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TS 5.6.2

May 18, 2001

Docket Nos. 50-277
50-278
License Nos. DPR-44
DPR-56

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

SUBJECT: Peach Bottom Atomic Power Station, Units 2 and 3
Annual Radiological Environmental Operating Report No. 58

Dear Sir/Madam:

In accordance with the requirements of Section 5.6.2 of the Peach Bottom Atomic Power Station, Units 2 and 3 Technical Specifications, this letter submits the Annual Radiological Environmental Operating Report No. 58. This report provides the 2000 results for the Radiological Environmental Monitoring Program (REMP) as called for in the Offsite Dose Calculation Manual.

In assessing the data collected for the REMP, we have concluded that the operation of PBAPS, Units 2 and 3, had no adverse impact on the environment. No plant produced fission or activation products with the exception of Co-60 and Cs-137 were found in any pathway modeled by the REMP. Cobalt-60 and Cs-137 levels detected in sediment were similar to those found in previous years. Calculated doses from this pathway were less than 0.01% of the allowable 10 CFR 50, Appendix I limits.

If you have any questions, please do not hesitate to contact us.

Sincerely,

D. A. Helker /for

James A. Hutton
Director - Licensing

Attachment

cc: H. J. Miller, Administrator, Region I, USNRC
A. C. McMurtray, USNRC Senior Resident Inspector, PBAPS
J. Boska, Senior Project Manager, USNRC

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Docket No: 50-277
50-278

PEACH BOTTOM ATOMIC POWER STATION
UNITS 2 and 3

Annual Radiological
Environmental Operating Report

Report No. 58

1 January Through 31 December 2000

Prepared By

Nuclear

Generation Support
200 Exelon Way
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May 2001

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I. Summary and Conclusions

This report on the Radiological Environmental Monitoring Program conducted for the Peach Bottom Atomic Power Station (PBAPS) by PECO Nuclear covers the period 1 January 2000 through 31 December 2000. During that time period, 1070 analyses were performed on 964 samples.

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

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

The remaining sample media representing the aquatic environment included fish and sediment samples. These media were analyzed for concentrations of gamma emitters. Fish samples showed no measurable effects from the operation of PBAPS. Cesium-137 activity was found at all sediment locations and was consistent with data from previous years. Co-60 was found at the nearest downstream sediment sampling location. The dose to a teenager's skin from the sediment pathway was calculated to be 1.04 E-03 mrem/yr., which represents 0.005% of the allowable fraction of 10 CFR 50, Appendix I limits.

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

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

Examination of the terrestrial environment was accomplished by analyzing milk samples for concentrations of Iodine-131 and gamma emitters. No fission or activation products were found.

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

In assessing all the data gathered for this report and comprising these results with preoperational data, it was evident that the operation of PBAPS had no adverse radiological impact on the environment.

II. Introduction

Peach Bottom Atomic Power Station (PBAPS) is located along the Susquehanna River between Holtwood and Conowingo Dams in Peach Bottom Township, York County, Pennsylvania. The initial loading of fuel into Unit 1, a 40 MWe (net) high temperature, gas-cooled reactor, began on 5 February 1966, and initial criticality was achieved on 3 March 1966. Shutdown of Peach Bottom Unit 1 for decommissioning was on 31 October 1974. For the purposes of the monitoring program, the beginning of the operational period for Unit 1 was considered to be 5 February 1966. A summary of the Unit 1 preoperational monitoring program was presented in a previous report [1]. PBAPS Units 2 and 3 are boiling water reactors, each with a power output of approximately 1159 MWe. The first fuel was loaded into Peach Bottom Unit 2 on 9 August 1973. Criticality was achieved on 16 September 1973, and full power was reached on 16 June 1974. The first fuel was loaded into Peach Bottom Unit 3 on 5 July 1974. Criticality was achieved on 7 August 1974, and full power was first reached on 21 December 1974. Preoperational summary reports [2][3] for Units 2 and 3 have been previously issued and summarize the results of all analyses performed on samples collected from 5 February 1966 through 8 August 1973.

A. Objectives

The objectives of the REMP are:

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

2. To monitor and evaluate ambient radiation levels

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

B. Implementation

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

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

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

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

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

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

5. Ambient gamma radiation levels at various site environs.

III. Program Description

A. Sample Collection

This section describes the collection methods used to obtain environmental samples for the PBAPS REMP in 2000. Normandeau Associates, RMC Environmental Services Division, collected samples for the PBAPS REMP for PECO. Sample locations and descriptions can be found in Table B-1 and Figures B-1 through B-3, Appendix B.

Aquatic Environment

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

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

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

Atmospheric Environment

The atmospheric environment was examined by analyzing airborne and terrestrial samples. These consisted of air particulates, airborne iodine, and milk. Air particulate and air iodine samples were collected and analyzed weekly from five locations (1B, 1Z, 1C, 3A, and 5H2). The control location was 5H2. Air samples were obtained using a vacuum sampler, glass fiber and charcoal filters, respectively. The filters were replaced weekly and sent to the laboratory for analysis. The vacuum samplers were run continuously at approximately 1 cubic foot per minute.

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

Ambient Gamma Radiation

Direct radiation measurements were made using Panasonic 801 and 814 calcium sulfate ($CaSO_4$) thermoluminescent dosimeters (TLD). The TLD locations were placed on and around the PBAPS site as follows:

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

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

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

The specific TLD locations were determined by the following criteria:

1. The presence of relatively dense population;

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

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

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

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

B. Data Interpretation

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

1. Lower Limit of Detection and Minimum Detectable Activity

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

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

2. Net Activity Calculation and Reporting of Results

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

Gamma spectroscopy results for each type of sample were grouped as follows:

For surface and drinking eleven nuclides, Mn–54, Co–58, Fe–59, Co–60, Zn–65, Zr–95, Nm–95, Cs–134, Cs–137, Ba–140, and La–140 were reported.

For fish seven nuclides, Mn–54, Co–58, Fe–59, Co–60, Zn–65, Cs–134, and Cs–137 were reported.

For sediment five nuclides, K-40, Co–58, Co–60, Cs–134, and Cs–137 were reported.

For air particulate six nuclides, Be–7, Mn–54, Co–58, Co–60, Cs–134, and Cs–137 were reported.

For milk five nuclides, K-40 , Cs–134, Cs–137, Ba–140, and La–140 were reported.

Means and standard deviations of the results were calculated. The standard deviations represent the variability of measured results for different samples rather than single analysis uncertainty.

C. Program Exceptions

For 2000 the PBAPS REMP had a sample collection recovery rate of better than 99%. The exceptions to this program are listed below:

1. Drinking water sampler at location 4L was out of service for the following dates: 07/07/2000 to 07/14/2000 due to equipment problems. A weekly grab sample was taken.

2. Surface water sampler at locations 1MM was out of service for the following dates: 01/10/2000 to 02/14/2000 due to a frozen sample line, from 05/24/2000 to 05/26/2000 due to clogged line.

3. Air particulate and air iodine samples from location 3A were not available for the period 07/14/2000 to 07/21/2000 due to a blown fuse.

4. The August QC drinking water sample for Location 4L was lost in shipment to the QC subcontract laboratory. As a result no gross beta results were available.

5. The October QC drinking water sample for Location 4L was lost by the subcontract laboratory after completing the gross beta analyses. As a result no gamma spectroscopy results were available.

6. The following samples processed by TBE, the QC laboratory, did not meet the LLDs required by Table 4.8.E.2 of the Peach Bottom ODCM:

   a. Drinking water - 4L, April, Ba-140 and La-140

   b. Drinking water – 4L, July Fe-59, Nb-95, Ba-140 and La-140

   c. Drinking water – 4L, September, Ba-140 and La-140

   d. Drinking water – 4L, November, Nb-95

   The LLDs were missed because samples were not processed in a timely manner. See D.3 below

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

1. The AmerGen ERL discontinued laboratory operations beginning fourth quarter. Environmental, Inc. located outside of Chicago, became the primary laboratory.

2. TLD processing was transferred from ERL to ICN located in California.

3. Teledyne Brown Engineering relocated its operations from Westwood, NJ to Knoxville, TN. As a result samples sent to them were transferred to Environmental, Inc., for processing.

4. Commencing with the fourth quarter, Environmental, Inc., reported results as a "less than" when ever positive activity was below the MDA.

IV. Results and Discussion

A. Aquatic Environment

1. Surface Water

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

Tritium

Samples from both locations were analyzed for concentrations of tritium (Table C-I.1, Appendix C). Results ranged from -11 to < 127 pCi/l and averaged 64 pCi/l at the control location and 83 pCi/l at the indicator location. Concentrations found were lower than those observed during the preoperational period.

Gamma Spectrometry

Samples from both locations were analyzed for concentrations of gamma emitters (Table C-I.2, Appendix C). No statistically significant fission or activation products were found.

2. Drinking (Potable) Water

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

Gross Beta

Samples from both locations were analyzed for concentrations of gross beta activity in insoluble and soluble fractions (Tables C-II.1 and C-II.2 and Figures C-1 and C-2, Appendix C). Gross beta activity in the insoluble fraction ranged from –1.6 to < 1.9 pCi/l. The values in the soluble fraction ranged from 1.1 to 3.6 pCi/l. No differences were observed between the means of the control and indicator stations. The values were generally below those seen in the preoperational period.

Tritium

Samples from both locations were analyzed for tritium quarterly (Table C-II.3, Appendix C). The values for the indicator location (4L) ranged

from 69 to < 127 pCi/l with a mean of 92 pCi/l. Control location (6I) values ranged from 49 to < 127 pCi/l with a mean of 90 pCi/l. The concentrations found were lower than those observed during the preoperational period.

Gamma Spectrometry

Samples from both locations were analyzed for concentrations of gamma emitters (Table C-II.4, Appendix C). No statistically significant fission or activation products were found.

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

No statistically significant fission or activation products were found (Table C-III.1, Appendix C). Figure C-3 illustrates the Cs-137 activity for indicator and control locations from the beginning of the operational period through the present. Cesium-137 activity has declined to non-detectable levels.

4. Sediment

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

Gamma Spectrometry

Samples from all locations were analyzed for concentrations of gamma emitters (Table C-IV.1, Appendix C). Statistically significant activity for naturally occurring K-40 was found at all locations. K-40 results ranged from 9,866 to 24,000 pCi/kg (dry).

Statistically significant activity for Cs-137 was found at all locations with a mean value of 127 pCi/kg (dry) for the indicator locations and 69 pCi/kg (dry) for the control location. Statistically significant activity for Co-60 was found at Location 4J located immediately downstream of the discharge. Co-60 averaged 51 pCi/kg (dry). The maximum calculated dose from this pathway to a teenager's skin was 1.04 E-03 mrem/yr. This value is based upon the assumption the maximum concentrations of Co-60 and Cs-137 at the downstream location (4J)

was present the entire year. This dose represents 0.005% of the allowable fraction of 10 CFR 50, Appendix I limits. Results found were consistent with those from previous years. Figure C-4, Appendix C illustrates the comparison of activities of Cs-137 detected at the control location and indicator locations from the preoperational period through the present.

B. Atmospheric Environment

1. Airborne

a. Air Particulates

Samples were collected from five locations (1B, 1Z, 1C, 3A, and 5H2). Control location was 5H2. The following analyses were performed.

Gross Beta

Samples from all locations were analyzed for concentrations of gross beta (Tables C-V.1 and C-V.2 and Figures C-5 and C-6, Appendix C). Air particulate locations were divided into three groups: Group I, consisting of 1B, 1Z, and 1C, located on PBAPS site; Group II, comprised of 3A, located at an intermediate distance from PBAPS; and Group III, consisting of 5H2, located at a remote distance from PBAPS. Comparison of results among these three groups aid in determining the effects, if any, resulting from the operation of PBAPS. The results from site location samples ranged from 4 E-3 to 44 E-3 pCi/m^3, with a mean of 17 E-3 pCi/m^3. The results from intermediate distance location ranged from 5 E-3 to 43 E-3 pCi/m^3, with a mean of 18 E-3 pCi/m^3. The results from the distant location ranged from 3 E-3 to 39 E-3 pCi/m^3, with a mean of 16 E-3 pCi/m^3. Comparison of the values indicates no notable difference among the three groups suggesting no effects from the operation of PBAPS (Figure C-5, Appendix C). However, An increase in gross beta activity was observed starting in the fourth quarter. Initially, it was thought that this activity was due to the processing of samples by another laboratory (program was moved at this time). However, this phenomenon has been observed at other plants that have their samples processed by a different laboratory.

Gamma Spectrometry

Weekly samples from five locations (1B, 1Z, 1C, 3A, and 5H2) were composited and analyzed quarterly for the presence of gamma emitters (Table C-V.3). Naturally occurring Be-7 was found in all samples with activity values similar to those from the preoperational years. No statistically significant activation or fission products were detected.

b. Airborne Iodine

Continuous air samples were collected weekly at five locations (1B, 1Z, 1C, 3A, and 5H2) and analyzed for I-131 (Table C-VI.1, Appendix C). All results were less than the minimum detectable activity.

2. Terrestrial

a. Milk

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

Iodine-131

Samples from all locations were analyzed for concentrations of I-131 (Tables C-VII.1, Appendix C). All results were less than the minimum detectable activity.

Gamma Spectrometry

Samples from five locations were analyzed quarterly for concentrations for gamma emitters (Table C-VII.2, Appendix C). Naturally occurring K-40 was found in all samples with values ranging from 1,360 to 1,700 pCi/l. All other nuclides searched for were less than the minimum detectable activity. Figure C-7 (Appendix C) illustrates the Cs-137 activity in milk from the beginning of the operational period through the present. Cesium-137 activity has declined to non-detectable levels.

C. Ambient Gamma Radiation

Ambient gamma radiation levels were measured quarterly at forty-six locations (as described in the program description section) using Panasonic 801 and 814 ($CaSO_4$) thermoluminescent dosimeters. Panasonic 814 badges were used beginning the fourth quarter. Each 814 badge has three $CaSO_4$ phosphors. The 802 badge has only two $CaSO_4$ phosphors. All TLD readings were below 10 mR/std. month with a range of 2.9 to 7.6 mR/std. Month (Tables C-VIII.1 through C-VIII.3 and Figures C-8 and C-9, Appendix C). No notable differences were observed between the site, intermediate, and distant TLD groupings.

VI. References

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

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

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

APPENDIX A

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT SUMMARY

APPENDIX A
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY

NAME OF FACILITY: PEACH BOTTOM ATOMIC POWER STATION DOCKET NUMBER: 50-277 & 50-278
LOCATION OF FACILITY: YORK COUNTY, PA REPORTING PERIOD: 2000

MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	TYPE OF ANALYSES PERFORMED	NUMBER OF ANALYSES PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (LLD) MEASUREMENTS	INDICATOR LOCATIONS MEAN (F) RANGE	CONTROL LOCATION MEAN (F) RANGE	LOCATION WITH HIGHEST ANNUAL MEAN MEAN (F) RANGE	LOCATION WITH HIGHEST ANNUAL MEAN STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED
SURFACE WATER (PCI/LITER)	TRITIUM	8	2000	83 (4/4) (37/116)	64 (4/4) (-11/127)	83 (4/4) (37/116)	1MM (INDICATOR) CANAL DISCHARGE 1.04 MILES SE OF SITE	0
	GAMMA	24						
	MN-54		15	0.6 (12/12) (-0.8/3.3)	0.5 (12/12) (-0.6/2.8)	0.6 (12/12) (-0.8/3.3)	1MM (INDICATOR) CANAL DISCHARGE 1.04 MILES SE OF SITE	0
	CO-58		15	0.4 (12/12) (-1.3/4.8)	0.4 (12/12) (-1.4/2.8)	0.4 (12/12) (-1.3/4.8)	1MM (INDICATOR) CANAL DISCHARGE 1.04 MILES SE OF SITE	0
	CO-60		15	0.7 (12/12) (-0.9/4.1)	0.6 (12/12) (-0.6/2.5)	0.7 (12/12) (-0.9/4.1)	1MM (INDICATOR) CANAL DISCHARGE 1.04 MILES SE OF SITE	0
	FE-59		30	2.2 (12/12) (-0.7/7.6)	1.7 (12/12) (-0.8/9.3)	2.2 (12/12) (-0.7/7.6)	1MM (INDICATOR) CANAL DISCHARGE 1.04 MILES SE OF SITE	0
	ZN-65		30	-1.3 (12/12) (-6/4.8)	-0.9 (12/12) (-5/5.3)	-0.9 (12/12) (-5/5.3)	1LL (CONTROL) UNITS 2 & 3 INTAKE 0.24 MILES ENE OF SITE	0
	ZR-95		15	1.1 (12/12) (-1.8/6.1)	1.8 (12/12) (-1.1/6.9)	1.8 (12/12) (-1.1/6.9)	1LL (CONTROL) UNITS 2 & 3 INTAKE 0.24 MILES ENE OF SITE	0
	NB-95		15	0.9 (12/12) (-1.7/4.5)	0.6 (12/12) (-1.8/3.5)	0.9 (12/12) (-1.7/4.5)	1MM (INDICATOR) CANAL DISCHARGE 1.04 MILES SE OF SITE	0
	CS-134		15	-3.0 (12/12) (-8/2.7)	-3 (12/12) (-9/2.9)	-3.0 (12/12) (-8/2.7)	1MM (INDICATOR) CANAL DISCHARGE 1.04 MILES SE OF SITE	0
	CS-137		18	0.4 (12/12) (-1/4.4)	1.0 (12/12) (-0.3/4.5)	1.0 (12/12) (-0.3/4.5)	1LL (CONTROL) UNITS 2 & 3 INTAKE 0.24 MILES ENE OF SITE	0

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

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	BA-140		60	6.0 (12/12) (-3/29)	4.7 (12/12) (-2.2/29)	6.0 (12/12) (-3/29)	1MM (INDICATOR) CANAL DISCHARGE 1.04 MILES SE OF SITE	0
	LA-140		15	1.2 (12/12) (-1.1/6.7)	1.5 (12/12) (-0.5/7.2)	1.5 (12/12) (-0.5/7.2)	1LL (CONTROL) UNITS 2 & 3 INTAKE 0.24 MILES ENE OF SITE	0
DRINKING WATER (PCI/LITER)	GROSS BETA SOLUBLE	24	4	2.2 (12/12) (1.1/3.6)	2.1 (12/12) (1.1/3.4)	2.2 (12/12) (1.1/3.6)	4L (INDICATOR) CONOWINGO DAM EL 33FT. 8.66 MILES SE OF SITE	0
	GROSS BETA INSOLUBLE	24	4	0.3 (12/12) (-1.3/1.9)	0.2 (12/12) (-1.6/1.7)	0.3 (12/12) (-1.3/1.9)	4L (INDICATOR) CONOWINGO DAM EL 33FT. 8.66 MILES SE OF SITE	0
	TRITIUM	8	2000	92 (4/4) (69/127)	90 (4/4) (49/127)	92 (4/4) (69/127)	4L (INDICATOR) CONOWINGO DAM EL 33FT. 8.66 MILES SE OF SITE	0
	GAMMA MN-54	24	15	0.6 (12/12) (-0.9/3.5)	0.5 (12/12) (-1/2.8)	0.6 (12/12) (-0.9/3.5)	4L (INDICATOR) CONOWINGO DAM EL 33FT. 8.66 MILES SE OF SITE	0
	CO-58		15	0.5 (12/12) (-0.9/3)	0.4 (12/12) (-1/2.7)	0.5 (12/12) (-0.9/3)	4L (INDICATOR) CONOWINGO DAM EL 33FT. 8.66 MILES SE OF SITE	0
	CO-60		15	0.5 (12/12) (-1.4/3.2)	0.2 (12/12) (-1.0/1.9)	0.5 (12/12) (-1.4/3.2)	4L (INDICATOR) CONOWINGO DAM EL 33FT. 8.66 MILES SE OF SITE	0
	FE-59		30	1.9 (12/12) (-0.8/7)	1.3 (12/12) (-0.6/4)	1.9 (12/12) (-0.8/7)	4L (INDICATOR) CONOWINGO DAM EL 33FT. 8.66 MILES SE OF SITE	0

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

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LOCATION OF FACILITY: YORK COUNTY, PA REPORTING PERIOD: 2000

MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	TYPE OF ANALYSES PERFORMED	NUMBER OF ANALYSES PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (LLD) MEASUREMENTS	INDICATOR LOCATIONS MEAN (F) RANGE	CONTROL LOCATION MEAN (F) RANGE	LOCATION WITH HIGHEST ANNUAL MEAN MEAN (F) RANGE	STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED
	ZN-65		30	-0.8 (12/12) (-5/7.4)	-1.2 (12/12) (-6/3.2)	-0.8 (12/12) (-5/7.4)	4L (INDICATOR) CONOWINGO DAM EL 33FT. 8.66 MILES SE OF SITE	0
	ZR-95		15	1.3 (12/12) (-1.8/7.9)	1.4 (12/12) (-1.4/6.7)	1.4 (12/12) (-1.4/6.7)	6I (CONTROL) HOLTWOOD STATION INTAKE 5.74 MILES NW OF SITE	0
	NB-95		15	0.3 (12/12) (-1.7/3.5)	0.7 (12/12) (-0.8/3)	0.7 (12/12) (-0.8/3)	6I (CONTROL) HOLTWOOD STATION INTAKE 5.74 MILES NW OF SITE	0
	CS-134		15	-2.5 (12/12) (-8/3.5)	-2.2 (12/12) (-11/3.8)	-2.2 (12/12) (-11/3.8)	6I (CONTROL) HOLTWOOD STATION INTAKE 5.74 MILES NW OF SITE	0
	CS-137		18	0.7 (12/12) (-0.1/2.6)	0.7 (12/12) (-0.7/3.1)	0.7 (12/12) (-0.7/3.1)	6I (CONTROL) HOLTWOOD STATION INTAKE 5.74 MILES NW OF SITE	0
	BA-140		60	2.7 (12/12) (-6/12)	4.0 (12/12) (-6/19)	4.0 (12/12) (-6/19)	6I (CONTROL) HOLTWOOD STATION INTAKE 5.74 MILES NW OF SITE	0
	LA-140		15	0.8 (12/12) (-2.3/5.1)	-0.1 (12/12) (-4/2.6)	0.8 (12/12) (-2.3/5.1)	4L (INDICATOR) CONOWINGO DAM EL 33FT. 8.66 MILES SE OF SITE	0
BOTTOM FEEDER (FISH) (PCI/KG WET)	GAMMA	4						
	MN-54		130	3.7 (2/2) (-0.7/8.1)	3.6 (2/2) (0.1/7.1)	3.7 (2/2) (-0.7/8.1)	4 (INDICATOR) CONOWINGO POND BELOW DISCHARGE CONOWINGO POND - BELOW DISCHARGE	0
	CO-58		130	0.7 (2/2) (-10/11)	1.9 (2/2) (-1.2/5)	1.9 (2/2) (-1.2/5)	6 (CONTROL) HOLTWOOD POND HOLTWOOD POND	0
	CO-60		130	6.7 (2/2) (1.3/12)	4.1 (2/2) (2.3/5.9)	6.7 (2/2) (1.3/12)	4 (INDICATOR) CONOWINGO POND BELOW DISCHARGE CONOWINGO POND - BELOW DISCHARGE	0

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

APPENDIX A
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY

NAME OF FACILITY: PEACH BOTTOM ATOMIC POWER STATION
LOCATION OF FACILITY: YORK COUNTY, PA
DOCKET NUMBER: 50-277 & 50-278
REPORTING PERIOD: 2000

MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	TYPE OF ANALYSES PERFORMED	NUMBER OF ANALYSES PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (LLD) MEASUREMENTS	INDICATOR LOCATIONS MEAN (F) RANGE	CONTROL LOCATION MEAN (F) RANGE	LOCATION WITH HIGHEST ANNUAL MEAN MEAN (F) RANGE	STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED
	FE-59		260	3.9 (2/2) (-5/13)	11 (2/2) (1.7/20)	11 (2/2) (1.7/20)	6 (CONTROL) HOLTWOOD POND HOLTWOOD POND	0
	ZN-65		260	-6 (2/2) (-24/12)	0.4 (2/2) (-17/18)	0.4 (2/2) (-17/18)	6 (CONTROL) HOLTWOOD POND HOLTWOOD POND	0
	CS-134		130	8.4 (2/2) (4.5/12)	5.1 (2/2) (1.3/8.8)	8.4 (2/2) (4.5/12)	4 (INDICATOR) CONOWINGO POND BELOW DISCHARGE CONOWINGO POND - BELOW DISCHARGE	0
	CS-137		150	5.7 (2/2) (3.3/8)	4.7 (2/2) (3.5/5.9)	5.7 (2/2) (3.3/8)	4 (INDICATOR) CONOWINGO POND BELOW DISCHARGE CONOWINGO POND - BELOW DISCHARGE	0
PREDATOR (FISH) (PCI/KG WET)	GAMMA	4						
	MN-54		130	1.3 (2/2) (-1.6/4.2)	1 (2/2) (-5/7.4)	1.3 (2/2) (-1.6/4.2)	4 (INDICATOR) CONOWINGO POND BELOW DISCHARGE CONOWINGO POND - BELOW DISCHARGE	0
	CO-58		130	6.0 (2/2) (4.8/7.1)	2.6 (2/2) (0.9/4.3)	6.0 (2/2) (4.8/7.1)	4 (INDICATOR) CONOWINGO POND BELOW DISCHARGE CONOWINGO POND - BELOW DISCHARGE	0
	CO-60		130	4.7 (2/2) (1.4/7.9)	-0.3 (2/2) (-3/2.9)	4.7 (2/2) (1.4/7.9)	4 (INDICATOR) CONOWINGO POND BELOW DISCHARGE CONOWINGO POND - BELOW DISCHARGE	0
	FE-59		260	5.4 (2/2) (0.5/10)	8.0 (2/2) (-4/20)	8.0 (2/2) (-4/20)	6 (CONTROL) HOLTWOOD POND HOLTWOOD POND	0
	ZN-65		260	3.7 (2/2) (-5/13)	0.7 (2/2) (-10/11)	3.7 (2/2) (-5/13)	4 (INDICATOR) CONOWINGO POND BELOW DISCHARGE CONOWINGO POND - BELOW DISCHARGE	0

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

APPENDIX A
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY

NAME OF FACILITY: PEACH BOTTOM ATOMIC POWER STATION DOCKET NUMBER: 50-277 & 50-278
LOCATION OF FACILITY: YORK COUNTY, PA REPORTING PERIOD: 2000

MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	TYPE OF ANALYSES PERFORMED	NUMBER OF ANALYSES PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (LLD) MEASUREMENTS	INDICATOR LOCATIONS MEAN (F) RANGE	CONTROL LOCATION MEAN (F) RANGE	LOCATION WITH HIGHEST ANNUAL MEAN MEAN (F) RANGE	STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED
	CS-134		130	3.3 (2/2) (0.6/5.9)	1.8 (2/2) (-2/5.6)	3.3 (2/2) (0.6/5.9)	4 (INDICATOR) CONOWINGO POND BELOW DISCHARGE CONOWINGO POND - BELOW DISCHARGE	0
	CS-137		150	2.6 (2/2) (-0.8/6)	2.8 (2/2) (-0.1/5.8)	2.8 (2/2) (-0.1/5.8)	6 (CONTROL) HOLTWOOD POND HOLTWOOD POND	0
SILT (PCI/KG DRY)	GAMMA K-40	6	N/A	16789 (4/4) (9866/24000)	11112 (2/2) (10223/12000)	24000 (1/1) (24000/24000)	4T (INDICATOR) CONOWINGO POND NEAR CONOWINGO DAM 7.92 MILES SE OF SITE	0
	CO-58		N/A	20 (4/4) (-5/33)	6.9 (2/2) (-17/31)	33 (1/1) (33/33)	4T (INDICATOR) CONOWINGO POND NEAR CONOWINGO DAM 7.92 MILES SE OF SITE	0
	CO-60		N/A	34 (4/4) (-1.3/77)	5.9 (2/2) (-15/27)	77 (1/1) (77/77)	4J (INDICATOR) CONOWINGO POND NET TRAP 15 1.39 MILES SE OF SITE	0
	CS-134		N/A	17 (4/4) (-8/44)	21 (2/2) (-2/44)	44 (1/1) (44/44)	4T (INDICATOR) CONOWINGO POND NEAR CONOWINGO DAM 7.92 MILES SE OF SITE	0
	CS-137		N/A	127 (4/4) (47/200)	69 (2/2) (49/88)	200 (1/1) (200/200)	4T (INDICATOR) CONOWINGO POND NEAR CONOWINGO DAM 7.92 MILES SE OF SITE	0
AIR PARTICULATE (E-3 PCI/CU. METER)	GROSS BETA	259	10	17 (207/207) (4.4/44)	16 (52/52) (3/39)	18 (52/52) (4.4/44)	1B (INDICATOR) WEATHER STATION NO.2 0.49 MILES NW OF SITE	0
	GAMMA BE-7	20	N/A	58 (16/16) (44/75)	54 (4/4) (44/65)	62 (4/4) (45/75)	1B (INDICATOR) WEATHER STATION NO.2 0.49 MILES NW OF SITE	0

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

APPENDIX A
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY

NAME OF FACILITY: PEACH BOTTOM ATOMIC POWER STATION
LOCATION OF FACILITY: YORK COUNTY, PA
DOCKET NUMBER: 50-277 & 50-278
REPORTING PERIOD: 2000

MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	TYPE OF ANALYSES PERFORMED	NUMBER OF ANALYSES PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (LLD) MEASUREMENTS	INDICATOR LOCATIONS MEAN (F) RANGE	CONTROL LOCATION MEAN (F) RANGE	LOCATION WITH HIGHEST ANNUAL MEAN MEAN (F) RANGE	LOCATION WITH HIGHEST ANNUAL MEAN STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED
	MN-54		N/A	0.2 (16/16) (-1.3/1.4)	0.1 (4/4) (-0.6/1)	0.5 (4/4) (0.1/1)	1B (INDICATOR) WEATHER STATION NO.2 0.49 MILES NW OF SITE	0
	CO-58		N/A	0.2 (16/16) (-0.6/1.1)	0.3 (4/4) (-0.3/0.7)	0.4 (4/4) (0.1/1)	1B (INDICATOR) WEATHER STATION NO.2 0.49 MILES NW OF SITE	0
	CO-60		N/A	0.2 (16/16) (-0.6/1)	0.1 (4/4) (-0.3/0.5)	0.4 (4/4) (0.2/0.6)	1B (INDICATOR) WEATHER STATION NO.2 0.49 MILES NW OF SITE	0
	CS-134		50	0.0 (16/16) (-3/1.4)	-0.2 (4/4) (-1.2/0.7)	0.4 (4/4) (0.1/0.7)	1Z (INDICATOR) WEATHER STATION 1 0.26 MILES SE OF SITE	0
	CS-137		60	0.3 (16/16) (-0.6/0.8)	0.2 (4/4) (-0.3/0.9)	0.4 (4/4) (0.0/0.8)	1B (INDICATOR) WEATHER STATION NO.2 0.49 MILES NW OF SITE	0
AIR IODINE (E-3 PCI/CU. METER)	I-131	259	70	4.3 (207/207) (-20/22)	3.4 (52/52) (-8/17)	6.0 (51/51) (-10/22)	3A (INDICATOR) DELTA, PA SUBSTATION 3.62 MILES SW OF SITE	0
MILK (PCI/LITER)	I-131	108	1	0.1 (75/75) (-0.3/0.5)	0.1 (33/33) (-0.2/0.5)	0.1 (4/4) (-0.1/0.5)	E (CONTROL) DISTANCE FARM E 8.74 MILES N OF SITE	0
	GAMMA K-40	16	N/A	1459 (12/12) (1360/1700)	1451 (4/4) (1400/1505)	1517 (4/4) (1369/1700)	J (INDICATOR) NEARBY FARM J 0.97 MILES W OF SITE	0
	CS-134		15	-2.0 (12/12) (-13/4.6)	-0.9 (4/4) (-7/3.8)	-0.4 (4/4) (-1.7/2.8)	R (INDICATOR) NEARBY FARM R 0.76 MILES WSW OF SITE	0
	CS-137		18	1.4 (12/12) (-0.3/5.3)	0.5 (4/4) (-0.9/3.6)	1.5 (4/4) (-0.3/5.3)	J (INDICATOR) NEARBY FARM J 0.97 MILES W OF SITE	0

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

APPENDIX A
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY

NAME OF FACILITY: PEACH BOTTOM ATOMIC POWER STATION DOCKET NUMBER: 50-277 & 50-278
LOCATION OF FACILITY: YORK COUNTY, PA REPORTING PERIOD: 2000

MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	TYPE OF ANALYSES PERFORMED	NUMBER OF ANALYSES PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (LLD)	INDICATOR LOCATIONS MEAN (F) RANGE	CONTROL LOCATION MEAN (F) RANGE	LOCATION WITH HIGHEST ANNUAL MEAN MEAN (F) RANGE	LOCATION WITH HIGHEST ANNUAL MEAN STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED
	BA-140		60	3.4 (12/12) (-4/16)	3.3 (4/4) (-0.1/12)	5.7 (4/4) (-0.3/16)	J (INDICATOR) NEARBY FARM J 0.97 MILES W OF SITE	0
	LA-140		15	0.8 (12/12) (-0.5/3.2)	0.4 (4/4) (-1.3/3.1)	1.0 (4/4) (0.0/3.1)	J (INDICATOR) NEARBY FARM J 0.97 MILES W OF SITE	0
DIRECT RADIATION (MILLI-ROENTGEN/STD. MO.)	TLD-QUARTERLY	184	N/A	5.6 (168/168) (2.9/7.6)	5.7 (16/16) (4.2/6.7)	7.1 (4/4) (6.6/7.6)	50 (INDICATOR) TRANSCO PUMPING STATION 4.99 MILES W OF SITE	0

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

APPENDIX B

SAMPLE DESIGNATION AND LOCATIONS

APPENDIX B: SAMPLE DESIGNATION AND LOCATIONS

LIST OF TABLES AND FIGURES

TABLES

FIGURES

TABLE B-1: Sample Collection and Analysis Program for the Radiological Environmental Monitoring Program for Peach Bottom Atomic Power Station, 2000

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

TABLE B-1: Sample Collection and Analysis Program for the Radiological Environmental Monitoring Program for Peach Bottom Atomic Power Station, 2000

Location	Location Description	Distance & Direction from PBAPS Vents	Collection Method and Frequency	Analysis & Frequency Performed—Consultant
D. Sediment				
4J	Conowingo Pond near Berkin's Run	1.39 miles SE	Recently deposited sediment collected below the waterline, semi-annually	Gamma Spec - semiannually - Primary
4T	Conowingo Pond near Conowingo Dam	7.92 miles SE	Same as location 4D	Gamma Spec - semiannually - Primary
6F	Holtwood Dam (Control)	5.96 miles NW	Same as location 4D	Gamma Spec - semiannually - Primary
E. Air Particulate - Air Iodine				
1B	Weather Station #2	0.49 miles NW	About 1 cfm continuous flow through glass fiber and charcoal filters (approx. 2" diameter} which are installed for a week and replaced	Gross beta - weekly - Primary Gamma Spec - quarterly - Primary I-131 - weekly – Primary
1Z	Weather Station #1	0.26 miles SE	Same as location 1B	Gross beta - weekly - Primary Gamma Spec - quarterly - Primary I-131 - weekly – Primary
1A	Weather Station #1	0.26 miles SE	Same as location 1B	Gross beta - weekly - Primary Gamma Spec - quarterly - Primary I-131 - weekly – Primary Gross beta - weekly - QC Gamma Spec - quarterly - QC
1C	Peach Bottom South Sub Station	0.85 miles SSE	Same as location 1B	Gross beta - weekly - Primary Gamma Spec - quarterly - Primary I-131 - weekly – Primary
3A	Delta, PA - Substation	3.62 miles SW	Same as location 1B	Gross beta - weekly - Primary Gamma Spec - quarterly - Primary I-131 - weekly – Primary

TABLE B-1: Sample Collection and Analysis Program for the Radiological Environmental Monitoring Program for Peach Bottom Atomic Power Station, 2000

Location	Location Description	Distance & Direction from PBAPS Vents	Collection Method and Frequency	Analysis & Frequency Performed—Consultant
5H2	Manor Substation	30.79 miles NE	Same as location 1B	Gross beta - weekly - Primary Gamma Spec - quarterly - Primary I-131 - weekly – Primary
F. Milk				
A	(Control)	5.78 miles WSW	Two gallon grab sample is collected at each farm from a bulk tank containing milk biweekly while cows are on pasture, monthly other times	I-131 - biweekly, monthly* - Primary Gamma Spec - quarterly - Primary I-131 - quarterly - QC Gamma Spec - quarterly - QC
B	(Control)	10.58 miles S	Same as Farm A	I-131 - quarterly – Primary
C	(Control)	9.54 miles NW	Same as Farm A	I-131 - quarterly – Primary
D		3.51 miles NE	Same as Farm A	I-131 - quarterly – Primary
E	(Control)	8.74 miles N	Same as Farm A	I-131 - quarterly – Primary
J		0.97 miles W	Same as Farm A	I-131 - biweekly, monthly* - Primary Gamma Spec - quarterly - Primary I-131 - quarterly - QC Gamma Spec - quarterly - QC
L		2.12 miles NE	Same as Farm A	I-131 - quarterly – Primary
O		2.32 miles SW	Same as Farm A	I-131 - biweekly, monthly* - Primary Gamma Spec - quarterly - Primary I-131 - quarterly - QC Gamma Spec - quarterly - QC

TABLE B-1: Sample Collection and Analysis Program for the Radiological Environmental Monitoring Program for Peach Bottom Atomic Power Station, 2000

Location	Location Description	Distance & Direction from PBAPS Vents	Collection Method and Frequency	Analysis & Frequency Performed—Consultant
P		2.08 miles ENE	Same as Farm A	I-131 - quarterly – Primary
R		0.89 miles WSW	Same as Farm A	I-131 - biweekly, monthly* - Primary Gamma Spec - quarterly - Primary
S		3.61 miles ESE	Same as Farm A	I-131 - biweekly, monthly* - Primary Gamma Spec - quarterly - Primary
T		3.17 miles W	Same as Farm A	I-131 - quarterly - Primary
G. Environmental Dosimetry - TLD				
Site Boundary				
1L	Peach Bottom Unit 3 Intake	0.24 miles NE	Collection method and frequency is described in placement procedure Section III, A.	TLD - quarterly - ICN
1P	Tower B & C Fence	0.40 miles ESE		TLD - quarterly – ICN
1A	Weather Station #1	0.26 miles SE		TLD - quarterly – ICN
1Q	Tower D & E Fence	0.62 miles SE		TLD - quarterly – ICN
1D	140° Sector	0.67 miles SE		TLD - quarterly – ICN
2	Peach Bottom 130° Sector Hill	0.88 miles SE		TLD - quarterly - ICN
1M	Discharge	1.03 miles SE		TLD - quarterly - ICN
1R	Transmission Line Hill	0.53 miles SSE		TLD - quarterly - ICN

TABLE B-1: Sample Collection and Analysis Program for the Radiological Environmental Monitoring Program for Peach Bottom Atomic Power Station, 2000

Location	Location Description	Distance & Direction from PBAPS Vents	Collection Method and Frequency	Analysis & Frequency Performed—Consultant
1I	Peach Bottom South Substation	0.54 miles SSE		TLD - quarterly - ICN
2B	Burk Property	0.71 miles SSE		TLD - quarterly - ICN
1C	Peach Bottom South Substation	0.85 miles SSE		TLD - quarterly - ICN
1J	Peach Bottom 180° Sector Hill	0.71 miles S		TLD - quarterly - ICN
1F	Peach Bottom 200° Sector Hill	0.51 miles SSW		TLD - quarterly - ICN
40	Peach Bottom Site Area	1.46 miles SW		TLD - quarterly - ICN
1NN	Peach Bottom Site	0.48 miles WSW		TLD - quarterly - ICN
1H	Peach Bottom 270° Sector Hill	0.59 miles W		TLD - quarterly - ICN
1G	Peach Bottom North Substation	0.60 miles WNW		TLD - quarterly - ICN
1B	Weather Station #2	0.49 miles NW		TLD - quarterly - ICN
1E	Peach Bottom 350° Sector Hill	0.59 miles NNW		TLD - quarterly - ICN
Intermediate Distance				
15	Silver Spring Rd	3.68 miles N		TLD - quarterly - ICN
22	Eagle Road	2.39 miles NNE		TLD - quarterly - ICN
44	Goshen Mill Rd	5.07 miles NE		TLD - quarterly - ICN

TABLE B-1: Sample Collection and Analysis Program for the Radiological Environmental Monitoring Program for Peach Bottom Atomic Power Station, 2000

Location	Location Description	Distance & Direction from PBAPS Vents	Collection Method and Frequency	Analysis & Frequency Performed—Consultant
32	Slate Hill Rd	2.75 miles ENE		TLD - quarterly - ICN
45	PB-Keeney Line	3.38 miles ENE		TLD - quarterly - ICN
14	Peters Creek	1.97 miles E		TLD - quarterly - ICN
17	Riverview Rd	4.07 miles ESE		TLD - quarterly - ICN
31A	Eckman Rd	4.57 miles SE		TLD - quarterly - ICN
4K	Conowingo Dam Power House Roof	8.61 miles SE		TLD - quarterly - ICN
23	Peach Bottom 150° Sector Hill	1.01 miles SSE		TLD - quarterly - ICN
27	N. Cooper Road	2.68 miles S		TLD - quarterly - ICN
48	Macton Substation	4.99 miles SSW		TLD - quarterly - ICN
3A	Delta, PA Substation	3.62 miles SW		TLD - quarterly - ICN
49	PB-Conastone Line	4.05 miles WSW		TLD - quarterly - ICN
50	TRANSCO Pumping Station	4.99 miles W		TLD - quarterly - ICN
51	Fin Substation	3.98 miles WNW		TLD - quarterly - ICN
26	Slab Road	4.23 miles NW		TLD - quarterly - ICN
6B	Holtwood Dam Power House Roof	5.78 miles NW		TLD - quarterly - ICN

TABLE B-1: Sample Collection and Analysis Program for the Radiological Environmental Monitoring Program for Peach Bottom Atomic Power Station, 2000

Location	Location Description	Distance & Direction from PBAPS Vents	Collection Method and Frequency	Analysis & Frequency Performed—Consultant
42	Muddy Run Envir. Laboratory	4.13 miles NNW		TLD - quarterly - ICN
Distant and Special Interest				
43	Drumore Township School	5.00 miles NNE		TLD - quarterly - ICN
5	Wakefield, PA	4.64 miles E		TLD - quarterly - ICN
16	Nottingham, PA Substation (Control)	12.72 miles E		TLD - quarterly - ICN
24	Harrisville, MD Substation (Control)	10.91 miles ESE		TLD - quarterly - ICN
46	Broad Creek	4.48 miles SSE		TLD - quarterly - ICN
47	Broad Creek Scout Camp	4.26 miles S		TLD - quarterly - ICN
18	Fawn Grove, PA (Control)	9.86 miles W		TLD - quarterly - ICN
19	Red Lion, PA (Control)	20.21 miles WNW		TLD - quarterly - ICN

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

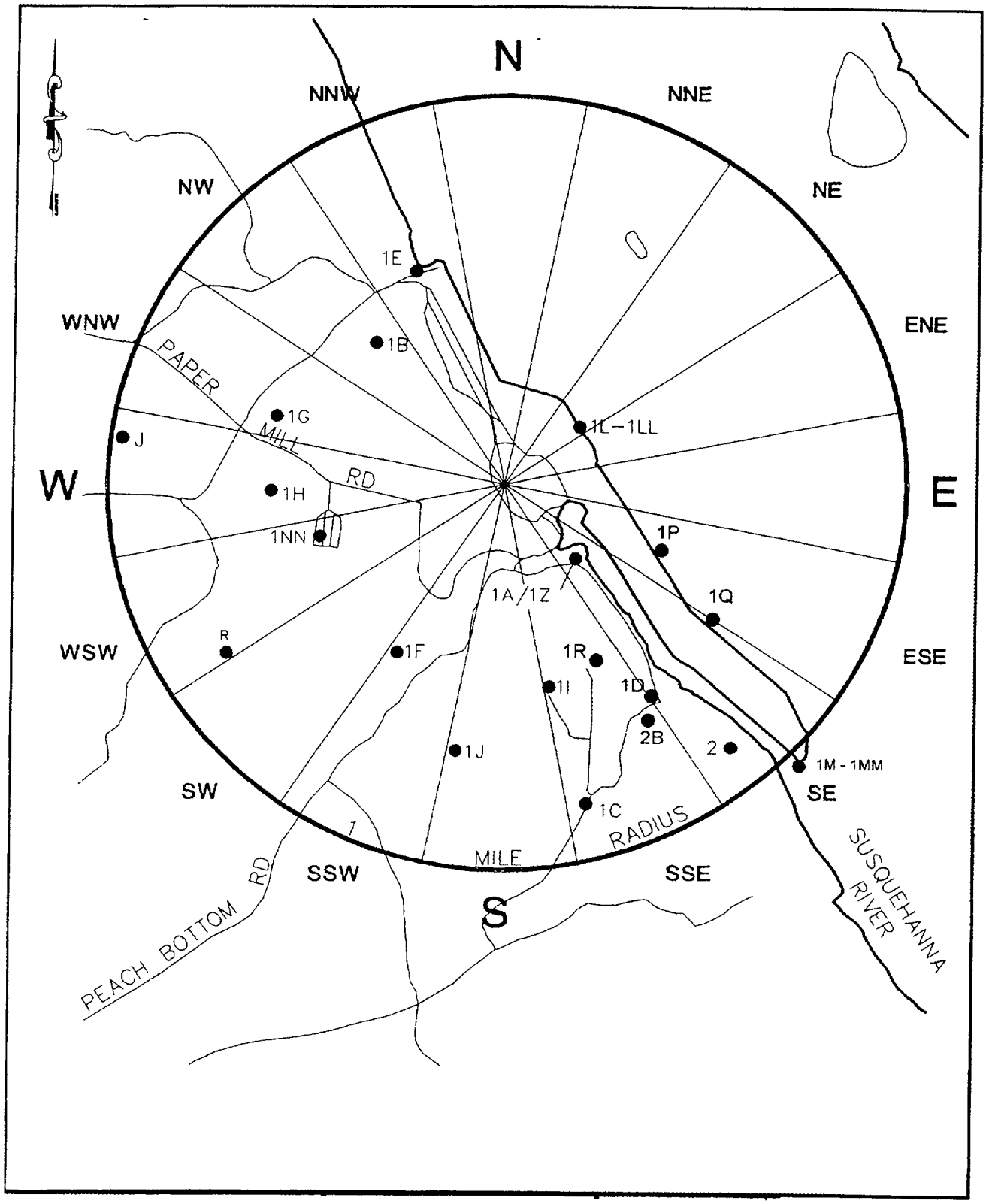


Figure B-1
Environmental Sampling Locations Within One
Mile of the Peach Bottom Atomic Power Station, 2000

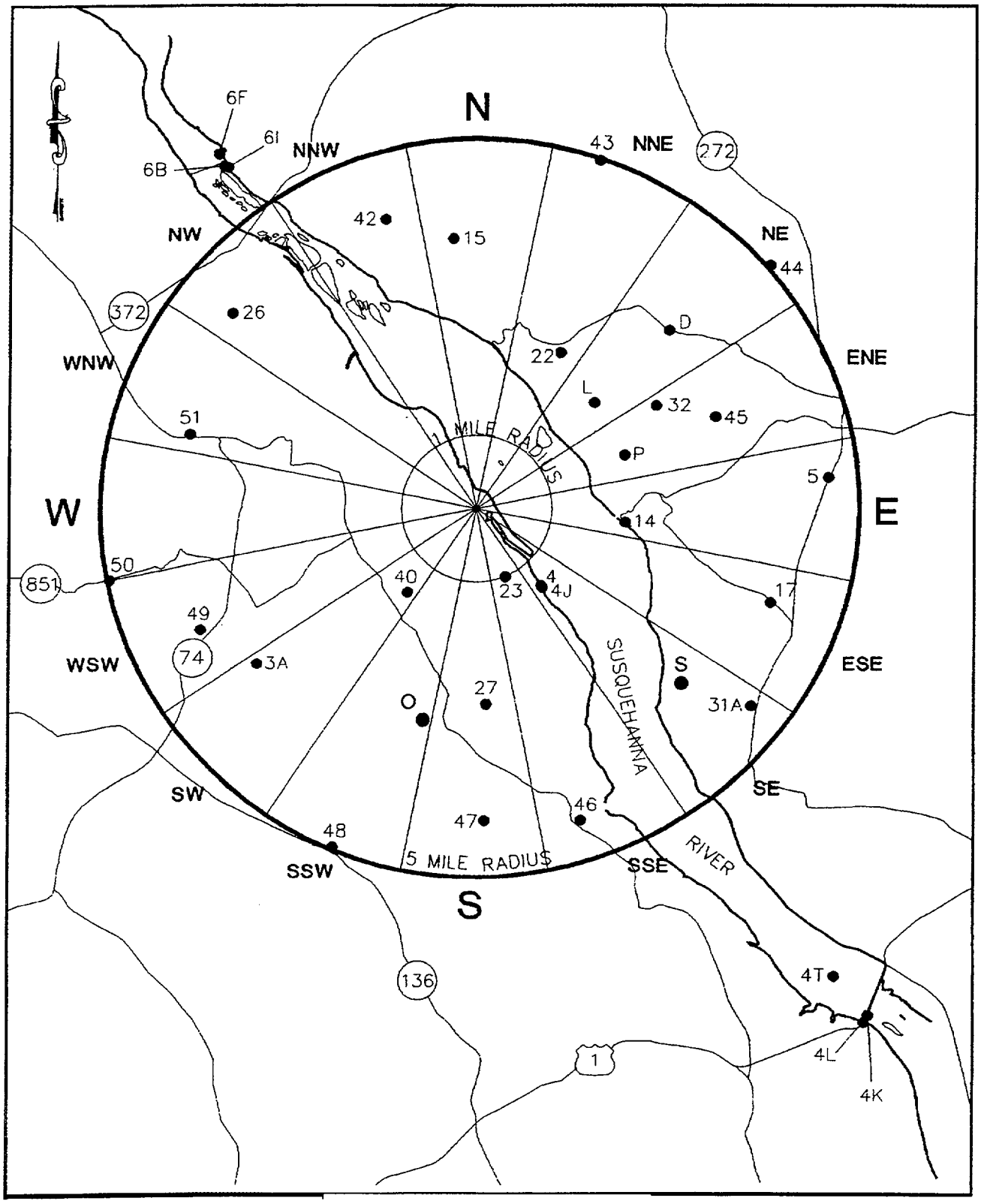


Figure B-2
Environmental Sampling Locations Between One and Approximately Five Miles of the Peach Bottom Atomic Power Station, 2000

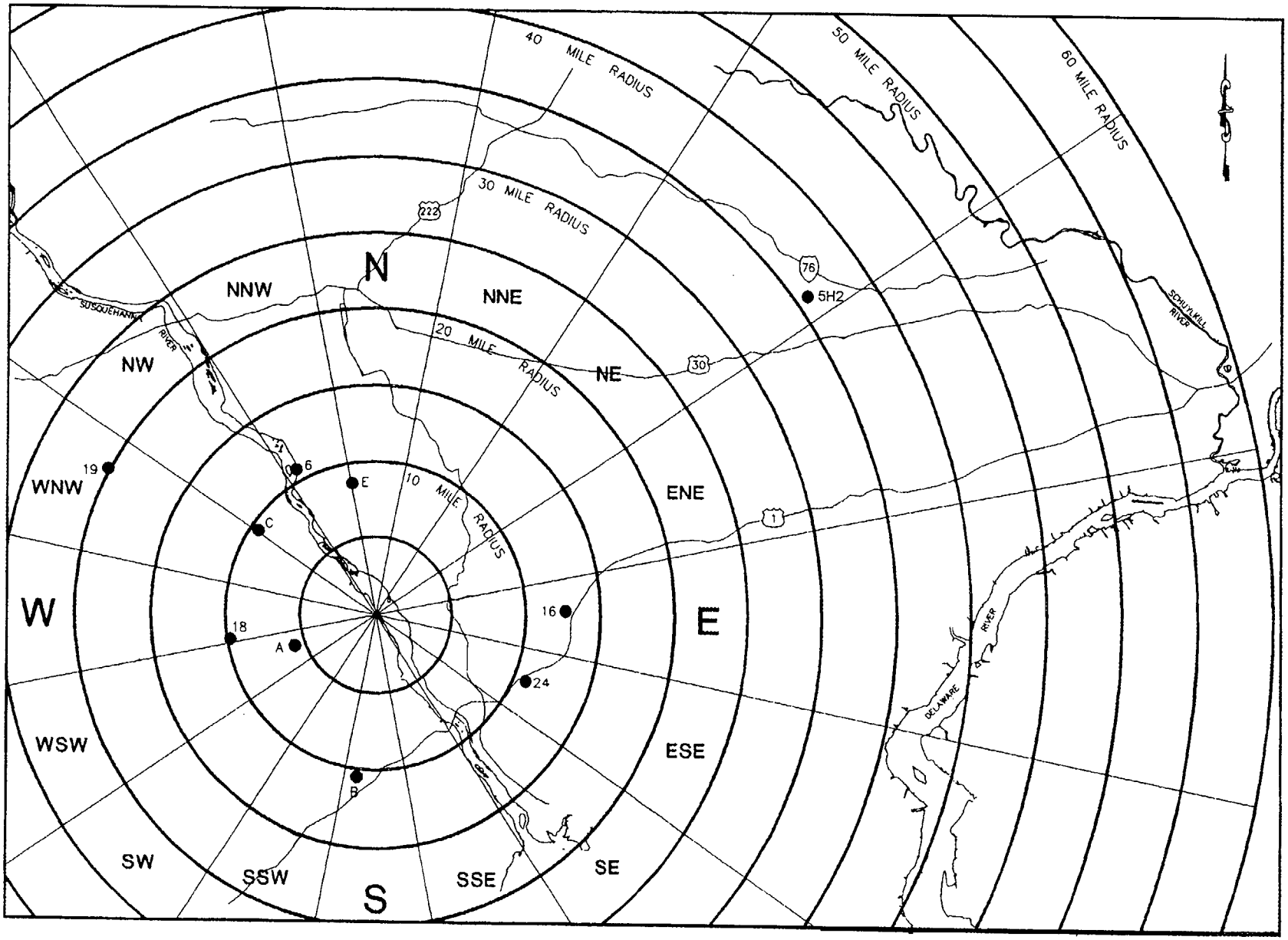


Figure B-3
Environmental Sampling Locations Greater Than
Five Miles from the Peach Bottom Atomic Power Station, 2000

APPENDIX C

DATA TABLES AND FIGURES
PRIMARY LABORATORY

APPENDIX C: DATA TABLES AND FIGURES - PRIMARY LABORATORY

TABLES

FIGURES

FIGURES

TABLE C-I.1 CONCENTRATIONS OF TITIUM IN SURFACE WATER SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 2000

RESULTS IN UNITS OF PCI/LITER +/- 2 SIGMA

COLLECTION PERIOD	1LL	1MM
JAN-MAR	95 ± 51	86 ± 51
APR-JUN	-11 ± 54	37 ± 56
JUL-SEP	45 ± 50	94 ± 51
OCT-DEC	< 127	< 116
MEAN	64 ± 121	83 ± 66

TABLE C-I.2 **CONCENTRATIONS OF GAMMA EMITTERS IN SURFACE WATER SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 2000**

RESULTS IN UNITS OF PCI/LITER +/- 2 SIGMA

STC	COLLECTION PERIOD	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Zr-95	Nb-95	Cs-134	Cs-137	Ba-140	La-140
1LL	JAN	1 ± 1	0 ± 1	0 ± 2	-1 ± 1	-4 ± 3	1 ± 2	1 ± 1	-9 ± 1	0 ± 1	-2 ± 5	1.7 ± 2
	FEB	0 ± 2	-1 ± 2	-1 ± 4	0 ± 2	-2 ± 4	2 ± 3	0 ± 2	-4 ± 2	1 ± 2	2 ± 7	1.2 ± 3
	MAR	0 ± 1	0 ± 1	3 ± 2	1 ± 1	-3 ± 2	0 ± 2	1 ± 1	-7 ± 1	1 ± 1	1 ± 5	0.0 ± 2
	APR	0 ± 1	-1 ± 1	0 ± 2	0 ± 1	-1 ± 2	-1 ± 2	0 ± 1	-4 ± 1	1 ± 1	5 ± 5	0.5 ± 2
	MAY	-1 ± 1	0 ± 1	2 ± 2	0 ± 1	-1 ± 2	0 ± 2	1 ± 1	-3 ± 1	1 ± 1	-2 ± 5	-0.4 ± 2
	JUN	0 ± 1	0 ± 1	0 ± 2	0 ± 1	-2 ± 2	1 ± 1	1 ± 1	-4 ± 1	0 ± 1	0 ± 4	0.4 ± 1
	JUL	0 ± 1	0 ± 1	-1 ± 2	1 ± 1	-5 ± 2	0 ± 2	-1 ± 1	-5 ± 1	0 ± 1	2 ± 4	0.0 ± 1
	AUG	-1 ± 1	0 ± 1	0 ± 2	0 ± 1	-4 ± 2	0 ± 1	-2 ± 1	-6 ± 1	0 ± 1	0 ± 3	-0.5 ± 1
	SEP	0 ± 1	0 ± 1	0 ± 1	1 ± 1	-2 ± 2	0 ± 1	-2 ± 1	-4 ± 1	0 ± 1	-2 ± 4	0.9 ± 1
	OCT	< 2	< 2	< 4	< 2	< 4	< 4	< 2	< 2	< 2	< 8	< 2.7
	NOV	< 3	< 3	< 9	< 3	< 4	< 7	< 2	< 3	< 5	< 17	< 7.2
	DEC	< 2	< 2	< 3	< 2	< 5	< 7	< 4	< 3	< 2	< 29	< 4.4
MEAN		0 ± 2	0 ± 3	2 ± 6	1 ± 2	-1 ± 7	2 ± 5	1 ± 3	-3 ± 7	1 ± 3	5 ± 19	1.5 ± 5
1MM												
	JAN	0 ± 1	0 ± 1	0 ± 2	0 ± 1	-5 ± 2	0 ± 2	0 ± 1	-6 ± 1	0 ± 1	0 ± 4	1.7 ± 2
	FEB	0 ± 2	-1 ± 2	3 ± 4	-1 ± 2	-2 ± 5	1 ± 4	1 ± 2	-8 ± 2	-1 ± 2	-1 ± 8	0.1 ± 3
	MAR	0 ± 1	0 ± 1	-1 ± 2	-1 ± 1	-3 ± 2	-1 ± 2	-2 ± 1	-5 ± 1	-1 ± 1	3 ± 5	-0.8 ± 2
	APR	0 ± 1	0 ± 1	0 ± 2	1 ± 1	-1 ± 2	0 ± 2	-1 ± 1	-3 ± 1	-1 ± 1	-3 ± 5	-0.2 ± 2
	MAY	0 ± 1	-1 ± 1	1 ± 2	1 ± 1	-2 ± 2	1 ± 2	0 ± 1	-3 ± 1	-1 ± 1	2 ± 4	-0.7 ± 1
	JUN	-1 ± 1	0 ± 1	0 ± 2	0 ± 1	-2 ± 2	-1 ± 2	0 ± 1	-4 ± 1	0 ± 1	0 ± 5	0.0 ± 2
	JUL	1 ± 2	-1 ± 2	4 ± 4	0 ± 2	-6 ± 4	-2 ± 3	0 ± 2	-6 ± 2	0 ± 2	0 ± 8	-1.1 ± 4
	AUG	0 ± 1	0 ± 1	1 ± 2	1 ± 1	-4 ± 2	0 ± 2	0 ± 1	-5 ± 1	1 ± 1	0 ± 4	-0.9 ± 1
	SEP	0 ± 1	0 ± 1	0 ± 2	0 ± 1	-3 ± 2	-1 ± 1	1 ± 1	-5 ± 1	-1 ± 1	-3 ± 4	0.4 ± 1
	OCT	< 3	< 3	< 7	< 3	< 3	< 6	< 4	< 3	< 2	< 24	< 4.1
	NOV	< 3	< 5	< 8	< 4	< 4	< 6	< 5	< 2	< 4	< 29	< 4.9
	DEC	< 2	< 2	< 3	< 1	< 5	< 4	< 2	< 2	< 2	< 21	< 6.7
MEAN		1 ± 3	0 ± 4	2 ± 6	1 ± 3	-1 ± 7	1 ± 5	1 ± 4	-3 ± 7	0 ± 3	6 ± 23	1.2 ± 5

TABLE C-II.1 CONCENTRATIONS OF GROSS BETA INSOLUBLE IN DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 2000

RESULTS IN UNITS OF PCI/LITER +/- 2 SIGMA

COLLECTION PERIOD	4L	6I
JAN	-1.3 ± 0.7	-1.6 ± 0.7
FEB	-0.6 ± 0.6	-0.4 ± 0.6
MAR	0.4 ± 0.7	-0.3 ± 0.6
APR	0.8 ± 0.6	0.3 ± 0.6
MAY	0.2 ± 0.5	0.4 ± 0.6
JUN	-0.6 ± 0.6	-0.6 ± 0.6
JUL	0.0 ± 0.6	0.0 ± 0.6
AUG	0.0 ± 0.6	0.1 ± 0.6
SEP	0.0 ± 0.7	-0.4 ± 0.6
OCT	< 1.6	< 1.7
NOV	< 1.9	< 1.7
DEC	< 1.6	< 1.7
MEAN	0.3 ± 2.0	0.2 ± 2.1

TABLE II.2 CONCENTRATIONS OF GROSS BETA SOLUBLE IN DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 2000

RESULTS IN UNITS OF PCI/LITER +/- 2 SIGMA

COLLECTION PERIOD	4L	6I
JAN	1.9 ± 0.9	1.7 ± 0.9
FEB	2.0 ± 1.0	2.5 ± 1.1
MAR	1.1 ± 0.7	1.4 ± 0.7
APR	1.5 ± 0.7	1.1 ± 0.7
MAY	2.0 ± 0.9	2.0 ± 0.9
JUN	2.0 ± 0.9	2.2 ± 0.9
JUL	1.6 ± 0.8	1.8 ± 0.8
AUG	3.6 ± 1.0	3.4 ± 1.0
SEP	2.3 ± 1.0	2.6 ± 1.0
OCT	2.7 ± 0.9	2.3 ± 0.9
NOV	2.7 ± 1.1	1.9 ± 0.7
DEC	2.8 ± 0.9	2.2 ± 0.9
MEAN	2.2 ± 1.4	2.1 ± 1.2

TABLE II-3 CONCENTRATIONS OF TRITIUM IN DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 2000

RESULTS IN UNITS OF PCI/LITER +/- 2 SIGMA

COLLECTION PERIOD	4L	6I
JAN-MAR	91 ± 58	49 ± 56
APR-JUN	82 ± 51	83 ± 51
JUL-SEP	69 ± 51	99 ± 52
OCT-DEC	< 127	< 127
MEAN	92 ± 50	90 ± 65

TABLE C-II.4 **CONCENTRATIONS OF GAMMA EMITTERS IN DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 2000**

RESULTS IN UNITS OF PCI/LITER +/- 2 SIGMA

STC	COLLECTION PERIOD	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Zr-95	Nb-95	Cs-134	Cs-137	Ba-140	La-140
4L	JAN	0 ± 1	0 ± 1	-1 ± 1	0 ± 1	-2 ± 1	-1 ± 1	0 ± 1	-3 ± 1	0 ± 1	-1 ± 4	0 ± 1
	FEB	0 ± 1	0 ± 1	0 ± 2	0 ± 1	-2 ± 2	0 ± 2	0 ± 1	-6 ± 1	0 ± 1	3 ± 3	0 ± 1
	MAR	-1 ± 2	0 ± 2	0 ± 4	0 ± 2	-5 ± 4	2 ± 3	0 ± 2	-8 ± 2	0 ± 2	7 ± 8	2 ± 3
	APR	1 ± 2	0 ± 2	2 ± 4	-1 ± 2	-2 ± 5	1 ± 4	0 ± 2	-6 ± 2	0 ± 2	-3 ± 7	-1 ± 3
	MAY	0 ± 2	-1 ± 2	1 ± 4	-1 ± 2	-3 ± 4	0 ± 3	0 ± 2	-1 ± 2	1 ± 2	-6 ± 7	-2 ± 3
	JUN	0 ± 2	-1 ± 2	3 ± 4	1 ± 2	1 ± 4	-1 ± 3	1 ± 2	-4 ± 2	0 ± 2	0 ± 7	0 ± 3
	JUL	0 ± 1	0 ± 1	0 ± 1	0 ± 1	-1 ± 2	1 ± 1	0 ± 1	-2 ± 1	0 ± 1	1 ± 3	-1 ± 1
	AUG	0 ± 1	-1 ± 1	1 ± 1	0 ± 1	-5 ± 2	-1 ± 1	-2 ± 1	-6 ± 1	0 ± 1	-1 ± 3	0 ± 1
	SEP	-1 ± 1	0 ± 1	0 ± 2	0 ± 1	-3 ± 2	-2 ± 1	-2 ± 1	-4 ± 1	0 ± 1	0 ± 3	0 ± 1
	OCT	< 4	< 3	< 7	< 3	< 3	< 3	< 4	< 3	< 3	< 12	< 2
	NOV	< 2	< 3	< 7	< 2	< 7	< 8	< 2	< 4	< 2	< 12	< 5
	DEC	< 2	< 2	< 3	< 2	< 3	< 5	< 2	< 2	< 1	< 8	< 5
MEAN		1 ± 3	0 ± 3	2 ± 5	0 ± 3	-1 ± 7	1 ± 6	0 ± 3	-3 ± 7	1 ± 2	3 ± 11	1 ± 4
6I	JAN	1 ± 2	0 ± 2	-1 ± 4	1 ± 2	-4 ± 4	0 ± 3	1 ± 2	-11 ± 2	1 ± 2	0 ± 7	-1 ± 3
	FEB	0 ± 1	0 ± 1	1 ± 2	1 ± 1	-1 ± 2	0 ± 1	-1 ± 1	-7 ± 1	0 ± 1	1 ± 3	-1 ± 1
	MAR	2 ± 2	-1 ± 2	1 ± 4	0 ± 2	-4 ± 4	2 ± 3	0 ± 2	-5 ± 2	0 ± 2	3 ± 7	0 ± 3
	APR	0 ± 2	-1 ± 2	3 ± 4	-1 ± 2	-2 ± 4	2 ± 3	0 ± 2	-3 ± 2	1 ± 2	5 ± 6	-1 ± 3
	MAY	-1 ± 2	0 ± 2	1 ± 4	-1 ± 2	-2 ± 4	0 ± 3	-1 ± 2	-1 ± 2	1 ± 2	-6 ± 6	-4 ± 3
	JUN	0 ± 1	0 ± 1	1 ± 2	0 ± 1	-1 ± 2	-1 ± 2	0 ± 1	-4 ± 1	0 ± 1	0 ± 4	-1 ± 2
	JUL	-1 ± 1	0 ± 1	0 ± 2	-1 ± 1	-6 ± 2	1 ± 1	1 ± 1	0 ± 1	0 ± 1	1 ± 3	0 ± 1
	AUG	0 ± 1	0 ± 1	0 ± 1	0 ± 1	-1 ± 2	0 ± 1	1 ± 1	-2 ± 1	0 ± 1	0 ± 3	0 ± 1
	SEP	-1 ± 1	0 ± 1	0 ± 1	-1 ± 1	-1 ± 2	-1 ± 1	0 ± 1	-1 ± 1	-1 ± 1	1 ± 3	< 0 ± 1
	OCT	< 1	< 3	< 3	< 2	< 2	< 4	< 2	< 2	< 2	< 15	< 2
	NOV	< 3	< 3	< 4	< 2	< 3	< 5	< 3	< 4	< 3	< 11	< 3
	DEC	< 2	< 2	< 2	< 1	< 1	< 7	< 2	< 2	< 3	< 19	3
MEAN		1 ± 2	0 ± 3	1 ± 3	0 ± 2	-1 ± 5	1 ± 5	1 ± 2	-2 ± 8	1 ± 3	4 ± 14	0 ± 4

TABLE C-III.1 **CONCENTRATIONS OF GAMMA EMITTERS IN PREDATOR AND BOTTOM FEEDER FISH SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 2000**

RESULTS IN UNITS OF PCI/KG WET +/- 2 SIGMA

STC	COLLECTION PERIOD		Mn-54		Co-58		Fe-59		Co-60		Zn-65		Cs-134		Cs-137
4	PREDATOR														
		06/22/2000	-2 ± 8		5 ± 8		1 ± 20		1 ± 9		-5 ± 30		1 ± 8		-1 ± 8
		10/26/2000	< 4	<	7	<	10	<	8	<	13	<	6	<	6
	Mean		1 ± 8		6 ± 3		5 ± 14		5 ± 9		4 ± 25		3 ± 7		3 ± 10
	BOTTOM FEEDER														
		06/22/2000	-1 ± 5		-10 ± 5		-5 ± 10		1 ± 5		-24 ± 10		5 ± 6		3 ± 5
		10/26/2000	< 8	<	11	<	13	<	12	<	12	<	12	<	8
	Mean		4 ± 12		1 ± 29		4 ± 26		7 ± 15		-6 ± 51		8 ± 11		6 ± 7
6	PREDATOR														
		06/23/2000	-5 ± 5		1 ± 6		-4 ± 10		-3 ± 6		-10 ± 20		-2 ± 7		0 ± 7
		10/24/2000	< 7	<	4	<	20	<	3	<	11	<	6	<	6
	Mean		1 ± 18		3 ± 5		8 ± 33		0 ± 9		1 ± 30		2 ± 11		3 ± 8
	BOTTOM FEEDER														
		06/27/2000	0 ± 4		-1 ± 4		2 ± 10		2 ± 5		-17 ± 10		1 ± 5		4 ± 5
		10/25/2000	< 7	<	5	<	20	<	6	<	18	<	9	<	6
	Mean		4 ± 10		2 ± 9		11 ± 25		4 ± 5		0 ± 49		5 ± 11		5 ± 3

TABLE C-IV.1 CONCENTRATIONS OF GAMMA EMITTERS IN SILT SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 2000

RESULTS IN UNITS OF PCI/KG DRY +/- 2 SIGMA

STC	COLLECTION PERIOD	K-40	Co-58	Co-60	Cs-134	Cs-137
4J	06/26/2000	12000 ± 1000	-5 ± 20	25 ± 20	-4 ± 10	47 ± 27
	11/03/2000	9866 ± 678	< 26	77 ± 29	< 38	81 ± 24
	Mean	10933 ± 3018	11 ± 45	51 ± 73	17 ± 60	64 ± 49
4T	06/26/2000	24000 ± 2000	26 ± 30	-1 ± 40	-8 ± 30	180 ± 70
	11/03/2000	21288 ± 1170	< 33	< 37	< 44	200 ± 46
	Mean	22644 ± 3835	29 ± 9	18 ± 54	18 ± 74	190 ±28
6F	06/26/2000	12000 ± 1000	-17 ± 20	- ± 20 15	-2 ± 10	88 ± 31
	11/03/2000	10223 ± 851	< 31	< 27	< 44	< 49
	Mean	11112 ± 2513	7 ± 67	6 ± 59	21 ± 64	69 ± 55

TABLE C-V.1 CONCENTRATIONS OF GROSS BETA IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 2000

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

	GROUP I			GROUP II	GROUP III
WEEK NO	1B	1Z	2	3A	5H2
1	21 ± 4	20 ± 4	24 ± 4	23 ± 4	17 ± 4
2	20 ± 3	18 ± 3	21 ± 3	19 ± 3	9 ± 3
3	14 ± 3	11 ± 3	14 ± 3	13 ± 3	24 ± 4
4	32 ± 5	30 ± 5	28 ± 4	29 ± 4	22 ± 4
5	23 ± 4	22 ± 4	17 ± 4	24 ± 4	17 ± 4
6	25 ± 3	22 ± 4	23 ± 3	26 ± 4	18 ± 3
7	15 ± 3	18 ± 3	16 ± 3	15 ± 3	15 ± 3
8	25 ± 4	16 ± 3	21 ± 4	19 ± 4	22 ± 3
9	13 ± 3	12 ± 3	13 ± 3	10 ± 3	12 ± 3
10	22 ± 3	17 ± 3	21 ± 3	19 ± 3	12 ± 3
11	10 ± 3	10 ± 3	11 ± 3	11 ± 3	14 ± 3
12	6 ± 2	10 ± 2	6 ± 2	8 ± 2	13 ± 3
13	10 ± 3	8 ± 3	12 ± 3	16 ± 3	10 ± 3
14	14 ± 3	11 ± 3	13 ± 3	13 ± 3	12 ± 3
15	11 ± 3	11 ± 3	15 ± 3	14 ± 3	10 ± 3
16	9 ± 2	8 ± 2	6 ± 2	10 ± 2	3 ± 2
17	4 ± 2	7 ± 2	6 ± 2	6 ± 2	13 ± 3
18	15 ± 3	12 ± 3	15 ± 3	11 ± 3	17 ± 3
19	21 ± 3	22 ± 3	24 ± 3	21 ± 3	19 ± 3
20	18 ± 3	16 ± 3	14 ± 3	19 ± 3	9 ± 2
21	7 ± 2	6 ± 2	5 ± 2	5 ± 2	8 ± 2
22	9 ± 2	6 ± 2	7 ± 2	8 ± 2	9 ± 3
23	13 ± 3	12 ± 3	10 ± 2	10 ± 2	14 ± 3
24	16 ± 3	14 ± 3	15 ± 3	14 ± 3	4 ± 2
25	10 ± 2	10 ± 2	10 ± 2	10 ± 2	13 ± 3
26	14 ± 3	12 ± 3	10 ± 3	13 ± 3	15 ± 3
27	16 ± 3	15 ± 3	12 ± 3	14 ± 3	9 ± 3
28	12 ± 2	13 ± 2	11 ± 2	12 ± 2	7 ± 2
29	10 ± 4	13 ± 4	9 ± 3	(1)	9 ± 3
30	12 ± 3	13 ± 3	9 ± 3	13 ± 3	6 ± 3
31	11 ± 2	8 ± 2	9 ± 2	11 ± 2	13 ± 3
32	21 ± 3	16 ± 3	16 ± 3	20 ± 3	18 ± 3
33	6 ± 3	6 ± 3	11 ± 3	8 ± 3	12 ± 3
34	12 ± 4	14 ± 4	12 ± 4	11 ± 4	19 ± 4
35	14 ± 3	16 ± 3	16 ± 3	14 ± 3	13 ± 3
36	10 ± 3	11 ± 3	8 ± 2	12 ± 3	15 ± 3
37	19 ± 3	20 ± 3	18 ± 3	18 ± 3	11 ± 3
38	14 ± 3	15 ± 3	15 ± 3	14 ± 3	14 ± 3
39	10 ± 2	12 ± 2	11 ± 2	12 ± 2	11 ± 3
40	30 ± 4	26 ± 4	28 ± 4	28 ± 4	22 ± 4
41	30 ± 4	25 ± 4	29 ± 4	28 ± 4	39 ± 4
42	37 ± 4	33 ± 4	34 ± 4	35 ± 4	37 ± 4
43	44 ± 5	43 ± 5	40 ± 4	43 ± 5	26 ± 4
44	22 ± 3	24 ± 4	22 ± 3	19 ± 3	16 ± 4
45	30 ± 4	30 ± 4	31 ± 4	27 ± 4	28 ± 4
46	20 ± 4	16 ± 3	17 ± 3	18 ± 4	27 ± 4
47	34 ± 4	32 ± 4	31 ± 4	38 ± 4	17 ± 3
48	21 ± 3	19 ± 3	20 ± 3	19 ± 3	21 ± 3
49	20 ± 4	20 ± 4	23 ± 4	19 ± 4	16 ± 3
50	22 ± 3	20 ± 3	19 ± 3	18 ± 3	15 ± 4
51	35 ± 5	33 ± 4	36 ± 4	36 ± 5	33 ± 4
52	28 ± 4	24 ± 4	24 ± 4	27 ± 4	20 ± 4
MEAN	18 ± 18	17 ± 16	17 ± 17	18 ± 17	16 ± 15

(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, 2000

GROUP I - ON-SITE LOCATIONS				GROUP II - INTERMEDIATE DISTANCE LOCATION				GROUP III - CONTROL LOCATION			
COLLECTION PERIOD	MIN.	MAX.	MEAN +/- 2 SD	COLLECTION PERIOD	MIN.	MAX.	MEAN +/- 2 SD	COLLECTION PERIOD	MIN.	MAX.	MEAN +/- 2 SD
12/31/1999 - 02/04/2000	11	32	21 ± 12	12/31/1999 - 02/04/2000	13	29	22 ± 12	01/03/2000 - 01/31/2000	9	24	18 ± 14
02/04/2000 - 03/03/2000	12	25	18 ± 10	02/04/2000 - 03/03/2000	10	26	17 ± 14	01/31/2000 - 02/28/2000	15	22	18 ± 6
03/03/2000 - 03/31/2000	6	22	12 ± 11	03/03/2000 - 03/31/2000	8	19	14 ± 10	02/28/2000 - 04/03/2000	10	14	12 ± 3
03/31/2000 - 04/28/2000	4	15	10 ± 7	03/31/2000 - 04/28/2000	6	14	11 ± 7	04/03/2000 - 05/01/2000	3	13	10 ± 9
04/28/2000 - 06/02/2000	5	24	13 ± 13	04/28/2000 - 06/02/2000	5	21	13 ± 14	05/01/2000 - 05/30/2000	8	19	13 ± 11
06/02/2000 - 06/30/2000	10	16	12 ± 5	06/02/2000 - 06/30/2000	10	14	12 ± 4	05/30/2000 - 07/03/2000	4	15	11 ± 9
06/30/2000 - 08/04/2000	8	16	12 ± 4	06/30/2000 - 08/04/2000	11	14	13 ± 3	07/03/2000 - 07/31/2000	6	9	8 ± 3
08/04/2000 - 09/01/2000	6	21	13 ± 8	08/04/2000 - 09/01/2000	8	20	13 ± 10	07/31/2000 - 08/28/2000	12	19	16 ± 7
09/01/2000 - 09/29/2000	8	20	14 ± 8	09/01/2000 - 09/29/2000	12	18	14 ± 6	08/28/2000 - 10/02/2000	11	15	13 ± 4
09/29/2000 - 11/03/2000	22	44	31 ± 14	09/29/2000 - 11/03/2000	19	43	31 ± 18	10/02/2000 - 10/30/2000	22	39	31 ± 17
11/03/2000 - 12/03/2000	16	34	25 ± 13	11/03/2000 - 12/03/2000	18	38	26 ± 19	10/30/2000 - 12/04/2000	16	28	22 ± 11
12/03/2000 - 12/29/2000	19	36	25 ± 12	12/03/2000 - 12/29/2000	18	36	25 ± 17	12/04/2000 - 01/02/2001	15	33	21 ± 17
12/31/1999 - 12/29/2000	4	44	17 ± 17	12/31/1999 - 12/29/2000	5	43	18 ± 17	01/03/2000 - 01/02/2001	3	39	16 ± 15

NOTE; GROUP I CONSISTS OF LOCATIONS 1B, 1Z, AND 1C
GROUP II CONSISTS OF LOCATION 3A
GROUP III CONSISTS OF LOCATION 5H2

TABLE C-V.3 **CONCENTRATION OF GAMMA EMITTERS IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 2000**

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

STC	COLLECTION PERIOD	Be-7	Mn-54	Co-58	Co-60	Cs-134	Cs-137
1B	12/31 - 03/31/00	75 ± 13	0.5± 0.8	0.1 ± 0.8	0.4± 0.8	0.2± 0.6	0.0± 0.8
	03/31 - 06/30/00	60 ± 13	0.6± 0.8	0.2± 0.7	0.6± 0.8	-2.0± 1.0	0.3± 0.8
	06/30 - 09/29/00	45 ± 16	0.1± 0.7	0.4± 0.8	0.2± 0.9	0.0± 0.8	0.8± 0.8
	09/29 - 12/29/00	68 ± 20	< 1.0	< 1.0	< 0.6	< 1.4	< 0.7
	MEAN	62 ± 26	0.5± 0.7	0.4± 0.8	0.4± 0.4	-1 ± 2.8	0.4± 0.8
1C	12/31 - 03/31/00	71 ± 25	1.4± 1.2	0.6± 1.1	-0.3± 1.0	-0.1 ± 0.9	0.4± 1.3
	03/31 - 06/30/00	55 ± 19	0.1± 1.2	-0.3± 1.1	0.6± 1.1	-3.0± 1.4	-0.2± 1.3
	06/30 - 09/29/00	47 ± 16	-1.3± 1.2	-0.2± 1.1	-0.4± 1.4	-0.1 ± 1.3	0.0± 1.0
	09/29 - 12/29/00	59 ± 21	< 0.9	< 0.6	< 1.0	< 1.0	< 0.6
	MEAN	58 ± 20	0.3± 2.4	0.1 ± 1.0	0.2± 1.4	-0.5± 3.4	0.2± 0.7
1Z	12/31 - 03/31/00	60 ± 14	-0.2± 0.7	0.2± 0.9	-0.6± 0.6	0.2± 0.7	0.2± 0.8
	03/31 - 06/30/00	64 ± 14	0.2± 0.7	0.0± 0.9	0.5± 0.8	0.5± 0.8	-0.5± 0.8
	06/30 - 09/29/00	44 ± 15	-0.2± 1.0	-0.6± 0.7	-0.1± 0.5	0.1 ± 0.7	0.5± 0.7
	09/29 - 12/29/00	49 ± 18	< 0.5	< 1.1	< 0.6	< 0.7	< 0.8
	MEAN	54 ± 19	0.1± 0.7	0.2±1.4	0.1 ± 1.1	0.4± 0.5	0.2± 1.1
3A							
	12/31 - 03/31/00	74 ± 18	-1.3± 1.4	0.1 ± 1.3	0.2± 1.3	-0.7 ± 1.3	0.6± 0.8
	03/31 - 06/30/00	47 ± 17	0.7± 0.9	0.2± 0.7	0.0± 0.8	-0.2± 1.0	-0.6± 0.9
	06/30 - 09/29/00	49 ± 21	-0.2± 1.5	-0.5± 1.6	-0.6± 1.8	0.6± 1.3	0.5± 1.3
	09/29 - 12/29/00	61 ± 15	< 0.3	< 0.9	< 0.4	< 0.7	< 0.3
	MEAN	58 ± 25	-0.1 ± 1.8	0.2± 1.1	0.0± 0.9	0.1 ± 1.3	0.2± 1.1
5H2	01/03 - 04/03/00	60 ± 15	-0.6± 0.9	-0.1 ± 0.7	-0.3± 1.0	-0.2± 1.1	-0.3± 0.9
	04/03 - 07/03/00	65 ± 20	0.1± 1.1	0.7± 1.3	0.0± 1.1	-1.2± 1.2	0.5± 1.1
	07/03 - 10/02/00	46 ± 12	0.0± 0.7	-0.3± 0.8	0.2± 1.0	-0.1 ± 0.8	-0.2± 0.7
	10/02 - 01/02/01	44 ± 14	< 1.0	< 0.7	< 0.5	< 0.7	< 0.9
	MEAN	54 ± 21	0.1 ± 1.3	-1 ± 1.0	0.1 ± 0.7	-0.2± 1.6	0.2± 1.1

TABLE C-VI.1 CONCENTRATIONS OF I-131 IN AIR IODINE SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 2000

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

	GROUP I			GROUP II	GROUP III
WEEK NO	1B	1Z	1C	3A	5H2
1	-20 ± 15	6 ± 14	0 ± 17	-7 ± 13	3 ± 12
2	-1 ± 14	-8 ± 17	-6 ± 18	6 ± 17	-1 ± 10
3	4 ± 11	1 ± 12	-6 ± 15	-6 ± 15	6 ± 16
4	6 ± 15	-1 ± 14	-13 ± 18	6 ± 19	-8 ± 15
5	-4 ± 15	-1 ± 18	-3 ± 11	8 ± 17	5 ± 10
6	3 ± 13	10 ± 13	4 ± 14	6 ± 13	1 ± 12
7	19 ± 12	-7 ± 12	-1 ± 13	-10 ± 14	-3 ± 10
8	1 ± 13	4 ± 14	-5 ± 19	-1 ± 18	9 ± 8
9	5 ± 12	1 ± 10	18 ± 16	4 ± 10	-5 ± 9
10	-2 ± 11	2 ± 12	11 ± 14	12 ± 14	5 ± 9
11	5 ± 17	-7 ± 11	-18 ± 20	-2 ± 19	2 ± 11
12	1 ± 11	-12 ± 14	-8 ± 17	7 ± 15	-5 ± 9
13	0 ± 15	0 ± 14	1 ± 21	0 ± 19	4 ± 11
14	-2 ± 14	-4 ± 13	6 ± 17	-2 ± 17	5 ± 9
15	-5 ± 12	4 ± 14	-5 ± 16	-1 ± 16	-1 ± 10
16	4 ± 13	-3 ± 12	-5 ± 15	-6 ± 18	3 ± 8
17	-5 ± 12	7 ± 14	-4 ± 18	0 ± 16	1 ± 7
18	0 ± 16	5 ± 14	-2 ± 14	-4 ± 11	3 ± 9
19	7 ± 14	-8 ± 18	2 ± 10	5 ± 16	5 ± 14
20	-10 ± 15	0 ± 14	-1 ± 15	-3 ± 18	-7 ± 10
21	6 ± 17	5 ± 13	-17 ± 18	17 ± 15	-4 ± 8
22	-10 ± 15	-8 ± 12	5 ± 16	-2 ± 12	8 ± 15
23	8 ± 12	4 ± 17	-5 ± 17	22 ± 19	0 ± 7
24	1 ± 10	4 ± 11	6 ± 15	6 ± 12	-2 ± 10
25	1 ± 11	-1 ± 12	2 ± 19	12 ± 16	-5 ± 10
26	14 ± 16	-1 ± 12	9 ± 14	-4 ± 11	0 ± 10
27	7 ± 13	-3 ± 12	3 ± 16	2 ± 12	-8 ± 9
28	2 ± 11	-3 ± 11	5 ± 13	9 ± 15	0 ± 9
29	11 ± 11	-6 ± 11	-3 ± 18	(1)	10 ± 12
30	-4 ± 14	-1 ± 14	4 ± 17	2 ± 19	-1 ± 11
31	-11 ± 13	-7 ± 11	6 ± 16	-2 ± 11	-3 ± 10
32	4 ± 13	-6 ± 13	9 ± 16	2 ± 17	2 ± 7
33	0 ± 14	0 ± 12	7 ± 14	-2 ± 14	2 ± 12
34	2 ± 20	0 ± 14	-7 ± 12	3 ± 9	1 ± 9
35	-2 ± 14	-5 ± 13	-2 ± 12	7 ± 12	-2 ± 9
36	9 ± 13	10 ± 15	-6 ± 18	8 ± 21	-4 ± 11
37	1 ± 11	2 ± 11	-4 ± 20	10 ± 16	4 ± 12
38	7 ± 16	-1 ± 14	-12 ± 22	13 ± 18	6 ± 10
39	5 ± 12	-1 ± 11	9 ± 14	-2 ± 8	8 ± 13
40	< 14	< 14	< 14	< 15	< 12
41	< 16	< 17	< 16	< 16	< 13
42	< 17	< 17	< 16	< 17	< 13
43	< 15	< 15	< 15	< 15	< 11
44	< 18	< 18	< 18	< 18	< 17
45	< 9	< 9	< 8	< 9	< 7
46	< 15	< 15	< 14	< 15	< 12
47	< 19	< 19	< 18	< 19	< 15
48	< 10	< 10	< 10	< 10	< 12
49	< 22	< 21	< 21	< 21	< 10
50	< 13	< 13	< 12	< 13	< 4
51	< 14	< 14	< 14	< 14	< 8
52	< 13	< 13	< 12	< 13	< 10
MEAN	5 ± 17	3 ± 17	3 ± 19	6 ± 16	3 ± 12

(1) SEE PROGRAM EXCEPTIONS SECTION FOR EXPLANATION

TABLE C-VII.1 **CONCENTRATIONS OF I-131 IN MILK SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 2000**

RESULTS IN UNITS OF PCI/LITER +/- 2 SIGMA

COLLECTION DATE	NEARBY FARMS			INTERMEDIATE DISTANCE FARMS				DISTANT FARMS			
	J	O	R	S	D	L	P	A	B	C	E
01/17/2000	0.0 ± 0.2	0.1 ± 0.2	0.0 ± 0.2	-0.1 ± 0.2				-0.1 ± 0.2			
02/14/2000	-0.1 ± 0.2	0.0 ± 0.2	0.1 ± 0.2	0.0 ± 0.3	-0.2 ± 0.2	0.0 ± 0.2	0.0 ± 0.2	0.0 ± 0.2	-0.1 ± 0.2	0.0 ± 0.3	0.0 ± 0.2
03/13/2000	0.0 ± 0.2	0.2 ± 0.2	0.1 ± 0.2	0.1 ± 0.2				0.0 ± 0.3			
04/10/2000	-0.1 ± 0.2	-0.2 ± 0.3	0.2 ± 0.2	0.0 ± 0.2				-0.1 ± 0.2			
04/24/2000	0.1 ± 0.2	0.1 ± 0.2	0.2 ± 0.2	0.0 ± 0.3				0.1 ± 0.2			
05/08/2000	-0.1 ± 0.2	0.1 ± 0.2	0.0 ± 0.2	0.0 ± 0.2	-0.2 ± 0.2	0.0 ± 0.2	0.0 ± 0.2	0.0 ± 0.2	-0.2 ± 0.2	-0.1 ± 0.2	0.1 ± 0.2
05/22/2000	0.0 ± 0.2	-0.1 ± 0.2	-0.1 ± 0.2	0.1 ± 0.2				0.1 ± 0.2			
06/05/2000	0.0 ± 0.2	0.2 ± 0.2	0.1 ± 0.2	0.0 ± 0.2				-0.1 ± 0.2			
06/19/2000	-0.1 ± 0.2	-0.1 ± 0.2	0.0 ± 0.2	-0.1 ± 0.2				0.1 ± 0.2			
07/04/2000	0.2 ± 0.2	0.1 ± 0.2	-0.1 ± 0.2	0.0 ± 0.2				0.0 ± 0.2			
07/17/2000	-0.2 ± 0.2	0.0 ± 0.2	0.1 ± 0.2	-0.1 ± 0.2				0.1 ± 0.2			
07/31/2000	-0.3 ± 0.2	-0.1 ± 0.3	0.0 ± 0.2	0.0 ± 0.2				0.0 ± 0.2			
08/14/2000	-0.1 ± 0.2	-0.1 ± 0.2	0.0 ± 0.2	-0.1 ± 0.3	0.0 ± 0.2	0.0 ± 0.2	-0.1 ± 0.2	-0.1 ± 0.2	0.1 ± 0.3	0.2 ± 0.2	-0.1 ± 0.2
08/28/2000	0.0 ± 0.2	0.1 ± 0.2	0.0 ± 0.2	0.0 ± 0.2				-0.1 ± 0.2			
09/11/2000	0.1 ± 0.2	0.0 ± 0.2	-0.1 ± 0.2	0.3 ± 0.2				0.0 ± 0.2			
09/25/2000	0.1 ± 0.2	-0.1 ± 0.2	0.1 ± 0.2	-0.1 ± 0.3				0.0 ± 0.2			
10/09/2000	< 0.3	< 0.3	< 0.3	< 0.3				< 0.3			
10/23/2000	< 0.3	< 0.3	< 0.2	< 0.2				< 0.4			
11/06/2000	< 0.4	< 0.4	< 0.3	< 0.3	< 0.5	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.5
11/19/2000											
11/20/2000	< 0.4	< 0.5	< 0.4	< 0.5				< 0.5			
12/03/2000											
12/04/2000	< 0.4	< 0.4	< 0.3	< 0.4				< 0.4			
MEAN	0.1 ± 0.4	0.1 ± 0.4	0.1 ± 0.3	0.1 ± 0.4	0.0 ± 0.7	0.1 ± 0.4	0.1 ± 0.4	0.1 ± 0.4	0.1 ± 0.5	0.1 ± 0.5	0.1 ± 0.5

TABLE C-VII.2 CONCENTRATIONS OF GAMMA EMITTERS IN MILK SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 2000

RESULTS IN UNITS OF PCI/LITER +/- 2 SIGMA

STC	COLLECTION PERIOD	K-40	Cs-134	Cs-137	Ba-140	La-140
A	02/14/2000	1500 ± 100	0 ± 1	0 ± 1	0 ± 4	0 ± 1
	05/08/2000	1400 ± 100	-1 ± 1	0 ± 1	0 ± 4	0 ± 1
	08/14/2000	1400 ± 100	-7 ± 1	-1 ± 1	1 ± 4	-1 ± 1
	11/19/2000	1505 ± 100	< 4	< 4	< 12	< 3
	MEAN	1451 ± 106	-1 ± 8	0 ± 4	3 ± 11	0 ± 3
J	02/14/2000	1700 ± 200	-13 ± 3	0 ± 2	7 ± 7	0 ± 3
	05/08/2000	1500 ± 200	-3 ± 3	0 ± 2	0 ± 7	1 ± 3
	08/14/2000	1500 ± 200	-6 ± 3	1 ± 2	1 ± 7	0 ± 3
	11/20/2000	1369 ± 200	< 5	< 5	< 16	< 3
	MEAN	1517 ± 244	-4 ± 13	2 ± 5	6 ± 13	1 ± 3
O	02/14/2000	1500 ± 100	-1 ± 1	1 ± 1	-4 ± 4	1 ± 1
	05/08/2000	1400 ± 100	-5 ± 1	0 ± 1	-2 ± 4	-1 ± 1
	08/14/2000	1500 ± 100	-3 ± 1	0 ± 1	-1 ± 4	0 ± 1
	11/20/2000	1360 ± 100	< 3	< 4	< 14	< 3
	MEAN	1440 ± 127	-1 ± 6	1 ± 3	2 ± 14	1 ± 3
R	02/14/2000	1500 ± 200	-1 ± 2	2 ± 2	-4 ± 6	0 ± 0
	05/08/2000	1400 ± 200	-1 ± 2	1 ± 2	5 ± 6	0 ± 0
	08/14/2000	1400 ± 200	-2 ± 2	0 ± 2	2 ± 6	0 ± 0
	11/20/2000	1382 ± 200	< 3	< 3	< 7	< 2
	MEAN	1421 ± 96	0 ± 4	1 ± 2	2 ± 9	0 ± 1
S	02/14/2000	1500 ± 200	-7 ± 2	-1 ± 2	-6 ± 7	0 ± 2
	05/08/2000	1500 ± 200	-4 ± 2	0 ± 2	-1 ± 7	-1 ± 2
	08/14/2000	1400 ± 200	-2 ± 2	0 ± 2	0 ± 7	1 ± 2
	11/20/2000	1519 ± 200	< 5	< 5	< 15	< 2
	MEAN	1480 ± 96	-2 ± 9	1 ± 4	2 ± 16	1 ± 2

TABLE C-VII.1 QUARTERLY TLD RESULTS FOR PEACH BOTTOM ATOMIC POWER STATION, 2000

RESULTS IN UNITS OF MILLI-ROENTGEN/STD. +/- 2 SIGMA

STATION CODE	MEAN[1] +/- 2 S.D.	JAN-MAR	APR-JUN	JUL-SEP	OCT-DEC
1A	5.4 ± 0.8	5.6 ± 0.4	5.9 ± 0.5	5.1 ± 0.3	5.0 ± 0.6
1B	4.9 ± 0.6	4.7 ± 0.2	5.2 ± 0.2	5.0 ± 0.4	4.6 ± 0.6
1C	5.9 ± 1.0	5.9 ± 0.4	6.5 ± 0.5	6.0 ± 0.3	5.3 ± 0.4
1D	5.6 ± 0.4	5.6 ± 0.3	5.8 ± 0.3	5.6 ± 0.3	5.3 ± 0.6
1E	5.4 ± 0.6	5.4 ± 0.3	5.8 ± 0.3	5.5 ± 0.4	5.0 ± 0.4
1F	7.0 ± 0.8	6.9 ± 0.2	7.4 ± 0.4	7.2 ± 0.7	6.4 ± 0.7
1G	4.2 ± 0.5	4.3 ± 0.1	4.5 ± 0.5	4.3 ± 0.2	3.9 ± 0.4
1H	5.9 ± 0.8	5.8 ± 0.3	6.2 ± 0.3	6.3 ± 0.2	5.4 ± 0.4
1I	4.7 ± 0.6	4.6 ± 0.3	5.0 ± 0.4	4.8 ± 0.2	4.3 ± 0.4
1J	6.9 ± 0.9	6.4 ± 0.3	7.3 ± 0.4	6.6 ± 0.3	7.3 ± 1.0
1L	4.6 ± 0.6	4.6 ± 0.5	5.0 ± 0.2	4.5 ± 0.2	4.2 ± 0.4
1M	3.1 ± 0.4	3.0 ± 0.2	3.4 ± 0.2	3.1 ± 0.2	2.9 ± 0.6
1P	3.5 ± 0.5	3.5 ± 0.1	3.7 ± 0.2	3.7 ± 0.3	3.1 ± 0.6
1Q	4.1 ± 0.5	4.1 ± 0.3	4.3 ± 0.1	4.2 ± 0.3	3.7 ± 0.6
1R	6.2 ± 0.5	6.0 ± 0.3	6.3 ± 0.8	6.6 ± 0.3	6.0 ± 0.4
2	5.5 ± 0.6	5.3 ± 0.2	5.8 ± 0.1	5.7 ± 0.4	5.2 ± 0.7
2B	5.2 ± 0.9	5.2 ± 0.3	5.4 ± 0.3	5.7 ± 0.2	4.6 ± 0.6
3A	4.1 ± 0.7	4.0 ± 0.2	4.2 ± 0.3	4.5 ± 0.1	3.6 ± 0.3
4K	3.7 ± 0.6	3.7 ± 0.3	3.8 ± 0.1	3.9 ± 0.1	3.3 ± 0.5
5	5.4 ± 0.4	5.3 ± 0.2	5.5 ± 0.5	5.5 ± 0.5	5.1 ± 0.3
1NN	6.5 ± 0.8	6.3 ± 0.4	6.9 ± 0.3	6.6 ± 0.6	6.0 ± 0.6
6B	4.7 ± 0.7	4.8 ± 0.1	5.0 ± 0.4	5.0 ± 0.1	4.2 ± 0.4
14	5.6 ± 0.5	5.6 ± 0.4	5.8 ± 0.2	5.7 ± 0.6	5.2 ± 0.6
15	5.8 ± 0.9	5.9 ± 0.5	6.3 ± 0.3	6.0 ± 1.0	5.2 ± 0.6
16	5.9 ± 0.5	5.8 ± 0.3	6.1 ± 0.2	6.0 ± 0.5	5.6 ± 0.8
17	6.6 ± 0.7	6.7 ± 0.6	7.1 ± 0.3	6.7 ± 0.6	6.2 ± 0.6
18	6.3 ± 0.8	6.1 ± 0.2	6.7 ± 0.3	6.5 ± 0.3	5.9 ± 0.6
19	6.2 ± 0.9	6.1 ± 0.2	6.7 ± 0.3	6.5 ± 0.7	5.6 ± 0.3
22	6.0 ± 0.8	5.9 ± 0.1	6.5 ± 0.4	6.1 ± 0.3	5.6 ± 0.7
23	6.0 ± 0.5	5.8 ± 0.4	6.4 ± 0.4	6.1 ± 0.5	5.9 ± 0.6
24	4.6 ± 0.6	4.5 ± 0.2	4.6 ± 0.2	4.9 ± 0.3	4.2 ± 0.4
26	6.7 ± 0.8	6.5 ± 0.1	7.2 ± 0.5	6.8 ± 0.2	6.3 ± 0.5
27	6.2 ± 0.6	6.1 ± 0.4	6.6 ± 0.3	6.3 ± 0.4	5.9 ± 0.5
31A	4.5 ± 0.7	4.3 ± 0.2	4.8 ± 0.2	4.6 ± 0.5	4.1 ± 0.3
32	6.3 ± 1.0	5.7 ± 0.2	6.7 ± 0.5	6.6 ± 0.3	6.0 ± 0.5
40	6.9 ± 0.8	6.7 ± 0.2	7.3 ± 0.2	7.2 ± 0.3	6.5 ± 0.4
42	5.0 ± 0.6	4.8 ± 0.3	5.2 ± 0.1	5.2 ± 0.3	4.6 ± 0.4
43	6.6 ± 1.0	6.3 ± 0.2	6.9 ± 0.7	7.2 ± 0.5	6.1 ± 0.4
44	5.5 ± 0.8	5.3 ± 0.1	5.9 ± 0.2	5.6 ± 0.5	5.0 ± 0.8
45	6.4 ± 0.9	6.2 ± 0.2	6.7 ± 0.4	6.8 ± 0.6	5.9 ± 0.4
46	5.4 ± 0.5	5.2 ± 0.2	5.6 ± 0.1	5.7 ± 0.2	5.2 ± 0.6
47	6.6 ± 0.8	6.3 ± 0.2	6.9 ± 0.4	7.0 ± 0.7	6.2 ± 0.6
48	5.9 ± 0.9	5.8 ± 0.1	6.3 ± 0.3	6.2 ± 0.8	5.3 ± 0.8
49	5.9 ± 0.7	5.7 ± 0.5	6.3 ± 0.3	6.0 ± 0.5	5.5 ± 0.3
50	7.1 ± 0.8	6.9 ± 0.5	7.6 ± 0.3	7.2 ± 0.7	6.6 ± 0.6
51	6.2 ± 0.9	5.9 ± 0.5	6.7 ± 0.2	6.5 ± 0.5	5.7 ± 0.4

(1) MEAN AND TWO TIMES THE STANDARD DEVIATION OF THE QUARTERLY RESULTS

TABLE C-VIII.2 MEAN TLD RESULTS FROM PEACH BOTTOM ATOMIC POWER STATION FOR THE SITE BOUNDARY, MIDDLE, AND OUTER RINGS 2000

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

EXPOSURE PERIOD	SITE RING	MIDDLE RING	OUTER RING
JAN-MAR	5.3 ± 2.1	5.6 ± 1.7	5.6 ± 1.5
APR-JUN	5.7 ± 2.4	6.1 ± 1.9	6.0 ± 2.0
JUL-SEP	5.5 ± 2.3	6.0 ± 1.8	6.0 ± 1.5
OCT-DEC	5.0 ± 2.3	5.3 ± 1.8	5.3 ± 1.5

TABLE C-VIII.3 SUMMARY OF THE 1999 AMBIENT DOSIMETRY PROGRAM FOR PEACH BOTTOM ATOMIC POWER STATION, 2000

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

LOCATION	SAMPLES ANALYZED	PERIOD MINIMUM	PERIOD MAXIMUM	PERIOD MEAN +/- 2 S.D.	PRE-OP MEAN +/- 2 S.D.
SITE RING	76	2.9	7.4	5.3 ± 2.3	5.4 ± 1.7
MIDDLE RING	92	3.3	7.6	5.7 ± 1.9	5.3 ± 1.3
OUTER RING	16	4.2	6.7	5.7 ± 1.6	5.7 ± 1.8

THE PRE-OPERATIONAL MEAN WAS CALCULATED FROM TLD READINGS 01/07/73 TO 08/05/73.
SITE BOUNDARY RING STATIONS - 1A, 1B, 1C, 1D, 1E, 1F, 1G, 1H, 1I, 1J, 1L, 1M, 1NN, 1P, 1Q, 1R, 2, 2B, 40
MIDDLE RING STATIONS - 3A, 4K, 5, 6B, 14, 15, 17, 22, 23, 26, 27, 31A, 32, 42, 43, 44, 45, 46, 47, 48, 49,
OUTER RING STATIONS - 16, 18, 19, 24

TABLE C-IX.1 SUMMARY OF COLLECTION DATES FOR SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1999

SURFACE WATER (TRITIUM)

COLLECTION PERIOD	1LL	1MM
JAN-MAR	12/29/1999 - 03/29/2000	12/29/1999 - 03/29/2000
APR-JUN	03/29/2000 - 06/28/2000	03/29/2000 - 06/28/2000
JUL-SEP	06/28/2000 - 09/27/2000	06/28/2000 - 09/27/2000
OCT-DEC	09/27/2000 - 01/03/2001	09/27/2000 - 01/02/2001

SURFACE WATER (GAMMA SPECTROSCOPY)

COLLECTION PERIOD	1LL	1MM
JAN	12/29/1999 - 02/02/2000	12/29/1999 - 02/02/2000
FEB	02/02/2000 - 03/01/2000	02/02/2000 - 03/01/2000
MAR	03/01/2000 - 03/29/2000	03/01/2000 - 03/29/2000
APR	03/29/2000 - 05/03/2000	03/29/2000 - 05/03/2000
MAY	05/03/2000 - 05/31/2000	05/03/2000 - 05/31/2000
JUN	05/31/2000 - 06/28/2000	05/31/2000 - 06/28/2000
JUL	06/28/2000 - 08/02/2000	06/28/2000 - 08/02/2000
AUG	08/02/2000 - 08/30/2000	08/02/2000 - 08/30/2000
SEP	08/30/2000 - 09/27/2000	08/30/2000 - 09/27/2000
OCT	09/29/1999 - 11/01/2000	09/29/1999 - 11/01/2000
NOV	11/01/2000 - 11/29/2000	11/01/2000 - 11/29/2000
DEC	11/29/2000 - 01/03/2001	11/29/2000 - 01/03/2001

DRINKING WATER (TRITIUM)

COLLECTION PERIOD	4L	6I
JAN-MAR	12/31/1999 - 03/31/2000	12/31/1999 - 03/31/2000
APR-JUN	03/31/2000 - 06/30/2000	03/31/2000 - 06/30/2000
JUL-SEP	06/30/2000 - 09/29/2000	06/30/2000 - 09/29/2000
OCT-DEC	09/27/2000 - 01/05/2001	09/27/2000 - 01/05/2001

DRINKING WATER (GROSS BETA & GAMMA)

COLLECTION PERIOD	4L	6I
JAN	12/31/1999 - 02/04/2000	12/31/1999 - 02/04/2000
FEB	02/04/2000 - 03/03/2000	02/04/2000 - 03/03/2000
MAR	03/03/2000 - 03/31/2000	03/03/2000 - 03/31/2000
APR	03/31/2000 - 05/05/2000	03/31/2000 - 05/05/2000
MAY	05/05/2000 - 06/02/2000	05/05/2000 - 06/02/2000
JUN	06/02/2000 - 06/30/2000	06/02/2000 - 06/30/2000
JUL	06/30/2000 - 08/04/2000	06/30/2000 - 08/04/2000
AUG	08/04/2000 - 09/01/2000	08/04/2000 - 09/01/2000
SEP	09/01/2000 - 09/29/2000	09/01/2000 - 09/29/2000
OCT	09/29/1999 - 11/03/2000	09/29/1999 - 11/03/2000
NOV	11/03/2000 - 12/03/2000	11/03/2000 - 12/03/2000
DEC	12/03/2000 - 01/05/2001	12/03/2000 - 01/05/2001

TABLE C-IX.1 SUMMARY OF COLLECTION DATES FOR SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 2000

AIR PARTICULATE & AIR IODINE (G. BETA & I-131)

SAMPLING PERIOD	1B	1Z	1C	3A	5H2
1	12/31 - 01/07/2000	12/31 - 01/07/2000	12/31 - 01/07/2000	12/31 - 01/07/2000	01/03 - 01/10/2000
2	01/07 - 01/14/2000	01/07 - 01/14/2000	01/07 - 01/14/2000	01/07 - 01/14/2000	01/10 - 01/18/2000
3	01/14 - 01/21/2000	01/14 - 01/21/2000	01/14 - 01/21/2000	01/14 - 01/21/2000	01/18 - 01/24/2000
4	01/21 - 01/28/2000	01/21 - 01/28/2000	01/21 - 01/28/2000	01/21 - 01/28/2000	01/24 - 01/31/2000
5	01/28 - 02/04/2000	01/28 - 02/04/2000	01/28 - 02/04/2000	01/28 - 02/04/2000	01/31 - 02/07/2000
6	02/04 - 02/11/2000	02/04 - 02/11/2000	02/04 - 02/11/2000	02/04 - 02/11/2000	02/07 - 02/14/2000
7	02/11 - 02/19/2000	02/11 - 02/19/2000	02/11 - 02/19/2000	02/11 - 02/19/2000	02/14 - 02/21/2000
8	02/19 - 02/25/2000	02/19 - 02/25/2000	02/19 - 02/25/2000	02/19 - 02/25/2000	02/21 - 02/28/2000
9	02/25 - 03/03/2000	02/25 - 03/03/2000	02/25 - 03/03/2000	02/25 - 03/03/2000	02/28 - 03/06/2000
10	03/03 - 03/10/2000	03/03 - 03/10/2000	03/03 - 03/10/2000	03/03 - 03/10/2000	03/06 - 03/13/2000
11	03/10 - 03/16/2000	03/10 - 03/16/2000	03/10 - 03/16/2000	03/10 - 03/16/2000	03/13 - 03/20/2000
12	03/16 - 03/24/2000	03/16 - 03/24/2000	03/16 - 03/24/2000	03/16 - 03/24/2000	03/20 - 03/27/2000
13	03/24 - 03/31/2000	03/24 - 03/31/2000	03/24 - 03/31/2000	03/24 - 03/31/2000	03/27 - 04/03/2000
14	03/31 - 04/07/2000	03/31 - 04/07/2000	03/31 - 04/07/2000	03/31 - 04/07/2000	04/03 - 04/10/2000
15	04/07 - 04/14/2000	04/07 - 04/14/2000	04/07 - 04/14/2000	04/07 - 04/14/2000	04/10 - 04/17/2000
16	04/14 - 04/21/2000	04/14 - 04/21/2000	04/14 - 04/21/2000	04/14 - 04/21/2000	04/17 - 04/24/2000
17	04/21 - 04/28/2000	04/21 - 04/28/2000	04/21 - 04/28/2000	04/21 - 04/28/2000	04/24 - 05/01/2000
18	04/28 - 05/05/2000	04/28 - 05/05/2000	04/28 - 05/05/2000	04/28 - 05/05/2000	05/01 - 05/08/2000
19	05/05 - 05/12/2000	05/05 - 05/12/2000	05/05 - 05/12/2000	05/05 - 05/12/2000	05/08 - 05/15/2000
20	05/12 - 05/19/2000	05/12 - 05/19/2000	05/12 - 05/19/2000	05/12 - 05/19/2000	05/15 - 05/22/2000
21	05/19 - 05/26/2000	05/19 - 05/26/2000	05/19 - 05/26/2000	05/19 - 05/26/2000	05/22 - 05/30/2000
22	05/26 - 06/02/2000	05/26 - 06/02/2000	05/26 - 06/02/2000	05/26 - 06/02/2000	05/30 - 06/05/2000
23	06/02 - 06/09/2000	06/02 - 06/09/2000	06/02 - 06/09/2000	06/02 - 06/09/2000	06/05 - 06/12/2000
24	06/09 - 06/16/2000	06/09 - 06/16/2000	06/09 - 06/16/2000	06/09 - 06/16/2000	06/12 - 06/19/2000
25	06/16 - 06/23/2000	06/16 - 06/23/2000	06/16 - 06/23/2000	06/16 - 06/23/2000	06/19 - 06/26/2000
26	06/23 - 06/30/2000	06/23 - 06/30/2000	06/23 - 06/30/2000	06/23 - 06/30/2000	06/26 - 07/03/2000
27	06/30 - 07/07/2000	06/30 - 07/07/2000	06/30 - 07/07/2000	06/30 - 07/07/2000	07/03 - 07/10/2000
28	07/07 - 07/14/2000	07/07 - 07/14/2000	07/07 - 07/14/2000	07/07 - 07/14/2000	07/10 - 07/17/2000
29	07/14 - 07/21/2000	07/14 - 07/21/2000	07/14 - 07/21/2000		07/17 - 07/24/2000
30	07/21 - 07/28/2000	07/21 - 07/28/2000	07/21 - 07/28/2000	07/21 - 07/28/2000	07/24 - 07/31/2000
31	07/28 - 08/04/2000	07/28 - 08/04/2000	07/28 - 08/04/2000	07/28 - 08/04/2000	07/31 - 08/07/2000
32	08/04 - 08/11/2000	08/04 - 08/11/2000	08/04 - 08/11/2000	08/04 - 08/11/2000	08/07 - 08/14/2000
33	08/11 - 08/18/2000	08/11 - 08/18/2000	08/11 - 08/18/2000	08/11 - 08/18/2000	08/14 - 08/21/2000
34	08/18 - 08/25/2000	08/18 - 08/25/2000	08/18 - 08/25/2000	08/18 - 08/25/2000	08/21 - 08/28/2000
35	08/25 - 09/01/2000	08/25 - 09/01/2000	08/25 - 09/01/2000	08/25 - 09/01/2000	08/28 - 09/05/2000
36	09/01 - 09/07/2000	09/01 - 09/07/2000	09/01 - 09/07/2000	09/01 - 09/07/2000	09/05 - 09/11/2000
37	09/07 - 09/15/2000	09/07 - 09/15/2000	09/07 - 09/15/2000	09/07 - 09/15/2000	09/11 - 09/18/2000
38	09/15 - 09/21/2000	09/15 - 09/21/2000	09/15 - 09/21/2000	09/15 - 09/21/2000	09/18 - 09/25/2000
39	09/21 - 09/29/2000	09/21 - 09/29/2000	09/21 - 09/29/2000	09/21 - 09/29/2000	09/25 - 10/02/2000
40	09/29 - 10/06/2000	09/29 - 10/06/2000	09/29 - 10/06/2000	09/29 - 10/06/2000	10/02 - 10/09/2000
41	10/06 - 10/13/2000	10/06 - 10/13/2000	10/06 - 10/13/2000	10/06 - 10/13/2000	10/09 - 10/16/2000
42	10/13 - 10/20/2000	10/13 - 10/20/2000	10/13 - 10/20/2000	10/13 - 10/20/2000	10/16 - 10/23/2000
43	10/20 - 10/26/2000	10/20 - 10/26/2000	10/20 - 10/26/2000	10/20 - 10/26/2000	10/23 - 10/30/2000
44	10/26 - 11/03/2000	10/26 - 11/03/2000	10/26 - 11/03/2000	10/26 - 11/03/2000	10/30 - 11/06/2000
45	11/03 - 11/10/2000	11/03 - 11/10/2000	11/03 - 11/10/2000	11/03 - 11/10/2000	11/06 - 11/13/2000
46	11/10 - 11/17/2000	11/10 - 11/17/2000	11/10 - 11/17/2000	11/10 - 11/17/2000	11/13 - 11/20/2000
47	11/17 - 11/24/2000	11/17 - 11/24/2000	11/17 - 11/24/2000	11/17 - 11/24/2000	11/20 - 11/27/2000
48	11/24 - 12/03/2000	11/24 - 12/03/2000	11/24 - 12/03/2000	11/24 - 12/03/2000	11/27 - 12/04/2000
49	12/03 - 12/08/2000	12/03 - 12/08/2000	12/03 - 12/08/2000	12/03 - 12/08/2000	12/04 - 12/12/2000
50	12/08 - 12/15/2000	12/08 - 12/15/2000	12/08 - 12/15/2000	12/08 - 12/15/2000	12/12 - 12/18/2000
51	12/15 - 12/22/2000	12/15 - 12/22/2000	12/15 - 12/22/2000	12/15 - 12/22/2000	12/18 - 12/26/2000
52	12/22 - 12/29/2000	12/22 - 12/29/2000	12/22 - 12/29/2000	12/22 - 12/29/2000	12/26 - 01/02/2001

AIR PARTICULATE (GAMMA SPECTROSCOPY)

JAN-MAR	12/31 - 03/31/2000	12/31 - 03/31/2000	12/31 - 03/31/2000	12/31 - 03/31/2000	01/03 - 04/03/2000
APR-JUN	03/31 - 06/30/2000	03/31 - 06/30/2000	03/31 - 06/30/2000	03/31 - 06/30/2000	04/03 - 07/03/2000
JUL-SEP	06/30 - 09/29/2000	06/30 - 09/29/2000	06/30 - 09/29/2000	06/30 - 09/29/2000	07/03 - 10/02/2000
OCT-DEC	09/29 - 12/29/2000	09/29 - 12/29/2000	09/29 - 12/29/2000	09/29 - 12/29/2000	10/02 - 01/02/2001

TABLE C-IX.1 SUMMARY OF COLLECTION DATES FOR SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1999

STATION CODE	JAN-MAR	APR-JUN	JUL-SEP	OCT-DEC
1A	01/02/1999 - 04/02/1999	04/02/1999 - 07/01/1999	07/01/1999 - 10/01/1999	10/01/1999 - 12/31/1999
1B	01/02/1999 - 04/02/1999	04/02/1999 - 07/02/1999	07/02/1999 - 10/01/1999	10/01/1999 - 12/31/1999
1C	01/02/1999 - 04/02/1999	04/02/1999 - 07/02/1999	07/02/1999 - 10/01/1999	10/01/1999 - 12/31/1999
1D	01/04/1999 04/02/1999	04/02/1999 - 07/01/1999	07/01/1999 - 10/01/1999	10/01/1999 - 12/31/1999
1E	01/02/1999 - 04/01/1999	04/01/1999 - 07/01/1999	07/01/1999 - 09/30/1999	09/30/1999 - 12/30/1999
1F	01/04/1999 - 04/02/1999	04/02/1999 - 07/01/1999	07/01/1999 - 09/30/1999	09/30/1999 - 12/30/1999
1G	01/02/1999 - 04/01/1999	04/01/1999 - 07/01/1999	07/01/1999 - 09/30/1999	09/30/1999 - 12/30/1999
1H	01/02/1999 - 04/02/1999	04/02/1999 - 07/01/1999	07/01/1999 - 09/30/1999	09/30/1999 - 12/30/1999
1I	01/02/1999 - 04/02/1999	04/02/1999 - 07/01/1999	07/01/1999 - 09/30/1999	09/30/1999 - 12/31/1999
1J	01/02/1999 - 04/01/1999	04/01/1999 - 07/01/1999	07/01/1999 - 09/30/1999	09/30/1999 - 12/30/1999
1L	01/02/1999 - 04/01/1999	04/01/1999 - 07/01/1999	07/01/1999 - 09/30/1999	09/30/1999 - 12/30/1999
1M	01/02/1999 04/01/1999	04/01/1999 - 07/01/1999	07/01/1999 - 10/01/1999	10/01/1999 - 12/31/1999
1P	01/02/1999 04/01/1999	04/01/1999 - 07/01/1999	07/01/1999 - 10/01/1999	10/01/1999 - 12/31/1999
1Q	01/02/1999 04/01/1999	04/01/1999 - 07/01/1999	07/01/1999 - 10/01/1999	10/01/1999 - 12/31/1999
1R	01/02/1999 04/02/1999	04/02/1999 - 07/01/1999	07/01/1999 - 10/01/1999	10/01/1999 - 12/31/1999
2	01/02/1999 - 04/01/1999	04/01/1999 - 07/01/1999	07/01/1999 - 09/30/1999	09/30/1999 - 12/30/1999
2B	01/02/1999 04/01/1999	04/01/1999 - 07/01/1999	07/01/1999 - 10/01/1999	10/01/1999 - 12/31/1999
3A	01/02/1999 - 04/02/1999	04/02/1999 - 07/02/1999	07/02/1999 - 10/01/1999	10/01/1999 - 12/31/1999
4K	01/02/1999 - 04/02/1999	04/02/1999 - 07/02/1999	07/02/1999 - 10/01/1999	10/01/1999 - 12/31/1999
5	01/03/1999 - 03/31/1999	03/31/1999 - 06/30/1999	06/30/1999 - 09/29/1999	09/29/1999 - 12/29/1999
1NN	01/02/1999 - 04/02/1999	04/02/1999 - 07/01/1999	07/01/1999 - 09/30/1999	09/30/1999 - 12/30/1999
6B	01/02/1999 - 04/02/1999	04/02/1999 - 07/02/1999	07/02/1999 - 10/01/1999	10/01/1999 - 12/31/1999
14	01/03/1999 - 03/31/1999	03/31/1999 - 06/30/1999	06/30/1999 - 09/29/1999	09/29/1999 - 12/29/1999
15	01/03/1999 - 03/31/1999	03/31/1999 - 06/30/1999	06/30/1999 - 09/29/1999	09/29/1999 - 12/29/1999
16	01/03/1999 - 03/31/1999	03/31/1999 - 06/30/1999	06/30/1999 - 09/29/1999	09/29/1999 - 12/29/1999
17	01/03/1999 - 03/31/1999	03/31/1999 - 06/30/1999	06/30/1999 - 09/29/1999	09/29/1999 - 12/29/1999
18	01/02/1999 - 03/31/1999	03/31/1999 - 06/30/1999	06/30/1999 - 09/29/1999	09/29/1999 - 12/29/1999
19	01/04/1999 - 03/31/1999	03/31/1999 - 07/01/1999	07/01/1999 - 09/29/1999	09/29/1999 - 12/29/1999
22	01/03/1999 - 03/31/1999	03/31/1999 - 06/30/1999	06/30/1999 - 09/29/1999	09/29/1999 - 12/29/1999
23	01/02/1999 - 04/01/1999	04/01/1999 - 07/01/1999	07/01/1999 - 09/30/1999	09/30/1999 - 12/30/1999
24	01/03/1999 - 03/31/1999	03/31/1999 - 06/30/1999	06/30/1999 - 09/29/1999	09/29/1999 - 12/29/1999
26	01/04/1999 - 03/31/1999	03/31/1999 - 06/30/1999	06/30/1999 - 09/29/1999	09/29/1999 - 12/29/1999
27	01/04/1999 - 04/01/1999	04/01/1999 - 07/01/1999	07/01/1999 - 09/30/1999	09/30/1999 - 12/30/1999
31A	01/03/1999 - 03/31/1999	03/31/1999 - 06/30/1999	06/30/1999 - 09/29/1999	09/29/1999 - 12/29/1999
32	01/03/1999 - 03/31/1999	03/31/1999 - 06/30/1999	06/30/1999 - 09/29/1999	09/29/1999 - 12/29/1999
40	01/04/1999 - 04/02/1999	04/02/1999 - 07/01/1999	07/01/1999 - 09/30/1999	09/30/1999 - 12/30/1999
42	01/03/1999 - 03/31/1999	03/31/1999 - 06/30/1999	06/30/1999 - 09/29/1999	09/29/1999 - 12/29/1999
43	01/03/1999 - 03/31/1999	03/31/1999 - 06/30/1999	06/30/1999 - 09/29/1999	09/29/1999 - 12/29/1999
44	01/03/1999 - 03/31/1999	03/31/1999 - 06/30/1999	06/30/1999 - 09/29/1999	09/29/1999 - 12/29/1999
45	01/03/1999 - 03/31/1999	03/31/1999 - 06/30/1999	06/30/1999 - 09/29/1999	09/29/1999 - 12/29/1999
46	01/03/1999 - 04/01/1999	04/01/1999 - 07/01/1999	07/01/1999 - 09/30/1999	09/30/1999 - 12/30/1999
47	01/03/1999 - 04/01/1999	04/01/1999 - 07/01/1999	07/01/1999 - 09/30/1999	09/30/1999 - 12/30/1999
48	01/03/1999 - 04/01/1999	04/01/1999 - 07/01/1999	07/01/1999 - 09/30/1999	09/30/1999 - 12/30/1999
49	01/02/1999 - 03/31/1999	03/31/1999 - 07/01/1999	07/01/1999 - 09/30/1999	09/30/1999 - 12/30/1999
50	01/02/1999 - 03/31/1999	03/31/1999 - 07/01/1999	07/01/1999 - 09/30/1999	09/30/1999 - 12/30/1999
51	01/04/1999 - 03/31/1999	03/31/1999 - 06/30/1999	06/30/1999 - 09/29/1999	09/29/1999 - 12/29/1999

FIGURE C-1
MONTHLY INSOLUBLE GROSS BETA CONCENTRATIONS IN DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF PBAPS, 2000

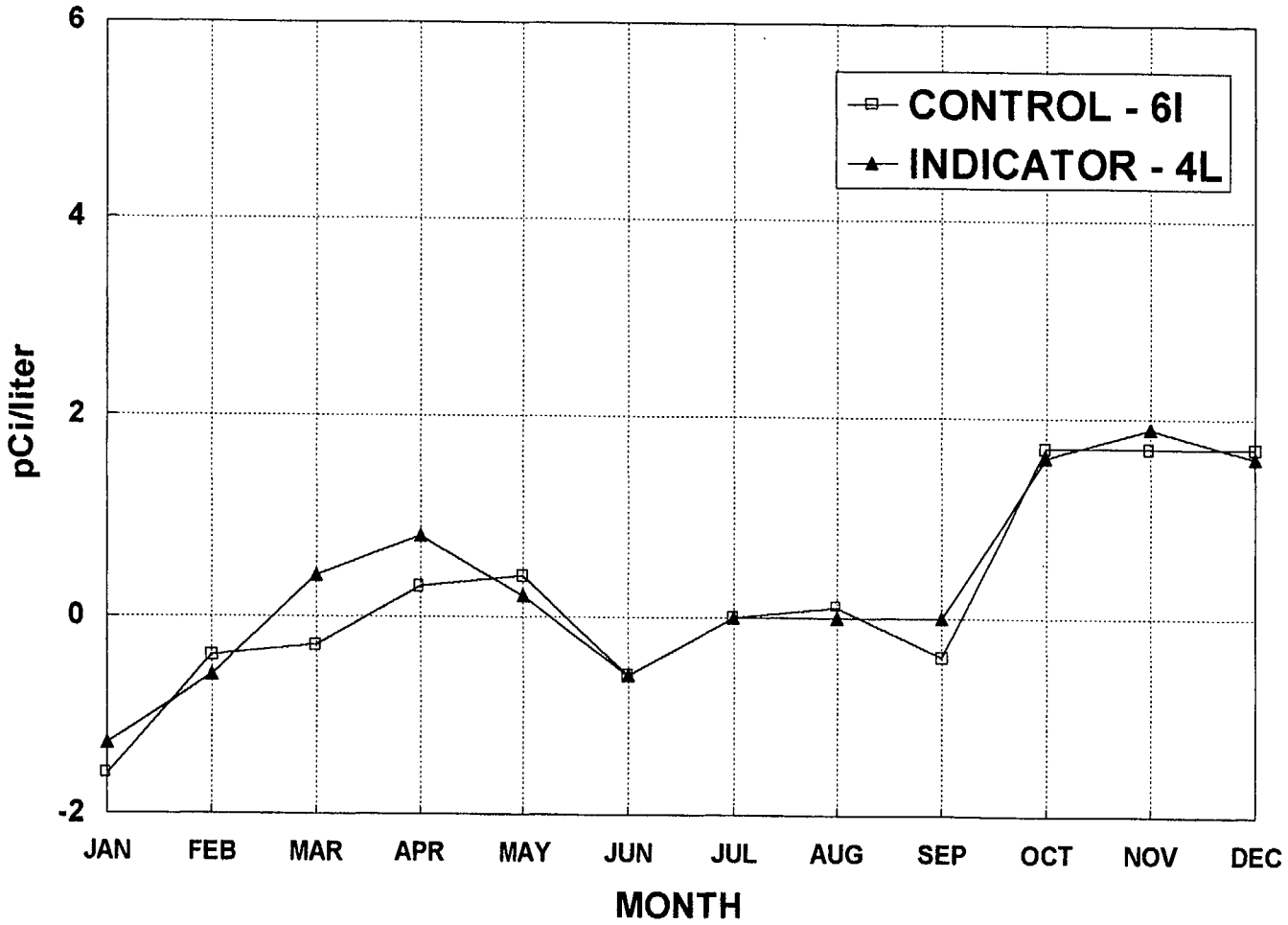


FIGURE C-2
MONTHLY SOLUBLE GROSS BETA CONCENTRATIONS IN DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF PBAPS, 2000

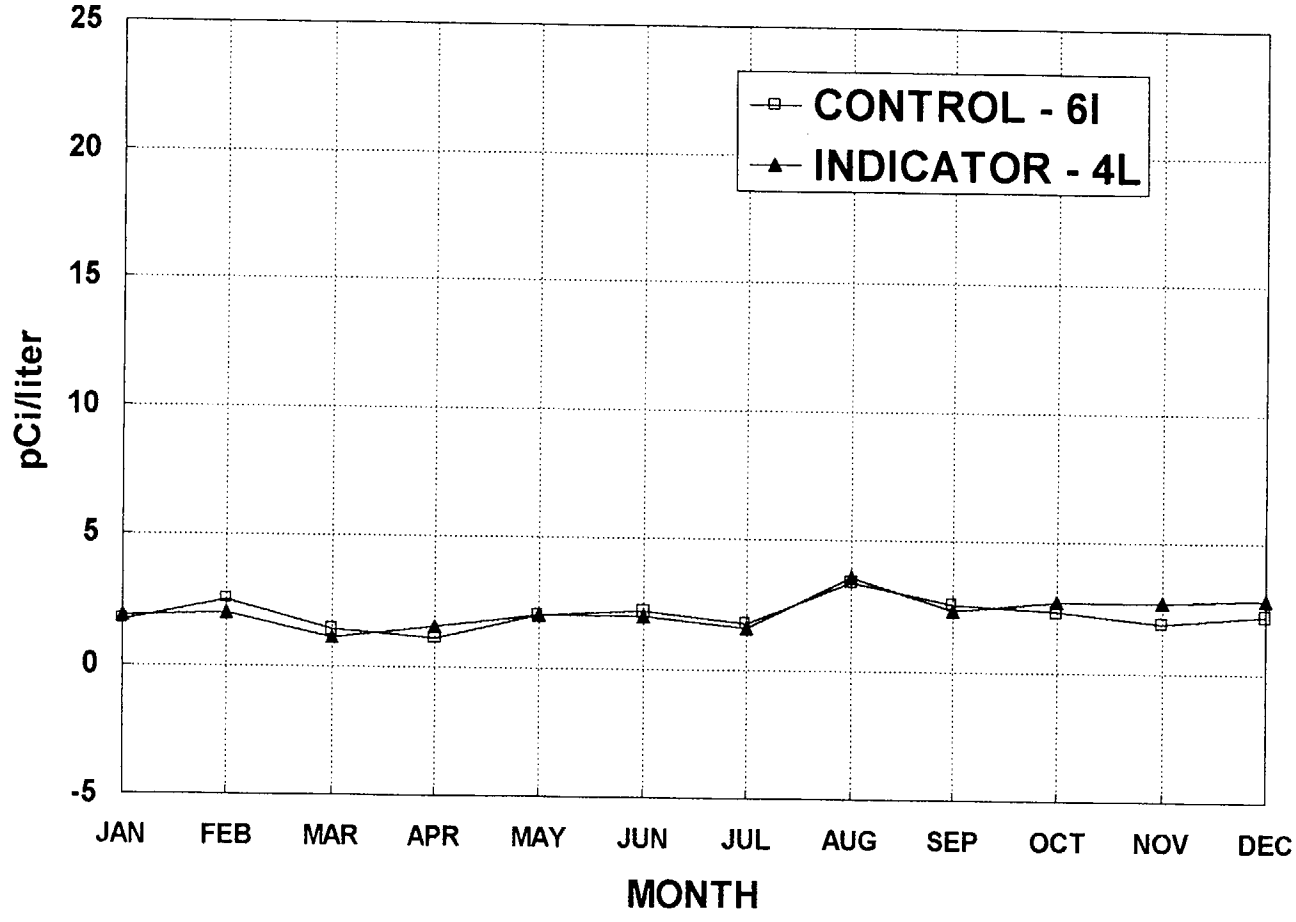


FIGURE C-3
MEAN ANNUAL CS-137 CONCENTRATIONS IN FISH SAMPLES COLLECTED IN THE VICINITY OF PBAPS, 1971 - 2000

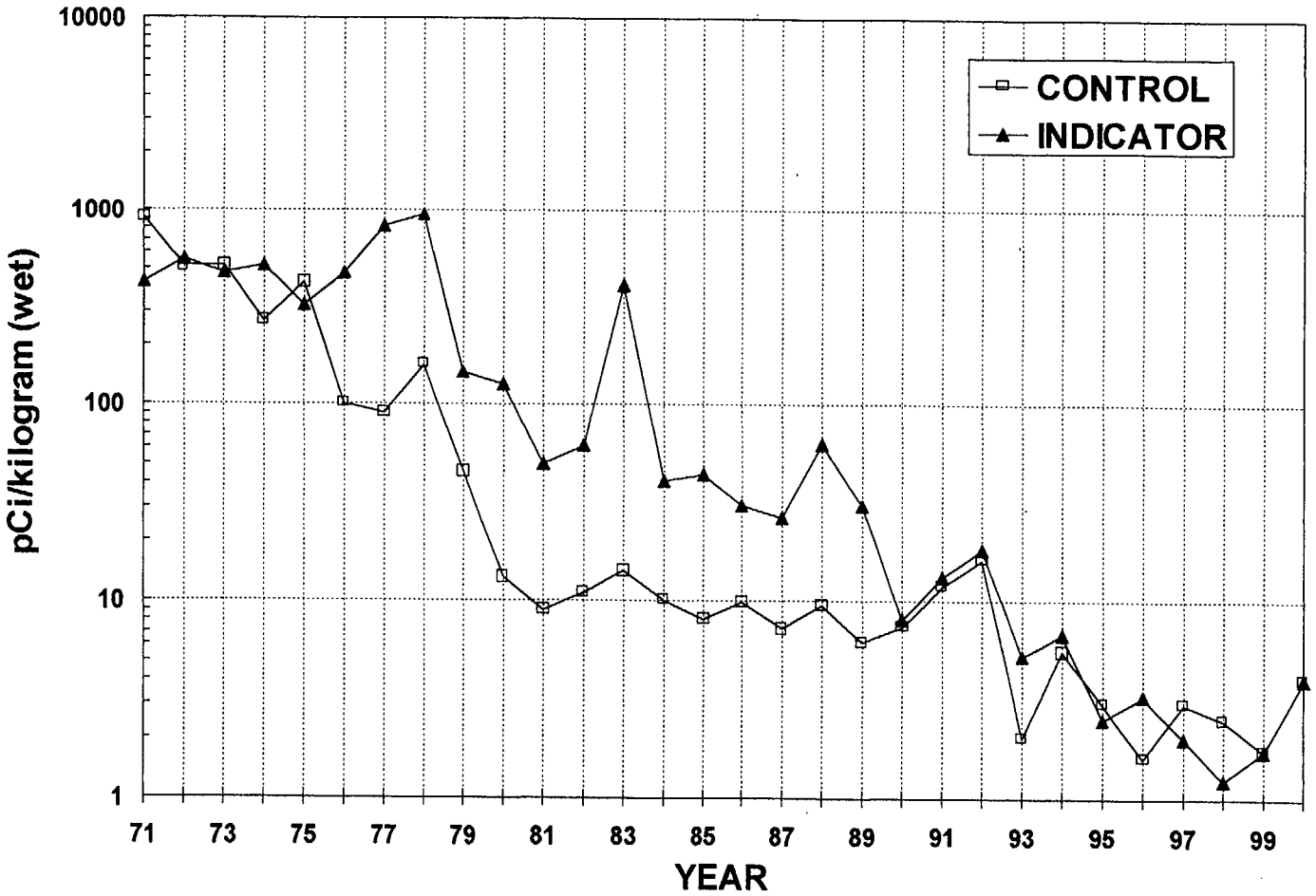
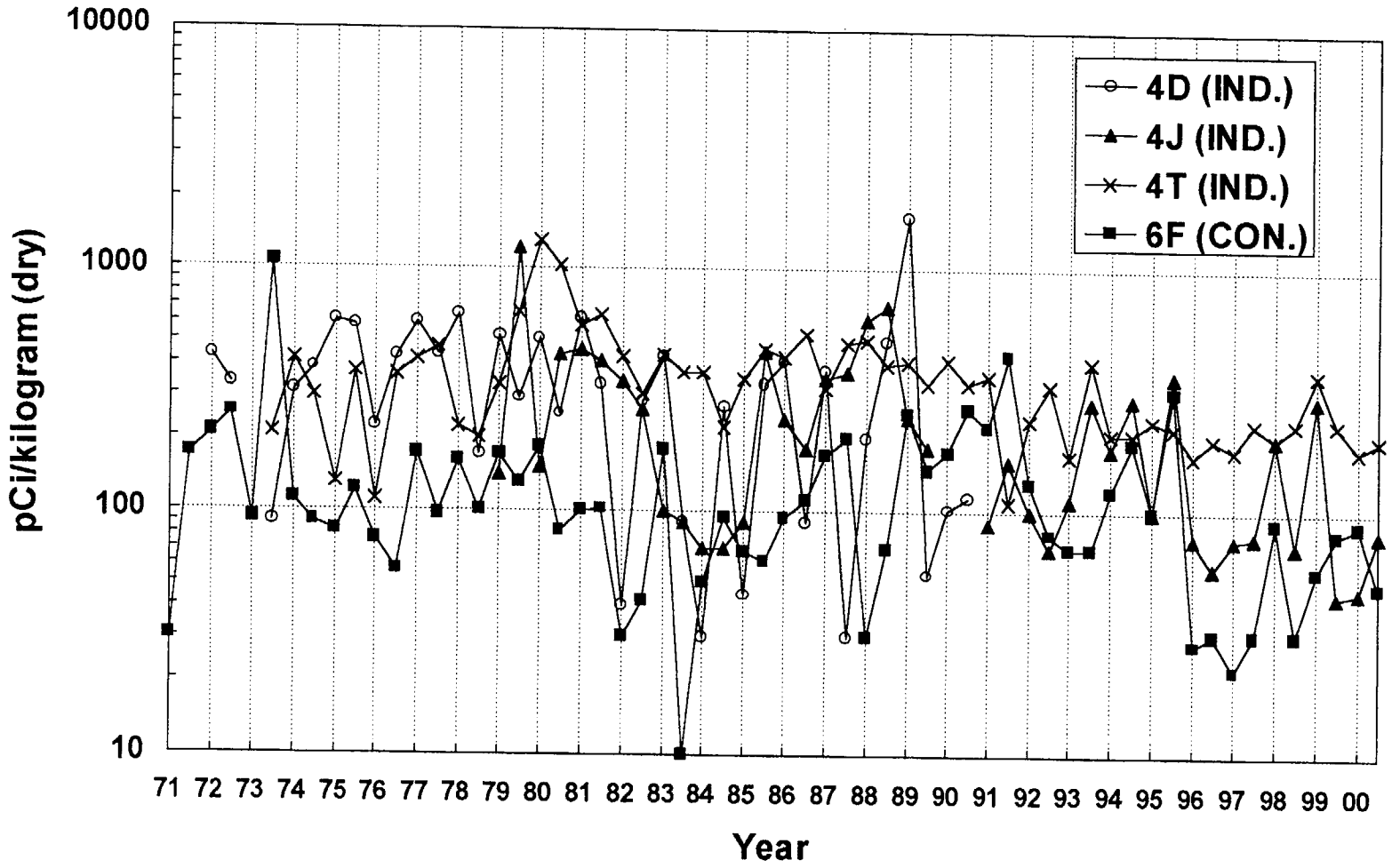


FIGURE C- 4
CONCENTRATIONS OF CS-137 IN SEDIMENT SAMPLES COLLECTED IN THE VICINITY OF PBAPS, 1971 - 2000



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

FIGURE C- 5
MEAN WEEKLY GROSS BETA CONCENTRATIONS IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF PBAPS, 2000

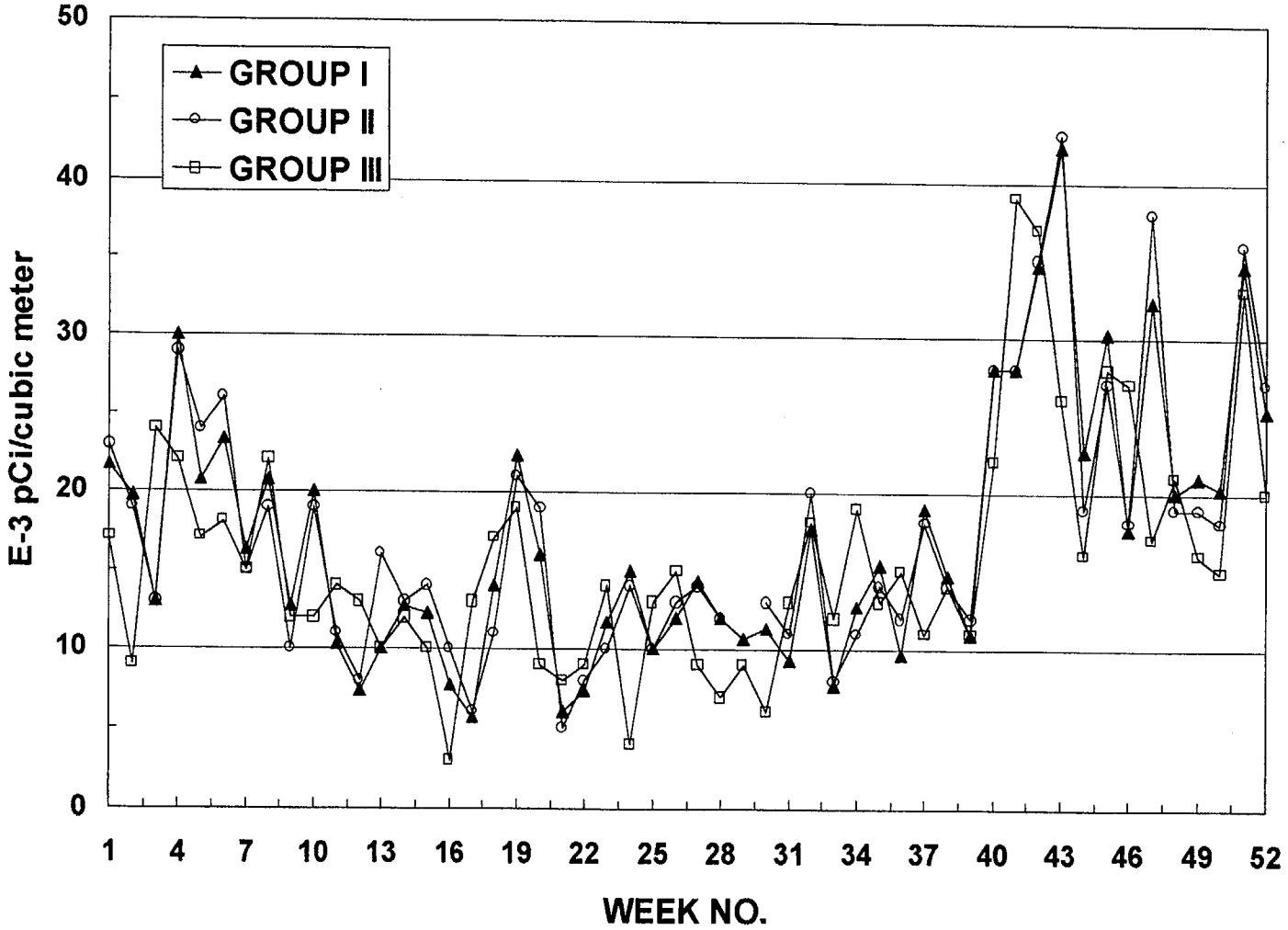


FIGURE C-6
MEAN MONTHLY GROSS BETA CONCENTRATIONS IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF PBAPS, 1970 - 2000

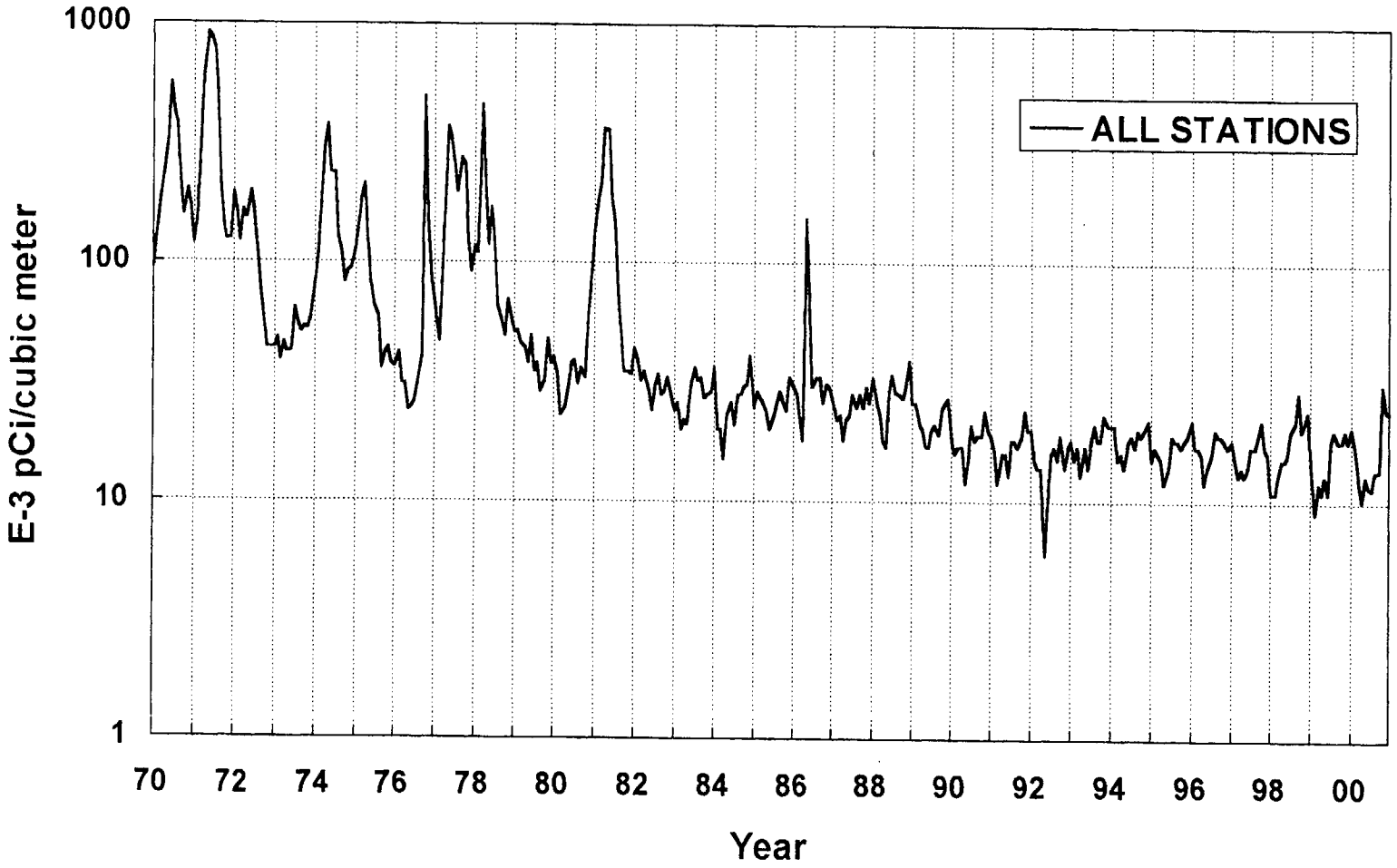
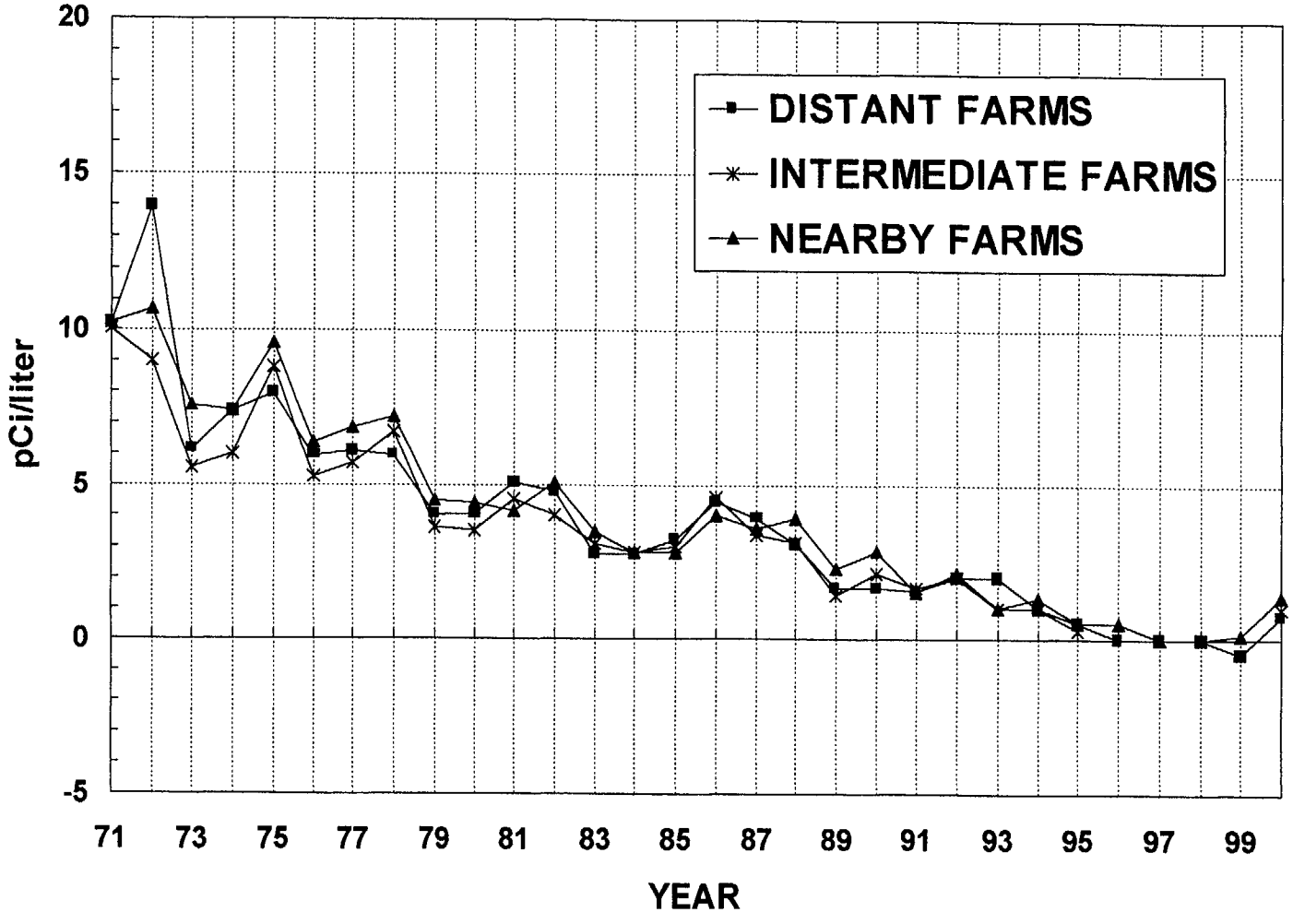


FIGURE C-7
MEAN ANNUAL CS-137 CONCENTRATIONS IN MILK SAMPLES COLLECTED IN THE VICINITY OF PBAPS, 1971 - 2000



Intermediate Farms Discontinued from 1995 to 2000

FIGURE C- 8
MEAN QUARTERLY AMBIENT GAMMA RADIATION LEVELS (TLD) IN THE VICINITY OF PBAPS, 1973 - 2000

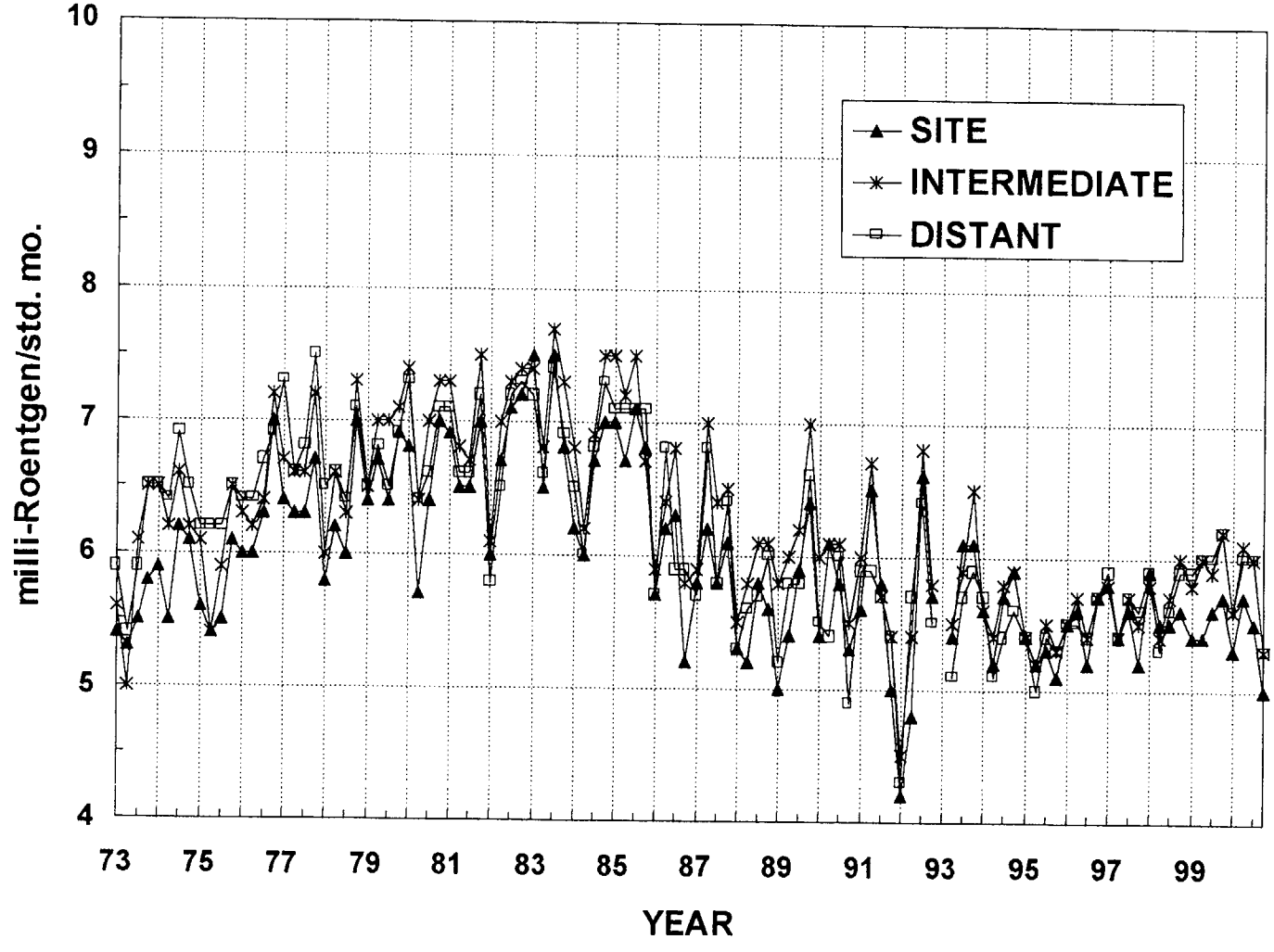
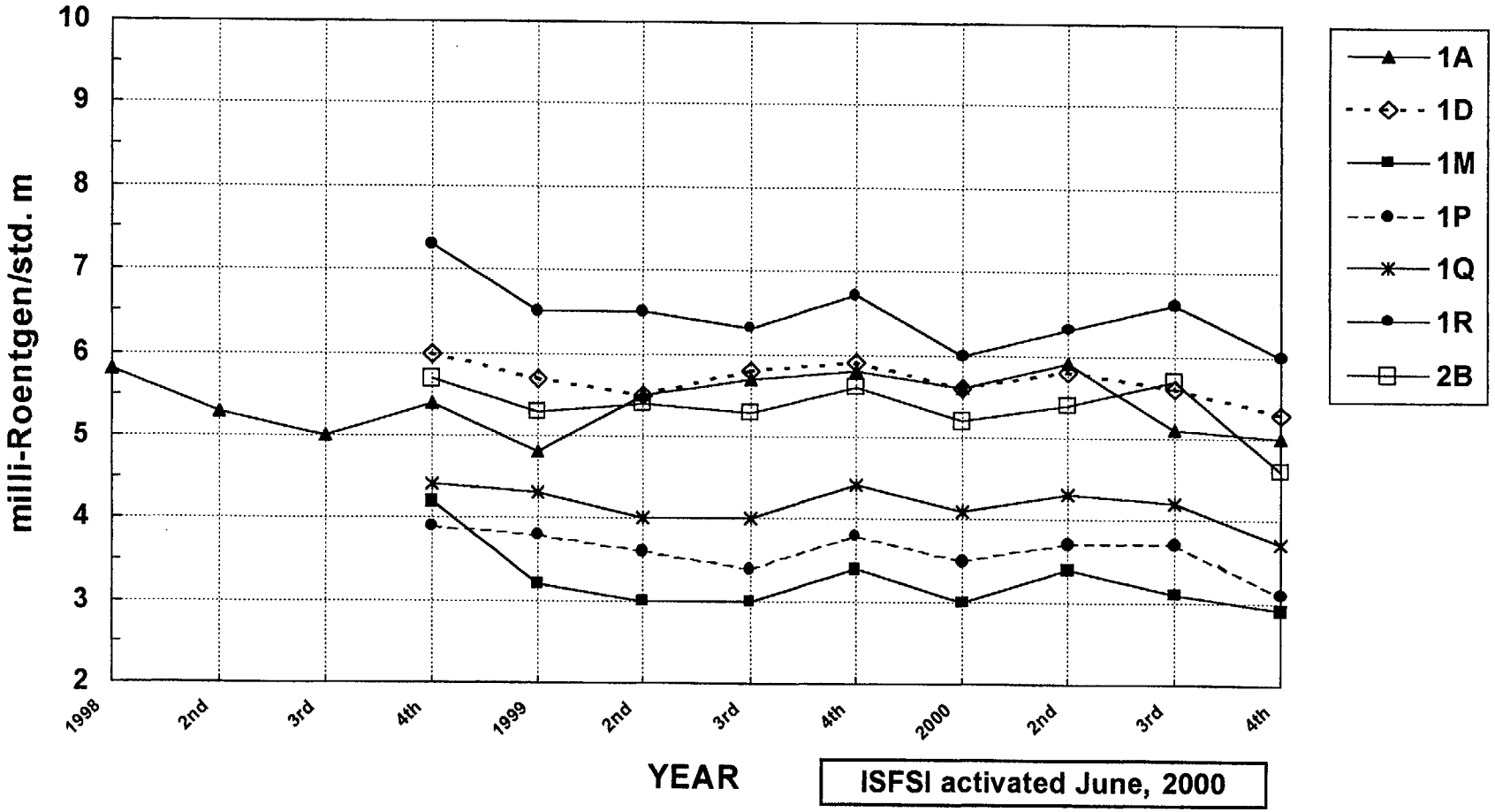


FIGURE C-9
QUARTERLY AMBIENT GAMMA RADIATION LEVELS (TLD)
NEAR THE INDEPENDENT SPENT FUEL STORAGE INSTALLATION
LOCATED AT PBAPS, 1998 - 2000



APPENDIX D

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, AmerGen ERL or Environmental, Inc. and the quality control laboratory, Teledyne Brown Engineering (TBE). During the second half of 2000 TBE's Westwood, NJ facility was closed and relocated to Knoxville, TN. Due to technical and logistical problems TBE subcontracted work out to Environmental, Inc. Comparison of the results for most media were within expected ranges.

The QC laboratory results for gross beta insoluble and soluble in drinking water samples were very similar to those reported by the Primary laboratory. All results between the laboratories were within 5 pCi/l. The data reported were well within the historical range.

The gross beta results for air particulate samples collected at the collocated stations 1Z (Primary) and 1A (QC) compared very well (Figure D-3, Appendix D). No significant differences were noted. An general increase in gross beta activity commencing in the fourth quarter was observed by other REMP programs.

TABLE D-I.1 CONCENTRATIONS OF GROSS BETA INSOLUBLE IN DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 2000

RESULTS IN UNITS OF PCI/LITER +/- 2 SIGMA

COLLECTION PERIOD	4L
JAN	0.2 ±0.9
FEB	-0.3 ±0.9
MAR	3.5 ±1.3
APR	0.6 ±0.4
MAY	4.6 ±1.3
JUN	1.1 ±0.6
JUL	< 1.6
AUG	(1)
SEP	< 1.9
OCT	< 0.7
NOV	< 0.6
DEC	< 1.8
MEAN	1.5 ±2.9

(1) SEE PROGRAM EXCEPTION SECTION FOR EXPLANATION

TABLE D-I.2 CONCENTRATIONS OF GROSS BETA SOLUBLE IN DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 2000

RESULTS IN UNITS OF PCI/LITER +/- 2 SIGMA

COLLECTION PERIOD	4L
JAN	1.2 ±1.2
FEB	3.9 ±1.5
MAR	1.3 ±1.2
APR	2.0 ±0.7
MAY	1.4 ±1.2
JUN	1.6 ±0.7
JUL	1.8 ±0.0
AUG	(1)
SEP	2.4 ±1.0
OCT	< 0.6
NOV	2.4 ±0.5
DEC	2.2 ±1.0
MEAN	1.9 ±1.7

(1) SEE PROGRAM EXCEPTION SECTION FOR EXPLANATION

TABLE D-I.3 **CONCENTRATIONS OF GAMMA EMITTERS IN DRINKING WATER SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 2000**

RESULTS IN UNITS OF PCI/LITER +/- 2 SIGMA

STC	COLLECTION PERIOD	MN-54	CO-58	FE-59	CO-60	ZN-65	ZR-95	NB-95	CS-134	CS-137	BA-140	LA-140
4L	JAN	0.1 ± 0.4	-0.1 ± 0.5	0 ± 1	0.0 ± 0.4	1 ± 1	-0.4 ± 1.1	0.1 ± 0.5	0.4 ± 0.5	0.4 ± 0.5	0 ± 3	1.0 ± 1.0
	FEB	0.0 ± 0.4	-0.3 ± 0.4	0 ± 1	0.6 ± 0.4	1 ± 1	1.4 ± 1.0	0.0 ± 0.4	-0.2 ± 0.5	0.1 ± 0.5	1 ± 2	0.3 ± 0.9
	MAR	0.5 ± 0.5	0.2 ± 0.6	0 ± 2	0.6 ± 0.5	-1 ± 1	-0.7 ± 1.4	-0.4 ± 0.7	-0.1 ± 0.5	-0.1 ± 0.5	-5 ± 11	-0.3 ± 4.6
	APR	0.0 ± 0.6	-0.4 ± 1.4	-1 ± 6	0.1 ± 0.5	-1 ± 1	-4.2 ± 2.9	0.7 ± 1.7	-1.0 ± 0.5	0.7 ± 0.5	(1)	(1)
	MAY	0.2 ± 0.5	0.0 ± 0.6	-3 ± 2	0.3 ± 0.5	-1 ± 1	0.0 ± 1.2	0.5 ± 0.6	0.2 ± 0.5	0.3 ± 0.5	-2 ± 5	1.0 ± 2.0
	JUN	-0.2 ± 0.5	-0.2 ± 0.6	0 ± 2	-0.1 ± 0.6	0 ± 1	-0.4 ± 1.2	0.6 ± 0.6	0.1 ± 0.6	0.2 ± 0.5	-1 ± 5	0.8 ± 2.1
	JUL	< 2.0	< 4.0	(1)	< 2.0	< 5	< 20	(1)	< 2.0	< 1.0	(1)	(1)
	AUG	< 0.4	< 0.5	< 1	< 0.5	< 1	< 1.0	< 0.5	< 0.5	< 0.6	< 3	< 1.1
	SEP	< 1.0	< 4.0	< 20	< 1.0	< 4	< 10	< 9.0	< 1.0	< 1.0	(1)	(1)
	OCT (1)											
	NOV	< 3.0	< 3.0	< 5	< 2.0	< 5	< 4.0	(1)	< 3.0	< 3.0	< 20	< 5.0
	DEC	< 1.0	< 1.0	< 4	< 1.0	< 3	< 2.0	< 3.0	< 1.0	< 2.0	< 20	< 3.0
	MEAN	0.7 ± 2.0	1.1 ± 3.5	2.6 ± 13.1	0.7 ± 1.5	2 ± 5	3.0 ± 13.3	1.6 ± 5.9	0.6 ± 2.2	0.8 ± 1.8	4.5 ± 19.7	1.5 ± 3.4

(1) SEE PROGRAM EXCEPTION SECTION FOR EXPLANATION

TABLE D-II.1 **CONCENTRATIONS OF GROSS BETA INSOLUBLE IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 2000**

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

WEEK NO.	1A
1	24 ±3
2	18 ±4
3	16 ±3
4	29 ±4
5	18 ±3
6	27 ±4
7	14 ±3
8	26 ±4
9	15 ±3
10	21 ±3
11	9 ±3
12	9 ±2
13	15 ±3
14	15 ±3
15	17 ±3
16	10 ±3
17	6 ±2
18	14 ±3
19	26 ±3
20	18 ±3
21	8 ±2
22	13 ±3
23	13 ±3
24	15 ±3
25	13 ±3
26	10 ±3
27	14 ±3
28	14 ±3
29	14 ±3
30	13 ±3
31	11 ±3
32	20 ±3
33	13 ±3
34	21 ±3
35	39 ±4
36	10 ±3
37	22 ±3
38	18 ±3
39	11 ±2
40	36 ±4
41	31 ±4
42	43 ±4
43	45 ±5
44	22 ±3
45	42 ±4
46	19 ±3
47	37 ±4
48	23 ±3
49	27 ±5
50	20 ±3
51	39 ±4
52	25 ±4
MEAN	20 ±20

TABLE D-II.2 **CONCENTRATION OF GAMMA EMITTERS IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 2000**

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

STC	COLLECTION PERIOD	Be-7	K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Zr-95	Nb-95	Cs-134	Cs-137
1A	12/31 - 03/31/00	70 ± 10	90 ± 10	-0.1 ± 0.4	-0.4 ± 0.7	1.0 ± 2.0	0.0 ± 0.5	-0.1 ± 1	-0.9 ± 1.3	0.2 ± 0.7	0.1 ± 0.5	0.3 ± 0.4
	03/31 - 06/30/00	50 ± 10	-11 ± 9	-0.1 ± 0.4	0.3 ± 0.7	0.0 ± 2.0	-0.1 ± 0.4	0.1 ± 1	-1.0 ± 1.0	0.5 ± 0.7	0.3 ± 0.4	0.0 ± 0.4
	06/30 - 09/29/00	118 ± 49	8 ± 4	-0.1 ± 0.5	-0.1 ± 0.4	41.0 ± 31.0	-0.4 ± 0.6	0.9 ± 2	-4.5 ± 10.4	-3.4 ± 5.6	0.2 ± 0.3	0.2 ± 0.3
	09/29 - 12/29/00	57 ± 8	4 ± 4	< 0.9	< 1.9	< 7.2	< 0.8	< 2.1	< 3.8	< 2.1	< 0.8	< 0.7
	MEAN	74 ± 61	23 ± 91	0.1 ± 1.0	0.4 ± 2.1	0.1 ± 1.0	12.3 ± 38.8	0.8 ± 2	-0.6 ± 6.8	-0.1 ± 4.6	0.3 ± 0.6	0.3 ± 0.6

TABLE D-III.1 CONCENTRATION OF I-131 BY CHEMICAL SEPARATION AND GAMMA EMITTERS IN MILK SAMPLES COLLECTED IN THE VINCINITY OF PEACH BOTTOM ATOMIC POWER STATION, 2000

RESULTS IN UNITS OF PCI/LITER +/- 2 SIGMA

STC	SAMPLING PERIOD	I-131	K-40	Cs-134	Cs-137	Ba-140	La-140
A	02/14/2000	0.02 ± 0.05	1000 ± 100	1 ± 2	1 ± 2	-9 ± 8	-2 ± 3
	05/08/2000	-0.06 ± 0.08	1100 ± 100	0 ± 2	3 ± 2	-5 ± 28	2 ± 12
	08/14/2000	0.05 ± 0.10	1100 ± 100	-1 ± 2	2 ± 2	-1 ± 8	1 ± 3
	11/06/2000	< 0.5	1530 ± 122	< 5	< 3	< 30	< 4
	MEAN	0.11 ± 0.46	1183 ± 473	1 ± 5	2 ± 2	4 ± 36	1 ± 5
J	02/14/2000	-0.05 ± 0.06	750 ± 80	0 ± 2	0 ± 2	-1 ± 7	1 ± 3
	05/08/2000	0.01 ± 0.08	1600 ± 200	-1 ± 3	2 ± 3	-10 ± 40	-3 ± 14
	08/14/2000	0.07 ± 0.09	1200 ± 100	0 ± 2	2 ± 2	-2 ± 7	-5 ± 3
	11/06/2000	< 0.5	1427 ± 110	< 3	< 3	< 20	< 4
	MEAN	0.12 ± 0.47	1244 ± 736	1 ± 3	2 ± 2	2 ± 26	-1 ± 8
O	02/14/2000	-0.02 ± 0.06	740 ± 70	0 ± 2	-3 ± 2	2 ± 7	1 ± 3
	05/08/2000	0.00 ± 0.06	1600 ± 200	2 ± 4	4 ± 3	-40 ± 40	-4 ± 15
	08/14/2000	-0.03 ± 0.10	1000 ± 100	0 ± 2	1 ± 2	10 ± 9	-1 ± 3
	11/06/2000	< 0.5	1699 ± 191	< 5	< 6	< 30	< 4
	MEAN	0.11 ± 0.51	1260 ± 928	2 ± 5	2 ± 8	1 ± 59	0 ± 7

TABLE D-IV.1 SUMMARY OF COLLECTION DATES FOR SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 2000

DRINKING WATER (GROSS BETA & GAMMA SPECTROSCOPY)

COLLECTION PERIOD	4L
JAN	12/31/1999 - 02/04/2000
FEB	02/04/2000 - 03/03/2000
MAR	03/03/2000 - 03/31/2000
APR	03/31/2000 - 05/05/2000
MAY	05/05/2000 - 06/02/2000
JUN	06/02/2000 - 06/30/2000
JUL	06/30/2000 - 08/04/2000
AUG	08/04/2000 09/01/2000
SEP	09/01/2000 - 09/29/2000
OCT	09/29/2000 - 11/03/2000
NOV	11/03/2000 - 12/03/2000
DEC	12/03/2000 - 01/05/2001

AIR PARTICULATE (Gross Beta)

WEEK NO	1A	WEEK NO	1A
1	12/31/1999 - 01/07/2000	27	06/30/2000 - 07/07/2000
2	01/07/2000 - 01/14/2000	28	07/07/2000 - 07/14/2000
3	01/14/2000 - 01/21/2000	29	07/14/2000 - 07/21/2000
4	01/21/2000 - 01/28/2000	30	07/21/2000 - 07/28/2000
5	01/28/2000 - 02/04/2000	31	07/28/2000 - 08/04/2000
6	02/04/2000 - 02/11/2000	32	08/04/2000 - 08/11/2000
7	02/11/2000 - 02/19/2000	33	08/11/2000 - 08/18/2000
8	12/03/2000 - 12/08/2000	34	08/18/2000 - 08/25/2000
9	02/25/2000 - 03/03/2000	35	08/25/2000 - 09/01/2000
10	03/03/2000 - 03/10/2000	36	09/01/2000 - 09/07/2000
11	03/10/2000 - 03/16/2000	37	09/07/2000 - 09/15/2000
12	03/16/2000 - 03/24/2000	38	09/15/2000 - 09/21/2000
13	03/24/2000 - 03/31/2000	39	09/21/2000 - 09/29/2000
14	03/31/2000 - 04/07/2000	40	09/29/2000 - 10/06/2000
15	04/07/2000 - 04/14/2000	41	10/06/2000 - 10/13/2000
16	04/14/2000 - 04/21/2000	42	10/13/2000 - 10/20/2000
17	04/21/2000 - 04/28/2000	43	10/20/2000 - 10/26/2000
18	04/28/2000 - 05/05/2000	44	10/26/2000 - 11/03/2000
19	05/05/2000 - 05/12/2000	45	11/03/2000 - 11/10/2000
20	05/12/2000 - 05/19/2000	46	11/10/2000 - 11/17/2000
21	05/19/2000 - 05/26/2000	47	11/17/2000 - 11/24/2000
22	05/26/2000 - 06/02/2000	48	11/24/2000 - 12/03/2000
23	06/02/2000 - 06/09/2000	49	12/03/2000 - 12/08/2000
24	06/09/2000 - 06/16/2000	50	12/08/2000 - 12/15/2000
25	06/16/2000 - 06/23/2000	51	12/15/2000 - 12/22/2000
26	06/23/2000 - 06/30/2000	52	12/22/2000 - 12/29/2000

AIR PARTICULATE (GAMMA SPECTROSCOPY)

COLLECTION PERIOD	1A
JAN-MAR	12/31/1999 - 03/31/2000
APR-JUN	03/31/2000 - 06/30/2000
JUL-SEP	06/30/2000 - 09/29/2000
OCT-DEC	09/29/2000 - 12/29/2000

FIGURE D-1
COMPARISON OF MONTHLY INSOLUBLE GROSS BETA CONCENTRATIONS IN DRINKING WATER SAMPLES SPLIT BETWEEN THE PRIMARY AND QC LABORATORIES, 2000

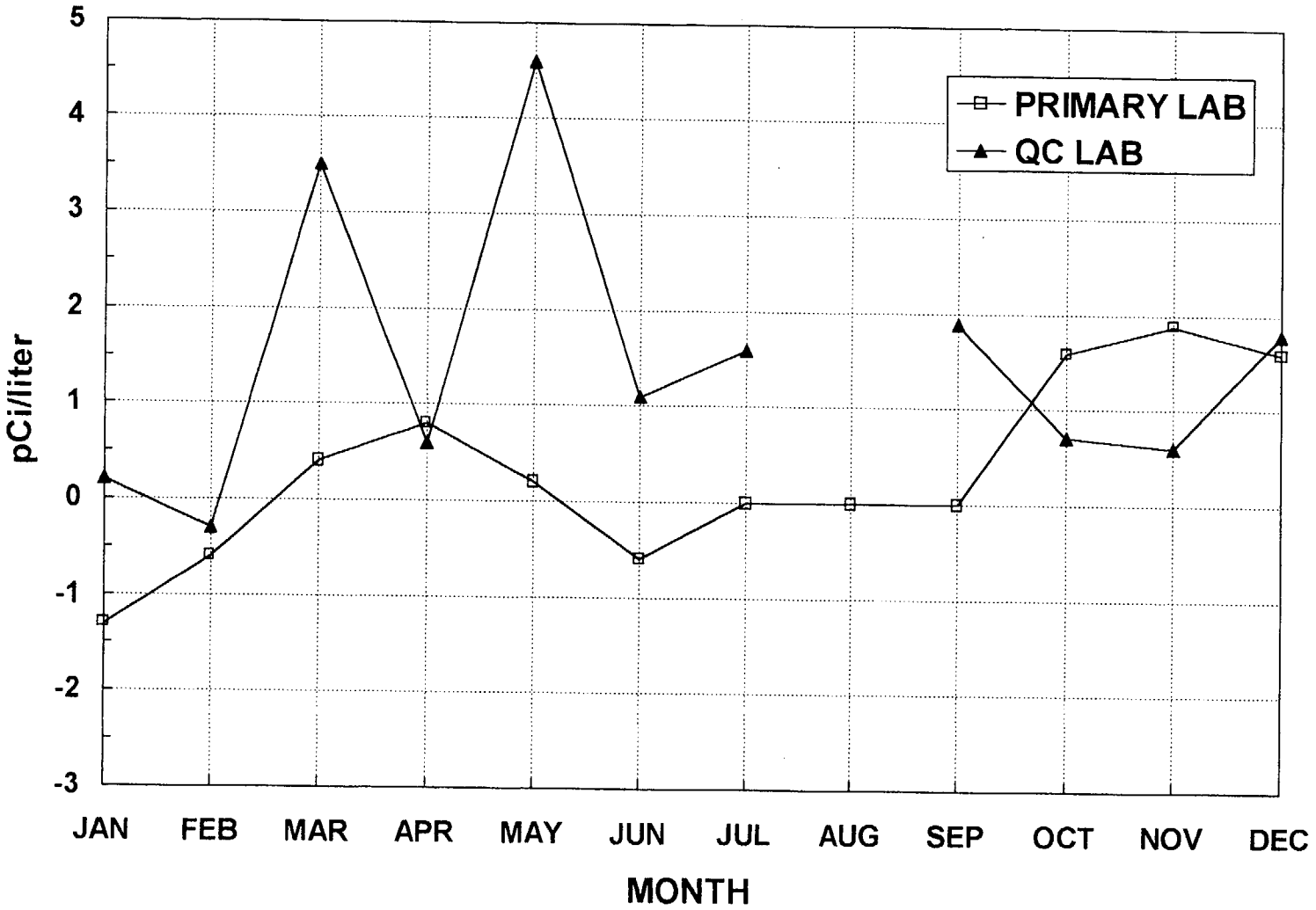


FIGURE D-2
COMPARISON OF MONTHLY SOLUBLE GROSS BETA CONCENTRATIONS IN DRINKING WATER SAMPLES SPLIT BETWEEN THE PRIMARY AND QC LABORATORIES, 2000

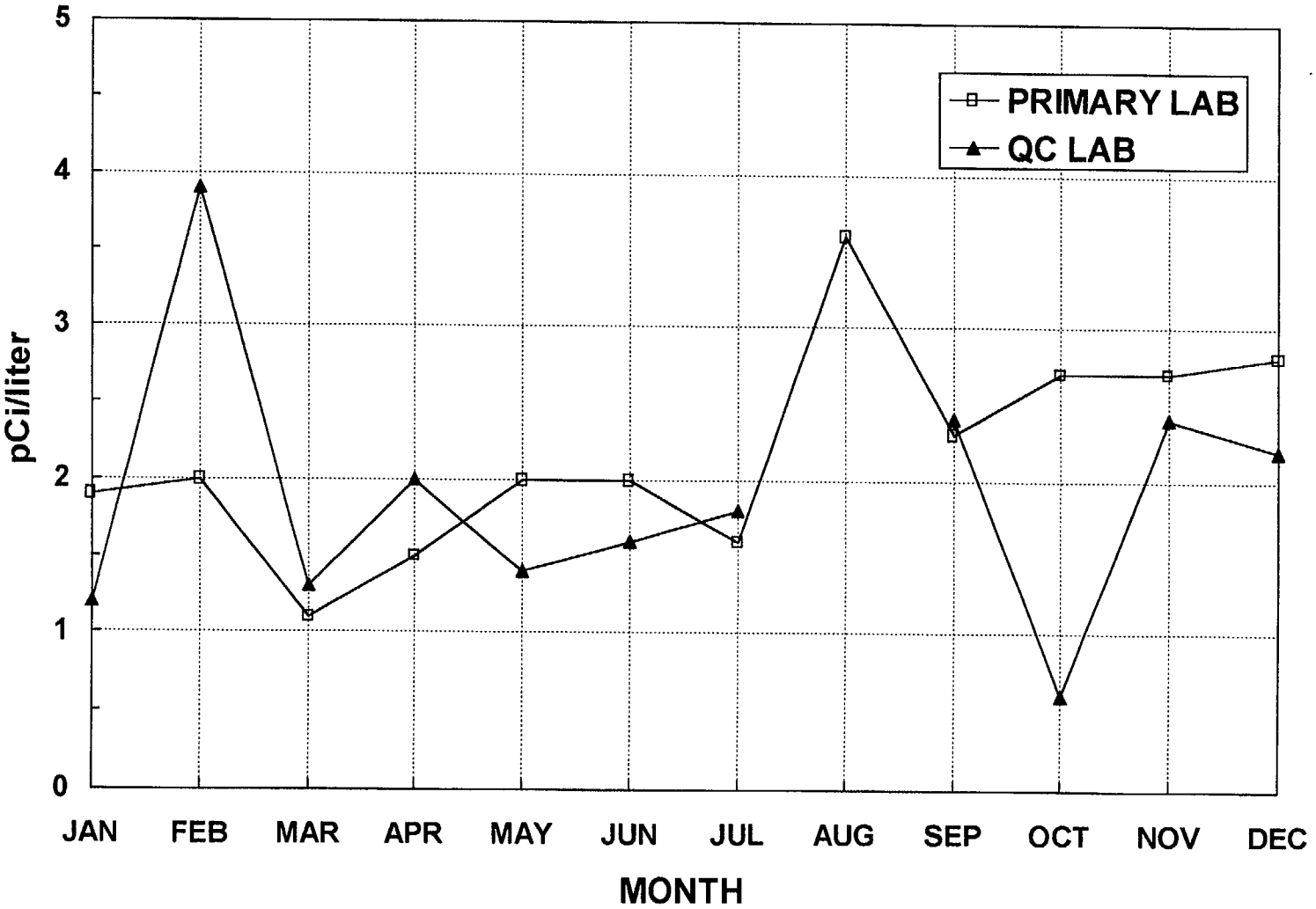
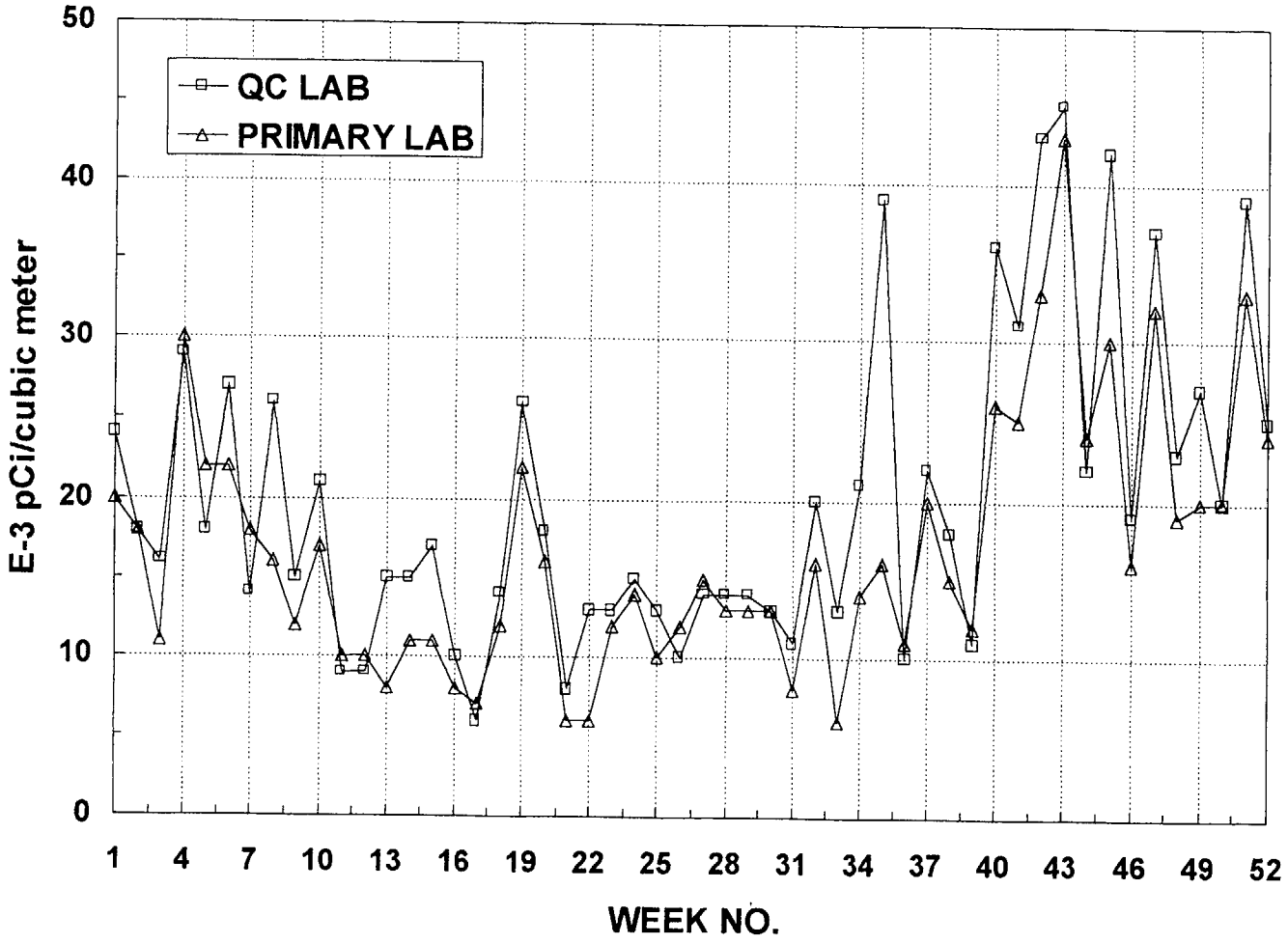


FIGURE D-3
COMPARISON OF WEEKLY GROSS BETA CONCENTRATIONS FROM COLLOCATED AIR PARTICULATE LOCATIONS SPLIT BETWEEN THE PRIMARY AND QC LABORATORIES, 2000



APPENDIX E

SYNOPSIS OF ANALYTICAL PROCEDURES

APPENDIX E: SYNOPSIS OF ANALYTICAL PROCEDURES

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

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

AmerGen Environmental Radioactivity Laboratory

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

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

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

Calculation of Sample Activity and 2 Sigma Uncertainty:

$$R = \frac{C - B}{2.22x\,E_0\,xTFxVxT}$$

$$2s = \frac{2x\sqrt{C + B}}{2.22x\,E_0\,xTFxVxT}$$

$$LLD = \frac{4.66x\sqrt{B}}{2.22x\,E_0\,xTFxVxT}$$

Where:

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

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

Teledyne Brown Engineering

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

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

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

Calculation of Sample Activity and 2 Sigma Error:

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

Net Activity Counting Error

where:

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

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

DETERMINATION OF TRITIUM IN WATER BY LIQUID SCINTILLATION COUNTING

AmerGen Environmental Radioactivity Laboratory

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

Calculation of Sample Activity and 2 Sigma Uncertainty:

$$R = \frac{C - B}{2.22x\,E_0\,xVxDF}$$

$$2s = \frac{2x\sqrt{\frac{C}{T_a} + \frac{\beta}{T_b}}}{2.22x\,E_0\,xVxDF}$$

$$LLD = \frac{3.29x\sqrt{\frac{\beta}{T_a} + \frac{\beta}{T_b}}}{2.22x\,E_0\,xVxDF}$$

Where:

T_a	=	Total count time of sample in minutes
T_b	=	Total count time of background in minutes
R	=	Tritium activity in picoCurie per unit volume (Volume units are those used in V)
2s	=	2 sigma Uncertainty in the same units as above
LLD	=	Lower limit of detection in same units as above
C	=	Average count rate of sample
ß	=	Average count rate of background
E_0	=	Tritium detection efficiency of counter, calculated as shown below
V	=	Volume of aliquot

DF = Decay factor, calculated as shown below

$$DF = e^{\frac{-\ln 2xDT}{12.43}} \quad 8$$

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

The efficiency is calculated as follows:

$$E_0 = \frac{S - B}{AsxVsxDFs} \quad 9$$

Where:

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

$$DFs = e^{\frac{-\ln 2xDTs}{12.43}} \quad 10$$

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

DETERMINATION OF GROSS BETA ACTIVITY IN AIR PARTICULATE SAMPLES

AmerGen Environmental Radioactivity Laboratory

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

Calculation of Sample Activity and 2 Sigma Uncertainty:

$$R = \frac{C - B}{2.22x\,E_0 xTFxVxT} \quad 11$$

$$2s = \frac{2x\sqrt{C + B}}{2.22x\,E_0 xTFxVxT} \quad 12$$

$$LLD = \frac{4.66x\sqrt{B}}{2.22x\,E_0 xTFxVxT} \quad 13$$

Where

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

DETERMINATION OF GROSS BETA ACTIVITY IN AIR PARTICULATE SAMPLES

Teledyne Brown Engineering

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

Calculation of Sample Activity and 2 Sigma Error:

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

Net Activity Counting Error

where:

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

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

DETERMINATION OF I-131 IN MILK SAMPLES

AmerGen Environmental Radioactivity Laboratory

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

Calculation of Sample Activity and 2 Sigma Uncertainty:

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

DETERMINATION OF I-131 IN MILK SAMPLES

Teledyne Brown Engineering

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

Calculation of the Sample Activity and 2 Sigma Error:

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

Net Activity Counting Error

where:

N	=	total counts from sample (counts)
t_s	=	counting time for sample (min)
ß	=	background rate of counter (cpm)
t_b	=	counting time for background (min)
2.22	=	dpm/pCi
v	=	volume of sample analyzed (liters)
y	=	chemical yield of the amount of sample counted
λ 16	=	is the radioactive decay constant for I-131 (0.693/8.05)
Δt 17	=	is the elapsed time between sample collection (or end of the sample collection) to the midcount time
2	=	multiple of the counting error
E	=	efficiency of the counter for I-131, corrected for self absorption effects by the formula:

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

where:

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

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

DETERMINATION OF GAMMA EMITTING RADIOISOTOPES

AmerGen Environmental Radioactivity Laboratory

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

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

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

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

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

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

Calculation of Sample Activity and 2 Sigma Uncertainty:

$$A = \frac{P}{2.22xqx\varepsilon xbx\,E_L} x\, e^{\lambda T_s} x \frac{\lambda E_R}{(1-e^{-\lambda E_R})}$$

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where:

A	=	the computed specific activity
P	=	peak area
2.22	=	dpm/picoCurie
q	=	sample quantity
ε 20	=	detection efficiency
b	=	gamma-ray abundance
E_L	=	elapsed live time
λ 21	=	decay constant
T_S	=	acquisition start time
E_R	=	elapsed real time

$$\Delta A = A\sqrt{\left(\frac{\Delta P}{P}\right)^2 + \left(\frac{\Delta b}{b}\right)^2 \left(\frac{\Delta \varepsilon}{\varepsilon}\right)^2 \left(\frac{sys}{100}\right)^2 (\Delta Decay)^2} \quad 22$$

where: ΔA 23 = uncertainty in the activity

$$\Delta Decay = \frac{\Delta T_{1/2}}{T_{1/2}} x \left(\frac{\lambda E_R}{1 - e^{-\lambda E_R}} - \lambda (T_S + E_R) - 1\right) \quad 24$$

ΔP 25 = uncertainty in the peak area P
Δb 26 = uncertainty in the **S**-ray abundance
$\Delta \varepsilon$ 27 = uncertainty in the efficiency
sys = systematic Uncertainty estimate (in %)
ΔT 28½ = uncertainty in the half-life

DETERMINATION OF GAMMA EMITTING RADIOISOTOPES

Teledyne Brown Engineering

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

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

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

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

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

Statistically Significant Activity

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

2 Sigma Counting Error

Where:

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

ABN	=	Nuclide Abundance (from Nuclide Line Activity Report)
EFF	=	Detector Efficiency (from Nuclide Line Activity Report)
0.037	=	Conversion Factor (dps to picoCurie)
unit mass	=	Sample weight or volume (from Header Information)

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

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

Statistically Non Significant Activity

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

2 Sigma Counting Error

where:

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

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

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

where:

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

ENVIRONMENTAL DOSIMETRY

AmerGen Environmental Radioactivity Laboratory

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

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

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

Each station comprises two TLD badges, each of which has two calcium sulfate elements. Outliers are identified using predefined algorithms. If all four elements are available, a given exposure value is judged an outlier if the standard deviation exceeds 5% of the mean exposure based on all four elements, and the exposure for one element is outside three standard deviations of the mean exposure based on the

other three elements. If only two elements are available, the relative standard deviation based on the two exposure values must be 12% or less, or else both exposure values are considered outliers and no valid data are reported for that station for that Quarter.

APPENDIX F

QUALITY CONTROL
INTER-LABORATORY COMPARISON PROGRAM

APPENDIX F: QUALITY CONTROL PROGRAM

AmerGen's ERL , Environmental, Inc. (EI) and Teledyne Brown Engineering (TBE) participated in an Inter-laboratory Radiological Comparison (cross check) Programs provided by Analytics, DOE Radiological Comparison Program (MAPEP) and Environmental Resources Associates (ERA). The results of these inter-laboratory programs represent the various media as found in the Peach Bottom Atomic Power Station REMP. As a result of this participation, an objective measurement of analytical precision and accuracy as well as, a bias estimation of the results are obtained.

Examination of the data shows that the vast majority were within the Analytics's, DOE's, or ERA's control limits. Each case of exceeding the control limits was investigated. There was no evidence to suggest systematic errors.

The results of ERL's , EI's, and TBE's participation in the DOE, Analytics and ERA cross check programs can be found in Tables F-1 through F-7.

TABLE F-1
DOE EML Cross Check Program Results
AmerGen ERL

Collection Date	Media	Nuclide	ERL VALUE (A & D)	ERL UNCERTAINTY (A)	DOE EML VALUE (B &D)	DOE EML UNCERTAINTY (C)	RATIO	Min. RATIO	Max. RATIO	AGREEMENT	
3/1/2000	Air Filter	Am-241	0.15	0.02	0.088	0.005	1.705	0.73	2.58	YES	
		Co-57	5.9	0.6	5.31	0.22	1.111	0.65	1.39	YES	
		Co-60	6.4	0.6	5.32	0.26	1.203	0.75	1.32	YES	
		Cs-137	7.1	0.7	6.1	0.3	1.164	0.73	1.37	YES	
		Mn-54	31	3	27.2	0.8	1.140	0.73	2.58	YES	
		Pu-238	0.079	0.013	0.08	0.001	0.988	0.74	1.4	YES	
		Pu-239	0.1	0.01	0.089	0.003	1.124	0.76	1.44	YES	
		Ru-106	3.3	1.7	2.01	1.94	1.642	0.59	1.3	NO	F
		U-234	0.055	0.009	0.062	0.001	0.887	0.83	1.92	YES	
		U-238	0.051	0.009	0.062	0.001	0.823	0.84	2.61	NO	F
		U-NAT	0.11		0.126	0.001	0.873	0.8	2.61	YES	
3/1/2000	Air Filter	ALPHA	2.7	0.3	3.02	0.3	0.894	0.5	1.55	YES	
		BETA	2.8	0.3	2.42	0.2	1.157	0.72	1.67	YES	
3/1/2000	Soil	Am-241	13	3	3.36	0.51	3.869	0.63	2.31	NO	F
		Cs-137	393	40	339	9.3	1.159	0.83	1.32	YES	
		K-40	943	97	811	29	1.163	0.78	1.53	YES	
		Pu-238	20	2	18.6	0.5	1.075	0.52	2.84	YES	
		Pu-239	7.7	1.3	7	0.34	1.100	0.69	1.74	YES	
		Sr-90	18	5	20.2	0.2	0.891	0.6	3.66	YES	
		U-234	105	10	111	11	0.946	0.47	1.3	YES	
		U-238	105	10	114	12	0.921	0.44	1.42	YES	
		U-NAT	214		229	23	0.934	0.42	1.3	YES	
3/1/2000	Vegetation	Am-241	16	2	10.4	1.4	1.538	0.68	2.7	YES	
		Cm-244	10	1	5	1.8	2.000	0.47	1.74	NO	F
		Co-60	55	6	52.8	1	1.042	0.69	1.46	YES	
		Cs-137	1400	100	1380	20	1.014	0.8	1.4	YES	
		K-40	550	60	521	20	1.056	0.79	1.42	YES	
		Pu-238	1.7	0.2	1.09	0.1	1.560	0.66	7.94	YES	
		Pu-239	16	2	15.5	2.1	1.032	0.68	1.59	YES	
		Sr-90	2200	200	1780	17.8	1.236	0.5	1.33	YES	
3/1/2000	Water	Am-241	3.8	0.4	1.95	0.18	1.949	0.75	1.49	NO	F
		Co-60	53	5	48.9	1.8	1.084	0.8	1.2	YES	
		Cs-137	110	10	103	4	1.068	0.8	1.26	YES	
		Fe-55	31	5	33.1	0.7	0.937	0.44	1.53	YES	
		H-3	81	7	79.4	2.5	1.020	0.71	1.79	YES	
		Pu-238	1.2	0.1	0.944	0.04	1.271	0.78	1.25	NO	F
		Pu-239	1.2	0.1	0.918	0.03	1.307	0.8	1.39	YES	
		Sr-90	3.1	0.8	3.39	0.12	0.914	0.75	1.5	YES	
		U-234	0.53	0.06	0.482	0.04	1.100	0.8	1.4	YES	
		U-238	0.51	0.05	0.492	0.04	1.037	0.8	1.26	YES	
		U-NAT	1.1		0.995	0.087	1.106	0.67	1.42	YES	
	Water	Alpha	1600	100	1700	170	0.941	0.61	1.32	YES	
		Beta	940	100	690	70	1.362	0.55	1.54	YES	

Notes:

A. The ERL Value is an average of 1 to 4 determinations.
B. The DOE EML value is the mean of replicate determinations for each nuclide.
C. The DOE EML uncertainty is the standard error of the mean.
D. Units are Bq/L for Water, Bq/kg (dry) for Soil, Bq/kg (wet) for Vegetation and total Bq for Air Filter.
E. This sample was analyzed three times for Ru-106 and the average (3.3 +/- 1.7 Bq/un) was reported. The individual results were as follows:

   3.5 +/- 2.0 Bq/un
   3.0 +/- 1.4
   3.4 +/- 1.7

   The EML value was 2.01 +/- 1.94. The ERL/EML ratio was 1.642 and was not acceptable. The acceptance range was between 0.59 and 1.3. No follow-up actions were requested because the concentrations were not statistically different (i.e. the results with their counting uncertainties overlapped.).
F. An investigation was conducted to determine why five out of twenty-two TRU radionuclides failed to achieve acceptable results from various media submitted by the EML crosscheck program. When processing EML crosscheck samples, separate glassware is used in order to avoid cross contaminating other client's samples. This glassware has become etched throughout the years due to acid digestions and flouric acid precipitations. What used to be very good test results from the various crosscheck programs has progressively depreciated. It has been determined that the etching causes fluctuations in radionuclide recoveries. This is true not only with TRU radionuclides but also other fission and activation product nuclides. The ERL is now disposing glassware that shows deterioration to prevent this problem from reoccurring. Also, when it is appropriate, plastic beakers are being substituted for glass. Both corrective actions should eliminate the problems that result from etched glassware.

The control limit concept was established from percentiles of historic data distributions (1982 - 1992). The evaluation of this historic data and the development of the control limits are presented in DOE report EML-564. The control limits for QAP-XLVIII were developed from percentiles of data distributions for the years 1993 - 1999.

TABLE F-2
2000 Analytics Environmental Cross Check Program Results
AmerGen ERL

Collection Date	Media	Nuclide	ERL VALUE (B)	ANALYTICS VALUE (A)	ANALYTICS UNCERTAINTY (3 SIGMA)	ANALYTICS UNCERTAINTY (1 SIGMA)	RESOLUTION	RATIO	Min. RATIO	Max. RATIO	AGREEMENT
6/22/2000	Milk	I-131 (Resin)	92	84	4	1.3	63.0	1.10	0.8	1.25	YES
	Milk	I-131	89	84	4	1.3	63.0	1.06	0.8	1.25	YES
6/22/2000	Cartridge	I-131	66	72	4	1.3	54.0	0.92	0.8	1.25	YES

Notes:

A. The Analytics Value is the known concentration. Units are pCi/L for Milk, pCi/g (dry) for Soil and total pCi for Filter and Cartridge.

B. The ERL Value is an average of three or more determinations. Units are pCi/L for Milk, pCi/g (dry) for Soil and total pCi for Filter and Cartridge.

To determine agreement or possible agreement:

1. Divide each Analytics value by its associated one sigma uncertainty to obtain the resolution.
2. Divide each ERL value by the corresponding Analytics value to obtain the ratio.
3. The ERL measurement is in agreement if the value of the ratio falls within the limits shown in the following table for the corresponding resolution.

Resolution	Agreement
< 4	0.4 - 2.5
= 4 - < 8	0.5 - 2.0
= 8 - < 16	0.6 - 1.66
= 16 - < 51	0.75 - 1.33
= 51 - < 200	0.80 - 1.25
= 200	0.85 - 1.18

Criteria are similar to those listed in USNRC Inspection Procedure 84750 "Radioactive Waste Treatment, and Effluent and Environmental Monitoring" with minor adjustments to account for activity concentrations with large uncertainties.

Table F-3
Environmental Resource Associates Cross Check Program[a]
Environmental, Inc.

				Concentration in pCi/L[b]		
Lab Code	Sample Type	Date Collected	Analysis	Laboratory results[c] ±2 Sigma	ERA Result[d] ls, N=1	Control Limits
STW-863	WATER	Jan, 2000	Gr. Alpha	39.3 ± 5.2	25.4 ± 6.4	14.5 - 36.3
			Gr. Beta	40.7 ± 1.2	42.1 ± 4.2	33.4 - 50.8
The analysis was repeated and recalculated with Am-241 efficiency; result of reanalysis 29.32 ± 5.79 pCi/L. Internal spike program results do not indicate a problem.						
STW-866	WATER	Jan, 2000	Sr-89	17.1 ± 2.2	22.5 ± 5.0	13.8 - 31.2
			Sr-90	8.1 ± 0.6	9.6 ± 5.0	0.9 - 18.3
STW-868	WATER	Feb, 2000	Ra-226	7.6 ± 0.5	8.3 ± 1.2	6.1 - 10.4
			Ra-228	5.6 ± 1.0	2.3 ± 0.6	1.3 - 3.2
			Uranium	5.4 ± 0.2	6.1 ± 3.0	0.9 - 11.3
Result of reanalysis: 6.34 ± 0.94. Activity confirmed by gamma spectroscopy (6.00 ± 1.42 pCi/L).						
STW-869	WATER	Mar, 2000	H-3	23,500.0 ± 306.0	23,800.0 ± 2,380.0	19,800.0 - 27,800.0
STW-867	WATER	Mar, 2000	Gr. Alpha	83.6 ± 5.8	58.4 ± 5.8	33.3 - 83.5
			Gr. Beta	15.4 ± 0.9	16.8 ± 1.7	8.1 - 25.5
			1-131	18.7 ± 0.6	19.9 ± 2.0	18.1 - 28.5
Results were recalculated with Am-241 efficiency; 57.80 ± 5.73 pCi/L. Refer to STW-863.						
STW-877	WATER	Apr, 2000	Gr. Alpha	52.3 ± 2.3	54.0 ± 13.5	30.8 - 77.2
			Ra-226	17.5 ± 1.1	18.6 ± 2.8	13.8 - 23.4
			Ra-228	3.7 ± 0.4	3.6 ± 0.9	2.0 - 5.1
STW-878	WATER	Apr, 2000	Co-60	19.2 ± 0.6	16.9 ± 5.0	8.2 - 25.6
			Cs-134	81.0 ± 1.3	86.4 ± 5.0	77.7 - 95.1
			Cs-137	119.0 ± 2.6	123.0 ± 6.2	112.0 - 134.0
			Gr. Beta	276.0 ± 9.6	289.0 ± 43.4	214.0 - 364.0
			Sr-89	32.3 ± 3.3	50.7 ± 5.0	42.0 - 59.4
			Sr-90	11.3 ± 1.0	32.8 ± 5.0	24.1- 41.5
An error was found in calculation. Result of recalculation: Sr-89, 55.5± 7.2 pCi/L / Sr-90, 30.7 ± 3.0 pCi/L Results of reanalysis: Sr-89, 47.4 ± 14.5 pCi/L / Sr-90, 33.0 ± 1.35 pCi/L. Both results are within limits..						
STW-879	WATER	Jun, 2000	Ba-133	22.4 ± 2.1	25.5 ± 5.0	16.8 - 34.2
			Co-60	69.9 ± 3.7	65.6 ± 5.0	56.9 - 74.3
			Cs-134	13.5 ± 0.8	13.8 ± 5.0	5.1 - 22.5
			Cs-137	232.0 ± 7.8	238.0 ± 11.9	217.0 - 259.0
			Zn-65	50.9 ± 3.8	54.6 ± 5.5	45.3 - 63.9
STW-880	WATER	Jun, 2000	Ra-226	2.8 ± 0.2	3.0 ± 0.5	2.2 - 3.8
			Ra-228	10.0 ± 0.9	13.0 ± 3.3	7.4 - 18.6
			Uranium	57.0 ± 4.4	63.4 ± 6.3	52.6 - 74.2
STW-883	WATER	Jul, 2000	Gr. Alpha	6.9 ± 1.1	7.2 ± 5.0	0.0 - 15.9
			Gr. Beta	88.8 ± 9.8	87.5 ± 10.0	70.2 - 105.0
STW-884	WATER	Aug, 2000	H-3	8,740.0 ± 174.0	8,320.0 ± 832.0	6,910.0 - 9,730.0

Table F-3
Environmental Resource Associates Cross Check Program[a]
Environmental, Inc.

				Concentration in pCi/L[b]		
Lab Code	Sample Type	Date Collected	Analysis	Laboratory results[c] ±2 Sigma	ERA Result[d] ls, N=1	Control Limits
STW-891	WATER	Sep, 2000	Ra-226	17.9 ± 1.3	18.9 ± 2.8	14.0 - 23.8
			Ra-228	5.7 ± 0.5	6.2 ± 1.6	3.5 - 8.8
			Uranium	10.3 ± 0.1	11.9 ± 3.0	6.7 - 17.1
STW-892	WATER	Oct, 2000	I-131	16.9 ± 0.3	15.9 ± 1.6	10.7 - 21.1
			I-131(g)	17.1 ± 5.4	15.9 ± 1.6	10.7 - 21.1
STW-893	WATER	Oct, 2000	Gr. Alpha	66.3 ± 5.3	74.4 ± 18.6	42.2 - 107.0
			Ra-226	10.1 ± 1.0	10.5 ± 1.6	7.8 - 13.2
			Ra-228	21.2 ± 0.5	19.4 ± 4.9	11.0 - 27.8
			Uranium	41.4 ± 1.9	44.5 ± 4.5	36.8 - 52.2
STW-894	WATER	Oct, 2000	Co-60	93.4 ± 1.6	91.1 ± 5.0	82.4 - 99.8
			Cs-134	54.8 ± 0.3	59.8 ± 5.0	51.1 - 68.5
			Cs-137	45.5 ± 2.3	45.0 ± 5.0	36.3 - 53.7
			Cs-137	45.5 ± 2.3	45.0 ± 5.0	36.3 - 53.7
			Gr. Beta	209.0 ± 7.9	256.0 ± 38.4	189.0 - 323.0
			Sr-89	32.8 ± 3.0	41.3 ± 5.0	32.6 - 50.0
			Sr-90	16.0 ± 2.4	18.0 ± 5.0	9.3 - 26.7
STW-895	WATER	Nov, 2000	Gr. Alpha	50.3 ± 2.6	60.3 ± 15.1	34.4 - 86.2
			Gr. Beta	28.6 ± 1.3	25.5 ± 5.0	16.8 - 34.2
STW-896	WATER	Nov, 2000	Ba-133	78.0 ± 2.0	82.2 ± 8.2	68.0 - 96.4
			Co-60	30.8 ± 1.7	27.8 ± 5.0	19.1 - 36.5
			Cs-134	67.2 ± 3.3	76.0 ± 5.0	67.3 - 84.7
STW-896	WATER	Nov, 2000	Cs-137	109.0 ± 1.0	106.0 ± 5.3	96.8 - 115.0
STW-896	WATER	Nov, 2000	Zn-65	81.5 ± 7.4	79.0 ± 7.9	65.3 - 92.7

The mean value for Cs-134 of all participating laboratories was 70.7 pCi/L. Other gamma emitters are within limits, the counting efficiency is not suspect. Library values were reviewed and found to be correct.

a Results obtained by Environmental, Inc., Midwest Laboratory as a participant in the environmental samples crosscheck program operated by Environmental Resources Associates (ERA).

b All results are in pCi/L, except for elemental potassium (K) data in milk, which are in mg/L; air filter samples, which are in pCi/Filter.

c Unless otherwise indicated, the laboratory results are given as the mean ± 2 standard deviations for three determinations.

d Results are presented as the known values, expected laboratory precision (1 sigma, 1 determination) and control limits as provided by ERA.

Table F-4
Department of Energy's Mixed Analyte Performance Evaluation Program (MAPEP)[a]
Environmental, Inc.

				Concentration[b]		
Lab Code	Sample Type	Date Collected	Analysis	Laboratory results[c]	MAPEP Result[d] ls, N=1	Control Limits
STSO-882	SOIL	Jan, 2000	Am-241	64.90 ± 6.49	61.10	42.77 - 79.43
			Co-57	721.10 ± 83.80	949.00	664.30 - 1,233.70
			Co-60	1,264.40 ± 78.60	1,180.00	826.00 - 1,534.00
			Cs-134	969.30 ± 76.90	1,047.00	732.90 - 1,361.10
			Cs-137	944.00 ± 92.00	930.00	651.00 - 1,209.00
			K-40	811.70 ± 79.90	652.00	456.40 - 847.60
			Mn-54	1,103.30 ± 64.20	1,023.00	716.10 - 1,329.90
			Ni-63	711.00 ± 71.10	960.00	672.00 - 1,248.00
			Pu-239/40	67.90 ± 6.79	74.40	52.08 - 96.72
			Sr-90	345.00 ± 34.50	304.00	212.80 - 395.20
			U-233/4	62.90 ± 6.29	90.00	63.00 - 117.00
			U-238	63.20 ± 6.32	93.00	65.10 - 120.90
			Zn-65	1,544.30 ± 61.50	1,540.00	1,078.00 - 2,002.00
The MAPEP soil sample (STSO-882), as received, did not closely match a standard gamma geometry. The results for gamma-emitting isotopes are reanalyses, with a reduced sample size.						
Incomplete dissolution of the sample is suspected. Results of reanalysis: U-233/234 67.3 ± 3.3 pCi/g, U-238 68.1 ± 8.9 pCi/g.						

a Results obtained by Environmental Inc., Midwest Laboratory as a participant in the Department of Energy's Mixed Analyte Performance Evaluation Program, Idaho Operations office, Idaho Falls, Idaho.

b All results are in Bq/kg or Bq/L as requested by the Department of Energy.

c Unless otherwise indicated, laboratory results are given as the mean ± 1 standard deviations for three determinations.

d Results are presented as the known values, expected laboratory precision (1 sigma, 1 determination), and control limits as defined by the MAPEP.

Table F-5
DOE EML Quality Assessment Program[a]
Environmental, Inc.

				Concentration[b]		
Lab Code	Sample Type	Date Collected	Analysis	Laboratory results[c]	EML Result[d]	Control Limits
STSO-870	SOIL	Mar, 2000	Ac-228	98.30 ± 7.10	97.60	0.79 – 1.75
			Bi-212	98.50 ± 15.10	106.00	0.42 – 1.22
			Bi-214	88.00 ± 3.80	86.70	0.75 – 1.42
			Cs-137	324.00 ± 5.00	339.00	0.83 – 1.32
			K-40	872.00 ± 34.00	811.00	0.78 – 1.53
			Pb-212	93.70 ±2.70	97.30	0.74 – 1.33
			Pb-214	100.10 ± 3.70	86.50	0.65 – 1.45
			Pu-238	19.80 ± 3.00	18.60	0.52 – 2.84
			Pu-239/40	8.10 ± 1.70	7.00	0.69 – 1.74
			Sr-90	13.60 t 3.10	20.20	0.60 – 3.66
STVE-871	VEGETATION	Mar, 2000	Am-241	9.80 ± 0.90	10.40	0.68 – 2.70
			Co-60	46.50 ± 2.10	52.80	0.69 – 1.46
			Cs-137	1,872.00±46.00	1,380.00	0.80 – 1.40
			K-40	506.40 ± 28.00	521.00	0.79 – 1.42
			Pu-239/40	14.30 ± 1.50	15.50	0.68 – 1.59
			Sr-90	1,198.00±85.00	1,780.00	0.50 – 1.33
STAP-872	AIR FILTER	Mar, 2000	Co-57	5.90 ± 0.10	5.31	0.65 – 1.39
			Co-60	5.90 ± 0.10	5.32	0.75 – 1.32
			Cs-137	7.50 ± 0.10	6.10	0.73 – 1.37
			Gr. Alpha	3.30 ± 0.10	3.02	0.50 – 1.55
			Gr. Beta	2.70 ± 0.10	2.42	0.72 – 1.67
			Mn-54	31.80 ± 0.30	27.20	0.76 – 1.33
			Pu-238	0.06 ± 0.03	0.08	0.74 – 1.40
			Pu-239/40	0.09 ± 0.01	0.09	0.76 – 1.44
			Ru-106	3.50 ± 1.00	2.01	0.59 – 1.30
Result within activity ± error margin.						
			Sr-90	0.31 ± 0.16	0.24	0.61 – 21.93
			Uranium	0.12 ± 0.01	0.13	0.80 – 3.35
STW-874	WATER	Mar, 2000	Am-241	1.70 ± 0.22	1.95	0.75 – 1.49
			Co-60	51.00 ± 1.20	48.90	0.80 – 1.20
			Cs-137	108.60 ± 1.80	103.00	0.80 - 1.26
			Fe-55	33.00 ± 1.20	33.10	0.44 - 1.53
			Gr. Alpha	1,217.00 ± 35.00	1,700.00	0.61 - 1.32
			Gr. Beta	792.00 ± 25.00	690.00	0.55 - 1.54
			H-3	147.00 ± 26.00	79.40	0.71 - 1.79
Analysis Was repeated; result of reanalysis 97.5 ± 11.6 Bq/l						
			Ni-63	101.00 ± 6.00	112.00	0.25 - 1.75
			Pu-238	0.75 ± 0.17	0.94	0.78 - 1.25
			Pu-239/40	0.99 ± 0.09	0.92	0.80 - 1.39
			Sr-90	4.46 ± 0.99	3.39	0.75 - 1.50
			Uranium	0.27 ± 0.02	0.995	0.67 - 1.42
Result reported was for U-234. Result for U (total); 0.58 ± 0.02 pCi/L.						

Table F-5
DOE EML Quality Assessment Program[a]
Environmental, Inc.

				Concentration in pCi/L[b]		
Lab Code	Sample Type	Date Collected	Analysis	Laboratory results[c] ±2 Sigma	ERA Result[d] 1s, N=1	Control Limits
STSO-885	SOIL	Sep, 2000	Ac-228	78.00 ± 1.50	80.20	0.80 - 1.50
			Bi-212	73.00 ± 3.30	80.50	0.45 - 1.23
			Bi-214	91.00 ± 4.00	83.30	0.78 - 1.50
			Cs-137	925.70 t 14.20	1,020.00	0.80 - 1.29
			K-40	713.60 ± 7.10	713.00	0.80 - 1.37
			Pb-212	66.10 ± 4.30	79.30	0.74 - 1.36
			Pb-214	100.10 ± 3.70	86.30	0.76 - 1.53
			Pu-239/40	18.40 ± 0.40	16.80	0.71 - 1.33
			Sr-90	39.90 ± 5.30	50.40	0.61 – 3.91
			Th-234	154.70 ± 9.30	148.00	0.68 – 2.36
			Uranium	254.30 ± 13.00	327.00	0.62 - 1.35
STW-886	WATER	Sep, 2000	Am-241	1.30 ± 0.20	1.19	0.76 - 1.48
			Co-60	71.90 ± 7.20	73.70	0.80 - 1.20
			Cs-137	62.70 ± 6.30	67.00	0.80 - 1.24
			H-3	92.30 ± 8.90	91.30	0.74 – 2.29
			Pu-238	0.70 ± 0.10	0.79	0.74 - 1.22
			Pu-239/40	0.60 ± 0.10	0.59	0.75 - 1.26
			Sr-90	4.60 ± 0.40	4.53	0.64 - 1.50
			Uranium	0.80 ± 0.10	0.92	0.73.- 1.37
STW-887	WATER	Sep, 2000	Gr. Alpha	1,113.70 ± 17.90	1,070.00	0.58 - 1.26
			Gr. Beta	1,129.40 ± 16.70	950.00	0.56 - 1.50
STAP-888	AIR FILTER	Sep, 2000	Am-241	0.06 ± 0.01	0.03	0.69 – 2.40
		Sep, 2000	Co-57	16.50 ± 0.60	14.50	0.69 - 1.37
		Sep, 2000	Co-60	9.20 ± 0.40	8.43	0.79 - 1.30
		Sep, 2000	Cs-137	8.80 ± 0.50	7.41	0.78 - 1.35
		Sep, 2000	Mn-54	50.20 ± 2.30	43.20	0.80 - 1.36
		Sep, 2000	Pu-238	0.03 ± 0.01	0.05	0.66 - 1.35
		Sep, 2000	Pu-239/40	0.08 ± 0.01	0.07	0.69 - 1.29
		Sep, 2000	Sr-90	3.30 ± 0.10	1.64	0.55 - 2.05
		Sep, 2000	U-233/4	0.03 ± 0.00	0.04	0.80 - 1.92
		Sep, 2000	U-238	0.03 ± 0.01	0.04	0.80 – 1.59
Result within activity ± error margin.						
		Sep, 2000	Uranium	0.07 ± 0.01	0.08	0.80 - 2.54
STAP-889	AIR FILTER	Sep, 2000	Gr. Alpha	2.84 ± 0.01	2.35	0.57 - 1.47
		Sep, 2000	Gr. Beta	2.08 ± 0.02	1.52	0.76 - 1.52
STVE-890	VEGETATION	Sep, 2000	Am-241	5.90 ± 1.20	5.60	0.72 - 2.34
		Sep, 2000	Cm-244	3.20 ± 0.10	3.60	0.61 - 1.61
		Sep, 2000	Co-60	29.40±0.40	32.80	0.75 - 1.51
		Sep, 2000	Cs-137	739.30 ± 23.00	867.00	0.80 - 1.37
		Sep, 2000	K-40	597.50±49.30	639.00	0.78 - 1.43
		Sep, 2000	Pu-239/40	4.50 ± 0.20	9.60	0.67- 1.49
No reason for deviation was found with original result. The result of reanalysis; 12.1 ±1.1 pCi/g.						
		Sep, 2000	Sr-90	1,201.50 ± 117.30	1,150.00	0.52 - 1.23

a The Environmental Measurements Laboratory provides the following nuclear species : Air Filters, Soil, Vegetation and Water.

b Results are reported in Bq/L with the following exceptions: Air Filter results are reported in Bq/Filter, Soil results are reported in Bq/Kg, Vegetation results are reported in Bq/Kg.

c Laboratory results are reported as the mean of three determinations ± standard deviation.

d The EML result listed is the mean of replicate determinations for each nuclide ± the standard error of the mean.

e The control limits are reported by EML as the ratio of Reported Value / EML value.

Table F-6
Analytics Cross Check Comparison Program
Teledyne Brown Engineering

Sample Date	Media	Nuclide	Teledyne Brown Engineering Result (a)	Analytics Result	Ratio (b)	
03/20/00	Milk	I-131	18 ± 1	20 ± 1	0.90	
		Cr-51	381 ± 38	387 ± 19	0.98	
		Cs-134	132 ± 13	143 ± 7	0.92	
		Cs-137	128 ± 13	114 ± 6	1.12	
		Co-58	89 ± 9	79 ± 4	1.13	
		Mn-54	195 ± 20	176 ± 9	1.11	
		Fe-59	161 ± 16	144 ± 7	1.12	
		Zn-65	171 ± 17	165 ± 8	1.04	
		Co-60	179 ± 18	176 ± 9	1.02	
03/20/00	Milk	Sr-89	13 ± 3	25 ± 1	0.52	(c)
06/19/00	Air Filter	Ce-141	143 ± 8	132 ± 7	1.08	
		Cr-51	229 ± 17	198 ± 10	1.16	
		Cs-134	74 ± 4	81 ± 4	0.91	
		Cs-137	143 ± 8	115 ± 6	1.24	
		Co-58	89 ± 5	77 ± 4	1.16	
		Mn-54	102 ± 6	84 ± 4	1.21	
		Fe-59	98 ± 6	75 ± 4	1.31	
		Zn-65	188 ± 11	139 ± 7	1.35	
		Co-60	113 ± 7	104 ± 5	1.09	
06/19/00	Cartridge	I-131	106 ± 6	88 ± 4	1.20	
06/19/00	Air Filter	Sr-90	88 ± 5	96 ± 5	0.92	
06/19/00	Air Filter	Gross Alpha	103 ± 6	93 ± 5	1.11	
		Gross Beta	210 ± 6	193 ± 10	1.09	
09/18/00	Milk	I-131	97 ± 10	87 ± 4	1.11	
		Ce-141	83 ± 8	77 ± 4	1.08	
		Cr-51	323 ± 40	304 ± 15	1.06	
		Cs-134	98 ± 10	102 ± 5	0.96	
		Cs-137	117 ± 12	107 ± 5	1.09	
		Co-58	64 ± 6	60 ± 3	1.07	
		Mn-54	99 ± 10	88 ± 4	1.13	
		Fe-59	132 ± 13	119 ± 6	1.11	
		Zn-65	218 ± 22	196 ± 10	1.11	
		Co-60	209 ± 21	197 ± 10	1.06	
09/18/00	Milk	Sr-89	14 ± 1	15 ± 1	0.93	
		Sr-90	18 ± 1	14 ± 1	1.29	

Footnotes:

(a) Teledyne Results - counting error is two standard deviations. Units are pCi/liter for water and milk. For gamma results, if two standard deviations are less than 10%, then a 10% error is reported. Units are total pCi for air particulate filters.

(b) Ratio of Teledyne Brown Engineering to Analytics results.

(c) Caused by incorrect rinsing of the strontium extraction column. Additional training was conducted and was documented in the analyst's training file. Subsequent tests on two milk samples spiked with Sr-89 produced correct results.

To determine agreement or possible agreement:

1. Divide each Analytics value by its associated one sigma uncertainty to obtain the resolution.
2. Divide each TBE value by the corresponding Analytics value to obtain the ratio.
3. The measurement is in agreement if the value of the ratio falls within the limits shown in the following table for the corresponding resolution.

Resolution	Agreement
< 4	0.4 - 2.5
= 4 - < 8	0.5 - 2.0
= 8 - < 16	0.6 - 1.66
= 16 - < 51	0.75 - 1.33
= 51 - < 200	0.80 - 1.25
= 200	0.85 - 1.18

Criteria are similar to those listed in USNRC Inspection Procedure 84750 "Radioactive Waste Treatment, and Effluent and Environmental Monitoring" with minor adjustments to account for activity concentrations with large uncertainties.

Table F-7
ERA Proficiency Testing Program
Teledyne Brown Engineering

ERA RAD No	Media	Nuclide	ERA Known Value (a)	Teledyne Brown Engineering (b)	Expected Dev Known (c)	Control Limits (d)	Warning Limits (e)	Performance Evaluation (f)
RAD 12	Water	I-131	To be reported to ERA					
RAD 13	Water	U-Nat	53.0	61.3	5.3	44.0 – 62.0	46.9 – 59.1	CE
		Ra-226	4.05	3.67	0.608	3.00 – 5.10	3.35 – 4.75	A
		Ra-228	2.29	1.33	0.573	1.31 – 3.27	1.63 – 2.95	CE
		Gr-A	71.8	14.0	18.0	40.9 – 103	51.1 – 92.5	NA
		Gr-B	194	34.0	29.1	144 - 244	160 – 228	NA
		Sr-89	16.4	15.7	5.00	7.70 – 25.1	10.6 – 22.2	A
		Sr-90	28.9	29.0	5.00	20.2 – 37.6	23.1 – 34.7	A
		Co-60	64.4	68.3	5.00	55.7 – 73.1	58.6 – 70.2	A
		Cs-134	12.3	12.0	5.00	3.60 – 21.0	6.53 – 18.1	A
		Cs-137	72.2	76.3	5.00	63.5 – 80.9	66.4 – 78.0	A
RAD 14	Water	Gr-A	25.4	14.0	6.35	14.5 – 36.3	66.4 – 78.0	A
		Gr-B	42.1	34.0	5.00	33.4 – 50.8	36.3 – 47.9	CE
RAD 15	Water	Ba-133	98.2	91.7	9.82	81.5 - 115	86.9 - 110	A
		Co-60	99.6	101	5.00	90.9 - 108	93.8 - 105	A
		Cs-134	49.2	48.0	5.00	40.5 – 57.9	43.4 – 55.0	A
		Cs-137	209	76.3	10.4	191 - 227	197 - 221	NA
		Zn-65	313	< 1.0	31.3	260 - 367	277 - 379	NA
RAD 16	Water	Sr-89	22.5	18.3	5.00	13.8 – 31.2	197 - 221	A
		Sr-90	9.60	8.33	5.00	0.9 – 18.3	16.7 – 28.3	A
RAD 17	Water	Gr-A	58.4	83.6	5.00	33.3 – 83.5	41.5 –75.30	A
		Gr-B	16.8	15.4	5.00	8.1 – 25.5	11.0 – 22.6	CE
RAD 18	Water	I-131	19.9	2.03	3.00	14.7 – 25.1	16.4 – 23.4	NA
RAD 19	Water	U-Nat	6.07	5.77	3.00	0.87 – 11.3	2.61 – 23.4	A
		Ra-226	8.26	7.20	1.24	6.11 – 10.4	6.83 – 9.69	A
		Ra-228	2.25	2.37	0.56	1.28 – 3.22	1.60 – 2.90	A
RAD 20		H-3	23800	22300	12380	21100 - 26500	21100 - 26500	A
RAD 23	Water	Ra-226	13.0	9.70	1.15	7.41 – 18.6	9.25-16.8	A
		U-Nat	63.4	57.0	4.44	52.6 – 74.2	56.1 – 70.7	A
		Ra-228	2.83	2.99	6.34	2.21 – 3.77	2.47 – 3.51	A
		Ra-228	13.0	10.0	3.25	7.41 – 16.8	9.25 – 16.8	A
RAD 24	Water	Sr90	26.2	28.6	1.40	17.5 – 34.9	20.4 – 32.0	A
RAD 25	Water	Gr-A	7.17	6.90	1.11	DL – 15.9	1.40 – 12.9	A
		Gr-B	87.5	88.8	9.76	70.2 – 105	76.0 – 99.0	A
RAD 26	Water	H-3	8320	8740	174	6910 – 9730	7360 – 9280	A

Footnotes:

(a) The ERA Known Value is equal to 100% of the parameter present in the standard as determined by gravimetric and/or volumetric measurements made during standard preparation.
(b) Average ± 1 sigma.
(c) Established per the guidelines contained in the EPA's National Standards for Water Proficiency Testing Criteria Document, December 1998, as applicable.
(d) Established per the guidelines contained in the EPA's National Standards for Water Proficiency Testing Criteria Document, December 1998, as applicable.
(e) A= Acceptable. Reported Result falls within the Warning Limits.
(f) NA = Not Acceptable. Reported Result falls outside of the Control Limits.
(g) CE = Check for Error. Reported Result falls within the Control Limits and outside of the Warning Limits.
(h) A calculation error was made by not correcting for Ra-226 content. If this correction is made, an average result of 5.7 pCi/l is obtained which is in the acceptance region.

RAD 23 through RAD 26 were received and analyzed in the Westwood, New Jersey laboratory in September 2000.

APPENDIX G

PBAPS SURVEY

APPENDIX G: PBAPS SURVEYS

A Land Use Census around the Peach Bottom Atomic Power Station (PBAPS) was conducted by Normandeau Associates, Inc., RMC Environmental Services Division for Exelon Nuclear to comply with Section 3.8.E.2 of PBAPS's Offsite Dose Calculation Manual Specifications (ODCMS) and Bases. The survey was conducted during the May to October 2000 growing season. The distance and direction of all locations were positioned from the barn to the PBAPS vents using Global Positioning System (GPS) technology. The results of this survey are summarized in Table G-1.

No changes were 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, 2000

Sector	Distance (ft.) from Vents
N	14,650
NNE	11,078
NE	11,211
ENE	10,978
E	15,163
ESE	20,149
SE	19,085
SSE	-
S	-
SSW	12,200
SW	12,241
WSW	4,694
W	5,119
WNW	9,040
NW	17,570
NNW	-

- INDICATES NO MILK ANIMALS LOCATED