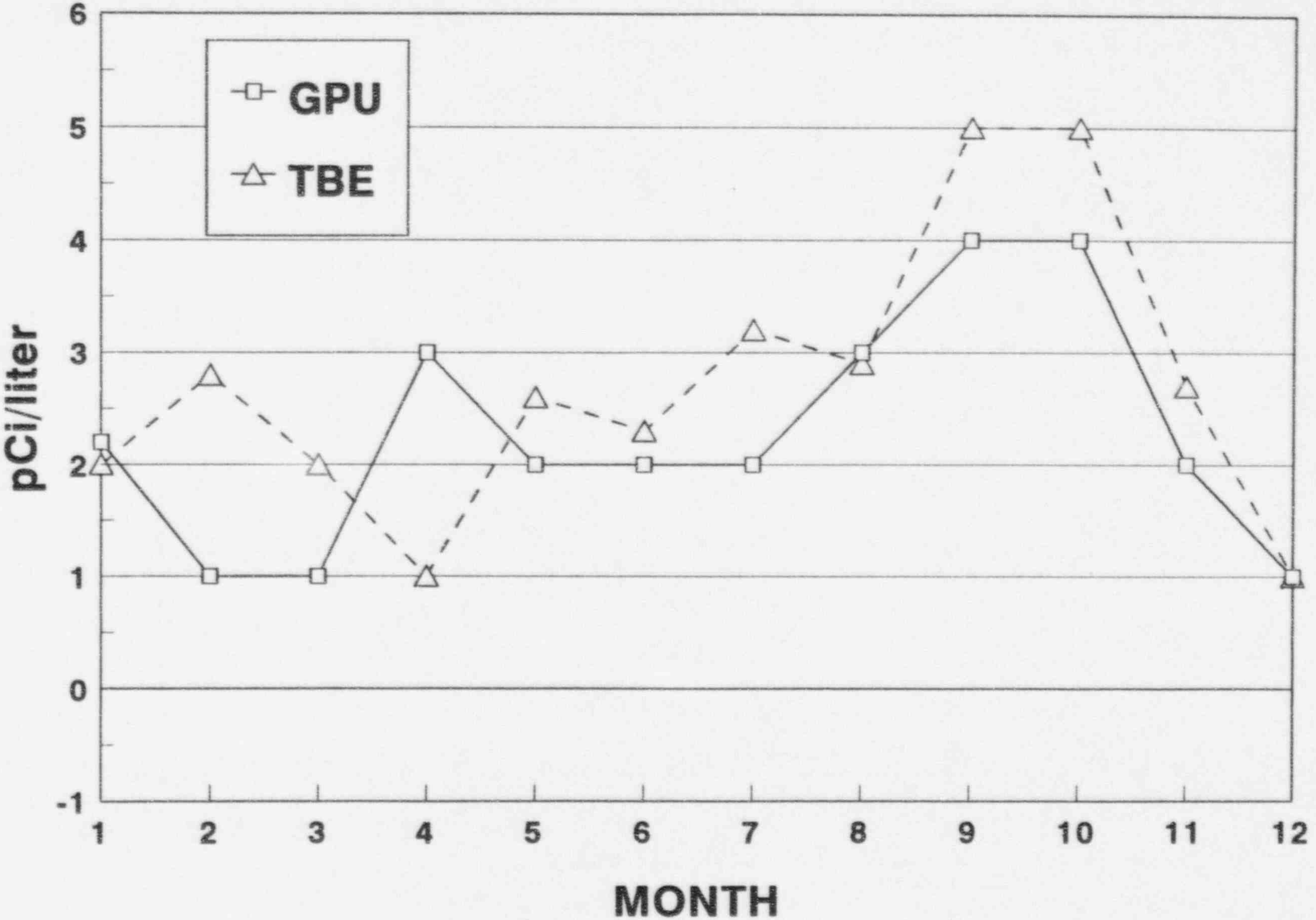
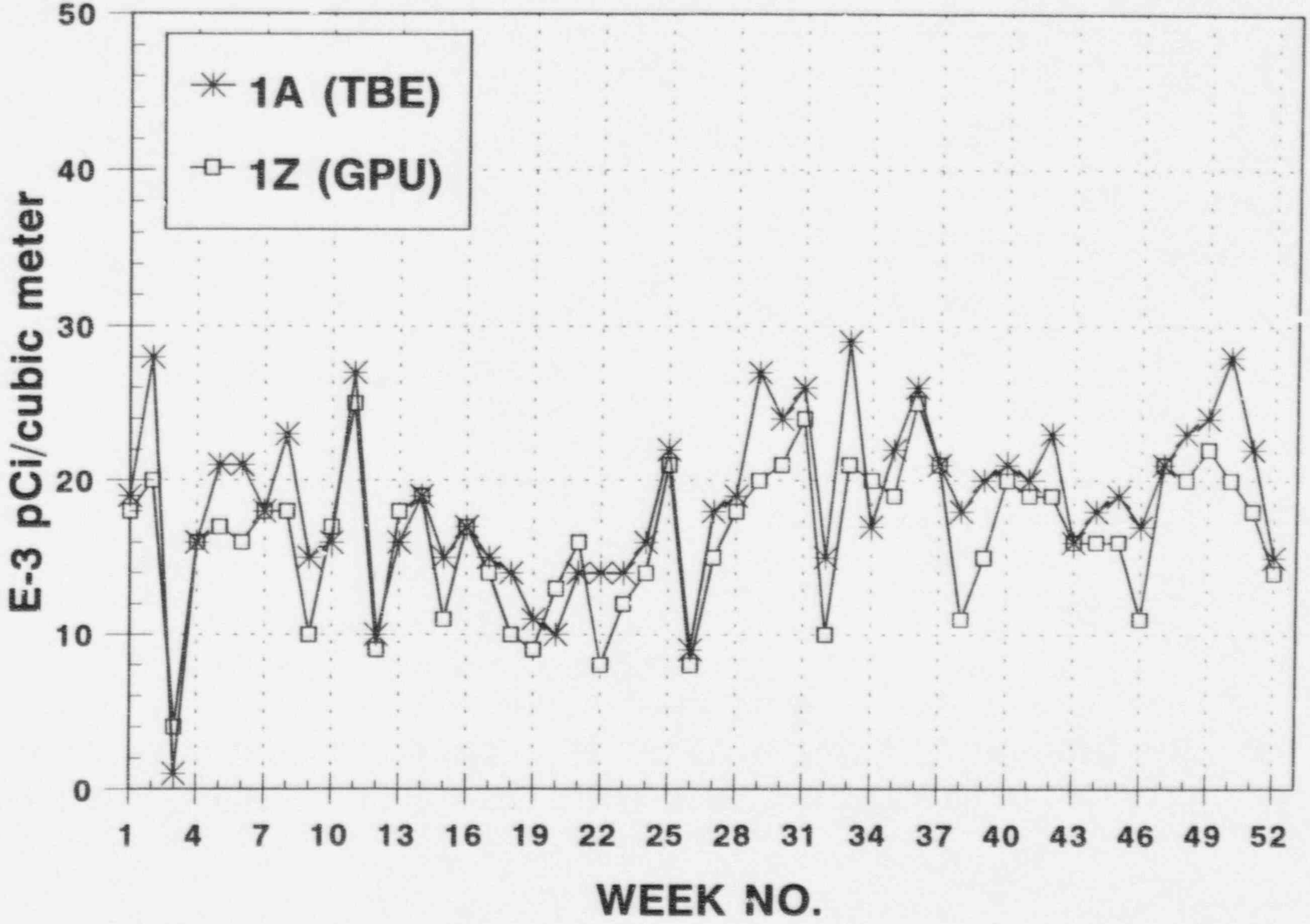


FIGURE D-3
WEEKLY GROSS BETA CONCENTRATIONS IN AIR PARTICULATE SAMPLES COLLECTED FROM CO-LOCATED PBAPS LOCATIONS 1A AND 1Z, 1995



APPENDIX E

SYNOPSIS OF ANALYTICAL PROCEDURES

APPENDIX E: SYNOPSIS OF ANALYTICAL PROCEDURES

The following section contains a description of the analytical laboratory procedures along with an explanation of the analytical calculation methods used by GPU Nuclear and Teledyne Brown Engineering to obtain the sample activities.

DETERMINATION OF GROSS BETA ACTIVITY IN WATER SAMPLES (TOTAL SUSPENDED AND DISSOLVED FRACTIONS)

GPUN Environmental Radioactivity Laboratory

This describes the process used to measure the radioactivity of water samples without identifying the radioactive species present. No chemical separation techniques are involved.

For surface and drinking water samples, 400 ml of the sample is filtered under vacuum through a 0.45 micron filter. This filter represents the insoluble portion of the sample. The filter is dried and mounted on a planchet. The filtrate which represents the soluble portion of the sample is evaporated on a hot plate, and the residue is transferred and dried on another planchet.

The planchets are counted for 100 minutes in a low-background gas flow proportional counter. Calculation of activity includes a self-absorption correction for counter efficiency based on the weight of residue on each planchet.

Calculation of Sample Activity and 2 Sigma Uncertainty:

$$R=\frac{C-B}{2.22\times E_0\times TF\times V\times T}$$

$$2s=\frac{2\times\sqrt{C+B}}{2.22\times E_0\times TF\times V\times T}$$

$$LLD=\frac{4.66\times\sqrt{B}}{2.22\times E_0\times TF\times V\times T}$$

Where:

R	=	Activity of sample in picocuries per unit volume or weight. Volume or weight units are those used for V.
2s	=	2 Sigma Counting Uncertainty
LLD	=	Lower Limit of Detection
C	=	Sample Counts
B	=	Blank Counts
E_0	=	Efficiency of the counter
TF	=	Transmission Factor
T	=	Acquisition time in minutes
V	=	Volume or weight of aliquot analyzed.

DETERMINATION OF GROSS BETA ACTIVITY IN WATER SAMPLES
(TOTAL SUSPENDED AND DISSOLVED FRACTIONS)

Teledyne Brown Engineering

This describes the process used to measure the radioactivity of water samples without identifying the radioactive species present. No chemical separation techniques are involved.

For surface and drinking water samples, one liter of the sample is filtered under vacuum through a 0.45 micron Millipore filter. This filter represents the insoluble portion of the sample. The filter is dried and mounted on a planchet. The filter which represents the soluble portion of the sample is evaporated on a hot plate, and the residue is transferred and dried on another planchet.

The planchets are counted for 50 minutes in a low-background gas flow proportional counter. Calculation of activity includes a self-absorption correction for counter efficiency based on the weight of residue on each planchet.

Calculation of Sample Activity and 2 Sigma Error:

$$\frac{Result}{(pCi/l)} = \frac{\frac{N}{t_s} - \beta}{(2.22)(v)(E)} + \frac{2\sqrt{\frac{N}{t_s^2} + \frac{\beta}{t_b}}}{(2.22)(v)(E)}$$

Net Activity Counting Error

where:

N	=	total counts from sample (counts)
t_s	=	counting time for sample (min)
β	=	background rate of counter (cpm)
t_b	=	counting time for background (min)
2.22	=	dpm/pCi
v	=	volume in liters
E	=	efficiency of the counter
2	=	multiple of counting error

The MDL is defined as that value equal to the two sigma counting error of the result.

DETERMINATION OF TRITIUM IN WATER BY
LIQUID SCINTILLATION COUNTING

GPUN Environmental Radioactivity Laboratory

Seven (7) milliliters of sample is filtered tnrough a 0.45 micron filter into a vial and mixed with 15 ml of liquid scintillation material and counted for a minimum of 480 minutes to determine its activity. The tritium activity is determined by measuring the count rate in the beta activity energy spectrum in Region A. 20.0 to 2000 represents Region C. If the sample Region C cpm is within ± 25% of the average background Region C cpm and the sample Quench Indicating Parameter (QIP) is within 20 of the H-3 source QIP the sample has no contamination and the tritium activity may be calculated directly. If not the sample must be purified before recounting.

Calculation of Sample Activity and 2 Sigma Uncertainty:

$$R = \frac{C-B}{2.22 \times E_0 \times V \times DF}$$

$$2s = \frac{2 \times \sqrt{\frac{C}{T_a} + \frac{\beta}{T_b}}}{2.22 \times E_0 \times V \times DF}$$

$$LLD = \frac{3.29 \times \sqrt{\frac{\beta}{T_a} + \frac{\beta}{T_b}}}{2.22 \times E_0 \times V \times DF}$$

Where:

T_a	=	Total count time of sample in minutes
T_b	=	Total count time of background in minutes
R	=	Tritium activity in picoCuries per unit volume (Volume units are those used in V)
2s	=	2 sigma Uncertainty in the same units as above
LLD	=	Lower limit of detection in same units as above
C	=	Average count rate of sample
ß	=	Average count rate of background

E_0 = Tritium detection efficiency of counter, calculated as shown below
V = Volume of aliquot
DF = Decay factor, calculated as shown below

$$DF = e^{\frac{-ln2 \times DT}{12.43}}$$

DT = time difference in years from collection stop date to counting date of sample

The efficiency is calculated as follows:

$$E_0 = \frac{S - B}{As \times Vs \times DFs}$$

Where:

S = Average count rate for the "efficiency determination" standard
B = Average count rate of background
As = Activity of standard in dpm per unit volume
Vs = Volume of standard used
DFs = Decay factor of standard, calculated as follows:

$$DFs = e^{\frac{-ln2 \times DTs}{12.43}}$$

DTs = time difference (in years) between calibration date and counting date

DETERMINATION OF GROSS BETA ACTIVITY IN AIR PARTICULATE SAMPLES

GPUN Environmental Radioactivity Laboratory

After allowing at least a three-day (extending from the sample stop date to the sample count time) period for the short-lived radionuclides to decay out, each air particulate filter paper is placed in a 2-inch diameter stainless steel planchet and counted using a gas flow proportional counter.

Calculation of Sample Activity and 2 Sigma Uncertainty:

$$R=\frac{C-B}{2.22\times E_0\times TF\times V\times T}$$

$$2s=\frac{2\times\sqrt{C+B}}{2.22\times E_0\times TF\times V\times T}$$

$$LLD=\frac{4.66\times\sqrt{B}}{2.22\times E_0\times TF\times V\times T}$$

Where

R	=	Activity of sample in picoCuries per unit volume or weight. Volume or weight units are those used for V.
2s	=	2 Sigma Counting Uncertainty
LLD	=	Lower Limit of Detection
C	=	Sample Counts
B	=	Blank Counts
E_0	=	Efficiency of the counter
TF	=	Transmission Factor of filter (i.e. 1.00 for gross beta, 0.80 for gross alpha)
T	=	Acquisition time in minutes
V	=	Volume analyzed.

DETERMINATION OF GROSS BETA ACTIVITY IN AIR PARTICULATE SAMPLES

Teledyne Brown Engineering

This describes the process used to measure the overall beta activity of air particulate filters without identifying the radioactive species present. No chemical separation techniques are involved. Each air particulate filter is placed directly on a 2-inch stainless steel planchet. The planchets are then counted for beta activity in a low-background gas flow proportional counter. Calculation of activity includes an empirical self-absorption correction curve which allows for the change in effective counting efficiency caused by the residue mass. Self-absorption is not considered in the case of air particulate filters because of the impracticality of accurately weighing the deposit and because the penetration depth of the deposit into the filter is unknown.

Calculation of Sample Activity and 2 Sigma Error:

$$\frac{Result}{(pCi/m^3)} = \frac{\frac{N}{t_s} - \beta}{2.22(v)(E)(.02832)} + \frac{2\sqrt{\frac{N}{t_s^2} + \frac{\beta}{t_b}}}{2.22(v)(E)(.02832)}$$

Net Activity — Counting Error

where:

N	=	total counts from sample (counts)
t_s	=	counting time for sample (min)
β	=	background rate of counter (cpm)
t_b	=	counting time for background (min)
2.22	=	dpm/pCi
v	=	volume of sample analyzed in cubic feet calculated from the elapsed time meter
E	=	efficiency of the counter
2	=	multiple of counting error
.02832	=	conversion to cubic meters

The MDL is defined as that value equal to the two sigma counting error of the result.

DETERMINATION OF I-131 IN MILK SAMPLES

GPUN Environmental Radioactivity Laboratory

Stable iodine carrier is equilibrated in a 3.5-liter volume of raw milk before pumping through 25cc of anion exchange resin to extract iodine. The system is washed with de-ionized water until clear and the washed resin is transferred to a gamma counting container and analyzed by gamma spectroscopy.

Calculation of Sample Activity and 2 Sigma Uncertainty:

The same calculations are used as in DETERMINATION OF GAMMA EMITTING RADIOISOTOPES below.

DETERMINATION OF I-131 IN MILK SAMPLES

Teledyne Brown Engineering

Two liters of sample are first equilibrated with stable iodide carrier. A batch treatment with anion exchange resin is used to remove iodide from the sample. The iodine is then stripped from the resin with sodium hypochlorite, reduced with hydroxylamine hydrochloride, and extracted into carbon tetrachloride as free iodine. It is then back-extracted as iodide into sodium bisulfite solution and is precipitated as palladium iodide. The precipitate is weighed for chemical yield and is mounted on a nylon planchet for low level beta counting. The chemical yield is corrected by measuring the stable iodide content of the milk or water with a specific ion electrode.

Calculation of the Sample Activity and 2 Sigma Error:

$$\frac{Result}{(pCi/l)} = \frac{\frac{N}{t_s} - \beta}{(2.22)(v)(E)(y)(\exp^{-\lambda\Delta t})} + \frac{2\sqrt{\frac{N}{t_s^2} + \frac{\beta}{t_b}}}{(2.22)(v)(E)(y)(\exp^{-\lambda\Delta t})}$$

Net Activity — Counting Error

where:

N	=	total counts from sample (counts)
t_s	=	counting time for sample (min)
ß	=	background rate of counter (cpm)
t_b	=	counting time for background (min)
2.22	=	dpm/pCi
v	=	volume of sample analyzed (liters)
y	=	chemical yield of the amount of sample counted
λ	=	is the radioactive decay constant for I-131 (0.693/8.05)
Δt	=	is the elapsed time between sample collection (or end of the sample collection) to the midcount time
2	=	multiple of the counting error
E	=	efficiency of the counter for I-131, corrected for self absorption effects by the formula:

$$E = E_s \frac{(\exp^{-0.0061M})}{(\exp^{-0.0061M_s})}$$

where:

E_s	=	efficiency of the counter determined from an I-131 standard mount
M	=	mass of PdI_2 on the sample mount (mg)
M_s	=	mass of PdI_2 on the standard mount (mg)

The MDL is defined as that value equal to the two sigma counting error of the result.

DETERMINATION OF GAMMA EMITTING RADIOISOTOPES

GPUN Environmental Radioactivity Laboratory

The procedure for detection of gamma emitting radioisotopes generates high resolution gamma spectra which are used for quantitative determination and identification. Standard geometries have been established to maximize efficiency for sample types: air particulate filters, water, milk, soil/sediment and food products.

A description of the analytical methods, beginning with air particulates used for each sample type is presented, followed by the general formula used for calculation of the sample activities.

Air particulate: At the end of each calendar quarter, 13 (or 14) weekly air filters from the given location are stacked in a two inch diameter Petri dish in chronological order, with the oldest filter at the bottom, nearest the detector, and the newest one on top. The Petri dish is closed and the sample counted.

Water and Milk: A well-mixed 3.5-liter sample is poured into a Marinelli beaker. The samples are brought to ambient temperature and counted.

Soil and Sediment: The sample is dried, sieved and put into a counting container and counted.

Food products: The sample is chopped up and put into a counting container and counted.

Calculation of Sample Activity and 2 Sigma Uncertainty:

$$A = \frac{P}{2.22 \times q \times \epsilon \times b \times E_L} \times e^{\lambda T_e} \times \frac{\lambda E_R}{(1 - e^{-\lambda E_R})}$$

where:

A	=	the computed specific activity
P	=	peak area
2.22	=	dpm/picoCuries
q	=	sample quantity
ϵ	=	detection efficiency
b	=	gamma-ray abundance
E_L	=	elapsed live time
λ	=	decay constant

T_S = acquisition start time
E_R = elapsed real time

$$\Delta A = A\sqrt{\left(\frac{\Delta P}{P}\right)^2 + \left(\frac{\Delta b}{b}\right)^2 \left(\frac{\Delta \epsilon}{\epsilon}\right)^2 \left(\frac{sys}{100}\right)^2 (\Delta Decay)^2}$$

where: ΔA = uncertainty in the activity

$$\Delta Decay = \frac{\Delta T_{1/2}}{T_{1/2}} \times \left(\frac{\lambda E_R}{1 - e^{-\lambda E_R}} - \lambda(T_S + E_R) - 1\right)$$

ΔP = uncertainty in the peak area P
Δb = uncertainty in the S-ray abundance
$\Delta \epsilon$ = uncertainty in the efficiency
sys = systematic Uncertainty estimate (in %)
$\Delta T_{1/2}$ = uncertainty in the half-life

DETERMINATION OF GAMMA EMITTING RADIOISOTOPES

Teledyne Brown Engineering

Gamma emitting radioisotopes are determined with the use of a lithium drifted germanium (GeLi) and high purity germanium detectors with high resolution spectrometry in specific media; such as, air particulate filters, charcoal filters, milk and water. Each sample to be assayed is prepared and counted in standard geometries such as one liter wrap-around Marinelli containers, 300 ml or 150 ml bottles, or 2-inch filter paper source geometries.

Samples are counted on large (>55 cc volume) GeLi detectors connected to Nuclear Data 6620 data acquisition and computation systems. All resultant spectra are stored on magnetic tape.

The analysis of each sample consists of calculating the specific activities of all detected radionuclides or the detection limits from a standard list of nuclides. The GeLi systems are calibrated for each standard geometry using certified radionuclides standards traceable to the National Bureau of Standards.

Gamma Spectroscopy Statistically Significant Activity and 2 Sigma Error Calculation for the ND6620 and ND6700 Systems:

$$\frac{Activity}{\left(\frac{pCi}{unit\ mass}\right)} = \frac{AREA * DECAY}{LIVETIME(sec.) * ABN * EFF * 0.037 * (unit\ mass)}$$

Statistically Significant Activity

$$\pm\ 200 * \frac{\sqrt{2 * BKGND + AREA}}{AREA} * Activity$$

2 Sigma Counting Error

Where:

AREA	=	Net Peak Area (from Nuclide Line Activity Report)
BKGND	=	Compton Background (from Nuclide Line Activity Report
DECAY	=	Decay Correction Factor (from Minimum Detectable Activity Report) (Nuclide Half Life - Collection time to Mid Count time)

LIVE TIME	=	Elapsed Live Time (from Header Information)
ABN	=	Nuclide Abundance (from Nuclide Line Activity Report)
EFF	=	Detector Efficiency (from Nuclide Line Activity Report)
0.037	=	Conversion Factor (dps to picoCuries)
unit mass	=	Sample weight or volume (from Header Information)

Gamma Spectroscopy Statistically Non Significant Activity and 2 Sigma Error Calculation for the ND6620 and ND6700 Systems:

$$\frac{Activity}{(\frac{pCi}{unit\ mass})} = \frac{AREA * DECAY}{LIVETIME(sec.) * ABN * EFF * 0.037 * (unit\ mass)}$$

Statistically Non Significant Activity

$$\pm\ 200 * \frac{\sqrt{2 * BKGND + NET}}{NET} * Net\ Activity$$

2 Sigma Counting Error

where:

NET	=	Net Peak Area (from Minimum Detectable Activity Report)
BKGND	=	Compton Background (from Nuclide Line Activity Report)
DECAY	=	Decay Correction Factor (from Minimum Detectable Activity Report) (Nuclide Half Life - Collection time to Mid Count time)
LIVE TIME	=	Elapsed Live Time (from Header Information)
(EFF*B.I)	=	Efficiency * Abundance (from Minimum Detectable Activity Report)
0.037	=	Conversion Factor (dps to picoCuries)
unit mass	=	Sample weight or volume (from Header Information)

Gamma Spectroscopy Minimum Detectable Activity Calculation for the ND6620 and ND6700 Systems:

$$\frac{MDA}{\left(\frac{pCi}{unit\ mass}\right)} = \frac{2.83\sqrt{BKGN} * DECAY}{LIVETIME(\text{sec.}) * (EFF * B.I.) * 0.037 * (unit\ mass)}$$

where:

BKGN	=	Total Peak Background Area (from Minimum Detectable Activity Report)
DECAY	=	Decay Correction Factor (from Minimum Detectable Activity Report) (Nuclide Half Life - Collection time to Mid Count time)
LIVE TIME	=	Elapsed Live Time (from Header Information)
(EFF*B.I)	=	Efficiency * Abundance (from Minimum Detectable Activity Report)
0.037	=	Conversion Factor (dps to picoCuries)
unit mass	=	Sample weight or volume (from Header Information)

ENVIRONMENTAL DOSIMETRY

GPUN Environmental Radioactivity Laboratory

GPU Nuclear thermoluminescent dosimeters (TLDS) are Panasonic Type 801 AS badges, two of which are deployed at each station. Each badge contains two calcium sulfate and two lithium borate elements. Since each element responds to radiation independently, this provides eight independent detectors at each station. The calcium sulfate elements are shielded with a thin layer of lead, which makes the response to different energies of gama radiation more linear. The lead also shields the calcium sulfate elements from beta radiation, so that they respond to gamma radiation only. The two lithium borate elements are shielded differently to permit the detection of beta radiation. Only the calcium sulfate elements normally are used for environmental monitoring; however, the lithium borate elements can be used to evaluate beta exposures or as a backup to the calcium sulfate elements should more data be required.

TLDs are annealed and read using a Panasonic UD701 A TLD Reader equipped with glow curve capture capability. A reader alignment is performed monthly using TLDs irradiated to a known exposure. Run Correction Factors (RCF) are inserted in each read batch to correct for small drifts in reader calibration. An Element Correction Factor (ECF) is generated for each element before a new TLD badge is placed into service to standardize each element to a known exposure. The ECF for each element is updated every two years. Each calcium sulfate element is annealed to a total residual exposure of less than 0.5 mR prior to being issued each time that a badge is used.

Control (transit) badges are issued with every batch of field TLDs and accompany the badges into the field to quantify transit exposure. After the field badges are deployed, the control badges are kept in a lead shield with minimum 2" thick lead during the period of field exposure. Additional control badges are kept in a lead shield for the entire quarter, and receive essentially no transit exposure. All control and field badges are read together at the end of each quarter, and the average field control badge exposure is subtracted from the average shield control badge exposure to generate the transit exposure. The transit exposure (generally less than 1 mR total) is subtracted from the gross exposures on the field badges to yield the net exposures. Net exposures are then converted to mR per standard month. This method of calculating transit exposure conforms to guidance contained in ANSI N545.

Each station comprises two TLD badges, each of which has two calcium sulfate elements. Outliers are identified using predefined algorithms. If all four elements are available, a given exposure value is judged an outlier if the standard deviation exceeds 5% of the mean exposure based on all four elements, and the exposure for one element is outside three standard deviations of the mean exposure based on the other three elements. If only two elements are available, the relative standard deviation based on the two exposure values must be 12% or less, or else both exposure values are considered outliers and no valid data are reported for that station for that quarter.

APPENDIX F

QUALITY CONTROL
EPA INTER-LABORATORY COMPARISON PROGRAM

APPENDIX F: QUALITY CONTROL PROGRAM

GPU Nuclear (GPU) and Teledyne Brown Engineering (TBE) participate in the EPA Radiological Inter-laboratory Comparison (cross check) Program. This participation includes a number of analyses on various sample media as found in the Peach Bottom Atomic Power Station REMP. As a result of this participation, an objective measurement of analytical precision and accuracy as well as, a bias estimation of the results are obtained.

Examination of the data shows that the vast majority were within the EPA control limits. Each case of exceeding the control limits was investigated. There was no evidence to suggest systematic errors.

The results of GPU's and TBE's participation in the EPA cross check program can be found in Table F-1.

TABLE F-1

USEPA
INTER-LABORATORY COMPARISONS - 1995
GPU NUCLEAR AND TELEDYNE BROWN ENGINEERING

Collection Date	Media	Nuclide	EPA Results (a)	GPU Nuclear - ERL Results (b)		Teledyne Brown Engineering Results(b)	
01/13/95	Water	Sr-89	20.0 ± 8.7	-	(c)	19.00 ± 2.65	
		Sr-90	15.0 ± 8.7	-	(c)	14.00 ± 0.00	
01/27/95	Water	Gr-Alpha	5.0 ± 8.7	-	(d)	5.00 ± 1.00	
		Gr-Beta	5.0 ± 8.7	-	(d)	6.00 ± 1.00	
02/03/95	Water	I-131	100.0 ± 17.3	100 ± 2.52		88.33 ± 2.31	(e)
03/10/95	Water	H-3	7435.0 ± 1290.8	-	(f)	7066.67 ± 115.47	
04/18/95	Water	Gr-Alpha	47.5 ± 20.6	31.67 ± 3.21		39.67 ± 2.52	
		Gr-Beta	86.6 ± 17.3	75.00 ± 2.00		80.33 ± 2.52	
		Sr-89	20.0 ± 8.7	-	(c)	20.67 ± 1.15	
		Sr-90	15.0 ± 8.7	-	(c)	14.67 ± 0.58	
		Co-60	29.0 ± 8.7	29.67 ± 0.58		31.67 ± 2.08	
		Cs-134	20.0 ± 8.7	18.67 ± 0.58		19.67 ± 1.73	
		Cs-137	11.0 ± 8.7	10.00 ± 1.00		11.67 ± 1.53	
06/09/95	Water	Co-60	40.0 ± 8.7	40.33 ± 1.53		42.33 ± 2.52	
		Zn-65	76.0 ± 13.9	76.00 ± 5.57		82.33 ± 3.51	
		Cs-134	50.0 ± 8.7	46.00 ± 1.73		46.67 ± 2.08	
		Cs-137	35.0 ± 8.7	35.00 ± 2.65		37.67 ± 1.15	
		Ba-133	79.0 ± 13.9	79.67 ± 2.08		74.33 ± 2.08	
07/14/95	Water	Sr-89	20.0 ± 8.7	-	(c)	18.33 ± 1.53	
		Sr-90	8.0 ± 8.7	-	(c)	8.00 ± 0.00	
7/21/95	Water	Gr-Alpha	27.5 ± 12.0	28.33 ± 4.04		18.33 ± 1.53	(g)
		Gr-Beta	19.4 ± 8.7	20.67 ± 3.51		19.33 ± 1.53	
08/04/95	Water	H-3	4872.0 ± 844.9	4933.33 ± 57.74		4866.67 ± 152.75	
8/25/95	Air Filters	Gr-Alpha	25.0 ± 10.9	25.00 ± 1.73		23.67 ± 1.53	
		Gr-Beta	86.6 ± 17.3	76.67 ± 2.89		84.67 ± 1.53	
		Sr-90	30.0 ± 8.7	-	(c)	25.33 ± 0.58	
		Cs-137	25.0 ± 8.7	28.00 ± 0.00		27.00 ± 1.00	
09/29/95	Milk	Sr-89	20.0 ± 8.7	-	(c)	23.33 ± 3.06	
		Sr-90	15.0 ± 8.7	-	(c)	16.33 ± 0.58	
		I-131	99.0 ± 17.3	98.33 ± 1.53		103.33 ± 5.77	
		Cs-137	50.0 ± 8.7	51.33 ± 2.89		54.67 ± 2.52	
		Total K	1654.0 ± 144.0	1733.33 ± 57.74		1683.33 ± 136.50	

TABLE F-1

USEPA
INTER-LABORATORY COMPARISONS - 1995
GPU NUCLEAR AND TELEDYNE BROWN ENGINEERING

Collection Date	Media	Nuclide	EPA Results (a)	GPU Nuclear - ERL Results (b)	Teledyne Brown Engineering Results(b)
10/06/95	Water	I-131	148.0 ± 26.0	156.67 ± 5.77	150.0 ± 0.00
10/17/95	Water	Gr-Alpha	99.4 ± 43.1	103.33 ± 5.77	94.67 ± 6.00
		Gr-Beta	141.8 ± 36.9	120.00 ± 10.00	120.00 ± 10.00
		Co-60	49.0 ± 8.7	49.33 ± 2.08	53.33 ± 5.37
		Sr-89	20.0 ± 8.7	- (c)	20.67 ± 3.00
		Sr-90	10.0 ± 8.7	- (c)	9.30 ± 1.20
		Cs-134	40.0 ± 8.7	33.33 ± 0.58	34.37 ± 4.03
		Cs 137	30.0 ± 8.7	29.00 ± 1.73	35.10 ± 3.93
10/27/95	Water	Gr-Alpha	51.2 ± 22.2	32.00 ± 0.00	37.00 ± 3.00
		Gr-Beta	24.8 ± 8.7	28.67 ± 1.53	25.33 ± 1.53
11/03/95	Water	Co-60	60.0 ± 8.7	57.33 ± 3.79	58.00 ± 7.00
		Zn-65	125.0 ± 22.6	133.33 ± 5.77	131.33 ± 19.14
		Ba-133	99.0 ± 17.3	94.67 ± 1.53	91.33 ± 3.06
		Cs-134	40.0 ± 8.7	85.67 ± 2.31	36.33 ± 2.08
		Cs-137	49.0 ± 8.7	49.33 ± 1.53	50.33 ± 4.62

Footnotes:

(a) EPA Results - Expected laboratory precision (control limit ± 3 sigma). Units are pCi/liter for water and milk except K is in mg/liter. Units are total pCi for air particulate filters.

(b) Results - Average ± one sigma. Units are pCi/liter for water and milk except K is in mg/liter. Units are total pCi for air particulate filters.

(c) No data available. Analysis not performed by laboratory.

(d) The ERL results were not reported to the EPA. The sample was analyzed six times and the precision of the individual results was not acceptable. The ERL policy is to report only highly confident results and since the confidence level could not be achieved from this sample the results were not submitted to the EPA.

(e) The normalized deviation marginally exceeded the warning level and an apparent trend in the results appeared. The cause was a probable high bias in the beta counting efficiency. Check source control charts did not indicate any changes in the counting equipment, so the I-131 calibration was suspected. New I-131 calibrations were performed July 3 through 6, 1995 after receiving a new standard from the EPA. The intercomparison sample data sheets were recalculated with the new efficiencies and the average result was in excellent agreement with the EPA (96 pCi/l versus the EPA value of 100 pCi/l). The discrepancy in the I-131 efficiency between the current calibration and the previous one (aside from the uncertainty in the standard) appears to be an abnormally low yield in the preparation of the standard for the older calibration which created a high bias in the counter efficiencies. The bias was less than ten percent, therefore further corrective action or revision of previously reported data is deemed not necessary.

(f) The ERL tritium results were not reported to the EPA in time for the report. The ERL result (average 3 determinations) was 7533.33 ± 208.17 pCi/l. The value was within all limits (0.23 sigma of known). Also, the precision (R.A. = 0.318) was acceptable.

(g) The mineral salt content of the water used by the EPA to prepare the samples has been shown to vary substantially throughout the year. Absorption curves to account for mount weight may vary from the true absorption characteristics of a specific sample. Previous results do not indicate a trend toward "out of control" for gross alpha/beta analysis and the normalized deviation from the grand average is only -0.36. The normalized deviation from the known for TBE-ES does not exceed three standard deviations and internal spikes have been in control. No corrective action is planned at this time.

APPENDIX G

PBAPS SURVEY

APPENDIX G: PBAPS SURVEYS

A Land Use Census around the Peach Bottom Atomic Power Station (PBAPS) was conducted by Normandeau Associates, RMC Environmental Services Division for PECO Energy to comply with Section 3.8.E.2 of PBAPS's Offsite Dose Calculation Manual Specifications (ODCMS) and Bases. The survey was conducted during the May to October 1995 growing season. The distance and direction of all locations were positioned from the barn to the PBAPS vents using Global Positioning System (GPS) technology. The results of this survey are summarized in Table G-1.

The farm identified in the WSW sector had a calculated D/Q that was 20 percent greater than an existing farm in the program. This farm has been added to the 1996 REMP.

TABLE G-1 LOCATION OF THE NEAREST MILK PRODUCING ANIMAL WITHIN A FIVE MILE RADIUS OF PBAPS, 1995

Sector	Distance (ft.) from Vents
N	14,995
NNE	11,683
NE	11,897
ENE	11,673
E	15,802
ESE	16,442
SE	25,604
SSE	-
S	-
SSW	7,324
SW	11,608
WSW	3,995
W	4,576
WNW	9,040
NW	17,570
NNW	-

\- INDICATES NO MILK ANIMALS LOCATED