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United States Nuclear Regulatory Commission
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Gentlemen:

2002 ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT
SALEM AND HOPE CREEK GENERATING STATIONS
DOCKET NOS. 50-272, 50-311 AND 50-354

As required by Section 6.9.1.7 of Appendix A to Facility Operating Licenses DPR-70 and DPR-75 for Salem Generating Station, Unit Nos. 1 and 2, and Section 6.9.1.6 of Appendix A to Facility Operating License NPF-57 for Hope Creek Generating Station, PSEG Nuclear hereby transmits one copy of the 2002 Annual Radiological Environmental Operating Report. This report summarizes the results of the radiological environmental surveillance program for 2002 in the vicinity of the Salem and Hope Creek Generating Stations. The result of this program for 2002 was specifically compared to the result of the pre-operational program.

If you have any questions or comments on this transmittal, please contact Michael Mosier at (856) 339-5434.

Sincerely,

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Attachment

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RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

For

Salem Generating Station, Unit 1: Docket No. 50-272
Salem Generating Station, Unit 2: Docket No. 50-311
Hope Creek Generating Station : Docket No. 50-354

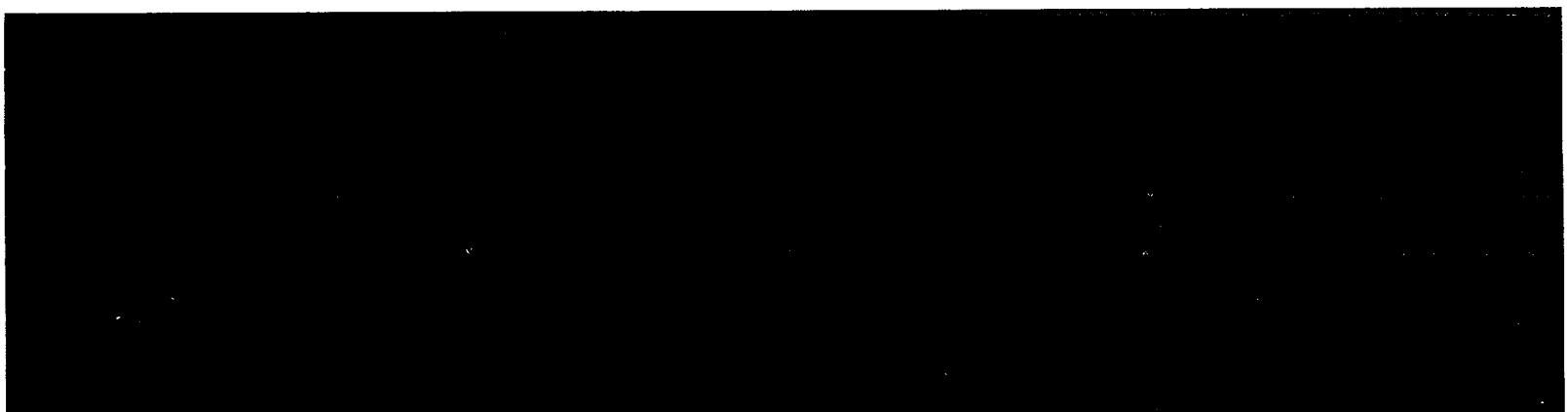
2002 ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT

JANUARY 1 TO DECEMBER 31, 2002

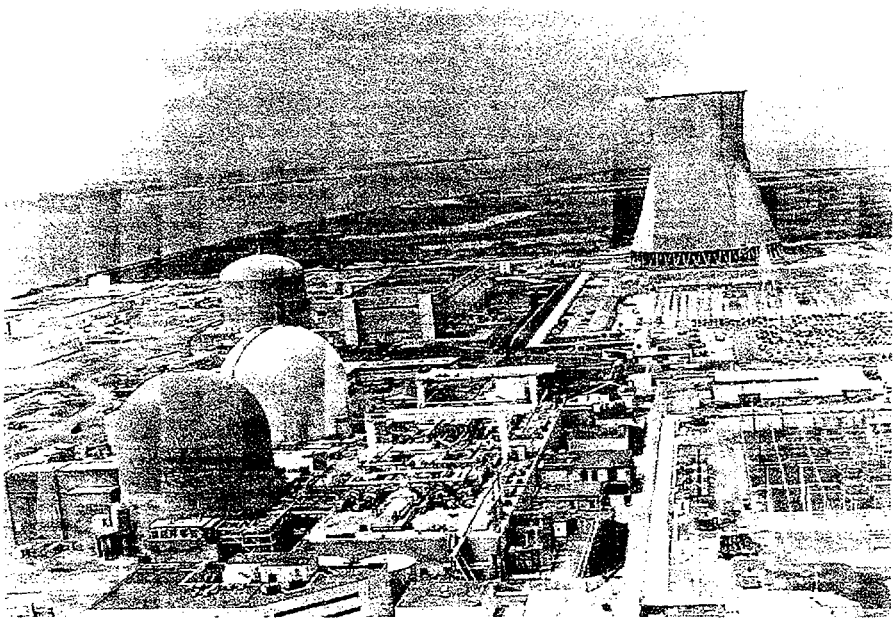
Prepared by

PSEG MAPLEWOOD TESTING SERVICES

APRIL 2003



RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM



SALEM & HOPE CREEK
GENERATING STATIONS

2002 ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT

JANUARY 1 TO DECEMBER 31, 2002

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SUMMARY

During normal operations of a nuclear power generating station there are releases of small amounts of radioactive material to the environment. To monitor and determine the effects of these releases a Radiological Environmental Monitoring Program (REMP) has been established for the environment around Artificial Island where the Salem Generating Stations (SGS) and Hope Creek Generating Station (HCGS) are located. The results of the REMP are published annually, providing a summary and interpretation of the data collected.

PSEG's Maplewood Testing Services (MTS) has been responsible for the collection and analysis of environmental samples during the period of January 1, 2002, through December 31, 2002, and the results are discussed in this report. The REMP for SGS/HCGS was conducted in accordance with the SGS and HCGS Technical Specifications/Offsite Dose Calculation Manual. The Lower Limit of Detection (LLD) values required by the Technical Specifications/ODCM were achieved for this reporting period. The objectives of the program were also met during this period. The data collected assists in demonstrating that SGS and HCGS were operated in compliance with Technical Specifications/ODCM.

Most of the radioactive materials noted in this report are normally present in the environment, either naturally, such as potassium-40, or as a result of non-nuclear generating station activity, such as nuclear bomb testing. Measurements made in the vicinity of SGS/HCGS were compared to background or control measurements and the preoperational REMP study performed before Salem Unit 1 became operational. Samples of air particulates, air iodine, milk, surface, ground and drinking water, vegetables, game, fodder crops, fish, crabs, and sediment were collected and analyzed. External radiation dose measurements were also made in the vicinity of SGS/HCGS using thermoluminescent dosimeters.

From the results obtained, it can be concluded that the levels and fluctuations of radioactivity in environmental samples were as expected for an estuarine environment. No unusual radiological characteristics were observed in the environs of SGS/HCGS during this reporting period. Since these results were comparable to the results obtained during the preoperational phase of the program, and with historical results collected since commercial operation, we can conclude that the operation of SGS and HCGS had no significant impact on the radiological characteristics of the environs of these stations.

To demonstrate compliance with Technical Specifications/ODCM (Sections 3/4.12.1 & 6.8.4.h -1,2,3), samples were analyzed for one or more of the following: gamma emitting isotopes, tritium (H-3), iodine-131 (I-131), gross beta and gross alpha.

The results of these analyses were used to assess the environmental impact of SGS and HCGS operations, thereby demonstrating compliance with Technical Specifications/ODCM (Section 3/4.11) and applicable Federal and State regulations, and to verify the adequacy of radioactive effluent control systems.
The results provided in this report are summarized below:

- There were a total of 1170 analyses on 1143 environmental samples during 2002. Direct radiation dose measurements were made using 196 thermoluminescent dosimeters (TLDs).

- In addition to the detection of naturally-occurring isotopes (i.e. Be-7, K-40, Ra-226 and Th-232) trace levels of Co-60 and Cs-137 were also detected. The concentrations of these nuclides were well below the Technical Specification reporting limit.

- Dose measurements made with quarterly TLDs at 31 offsite locations around the SGS/HCGS site, averaged 47 millirems for the year 2002. The average dose measurements at the control locations (background) was 51 millirems for the year. This was comparable to the preoperational phase of the program which had an average of 55 millirems per year for 1973 to 1976.

THE RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

Lower Alloways Creek Township, Salem County, New Jersey is the site of Salem (SGS)and Hope Creek (HCGS) Generating Stations. SGS consists of two operating pressurized water nuclear power reactors. Salem Unit One has a net rating of 1133 megawatt electric(MWe) and Salem Unit Two has a net rating of 1134 MWe. The licensed core power for both units is 3459 megawatt thermal (MWt). HCGS is a boiling water nuclear power reactor, which has a net rating of 1091 MWe (3339 MWt).

SGS/HCGS are located on a man-made peninsula on the east bank of the Delaware River. It was created by the deposition of hydraulic fill from dredging operations. The environment surrounding SGS/HCGS is characterized mainly by the Delaware River and Bay, extensive tidal marshlands, and low-lying meadowlands. These land types make up approximately 85% of the land area within five miles of the site. Most of the remaining land is used for agriculture [1,2]. More specific information on the demography, hydrology, meteorology, and land use of the area may be found in the Environmental Reports [1,2], Environmental Statements [3,4], and the Updated Final Safety Analysis Reports for SGS and HCGS [5,6].

Since 1968, a radiological environmental monitoring program (REMP) has been conducted at the SGS/HCGS Site. Starting in December, 1972, more extensive radiological monitoring programs were initiated. The operational REMP was initiated in December, 1976, when Salem Unit 1 achieved criticality. PSEG's Maplewood Testing Services (MTS) has been involved in the REMP since its inception. MTS is responsible for the collection of all radiological environmental samples and, from 1973 through June, 1983, conducted a quality assurance program in which duplicates of a portion of those samples analyzed by the primary laboratory were also analyzed by MTS.

From January, 1973, through June, 1983, Radiation Management Corporation (RMC) had primary responsibility for the analysis of all samples under the SGS/HCGS REMP and annual reporting of results. RMC reports for the preoperational and operational phase of the program are referenced in this report [7-9]. On July 1, 1983, MTS assumed primary responsibility for the analysis of all samples (except TLDs) and the reporting of results. Teledyne Brown Engineering Environmental Services (TBE), assumed responsibility for third-party QA analyses and TLDs. An additional vendor, Controls for Environmental Pollution Inc. (CEP), was retained to provide third-party QA analyses and certain non-routine analyses from May, 1988, until June 1, 1992. Currently, Framatome ANP DE&S Environmental Laboratory (Framatome) is the third party QA vendor and the laboratory which performs the TLD analyses. MTS reports for the operational phase from 1983 to 2001 are referenced in this report [10].

An overview of the 2002 Program is provided in Table 1. Radioanalytical data from samples collected under this program were compared with results from the preoperational phase. Differences between these periods were examined statistically to determine the effects of station operations. This report presents the results from January 1 through December 31, 2002, for the SGS/HCGS REMP.

OBJECTIVES

The objectives of the Operational REMP are:

- To fulfill the requirements of the Radiological Surveillance sections of the Technical Specifications/ODCM for SGS/HCGS.
- To determine whether any significant increase occurred in the concentration of radionuclides in critical pathways.
- To determine if SGS or HCGS has caused an increase in the radioactive inventory of long-lived radionuclides.
- To detect any change in ambient gamma radiation levels.
- To verify that SGS and HCGS operations have no detrimental effects on the health and safety of the public or on the environment.

This report, as required by Section 6.9.1.7 of the Salem Technical Specifications/ODCM and Section 6.9.1.6 of the Hope Creek Technical Specifications/ODCM, summarizes the findings of the 2002 REMP. Results of the four-year preoperational program have been summarized for comparison with subsequent operational reports [8].

In order to meet the objectives, an operational REMP was developed. Samples of various media were selected for monitoring due to the radiological dose impact to human and other organisms. The selection of samples was based on: (1), established critical pathways for the transfer of radionuclides through the environment to man, and, (2), experience gained during the preoperational phase. Sampling locations were determined based on site meteorology, Delaware estuarine hydrology, local demography, and land uses.

Sampling locations were divided into two classes, indicator and control. Indicator stations are those, which are expected to manifest station effects. Control samples are collected at locations which are believed to be unaffected by station operations, usually at 15 to 30 kilometers distance. Fluctuations in the levels of radionuclides and direct radiation at indicator stations are evaluated with respect to analogous fluctuations at control stations. Indicator and control station data are also evaluated relative to preoperational data. Appendix A describes and summarizes, in accordance with Section 6.9.1.7 of the Salem TS and Section 6.9.1.6 of the Hope Creek TS, the operational program as performed in 2002.

Appendix B describes the coding system which identifies sample type and location. Table B-1 lists the sampling stations and the types of samples collected at each station. These sampling stations are indicated on Maps B-1 and B-2.

DATA INTERPRETATION

Results of analyses are grouped according to sample type and presented in Appendix C. All results above the Lower Limit of Detection (LLD) are at a confidence level of 2 sigma. This represents the range of values into which 95% of repeated analyses of the same sample should fall. As defined in Regulatory Guide 4.8, LLD is the smallest concentration of radioactive material in a sample that will yield a net count (above system background) that will be detected with 95% probability, with only 5% probability of falsely concluding that a blank observation represents a "real signal". LLD is normally calculated as 4.66 times the standard deviation of the background counting rate, or of the blank sample count, as appropriate, divided by counting efficiency, sample size, 2.22 (dpm per picocurie), the radiochemical yield when applicable, the radioactive decay constant and the elapsed time between sample collection and time of counting. The Minimum Detectable Concentration (MDC) is defined as the smallest concentration of radioactive material that can be detected at a given confidence level. The MDC differs from the LLD in that the MDC takes into consideration the interference caused by the presence of other nuclides while the LLD does not.

The grouped data were averaged and standard deviations calculated in accordance with Appendix B of Reference 16. Thus, the 2 sigma deviations of the averaged data represent sample and not analytical variability. For reporting and calculation of averages, any result occurring at or below the LLD is considered to be at that level. When a group of data was composed of 50% or more LLD values, averages were not calculated.

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, averages based upon repetitive grab samples is considered valid.

QUALITY ASSURANCE PROGRAM

MTS has a quality assurance program designed to ensure confidence in the analytical program. Approximately 20% of the total analytical effort is spent on quality control, including process quality

control, instrument quality control, interlaboratory cross-check analyses, and data review.

The quality of the results obtained by MTS is ensured by the implementation of the Quality Assurance Program as described in the Maplewood Testing Services Quality Assurance Plan [11] and the Environmental and Chemical Division Procedures Manual. The internal quality control activity of MTS includes the quality control of instrumentation, equipment and reagents; the use of reference standards in calibration, documentation of established procedures and computer programs, and analysis of duplicate samples. The external quality control activity is implemented through participation in both the Analytics and the Environmental Resource Associates Interlaboratory Comparison Programs. The results of these Interlaboratory Comparison Programs are listed in Tables D-1 through D-4 in Appendix D.

PROGRAM CHANGES

Two of our milk farms were replaced in 2002 when their owners decided to leave the dairy business. In May, location 11F3 was replaced by 13E3 and in October, location 2F9 was replaced by 2G3.

One of our TLD locations, 9E1, was relocated to 9F1 due to road closures in the area.

RESULTS AND DISCUSSION

The analytical results of the 2002 REMP samples are divided into categories based on exposure pathways: atmospheric, direct, terrestrial, and aquatic. The analytical results for the 2002 REMP are summarized in Appendix A. The data for individual samples are presented in Appendix C. The data collected demonstrates that the SGS and HCGS REMP was conducted in compliance with the Technical Specifications/ODCM.

The REMP for the SGS/HCGS Site has historically included samples and analyses not specifically required by these Stations' Technical Specifications/ODCM. MTS continues to collect and analyze some of these samples in order to maintain personnel proficiency in performing these non-routine analyses. These analyses are referenced throughout the report as Management Audit samples. The summary tables in this report include these additional samples and analyses.

ATMOSPHERIC

Air particulates were collected on Schleicher-Schuell No. 25 glass fiber filters with low-volume air samplers. Iodine was collected from the air by adsorption on triethylenediamine (TEDA) impregnated charcoal cartridges connected in series after the air particulate filters. Air sample volumes were measured with calibrated dry-gas meters and were corrected to standard temperature and pressure.

Air Particulates (Tables C-1, C-2)

Air particulate samples were collected weekly, at 6 locations. Each of the 311 samples collected for the year were analyzed for gross beta. Quarterly composites of the weekly samples from each station were analyzed for specific gamma emitters. Total data recovery for the 6 sampling stations in 2002 was 99.69 percent.

- Gross beta activity was detected in 259 of the indicator station samples at concentrations ranging from 12 x 10^{-3} to 40 x 10^{-3} pCi/m^3 and in all of the control station samples from 14 x 10^{-3} to 47 x 10^{-3} pCi/m^3. The averages for the indicator and control station samples were 23 and 25 x 10^{-3} pCi/m^3, respectively. The maximum preoperational level detected was 920 x 10^{-3} pCi/m^3, with an average of 74 x 10^{-3} pCi/m^3. Results from 1982 to current year are plotted on Figure 1 as quarterly averages. Included along with this plot, for purposes of comparison, is an inset depicting a continuation of this plot from the current year all the way back to 1973.

- Gamma spectroscopy, performed on each of the 24 quarterly composite samples analyzed, indicated the presence of the naturally-occurring radionuclides Be-7 and K-40. All other gamma emitters searched for were below the LLD.

  - Beryllium-7, attributed to cosmic ray activity in the atmosphere, was detected in all 20 indicator station composites that were analyzed, at concentrations ranging from 43 x 10^{-3} to 76 x 10^{-3} pCi/m^3, with an average of 60 x 10^{-3} pCi/m^3. It was detected in the 4 control station composites ranging from 45 x 10^{-3} to 70 x 10^{-3} pCi/m^3, with an average of 60 x 10^{-3} pCi/m^3. The maximum preoperational level detected was 330 x 10^{-3} pCi/m^3, with an average of 109 x 10^{-3} pCi/m^3.

  - Potassium-40 activity was detected in 9 of the indicator station samples, with concentrations ranging from 8 x 10^{-3} to 13 x 10^{-3} pCi/m^3, with an average of 10 x 10^{-3} pCi/m^3. K-40 was also detected in 1 control station sample, at a concentration of 8 x 10^{-3} pCi/m^3. No preoperational data is available for comparison.

Air Iodine (Table C-3)

Iodine in filtered air samples was collected weekly, at 6 locations. Each of the 311 samples collected for the year was analyzed for I-131.

Iodine-131 was not detected in any of the weekly samples analyzed. LLD sensitivities for all the stations, both indicator and control, ranged from <0.8 x 10^{-3} to <9.7 x 10^{-3} pCi/m^3. The maximum preoperational level detected was 42 x 10^{-3} pCi/m^3.

DIRECT RADIATION

Ambient radiation levels in the environs were measured with energy-compensated $CaSO_4$ (Tl) thermoluminescent dosimeters (TLDs) supplied and read by Framatome. Packets containing TLDs for quarterly exposure were placed in the owner- controlled area and around the Site at various distances.

Direct Radiation (Table C-4)

A total of 49 locations were monitored for direct radiation during 2002, including 12 on-site locations, 31 off-site locations within the 10 mile zone, and 6 control locations beyond 10 miles. Effort was made to locate TLDs at schools and population centers in the area.

Five readings for each TLD (ie; 5 elements) at each location were taken in order to obtain a more statistically valid result. For these measurements, the rad is considered equivalent to the rem, in accordance with 10CFR20.1004.

The average dose rate for the 31 quarterly off-site indicator TLDs was 3.9 millirads per standard month, while the on-site average was 4.1 millirads per standard month. The average control rate was 4.3 millirads per standard month. The preoperational average for the quarterly TLD readings was 4.4 millirads per standard month.

In Figure 2, the quarterly average radiation levels of the off-site indicator stations versus the control stations, are plotted for the period 1982 through 2002, with an inset graph depicting the current year back to 1973.

TERRESTRIAL

Milk samples were taken semi-monthly when cows were on pasture and monthly when cows were not grazing on open pasture. Animals are considered on pasture from April to November of each year. Samples were collected in polyethylene containers and transported in ice chests with no preservatives added to the milk.

A well water sample was collected monthly. Separate raw and treated potable water samples were composited daily at the City of Salem water treatment plant. All samples were collected in new polyethylene containers.

Locally grown vegetable and fodder crops were collected at the time of harvest. Such samples were weighed and packed in plastic bags.

Game (muskrat) has been collected annually (time of year dependent on weather conditions, which affect pelt thickness) from local farms after being trapped, stripped of their pelts and gutted. The carcasses were packed in plastic bags and kept chilled in ice chests during transport.

Milk (Table C-5)

Milk samples were collected at 4 local dairy farms (2 farms in NJ and 2 in Delaware). Each sample was analyzed for I-131 and gamma emitters.

- Iodine-131 was not detected in any of the 80 samples analyzed.

  LLD sensitivities for both the indicator and the control station samples ranged from <0.2 to <0.4 pCi/L. The maximum preoperational level detected was 65 pCi/L which occurred following a period of atmospheric nuclear weapons tests. Results from 1982 to 2002 are plotted on Figure 3, with an inset graph depicting the current year back to 1973.

- Gamma spectroscopy performed on each of the 80 samples indicated the presence of the naturally-occurring radionuclide K-40. All other gamma emitters searched for were below the LLD.

  - Potassium-40 was detected in all 80 samples. Concentrations for the 60 indicator station samples ranged from 1010 to 1470 pCi/L, with an average of 1350 pCi/L. The 20 control station sample concentrations ranged from 1170 to 1440 pCi/L, with an average of 1340 pCi/L. The maximum preoperational level detected was 2000 pCi/L, with an average of 1437 pCi/L.

Well Water (Ground Water) (Tables C-6, C-7)

Although wells in the vicinity of SGS/HCGS are not directly affected by plant operations, water samples were collected monthly from one farm's well during January through December of the year. Each sample was analyzed for gross alpha, gross beta, tritium, and gamma emitters.

- Gross alpha activity was detected in 9 of the well water samples at concentrations ranging from 1.5 to 3.0 pCi/L and an average of 2.1 pCi/L. The maximum preoperational level detected was 9.6 pCi/L. There was no preoperational average determined for this analysis.

- Gross beta activity was detected in all 12 well water samples. Concentrations for the samples ranged from 10 to 13 pCi/L, with an average of 11 pCi/L. The 2002 gross beta results are comparable with the preoperational results which ranged from <2.1 to 38 pCi/L, with an average value of 9 pCi/L.

- Tritium activity was not detected in any of the well water samples. The LLD sensitivities ranged from <150 to <180 pCi/L. The maximum preoperational level detected was 380 pCi/L.

- Gamma spectroscopy performed on each of the 12 well water samples indicated the presence of the naturally-occurring radionuclides K-40 and Radium. All other gamma emitters searched for were below the LLD.

  - Radium was detected in all 12 of the well water samples at concentrations ranging from 40 to 176 pCi/L with an average of 112 pCi/L. The maximum preoperational level detected was 2.0 pCi/L.

    These values are similar to those found in the past 12 years. However, as with the 1989 through 2001 results, they are higher than those found in the preoperational program. The results are most likely due to a procedural change for sample preparation. The change results in less removal of radon (and its daughter products) from the sample. It is reasonable to conclude that values currently observed are typical for this region.

  - Potassium-40 was detected in 4 of the samples at concentrations ranging from 43 to 58 pCi/L and an average of 51 pCi/L. The maximum preoperational level detected was 30 pCi/L.

Potable Water (Drinking Water) (Tables C-8, C-9)

Both raw and treated potable water samples were collected and composited by Salem water treatment plant personnel. Each sample consisted of daily aliquots composited into a monthly sample. The raw water source for this plant is Laurel Lake and adjacent wells. Each of the 24 individual samples was analyzed for gross alpha, gross beta, tritium, iodine-131 and gamma emitters.

- Gross alpha activity was detected in 10 raw water samples at concentrations of 0.8 to 2.0 pCi/L and in 7 treated water samples ranging from 0.9 to 1.6 pCi/L. The averages for both raw and treated water samples was 1.1 pCi/L. The maximum preoperational level detected was 2.7 pCi/L.

- Gross beta activity was detected in all 24 samples at concentrations ranging from 2.6 to 4.9 pCi/L for both the raw and treated water. The average concentration for both raw and treated was 3.4 pCi/L. The maximum preoperational level detected was 9.0 pCi/L, with an average of 4.2 pCi/L.

- Tritium activity was not detected in any of the raw or treated water samples. LLD sensitivities ranged from <150 to <180 pCi/L. The maximum preoperational level detected was 350 pCi/L, with an average of 179 pCi/L.

- Iodine-131 measurements were performed to a sensitivity of 1.0 pCi/L even though the drinking water supplies are not affected by discharges from the site since the receiving water body (Delaware River) is brackish and therefore the water is not used for human consumption. Iodine-131 measurements for all 24 samples were below the LLD sensitivities. These sensitivities ranged from <0.2 to <0.4 pCi/L.

- Gamma spectroscopy performed on each of the 24 monthly water samples indicated the presence of the naturally-occurring radionuclides K-40 and Radium. All other gamma emitters searched for were below the LLD.

  - The radionuclide K-40 was detected in 8 of the raw and treated potable waters at concentrations ranging from 44 to 65 pCi/L. The combined average for both raw and treated positive results was 52 pCi/L. There was no preoperational data available for comparison.

  - Radium was detected in one potable raw and 3 of the treated samples at concentrations of 5 to 42 pCi/L. LLD sensitivities for the remaining raw and treated waters ranged from <2 to <6 pCi/L. The maximum preoperational level detected was 1.4 pCi/L. The higher results in the two measurable samples are most likely due to the procedural change for sample preparation, as discussed in the Well Water section.

Vegetables (Table C-10)

Although vegetables in the region are not irrigated with water into which liquid plant effluents have been discharged, a variety of food products grown in the area for human consumption were sampled at 5 indicator stations (12 samples) and 5 control stations (14 samples). The vegetables collected as management audit samples were analyzed for gamma emitters and included asparagus, cabbage, sweet corn, peppers and tomatoes.

Gamma spectroscopy performed on each of the 26 samples indicated the presence of the naturally-occurring radionuclides K-40 and Radium. All other gamma emitters searched for were below the LLD.

Potassium-40 was detected in all 26 samples. Concentrations for the 12 indicator station samples ranged from 1620 to 3030 pCi/kg-wet and averaged 2350 pCi/kg-wet. Concentrations for the 14 control station samples ranged from 1320 to 2550 pCi/kg-wet, and averaged 2050 pCi/kg-wet. The average concentration detected for all samples, both indicator and control, was 2190 pCi/kg-wet. The maximum preoperational level detected was 4800 pCi/kg-wet, with an average of 2140 pCi/kg-wet.

Radium was detected in one control sample (asparagus) at a concentration of 38 pCi/kg-wet. It was not detected in any of the indicator station samples. No preoperational data is available for comparison.

Game (Table C-11)

Although not required by the SGS or HCGS Technical Specifications/ODCM, samples of muskrats inhabiting the marshlands surrounding the Site, are collected. This game is consumed by local residents. The samples, when available, are collected from 2 locations once a year as management audit samples and analyzed for gamma emitters.

Gamma spectroscopy performed on the flesh indicated the presence of the naturally-occurring radionuclide K-40. All other gamma emitters searched for were below the LLD.

Potassium-40 was detected in the indicator station sample at a concentration of 3240 pCi/kg-wet and the control station sample at 2580 pCi/kg-wet. The average for both muskrat samples was 2910 pCi/kg-wet. The maximum preoperational level detected was 27000 pCi/kg-wet, with an average of 4400 pCi/kg-wet.

Fodder Crops (Table C-12)

Although not required by the SGS or HCGS Technical Specifications/ODCM, 6 samples of crops normally used as cattle feed (silage and soybeans) were collected from 3 indicator stations (4 samples) and one control station (2 samples). It was determined that these products may be a significant element in the food-chain pathway. Fodder crops are collected as management audit samples and analyzed for gamma emitters. All of the locations from which samples were collected this year are milk sampling stations.

Gamma spectroscopy performed on each of the 6 samples indicated the presence of the naturally-occurring radionuclides Be-7, K-40 and Radium. All other gamma emitters searched for were below the LLD.

Beryllium-7, attributed to cosmic ray activity in the atmosphere, was detected in 2 indicator silage samples at concentrations of 140 and 340 pCi/kg-wet. It was detected in the control station silage sample at 390 pCi/kg-wet. The average for all the positive silage samples was 290 pCi/kg-wet. The maximum preoperational level detected for silage was 4700 pCi/kg-wet, with an average of 2000 pCi/kg-wet. Be-7 was not detected in either of the two soybean samples. LLD sensitivities for the soybean samples were <23 and <46 pCi/kg-wet. The maximum preoperational level detected for soybean samples was 9300 pCi/kg-dry.

Potassium-40 was detected in all 6 samples. Concentrations for the 4 indicator station samples ranged from 2630 to 14800 pCi/kg-wet and for the 2 control station samples at 9780 and 14600 pCi/kg-wet. The average concentration detected for the silage samples (both indicator and control) was 7790 pCi/kg-wet. Preoperational results averaged 7000 pci/kg-wet. Results for the soybean samples (both indicator and control) averaged 14400 pCi/kg-wet which is comparable to preoperational studies when the average wet/dry factor of 1.2 is used. Preoperational soybean results averaged 22000 pCi/kg-dry.

AQUATIC

All aquatic samples (with the exception of 6S2 shoreline sediment) were collected by Environmental Consulting Services, Inc (ECS). Surface water samples were collected in new polyethylene containers that were rinsed twice with the sample medium prior to collection.

Edible fish and crabs are taken by net and then processed. In processing, the flesh is separated from the bone and shell and placed in sealed polyethylene containers and frozen before being transported in ice chests.

Sediment samples collected by ECS were taken with a bottom grab sampler and frozen in sealed polyethylene containers before being transported in ice chests. MTS personnel collect location 6S2 shoreline sediment on the beach behind the observation building.

Surface Water (Tables C-13, C-14, C-15)

Surface water samples were collected monthly at 4 indicator stations and one control station in the Delaware estuary.

One location is at the outfall area (which is the area where liquid radioactive effluents from the Salem Station are allowed to be discharged into the Delaware River), another is downstream from the outfall area, and another is directly west of the outfall area at the mouth of the Appoquinimink River. Two upstream locations are in the Delaware River and at the mouth of the Chesapeake and Delaware Canal, the latter being sampled when the flow is from the Canal into the river. Station 12C1, at the mouth of the Appoquinimink River, serves as the operational control. All surface water samples were analyzed monthly for gross beta and gamma emitters. Quarterly composites were analyzed for tritium.

- Gross beta activity was detected in all 48 of the indicator station samples ranging from 6 to 168 pCi/L, with an average of 78 pCi/L. Beta activity was detected in all 12 of the control station samples with concentrations ranging from 25 to 156 pCi/L, with an average of 76 pCi/L. The maximum preoperational level detected was 110 pCi/L, with an average of 32 pCi/L.

Quarterly results for all locations are plotted on Figure 4, for the years 1982 to 2002, with an inset graph depicting the current year back to 1973.

- Tritium activity was not detected in any of the control station composites and in only one of the indicator station composites at a concentration of 197 pCi/L. LLD sensitivities for the remaining station composites, both indicator and control, ranged from <160 to <200 pCi/L. The maximum preoperational level detected was 600 pCi/L, with an average of 210 pCi/L. Positive results from 1982 to 2002 are plotted on Figure 5, with an inset graph depicting the current year back to 1973.

- Gamma spectroscopy performed on each of the 48 indicator station and 12 control station surface water samples indicated the presence of the naturally-occurring radionuclide K-40. All other gamma emitters searched for were below the LLD.

  Potassium-40 was detected in 43 samples from the indicator stations at concentrations ranging from 52 to 200 pCi/L and in 11 of the control station samples ranging from 46 to 141 pCi/L. The average for the indicator station locations was 112 pCi/L, while the average for the control station locations was 91 pCi/L. The maximum preoperational level detected was 200 pCi/L, with an average of 48 pCi/L.

Fish (Table C-16)

Edible species of fish were collected semi-annually at 3 locations and analyzed for gamma emitters in flesh. Samples included catfish, weakfish, white perch and striped bass.

- Gamma spectroscopy performed on each of the 4 indicator station samples and 2 control station samples indicated the presence of the naturally-occurring radionuclide K-40. All other gamma emitters searched for were below the LLD.

  - Potassium-40 was detected in all 4 samples from the indicator stations at concentrations ranging from 3190 to 3980 pCi/kg-wet for an average of 3540 pCi/kg-wet. K-40 was detected in both samples from the control location at 3630 and 4020 pCi/kg-wet. The average for the control samples was 3825 pCi/kg-wet. The maximum preoperational level detected was 13000 pCi/kg-wet, with an average of 2900 pCi/kg-wet.

Blue Crab (Table C-17)

Blue crab samples were collected once during the season at 2 locations, 1 indicator and 1 control, and the edible portions were analyzed for gamma emitters.

Gamma spectroscopy performed on the flesh of the indicator station sample and the control station sample indicated the presence of the naturally-occurring radionuclide K-40. All other gamma emitters searched for were below the LLD.

Potassium-40 was detected in the indicator station sample at a concentration of 3050 pCi/kg-wet and in the control station sample at 3010 pCi/kg-wet. The average for both the indicator and control station samples was 3030 pCi/kg-wet. The maximum preoperational level detected was 12000 pCi/kg-wet, with an average of 2835 pCi/kg-wet.

Sediment (Table C-18)

Sediment samples were collected semi-annually from 7 locations, including 6 indicator stations and 1 control station. (Location 6S2 is the only shoreline sediment and it is directly affected by tidal fluctuations) Each of the 14 samples was analyzed for gamma emitters. Although trace levels of man-made nuclides were detected in some sediment samples, these levels were expected and well within the acceptable levels specified in section 3/4.12.1 of the Technical Specifications/ODCM.

Gamma spectroscopy was performed on each of the 12 indicator station samples and 2 control station samples. In addition to the detection of the naturally-occurring radionuclides Radium, K-40, Be-7 and Th-232, low levels of Co-60 and Cs-137 were also detected. All other gamma emitters searched for were below the LLD.

Cesium-137 was detected in 9 indicator station samples at concentrations ranging from 8 to 110 pCi/kg-dry with an average of 58 pCi/kg-dry. It was not detected in either of the control station samples. The maximum preoperational level detected was 400 pCi/kg-dry with an average of 150 pCi/kg-dry. Results from 1982 to 2002 are plotted on Figure 6A, with an inset graph depicting the current year back to 1973.

Cobalt-60 was detected in one of the indicator station samples at a concentration of 53 pCi/kg-dry. It was not detected in either of the control station samples. LLD sensitivities for the remaining 13 samples, indicator and control, ranged from <4 to <51 pCi/kg-dry. Results of all the positive values from 1982 to 2002 are plotted on Figure 6B, with an inset graph depicting the current year back to 1973.

Potassium-40 was detected in all 12 indicator station samples at concentrations ranging from 1310 to 16800 pCi/kg-dry, with an average of 12020 pCi/kg-dry. Concentrations detected in both of the control station samples were at 10200 and 13700 pCi/kg-dry. The average for both the indicator and control station samples was 12000 pCi/kg-dry. The maximum preoperational level detected was 21000 pCi/kg-dry, with an average of 15000 pCi/kg-dry.

Radium was detected in all 12 indicator station samples at concentrations ranging from 80 to 800 pCi/kg-dry, with an average of 530 pCi/kg-dry. Concentrations detected in both of the control station samples were at 590 and 790 pCi/kg-dry, with an average of 690 pCi/kg-dry. The grand average for both the indicator and control station samples was 550 pCi/kg-dry. The maximum pre-operational level detected was 1200 pCi/kg-dry, with an average of 760 pCi/kg-dry.

Thorium-232 was detected in all 12 indicator station samples at concentrations ranging from 90 to 1130 pCi/kg-dry, with an average of 810 pCi/kg-dry. Concentrations detected in both of the control station samples were at 800 and 930 pCi/kg-dry, with an average of 860 pCi/kg-dry.

The grand average for both the indicator and control station samples was 820 pCi/kg-dry. The maximum pre-operational level detected was 1300 pCi/kg-dry, with an average of 840 pCi/kg-dry.

Beryllium-7 was detected in one of the indicator station samples at a concentration of 1640 pCi/kg-dry. It was not detected in any of the control station samples. The LLD sensitivities for the remaining samples, both indicator and control, ranged from <60 to <670 pCi/kg-dry. The maximum preoperational level detected was 2300 pCi/kg-dry.

PROGRAM DEVIATIONS

The following air sampler was unavailable due to equipment malfunction:

STATION	LOCATION	HOURS UNAVAILABLE
1F1	5.8 mi., N of vent	118.9 (1.38%)

This outage was attributable to broken carbon vanes in the sampler vacuum pump. To ensure that this outage would not happen to another location, all air samplers were pulled on a weekly schedule and carbon vanes in all the air sampler vacuum pumps were replaced as a precautionary measure.

The TLDS from locations 2S2 and 16G1 were lost during the 3rd quarter, 2002. The utility poles that the TLDs had been stapled to were removed and disposed of with the TLDS not recovered. In both cases, inquiries were made but it was stated that the TLDS had not been noticeable to the contractors removing the poles. To prevent a reoccurrence, laminated signs were placed on the poles containing our TLDS with "Environmental Radiological Monitoring Samples in Progress" with contact names and phone numbers to notify MTS in the event a pole needs to be replaced.

CONCLUSIONS

The Radiological Environmental Monitoring Program for Salem and Hope Creek Generating Stations was conducted during 2002 in accordance with the SGS and HCGS Technical Specifications/ODCM. The LLD values required by the Technical Specifications/ODCM were achieved for this reporting period. The objectives of the program were also met during this period. The data collected assists in demonstrating that SGS and HCGS were operated in compliance with Technical Specifications/ODCM.

From the results obtained, it can be concluded that the levels and fluctuations of radioactivity in environmental samples were as expected for an estuarine environment. No unusual radiological characteristics were observed in the environs of SGS/HCGS during this reporting period. Since these results were comparable to the results obtained during the preoperational phase of the program, which ran from 1973 to 1976, and with historical results collected since commercial operation, we can conclude that the operation of the Salem and Hope Creek Stations had no significant impact on the radiological characteristics of the environs of that area.

TABLE 1

SALEM AND HOPE CREEK GENERATING STATIONS
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM
(PROGRAM OVERVIEW)

MEDIUM	STATION CODE INDICATOR	STATION CODE CONTROL	COLLECTION FREQUENCY	TYPE/FREQUENCY* OF ANALYSIS
I. ATMOSPHERIC ENVIRONMENT				
a. Air Particulate	5S1 5D1 16E1 1F1 2F6	14G1	Weekly	Gross beta/weekly Gamma scan/quarterly
b. Air Iodine	5S1 5D1 16E1 1F1 2F6	14G1	Weekly	Iodine-131/weekly
II. DIRECT RADIATION				
a. Thermoluminescent Dosimeters	1S1 2S4 3S1 4S1 2S2 5D1 2E1 1F1 5S1 10D1 3E1 2F2 6S2 14D1 13E1 2F6 7S1 15S1 16S1 4F2 10S1 16E1 5F1 6F1 11S1 7F2 11F1 13F4 4D2 9E1 2F5 3F2 11E2 15D1 12E1 3F3 16F2 10F2 12F1 13F2 13F3 14F2 15F3 9F1	3G1 1G3 10G1 16G1 14G1 3H1	Quarterly	Gamma dose/ quarterly
III. Terrestrial Environment				
a. Milk	2F9 11F3 14F4 13E3 2G3	3G1	Monthly (when animals are on pasture) Semi-monthly (when animals are not on pasture)	Iodine-131/monthly Gamma scan/monthly Iodine-131/semi-monthly Gamma scan/semi-monthly

TABLE 1 (cont'd)

SALEM AND HOPE CREEK GENERATING STATIONS
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM
(PROGRAM OVERVIEW)

MEDIUM	STATION CODE INDICATOR	STATION CODE CONTROL	COLLECTION FREQUENCY	TYPE/FREQUENCY* OF ANALYSIS
b. Well Water	3E1		Monthly	Gross alpha/monthly Gross beta/monthly Tritium/monthly Gamma scan/monthly
c. Potable Water (Raw & Treated)	2F3		Monthly (composited daily)	Gross alpha/monthly Gross beta/monthly Tritium/monthly Gamma scan/monthly Iodine-131/monthly
d. Vegetables	3E1 2F4 2F9 3F5 3F6 3F8 6F2 14F3	1G1 2G2 3H5 9G1 14G2	Annually (at harvest)	Gamma scan/on collection
e. Game (Muskrat)	11D1 3E1		Annually	**Gamma scan/on collection
f. Fodder Crops	2F9 11F3 14F4 2G3	3G1	Annually	**Gamma scan/on collection
g. Soil	6S2 2F7 11F3 10D1 2F9 14F4 16E1 5F1	3G1	Every 3 years (2001-2004-2007)	Gamma scan/on collection

TABLE 1 (cont'd)

SALEM AND HOPE CREEK GENERATING STATIONS
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM
(PROGRAM OVERVIEW)

MEDIUM	STATION CODE INDICATOR	CONTROL	COLLECTION FREQUENCY	TYPE/FREQUENCY* OF ANALYSIS
IV. AQUATIC ENVIRONMENT				
a. Surface Water	11A1 7E1 1F2 16F1	12C1	Monthly	Gross beta/monthly Gamma scan/monthly Tritium/quarterly
b. Edible Fish	11A1 7E1	12C1	Semi-annually	Gamma scan (flesh)/on collection
c. Blue Crabs	11A1	12C1	Semi-annually	Gamma scan (flesh)/on collection
d. Sediment	11A1 6S2 7E1 15A1 16F1 16A1	12C1	Semi-annually	Gamma scan/on collection

* Except for TLDs, the quarterly analysis is performed on a composite of individual samples collected during the quarter.

** Management audit analyses, not required by Technical Specifications or by specific commitments to local officials.

FIGURE 1
GROSS BETA ACTIVITY IN AIR PARTICULATE
1982 THROUGH 2002

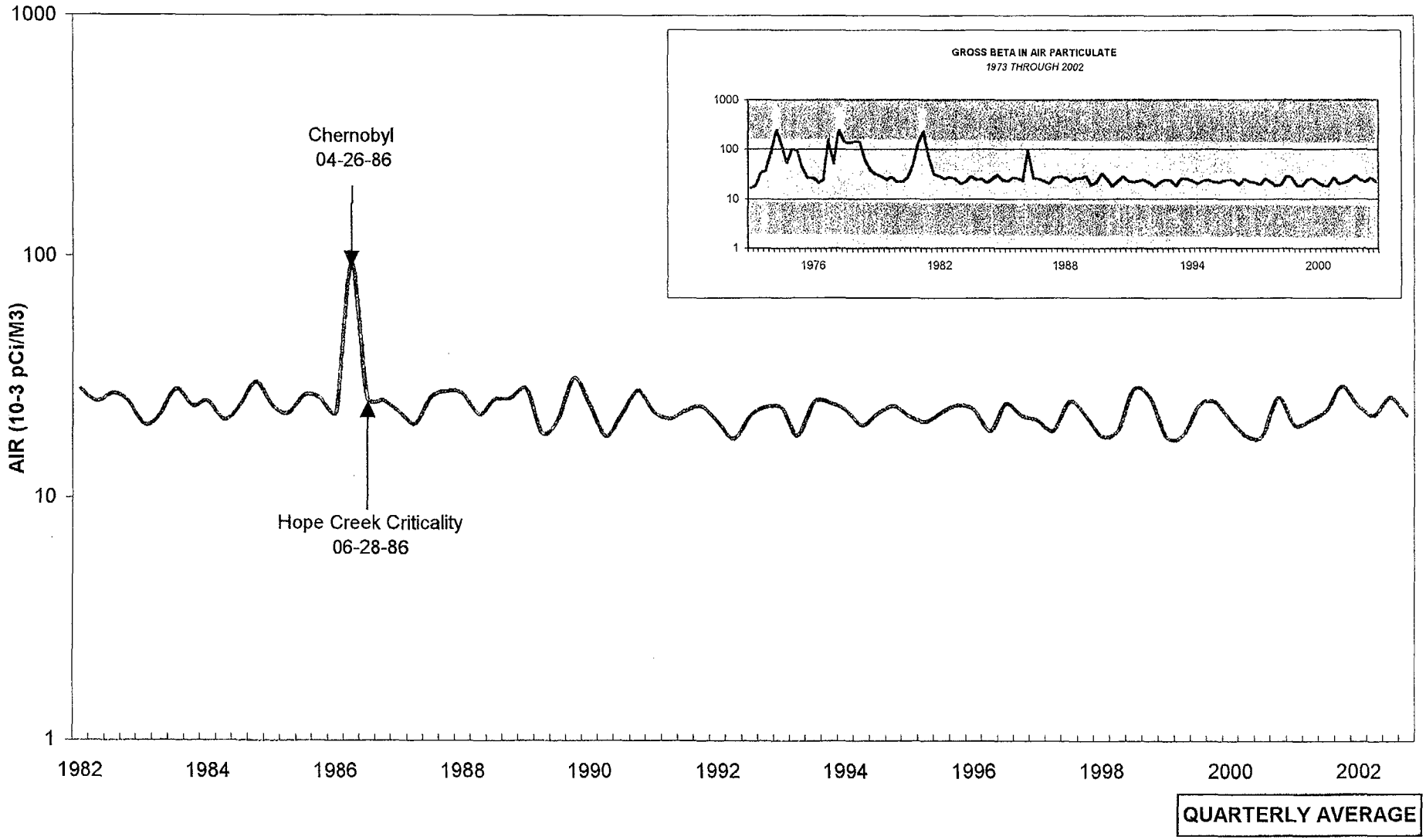
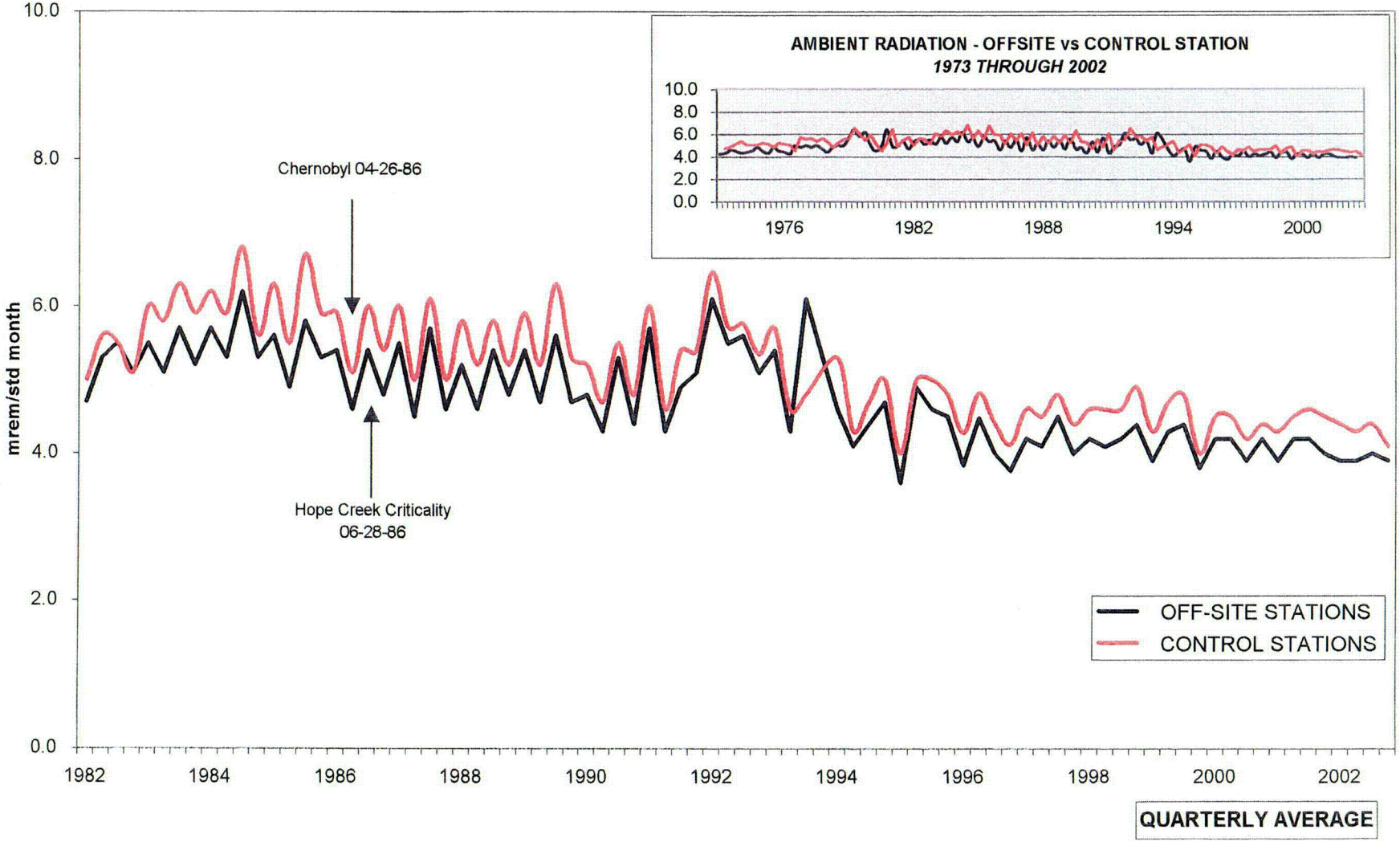


FIGURE 2
AMBIENT RADIATION - OFFSITE vs CONTROL STATION
1982 THROUGH 2002



C01

FIGURE 3
IODINE - 131 ACTIVITY IN MILK
1982 THROUGH 2002

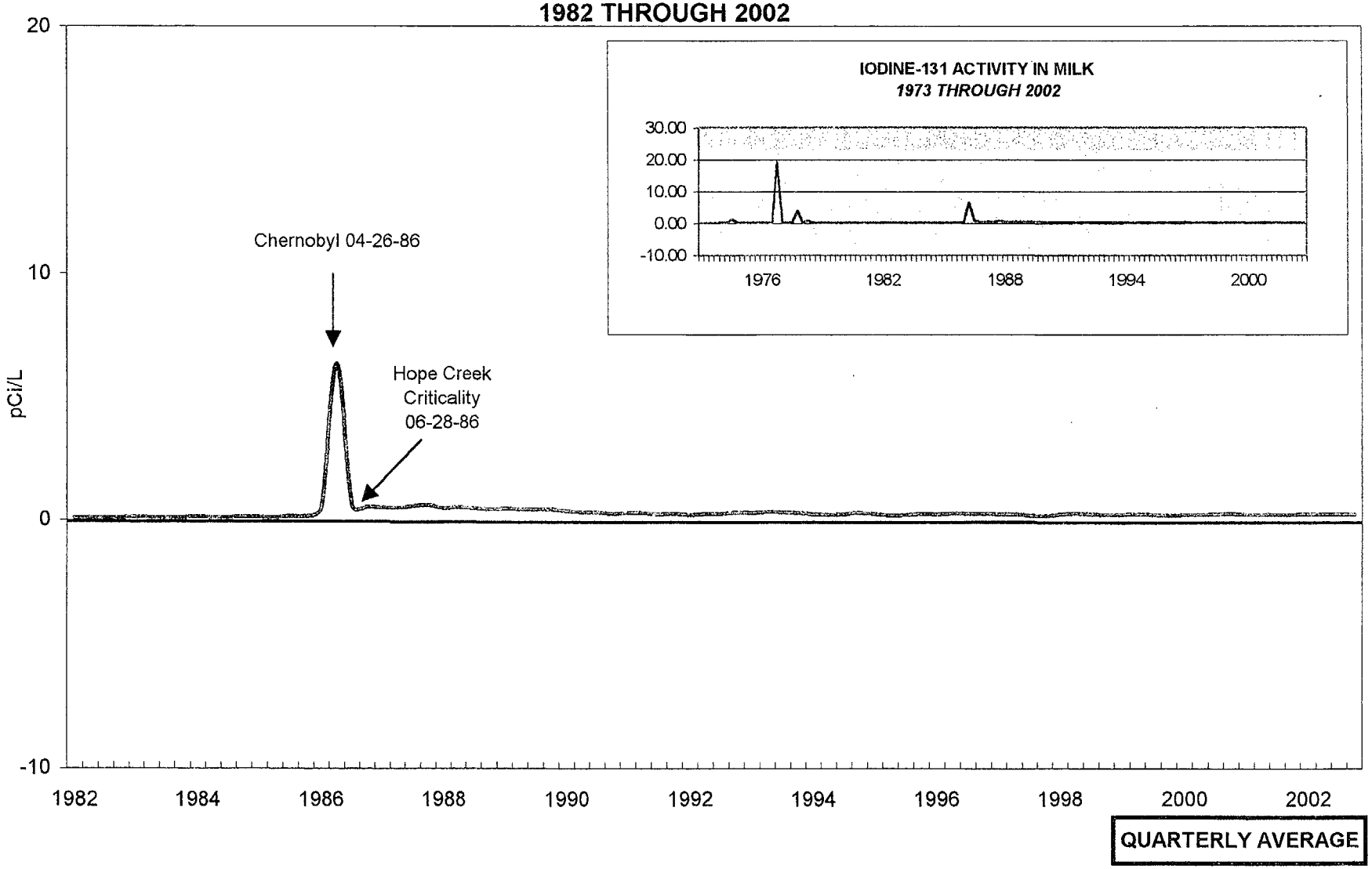


FIGURE 4
GROSS BETA ACTIVITY IN SURFACE WATER
1982 THROUGH 2002

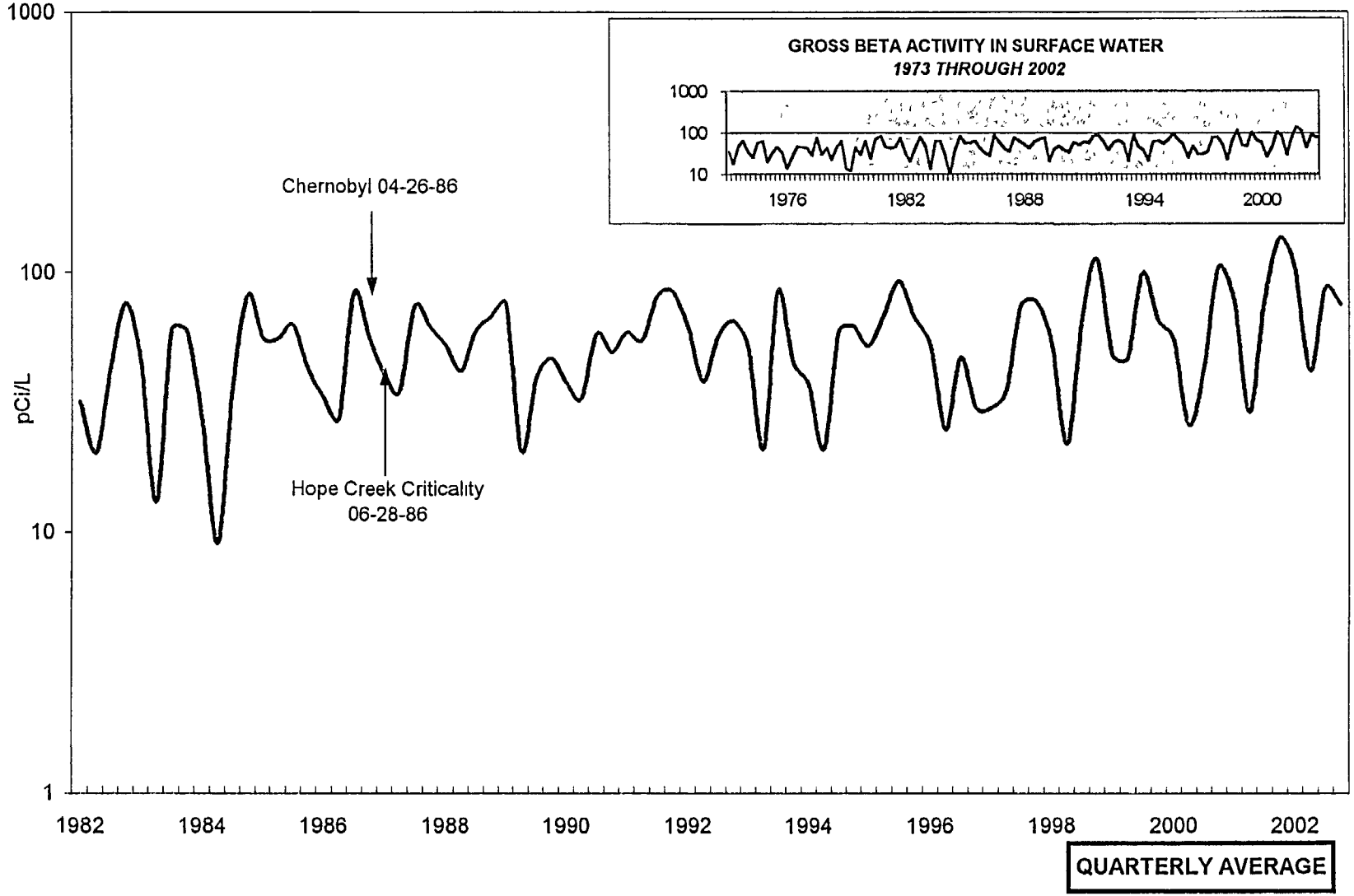


FIGURE 5
TRITIUM ACTIVITY IN SURFACE WATER
1982 THROUGH 2002

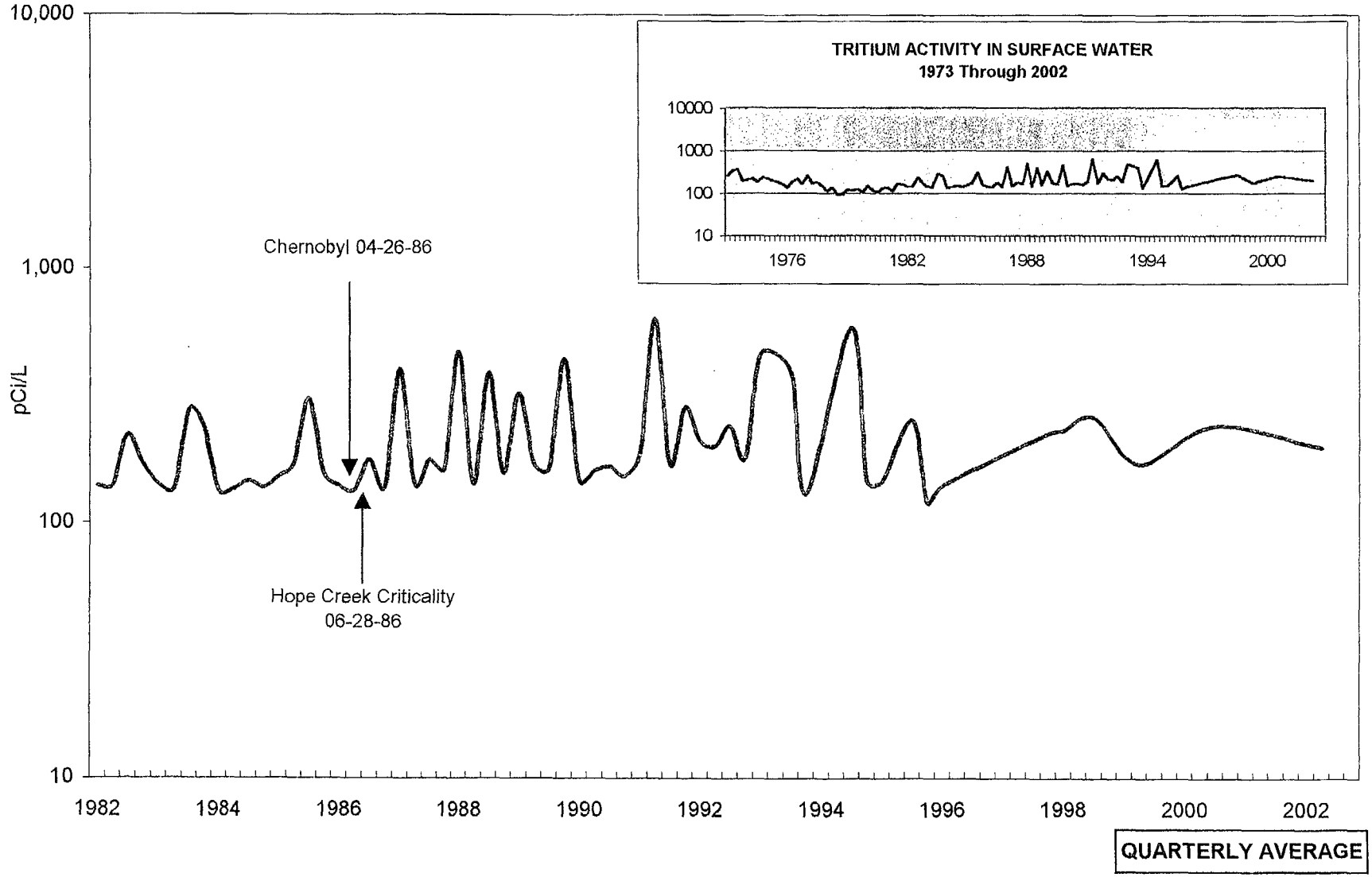


FIGURE 6A
CESIUM-137 ACTIVITY IN AQUATIC SEDIMENT
1982 THROUGH 2002

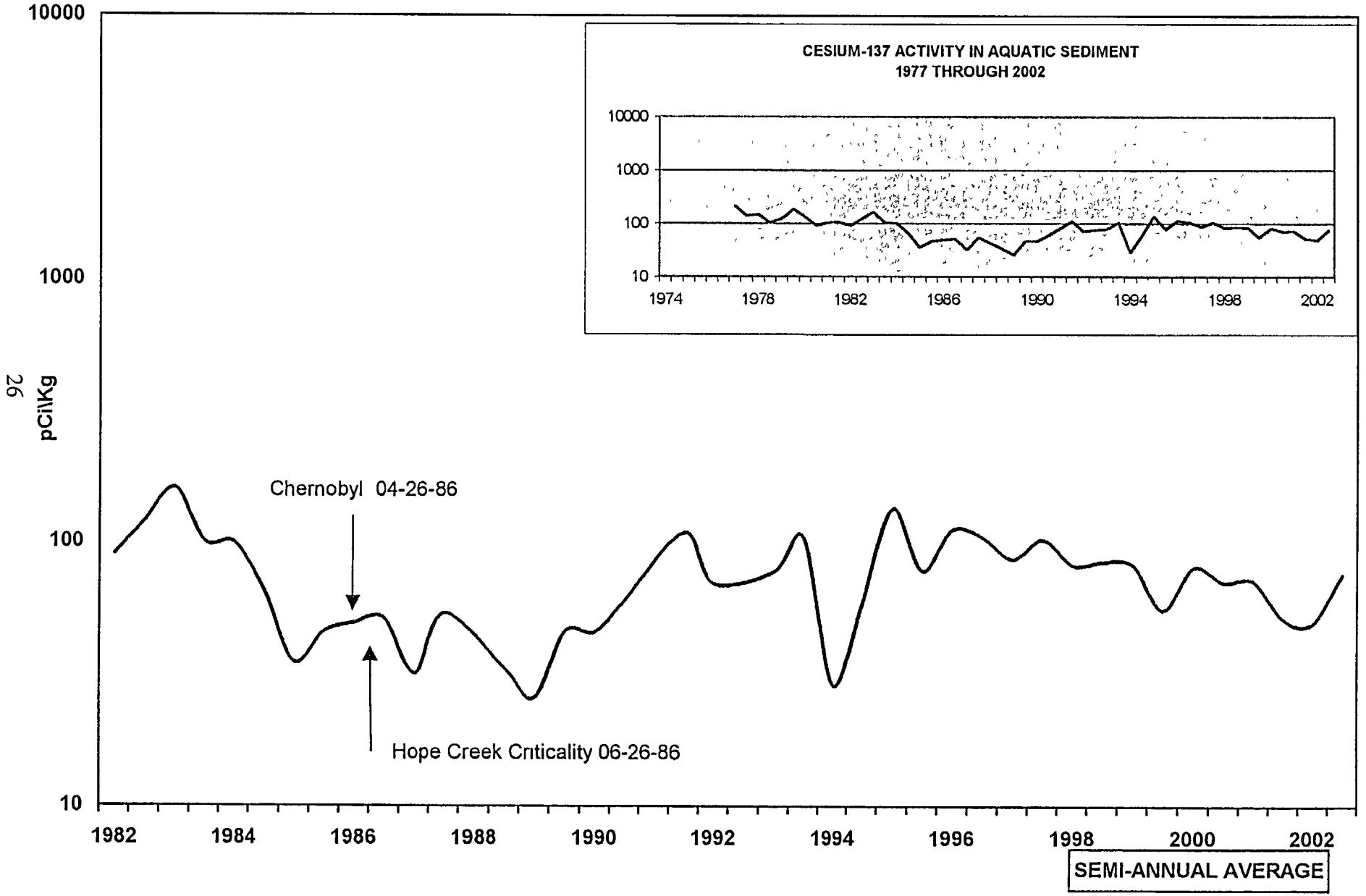
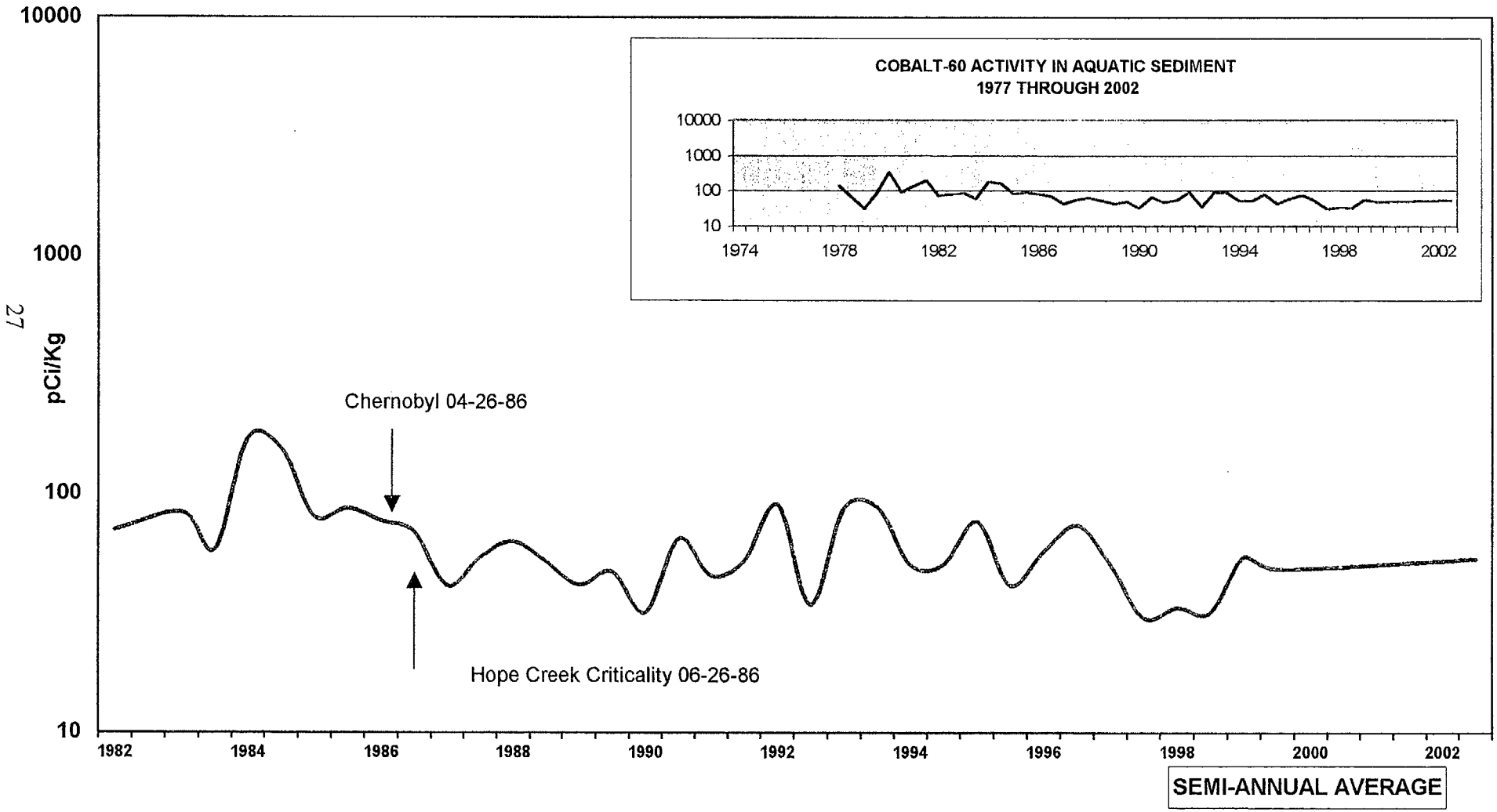


FIGURE 6B
COBALT- 60 ACTIVITY IN AQUATIC SEDIMENT
1982 THROUGH 2002



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[10] PSEG Power LLC Maplewood Testing Services. "Salem and Hope Creek Generating Stations' Radiological Environmental Monitoring Program - Annual Reports 1983 through 2001".

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[12] Public Service Enterprise Group . "Salem Nuclear Generating Station Technical Specifications", Appendix A to Operating License No. DPR-70, 1976, Sections 6.8.4.h - 1,2,3 and 6.9.1.7.

[13] Public Service Enterprise Group . "Hope Creek Generating Station Technical Specifications", Appendix A to Facility Operating License No. NPF-57, 1986, Sections 6.8.4.h - 1,2,3 and 6.9.1.6.

[14] Public Service Enterprise Group . "Offsite Dose Calculation Manual" - Salem Generating Station.

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APPENDIX A

PROGRAM SUMMARY

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

SALEM GENERATING STATION — DOCKET 50-272/-311
HOPE CREEK GENERATING STATION — DOCKET NO. 50-354

SALEM COUNTY, NEW JERSEY — JANUARY 1, 2002 to DECEMBER 31, 2002

MEDIUM OR PATHWAY SAMPLE (UNIT OF MEASUREMENT)	Analysis And Total Number of Analyses Performed		Lower Limit of Detection (LLD)*	All Indicator Locations Mean (Range) **	Location with Highest Mean Name Distance and Direction	Mean (Range)	Control Location Mean (Range)	Number of Nonroutine Reported Measurements
I. AIRBORNE								
Air Particulates (10^{-3} pCi/m^3)	Beta	311	6.0	23 (259 /260) (12-40)	14G1 11.8 mi WNW	25 (52 /52) (14-47)	25 (52 /52) (14-47)	0
	Gamma Be7	24	7.6	60 (20 /20) (43-76)	5D1 3.5 mi E	60 (4 /4) (49-70)	60 (4 /4) (45-70)	0
					14G1 11.8 mi WNW	60 (4 /4) (45-70)		0
					16E1 4.1 mi NNW	60 (4 /4) (47-76)		0
	K-40	24	13	10 (9 /20) (8-13)	5S1 1.0 mi E	11 (3 /4) (10-13)	8 (1 /4) (8-8)	0
Air Iodine (10^{-3} pCi/m^3)	I-131	311	9.1	<LLD	-	<LLD	<LLD	0
II DIRECT								
Direct Radiation (mrad/std. month)	Quarterly Badges	194	-	4 (175 /175) (2.6-6.9)	2S2 0.4 mi NNE	6 (3 /3) (5.4-6.9)	4.3 (23 /23) (3.4-5.1)	0
III TERRESTRIAL								
Milk (pCi/L)	I-131	80	0.5	<LLD	-	<LLD	<LLD	0
	Gamma K-40	80	50	1350 (60 /60) (1010-1470)	13E3 4.9 mi W	1370 (20 /20) (1270-1460)	1340 (20 /20) (1170-1440)	0

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

SALEM GENERATING STATION DOCKET 50-272/-311
HOPE CREEK GENERATING STATION DOCKET NO. 50-354

SALEM COUNTY, NEW JERSEY JANUARY 1, 2002 to DECEMBER 31, 2002

MEDIUM OR PATHWAY SAMPLE (UNIT OF MEASUREMENT)	Analysis And Total Number of Analyses Performed		Lower Limit of Detection (LLD)*	All Indicator Locations Mean (Range) **	Location with Highest Mean Name Distance and Direction	Mean (Range)	Control Location Mean (Range)	Number of Nonroutine Reported Measurements
III TERRESTRIAL								
Well Water (pCi/L)	Alpha	12	1.7	2.3 (9 /12) (1.5-3)	3E1 4.1 mi NE	2.3 (9 /12) (1.5-3)	No Control Location	0
	Beta	12	1 0***	11 (12 /12) (10-13)	3E1 4 1 mi NE	11 (12 /12) (10-13)	No Control Location	0
	H-3	12	180	<LLD	-	<LLD	No Control Location	0
	Gamma							
	K-40	12	30	51 (4 /12) (43-58)	3E1 4.1mi NE	51 (4 /12) (43-58)	No Control Location	0
	RA-NAT	12	6 5	112 (12 /12) (40-176)	3E1 4.1mi NE	112 (12 /12) (40-176)	No Control Location	0
Potable Water (pCi/L)	Alpha	24	1.0	1.2 (15 /24) (0.8-2)	2F3 8.0 mi NNE	1.2 (15 /24) (0.8-2)	No Control Location	0
	Beta	24	1.0***	3 4 (24 /24) (2.6-4.9)	2F3 8.0 mi NNE	3.4 (24 /24) (2.6-4.9)	No Control Location	0
	H-3	24	180	<LLD	-	<LLD	No Control Location	0
	Gamma							
	K-40	24	30	52 (8 /24) (44-65)	2F3 8.0 mi NNE	52 (8 /24) (44-65)	No Control Location	0
	I-131	24	0.4	<LLD	-	<LLD	No Control Location	0
	RA-NAT	24	6.5	16 (4 /24) (4.9-42)	2F3 8.0 mi NNE	16 (4 /24) (4.9-42)	No Control Location	0

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

SALEM GENERATING STATION — DOCKET 50-272/-311
HOPE CREEK GENERATING STATION — DOCKET NO. 50-354

SALEM COUNTY, NEW JERSEY — JANUARY 1, 2002 to DECEMBER 31, 2002

MEDIUM OR PATHWAY SAMPLE (UNIT OF MEASUREMENT)	Analysis And Total Number of Analyses Performed		Lower Limit of Detection (LLD)*	All Indicator Locations Mean (Range) **	Location with Highest Mean Name Distance and Direction	Mean (Range)	Control Location Mean (Range)	Number of Nonroutine Reported Measurements
III TERRESTRIAL								
Fruit & Vegetables	Gamma K-40	26	70	2350 (12 /12) (1620-3030)	6F2 8.2 mi ESE	2950 (1 /1) (2950-2950)	2050 (14 /14) (1320-2550)	0
(pCi/Kg-wet)	RA-NAT	26	13	<LLD	3H5 25 mi NE	38 (1 /5) (38)	38	0
Game (pCi/Kg-wet)	Gamma K-40	2	70	3240 (1 /1) (3240)	3E1 4.1 mi. NE	3240 (1 /1) (3240)	2580 (1 /1) (2580)	0
Fodder Crops (pCi/Kg-wet)	Gamma Be-7	6	46	240 (2 /4) (140-340)	3G1 17 mi NE	390 (1 /2) (390)	390 (1 /2) (390)	0
	K-40	6	70	8870 (4 /4) (2630-14800)	2G3 12 mi NNE	14800 (1 /1) (14800-14800)	12190 (2 /2) (9780-14600)	0
	RA-NAT	6	22	23 (1 /4) (23)	2G3 12 mi NNE	23 (1 /1) (23)	<LLD	0
IV AQUATIC								
Surface Water (pCi/L)	Beta	60	3.8	78 (48 /48) (6-168)	7E1 4.5 mi SE	110 (12 /12) (71-161)	76 (12 /12) (25-156)	0
	H-3	20	200	197 (1 /48) (197-197)	11A1 0.2 mi SW	197 (1 /12) (197-197)	<LLD	0
	Gamma K-40	60	30	112 (43 /48) (52-200)	11A1 0.2 mi SW	135 (10 /12) (83-193)	91 (11 /12) (46-141)	0
					7E1 4.5 mi SE	135 (12 /12) (77-200)		

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

SALEM GENERATING STATION DOCKET 50-272/-311
HOPE CREEK GENERATING STATION DOCKET NO. 50-354

SALEM COUNTY, NEW JERSEY JANUARY 1, 2002 to DECEMBER 31, 2002

MEDIUM OR PATHWAY SAMPLE (UNIT OF MEASUREMENT)	Analysis And Total Number of Analyses Performed		Lower Limit of Detection (LLD)*	All Indicator Locations Mean (Range) **	Location with Highest Mean Name Distance and Direction	Mean (Range)	Control Location Mean (Range)	Number of Nonroutine Reported Measurements
IV AQUATIC								
Blue Crabs (pCi/kg-wet)	Gamma K-40	2	70	3050 (1 /1) (3050-3050)	11A1 0.2 mi SW	3050 (1 /1) (3050-3050)	3010 (1 /1) (3010-3010)	0
Edible Fish (pCi/kg-wet)	Gamma K-40	6	70	3540 (4 /4) (3190-3980)	12C1 2.5 mi WSW	3825 (2 /2) (3630-4020)	3825 (2 /2) (3630-4020)	0
Sediment (pCi/kg-dry)	Gamma							
	Be-7	14	158	1640 (1 /12) (1640-1640)	16A1 0.7 mi NNW	1640 (1 /2) (1640)	<LLD	0
	K-40	14	70	12020 (12 /12) (1310-16800)	11A1 0.2 mi SW	15600 (2 /2) (15300-15900)	11950 (2 /2) (10200-13700)	0
	Co-60	14	53	53 (1 /12) (53-53)	16A1 0.7 mi NNW	53 (1 /2) (53)	<LLD	0
	Cs-134	14	15	<LLD			<LLD	0
	Cs-137	14	33	68 (9 /12) (8-119)	11A1 0.2 mi SW	110 (2 /2) (100-119)	<LLD	0
	RA-NAT	14	45	530 (12 /12) (80-800)	7E1 4.5 mi SE	760 (2 /2) (710-800)	690 (2 /2) (590-790)	0
	Th-232	14	50	810 (12 /12) (90-1130)	11A1 0.2 mi SW	1070 (2 /2) (1060-1080)	865 (2 /2) (800-930)	0

* LLD listed is the lower limit of detection which we endeavored to achieve during this reporting period. In some instances nuclides were detected at concentrations above the LLD values shown.

** Mean calculated using values above LLD only. Fraction of measurements above LLD are in parentheses.

*** Typical LLD values.

APPENDIX B

SAMPLE DESIGNATION

AND

LOCATIONS

APPENDIX B

SAMPLE DESIGNATION

The PSEG's Maplewood Testing Services identifies samples by a three part code. The first two letters are the program identification code. Because of the proximity of the Salem and Hope Creek Stations a common environmental surveillance program is being conducted. The identification code, "SA", has been applied to Salem and Hope Creek stations. The next three letters are for the media sampled.

AIO = Air Iodine	IDM = Immersion Dose (TLD)
APT = Air Particulate	MLK = Milk
ECH = Hard Shell Blue Crab	PWR = Potable Water (Raw)
ESF = Edible Fish	PWT = Potable Water (Treated)
ESS = Sediment	SOL = Soil
FPL = Green Leafy Vegetables	SWA = Surface Water
FPV = Vegetables (Various)	VGT = Fodder Crops (Various)
GAM = Game (Muskrat)	WWA = Well Water

The last four symbols are a location code based on direction and distance from a standard reference point. Of these, the first two represent each of the sixteen angular sectors of 22.5 degrees centered about the reactor site. Sector one is divided evenly by the north axis and other sectors are numbered in a clockwise direction; e.g., 2=NNE, 3=NE, 4=ENE, etc. The next digit is a letter which represents the radial distance from the reference point:

S = On-site location	E = 4-5 miles off-site
A = 0-1 miles off-site	F = 5-10 miles off-site
B = 1-2 miles off-site	G = 10-20 miles off-site
C = 2-3 miles off-site	H = >20 miles off-site
D = 3-4 miles off-site	

The last number is the station numerical designation within each sector and zone; e.g., 1,2,3,... For example, the designation SA-WWA-3E1 would indicate a sample in the Salem and Hope Creek program (SA), consisting of well water (WWA), which had been collected in sector number 3, centered at 45° (north east) with respect to the reactor site at a radial distance of 4 to 5 miles off-site, (therefore, radial distance E). The number 1 indicates that this is sampling station #1 in that particular sector.

TABLE B-1
SAMPLING LOCATIONS

Specific information about the individual sampling locations are given in Table B-1. Maps B-1 and B-2 show the locations of sampling stations with respect to the site. A Portable Global Positioning System (GPS) was used to provide the coordinates of sampling locations. The Datem used was WGS 84.

STATION CODE	STATION LOCATION	LATITUDINAL DEG. MIN. SEC	LONGITUDINAL DEG. MIN. SEC	SAMPLE TYPE
1S1	0.55mi. N of vent	39 - 28 - 16	75 - 32 - 15	IDM
2S2	0.4 mi. NNE of vent; Lamp Pole 65 Near HC Switch Yard	39 - 28 - 07	75 - 32 - 00	IDM
2S4	0.59 mi. NNE of vent	39 - 28 - 16	75 - 31 - 55	IDM
3S1	0.58 mi. NE of vent	39 - 28 - 08	75 - 31 - 41	IDM
4S1	0.60 mi. ENE of vent	39 - 28 - 02	75 - 31 - 33	IDM
5S1	1.0 mi. E of vent; site access road	39 - 27 - 38	75 - 31 - 08	AIO,APT,IDM
6S2	0.2 mi. ESE of vent; observation building	39 - 27 - 43	75 - 31 - 55	IDM,SOL,ESS
7S1	0.12 mi. SE of vent; station personnel gate	39 - 27 - 44	75 - 32 - 03	IDM
10S1	0.14 mi. SSW of vent; inlet cooling water bldg.	39 - 27 - 39	75 - 32 - 10	IDM
11S1	0.09 mi. SW of vent; service water inlet bldg.	39 - 27 - 43	75 - 32 - 12	IDM
15S1	0.57 mi. NW of vent	39 - 28 - 10	75 - 32 - 32	IDM
16S1	0.54 mi. NNW of vent	39 - 28 - 13	75 - 32 - 26	IDM
11A1	0.2 mi. SW of vent; outfall area	39 - 27 - 59	75 - 32 - 25	ECH,ESF,ESS,SWA
15A1	0.3 mi. NW of vent; cooling tower blowdown discharge line outfall	39 - 27 - 67	75 - 32 - 19	ESS
16A1	0.7 mi. NNW of vent; south storm drain discharge line	39 - 28 - 24	75 - 32 - 58	ESS
12C1	2.5 mi. WSW of vent; west bank of Delaware River	39 - 27 - 22	75 - 34 - 08	ECH,ESF,ESS,SWA
4D2	3.7 mi. ENE of vent; Alloway Creek Neck Road	39 - 29 - 18	75 - 32 - 11	IDM
5D1	3.5 mi. E of vent; local farm	39 - 28 - 24	75 - 28 - 22	AIO,APT,IDM
10D1	3.9 mi. SSW of vent; Taylor's Bridge Spur	39 - 24 - 37	75 - 33 - 44	IDM,SOL
11D1	3.5 mi. SW of vent	39 - 24 - 49	75 - 34 - 26	GAM
14D1	3.4 mi. WNW of vent; Bay View, Delaware	39 - 29 - 02	75 - 35 - 31	IDM
15D1	3.8 mi. NW of vent; Rt. 9, Augustine Beach	39 - 30 - 08	75 - 35 - 02	IDM
2E1	4.4 mi. NNE of vent; local farm	39 - 31 - 23	75 - 30 - 26	IDM
3E1	4.1 mi. NE of vent; local farm	39 - 30 - 07	75 - 28 - 41	GAM,IDM,VGT,WWA,FPV

TABLE B-1 (cont'd)

STATION CODE	STATION LOCATION	LATITUDINAL DEG. MIN. SEC	LONGITUDINAL DEG. MIN. SEC	SAMPLE TYPE
7E1	4.5 mi. SE of vent; 1 mi. W of Mad Horse Creek	39 - 25 - 08	75 - 28 - 64	ESF,ESS,SWA
9E1	4.2 mi. S of vent	39 - 24 - 10	75 - 32 - 42	IDM
11E2	5.0 mi. SW of vent; Rt. 9	39 - 24 - 20	75 - 35 - 33	IDM
12E1	4.4 mi. WSW of vent; Thomas Landing	39 - 26 - 52	75 - 36 - 59	IDM
13E1	4.2 mi. W of vent; Diehl House Lab	39 - 27 - 59	75 - 36 - 44	IDM
13E3	4.9 mi. W of vent; Joseph Vari, Odessa, DE	39 - 27 - 17	75 - 37 - 30	MLK,FPV,VGT
16E1	4.1 mi. NNW of vent; Port Penn	39 - 30 - 47	75 - 34 - 34	AIO,APT,IDM,SOL
1F1	5.8 mi. N of vent; Fort Elfsborg	39 - 32 - 45	75 - 31 - 06	AIO,APT,IDM
1F2	7.1 mi. N of vent; midpoint of Delaware River	39 - 33 - 08	75 - 32 - 54	SWA
2F2	8.7 mi. NNE of vent; Corner of 5th & Howell, Salem	39 - 34 - 38	75 - 28 - 04	IDM
2F3	8.0 mi. NNE of vent; Salem Water Company	39 - 33 - 40	75 - 27 - 18	PWR,PWT
2F4	6.3 mi. NNE of vent; local farm	39 - 33 - 21	75 - 30 - 33	FPV,FPL
2F5	7.4 mi. NNE of vent; Salem High School	39 - 33 - 27	75 - 28 - 31	IDM
2F6	7.3 mi. NNE of vent; Southern Training Center	39 - 33 - 43	75 - 28 - 48	AIO,APT,IDM
2F7	5.7 mi. NNE of vent; local farm	39 - 32 - 40	75 - 30 - 53	SOL
2F8	5.3 mi. NNE OF vent; local farm	39 - 31 - 54	75 - 29 - 18	FPV
2F9	7.5 mi. NNE of vent; Tilbury Farms , 45 S. Tilbury Rd, Salem	39 - 33 - 55	75 - 29 - 30	MLK,FPV,VGT,SOL
3F2	5.1 mi. NE of vent;Hancocks Bridge Municipal Bld	39 - 30 - 25	75 - 27 - 36	IDM
3F3	8.6 mi. NE of vent; Quinton Township School	39 - 32 - 38	75 - 24 - 45	IDM
3F5	9.4 mi. NE of vent; Harris's Farm Market	39 - 33 - 29	75 - 24 - 54	FPV
3F6	6.5 mi. NE of vent; #324 Salem/Hancocks Bridge Road	39 - 32 - 03	75 - 28 - 00	FPV
3F8	5.1 mi. NE of vent; 33 Maple Ave., Hancocks Bridge	39 - 30 -25	75 - 27 - 37	FPV,FPL
4F2	6.0 mi. ENE of vent; Mays Lane, Harmersville	39 - 29 - 58	75 - 26 - 03	IDM
5F1	6.5 mi. E of vent; Canton	39 - 28 - 22	75 - 24 - 59	IDM,SOL
6F1	6.4 mi. ESE of vent; Stow Neck Road	39 - 26 - 24	75 - 25 - 09	IDM
6F2	8.2 mi. ESE of vent; RD#3 Box 160 Bridgeton, NJ	39 - 26 - 04	75 - 23 - 09	FPV,FPL
7F2	9.1 mi. SE of vent; Bayside, New Jersey	39 - 22 - 56	75 - 24 - 17	IDM
9F1	5.3 mi. S of vent; D.P.A.L. 48912-30217	39 - 23 - 03	75 - 32 - 06	IDM
10F2	5.8 mi. SSW of vent; Rt. 9	39 - 23 - 01	75 - 34 - 09	IDM
11F1	6.2 mi. SW of vent; Taylor's Bridge Delaware	39 - 24 - 44	75 - 37 - 37	IDM
11F3	5.3 mi. SW of vent; Townsend, Delaware	39 - 24 - 06	75 - 36 - 20	MLK,VGT,SOL
12F1	9.4 mi. WSW of vent; Townsend Elementary School	39 - 23 - 47	75 - 41 - 18	IDM

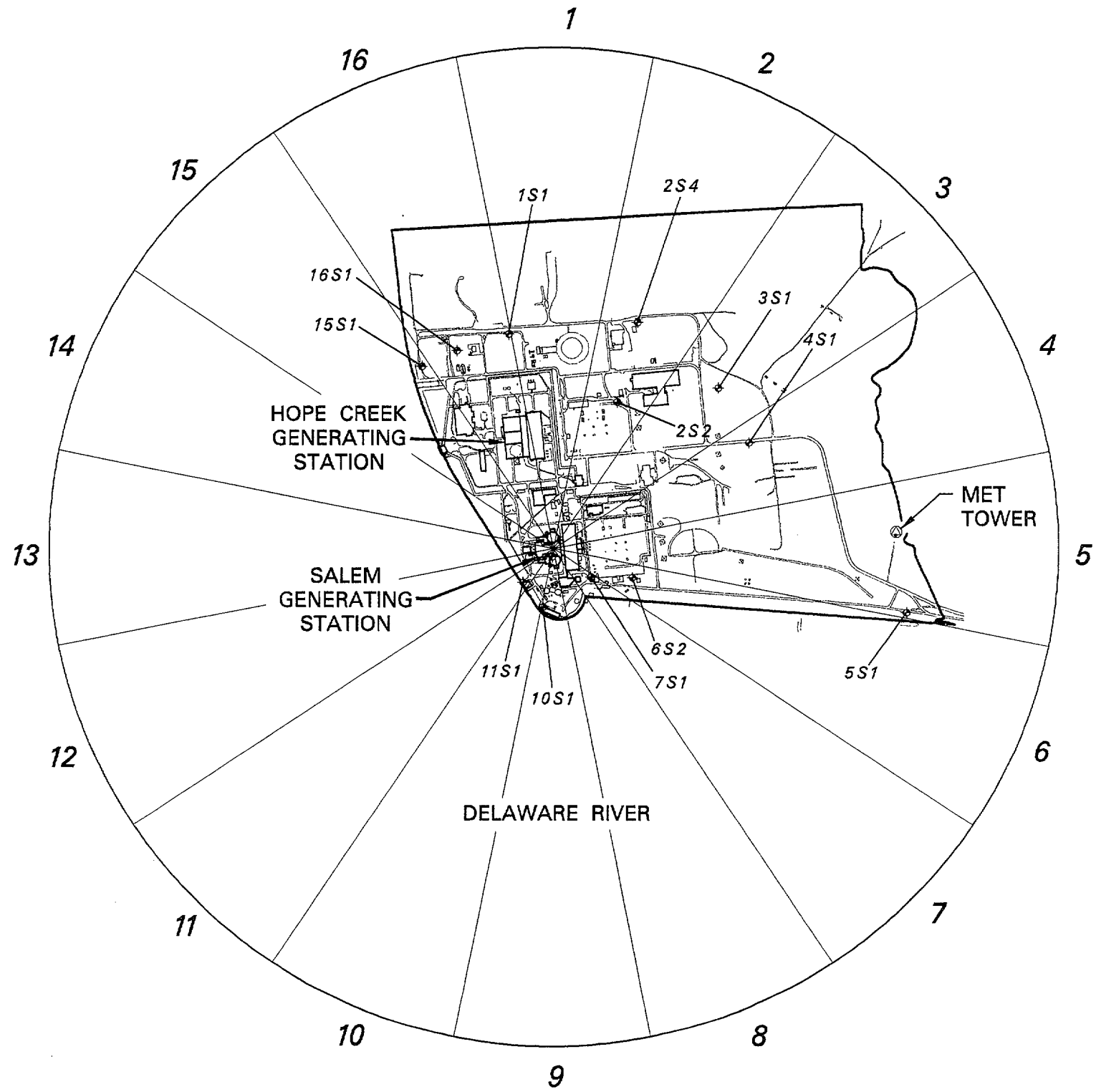
TABLE B-1 (cont'd)

STATION CODE	STATION LOCATION	LATITUDINAL DEG. MIN. SEC	LONGITUDINAL DEG. MIN. SEC	SAMPLE TYPE
13F2	6.5 mi. W of vent; Odessa, Delaware	39 - 27 - 18	75 - 39 - 21	IDM
13F3	9.3 mi. W of vent; Redding Middle School, Middletown, Delaware	39 - 27 - 14	75 - 42 - 32	IDM
13F4	9.8 mi. W of vent; Middletown, Delaware	39 - 26 - 51	75 - 43 - 07	IDM
14F2	6.6 mi. WNW of vent; Boyds Corner	39 - 30 - 00	75 - 38 - 59	IDM
14F3	5.4 mi. WNW of vent; local farm	39 - 29 - 33	75 - 37 - 55	FPV,FPL
14F4	7.6 mi. WNW of vent; local farm	39 - 30 - 44	75 - 40 - 52	MLK,VGT,SOL
15F3	5.4 mi. NW of vent	39 - 30 - 58	75 - 36 - 36	IDM
16F1	6.9 mi. NNW of vent; C&D Canal	39 - 33 - 55	75 - 34 - 25	ESS,SWA
16F2	8.1 mi. NNW of vent; Delaware City Public School	39 - 34 - 18	75 - 35 - 25	IDM
1G1	10.3 mi. N of vent; local farm	39 - 36 - 31	75 - 29 - 59	FPV,FPL
1G3	19 mi. N of vent; N. Church St. Wilmington, Del	39 - 44 - 16	75 - 32 - 31	IDM
1G4	10.8 mi. N of vent; (Dads Produce) Rte. 49, South Broadway, Pennsville	39 - 37 - 55	75 - 30 - 44	FPV
2G2	13.5 mi. NNE of vent; Moore's Market; 324 Pointers Auburn Road (Rt. 540), Salem, NJ 08079	39 - 38 - 19	75 - 26 - 10	FPV
2G3	12 mi. NNE; Asa Caldwallader, Waldac Farms, Corner of Routes 540 & 45	39 - 36 - 21	75 - 24 - 53	MLK,FPV,VGT
3G1	17 mi. NE of vent; Mr. Lee Williams Farm	39 - 35 - 56	75 - 16 - 47	IDM,MLK,VGT,SOL
9G1	10.3 mi. S of Vent; Mr. Goldsburrough, 1784 Woodland Beach Rd., Smyrna, Delaware	39 - 18 - 47	75 - 33 - 50	FPV
10G1	12 mi. SSW of vent; Smyrna, Delaware	39 - 18 - 13	75 - 36 - 05	IDM
14G1	11.8 mi. WNW of vent; Rte. 286; Bethel Church Road; Delaware	39 - 31 - 18	75 - 46 - 30	AIO,APT,IDM
14G2	12.1 mi. WNW of vent; Locust Grove Farm & Garden Center; 1084 Bethel Church Road; Middletown, DE 19709	39 - 31 - 21	75 - 44 - 57	FPV
16G1	15 mi. NNW of vent; Across from Greater Wilmington Airport	39 - 40 - 38	75 - 35 - 35	IDM
3H1	32 mi. NE of vent; National Park, New Jersey	39 - 51 - 36	75 - 11 - 06	IDM
3H5	25 mi. NE of vent; Sorbello Girl's Market	39 - 41 - 02	75 - 12 - 23	FPL,FPV
3H3	110 mi. NE of vent; Maplewood Testing Services	40 - 43 - 25	74 - 15 - 09	IDM

NOTE: All station locations are referenced to the midpoint of the two Salem Units' Vents. The coordinates of this location are: Latitude N 39° - 27' - 45.3" and Longitude W 75° - 32' - 09.7".

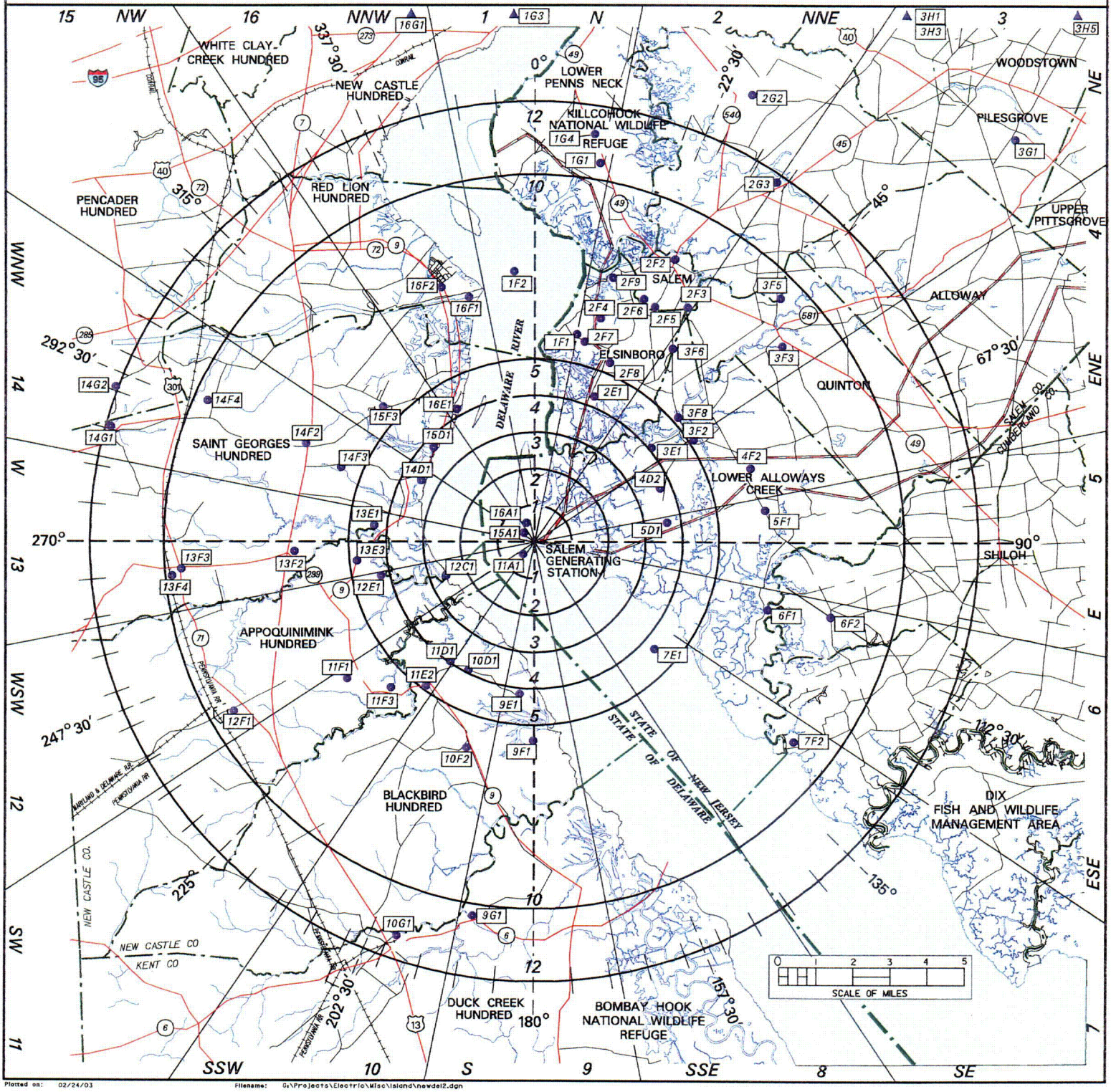
All Game (GAM), Vegetables(FPV & FPL) and Vegetation (VGT), are management audit samples. They are not required by the Salem & Hope Creek Stations' Tech Specs nor listed in the Station's ODCM. Vegetable samples are not always collected in consecutive years from the same farmer since they rotate the type of crop they grow.

MAP B-1
ON-SITE SAMPLING LOCATIONS



MAP B–2

SALEM AND HOPE CREEK GENERATING STATIONS
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM
OFF-SITE SAMPLING LOCATION



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C02

APPENDIX C

DATA TABLES

APPENDIX C

DATA TABLES

Appendix C presents the analytical results of the 2002 Radiological Environmental Monitoring Program for the period of January 1 to December 31, 2002.

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DATA TABLES (cont'd.)

DATA TABLES (cont'd.)

Table C-1

2002 CONCENTRATIONS OF GAMMA EMITTERS*
IN QUARTERLY COMPOSITES OF AIR PARTICULATES

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

STATION ID	Sampling Period Start		Stop	<--- Gamma Emitters ---> Be-7	K-40
SA-APT-5S1	1/2/2002	to	4/1/2002	51 ± 4	11 ± 4
SA-APT-1F1	1/2/2002	to	4/1/2002	53 ± 4	< 9
SA-APT-2F6	1/2/2002	to	4/1/2002	56 ± 4	< 3
SA-APT-5D1	1/2/2002	to	4/1/2002	54 ± 4	< 4
SA-APT-16E1	1/3/2002	to	4/1/2002	47 ± 4	11 ± 2
SA-APT-14G1(C)	1/3/2002	to	4/1/2002	58 ± 5	8 ± 3
SA-APT-5S1	4/1/2002	to	7/1/2002	75 ± 5	13 ± 3
SA-APT-1F1	4/1/2002	to	7/1/2002	73 ± 5	< 5
SA-APT-2F6	4/1/2002	to	7/1/2002	68 ± 5	< 6
SA-APT-5D1	4/1/2002	to	7/1/2002	70 ± 4	< 4
SA-APT-16E1	4/1/2002	to	7/1/2002	76 ± 4	< 3
SA-APT-14G1(C)	4/1/2002	to	7/1/2002	70 ± 5	< 4
SA-APT-5S1	7/1/2002	to	9/30/2002	70 ± 6	< 4
SA-APT-1F1	7/1/2002	to	9/30/2002	67 ± 5	< 5
SA-APT-2F6	7/1/2002	to	9/30/2002	68 ± 4	< 4
SA-APT-5D1	7/1/2002	to	9/30/2002	66 ± 4	9 ± 2
SA-APT-16E1	7/1/2002	to	9/30/2002	67 ± 4	< 4
SA-APT-14G1(C)	7/1/2002	to	9/30/2002	68 ± 5	< 6
SA-APT-5S1	9/30/2002	to	12/30/2002	43 ± 4	10 ± 2
SA-APT-1F1	9/30/2002	to	12/30/2002	45 ± 3	10 ± 2
SA-APT-2F6	9/30/2002	to	12/30/2002	45 ± 3	10 ± 2
SA-APT-5D1	9/30/2002	to	12/30/2002	49 ± 3	8 ± 2
SA-APT-16E1	10/1/2002	to	12/30/2002	50 ± 4	10 ± 3
SA-APT-14G1(C)	10/1/2002	to	12/30/2002	45 ± 3	< 2
AVERAGE				60 ± 22	-

* All other gamma emitters searched for were < LLD; typical LLDs are given in Table C-19.
(C) Control Station

TABLE C-2

2002 CONCENTRATIONS OF GROSS BETA EMITTERS IN AIR PARTICULATES

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

	<---------- STATION ID ---------->						
MONTH	Control SA-APT-14G1	SA-APT-16E1	SA-APT-1F1	SA-APT-2F6	SA-APT-5D1	SA-APT-5S1	AVERAGE
January	30±3	27±3	28±3	30±3	27±3	26±3	28±3
	34±3	27±3	29±3	32±3	28±3	29±3	30±5
	23±2	25±2	(1)	23±2	21±2	23±3	23±3
	25±2	23±2	24±2	21±2	20±2	22±2	22±3
	19±2	18±2	22±2	23±2	20±2	20±2	20±4
February	25±3	20±2	24±2	23±2	24±2	19±2	22±5
	47±3	36±3	35±3	40±3	28±2	24±2	35±16
	24±2	28±3	24±3	26±3	23±2	23±3	24±4
	21±2	20±2	19±2	21±2	20±2	17±2	20±3
March	33±3	32±3	29±3	34±3	30±3	33±3	32±4
	24±3	22±2	24±2	22±2	22±2	20±2	22±3
	25±2	22±2	24±3	26±3	28±3	26±3	25±4
	19±2	18±2	17±2	18±2	19±2	18±2	18±1
April	25±2	27±2	24±2	25±2	24±2	24±2	25±2
	22±2	18±2	19±2	22±2	21±2	18±2	20±4
	27±3	28±3	30±3	26±2	26±3	28±3	27±3
	19±2	18±2	16±2	19±2	17±2	18±2	18±2
	21±3	21±3	21±3	24±3	21±3	22±3	22±3
May	26±2	25±2	24±2	24±2	22±2	25±2	24±3
	20±2	20±2	20±2	19±2	20±2	15±2	19±4
	21±2	14±2	22±2	22±2	20±2	19±2	20±6
	26±3	25±3	26±2	27±3	28±3	25±3	26±2
June	20±2	18±3	18±2	20±3	16±2	16±2	18±4
	18±2	18±2	20±2	16±2	13±2	18±2	17±5
	27±3	21±2	22±2	23±2	21±2	21±2	22±4
	28±3	26±2	29±3	26±2	24±2	27±2	26±4

TABLE C-2

2002 CONCENTRATIONS OF GROSS BETA EMITTERS IN AIR PARTICULATES

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

		<---------- STATION ID ---------->					
MONTH	Control SA-APT-14G1	SA-APT-16E1	SA-APT-1F1	SA-APT-2F6	SA-APT-5D1	SA-APT-5S1	AVERAGE
July	33±3	34±3	33±3	35±3	34±3	34±3	34±1
	28±3	29±2	27±2	22±2	23±2	23±2	25±6
	39±3	37±3	38±3	38±3	34±3	40±3	38±4
	21±2	18±2	19±2	19±2	17±2	15±2	18±4
	36±3	32±2	36±3	35±3	36±2	38±2	35±4
August	22±2	19±2	15±2	15±2	15±2	17±2	17±5
	39±3	30±2	32±3	32±3	27±2	32±3	32±8
	27±3	27±2	22±2	26±2	24±2	20±2	24±6
	17±2	14±2	15±2	12±2	14±2	13±2	14±3
September	24±3	21±2	23±3	23±3	23±3	19±2	22±4
	30±2	24±2	21±2	24±2	24±2	24±2	24±6
	32±3	30±2	33±3	29±3	30±2	26±2	30±5
	23±2	23±2	23±2	21±2	22±2	24±2	23±2
October	34±3	32±3	33±2	31±3	33±2	31±2	32±3
	14±2	15±2	16±2	15±2	15±2	14±2	15±1
	21±2	22±2	22±2	24±2	21±2	21±2	22±2
	23±2	22±2	21±2	21±2	22±2	23±2	22±2
	31±3	27±3	30±3	28±3	27±3	25±3	28±4
November	25±2	28±2	20±2	26±2	27±2	24±2	25±6
	22±2	14±2	20±3	20±3	19±3	16±3	19±6
	26±2	23±2	25±2	22±2	26±2	23±2	24±3
	21±2	22±2	22±2	22±2	20±2	20±2	21±2
December	25±2	25±2	23±2	24±2	24±2	25±2	24±1
	16±2	15±2	17±2	18±2	15±2	18±2	16±2
	20±2	19±2	19±2	22±2	17±2	20±2	19±3
	20±2	21±2	23±2	21±2	20±2	20±2	21±3
AVERAGE	25±13	23±11	24±11	24±11	23±11	23±12	
					GRAND AVERAGE		24±12

(1) Sampler Malfunction. See Program Deviations.

TABLE C-3

2002 CONCENTRATIONS OF IODINE-131* IN FILTERED AIR

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

MONTH	Control SA-AIO-14G1	SA-AIO-16E1	SA-AIO-1F1	SA-AIO-2F6	SA-AIO-5D1	SA-AIO-5S1
			STATION ID			
January	<4	<2.6	<9.1	<2.4	<1.6	<3.3
	<4.2	<6.5	<5	<3.4	<3.2	<3.6
	<2.1	<3.3	(1)	<2.4	<3.9	<4.3
	<1.7	<2.8	<1.4	<2.4	<2.1	<1.7
	<3	<1.4	<4	<3.3	<2.1	<1.9
February	<2.7	<2.5	<6.4	<4.3	<2.6	<2.8
	<4.6	<3.1	<4.6	<2.5	<1.3	<5.3
	<4.5	<2.5	<3.4	<6.5	<2.5	<4.5
	<3.5	<2.7	<3.8	<4.3	<2.7	<2.4
March	<1.8	<2	<1.7	<2.2	<2.7	<3.1
	<3.4	<1.9	<4.5	<2.5	<1.8	<3.3
	<4.4	<2.4	<1.2	<2.8	<1.9	<2
	<3.9	<3.3	<2.9	<2.8	<3.2	<1.5
April	<2.4	<2.4	<2.2	<3.2	<1.6	<3.3
	<3.3	<1.8	<4	<2.4	<6.5	<4
	<1.6	<7.6	<5.2	<3.1	<3.9	<2.1
	<3.4	<2.5	<5	<3.7	<1.9	<5
	<4.6	<1.8	<4.1	<4.1	<3.3	<4.3
May	<4.3	<6.4	<2.3	<3.1	<2.2	<3.9
	<2.5	<2.2	<2.5	<4.1	<3.1	<1.9
	<2.2	<4.3	<1.3	<2.7	<3.6	<3.5
	<3.1	<3.1	<3.3	<2.7	<1.7	<2.4
June	<3.4	<2.6	<2.2	<4.7	<1.5	<2.6
	<2.4	<2.3	<3.2	<3.9	<3.1	<6.2
	<1.4	<3.8	<3.1	<1.3	<2.1	<2.9
	<4.4	<3	<2.2	<3.7	<2.6	<2.8

TABLE C-3

2002 CONCENTRATIONS OF IODINE-131* IN FILTERED AIR

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

	<---------- STATION ID ---------->					
MONTH	Control SA-AIO-14G1	SA-AIO-16E1	SA-AIO-1F1	SA-AIO-2F6	SA-AIO-5D1	SA-AIO-5S1
July	<4.1	<5.6	<2.6	<5	<4.7	<2.4
	<1.5	<2.6	<1.6	<2	<1.4	<2.2
	<4.7	<3	<1.9	<1.6	<9.7	<2.4
	<1.9	<2.1	<1.4	<2.8	<5.6	<6.9
	<4.6	<3	<1.3	<2.7	<3.1	<2.2
August	<3.2	<2.4	<3.6	<1.8	<3.2	<2.4
	<1.1	<2.5	<3.3	<2.7	<2.5	<1.7
	<3.1	<1.3	<1.6	<2.2	<2.3	<2.1
	<3.1	<1.8	<2.8	<2.4	<1.9	<1.4
September	<4.5	<2.7	<1.5	<3.3	<3.4	<6.2
	<3.2	<2.5	<2.4	<1.9	<3.4	<1.9
	<2.2	<1.6	<4.7	<1.6	<2	<3.6
	<2.9	<2.8	<3.3	<3.9	<3.4	<4.1
October	<2.9	<2.3	<3.3	<2	<2.9	<2.5
	<4.7	<4.6	<3.7	<3.4	<2	<1.6
	<2.5	<2.1	<1.6	<2.1	<2.6	<4.7
	<5.9	<2.1	<3.2	<3.3	<2.9	<2.7
	<2.8	<5.4	<7	<2.6	<4.8	<1.9
November	<2.4	<1.8	<3.3	<1.3	<0.8	<1.5
	<2.6	<2.5	<2.1	<4.2	<4.4	<5.1
	<2.1	<4.1	<3.3	<4.5	<1.2	<2.1
	<3.7	<3.4	<2.3	<3.2	<7.8	<2.2
December	<2.8	<2.4	<2.3	<0.9	<3.1	<1.2
	<3.4	<5	<2.8	<3.3	<4.3	<2.2
	<3.2	<1.3	<4.3	<2.4	<1.7	<2.1
	<3.3	<1.8	<1.9	<1.8	<3.4	<2.2

* I-131 results are corrected for decay to sample stop date.

(1) Sampler Malfunction. See Program Deviations.

TABLE C-4

2002 DIRECT RADIATION MEASUREMENTS - QUARTERLY TLD RESULTS

Results in mrad/standard month* +/- 2 sigma

STATION ID	JAN to MAR	APR to JUN	JUL to SEP	OCT to DEC	QTR ELEMENTS AVG**
SA-IDM-2S2	5.7±0 7	5 4±0 5	(1)	6.9±0.9	6 0±1 5
SA-IDM-5S1	3.5±0 4	3.5±0 3	3 6±0.4	3.6±0.4	3 5±0.2
SA-IDM-6S2	5.1±0 6	4 8±0 5	4.7±0 4	4 8±0.7	4 9±0.3
SA-IDM-7S1	5.1±0.7	5.5±0 4	5.5±0.4	5.5±0.6	5 4±0.4
SA-IDM-10S1	4 0±0.4	4 2±0 5	4.1±0 4	3 8±0.7	4 0±0.3
SA-IDM-11S1	3 5±0.6	3.7±0 4	3.5±0 3	2 8±0.4	3 4±0.7
SA-IDM-4D2	4 2±0.5	4 0±0 4	4.3±0 3	4 0±0.5	4 1±0.3
SA-IDM-5D1	3.7±0.5	3 8±0 3	3.9±0.3	3.5±0.6	3.7±0.4
SA-IDM-10D1	4 4±0.5	4 5±0 5	4.8±0 3	3.9±0.8	4 4±0.7
SA-IDM-14D1	4 0±0.4	3 9±0 4	3 9±0 3	3 9±0.4	3 9±0.1
SA-IDM-15D1	4 4±0.5	4 5±0 4	4 7±0 4	4.1±0 7	4 4±0 5
SA-IDM-2E1	4 1±1 0	4 2±0 5	4 2±0 4	4.3±0 6	4 2±0.1
SA-IDM-3E1	3 3±0 4	3 3±0 3	3 4±0.3	3.3±0 5	3 4±0 1
SA-IDM-9E1	4 2±0 6	4 1±0 4	4 3±0 3	(2)	4 2±0 3
SA-IDM-9F1	(2)	(2)	(2)	4.5±0 7	4 5±0 7
SA-IDM-11E2	4 4±0 5	4 4±0 4	4 5±0 5	4.4±0 6	4 4±0 1
SA-IDM-12E1	4 4±0 4	4 6±0 4	4 5±0 5	4.3±0 5	4 4±0 2
SA-IDM-13E1	3 6±0 5	3 6±0 5	3 7±0 3	3.4±0 4	3 6±0 2
SA-IDM-16E1	4 0±0 5	4 2±0 4	4 3±0 3	4.0±0 6	4.1±0 2
SA-IDM-1F1	4 0±0 5	4 0±0.3	4 3±0 3	4 0±0 5	4.1±0 3
SA-IDM-2F2	3 5±0 4	3 5±0.5	3 5±0 3	3 5±0 5	3.5±0 1
SA-IDM-2F5	4 3±0 7	4 1±0.4	4 5±0 6	4 2±0 5	4.2±0.3
SA-IDM-2F6	3.8±0 6	3.9±0.4	4 0±0.5	3.8±0.5	3.9±0 1
SA-IDM-3F2	3.5±0 3	3.6±0 4	3 6±0.4	3.5±0 4	3 6±0 2
SA-IDM-3F3	3.5±0 5	3.5±0 4	3 4±0.4	3 4±0 4	3.5±0 1
SA-IDM-4F2	3 4±0 4	3.4±0 3	3 6±0.5	3 4±0.4	3 4±0.2
SA-IDM-5F1	3.7±0 4	3.7±0 3	3 8±0.4	3 5±0.4	3 7±0.2
SA-IDM-6F1	2.9±0 4	2.9±0 3	3 0±0 4	3 1±0.4	3 0±0.2
SA-IDM-7F2	2.7±0 3	2.8±0 3	2.6±0 3	2 7±0.3	2 7±0.1
SA-IDM-10F2	4 3±0.5	4.2±0 3	4.3±0 5	4 2±0.5	4 3±0.1
SA-IDM-11F1	4 5±0.6	4 4±0 4	4.6±0 4	4 4±0.5	4 5±0.2
SA-IDM-12F1	4 2±0.4	4 2±0 3	4.3±0 3	4 0±0.5	4 2±0.2
SA-IDM-13F2	4 0±0.5	3 9±0 3	4.1±0 6	3 9±0.5	4 0±0.2
SA-IDM-13F3	4 1±0.4	4 0±0 4	4.2±0 5	4 0±0.4	4 1±0.2
SA-IDM-13F4	4 2±0.5	4 1±0 3	4 0±0 4	4.1±0.6	4 1±0 2
SA-IDM-14F2	4 4±0.5	4 5±0 3	4 3±0 4	4.4±0.5	4 4±0 2
SA-IDM-15F3	4 6±0.5	4 7±0 6	4.9±0 5	4.5±0 4	4 7±0 3
SA-IDM-16F2	3 8±0.5	3 7±0 4	4.0±0 4	3.7±0 4	3 8±0 3
SA-IDM-1G3 (C)	5 0±0.5	4 9±0 5	5.1±0 6	4.7±0 6	4 9±0 3
SA-IDM-3G1 (C)	4 5±1.1	4 3±0 5	4 5±0 4	4.2±0 8	4 4±0 3
SA-IDM-10G1(C)	4 2±0.4	4 0±0 5	4 4±0 4	4.1±0 4	4 2±0 3
SA-IDM-16G1(C)	4 7±0.6	4 8±0 4	(1)	3.8±0.4	4 5±1.1
SA-IDM-3H1 (C)	3 5±0.3	3 4±0 4	3.5±0 3	3 4±0.4	3 4±0.2
SA-IDM-1S1	4 3±0.4	4 4±0 4	4 6±0 3	4.4±0.5	4 4±0 2
SA-IDM-3S1	3 3±0.4	3 5±0 3	3.4±0 3	3 4±0.4	3 4±0.2
SA-IDM-2S4	3 6±0.4	3 6±0 3	3.5±0 4	3 5±0.4	3 5±0.1
SA-IDM-4S1	3 7±0.5	3 8±0 4	4 0±0 6	4 0±0.5	3 9±0.3
SA-IDM-15S1	3 4±0.6	3 4±0 3	3.5±0 4	3 5±0.5	3 4±0.2
SA-IDM-16S1	4 3±0.4	4 2±0 4	4.3±0 4	4 4±0.6	4 3±0.1
SA-IDM-14G1(C)	4 3±0.8	4 4±0 4	4.5±0 5	4 2±0.5	4.3±0.2
AVERAGE	4±1.1	4±1.1	4.1±1 1	4±1.3	
			GRAND AVG		4±1.2

* The standard month = 30 4 days.
** Quarterly Element TLD results by DESEL.
(C) Control Station
(1) TLD'S Not Recovered. See Program Deviations
(2) 9E1 TLD Relocated to 9F1 before the 4th quarter

TABLE C-5

2002 CONCENTRATIONS OF IODINE-131* AND GAMMA EMITTERS** IN MILK

Results in Units of pCi/L +/- 2 sigma

STATION ID	SAMPLING PERIOD *** START	STOP	I-131	GAMMA EMITTERS K-40
SA-MLK-2F9	01/07/2002	01/08/2002	<0.2	1430 ±80
SA-MLK-11F3	01/08/2002	01/09/2002	<0.2	1300 ±80
SA-MLK-14F4	01/07/2002	01/08/2002	<0.2	1390 ±90
SA-MLK-3G1 (C)	01/08/2002	01/09/2002	<0.3	1300 ±80
SA-MLK-2F9	02/04/2002	02/05/2002	<0.2	1010 ±130
SA-MLK-11F3	02/04/2002	02/05/2002	<0.3	1240 ±90
SA-MLK-14F4	02/04/2002	02/05/2002	<0.2	1430 ±80
SA-MLK-3G1 (C)	02/03/2002	02/04/2002	<0.2	1340 ±90
SA-MLK-2F9	03/04/2002	03/05/2002	<0.2	1370 ±80
SA-MLK-11F3	03/04/2002	03/05/2002	<0.2	1340 ±90
SA-MLK-14F4	03/04/2002	03/05/2002	<0.2	1280 ±70
SA-MLK-3G1 (C)	03/03/2002	03/04/2002	<0.2	1350 ±70
SA-MLK-2F9	04/07/2002	04/08/2002	<0.3	1370 ±70
SA-MLK-11F3	04/07/2002	04/08/2002	<0.2	1290 ±90
SA-MLK-14F4	04/07/2002	04/08/2002	<0.2	1290 ±80
SA-MLK-3G1 (C)	04/07/2002	04/08/2002	<0.2	1410 ±80
SA-MLK-2F9	04/21/2002	04/22/2002	<0.2	1220 ±70
SA-MLK-11F3	04/21/2002	04/22/2002	<0.2	1380 ±80
SA-MLK-14F4	04/21/2002	04/22/2002	<0.2	1360 ±70
SA-MLK-3G1 (C)	04/20/2002	04/22/2002	<0.3	1420 ±80
SA-MLK-2F9	05/05/2002	05/06/2002	<0.2	1260 ±70
SA-MLK-11F3	05/05/2002	05/06/2002	<0.2	1400 ±80
SA-MLK-14F4	05/05/2002	05/06/2002	<0.2	1310 ±90
SA-MLK-3G1 (C)	05/06/2002	05/07/2002	<0.3	1310 ±70
SA-MLK-2F9	05/20/2002	05/21/2002	<0.3	1340 ±80
SA-MLK-13E3 (1)	05/22/2002	05/23/2002	<0.4	1360 ±70
SA-MLK-14F4	05/19/2002	05/20/2002	<0.2	1340 ±80
SA-MLK-3G1 (C)	05/18/2002	05/20/2002	<0.2	1340 ±90
SA-MLK-2F9	06/03/2002	06/04/2002	<0.3	1320 ±80
SA-MLK-13E3	06/03/2002	06/04/2002	<0.2	1360 ±70
SA-MLK-14F4	06/02/2002	06/03/2002	<0.3	1340 ±70
SA-MLK-3G1 (C)	06/02/2002	06/03/2002	<0.2	1360 ±90
SA-MLK-2F9	06/17/2002	06/18/2002	<0.2	1290 ±90
SA-MLK-13E3	06/17/2002	06/18/2002	<0.3	1280 ±70
SA-MLK-14F4	06/16/2002	06/17/2002	<0.2	1360 ±80
SA-MLK-3G1 (C)	06/17/2002	06/18/2002	<0.2	1360 ±80
SA-MLK-2F9	07/07/2002	07/08/2002	<0.2	1370 ±90
SA-MLK-13E3	07/07/2002	07/08/2002	<0.2	1270 ±70
SA-MLK-14F4	07/08/2002	07/09/2002	<0.2	1440 ±70
SA-MLK-3G1 (C)	07/07/2002	07/08/2002	<0.2	1380 ±80
SA-MLK-2F9	07/21/2002	07/22/2002	<0.2	1430 ±90
SA-MLK-13E3	07/21/2002	07/22/2002	<0.2	1460 ±70
SA-MLK-14F4	07/22/2002	07/23/2002	<0.3	1280 ±80
SA-MLK-3G1 (C)	07/21/2002	07/22/2002	<0.2	1320 ±70

TABLE C-5

2002 CONCENTRATIONS OF IODINE-131* AND GAMMA EMITTERS** IN MILK

Results in Units of pCi/L +/- 2 sigma

STATION ID	SAMPLING PERIOD *** START	STOP	I-131	GAMMA EMITTERS K-40
SA-MLK-2F9	08/04/2002	08/05/2002	<0.2	1410 ±70
SA-MLK-13E3	08/04/2002	08/05/2002	<0.2	1440 ±70
SA-MLK-14F4	08/05/2002	08/06/2002	<0.2	1310 ±80
SA-MLK-3G1 (C)	08/04/2002	08/05/2002	<0.2	1350 ±80
SA-MLK-2F9	08/18/2002	08/19/2002	<0.3	1390 ±80
SA-MLK-13E3	08/18/2002	08/19/2002	<0.2	1320 ±80
SA-MLK-14F4	08/19/2002	08/20/2002	<0.2	1400 ±80
SA-MLK-3G1 (C)	08/18/2002	08/19/2002	<0.2	1300 ±70
SA-MLK-2F9	09/03/2002	09/04/2002	<0.2	1470 ±80
SA-MLK-13E3	09/03/2002	09/04/2002	<0.2	1380 ±80
SA-MLK-14F4	09/02/2002	09/03/2002	<0.2	1290 ±70
SA-MLK-3G1 (C)	09/03/2002	09/04/2002	<0.2	1440 ±80
SA-MLK-2F9	09/15/2002	09/16/2002	<0.2	1430 ±70
SA-MLK-13E3	09/15/2002	09/16/2002	<0.2	1440 ±70
SA-MLK-14F4	09/16/2002	09/17/2002	<0.2	1350 ±80
SA-MLK-3G1 (C)	09/15/2002	09/16/2002	<0.2	1170 ±70
SA-MLK-2F9	10/07/2002	10/08/2002	<0.2	1310 ±70
SA-MLK-13E3	10/06/2002	10/07/2002	<0.2	1360 ±80
SA-MLK-14F4	10/06/2002	10/07/2002	<0.2	1310 ±80
SA-MLK-3G1 (C)	10/06/2002	10/07/2002	<0.2	1300 ±70
SA-MLK-2G3 (1)	10/22/2002	10/23/2002	<0.2	1320 ±80
SA-MLK-13E3	10/21/2002	10/22/2002	<0.2	1410 ±90
SA-MLK-14F4	10/20/2002	10/21/2002	<0.3	1320 ±90
SA-MLK-3G1 (C)	10/20/2002	10/21/2002	<0.3	1350 ±70
SA-MLK-2G3	11/11/2002	11/12/2002	<0.2	1330 ±70
SA-MLK-13E3	11/12/2002	11/13/2002	<0.2	1360 ±80
SA-MLK-14F4	11/11/2002	11/12/2002	<0.2	1300 ±80
SA-MLK-3G1 (C)	11/12/2002	11/13/2002	<0.2	1320 ±70
SA-MLK-2G3	11/24/2002	11/25/2002	<0.3	1290 ±90
SA-MLK-13E3	11/24/2002	11/25/2002	<0.2	1370 ±70
SA-MLK-14F4	11/25/2002	11/26/2002	<0.2	1370 ±90
SA-MLK-3G1 (C)	11/24/2002	11/25/2002	<0.2	1370 ±70
SA-MLK-2G3	12/08/2002	12/09/2002	<0.3	1400 ±90
SA-MLK-13E3	12/08/2002	12/09/2002	<0.2	1430 ±80
SA-MLK-14F4	12/09/2002	12/10/2002	<0.2	1370 ±80
SA-MLK-3G1 (C)	12/08/2002	12/09/2002	<0.2	1320 ±80
AVERAGE			-	1350 ±140

* Iodine-131 results are corrected for decay to midpoint of collection period & analyzed to a sensitivity of 1.0 pCi/L.

** All other gamma emitters searched for were <LLD; typical LLDs are given in Table C-19.

*** Monthly sample collected during Jan., Feb., March and Dec., when animals are not on pasture

(C) Control Station

(1) Two Milk Farms were replaced. See Program Changes.

TABLE C-6

2002 CONCENTRATIONS OF GROSS ALPHA AND GROSS BETA EMITTERS, AND TRITIUM IN WELL WATER

Results in Units of pCi/L +/- 2 sigma

STATION ID	SAMPLING DATE	GROSS ALPHA	GROSS BETA	TRITIUM
SA-WWA-3E1	01/28/2002	<1.6	13±1	<180
SA-WWA-3E1	02/25/2002	<1.1	12±1	<180
SA-WWA-3E1	03/25/2002	2.1±1	13±1	<170
SA-WWA-3E1	04/30/2002	3±1.4	11±0.8	<160
SA-WWA-3E1	05/28/2002	1.8±1.1	11±0.8	<160
SA-WWA-3E1	06/24/2002	2.8±1.2	11±0.8	<160
SA-WWA-3E1	07/29/2002	1.5±1.2	11±0.8	<180
SA-WWA-3E1	08/26/2002	<1.7	11±0.8	<160
SA-WWA-3E1	09/30/2002	2.8±1.3	10±0.8	<150
SA-WWA-3E1	10/29/2002	2.7±1.4	11±0.8	<170
SA-WWA-3E1	11/26/2002	1.8±1	11±0.8	<160
SA-WWA-3E1	12/30/2002	2.4±1.3	10±0.8	<150
AVERAGE		2.1±1.3	11±2	-

TABLE C-7

2002 CONCENTRATIONS OF GAMMA EMITTERS* IN WELL WATER

Results in Units of pCi/L +/- 2 sigma

STATION ID	SAMPLING DATE	<-----GAMMA EMITTERS -----> K-40	RA-NAT
SA-WWA-3E1	01/28/2002	<15	168±5
SA-WWA-3E1	02/25/2002	58±20	150±4
SA-WWA-3E1	03/25/2002	<40	164±4
SA-WWA-3E1	04/30/2002	<7	153±6
SA-WWA-3E1	05/28/2002	<12	176±6
SA-WWA-3E1	06/24/2002	56±15	68±3
SA-WWA-3E1	07/29/2002	<18	67±3
SA-WWA-3E1	08/26/2002	<17	62±4
SA-WWA-3E1	09/30/2002	<17	110±4
SA-WWA-3E1	10/29/2002	46±15	53±3
SA-WWA-3E1	11/26/2002	43±16	40±3
SA-WWA-3E1	12/30/2002	<54	133±5
AVERAGE		-	112±102

* All other gamma emitters searched for were <LLD; typical LLDs are given in Table C-19.

TABLE C-8

2002 CONCENTRATIONS OF GROSS ALPHA AND GROSS BETA EMITTERS AND TRITIUM IN RAW AND TREATED POTABLE WATER

Results in Units of pCi/L +/- 2 sigma

TYPE	SAMPLING PERIOD	GROSS ALPHA	GROSS BETA	TRITIUM
RAW	1/1-31/2002	<0.7	3±0.6	<180
TREATED	1/1-31/2002	<1.1	4.9±0.7	<170
RAW	2/1-28/2002	0.8±0.5	3.3±0.6	<170
TREATED	2/1-28/2002	0.9±0.7	2.9±0.6	<170
RAW	3/1-31/2002	1±0.5	3.1±0.6	<180
TREATED	3/1-31/2002	1±0.7	3.9±0.6	<170
RAW	4/1-30/2002	1.2±0.7	2.8±0.5	<150
TREATED	4/1-30/2002	<1	2.8±0.5	<160
RAW	5/1-31/2002	0.8±0.6	3.2±0.5	<160
TREATED	5/1-31/2002	1±0.7	3.1±0.5	<150
RAW	6/1-30/2002	1.4±0.7	3.6±0.5	<150
TREATED	6/1-30/2002	<0.7	3.7±0.5	<160
RAW	7/1-31/2002	1.3±0.7	3.9±0.5	<160
TREATED	7/1-31/2002	<0.9	3.4±0.5	<160
RAW	8/1-31/2002	<0.8	3.3±0.5	<160
TREATED	8/1-31/2002	<1.4	3.7±0.6	<160
RAW	9/1-30/2002	0.9±0.5	2.6±0.5	<150
TREATED	9/1-30/2002	1.6±1	3.4±0.5	<150
RAW	10/1-31/2002	1.3±1	2.9±0.5	<160
TREATED	10/1-31/2002	<0.8	3.3±0.5	<160
RAW	11/1-30/2002	2±0.8	4±0.5	<160
TREATED	11/1-30/2002	<1	3.6±0.5	<150
RAW	12/1-31/2002	1.4±0.7	3.5±0.5	<150
TREATED	12/1-31/2002	1.1±0.7	3.2±0.5	<150
AVERAGE				
RAW		1.2±0.8	3.3±0.9	-
TREATED		1±0.5	3.5±1.1	-
GRAND AVERAGE		1.1±0.6	3.4±1	-

TABLE C-9

2002 CONCENTRATIONS OF IODINE-131* AND GAMMA EMITTERS**
IN RAW AND TREATED POTABLE WATER

Results in Units of pCi/L +/- 2 sigma

TYPE	SAMPLING PERIOD	I-131	<-----GAMMA EMITTERS -----> K-40	RA-NAT
RAW	1/1-31/2002	<0.3	51±23	<3
TREATED	1/1-31/2002	<0.3	50±17	<3
RAW	2/1-28/2002	<0.2	<16	<2
TREATED	2/1-28/2002	<0.3	<36	<2
RAW	3/1-31/2002	<0.2	62±11	<2
TREATED	3/1-31/2002	<0.2	44±21	<2
RAW	4/1-30/2002	<0.2	<15	<3
TREATED	4/1-30/2002	<0.2	<36	<2
RAW	5/1-31/2002	<0.3	<9	<2
TREATED	5/1-31/2002	<0.2	<15	<2
RAW	6/1-30/2002	<0.2	<14	<2
TREATED	6/1-30/2002	<0.2	45±17	<5
RAW	7/1-31/2002	<0.2	<15	<2
TREATED	7/1-31/2002	<0.2	65±15	<6
RAW	8/1-31/2002	<0.4	<14	<2
TREATED	8/1-31/2002	<0.2	<15	6±2
RAW	9/1-30/2002	<0.2	<16	<4
TREATED	9/1-30/2002	<0.3	<28	42±3
RAW	10/1-31/2002	<0.2	<22	<3
TREATED	10/1-31/2002	<0.2	<18	13±4
RAW	11/1-30/2002	<0.3	<12	<2
TREATED	11/1-30/2002	<0.2	44±14	<4
RAW	12/1-31/2002	<0.4	58±21	5±2
TREATED	12/1-31/2002	<0.3	<30	<2
AVERAGES				
RAW		-	-	-
TREATED		-	-	-
GRAND AVERAGE		-	-	-

* Iodine-131 analyzed to a sensitivity of 1.0 pCi/L.

** All other gamma emitters searched for were <LLD; typical LLDs are given in Table C-19.

TABLE C-10

2002 CONCENTRATIONS OF GAMMA EMITTERS* IN VEGETABLES
Results in Units of pCi/kg (Wet) +/- 2 sigma

STATION ID	SAMPLING DATE	SAMPLE TYPE	<--- GAMMA EMITTERS ---> K-40	Ra-NAT
SA-FPV-2F9	04/22/2002	Asparagus	2250 ± 207	<11
SA-FPV-3H5 (C)	04/22/2002	Asparagus	2510 ± 251	38 ± 14
AVERAGE			2380 ± 370	-
SA-FPL-14F3	07/25/2002	Cabbage	2710 ± 182	<15
SA-FPL-2F4	07/25/2002	Cabbage	3030 ± 155	<7.2
SA-FPL-3H5 (C)	07/22/2002	Cabbage	2280 ± 165	<7.2
SA-FPL-6F2	07/25/2002	Cabbage	2950 ± 170	<6.4
AVERAGE			2740 ± 670	-
SA-FPV-3F5	07/25/2002	Corn	2470 ± 165	<7.1
SA-FPV-14G2 (C)	07/25/2002	Corn	2550 ± 164	<7.2
SA-FPV-1G1 (C)	07/22/2002	Corn	2210 ± 147	<6.6
SA-FPV-2F4	07/15/2002	Corn	2340 ± 164	<7.4
SA-FPV-2F9	07/15/2002	Corn	2350 ± 163	<6.3
SA-FPV-2G2 (C)	07/15/2002	Corn	2140 ± 150	<8.3
SA-FPV-3H5 (C)	07/15/2002	Corn	2460 ± 166	<5.8
AVERAGE			2360 ± 290	-
SA-FPV-14F3	07/25/2002	Peppers	1670 ± 157	<20
SA-FPV-2G2 (C)	07/23/2002	Peppers	1320 ± 144	<8.2
SA-FPV-3F5	07/25/2002	Peppers	1620 ± 178	<12
SA-FPV-3H5 (C)	07/22/2002	Peppers	1410 ± 161	<10
SA-FPV-9G1 (C)	07/25/2002	Peppers	1530 ± 166	<8.8
AVERAGE			1510 ± 290	-
SA-FPV-2F9	07/15/2002	Tomatoes	2230 ± 146	<5.5
SA-FPV-14F3	07/25/2002	Tomatoes	2050 ± 144	<6.7
SA-FPV-14G2 (C)	07/25/2002	Tomatoes	1890 ± 73	<6
SA-FPV-1G1 (C)	07/22/2002	Tomatoes	2330 ± 158	<7.7
SA-FPV-2G2 (C)	07/15/2002	Tomatoes	1700 ± 158	<13
SA-FPV-3F5	07/25/2002	Tomatoes	2530 ± 82	<11
SA-FPV-3H5 (C)	07/15/2002	Tomatoes	2150 ± 77	<6.2
SA-FPV-9G1 (C)	07/25/2002	Tomatoes	2150 ± 178	<16
AVERAGE			2130 ± 510	-
GRAND AVERAGE			2190 ± 880	-

* All other gamma emitters searched for were <LLD; typical LLDs are given in Table C-19
(C) Control Station

TABLE C-11

2002 CONCENTRATIONS OF GAMMA EMITTERS* IN GAME

Results in Units of pCi/kg (wet) +/- 2 sigma

STATION ID	SAMPLING DATE	SAMPLE TYPE	GAMMA EMITTERS K-40
SA-GAM-11D1 (C)	02/19/2002	Muskrat	2580 ± 160
SA-GAM-3E1	02/19/2002	Muskrat	3240 ± 190
AVERAGE		Muskrat	2910 ± 930

*All other gamma emitters searched for were <LLD; typical LLDs are given in Table C-19

TABLE C-12

2002 CONCENTRATIONS OF GAMMA EMITTERS* IN FODDER CROPS

Results in Units of pCi/kg (wet) +/- 2 sigma

STATION ID	SAMPLING DATE	SAMPLE TYPE	<- GAMMA EMITTERS -> Be-7	K-40	Ra-NAT
SA-VGT-2F9	10/08/2002	Silage	<390	2630±180	<8.6
SA-VGT-3G1 (C)	10/07/2002	Silage	390±120	9780±370	<9.4
SA-VGT-14F4	10/07/2002	Silage	140±40	3960±220	<9.4
SA-VGT-2G3	10/01/2002	Silage	340±100	14800±460	23±9
AVERAGE			310±240	7790±11220	-
SA-VGT-14F4	11/12/2002	Soybeans	<46	14100±270	<15
SA-VGT-3G1 (C)	11/25/2002	Soybeans	<23	14600±280	<7
AVERAGE			-	14400±700	-

* All other gamma emitters searched for were <LLD; typical LLDs are given in Table C-19.
(C) Location 3G1 is the Control Station.

TABLE C-13

2002 CONCENTRATIONS OF GROSS BETA EMITTERS IN SURFACE WATER

Results in Units of pCi/L +/- 2 sigma

SAMPLING DATE	STATION ID SA-SWA-11A1	SA-SWA-12C1 (Control)	SA-SWA-16F1	SA-SWA-1F2	SA-SWA-7E1	AVERAGE
January	153±13	156±13	99±10	107±11	168±13	136±62
February	143±12	110±11	79±9	96±10	123±11	110±49
March	82±10	66±9	38±8	33±7	125±11	69±75
April	80±9	49±8	37±7	23±7	90±10	56±57
May	48±7	25±6	19±5	13±5	72±8	35±48
June	48±7	41±7	6±4	15±5	71±8	36±52
July	74±8	57±7	21±5	27±6	79±8	52±54
August	110±10	83±9	80±8	72±8	114±10	92±38
September	142±11	111±10	91±9	83±8	146±11	114±57
October	133±11	100±10	92±9	81±9	161±12	113±66
November	69±8	48±7	40±6	32±6	90±9	56±47
December	73±8	59±7	40±6	25±5	88±9	57±50
AVERAGE	96±76	76±75	53±65	51±69	110±68	
				GRAND AVERAGE		77±83

TABLE C-14

2002 CONCENTRATIONS OF GAMMA EMITTERS* IN SURFACE WATER

Results in Units of pCi/L +/- 2 sigma

STATION ID	SAMPLING DATE	GAMMA EMITTERS K-40
SA-SWA-1F2	01/09/2002	114 ± 19
SA-SWA-7E1	01/09/2002	169 ± 30
SA-SWA-11A1	01/09/2002	193 ± 26
SA-SWA-12C1(C)	01/09/2002	141 ± 27
SA-SWA-16F1	01/09/2002	114 ± 25
SA-SWA-1F2	02/06/2002	113 ± 16
SA-SWA-7E1	02/06/2002	153 ± 22
SA-SWA-11A1	02/06/2002	175 ± 19
SA-SWA-12C1(C)	02/06/2002	140 ± 24
SA-SWA-16F1	02/06/2002	119 ± 25
SA-SWA-1F2	03/07/2002	96 ± 24
SA-SWA-7E1	03/07/2002	115 ± 21
SA-SWA-11A1	03/07/2002	113 ± 22
SA-SWA-12C1(C)	03/07/2002	80 ± 15
SA-SWA-16F1	03/07/2002	90 ± 26
SA-SWA-1F2	04/10/2002	52 ± 17
SA-SWA-7E1	04/10/2002	117 ± 18
SA-SWA-11A1	04/10/2002	83 ± 29
SA-SWA-12C1(C)	04/10/2002	64 ± 16
SA-SWA-16F1	04/10/2002	80 ± 26
SA-SWA-1F2	05/11/2002	64 ± 21
SA-SWA-7E1	05/11/2002	110 ± 23
SA-SWA-11A1	05/11/2002	< 36
SA-SWA-12C1(C)	05/11/2002	< 18
SA-SWA-16F1	05/11/2002	< 23
SA-SWA-1F2	06/05/2002	69 ± 19
SA-SWA-7E1	06/05/2002	87 ± 20
SA-SWA-11A1	06/05/2002	89 ± 28
SA-SWA-12C1(C)	06/05/2002	46 ± 21
SA-SWA-16F1	06/05/2002	< 17
SA-SWA-1F2	07/08/2002	< 17
SA-SWA-7E1	07/08/2002	77 ± 24
SA-SWA-11A1	07/08/2002	< 13
SA-SWA-12C1(C)	07/08/2002	50 ± 18
SA-SWA-16F1	07/08/2002	65 ± 21

TABLE C-14

2002 CONCENTRATIONS OF GAMMA EMITTERS* IN SURFACE WATER

Results in Units of pCi/L +/- 2 sigma

STATION ID	SAMPLING DATE	GAMMA EMITTERS K-40
SA-SWA-1F2	08/09/2002	62 ± 20
SA-SWA-7E1	08/09/2002	200 ± 28
SA-SWA-11A1	08/09/2002	177 ± 27
SA-SWA-12C1(C)	08/09/2002	96 ± 20
SA-SWA-16F1	08/09/2002	71 ± 15
SA-SWA-1F2	09/06/2002	127 ± 20
SA-SWA-7E1	09/06/2002	189 ± 28
SA-SWA-11A1	09/06/2002	126 ± 27
SA-SWA-12C1(C)	09/06/2002	90 ± 19
SA-SWA-16F1	09/06/2002	162 ± 27
SA-SWA-1F2	10/13/2002	122 ± 28
SA-SWA-7E1	10/13/2002	137 ± 27
SA-SWA-11A1	10/13/2002	167 ± 24
SA-SWA-12C1(C)	10/13/2002	92 ± 29
SA-SWA-16F1	10/13/2002	95 ± 24
SA-SWA-1F2	11/13/2002	66 ± 11
SA-SWA-7E1	11/13/2002	117 ± 23
SA-SWA-11A1	11/13/2002	122 ± 29
SA-SWA-12C1(C)	11/13/2002	88 ± 21
SA-SWA-16F1	11/13/2002	62 ± 13
SA-SWA-1F2	12/12/2002	57 ± 18
SA-SWA-7E1	12/12/2002	150 ± 34
SA-SWA-11A1	12/12/2002	101 ± 20
SA-SWA-12C1(C)	12/12/2002	119 ± 33
SA-SWA-16F1	12/12/2002	62 ± 15
AVERAGE		99 ± 93

* All other gamma emitters searched for were <LLD; typical LLDs are given in Table C-19.
C) Control Station

TABLE C-15

2002 CONCENTRATIONS OF TRITIUM IN QUARTERLY COMPOSITES OF SURFACE WATER

Results in Units of pCi/L +/- 2 sigma

SAMPLING PERIOD	STATION ID SA-SWA-11A1	SA-SWA-12C1 (Control)	SA-SWA-16F1	SA-SWA-1F2	SA-SWA-7E1	AVERAGE
01/09/2002 to 03/07/2002	<190	<190	<200	<190	<200	-
04/10/2002 to 06/05/2002	197±99	<160	<160	<160	<160	-
07/08/2002 to 09/06/2002	<160	<170	<170	<170	<160	-
10/13/2002 to 12/12/2002	<170	<170	<160	<160	<170	-

TABLE C-16

2002 CONCENTRATIONS OF GAMMA EMITTERS** IN EDIBLE FISH

Results in Units of pCi/kg (wet) +/- 2 sigma

STATION ID	SAMPLING PERIOD	GAMMA EMITTERS (FLESH) K-40
SA-ESF-7E1	5/16-21/2002	3190 ± 230
SA-ESF-11A1	5/16-21/2002	3300 ± 200
SA-ESF-12C1 (C)	5/16-21/2002	3630 ± 200
AVERAGE		3370 ± 460
SA-ESF-7E1	09/26/2002	3680 ± 210
SA-ESF-11A1	10/1-3/2002	3980 ± 200
SA-ESF-12C1 (C)	9/26-10/01/2002	4020 ± 210
AVERAGE		3890 ± 370
GRAND AVERAGE		3630 ± 680

** All other gamma emitters searched for were <LLD; typical LLDs are given in Table C-19
(C) Control Station

TABLE C-17

2002 CONCENTRATIONS OF GAMMA EMITTERS* IN CRABS

Results in Units of pCi/kg (wet) +/- 2 sigma

STATION ID	SAMPLING PERIOD	GAMMA EMITTER (FLESH) K-40
SA-ECH-11A1	09/23-26/2002	3050 ± 190
SA-ECH-12C1 (C)	09/23-26/2002	3010 ± 220
AVERAGE		3030 ± 60
GRAND AVERAGE		3030 ± 60

* All other gamma emitters searched for were <LLD; Typical LLDs are given in Table C-19.

(C) Control Station

TABLE C-18

2002 CONCENTRATIONS OF GAMMA EMITTERS* IN SEDIMENT

Results in Units of pCi/kg (dry) +/- 2 sigma

STATION ID	SAMPLING DATE	GAMMA EMITTERS						
		Be-7	K-40	Co-60	Cs-134	Cs-137	RA NAT	Th-232
SA-ESS-6S2	06/24/2002	<60	1410±60	<4	<2	8±3	80±4	90±10
SA-ESS-11A1	06/12/2002	<140	15300±410	<13	<7	119±20	610±30	1080±60
SA-ESS-15A1	06/12/2002	<160	16400±510	<51	<15	110±20	580±30	1060±70
SA-ESS-16A1	06/12/2002	1640±300	15000±500	<17	<19	67±20	620±30	840±100
SA-ESS-12C1(C)	06/12/2002	<90	10200±370	<8	<5	<29	590±30	800±50
SA-ESS-7E1	06/12/2002	<130	12100±180	<10	<7	32±6	800±10	980±30
SA-ESS-16F1	06/12/2002	<670	14500±380	<7	<6	46±14	610±30	850±60
AVERAGE		-	12100±10400	-	-	59±84	560±450	810±680
SA-ESS-6S2	10/29/2002	<90	1310±110	<4	<2	<5	100±10	100±30
SA-ESS-11A1	10/29/2002	<60	15900±250	<33	<8	100±10	610±10	1060±30
SA-ESS-15A1	10/29/2002	<90	11500±660	<12	<7	97±19	530±30	960±60
SA-ESS-16A1	10/29/2002	<60	7760±290	53±9	<5	29±11	540±20	630±60
SA-ESS-12C1(C)	10/28/2002	<160	13700±380	<10	<7	<41	790±20	930±70
SA-ESS-7E1	10/28/2002	<60	16800±230	<44	<6	<29	710±10	1130±40
SA-ESS-16F1	10/28/2002	<170	16300±470	<9	<6	<9	530±30	990±70
AVERAGE		-	11900±11300	-	-	-	540±440	830±720
GRAND AVERAGE		-	12000±10400	-	-	-	550±430	820±670

* All other gamma emitters searched for were <LLD; typical LLDs are given in Table C-19

(C) Control Station

TABLE C-19

2002 MAPLEWOOD TESTING SERVICES

LLDs FOR GAMMA SPECTROSCOPY

SAMPLE TYPE:	<----------AIR---------->		<---------WATER---------->		<----------MILK---------->	
	IODINE	PARTICULATES	GAMMA SCAN	IODINE	GAMMA SCAN	IODINE
ACTIVITY:	10-3 pCi/m^3	10^{-3} pCi/m^3	pCi/L	pCi/L	pCi/L	pCi/L
GEOMETRY:	47 ML	13 FILTERS	3.5 LITER	100 ML	3.5 LITER	100 ML
COUNT TIME:	120 MINS	500 MINS	1000 MIN	1000 MINS	500 MINS	1000 MINS
DELAY TO COUNT:	2 DAYS	5 DAYS	7 DAYS	3 DAYS	2 DAYS	2 DAYS
NUCLIDES						
BE-7	-	7.6	13	-	16	-
NA-22	-	0.6	4	-	8.9	-
K-40	-	13	30	-	50	-
CR-51	-	3.5	9.1	-	12	-
MN-54	-	0.72	0.9	-	3.8	-
CO-58	-	0.23	0.9	-	2.2	-
FE-59	-	0.80	4.8		8.5	-
CO-60	-	0.33	2.0	-	5.9	-
ZN-65	-	0.77	2.9		9.5	-
ZRNB-95	-	0.46	1.8	-	3.3	-
MO-99	-	27	56	-	52	-
RU-103	-	0.18	1.0	-	1.6	-
RU-106	-	3.0	13	-	17	-
AG-110M	-	0.41	2.3	-	3.0	-
SB-125	-	0.46	2.5	-	5.0	-
TE-129M	-	7.3	41	-	94	-
I-131	9.1	0.40	2.0	0.4	2.0	0.5
TE-132	-	0.62	3.1	-	3.4	-
BA-133	-	0.46	1.2	-	1.6	-
CS-134	-	0.34	1.0	-	1.8	-
CS-136	-	0.46	1.6	-	2.5	-
CS-137	-	0.37	2.1	-	2.5	-
BALA-140	-	1.2	6.2	-	6.4	-
CE-141	-	0.25	1.3	-	2.7	-
CE-144	-	0.52	5.5	-	12	-
RA-NAT	-	0.42	6.5	-	7.9	-
TH-232	-	3.9	8.9	-	22	-

TABLE C-19 (Cont'd)

2002 MAPLEWOOD TESTING SERVICES

LLDs FOR GAMMA SPECTROSCOPY

SAMPLE TYPE:	FOOD PRODUCTS	VEGETATION	GAME	FISH & SHELLFISH	SEDIMENT & SOIL
ACTIVITY:	pCi/kg WET	pCi/kg WET	pCi/kg WET	pCi/kg WET	pCi/kg DRY
GEOMETRY:	500 ml	3.5 LITER	500 ml	500 ml	500 ml
COUNT TIME:	500 MINS	500 MINS	500 MINS	500 MINS	500 MINS
DELAY TO COUNT:	3 DAYS	7 DAYS	5 DAYS	5 DAYS	30 DAYS
NUCLIDES					
BE-7	47	46	60	36	158
NA-22	17	32	10	9.6	22
K-40	70	70	70	70	70
CR-51	45	34	28	31	275
MN-54	8.9	6.6	10	6.1	41
CO-58	7.1	6.4	3.1	6.3	17
FE-59	26	21	9.0	20	82
CO-60	12.5	12	8.1	7.0	53
ZN-65	16	21	7.9	12	24
ZRNB-95	13	41	9.4	11	60
MO-99	963	41	44	1350	16700
RU-103	4.4	9.5	2.8	5.1	24
RU-106	51	21	54	46	95
AG-110M	10	10	3.8	8.8	35
SB-125	15	14	11	8.9	24
TE-129M	238	464	166	167	315
I-131	9.0	31	3.2	43	143
TE-132	14.0	14	2.9	4.0	1082
BA-133	4.6	7.1	3.9	4.3	11
CS-134	5.6	5.2	4.1	9.2	15
CS-136	6.1	1.8	2.9	7.2	60
CS-137	7.1	8.3	4.9	12	33
BALA-140	28	81	12.6	28	90
CE-141	60	1.0	4.3	6.2	31
CE-144	24	32	18	20	59
RA-NAT	13	22	7.1	11	45
TH-232	45	55	26	45	50

APPENDIX D

SUMMARY OF RESULTS FROM ANALYTICS AND ENVIRONMENTAL RESOURCE ASSOCIATES INTERLABORATORY COMPARISON PROGRAMS

APPENDIX D

SUMMARY OF RESULTS FOR ANALYTICS AND ENVIRONMENTAL RESOURCE ASSOCIATES INTERLABORATORY COMPARISON PROGRAM

Appendix D presents a summary of the analytical results for the 2002 Analytics and Environmental Resource Associates (ERA) Interlaboratory Comparison Program.

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TABLE D-1

RESULTS FOR ANALYTICS AND ERA INTERLABORATORY COMPARISON PROGRAM

Gross Alpha and Gross Beta Emitters In Water (pCi/L)

DATE MM-YY	PSEG SAMPLE CODE	MEDIUM	ANALYSIS	* PSEG Mean ± s.d.	ANALYTICS ERA Known	ANALYTICS/ERA Acceptance Criteria Lower Limit	ANALYTICS/ERA Acceptance Criteria Upper Limit
06-2002	ANL-WAT-AB549	Water	Alpha	34±8	40	30	50
			Beta	298±5	280	196	364
11-2002	ERA-WAT-AB553	Water	Alpha	8.9±0.6	12.2	3.5	20.9
			Beta	42.2±2.4	47	38.3	55.7
09-2002	ANL-WAT-AB554	Water	Alpha	2.7±0.6	92	62	122
			Beta	247±4	239	167	311
12-2002	ANL-WAT-AB559	Water	Alpha	78±3	84	51	108
			Beta	231±3	216	150	282

* s.d. - one standard deviation of three individual analytical results

TABLE D-2

RESULTS FOR ANALYTICS AND ERA INTERLABORATORY COMPARISON PROGRAM

Gamma Emitters In Water and Milk (pCi/L)

DATE MM-YY	PSEG SAMPLE CODE	MEDIUM	ANALYSIS	* PSEG Mean ± s.d.	ANALYTICS ERA Known	ANALYTICS/ERA Acceptance Criteria Lower Limit	ANALYTICS/ERA Acceptance Criteria Upper Limit
03-2002	ANL-WAT-G544	Water	Cr-51	188±40	198	138	258
			Mn-54	179±8	166	118	214
			Fe-59	99±10	86	62	110
			Co-60	116±3	117	81	153
			Zn-65	159±7	164	116	212
			I-131	62±7	61	43	79
			Cs-137	206±2	197	137	257
			Ce-141	250±4	242	170	314
03-2002	ANL-MLK-G546	Milk	Cr-51	273±31	267	189	345
			Mn-54	232±6	224	158	290
			Fe-59	129±6	116	80	152
			Co-60	154±11	158	110	206
			Zn-65	241±10	221	155	287
			I-131	92±6	92	62	122
			Cs-134	114±1	122	86	158
			Cs-137	261±10	266	188	344
			Ce-141	320±14	326	230	422
12-2002	ANL-WAT-G561	Water					
			Cr-51	362±17	331	229	433
			Mn-54	153±6	136	94	178
			Fe-59	84±9	69	51	87
			Co-58	142±9	133	91	175
			Co-60	165±5	157	109	205
			Zn-65	190±5	171	117	225
			I-131	103±5	94	64	124
			Cs-134	93±1	95	65	125
			Cs-137	227±3	210	144	276
			Ce-141	116±5	106	76	136

* s.d. - one standard deviation of three individual analytical results

TABLE D-3

RESULTS OF ANALYTICS AND ERA INTERLABORATORY COMPARISON PROGRAM

Gamma Emitters In Soil (pCi/Kg-dry)
and Air Particulate Samples (pCi/m^3)

DATE MM-YY	PSEG SAMPLE CODE	MEDIUM	ANALYSIS	* PSEG Mean ± s.d.	ANALYTICS ERA Known	ANALYTICS/ERA Acceptance Criteria Lower Limit	& Upper Limit
03-2002	ANL-SOL-G545	Soil	Cr-51	323±21	314	218	410
			Mn-54	290±7	263	185	341
			Fe-59	149±10	136	94	178
			Co-60	198±7	185	131	239
			Zn-65	263±20	259	181	337
			Cs-137	459±2	439	307	571
			Ce-141	392±7	383	269	497
06-2002	ANL-APT-G551	APT	Cr-51	188±10	186	132	240
			Mn-54	85±5	75	51	99
			Co-60	101±4	99	69	129
			Fe-59	75±4	64	46	82
			Zn-65	165±11	142	100	184
			Cs-134	82±5	95	65	125
			Cs-137	79±5	72	48	96
			Co-58	83±4	79	55	103
			Ce-141	75±1	71	47	95
09-2002	ANL-SOL-G556	Soil	Cr-51	348±37	354	246	462
			Mn-54	252±3	238	166	310
			Fe-59	148±11	138	96	180
			Co-58	156±2	151	103	199
			Co-60	225±3	232	160	304
			Zn-65	302±21	293	203	383
			Cs-137	296±20	282	198	366
			Ce-141	241±7	249	177	321
			Cs-134	193±9	205	145	265

* s.d. - one standard deviation of three individual analytical results

TABLE D-4

RESULTS OF ANALYTICS AND ERA INTERLABORATORY COMPARISON PROGRAM

Tritium Analysis In Water (pCi/L)
Iodine-131 Analysis In Water (pCi/L)
And Iodine In Air Samples (pCi/m^3)

DATE MM-YY	PSEG SAMPLE CODE	MEDIUM	ANALYSIS	* PSEG Mean ± s.d.	ANALYTICS ERA Known	ANALYTICS/ERA Acceptance Criteria Lower Limit	& Upper Limit
03-2002	ANL-WAT-H543	Water	H-3	10902±398	10026	7020	13032
03-2002	ANL-AIO-I547	AIO	I-131	78±0	77	53	101
06-2002	ANL-AIO-I550	AIO	I-131	90±4	93	63	123
06-2002	ANL-WAT-H552	Water	H-3	7253±110	6970	4876	9064
09-2002	ANL-AIO-I555	AIO	I-131	82±2	81	57	105
09-2002	ANL-WAT-H557	Water	H-3	12379±338	11967	8379	15555
11-2002	ERA-WAT-H563	Water	H-3	9285±312	10200	8433	11967
11-2002	ERA-WAT-I558	Water	I-131	6.99±0.2	6.76	3.3	10.2
12-2002	ANL-WAT-H562	Water	H-3	6497±220	5987	4193	7781
12-2002	ANL-AIO-I560	Water	I-131	90±1	95	65	125

* s.d. - one standard deviation of three individual analytical results

APPENDIX E

SYNOPSIS OF LAND USE CENSUS

APPENDIX E

SYNOPSIS OF 2002 LAND USE CENSUS

A land use census was conducted to identify, within a distance of 8 km (5 miles), the location of the nearest milk animal, the nearest residence, and the nearest garden of greater than $50m^2$ ($500ft^2$) producing broad leaf vegetation, in each of the 16 meteorological sectors.

Tabulated below are the results of these surveys:

Meteorological Sector	Milk Animal July, 2002 km (miles)	Nearest Residence July, 2002 km (miles)	Vegetable Garden July, 2002 km (miles)
N	None	None	None
NNE	None	None	None
NE	None	6.4 (4.0)	None
ENE	None	5.8 (3.6)	None
E	None	5.4 (3.4)	None
ESE	None	None	None
SE	None	None	None
SSE	None	None	None
S	None	None	None
SSW	None	5.5 (3.4)	None
SW	None	6.9 (4.3)	None
WSW	None	7.1 (4.4)	None
W	7.8 (4.9)	6.5 (4.0)	None
WNW	None	5.5 (3.4)	None
NW	None	5.9 (3.7)	None
NNW	None	6.8 (4.2)	None