PEACH BOTTOM ATOMIC POWER STATION

Regional Radiological Environmental
Monitoring Program
Report #19

January 1, 1983 Through December 31, 1983

Prepared For
PHILADELPHIA ELECTRIC COMPANY
By

TELEDYNE ISOTOPES

70 Van Buren Avenue
Westwood, NJ 07675

May 1984

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TABLE OF CONTENTS

LIST OF TABLES

TABLES

LIST OF TABLES (CONT.)

TABLES

LIST OF FIGURES

LIST OF FIGURES (CONT.)

FIGURE

I. SUMMARY AND CONCLUSIONS

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This report on the radiological environmental monitoring program conducted at the Peach Bottom Atomic Power Station for Philadelphia Electric company by Teledyne Isotopes covers the period January 1, 1983 to December 31, 1983. During this period 4558 analyses were performed on 3924 samples.

Surface water and discharge water samples were analyzed for concentrations of tritium, gross beta, and gamma-emitting nuclides. Surface water was also analyzed for concentrations of gross alpha. Comparisons of unaffected stations with potentially affected stations, in Conowingo Pond, showed no significant difference in concentrations of the radionuclides studied. It was shown that no significant differences existed between the preoperational and operational periods; therefore, it can be concluded that the levels of radioactivity in Conowingo Pond water have not been measurably influenced by the operation of the Peach Bottom Atomic Power Station.

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

High sensitivity I-131 analyses were also performed on weekly milk samples while cows were on pasture and on monthly samples when cows were not grazing. Milk collected from stations A, C, and G showed positive results on March 25, 1983, which was attributed to PBAPS operations. The maximum hypothetical dose is calculated to be 0.4 mRem to an infant's thyroid.

Soil samples were analyzed for concentrations of Sr-89, Sr-90 and gamma-emitting nuclides. The levels observed were not significantly different from preoperational data.

Environmental gamma radiation measurements were made using thermoluminescent dosimeters. Results from the site-boundary, middle and outer rings were found to be not significantly different, so it can be concluded that the operation of Peach Bottom Atomic Power Station did not produce measurable levels of ambient gamma radiation at any off-site location.

In assessing all the data gathered for this report and comparing the results with preoperational data, it was evident that the operation of the Peach Bottom Atomic Power Station resulted in no significant radiological impact on the environment.

II. INTRODUCTION

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Teledyne Isotopes (TI) began conducting a radiological environmental monitoring program in July 1983 for the Philadelphia Electric Company in connection with the Peach Bottom Atomic Power Station (PBAPS) located in Peach Bottom Township, York County, Pennsylvania. TI replaced Radiation Management Corporation (RMC) when the analytical laboratory was aquired by TI. This report, therefore, covers the entire 1983 year, including those results generated by both TI and RMC.

In order to maintain the integrity and consistency of the monitoring program, all records and most equipment were transferred from RMC to TI. In addition, a six-month overlap period existed, during which close contact between TI and RMC personnel was maintained. RMC's analytical procedures were reviewed and where appropriate, adopted by TI. Finally, in July all activities were transferred to TI.

This TI program complements an existing program being conducted by others which has been carried out since March 1960. PBAPS is located along the Susquehanna River between Holtwood and Conowingo Dams. The fourteen mile long pond created by Conowingo Dam is called Conowingo Pond.

The initial loading of fuel into Peach Bottom Unit No. 1, a 40 MWe (Net) high temperature gas-cooled reactor, was started on February 5, 1966, and initial criticality was achieved March 3, 1966. Final shutdown of Peach Bottom Unit No. 1 was on October 31, 1974. Peach Bottom Unit No. 2 and No. 3 are boiling water reactors each with a power output of approximately 1050 MWe (Net). The first fuel was loaded into Unit No. 2 on August 9, 1973, and criticality was first achieved on September 16, 1973. The fuel was loaded into Unit No. 3 on July 5, 1974 and criticality was first achieved on August 7, 1974. Peach Bottom Unit No. 2 first reached full power on June 16, 1974. Peach Bottom Unit No. 3 first reached full power on December 21, 1974.

A special preoperational report(1) for Peach Bottom Units No. 2 and No. 3 has been issued previously which summarizes results of all analyses performed on samples collected from September, 1970 through August 8, 1973, the day before fuel was first loaded into Peach Bottom Unit No. 2. This report contains data for samples representing the period January 1, 1983 through December 31, 1983.

A. PROGRAM OBJECTIVES

1. Identify, measure, and evaluate existing radionuclides in the environs of the Peach Bottom Site and any fluctuations in radioactivity levels which may occur.

2. Monitor and evaluate ambient radiation levels.

3. Determine, within the scope of the program, any measurable quantity of radioactivity introduced to the environment by the operation of the Peach Bottom Atomic Power Station.

4. Complement other existing radiological environmental monitoring programs at Peach Bottom Atomic Power Station.

B. PROGRAM IMPLEMENTATION

In order to achieve these objectives, the following analyses were performed on samples collected during the period of this report.

1. Measured and evaluated concentrations of aqueous tritium in surface water, discharge water, well water and milk.

2. Measured and evaluated concentrations of alpha emitters in surface water.

3. Measured and evaluated concentrations of beta emitters in surface water, discharge water, well water, precipitation and air particulates.

4. Identified, measured and evaluated gamma emitting radionuclides in surface water, discharge water, precipitation, air particulates, milk and soil.

5. Measured and evaluated concentrations of I-131 in milk, air and surface water.

6. Measured and evaluated concentrations of Sr-89 and Sr-90 in soil and milk.

7. Measured ambient gamma radiation levels in the environment and evaluated the variations with time and location with respect to the Site.

III. TI PROGRAM DESCRIPTION

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A. SAMPLE COLLECTION AND TLD PLACEMENT PROCEDURES

The program being conducted by TI is described in Tables I and II and Figures 1-3.

1. Sample Collection

a. Water (except precipitation)

All samples were collected in new polyethylene bottles. All persons involved in sample collection and handling were advised not to wear luminous dial watches in order to avoid possible cross contamination from that source. Sample containers were rinsed at least twice with the water to be sampled before collection.

All water samples were grab samples except those collected at stations 1LL, 1MM, 6I and 4L. Weekly samples were taken from a tank which continually collects a sample at these four locations. The weekly samples were composited into a monthly sample for analysis. Collection methods are described in more detail in Table II, Section V.

b. Precipitation

Precipitation was collected in an apparatus consisting of a new polyethylene bottle with a plastic funnel 8 inches in diameter. The bottle was replaced monthly and the sample bottle was shipped to TI for analysis. The amount of precipitation was recorded continuously by a separate rain gauge at station 1A.

c. AIR PARTICULATES

Air particulate samples were obtained using a vacuum sampler and glass fiber filters, approximately 2" in diameter. The filter was replaced weekly and sent to TI for analysis. The vacuum sampler was run continuously at approximately 1 cubic foot per minute.

d. AIR IODINE

Air iodine samples were obtained using a vacuum sampler and charcoal filters, aproximately 2 " in diameter. The filter was replaced weekly and sent to TI for analysis. The vacuum sampler was run continuously at approximately 1 cubic foot per minute.

e. MILK

Milk samples were collected in new polyethylene bottle from the bulk tank at each farm, refrigerated and shipped immediately. No preservative was added.

f. Soil

Soil samples consisting of seven cores, 2" in diameter and 6" deep were collected from a 50 X 50 ft. area at each sampling location. Top soil (upper 1 inch) and bottom soil (lower 5 inches) were separated, then sealed in separate plastic bags, and shipped to TI.

2. TLD Placement

A system using thermoluminescent dosimeters (TLDs) was used to measure the direct radiation levels in the PBAPS environment. The TLD stations were placed on and around the Peach Bottom Site using the "three ring concept". Two on-site stations, designated as plant complex stations are not included in any of the three rings.

a. A site boundary ring near and within the site perimeter, representing fencepost doses, i.e., at locations where the doses are greater than maximum annual off-site doses from Station releases;

b. A middle ring extending to approximately 10 miles from the Site, designed to measure possible exposures to close-in population;

c. An outer ring extending from approximately 10 to about 60 miles from the Site; and considered not to be affected by Station releases;

d. The specific location of each station was determined by the following criteria:

(1) The presence of relatively densely populated areas;

(2) From 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 the Station, if any, would be more significant;

(3) On hills and (where pratical) within sight of the stack, and free from local obstructions;

(4) Near the closest house to the stack in the prevailing down wind direction.

e. Each TLD set (4 TLDs per set) was placed in a sealed polyethylene package to verify the integrity of the dosimeters when collected. Two packages were kept in a locked formica "birdhouse" or polyethylene jar, about six feet above the ground or supporting surface at each location. At each station one package was exchanged for measurement on a monthly schedule, and one on a quarterly schedule.

B. PROGRAM CHANGES

1. Teledyne Isotopes replaced Radiation Management Corporation as the analytical laboratory for the Radiological Environmental Monitoring on July 1, 1983.

C. ANALYSES PERFORMED

The schedule of analyses performed by TI is listed by sample type in Table II. This schedule was followed except where noted below. Table III lists the type and number of analyses performed during this period by sample type and station location. Methods used in performing these analyses can be found in Section VII of this report.

D. EXCEPTIONS TO THE PROGRAM.

1. The composite discharge water sampler at station 1MM malfunctioned, therefore, allowing for only a grab sample in September and no sample in November and December. Corresponding dates are 8/26/83 to 9/09/83; 9/16/83 to 10/04/83 and 11/14/83 to 1984.

2. The composite surface water sampler at station 1LL malfunctioned, therefore, allowing only for a grab sample in October (10/07/83) and no sample in November. (10/08/83 to 12/09/83).

3. The composite surface water sampler at station 6I malfunctioned from 07/02/83 to 07/09/83 and from 07/30/83 to 08/06/83, therefore, no sample was collected for I-131 analysis during July and August.

4. No air particulate sample for gross beta analysis was collected from station 1Z from 02/05/83 to 02/13/83 due to sampler malfunction.

5. No charcoal filter samples were collected from station 1Z between 02/05/83 and 02/13/83; at station 2 between 04/16/83 and 05/15/83; at station 3A between 03/05/83 and 03/19/83; at station 5 between 06/12/83 and 06/18/83 and at station 14 between 08/27/83 and 09/02/83.

6. The charcoal filter collected from station 1B for the period 11/05/83 to 11/12/83 was not alalyzed due to low air volume.

7. TLD data was unavailable from station 1M in July; from station 16 in April and May and from station 21B in February of 1983 due to vandalism of TLD's.

8. TLD data was unavailable from station 1M in the third quarter and from station 16 in the second quarter due to vandalism of TLD's.

IV. RESULTS AND DISCUSSION

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A. DATA INTERPRETATION AND STATISTICAL ANALYSIS

Several factors are important in the interpretation of the data. In order to avoid undue repetition in the discussion which follows, these factors are described below.

1. Grab Sampling

Grab sampling is a useful and acceptable procedure for taking environmental samples of a medium in which the concentration of radionuclides is expected to vary slowly with time or where intermittent sampling is deemed sufficient to establish the radiological characteristics of the medium. This method, however, is only representative of the sampled medium for that specific location and instant of time. As a result, variation in the radionuclide concentrations of the samples will normally occur. Since these variations will tend to counterbalance one another, the extraction of averages based upon repetitive grab samples is valid.

2. Minimum Detectable Levels (MDL)

It is characteristic of environmental monitoring data that many results occur at or below the specified detection level. Formal statistical error analysis of groups of such data is difficult. Pragmatic approaches to the problem include counting the detection level entries as zero, as half the detection level value, or as full detection level value. For reporting and calculation of averages in this report, any result occuring at or below the minimum detectable level is considered to be at that level. Averages obtained using this method are therefore biased high.

3. Standard Deviation of Analytical Results

Within the data tables an approximate 95 percent (2 sigma) confidence interval is supplied for those data points at and above the minimum detectable level. These intervals represent the range of values into which 95 percent of repeated counts of the prepared sample would fall.

4. Table Means and Standard Deviations

Results for each type of sample were grouped according to the analysis performed. Means and standard deviations of these results were calculated. These standard deviations represent the variability of measured results for different samples rather than single analysis uncertainty. For these calculations, all results below the MDL were considered to be at the MDL. As a result, the means are biased high, and the standard deviations are biased low.

B. DISCUSSION OF RESULTS

Results are summarized in brief form in Tables IV, V and VI (Section V). Tables of results for individual sample types and analyses performed can be found in Section V, Tables VII to XXVI. Graphical presentations of results can be found in Section VI.

1. Surface Water

Samples were taken from nine stations on a monthly schedule. Three stations (1LL, 4L and 6I) were continuous composite samples and five (1Q, 4F, 4G, 6A and 13A) were grab samples. Station 13B was sampled a total of seven times in 1983. Of these stations, seven could be affected by released from Peach Bottom Atomic Power Station. The remaining stations (6A and 6I) were above Holtwood Dam and, therefore, could not be affected by plant discharges (refer to Figures 1 and 2, Section VI, for station locations). The following analyses were performed on surface water samples.

a. Tritium

Total samples from seven stations were analyzed for concentrations of aqueous tritium. Samples from stations 1LL, 1Q, 4L and 6I were analyzed on a monthly basis, while samples from stations 4F, 6A and 13A were composited monthly into a quarterly sample. Results of this analysis for surface water samples can be found in Tables VII and VIII, Section V. The concentrations detected were within the range found during the Peach Bottom Units number 2 and number 3 preoperational period (1). Graphical comparisons of the unaffected stations (6A and 6I) above Holtwood Dam with potentially affected stations (4F and 4L) at Conowingo Dam showed no detectable addition of tritium to Conowingo Pond from the operation of PBAPS (Figures 4 and 5, Section VI). Reported tritium concentrations generally increased from below minimum detectable level to approximately 150 pCi/ℓ during the second half of the year. This increase is correllated with the change in the analytical laboratory and resulting change in procedure.

b. Gross Alpha

Samples from four stations (4F, 4L, 6A and 6I) were analyzed for gross alpha concentrations in the soluble and insoluble fractions. Results of gross alpha analysis in surface water samples can be found in Tables VII and VIII, Section V. Results at all locations were generally at or below the minimum detectable level in the soluble fraction. Results of the insoluble fraction were generally at or below the minimum detectable level at stations 4L, 6A and 6I, and detectable at low levels at station 4F. Those values were similar to those seen in previous year's and can be attributed to the presence of sediment, a reservoir of fallout and natural alpha emitters.

c. Gross Beta

Samples from all stations, were analyzed for concentrations of gross beta in the soluble and insoluble fractions. Results of gross beta analysis in surface water samples can be found in Tables VII, VIII and Section V. The concentrations detected in the soluble and insoluble fractions were within the range observed during the preoperational period for Units number 2 and 3 (1). A graphical comparison of two Conowingo Dam stations (4F and 4G) with one Holtwood Dam station (6A) showed the results of the soluble and insoluble fractions to be generally the same for all three locations (Figures 6 and 7, Section VI).

d. Iodine-131

Samples collected during the last week of each month from 01/08/83 to 12/03/83 from two stations (4L and 6I) were analyzed for concentrations of I-131. Results of I-131 analysis of surface water samples can be found in Table VIII, Section V. Almost all results were below the minimum detectable level. Detectable concentrations were found at station 6I in February. The I-131 activity was attributed to upstream sources.

e. Gamma Spectrometry

Samples from all stations were analyzed for gamma-emitting nuclides by gamma spectrometry. Results of gamma spectrometry on surface water samples can be found in Table IX, Section V. The nuclides searched for were below the minimum detectable level with the exception of K-40 which was found at three stations, 6I, 1LL and 4L.

2. Discharge Water

Samples were taken from two stations (1M and 1MM) on a monthly schedule (refer to Figure 1, Section VI, for station locations). The following analyses were performed on discharge water samples.

a. Tritium

Total samples from both stations were analyzed for concentrations of aqueous tritium on a monthly basis. Results of tritium analysis in discharge water samples can be found in Table X and XI, Section V. The concentrations detected were

within the range found during the Peach Bottom Units numbers 2 and 3 preoperational period (1). Reported tritium concentrations generally increased from below minimum detectable level to approximately 200 pCi/ℓ during the second half of the year. This increase is correllated with the change in analytical laboratory and resulting change in procedure. A graphical comparison of concentrations of aqueous tritium results for composite surface water and discharge water samples showed no significant differences (Figure 8, Section VI).

b. Gross Beta

Monthly samples from both stations were analyzed for gross beta concentrations in the soluble and insoluble fractions. Results of these analyses in discharge water samples can be found in Tables X and XI, Section V. The concentrations detected in the soluble and insoluble fractions were similar to those observed in surface water samples (Figures 9 and 10, Section VI).

c. Gamma Spectrometry

Samples from both stations were analyzed for gamma-emitting nuclides by spectrometry. Results of gamma spectrometric analysis are given in Table XII, Section V. Low concentrations of Co-58 and Mn-54 were found at station 1M in February and K-40 was found at Station 1MM in July. In all other samples all nuclides searched for were below the MDL.

3. Well Water Samples were taken from four stations on a quarterly schedule. Two stations (1U and 1V) were located within the Site area. The other stations were located approximately one mile (Station 40) and 10 miles (station 7) from the Plant. These station locations are shown in Figures 1 and 2, Section VI. The following analyses were performed on well water samples.

a. Tritium

Total samples from all four stations were analyzed for aqueous tritium concentrations. Results of tritium analysis of well water samples can be found in Table XIII, Section V. Results of all samples were within the range found during the Peach Bottom Units numbers 2 and 3 preoperational period (1). Reported tritium concentrations generally increased from below minimum detectable level to approximately 200 pCi/ℓ during the second half of the year. This increase is correllated with the change in analytical laboratory and resulting change in procedure. A graphical comparison of the distant site-area, and on-site wells showed that tritium levels have been gradulally decreasing with time due to the cessation of routine atmospheric nuclear weapons testing (Figure 11, Section VI).

b. Gross Beta

Samples from all four stations were analyzed for gross beta concentrations in the soluble and insoluble fractions. Results of gross beta analysis on well water samples can be found in Table XIII, Section V. The concentrations detected were within the range observed during the Peach Bottom Units numbers 2 and 3 preoperational period (1).

4. Precipitation

Precipitation was collected from two stations on a monthly schedule. Station 1A is located at the on-site Peach Bottom Weather Station number 1. Station 8, located in Colora, Md., is approximately 10 miles from the Site (for station locations, refer to Figures 1 and 2, Section VI). The following analyses were performed on precipitation samples.

a. Gross Beta

Monthly samples were analyzed for gross beta concentrations in the total sample. Results of gross beta analysis in precipitation samples can be found in Table XIV, Section V. Concentrations detected were within the range found during the Peach Bottom Units 2 and 3 preoperational period (1).

b. Gamma Spectrometry

Monthly samples were analyzed for gamma-emitting nuclides by spectrometry of the total sample. Results of gamma spectrometric analysis of samples from both stations are given in Table XV, Section V. Be-7 was found in eleven of twenty-four samples and can be attributed to cosmic ray activity. K-40 was found at station 8 in August and was within the range of other MDL values observed.

5. Air Particulates

Continuous air particulate samples were collected from the on-site Peach Bottom Weather Station number 1 (1Z) and from the intermediate location, Conowingo Dam (4A) (For station locations, see Figure 1 and 2, section VI). The following analyses were performed on air particulate samples.

a. Gross Beta

Weekly samples were analyzed for concentrations of beta emitters. Results of gross beta analysis of air particulate samples can be found in Table XVI, Section v. Results observed were similar to levels observed in previous years.

b. Gamma Spectrometry

Monthly composite samples were analyzed for gamma-emitting nuclides by gamma spectrometry. Results of gamma spectrometric analysis are given in Table XVII, Section V. Be-7 was detected in all of the samples and was the result of cosmic ray activity. Naturally occuring K-40 was found in 1 of 24 samples. All other nuclides searched for were below the minimum detectable levels.

6. Air Iodine

Continuous air samples were collected at eight stations and analyzed weekly for I-131. Three stations (1B, 1Z, 2) were located within the Site area. Four stations (3A, 5, 6B, 14) were located at intermediate distances of 1.9 to 5.8 miles from the site. One station (12D) was located 62 miles from the Site. Results of I-131 analysis can be found in Table XVIII, Section V. All results of the 406 analyses performed were less than the minimum detectable level.

7. Milk

Milk was sampled at eleven farms; three farms (G, J and O) located within two miles of PBAPS were designated "near farms"; four farms (D, L, M and N) located 3 to 5 miles from PBAPS were designated as "intermediate farms"; and four farms (A, B, C and E) located greater than five miles from PBAPS were designated as "distant farms". The following analyses were performed on milk samples.

a. Tritium

Milk from four farms (A, C, G and J) was analyzed for tritium concentrations in the aqueous fraction on a quarterly basis. Results of tritium determinations in milk samples can be found in Table XIX, Section V. Concentrations detected were within the range found during the Peach Bottom Units numbers 2 and 3 peroperational period (1) Reported tritium concentrations generally increased from approximately 115 pCi/ℓ to approximately 140 pCi/ℓ during the second half of the year. This increase is correllated with the change in analytical laboratory and resulting change in procedure.

b. Iodine-131

Milk from eight farms (A, B, C, D, G, J, N and O) near Peach Bottom was analyzed for concentrations of I-131, monthly in January, February, March and December. Weekly I-131 analyses resumed during the first week of April and continued through

the third week of November. Three additional farms (L, M and E) were sampled and analyzed quarterly for I-131. Results of I-131 analysis can be found in Tables XIX and XX, Section V and Figure 12, Section VI. Samples collected from three stations A, C and G on March 25, 1983 showed detectable levels of .07±.03, .6±.1 and 4.4±.4, respectively. This activity can be correllated with slightly increased I-131 increases from PBAPS during March.

The maximum hypothetical dose to an infant's thyroid was calculated to be 0.4 mRem. This calculation was done using the assumptions of USNRC Regulatory Guide 1.109, Revision 1, October 1977.

c. Strontium-89 and Strontium-90

One milk sample was collected at farm J in each quarter and analyzed for Sr-89 and Sr-90. Results can be found in Table XXI, Section V. All Sr-89 results were less than the minimum detectable level. Sr-90 concentrations were similar to those observed in previous years.

d. Gamma Spectrometry

One milk sample collected at farm J in each quarter was analyzed for gamma-emitting nuclides by gamma spectrometry. Results can be found in Table XXI, Section V. Nuclides detected were naturally-occuring K-40 and Cs-137. Cesium-137 is commonly found in milk as a result of world-wide fallout. Concentrations were similar to those observed in previous years.

8. Soil

Semiannual samples were taken at three locations, one on-site station (2) and two distant stations (3A and 5) located about four miles from PBAPS (for station locations, see Figures 1 and 2, Section VI). The area at station 2 is heavily wooded with rock outcroppings. The soil at this location would be expected to contain substantial humus from the accumulation of natural vegetative debris. Station 3A is covered only with grass. Station 5 is a combination of grass and cultivated land. The following analyses were performed on soil samples.

a. Strontium-89 and Strontium-90

Samples from all stations were analyzed for Sr-89 and Sr-90 concentrations in the top one inch and bottom five inches separately. Results of Sr-89 and Sr-90 analysis in soil samples can be found in Table XXII, Section V. Concentrations of Sr-89 were less than the minimum detectable level in all

samples. Concentrations of Sr-90 detected were within the range found during the PBAPS Units numbers 2 and 3 preoperational period (1). Graphical comparisons of Sr-90 in the top one inch and bottom cut can be found in Figures 13 and 14, Section VI. Differences between the on-site location (2) and distant locations (3A and 5) were attributed to the accumulation of vegetative debris at station 2.

b. Gamma Spectrometry

Samples from all stations were analyzed for gamma-emitting nuclides by Ge(Li) gamma spectrometry (Table XXII, Section V). Nuclides identified were generally the same as those found during the PBAPS Units numbers 2 and 3 preoperational period with most at the same or lower concentrations (1). Some naturally-occurring nuclides were found (K-40, Ra-226, Be-7 and Th-228/232. Small concentrations of Cs-137 were detected in all twelve samples and were similar to levels observed in previous years. The 30 year half-life and biological assimilation of Cs-137 accounts for the continued appearance of this nuclide in soil samples many years after atmospheric testing of nuclear weapons. There was little difference between the on-site location (2) and distant locations (3A and 5) (Figures 15 and 16, Section VI). The concentrations of other nuclides detected were similar to levels observed in previous years.

9. Ambient Gamma Radiation

Ambient gamma radiation levels were measured with calcium sulfate: Tm thermoluminescent dosimeters.

Thirteen stations (1B, 1C, 1D, 1E, 1F, 1G, 1H, 1J, 1L, 1M, 1NN, 2 and 40) were located around the Site boundary and designated for comparison purposes as the "site boundary ring". Twenty-five stations (3A, 4K, 5, 6B, 14, 15, 17, 22, 23, 26, 27, 31, 32, 33A, 38, 42, 43, 44, 45, 46, 47, 48, 49, 50 and 51) were located within a 10 mile radius of the Site and designated as the "middle ring". Seven stations (12B, 16, 18, 19, 20, 21B and 24) were located from 10 to 60 miles from the Site and designated as the "outer ring". Since they could be more directly affected by Plant activities and do not represent doses to the public, two stations (1A and 1I) located within the plant complex constitute a fourth group called plant-complex station (for station locations, see Figures 1, 2 and 3, Section VI). Results of TLD measurements are listed in Tables XXIII, XXIV and XXV, Section V. TLD readings of greater than 10 mRad/std. month were observed in January, February and March at Station 1L (located at the Plant Water Intake). This trend was also noted in the first quarterly result. An investigation showed that radiography tests were being performed near Station 1L during this time period.

Erratic TLD readings were observed from many Stations in July, (Table XXIII). The values ranged from 1.43 to 19.95 mRad/std. month. New personnel processed the TLD's in July; however a laboratory investigation could not determine any reason for the anomalies.

The annual average of monthly and quarterly radiation levels were within the range found during the Peach Bottom Units numbers 2 and 3 preoperational period (1). Graphical comparisons of the site-boundary, middle and outer rings on monthly and quarterly readings showed no significant differences in ambient radiation levels with distance from PBAPS, indicating no measurable Station contribution (Table XXV, Section V, Figures 17 and 18, section VI).

REFERENCES

(1) Radiation Management Corporation Publication, Peach Bottom Atomic Power Station Preoperational Radiological Monitoring Report for Units 2 and 3, January 1974, Philadelphia, Pa.

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

(3) Radiation Management Corporation, "Quality Control Data - 1983 Annual Report", March, 1984.

(4) Teledyne Isotopes, Quality Control Data - 1983.

V. TABLES

TABLE I

TI STATION DESIGNATION AND SAMPLE IDENTIFICATION SYSTEM
FOR PEACH BOTTOM ATOMIC POWER STATION REMP, 1983

VV-WWW-XXYZ General code for identification of samples, where:

VV - Power Plant identification code

PB - Peach Bottom Atomic Power Station

WWW - Type of Sample

SWA - Surface Water

DWA - Discharge Water

WWA - Well Water

RWA - Rain Water

APT - Air Particulates

AIO - Air iodine

MLK - Milk

SOL - Soil

IDM - Immersion Dose

XX - Angular Sector of Sampling Location

Compass is divided into 36 sectors of 10 degrees each with center at Peach bottom off-gas stack. Sector 36 is centered due North, and others are numbered in a clockwise direction. Sector 00 is used to designate an unidentified direction.

Y - Radial Zone of Sampling Location

In this report, the Radial distance from the Peach Bottom off-gas stack for all regional stations are as follows:

S:	on-site location	D:	3-4 miles off-site
A:	0-1 mile off-site	E:	4-5 miles off-site
B:	1-2 miles off-site	F:	5-10 miles off-site
C:	2-3 miles off-site	G:	10-20 miles off-site
		H:	20-100 miles off-site

Z - Station's Numerical Designation within sector and zone, using 1,2,3.... in each sector and zone.

TABLE II

TI SAMPLE COLLECTION AND ANALYSIS PROGRAM

ENV. STATION NO.	STATION NAME	TI STATION DESIGNATION	STATION LOCATION, DIRECTION AND DISTANCE FROM PEACH BOTTOM	COLLECTION METHOD AND FREQUENCY	ANALYSIS AND FREQUENCY PERFORMED
A. SURFACE WATER					
1LL	Peach Bottom Units 2 and 3 Intake - Composite	PB-SWA-6S4	Continuous sampler On Site at Units 2 and 3 Intake 1200' ENE of Units 2 and 3.	Water is continuously sampled from the Peach Bottom Units 2 and 3 Intake and is collected in a 190 gallon tank. Each week 2 qts. are withdrawn from the tank prior to draining the tank and placed in a 2 gallon polyethylene bottle to form a monthly composite sample.	Aq Tritium - monthly Gross Beta (S&I) - monthly Gamma Spec - monthly
1Q	Peach Bottom Unit No. 2 Intake	PB-SWA-6S3	On Site at Unit No. 2 Intake about 1200' ENE of Units 2 and 3.	Two gallon grab sample is collected in front of intake structure monthly.	Same as station 1LL above
4F	Conowingo Dam El. 33' MSL	PB-SWA-14F2	In the Conowingo Hydroelectric Station, 8.6 miles SE of Units 2 and 3.	Two gallon grab sample is taken monthly from the same header which is used for the composite sample (4L). This header continuously draws pond water from about elevation 33' MSL. This sample and PB-SWA-14F3 samples are collected at the same time.	Aq Tritium - quarterly comp. Gross Alpha (S&I) - monthly Gross Beta (S&I) - monthly Gamma Spec - monthly
4G	Conowingo Dam Surface	PB-SWA-14F3	At Conowingo Dam in Maryland, 8.5 miles SE of Units 2 and 3. Water sample is taken from Conowingo Pond on upstream side of dam.	Two gallon grab sample is collected near the surface of the Pond on the upstream side of the dam monthly.	Gross Beta (S&I) - monthly Gamma Spec - monthly
4L	Conowingo Dam El. 33' MSL - Composite	PB-SWA-14F5	Continuous sampler in Conowingo Hydroelectric Station; about 8.6 miles SE of Units 2 and 3.	Water is continuously sampled from a header which draws Pond water from elevation 33' MSL and is collected in a 175 gal. tank. Each week 2 qts. are withdrawn from the tank prior to draining the tank and placed in a 2 gal. polyethylene bottle to form a monthly composite sample.	Aq Tritium - monthly Gross Alpha (S&I) - monthly Gross Beta (S&I) - monthly Gamma Spec - monthly I-131 - monthly
6A	Holtwood Dam Hydroelectric Station	PB-SWA-33F1	At Holtwood Dam, Pa., 5.8 miles NW of Units 2 and 3.	Two gallon grab sample is collected from Holtwood Pond at Hydroelectric Station intake monthly.	Same as station 4F above

TABLE II (cont.)

TI SAMPLE COLLECTION AND ANALYSIS PROGRAM

ENV. STATION NO.	STATION NAME	TI STATION DESIGNATION	STATION LOCATION, DIRECTION AND DISTANCE FROM PEACH BOTTOM	COLLECTION METHOD AND FREQUENCY	ANALYSIS AND FREQUENCY PERFORMED
A. SURFACE WATER (cont.)					
6I	Holtwood Dam Hydroelectric Station-Composite	PB-SWA-33F4	Continuous sampler at Holtwood Dam, Pa., 5.8 miles NW of Units 2 and 3.	Water is continuously sampled from the Holtwood Hydroelectric Station Intake and is collected in a 175 gal. tank. Each week 2 qts. are withdrawn from the tank and placed in a 2 gal. polyethylene bottle to form a monthly composite sample.	Aq Tritium - monthly Gross Alpha (S&I) - monthly Gross Beta (S&I) - monthly Gamma Spec - monthly I-131 - monthly
13A	Chester Water Intake-Pond	PB-SWA-11C1	On east shore of Conowngo Pond at Chester Water Authority Intake, 2.4 miles ESE of Units 2 and 3.	Two gallon grab sample is collected from Conowingo Pond near the shore monthly.	Aq Tritium - quarterly comp. Gross Beta (S&I) - monthly Gamma Spec - monthly
13B	Chester Water Intake-pump Discharge	PB-SWA-11C2	At Chester Water Authority Intake. The same as PB-SWA-11C1 but the sample is collected from the pump discharge.	Two gallon grab sample is collectged from pump discharge during any month that the pump operates.	Gross Beta (S&I) - monthly Gamma Spec - monthly
B. DISCHARGE WATER					
1M	Peach Bottom Canal Discharge	PB-DWA-13S2	Located at Canal Discharge structure; 1.0 miles SE of Units 2 and 3.	Two gallon grab sample is collected at the exit of the discharge canal monthly.	Aq Tritium - monthly Gross Beta (S&I) - monthly Gamma Spec - monthly
1MM	Peach Bottom Canal Discharge-Composite	PB-DWA-13S5	A continuous sampler on site at canal discharge 1.0 miles SE of Units 2 and 3.	Water is continuously sampled from the Peach Bottom Unit 2 and 3 discharge canal and is collected in a 190 gallon tank. Each week 2 qts. are withdrawn from the tank and placed in a 2 gal. polyethylene bottle to form a monthly composite sample.	Same as station 1M above

TABLE II (cont.)

TI SAMPLE COLLECTION AND ANALYSIS PROGRAM

ENV. STATION NO.	STATION NAME	TI STATION DESIGNATION	STATION LOCATION, DIRECTION AND DISTANCE FROM PEACH BOTTOM	COLLECTION METHOD AND FREQUENCY	ANALYSIS AND FREQUENCY PERFORMED
C. WELL WATER					
1U	Peach Bottom Site-Utility Building	PB-WWA-15S2	Well at Plant Site. 1400' S of Units 2 and 3.	Well pump is run for several minutes prior to sampling in order to flush the sample line. Then two gallon grab sample is taken from the building faucet quarterly.	Aq Tritium - quarterly Gross Beta (S&I) - quarterly
1V	Peach Bottom Site-Info. Center	PB-WWA-12S2	Well at Plant Site. 1400' SSE of Units 2 and 3.	Same as station 1U above	Same as station 1U above
4D	Peach Bottom Site Area	PB-WWA-21B2	Well in Site Area, 1.5 miles SW of Units 2 and 3.	Same as station 1U above	Same as station 1U above
7	Darlington, Md. Area	PB-WWA-16F1	9.6 miles SSE of Units 2 and 3 in Hartford Co., Md.	Same as station 1U above	Same as station 1U above
D. PRECIPITATION					
1A	Peach Bottom Weather Station No. 1	PB-RWA-11S1	On Site at Weather Station NO. 1, 0.3 miles SE of Units 2 and 3.	The sample from the rain collector is shipped to TI monthly. The rain collector consists of an 8-inch diameter plastic funnel connected to a two-gallon polyethylene container.	Gross Beta - monthly Gamma Spec - monthly
8	Colora, Md.	PB-RWA-12F1	9.9 miles ESE of Units 2 and 3 in Cecil Co., Md.	Same as station 1A above	Same as station 1A above
E. AIR PARTICULATES - AIR IODINE					
1B	Peach Bottom Weather Station No. 2	PB-AIO-33S1	On Site, 0.3 miles SE of Units 2 and 3.	About 1 cfm continuous flow through charcoal filter (approx. 2" diam.) is installed for a week and replaced.	I - 131-weekly
1Z	Peach Bottom Weather Station No. 1	PB-API-11S4 PB-AIO-11S4	On Site at Weather Station No. 1, 0.3 miles SE of Units 2 and 3.	About 1 cfm continuous flow through glass fiber and charcoal filters (approx. 2" diam.) are installed for a week and replaced.	Gross Beta - weekly I - 131-weekly Gamma Spec - monthly comp.

TABLE II (cont.)

TI SAMPLE COLLECTION AND ANALYSIS PROGRAM

ENV. STATION NO.	STATION NAME	TI STATION DESIGNATION	STATION LOCATION, DIRECTION AND DISTANCE FROM PEACH BOTTOM	COLLECTION METHOD AND FREQUENCY	ANALYSIS AND FREQUENCY PERFORMED
E. AIR PARTICULATES - AIR IODINE (cont.)					
2	Peach Bottom Site 130° Sector Hill	PB-A1O-13S1	On Site, 0.9 Miles SE of Units 2 and 3.	Same as station 1B above	1-131 - weekly
3A	Delta, Pa. Substation	PB-A1O-23D1	3.6 miles SW of Units 2 and 3 at Delta, Pa.	Same as station 1B above	I-131 - weekly
4A	Conowingo Dam Powerhouse roof	PB-APT-14F1	8.6 miles SE of Units 2 and 3 on Powerhouse roof in Cecil County, Md.	About 1 cfm continuous flow through a glass fiber filter (approx. 2" diam.) is installed for a week and replaced.	Gross Beta - weekly Gamma Spec - monthly comp.
5	Wakefield, Pa.	PB-AIO-8E1	At Wakefield, Pa., 4.6 miles E of Units 2 and 3.	Same as station 1B above	I-131 - weekly
6B	Holtwood Dam Hydroelectric Station	PB-AIO-33F2	On the roof of Hydroelectric Station, 5.8 miles NW of Units of Units 2 and 3.	Same as station 1B abouve	I-131 - weekly
14	Peters Creek	PB-AIO-10B1	1.9 miles ESE of Units 2 and 3 near mouth of Peters Creek.	Same as station 1B above	I-131 - weekly
12D	Phila., Pa. 2301 Market St.	PB-AIO-8H2	62 miles ENE of Units 2 and 3 on the roof of 2301 Market Street.	Same as station 1B above	I-131 - weekly
F. MILK					
A	Regional Farm A	PB-MLK-12F1	Distant regional farms surrounding the Site, designated "A", "B" and "C" on the west side of Conowingo Pond and "E" on the east side of Conowingo Pond. Nearby regional farm surrounding the Peach Bottom Site on the west side of Conowingo Pond are designated "G", "J",	Two gallon grab sample is collected at each farm from a tank containing milk from all cows weekly while cows are on pasture, monthly otherwise. Samples are shipped to TI.	I-131 - weekly Aq tritium - quarterly
B	Regional Farm B	PB-MLK-24F1			I-131 - weekly
C	Regional Farm C	PB-MLK-31F1			Same as station A above
D	Regional Farm D	PB-MLK-5D1			Same as station B above

TABLE II (cont.)

TI SAMPLE COLLECTION AND ANALYSIS PROGRAM

ENV. STATION NO.	STATION NAME	TI STATION DESIGNATION	STATION LOCATION, DIRECTION AND DISTANCE FROM PEACH BOTTOM	COLLECTION METHOD AND FREQUENCY	ANALYSIS AND FREQUENCY PERFORMED
F. MILK (cont.)					
E	Regional Farm E	PB-MLK-36F1	and "O". Regional farms at intermediate distances from Peach Bottom on the east side are designated "D", "L", "M" AND "N".	Same as Station A above except quarterly	I-131-quarterly
G	Regional Farm G	PB-MLK-20B1			Same as station A above
J	Regional Farm J	PB-MLK-28A1			I-131 - weekly Aq tritium - quarterly Sr-89 & -90 - quarterly Gamma Spec - quarterly
L	Regional Farm L	PB-MLK-5B1		Same as station A above except quarterly	I-131 - quarterly
M	Regional Farm M	PB-MLK-7C1		Same as Station A above except quarterly	Same as station L above
N	Regional Farm N	PB-MLK-11C3			Same as station B above
O	Regional Farm O	PB-MLK-22C1			Same as station B above
G. SOIL					
2	Peach Bottom 130° Sector Hill	PB-SOL-13S1	On Site, 0.9 miles SE of Units 2 and 3.	Seven cores (2" in diameter and 6" deep) are collected from a 50 X 50 ft. area semi-annually. Top 1 inch and bottom 5 inches are separated, sealed in plastic bags, and shipped to TI.	Gamma Spec - semiannual Sr-89 & -90 - semiannual
3A	Delta, Pa. Substation	PB-SOL-23D1	3.6 miles SW of Units 2 and 3 at Delta, Pa.	Same as station 2 above	Same as station 2 above
5	Wakefield, Pa.	PB-SOL-8E1	4.6 miles E of Units 2 and 3 at Wakefield, Pa.	Same as station 2 above	Same as station 2 above

TABLE II (cont.)

TI SAMPLE COLLECTION AND ANALYSIS PROGRAM

ENV. STATION NO.	STATION NAME	TI STATION DESIGNATION	STATION LOCATION, DIRECTION AND DISTANCE FROM PEACH BOTTOM	COLLECTION METHOD AND FREQUENCY	ANALYSIS AND FREQUENCY PERFORMED
H.	ENVIRONMENTAL DOSIMETRY - TLD				
	At each of the following stations there are 2 environmental dosimeter packets with 4 TLDs per package. One packet is replaced monthly, and one quarterly. The packets for each time period are collected and replaced on the same day at all the stations.				
1A	Peach Bottom Weather Station No. 1	PB-IDM-11S1	On Site, 0.3 miles SE of Units 2 and 3 .	Procedure for collection is described in the placement procedure in Sec. II., A.	TLD - monthly and quarterly
1B	Peach Bottom Weather Station No. 2	PB-IDM-33S1	On Site, 0.5 miles NW of Units 2 and 3.		TLD - monthly and quarterly
1C	Peach Bottom South Substation Rd.	PB-IDM-16S1	On Site, 0.9 miles SSE of Units 2 and 3.		TLD - monthly and quarterly
1D	Peach Bottom 140 ° Sector Site Boundary	PB-IDM-14S1	On Site, 0.7 miles SE of Units 2 and 3.		TLD - monthly and quarterly
1E	Peach Bottom 350° Sector Site Boundary	PB-IDM-35S1	On Site, 0.6 miles NNW of Units 2 and 3.		TLD - monthly and quarterly
1F	Peach Bottom 200° Sector Hill	PB-IDM-20S1	On Site, 0.6 miles SSW of Units 2 and 3.		TLD - monthly and quarterly
1G	Peach Bottom North Substation	PB-IDM-30S1	On Site, 0.7 miles WNW of Units 2 and 3.		TLD - monthly and quarterly
1H	Peach Bottom Site 270° Sector Hill	PB-IDM-27S1	On Site, 0.6 miles W of Units 2 and 3.		TLD - monthly and quarterly
1I	Peach Bottom South Substation	PB-IDM-15S1	On Site, 0.6 miles SSE of Units 2 and 3.		TLD - monthly and quarterly
1J	Peach Bottom Site 180° Sector Hill	PB-IDM-18S1	On Site, 0.7 miles S of Units 2 and 3.		TLD - monthly and quarterly

TABLE II (cont.)

TI SAMPLE COLLECTION AND ANALYSIS PROGRAM

ENV. STATION NO.	STATION NAME	TI STATION DESIGNATION	STATION LOCATION, DIRECTION AND DISTANCE FROM PEACH BOTTOM	COLLECTION METHOD AND FREQUENCY	ANALYSIS AND FREQUENCY PERFORMED
H. ENVIRONMENTAL DOSIMETRY - TLD (cont.)					
1L	Peach Bottom Unit 3 Intake	PB-IDM-6S2	Located near Unit 3 Intake structure; 0.2 miles ENE of Units 2 and 3.		TLD - monthly and quarterly
1M	Peach Bottom Canal Discharge	PB-IDM-13S2	Located near Canal Discharge structure; 1.0 miles SE of Units 2 and 3.		TLD - monthly and quarterly
1NN	Peach Bottom Site	PB-IDM-26S1	On Site, 0.5 miles WSW of Units 2 and 3.		TLD - monthly and quarterly
2	Peach Bottom Site 130° Sector Hill	PB-IDM-13S1	On Site, 0.9 miles SE of Units 2 and 3.		TLD - monthly and quarterly
3A	Delta, Pa. Substation	PB-IDM-23D1	3.6 miles SW of Units 2 and 3.		TLD - monthly and quarterly
4K	Conowingo Dam Powerhouse Roof	PB-IDM-14F1	On roof of Conowingo Power-house, 8.6 miles SE of Units 2 and 3.		TLD - monthly and quarterly
5	Wakefield, Pa.	PB-IDM-8E1	At Wakefield, Pa. 4.6 miles E of Units 2 and 3.		TLD - monthly and quarterly
6B	Holtwood Dam Hydroelectric Station	PB-IDM-33F2	On roof of Hydroelectric Station, 5.8 miles NW of Units 2 and 3.		TLD - monthly and quarterly
12B	Phila., Pa. 3508 Market St.	PB-IDM-8H1	On roof of 3508 Market St., Philadelphia, Pa. 64 miles E of Units 2 and 3.		TLD - monthly and quarterly
14	Peters Creek	PB-IDM-10B1	1.9 miles ESE of Units 2 and 3 near the mouth of Peters Creek.		TLD - monthly and quarterly
15	Silver Spring Road	PB-IDM-36D1	3.6 miles N of Units 2 and 3 near Silver Spring Road.		TLD - monthly and quarterly
16	Nottingham, Pa. Substation	PB-IDM-9G1	12.8 miles E of Units 2 and 3 at Nottingham Substation.		TLD - monthly and quarterly

TABLE II (cont.)

TI SAMPLE COLLECTION AND ANALYSIS PROGRAM

ENV. STATION NO.	STATION NAME	TI STATION DESIGNATION	STATION LOCATION, DIRECTION AND DISTANCE FROM PEACH BOTTOM	COLLECTION METHOD AND FREQUENCY	ANALYSIS AND FREQUENCY PERFORMED
H. ENVIRONMENTAL DOSIMETRY - TLD (cont.)					
17	Riverview Road	PB-IDM-11E1	4.0 Miles ESE of Units 2 and 3 near Riverview Road.		TLD - monthly and quarterly
18	Fawn Grove, Pa.	PB-IDM-26F1	10 miles W of Units 2 and 3 at Fawn Grove, Pa.		TLD - monthly and quarterly
19	Red Lion, Pa.	PB-IDM-30H1	20.6 miles WNW of Units 2 and 3 at Red Lion, Pa.		TLD - monthly and quarterly
20	Bel Air, Md. Area	PB-IDM-20G1	15.1 miles SSW of Units 2 and 3 near Bel Air, Maryland.		TLD - monthly and quarterly
21B	Lancaster, Pa. Area	PB-IDM-35G1	19 miles NNW of Units 2 and 3 near Lancaster, Pa.		TLD - monthly and quarterly
22	Eagle Road	PB-IDM-3C1	2.4 miles NNE of Units 2 and 3 near Eagle Road.		TLD - monthly and quarterly
23	Peach Bottom 150° Sector Hill Off Site	PB-IDM-15B1	Off-site Hill 1.0 miles SSE of Units 2 and 2.		TLD - monthly and quarterly
24	Harrisville, Md. Substation	PB-IDM-11G1	10.9 miles ESE of Units 2 and 3 at Harris Substation		TLD - monthly and quarterly
26	Slab Road	PB-IDM-31E1	4.2 miles NW of Units 2 and 3 near Slab Road.		TLD - monthly and quarterly
27	N. Cooper Road	PB-IDM-18C1	2.6 miles S of Units 2 and 3 near N. Cooper Road.		TLD - monthly and quarterly
31	Pilotown Road	PB-IDM-13E1	4.9 miles SE of Units 2 and 3 near Pilotown Road.		TLD - monthly and quarterly
32	Slate Hill Road	PB-IDM-6C1	2.7 miles ENE of Units 2 and 3 near Slate Hill Road.		TLD - monthly and quarterly
33A	Fulton Main Weather Station	PB-IDM-6B2	1.7 miles ENE of Units 2 and 3.		TLD - monthly and quarterly
38	Peach Bottom Road	PB-IDM-8D1	3.0 miles E of Units 2 and 3 near Peach Bottom Road.		TLD - monthly and quarterly

TABLE II (cont.)

TI SAMPLE COLLECTION AND ANALYSIS PROGRAM

ENV. STATION NO.	STATION NAME	TI STATION DESIGNATION	STATION LOCATION, DIRECTION AND DISTANCE FROM PEACH BOTTOM	COLLECTION METHOD AND FREQUENCY	ANALYSIS AND FREQUENCY PERFORMED
H. ENVIRONMENTAL DOSIMETRY - TLD (cont.)					
40	Peach Bottom Site Area	PB-IDM-21B2	In site Area about 1.2 miles SW of Units 2 and 3.		TLD - monthly and quarterly
42	Muddy Run Environmental Lab.	PB-IDM-35E1	4.2 miles NNW of Units 2 and 3.		TLD - monthly and quarterly
43	Drumore Township School	PB-IDM-2F1	5.0 miles NNE of Units 2 and 3.		TLD - monthly and quarterly
44	Goshen Mill Road	PB-IDM-5F1	5.1 miles NE of Units 2 and 3.		TLD - monthly and quarterly
45	PB - Keeney Line	PB-IDM-7D1	3.3 miles ENE of Units 2 and 3.		TLD - monthly and quarterly
46	Broad Creek	PB-IDM-16E1	4.5 miles SSE of Units 2 and 3 near Flintville Road.		TLD - monthly and quarterly
47	Broad Creek Scout Camp	PB-IDM-18E1	4.3 miles S of Units 2 and 3.		TLD - monthly and quarterly
48	Macton Substation	PB-IDM-20E1	5.0 miles SSW of Units 2 and 3.		TLD - monthly and quarterly
49	PB-Conastone Line	PB-IDM-25E1	4.1 miles WSW of Units 2 and 3.		TLD - monthly and quarterly
50	TRANSCO Pumping Station	PB-IDM-26E1	4.9 miles W of Units 2 and 3.		TLD - monthly and quarterly
51	Fin Substation	PB-IDM-29D1	4.0 miles WNW of Units 2 and 3.		TLD - monthly and quarterly

TABLE III

SUMMARY OF ANALYSES PERFORMED ON SAMPLES COLLECTED DURING 1983

STATION NO.	TI DESIGNATION	LOCATION	NUMBER OF SAMPLES	TYPE OF ANALYSIS H-3	GROSS BETA	GROSS ALPHA	TLD	GAMMA SPEC.	I-131	Sr-89	Sr-90	TOTAL ANALYSES
A. SURFACE WATER												
1Q	PB-SWA-6S3	Peach Bottom Unit No. 2 Intake - Grab	12	12	24			12				48
1LL	PB-SWA-6S4	Peach Bottom Unit 2 and 3 Intake - Composite	11	11	22			11				44
13A	PB-SWA-11C1	Chester Water Intake Pond	12	4	24			12				40
13B	PB-SWA-11C2	Chester Water Intake - Pump Discharge	9		18			9				27
4F	PB-SWA-14F2	Conowingo Dam El 33' MSL-Grab	12	4	24	24		12				64
4G	PB-SWA-14F3	Conowingo Dam Surface-Grab	12		24			12				36
4L	PB-SWA-14F5	Conowingo Dam El 33' - Composite	12	12	24	24		12	12			84
6A	PB-SWA-33F1	Holtwood Dam Hydroelectric Station	12	4	24	24		12				64
6I	PB-SWA-33F4	Holtwood Dam Hydroelectric Station	12	12	24	24		12	10			82

TABLE III (cont.)

SUMMARY OF ANALYSES PERFORMED ON SAMPLES COLLECTED DURING 1983

STATION NO.	TI DESIGNATION	LOCATION	NUMBER OF SAMPLES	TYPE OF ANALYSIS H-3	GROSS BETA	GROSS ALPHA	TLD	GAMMA SPEC.	I-131	Sr-89	Sr-90	TOTAL ANALYSES
B. Discharge Water												
1M	PB-DWA-13S2	Peach Bottom Canal Discharge-Grab	12	12	24			12				48
1MM	PB-DWA-13S5	Peach Bottom Canal Discharge - Composite	10	10	20			10				40
C. WELL WATER												
1U	PB-WWA-15S2	Peach Bottom Site Utility Bldg.	4	4	8							12
1V	PB-WWA-12S2	Peach Bottom Site Info. Center	4	4	8							12
4O	PB-WWA-21B2	Peach Bottom Site Area	4	4	8							12
7	PB-WWA-16F1	Darlington, MD Area	4	4	8							12
D. AIR IODINE AND PARTICULATES												
1B	PB-AIO-33S1	Peach Bottom Weather Station No. 2	51						51			51
1Z	PB-API-11S4 PB-AIO-11S4	Peach Bottom Weather Station No. 1	51		51			12	51			114
2	PB-AIO-13S1	Peach Bottom Site 130° Sector Hill	48						48			48

TABLE III (cont.)

SUMMARY OF ANALYSES PERFORMED ON SAMPLES COLLECTD DURING 1983

STATION NO.	TI DESIGNATION	LOCATION	NUMBER OF SAMPLES	TYPE OF ANALYSIS H-3	GROSS BETA	GROSS ALPHA	TLD	GAMMA SPEC.	I-131	Sr-89	Sr-90	TOTAL ANALYSES
D. AIR IODINE AND PARTICULATES (cont.)												
3A	PB-AIO-23D1	Delta, PA Substation	50						50			50
4A	PB-APT-14F1	Conowingo Dam Powerhouse Rood	52		52			12				64
5	PB-AIO-8E1	Wakefield, PA	51						51			51
6B	PB-AIO-33F2	Holtwood Dam Hydroelectric Station	52						52			52
14	PB-AIO-10C1	Peters Creek	51						51			51
12D	PB-AIO-8H2	Phila., PA 2301 Market St.	52						52			52
E. RAIN WATER												
1A	PB-RWA-11S1	Peach Bottom Weather Station No. 1	12		12			12				24
8	PB-RWA-12F1	Colora, MD	12		12			12				24
F. MILK												
A	PB-MLK-24F1	Regional Farm A	38	4					38			42
B	PB-MLK-19G1	Regional Farm B	38						38			38

TABLE III (cont.)

SUMMARY OF ANALYSES PERFORMED ON SAMPLES COLLECTD DURING 1983

STATION NO.	TI DESIGNATION	LOCATION	NUMBER OF SAMPLES	TYPE OF ANALYSIS H-3	GROSS BETA	GROSS ALPHA	TLD	GAMMA SPEC.	I-131	Sr-89	Sr-90	TOTAL ANALYSES
F. MILK (cont.)												
C	PB-MLK-31F1	Regional Farm C	38	4					38			42
D	PB-MLK-5D1	Regional Farm D	38						38			38
E	PB-MLK-36F1	Regional Farm E	4						4			4
G	PB-MLK-20B1	Regional Farm G	38	4					38			42
J	PB-MLK-28A1	Regional Farm J	38	4				4	38	4	4	54
L	PB-MLK-5B1	Regional Farm L	4						4			4
M *	PB-MLK-7C1	Regional Farm M	4						4			4
N	PB-MLK-11C3	Regional Farm N	38						38			38
O	PB-MLK-22C1	Regional Farm O	38						38			38
G. SOIL												
2	PB-SOL-13S1	Peach Bottom 130° Sector Hill	4					4		4	4	12
3A	PB-SOL-23D1	Delta, PA Substation	4					4		4	4	12
5	PB-SOL-8E1	Wakefield, PA	4					4		4	4	12

TABLE III (cont.)

SUMMARY OF ANALYSES PERFORMED ON SAMPLES COLLECTD DURING 1983

STATION NO.	TI DESIGNATION	LOCATION	NUMBER OF SAMPLES	TYPE OF ANALYSIS H-3	GROSS BETA	GROSS ALPHA	TLD	GAMMA SPEC.	I-131	Sr-89	Sr-90	TOATL ANALYSES
H. ENVIRONMENTAL DOSIMETRY												
1A	PB-IDM-11S1	Peach Bottom Weather Station No. 1	64				64					64
1B	PB-IDM-33S1	Peach Bottom Weather Station No. 2	64				64					64
1C	PB-IDM-16S1	Peach Bottom South Substation Road	62				62					62
1D	PB-IDM-4S1	Peach Bottom 140° Sector Site Boundary	64				64					64
1E	PB-IDM-35S1	Peach Bottom 350° Sector Site Boundary	63				63					63
1F	PB-IDM-20S1	Peach Bottom 200° Sector Hill	63				63					63
1G	PB-IDM-30S1	Peach Bottom North Substation	63				63					63
1H	PB-IDM-27S1	Peach Bottom 270° Sector Hill	64				64					64
1I	PB-IDM-15S1	Peach Bottom South Substation	64				64					64
1J	PN-IDM-18S1	Peach Bottom 180° Sector Hill	64				64					64

TABLE III (cont.)

SUMMARY OF ANALYSES PERFORMED ON SAMPLES COLLECTD DURING 1983

STATION NO.	TI DESIGNATION	LOCATION	NUMBER OF SAMPLES	TYPE OF ANALYSIS H-3	GROSS BETA	GROSS ALPHA	TLD	GAMMA SPEC.	I-131	Sr-89	Sr-90	TOTAL ANALYSES
H. ENVIRONMENTAL DOSIMETRY (cont.)												
1L	PB-IDM-6S2	Peach Bottom Units 2 and 3 Intake	64				64					64
1M	PB-IDM-13S2	Peach Bottom Canal-Discharge	56				56					56
1NN	PB-IDM-26S1	Peach Bottom Site	64				64					64
2	PB-IDM-13S1	Peach Bottom 130° Sector	64				64					64
3A	PB-IDM-23D1	Delta, PA Station	63				63					63
4K	PB-IDM-14F1	Conowingo Dam Powerhouse Roof	64				64					64
5	PB-IDM-8E1	Wakefield, PA	64				64					64
6B	PB-IDM-33F2	Holtwood Dam Hydroelectric Station	64				64					64
12B	PB-IDM-8H1	Phila., PA 3508 Market Street	64				64					64
14	PB-IDM-10C1	Peters Creek	64				64					64
15	PB-IDM-36D1	Silver Spring Rd.	64				64					64
16	PB-IDM-9G1	Nottingham, PA Substation	52				52					52
17	PB-IDM-11E1	Riverview Rd.	64				64					64

TABLE III (cont.)

SUMMARY OF ANALYSES PERFORMED ON SAMPLES COLLECTD DURING 1983

STATION NO.	TI DESIGNATION	LOCATION	NUMBER OF SAMPLES	TYPE OF ANALYSIS H-3	GROSS BETA	GROSS ALPHA	TLD	GAMMA SPEC.	I-131	Sr-89	Sr-90	TOTAL ANALYSES
H. ENVIRONMENTAL DOSIMETRY (cont.)												
18	PB-IDM-26F1	Fawn Grove, PA	64				64					64
19	PB-IDM-30G1	Red Lion, PA	64				64					64
20	PB-IDM-20G1	Bel Air, MD Area	64				64					64
21B	PB-IDM-35G1	Lancaster, PA	60				60					60
22	PB-IDM-3C1	Eagle Road	64				64					64
23	PB-IDM-15B1	Off-site 150° Sector Hill	64				64					64
24	PB-IDM-11G1	Harrisville, MD	64				64					64
26	PB-IDM-31E1	Slab R ad	63				63					63
27	PB-IDM-18C1	N. Cooper Road	64				64					64
31	PB-IDM-13F1	Pilotown Road	64				64					64
32	PB-IDM-6C1	Slate Hill Road	64				64					64
33A	PB-IDM-6B2	Fulton Weather Station	64				64					64
38	PB-IDM-8D1	Peach Bottom Road	63				63					63
40	PB-IDM-21B2	Peach Bottom Site Area	64				64					64
42	PB-IDM-35E1	Muddy Run Environmental Lab	64				64					64

TABLE III (cont.)

SUMMARY OF ANALYSES PERFORMED ON SAMPLES COLLECTD DURING 1983

STATION NO.	TI DESIGNATION	LOCATION	NUMBER OF SAMPLES	TYPE OF ANALYSIS H-3	GROSS BETA	GROSS ALPHA	TLD	GAMMA SPEC.	I-131	Sr-89	Sr-90	TOTAL ANALYSES
H. ENVIRONMENTAL DOSIMETRY (cont.)												
43	PB-IDM-2F1	Drumore Township School	64				64					64
44	PB-IDM-5F1	Goshen Mill Road	64				64					64
45	PB-IDM-7D1	PB-Keeney Line	64				64					64
46	PB-IDM-16D1	Broad Creek	62				62					62
47	PB-IDM-18E1	Broad Creek Scout Camp	63				63					63
48	PB-IDM-20E1	Macton Substation	64				64					64
49	PB-IDM-25D1	PB-Conastone Line	63				63					63
50	PB-IDM-26E1	TRANSCO Pumping	64				64					64
51	PB-IDM-29D1	Fin substation	64				64					64
TOTAL			3924	113	411	96	2972	190	744	16	16	4558

TABLE IV

SUMMARY OF RADIOACTIVITY CONCENTRATIONS IN SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1983

SAMPLE TYPE AND LOCATION	ANALYSIS	NO. OF SAMPLES ANALYZED	NUMBER DETECTED	PERIOD* MINIMUM	PERIOD* MAXIUM	PERIOD** MEAN	PRE-OP*** MEAN	UNITS
SURFACE WATER								
Potentially Affected Stations (1Q, 4F, 4G, 13A-Grab) (1LL + 4L -Composite) (4F + 13A -Quarterly Composite for Tritium)	Aqueous Tritium (Grab)	12	5	<60	200±80	106±95	320±250	pCi/ℓ
	Aqueous Tritium (Grab-Quarterly Composite)	8	4	<70	180±80	101±84	-	pCi/ℓ
	Aqueous Tritium (Composite)	23	12	<70	270±70	119±118	240±30	pCi/ℓ
	Gross Beta (Soluble-Grab)	48	47	<.4	6±1	2.3±2.5	3.3±2.6	pCi/ℓ
	Gross Beta (Soluble-Composite)	23	22	<.4	5±1	2.1±2.6	3.5±2.6	pCi/ℓ
	Gross Beta (Insoluble-Grab)	48	35	<.2	6.4±.6	1.3±2.7	3.4±3.1	pCi/ℓ
	Gross Beta (Insoluble-Composite)	23	18	<.3	6±1	1.2±2.9	3.4±2.6	pCi/ℓ
	Gross Alpha (Soluble-Grab)	12	2	<.1	2.3±.6	.9±1.3	-	pCi/ℓ
	Gross Alpha (Soluble-Composite)	12	0	<.1	<1	<.6	-	pCi/ℓ
	Gross Alpha (Insoluble-Grab)	12	8	<.1	1.1±.6	.7±.7	-	pCi/ℓ
	Gross Alpha (Insoluble-Composite)	12	2	<.1	.4±.4	.3±.2	-	pCi/ℓ
Unaffected Stations (6A-Grab) (6I-Composite) (6A-Quarterly Composite for Tritium)	Aqueous Tritium (Grab-Quarterly Composite)	4	2	<70	110±70	90±46	-	pCi/ℓ
	Aqueous Tritium (Composite)	12	5	<60	190±70	102±89	-	pCi/ℓ
	Gross Beta (Soluble-Grab)	12	12	.8±.4	5±1	2.3±2.6	3.5±0.4	pCi/ℓ
	Gross Beta (Soluble-Composite)	12	12	1.1±.5	7±1	3.0±4.2	-	pCi/ℓ
	Gross Beta (Insoluble-Grab)	12	6	<.3	1.3±.4	.7±.6	3.7±4.5	pCi/ℓ
	Gross Beta (Insoluble-Composite)	12	6	<.2	2.5±.4	.7±1.2	-	pCi/ℓ
	Gross Alpha (Soluble-Grab	12	3	<.1	1.0±.7	.6±.7	-	pCi/ℓ
	Gross Alpha (Soluble-Composite)	12	2	<.1	6±3	1.1±3.2	-	pCi/ℓ
	Gross Alpha (Insoluble-Grab	12	3	<.1	.4±.3	.3±.2	-	pCi/ℓ
	Gross Alpha (Insoluble-Composite)	12	4	<.1	1.2±.6	.4±.7	-	pCi/ℓ

TABLE IV (cont.)

SUMMARY OF RADIOACTIVITY CONCENTRATIONS IN SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1983

SAMPLE TYPE AND LOCATION	ANALYSIS	NO. OF SAMPLES ANALYZED	NUMBER DETECTED	PERIOD* MINIMUM	PERIOD* MAXIUM	PERIOD** MEAN	PRE-OP*** MEAN	Units
DISCHARGE WATER								
Potentially	Aqueous Tritium (Grab)	12	6	<70	300±200	128±155	310±200	pCi/ℓ
Affected	Aqueous Tritium (Composite)	10	4	<70	300±100	142±191	480±30	pCi/ℓ
Stations	Gross Beta (Soluble-Grab)	12	12	.6±.4	4±1	2.2±2.3	3.4±0.6	pCi/ℓ
(1M - Grab)	Gross Beta (Soluble-Composite)	10	10	.9±.4	4±1	2.2±2.4	3.4±0.6	pCi/ℓ
(1MM-Composite)	Gross Beta (Insoluble-Grab)	12	9	<.2	1.5±.4	.7±.7	3.2±1.3	pCi/ℓ
	Gross Beta (Insoluble-Composite)	10	7	<.3	5±4	1.2±2.9	4.3±2.5	PCi/ℓ
WELL WATER								
On-Site	Aqueous Tritium	8	4	<70	300±100	160±220	270±300	pCi/ℓ
Wells	Gross Beta (Soluble)	8	3	<.3	.8±.7	.5±.3	3.1±0.8	pCi/ℓ
(1U + 1V)	Gross Beta (Insoluble)	8	5	<.3	5.6±.9	1.5±3.6	3.2±1.2	pCi/ℓ
Site Area	Aqueous Tritium	4	2	<70	180±70	123±122	410±100	pCi/ℓ
(40)	Gross Beta (Soluble)	4	3	<.3	3.7±.9	1.4±3.2	3.0±0.1	pCi/ℓ
	Gross Beta (Insoluble)	4	2	<.3	1.3±.6	.7±.9	<3.0	pCi/ℓ
Distant	Aqueous Tritium	4	2	<70	120±90	95±58	-	pCi/ℓ
Well (7)	Gross Beta (Soluble)	4	4	1.0±.3	1.8±.8	1.4±.7	-	pCi/ℓ
	Gross Beta (Insoluble)	4	0	<.3	<.5	<.4	-	pCi/ℓ
RAIN WATER								
On-site (1A)	Gross Beta (Total)	12	11	< 1	9±1	3.2±5.0	4.8±6.4	pCi/ℓ
	Gross Beta (Total-Surface Density)	12	11	<100	800±100	258±409	-	pCi/m^2

TABLE IV (cont.)

SUMMARY OF RADIOACTIVITY CONCENTRATIONS IN SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1983

SAMPLE TYPE AND LOCATION	ANALYSIS	NO. OF SAMPLES ANALYZED	NUMBER DETECTED	PERIOD* MINIMUM	PERIOD* MAXIMUM	PERIOD** MEAN	PRE-OP*** MEAN	UNITS
RAIN WATER (cont.)								
Distant (8)	Gross Beta (Total)	12	10	<1	10±2	4.2±5.9	-	pCi/ℓ
	Gross Beta (Total-Surface Density)	12	10	<100	1000±100	330±550	-	pCi/m2
AIR PARTICULATES								
Weather Station	Gross Beta	51	51	.005±.004	.048±.007	.021±.016	-	pCi/m3
No. 1 (1Z)		52	52	.005±.004	.037±.005	.019±.014	-	pCi/m3
Distant (4A)								
AIR IODINE								
1B	I-131	51	0	<.003	<.9	<.04	-	pCi/m^3
1Z		51	0	<.002	<.2	<.02	-	pCi/m^3
2		48	0	<.003	<.04	<.02	-	pCi/m^3
3A		50	0	<.002	<.05	<.02	-	pCi/m^3
5		51	0	<.001	<.1	<.04	-	pCi/m^3
6B		52	0	<.001	<.08	<.02	-	pCi/m^3
14		51	0	<.003	<.08	<.02	-	pCi/m^3
12D		52	0	<.001	<.08	<.02	-	pCi/m^3
MILK								
Near Farms (G,J,O)	Tritium (Aqueous Fraction)	8	7	<50	240±50	126±126	-	pCi/ℓ (milk)
(G,J only for Tritium)	Tritium (Aqueous Fraction)	8	7	<90	350±80	175±202	140±248	pCi/ℓ (water)
	I-131	114	1	<.02	4.4±.4	.1±.8	0.2	pCi/ℓ (milk)
	Sr-89 (Quarterly-Grab, Farm J)	4	0	<.8	<3	<2	-	pCi/ℓ (milk)
	Sr-90 (Quarterly-Grab, Farm J)	4	4	2.1±.4	4±1	3.1±1.6	-	PCi/ℓ (milk
Intermediate Farms (D,L,M,N)	I-131	84	0	<.02	<.6	<.07	0.2	pCi/ℓ

TABLE IV (cont.)

SUMMARY OF RADIOACTIVITY CONCENTRATIONS IN SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1983

SAMPLE TYPE AND LOCATION	ANALYSIS	NO. OF SAMPLES ANALYZED	NUMBER DETECTED	PERIOD* MINIMUM	PERIOD* MAXIMUM	PERIOD** MEAN	PRE-OP*** MEAN	UNITS
MILK (cont.)								
Distant Farms (A,B,C,E)	Tritium (Aqueous Fraction)	8	7	<50	220±70	128±104	-	pCi/ℓ (milk)
(A,C only for Tritium)	Tritium (Aqueous Fraction)	8	7	<90	300±100	176±164	103±73	pCi/ℓ (water)
	I-131	118	2	<.02	.6±.1	.06±.15	0.2	pCi/ℓ (milk)
SOIL								
On-Site Location (2)	Sr-89 (top 1")	2	0	<.1	<.2	<.2	-	pCi/g (dry)
	(bottom)	2	0	<.07	<.4	<.2	-	pCi/g (dry)
	Sr-90 (top 1")	2	2	.09±.05	.57±.07	.33±.68	2.1	pCi/g (dry)
	(bottom)	2	2	.62±.06	1.0±.1	.81±.54	0.1	pCi/g (dry)
Distant Location (3A,5)	Sr-89 (top 1")	4	0	<.04	<.2	<.12	-	pCi/g (dry)
	(bottom)	4	0	<.03	<.2	<.12	-	pCi/g (dry)
	Sr-90 (top 1")	4	4	.06±.03	.27±.05	.14±.18	0.6	pCi/g (dry)

TABLE V

SUMMARY OF GAMMA SPECTROMETRY OF SAMPLES COLLECTED IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1983

SAMPLE TYPE	NO. of SAMPLES ANALYZED	NUCLIDES FOUND	NO. OF SAMPLES WITH NUCLIDE DETECTED	PERIOD* MINIMUM	PERIOD* MAXIMUM	PERIOD** MEAN	PRE-OP*** MEAN	UNITS
Surface Water - Potentially Affected Stations								
(1Q, 4F, 4G, 13A, 13B - Grab)	57	None						
(11, 4L - Composite)	23	K-40	5	10±6	51±13	25±37	-	pCi/ℓ
Surface Water - Unaffected Stations								
(6A - Grab)	12	None						
(6I - Composite)	12	K-40	1	-	26±13	26	-	pCi/ℓ
Discharge Water - Potentially Affected Stations								
(1M - Grab)	12	Co-58	1	-	1.0±.9	1.0	-	pCi/ℓ
		Mn-54	1	-	1.0±.6	1.0	-	pCi/ℓ
(1MM - Composite)	10	K-40	1	-	18.1±.8	18.1	-	pCi/ℓ
Precipitation - On-Site Station								
(1A - Composite)	12	Be-7	6	22±9	57±19	35±26	-	pCi/ℓ
Precipitation - Distant Station								
(8 - Composite)	12	Be-7	5	17±8	68±16	37±39	-	pCi/ℓ
		K-40	1	-	30±17	30	-	pCi/ℓ
Air Particulates - Weather Station No. 1								
(1Z)	12	Be-7	12	50±16	122±34	91±47	-	10^{-3}pCi/m^3
Air Particulates - Conowingo Dam								
(4A)	12	Be-7	12	55±20	180±28	98±69	-	10^{-3}pCi/m^3
		K-40	1	-	23±20	23	-	10^{-3}pCi/m^3
Milk - Near Farm								
(J)	4	K-40	4	1020±100	1500±150	1293±401	-	pCi/ℓ
		Cs-137	2	1±1	1.7±.7	1.4±1.0	-	pCi/ℓ
Soil - On-Site Location								
(2) (Top 1")	2	K-40	2	2.0±.5	5±1	3.5±4.2	19±7	pCi/g(dry)
		Cs-137	2	.72±.09	1.20±.12	.96±.68	2±6	pCi/g(dry)
		Ra-226	1	-	.5±.1	.5	1.0±.3	pCi/g(dry)
		Th228/232	1	-	.5±.2	.5	1.2±.4	pCi/g(dry)
		Be-7	1	-	.6±.6	.6	-	pCi/g(dry)

TABLE V (cont.)

SUMMARY OF GAMMA SPECTROMETRY OF SAMPLES COLLECTED IN THE VICINITY OF
PEACH BOTTOM ATOMIC POWER STATION, 1983

SAMPLE TYPE	NO. OF SAMPLES ANALYZED	NUCLIDES FOUND	NO. OF SAMPLES WITH NUCLIDE DETECTED	PERIOD* MINIMUM	PERIOD* MAXIMUM	PERIOD** MEAN	PRE-OP*** MEAN	UNITS
Soil - On-site Location (cont.)								
(2) (Bottom)	2	K-40	2	4±2	6±1	5.0±2.8	23±5	pCi/g(dry)
		Cs-137	2	1.1±.11	1.3±.1	1.2±.3	1±4	pCi/g(dry)
		Ra-226	1	-	.7±.2	.7	1.4±.5	pCi/g(dry)
		Th-228/232	1	-	.6±.1	.6	2±2	pCi/g(dry)
		Be-7	1	-	1.6±.6	1.6	-	pCi/g(dry)
Soil - Distant Locations								
(3A, 5) (Top)	4	K-40	4	13±1	25±3	19.8±1.0	21±4	pCi/g(dry)
		Cs-137	4	.34±.03	1.6±.2	.9±1.1	.6±.8	pCi/g(dry)
		Ra-226	3	.95±.09	2.1±.4	1.3±1.3	.8±.9	pCi/g(dry)
		Th228/232	4	1.1±.1	1.4±.1	1.2±.3	1±1	pCi/g(dry)
(Bottom)	4	K-40	4	.15±2	23±2	19.0±7.3	21±26	pCi/g(dry)
		Cs-137	4	.31±.04	1.0±.1	.7±.6	.2±.2	pCi/g(dry)
		Ra-226	4	1.1±.1	2.4±.7	1.6±1.2	1±1	pCi/g(dry)
		Th228/232	4	1.2±.1	1.3±.1	1.3±.1	.9±1.1	pCi/g(dry)

* All results above the MDL are quoted with a two sigma counting error.
** MDL values were not included. Period mean was calculated using only positive values for the nuclide listed.
*** Pre-op mean was calculated using only positive pre-operational values and not MDLs for the nuclides listed. A dash indicates this analysis was not performed.

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TABLE VI

SUMMARY OF AMBIENT DOSIMETRY PROGRAM

STANDARD MONTHLY EQUIVALENT AVERAGE DOSE

SAMPLE TYPE	LOCATION	NO. OF SAMPLES ANALYZED	PERIOD MINIMUM	PERIOD MAXIMUM	PERIOD MEAN ± 2 SIGMA	PRE-OP(1) MEAN ± 2 SIGMA	UNITS
TLD							
	Site	617	1.43±0.45	14.85±1.20	6.94±3.76	5.05±2.05	mRad/Std. Month
Monthly	Middle Ring	1196	2.30±0.77	19.95±9.64	7.32±3.48	5.70±1.87	mRad/Std. Month
	Outer Ring	324	3.04±1.20	9.48±2.25	6.80±2.38	5.89±1.37	mRad/Std. Month
TLD							
	Site	202	3.62±0.35	11.49±0.97	6.77±2.96	5.14±1.60	mRad/Std. Month
Quarterly	Middle Ring	398	4.38±1.11	9.81±3.60	6.99±2.06	5.07±1.25	mRad/Std. Month
	Outer Ring	108	4.87±0.07	8.67±0.80	6.72±2.04	5.44±1.70	mRad/Std. Month

THE PRE-OPTIONAL MEAN WAS CALCULATED FROM TLD READINGS 1-07-73 to 8-05-76.
STATIONS 1M, 31 AND 32 WERE ADDED TO THE PROGRAM 7-06-73 AND STATIONS 33A, 38,
WERE NOT IN THE PRE-OPERATIONAL PROGRAM.
STATIONS 1NN AND 40 THROUGH 51 WERE ADDED TO THE PROGRAM ON 07/12/80.

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

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

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

EXPOSURE PERIOD DATES ARE INDICATED ON TABLES XXIII AND XXIV.

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TABLE VII

ANALYTICAL DATA FOR SURFACE WATER GRAB SAMPLES

CONCENTRATION (PCi/ℓ)

STATION CODE		COLLECTION DATE	Gr. ALPHA SOLUBLE	Gr. ALPHA INSOLUBLE	Gr. BETA SOLUBLE	Gr. BETA INSOLUBLE	Aq. H-3 TOTAL
1Q	83	01/08			1.8±.3	<.2	<90
		02/20			<.4	<.3	<70
		03/12			1.0±.5	1.1±.3	80±70
		04/09			1.1±.3	.9±.3	<70
		05/15			1.2±.3	.7±.3	<70
		06/12			1.5±.4	.5±.3	<70
		07/09			2.0±.8	<.5	<100
		08/06			3±1	2.7±.7	170±80
		09/10			4±1	<.5	200±80
		10/01			3±1	2.5±.7	<60
		11/05			4±1	<.5	160±70
		12/03			2.7±.8	.7±.5	130±80
ANNUAL MEANS					2.1±2.4	.9±1.6	106±95
4F	83	01/08	<.5	<.1	1.8±.3	.3±.3	
		02/20	2.3±.6	.5±.4	.9±.4	1.3± .4	
		03/12	<.5	1.0±.5	1.3±.5	1.9±.4	<70
		04/09	<.1	.9±.5	1.0±.3	3.7±.5	
		05/15	<.5	.7±.5	1.2±.3	1.5±.4	
		06/12	<.5	1.0±.3	1.3±.3	4.7±.5	<70
		07/09	<.7	1.1±.6	2.6±.8	2.7±.7	
		08/06	<1	.9± .5	3.4±.8	3.4±.8	
		09/10	<.9	<.2	6±1	<.5	100±70
		10/01	2±2	<.5	1.9±.7	1.1±.6	
		11/05	<1	<.3	5±1	1.3±.7	
		12/03	<.5	1.1±.7	2.6±.8	1.6±.6	100±70
ANNUAL MEANS			.9±1.3	.7±.7	2.4±3.3	2.0±2.7	85±35
4G	83	01/08			1.6±.3	<.3	
		02/20			.9±.4	<.3	
		03/12			1.1±.5	.6±.3	
		04/09			1.2±.3	.9±.3	
		05/15			1.4±.3	.9±.3	
		06/12			1.3±.3	.4±.3	
		07/09			2.0±.7	.7±.5	
		08/06			3±1	<.5	
		09/10			2.9±.9	<.5	
		10/01			3±1	2.1±.6	
		11/05			5±1	<.5	
		12/03			2.6±.8	1.1±.5	
ANNUAL MEANS					2.2±2.4	.7±1.0	

TABLE VII (cont.)
ANALYTICAL DATA FOR SURFACE WATER GRAB SAMPLES
CONCENTRATION (PCi/ℓ)

STATION CODE		COLLECTION DATE	Gr. ALPHA SOLUBLE	Gr. ALPHA INSOLUBLE	Gr. BETA SOLUBLE	Gr. BETA INSOLUBLE	Aq. H-3 TOTAL
6A	83	01/08	<.5	<.2	1.4±.3	.4±.3	
		02/20	<.3	<.1	1.0±.4	<.3	
		03/12	<.6	.4±.3	.8±.4	1.0±.3	<70
		04/09	<.1	.3±.2	1.1±.3	1.0±.3	
		05/15	1.0±.7	<.3	1.6±.4	1.3±.4	
		06/12	1.0±.7	.3±.2	1.2±.3	1.0±.3	<70
		07/09	.9±.9	<.2	2.3±.8	<.5	
		08/06	<.1	<.2	3±1	<.5	
		09/10	<.9	<.2	5±1	<.5	110±70
		10/01	<1	<.4	3±1	<.6	
		11/05	<.7	<.3	4±1	<.5	
		12/03	<.5	<.2	2.7±.8	.7±.5	110±70
ANNUAL MEANS			.6±.7	.3±.2	2.3±2.6	.7±.6	90±46
13A	83	01/08			1.6±.3	.3±.3	
		02/20			1.4±.4	.4±.3	
		03/12			1.2±.5	6.4±.6	<70
		04/09			1.7±.4	.9±.3	
		05/15			1.6±.4	.3±.3	
		06/12			1.3±.3	.3±.2	<70
		07/09			2.3±.8	<.5	
		08/06			3±1	1.0±.6	
		09/10			4±1	<.5	180±80
		10/01			3±1	.9±.6	
		11/05			4±1	4.6±.8	
		12/03			2.7±.8	1.1±.5	150±70
ANNUAL MEANS					2.3±2.0	1.4±3.9	118±112
13B	83	01/13			1.2±.4	1.5±4	
		02/15			<.4	1.0±3	
		06/07			1.3±.3	.7±.3	
		07/21			2.0±.8	<.5	
		08/09			3.1±.9	<.5	
		09/14			3.3±1.1	1.9±.6	
		10/12			4±1	1.7±.6	
		11/15			2.9±.9	<.7	
		12/08			2.1±.8	<.5	
ANNUAL MEANS					2.3±2.3	1±1.1	
MEAN	(4F, 13A)		.9±1.3	.7±.7	2.4±2.7	1.7±3.3	101±84
MEAN	(4F, 6A, 13A)		.8±1.0	.5±.7	2.4±2.6	1.4±2.9	98±72
MEAN	(1Q, 4F, 4G, 13A)		.9±1.3	.7±.7	2.3±2.5	1.3±2.7	104±89

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TABLE VIII

ANALYTICAL DATA FOR SURFACE WATER COMPOSITE SAMPLES

CONCENTRATION (PCi/ℓ)

STATION CODE		COLLECTION DATE	Gr. ALPHA SOLUBLE	Gr. ALPHA INSOLUBLE	Gr. BETA SOLUBLE	Gr. BETA INSOLUBLE	I-131 TOTAL	Aq H-3 TOTAL
1LL	83	01/07-02/10			<.4	.6±.3		<70
		02/10-03/11			1.1±.5	.6±.3		<70
		03/11-04/08			1.4±.4	.7±.3		<70
		04/08-05/13			1.1±.3	1.2±.4		<70
		05/13-06/10			1.3±.3	1.4±.3		<70
		06/10-07/08			2.0±.7	6±1		270±70
		07/08-08/05			2.0±.8	.9±.6		200±80
		08/05-09/09			3.3±0.9	<.5		100±80
		09/09-09/23			4±1	.6±.6		180±90
		10/07-Grab(B)			5±1	<.3		150±70
		November			(A)	(A)		(A)
		12/09-01/06			2.4±0.8	1.6±.7		110±70
ANNUAL MEANS					2.2±2.8	1.3±3.2		124±136
4L	83	01/01-01/08					<.4	
		01/08-02/13	<.3	<.2	.7±.4	.5±.3		<70
		02/13-02/20					<.1	
		02/13-03/12	<.4	<.2	.5±.4	.3±.3		<70
		03/05-03/12					<.07	
		03/12-04/09	<.1	<.1	1.2±.3	.6±.3		<70
		04/02-04/09					<.08	
		04/09-05/15	<.4	<.4	1.5±.4	1.4±.4		<70
		05/07-05/15					<.05	
		05/15-06/12	<.4	<.2	1.0±.3	.9±.3		<70
		06/04-06/12					<.05	
		06/12-07/09	<.4	.4±.4	2.4±.8	1.0±.6		140±90
		07/02-07/09					<.1	
		07/09-08/06	<.9	<.2	3±1	<.5		150±70
		07/30-08/06					<.05	
		08/06-09/10	<.8	<.2	3±1	<.5		170±80
		09/03-09/10					<.05	
		09/10-10/01	<1	<.4	2±1	5.1±.9		<70
		09/24-10/01					<.03	
		10/01-11/05	<1	<.3	5±1	<.5		220±60
		10/29-11/05					<.08	
		11/05-12/03	<.4	.4±.4	2.9±.8	.7±.5		160±70
		11/26-12/03					<.05	
		12/03-01/07	<.7	<.5	1.7±.9	1.5±.7		110±50
ANNUAL MEANS			<.6	.3±.2	2.1±2.5	1.1±2.6	<.09	114±105

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TABLE VIII (CONT.)
ANALYTICAL DATA FOR SURFACE WATER COMPOSITE SAMPLES
CONCENTRATION (PCi/ℓ)

STATION CODE	COLLECTION DATE	Gr. ALPHA SOLUBLE	Gr. ALPHA INSOLUBLE	Gr. BETA SOLUBLE	Gr. BETA INSOLUBLE	I-131 TOTAL	Aq.H-3 TOTAL
6I 83	01/01-01/08					<.5	
	01/08-02/13	<.4	<.1	1.6±.4	.3±.3		<70
	02/13-02/20					.40±.07	
	02/13-03/12	<.7	<.2	1.1±.5	<.2		<70
	03/05-03/12					<.09	
	03/12-04/09	<.1	.3±.2	1.2±.3	.5±.3		<70
	04/02-04/09					<.07	
	04/09-05/15	<.4	.8±.4	1.3±.3	2.5±.4		<70
	05/08-05/15					<.05	
	05/15-06/12	1.3±.7	<.2	1.7±.4	.6±.3		<70
	06/04-06/12					<.05	
	06/12-07/09	<.4	<.2	2.6±.8	<.5		150±100
	07/02-07/09					(A)	
	07/09-07/30	<.9	<.6	7±1	1±1		150±100
	07/30-08/06					(A)	
	08/06-09/10	<1	<.2	4±1	<.5		140±70
	09/02-09/10					<.07	
	09/10-10/01	6±3	1.2±.6	7±1	<.5		<70
	09/24-10/01					<.03	
	10/01-11/05	<1	<.2	3±1	<.5		<60
	10/29-11/05					<.08	
	11/05-12/03	<.4	.4±.4	3.4±.9	1.1±.5		190±70
	11/26-12/03					<.05	
	12/03-01/07	<.7	<.2	2±1	<.5		110±60
ANNUAL MEANS		1.1±3.2	.4±.7	3.0±4.2	.7±1.2	.14±.33	102±89
MEAN (1LL, 4L)		<.6	.3±.2	2.1±2.6	1.2±2.9	<.09	119±118
MEAN (1LL, 4L, 6I)		.8±2.3	.3±.5	2.4±3.3	1.0±2.4	.11±.27	113±109

(A) No sample pump failed
(B) Grab sample due to pump failure

TABLE IX

CONCENTRATIONS OF GAMMA EMITTERS* IN SURFACE WATER
IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1983

Results in Units of pCi/ℓ ± 2 sigma

GRAB SAMPLES

Sample Dates

STATION NUMBER	1-08-83	2-20-83	3-12-83	4-09-83	5-15-83	6-12-83	7-09-83	8-06-83	9-10-83	10-14-83	11-05-83	12-03-83
1Q	ALL<MDL	ALL<MDL	ALL<MDL	ALL<MDL	ALL<MDL	ALL<MDL	ALL<MDL	ALL<MDL	ALL<MDL	ALL<MDL	ALL<MDL	ALL<MDL
4F	ALL<MDL	ALL<MDL	ALL<MDL	ALL<MDL	ALL<MDL	ALL<MDL	ALL<MDL	ALL<MDL	ALL<MDL	ALL<MDL	ALL<MDL	ALL<MDL
4G	ALL<MDL	ALL<MDL	ALL<MDL	ALL<MDL	ALL<MDL	ALL<MDL	ALL<MDL	ALL<MDL	ALL<MDL	ALL<MDL	ALL<MDL	ALL<MDL
6A	ALL<MDL	ALL<MDL	ALL<MDL	ALL<MDL	ALL<MDL	ALL<MDL	ALL<MDL	ALL<MDL	ALL<MDL	ALL<MDL	ALL<MDL	ALL<MDL
13A	ALL<MDL	ALL<MDL	ALL<MDL	ALL<MDL	ALL<MDL	ALL<MDL	ALL<MDL	ALL<MDL	ALL<MDL	ALL<MDL	ALL<MDL	ALL<MDL
13B(1)	ALL<MDL	ALL<MDL				ALL<MDL	ALL<MDL	ALL<MDL	ALL<MDL	ALL<MDL	ALL<MDL	ALL<MDL

COMPOSITE SAMPLES

Sampling Period

STATION NUMBER	1-08-13)to 2-13-83	2-13-83 to 3-12-83	3-12-83 to 4-09-83	4-09-83 to 5-15-83	5-15-83 to 6-12-83	6-12-83 to 7-09-83	7-09-83 to 8-06-83	8-06-83 to 9-10-83	9-10-83 to 10-01-83	10-01-83 to 11-05-83	11-05-83 to 12-03-83	12-03-83 to 01-07-84
1LL(2)	ALL<MDL	ALL<MDL	ALL<MDL	ALL<MDL	ALL<MDL	ALL<MDL	ALL<MDL	K-40 11±6 Others<MDL	K-40 51±13 Others<MDL	K-40 16±9 Others<MDL	(3)	ALL<MDL
4L	ALL<MDL	ALL<MDL	ALL<MDL	ALL<MDL	ALL<MDL	ALL<MDL	ALL<MDL	K-40 39±13 Others<MDL	ALL<MDL	K-40 10±6 Others<MDL	ALL<MDL	ALL<MDL
6I	ALL<MDL	ALL<MDL	ALL<MDL	ALL<MDL	ALL<MDL	K-40 26±13 Others<MDL	ALL<MDL	ALL<MDL	ALL<MDL	ALL<MDL	ALL<MDL	ALL<MDL

* For typical minimum detectable levels of nuclides searched for and not found, see Table XXVI.
(1) Sampling dates for station 13B were 1/13/83; 2/15/83; 6/07/83; 7/21/83; 8/09/83; 9/14/83; 10/12/83; 11/15/83; 12/08/83
(2) Sampling dates for station 1LL were 1/07/83-2/10; 2/10-3/11; 3/11-4/8; 4/8-5/13; 5/13-6/10; 6/10-7/8; 7/8-8/5; 8/5-9/9; 9/9-9/23; 10/7-Grab; (3); 12/9-1/6/84
(3) Pump out of service

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TABLE X
ANALYTICAL DATA FOR DISCHARGE WATER GRAB SAMPLES
CONCENTRATION (PCi/ℓ)

STATION CODE	COLLECTION DATE	Gr. BETA SOLUBLE	Gr. BETA INSOLUBLE	Aq. H-3 TOTAL
1M	83 01/08	1.5±.3	<.2	<90
	02/20	.6±.4	.4±.3	<70
	03/12	1.1±.5	1.3±.3	<70
	04/09	1.2±.3	1.5±.4	<70
	05/15	1.3±.3	.8±.3	<70
	06/12	1.9±.4	.8±.3	<70
	07/09	2.4±.8	.8±.6	300±200
	08/06	4±1	.8±.7	120±80
	09/10	3±1	<.5	150±70
	10/01	3±1	<.5	140±90
	11/05	4±1	.4±.3	120±60
	12/03	2.5±.8	.8±.4	260±70
ANNUAL MEANS		2.2±2.3	.7±.7	128±155

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TABLE XI
ANALYTICAL DATA FOR DISCHARGE WATER COMPOSITE SAMPLES
CONCENTRATION (PCi/ℓ)

STATION CODE	COLLECTION DATE	Gr. BETA SOLUBLE	Gr. BETA INSOLUBLE	Aq. H-3 TOTAL
1MM	83 01/07-02/10	1.3±.4	<.3	<70
	02/10-03/11	.9±.4	.4±.3	<70
	03/11-04/08	1.2±.3	1.3±.3	<70
	04/08-05/13	1.2±.3	2.1±.4	<70
	05/13-06/10	1.2±.3	.5 ±.3	<70
	06/10-07/08	1.7±.7	1.3±.6	300±100
	07/08-08/05	3±1	5±4	260±80
	08/05-08/26	3±1	<.5	<70
	09/09-09/16(1)	4±1	<.5	230±80
	10/04-10/14	4±1	.5±.3	210±60
	November	(2)	(2)	(2)
	December	(2)	(2)	(2)
ANNUAL MEANS		2.2±2.4	1.2±2.9	142±191

(1) Sample collected from 1MM in September was grab due to sampler malfunction
(2) Water sampler non-fuctional

TABLE XII

CONCENTRATIONS OF GAMMA EMITTERS* IN DISCHARGE WATER
IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1983

GRAB SAMPLES

Sampling Dates

STATION NUMBER	01-08-83	02-20-83	03-12-83	04-09-83	05-15-83	06-12-83	07-09-83	08-06-83	09-10-83	10-01-83	11-05-83	12-03-83
1M	ALL<MDL	CO-58 1.0±.9 MN-54 1.0±.6 Others <MDL	ALL<MDL	ALL<MDL	ALL<MDL	ALL<MDL	ALL<MDL	ALL<MDL	ALL<MDL	ALL<MDL	ALL<MDL	ALL<MDL

COMPOSITE SAMPLES

SAMPLING PERIOD

STATOPM NUMBER	01-07-83 to 02-10-83	02-10-83 to 03-11-83	03-11-83 to 04-08-83	04-08-84 to 05-13-83	05-13-83 to 06-10-83	06-10-83 to 07-08-83	07-08-83 to 08-05-83	08-05-83 to 08-26-83	09-09-83 to 09-16-83	10-04-83 to 11-14-83	NOVEMBER	DECEMBER
1MM	ALL<MDL	ALL<MDL	ALL<MDL	ALL<MDL	ALL<MDL	ALL<MDL	K-40 18.1±.8 Others <MDL	ALL<MDL	ALL<MDL	ALL<MDL	(1)	(1)

* For typical minimum detectable levels of nuclides serarched for and not found, see Table XXVI.
(1) Sample not collected due to sampler malfunction

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TABLE XIII

ANALYTICAL DATA FOR WELL WATER SAMPLES

CONCENTRATION (PCi/ℓ)

STATION CODE		COLLECTION DATE	G. BETA SOLUBLE	G. BETA INSOLUBLE	A. H3 TOTAL
1U	83	02/20	.4±.3	1.6±.4	<70
		05/15	.5±.3	2.0±.4	<70
		07/09	<.5	5.6±.9	300±100
		10/01	.8±.7	<.5	300±100
ANNUAL MEANS			.6±.3	2.4±4.4	185±266
1V	83	02/20	<.3	<.3	<70
		05/15	<.3	.5±.3	<70
		07/09	<.5	.6±.5	130±60
		10/01	<.6	<.5	270±80
ANNUAL MEANS			<.4	.5±.3	135±189
40	83	02/20	<.3	.6±.3	<70
		05/15	.4±.3	<.3	<70
		07/09	1.2±.6	<.5	170±60
		10/01	3.7±.9	1.3±.6	180±70
ANNUAL MEANS			1.4±3.2	.7±.9	123±122
7	83	02/21	1.0±.3	<.3	<70
		05/16	1.1±.3	<.3	<70
		07/09	1.5±.7	<.5	120±60
		11/05	1.8±.8	<.3	120±90
ANNUAL MEANS			1.4±.7	<.4	95±58

QUARTERLY MEANS - Tritium (Aq. H-3), Stations 1U and 1V

83	02/20	<70
	05/15	<70
	07/09	215±240
	10/01	285±42

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TABLE XIV
ANALYTICAL DATA FOR PRECIPITATION SAMPLES

STATION CODE		COLLECTIN PERIOD	VOLUME (ML)	CONCENTRATION (PCi/ℓ) G. BETA
1A	83	01/08-02/20	3160	<1
		02/20-03/12	1540	2±1
		03/12-04/09	3156	2±1
		04/09-05/15	5350	2±1
		05/15-06/12	3900	2±1
		06/12-07/09	5000*	3.1±.7
		07/09-08/06	200*	5±2
		08/06-09/10	2000*	2.1±.7
		09/10-10/01	900*	9±1
		10/01-11/05	4000*	7±1
		11/05-12/03	4900*	2.5±.6
		12/03-01/07	6000*	1.2±.7
		ANNUAL MEAN		3.2±5.0
8	83	01/08-02/20	2670	2±1
		02/20-03/12	1640	3±1
		03/12-04/19	4136	2±1
		04/19-05/15	3925	<1
		05/15-06/12	3225	<1
		06/12-07/09	4000*	2.2±.7
		07/09-08/06	200*	10±2
		08/06-09/10	2000*	8±1
		09/10-10/01	800*	7±1
		10/01-11/05	4200*	4.6±.9
		11/05-12/03	5100*	6.2±.9
		12/03-01-07	600 *	2.9±.9
		ANNUAL MEAN		4.2±5.9

STATION CODE		COLLECTION PERIOD	VOLUME (ML)	CONCENTRATION (pCi/Sq.M) G. BETA
1A	83	01/08-02/20	3160	<100
		02/20-03/12	1540	100±60
		03/12-04/09	3156	200±100
		04/09-05/15	5350	300±200
		05/15-06/12	3900	200±200
		06/12-07/09	5000*	400±100
		07/09-08/06	200*	30±10
		08/06-09/10	2000*	130±40
		09/10-10/01	900*	250±40
		10/01-11-05	4000*	800±100
		11/05-12/03	4900*	380±90
		12/03-01/07	6000*	200±100
		ANNUAL MEAN		258±409
8	83	01/08-02/20	2670	200±100
		02/20-03/12	1640	170±70
		03/12-04/19	4136	300±200
		04/19-05/15	3925	<100
		05/15-06/12	3225	<100
		06/12-07/09	4000*	250±90
		07/09-08/06	200*	70±10
		08/06-09/10	2000*	510±70
		09/10-10/01	800*	170±30
		10/01-11/05	4200*	600±100
		11/05-12/03	5100*	1000±100
		12/03-01/07	6000*	500±200
		ANNUAL MEAN		330±550

* Rounded volume

TABLE XV

CONCENTRATIONS OF GAMMA EMITTERS* IN PRECIPITATION IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1983

Results in Units of pCi/ℓ ± 2 sigma

DATES	STATION 1A NUCLIDES		STATION 8 NUCLIDES	
01-08-83 to 02-20-83	Be-7	44±17	Be-7	24±10
	Others	ALL<MDL	Others	ALL<MDL
02-20-83 to 03-12-83	Be-7	<30	Be-7	<18
	Others	ALL<MDL	Others	ALL<MDL
03-12-83 to 04-09-83	Be-7	31±13	Be-7	<14
	Others	ALL<MDL	Others	ALL<MDL
04-09-83 to 05-15-83	Be-7	<7	Be-7	<5
	Others	ALL<MDL	Others	ALL<MDL
05-15-83 to 06-12-83	Be-7	26±6	Be-7	<7
	Others	ALL<MDL	Others	ALL<MDL
06-12-83 to 07-09-83	Be-7	<7	Be-7	<6
	Others	ALL<MDL	Others	ALL<MDL
07-09-83 to 08-06-83	Be-7	<30	Be-7	<10
	Others	ALL<MDL	Others	ALL<MDL
08-06-83 to 09-10-83	Be-7	<6	Be-7	68±16
	Others	ALL<MDL	K-40	30±17
			Others	ALL<MDL
09-10-83 to 10-01-83	Be-7	<6	Be-7	<5
	Others	ALL<MDL	Others	ALL<MDL
10-01-83 to 11-05-83	Be-7	57±19	Be-7	35±15
	Others	ALL<MDL	Others	ALL<MDL
11-05-83 to 12-03-83	Be-7	29±9	Be-7	42±6
	Others	ALL<MDL	Others	ALL<MDL
12-03-83 to 01-07-83	Be-7	22±9	Be-7	17±8
	Others	ALL<MDL	Others	ALL<MDL

* For typical minimum detectable levels of nuclides searched for and not found, see Table XXVI.

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TABLE XVI

ANALYTICAL DATA FOR AIR PARTICULATE SAMPLES

CONCENTRATIONS OF GROSS BETA RADIOACTIVITY (PCI/M3)

	COLLECTION PERIOD	1Z	4A	COLLECTION PERIOD	1Z	4A
83	01/01-01/08	.027±.006	.023±.005	07/02-07/09	.017±.003	.016±.004
	01/08-01/15	.010±.004	.010±.004	07/09-07/17	.027±.003	.027±.003
	01/15-01/22	.011±.005	.010±.005	07/17-07/23	.024±.005	.020±.004
	01/22-01/29	.020±.005	.024±.005	07/23-07/30	.024±.004	.021±.003
	01/29-02/05	.011±.004	.018±.005	07/30-08/06	.019±.004	.010±.003
	02/05-02/13	(1)	.019±.004	08/06-08/13	.023±.003	.023±.003
	02/13-02/20	.034±.006	.025±.005	08/13-08/20	.032±.004	.030±.004
	02/20-02/26	.023±.006	.021±.006	08/20-08/27	.025±.003	.025±.003
	02/26-03/05	.020±.005	.024±.005	08/27-09/03	.027±.004	.025±.004
	03/05-03/12	.013±.004	.006±.004	09/03-09/10	.032±.004	.024±.004
	03/12-03/19	.011±.003	.012±.003	09/10-09/17	.022±.003	.022±.003
	03/19-03/26	.009±.004	.011±.004	09/17-09/24	.028±.004	.025±.004
	03/26-04/02	.016±.005	.020±.005	09/24-10/01	.021±.003	.021±.003
	04/02-04/09	.011±.004	.011±.005	10/01-10/08	.026±.004	.028±.004
	04/09-04/16	.005±.004	.005±.004	10/08-10/15	.017±.003	.012±.003
	04/16-04/23	.020±.005	.016±.005	10/15-10/23	.019±.003	.020±.003
	04/23-04/30	.027±.006	.021±.005	10/23-10/29	.012±.004	.015±.004
	04/30-05/07	.022±.005	.021±.005	10/29-11/05	.014±.003	.014±.003
	05/07-05/15	.015±.004	.016±.004	11/05-11/12	.019±.003	.018±.003
	05/15-05/21	.015±.006	.012±.006	11/12-11/19	.019±.004	.014±.004
	05/21-05/28	.010±.004	.012±.004	11/19-11/26	.027±.004	.024±.004
	05/28-06/04	.017±.005	.016±.005	11/26-12/03	.027±.004	.028±.004
	06/04-06/12	.021±.005	.006±.003	12/03-12/11	.022±.003	.037±.005
	06/12-06/19	.030±.005	.030±.006	12/11-12/17	.014±.004	.014±.004
	06/19-06/25	.022±.006	.018±.005	12/17-12/24	.022±.004	.019±.003
	06/25-07/02	.018±.005	.013±.005	12/24-12/31	.048±.007	.021±.003
				ANNUAL MEANS	.021±.016	.019±.014

(1) No sample due to pump malfunction

TABLE XVII

CONCENTRATIONS OF GAMMA EMITTERS* IN AIR PARTICULATES IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1983

Results in Units of 10^{-3} pCi/m^3 ± 2 sigma

MONTHLY COMPOSITE PERIODS

STATION NUMBER 1Z	1/01/83 to 1/29/83	1/29/83 to 2/06/83	2/06/83 to 4/02/83	4/02/83 to 4/30/83	4/30/83 to 5/28/83	5/28/83 to 7/02/83	7/02/83 to 7/30/83	7/30/83 to 9/03/83	9/03/83 to 10/01/83	10/01/83 to 10/29/83	10/29/83 to 12/03/83	12/03/83 to 12/31/83	Mean ± 2 s.d
Be-7	84±19	54±17	75±12	120±28	110±17	110±13	88±19	82±29	122±34	104±28	50±16	91±19	91±47
K-40	<19	<18	<11	<32	<17	<13	<10	<30	<10	<40	<7	<10	<18
Others	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL

MONTHLY COMPOSITE PERIODS

STATION NUMBER 4A	1/01/83 to 1/29/83	1/29/83 to 2/06/83	2/06/83 to 4/02/83	4/02/83 to 4/30/83	4/30/83 to 5/28/83	5/28/83 to 7/02/83	7/02/83 to 7/30/83	7/30/83 to 9/03/83	9/03/83 to 10/01/83	10/01/83 to 10/29/83	10/29/83 to 12/03/83	12/03/83 to 12/31/83	Mean ± 2 s.d.
Be-7	55±20	66±14	89±13	97±19	140±19	81±10	180±28	110±29	110±28	73±18	87±18	86±17	98±69
K-40	<14	<17	<17	23±20	<18	<12	<20	<20	<10	<30	<9	<10	17±12
Others	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL

* For detectable levels of nuclides searched for and not found, see Table XXVI.

TABLE XVIII

CONCENTRATIONS OF I-131 IN FILTERED AIR IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1983

Results in Units of pCi/m3 ± 2 Sigma

STATION NUMBER COLLECTION DATE	1B	1Z	2	3A	5*	6B*	14*	COLLECTION DATE	STATION NUMBER 12D
01/01/83-01/08/83	<.04	<.04	<.04	<.04	<.02	<.08	<.08	01/03/83-01/10/83	<.07
01/08/83-01/15/83	<.03	<.03	<.03	<.03	<.02	<.03	<.05	01/10/83-01/17/83	<.04
01/15/83-01/22/83	<.03	<.03	<.03	<.03	<.04	<.02	<.04	01/17/83-01/24/83	<.02
01/22/83-01/29/83	<.003	<.002	<.003	<.002	<.001	<.001	<.003	01/24/84-01/31/83	<.002
01/29/83-02/05/83	<.02	<.2(7)	<.01	<.02	<.02	<.02	<.02	01/31/83-02/07/83	<.01
02/05/83-02/13/83	<.01	(1)	<.01	<.01	<.01	<.01	<.01	02/07/83-02/14/83	<.002
02/13/83-02/20/83	<.02	<.02	<.02	<.02	<.02	<.02	<.02	02/14/83-02/22/83	<.01
02/20/83-02/26/83	<.01	<.02	<.02	<.02	<.02	<.04	<.02	02/22/83-02/28/83	<.08
02/26/83-03/05/83	<.02	<.02	<.02	<.01	<.01	<.01	<.02	02/28/83-03/07/83	<.02
03/05/83-03/12/83	<.009	<.008	<.008	(1)	<.008	<.008	<.009	03/07/83-03/14/83	<.008
03/12/83-03/19/83	<.01	<.01	<.01	(1)	<.009	<.01	<.01	03/14/83-03/21/83	<.007
03/19/83-03/26/83	<.01	<.01	<.01	<.03(2)	<.01	<.02	<.02	03/21/83-03/28/83	<.02
03/26/83-04/02/83	<.02	<.02	<.01	<.02	<.02	<.02	<.02	03/28/83-04/04/83	<.02
04/02/83-04/09/83	<.02	<.02	<.02	<.02	<.02	<.02	<.02	04/04/83-04/11/83	<.03
04/09/83-04/16/83	<.02	<.02	<.02	<.02	<.01	<.01	<.01	04/11/83-04/18/83	<.01
04/16/83-04/23/83	<.01	<.01	(1)	<.01	<.02	<.02	<.02	04/18/83-04/25/83	<.02
04/23/83-04/30/83	<.02	<.01	(1)	<.02	<.02	<.02	<.02	04/25/83-05/02/83	<.02
04/30/83-05/07/83	<.02	<.02	(1)	<.02	<.01	<.01	<.01	05/02/83-05/09/83	<.02
05/07/83-05/15/83	<.02	<.01	(1)	<.01	<.02	<.02	<.02	05/09/83-05/16/83	<.02
05/15/83-05/21/83	<.02	<.02	<.02	<.02	<.03	<.02	<.02	05/16/83-05/23/83	<.01
05/21/83-05/28/83	<.02	<.02	<.02	<.02	<.02	<.02	<.01	05/23/83-05/31/83	<.02
05/28/83-06/04/83	<.02	<.01	<.02	<.02	<.02	<.02	<.02	05/31/83-06/06/83	<.02
06/04/83-06/12/83	<.01	<.007	<.01	<.01	<.01	<.01	<.01	06/06/83-06/13/83	<.02
06/12/83-06/19/83	<.01	<.01	<.01	<.01	(1)	<.02	<.02	06/13/83-06/20/83	<.02
06/19/83-06/25/83	<.02	<.02	<.02	<.02	<.1(3)(6)	<.02	<.01	06/20/83-06/27/83	<.02
06/25/83-07/02/83	<.02	<.02	<.02	<.02	<.02	<.02	<.02	06/27/83-07/05/83	<.01
07/02/83-07/09/83	<.03	<.02	<.03	<.03	<.01	<.02	<.02	07/05/83-07/11/83	<.06
07/09/83-07/17/83	<.008	<.008	<.007	<.008	<.007	<.02(4)	<.02	07/11/83-07/18/83	<.02
07/17/83-07/23/83	<.03	<.03	<.02	<.05	<.02	<.02(5)	<.01	07/18/83-07/25/83	<.01
07/23/83-07/30/83	<.01	<.01	<.01	<.01	<.008	<.01	<.01	07/25/83-08/01/83	<.05
07/30/83-08/06/83	<.04	<.04	<.03	<.03	<.04	<.04	<.02	08/01/83-08/08/83	<.03
08/06/83-08/13/83	<.01	<.02	<.02	<.02	<.01	<.01	<.01	08/08/83-08/15/83	<.03
08/13/83-08/20/83	<.01	<.01	<.01	<.01	<.01	<.02	<.02	08/15/83-08/22/83	<.03
08/20/83-08/27/83	<.02	<.02	<.01	<.01	<.01	<.02	<.008	08/22/83-08/29/83	<.03
08/27/83-09/03/83	<.04	<.03	<.03	<.04	<.02	<.06	(1)	08/29/83-09/06/83	<.02
09/03/83-09/10/83	<.3(6)	<.01	<.02	<.01	<.008	<.02	<.01	09/06/83-09/12/83	<.02
09/10/83-09/17/83	<.02	<.02	<.02	<.02	<.006	<.02	<.02	09/12/83-09/19/83	<.02
09/17/83-09/24/83	<.02	<.02	<.02	<.02	<.01	<.02	<.02	09/19/83-09/26/83	<.08

TABLE XVIII (cont.)

CONCENTRATIONS OF I-131 IN FILTERED AIR IN THE VICINITY OF
PEACH BOTTOM ATOMIC POWER STATION, 1983

Results in Units of pCi/m3 ± 2 Sigma

STATION NUMBER COLLECTION DATE	1B	1Z	2	3A	5*	6B*	14*	COLLECTION DATE	STATION NUMBER 12D
09/24/83-10/01/83	<.02	<.02	<.02	<.02	<.01	<.02	<.02	09/26/83-10/03/83	<.02
10/01/83-10/08/83	<.02	<.02	<.02	<.01	<.01	<.01	<.01	10/03/83-10/11/83	<.006
10/08/83-10/15/83	<.02	<.02	<.02	<.02	<.009	<.03	<.03	10/11/83-10/18/83	<.02
10/15/83-10/23/83	<.01	<.02	<.02	<.02	<.01	<.01	<.02	10/18/83-10/24/83	<.01
10/23/83-10/29/83	<.05	<.02	<.02	<.02	<.01	<.02	<.02	10/24/83-10/31/83	<.01
10/29/83-11/05/83	<.02	<.02	<.02	<.02	<.007	<.009	<.009	10/31/83-11/07/83	<.007
11/05/83-11/12/83	(1)	<.03	<.03	<.03	<.02	<.02	<.02	11/07/83-11/14/83	<.001
11/12/83-11/19/83	<.04	<.02	<.02	<.02	<.01	<.02	<.02	11/14/83-11/21/83	<.03
11/19/83-11/26/83	<.9(6)	<.04	<.04	<.04	<.02	<.05	<.05	11/21/83-11/28/83	<.02
11/26/83-12/03/83	<.07	<.03	<.02	<.01	<.01	<.01	<.009	11/28/83-12/05/83	<.01
12/03/83-12/11/83	<.02	<.02	<.02	<.02	<.04	<.04	<.04	12/05/83-12/12/83	<.01
12/11/83-12/17/83	<.02	<.02	<.02	<.02	<.01	<.009	<.009	12/12/83-12/19/83	<.01
12/17/83-12/24/83	<.04	<.04	<.04	<.04	<.02	<.02	<.02	12/19/83-12/27/83	<.02
12/24/83-12/31/83	<.01	<.02	<.006	<.02	<.02	<.02	<.02	12/27/83-01/03/84	<.01
MEAN	<.04	<.02	<.02	<.02	<.04	<.02	<.02		<.02

(1) No sample available; pump out of service
(2) Sampling dates 03/22/83-03/26/83 due to pump repair
(3) Sampling dates 06/24/83-06/25/83 due to pump repair
(4) Sampling dates 07/09/83-07/16/83 due to pump repair
(5) Sampling dates 07/16/83-07/31/83 due to pump repair
(6) High MDL due to low air volume.
(7) High MDL due to delay in counting.

* Sampling dates for station 5, 6B and 14 in 1983 were as follows: 1/01-1/08; 1/08-1/15; 1/15-1/22; 1/22-1/30; 1/30-2/05; 2/05-2/13; 2/13-2/20; 2/20-2/26; 2/26-3/05; 3/05-3/12; 3/12-3/20; 3/20-3/26; 3/26-4/02; 4/02-4/09; 4/09-4/17; 4/17-4/23; 4/23-4/30; 4/30-5/08; 5/08-5/15; 5/15-5/21; 5/21-5/29; 5/29-6/04; 6/04-6/12; 6/12-6/18; 6/18-6/25; 6/25-7/02; 7/02-7/09; 7/09-7/17; 7/17-7/23; 7/23-7/31; 7/31-8/06; 8/06-8/13; 8/13-8/20; 8/20-8/27; 8/27-9/02; 9/02-9/10; 9/10-9/18; 9/18-9/24; 9/24-10/01; 10/01-10/08; 10/08-10/15; 10/15-10/22; 10/22-10/29; 10/29-11/05; 11/05-11/12; 11/12-11/19; 11/19-11/26; 11/26-12/03; 12/03-12/10; 12/10-12/17; 12/17-12/24; 12/24-12/31/83.

TABLE XIX
CONCENTRATIONS OF I-131 AND TRITIUM IN MILK IN THE
VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1983

Results in Units of pCi/ℓ ± 2 sigma

I-131

COLLECTION DATE	STATION A	STATION B	STATION C	STATION D	STATION E	STATION G	STATION J	STATION L	STATION M	STATION N	STATION O
01/10/83	<.3	<.3	<.3	<.4	<.4	<.4	<.4	<.4	<.5	<.6	<.3
02/21/83	<.07	<.06	<.08	<.08		<.09	<.1			<.06	<.08
03/14/83	<.06	<.07	<.07	<.07		<.07	<.08			<.08	<.07
04/04/83	<.05	<.04	<.05	<.05		<.06	<.05			<.05	<.05
04/11/83	<.07	<.07	<.06	<.07		<.07	<.08			<.07	<.07
04/18/83	<.06	<.05	<.06	<.07		<.06	<.07			<.06	<.06
04/25/83	.07±.03	<.06	.6±.1	<.08		4.4±.4	<.05			<.07	<.05
05/02/83	<.09	<.09	<.1	<.1		<.1	<.09			<.1	<.09
05/09/83	<.07	<.08	<.07	<.08		<.09	<.08			<.08	<.08
05/16/83	<.05	<.06	<.06	<.05	<.07	<.06	<.08	<.06	<.07	<.06	<.06
05/23/83	<.06	<.06	<.06	<.06		<.07	<.07			<.06	<.06
06/01/83	<.04	<.04	<.05	<.04		<.05	<.05			<.05	<.05
06/06/83	<.05	<.05	<.06	<.05		<.05	<.06			<.05	<.04
06/13/83	<.04	<.05	<.05	<.05		<.04	<.05			<.06	<.06
06/20/83	<.04	<.06	<.06	<.06		<.05	<.06			<.05	<.08
06/27/83	<.04	<.04	<.06	<.04		<.04	<.04			<.05	<.04
07/04/83	<.05	<.05	<.04	<.06		<.05	<.05			<.06	<.05
07/11/83	<.05	<.07	<.05	<.05	<.05	<.05	<.06	<.06	<.06	<.06	<.06
07/18/83	<.04	<.04	<.04	<.04		<.05	<.03			<.04	<.04
07/25/83	<.05	<.05	<.05	<.04		<.06	<.05			<.06	<.05
08/01/83	<.05	<.04	<.05	<.07		<.06	<.05			<.05	<.05
08/08/83	<.04	<.04	<.06	<.04		<.06	<.05			<.05	<.07
08/15/83	<.04	<.05	<.03	<.09		<.04	<.04			<.04	<.04
08/22/83	<.03	<.03	<.03	<.04		<.04	<.04			<.04	<.03
08/29/83	<.03	<.03	<.03	<.03		<.03	<.03			<.03	<.03
09/05/83	<.03	<.03	<.03	<.03		<.03	<.03			<.03	<.02
09/12/83	<.04	<.04	<.04	<.04		<.04	<.05			<.06	<.05
09/19/83	<.04	<.04	<.05	<.05		<.05	<.05			<.06	<.04
09/26/83	<.06	<.04	<.03	<.03		<.03	<.03			<.03	<.04
10/01/83	<.05	<.02	<.03	<.05		<.04	<.04			<.05	<.05
10/10/83	<.04	<.03	<.03	<.03		<.04	<.06			<.05	<.05
10/17/83	<.06	<.04	<.06	<.07		<.03	<.03			<.02	<.02
10/24/83	<.05	<.04	<.06	<.04		<.05	<.07			<.05	<.05
10/31/83	<.05	<.04	<.05	<.05		<.05	<.05			<.05	<.04
11/07/83	<.06	<.05	<.05	<.06	<.06	<.07	<.07	<.06	<.06	<.06	<.05
11/14/83	<.05	<.04	<.04	<.04		<.06	<.05			<.05	<.04
11/21/83	<.04	<.03	<.04	<.04		<.04	<.04			<.04	<.04
12/19/83	<.04	<.03	<.03	<.04		<.05	<.04			<.04	<.04
MEAN	.06±.09	<.05	.07±.20	<.06	<.15	.18±1.41	<.06	<.15	<.2	<.07	<.06

TABLE XIX (cont)
CONCENTRATIONS OF I-131 AND TRITIUM IN MILK IN THE
VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1983

Results in Units of pCi/l ± 2 Sigma

TRITIUM

COLLECTION	A		C		G		J	
DATES	MILK	WATER	MILK	WATER	MILK	WATER	MILK	WATER
01/10/83	110±70	130±90	<50	<90	70±60	100±90	<50	<90
05/16/83	110±60	130±70	100±60	110±70	140±60	160±70	100±60	100±70
07/11/83*	130±50	190±80	180±60	260±90	170±80	300±100	160±80	200±100
11/07/83*	220±70	300±100	120±70	200±100	80±70	100±100	240±50	350±80
MEAN	143±105	188±160	113±108	165±159	115±96	165±189	138±164	185±241

* The fraction .68 was used to calculate the aqueous portion in milk for the third and fourth quarter.

TABLE XX

WEEKLY MEAN CONCENTRATION OF I-131 IN MILK IN THE VICINITY
OF PEACH BOTTOM ATOMIC POWER STATION, 1983

Results in Units of pCi/ ℓ ± 2 Sigma

COLLECTION DATE	NEAR FARMS (G,J,O)	INTERMEDIATE FARMS (D,L,M,N)	DISTANT FARMS (A,B,C,E)	ALL FARMS
01/10/83	<.37	<.47	<.33	<.39
02/21/83	<.09	<.07	<.07	<.08
03/14/83	<.07	<.07	<.07	<.07
04/04/83	<.05	<.05	<.05	<.05
04/11/83	<.07	<.07	<.07	<.07
04/18/83	<.06	<.06	<.06	<.06
04/25/83	1.5±5.0	<.07	.24±.62	.067±3.0
05/02/83	<.09	<.1	<.09	<.09
05/09/83	<.08	<.08	<.07	<.08
05/16/83	<.07	<.06	<.06	<.06
05/23/83	<.07	<.06	<.06	<.06
06/01/83	<.05	<.05	<.04	<.05
06/06/83	<.05	<.05	<.05	<.05
06/13/83	<.05	<.05	<.05	<.05
06/20/83	<.06	<.05	<.05	<.06
06/27/83	<.04	<.04	<.05	<.04
07/04/83	<.05	<.06	<.04	<.05
07/11/83	<.06	<.06	<.05	<.04
07/17/83	<.04	<.04	<.04	<.04
07/25/83	<.05	<.05	<.05	<.04
08/01/83	<.05	<.06	<.05	<.05
08/08/83	<.06	<.04	<.05	<.05
08/15/83	<.04	<.06	<.04	<.05
08/22/83	<.04	<.04	<.03	<.04
08/29/83	<.03	<.03	<.03	<.03
09/05/83	<.03	<.03	<.03	<.03
09/12/83	<.05	<.05	<.04	<.05
09/19/83	<.05	<.05	<.04	<.05
09/26/83	<.03	<.03	<.04	<.03
10/01/83	<.04	<.05	<.03	<.04
10/10/83	<.04	<.05	<.03	<.04
10/17/83	<.03	<.05	<.05	<.04
10/24/83	<.06	<.05	<.05	<.05
10/31/83	<.05	<.05	<.05	<.05
11/07/83	<.06	<.06	<.05	<.06
11/14/83	<.05	<.05	<.04	<.05
11/21/83	<.04	<.04	<.04	<.04
12/19/83	<.04	<.04	<.03	<.04

TABLE XXI

CONCENTRATIONS OF Sr-89, Sr-90 and GAMMA EMITTERS* IN MILK
IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1983

Results in Units of pCi/ℓ ± 2 sigma

STATION NUMBER	SAMPLING DATE	NUCLIDES FOUND			
		Sr-89	Sr-90	K-40	Cs-137
J	01/10/83	<2	3±1	1300±130	1±1
	05/16/83	<.8	2.1±.4	1500±150	1.7±.7
	07/11/83	<3	4±1	1020±100	<3
	11/07/83	<2	3.1±.9	1350±140	<2
MEAN ± 2 s.d.		<2	3.1±1.6	1293±401	1.9±1.7

* For typical minimum detectable levels of nuclides searched for and not found, see Table XXVI.

TABLE XXII

CONCENTRATIONS OF Sr-89, Sr-90 and GAMMA EMITTERS* IN SOIL IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1983

Results in Units of pCi/g(dry)

ENV. STATION NO.		STATION 2		AVERAGE SITE	STATION 3A		STATION 5		AVERAGE DISTANT
Date		06/19/83	09/24/83	LOCATIONS	06/19/83	09/24/83	06/18/83	09/24/83	LOCATIONS
Sr-89	top 1"	<.1	<.2	<.2	<.04	<.2	<.04	<.2	<.12
	bottom	<.07	<.4	<.2	<.04	<.2	<.03	<.2	<.12
Sr-90	Top 1"	.57±.07	.09±.05	.33±.68	.11±.03	.27±.05	.11±.03	.06±.03	.14±.18
	bottom	.62±.06	1.0±.1	.81±.54	.13±.03	.27±.05	.09±.03	.04±.03	.13±.20
K-40	Top 1"	5±1	2.0±.5	3.5±4.2	13±1	20±2	25±3	21±2	19.8±10.0
	bottom	4±2	6±1	5.0±2.8	15±2	17±2	23±2	21±2	19.0±7.3
Cs-137	top 1"	.72±.09	1.2±.1	.96±.68	1.1±.1	1.6±.2	.58±.06	.34±.03	.9±1.1
	bottom	1.3±.1	1.1±.1	1.2±.3	1.0±.1	.86±.09	.62±.06	.31±.04	.7±.6
Ra-226	top 1"	.5±.2	<.5	.5±0	1.1±.1	<.4	.95±.09	2.1±.4	1.1±1.4
	bottom	.7±.2	<.7	.7±0	1.1±.1	1.7±.5	1.1±.1	2.4±.7	1.6±1.2
Th-228/232 (1)	top 1"	.5±.2	<.05	.27±.64	1.1±.1	1.1±.1	1.4±.1	1.2±.1	1.2±.3
	bottom	<.3	.6±.1	.5±.4	1.2±.1	1.3±.1	1.3±.1	1.2±.1	1.3±.1
Be-7	top 1"	.6±.6	<.3	.5±.4	<.3	<.4	<.3	<.1	<.3
	bottom	1.6±.6	<.4	1.0±1.7	<.3	<.1	<.3	<.2	<.2
Others	top 1"	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
	bottom	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL

* For typical minimum detectable levels of nuclides searched for and not found, see Table XXVI.

(1) Th-232 and Th-228 are in the natural radioactive thorium series and are presumably in equilibrium. Th-232, though not a gamma emitter directly, was the listed nuclide by RMC; Teledyne Isotopes lists Th-228 by measuring one of the several short-lived gamma emitting daughter products.

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TABLE XXIII

MONTHLY TLD RESULTS

Results in units of mRads/std. month

Station Code	Eqv.Mo.Avg.	83 1/15-2/20	83 2/20-3/12	83 3/12-4/09	83 4/09-5/15	83 5/15-6/12	83 6/12-7/09	83 7/09-8/06	83 8/06-9/10	83 9/10-10/01	83 10/01-11/05	83 11/05-12/03	84 12/03-01/07
1A	7.94±1.71	8.05±0.58	7.80±0.30	8.77±0.82	7.67±0.84	7.15±0.41	10.13±0.80	4.67±0.75	8.19±0.92	7.68±2.09	7.38±1.12	7.37±0.62	7.38±0.52
1B	5.90±1.39	6.05±0.73	6.10±0.59	6.58±0.69	5.94±0.32	5.15±0.43	7.20±0.67	3.17±0.32	6.95±1.39	5.38±0.53	5.56±0.70	5.77±0.66	5.09±0.35
1C	7.85±2.09	6.21±0.45	8.38±1.23	7.90±1.29	6.93±0.44	6.91±0.25	10.00±0.85	5.63±0.52	8.47±0.98	8.71±1.01	8.52±2.45	7.83±2.44	7.48±0.49
1D	6.91±1.43	6.26±0.78	7.08±1.30	7.78±0.75	7.30±0.58	7.14±0.74	8.47±0.98	5.10±0.49	6.92±0.57	6.47±0.92	6.24±1.52	6.42±1.29	6.31±0.65
1E	7.04±1.41	5.98±0.80	6.74±0.53	8.16±0.57	6.96±0.57	6.88±0.38	7.86±0.94	3.72±0.94	7.57±1.02	7.00±0.95	7.70±2.38	6.17±0.59	6.50±0.54
1F	8.43±1.91	7.04±0.60	10.23±1.14	9.28±0.89	8.43±0.82	8.58±1.44	9.99±0.32	5.83±1.73	7.96±0.79	7.85±0.72	8.27±1.60	8.32±2.41	7.86±0.73
1G	5.60±1.89	5.12±0.34	5.12±0.72	5.96±0.71	5.46±0.89	5.03±1.29	6.23±0.70	2.62±0.41	8.10±5.73	5.01±1.06	4.81±2.09	5.43±1.07	5.01±0.83
1H	7.45±1.60	6.80±0.46	8.24±0.95	8.68±1.50	7.64±0.89	6.88±1.12	8.09±2.38	5.39±0.85	8.11±1.26	7.93±1.07	7.00±1.09	7.50±1.68	5.95±0.96
1I	5.83±1.81	5.46±0.73	6.42±1.48	6.61±1.20	5.77±0.91	5.09±0.28	7.27±0.28	3.43±0.64	5.69±0.66	5.41±1.21	5.65±1.11	5.98±1.40	5.26±0.48
1J	8.53±1.62	7.63±0/42	8.72±1.55	8.38±1.27	8.04±1.11	8.11±0.96	9.57±1.05	5.87±0.64	9.74±0.77	8.07±0.44	8.93±1.95	9.57±1.53	7.38±1.79
1L	6.74±7.90	10.49±0.58	14.85±1.20	13.08±1.80	5.02±0.78	4.51±0.63	6.83±0.27	1.43±0.45	3.63±0.24	3.82±0.65	4.70±0.52	4.79±1.00	5.14±1.20
1M	4.02±0.79	3.99±0.25	4.47±0.45	4.05±1.01	4.01±0.37	3.80±0.51	4.91±0.49	(A)	4.09±0.37	3.83±0.66	3.68±0.66	4.24±0.79	3.47±1.15
2	7.07±1.35	6.15±0.46	6.58±0.74	6.91±0.90	6.68±0.89	6.65±1.14	8.23±1.38	4.73±0.67	7.78±0.83	7.20±0.92	7.48±1.14	7.90±0.96	6.42±1.00
3A	5.42±1.04	5.09±0.42	6.48±1.10	5.18±0.70	5.41±0.51	5.20±0.44	6.34±1.54	2.39±1.43	5.45±0.39	5.16±0.72	5.14±1.20	5.79±0.51	4.92±0.68
4K	4.81±0.95	4.31±0.79	5.42±1.01	5.16±0.31	4.86±0.48	4.75±0.38	5.38±0.41	2.30±0.77	4.44±0.88	3.97±0.34	4.49±0.79	5.04±0.79	5.26±1.00
5	6.57±1.05	5.83±1.07	6.73±0.48	6.50±0.44	6.48±0.54	6.16±0.83	6.98±0.64	6.47±1.88	7.36±1.03	6.14±0.61	6.61±0.95	7.49±0.96	6.13±0.85
6B	5.36±0.87	5.34±0.38	5.82±0.99	5.75±0.32	5.32±0.81	5.09±1.05	5.55±0.75	3.01±1.21	5.70±0.38	5.28±2.07	5.51±1.52	5.65±0.87	4.27±1.02
14	6.80±1.81	5.58±0.84	7.67±1.19	6.87±0.75	5.73±0.41	7.52±1.98	7.00±0.85	5.65±3.45	8.26±0.45	7.06±1.37	7.55±2.82	5.61±0.88	6.47±0.40
15	7.13±1.16	6.39±1.11	7.07±0.65	6.94±1.50	7.72±0.40	6.46±0.64	7.72±0.83	3.91±1.21	7.51±1.22	7.40±0.90	7.51±0.62	7.71±2.12	6.17±1.51
16	7.50±1.21	6.58±0.67	8.41±1.90	7.80±0.89	(A)	(A)	7.48±1.15	5.91±1.26	7.64±1.75	6.75±0.50	8.19±1.22	7.62±2.17	7.24±0.82
17	8.20±1.29	7.36±0.96	8.59±0.56	8.23±2.06	7.60±1.36	8.45±0.31	8.82±0.11	5.83±2.69	8.81±0.93	6.90±0.45	8.83±0.40	8.11±2.41	8.36±1.57
18	7.37±0.96	6.88±0.93	7.17±0.73	7.97±0.92	7.83±0.50	6.94±0.93	7.91±0.79	4.04±0.88	7.62±1.17	6.54±0.13	7.32±1.09	7.70±1.25	7.04±0.98
19	7.06±1.34	6.63±0.92	7.81±1.25	6.29±0.35	6.86±0.46	6.31±0.30	6.43±0.84	4.23±2.11	7.70±1.03	7.93±0.52	7.93±2.11	7.40±0.49	6.69±0.41
20	8.29±1.02	8.23±0.61	8.73±1.08	9.48±2.25	8.13±1.16	8.11±1.03	8.10±1.02	6.17±0.62	8.26±0.39	7.69±1.08	8.53±1.61	8.41±0.93	7.62±1.09
21B	7.12±1.18	6.66±0.50	(A)	7.51±0.69	6.75±1.06	6.57±1.02	7.01±1.73	5.18±0.44	7.85±0.91	6.66±1.72	8.07±1.19	7.53±1.24	6.42±1.57

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TABLE XXIII (cont.)
MONTHLY TLD RESULTS

Results in units of mRads/std. month

Station Code	Eqv.Mo.Avg	83 1/15-2/20	83 2/20-3/12	83 3/12-4/09	83 4/09-5/15	83 5/15-6/12	83 6/12-7/09	83 7/09-8/06	83 8/06-9/10	83 9/10-10/01	83 10/01-11/05	83 11/05-12/03	84 12/03/01/07
22	7.23±0.86	6.56±0.38	6.93±1.05	7.33±0.73	7.34±0.37	6.96±1.10	7.56±0.90	8.03±4.48	7.47±0.11	7.64±1.00	7.98±2.43	6.70±0.78	7.06±1.45
23	7.37±1.30	6.94±0.90	7.06±0.06	8.13±0.70	6.50±0.60	6.96±1.12	8.25±1.02	5.46±0.56	8.30±0.73	6.65±0.70	7.64±0.45	7.58±1.03	6.99±1.14
24	5.61±0.60	5.46±0.45	5.74±0.39	6.07±0.49	5.61±0.68	5.27±0.79	5.91±1.40	3.04±1.20	6.11±0.44	5.59±0.21	5.27±0.31	5.54±0.44	5.31±1.43
26	7.65±1.05	7.90±0.60	7.85±1.14	8.21±1.69	7.39±0.63	7.51±0.73	7.69±2.36	6.09±0.69	8.40±0.31	6.65±0.27	7.88±0.72	7.56±0.65	6.84±0.18
27	7.68±1.04	7.43±0.78	7.18±0.20	8.00±0.89	7.49±0.37	7.92±1.11	8.35±1.34	6.65±1.06	8.33±0.76	7.79±1.05	8.08±0.82	6.98±1.54	6.86±0.87
31	7.12±1.26	6.61±0.71	7.60±2.30	8.26±0.27	7.37±0.64	7.57±0.81	6.95±1.23	5.70±2.06	7.51±0.61	6.27±0.61	7.26±1.02	6.79±1.81	6.18±0.84
32	7.83±0.72	7.52±0.62	8.10±1.20	8.21±0.67	7.52±0.56	7.69±1.32	7.98±1.72	5.81±0.36	7.37±0.79	8.41±4.70	8.00±0.51	8.32±1.01	7.56±0.89
33A	5.71±2.08	5.51±0.48	5.43±0.37	8.59±0.57	5.37±0.56	6.29±1.35	5.15±0.53	3.05±0.32	5.40±0.56	4.91±0.88	5.96±0.75	5.45±1.74	4.84±0.45
38	7.57±0.94	7.48±0.65	7.18±1.27	7.81±1.24	7.28±0.42	7.67±0.38	7.97±1.06	5.80±0.73	8.14±0.75	6.83±0.58	7.61±1.34	8.20±1.23	6.90±1.04
40	8.21±1.21	8.18±0.29	8.39±1.10	7.59±1.02	8.24±0.38	9.03±3.61	8.04±0.79	7.02±1.05	8.42±0.49	8.54±0.38	8.90±2.07	6.84±0.46	8.04±0.88
42	8.69±1.14	8.87±0.30	8.26±0.53	9.13±1.67	8.85±0.38	9.62±1.02	8.53±1.19	6.92±2.03	9.30±1.14	7.64±0.83	8.49±0.96	8.19±2.16	8.26±0.97
43	8.38±1.49	8.27±0.30	7.65±0.26	8.62±0.61	8.14±0.63	8.76±0.62	7.71±0.53	14.25±1.83	9.64±0.92	8.02±2.05	9.48±1.06	7.33±0.67	7.83±0.63
44	6.83±1.19	6.67±0.80	6.64±0.36	7.49±0.38	6.07±0.65	7.50±1.00	6.19±0.63	10.31±1.12	6.64±1.05	6.95±0.43	7.92±1.49	6.21±1.92	6.84±0.48
45	7.81±1.67	7.51±0.53	8.33±1.92	8.67±0.44	7.61±0.33	7.66±0.94	7.87±1.53	12.29±2.71	8.46±1.13	7.57±2.22	9.46±0.67	7.15±1.13	6.33±0.58
46	6.92±1.63	6.96±1.55	6.49±0.70	7.51±0.87	6.50±0.45	6.72±0.63	7.83±3.15	11.22±1.76	8.17±0.06	6.21±0.94	7.70±1.05	6.11±0.63	5.60±0.76
47	8.79±1.16	8.30±1.23	7.83±0.88	9.08±1.28	8.59±1.05	8.46±1.38	8.74±1.50	19.95±9.64	9.84±0.14	8.17±1.40	9.48±1.71	8.63±1.02	8.84±0.96
48	7.39±1.19	7.08±0.52	7.96±1.38	8.49±0.66	6.55±1.00	7.51±0.36	7.98±0.11	13.37±1.86	7.76±1.20	6.99±0.09	7.62±1.79	6.90±1.81	6.85±1.31
49	7.71±1.49	7.07±0.99	7.10±1.48	8.53±0.71	7.53±1.72	8.23±0.52	7.40±2.67	11.79±2.13	7.69±0.88	6.81±0.47	9.31±1.58	7.28±0.55	7.35±1.56
50	5.56±1.70	7.64±1.06	8.14±0.51	9.67±0.79	7.39±0.53	9.01±1.84	9.26±0.92	15.10±1.96	9.79±0.59	7.73±0.25	9.14±2.15	8.34±0.99	8.03±0.57
51	7.55±0.85	7.38±0.60	6.96±2.86	8.33±0.82	7.48±1.11	7.90±0.25	8.01±0.29	13.15±4.01	7.64±0.84	6.98±1.67	7.56±1.29	7.39±1.04	7.20±1.04
1NN	8.18±1.14	8.17±0.70	7.79±0.88	8.59±0.57	7.54±0.74	7.81±0.53	8.36±1.61	6.03±1.12	8.82±2.09	8.70±1.75	8.55±2.37	7.00±0.56	8.55±1.08

Station Code	Eqv.Mo.Avg	83 1/14-2/25	83 2/09-3/09	83 3/09-4/12	83 4/07-5/17	83 5/11-6/12	83 6/06-7/11	83 7/05-8/09	83 8/02-9/15	83 9/08-09/28	83 09/28-11/02	83 11/02-12/05	84 12/05/01/09
12B	5.96±1.50	4.74±0.87	5.95±1.07	6.90±0.54	6.07±0.24	5.98±0.38	7.33±0.95	5.20±0.31	5.38±0.47	5.64±0.48	5.35±1.11	6.71±1.21	5.78±1.41

(A) TLD's vandalized
July results were excluded from the equivalent monthly average because of questionable results.

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TABLE XXIV

QUARTERLY TLD RESULTS

Results in units of mRads std. month

STATION CODE	EQV.MO.AVG.	83 01/15-04/09	83 04/09-07/09	83 07/09-10/01	84 10/01-01/07
1A	7.36 ± 1.03	8.04 ± 0.38	7.46 ± 1.00	6.91 ± 0.74	7.01 ± 0.76
1B	5.93 ± 0.52	5.68 ± 0.21	5.88 ± 0.37	6.30 ± 0.53	5.84 ± 0.51
1C	7.08 ± 0.59	7.04 ± 1.49	6.72 ± 0.48	7.14 ± 1.18	7.43 ± 0.94
1D	6.61 ± 0.79	6.38 ± 0.37	6.37 ± 0.59	7.19 ± 1.36	6.48 ± 0.30
1E	6.76 ± 0.57	6.77 ± 0.29	6.93 ± 1.13	6.97 ± 0.93	6.35 ± 1.14
1F	7.97 ± 2.14	8.29 ± 0.60	6.69 ± 0.80	9.24 ± 1.03	7.67 ± 1.28
1G	5.19 ± 0.51	5.27 ± 0 74	4.93 ± 0.35	5.50 ± 0.31	5.04 ± 0.40
1H	6.72 ± 0.72	6.81 ± 0.42	6.25 ± 0.43	7.12 ± 0.84	6.68 ± 0.34
1I	5.49 ± 0.89	5.64 ± 0.51	5.27 ± 0.32	6.04 ± 0.25	5.02 ± 0.55
1J	8.04 ± 0.90	8.09 ± 0.87	7.48 ± 0.56	8.58 ± 0.51	8.02 ± 0.79
1L	6.39 ± 6.91	11.49 ± 0.97	4.71 ± 0.55	3.93 ± 0.23	5.42 ± 0.17
1M	3.82 ± 0.38	3.99 ±0.80	3.89 ± 0.47	(A)	3.62 ± 0.35
2	6.63 ± 1.20	6.76 ± 0.67	5.74 ± 0.39	7.03 ± 0.24	6.97 ± 0.97
3A	5.26 ± 0.61	5.59 ± 0.42	5.26 ± 0.25	5.34 ± 0.66	4.86 ± 0.59
4K	4.67 ± 0.42	4.87 ± 0.21	4.38 ± 1.11	4.65 ± 1.25	4.76 ± 0.65
5	6.77 ± 0.67	6.66 ± 0.62	6.42 ± 0.76	7.22 ± 0.28	6.78 ± 0.66
6B	5.57 ± 1.39	6.02 ± 0.79	4.68 ± 0.37	6.21 ± 0.59	5.38 ± 0.05
14	6.75 ± 0.47	6.87 ± 0.31	6.66 ± 0.81	7.00 ± 0.63	6.46 ± 1.00
15	6.80 ± 0.26	6.86 ± 0.21	6.67 ± 0.80	6.96 ± 0.90	6.72 ± 0.95
16	7.39 ± 0.52	7.25 ± 1.21	(A)	7.23 ± 0.30	7.69 ± 1.43
17	7.65 ± 0.46	7.97 ± 0.93	7.48 ± 0.76	7.66 ± 0.77	7.49 ± 1.10
18	7.17 ± 0.96	7.66 ± 0.92	6.51 ± 2.07	7.21 ± 0.42	7.29 ± 0.44
19	6.89 ± 0.61	6.88 ± 0.62	6.58 ± 0.76	7.31 ± 0.56	6.80 ± 0.93
20	7.94 ± 1.65	8.07 ± 0.44	6.76 ± 0.95	8.67 ± 0.80	8.25 ± 0.79
21B	6.86 ± 1.60	6.83 ± 0.98	7.08 ± 1.19	7.73 ± 0.38	5.80 ± 0.24
22	6.75 ± 0.46	6.70 ± 0.52	6.54 ± 0.29	7.08 ± 1.49	6.69 ± 0.92
23	7.71 ± 2.88	7.09 ± 0.79	6.56 ± 0.46	9.81 ± 3.60	7.37 ± 0.64
24	5.39 ± 0.73	5.69 ± 0.44	4.87 ± 0.07	5.60 ± 0.84	5.41 ± 0.54
26	7.65 ± 0.26	7.50 ± 1.26	7.67 ± 0.74	7.81 ± 2.25	7.63 ± 1.02
27	7.68 ± 1.21	8.01 ± 0.57	7.17 ± 0.67	8.36 ± 0.66	7.16 ± 0.49
31	6.95 ± 0.45	6.97 ± 0.56	6.66 ± 0.67	7.21 ± 0.82	6.94 ± 0.93
32	7.27 ± 0.94	7.41 ± 1.04	6.62 ± 1.13	7.30 ± 1.56	7.74 ± 0.79
33A	5.43 ± 1.14	5.41 ± 1.02	4.69 ± 0.47	6.07 ± 0.50	5.53 ± 0.40
38	7.34 ± 0.71	7.63 ± 0.59	7.65 ± 0.71	7.00 ± 1.09	7.06 ± 0.45
40	8.24 ± 0.88	8.36 ± 0.51	7.62 ± 0.66	8.66 ± 0.86	8.32 ± 0.56
42	8.32 ± 1.03	8.30 ± 0.89	7.62 ± 0.84	8.82 ± 0.49	8.54 ± 1.21
43	7.57 ± 1.48	7.52 ± 0.92	6.59 ± 0.85	8.37 ± 0.41	7.79 ± 0.88
44	6.69 ± 1.34	6.34 ± 0.26	6.03 ± 0.64	6.82 ± 0.28	7.57 ± 4.17
45	7.44 ± 0.85	7.85 ± 0.66	6.84 ± 0.81	7.50 ± 1.01	7.55 ± 0.83
46	6.69 ± 2.36	6.90 ± 0.25	5.40 ± 0.39	8.20 ± 0.70	6.25 ± 0.92
47	7.74 ± 1.23	8.25 ± 1.09	7.83 ± 1.06	6.86 ± 0.69	8.03 ± 0.83
48	7.07 ± 0.98	7.08 ± 0.78	6.46 ± 0.89	7.66 ± 0.66	7.08 ± 0.51
49	7.40 ± 1.14	7.38 ± 0.62	6.69 ± 0.49	7.43 ± 0.94	8.09 ± 0.67
50	8.21 ± 0.56	8.15 ± 0.91	7.85 ± 0.47	8.50 ± 0.72	8.35 ± 0.66
51	7.30 ± 1.03	7.26 ± 0.44	6.59 ± 0.37	7.66 ± 0.51	7.70 ± 0.60
1NN	7.76 ± 1.26	8.08 ± 0.23	7.38 ± 0.93	8.48 ± 0.70	7.11 ± 1.26

STATION CODE	EQV.MO.AVG.	83 01/14-04/14	83 04/07-0712	83 07/12-10/01	83 09/29-01/09
12B	5.60 ± 1.25	5.86 ± 0.83	6.24 ± 0.76	5.38 ± 0.31	4.92 ± 0.16

(A) TLD STOLEN

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TABLE XXV

MEAN MONTHLY AND QUARTERLY TLD RESULTS
FOR THE SITE BOUNDARY, MIDDLE, AND OUTER RINGS

Results in units of mRad/std month ± 2 sigma deviation of the data

SAMPLE TYPE	EXPOSURE PERIOD	BOUNDARY	MIDDLE RING	OUTER RING
MONTHLY	JAN/83	6.77 ± 3.22	6.86 ± 2.19	6.45 ± 2.21
	FEB/83	7.90 ± 5.21	7.22 ± 1.73	7.30 ± 2.50
	MAR/83	7.92 ± 4.14	7.79 ± 2.34	7.43 ± 2.32
	APR/83	6.78 ± 2.67	6.96 ± 2.09	6.88 ± 1.95
	MAY/83	6.65 ± 3.21	7.34 ± 2.41	6.53 ± 1.92
	JUN/83	7.99 ± 2.92	7.49 ± 2.15	7.17 ± 1.57
	JUL/83	4.71 ± 3.28	8.18 ± 9.18	4.82 ± 2.22
	AUG/83	7.43 ± 3.50	7.74 ± 2.75	7.22 ± 2.11
	SEP/83	6.81 ± 3.54	6.81 ± 2.16	6.69 ± 1.80
	OCT/83	6.95 ± 3.57	7.69 ± 2.66	7.24 ± 2.73
	NOV/83	6.75 ± 2.99	7.06 ± 2.04	7.27 ± 1.83
	DEC/83	6.39 ± 2.91	6.72 ± 2.29	6.72 ± 1.62
QUARTERLY	JAN/83-APR/83	7.15 ± 3.65	7.06 ± 1.79	6.89 ± 1.75
	APR/83-JUL/83	6.20 ± 2.28	6.52 ± 1.97	6.34 ± 1.54
	JUL/83-OCT/83	7.18 ± 2.97	7.34 ± 2.16	7.02 ± 2.32
	OCT/83-JAN/84	6.53 ± 2.62	7.02 ± 2.04	6.87 ± 2.20

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

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

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

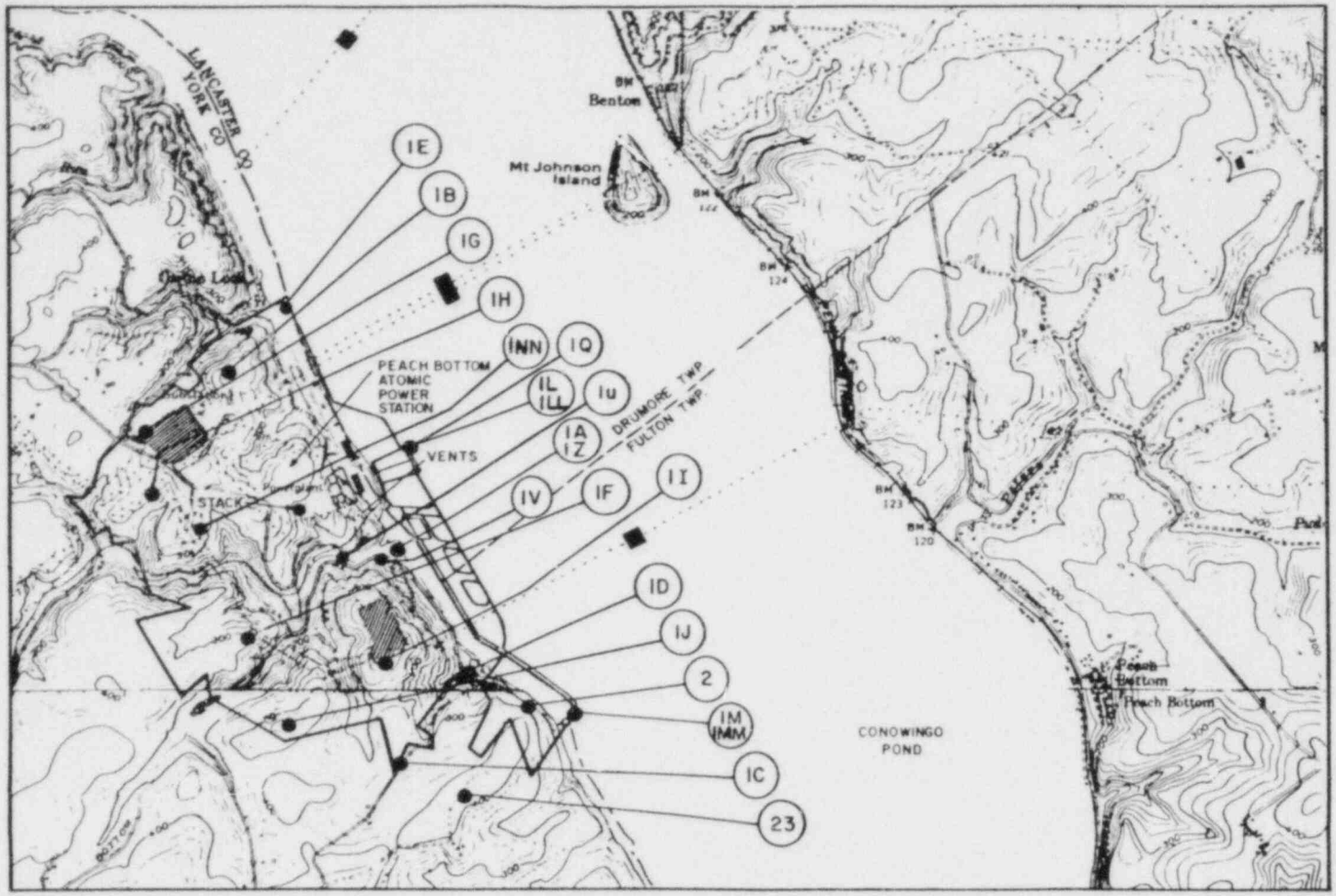
TABLE XXVI

TYPICAL * MINIMUM DETECTABLE LEVELS OF NUCLIDES SEARCHED FOR BUT NOT FOUND
IN THE VICINITY OF PEACH BOTTOM NUCLEAR POWER STATION, 1983

NUCLIDE	SURFACE WATER (pCi/ℓ)	DISCHARGE WATER (pCi/ℓ)	RAIN WATER (pCi/ℓ)	AIR PARTICULATES (10-3 pCi/m3)	MILK (pCi/ℓ)	SOIL (pCi/g-dry)
Be-7	10.7	5.7	13	-	12	0.6
Na-22	**	**	**	**	**	**
K-40	17.2	15.1	12	18	-	-
Cr-51	10.3	8.5	31	31	59	0.7
Mn-54	1.1	0.8	1.7	1.2	1.7	0.04
Co-57	0.5	0.6	**	1.2	1.5	0.03
Co-58	0.9	0.6	2.0	2.8	5.0	0.05
Fe-59	2.0	1.5	8.2	11	28	0.1
Co-60	0.4	0.8	3.8	1.6	1.9	0.05
Zn-65	0.8	1.1	5.9	3.0	5.3	0.1
Zr-95	2.0	1.6	**	5.0	7.6	0.09
Nb-95	2.1	1.3	**	7	14	0.08
ZrNb-95	**	**	**	**	**	**
Mo-99	**	**	**	**	**	**
Ru-103	1.9	1.3	**	7.4	11	0.07
Ru-106	4.2	5.3	12	11	12	0.4
Ag-110M	0.4	0.6	0.8	1.3	1.8	0.1
Sb-125	1.5	1.3	**	3.2	3.4	0.1
Te-129M	27	30	20	129	180	2.3
I-131	12	84	16	82	8.3	1.1
Te-132	**	**	**	**	**	**
I-133	**	18	**	**	**	**
Cs-134	0.3	0.6	2.1	1.0	1.3	0.04
Cs-136	5.1	5.6	5.3	4.9	4.6	0.2
Cs-137	0.6	0.7	1.7	1.1	0.6	-
Ba-140	121	41	**	12	**	1.2
La-140	109	10	**	8.1	**	0.3
BaLa-140	**	**	**	**	**	**
Ce-141	4.9	2.2	**	4.9	37	0.1
Ce-144	7.7	4.0	5.3	5.1	15	0.3
Ra-226	1.9	1.4	2.8	2.9	2.5	-
Th-232/228	1.4	2.1	4.1	3.5	4.0	-
Np-239	**	**	**	**	**	**

* Typical refers to mean plus two standard deviations.
** Minimum detectable levels of these nuclides were not calculated for these media.
- Indicates a positive concentration was measured in all samples analyzed.

VI. FIGURES

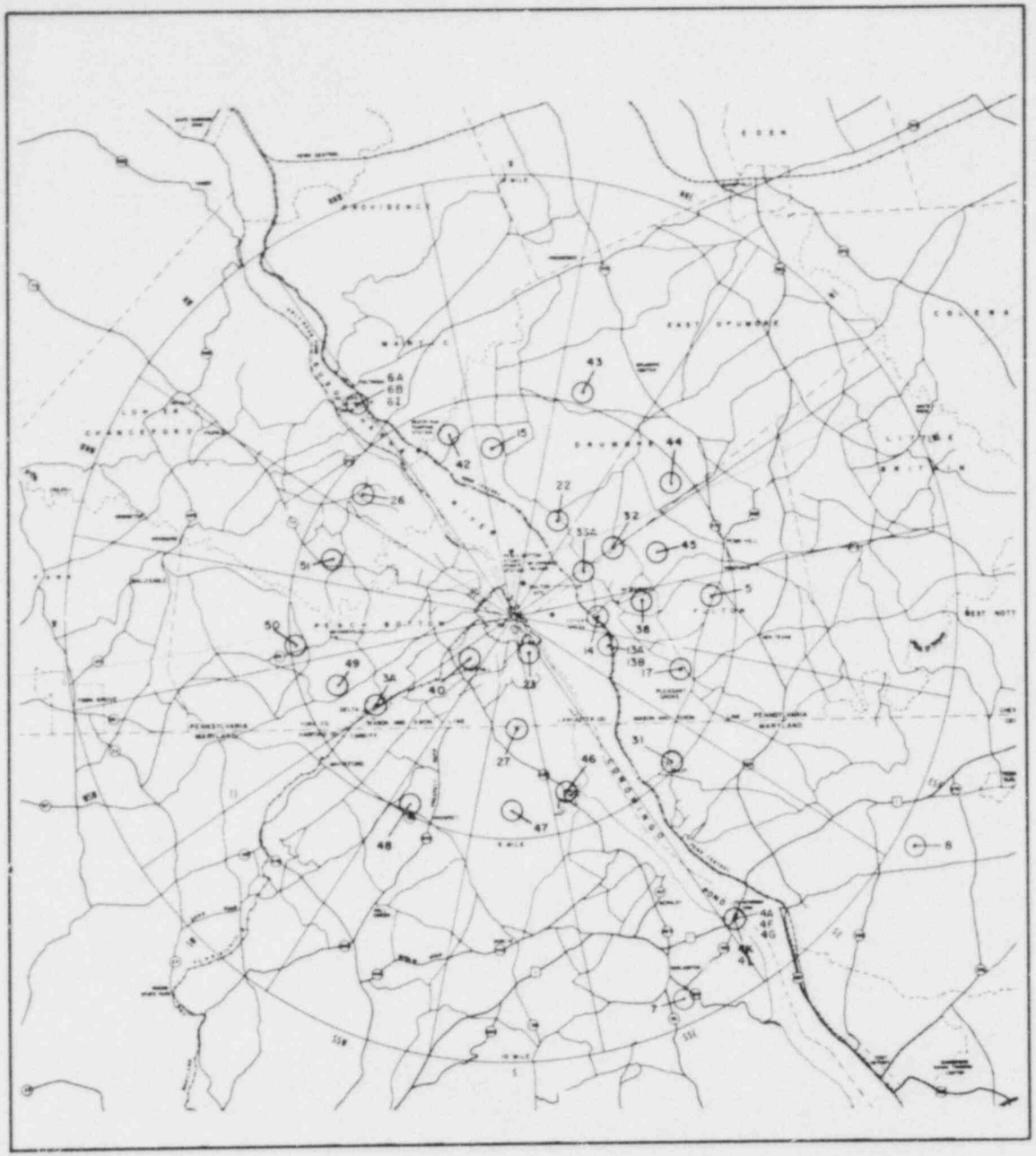


ENVIRONMENTAL SAMPLING STATIONS ON OR NEAR PEACH BOTTOM SITE
FIGURE 1

LEGEND

● ENVIRONMENTAL SAMPLING STATIONS

1A PEACH BOTTOM WEATHER STATION #1
1B PEACH BOTTOM WEATHER STATION #2
1C PEACH BOTTOM SOUTH SUBSTATION RD.
1D PEACH BOTTOM 140^0 SECTOR SITE BOUNDARY
1E PEACH BOTTOM 350^0 SECTOR SITE BOUNDARY
1F PEACH BOTTOM SITE - 200^0 SECTOR HILL
1G PEACH BOTTOM NORTH SUBSTATION
1H PEACH BOTTOM SITE - 270^0 SECTOR HILL
1I PEACH BOTTOM SOUTH SUBSTATION
1J PEACH BOTTOM SITE - 180^0 SECTOR HILL
1L PEACH BOTTOM UNITS 2 & 3 INTAKE
1LL PEACH BOTTOM UNITS 2 & 3 INTAKE-COMPOSITE
1M PEACH BOTTOM CANAL DISCHARGE
1MM PEACH BOTTOM CANAL DISCHARGE-COMPOSITE
1NN PEACH BOTTOM SITE - 260^0 SECTOR
1Q PEACH BOTTOM UNIT 2 INTAKE
1U PEACH BOTTOM SITE-UTILITY BUILDING
1V PEACH BOTTOM SITE-INFORMATION CENTER
1Z PEACH BOTTOM WEATHER STATION #1
2 PEACH BOTTOM 130^0 SECTOR HILL
23 PEACH BOTTOM 150^0 SECTOR HILL OFF SITE

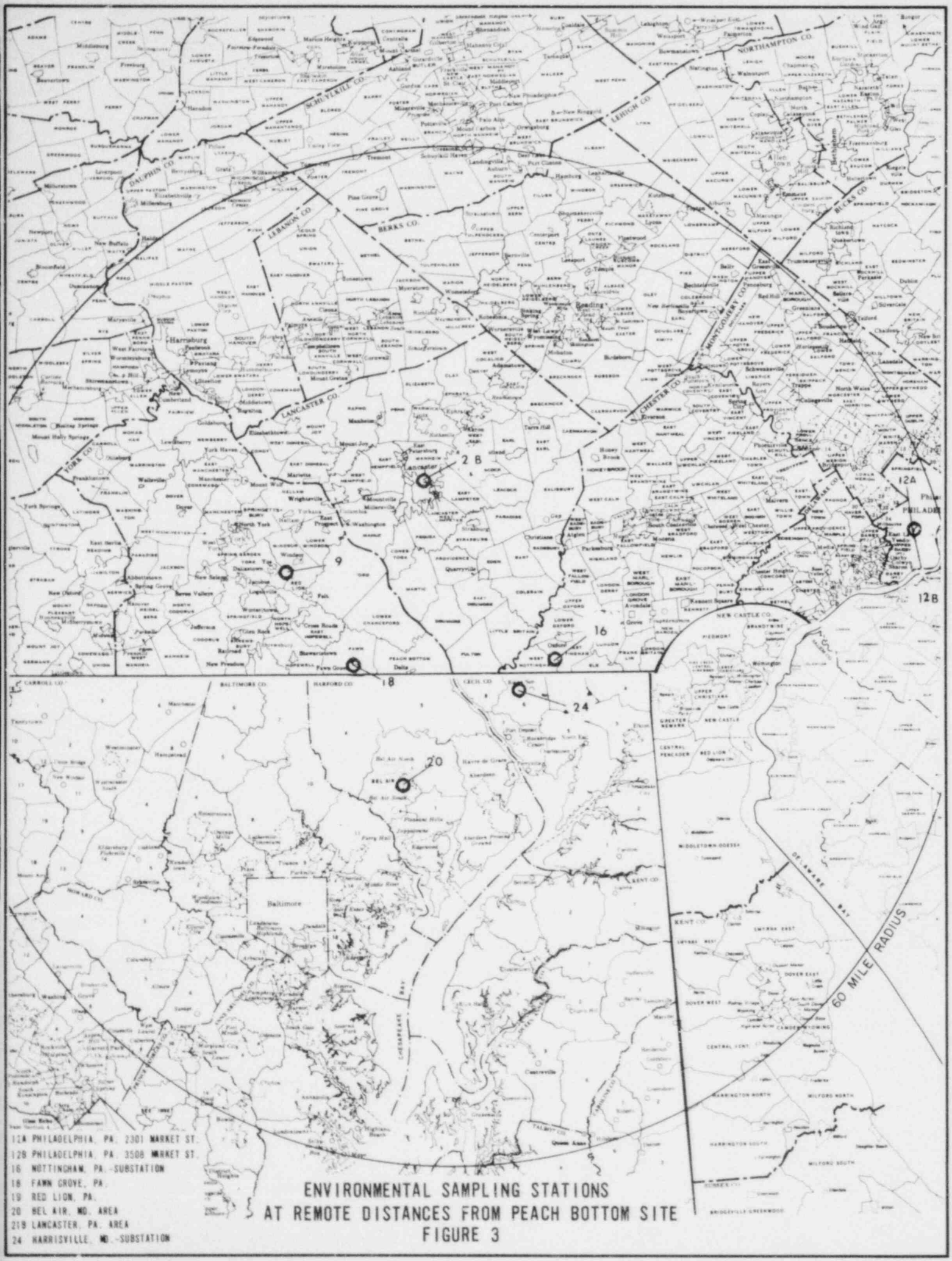


LEGEND

● ENVIRONMENTAL SAMPLING STATIONS

3A	DELTA, PA.-SUBSTATION
4A	CONOWINGO DAM-POWERHOUSE ROOF
4F	CONOWINGO DAM-EL. 33' MSL GRAB
4G	CONOWINGO DAM-SURFACE
4L	CONOWINGO DAM-EL. 33' MSL COMPOSITE
5	WAKEFIELD, PA.
6A	HOLTWOOD DAM-HYDROELECTRIC STATION-GRAB
6B	HOLTWOOD DAM-HYDROELECTRIC STATION
6I	HOLTWOOD DAM-HYDROELECTRIC STATION -COMPOSITE
7	DARLINGTON, MD. AREA
8	COLORA, MD.
13A	CHESTER WATER INTAKE-POND
13B	CHESTER WATER INTAKE-PUMP DISCHARGE
14	PETERS CREEK
15	SILVER SPRING ROAD
17	RIVERVIEW ROAD
22	EAGLE ROAD
23	PEACH BOTTOM-150^0 SECTOR OFF SITE
26	SLAB ROAD
27	NORTH COOPER ROAD
31	PILOTOWN ROAD
32	SLATE HILL ROAD
33A	FULTON WEATHER STATION
38	PEACH BOTTOM ROAD
40	PEACH BOTTOM SITE AREA
42	MUDDY RUN ECOLOGICAL LAB
43	DRUMORE TOWNSHIP SCHOOL
44	GOSHENMILL ROAD
45	PB-KEENEY LINE
46	BROADCREEK
47	BROADCREEK SCOUT CAMP
48	MACTON SUBSTATION
49	PB-CONASTONE LINE
50	TRANSCO PIPELINE SITE
51	FIN SUBSTATION

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



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

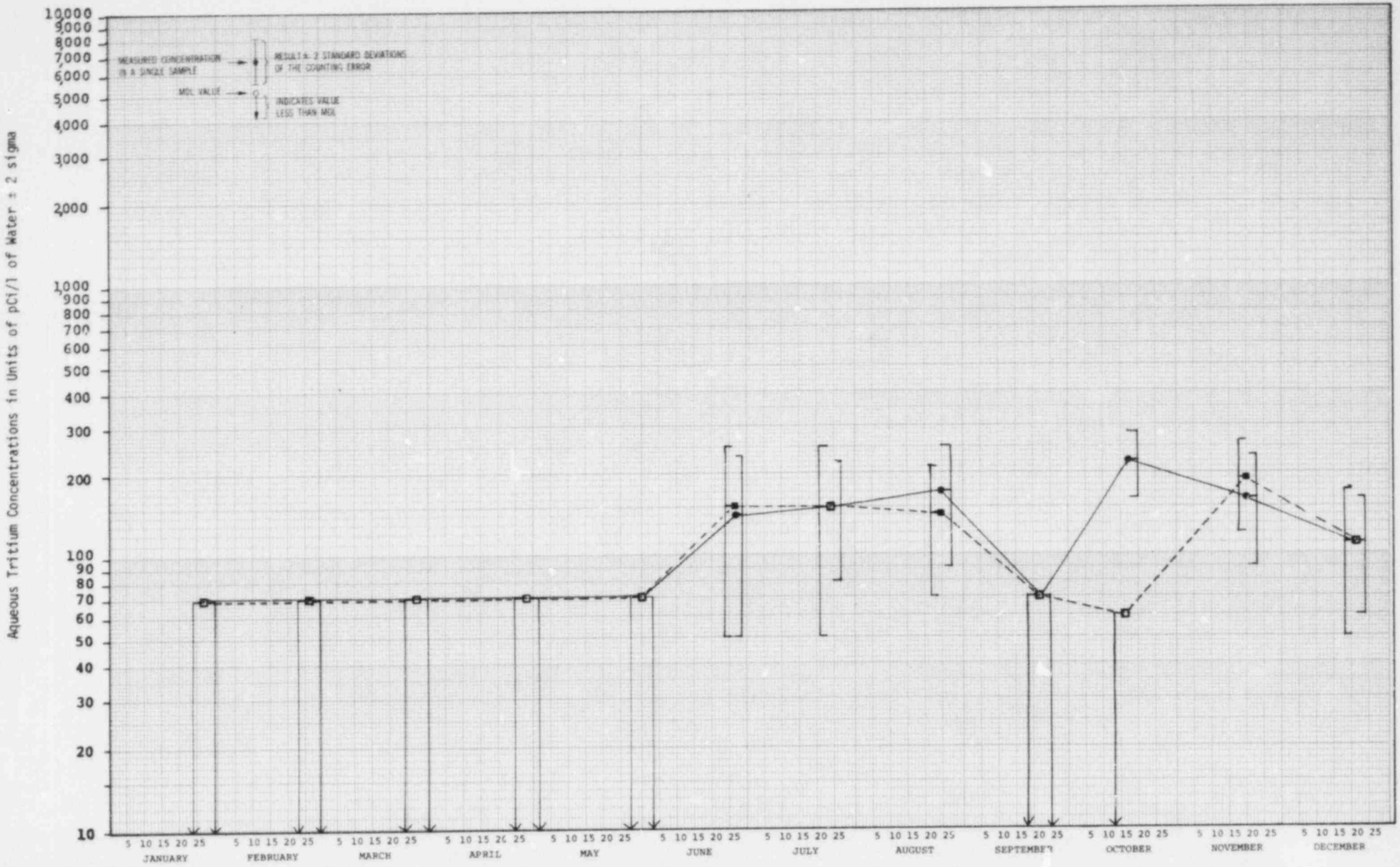
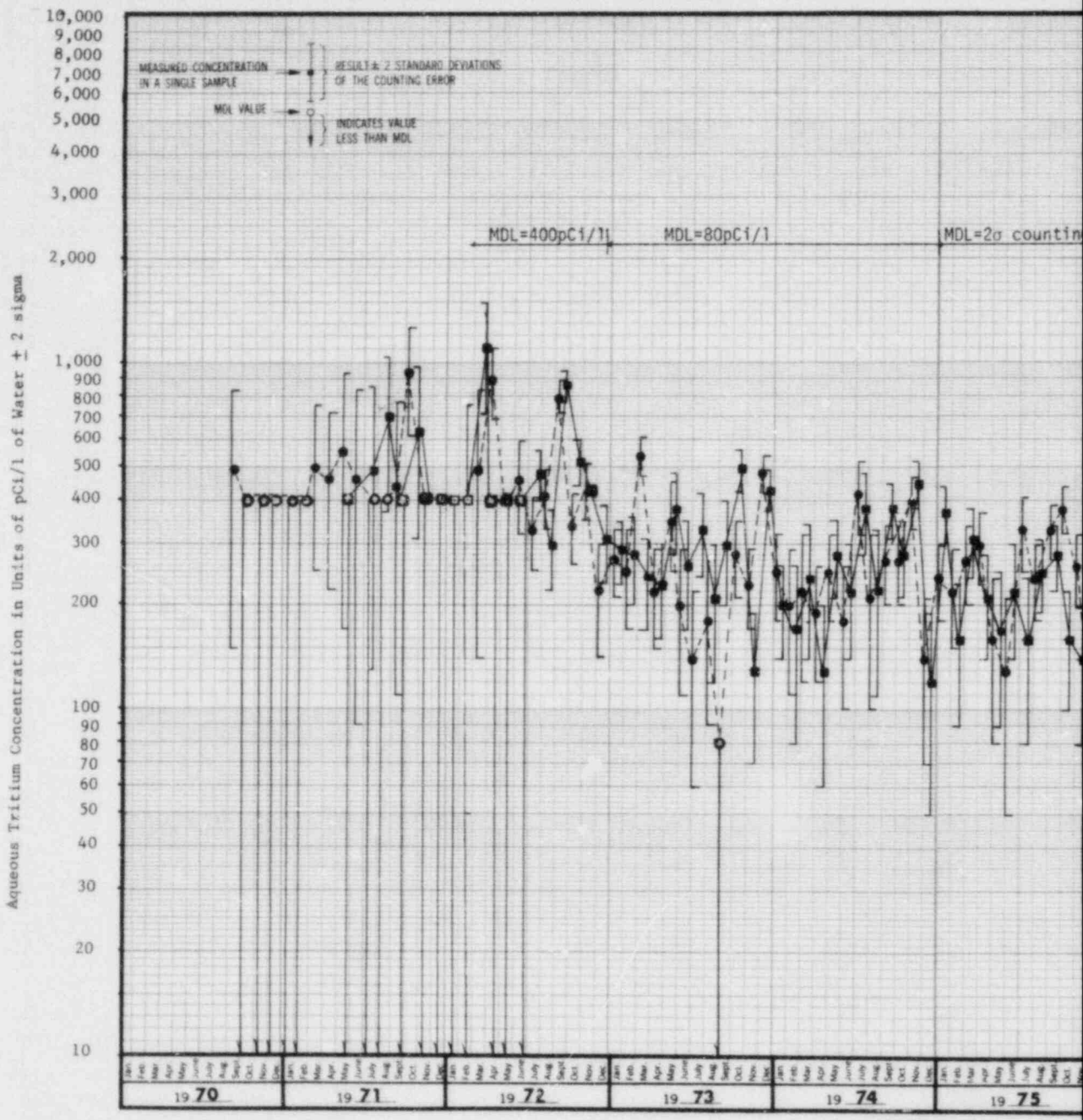


FIGURE 4

COMPARISON OF MONTHLY AQUEOUS TRITIUM CONCENTRATIONS IN SURFACE WATER
COLLECTED NEAR PEACH BOTTOM ATOMIC POWER STATION, 1983.
TOTAL SAMPLE - COMPOSITE

Station 6I (PB-SWA-33F4) Holtwood Dam
Station 4L (PB-SWA-14F5) Conowingo Dam

If More Than One Value The Same ◘



COMPARISON OF QUARTE
COLLECTED NEAR

Station 6A (P
Station 4F (P

If

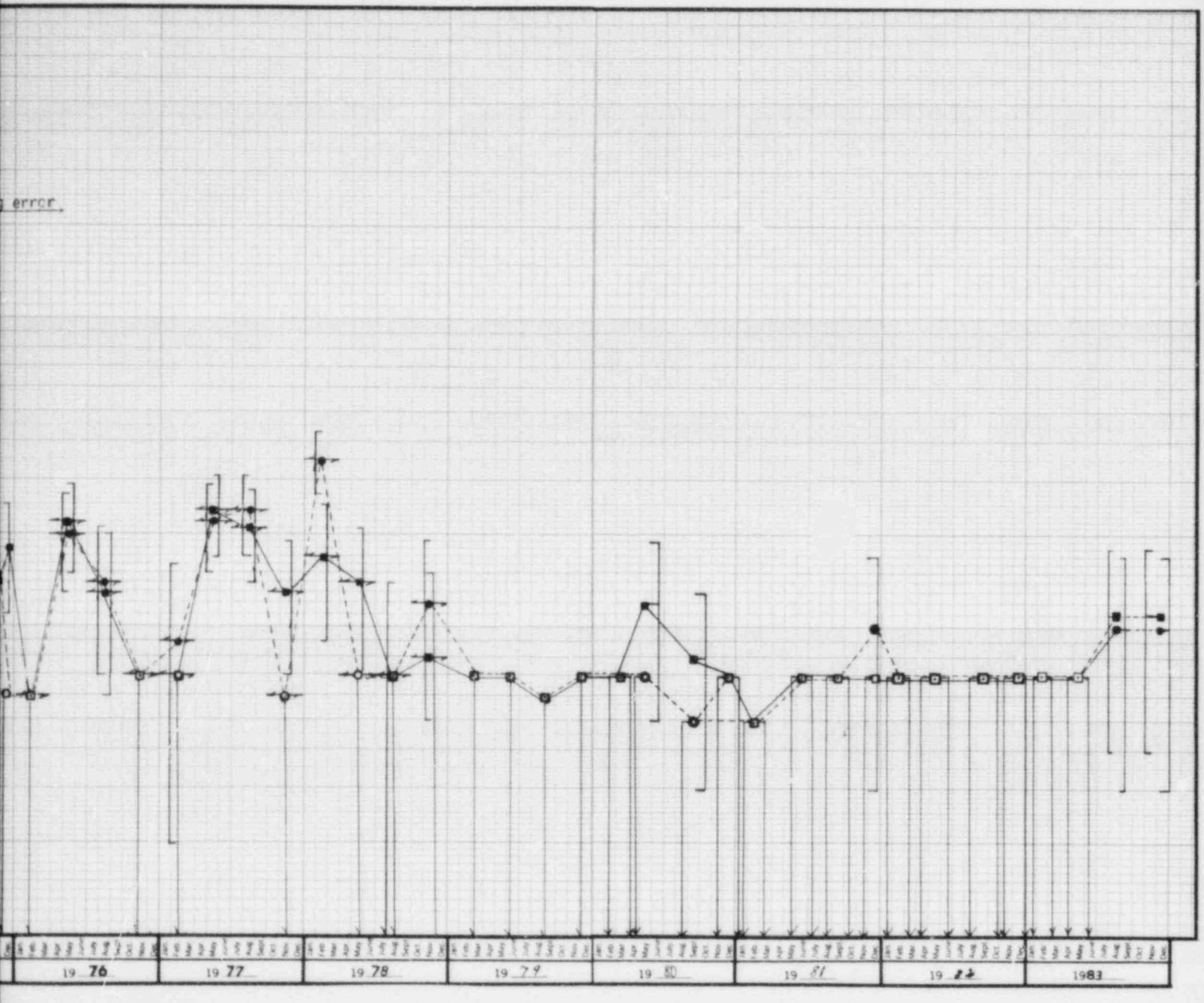


FIGURE 5

RLY AQUEOUS TRITIUM CONCENTRATIONS IN SURFACE WATER
PEACH BOTTOM ATOMIC POWER STATION, 1970-1983.
TOTAL SAMPLE - COMPOSITE

-SWA-33F1) Holtwood Dam
-SWA-14F2) Conowingo Dam - EL 33' MSL

ore Than One Value The Same ◘

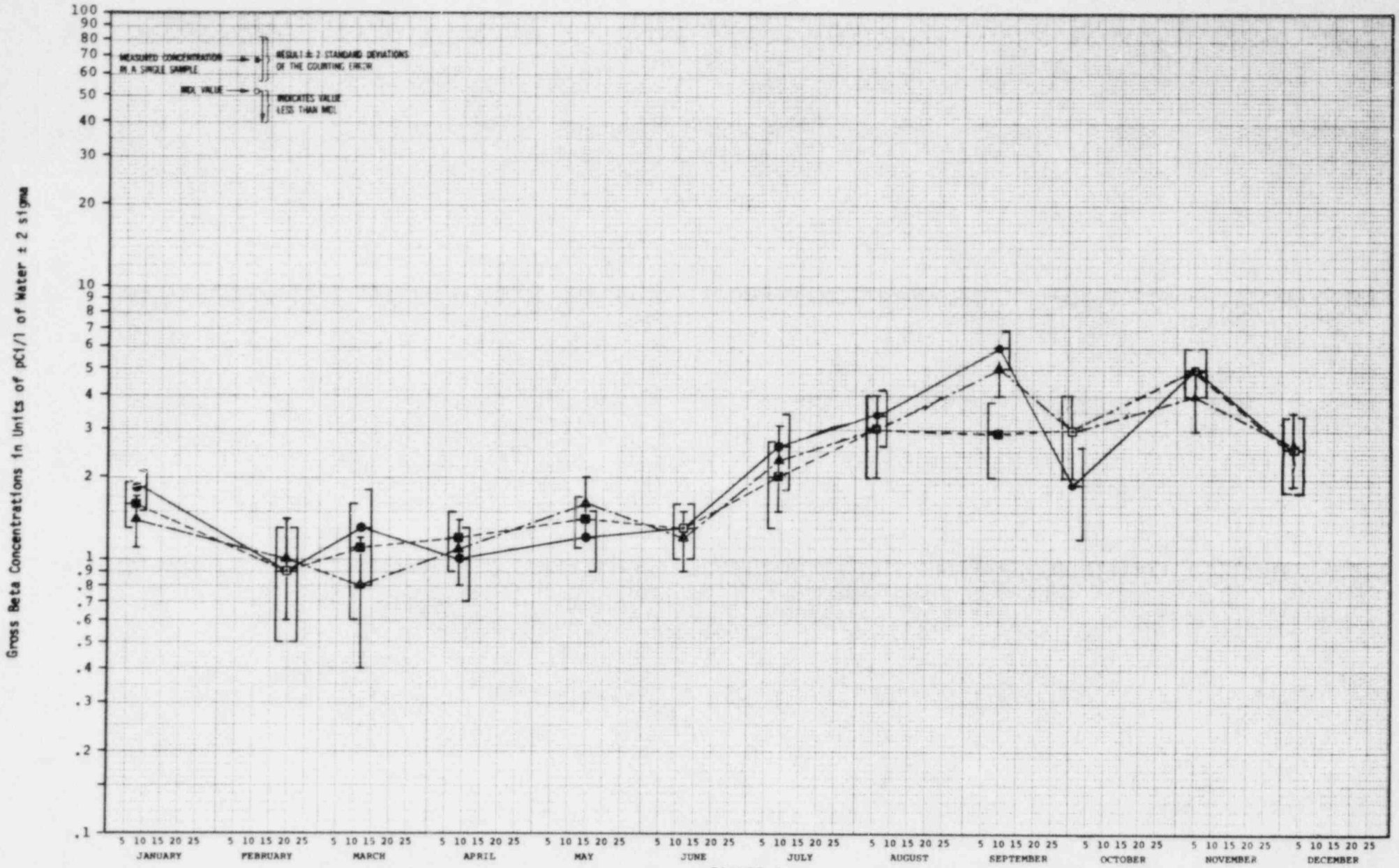


FIGURE 6

COMPARISON OF MONTHLY GROSS BETA CONCENTRATIONS IN SURFACE WATER
COLLECTED NEAR PEACH BOTTOM ATOMIC POWER STATION, 1983.
SOLUBLE FRACTION - GRAB

Station 4F (PB-SWA-14F2) Conowingo Dam - EL 33' MSL
Station 4G (PB-SWA-14F3) Conowingo Dam - Surface
Station 6A (PB-SWA-33F1) Holtwood Dam

If More Than One Value The Same

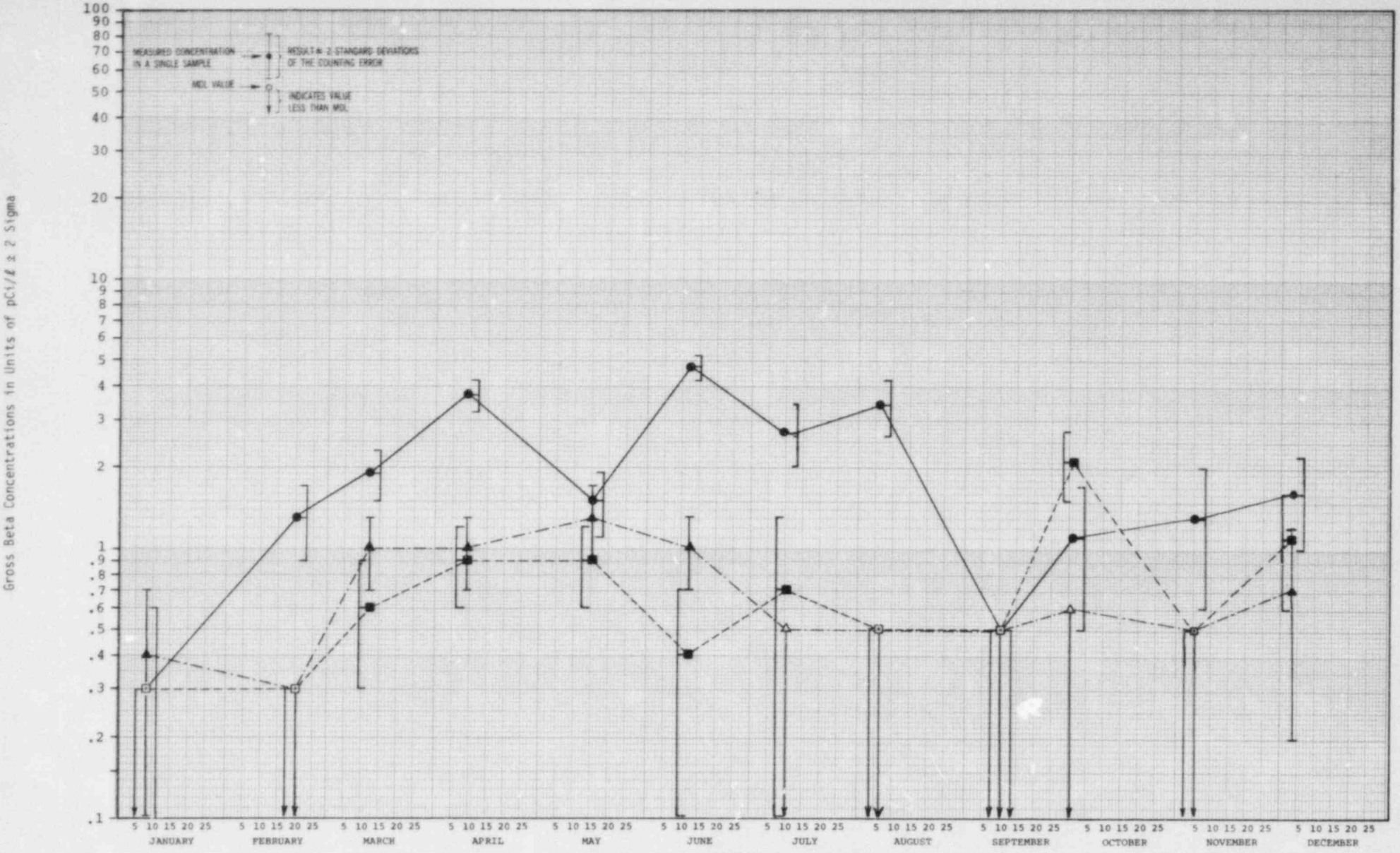


FIGURE 7

COMPARISON OF MONTHLY GROSS BETA CONCENTRATIONS IN SURFACE WATER
COLLECTED NEAR PEACH BOTTOM ATOMIC POWER STATION, 1983.
INSOLUBLE FRACTION - GRAB

Station 4F (PB-SWA-14F2) Conowingo Dam - EL 33' MSL
Station 4G (PB-SWA-14F3) Conowingo Dam - Surface
Station 6A (PB-SWA-33F1) Holtwood Dam

If More Than One Value The Same ◘

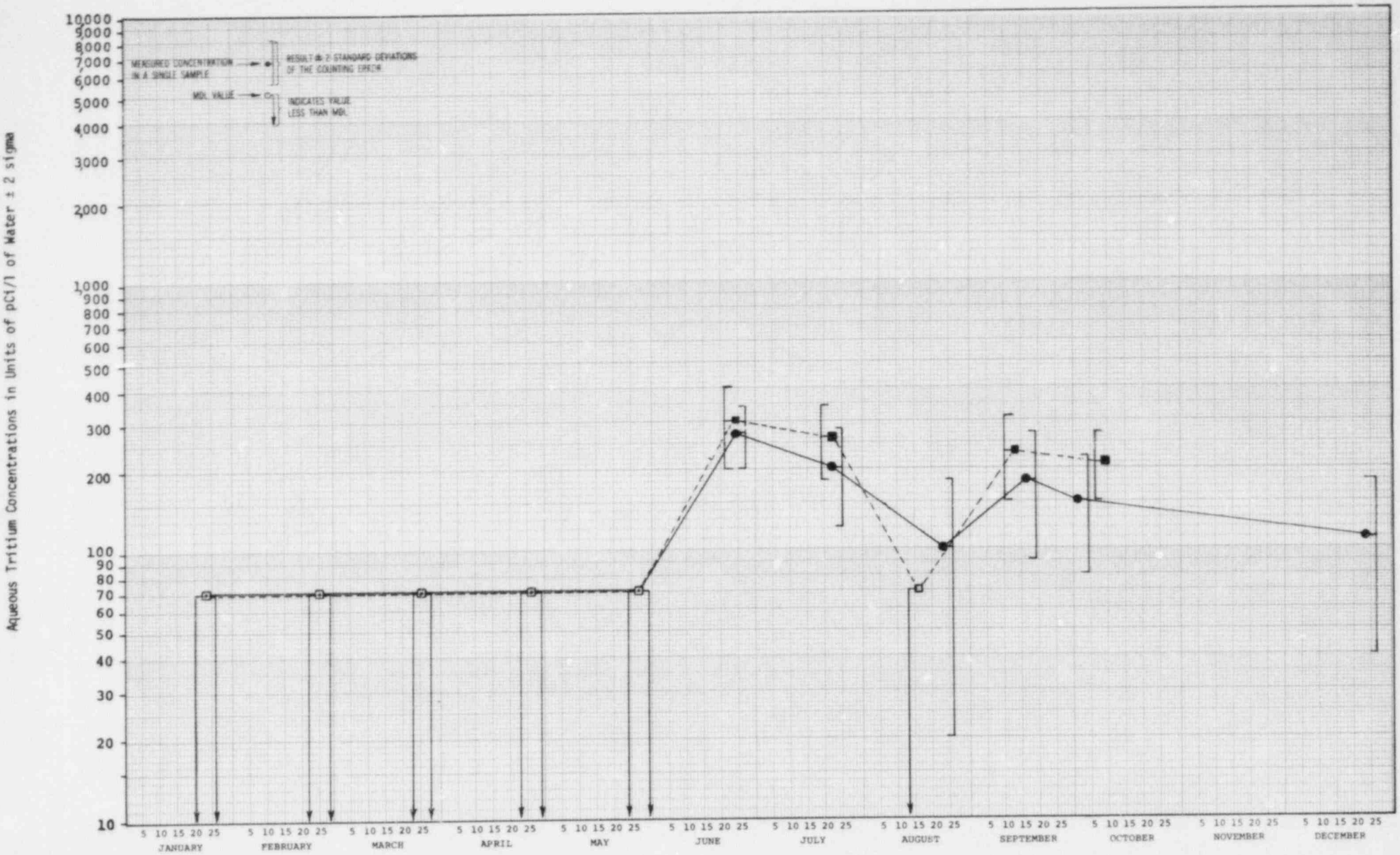


FIGURE 8

COMPARISON OF MONTHLY AQUEOUS TRITIUM CONCENTRATIONS IN SURFACE AND DISCHARGE WATER COLLECTED NEAR PEACH BOTTOM ATOMIC POWER STATION, 1983.
TOTAL SAMPLE - COMPOSITE

Station 1LL (PB-SWA-6S3) PB Intake
Station 1MM (PB-SWA-13S2) PB Discharge

If More Than One Value The Same

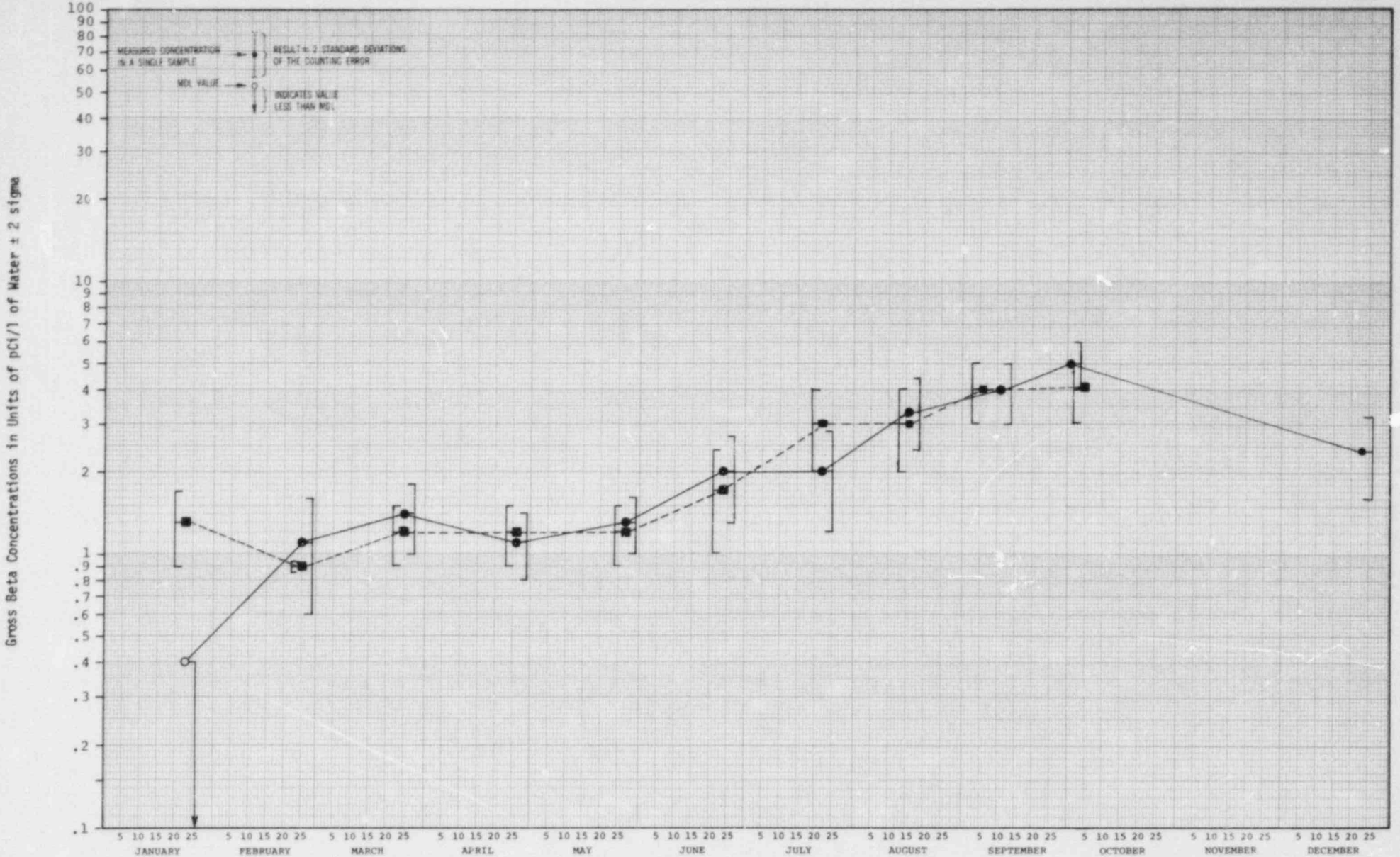


FIGURE 9

COMPARISON OF MONTHLY GROSS BETA CONCENTRATIONS IN SURFACE AND DISCHARGE WATER COLLECTED NEAR PEACH BOTTOM ATOMIC POWER STATION. 1983
SOLUBLE FRACTION - COMPOSITE

Station 1LL (PB-SWA-6S3) PB Intake
Station 1MM (PB-SWA-13S2) PB Discharge

If More Than One Value The Same

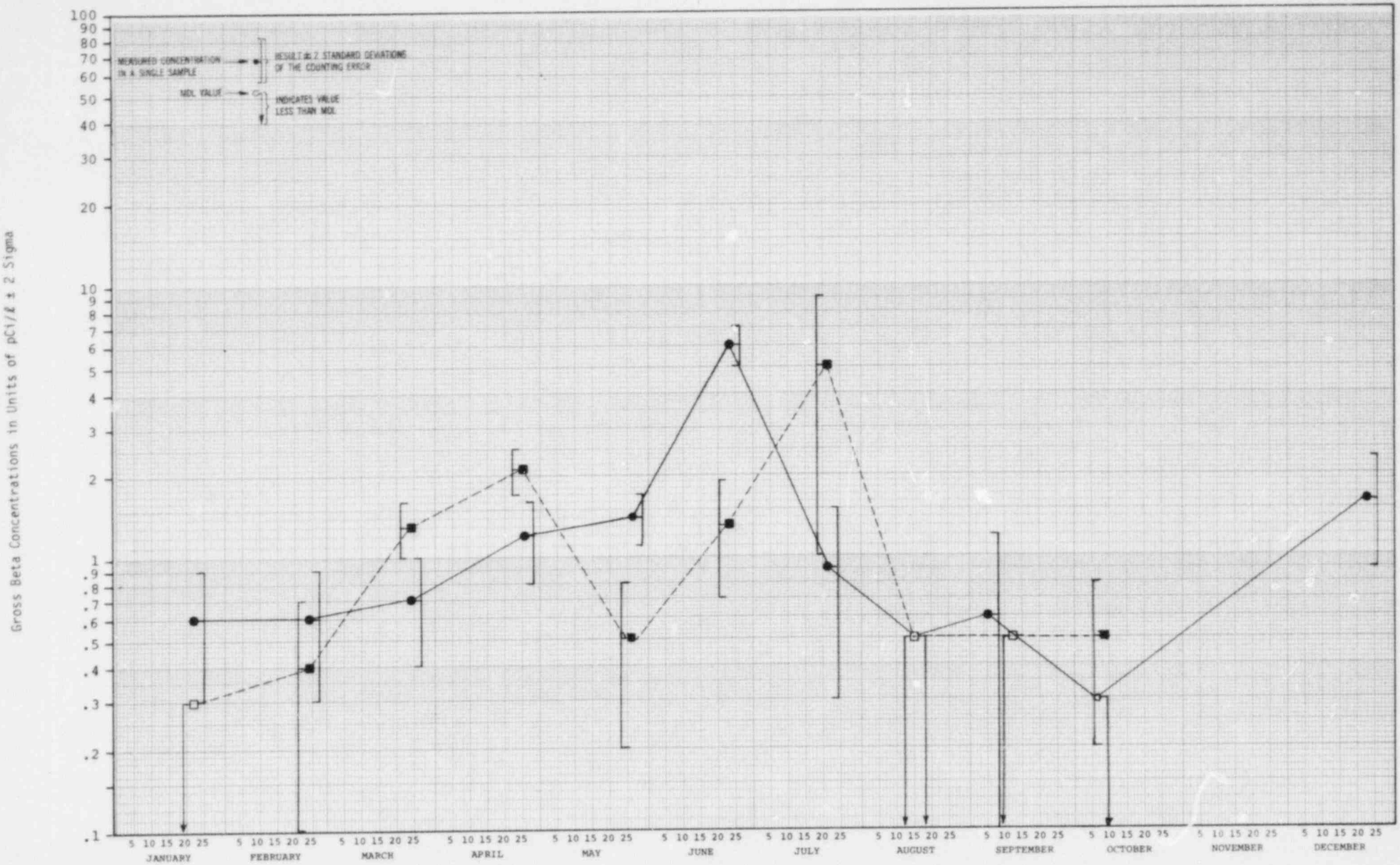
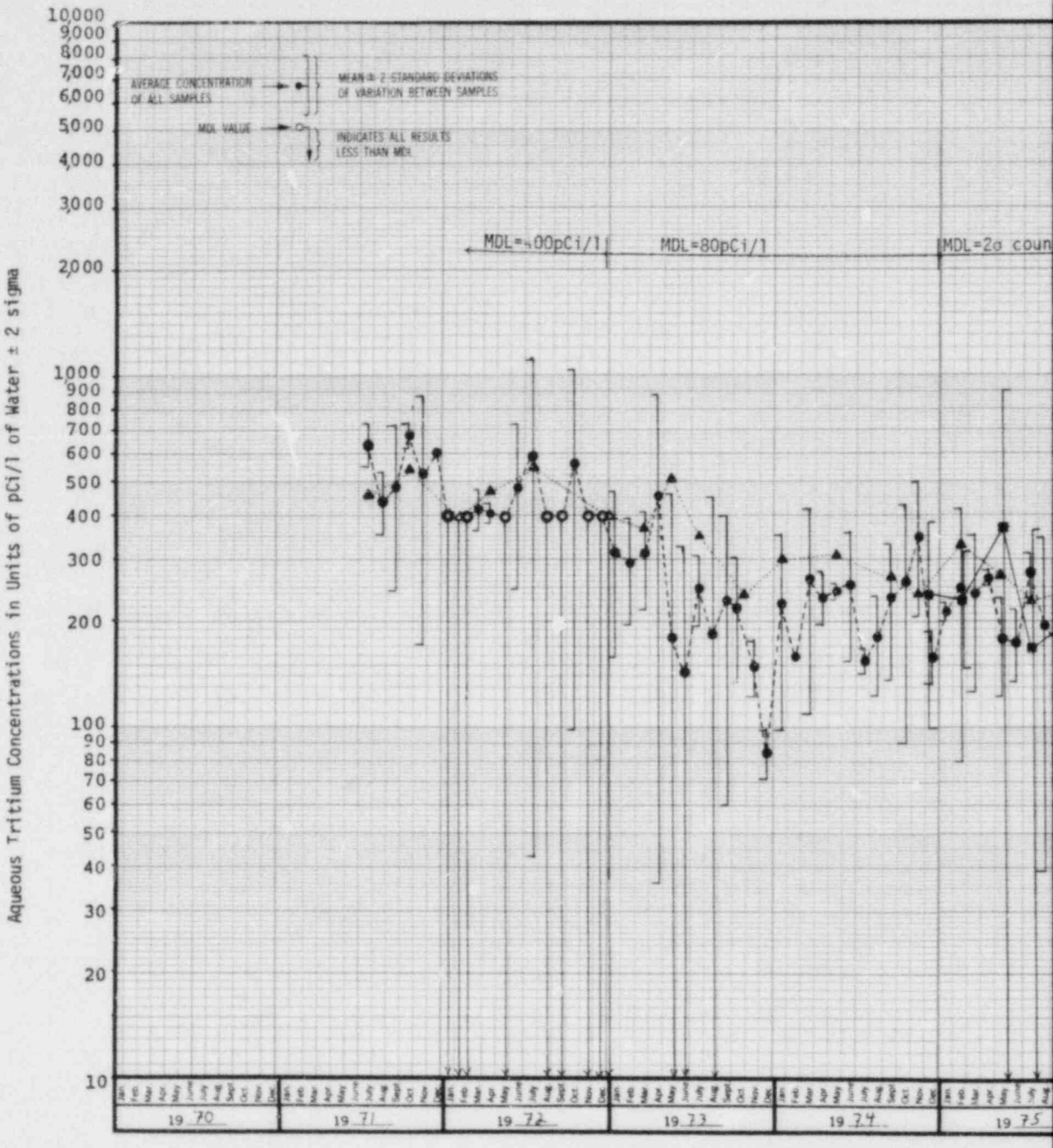


FIGURE 10

COMPARISON OF MONTHLY GROSS BETA CONCENTRATIONS IN SURFACE AND DISCHARGE WATER COLLECTED NEAR PEACH BOTTOM ATOMIC POWER STATION. 1983
INSOLUBLE FRACTION - COMPOSITE

Station 1LL (PB-SWA-6S3) PB Intake
Station 1MM (PB-SWA-13S2) PB Discharge

If More Than One Value The Same



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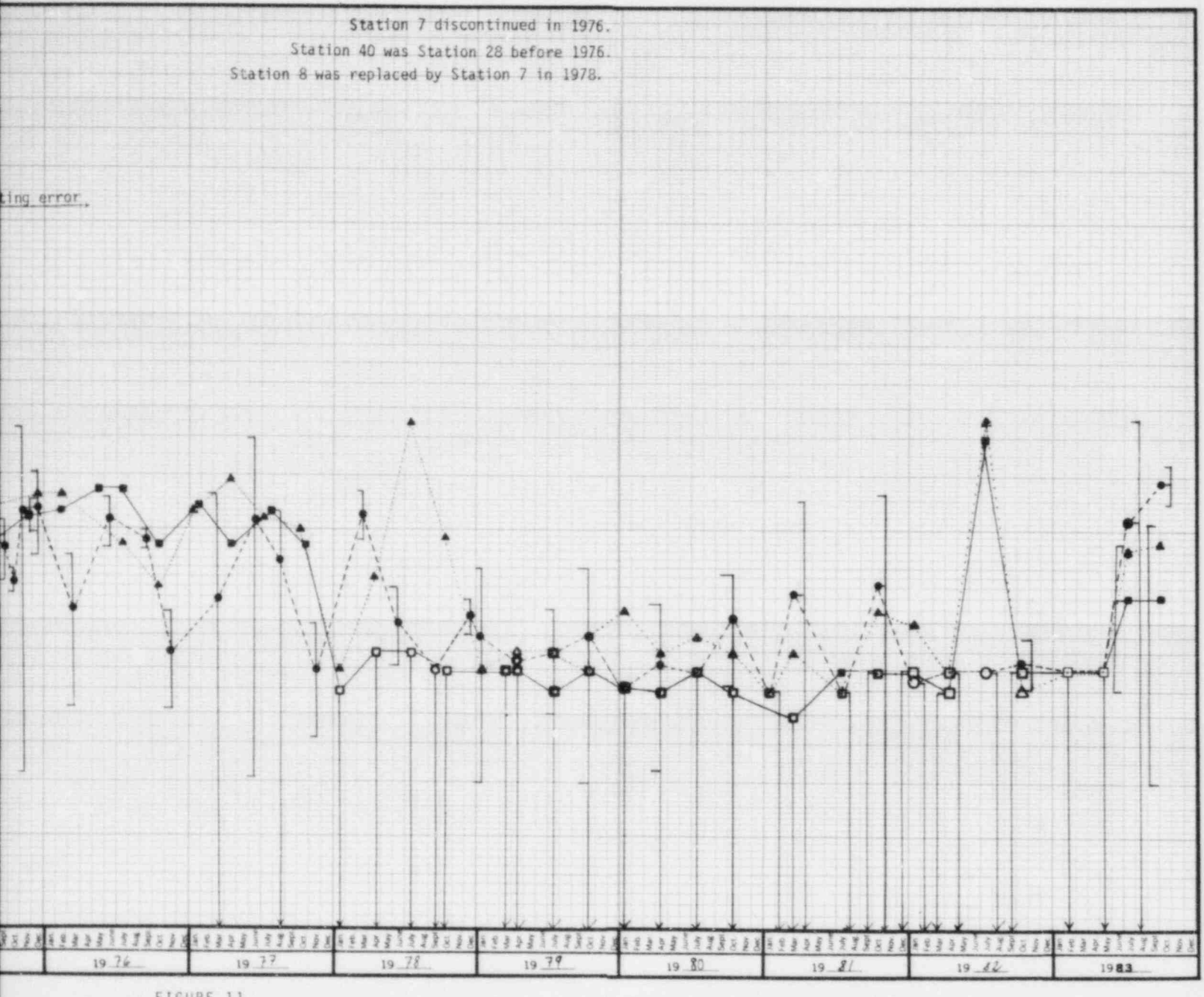


FIGURE 11

VERAGE AQUEOUS TRITIUM CONCENTRATIONS IN WELL WATER
AR PEACH BOTTOM ATOMIC POWER STATION.1970-1983.
TOTAL SAMPLE - GRAB

ation 1U (PB-WWA-15S2) PB Site Utility Bldg.
ation 1V (PB-WWA-12S2) PB Site Info. Center
ation 40 (PB-WWA-21B2) PB Site Area
ation 7 (PB-WWA-16F1) Darlington, Md. Area
ation 8 (PB-WWA-12F1) Colora, MD.

If More Than One Value The Same

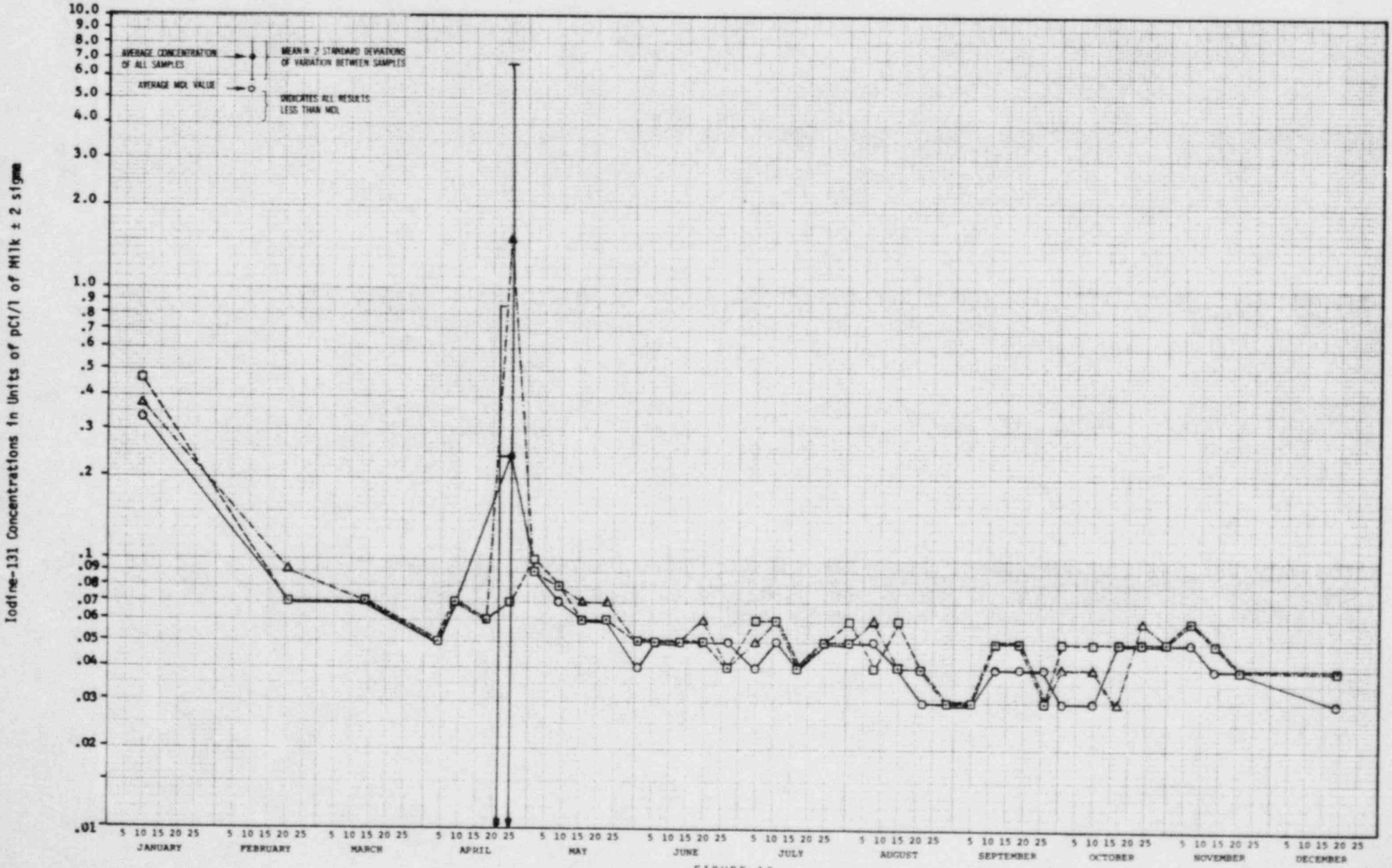
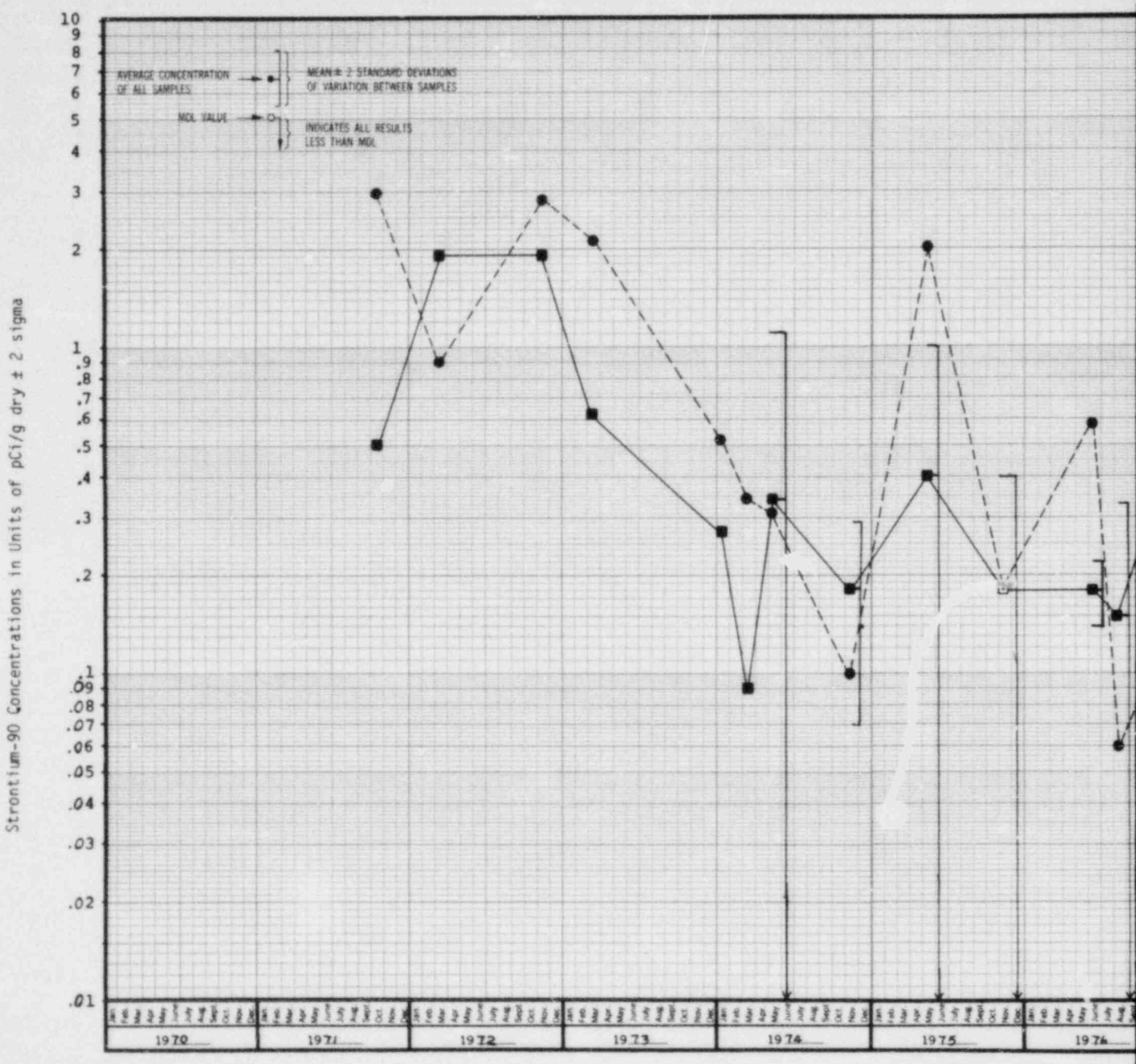


FIGURE 12

COMPARISON OF AVERAGE IODINE-131 CONCENTRATIONS IN MILK COLLECTED AT NEAR, INTERMEDIATE AND DISTANT FARMS IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1983.
TOTAL SAMPLE

Near Farms (Station G, J and O)
Intermediate Farms (Stations D, L, M and N)
Distant Farms (Stations A, B, C and E)

If More Than One Value The Same



COMPARISON OF AVERAGE STRONTIU
NEAR THE PEACH BOTTOM AT
TOP

Station 2 (PB-SOL-13S1
Station 3A (PB-SOL-23D
Station 5 (PB-SOL-8E1)

If More Than

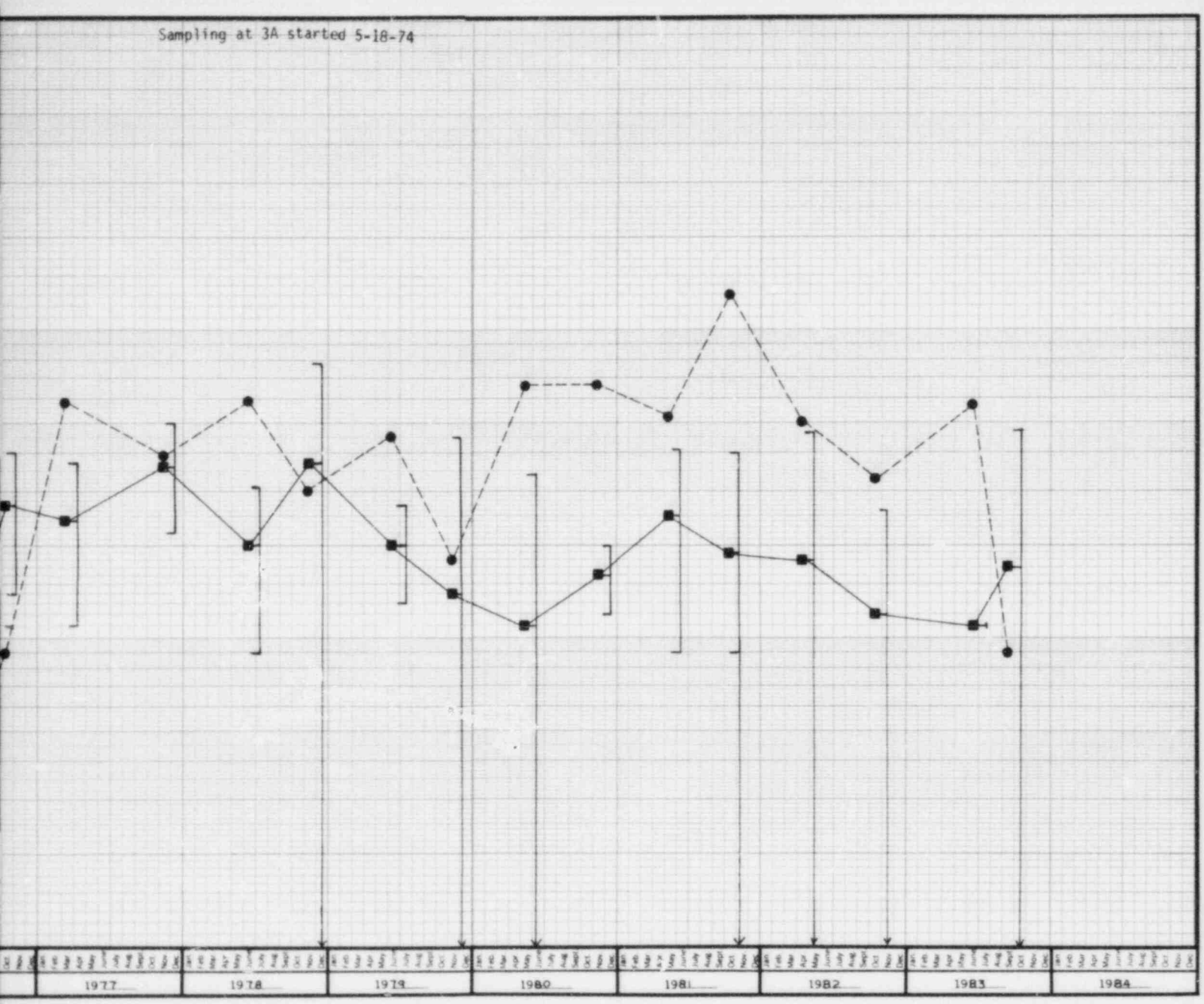
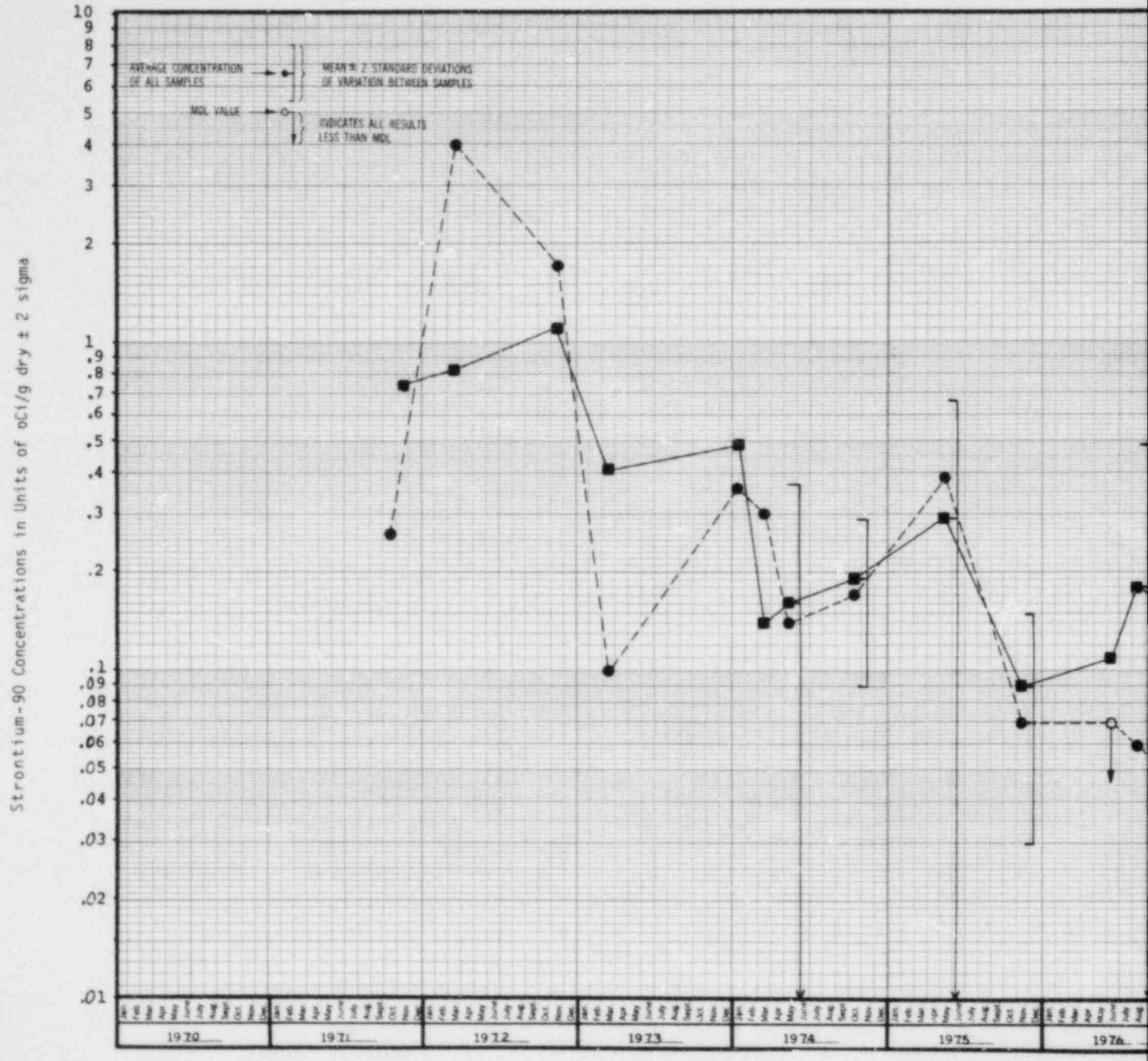


FIGURE 13

-90 CONCENTRATIONS IN SOIL COLLECTED
MIC POWER STATION, 1970-1983.
ONE INCH

PB 130° Sector Hill
) Delta, Pa. Substation
Wakefield, Pa.

One Value The Same



COMPARISON OF AVERAGE STRONTIUM
NEAR THE PEACH BOTTOM AT
B

Station 2 (PB-SOL-13S1
Station 3A (PB-SOL-23D
Station 5 (PB-SOL-8E1)

If More Than

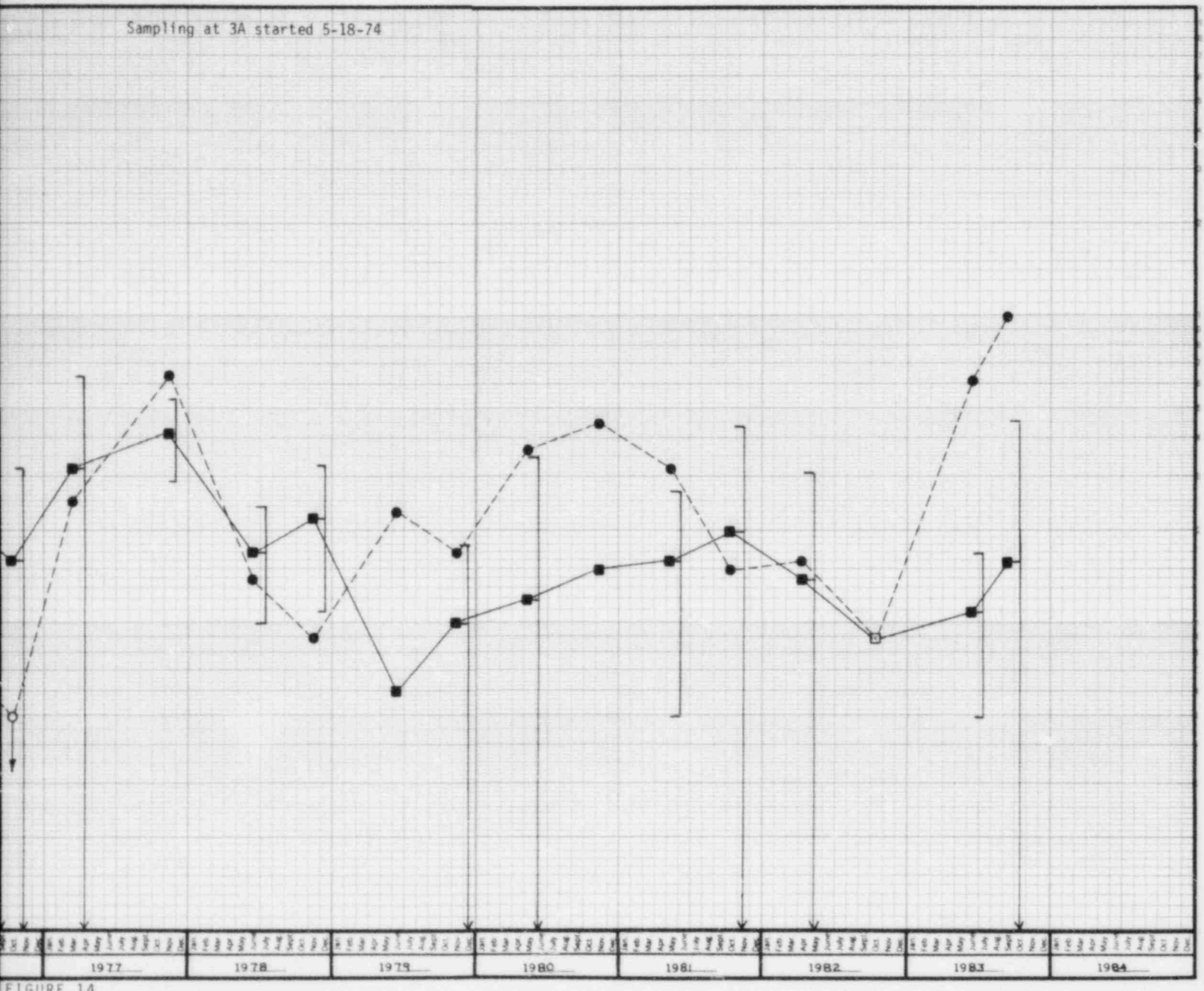
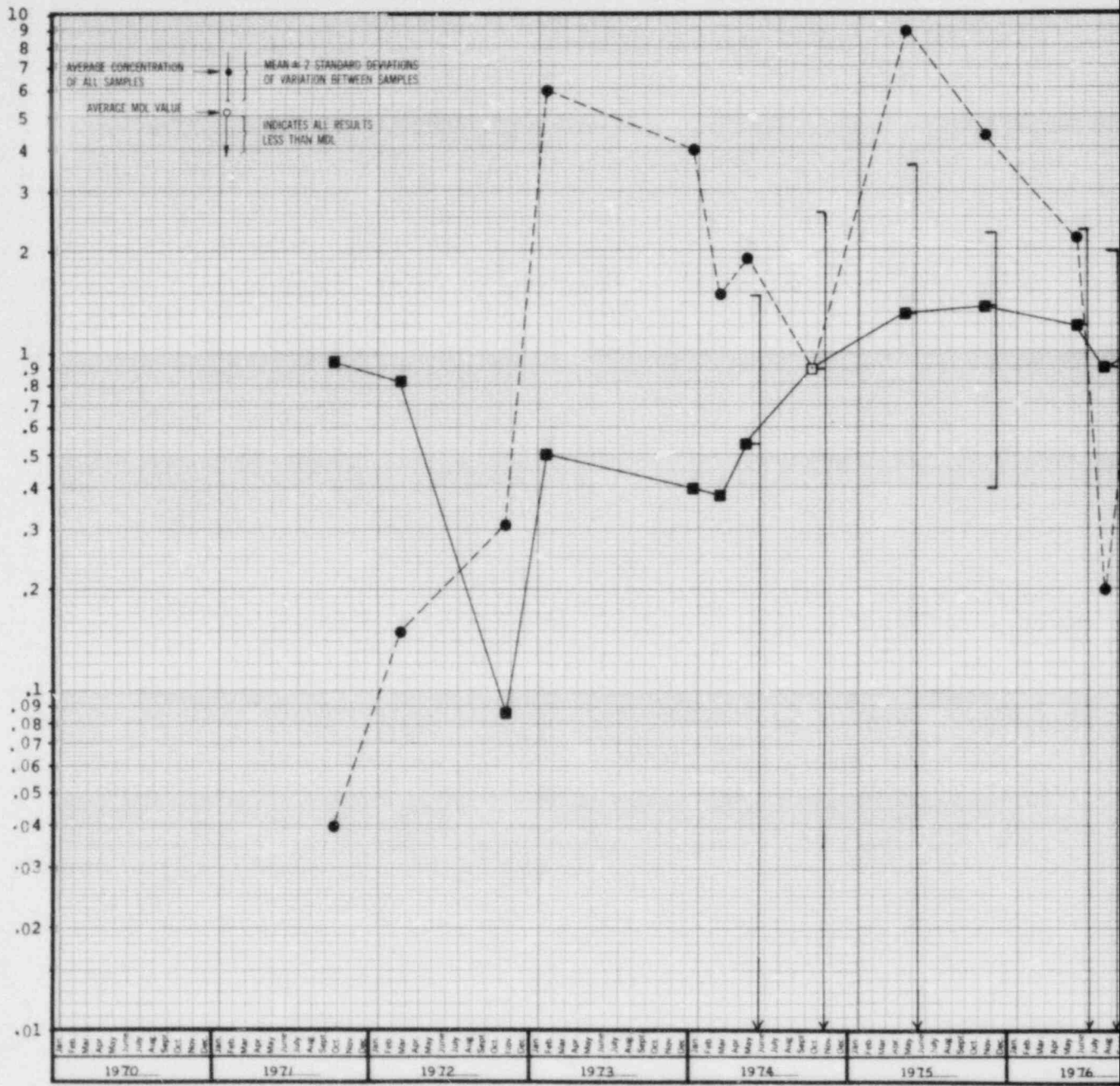


FIGURE 14

-90 CONCENTRATIONS IN SOIL COLLECTED
MIC POWER STATION, 1970-1983.
TTOM CUT

PB 130° Sector Hill
) Delta, Pa. Substation
Wakefield, Pa.

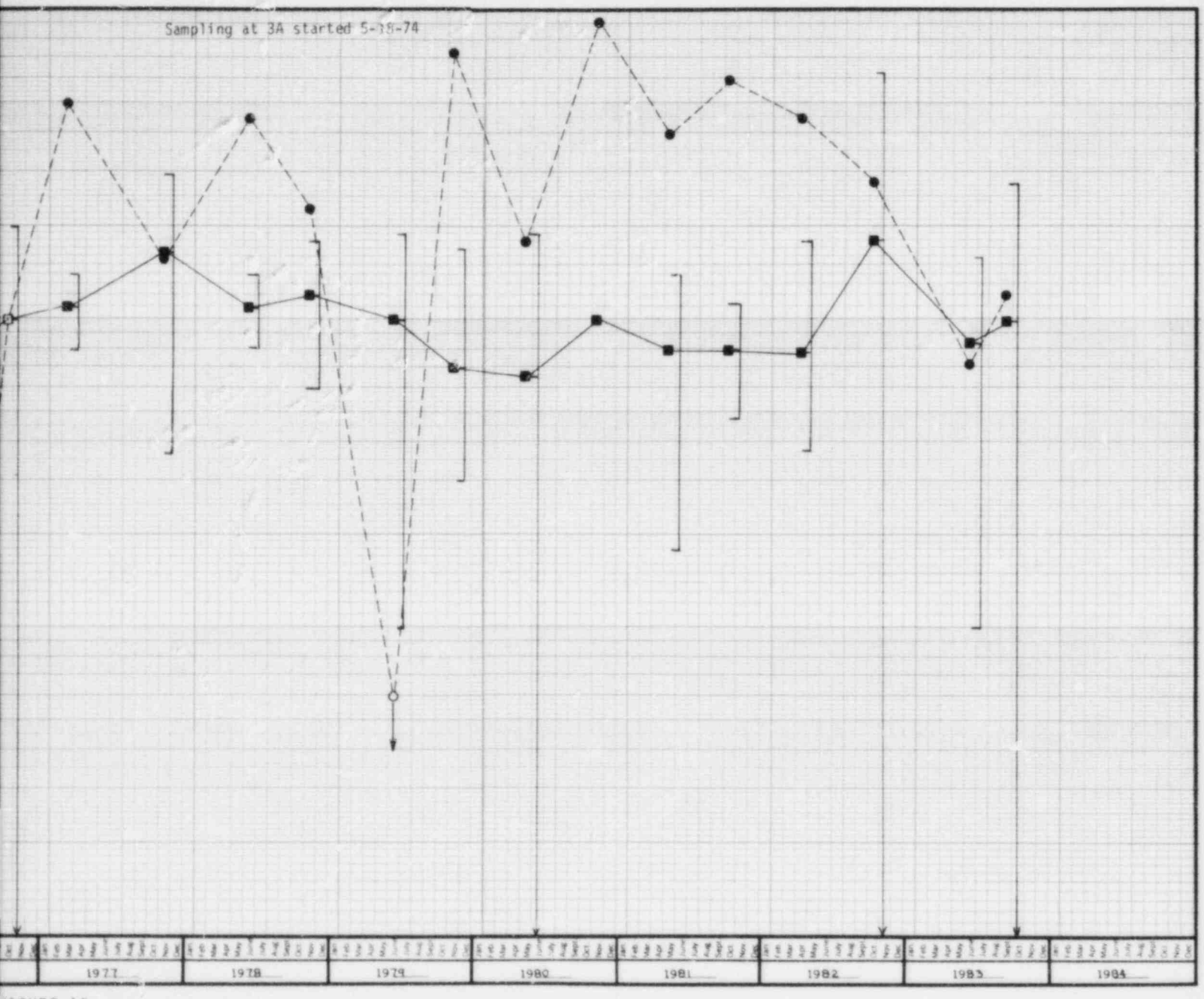
One Value The Same



COMPARISON OF AVERAGE CESIUM-13
NEAR THE PEACH BOTTOM AT
T

Station 2 (PB-SOL-13S1)
Station 3A (PB-SOL-230
Station 5 (PB-SOL-8E1)

If More Than

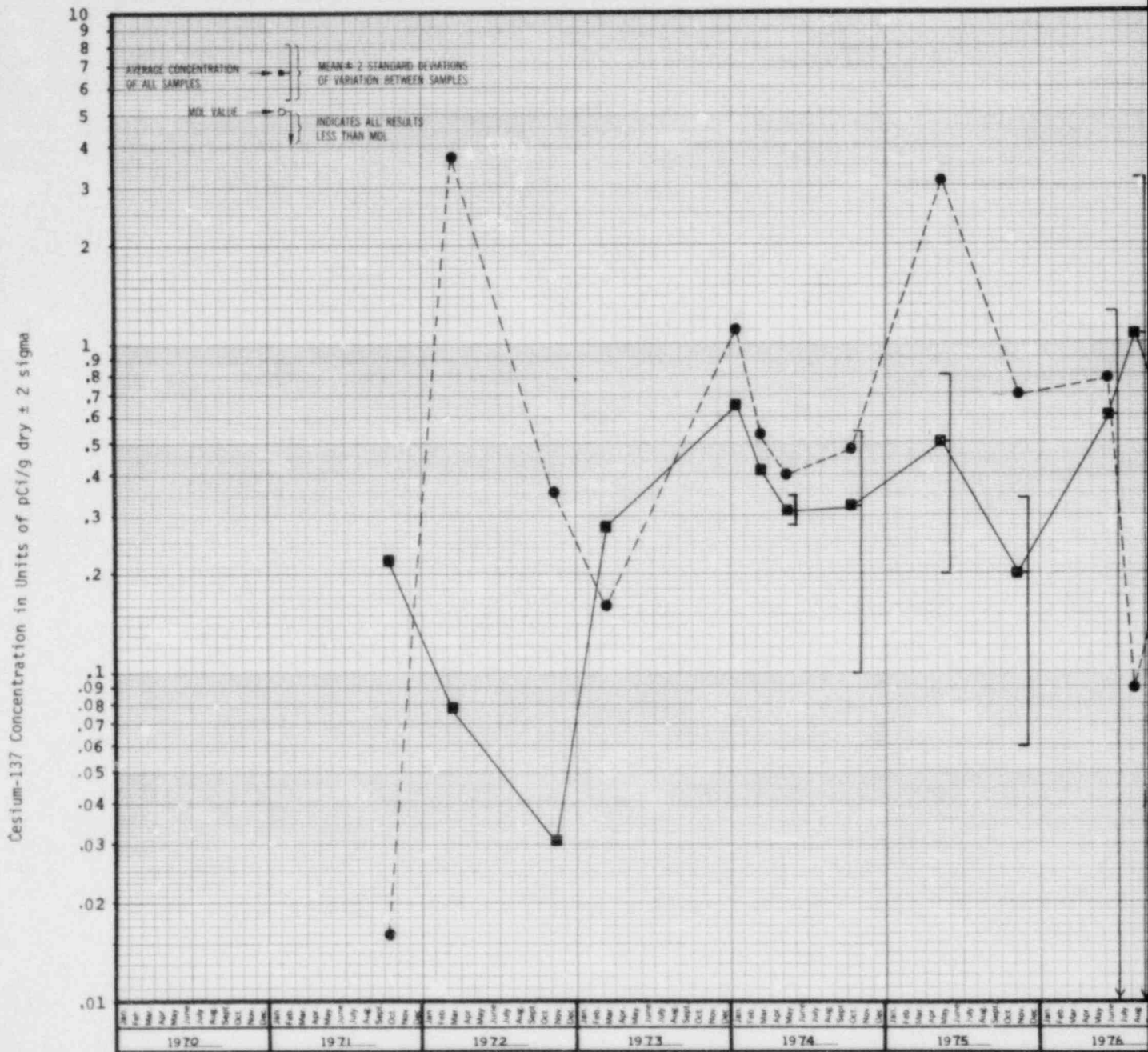


IGURE 15

7 CONCENTRATIONS IN SOIL COLLECTED
OMIC POWER STATION, 1970-1983.
OP ONE INCH

PB 130° Sector Hill
Delta, Pa. Substation
Wakefield, Pa.

One Value The Same



COMPARISON OF AVERAGE CESIUM-13
NEAR PEACH BOTTOM ATOMI
BOTT

Station 2 (PB-SOL-13S1)
Station 3A (PB-SOL-23D)
Station 5 (PB-SOL-8E1)

If More Than

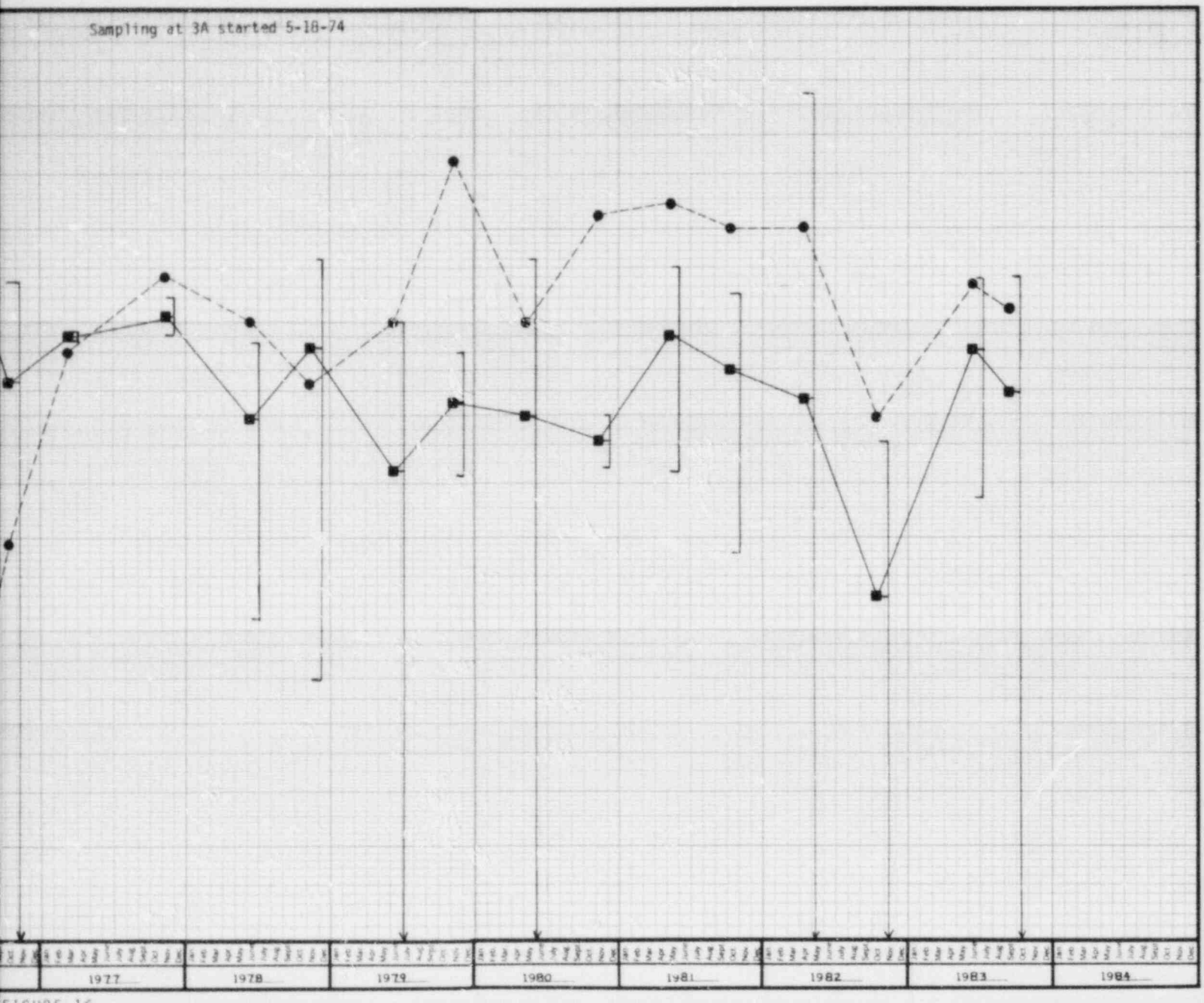


FIGURE 16

7 CONCENTRATIONS IN SOIL COLLECTED
POWER STATION, 1970-1983.
M CUT

PB 130° Sector Hill
) Delta, Pa. Substation
Wakefield, Pa.

One Value The Same

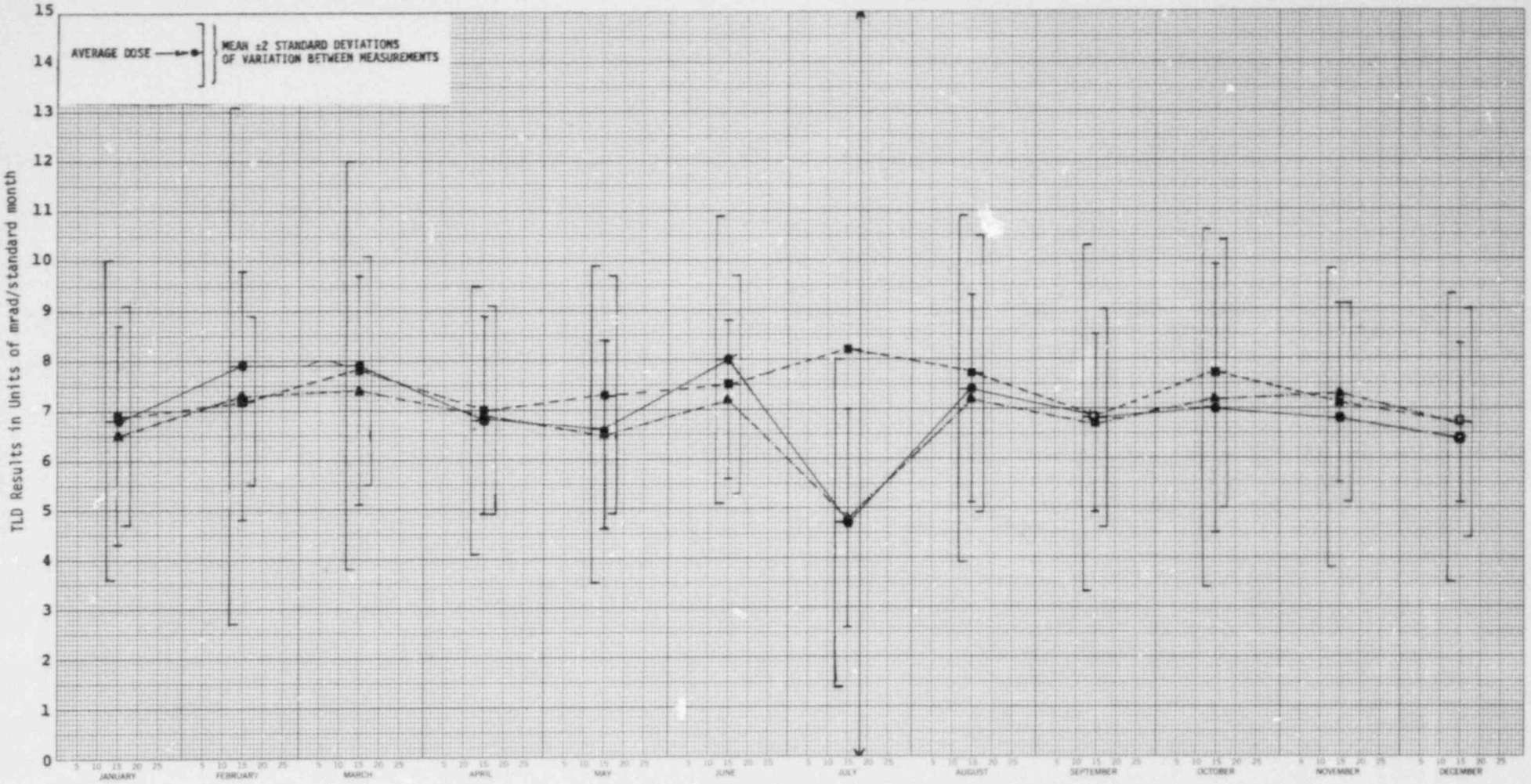


FIGURE 17

COMPARISON OF AVERAGE MONTHLY TLD RESULTS COLLECTED AT SITE BOUNDARY, MIDDLE, AND OUTER RING STATIONS IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1983.

Site Boundary (Stations 1B, 1C, 1D, 1E, 1F, 1G, 1H, 1J, 1L, 1M, 1NN, 2 and 40)

Middle Ring (Stations 3A, 4K, 5, 6B, 14, 15, 17, 22, 23, 26, 27, 31, 32, 33A, 38, 42, 43, 44, 45, 46, 47, 48, 49, 50 and 51)

Outer Ring (Stations 12B, 16, 18, 19, 20, 21B and 24)

If More Than One Value The Same

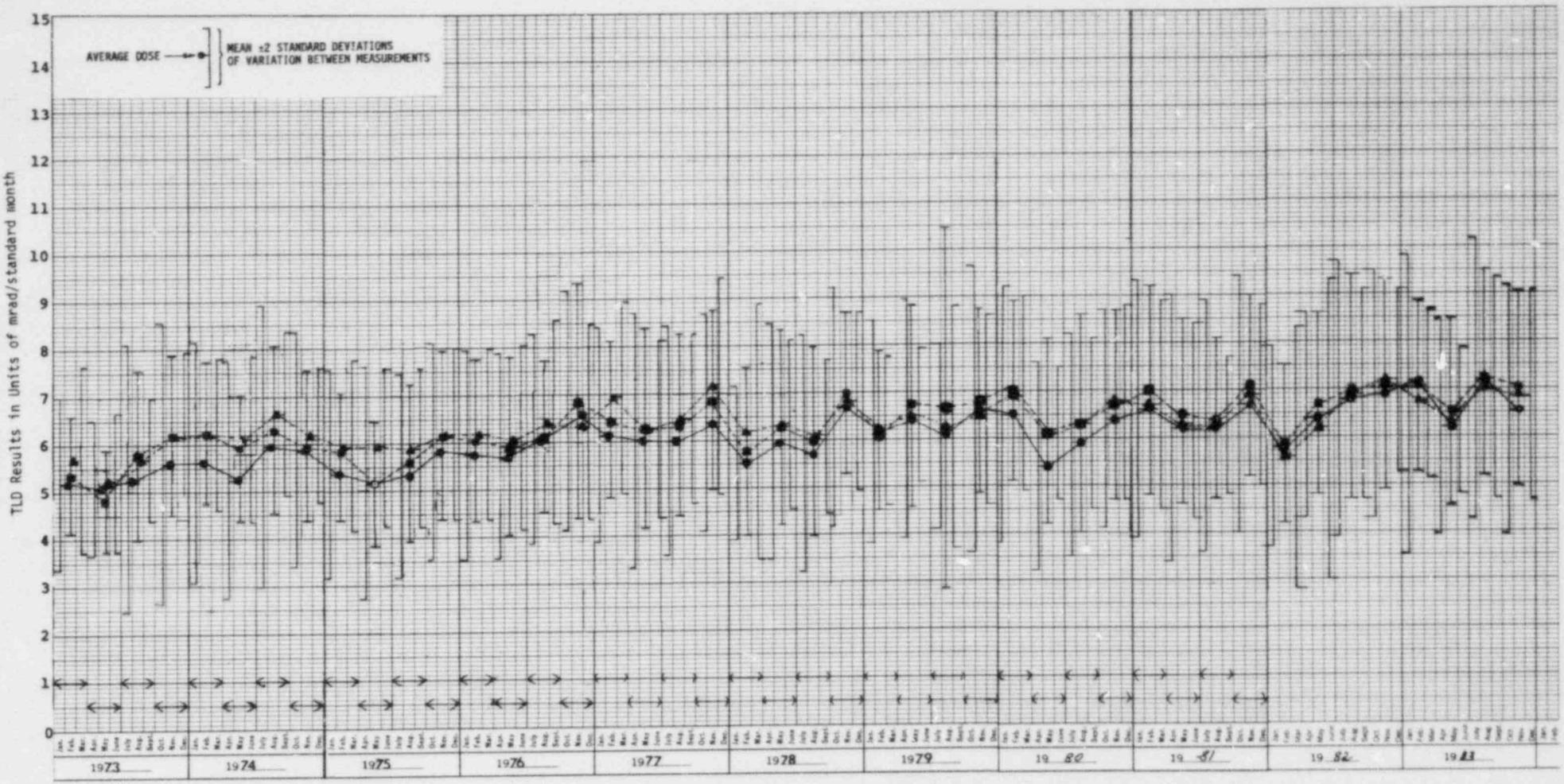


FIGURE 18

COMPARISON OF AVERAGE QUARTERLY TLD RESULTS COLLECTED AT SITE BOUNDARY, MIDDLE, AND OUTER RING STATIONS IN THE VICINITY OF PEACH BOTTOM ATOMIC POWER STATION, 1983.

Site Boundary (Stations 1B, 1C, 1D, 1E, 1F, 1G, 1H, 1J, 1L, 1M, 1NN, 2 and 40)

Middle Ring (Stations 3A, 4K, 5, 6B, 14, 15, 17, 22, 23, 26, 27, 31, 32, 33A, 38, 42, 43, 44, 45, 46, 47, 48, 49, 50 and 51)

Outer Ring (Stations 12B, 16, 18, 19, 20, 21B and 24)

If More Than One Value The Same

VII. SYNOPSIS OF ANALYTICAL PROCEDURES

SYNOPSIS OF ANALYTICAL PROCEDURES

In the following section there is a description of the analytical laboratory procedures used along with an explanation of the analytical calculation methods. The first part consists of the procedures that were followed in Philadelphia (RMC). The second part consists of those procedures followed in Westwood (TI).

Sample Preparation and Counting Procedures

Several types of liquid samples are separated by filtration prior to analysis. Resulting portions are identified as soluble and insoluble. Therefore, soluble as used in this report, is defined as that portion of a sample that passes through a No. 50 Whatman filter paper. Insoluble is defined as that portion of a sample that is collected on No. 50 Whatman filter paper.

GROSS BETA ANALYSIS OF SAMPLES (ANALYZED BY RMC)

Insoluble Fraction of Water (B4)

A 1000 ml aliquot of the sample is filtered through Whatman No. 50 filter paper. The filter paper is ashed in a preignited and preweighed 2" x 1/4" ringed planchet and reweighed. The planchet is counted in a low-background gas-flow proportional counter. Self-absorption corrections are made based on measured sample weight and calculated thickness. Sr-90-Y-90 is used as the calibration standard. A clean, unused filter paper is processed in the same manner and used as a blank.

Soluble Fraction of Water (B6)

The filtrate obtained during procedure B4 is evaporated to dryness in a preweighed, 2" x 1/4" ringed planchet and reweighed. The planchet is counted in a low-background gas-flow proportional counter. Self-absorption corrections are made based on measured sample weight and calculated thickness. Sr-90-Y-90 is used as calibration standard. An aliquot of distilled water is evaporated in the same manner and used as a blank.

Calculation of results and two sigma error:

$$\frac{\text{RESULT}}{(\text{pCi}/\ell)} = \left[\frac{C(s+b)}{T(s+b)} - \frac{C(b)}{T(b)}\right] \times \frac{1}{2.22} \times \frac{1}{E} \times \frac{1}{V} \times \frac{1}{TF}$$

$$\frac{2\ \text{SIGMA ERROR}}{(\text{pCi}/\ell)} = \sqrt{\frac{C(s+b)}{T(s+b)^2} + \frac{C(b)}{T(b)^2}} \times \frac{1}{2.22} \times \frac{1}{E} \times \frac{1}{V} \times \frac{1}{TF}$$

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

where:

C(s+b)	=	gross counts of sample
C(b)	=	counts of blank
E	=	fractional Sr-90-Y-90 counting efficiency
T(s+b)	=	number of minutes sample was counted
T(b)	=	number of minutes blank was counted
V	=	volume of aliquot (in liters)
TF	=	transmission factor

ANALYSIS OF SAMPLE FOR TRITIUM (ANALYZED BY RMC)

Water (H2)

A 15 ml aliquot of the sample is vacuum distilled to eliminate dissolved gases and non-volatile matter. The distillate is frozen in a trap cooled with a dry ice-isopropanol mixture. Eight (8) ml of the distillate are mixed with ten (10) ml of Insta-Gel liquid scintillation solution. The sample is then counted for tritium in a liquid scintillation counter. A sample of low tritium (<50) pCi/ℓ) water is vacuum distilled as a blank and is counted with each batch of samples. In the calculation of the result it is assumed that the condensed and original sample are of equivalent volumes. The volume change associated with the removal of dissolved gases and non-volatile matter is not significant compared to the other errors in the analysis.

Milk (H3)

A 100 ml aliquot of sample is dried in a rotating vacuum flash evaporator. During the evaporation process, the evaporated water fraction is trapped out by a dry ice-isopropanol mixture for counting. Approximately 20 ml of condensate is vacuum distilled to elimin 'e dissolved gasses and non-volatile matter. Counting is the same as for water above.

Calculation of results and two sigma error:

$$\frac{\text{RESULT}}{(\text{pCi}/\ell)} = \left[\frac{C(s+b)}{T(s+b)} - \frac{C(b)}{T(b)}\right] \times \frac{1}{2.22} \times \frac{1}{E} \times \frac{1}{V}$$

$$\frac{\text{2 SIGMA ERROR}}{(\text{pCi}/\ell)} = 2\sqrt{\frac{C(s+b)}{T(s+b)^2} + \frac{C(b)}{T(b)^2}} \times \frac{1}{2.22} \times \frac{1}{E} \times \frac{1}{V}$$

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

where:

C(s+b)	=	gross counts of sample
C(b)	=	counts of blank
E	=	fractional H-3 counting efficiency
T(s+b)	=	number of minutes sample was counted
T(b)	=	number of minutes blank was counted
V	=	volume of distillate counted (in liters)

ANALYSIS OF SAMPLES FOR I-131 (ANALYZED BY RMC)

Milk (10)

The initial stable iodide concentration in milk is determined with an iodide specific electrode. Three milliliters of stable iodide carrier is then added to four (4) liters of milk. The iodide is removed from the milk by passage through an ion-exchange resin. The iodide is eluted from the resin with sodium hypochlorite, and purified by a series of solvent extractions with the final extraction into a toluene phase. The toluene phase is mixed with a toluene-based liquid scintillation solution. The sample is then counted in a beta-gated gamma coincidence detector shielded by six inches of steel. Distilled water is used as a blank. The yield is calculated from stable iodide recovery based on the recovered volume. Results are corrected for decay from the sampling time to the middle of the counting period using a half-life value for I-131 of 8.06 days.

Calculation of results and two sigma error:

The spectrum obtained is smoothed to minimize the effects of random statistical fluctuations. The presence of Iodine-131 is identified by the presence of a 364 KeV peak. The net area above the baseline is calculated. This counting rate is converted to activity (pCi) for units volume making allowance for counting efficiency and gamma ray abundance.

$$\frac{\text{RESULT}}{(\text{pCi}/\ell)} = \left[\frac{C(s+b)}{T(s+b)} - \frac{C(b)}{T(b)}\right] \times \frac{1}{2.22} \times \frac{1}{E} \times \frac{1}{V} \times \frac{1}{Y} \times \frac{1}{F} \times \frac{1}{e^{[-.693(ti-ts)/8.06]}}$$

$$\frac{2\ \text{SIGMA ERROR}}{(\text{pCi}/\ell)} = 2\sqrt{\frac{C(s+b)}{T(s+b)^2} + \frac{C(b)}{T(b)^2}} \times \frac{1}{2.22} \times \frac{1}{E} \times \frac{1}{V} \times \frac{1}{Y} \times \frac{1}{F} \times \frac{1}{e^{[-.693(ti-ts)/8.06]}}$$

where:

C(s+b)	=	gross counts in channels containing 1-131 peak
C(b)	=	background counts in channel containing 1-131 peak
T(s+b)	=	number of minutes aliquot was counted
T(b)	=	number of minutes blank was counted
E	=	I-131 counting efficiency
V	=	volume of aliquot utilized (in liters)
Y	=	chemical yield of iodine
F	=	fractional gamma abundance for I-131 = 0.824
ti	=	time at midpoint of the counting interval
ts	=	time of sample collection
e	=	natural antilog

Calculation of minimum detectable level (MDL):

$$\frac{MDL}{(pCi/\ell)} = 3\sqrt{6 \times C} \times \frac{1}{2.22} \times \frac{1}{E} \times \frac{1}{V} \times \frac{1}{Y} \times \frac{1}{T} \times \frac{1}{F} \times \frac{1}{e^{[-.693(ti-ts)8.06]}}$$

where

C	=	number of counts in the channel that would have been the centroid if a peak was there
E	=	I-131 counting efficiency
V	=	volume of aliquot (in liters)
Y	=	chemical yield of iodine
T	=	number of minutes aliquot was counted
F	=	fractional gamma abundance for I-131 - 0.824
ti	=	time at midpoint of the counting interval
ts	=	time of sample collection
e	=	natural antilog

GAMMA SPECTROMETRY OF SAMPLES (ANALYZED BY RMC)

Water (N1)

Four liters of sample is reduced to 100 ml and sealed in a standard container and counted with a NaI(TL) detector coupled to a multi-channel pulse-height analyzer.

Milk (N7)

A three liter aliquot is dried at 175 C, ashed at 500 C until no carbon residue is present, compressed and sealed in a standard container, and counted with a NaI(TL) detector coupled to a multi-channel pulse-height analyzer.

Air Particulate (GB)

All samples received for the month are mixed and sealed in a standard container. The container is counted with a high resolution Ge(Li) detector, coupled to a multi-channel pulse-height analyzer.

Calculation of result and two sigma error:

The spectrum obtained is smoothed to minimize the effects of random statistical fluctuations. Peaks are identified by changes in the slope of the gross spectrum. The net area above the baseline is calculated. This counting rate is converted to activity in curie units making allowance for counting efficiency and gamma ray abundance.

$$\frac{\text{RESULT}}{(\text{pCi/v})} = \frac{\left[\frac{C(s+b)}{T(s+b)} - \frac{C(b)}{T(b)}\right] \times \frac{1}{2.22} \times \frac{1}{E} \times \frac{1}{V} \times \frac{1}{F} \times 1}{e^{[-.693(ti-ts)/t_{1/2}]}}$$

$$\frac{\text{2 SIGMA ERROR}}{(\text{pCi/v})} = \frac{2\sqrt{\frac{C(s+b)}{T(s+b)^2} + \frac{C(b)}{T(b)^2}} \times \frac{1}{2.22} \times \frac{1}{E} \times \frac{1}{V} \times \frac{1}{F} \times 1}{e^{[-.693(ti-ts)/t_{1/2}]}}$$

where:

C(s+b)	=	gross counts in channels containing peak of nuclide being quantized
C(b)	=	background counts in channels containing peak of nuclide being quantized
T(s+b)	=	number of minutes aliquot was counted
T(b)	=	number of minutes blank was counted
E	=	measured from efficiency curve for a given energy
F	=	fractional gamma abundance
V	=	volume of aliquot (in liters or meters^3)
ti	=	time at midpoint of the counting interval
ts	=	time of sample collection
$t_{1/2}$	=	half-life of radionuclide
e	=	natural antilog

Calculation of minimum detectable level (MDL) for NaI detectors:

$$\frac{MDL}{pCi/v} = \sqrt[3]{0.63 \times C} \times \frac{1}{2.22} \times \frac{1}{E} \times \frac{1}{V} \times \frac{1}{F} \times \frac{1}{T} \times \frac{1}{e^{[-.693(ti-ts)/t_{1/2}}}$$

Calculation of minimum detectable level (MDL) for GeLi detectors

$$\frac{MDL}{(pCi/v)} = \sqrt[3]{\frac{C}{T}} \times \frac{1}{2.22} \times \frac{1}{E} \times \frac{1}{V} \times \frac{1}{F} \times \frac{1}{e^{[-.693(ti-ts)/t_{1/2}]}}$$

where
- C = number of counts in the channel that would have been the centroid if a peak was there
- E = measured from efficiency curve for a given energy
- V = volume of aliquot utilized (in liters or meter^3)
- F = fractional gamma abundance
- T = number of minutes aliquot was counted
- ti = time at midpoint of the counting interval
- ts = time of sample collection
- $t_{1/2}$ = half-life of radionuclide
- e = natural antilog

STRONTIUM-89 AND STRONTIUM-90 ANALYSIS OF SAMPLES (ANALYZED BY RMC)

Milk (S4, T4)

A one and half liter aliquot of milk is ashed to destroy organic material and then dissolved in concentrated mineral acid. Stable strontium is added to the eluted liquid or dissolved ash to facilitate chemical separation of Sr-89 and -90, and to determine the strontium recovery. Strontium concentrations and purification is ultimately realized by at least two precipitations of strontium nitrate in concentrated nitric acid. Additional iron/rare earth hydroxide precipitations and barium chromate separations are performed to remove suspected interfering nuclides. After purification, the Y-90 is allowed to ingrow for a known period of time. Sr-90 is then determined by counting yttrium oxalate after initially precipitating Y-90 hydroxide. Sr-89 is determined by counting strontium carbonate and correcting the observed activity for the amount of Sr-90 and Y-90 on the planchet. A sample of distilled water is used as a blank.

Calculation of result and two sigma error:

$$\frac{\text{RESULT Sr-90}}{(\text{pCi}/\ell)} = \left[\frac{A}{T1} - \frac{B}{T2}\right] \times \frac{1}{2.22} \times \frac{1}{V} \times \frac{1}{E} \times \frac{1}{Y} \times \frac{1}{X} \times \frac{1}{e^{[-.693\ t1/64.1)}\left[1-e^{(-.693t2/64.1)}\right]}$$

$$\frac{\text{2 SIGMA ERROR Sr-90}}{(\text{pCi}/\ell)} = \frac{2}{}\sqrt{\frac{A}{T1^2} + \frac{B}{T2^2}} \times \frac{1}{2.22} \times \frac{1}{E} \times \frac{1}{V} \times \frac{1}{Y} \times \frac{1}{F} \times \frac{1}{e^{[-.693\ ti/64.1)}\left[1-e^{(-.693t2/64.1)}\right]}$$

where:

A	=	Gross Y-90 counts
B	=	Blank counts of yttrium
T1	=	Y-90 counting time
T2	=	Blank counting time
V	=	Sample aliquot size (in liters)
E	=	Y-90 counting efficiencyed (in liters)
Y	=	Yttrium chemical yield
X	=	Strontium chemical yield
t1	=	Time in hours from second separation of Y-90 until counting time of yttrium planchet plus one half the counting time
t2	=	Time in hours between first and second separations of Y-90 (ingrowth time)
e	=	natural antilog

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

$$\frac{\text{RESULT Sr-89}}{(\text{pCi/v})} = \left[\left(\frac{C}{T3}\right) - \left(\frac{D}{T4}\right) - G - H\right] \times \frac{1}{2.22} \times \frac{1}{V} \times \frac{1}{F} \times \frac{1}{X} \times \frac{1}{e^{(-.693t4/50.5}}$$

$$\frac{\text{2 SIGMA ERROR Sr-89}}{(\text{pci/}\ell)} = 2\sqrt{\frac{C}{T3^2} + \frac{D}{T4^2}} + \frac{G}{T3} + \frac{H}{T3} \times \frac{1}{2.22} \times \frac{1}{V} \times \frac{1}{F} \times \frac{1}{X} \times \frac{1}{e^{(-.693t4/50.5)}}$$

where
- C = Gross strontium counts
- D = Blank counts of strontium
- G = Additional background from Sr-90 activity
  = (Sr-90 activity of sample) 2.22 VXJ)
- H = Additional background from Y-90 activity
  = (Sr-90 activity of sample)(2.22 VXE)[1-e(-.693t5/64.1)]
- V = Sample aliquot size (in liters)
- J = Sr-90 counting efficiency
- F = Sr-89 counting efficiency
- X = Strontium chemical yield
- t4 = Time in days from sampling date to strontium count date
- T3 = Strontium counting time
- T4 = Blank counting time
- t5 = Time in hours from second separation of Y-90 to counting of strontium planchet plus one half the counting time
- e = natural antilog

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

ENVIRONMENTAL DOSIMETRY (DO), (D1) (ANALYZED BY RMC AND TELEDYNE ISOTOPES)

By TI definition, a thermoluminescent dosimeter (TLD) is considered one end of a capillary tube containing calcium sulfate (Tm) powder as the thermoluminescent material. This material was chosen for its characteristic high light output, minimal thermally induced signal loss (fading), and negligible self-dosing. The energy response curve has been flattened by a complex multiple element energy compensator shield supplied by Panasonic Corporation, manufacturer of the TLD reader. There exists four dosimeters per station sealed in a polyethylene bag to demonstrate integrity at the time of measurement, and for visualization of the sample placement instructions. The zero dose is determined from TLDs located in the lead shield found in Philadelphia from January 1 to July 1 and in Westwood, New Jersey from July 1 on.

Following the predesignated exposure period the TLDs are placed in the TLD reader. The reader heats the calcium sulfate (Tm) and the measured light emission (luminescence) is used to calculate the environmental radiation exposure.

Data are normalized to standard machine conditions by correcting machine settings to designated values before readout. Data are also corrected for in-transit dose using a set of TLDs kept in a lead shield in the field, exposed only during transit. The average dose per exposure period, and its associated error is then calculated.

A Cs-137 source is used to expose TLDs as a reference sample. An absorbed dose in tissue is determined using the 0.955 rad/Roentgen conversion factor and dose equivalent (mrem) by using a quality factor of 1.

Calculation of results and two sigma error:

$$\text{Gross TLD}(i) = [\text{TLD}(i) - \text{DO}(i)] \times \text{CF}(i) \times \text{CF(ins)} \times 0.955 \text{ mrad/mRoentgen}$$

$$\text{ITD} - \text{Net (site 0)} - [\text{NET(RMC 0)} (\text{D(sta)} / \text{D(RMC 0)})]$$

$$\text{NET TLD}(i) - \text{gross TLD}(i) - \text{ITD}$$

$$\text{AVG} = \left[\left(\sum_{1=1}^{n} \text{NET TLD}\right) / n\right] [\text{D(STD)} / \text{D(EX)}]$$

$$\text{ERROR (95\% CL)} = t(n-1) [\text{sigma NET TLD}(i) / \sqrt{n}] [\text{D(STD)} / \text{D(EX)}]$$

Where	Gross TLD(1)	=	individual TLD reading correctd to standard instrument conditions
	TLD(i)	=	Gross reading of dosimeter i
	NET TLD(i)	=	Net dose obtained during exposure period in the field
	CF(ins)	=	Correction factor of reader = (6.158) ($ELS^{-1.0129}$)
	ELS	=	External light source
	DO(i)	=	Zero for dosimeter i
	CF(i)	=	Calibration factor for dosimeter i
	ITD	=	in-Transit dose
	NET(site)O	=	Mean of n dosimeters in site lead shield
	NET(RMC)O	=	Mean of n dosimeters in RMC lead shield
	D(sta)	=	Exposure period of station (SZRO)
	D(RMC)O	=	Exposure period of RMC O
	AVG	=	Mean exposure per standard exposure period at a given station
	n	=	Number of readings
	D(EX)	=	Days exposed
	D(STD)	=	Days in standard exposure period
	t(n-1)	=	T-distribution (student) factor for 95% CL
	sigma NET TLD (1)	=	Standard deviation of n readings of NET TLD (i)
	ERROR	=	The 95% confidence limit error of AVG

DETERMINATION OF GROSS ALPHA AND/OR GROSS BETA ACTIVITY
IN WATER SAMPLES

(SUSPENDED AND DISSOLVED FRACTIONS)

TELEDYNE ISOTOPES

This describes the process used to measure the overall radioactivity of water samples without identifying the radioactive species present. No chemical separation techniques are involved. One liter of the sample is filtered under vacuum through a 0.45 μm Millipore filter. The filter is dried and mounted on a 2 inch stainless steel planchet to represent the suspended fraction of the sample. The filtrate is evaporated on a hotplate, and the residue is transferred and dried on another planchet to represent the dissolved fraction of the sample.

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 THE SAMPLE ACTIVITY OR OF THE MDL

$$\frac{\text{Net pCi on collection date}}{\text{unit volume or wt.}} = \frac{\frac{N}{\Delta t} - \beta}{2.22\,(v)\,(y)\,(DF)\,(\varepsilon)} \pm \frac{\sigma_m \sqrt{\frac{\frac{N}{\Delta t} + \beta}{\Delta t}}}{2.22\,(v)\,(y)\,(DF)\,(\varepsilon)}$$

net activity counting error

where: N = total counts from sample (counts)

Δt = counting time for sample (min)

β = background rate of counter (cpm)

$2.22 = \frac{dpm}{pCi}$

$v(w)$ = volume or weight of sample analyzed

y = chemical yield of the mount or sample counted

DF = decay factor from the collection to the counting date

= efficiency of the counter

σm = multiples of counting error

For gross alpha and gross beta calculations set y = 1 and DF = 1.

If the net activity $\left(\frac{N}{\Delta t} - \beta\right)$ is equal to or is less than the counting error, the activity on the collection date is below the limits of detection and is called "less than" (L.T.) or "minimum detectable level" (MDL).

DETERMINATION OF TRITIUM BY GAS COUNTING (ANALYZED BY TELEDYNE ISOTOPES)

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

Calculation of the sample activity or the MDL:

$$\frac{\text{Net pCi}}{\text{unit vol.}} = \frac{3.234 \times (TU)_N \times V_N}{CPM_N \times V_S} \left[(CPM)_G - BKG \pm \sigma_m \sqrt{\sigma_G^2 + \sigma_B^2} \right]$$

where: $(TU)_N$ = the tritium units of the standard

V_N = volume of the standard used to calibrate the efficiency of the detector - in psia

V_S = volume of the sample loaded into the detector - in psia

$(CPM)_N$ = the cpm activity of the standard of volume V_N

$(CPM)_G$ = the gross activity of the sample of volume V_S and the detector background

BKG = the background of the detector in cpm

3.234 = conversion factor changing TU to pC/ℓ

Δt = counting time for the sample

σ_m = multiple of the counting error

σ_G = standard deviation of the gross activity of the sample and the detector background, in cpm

σ_B = standard deviation of the background, in cpm

Tritium (cont.)

If the net activity $(CPM)_G$ - BKG is equal to or is less than twice the counting error, the activity on the collection date is below the limits of detection and is called "less than" (L.T.) or "minimum detectable level" (MDL).

$$\text{thus L.T.} = \frac{2 \times 3.234 \times (TU)_N \times V_N \times \sqrt{\sigma_G^{\,2} + \sigma_\beta^{\,2}}}{(CPM)_N \times V_S}$$

where: σ_G = standard deviation of the gross activity of the sample and the detector background, in cpm

σ_β = standard deviation of the background, in cpm

DETERMINATION OF GAMMA EMITTING RADIOISOTOPES (TELEDYNE ISOTOPES)

Gamma emitting radioisotopes are determined by lithium-drifted germanium (Ge(Li)) high resolution spectrometry in specific media, eg., air particulate filters, charcoal filters, milk, water, vegetation, soil/sediments, biological media, etc. 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 two-inch filter paper source geometries.

Samples are counted on large (>55 cc volume) Ge(Li) detectors connected to mult-channel pulse height analyzers and mini-computers for data acquisition and computations. 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 16 nuclides. (Li) systems are calibrated for each standard geometry using certified radionuclide standards from Amersham/Searle and the National Bureau of Standards.

DETERMINATION OF RADIOSTRONTIUM IN MILK SAMPLES (TELEDYNE ISOTOPES)

Stable strontium carrier is added to 1 liter of sample and trichloracetic acid (TCA) is added to produce a curd. The curd is separated by filtration and is discarded. An oxalate precipitation is performed on the filtrate and the precipitate is ashed in a muffle furnace. The ash is dissolved and strontium is precipitated as $SrNO_3$ using fuming nitric acid. A barium chromate scavenge and an iron scavenge are then performed. Stable yttrium carrier is added and the sample is allowed to stand for 7 to 10 days for yttrium ingrowth. Yttrium is then precipitated as hydroxide, is dissolved and re-precipitated as oxalate. The yttrium oxalate is mounted on a nylon planchette and is counted in a low level beta counter to infer Sr-90 activity. Sr-89 activity is determined by precipitating $SrCO_3$ from the sample after yttrium separation. The precipitate is mounted on a nylon planchette and is covered with an 80 mg/cm^2 aluminum absorber for low level beta counting.

CALCULATION OF THE SAMPLE ACTIVITY OR OF THE MDL FOR Sr-89

$$\frac{\text{Net pCi}}{\text{(unit vol. or wt.)}} = \frac{\frac{N}{\Delta t} - \beta - \beta_A}{2.22\,(v)\,(y_S)\,(DF)_{Sr\text{-}89}\,(\varepsilon_{Sr\text{-}89})} \pm \frac{m\sigma\sqrt{\frac{\frac{N}{\Delta t} + \beta + \beta_A}{\Delta t}}}{2.22\,(v)\,(y_S)\,(DF)_{Sr\text{-}89}\,(\varepsilon_{Sr\text{-}89})}$$

net activity

counting error

where:

- N = total counts from sample (counts)
- Δt = counting time for sample (min)
- β = background rate of counter (cpm)
- 2.22 = $\frac{dpm}{pCi}$
- v = volume of sample analyzed
- β_A = background addition from Sr-90 and ingrowth of Y-90
- y_S = chemical yield of strontium
- DF_{Sr-89} = decay factor from the mid collection date to the counting date for Sr-89
- ε_{Sr-89} = Efficiency of the counter Sr-89 with the 80 mg/cm.sq. aluminum absorber
- σ_m or 2 = multiples of counting error

CALCULATION OF THE SAMPLE ACTIVITY OR OF THE MDL FOR Sr-90

$$\frac{\text{Net pCi}}{\text{(unit vol. or wt.)}} = \frac{\frac{N}{\Delta t} - \beta}{2.22\,(v)(y_1)(y_2)(DF)(IF)(\varepsilon)} \pm \frac{2\sqrt{\frac{\frac{N}{\Delta t} + \beta}{\Delta t}}}{2.22\,(v)(y_1)(y_2)(DF)(\varepsilon)(IF)}$$

net activity counting error

where: N = total counts from sample (counts)

Δt = counting time for sample (min)

β = background rate of counter (cpm)

$2.22 = \frac{dpm}{pCi}$

v = volume or weight of sample analyzed

y_1 = chemical yield of the mount or sample counted

y_2 = chemical yield of strontium

DF = decay factor of yttrium from the milking time to the mid count time

ε = efficiency of the counter

$2 \text{ or } \sigma_m$ = multiples of counting error

IF = ingrowth factor for Y-90 from scavenge time to milking time

VIII. EPA INTERLABORATORY COMPARISON PROGRAM

INTER-LABORATORY COMPARISON PROGRAM

TI and RMC participate in the EPA radiological interlaboratory comparison (cross check) program. This participation includes a number of analyses on various sample media as found in the Peach Bottom Atomic Power Station REMP. As a result of this participation, an objective measurement of analytical precision and accuracy, as well as, a bias estimation of the results are obtained. Of the 26 analyses performed at TI,23 fell within the EPA mean and standard deviation. Of the 58 analyses performed at RMC, 38 fell within the EPA mean and standard deviation. Refrence No. 3 discusses any discrepancies between the data. Tables 1-5 summarize the results of the 1983 samples.

TABLE 1

INTER-LABORATORY COMPARISONS
GROSS ALPHA AND BETA IN WATER
(pCi/liter) and AIR PARTICULATES (pCi/filter)

DATE	*RMC/TI No.	SAMPLE TYPE	ISOTOPE	*RMC/TI MEAN±s.d.	EPA MEAN+s.d.	ALL PARTICIPANTS MEAN+s.d.
Jan* 1983	92776	Water	α	15±1	29±7.25	26±6
			β	30±0	31±5	32±5
March* 1983	95367	Water	α	8±1	31±7.8	27±8
			β	9±2	28±5	28±4
March* 1983	96530	APT	α	26±1	26.6±5	28±4
			β	69±1	68±5	69±6
May* 1983	97241	Water	α	29±2	64±16	58±16
			β	87±2	149±7.5	136±17
May* 1983	97490	Water	α	2.9±1	11±5	11±3
			β	19±1	57±5	54±8
July 1983	58244	Water	α	3±0.0	7±5.0	8±2.0
			β	22±1.0	22±5.0	22±4.0
Aug 1983	60596	APT	α	17±1	13±5	14±3
			β	34±1	36±5	39±6
Sept 1983	63237	Water	α	5±1	5±5	5±2
			β	11±1	9±5	10±3
Nov 1983	72309	Water	α	12±1	14±5	13±3
			β	17±1	16±5	17±4

Investigations begun at RMC were never completed due to the lab closing.

*Represents samples analyzed by RMC, others analyzed at TI.

TABLE 2

INTER-LABORATORY COMPARISONS
GAMMA([1])

DATE	*RMC/TI No.	SAMPLE TYPE	ISOTOPE	*RMC/TI MEAN+s.d.	EPA MEAN+s.d.	ALL PARTICIPANTS MEAN+s.d.
Feb* 1983	93729	Water	Cr-51	<102	45±5	48±10
			Co-60	20±2	22±5	23±3
			Z -65	26±2	21±5	22±5
			Ru-106	53±3	48±5	47±10
			Cs-134	20±1	20±5	20±3
			Cs-137	19±3	21±2	19±5
Feb* 1983	94233	Milk	I-131	55.7±7.5	54.5±6.0	54.5±4.8
			Cs-137	27±1	25.6±5	26.3±4.1
			Ba-140	<63	0±0	-
			K-40	1643±118	1512±76	1517±162
March* 1983	94568	Food	I-131	<37	36.9±6	37.1±3.9
			Cs-137	36.3±.6	31.1±5	32.9±3.1
			Ba-140	<60	0±0	-
			K-40	2934±0	2592±130	2649±280
March* 1983	95272	Water	Ra-226	7.4±2.2	12.7±1.9	11.8±2.1
			Ra-228	<2.6	0±0	1±2
March* 1983	96530	APT	Cs-137	39±3	27±5	31±5
May* 1983	97241	Water	Ra-226	9.8±.3	8.5±1.3	8.3±1.1
			Ra-228	8.3±2	4.7±0.7	6.4±2.9
			Co-60	31±4	30±5	31±4
			Cs-134	32±1	33±5	31±4
			Cs-137	25±0	27±5	27±4
June* 1983	97810	Water	Cr-51	<54	60±5	62±11
			Co-60	14±1	13±5	14±2
			Zn-65	34±6	36±5	37±6
			Ru-106	<40	40±5	40±7
			Cs-134	42±1	47±5	44±4
			Cs-137	25±2	26±5	28±5

Investigations begun at RMC were never completed due to the lab closing.

*Represents samples analyzed by RMC, others analyzed at TI.

TABLE 2 (cont.)

INTER-LABORATORY COMPARISONS
GAMMA(1)

DATE	*RMC/TI NO.	SAMPLE TYPE	ISOTOPE	*RMC/TI MEAN±s.d.	EPA MEAN+s.d.	ALL PARTICIPANTS MEAN+s.d.
June 1983	55431	Water	Ra-226(a)	3.4±0.4	4.8±0.7	4.7±1.0
			Ra-228	<3	0±0	3.0±1.0
June* 1983	97824	Milk	I-131	29±1	30±6.0	30±4.0
			Cs-137	46±3	47±5.0	47±3.0
			K-40	1408±0	1486±74	1494±148
Aug 1983	60596	APT	Cs-137	12±1	15±5	19±4
Sept 1983	64681	Water	Ra-226	3.7±0.4	3.1±0.47	3.1±0.6
			Ra-228(a)	2.7±0.7	2.0±0.30	2.3±1.1
Oct 1983	66103	Water	Cr-51	<87	51±5	48±9
			Co-60	21±2	19±5	19±2
			Zn-65(b)	47±4	40±5	40±6
			Ru-106	<50	52±5	48±8
			Cs-134	14±1	15±5	15±3
			Cs-137	25±5	22±5	22±3

(1) Results reported in pCi/liter for milk and water, pCi/sample for air particulates, and pCi/kilograms for food products except K which is reported in mg/liter for milk and mg/kilogram for food products.

(a) In order to improve the results for Ra-226 a new standard was ordered and the efficiency calibration of the alpha counter was checked. For Ra-228 the results are being counted at both the high and low beta-gamma energy regions of the daughter product Ac-228 in order to have two measures of the Ra-228 activity.

(b) Two samples analyzed for Zn-65 were within the 2 sigma limits. One sample gave high results which may have been due to a low count time.

*Represents samples analyzed by RMC, others analyzed at TI.

TABLE 3

INTER-LABORATORY COMPARISONS
TRITIUM IN WATER
PCi/liter

DATE	*RMC/TI	SAMPLE TYPE	ANALYSIS	*RMC/TI MEAN±s.d.	EPA MEAN+s.d.	ALL PARTICIPANTS MEAN+s.d.
Feb* 1983	93757	Water	H-3	2527±136	2560±35	2534±273
April* 1983	96405	Water	H-3	3254±50	3330±362	3298±241
June* 1983	98042	Water	H-3	1603±90	1529±337	1552±202
Oct 1983	66160	Water	H-3	1260±61	1210±329	1226±185
Dec 1983	73265	Water	H-3	2389±405	2410±260	2341±262

*Represents samples analyzed by RMC, others analyzed at TI.

TABLE 4

INTER-LABORATORY COMPARISONS
IODINE-131 IN WATER
PCi/liter

DATE	*RMC/TI NO.	SAMPLE TYPE	ANALYSIS	*RMC/TI MEAN±s.d.	EPA MEAN+s.d.	ALL PARTICIPANTS MEAN+s.d.
April* 1983	95633	Water	I-131	23.0±3.6	26.8±6.0	26.5±4.6
Aug 1983	59188	Water	I-131	14±1	14±6	14±3
Dec 1983	72522	Water	I-131	18±1	20±6	20±4

*Represents samples analyzed by RMC, others analyzed at TI.

TABLE 5

INTER-LABORATORY COMPARISONS
STRONTIUM-89 AND STRONTIUM-90(1)

DATE	*RMC/TI No.	SAMPLE TYPE	ANALYSIS	*RMC/TI MEAN±s.d.	EPA MEAN+s.d.	ALL PARTICIPANTS MEAN+s.d.
Jan* 1983	96261	WATER	Sr-89	19.3±1.5	29.2±5	26.8±7
			Sr-90	16.4± .4	17.2±1.5	16.7±1.7
Feb* 1983	94233	Milk	Sr-89	36.7±2.9	37.4±5	32.2±6.8
			Sr-90	21.0±2	17.8±1.5	16.9±3.5
Mar* 1983	94568	Food	Sr-89	16.7±3.1	34.6±5	33.0±6.3
			Sr-90	26.7±1.5	27.8±1.5	29.2±2.0
Mar* 1983	96530	APT	Sr-90	18±2	20±1.5	19±2
May* 1983	97244	Water	Sr-89	9±1	24±5	25±5
			Sr-90	5±0	13±1.5	13±2
May* 1983	97276	Water	Sr-89	63±3.6	57.1±5	57.2±9.7
			Sr-90	55.7±1.5	37.7±1.9	37.1±4.6
June* 1983	97824	Milk	Sr-89	15±3	25±5.0	23±4
			Sr-90	14±2	16±1.5	15±2
Aug 1983	60596	APT	Sr-90	10±0	10±1.5	10±1
Sept 1983	63234	Water	Sr-89	17±2	15±5	15±3
			Sr-90	10±1	10±1.5	10±2

Investigations begun at RMC were never completed due to the lab closing.

(1) Results reported in pCi/ℓ for water and milk, pCi/filter for air particulates, and pCi/kg for food.

*Represents samples analyzed by RMC, others analyzed at TI.