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NIAGARA MOHAWK

NMP 86909

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April 27 , 1992

United States Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

RE: Nine Mile Point Nuclear Station Unit 1
Facility Operating License DPR-63
Docket No. 50-220

Nine Mile Point Nuclear Station Unit 2
Facility Operating License NPF-69
Docket No. 50-410

SUBJECT: Transmittal of 1991 Annual Radiological Environmental Operating Report

Gentlemen:

In accordance with the Technical Specifications for Nine Mile Point Nuclear Station Unit 1 and Unit 2, we are enclosing the Annual Radiological Environmental Operating Report for the period January 1, 1991 through December 31, 1991.

Any questions concerning the enclosed report should be directed to Hugh J. Flanagan at Nine Mile Point (315/349-2428).

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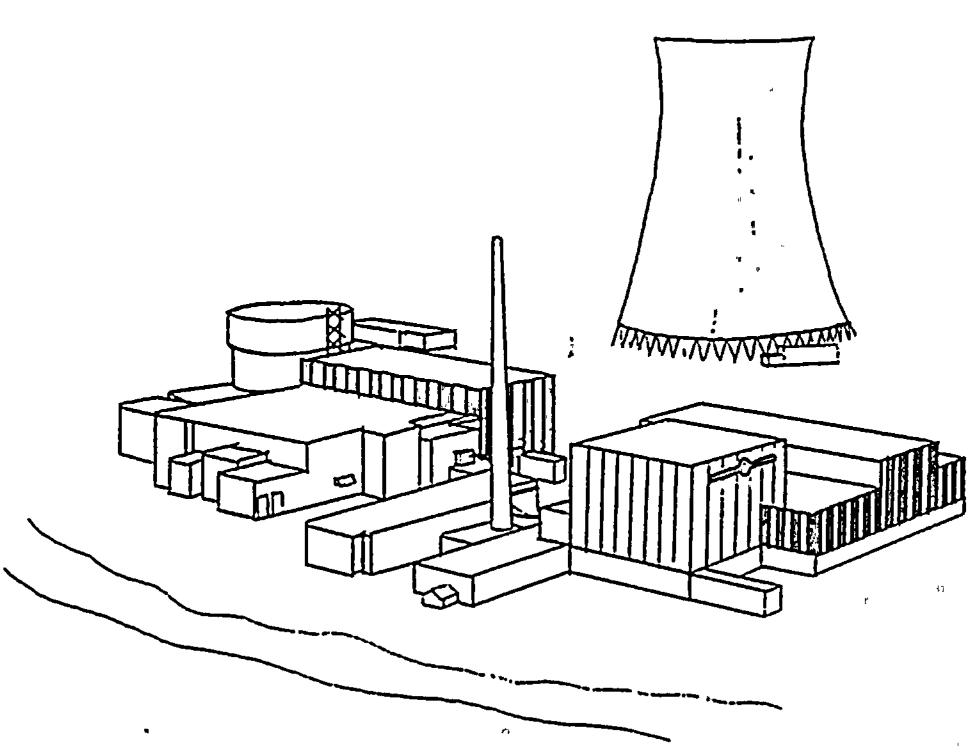
NIAGARA MOHAWK POWER CORPORATION

# ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT



## NINE MILE POINT NUCLEAR STATION

NIAGARA MOHAWK POWER CORPORATION

# ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT

January 1, 1991 - December 31, 1991

for

NINE MILE POINT NUCLEAR STATION UNIT 1

Facility Operating License DPR-63

Docket Number 50-220

and

NINE MILE POINT NUCLEAR STATION UNIT 2

Facility Operating License NPF-69

Docket No. 50-410

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# 1.0 INTRODUCTION

## 1.0 INTRODUCTION

This report is submitted in accordance with Appendix A (Technical Specifications), Section 6.9.1.d to License DPR-63, Docket No. 50-220 for the Nine Mile Point Nuclear Station Unit 1 and Section 6.9.1.7 to License NPF 69, Docket No. 50-410 for the Nine Mile Point Nuclear Station Unit 2 for the calendar year 1991.

The Radiological Environmental Monitoring Program (REMP) is a joint program between the Nine Mile Point Nuclear Station (NMPNS) and the James A. FitzPatrick Nuclear Power Plant (JAFNPP). The sample collections for the radiological programs are performed in large part by EA Science and Technology (EA). EA also performs the sampling required for the Station's SPDES Permit. The same staff from EA is utilized to perform the majority of terrestrial and aquatic sampling required for the REMP. In-plant canal water sampling, air sample collection, and environmental TLD collections are performed jointly by the NMPNS and JAFNPP staffs.

The present sample collection and analysis schedule required by the Technical Specifications for the Nine Mile Point Nuclear Station Unit 1 and 2 (NMPNS) is listed in Table 1 and 2.

The REMP samples were analyzed by Teledyne Isotopes and by the Site Environmental Laboratory during 1991. The following samples were analyzed by the Site Environmental Laboratory:

- Shoreline sediment (gamma spectral analysis)
- Fish (gamma spectral analysis)
- Lake water (monthly gamma spectral analysis only)
- Air particulate filter (weekly gross beta analysis)
- Air particulate filter (monthly gamma spectral analysis)
- Airborne radioiodine cartridge (weekly gamma spectral analysis)
- Milk (gamma spectral and I-131 analysis)
- Food products (gamma spectral analysis)

The remainder of the sample analyses, as outlined in Table 1 and 2, were analyzed by Teledyne Isotopes.

Data are evaluated only from locations required by the Technical Specifications. Data from optional locations are not evaluated unless indicated otherwise.

There were four separate groups of radionuclides that were detected in the environment during 1991. Several radionuclides could possibly fall into two of the four groups. The first of these groups is naturally occurring radionuclides. It must be realized that the environment contains a broad inventory of naturally occurring radioactive elements. Background radiation, as a function of primordial radioactive elements

## 1.0 INTRODUCTION

and cosmic radiation of solar origin, offers a constant exposure to the environment and man. These radionuclides, such as Ra-226, Be-7 and especially K-40, account for a majority of the annual per capita background dose.

A second group of radionuclides that were detected are a result of the detonation of thermonuclear devices in the earth's upper atmosphere. The detonation frequency during the early 1950's produced a significant inventory of radionuclides found in the lower atmosphere as well as in ecological systems. A ban was placed on atmospheric weapons testing in 1963 which greatly reduced the inventory through the decay of short lived radionuclides, deposition, and the removal (by natural processes) of radionuclides from the food chain. Since 1963, several atmospheric weapons tests have been conducted by the People's Republic of China. In each case, the usual radionuclides associated with nuclear detonations were detected several months afterwards, and after a peak detection period, diminished to a point where most could not be detected. The last such weapons test was conducted in October of 1980. The resulting fallout or deposition from this test had influenced the background radiation in the vicinity of the site and was very evident in many of the sample media analyzed during 1981. Calculations from 1981 of the resulting doses to man from fallout related radionuclides in the environment show that the contribution from such nuclides (such as Sr-90 or Cs-137) is significant and second in intensity only to natural background radiation. Quantities of Nb-95, Zr-95, Ce-141, Ce-144, Ru-106, Ru-103, La-140, Cs-137, Mn-54 and Co-60 were typical in air particulate samples during 1981 and have a weapons test origin. During 1991, Cs-137 was the only radionuclide detected in environmental samples that had a weapons testing origin.

The third group of radionuclides includes those that were a result of the Chernobyl Nuclear Plant accident. These radionuclides were first detected in May of 1986 and were found in samples of air particulates, air radioiodine and milk. Applicable radionuclides include I-131, Cs-134, Cs-137, Nb-95, Ru-103, Ru-106, and La-140.

The fourth group of radionuclides are those that could be related to operations at the site. Many of these radionuclides are a by-product of both nuclear detonations and the operation of light water reactors and therefore, make a distinction between the two sources difficult, if not impossible. Radionuclides falling into this category (as applicable to the 1991 Nine Mile Point Radiological Environmental Monitoring Program) were Cs-137, Zn-65, and H-3. The dose to man as a result of these radionuclides is small and significantly less than the radiation exposure from naturally occurring sources of radiation and from fallout.

The evaluation and interpretation of environmental data must be made at several levels including trend analysis, dose to man, etc. An attempt has been made not only to report the data collected during 1991, but also to assess the significance of the radionuclides detected in the environment as compared to natural radiation sources. It is

# 1.0 INTRODUCTION

important to note that detected concentrations of radionuclides that are possibly related to operations at the site are very small and are not an indication of environmental significance. In regards to these very small quantities, it will be further noted that at such minute concentrations the assessment of the significance of detected radionuclides is very difficult. Therefore, concentrations in one sample that are two times the concentration of another, for example, are not significant overall. Moreover, concentrations at such low levels may show a particular radionuclide in one sample and yet not in another because of analytical counting statistics at such low concentrations.

The average annual dose equivalent to individuals in the United States has been estimated to be 360 mrem (NCRP 93, 1987). The majority of this dose (300 mrem) is attributed to natural background of which radon and daughter products contributed 200 mrem. Of man-made sources, medical diagnosis was the highest, contributing approximately 50 mrem. Consumer products added the remaining 10 mrem. The annual dose from the nuclear fuel cycle (including the operation of nuclear power facilities) is 0.05 mrem per year and is considered negligible.

Background gamma radiation around the Nine Mile Point Site, as a result of radionuclides in the atmosphere and the ground, accounted for approximately 54 mrem during 1991. This dose is a result of radionuclides of cosmic origin (for example, Be-7), of a primordial origin (Ra-226, K-40, and Th-232) and, to a much smaller extent, of a man-made origin from weapons testing. A dose of 54 mrem, as a background dose, is significantly greater than any possible dose as a result of operations at the site during 1991.

Environmental Sample Locations - Table 3

Table 3 contains the locations of the environmental samples presented in the data tables. The locations are given in degrees and distance from the Nine Mile Point Nuclear Station Unit 2 reactor centerline. Table 3 also gives the figure (map) number as well as the map designation for each sample location by sample medium type. The requirement for Table 3 is found in section 6.9.1.d of the Technical Specifications for the Nine Mile Point Nuclear Station Unit 1 and section 6.9.1.7 of the Technical Specifications for the Nine Mile Point Nuclear Station Unit 2.

Radiological Environmental Monitoring Program Annual Summary - Table 4

Table 4 contains a summary of basic statistics for environmental sample media as required by the Technical Specifications. Table 4 is in the format presented on Table 3 of the NRC Branch Technical Position (Revision 1 dated November 1979) to NRC Regulatory Guide 4.8 "Environmental Technical Specifications for Nuclear Power Plants". The table is presented to meet the requirements of section 6.9.1.d and section 6.9.1.7 of the Technical Specifications for Nine Mile Point Nuclear Station Unit 1 and Unit 2 respectively.

# 2.0 AQUATIC SAMPLES

## 2.0 AQUATIC SAMPLES

I SHORELINE SEDIMENT

A. Sample Collection Methodology and Analysis

Shoreline sediment samples are collected twice per year from one area of existing or potential recreational value and from one area beyond the influence of the site. The area of potential recreational value is the only area from which samples are required by the Technical Specifications. Approximately one kilogram of shoreline sediment is obtained from areas washed by the lakeshore surf at the two locations twice per year. All samples are shipped and analyzed for gamma emitters at the Site Environmental Laboratory. Optional samples may be collected from other shoreline locations at or near the site.

Shoreline sediment locations are shown on Figure 1A (refer to Table 3 for location designations and descriptions).

B. Evaluation of Shoreline Sediment Data - Tables 5A and 5B

Shoreline sediment samples were obtained in April and October of 1991 at one off-site control location (near Oswego Harbor) and at one indicator location (shoreline area just east of the site with recreational value).

The results of the shoreline sediment samples collected during 1991 at the indicator and control locations are shown on Table 5. Table 5A shows results in units of pCi/g (dry) for purposes of data evaluation. Table 5B shows results in units of pCi/kg (dry), as required by the Technical Specifications. Only the Sunset Beach location was required by the Technical Specifications during 1991.

Several radionuclides were detected in sediment samples using gamma spectral analysis. K-40 was detected at both the control location and indicator locations for both collection periods during 1991. K-40 ranged in concentration from 10.9 pCi/g (dry) to 13.4 pCi/g (dry) at the control location and 15.9 pCi/g (dry) to 18.8 pCi/g (dry) at the indicator location. K-40 is a naturally occurring primordial radionuclide.

In addition to K-40, Ra-226 and AcTh-228 were also detected and are also naturally occurring radionuclides. Ra-226 was detected at concentrations that were representative of normal background level fluctuations. Ra-226 was found at concentrations of 1.75 pCi/g (dry) to 1.78 pCi/g (dry) at the indicator location and 0.67 pCi/g (dry) to 1.00 pCi/g (dry) at the control location. The AcTh-228 concentration at the control location ranged from 0.23 to 0.33 pCi/g (dry). The AcTh-228 concentration ranged from 0.67 pCi/g (dry) to 0.68 pCi/g (dry) at the indicator location.

I SHORELINE SEDIMENT (Cont'd)

B. Evaluation of Shoreline Sediment Data-Tables 5A and 5B (Cont'd)

Cs-137 was not detected at the control location during 1991. Cs-137 was detected twice at the indicator location at concentrations ranging from 0.11 to 0.16 pCi/g (dry). Cs-137 was also detected in 1989 and 1990 at concentrations of 0.30 and 0.28 pCi/g (dry) respectively. Cs-137 had not been detected at this location in the past (1985-1988).

The source of Cs-137 in 1991 indicator shoreline sediment samples is difficult to determine. Possible sources are fallout from past weapons or from site operations. It is highly probable that the Cs-137 is from fallout. Cs-137 has been detected in the past at control locations beyond the influence of the site. Due to the fact that few shoreline regions west of the site contain fine sediment and/or sand, it is difficult to obtain control samples which are comparable to the physical and chemical characteristics of the indicator samples. Other factors, which include changing lake level and shoreline erosion, further complicate any consistency in shoreline sediment sampling. Soil samples in areas which are likely to be affected by plant operations, as well as soil beyond any influence from the site, all contain levels of Cs-137 at or greater than the concentration found in 1991 shoreline sediment. Cs-137 in soil samples has been attributed to weapons testing fallout. Therefore, any shoreline sediment sample containing soil would reveal Cs-137. These factors support the likelihood that the trace amounts of Cs-137 detected in the indicator shoreline sediment samples is due to fallout from past weapons testing.

Using Regulatory Guide 1.109 methodology, and conservatively assuming that the maximum exposed individual (adult or teenager) would spend approximately 67 hours per year at this location, a conservative dose due to Cs-137 was calculated to be 0.0005 mrem to the whole body and 0.0006 to the skin. These doses are very small when compared to average annual whole body doses due to natural background and may be considered insignificant. For the purpose of comparison, soil sampled at a location beyond any influence of the site contained Cs-137 at a concentration of 0.70 pCi/g. Using the same methodology and assumptions for that of sediment, an annual whole body dose of 0.002 mrem was calculated. Thus, it is shown that a dose to an individual at the shoreline is less than an individual would receive from soil. Both doses may be considered insignificant.

No other radionuclides were detected in shoreline sediment samples using gamma spectral analysis.

Tables 21 and 22 show historical environmental data for shoreline sediment samples. Shoreline sediment samples at this location were not collected prior to 1985.

# 2.0 AQUATIC SAMPLES

## II FISH

### A. Sample Collection Methodology and Analysis

Available fish species are obtained from collections during the spring and fall. Samples are collected from two of four possible on-site sample transects located in the vicinity of the site lake discharge points and one off-site sample transect. Available species are selected under the following guidelines:

1. Samples of 0.5 to 1 kilogram of edible fish portions for a minimum of two species per location.

2. When two independent species are not available at all sample locations, a species may be divided into two samples for each location. This procedure may be accomplished provided that a sufficient sample size is available for the species in question at all three locations.

Selected fish samples are segregated by species and location and are processed immediately after collection. Samples are shipped frozen in insulated containers. Edible portions of samples are analyzed for gamma emitting radionuclides.

Fish sample transects are shown on Figure 1A (refer to Table 3 for location designations and descriptions).

### B. Evaluation of Fish Data - Tables 6A and 6B

A total of thirty fish samples were analyzed as a result of collections in the spring season (May-June 1991) and in the fall season (September-October 1991). Collections were made utilizing gill nets at one location greater than five miles from the site (Oswego Harbor area), and at two locations in the vicinity of the lake discharges for the Nine Mile Point Unit #1 (02), and the James A. FitzPatrick (03) generating facilities. The Oswego Harbor samples served as control samples while the NMP (02) and JAF (03) samples served as indicator samples. Samples were analyzed for gamma emitters. Table 6A shows results in units of pCi/g (wet) for purposes of data evaluation. Table 6B shows results in units of pCi/kg (wet), as required by the Technical Specifications.

Spring fish sample collections were comprised of six separate species and seventeen individual samples. Brown trout, white sucker, lake trout, smallmouth bass, white perch and walleye were collected at the indicator locations (NMP and JAF). At the control location (Oswego Harbor) brown trout, white sucker, lake trout, white perch, smallmouth bass and walleye were also collected.

## 2.0 AQUATIC SAMPLES

II FISH (Cont'd)

B. Evaluation of Fish Data - Tables 6A and 6B (Cont'd)

Cs-137 was detected in four of the eleven indicator samples and in one of the six control samples collected during the spring. Indicator samples showed Cs-137 concentrations to be slightly less than control results for all samples. The indicator results, however, are not significantly different from the control results and are therefore considered to be representative of background concentrations. The detected Cs-137 concentration in walleye was 0.035 pCi/g (wet) at one indicator sample location. The detected Cs-137 concentration in control samples was 0.045 pCi/g (wet) for walleye. Cs-137 in brown trout was 0.024 pCi/g (wet) at one indicator location. Cs-137 was not detected in the control sample location brown trout sample. Cs-137 was not detected in white sucker, lake trout, or smallmouth bass samples at the indicator or control locations. Cs-137 was detected in white perch samples at both indicator locations at concentrations of 0.022 pCi/g (wet) and 0.033 pCi/g (wet). At the control location Cs-137 was not detected in white perch.

K-40 was detected in all of the spring samples collected. K-40 is a naturally occurring radionuclide and is not related to power plant operations. Detectable concentrations of K-40 in the indicator samples ranged from 2.95 to 6.08 pCi/g (wet) and 2.42 to 5.20 pCi/g (wet) for the control samples. Ra-226, also naturally occurring, was found at levels that ranged from 0.38 to 0.95 pCi/g (wet) at the indicator locations. Ra-226 was detected in all control samples and ranged in concentration from 0.40 to 0.86 pCi/g (wet). No other radionuclides were detected in the spring fish samples.

Fall fish sample collections were comprised of seven separate species and nineteen individual samples. Lake trout, brown trout, smallmouth bass, white sucker, white perch, walleye and salmon samples were collected at indicator sampling locations (NMP and JAF). All seven species were collected at the control location (Oswego Harbor).

Cs-137 was detected in ten of the nineteen samples which included the control samples. Indicator samples showed an average Cs-137 concentration that was slightly greater than the control sample mean from the off-site location. The detected concentrations were not significantly different from one another because of the extremely small quantities detected. Cs-137 in walleye samples at the indicator locations ranged from 0.021 to 0.025 pCi/g (wet) and was 0.028 pCi/g (wet) at the control location.

II FISH (Cont'd)

B. Evaluation of Fish Data - Tables 6A and 6B (Cont'd)

Cs-137 was detected in lake trout sampled at NMP and JAF at concentrations of 0.034 and 0.027 pCi/g (wet) respectively, and in brown trout at the JAF location at a concentration of 0.022 pCi/g (wet). Cs-137 was not detected in either type of trout collected at the control location (Oswego Harbor). The concentration of Cs-137 in smallmouth bass sampled at both NMP and JAF was 0.026 pCi/g (wet). The smallmouth bass sample from the control location did not reveal any Cs-137. Salmon sampled at NMP contained 0.028 pCi/g (wet), while salmon at the control location revealed 0.016 pCi/g (wet). White sucker and white perch samples collected at indicator or control locations did not reveal any detectable concentrations of Cs-137.

Naturally occurring K-40 was detected in all of the fall samples collected. Detectable concentrations of K-40 in the indicator samples ranged from 3.79 to 5.04 pCi/g (wet) and 3.57 to 4.75 pCi/g (wet) for the control samples. Ra-226, also naturally occurring, was detected intermittently at concentrations which ranged from 0.30 to 0.92 pCi/g (wet) for the indicator samples and from 0.46 to 0.70 pCi/g (wet) for the control samples. No other radionuclides were detected in the fall fish samples.

Review of past environmental data indicates that the mean annual Cs-137 concentration has decreased significantly from the 1976 through 1979 results for indicator samples. Average concentrations for these samples decreased from a level of 1.4 pCi/g (wet) in 1976 to a level of 0.027 pCi/g (wet) in 1991. Control sample results have also decreased from a level of 1.2 pCi/g (wet) in 1976 to a level of 0.025 pCi/g (wet) in 1986. The average result for 1991 was 0.030 pCi/g (wet). Results from 1980 to 1986 have shown a fairly consistent decreasing trend for control and indicator samples. During 1987 through 1990, control and indicator mean results increased slightly when compared to 1986.

The general decreasing trend for Cs-137 is most probably a result of ecological cycling. The concentrations of Cs-137 detected since 1976 in fish are a result of weapons testing fallout, and the general downward trend in concentrations will continue as a function of ecological cycling and nuclear decay. There was no apparent effect from the 1986 Chernobyl Nuclear Plant accident during 1986 relative to Cs-137 results in fish samples although an effect may have been detected during the period of 1987 through 1990 since both indicator and control location mean results increased slightly.

Tables 23 and 24 show historical environmental sample data for fish.

## 2.0 AQUATIC SAMPLES

II FISH (Cont'd)

B. Evaluation of Fish Data - Tables 6A and 6B (Cont'd)

Lake Ontario fish are considered an important food source by many. Therefore, fish are an integral part of the human food chain. Based on the importance of fish in the local diet, a reasonable conservative estimate of dose to man can be calculated. Assuming that an adult consumes 21.0 kg of fish per year (Regulatory Guide 1.109 maximum exposed age group) and the fish consumed contains an average Cs-137 concentration of 0.027 pCi/g (wet) (annual mean result of indicator samples for 1991), the whole body dose received would be 0.040 mrem per year. The critical organ in this case is the teen liver which would receive a calculated dose of 0.064 mrem per year. The Cs-137 whole body and critical organ doses are conservative calculated doses associated with consuming fish from the Nine Mile Point area (indicator samples). No radiological decay is assumed for the calculation of doses.

Conservative whole body and critical organ doses can be calculated for the consumption of fish from the control location as well. In this case the consumption rate is assumed to remain the same (21.0 kg per year ) but the average annual Cs-137 concentration for the control samples is 0.030 pCi/g (wet). The calculated Cs-137 whole body dose is 0.045 mrem per year and the associated dose to the teen liver is 0.071 mrem per year. In this case, the fish sampled from the control location resulted in doses which were higher than that from the locations near the nuclear facilities. The control location is located beyond any influence of the site. This strongly suggests that any Cs-137 detected in fish is due to weapons testing fallout and not due to plant operations.

In summary, the whole body and critical organ doses observed as a result of consumption of fish is small. The doses from indicator sample fish are slightly less although well within natural variability. Doses from both sample groups are considered background doses and negligible.

## 2.0 AQUATIC SAMPLES

### III SURFACE WATER

#### A. Sample Collection Methodology and Analysis

Surface water samples are taken from the respective inlet canals of the J.A. FitzPatrick facility and Niagara Mohawk's Oswego Steam Station. The FitzPatrick facility removes water from Lake Ontario on a continuous basis and generally represents a "down-current" sampling point from the Nine Mile Point Unit 1 and Unit 2 facilities. The Oswego Steam Station inlet canal removes water from Lake Ontario at a point approximately 7.6 miles west of the site. This "up-current" location is considered a control location because of the distance from the site as well as the result of the lake current patterns and current patterns from the Oswego River located nearby (see Figure 1A).

Samples from the FitzPatrick facility are composited from automatic sampling equipment which discharges into a compositing tank. Samples are obtained from the tank monthly and analyzed for gamma emitters. Samples from the Oswego Steam Station are also composited from automatic sampling equipment which discharge to a compositing tank. Samples from this location are obtained weekly and are composited to form monthly composite samples. Monthly samples are analyzed for gamma emitters.

A portion of the samples from each of the locations is saved and composited to form quarterly composite samples for each calendar quarter. Quarterly composite samples are analyzed for tritium.

In addition to the FitzPatrick and Oswego Steam Station facilities, data are presented for the Nine Mile Point Unit 1 and Unit 2 facility inlet canals and city water from the City of Oswego. The latter three locations are not required by the Technical Specifications, but are optional samples. Monthly composite samples from these three locations are analyzed for gamma emitters and quarterly composite samples are analyzed for tritium.

Sampling for ground water and drinking water, as found in Section 3.12.1 of the Nine Mile Point Unit 2 Technical Specifications, was not required during 1991 because these pathways were not applicable to the site during the year. Applicable sampling requirements and conditions are presented in the Unit 2 Off-Site Dose Calculation Manual.

Surface water sample locations are shown on Figure 1A (refer to Table 3 for location designations and descriptions).

II SURFACE WATER (Cont'd)

B. Evaluation of Data - Tables 7 and 8

Surface water samples were analyzed monthly for gamma emitters (using gamma spectral analysis) during 1991. Tritium analyses were performed quarterly. Quarterly samples (i.e., analysis for tritium) were composite samples.

The analytical results for the 1991 surface water samples showed no evidence of plant related radionuclide buildup in the surface water in the vicinity of the site. Indicator samples were collected from the inlet canal at the James A. FitzPatrick facility. The control location samples were collected at the inlet canal of Niagara Mohawk's Oswego Steam Station. These two locations are required to be sampled by the Technical Specifications. Tables 7 and 8 show the results of surface water samples analyzed during 1991.

Gamma spectral analysis was performed on twenty four monthly composite samples (two locations) required by the Technical Specifications. In addition, three optional sample locations were evaluated. These included the Nine Mile Point Nuclear Station Unit 1 and Unit 2 inlet canals and the City of Oswego drinking water supply. The drinking water supply composite samples consisted of twice per week grab samples. Only two radionuclides were detected in samples from the five locations over the course of 1991. Both radionuclides were naturally occurring.

K-40 was detected consistently in both Technical Specification required intake canal samples. K-40 in James A. FitzPatrick inlet canal samples ranged from 44 to 257 pCi/liter. K-40 in the Oswego Steam Station inlet canal ranged from 26 to 246 pCi/liter. The Nine Mile Point Unit 1 inlet canal, Unit 2 inlet canal and the city water samples showed K-40 detected in all of the twelve monthly samples for each location. For these samples, K-40 concentrations ranged from 37 to 244 pCi/liter, from 57 to 251 pCi/liter and from 32 to 261 pCi/liter respectively.

Ra-226 was detected intermittently in samples from all five locations. Ra-226 was detected intermittently in samples from the Nine Mile Point Unit 1 inlet canal and ranged from 55 to 122 pCi/liter. The Nine Mile Point Unit 2 inlet canal showed Ra-226 detected at concentrations that ranged from 50 to 131 pCi/liter. Samples from the FitzPatrick location showed Ra-226 that ranged from 49 to 131 pCi/liter. The control sample location (Oswego Steam Station) showed Ra-226 that ranged in concentration from 52 to 126 pCi/liter. The city water samples results showed Ra-226 that ranged from 75 to 140 pCi/liter.

III SURFACE WATER (Cont'd)

B. Evaluation of Data - Tables 7 and 8 (Cont'd)

Tritium samples are quarterly samples that are a composite of the appropriate calendar months. Tritium was detected in samples taken at all five locations. Seven of the sample results showed that tritium was not detected within the analytical sensitivity of the analysis. The City of Oswego drinking water showed tritium concentrations ranging from 220 to 590 pCi/liter with a mean of 360 pCi/liter. Tritium concentrations for the James A. FitzPatrick inlet canal ranged from 250 to 390 pCi/liter and showed a mean concentration of 310 pCi/liter. Inlet canal samples taken at Nine Mile Point Unit 1 and Unit 2 showed tritium concentrations ranging from 220 to 390 pCi/liter and 230 to 360 pCi/liter respectively. The annual mean concentration was 293 pCi/liter and 310 pCi/liter respectively. At the Technical Specification control location (Oswego Steam Station inlet canal) tritium was detected twice at concentrations of 180 and 200 pCi/liter.

The impact of tritium in water to members of the public is minimal. This can be evaluated by calculating a dose to the whole body and maximum organ. Using Regulatory Guide 1.109 methodology, ingestion of water at the indicator location would result in a dose of 0.032 mrem to the whole body and 0.032 mrem to the child liver. The doses at the control location were 0.020 mrem whole body and 0.020 mrem to the child liver. Drinking water sampled in Oswego is drawn from Lake Ontario at a location even more distant than the control location. Doses from tritium at this location were 0.037 mrem to the whole body and 0.037 mrem to the child liver. Detecting tritium at the highest average concentration at the location most distant from the nuclear facilities strongly suggests that the tritium is present due to past weapons testing and natural sources. Doses from all water sampled are considered background doses and are negligible.

Review of past environmental data for Cs-137 from 1979 through 1990 shows that this radionuclide was detected only once at the control location during 1979 at a concentration of 2.5 pCi/liter. Cs-137 at the indicator location (JAF inlet canal) was detected only once during 1982 at a concentration of 0.43 pCi/liter. The 1979 control sample result is suspect and may have been a result of contamination during handling or instrument background since Cs-137 was not detected in the indicator inlet canal. The one result from the indicator location (JAF inlet canal) during 1982 was detected in a January

## 2.0 AQUATIC SAMPLES

III SURFACE WATER (Cont'd)

B. Evaluation of Data - Tables 7 and 8 (Cont'd)

composite sample and may have been a result of inlet canal tempering (the addition of discharge water to the inlet canal) or instrument background. Cs-137 was not detected during 1991 in surface water samples.

Other plant related radionuclides detected during a review period of 1979 - 1990 include only Co-60. The control sample location results showed that Co-60 was detected once in 1981 (the May composite sample). This result is suspect and, as noted above, may be a result of contamination during handling or may be instrument background. This result was 1.4 pCi/liter. Results from the indicator location showed that Co-60 was detected three times during 1982 and averaged 1.9 pCi/liter. These positive results were attributed to inlet canal tempering and instrument background. Co-60 was not detected during 1991 in surface water samples.

Tables 25 and 26 show historical environmental sample data for surface water using gamma spectral analysis.

Previous annual mean results for tritium at the indicator sample location (FitzPatrick inlet canal) has generally decreased since 1976. Mean sample results reviewed from 1976 through 1990 showed a peak average value of 627 pCi/liter (1976) and a minimum value of 227 pCi/liter (1980). The annual mean tritium result at the indicator location for 1991 was 310 pCi/liter.

Mean tritium results for the control location (Oswego Steam Station) can not be evaluated with regard to long term historical data since sampling was only initiated at this location in 1985. Some idea of the variability of control sample data can be obtained, however, by review of previous data from the City of Oswego drinking water samples. The drinking water samples are not likely to be affected by the station because of the effects of the distance, lake currents, and the discharge of the Oswego River. Therefore, this previous sample data represents acceptable control sample data for evaluation purposes.

Historical mean annual tritium results from previous city water samples (1976-1984) and Oswego Steam Station samples (1985-1990) show that the tritium concentrations have decreased. The maximum annual average was found in 1976 (652 pCi/liter) and the minimum in 1982 (165 pCi/liter). Mean annual results from 1979 to 1990 have remained relatively consistent. The annual mean result for 1991 was 190 pCi/liter.

Tables 27 and 28 show historical environmental sample data for surface water tritium.

# 3.0 DIRECT RADIATION

## 3.0 DIRECT RADIATION

### A. Sample Collection Methodology and Analysis

Thermoluminescent dosimeters (TLD's) are used to measure direct radiation (gamma dose) in the environment. TLD's are obtained from Teledyne Isotopes on a quarterly basis and are read at Teledyne Isotopes' facility in Westwood, New Jersey. Control TLD's accompany the TLD's when they are being placed or collected and are shielded by lead when they are not being used. TLD data results are corrected for a transit dose by use of the data from shipment control TLD's.

Five different types of areas are evaluated by environmental TLD's. These areas include on-site areas (areas within the site boundary not required by the Technical Specifications), the site boundary area in each of the sixteen meteorological sectors, an outer ring of TLD's located four to five miles from the site in eight available land based meteorological sectors, special interest TLD's located at sites of high population density and control TLD's located at sites beyond significant influence of the site. Special interest TLD's are located at or near large industrial sites, schools, proximal towns or communities or other special activity areas. Control TLD's are located to the southwest, south, south-southeast and northeast of the site at distances of 12.6 to 26.4 miles.

TLD's used during 1991 were composed of rectangular teflon wafers impregnated with 25% $CaSO_4$: Dy Phosphor. These were placed in thin plastic packages to ensure dosimeter integrity. TLD packages were placed in open webbed plastic holders and were attached to supporting structures; usually trees or utility poles.

Environmental TLD locations are shown on Figures 1A, 1B, and 2 (refer to Table 3 for location designations and descriptions).

### B. Evaluation of TLD Data - Tables 9A and 9B

TLD's were collected and read once per quarter during the 1991 sample year. The TLD results are, for the most part, an average of eight independent readings at each location and are reported in mrem per standard month (Table 9A) and in mrem per quarterly period (Table 9B).

TLD's required by the Technical Specifications include two TLD's at each location with four independent readings per TLD. TLD results included on Tables 9A and 9B are comprised of TLD's required by the Technical Specifications and special interest TLD's not required by the Technical Specifications. During 1991, TLD's were collected during the weeks of March 24, 1991, June 23, 1991, September 22, 1991 and December 22, 1991.

## 3.0 DIRECT RADIATION

B. Evaluation of TLD Data - Tables 9A and 9B (Cont'd)

Overall TLD results are evaluated by organizing environmental TLD's into five different groups. These groups include: (1) on-site TLD's (TLD's within the site boundary not required by the Technical Specifications), (2) site boundary TLD's (one in each of the sixteen 22 1/2 degree meteorological sectors), (3) a ring of TLD's four to five miles from the site in each of the land based 22 1/2 degree meteorological sectors, (4) special interest TLD's in areas of high population density, and (5) control TLD's in areas beyond any significant influence of the generating facilities. Special interest TLD's are located at or near large industrial sites, schools, or proximal towns or communities. Control TLD's are located to the southwest, south, south-southeast, and northeast of the site at distances of 12.6 to 26.4 miles from the site.

Most of the TLD locations required by the Technical Specifications during 1991 were initiated in 1985 as a result of the issuance of new Technical Specifications by the NRC. Therefore, these TLD results can only be compared to 1985 - 1990 results. Other TLDs, which include a few TLDs required by the Technical Specifications (i.e., numbers 7, 14, 15, 18, 23, 49, 56, and 58) and other optional TLDs, can be compared to results prior to 1985 since these TLDs were established prior to 1985.

On-site TLD's are TLD's at special interest areas and, with the exception of TLD numbers 7 and 23, are not required by the Technical Specifications. These are located near the generating facilities and at previous or existing on-site air sampling stations. TLD's located at the air sampling stations include numbers 3, 4, 5, 6, 7, 23, 24, 25 and 26. The results for these TLD's are generally consistent with previous years results. These results ranged from 3.2 to 11.6 mrem per standard month. TLD #3 is located in the vicinity of Nine Mile Point Unit 2 and is between the Unit 1 facility and the FitzPatrick facility. The results for TLD #3 were approximately double the results of the other TLD's during 1991 because of the effects from the Unit 1, Unit 2 and the FitzPatrick facilities.

Other on-site TLD's include special interest TLD's located near the north shoreline of the Unit 1, Unit 2 and FitzPatrick facilities, but in close proximity to radwaste facilities and the Unit 1 reactor building. These TLD's include numbers 27, 28, 29, 30, 31, 39, and 47. Results for these TLD's during 1991 were variable and ranged from 5.2 to 31.4 mrem per standard month as a result of activities at the radwaste facilities and the operating modes of the generating facilities. Results for 1991 are consistent with the ranges of variability noted in 1990 for TLD's at or near these locations. TLD's in this group ranged up to approximately seven times control TLD results.

## 3.0 DIRECT RADIATION

B. Evaluation of TLD Data - Tables 9A and 9B (Cont'd)

Additional on-site TLD's are located near the on-site Energy Center and the associated northeast shoreline. These TLD's include numbers 18, 103, 106 and 107. TLD's 103, 106 and 107 are located to the east of the Energy Center and to the west of the Unit 1 facility. TLD number 18 is located on the west side of the Energy Center. Results during 1991 showed these TLD's ranged from 4.2 - 6.0 mrem per standard month and were consistent with the 1990 results.

Site boundary TLD's are required by the Technical Specifications and are located in the approximate area of the site boundary with one in each of the sixteen 22 1/2 degree meteorological sectors. These TLD's include numbers 75, 76, 77, 23, 78, 79, 80, 81, 82, 83, 84, 7, 18, 85, 86 and 87. TLD numbers 78, 79, 80, 81, 82, 83, 84, 7 and 18 showed results that were consistent with control TLD results and ranged from 3.2 to 5.8 mrem per standard month. Site boundary TLD's during 1991 were consistent with 1985-1990 results. TLD numbers 75, 76, 77, 23, 85, 86, and 87 showed results that ranged up to three times the results of control TLD's. These results ranged from 4.6 to 16.7 mrem per standard month. This latter group of TLD's are located near the lake shoreline (approximately 100 feet from the shoreline), but are also located in close proximity of the reactor building and radwaste facilities of Unit 1 and Unit 2 and the radwaste facilities of the FitzPatrick facility.

A net site boundary dose can be estimated from available TLD results and control TLD results. TLD results from TLD's located near the site boundary in sectors facing the land occupied by members of the public (excluding TLD's near the generating facilities and facing Lake Ontario) are compared to control TLD results. The site boundary TLD's include numbers 78, 79, 80, 81, 82, 83, 84, 7 and 18. Control TLD's include numbers 8, 14, 49, 111 and 113. Net site boundary doses for each quarter in mrem per standard month are as follows:

| Quarter | Net Site Boundary Dose* |
|---|---|
| 1 | +0.4 |
| 2 | -0.2 |
| 3 | +0.3 |
| 4 | +0.0 |

*Dose in mrem per standard month

Site boundary TLD numbers 75, 76, 77, 23, 85, 86, and 87 were excluded from the net site boundary dose calculation since these TLD's are not representative of doses at areas where a member of the public may be located. These areas are near the north shoreline which are in close proximity to the generating facilities and are not accessible to members of the public.

B. Evaluation of TLD Data - Tables 9A and 9B (Cont'd)

The third group of environmental TLD's are those TLD's located four to five miles from the site in each of the land based 22.5 degree meteorological sectors. These TLDs are required by the Technical Specifications. At this distance, TLD's are not present in eight of the sixteen meteorological sectors that are located over Lake Ontario.

Results for this group of TLD's during 1991 fluctuated slightly as a result of changing naturally occurring conditions and the different concentrations of naturally occurring radionuclides in the ground at each of the locations. These TLD's were established in 1985 and include numbers 88, 89, 90, 91, 92, 93, 94 and 95. Results fluctuated from 3.6 to 5.6 mrem per standard month. These results are generally consistent with control TLD results during 1991. Results for this group of TLDs were consistent with the 1985 - 1990 results. Results were also consistent with other off-site TLD results during 1991 and previous to 1991.

The fourth group of environmental TLD's are those TLD's located near the site boundary and at special interest areas such as industrial sites, schools, nearby communities, towns, off-site air sampling stations, the closest residence to the site, and the off-site environmental laboratory. Many of these TLDs are required by the Technical Specifications. Others are optional. This group of TLD's include numbers 9, 10, 11, 12, 13, 15, 19, 51, 52, 53, 54, 55, 56, 58, 96, 97, 98, 99, 100, 101, 102, 108 and 109. TLD numbers 108 and 109 are TLD locations that were established to assist in the evaluation of the critical residence. Results ranged from 2.9 to 5.6 mrem per standard month. All the TLD results from this group were within the general variation noted for the control TLD's. Results during 1991 for TLD's established during previous years were consistent with results noted for those years.

The fifth group of TLD's include those TLD's considered as control TLD's. These TLD's are required by the Technical Specifications and include numbers 14 and 49. Optional control locations are TLD numbers 8, 111, and 113 and were added to the program to expand the data base for control TLD's. Results for 1991 ranged from 3.8 to 5.4 mrem per standard month. Results from 1991 were consistent with previous years results. However, an annual average increase was noted in 1986. This increase may have been a result of the Chernobyl Nuclear Plant accident and was not noted during 1987-1991.

## 3.0 DIRECT RADIATION

B. Evaluation of TLD Data - Tables 9A and 9B (Cont'd)

Review of past TLD results required by the Technical Specifications show that these TLDs can be separated into four groups. These groups include site boundary TLDs in each meteorological sector (16 TLDs total), TLDs located off-site in each land based sector at a distance of 4 to 5 miles (8 TLDs total), TLDs located at special interest areas (6 TLDs total) and TLDs located at control locations (2 TLDs total). As noted previously, since the present Technical Specifications became effective in 1985, these TLDs, for the most part, can only be evaluated for 1985 - 1991.

Technical Specification TLDs located at the site boundary averaged 6.2 mrem per standard month during 1985. During 1986, 1987, 1988, 1989 and 1990 site boundary TLDs averaged 7.0, 6.1, 6.4, 5.9, and 5.8 mrem per standard month respectively. As noted previously, this group of TLDs can fluctuate because several of these TLDs are located in close proximity to the generating facilities. An increase was noted during 1986 although such an increase was noted for all TLDs including control TLDs. During 1991, site boundary TLDs averaged 5.7 mrem per standard month.

Technical Specification TLDs located off-site at a distance of 4 to 5 miles from the site in each of the land based meteorological sectors averaged 5.0 mrem during 1985. During 1986, 1987, 1988 1989, and 1990 off-site sector TLDs averaged 6.0, 5.2, 5.3, 4.9 and 4.7 mrem per standard month respectively. The 1986 results demonstrated an increase for this group of TLDs. Results for 1991 for the group averaged 4.5 mrem per standard month. This is fairly consistent with previous years results.

Special interest Technical Specification TLDs are located at areas of high population density, such as major work sites, communities, schools, etc. and at residences near the site (critical receptor areas). This group of TLDs averaged 5.3 mrem per standard month during 1985. During 1986, this same group of TLDs averaged 6.1 mrem. The 1987 results showed a decrease when compared to the 1985 and 1986 results and averaged 5.1 mrem per standard month. 1988, 1989 and 1990 results averaged 5.3, 4.8 and 4.7 mrem per standard month respectively. 1991 results for these locations averaged 4.4 mrem per standard month.

The final group of TLDs required by the Technical Specifications is the control group. This group utilizes two TLD locations positioned well beyond the site. Results from 1985 for the control group averaged 5.4 mrem per standard month. During 1986, this same group of TLDs averaged 6.3 mrem per standard month. A marked increase was noted in the second quarter of 1986. The increase may have been a result of the Chernobyl

B. Evaluation of TLD Data - Tables 9A and 9B (Cont'd)

Nuclear Plant accident. Results for 1987, 1988, 1989 and 1990 averaged 5.2, 5.4, 4.6 and 4.6 mrem per standard month respectively. Results for 1991 averaged 4.3 mrem per standard month and showed levels slightly less than previous years.

Tables 29 and 30A-30E show the historical environmental sample data for environmental TLD's.

During 1991, all environmental TLD groups required by the Technical Specifications were consistent with results observed during 1990. Overall, environmental TLD results for 1991 showed no significant impact from direct radiation measured outside the site boundary.

# 4.0 TERRESTRIAL SAMPLES

# 4.0 TERRESTRIAL SAMPLES

## I AIR PARTICULATE/IODINE

### A. Sample Collection and Methodology

The air sampling stations required by the Technical Specifications are located in the general area of the site boundary (within 0.7 miles) in sectors of highest calculated meteorological deposition factors (D/Q) based on historical meteorological data. These stations (R-1, R-2, and R-3) are located in the east, east-southeast, and southeast sectors as measured from the center of the Nine Mile Point Nuclear Station Unit 2 reactor building. The Technical Specifications also require that a fourth air sampling station be located in the vicinity of a year round community having the highest calculated deposition factor (D/Q) based on historical meteorological data. This station is located in the southeast sector (R-4). A fifth station required by the Technical Specifications is located 16.4 miles from the site in a northeast direction (R-5). This location is considered a control location.

In addition to the Technical Specification required locations, there are six sampling stations located within the site boundary (D1, G, H, I, J, and K). These locations generally surround the area occupied by the three generating facilities, but are well within the site boundary. One other air sampling station is located off-site in the southwest sector and is in the vicinity of the City of Oswego. Three remaining air sampling stations (D2, E and F) are located in the east-southeast, south-southeast and south sectors and range in distance from 7.2 to 9.0 miles.

At each station, airborne particulates are collected by glass fiber filters and radioiodine by charcoal filters. Air particulate glass fiber filters are approximately two inches (47 millimeters) in diameter and are placed in sample holders in the intake line of a vacuum sampler. Directly down stream from the particulate filter is a 2 x 1 inch charcoal cartridge used to absorb airborne radioiodine. The samplers run continuously and the charcoal cartridges and particulate filters are changed on a weekly basis, or as required by dust loading. Gross beta analysis is performed for the individual particulate filters on a weekly basis. Charcoal cartridges are analyzed weekly for radioiodine by GeLi detector.

The particulate filters are composited by location for gamma analyses on a monthly basis after all weekly particulate filters have been counted for gross beta activity.

Air sampling stations are shown in Figures 1 and 2 (refer to Table 3 for location designations and descriptions).

## 4.0 TERRESTRIAL SAMPLES

AIR PARTICULATE/IODINE (Cont'd)

B. Evaluation of Air Particulate Gross Beta - Tables 10 and 11

Tables 10 and 11 contain the results for the weekly air particulate gross beta analysis for a total of nine off-site and six on-site sample locations. Five of the nine off-site locations are required by the Technical Specifications. These sample locations are R-1, R-2, R-3, R-4 (all located near the site boundary) and R-5 (located at a control location beyond any significant influence from the site). Data contained on Tables 10 and 11 also shows the results from other air sampling locations not required by the Technical Specifications. These locations are designated as D1 on-site, G on-site, H on-site, I on-site, J on-site, K on-site, D2 off-site, E off-site, F off-site and G off-site locations. A total of 52 control samples from location R-5 and 208 indicator samples from locations R-1, R-2, R-3, and R-4 were collected and analyzed during 1991.

The minimum, maximum, and average gross beta results for sample locations required by the Technical Specifications are presented below.

| Location ** | Minimum* | Maximum* | Average* |
|---|---|---|---|
| R-1 | 0.007 | 0.027 | 0.014 |
| R-2 | 0.007 | 0.033 | 0.015 |
| R-3 | 0.007 | 0.030 | 0.014 |
| R-4 | 0.007 | 0.032 | 0.015 |
| R-5 (control) | 0.006 | 0.028 | 0.014 |

* - Concentration in $pCi/m^3$
** - Locations required by the Technical Specifications

The observed small increases and decreases in general gross beta activity can be attributed to changes in the environment, especially seasonal changes. The concentration of naturally occurring radionuclides in the lower limits of the atmosphere directly above land areas are affected by processes such as wind direction, snow cover, soil temperature and soil moisture content. Little change was noted in gross beta activity which corresponded with weapons testing as has been observed in past years. Review of air particulate gross beta concentrations shows that no significant increases in concentration occurred during 1991.

In general, the trend in air particulate gross beta activity has been one of decreasing activity since 1977 (extent of the review period). The mean gross beta concentration at control locations has decreased from a level of 0.165 $pCi/m^3$ in 1981 to 0.013 in 1990. The 1991 average for control locations was 0.014 $pCi/m^3$. Results from indicator air sampling locations ranged from 0.151 $pCi/m^3$ in 1981 to 0.014 $pCi/m^3$ in 1990. The 1991 average for

I AIR PARTICULATE/IODINE (Cont'd)

B. Evaluation of Air Particulate Gross Beta - Tables 10 and 11 (Cont'd)

indicator locations was 0.015 pCi/$m^3$. For both indicator locations and control location, the gross beta concentration during 1977 to 1987 fluctuated with the detonation of thermonuclear weapons. The Technical Specification control and indicator results during 1991 averaged 0.014 pCi/$m^3$ and .015 pCi/$m^3$ respectively which represented a minute increase over 1990 values.

Tables 31 and 32 show historical environmental sample data for air particulate gross beta levels.

C. Evaluation of Monthly Air Particulate Composites - Table 12

Weekly air particulate samples were composited by location to form monthly composite samples. The monthly composite samples required by the Technical Specifications include R-1, R-2, R-3, R-4, and R-5. Other sample locations not required by the Technical Specifications include D1 on-site, G on-site, H on-site, I on-site, J on-site, K on-site, D2 off-site, E off-site, F off-site and G off-site locations. The results of all monthly composite samples are included on Table 12.

The results for the monthly composite samples showed positive results for Be-7, K-40, and Ra-226. All three of these radionuclides are naturally occurring. Be-7 was found in all of the monthly composite samples from the locations required by the Technical Specifications. Be-7 ranged from 0.043 to 0.102 pCi/$m^3$ for the Technical Specification indicator locations (R-1, R-2, R-3, and R-4). The Technical Specification control location (R-5) results showed Be-7 ranging from 0.042 to 0.088 pCi/$m^3$. K-40 was found intermittently in the monthly composite samples required by the Technical Specifications. K-40 ranged from 0.012 to 0.048 pCi/$m^3$ at the control location (R-5) and 0.008 to 0.054 pCi/$m^3$ at the indicator locations. Ra-226 ranged from 0.010 to 0.022 pCi/$m^3$ at the indicator locations required by the Technical Specifications. The Technical Specification control location results ranged from 0.010 to 0.024 pCi/$m^3$.

As a result of the Chernobyl Nuclear Plant accident in April 1986, several radionuclides attributable to the fission process were detected in air particulate samples during 1986. Detectable radionuclides included Cs-134, Cs-137, Nb-95, Ru-103, Ru-106, La-140 and I-131. These radionuclides were not detected during 1991.

No other radionuclides were detected at Technical Specification locations using gamma spectral analysis during 1991.

## 4.0 TERRESTRIAL SAMPLES

I AIR PARTICULATE/IODINE (Cont'd)

C. Evaluation of Monthly Air Particulate Composites - Table 12 (Cont'd)

The location, concentration range and mean, and frequency of occurrence of each radionuclide detected during 1991 at the Technical Specification required locations are included below.

| Radionuclide | Location | Range* | Mean* | Frequency** |
|---|---|---|---|---|
| Ra-226 | Indicator | 0.010 - 0.022 | 0.014 | 10/48 |
| Ra-226 | Control | 0.010 - 0.024 | 0.015 | 7/12 |
| K-40 | Indicator | 0.008 - 0.054 | 0.027 | 33/48 |
| K-40 | Control | 0.012 - 0.048 | 0.029 | 12/12 |
| Be-7 | Indicator | 0.043 - 0.102 | 0.069 | 48/48 |
| Be-7 | Control | 0.042 - 0.088 | 0.064 | 12/12 |

* - Results in units of pCi/$m^3$.
** - Frequency is the number of times detected over the number of samples.

Historically, the naturally occurring radionuclides Ra-226, K-40 and Be-7 have shown fluctuations that are representative of natural changing conditions. No significant trends were noted during 1991.

Co-60 concentrations in air particulate samples have shown a general decrease in both indicator and control samples. The Co-60 detected has primarily been attributed to past weapons testing fallout. The general decrease in Co-60 is due to ecological cycling and nuclear decay of the Co-60 initially produced by weapons tests. In 1977, Co-60 concentrations in control samples averaged 0.0172 pCi/$m^3$. A general decrease was observed in the years subsequent to 1977 until 1985 when no Co-60 was detected. From the period 1985-1991 no Co-60 was detected in control samples. Co-60 concentrations in indicator samples have shown a similar decrease. In 1977, the average concentration of Co-60 in indicator samples was 0.0179 pCi/$m^3$. By 1982, this value had decreased to 0.0005 pCi/$m^3$. Slight increases were observed in 1983 and 1984, but these anomolies were due to contamination during handling of the unused samples and not due to plant operations (this has been previously documented in the 1984 annual report). Since 1984, no Co-60 has been detected at any Technical Specification indicator location.

I AIR PARTICULATE/IODINE (Cont'd)

C. Evaluation of Monthly Air Particulate Composites - Table 12 (Cont'd)

During 1987, Co-60 was detected once at a concentration of 0.0017 pCi/$m^3$ at an optional air monitoring station. However, the Co-60 detected during 1987 was a result of contamination from improper handling of the sample, and not as a result of effluents from the site. This evaluation is contained in the 1987 annual report. Co-60 was not detected during 1988. During 1989 Co-60 was detected at one on-site optional location during November at a concentration of 0.009 pCi/$m^3$. The Co-60 was attributed to operations at the FitzPatrick facility and was presented in the 1989 annual report. Results from 1990-1991 showed that Co-60 was not detected from any indicator sample locations.

Historically, the presence of Cs-137 has been variable and has been present in air particulate samples since 1977. During 1977, both indicator and control Cs-137 average concentrations were approximately equal and averaged 0.0038 pCi/$m^3$. Since that time the concentration in both control and indicator samples has been steadily decreasing. As noted above for Co-60, the decreasing concentrations of Cs-137 are due to ecological cycling and nuclear decay of Cs-137 which was produced during weapons testing. 1978 concentrations of Cs-137 in control and indicator locations both averaged 0.0017 pCi/$m^3$, and steadily decreased to 0.0002 pCi/$m^3$ in 1983. Cs-137 was not detected during 1984 and 1985. In 1986, Cs-137 was detected as a result of the Chernobyl accident in April 1986. Average concentrations during that year for indicator and control samples were 0.0183 and 0.0193 pCi/$m^3$ respectively. During the period of 1987-1991 Cs-137 was not detected at any indicator or control location.

Prior to 1984, several radionuclides were detected that were associated with the 1980 Chinese weapons test and other weapons tests prior to 1980. These radionuclides were not detected during 1984 or 1985 as a result of nuclear decay and ecological cycling. These include Zr-95, Ce-141, Nb-95, Ce-144, Mn-54, Ru-103, Ru-106 and Ba-140. In addition, La-140 was detected once during 1983 and infrequently during 1978 and 1981. La-140

## 4.0 TERRESTRIAL SAMPLES

I AIR PARTICULATE/IODINE (Cont'd)

C. Evaluation of Monthly Air Particulate Composites - Table 12 (Cont'd)

was not detected during 1984 or 1985. During 1986, however, several fission product radionuclides were detected that were a result of the Chernobyl Nuclear Plant accident. These included Cs-134, Cs-137, Nb-95, Ru-103, Ru-106, La-140 and I-131. All of these, with the exception of Cs-134 and particulate I-131, were detected subsequent to the 1980 Chinese weapons test (1981 - 1983). These radionuclides were not detected during 1984 - 1985. The concentrations detected during 1986 as a result of the Chernobyl accident were generally greater than the concentrations detected as a result of the 1980 Chinese weapons test. The presence of the radionuclides from the Chernobyl facility, however, extended over a very brief period (two months) while many of the radionuclides from the 1980 Chinese weapons test were present for approximately two years. During 1987 through 1991, none of the radionuclides associated with the 1986 Chernobyl accident or past weapons testing were detected in air particulate samples.

During 1991, Zn-65 was detected at one of the optional on-site locations. Zn-65 was detected at the H-onsite location at a concentration of 0.0046 $pCi/m^3$ during the analysis of the February air particulate composite sample. The air particulate filters were then analyzed separately and it was determined that the Zn-65 was deposited during week 5 of 1991 (1/28/91 - 2/4/91) at a concentration of 0.0283 $pCi/m^3$. The presence of Zn-65 in the sample was due to operations at the James A. Fitzpatrick facility. Zn-65 was not detected at any other location during this period. Although the H-onsite location is located on JAF property, not readily accessible to members of the public, a calculation utilizing Regulatory Guide 1.109 was performed. This conservative calculation assumed that a person remained at the H-onsite location 24 hours per day, 7 days per week. The calculation also assumed that the concentration of Zn-65 remained at 0.0283 $pCi/m^3$ throughout the week. No nuclear decay was assumed. The maximum whole body dose to an individual was 3.8E-05 mrem. The critical organ dose was 6.7E-04 mrem to the lung. These doses are insigificant and a dose to a real person of the public would be much less due to the fact that the H-onside location is located on JAF property and members of the public do not readily have access to this area. The whole body dose of 3.8E-05 mrem is equivalent to an increase in altitude of 100 meters (328 feet) and remaining there for 10 minutes. An occasion, such as moving to a location 100 meters higher, is a common occurrence. Any dose that may be received is considered insignificant and small.

Tables 33 and 34 show historical environmental sample data for air particulate composites.

I AIR PARTICULATE/IODINE (Cont'd)

D. Evaluation of Airborne Radioiodine - Tables 13 and 14

During the 1991 sampling program, airborne radioiodine was not found in any of the fifty-two weekly samples from the control location required by the Technical Specifications. LLD values at the control location ranged from 0.007 - 0.016 pCi/m$^3$.

I-131 has been detected in the past at control locations. During 1976, the mean off-site I-131 concentration was 0.60 pCi/m$^3$. The 1977 mean I-131 concentration decreased to 0.32 pCi/m$^3$ and for 1978 the concentration decreased by a factor of ten to 0.03 pCi/m$^3$. During 1979 - 1981 and 1983 - 1985, I-131 was not detected. I-131 was detected once during 1982 at a concentration of 0.039 pCi/m$^3$. Results from 1986 showed that I-131 was detected at the control location. This was a result of the 1986 Chernobyl Nuclear Plant accident. The I-131 mean result was 0.151 pCi/m$^3$. I-131 was not detected at the control location during the period 1987 through 1991.

During 1991, the indicator locations required by the Technical Specifications (approximate site boundary locations) showed no detectable levels of I-131. LLD values for I-131 ranged from 0.006 - 0.021 pCi/m$^3$. During 1991, I-131 was not detected at any of the optional monitoring locations that were not required by the Technical Specifications.

I-131 at indicator locations has been detected in the past and was detected at a mean concentration of 0.33 and 0.31 pCi/m$^3$ during 1976 and 1977. The average concentration decreased to 0.04 pCi/m$^3$ during 1978 and was not detected during 1979. The 1980-1982 average concentrations were 0.013, 0.029, and 0.016 pCi/m$^3$ which were reductions in view of previous I-131 concentrations. During 1983, the mean I-131 concentration was 0.028 pCi/m$^3$ which represented a slight increase compared to 1982. For the most part, I-131 in indicator and control samples was a result of I-131 from weapons testing. A small portion of the concentrations detected may have been a result of operations at the site. The concentrations detected during 1983 at the on-site sample stations were a result of operations at the site. I-131 was not detected in any of the 1984 or 1985 samples. During 1986, I-131 was detected at the indicator locations at a mean concentration of 0.119 pCi/m$^3$ as a result of the Chernobyl Nuclear Plant accident. I-131 was found at a mean concentration of 0.014 pCi/m$^3$ during 1987 and was a result of operations at the site. As noted previously, I-131 was not found at the Technical Specification required indicator locations during 1988 through 1991.

Tables 35 and 36 show the historical environmental sample data for airborne radioiodine.

# 4.0 TERRESTRIAL SAMPLES

## II MILK

### A. Sample Collection Methodology and Analysis

Milk samples are collected in polyethylene bottles from a bulk storage tank at each sampled farm. Before the sample is drawn, the tank contents are agitated from three to five minutes to assure a homogenous mixture of milk and butterfat. Two gallons are collected during the first half and second half of each month from each of the selected locations within ten miles of the site and from a control location. The samples are chilled and shipped fresh to the analytical laboratory within thirty-six hours of collection in insulated shipping containers.

The selection of milk sample locations is based on maximum deposition factors (D/Q). Deposition factors are generated from average historical meteorological data based on all licensed reactors. The Technical Specifications require three sample locations within 5.0 miles of the site with the highest calculated deposition factors. During 1991, there were no milk sample locations within 5.0 miles that could be sampled. However, there were several optional locations beyond five miles that were sampled.

A fourth sample location required by the Technical Specifications is located in a least prevalent wind direction from the site. This location is in the southwest sector and serves as a control location.

Milk samples are collected twice per month (April - December) and analyzed for gamma emitters and I-131. Samples are collected and analyzed in January - March in the event I-131 is detected in November and December of the preceding year.

The milk sample locations are found on Figure 4. (refer to Table 3 for location designations and descriptions).

### B. Evaluation of Milk Data - Tables 15 and 16

Milk samples were collected from a total of six indicator locations (within 10 miles of the site) and one control location (beyond 10 miles from the site) during 1991. The Technical Specifications require that three locations be sampled for milk within 5.0 miles of the site. During 1991, there were no milk sample locations within 5.0 miles of the site. The locations that were sampled during 1991 are located from 5.5 to 9.5 miles from the site. The only sample location required by the Technical Specifications during 1991 was the control location which was located 17.0 miles to the southwest of the site (location #65). Sample location descriptions for all milk sample locations utilized during 1991 are listed below.

## 4.0 TERRESTRIAL SAMPLES

II MILK

B. Evaluation of Milk Data - Tables 15 and 16 (Cont'd)

| Location No. | | Direction From Site | | Distance From Site (miles) |
|---|---|---|---|---|
| 7 | | ESE | (107°) | 5.5 |
| 16 | | S | (190°) | 5.9 |
| 50 | | E | ( 93°) | 9.3 |
| 55 | | E | ( 95°) | 9.0 |
| 60 | | E | ( 90°) | 9.5 |
| 4 | | ESE | (113°) | 7.8 |
| 65 | (Control) | SW | (220°) | 17.0 |

During 1991, milk samples were collected at each of the six indicator locations and the control location in the first half and the second half of each month. Samples were collected during the months of April through December 1991. Since I-131 was not detected during November and December of 1990, no additional samples were collected in January through March of 1991. For each sample, analyses were performed for gamma emitters (analysis by GeLi detector) and for I-131 using a resin extraction technique. Sample analysis results for gamma emitters are found on Table 15 and for I-131 on Table 16.

Gamma spectral analyses of the bimonthly samples showed only naturally occurring radionuclides such as K-40 and Ra-226 to be detected in milk samples during 1991. K-40 was detected in all indicator samples. Indicator sample location concentrations ranged from 1360 pCi/liter to 1790 pCi/liter while K-40 concentrations at the control location ranged from 1260 pCi/liter to 1780 pCi/liter. Ra-226 ranged from 49 to 261 pCi/liter at the indicator locations and 77 to 241 pCi/liter at the control location. Ra-226 occurred intermittently in milk samples. K-40 and Ra-226 are naturally occurring radionuclides and are found in many of the environmental media sampled.

During 1991, Cs-134 or Cs-137 was not detected in any control or indicator location milk samples. Cs-137 had been detected once in 1988 and was attributed to the use of silage containing trace amounts of Cs-137 from the 1986 Chernobyl Nuclear Plant accident.

No other radionuclides were detected in milk samples using gamma spectral analysis.

II MILK

B. Evaluation of Milk Data - Tables 15 and 16 (Cont'd)

Milk samples were collected and analyzed twice per month for I-131. I-131 was not detected during 1991 in any of the indicator or control samples. All 1991 I-131 milk sample results are reported as the lower limit of detection (LLD). The LLD results for 1991 milk samples ranged from <0.36 pCi/liter to <0.84 pCi/liter.

Evaluation of site historical milk data shows that Cs-137 has been detected in environmental milk samples at both indicator (within 10 miles) and control locations (beyond 10 miles). Mean Cs-137 concentrations for 1976 - 1981 remained fairly consistent and ranged from 8.1 (1980) to 17.1 pCi/liter (1977) at the indicator locations. The 1982 indicator mean was 5.7 pCi/liter which showed a decrease when compared to 1976 - 1981. Cs-137 in milk during 1983 yielded a mean of 7.2 pCi/liter which was slightly greater than the 1982 mean but was less than the 1976 - 1981 mean range. During 1983, however, Cs-137 was detected in only 3 of the 66 samples, while in 1982, Cs-137 was detected in 10 of the 54 samples analyzed. Cs-137 was not detected during 1984 or 1985 in indicator milk samples. Results from 1986 showed a mean Cs-137 concentration of 8.6 pCi/liter at the indicator locations. Cs-137 in 1986 milk samples was a result of the 1986 Chernobyl Nuclear Plant accident. During 1987, Cs-137 was found in two indicator samples only at a mean concentration of 6.8 pCi/liter and was also a result of the Chernobyl accident. The 1988 results showed Cs-137 was detected only once at a concentration of 10.0 pCi/liter and was attributed to the Chernobyl accident. No Cs-137 was detected in milk samples during 1989 through 1991.

At the control location, Cs-137 has remained fairly consistent for all years from 1978 - 1982 except for 1979 and 1982. For these years, this radionuclide was not detected. Control samples were not obtained prior to 1978. Cs-137 ranged from 3.9 - 5.8 pCi/liter during 1978 - 1981. Cs-137 was not detected at the control location during 1982, 1983, 1984, or 1985. The absence of Cs-137 during 1982 through 1985 is a result of a two to five year time interval since the last weapons test. Results from 1986 showed a mean Cs-137 concentration of 8.4 pCi/liter at the control location. The positive Cs-137 results during 1986 were a result of the Chernobyl Nuclear Plant accident. Cs-137 was not detected during 1987 through 1991 at the control location.

Past Cs-137 in milk samples is, for the most part, a result of previous weapons testing and more recently, the Chernobyl accident. The continued reduction of Cs-137 levels is a result of nuclear decay and ecological cycling.

II MILK

B. Evaluation of Milk Data - Tables 15 and 16 (Cont'd)

An evaluation of historical data for I-131 in milk samples shows that annual mean results ranged from 0.19 pCi/liter to 6.88 pCi/liter at the indicator locations during 1976 - 1978. I-131 during these years is a result of intermittent weapons testing. During 1979 - 1985, I-131 in milk samples at the indicator locations was not detected except during 1980. The mean result during 1980 was 3.8 pCi/liter and was a result of the 1980 Chinese Weapons Test. Results from 1986 showed that I-131 was detected at a mean concentration of 5.2 pCi/liter as a result of the Chernobyl accident. I-131 was not detected during the period 1987 through 1991 in milk samples.

Historical data for I-131 from the control location showed that I-131 was detected during 1980 at a mean concentration of 1.4 pCi/liter. There was no detectable I-131 during the period of 1978 - 1985 with the exception of 1980. Sampling at a control location was not initiated until 1978. During 1986, I-131 from the control location showed a mean concentration of 13.6 pCi/liter as a result of the Chernobyl accident. I-131 was not detected during the period 1987 through 1991 at the control location.

Tables 37 and 38 show the historical environmental sample data for milk.

Cs-134, Cs-137, and I-131 were not detected in the bi-monthly milk samples analyzed for 1991. Only naturally occurring radionuclides such as Ra-226 and K-40 were detected. Therefore, no doses to man have been calculated.

## 4.0 TERRESTRIAL SAMPLES

II FOOD PRODUCTS

### A. Sample Collection Methodology and Analysis

Food products are collected once per year during the late summer at the approximate height of the harvest season. Approximately one kilogram of a broadleaf vegetable or other broadleaf vegetation is collected from garden locations with the highest deposition factors (D/Q) based on average historical meteorological data. Six samples are collected from at least two sectors. Additional samples may also be obtained. Control samples are also collected from available off-site locations 9 to 20 miles distant in a least prevalent wind direction. Control samples are of the same or of a similar type of vegetation. All samples are shipped fresh as soon as possible after collection.

Food product samples are analyzed for gamma emitters (gamma isotopic analysis). The gamma isotopic analysis also includes I-131.

Food product locations are shown on Figure 3 (refer to Table 3 for location designations and descriptions).

### B. Evaluation of Food Product Data - Tables 17A and 17B

Food product samples collected during 1991 were comprised of garden vegetables and other types of vegetation. Samples were collected from five indicator locations and one control location. The indicator locations were represented by nearby gardens in areas of highest D/Q (deposition factor) values based on historical meteorology and all site release points at operating facilities. The control location was represented by a garden location 9-20 miles distant in a least prevalent wind direction. Garden vegetables were comprised of cabbage, squash leaves, and lettuce, which are all considered broadleaf vegetables. Other broadleaf vegetation consisted of corn leaves, pepper leaves, bean leaves, grape leaves, and cucumber leaves. At the control location, one sample of each of the same or of a similar type of vegetable or vegetation was collected. Vegetables and vegetation were collected in the late summer harvest season.

Results for food products are shown on Tables 17A and 17B. Table 17A shows results in pCi/g (wet) while Table 17B results are in units of pCi/kg (wet). K-40 was detected in all food product samples. Vegetation sampled showed concentrations of K-40 ranging from 1.19 pCi/g to 6.99 pCi/g (wet). Be-7 was also found in all vegetation samples. This radionuclide ranged from 0.05 pCi/g to 1.10 pCi/g (wet). Ra-226 was detected intermittently at concentrations that ranged from 0.14 to 0.43 pCi/g (wet) for all sample types at the indicator and control locations. AcTh-228 was also detected intermittently for all sample types at concentrations that ranged from 0.03 to 0.06 pCi/g (wet) for both indicator and control locations. K-40,

III FOOD PRODUCTS

B. Evaluation of Food Product Data - Tables 17A and 17B (Cont'd)

Be-7, Ra-226 and AcTh-228 are naturally occurring radionuclides.

Cs-137 was detected in one indicator sample of squash leaves at a concentration of 0.04 pCi/g (wet). Cs-137 was not detected in any other indicator or control location food product samples. The source of Cs-137 is difficult to determine as Cs-137 is produced by nuclear facilities as well as past weapons testing. No other radionuclides were detected in the 1991 samples of food products.

The impact of Cs-137 in food product samples can be evaluated by calculating a dose to the maximum exposed individual as a result of consumption. Using Regulatory Guide 1.109 methodology, the maximum organ dose is 0.34 mrem to the child bone and the maximum whole body dose is 0.18 mrem to the adult. Both of these doses are small and insignificant when compared to doses from man-made sources. For example, the child organ dose of 0.18 mrem is small when compared to the organ dose from naturally occurring K-40. This dose is 20 mrem per year. The whole body dose is also small when compared to the effects of an increase in altitude. A whole body dose of 0.18 mrem is equivalent to an increase in altitude of 100 meters (328 feet) and remaining there for 33 days. An occasion, such as moving to a location 100 meters higher, is a common occurrence. Any dose that may be received is considered insignificant and small.

Review of past environmental data indicates that Cs-137 has been detected intermittently during the years 1976-1990 at the indicator locations and during the years 1980-1990 at the control locations (control samples were not obtained prior to 1980). Review of indicator sample results from 1976-1990 showed that Cs-137 was not detected during 1976-1978, 1981-1984, 1986-1987 or 1990. During 1979 and 1980, Cs-137 in fruits and/or vegetables showed annual mean concentrations of 0.004 and 0.036 pCi/g (wet) respectively. Cs-137 was found at an indicator location during 1985 at a concentration of 0.047 pCi/g (wet). During 1988, Cs-137 was found at a concentration of 0.008 pCi/g (wet). Cs-137 was detected in one broad leaf sample during 1989 at a concentration of 0.009 pCi/g (wet). As noted above, Cs-137 was detected at a concentration of 0.04 pCi/g (wet) at an indicator location during 1991. Control sample results during 1980-1990 showed Cs-137 detected only once during 1980 at a concentration of 0.02 pCi/g (wet). Cs-137 was not detected in control samples during 1991.

Tables 39 and 40 show historical environmental sample data for food products.

## 4.0 TERRESTRIAL SAMPLES

## IV LAND USE CENSUS

### A. Methodology

A land use census is conducted to determine the utilization of land in the vicinity of the site. The land use census actually consists of two types of census. A milk animal census is conducted to identify all milk animals within a distance of 10 miles from the site.

The milk animal census is an estimation of the number of cows and goats within an approximate ten mile radius of the Nine Mile Point Site. A census is initiated once per year in the spring. The census is conducted by sending questionnaires to previous milk animal owners and also by road surveys to locate any possible new owners. In the event questionnaires are not answered, then the owners are contacted by telephone or in person. The local agricultural agency was also contacted.

A second type of census is a residence census. This census is conducted in accordance with the Technical Specifications in order to identify the closest residence within three miles in each of the 22.5 degree meteorological sectors. A residence, for the purposes of this census, is a residence that is occupied on a part time basis (such as a summer camp), or on a full time, year round basis. For the residence census, several of the meteorological sectors are over Lake Ontario because the site is located at the shoreline. Therefore, there are only eight sectors over land where residences are located within 3 miles.

During 1991, a residence census was conducted to identify the nearest residence in each of the sixteen 22.5 degree meteorological sectors within a distance of five miles from the site in order to provide more comprehensive census data. At this distance, some of the meteorological sectors are over water. These sectors include: N, NNE, NE, ENE, W, WNW, NW, and NNW.

### B. Evaluation of Data - Tables 18 and 19

In accordance with the Technical Specifications, a land use census was conducted during 1991 to identify within a distance of five miles the location of all milk animals (cows and goats) and the location of the nearest residence in each of the sixteen 22.5 degree meteorological sectors. The milk animal census was actually conducted out to a distance of ten miles in order to provide a more comprehensive census.

## IV LAND USE CENSUS

### B. Evaluation of Data - Tables 18 and 19 (Cont'd)

The number of milk animals located within an approximate ten mile radius of the site was estimated to be 1148 cows and 20 goats for the 1991 census. The number of cows increased by 62 and the number of goats decreased by 10 with respect to the 1990 census. One new milk location and several deactivated milk locations were identified during the 1991 census. However, no changes were made to the 1991 sampling program because the new location did not meet milk sampling location criteria, nor did the location provide a higher D/Q value for optional samples. Therefore, there were no changes made to the milk sampling program. Most of the goats found on the census were milking goats. However, any milk produced was utilized by the owners and was not available for the sampling program. The results of the milk animal census are found on Table 18. Milk animal locations are shown on Figure 4.

The results of the 1991 residence census showing the applicable sectors and degrees and distance of each of the nearest residences are found on Table 19. The nearest residences are shown in Figure 3. No changes were noted in 1991.

# 5.0 INTERLABORATORY COMPARISON PROGRAM

## 5.0 INTERLABORATORY COMPARISON PROGRAM - TABLE 20

Section 3.6.21 and Section 3.12.3 of the Technical Specifications for the Nine Mile Point Nuclear Station Unit 1 and Unit 2, respectively, require that a summary of the results obtained as part of an Interlaboratory Comparison Program be included in the Annual Radiological Environmental Operating Report. Presently, the only NRC approved Interlaboratory Comparison Program is the USEPA Cross Check Program. Table 20 shows the results of the EPA's reference results and the licensee's results. Some of the EPA reference samples have been analyzed by the site. Other EPA reference samples have been analyzed by a vendor who normally analyzes those types of sample media for the site. Participation in the EPA Cross Check Program includes sample media for which environmental samples are routinely collected, as required by Table 3.6.20 - 1 and Table 3.12.1 - 1 of the Technical Specifications, and for which intercomparison samples are available from the EPA. Where many samples are available from the EPA, a QC sample to program sample ratio of ten percent is utilized, where applicable.

Results from the EPA are presented in terms of normalized deviations from a known value (NDKV). Laboratory results are considered acceptable by EPA if the NDKV for each sample is between plus or minus 3 NDKV. All analyses but one performed by the Site Environmental Laboratory during 1991 were within 3NDKV. One sample analyzed by the Site Environmental Laboratory was outside three normalized deviations. The sample QA-91-103 was a water sample analyzed for mixed gamma. All three results were lower than the EPA result with one of the three significantly lower. The sample was re-analyzed by the Site Environmental Laboratory and acceptable results were generated. It was determined that one of the three original analyses results was an outlier and averaging this value with the other two values brought the final result submitted into an unacceptable range. All other analyses performed during 1991 were acceptable.

## 6.0 HISTORICAL ENVIRONMENTAL SAMPLE DATA

## 6.0 HISTORICAL ENVIRONMENTAL SAMPLE DATA

Tables 21 - 40 show historical environmental sample data for critical radionuclides or radionuclides routinely detected in environmental sample media. Data show the minimum, maximum, and mean for each year evaluated. The data only consider detectable quantities and do not consider lower limit of detection (LLD) quantities. Data on Tables 21 - 40 were obtained from previous Annual Radiological Environmental Operating Report tables.

# 7.0 CHANGES AND EXCEPTIONS TO THE PROGRAM

## 7.0 CHANGES AND EXCEPTIONS TO THE PROGRAM

### A. Changes to the 1991 Sample Program

1. Food product locations L and N were added to the sample program during 1991. Locations L and N are optional sampling locations.

2. Also during 1991, optional food product locations P and Q were not utilized by the sampling program because of either sample unavailability or because the location had a low deposition potential as a result of the addition of locations L and N.

3. During 1991, TLD location 113 was added to the program. TLD 113 is an optional, control TLD.

4. Also during 1991, TLD location 110 was dropped from the program. TLD 110 was an optional, control TLD.

### B. Exceptions to the 1991 Sample Program

Exceptions to the 1991 sample program concerns those samples or monitoring requirements which are required by the Technical Specifications. This section implements section 3.6.20 of the Nine Mile Point Nuclear Station Unit 1 Technical Specifications and Section 3.12.1 of the Nine Mile Point Nuclear Station Unit 2 Technical Specifications.

- Air Radioiodine and Particulate Sampling Required by the Technical Specifications

  1. Environmental air sample equipment at R-4 off-site air sampling station was inoperable from 1/14/91 (0200 hours) to 1/15/91 (0800 hours). The vacuum pump was found to be defective and was replaced.

  2. Environmental air sample equipment at R-3 off-site air sampling station was inoperable from 3/04/91 (0106 hours) to 3/04/91 (1310 hours). This equipment was inoperable due to a power interruption caused by an ice storm.

  3. Environmental air sample equipment at R-4 off-site air sampling station was inoperable from 3/04/91 (0106 hours) to 3/04/91 (1310 hours). This equipment was inoperable due to a power interruption caused by an ice storm.

  4. Environmental air sample equipment at R-2 off-site air sampling station was inoperable from 12/03/91 (0630 hours) to 12/03/91 (0830 hours). The vacuum pump was found to be defective and was replaced.

B. Exceptions to the 1991 Sample Program (Cont'd)

Other occurrences of downtime for optional air sampling stations were documented for 1991. However, these occurrences are not presented here because optional air sampling stations are not required by the Technical Specifications.

C. Lower Limit of Detection for Environmental Samples

The Technical Specifications require that environmental samples analyzed for the Radiological Environmental Monitoring Program meet the lower limits of detection (LLD) found on Table 4.6.20-1 of the Nine Mile Point Unit 1 Technical Specifications and Table 4.12.1-1 of the Nine Mile Point Unit 2 Technical Specifications. All of the 1991 environmental samples required by the Technical Specifications which showed no net activity were less than the required values found on Table 4.6.20-1 and Table 4.12.1-1.

D. Deviations from the Interlaboratory Comparison Program

Section 3.6.21 of the Nine Mile Point Unit 1 Technical Specifications and Section 3.12.3 of the Nine Mile Point Unit 2 Technical Specifications require the site to conduct an Interlaboratory Comparison Program utilizing QC samples from the Environmental Protection Agency (EPA). This section also requires that deviations from the sample schedules be reported in the Annual Radiological Environmental Operating Report. The sample schedule is set by the EPA and includes media for which environmental samples are routinely collected and for which interlaboratory comparison samples are available from the EPA.

During 1991, sample media offered by the EPA for the Interlaboratory Comparison Program, and for which environmental samples are routinely collected and analyzed, were obtained and analyzed. There were no deviations from the program.

# 8.0 CONCLUSION

# 8.0 CONCLUSION

## CONCLUSION

The Radiological Environmental Monitoring Program (REMP) was established to detect and evaluate any possible impact to the environment surrounding the Nine Mile Point area resulting from operations at the site.

Samples representing food sources consumed at higher trophic levels, such as fish and milk, were reviewed closely to evaluate any impact to the general environment or to man. In addition, the data was reviewed for any possible historical trophic level bioaccumulation trends. Little or no impact could be determined resulting from radionuclide deposition considering all sources (natural, weapons testing, etc.). In regards to doses as a result of man-made radionuclides, a significant portion of the small doses received by a member of the public was from past nuclear weapons testing. Doses as a result of naturally occurring radionuclides, such as K-40, contributed a major portion of the total annual dose to members of the public.

Any possible impact as a result of site operations is extremely minimal when compared to the impact from natural background levels or weapons testing. It has been demonstrated that almost all environmental samples contain traces of radionuclides which are a result of weapons testing or naturally occurring sources (primordial and/or cosmic related). Whole body doses to man as a result of natural sources (naturally occurring radionuclides in the soil and lower atmosphere) in Oswego County account for approximately 54 mrem per year as demonstrated by control environmental TLD's. Possible doses due to site operations are a minute fraction of this particular natural exposure.

During 1991, the presence of one fission product radionuclide, Cs-137, was noted in three different sample media. These media included sediment, food product and fish samples. The most likely source of the Cs-137 is past weapons testing. Also during 1991, the presence of one activation product, Zn-65, was noted in one air particulate filter composite sample. The source of the Zn-65 was determined to be due to operations at the James A. FitzPatrick nuclear facility. The impact, expressed as a dose to man, from these radionuclides is minimal and insignificant when compared to the natural background dose.

Therefore, as determined by review of the data presented herein, no impact due to operations at the Nine Mile Point Nuclear Station was detected that would effect the health and safety of the public.

# 9.0 GENERAL REFERENCE MATERIAL

## 9.0 GENERAL REFERENCE MATERIAL


1. U.S. Nuclear Regulatory Commission Regulatory Guide 1.109, "Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR Part 50, Appendix I", March 1976 (Revision 0).

2. U.S. Nuclear Regulatory Commission Regulatory Guide 1.109, "Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance With 10 CFR Part 50, Appendix I", October 1977 (Revision 1).

3. U.S. Nuclear Regulatory Commission Regulatory Guide 4.8, "Environmental Technical Specifications for Nuclear Power Plants", December, 1975.

4. U.S. Nuclear Regulatory Commission Branch Technical Position to Regulatory Guide 4.8, "An Acceptable Radiological Environmental Monitoring Program", Revision 1, November 1979.

5. National Council on Radiation Protection and Measurements (NCRP), Environmental Radiation Measurements, NCRP Report No. 50, 1976.

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National Council on Radiation Protection and Measurements (NCRP), Cesium-137 from the Environment to Man: Metabolism and Dose, NCRP Report No. 52, 1977.

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16. U.S. Department of Health and Human Services. Preparedness and Response in Radiation Accidents, National Center for Devices and Radiological Health, Rockville, Maryland 20857. August 1983.

17. National Council on Radiation Protection and Measurements (NCRP), Ionizing Radiation Exposure of the Population of the United States, NCRP Report No. 93, 1987.

# 10.0 DATA TABLES - 1991

## TABLE 1

## SAMPLE COLLECTION AND ANALYSIS

## SITE RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM *

| MEDIA | ANALYSIS | FREQUENCY | LOCATIONS (1) |
|---|---|---|---|
| **A. AQUATIC PROGRAM** | | | |
| 1. Shoreline Sediment | GSA | 2/Year | 1 Indicator (2) |
| 2. Fish | GSA | 2/Year | 2 Indicator (3), 1 Control |
| 3. Surface Water | GSA<br>H-3 | Monthly Composite<br>Quarterly Composite | 1 Indicator (4), 1 Control<br>1 Indicator (4), 1 Control |
| **B. DIRECT RADIATION** | | | |
| 1. TLD | Gamma Dose | Quarterly | 30 Indicator, 2 Control (5) |

NOTES:

* Sampling and analysis program as required by the Technical Specifications.
(1) Aquatic program indicator samples collected in the vicinity of the site; control samples collected at a distance of at least five miles from the site.
(2) Indicator sample from an area of potential recreational value.
(3) Indicator samples from an area near the vicinity of a site discharge point. Control samples of the same species or of species of similar feeding habits.
(4) Indicator sample from the J. A. Fitzpatrick inlet canal.
(5) Indicator samples from the site boundary, four-five miles from the site, special interest areas and control areas (greater than ten miles from the site).

TABLE 2

SAMPLE COLLECTION AND ANALYSIS

SITE RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM*

C. TERRESTRIAL PROGRAM

| MEDIA | ANALYSIS | FREQUENCY | LOCATIONS |
|---|---|---|---|
| 1. Air Particulates | GB<br>GSA | Weekly<br>Monthly Composite | 4 Indicator, 1 Control (1) |
| 2. Airborne - I-131 | GSA | Weekly | 4 Indicator, 1 Control (1) |
| 3. Milk | I-131<br>GSA | 2/Month<br>2/Month | 3 Indicator, 1 Control (2) |
| 4. Human Food Crops | GSA, I-131 (5) | Annually | (3) |

NOTES:

* Sampling and analysis program as required by the Technical Specifications.

(1) Three indicator samples from near the site boundary in three of the highest D/Q meteorological sectors, one indicator sample from near a year round community, and one control sample from an area of least prevalent wind direction or previously established control location.

(2) Three indicator samples from areas within 5.0 miles of the site. Control sample from an area in a least prevalent wind direction.

(3) Samples of three different kinds of broadleaf vegetation nearest to each of two different off-site locations of highest D/Q and one sample of each of similar broadleaf vegetation at least 9.3-20 miles distant in a least prevalent wind direction.

(4) Gamma spectral analysis to include I-131.

TA[illegible] 3

ENVIRONMENTAL SAMPLE LOCATIONS

| SAMPLE MEDIUM | MAP DESIGNATION | FIGURE NUMBER | LOCATION DESCRIPTION | DEGREES & DISTANCE (1) |
|---|---|---|---|---|
| Shoreline Sediment | 05* | Figure 1A | Sunset Bay | 80° at 1.5 miles |
| | 06 | Figure 1A | Langs Beach, Control | 230° at 5.8 miles |
| Fish | 02* | Figure 1A | Nine Mile Point Transect | 315° at 0.3 miles |
| | 03* | Figure 1A | FitzPatrick Transect | 55° at 0.6 miles |
| | 00* | Figure 1A | Oswego Transect | 235° at 6.2 miles |
| Surface Water | 03* | Figure 1A | FitzPatrick Inlet | 70° at 0.5 miles |
| | 08* | Figure 1A | Oswego Steam Station Inlet | 235° at 7.6 miles |
| | 09 | Figure 1A | NMP Unit 1 Inlet | 305° at 0.3 miles |
| | 10 | Figure 1A | Oswego City Water | 240° at 7.8 miles |
| | 11 | Figure 1A | NMP Unit 2 Inlet | 335° at 0.1 miles |
| Air Radioiodine and Particulates | R-1* | Figure 1A | R-1 Station, Nine Mile Point Road | 88° at 1.8 miles |
| | R-2* | Figure 2 | R-2 Station, Lake Road | 104° at 1.1 miles |
| | R-3* | Figure 2 | R-3 Station, Co. Rt. 29 | 132° at 1.5 miles |
| | R-4* | Figure 2 | R-4 Station, Co. Rt. 29 | 143° at 1.8 miles |
| | R-5* | Figure 1A | R-5 Station, Montario Point Road | 42° at 16.4 miles |
| | D1 | Figure 2 | D1 On-Site Station | 69° at 0.2 miles |
| | G | Figure 2 | G On-Site Station | 250° at 0.7 miles |
| | H | Figure 2 | H On-Site Station | 70° at 0.8 miles |
| | I | Figure 2 | I On-Site Station | 98° at 0.8 miles |
| | J | Figure 2 | J On-Site Station | 110° at 0.9 miles |
| | K | Figure 2 | K On-Site Station | 132° at 0.5 miles |
| | G | Figure 1A | G Off-Site Station, Saint Paul Street | 225° at 5.3 miles |
| | D2 | Figure 1A | D2 Off-Site Station, Rt. 64 | 117° at 9.0 miles |
| | E | Figure 1A | E Off-Site Station, Rt. 4 | 160° at 7.2 miles |
| | F | Figure 1A | F Off-Site Station, Dutch Ridge Road | 190° at 7.7 miles |

TABLE 3 (Continued)

ENVIRONMENTAL SAMPLE LOCATIONS

| SAMPLE MEDIUM | MAP DESIGNATION | FIGURE NUMBER | LOCATION DESCRIPTION | DEGREES & DISTANCE (1) |
|---|---|---|---|---|
| Thermoluminescent Dosimeters (TLD) | 3 | Figure 2 | D1 On-Site Station | 69° at 0.2 miles |
| | 4 | Figure 2 | D2 On-Site Location | 140° at 0.4 miles |
| | 5 | Figure 2 | E On-Site Location | 175° at 0.4 miles |
| | 6 | Figure 2 | F On-Site Location | 210° at 0.5 miles |
| | 7* | Figure 2 | G On-Site Station | 250° at 0.7 miles |
| | 8 | Figure 1A | R-5 Off-Site Station | 42° at 16.4 miles |
| | 9 | Figure 1A | D1 Off-Site Location | 80° at 11.4 miles |
| | 10 | Figure 1A | D2 Off-Site Station | 117° at 9.0 miles |
| | 11 | Figure 1A | E Off-Site Station | 160° at 7.2 miles |
| | 12 | Figure 1A | F Off-Site Station | 190° at 7.7 miles |
| | 13 | Figure 1A | G Off-Site Station | 225° at 5.3 miles |
| | 14* | Figure 1A | Southwest Oswego - Control | 226° at 12.6 miles |
| | 15* | Figure 1A | West Site Boundary | 237° at 0.9 miles |
| | 18* | Figure 2 | Energy Information Center | 265° at 0.4 miles |
| | 19 | Figure 1A | East Site Boundary | 81° at 1.3 miles |
| | 23* | Figure 2 | H On-Site Station | 70° at 0.8 miles |
| | 24 | Figure 2 | I On-Site Station | 98° at 0.8 miles |
| | 25 | Figure 2 | J On-Site Station | 110° at 0.9 miles |
| | 26 | Figure 2 | K On-Site Station | 132° at 0.5 miles |
| | 27 | Figure 2 | North Fence, JAFNPP | 60° at 0.4 miles |
| | 28 | Figure 2 | North Fence, JAFNPP | 68° at 0.5 miles |
| | 29 | Figure 2 | North Fence, JAFNPP | 65° at 0.5 miles |
| | 30 | Figure 2 | North Fence, JAFNPP | 57° at 0.4 miles |
| | 31 | Figure 2 | North Fence, NMP-1 | 276° at 0.2 miles |
| | 39 | Figure 2 | North Fence, NMP-1 | 292° at 0.2 miles |
| | 47 | Figure 2 | North Fence, JAFNPP | 69° at 0.6 miles |
| | 49* | Figure 1B | Phoenix, NY - Control | 163° at 19.8 miles |
| | 51 | Figure 1A | Oswego Steam Station, East | 233° at 7.4 miles |
| | 52 | Figure 1A | Fitzhugh Park Elementary School, East | 227° at 5.8 miles |
| | 53 | Figure 1B | Fulton High School | 183° at 13.7 miles |
| | 54 | Figure 1A | Mexico High School | 115° at 9.3 miles |
| | 55 | Figure 1A | Pulaski Gas Substation, Rt. 5 | 75° at 13.0 miles |

TABLE 3 (Continued)

ENVIRONMENTAL SAMPLE LOCATIONS

| SAMPLE MEDIUM | MAP DESIGNATION | FIGURE NUMBER | LOCATION DESCRIPTION | DEGREES & DISTANCE (1) |
|---|---|---|---|---|
| Thermoluminescent Dosimeters (TLD) (Continued) | 56* | Figure 1A | New Haven Elementary School | 123° at 5.3 miles |
| | 58* | Figure 1A | County Route 1 and Alcan | 220° at 3.1 miles |
| | 75* | Figure 2 | North Fence, NMP-2 | 5° at 0.1 miles |
| | 76* | Figure 2 | North Fence, NMP-2 | 25° at 0.1 miles |
| | 77* | Figure 2 | North Fence, NMP-2 | 45° at 0.2 miles |
| | 78* | Figure 2 | East Boundary, JAFNPP | 90° at 1.0 miles |
| | 79* | Figure 2 | County Route 29 | 115° at 1.1 miles |
| | 80* | Figure 2 | County Route 29 | 133° at 1.4 miles |
| | 81* | Figure 2 | Miner Road | 159° at 1.6 miles |
| | 82* | Figure 2 | Miner Road | 181° at 1.6 miles |
| | 83* | Figure 2 | Lakeview Road | 200° at 1.2 miles |
| | 84* | Figure 1A | Lakeview Road | 225° at 1.1 miles |
| | 85* | Figure 2 | North Fence, NMP-1 | 294° at 0.2 miles |
| | 86* | Figure 2 | North Fence, NMP-1 | 315° at 0.1 miles |
| | 87* | Figure 2 | North Fence, NMP-2 | 341° at 0.1 miles |
| | 88* | Figure 1A | Hickory Grove Road | 97° at 4.5 miles |
| | 89* | Figure 1A | Leavitt Road | 111° at 4.1 miles |
| | 90* | Figure 1A | Route 104 and Keefe Road | 135° at 4.2 miles |
| | 91* | Figure 1A | County Route 51A | 156° at 4.8 miles |
| | 92* | Figure 1A | Maiden Lane Road | 183° at 4.4 miles |
| | 93* | Figure 1A | County Route 53 | 205° at 4.4 miles |
| | 94* | Figure 1A | County Route 1 and Kocher Road | 223° at 4.7 miles |
| | 95* | Figure 1A | Lakeshore Camp Site | 237° at 4.1 miles |
| | 96* | Figure 1A | Creamery Road | 199° at 3.6 miles |
| | 97* | Figure 2 | County Route 29 | 143° at 1.8 miles |
| | 98* | Figure 1A | Lake Road | 101° at 1.2 miles |
| | 99 | Figure 1A | Nine Mile Point Road | 88° at 1.8 miles |
| | 100 | Figure 2 | County Route 29 and Lake Road | 104° at 1.1 miles |
| | 101 | Figure 2 | County Route 29 | 132° at 1.5 miles |
| | 102 | Figure 1B | Oswego County Airport | 175° at 11.9 miles |
| | 103 | Figure 2 | Energy Center, East | 267° at 0.4 miles |
| | 104 | Figure 1A | Parkhurst Road | 102° at 1.4 miles |

TABLE 3 (Continued)

ENVIRONMENTAL SAMPLE LOCATIONS

| SAMPLE MEDIUM | MAP DESIGNATION | FIGURE NUMBER | LOCATION DESCRIPTION | DEGREES & DISTANCE (1) |
|---|---|---|---|---|
| Thermoluminescent Dosimeters (TLD) (Continued) | 105 | Figure 2 | Lakeview Road | 198° at 1.4 miles |
| | 106 | Figure 2 | Shoreline Cove, West of NMP-1 | 274° at 0.3 miles |
| | 107 | Figure 2 | Shoreline Cove, West of NMP-1 | 272° at 0.3 miles |
| | 108 | Figure 1A | Lake Road | 104° at 1.1 miles |
| | 109 | Figure 1A | Lake Road | 103° at 1.1 miles |
| | 111 | Figure 1A | Sterling, NY - Control | 214° at 21.8 miles |
| | 113 | Figure 1B | Baldwinsville, NY - Control | 178° at 24.7 miles |
| Cows Milk | 7 | Figure 4 | Indicator Location | 107° at 5.5 miles |
| | 16 | Figure 4 | Indicator Location | 190° at 5.9 miles |
| | 50 | Figure 4 | Indicator Location | 93° at 9.3 miles |
| | 55 | Figure 4 | Indicator Location | 95° at 9.0 miles |
| | 60 | Figure 4 | Indicator Location | 90° at 9.5 miles |
| | 4 | Figure 4 | Indicator Location | 113° at 7.8 miles |
| | 65* | Figure 4 | Control Location | 220° at 17.0 miles |
| Food Products | T* | Figure 3 | Indicator Location | 84° at 1.6 miles |
| | N | Figure 3 | Indicator Location | 207° at 1.2 miles |
| | M* | Figure 3 | Control Location | 225° at 15.6 miles |
| | K* | Figure 3 | Indicator Location | 96° at 1.7 miles |
| | L | Figure 3 | Indicator Location | 115° at 1.9 miles |
| | Z* | Figure 3 | Indicator Location | 95° at 1.9 miles |

* - Technical Specification location.
(1) - Degrees and distance based on Nine Mile Point Unit 2 reactor centerline.

TA[illegible]4

**RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY**
**NINE MILE POINT NUCLEAR STATION UNIT 1 DOCKET NO. 50-220**
**NINE MILE POINT NUCLEAR STATION UNIT 2 DOCKET NO. 50-410**
**OSWEGO COUNTY, STATE OF NEW YORK, JANUARY - DECEMBER 1991***

| MEDIUM (UNITS) | TYPE AND NUMBER OF ANALYSES* | LLD(a) | INDICATOR LOCATIONS: MEAN (f) RANGE | LOCATION (b) OF HIGHEST ANNUAL MEAN: LOCATION & MEAN (f) RANGE | CONTROL LOCATION: MEAN (f) RANGE | NUMBER OF NONROUTINE REPORTS |
|---|---|---|---|---|---|---|
| Shoreline | GSA(4): | | | | | |
| Sediment* | Cs-134 | 150 | <LLD | <LLD | <LLD | 0 |
| (pCi/kg-dry) | Cs-137 | 180 | 135 (2/2) | Sunset Bay: 135 (2/2) | <LLD | 0 |
| | | | 110-160 | 1.5 at 80° 110-160 | | |
| Fish* | GSA(36): (h) | | | | | 0 |
| (pCi/kg-wet) | Mn-54 | 130 | <LLD | <LLD | <LLD | 0 |
| | Fe-59 | 260 | <LLD | <LLD | <LLD | 0 |
| | Co-58 | 130 | <LLD | <LLD | <LLD | 0 |
| | Co-60 | 130 | <LLD | <LLD | <LLD | 0 |
| | Zn-65 | 260 | <LLD | <LLD | <LLD | 0 |
| | Cs-134 | 130 | <LLD | <LLD | <LLD | 0 |
| | Cs-137 | 150 | 27 (12/23) | OSW: 30 (3/13) | 30 (3/13) | |
| | | | 21-35 | 6.2 at 235° 16-45 | 16-45 | |
| | | | | | | 0 |
| Surface Water* | H-3 (8): | | 310 (3/4) | JAF: 310 (3/4) | 190 (2/4) | |
| (pCi/liter) | H-3 | 3000(c) | 250-390 | 0.5 at 70° 250-390 | 180-200 | |
| | GSA (24): | | | | | 0 |
| | Mn-54 | 15 | <LLD | <LLD | <LLD | 0 |
| | Fe-59 | 30 | <LLD | <LLD | <LLD | 0 |
| | Co-58 | 15 | <LLD | <LLD | <LLD | 0 |
| | Co-60 | 15 | <LLD | <LLD | <LLD | 0 |
| | Zn-65 | 30 | <LLD | <LLD | <LLD | 0 |
| | Zr-95 | 15 | <LLD | <LLD | <LLD | 0 |
| | Nb-95 | 15 | <LLD | <LLD | <LLD | 0 |
| | I-131 | 15(c) | <LLD | <LLD | <LLD | 0 |
| | Cs-134 | 15 | <LLD | <LLD | <LLD | 0 |
| | Cs-137 | 18 | <LLD | <LLD | <LLD | 0 |
| | Ba/La-140 | 15 | <LLD | <LLD | <LLD | |

**TABLE 4 (Continued)**

**RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY**
**NINE MILE POINT NUCLEAR STATION UNIT 1 DOCKET NO. 50-220**
**NINE MILE POINT NUCLEAR STATION UNIT 2 DOCKET NO. 50-410**
**OSWEGO COUNTY, STATE OF NEW YORK, JANUARY - DECEMBER 1991***

| MEDIUM (UNITS) | TYPE AND NUMBER OF ANALYSES* | LLD(a) | INDICATOR LOCATIONS: MEAN (f) RANGE | LOCATION (b) OF HIGHEST ANNUAL MEAN: LOCATION & MEAN (f) RANGE | CONTROL LOCATION: MEAN (f) RANGE | NUMBER OF NONROUTINE REPORTS |
|---|---|---|---|---|---|---|
| TLD* (mrem per quarterly period) | Gamma Dose(128): | (d) | 15.7(120/120)<br>8.8-53.4 | TLD #86 (g) 29.0(4/4)<br>0.1 at 315° 17.7-53.4 | 13.0(8/8)<br>10.7-16.1 | 0 |
| Air Particulates* pCi/m$^3$ | Gross Beta(260): | 0.01 | 0.015(208/208)<br>0.007-0.033 | R-2 0.015(52/52)<br>1.1 at 104° 0.007-0.033 | 0.014(52/52)<br>0.006-0.028 | 0 |
| | I-131(260): | 0.07 | <LLD | <LLD | <LLD | 0 |
| | GSA(60): | | | | | |
| | Cs-134 | 0.05 | <LLD | <LLD | <LLD | 0 |
| | Cs-137 | 0.06 | <LLD | <LLD | <LLD | 0 |
| Milk* (pCi/liter) | GSA(126): (e) | (h) | | | | |
| | Cs-134 | 15 | <LLD | <LLD | <LLD | 0 |
| | Cs-137 | 18 | <LLD | <LLD | <LLD | 0 |
| | Ba/La-140 | 15 | <LLD | <LLD | <LLD | 0 |
| | I-131(126): | | | | | |
| | I-131 | 1 | <LLD | <LLD | <LLD | 0 |
| Food Products* (pCi/kg-wet) (broadleaf vegetation) | GSA(21):(h) | | | | | |
| | I-131 | 60 | <LLD | <LLD | <LLD | 0 |
| | Cs-134 | 60 | <LLD | <LLD | <LLD | 0 |
| | Cs-137 | 80 | 42 (1/16)<br>42-42 | N 42 (1/2)<br>1.2 at 218° 42-42 | <LLD | 0 |

**TABLE 4 (Continued)**

**RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY**
**NINE MILE POINT NUCLEAR STATION UNIT 1 DOCKET NO. 50-220**
**NINE MILE POINT NUCLEAR STATION UNIT 2 DOCKET NO. 50-410**
**OSWEGO COUNTY, STATE OF NEW YORK, JANUARY - DECEMBER 1991***

TABLE NOTES:

* = Data for Table 4 is based on Technical Specification required samples unless otherwise indicated.

(a) = LLD values as required by the Radiological Technical Specifications. LLD units are specified in the medium column.

(b) = Location is distance in miles and direction in compass degrees based on NMP-2 reactor center-line. Units for this column are specified in medium column.

(c) = The Technical Specifications specify an I-131 and tritium LLD value for surface water analysis (non-drinking water) of 15 pCi/liter and 3000 pCi/liter respectively.

(d) = The Technical Specifications do not specify a particular LLD value for environmental TLDs. The NMP-1 and NMP-2 Off-Site Dose Calculation Manuals contain specifications for environmental TLD sensitivities.

(e) = The Technical Specification criteria for indicator milk sample locations includes locations within 5.0 miles of the site. There are no milk sample locations within 5.0 miles of the site. Therefore, the only sample location required by the Technical Specifications is the control location. There were six optional indicator locations during 1991.

(f) = Fraction of number of detectable measurements to total number of measurements. Mean and range results are based on detectable measurements only.

(g) = The results for TLD #86 must be evaluated with the knowledge that this TLD is in close proximity (300-500 feet) of the Nine Mile Point Unit 1 reactor building and the radwaste buildings. This TLD, as well as other TLDs in this area, are adjacent to the lake shoreline which is a restricted area to members of the public. There are no residences or private property near this area.

(h) = Data includes results from optional samples in addition to samples required by the Technical Specifications. For food products, only broadleaf vegetation was evaluated.

TABLE 5A

CONCENTRATION OF GAMMA EMITTERS IN SHORELINE SEDIMENT SAMPLES

Results in units of pCi/g (dry) ± 2 sigma

| SAMPLE LOCATION | COLLECTION DATE | Be-7 | K-40 | Co-60 | Cs-134 | Cs-137 | Ra-226 | AcTh-228 | Other |
|---|---|---|---|---|---|---|---|---|---|
| Langs Beach (Control)* | 4/24/91 | <0.33 | 13.4±0.48 | <0.054 | <0.060 | <0.042 | 0.67±0.32 | 0.33±0.06 | <LLD |
| | 10/25/91 | <0.31 | 10.9±0.47 | <0.051 | <0.053 | <0.045 | 1.00±0.34 | 0.23±0.06 | <LLD |
| Sunset Beach (Off-Site) | 4/24/91 | <0.43 | 15.9±0.54 | <0.067 | <0.095 | 0.11±0.02 | 1.75±0.40 | 0.67±0.08 | <LLD |
| | 10/25/91 | <0.47 | 18.8±0.59 | <0.063 | <0.103 | 0.16±0.02 | 1.78±0.42 | 0.68±0.08 | <LLD |

*Sample not required by the Technical Specifications (Optional sample location)
Results in units of activity per gram dry weight.

**TABLE 5B**

**CONCENTRATION OF GAMMA EMITTERS IN SHORELINE SEDIMENT SAMPLES**

**Results in units of pCi/kg (dry) ± 2 sigma**

| SAMPLE LOCATION | COLLECTION DATE | Be-7 | K-40 | Co-60 | Cs-134 | Cs-137 | Ra-226 | AcTh-228 | OTHERS |
|---|---|---|---|---|---|---|---|---|---|
| Langs Beach (Control)* | 4/24/91 | <332 | 13400±479 | <54 | <60 | <42 | 672±324 | 332±63 | <LLD |
| | 10/25/91 | <314 | 10900±468 | <51 | <53 | <45 | 1000±341 | 229±59 | <LLD |
| Sunset Beach (Off-Site) | 4/24/91 | <427 | 15900±541 | <67 | <95 | 110±22 | 1750±405 | 666±80 | <LLD |
| | 10/25/91 | <469 | 18800±594 | <63 | <103 | 160±22 | 1780±425 | 685±82 | <LLD |

* Sample not required by the Technical Specifications
Results in units of activity per kilogram dry weight

**TABLE 6A**

**CONCENTRATION OF GAMMA EMITTERS IN FISH SAMPLES**

**Results in units of pCi/g (wet) ± 2 sigma**

| | | GAMMA EMITTERS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| SAMPLE DATE | SAMPLE TYPE | Fe-59 | Co-58 | K-40 | Mn-54 | Co-60 | Cs-134 | Cs-137 | Zn-65 | Ra-226 | OTHER |
| OSWEGO (CONTROL) - 00 | | | | | | | | | | | |
| 6/19/91 | Smallmouth Bass | <0.155 | <0.066 | 5.20±0.37 | <0.052 | <0.080 | <0.038 | <0.054 | <0.139 | 0.52±0.26 | <LLD |
| 5/29/91 | Brown Trout | <0.155 | <0.061 | 5.10±0.29 | <0.036 | <0.045 | <0.037 | <0.040 | <0.118 | 0.86±0.20 | <LLD |
| 6/6/91 | Lake Trout | <0.111 | <0.040 | 3.40±0.22 | <0.030 | <0.042 | <0.032 | <0.030 | <0.092 | 0.74±0.19 | <LLD |
| 5/29/91 | White Sucker | <0.197 | <0.064 | 4.45±0.30 | <0.049 | <0.060 | <0.037 | <0.043 | <0.120 | 0.40±0.20 | <LLD |
| 6/19/91 | White Perch | <0.098 | <0.042 | 2.42±0.19 | <0.033 | <0.035 | <0.030 | <0.031 | <0.074 | 0.55±0.19 | <LLD |
| 6/4/91 | Walleye | <0.145 | <0.045 | 4.54±0.26 | <0.038 | <0.045 | <0.035 | 0.045±0.011 | <0.094 | 0.49±0.19 | <LLD |
| 9/13/91 | Smallmouth Bass | <0.175 | <0.063 | 4.72±0.31 | <0.043 | <0.063 | <0.035 | <0.042 | <0.127 | <0.58 | <LLD |
| 9/13/91 | Walleye | <0.144 | <0.058 | 4.75±0.30 | <0.041 | <0.041 | <0.033 | 0.028±0.015 | <0.124 | <0.50 | <LLD |
| 9/13/91 | Salmon | <0.096 | <0.032 | 3.93±0.20 | <0.028 | <0.030 | <0.024 | 0.016±0.007 | <0.070 | 0.61±0.16 | <LLD |
| 9/25/91 | Brown Trout | <0.136 | <0.055 | 4.58±0.30 | <0.045 | <0.057 | <0.036 | <0.038 | <0.116 | 0.61±0.18 | <LLD |
| 10/2/91 | Lake Trout | <0.129 | <0.042 | 3.79±0.27 | <0.035 | <0.055 | <0.031 | <0.039 | <0.118 | 0.70±0.19 | <LLD |
| 10/2/91 | White Sucker | <0.062 | <0.028 | 3.57±0.20 | <0.026 | <0.035 | <0.024 | <0.026 | <0.071 | 0.61±0.18 | <LLD |
| 10/2/91 | White Perch | <0.076 | <0.031 | 4.48±0.22 | <0.030 | <0.034 | <0.030 | <0.028 | <0.077 | 0.46±0.20 | <LLD |
| NINE MILE POINT - 02 | | | | | | | | | | | |
| 6/6/91 | Smallmouth Bass | <0.111 | <0.044 | 4.72±0.25 | <0.035 | <0.041 | <0.036 | <0.032 | <0.093 | 0.95±0.21 | <LLD |
| 6/6/91 | Brown Trout | <0.127 | <0.045 | 4.12±0.25 | <0.036 | <0.044 | <0.031 | <0.032 | <0.093 | 0.63±0.23 | <LLD |
| 6/6/91 | Lake Trout | <0.142 | <0.051 | 4.83±0.27 | <0.039 | <0.047 | <0.038 | <0.033 | <0.094 | 0.69±0.22 | <LLD |
| 6/18/91 | White Sucker | <0.082 | <0.035 | 2.95±0.19 | <0.031 | <0.033 | <0.028 | <0.027 | <0.083 | 0.39±0.18 | <LLD |
| 6/18/91 | White Perch | <0.104 | <0.037 | 4.59±0.23 | <0.027 | <0.032 | <0.032 | 0.022±0.009 | <0.082 | <0.46 | <LLD |
| 9/13/91 | Smallmouth Bass | <0.099 | <0.036 | 4.17±0.21 | <0.028 | <0.033 | <0.030 | 0.026±0.011 | <0.079 | 0.54±0.17 | <LLD |
| 10/10/91 | Lake Trout | <0.091 | <0.040 | 3.93±0.25 | <0.032 | <0.046 | <0.032 | 0.034±0.010 | <0.095 | 0.38±0.21 | <LLD |
| 10/10/91 | White Sucker | <0.073 | <0.035 | 3.94±0.21 | <0.027 | <0.034 | <0.026 | <0.027 | <0.077 | <0.39 | <LLD |
| 9/25/91 | White Perch | <0.157 | <0.059 | 4.69±0.33 | <0.046 | <0.070 | <0.047 | <0.050 | <0.126 | 0.92±0.31 | <LLD |
| 9/13/91 | Salmon | <0.128 | <0.043 | 5.04±0.23 | <0.031 | <0.034 | <0.028 | 0.028±0.012 | <0.082 | 0.49±0.16 | <LLD |
| 9/25/91 | Walleye | <0.102 | <0.037 | 4.55±0.25 | <0.030 | <0.036 | <0.029 | 0.021±0.010 | <0.091 | 0.32±0.16 | <LLD |

TABLE 6A (Continued)

CONCENTRATION OF GAMMA EMITTERS IN FISH SAMPLES

Results in units of pCi/g (wet) ± 2 sigma

| SAMPLE DATE | SAMPLE TYPE | GAMMA EMITTERS | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Fe-59 | Co-58 | K-40 | Mn-54 | Co-60 | Cs-134 | Cs-137 | Zn-65 | Ra-226 | OTHER |
| JA FITZPATRICK - 03 | | | | | | | | | | | |
| 6/18/91 | Smallmouth Bass | <0.098 | <0.036 | 6.08±0.26 | <0.030 | <0.032 | <0.031 | <0.032 | <0.089 | 0.61±0.18 | <LLD |
| 5/29/91 | Brown Trout | <0.106 | <0.036 | 4.87±0.22 | <0.031 | <0.032 | <0.032 | 0.024±0.010 | <0.075 | 0.38±0.21 | <LLD |
| 6/6/91 | Lake Trout | <0.115 | <0.041 | 4.88±0.23 | <0.032 | <0.033 | <0.034 | <0.030 | <0.084 | 0.43±0.21 | <LLD |
| 6/7/91 | White Sucker | <0.124 | <0.049 | 5.49±0.26 | <0.037 | <0.038 | <0.036 | <0.032 | <0.101 | <0.50 | <LLD |
| 6/18/91 | White Perch | <0.107 | <0.044 | 3.41±0.24 | <0.038 | <0.049 | <0.038 | 0.033±0.013 | <0.092 | 0.76±0.21 | <LLD |
| 6/18/91 | Walleye | <0.123 | <0.042 | 5.46±0.29 | <0.036 | <0.040 | <0.038 | 0.035±0.013 | <0.101 | 0.54±0.22 | <LLD |
| 9/25/91 | Smallmouth Bass | <0.127 | <0.038 | 4.38±0.23 | <0.032 | <0.042 | <0.029 | 0.026±0.010 | <0.087 | <0.39 | <LLD |
| 10/10/91 | Brown Trout | <0.078 | <0.034 | 3.93±0.25 | <0.031 | <0.040 | <0.032 | 0.022±0.011 | <0.090 | <0.42 | <LLD |
| 10/01/91 | Lake Trout | <0.081 | <0.033 | 4.30±0.20 | <0.027 | <0.030 | <0.028 | 0.027±0.009 | <0.074 | 0.30±0.16 | <LLD |
| 10/01/91 | White Sucker | <0.101 | <0.036 | 3.79±0.21 | <0.030 | <0.042 | <0.027 | <0.025 | <0.078 | 0.69±0.15 | <LLD |
| 10/10/91 | White Perch | <0.124 | <0.050 | 4.20±0.31 | <0.046 | <0.047 | <0.037 | <0.045 | <0.114 | 0.62±0.24 | <LLD |
| 10/01/91 | Walleye | <0.072 | <0.030 | 4.32±0.20 | <0.025 | <0.028 | <0.024 | 0.025±0.008 | <0.063 | 0.73±0.15 | <LLD |

TABLE 6B

CONCENTRATION OF GAMMA EMITTERS IN FISH SAMPLES

Results in units of pCi/kg (wet) ± 2 sigma

| | | GAMMA EMITTERS | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SAMPLE DATA | SAMPLE TYPE | Fe-59 | Co-58 | K-40 | Mn-54 | Co-60 | Cs-134 | Cs-137 | Zn-65 | Ra-226 | OTHER |
| OSWEGO( CONTROL)-00 | | | | | | | | | | | |
| 6/19/91 | Smallmouth Bass | <155 | <66 | 5200±368 | <52 | <80 | <38 | <54 | <139 | 520±260 | <LLD |
| 5/29/91 | Brown Trout | <155 | <61 | 5100±286 | <36 | <45 | <37 | <40 | <118 | 863±199 | <LLD |
| 6/6/91 | Lake Trout | <111 | <40 | 3400±224 | <30 | <42 | <32 | <30 | <92 | 743±191 | <LLD |
| 5/29/91 | White Sucker | <197 | <64 | 4450±301 | <49 | <60 | <37 | <43 | <120 | 395±201 | <LLD |
| 6/19/91 | White Perch | <98 | <42 | 2420±193 | <33 | <35 | <30 | <31 | <74 | 553±190 | <LLD |
| 6/4/91 | Walleye | <145 | <45 | 4540±256 | <38 | <45 | <35 | 45±11 | <94 | 488±193 | <LLD |
| 9/13/91 | Smallmouth Bass | <175 | <63 | 4720±310 | <43 | <63 | <35 | <42 | <127 | <575 | <LLD |
| 9/25/91 | Brown Trout | <136 | <55 | 4580±295 | <45 | <57 | <36 | <38 | <116 | 608±184 | <LLD |
| 10/02/91 | Lake Trout | <129 | <42 | 3790±269 | <35 | <55 | <31 | <39 | <118 | 699±187 | <LLD |
| 10/02/91 | White Sucker | <62 | <28 | 3570±198 | <26 | <35 | <24 | <26 | <71 | 609±185 | <LLD |
| 10/02/91 | White Perch | <76 | <31 | 4480±215 | <30 | <34 | <30 | <28 | <77 | 461±196 | <LLD |
| 9/13/91 | Walleye | <144 | <58 | 4750±296 | <41 | <41 | <33 | 28±15 | <124 | <496 | <LLD |
| 9/13/91 | Salmon | <96 | <32 | 3930±196 | <28 | <30 | <24 | 16±7 | <70 | 612±164 | <LLD |
| NINE MILE POINT -02 | | | | | | | | | | | |
| 6/6/91 | Smallmouth Bass | <111 | <44 | 4720±251 | <35 | <41 | <36 | <32 | <93 | 950±207 | <LLD |
| 6/6/91 | Brown Trout | <127 | <45 | 4120±251 | <36 | <44 | <31 | <32 | <93 | 630±229 | <LLD |
| 6/6/91 | Lake Trout | <142 | <51 | 4830±270 | <39 | <47 | <38 | <33 | <94 | 687±215 | <LLD |
| 6/18/91 | White Sucker | <82 | <35 | 2950±193 | <31 | <33 | <28 | <27 | <83 | 390±182 | <LLD |
| 6/18/91 | White Perch | <104 | <37 | 4590±230 | <27 | <32 | <32 | 22±9 | <82 | <459 | <LLD |
| 9/13/91 | Smallmouth Bass | <99 | <36 | 4170±212 | <28 | <33 | <30 | 26±11 | <79 | 539±173 | <LLD |
| 10/10/91 | Lake Trout | <91 | <40 | 3930±252 | <32 | <46 | <32 | 34±10 | <95 | 385±212 | <LLD |
| 10/10/91 | White Sucker | <73 | <35 | 3940±214 | <27 | <34 | <26 | <27 | <77 | <390 | <LLD |
| 9/25/91 | White Perch | <157 | <59 | 4690±330 | <46 | <70 | <47 | <50 | <126 | 918±313 | <LLD |
| 9/13/91 | Salmon | <128 | <43 | 5040±231 | <31 | <34 | <28 | 28±12 | <82 | 493±163 | <LLD |
| 9/25/91 | Walleye | <102 | <37 | 4550±248 | <30 | <36 | <29 | 21±10 | <91 | 320±164 | <LLD |

## TABLE 6B (continued)

## CONCENTRATION OF GAMMA EMITTERS IN FISH SAMPLES

**Results in units of pCi/kg (wet) ± 2 sigma**

| | | GAMMA EMITTERS | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SAMPLE DATE | SAMPLE TYPE | Fe-59 | Co-58 | K-40 | Mn-54 | Co-60 | Cs-134 | Cs-137 | Zn-65 | Ra-226 | OTHER |
| J. A. FITZPATRICK - 03 | | | | | | | | | | | |
| 6/18/91 | Smallmouth Bass | <98 | <36 | 6080±259 | <30 | <32 | <31 | <32 | <89 | 613±175 | <LLD |
| 5/29/91 | Brown Trout | <106 | <36 | 4870±225 | <31 | <32 | <32 | 24±10 | <75 | 378±207 | <LLD |
| 6/6/91 | Lake Trout | <115 | <41 | 4880±230 | <32 | <33 | <34 | <30 | <84 | 432±210 | <LLD |
| 6/7/91 | White Sucker | <124 | <49 | 5490±260 | <37 | <38 | <36 | <32 | <101 | <504 | <LLD |
| 6/18/91 | White Perch | <107 | <44 | 3410±239 | <38 | <49 | <38 | 33±13 | <92 | 760±212 | <LLD |
| 6/18/91 | Walleye | <123 | <42 | 5460±287 | <36 | <40 | <38 | 35±13 | <101 | 538±225 | <LLD |
| 9/25/91 | Smallmouth Bass | <127 | <38 | 4380±229 | <32 | <42 | <29 | 26±10 | <87 | <393 | <LLD |
| 10/10/91 | Brown Trout | <78 | <34 | 3930±254 | <31 | <40 | <32 | 22±11 | <90 | <417 | <LLD |
| 10/01/91 | Lake Trout | <81 | <33 | 4300±197 | <27 | <30 | <28 | 27±9 | <74 | 304±162 | <LLD |
| 10/01/91 | White Sucker | <101 | <36 | 3790±214 | <30 | <42 | <27 | <25 | <78 | 694±153 | <LLD |
| 10/10/91 | White Perch | <124 | <50 | 4200±307 | <46 | <47 | <37 | <45 | <114 | 621±237 | <LLD |
| 10/01/91 | Walleye | <72 | <30 | 4320±203 | <25 | <28 | <24 | 25±8 | <63 | 726±146 | <LLD |

TABLE 7

CONCENTRATION OF GAMMA EMITTERS IN SURFACE WATER SAMPLES

Results in units of pCi/liter ± 2 sigma

| | | 1991 | | | | | |
|---|---|---|---|---|---|---|---|
| LOCATION | NUCLIDE | JANUARY | FEBRUARY | MARCH | APRIL | MAY | JUNE |
| OSWEGO CITY WATER** | K-40 | 182 ± 35 | 261 ± 19 | 252 ± 19 | 85 ± 14 | 202 ± 18 | 32 ± 12 |
| | Ra-226 | 95 ± 41 | 120 ± 31 | 132 ± 30 | <61 | 86 ± 31 | 99 ± 28 |
| | Cs-134 | <3.56 | <4.09 | <3.74 | <5.01 | <3.90 | <3.38 |
| | Cs-137 | <3.68 | <3.55 | <3.25 | <4.21 | <3.39 | <2.95 |
| | Zr-95 | <6.72 | <7.67 | <6.81 | <8.63 | <6.52 | <6.29 |
| | Nb-95 | <5.50 | <4.94 | <4.58 | <4.97 | <4.57 | <4.34 |
| | Co-58 | <3.53 | <4.42 | <4.05 | <4.52 | <4.02 | <3.23 |
| | Mn-54 | <3.81 | <3.72 | <3.61 | <4.37 | <3.50 | <3.00 |
| | Fe-59 | <8.5 | <10.2 | <8.7 | <8.8 | <9.3 | <8.8 |
| | Co-60 | <3.16 | <3.76 | <4.01 | <4.82 | <3.35 | <3.63 |
| | Zn-65 | <7.3 | <9.8 | <9.9 | <9.6 | <9.1 | <9.6 |
| | I-131 | <12.4 | <12.3 | <10.4 | <9.1 | <10.3 | <11.4 |
| | Ba/La-140 | <8.0 | <10.1 | <10.8 | <13.3 | <10.9 | <10.6 |
| NINE MILE POINT UNIT I (INLET) ** | K-40 | 48 ± 13 | 242 ± 20 | 213 ± 18 | 223 ± 19 | 37 ± 12 | 41 ± 13 |
| | Ra-226 | 122 ± 23 | 86 ± 31 | <80 | 74 ± 29 | <58 | 55 ± 25 |
| | Cs-134 | <3.13 | <4.10 | <3.78 | <4.02 | <3.10 | <2.91 |
| | Cs-137 | <3.54 | <3.30 | <3.62 | <3.68 | <2.99 | <3.13 |
| | Zr-95 | <6.17 | <6.78 | <7.05 | <6.75 | <5.81 | <6.59 |
| | Nb-95 | <4.01 | <4.66 | <4.71 | <4.29 | <3.99 | <3.97 |
| | Co-58 | <3.86 | <4.07 | <3.62 | <3.69 | <3.43 | <3.13 |
| | Mn-54 | <3.24 | <3.42 | <3.28 | <3.66 | <3.13 | <3.18 |
| | Fe-59 | <8.9 | <9.3 | <10.1 | <8.6 | <7.4 | <7.3 |
| | Co-60 | <3.82 | <3.32 | <3.32 | <3.60 | <3.76 | <3.82 |
| | Zn-65 | <7.7 | <9.7 | <8.9 | <9.2 | <8.3 | <8.1 |
| | I-131 | <8.4 | <8.6 | <9.9 | <9.8 | <8.9 | <9.7 |
| | Ba/La-140 | <9.7 | <7.6 | <10.4 | <9.4 | <8.4 | <9.8 |

** - Optional sample location. Sample not required by the Technical Specifications.

## TABLE 7 (Continued)

## CONCENTRATION OF GAMMA EMITTERS IN SURFACE WATER SAMPLES

**Results in units of pCi/liter ± 2 sigma**

| | | 1991 | | | | | |
|---|---|---|---|---|---|---|---|
| LOCATION | NUCLIDE | JANUARY | FEBRUARY | MARCH | APRIL | MAY | JUNE |
| NINE MILE POINT UNIT 2 (INLET) ** | K-40 | 207 ± 41 | 81 ± 17 | 88 ± 15 | 116 ± 17 | 244 ± 25 | 251 ± 25 |
| | Ra-226 | 81 ± 55 | 65 ± 25 | <59 | 55 ± 17 | 103 ± 34 | 105 ± 34 |
| | Cs-134 | <3.78 | <4.75 | <5.06 | <4.67 | <4.71 | <5.23 |
| | Cs-137 | <3.81 | <3.58 | <4.36 | <3.92 | <4.28 | <4.52 |
| | Zr-95 | <8.04 | <9.50 | <7.46 | <7.63 | <9.09 | <9.32 |
| | Nb-95 | <5.52 | <5.61 | <4.57 | <5.01 | <5.95 | <6.13 |
| | Co-58 | <4.29 | <4.90 | <4.31 | <4.86 | <5.23 | <5.36 |
| | Mn-54 | <3.60 | <4.24 | <4.42 | <4.66 | <4.63 | <4.60 |
| | Fe-59 | <8.9 | <10.7 | <8.8 | <10.1 | <11.0 | <10.8 |
| | Co-60 | <3.60 | <5.77 | <4.73 | <5.07 | <5.7 | <5.69 |
| | Zn-65 | <7.7 | <9.3 | <10.8 | <10.0 | <10.9 | <11.9 |
| | I-131 | <11.8 | <12.4 | <9.9 | <9.0 | <12.5 | <13.6 |
| | Ba/La-140 | <8.3 | <14.3 | <12.3 | <10.4 | <9.2 | <13.1 |
| FITZPATRICK (INLET) * | K-40 | 69 ± 23 | 217 ± 23 | 246 ± 18 | 50 ± 14 | 185 ± 18 | 240 ± 19 |
| | Ra-226 | 68 ± 29 | 93 ± 39 | 102 ± 28 | 73 ± 25 | 66 ± 22 | 79 ± 32 |
| | Cs-134 | <2.52 | <4.95 | <3.83 | <3.09 | <3.74 | <3.94 |
| | Cs-137 | <2.49 | <4.53 | <3.50 | <3.38 | <3.76 | <3.46 |
| | Zr-95 | <5.08 | <8.96 | <7.15 | <6.25 | <7.05 | <7.29 |
| | Nb-95 | <2.94 | <5.68 | <4.32 | <4.09 | <4.19 | <4.86 |
| | Co-58 | <3.03 | <5.51 | <3.60 | <3.88 | <3.78 | <4.21 |
| | Mn-54 | <2.48 | <4.77 | <3.36 | <3.11 | <3.50 | <3.19 |
| | -59 | <6.3 | <11.4 | <8.2 | <8.6 | <8.7 | <9.3 |
| | 0 | <2.45 | <4.61 | <3.20 | <3.82 | <3.53 | <3.91 |
| | [illegible] | <5.1 | <13.8 | <9.4 | <8.1 | <9.2 | <9.6 |
| | [illegible] | <0.20 | <0.10 | <0.26 | <0.36 | <0.70 | <0.90 |
| | [illegible] | <4.8 | <11.6 | <8.2 | <9.9 | <10.0 | <10.8 |

...n. Sample not required by the Technical Specifications.
...hnical Specifications.

TABLE 7 (Continued)

CONCENTRATION OF GAMMA EMITTERS IN SURFACE WATER SAMPLES

Results in units of pCi/liter ± 2 sigma

1991

| LOCATION | NUCLIDE | JANUARY | FEBRUARY | MARCH | APRIL | MAY | JUNE |
|---|---|---|---|---|---|---|---|
| OSWEGO | K-40 | 176 ± 29 | 53 ± 13 | 71 ± 15 | 236 ± 18 | 26 ± 13 | 58 ± 12 |
| STEAM | Ra-226 | 98 ± 34 | 59 ± 26 | 52 ± 18 | 126 ± 34 | 112 ± 25 | 84 ± 25 |
| STATION | Cs-134 | <2.89 | <3.63 | <4.32 | <3.73 | <3.19 | <3.15 |
| (CONTROL) | Cs-137 | <2.95 | <3.34 | <3.76 | <3.58 | <3.19 | <3.42 |
| * | Zr-95 | <6.18 | <5.60 | <8.49 | <6.53 | <5.38 | <5.95 |
| | Nb-95 | <3.73 | <4.23 | <5.01 | <4.20 | <3.77 | <4.03 |
| | Co-58 | <3.04 | <3.45 | <4.77 | <4.01 | <3.78 | <3.59 |
| | Mn-54 | <2.85 | <2.92 | <4.22 | <3.51 | <2.97 | <3.08 |
| | Fe-59 | <6.9 | <9.1 | <11.5 | <9.0 | <7.5 | <8.3 |
| | Co-60 | <3.02 | <3.41 | <4.82 | <3.81 | <3.94 | <4.07 |
| | Zn-65 | <5.9 | <8.3 | <9.0 | <9.0 | <8.8 | <8.4 |
| | I-131 | <0.13 | <0.13 | <0.24 | <0.26 | <1.00 | <0.50 |
| | Ba/La-140 | <7.0 | <7.6 | <12.1 | <8.1 | <9.2 | <8.3 |
| LOCATION | NUCLIDE | JULY | AUGUST | SEPTEMBER | OCTOBER | NOVEMBER | DECEMBER |
| OSWEGO CITY | K-40 | 88 ± 17 | 179 ± 22 | 50 ± 14 | 158 ± 22 | 229 ± 23 | 77 ± 11 |
| WATER | Ra-226 | 77 ± 24 | 140 ± 38 | 75 ± 15 | 89 ± 20 | 101 ± 36 | 91 ± 20 |
| ** | Cs-134 | <3.76 | <4.68 | <3.16 | <4.16 | <4.50 | <2.60 |
| | Cs-137 | <3.65 | <4.61 | <3.13 | <4.60 | <4.47 | <2.43 |
| | Zr-95 | <7.21 | <9.48 | <6.27 | <9.79 | <8.87 | <5.40 |
| | Nb-95 | <4.44 | <6.10 | <4.09 | <5.67 | <5.44 | <3.55 |
| | Co-58 | <3.69 | <5.38 | <3.67 | <5.14 | <5.52 | <2.92 |
| | Mn-54 | <3.50 | <4.55 | <3.30 | <4.30 | <4.71 | <2.69 |
| | Fe-59 | <9.1 | <10.5 | <9.2 | <10.5 | <11.1 | <6.5 |
| | Co-60 | <4.63 | <6.56 | <4.01 | <5.75 | <5.41 | <2.79 |
| | Zn-65 | <10.2 | <10.4 | <8.3 | <12.7 | <11.9 | <6.9 |
| | I-131 | <9.0 | <12.3 | <9.1 | <11.6 | <13.7 | <11.0 |
| | Ba/La-140 | <13.0 | <14.5 | <9.5 | <12.3 | <14.2 | <9.9 |

** - Optional sample location. Sample not required by the Technical Specifications.
* - Sample required by the Technical Specifications.

TABLE 7 (Continued)

CONCENTRATION OF GAMMA EMITTERS IN SURFACE WATER SAMPLES

Results in units of pCi/liter ± 2 sigma

| | | 1991 | | | | | |
|---|---|---|---|---|---|---|---|
| LOCATION | NUCLIDE | JULY | AUGUST | SEPTEMBER | OCTOBER | NOVEMBER | DECEMBER |
| NINE MILE POINT UNIT I (INLET) ** | K-40 | 62 ± 13 | 244 ± 18 | 48 ± 15 | 47 ± 13 | 47 ± 15 | 49 ± 11 |
| | Ra-226 | 118 ± 24 | 89 ± 31 | 109 ± 24 | 94 ± 25 | 69 ± 23 | 116 ± 20 |
| | Cs-134 | <2.68 | <3.97 | <3.12 | <3.05 | <3.55 | <2.37 |
| | Cs-137 | <3.09 | <3.59 | <3.42 | <3.13 | <3.36 | <2.73 |
| | Zr-95 | <6.35 | <7.32 | <6.91 | <5.75 | <6.08 | <5.32 |
| | Nb-95 | <3.68 | <4.44 | <4.44 | <4.25 | <4.21 | <3.17 |
| | Co-58 | <3.32 | <3.90 | <3.72 | <2.81 | <4.10 | <2.81 |
| | Mn-54 | <2.70 | <3.73 | <3.58 | <3.20 | <3.25 | <2.44 |
| | Fe-59 | <7.1 | <9.3 | <8.8 | <7.6 | <8.8 | <6.4 |
| | Co-60 | <3.75 | <3.65 | <5.13 | <3.42 | <4.41 | <3.08 |
| | Zn-65 | <6.7 | <9.9 | <9.3 | <7.2 | <9.2 | <6.0 |
| | I-131 | <8.2 | <11.5 | <8.2 | <9.1 | <9.7 | <8.5 |
| | Ba/La-140 | <9.4 | <11.0 | <11.0 | <11.1 | <11.9 | <9.1 |
| NINE MILE POINT UNIT 2 (INLET) ** | K-40 | 57 ± 13 | 187 ± 19 | 66 ± 18 | 239 ± 16 | 66 ± 11 | 214 ± 19 |
| | Ra-226 | 50 ± 25 | 87 ± 28 | 80 ± 24 | 86 ± 21 | 101 ± 22 | 131 ± 33 |
| | Cs-134 | <3.21 | <3.83 | <3.11 | <3.57 | <2.43 | <3.66 |
| | Cs-137 | <2.95 | <3.96 | <3.54 | <2.98 | <2.69 | <3.39 |
| | Zr-95 | <6.89 | <7.96 | <6.29 | <6.05 | <5.29 | <7.51 |
| | Nb-95 | <4.25 | <5.20 | <4.01 | <3.94 | <3.52 | <4.85 |
| | Co-58 | <3.70 | <4.64 | <3.98 | <3.08 | <3.03 | <4.32 |
| | Mn-54 | <3.29 | <4.17 | <3.50 | <2.92 | <2.30 | <3.97 |
| | Fe-59 | <8.4 | <11.0 | <9.2 | <7.5 | <6.8 | <9.7 |
| | Co-60 | <3.49 | <5.43 | <4.05 | <3.34 | <3.01 | <4.63 |
| | Zn-65 | <8.0 | <9.8 | <9.0 | <7.7 | <5.9 | <9.5 |
| | I-131 | <8.9 | <13.0 | <9.8 | <9.8 | <8.3 | <11.8 |
| | Ba/La-140 | <10.9 | <12.9 | <13.6 | <8.7 | <9.1 | <13.5 |

** - Optional sample location. Sample not required by the Technical Specifications.
* - Sample required by the Technical Specifications.

TABLE 7 (Continued)

CONCENTRATION OF GAMMA EMITTERS IN SURFACE WATER SAMPLES

Results in units of pCi/liter ± 2 sigma

1991

| LOCATION | NUCLIDE | JULY | AUGUST | SEPTEMBER | OCTOBER | NOVEMBER | DECEMBER |
|---|---|---|---|---|---|---|---|
| FITZPATRICK (INLET) * | K-40 | 232 ± 22 | 60 ± 15 | 230 ± 19 | 44 ± 14 | 257 ± 20 | 223 ± 22 |
| | Ra-226 | 78 ± 34 | 49 ± 21 | 81 ± 25 | 131 ± 26 | 79 ± 32 | 89 ± 32 |
| | Cs-134 | <4.85 | <3.57 | <4.34 | <2.70 | <3.89 | <5.40 |
| | Cs-137 | <4.40 | <3.38 | <3.77 | <2.86 | <3.64 | <4.31 |
| | Zr-95 | <8.29 | <7.89 | <7.17 | <6.16 | <6.71 | <8.37 |
| | Nb-95 | <5.36 | <4.77 | <4.81 | <3.92 | <4.26 | <4.99 |
| | Co-58 | <4.98 | <3.88 | <3.89 | <3.50 | <4.10 | <4.65 |
| | Mn-54 | <4.73 | <3.77 | <3.54 | <3.15 | <3.32 | <4.30 |
| | Fe-59 | <11.8 | <8.9 | <9.5 | <7.7 | <8.4 | <12.5 |
| | Co-60 | <5.58 | <4.93 | <3.75 | <3.75 | <4.12 | <6.13 |
| | Zn-65 | <11.4 | <9.9 | <9.6 | <6.9 | <8.9 | <11.9 |
| | I-131 | <0.60 | <0.40 | <0.10 | <0.90 | <0.50 | <1.00 |
| | Ba/La-140 | <9.7 | <13.0 | <9.0 | <9.7 | <9.0 | <14.4 |
| OSWEGO STEAM STATION (CONTROL) * | K-40 | 202 ± 19 | 63 ± 16 | 46 ± 14 | 226 ± 18 | 45 ± 13 | 246 ± 15 |
| | Ra-226 | 57 ± 25 | 84 ± 25 | 100 ± 24 | 115 ± 28 | 98 ± 20 | 78 ± 28 |
| | Cs-134 | <4.09 | <3.25 | <3.00 | <3.97 | <2.88 | <3.06 |
| | Cs-137 | <3.77 | <3.01 | <3.17 | <3.48 | <3.27 | <2.94 |
| | Zr-95 | <6.85 | <5.74 | <5.98 | <7.47 | <6.24 | <5.59 |
| | Nb-95 | <4.48 | <4.06 | <4.33 | <4.68 | <3.96 | <3.60 |
| | Co-58 | <3.87 | <3.64 | <3.68 | <4.19 | <3.60 | <3.20 |
| | Mn-54 | <3.54 | <3.24 | <3.31 | <3.34 | <3.13 | <2.97 |
| | Fe-59 | <9.6 | <8.5 | <7.9 | <9.2 | <8.1 | <7.3 |
| | Co-60 | <3.86 | <4.07 | <4.62 | <3.64 | <3.88 | <3.08 |
| | Zn-65 | <9.2 | <8.5 | <8.2 | <9.4 | <8.4 | <7.6 |
| | I-131 | <0.60 | <0.30 | <0.20 | <0.90 | <0.30 | <1.00 |
| | Ba/La-140 | <9.2 | <9.6 | <11.4 | <9.7 | <7.8 | <8.7 |

* Sample required by the Technical Specifications.
** Optional sample location. Sample not required by the Technical Specifications.

## TABLE 8

### CONCENTRATION OF TRITIUM IN SURFACE WATER SAMPLES (QUARTERLY COMPOSITE SAMPLES)

**Results in units of pCi/liter ± 2 sigma**

| LOCATION | PERIOD | DATE | TRITIUM |
|---|---|---|---|
| JAF INLET * | First Quarter | 01/01/91 - 03/30/91 | 390 ± 60 |
| | Second Quarter | 03/30/91 - 07/01/91 | 250 ± 100 |
| | Third Quarter | 07/01/91 - 09/30/91 | 290 ± 90 |
| | Fourth Quarter | 09/30/91 - 12/30/91 | <100 |
| NMP-1 INLET ** | First Quarter | 12/31/90 - 04/01/91 | 390 ± 110 |
| | Second Quarter | 04/01/91 - 07/01/91 | 220 ± 70 |
| | Third Quarter | 07/01/91 - 09/30/91 | 270 ± 60 |
| | Fourth Quarter | 09/30/91 - 12/31/91 | <160 |
| NMP-2 INLET ** | First Quarter | 12/31/90 - 04/01/91 | 360 ± 100 |
| | Second Quarter | 04/01/91 - 07/01/91 | 230 ± 70 |
| | Third Quarter | 07/01/91 - 09/30/91 | 340 ± 110 |
| | Fourth Quarter | 09/30/91 - 12/31/91 | <160 |
| OSWEGO CITY WATER ** | First Quarter | 12/31/90 - 04/01/91 | 590 ± 70 |
| | Second Quarter | 04/01/91 - 07/01/91 | 270 ± 100 |
| | Third Quarter | 07/01/91 - 09/30/91 | 220 ± 70 |
| | Fourth Quarter | 09/10/91 - 12/31/91 | <160 |
| OSWEGO STEAM STATION * (CONTROL) | First Quarter | 12/31/90 - 04/01/91 | <100 |
| | Second Quarter | 04/01/91 - 07/01/91 | 180 ± 70 |
| | Third Quarter | 07/01/91 - 09/30/91 | 200 ± 70 |
| | Fourth Quarter | 09/30/91 - 12/31/91 | <160 |

* - Samples required by the Technical Specifications.
**- Optional samples. Oswego City Water samples are composites of twice per week grab samples.

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## TABLE 9A

## DIRECT RADIATION MEASUREMENT RESULTS

**Results in units of mrem/standard month ± 2 sigma**

| LOCATION NUMBER | LOCATION | JANUARY THROUGH MARCH | APRIL THROUGH JUNE | JULY THROUGH SEPTEMBER | OCTOBER THROUGH DECEMBER | LOCATION (DIRECTION & DISTANCE) (2) |
|---|---|---|---|---|---|---|
| | | 1991 | | | | |
| 3 | D1 On Site | 10.2±0.9 | 5.7±0.7 | 7.5±0.9 | 11.6±0.8 | 0.2 miles @ 69° |
| 4 | D2 On Site | 5.4±0.5 | 5.1±0.5 | 5.1±0.8 | 4.7±0.6 | 0.4 miles @ 140° |
| 5 | E On Site | 4.8±0.3 | 4.7±0.5 | 6.0±1.5 | 4.2±0.5 | 0.4 miles @ 175° |
| 6 | F On Site | 4.4±0.7 | 4.0±0.5 | 4.8±0.8 | 5.2±0.4 | 0.5 miles @ 210° |
| 7* | G On Site | 5.0±0.5 | 3.2±0.2 | 4.2±0.5 | 4.0±0.4 | 0.7 miles @ 250° |
| 8 | R-5 Off Site-Control | 5.0±0.3 | 4.0±0.3 | 4.7±0.5 | 4.6±0.3 | 16.4 miles @ 42° |
| 9 | D1 Off Site | 4.7±0.2 | 3.6±0.3 | 4.5±0.4 | 4.8±0.4 | 11.4 miles @ 80° |
| 10 | D2 Off Site | 4.8±0.2 | 3.6±0.3 | 4.6±0.4 | 3.6±0.2 | 9.0 miles @ 117° |
| 11 | E Off Site | 4.3±0.2 | 3.7±0.4 | 3.8±0.3 | 4.0±0.3 | 7.2 miles @ 160° |
| 12 | F Off Site | 3.4±0.2 | 3.4±0.3 | 4.8±0.8 | 3.8±0.4 | 7.7 miles @ 190° |
| 13 | G Off Site | 4.8±0.4 | 5.4±0.5 | 4.5±0.8 | 4.5±0.2 | 5.3 miles @ 225° |
| 14* | DeMass Rd., SW Oswego-Control | 4.7±0.3 | 4.1±0.3 | 4.4±0.4 | 5.3±0.2 | 12.6 miles @ 226° |
| 15* | Pole 66, W. Boundary-Bible Camp | 4.3±0.5 | 2.9±0.2 | 4.4±0.6 | 4.4±0.2 | 0.9 miles @ 237° |
| 18* | Energy Info. Center - Lamp Post, SW. | 5.2±0.2 | 4.6±0.5 | 5.4±0.3 | 4.8±0.4 | 0.4 miles @ 265° |
| 19 | East Boundary-JAF, Pole 9 | 4.5±0.2 | 4.8±0.6 | 5.3±0.4 | 4.6±0.2 | 1.3 miles @ 81° |
| 23* | H On Site | 4.6±0.4 | 5.3±0.7 | 5.6±0.4 | 5.4±0.5 | 0.8 miles @ 70° |
| 24 | I On Site | 5.0±0.5 | 3.4±0.4 | 4.5±0.7 | 5.4±0.6 | 0.8 miles @ 98° |
| 25 | J On Site | 4.9±0.3 | 4.1±0.6 | 5.2±1.5 | 4.0±0.4 | 0.9 miles @ 110° |
| 26 | K On Site | 4.3±0.2 | 4.5±0.9 | 5.3±1.2 | 3.9±0.4 | 0.5 miles @ 132° |
| 27 | N. Fence, N. of Switchyard, JAF | 14.4±3.0 | 8.8±1.3 | 11.7±1.5 | 15.0±0.4 | 0.4 miles @ 60° |
| 28 | N. Light Pole, N. of Screenhouse, JAF | 19.2±4.7 | 18.1±2.7 | 22.8±3.4 | 31.4±6.4 | 0.5 miles @ 68° |
| 29 | N. Fence, N. of W. Side Screenhouse, JAF | 18.2±4.5 | 15.0±2.2 | 16.8±3.6 | 22.6±5.0 | 0.5 miles @ 65° |

TABLE 9A (Continued)

DIRECT RADIATION MEASUREMENT RESULTS

Results in units of mrem/standard month ± 2 sigma

| LOCATION NUMBER | LOCATION | JANUARY THROUGH MARCH | APRIL THROUGH JUNE | JULY THROUGH SEPTEMBER | OCTOBER THROUGH DECEMBER | LOCATION (DIRECTION & DISTANCE) (2) |
|---|---|---|---|---|---|---|
| | | | 1991 | | | |
| 30 | N Fence (NW) JAF | 11.8±1.6 | 8.0±0.7 | 9.6±1.0 | 12.6±2.3 | 0.4 miles @ 57° |
| 31 | N Fence (NW) NMP-1 | 6.9±0.8 | 6.3±0.9 | 7.0±0.9 | 8.8±2.0 | 0.2 miles @ 276° |
| 39 | N Fence, Rad Waste, NMP-1 | 13.0±2.4 | 10.4±1.6 | 12.4±1.5 | 15.9±2.3 | 0.2 miles @ 292° |
| 47 | N Fence, NE, JAF | 7.2±1.1 | 5.2±0.6 | 6.2±0.8 | 7.5±1.5 | 0.6 miles @ 69° |
| 49* | Phoenix, NY-Control | 4.2±0.2 | 3.8±0.2 | 3.8±0.5 | 4.2±0.4 | 19.8 miles @ 163° |
| 51 | Liberty & Bronson Sts., E of OSS | 3.6±0.3 | 4.0±0.3 | 5.0±0.4 | 5.0±0.7 | 7.4 miles @ 233° |
| 52 | East 12th & Cayuga Sts., Osw. School | 5.2±0.2 | 3.8±0.2 | 4.3±0.6 | 4.8±0.4 | 5.8 miles @ 227° |
| 53 | Broadwell & Chestnut Sts., Fulton H.S. | 4.9±0.3 | 4.6±0.7 | 5.2±0.5 | 4.8±0.4 | 13.7 miles @ 183° |
| 54 | Liberty St., & Co Rt 16, Mexico H.S. | 5.2±0.5 | 4.0±0.3 | 4.0±0.5 | 4.6±0.3 | 9.3 miles @ 115° |
| 55 | Gas Substation & Co Rt 5 - Pulaski | 5.0±0.4 | 4.4±0.4 | 4.6±0.4 | 4.2±0.4 | 13.0 miles @ 75° |
| 56* | Rt 104 - New Haven School (SE Corner) | 4.9±0.4 | 3.8±0.2 | 4.5±0.6 | 4.4±0.2 | 5.3 miles @ 123° |
| 58* | Co Rt 1A - Alcan (E of E Entrance Rd.) | 5.6±0.3 | 3.8±0.2 | 4.9±0.7 | 4.4±0.4 | 3.1 miles @ 220° |
| 75* | Unit 2, N Fence, N of Reactor Bldg. | 6.2±0.7 | 5.4±0.7 | 5.8±0.5 | 6.6±1.0 | 0.1 miles @ 5° |
| 76* | Unit 2, N Fence, N of Change House | 6.2±0.4 | 5.2±0.4 | 5.6±0.6 | 5.2±0.4 | 0.1 miles @ 25° |
| 77* | Unit 2, N Fence, N of Pipe Bldg. | 6.4±0.8 | 5.0±0.3 | 6.3±0.5 | 6.9±0.9 | 0.2 miles @ 45° |
| 78* | JAF, E of E Old Lay Down Area | 5.8±0.4 | 4.3±0.3 | 5.4±0.8 | 4.8±0.4 | 1.0 miles @ 90° |
| 79* | Co Rt 29, Pole #63, 0.2 mi. S of Lake Rd | 5.4±0.5 | 3.6±0.2 | 5.2±0.2 | 4.6±0.7 | 1.1 miles @ 115° |
| 80* | Co Rt 29, Pole #54, 0.7 mi. S of Lake Rd | 5.1±0.2 | 3.8±0.4 | 4.8±0.8 | 4.8±0.4 | 1.4 miles @ 133° |
| 81* | Miner Rd., Pole #16, 0.5 mi. W of Rt 29 | 4.7±0.2 | 3.6±0.4 | 4.8±0.4 | 4.7±0.4 | 1.6 miles @ 159° |
| 82* | Miner Rd., Pole #1 1/2, 1.1 mi. W of Rt 29 | 5.3±0.1 | 3.6±0.3 | 5.0±0.7 | 4.5±0.2 | 1.6 miles @ 181° |
| 83* | Lakeview Rd, Tree, 0.45 mi. N of Miner Rd | 5.0±0.2 | 4.2±0.3 | 4.5±0.5 | 4.4±0.4 | 1.2 miles @ 200° |

TABLE 9A (Continued)

DIRECT RADIATION MEASUREMENT RESULTS

Results in units of mrem/standard month ± 2 sigma

| LOCATION NUMBER | LOCATION | JANUARY THROUGH MARCH | APRIL THROUGH JUNE | JULY THROUGH SEPTEMBER | OCTOBER THROUGH DECEMBER | LOCATION (DIRECTION & DISTANCE) (2) |
|---|---|---|---|---|---|---|
| | | | 1991 | | | |
| 84* | Lakeview Rd. N, Pole #6117, 200 Ft. N of Lake Rd. | 4.4±0.2 | 4.2±0.3 | 5.0±0.6 | 4.2±0.4 | 1.1 miles @ 225° |
| 85* | Unit 1, N. Fence, N of W Side of Screen House | 13.8±1.6 | 9.8±1.8 | 11.0±1.4 | 13.4±1.9 | 0.2 miles @ 294° |
| 86* | Unit 2, N. Fence, N of W Side of Screen House | 6.6±0.8 | 6.0±0.8 | 8.4±0.9 | 16.7±2.5 | 0.1 miles @ 315° |
| 87* | Unit 2, N Fence, N of E Side of Screen House | 7.2±0.7 | 6.2±1.0 | 6.0±0.9 | 8.0±1.7 | 0.1 miles @ 341° |
| 88* | Hickory Grove Rd., Pole #2, 0.6 mi. N of Rt. 1 | 4.8±0.3 | 4.5±0.4 | 4.1±0.2 | 4.6±0.5 | 4.8 miles @ 97° |
| 89* | Leavitt Rd., Pole #16, 0.4 mi. S of Rt 1 | 4.5±0.3 | 4.2±0.4 | 5.5±0.5 | 4.4±0.3 | 4.1 miles @ 111° |
| 90* | Rt. 104, Pole #300, 150 Ft. E of Keefe Rd. | 4.8±0.6 | 4.3±0.4 | 5.0±0.4 | 5.2±0.6 | 4.2 miles @ 135° |
| 91* | Rt. 51A, Pole #59, 0.8 mi. W of Rt. 51 | 4.5±0.2 | 3.6±0.3 | 4.2±0.3 | 3.6±0.3 | 4.8 miles @ 156° |
| 92* | Maiden Lane Rd., Power Pole, 0.6 mi., S of Rt. 104 | 5.0±0.4 | 4.9±0.4 | 5.6±0.8 | 5.4±0.4 | 4.4 miles @ 183° |
| 93* | Rt. 53, Pole 1-1, 120 Ft. S Of Rt. 104 | 4.6±0.2 | 4.0±0.6 | 5.0±0.5 | 4.4±0.5 | 4.4 miles @ 205° |
| 94* | Rt. 1, Pole #82, 250 Ft. E of Kocher Rd. | 4.8±0.2 | 4.0±0.3 | 4.5±0.5 | 4.5±0.2 | 4.7 miles @ 223° |
| 95* | Lakeshore Camp Site, from Alcan W Access Rd., Pole #21, 1.2 mi. N of Rt. 1 | 4.4±0.3 | 3.8±0.2 | 4.5±0.7 | 3.8±0.3 | 4.1 miles @ 237° |
| 96* | Creamery Rd., 0.3 mi. S of Middle Rd., Pole 1 1/2 | 4.8±0.8 | 4.0±0.2 | 4.0±0.4 | 4.2±0.5 | 3.6 miles @ 199° |
| 97* | Rt. 29, Env. Station R4, 200 Ft. N of Miner Rd. | 5.6±0.5 | 3.8±0.2 | 5.2±0.9 | 4.2±0.4 | 1.8 miles @ 143° |
| 98* | Lake Rd., Pole #145, 0.15 mi. E of Rt. 29 | 5.2±0.9 | 4.2±0.2 | 5.0±0.3 | 4.4±0.4 | 1.2 miles @ 101° |

TABLE 9A (Continued)

DIRECT RADIATION MEASUREMENT RESULTS

Results in units of mrem/standard month ± 2 sigma

| LOCATION NUMBER | LOCATION | JANUARY THROUGH MARCH | APRIL THROUGH JUNE | JULY THROUGH SEPTEMBER | OCTOBER THROUGH DECEMBER | LOCATION (DIRECTION & DISTANCE) (2) |
|---|---|---|---|---|---|---|
| | | | 1991 | | | |
| 99 | NMP Rd., 0.4 miles N of Lake Rd., Env. Station R1 Off-Site | 5.4±0.4 | 4.0±0.2 | 5.4±0.3 | 4.4±0.5 | 1.8 miles @ 88° |
| 100 | Rt. 29 and Lake Rd., Env. Station R2 Off-Site | 5.0±0.3 | 3.8±0.2 | 4.6±1.4 | 4.4±0.3 | 1.1 miles @ 104° |
| 101 | Rt. 29, 0.7 mi. S of Lake Rd., Env. Station R3 Off-Site | 5.4±0.7 | 3.8±0.2 | 4.7±0.6 | 4.0±0.2 | 1.5 miles @ 132° |
| 102 | EOF/Env. Lab, Oswego Co. Airport (Fulton Airport), Rt. 176, E. Driveway Lamp Post | 5.2±0.4 | 4.6±0.4 | 5.2±0.3 | 4.2±0.2 | 11.9 miles @ 175° |
| 103 | EIC, East Garage Rd., Lamp Post | 5.2±0.3 | 4.2±0.2 | 5.5±0.7 | 4.4±0.2 | 0.4 miles @ 267° |
| 104 | Parkhurst Road, Pole 148 1/2-A, 0.1 mi. S of Lake Rd. | 4.8±0.2 | 5.2±0.6 | 5.2±0.9 | 4.0±0.3 | 1.4 miles @ 102° |
| 105 | Lakeview Road, Pole 6125, 0.6 mi. S of Lake Rd. | 5.1±0.3 | 4.0±0.5 | 5.0±1.1 | 4.2±0.2 | 1.4 miles @ 198° |
| 106 | Shoreline Cove, E of NMP-1, Tree on W Edge | 5.9±0.5 | 4.6±0.5 | 6.0±0.8 | 6.0±0.4 | 0.3 miles @ 274° |
| 107 | Shoreline Cove, E of NMP-1, Tree 30 Ft. S of TLD #106 | 5.4±0.6 | 4.8±0.4 | 6.2±1.1 | 6.0±0.7 | 0.3 miles @ 272° |
| 108 | Lake Rd. Pole #142 - 300′ East of Co. Rt. 29 (S) | 4.9±0.3 | 4.2±0.4 | 4.8±0.6 | 5.0±0.6 | 1.1 miles @ 104° |
| 109 | Lake Rd. Tree 300′ E of Co. Rt. 29 (N) | 5.0±0.3 | 4.3±0.3 | 4.2±0.3 | 4.1±0.4 | 1.1 miles @ 103° |
| 111 | Sterling, NY - Control Blasiak Residence | 4.6±0.2 | 4.0±0.2 | 5.4±1.3 | 4.6±0.4 | 21.8 miles @ 214° |
| 113 | Baldwinsville, NY - Control Coates Residence | 5.0±0.3 | 4.4±0.7 | 4.8±0.9 | 3.9±0.5 | 26.4 miles @ 166° |

(1) TLD lost in the field.
(2) Direction and distance based on NMP-2 reactor centerline and sixteen 22.5° sector grid.
* Technical Specification location

## TABLE 9B

## DIRECT RADIATION MEASUREMENT RESULTS

**Results in units of mrem/quarterly period ± 2 sigma**

| LOCATION NUMBER | LOCATION | JANUARY THROUGH MARCH | APRIL THROUGH JUNE | JULY THROUGH SEPTEMBER | OCTOBER THROUGH DECEMBER | LOCATION (DIRECTION & DISTANCE) (2) |
|---|---|---|---|---|---|---|
| | | 1991 | | | | |
| 3 | D1 On Site | 30.6±1.4 | 17.0±1.1 | 22.5±1.3 | 36.2±1.2 | 0.2 miles @ 69° |
| 4 | D2 On Site | 16.2±0.7 | 15.1±0.7 | 15.3±1.1 | 14.7±0.9 | 0.4 miles @ 140° |
| 5 | E On Site | 14.2±0.4 | 14.1±0.7 | 17.9±2.2 | 13.1±0.8 | 0.4 miles @ 175° |
| 6 | F On Site | 13.3±1.0 | 11.9±0.7 | 14.4±1.1 | 16.4±0.6 | 0.5 miles @ 210° |
| 7* | G On Site | 15.2±0.9 | 9.4±0.3 | 12.3±0.7 | 12.6±0.6 | 0.7 miles @ 250° |
| 8 | R-5 Off Site-Control | 15.0±0.4 | 11.9±0.4 | 13.8±0.8 | 14.4±0.5 | 16.4 miles @ 42° |
| 9 | D1 Off Site | 14.0±0.4 | 11.0±0.4 | 13.2±0.5 | 15.1±0.6 | 11.4 miles @ 80° |
| 10 | D2 Off Site | 14.4±0.3 | 10.6±0.5 | 13.6±0.6 | 11.1±0.4 | 9.0 miles @ 117° |
| 11 | E Off Site | 12.8±0.3 | 11.0±0.5 | 13.0±0.5 | 12.5±0.5 | 7.2 miles @ 160° |
| 12 | F Off Site | 10.2±0.3 | 9.9±0.4 | 14.6±1.2 | 11.6±0.6 | 7.7 miles @ 190° |
| 13 | G Off Site | 14.4±0.5 | 16.4±0.8 | 13.6±1.2 | 13.8±0.3 | 5.3 miles @ 225° |
| 14* | DeMass Rd., SW Oswego-Control | 14.0±0.4 | 12.2±0.5 | 13.0±0.6 | 16.1±0.3 | 12.6 miles @ 226° |
| 15* | Pole 66, W. Boundary-Bible Camp | 13.0±0.7 | 8.8±0.4 | 12.8±0.9 | 13.6±0.2 | 0.9 miles @ 237° |
| 18* | Energy Info. Center-Lamp Post, SW. | 15.7±0.3 | 14.1±0.8 | 15.7±0.5 | 14.9±0.6 | 0.4 miles @ 265° |
| 19 | East Boundary-JAF, Pole 9 | 13.6±0.3 | 14.2±0.9 | 15.8±0.7 | 14.2±0.3 | 1.3 miles @ 81° |
| 23* | H On Site | 14.4±0.5 | 16.0±1.1 | 16.4±0.6 | 16.4±0.7 | 0.8 miles @ 70° |
| 24 | I On Site | 15.0±0.7 | 10.7±0.6 | 13.1±0.9 | 16.8±0.9 | 0.8 miles @ 98° |
| 25 | J On Site | 14.8±0.5 | 12.5±0.8 | 15.3±2.2 | 12.4±0.6 | 0.9 miles @ 110° |
| 26 | K On Site | 13.0±0.3 | 13.8±1.4 | 15.4±1.8 | 12.1±0.6 | 0.5 miles @ 132° |
| 27 | N Fence, N of Switchyard, JAF | 41.6±4.3 | 27.1±1.9 | 34.6±2.2 | 48.8±4.0 | 0.4 miles @ 60° |
| 28 | N Light Pole, N of Screenhouse, JAF | 55.6±6.7 | 55.2±4.1 | 67.6±5.1 | 102.2 ± 10.4 | 0.5 miles @ 68° |

TABLE 9B (Continued)

DIRECT RADIATION MEASUREMENT RESULTS

Results in units of mrem/quarterly period ± 2 sigma

| LOCATION NUMBER | LOCATION | JANUARY THROUGH MARCH | APRIL THROUGH JUNE | JULY THROUGH SEPTEMBER | OCTOBER THROUGH DECEMBER | LOCATION (DIRECTION & DISTANCE) (2) |
|---|---|---|---|---|---|---|
| | | 1991 | | | | |
| 29 | N Fence, N of W Side Screenhouse, JAF | 52.8±6.6 | 45.8±3.5 | 49.7±5.3 | 73.6±8.2 | 0.5 miles @ 65° |
| 30 | N Fence (NW) JAF | 34.0±2.3 | 24.4±1.1 | 28.2±1.5 | 41.4±3.8 | 0.4 miles @ 57° |
| 31 | N Fence (NW) NMP-1 | 21.2±1.2 | 18.8±1.3 | 20.6±1.3 | 28.2±3.2 | 0.2 miles @ 276° |
| 39 | N Fence, Rad Waste, NMP-1 | 39.8±3.6 | 31.0±2.4 | 36.2±2.2 | 50.6±3.7 | 0.2 miles @ 292° |
| 47 | N Fence, NE, JAF | 21.0±1.6 | 15.8±0.9 | 17.9±1.2 | 24.4±2.5 | 0.6 miles @ 69° |
| 49* | Phoenix, NY-Control | 13.4±0.3 | 10.7±0.2 | 11.2±0.7 | 13.7±0.6 | 19.8 miles @ 163° |
| 51 | Liberty & Bronson Sts., E of OSS | 12.0±0.5 | 12.2±0.5 | 15.1±0.7 | 15.2±1.1 | 7.4 miles @ 233° |
| 52 | East 12th & Cayuga Sts., Osw. School | 15.4±0.3 | 11.5±0.3 | 12.9±0.9 | 14.2±0.5 | 5.8 miles @ 227° |
| 53 | Broadwell & Chestnut Sts., Fulton H.S. | 14.6±0.5 | 13.6±1.0 | 15.4±0.7 | 14.7±0.6 | 13.7 miles @ 183° |
| 54 | Liberty St., & Co Rt 16, Mexico H.S. | 15.4±0.7 | 11.9±0.5 | 12.0±0.7 | 14.0±0.4 | 9.3 miles @ 115° |
| 55 | Gas Substation & Co Rt 5 - Pulaski | 15.0±0.7 | 13.0±0.5 | 13.9±0.5 | 13.4±0.6 | 13.0 miles @ 75° |
| 56* | Rt 104 - New Haven School (SE Corner) | 15.0±0.7 | 11.4±0.3 | 13.2±0.9 | 13.3±0.3 | 5.3 miles @ 123° |
| 58* | Co Rt 1A - Alcan (E of Entrance Rd.) | 16.8±0.4 | 11.6±0.4 | 14.4±1.0 | 13.5±0.7 | 3.1 miles @ 220° |
| 75* | Unit 2, N Fence, N of Reactor Bldg. | 19.2±1.1 | 16.4±1.1 | 16.8±0.8 | 20.9±1.5 | 0.1 miles @ 5° |
| 76* | Unit 2, N Fence, N of Change House | 19.0±0.7 | 15.6±0.6 | 16.4±0.8 | 16.8±0.7 | 0.1 miles @ 25° |
| 77* | Unit 2, N Fence, N of Pipe Bldg. | 20.1±1.3 | 14.9±0.4 | 18.2±0.8 | 21.6±1.4 | 0.2 miles @ 45° |
| 78* | JAF, E of E Old Laydown Area | 17.8±0.6 | 13.0±0.5 | 15.6±1.1 | 14.9±0.6 | 1.0 miles @ 90° |
| 79* | Co Rt 29, Pole #63, 0.2 mi. S of Lake Rd | 16.4±0.8 | 11.2±0.3 | 15.0±0.4 | 14.2±1.2 | 1.1 miles @ 115° |
| 80* | Co Rt 29, Pole #54, 0.7 mi. S of Lake Rd | 15.6±0.3 | 11.6±0.6 | 13.7±1.2 | 14.8±0.7 | 1.4 miles @ 133° |
| 81* | Miner Rd, Pole #16, 0.5 mi. W of Rt 29 | 14.4±0.2 | 11.1±0.5 | 14.0±0.6 | 14.6±0.7 | 1.6 miles @ 159° |
| 82* | Miner Rd, Pole #1 1/2, 1.1 mi. W of Rt 29 | 16.2±0.2 | 11.0±0.5 | 14.4±1.0 | 14.0±0.3 | 1.6 miles @ 181° |

TABLE 9B (Continued)

DIRECT RADIATION MEASUREMENT RESULTS

Results in units of mrem/quarterly period ± 2 sigma

| LOCATION NUMBER | LOCATION | JANUARY THROUGH MARCH | APRIL THROUGH JUNE | JULY THROUGH SEPTEMBER | OCTOBER THROUGH DECEMBER | LOCATION (DIRECTION & DISTANCE) (2) |
|---|---|---|---|---|---|---|
| | | | 1991 | | | |
| 83* | Lakeview Rd., Tree, 0.45 mi. N of Miner Rd | 15.4±0.3 | 13.0±0.5 | 13.0±0.7 | 13.5±0.5 | 1.2 miles @ 200° |
| 84* | Lakeview Rd. N, Pole #6117, 200 Ft. N of Lake Rd. | 13.3±0.2 | 13.0±0.5 | 14.8±0.9 | 13.0±0.7 | 1.1 miles @ 225° |
| 85* | Unit 1, N Fence, N of W Side of Screen House | 42.1±2.4 | 29.6±2.8 | 32.2±2.0 | 42.7±3.0 | 0.2 miles @ 294° |
| 86* | Unit 2, N Fence, N of W Side of Screen House | 20.4±1.2 | 17.7±1.2 | 24.5±1.3 | 53.4±4.0 | 0.1 miles @ 315° |
| 87* | Unit 2, N Fence, N of E Side of Screen House | 22.0±1.1 | 18.4±1.5 | 17.6±1.1 | 25.6±2.7 | 0.1 miles @ 341° |
| 88* | Hickory Grove Rd., Pole #2, 0.6 mi. N of Rt. 1 | 14.8±0.4 | 13.8±0.6 | 12.0±0.3 | 14.3±0.8 | 4.8 miles @ 97° |
| 89* | Leavitt Rd., Pole #16, 0.4 mi. S of Rt 1 | 13.6±0.5 | 12.7±0.6 | 16.2±0.7 | 13.4±0.5 | 4.1 miles @ 111° |
| 90* | Rt. 104, Pole #300, 150 Ft. E of Keefe Rd. | 14.7±0.9 | 13.0±0.5 | 14.9±0.5 | 15.7±0.9 | 4.2 miles @ 135° |
| 91* | Rt. 51A, Pole #59, 0.8 mi. W of Rt. 51 | 13.5±0.2 | 10.8±0.5 | 12.7±0.4 | 11.2±0.5 | 4.8 miles @ 156° |
| 92* | Maiden Lane Rd., Power Pole, 0.6 mi., S of Rt. 104 | 15.3±0.6 | 15.0±0.5 | 16.4±1.2 | 16.5±0.5 | 4.4 miles @ 183° |
| 93* | Rt. 53, Pole 1-1, 120 Ft. S Of Rt. 104 | 14.0±0.3 | 12.1±0.9 | 14.7±0.7 | 13.4±0.7 | 4.4 miles @ 205° |
| 94* | Rt. 1, Pole #82, 250 Ft. E of Kocher Rd. | 14.5±0.2 | 12.3±0.5 | 13.2±0.8 | 13.8±0.4 | 4.7 miles @ 223° |
| 95* | Lakeshore Camp Site, from Alcan W Access Rd., Pole #21, 1.2 mi. N of Rt. 1 | 13.1±0.5 | 11.8±0.4 | 13.3±1.0 | 11.6±0.4 | 4.1 miles @ 237° |
| 96* | Creamery Rd., 0.3 mi. S of Middle Rd., Pole 1 1/2 | 14.6±1.2 | 11.9±0.4 | 11.8±0.5 | 13.0±0.7 | 3.6 miles @ 199° |

**TABLE 9B (Continued)**

**DIRECT RADIATION MEASUREMENT RESULTS**

**Results in units of mrem/quarterly period ± 2 sigma**

| LOCATION NUMBER | LOCATION | JANUARY THROUGH MARCH | APRIL THROUGH JUNE | JULY THROUGH SEPTEMBER | OCTOBER THROUGH DECEMBER | LOCATION (DIRECTION & DISTANCE) (2) |
|---|---|---|---|---|---|---|
| 1991 | | | | | | |
| 97* | Rt. 29, Env. Station R4, 200 Ft. N of Miner Rd. | 16.8±0.7 | 11.6±0.3 | 15.5±1.3 | 13.0±0.6 | 1.8 miles @ 143° |
| 98* | Lake Rd., Pole #145, 0.15 mi. E of Rt. 29 | 15.7±1.3 | 12.8±0.3 | 14.5±0.5 | 13.6±0.6 | 1.2 miles @ 101° |
| 99 | NMP Rd., 0.4 miles N of Lake Rd., Env. Station R1 Off-Site | 16.2±0.6 | 12.1±0.4 | 15.8±0.4 | 13.2±0.8 | 1.8 miles @ 88° |
| 100 | Rt. 29 and Lake Rd., Env. Station R2 Off-Site | 15.2±0.4 | 11.6±0.2 | 13.6±2.2 | 13.8±0.4 | 1.1 miles @ 104° |
| 101 | Rt. 29, 0.7 mi. S of Lake Rd., Env. Station R3 Off-Site | 16.6±1.1 | 11.4±0.3 | 13.9±0.9 | 12.2±0.2 | 1.5 miles @ 132° |
| 102 | EOF/Env. Lab, Oswego Co. Airport (Fulton Airport), Rt. 176, E Driveway Lamp Post | 15.6±0.6 | 13.5±0.6 | 15.4±0.5 | 12.8±0.3 | 11.9 miles @ 175° |
| 103 | EIC, East Garage Rd., Lamp Post | 15.6±0.5 | 12.7±0.4 | 16.3±1.0 | 13.5±0.4 | 0.4 miles @ 267° |
| 104 | Parkhurst Rd., Pole 148 1/2-A, 0.1 mi. S of Lake Rd. | 14.4±0.3 | 16.0±0.8 | 15.0±1.3 | 12.2±0.4 | 1.4 miles @ 102° |
| 105 | Lakeview Rd., Pole 6125, 0.6 mi. S of Lake Rd. | 15.7±0.4 | 12.2±0.7 | 14.3±1.5 | 12.8±0.4 | 1.4 miles @ 198° |
| 106 | Shoreline Cove, E of NMP-1, Tree on W Edge | 17.5±0.8 | 14.0±0.8 | 17.6±1.2 | 18.8±0.7 | 0.3 miles @ 274° |
| 107 | Shoreline Cove, E of NMP-1, Tree 30 Ft. S of TLD #106 | 15.8±0.8 | 14.6±0.6 | 18.4±1.7 | 18.6±1.1 | 0.3 miles @ 272° |
| 108 | Lake Rd Pole #142 - 300′ E of Co Rt 29 (S) | 14.8±0.5 | 12.9±0.5 | 14.4±0.9 | 15.3±0.9 | 1.1 miles @ 104° |
| 109 | Lake Rd Tree, 300′ E of Co. Rt. 29 (N) | 15.0±0.4 | 13.2±0.5 | 12.4±0.4 | 12.6±0.5 | 1.1 miles @ 103° |
| 111 | Sterling, NY - Control Blasiak Residence | 14.6±0.4 | 11.2±0.4 | 15.8±1.9 | 15.0±0.6 | 21.8 miles @ 214° |
| 113 | Baldwinsville, NY - Control Coates Residence | 15.7±0.4 | 12.4±0.8 | 14.5±1.4 | 12.8±0.8 | 26.4 miles @ 166° |

(1) TLD lost in the field
(2) Direction and distance based on NMP-2 reactor centerline and sixteen 22.5° sector grid.
* Technical Specification location.

# TABLE 10

NMP/JAF SITE
ENVIRONMENTAL AIRBORNE PARTICULATE SAMPLES - OFF-SITE STATIONS
GROSS BETA ACTIVITY pCi/m$^3$ ± 2 SIGMA

LOCATION

| WEEK END DATE | R-1 OFF* | R-2 OFF* | R-3 OFF* | R-4 OFF* | R-5 OFF* | D-2 OFF | E-OFF | F-OFF | G-OFF |
|---|---|---|---|---|---|---|---|---|---|
| 91/01/08 | 0.018±0.002 | 0.020±0.002 | 0.017±0.002 | 0.020±0.002 | 0.020±0.002 | 0.014±0.002 | 0.017±0.002 | 0.017±0.002 | 0.017±0.002 |
| 91/01/15 | 0.018±0.002 | 0.021±0.002 | 0.014±0.002 | 0.019±0.002 | 0.013±0.002 | 0.015±0.002 | 0.018±0.002 | 0.015±0.002 | 0.015±0.002 |
| 91/01/22 | 0.023±0.002 | 0.022±0.002 | 0.021±0.002 | 0.021±0.002 | 0.023±0.002 | 0.015±0.002 | 0.016±0.002 | 0.014±0.002 | 0.014±0.002 |
| 91/01/29 | 0.017±0.002 | 0.016±0.002 | 0.018±0.002 | 0.020±0.002 | 0.017±0.002 | 0.011±0.002 | 0.013±0.002 | 0.012±0.002 | 0.011±0.002 |
| 91/02/05 | 0.017±0.002 | 0.019±0.002 | 0.017±0.002 | 0.017±0.002 | 0.017±0.002 | 0.012±0.002 | 0.012±0.002 | 0.014±0.002 | 0.012±0.002 |
| 91/02/12 | 0.018±0.002 | 0.020±0.002 | 0.019±0.002 | 0.021±0.002 | 0.016±0.002 | 0.014±0.002 | 0.017±0.002 | 0.017±0.002 | 0.017±0.002 |
| 91/02/20 | 0.010±0.002 | 0.009±0.002 | 0.012±0.002 | 0.012±0.002 | 0.012±0.002 | 0.012±0.002 | 0.013±0.002 | 0.015±0.002 | 0.015±0.002 |
| 91/02/26 | 0.013±0.002 | 0.014±0.002 | 0.014±0.002 | 0.015±0.002 | 0.015±0.002 | 0.014±0.002 | 0.015±0.002 | 0.016±0.002 | 0.014±0.002 |
| 91/03/05 | 0.011±0.002 | 0.012±0.002 | 0.014±0.002 | 0.014±0.002 | 0.011±0.002 | 0.015±0.002 | 0.018±0.002 | 0.017±0.002 | 0.015±0.002 |
| 91/03/12 | 0.018±0.002 | 0.018±0.002 | 0.018±0.002 | 0.019±0.002 | 0.019±0.002 | 0.012±0.002 | 0.014±0.002 | 0.014±0.002 | 0.012±0.002 |
| 91/03/19 | 0.009±0.001 | 0.008±0.001 | 0.009±0.002 | 0.008±0.002 | 0.010±0.002 | 0.010±0.002 | 0.010±0.002 | 0.010±0.002 | 0.010±0.002 |
| 91/03/26 | 0.010±0.002 | 0.013±0.002 | 0.010±0.002 | 0.010±0.002 | 0.009±0.002 | 0.013±0.002 | 0.014±0.002 | 0.015±0.002 | 0.014±0.002 |
| 91/04/02 | 0.015±0.002 | 0.014±0.002 | 0.014±0.002 | 0.016±0.002 | 0.014±0.001 | 0.008±0.001 | 0.009±0.002 | 0.008±0.002 | 0.009±0.002 |
| 91/04/09 | 0.016±0.002 | 0.017±0.002 | 0.017±0.002 | 0.020±0.002 | 0.017±0.002 | 0.011±0.002 | 0.012±0.002 | 0.013±0.002 | 0.011±0.002 |
| 91/04/16 | 0.011±0.002 | 0.013±0.002 | 0.011±0.002 | 0.014±0.002 | 0.011±0.002 | 0.014±0.002 | 0.014±0.002 | 0.013±0.002 | 0.014±0.002 |
| 91/04/23 | 0.008±0.001 | 0.008±0.002 | 0.007±0.001 | 0.008±0.002 | 0.008±0.002 | 0.016±0.002 | 0.017±0.002 | 0.017±0.002 | 0.016±0.002 |
| 91/05/30 | 0.014±0.002 | 0.016±0.002 | 0.015±0.002 | 0.017±0.002 | 0.015±0.002 | 0.015±0.002 | 0.018±0.002 | 0.014±0.002 | 0.015±0.002 |
| 91/05/07 | 0.008±0.001 | 0.009±0.002 | 0.007±0.001 | 0.007±0.002 | 0.008±0.001 | 0.010±0.002 | 0.010±0.002 | 0.009±0.002 | 0.008±0.001 |
| 91/05/14 | 0.014±0.002 | 0.014±0.002 | 0.010±0.002 | 0.011±0.002 | 0.011±0.002 | 0.010±0.002 | 0.012±0.002 | 0.011±0.002 | 0.011±0.002 |
| 91/05/21 | 0.008±0.002 | 0.019±0.002 | 0.016±0.002 | 0.018±0.001 | 0.006±0.001 | 0.006±0.001 | 0.006±0.001 | 0.007±0.001 | 0.006±0.001 |
| 91/05/28 | 0.013±0.002 | 0.015±0.002 | 0.014±0.002 | 0.013±0.002 | 0.013±0.002 | 0.008±0.001 | 0.011±0.002 | 0.009±0.002 | 0.007±0.001 |
| 91/06/04 | 0.017±0.002 | 0.010±0.002 | 0.010±0.002 | 0.010±0.002 | 0.008±0.001 | 0.009±0.002 | 0.011±0.002 | 0.010±0.002 | 0.008±0.002 |
| 91/06/11 | 0.011±0.002 | 0.007±0.002 | 0.010±0.002 | 0.011±0.002 | 0.011±0.002 | 0.010±0.002 | 0.011±0.002 | 0.011±0.002 | 0.011±0.002 |
| 91/06/18 | 0.009±0.002 | 0.011±0.002 | 0.010±0.002 | 0.012±0.002 | 0.013±0.002 | 0.014±0.002 | 0.016±0.002 | 0.014±0.002 | 0.013±0.002 |
| 91/06/25 | 0.011±0.002 | 0.015±0.002 | 0.012±0.002 | 0.013±0.002 | 0.007±0.001 | 0.008±0.001 | 0.009±0.002 | 0.010±0.002 | 0.010±0.002 |

* Sample locations required by Technical Specifications.

# TABLE 10 (CONTINUED)

## NMP/JAF SITE
## ENVIRONMENTAL AIRBORNE PARTICULATE SAMPLES - OFF-SITE STATIONS
## GROSS BETA ACTIVITY pCi/m$^3$ ± 2 SIGMA

LOCATION

| WEEK END DATE | R-1 OFF* | R-2 OFF* | R-3 OFF* | R-4 OFF* | R-5 OFF* | D-2 OFF | E-OFF | F-OFF | G-OFF |
|---|---|---|---|---|---|---|---|---|---|
| 91/07/02 | 0.017±0.002 | 0.017±0.002 | 0.015±0.002 | 0.017±0.002 | 0.015±0.002 | 0.016±0.002 | 0.018±0.002 | 0.018±0.002 | 0.016±0.002 |
| 91/07/09 | 0.011±0.002 | 0.012±0.002 | 0.011±0.002 | 0.010±0.002 | 0.008±0.001 | 0.010±0.002 | 0.014±0.002 | 0.011±0.002 | 0.011±0.002 |
| 91/07/16 | 0.009±0.002 | 0.014±0.002 | 0.015±0.002 | 0.014±0.002 | 0.013±0.002 | 0.016±0.002 | 0.013±0.002 | 0.013±0.002 | 0.013±0.002 |
| 91/07/23 | 0.019±0.002 | 0.022±0.002 | 0.018±0.002 | 0.023±0.002 | 0.018±0.002 | 0.026±0.003 | 0.020±0.002 | 0.020±0.002 | 0.023±0.002 |
| 91/07/30 | 0.012±0.002 | 0.011±0.002 | 0.009±0.002 | 0.012±0.002 | 0.011±0.002 | 0.011±0.002 | 0.009±0.002 | 0.011±0.002 | 0.009±0.002 |
| 91/08/06 | 0.008±0.001 | 0.010±0.002 | 0.009±0.002 | 0.010±0.002 | 0.009±0.002 | 0.010±0.002 | 0.012±0.002 | 0.010±0.002 | 0.010±0.002 |
| 91/08/13 | 0.009±0.001 | 0.010±0.002 | 0.008±0.001 | 0.008±0.001 | 0.008±0.001 | 0.009±0.002 | 0.010±0.002 | 0.010±0.002 | 0.008±0.002 |
| 91/08/20 | 0.016±0.002 | 0.020±0.002 | 0.018±0.002 | 0.019±0.002 | 0.019±0.002 | 0.022±0.002 | 0.017±0.002 | 0.017±0.002 | 0.014±0.002 |
| 91/08/27 | 0.014±0.002 | 0.015±0.002 | 0.014±0.002 | 0.015±0.002 | 0.013±0.002 | 0.015±0.002 | 0.011±0.002 | 0.015±0.002 | 0.013±0.002 |
| 91/09/03 | 0.018±0.002 | 0.021±0.002 | 0.029±0.003 | 0.016±0.002 | 0.013±0.002 | 0.019±0.002 | 0.015±0.002 | 0.016±0.002 | 0.018±0.002 |
| 91/09/10 | 0.018±0.002 | 0.020±0.002 | 0.019±0.002 | 0.017±0.002 | 0.015±0.002 | 0.019±0.002 | 0.019±0.002 | 0.015±0.002 | 0.014±0.002 |
| 91/09/17 | 0.016±0.002 | 0.015±0.002 | 0.014±0.002 | 0.015±0.002 | 0.012±0.002 | 0.011±0.002 | 0.015±0.002 | 0.012±0.002 | 0.016±0.002 |
| 91/09/24 | 0.010±0.002 | 0.009±0.002 | 0.010±0.002 | 0.009±0.002 | 0.010±0.002 | 0.011±0.002 | 0.009±0.002 | 0.011±0.002 | 0.008±0.002 |
| 91/10/01 | 0.007±0.002 | 0.009±0.002 | 0.007±0.001 | 0.010±0.002 | 0.007±0.001 | 0.007±0.001 | 0.009±0.002 | 0.008±0.002 | 0.008±0.001 |
| 91/10/08 | 0.017±0.002 | 0.019±0.002 | 0.018±0.002 | 0.018±0.002 | 0.018±0.002 | 0.019±0.002 | 0.019±0.002 | 0.018±0.002 | 0.016±0.002 |
| 91/10/15 | 0.015±0.002 | 0.017±0.002 | 0.017±0.002 | 0.016±0.002 | 0.014±0.002 | 0.016±0.002 | 0.014±0.002 | 0.014±0.002 | 0.013±0.002 |
| 91/10/22 | 0.012±0.002 | 0.013±0.002 | 0.014±0.002 | 0.014±0.002 | 0.013±0.002 | 0.014±0.002 | 0.013±0.002 | 0.014±0.002 | 0.013±0.002 |
| 91/10/29 | 0.027±0.003 | 0.033±0.003 | 0.030±0.003 | 0.032±0.003 | 0.028±0.002 | 0.029±0.002 | 0.029±0.003 | 0.030±0.003 | 0.022±0.002 |
| 91/11/05 | 0.018±0.002 | 0.020±0.002 | 0.018±0.002 | 0.021±0.002 | 0.015±0.002 | 0.018±0.002 | 0.021±0.002 | 0.016±0.002 | 0.015±0.002 |
| 91/11/12 | 0.016±0.002 | 0.014±0.002 | 0.016±0.002 | 0.015±0.002 | 0.015±0.002 | 0.014±0.002 | 0.013±0.002 | 0.015±0.002 | 0.011±0.002 |
| 91/11/19 | 0.019±0.002 | 0.018±0.002 | 0.018±0.002 | 0.020±0.002 | 0.019±0.002 | 0.015±0.002 | 0.018±0.002 | 0.018±0.002 | 0.017±0.002 |
| 91/11/26 | 0.015±0.002 | 0.014±0.002 | 0.013±0.002 | 0.015±0.002 | 0.013±0.002 | 0.013±0.002 | 0.015±0.002 | 0.013±0.002 | 0.013±0.002 |
| 91/12/03 | 0.013±0.002 | 0.013±0.002 | 0.014±0.002 | 0.016±0.002 | 0.013±0.002 | 0.015±0.002 | 0.014±0.002 | 0.010±0.002 | 0.010±0.002 |
| 91/12/10 | 0.016±0.002 | 0.013±0.002 | 0.014±0.002 | 0.017±0.002 | 0.014±0.002 | 0.013±0.002 | 0.014±0.002 | 0.015±0.002 | 0.012±0.002 |
| 91/12/17 | 0.017±0.002 | 0.013±0.002 | 0.016±0.002 | 0.016±0.002 | 0.017±0.002 | 0.015±0.002 | 0.015±0.002 | 0.016±0.002 | 0.015±0.002 |
| 91/12/23 | 0.013±0.002 | 0.014±0.002 | 0.014±0.002 | 0.017±0.002 | 0.015±0.002 | 0.015±0.002 | 0.015±0.002 | 0.015±0.002 | 0.011±0.002 |
| 91/12/30 | 0.014±0.002 | 0.014±0.002 | 0.013±0.002 | 0.013±0.002 | 0.013±0.002 | 0.014±0.002 | 0.013±0.002 | 0.013±0.002 | 0.012±0.002 |

* Sample locations required by Technical Specifications.

# TABLE 11

## NMP/JAF SITE
## ENVIRONMENTAL AIRBORNE PARTICULATE SAMPLES - ON-SITE STATIONS

GROSS BETA ACTIVITY pCi/m$^3$ ± 2 SIGMA

LOCATION

| WEEK END DATE | D1--ON | G--ON | H--ON | I--ON | J--ON | K--ON |
|---|---|---|---|---|---|---|
| 91/01/07 | 0.015±0.002 | 0.021±0.002 | 0.013±0.002 | 0.019±0.002 | 0.017±0.002 | 0.018±0.002 |
| 91/01/14 | 0.017±0.002 | 0.019±0.002 | 0.014±0.002 | 0.026±0.003 | 0.014±0.002 | 0.017±0.002 |
| 91/01/21 | 0.018±0.002 | 0.022±0.002 | 0.021±0.002 | 0.021±0.002 | 0.020±0.002 | 0.021±0.002 |
| 91/01/28 | 0.019±0.002 | 0.020±0.002 | 0.018±0.002 | 0.019±0.002 | 0.018±0.002 | 0.020±0.002 |
| 91/02/04 | 0.016±0.002 | 0.019±0.002 | 0.023±0.002 | 0.015±0.002 | 0.017±0.002 | 0.016±0.002 |
| 91/02/11 | 0.016±0.002 | 0.020±0.002 | 0.020±0.002 | 0.018±0.002 | 0.017±0.002 | 0.020±0.002 |
| 91/02/19 | 0.011±0.002 | 0.012±0.002 | 0.012±0.002 | 0.012±0.002 | 0.012±0.002 | 0.011±0.002 |
| 91/02/25 | 0.013±0.002 | 0.015±0.002 | 0.013±0.002 | 0.014±0.002 | 0.014±0.002 | 0.013±0.002 |
| 91/03/04 | 0.012±0.002 | 0.012±0.002 | 0.018±0.003 | 0.012±0.002 | 0.012±0.002 | 0.013±0.002 |
| 91/03/11 | 0.015±0.002 | 0.020±0.002 | 0.017±0.003 | 0.019±0.002 | 0.018±0.002 | 0.016±0.002 |
| 91/03/18 | 0.011±0.002 | 0.011±0.002 | 0.011±0.002 | 0.011±0.002 | 0.011±0.002 | 0.011±0.002 |
| 91/03/25 | 0.011±0.002 | 0.012±0.002 | 0.019±0.003 | 0.010±0.002 | 0.012±0.002 | 0.010±0.002 |
| 91/04/01 | 0.013±0.002 | 0.016±0.002 | 0.016±0.002 | 0.015±0.002 | 0.014±0.002 | 0.014±0.002 |
| 91/04/08 | 0.017±0.002 | 0.013±0.002 | 0.019±0.002 | 0.019±0.002 | 0.018±0.002 | 0.018±0.002 |
| 91/04/15 | 0.012±0.002 | 0.013±0.002 | 0.013±0.002 | 0.013±0.002 | 0.013±0.002 | 0.013±0.002 |
| 91/04/22 | 0.008±0.002 | 0.009±0.002 | 0.010±0.002 | 0.010±0.002 | 0.008±0.002 | 0.009±0.002 |
| 91/04/29 | 0.014±0.002 | 0.014±0.002 | 0.016±0.002 | 0.014±0.002 | 0.015±0.002 | 0.014±0.002 |
| 91/05/06 | 0.009±0.002 | 0.009±0.002 | 0.011±0.002 | 0.009±0.002 | 0.010±0.002 | 0.010±0.002 |
| 91/05/13 | 0.013±0.002 | 0.012±0.002 | 0.014±0.002 | 0.014±0.002 | 0.013±0.002 | 0.010±0.002 |
| 91/05/20 | 0.016±0.002 | 0.016±0.002 | 0.018±0.002 | 0.017±0.002 | 0.017±0.002 | 0.015±0.002 |
| 91/05/28 | 0.013±0.002 | 0.014±0.002 | 0.014±0.002 | 0.014±0.002 | 0.014±0.002 | 0.014±0.002 |
| 91/06/03 | 0.010±0.002 | 0.013±0.002 | 0.014±0.002 | 0.013±0.002 | 0.012±0.002 | 0.010±0.002 |
| 91/06/10 | 0.011±0.002 | 0.009±0.002 | 0.009±0.002 | 0.009±0.002 | 0.009±0.002 | 0.010±0.002 |
| 91/06/17 | 0.011±0.002 | 0.011±0.002 | 0.011±0.002 | 0.013±0.002 | 0.010±0.002 | 0.015±0.004 |
| 91/06/24 | 0.011±0.002 | 0.013±0.002 | 0.010±0.002 | 0.012±0.002 | 0.013±0.002 | 0.002±0.001 |

## TABLE 11 (CONTINUED)

NMP/JAF SITE
ENVIRONMENTAL AIRBORNE PARTICULATE SAMPLES - ON-SITE STATIONS
GROSS BETA ACTIVITY pCi/m$^3$ ± 2 SIGMA
LOCATION

| WEEK END DATE | D1--ON | G--ON | H--ON | I--ON | J--ON | K--ON |
|---|---|---|---|---|---|---|
| 91/07/01 | 0.017±0.002 | 0.018±0.002 | 0.015±0.002 | 0.015±0.002 | 0.016±0.002 | 0.015±0.002 |
| 91/07/08 | 0.011±0.002 | 0.012±0.002 | 0.013±0.002 | 0.011±0.002 | 0.010±0.002 | 0.012±0.002 |
| 91/07/15 | 0.011±0.002 | 0.012±0.002 | 0.014±0.002 | 0.012±0.002 | 0.013±0.002 | 0.012±0.002 |
| 91/07/22 | 0.020±0.002 | 0.027±0.002 | 0.029±0.003 | 0.024±0.002 | 0.022±0.002 | 0.019±0.002 |
| 91/07/29 | 0.012±0.002 | 0.014±0.002 | 0.015±0.002 | 0.014±0.002 | 0.013±0.002 | 0.011±0.002 |
| 91/08/05 | 0.009±0.002 | 0.010±0.002 | 0.010±0.002 | 0.011±0.002 | 0.011±0.002 | 0.006±0.001 |
| 91/08/12 | 0.006±0.001 | 0.007±0.001 | 0.006±0.002 | 0.007±0.001 | 0.006±0.001 | 0.004±0.001 |
| 91/08/19 | 0.022±0.003 | 0.024±0.003 | 0.026±0.003 | 0.016±0.002 | 0.017±0.002 | 0.016±0.002 |
| 91/08/26 | 0.011±0.002 | 0.012±0.002 | 0.011±0.002 | 0.011±0.002 | 0.013±0.002 | 0.004±0.001 |
| 91/09/03 | 0.019±0.002 | 0.024±0.002 | 0.023±0.002 | 0.023±0.002 | 0.021±0.002 | 0.005±0.001 |
| 91/09/09 | 0.018±0.002 | 0.020±0.003 | 0.021±0.003 | 0.023±0.003 | 0.019±0.002 | 0.012±0.002 |
| 91/09/16 | 0.018±0.002 | 0.017±0.002 | 0.016±0.002 | 0.012±0.002 | 0.014±0.002 | 0.012±0.002 |
| 91/09/23 | 0.012±0.002 | 0.011±0.002 | 0.015±0.002 | 0.009±0.002 | 0.010±0.002 | 0.010±0.002 |
| 91/09/30 | 0.006±0.001 | 0.007±0.001 | 0.007±0.001 | 0.007±0.001 | 0.006±0.001 | 0.006±0.001 |
| 91/10/07 | 0.019±0.002 | 0.021±0.002 | 0.023±0.002 | 0.018±0.002 | 0.020±0.002 | 0.016±0.002 |
| 91/10/14 | 0.014±0.002 | 0.014±0.002 | 0.014±0.002 | 0.014±0.002 | 0.014±0.002 | 0.015±0.002 |
| 91/10/21 | 0.010±0.002 | 0.015±0.002 | 0.012±0.002 | 0.012±0.002 | 0.015±0.002 | 0.010±0.002 |
| 91/10/28 | 0.028±0.003 | 0.032±0.003 | 0.029±0.003 | 0.030±0.003 | 0.027±0.003 | 0.028±0.002 |
| 91/11/04 | 0.014±0.002 | 0.018±0.002 | 0.020±0.002 | 0.017±0.002 | 0.018±0.002 | 0.014±0.002 |
| 91/11/12 | 0.015±0.002 | 0.016±0.002 | 0.016±0.002 | 0.017±0.002 | 0.017±0.002 | 0.016±0.002 |
| 91/11/18 | 0.019±0.002 | 0.020±0.002 | 0.022±0.003 | 0.018±0.002 | 0.018±0.002 | 0.017±0.002 |
| 91/11/25 | 0.013±0.002 | 0.018±0.002 | 0.020±0.002 | 0.016±0.002 | 0.014±0.002 | 0.015±0.002 |
| 91/12/02 | 0.011±0.002 | 0.013±0.002 | 0.012±0.002 | 0.010±0.002 | 0.014±0.002 | 0.013±0.002 |
| 91/12/09 | 0.017±0.002 | 0.017±0.002 | 0.012±0.002 | 0.014±0.002 | 0.013±0.002 | 0.013±0.002 |
| 91/12/16 | 0.016±0.002 | 0.018±0.002 | 0.013±0.002 | 0.016±0.002 | 0.016±0.002 | 0.014±0.002 |
| 91/1[illegible]3 | 0.014±0.002 | 0.015±0.002 | 0.010[illegible].002 | 0.012±0.002 | 0.013±0.002 | 0.01[illegible]0.002 |
| 91/[illegible]0 | 0.013±0.002 | 0.018±0.002 | 0.01[illegible]002 | 0.016±0.002 | 0.012±0.002 | 0.0[illegible].002 |

## TABLE 12

### CONCENTRATION OF GAMMA EMITTERS IN MONTHLY COMPOSITES OF NMP AIR PARTICULATE SAMPLES

### R-1 OFF-SITE STATION*

**Results in units of $10^{-3}$ pCi/m$^3$ ± 2 sigma**

| NUCLIDES | JANUARY | FEBRUARY | MARCH | APRIL | MAY | JUNE |
|---|---|---|---|---|---|---|
| | | | 1991 | | | |
| Co-60 | <1.1 | <2.2 | <0.7 | <1.4 | <1.6 | <1.8 |
| Mn-54 | <1.0 | <1.6 | <1.0 | <1.1 | <0.6 | <1.8 |
| Cs-134 | <1.0 | <1.7 | <0.9 | <1.2 | <1.0 | <1.3 |
| Cs-137 | <0.9 | <1.5 | <0.8 | <1.2 | <1.0 | <1.7 |
| Nb-95 | <1.5 | <2.7 | <1.1 | <1.5 | <1.4 | <1.4 |
| Zr-95 | <1.9 | <1.6 | <2.0 | <2.6 | <1.9 | <3.0 |
| Ce-141 | <1.2 | <1.6 | <1.0 | <1.3 | <1.1 | <1.5 |
| Ce-144 | <4.0 | <4.7 | <3.0 | <3.9 | <3.6 | <4.4 |
| Ru-106 | <8.7 | <12.3 | <6.3 | <8.6 | <10.9 | <10.2 |
| Ru-103 | <1.3 | <1.4 | <1.1 | <1.3 | <1.0 | <1.5 |
| Be-7 | 69 ± 12 | 69 ± 8 | 63 ± 5 | 87 ± 6 | 74 ± 6 | 69 ± 7 |
| K-40 | <14 | <20 | <11 | 39 ± 7 | 27 ± 6 | 22 ± 7 |
| BaLa-140 | <1.4 | <7.2 | <3.1 | <4.4 | <3.6 | <4.6 |
| Ra-226 | 17 ± 8 | <18 | <11 | <16 | <12 | <14 |
| I-131 | <2.6 | <3.7 | <2.6 | <3.2 | <3.0 | <4.0 |
| Others** | <LLD | <LLD | <LLD | <LLD | <LLD | <LLD |

| NUCLIDES | JULY | AUGUST | SEPTEMBER | OCTOBER | NOVEMBER | DECEMBER |
|---|---|---|---|---|---|---|
| Co-60 | <2.2 | <1.4 | <2.9 | <1.6 | <3.6 | <2.5 |
| Mn-54 | <1.6 | <1.0 | <1.4 | <1.1 | <1.9 | <1.8 |
| Cs-134 | <1.4 | <1.2 | <1.4 | <2.0 | <2.1 | <1.5 |
| Cs-137 | <1.4 | <1.3 | <2.0 | <1.1 | <2.1 | <1.3 |
| Nb-95 | <1.7 | <1.8 | <2.1 | <1.9 | <2.2 | <2.2 |
| Zr-95 | <3.2 | <2.3 | <2.5 | <2.4 | <4.1 | <3.2 |
| Ce-141 | <1.3 | <1.2 | <1.6 | <1.2 | <1.8 | <1.5 |
| Ce-144 | <4.1 | <3.4 | <5.0 | <3.8 | <6.5 | <5.1 |
| Ru-106 | <14.1 | <11.4 | <14.8 | <9.2 | <15.6 | <14.7 |
| Ru-103 | <1.3 | <1.2 | <1.9 | <1.0 | <2.2 | <1.5 |
| Be-7 | 78 ± 7 | 54 ± 5 | 50 ± 7 | 69 ± 6 | 49 ± 8 | 62 ± 6 |
| K-40 | 35 ± 9 | 18 ± 5 | 36 ± 9 | 30 ± 7 | 15 ± 8 | 24 ± 8 |
| BaLa-140 | <3.0 | <6.1 | <4.4 | <3.1 | <7.3 | <6.1 |
| Ra-226 | <15 | <13 | <20 | 13 ± 6 | <21 | <17 |
| I-131 | <3.2 | <4.0 | <4.6 | <3.6 | <4.4 | <3.4 |
| Others** | <LLD | <LLD | <LLD | <LLD | <LLD | <LLD |

* - Location required by the Technical Specifications.
**- Other plant related radionuclides.

TABLE 12 (Continued)

CONCENTRATION OF GAMMA EMITTERS IN MONTHLY COMPOSITES OF NMP AIR PARTICULATE SAMPLES

R-2 OFF-SITE STATION*

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

| NUCLIDES | JANUARY | FEBRUARY | MARCH | APRIL | MAY | JUNE |
|---|---|---|---|---|---|---|
| | | | 1991 | | | |
| Co-60 | <1.7 | <2.2 | <1.7 | <3.0 | <2.3 | <1.8 |
| Mn-54 | <1.4 | <1.2 | <1.1 | <2.4 | <1.3 | <1.0 |
| Cs-134 | <1.0 | <1.4 | <1.4 | <1.8 | <1.3 | <1.6 |
| Cs-137 | <1.3 | <1.3 | <1.5 | <1.5 | <1.4 | <1.5 |
| Nb-95 | <1.6 | <1.4 | <1.8 | <2.1 | <2.2 | <2.0 |
| Zr-95 | <2.0 | <2.5 | <2.8 | <2.6 | <2.7 | <3.0 |
| Ce-141 | <1.2 | <1.2 | <1.4 | <1.4 | <1.4 | <1.8 |
| Ce-144 | <4.3 | <4.5 | <4.0 | <3.9 | <4.6 | <5.1 |
| Ru-106 | <9.6 | <9.5 | <12.8 | <14.7 | <11.9 | <14.7 |
| Ru-103 | <1.2 | <1.4 | <1.6 | <1.6 | <1.2 | <1.6 |
| Be-7 | 74 ± 6 | 74 ± 6 | 65 ± 7 | 86 ± 7 | 88 ± 8 | 75 ± 8 |
| K-40 | <16 | <16 | 24 ± 7 | <22 | 16 ± 6 | 54 ± 9 |
| BaLa-140 | <2.6 | <4.4 | <7.0 | <3.8 | <4.0 | <6.1 |
| Ra-226 | <16 | <15 | <15 | 11 ± 5 | <15 | 16 ± 7 |
| I-131 | <3.2 | <3.2 | <3.8 | <3.6 | <4.4 | <4.5 |
| Others** | <LLD | <LLD | <LLD | <LLD | <LLD | <LLD |
| NUCLIDES | JULY | AUGUST | SEPTEMBER | OCTOBER | NOVEMBER | DECEMBER |
| Co-60 | <2.0 | <2.1 | <2.0 | <2.0 | <2.6 | <3.8 |
| Mn-54 | <1.3 | <1.5 | <1.6 | <1.4 | <2.1 | <2.1 |
| Cs-134 | <1.7 | <1.2 | <1.5 | <1.8 | <2.1 | <1.7 |
| Cs-137 | <1.2 | <1.5 | <1.3 | <1.4 | <2.2 | <1.5 |
| Nb-95 | <1.2 | <2.2 | <1.6 | <1.7 | <2.7 | <2.2 |
| Zr-95 | <2.6 | <2.1 | <2.6 | <1.8 | <4.1 | <3.8 |
| Ce-141 | <1.3 | <1.7 | <1.5 | <1.4 | <2.1 | <1.8 |
| Ce-144 | <4.8 | <4.5 | <5.5 | <3.9 | <5.6 | <5.5 |
| Ru-106 | <11.0 | <11.4 | <14.4 | <10.2 | <19.6 | <13.6 |
| Ru-103 | <1.6 | <1.7 | <1.4 | <1.3 | <2.3 | <2.3 |
| Be-7 | 76 ± 7 | 72 ± 7 | 60 ± 7 | 77 ± 6 | 49 ± 8 | 52 ± 7 |
| K-40 | 16 ± 8 | 14 ± 7 | <16 | 38 ± 6 | 37 ± 10 | 30 ± 9 |
| BaLa-140 | <3.3 | <6.3 | <5.5 | <4.0 | <5.0 | <7.6 |
| Ra-226 | <17 | <15 | <18 | <15 | <24 | <20 |
| I-131 | <3.6 | <5.7 | <3.0 | <3.9 | <5.2 | <4.8 |
| Others** | <LLD | <LLD | <LLD | <LLD | <LLD | <LLD |

* - Location required by the Technical Specifications.
** - Other plant related radionuclides.

**TABLE 12 (Continued)**

**CONCENTRATION OF GAMMA EMITTERS IN MONTHLY COMPOSITES OF NMP AIR PARTICULATE SAMPLES**

**R-3 OFF-SITE STATION***

**Results in units of $10^{-3}$pCi/$m^3$ ± 2 sigma**

| NUCLIDES | JANUARY | FEBRUARY | MARCH | APRIL | MAY | JUNE |
|---|---|---|---|---|---|---|
| | | | 1991 | | | |
| Co-60 | <1.8 | <2.4 | <2.3 | <1.6 | <1.6 | <1.6 |
| Mn-54 | <1.9 | <1.8 | <1.3 | <1.3 | <0.8 | <1.0 |
| Cs-134 | <2.1 | <1.5 | <1.3 | <1.1 | <1.0 | <1.4 |
| Cs-137 | <1.2 | <1.3 | <1.4 | <1.0 | <1.0 | <1.1 |
| Nb-95 | <1.6 | <2.1 | <1.6 | <1.4 | <0.8 | <1.1 |
| Zr-95 | <2.1 | <3.8 | <2.0 | <2.4 | <2.2 | <1.7 |
| Ce-141 | <1.5 | <1.7 | <1.3 | <1.2 | <1.1 | <1.4 |
| Ce-144 | <4.2 | <5.2 | <3.4 | <4.2 | <3.4 | <4.2 |
| Ru-106 | <13.3 | <14.2 | <14.1 | <7.3 | <11.7 | <11.1 |
| Ru-103 | <1.4 | <1.6 | <1.5 | <0.9 | <1.0 | <1.4 |
| Be-7 | 63 ± 6 | 62 ± 8 | 75 ± 7 | 90 ± 7 | 75 ± 6 | 69 ± 6 |
| K-40 | <17 | 20 ± 9 | 9 ± 4 | <3 | 8 ± 5 | 40 ± 8 |
| BaLa-140 | <7.2 | <8.9 | <6.0 | <3.6 | <4.6 | <5.0 |
| Ra-226 | <16 | <18 | <13 | 10 ± 5 | 16 ± 6 | <15 |
| I-131 | <3.6 | <4.8 | <2.8 | <3.2 | <3.1 | <4.0 |
| Others** | <LLD | <LLD | <LLD | <LLD | <LLD | <LLD |
| NUCLIDES | JULY | AUGUST | SEPTEMBER | OCTOBER | NOVEMBER | DECEMBER |
| Co-60 | <1.9 | <2.3 | <1.5 | <1.2 | <2.8 | <2.0 |
| Mn-54 | <1.3 | <1.4 | <2.3 | <1.2 | <1.5 | <1.4 |
| Cs-134 | <1.3 | <1.2 | <1.6 | <0.8 | <2.4 | <1.5 |
| Cs-137 | <1.2 | <1.3 | <1.5 | <1.0 | <1.8 | <1.5 |
| Nb-95 | <2.0 | <2.0 | <2.1 | <1.2 | <2.6 | <1.9 |
| Zr-95 | <2.2 | <2.8 | <3.0 | <1.8 | <3.9 | <2.4 |
| Ce-141 | <1.4 | <1.6 | <1.8 | <1.2 | <1.8 | <1.4 |
| Ce-144 | <4.7 | <4.3 | <6.0 | <3.8 | <6.0 | <4.4 |
| Ru-106 | <11.3 | <10.7 | <13.7 | <12.7 | <12.8 | <14.5 |
| Ru-103 | <1.2 | <1.7 | <1.8 | <0.9 | <2.0 | <1.2 |
| Be-7 | 82 ± 7 | 47 ± 6 | 43 ± 7 | 70 ± 6 | 51 ± 7 | 46 ± 6 |
| K-40 | <3 | 24 ± 6 | 42 ± 9 | <12 | <20 | 30 ± 6 |
| BaLa-140 | <5.1 | <5.4 | <1.2 | <4.8 | <4.4 | <5.6 |
| Ra-226 | 13 ± 6 | <14 | <18 | <13 | 16 ± 8 | <16 |
| I-131 | <3.1 | <6.8 | <4.0 | <3.3 | <4.9 | <3.9 |
| Others** | <LLD | <LLD | <LLD | <LLD | <LLD | <LLD |

* - Location required by the Technical Specifications.
** - Other plant related radionuclides.

## TABLE 12 (Continued)

## CONCENTRATION OF GAMMA EMITTERS IN MONTHLY COMPOSITES OF NMP AIR PARTICULATE SAMPLES

### R-4 OFF-SITE STATION (CONTROL)*

Results in units of $\underline{10^{-3}pCi/m^3}$ ± 2 sigma

| NUCLIDES | JANUARY | FEBRUARY | MARCH | APRIL | MAY | JUNE |
|---|---|---|---|---|---|---|
| Co-60 | <0.8 | <2.5 | <1.2 | <1.2 | <0.8 | <1.9 |
| Mn-54 | <1.1 | <1.7 | <0.9 | <1.2 | <1.1 | <1.1 |
| Cs-134 | <1.1 | <1.8 | <0.9 | <1.2 | <1.1 | <1.4 |
| Cs-137 | <1.0 | <1.5 | <1.0 | <1.1 | <1.1 | <1.3 |
| Nb-95 | <1.5 | <2.6 | <0.7 | <2.0 | <1.6 | <2.0 |
| Zr-95 | <1.8 | <3.4 | <1.6 | <2.1 | <2.2 | <2.6 |
| Ce-141 | <2.0 | <1.9 | <1.1 | <1.4 | <1.2 | <1.6 |
| Ce-144 | <5.2 | <5.1 | <3.4 | <4.0 | <3.8 | <4.6 |
| Ru-106 | <9.8 | <11.7 | <8.6 | <11.0 | <9.8 | <11.4 |
| Ru-103 | <1.5 | <1.8 | <1.2 | <1.4 | <1.1 | <1.7 |
| Be-7 | 73 ± 12 | 95 ± 9 | 72 ± 6 | 91 ± 7 | 77 ± 6 | 86 ± 8 |
| K-40 | 43 ± 14 | 24 ± 8 | <14 | 12 ± 6 | 30 ± 6 | 32 ± 8 |
| BaLa-140 | <3.6 | <8.2 | <4.0 | <2.9 | <3.0 | <5.0 |
| Ra-226 | <25 | <19 | 10 ± 5 | <15 | <12 | <16 |
| I-131 | <3.7 | <5.5 | <3.5 | <2.5 | <3.5 | <4.3 |
| Others** | <LLD | <LLD | <LLD | <LLD | <LLD | <LLD |

| NUCLIDES | JULY | AUGUST | SEPTEMBER | OCTOBER | NOVEMBER | DECEMBER |
|---|---|---|---|---|---|---|
| Co-60 | <2.0 | <1.4 | <1.5 | <1.7 | <2.3 | <1.3 |
| Mn-54 | <1.0 | <1.1 | <1.3 | <1.3 | <2.2 | <1.8 |
| Cs-134 | <1.3 | <1.2 | <1.6 | <1.1 | <2.3 | <1.8 |
| Cs-137 | <1.1 | <0.8 | <1.5 | <1.4 | <2.3 | <1.6 |
| Nb-95 | <1.8 | <1.1 | <2.4 | <1.8 | <2.5 | <2.4 |
| Zr-95 | <3.0 | <2.1 | <3.2 | <2.7 | <3.4 | <2.9 |
| Ce-141 | <1.2 | <1.3 | <2.2 | <1.5 | <2.0 | <1.7 |
| Ce-144 | <4.4 | <3.5 | <5.0 | <4.1 | <6.5 | <5.1 |
| Ru-106 | <13.4 | <11.6 | <16.2 | <12.6 | <16.9 | <13.6 |
| Ru-103 | <1.4 | <1.2 | <2.1 | <1.6 | <2.4 | <1.7 |
| Be-7 | 102 ± 8 | 63 ± 5 | 64 ± 8 | 82 ± 7 | 51 ± 8 | 64 ± 7 |
| K-40 | <15 | 28 ± 5 | 43 ± 8 | <16 | 23 ± 10 | 15 ± 8 |
| BaLa-140 | <3.0 | <3.6 | <9.4 | <5.2 | <9.8 | <6.6 |
| Ra-226 | <17 | <13 | <18 | 22 ± 6 | <27 | <19 |
| I-131 | <3.0 | <4.5 | <1.5 | <5.4 | <5.2 | <4.2 |
| Others** | <LLD | <LLD | <LLD | <LLD | <LLD | <LLD |

* - Location required by the Technical Specifications.
**- Other plant related radionuclides.

## TABLE 12 (Continued)

## CONCENTRATION OF GAMMA EMITTERS IN MONTHLY COMPOSITES OF NMP AIR PARTICULATE SAMPLES

### R-5 OFF-SITE STATION*

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

| NUCLIDES | JANUARY | FEBRUARY | MARCH | APRIL | MAY | JUNE |
|---|---|---|---|---|---|---|
| 1991 | | | | | | |
| Co-60 | <1.6 | <1.8 | <1.2 | <2.1 | <1.3 | <3.2 |
| Mn-54 | <1.1 | <1.2 | <0.9 | <1.8 | <0.9 | <2.0 |
| Cs-134 | <1.1 | <1.4 | <1.1 | <2.4 | <1.3 | <1.4 |
| Cs-137 | <1.2 | <1.2 | <0.9 | <1.6 | <1.2 | <1.7 |
| Nb-95 | <1.1 | <1.8 | <1.4 | <2.4 | <1.6 | <2.2 |
| Zr-95 | <1.9 | <2.6 | <1.9 | <3.3 | <2.1 | <3.3 |
| Ce-141 | <1.6 | <1.4 | <1.1 | <1.6 | <1.3 | <1.9 |
| Ce-144 | <5.1 | <4.2 | <3.1 | <4.4 | <3.3 | <5.9 |
| Ru-106 | <9.1 | <12.0 | <6.9 | <14.2 | <9.2 | <14.5 |
| Ru-103 | <1.4 | <1.7 | <1.2 | <1.8 | <1.1 | <2.0 |
| Be-7 | 61 ± 14 | 77 ± 6 | 66 ± 5 | 88 ± 8 | 77 ± 6 | 73 ± 8 |
| K-40 | 29 ± 15 | 48 ± 7 | 33 ± 6 | 14 ± 5 | 35 ± 6 | 47 ± 9 |
| BaLa-140 | <2.7 | <4.5 | <2.8 | <7.2 | <4.4 | <6.6 |
| Ra-226 | 18 ± 12 | 18 ± 6 | 11 ± 3 | 24 ± 6 | <14 | <19 |
| I-131 | <3.1 | <4.4 | <2.5 | <3.6 | <3.2 | <5.0 |
| Others ** | <LLD | <LLD | <LLD | <LLD | <LLD | <LLD |

| NUCLIDES | JULY | AUGUST | SEPTEMBER | OCTOBER | NOVEMBER | DECEMBER |
|---|---|---|---|---|---|---|
| Co-60 | <1.1 | <1.5 | <2.2 | <1.6 | <1.5 | <1.7 |
| Mn-54 | <1.3 | <0.9 | <1.7 | <1.2 | <1.1 | <1.3 |
| Cs-134 | <1.6 | <1.0 | <1.5 | <2.1 | <2.0 | <1.6 |
| Cs-137 | <1.3 | <0.8 | <1.7 | <1.0 | <1.2 | <1.3 |
| Nb-95 | <1.9 | <1.8 | <2.2 | <1.5 | <1.8 | <2.0 |
| Zr-95 | <2.3 | <2.4 | <3.7 | <2.3 | <2.3 | <2.9 |
| Ce-141 | <1.3 | <1.3 | <1.6 | <1.3 | <1.3 | <1.5 |
| Ce-144 | <4.4 | <3.6 | <5.3 | <3.5 | <4.0 | <4.6 |
| Ru-106 | <13.9 | <9.9 | <13.1 | <8.5 | <10.7 | <10.7 |
| Ru-103 | <1.5 | <1.1 | <2.0 | <1.1 | <1.1 | <1.7 |
| Be-7 | 69 ± 7 | 46 ± 5 | 52 ± 7 | 63 ± 6 | 42 ± 5 | 57 ± 6 |
| K-40 | 19 ± 6 | 12 ± 4 | 24 ± 8 | 26 ± 6 | 32 ± 7 | 34 ± 7 |
| BaLa-140 | <4.9 | <5.7 | <5.4 | <4.6 | <4.3 | <5.1 |
| Ra-226 | 10 ± 6 | 12 ± 6 | <19 | <13 | <14 | 11 ± 6 |
| I-131 | <3.4 | <3.8 | <3.9 | <3.0 | <3.1 | <4.0 |
| Others** | <LLD | <LLD | <LLD | <LLD | <LLD | <LLD |

* - Location required by the Technical Specifications.
** - Other plant related radionuclides.

TABLE 12 (Continued)

CONCENTRATION OF GAMMA EMITTERS IN MONTHLY COMPOSITES OF NMP AIR PARTICULATE SAMPLES

D2 OFF-SITE STATION*

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

| NUCLIDES | JANUARY | FEBRUARY | MARCH | APRIL | MAY | JUNE |
|---|---|---|---|---|---|---|
| | | | 1991 | | | |
| Co-60 | <0.5 | <1.5 | <1.9 | <2.6 | <1.6 | <1.1 |
| Mn-54 | <1.1 | <1.6 | <1.1 | <1.3 | <1.6 | <1.4 |
| Cs-134 | <0.7 | <1.4 | <1.1 | <2.4 | <1.3 | <1.4 |
| Cs-137 | <1.0 | <1.0 | <1.1 | <1.9 | <1.7 | <0.9 |
| Nb-95 | <1.4 | <1.4 | <1.6 | <2.2 | <2.2 | <1.9 |
| Zr-95 | <2.2 | <2.9 | <2.5 | <3.4 | <3.1 | <2.9 |
| Ce-141 | <1.7 | <1.5 | <1.3 | <2.0 | <1.5 | <1.6 |
| Ce-144 | <5.6 | <4.5 | <3.6 | <5.3 | <4.8 | <4.8 |
| Ru-106 | <9.7 | <13.3 | <10.5 | <16.4 | <12.1 | <13.4 |
| Ru-103 | <1.4 | <1.5 | <1.2 | <1.6 | <1.7 | <1.7 |
| Be-7 | 69 ± 13 | 64 ± 7 | 63 ± 6 | 76 ± 9 | 76 ± 8 | 89 ± 7 |
| K-40 | 32 ± 13 | <23 | 21 ± 5 | 22 ± 8 | 15 ± 7 | 48 ± 8 |
| BaLa-140 | <3.1 | <6.1 | <0.8 | <4.8 | <1.2 | <3.3 |
| Ra-226 | <22 | <14 | 14 ± 6 | <20 | 12 ± 6 | 13 ± 7 |
| I-131 | <3.0 | <5.1 | <3.1 | <4.1 | <3.8 | <4.9 |
| Others** | <LLD | <LLD | <LLD | <LLD | <LLD | <LLD |

| NUCLIDES | JULY | AUGUST | SEPTEMBER | OCTOBER | NOVEMBER | DECEMBER |
|---|---|---|---|---|---|---|
| Co-60 | <1.8 | <2.2 | <2.2 | <2.5 | <1.1 | <1.7 |
| Mn-54 | <1.4 | <1.7 | <1.3 | <1.2 | <1.4 | <1.4 |
| Cs-134 | <1.3 | <1.6 | <1.5 | <1.4 | <1.4 | <1.7 |
| Cs-137 | <1.3 | <1.4 | <1.3 | <1.4 | <1.3 | <1.4 |
| Nb-95 | <1.7 | <1.4 | <1.5 | <1.6 | <1.6 | <1.8 |
| Zr-95 | <2.7 | <2.6 | <1.8 | <3.2 | <2.1 | <3.2 |
| Ce-141 | <1.7 | <1.6 | <1.2 | <1.5 | <1.4 | <1.5 |
| Ce-144 | <4.6 | <4.3 | <4.2 | <4.3 | <3.9 | <4.5 |
| Ru-106 | <14.3 | <12.1 | <14.6 | <10.6 | <11.4 | <15.7 |
| Ru-103 | <1.4 | <1.8 | <1.2 | <1.4 | <1.0 | <1.7 |
| Be-7 | 86 ± 8 | 59 ± 7 | 47 ± 6 | 72 ± 7 | 52 ± 5 | 55 ± 6 |
| K-40 | <18 | <17 | <16 | 21 ± 6 | 11 ± 5 | 22 ± 6 |
| BaLa-140 | <7.2 | <6.7 | <5.3 | <7.2 | <5.2 | <6.4 |
| Ra-226 | <16 | <16 | 7 ± 4 | <15 | <15 | <18 |
| I-131 | <3.6 | <5.4 | <3.9 | <5.4 | <3.2 | <4.6 |
| Others** | <LLD | <LLD | <LLD | <LLD | <LLD | <LLD |

* - Optional sample location.
** - Other plant related radionuclides.

TABLE 12 (Continued)

CONCENTRATION OF GAMMA EMITTERS IN MONTHLY COMPOSITES OF NMP AIR PARTICULATE SAMPLES

E OFF-SITE STATION *

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

| NUCLIDES | JANUARY | FEBRUARY | MARCH | APRIL | MAY | JUNE |
|---|---|---|---|---|---|---|
| 1991 | | | | | | |
| Co-60 | <0.9 | <2.1 | <2.1 | <1.6 | <1.4 | <1.9 |
| Mn-54 | <1.0 | <1.4 | <1.2 | <2.1 | <0.8 | <1.4 |
| Cs-134 | <0.9 | <1.2 | <1.2 | <2.1 | <0.9 | <1.5 |
| Cs-137 | <1.0 | <1.1 | <1.2 | <1.5 | <0.8 | <1.5 |
| Nb-95 | <1.3 | <1.5 | <1.6 | <2.0 | <1.1 | <1.9 |
| Zr-95 | <1.5 | <2.5 | <2.1 | <3.6 | <2.3 | <2.8 |
| Ce-141 | <1.5 | <1.3 | <1.2 | <1.5 | <1.2 | <1.7 |
| Ce-144 | <4.4 | <4.6 | <3.9 | <4.4 | <3.5 | <5.0 |
| Ru-106 | <8.4 | <9.0 | <8.5 | <13.9 | <8.1 | <13.1 |
| Ru-103 | <1.0 | <1.3 | <1.3 | <1.7 | <1.0 | <1.8 |
| Be-7 | 77 ± 13 | 84 ± 7 | 69 ± 7 | 81 ± 7 | 85 ± 6 | 62 ± 7 |
| K-40 | <15 | <19 | <18 | <16 | <12 | 43 ± 7 |
| BaLa-140 | <1.5 | <3.4 | <1.0 | <5.9 | <4.6 | <1.1 |
| Ra-226 | <20 | <15 | <15 | <16 | 15 ± 5 | 22 ± 8 |
| I-131 | <2.8 | <4.2 | <3.4 | <3.6 | <3.0 | <4.9 |
| Others** | <LLD | <LLD | <LLD | <LLD | <LLD | <LLD |

| NUCLIDES | JULY | AUGUST | SEPTEMBER | OCTOBER | NOVEMBER | DECEMBER |
|---|---|---|---|---|---|---|
| Co-60 | <1.7 | <1.8 | <1.9 | <1.7 | <2.0 | <2.3 |
| Mn-54 | <1.4 | <1.1 | <1.2 | <1.0 | <1.4 | <1.5 |
| Cs-134 | <1.5 | <1.2 | <1.8 | <1.0 | <1.4 | <1.5 |
| Cs-137 | <1.2 | <1.2 | <1.3 | <1.0 | <1.5 | <1.2 |
| Nb-95 | <2.0 | <1.8 | <1.5 | <1.2 | <1.7 | <2.2 |
| Zr-95 | <2.5 | <2.8 | <2.0 | <1.9 | <2.1 | <3.4 |
| Ce-141 | <1.5 | <1.3 | <1.4 | <0.9 | <1.4 | <1.5 |
| Ce-144 | <4.5 | <3.6 | <4.2 | <3.1 | <4.3 | <4.4 |
| Ru-106 | <12.0 | <9.9 | <10.2 | <11.5 | <10.4 | <12.5 |
| Ru-103 | <1.5 | <1.3 | <1.4 | <1.1 | <1.1 | <1.6 |
| Be-7 | 55 ± 6 | 41 ± 5 | 62 ± 6 | 82 ± 6 | 42 ± 6 | 57 ± 6 |
| K-40 | 38 ± 7 | 25 ± 6 | <15 | <12 | 16 ± 6 | <18 |
| BaLa-140 | <4.2 | <6.2 | <5.1 | <5.5 | <6.5 | <7.2 |
| Ra-226 | 12 ± 6 | 13 ± 4 | <15 | <13 | 13 ± 6 | 9 ± 6 |
| I-131 | <3.1 | <4.4 | <3.9 | <3.0 | <3.2 | <4.3 |
| Others** | <LLD | <LLD | <LLD | <LLD | <LLD | <LLD |

* - Optional sample location.
**- Other plant related radionuclides.

TABLE 12 (Continued)

CONCENTRATION OF GAMMA EMITTERS IN MONTHLY COMPOSITES OF NMP AIR PARTICULATE SAMPLES

F OFF-SITE STATION *

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

| NUCLIDES | JANUARY | FEBRUARY | MARCH | APRIL | MAY | JUNE |
|---|---|---|---|---|---|---|
| | | | 1991 | | | |
| Co-60 | <1.0 | <1.2 | <1.6 | <1.4 | <1.6 | <1.7 |
| Mn-54 | <0.9 | <1.7 | <0.6 | <1.4 | <1.0 | <1.3 |
| Cs-134 | <1.1 | <1.2 | <1.5 | <1.4 | <1.0 | <1.2 |
| Cs-137 | <0.8 | <1.2 | <1.1 | <1.3 | <1.0 | <1.4 |
| Nb-95 | <1.2 | <1.6 | <1.5 | <2.0 | <1.4 | <2.0 |
| Zr-95 | <2.0 | <2.9 | <2.5 | <2.4 | <2.3 | <3.6 |
| Ce-141 | <1.6 | <1.5 | <1.1 | <1.5 | <1.2 | <1.6 |
| Ce-144 | <5.2 | <4.5 | <3.2 | <4.4 | <3.7 | <4.4 |
| Ru-106 | <10.0 | <13.9 | <13.2 | <8.7 | <9.9 | <12.2 |
| Ru-103 | <1.4 | <1.6 | <1.3 | <1.4 | <1.2 | <1.6 |
| Be-7 | 83 ± 12 | 70 ± 6 | 68 ± 6 | 80 ± 7 | 64 ± 5 | 55 ± 6 |
| K-40 | 32 ± 12 | 42 ± 8 | 18 ± 5 | 43 ± 8 | <14 | 51 ± 8 |
| BaLa-140 | <2.4 | <6.4 | <6.2 | <6.0 | <5.2 | <6.7 |
| Ra-226 | <19 | <18 | <14 | <14 | <13 | <17 |
| I-131 | <2.7 | <4.6 | <3.4 | <3.8 | <3.0 | <4.7 |
| Others** | <LLD | <LLD | <LLD | <LLD | <LLD | <LLD |
| **NUCLIDES** | **JULY** | **AUGUST** | **SEPTEMBER** | **OCTOBER** | **NOVEMBER** | **DECEMBER** |
| Co-60 | <1.4 | <1.3 | <1.9 | <2.4 | <1.9 | <4.1 |
| Mn-54 | <1.5 | <1.0 | <1.7 | <1.5 | <2.0 | <1.8 |
| Cs-134 | <1.6 | <1.0 | <1.4 | <1.2 | <1.5 | <1.5 |
| Cs-137 | <1.4 | <1.0 | <1.8 | <1.2 | <1.7 | <1.9 |
| Nb-95 | <1.7 | <1.7 | <1.8 | <1.8 | <2.6 | <2.8 |
| Zr-95 | <3.2 | <2.4 | <3.7 | <1.8 | <3.6 | <5.3 |
| Ce-141 | <1.5 | <1.2 | <1.8 | <1.3 | <1.8 | <2.0 |
| Ce-144 | <4.5 | <3.3 | <5.4 | <3.9 | <5.7 | <6.1 |
| Ru-106 | <12.6 | <8.6 | <14.9 | <11.4 | <12.8 | <16.4 |
| Ru-103 | <1.6 | <1.2 | <2.0 | <1.5 | <2.1 | <1.9 |
| Be-7 | 80 ± 7 | 47 ± 5 | 35 ± 6 | 63 ± 6 | 49 ± 7 | 48 ± 7 |
| K-40 | 27 ± 7 | 33 ± 6 | 29 ± 8 | 19 ± 6 | 25 ± 8 | 35 ± 10 |
| BaLa-140 | <4.5 | <5.3 | <1.2 | <7.2 | <4.4 | <8.9 |
| Ra-226 | <17 | <12 | <19 | <14 | <19 | <21 |
| I-131 | <3.9 | <5.0 | <4.5 | <5.4 | <4.3 | <6.6 |
| Others** | <LLD | <LLD | <LLD | <LLD | <LLD | <LLD |

* - Optional sample location.
**- Other plant related radionuclides.

TABLE 12 (Continued)

CONCENTRATION OF GAMMA EMITTERS IN MONTHLY COMPOSITES OF NMP AIR PARTICULATE SAMPLES

G OFF-SITE STATION *

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

| NUCLIDES | JANUARY | FEBRUARY | MARCH | APRIL | MAY | JUNE |
|---|---|---|---|---|---|---|
| | | | 1991 | | | |
| Co-60 | <1.2 | <2.0 | <1.4 | <3.1 | <2.0 | <2.0 |
| Mn-54 | <1.2 | <1.2 | <1.0 | <1.8 | <1.4 | <1.7 |
| Cs-134 | <0.8 | <1.5 | <0.8 | <2.3 | <1.2 | <1.6 |
| Cs-137 | <1.2 | <1.4 | <0.9 | <1.8 | <1.1 | <1.4 |
| Nb-95 | <1.9 | <2.3 | <1.3 | <2.6 | <1.1 | <1.7 |
| Zr-95 | <2.7 | <3.0 | <2.4 | <3.4 | <2.3 | <3.3 |
| Ce-141 | <1.8 | <1.7 | <1.2 | <1.5 | <1.4 | <1.8 |
| Ce-144 | <5.1 | <4.7 | <3.4 | <5.0 | <3.9 | <4.8 |
| Ru-106 | <12.1 | <12.9 | <6.4 | <15.7 | <11.2 | <13.8 |
| Ru-103 | <1.4 | <1.4 | <0.9 | <1.6 | <1.4 | <1.4 |
| Be-7 | 68 ± 14 | 66 ± 7 | 68 ± 5 | 66 ± 8 | 72 ± 6 | 76 ± 7 |
| K-40 | 30 ± 16 | 45 ± 8 | 8 ± 4 | <24 | 27 ± 6 | 43 ± 8 |
| BaLa-140 | <2.0 | <6.2 | <5.5 | <6.2 | <3.2 | <7.3 |
| Ra-226 | 20 ± 11 | <19 | <12 | <17 | <16 | <17 |
| I-131 | <2.5 | <5.7 | <2.8 | <4.8 | <3.5 | <4.8 |
| Others** | <LLD | <LLD | <LLD | <LLD | <LLD | <LLD |
| NUCLIDES | JULY | AUGUST | SEPTEMBER | OCTOBER | NOVEMBER | DECEMBER |
| Co-60 | <1.9 | <1.3 | <1.8 | <2.1 | <1.5 | <1.3 |
| Mn-54 | <1.3 | <1.0 | <1.9 | <1.2 | <1.2 | <1.7 |
| Cs-134 | <1.5 | <1.1 | <1.6 | <1.2 | <1.4 | <1.8 |
| Cs-137 | <1.4 | <1.0 | <1.7 | <1.5 | <1.4 | <1.3 |
| Nb-95 | <1.9 | <1.9 | <2.4 | <1.9 | <1.6 | <1.8 |
| Zr-95 | <2.8 | <2.8 | <3.1 | <3.1 | <2.2 | <2.8 |
| Ce-141 | <1.7 | <1.4 | <1.5 | <1.7 | <1.6 | <1.7 |
| Ce-144 | <4.7 | <3.6 | <5.0 | <4.5 | <4.4 | <4.5 |
| Ru-106 | <13.0 | <11.3 | <14.3 | <12.5 | <10.7 | <12.6 |
| Ru-103 | <1.4 | <1.2 | <1.7 | <1.6 | <1.4 | <1.4 |
| Be-7 | 72 ± 7 | 52 ± 5 | 38 ± 6 | 64 ± 7 | 39 ± 6 | 36 ± 5 |
| K-40 | 33 ± 8 | 30 ± 7 | <20 | 24 ± 7 | 44 ± 7 | 49 ± 8 |
| BaLa-140 | <6.0 | <6.1 | <7.5 | <4.9 | <5.6 | <4.2 |
| Ra-226 | <19 | 7 ± 3 | 10 ± 6 | <16 | <15 | <18 |
| I-131 | <4.1 | <4.4 | <4.1 | <5.8 | <4.4 | <5.0 |
| Others** | <LLD | <LLD | <LLD | <LLD | <LLD | <LLD |

* - Optional sample location.
**- Other plant related radionuclides.

TABLE 12 (Continued)

**CONCENTRATION OF GAMMA EMITTERS IN MONTHLY COMPOSITES OF NMP AIR PARTICULATE SAMPLES**

**D1 ON-SITE STATION***

**Results in units of $\underline{10^{-3}\text{pCi/m}^3}$ $\underline{+}$ 2 sigma**

| NUCLIDES | JANUARY | FEBRUARY | MARCH | APRIL | MAY | JUNE |
|---|---|---|---|---|---|---|
| | | | 1991 | | | |
| Co-60 | <0.7 | <1.5 | <1.1 | <3.1 | <1.1 | <1.6 |
| Mn-54 | <0.8 | <1.3 | <1.1 | <1.6 | <1.1 | <1.3 |
| Cs-134 | <0.9 | <1.1 | <1.5 | <1.5 | <1.1 | <1.4 |
| Cs-137 | <0.9 | <1.0 | <1.4 | <1.6 | <1.0 | <1.4 |
| Nb-95 | <1.3 | <1.8 | <1.9 | <2.3 | <1.4 | <1.3 |
| Zr-95 | <2.3 | <2.6 | <2.8 | <3.5 | <1.3 | <1.8 |
| Ce-141 | <1.5 | <1.3 | <1.3 | <1.6 | <1.2 | <1.3 |
| Ce-144 | <4.5 | <4.4 | <4.3 | <5.3 | <3.4 | <4.3 |
| Ru-106 | <8.3 | <11.0 | <8.5 | <15.0 | <7.3 | <12.9 |
| Ru-103 | <1.2 | <1.5 | <1.0 | <1.8 | <1.1 | <1.4 |
| Be-7 | 65 ± 11 | 53 ± 5 | 62 ± 7 | 81 ± 8 | 68 ± 5 | 66 ± 6 |
| K-40 | 40 ± 14 | 33 ± 7 | <15 | 21 ± 9 | 45 ± 6 | 27 ± 6 |
| BaLa-140 | <3.1 | <4.3 | <6.1 | <6.9 | <2.2 | <5.4 |
| Ra-226 | <18 | <18 | <14 | <19 | <12 | <16 |
| I-131 | <2.9 | <3.2 | <3.3 | <3.9 | <3.5 | <3.6 |
| Others** | <LLD | <LLD | <LLD | <LLD | <LLD | <LLD |
| **NUCLIDES** | **JULY** | **AUGUST** | **SEPTEMBER** | **OCTOBER** | **NOVEMBER** | **DECEMBER** |
| Co-60 | <1.9 | <2.0 | <1.9 | <1.4 | <2.0 | <2.1 |
| Mn-54 | <1.3 | <1.5 | <1.3 | <1.2 | <1.3 | <1.3 |
| Cs-134 | <1.4 | <1.2 | <1.6 | <1.4 | <1.3 | <1.7 |
| Cs-137 | <1.6 | <1.4 | <1.3 | <0.9 | <1.3 | <1.3 |
| Nb-95 | <1.4 | <1.6 | <1.8 | <1.2 | <1.5 | <2.0 |
| Zr-95 | <2.8 | <2.3 | <2.8 | <2.4 | <2.7 | <2.2 |
| Ce-141 | <1.6 | <1.5 | <1.5 | <1.3 | <1.6 | <1.7 |
| Ce-144 | <4.9 | <3.9 | <4.7 | <3.9 | <4.2 | <4.8 |
| Ru-106 | <13.3 | <12.0 | <12.9 | <9.6 | <11.4 | <14.9 |
| Ru-103 | <1.8 | <1.6 | <1.4 | <1.2 | <1.5 | <1.5 |
| Be-7 | 81 ± 8 | 45 ± 6 | 39 ± 6 | 68 ± 5 | 49 ± 6 | 64 ± 7 |
| K-40 | 33 ± 7 | 16 ± 6 | 50 ± 9 | 31 ± 6 | 9 ± 5 | 23 ± 8 |
| BaLa-140 | <4.2 | <4.0 | <4.4 | <3.7 | <4.1 | <6.2 |
| Ra-226 | 17 ± 7 | <16 | <17 | 5 ± 4 | 14 ± 8 | <18 |
| I-131 | <3.2 | <4.1 | <3.1 | <3.4 | <3.2 | <4.0 |
| Others** | <LLD | <LLD | <LLD | <LLD | <LLD | <LLD |

* - Optional sample location.
**- Other plant related radionuclides.

TABLE 12 (Continued)

**CONCENTRATION OF GAMMA EMITTERS IN MONTHLY COMPOSITES OF NMP AIR PARTICULATE SAMPLES**

**G ON-SITE STATION ***

Results in units of $\underline{10^{-3}}\,\underline{pCi/m^3}$ $\pm$ 2 sigma

| NUCLIDES | JANUARY | FEBRUARY | MARCH | APRIL | MAY | JUNE |
|---|---|---|---|---|---|---|
| | | | 1991 | | | |
| Co-60 | <1.1 | <1.5 | <1.8 | <2.0 | <0.3 | <1.7 |
| Mn-54 | <1.2 | <1.1 | <1.2 | <1.3 | <1.2 | <1.2 |
| Cs-134 | <1.0 | <1.2 | <1.3 | <1.1 | <1.2 | <1.3 |
| Cs-137 | <0.8 | <1.1 | <1.6 | <1.0 | <1.3 | <1.2 |
| Nb-95 | <1.3 | <1.7 | <1.4 | <1.7 | <1.4 | <1.7 |
| Zr-95 | <1.8 | <2.3 | <2.4 | <2.1 | <2.9 | <2.3 |
| Ce-141 | <1.6 | <1.5 | <1.3 | <1.2 | <1.4 | <1.3 |
| Ce-144 | <4.8 | <4.1 | <3.8 | <3.9 | <4.5 | <3.9 |
| Ru-106 | <9.8 | <11.4 | <12.4 | <8.0 | <10.7 | <10.6 |
| Ru-103 | <1.1 | <1.5 | <1.2 | <1.2 | <1.6 | <1.4 |
| Be-7 | 84 ± 13 | 83 ± 6 | 69 ± 6 | 72 ± 7 | 77 ± 7 | 66 ± 6 |
| K-40 | 37 ± 14 | 37 ± 6 | 22 ± 6 | <15 | 24 ± 6 | 41 ± 7 |
| BaLa-140 | <2.0 | <4.0 | <5.8 | <2.8 | <3.8 | <3.8 |
| Ra-226 | <20 | <16 | <14 | <14 | <16 | <15 |
| I-131 | <2.4 | <4.8 | <4.1 | <3.3 | <4.1 | <3.2 |
| Others** | <LLD | <LLD | <LLD | <LLD | <LLD | <LLD |

| NUCLIDES | JULY | AUGUST | SEPTEMBER | OCTOBER | NOVEMBER | DECEMBER |
|---|---|---|---|---|---|---|
| Co-60 | <1.7 | <1.2 | <1.4 | <2.1 | <1.5 | <1.9 |
| Mn-54 | <1.1 | <1.2 | <1.4 | <1.6 | <1.3 | <1.4 |
| Cs-134 | <1.4 | <1.0 | <1.3 | <1.4 | <1.7 | <1.3 |
| Cs-137 | <1.2 | <0.9 | <1.2 | <1.4 | <1.2 | <0.9 |
| Nb-95 | <1.5 | <1.4 | <2.1 | <1.5 | <1.8 | <1.7 |
| Zr-95 | <2.6 | <2.3 | <3.3 | <2.8 | <2.7 | <2.4 |
| Ce-141 | <1.3 | <1.3 | <1.6 | <1.6 | <1.4 | <1.4 |
| Ce-144 | <4.2 | <3.2 | <5.1 | <4.7 | <4.2 | <4.3 |
| Ru-106 | <10.2 | <9.8 | <14.4 | <13.5 | <11.6 | <13.2 |
| Ru-103 | <1.2 | <1.2 | <1.4 | <1.3 | <1.2 | <1.4 |
| Be-7 | 98 ± 7 | 63 ± 5 | 48 ± 6 | 68 ± 7 | 54 ± 6 | 60 ± 6 |
| K-40 | <16 | 28 ± 6 | <14 | 18 ± 7 | 44 ± 8 | <13 |
| BaLa-140 | <3.7 | <2.6 | <4.2 | <4.0 | <3.3 | <4.2 |
| Ra-226 | <15 | <12 | <18 | <16 | <17 | 12 ± 7 |
| I-131 | <3.2 | <4.3 | <3.8 | <4.8 | <3.8 | <3.5 |
| Others** | <LLD | <LLD | <LLD | <LLD | <LLD | <LLD |

* - Optional sample location.
** -Other plant related radionuclides.

TABLE 12 (Continued)

CONCENTRATION OF GAMMA EMITTERS IN MONTHLY COMPOSITES OF NMP AIR PARTICULATE SAMPLES

H ON-SITE STATION *

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

| NUCLIDES | JANUARY | FEBRUARY | MARCH | APRIL | MAY | JUNE |
|---|---|---|---|---|---|---|
| | | | 1991 | | | |
| Co-60 | <0.7 | <1.8 | <2.7 | <1.4 | <2.0 | <1.8 |
| Mn-54 | <0.7 | <1.4 | <1.6 | <1.3 | <1.8 | <1.5 |
| Cs-134 | <0.9 | <1.4 | <2.0 | <1.5 | <1.3 | <1.7 |
| Cs-137 | <0.8 | <1.2 | <1.6 | <1.4 | <1.2 | <1.5 |
| Nb-95 | <1.2 | <1.6 | <2.0 | <2.2 | <2.5 | <1.8 |
| Zr-95 | <1.6 | <2.2 | <3.5 | <2.9 | <3.6 | <2.7 |
| Ce-141 | <1.5 | <1.3 | <1.6 | <1.4 | <1.6 | <1.6 |
| Ce-144 | <4.4 | <3.9 | <5.1 | <4.7 | <4.9 | <4.9 |
| Ru-106 | <9.0 | <11.1 | <13.3 | <13.5 | <13.5 | <12.2 |
| Ru-103 | <1.2 | <1.7 | <1.9 | <1.5 | <1.7 | <1.6 |
| Be-7 | 62 ± 12 | 67 ± 6 | 82 ± 8 | 78 ± 7 | 61 ± 7 | 58 ± 6 |
| K-40 | 33 ± 11 | 39 ± 7 | 22 ± 8 | 30 ± 7 | <13 | 44 ± 9 |
| BaLa-140 | <1.6 | <3.8 | <5.0 | <5.0 | <6.6 | <5.0 |
| Ra-226 | <17 | <17 | <18 | <20 | <19 | 12 ± [illegible] |
| I-131 | <2.6 | <3.4 | <4.9 | <3.6 | <5.2 | <3.9 |
| Others** | <LLD | (1) | <LLD | <LLD | <LLD | <LLD |

| NUCLIDES | JULY | AUGUST | SEPTEMBER | OCTOBER | NOVEMBER | DECEMBER |
|---|---|---|---|---|---|---|
| Co-60 | <0.9 | <1.2 | <1.6 | <1.8 | <1.6 | <3.1 |
| Mn-54 | <1.6 | <1.3 | <1.4 | <1.2 | <1.3 | <1.8 |
| Cs-134 | <1.8 | <1.3 | <1.4 | <3.2 | <1.4 | <1.7 |
| Cs-137 | <1.3 | <0.9 | <1.1 | <1.3 | <1.1 | <1.6 |
| Nb-95 | <1.7 | <2.0 | <1.5 | <2.2 | <1.8 | <2.4 |
| Zr-95 | <2.8 | <2.5 | <2.2 | <3.1 | <2.2 | <3.0 |
| Ce-141 | <1.7 | <1.4 | <1.3 | <1.5 | <1.5 | <2.1 |
| Ce-144 | <5.0 | <3.9 | <4.1 | <4.9 | <4.6 | <6.4 |
| Ru-106 | <11.4 | <9.7 | <13.7 | <12.2 | <13.0 | <13.6 |
| Ru-103 | <1.4 | <1.6 | <1.3 | <1.8 | <1.3 | <1.8 |
| Be-7 | 75 ± 7 | 52 ± 6 | 33 ± 5 | 71 ± 7 | 42 ± 5 | 30 ± 7 |
| K-40 | 43 ± 8 | 27 ± 7 | 37 ± 6 | <17 | 11 ± 4 | 29 ± 8 |
| BaLa-140 | <6.0 | <3.8 | <2.2 | <4.8 | <8.1 | <6.6 |
| Ra-226 | <18 | <14 | 11 ± 6 | 8 ± 5 | 15 ± 6 | <20 |
| I-131 | <3.7 | <4.9 | <2.8 | <3.8 | <3.7 | <5.1 |
| Others** | <LLD | <LLD | <LLD | <LLD | <LLD | <LLD |

* - Optional sample location.
** - Other plant related radionuclides.
(1) Zn-65 detected at a concentration of 4.56 ± 1.15 E-03 pCi/$m^3$.

## TABLE 12 (Continued)

### CONCENTRATION OF GAMMA EMITTERS IN MONTHLY COMPOSITES OF NMP AIR PARTICULATE SAMPLES

### I ON-SITE STATION *

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

| NUCLIDES | JANUARY | FEBRUARY | MARCH | APRIL | MAY | JUNE |
|---|---|---|---|---|---|---|
| | | | 1991 | | | |
| Co-60 | <1.0 | <3.4 | <3.5 | <1.8 | <1.0 | <1.8 |
| Mn-54 | <1.1 | <1.7 | <1.8 | <1.4 | <1.0 | <1.5 |
| Cs-134 | <1.2 | <1.7 | <1.8 | <1.6 | <1.1 | <1.6 |
| Cs-137 | <1.3 | <1.8 | <1.1 | <1.2 | <1.1 | <1.5 |
| Nb-95 | <1.1 | <2.8 | <1.6 | <2.2 | <1.6 | <1.8 |
| Zr-95 | <2.5 | <3.7 | <3.0 | <3.0 | <1.9 | <2.6 |
| Ce-141 | <1.9 | <1.8 | <1.5 | <1.5 | <1.3 | <1.7 |
| Ce-144 | <5.4 | <5.8 | <4.4 | <4.6 | <3.7 | <4.8 |
| Ru-106 | <9.4 | <16.2 | <13.5 | <12.0 | <8.5 | <14.3 |
| Ru-103 | <1.3 | <1.9 | <1.7 | <1.2 | <1.0 | <1.4 |
| Be-7 | 68 ± 13 | 60 ± 8 | 81 ± 8 | 80 ± 7 | 78 ± 6 | 55 ± 6 |
| K-40 | 22 ± 13 | <20 | <24 | 28 ± 8 | 32 ± 6 | 31 ± 7 |
| BaLa-140 | <3.2 | <9.7 | <5.7 | <7.7 | <3.8 | <6.4 |
| Ra-226 | 15 ± 9 | <18 | <17 | <20 | <13 | <17 |
| I-131 | <3.6 | <4.8 | <4.4 | <3.4 | <3.6 | <3.5 |
| Others** | <LLD | <LLD | <LLD | <LLD | <LLD | <LLD |

| NUCLIDES | JULY | AUGUST | SEPTEMBER | OCTOBER | NOVEMBER | DECEMBER |
|---|---|---|---|---|---|---|
| Co-60 | <1.6 | <1.4 | <2.6 | <2.6 | <2.7 | <1.6 |
| Mn-54 | <1.5 | <1.0 | <1.8 | <1.8 | <1.6 | <1.1 |
| Cs-134 | <1.4 | <1.0 | <1.9 | <2.2 | <1.4 | <1.4 |
| Cs-137 | <1.4 | <1.0 | <1.5 | <1.6 | <1.5 | <1.3 |
| Nb-95 | <1.9 | <1.6 | <2.3 | <1.8 | <2.1 | <1.8 |
| Zr-95 | <2.8 | <2.2 | <3.2 | <2.4 | <3.8 | <2.9 |
| Ce-141 | <1.4 | <1.2 | <1.6 | <1.7 | <1.8 | <1.4 |
| Ce-144 | <4.6 | <3.3 | <5.2 | <5.2 | <5.0 | <4.6 |
| Ru-106 | <13.8 | <7.2 | <15.1 | <13.6 | <14.6 | <12.0 |
| Ru-103 | <1.3 | <1.1 | <1.6 | <1.7 | <2.1 | <1.5 |
| Be-7 | 61 ± 6 | 54 ± 5 | 42 ± 7 | 67 ± 7 | 29 ± 6 | 54 ± 6 |
| K-40 | 27 ± 7 | 34 ± 6 | <18 | 24 ± 8 | 27 ± 8 | 52 ± 8 |
| BaLa-140 | <5.9 | <4.8 | <3.8 | <8.4 | <4.6 | <4.9 |
| Ra-226 | <16 | <12 | <18 | <18 | <20 | <16 |
| I-131 | <3.2 | <4.0 | <4.7 | <5.5 | <4.0 | <3.6 |
| Others** | <LLD | <LLD | <LLD | <LLD | <LLD | <LLD |

* - Optional sample location.
** - Other plant related radionuclides.

TABLE 12 (Continued)

CONCENTRATION OF GAMMA EMITTERS IN MONTHLY COMPOSITES OF NMP
AIR PARTICULATE SAMPLES

J ON-SITE STATION *

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

| NUCLIDES | JANUARY | FEBRUARY | MARCH | APRIL | MAY | JUNE |
|---|---|---|---|---|---|---|
| | | | 1991 | | | |
| Co-60 | <1.3 | <1.3 | <1.2 | <1.0 | <2.4 | <1.5 |
| Mn-54 | <1.0 | <1.5 | <1.1 | <1.7 | <1.5 | <1.2 |
| Cs-134 | <1.1 | <1.1 | <1.4 | <1.2 | <1.2 | <1.6 |
| Cs-137 | <1.5 | <1.0 | <1.1 | <1.1 | <1.6 | <1.6 |
| Nb-95 | <1.9 | <1.4 | <1.9 | <1.8 | <1.4 | <1.8 |
| Zr-95 | <2.8 | <1.8 | <2.7 | <3.1 | <2.6 | <3.1 |
| Ce-141 | <1.7 | <1.2 | <1.4 | <1.4 | <1.5 | <1.5 |
| Ce-144 | <5.6 | <3.7 | <3.8 | <4.9 | <4.9 | <4.5 |
| Ru-106 | <12.6 | <9.2 | <11.1 | <11.4 | <13.3 | <14.2 |
| Ru-103 | <1.6 | <1.1 | <1.4 | <1.2 | <1.6 | <1.3 |
| Be-7 | 62 ± 14 | 74 ± 6 | 77 ± 7 | 90 ± 7 | 51 ± 6 | 69 ± 7 |
| K-40 | 25 ± 14 | <12 | 39 ± 7 | 16 ± 6 | <22 | 25 ± 7 |
| BaLa-140 | <3.0 | <5.1 | <7.6 | <6.5 | <5.4 | <3.6 |
| Ra-226 | <25 | <13 | <16 | 16 ± 5 | <16 | 16 ± [illegible] |
| I-131 | <3.2 | <3.5 | <3.5 | <3.1 | <4.7 | <4.0 |
| Others** | <LLD | <LLD | <LLD | <LLD | <LLD | <LLD |

| NUCLIDES | JULY | AUGUST | SEPTEMBER | OCTOBER | NOVEMBER | DECEMBER |
|---|---|---|---|---|---|---|
| Co-60 | <1.0 | <1.6 | <2.2 | <1.2 | <1.7 | <2.1 |
| Mn-54 | <1.6 | <1.0 | <1.9 | <1.2 | <1.4 | <1.7 |
| Cs-134 | <1.3 | <1.2 | <1.5 | <2.3 | <1.9 | <1.8 |
| Cs-137 | <0.9 | <1.1 | <1.3 | <1.3 | <1.4 | <1.5 |
| Nb-95 | <1.8 | <1.6 | <2.3 | <1.8 | <1.7 | <1.7 |
| Zr-95 | <2.6 | <2.3 | <3.8 | <3.0 | <2.9 | <3.1 |
| Ce-141 | <1.4 | <1.4 | <2.0 | <1.4 | <1.5 | <1.6 |
| Ce-144 | <4.7 | <3.7 | <6.0 | <4.0 | <4.8 | <4.6 |
| Ru-106 | <10.8 | <10.4 | <16.3 | <9.6 | <13.2 | <14.9 |
| Ru-103 | <1.4 | <1.2 | <2.0 | <1.5 | <1.4 | <1.7 |
| Be-7 | 64 ± 6 | 52 ± 5 | 59 ± 7 | 57 ± 6 | 44 ± 6 | 39 ± 6 |
| K-40 | <19 | 31 ± 6 | 15 ± 9 | 23 ± 7 | 38 ± 7 | 37 ± 8 |
| BaLa-140 | <0.8 | <6.2 | <7.3 | <5.6 | <5.5 | <4.0 |
| Ra-226 | <15 | 14 ± 6 | <21 | <15 | <18 | <16 |
| I-131 | <3.2 | <4.7 | <5.0 | <4.0 | <3.5 | <4.2 |
| Others** | <LLD | <LLD | <LLD | <LLD | <LLD | <LLD |

* - Optional sample location
**- Other plant related radionuclides

TABLE 12 (Continued)

CONCENTRATION OF GAMMA EMITTERS IN MONTHLY COMPOSITES OF NMP AIR PARTICULATE SAMPLES

K ON-SITE STATION *

Results in units of $\underline{10^{-3} pCi/m^3}$ ± 2 sigma

| NUCLIDES | JANUARY | FEBRUARY | MARCH | APRIL | MAY | JUNE |
|---|---|---|---|---|---|---|
| | | | 1991 | | | |
| Co-60 | <1.0 | <2.4 | <2.6 | <2.8 | <1.4 | <2.0 |
| Mn-54 | <0.9 | <1.8 | <1.6 | <1.9 | <0.8 | <0.7 |
| Cs-134 | <0.9 | <1.7 | <1.3 | <2.3 | <0.9 | <1.3 |
| Cs-137 | <1.0 | <1.7 | <1.1 | <1.8 | <1.0 | <1.6 |
| Nb-95 | <1.1 | <2.4 | <2.0 | <2.1 | <1.1 | <2.1 |
| Zr-95 | <2.0 | <3.2 | <2.6 | <4.0 | <2.1 | <2.9 |
| Ce-141 | <1.6 | <1.5 | <1.3 | <1.8 | <1.1 | <1.7 |
| Ce-144 | <4.3 | <5.0 | <4.1 | <4.8 | <3.4 | <4.8 |
| Ru-106 | <8.2 | <11.0 | <12.7 | <15.6 | <9.2 | <14.7 |
| Ru-103 | <1.2 | <1.8 | <1.4 | <1.6 | <1.0 | <1.4 |
| Be-7 | 72 ± 12 | 67 ± 8 | 79 ± 7 | 87 ± 8 | 66 ± 5 | 64 ± 7 |
| K-40 | 37 ± 12 | 42 ± 9 | 22 ± 6 | <26 | 11 ± 4 | 34 ± 8 |
| [illegible]-140 | <2.9 | <4.5 | <6.0 | <6.6 | <4.2 | <4.0 |
| R[illegible]26 | <19 | <18 | <14 | <19 | 14 ± 5 | <20 |
| I-131 | <2.6 | <4.8 | <3.9 | <4.1 | <3.1 | <4.1 |
| Others** | <LLD | <LLD | <LLD | <LLD | <LLD | <LLD |

| NUCLIDES | JULY | AUGUST | SEPTEMBER | OCTOBER | NOVEMBER | DECEMBER |
|---|---|---|---|---|---|---|
| Co-60 | <1.6 | <1.1 | <2.5 | <2.3 | <2.9 | <2.7 |
| Mn-54 | <1.0 | <1.2 | <1.3 | <1.5 | <1.5 | <1.4 |
| Cs-134 | <1.2 | <1.1 | <1.5 | <1.9 | <1.4 | <1.4 |
| Cs-137 | <1.2 | <0.9 | <1.5 | <1.5 | <1.4 | <1.5 |
| Nb-95 | <1.7 | <1.4 | <1.7 | <1.7 | <2.7 | <2.2 |
| Zr-95 | <2.5 | <2.5 | <2.8 | <3.2 | <3.9 | <3.2 |
| Ce-141 | <1.3 | <1.3 | <1.4 | <1.6 | <1.6 | <1.8 |
| Ce-144 | <3.8 | <3.6 | <4.8 | <4.6 | <5.0 | <5.1 |
| Ru-106 | <11.2 | <8.5 | <17.1 | <12.6 | <11.5 | <12.8 |
| Ru-103 | <1.3 | <1.3 | <1.8 | <1.3 | <1.4 | <1.7 |
| Be-7 | 53 ± 6 | 27 ± 4 | 43 ± 6 | 77 ± 7 | 34 ± 6 | 60 ± 7 |
| K-40 | 45 ± 7 | 19 ± 5 | 23 ± 5 | 19 ± 7 | <30 | 58 ± 11 |
| BaLa-140 | <3.7 | <3.6 | <6.9 | <6.0 | <1.1 | <6.8 |
| Ra-226 | <16 | <12 | <18 | <15 | <16 | <19 |
| I-131 | <2.9 | <4.0 | <4.0 | <4.5 | <4.0 | <4.4 |
| Others** | <LLD | <LLD | <LLD | <LLD | <LLD | <LLD |

* - Optional sample location
**- Other plant related radionuclides

# TABLE 13

NMP/JAF SITE
ENVIRONMENTAL CHARCOAL CARTRIDGE SAMPLES - OFF-SITE STATIONS
I-131 ACTIVITY pCi/$m^3$ ± 1 SIGMA
LOCATION

| WEEK END DATE | R-1* | R-2* | R-3* | R-4* | R-5* | D-2 | E | F | G |
|---|---|---|---|---|---|---|---|---|---|
| 91/01/08 | <0.007 | <0.012 | <0.012 | <0.012 | <0.009 | <0.011 | <0.013 | <0.008 | <0.009 |
| 91/01/15 | <0.011 | <0.009 | <0.008 | <0.014 | <0.012 | <0.007 | <0.009 | <0.008 | <0.011 |
| 91/01/22 | <0.009 | <0.010 | <0.010 | <0.008 | <0.008 | <0.012 | <0.011 | <0.008 | <0.009 |
| 91/01/29 | <0.006 | <0.009 | <0.009 | <0.012 | <0.013 | <0.010 | <0.008 | <0.009 | <0.009 |
| 91/02/05 | <0.007 | <0.008 | <0.011 | <0.010 | <0.011 | <0.009 | <0.008 | <0.007 | <0.014 |
| 91/02/12 | <0.007 | <0.009 | <0.013 | <0.012 | <0.009 | <0.011 | <0.009 | <0.006 | <0.011 |
| 91/02/20 | <0.014 | <0.013 | <0.009 | <0.011 | <0.008 | <0.012 | <0.010 | <0.016 | <0.011 |
| 91/02/26 | <0.009 | <0.009 | <0.010 | <0.011 | <0.013 | <0.012 | <0.012 | <0.012 | <0.010 |
| 91/03/05 | <0.012 | <0.014 | <0.011 | <0.016 | <0.012 | <0.011 | <0.011 | <0.013 | <0.016 |
| 91/03/12 | <0.007 | <0.014 | <0.012 | <0.010 | <0.011 | <0.011 | <0.013 | <0.015 | <0.010 |
| 91/03/19 | <0.010 | <0.010 | <0.012 | <0.014 | <0.009 | <0.013 | <0.010 | <0.009 | <0.013 |
| 91/03/26 | <0.011 | <0.012 | <0.012 | <0.009 | <0.009 | <0.011 | <0.015 | <0.014 | <0.012 |
| 91/04/02 | <0.009 | <0.013 | <0.011 | <0.013 | <0.016 | <0.013 | <0.012 | <0.015 | <0.011 |
| 91/04/09 | <0.009 | <0.015 | <0.012 | <0.014 | <0.008 | <0.010 | <0.008 | <0.016 | <0.011 |
| 91/04/16 | <0.010 | <0.013 | <0.014 | <0.012 | <0.010 | <0.014 | <0.009 | <0.011 | <0.014 |
| 91/04/23 | <0.009 | <0.015 | <0.011 | <0.012 | <0.009 | <0.009 | <0.012 | <0.011 | <0.012 |
| 91/05/30 | <0.009 | <0.012 | <0.013 | <0.014 | <0.010 | <0.010 | <0.012 | <0.013 | <0.011 |
| 91/05/07 | <0.009 | <0.013 | <0.010 | <0.011 | <0.010 | <0.012 | <0.012 | <0.012 | <0.013 |
| 91/05/14 | <0.011 | <0.012 | <0.014 | <0.014 | <0.010 | <0.012 | <0.012 | <0.013 | <0.011 |
| 91/05/21 | <0.010 | <0.010 | <0.011 | <0.013 | <0.012 | <0.012 | <0.093 | <0.011 | <0.007 |
| 91/05/28 | <0.013 | <0.011 | <0.014 | <0.008 | <0.012 | <0.012 | <0.014 | <0.012 | <0.014 |
| 91/06/04 | <0.009 | <0.014 | <0.009 | <0.009 | <0.011 | <0.006 | <0.008 | <0.010 | <0.015 |
| 91/06/11 | <0.007 | <0.013 | <0.015 | <0.010 | <0.012 | <0.012 | <0.012 | <0.010 | <0.012 |
| 91/06/18 | <0.013 | <0.011 | <0.012 | <0.012 | <0.008 | <0.015 | <0.010 | <0.013 | <0.012 |
| 91/06/25 | <0.013 | <0.009 | <0.010 | <0.011 | <0.010 | <0.011 | <0.010 | <0.015 | <0.010 |

* Sample locations required by Technical Specifications

## TABLE 13 (CONTINUED)

### NMP/J[illegible] SITE

### ENVIRONMENTAL CHARCOAL CARTRIDGE SAMPLES - OFF-SITE STATIONS

I-131 ACTIVITY pCi/m$^3$ ± 1 SIGMA

LOCATION

| WEEK END DATE | R-1* | R-2* | R-3* | R-4* | R-5* | D-2 | E | F | G |
|---|---|---|---|---|---|---|---|---|---|
| 91/07/02 | <0.012 | <0.011 | <0.010 | <0.015 | <0.012 | <0.013 | <0.014 | <0.014 | <0.010 |
| 91/07/09 | <0.009 | <0.016 | <0.010 | <0.011 | <0.010 | <0.013 | <0.009 | <0.014 | <0.012 |
| 91/07/16 | <0.010 | <0.012 | <0.008 | <0.012 | <0.011 | <0.018 | <0.012 | <0.014 | <0.011 |
| 91/07/23 | <0.015 | <0.013 | <0.012 | <0.013 | <0.012 | <0.016 | <0.011 | <0.010 | <0.012 |
| 91/07/30 | <0.011 | <0.014 | <0.010 | <0.012 | <0.011 | <0.016 | <0.012 | <0.010 | <0.019 |
| 91/08/06 | <0.009 | <0.013 | <0.009 | <0.013 | <0.012 | <0.011 | <0.012 | <0.014 | <0.011 |
| 91/08/13 | <0.011 | <0.014 | <0.014 | <0.009 | <0.014 | <0.011 | <0.014 | <0.014 | <0.009 |
| 91/08/20 | <0.011 | <0.013 | <0.014 | <0.011 | <0.014 | <0.011 | <0.011 | <0.009 | <0.012 |
| 91/08/27 | <0.013 | <0.013 | <0.015 | <0.010 | <0.010 | <0.018 | <0.013 | <0.010 | <0.012 |
| 91/09/03 | <0.011 | <0.013 | <0.014 | <0.014 | <0.012 | <0.010 | <0.015 | <0.014 | <0.012 |
| 91/09/10 | <0.010 | <0.010 | <0.011 | <0.008 | <0.010 | <0.011 | <0.009 | <0.012 | <0.012 |
| 91/09/17 | <0.010 | <0.011 | <0.013 | <0.014 | <0.011 | <0.008 | <0.015 | <0.010 | <0.013 |
| 91/09/24 | <0.011 | <0.019 | <0.012 | <0.013 | <0.010 | <0.014 | <0.013 | <0.010 | <0.012 |
| 91/10/01 | <0.009 | <0.014 | <0.015 | <0.012 | <0.012 | <0.013 | <0.011 | <0.016 | <0.012 |
| 91/10/08 | <0.010 | <0.012 | <0.011 | <0.013 | <0.012 | <0.011 | <0.011 | <0.012 | <0.012 |
| 91/10/15 | <0.018 | <0.011 | <0.012 | <0.014 | <0.008 | <0.011 | <0.014 | <0.012 | <0.012 |
| 91/10/22 | <0.010 | <0.015 | <0.010 | <0.014 | <0.012 | <0.012 | <0.009 | <0.013 | <0.015 |
| 91/10/29 | <0.010 | <0.014 | <0.011 | <0.012 | <0.009 | <0.010 | <0.009 | <0.011 | <0.012 |
| 91/11/05 | <0.014 | <0.010 | <0.011 | <0.011 | <0.013 | <0.012 | <0.010 | <0.014 | <0.010 |
| 91/11/12 | <0.013 | <0.018 | <0.011 | <0.013 | <0.009 | <0.011 | <0.013 | <0.010 | <0.011 |
| 91/11/19 | <0.013 | <0.011 | <0.008 | <0.011 | <0.011 | <0.007 | <0.010 | <0.011 | <0.015 |
| 91/11/26 | <0.012 | <0.015 | <0.013 | <0.013 | <0.007 | <0.014 | <0.011 | <0.011 | <0.015 |
| 91/12/03 | <0.012 | <0.016 | <0.013 | <0.013 | <0.011 | <0.013 | <0.010 | <0.011 | <0.011 |
| 91/12/10 | <0.010 | <0.014 | <0.010 | <0.015 | <0.010 | <0.011 | <0.010 | <0.011 | <0.010 |
| 91/12/17 | <0.013 | <0.013 | <0.007 | <0.015 | <0.014 | <0.011 | <0.010 | <0.012 | <0.015 |
| 91/12/23 | <0.014 | <0.013 | <0.009 | <0.021 | <0.010 | <0.009 | <0.018 | <0.013 | <0.016 |
| 91/12/30 | <0.010 | <0.012 | <0.010 | <0.014 | <0.009 | <0.015 | <0.011 | <0.010 | <0.012 |

* Sample locations required by Technical Specification

** Pump Inoperative

# TABLE 14

NMP/JAF SITE
ENVIRONMENTAL CHARCOAL CARTRIDGE SAMPLES - ON-SITE STATIONS
I-131 ACTIVITY pCi/m$^3$ ± 1 SIGMA

LOCATION

| WEEK END | D1--ON | G--ON | H--ON | I--ON | J--ON | K--ON |
|---|---|---|---|---|---|---|
| 91/01/07 | <0.011 | <0.010 | <0.010 | <0.011 | <0.011 | <0.012 |
| 91/01/14 | <0.013 | <0.009 | <0.010 | <0.015 | <0.015 | <0.007 |
| 91/01/21 | <0.006 | <0.008 | <0.017 | <0.010 | <0.010 | <0.010 |
| 91/01/28 | <0.013 | <0.011 | <0.008 | <0.009 | <0.011 | <0.008 |
| 91/02/04 | <0.008 | <0.010 | <0.010 | <0.010 | <0.011 | <0.008 |
| 91/02/11 | <0.012 | <0.008 | <0.012 | <0.012 | <0.007 | <0.006 |
| 91/02/19 | <0.011 | <0.013 | <0.012 | <0.013 | <0.011 | <0.009 |
| 91/02/25 | <0.012 | <0.011 | <0.012 | <0.010 | <0.011 | <0.014 |
| 91/03/04 | <0.012 | <0.012 | <0.015 | <0.015 | <0.009 | <0.013 |
| 91/03/11 | <0.010 | <0.015 | <0.018 | <0.012 | <0.013 | <0.011 |
| 91/03/18 | <0.010 | <0.013 | <0.014 | <0.010 | <0.016 | <0.014 |
| 91/03/25 | <0.016 | <0.016 | <0.015 | <0.024 | <0.020 | <0.012 |
| 91/04/01 | <0.014 | <0.011 | <0.014 | <0.014 | <0.017 | <0.012 |
| 91/04/08 | <0.007 | <0.014 | <0.009 | <0.018 | <0.012 | <0.013 |
| 91/04/15 | <0.009 | <0.010 | <0.012 | <0.011 | <0.012 | <0.010 |
| 91/04/22 | <0.012 | <0.011 | <0.013 | <0.009 | <0.011 | <0.010 |
| 91/04/29 | <0.010 | <0.011 | <0.011 | <0.008 | <0.011 | <0.009 |
| 91/05/06 | <0.010 | <0.011 | <0.013 | <0.009 | <0.010 | <0.009 |
| 91/05/13 | <0.014 | <0.009 | <0.010 | <0.014 | <0.012 | <0.009 |
| 91/05/20 | <0.011 | <0.013 | <0.014 | <0.010 | <0.015 | <0.012 |
| 91/05/28 | <0.009 | <0.014 | <0.011 | <0.012 | <0.010 | <0.009 |
| 91/06/03 | <0.013 | <0.012 | <0.015 | <0.013 | <0.014 | <0.012 |
| 91/06/10 | <0.009 | <0.014 | <0.014 | <0.017 | <0.011 | <0.013 |
| 91/06/17 | <0.007 | <0.010 | <0.014 | <0.012 | <0.012 | <0.024 |
| 91/06/24 | <0.011 | <0.016 | [illegible].015 | <0.015 | <0.010 | [illegible]15 |

## TABLE 14 (Continued)
NMP/JAF SITE
ENVIRONMENTAL CHARCOAL CARTRIDGE SAMPLES - ON-SITE STATIONS
I-131 ACTIVITY pCi/m$^3$ ± 1 SIGMA
LOCATION

| WEEK END | D1--ON | G--ON | H--ON | I--ON | J--ON | K--ON |
|---|---|---|---|---|---|---|
| 91/07/01 | <0.011 | <0.011 | <0.015 | <0.012 | <0.014 | <0.010 |
| 91/07/08 | <0.016 | <0.010 | <0.012 | <0.013 | <0.015 | <0.009 |
| 91/07/15 | <0.014 | <0.010 | <0.015 | <0.008 | <0.013 | <0.010 |
| 91/07/22 | <0.010 | <0.016 | <0.012 | <0.009 | <0.010 | <0.016 |
| 91/07/29 | <0.009 | <0.012 | <0.012 | <0.007 | <0.015 | <0.010 |
| 91/08/05 | <0.010 | <0.014 | <0.014 | <0.011 | <0.012 | <0.010 |
| 91/08/12 | <0.010 | <0.011 | <0.017 | <0.011 | <0.019 | <0.010 |
| 91/08/19 | <0.011 | <0.009 | <0.011 | <0.012 | <0.011 | <0.014 |
| 91/08/26 | <0.010 | <0.010 | <0.012 | <0.010 | <0.012 | <0.011 |
| 91/09/03 | <0.010 | <0.012 | <0.010 | <0.010 | <0.009 | <0.016 |
| 91/09/09 | <0.013 | <0.022 | <0.015 | <0.011 | <0.014 | <0.016 |
| 91/09/16 | <0.011 | <0.012 | <0.014 | <0.013 | <0.010 | <0.011 |
| 91/09/23 | <0.009 | <0.012 | <0.010 | <0.011 | <0.016 | <0.013 |
| 91/09/30 | <0.012 | <0.014 | <0.014 | <0.013 | <0.011 | <0.015 |
| 91/10/07 | <0.010 | <0.012 | <0.014 | <0.011 | <0.014 | <0.009 |
| 91/10/14 | <0.012 | <0.009 | <0.014 | <0.015 | <0.010 | <0.015 |
| 91/10/21 | <0.014 | <0.011 | <0.013 | <0.012 | <0.011 | <0.017 |
| 91/10/28 | <0.009 | <0.014 | <0.013 | <0.010 | <0.011 | <0.009 |
| 91/11/04 | <0.011 | <0.012 | <0.010 | <0.012 | <0.010 | <0.011 |
| 91/11/12 | <0.006 | <0.009 | <0.010 | <0.011 | <0.008 | <0.008 |
| 91/11/18 | <0.013 | <0.013 | <0.010 | <0.008 | <0.016 | <0.011 |
| 91/11/25 | <0.014 | <0.010 | <0.012 | <0.015 | <0.010 | <0.011 |
| 91/12/02 | <0.011 | <0.013 | <0.012 | <0.013 | <0.010 | <0.014 |
| 91/12/09 | <0.012 | <0.017 | <0.011 | <0.014 | <0.011 | <0.013 |
| 91/12/16 | <0.011 | <0.010 | <0.012 | <0.008 | <0.011 | <0.013 |
| 91/12/23 | <0.011 | <0.016 | <0.012 | <0.011 | <0.009 | <0.016 |
| 91/12/30 | <0.010 | <0.017 | <0.012 | <0.011 | <0.010 | <0.011 |

## TABLE 15

## CONCENTRATION OF GAMMA EMITTERS IN MILK

**Results in units of pCi/liter ± 2 sigma**

| LOCATION | NUCLIDES | 4/1/91 | 4/15/91 | 5/6/91 | 5/20/91 | 6/3/91 | 6/17/91 |
|---|---|---|---|---|---|---|---|
| 60 | K-40 | 1670 ± 67 | 1680 ± 86 | 1520 ± 66 | 1430 ± 65 | 1710 ± 69 | 1470 ± 64 |
| | Cs-134 | <6.5 | <8.8 | <5.5 | <5.6 | <7.6 | <5.7 |
| | Cs-137 | <6.9 | <8.3 | <7.2 | <6.7 | <6.7 | <6.0 |
| | Ba/La-140 | <5.5 | <12.9 | <8.8 | <6.4 | <8.4 | <9.0 |
| | Ra-226 | 104 ± 50 | 224 ± 82 | <120 | <115 | 69 ± 41 | <108 |
| | Others | <LLD | <LLD | <LLD | <LLD | <LLD | <LLD |
| 55 | K-40 | 1540 ± 69 | 1729 ± 70 | 1590 ± 68 | 1550 ± 66 | 1590 ± 66 | 1750 ± 71 |
| | Cs-134 | <8.6 | <7/3 | <7.2 | <6.3 | <6.0 | <6.9 |
| | Cs-137 | <7.8 | <6.4 | <6.3 | <5.7 | <5.7 | <6.6 |
| | Ba/La-140 | <9.9 | <6.2 | <8.7 | <8.5 | <9.4 | <7.6 |
| | Ra-226 | <109 | <145 | 73 ± 44 | 118 ± 45 | <114 | 142 ± 52 |
| | Others | <LLD | <LLD | <LLD | <LLD | <LLD | <LLD |
| 50 | K-40 | 1620 ± 101 | 1420 ± 70 | 1360 ± 69 | 1580 ± 96 | 1790 ± 88 | 1530 ± 66 |
| | Cs-134 | <11.9 | <7.9 | <8.6 | <9.3 | <10.3 | <5.2 |
| | Cs-137 | <11.9 | <7.7 | <6.5 | <10.6 | <9.5 | <6.1 |
| | Ba/La-140 | <14.4 | <7.2 | <7.7 | <13.3 | <10.9 | <7.6 |
| | Ra-226 | <179 | <113 | 105 ± 39 | <175 | 176 ± 66 | <112 |
| | Others | <LLD | <LLD | <LLD | <LLD | <LLD | <LLD |
| 7 | K-40 | 1610 ± 67 | 1380 ± 63 | 1630 ± 69 | 1540 ± 66 | 1420 ± 62 | 1680 ± 87 |
| | Cs-134 | <7.3 | <5.6 | <6.5 | <9.5 | <5.9 | <9.2 |
| | Cs-137 | <7/0 | <6.4 | <7.1 | <6.3 | <5.8 | <8.5 |
| | Ba/La-140 | <9.0 | <8.4 | <9.0 | <8.3 | <6.2 | <10.5 |
| | Ra-226 | <153 | 113 ± 46 | <123 | <125 | 158 ± 47 | 94 ± 55 |
| | Others | <LLD | <LLD | <LLD | <LLD | <LLD | <LLD |

**TABLE 15 (Continued)**

**CONCENTRATION OF GAMMA EMITTERS IN MILK**

**Results in units of pCi/liter ± 2 sigma**

| LOCATION | NUCLIDES | 4/1/91 | 4/15/91 | 5/6/91 | 5/20/91 | 6/3/91 | 6/17/91 |
|---|---|---|---|---|---|---|---|
| 4 | K-40 | 1550 ± 67 | 1380 ± 68 | 1530 ± 83 | 1520 ± 67 | 1580 ± 83 | 1680 ± 10.2 |
| | Cs-134 | <7.5 | <7.9 | <8.6 | <8.0 | <10.2 | <10.2 |
| | Cs-137 | <6.3 | <8.3 | <9.4 | <6.7 | <9.2 | <11.2 |
| | Ba/La-140 | <7.8 | <10.0 | <11.0 | <8.4 | <12.3 | <9.4 |
| | Ra-226 | <152 | <113 | <156 | <128 | <139 | <186 |
| | Others | <LLD | <LLD | <LLD | <LLD | <LLD | <LLD |
| 16 | K-40 | 1540 ± 83 | 1670 ± 68 | 1640 ± 85 | 1640 ± 85 | 1480 ± 10.1 | 1510 ± 64 |
| | Cs-134 | <8.5 | <8.0 | <9.7 | <8.2 | <8.4 | <5.6 |
| | Cs-137 | <9.0 | <7.7 | <9.4 | <8,0 | <11.2 | <6.4 |
| | Ba/La-140 | <10.6 | <6.0 | <10.5 | <13.9 | <11.2 | <8.8 |
| | Ra-226 | 261 ± 75 | <146 | 147 ± 63 | <150 | <177 | <112 |
| | Others | <LLD | <LLD | <LLD | <LLD | <LLD | <LLD |
| 65* (Control) | K-40 | 1610 ± 85 | 1620 ± 83 | 1690 ± 70 | 1480 ± 64 | 1630 ± 100 | 1550 ± 99 |
| | Cs-134 | <9.3 | <8.8 | <6.8 | <5.5 | <9.7 | <10.6 |
| | Cs-137 | <8.9 | <9.0 | <6.6 | <6.5 | <9.9 | <10.9 |
| | Ba/La-140 | <13.3 | <11.7 | <8.4 | <8.9 | <11.0 | <8.5 |
| | Ra-226 | 115 ± 63 | 77 ± 47 | <133 | 132 ± 36 | <177 | <174 |
| | Others | <LLD | <LLD | <LLD | <LLD | <LLD | <LLD |

* - Technical Specification location.

TABLE 15 (Continued)

CONCENTRATION OF GAMMA EMITTERS IN MILK

Results in units of pCi/liter ± 2 sigma

| LOCATION | NUCLIDES | 7/1/91 | 7/15/91 | 8/5/91 | 8/19/91 | 9/3/91 | 9/16/91 |
|---|---|---|---|---|---|---|---|
| 60 | K-40 | 1760 ± 71 | 1500 ± 64 | 1700 ± 86 | 1530 ± 82 | 1610 ± 86 | 1650 ± 83 |
| | Cs-134 | <6.9 | <5.5 | <9.0 | <7.6 | <8.5 | <9.0 |
| | Cs-137 | <7.2 | <6.7 | <9.2 | <10.0 | <8.8 | <8.4 |
| | Ba/La-140 | <8.4 | <6.4 | <10.9 | <12.6 | <8.2 | <9.2 |
| | Ra-226 | <124 | 52 ± 36 | <144 | <144 | <140 | <148 |
| | Others | <LLD | <LLD | <LLD | <LLD | <LLD | <LLD |
| 55 | K-40 | 1470 ± 65 | 1640 ± 101 | 1750 ± 85 | 1530 ± 81 | 1660 ± 68 | 1460 ± 65 |
| | Cs-134 | <6.1 | <10.6 | <9.4 | <10.0 | <7.4 | <6.0 |
| | Cs-137 | <6.5 | <9.9 | <8.7 | <8.4 | <6.8 | <4.6 |
| | Ba/La-140 | <7.0 | <8.8 | <6.2 | <9.1 | <7.6 | <8.8 |
| | Ra-226 | 111 ± 54 | <166 | <152 | <154 | <129 | 76 ± 42 |
| | Others | <LLD | <LLD | <LLD | <LLD | <LLD | <LLD |
| 50 | K-40 | 1550 ± 96 | 1510 ± 99 | 1620 ± 68 | 1570 ± 68 | 1530 ± 72 | 1580 ± 68 |
| | Cs-134 | <9.6 | <9.8 | <6.8 | <7.0 | <6.0 | <7.5 |
| | Cs-137 | <12.1 | <12.8 | <5.7 | <6.9 | <7.2 | <6.6 |
| | Ba/La-140 | <13.9 | <13.7 | <8.0 | <6.9 | <8.2 | <5.4 |
| | Ra-226 | 134 ± 68 | 111 ± 65 | <132 | <121 | <112 | 96 ± 52 |
| | Others | <LLD | <LLD | <LLD | <LLD | <LLD | <LLD |
| 7 | K-40 | 1560 ± 66 | 1500 ± 65 | 1630 ± 69 | 1440 ± 65 | 1440 ± 62 | 1620 ± 99 |
| | Cs-134 | <6.7 | <6.3 | <7.2 | <6.5 | <5.6 | <9.0 |
| | Cs-137 | <7.0 | <6.9 | <7.7 | <6.6 | <5.8 | <10.4 |
| | Ba/La-140 | <6.8 | <7.6 | <8.7 | <7.6 | <6.2 | <14.2 |
| | Ra-226 | <117 | 107 ± 37 | 124 ± 45 | 100 ± 43 | <116 | <179 |
| | Others | <LLD | <LLD | <LLD | <LLD | <LLD | <LLD |

TABLE 15 (Continued)

CONCENTRATION OF GAMMA EMITTERS IN MILK

Results in units of pCi/liter ± 2 sigma

| LOCATION | NUCLIDES | 7/1/91 | 7/15/91 | 8/5/91 | 8/19/91 | 9/3/91 | 9/16/91 |
|---|---|---|---|---|---|---|---|
| 4 | K-40 | 1430 ± 95 | 1510 ± 65 | 1490 ± 66 | 1530 ± 73 | 1510 ± 65 | 1440 ± 83 |
| | Cs-134 | <10.4 | <5.4 | <5.2 | <5.6 | <6.0 | <9.5 |
| | Cs-137 | <11.8 | <5.8 | <6.0 | <6.6 | <6.9 | <8.4 |
| | Ba/La-140 | <11.8 | <5.5 | <8.9 | <10.4 | <6.8 | <9.5 |
| | Ra-226 | <172 | <114 | 104 ± 46 | 127 ± 48 | 139 ± 45 | <153 |
| | Others | <LLD | <LLD | <LLD | <LLD | <LLD | <LLD |
| 16 | K-40 | 1710 ± 88 | 1660 ± 101 | 1480 ± 74 | 1610 ± 81 | 1700 ± 104 | 1530 ± 74 |
| | Cs-134 | <10.2 | <9.9 | <6.4 | <7.9 | <10.2 | <7.2 |
| | Cs-137 | <9.6 | <12.1 | <8.0 | <9.8 | <12.1 | <6.6 |
| | Ba/La-140 | <9.1 | <12.9 | <10.8 | <11.0 | <9.9 | <10.4 |
| | Ra-226 | <149 | <183 | 129 ± 42 | <157 | <177 | <113 |
| | Others | <LLD | <LLD | <LLD | <LLD | <LLD | <LLD |
| 65* (Control) | K-40 | 1780 ± 88 | 1470 ± 64 | 1600 ± 83 | 1260 ± 62 | 1320 ± 96 | 1540 ± 100 |
| | Cs-134 | <8.8 | <5.7 | <9.0 | <6.5 | <9.5 | <10.5 |
| | Cs-137 | <8.0 | <6.5 | <7.2 | <6.2 | <9.9 | <12.9 |
| | Ba/La-140 | <11.6 | <9.4 | <8.5 | <7.5 | <12.3 | <12.9 |
| | Ra-226 | 241 ± 59 | <117 | <143 | 118 ± 40 | <179 | 160 ± 50 |
| | Others | <LLD | <LLD | <LLD | <LLD | <LLD | <LLD |

* - Technical Specification location.

TABLE 15 (Continued)

CONCENTRATION OF GAMMA EMITTERS IN MILK

Results in units of pCi/liter ± 2 sigma

| LOCATION | NUCLIDES | 10/7/91 | 10/21/91 | 11/4/91 | 11/18/91 | 12/2/91 | 12/16/91 |
|---|---|---|---|---|---|---|---|
| 60 | K-40 | 1650 ± 69 | 1500 ± 66 | 1430 ± 64 | 1550 ± 83 | 1490 ± 64 | 1530 ± 67 |
| | Cs-134 | <7.0 | <6.8 | <5.6 | <9.2 | <5.5 | <6.7 |
| | Cs-137 | <7.1 | <6.4 | <6.0 | <7.8 | <6.4 | <7.5 |
| | Ba/La-140 | <9.4 | <8.4 | <10.0 | <9.8 | <10.6 | <8.0 |
| | Ra-226 | 49 ± 31 | 105 ± 52 | 143 ± 52 | 103 ± 37 | 97 ± 55 | <125 |
| | Others | <LLD | <LLD | <LLD | <LLD | <LLD | <LLD |
| 55 | K-40 | 1670 ± 98 | 1460 ± 70 | 1580 ± 83 | 1620 ± 68 | 1560 ± 66 | 1580 ± 84 |
| | Cs-134 | <8.9 | <7.7 | <9.2 | <5.3 | <6.8 | <9.2 |
| | Cs-137 | <11.7 | <7.5 | <8.8 | <6.0 | <6.3 | <8.7 |
| | Ba/La-140 | <14.9 | <9.9 | <13.4 | <6.8 | <5.7 | <9.2 |
| | Ra-226 | <173 | 84 ± 30 | <153 | 80 ± 28 | 78 ± 28 | <154 |
| | Others | <LLD | <LLD | <LLD | <LLD | <LLD | <LLD |
| 50 | K-40 | 1610 ± 101 | 1640 ± 69 | 1450 ± 64 | 1600 ± 88 | 1680 ± 87 | 1380 ± 83 |
| | Cs-134 | <10.4 | <6.9 | <5.5 | <9.3 | <8.6 | <8.2 |
| | Cs-137 | <9.7 | <7.2 | <6.2 | <11.4 | <10.0 | <10.7 |
| | Ba/La-140 | <11.8 | <7.6 | <8.1 | <10.8 | <13.3 | <13.0 |
| | Ra-226 | 104 ± 65 | <125 | 87 ± 50 | <158 | 167 ± 62 | <158 |
| | Others | <LLD | <LLD | <LLD | <LLD | <LLD | <LLD |
| 7 | K-40 | 1420 ± 63 | 1740 ± 73 | 1520 ± 82 | 1450 ± 64 | 1600 ± 82 | 1640 ± 85 |
| | Cs-134 | <6.2 | <7.7 | <9.0 | <5.6 | <7.9 | <9.2 |
| | Cs-137 | <7.0 | <7.0 | <7.7 | <6.6 | <8.1 | <9.7 |
| | Ba/La-140 | <5.7 | <6.8 | <9.3 | <7.1 | <12.1 | <12.0 |
| | Ra-226 | <109 | <125 | <148 | <108 | 130 ± 40 | <148 |
| | Others | <LLD | <LLD | <LLD | <LLD | <LLD | <LLD |

TABLE 15 (Continued)

CONCENTRATION OF GAMMA EMITTERS IN MILK

Results in units of pCi/liter ± 2 sigma

| LOCATION | NUCLIDES | 10/7/91 | 10/21/91 | 11/4/91 | 11/18/91 | 12/2/91 | 12/16/91 |
|---|---|---|---|---|---|---|---|
| 4 | K-40 | 1460 ± 71 | 1620 ± 68 | 1520 ± 82 | 1730 ± 7.0 | 1680 ± 103 | 1500 ± 80 |
| | Cs-134 | <6.5 | <8.1 | <9.0 | <7.2 | <9.8 | <8.0 |
| | Cs-137 | <6.6 | <6.4 | <7.7 | <7.0 | <11.5 | <9.5 |
| | Ba/La-140 | <10.4 | <6.0 | <9.3 | <7.6 | <13.4 | <11.9 |
| | Ra-226 | <107 | <125 | <148 | <119 | <184 | <155 |
| | Others | <LLD | <LLD | <LLD | <LLD | <LLD | <LLD |
| 16 | K-40 | 1620 ± 74 | 1490 ± 72 | 1710 ± 70 | 1690 ± 84 | 1720 ± 72 | 1540 ± 81 |
| | Cs-134 | <6.2 | <6.3 | <9.8 | <10.3 | <6.7 | <9.8 |
| | Cs-137 | <6.1 | <7.4 | <7.0 | <8.1 | <7.2 | <8.7 |
| | Ba/La-140 | <7.7 | <11.3 | <6.8 | <13.3 | <8.3 | <12.0 |
| | Ra-226 | <111 | <116 | <128 | <149 | <127 | 150 ± 60 |
| | Others | <LLD | <LLD | <LLD | <LLD | <LLD | <LLD |
| 65* (Control) | K-40 | 1480 ± 65 | 1360 ± 62 | 1610 ± 68 | 1610 ± 86 | 1680 ± 70 | 1620 ± 68 |
| | Cs-134 | <6.6 | <6.6 | <7.6 | <12.0 | <7.3 | <6.6 |
| | Cs-137 | <6.0 | <6.6 | <7.0 | <9.5 | <6.7 | <7.2 |
| | Ba/La-140 | <5.9 | <9.3 | <7.2 | <9.4 | <6.4 | <7.6 |
| | Ra-226 | 100 ± 35 | 160 ± 50 | <129 | 117 ± 67 | 107 ± 55 | 106 ± 32 |
| | Others | <LLD | <LLD | <LLD | <LLD | <LLD | <LLD |

* - Technical Specification location.

**TABLE 16**

**CONCENTRATION OF IODINE - 131 IN MILK (1)**

**Results in units of pCi/liter ± 2 sigma**

| LOCATION | 4/1/91 | 4/15/91 | 5/6/91 | 5/20/91 | 6/3/91 | 6/17/91 |
|---|---|---|---|---|---|---|
| 60 | <0.54 | <0.62 | <0.56 | <0.56 | <0.57 | <0.57 |
| 55 | <0.50 | <0.55 | <0.52 | <0.54 | <0.57 | <0.55 |
| 50 | <0.72 | <0.58 | <0.49 | <0.48 | <0.53 | <0.52 |
| 7 | <0.48 | <0.50 | <0.53 | <0.61 | <0.50 | <0.59 |
| 4 | <0.55 | <0.55 | <0.59 | <0.60 | <0.66 | <0.55 |
| 16 | <0.57 | <0.49 | <0.54 | <0.55 | <0.53 | <0.48 |
| 65* | <0.63 | <0.64 | <0.62 | <0.54 | <0.55 | <0.84 |

| LOCATION | 7/1/91 | 7/15/91 | 8/5/91 | 8/19/91 | 9/3/91 | 9/16/91 |
|---|---|---|---|---|---|---|
| 60 | <0.39 | <0.62 | <0.39 | <0.50 | <0.50 | <0.57 |
| 55 | <0.58 | <0.69 | <0.39 | <0.67 | <0.54 | <0.36 |
| 50 | <0.57 | <0.44 | <0.49 | <0.62 | <0.57 | <0.52 |
| 7 | <0.64 | <0.52 | <0.47 | <0.57 | <0.54 | <0.65 |
| 4 | <0.51 | <0.66 | <0.56 | <0.54 | <0.43 | <0.54 |
| 16 | <0.63 | <0.58 | <0.54 | <0.39 | <0.39 | <0.57 |
| 65* | <0.56 | <0.60 | <0.59 | <0.53 | <0.51 | <0.52 |

| LOCATION | 10/7/91 | 10/21/91 | 11/4/91 | 11/18/91 | 12/2/91 | 12/16/91 |
|---|---|---|---|---|---|---|
| 60 | <0.47 | <0.59 | <0.36 | <0.55 | <0.62 | <0.44 |
| 55 | <0.53 | <0.49 | <0.48 | <0.35 | <0.52 | <0.63 |
| 50 | <0.53 | <0.46 | <0.50 | <0.53 | <0.67 | <0.60 |
| 7 | <0.36 | <0.38 | <0.54 | <0.47 | <0.46 | <0.58 |
| 4 | <0.56 | <0.54 | <0.51 | <0.51 | <0.52 | <0.44 |
| 16 | <0.51 | <0.55 | <0.53 | <0.48 | <0.68 | <0.36 |
| 65* | <0.48 | <0.53 | <0.56 | <0.38 | <0.54 | <0.52 |

* - Control Result. Technical Specification location.
(1) Iodine 131 results are corrected for decay to the sample stop date.

TAB[illegible]7A

CONCENTRATION OF GAMMA EMITTERS IN FOOD PRODUCTS

Results in units of pCi/g (wet) ± 2 sigma

| LOCATION | DATE | SAMPLE TYPE | Be-7 | K-40 | I-131 | Cs-134 | Cs-137 | Ra-226 | AcTh-228 | OTHER |
|---|---|---|---|---|---|---|---|---|---|---|
| T | 8/26/91 | Cucumber Leaves | 1.10±0.06 | 2.85±0.13 | <0.02 | <0.02 | <0.01 | 0.30±0.08 | <0.06 | <LLD |
| T | 8/26/91 | Green Bean Leaves | 0.55±0.04 | 4.01±0.12 | <0.02 | <0.01 | <0.01 | 0.26±0.08 | 0.05±0.02 | <LLD |
| T | 8/26/91 | Cabbage | 0.06±0.03 | 3.55±0.12 | <0.01 | <0.01 | <0.01 | 0.33±0.08 | <0.05 | <LLD |
| T | 8/26/91 | Squash Leaves | 0.45±0.04 | 3.36±0.13 | <0.01 | <0.01 | <0.01 | 0.26±0.07 | <0.05 | <LLD |
| K | 8/26/91 | Corn Leaves | 0.65±0.08 | 5.36±0.24 | <0.03 | <0.02 | <0.03 | <0.36 | <0.11 | <LLD |
| K | 8/26/91 | Green Bean Leaves | 0.42±0.04 | 3.79±0.12 | <0.01 | <0.01 | <0.01 | 0.16±0.07 | 0.06±0.01 | <LLD |
| K | 8/26/91 | Squash Leaves | 0.93±0.04 | 4.46±0.12 | <0.01 | <0.01 | <0.01 | 0.31±0.09 | 0.03±0.02 | <LLD |
| L | 8/26/91 | Cucumber Leaves | 0.75±0.03 | 1.19±0.05 | <0.01 | <0.01 | <0.01 | 0.21±0.05 | <0.02 | <LLD |
| L | 8/26/91 | Green Bean Leaves | 0.37±0.03 | 1.39±0.07 | <0.01 | <0.01 | <0.01 | 0.14±0.05 | <0.04 | <LLD |
| L | 8/26/91 | Pepper Leaves | 0.24±0.03 | 5.35±0.12 | <0.01 | <0.01 | <0.01 | 0.25±0.08 | 0.04±0.02 | <LLD |
| N | 8/27/91 | Grape Leaves | 0.35±0.03 | 3.20±0.09 | <0.01 | <0.01 | <0.01 | 0.22±0.06 | 0.03±0.01 | <LLD |
| N | 8/27/91 | Squash Leaves | 0.50±0.04 | 3.49±0.11 | <0.01 | <0.01 | 0.04±0.01 | 0.23±0.08 | 0.03±0.02 | <LLD |
| Z | 8/26/91 | Pepper Leaves | 0.09±0.02 | 6.99±0.11 | <0.01 | <0.01 | <0.01 | 0.18±0.04 | <0.03 | <LLD |
| Z | 8/26/91 | Lettuce | 0.05±0.02 | 3.64±0.09 | <0.01 | <0.01 | <0.01 | <0.10 | <0.03 | <LLD |
| Z | 8/25/91 | Grape Leaves | 0.38±0.05 | 3.11±0.14 | <0.01 | <0.01 | <0.02 | 0.23±0.08 | <0.06 | <LLD |
| Z | 8/26/91 | Bean Leaves | 0.30±0.04 | 4.35±0.13 | <0.01 | <0.01 | <0.01 | <0.17 | <0.05 | <LLD |
| M* | 8/26/91 | Cucumber Leaves | 0.36±0.03 | 2.41±0.08 | <0.01 | <0.01 | <0.01 | 0.20±0.05 | 0.03±0.01 | <LLD |
| M* | 8/26/91 | Pepper Leaves | 0.34±0.04 | 6.63±0.13 | <0.01 | <0.01 | <0.01 | 0.20±0.06 | <0.04 | <LLD |
| M* | 8/26/91 | Squash Leaves | 0.25±0.04 | 5.09±0.14 | <0.02 | <0.02 | <0.01 | 0.30±0.10 | 0.06±0.02 | <LLD |
| M* | 8/26/91 | Grape Leaves | 0.66±0.06 | 2.92±0.14 | <0.01 | <0.01 | <0.02 | 0.43±0.10 | <0.08 | <LLD |
| M* | 8/26/91 | Green Bean Leaves | 0.48±0.04 | 4.60±0.14 | <0.01 | <0.02 | <0.02 | 0.36±0.10 | 0.06±0.02 | <LLD |

* - Control result
All results in units of activity <u>per gram</u> wet weight

TABLE 17B

CONCENTRATION OF GAMMA EMITTERS IN FOOD PRODUCTS

Results in units of pCi/kg (wet) ± 2 sigma

| LOCATION | DATE | SAMPLE TYPE | Be-7 | K-40 | I-131 | Cs-134 | Cs-137 | Ra-226 | AcTh-228 | OTHER |
|---|---|---|---|---|---|---|---|---|---|---|
| T | 8/26/91 | Cucumber Leaves | 1100 ± 58 | 2850±126 | <17 | <15 | <13 | 303 ± 77 | <60 | <LLD |
| T | 8/26/91 | Green Bean Leaves | 550 ± 45 | 4010±123 | <16 | <14 | <14 | 262 ± 85 | 49 ± 16 | <LLD |
| T | 8/26/91 | Cabbage | 56 ± 29 | 3550±119 | <11 | <12 | <12 | 328 ± 78 | <47 | <LLD |
| T | 8/26/91 | Squash Leaves | 453 ± 39 | 3360±129 | <12 | <13 | <12 | 258 ± 73 | <49 | <LLD |
| K | 8/26/91 | Corn Leaves | 647 ± 80 | 5360±239 | <27 | <24 | <28 | <358 | <111 | <LLD |
| K | 8/26/91 | Green Bean Leaves | 420 ± 41 | 3790±121 | <12 | <13 | <12 | 157 ± 68 | 64 ± 15 | <LLD |
| K | 8/26/91 | Squash Leaves | 928 ± 43 | 4460±118 | <11 | <12 | <12 | 313 ± 90 | 30 ± 15 | <LLD |
| L | 8/26/91 | Cucumber Leaves | 749 ± 31 | 1190±53 | <8 | <6 | <7 | 212 ± 47 | <25 | <LLD |
| L | 8/26/91 | Green Bean Leaves | 371 ± 35 | 1390±73 | <12 | <8 | <11 | 145 ± 54 | <39 | <LLD |
| L | 8/26/91 | Pepper Leaves | 245 ± 33 | 5350±124 | <12 | <12 | <11 | 249 ± 76 | 36 ± 18 | <LLD |
| N | 8/27/91 | Grape Leaves | 349 ± 30 | 3200±90 | <9 | <10 | <9 | 225 ± 59 | 35 ± 13 | <LLD |
| N | 8/26/91 | Squash Leaves | 499 ± 36 | 3490±111 | <12 | <12 | 42 ± 5 | 233 ± 80 | 34 ± 16 | <LLD |
| Z | 8/26/91 | Pepper Leaves | 90 ± 21 | 6990±110 | <7 | <6 | <7 | 176 ± 43 | <29 | <LLD |
| Z | 8/26/91 | Lettuce | 45 ± 18 | 3640±89 | <7 | <7 | <7 | <98 | <33 | <LLD |
| Z | 8/25/91 | Grape Leaves | 384 ± 49 | 3110±140 | <17 | <14 | <15 | 234 ± 80 | <62 | <LLD |
| Z | 8/26/91 | Bean Leaves | 305 ± 37 | 4350±127 | <12 | <13 | <12 | <170 | <48 | <LLD |
| M* | 8/26/91 | Cucumber Leaves | 357 ± 28 | 2410±84 | <8 | <8 | <8 | 202 ± 53 | 26 ± 11 | <LLD |
| M* | 8/26/91 | Pepper Leaves | 336 ± 28 | 6630±133 | <11 | <10 | <10 | 197 ± 59 | <42 | <LLD |
| M* | 8/26/91 | Squash Leaves | 249 ± 43 | 5090±142 | <15 | <17 | <14 | 302 ± 101 | 56 ± 24 | <LLD |
| M* | 8/26/91 | Grape Leaves | 664 ± 58 | 2920±145 | <17 | <14 | <18 | 430 ± 98 | <76 | <LLD |
| M* | 8/26/91 | Green Bean Leaves | 478 ± 42 | 4600±143 | <14 | <16 | <15 | 359 ± 96 | 60 ± 17 | <LLD |

* - Control result
All results in units of activity per kilogram wet weight

TABLE 18

MILK ANIMAL CENSUS

1991

| TOWN OR AREA(a) | NO. ON CENSUS MAP(1) | DEGREES(3) | DISTANCE(3) | NO. OF MILK ANIMALS |
|---|---|---|---|---|
| Scriba | 16* | 190° | 5.9 | 40C |
| | 2 | 195° | 8.0 | None |
| | 3 | 190° | 4.5 | 3C |
| | 6 | 162° | 2.2 | 1C |
| | 26 | 114° | 1.5 | ND |
| | 61 | 140° | 3.0 | 5G |
| | 62 | 183° | 6.7 | 7G |
| | 63 | 185° | 8.0 | 40C |
| New Haven | 9 | 95° | 5.2 | 45C |
| | 4* | 113° | 7.8 | 95C |
| | 45 | 125° | 8.0 | ND |
| | 10 | 130° | 2.6 | 28C |
| | 5 | 146° | 7.2 | 46C |
| | 11 | 130° | 8.5 | None |
| | 7* | 107° | 5.5 | 62C |
| | 64 | 107° | 7.9 | 50C |
| | 71 | 111° | 4.2 | 3G |
| Mexico | 12 | 107° | 11.5 | 22C |
| | 14 | 120° | 9.8 | 62C |
| | 17 | 115° | 10.2 | 2C |
| | 19 | 132° | 10.5 | 40C |
| | 60* | 90° | 9.5 | 40C |
| | 50* | 93° | 9.3 | 150C |
| | 55* | 95° | 9.0 | 50C |
| | 21 | 112° | 10.5 | 75C |
| | 68 | 108° | 11.6 | 79C |
| | 49 | 88° | 7.9 | 5G |
| Richland | 22 | 85° | 10.2 | 43C |
| Pulaski | 23 | 92° | 10.5 | None |
| | 69 | 85° | 11.6 | 45C |
| Sterling | 65** | 220° | 17.0 | 45C |
| Volney | 25 | 182° | 9.5 | 40C |
| | 70 | 147° | 9.4 | 20C |
| | 66 | 156° | 7.8 | 70C |
| | 67 | 152° | 8.3 | None |

MILKING ANIMAL TOTALS: 1,193 Cows
(including control locations) 20 Goats

MILKING ANIMAL TOTALS: 1,148 Cows (b)
(exlcuding control locations) 20 Goats (b)

**TABLE 18 (Continued)**

**MILK ANIMAL CENSUS**

**1991**

NOTES:

C = Cows
G = Goats
* = Milk sample location
** = Milk sample control location
ND = Did not wish to participate in the survey
(1) = References Figure 4
(2) = Goat is not currently producing milk or any milk produced is utilized by the owner
(3) = Degrees and distance are based on NMP-2 Reactor Building centerline
None = No cows or goats at that location. Location was a previous location with cows and/or goats.
(a) = Census performed out to a distance of approximately ten miles.
(b) = Totals excluding control location results.

TABLE 19

1991 RESIDENCE CENSUS

| LOCATION | MAP (1) LOCATION | METEOROLOGICAL SECTOR | DEGREES (2) | DISTANCE (2) |
|---|---|---|---|---|
| * | | N | -- | -- |
| * | | NNE | -- | -- |
| * | | NE | -- | -- |
| * | | ENE | -- | -- |
| Lake Road | A | E | 99° | 1.3 miles |
| Lake Road | B | ESE | 102° | 1.1 miles |
| County Route 29 | C | SE | 130° | 1.4 miles |
| Miner Road | D | SSE | 163° | 1.6 miles |
| Miner Road | E | S | 170° | 1.6 miles |
| Lakeview Road | F | SSW | 207° | 1.2 miles |
| Bible Camp Retreat | G | SW | 234° | 0.9 miles |
| Bible Camp Retreat | H | WSW | 238° | 0.9 miles |
| * | | W | -- | -- |
| * | | WNW | -- | -- |
| * | | NW | -- | -- |
| * | | NNW | -- | -- |

* This meteorological sector is over Lake Ontario. There is no residence within five miles.

(1) Corresponds to Figure 3.

(2) Based on NMP-2 reactor centerline.

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TABLE 20

INTERLABORATORY COMPARISON PROGRAM RESULTS

| ANALYSIS | DATE | MEDIUM | SITE REFERENCE NO. | EPA RESULT (1) | SITE RESULT (2) |
|---|---|---|---|---|---|
| Beta | 3/91 | Air Filter (pCi/filter) | QA 91-025 | 124 ± 6 | 130 ± 2 (3)<br>129 ± 2<br>131 ± 2 |
| Beta | 8/91 | Air Filter (pCi/filter) | QA 91-086 | 92 ± 10 | 96 ± 3 (3)<br>95 ± 3<br>95 ± 3 |
| Tritium | 2/91 | Water (pCi/liter) | QA 91-019 | 4418 ± 442 | 4400 ± 100 (4)<br>4500 ± 100<br>4700 ± 100 |
| Tritium | 6/91 | Water (pCi/liter) | QA 91-063 | 12480 ± 1248 | 13000 ± 1000 (4)<br>13000 ± 1000<br>13000 ± 1000 |
| Tritium | 10/91 | Water (pCi/liter) | QA 91-111 | 2454 ± 352 | 2400 ± 200 (4)<br>2600 ± 200<br>2500 ± 200 |
| Beta | 4/91 | Water (pCi/liter) | QA 91-033 | 115 ± 17 | 105 ± 2 (3)<br>103 ± 2<br>113 ± 2 |
| Beta | 10/91 | Water (pCi/liter) | QA 91-112 | 65 ± 10 | 53 ± 1 (3)<br>53 ± 1<br>54 ± 1 |
| I-131 | 4/91 | Milk (pCi/liter) | QA 91-034 | 60 ± 6 | 61 ± 4 (3)<br>58 ± 20 (4) |

TABLE 20 (Continued)

INTERLABORATORY COMPARISON PROGRAM RESULTS

| ANALYSIS | DATE | MEDIUM | SITE REFERENCE NO. | EPA RESULT (1) | SITE RESULT (2) |
|---|---|---|---|---|---|
| I-131 | 2/91 | Water (pCi/liter) | QA 91-018 | 75 ± 8 | 85 ± 3 (3)<br>83 ± 2<br>87 ± 3 |
| I-131 | 8/91 | Water (pCi/liter) | QA 91-084 | 20 ± 6 | 21 ± 1 (3)<br>20 ± 1<br>21 ± 1 |
| Gamma (Cs-137) | 3/91 | Air Filter (pCi/filter) | QA 91-025 | 40 ± 5 | 38 ± 3 (3)<br>37 ± 3<br>37 ± 3 |
| Gamma (Cs-137) | 8/91 | Air Filter (pCi/filter) | QA 91-086 | 30 ± 5 | 26 ± 3 (3)<br>28 ± 3<br>32 ± 3 |
| Gamma (Cs-137) | 4/91 | Milk (pCi/liter) | QA 91-034 | 49 ± 5 | 54 ± 4 (3) |
| Beta | 1/91 | Water (pCi/liter) | QA 91-016 | 5 ± 5 | 6 ± 1 (3)<br>6 ± 1<br>7 ± 1 |
| Beta | 5/91 | Water (pCi/liter) | QA 91-035 | 46 ± 5 | 46 ± 1 (3)<br>50 ± 1<br>52 ± 1 |
| Beta | 9/91 | Water (pCi/liter) | QA 91-099 | 20 ± 5 | 20 ± 1 (3)<br>22 ± 1<br>19 ± 1 |

## TABLE 20 (Continued)

## INTERLABORATORY COMPARISON PROGRAM RESULTS

| ANALYSIS | DATE | MEDIUM | SITE REFERENCE NO. | EPA RESULT (1) | SITE RESULT (2) |
|---|---|---|---|---|---|
| Gamma (Ba-133) | 2/91 | Water (pCi/liter) | QA 91-017 | 75 ± 8 | 73 ± 3 (3)<br>78 ± 5<br>68 ± 3 |
| Gamma (Zn-65) | 2/91 | Water (pCi/liter) | QA 91-017 | 149 ± 15 | 153 ± 7 (3)<br>151 ± 7<br>139 ± 10 |
| Gamma (Ru-106) | 2/91 | Water (pCi/liter) | QA 91-017 | 186 ± 19 | 169 ± 20 (3)<br>158 ± 18<br>165 ± 32 |
| Gamma (Cs-134) | 2/91 | Water (pCi/liter) | QA 91-017 | 8 ± 5 | 6 ± 1 (3)<br>6 ± 1<br>6 ± 2 |
| Gamma (Cs-137) | 2/91 | Water (pCi/liter) | QA 91-017 | 8 ± 5 | 8 ± 2 (3)<br>11 ± 2<br>7 ± 2 |
| Gamma (Co-60) | 2/91 | Water (pCi/liter) | QA 91-017 | 40 ± 5 | 39 ± 2 (3)<br>39 ± 2<br>37 ± 3 |
| I-131 | 9/91 | Milk (pCi/liter) | QA 91-100 | 108 ± 11 | 111 ± 3 (3)<br>116 ± 2<br>94 ± 2 |
| Gamma (Cs-137) | 9/91 | Milk (pCi/liter) | QA 91-100 | 30 ± 5 | 28 ± 3 (3)<br>26 ± 3<br>26 ± 5 |

TABLE 20 (Continued)

INTERLABORATORY COMPARISON PROGRAM RESULTS

| ANALYSIS | DATE | MEDIUM | SITE REFERENCE NO. | EPA RESULT (1) | SITE RESULT (2) |
|---|---|---|---|---|---|
| Gamma (Co-60) | 6/91 | Water (pCi/liter) | QA 91-062 | 10 ± 5 | 10 ± 2 (3)<br>9 ± 1<br>10 ± 1 |
| Gamma (Zn-65) | 6/91 | Water (pCi/liter) | QA 91-062 | 108 ± 11 | 114 ± 6 (3)<br>111 ± 7<br>110 ± 5 |
| Gamma (Ru-106) | 6/91 | Water (pCi/liter) | QA 91-062 | 149 ± 15 | 123 ± 27 (3)<br>143 ± 20<br>162 ± 17 |
| Gamma (Cs-134) | 6/91 | Water (pCi/liter) | QA 91-062 | 15 ± 5 | 10 ± 1 (3)<br>11 ± 2<br>10 ± 1 |
| Gamma (Cs-137) | 6/91 | Water (pCi/liter) | QA 91-062 | 14 ± 5 | 12 ± 2 (3)<br>15 ± 2<br>13 ± 2 |
| Gamma (Ba-133) | 6/91 | Water (pCi/liter) | QA 91-062 | 62 ± 6 | 59 ± 3 (3)<br>59 ± 3<br>54 ± 3 |

TABLE 20 (Continued)

INTERLABORATORY COMPARISON PROGRAM RESULTS

| ANALYSIS | DATE | MEDIUM | SITE REFERENCE NO. | EPA RESULT (1) | SITE RESULT (2) |
|---|---|---|---|---|---|
| Gamma (Co-60) | 10/91 | Water (pCi/liter) | QA 91-103 | 29 ± 5 | 28 ± 2 (3)<br>28 ± 3<br>27 ± 2 |
| Gamma (Zn-65) | 10/91 | Water (pCi/liter) | QA 91-103 | 73 ± 7 | 67 ± 9 (3)<br>69 ± 6<br>64 ± 6 |
| Gamma (Ru-106) | 10/91 | Water (pCi/liter) | QA 91-103 | 199 ± 20 | 166 ± 36 (3)<br>161 ± 15<br>130 ± 22 |
| Gamma (Cs-134) | 10/91 | Water (pCi/liter) | QA 91-103 | 10 ± 5 | 9 ± 4 (3)<br>7 ± 2<br>8 ± 2 |
| Gamma (Cs-137) | 10/91 | Water (pCi/liter) | QA 91-103 | 10 ± 5 | 8 ± 3 (3)<br>6 ± 2<br>9 ± 2 |
| Gamma (Ba-133) | 10/91 | Water (pCi/liter) | QA 91-103 | 98 ± 10 | 95 ± 6 (3)<br>91 ± 4<br>90 ± 4 |

## TABLE 20 (Continued)

## INTERLABORATORY COMPARISON PROGRAM RESULTS

| ANALYSIS | DATE | MEDIUM | SITE REFERENCE NO. | EPA RESULT (1) | SITE RESULT (2) |
|---|---|---|---|---|---|
| Gamma (Cs-134) | 4/91 | Water (pCi/liter) | QA 91-033 | 24 ± 5 | 21 ± 2 (3)<br>19 ± 1<br>20 ± 1 |
| Gamma (Cs-137) | 4/91 | Water (pCi/liter) | QA 91-033 | 25 ± 5 | 23 ± 2 (3)<br>19 ± 2<br>26 ± 3 |
| Gamma (Cs-134) | 10/91 | Water (pCi/liter) | QA 91-112 | 10 ± 5 | 8 ± 2 (3)<br>7 ± 3<br>9 ± 1 |
| Gamma (Cs-137) | 10/91 | Water (pCi/liter) | QA 91-112 | 11 ± 5 | 12 ± 2 (3)<br>17 ± 3<br>12 ± 2 |
| Gamma (Co-60) | 10/91 | Water (pCi/liter) | QA 91-112 | 20 ± 5 | 19 ± 2 (3)<br>18 ± 2<br>19 ± 2 |

## TABLE 20 (Continued)

## INTERLABORATORY COMPARISON PROGRAM RESULTS

NOTES:

(1) Results reported as activity ± the standard deviation of the error.

(2) Results reported as activity ± the error (2 sigma).

(3) Analyzed at the site environmental laboratory.

(4) Analyzed at a vendor laboratory.

(5) No results: No sample sent by EPA.

TABLE 21

HISTORICAL ENVIRONMENTAL SAMPLE DATA
SHORELINE SEDIMENT

| | Cs-134 | | | Cs-137 | | | Co-60 | | |
|---|---|---|---|---|---|---|---|---|---|
| LOCATION: CONTROL [1] | | | | | | | | | |
| YEAR | MIN. | MAX. | MEAN | MIN. | MAX. | MEAN | MIN. | MAX. | MEAN |
| 1979 (2) | LLD | LLD | LLD | 0.22 | 0.22 | 0.22 | LLD | LLD | LLD |
| 1980 | LLD | LLD | LLD | 0.07 | 0.09 | 0.08 | LLD | LLD | LLD |
| 1981 | LLD | LLD | LLD | LLD | LLD | LLD | LLD | LLD | LLD |
| 1982 | LLD | LLD | LLD | 0.05 | 0.05 | 0.05 | LLD | LLD | LLD |
| 1983 | LLD | LLD | LLD | LLD | LLD | LLD | LLD | LLD | LLD |
| 1984 | LLD | LLD | LLD | LLD | LLD | LLD | LLD | LLD | LLD |
| 1985 | LLD | LLD | LLD | LLD | LLD | LLD | LLD | LLD | LLD |
| 1986 | LLD | LLD | LLD | LLD | LLD | LLD | LLD | LLD | LLD |
| 1987 | LLD | LLD | LLD | LLD | LLD | LLD | LLD | LLD | LLD |
| 1988 | LLD | LLD | LLD | LLD | LLD | LLD | LLD | LLD | LLD |
| 1989 | LLD | LLD | LLD | LLD | LLD | LLD | LLD | LLD | LLD |
| 1990 | LLD | LLD | LLD | LLD | LLD | LLD | LLD | LLD | LLD |
| 1991 | LLD | LLD | LLD | LLD | LLD | LLD | LLD | LLD | LLD |

Results in pCi/g (dry)

(1) Control location was at an area beyond the influence of the site (westerly direction).
(2) Sampling was initiated in 1979. Sampling was not required prior to 1979.

TABLE 22

HISTORICAL ENVIRONMENTAL SAMPLE DATA
SHORELINE SEDIMENT

| | Cs-134 | | | Cs-137 | | | Co-60 | | |
|---|---|---|---|---|---|---|---|---|---|
| LOCATION: INDICATOR (SUNSET BAY) (1) | | | | | | | | | |
| YEAR | MIN. | MAX. | MEAN | MIN. | MAX. | MEAN | MIN. | MAX. | MEAN |
| 1979 | (2) | (2) | (2) | (2) | (2) | (2) | (2) | (2) | (2) |
| 1980 | (2) | (2) | (2) | (2) | (2) | (2) | (2) | (2) | (2) |
| 1981 | (2) | (2) | (2) | (2) | (2) | (2) | (2) | (2) | (2) |
| 1982 | (2) | (2) | (2) | (2) | (2) | (2) | (2) | (2) | (2) |
| 1983 | (2) | (2) | (2) | (2) | (2) | (2) | (2) | (2) | (2) |
| 1984 | (2) | (2) | (2) | (2) | (2) | (2) | (2) | (2) | (2) |
| 1985 | LLD | LLD | LLD | LLD | LLD | LLD | LLD | LLD | LLD |
| 1986 | LLD | LLD | LLD | LLD | LLD | LLD | LLD | LLD | LLD |
| 1987 | LLD | LLD | LLD | LLD | LLD | LLD | LLD | LLD | LLD |
| 1988 | LLD | LLD | LLD | LLD | LLD | LLD | LLD | LLD | LLD |
| 1989 | LLD | LLD | LLD | 0.25 | 0.34 | 0.30 | LLD | LLD | LLD |
| 1990 | LLD | LLD | LLD | 0.28 | 0.28 | 0.28 | LLD | LLD | LLD |
| 1991 | LLD | LLD | LLD | 0.11 | 0.16 | 0.14 | LLD | LLD | LLD |

Results in pCi/g (dry)

(1) Location was off-site at Sunset Beach (closest location with recreational value).
(2) Sampling initiated in 1985 as required by the new Technical Specifications.

**TABLE 23**

**HISTORICAL ENVIRONMENTAL SAMPLE DATA**
**FISH**

| | Cs-137 | | |
|---|---|---|---|
| LOCATION: CONTROL [1] | | | |
| YEAR | MIN. | MAX. | MEAN |
| 1976 | 1.2 | 1.2 | 1.2 |
| 1977 | 0.13 | 0.13 | 0.13 |
| 1978 | 0.04 | 0.20 | 0.09 |
| 1979 | 0.03 | 0.06 | 0.04 |
| 1980 | 0.03 | 0.11 | 0.06 |
| 1981 | 0.028 | 0.062 | 0.043 |
| 1982 | 0.027 | 0.055 | 0.046 |
| 1983 | 0.041 | 0.057 | 0.049 |
| 1984 | 0.015 | 0.038 | 0.032 |
| 1985 | 0.026 | 0.047 | 0.034 |
| 1986 | 0.021 | 0.032 | 0.025 |
| 1987 | 0.017 | 0.040 | 0.031 |
| 1988 | 0.023 | 0.053 | 0.033 |
| 1989 | 0.020 | 0.033 | 0.029 |
| 1990 | 0.025 | 0.079 | 0.043 |
| 1991 | 0.016 | 0.045 | 0.030 |

Results in pCi/g (wet)

(1) Control location was at an area beyond the influence of the site (westerly direction).

TABLE 24

HISTORICAL ENVIRONMENTAL SAMPLE DATA
FISH

| | Cs-137 | | |
|---|---|---|---|
| LOCATION: INDICATOR (NMP/JAF) | | | |
| YEAR | MIN. | MAX. | MEAN |
| 1976 | 0.5 | 3.9 | 1.4 |
| 1977 | 0.13 | 0.79 | 0.29 |
| 1978 | 0.03 | 0.10 | 0.08 |
| 1979 | 0.02 | 0.55 | 0.10 |
| 1980 | 0.03 | 0.10 | 0.06 |
| 1981 | 0.03 | 0.10 | 0.06 |
| 1982 | 0.034 | 0.064 | 0.048 |
| 1983 | 0.033 | 0.056 | 0.045 |
| 1984 | 0.033 | 0.061 | 0.043 |
| 1985 | 0.018 | 0.044 | 0.030 |
| 1986 | 0.009 | 0.051 | 0.028 |
| 1987 | 0.024 | 0.063 | 0.033 |
| 1988 | 0.020 | 0.074 | 0.034 |
| 1989 | 0.020 | 0.043 | 0.035 |
| 1990 | 0.024 | 0.115 | 0.044 |
| 1991 | 0.021 | 0.035 | 0.027 |

Results in pCi/g (wet)

Indicator locations are in the general area of the NMP-1 and J. A. FitzPatrick cooling water discharge structures.

## TABLE 25

### HISTORICAL ENVIRONMENTAL SAMPLE DATA
### SURFACE WATER

| | Cs-137 | | | Co-60 | | |
|---|---|---|---|---|---|---|
| LOCATION: CONTROL [3] | | | | | | |
| YEAR | MIN. | MAX. | MEAN | MIN. | MAX. | MEAN |
| 1976 | (1) | (1) | (1) | (1) | (1) | (1) |
| 1977 | (2) | (2) | (2) | (2) | (2) | (2) |
| 1978 | LLD | LLD | LLD | (2) | (2) | (2) |
| 1979 | 2.5 | 2.5 | 2.5 | LLD | LLD | LLD |
| 1980 | LLD | LLD | LLD | LLD | LLD | LLD |
| 1981 | LLD | LLD | LLD | 1.4 | 1.4 | 1.4 |
| 1982 | LLD | LLD | LLD | LLD | LLD | LLD |
| 1983 | LLD | LLD | LLD | LLD | LLD | LLD |
| 1984 | LLD | LLD | LLD | LLD | LLD | LLD |
| 1985 | LLD | LLD | LLD | LLD | LLD | LLD |
| 1986 | LLD | LLD | LLD | LLD | LLD | LLD |
| 1987 | LLD | LLD | LLD | LLD | LLD | LLD |
| 1988 | LLD | LLD | LLD | LLD | LLD | LLD |
| 1989 | LLD | LLD | LLD | LLD | LLD | LLD |
| 1990 | LLD | LLD | LLD | LLD | LLD | LLD |
| 1991 | LLD | LLD | LLD | LLD | LLD | LLD |

Results in pCi/liter

(1) No gamma analyses performed (not required).
(2) Data showed instrument background results.
(3) Location was the City of Oswego Water Supply for 1976 - 1984 and the Oswego Steam Station inlet canal for 1985 - 1991.

## TABLE 26

## HISTORICAL ENVIRONMENTAL SAMPLE DATA
## SURFACE WATER

| | Cs-137 | | | Co-60 | | |
|---|---|---|---|---|---|---|
| | LOCATION: INDICATOR [3] | | | | | |
| YEAR | MIN. | MAX. | MEAN | MIN. | MAX. | MEAN |
| 1976 | (1) | (1) | (1) | (1) | (1) | (1) |
| 1977 | (2) | (2) | (2) | (2) | (2) | (2) |
| 1978 | LLD | LLD | LLD | (2) | (2) | (2) |
| 1979 | LLD | LLD | LLD | LLD | LLD | LLD |
| 1980 | LLD | LLD | LLD | LLD | LLD | LLD |
| 1981 | LLD | LLD | LLD | LLD | LLD | LLD |
| 1982 | 0.43 | 0.43 | 0.43 | 1.6 | 2.4 | 1.9 |
| 1983 | LLD | LLD | LLD | LLD | LLD | LLD |
| 1984 | LLD | LLD | LLD | LLD | LLD | LLD |
| 1985 | LLD | LLD | LLD | LLD | LLD | LLD |
| 1986 | LLD | LLD | LLD | LLD | LLD | LLD |
| 1987 | LLD | LLD | LLD | LLD | LLD | LLD |
| 1988 | LLD | LLD | LLD | LLD | LLD | LLD |
| 1989 | LLD | LLD | LLD | LLD | LLD | LLD |
| 1990 | LLD | LLD | LLD | LLD | LLD | LLD |
| 1991 | LLD | LLD | LLD | LLD | LLD | LLD |

Results in pCi/liter

(1) No gamma analyses performed (not required).
(2) Data showed instrument background results.
(3) Location was the J. A. FitzPatrick inlet canal.

**TABLE 27**

**HISTORICAL ENVIRONMENTAL SAMPLE DATA**
**SURFACE WATER TRITIUM**

| | TRITIUM | | |
|---|---|---|---|
| LOCATION: CONTROL [1] | | | |
| YEAR | MIN. | MAX. | MEAN |
| 1976 | 440 | 929 | 652 |
| 1977 | 300 | 530 | 408 |
| 1978 | 215 | 490 | 304 |
| 1979 | 174 | 308 | 259 |
| 1980 | 211 | 290 | 257 |
| 1981 | 211 | 328 | 276 |
| 1982 | 112 | 307 | 165 |
| 1983 | 230 | 280 | 250 |
| 1984 | 190 | 220 | 205 |
| 1985 | 230 | 370 | 278 |
| 1986 | 250 | 550 | 373 |
| 1987 | 140 | 270 | 210 |
| 1988 | 240 | 460 | 320 |
| 1989 | 180 | 660 | 373 |
| 1990 | 260 | 320 | 290 |
| 1991 | 180 | 200 | 190 |

Results in pCi/liter

(1) Control location is the City of Oswego drinking water for 1976 - 1984 and the Oswego Steam Station inlet canal for 1985 - 1991.

## TABLE 28

## HISTORICAL ENVIRONMENTAL SAMPLE DATA
## SURFACE WATER TRITIUM

| | TRITIUM | | |
|---|---|---|---|
| LOCATION: INDICATOR [1] | | | |
| YEAR | MIN. | MAX. | MEAN |
| 1976 | 365 | 889 | 627 |
| 1977 | 380 | 530 | 455 |
| 1978 | 377 | 560 | 476 |
| 1979 | 176 | 276 | 228 |
| 1980 | 150 | 306 | 227 |
| 1981 | 212 | 388 | 285 |
| 1982 | 194 | 311 | 266 |
| 1983 | 249 | 560 | 347 |
| 1984 | 110 | 370 | 280 |
| 1985 | 250 | 1200 (2) | 530 (2) |
| 1986 | 260 | 500 | 380 |
| 1987 | 160 | 410 | 322 |
| 1988 | 430 | 480 | 460 |
| 1989 | 210 | 350 | 280 |
| 1990 | 220 | 290 | 250 |
| 1991 | 250 | 390 | 310 |

Results in pCi/liter

(1) Indicator location is the FitzPatrick inlet canal.
(2) Suspect sample contamination in the third calendar quarter. Discharge canal samples showed normal levels of tritium (280 pCi/liter).

TABLE 29

HISTORICAL ENVIRONMENTAL SAMPLE DATA
ENVIRONMENTAL TLD

| | DOSE (mrem) | | |
|---|---|---|---|
| | LOCATION: CONTROL (2) | | |
| YEAR | MIN. | MAX. | MEAN |
| Preop | (1) | (1) | (1) |
| 1970 | 6.0 | 7.3 | 6.7 |
| 1971 | 2.0 | 6.7 | 4.3 |
| 1972 | 2.2 | 6.2 | 4.4 |
| 1973 | 2.2 | 6.9 | 4.7 |
| 1974 | 2.7 | 8.9 | 5.6 |
| 1975 | 4.8 | 6.0 | 5.5 |
| 1976 | 3.2 | 7.2 | 5.4 |
| 1977 | 4.0 | 8.0 | 5.3 |
| 1978 | 3.3 | 4.7 | 4.3 |
| 1979 | 3.3 | 5.7 | 4.7 |
| 1980 | 3.8 | 5.8 | 4.9 |
| 1981 | 3.5 | 5.9 | 4.8 |
| 1982 | 3.8 | 6.1 | 5.1 |
| 1983 | 4.9 | 7.2 | 5.8 |
| 1984 | 4.7 | 8.2 | 6.2 |
| 1985 | 4.5 (4.4)* | 7.6 (6.8)* | 5.6 (5.4)* |
| 1986 | 5.3 (5.5)* | 7.5 (7.2)* | 6.3 (6.3)* |
| 1987 | 4.6 (4.6)* | 6.6 (5.8)* | 5.4 (5.2)* |
| 1988 | 4.4 (4.8)* | 6.8 (6.8)* | 5.6 (5.4)* |
| 1989 | 2.9 (2.9)* | 6.4 (5.6)* | 4.7 (4.6)* |
| 1990 | 3.7 (3.7)* | 6.0 (5.9)* | 4.7 (4.6)* |
| 1991 | 3.8 (3.8)* | 5.4 (5.3)* | 4.5 (4.3)* |

Results in mrem per standard month

(1) Data not available.
(2) TLD #8, 14, 49, 111, and 113, where applicable.
( )* TLD result based on the Technical Specification required locations (TLD #14 and 49).

TAB[illegible]0A

## HISTORICAL ENVIRONMENTAL SAMPLE DATA
## ENVIRONMENTAL TLD

| | DOSE (mrem) | | |
|---|---|---|---|
| | LOCATION: SITE BOUNDARY [2] | | |
| YEAR | MIN. | MAX. | MEAN |
| Preop | (1) | (1) | (1) |
| 1970 | (1) | (1) | (1) |
| 1971 | (1) | (1) | (1) |
| 1972 | (1) | (1) | (1) |
| 1973 | (1) | (1) | (1) |
| 1974 | (1) | (1) | (1) |
| 1975 | (1) | (1) | (1) |
| 1976 | (1) | (1) | (1) |
| 1977 | (1) | (1) | (1) |
| 1978 | (1) | (1) | (1) |
| 1979 | (1) | (1) | (1) |
| 1980 | (1) | (1) | (1) |
| 1981 | (1) | (1) | (1) |
| 1982 | (1) | (1) | (1) |
| 1983 | (1) | (1) | (1) |
| 1984 | (1) | (1) | (1) |
| 1985 | 4.1 | 12.6 | 6.2 |
| 1986 | 4.4 | 18.7 | 7.0 |
| 1987 | 4.4 | 14.3 | 6.1 |
| 1988 | 3.4 | 17.9 | 6.4 |
| 1989 | 2.8 | 15.4 | 5.9 |
| 1990 | 3.6 | 14.8 | 5.8 |
| 1991 | 3.2 | 16.7 | 5.7 |

Results in mrem per standard month

(1) No data available (not required prior to 1985).
(2) TLD locations initiated in 1985 as required by the new Technical Specifications. Includes TLD numbers 75, 76, 77, 23, 78, 79, 80, 81, 82, 83, 84, 7, 18, 85, 86, and 87.

TABLE 30B

HISTORICAL ENVIRONMENTAL SAMPLE DATA
ENVIRONMENTAL TLD

| | DOSE (mrem) | | |
|---|---|---|---|
| LOCATION: OFF-SITE SECTORS [2] | | | |
| YEAR | MIN. | MAX. | MEAN |
| Preop | (1) | (1) | (1) |
| 1970 | (1) | (1) | (1) |
| 1971 | (1) | (1) | (1) |
| 1972 | (1) | (1) | (1) |
| 1973 | (1) | (1) | (1) |
| 1974 | (1) | (1) | (1) |
| 1975 | (1) | (1) | (1) |
| 1976 | (1) | (1) | (1) |
| 1977 | (1) | (1) | (1) |
| 1978 | (1) | (1) | (1) |
| 1979 | (1) | (1) | (1) |
| 1980 | (1) | (1) | (1) |
| 1981 | (1) | (1) | (1) |
| 1982 | (1) | (1) | (1) |
| 1983 | (1) | (1) | (1) |
| 1984 | (1) | (1) | (1) |
| 1985 | 4.0 | 7.1 | 5.0 |
| 1986 | 4.6 | 8.6 | 6.0 |
| 1987 | 4.3 | 6.0 | 5.2 |
| 1988 | 3.8 | 7.0 | 5.3 |
| 1989 | 2.5 | 6.8 | 4.9 |
| 1990 | 3.6 | 6.3 | 4.7 |
| 1991 | 3.6 | 5.6 | 4.5 |

Results in mrem per standard month

(1) No data available (not required prior to 1985).
(2) TLD locations initiated in 1985 as required by the new Technical Specifications. Includes TLD numbers 88, 89, 90, 91, 92, 93, 94, and 95.

TABLE 30C

HISTORICAL ENVIRONMENTAL SAMPLE DATA
ENVIRONMENTAL TLD

| | DOSE (mrem) | | |
|---|---|---|---|
| LOCATION: SPECIAL INTEREST (2) (3) | | | |
| YEAR | MIN. | MAX. | MEAN |
| Preop | (1) | (1) | (1) |
| 1970 | (1) | (1) | (1) |
| 1971 | (1) | (1) | (1) |
| 1972 | (1) | (1) | (1) |
| 1973 | (1) | (1) | (1) |
| 1974 | (1) | (1) | (1) |
| 1975 | (1) | (1) | (1) |
| 1976 | (1) | (1) | (1) |
| 1977 | (1) | (1) | (1) |
| 1978 | (1) | (1) | (1) |
| 1979 | (1) | (1) | (1) |
| 1980 | (1) | (1) | (1) |
| 1981 | (1) | (1) | (1) |
| 1982 | (1) | (1) | (1) |
| 1983 | (1) | (1) | (1) |
| 1984 | (1) | (1) | (1) |
| 1985 | 3.9 | 6.8 | 5.3 |
| 1986 | 4.8 | 8.2 | 6.1 |
| 1987 | 3.5 | 6.0 | 5.1 |
| 1988 | 3.9 | 6.6 | 5.3 |
| 1989 | 2.1 | 7.0 | 4.8 |
| 1990 | 3.2 | 6.3 | 4.7 |
| 1991 | 2.9 | 5.6 | 4.4 |

Results in mrem per standard month

(1) No data available (not required prior to 1985).
(2) TLD locations initiated in 1985 as required by the new Technical Specifications. TLD's included are numbers 96, 58, 97, 56, 15, and 98.
(3) TLD locations include critical residences and populated areas near the site.

TABLE 30D

HISTORICAL ENVIRONMENTAL SAMPLE DATA
ENVIRONMENTAL TLD

| | DOSE (mrem) | | |
|---|---|---|---|
| LOCATION: ON-SITE INDICATOR (2) | | | |
| YEAR | MIN. | MAX. | MEAN |
| Preop | (1) | (1) | (1) |
| 1970 | 4.7 | 9.0 | 6.0 |
| 1971 | 1.5 | 7.7 | 4.7 |
| 1972 | 2.3 | 8.2 | 4.9 |
| 1973 | 3.0 | 24.4 | 6.6 |
| 1974 | 3.1 | 10.6 | 5.7 |
| 1975 | 4.6 | 16.0 | 7.3 |
| 1976 | 3.7 | 18.8 | 6.9 |
| 1977 | 3.0 | 15.3 | 5.7 |
| 1978 | 3.0 | 9.0 | 4.3 |
| 1979 | 2.7 | 8.3 | 4.3 |
| 1980 | 3.9 | 12.0 | 5.3 |
| 1981 | 4.1 | 11.8 | 5.8 |
| 1982 | 3.9 | 13.0 | 6.3 |
| 1983 | 5.0 | 16.5 | 6.9 |
| 1984 | 4.6 | 13.2 | 7.0 |
| 1985 | 4.7 | 15.9 | 6.3 |
| 1986 | 4.7 | 16.1 | 7.0 |
| 1987 | 4.0 | 11.4 | 5.8 |
| 1988 | 4.4 | 11.9 | 6.0 |
| 1989 | 2.7 | 14.5 | 6.0 |
| 1990 | 3.6 | 12.9 | 5.5 |
| 1991 | 3.2 | 11.6 | 5.1 |

Results in mrem per standard month

(1) No data available.
(2) Includes TLD numbers 3, 4, 5, 6, and 7 (1970 - 1973). Includes TLD numbers 3, 4, 5, 6, 7, 23, 24, 25, and 26 (1974 - 1991). Locations are existing or previous on-site environmental air monitoring locations.

TABLE 30E

HISTORICAL ENVIRONMENTAL SAMPLE DATA
ENVIRONMENTAL TLD

| | DOSE (mrem) | | |
|---|---|---|---|
| LOCATION: OFF-SITE INDICATOR (2) | | | |
| YEAR | MIN. | MAX. | MEAN |
| Preop | (1) | (1) | (1) |
| 1970 | 5.0 | 8.0 | 6.7 |
| 1971 | 1.1 | 7.7 | 4.5 |
| 1972 | 1.8 | 6.6 | 4.4 |
| 1973 | 2.2 | 6.9 | 4.1 |
| 1974 | 2.4 | 8.9 | 5.3 |
| 1975 | 4.5 | 7.1 | 5.5 |
| 1976 | 3.4 | 7.2 | 5.2 |
| 1977 | 3.7 | 8.0 | 5.3 |
| 1978 | 2.7 | 4.7 | 3.7 |
| 1979 | 3.0 | 5.7 | 4.0 |
| 1980 | 3.1 | 5.8 | 4.6 |
| 1981 | 3.6 | 5.9 | 4.7 |
| 1982 | 4.0 | 6.2 | 5.2 |
| 1983 | 4.6 | 7.2 | 5.6 |
| 1984 | 4.6 | 8.2 | 6.1 |
| 1985 | 4.6 | 7.7 | 5.5 |
| 1986 | 5.0 | 7.6 | 6.1 |
| 1987 | 4.4 | 6.6 | 5.2 |
| 1988 | 4.2 | 6.6 | 5.4 |
| 1989 | 2.8 | 6.4 | 4.6 |
| 1990 | 3.8 | 6.0 | 4.8 |
| 1991 | 3.4 | 5.4 | 4.3 |

Results in mrem per standard month

(1) No data available.
(2) Includes TLD numbers 8, 9, 10, 11, 12, and 13 (off-site environmental air monitoring locations).

## TABLE 31

### HISTORICAL ENVIRONMENTAL SAMPLE DATA
### AIR PARTICULATE GROSS BETA

| | GROSS BETA | | |
|---|---|---|---|
| LOCATION: CONTROL [1] | | | |
| YEAR | MIN. | MAX. | MEAN |
| 1977 | 0.001 | 0.484 | 0.125 |
| 1978 | 0.01 | 0.66 | 0.16 |
| 1979 | 0.010 | 0.703 | 0.077 |
| 1980 | 0.009 | 0.291 | 0.056 |
| 1981 | 0.016 | 0.549 | 0.165 |
| 1982 | 0.011 | 0.078 | 0.033 |
| 1983 | 0.007 | 0.085 | 0.024 |
| 1984 | 0.013 | 0.051 | 0.026 |
| 1985 | 0.013 | 0.043 | 0.024 |
| 1986 | 0.008 | 0.272 | 0.039 |
| 1987 | 0.009 | 0.037 | 0.021 |
| 1988 | 0.008 | 0.039 | 0.018 |
| 1989 | 0.007 | 0.039 | 0.017 |
| 1990 | 0.003 | 0.027 | 0.013 |
| 1991 | 0.006 | 0.028 | 0.014 |

Results in $pCi/m^3$

(1) Locations used for 1977 - 1984 were C off-site, D1 off-site, D2 off-site, E off-site, F off-site, and G off-site. Control location R-5 off-site was used for 1985 - 1991 (formerly C off-site location).

## TABLE 32

## HISTORICAL ENVIRONMENTAL SAMPLE DATA
## AIR PARTICULATE GROSS BETA

| | GROSS BETA | | |
|---|---|---|---|
| LOCATION: INDICATOR (1) | | | |
| YEAR | MIN. | MAX. | MEAN |
| 1977 | 0.002 | 0.326 | 0.106 |
| 1978 | 0.01 | 0.34 | 0.11 |
| 1979 | 0.001 | 0.271 | 0.058 |
| 1980 | 0.002 | 0.207 | 0.044 |
| 1981 | 0.004 | 0.528 | 0.151 |
| 1982 | 0.001 | 0.113 | 0.031 |
| 1983 | 0.002 | 0.062 | 0.023 |
| 1984 | 0.002 | 0.058 | 0.025 |
| 1985 | 0.010 | 0.044 | 0.023 |
| 1986 | 0.007 | 0.289 | 0.039 |
| 1987 | 0.009 | 0.040 | 0.021 |
| 1988 | 0.007 | 0.040 | 0.018 |
| 1989 | 0.007 | 0.041 | 0.017 |
| 1990 | 0.005 | 0.023 | 0.014 |
| 1991 | 0.007 | 0.033 | 0.015 |

Results in $pCi/m^3$

(1) Locations used for 1977 - 1984 were D1 on-site, D2 on-site, E on-site, F on-site, G on-site, H on-site, I on-site, J on-site, and K on-site, as applicable. 1985 - 1991 locations were R-1 off-site, R-2 off-site, R-3 off-site, and R-4 off-site.

TABLE 33

HISTORICAL ENVIRONMENTAL SAMPLE DATA
AIR PARTICULATES

| | Cs-137 | | | Co-60 | | |
|---|---|---|---|---|---|---|
| LOCATION: CONTROL [2] | | | | | | |
| YEAR | MIN. | MAX. | MEAN | MIN. | MAX. | MEAN |
| Preop. | (1) | (1) | (1) | (1) | (1) | (1) |
| 1970 | (1) | (1) | (1) | (1) | (1) | (1) |
| 1971 | (1) | (1) | (1) | (1) | (1) | (1) |
| 1972 | (1) | (1) | (1) | (1) | (1) | (1) |
| 1973 | (1) | (1) | (1) | (1) | (1) | (1) |
| 1974 | (1) | (1) | (1) | (1) | (1) | (1) |
| 1975 | (1) | (1) | (1) | (1) | (1) | (1) |
| 1976 | (1) | (1) | (1) | (1) | (1) | (1) |
| 1977 | 0.0002 | 0.0112 | 0.0034 | 0.0034 | 0.0347 | 0.0172 |
| 1978 | 0.0008 | 0.0042 | 0.0018 | 0.0003 | 0.0056 | 0.0020 |
| 1979 | 0.0008 | 0.0047 | 0.0016 | 0.0005 | 0.0014 | 0.0009 |
| 1980 | 0.0015 | 0.0018 | 0.0016 | LLD | LLD | LLD |
| 1981 | 0.0003 | 0.0042 | 0.0017 | 0.0003 | 0.0012 | 0.0008 |
| 1982 | 0.0002 | 0.0009 | 0.0004 | 0.0004 | 0.0007 | 0.0006 |
| 1983 | 0.0002 | 0.0002 | 0.0002 | 0.0007 | 0.0007 | 0.0007 |
| 1984 | LLD | LLD | LLD | 0.0004 | 0.0012 | 0.0008 |
| 1985 | LLD | LLD | LLD | LLD | LLD | LLD |
| 1986 | 0.0075 | 0.0311 | 0.0193 | LLD | LLD | LLD |
| 1987 | LLD | LLD | LLD | LLD | LLD | LLD |
| 1988 | LLD | LLD | LLD | LLD | LLD | LLD |
| 1989 | LLD | LLD | LLD | LLD | LLD | LLD |
| 1990 | LLD | LLD | LLD | LLD | LLD | LLD |
| 1991 | LLD | LLD | LLD | LLD | LLD | LLD |

Results in $pCi/m^3$

(1) No data available (not required prior to 1977).

(2) Locations included composites of off-site air monitoring locations for 1977 - 1984. Sample location included only R-5 off-site air monitoring location for 1985 - 1991.

TABLE 34

HISTORICAL ENVIRONMENTAL SAMPLE DATA
AIR PARTICULATES

| | Cs-137 | | | Co-60 | | |
|---|---|---|---|---|---|---|
| LOCATION: INDICATOR (2) | | | | | | |
| YEAR | MIN. | MAX. | MEAN | MIN. | MAX. | MEAN |
| 1977 | 0.0001 | 0.0105 | 0.0043 | 0.0003 | 0.0711 | 0.0179 |
| 1978 | 0.0003 | 0.0026 | 0.0016 | 0.0003 | 0.0153 | 0.0023 |
| 1979 | 0.0003 | 0.0020 | 0.0010 | 0.0003 | 0.0007 | 0.0005 |
| 1980 | 0.0005 | 0.0019 | 0.0011 | 0.0016 | 0.0016 | 0.0016 |
| 1981 | 0.0002 | 0.0045 | 0.0014 | 0.0002 | 0.0017 | 0.0006 |
| 1982 | 0.0001 | 0.0006 | 0.0004 | 0.0003 | 0.0010 | 0.0005 |
| 1983 | 0.0002 | 0.0003 | 0.0002 | 0.0003 | 0.0017 | 0.0007 |
| 1984 | LLD | LLD | LLD | 0.0007 | 0.0017 | 0.0012 |
| 1985 | LLD | LLD | LLD | LLD | LLD | LLD |
| 1986 | 0.0069 | 0.0364 | 0.0183 | LLD | LLD | LLD |
| 1987 | LLD | LLD | LLD | LLD | LLD | LLD |
| 1988 | LLD | LLD | LLD | LLD | LLD | LLD |
| 1989 | LLD | LLD | LLD | LLD | LLD | LLD |
| 1990 | LLD | LLD | LLD | LLD | LLD | LLD |
| 1991 | LLD | LLD | LLD | LLD | LLD | LLD |

Results in $pCi/m^3$

(1) No data available (not required prior to 1977).
(2) Locations included composites of on-site air monitoring locations for 1977 - 1984. Locations included R-1 through R-4 off-site air monitoring locations for 1985 - 1991.

TABLE 35

HISTORICAL ENVIRONMENTAL SAMPLE DATA
AIR RADIOIODINE

| | IODINE-131 | | |
|---|---|---|---|
| LOCATION: CONTROL [1] | | | |
| YEAR | MIN. | MAX. | MEAN |
| 1976 | 0.01 | 5.88 | 0.60 |
| 1977 | 0.02 | 0.82 | 0.32 |
| 1978 | 0.03 | 0.04 | 0.03 |
| 1979 | LLD | LLD | LLD |
| 1980 | LLD | LLD | LLD |
| 1981 | LLD | LLD | LLD |
| 1982 | 0.039 | 0.039 | 0.039 |
| 1983 | LLD | LLD | LLD |
| 1984 | LLD | LLD | LLD |
| 1985 | LLD | LLD | LLD |
| 1986 | 0.041 | 0.332 | 0.151 |
| 1987 | LLD | LLD | LLD |
| 1988 | LLD | LLD | LLD |
| 1989 | LLD | LLD | LLD |
| 1990 | LLD | LLD | LLD |
| 1991 | LLD | LLD | LLD |

Results in $pCi/m^3$

(1) Locations D1 off-site, D2 off-site, E off-site, F off-site, and G off-site used for 1976 - 1984. Location R-5 off-site used for 1985 - 1991.

TABLE 36

# HISTORICAL ENVIRONMENTAL SAMPLE DATA
# AIR RADIOIODINE

| | IODINE-131 | | |
|---|---|---|---|
| LOCATION: INDICATOR [1] | | | |
| YEAR | MIN. | MAX. | MEAN |
| 1976 | 0.01 | 2.09 | 0.33 |
| 1977 | 0.02 | 0.73 | 0.31 |
| 1978 | 0.02 | 0.07 | 0.04 |
| 1979 | LLD | LLD | LLD |
| 1980 | 0.013 | 0.013 | 0.013 |
| 1981 | 0.016 | 0.042 | 0.029 |
| 1982 | 0.002 | 0.042 | 0.016 |
| 1983 | 0.022 | 0.035 | 0.028 |
| 1984 | LLD | LLD | LLD |
| 1985 | LLD | LLD | LLD |
| 1986 | 0.023 | 0.360 | 0.119 |
| 1987 | 0.011 | 0.018 | 0.014 |
| 1988 | LLD | LLD | LLD |
| 1989 | LLD | LLD | LLD |
| 1990 | LLD | LLD | LLD |
| 1991 | LLD | LLD | LLD |

Results in $pCi/m^3$

(1) Locations used for 1976 - 1984 were D1 on-site, D2 on-site, E on-site, F on-site, G on-site, H on-site, I on-site, J on-site, and K on-site, as applicable. Locations used for 1985 - 1991 were R1 off-site, R-2 off-site, R-3 off-site, and R-4 off-site.

TABLE 37

HISTORICAL ENVIRONMENTAL SAMPLE DATA
MILK

| | Cs-137 | | | I-131 | | |
|---|---|---|---|---|---|---|
| LOCATION: CONTROL (2) | | | | | | |
| YEAR | MIN. | MAX. | MEAN | MIN. | MAX. | MEAN |
| 1976 | (1) | (1) | (1) | (1) | (1) | (1) |
| 1977 | (1) | (1) | (1) | (1) | (1) | (1) |
| 1978 | 2.4 | 7.8 | 5.8 | LLD | LLD | LLD |
| 1979 | LLD | LLD | LLD | LLD | LLD | LLD |
| 1980 | 3.6 | 5.6 | 4.5 | 1.4 | 1.4 | 1.4 |
| 1981 | 3.9 | 3.9 | 3.9 | LLD | LLD | LLD |
| 1982 | LLD | LLD | LLD | LLD | LLD | LLD |
| 1983 | LLD | LLD | LLD | LLD | LLD | LLD |
| 1984 | LLD | LLD | LLD | LLD | LLD | LLD |
| 1985 | LLD | LLD | LLD | LLD | LLD | LLD |
| 1986 | 5.3 | 12.4 | 8.4 | 0.8 | 29.0 | 13.6 |
| 1987 | LLD | LLD | LLD | LLD | LLD | LLD |
| 1988 | LLD | LLD | LLD | LLD | LLD | LLD |
| 1989 | LLD | LLD | LLD | LLD | LLD | LLD |
| 1990 | LLD | LLD | LLD | LLD | LLD | LLD |
| 1991 | LLD | LLD | LLD | LLD | LLD | LLD |

Results in pCi/liter

(1) No data available (samples not required).
(2) Location used was an available milk sample location in a least prevalent wind direction greater than ten miles from the site.

## TABLE 38

## HISTORICAL ENVIRONMENTAL SAMPLE DATA
## MILK

| | Cs-137 | | | I-131 | | |
|---|---|---|---|---|---|---|
| | LOCATION: INDICATOR [1] | | | | | |
| YEAR | MIN. | MAX. | MEAN | MIN. | MAX. | MEAN |
| 1976 | 4.0 | 15.0 | 9.3 | 0.02 | 45.00 | 3.20 |
| 1977 | 11.0 | 22.0 | 17.1 | 0.01 | 49.00 | 6.88 |
| 1978 | 3.4 | 33.0 | 9.9 | 0.19 | 0.19 | 0.19 |
| 1979 | 3.2 | 53.0 | 9.4 | LLD | LLD | LLD |
| 1980 | 3.2 | 21.0 | 8.1 | 0.3 | 8.8 | 3.8 |
| 1981 | 3.5 | 29.0 | 8.6 | LLD | LLD | LLD |
| 1982 | 3.5 | 14.0 | 5.7 | LLD | LLD | LLD |
| 1983 | 3.3 | 10.9 | 7.2 | LLD | LLD | LLD |
| 1984 | LLD | LLD | LLD | LLD | LLD | LLD |
| 1985 | LLD | LLD | LLD | LLD | LLD | LLD |
| 1986 | 6.1 | 11.1 | 8.6 | 0.3 | 30.0 | 5.2 |
| 1987 | 5.5 | 8.1 | 6.8 | LLD | LLD | LLD |
| 1988 | 10.0 | 10.0 | 10.0 | LLD | LLD | LLD |
| 1989 | LLD | LLD | LLD | LLD | LLD | LLD |
| 1990 | LLD | LLD | LLD | LLD | LLD | LLD |
| 1991 | LLD | LLD | LLD | LLD | LLD | LLD |

Results in pCi/liter

(1) Locations sampled were available downwind locations within ten miles with high deposition potential.

TABLE 39

HISTORICAL ENVIRONMENTAL SAMPLE DATA
FOOD PRODUCTS

| | Cs-137 | | |
|---|---|---|---|
| LOCATION: CONTROL (2) | | | |
| YEAR | MIN. | MAX. | MEAN |
| 1976 | (1) | (1) | (1) |
| 1977 | (1) | (1) | (1) |
| 1978 | (1) | (1) | (1) |
| 1979 | (1) | (1) | (1) |
| 1980 (3) | 0.02 | 0.02 | 0.02 |
| 1981 | LLD | LLD | LLD |
| 1982 | LLD | LLD | LLD |
| 1983 | LLD | LLD | LLD |
| 1984 | LLD | LLD | LLD |
| 1985 (4) | LLD | LLD | LLD |
| 1986 | LLD | LLD | LLD |
| 1987 | LLD | LLD | LLD |
| 1988 | LLD | LLD | LLD |
| 1989 | LLD | LLD | LLD |
| 1990 | LLD | LLD | LLD |
| 1991 | LLD | LLD | LLD |

Results in pCi/g (wet)

(1) No data available (control samples not required).
(2) Location was an available food product sample location in a least prevalent wind direction greater than ten miles from the site.
(3) Data comprised of broadleaf and non-broadleaf vegetation (1980 - 1984).
(4) Data comprised of broadleaf vegetation only (1985 - 1991).

TABLE 40

HISTORICAL ENVIRONMENTAL SAMPLE DATA
FOOD PRODUCTS

| | Cs-137 | | |
|---|---|---|---|
| LOCATION: INDICATOR [1] | | | |
| YEAR | MIN. | MAX. | MEAN |
| 1976 (2) | LLD | LLD | LLD |
| 1977 | LLD | LLD | LLD |
| 1978 | LLD | LLD | LLD |
| 1979 | 0.004 | 0.004 | 0.004 |
| 1980 | 0.004 | 0.060 | 0.036 |
| 1981 | LLD | LLD | LLD |
| 1982 | LLD | LLD | LLD |
| 1983 | LLD | LLD | LLD |
| 1984 | LLD | LLD | LLD |
| 1985 (3) | 0.047 | 0.047 | 0.047 |
| 1986 | LLD | LLD | LLD |
| 1987 | LLD | LLD | LLD |
| 1988 | 0.008 | 0.008 | 0.008 |
| 1989 | 0.009 | 0.009 | 0.009 |
| 1990 | LLD | LLD | LLD |
| 1991 | 0.040 | 0.040 | 0.040 |

Results in pCi/g (wet)

(1) Indicator locations were available downwind locations within ten miles of the site and with high deposition potential.
(2) Data comprised of broadleaf and non-broadleaf vegetation (1976 - 1984).
(3) Data comprised of broadleaf vegetation only (1985 - 1991).

# 11.0 FIGURES

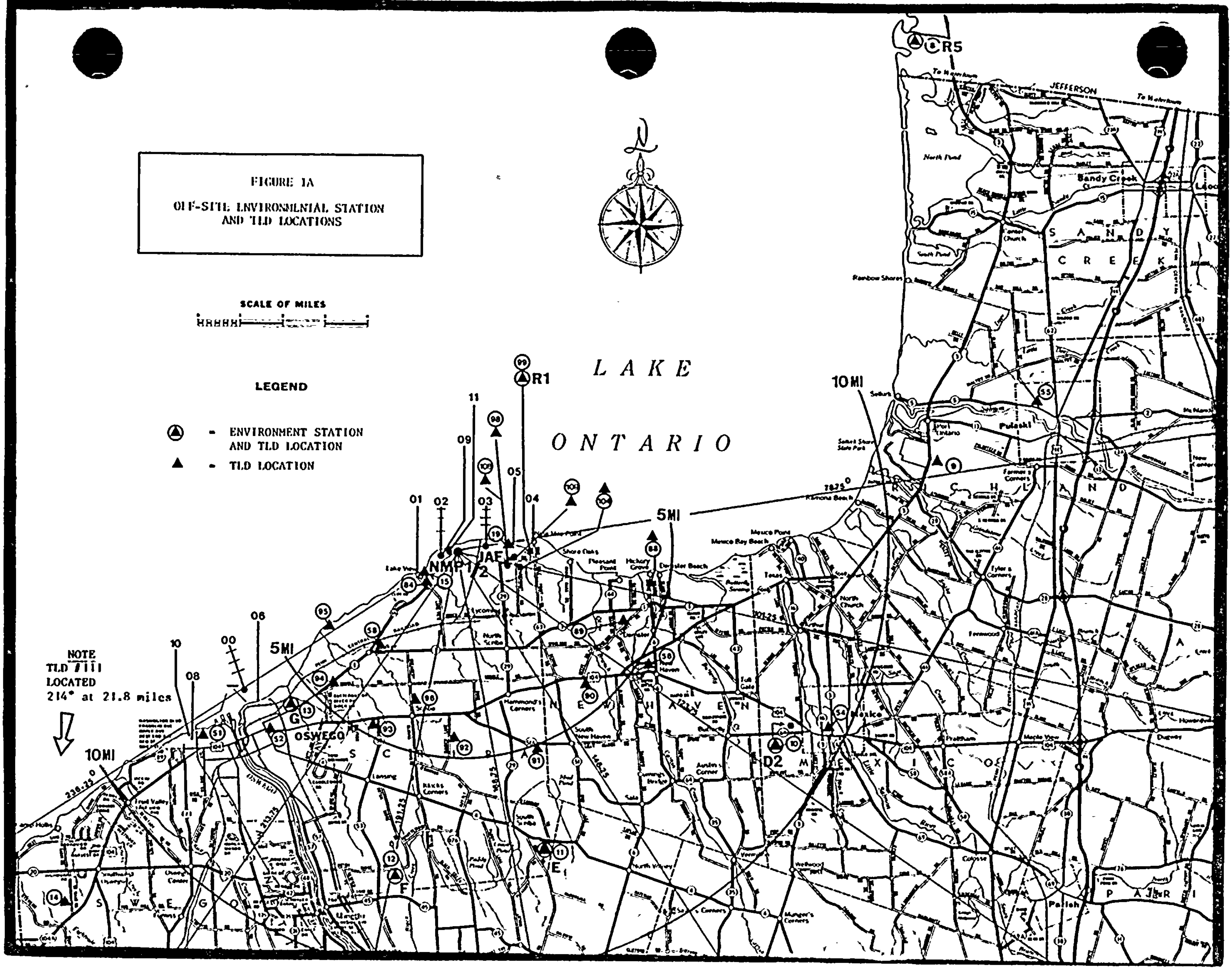
FIGURE 1A
OFF-SITE ENVIRONMENTAL STATION AND TLD LOCATIONS
SCALE OF MILES
LEGEND
- ENVIRONMENT STATION AND TLD LOCATION
- TLD LOCATION
NOTE
TLD #111 LOCATED 214° at 21.8 miles
LAKE ONTARIO
5MI
10MI
R1
R5
NMP1
JAF
OSWEGO
D2
JEFFERSON
Sandy Creek
Pulaski
Mexico
Parish
SANDY CREEK
RICHLAND
NEW HAVEN
MEXICO
SCRIBA
OSWEGO
PARISH

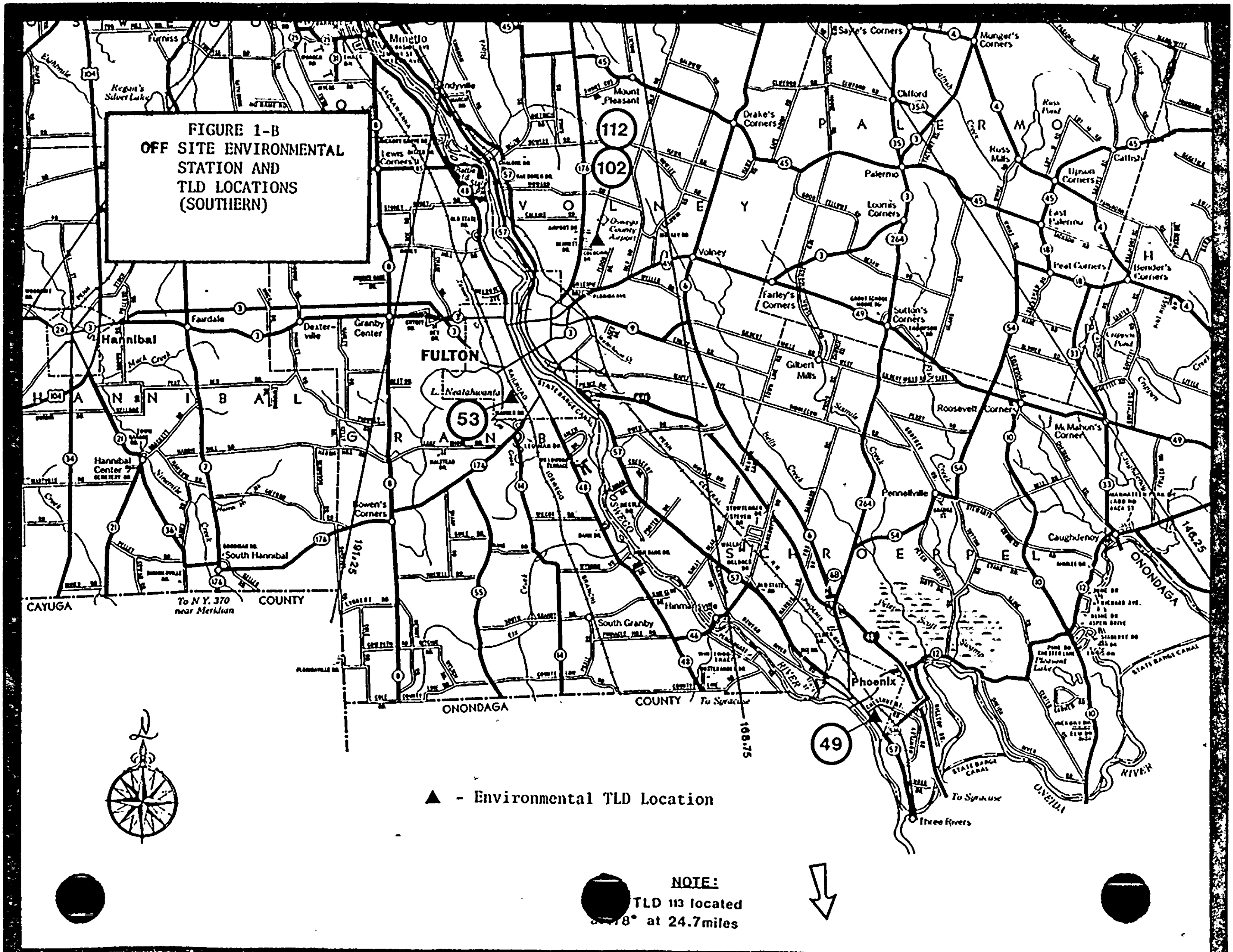


FIGURE 1-B
OFF SITE ENVIRONMENTAL STATION AND TLD LOCATIONS (SOUTHERN)

▲ - Environmental TLD Location

NOTE:
TLD 113 located
…8° at 24.7miles

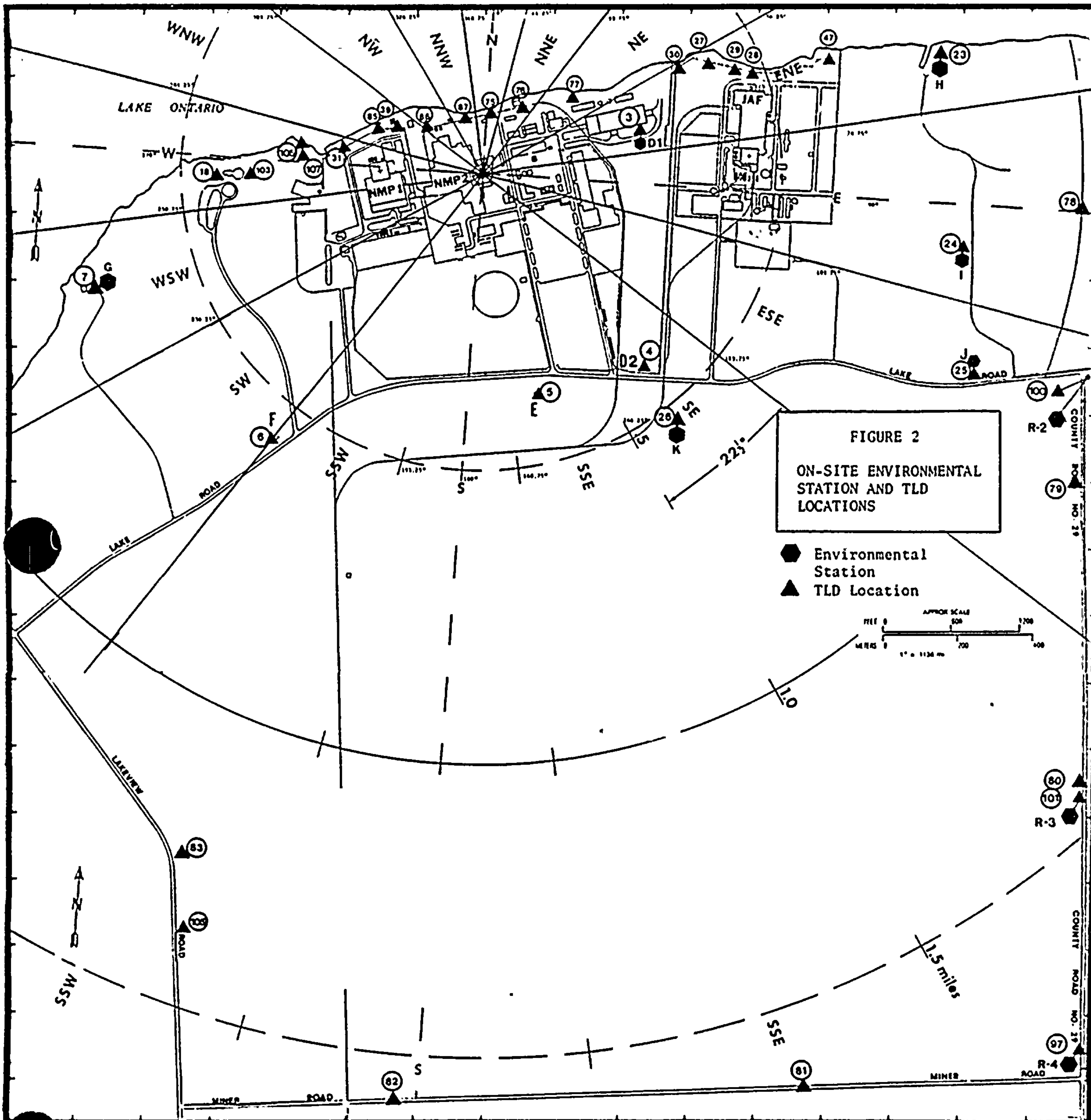
FIGURE 2
ON-SITE ENVIRONMENTAL STATION AND TLD LOCATIONS
Environmental Station
TLD Location
LAKE ONTARIO
WNW
NW
NNW
N
NNE
NE
ENE
W
E
WSW
ESE
SW
SE
SSW
S
SSE
NMP1
NMP2
JAF
LAKE ROAD
LAKEVIEW ROAD
MINER ROAD
COUNTY ROAD NO. 29
1.0
1.5 miles
22½°
D1
D2
E
F
G
H
I
J
K
R-2
R-3
R-4

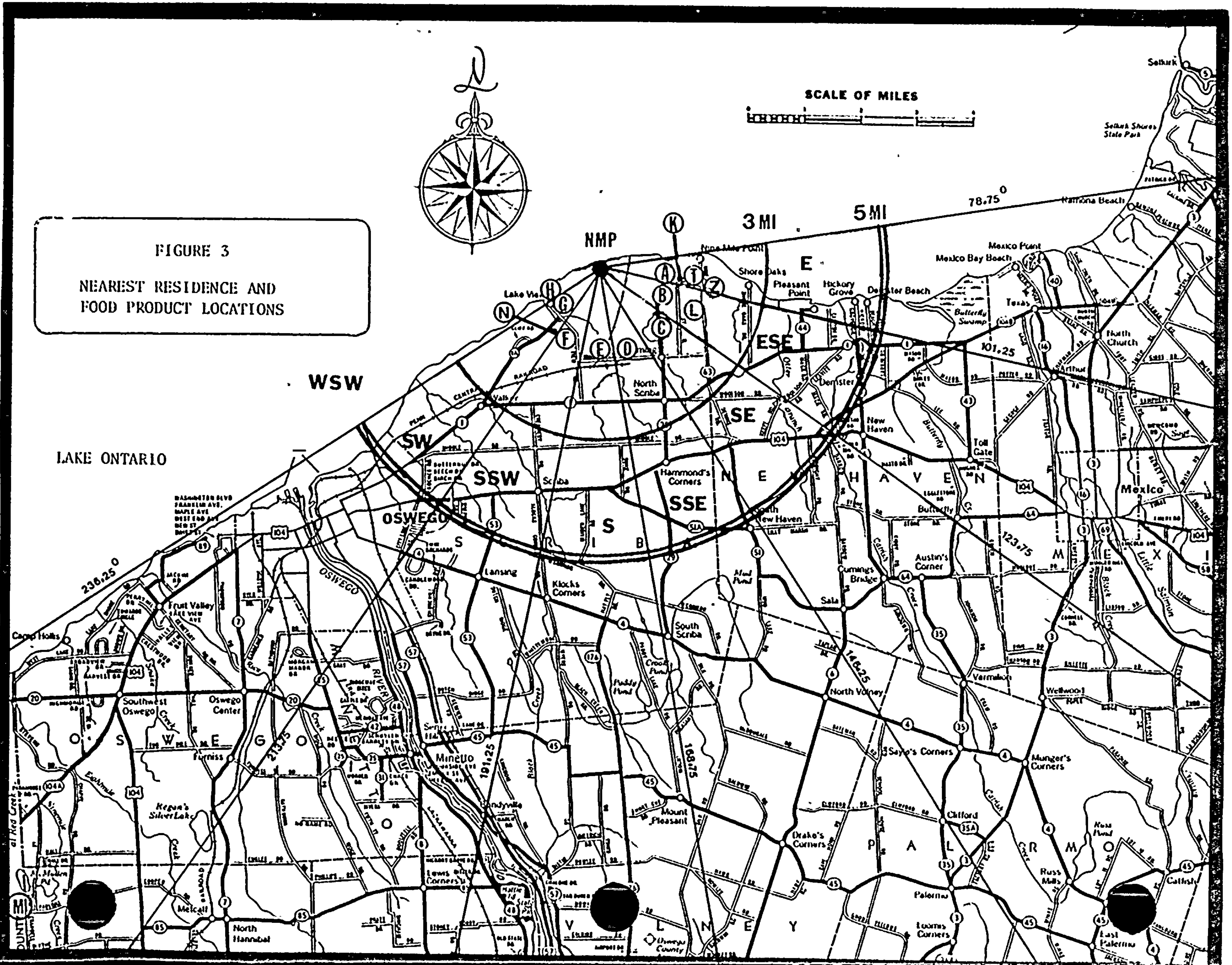


FIGURE 3

NEAREST RESIDENCE AND FOOD PRODUCT LOCATIONS

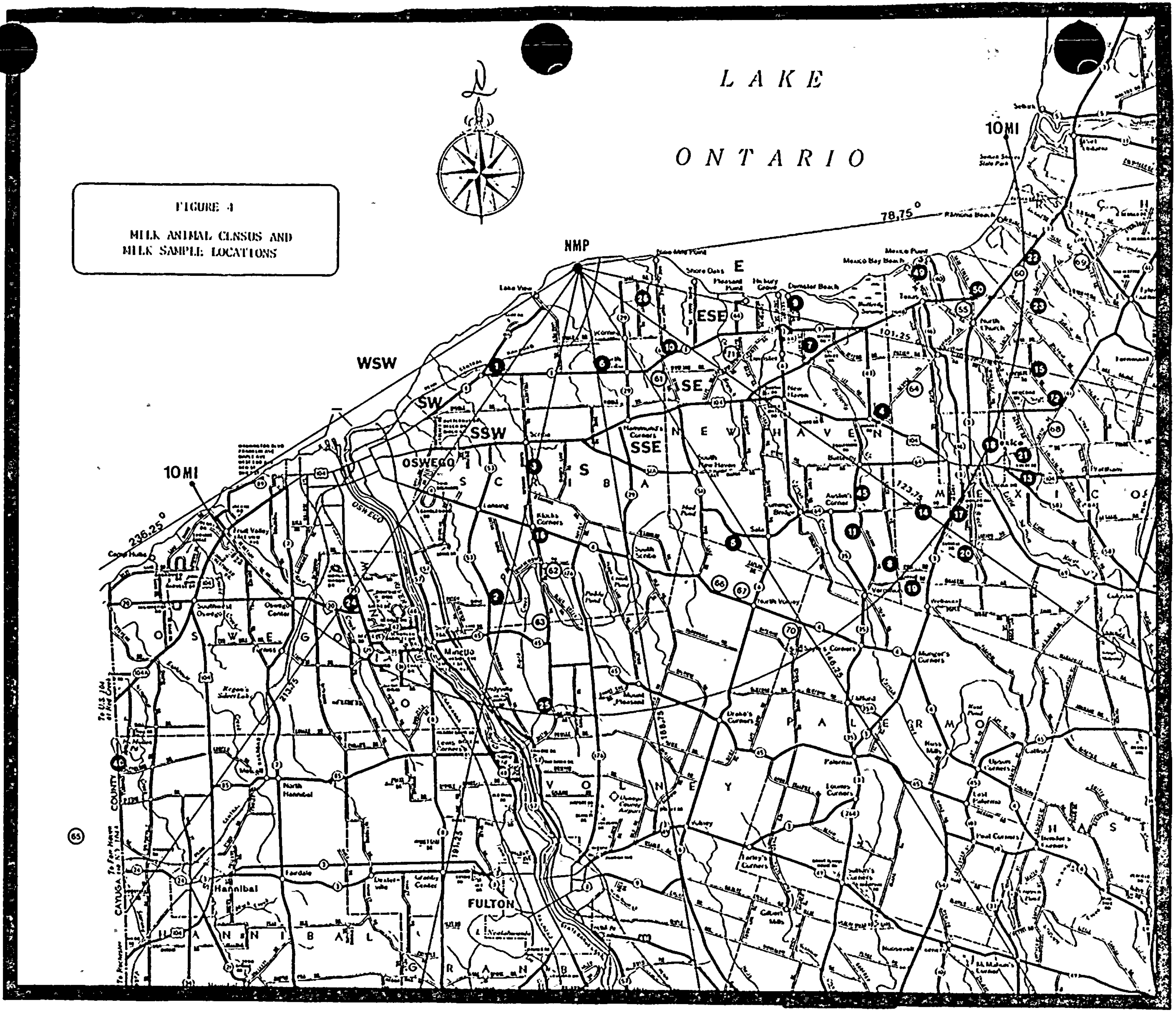


FIGURE 4

MILK ANIMAL CENSUS AND MILK SAMPLE LOCATIONS

FIGURE 5
NEW YORK STATE MAP