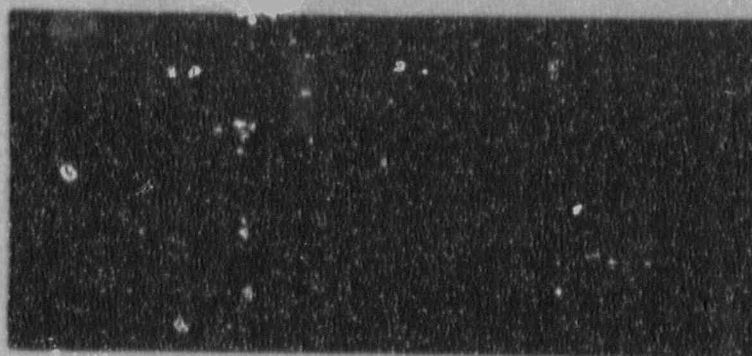
Docket No: 50-277
50-278

PEACH BOTTOM ATOMIC POWER STATION
UNITS 2 and 3



ANNUAL RADIOLOGICAL
ENVIRONMENTAL OPERATING REPORT

Prepared by

PHILADELPHIA ELECTRIC COMPANY

Nuclear Group Headquarters

955-65 Chesterbrook Blvd.

Wayne, PA 19087-5691

Radiological Analyses Performed

By

TELEDYNE ISOTOPES

50 Van Buren Avenue

Westwood, New Jersey 07675

And

CLEAN HARBORS ANALYTICAL SERVICES, INC.

325 Wood Road

Braintree, Massachusetts 02184

MAY 1991

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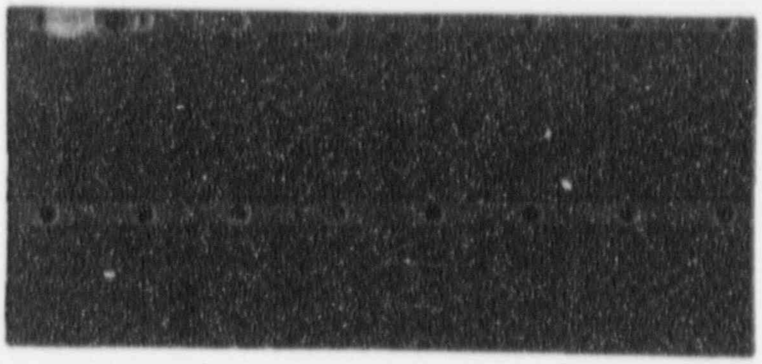

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PEACH BOTTOM ATOMIC POWER STATION

Units 2 and 3

Annual Radiological
Environmental Operating Report
Report #48

1 January 1990 through 31 December 1990

Prepared by

Philadelphia Electric Company
Nuclear Group Headquarters
955-65 Chesterbrook Blvd.
Wayne, PA 19087-5691

Radiological Analyses Performed

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May 1991

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SUMMARY AND CONCLUSIONS

I. Summary and Conclusions

This report on the Radiological Environmental Monitoring Program (REMP) conducted at the Peach Bottom Atomic Power Station (PBAPS) by Philadelphia Electric Company (PECo) covers the period 1 January 1990 through 31 December 1990. This report combines the results of the programs conducted by Teledyne Isotopes (TI) and Clean Harbors (CH) Laboratories. During this period 2,166 analyses were performed on 1,942 samples.

Surface water and drinking (potable) water samples were analyzed for concentrations of gross beta, gamma spectrometry, and tritium. Additionally, drinking water samples were analyzed for concentrations of Iodine-131. Results of these analyses showed no significant differences between control locations and potentially-affected stations. The values observed were within the ranges noted in the preoperational report.

The remaining sample media representing the aquatic environment included fish and sediment samples. These media were analyzed for concentrations of gamma emitters. No measurable effects from the operation of PBAPS were detected.

The atmospheric environment was divided into two parts for examination: airborne and terrestrial. Sample media for determining airborne effects include air particulates and air iodine samples. Analyses performed on air particulate samples included gross beta and gamma spectrometry. The results from both analyses were generally consistent with results from the previous years. Furthermore, no notable differences among results from on-site, intermediate, and distant locations in either analysis 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 level.

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 no indication of PBAPS effect.

Ambient gamma radiation levels were measured monthly and quarterly throughout the year. Most monthly and quarterly measurements were below 10 mR/std. month. These results were consistent with those from previous years.

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

INTRODUCTION

II. Introduction

Peach Bottom Atomic Power Station (PBAPS) is located along the Susquehanna River between Holtwood and Conowingo Dams in Peach Bottom Town-ship, 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 1050 MWe (net). 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 radionuc[illegible] 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 surface and drinking water, and air particulates.

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

3. Concentrations of tritium in surface and drinking water.

4. Concentrations of Iodine-131 in drinking water, air, and milk.

5. Amb [illegible] gamma radiation levels at various site environs.

PROGRAM DESCRIPTION

III. Program Description

A. Sample Collection

This section describes the basic collection methods used to obtain environmental samples. For a more detailed account, including equipment used, refer to Appendix E, Section 1: Synopsis of Procedures - Collection Methods.

<u>Aquatic Environment</u>

The aquatic environment was examined by analyzing samples of surface water, drinking water, fish, and sediment. Surface water from two locations (1LL and 1MM) and drinking water from two locations (4L and 6I) were collected weekly from a tank at each location and were composited into a monthly sample for analysis. Two additional surface water locations (13A and 13B) were collected as grab samples. Control locations were 1LL and 6I.

Fish samples from two groups, catfish (bottom feeder) and smallmouth bass (predator) were collected semiannually at two locations: 4 (indicator) and 6 (control).

Sediment samples composed of recently deposited substrate were collected at three locations semiannually: 4D, 4T (indicators), and 6F (control).

<u>Atmospheric Environment</u>

The atmospheric environment was examined by analyzing airborne and terrestrial samples. These consisted of air particulates, airborne iodine, and milk. Air particulate samples were collected and analyzed weekly from fifteen locations (1B, 1Z, 2, 3A, 4A, 5, 6E, 12D, 14, 15, 17, 31, 32, 33A, and 38). Control locations were 4A, 6E, and 12D. Air iodine samples were collected from five locations (1B, 1Z, 2, 3A, and 12D). Control location was 12D. Air particulate and air iodine 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 six locations (A, B, G, J, N, and O) monthly from December through March and biweekly during the grazing season (April through November). Additionally, samples from five locations (C, D, E, L, and M) were collected quarterly. Locations A, B, C, and E were controls.

<u>Ambient Gamma Radiation</u>

Direct radiation measurements were made using thermoluminescent

dosimeters (TLDs) consisting of calcium sulfate ($CaSO_4$) doped with dysprosium (Dy). Samples were collected from forty-seven locations. The TLD locations were placed on and around the PBAPS site using a "three ring concept":

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

A middle ring consisting of twenty-five locations (3A, 4K, 5, 6B, 14, 15, 17, 22, 23, 26, 27, 31, 32, 33A, 38, 42, 43, 44, 45, 46, 47, 48, 49, 50, and 51) extending to approximately ten miles from the site, designed to measure possible exposures to close-in population;

An outer ring consisting of seven locations (12D, 16, 18, 19, 20, 21B, and 24) extending from approximately 10 to 60 miles from the site, and considered to be unaffected by station releases.

Two on-site locations (1A and 1I), designated as plant complex locations, are not included in any of the three rings.

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 for interpretation of the data presented in this report. These factors are discussed here to avoid unnecessary repetition in the discussion of the results.

The minimum detectable level (MDL) was defined as the two sigma

counting statistic. It represents the range of values into which 95% of repeated counts of the same aliquot would fall. For all analyses an activity that was greater than or equal to the MDL was reported as "activity plus/minus the MDL value". When an activity was less than the MDL, the result was reported as the "<MDL value". Data received from the laboratories were reported using the convention of rounding the result to the same number of significant places as the first significant digit in the error term (e.g., 3.62 ± 1.24 rounds to 4 ± 1: 10.93 ± 0.96 rounds to 10.9 ± 1.0).

Results for each type of sample were grouped according to the analyses performed. 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. For these calculations, all results below the MDL were considered to be at the MDL. As a result, the means were biased high, and the standard deviations were generally biased low.

C. Program Exceptions

For 1990 the PBAPS REMP had a sample collection recovery rate of approximately 98%. The exceptions to this program are listed below:

1. Surface water sampler at location 1MM was out of service from 01/16 to 01/18, 05/11 to 05/18, and 06/02 to 08/05 due to pump malfunctions. Grab samples were taken.

2. Surface water sampler at location 1LL was out of service from 01/6 to 01/12, 07/06 to 08/22 due to pump malfunctions and from 12/19 to 12/21 due to low Pond elevation. Grab samples were taken.

3. Surface water collections for location 13B were not performed for March and June since no water usage was recorded.

4. Drinking water sampler at location 4L was out of service from 06/02 to 06/10 and 11/09 to 11/24 due to pump malfunction. Grab samples were taken.

5. Drinking water sampler at location 6I was out of service from 01/20 to 01/27, 07/01 to 07/07, 07/28 to 08/05, 08/18 to 08/25, 09/02 to 09/22, 10/06 to 10/12, 10/21 to 12/02, and 12/16 to 01/04 due to pump malfunctions. Grab samples were taken.

6. Air particulate samples were not available from the locations 15 and 12D during the weeks of 10/06 to 10/12 and 10/09 to 10/15, respectively due a sample collection error.

7. Air particulate and air iodine samples were not available from location 2 during the week of 05/20 to 05/26 due to out-of-service equipment.

8. As a result of a typographical error our consultant responsible for collecting sediment samples did not collect at the required location 4J (Berkin's Run). Sediment samples were collected at location 4D (near the discharge outfall). As a result the required ODCM sediment samples were not collected. The impact of this error was minimal because location 4D typically shows higher activity levels than location 4J. Consequently, any skin dose projection made using data from 4D would be more conservative. All vendors have been reinstructed to cross check the information that they receive from PECo with that information that they may receive from other sources.

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 1990 PBAPS REMP:

1. Teledyne Isotopes (TI) became the primary laboratory for all REMP analyses. Clean Harbors (CH) became the QC laboratory for air particulates, surface water and milk.

2. Air particulate location 31 was discontinued.

3. TLD location 31 was dropped and replaced by another station 31A located within the same sector.

4. Game, vegetation, soil and well water sampling was discontinued.

5. Compositing of air particulate samples for gamma analysis was changed from monthly at seventeen locations to quarterly at five locations.

6. Iodine-131 analysis of air iodine samples was conducted weekly at five locations instead of the previous year's eight.

7. Gross Alpha analyses were dropped from surface and drinking water samples.

8. Strontium -89 and -90 analyses were dropped from fish and milk samples.

9. Fish sampling was discontinued at two onsite locations and offsite locations were changed to reflect samples collected below PBAPS discharge (4) and above Holtwood Dam (6).

10. Gross Alpha and Gross Beta analyses were discontinued from sediment samples.

11. Sediment sampling was discontinued from two onsite and one offsite locations.

12. Air particulate location 6B was renamed to 6E so as to distinguish it from the TLD location 6B. They were both located at Holtwood Dam, however, 6E is considered a "control" location for air particulate samples where as, 6B is an "indicator" location (as part of the intermediate distance locations) for TLD.

RESULTS AND DISCUSSION

IV. Results and Discussion

A. Aquatic Environment

1. Surface Water

Samples were collected from four locations monthly (1LL, 1MM, 13A and 13B). 1LL served as the control location. The following analyses were performed.

Gross Beta

Samples from all locations were analyzed for concentrations of gross beta in both soluble and insoluble fractions (Table C-I.1 and C-I.2 and Figures C-1 and C-2). The results for the soluble fraction ranged from 1.4 to 4.3 pCi/l. The mean for the three indicator locations was 2.7 pCi/l, compared to the mean value of 2.4 pCi/l from the control location. The results from analysis of the insoluble portion of all samples from the surface water locations ranged from <.4 to 4.5 pCi/l. The mean of the indicator and control locations were 1.2 pCi/l and 1.8 pCi/l, respectively.

Tritium

Samples from three locations (1LL, 1MM, 13A) were analyzed for concentrations of aqueous tritium (Table C-I.3). Results ranged from <50 to 180 pCi/l and were within the range found during the preoperational period. Means from indicator and control locations compared well, with values of 100 pCi/l and 90 pCi/l, respectively.

Gamma Spectrometry

Samples from all locations were analyzed for concentrations of gamma emitters (Table C-I.4). The nuclides searched for were below the minimum detectable level with the exception of naturally occurring K-40. Potassium-40 was found at all locations and ranged from <4 to 30 pCi/l.

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 soluble and insoluble fractions (Tables C-II.1 and C-II.2 and Figures C-3 and C-4). Positive beta activity was detected in all soluble fraction samples

from both locations ranging from 1.2 to 6 pCi/l. The values from the insoluble fraction ranged from <.4 to 8.0 pCi/l. Only slight differences were observed between the means of the control and indicator stations. The values were generally below those seen in the preoperational period.

Iodine-131

Samples from both locations were analyzed monthly for I-131 concentrations (Table C-II.3). Results from the indicator location were all less than MDL. One result (September) showed a positive activity of .15 pCi/l at the control location.

Tritium

Samples from both locations were analyzed for tritium concentration quarterly (Table C-II.4). Results from both indicator and control locations indicate positive tritium activity, with no notable difference between the two locations. The indicator location values ranged from 70 to 200 pCi/l with a mean of 130 pCi/l. Control location values ranged from 80 to 110 pCi/l with a mean of 100 pCi/l. The concentrations were within the range found during the preoperational period.

Gamma Spectrometry

Samples from both locations were analyzed for concentrations of gamma emitters (Table C-II.5). The nuclides searched for were below the minimum detectable level, except for K-40 which was found in four samples at both locations and Ra-226 which was found in one sample. The values for K-40 ranged from <3 to 15 pCi/l. Ra-226 activity values ranged from <4 to 20 pCi/l.

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

Positive activity was observed only for the nuclides K-40 which ranged from 0.7 to 3.3 pCi/g (wet). All other nuclides searched for were below the minimum detectable level (Table C-III.2). Figure C-5 illustrates the Cs-137 activity for indicator and control locations from the beginning of the operational period through the present. No Plant related nuclides were detected.

4. <u>Sediment</u>

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

<u>Gamma Spectrometry</u>

Samples from all locations were analyzed for concentrations of gamma emitters (Table C-IV.1). Beryllium-7 was found in two of six samples with values ranging from <.1 to .9 pCi/g (dry). Potassium-40 was found in all samples ranging from 9.5 to 23 pCi/g (dry). Positive activity from Cs-137 was found at all locations with a mean value of .24 pCi/g (dry) for the indicator locations and .22 pCi/g (dry) for the control location. Radium-226 and Th-228 activity was found at all locations. The results were consistent with those from previous years. Figure C-6 illustrates the comparison of activities of Cs-137 detected at the control location and two indicator locations from the preoperational period through the present. No Plant related nuclides were detected.

B. Atmospheric Environment

1. <u>Airborne</u>

a. <u>Air Particulates</u>

Samples were collected from fifteen locations (1B, 1Z, 2, 3A, 4A, 5, 6E, 12D, 14, 15, 17, 31, 32, 33A, and 38). Control locations were 4A, 6E, and 12D. The following analyses were performed.

<u>Gross Beta</u>

Samples from all locations were analyzed for concentrations of gross beta (Tables C-V.1 and C-V.2 and Figures C-7 and C-8). Air particulate locations are divided into three groups: Group I, consisting of 1B, 1Z, and 2, located on site at PBAPS; Group II, comprised of 3A, 5, 14, 15, 17, 31, 32, 33A and 38, located at intermediate distances from PBAPS; and Group III, consisting of 4A, 6E and 12D, located at 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 5 to 40 E-3 pCi/m^3, with a mean of 18 E-3 pCi/m^3. The results from intermediate locations ranged from 3 to 31 E-3 pCi/m^3, with a mean of 18 E-3 pCi/m^3. The results from distant locations ranged from 4 to 36 E-3 pCi/m^3, with a mean of

18 E-3 pCi/m^3. Comparison of the mean values indicate no notable difference among the three groups suggesting no effects from operation of PBAPS.

Gamma Spectrometry

Samples from all locations were analyzed monthly 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. Potassium-40 was found in approximately half of the samples at or slightly above the detection limit. No Plant related nuclides were detected.

b. Airborne Iodine

Continuous air samples were collected weekly at five locations and analyzed for I-131 (Table C-VI.1). All results were less than the minimum detectable level.

2. Terrestrial

a. Milk

Samples were collected from eleven locations (A, B, C, D, E, G, J, L, M, N, and O). 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). All results but one were less than the minimum detectable level. Nearby Farm G had a positive result of .1 ± .1 pCi/l (04/23/90) which was at the detection limit.

Gamma Spectrometry

Samples from five locations were analyzed quarterly for concentrations for gamma emitters (Table C-VII.2 and Figure C-9). Naturally occurring K-40 was found in all samples with values ranging from 1,200 to 1,500 pCi/l. Positive concentrations of Cs-137 were detected at or slightly above the detection limit in about half of the samples. Values ranging from <2 to 7 pCi/l. Nearby Farm J showed positive activity for Mn-54 and Ra-226 at the detection limit in February (.9 ± .9 and 30 ± 20 pCi/l, respectively). All other nuclides searched for were less than the minimum detectable level.

C. Ambient Gamma Radiation

Ambient gamma radiation levels were measured at forty-seven locations (as described in the program description section) using $CaSO_4$:Dy thermoluminescent dosimeters (Tables C-VIII.1 through C-VIII.4 and Figures C-10 and C-11). Most monthly and quarterly TLD readings were below 10 mR/std. month with a range of 3.6 to 15.1 mR/std. month for the monthly's and 2.6 to 10.1 mR/std. month for the quarterly's. The high value of 15.1 occurred in April at control location 12D. This exposure was suspect because of the high error (2 standard deviation) term associated with the result. An investigation by the laboratory could give no explanation for this unusual result. The TLDs used at this location are not send at the same time as the TLDs for the other locations in the REMP. No notable differences were observed among site-boundary, middle, and outer ring measurements. The data indicated that operation of PBAPS did not affect the existing ambient gamma radiation levels.

REFERENCES

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.

RADIOLOGICAL ENVIRONMENTAL

MONITORING REPORT SUMMARY

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: 1990

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)	GROSS BETA SOLUBLE	46	2.5	2.7 (34/34) (1.9-4.3)	2.4 (12/12) (1.4-4.0)	3.1 (12/12) (2.2-4.3)	13A (INDICATOR) CHESTER WATER INTAKE POND 2.4 MILES ESE OF SITE	0
	GROSS BETA INSOLUBLE	46	2.5	1.3 (28/34) (0.4-4.4)	1.8 (12/12) (0.6-4.5)	1.8 (12/12) (0.6-4.5)	1LL (CONTROL) UNITS 2 & 3 INTAKE 0.25 MILES ENE OF SITE	0
	TRITIUM LIQ. SCINT. W/ENR	12	1200	100 (7/8) (80-180)	90 (4/4) (60-120)	120 (3/4) (80-180)	13A (INDICATOR) CHESTER WATER INTAKE POND 2.4 MILES ESE OF SITE	0
	GAMMA	46						
	K-40		N/A	13 (6/34) (4-30)	12 (1/12) (12-12)	22 (2/12) (13-30)	1MM (INDICATOR) DISCHARGE CANAL 1.0 MILES SE OF SITE	0
	MN-54		9	< MDL	< MDL	< MDL		0
	CO-58		9	< MDL	< MDL	< MDL		0
	FE-59		18	< MDL	< MDL	< MDL		0
	CO-60		9	< MDL	< MDL	< MDL		0
	ZN-65		18	< MDL	< MDL	< MDL		0
	ZR-95		9	< MDL	< MDL	< MDL		0
	NB-95		9	< MDL	< MDL	< MDL		0
	CS-134		9	< MDL	< MDL	< MDL		0
	CS-137		11	< MDL	< MDL	< MDL		0
	BA-140		35	< MDL	< MDL	< MDL		0
	LA-140		9	< MDL	< MDL	< MDL		0
DRINKING WATER (PCI/LITER)	GROSS BETA SOLUBLE	24	2.5	2.5 (12/12) (1.2-3.8)	3.0 (12/12) (1.9-6.0)	3.0 (12/12) (1.9-6.0)	6I (CONTROL) HOLTWOOD STATION INTAKE 5.8 MILES NW OF SITE	0

MEAN AND RANGE BASED UPON DETECTABLE MEASUREMENTS ONLY. 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: 1990

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
DRINKING WATER (PCI/LITER	GROSS BETA INSOLUBLE	24	2.5	0.9 (10/12) (0.6-1.3)	2.1 (12/12) (0.5-8.0)	2.1 (12/12) (0.5-8.0)	6I (CONTROL) HOLTWOOD STATION INTAKE 5.8 MILES NW OF SITE	0
	TRITIUM LIQ. SCINT. W/ENR	8	1200	130 (4/4) (70-200)	100 (4/4) (80-110)	130 (4/4) (70-200)	4L (INDICATOR) CONOWINGO DAM EL 33FT. COMPOS 8.6 MILES SE OF SITE	0
	I-131 RADIOCHEMISTY	24		< MDL	0.15 (1/12) (0.15)	0.15 (1/12) (0.15)	6I (CONTROL) HOLTWOOD STATION INTAKE 5.8 MILES NW OF SITE	0
	GAMMA	24						
	K-40		N/A	15 (1/12) (15-15)	10 (3/12) (7-10)	15 (1/12) (15-15)	4L (INDICATOR) CONOWINGO DAM EL. 33' MSL 8.6 MILES SE OF SITE	0
	MN-54		9	< MDL	< MDL	< MDL		0
	CO-58		9	< MDL	< MDL	< MDL		0
	FE-59		18	< MDL	< MDL	< MDL		0
	CO-60		9	< MDL	< MDL	< MDL		0
	ZN-65		18	< MDL	< MDL	< MDL		0
	ZR-95		9	< MDL	< MDL	< MDL		0
	NB-95		9	< MDL	< MDL	< MDL		0
	CS-134		9	< MDL	< MDL	< MDL		0
	CS-137		11	< MDL	< MDL	< MDL		0
	BA-140		35	< MDL	< MDL	< MDL		0
	LA-140		9	< MDL	< MDL	< MDL		
	RA-226		N/A	16 (1/12) (20-20)	< MDL	16 (1/12) (20-20)	4L (INDICATOR) CONOWINGO DAM EL. 33' MSL 8.6 MILES SE OF SITE	0

MEAN AND RANGE BASED UPON DETECTABLE MEASUREMENTS ONLY. 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: 1990

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
FISH BOTTOM FEEDER (PCI/GRAM WET)	GAMMA	4						
	K-40		N/A	2.0 (2/2) (0.7-3.3)	2.3 (2/2) (1.5-3.2)	2.3 (2/2) (1.5-3.2)	6 (CONTROL) HOLTWOOD POND UPSTREAM - HOLTWOOD POND	0
	MN-54		.08	< MDL	< MDL	< MDL		0
	CO-58		.08	< MDL	< MDL	< MDL		0
	FE-59		.16	< MDL	< MDL	< MDL		0
	CO-60		.08	< MDL	< MDL	< MDL		0
	ZN-65		.16	< MDL	< MDL	< MDL		0
	CS-134		.09	< MDL	< MDL	< MDL		0
	CS-137		.09	< MDL	< MDL	< MDL		0
FISH PREDATOR (PCI/GRAM WET)	GAMMA	4						
	K-40		N/A	2.5 (2/2) (2.1-3.0)	2.4 (2/2) (1.9-2.8)	2.5 (2/2) (2.1-3.0)	4 (INDICATOR) CONOWINGO POND BELOW DISCHARGE DOWNSTREAM OF DISCHARGE	0
	MN-54		.08	< MDL	< MDL	< MDL		0
	CO-58		.08	< MDL	< MDL	< MDL		0
	FE-59		.16	< MDL	< MDL	< MDL		0
	CO-60		.08	< MDL	< MDL	< MDL		0
	ZN-65		.16	< MDL	< MDL	< MDL		0
	CS-134		.09	< MDL	< MDL	< MDL		0
	CS-137		.09	< MDL	< MDL	< MDL		
SILT/SEDIMENT (PCI/GRAM DRY)	GAMMA	6						
	BE-7		N/A	0.4 (1/4) (0.4-0.4)	0.9 (1/2) (0.9-0.9)	0.9 (1/2) (0.9-0.9)	6F (CONTROL) HOLTWOOD DAM EAST SHORE UPSTREAM 5.8 MILES NW OF SITE	0

MEAN AND RANGE BASED UPON DETECTABLE MEASUREMENTS ONLY. 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: 1990

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
SILT/SEDIMENT (PCI/GRAM DRY)	GAMMA K-40		N/A	18.4 (4/4) (9.5-23)	17 (2/2) (13-20)	22 (2/2) (21-23)	4T (INDICATOR) CONOWINGO POND NEAR DAM 8.1 MILES SE OF SITE	0
	CS-134		.10	< MDL	< MDL	< MDL		0
	CS-137		.10	0.24 (4/4) (0.10-0.42)	0.22 (2/2) (0.18-0.26)	0.38 (2/2) (0.34-0.42)	4T (INDICATOR) CONOWINGO POND NEAR DAM 8.1 MILES SE OF SITE	0
	RA-226		N/A	2.4 (4/4) (0.8-3.7)	2.3 (2/2) (2.1-2.5)	3.6 (2/2) (3.6-3.7)	4T (INDICATOR) CONOWINGO POND NEAR DAM 8.1 MILES SE OF SITE	0
	TH-228		N/A	1.26 (4/4) (0.46-2.0)	1.3 (2/2) (1.2-1.5)	1.8 (2/2) (1.6-2.0)	4T (INDICATOR) CONOWINGO POND NEAR DAM 8.1 MILES SE OF SITE	0
AIR PARTICULATE (E-3 PCI/CU. METER)	GROSS BETA	750		18 (594/594) (3-40)	18 (156/156) (4-36)	19 (52/52) (7-31)	6E (CONTROL) HOLTWOOD DAM 5.8 MILES NW OF SITE	0
	GAMMA BE-7	20	N/A	59 (16/16) (46-74)	58 (4/4) (46-70)	63 (4/4) (57-68)	2 (INDICATOR) SITE 130° SECTOR HILL 0.9 MILES SE OF SITE	0
	K-40		N/A	14 (8/16) (7-23)	5 (2/4) (4-7)	23 (1/4) (23-23)	2 (INDICATOR) SITE 130° SECTOR HILL 0.9 MILES SE OF SITE	0

MEAN AND RANGE BASED UPON DETECTABLE MEASUREMENTS ONLY. 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: 1990

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
AIR PARTICULATE (E-3 PCI/CU. METER)	GAMMA							
	CS-134		.04	< MDL	< MDL	< MDL		0
	CS-137		.04	< MDL	< MDL	< MDL		0
AIR IODINE (E-3 PCI/CU. METER)	I-131	259		< MDL	< MDL	< MDL		0
MILK (PCI/LITER)	I-131 RADIOCHEMISTY	129	0.6	0.1 (1/96) (0.1)	< MDL	0.1 (1/21) (0.1)	G (INDICATOR) NEARBY FARM G 1.3 MILES SSW OF SITE	0
	GAMMA	20						
	K-40		N/A	1300 (16/16) (1200-1500)	1300 (4/4) (1200-1400)	1300 (4/4) (1300-1500)	O (INDICATOR) NEAR SITE FARM WEST OF CONOWINGO POND	0
	MN-54		N/A	0.9 (1/16) (0.9-0.9)	< MDL	0.9 (1/4) (0.9-0.9)	J (INDICATOR) NEAR SITE FARM WEST OF CONOWINGO POND	0
	CS-134		10	< MDL	< MDL	< MDL		0
	CS-137		10	4.2 (6/16) (3.0-7)	< MDL	5.0 (2/4) (3.0-7)	J (INDICATOR) NEAR SITE FARM WEST OF CONOWINGO POND	0
	BA-140		35	< MDL	< MDL	< MDL		0
	LA-140		9	< MDL	< MDL	< MDL		0
	RA-226		N/A	30 (1/16) (30-30)	< MDL	30 (1/4) (30-30)	J (INDICATOR) NEAR SITE FARM WEST OF CONOWINGO POND	0

MEAN AND RANGE BASED UPON DETECTABLE MEASUREMENTS ONLY. 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: 1990

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
DIRECT RADIATION (MILLI-ROENTGEN / STD. MONTH)	TLD-MONTHLY	540	N/A	6.67 (456/456) (3.70-9.60)	6.39 (84/84) (4.10-15.10)	7.89 (12/12) (6.90-9.60)	50 (INDICATOR) TRANSCO PUMPING STATION 4.9 MILES W OF SITE	0
	TLD-QUARTERLY	180	N/A	5.84 (152/152) (3.20-10.10)	5.46 (28/28) (2.50-7.60)	7.35 (4/4) (5.60-10.10)	1F (INDICATOR) SITE, 200° SECTOR HILL 0.6 MILES SSW OF SITE	0

MEAN AND RANGE BASED UPON DETECTABLE MEASUREMENTS ONLY. FRACTION OF DETECTABLE MEASUREMENTS AT SPECIFIED LOCATIONS IS INDICATED IN PARENTHESES. (F)

SAMPLE DESIGNATION

AND LOCATIONS

APPENDIX B: SAMPLE DESIGNATION AND LOCATIONS

LIST OF TABLES AND FIGURES

TABLES

FIGURES

TABLE B-I: Sample Collection and Analysis Program for the Radiological Environmental Monitoring Program for Peach Bottom Atomic Power Station, 1990

Location	Location Description	Distance and Direction	Collection Method and Frequency	Analysis & Frequency Performed--Consultant
A. Surface Water				
1LL	Peach Bottom Units 2 and 3 Intake - Composite (Control)	0.2 miles ENE	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	Gross Beta (S&I) - monthly - TI Gamma Spec - monthly - TI Tritium - quarterly - TI Gross Beta (S&I) -quarterly - CH* Gamma Spec - quarterly - CH*
1MM	Peach Bottom Canal Discharge -Composite	1.0 miles SE	Same as location 1LL	Same as location 1LL
13A	Chester Water Intake (raw)	2.4 miles ESE	Water is continuously sampled. Each week 2 quarts are withdrawn and placed in a 2 gallon polyethylene bottle to form a monthly composite	Gross Beta (S&I) - monthly - TI Gamma Spec - monthly - TI Tritium - quarterly - TI
13B	Chester Water Intake	2.4 miles ESE	Same as 13A but sample is collected only when water is used by the Chester County Water Authority.	Same as location 13A except no tritium analysis
B. Drinking (Potable) Water				
4L	Conowingo Dam EL 33' MSL - Composite	8.6 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 fraining the tank and placed in a 2 gallon polyethylene bottle to form a monthly composite sample.	Gross Beta (S&I) - monthly - TI Gamma Spec - monthly - TI Tritium - quarterly - TI Gross Beta (S&I)- quarterly - CH* Gamma Spec - quarterly - CH*

TABLE B-I: Sample Collection and An 'ysis Program for the Radiological Environmental Monitoring Program for Peach Bottom Atomic Powe Station, 1990

Location	Location Description	Distance and Direction	Collection Method and Frequency	Analysis & Frequency Performed--Consultant
6I	Holtwood Dam Hydroelectric Station - Composite (Control)	5.8 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
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 - TI
6	Holtwood Pond (Control)	Located in Holtwood Pond	Same as location 4	Same as location 4
D. Sediment				
4D	Conowingo Pond near discharge	1.1 miles SE	Recently deposited sediment collected below the waterline, semi-annually	Gamma Spec - semiannually - TI
4T	Conowingo Pond near Conowingo Dam	8.1 miles SE	Same as location 4D	Same as location 4D
6F	Holtwood Dam (Control)	5.8 miles NW	Same as location 4D	Same as location 4D

TABLE B-I: Sample Collection and Analysis Program for the Radiological Environmental Monitoring Program for Peach Bottom Atomic Power Station, 1990

Location	Location Description	Distance and Direction	Collection Method and Frequency	Analysis & Frequency Performed--Consultant
E.	Air Particulate - Air Iodine			
1A	Weather Station #1	0.3 miles SE	About 1 cfm continuous flow through glass fiber filter (approx. 2" diameter) which is installed for a week and replaced	Gross beta - weekly - CH* Gamma Spec - quarterly - CH*
1B	Weather Station #2	0.5 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 - TI Gamma Spec - quarterly - TI I-131 - weekly - TI
1Z	Weather Station #1	0.3 miles SE	Same as location 1B	Same as location 1B
2	On-site - 130° Sector Hill	0.9 miles SE	Same as location 1B	Same as location 1B
3A	Delta, PA - Substation	3.6 miles SW	Same ar location 1B	Same as location 1B
4A	Conowingo Dam - Power House Roof (Control)	8.6 miles SE	Same as location 1A	Gross Beta - weekly - TI Gamma Spec - quarterly - TI
4B	Conowingo Dam - Power House Roof	8.6 miles SE	Same as location 1A	Same as location 4A
5	Wakefield, PA	4.6 miles E	Same as location 1A	Same as location 4A
6E	Holtwood Dam - Power House Roof (Control)	5.8 miles NW	Same as location 1A	Same as location 4A
12D	2301 Market Stree Phila., PA - (Control)	62 miles ENE	Same as location 1B	Same as location 1B
14	Peters Creek	1.9 miles ESE	Same as location 1A	Same as location 4A

TABLE B-I: Sample Collection and Analysis Program for the Radiological Environmental Monitoring Program for Peach Bottom Atomic Power Station, 1990

Location	Location Description	Distance and Direction	Collection Method and Frequency	Analysis Frequency Performed--Consultant
15	Silver Spring Rd	3.6 miles N	Same as location 1A	Same as location 4A
17	Riverview Rd	4.0 miles ESE	Same as location 1A	Same as location 4A
31	Pilotown Rd	4.9 miles SE	Same as location 1A	Same as location 4A
32	Slate Hill Rd	2.7 miles ENE	Same as location 1A	Same as location 4A
33A	Fulton Weather Station	1.7 miles ENE	Same as location 1A	Same as location 4A
38	Peach Bottom Rd	3.0 miles E	Same as location 1A	Same as location 4A
F. Milk				
A	(Control)	6.0 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** - TI Gamma Spec - quarterly - TI I-131 - quarterly - CH* Gamma Spec - quarterly - CH*
B	(Control)	9.2 miles S	Same as Farm A	I-131 - quarterly - TI
C	(Control)	10.0 miles NW	Same as Farm A	Same as Farm B
D		3.5 miles NE	Same as Farm A	Same as Farm B
E	(Control)	8.2 miles N	Same as Farm A	Same as Farm B
G		1.3 miles SSW	Same as Farm A	I-131 - biweekly, monthly** - TI Gamma Spec - quarterly - TI
J		1.1 miles W	Same as Farm A	Same as Farm A
L		2.1 miles NE	Same as Farm A	Same as Farm B

TABLE B-I: Sample Collection and Analysis Program for the Radiological Environmental Monitoring Program for Peach Bottom Atomic Power Station, 1990

Location	Location Description	Distance and Direction	Collection Method and Frequency	Analysis & Frequency Performed--Consultant
M		2.7 miles ENE	Same as Farm A	Same as Farm B
N		3.2 miles ESE	Same as Farm A	Same as Farm A
O		2.2 miles SW	Same as Farm A	Same as Farm B

G. Environmental Dosimetry - TLD

At each of the following locations there are two environmental dosimeters packets with four (4) TLD phosphors per package. One packet is relplaced monthly, and one quarterly.

Location	Location Description	Distance and Direction	Collection Method and Frequency	Analysis & Frequency Performed--Consultant
1A	Weather Station #1	0.3 miles SE	Procedure for collection is described in the placement procedure in Section III, A	TLD - monthly and quarterly - TI
1B	Weather Station #2	0.5 miles NW		Same as location 1A
1C	Peach Bottom South Substation	0.9 miles SSE		Same as location 1A
1D	Peach Bottom 140° Sector Site Boundary	0.7 miles SE		Same as location 1A
1E	Peach Bottom 350° Sector Hill	0.6 miles NNW		Same as location 1A
1F	Peach Bottom 200° Sector Hill	0.6 miles SSW		Same as location 1A
1G	Peach Bottom North Substation	0.7 miles WNW		Same as location 1A
1H	Peach Bottom 270° Sector Hill	0.6 miles W		Same as location 1A

TABLE B-I: Sample Collection and Analysis Program for the Radiological Environmental Monitoring Program for ?each Bottom Atomic Power Station, 1990

Location	Location Description	Distance and Dire..tion	Collection Method and Frequency	Analysis & Frequency Performed--Consultant
1I	Peach ..tom South Substi..ion	0.6 miles SSE	Same as location 1A	
1J	Peach Bottom 180° Sectir Hill	0.7 miles S		Same as location 1A
1L	Peach Bottom Unit 3 Intake	0.2 miles ENE		Same as location 1A
1M	Peach Bottom Canal Discharge	1.0 miles SE		Same as location 1A
1NN	Peach Bottom Site	0.5 miles WSW		Same as location 1A
2	Peach Bottom 130° Sector Hill	0.2 miles SE		Same as location 1A
3A	Delta, PA Substation	3.6 miles SW		Same as location 1A
4K	Conowing Dam Power House Roof	8.6 miles SE		Same as location 1A
5	Wakefield, PA	4.6 miles E		Same as location 1A
6B	Holtwood Dam Power House Roof	5.8 miles NW		Same as location 1A
12D	Philadelphia, PA 2301 Market St. (control)	62 miles ENE		Same as location 1A
14	Peters Creek	1.9 miles ESE		Same as location 1A
15	Silver Spring Rd	3.6 miles N		Same as location 1A
16	Nottingham, PA Substation (Control)	12.8 miles E		Same as location 1A

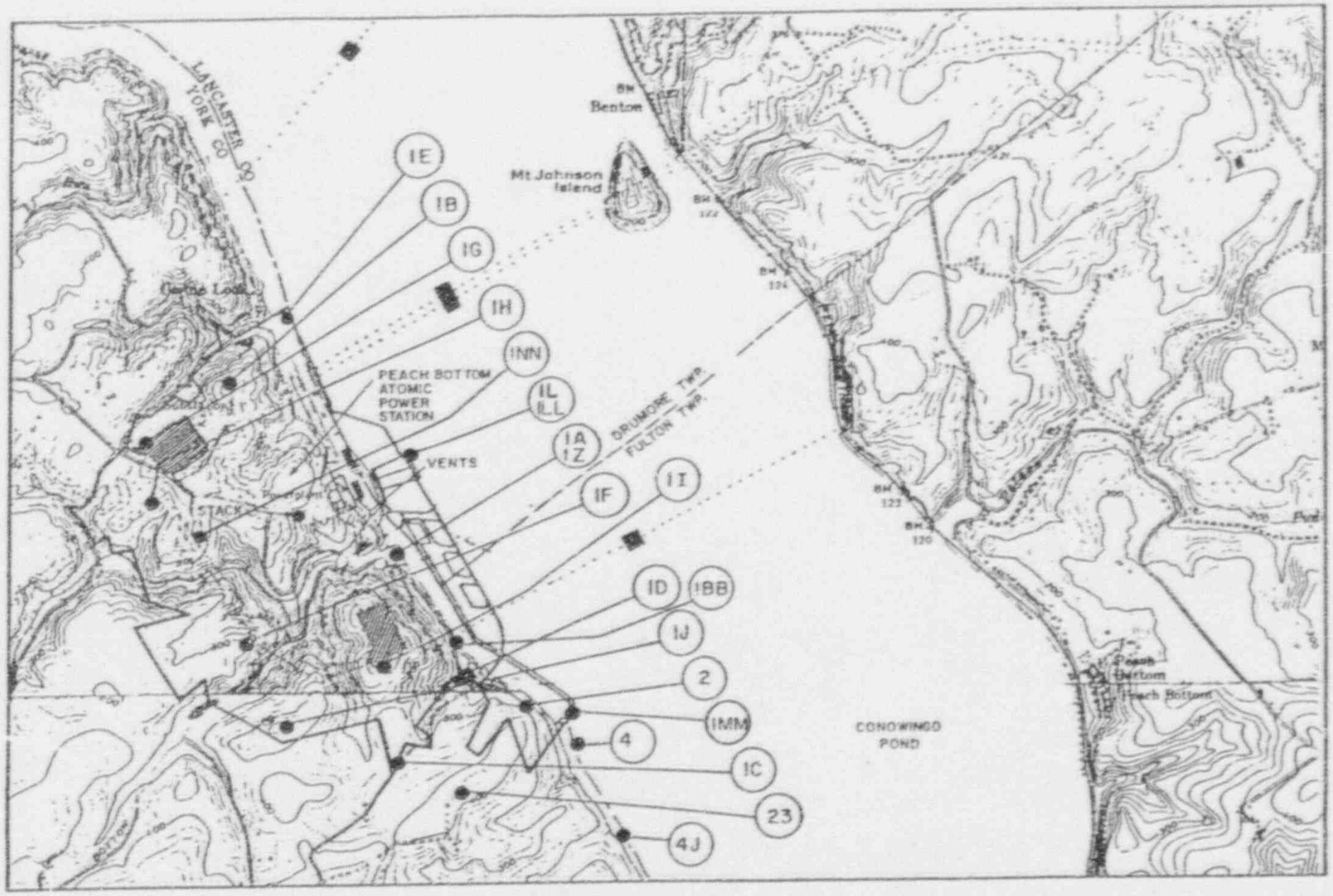
TABLE B-I: Sample Collection and Analysis Program for the Radiological Environmental Monitoring Program for Peach Bottom Atomic Power Station, 1990

Location	Location Description	Distance and Direction	Collection Method and Frequency	Analysis & Frequency Performed--Consultant
17	Riverview Rd	4.0 miles ESE		Same as location 1A
18	Fawn Grove, PA	10.0 miles W		Same as location 1A
19	Red Lion, PA (Control)	20.6 miles WNW		Same as location 1A
20	Bel Air, MD Area (Control)	15.1 miles SSW		Same as location 1A
21B	Lancaster, PA Area (Control)	19.0 miles NNW		Same as location 1A
22	Eagle Road	2.4 miles NNE		Same as location 1A
23	Peach Bottom 150° Sector Hill	1.0 miles SSE		Same as location 1A
24	Harrisville, MD Substation (Control)	10.9 miles ESE		Same as location 1A
26	Slab Road	4.2 miles NW		Same as location 1A
27	N. Cooper Road	2.6 miles S		Same as location 1A
31	Pilotown Rd	6.9 miles SE		Same as location 1A
31A	Eckman Rd	4.8 miles SE		Same as location 1A
32	Slate Hill Rd	2.7 miles ENE		Same as location 1A
33A	Fulton Weather Station	1.7 miles ENE		Same as location 1A
38	Peach Bottom Rd	3.0 miles E		Same as location 1A
40	Peach Bottom Site Area	1.5 miles SW		Same as location 1A

TABLE B-I: Sample Collection and Analysis Program for the Radiological Environmental Monitoring Program for Peach Bottom Atomic Power Station, 1990

Location	Location Description	Distance and Direction	Collection Method and Frequency	Analysis & Frequency Performed--Consultant
42	Muddy Run Envir. Laboratory	4.2 miles NNW		Same as location 1A
43	Drumore Township School	5.0 miles NNE		Same as location 1A
44	Goshen Mill Rd	5.1 miles NE		Same as location 1A
45	PB-Keeney Line	3.3 miles ENE		Same as location 1A
46	Broad Creek	4.5 miles SSE		Same as location 1A
47	Broad Creek Scout Camp	4.3 miles S		Same as location 1A
48	Macton Substation	5.0 miles SSW		Same as location 1A
49	PB-Conastone Line	4.1 miles WSW		Same as location 1A
50	TRANSCO Pumping Station	4.9 miles W		Same as location 1A
51	Fin Substation	4.0 miles WNW		Same as location 1A

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



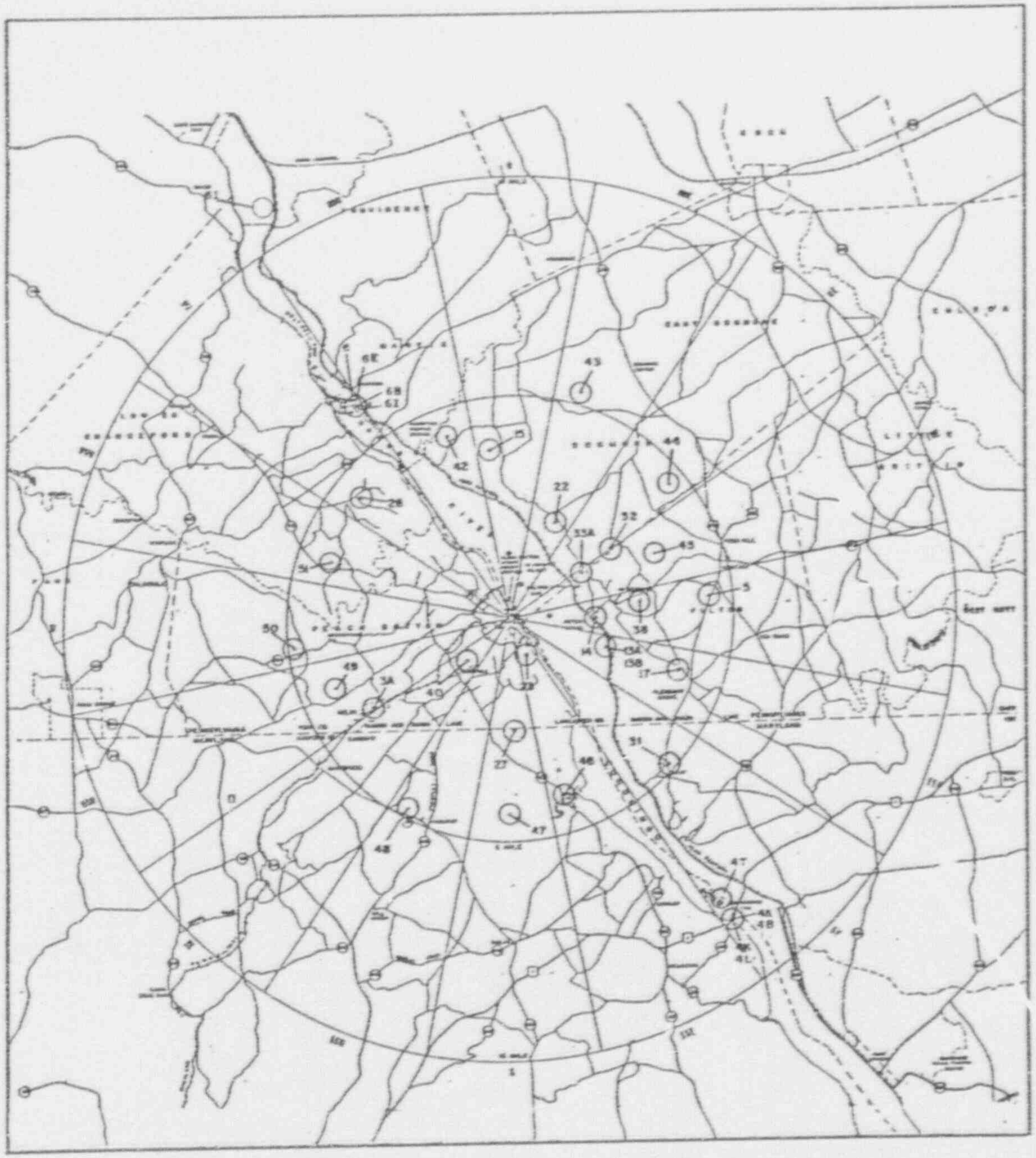
ENVIRONMENTAL SAMPLING LOCATIONS ON OR NEAR PEACH BOTTOM SITE

FIGURE 1

LEGEND

ENVIRONMENTAL SAMPLING LOCATIONS

1A	PEACH BOTTOM WEATHER STATION #1
1B	PEACH BOTTOM WEATHER STATION #2
1C	PEACH BOTTOM SOUTH SUBSTATION RD.
1D	PEACH BOTTOM 140° SECTOR SITE BOUNDARY
1E	PEACH BOTTOM 350° SECTOR SITE BOUNDARY
1F	PEACH BOTTOM SITE - 200° SECTOR HILL
1G	PEACH BOTTOM NORTH SUBSTATION
1H	PEACH BOTTOM SITE - 270° SECTOR HILL
1I	PEACH BOTTOM SOUTH SUBSTATION
1J	PEACH BOTTOM SITE - 180° SECTOR HILL
1L	PEACH BOTTOM UNITS 2 & 3 INTAKE
1LL	PEACH BOTTOM UNITS 2 & 3 INTAKE
1MM	PEACH BOTTOM CANAL DISCHARGE
1NN	PEACH BOTTOM - 260° SECTOR
1Z	PEACH BOTTOM WEATHER STATION #1
2	PEACH BOTTOM 130° SECTOR HILL
4	CONOWINGO POND, PA.
4J	CONOWINGO POND - BURKINS RUN
23	PEACH BOTTOM 150° SECTOR HILL OFF SITE

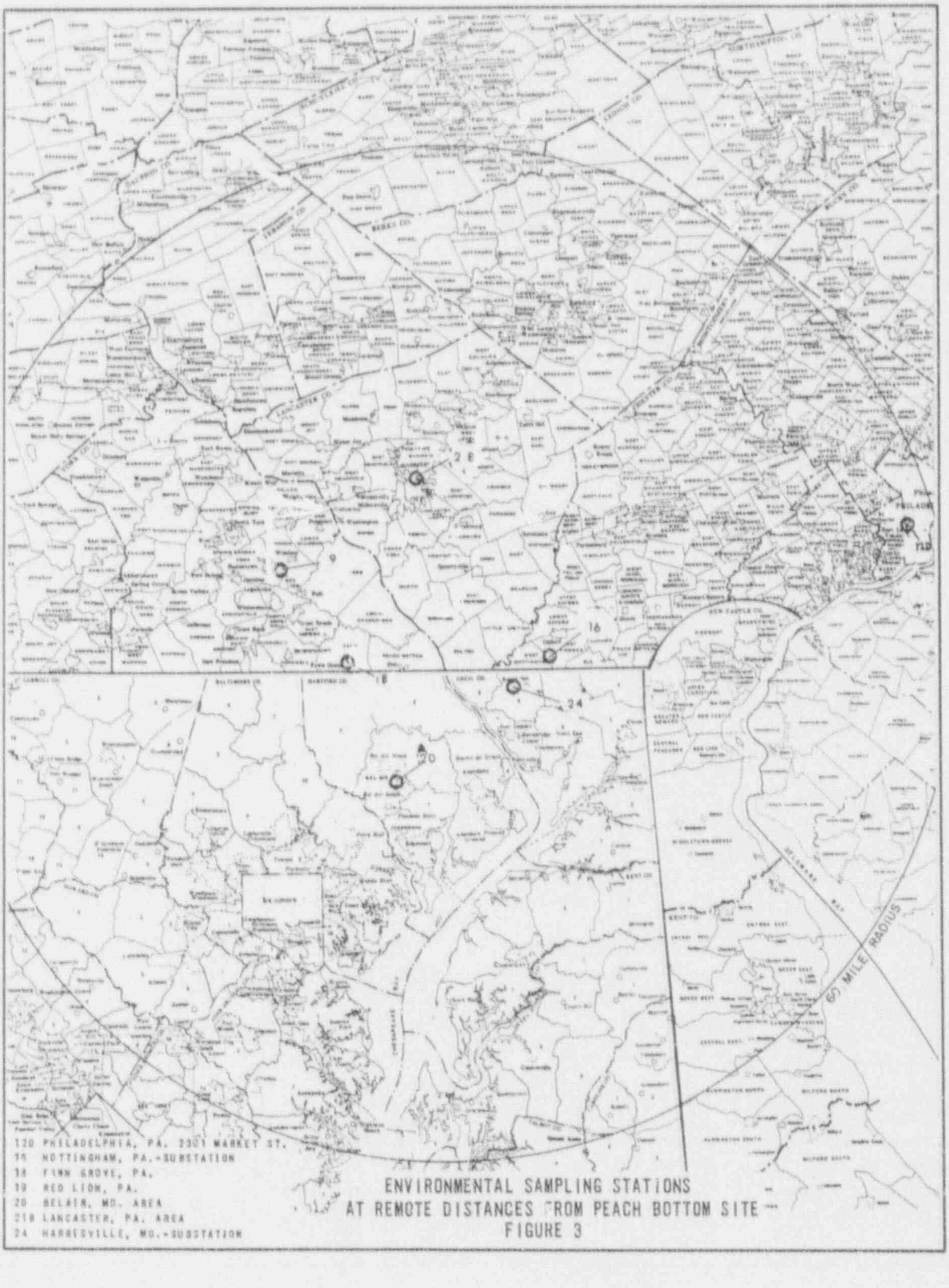


ENVIRONMENTAL SAMPLING LOCATIONS
AT INTERMEDIATE DISTANCES FROM PEACH BOTTOM SITE
FIGURE 2

LEGEND

ENVIRONMENTAL SAMPLING LOCATIONS

3A	DELTA, PA - SUBSTATION
4A/4B/4K	CONOWINGO DAM - POWERHOUSE ROOF
4L	CONOWINGO DAM - EL 33' MSL
4N	CONOWINGO DAM - ENVIRONMENTAL STATION
4T	CONOWINGO POND, NEAR CONOWINGO DAM
5	WAKEFIELD, PA
6	LAKE ALDRED ABOVE HOLTWOOD DAM
6B/6E	HOLTWOOD DAM
6I	HOLTWOOD DAM - HYDROELECTRIC STATION
13A	CHESTER WATER INTAKE - POND
13B	CHESTER WATER INTAKE - PUMP DISCHARGE
14	PETERS CREEK
15	SILVER SPRING ROAD
17	RIVERVIEW ROAD
22	EAGLE ROAD
23	PEACH BOTTOM - 150° SECTOR OFF SITE
26	SLAB ROAD
27	NORTH COOPER ROAD
31	PILOTOWN ROAD
31A	ECKMAN ROAD
32	SLATE HILL ROAD
33A	FULTON WEATHER STATION
38	PEACH BOTTOM ROAD
40	PEACH BOTTOM SITE AREA
42	MUDDY RUN ECOLOGICAL LAB
43	DRUMORE TOWNSHIP SCHOOL
44	GOSHEN MILL ROAD
45	PB-KEENEY LINE
46	BROAD CREEK
47	BROAD CREEK SCOUT CAMP
48	MACTON SUBSTATION
49	PB-CONASTONE LINE
50	TRANSCO PIPELINE SITE
51	FIN SUBSTATION



ENVIRONMENTAL SAMPLING STATIONS
AT REMOTE DISTANCES FROM PEACH BOTTOM SITE
FIGURE 3

DATA TABLES AND FIGURES

PRIMARY LABORATORY

APPENDIX C: DATA TABLES AND FIGURES - PRIMARY LABORATORY

TABLES

FIGURES

TABLE C-I.1 CONCENTRATIONS OF GROSS BETA SOLUBLE IN SURFACE WATER SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1990

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	13A	13B	1LL	1MM
JAN 90	2.5 ± 0.8	2.5 ± 0.9	2.1 ± 0.8	3.0 ± 0.9
FEB 90	2.5 ± 0.8	1.9 ± 0.8	1.4 ± 0.7	1.9 ± 0.7
MAR 90	2.8 ± 0.8	(1)	3.2 ± 0.8	4.1 ± 0.9
APR 90	2.2 ± 0.8	1.9 ± 0.8	1.6 ± 0.7	1.9 ± 0.8
MAY 90	2.9 ± 0.8	2.1 ± 0.7	1.9 ± 0.7	2.0 ± 0.7
JUN 90	4 ± 1	(1)	2.4 ± 0.9	1.9 ± 0.9
JUL 90	2.9 ± 0.9	2.8 ± 0.8	4 ± 1	2.7 ± 0.9
AUG 90	3.1 ± 0.9	3.1 ± 0.9	2.4 ± 0.8	2.6 ± 0.8
SEP 90	4.3 ± 0.9	2.[illegible] ± 0.8	3.3 ± 0.9	2.1 ± 0.7
OCT 90	3.3 ± 0.8	2.9 ± 0.8	2.8 ± 0.8	2.6 ± 0.8
NOV 90	3.9 ± 0.9	2.3 ± 0.8	2.2 ± 0.7	2.4 ± 0.8
DEC 90	3.1 ± 0.8	2.8 ± 0.8	1.7 ± 0.7	2.3 ± 0.7
MEAN	3.1 ± 1.3	2.5 ± 0.9	2.4 ± 1.6	2.5 ± 1.3

TABLE C-I.2 CONCENTRATIONS OF GROSS BETA INSOLUBLE IN SURFACE WATER SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1990

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	13A	13B	1LL	1MM
JAN 90	1.7 ± 0.4	0.6 ± 0.4	1.8 ± 0.5	1.4 ± 0.4
FEB 90	< 0.4	< 0.4	2.1 ± 0.5	1.3 ± 0.5
MAR 90	0.7 ± 0.5	(1)	0.7 ± 0.5	0.7 ± 0.5
APR 90	1.3 ± 0.4	0.6 ± 0.4	1.4 ± 0.5	1.6 ± 0.5
MAY 90	< 0.4	< 0.8	1.9 ± 0.6	1.4 ± 0.5
JUN 90	0.8 ± 0.5	(1)	2.5 ± 0.6	1.6 ± 0.5
JUL 90	0.5 ± 0.4	< 0.4	1.1 ± 0.4	1.0 ± 0.4
AUG 90	0.4 ± 0.4	1.7 ± 0.5	0.6 ± 0.4	1.2 ± 0.5
SEP 90	4.4 ± 0.6	0.6 ± 0.4	1.2 ± 0.4	1.4 ± 0.4
OCT 90	0.6 ± 0.4	2.1 ± 0.5	4.5 ± 0.7	3.8 ± 0.6
NOV 90	< 0.4	0.8 ± 0.5	2.6 ± 0.6	1.0 ± 0.5
DEC 90	1.3 ± 0.5	0.5 ± 0.4	1.7 ± 0.5	1.2 ± 0.5
MEAN	1.1 ± 2.3	0.9 ± 1.2	1.8 ± 2.1	1.5 ± 1.6

TABLE C-I.3 CONCENTRATIONS OF TRITIUM IN SURFACE WATER SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1990

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	13A	13B	1LL	1MM
JAN-MAR 90	< 50		80 ± 50	100 ± 50
APR-JUN 90	100 ± 50		100 ± 50	80 ± 50
JUL-SEP 90	180 ± 30		120 ± 30	80 ± 20
OCT-DEC 90	80 ± 50		60 ± 50	90 ± 50
MEAN	100 ± 110		90 ± 50	90 ± 20

(1) SEE PROGRAM EXCEPTIONS SECTION FOR EXPLANATION

TABLE C-I.4 CONCENTRATIONS OF GAMMA EMITTERS IN SURFACE WATER SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1990

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

STATION CODE	COLLECTION PERIOD	K-40	MN-54	CO-58	FE-59	CO-60	ZN-65	ZR-95	NB-95	CS-134	CS-137	BA-140	LA-140
1LL	JAN 90	< 5	< 0.3	< 0.3	< 0.6	< 0.3	< 0.5	< 0.6	< 0.3	< 0.3	< 0.3	< 2	< 0.8
	FEB 90	< 7	< 0.4	< 0.4	< 0.8	< 0.4	< 0.9	< 0.9	< 0.4	< 0.4	< 0.4	< 3	< 1
	MAR 90	< 4	< 0.3	< 0.3	< 0.5	< 0.3	< 0.5	< 0.5	< 0.3	< 0.3	< 0.2	< 1	< 0.6
	APR 90	< 6	< 0.3	< 0.4	< 0.8	< 0.3	< 0.7	< 0.7	< 0.4	< 0.3	< 0.4	< 2	< 1
	MAY 90	< 7	< 0.3	< 0.4	< 0.8	< 0.4	< 0.7	< 0.8	< 0.4	< 0.3	< 0.4	< 3	< 1
	JUN 90	< 30	< 0.9	< 0.8	< 3	< 1	< 2	< 1	< 0.9	< 0.8	< 0.6	< 4	< 6
	JUL 90	< 4	< 0.2	< 0.2	< 0.6	< 0.3	< 0.4	< 0.5	< 0.3	< 0.2	< 0.2	< 2	< 0.9
	AUG 90	< 9	< 0.3	< 0.4	< 0.8	< 0.4	< 0.7	< 0.8	< 0.4	< 0.3	< 0.4	< 3	< 0.9
	SEP 90	< 9	< 0.3	< 0.4	< 0.9	< 0.4	< 0.7	< 0.8	< 0.4	< 0.3	< 0.4	< 3	< 1.0
	OCT 90	< 4	< 0.2	< 0.3	< 0.5	< 0.2	< 0.5	< 0.5	< 0.3	< 0.2	< 0.2	< 2	< 0.8
	NOV 90	12 ± 5	< 0.3	< 0.4	< 0.8	< 0.3	< 0.7	< 0.8	< 0.4	< 0.3	< 0.4	< 3	< 1
	DEC 90	< 6	< 0.3	< 0.4	< 0.9	< 0.4	< 0.8	< 0.9	< 0.4	< 0.3	< 0.4	< 3	< 1
	MEAN	9 ± 14	< 0.3	< 0.4	< 0.9	< 0.4	< 0.8	< 0.7	< 0.4	< 0.3	< 0.4	< 3	< 1.3
1NM	JAN 90	< 4	< 0.2	< 0.2	< 0.6	< 0.3	< 0.6	< 0.5	< 0.3	< 0.2	< 0.3	< 1	< 0.7
	FEB 90	30 ± 30	< 0.8	< 0.9	< 3	< 1	< 3	< 2	< 0.9	< 0.8	< 0.7	< 4	< 5
	MAR 90	< 4	< 0.2	< 0.2	< 0.5	< 0.3	< 0.5	< 0.5	< 0.2	< 0.2	< 0.2	< 1	< 0.5
	APR 90	< 9	< 0.3	< 0.4	< 0.8	< 0.4	< 0.7	< 0.7	< 0.4	< 0.4	< 0.3	< 3	< 0.9
	MAY 90	< 10	< 0.3	< 0.4	< 0.9	< 0.4	< 0.8	< 0.8	< 0.4	< 0.4	< 0.4	< 3	< 1
	JUN 90	< 5	< 0.3	< 0.3	< 0.8	< 0.3	< 0.6	< 0.7	< 0.4	< 0.3	< 0.3	< 3	< 1
	JUL 90	< 10	< 0.4	< 0.4	< 1	< 0.4	< 0.8	< 0.9	< 0.5	< 0.4	< 0.4	< 4	< 1
	AUG 90	13 ± 6	< 0.3	< 0.3	< 0.6	< 0.3	< 0.6	< 0.6	< 0.3	< 0.3	< 0.3	< 2	< 0.9
	SEP 90	< 7	< 0.4	< 0.4	< 1	< 0.4	< 0.8	< 0.9	< 0.5	< 0.4	< 0.4	< 3	< 1
	OCT 90	< 7	< 0.4	< 0.4	< 0.9	< 0.4	< 0.8	< 0.8	< 0.5	< 0.4	< 0.4	< 3	< 1
	NOV 90	< 4	< 0.3	< 0.3	< 0.6	< 0.3	< 0.6	< 0.6	< 0.3	< 0.3	< 0.2	< 2	< 1.0
	DEC 90	< 9	< 0.3	< 0.4	< 0.9	< 0.4	< 0.7	< 0.8	< 0.4	< 0.4	< 0.4	< 3	< 1
	MEAN	9 ± 14	< 0.4	< 0.4	< 1.0	< 0.4	< 0.9	< 0.8	< 0.4	< 0.4	< 0.4	< 3	< 1.3

TABLE C-I.4 CONCENTRATIONS OF GAMMA EMITTERS IN SURFACE WATER SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1990

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

STATION CODE	COLLECTION PERIOD	K-40	MN-54	CO-58	FE-59	CO-60	ZN-65	ZR-95	NB-95	CS-134	CS-137	BA-140	LA-140
13A	JAN 90	4 ± 3	< 0.2	< 0.2	< 0.5	< 0.2	< 0.4	< 0.4	< 0.2	< 0.2	< 0.2	< 1	< 0.5
	FEB 90	< 4	< 0.3	< 0.3	< 0.8	< 0.3	< 0.7	< 0.6	< 0.3	< 0.3	< 0.3	< 2	< 1.0
	MAR 90	< 20	< 0.5	< 0.6	< 1	< 0.6	< 1	< 1	< 0.6	< 0.6	< 0.6	< 3	< 1
	APR 90	< 20	< 0.7	< 0.7	< 2	< 1	< 2	< 1	< 0.8	< 0.7	< 0.6	< 3	< 5
	MAY 90	< 30	< 0.7	< 0.9	< 3	< 1	< 2	< 2	< 0.8	< 0.8	< 0.7	< 4	< 6
	JUN 90	< 4	< 0.3	< 0.3	< 0.7	< 0.3	< 0.6	< 0.6	< 0.3	< 0.3	< 0.3	< 2	< 0.9
	JUL 90	< 5	< 0.3	< 0.4	< 0.8	< 0.3	< 0.7	< 0.8	< 0.4	< 0.3	< 0.3	< 3	< 1
	AUG 90	< 4	< 0.2	< 0.2	< 0.6	< 0.2	< 0.5	< 0.5	< 0.3	< 0.2	< 0.2	< 2	< 0.7
	SEP 90	< 10	< 0.4	< 0.4	< 0.9	< 0.4	< 0.8	< 0.9	< 0.5	< 0.4	< 0.4	< 3	< 1
	OCT 90	14 ± 6	< 0.4	< 0.4	< 1.0	< 0.4	< 0.8	< 0.9	< 0.5	< 0.4	< 0.4	< 3	< 1
	NOV 90	< 4	< 0.2	< 0.2	< 0.6	< 0.2	< 0.5	< 0.5	< 0.3	< 0.2	< 0.2	< 2	< 0.7
	DEC 90	8 ± 5	< 0.3	< 0.3	< 0.8	< 0.3	< 0.6	< 0.7	< 0.3	< 0.3	< 0.4	< 2	< 1
	MEAN	11 ± 17	< 0.4	< 0.4	< 1.1	< 0.4	< 0.9	< 0.8	< 0.4	< 0.4	< 0.4	< 3	< 1.7
13B	JAN 90	< 4	< 0.2	< 0.2	< 0.6	< 0.2	< 0.5	< 0.6	< 0.3	< 0.2	< 0.2	< 2	< 1.0
	FEB 90	< 5	< 0.3	< 0.3	< 0.6	< 0.3	< 0.6	< 0.6	< 0.3	< 0.3	< 0.3	< 2	< 0.9
	MAR 90 (1)												
	APR 90	< 4	< 0.3	< 0.3	< 0.8	< 0.3	< 0.6	< 0.7	< 0.4	< 0.3	< 0.3	< 3	< 2
	MAY 90	< 5	< 0.3	< 0.4	< 0.9	< 0.3	< 0.7	< 0.8	< 0.4	< 0.3	< 0.3	< 6	< 3
	JUN 90 (1)												
	JUL 90	< 5	< 0.3	< 0.3	< 0.7	< 0.3	< 0.5	< 0.7	< 0.3	< 0.3	< 0.3	< 3	< 1
	AUG 90	6 ± 5	< 0.3	< 0.3	< 0.7	< 0.3	< 0.6	< 0.6	< 0.3	< 0.3	< 0.3	< 3	< 1
	SEP 90	< 6	< 0.3	< 0.4	< 1	< 0.4	< 0.8	< 0.9	< 0.5	< 0.3	< 0.4	< 7	< 3
	OCT 90	< 6	< 0.4	< 0.4	< 1	< 0.4	< 0.7	< 0.9	< 0.4	< 0.3	< 0.3	< 5	< 2
	NOV 90	< 6	< 0.3	< 0.3	< 0.8	< 0.4	< 0.7	< 0.7	< 0.4	< 0.3	< 0.3	< 3	< 1
	DEC 90	< 4	< 0.3	< 0.3	< 0.9	< 0.3	< 0.6	< 0.7	< 0.4	< 0.3	< 0.3	< 5	< 2
	MEAN	5 ± 2	< 0.3	< 0.3	< 0.8	< 0.3	< 0.6	< 0.7	< 0.4	< 0.3	< 0.3	< 4	< 1.7
MEAN ALL STATIONS		8 ± 13	< 0.3	< 0.4	< 0.9	< 0.4	< 0.8	< 0.8	< 0.4	< 0.3	< 0.3	< 3	< 1.4

(1) SEE PROGRAM EXCEPTIONS SECTION FOR EXPLANATION

TABLE C-II.1 CONCENTRATIONS OF GROSS BETA SOLUBLE IN DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1990

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	4L		6I	
JAN 90	2.2	± 0.8	2.1	± 0.8
FEB 90	1.2	± 0.7	1.9	± 0.8
MAR 90	3.3	± 0.8	2.7	± 0.8
APR 90	2.3	± 0.8	2.4	± 0.8
MAY 90	2.3	± 0.7	2.7	± 0.8
JUN 90	1.8	± 0.7	2.9	± 0.7
JUL 90	2.8	± 0.9	6	± 1
AUG 90	2.9	± 0.9	3.5	± 0.9
SEP 90	3.8	± 0.9	3.3	± 0.8
OCT 90	2.5	± 0.8	3.2	± 0.8
NOV 90	2.6	± 0.8	2.9	± 0.8
DEC 90	2.3	± 0.8	2.1	± 0.7
MEAN	2.5	± 1.3	3.0	± 2.2

TABLE C-II.2 CONCENTRATIONS OF GROSS BETA INSOLUBLE IN DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1990

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	4L		6I	
JAN 90	0.6	± 0.4	0.9	± 0.4
FEB 90	< 0.4		0.6	± 0.4
MAR 90	0.8	± 0.5	0.6	± 0.5
APR 90	1.2	± 0.4	0.9	± 0.4
MAY 90	< 0.4		0.7	± 0.5
JUN 90	0.6	± 0.4	1.1	± 0.5
JUL 90	0.6	± 0.4	1.5	± 0.5
AUG 90	0.8	± 0.4	0.9	± 0.4
SEP 90	0.9	± 0.4	0.5	± 0.4
OCT 90	0.9	± 0.4	7.8	± 0.8
NOV 90	1.3	± 0.5	1.3	± 0.5
DEC 90	1.0	± 0.4	8.0	± 0.9
MEAN	0.8	± 0.6	2.1	± 5.5

TABLE C-II.3 CONCENTRATIONS OF I-131 RADIOCHEMISTY IN DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1990

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	4L	6I
JAN 90	< 0.05	< 0.05
FEB 90	< 0.09	< 0.08
MAR 90	< 0.07	< 0.05
APR 90	< 0.10	< 0.1
MAY 90	< 0.08	< 0.09
JUN 90	< 0.1	< 0.1
JUL 90	< 0.07	< 0.07
AUG 90	< 0.1	< 0.1
SEP 90	< 0.07	0.15 ± 0.08
OCT 90	< 0.2	< 0.2
NOV 90	< 0.04	< 0.08
DEC 90	< 0.09	< 0.06
MEAN	< 0.09	0.09 ± 0.09

TABLE C-II.4 CONCENTRATIONS OF H-3 AQUEOUS LIQ. SCINT. W/ENR IN DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1990

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	4L	6I
JAN-MAR 90	80 ± 50	90 ± 50
APR-JUN 90	200 ± 30	110 ± 30
JUL-SEP 90	170 ± 30	110 ± 30
OCT-DEC 90	70 ± 50	80 ± 50
MEAN	130 ± 130	100 ± 30

TABLE C-II.5 CONCENTRATIONS OF GAMMA EMITTERS IN DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1990

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

STATION CODE	COLLECTION PERIOD	K-40	MN-54	CO-58	FE-59	CO-60	ZN-65	ZR-95	NB-95	CS-134	CS-137	BA-140	LA-140	RA-226
4L	JAN 90	< 6	< 0.3	< 0.4	< 0.7	< 0.4	< 0.7	< 0.7	< 0.4	< 0.4	< 0.3	< 2	< 1	< 7
	FEB 90	< 10	< 0.4	< 0.4	< 0.9	< 0.4	< 0.8	< 0.9	< 0.4	< 0.4	< 0.4	< 3	< 1.0	< 8
	MAR 90	< 10	< 0.4	< 0.4	< 0.9	< 0.5	< 0.8	< 0.9	< 0.5	< 0.4	< 0.5	< 3	< 0.8	< 8
	APR 90	< 3	< 0.2	< 0.3	< 0.6	< 0.2	< 0.6	< 0.6	< 0.3	< 0.3	< 0.2	< 2	< 0.9	< 4
	MAY 90	< 4	< 0.3	< 0.3	< 0.7	< 0.3	< 0.6	< 0.6	< 0.3	< 0.3	< 0.3	< 2	< 1	< 5
	JUN 90	< 7	< 0.3	< 0.3	< 0.8	< 0.4	< 0.7	< 0.8	< 0.4	< 0.4	< 0.4	< 2	< 1	< 8
	JUL 90	< 9	< 0.3	< 0.4	< 0.8	< 0.4	< 0.7	< 0.8	< 0.4	< 0.3	< 0.3	< 3	< 0.9	< 8
	AUG 90	< 10	< 0.3	< 0.4	< 0.9	< 0.4	< 0.8	< 0.8	< 0.4	< 0.4	< 0.4	< 3	< 0.8	20 ± 10
	SEP 90	< 5	< 0.3	< 0.3	< 0.6	< 0.3	< 0.6	< 0.6	< 0.3	< 0.3	< 0.3	< 2	< 1.0	< 6
	OCT 90	15 ± 7	< 0.3	< 0.3	< 0.8	< 0.3	< 0.7	< 0.7	< 0.3	< 0.3	< 0.3	< 2	< 1	< 5
	NOV 90	< 9	< 0.3	< 0.3	< 0.8	< 0.4	< 0.7	< 0.7	< 0.4	< 0.3	< 0.4	< 2	< 0.8	< 7
	DEC 90	< 5	< 0.2	< 0.3	< 0.6	< 0.3	< 0.5	< 0.5	< 0.3	< 0.3	< 0.3	< 2	< 0.9	< 6
	MEAN	8 ± 7	< 0.3	< 0.3	< 0.8	< 0.4	< 0.7	< 0.7	< 0.4	< 0.3	< 0.3	< 2	< 0.9	8 ± 8
61	JAN 90	< 5	< 0.3	< 0.3	< 0.6	< 0.3	< 0.5	< 0.6	< 0.3	< 0.3	< 0.3	< 2	< 0.8	< 6
	FEB 90	10 ± 7	< 0.4	< 0.4	< 1.0	< 0.4	< 0.8	< 0.9	< 0.5	< 0.4	< 0.4	< 3	< 1.0	< 8
	MAR 90	< 5	< 0.3	< 0.3	< 0.8	< 0.3	< 0.6	< 0.7	< 0.4	< 0.4	< 0.4	< 2	< 1	< 8
	APR 90	< 4	< 0.2	< 0.2	< 0.6	< 0.2	< 0.5	< 0.5	< 0.3	< 0.2	< 0.2	< 2	< 0.7	< 5
	MAY 90	< 5	< 0.2	< 0.3	< 0.6	< 0.3	< 0.5	< 0.6	< 0.3	< 0.2	< 0.3	< 2	< 0.9	< 6
	JUN 90	< 10	< 0.4	< 0.4	< 0.9	< 0.4	< 0.8	< 0.8	< 0.4	< 0.4	< 0.4	< 3	< 0.9	< 7
	JUL 90	10 ± 10	< 0.6	< 0.7	< 1	< 0.5	< 1.0	< 1	< 0.7	< 0.6	< 0.7	< 5	< 2	< 10
	AUG 90	< 5	< 0.3	< 0.3	< 0.8	< 0.4	< 0.6	< 0.7	< 0.4	< 0.3	< 0.4	< 2	< 1	< 7
	SEP 90	< 5	< 0.3	< 0.3	< 0.7	< 0.3	< 0.5	< C.6	< 0.3	< 0.3	< 0.3	< 2	< 1	< 6
	OCT 90	< 5	< 0.3	< 0.3	< 0.7	< 0.3	< 0.5	< 0.6	< 0.3	< 0.3	< 0.3	< 2	< 0.9	< 6
	NOV 90	< 4	< 0.2	< 0.2	< 0.5	< 0.2	< 0.5	< 0.5	< 0.2	< 0.2	< 0.2	< 2	< 0.7	< 5
	DEC 90	7 ± 7	< 0.4	< 0.4	< 1	< 0.4	< 0.8	< 0.9	< 0.5	< 0.4	< 0.4	< 4	< 1	< 8
	MEAN	6 ± 5	< 0.3	< 0.3	< 0.8	< 0.3	< 0.6	< 0.7	< 0.4	< 0.3	< 0.4	< 3	< 1.0	< 7
MEAN ALL STATIONS		7 ± 6	< 0.3	< 0.3	< 0.8	< 0.3	< 0.7	< 0.7	< 0.4	< 0.3	< 0.4	< 2	< 1.0	7 ± 6

TABLE C-III.1 CONCENTRATIONS OF GAMMA EMITTERS IN FISH SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1990

RESULTS IN UNITS OF PCI/GRAM (WET) ± 2 SIGMA

STATION CODE	MEDIA	COLLECTION PERIOD	K-40	MN-54	CO-58	FE-59	CO-60	ZN-65	CS-134	CS-137
4	PREDATOR	06/05-06/05	2.1 ± 0.2	< 0.01	< 0.01	< 0.03	< 0.01	< 0.02	< 0.01	< 0.01
		09/18-09/18	3.0 ± 0.3	< 0.006	< 0.008	< 0.02	< 0.007	< 0.02	< 0.007	< 0.007
		MEAN	2.6 ± 1.3	< 0.008	< 0.009	< 0.03	< 0.009	< 0.02	< 0.009	< 0.00[illegible]
	BOTTOM FEEDER	06/05-06/05	0.7 ± 0.2	< 0.007	< 0.008	< 0.02	< 0.008	< 0.02	< 0.007	< 0.007
		09/18-09/18	3.3 ± 0.3	< 0.006	< 0.007	< 0.02	< 0.006	< 0.01	< 0.006	< 0.006
		MEAN	2.0 ± 5.5	< 0.007	< 0.008	< 0.02	< 0.007	< 0.02	< 0.007	< 0.007
6	PREDATOR	06/05-06/06	1.9 ± 0.3	< 0.009	< 0.009	< 0.02	< 0.009	< 0.02	< 0.009	< 0.009
		09/25-09/26	2.8 ± 0.3	< 0.007	< 0.009	< 0.02	< 0.008	< 0.01	< 0.008	< 0.007
		MEAN	2.4 ± 1.3	< 0.008	< 0.009	< 0.02	< 0.009	< 0.02	< 0.009	< 0.008
	BOTTOM FEEDER	06/05-06/06	1.5 ± 0.2	< 0.006	< 0.007	< 0.02	< 0.006	< 0.01	< 0.[illegible]	< 0.006
		09/25-09/26	3.2 ± 0.3	< 0.006	< 0.007	< 0.02	< 0.007	< 0.01	< 0.006	< 0.007
		MEAN	2.4 ± 2.4	< 0.006	< 0.007	< 0.02	< 0.007	< 0.01	< 0.006	< 0.007
MEAN ALL STATIONS	PREDATOR		2.5 ± 1.1	< 0.008	< 0.009	< 0.02	< 0.009	< 0.02	< 0.009	< 0.009
	BOTTOM FEEDER		2.2 ± 2.6	< 0.007	< 0.008	< 0.02	< 0.007	< 0.02	< 0.007	< 0.007

TABLE C-IV.1 CONCENTRATIONS OF GAMMA EMITTERS IN SEDIMENT SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1990

RESULTS IN UNITS OF PCI/GRAM (DRY) ± 2 SIGMA

STATION CODE	COLLECTION PERIOD	BE-7	K-40	CS-134	CS-137	RA-226	TH-228
4D	06/07-06/07	< 0.1	9.5 ± 1.0	< 0.01	0.10 ± 0.02	0.8 ± 0.3	0.46 ± 0.05
	11/02-11/02	0.4 ± 0.2	20 ± 2	< 0.02	0.11 ± 0.02	1.7 ± 0.6	1.1 ± 0.1
	MEAN	0.3 ± 0.4	14.8 ± 14.8	< 0.02	0.11 ± 0.01	1.3 ± 1.3	0.78 ± 0.91
4T	06/07-06/07	< 0.3	23 ± 2	< 0.03	0.42 ± 0.08	3.7 ± 0.9	2.0 ± 0.2
	11/02-11/02	< 0.2	21 ± 2	< 0.04	0.34 ± 0.08	3.6 ± 1.0	1.6 ± 0.2
	MEAN	< 0.3	22 ± 3	< 0.04	0.38 ± 0.11	3.7 ± .1	1.8 ± 0.6
6F	06/07-06/07	< 0.1	13 ± 1	< 0.01	0.18 ± 0.03	2.5 ± 0.4	1.2 ± 0.1
	11/02-11/02	0.9 ± 0.4	20 ± 2	< 0.03	0.26 ± 0.06	2.1 ± 0.8	1.5 ± 0.1
	MEAN	0.5 ± 1.1	17 ± 10	< 0.02	0.22 ± 0.11	2.3 ± 0.6	1.4 ± 0.4
MEAN ALL STATIONS		0.3 ± 0.6	17.8 ± 10.5	< 0.02	0.24 ± 0.26	2.4 ± 2.2	1.31 ± 1.05

TABLE C-V.1 CONCENTRATIONS OF GROSS BETA IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1990

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

GROUP I - ON-SITE LOCATIONS

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

(1) SEE PROGRAM EXCEPTIONS SECTION FOR EXPLANATION

TABLE C-V.1 CONCENTRATIONS OF GROSS BETA IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1990

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

GROUP II - INTERMEDIATE DISTANCE LOACATIONS

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

(1) SEE PROGRAM EXCEPTIONS SECTION FOR EXPLANATION

TABLE C-V.1 CONCENTRATIONS OF GROSS BETA IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1990

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

GROUP .I - INTERMEDIATE DISTANCE LOACATIONS

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

(1) SEE PROGRAM EXCEPTIONS SECTION FOR EXPLANATION

TABLE C-V.1 CONCENTRATIONS OF GROSS BETA IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1990

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

GROUP III - CONTROL LOACATIONS

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

(1) SEE PROGRAM EXCEPTIONS SECTION FOR EXPLANATION

TABLE C-V.2 MONTHLY AND YEARLY MEAN VALUES OF GROSS BETA CONCENTRATIONS (E-3 PCI/CU. METER) IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1990

GROUP I				GROUP II				GROUP III			
COLLECTION PERIOD	MIN.	MAX.	MEAN + 2 SD	COLLECTION PERIOD	MIN.	MAX.	MEAN + 2 SD	COLLECTION PERIOD	MIN.	MAX.	MEAN + 2 SD
12/29/89-02/03/90	13	27	20 + 9	12/29/89-02/03/90	12	25	19 + 7	12/29/89-02/03/90	14	28	20 + 7
02/03/90-03/03/90	11	18	15 + 4	02/03/90-03/03/90	13	21	17 + 4	01/29/90-03/03/90	12	19	16 + 3
03/03/90-03/31/90	10	25	18 + 10	03/03/90-03/31/90	11	27	17 + 8	02/26/90-04/02/90	10	25	17 + 9
03/31/90-04/28/90	8	31	18 + 12	03/31/90-04/28/90	8	30	17 + 11	03/31/90-04/30/90	10	24	17 + 10
04/28/90-06/02/90	7	17	13 + 6	04/28/90-06/02/90	3	21	12 + 8	04/28/90-06/02/90	4	32	12 + 14
06/02/90-07/01/90	11	24	15 + 8	06/02/90-07/01/90	6	24	14 + 10	05/29/90-07/02/90	10	24	15 + 8
07/01/90-08/03/90	5	36	22 + 18	06/30/90-08/03/90	9	31	22 + 10	06/30/90-08/03/90	15	27	20 + 7
08/03/90-09/02/90	12	40	20 + 16	07/28/90-09/02/90	10	28	17 + 10	07/28/90-09/04/90	8	31	19 + 13
09/02/90-09/30/90	12	26	17 + 10	09/02/90-09/29/90	13	25	20 + 6	09/02/90-10/01/90	13	23	19 + 8
09/30/90-11/03/90	10	25	17 + 8	09/29/90-11/03/90	9	31	20 + 10	09/29/90-11/03/90	6	27	18 + 10
11/03/90-12/02/90	16	32	24 + 10	11/03/90-12/02/90	17	31	24 + 5	10/29/90-12/03/90	18	36	26 + 10
12/02/90-12/28/90	17	30	21 + 9	12/02/90-12/29/90	11	28	19 + 8	12/02/90-12/31/90	15	29	21 + 8
12/29/89-12/28/90	5	40	18 + 12	12/29/89-12/29/90	3	31	18 + 10	12/29/89-12/31/90	4	36	18 + 11

NOTE:

GROUP I CONSISTS OF LOCATIONS 1B, 12, 2
GROUP II CONSISTS OF LOCATIONS 3A, 5, 14, 15, 17, 31, 32, 33A, 38
GROUP III CONSISTS OF LOCATIONS 4B, 6E, 12D

TABLE C-V.3 CONCENTRATIONS OF GAMMA EMITTERS IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1990

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

STATION CODE	COLLECTION PERIOD	BE-7	K-40	CS-134	CS-137
1B	12/29-03/31/90	60 ± 8	7 ± 7	< 0.3	< 0.3
	03/31-07/01/90	54 ± 9	12 ± 8	< 0.4	< 0.4
	07/01-09/30/90	53 ± 7	< 7	< 0.2	< 0.3
	09/30-12/28/90	54 ± 6	7 ± 4	< 0.2	< 0.2
	MEAN	55 ± 6	8 ± 5	< 0.3	< 0.3
1Z	12/29-03/31/90	74 ± 10	19 ± 8	< 0.2	< 0.3
	03/31-07/01/90	71 ± 8	20 ± 7	< 0.3	< 0.3
	07/01-09/30/90	51 ± 8	< 5	< 0.2	< 0.2
	09/30-12/28/90	46 ± 5	< 3	< 0.1	< 0.1
	MEAN	61 ± 28	12 ± 18	< 0.2	< 0.2
2	12/29-03/31/90	68 ± 9	< 5	< 0.2	< 0.2
	03/31-07/01/90	65 ± 8	23 ± 9	< 0.2	< 0.2
	07/01-09/30/90	63 ± 7	< 4	< 0.2	< 0.2
	09/30-12/28/90	57 ± 6	< 3	< 0.1	< 0.1
	MEAN	63 ± 9	9 ± 19	< 0.2	< 0.2
3A	12/29-03/31/90	62 ± 7	11 ± 5	< 0.2	< 0.2
	03/31-07/01/90	61 ± 6	12 ± 5	< 0.2	< 0.2
	07/01-09/30/90	46 ± 5	< 3	< 0.2	< 0.2
	09/30-12/28/90	5 ± 5	< 2	< 0.1	< 0.1
	MEAN	44 ± 53	7 ± 10	< 0.2	< 0.2
12D	01/02-04/02/90	46 ± 6	7 ± 5	< 0.2	< 0.1
	04/02-07/02/90	52 ± 6	< 3	< 0.2	< 0.2
	07/02-10/01/90	63 ± 6	4 ± 4	< 0.2	< 0.2
	10/01-12/31/90	7 ± 7	< 3	< 0.2	< 0.1
	MEAN	42 ± 49	4 ± 4	< 0.2	< 0.2

TABLE C-VI.1 CONCENTRATIONS OF I-131 RADIOCHEMISTRY IN AIR IODINE SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1990

RESULT 'N UNITS OF E-3 PCI/CU. METER ± 2 SIGMA

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

(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, 1990

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION DATE	NEARBY FARMS			INTERMEDIATE FARMS				DISTANT FARMS			
	G	J	O	D	L	M	N	A	B	C	E
01/15/90	< 0.2	< 0.1	< 0.2				< 0.1	< 0.08			
02/19/90	< 0.06	< 0.2	< 0.09	< 0.05	< 0.07	< 0.07	< 0.09	< 0.07	< 0.09	< 0.08	< 0.07
03/19/90	< 0.07	< 0.1	< 0.08				< 0.1	< 0.08			
04/09/90	0.1 ± 0.1	< 0.3	< 0.2				< 0.4	< 0.2			
04/23/90	< 0.06	< 0.06	< 0.06				< 0.07	< 0.06			
05/07/90	< 0.2	< 0.2	< 0.1				< 0.1	< 0.4			
05/21/90	< 0.09	< 0.07	< 0.10				< 0.1	< 0.05			
06/04/90	< 0.07	< 0.08	< 0.07	< 0.07	< 0.2	< 0.1	< 0.1	< 0.06	< 0.06	< 0.07	< 0.09
06/18/90	< 0.06	< 0.08	< 0.1				< 0.09	< 0.2			
07/02/90	< 0.08	< 0.3	< 0.1				< 0.1	< 0.2			
07/16/90	< 0.08	< 0.06	< 0.08				< 0.09	< 0.2			
07/30/90	< 0.03	< 0.1	< 0.05				< 0.08	< 0.1			
08/13/90	< 0.03	< 0.2	< 0.1	< 0.06	< 0.05	< 0.07	< 0.06	< 0.08	< 0.10	< 0.07	< 0.06
08/27/90	< 0.06	< 0.05	< 0.10				< 0.2	< 0.09			
09/10/90	< 0.09	< 0.09	< 0.07				< 0.08	< 0.10			
09/24/90	< 0.07	< 0.05	< 0.06				< 0.1	< 0.09			
10/08/90	< 0.05	< 0.06	< 0.07				< 0.07	< 0.1			
10/22/90	< 0.05	< 0.08	< 0.06				< 0.1	< 0.06			
11/05/90	< 0.04	< 0.03	< 0.06	< 0.08	< 0.03	< 0.05	< 0.04	< 0.06	< 0.05	< 0.06	< 0.05
11/19/90	< 0.07	< 0.08	< 0.06				< 0.2	< 0.2			
12/17/90	< 0.06	< 0.06	< 0.05				< 0.06	< 0.04			
MEAN	0.08 ± 0.08	< 0.11	< 0.09	< 0.07	< 0.09	< 0.07	< 0.11	< 0.12	< 0.08	< 0.07	< 0.07

TABLE C-VII.2 CONCENTRATIONS OF GAMMA EMITTERS IN MILK SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1990

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

STC	COLLECTION DATE	K-40	MN-54	CS-134	CS-137	BA-140	LA-140	RA-226
G	02/19/90	1400 ± 100	< 3	< 3	< 3	< 10	< 5	< 50
	06/03/90	1300 ± 100	< 2	< 2	3 ± 3	< 5	< 2	< 30
	08/12/90	1300 ± 100	< 1	< 2	< 2	< 6	< 2	< 30
	11/04/90	1300 ± 100	< 1	< 2	5 ± 3	< 6	< 2	< 40
	MEAN	1325 ± 100	< 2	< 2	3 ± 3	< 7	< 3	< 38
J	02/19/90	1400 ± 100	0.9 ± 0.9	< 0.6	3.0 ± 1.0	< 20	< 6	30 ± 20
	06/04/90	1300 ± 100	< 2	< 2	< 2	< 6	< 2	< 30
	08/13/90	1200 ± 100	< 1	< 2	< 2	< 6	< 3	< 40
	11/05/90	1300 ± 100	< 2	< 2	7 ± 3	< 5	< 2	< 40
	MEAN	1300 ± 163	1.5 ± 1.2	< 1.7	3.5 ± 4.8	< 9	< 3	35 ± 12
O	02/19/90	1300 ± 100	< 2	< 2	< 2	< 6	< 2	< 30
	06/04/90	1300 ± 100	< 2	< 2	4 ± 3	< 6	< 2	< 40
	08/13/90	1500 ± 100	< 1	< 2	< 2	< 6	< 3	< 30
	11/05/90	1300 ± 100	< 2	< 2	< 2	< 6	< 3	< 40
	MEAN	1350 ± 200	< 2	< 2	3 ± 2	< 6	< 3	< 35
N	02/19/90	1200 ± 100	< 2	< 2	< 2	< 6	< 3	< 30
	06/04/90	1200 ± 100	< 2	< 2	< 2	< 6	< 3	< 30
	08/13/90	1400 ± 100	< 2	< 2	< 2	< 7	< 3	< 40
	11/05/90	1200 ± 100	< 2	< 2	3 ± 3	< 6	< 2	< 30
	MEAN	1250 ± 200	< 2	< 2	2 ± 1	< 6	< 3	< 33
A	02/19/90	1400 ± 100	< 1	< 2	< 2	< 6	< 2	< 40
	06/04/90	1200 ± 100	< 2	< 2	< 2	< 6	< 2	< 40
	08/13/90	1300 ± 100	< 2	< 2	< 2	< 6	< 2	< 40
	11/05/90	1400 ± 100	< 1	< 2	< 2	< 6	< 3	< 30
	MEAN	1325 ± 191	< 2	< 2	< 2	< 6	< 2	< 38

TABLE C-VIII.1 MONTHLY TLD RESULTS FOR PEACH BOTTOM ATOMIC POWER STATION, 1990

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

STATION CODE	MEAN ± 2 S.D. (1)	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1A	6.9 ± 1.0	7.4 ± 0.7	7.5 ± 0.6	6.9 ± 1.0	6.3 ± 1.2	6.4 ± 0.3	7.4 ± 1.1	7.2 ± 0.6	6.5 ± 0.5	7.3 ± 0.8	6.7 ± 1.0	6.2 ± 0.4	7.3 ± 1.0
1B	5.9 ± 1.2	6.3 ± 0.5	6.6 ± 0.5	5.9 ± 0.8	5.3 ± 0.3	5.1 ± 0.2	5.8 ± 0.4	5.9 ± 0.3	5.0 ± 0.3	6.3 ± 0.4	6.9 ± 0.3	5.8 ± 0.4	5.4 ± 0.3
1C	6.8 ± 0.6	7.0 ± 0.3	7.4 ± 0.5	6.8 ± 0.6	6.6 ± 0.4	6.4 ± 0.4	6.9 ± 0.3	7.0 ± 0.5	6.3 ± 0.5	7.3 ± 0.6	6.8 ± 0.3	6.8 ± 0.7	6.9 ± 0.5
1D	6.5 ± 0.8	6.8 ± 0.4	7.3 ± 1.4	6.6 ± 0.5	6.3 ± 0.4	6.1 ± 0.4	6.4 ± 0.3	6.5 ± 0.4	6.1 ± 0.3	7.0 ± 0.3	6.2 ± 0.4	6.4 ± 0.4	5.9 ± 0.3
1E	6.4 ± 1.0	6.7 ± 0.3	7.4 ± 1.2	6.6 ± 0.4	6.2 ± 0.5	5.7 ± 0.4	6.5 ± 0.5	6.5 ± 0.4	5.5 ± 0.4	6.9 ± 0.1	6.5 ± 0.8	6.2 ± 0.3	6.0 ± 0.3
1F	7.5 ± 0.8	7.8 ± 0.6	8.3 ± 0.3	7.7 ± 0.6	7.2 ± 0.6	7.0 ± 0.5	7.6 ± 0.5	7.8 ± 0.4	6.9 ± 0.4	7.7 ± 1.0	7.6 ± 0.6	7.4 ± 0.4	7.2 ± 0.8
1G	5.1 ± 0.7	5.3 ± 0.2	5.8 ± 0.7	5.4 ± 0.5	4.9 ± 0.4	4.7 ± 0.2	5.2 ± 0.4	5.1 ± 0.2	4.7 ± 0.3	5.3 ± 0.4	5.2 ± 0.1	4.9 ± 0.1	4.6 ± 0.2
1H	6.7 ± 1.0	7.1 ± 0.5	7.6 ± 1.3	7.0 ± 0.7	6.2 ± 0.8	6.2 ± 0.2	6.8 ± 0.5	6.8 ± 0.7	6.0 ± 0.4	7.3 ± 0.3	6.8 ± 0.3	6.6 ± 0.9	6.2 ± 0.3
1I	5.5 ± 0.7	5.7 ± 0.3	6.1 ± 0.3	5.5 ± 0.2	5.5 ± 0.3	5.0 ± 0.4	5.6 ± 0.5	5.5 ± 0.3	5.2 ± 0.2	6.0 ± 0.4	5.5 ± 0.5	5.5 ± 1.1	5.0 ± 0.3
1J	7.5 ± 0.7	7.7 ± 0.6	8.[illegible] ± 0.5	7.7 ± 0.7	7.2 ± 0.4	7.0 ± 0.4	7.6 ± 0.8	7.8 ± 0.6	7.3 ± 0.6	7.8 ± 0.6	7.5 ± 0.6	7.4 ± 0.4	6.8 ± 0.5
1L	5.1 ± 0.9	5.7 ± 0.3	5.7 ± 0.7	4.6 ± 0.1	4.9 ± 0.6	4.7 ± 0.3	5.5 ± 0.1	5.5 ± 0.3	4.8 ± 0.4	5.4 ± 0.2	5.3 ± 0.3	4.5 ± 0.2	4.8 ± 0.4
1M	4.2 ± 0.5	4.3 ± 0.2	4.6 ± 0.3	4.1 ± 0.4	4.1 ± 0.3	3.8 ± 0.4	4.2 ± 0.4	4.[illegible] ± 0.4	4.5 ± 0.5	4.4 ± 0.1	4.1 ± 0.3	4.3 ± 0.6	3.7 ± 0.3
2	6.4 ± 0.7	6.4 ± 0.7	6.9 ± 0.6	6.8 ± 0.6	6.1 ± 0.4	5.9 ± 0.3	6.5 ± 0.6	6.5 ± 0.5	6.0 ± 0.5	6.9 ± 0.3	6.6 ± 0.8	6.7 ± 0.1	5.9 ± 0.5
3A	5.0 ± 1.3	5.3 ± 0.5	5.4 ± 0.2	5.2 ± 0.8	4.5 ± 0.2	4.5 ± 0.5	6.7 ± 0.4	4.9 ± 0.3	4.2 ± 0.1	5.1 ± 0.3	4.8 ± 0.3	5.1 ± 0.4	4.4 ± 0.2
4K	4.8 ± 0.7	5.2 ± 0.8	5.3 ± 0.5	4.8 ± 0.3	4.6 ± 0.3	4.2 ± 0.1	4.8 ± 0.6	4.7 ± 0.3	4.3 ± 0.2	5.2 ± 0.5	4.8 ± 0.9	4.9 ± 0.5	4.4 ± 0.1
5	6.2 ± 0.8	6.2 ± 0.3	6.9 ± 0.2	6.7 ± 0.9	6.3 ± 0.4	5.7 ± 0.4	6.4 ± 0.5	6.5 ± 0.3	5.7 ± 0.4	6.1 ± 0.5	6.4 ± 0.2	6.3 ± 0.2	5.5 ± 0.3
6B	5.5 ± 0.9	5.7 ± 0.5	6.3 ± 0.3	5.9 ± 0.5	5.5 ± 0.4	4.8 ± 0.4	5.5 ± 1.0	5.6 ± 0.4	4.7 ± 0.3	5.6 ± 0.2	5.6 ± 0.9	5.6 ± 0.4	5.0 ± 0.2
1NN	7.6 ± 1.3	8.2 ± 0.7	9.1 ± 0.6	8.1 ± 0.4	7.1 ± 0.6	7.1 ± 0.4	7.3 ± 0.2	7.6 ± 0.5	7.0 ± 0.6	8.2 ± 1.5	7.5 ± 0.6	7.5 ± 0.3	6.7 ± 0.4
14	6.6 ± 0.9	7.1 ± 0.3	7.3 ± 0.4	6.8 ± 0.7	6.5 ± 0.5	5.9 ± 0.4	6.5 ± 0.5	6.6 ± 0.6	5.8 ± 0.7	7.0 ± 0.3	6.5 ± 0.6	6.7 ± 0.4	6.2 ± 0.4
12D	6.0 ± 6.0	6.6 ± 0.8	6.8 ± 0.4	5.3 ± 0.2	15.1 ± 1.4	4.7 ± 0.4	4.1 ± 0.3	4.6 ± 0.2	4.8 ± 0.3	5.2 ± 0.2	4.1 ± 0.3	5.1 ± 0.7	5.3 ± 0.2
15	7.0 ± 1.5	7.2 ± 0.5	8.8 ± 0.2	7.0 ± 0.4	7.6 ± 0.8	6.1 ± 0.4	6.7 ± 0.4	7.0 ± 0.4	6.2 ± 0.4	7.0 ± 0.4	6.7 ± 0.2	7.1 ± 0.9	6.2 ± 0.5
16	6.7 ± 1.0	6.9 ± 0.4	7.4 ± 0.4	7.0 ± 0.8	6.4 ± 0.6	5.9 ± 0.8	6.6 ± 0.3	7.0 ± 0.5	5.9 ± 0.4	7.1 ± 0.2	6.9 ± 0.4	7.0 ± 0.4	6.0 ± 0.3
17	7.5 ± 0.9	7.7 ± 0.8	8.4 ± 0.5	7.7 ± 0.2	7.3 ± 0.4	6.9 ± 0.4	7.5 ± 0.4	7.4 ± 0.5	6.8 ± 0.5	7.6 ± 0.4	7.4 ± 0.3	8.0 ± 0.3	7.1 ± 0.4
18	6.9 ± 1.0	7.2 ± 0.4	7.6 ± 0.3	7.3 ± 0.9	6.5 ± 0.5	6.5 ± 0.7	7.0 ± 0.5	7.4 ± 0.6	6.3 ± 0.4	6.8 ± 1.2	7.1 ± 0.4	7.3 ± 0.6	6.0 ± 0.5

1. MEAN AND TWO TIMES THE STANDARD DEVIATION OF THE MONTHLY RESULTS.

TABLE C-VIII.1 MONTHLY TLD RESULTS FOR PEACH BOTTOM ATOMIC POWER STATION, 1990

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

STATION CODE	MEAN ± 2 S.D. (1)	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
19	6.8 ± 1.1	7.1 ± 0.4	7.7 ± 0.5	6.9 ± 0.4	6.4 ± 0.4	6.0 ± 0.4	6.9 ± 0.2	7.0 ± 0.3	6.0 ± 0.4	7.5 ± 0.8	7.0 ± 0.4	7.3 ± 0.3	6.2 ± 0.4
20	5.9 ± 0.9	6.5 ± 0.6	6.6 ± 0.4	6.1 ± 0.4	5.7 ± 0.1	5.3 ± 0.2	5.9 ± 0.5	5.6 ± 0.4	5.3 ± 0.7	6.5 ± 0.4	5.7 ± 0.4	6.1 ± 0.2	5.5 ± 0.5
21B	6.8 ± 1.2	6.9 ± 0.3	8.5 ± 0.6	7.0 ± 0.5	6.4 ± 0.5	6.7 ± 0.5	6.6 ± 0.8	6.8 ± 0.3	6.1 ± 0.4	7.1 ± 0.5	6.4 ± 0.6	6.6 ± 0.3	6.2 ± 0.3
22	7.2 ± 1.4	7.8 ± 0.9	8.9 ± 0.4	7.6 ± 0.9	6.9 ± 0.4	6.6 ± 0.5	7.4 ± 0.3	7.2 ± 0.4	6.4 ± 0.5	7.6 ± 0.5	6.7 ± 0.4	7.2 ± 0.5	6.3 ± 0.7
23	7.1 ± 1.1	7.3 ± 0.5	8.5 ± 0.5	7.5 ± 0.6	6.8 ± 0.6	6.5 ± 0.4	7.1 ± 0.5	7.2 ± 0.7	6.7 ± 0.4	7.2 ± 0.2	7.1 ± 1.3	7.0 ± 0.2	6.4 ± 0.6
24	5.6 ± 1.2	5.9 ± 0.3	7.2 ± 0.5	6.1 ± 0.4	5.4 ± 1.1	5.2 ± 0.2	5.3 ± 0.2	5.5 ± 0.3	5.2 ± 0.1	5.8 ± 0.2	5.4 ± 0.9	5.6 ± 0.2	5.0 ± 0.3
26	7.6 ± 1.4	8.3 ± 0.6	9.2 ± 0.7	8.2 ± 0.8	7.1 ± 0.5	6.8 ± 0.5	7.5 ± 0.5	7.8 ± 0.4	7.1 ± 0.9	7.8 ± 0.6	7.3 ± 0.5	7.5 ± 0.4	6.7 ± 0.6
27	7.0 ± 1.1	7.4 ± 0.5	8.4 ± 0.5	7.4 ± 0.4	6.7 ± 0.5	6.7 ± 0.2	6.8 ± 0.4	6.8 ± 0.2	6.5 ± 0.4	7.2 ± 0.3	6.5 ± 0.4	7.0 ± 0.4	6.5 ± 0.5
31	6.9 ± 1.5	7.1 ± 0.4	8.3 ± 0.5	7.0 ± 0.5	6.4 ± 0.2	6.4 ± 0.3	6.3 ± 0.2	(2)					
31A	5.4 ± 0.7							5.6 ± 0.2	5.3 ± 0.3	5.9 ± 0.3	5.2 ± 0.2	5.7 ± 0.4	5.0 ± 0.2
32	7.5 ± 1.5	7.9 ± 0.5	9.4 ± 0.5	7.7 ± 0.7	6.9 ± 0.4	6.8 ± 0.3	7.3 ± 0.6	7.5 ± 0.5	6.9 ± 0.6	7.8 ± 0.5	7.4 ± 0.5	7.3 ± 0.6	6.6 ± 0.7
33A	5.5 ± 1.2	5.7 ± 0.3	6.9 ± 0.4	6.2 ± 0.3	5.3 ± 0.4	5.1 ± 0.3	5.1 ± 0.0	5.2 ± 0.2	5.0 ± 0.2	5.5 ± 0.2	5.4 ± 0.2	5.3 ± 0.2	4.8 ± 0.7
38	7.3 ± 1.4	7.9 ± 0.4	8.7 ± 0.7	8.3 ± 1.5	7.0 ± 0.6	7.0 ± 0.9	7.0 ± 0.5	7.2 ± 0.5	6.8 ± 0.9	7.4 ± 0.5	7.2 ± 0.5	7.0 ± 0.5	6.2 ± 0.5
40	7.6 ± 1.5	7.9 ± 0.7	9.1 ± 0.3	8.4 ± 0.9	7.1 ± 0.4	6.8 ± 0.3	7.3 ± 0.2	7.8 ± 0.6	7.7 ± 0.3	8.3 ± 0.4	7.5 ± 0.4	7.1 ± 0.8	6.5 ± 0.6
42	7.1 ± 1.4	8.2 ± 1.6	8.5 ± 0.6	7.8 ± 0.5	6.9 ± 0.6	6.6 ± 0.6	7.1 ± 1.4	6.8 ± 0.5	6.6 ± 0.4	7.1 ± 0.7	7.0 ± 0.5	7.2 ± 0.8	6.0 ± 0.6
43	7.7 ± 1.4	8.4 ± 0.6	9.2 ± 0.4	8.2 ± 0.8	7.1 ± 0.6	7.1 ± 0.4	7.8 ± 1.1	7.7 ± 0.4	6.9 ± 0.5	7.8 ± 0.4	7.6 ± 0.7	7.8 ± 0.4	6.6 ± 0.7
44	6.5 ± 1.2	6.6 ± 0.6	7.9 ± 0.7	7.2 ± 0.4	6.4 ± 0.4	5.9 ± 0.7	6.4 ± 0.2	6.3 ± 0.2	5.9 ± 0.4	6.5 ± 0.4	6.1 ± 0.9	6.7 ± 0.3	5.6 ± 0.3
45	7.3 ± 1.3	7.4 ± 0.4	8.8 ± 0.4	7.7 ± 0.5	7.1 ± 0.8	6.6 ± 0.4	7.0 ± 0.3	7.2 ± 0.4	6.7 ± 0.5	7.6 ± 0.5	7.4 ± 0.7	7.4 ± 0.5	6.3 ± 0.4
46	6.6 ± 1.3	6.9 ± 0.3	8.2 ± 0.7	6.7 ± 0.4	6.1 ± 0.5	5.8 ± 0.2	6.3 ± 0.4	6.4 ± 0.3	5.9 ± 0.6	6.8 ± 0.5	6.9 ± 0.4	6.9 ± 0.4	5.8 ± 0.4
47	7.6 ± 1.3	7.9 ± 0.7	9.3 ± 0.3	7.9 ± 0.7	7.5 ± 0.8	6.9 ± 0.4	6.9 ± 0.4	7.6 ± 0.5	7.4 ± 0.5	7.8 ± 0.5	7.8 ± 0.3	7.6 ± 0.2	6.9 ± 0.4
48	7.1 ± 1.3	7.5 ± 0.5	8.7 ± 0.2	7.5 ± 0.5	6.8 ± 0.7	6.4 ± 0.4	7.0 ± 0.4	7.1 ± 0.2	6.5 ± 0.6	7.0 ± 0.4	7.1 ± 0.4	6.9 ± 0.1	6.2 ± 0.3
49	7.1 ± 1.3	7.2 ± 0.6	8.7 ± 0.4	7.6 ± 0.6	6.8 ± 0.5	6.4 ± 0.6	7.0 ± 0.5	7.2 ± 0.4	6.3 ± 0.4	7.4 ± 0.6	7.1 ± 0.6	7.0 ± 0.5	6.4 ± 0.6
50	7.9 ± 1.5	8.3 ± 0.7	9.6 ± 0.4	8.8 ± 0.8	7.9 ± 0.5	6.9 ± 0.5	7.7 ± 1.3	7.4 ± 1.1	7.0 ± 0.6	7.9 ± 0.5	8.0 ± 0.6	7.9 ± 0.5	7.3 ± 0.5
51	7.4 ± 1.4	7.6 ± 0.7	9.2 ± 0.3	7.5 ± 0.7	7.2 ± 0.4	6.7 ± 0.7	7.3 ± 0.5	7.7 ± 0.8	6.7 ± 0.5	7.4 ± 0.6	7.5 ± 0.5	7.4 ± 0.6	6.3 ± 0.6

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

TABLE C-VIII.2 QUARTERLY TLD RESULTS FOR PEACH BOTTOM ATOMIC POWER STATION, 1990

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	6.1 ± 2.3	6.9 ± 0.4	6.8 ± 0.5	6.4 ± 0.4	4.4 ± 0.4
1B	4.9 ± 0.3	5.0 ± 0.4	4.7 ± 0.1	4.9 ± 0.2	4.9 ± 0.7
1C	5.9 ± 1.3	6.0 ± 0.3	6.5 ± 0.3	6.3 ± 0.4	5.0 ± 0.4
1D	5.5 ± 0.4	5.5 ± 0.3	5.2 ± 0.1	5.7 ± 0.4	5.6 ± 0.3
1E	5.6 ± 1.5	5.6 ± 0.5	6.4 ± 0.8	5.8 ± 0.3	4.6 ± 0.6
1F	7.3 ± 3.9	6.8 ± 1.7	10.1 ± 0.8	6.9 ± 0.4	5.6 ± 0.4
1G	4.4 ± 0.6	4.2 ± 0.2	4.9 ± 0.5	4.4 ± 0.2	4.3 ± 0.5
1H	6.0 ± 0.8	5.9 ± 0.5	6.6 ± 0.4	6.1 ± 0.4	5.6 ± 0.6
1I	4.7 ± 0.2	4.6 ± 0.2	4.8 ± 0.2	4.8 ± 0.3	4.6 ± 0.3
1J	6.8 ± 0.6	6.6 ± 0.4	7.2 ± 0.5	6.9 ± 0.4	6.6 ± 0.8
1L	4.5 ± 0.8	4.2 ± 0.3	5.1 ± 0.8	4.5 ± 0.3	4.2 ± 0.2
1M	3.5 ± 0.5	3.2 ± 0.1	3.8 ± 0.1	3.5 ± 0.2	3.4 ± 0.2
2	5.7 ± 0.8	5.1 ± 0.3	6.1 ± 0.3	5.8 ± 0.3	5.8 ± 0.2
3A	4.3 ± 0.6	3.9 ± 0.2	4.6 ± 0.1	4.3 ± 0.3	4.5 ± 0.5
4K	4.2 ± 0.6	3.9 ± 0.1	4.6 ± 0.4	4.0 ± 0.2	4.3 ± 0.2
5	5.9 ± 0.7	5.6 ± 0.2	6.4 ± 0.3	5.9 ± 0.2	5.7 ± 0.3
6B	5.0 ± 0.5	4.7 ± 0.2	5.3 ± 0.4	5.1 ± 0.2	4.9 ± 0.5
1NN	6.6 ± 1.7	6.7 ± 0.5	6.0 ± 0.4	7.8 ± 0.7	6.1 ± 0.7
14	5.9 ± 0.5	5.7 ± 0.3	6.3 ± 0.1	5.9 ± 0.3	5.8 ± 0.4
12D	3.4 ± 2.0	4.5 ± 0.1	2.5 ± 1.5	4.1 ± 0.4	2.6 ± 0.1
15	6.3 0.7	5.9 ± 0.3	6.7 ± 0.6	6.4 ± 0.3	6.1 ± 0.5
16	6.1 ± 0.6	5.9 ± 0.5	6.5 ± 1.0	6.2 ± 0.6	5.8 ± 0.5
17	6.9 ± 1.0	6.5 ± 0.3	7.5 ± 0.5	7.0 ± 0.3	6.5 ± 0.6
18	6.6 ± 1.3	6.1 ± 0.2	6.9 ± 0.6	7.4 ± 0.4	6.1 ± 0.9
19	6.5 ± 2.0	6.1 ± 0.3	7.0 ± 0.7	7.6 ± 0.5	5.3 ± 0.2
20	5.0 ± 0.9	5.4 ± 0.8	4.5 ± 0.2	5.4 ± 0.1	4.9 ± 0.3
21B	6.3 ± 0.6	5.9 ± 1.1	6.6 ± 0.6	6.4 ± 0.4	6.1 ± 0.7
22	6.7 ± 1.5	6.3 ± 0.3	7.8 ± 0.6	6.7 ± 0.3	6.1 ± 0.5
23	6.4 ± 0.6	6.3 ± 0.3	6.8 ± 0.3	6.4 ± 0.2	6.1 ± 0.1
24	4.3 ± 1.4	4.7 ± 0.2	4.1 ± 0.3	5.0 ± 0.2	3.4 ± 0.6
26	6.4 ± 1.5	6.9 ± 0.2	6.1 ± 0.5	7.1 ± 0.4	5.5 ± 0.3
27	6.3 ± 0.2	6.3 ± 0.3	6.4 ± 0.3	6.3 ± 0.4	6.2 ± 0.2
31	5.5 ± 1.0	5.9 ± 0.4	5.2 ± 0.3	(2)	
31A	4.3 ± 2.1			5.1 ± 0.2	3.6 ± 0.2
32	6.8 ± 0.5	6.7 ± 0.9	7.1 ± 0.6	6.7 ± 0.5	6.5 ± 0.4
33A	4.3 ± 1.4	4.9 ± 0.3	4.0 ± 0.1	4.8 ± 0.1	3.4 ± 0.0
38	5.9 ± 1.4	6.4 ± 0.4	5.7 ± 0.4	6.5 ± 0.3	5.0 ± 0.4
40	7.1 ± 0.7	7.4 ± 0.4	7.1 ± 0.5	7.4 ± 0.1	6.7 ± 0.3
42	5.9 ± 1.9	6.3 ± 0.4	6.5 ± 0.3	6.5 ± 0.3	4.5 ± 0.2
43	6.7 ± 0.9	7.0 ± 0.5	6.1 ± 0.4	7.0 ± 0.3	6.6 ± 0.4
44	5.4 ± 1.5	5.8 ± 0.3	5.8 ± 0.2	5.8 ± 0.4	4.3 ± 0.3
45	5.9 ± 1.3	6.3 ± 0.3	5.7 ± 0.9	6.5 ± 0.4	5.1 ± 0.4
46	5.3 ± 1.2	5.6 ± 0.3	5.0 ± 0.4	6.0 ± 0.3	4.6 ± 0.3
47	6.8 ± 1.2	7.0 ± 0.6	5.9 ± 0.4	7.0 ± 0.5	7.2 ± 0.9
48	5.9 ± 1.4	6.2 ± 0.4	6.3 ± 0.3	6.3 ± 0.4	4.9 ± 0.3
49	6.2 ± 0.8	6.4 ± 0.5	5.6 ± 0.4	6.5 ± 0.4	6.3 ± 0.2
50	7.1 ± 0.6	7.3 ± 0.6	7.0 ± 0.8	7.3 ± 0.3	6.7 ± 0.8
51	6.5 ± 0.8	6.4 ± 0.2	7.1 ± 0.7	6.6 ± 0.4	6.1 ± 0.4

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

TABLE C-VIII.3 1990 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
MONTHLY	JAN 1990	6.7 ± 2.2	7.2 ± 1.9	6.7 ± 0.9
	FEB 1990	7.2 ± 2.6	8.2 ± 2.4	7.4 ± 1.3
	MAR 1990	6.6 ± 2.6	7.2 ± 1.9	6.5 ± 1.4
	APR 1990	6.1 ± 2.0	6.6 ± 1.7	7.4 ± 6.8
	MAY 1990	5.9 ± 2.1	6.2 ± 1.6	5.8 ± 1.5
	JUN 1990	6.4 ± 2.0	6.8 ± 1.5	6.1 ± 2.1
	JUL 1990	6.5 ± 2.3	6.7 ± 1.8	6.3 ± 2.1
	AUG 1990	6.0 ± 2.1	6.2 ± 1.8	5.7 ± 1.1
	SEP 1990	6.8 ± 2.4	6.9 ± 1.7	6.6 ± 1.6
	OCT 1990	6.5 ± 2.2	6.7 ± 1.8	6.1 ± 2.2
	NOV 1990	6.3 ± 2.2	6.8 ± 1.7	6.4 ± 1.7
	DEC 1990	5.9 ± 2.0	6.0 ± 1.6	5.7 ± 1.0
QUARTERLY	JAN-MAR 1990	5.4 ± 2.4	6.0 ± 1.8	5.5 ± 1.3
	APR-JUN 1990	6.1 ± 3.1	6.1 ± 1.9	5.4 ± 3.5
	JUL-SEP 1990	5.8 ± 2.5	6.1 ± 1.7	6.0 ± 2.5
	OCT-DEC 1990	5.3 ± 1.9	5.5 ± 2.0	4.9 ± 2.8

TABLE C-VIII.4 SUMMARY OF THE 1990 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)
MONTHLY	SITE	156	3.7	9.1	6.4 ± 2.3	5.3 ± 2.2
	MIDDLE RING	300	4.2	9.6	6.8 ± 2.1	6.0 ± 2.0
	OUTER RING	84	4.1	15.1	6.4 ± 2.6	6.2 ± 1.4
QUARTERLY	SITE	52	3.2	10.1	5.7 ± 2.5	5.4 ± 1.7
	MIDDLE RING	100	3.4	7.8	5.9 ± 1.9	5.3 ± 1.3
	OUTER RING	28	2.6	7.6	5.6 ± 2.6	5.7 ± 1.8

(1) THE PRE-OPERATIONAL MEAN WAS CALCULATED FROM TLD READINGS 1/07/73 TO 8/05/73. STATIONS 1M, 31 AND 32 WERE ADDED TO THE PROGRAM 7/06/73 AND STATIONS 33A AND 38 WERE NOT IN THE PRE-OPERATIONAL PROGRAM. STATIONS 1NN AND 40 THROUGH 51 WERE ADDED TO THE PROGRAM ON 07/12/80.

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

MIDDLE RING STATIONS - 3A, 4K, 5, 6B, 14, 15, 17, 22, 23, 26, 27, 31, 31A, 32, 33A, 38, 42, 43, 44, 45, 46,47, 48, 49, 50, 51.

OUTER RING STATIONS - 12D, 16, 18, 19, 20, 21B, 24.

TABLE C-IX.1 SUMMARY OF COLLECTION DATES FOR SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1990

SURFACE WATER (GROSS BETA AND GAMMA)

COLLECTION PERIOD	13A	13B	1LL	1MM
JAN 90	02/03-02/03	01/19-01/19	01/05-02/02	01/05-02/02
FEB 90	03/03-03/03	03/02-03/02	02/02-03/02	02/02-03/02
MAR 90	03/31-03/31	03/31-03/31	03/02-03/30	03/02-03/30
APR 90	05/05-05/05	04/26-04/26	03/30-05/04	03/30-05/04
MAY 90	06/02-06/02	05/18-05/18	05/04-06/01	05/04-06/01
JUN 90	06/24-06/24	06/24-06/24	06/01-06/22	06/01-06/22
JUL 90	07/28-07/28	07/20-07/20	06/22-07/27	06/22-07/27
AUG 90	09/02-09/02	08/30-08/30	07/27-08/31	07/27-08/31
SEP 90	10/06-10/06	09/21-09/21	08/31-10/05	08/31-10/05
OCT 90	11/03-11/03	10/26-10/26	10/05-11/02	10/05-11/02
NOV 90	12/02-12/02	11/28-11/28	11/02-11/30	11/02-11/30
DEC 90	01/05-01/05	12/19-12/19	11/30-01/04	11/30-01/04

SURFACE WATER (TRITIUM)

COLLECTION PERIOD	13A	13B	1LL	1MM
JAN-MAR 90	02/03-03/31		01/05-03/30	01/05-03/30
APR-JUN 90	05/05-06/24		03/30-06/22	03/30-06/22
JUL-SEP 90	07/28-10/06		06/22-10/05	06/22-10/05
OCT-DEC 90	11/03-01/05		10/05-01/04	10/05-01/04

DRINKING WATER (GROSS BETA AND GAMMA) (IODINE - 131)

COLLECTION PERIOD	4L (GROSS BETA AND GAMMA)	6I (GROSS BETA AND GAMMA)	4L (IODINE - 131)	6I (IODINE - 131)
JAN 90	01/07-02/03	01/07-02/03	01/26-02/03	01/27-02/03
FEB 90	02/03-03/03	02/03-03/03	02/24-03/03	02/23-03/03
MAR 90	03/03-03/31	03/03-03/31	03/24-03/31	03/24-03/31
APR 90	03/31-05/05	03/31-05/05	04/28-05/05	04/28-05/05
MAY 90	05/05-06/02	05/05-06/02	05/26-06/02	05/26-06/02
JUN 90	06/02-06/24	06/02-06/24	06/16-06/24	06/15-06/24
JUL 90	06/24-07/28	06/24-07/28	07/21-07/28	07/21-07/28
AUG 90	07/28-09/02	07/28-09/02	08/24-09/02	08/25-09/02
SEP 90	09/02-10/06	09/02-10/06	09/29-10/06	09/29-10/06
OCT 90	10/06-11/03	10/06-11/03	10/26-11/03	10/27-11/03
NOV 90	11/03-12/02	11/03-12/02	11/24-12/02	12/02-12/02
DEC 90	12/02-01/04	01/04-01/05	12/28-01/04	12/02-01/05

DRINKING WATER (TRITIUM)

COLLECTION PERIOD	4L	6I
JAN-MAR 90	01/07-03/31	01/07-03/31
APR-JUN 90	03/31-06/24	03/31-06/24
JUL-SEP 90	06/24-10/06	06/24-10/06
OCT-DEC 90	10/06-01/04	10/06-01/05

TABLE C-IX.1 SUMMARY OF COLLECTION DATES FOR SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1990

AIR PARTICULATES AND AIR IODINE

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

TABLE C-IX.1 SUMMARY OF COLLECTION DATES FOR SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1990

AIR PARTICULATES AND AIR IODINE

GROUP II - INTERMEDIATE DISTANCE LOACATIONS

WEEK	3A	5	14	15	17
01	12/29-01/07	12/30-01/07	12/30-01/07	12/30-01/07	12/30-01/07
02	01/07-01/13	01/07-01/13	01/07-01/13	01/07-01/13	01/07-01/13
03	01/13-01/19	01/13-01/20	01/13-01/20	01/13-01/20	01/13-01/20
04	01/19-01/26	01/20-01/27	01/20-01/27	01/20-01/27	01/20-01/27
05	01/26-02/03	01/27-02/03	01/27-02/03	01/27-02/03	01/27-02/03
06	02/03-02/10	02/03-02/10	02/03-02/10	02/03-02/10	02/03-02/10
07	02/10-02/17	02/10-02/17	02/10-02/17	02/10-02/17	02/10-02/17
08	02/17-02/24	02/17-02/23	02/17-02/23	02/17-02/23	02/17-02/23
09	02/24-03/03	02/23-03/03	02/23-03/03	02/23-03/03	02/23-03/03
10	03/03-03/10	03/03-03/10	03/03-03/10	03/03-03/10	03/03-03/10
11	03/10-03/17	03/10-03/17	03/10-03/17	03/10-03/17	03/10-03/17
12	03/17-03/24	03/17-03/24	03/17-03/24	03/17-03/24	03/17-03/24
13	03/24-03/31	03/24-03/31	03/24-03/31	03/24-03/31	03/24-03/31
14	03/31-04/07	03/31-04/07	03/31-04/07	03/31-04/07	03/31-04/07
15	04/07-04/14	04/07-04/14	04/07-04/14	04/07-04/14	04/07-04/14
16	04/14-04/21	04/14-04/21	04/14-04/21	04/14-04/21	04/14-04/21
17	04/21-04/28	04/21-04/28	04/21-04/28	04/21-04/28	04/21-04/28
18	04/28-05/05	04/28-05/05	04/28-05/05	04/28-05/05	04/28-05/05
19	05/05-05/12	05/05-05/12	05/05-05/12	05/05-05/12	05/05-05/12
20	05/12-05/20	05/12-05/19	05/12-05/19	05/12-05/19	05/12-05/19
21	05/20-05/26	05/19-05/26	05/19-05/26	05/19-05/26	05/19-05/26
22	05/26-06/02	05/26-06/02	05/26-06/02	05/26-06/02	05/26-06/02
23	06/02-06/10	06/02-06/09	06/02-06/09	06/02-06/09	06/02-06/09
24	06/10-06/16	06/09-06/15	06/09-06/15	06/09-06/15	06/09-06/15
25	06/16-06/24	06/15-06/24	06/15-06/24	06/15-06/24	06/15-06/24
26	06/24-07/01	06/24-06/30	06/24-06/30	06/24-06/30	06/24-06/30
27	07/01-07/07	06/30-07/07	06/30-07/07	06/30-07/07	06/30-07/07
28	07/07-07/15	07/07-07/15	07/07-07/15	07/07-07/15	07/07-07/15
29	07/15-07/21	07/15-07/21	07/15-07/21	07/15-07/21	07/15-07/21
30	07/21-07/28	07/21-07/28	07/21-07/28	07/21-07/28	07/21-07/28
31	07/28-08/03	07/28-08/05	07/28-08/05	07/28-08/05	07/28-08/05
32	08/03-08/11	08/05-08/11	08/05-08/11	08/05-08/11	08/05-08/11
33	08/11-08/17	08/11-08/18	08/11-08/18	08/11-08/18	08/11-08/18
34	08/17-08/24	08/18-08/25	08/18-08/25	08/18-08/25	08/18-08/25
35	08/24-09/02	08/25-09/02	08/25-09/02	08/25-09/02	08/25-09/02
36	09/02-09/07	09/02-09/08	09/02-09/08	09/02-09/08	09/02-09/08
37	09/07-09/16	09/08-09/15	09/08-09/15	09/08-09/15	09/08-09/15
38	09/16-09/21	09/15-09/22	09/15-09/22	09/15-09/22	09/15-09/22
39	09/21-09/29	09/22-09/29	09/22-09/29	09/22-09/29	09/22-09/29
40	09/29-10/06	09/29-10/06	09/29-10/06	09/29-10/06	09/29-10/06
41	10/06-10/12	10/06-10/12	10/06-10/12	10/06-10/12	10/06-10/12
42	10/12-10/19	10/12-10/21	10/12-10/19	10/12-10/21	10/12-10/19
43	10/19-10/26	10/21-10/27	10/19-10/27	10/21-10/27	10/19-10/27
44	10/26-11/03	10/27-11/03	10/27-11/03	10/27-11/03	10/27-11/03
45	11/03-11/09	11/03-11/11	11/03-11/11	11/03-11/11	11/03-11/11
46	11/09-11/16	11/11-11/17	11/11-11/17	11/11-11/17	11/11-11/17
47	11/16-11/24	11/17-11/24	11/17-11/24	11/17-11/24	11/17-11/24
48	11/24-12/02	11/24-12/02	11/24-12/02	11/24-12/02	11/24-12/02
49	12/02-12/07	12/02-12/08	12/02-12/08	12/02-12/08	12/02-12/08
50	12/07-12/14	12/08-12/16	12/08-12/16	12/08-12/16	12/08-12/16
51	12/14-12/21	12/16-12/22	12/16-12/22	12/16-12/22	12/16-12/22
52	12/21-12/28	12/22-12/29	12/22-12/29	12/22-12/29	12/22-12/29

TABLE C-IX.1 SUMMARY OF COLLECTION DATES FOR SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1990

AIR PARTICULATES AND AIR IODINE

GROUP II - INTERMEDIATE DISTANCE LOACATIONS

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

TABLE C-IX.1 SUMMARY OF COLLECTION DATES FOR SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1990

AIR PARTICULATES AND AIR IODINE

GROUP III - CONTROL LOACATIONS

WEEK	4A	6E	12D
01	12/29-01/07	12/30-01/07	01/02-01/08
02	01/07-01/13	01/07-01/13	01/08-01/16
03	01/13-01/19	01/13-01/20	01/17-01/22
04	01/19-01/26	01/20-01/27	01/22-01/29
05	01/26-02/03	01/27-02/03	01/29-02/05
06	02/03-02/10	02/03-02/10	02/05-02/12
07	02/10-02/17	02/10-02/17	02/12-02/20
08	02/17-02/24	02/17-02/23	02/20-02/26
09	02/24-03/03	02/23-03/03	02/26-03/05
10	03/03-03/10	03/03-03/10	03/05-03/12
11	03/10-03/17	03/10-03/17	03/12-03/19
12	03/17-03/24	03/17-03/24	03/19-03/26
13	03/24-03/31	03/24-03/31	03/26-04/02
14	03/31-04/07	03/31-04/07	04/02-04/09
15	04/07-04/14	04/07-04/14	04/09-04/16
16	04/14-04/21	04/14-04/21	04/16-04/23
17	04/21-04/28	04/21-04/28	04/23-04/30
18	04/28-05/05	04/28-05/05	04/30-05/07
19	05/05-05/12	05/05-05/12	05/07-05/14
20	05/12-05/20	05/12-05/19	05/14-05/21
21	05/20-05/26	05/19-05/26	05/21-05/29
22	05/26-06/02	05/26-06/02	05/29-06/04
23	06/02-06/10	06/02-06/09	06/04-06/11
24	06/10-06/16	06/09-06/15	06/11-06/19
25	06/16-06/24	06/15-06/24	06/19-06/25
26	06/24-07/01	06/24-06/30	06/25-07/02
27	07/01-07/07	06/30-07/07	07/02-07/09
28	07/07-07/15	07/07-07/15	07/09-07/16
29	07/15-07/21	07/15-07/21	07/16-07/23
30	07/21-07/28	07/21-07/28	07/23-07/30
31	07/28-08/03	07/28-08/05	07/30-08/06
32	08/03-08/11	08/05-08/11	08/06-08/13
33	08/11-08/17	08/11-08/18	08/13-08/20
34	08/17-08/24	08/18-08/25	08/20-08/27
35	08/24-09/02	08/25-09/02	08/27-09/04
36	09/02-09/07	09/02-09/08	09/04-09/10
37	09/07-09/16	09/08-09/15	09/10-09/17
38	09/16-09/21	09/15-09/22	09/17-09/24
39	09/21-09/29	09/22-09/29	09/24-10/01
40	09/29-10/06	09/29-10/06	10/01-10/09
41	10/06-10/12	10/06-10/12	10/09-10/15
42	10/12-10/19	10/12-10/21	10/15-10/22
43	10/19-10/26	10/21-10/27	10/22-10/29
44	10/26-11/03	10/27-11/03	10/29-11/05
45	11/03-11/09	11/03-11/11	11/05-11/13
46	11/09-11/16	11/11-11/17	11/13-11/19
47	11/16-11/24	11/17-11/24	11/19-11/26
48	11/24-12/02	11/24-12/02	11/26-12/03
49	12/02-12/07	12/02-12/08	12/03-12/10
50	12/07-12/14	12/08-12/16	12/10-12/17
51	12/14-12/21	12/16-12/22	12/17-12/24
52	12/21-12/28	12/22-12/29	12/24-12/31

TABLE C-IX.1 SUMMARY OF COLLECTION DATES FOR SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1990

TLD - MONTHLY

STATION CODE	JAN 1990	FEB 1990	MAR 1990	APR 1990	MAY 1990	JUN 1990	JUL 1990	AUG 1990	SEP 1990	OCT 1990	NOV 1990	DEC 1990
1A	01/07-02/03	02/03-03/03	03/03-03/31	03/31-05/05	05/05-06/02	06/02-06/24	06/24-07/28	07/28-09/02	09/02-10/06	10/06-11/03	11/03-12/02	12/02-01/04
1B	01/07-02/03	02/03-03/03	03/03-03/31	03/31-05/05	05/05-06/02	06/02-06/24	06/24-07/28	07/28-09/02	09/02-10/06	10/06-11/03	11/03-12/02	12/02-01/04
1C	01/07-02/03	02/03-03/03	03/03-03/31	03/31-05/05	05/05-06/02	06/02-06/24	06/24-07/28	07/28-09/02	09/02-10/06	10/06-11/03	11/03-12/02	12/02-01/04
1D	01/07-02/03	02/03-03/03	03/03-03/31	03/31-05/05	05/05-06/02	06/02-06/24	06/24-07/28	07/28-09/02	09/02-10/06	10/06-11/03	11/03-12/02	12/02-01/04
1E	01/07-02/03	02/03-03/03	03/03-03/31	03/31-05/05	05/05-06/02	06/02-06/24	06/24-07/28	07/28-09/02	09/02-10/06	10/06-11/03	11/03-12/02	12/02-01/04
1F	01/07-02/03	02/03-03/03	03/03-03/31	03/31-05/05	05/05-06/02	06/02-06/24	06/24-07/28	07/28-09/02	09/02-10/06	10/06-11/03	11/03-12/02	12/02-01/04
1G	01/07-02/03	02/03-03/03	03/03-03/31	03/31-05/05	05/05-06/02	06/02-06/24	06/24-07/28	07/28-09/02	09/02-10/06	10/06-11/03	11/03-12/02	12/02-01/04
1H	01/07-02/03	02/03-03/03	03/03-03/31	03/31-05/05	05/05-06/02	06/02-06/24	06/24-07/28	07/28-09/02	09/02-10/06	10/06-11/03	11/03-12/02	12/02-01/04
1I	01/07-02/03	02/03-03/03	03/03-03/31	03/31-05/05	05/05-06/02	06/02-06/24	06/24-07/28	07/28-09/02	09/02-10/06	10/06-11/03	11/03-12/02	12/02-01/04
1J	01/07-02/03	02/03-03/03	03/03-03/31	03/31-05/05	05/05-06/02	06/02-06/24	06/24-07/28	07/28-09/02	09/02-10/06	10/06-11/03	11/03-12/02	12/02-01/04
1L	01/07-02/03	02/03-03/03	03/03-03/31	03/31-05/05	05/05-06/02	06/02-06/24	06/24-07/28	07/28-09/02	09/02-10/06	10/06-11/03	11/03-12/02	12/02-01/04
1M	01/07-02/03	02/03-03/03	03/03-03/31	03/31-05/05	05/05-06/02	06/02-06/24	06/24-07/28	07/28-09/02	09/02-10/06	10/06-11/03	11/03-12/02	12/02-01/04
2	01/07-02/03	02/03-03/03	03/03-03/31	03/31-05/05	05/05-06/02	06/02-06/24	06/24-07/28	07/28-09/02	09/02-10/06	10/06-11/03	11/03-12/02	12/02-01/04
3A	01/07-02/03	02/03-03/03	03/03-03/31	03/31-05/05	05/05-06/02	06/02-06/24	06/24-07/28	07/28-09/02	09/02-10/06	10/06-11/03	11/03-12/02	12/02-01/04
4K	01/07-02/03	02/03-03/03	03/03-03/31	03/31-05/05	05/05-06/02	06/02-06/24	06/24-07/28	07/28-09/02	09/02-10/06	10/06-11/03	11/03-12/02	12/02-01/04
5	01/07-02/03	02/03-03/03	03/03-03/31	03/31-05/05	05/05-06/02	06/02-06/24	06/24-07/28	07/28-09/02	09/02-10/06	10/06-11/03	11/03-12/02	12/02-01/05
6B	01/07-02/03	02/03-03/03	03/03-03/31	03/31-05/05	05/05-06/02	06/02-06/24	06/24-07/28	07/28-09/02	09/02-10/06	10/06-11/03	11/03-12/02	12/02-01/05
1NN	01/07-02/03	02/03-03/03	03/03-03/31	03/31-05/05	05/05-06/02	06/02-06/24	06/24-07/28	07/28-09/02	09/02-10/06	10/06-11/03	11/03-12/02	12/02-01/04
14	01/07-02/03	02/03-03/03	03/03-03/31	03/31-05/05	05/05-06/02	06/02-0[illegible]	06/24-07/28	07/28-09/02	09/02-10/06	10/06-11/03	11/03-12/02	12/02-01/05
12D	01/08-02/05	02/05-03/05	03/05-04/09	04/09-05/07	05/07-06/04	06/0[illegible]	07/02-08/06	08/06-09/04	09/04-10/01	10/01-11/05	11/05-12/10	12/10-01/07
15	01/07-02/03	02/03-03/03	03/03-03/31	03/31-05/05	05/05-06/02	06/0[illegible]	[illegible]24-07/28	07/28-09/02	09/02-10/06	10/06-11/03	11/03-12/02	12/02-01/05
16	01/07-02/03	02/03-03/03	03/03-03/31	03/31-05/05	05/05-06/02	06/02[illegible]	[illegible]4-07/28	07/28-09/02	09/02-10/06	10/06-11/03	11/03-12/02	12/02-01/05
17	01/07-02/03	02/03-03/03	03/03-03/31	03/31-05/05	05/05-06/02	06/02-06/24	06/24-07/28	07/28-09/02	09/02-10/06	10/06-11/03	11/03-12/02	12/02-01/05
18	01/07-02/03	02/03-03/03	03/03-03/31	03/31-05/05	05/05-06/02	06/02-06/24	06/24-07/28	07/28-09/02	09/02-10/06	10/06-11/03	11/03-12/02	12/02-01/05
19	01/07-02/03	02/03-03/03	03/03-03/31	03/31-05/05	05/05-06/02	06/02-06/24	06/24-07/28	07/28-09/02	09/02-10/06	10/06-11/03	11/03-12/02	12/02-01/05
20	01/07-02/03	02/03-03/03	03/03-03/31	03/31-05/05	05/05-06/02	06/02-06/24	06/24-07/28	07/28-09/02	09/02-10/06	10/06-11/03	11/03-12/02	12/02-01/04
21B	01/07-02/03	02/03-03/03	03/03-03/31	03/31-05/05	05/05-06/02	06/02-06/24	06/24-07/28	07/28-09/02	09/02-10/06	10/06-11/03	11/03-12/02	12/02-01/05
22	01/07-02/03	02/03-03,03	03/03-03/31	03/31-05/05	05/05-06/02	06/02-06/24	06/24-07/28	07/28-09/02	09/02-10/06	10/06-11/03	11/03-12/02	12/02-01/05
23	01/07-02/03	02/03-03/03	03/03-03/31	03/31-05/05	05/05-06/02	06/02-06/24	06/24-07/28	07/28-09/02	09/02-10/06	10/06-11/03	11/03-12/02	12/02-01/04
24	01/07-02/03	02/03-03/03	03/03-03/31	03/31-05/05	05/05-06/02	06/02-06/24	06/24-07/28	07/28-09/02	09/02-10/06	10/06-11/03	11/03-12/02	12/02-01/05
26	01/07-02/03	02/03-03/03	03/03-03/31	03/31-05/05	05/05-06/02	06/02-06/24	06/24-07/28	07/28-09/02	09/02-10/06	10/06-11/03	11/03-12/02	12/02-01/05
27	01/07-02/03	02/03-03/03	03/03-03/31	03/31-05/05	05/05-06/02	06/02-06/24	06/24-07/28	07/28-09/02	09/02-10/06	10/06-11/03	11/03-12/02	12/02-01/04
31	01/07-02/03	02/03-03/03	03/03-03/31	03/31-05/05	05/05-06/02	06/02-06/24						
31A							06/24-07/28	07/28-09/02	09/02-10/06	10/06-11/03	11/03-12/02	12/02-01/05
32	01/07-02/03	02/03-03/03	03/03-03/31	03/31-05/05	05/05-06/02	06/02-06/24	06/24-07/28	07/28-09/02	09/02-10/06	10/06-11/03	11/03-12/02	12/02-01/05
33A	01/07-02/03	02/03-03/03	03/03-03/31	03/31-05/05	05/05-06/02	06/02-06/24	06/24-07/28	07/28-09/02	09/02-10,06	10/06-11/03	11/03-12/02	12/02-01/05
38	01/07-02/03	02/03-03/03	03/03-03/31	03/31-05/05	05/05-06/02	06/02-06/24	06/24-07/28	07/28-09/02	09/02-10/06	10/06-11/03	11/03-12/02	12/02-01/05
40	01/07-02/03	02/03-03/03	03/03-03/31	03/31-05/05	05/05-06/02	06/02-06/24	06/24-07/28	07/28-09/02	09/02-10/06	10/06-11/03	11/03-12/02	12/02-01/04
42	01/07-02/03	02/03-03/03	03/03-03/31	03/31-05/05	05/05-06/02	06/02-06/24	06/24-07/28	07/28-09/02	09/02-10/06	10/06-11/03	11/03-12/02	12/02-01/05
43	01/07-02/03	02/03-03/03	03/03-03/31	03/31-05/05	05/05-06/02	06/02-06/24	06/24-07/28	07/28-09/02	09/02-10/06	10/06-11/03	11/03-12/02	12/02-01/05
44	01/07-02/03	02/03-03/03	03/03-03/31	03/31-05/05	05/05-06/02	06/02-06/24	06/24-07/28	07/28-09/02	09/02-10/06	10/06-11/03	11/03-12/02	12/02-01/05
45	01/07-02/03	02/03-03/03	03/03-03/31	03/31-05/05	05/05-06/02	06/02-06/24	06/24-07/28	07/28-09/02	09/02-10/06	10/06-11/03	11/03-12/02	12/02-01/05
46	01/07-02/03	02/03-03/03	03/03-03/31	03/31-05/05	05/05-06/02	06/02-06/24	06/24-07/28	07/28-09/02	09/02-10/06	10/06-11/03	11/03-12/02	12/02-01/04
47	01/07-02/03	02/03-03/03	03/03-03/31	03/31-05/05	05/05-06/02	06/02-06/24	06/24-07/28	07/28-09/02	09/02-10/06	10/06-11/03	11/03-12/02	12/02-01/04
48	01/07-02/03	02/03-03/03	03/03-03/31	03/31-05/05	05/05-06/02	06/02-06/24	06/24-07/28	07/28-09/02	09/02-10/06	10/06-11/03	11/03-12/02	12/02-01/04
49	01/07-02/03	02/03-03/03	03/03-03/31	03/31-05/05	05/05-06/02	06/02-06/24	06/24-07/28	07/28-09/02	09/02-10/06	10/06-11/03	11/03-12/02	12/02-01/04
50	01/07-02/03	02/03-03/03	03/03-03/31	03/31-05/05	05/05-06/02	06/02-06/24	06/24-07/28	07/28-09/02	09/02-10/06	10/06-11/03	11/03-12/02	12/02-01/04
51	01/07-02/03	02/03-03/03	03/03-03/31	03/31-05/05	05/05-06/02	06/02-06/24	06/24-07/28	07/28-09/02	09/02-10/06	10/06-11/03	11/03-12/02	12/02-01/05

TABLE C-IX.1 SUMMARY OF COLLECTION DATES FOR SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1990

TLD - QUARTERLY

STATION CODE	JAN-MAR 1990	APR-JUN 1990	JUL-SEP 1990	OCT-DEC 1990
1A	01/07-03/31	03/31-06/24	06/24-10/06	10/06-01/04
1B	01/07-03/31	03/31-06/24	06/24-10/06	10/06-01/04
1C	01/07-03/31	03/31-06/24	06/24-10/06	10/06-01/04
1D	01/07-03/31	03/31-06/24	06/24-10/06	10/06-01/04
1E	01/07-03/31	03/31-06/24	06/24-10/06	10/06-01/04
1F	01/07-03/31	03/31-06/24	06/24-10/06	10/06-01/04
1G	01/07-03/31	03/31-06/24	06/24-10/06	10/06-01/04
1H	01/07-03/31	03/31-06/24	06/24-10/06	10/06-01/04
1I	01/07-03/31	03/31-06/24	06/24-10/06	10/06-01/04
1J	01/07-03/31	03/31-06/24	06/24-10/06	10/06-01/04
1L	01/07-03/31	03/31-06/24	06/24-10/06	10/06-01/04
1M	01/07-03/31	03/31-06/24	06/24-10/06	10/06-01/04
2	01/07-03/31	03/31-06/24	06/24-10/06	10/06-01/04
3A	01/07-03/31	03/31-06/24	06/24-10/06	10/06-01/04
4K	01/07-03/31	03/31-06/24	06/24-10/06	10/06-01/04
5	01/07-03/31	03/31-06/24	06/24-10/06	10/06-01/05
6B	01/07-03/31	03/31-06/24	06/24-10/06	10/06-01/05
1NN	01/07-03/31	03/31-06/24	06/24-10/06	10/06-01/04
14	01/07-03/31	03/31-06/24	06/24-10/06	10/06-01/05
12D	01/08-04/09	04/09-07/02	07/02-10/01	10/01-01/07
15	01/07-03/31	03/31-06/24	06/24-10/06	10/06-01/05
16	01/07-03/31	03/31-06/24	06/24-10/06	10/06-01/05
17	01/07-03/31	03/31-06/24	06/24-10/06	10/06-01/05
18	01/07-03/31	03/31-06/24	06/24-10/06	10/06-01/05
19	01/07-03/31	03/31-06/24	06/24-10/06	10/06-01/05
20	01/07-03/31	03/31-06/24	06/24-10/06	10/06-01/04
21B	01/07-03/31	03/31-06/24	06/24-10/06	10/06-01/05
22	01/07-03/31	03/31-06/24	06/24-10/06	10/06-01/05
23	01/07-03/31	03/31-06/24	06/24-10/06	10/06-01/04
24	01/07-03/31	03/31-06/24	06/24-10/06	10/06-01/05
26	01/07-03/31	03/31-06/24	06/24-10/06	10/06-01/05
27	01/07-03/31	03/31-06/24	06/24-10/06	10/06-01/04
31	01/07-03/31	03/31-06/24		
31A			06/24-10/06	10/06-01/05
32	01/07-03/31	03/31-06/24	06/24-10/06	10/06-01/05
33A	01/07-03/31	03/31-06/24	06/24-10/06	10/06-01/05
38	01/07-03/31	03/31-06/24	06/24-10/06	10/06-01/05
40	01/07-03/31	03/31-06/24	06/24-10/06	10/06-01/04
42	01/07-03/31	03/31-06/24	06/24-10/06	10/06-01/05
43	01/07-03/31	03/31-06/24	06/24-10/06	10/06-01/05
44	01/07-03/31	03/31-06/24	06/24-10/06	10/06-01/05
45	01/07-03/31	03/31-06/24	06/24-10/06	10/06-01/05
46	01/07-03/31	03/31-06/24	06/24-10/06	10/06-01/04
47	01/07-03/31	03/31-06/24	06/24-10/06	10/06-01/04
48	01/07-03/31	03/31-06/24	06/24-10/06	10/06-01/04
49	01/07-03/31	03/31-06/24	06/24-10/06	10/06-01/04
50	01/07-03/31	03/31-06/24	06/24-10/06	10/06-01/04
51	01/07-03/31	03/31-06/24	06/24-10/06	10/06-01/05

FIGURE C-1

MONTHLY INSOLUBLE GROSS BETA CONCENTRATIONS IN SURFACE WATER SAMPLES COLLECTED IN THE VICINITY OF PBAPS, 1990

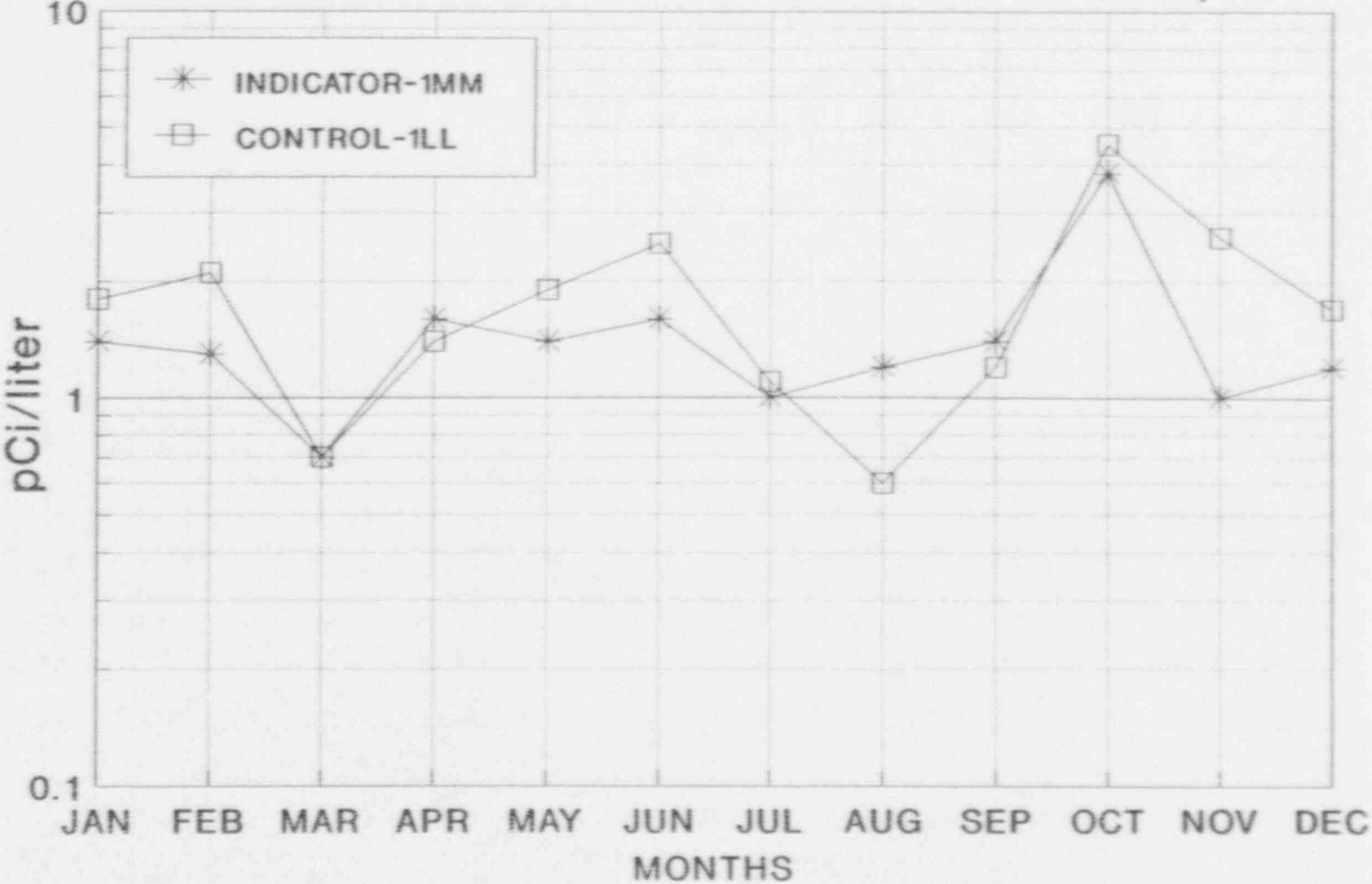


FIGURE C-2

MONTHLY SOLUBLE GROSS BETA CONCENTRATIONS IN SURFACE WATER SAMPLES COLLECTED IN THE VICINITY OF PBAPS, 1990

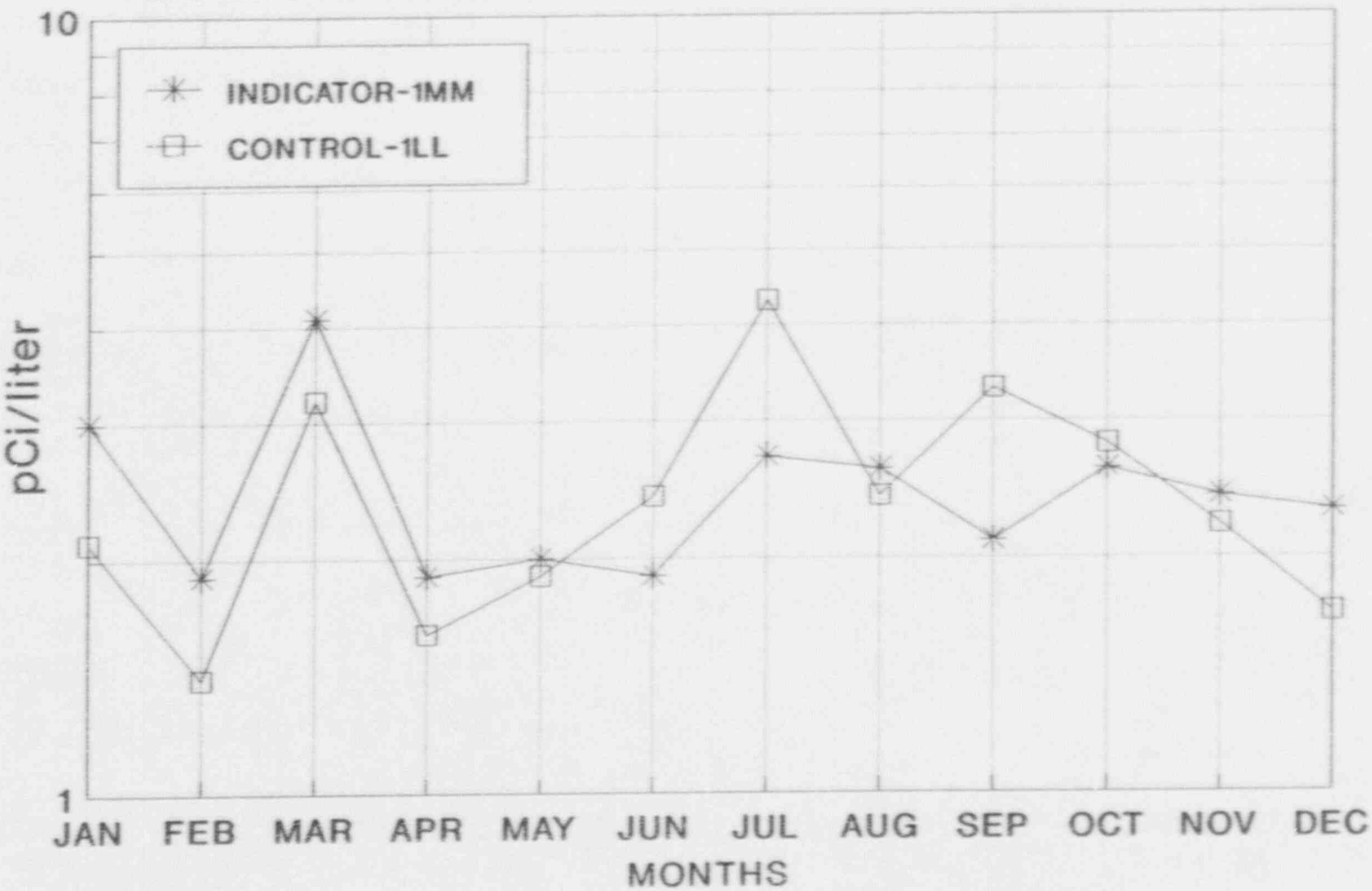


FIGURE C-3

MONTHLY INSOLUBLE GROSS BETA CONCENTRATIONS IN DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF PBAPS, 1990

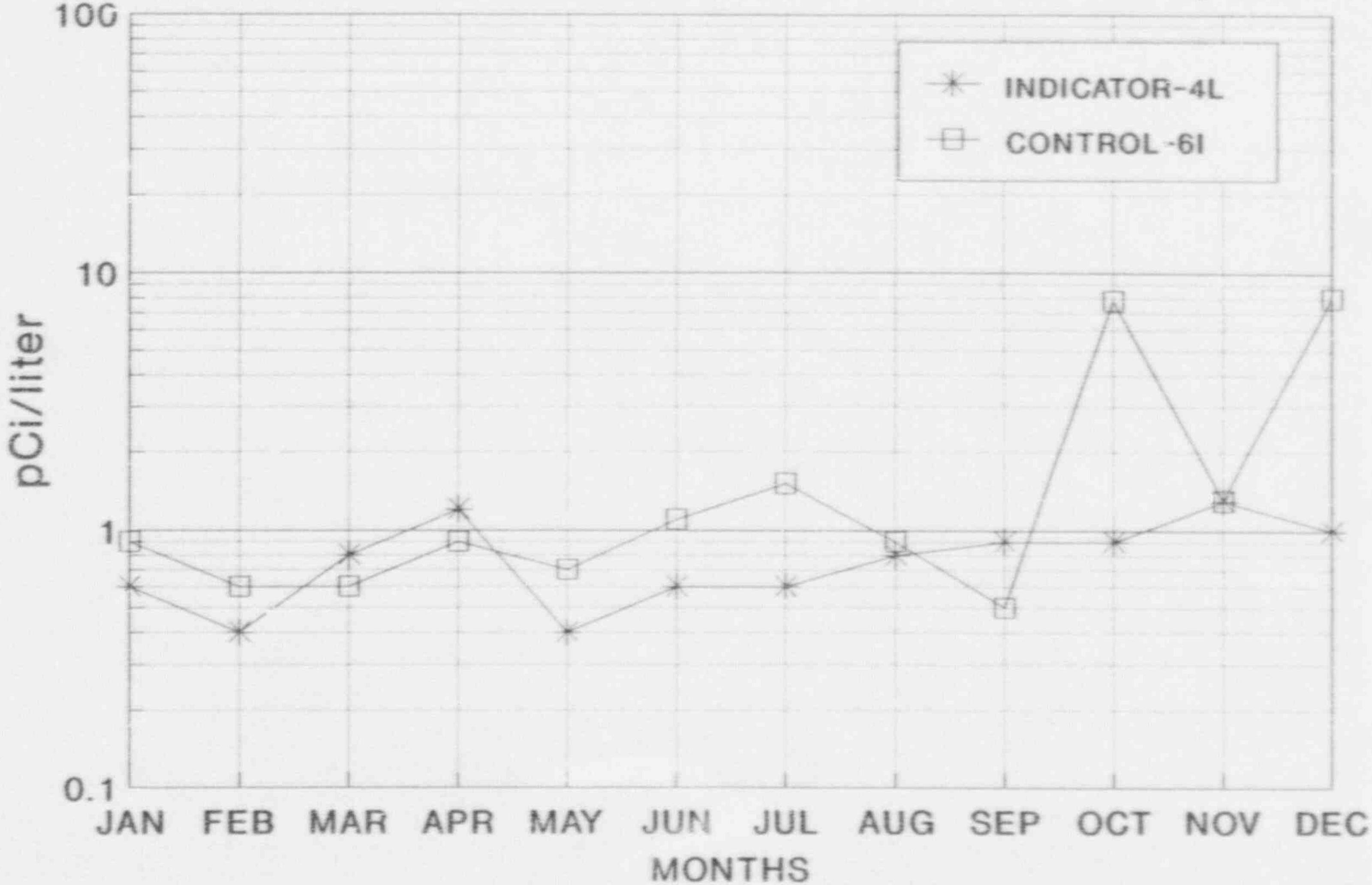


FIGURE C-4

MONTHLY SOLUBLE GROSS BETA CONCENTRATIONS IN DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF PBAPS, 1990

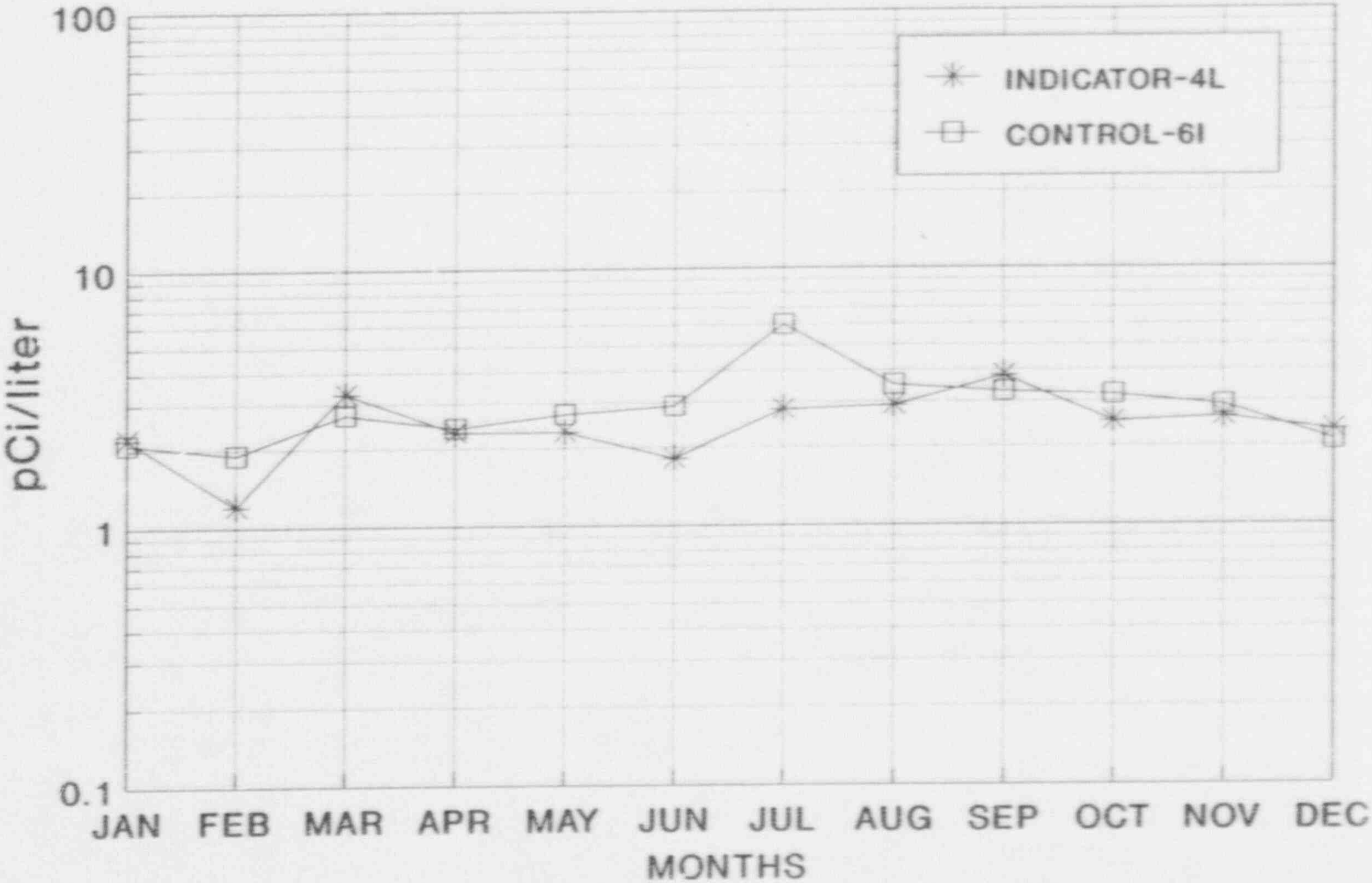


FIGURE C-5

MEAN ANNUAL CS-137 CONCENTRATIONS IN FISH SAMPLES COLLECTED IN THE VINCINITY OF PBAPS, 1971 - 1990

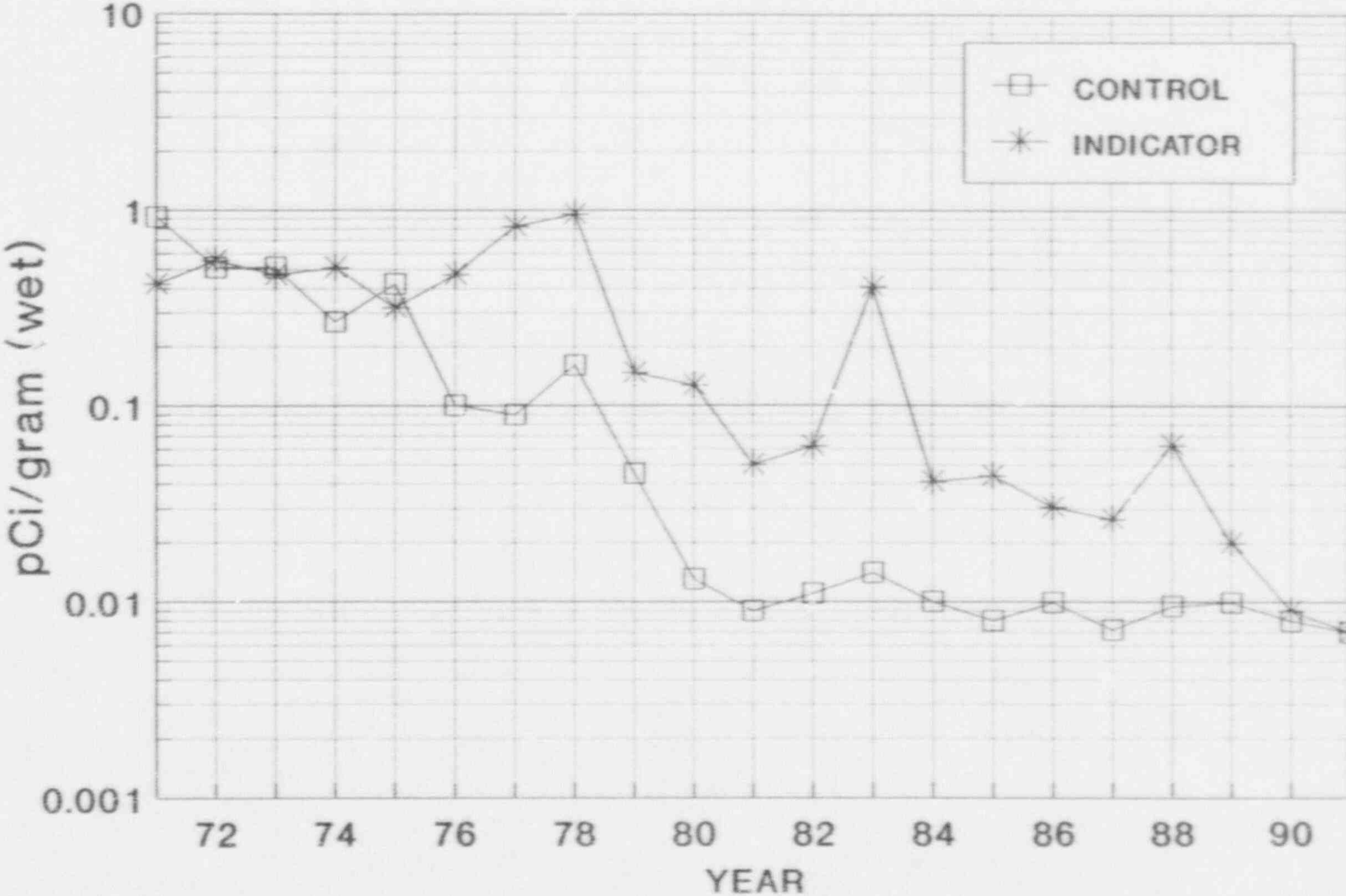


FIGURE C-6

MEAN SEMI-ANNUAL CS-137 CONCENTRATIONS IN SEDIMENT SAMPLES COLLECTED IN THE VICINITY OF PBAPS, 1971 - 1990

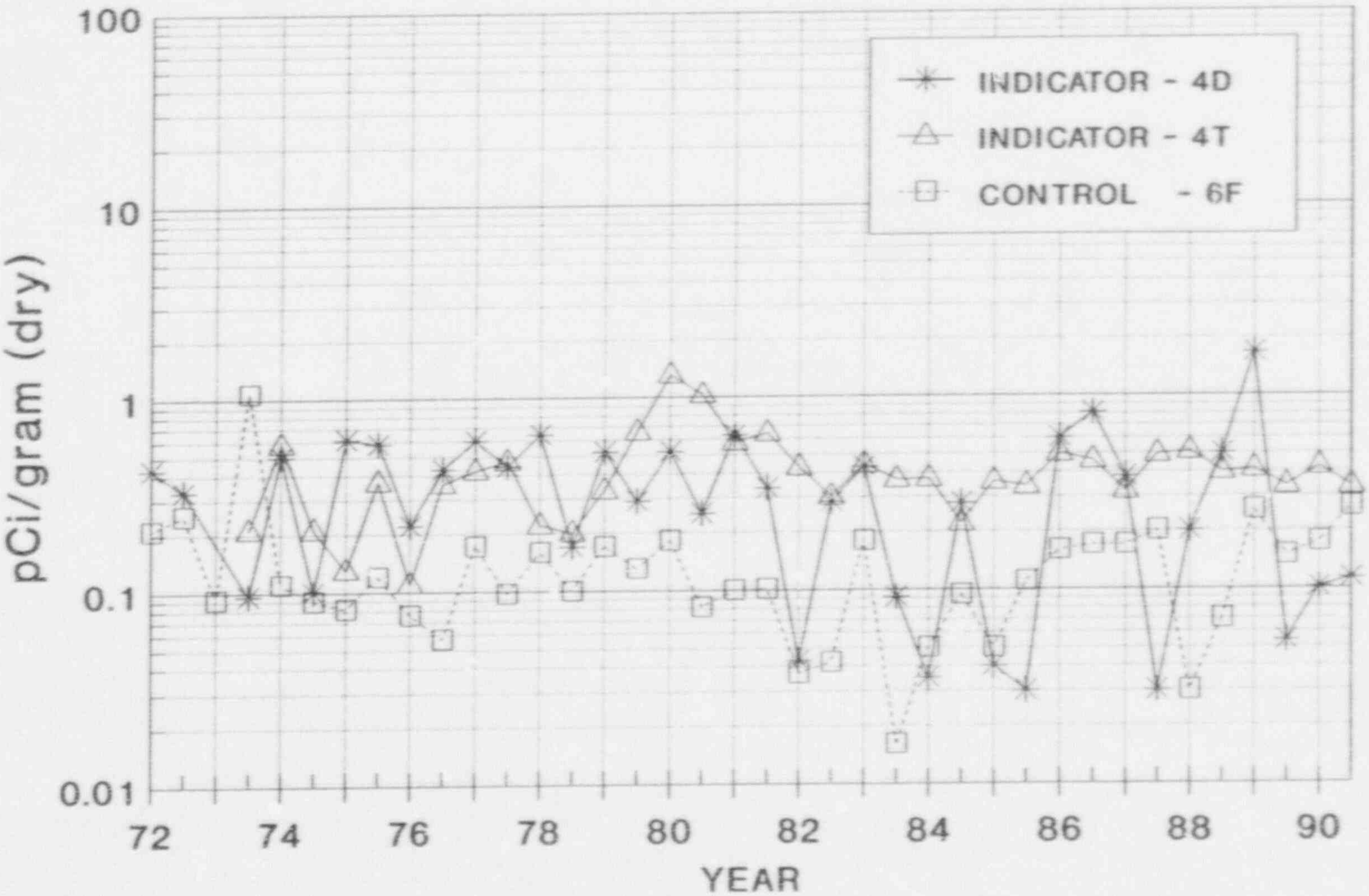


FIGURE C-7

MEAN WEEKLY GROSS BETA CONCENTRATIONS IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF PBAPS, 1990

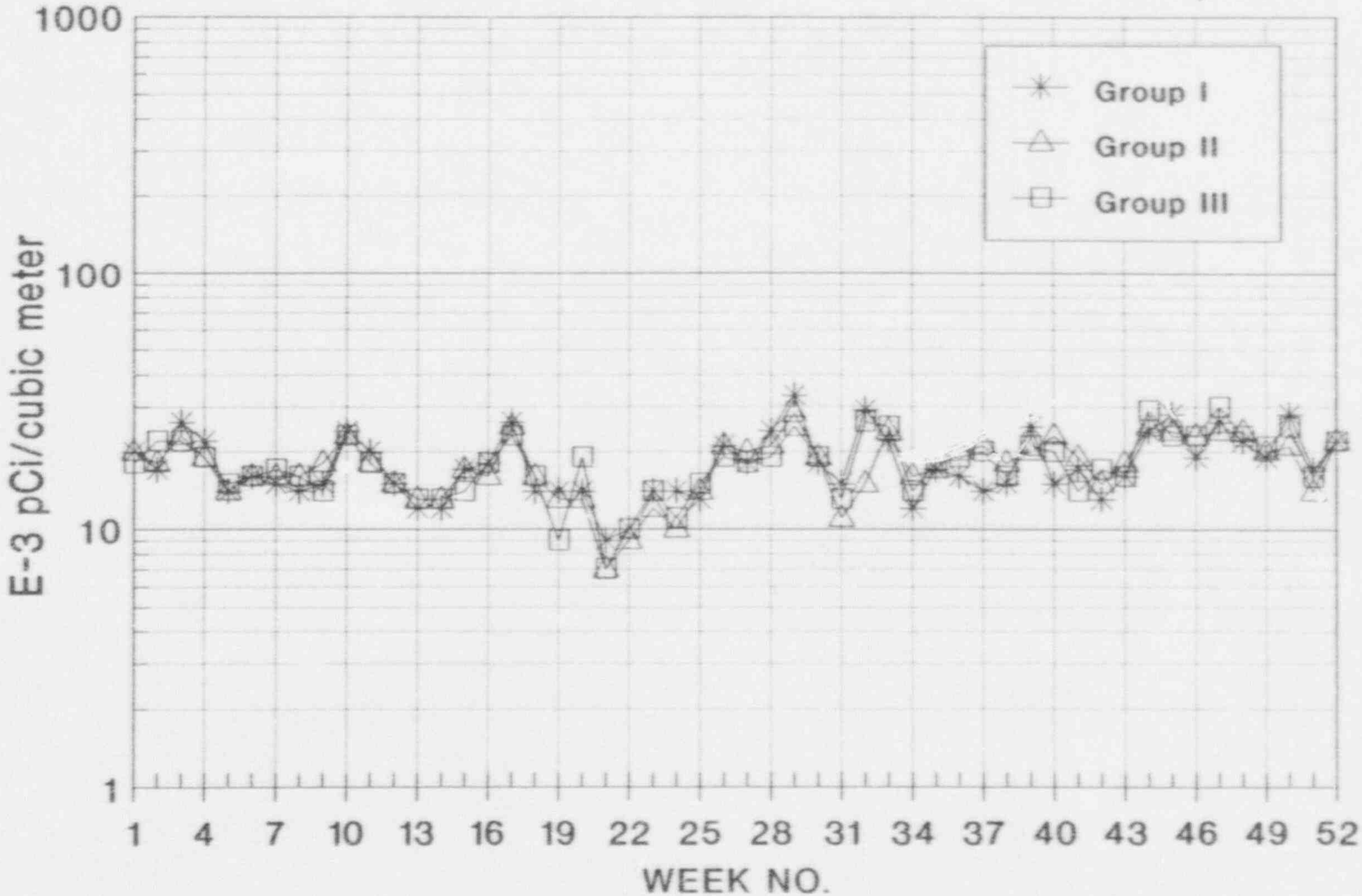
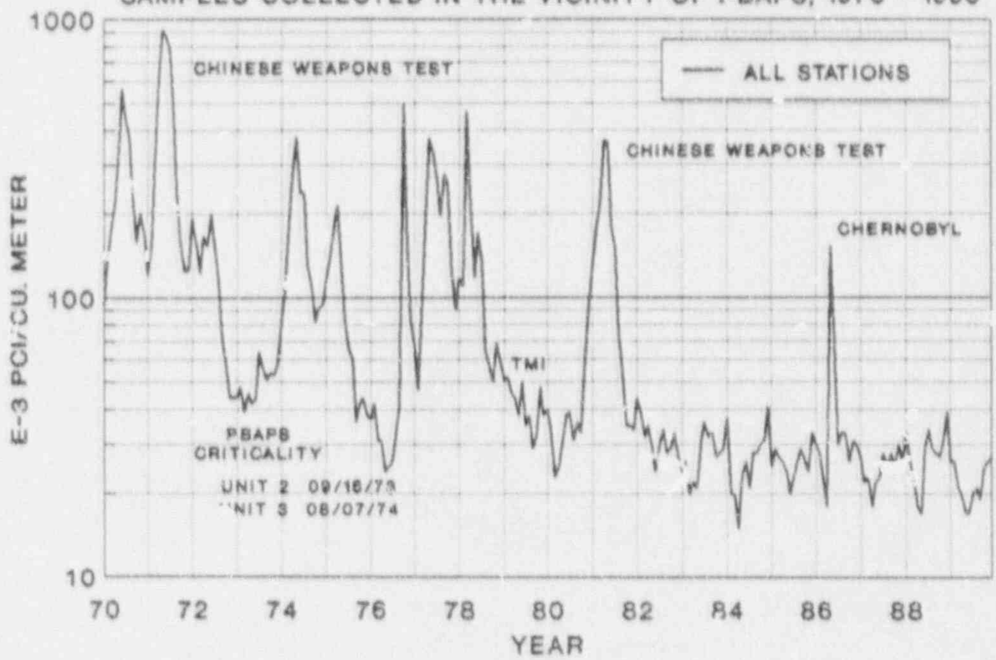


FIGURE C-8

MEAN MONTHLY GROSS BETA CONCENTRATIONS IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF PBAPS, 1970 - 1990



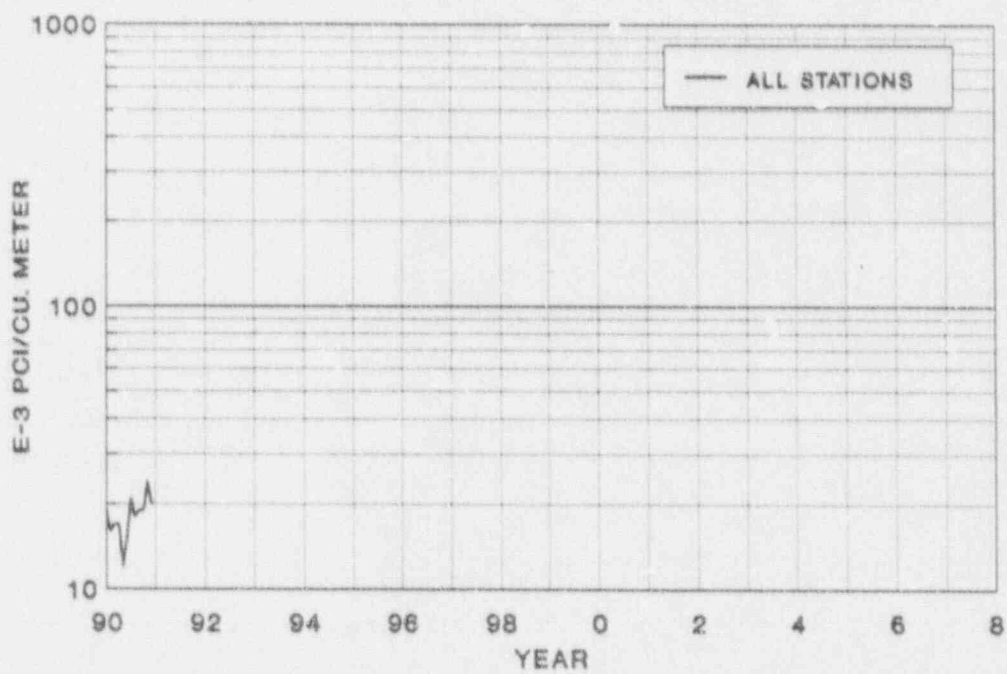


FIGURE C-9
MEAN ANNUAL CS-137 CONCENTRATIONS IN MILK SAMPLES COLLECTED IN THE VICINITY OF PBAPS, 1971 - 1990

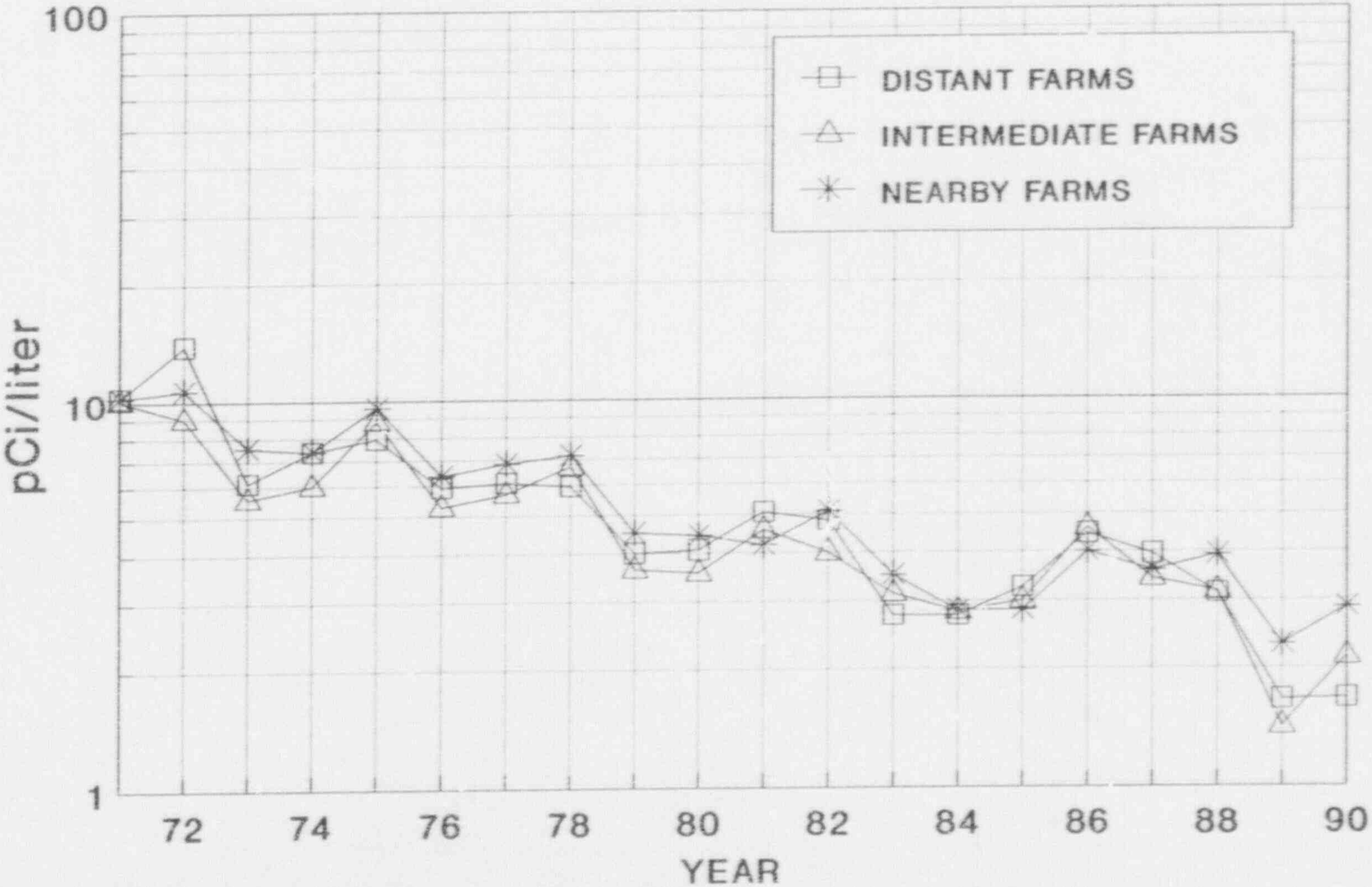


FIGURE C-10
MEAN MONTHLY AMBIENT GAMMA RADIATION (TLD)
LEVELS IN THE VICINITY OF PBAPS, 1990

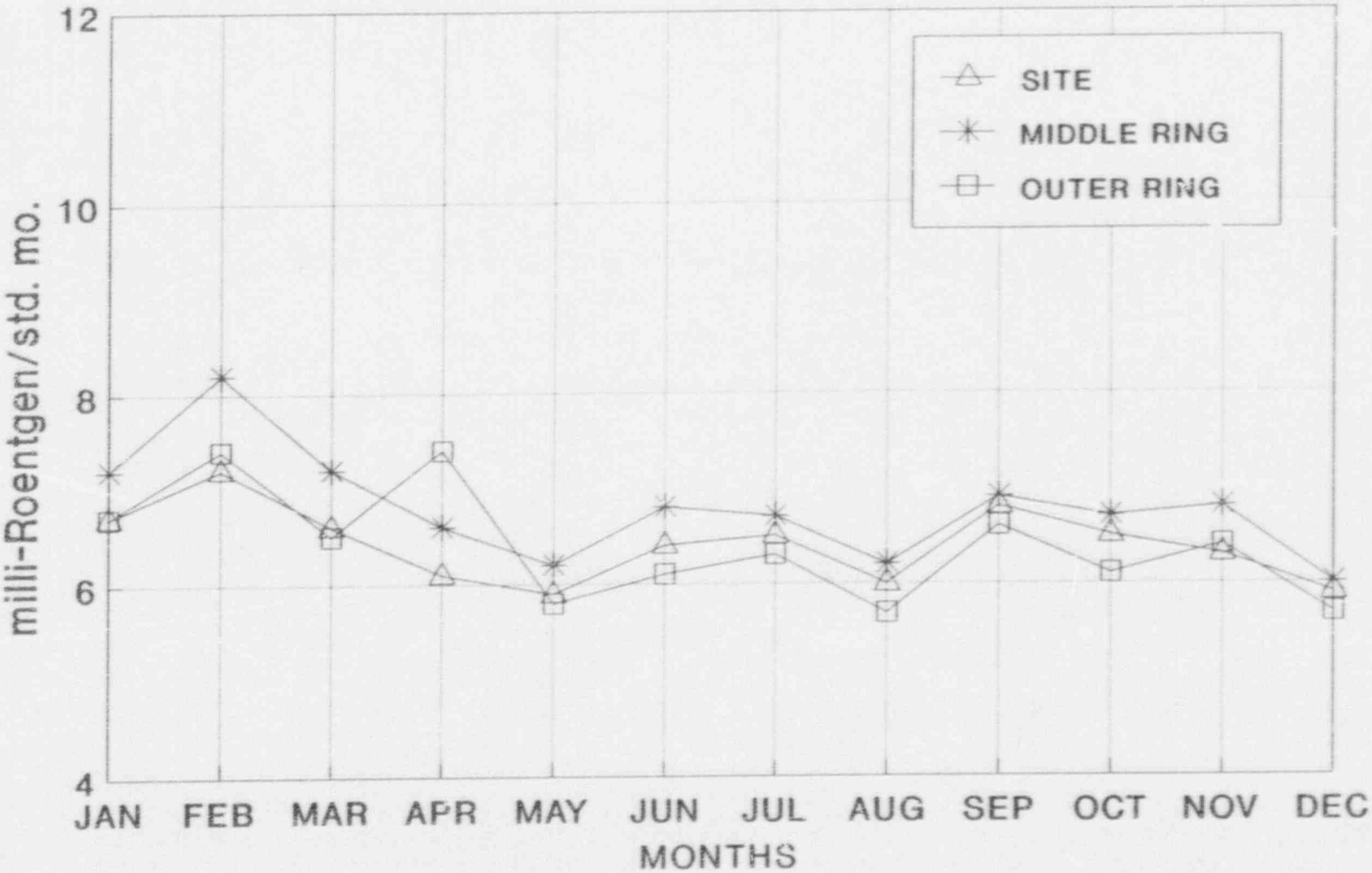
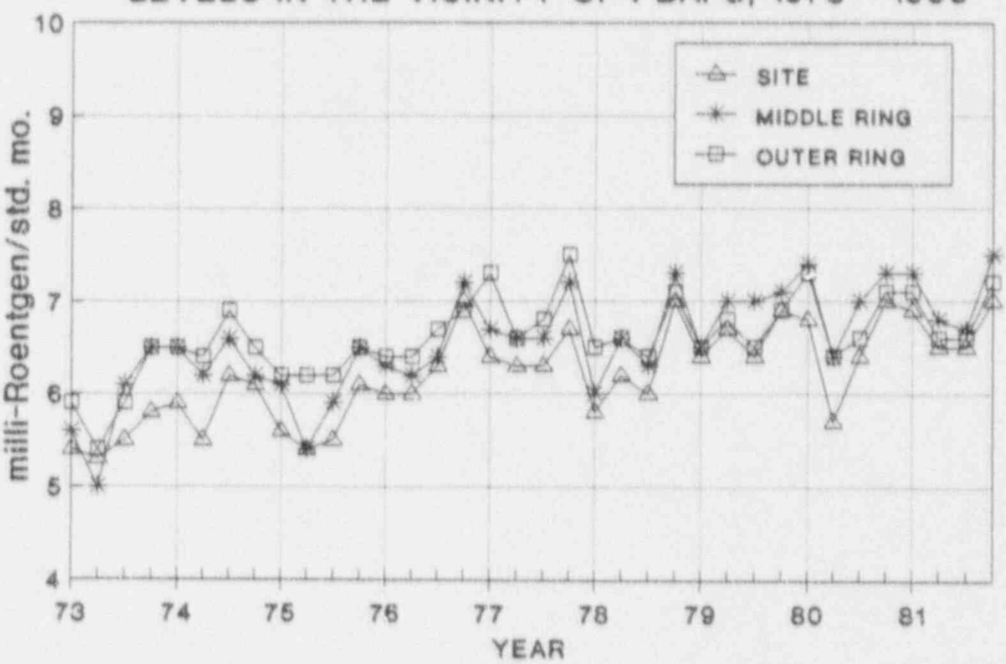
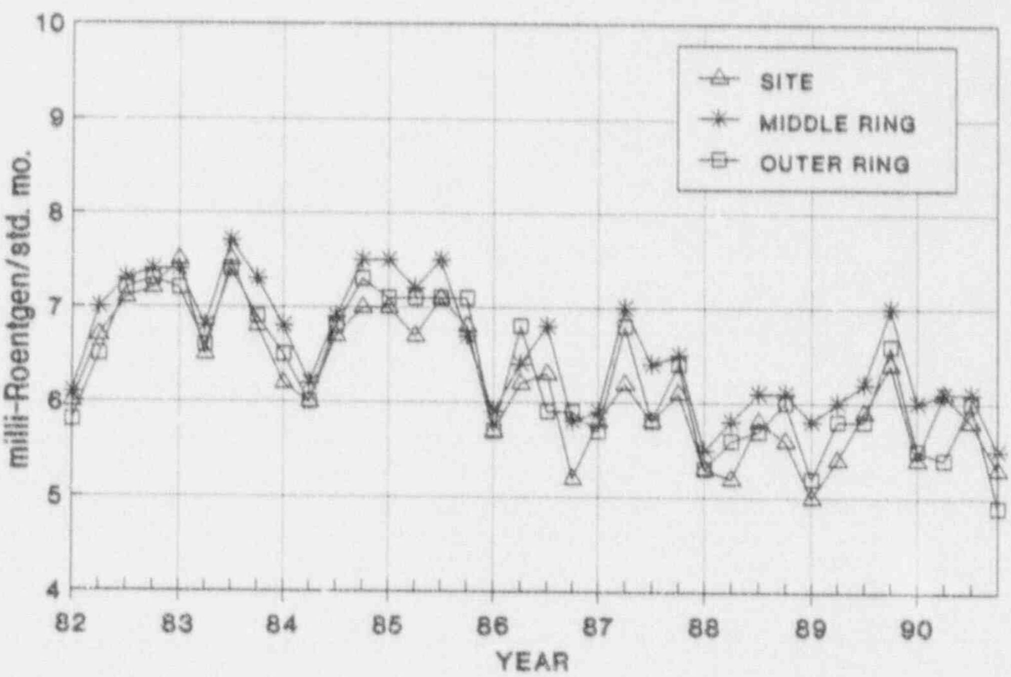


FIGURE C-11
MEAN QUARTERLY AMBIENT GAMMA RADIATION (TLD)
LEVELS IN THE VICINITY OF PBAPS, 1973 - 1990



PBAPS
CRITICALITY

UNIT 2 09/16/73
UNIT 3 08/07/74



DATA TABLES AND FIGURES

COMPARISON LABORATORY

APPENDIX D: DATA TABLES AND FIGURES - COMPARISON LABORATORY

TABLES

FIGURES

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, Teledyne Isotopes (TI) and the quality control laboratory, Clean Harbors (CH). Comparison of the results for most media were within expected ranges, though occasional differences were seen:

Clean Harbors results of gross beta insoluble in surface and drinking water samples (Table D-I.2) were generally lower than the results from Teledyne Isotopes (Table C-I.2, Appendix C). The differences were probably due to differences in the laboratory's respective analytical procedures. CH ashes the sample prior to counting whereas TI does no ashing prior to counting.

CH had some difficulty meeting the MDL values required for La-140 in water samples.

Gross beta results for air particulate samples were similar for both laboratories (Figures D-1 and D-2).

TABLE D-I.1 CONCENTRATIONS OF GROSS BETA INSOLUBLE IN SURFACE AND DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1990

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	1LL	1MM	4L	6I
FEB 90	0.9 ± 0.1	0.4 ± 0.1	0.4 ± 0.1	0.6 ± 0.1
MAY 90	3.0 ± 0.3	2.3 ± 0.3	0.7 ± 0.2	1.2 ± 0.2
AUG 90	0.5 ± 0.1	1.0 ± 0.2	0.4 ± 0.1	1.1 ± 0.2
OCT 90	3.0 ± 0.3	2.7 ± 0.3	0.9 ± 0.2	5.7 ± 0.5
MEAN	1.9 ± 2.7	1.6 ± 2.2	0.6 ± 0.5	2.2 ± 4.8

TABLE D-I.2 CONCENTRATIONS OF GROSS BETA SOLUBLE IN SURFACE AND DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1990

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	1LL	1MM	4L	6I
FEB 90	1.5 ± 0.4	1.4 ± 0.4	0.8 ± 0.4	0.9 ± 0.4
MAY 90	2.4 ± 0.6	2.8 ± 0.6	2.6 ± 0.6	2.9 ± 0.6
AUG 90	3.0 ± 0.8	2.9 ± 0.8	2.9 ± 0.8	3 ± 1
OCT 90	2.8 ± 0.7	3.2 ± 0.7	3.7 ± 0.8	2.8 ± 0.8
MEAN	2.4 ± 1.3	2.6 ± 1.6	2.5 ± 2.4	2.4 ± 2.0

TABLE D-1.3 CONCENTRATIONS OF GAMMA EMITTERS IN SURFACE AND DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1990

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

STATION CODE	COLLECTION PERIOD	K-40	MN-54	CO-58	FE-59	CO-60	ZN-65	ZR-95	NB-95	CS-134	CS-136	CS-137	BA-140	LA-140	RA-226
1LL	FEB 90	< 60	< 3	< 3	< 8	< 3	< 7	< 6	< 4	< 3	< 8	< 3	< 20	< 8	< 5
	MAY 90	< 60	< 3	< 3	< 8	< 3	< 6	< 6	< 4	< 3	< 9	< 3	< 30	< 8	< 5
	AUG 90	< 60	< 3	< 3	< 9	< 3	< 6	< 6	< 4	< 3	< 10	< 3	< 30	< 10	< 5
	OCT 90	80 ± 60	< 3	< 3	< 8	< 3	< 6	< 6	< 4	< 3	< 9	< 3	< 20	< 8	< 5
	MEAN	65 ± 20	< 3	< 3	< 8	< 3	< 6	< 6	< 4	< 3	< 9	< 3	< 25	< 9	< 5
1MM	FEB 90	80 ± 60	< 3	< 3	< 8	< 3	< 6	< 6	< 4	< 3	< 9	< 3	< 30	< 9	< 5
	MAY 90	< 60	< 3	< 3	< 8	< 3	< 6	< 6	< 4	< 3	< 10	< 3	< 30	< 9	< 5
	AUG 90	< 60	< 3	< 3	< 9	< 3	< 6	< 6	< 4	< 3	< 10	< 3	< 40	< 10	8 ± 5
	OCT 90	< 60	< 3	< 3	< 8	< 3	< 6	< 6	< 4	< 3	< 9	< 3	< 30	< 8	< 5
	MEAN	65 ± 20	< 3	< 3	< 8	< 3	< 6	< 6	< 4	< 3	< 10	< 3	< 33	< 9	6 ± 3
4L	FEB 90	< 60	< 3	< 3	< 8	< 3	< 6	< 6	< 4	< 3	< 9	< 3	< 30	< 8	< 5
	MAY 90	< 60	< 3	< 3	< 9	< 3	< 6	< 6	< 4	< 3	< 10	< 3	< 30	< 9	< 5
	AUG 90	< 60	< 3	< 3	< 9	< 3	< 6	< 6	< 4	< 3	< 10	< 3	< 40	< 10	< 5
	OCT 90	110 ± 60	< 3	< 3	< 9	< 3	< 7	< 6	< 4	< 3	< 10	< 3	< 30	< 10	< 6
	MEAN	73 ± 50	< 3	< 3	< 9	< 3	< 6	< 6	< 4	< 3	< 10	< 3	< 33	< 9	< 5
6I	FEB 90	< 60	< 3	< 3	< 9	< 3	< 6	< 6	< 4	< 3	< 10	< 3	< 30	< 10	< 5
	MAY 90	< 60	< 3	< 3	< 9	< 3	< 7	< 6	< 4	< 3	< 10	< 3	< 40	< 10	< 5
	AUG 90	< 60	< 3	< 3	< 9	< 3	< 6	< 6	< 5	< 3	< 20	< 3	< 50	< 10	< 5
	OCT 90	< 60	< 3	< 3	< 9	< 3	< 7	< 6	< 4	< 3	10 ± 10	< 3	< 30	< 9	6 ± 6
	MEAN	< 60	< 3	< 3	< 9	< 3	< 7	< 6	< 4	< 3	13 ± 10	< 3	< 38	< 10	[illegible] ± 1

TABLE D-II.1 CONCENTRATIONS OF GROSS BETA IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1990

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

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

TABLE D-II.2 CONCENTRATIONS OF GAMMA EMITTERS IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1990

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

STATION CODE	COLLECTION PERIOD	BE-7	K-40	CS-134	CS-137	CE-141	RA-226
1A	12/29-03/31	120 ± 40	< 50	< 2	< 2	< 5	< 3
	03/31-07/01	160 ± 40	< 50	< 2	< 2	< 6	< 4
	07/01-09/30	100 ± 40	< 40	< 2	< 2	< 8	< 3
	09/30-12/28	140 ± 40	< 50	< 2	< 2	< 6	6 ± 4
	MEAN	130 ± 52	< 48	< 2	< 2	< 6	4 ± 3
4B	12/29-03/31	130 ± 40	< 50	< 2	< 2	< 5	< 4
	03/31-07/01	150 ± 40	70 ± 50	< 2	< 2	6 ± 5	< 3
	07/01-09/29	90 ± 50	< 50	< 2	< 2	< 8	< 3
	09/29-12/28	150 ± 50	< 50	< 2	< 2	< 7	6 ± 5
	MEAN	130 ± 57	55 ± 20	< 2	< 2	7 ± 3	4 ± 3

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, 1990

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

STATION CODE	COLLECTION PERIOD	I-131	K-40	CS-134	CS-137	BA-140	LA-140	RA-226
J	02/19/90	< 0.07	1290 ± 90	< 3	< 3	< 10	< 4	< 6
	06/04/90	< 0.08	1230 ± 90	< 3	< 3	< 20	< 5	< 5
	08/13/90	< 0.1	1360 ± 90	< 3	< 3	< 20	< 4	< 6
	11/05/90	< 0.1	1190 ± 80	< 3	< 3	< 20	< 6	< 5
	MEAN	< 0.09	1268 ± 148	< 3	< 3	< 18	< 5	< 6
N	02/19/90	< 0.04	1370 ± 90	< 3	< 3	< 20	< 4	< 6
	06/04/90	< 0.08	1460 ± 90	< 3	< 3	< 20	< 5	< 6
	08/13/90	< 0.1	1210 ± 90	< 3	< 3	< 20	< 4	< 6
	11/05/90	< 0.09	1280 ± 90	< 3	< 3	< 20	< 7	< 6
	MEAN	< 0.08	1330 ± 217	< 3	< 3	< 20	< 5	< 6
A	02/19/90	< 0.05	1420 ± 90	< 3	< 3	< 10	< 3	< 6
	06/04/90	< 0.08	1350 ± 90	< 3	< 3	< 20	< 6	6 ± 6
	08/13/90	< 0.1	1360 ± 90	< 3	< 3	< 10	< 3	7 ± 6
	11/05/90	< 0.10	1230 ± 90	< 3	< 3	< 20	< 6	< 6
	MEAN	< 0.08	1340 ± 159	< 3	< 3	< 15	< 5	6 ± 1

TABLE D-IV.1 SUMMARY OF COLLECTION DATES FOR SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1990

SURFACE AND DRINKING WATER

COLLECTION PERIOD	1LL	1MM	4L	6I
FEB 90	02/02-03/02	02/02-03/02	02/03-03/03	02/03-03/03
MAY 90	05/04-06/01	05/04-06/01	05/05-06/02	05/05-06/02
AUG 90	07/27-08/31	07/27-08/31	07/28-09/02	07/28-09/02
OCT 90	10/05-11/02	10/05-11/02	10/06-11/03	10/06-11/03

AIR PARTICULATES

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

FIGURE D-1

MEAN WEEKLY GROSS BETA CONCENTRATIONS IN AIR PARTICULATE SAMPLES COLLECTED FROM PBAPS LOCATIONS 1A AND 1Z, 1990

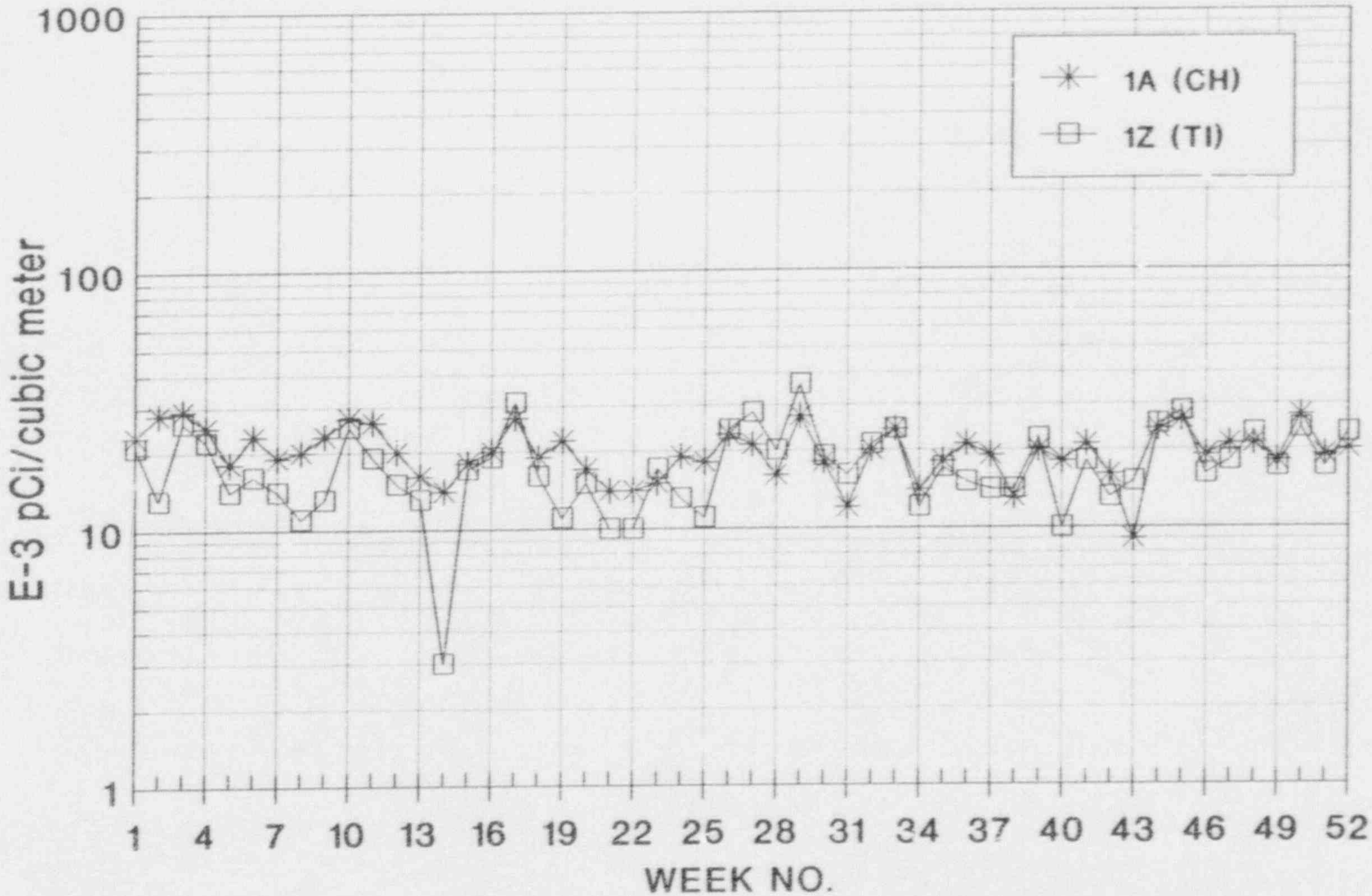
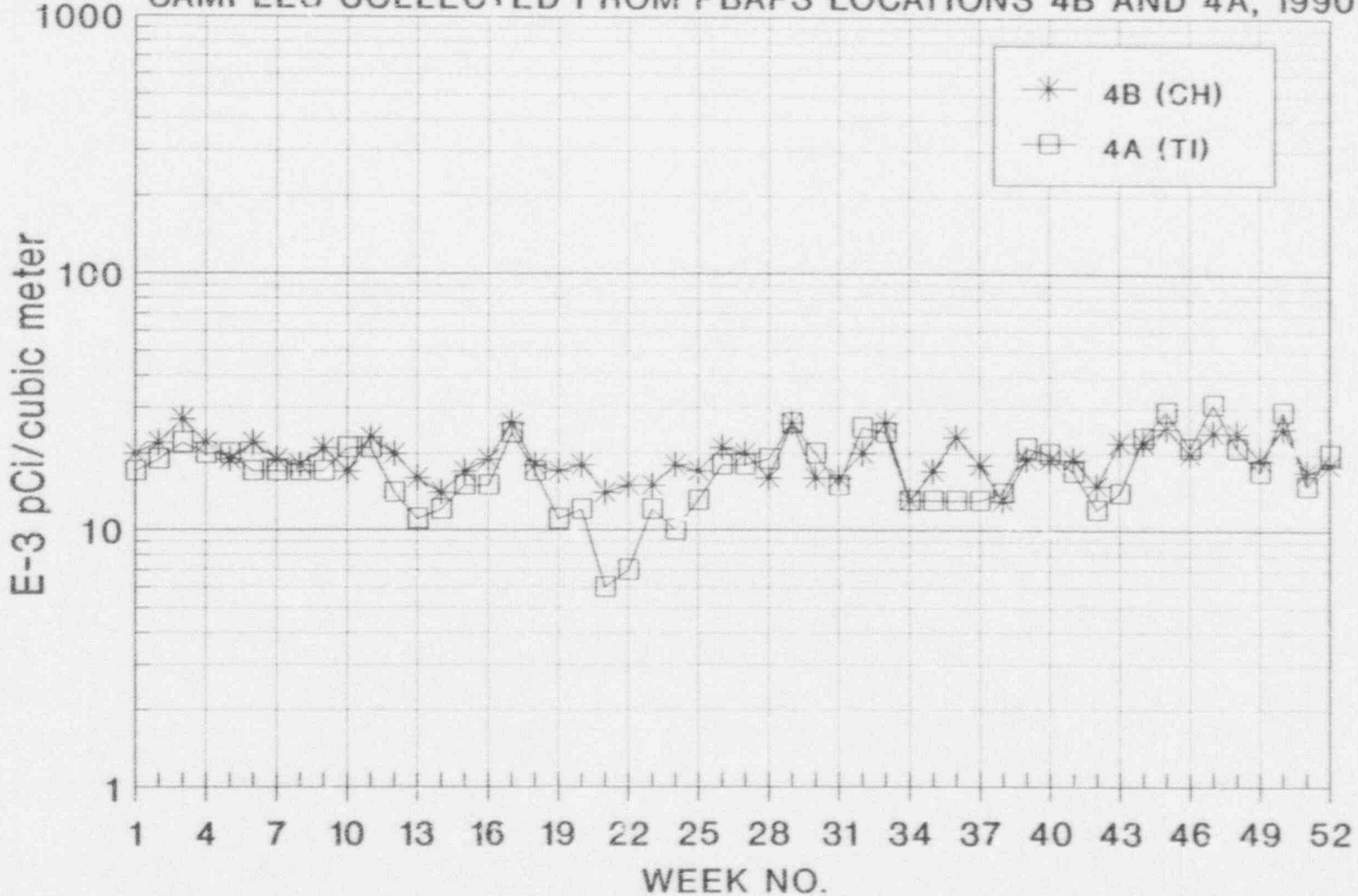


FIGURE D-2

MEAN WEEKLY GROSS BETA CONCENTRATIONS IN AIR PARTICULATE SAMPLES COLLECTED FROM PBAPS LOCATIONS 4B AND 4A, 1990



SYNOPSIS OF ANALYTICAL PROCEDURES

APPENDIX E: SYNOPSIS OF ANALYTICAL PROCEDURES

The following appendix is comprised of two sections: Section 1 describes the collection methods used to obtain samples for the REMP, and Section 2 describes the methods and formulas used by Teledyne Isotopes and Clean Harbors to obtain the sample activities.

Section 1: Collection Methods

Surface and Drinking Water Samples

Surface and drinking water samples are composited over a one-month period at four locations (1LL, 1MM, 4L, and 6I). Water is continuously sampled at each location and collected in large tanks. Two quarts of water are removed from the tank each week and put into a clean two-gallon polyethylene bottle to form a monthly composite. At locations 13A and 13B a monthly grab sample is obtained.

Air Particulate and Air Iodine Samples

Air particulate samples are obtained using a system consisting of a pump, a glass fiber filter with a 35-mm diameter orifice, and a running time meter to indicate the total period of operation. At those locations where airborne iodine was also sampled, a charcoal filter was mounted behind the glass fiber filter. The volume sampled for the period if determined from the known flow rate and the running time. At the end of each weekly air particulate collection period, the air sampling unit is stopped. The filter is then removed from the holder and replaced with a clean filter, and the air sampling unit is returned to operation.

Sediment Samples

Sediment samples are collected by one of two methods, determined by the depth from which the sediment is obtained. In water greater than 4-feet deep, sediment is collected by either a Ponar or Ekman Grab with a surface area of 81 square inches. In shallow water (1-4 feet), sediment is collected by scooping up mud with a plastic two gallon bucket.

Milk Samples

Milk samples are obtained by removing two gallons from the dairyman's bulk tank. The sample from each location is therefore a composite of all the milk from the dairy herd (from 1 to 3 milkings). The milk is scooped from the agitated bulk tank and placed in new plastic containers.

Fish Samples

Fish samples are collected via several methods at Conowingo Pond locations; canal fish are caught by net trapping. Fish at other locations are caught by seine or electroshocking techniques.

Section 2: Analytical Methods and Calculations

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

Teledyne Isotopes

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 hotplate, and the residue is tranferred 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 or of the MDL:

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

Net Activity Counting Error

where:

N	=	total counts from sample (counts)
t	=	counting time for sample (min)
ß	=	background rate of counter (cpm)
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. Less than MDL is reported as the result when this value is greater than the measured result defined above.

Clean Harbors

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

For surface and drinking water samples, the samples are first filtered through membrane filters of 0.45 micron mean pore size. The filtrate is treated as above. The filter papers are transferred to a pre-weighed planchet, ignited using acetone and a flame, and then put into a muffle furnace for final ashing. The ash is then counted using a gas flow proportional counter.

Calculation of Sample Activity or of the MDL:

$$\frac{Result}{(pCi/l)} = \frac{\frac{C_s}{T_s} - \frac{C_b}{T_b}}{2.22(v)(E)} \pm \frac{2\sqrt{\frac{C_s}{T_s^2} + \frac{C_b}{T_b^2}}}{2.22(v)(E)}$$

Net Activity Counting Error

where:

C_s = total gross sample counts (counts)
T_s = sample count time (min)
C_b = total background count (counts)
T_b = background count time (min)
E = counting efficiency based on CS-137 or uranium for the weight of planchetted sample
v = aliquot size in liters
2.22 = dpm per pCi
2 = multiple of counting error

The MDL is defined as that value equal to the two sigma counting error of the result. Less than MDL is reported as the result when this value is greater than the net activity.

DETERMINATION OF TRITIUM IN WATER BY ELECTROLYTIC ENRICHMENT AND LIQUID SCINTILLATION COUNTING

Teledyne Isotopes

A 60 ml aliquot is distilled and collected in an Erlenmeyer flask. Approximately 55 g of the distillate is transferred into an electrolytic enrichment cell. One ml of 30% sodium hydroxide solution is added to the cell. The sample is electrolyzed in a 10 C cooling water bath until the volume is 3-4 mls. CO_2 is bubbled through the solution to neutralize the sodium hydroxide. The sample is transferred to a collecting bottle at 80 C and weighed. It is then transferred into a liquid scintillation vial and 20 mls of cocktail is added. The sample is counted for 100 minutes in a liquid scintillation counter.

Determination of the Enrichment Factor:

$$EnrichmentFactor = \frac{(final\ volume)(observed\ dpm/ml)}{(initial\ volume)(standard\ dpm/ml)}$$

Aliquots of a tritium standard solution have been enriched to different final volumes to provide a graph of the enrichment factor versus the final volume.

Calculation of Sample Activity or of the MDL:

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

Net Activity　　　　Counting Error

where:

N	=	total counts from sample (counts)
t	=	counting time for sample (min)
B	=	background rate of counter (cpm)
2.22	=	dpm/pCi
v	=	initial volume (in liters) before enrichment
EF	=	enrichment factor = .039 x VF + .603 where VF = Final Volume
E	=	efficiency of the counter tritium
2	=	multiples of counting error

The MDL is defined as that value equal to the two sigma counting error of the result. Less than MDL is reported as the result when this value is greater than the net activity.

DETERMINATION OF TRITIUM BY GAS COUNTING

Teledyne Isotopes

A 2 ml aliquot is oxidized and the hydrogen gas is collected in an activated charcoal trap. The hydrogen is then transferred into a previously evacuated one liter proportional counter. Non-tritiated hydrogen and ultra-high purity methane is added and then counted. Backgrounds and standards are counted in the same gas mixture as the samples.

Calculation of Sample Activity or of the MDL:

$$\frac{Result}{(pCi/l)} = \frac{(3.234)(TU_n)(V_n)}{(CPM_g)(V_s)}(CPM_g - BKG)$$

Net Activity

$$\pm \frac{(3.234)(TU_n)(V_n)}{(CPM_n)(V_s)} 2\sqrt{\sigma G^2 + \sigma B^2}$$

Counting Error

where:

- TU_n = the tritium units of the standard
- V_n = vol me of the standard used to calibrate the efficiency of the detector (psia)
- V_s = volume of the sample loaded into the detector (psia)
- CPM_n = the cpm activity of the standard of volume V
- CPM_g = the gross activity of the sample of volume V and the detector background
- BKG = the background rate of the detector (cpm)
- 3.234 = conversion factor changing TU to pCi/l
- 2 = multiple of the counting error
- σG = standard deviation of the gross activity of the sample and the detector background, in cpm
- σB = standard deviation of the background, in cpm

The MDL is defined as that value equal to the two sigma counting error of the result. Less than MDL is reported as the result when this value is greater than the net activity.

DETERMINATION OF GROSS BETA ACTIVITY IN AIR PARTICULATE SAMPLES

Teledyne Isotopes

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 pariculate 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 or of the MDL:

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

Net Activity Counting Error

where:

- N = total counts from sample (counts)
- t = counting time for sample (min)
- β = background rate of counter (cpm)
- 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. Less than MDL is reported as the result when this value is greater than the net activity.

Clean Harbors

Each filter paper is placed in a 2-inch diameter planchet and counted using a gas flow proportional counter.

Calculation of Sample Activity and 2 Sigma Error:

$$\frac{Result}{(pCi/m^3)} = \frac{\frac{C_s}{T_s} - \frac{C_b}{T_b}}{2.22(v)(E)(.02832)} \pm \frac{2\sqrt{\frac{C_s}{T_i^2} + \frac{C_b}{T_b^2}}}{2.22(v)(E)(.02832)}$$

Net Activity   Counting Error

where:

C_s = total gross sample counts (counts)
T_s = sample count time (min)
C_b = total background count (counts)
T_b = background count time (min)
E = counting efficiency based on CS-137
v = sample volume in cubic feet calculated from the elapsed time meter readings and the flow rate
.02832 = conversion to cubic meters
2.22 = dpm/pCi
2 = multiple of the counting error

The MDL is defined as that value equal to the two sigma counting error of the result. Less than MDL is reported as the result when this value is greater than the net activity.

DETERMINATION OF I-131 IN MILK AND WATER SAMPLES

Teledyne Isotopes

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:

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

Net Activity　　　　Counting Error

where:

N	=	total counts from sample (counts)
t	=	counting time for sample (min)
β	=	background rate of counter (cpm)
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
Δt	=	is the elaspsed 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. Less than MDL is reported as the result when this value is greater than the net activity.

Clean Harbors

Analysis for determination of I-131 activity is performed by initially adding iodide carrier to an aliquot of sample. The iodide is concentrated by stirring with ion exchange resin, and then purified by extraction into chloroform and back extraction. The iodide is precipitated as palladium iodide for counting in a low-background beta counter or a beta-gamma coincidence counter.

Calculation of the Sample Activity and 2 Sigma Error:

$$\frac{Result}{(pCi/l)} = \frac{\frac{C_s}{T_s} - \frac{C_b}{T_b}}{(2.22)(v)(E)(y)(\exp^{-\lambda\Delta t})} \pm \frac{2\sqrt{\frac{C_s}{T_s^2} + \frac{C_b}{T_b^2}}}{(2.22)(v)(E)(y)(\exp^{-\lambda\Delta t})}$$

Net Activity Counting Error

where:

C_s	=	total gross sample counts (counts)
T_s	=	sample count time (min)
C_b	=	total background count time (counts)
T_b	=	background count time (min)
E	=	counting efficiency for I-131
v	=	aliquot analyzed (liters)
y	=	iodine yield
λ	=	is the radioactive decay constant for I-131
Δt	=	is the elaspsed time between sample collection (or end of the sample collection) to the midcount time
2.22	=	dpm/pCi
2	=	multiple of counting error

The MDL is defined as that value equal to the two sigma counting error of the result. Less than MDL is reported as the result when this value is greater than the net activity.

DETERMINATION OF GAMMA EMITTING RADIOISOTOPES

Teledyne Isotopes

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 radionuclide standards traceable to the National Bureau of Standards.

Calculation of the Sample Activity and 2 Sigma Error:

$$\frac{Result}{\left(\frac{pCi}{vol - mass}\right)} = \frac{N_{(j)} - B_{(j)}}{(2.22)(v)(t)(E_{(j)})(BI_{(j)})(\exp^{-\lambda_{(j)}\Delta t})}$$

Net Activity

$$\pm \frac{2\sqrt{N_{(j)} + B_{(j)}}}{(2.22)(v)(t)(E_{(j)})(BI_{(j)})(\exp^{-\lambda_{(j)}\Delta t})}$$

Counting Error

where:

$N_{(j)}$ = area, in counts, of a special region containing a gamma emission of the nuclide of interest

NOTE: If the detector exhibits a peak in this region when counting a blank (i.e., from natural background (B)(t) is subtracted from N before using the above equation. B is the count rate of the blank, cpm, in the background peak.

$B_{(j)}$ = background counts in the region of interest, calculated by fitting a straight line across the region connecting the two adjacent region.

2	=	multiple of counting error
2.22	=	dpm/pCi
v	=	volume or mass of sample analyzed
t	=	counting interval of sample, minutes
$E_{(j)}$	=	efficiency of counter at the energy region of interest
$BI_{(j)}$	=	branching intensity of the nuclide at the gamma emission energy under consideration
$\lambda_{(j)}$	=	is the radioactive decay constant for nuclide (j)
Δt	=	is the elaspsed time between sample collection (or end of the sample collection) to the midcount time

The MDL is defined as that value equal to the two sigma counting error of the result. Less than MDL is reported as the result when this value is greater than the measured result defined above.

Clean Harbors

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 all sample types; primarily air particulate filters, water, vegetation, soil, sediment, and fish.

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 samples from each location are placed in a petri dish and counted on GeLi detectors connected to a multichannel analyzer and micro-computer. Spectra are stored first on floppy disk, then on magnetic tape.

Water and milk samples are placed into the appropriate sized container, depending on the volume of sample available. The preferred volume is 3.5 liters. The samples are counted and spectra are stored as with air particulate samples.

Vegetation samples are packed tightly in a tared container and weighed. Samples that contain excess liquid due to preservatives or decomposition are drained before weighing, and then returned to the container for counting. Samples such as grass are air dryed to remove surface moisture before weighing and counting. Samples are counted and spectra stored as with air particulate samples.

Soil samples are dried prior to weighing. An aliquot of dried sample is placed in a marinelli beaker and counted and spectra stored as with air particulate samples.

Fish samples from each location are placed into marinelli beakers for counting. The aliquot size may vary, depending on availability of sample, up to 4 liters. The samples are counted and spectra stored as for air particulate samples.

Calculation of the Sample Activity and 2 Sigma Error:

$$\frac{Result}{\left(\frac{pCi}{vol - mass}\right)} = \frac{(P_{(j)} - B_{(j)})(M)(E_{(j)})(G)(.06)}{(v)(t)(\exp^{-\lambda_{(j)}\Delta t})}$$

Net Activity

$$\pm \frac{2\sqrt{(P_{(j)} + B_{(j)})(M)(E_{(j)})(G)(.06)}}{(v)(t)(\exp^{-\lambda_{(j)}\Delta t})}$$

Counting Error

where:

- $P_{(j)}$ = number of gross counts in peak channels for nuclide (j)
- $B_{(j)}$ = number of background counts in peak channels for nuclide (j)
- M = relative GeLi efficiency (GeLi 1=1)
- $E_{(j)}$ = efficiency of counter at the energy region of interest
- G = geometry factor for deviation from 1 liter in volume
- .06 = conversion to minutes
- 2 = multiple of counting error
- v = volume or mass of sample analyzed
- t = counting interval of sample (kiloseconds)
- $\lambda_{(j)}$ = is the radioactive decay constant for nuclide (j)
- Δt = is the elaspsed time between sample collection (or end of the sample collection) to the midcount time

The MDL is defined as that value equal to the two sigma counting error of the result. Less than MDL is reported as the result when this value is greater than the measured result defined above.

ENVIRONMENTAL DOSIMETRY

Teledyne Isotopes

Teledyne Isotopes dosimeters are rectangular teflon wafers impregnated with 25% CaSO4:Dy phosphor. They are annealed in a hot air oven prior to use and are inserted into black polyethylene pouches. The filled pouches are labelled and placed in rectangular holders which contain copper shielding to filter out low energy radiation. After exposure in the environment, four separate areas of the dosimeter are read in a Teledyne Isotopes model 8300 TLD reader. The dosimeter is then re-irradiated by a standardized Cs-137 source and the four areas are read again. Calculation of the environmental exposure is performed by computer, using the re-irradiation readings to determine the sensitivity of each area of the dosimeter. The reading of control dosimeters are subtracted to allow for transit dose and system background.

A. For any given area of the dosimeter, the dose mR is calculated by the formula:

$$Dose = (R)\left(\frac{redose}{RR}\right)(avcontrol)$$

where:

R = initial reading of the area
RR = second reading of the area (after re-irradiation)
redose = re-irradiation dose in mR
avcontrol = average of control values calculated as explained below. If no controls are used, avcontrol = 0 and gross exposures result

B. Each area of each control is calculated by the formula:

$$cdose = (cr)\left(\frac{credose}{crr}\right)$$

where:

cdose = control area dose in mR
cr = initial reading of the control area
crr = second reading of the control area (after re-irradation)
credose = re-irradiation dose of the control dosimeter in mR

The average of control values is then calculated from all four areas of all controls by the formula:

$$avcontrol = \frac{\sum_{1}^{4N} cdose}{4N}$$

where:

N = total number of control dosimeters

C. The average and standard deviation of the area readings for each dosimeter are calculated by standard methods.

D. Using the criteria that if one standard deviation is greater than 10% of the average of the four readings and that if the value of one area is outside the range of 3 standard deviations of the average of the other three areas, then that area will be eliminated and the results will be based on the remaining areas.

QUALITY CONTROL
EPA CROSSCHECK PROGRAM

APPENDIX F: QUALITY CONTROL PROGRAM

TI and CH 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 Limerick Generating 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. For CH the results from participation in the EPA program are the basis for continued certification by the Commonwealth of Massachusetts in radiological analysis.

The results of TI's and CH's participation in the EPA cross check program can be found in Tables F-1 and F-2, respectively.

TABLE F-1
INTER-LABORATORY COMPARISONS - 1990
TELEDYNE ISOTOPES

Collection Date	Sequence No.	Media	Nuclide	EPA Results(a)	Teledyne Isotopes Results(b)	Normalized Deviation Grand Avg.	Normalized Deviation Known	All Participants Mean ± 2 s.d.
01/12/90	535	Water	Sr-89	25.00 ± 8.66	24.00 ± 5.19	-0.46	-0.35	25.14 ± 14.44
			Sr-90	20.00 ± 2.60	19.67 ± 7.5	60.51	-0.38	19.66 ± 7.38
02/23/90	536	Water	H-3	4976.00 ± 862.56	4900.00 ± 300.00	-0.05	-0.26	4839.04 ± 1858.46
02/09/90	537	Water	Co-60	15.00 ± 8.66	15.00 ± 10.38	-0.11	0.00	15.31 ± 4.56
			Zn-65	139.00 ± 24.25	131.33 ± 27.21	-0.94	-0.95	138.93 ± 19.20
			Ru-106	139.00 ± 24.25	113.67 ± 12.12 (c)	-2.47	-3.13	133.60 ± 42066
			Cs-134	18.00 ± 8.66	15.33 ± 6.93	-0.58	-0.92	17.00 ± 4.28
			Cs-137	18.00 ± 8.66	19.33 ± 9.63	0.20	0.46	18.76 ± 4.80
			Ba-133	74.00 ± 12.12	66.00 ± 10.38	-1.61	-1.98	72.49 ± 12.42
03/30/90	540	Air Filter	Gross Alpha	5.0 ± 8.66	6.33 ± 1.74	0.03	0.46	6.25 ± 2.62
			Gross Beta	31.0 ± 8.66	31.67 ± 1.74	-0.18	0.23	32.19 ± 7.36
			Sr-90	10.0 ± 2.60	9.33 ± 1.74	-0.41	-0.77	9.69 ± 2.72
			Cs-137	10.0 ± 8.66	10.67 ± 3.45	-0.31	0.23	11.56 ± 4.05
04/17/90	542	Water	Gross Alpha	90.0 ± 39.83	79.33 ± 8.67	-0.14	-0.80	81.18 ± 42.6
			Gross Beta	52.0 ± 8.66	53.33 ± 4.59	1.48	0.46	49.06 ± 12.78
			Sr-89	10.0 ± 8.66	10.67 ± 3.45	-0.71	0.23	12.71 ± 50.18
			Sr-90	10.0 ± 2.60	9.67 ± 1.74	0.20	-0.38	9.50 ± 1.98
			Cs-134	15.0 ± 8.66	12.67 ± 4.59	-0.61	-0.81	14.44 ± 3.54
			Cs-137	15.0 ± 8.66	16.33 ± 3.45	0.19	0.46	15.80 ± 3.76
04/27/90	543	Milk	Sr-89	[illegible].0 ± 8.66	24.67 ± 4.59	0.53	0.58	23.14 ± 10.20
			Sr-90	23.0 ± 8.66	24.00 ± 0.00	0.58	0.35	22.33 ± 6.76
			I-131	99.0 ± 17.32	89.67 ± 9.63	-1.53	-1.62	98.49 ± 16.26
			Cs-137	24.0 ± 8.66	27.33 ± 7.56	0.93	1.15	24.65 ± 6.06
			K	1550.0 ± 135.10	1483.33 ± 225.18	-1.44	-1.48	1548.38 ± 234.66
05/[illegible]/90	544	Water	Sr-89	7.0 ± 8.66	6.67 ± 1.74	-0.34	-0.12	7.64 ± 4.52
			Sr-90	7.0 ± 8.66	6.67 ± 1.74	-0.12	-0.12	7.02 ± 3.42

TABLE F-1
INTER-LABORATORY COMPARISONS - 1990
TELEDYNE ISOTOPES

Collection Date	Sequence No.	Media	Nuclide	EPA Results(a)		Teledyne Isotopes Results(b)			Normalized Deviation Grand Avg.	Normalized Deviation Known	All Participants Mean ± 2 s.d.	
06/08/90	545	Water	Co-60	24.0 ±	8.66	25.33 ±	7.56		0.07	0.46	25.12 ±	5.38
			Zn-65	148.0 ±	25.98	148.67 ±	9.18		-0.06	0.081	49.18 ±	24.60
			Ru-106	210.0 ±	36.37	196.00 ±	61.98		-0.41	-1.15	201.0 ±	34.02
			Cs-134	24.0 ±	8.66	23.67 ±	8.67		0.14	-0.12	23.26 ±	4.20
			Cs-137	25.0 ±	8.66	24.67 ±	6.24		-0.54	-0.12	26.21 ±	5.22
			Ba-133	99.0 ±	17.32	93.00 ±	18.24		-0.58	-1.04	96.37 ±	16.32
06/22/90	546	Water	H-3	2933.0 ±	620.07	2900. ±	300.00		-0.32	-0.16	2966.81 ±	571.28
08/10/90	548	Water	I-131	39.0 ±	10.39	36.00 ±	9.00		-1.23	-0.87	40.26 ±	8.20
09/21/90	551	Water	Gross Alpha	10.0 ±	8.66	11.00 ±	3.00		0.34	0.35	10.01 ±	6.24
			Gross Beta	10.0 ±	8.66	11.00 ±	3.00		0.03	0.35	10.91 ±	4.50
08/31/90	552	Air Filter	Gross Alpha	10.0 ±	8.66	16.00 ±	3.00	(d)	1.31	2.08	12.21 ±	5.14
			Gross Beta	62.0 ±	8.66	63.33 ±	4.59		-0.46	0.46	64.66 ±	13.54
			Sr-90	20.0 ±	8.66	18.00 ±	3.00		-0.50	-0.69	19.45 ±	5.02
			Cs-137	20.0 ±	8.66	18.33 ±	9.63		-1.51	-0.58	22.70 ±	7.82
10/15/90	553	Water	Co-60	20.0 ±	8.66	21.00 ±	3.00		0.16	0.35	20.53 ±	5.06
			Zn-65	115.0 ±	20.78	115.00 ±	34.59		-0.18	0.00	116.25 ±	19.78
			Ru-106	151.0 ±	25.98	142.00 ±	25.98		0.19	-1.04	140.39 ±	30.66
			Cs-134	12.0 ±	8.66	11.00 ±	0.00		-0.31	-0.35	11.89 ±	4.18
			Cs-137	12.0 ±	8.66	16.33 ±	7.56		1.12	1.50	13.11 ±	4.34
			Ba-133	110.0 ±	19.05	94.67 ±	15.34	(d)	-2.06	-2.41	107.73 ±	18.44
10/19/90	554	Water	H-3	7203.0 ±	1247.08	7133.33 ±	754.98		0.02	-0.17	7125.08 ±	1343.86
09/14/90	555	Water	Sr-89	10.0 ±	8.66	8.67 ±	1.74		-0.43	-0.46	9.89 ±	5.44
			Sr-90	9.0 ±	8.66	9.0 ±	3.00		-0.11	0.00	9.30 ±	3.96

TABLE F-1
INTER-LABORATORY COMPARISONS - 1990
TELEDYNE ISOTOPES

Collection Date	Sequence No.	Media	Nuclide	EPA Results(a)		Teledyne Isotopes Results(b)			Normalized Deviation Grand Avg.	Normalized Deviation Known	All Participants Mean ± 2 s.d.	
09/28/90	556	Milk	Sr-89	16.0 ±	8.66	9.0 ±	7.95	(d)	-1.57	-2.42	13.53 ±	8.56
			Sr-90	20.0 ±	8.66	15.33 ±	1.74		-0.78	-1.62	17.57 ±	6.50
			I-131	58.0 ±	10.39	54.67 ±	4.59		-1.21	-0.96	58.88 ±	9.34
			Cs-137	20.0 ±	8.66	23.00 ±	5.19		0.53	1.04	21.47 ±	4.70
			K	1700.0 ±	147.22	1710.00 ±	19[illegible].53		-0.07	0.20	1713.52 ±	249.38
10/30/90	559	Water	Gross Alpha	62.00 ±	27.80	57.00 ±	3.00		-0.39	-0.54	60.64 ±	32.10
			Gross Beta	53.0 ±	8.66	51.00 ±	6.93		0.65	-0.12	50.78 ±	12.64
			Sr-89	20.0 ±	8.66	19.00 ±	10.83		0.06	-0.35	18.84 ±	10.24
			Sr-90	15.0 ±	8.66	14.33 ±	1.74		-0.04	-0.23	14.44 ±	4.04
			Cs-134	7.0 ±	8.66	9.00 ±	0.00		0.52	0.69	7.49 ±	2.88
			Cs-137	5.0 ±	8.66	7.67 ±	3.45		0.62	0.92	5.94 ±	3.10
01/25/91	560	Water	Gross Alpha	5.00 ±	8.66	9.00 ±	3.00		1.15	1.39	5.69 ±	3.58
			Gross Beta	5.00 ±	8.66	7.00 ±	0.00		0.24	0.[illegible]9	6.30 ±	3.02

Footnotes:

(a) EPA Results - Expected laboratory precision (3 sigma). Units are pCi/l for water and milk except K is in mg/l.

(b) Teledyne Results - Average ± 3 sigma. Units are pCi/l for water and milk except K is in mg/l. Units are total pCi for air particulate filters.

(c) No apparent cause for the low results were found. Three aliquots of the sample were counted on three separate detectors. The results of all three were similar. The calibration curve fit is good (0.9?7). Ruthenium-106 will be obtained from the EPA to further investigate the matter and future mixed gamma in water EPA Intercomparisons will be monitored to identify continuing trends.

(d) An investigation is being conducted and the results will be available shortly.

Table F-2
EPA Intercomparison Samples
Clean Harbors Analytical Services
1991

The EPA section of the quarterly QC report is cumulative for the year. The table submitted with the last report of the year should be complete for results received and will be updated finally for results received later.

Results are presented as follows:

	Sr-90
	17 (xx)
	16
	18
CHAS Avg.	17 (1.0)
EPA Known	17 (1.5, 2.6, 3)
EPA Gr. Avg.	16 (yy, zz)

(xx) - This value will be given when the precision (1 SD) of the CHAS measurement due to counting statistics is significantly different from the expected EPA precision. This should cause different spread in our results.

(1.0) - Next to CHAS Avg. - This is the actual SD of the CHAS data (i.e., 1 SD, 1 determination). This means that an additional single measurement should yield a result within 1 SD of the mean 66% of the time.

(1.5, 2.6, 3) - Next to EPA Known - The first number is the anticipated 1 SD as decreed by the EPA. This value can be compared to the figure above to see that the CHAS precision is as expected.

The second number is 3 SD of the mean which is the EPA Control Limit. If the observed mean (i.e. CHAS Avg.) differs from the known by more than this value the result is unacceptable according to the EPA criteria.

The third number is the deviation from the EPA's known value.

(yy, zz) - The first number is the observed 1 SD, 1 determination for all labs whose results were not deemed outliers. A significant difference between this value and the one above it indicates that the anticipated precision is not being attained by the majority of the laboratories.

The second number is the normalized value for the grand average.

Table F-2
EPA Intercomparison Samples
Clean Harbors Analytical Services
1991

Gross Alpha and Beta

Sample No.	Sample Date	Sample Type	Gross Alpha	Gross Beta
9001271	01/26/90	Water (a)	14	13
			13	14
			14	14
		Lab Avg.	14(1)	14(1)
		EPA Known	12(5,9,1)	12(5,9,1)
		EPA Gr. Avg.	12(3,1)	13(2,0)
9004010 (Note 1)	03/30/90	Air Filter (b)		26
				26
				26
		Lab Avg.		26(0)
		EPA Known		31(5,9,-2)
		EPA Gr. Avg.		32(4,-2)
9004222	04/17/90	Water (a)	92	
			86	
			87	
		Lab Avg.	88(3)	
		EPA Known	90(23,40,0)	
		EPA Gr. Avg.	81(21,1)	
9004223 (Note 2)	04/17/90	Water (a)		42
				44
				43
		Lab Avg.		43(1)
		EPA Known		52(5,9,-3)
		EPA Gr. Avg.		49(6,-2)

Note: (a) pCi/l
(b) pCi/filter

Table F-2
EPA Intercomparison Samples
Clean Harbors Analytical Services
1991

Gross Alpha and Beta

Sample No.	Sample Date	Sample Type	Gross Alpha	Gross Beta
9005157	05/11/90	Water (a)	14	16
			14	15
			18	15
		Lab Avg.	15(2)	15(1)
		EPA Known	22(6,10,-2)	15(5,9,0)
		EPA Gr. Avg.	17(6,0)	16(4,0)
9009022 (Note 1) (Note 3)	08/31/90	Air Filter (b)		1710
				1790
				1880
		Lab Avg.		1793(85)
		EPA Known		62(5,9,600)
		EPA Gr. Avg.		65(7,599)
9009210	09/21/90	Water (a)	11	15
			11	14
			8	15
		Lab Avg.	10(2)	15(1)
		EPA Known	10(5,9,0)	10(5,9,2)
		EPA Gr. Avg.	10(3,0)	11(2,1)
9011004 (Note 4)	10/30/90	Water (a)	58	42
			59	43
			64	40
		Lab Avg.	60(3)	42(2)
		EPA Known	62(16,28,0)	53(5,9,-4)
		EPA Gr. Avg.	61(16,0)	51(6,-3)

Note: (a) pCi/l
(b) pCi/filter

Table F-2
EPA Intercomparison Samples
Clean Harbors Analytical Services
1991

Gamma

Sample No.	Sample Date	Type
9002103 (Note 5)	02/09/90	Water

Nuclide (pCi/l) Cs-134		Nuclide (pCi/l) Cs-137	
	15		8
	15		13
	17		12
Lab Avg.	16(1)	Lab Avg.	11(3)
EPA Known	18(5,9,-1)	EPA Known	18(5,9,-2)
EPA Gr. Avg.	17(2,0)	EPA Gr. Avg.	19(2,-3)

Nuclide (pCi/l) Ba-133		Nuclide (pCi/l) Co-60	
	52		15
	54		15
	52		13
Lab Avg.	53(1)	Lab Avg.	14(1)
EPA Known	74(7,12,-5)	EPA Known	15(5,9,0)
EPA Gr. Avg.	72(6,-5)	EPA Gr. Avg.	15(2,0)

Nuclide (pCi/l) Zn-65		Nuclide (pCi/l) Ru-106	
	129		98
	129		165
	137		128
Lab Avg.	132(5)	Lab Avg.	130(34)
EPA Known	139(14,24,-1)	EPA Known	139(14,24,-1)
EPA Gr. Avg.	139(10,-1)	EPA Gr. Avg.	134(14,0)

Sample No.	Sample Date	Type
9004010	03/30/90	Air Filter

Nuclide (pCi/filter) Cs-137	
	8
	12
	11
Lab Avg.	10(2)
EPA Known	10(5,9,0)
EPA Gr. Avg.	12(2,0)

Table F-2
EPA Intercomparison Samples
Clean Harbors Analytical Services
1991

Gamma

Sample No.	Sample Date	Type
9004223	04/17/90	Water

Nuclide (pCi/l)	17	Nuclide (pCi/l)	8
Cs-134	17	Cs-137	13
	15		12
Lab Avg.	16(1)	Lab Avg.	11(1)
EPA Known	15(5,9,1)	EPA Known	15(5,9,-1)
EPA Gr. Avg.	14(2,1)	EPA Gr. Avg.	16(2,-2)

Sample No.	Sample Date	Type
9004287	04/27/90	Milk

Nuclide (pCi/l)	14	Nuclide (mg/l)	1440
Cs-137	18	K	1610
	19		[illegible]
Lab Avg.	17(3)	Lab Avg.	[illegible]
EPA Known	24(5,9,-2)	EPA Known	[illegible]40,0)
EPA Gr. Avg.	25(3,-3)	EPA Gr. Avg.	1550([illegible]0,0)

Sample No.	Sample Date	Type
9006089	06/08/90	Water

Nuclide (pCi/l)	23	Nuclide (pCi/l)	23
Cs-134	23	Cs-137	22
	25		25
Lab Avg.	24(1)	Lab Avg.	23(2)
EPA Known	24(5,9,0)	EPA Known	25(5,9,-1)
EPA Gr. Avg.	23(2,0)	EPA Gr. Avg.	26(3,-1)

Nuclide (pCi/l)	90	Nuclide (pCi/l)	23
Ba-133	90	Co-60	26
	96		23
Lab Avg.	92(3)	Lab Avg.	24(2)
EPA Known	99(10,17,-1)	EPA Known	24(5,9,0)
EPA Gr. Avg.	96(8,-1)	EPA Gr. Avg.	25(3,0)

Table F-2
EPA Intercomparison Samples
Clean Harbors Analytical Services
1991

Gamma

Sample No.	Sample Date	Type	
Nuclide (pCi/l)	145	Nuclide (pCi/l)	184
Zn-65	173	Ru-106	219
	156		231
Lab Avg.	158(14)	Lab Avg.	211(24)
EPA Known	148(15,26,1)	EPA Known	210(21,36,0)
EPA Gr. Avg.	149(12,1)	EPA Gr. Avg.	201(17,1)

9009022 (Note 6)	08/31/90	Air Filter	
Nuclide (pCi/filter)	36		
Cs-137	43		
	42		
Lab Avg.	40(4)		
EPA Known	20(5,9,7)		
EPA Gr. Avg.	23(4,6)		

9010003	09/28/90	Milk	
Nuclide (pCi/l)	20	Nuclide (mg/l)	1691
Cs-134	23	K	1730
	17		1672
Lab Avg.	20(3)	Lab Avg.	1698(30)
EPA Known	20(5,9,0)	EPA Known	1700(85,147,0)
EPA Gr. Avg.	21(2,-1)	EPA Gr. Avg	1714(125,0)

9010094 (Note 7)	10/05/90	Water	
Nuclide (pCi/l)	11	Nuclide (pCi/l)	12
Cs-134	13	Cs-137	10
	8		7
Lab Avg.	11(3)	Lab Avg.	10(1)
EPA Known	12(5,9,0)	EPA Known	12(5,9,-1)
EPA Gr. Avg.	12(2,0)	EPA Gr. Avg.	13(2,-1)

Table F-2
EPA Intercomparison Samples
Clean Harbors Analytical Services
1991

Gamma

Sample No.	Sample Date	Type	
Nuclide (pCi/l)	90	Nuclide (pCi/l)	19
Ba-133	84	Co-60	16
	92		21
Lab Avg.	87(4)	Lab Avg.	19(3)
EPA Known	110(11,19,-3)	EPA Known	20(5,9,0)
EPA Gr. Avg.	108(9,-3)	EPA Gr. Avg.	21(3,-1)
Nuclide (pCi/l)	102	Nuclide (pCi/l)	115
Zn-65	103	Ru-106	159
	103		112
Lab Avg.	103(1)	Lab Avg.	129(26)
EPA Known	115(15,21,-2)	EPA Known	151(15,26,-3)
EPA Gr. Avg.	116(10,-2)	EPA Gr. Avg.	140(15,-1)
9011003	10/30/90	Water	
Nuclide (pCi/l)	9	Nuclide (pCi/l)	8
Cs-134	7	Cs-137	7
	9		6
Lab Avg.	8(1)	Lab Avg.	7(1)
EPA Known	7(5,9,0)	EPA Known	5(5,9,1)
EPA Gr. Avg.	7(1,0)	EPA Gr. Avg	6(2,0)

Table F-2
EPA Intercomparison Samples
Clean Harbors Analytical Services
1991

Tritium

Sample No.	Sample date	Sample Type	Tritium (pCi/l)
9002221	02/23/90	Water	6559
(Note 8)			6646
			6542
		Lab Avg.	6582(56)
		EPA Known	4976(498,863,6)
		EPA Gr. Avg.	4916(641,6)
9006215	06/22/90	Water	2579
			2647
			2541
		Lab Avg.	2589(54)
		EPA Known	2933(358,620,-2)
		EPA Gr. Avg.	2967(286,-2)
9010237	10/19/90	Water	7362
			7245
			7308
		Lab Avg.	7305(59)
		EPA Known	7203(720,1247,0)
		EPA Gr. Avg.	7125(672,0)

Table F-2
EPA Intercomparison Samples
Clean Harbors Analytical Services
1991

Iodine-131

Sample No.	Sample date	Sample Type	Iodine-131(pCi/l)
9004287 (Note 9)	04/27/90	Milk	81
			81
			73
		Lab Avg.	78(5)
		EPA Known	99(10,17,-4)
		EPA Gr. Avg.	99(8,-4)
9008112	08/10/90	Water	36
			38
			34
		Lab Avg.	36(2)
		EPA Known	39(6,10,-1)
		EPA Gr. Avg.	40(4,-1)
9010003	09/28/90	Milk	53
			52
			46
		Lab Avg.	50(4)
		EPA Known	58(6,10,-2)
		EPA Gr. Avg.	59(5,-2)

Table F-2
EPA Intercomparison Samples
Clean Harbors Analytical Services
1991

NOTES

1. CHAS did not analyze for gross alpha because it is not an analysis performed at this time.

2. Beta was outside acceptable limits for 9004223. The sample was rerun and recalculated. The new results fell within acceptance limits.

3. Beta was outside acceptable limits for 9009022. Incorrect units were used when calculating the results. When recalculated with the proper units, an overall average of 50.3 pCi/filter was obtained. This result is slightly outside acceptable limits for no known reason.

4. Beta was out side acceptable limits for 9011004. Raw data and calculations were checked and no errors were found.

5. Ba-133 was outside acceptable limits for 9002103.

6. Cs-137 was outside acceptable limits for 9009022.

7. Ba-133 was outside acceptable limits for 9010094.

8. Tritium was outside acceptable limits for 9002221. Calculations were verified and no discrepancies were found. New standards were made and the sample was recalculated with new efficiencies. The new results fell within acceptable limits.

9. Iodine-131 was outside acceptable limits for 9004287. Raw data and calculations were checked and no problems were detected. The results obtained for Iodine-131 by GeLi analysis were in agreement with the results obtained by Iodine analysis.

PBAPS SURVEY

PBAPS SURVEYAPPENDIX G: PBAPS SURVEYS

A Land Use Census around the Peach Bottom Atomic Power Station (PBAPS) was conducted by Philadelphia Electric Company to comply with Section 3/4.8.E.2 of PBAPS's Technical Specifications. The survey was conducted during the May to October 1990 growing season. The results of this survey are summarized in Table G-1.

There were no changes required to the PBAPS REMP as a result of this survey.

TABLE G-1 LOCATION OF THE NEAREST MILK PRODUCING ANIMAL WITHIN A FIVE MILE RADIUS OF PBAPS, 1990

Sector	Distance (ft.) from Vents
N	18,500
NNE	10,700
NE	11,200
ENE	10,900
E	19,700
ESE	17,000
SE	24,700
SSE	-
S	15,900
SSW	6,900
SW	11,600
WSW	12,400
W	6,000
WNW	8,400
NW	17,900
NNW	-

\- INDICATES NO MILK ANIMALS LOCATED