CENG
a joint venture of Constellation Energy · eDF

NINE MILE POINT
NUCLEAR STATION

P.O. Box 63
Lycoming, NY 13093

May 13, 2011

U. S. Nuclear Regulatory Commission
Washington, DC 20555-0001

ATTENTION: Document Control Desk

SUBJECT: Nine Mile Point Nuclear Station
Unit Nos. 1 & 2; Docket Nos. 50-220 & 50-410

2010 Annual Radiological Environmental Operating Report

In accordance with the Technical Specifications for Nine Mile Point Nuclear Station, Units 1 and 2, enclosed is the 2010 Annual Radiological Environmental Operating Report for the period January 1, 2010 through December 31, 2010.

This submittal does not contain any new regulatory commitments.

Should you have questions regarding the information in this submittal, please contact me at (315) 349-5219.

Very truly yours,

John J. Dosa
Director Licensing

JJD/KES

Enclosure: Nine Mile Point Nuclear Station, LLC, 2010 Annual Radiological Environmental Operating Report

cc: Regional Administrator, Region I, NRC
Project Manager, NRC
Resident Inspector, NRC
J. T. Furia, NRC
B. Youngberg, NYS DEC
P. Egan, Oswego County Emergency Management

IE25
NRR

ENCLOSURE

NINE MILE POINT NUCLEAR STATION, LLC

2010 ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT

Nine Mile Point Nuclear Station, LLC
May 13, 2011

CENG
a joint venture of
Constellation Energy
eDF

NINE MILE POINT
NUCLEAR STATION

NINE MILE POINT NUCLEAR STATION, LLC

2010 ANNUAL

RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT

NINE MILE POINT NUCLEAR STATION, LLC

ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT

January 1, 2010 – December 31, 2010

For

NINE MILE POINT NUCLEAR STATION UNIT 1

Facility Operating License DPR-63

Docket No. 50-220

And

NINE MILE POINT NUCLEAR STATION UNIT 2

Facility Operating License NPF-69

Docket No. 50-410

TABLE OF CONTENTS

TABLE OF CONTENTS (Continued)

LIST OF TABLES

LIST OF TABLES (continued)

LIST OF TABLES (continued)

LIST OF FIGURES

1.0 EXECUTIVE SUMMARY

The Annual Radiological Environmental Operating Report is published pursuant to Section 6.6.2 of the Nine Mile Point Unit 1 (NMP1) Technical Specifications, Section 5.6.2 of the Nine Mile Point Unit 2 (NMP2) Technical Specifications, and 10 CFR 50.4.

This report describes the Radiological Environmental Monitoring Program (REMP), the implementation of the program, and the results obtained as required by the Offsite Dose Calculation Manuals (ODCM). The report also contains the analytical results tables, data evaluation, dose assessment, and data trends for each environmental sample media. Also included are results of the land use census, historical data, and the Environmental Laboratory's performance in the Interlaboratory Comparison Quality Assurance Program (ICQAP) required by the NMP1 and NMP2 ODCM.

The REMP is a comprehensive surveillance program, which is implemented to assess the impact of site operations on the environment and compliance with 10 CFR 20 and 40 CFR 190. Samples are collected from the aquatic and terrestrial pathways applicable to the site. The aquatic pathways include Lake Ontario fish, surface waters, and lakeshore sediment. The terrestrial pathways include airborne particulate and radioiodine, milk, food products, and direct radiation.

During 2010, there were 2,155 analyses performed on environmental media collected as part of the REMP. The results demonstrate that there was no significant or measurable radiological impact from the operation of either the NMP1 or NMP2 facilities. The 2010 results for all pathways sampled were consistent with the previous five-year historical results and exhibited no adverse trends.

In summary, the analytical results from the 2010 REMP demonstrate that the routine operation of both facilities at the Nine Mile Point site had no significant or measurable radiological impact on the environment. The results of the REMP continue to demonstrate that the operation of the plants did not result in a significant measurable dose to a member of the general population, or adversely impact the environment as a result of radiological effluents. The program continues to demonstrate that the dose to a member of the public, as a result of the operation of NMP1 and NMP2, remains significantly below the federally required dose limits specified in 10 CFR 20 and 40 CFR 190.

2.0 INTRODUCTION

Nine Mile Point Units 1 and 2 are operated by Nine Mile Point Nuclear Station, LLC. This report is submitted in accordance with Appendix A (Technical Specifications) Section 6.6.2 to License DPR-63, Docket No. 50-220 for Nine Mile Point Nuclear Station, Unit 1, and Appendix A (Technical Specifications) Section 5.6.2 to License NPF-69, Docket No. 50-410 for Nine Mile Point Nuclear Station, Unit 2, for the calendar year 2010.

Nine Mile Point Unit 1 (NMP1) and Nine Mile Point Unit 2 (NMP2) Radiological Environmental Monitoring Program (REMP) requirements reside within the NMP1 Offsite Dose Calculation Manual (ODCM) and NMP2 ODCM, respectively. Throughout this report, references will be made to the ODCM. This refers to both the NMP1 ODCM and the NMP2 ODCM.

2.1 PROGRAM HISTORY

Environmental monitoring of the Nine Mile Point (NMP) site has been on-going since 1964. The program includes five years of pre-operational data which was conducted prior to any reactor operations. In 1968, the Niagara Mohawk Power Company began the required pre-operational environmental site testing program. This pre-operational data serves as a reference point to compare data obtained during reactor operation. In 1969, NMP1, a 1,850 Megawatt-Thermal (MWt) Boiling Water Reactor (BWR) began full power operation. In 1975, the James A. FitzPatrick Nuclear Power Plant (JAFNPP), a 2,536 MWt BWR, currently owned and operated by Entergy, began full power operation. In 1988, NMP2, a 3,323 MWt BWR located between NMP1 and JAFNPP, began full power operation. In 1995, NMP2 was uprated to 3,467 MWt.

In 1985, the individual station's Plant Effluent Technical Specifications were standardized to the generic Radiological Effluent Technical Specifications, much of which is common to both NMP1 and JAFNPP, and subsequently to NMP2. Subsequent Technical Specification amendments relocated the REMP requirements to the ODCM for all three plants. Data generated by the REMP is shared between Nine Mile Point Nuclear Station (NMPNS) and JAFNPP, but each operating company reviews and publishes their own annual report.

In summary, the three BWRs, which together generate approximately 7,853 MWt, have operated collectively since 1988. A large database of environmental results for the exposure pathways has been collected and analyzed to determine the effect from reactor operations.

2.2 SITE DESCRIPTION

The NMP site is located on the southeast shore of Lake Ontario in the town of Scriba, approximately 6.2 miles northeast of the city of Oswego. The nearest metropolitan area is located approximately 36 miles south southeast of the site. The reactors and support buildings occupy a small shoreline portion of the 900-acre site. The land, soil of glacier deposits, rises gently from the lake in all directions. Oswego County is a rural environment, with about 15% of the land devoted to agriculture.

2.3 PROGRAM OBJECTIVES

The objectives of the REMP are to:

1. Measure and evaluate the effects of plant operation on the environs and to verify the effectiveness of the controls on radioactive material sources.

2. Monitor natural radiation levels in the environs of the NMP site.

3. Demonstrate compliance with the requirements of applicable federal regulatory agencies and the Offsite Dose Calculation Manuals.

3.0 PROGRAM DESCRIPTION

To achieve the objectives listed in Section 2.3, an extensive sampling and analysis program is conducted every year. The Nine Mile Point Nuclear Station (NMPNS) Radiological Environmental Monitoring Program (REMP) consists of sampling and analysis of various media that include:

- Air
- Fish
- Food Products
- Milk
- Shoreline Sediment
- Surface Waters
- Groundwater

In addition, direct radiation measurements are performed using thermoluminescent dosimeters (TLDs). These sampling programs are outlined in Table 3.0-1 and Table 3.0-2. The NMPNS REMP sampling locations are selected and verified by an annual land use census. The accuracy and precision of the sample analysis program is assured by participation in an Interlaboratory Comparison Quality Assurance Program (ICQAP). In addition to the participation in the ICQAP, sample splits are provided to the New York State Department of Health for cross-checking purposes.

Sample collections for the radiological program are accomplished by a dedicated site environmental staff from both the NMPNS and James A. FitzPatrick Nuclear Power Plant (JAFNPP). The site staff is assisted by a contracted environmental engineering company, EA Engineering, Science and Technology, Inc. (EA).

TABLE 3.0-1

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM
REQUIRED SAMPLE COLLECTION AND ANALYSIS
Nine Mile Point Unit 1

Exposure Pathway and/or Sample	Number of Samples [a] and Locations	Sampling and Collection Frequency [a]	Type of Analysis and Frequency
AIRBORNE			
a. Radioiodine and Particulates	Samples from five locations: 1. Three samples from offsite locations in different sectors of the highest calculated site average D/Q (based on all site licensed reactors). 2. One sample from the vicinity of an established year round community having the highest calculated site average D/Q (based on all site licensed reactors). 3. One sample from a control location 10-17 miles distant and in a least prevalent wind direction [d].	Continuous sampler operation with sample collection weekly or as required by dust loading, whichever is more frequent.	Radioiodine Canisters - analyze once per week for I-131. Particulate Samplers - Gross beta radioactivity following filter change [b]. Composite (by location) for gamma isotopic analysis [c] once per 3 months (as a minimum).
b. Direct Radiation [e]	32 stations with two or more dosimeters to be placed as follows: an inner ring of stations in the general area of the site boundary and an outer ring in the 4 to 5 mile range from the site with a station in each land based sector [*]. The balance of the stations should be placed in special interest areas such as population centers, nearby residences, schools and in 2 or 3 areas to serve as control stations.	Once per 3 months.	Gamma dose once per 3 months.

[*] At this distance, 8 wind rose sectors, (W, WNW, NW, NNW, N, NNE, NE, and ENE) are over Lake Ontario.

TABLE 3.0-1 (Continued)

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM
REQUIRED SAMPLE COLLECTION AND ANALYSIS
Nine Mile Point Unit 1

Exposure Pathway and/or Sample	Number of Samples [a] and Locations	Sampling and Collection Frequency [a]	Type of Analysis and Frequency
WATERBORNE			
a. Surface [f]	1. One sample upstream. 2. One sample from the site's downstream cooling water intake.	Composite sample over 1 month period [g].	Gamma isotopic analysis [c] once per month. Composite for once per 3 months tritium analysis.
b. Sediment from Shoreline	One sample from a downstream area with existing or potential recreational value.	Twice per year.	Gamma isotopic analysis[c].
INGESTION			
a. Milk	1. Samples from milk sampling locations in three locations within 3.5 miles distance having the highest calculated site average D/Q. If there are none, then one sample from milking animals in each of 3 areas 3.5 – 5.0 miles distant having the highest calculated site average D/Q (based on all site licensed reactors). 2. One sample from a milk sampling location at a control location (9-20 miles distant and in a least prevalent wind direction) [d].	Twice per month, April – December (samples will be collected in January – March if I-131 is detected in November and December of the preceding year).	Gamma isotopic [c] and I-131 analysis twice per month when animals are on pasture (April – December); once per month at other times (January – March) if required.

TABLE 3.0-1 (Continued)

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM
REQUIRED SAMPLE COLLECTION AND ANALYSIS
Nine Mile Point Unit 1

Exposure Pathway and/or Sample	Number of Samples [(a)] and Locations	Sampling and Collection Frequency [(a)]	Type of Analysis and Frequency
b. Fish	1. One sample each of two commercially or recreationally important species in the vicinity of a plant discharge area [(h)]. 2. One sample each of the same species from an area at least 5 miles distant from the site [(d)].	Twice per year.	Gamma isotopic analysis [(c)] on edible portions twice per year.
c. Food Products	1. Samples of three different kinds of broad leaf vegetation (such as vegetables) grown nearest to each of two different off-site locations of highest calculated site average D/Q (based on all licensed site reactors). 2. One sample of each of the similar broad leaf vegetation grown at least 9.3 – 20 miles distant in a least prevalent wind direction.	Once per year during harvest season.	Gamma isotopic [(c)] analysis of edible portions (Isotopic to include I-131 or a separate I-131 analysis may be performed) once during the harvest season.

NOTES FOR TABLE 3.0-1

(a) It is recognized that, at times, it may not be possible or practical to obtain samples of the media of choice at the most desired location or time. In these instances, suitable alternative media and locations may be chosen for the particular pathway in question and may be substituted. Actual locations (distance and directions) from the site shall be provided in the Annual Radiological Environmental Operating Report. Highest D/Q locations are based on historical meteorological data for all site licensed reactors.

(b) Particulate sample filters should be analyzed for gross beta 24 hours or more after sampling to allow for radon and thoron daughter decay. If the gross beta activity in air is greater than 10 times a historical yearly mean of control samples, gamma isotopic analysis shall be performed on the individual samples.

(c) Gamma isotopic analysis means the identification and quantification of gamma-emitting radionuclides that may be attributable to the effluents from the facility.

(d) The purpose of these samples is to obtain background information. If it is not practical to establish control locations in accordance with the distance and wind direction criteria, other sites, such as historical control locations which provide valid background data may be substituted.

(e) One or more instruments, such as a pressurized ion chamber, for measuring and recording dose rate continuously, may be used in place of, or in addition to, integrating dosimeters. For the purpose of this table, a thermoluminescent dosimeter may by considered to be one phosphor, and two or more phosphors in a packet may be considered as two or more dosimeters. Film badges shall not be used for measuring direct radiation.

(f) The "upstream sample" should be taken at a distance beyond significant influence of the discharge. The "downstream sample" should be taken in an area beyond but near the mixing zone, if possible.

(g) Composite samples should be collected with equipment (or equivalent) which is capable of collecting an aliquot at time intervals which are very short (e.g. hourly) relative to the compositing period (e.g. monthly) in order to assure obtaining a representative sample.

(h) In the event commercial or recreational important species are not available as a result of three attempts, then other species may be utilized as available.

TABLE 3.0-2

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM
REQUIRED SAMPLE COLLECTION AND ANALYSIS
Nine Mile Point Unit 2

Exposure Pathway and/or Sample	Number of Samples and Sample Locations [(a)]	Sampling and Collection Frequency	Type of Analysis and Frequency
AIRBORNE			
a. Direct Radiation	32 routine monitoring stations [(b)] either with two or more dosimeters or with one instrument for measuring and recording dose rate continuously, placed as follows: 1. An inner ring of stations, one in each meteorological sector in the general area of the Site Boundary. 2. An outer ring of stations, one in each land base meteorological sector in the 4 to 5 mile [(c)] range from the site. 3. The balance of the stations should be placed in special interest areas such as population centers, nearby residences, schools, and in one of two areas to serve as control stations [(d)].	Once per 3 months.	Gamma dose once per 3 months.

TABLE 3.0-2 (Continued)

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM
REQUIRED SAMPLE COLLECTION AND ANALYSIS
Nine Mile Point Unit 2

Exposure Pathway and/or Sample	Number of Samples and Sample Locations [a]	Sampling and Collection Frequency	Type of Analysis and Frequency
b. Airborne Radioiodine and Particulates	Samples from five locations: 1. Three samples from off-site locations close to the site boundary (within one mile) in different sectors of the highest calculated annual site average ground-level D/Q (based on all site licensed reactors)[c]. 2. One sample from the vicinity of an established year-round community having the highest calculated annual site average ground-level D/Q (based on all site licensed reactors)[c]. 3. One sample from a control location at least 10 miles distant and in a least prevalent wind direction [d].	Continuous sampler operation with sample collection weekly, or more frequently if required by dust loading.	Radioiodine Canister: I-131 analysis weekly. Particulate Sampler: 1. Gross beta radioactivity analysis ≥ 24 hours following filter change[f], 2. Gamma isotopic analysis on each sample where gross beta activity is >10 times the previous yearly mean of control samples, and 3. Gamma isotopic analysis [g] of composite sample (by location) once per 3 months.
WATERBORNE			
a. Surface	1. One sample upstream [d] [h]. 2. One sample from the site's downstream cooling water intake [h].	Composite sample over 1-month period [i].	Gamma isotopic analysis [g] once per month and tritium analysis once per 3 months.

TABLE 3.0-2 (Continued)

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM
REQUIRED SAMPLE COLLECTION AND ANALYSIS
Nine Mile Point Unit 2

Exposure Pathway and/or Sample	Number of Samples and Sample Locations [(a)]	Sampling and Collection Frequency	Type of Analysis and Frequency
b. Ground	Samples from one or two sources if likely to be affected [(j)].	Grab sample once per 3 months.	Gamma isotopic [(g)] and tritium analysis once per 3 months.
c. Drinking	One sample each of one to three of the nearest water supplies that could be affected by its discharge [(k)].	When I-131 analysis is performed, a composite sample over a 2-week period[(i)]; otherwise, a composite sample monthly	1. I-131 analysis on each composite when the dose calculated for the consumption of the water is greater than 1 mrem per year[(l)]. 2. Composite for gross beta and gamma isotopic analyses [(g)] monthly. 3. Composite for tritium analysis once per 3 months.
d. Sediment from Shoreline	One sample from a downstream area with existing or potential recreational value.	Twice per year.	Gamma isotopic analysis[(g)].

TABLE 3.0-2 (Continued)

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM
REQUIRED SAMPLE COLLECTION AND ANALYSIS
Nine Mile Point Unit 2

Exposure Pathway and/or Sample	Number of Samples and Sample Locations [(a)]	Sampling and Collection Frequency	Type of Analysis and Frequency
INGESTION			
a. Milk	1. Samples from Milk Sampling Locations in three locations within 3.5 miles[(e)] distance having the highest calculated annual site average D/Q (based on all licensed site reactors). 2. If there are none, then 1 sample from Milk Sampling Locations in each of three areas 3.5 – 5.0 miles[(e)] distant having the highest calculated annual site average D/Q (based on all licensed site reactors). 3. One sample from a Milk Sample Location at a control location 9 - 20 miles distant and in a least prevalent wind direction [(d)].	Twice per month, April – December (samples will be collected January – March if I-131 is detected in November and December of the preceding year)[(m)].	1. Gamma isotopic [(g)] and I-131 analysis twice per month when animals are on pasture (April – December); 2. Gamma isotopic [(g)] and I-131 analysis once per month at other times (January – March, if required).
b. Fish	1. One sample each of two commercially or recreationally important species in the vicinity of a plant discharge area [(n)]. 2. One sample of the same species in areas not influenced by station discharge [(d)].	Twice per year.	Gamma isotopic analysis [(g)] on edible portions twice per year.

TABLE 3.0-2 (Continued)

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM
REQUIRED SAMPLE COLLECTION AND ANALYSIS
Nine Mile Point Unit 2

Exposure Pathway and/or Sample	Number of Samples and Sample Locations [a]	Sampling and Collection Frequency	Type of Analysis and Frequency
c. Food Products	1. One sample of each principal class of food products from any area that is irrigated by water in which liquid plant wastes have been discharged [o].	At time of harvest [p].	Gamma isotopic [g] and I-131 analysis of each sample of edible portions.
	2. Samples of three different kinds of broad leaf vegetation (such as vegetables) grown nearest to each of two different off-site locations of highest calculated annual site average D/Q (based on all licensed site reactors)[e].	Once per year during the harvest season.	
	3. One sample of each of the similar broad leaf vegetation grown at least 9.3 miles distant in a least prevalent wind direction.	Once per year during the harvest season.	

NOTES FOR TABLE 3.0-2

(a) Specific parameters of distance and direction sector from the centerline of one reactor, and additional descriptions where pertinent, shall be provided for each and every sample location in Table 3.0-2. Refer to NUREG-0133, "Preparation of Radiological Effluent Technical Specifications for Nuclear Power Plants," October 1978, and to Radiological Assessment Branch Technical Position on Environmental Monitoring, Revision 1, November 1979. Deviations are permitted from the required sampling schedule if specimens are unobtainable because of such circumstances as hazardous conditions, seasonal unavailability (which includes theft and uncooperative residents), or malfunction of automatic sampling equipment.

(b) One or more instruments, such as a pressurized ion chamber, for measuring and recording dose rate continuously, may be used in place of, or in addition to, integrating dosimeters. Each of the 32 routine monitoring stations shall be equipped with 2 or more dosimeters or with 1 instrument for measuring and recording dose rate continuously. For the purpose of this table, a thermoluminescent dosimeter (TLD) is considered to be one phosphor, two or more phosphors in a packet are considered as two or more dosimeters. Film badges shall not be used as dosimeters for measuring direct radiation.

(c) At this distance, 8 wind rose sectors, (W, WNW, NW, NNW, N, NNE, NE, and ENE) are over Lake Ontario.

(d) The purpose of these samples is to obtain background information. If it is not practical to establish control locations in accordance with the distance and wind direction criteria, other sites, which provide valid background data, may be substituted.

(e) Having the highest calculated annual site average ground-level D/Q based on all site licensed reactors.

(f) Airborne particulate sample filters shall be analyzed for gross beta radioactivity 24 hours or more after sampling to allow for radon and thoron daughter decay.

(g) Gamma isotopic analysis means the identification and quantification of gamma-emitting radionuclides that may be attributable to the effluents from the facility.

(h) The "upstream" sample shall be taken at a distance beyond significant influence of the discharge. The "downstream" sample shall be taken in an area beyond but near the mixing zone.

(i) In this program, representative composite sample aliquots shall be collected at time intervals that are very short (e.g., hourly) relative to the compositing period (e.g., monthly) in order to assure obtaining a representative sample.

(j) Groundwater samples shall be taken when this source is tapped for drinking or irrigation purposes in areas where the hydraulic gradient or recharge properties are suitable for contamination.

(k) Drinking water samples shall be taken only when drinking water is a dose pathway.

(l) Analysis for I-131 may be accomplished by Ge-Li analysis, provided that the lower limit of detection (LLD) for I-131 in water samples found on Table 3.8-1 can be met. Doses shall be calculated for the maximum organ and age group.

(m) Samples will be collected January through March if I-131 is detected in November and December of the proceeding year.

(n) In the event two commercially or recreationally important species are not available after three attempts of collection, then two samples of one species or other species not necessarily commercially or recreationally important may be utilized.

(o) Applicable only to major irrigation projects within 9 miles of the site in the general down current direction.

(p) If harvest occurs more than once/year, sampling shall be performed during each discrete harvest. If harvest occurs continuously, sampling shall be taken monthly. Attention shall be paid to including samples of tuberous and root food products.

3.1 SAMPLE COLLECTION METHODOLOGY

3.1.1 SHORELINE SEDIMENTS

Shoreline sediment is collected at one area of existing or potential recreational value. One sample is also collected from a location beyond the influence of the site. Samples are collected as surface scrapings to a depth of approximately one inch. The samples are placed in plastic bags, sealed and shipped to the lab for analysis. Sediment samples are analyzed for gamma-emitting radionuclides.

Shoreline sediment sample locations are shown in Section 3.3, Figure 3.3-5.

3.1.2 FISH

Samples of available fish species that are commercially or recreationally important to Lake Ontario, such as lake trout, salmon, walleye, and smallmouth bass, are collected twice per year, once in the spring and again in the fall. Indicator samples are collected from a combination of the two on-site sample transects located offshore from the site. One set of control samples are collected at an off-site sample transect located offshore, 8 – 10 miles west of the site. Available species are selected using the following guidelines:

a. A minimum of two species that are commercially or recreationally important are to be collected from each sample location. Samples selected are limited to edible and/or sport species when available.

b. Samples are composed of the edible portion only.

Selected fish samples are frozen after collection and segregated by species and location. Samples are shipped frozen in insulated containers for analysis. Edible portions of each sample are analyzed for gamm-emitting radionuclides.

Fish collection locations are shown in Section 3.3, Figure 3.3-5.

3.1.3 SURFACE WATER

Surface water samples are taken from the respective inlet canals of the JAFNPP and the NRG Oswego Generating Station. The JAFNPP facility draws water from Lake Ontario on a continuous basis. This is used for the "downstream" or indicator sampling point for the Nine Mile Point site. The Oswego Generating Station inlet canal removes water from Lake Ontario at a point approximately 7.6 miles west of the site. This "upstream" 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.

Samples from the JAFNPP facility are composited from automatic sampling equipment, which discharges into a compositing tank or bottles. Samples are collected monthly from the compositor and analyzed for gamma emitters. Samples from the Oswego Generating Station are also obtained using automatic sampling equipment and collected in a holding tank. Representative samples from this location are obtained weekly and are composited to form a monthly composite sample. The monthly samples are analyzed for gamma emitting radionuclides.

A portion of the monthly sample from each of the locations is saved and composited to form quarterly composite samples, that are analyzed for tritium.

In addition to the sample results for the JAFNPP and Oswego Generating Station collection sites, data is presented for the Nine Mile Point Unit 1 (NMP1) and Nine Mile Point Unit 2 (NMP2) facility inlet canal samples and from the City of Oswego drinking water supply. These three locations are not required by the ODCM. These locations are optional sample points which are collected and analyzed to enhance the surface water sampling program. Monthly composite samples from these three locations are analyzed for gamma emitting nuclides, and quarterly composite samples are analyzed for tritium.

Sampling for groundwater and drinking water, as found in Section D 3.5.1 of the NMP2 ODCM, was not required during 2010. There was no groundwater source in 2010 that was tapped for drinking or irrigation purposes in areas where the hydraulic gradient or recharge properties support contamination migration; therefore, drinking water was not a dose pathway during 2010.

Surface water sample locations are shown in Section 3.3, Figure 3.3-4.

3.1.4 GROUNDWATER MONITORING PROGRAM

The Nuclear Energy Institute (NEI) Groundwater Protection Initiative was established to determine the potential impact nuclear power plants may have on the surrounding environment due to unplanned releases of radioactive liquids. Under the NEI 07-07 Groundwater Protection Initiative (GPI) – Final Guidance Document, August 2007, groundwater monitoring is accomplished through sampling of the water table around the plant and analyzing for tritium. In addition to the groundwater monitoring requirements specified in the NMP2 ODCM, NMPNS started monitoring groundwater wells in October 2005 and has been monitoring the plant dewatering systems as part of the response to Generic Letter 80-10 for several years. Samples collected from these locations are analyzed for tritium, gamma emitters, and strontium.

During the operating year 2010, there were no unplanned releases or spills of radioactive liquids on the NMPNS site.

Groundwater samples are analyzed using liquid scintillation detection and gamma isotopic analysis.

Groundwater tritium results are documented in the 2010 Annual Radiological Effluent Release Report. Historical groundwater data is presented in Section 7, Historical Data Tables.

Groundwater sample locations are shown in Section 3.3, Figure 3.3-6.

3.1.5 AIR PARTICULATE / IODINE

The air sampling stations required by the ODCM are located in the general area of the site boundary. The sampling stations are sited within a distance of 0.2 miles of the site boundary in sectors with the highest calculated annual site average ground-level deposition factor (D/Q) based on historical meteorological data. These stations (R-1, R-2, and R-3) are located in the E, ESE, and SE sectors as measured from the center of the NMP2 Reactor Building. The ODCM also requires that a fourth air sampling station be located in the vicinity of a year-round community. This station is located in the SE sector at a distance of 1.8 miles and is designated as Station R-4. A fifth station required by the ODCM is a control location designated as Station R-5. Station R-5 is located 16.4 miles from the site in the NE meteorological sector.

In addition to the five ODCM required locations, there are ten additional sampling stations. Six of these sampling stations are located within the site boundary and are designated as Onsite Stations D1, G, H, I, J, and K. These locations are within the site boundary of the NMPNS and JAFNPP. One air sampling station is located offsite in the SW sector in the vicinity of the City of Oswego and is designated as Offsite Station G. Three remaining air sampling stations are located in the ESE, SSE, and SSW sectors and range in distance from 7.2 to 9.0 miles. These are designated as Offsite Stations D2, E and F, respectively.

Each station collects airborne particulates using glass fiber filters (47 millimeter diameter) and radioiodine using charcoal sample cartridges (2 x 1 inches). The samplers run continuously and the charcoal cartridges and particulate filters are changed on a weekly basis. Sample volume is determined by use of calibrated gas flow meters located at the sample discharge. Gross beta analysis is performed on each particulate filter. Charcoal cartridges are analyzed for radioiodine using gamma spectral analysis. The particulate filters are composited quarterly by location and analyzed for gamma-emitting radionuclides.

Air sampling station locations (Environmental Stations) are shown in Section 3.3, Figures 3.3-2 and 3.3-3.

3.1.6 THERMOLUMMINESCENT DOSIMETERS (DIRECT RADIATION)

Thermoluminescent dosimeters (TLDs) are used to measure direct radiation (gamma dose) in the environment. Environmental TLDs are supplied and processed quarterly by the AREVA NP Environmental Laboratory. The laboratory utilizes a Panasonic based system using UD-814 dosimeters that are constructed of rectangular teflon wafers impregnated with 25% $CaSO_4$:Dy phosphor. Each dosimeter contains three calcium sulfate elements and one lithium borate element.

Environmental TLDs are placed in five different geographical regions around the site to evaluate effects of direct radiation as a result of plant operations. The following is a description of the five TLD geographical categories used in the NMPNS and JAFNPP Environmental Monitoring Program and the TLDs that make up each region:

TLD Geographical Category	Description
Onsite	TLDs placed at various locations within the Site Boundary are not required by the ODCM, with the exception of TLD # 7, 18 and 23. (TLD locations comprising this group are: 3, 4, 5, 6, 7*, 18*, 23*, 24, 25, 26, 27, 28, 29, 30, 31, 39, 47, 103, 106 and 107)
Site Boundary	An inner ring of TLDs placed in the general area of the Site Boundary in each of the sixteen meteorological sectors. This category is required by the ODCM. (TLD locations comprising this group are: 7*, 18*, 23*, 75*, 76*, 77*, 78*, 79*, 80*, 81*, 82*, 83*, 84*, 85*, 86*, and 87*)
Offsite	An outer ring of TLDs placed 4 to 5 miles from the site in each of the eight land-based meteorological sectors. This category is required by the ODCM. (TLD locations comprising this group are 88*, 89*, 90*, 91*, 92*, 93*, 94*, and 95*)
Special Interest	TLDs placed in Special Interest areas of high population density and use. These TLDs are located at or near large industrial sites, schools, or nearby towns or communities. This category is required by the ODCM. (TLD locations comprising this group are: 9, 10, 11, 12, 13, 15*, 19, 51, 52, 53, 54, 55, 56*, 58*, 96*, 97*, 98*, 99, 100, 101, 102, 108, and 109)
Control	TLDs placed in areas beyond significant influence of the site and plant operations. These TLDs are located to the SW, S and NE of the site at distances of 12.6 to 24.7 miles. This category is also required by the ODCM. (TLD locations comprising this group are 8, 14*, 49*, 111, 113)

* TLD location required by ODCM

The ODCM requires a total of 32 TLD stations. Environmental TLDs are also placed at additional locations not required by the ODCM, within the Onsite, Special Interest and Control TLD categories to supplement the ODCM required direct radiation data.

Two dosimeters are placed at each TLD monitoring location. The TLDs are sealed in polyethylene packages to ensure dosimeter integrity, placed in open webbed plastic holders, and attached to supporting structures, such as utility poles.

Environmental TLD locations are shown in Section 3.3, Figures 3.3-2 and 3.3-3.

3.1.7 MILK

Milk samples are routinely collected from farms during the sampling year. These farms include one indicator location and one control location. Samples are normally collected April through December of the sample year. If plant-related radionuclides are detected during November and December of the previous year, milk collections are continued into the following year, starting in January. If plant-related radionuclides are not detected in the November and December samples, then milk collections do not commence until April of the next sampling year. Milk samples were not collected in January through March of 2010, as there were no positive detections of plant related radionuclides in samples collected during November and December 2009.

The ODCM also requires that a sample be collected from a control location nine to twenty miles from the site and in a least prevalent wind direction. This location is in the south sector at a distance of 16 miles and serves as the control location.

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 to assure a homogenous mixture of milk and butterfat. Two gallons are collected from each indicator and control location during the first half and second half of each month. The samples are chilled, preserved and shipped fresh to the analytical laboratory within thirty-six hours of collection, in insulated shipping containers.

The milk sample locations are shown in Section 3.3, Figure 3.3-4.

3.1.8 FOOD PRODUCTS (VEGETATION)

Food products are collected once per year during the late summer harvest season. A minimum of three different kinds of broadleaf vegetation, edible or inedible, is collected from three different indicator garden locations. Sample locations are selected from gardens identified in the annual census that have the highest calculated annual site average D/Q values based on historical site meteorological data. Control samples are also collected from available locations greater than 9.3 miles distant from the site in a least prevalent wind direction. Control samples are of the same or similar type of vegetation when available.

Food product samples are analyzed for gamma emitters using gamma isotopic analysis and I-131.

Food product locations are shown in Section 3.3, Figure 3.3-5.

3.2 ANALYSES PERFORMED

The following environmental sample analyses are performed by the JAFNPP Environmental Laboratory:

- Air Particulate Filter – Gross Beta
- Air Particulate Filter Composites – Gamma Spectral Analysis
- Airborne Radioiodine – Gamma Spectral Analysis

- Fish – Gamma Spectral Analysis
- Food Products (Vegetation) – Gamma Spectral Analysis and I-131
- Milk – Gamma Spectral Analysis and I-131
- Shoreline Sediment – Gamma Spectral Analysis
- Special Samples (soil, food products, bottom sediment, etc.) – Gamma Spectral Analysis
- Surface Water Monthly Composites – Gamma Spectral Analysis and I-131
- Surface Water Quarterly Composites – Tritium
- Groundwater Quarterly Samples – Gamma Spectral Analysis and Tritium

The analyses of Direct Radiation using Thermoluminescent (TLDs) are performed by a contractor laboratory – Areva NP Environmental Laboratory.

The strontium analyses are performed by a contractor laboratory – GEL Laboratories, LLC.

3.3 SAMPLE LOCATIONS

Figures 3.3-1 through 3.3-6 provide maps illustrating sample locations. Sample locations referenced as letters and numbers on the report period data tables are consistent with designations plotted on the maps.

This section also contains an environmental sample location reference table (Table 3.3-1). This table contains the following information:

- Sample medium
- Map designation, (this column contains the key for the sample location and is consistent with the designation on the sample location maps and on the sample results data tables).
- Figure number
- Location description
- Degrees and distance of the sample location from the site.

TABLE 3.3-1

2010 ENVIRONMENTAL SAMPLE LOCATIONS

SAMPLE MEDIUM	MAP DESIGNATION (a & b)	FIGURE NUMBER	LOCATION DESCRIPTION	DEGREES & DISTANCE (c & d)
Shoreline Sediment	5*	Figure 3.3-5	Sunset Bay	84° at 1.2 miles
	6	Figure 3.3-5	Langs Beach, Control	232° at 4.8 miles
Fish	02*	Figure 3.3-5	Nine Mile Point Transect	290° at 0.4 miles
	03*	Figure 3.3-5	FitzPatrick Transect	62° at 0.8 miles
	00*	Figure 3.3-5	Oswego Transect - Control	237° at 5.9 miles
Surface Water	03*	Figure 3.3-4	FitzPatrick Inlet	71° at 0.5 miles
	08*	Figure 3.3-4	Oswego Generating Station Inlet - Control	236° at 7.6 miles
	09	Figure 3.3-4	NMP1 Inlet	319° at 0.3 miles
	10	Figure 3.3-4	Oswego City Water	240° at 7.8 miles
	11	Figure 3.3-4	NMP2 Inlet	336° at 0.3 miles
				353° at 0.3 miles
Air Radioiodine and Particulates	R-1*	Figure 3.3-2	R-1 Station, Nine Mile Point Road	92° at 1.8 miles
	R-2*	Figure 3.3-3	R-2 Station, Lake Road	106° at 1.1 miles
	R-3*	Figure 3.3-3	R-3 Station, Co. Rt. 29	134° at 1.4 miles
	R-4*	Figure 3.3-3	R-4 Station, Co. Rt. 29	145° at 1.8 miles
	R-5*	Figure 3.3-2	R-5 Station, Montario Point - Control	42° at 16.2 miles
	D1	Figure 3.3-3	D1 On-Site Station	73° at 0.3 miles
	G	Figure 3.3-3	G On-Site Station	244° at 0.7 miles
	H	Figure 3.3-3	H On-Site Station	74° at 0.8 miles
	I	Figure 3.3-3	I On-Site Station	96° at 0.8 miles
	J	Figure 3.3-3	J On-Site Station	110° at 0.9 miles
	K	Figure 3.3-3	K On-Site Station	133° at 0.5 miles
	G	Figure 3.3-2	G Off-Site Station, Saint Paul Street	226° at 5.4 miles
	D2	Figure 3.3-2	D2 Off-Site Station, Rt. 64	118° at 9.0 miles
	E	Figure 3.3-2	E Off-Site Station, Rt. 4	162° at 7.1 miles
	F	Figure 3.3-2	F Off-site Station, Dutch Ridge Road	192° at 7.6 miles

TABLE 3.3-1 (Continued)

2010 ENVIRONMENTAL SAMPLE LOCATIONS

SAMPLE MEDIUM	MAP DESIGNATION (a & b)	FIGURE NUMBER	LOCATION DESCRIPTION	DEGREES & DISTANCE (c & d)
Thermoluminescent Dosimeters (TLD)	3	Figure 3.3-3	D1 On-Site Station	73° at 0.3 miles
	4	Figure 3.3-3	D2 On-Site Station	143° at 0.4 miles
	5	Figure 3.3-3	E On-Site Station	150° at 0.4 miles
	6	Figure 3.3-3	F On-Site Station	213° at 0.5 miles
	7*	Figure 3.3-3	G On-Site Station	244° at 0.7 miles
	8	Figure 3.3-2	R-5 Off-Site Station - Control	42° at 16.2 miles
	9	Figure 3.3-2	State Route 3	80° at 11.4 miles
	10	Figure 3.3-2	D2 Off-Site Station	118° at 9.0 miles
	11	Figure 3.3-2	E Off-Site Station	162° at 7.1 miles
	12	Figure 3.3-2	F Off-Site Station	192° at 7.7 miles
	13	Figure 3.3-2	G Off-Site Station	226° at 5.4 miles
	14*	Figure 3.3-2	Southwest Oswego – Control	227° at 12.5 miles
	15*	Figure 3.3-2	West Site Boundary	239° at 0.9 miles
	18*	Figure 3.3-3	Energy Information Center	266° at 0.5 miles
	19	Figure 3.3-2	East Site Boundary	83° at 1.4 miles
	23*	Figure 3.3-3	H On-Site Station	74° at 0.8 miles
	24	Figure 3.3-3	I On-Site Station	96° at 0.8 miles
	25	Figure 3.3-3	J On-Site Station	110° at 0.9 miles
	26	Figure 3.3-3	K On-Site Station	133° at 0.5 miles
	27	Figure 3.3-3	North Fence, JAFNPP	60° at 0.4 miles
	28	Figure 3.3-3	North Fence, JAFNPP	68° at 0.5 miles
	29	Figure 3.3-3	North Fence JAFNPP	65° at 0.5 miles
	30	Figure 3.3-3	North Fence JAFNPP	57° at 0.4 miles
	31	Figure 3.3-3	North Fence NMP1	278° at 0.2 miles
	39	Figure 3.3-3	North Fence NMP1	296° at 0.2 miles
	47	Figure 3.3-3	North Fence JAFNPP	69° at 0.6 miles
	49*	Figure 3.3-2	Phoenix, NY – Control	168° at 19.7 miles
	51	Figure 3.3-2	Oswego Generating Station, East	234° at 7.3 miles
	52	Figure 3.3-2	Fitzhugh Park Elementary School, East	227° at 5.9 miles
	53	Figure 3.3-2	Fulton High School	183° at 13.7 miles
	54	Figure 3.3-2	Mexico High School	115° at 9.4 miles
	55	Figure 3.3-2	Pulaski Gas Substation, Rt. 5	75° at 13.0 miles

TABLE 3.3-1 (Continued)

2010 ENVIRONMENTAL SAMPLE LOCATIONS

SAMPLE MEDIUM	MAP DESIGNATION (a & b)	FIGURE NUMBER	LOCATION DESCRIPTION	DEGREES & DISTANCE (c & d)
Thermoluminescent Dosimeters (TLD) (Continued)	56*	Figure 3.3-2	New Haven Elementary School	124° at 5.2 miles
	58*	Figure 3.3-2	County Route 1A and Alcan	222° at 3.0 miles
	75*	Figure 3.3-3	North Fence, NMP2	354° at 0.1 miles
	76*	Figure 3.3-3	North Fence, NMP2	27° at 0.1 miles
	77*	Figure 3.3-3	North Fence, NMP2	37° at 0.2 miles
	78*	Figure 3.3-3	East Boundary, JAFNPP	86° at 1.0 miles
	79*	Figure 3.3-3	County Route 29	121° at 1.2 miles
	80*	Figure 3.3-3	County Route 29	136° at 1.5 miles
	81*	Figure 3.3-3	Miner Road	160° at 1.7 miles
	82*	Figure 3.3-3	Miner Road	180° at 1.6 miles
	83*	Figure 3.3-3	Lakeview Road	203° at 1.2 miles
	84*	Figure 3.3-3	Lakeview Road	225° at 1.1 miles
	85*	Figure 3.3-3	North Fence, NMP1	290° at 0.2 miles
	86*	Figure 3.3-3	North Fence, NMP1	310° at 0.1 miles
	87*	Figure 3.3-3	North Fence, NMP2	332° at 0.1 miles
	88*	Figure 3.3-2	Hickory Grove Road	97° at 4.5 miles
	89*	Figure 3.3-2	Leavitt Road	112° at 4.3 miles
	90*	Figure 3.3-2	Route 104 and Keefe Road	135° at 4.2 miles
	91*	Figure 3.3-2	County Route 51A	157° at 4.9 miles
	92*	Figure 3.3-2	Maiden Lane Road	183° at 4.5 miles
	93*	Figure 3.3-2	County Route 53	206° at 4.4 miles
	94*	Figure 3.3-2	Country Route 1 and Kocher Road	224° at 4.4 miles
	95*	Figure 3.3-2	Lakeshore Camp Site	239° at 3.7 miles
	96*	Figure 3.3-2	Creamery Road	199° at 3.7 miles
	97*	Figure 3.3-3	County Route 29	145° at 1.8 miles
	98*	Figure 3.3-2	Lake Road	103° at 1.2 miles
	99	Figure 3.3-2	Nine Mile Point Road	92° at 1.8 miles
	100	Figure 3.3-3	Country Route 29 and Lake Road	106° at 1.1 miles
	101	Figure 3.3-3	County Route 29	134° at 1.4 miles
	102	Figure 3.3-2	Oswego County Airport	175° at 11.9 miles
	103	Figure 3.3-3	Energy Center, East	268° at 0.4 miles
	104	Figure 3.3-2	Parkhurst Road	102° at 1.4 miles

TABLE 3.3-1 (Continued)

2010 ENVIRONMENTAL SAMPLE LOCATIONS

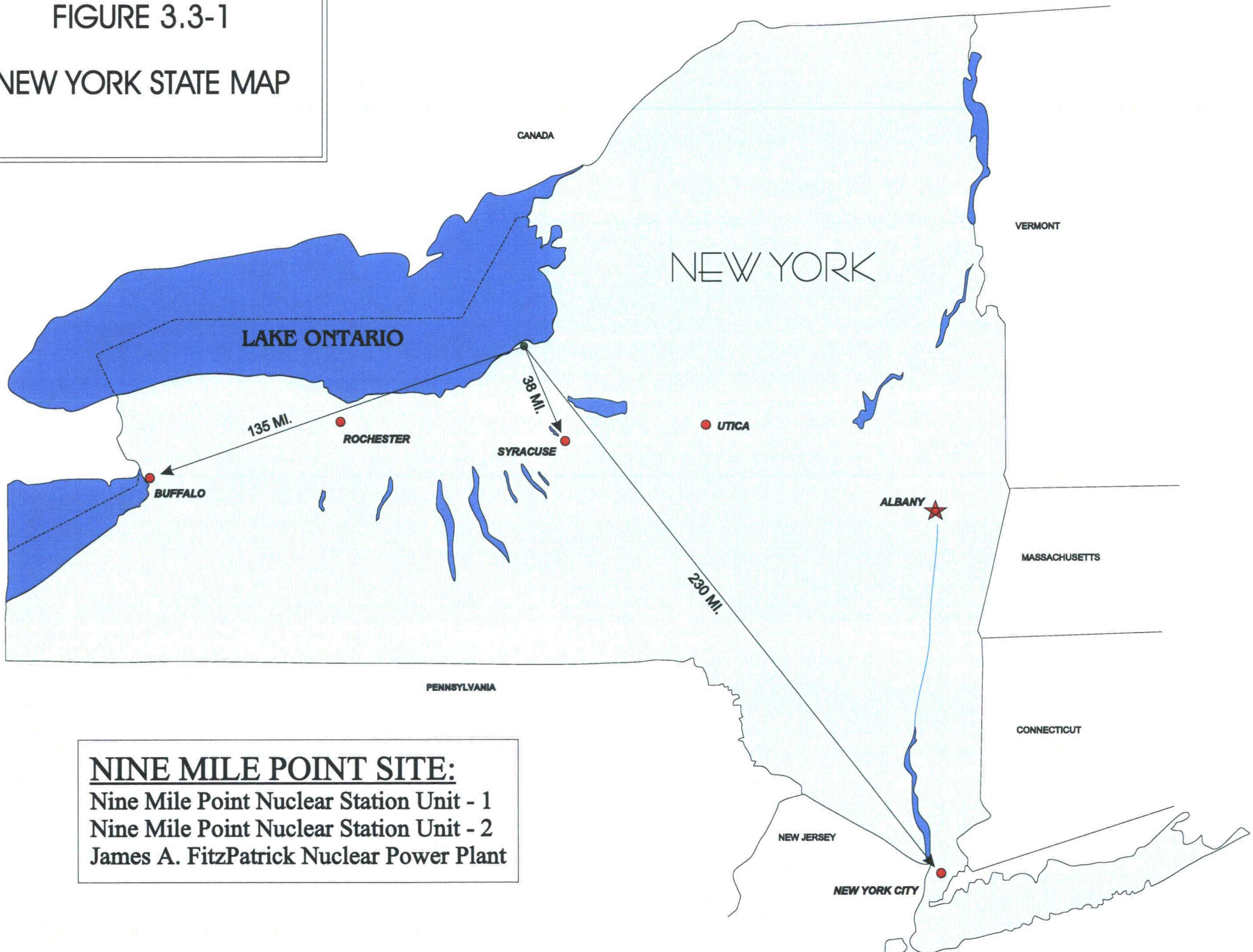
SAMPLE MEDIUM	MAP DESIGNATION (a & b)	FIGURE NUMBER	LOCATION DESCRIPTION	DEGREES & DISTANCE (c & d)
Thermoluminescent	105	Figure 3.3-3	Lakeview Road	199° at 1.4 miles
Dosimeters (TLD)	106	Figure 3.3-3	Shoreline Cove, West of NMP1	272° at 0.3 miles
(Continued)	107	Figure 3.3-3	Shoreline Cove, West of NMP1	271° at 0.3 miles
	108	Figure 3.3-3	Lake Road	105° at 1.1 miles
	109	Figure 3.3-3	Lake Road	104° at 1.1 miles
	111	Figure 3.3-2	Sterling, NY – Control	214° at 21.8 miles
	112	Figure 3.3-2	EOF/Env. Lab, Oswego County Airport	175° at 11.9 miles
	113	Figure 3.3-2	Baldwinsville, NY – Control	178° at 24.7 miles
Cows Milk	55	Figure 3.3-4	Indicator Location	97° at 8.8 miles
	77*	Figure 3.3-4	Control Location	190° at 16.0 miles
	69**	Figure 3.3-5	Indicator Location	124° at 2.3 miles
Food Products	133*	Figure 3.3-5	Indicator Location	84° at 1.6 miles
	134**	Figure 3.3-5	Indicator Location	84° at 1.5 miles
	144**	Figure 3.3-5	Indicator Location	139° at 1.6 miles
	145*	Figure 3.3-5	Control Location	222° at 15.1 miles
	484*	Figure 3.3-5	Indicator Location	132° at 1.4 miles
Groundwater	MW 1-8	Figure 3.3-6	Down Gradient Wells - Indicator	258 ° to 56 ° at <0.3 miles
	GMX-MW-1	Figure 3.3-6	Upland Well - Control	160 ° at 0.3 miles
	GMX-MW-2	Figure 3.3-6	Upland Well - Control	198 ° at 0.3 miles
	Storm Drain	Figure 3.3-6	NMP2 Dewatering System - Indicator	32 ° at 0.2 miles

Table Notes:

(a) Sample marked by an asterisk (*) are location required by ODCM
(b) Sample marked by an double asterisk (**) are optional loacations
(c) Degrees and distance based on Nine Mile Point Unit 2 Reactor Centerline
(d) Degrees and Distances updated by Global Positioning System (GPS)

FIGURE 3.3-1

NEW YORK STATE MAP



NINE MILE POINT SITE:

Nine Mile Point Nuclear Station Unit - 1
Nine Mile Point Nuclear Station Unit - 2
James A. FitzPatrick Nuclear Power Plant

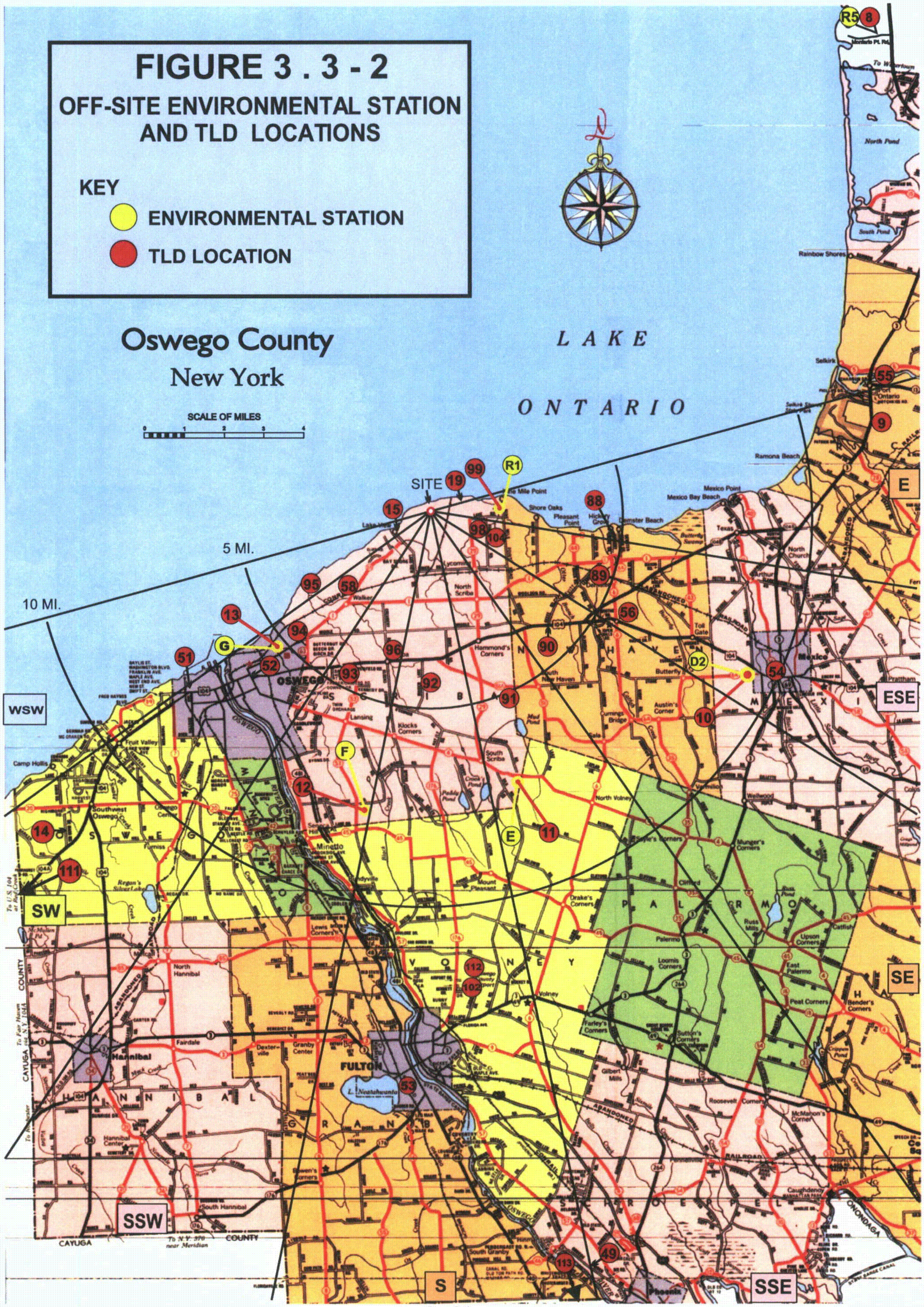


FIGURE 3 . 3 - 2
OFF-SITE ENVIRONMENTAL STATION AND TLD LOCATIONS

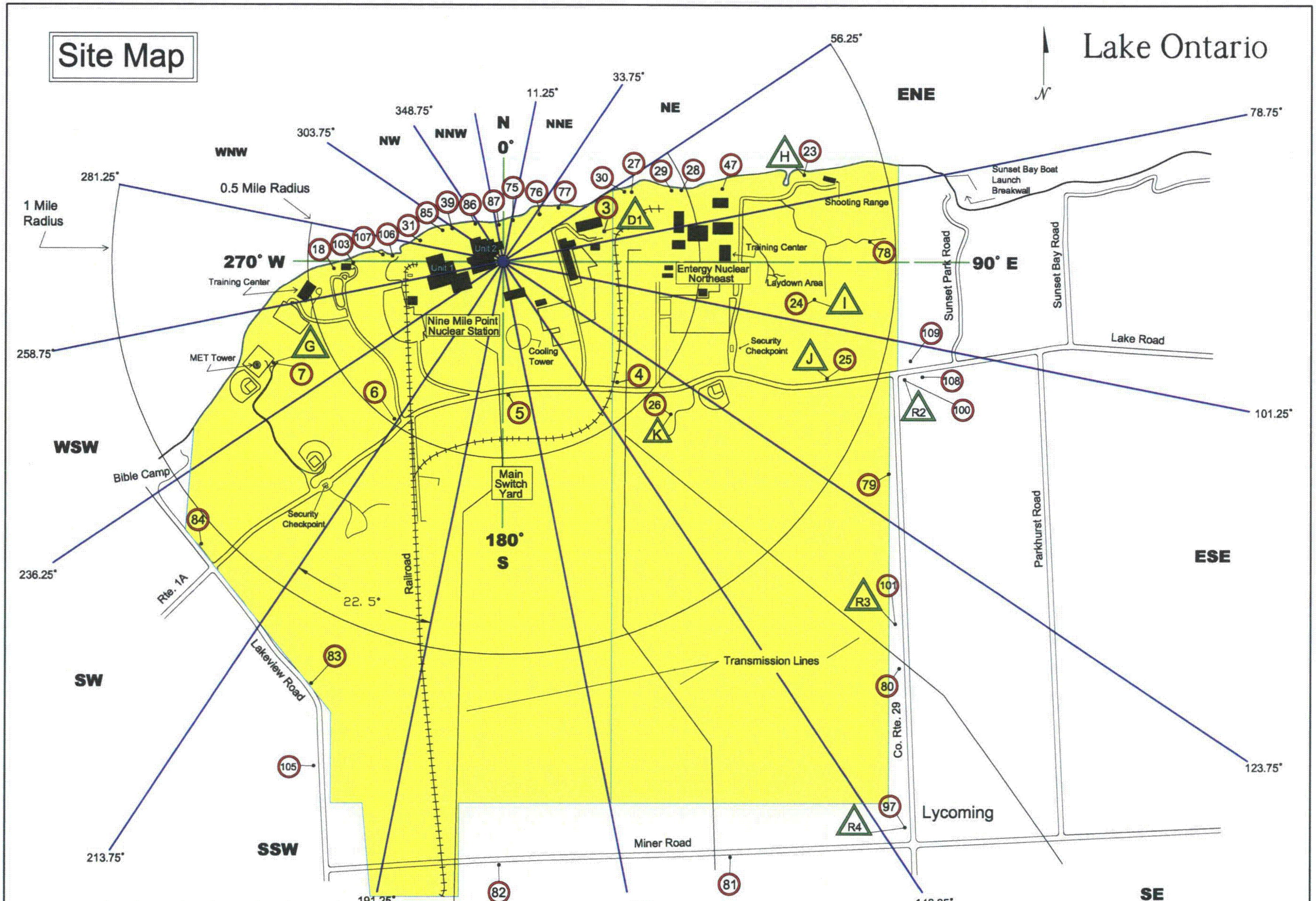
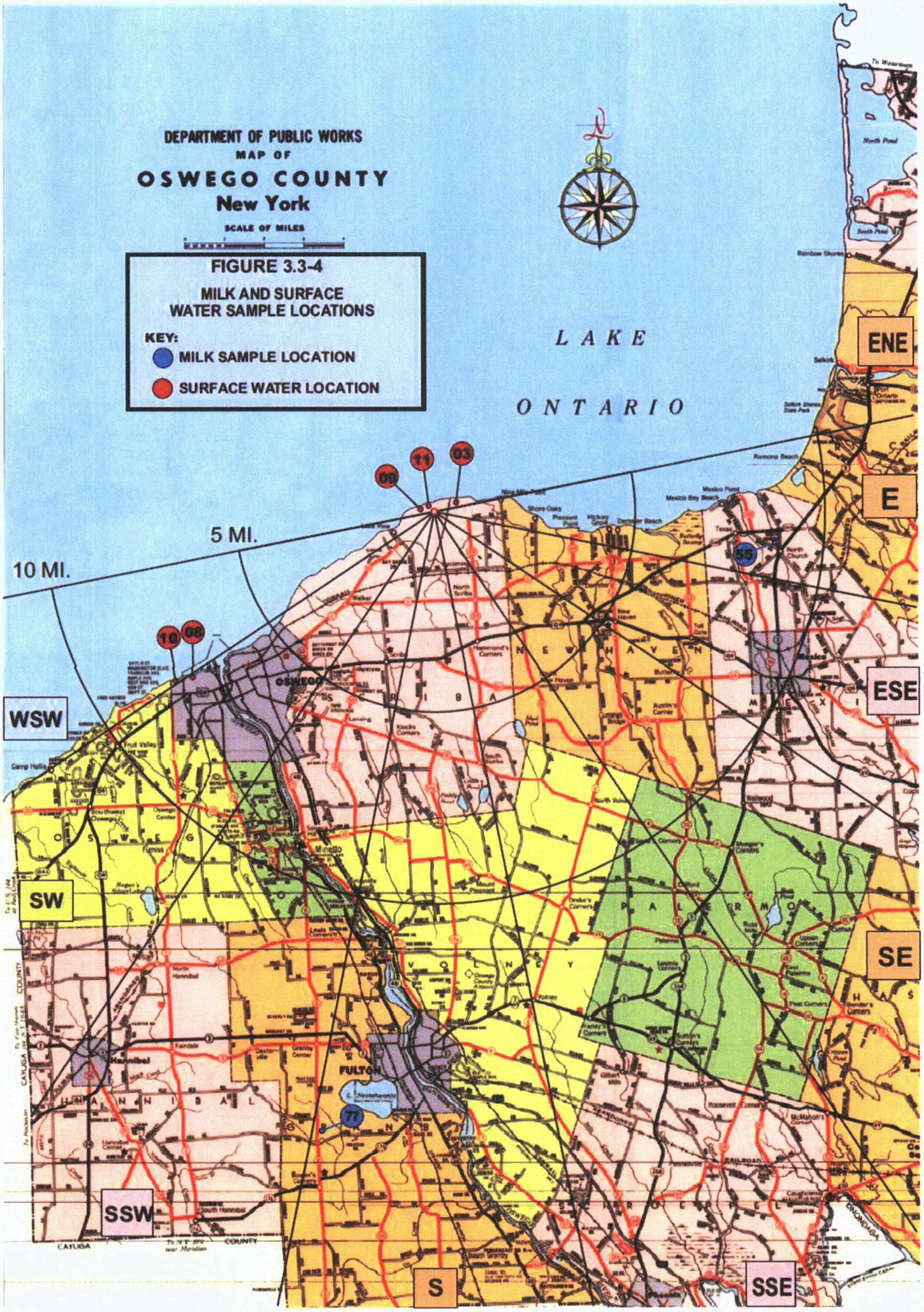
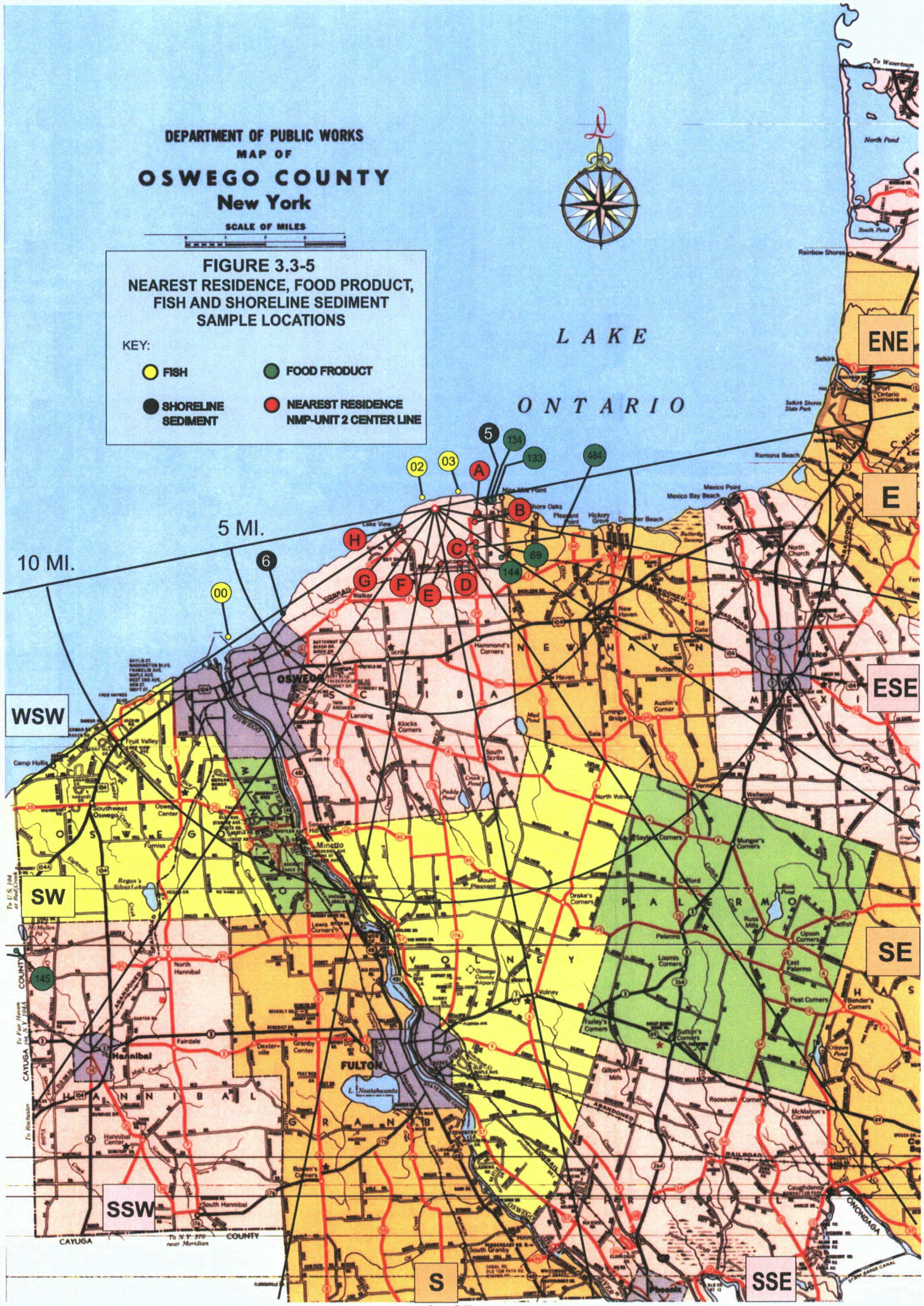
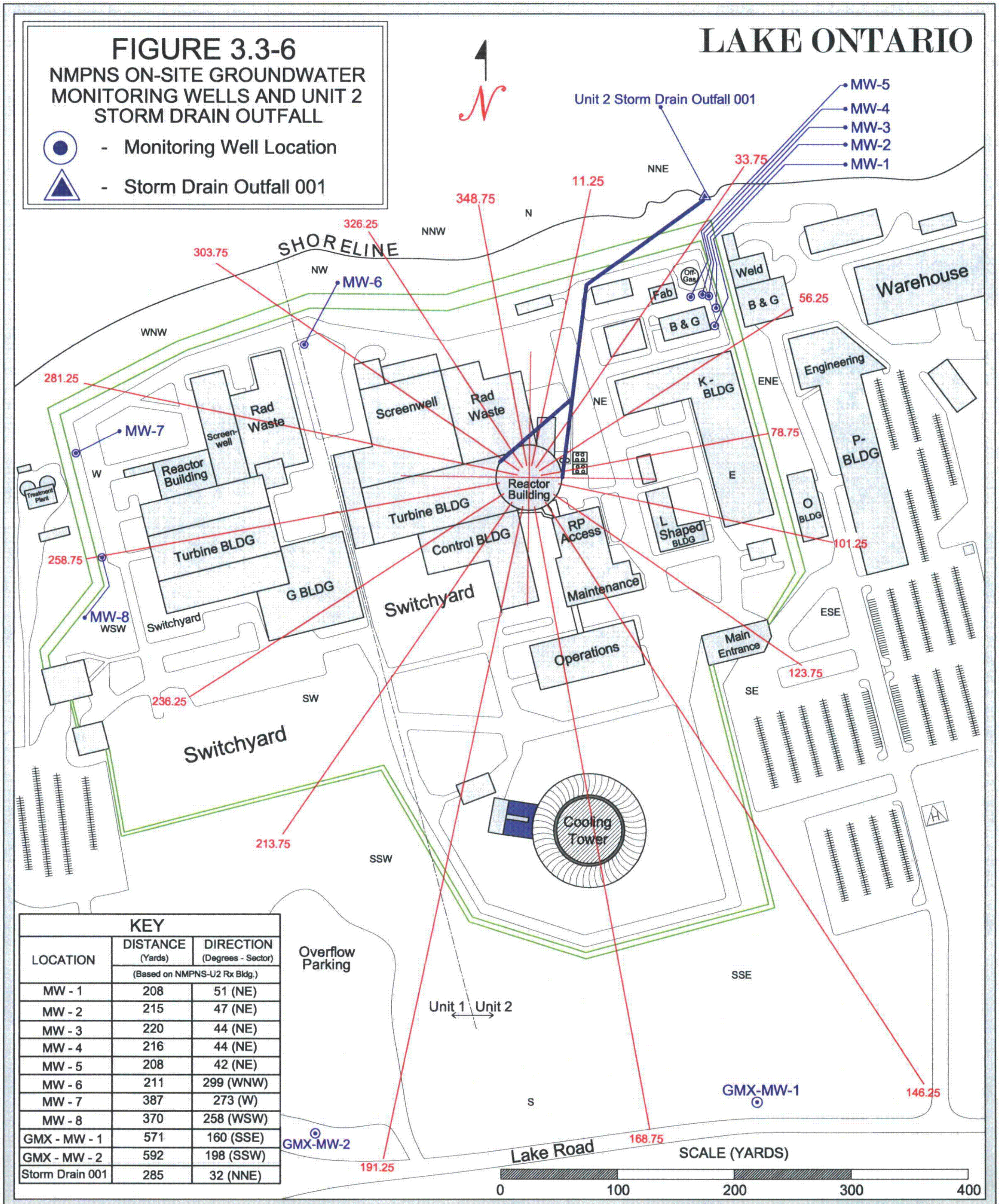


FIGURE 3.3-3
ON-SITE ENVIRONMENTAL STATION AND TLD LOCATIONS

KEY:
△ ENVIRONMENTAL STATIONS
○ TLD LOCATIONS


DEPARTMENT OF PUBLIC WORKS
MAP OF
OSWEGO COUNTY
New York
SCALE OF MILES
FIGURE 3.3-4
MILK AND SURFACE WATER SAMPLE LOCATIONS
KEY:
MILK SAMPLE LOCATION
SURFACE WATER LOCATION
LAKE
ONTARIO
5 MI.
10 MI.
09
11
03
10
08
55
77
ENE
E
ESE
SE
SSE
S
SSW
SW
WSW
OSWEGO
FULTON


DEPARTMENT OF PUBLIC WORKS
MAP OF
OSWEGO COUNTY
New York
SCALE OF MILES
FIGURE 3.3-5
NEAREST RESIDENCE, FOOD PRODUCT, FISH AND SHORELINE SEDIMENT SAMPLE LOCATIONS
KEY:
FISH
FOOD PRODUCT
SHORELINE SEDIMENT
NEAREST RESIDENCE NMP-UNIT 2 CENTER LINE
LAKE
ONTARIO
5 MI.
10 MI.
00
02
03
5
6
134
133
484
69
144
145
A
B
C
D
E
F
G
H
WSW
SW
SSW
S
SSE
SE
ESE
E
ENE
OSWEGO
FULTON
Hannibal
Mexico



KEY

LOCATION	DISTANCE (Yards)	DIRECTION (Degrees - Sector)
	(Based on NMPNS-U2 Rx Bldg.)	
MW - 1	208	51 (NE)
MW - 2	215	47 (NE)
MW - 3	220	44 (NE)
MW - 4	216	44 (NE)
MW - 5	208	42 (NE)
MW - 6	211	299 (WNW)
MW - 7	387	273 (W)
MW - 8	370	258 (WSW)
GMX - MW - 1	571	160 (SSE)
GMX - MW - 2	592	198 (SSW)
Storm Drain 001	285	32 (NNE)

3.4 LAND USE CENSUS

The ODCM require that a milch animal census and a residence census be conducted annually out to a distance of five miles. Milch animals are defined as any animal that is routinely used to provide milk for human consumption.

The milch animal census is an estimation of the number of cows and goats within an approximate ten-mile radius of the Nine Mile Point site. This census is performed once per year in the summer by sending questionnaires to previous milch animal owners, and by road surveys to locate any possible new owners. In the event that questionnaires are not answered, the owners are contacted by telephone or in person. The Oswego County Cooperative Extension Service was also contacted to provide any additional information.

The residence census is conducted each year to identify the closest residence in each of the 22.5 degree meteorological sectors out to a distance of five miles. 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. Several of the site meteorological sectors are located over Lake Ontario; therefore, there are only eight sectors over land where residences are located within five miles.

In addition to the milch animal and residence census, a garden census is performed. The census is conducted each year to identify the gardens near the site that are to be used for the collection of food product samples. The results of the garden census are not provided in this report. The results are used only to identify appropriate sample locations. The garden census is not required by the ODCMs if broadleaf vegetation sampling and analysis is performed.

3.5 CHANGES TO THE REMP PROGRAM

There were no changes to the 2010 REMP sampling program.

3.6 DEVIATION AND EXCEPTIONS TO THE PROGRAM

The noted exceptions to the 2010 sample program address only those samples or monitoring requirements which are required by the ODCM. This section satisfies the reporting requirements of Section D 6.9.1.d of the NMP1 ODCM and Section D 4.1.2 of the NMP2 ODCM.

A. ODCM PROGRAM DEVIATIONS

The following are the deviations from the program specified by the NMP1 and NMP2 ODCM:

1. The air station sample pumps at R1 and R2 off-site environmental sampling stations were inoperable for approximately 3 hours each during the sampling period of May 18, 2011 to May 25, 2011. The sample pump out–of-service time was determined based on the sample pump run time integrator. The inoperability of the pump was due to loss of power to the air station. No corrective actions were required to restore power to the air stations.

2. The air station sample pumps at R1 and R2 off-site environmental sampling stations were inoperable for approximately 1 hour each during the sampling period of August 17, 2011 to August 24, 2011. The sample pump out–of-service time was determined based on the sample pump run time integrator. The inoperability of the pump was due to loss of power to the air station. No corrective actions were required to restore power to the air stations.

3. The JAFNPP Inlet Canal surface water sampler was discovered inoperable on September 4, 2010. The sampler was out of service for 24 hours due to equipment failure. The inoperable sample pump was replaced.

4. The JAFNPP Inlet Canal surface water sampler was discovered inoperable on September 18, 2010. The sampler was out of service for 26 hours due to equipment failure. The inoperable sample pump was replaced.

5. The gas meter at R1 off-site environmental sample station was taken out of service on August 10, 2010 due to variation in sample flow noted from July 27, 2010 to August 10, 2010. The gas meter was sent to a vendor to perform a calibration check. The calibration check indicated that the flow rate for the R-1 off-site gas meter was low by 8.5%. Sample data from July 27, 2010 to August 10, 2010 were recalculated using a flow correction factor of -8.5%. The recalculated results met the NMP 1 and NMP2 ODCM lower limit of detection criteria. The gas meter has been retired.

6. The air station sample pumps at R1, R2 and R5 off-site environmental sampling stations were inoperable for approximately 2 hours each during the sampling period of November 16, 2011 to November 23, 2011. The sample pump out–of-service times were determined based on the sample pump run time integrators. The inoperability of the pumps was due to loss of power to the air stations. No corrective actions were required to restore power to the air stations.

7. The air station sample pump at R5 off-site environmental sampling station was inoperable for approximately 3 hours during the sampling period of December 7, 2011 to December 14, 2011. The sample pump out of service time was determined based on the sample pump run time integrator. The inoperability of the pump was due to loss of power to the air station. No corrective actions were required to restore power to the air stations.

B. AIR SAMPLING STATION OPERABILITY ASSESSMENT

The ODCM required air sampling program consists of 5 individual sampling locations. The collective operable time period for the air monitoring stations was 43,781 hours out of a possible 43,800 hours. The air sampling availability factor for the reporting period was 99.96%.

3.7 STATISTICAL METHODOLOGY

There are a number of statistical calculation methodologies used in evaluating the data from the environmental monitoring program. These methodologies include determination of standard deviation, the mean and associated error for the mean and the lower limit of detection (LLD).

3.7.1 ESTIMATION OF THE MEAN AND STANDARD DEVIATION

The mean, ($\overline{X}$), and standard deviation, (s), were used in the reduction of the data generated by the sampling and analysis of the various media in the NMPNS REMP. The following equations were utilized to compute the mean ($\overline{X}$) and the standard deviation (s):

A. Mean

$$\overline{X} = \frac{\sum_{i=1}^{n} X_i}{N}$$

Where,

$\overline{X}$ = estimate of the mean
i = individual sample, i
N, n = total number of samples with positive indications
X_i = value for sample i above the lower limit of detection

B. Standard Deviation

$$s = \left[\frac{\sum_{i=1}^{n} (X_i - \overline{X})^2}{(N-1)} \right]^{1/2}$$

Where,

$\overline{X}$ = mean for the values of X
s = standard deviation for the sample population.

3.7.2 ESTIMATION OF THE MEAN AND THE ESTIMATED ERROR FOR THE MEAN

In accordance with program policy, two recounts of samples are performed when the initial count indicates the presence of a plant-related radionuclide(s). When a radionuclide is positively identified in two or more counts, the analytical result for the radionuclide is reported as the mean of the positive detections and the associated propagated error for that mean. In cases where more than one positive sample result is available, the mean of the sample results and the estimated error for the mean are reported in the Annual Report.

The following equations were utilized to estimate the mean ($\bar{X}$) and the associated propagated error.

A. Mean

$$\bar{X} = \frac{\sum_{i=1}^{n} X_i}{N}$$

Where,

$\bar{X}$ = estimate of the mean

i = individual sample, i

N, n = total number of samples with positive indications

X_i = value for sample i above the lower limit of detection

B. Error of the Mean

$$\text{ERROR MEAN} = \frac{\left[\sum_{i=1}^{n} (\text{ERROR})^2\right]^{1/2}}{N}$$

Where,

ERROR MEAN = propagated error

i = individual sample

ERROR = 1 sigma* error of the individual analysis

N, n = number of samples with positive indications

* Sigma (σ)

Sigma is the greek letter used to represent the mathematical term Standard Deviation.

Standard Deviation is a measure of dispersion from the arithmetic mean of a set of numbers.

3.7.3 LOWER LIMIT OF DETECTION (LLD)

The LLD is the predetermined concentration or activity level used to establish a detection limit for the analytical procedures.

The LLDs are specified by the ODCM for radionuclides in specific media and are determined by taking into account the overall measurement methods. The equation used to calculate the LLD is:

$$LLD = \frac{4.66\ S_b}{(E)\ (V)\ (2.22)\ (Y)\ \exp(-\lambda \Delta t)}$$

Where:

LLD = the a priori lower limit of detection, as defined above (in picocuries per unit mass or volume)

S_b = the standard deviation of the background counting rate or of the counting rate of a blank sample, as appropriate (in counts per minute)

E = the counting efficiency (in counts per disintegration)

V = the sample size (in units of mass or volume)

2.22 = the number of disintegrations per minute per picocurie

Y = the fractional radiochemical yield (when applicable)

λ = the radioactive decay constant for the particular radionuclide

Δt = the elapsed time between sample collection (or end of the sample collection period) and time of counting

The ODCM LLD formula assumes that:

- The counting times for the sample and background are equal.
- The count rate of the background is approximately equal to the count rate of the sample.

In the ODCM program, LLDs are used to ensure that minimum acceptable detection capabilities are met with specified statistical confidence levels (95% detection probability with 5% probability of a false negative).

Table 3.7-1 lists the ODCM program required LLDs for specific media and radionuclides. The LLDs actually achieved are routinely lower than those specified by the ODCM.

TABLE 3.7-1

REQUIRED DETECTION CAPABILITIES FOR ENVIRONMENTAL SAMPLE ANALYSIS
LOWER LIMIT OF DETECTION (LLD)

Analysis	Water (pCi/l)	Airborne Particulate or Gases (pCi/m^3)	Fish (pCi/kg, wet)	Milk (pCi/l)	Food Products (pCi/kg, wet)	Sediment (pCi/kg, dry)
Gross Beta	4	0.01				
H-3	3000 (a)					
Mn-54	15		130			
Fe-59	30		260			
Co-58, Co-60	15		130			
Zn-65	30		260			
Zr-95, Nb-95	15					
I-131	15 (a)	0.07		1	60	
Cs-134	15	0.05	130	15	60	150
Cs-137	18	0.06	150	18	80	180
Ba/La - 140	15			15		

(a) No drinking water pathway exists at the Nine Mile Point Site under normal operating conditions due to the direction and distance of the nearest drinking water intake. Therefore, an LLD value of 3000 pCi/liter is used for H-3, and an LLD value of 15 pCi/liter is used for I-131.

3.8 COMPLIANCE WITH REQUIRED LOWER LIMITS OF DETECTION (LLD)

Tables D 4.6.20-1 and D 3.5.1-3 of the NMP1 ODCM and NMP2 ODCM, respectively, specify the detection capabilities for environmental sample analysis (See Table 3.7-1). The reporting requirements of NMP1 ODCM, Section D 6.9.1.d and NMP2 ODCM, Section D 4.1.2 require that a discussion of all analyses for which the LLDs required by Tables D 4.6.20-1 and D 3.5.1-3 were not achieved be included in the Annual Radiological Environmental Operating Report. This Section is provided pursuant to this requirement.

All sample analyses performed in 2010, as required by the ODCM, achieved the LLD specified by ODCM Tables D 4.6.20-1 and D 3.5.1-3.

3.9 REGULATORY DOSE LIMITS

Two federal agencies, the Nuclear Regulatory Commission (NRC) and the Environmental Protection Agency (EPA) have responsibility for regulations promulgated for protecting the public from radiation and radioactivity beyond the site boundary.

3.9.1 The Nuclear Regulatory Commission

The NRC, in 10 CFR 20.1301, limits the levels of radiation in unrestricted areas resulting from the possession or use of radioactive materials such that they limit any individual to a dose of:

- less than or equal to 100 mrem per year to the total body.

In addition to this dose limit, the NRC has established design objectives for nuclear plant licensees. Conformance to these guidelines ensures that nuclear power reactor effluents are maintained as far below the legal limits as is reasonably achievable.

The NRC, in 10 CFR 50, Appendix I, establishes design objectives for the dose to a member of the general public from radioactive material in liquid effluents released to unrestricted areas to be limited to:

- less than or equal to 3 mrem per year to the total body, or
- less than or equal to 10 mrem per year to any organ.

The air dose due to release of noble gases in gaseous effluents is restricted to:

- less than or equal to 10 mrad per year for gamma radiation, or
- less than or equal to 20 mrad per year for beta radiation.

The dose to a member of the general public from iodine-131, tritium, and all particulate radionuclides with half-lives greater than eight days in gaseous effluents is limited to:

- less than or equal to 15 mrem per year to any organ.

3.9.2 Environmental Protection Agency

The EPA, in 40 CFR 190.10 Subpart B, sets forth the environmental standards for the uranium fuel cycle. During normal operation, the annual dose to any member of the public from the entire uranium fuel cycle shall be limited to:

- less than or equal to 25 mrem per year to the whole body,
- less than or equal to 75 mrem per year to the thyroid, and
- less than or equal to 25 mrem per year to any other organ.

4.0 SAMPLE SUMMARY TABLES IN BRANCH TECHNICAL POSITION FORMAT

All sample data is summarized in table form. Table 4.0-1 is titled "Radiological Environmental Monitoring Program Annual Summary" and follows the specification outlined by in the NRC Radiological Assessment Branch Technical Position (Rev. 1, November 1979), which is summarized below.

<u>Column</u>

1. Sample medium.
2. Type and number of analyses performed.
3. Required Lower Limits of Detection (LLD), see Section 3.7.3, Table 3.7-1. This wording indicates that inclusive data is based on 4.66 S_b (sigma) of background (See Section 3.7).
4. The mean and range of the positive measured values of the indicator locations.
5. The mean, range, and location of the highest indicator annual mean. Location designations are keyed to Table 3.3-1 in Section 3.3.
6. The mean and range of the positive measured values of the control locations.
7. The number of non-routine reports sent to the Nuclear Regulatory Commission.

NOTE: Only positive measured values are used in statistical calculations.

TABLE 4.0-1

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY
JANUARY – DECEMBER 2010*

MEDIUM (UNITS)	TYPE AND NUMBER OF ANALYSES*	LLD[a]	INDICATOR LOCATIONS: MEAN [b] / RANGE	LOCATION [c] OF HIGHEST ANNUAL MEAN: LOCATION & MEAN [b] / RANGE	CONTROL LOCATION: MEAN [b] / RANGE	NUMBER OF NONROUTINE REPORTS
Shoreline Sediment (pCi/kg-dry)	Gamma-Spectrum Analysis (GSA) (4):					
	Cs-134	150	<LLD	<LLD	<LLD	0
	Cs-137	180	<LLD	<LLD	<LLD	0
Fish (pCi/kg-wet)	GSA (18) [d]:					
	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	<LLD	<LLD	<LLD	0

TABLE 4.0-1 (continued)

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY
JANUARY – DECEMBER 2010*

MEDIUM (UNITS)	TYPE AND NUMBER OF ANALYSES*	LLD[a]	INDICATOR LOCATIONS: MEAN [b] / RANGE	LOCATION (c) OF HIGHEST ANNUAL MEAN: LOCATION & MEAN [b] / RANGE	CONTROL LOCATION: MEAN [b] / RANGE	NUMBER OF NONROUTINE REPORTS
Surface Water (pCi/liter)	H-3 (8):					
	H-3	3000[e]	<LLD	<LLD	<LLD	0
	GSA (24):					
	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[e]	<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	0

TABLE 4.0-1 (continued)

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY
JANUARY – DECEMBER 2010*

MEDIUM (UNITS)	TYPE AND NUMBER OF ANALYSES*	LLD[a]	INDICATOR LOCATIONS: MEAN [b] / RANGE	LOCATION (c) OF HIGHEST ANNUAL MEAN: LOCATION & MEAN [b] / RANGE	CONTROL LOCATION: MEAN [b] / RANGE	NUMBER OF NONROUTINE REPORTS
TLD (mrem per standard month)	Gamma Dose (140)	[f]	4.7 (120/120) [g] 3.0 – 12.1	TLD #85 [h]: 0.2 miles at 290° 10.7 (4/4) 9.8 – 12.1	3.9 (20/20) 2.7 – 4.6	0
Air Particulates (pCi/m^3)	Gross Beta (260):	0.01	0.015 (208/208) 0.005 – 0.030	R-1 1.8 miles at 92° 0.015 (52/52) 0.005 – 0.030	0.014 (52/52) 0.004 – 0.026	0
	I-131 (260):	0.07	<LLD	<LLD	<LLD	0
	GSA (20): Cs-134	0.05	<LLD	<LLD	<LLD	0
	Cs-137	0.06	<LLD	<LLD	<LLD	0
Milk (pCi/liter)	GSA (36): [d] [i] Cs-134	15	<LLD	<LLD	<LLD	0
	Cs-137	18	<LLD	<LLD	<LLD	0
	Ba/La-140	15	<LLD	<LLD	<LLD	0
	I-131 (36): I-131	1	<LLD	<LLD	<LLD	0

TABLE 4.0-1 (continued)

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY
JANUARY – DECEMBER 2010*

MEDIUM (UNITS)	TYPE AND NUMBER OF ANALYSES*	LLD[a]	INDICATOR LOCATIONS: MEAN [b] / RANGE	LOCATION (c) OF HIGHEST ANNUAL MEAN: LOCATION & MEAN [b] / RANGE	CONTROL LOCATION: MEAN [b] / RANGE	NUMBER OF NONROUTINE REPORTS
Food Products (pCi/kg-wet)	GSA (12): [d]					
	I-131	60	<LLD	<LLD	<LLD	0
	Cs-134	60	<LLD	<LLD	<LLD	0
	Cs-137	80	<LLD	<LLD	<LLD	0

TABLE NOTES:

* Data for Table 4.0-1 is based on NMP1 and NMP2 ODCM required samples unless otherwise indicated.

(a) LLD values as required by the ODCM. LLD units are specified in the medium column.

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

(c) Location is distance in miles and direction in compass degrees based on NMP2 reactor center-line. Units in this column are specified in medium column.

(d) Data includes results from optional samples in addition to samples required by the ODCM.

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

(f) The ODCM do not specify a particular LLD value for environmental TLDs. The NMP1 and NMP2 ODCM contain specifications for environmental TLD sensitivities.

(g) Indicator TLD locations are: #7, 15, 18, 23, 56, 58, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, and 98. Control TLDs are all TLDs located beyond the influence of the site (TLD #8, 14, 49, 111, and 113).

(h) This dose is not representative of doses to a member of the public since this area is located near the north shoreline, which is in close proximity to the generating facility and is not accessible to members of the public (See Section 5.2.4, TLDs).

(i) The ODCM criteria for indicator milk sample locations include 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 ODCM is the control location. There was one optional location during 2010.

5.0 DATA EVALUATION AND DISCUSSION

A. Introduction

Each year, the results of the Radiological Environmental Monitoring Program (REMP) are evaluated with consideration of plant operations at the site, the natural processes in the environment and the archive of historical environmental radiological data. A number of factors are considered in the course of evaluating and interpreting the annual environmental radiological data. This interpretation can be made using several methods including trend analysis, population dose estimates, risk estimates to the general population based on significance of environmental concentrations, effectiveness of plant effluent controls, and specific research areas. This report not only presents the data collected during the 2010 sample program but also assesses the significance of radionuclides detected in the environment. It is important to note that detection of a radionuclide is not, of itself, an indication of environmental significance. Evaluation of the impact of the radionuclide in terms of potential increased dose to man, in relation to natural background, is necessary to determine the true significance of any radionuclide detection.

B. Units of Measure

Some of the units of measure used in this report are explained below.

Radioactivity is the number of atoms in a material that decay per unit of time. Each time an atom decays, radiation is emitted. The *curie* (Ci) is the unit used to describe the activity of a material and indicates the rate at which the atoms are decaying. One curie of activity indicates the decay of 37 billion atoms per second.

Smaller units of the curie are used in this report. Two common units are the *microcurie* (uCi), which is one millionth (0.000001) of a curie, and the *picocurie* (pCi), which is one trillionth (0.000000000001) of a curie. The picocurie is the unit of radiation that is routinely used in this report. The mass, or weight, of radioactive material that would result in one curie of activity depends on the disintegration rate or half-life. For example, one gram of radium-226 contains one curie of activity, but it would require about 1.5 million grams of natural uranium to equal one curie. Radium-226 is more radioactive than natural uranium on a weight or mass basis.

C. Dose/Dose to Man

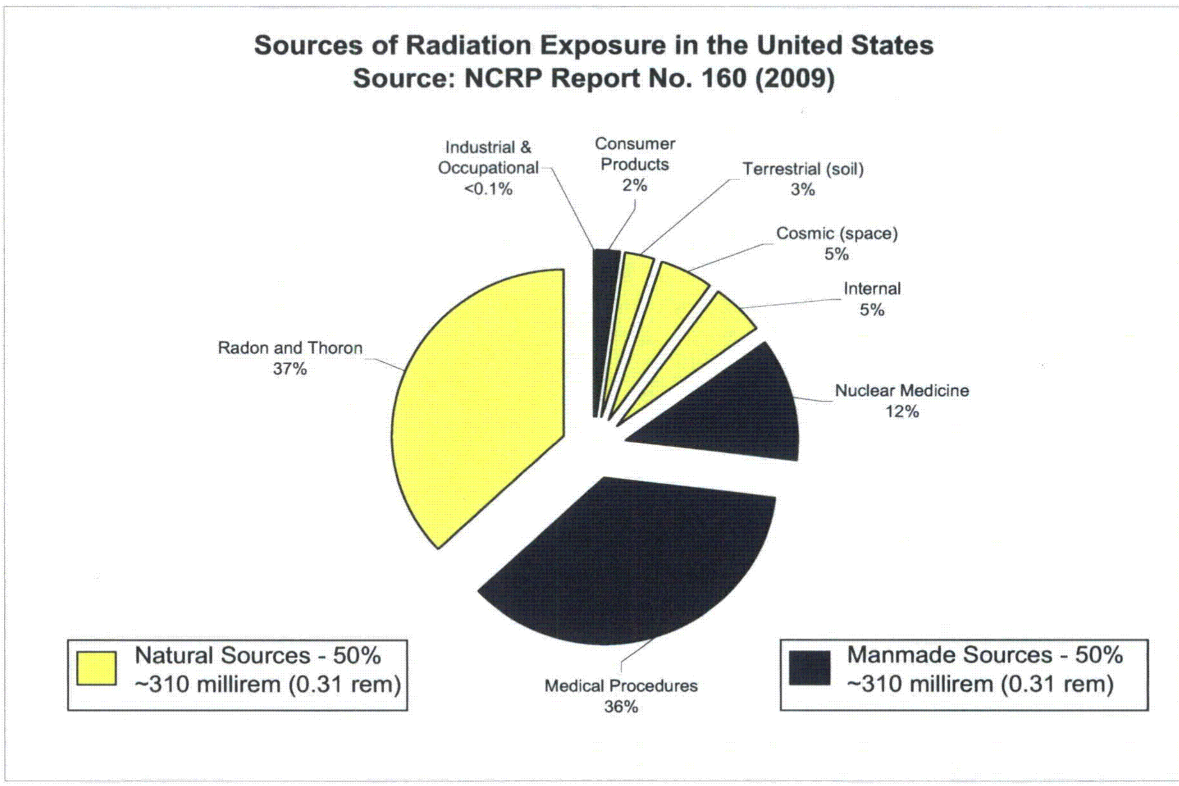
The *dose* or *dose equivalent*, simply put, is the amount of ionizing energy deposited or absorbed in living tissue. The amount of energy deposited or ionization caused is dependent on the type of radiation. For example, alpha radiation can cause dense localized ionization that can be up to 20 times the amount of ionization for the same energy imparted as from gamma or x-rays. Therefore, a quality factor must be applied to account for the different ionizing capabilities of various types of radiation. When the quality factor is multiplied by the absorbed dose, the result is the dose equivalent, which is an estimate of the possible biological damage resulting from exposure to any type of ionizing radiation. The dose equivalent is measured in rem (roentgen equivalent man). In terms of environmental radiation, the rem is a large unit. Therefore, a smaller unit, the millirem (mrem) is often used. One millirem (mrem) is equal to 0.001 of a rem.

The term "dose to man" refers to the dose or dose equivalent that is received by members of the general public at or beyond the site boundary. The dose is calculated based on concentrations of radioactive material measured in the environment. The primary pathways that contribute to the dose to man are: the inhalation pathway, the ingestion pathway and direct radiation.

D. Discussion

In the United States, a person's average annual radiation dose is 620 mrem. About half that amount comes from naturally occurring radionuclides. Radon and thoron gases account for two-thirds of this exposure, while cosmic, terrestrial, and internal radiation account for the remainder. The other half comes from manmade sources and is mostly from diagnostic medical procedures.

The pie chart below shows a breakdown of radiation sources that contribute to the average annual U.S. radiation dose of 620 mrem. Nearly three-fourths of this dose is split between radon/thoron gas (naturally occurring) and diagnostic medical procedures (manmade).



There are three separate groups of radionuclides that were measured in the environment and analyzed for the 2010 sampling program.

1. The first of these groups consists of the radionuclides that are naturally occurring. The environment contains a significant inventory of naturally occurring radioactive elements. The components of natural or background radiation include the decay of radioactive elements in the earth's crust, a steady stream of high-energy particles from space called cosmic radiation and naturally-occurring radioactive isotopes in the human body like potassium-40.

   A number of naturally occurring radionuclides are present in the environment. These are expected to be present in many of the environmental samples collected in the vicinity of the Nine Mile Point Site. Some of the radionuclides normally present include:

   - *Tritium (H-3)*, present as a result of the interaction of cosmic radiation with the upper atmosphere
   - *Beryllium*-7 (Be-7), present as a result of the interaction of cosmic radiation with the upper atmosphere
   - *Potassium*-40 (K-40) and *Radium*-226, naturally occurring radionuclides found in the human body and throughout the environment

   Be-7 and K-40 are especially common in REMP samples. Since they are naturally occurring and are abundant, positive results for these radionuclides are reported in some cases in Section 6.0 of this report. Comparisons of program samples to naturally occurring radiation are made throughout this section to help put program results into perspective and to aid the reader in determining what, if any, significant impact is demonstrated by the REMP results.

2. The second group consists of radionuclides that may be detected in the environment as a result of the detonation of thermonuclear devices in the earth's atmosphere. Atmospheric nuclear testing during the early 1950's produced a measurable inventory of radionuclides presently found in the lower atmosphere, as well as in ecological systems. In 1963, an Atmospheric Test Ban Treaty was signed. Since the treaty, the global inventory of manmade radioactivity in the environment has been greatly reduced through the decay of short lived radionuclides and the removal of radionuclides from the food chain by such natural processes as weathering and sedimentation. This process is referred to in this report as ecological cycling. Since 1963, several atmospheric weapons tests have been conducted by the People's Republic of China and underground weapons testing by India, Pakistan & North Korea. In some cases, the usual radionuclides associated with nuclear detonations were detected for several months following the test, and then after a peak detection period, diminished to a point where most could not be detected. Although reduced in frequency, atmospheric testing continued into the 1980's. The resulting fallout or deposition from these most recent tests has influenced the background radiation in the vicinity of the site and was evident in many of the sample media analyzed over the years. Fallout radionuclides from nuclear weapons testing included Cesium-137 (Cs-137) and Strontium-90 (Sr-90). The highest weapons testing concentrations were noted in samples

collected for the 1981 REMP. Cs-137 was the major byproduct of this testing and is still occasionally detected in a few select number of environmental media.

3. The third group consists of radionuclides that may be detected in the environment are related to nuclear power technology. These radionuclides are the byproduct of the operation of light water reactors. These byproduct radionuclides are the same as those produced in atmospheric weapons testing and found in the Chernobyl fallout. This commonality makes a determination of the source of these radionuclides that may be detected in environmental samples difficult to determine. During 2010, there were no plant-related radionuclides detected in the REMP samples.

   A number of factors must be considered in performing radiological sample data evaluation and interpretation. An attempt has been made not only to report the data collected during 2010, but also to assess the significance of the radionuclides detected in the environment as compared to naturally occurring and manmade radiation sources. It is important to note that detected concentrations of radionuclides in the local environment as a result of man's technology are very small and are of no or little significance from an environmental or dose to man perspective.

The 2009 per capita average dose was determined to be 620 mrem per year from all sources, as noted in National Council on Radiation Protection and Measurement (NCRP) Report No. 160. This average dose includes such exposure sources as industrial & occupational, consumer products, terrestrial, cosmic, internal, nuclear medicine, medical procedures, radon and thoron. The 2009 per capita dose rate due to naturally occurring sources was 310 mrem per year. The per capita radiation dose from nuclear power production nationwide is less than one mrem per year.

The naturally occurring gamma radiation in the environs of the Nine Mile Point site, resulting from radionuclides in the atmosphere and in the ground, accounts for approximately 60-65 mrem per year. This dose is a result of radionuclides of cosmic origin (for example, Be-7) and of primordial origin Ra-226, K-40, and Thorium-232 (Th-232). A dose of 60 mrem per year, as a background dose, is significantly greater than any possible doses as a result of routine operations at the site during 2010.

The results of each sample medium are discussed in detail in Sections 5.1 and 5.2. This includes a summary of the results, the estimated environmental impact, a detailed review of any relevant findings with a dose to man estimate where appropriate, and an analysis of possible long-term and short-term trends.

During routine implementation of the REMP, additional or optional environ mental pathway media are sampled and analyzed. These samples are obtained to:

- Expand the area covered by the program beyond that required by the ODCM
- Provide more comprehensive monitoring than is currently required

- Monitor the secondary dose to man pathways
- Maintain the analytical data base established when the plants began commercial operation

The optional samples that are collected will vary from year to year. In addition to the optional sample media, additional locations are sampled and analyzed for those pathways required by the ODCM. These additional sample locations are obtained to ensure that a variety of environmental pathways are monitored in a comprehensive manner. Data from additional sample locations that are associated with the required ODCM sample media are included in the data presentation and evaluation. When additional locations are included, the use of this data is specifically noted in Sections 5.1 and 5.2.

Section 6.0 contains the analytical results for the sample media addressed in the report. Tables are provided for each required sample medium analyzed during the 2010 program.

Section 7.0, titled Historical Data, contains statistics from previous years' environmental sampling. The process of determining the impact of plant operation on the environment includes the evaluation of past analytical data to determine if trends are changing or developing. As state-of-the-art detection capabilities improve, data comparison is difficult in some cases. For example, Lower Limits of Detections (LLDs) have improved significantly since 1969 due to technological advances in laboratory procedures and analytical equipment.

5.1 AQUATIC PROGRAM

The aquatic program consists of samples collected from four environmental pathways. These pathways are:

- Shoreline Sediment
- Fish
- Surface Waters
- Groundwater

Section 6.0, Tables 6-1 through 6-4 present the analytical results for the aquatic samples collected for the 2010 sampling period.

Sampling for groundwater, as found in Section D 3.5.1 of the NMP2 ODCM, was not required during 2010. There was no groundwater source in 2010 that was tapped for drinking or irrigation purposes in areas where the hydraulic gradient or recharge properties were suitable for contamination; therefore, groundwater was not a dose pathway during 2010.

5.1.1 SHORELINE SEDIMENT RESULTS

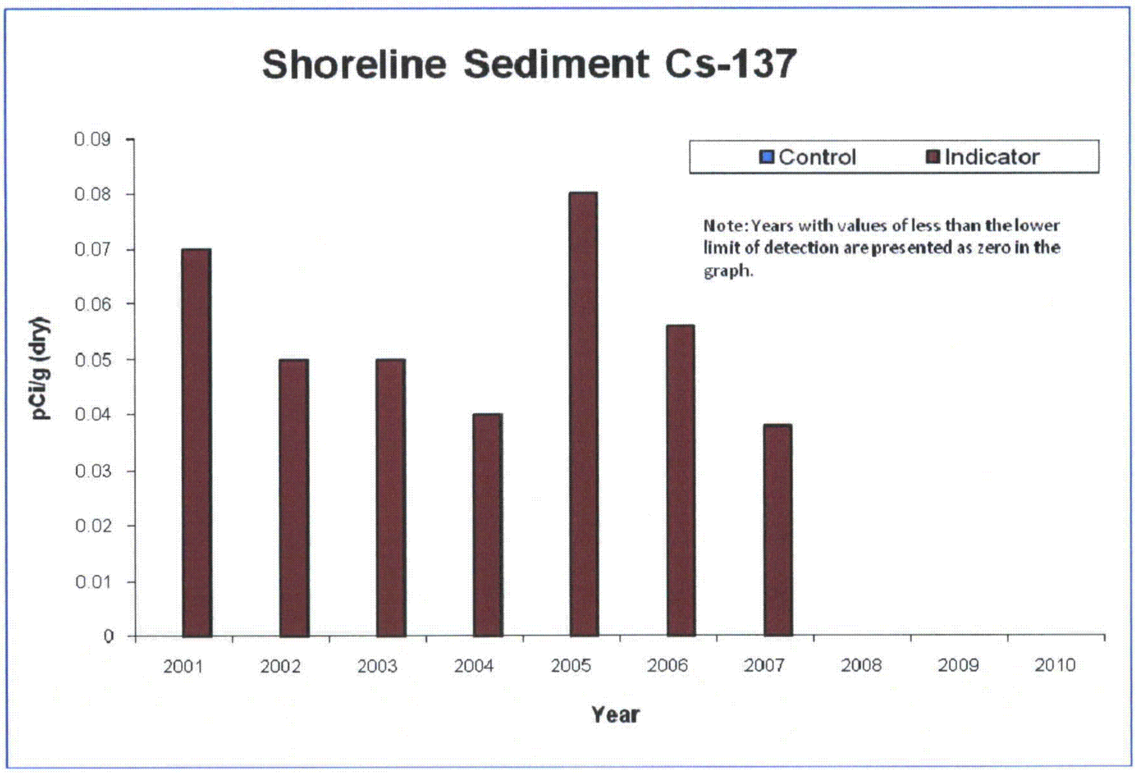
A. Results Summary

Shoreline sediment samples were obtained in April and October of 2010 at one off-site control location (Lang's Beach located near Oswego Harbor) and at one indicator location (Sunset Bay), which is an area east of the site considered to have recreational value.

A total of four sediment samples were collected for the 2010 sample program, two indicator and two control. These results continue to show a downward trend over the past 10 plus years. Cs-137 was not detected in samples collected from the control or indicator locations during 2010.

Historical mean concentrations measured at the Sunset Bay indicator location ranged from a maximum of 0.33 pCi/g in 1993 to a minimum of less than lower limit of detection (<LLD) in 2010. The results for the 2010 control location were less than the detection limit. The one naturally-occurring radionuclide detected was K-40, which was not related to plant operations. No other plant-related radionuclides were detected in the 2010 shoreline sediment samples.

The following is a graph of the average Cs-137 concentration in shoreline sediment samples over the previous ten years. This graph illustrates a general downward trend in the Cs-137 concentrations since 2000.



B. Data Evaluation and Discussion

Shoreline sediment samples are routinely collected twice per year from the shoreline of Lake Ontario. Samples are collected from one indicator location (Sunset Bay) and one control location (Lang's Beach). Samples were collected from both the indicator and control locations in April and October 2010. The results of these sample collections are presented in Section 6.0, Table 6-1, "Concentrations of Gamma Emitters in Shoreline Sediment Samples - 2010". K-40 was the only significant radionuclide detected in the sediment samples during 2010.

C. Dose Evaluation

The calculated potential whole body and skin dose which may result from the mesured Cs-137 concentrations in preveous years are extremely small and are insignificant when compared to natural background doses.

The radiological impact of Cs-137 measured in the shoreline sediment can be evaluated on the basis of dose to man. In the case of shoreline sediments, the critical pathway is direct radiation to the whole body and skin. Using the parameters provided in Regulatory Guide 1.109, the potential dose to man in mrem per year can be calculated. The following regulatory guide values and the maximum 2010 shoreline sediment indicator Cs-137 concentration were used in calculating the dose to man:

- A teenager spends 67 hours per year at the beach area or on the shoreline,
- The sediment has a mass of 40 kg/m^2 (dry) to a depth of 2.5 cm,
- The shoreline width factor is 0.3, and
- The maximum measured Cs-137 concentration of <0.106 pCi/g (dry) (<LLD).

Using these conservative parameters, the potential dose to the maximum exposed individual (teenager) would be 0.00036 mrem/year to the whole body and 0.00042 mrem/year to the skin. This calculated dose is very small and is insignificant when compared to the natural background annual exposure of approximately 47 mrem as measured by control TLDs in the vicinity of the site.

D. Data Trends

Cs-137 was not detected at the indicator or the control samples locations in 2010. The average Cs-137 concentration (LLD) for the shoreline sediment indicator sample for 2010 was <0.104 pCi/g (dry). This is consistent with mean concentration measured at the indicator location over the past ten years.

The previous five years of data show a general decreasing mean concentration values measured at the indicator locations. Over the five year period, mean concentrations ranged from a high of 0.08

pCi/g (dry) in 2005 to a low value of 0.04 pCi/g (dry) measured in 2007. Cesium-137 was not detected in the control location samples over this same five-year period.

The general absence of Cs-137 in the control samples is attributed to the differences in the sediment types between the two sample locations. Few shoreline regions west of the site contain fine sediment and/or sand that are characteristic of the indicator location. It is difficult to obtain control samples that are comparable in physical and chemical characteristics to the indicator samples. Other factors, which include changing lake level and shoreline erosion, further complicate attempts at consistency in shoreline sediment sampling. Recent soil samples from locations beyond any expected influence from the site have contained levels of Cs-137 equal to or greater than the concentrations found in the shoreline sediment samples collected in the past. The Cs-137 is commonly found in soil samples and is attributed to weapons testing fallout. Shoreline samples containing soil or sediment are likely to contain Cs-137.

The previous ten year data trend for indicator shoreline samples showed an overall downward trend in concentration measured at the indicator sample locations. Over the previous ten-year period of 2001 through 2010, mean concentrations at the indicator location ranged from a maximum of 0.08 pCi/g (dry) in 2005 to a minimum of 0.04 pCi/g (dry) measured in 2004 and again in 2007. Cs-137 was not detected at the indicator location for 2010. This continues to support the long-term decreasing trend in Cs-137 concentration in shoreline sediment samples. Cesium-137 was not detected in the control samples collected over the previous ten years.

Shoreline sediment sampling at the indicator location commenced in 1985. Prior to 1985, no data was available for long-term trend analysis.

Section 7.0, Tables 7-1 and 7-2 illustrate historical environmental data for shoreline sediment samples.

5.1.2 FISH SAMPLE RESULTS

A. Results Summary

A total of 18 fish samples were collected for the 2010 sample program. Species collected were: smallmouth bass, brown trout, salmon and walleye. The analytical results for the 2010 fish samples showed no detectable concentration of radionuclides that would be attributable to plant operations at the site or past atmospheric weapons testing. Since 2003, no Cs-137 has been measured in fish samples. Over the previous 20 years prior to 2003, Cs-137 has been detected at a combination of both the indicator and/or control locations (Refer to Tables 7-3 and 7-4). These low levels of Cs-137 represented no significant dose to man or impact on the environment.

The 2010 fish sample results demonstrate that plant operations at the Nine Mile Point site have no measurable radiological environmental impact on the upper levels of the Lake Ontario food chain. The 2010 results are consistent with the previous years' results in that they continue to support the general long-term downward trend in fish Cs-137 concentrations over the last 33 years. Cs-137 was not detected in fish samples collected in 2003 to 2010 from indicator locations. The period of 2001 through 2010 as a group are the lowest results measured since the beginning of the Site Environmental Monitoring Program in 1969.

B. Data Evaluation and Discussion

Fish 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 NMPNS and the JAFNPP facilities. The Oswego Harbor samples served as control samples, while the NMPNS and JAFNPP samples served as indicator samples. All samples were analyzed for gamma-emitters. Section 6.0, Table 6-2 shows individual results for all the samples collected in 2010 in units of pCi/g (wet).

The spring fish collection was made up of 9 individual samples representing three separate species. Walleye, smallmouth bass and brown trout were collected.

The total fall fish collection was comprised of 9 individual samples representing three individual species. Salmon, smallmouth bass and brown trout were collected.

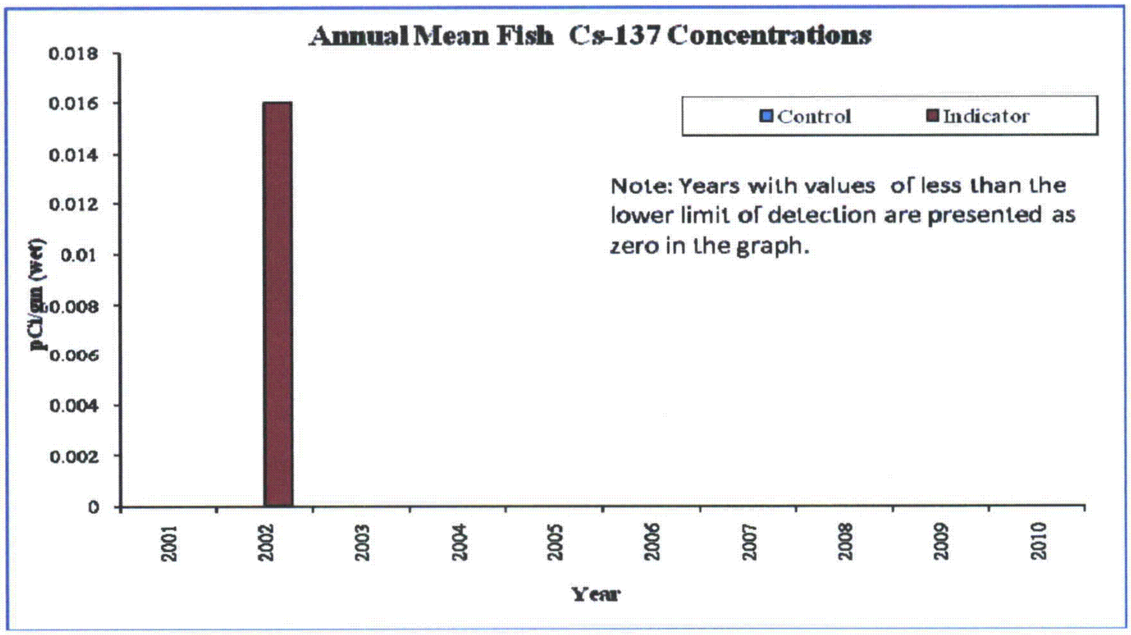
Cs-137 was not detected in any of the fish species collected for the 2010 sample program.

C. Dose Evaluation

Fish represent the highest level in the aquatic food chain and have the potential to be a contributor to the dose to man from the operations at the site. Some Lake Ontario fish species may be considered an important food source due to the local sport fishing industry. Therefore, these fish are an integral part of the human food chain. The lack of detectable concentrations of plant-related radionuclides in the 2010 fish samples demonstrates that there is no attributable dose to man from operations at the site through the aquatic pathway.

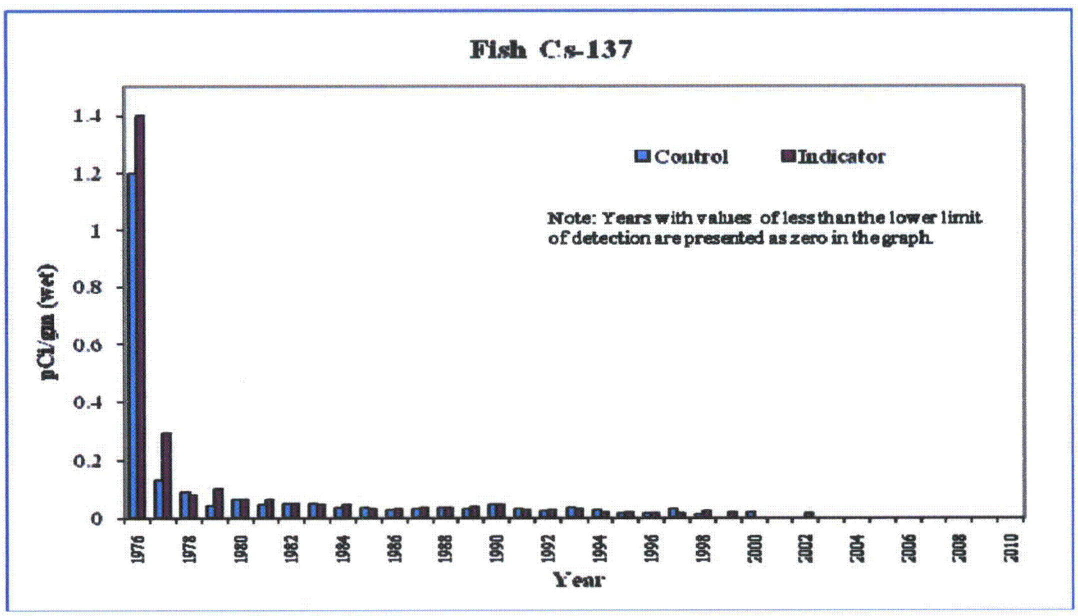
D. Data Trends

The Cs-137 data for fish samples over the previous five years (2006 through 2010) show that the number of positive detections has decreased over this period relative to historical data. There were no positive detections of Cs-137 over the previous five-year period at the indicator locations. The graph below illustrates the mean control and indicator Cs-137 concentrations for 2010 and the previous ten years.



The ten-year data trend shows a consistent decrease in the level of Cs-137 measured in fish between 2001 and 2010. The 2001 through 2010 results, as a group, are the lowest Cs-137 concentrations measured over the existence of the sample program.

The general long-term decreasing trend for Cs-137, illustrated in the following graph, is most probably a result of the cesium becoming unavailable to the ecosystem due to ion exchange with soils and sediments and radiological decay. The concentrations of Cs-137 detected in fish since 1976 are considered to be the result of weapons testing fallout. The general downward trend in concentrations will continue as a function of additional ecological cycling and radiological decay. Section 7.0, Tables 7-3 and 7-4 show historical environmental sample data for fish.



5.1.3 SURFACE WATER (LAKE)

A. Results Summary

The ODCM requires that monthly surface water samples be taken from the respective inlet water supplies of the JAFNPP and NRG Energy's Oswego Generating Station. In conjunction with the required samples, three additional Lake Ontario surface water locations are sampled and analyzed. These additional locations are the Oswego City Water Intake, the Nine Mile Point Unit 1 (NMP1) Intake and the Nine Mile Point Unit 2 (NMP2) Intake. Gamma spectral analysis was performed on 24 monthly composite samples from the ODCM locations and on 36 monthly composite samples collected from the additional sample locations. The results of the gamma spectral analyses showed that only naturally-occurring radionuclides were detected in the 60 samples from the five locations collected for the 2010 Sampling Program. The two naturally-occurring radionuclide detected were K-40 and Ra-226 and were not related to plant operations. Monthly composite samples showed no presence of plant-related gamma-emitting isotopes in the waters of Lake Ontario as a result of plant operations.

The monthly surface water samples are composited on a quarterly basis and are analyzed for tritium. A total of 20 samples were analyzed for tritium as part of the 2010 REMP program. The results for the 2010 samples showed no positive detection for tritium in samples taken during 2010. All results for 2010 were below the established measurement sensitivity and are reported as less than the lower limit of detection (<LLD).

B. Data Evaluation and Discussion

Gamma spectral analysis was performed on monthly composite samples from five Lake Ontario sampling locations. No plant-related radionuclides were detected in 2010 samples. This is consistent with historical data, which has not shown the presence of plant-related radionuclides in surface water samples.

Tritium samples are quarterly samples that are a composite of the applicable monthly samples for a given location. Tritium samples analyzed for the 2010 sample program were analyzed to an instrument detection level of 500 pCi/l.

The ODCM required indicator location (JAFNPP inlet canal) showed no positive detections of tritium. The 2010 results had LLD values that ranged from <397 pCi/l to <420 pCi/l. The ODCM control location (Oswego Generating Station inlet canal) results showed no positive detections, and the sample results had LLD values in the range of <403 pCi/l to <420 pCi/l.

Tritium was not detected in any of the twelve optional Lake Ontario samples collected in the 2010 program.

The Oswego City Water inlet is sampled to monitor drinking water quality and is representative of a control location due to its distance from the site. The city water inlet is located 7.8 miles west of the site in an "up-stream" direction based on the current patterns in the lake.

The following table provides the specific results for the 2010 sample program:

Sample Location	Tritium Concentration pCi/liter		
	Minimum	**Maximum**	**Mean (Annual)**
JAFNPP Inlet (Indicator)*	<397	<420	<412
Oswego Generating Station Inlet (Control)*	<403	<420	<410
NMP1 Inlet	<402	<420	<413
NMP2 Inlet	<403	<420	<413
Oswego City Water Supply	<403	<420	<413

* Sample location required by ODCM

The LLD values are below the ODCM required LLD of 3000 pCi/l for a non-drinking water pathway.

Analytical results for surface water samples are found in Section 6.0, Tables 6-3 through 6-4.

C. Dose Evaluation

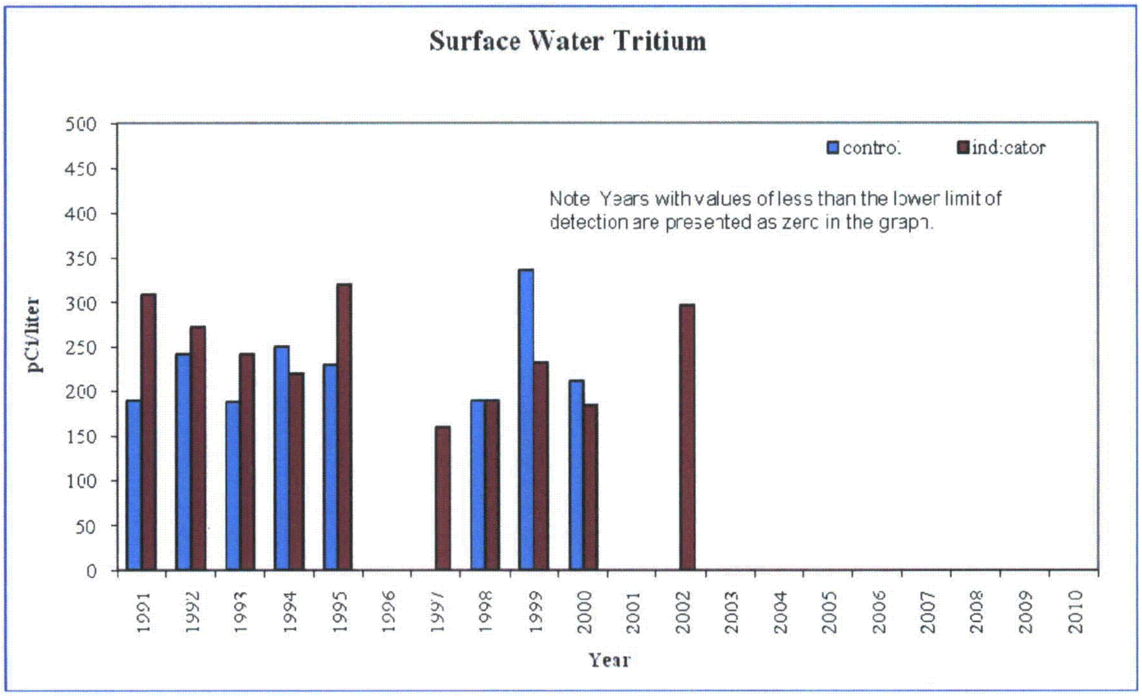
The radiological impact to members of the public from low levels of tritium in water is insignificant. This can be illustrated by calculating a dose to the whole body and maximum organ using the maximum LLD value and Regulatory Guide 1.109 methodology. Based on a water ingestion rate of 510 liters/yr and the maximum 2010 LLD concentration of <420 pCi/l, the calculated dose would be less than 0.044 mrem to the child whole body and less than 0.044 mrem to the child liver (critical age group/organ).

D. Data Trends

There are no data trends for gamma-emitters such as Cs-137 and Co-60, as historically these radionuclides have not been detected in lake water samples.

Tritium results for the 2010 lake water samples were consistent with results from the previous five-years for both the indicator and control locations. The mean measured tritium concentrations for the previous five-year period of 2005 to 2009 was <LLD pCi/l for the control and the indicator location. The mean 2010 tritium concentrations were <410 pCi/l for the control and <412 pCi/l for the indicator locations. The previous five-year data indicates no significant trends in either the indicator or the control mean concentrations. This previous five-year data set is consistent with long-term tritium results measured at the site. The indicator data from the previous ten-year period, 2000 through 2009, is representative of natural variations in environmental tritium concentrations with no significant levels of tritium measured. The 1999 mean control value of 337 pCi/l is the highest concentration measured since 1989 and is within the variability of results measured over the life of the program. The ten-year historical results are consistent between the control and indicator locations with no large variation in the measured results.

The following graph illustrates the concentrations of tritium measured in Lake Ontario over the previous 20 years at both an indicator and control location. Prior to 1985, the Oswego City Water Supply results were used as control location data as this location closely approximates the Oswego Generating Station, the current control location.



Section 7.0, Tables 7-5 and 7-6 show historical environmental sample data for surface water Co-60 and Cs-137. Tables 7-7 and 7-8 show historical environmental sample data for surface water tritium.

5.1.4 GROUNDWATER

A. Results Summary

A groundwater monitoring program is not required by the ODCM. The program is being implemented as the result of Nuclear Energy Institue (NEI) Ground Water Protection Initiative. Groundwater samples were collected from a number of locations shown in Section 3.3, Figure 3.3-6 and listed in Table 3.3-1.

A total of 35 tritium samples were collected for the 2010 sample program using six indicator locations and two control locations. One indicator location had a positive detection for tritium at a concentration of 611 +/- 131 pCi/l. The monitoring well was resampled and analyzed for tritium. The tritum concentration was determined to be less than the lower limit of detection (LLD) of 268 pCi/l. All other samples results for 2010 groundwater monitoring program were less than the LLD for tritium.

A total of 74 samples were collected for plant-related gamma-emitters, and six strontium-90 (Sr-90) samples were collected for the 2010 sample program using six indicator locations and two control locations. All samples results for 2010 groundwater monitoring program were less than the LLD for plant-related gamma-emitters and Sr-90.

B. Data Evaluation and Discussion

Plant related gamma-emitters and strontium-90 analysis were performed on samples from the indicator and control locations. No plant-related radionuclides were detected in the 2010 samples. This is consistent with historical data, which has not shown the presence of plant-related radionuclides in groundwater samples.

Tritium samples analyzed for the 2010 sample program were analysed to a lower limit of detection of 500 pCi/l. The tritium results for the control locations had LLD values that ranged from <172 pCi/l to <410 pCi/l. The indicator locations results ranged from <287 pCi/l to 611 +/- 131 pCi/l. During 2010 one indicator location had a positive tritium concentration of 611 +/- 131 pCi/l. The indicator location was resampled and analyzed. The concentration of tritium was determined to be <268 pCi/l.

C. Dose Evaluation

Sampling for groundwater, as found in Section D 3.5.1 of the NMP2 ODCM, was not required during 2010. There was no groundwater source in 2010 that was tapped for drinking or irrigation purposes in areas where the hydraulic gradient or recharge properties support contaminant migration; therefore, drinking water was not a dose pathway during 2010.

D. Data Trends

There are no data trends for gamma-emitters or Strontium-90 as these radionuclides have not been detected in groundwater samples.

Groundwater tritium results are documented in the Annual Radiological Effluent Release Report for 2010. Historical data for groundwater tritium is presented in Section 7.0, Tables 7-9 and 7-10.

5.2 TERRESTRIAL PROGRAM

The terrestrial program consists of samples collected from four environmental pathways. These pathways are:

- Airborne Particulate and Radioiodine,
- Direct Radiation,
- Milk, and
- Food Products.

Section 6.0, Tables 6-5 through 6-12 present the analytical results for the terrestrial samples collected for the 2010 reporting period.

5.2.1 AIR PARTICULATE GROSS BETA

A. Results Summary

Weekly air samples were collected and analyzed for particulate gross beta particulate activity. For the 2010 program, a total of 52 samples were collected from control location R-5, and 208 samples were collected from indicator locations R-1, R-2, R-3, and R-4. These five locations are required by the ODCM. Additional air sampling locations are maintained and are discussed in Section 5.2.1.B below. The mean gross beta concentration for samples collected from the control location (R-5) in 2010 was 0.014 pCi/m^3. The mean gross beta concentration for the samples collected from the indicator locations (R-1, R-2, R-3, and R-4) in 2010 was 0.015 pCi/m^3. The consistency between the indicator and control mean values, demonstrates that there are no increased airborne radioactivity levels in the general vicinity of the site. The indicator results are consistent with concentrations measured over the last twenty one years. This consistency demonstrates that the natural baseline gross beta activity has been reached. The man-made radionuclide contribution to the natural background from atmospheric weapons testing and Chernobyl can no longer be detected above the background concentrations of naturally occurring beta-emitting radionuclides.

B. Data Evaluation and Discussion

The air monitoring system consists of fifteen sample locations, six on-site and nine off-site. Each location is sampled weekly for particulate gross beta activity. A total of 780 samples were collected and analyzed as part of the 2010 program. Five of the nine off-site locations are required by the ODCM. These locations are designated as R-1, R-2, R-3, R-4, and R-5. R-5 is a control location required by the ODCM and is located beyond any local influence from the site. In addition, optional off-site and on-site air sample locations are maintained from which weekly samples are collected. The optional off-site locations are designated as D-2, E, F and G. The optional on-site locations are designated as D-1, G, H, I, J and K.

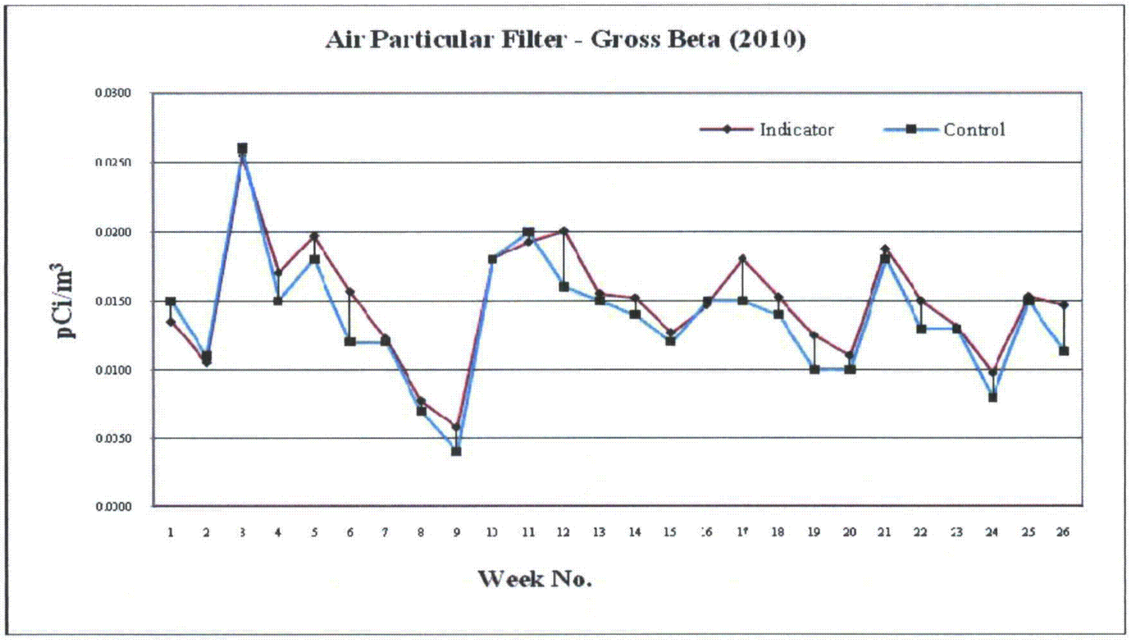
Gross beta analysis requires that the samples be counted no sooner than 24 hours after collection. This allows for the decay of short half-life naturally-occurring radionuclides, thereby increasing the sensitivity of the analysis for plant-related radionuclides.

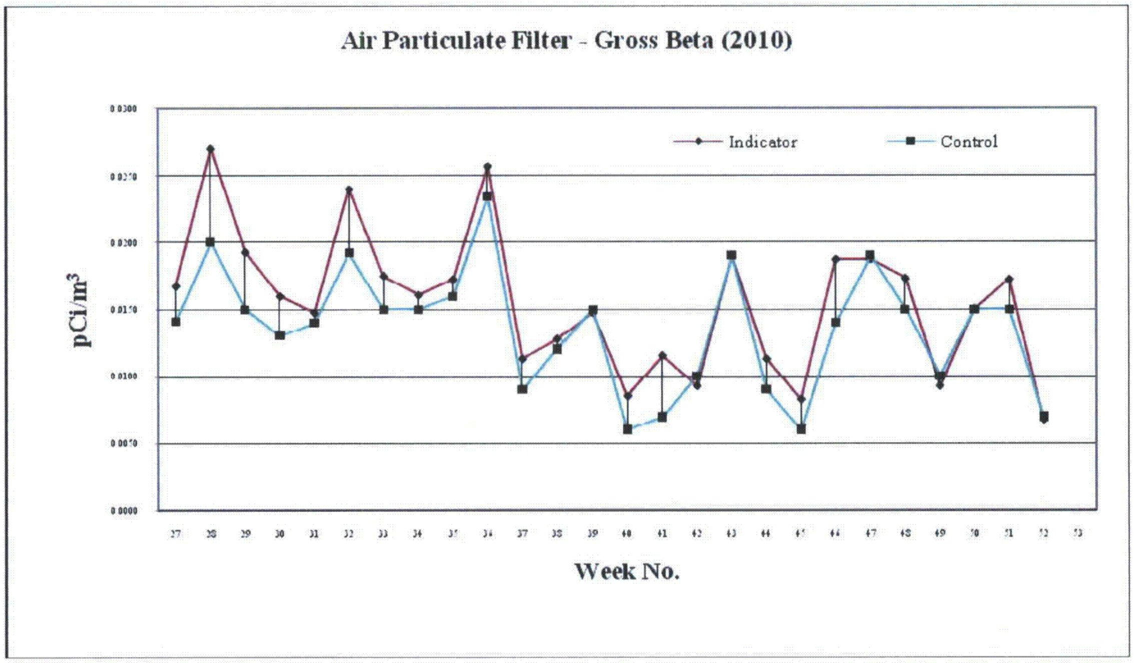
Section 6.0, Tables 6-5 and 6-6 present the weekly gross beta activity results for samples collected from the off-site and on-site locations.

The mean annual gross beta indicator concentrations for the ODCM indicator stations (R-1, R-2, R-3 and R-4) was 0.015 pCi/m^3. The off-site ODCM control station (R-5) annual mean gross beta concentration was 0.014 pCi/m^3. The minimum, maximum and average gross beta results for sample locations required by the ODCM were as follows:

	Concentration pCi/m^3		
Location	Minimum	Maximum	Mean
R-1	0.005	0.030	0.015
R-2	0.005	0.028	0.015
R-3	0.007	0.027	0.015
R-4	0.005	0.026	0.015
Summary (R1 – R4)	0.005	0.030	0.015
R-5 (Control)	0.004	0.026	0.014

The mean weekly gross beta concentrations measured in 2010 are illustrated in the following graphs:





The fluctuations observed in the gross beta activity over the year can be attributed to changes in the environment, especially seasonal changes. The concentrations of naturally-occurring radionuclides in the lower levels of the atmosphere directly above the land are affected by time-related processes such as wind direction, precipitation, snow cover, soil temperature and soil moisture content.

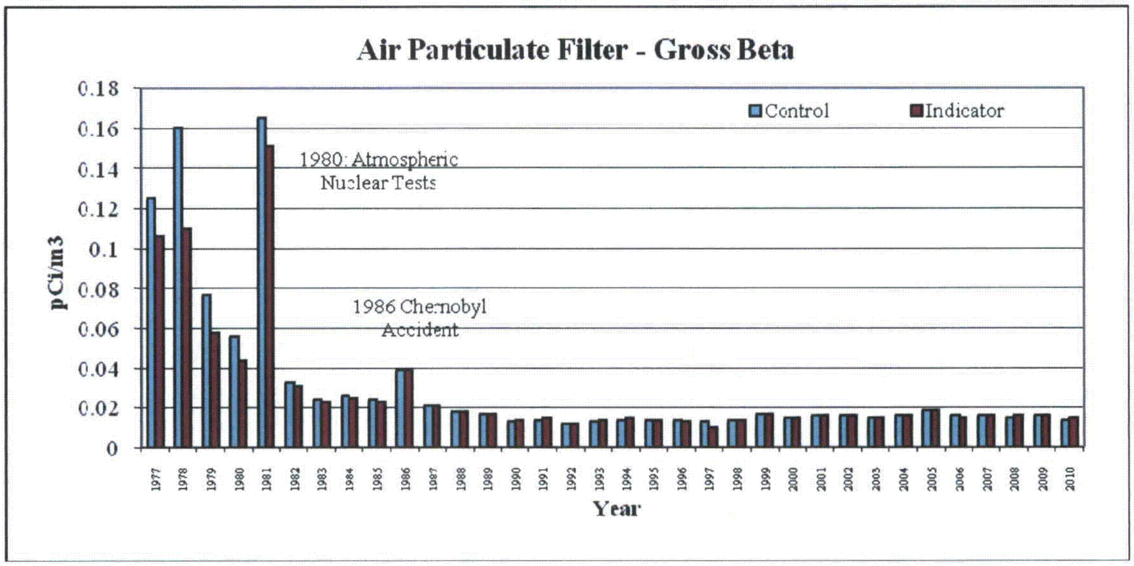
C. Dose Evaluation

Dose calculations are not performed based on gross beta concentrations. Dose to man as a result of radioactivity in air is calculated using the specific radionuclide and the associated dose factor. See Section 5.2.2.C for dose calculations from air concentrations. The dose received by man from air gross beta concentration is a component of the natural background.

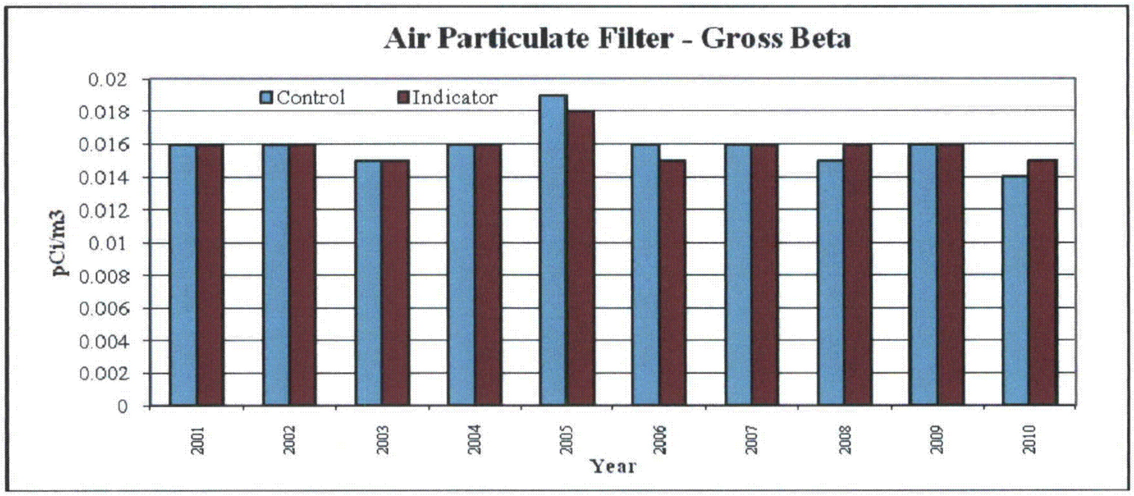
D. Data Trends

With the exception of the 1986 sample data, which was affected by the Chernobyl accident, the general trend in air particulate gross beta activity has been one of decreasing activity since 1981, when the mean control value was 0.165 pCi/m^3. The 1981 samples were affected by fallout from a Chinese atmospheric nuclear test which was carried out in 1980.

The mean gross beta concentrations measured in 1977 to 2010 are illustrated in the following graph:



The trend for the previous five years represents a base line concentration or natural background level for gross beta concentrations. This trend is stable with minor fluctuations due to natural variations. The change in concentrations over the period of 2001 through 2010 is very small. This is illustrated by the following graph:



For the previous 10 years, the mean annual gross beta concentration at the control station (R-5) has remained steady with a narrow range of 0.014 pCi/m^3 to 0.019 pCi/m^3. The mean annual concentrations for the indicator stations for this same time period were similar to the control and ranged from a minimum mean of 0.015 pCi/m^3 to a maximum mean of 0.018 pCi/m^3.

Historical data of air particulate gross beta activity are presented in Section 7.0, Tables 7-11 and 7-12.

5.2.2 QUARTERLY PARTICULATE COMPOSITES (GAMMA-EMITTERS)

A. Results Summary

Fifteen air monitoring stations are maintained around the Nine Mile Point site. Five of the 15 air monitoring stations are required by the ODCM; four are located off-site near the site boundary, and one is located off-site as a control location. Ten additional air sampling stations are also maintained as part of the sampling program. Together, these fifteen continuous air sampling stations make up a comprehensive environmental monitoring network for measuring radioactive air particulate concentrations in the environs of the site. Annually, the air monitoring stations provide 780 individual air particulate samples that are assembled by location into 60 monthly composite samples. The quarterly composites are analyzed using gamma spectroscopy.

No plant-related gamma-emitting radionuclides were detected in any of the air particulate filter samples collected during 2010.

The gamma analysis results for the quarterly composite samples routinely showed positive detections of Be-7, K-40, and Ra-226. Each of these radionuclides is naturally occurring.

B. Data Evaluation Discussion

A total of fifteen air sampling stations are in continuous operation and located both on-site and in the off-site sectors surrounding the Nine Mile Point site. Five of the fifteen monitoring stations are required by the ODCM, and the remaining ten are optional to provide an effective monitoring network. Composite air filter samples are assembled for each of the fifteen sampling locations. Each of the weekly air particulate filters collected for the quarter is assembled by location to form quarterly composite samples. The quarterly composite samples required by the ODCM are composite samples assembled for R-1, R-2, R-3, R-4 and R-5. Other sample locations not required by the ODCM, for which analytical results have been provided, include six on-site locations and four off-site locations. The analytical results for the 60 air particulate filter composites in 2010 showed no detectable activity of plant related radionuclides.

The results of the quarterly composite samples are presented in Section 6.0, Table 6-7.

C. Dose Evaluation

The calculated dose as a result of plant effluents is not evaluated due to the fact that no plant related radionuclides were detected in 2010. The monthly air particulate sampling program demonstrated no off-site dose to man from this pathway as a result of operations of the plants located at the Nine Mile Point site.

D. Data Trends

No plant-related radionuclides were detected during 2010 at the off-site air monitoring locations.

The ten-year database of air particulate composite analysis shows that there is no buildup or routine presence of plant related radionuclides in particulate form in the atmosphere around the site. Historically Co-60 was detected in each of the years from 1977 through 1984 at both the indicator and control locations, with the exception of 1980 when Co-60 was not detected at the control location. The presence of Co-60 in the air samples collected during these years was the result of atmospheric weapons testing. Co-60 was again detected in an off-site 2000 indicator sample and was the only positive detection of Co-60 since 1984. The detection of Co-60 in the one 2000 sample was an isolated event associated with effluents from the NMP1 facility. There have been no subsequent measurable concentrations of Co-60 in the environment surrounding the Nine Mile Point site.

Historical data shows that cesium-137 (Cs-137) is the fission product radionuclide most frequently detected in the air particulate filter composites. Cs-137 was detected in each of the years from 1977 through 1983 at both the control and indicator sampling locations. The presence of Cs-137 in the air samples collected during these years was the result of atmospheric weapons testing. Cs-137 was again detected in 1986 as a result of the Chernobyl accident. Since 1986 there have been no detections of Cs-137 in the environment surrounding the Nine Mile Point site.

After 1986, no plant-related or fallout radionuclides were detected in any of the off-site air particulate composite samples with the exception of the isolated detection of Co-60 in 2000 in a single sample. A review of the past five years' data for air particulate filter composites indicates no plant related radiological impact on the environment. All previous historical positive detections of fission product radionuclides were associated with atmospheric weapons testing or the Chernobyl accident, with the exception of the 2000 detection noted above.

Historical data for air particulate results are presented in Section 7.0, Tables 7-13 and 7-14.

5.2.3 AIRBORNE RADIOIODINE (I-131)

A. Results Summary

Iodine-131 (I-131) was not detected in any of the 780 samples analyzed for the 2010 program. No radioiodine has been measured off-site at the constant air monitoring stations since 1987.

B. Data Evaluation and Discussion

Airborne radioiodine (I-131) is monitored at the fifteen air sampling stations also used to collect air particulate samples. There are nine off-site locations, five of which are required by the ODCM. The off-site locations required by the ODCM are designated as R-1, R-2, R-3, R-4 and R-5. R-5 is a control station located beyond any local influence from the plant. Ten air sampling locations are also maintained in addition to those required by the ODCM. Six of these stations D-1, G, H, I, J and K are located on-site. D-2, E, F and G are the optional stations located off-site. Samples are collected using activated charcoal cartridges and analyzed weekly for I-131. I-131 was not detected in any of the 2010 samples collected.

The analytical data for radioiodine are presented in Section 6.0, Tables 6-8 and 6-9.

C. Dose Evaluation

The calculated dose as a result of I-131 was not evaluated due to the fact I-131 was not detected during 2010. The I-131 sampling program demonstrated no off-site dose to man from this pathway as a result of operation of the plants located at the Nine Mile Point site.

D. Data Trends

No radioiodine has been detected in samples collected from the air sampling locations required by the ODCM since 1987.

There has been no positive detection of I-131 in air samples collected over the last ten years. This demonstrates that there is no measurable environmental impact or positive trend for iodine buildup due to plant operations during the period from 2001 through 2010. I-131 has previously been detected in samples collected during the last twenty five year period in 1986 and 1987. The 1986 detection of I-131 was the result of the Chernobyl accident, and the 1987 detection was the result of plant operations.

I-131 has been detected in the past at control locations. Control samples collected during 1976 had a mean I-131 concentration of 0.60 pCi/m^3. During 1977 this mean decreased to 0.32 pCi/m^3, and further decreased by a factor of ten to 0.03 pCi/m^3 in 1978. I-131 was not detected in samples collected from the control location during 1979 – 1981 and 1983 to 1985. I-131 was detected once at the control location during 1982 at a concentration of 0.039 pCi/m^3.

Iodine-131 has been detected in samples collected from the on-site indicator locations during 1976 to 1978, 1980 to 1983 and 1986 to 1987. The mean concentrations ranged from 0.013 pCi/m^3 in 1980 to a maximum of 0.33 pCi/m^3 in 1976. The maximum mean indicator I-131 concentration of 0.33 pCi/m^3 was the result of the atmospheric nuclear testing. The Chernobyl accident resulted in I-131 being detected in a total of 75 weekly samples collected during the 1986 sample program. The 1986 measured concentrations ranged from a minimum of 0.023 pCi/m^3 to a maximum of 0.36 pCi/m^3. Each positive detection of I-131 in samples collected in 1986 was the direct result of the Chernobyl Nuclear accident.

Historical data for I-131 are presented in Section 7.0, Tables 7-15 and 7-16.

5.2.4 DIRECT RADIATION THERMOLUMINESCENT DOSIMETERS (TLD)

A. Results Summary

Thermoluminescent dosimeters (TLDs) are used to measure direct radiation (gamma dose) in the environment. As part of the 2010 environmental monitoring program, TLDs were placed at a total of 72 different environmental TLD locations (32 required by the ODCM and 40 optional locations). These TLDs were placed, collected and read each quarter of 2010. As a result of placing two TLDs at each location, the results presented in this report are the average of two TLD readings obtained for a given location.

The TLDs were placed in the following five geographical locations around the site boundary:

- On-site (areas within the site boundary: TLDs 3, 4, 5, 6, 7, 23, 24, 25, and 26; TLDs 18, 27, 28, 29, 30, 30, 31, 39, 47, 103, 106, and 107 are excluded)
- Site Boundary (area of the site boundary in each of the 16 meteorological sectors: Only includes TLD results that are not affected by radwaste direct shine, TLDs 7, 18, 78, 79, 80, 81, 82, 83, and 84; TLDs 23, 75, 76, 77, 85, 86, and 87 are excluded)
- Off-site Sector (area four to five miles from the site in each of the eight land based meteorological sectors: TLDs 88, 89, 90, 91, 92, 93, 94, and 95)
- Special Interest (areas of high population density and use: TLDs 15, 56, 58, 96, 97 and 98)
- Control (areas beyond significant influence of the site: TLDs 14 and 49)

All geographical locations are required by the ODCM with the exception of the On-site area which was optional. Description of the five geograpical categories and the designation of specific TLD locations that make up each category is presented in Section 3.1.6, TLD (Direct Radiation) of this report. A summary of the 2010 dose rates for each of the five geographical locations is as follows:

	Dose in mrem per standard month		
Geographic Category	Minimum	Maximum	Mean
On-site (Optional)	3.3	13.3	4.8
Site Boundary (Inner Ring) * (1)	3.3	4.3	3.9
Off-site Sectors (Outer Ring) *	3.0	4.4	3.9
Special Interest * (2)	3.2	4.7	3.8
Control * (3)	2.7	4.1	3.6

* Geographical locations required by the ODCM

1 Only includes TLD results that are not affected by radwaste direct shine (TLDs. 7, 18, 78, 79, 80, 81, 82, 83, and 84)

2 Only includes TLD results required by the ODCM (TLDs 15, 56, 58, 96, 97, and 98)

3 Only includes TLD results required by the ODCM (TLDs 14 and 49)

Comparison of annual mean dose rates associated with each geographical location indicate that there is no statistical difference in annual dose as a function of distance from the site boundary. The measured annual dose rate at the nearest resident to the site was consistent with the dose rates measured at the site boundary and control locations. The results for the Site Boundary, Off-site Sectors and Special Interest (Off-site) were well within expected normal variation when compared to the Control TLD results.

The results for the 2010 environmental TLD monitoring program indicate that there was no significant increase in dose rates as a result of operations at the site. The Hydrogen Water Chemistry systems used at NMPNS did not measurably increase the ambient radiation exposure rate beyond the site boundary.

B. Data Evaluation and Discussion

Direct Radiation (Gamma Dose) measurements were taken at 72 different environmental locations during 2010, 32 of which are required by the ODCM. These locations are grouped into five geographical location categories for evaluation of results. The five categories include: Onsite, Site Boundary, Offsite by Sector, Special Interest, and Control locations. All categories are required by the ODCM with the exception of the On-site TLDs. On-site TLDs are placed at various locations within the site boundary to provide additional information on direct radiation levels at and around the NMP1, NMP2 and JAFNPP facilities.

On-site TLDs are optional and are subdivided into three categories for which direct radiation results are evaluated. The 2010 direct radiation results for On-site TLD locations were as follows:

1. Results for TLDs located near the NMP1, NMP2 and JAFNPP facilities and at previous or existing on-site air monitoring stations ranged from 3.3 to 13.3 mrem per standard month.

2. Results for TLDs located near the north shoreline of NMP1, NMP2 and JAFNPP in close proximity to the Radwaste and NMP1 Reactor Building ranged from 2.7 to 26.6 mrem per standard month.

3. Results for TLDs located on-site near the Energy Information Center and its associated shoreline ranged from 3.9 to 5.2 mrem per standard month.

Site Boundary TLD results ranged from 3.3 to 12.1 mrem per standard month in 2010. This range included all TLDs placed in each of the 16 meteorological sectors in the general area of the site boundary. The highest dose rate measured at a location required by the ODCM was 12.1 mrem per standard month. This TLD, (TLD 85) represents the site boundary maximum dose and is located in the WNW sector along the lake shore in close proximity to the NMP1 plant. The TLD locations along the lakeshore close to the plants (TLDs 75, 76, 77, 85, 86 and 87) are influenced by radwaste buildings and radwaste shipping activities. These locations and are not accessible to members of the public, and the TLD results for these areas are not representative of dose rates measured at the remaining site boundary locations. The remaining Site Boundary TLD locations, which are located away from the plant ranged from 3.3 to 4.3 mrem per standard month resulting in an average dose rate of 3.9 mrem per standard month.

Off-site Sector TLDs, required by the ODCM, located 4 to 5 miles from the site in each of the 8 land based meteorological sectors ranged from 3.0 to 4.4 mrem per standard month with an average dose rate of 3.9 mrem per standard month.

Special Interest TLDs from all locations ranged from 3.2 to 4.7 mrem per standard month with an annual average dose rate of 3.8 mrem per standard month.

The Control TLD group required by the ODCM utilizes locations positioned well beyond the site. 2010 Control TLD results ranged from 2.7 to 4.6 mrem per standard month with an annual average dose rate of 3.9 mrem per standard month. These results include both the ODCM required control TLDs (14 and 49) and the additional control TLDs (8, 111 and 113).

TLD analysis results are presented in Section 6.0, Table 6-10.

C. Dose evaluation

2010 annual mean dose rates for each geographic location required by the ODCM are as follows:

Site Boundary:	3.9 mrem per standard month	(TLDs: 78, 79, 80, 81, 82, 83, 84, 7 and 18)
Off-site Sectors:	3.9 mrem per standard month	(TLDs: 88, 89, 90, 91, 92, 93, 94 and 95)
Special Interest:	3.8 mrem per standard month	(TLDs: 15, 56, 58, 96, 97 and 98)
Control:	3.6 mrem per standard month	(TLDs 14 and 49)

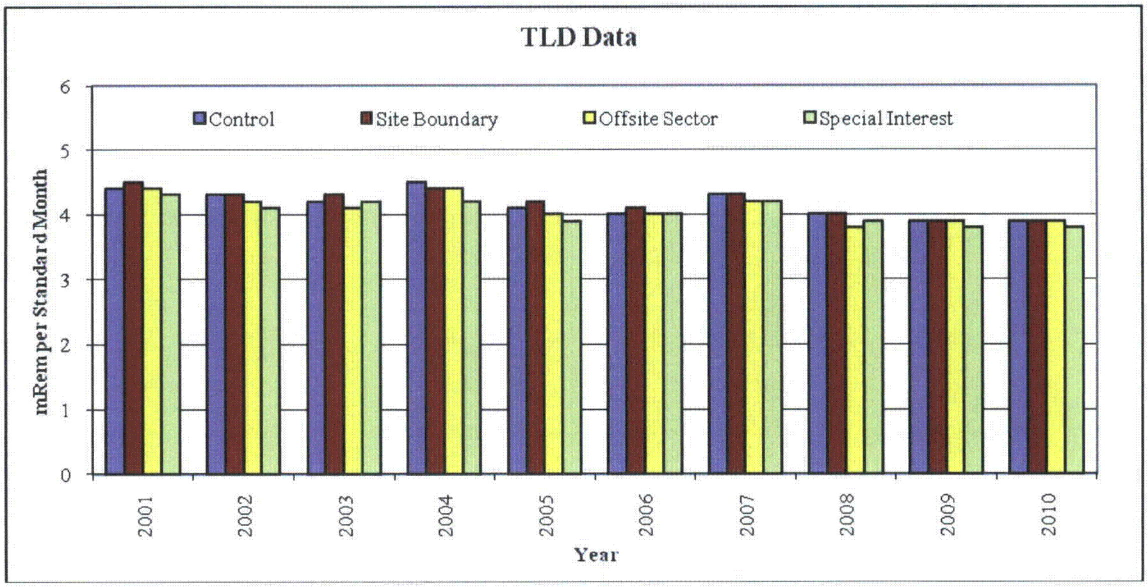
The measured mean dose rate in the proximity of the closest resident was 4.2 mrem per standard month (TLD #s: 108, 109), which is consistent with the control measurements of 3.6 mrem per standard month.

The mean annual dose for each of the geographic location categories demonstrates that there is no statistical difference in the annual dose as a function of distance from the site. The TLD program verifies that operations at the site do not measurably contribute to the levels of direct radiation present in the off-site environment.

D. Data Trends

A comparison of historical TLD results can be made using the different geographical categories of measurement locations. These include Site Boundary TLDs located in each of the 16 meteorological sectors, TLDs located off-site in each land based sector at a distance of 4 to 5 miles from the site, TLDs located at special interest areas and TLDs located at control locations. Site Boundary, Off-site Sector and Special Interest TLD locations became effective in 1985; therefore, trends for these results can only be evaluated from 1985 to the present.

The following graph illustrates TLD results for the Control, Site Boundary, Off-site Sectors and Special Interest groups from 2001 through 2010:



TLDs located at the site boundary averaged 3.9 mrem per standard month during 2010 (Site Boundary average results do not include TLDs influenced by radwaste buildings and radwaste shipping activities). This result is consistent with the previous five year average of 4.0 mrem per standard month.

Off-site Sector TLDs averaged 3.9 mrem per standard month during 2010. This result is also consistent with the previous five-year average of 4.0 mrem per standard month for off-site sectors.

Special Interest TLD locations averaged 3.8 mrem per standard month during 2010 which is consistent with the previous five-year average of 4.0 mrem per standard month.

The last group of TLD locations required by the ODCM is the Control Group. This group utilized TLD locations positioned well beyond the site. 2010 control results from all Control TLDs averaged 3.9 mrem per standard month, consistent with the previous five-year average of 4.1 mrem per standard month. The 2010 TLD program results, when compared to the previous ten years, showed no significant trends relative to increased dose rates in the environment.

Section 7.0, Tables 7-17 through 7-22 show the historical environmental sample data for environmental TLDs.

5.2.5 MILK

A. Results Summary

A total of 36 milk samples were collected during the 2010 program and analyzed for gamma emitting radionuclides using gamma spectroscopy. In addition, each sample undergoes an iodine extraction procedure to determine the presence of Iodine-131 (I-131).

I–131, a possible plant related radionuclide, is measured to evaluate the cow/milk dose pathway to man. I-131 was not detected in any of the 36 milk samples collected in 2010 from the two milk sample locations.

Gamma spectral analyses of the milk samples showed only naturally occurring radionuclides, such as K-40, were detected in milk samples collected during 2010. K-40 was detected in all indicator and control samples. K-40 is a naturally occurring radionuclide and is found in many environmental sample media.

The 2010 results demonstrate that routine operations of the Nine Mile Point site resulted in no measurable contribution to the "dose to the public" from the cow/milk pathway.

B. Sampling Overview

Milk samples were collected from one indicator locations and one control location. The ODCM requires that three sample locations be within five miles of the site. Based on the milch animal census, there were no adequate milk sample locations within five miles of the site in 2010. Samples were collected from two farms located beyond the five-mile requirement to ensure the continued monitoring of this important pathway. The indicator location is approximately 9 miles east from the site. The control samples were collected from a farm located 16.0 miles from the site and in a low frequency wind sector (upwind). The geographic location of each sample location is listed below:

Location No.	Direction From Site	Distance (Miles)
55	E	8.8
77 (Control)	SSW	16.0

Samples were collected from Indicator location #55 from April through December. Sampling occurs during the first and second half of each month. Samples were not required to be collected during January through March of 2010 as a result of I-131 not having been detected in samples collected during November and December of 2009, as stipulated in the ODCM.

C. Data Evaluation and Discussion

Each milk sample is analyzed for gamma-emitters using gamma spectral analysis. The I-131 analysis is performed using resin extraction followed by spectral analysis for each sample. I-131 and gamma analysis results for milk samples collected during 2010 are provided in Section 6.0, Table 6-11.

Iodine 131 was not detected in any indicator or control milk samples analyzed during 2010. All I-131 milk results were reported as Lower Limits of Detection (LLD). The LLD results for all samples ranged from <0.46 to <0.87 pCi/liter. No plant-related radionuclides were detected in any milk sample collected in 2010. K-40 was the most abundant radionuclide detected, and found in every indicator and control sample collected. K-40 is a naturally-occurring radionuclide and is found in many of the environmental media samples. Cs-137 was not detected in any indicator or control milk sample collected in 2010.

The results of the milk samples are presented in Section 6.0, Table 6-11.

D. Dose Evaluation

The calculated dose as a result of plant effluents is not evaluated due to the fact that no plant-related radionuclides were detected.

The dose to man from naturally occurring concentrations of K-40 in milk and other environmental media can be calculated. This calculation illustrates that the dose received due to exposure from plant effluents is negligible compared to the dose received from naturally occurring radionuclides. Significant levels of K-40 have been measured in environmental samples. A 70 kilogram (154 pound) adult contains approximately 0.1 microcuries of K-40 as a result of normal life functions (inhalation, consumption, etc.). The dose to bone tissue is about 20 mrem per year as a result of internal deposition of naturally-occurring K-40.

E. Data Trends

Man-made radionuclides are not routinely detected in milk samples. In the past twenty five years, Cs-137 was only detected in 1986, 1987, and 1988. The mean Cs-137 indicator activities for those years were 8.6, 6.8 and 10.0 pCi/liter, respectively. I-131 was measured in two milk samples collected in 1997 from a single indicator sample location, having a mean concentration of 0.50 pCi/liter and was of undetermined origin. The previous detection was in 1986 with a mean concentration of 13.6 pCi/liter in a control location. The 1986 - 1988 activity was a result of the Chernobyl accident.

The comparison of 2010 data to historical results over the operating life of the plants shows that Cs-137 and I-131 levels have decreased significantly since the 1980's.

Historical data of milk sample results for Cs-137 and I-131 are presented in Section 7.0, Tables 7-23 and 7-24.

5.2.6 FOOD PRODUCTS (VEGETATION)

A. Results Summary

There were no plant-related radionuclides detected in the 12 food product samples collected and analyzed for the 2010 program.

Detectable levels of naturally occurring K–40 were measured in all control and indicator samples collected for the 2010 program. Be-7 a naturally-occurring radionuclide, was also detected intermittently in samples collected in 2010. These results are consistent with the levels measured in previous years.

The results of the 2010 sampling program demonstrate that there is no measurable impact on the dose to the public from the garden pathway as a result of plant operations.

B. Data Analysis and Discussion

Food product samples were collected from five indicator locations and one control location. The indicator locations are represented by nearby gardens in areas of highest D/Q (deposition factor) values based on historical meteorology and an annual garden census. The control location was a garden 15 miles away in a predominately upwind direction.

Food product samples collected during 2010 did not included any varieties considered to be an edible broadleaf vegetables. The general lack of edible broadleaf vegetation samples was the result of grower preference and such varieties were not available in local gardens. Where broadleaf vegetables were not available, non-edible broadleaf vegetation were collected. Non-edible vegetation consisting of cabbage, swiss chard, squash leaves, rhubarb leaves, brussel sprout leaves and zucchini leaves were collected for the 2010 program. The leaves of these plants were sampled as representative of broadleaf vegetation, which is a measurement of radionuclide deposition. Samples were collected during the late summer/fall harvest season. Each sample was analyzed for gamma-emitters using gamma spectroscopy.

The analysis of food product samples collected during 2010 did not detect any plant-related radionuclides. Results for the past five years also demonstrate that there is no buildup of plant-related radionuclides in the garden food products grown in areas close to the site.

Naturally-occurring Be-7 and K-40 were detected in food product samples. The results for naturally-occurring radionuclides are consistent with the data of prior years.

Analytical results for food products are found in Section 6.0, Table 6-12.

C. Dose Evaluation

The calculated dose as a result of plant effluents is not evaluated due to the fact that no plant-related radionuclides were detected. The food product sampling program demonstrated no measurable off-site dose to man from this pathway as a result of operations of the plants located at the Nine Mile Point site.

D. Data Trends

Food product/vegetation sample results for the last five years demonstrate that there is no chronic deposition or buildup of plant-related radionuclides in the garden food products in the environs near the site.

The last positive indication was for Cs-137 which was detected at one indicator location in 1999 with a concentration of 0.008 pCi/g (wet).

Historically, Cs-137 had been detected in ten separate years since 1976 ranging from a maximum mean concentration of 0.047 pCi/g (wet) in 1985 to a minimum of 0.004 pCi/g (wet) in 1979. The trend for Cs-137 is a general reduction in concentration to non-detectable levels in samples collected during the 2001 through 2010 sample programs.

Historical data of food product results are presented in Section 7.0, Tables 7-25 and 7-26.

5.2.7 LAND USE CENSUS RESULTS

A. Results Summary

The ODCM requires that an annual land use census be performed to identify potential new locations for milk sampling and for calculating the dose to man from plant effluents. In 2010, a milk animal census, a nearest resident census, and a garden census were performed.

The results of the closest residence census conducted in 2010 required no change to either the NMP1 or NMP2 ODCMs' closest resident location.

A garden census, not required by the ODCM, is performed to identify appropriate garden sampling locations and dose calculation receptors. Garden samples were collected from a number of locations listed in Table 5-1 of the NMP1 and NMP2 ODCMs and identified in the census as active for 2010. See Table 3.3-1 for 2010 sampling locations.

B. Data Evaluation and Discussion

A land use census is conducted each year to determine the utilization of land in the vicinity of the Nine Mile Point site. The land use census consists of two types of surveys. A milk animal census is conducted to identify all milk animals within a distance of 10 miles from the site. The census, covering areas out to a distance of 10 miles exceeds the 5 mile distance required by the ODCM. A resident census is conducted and is designed to identify the nearest resident in each meteorological sector out to a distance of 5 miles.

The milk animal census is an estimation of the number of cows and goats within an approximate 10 mile radius of the Nine Mile Point Site. The annual census is conducted during the first half of the grazing season by sending questionnaires to previous milk animal owners and also by road surveys to locate any possible new locations. In the event the questionnaires are not answered, the owners are contacted by telephone or in person. The local county agricultural extension service is also contacted as an additional source of information concerning new milk animal locations in the vicinity of the site.

The number of milk animals located within an approximate 10-mile radius of the site was estimated to be 409 cows and no goats based on the 2010 land use census. The number of cows has increased by 3, when compared to the 2009 census. The results of the milk animal census are found in Section 6.0, Table 6-13.

The second type of census conducted is a residence census. The census is conducted in order to identify the closest residence within 5 miles in each of the 22.5 degree land-based meteorological sectors. There are only eight sectors over land where residences are located within 5 miles. The water sectors include: N, NNE, NE, ENE, W, WNW, NW and NNW. The results of the residence census, showing the applicable sectors and degrees and distance of each of the nearest residence, are found in Section 6.0, Table 6-14. There were no changes identified in the 2010 census for the closest resident in the land based meteorological sectors. The nearest resident locations are illustrated in Section 3.3, Figure 3.3-5.

5.3 CONCLUSION

The Radiological Environmental Monitoring Program (REMP) is an ongoing program implemented to measure and document the radiological impact of NMPNS operations on the local environment. The program is designed to detect and evaluate small changes in the radiological environment surrounding the site. Environmental media representing food sources consumed at the higher levels of the food chain, such as fish, food products and milk, are part of a comprehensive sampling program. Results of all samples are reviewed closely to determine any possible impact to the environment or to man. In addition, program results are evaluated for possible short- and long-term historical trends.

The federal government has established dose limits to protect the public from radiation and radioactivity. The Nuclear Regulatory Commission (NRC) specifies a whole body dose limit of 100 mrem/yr to be received by the maximum exposed member of the general public. This limit is set forth in Section 1301, Part 20, Title 10 of the U.S. Code of Federal Regulations (10 CFR 20). The Environmental Protection Agency (EPA) limits the annual whole body dose to 25 mrem/yr, which is specified in Section 10, Part 190, Title 40, of the Code of Federal Regulations (40 CFR 190). Radiation exposure to members of the public, calculated based on the results of the REMP, is extremely small. The dose to members of the public from operations at the Nine Mile Point site, based on environmental measurement and calculations made from effluent releases, is determined to be a fraction of limits set forth by the NRC and EPA.

The results of the 2010 REMP continue to clearly demonstrate that there is no significant short-term or chronic long-term radiological impact on the environment in the vicinity of the Nine Mile Point site. No unusual radiological characteristics were measured or observed in the local environment. The REMP continues to demonstrate that the effluents from the site to the environment contribute no significant or even measurable radiation exposures to the general public as confirmed by the sampling and analysis of environmental media from recognized environmental pathways. Based on TLD results, there was no measurable increase in radiation levels beyond the site boundary as a result of the hydrogen water chemistry programs. Environmental radiation levels measured at the nearest residence are at the background level based on control station TLD results. The only measurable radiological impact on the environment continues to be the result of atmospheric weapons testing conducted in the early 1980s and the 1986 accident at the Chernobyl Nuclear Power Plant. Both of these source terms have contributed to a measurable inventory of Cs-137 in the environment. The results for the 2010 sample program demonstrate that the concentrations of man-made radionuclides continue to decline. This reduction in environmental background concentrations will allow for the site environmental program to become more sensitive to the measurable impact of plant operations on the environment as time goes on.

The REMP did not detect any plant-related radionuclide in the sample media collected during 2010. Dose from man-made sources in the environment is very small when compared to the dose originating from naturally-occurring sources of radioactivity.

Radiation from naturally-occurring radionuclides such as K-40 and Ra-226 contributed the vast majority of the total annual dose to members of the general public. The dose to members of the public, resulting from plant operations, is extremely small in comparison to the dose contribution from natural background levels and sources other than the plants. The whole body dose in Oswego County due to natural sources is approximately 50 – 60 mrem per individual per year as demonstrated by control environmental TLDs. The fraction of the annual dose to man, attributable to site operation, remains insignificant.

Based upon the overall results of the 2010 Radiological Environmental Monitoring Program, it can be concluded that the levels and variation of radioactivity in the environment samples were consistent with background levels that would be expected for the lakeshore environment of the site.

5.4 REFERENCES

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.

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, 1975.

6. National Council on Radiation Protection and Measurements (NCRP), Natural Background Radiation in the United States, NCRP Report No. 45, 1975.

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

8. National Council on Radiation Protection and Measurments (NCRP), Radiation Exposure from Consumer Products and Miscellaneous Sources, NCRP Report No. 56, 1977.

9. International Commission on Radiological Protection (ICRP), Radionuclide Release into the Environment: Assessment of Doses to Man, ICRP Publication 29, 1979.

10. Glasstone, Samuel and Jordan, Walter H., Nuclear Power and Its Environmental Effects, First Edition, American Nuclear Society, La Grange Park, Ill., 1980.

11. Schleien, Bernard. The Health Physics and Radiological Health Handbook, Scinta, Inc., Silver Spring, Maryland, 1992.

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

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

14. National Council on Radiation Protection and Measurements (NCRP), Exposure of the Population in the United States and Canada from National Background Radiation, NCRP Report No. 94, 1987.

15. National Council on Radiation Protection and Measurement (NCRP), Ionizing Radiation Exposure of the Population of the United States, NCRP Report No. 160 2009.

6.0 REPORT PERIOD ANALYTICAL RESULTS TABLES

Environmental sample data is summarized in table format. Tables are provided for select sample media and contain data based on actual values obtained over the year. These values are comprised of both positive values and LLD values where applicable.

The LLD is the smallest concentration of radioactive material in a sample that will be detected with 95% probability and with 5% probability of falsely concluding that a blank observation represents a "real" signal (see Section 3.7.3 for detailed explanation).

When the initial count of a sample indicates the presence of radioactivity, two recounts are normally performed. When a radionuclide is positively identified in two or more counts, the analytical results for that radionuclide are reported as the mean of the positive detections and the associated error for that mean (see Section 3.7.2 for methodology).

Many of the tables are footnoted with the term "Plant-Related Radionuclides". Plant-related radionuclides are radionuclides that are produced in the reactor as a result of plant operation, either through the activation or fission process.

TABLE 6-1
CONCENTRATIONS OF GAMMA EMITTERS IN SHORELINE SEDIMENT SAMPLES
Results in Units of pCi/kg (dry) ± 1 Sigma

Sample Location **	Collection Date	GAMMA EMITTERS					
		K-40	Co-60	Cs-134	Cs-137	Zn-65	Others †
Sunset Bay (05) *	04/26/10	19700 ± 1228	< 104.8	< 76.9	< 102.5	< 393.3	< LLD
	10/18/10	21430 ± 1262	< 143.1	< 90.3	< 106.2	< 300.2	< LLD
Lang's Beach (06, Control)	04/26/10	11250 ± 706	< 53.2	< 48.3	< 59.4	< 174.4	< LLD
	10/18/10	14470 ± 839	< 83.2	< 53.7	< 87.5	< 240.9	< LLD

* Sample required by the ODCM
** Corresponds to sample location noted on Figure 3.3-5
† Plant related radionuclides

TABLE 6-2
CONCENTRATIONS OF GAMMA EMITTERS IN FISH SAMPLES
Results in Units of pCi/kg (wet) ± 1 Sigma
FITZPATRICK * (03)***

Date	Description	GAMMA EMITTERS								
		K-40	Mn-54	Co-58	Fe-59	Co-60	Cs-134	Cs-137	Zn-65	Others †
6/15/2010	BROWN TROUT	7065 ± 606	< 70	< 86	< 240	< 79	< 68	< 69	< 125	< LLD
6/15/2010	WALLEYE	8312 ± 577	< 53	< 56	< 230	< 48	< 38	< 55	< 153	< LLD
6/25/2010	SMALLMOUTH BASS	6738 ± 486	< 39	< 54	< 158	< 55	< 55	< 55	< 90	< LLD
9/21/2010	BROWN TROUT	5428 ± 556	< 62	< 53	< 209	< 76	< 66	< 67	< 188	< LLD
9/21/2010	SALMON	7219 ± 576	< 60	< 54	< 134	< 70	< 66	< 56	< 147	< LLD
9/21/2010	SMALLMOUTH BASS	6380 ± 476	< 49	< 50	< 137	< 56	< 50	< 63	< 127	< LLD

* Sample required by the ODCM
*** Corresponds to sample location noted on Figure 3.3-5
† Plant related radionuclides

TABLE 6-2 (Continued)
CONCENTRATIONS OF GAMMA EMITTERS IN FISH SAMPLES
Results in Units of pCi/kg (wet) ± 1 Sigma
NINE MILE POINT * (02)***

Date	Description	GAMMA EMITTERS								
		K-40	Mn-54	Co-58	Fe-59	Co-60	Cs-134	Cs-137	Zn-65	Others †
6/15/2010	BROWN TROUT	3387 ± 345	< 49	< 52	< 152	< 55	< 58	< 54	< 116	< LLD
6/15/2010	WALLEYE	5470 ± 456	< 58	< 40	< 171	< 45	< 60	< 37	< 137	< LLD
6/23/2010	SMALLMOUTH BASS	5213 ± 468	< 40	< 48	< 129	< 51	< 37	< 49	< 119	< LLD
9/21/2010	BROWN TROUT	4955 ± 401	< 47	< 46	< 93	< 50	< 58	< 45	< 118	< LLD
9/21/2010	SALMON	4983 ± 408	< 43	< 49	< 138	< 49	< 42	< 51	< 114	< LLD
9/21/2010	SMALLMOUTH BASS	3967 ± 439	< 41	< 46	< 139	< 46	< 47	< 34	< 134	< LLD

* Sample required by the ODCM
*** Corresponds to sample location noted on Figure 3.3-5
† Plant related radionuclides

TABLE 6-2 (Continued)
CONCENTRATIONS OF GAMMA EMITTERS IN FISH SAMPLES
Results in Units of pCi/kg (wet) ± 1 Sigma
OSWEGO HARBOR (CONTROL) * (00)***

Date	Description	GAMMA EMITTERS								
		K-40	Mn-54	Co-58	Fe-59	Co-60	Cs-134	Cs-137	Zn-65	Others †
6/22/2010	BROWN TROUT	5060 ± 441	< 48	< 54	< 165	< 56	< 37	< 57	< 155	< LLD
6/22/2010	WALLEYE	4756 ± 422	< 54	< 40	< 155	< 47	< 48	< 54	< 118	< LLD
6/25/2010	SMALLMOUTH BASS	4503 ± 446	< 49	< 54	< 122	< 62	< 53	< 50	< 120	< LLD
9/21/2010	BROWN TROUT	4309 ± 399	< 43	< 49	< 134	< 57	< 58	< 55	< 108	< LLD
9/21/2010	SALMON	4852 ± 426	< 39	< 44	< 93	< 48	< 56	< 51	< 125	< LLD
9/21/2010	SMALLMOUTH BASS	3928 ± 429	< 49	< 44	< 135	< 54	< 44	< 52	< 112	< LLD

* Sample required by the ODCM
*** Corresponds to sample location noted on Figure 3.3-5
† Plant related radionuclides

TABLE 6-3
CONCENTRATIONS OF TRITIUM IN SURFACE WATER SAMPLES
(QUARTERLY COMPOSITE SAMPLES)

Results in Units of pCi/l ± 1 Sigma

STATION CODE	PERIOD	DATE		TRITIUM
FITZPATRICK* (03, INLET)***	First Quarter	12/28/09	03/31/10	< 420
	Second Quarter	03/31/10	06/30/10	< 397
	Third Quarter	06/30/10	09/30/10	< 409
	Fourth Quarter	09/30/10	12/28/10	< 420
OSWEGO STEAM STATION* (08, CONTROL)***	First Quarter	12/30/09	03/26/10	< 420
	Second Quarter	03/26/10	06/25/10	< 403
	Third Quarter	06/25/10	10/01/10	< 409
	Fourth Quarter	10/01/10	12/27/10	< 408
NINE MILE POINT UNIT 1** (09, INLET)***	First Quarter	12/30/09	03/26/10	< 420
	Second Quarter	03/26/10	06/25/10	< 402
	Third Quarter	06/25/10	10/01/10	< 409
	Fourth Quarter	10/01/10	12/27/10	< 420
NINE MILE POINT UNIT 2** (11, INLET)***	First Quarter	12/30/09	03/26/10	< 420
	Second Quarter	03/26/10	06/25/10	< 403
	Third Quarter	06/25/10	10/01/10	< 409
	Fourth Quarter	10/01/10	12/27/10	< 420
OSWEGO CITY WATER** (10)***	First Quarter	12/30/09	03/26/10	< 420
	Second Quarter	03/26/10	06/25/10	< 403
	Third Quarter	06/25/10	10/01/10	< 409
	Fourth Quarter	10/01/10	12/27/10	< 420

* Sample location required by ODCM

** Optional Sample location

*** Corresponds to sample location noted on Figure 3.3-4

TABLE 6-4
CONCENTRATIONS OF GAMMA EMITTERS IN SURFACE WATER SAMPLES
Results in Units of pCi/liter ± 1 Sigma
OSWEGO STEAM STATION * (08, CONTROL)***

Date	1/29/2010	2/26/2010	3/26/2010	4/30/2010	5/28/2010	6/25/2010
NUCLIDE						
I-131	< 0.99	< 0.62	< 0.62	< 0.64	< 0.79	< 0.97
Cs-134	< 2.58	< 1.58	< 3.95	< 1.81	< 2.74	< 1.49
Cs-137	< 3.52	< 2.54	< 3.80	< 2.37	< 3.69	< 1.96
Zr-95	< 7.92	< 4.57	< 7.46	< 4.74	< 7.17	< 3.73
Nb-95	< 5.30	< 2.91	< 4.81	< 3.36	< 4.82	< 3.02
Co-58	< 4.45	< 2.63	< 5.02	< 2.73	< 4.28	< 2.14
Mn-54	< 3.73	< 2.31	< 3.86	< 2.38	< 4.20	< 1.96
Fe-59	< 12.54	< 7.40	< 11.58	< 7.13	< 14.20	< 7.05
Zn-65	< 10.24	< 5.59	< 10.25	< 4.95	< 9.83	< 4.30
Co-60	< 4.12	< 2.23	< 4.38	< 2.48	< 3.94	< 1.78
K-40	396.8 ± 24.96	104 ± 12.10	< 47.27	108.5 ± 11.40	177.2 ± 21.57	102.8 ± 9.97
Ba/La-140	< 9.98	< 6.82	< 9.31	< 8.14	< 13.11	< 8.70
Date	7/30/2010	8/27/2010	10/1/2010	10/29/2010	12/3/2010	12/27/2010
NUCLIDE						
I-131	< 0.77	< 0.81	< 0.67	< 0.81	< 0.76	< 1.00
Cs-134	< 2.23	< 2.89	< 3.51	< 2.44	< 2.24	< 1.20
Cs-137	< 3.51	< 3.01	< 4.81	< 3.46	< 2.82	< 1.04
Zr-95	< 6.78	< 5.62	< 9.97	< 7.10	< 6.06	< 1.98
Nb-95	< 4.48	< 3.96	< 6.24	< 4.63	< 3.78	< 1.38
Co-58	< 4.04	< 3.51	< 6.04	< 3.73	< 3.39	< 1.14
Mn-54	< 3.19	< 2.78	< 5.10	< 3.61	< 3.26	< 1.07
Fe-59	< 11.51	< 9.75	< 15.97	< 10.01	< 9.70	< 3.48
Zn-65	< 9.28	< 5.76	< 12.98	< 9.01	< 6.93	< 1.46
Co-60	< 4.24	< 2.72	< 6.38	< 4.01	< 3.02	< 1.01
K-40	307 ± 22.18	433.6 ± 21.32	444.7 ± 34.66	309.5 ± 21.80	< 32.14	108.4 ± 5.33
Ba/La-140	< 12.23	< 8.33	< 12.44	< 10.64	< 10.23	< 3.82

* Sample Location required by ODCM
*** Corresponds to sample location noted on Figure 3.3-4

TABLE 6-4 (continued)
CONCENTRATIONS OF GAMMA EMITTERS IN SURFACE WATER SAMPLES
Results in Units of pCi/liter ± 1 Sigma
OSWEGO CITY WATER (10)*****

Date	1/29/2010	2/26/2010	3/26/2010	4/30/2010	5/28/2010	6/25/2010
NUCLIDE						
I-131	< 11.97	< 10.38	< 13.30	< 13.99	< 9.69	< 14.95
Cs-134	< 1.82	< 3.03	< 2.49	< 2.28	< 3.41	< 2.25
Cs-137	< 2.64	< 2.98	< 3.49	< 2.86	< 3.32	< 2.00
Zr-95	< 6.17	< 6.11	< 7.37	< 7.05	< 5.99	< 4.78
Nb-95	< 3.62	< 3.82	< 4.67	< 4.78	< 4.21	< 3.35
Co-58	< 3.52	< 3.62	< 4.08	< 3.63	< 3.48	< 2.51
Mn-54	< 2.86	< 2.74	< 3.68	< 3.51	< 2.72	< 2.00
Fe-59	< 10.05	< 9.52	< 11.63	< 11.70	< 9.48	< 7.49
Zn-65	< 3.43	< 4.22	< 7.96	< 4.49	< 4.12	< 2.84
Co-60	< 2.96	< 3.12	< 3.55	< 3.66	< 2.84	< 1.94
K-40	421.1 ± 19.13	426.5 ± 21.55	83.07 ± 15.64	430.4 ± 24.28	400.5 ± 20.62	425.9 ± 14.87
Ba/La-140	< 8.25	< 7.60	< 11.87	< 10.48	< 6.79	< 8.59
Date	7/30/2010	8/27/2010	10/1/2010	10/29/2010	12/3/2010	12/27/2010
NUCLIDE						
I-131	< 9.77	< 8.45	< 10.01	< 7.32	< 14.24	< 6.65
Cs-134	< 1.57	< 2.80	< 2.37	< 2.54	< 3.96	< 0.83
Cs-137	< 2.55	< 2.61	< 3.96	< 2.63	< 3.67	< 1.07
Zr-95	< 5.07	< 4.75	< 7.77	< 4.91	< 5.99	< 2.30
Nb-95	< 3.69	< 3.60	< 5.39	< 3.49	< 4.39	< 1.64
Co-58	< 2.88	< 2.64	< 4.18	< 2.99	< 3.85	< 1.32
Mn-54	< 2.60	< 2.35	< 3.67	< 2.61	< 3.24	< 1.13
Fe-59	< 8.30	< 7.38	< 10.77	< 7.27	< 11.56	< 4.04
Zn-65	< 6.22	< 3.44	< 8.12	< 5.32	< 9.15	< 2.64
Co-60	< 2.85	< 2.45	< 3.75	< 2.47	< 2.98	< 1.21
K-40	366.7 ± 17.14	401.8 ± 17.61	398.2 ± 25.22	407.9 ± 17.98	109.4 ± 18.22	42.33 ± 4.91
Ba/La-140	< 6.75	< 6.45	< 6.89	< 6.40	< 10.48	< 4.77

* Sample Location required by ODCM
*** Corresponds to sample location noted on Figure 3.3-4

TABLE 6-4 (continued)
CONCENTRATIONS OF GAMMA EMITTERS IN SURFACE WATER SAMPLES
Results in Units of pCi/liter ± 1 Sigma
FITZPATRICK* (03, INLET)***

Date	1/27/2010	3/2/2010	3/31/2010	4/30/2010	5/28/2010	6/30/2010
NUCLIDE						
I-131	< 0.40	< 0.53	< 0.55	< 0.77	< 0.56	< 0.58
Cs-134	< 2.21	< 1.63	< 2.09	< 2.10	< 2.31	< 1.80
Cs-137	< 2.80	< 2.30	< 2.92	< 2.80	< 2.92	< 2.82
Zr-95	< 4.63	< 4.60	< 5.30	< 5.39	< 5.27	< 5.05
Nb-95	< 3.22	< 2.73	< 3.75	< 3.41	< 3.69	< 3.65
Co-58	< 3.28	< 2.33	< 3.30	< 2.81	< 3.09	< 3.17
Mn-54	< 2.92	< 2.58	< 2.83	< 3.09	< 2.64	< 2.75
Fe-59	< 6.55	< 7.14	< 9.38	< 7.28	< 8.80	< 6.71
Zn-65	< 6.50	< 2.95	< 3.92	< 3.62	< 6.61	< 6.91
Co-60	< 3.30	< 2.04	< 2.96	< 2.80	< 2.96	< 2.80
K-40	< 28.22	26.38 ± 8.72	40.97 ± 12.48	< 30.73	35.07 ± 10.93	25 ± 8.65
Ba/La-140	< 6.63	< 6.45	< 6.22	< 5.87	< 6.81	< 6.60
Date	7/28/2010	8/31/2010	9/30/2010	10/28/2010	11/30/2010	12/28/2010
NUCLIDE						
I-131	< 0.57	< 0.59	< 0.73	< 0.52	< 0.46	< 0.92
Cs-134	< 1.74	< 1.94	< 1.98	< 2.09	< 2.02	< 2.50
Cs-137	< 2.30	< 2.90	< 2.77	< 2.92	< 2.04	< 2.23
Zr-95	< 4.58	< 4.73	< 4.64	< 5.92	< 3.63	< 4.52
Nb-95	< 2.93	< 3.37	< 3.41	< 3.88	< 2.39	< 3.30
Co-58	< 2.71	< 3.01	< 3.19	< 2.82	< 1.91	< 2.84
Mn-54	< 2.17	< 2.66	< 2.55	< 3.00	< 1.90	< 2.03
Fe-59	< 7.28	< 8.29	< 8.51	< 9.19	< 5.67	< 6.77
Zn-65	< 3.27	< 5.27	< 6.76	< 6.98	< 4.31	< 3.16
Co-60	< 2.20	< 2.58	< 3.01	< 2.69	< 1.94	< 2.49
K-40	23.87 ± 9.44	< 25.45	< 27.70	32.3 ± 9.83	30.26 ± 7.60	424.6 ± 16.46
Ba/La-140	< 4.82	< 6.31	< 5.86	< 5.47	< 4.77	< 6.50

* Sample Location required by ODCM

*** Corresponds to sample location noted on Figure 3.3-4

TABLE 6-4 (Continued)
CONCENTRATIONS OF GAMMA EMITTERS IN SURFACE WATER SAMPLES
Results in Units of pCi/liter ± 1 Sigma
NINE MILE POINT UNIT 1 ** (09, INLET)***

Date	1/29/2010	2/26/2010	3/26/2010	4/30/2010	5/28/2010	6/25/2010
NUCLIDE						
I-131	< 12.46	< 7.23	< 11.74	< 7.89	< 11.39	< 4.53
Cs-134	< 3.17	< 1.41	< 2.02	< 1.53	< 2.07	< 4.94
Cs-137	< 2.47	< 1.94	< 3.02	< 1.94	< 2.82	< 4.73
Zr-95	< 4.68	< 3.52	< 5.86	< 3.83	< 5.44	< 10.40
Nb-95	< 3.62	< 2.36	< 4.34	< 2.67	< 3.62	< 6.64
Co-58	< 2.70	< 2.08	< 3.58	< 2.26	< 3.44	< 5.89
Mn-54	< 2.74	< 1.95	< 3.13	< 1.74	< 2.85	< 5.02
Fe-59	< 8.46	< 5.72	< 10.73	< 6.13	< 8.14	< 18.05
Zn-65	< 5.69	< 4.29	< 7.62	< 2.46	< 6.81	< 11.92
Co-60	< 2.29	< 1.84	< 3.33	< 1.80	< 2.91	< 4.64
K-40	38.26 ± 12.11	42.39 ± 8.20	159.2 ± 17.16	25.05 ± 7.83	34.42 ± 10.85	455.2 ± 34.98
Ba/La-140	< 9.13	< 4.99	< 9.29	< 5.80	< 8.60	< 12.70
Date	7/30/2010	8/27/2010	10/1/2010	10/29/2010	12/3/2010	12/27/2010
NUCLIDE						
I-131	< 9.13	< 7.30	< 9.13	< 6.90	< 12.11	< 7.48
Cs-134	< 1.70	< 1.45	< 4.16	< 1.31	< 4.10	< 0.87
Cs-137	< 2.27	< 1.81	< 3.52	< 1.64	< 3.44	< 1.29
Zr-95	< 4.27	< 3.63	< 6.43	< 3.61	< 6.87	< 2.50
Nb-95	< 2.99	< 2.35	< 4.38	< 2.55	< 4.84	< 1.68
Co-58	< 2.63	< 2.01	< 3.66	< 2.09	< 4.19	< 1.35
Mn-54	< 2.31	< 1.95	< 3.55	< 1.94	< 3.81	< 1.20
Fe-59	< 7.03	< 6.29	< 10.04	< 6.29	< 10.97	< 4.02
Zn-65	< 4.91	< 4.25	< 9.26	< 2.66	< 9.78	< 1.56
Co-60	< 2.26	< 1.94	< 3.22	< 1.90	< 3.37	< 1.31
K-40	42.74 ± 9.25	36.3 ± 7.68	86.28 ± 15.11	24.22 ± 7.22	129.8 ± 18.01	41.63 ± 5.46
Ba/La-140	< 6.04	< 5.58	< 7.63	< 4.67	< 11.51	< 4.65

** Optional Sample Location

*** Corresponds to sample location noted on Figure 3.3-4

TABLE 6-4 (Continued)
CONCENTRATIONS OF GAMMA EMITTERS IN SURFACE WATER SAMPLES
Results in Units of pCi/liter ± 1 Sigma
NINE MILE POINT UNIT 2 ** (11, INLET)***

Date	1/29/2010	2/26/2010	3/26/2010	4/30/2010	5/28/2010	6/25/2010
NUCLIDE						
I-131	< 14.60	< 8.85	< 12.42	< 9.99	< 12.51	< 13.66
Cs-134	< 2.59	< 1.61	< 2.14	< 2.98	< 4.43	< 0.82
Cs-137	< 3.95	< 2.59	< 2.95	< 2.37	< 3.74	< 1.13
Zr-95	< 6.95	< 5.15	< 6.79	< 5.39	< 7.24	< 2.53
Nb-95	< 5.11	< 3.30	< 4.54	< 3.91	< 4.63	< 1.95
Co-58	< 3.89	< 3.08	< 3.90	< 3.18	< 4.56	< 1.44
Mn-54	< 3.52	< 2.53	< 3.34	< 2.84	< 4.36	< 1.21
Fe-59	< 13.00	< 7.90	< 10.55	< 8.99	< 12.20	< 4.42
Zn-65	< 8.71	< 6.39	< 4.26	< 7.07	< 8.82	< 1.51
Co-60	< 4.38	< 2.52	< 3.23	< 2.77	< 4.94	< 1.20
K-40	159.4 ± 19.97	49.7 ± 11.89	433.3 ± 22.15	49.5 ± 11.21	41.0 ± 14.53	45.4 ± 4.77
Ba/La-140	< 13.16	< 7.50	< 7.66	< 8.09	< 11.39	< 6.80
Date	7/30/2010	8/27/2010	10/1/2010	10/29/2010	12/3/2010	12/27/2010
NUCLIDE						
I-131	< 10.39	< 9.14	< 11.05	< 7.42	< 13.93	< 8.77
Cs-134	< 3.48	< 2.53	< 2.20	< 2.91	< 2.15	< 1.13
Cs-137	< 2.86	< 2.49	< 3.60	< 2.37	< 3.24	< 1.64
Zr-95	< 6.14	< 5.25	< 6.59	< 4.55	< 5.89	< 3.36
Nb-95	< 3.41	< 2.82	< 4.24	< 3.05	< 4.77	< 2.29
Co-58	< 3.78	< 2.74	< 4.11	< 2.63	< 3.87	< 1.91
Mn-54	< 2.97	< 2.59	< 3.34	< 2.66	< 3.08	< 1.68
Fe-59	< 8.69	< 8.16	< 11.83	< 8.43	< 9.85	< 5.79
Zn-65	< 6.35	< 5.47	< 8.65	< 6.02	< 4.43	< 3.58
Co-60	< 3.36	< 3.11	< 4.06	< 2.76	< 3.26	< 1.86
K-40	43.12 ± 15.30	38.33 ± 11.04	297.8 ± 22.06	34.05 ± 10.70	40.05 ± 10.75	45.26 ± 7.46
Ba/La-140	< 9.78	< 8.07	< 9.57	< 7.21	< 9.34	< 6.53

** Optional Sample Location

*** Corresponds to sample location noted on Figure 3.3-4

TABLE 6-5

ENVIRONMENTAL AIRBORNE PARTICULATE SAMPLES - OFF-SITE SAMPLE LOCATIONS

GROSS BETA ACTIVITY pCi/ m^3 ± 1 Sigma

Week End Date	R-1 *	R-2 *	R-3 *	R-4 *	R-5 *	D-2 **	E **	F **	G **
01/05/10	0.016 ± 0.001	0.013 ± 0.001	0.013 ± 0.001	0.012 ± 0.001	0.015 ± 0.001	0.012 ± 0.001	0.014 ± 0.001	0.015 ± 0.001	0.015 ± 0.001
01/12/10	0.012 ± 0.001	0.012 ± 0.001	0.007 ± 0.001	0.011 ± 0.001	0.011 ± 0.001	0.012 ± 0.001	0.013 ± 0.001	0.011 ± 0.001	0.014 ± 0.001
01/19/10	0.028 ± 0.002	0.026 ± 0.002	0.022 ± 0.002	0.026 ± 0.002	0.026 ± 0.002	0.025 ± 0.002	0.027 ± 0.002	0.029 ± 0.002	0.028 ± 0.002
01/26/10	0.015 ± 0.001	0.018 ± 0.001	0.018 ± 0.001	0.017 ± 0.001	0.015 ± 0.001	0.015 ± 0.001	0.016 ± 0.001	0.018 ± 0.001	0.018 ± 0.001
02/02/10	0.022 ± 0.001	0.019 ± 0.001	0.019 ± 0.001	0.019 ± 0.001	0.018 ± 0.001	0.018 ± 0.001	0.017 ± 0.001	0.019 ± 0.001	0.017 ± 0.001
02/09/10	0.016 ± 0.001	0.015 ± 0.001	0.015 ± 0.001	0.017 ± 0.001	0.012 ± 0.001	0.014 ± 0.001	0.016 ± 0.001	0.014 ± 0.001	0.014 ± 0.001
02/16/10	0.014 ± 0.001	0.012 ± 0.001	0.011 ± 0.001	0.012 ± 0.001	0.012 ± 0.001	0.014 ± 0.001	0.012 ± 0.001	0.012 ± 0.001	0.012 ± 0.001
02/23/10	0.009 ± 0.001	0.005 ± 0.001	0.008 ± 0.001	0.009 ± 0.001	0.007 ± 0.001	0.008 ± 0.001	0.006 ± 0.001	0.008 ± 0.001	0.008 ± 0.001
03/02/10	0.005 ± 0.001	0.006 ± 0.001	0.007 ± 0.001	0.005 ± 0.001	0.004 ± 0.001	0.005 ± 0.001	0.005 ± 0.001	0.005 ± 0.001	0.006 ± 0.001
03/09/10	0.016 ± 0.001	0.018 ± 0.001	0.018 ± 0.001	0.020 ± 0.001	0.018 ± 0.001	0.017 ± 0.001	0.017 ± 0.001	0.018 ± 0.001	0.016 ± 0.001
03/16/10	0.017 ± 0.001	0.019 ± 0.001	0.020 ± 0.001	0.021 ± 0.001	0.020 ± 0.001	0.018 ± 0.001	0.019 ± 0.001	0.018 ± 0.001	0.014 ± 0.001
03/23/10	0.023 ± 0.002	0.017 ± 0.001	0.020 ± 0.001	0.020 ± 0.001	0.016 ± 0.001	0.017 ± 0.001	0.017 ± 0.001	0.014 ± 0.001	0.015 ± 0.001
03/30/10	0.017 ± 0.001	0.014 ± 0.001	0.016 ± 0.001	0.015 ± 0.001	0.015 ± 0.001	0.015 ± 0.001	0.016 ± 0.001	0.016 ± 0.001	0.016 ± 0.001
04/06/10	0.014 ± 0.001	0.015 ± 0.001	0.017 ± 0.001	0.015 ± 0.001	0.014 ± 0.001	0.012 ± 0.001	0.013 ± 0.001	0.015 ± 0.001	0.013 ± 0.001
04/13/10	0.012 ± 0.001	0.014 ± 0.001	0.012 ± 0.001	0.013 ± 0.001	0.012 ± 0.001	0.011 ± 0.001	0.011 ± 0.001	0.013 ± 0.001	0.017 ± 0.001
04/20/10	0.017 ± 0.001	0.017 ± 0.001	0.013 ± 0.001	0.012 ± 0.001	0.015 ± 0.001	0.014 ± 0.001	0.015 ± 0.001	0.013 ± 0.001	0.017 ± 0.001
04/27/10	0.016 ± 0.001	0.019 ± 0.001	0.019 ± 0.001	0.018 ± 0.001	0.015 ± 0.001	0.015 ± 0.001	0.014 ± 0.001	0.017 ± 0.001	0.018 ± 0.001
05/04/10	0.015 ± 0.001	0.016 ± 0.001	0.016 ± 0.001	0.014 ± 0.001	0.014 ± 0.001	0.014 ± 0.001	0.016 ± 0.001	0.015 ± 0.001	0.014 ± 0.001
05/11/10	0.013 ± 0.001	0.012 ± 0.001	0.013 ± 0.001	0.012 ± 0.001	0.010 ± 0.001	0.010 ± 0.001	0.010 ± 0.001	0.012 ± 0.001	0.011 ± 0.001
05/18/10	0.010 ± 0.001	0.011 ± 0.001	0.011 ± 0.001	0.012 ± 0.001	0.010 ± 0.001	0.011 ± 0.001	0.012 ± 0.001	0.012 ± 0.001	0.012 ± 0.001
05/25/10	0.017 ± 0.001	0.023 ± 0.002	0.017 ± 0.001	0.018 ± 0.001	0.018 ± 0.001	0.018 ± 0.001	0.020 ± 0.001	0.016 ± 0.001	0.021 ± 0.001
06/02/10	0.015 ± 0.001	0.016 ± 0.001	0.014 ± 0.001	0.015 ± 0.001	0.013 ± 0.001	0.016 ± 0.001	0.016 ± 0.001	0.014 ± 0.001	0.015 ± 0.001
06/08/10	0.011 ± 0.001	0.013 ± 0.001	0.013 ± 0.001	0.015 ± 0.001	0.013 ± 0.001	0.014 ± 0.001	0.013 ± 0.001	0.014 ± 0.001	0.013 ± 0.001
06/15/10	0.010 ± 0.001	0.010 ± 0.001	0.010 ± 0.001	0.009 ± 0.001	0.008 ± 0.001	0.009 ± 0.001	0.010 ± 0.001	0.010 ± 0.001	0.011 ± 0.001
06/22/10	0.017 ± 0.001	0.015 ± 0.001	0.016 ± 0.001	0.013 ± 0.001	0.015 ± 0.001	0.014 ± 0.001	0.010 ± 0.001	0.014 ± 0.001	0.015 ± 0.001
06/29/10	0.015 ± 0.001	0.015 ± 0.001	0.014 ± 0.001	0.015 ± 0.001	0.011 ± 0.001	0.015 ± 0.001	0.013 ± 0.001	0.015 ± 0.001	0.016 ± 0.001

* Sample location required by ODCM

** Optional sample location

TABLE 6-5 (Continued)
ENVIRONMENTAL AIRBORNE PARTICULATE SAMPLES - OFF-SITE SAMPLE LOCATIONS
GROSS BETA ACTIVITY pCi/ m^3 ± 1 Sigma

Week End Date	R-1 *	R-2 *	R-3 *	R-4 *	R-5 *	D-2 **	E **	F **	G **
07/07/10	0.015 ± 0.001	0.020 ± 0.001	0.016 ± 0.001	0.016 ± 0.001	0.014 ± 0.001	0.014 ± 0.001	0.014 ± 0.001	0.014 ± 0.001	0.016 ± 0.001
07/13/10	0.030 ± 0.002	0.026 ± 0.002	0.027 ± 0.002	0.025 ± 0.002	0.020 ± 0.002	0.022 ± 0.002	0.024 ± 0.002	0.024 ± 0.002	0.030 ± 0.002
07/20/10	0.018 ± 0.001	0.020 ± 0.001	0.020 ± 0.001	0.019 ± 0.001	0.015 ± 0.001	0.022 ± 0.002	0.018 ± 0.001	0.021 ± 0.001	0.020 ± 0.001
07/27/10	0.018 ± 0.001	0.017 ± 0.001	0.015 ± 0.001	0.014 ± 0.001	0.013 ± 0.001	0.013 ± 0.001	0.016 ± 0.001	0.015 ± 0.001	0.017 ± 0.001
08/03/10	0.017 ± 0.001	0.014 ± 0.001	0.015 ± 0.001	0.013 ± 0.001	0.014 ± 0.001	0.013 ± 0.001	0.015 ± 0.001	0.018 ± 0.001	0.012 ± 0.001
08/10/10	0.024 ± 0.002	0.025 ± 0.002	0.024 ± 0.002	0.023 ± 0.002	0.019 ± 0.001	0.025 ± 0.002	0.023 ± 0.002	0.021 ± 0.001	0.024 ± 0.002
08/17/10	0.017 ± 0.001	0.019 ± 0.001	0.017 ± 0.001	0.017 ± 0.001	0.015 ± 0.001	0.018 ± 0.001	0.015 ± 0.001	0.019 ± 0.001	0.020 ± 0.001
08/24/10	0.016 ± 0.001	0.016 ± 0.001	0.015 ± 0.001	0.017 ± 0.001	0.015 ± 0.001	0.015 ± 0.001	0.018 ± 0.001	0.015 ± 0.001	0.017 ± 0.001
08/31/10	0.018 ± 0.001	0.017 ± 0.001	0.018 ± 0.001	0.016 ± 0.001	0.016 ± 0.001	0.018 ± 0.001	0.016 ± 0.001	0.015 ± 0.001	0.018 ± 0.001
09/08/10	0.026 ± 0.001	0.028 ± 0.002	0.024 ± 0.001	0.025 ± 0.001	0.023 ± 0.001	0.026 ± 0.001	0.022 ± 0.001	0.025 ± 0.001	0.026 ± 0.001
09/14/10	0.011 ± 0.001	0.012 ± 0.001	0.012 ± 0.001	0.010 ± 0.001	0.009 ± 0.001	0.008 ± 0.001	0.012 ± 0.001	0.012 ± 0.001	0.009 ± 0.001
09/21/10	0.014 ± 0.001	0.012 ± 0.001	0.013 ± 0.001	0.012 ± 0.001	0.012 ± 0.001	0.012 ± 0.001	0.011 ± 0.001	0.012 ± 0.001	0.013 ± 0.001
09/28/10	0.015 ± 0.001	0.015 ± 0.001	0.016 ± 0.001	0.013 ± 0.001	0.015 ± 0.001	0.016 ± 0.001	0.013 ± 0.001	0.015 ± 0.001	0.015 ± 0.001
10/05/10	0.009 ± 0.001	0.008 ± 0.001	0.007 ± 0.001	0.010 ± 0.001	0.006 ± 0.001	0.008 ± 0.001	0.009 ± 0.001	0.009 ± 0.001	0.008 ± 0.001
10/12/10	0.010 ± 0.001	0.012 ± 0.001	0.012 ± 0.001	0.012 ± 0.001	0.007 ± 0.001	0.011 ± 0.001	0.011 ± 0.001	0.013 ± 0.001	0.011 ± 0.001
10/19/10	0.009 ± 0.001	0.009 ± 0.001	0.009 ± 0.001	0.010 ± 0.001	0.010 ± 0.001	0.013 ± 0.001	0.009 ± 0.001	0.010 ± 0.001	0.010 ± 0.001
10/26/10	0.019 ± 0.001	0.019 ± 0.001	0.020 ± 0.001	0.018 ± 0.001	0.019 ± 0.001	0.018 ± 0.001	0.019 ± 0.001	0.018 ± 0.001	0.018 ± 0.001
11/02/10	0.011 ± 0.001	0.012 ± 0.001	0.012 ± 0.001	0.010 ± 0.001	0.009 ± 0.001	0.011 ± 0.001	0.010 ± 0.001	0.009 ± 0.001	0.010 ± 0.001
11/09/10	0.010 ± 0.001	0.008 ± 0.001	0.009 ± 0.001	0.006 ± 0.001	0.006 ± 0.001	0.007 ± 0.001	0.009 ± 0.001	0.010 ± 0.001	0.009 ± 0.001
11/16/10	0.020 ± 0.001	0.017 ± 0.001	0.019 ± 0.001	0.019 ± 0.001	0.014 ± 0.001	0.021 ± 0.001	0.021 ± 0.001	0.018 ± 0.001	0.019 ± 0.001
11/23/10	0.018 ± 0.001	0.021 ± 0.002	0.018 ± 0.001	0.018 ± 0.001	0.019 ± 0.001	0.019 ± 0.001	0.019 ± 0.001	0.018 ± 0.001	0.024 ± 0.002
12/01/10	0.016 ± 0.001	0.020 ± 0.001	0.016 ± 0.001	0.017 ± 0.001	0.015 ± 0.001	0.017 ± 0.001	0.017 ± 0.001	0.018 ± 0.001	0.018 ± 0.001
12/07/10	0.011 ± 0.001	0.009 ± 0.001	0.009 ± 0.001	0.008 ± 0.001	0.010 ± 0.001	0.011 ± 0.001	0.010 ± 0.001	0.009 ± 0.001	0.011 ± 0.001
12/14/10	0.016 ± 0.001	0.014 ± 0.001	0.015 ± 0.001	0.015 ± 0.001	0.015 ± 0.001	0.013 ± 0.001	0.014 ± 0.001	0.016 ± 0.001	0.017 ± 0.001
12/21/10	0.018 ± 0.001	0.017 ± 0.001	0.017 ± 0.001	0.017 ± 0.001	0.015 ± 0.001	0.018 ± 0.001	0.016 ± 0.001	0.013 ± 0.001	0.018 ± 0.001
12/28/10	0.007 ± 0.001	0.006 ± 0.001	0.007 ± 0.001	0.007 ± 0.001	0.007 ± 0.001	0.008 ± 0.001	0.005 ± 0.001	0.007 ± 0.001	0.007 ± 0.001

* Sample location required by ODCM

** Optional sample location

TABLE 6-6

ENVIRONMENTAL AIRBORNE PARTICULATE SAMPLES - ON-SITE SAMPLE LOCATIONS

GROSS BETA ACTIVITY pCi/ m^3 ± 1 Sigma

Week End Date	D-1 **	G **	H **	I **	J **	K **
01/04/10	0.014 ± 0.001	0.018 ± 0.001	0.015 ± 0.001	0.014 ± 0.001	0.016 ± 0.001	0.013 ± 0.001
01/11/10	0.009 ± 0.001	0.009 ± 0.001	0.009 ± 0.001	0.009 ± 0.001	0.008 ± 0.001	0.009 ± 0.001
01/18/10	0.036 ± 0.002	0.028 ± 0.002	0.029 ± 0.002	0.027 ± 0.002	0.028 ± 0.002	0.026 ± 0.002
01/25/10	0.019 ± 0.001	0.021 ± 0.001	0.021 ± 0.001	0.020 ± 0.001	0.020 ± 0.001	0.015 ± 0.001
02/01/10	0.019 ± 0.001	0.020 ± 0.001	0.018 ± 0.001	0.020 ± 0.001	0.017 ± 0.001	0.013 ± 0.001
02/08/10	0.018 ± 0.001	0.017 ± 0.001	0.017 ± 0.001	0.018 ± 0.001	0.016 ± 0.001	0.016 ± 0.001
02/15/10	0.012 ± 0.001	0.014 ± 0.001	0.014 ± 0.001	0.011 ± 0.001	0.012 ± 0.001	0.011 ± 0.001
02/22/10	0.007 ± 0.001	0.008 ± 0.001	0.010 ± 0.001	0.009 ± 0.001	0.008 ± 0.001	0.009 ± 0.001
03/01/10	0.006 ± 0.001	0.005 ± 0.001	0.005 ± 0.001	0.005 ± 0.001	0.005 ± 0.001	0.003 ± 0.001
03/08/10	0.017 ± 0.001	0.018 ± 0.001	0.018 ± 0.001	0.019 ± 0.001	0.019 ± 0.001	0.017 ± 0.001
03/15/10	0.022 ± 0.002	0.024 ± 0.002	0.019 ± 0.001	0.021 ± 0.002	0.020 ± 0.001	0.019 ± 0.001
03/22/10	0.019 ± 0.001	0.017 ± 0.001	0.019 ± 0.001	0.017 ± 0.001	0.019 ± 0.001	0.018 ± 0.001
03/29/10	0.014 ± 0.001	0.017 ± 0.001	0.018 ± 0.001	0.019 ± 0.001	0.020 ± 0.001	0.015 ± 0.001
04/05/10	0.010 ± 0.001	0.013 ± 0.001	0.013 ± 0.001	0.014 ± 0.001	0.012 ± 0.001	0.013 ± 0.001
04/12/10	0.013 ± 0.001	0.016 ± 0.001	0.016 ± 0.001	0.015 ± 0.001	0.015 ± 0.001	0.014 ± 0.001
04/19/10	0.014 ± 0.001	0.015 ± 0.001	0.013 ± 0.001	0.016 ± 0.001	0.016 ± 0.001	0.014 ± 0.001
04/26/10	0.018 ± 0.001	0.018 ± 0.001	0.018 ± 0.001	0.017 ± 0.001	0.016 ± 0.001	0.019 ± 0.001
05/03/10	0.015 ± 0.001	0.019 ± 0.001	0.015 ± 0.001	0.015 ± 0.001	0.015 ± 0.001	0.016 ± 0.001
05/10/10	0.012 ± 0.001	0.013 ± 0.001	0.011 ± 0.001	0.011 ± 0.001	0.014 ± 0.001	0.011 ± 0.001
05/17/10	0.014 ± 0.001	0.012 ± 0.001	0.011 ± 0.001	0.013 ± 0.001	0.010 ± 0.001	0.011 ± 0.001
05/24/10	0.018 ± 0.001	0.018 ± 0.001	0.015 ± 0.001	0.022 ± 0.002	0.017 ± 0.001	0.016 ± 0.001
06/01/10	0.016 ± 0.001	0.016 ± 0.001	0.015 ± 0.001	0.015 ± 0.001	0.016 ± 0.001	0.015 ± 0.001
06/07/10	0.012 ± 0.001	0.019 ± 0.002	0.015 ± 0.001	0.014 ± 0.001	0.012 ± 0.001	0.015 ± 0.001
06/14/10	0.009 ± 0.001	0.006 ± 0.001	0.009 ± 0.001	0.007 ± 0.001	0.009 ± 0.001	0.007 ± 0.001
06/21/10	0.016 ± 0.001	0.017 ± 0.001	0.015 ± 0.001	0.017 ± 0.001	0.017 ± 0.001	0.013 ± 0.001
06/28/10	0.015 ± 0.001	0.016 ± 0.001	0.014 ± 0.001	0.014 ± 0.001	0.013 ± 0.001	0.014 ± 0.001

** Optional sample location

TABLE 6-6 (Continued)

ENVIRONMENTAL AIRBORNE PARTICULATE SAMPLES - ON-SITE SAMPLE LOCATIONS

GROSS BETA ACTIVITY pCi/ m^3 ± 1 Sigma

Week End Date	D-1 **	G **	H **	I **	J **	K **
07/06/10	0.013 ± 0.001	0.010 ± 0.001	0.011 ± 0.001	0.011 ± 0.001	0.014 ± 0.001	0.011 ± 0.001
07/12/10	0.026 ± 0.002	0.023 ± 0.002	0.026 ± 0.002	0.028 ± 0.002	0.028 ± 0.002	0.025 ± 0.002
07/19/10	0.021 ± 0.001	0.020 ± 0.001	0.020 ± 0.001	0.019 ± 0.001	0.019 ± 0.001	0.020 ± 0.001
07/26/10	0.013 ± 0.001	0.013 ± 0.001	0.017 ± 0.001	0.017 ± 0.001	0.015 ± 0.001	0.012 ± 0.001
08/02/10	0.015 ± 0.001	0.013 ± 0.001	0.015 ± 0.001	0.016 ± 0.001	0.013 ± 0.001	0.017 ± 0.001
08/09/10	0.025 ± 0.002	0.023 ± 0.002	0.021 ± 0.001	0.022 ± 0.001	0.021 ± 0.001	0.024 ± 0.002
08/16/10	0.019 ± 0.001	0.019 ± 0.001	0.018 ± 0.001	0.017 ± 0.001	0.021 ± 0.001	0.020 ± 0.001
08/23/10	0.017 ± 0.001	0.018 ± 0.001	0.015 ± 0.001	0.016 ± 0.001	0.017 ± 0.001	0.015 ± 0.001
08/30/10	0.012 ± 0.001	0.012 ± 0.001	0.013 ± 0.001	0.015 ± 0.001	0.016 ± 0.001	0.012 ± 0.001
09/07/10	0.029 ± 0.002	0.030 ± 0.002	0.026 ± 0.001	0.026 ± 0.001	0.031 ± 0.002	0.029 ± 0.002
09/13/10	0.010 ± 0.001	0.015 ± 0.001	0.013 ± 0.001	0.015 ± 0.001	0.012 ± 0.001	0.009 ± 0.001
09/20/10	0.012 ± 0.001	0.012 ± 0.001	0.014 ± 0.001	0.014 ± 0.001	0.012 ± 0.001	0.010 ± 0.001
09/27/10	0.017 ± 0.001	0.018 ± 0.001	0.016 ± 0.001	0.015 ± 0.001	0.018 ± 0.001	0.017 ± 0.001
10/04/10	0.007 ± 0.001	0.010 ± 0.001	0.008 ± 0.001	0.008 ± 0.001	0.007 ± 0.001	0.009 ± 0.001
10/11/10	0.011 ± 0.001	0.012 ± 0.001	0.009 ± 0.001	0.011 ± 0.001	0.012 ± 0.001	0.010 ± 0.001
10/18/10	0.009 ± 0.001	0.010 ± 0.001	0.009 ± 0.001	0.012 ± 0.001	0.010 ± 0.001	0.007 ± 0.001
10/20/10	0.024 ± 0.003	0.015 ± 0.001	0.015 ± 0.001	0.016 ± 0.001	0.014 ± 0.001	0.015 ± 0.001
11/01/10	0.017 ± 0.001	0.013 ± 0.001	0.015 ± 0.001	0.014 ± 0.001	0.014 ± 0.001	0.014 ± 0.001
11/08/10	0.008 ± 0.001	0.007 ± 0.001	0.006 ± 0.001	0.007 ± 0.001	0.007 ± 0.001	0.006 ± 0.001
11/15/10	0.016 ± 0.001	0.018 ± 0.001	0.017 ± 0.001	0.014 ± 0.001	0.016 ± 0.001	0.017 ± 0.001
11/22/10	0.019 ± 0.001	0.020 ± 0.001	0.019 ± 0.001	0.021 ± 0.001	0.017 ± 0.001	0.017 ± 0.001
11/29/10	0.018 ± 0.001	0.024 ± 0.002	0.021 ± 0.001	0.019 ± 0.001	0.020 ± 0.001	0.018 ± 0.001
12/06/10	0.011 ± 0.001	0.013 ± 0.001	0.010 ± 0.001	0.009 ± 0.001	0.012 ± 0.001	0.010 ± 0.001
12/13/10	0.016 ± 0.001	0.013 ± 0.001	0.017 ± 0.001	0.015 ± 0.001	0.014 ± 0.001	0.015 ± 0.001
12/20/10	0.015 ± 0.001	0.015 ± 0.001	0.017 ± 0.001	0.015 ± 0.001	0.015 ± 0.001	0.013 ± 0.001
12/27/10	0.008 ± 0.001	0.009 ± 0.001	0.010 ± 0.001	0.009 ± 0.001	0.010 ± 0.001	0.007 ± 0.001

** Optional sample location

TABLE 6-7
CONCENTRATIONS OF GAMMA EMITTERS IN QUARTERLY COMPOSITES
JAFNPP/NMPNS SITE AIR PARTICULATE SAMPLES
Results in Units of 10E-3 pCi/ m^3 ± 1 Sigma

OFF-SITE SAMPLE LOCATIONS - 1ST QTR 2010

Nuclide	R-1 *	R-2 *	R-3 *	R-4 *	R-5 *	D-2 **	E **	F **	G **
Be-7	93.0 ± 11.2	82.4 ± 10.7	111.4 ± 14.1	99.3 ± 12.7	118.9 ± 11.8	92.4 ± 11.8	102.8 ± 11.6	106.4 ± 12.8	107.0 ± 13.7
Cs-134	< 0.9	< 1.9	< 1.8	< 1.7	< 1.9	< 1.4	< 1.6	< 1.6	< 2.3
Cs-137	< 0.8	< 1.0	< 1.8	< 1.9	< 0.2	< 1.2	< 1.0	< 1.2	< 1.5
Zr-95	< 2.4	< 2.2	< 5.5	< 5.2	< 4.0	< 2.4	< 3.1	< 0.9	< 5.6
Nb-95	< 2.5	< 2.6	< 5.0	< 2.7	< 2.0	< 2.8	< 3.1	< 3.0	< 4.8
Co-58	< 0.5	< 1.8	< 2.1	< 2.8	< 1.1	< 2.0	< 1.2	< 2.4	< 2.2
Mn-54	< 1.2	< 1.6	< 2.1	< 1.6	< 1.4	< 1.0	< 1.4	< 1.8	< 1.5
Zn-65	< 2.8	< 3.1	< 5.4	< 4.9	< 2.3	< 4.9	< 0.8	< 6.5	< 4.2
Co-60	< 1.4	< 1.3	< 1.5	< 1.2	< 1.1	< 1.4	< 2.3	< 0.5	< 1.9
K-40	< 5.3	< 20.5	50.3 ± 11.3	50.4 ± 10.3	< 11.8	< 14.6	< 15.3	41.9 ± 10.0	53.6 ± 10.8

OFF-SITE SAMPLE LOCATIONS - 2ND QTR 2010

Nuclide	R-1 *	R-2 *	R-3 *	R-4 *	R-5 *	D-2 **	E **	F **	G **
Be-7	118.0 ± 12.9	125.6 ± 13.4	110.0 ± 13.1	117.0 ± 12.3	87.3 ± 11.2	106.9 ± 13.6	106.0 ± 13.8	119.2 ± 13.4	117.9 ± 13.2
Cs-134	< 2.0	< 2.0	< 2.0	< 1.1	< 1.5	< 1.7	< 2.2	< 2.5	< 2.6
Cs-137	< 1.0	< 0.9	< 1.3	< 1.1	< 0.8	< 1.7	< 1.4	< 1.4	< 1.3
Zr-95	< 4.6	< 2.4	< 2.8	< 3.0	< 3.1	< 4.4	< 4.2	< 3.0	< 3.9
Nb-95	< 4.2	< 3.9	< 3.9	< 2.2	< 3.0	< 3.7	< 4.1	< 4.1	< 3.0
Co-58	< 2.8	< 2.0	< 1.8	< 1.2	< 0.5	< 1.5	< 2.8	< 2.6	< 1.8
Mn-54	< 2.0	< 2.0	< 1.4	< 0.9	< 1.2	< 1.8	< 1.7	< 1.5	< 1.1
Zn-65	< 3.9	< 4.1	< 52.0	< 2.4	< 1.0	< 3.8	< 4.3	< 4.4	< 4.3
Co-60	< 1.9	< 1.3	< 0.4	< 0.4	< 0.5	< 2.1	< 1.5	< 2.3	< 1.5
K-40	< 5.5	< 4.5	< 4.2	< 17.8	< 5.1	< 22.0	< 19.5	51.8 ± 9.6	< 11.5

* ODCM Required Sample Loction

** Optional Sample Location

TABLE 6-7 (Continued)
CONCENTRATIONS OF GAMMA EMITTERS IN QUARTERLY COMPOSITES
JAFNPP/NMPNS SITE AIR PARTICULATE SAMPLES
Results in Units of 10E-3 pCi/ m^3 ± 1 Sigma

OFF-SITE SAMPLE LOCATIONS - 3RD QTR 2010

Nuclide	R-1 *	R-2 *	R-3 *	R-4 *	R-5 *	D-2 **	E **	F **	G **
Be-7	115.6 ± 11.9	109.8 ± 12.9	133.6 ± 14.6	93.5 ± 13.7	106.3 ± 12.4	119.5 ± 12.8	101.9 ± 11.7	104.3 ± 12.6	127.2 ± 13.0
Cs-134	< 2.0	< 1.5	< 1.6	< 2.2	< 2.0	< 1.3	< 0.3	< 1.9	< 2.1
Cs-137	< 0.8	< 1.2	< 1.0	< 1.6	< 1.3	< 1.1	< 1.0	< 1.2	< 1.2
Zr-95	< 3.1	< 4.2	< 3.7	< 4.3	< 3.8	< 2.6	< 2.4	< 4.3	< 4.9
Nb-95	< 2.0	< 3.5	< 3.4	< 4.0	< 2.5	< 2.7	< 2.9	< 2.5	< 2.6
Co-58	< 2.0	< 2.1	< 2.4	< 2.4	< 1.5	< 1.9	< 1.7	< 2.9	< 2.4
Mn-54	< 1.7	< 2.1	< 1.5	< 1.7	< 1.2	< 1.6	< 1.6	< 1.8	< 1.3
Zn-65	< 2.8	< 3.8	< 4.7	< 4.2	< 3.1	< 3.1	< 1.0	< 3.0	< 5.1
Co-60	< 0.5	< 0.5	< 0.5	< 1.6	< 1.1	< 0.5	< 1.8	< 1.7	< 2.2
K-40	< 5.2	< 17.0	44.2 ± 10.0	< 18.1	< 11.4	< 15.7	< 21.9	< 17.3	51.1 ± 10.2

OFF-SITE SAMPLE LOCATIONS - 4TH QTR 2010

Nuclide	R-1 *	R-2 *	R-3 *	R-4 *	R-5 *	D-2 **	E **	F **	G **
Be-7	67.0 ± 9.3	66.1 ± 9.3	63.4 ± 10.1	64.7 ± 10.0	55.3 ± 10.1	61.0 ± 9.7	60.1 ± 10.0	72.5 ± 10.5	79.1 ± 11.6
Cs-134	< 1.4	< 2.3	< 1.7	< 2.1	< 1.9	< 1.4	< 0.9	< 1.6	< 2.2
Cs-137	< 1.4	< 0.8	< 1.2	< 0.9	< 1.4	< 0.9	< 1.3	< 1.5	< 1.5
Zr-95	< 3.7	< 2.5	< 3.9	< 4.8	< 2.2	< 2.6	< 0.9	< 4.0	< 3.5
Nb-95	< 2.2	< 2.1	< 3.5	< 3.2	< 1.8	< 0.7	< 3.0	< 3.3	< 3.9
Co-58	< 1.9	< 2.1	< 1.8	< 1.7	< 1.8	< 0.5	< 2.3	< 2.1	< 2.8
Mn-54	< 1.4	< 1.2	< 1.8	< 1.6	< 1.6	< 1.3	< 1.9	< 1.7	< 1.7
Zn-65	< 2.4	< 2.8	< 1.0	< 4.9	< 3.8	< 3.0	< 1.0	< 3.8	< 4.8
Co-60	< 1.5	< 1.4	< 1.6	< 1.2	< 1.2	< 0.4	< 1.8	< 2.1	< 2.3
K-40	< 12.2	< 5.3	< 28.3	65.3 ± 11.2	< 11.6	< 15.2	< 14.7	< 5.4	57.0 ± 11.1

* ODCM Required Sample Loction
** Optional Sample Location

TABLE 6-7 (Continued)
CONCENTRATIONS OF GAMMA EMITTERS IN QUARTERLY COMPOSITES
JAFNPP/NMPNS SITE AIR PARTICULATE SAMPLES
Results in Units of 10E-3 pCi/ m^3 ± 1 Sigma

ON-SITE SAMPLE LOCATIONS - 1ST QTR 2010

Nuclide	D-1 **	G **	H **	I **	J **	K **
Be-7	103.8 ± 12.0	130.7 ± 13.4	115.6 ± 11.8	130.9 ± 13.7	112.8 ± 13.3	114.0 ± 11.4
Cs-134	< 1.3	< 1.6	< 2.1	< 2.4	< 2.5	< 1.6
Cs-137	< 1.1	< 1.0	< 1.0	< 1.3	< 0.9	< 0.3
Zr-95	< 3.4	< 4.4	< 2.7	< 4.6	< 4.5	< 3.3
Nb-95	< 2.8	< 2.6	< 1.8	< 2.7	< 2.8	< 3.0
Co-58	< 1.7	< 1.8	< 2.8	< 2.1	< 2.5	< 1.5
Mn-54	< 0.3	< 1.0	< 0.3	< 1.7	< 2.3	< 1.1
Zn-65	< 2.5	< 2.8	< 0.8	< 5.7	< 4.1	< 3.5
Co-60	< 1.5	< 1.4	< 1.2	< 1.5	< 1.3	< 0.4
K-40	< 18.2	< 5.3	< 19.8	48.3 ± 10.5	45.4 ± 10.3	< 12.1

ON-SITE SAMPLE LOCATIONS - 2ND QTR 2010

Nuclide	D-1 **	G **	H **	I **	J **	K **
Be-7	122.1 ± 12.8	115.3 ± 13.4	103.7 ± 13.2	102.0 ± 12.5	142.9 ± 13.3	91.1 ± 12.3
Cs-134	< 1.7	< 1.6	< 2.2	< 1.8	< 1.9	< 2.1
Cs-137	< 1.1	< 1.5	< 1.2	< 1.2	< 1.3	< 0.8
Zr-95	< 3.6	< 4.0	< 5.0	< 3.9	< 3.9	< 5.3
Nb-95	< 2.5	< 3.3	< 3.5	< 3.8	< 3.0	< 4.7
Co-58	< 2.1	< 2.4	< 2.6	< 2.4	< 1.8	< 2.4
Mn-54	< 1.6	< 1.8	< 1.7	< 1.3	< 1.2	< 1.9
Zn-65	< 4.3	< 5.8	< 5.7	< 4.9	< 3.8	< 5.4
Co-60	< 1.2	< 2.7	< 2.2	< 2.1	< 1.2	< 1.6
K-40	< 12.1	< 25.5	< 19.6	49.9 ± 9.7	< 14.5	< 17.0

** Optional Sample Location

TABLE 6-7 (Continued)
CONCENTRATIONS OF GAMMA EMITTERS IN QUARTERLY COMPOSITES
JAFNPP/NMPNS SITE AIR PARTICULATE SAMPLES
Results in Units of 10E-3 pCi/ m^3 ± 1 Sigma

ON-SITE SAMPLE LOCATIONS - 3RD QTR 2010

Nuclide	D-1 **	G **	H **	I **	J **	K **
Be-7	115.2 ± 12.7	115.0 ± 13.5	120.0 ± 13.0	121.0 ± 13.4	115.9 ± 12.1	115.0 ± 11.8
Cs-134	< 1.2	< 2.0	< 2.0	< 1.5	< 2.3	< 1.4
Cs-137	< 1.0	< 1.2	< 1.4	< 1.4	< 1.1	< 1.5
Zr-95	< 3.0	< 3.0	< 4.4	< 4.9	< 3.1	< 2.0
Nb-95	< 2.5	< 3.1	< 3.3	< 3.0	< 2.9	< 2.9
Co-58	< 0.5	< 3.3	< 1.4	< 2.5	< 1.8	< 1.8
Mn-54	< 1.4	< 1.9	< 1.2	< 1.4	< 1.7	< 1.5
Zn-65	< 3.5	< 5.6	< 4.9	< 4.2	< 2.1	< 2.4
Co-60	< 1.8	< 2.4	< 1.8	< 1.2	< 1.1	< 1.7
K-40	< 18.5	46.7 ± 9.5	50.0 ± 10.4	59.2 ± 10.0	< 16.6	< 11.9

ON-SITE SAMPLE LOCATIONS - 4TH QTR 2010

Nuclide	D-1 **	G **	H **	I **	J **	K **
Be-7	73.0 ± 11.0	56.2 ± 9.7	65.7 ± 10.3	42.4 ± 9.9	52.6 ± 10.4	73.5 ± 10.6
Cs-134	< 2.3	< 2.0	< 1.4	< 1.3	< 2.4	< 1.8
Cs-137	< 0.9	< 1.3	< 0.3	< 1.7	< 1.1	< 1.3
Zr-95	< 2.9	< 3.1	< 2.4	< 3.9	< 4.6	< 2.2
Nb-95	< 2.8	< 3.1	< 2.6	< 3.6	< 3.6	< 3.0
Co-58	< 2.1	< 1.9	< 2.0	< 2.1	< 2.9	< 1.8
Mn-54	< 1.8	< 1.7	< 0.4	< 1.4	< 1.6	< 1.7
Zn-65	< 2.8	< 4.7	< 3.4	< 3.7	< 3.8	< 4.3
Co-60	< 1.2	< 1.5	< 1.7	< 2.7	< 2.3	< 0.4
K-40	< 12.1	< 4.5	< 18.2	< 5.3	< 19.7	< 11.5

** Optional Sample Location

TABLE 6-8
ENVIRONMENTAL CHARCOAL CARTRIDGE SAMPLES - OFF-SITE SAMPLE LOCATIONS
I-131 ACTIVITY pCi/ m^3 ± 1 Sigma

Week End Date	R-1 *	R-2 *	R-3 *	R-4 *	R-5 *	D-2 **	E **	F **	G **
01/05/10	< 0.019	< 0.018	< 0.019	< 0.027	< 0.023	< 0.021	< 0.013	< 0.013	< 0.015
01/12/10	< 0.033	< 0.019	< 0.019	< 0.024	< 0.019	< 0.026	< 0.025	< 0.027	< 0.019
01/19/10	< 0.022	< 0.014	< 0.010	< 0.023	< 0.020	< 0.017	< 0.023	< 0.022	< 0.015
01/26/10	< 0.021	< 0.019	< 0.017	< 0.014	< 0.014	< 0.025	< 0.021	< 0.015	< 0.015
02/02/10	< 0.026	< 0.023	< 0.006	< 0.023	< 0.020	< 0.019	< 0.022	< 0.028	< 0.017
02/09/10	< 0.016	< 0.018	< 0.018	< 0.018	< 0.022	< 0.027	< 0.022	< 0.016	< 0.019
02/16/10	< 0.024	< 0.019	< 0.009	< 0.016	< 0.014	< 0.017	< 0.014	< 0.022	< 0.020
02/23/10	< 0.022	< 0.013	< 0.023	< 0.028	< 0.024	< 0.027	< 0.025	< 0.029	< 0.019
03/02/10	< 0.018	< 0.021	< 0.019	< 0.017	< 0.023	< 0.020	< 0.025	< 0.016	< 0.014
03/09/10	< 0.018	< 0.012	< 0.016	< 0.016	< 0.019	< 0.025	< 0.021	< 0.017	< 0.040
03/16/10	< 0.017	< 0.021	< 0.014	< 0.012	< 0.019	< 0.025	< 0.026	< 0.020	< 0.011
03/23/10	< 0.021	< 0.012	< 0.017	< 0.015	< 0.028	< 0.027	< 0.019	< 0.018	< 0.012
03/30/10	< 0.020	< 0.019	< 0.016	< 0.020	< 0.013	< 0.022	< 0.021	< 0.019	< 0.018
04/06/10	< 0.021	< 0.015	< 0.017	< 0.019	< 0.019	< 0.022	< 0.020	< 0.017	< 0.012
04/13/10	< 0.018	< 0.020	< 0.017	< 0.026	< 0.022	< 0.026	< 0.024	< 0.011	< 0.015
04/20/10	< 0.014	< 0.020	< 0.015	< 0.016	< 0.026	< 0.017	< 0.016	< 0.015	< 0.010
04/27/10	< 0.018	< 0.021	< 0.016	< 0.003	< 0.016	< 0.018	< 0.022	< 0.019	< 0.022
05/04/10	< 0.019	< 0.025	< 0.035	< 0.034	< 0.021	< 0.022	< 0.012	< 0.023	< 0.025
05/11/10	< 0.025	< 0.025	< 0.032	< 0.020	< 0.026	< 0.028	< 0.029	< 0.016	< 0.026
05/18/10	< 0.016	< 0.014	< 0.012	< 0.004	< 0.021	< 0.022	< 0.017	< 0.017	< 0.016
05/25/10	< 0.019	< 0.015	< 0.012	< 0.013	< 0.024	< 0.020	< 0.016	< 0.022	< 0.019
06/02/10	< 0.015	< 0.011	< 0.018	< 0.017	< 0.017	< 0.015	< 0.019	< 0.013	< 0.013
06/08/10	< 0.021	< 0.014	< 0.014	< 0.023	< 0.020	< 0.024	< 0.024	< 0.017	< 0.014
06/15/10	< 0.014	< 0.013	< 0.021	< 0.016	< 0.024	< 0.020	< 0.018	< 0.016	< 0.014
06/22/10	< 0.019	< 0.017	< 0.020	< 0.025	< 0.024	< 0.022	< 0.020	< 0.015	< 0.019
06/29/10	< 0.022	< 0.010	< 0.016	< 0.024	< 0.017	< 0.023	< 0.015	< 0.018	< 0.023

* ODCM Required Sample Location
** Optional Sample Location

TABLE 6-8 (Continued)
ENVIRONMENTAL CHARCOAL CARTRIDGE SAMPLES - OFF-SITE SAMPLE LOCATIONS
I-131 ACTIVITY pCi/ $m^3 \pm$ 1 Sigma

Week End Date	R-1 *	R-2 *	R-3 *	R-4 *	R-5 *	D-2 **	E **	F **	G **
07/07/10	< 0.029	< 0.022	< 0.021	< 0.024	< 0.025	< 0.024	< 0.028	< 0.021	< 0.005
07/13/10	< 0.020	< 0.016	< 0.011	< 0.020	< 0.023	< 0.023	< 0.014	< 0.018	< 0.025
07/20/10	< 0.024	< 0.012	< 0.022	< 0.024	< 0.020	< 0.025	< 0.017	< 0.022	< 0.016
07/27/10	< 0.027	< 0.018	< 0.012	< 0.020	< 0.013	< 0.023	< 0.020	< 0.012	< 0.014
08/03/10	< 0.024	< 0.016	< 0.013	< 0.025	< 0.026	< 0.020	< 0.017	< 0.016	< 0.022
08/10/10	< 0.021	< 0.016	< 0.014	< 0.024	< 0.023	< 0.022	< 0.024	< 0.021	< 0.016
08/17/10	< 0.030	< 0.021	< 0.033	< 0.018	< 0.021	< 0.030	< 0.032	< 0.020	< 0.026
08/24/10	< 0.015	< 0.020	< 0.025	< 0.020	< 0.023	< 0.024	< 0.020	< 0.005	< 0.024
08/31/10	< 0.013	< 0.017	< 0.018	< 0.017	< 0.019	< 0.023	< 0.016	< 0.024	< 0.019
09/08/10	< 0.019	< 0.014	< 0.016	< 0.021	< 0.022	< 0.016	< 0.022	< 0.016	< 0.013
09/14/10	< 0.019	< 0.018	< 0.018	< 0.022	< 0.027	< 0.022	< 0.016	< 0.020	< 0.021
09/21/10	< 0.020	< 0.018	< 0.019	< 0.024	< 0.023	< 0.019	< 0.012	< 0.011	< 0.018
09/28/10	< 0.020	< 0.012	< 0.017	< 0.026	< 0.022	< 0.023	< 0.016	< 0.015	< 0.019
10/05/10	< 0.021	< 0.018	< 0.015	< 0.018	< 0.024	< 0.018	< 0.020	< 0.017	< 0.011
10/12/10	< 0.021	< 0.011	< 0.015	< 0.022	< 0.023	< 0.022	< 0.017	< 0.019	< 0.016
10/19/10	< 0.025	< 0.012	< 0.018	< 0.022	< 0.031	< 0.021	< 0.020	< 0.012	< 0.021
10/26/10	< 0.024	< 0.015	< 0.021	< 0.014	< 0.026	< 0.016	< 0.014	< 0.012	< 0.022
11/02/10	< 0.024	< 0.015	< 0.017	< 0.024	< 0.022	< 0.016	< 0.011	< 0.015	< 0.024
11/09/10	< 0.026	< 0.014	< 0.016	< 0.018	< 0.023	< 0.022	< 0.016	< 0.016	< 0.028
11/16/10	< 0.019	< 0.017	< 0.020	< 0.024	< 0.020	< 0.022	< 0.024	< 0.027	< 0.024
11/23/10	< 0.014	< 0.019	< 0.023	< 0.022	< 0.016	< 0.025	< 0.018	< 0.016	< 0.018
12/01/10	< 0.015	< 0.016	< 0.015	< 0.018	< 0.018	< 0.020	< 0.016	< 0.012	< 0.022
12/07/10	< 0.028	< 0.015	< 0.019	< 0.023	< 0.024	< 0.024	< 0.020	< 0.019	< 0.026
12/14/10	< 0.022	< 0.017	< 0.019	< 0.024	< 0.016	< 0.013	< 0.019	< 0.018	< 0.017
12/21/10	< 0.022	< 0.021	< 0.017	< 0.023	< 0.019	< 0.014	< 0.015	< 0.017	< 0.024
12/28/10	< 0.019	< 0.018	< 0.019	< 0.015	< 0.022	< 0.016	< 0.016	< 0.022	< 0.020

* ODCM Required Sample Location
** Optional Sample Location

TABLE 6-9
ENVIRONMENTAL CHARCOAL CARTRIDGE SAMPLES - ON-SITE SAMPLE LOCATIONS
I-131 ACTIVITY pCi/ m^3 ± 1 Sigma

Week End Date	D-1 **	G **	H **	I **	J **	K **
01/04/10	< 0.029	< 0.020	< 0.014	< 0.024	< 0.023	< 0.032
01/11/10	< 0.027	< 0.016	< 0.023	< 0.015	< 0.020	< 0.034
01/18/10	< 0.027	< 0.022	< 0.028	< 0.015	< 0.026	< 0.006
01/25/10	< 0.033	< 0.030	< 0.018	< 0.024	< 0.034	< 0.031
02/01/10	< 0.032	< 0.013	< 0.024	< 0.025	< 0.029	< 0.016
02/08/10	< 0.020	< 0.016	< 0.015	< 0.014	< 0.017	< 0.019
02/15/10	< 0.028	< 0.019	< 0.015	< 0.016	< 0.022	< 0.023
02/22/10	< 0.023	< 0.019	< 0.019	< 0.025	< 0.030	< 0.036
03/01/10	< 0.019	< 0.019	< 0.018	< 0.003	< 0.017	< 0.014
03/08/10	< 0.014	< 0.016	< 0.018	< 0.022	< 0.020	< 0.018
03/15/10	< 0.021	< 0.020	< 0.017	< 0.017	< 0.021	< 0.017
03/22/10	< 0.025	< 0.011	< 0.015	< 0.020	< 0.026	< 0.019
03/29/10	< 0.019	< 0.012	< 0.016	< 0.023	< 0.023	< 0.018
04/05/10	< 0.023	< 0.012	< 0.017	< 0.015	< 0.018	< 0.028
04/12/10	< 0.022	< 0.016	< 0.024	< 0.014	< 0.028	< 0.021
04/19/10	< 0.023	< 0.018	< 0.017	< 0.014	< 0.018	< 0.025
04/26/10	< 0.022	< 0.016	< 0.010	< 0.017	< 0.018	< 0.024
05/03/10	< 0.018	< 0.019	< 0.020	< 0.016	< 0.021	< 0.020
05/10/10	< 0.020	< 0.010	< 0.014	< 0.019	< 0.021	< 0.021
05/17/10	< 0.024	< 0.018	< 0.019	< 0.019	< 0.031	< 0.037
05/24/10	< 0.023	< 0.018	< 0.022	< 0.020	< 0.022	< 0.022
06/01/10	< 0.013	< 0.019	< 0.015	< 0.016	< 0.021	< 0.017
06/07/10	< 0.011	< 0.016	< 0.014	< 0.020	< 0.024	< 0.024
06/14/10	< 0.023	< 0.010	< 0.017	< 0.023	< 0.023	< 0.020
06/21/10	< 0.025	< 0.021	< 0.018	< 0.023	< 0.025	< 0.021
06/28/10	< 0.019	< 0.018	< 0.018	< 0.023	< 0.024	< 0.016

** Optional Sample Location

TABLE 6-9 (Continued)
ENVIRONMENTAL CHARCOAL CARTRIDGE SAMPLES - ON-SITE SAMPLE LOCATIONS
I-131 ACTIVITY pCi/ $m^3 \pm$ 1 Sigma

Week End Date	D-1 **	G **	H **	I **	J **	K **
07/06/10	< 0.025	< 0.025	< 0.023	< 0.026	< 0.021	< 0.024
07/12/10	< 0.024	< 0.020	< 0.017	< 0.023	< 0.031	< 0.026
07/19/10	< 0.019	< 0.019	< 0.016	< 0.018	< 0.019	< 0.019
07/26/10	< 0.027	< 0.019	< 0.021	< 0.033	< 0.024	< 0.023
08/02/10	< 0.018	< 0.019	< 0.016	< 0.018	< 0.019	< 0.020
08/09/10	< 0.012	< 0.022	< 0.023	< 0.023	< 0.018	< 0.028
08/16/10	< 0.020	< 0.015	< 0.014	< 0.020	< 0.025	< 0.026
08/23/10	< 0.021	< 0.036	< 0.035	< 0.028	< 0.013	< 0.021
08/30/10	< 0.016	< 0.013	< 0.017	< 0.013	< 0.026	< 0.024
09/07/10	< 0.016	< 0.013	< 0.013	< 0.018	< 0.022	< 0.020
09/13/10	< 0.020	< 0.021	< 0.017	< 0.024	< 0.025	< 0.026
09/20/10	< 0.027	< 0.010	< 0.017	< 0.024	< 0.022	< 0.023
09/27/10	< 0.020	< 0.018	< 0.016	< 0.022	< 0.022	< 0.018
10/04/10	< 0.026	< 0.017	< 0.016	< 0.025	< 0.023	< 0.019
10/11/10	< 0.016	< 0.014	< 0.017	< 0.021	< 0.024	< 0.020
10/18/10	< 0.012	< 0.017	< 0.012	< 0.022	< 0.027	< 0.016
10/25/10	< 0.065	< 0.017	< 0.012	< 0.019	< 0.027	< 0.016
11/01/10	< 0.019	< 0.019	< 0.018	< 0.016	< 0.021	< 0.019
11/08/10	< 0.020	< 0.021	< 0.013	< 0.020	< 0.021	< 0.026
11/15/10	< 0.019	< 0.018	< 0.020	< 0.021	< 0.012	< 0.004
11/22/10	< 0.014	< 0.016	< 0.021	< 0.016	< 0.017	< 0.019
11/29/10	< 0.019	< 0.017	< 0.016	< 0.021	< 0.026	< 0.025
12/06/10	< 0.016	< 0.015	< 0.017	< 0.021	< 0.025	< 0.018
12/13/10	< 0.017	< 0.018	< 0.022	< 0.016	< 0.012	< 0.017
12/20/10	< 0.015	< 0.021	< 0.014	< 0.017	< 0.025	< 0.021
12/27/10	< 0.021	< 0.022	< 0.029	< 0.017	< 0.016	< 0.025

** Optional sample location

TABLE 6-10
DIRECT RADIATION MEASUREMENT RESULTS
Results in Units of mrem/std. Month ± 1 Sigma

LOCATION NUMBER		FIRST QUARTER	SECOND QUARTER	THIRD QUARTER	FOURTH QUARTER	DEGREES & DISTANCE (1)
3	D1 Onsite	11.54 ± 0.59	13.27 ± 0.52	9.50 ± 0.36	9.76 ± 0.41	69° at 0.2 miles
4	D2 Onsite	4.28 ± 0.25	3.93 ± 0.21	4.28 ± 0.12	3.93 ± 0.14	140° at 0.4 miles
5	E Onsite	4.21 ± 0.29	3.94 ± 0.19	4.29 ± 0.20	3.82 ± 0.13	175° at 0.4 miles
6	F Onsite	3.62 ± 0.24	3.31 ± 0.16	3.76 ± 0.19	3.38 ± 0.13	210° at 0.5 miles
7*	G Onsite	3.29 ± 0.19	3.86 ± 0.20	3.62 ± 0.17	3.42 ± 0.13	250° at 0.7 miles
8*	R-5 Offsite Control	4.60 ± 0.42	4.37 ± 0.22	4.64 ± 0.17	4.38 ± 0.20	42° at 16.4 miles
9	D1 Offsite	3.60 ± 0.39	3.53 ± 0.18	4.03 ± 0.19	3.79 ± 0.18	80° at 11.4 miles
10	D2 Offsite	3.57 ± 0.21	3.55 ± 0.15	3.77 ± 0.13	3.69 ± 0.17	117° at 9.0 miles
11	E Offsite	3.56 ± 0.23	3.51 ± 0.19	3.77 ± 0.19	3.52 ± 0.14	160° at 7.2 miles
12	F- Offsite	3.68 ± 0.23	3.49 ± 0.19	3.87 ± 0.20	3.80 ± 0.17	190° at 7.7 miles
13	G Offsite	3.85 ± 0.30	3.53 ± 0.26	3.83 ± 0.13	4.01 ± 0.17	225° at 5.3 miles
14*	DeMass Rd SW Oswego - Control	4.10 ± 0.25	3.69 ± 0.16	3.86 ± 0.13	3.86 ± 0.15	226° at 12.6 miles
15*	Pole 66 W Boundary - Bible Camp	3.37 ± 0.25	3.22 ± 0.15	3.57 ± 0.11	3.51 ± 0.17	237° at 0.9 miles
18*	Energy Info Center - Lamp Post SW	4.09 ± 0.29	4.05 ± 0.19	4.16 ± 0.13	3.95 ± 0.16	265° at 0.4 miles
19	East Boundary - JAF Pole 9	4.24 ± 0.27	3.77 ± 0.20	4.25 ± 0.22	4.11 ± 0.14	81° at 1.3 miles
23*	H Onsite	4.93 ± 0.32	4.64 ± 0.28	4.71 ± 0.23	4.66 ± 0.17	70° at 0.8 miles
24	I Onsite	4.20 ± 0.28	4.03 ± 0.26	4.15 ± 0.14	3.87 ± 0.11	98° at 0.8 miles
25	J Onsite	3.95 ± 0.26	3.60 ± 0.19	4.17 ± 0.13	4.05 ± 0.23	110° at 0.9 miles
26	K Onsite	3.89 ± 0.29	3.71 ± 0.17	4.02 ± 0.22	4.10 ± 0.12	132° at 0.5 miles
27	N Fence N of Switchyard JAF	19.37 ± 1.29	19.95 ± 1.50	13.85 ± 0.57	16.28 ± 0.72	60° at 0.4 miles
28	N Light Pole N of Screenhouse JAF	23.46 ± 1.45	26.65 ± 1.84	22.16 ± 0.98	21.35 ± 1.09	68° at 0.5 miles
29	N Fence N of W Side	23.13 ± 1.61	25.16 ± 1.55	15.90 ± 0.98	19.24 ± 1.01	65° at 0.5 miles
30	N Fence (NW) JAF	11.08 ± 0.54	12.10 ± 0.92	8.62 ± 0.47	9.93 ± 0.75	57° at 0.4 miles
31	N Fence (NW) NMP-1	6.87 ± 0.32	7.90 ± 0.40	6.89 ± 0.30	7.30 ± 0.24	276° at 0.2 miles
39	N Fence Rad Waste-NMP-1	11.68 ± 0.82	12.69 ± 0.59	10.81 ± 0.42	11.40 ± 0.55	292° at 0.2 miles
47	N Fence (NE) JAF	6.31 ± 0.32	6.85 ± 0.29	5.72 ± 0.19	6.09 ± 0.28	69° at 0.6 miles
49*	Phoenix NY-Control	2.75 ± 0.17	3.83 ± 0.21	3.37 ± 0.12	3.62 ± 0.17	163° at 19.8 miles
51	Liberty & Bronson Sts E of OSS	3.88 ± 0.32	3.81 ± 0.20	4.00 ± 0.18	4.24 ± 0.13	233° at 7.4 miles
52	E 12th & Cayuga Sts Oswego School	3.53 ± 0.29	3.71 ± 0.21	3.68 ± 0.12	3.96 ± 0.22	227° at 5.8 miles
53	Broadwell & Chestnut Sts Fulton HS	3.54 ± 0.21	4.65 ± 0.29	4.11 ± 0.19	4.56 ± 0.19	183° at 13.7 miles
54	Liberty St & Co Rt 16 Mexico HS	3.53 ± 0.27	3.66 ± 0.15	3.69 ± 0.13	3.83 ± 0.13	115° at 9.3 miles
55	Gas Substation Co Rt 5-Pulaski	3.76 ± 0.27	3.93 ± 0.23	3.83 ± 0.23	3.87 ± 0.13	75° at 13.0 miles
56*	Rt 104-New Haven Sch (SE Corner)	3.26 ± 0.28	3.65 ± 0.20	3.75 ± 0.17	3.64 ± 0.25	123° at 5.3 miles
58*	Co Rt 1A-Alcan (E of E Entrance Rd)	3.68 ± 0.24	4.74 ± 0.19	4.30 ± 0.16	4.26 ± 0.15	220° at 3.1 miles
75*	Unit 2 N Fence N of Reactor Bldg	6.47 ± 0.45	8.31 ± 0.45	7.12 ± 0.32	7.55 ± 0.36	5° at 0.1 miles
76*	Unit 2 N Fence N of Change House	4.98 ± 0.27	6.24 ± 0.30	5.42 ± 0.16	5.38 ± 0.19	25° at 0.1 miles
77*	Unit 2 N Fence N of Pipe Bldg	5.69 ± 0.30	7.07 ± 0.37	6.34 ± 0.34	6.17 ± 0.19	45° at 0.2 miles

(1) Direction and distance based on NMP-2 reactor centerline.

* TLD required by ODCM

TABLE 6-10 (Continued)
DIRECT RADIATION MEASUREMENT RESULTS
Results in Units of mrem/std. Month ± 1 Sigma

LOCATION NUMBER		FIRST QUARTER	SECOND QUARTER	THIRD QUARTER	FOURTH QUARTER	DEGREES & DISTANCE (1)
78*	JAF E of E Old Lay Down Area	4.22 ± 0.24	4.29 ± 0.15	4.20 ± 0.20	4.22 ± 0.11	90° at 1.0 miles
79*	Co Rt 29 Pole #63 02 mi S of Lake Rd	3.67 ± 0.25	3.84 ± 0.17	3.71 ± 0.12	3.82 ± 0.16	115° at 1.1 miles
80*	Co Rt 29 Pole #54 07 mi S of Lake Rd	3.78 ± 0.31	4.05 ± 0.18	3.88 ± 0.13	3.96 ± 0.18	133° at 1.4 miles
81*	Miner Rd Pole #16 05 mi W of Rt 29	3.81 ± 0.26	3.93 ± 0.17	3.73 ± 0.14	3.98 ± 0.14	159° at 1.6 miles
82*	Miner Rd Pole # 1-1/2 11 mi W of Rt 29	3.84 ± 0.29	3.81 ± 0.17	3.90 ± 0.14	3.87 ± 0.20	181° at 1.6 miles
83*	Lakeview Rd Tree 045 mi N of Miner Rd	3.77 ± 0.23	3.65 ± 0.18	3.70 ± 0.18	3.68 ± 0.15	200° at 1.2 miles
84*	Lakeview Rd N Pole #6117 200ft N of Lake Rd	3.99 ± 0.24	4.00 ± 0.17	4.07 ± 0.15	3.98 ± 0.16	225° at 1.1 miles
85*	Unit 1 N Fence N of W Side of Screen House	10.51 ± 0.53	12.08 ± 0.63	9.81 ± 0.49	10.52 ± 0.42	294° at 0.2 miles
86*	Unit 2 N Fence N of W Side of Screen House	7.49 ± 0.46	9.96 ± 0.53	7.46 ± 0.34	8.50 ± 0.31	315° at 0.1 miles
87*	Unit 2 N Fence N of E Side of Screen House	7.17 ± 0.44	9.30 ± 0.51	7.61 ± 0.28	8.19 ± 0.33	341° at 0.1 miles
88*	Hickory Grove Rd Pole #2 06 mi N of Rt 1	3.89 ± 0.30	4.04 ± 0.15	3.78 ± 0.20	3.99 ± 0.17	97° at 4.5 miles
89*	Leavitt Rd Pole #16 04 mi S of Rt1	4.13 ± 0.32	4.32 ± 0.15	4.18 ± 0.14	4.18 ± 0.12	111° at 4.1 miles
90*	Rt 104 Pole #300 150 ft E of Keefe Rd	3.72 ± 0.23	4.10 ± 0.15	3.90 ± 0.15	3.99 ± 0.16	135° at 4.2 miles
91*	Rt 51A Pole #59 08 mi W of Rt 51	3.69 ± 0.26	3.76 ± 0.16	3.54 ± 0.13	3.66 ± 0.17	156° at 4.8 miles
92*	Maiden Lane Rd Power Pole 06 mi S of Rt 104	3.86 ± 0.23	4.40 ± 0.22	4.21 ± 0.16	4.19 ± 0.16	183° at 4.4 miles
93*	Rt 53 Pole 1-1 120 ft S of Rt 104	3.88 ± 0.28	3.93 ± 0.19	3.84 ± 0.14	4.20 ± 0.20	205° at 4.4 miles
94*	Rt 1 Pole #82 250 ft E of Kocher Rd (Co Rt 63)	3.60 ± 0.23	3.76 ± 0.20	3.41 ± 0.15	3.83 ± 0.18	223° at 4.7 miles
95*	Alcan W access Rd Joe Fultz Blvd Pole #21	2.95 ± 0.24	4.05 ± 0.16	3.34 ± 0.14	3.65 ± 0.12	237° at 4.1 miles
96*	Creamery Rd 03 mi S of Middle Rd Pole 1-1/2	3.26 ± 0.20	4.34 ± 0.26	3.66 ± 0.13	3.92 ± 0.14	199° at 3.6 miles
97*	Rt 29 Pole #50 200ft N of Miner Rd	3.63 ± 0.25	3.91 ± 0.16	3.80 ± 0.19	3.87 ± 0.13	143° at 1.8 miles
98	Lake Rd Pole #145 015 mi E of Rt 29	3.78 ± 0.24	4.09 ± 0.16	3.87 ± 0.17	4.13 ± 0.19	101° at 1.2 miles
99	NMP Rd 04 mi N of Lake Rd Env Station R1	4.02 ± 0.24	4.26 ± 0.25	4.06 ± 0.14	4.28 ± 0.17	88° at 1.8 miles
100	Rt 29 & Lake Rd Env Station R2	3.81 ± 0.26	4.15 ± 0.15	3.87 ± 0.15	4.21 ± 0.16	104° at 1.1 miles
101	Rt 29 07 mi S of Lake Rd Env Station R3	3.45 ± 0.22	3.58 ± 0.17	3.57 ± 0.24	3.67 ± 0.13	132° at 1.5 miles
102	EOF/Env Lab Rt 176 E Driveway Lamp Post	3.37 ± 0.19	4.32 ± 0.21	3.62 ± 0.14	4.29 ± 0.23	175° at 11.9 miles
103	EIC East Garage Rd Lamp Post	4.32 ± 0.27	4.38 ± 0.20	4.15 ± 0.16	4.53 ± 0.40	267° at 0.4 miles
104	Parkhurst Rd Pole #23 01 mi S of Lake rd	3.68 ± 0.23	4.06 ± 0.18	3.90 ± 0.20	4.05 ± 0.11	102° at 1.4 miles
105	Lake view Rd Pole #36 05 mi S of Lake Rd	3.81 ± 0.24	4.23 ± 0.17	3.91 ± 0.16	4.13 ± 0.14	198° at 1.4 miles
106	Shoreline Cove W of NMP-1 Tree on W Edge	4.76 ± 0.31	5.25 ± 0.21	4.88 ± 0.22	5.15 ± 0.19	274° at 0.3 miles
107	Shoreline Cove W of NMP-1 30 ft SSW of #106	4.78 ± 0.30	5.09 ± 0.28	4.84 ± 0.19	5.02 ± 0.20	272° at 0.3 miles
108	Lake Rd Pole #142 300 ft E of Rt 29 S	4.04 ± 0.25	4.28 ± 0.21	4.07 ± 0.19	4.19 ± 0.13	104° at 1.1 miles
109	Tree North of Lake Rd 300 ft E of Rt 29 N	4.07 ± 0.24	4.29 ± 0.22	3.96 ± 0.15	4.31 ± 0.17	103° at 1.1 miles
111	State Route 38 Sterling NY - Control	3.54 ± 0.22	3.77 ± 0.17	3.62 ± 0.13	4.08 ± 0.20	166° at 26.4 miles
112	EOF/Env Lab Oswego County Airport	3.59 ± 0.22	4.48 ± 0.26	3.70 ± 0.12	4.69 ± 0.18	175° at 11.9 miles
113	Baldwinsville NY - Control	3.18 ± 0.21	4.31 ± 0.17	3.54 ± 0.14	3.95 ± 0.14	214° at 21.8 miles

(1) Direction and distance based on NMP-2 reactor centerline.

* TLD required by ODCM

TABLE 6-11
CONCENTRATIONS OF IODINE-131 AND GAMMA EMITTERS IN MILK
Results in Units of pCi/liter ± 1 Sigma
Sample Location ** No. 55 ***

Date	I-131	Cs-134	Cs-137	K-40	Ba/La-140	Others †
04/12/10	< 0.558	< 7.85	< 5.82	1483 ± 81.1	< 4.70	<LLD
04/26/10	< 0.483	< 7.13	< 7.64	1413 ± 80.7	< 7.61	<LLD
05/10/10	< 0.642	< 5.28	< 6.20	1425 ± 80.1	< 8.02	<LLD
05/24/10	< 0.496	< 4.91	< 7.49	1490 ± 81.8	< 6.65	<LLD
06/07/10	< 0.681	< 9.81	< 9.59	1665 ± 106.9	< 10.40	<LLD
06/21/10	< 0.626	< 8.38	< 7.78	1575 ± 82.8	< 7.13	<LLD
07/06/10	< 0.505	< 4.60	< 7.19	1477 ± 80.9	< 7.61	<LLD
07/19/10	< 0.499	< 5.19	< 5.62	1445 ± 81.0	< 6.64	<LLD
08/09/10	< 0.505	< 5.19	< 5.82	1575 ± 84.3	< 8.46	<LLD
08/23/10	< 0.540	< 3.59	< 5.71	1407 ± 68.6	< 5.84	<LLD
09/07/10	< 0.698	< 7.57	< 7.19	1661 ± 86.6	< 6.09	<LLD
09/20/10	< 0.551	< 8.25	< 6.55	1746 ± 87.6	< 8.44	<LLD
10/04/10	< 0.457	< 4.70	< 7.19	1600 ± 83.7	< 7.63	<LLD
10/18/10	< 0.491	< 7.71	< 6.72	1532 ± 83.5	< 6.66	<LLD
11/01/10	< 0.482	< 7.57	< 7.35	1605 ± 84.7	< 5.47	<LLD
11/15/10	< 0.873	< 8.39	< 8.25	1542 ± 96.3	< 8.70	<LLD
12/06/10	< 0.673	< 5.19	< 6.55	1498 ± 82.0	< 8.10	<LLD
12/20/10	< 0.506	< 7.99	< 5.41	1401 ± 78.9	< 8.49	<LLD

** Sample Location is Optional
*** Corresponds to sample location noted on Figure 3.3-4
† Plant related radionuclides

TABLE 6-11(Continued)
CONCENTRATIONS OF IODINE-131 AND GAMMA EMITTERS IN MILK
Results in Units of pCi/liter ± 1 Sigma
Sample Location * No.77 (Control) ***

Date	I-131	Cs-134	Cs-137	K-40	Ba/La-140	Others †
04/12/10	< 0.690	< 4.22	< 5.90	1621 ± 72.2	< 6.77	<LLD
04/26/10	< 0.576	< 4.47	< 5.19	1646 ± 72.1	< 4.63	<LLD
05/10/10	< 0.514	< 4.11	< 5.90	1492 ± 71.2	< 5.45	<LLD
05/24/10	< 0.681	< 3.59	< 5.81	1464 ± 68.2	< 4.64	<LLD
06/07/10	< 0.735	< 9.67	< 7.75	1551 ± 96.3	< 7.77	<LLD
06/21/10	< 0.698	< 8.16	< 5.59	1458 ± 95.4	< 6.66	<LLD
07/06/10	< 0.617	< 3.89	< 6.78	1571 ± 71.4	< 5.08	<LLD
07/19/10	< 0.670	< 4.22	< 6.09	1506 ± 70.6	< 5.07	<LLD
08/09/10	< 0.641	< 3.95	< 5.71	1533 ± 70.6	< 5.49	<LLD
08/23/10	< 0.759	< 8.12	< 6.20	1467 ± 82.4	< 6.10	<LLD
09/07/10	< 0.643	< 3.95	< 6.09	1485 ± 69.7	< 6.47	<LLD
09/20/10	< 0.488	< 4.17	< 5.19	1597 ± 71.4	< 6.45	<LLD
10/04/10	< 0.569	< 3.89	< 5.71	1534 ± 70.4	< 5.47	<LLD
10/18/10	< 0.673	< 4.00	< 5.90	1573 ± 71.8	< 4.65	<LLD
11/01/10	< 0.538	< 3.89	< 5.41	1423 ± 68.1	< 5.46	<LLD
11/15/10	< 0.932	< 6.12	< 7.64	1624 ± 85.8	< 6.65	<LLD
12/06/10	< 0.707	< 3.89	< 5.71	1451 ± 69.4	< 5.49	<LLD
12/20/10	< 0.443	< 3.66	< 5.71	1308 ± 65.3	< 7.06	<LLD

** Sample Location is Optional

*** Corresponds to sample location noted on Figure 3.3-4

† Plant related radionuclides

TABLE 6-12
CONCENTRATIONS OF GAMMA EMITTERS IN FOOD PRODUCTS
Results in Units of pCi/kg (wet) ± 1 sigma

Location ***	Date	Description	Be-7	K-40	I-131	Cs-134	Cs-137	Zn-65	Others †
C2*	09/07/10	SQUASH LEAVES	1053 ± 89	3577 ± 215	< 20.8	< 23.8	< 20.7	< 48.5	< LLD
	09/07/10	RHUBARB LEAVES	161 ± 67	4909 ± 266	< 20.2	< 32.2	< 21.1	< 68.3	< LLD
	09/07/10	ZUCCHINI LEAVES	791 ± 71	3418 ± 195	< 17.0	< 19.8	< 14.3	< 44.0	< LLD

Location ***	Date	Description	Be-7	K-40	I-131	Cs-134	Cs-137	Zn-65	Others †
133 *	09/07/10	SWISS CHARD	215 ± 59	6837 ± 258	< 18.9	< 24.9	< 16.9	< 46.7	< LLD
	09/07/10	ZUCCHINI LEAVES	843 ± 69	4095 ± 193	< 13.2	< 16.8	< 16.7	< 46.1	< LLD
	09/07/10	BRUSSEL SPROUT LEAVES	277 ± 55	3621 ± 181	< 16.2	< 14.1	< 14.6	< 38.1	< LLD

Location ***	Date	Description	Be-7	K-40	I-131	Cs-134	Cs-137	Zn-65	Others †
144*	09/08/10	CABBAGE	520 ± 71	3340 ± 188	< 21.8	< 16.2	< 17.7	< 50.5	< LLD
	09/08/10	SQUASH LEAVES	1893 ± 98	2656 ± 173	< 16.7	< 11.1	< 16.2	< 39.0	< LLD
	09/08/10	RHUBARB LEAVES	479 ± 44	2459 ± 135	< 10.8	< 9.7	< 11.6	< 28.5	< LLD

Location ***	Date	Description	Be-7	K-40	I-131	Cs-134	Cs-137	Zn-65	Others †
484*	09/07/10	RHUBARB LEAVES	250 ± 50	4182 ± 200	< 16.4	< 15.8	< 15.7	< 45.1	< LLD
	09/07/10	ZUCCHINI LEAVES	724 ± 64	3608 ± 189	< 17.2	< 11.7	< 15.5	< 55.8	< LLD
	09/07/10	SQUASH LEAVES	976 ± 62	3415 ± 149	< 13.1	< 13.3	< 13.6	< 15.5	< LLD

* Sample Location Required by the ODCM
** Sample location is Optional
*** Corresponds to Sample Location noted on Figure 3.3-5
† Plant Related Radionuclides

TABLE 6-13
MILK ANIMAL CENSUS

Town or Area[a]	Location Designation[b]	Degrees[c]	Distance[c] (Miles)	Number of Milk Animals[d]
Scriba	62	184°	6.6	0G
New Haven	9	98°	4.8	40C
	64	108°	7.8	38C
	78	128°	8.0	21C
Mexico	14	125°	9.1	51C
	60	91°	9.5	20C
	55*	97°	8.8	58C
	21	112°	10.4	80C
	72	100°	9.6	36C
	50	93°	8.7	0C
Granby (Control)	77*	190°	16.0	65C

MILKING ANIMAL TOTALS: 409 Cows
(including control locations) 0 Goats

MILKING ANIMAL TOTALS: 344 Cows
(excluding control locations) 0 Goats

NOTES:
(a) Census performed out to a distance of approximately 10 miles
(b) Reference Figure 3.3-4
(c) Degrees and distance are based on NMP-2 Reactor Building centerline
(d) C Cows
G Milking Goats
* Milk sample location

TABLE 6-14
RESIDENCE CENSUS

Meteorological Sector	Location	Map Location(a)	Degrees(b)	Distance(b)
N	*	-	-	-
NNE	*	-	-	-
NE	*	-	-	-
ENE	*	-	-	-
E	West Sunset Bay / Lake Road	A	100°	1.3 miles
ESE	Lake Road	B	104°	1.1 miles
SE	County Route 29	C	125°	1.4 miles
SSE	County Route 29 / Miner Road	D	158°	1.7 miles
S	Miner Road	E	171°	1.6 miles
SSW	Lakeview Road	F	208°	1.2 miles
SW	Lakeview Road	G	217°	1.1 miles
WSW	Bayshore Drive	H	237°	1.4 miles
W	*	-	-	-
WNW	*	-	-	-
NW	*	-	-	-
NNW	*	-	-	-

NOTES:
* This meteorological sector is over Lake Ontario. There is no residence within five miles
(a) Corresponds to Figure 3.3-5
(b) Degrees and distance are based on NMP-2 Reactor Building centerline

7.0 HISTORICAL DATA TABLES

TABLE 7-1

HISTORICAL ENVIRONMENTAL SAMPLE DATA
SHORELINE SEDIMENT (CONTROL) [(a)]

	Cs-137 (pCi/g (dry))			Co-60 (pCi/g (dry))		
YEAR	MIN.	MAX.	MEAN	MIN.	MAX.	MEAN
1979 [(b)]	0.22	0.22	0.22	LLD	LLD	LLD
1980	0.07	0.09	0.08	LLD	LLD	LLD
1981	LLD	LLD	LLD	LLD	LLD	LLD
1982	0.05	0.05	0.05	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
1992	LLD	LLD	LLD	LLD	LLD	LLD
1993	0.03	0.03	0.03	LLD	LLD	LLD
1994	LLD	LLD	LLD	LLD	LLD	LLD
1995	LLD	LLD	LLD	LLD	LLD	LLD
1996	LLD	LLD	LLD	LLD	LLD	LLD
1997	LLD	LLD	LLD	LLD	LLD	LLD
1998	LLD	LLD	LLD	LLD	LLD	LLD
1999	LLD	LLD	LLD	LLD	LLD	LLD
2000	LLD	LLD	LLD	LLD	LLD	LLD
2001	LLD	LLD	LLD	LLD	LLD	LLD
2002	LLD	LLD	LLD	LLD	LLD	LLD
2003	LLD	LLD	LLD	LLD	LLD	LLD
2004	LLD	LLD	LLD	LLD	LLD	LLD
2005	LLD	LLD	LLD	LLD	LLD	LLD
2006	LLD	LLD	LLD	LLD	LLD	LLD
2007	LLD	LLD	LLD	LLD	LLD	LLD
2008	LLD	LLD	LLD	LLD	LLD	LLD
2009	LLD	LLD	LLD	LLD	LLD	LLD
2010	LLD	LLD	LLD	LLD	LLD	LLD

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

TABLE 7-2

HISTORICAL ENVIRONMENTAL SAMPLE DATA
SHORELINE SEDIMENT (INDICATOR) [(a)]

	Cs-137 (pCi/g (dry))			Co-60 (pCi/g (dry))		
YEAR	MIN.	MAX.	MEAN	MIN.	MAX.	MEAN
1985 [(b)]	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	0.25	0.34	0.30	LLD	LLD	LLD
1990	0.28	0.28	0.28	LLD	LLD	LLD
1991	0.11	0.16	0.14	LLD	LLD	LLD
1992	0.10	0.16	0.13	LLD	LLD	LLD
1993	0.17	0.49	0.33	LLD	LLD	LLD
1994	0.08	0.39	0.24	LLD	LLD	LLD
1995	0.16	0.17	0.16	LLD	LLD	LLD
1996	0.13	0.18	0.16	LLD	LLD	LLD
1997	0.13	0.18	0.16	LLD	LLD	LLD
1998	0.07	0.07	0.07	LLD	LLD	LLD
1999	0.06	0.09	0.08	LLD	LLD	LLD
2000	0.06	0.08	0.07	LLD	LLD	LLD
2001	0.06	0.07	0.07	LLD	LLD	LLD
2002	0.05	0.05	0.05	LLD	LLD	LLD
2003	0.04	0.05	0.05	LLD	LLD	LLD
2004	0.04	0.04	0.04	LLD	LLD	LLD
2005	0.06	0.09	0.08	LLD	LLD	LLD
2006	0.06	0.06	0.06	LLD	LLD	LLD
2007	0.04	0.04	0.04	LLD	LLD	LLD
2008	LLD	LLD	LLD	LLD	LLD	LLD
2009	LLD	LLD	LLD	LLD	LLD	LLD
2010	LLD	LLD	LLD	LLD	LLD	LLD

(a) Location was offsite at Sunset Beach (closest location with recreational value).
(b) Sampling initiated in 1985 as required by Technical Specifications requirements.

TABLE 7-3

HISTORICAL ENVIRONMENTAL SAMPLE DATA
FISH (CONTROL) [(a)]

	Cs-137 (pCi/g (wet))		
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
1992	0.019	0.024	0.022
1993	0.023	0.041	0.032
1994	0.012	0.035	0.024
1995	0.014	0.020	0.016
1996	0.014	0.018	0.016
1997	0.019	0.043	0.031
1998	0.013	0.013	0.013
1999	LLD	LLD	LLD
2000	0.02	0.02	0.02
2001	LLD	LLD	LLD
2002	LLD	LLD	LLD
2003	LLD	LLD	LLD
2004	LLD	LLD	LLD
2005	LLD	LLD	LLD
2006	LLD	LLD	LLD
2007	LLD	LLD	LLD
2008	LLD	LLD	LLD
2009	LLD	LLD	LLD
2010	LLD	LLD	LLD

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

TABLE 7-4

HISTORICAL ENVIRONMENTAL SAMPLE DATA
FISH (INDICATOR) [(a)]

	Cs-137 (pCi/g (wet))		
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
1992	0.013	0.034	0.026
1993	0.021	0.038	0.030
1994	0.011	0.028	0.020
1995	0.016	0.019	0.018
1996	0.014	0.016	0.015
1997	0.015	0.017	0.016
1998	0.021	0.021	0.021
1999	0.016	0.018	0.017
2000	LLD	LLD	LLD
2001	LLD	LLD	LLD
2002	0.016	0.016	0.016
2003	LLD	LLD	LLD
2004	LLD	LLD	LLD
2005	LLD	LLD	LLD
2006	LLD	LLD	LLD
2007	LLD	LLD	LLD
2008	LLD	LLD	LLD
2009	LLD	LLD	LLD
2010	LLD	LLD	LLD

(a) Indicator locations are in the general area of the NMP1 and J. A. FitzPatrick cooling water discharge structures.

TABLE 7-5

HISTORICAL ENVIRONMENTAL SAMPLE DATA SURFACE WATER (CONTROL) (a)

	Cs-137 (pCi/liter)			Co-60 (pCi/liter)		
YEAR	MIN.	MAX.	MEAN	MIN.	MAX.	MEAN
1976	(b)	(b)	(b)	(b)	(b)	(b)
1977	(c)	(c)	(c)	(c)	(c)	(c)
1978	LLD	LLD	LLD	(c)	(c)	(c)
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
1992	LLD	LLD	LLD	LLD	LLD	LLD
1993	LLD	LLD	LLD	LLD	LLD	LLD
1994	LLD	LLD	LLD	LLD	LLD	LLD
1995	LLD	LLD	LLD	LLD	LLD	LLD
1996	LLD	LLD	LLD	LLD	LLD	LLD
1997	LLD	LLD	LLD	LLD	LLD	LLD
1998	LLD	LLD	LLD	LLD	LLD	LLD
1999	LLD	LLD	LLD	LLD	LLD	LLD
2000	LLD	LLD	LLD	LLD	LLD	LLD
2001	LLD	LLD	LLD	LLD	LLD	LLD
2002	LLD	LLD	LLD	LLD	LLD	LLD
2003	LLD	LLD	LLD	LLD	LLD	LLD
2004	LLD	LLD	LLD	LLD	LLD	LLD
2005	LLD	LLD	LLD	LLD	LLD	LLD
2006	LLD	LLD	LLD	LLD	LLD	LLD
2007	LLD	LLD	LLD	LLD	LLD	LLD
2008	LLD	LLD	LLD	LLD	LLD	LLD
2009	LLD	LLD	LLD	LLD	LLD	LLD
2010	LLD	LLD	LLD	LLD	LLD	LLD

(a) Location was the City of Oswego Water Supply for 1976 – 1984, and the Oswego Steam Station inlet canal for 1985 – 2010.
(b) No gamma analyses performed (not required).
(c) Data showed instrument background results.

TABLE 7-6

HISTORICAL ENVIRONMENTAL SAMPLE DATA
SURFACE WATER (INDICATOR) [(a)]

	Cs-137 (pCi/liter)			Co-60 (pCi/liter)		
YEAR	MIN.	MAX.	MEAN	MIN.	MAX.	MEAN
1976	(b)	(b)	(b)	(b)	(b)	(b)
1977	(c)	(c)	(c)	(c)	(c)	(c)
1978	LLD	LLD	LLD	(c)	(c)	(c)
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
1992	LLD	LLD	LLD	LLD	LLD	LLD
1993	LLD	LLD	LLD	LLD	LLD	LLD
1994	LLD	LLD	LLD	LLD	LLD	LLD
1995	LLD	LLD	LLD	LLD	LLD	LLD
1996	LLD	LLD	LLD	LLD	LLD	LLD
1997	LLD	LLD	LLD	LLD	LLD	LLD
1998	LLD	LLD	LLD	LLD	LLD	LLD
1999	LLD	LLD	LLD	LLD	LLD	LLD
2000	LLD	LLD	LLD	LLD	LLD	LLD
2001	LLD	LLD	LLD	LLD	LLD	LLD
2002	LLD	LLD	LLD	LLD	LLD	LLD
2003	LLD	LLD	LLD	LLD	LLD	LLD
2004	LLD	LLD	LLD	LLD	LLD	LLD
2005	LLD	LLD	LLD	LLD	LLD	LLD
2006	LLD	LLD	LLD	LLD	LLD	LLD
2007	LLD	LLD	LLD	LLD	LLD	LLD
2008	LLD	LLD	LLD	LLD	LLD	LLD
2009	LLD	LLD	LLD	LLD	LLD	LLD
2010	LLD	LLD	LLD	LLD	LLD	LLD

(a) Location was the J. A. FitzPatrick inlet canal.
(b) No gamma analyses performed (not required).
(c) Data showed instrument background results.

TABLE 7-7

HISTORICAL ENVIRONMENTAL SAMPLE DATA
SURFACE WATER TRITIUM (CONTROL) [(a)]

	TRITIUM (pCi/liter)		
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
1992	190	310	242
1993	160	230	188
1994	250	250	250
1995	230	230	230
1996	LLD	LLD	LLD
1997	LLD	LLD	LLD
1998	190	190	190
1999	220	510	337
2000	196	237	212
2001	LLD	LLD	LLD
2002	LLD	LLD	LLD
2003	LLD	LLD	LLD
2004	LLD	LLD	LLD
2005	LLD	LLD	LLD
2006	LLD	LLD	LLD
2007	LLD	LLD	LLD
2008	LLD	LLD	LLD
2009	LLD	LLD	LLD
2010	LLD	LLD	LLD

(a) Control location is the City of Oswego drinking water for 1976 – 1984, and the Oswego Steam Station inlet canal for 1985 – 2010.

TABLE 7-8

HISTORICAL ENVIRONMENTAL SAMPLE DATA SURFACE WATER TRITIUM (INDICATOR) [(a)]

	TRITIUM (pCi/liter)		
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 [(b)]	530
1986	260	500	380
1987	160	410	322
1988	430	480	460
1989	210	350	280
1990	220	290	250
1991	250	390	310
1992	240	300	273
1993	200	280	242
1994	180	260	220
1995	320	320	320
1996	LLD	LLD	LLD
1997	160	160	160
1998	190	190	190
1999	180	270	233
2000	161	198	185
2001	LLD	LLD	LLD
2002	297	297	297
2003	LLD	LLD	LLD
2004	LLD	LLD	LLD
2005	LLD	LLD	LLD
2006	LLD	LLD	LLD
2007	LLD	LLD	LLD
2008	LLD	LLD	LLD
2009	LLD	LLD	LLD
2010	LLD	LLD	LLD

(a) Indicator location is the FitzPatrick inlet canal.
(b) Suspect sample contamination. Recollected samples showed normal levels of tritium.

TABLE 7-9

HISTORICAL ENVIRONMENTAL SAMPLE DATA
GROUNDWATER TRITIUM (CONTROL) [a]

	TRITIUM (pCi/liter)		
YEAR	MIN.	MAX.	MEAN
2005	<854	<854	<854
2006[b]	<447	<825	<636
2007	<442	<445	<444
2008	<427	<439	<431
2009	<411	<418	<415
2010	<172	<410	<341

(a) Control well locations (2) are upland wells located south of protected area.

(b) Required LLD changed to 500 pCi/l from 1000 pCi/l

TABLE 7-10

HISTORICAL ENVIRONMENTAL SAMPLE DATA
GROUNDWATER TRITIUM (INDICATOR) [(a)]

	TRITIUM (pCi/liter)		
YEAR	MIN.	MAX.	MEAN
2005	<854	<871	<863
2006[(b)]	<462	<933	<823
2007	<440	<461	<445
2008	<427	<439	<433
2009	<406	<424	<413
2010	<287	611[(c)]	<384

(a) Indicator locations are down gradient wells located in the protected area and samples collected from the NMP2 depression cone system.
(b) Required LLD changed to 500 pCi/l from 1000 pCi/l
(c) Re-sample tritium concentration = <268 pCi/l

TABLE 7-11

HISTORICAL ENVIRONMENTAL SAMPLE DATA
AIR PARTICULATE GROSS BETA (CONTROL) [(a)]

	GROSS BETA (pCi/m^3)		
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
1992	0.006	0.020	0.012
1993	0.007	0.022	0.013
1994	0.008	0.025	0.015
1995	0.006	0.023	0.014
1996	0.008	0.023	0.014
1997	0.006	0.025	0.013
1998	0.004	0.034	0.014
1999	0.010	0.032	0.017
2000	0.006	0.027	0.015
2001	0.006	0.034	0.016
2002	0.008	0.027	0.016
2003	0.004	0.032	0.015
2004	0.008	0.032	0.016
2005	0.008	0.034	0.019
2006	0.007	0.033	0.016
2007	0.008	0.028	0.016
2008	0.007	0.031	0.015
2009	0.006	0.032	0.016
2010	0.004	0.026	0.014

(a) 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 – 2010 (formerly C offsite location).

TABLE 7-12

HISTORICAL ENVIRONMENTAL SAMPLE DATA
AIR PARTICULATE GROSS BETA (INDICATOR) [(a)]

	GROSS BETA (pCi/m^3)		
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
1992	0.005	0.024	0.013
1993	0.005	0.025	0.014
1994	0.006	0.025	0.015
1995	0.004	0.031	0.014
1996	0.006	0.025	0.013
1997	0.001	0.018	0.010
1998	0.002	0.040	0.015
1999	0.009	0.039	0.017
2000	0.005	0.033	0.015
2001	0.004	0.037	0.016
2002	0.006	0.026	0.016
2003	0.005	0.035	0.015
2004	0.003	0.037	0.016
2005	0.007	0.040	0.018
2006	0.005	0.035	0.015
2007	0.007	0.028	0.016
2008	0.004	0.030	0.016
2009	0.006	0.032	0.016
2010	0.005	0.030	0.016

(a) Locations used for 1977 - 1984 were D1 onsite, D2 onsite, E onsite, F onsite, G onsite, H onsite, I onsite, J onsite, and K onsite as applicable. 1985 – 2010 locations were R-1 offsite, R-2 offsite, R-3 offsite, and R-4 offsite.

TABLE 7-13

HISTORICAL ENVIRONMENTAL SAMPLE DATA
AIR PARTICULATES (CONTROL) (a)

	Cs-137 (pCi/m^3)			Co-60 (pCi/m^3)		
YEAR	MIN.	MAX.	MEAN	MIN.	MAX.	MEAN
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
1992	LLD	LLD	LLD	LLD	LLD	LLD
1993	LLD	LLD	LLD	LLD	LLD	LLD
1994	LLD	LLD	LLD	LLD	LLD	LLD
1995	LLD	LLD	LLD	LLD	LLD	LLD
1996	LLD	LLD	LLD	LLD	LLD	LLD
1997	LLD	LLD	LLD	LLD	LLD	LLD
1998	LLD	LLD	LLD	LLD	LLD	LLD
1999	LLD	LLD	LLD	LLD	LLD	LLD
2000	LLD	LLD	LLD	LLD	LLD	LLD
2001	LLD	LLD	LLD	LLD	LLD	LLD
2002	LLD	LLD	LLD	LLD	LLD	LLD
2003	LLD	LLD	LLD	LLD	LLD	LLD
2004	LLD	LLD	LLD	LLD	LLD	LLD
2005	LLD	LLD	LLD	LLD	LLD	LLD
2006	LLD	LLD	LLD	LLD	LLD	LLD
2007	LLD	LLD	LLD	LLD	LLD	LLD
2008	LLD	LLD	LLD	LLD	LLD	LLD
2009	LLD	LLD	LLD	LLD	LLD	LLD
2010	LLD	LLD	LLD	LLD	LLD	LLD

(a) Locations included composites of C, D1, E, F, and G offsite air monitoring locations for 1977 - 1984. Sample location included only R-5 air monitoring location for 1985 - 2010.

TABLE 7-14

HISTORICAL ENVIRONMENTAL SAMPLE DATA
AIR PARTICULATES (INDICATOR) [a]

	Cs-137 (pCi/m^3)			Co-60 (pCi/m^3)		
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
1992	LLD	LLD	LLD	LLD	LLD	LLD
1993	LLD	LLD	LLD	LLD	LLD	LLD
1994	LLD	LLD	LLD	LLD	LLD	LLD
1995	LLD	LLD	LLD	LLD	LLD	LLD
1996	LLD	LLD	LLD	LLD	LLD	LLD
1997	LLD	LLD	LLD	LLD	LLD	LLD
1998	LLD	LLD	LLD	LLD	LLD	LLD
1999	LLD	LLD	LLD	LLD	LLD	LLD
2000	LLD	LLD	LLD	0.0048	0.0048	0.0048
2001	LLD	LLD	LLD	LLD	LLD	LLD
2002	LLD	LLD	LLD	LLD	LLD	LLD
2003	LLD	LLD	LLD	LLD	LLD	LLD
2004	LLD	LLD	LLD	LLD	LLD	LLD
2005	LLD	LLD	LLD	LLD	LLD	LLD
2006	LLD	LLD	LLD	LLD	LLD	LLD
2007	LLD	LLD	LLD	LLD	LLD	LLD
2008	LLD	LLD	LLD	LLD	LLD	LLD
2009	LLD	LLD	LLD	LLD	LLD	LLD
2010	LLD	LLD	LLD	LLD	LLD	LLD

(a) Locations included composites of D1, D2, E, F, G, H, I, J, and K onsite air monitoring locations for 1977 - 1984. Locations included R-1 through R-4 air monitoring locations for 1985 - 2010.

TABLE 7-15

HISTORICAL ENVIRONMENTAL SAMPLE DATA
AIR RADIOIODINE (CONTROL) [(a)]

	IODINE-131 (pCi/m^3)		
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
1992	LLD	LLD	LLD
1993	LLD	LLD	LLD
1994	LLD	LLD	LLD
1995	LLD	LLD	LLD
1996	LLD	LLD	LLD
1997	LLD	LLD	LLD
1998	LLD	LLD	LLD
1999	LLD	LLD	LLD
2000	LLD	LLD	LLD
2001	LLD	LLD	LLD
2002	LLD	LLD	LLD
2003	LLD	LLD	LLD
2004	LLD	LLD	LLD
2005	LLD	LLD	LLD
2006	LLD	LLD	LLD
2007	LLD	LLD	LLD
2008	LLD	LLD	LLD
2009	LLD	LLD	LLD
2010	LLD	LLD	LLD

(a) 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 – 2010.

TABLE 7-16

HISTORICAL ENVIRONMENTAL SAMPLE DATA
AIR RADIOIODINE (INDICATOR) [a]

	IODINE-131 (pCi/m^3)		
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
1992	LLD	LLD	LLD
1993	LLD	LLD	LLD
1994	LLD	LLD	LLD
1995	LLD	LLD	LLD
1996	LLD	LLD	LLD
1997	LLD	LLD	LLD
1998	LLD	LLD	LLD
1999	LLD	LLD	LLD
2000	LLD	LLD	LLD
2001	LLD	LLD	LLD
2002	LLD	LLD	LLD
2003	LLD	LLD	LLD
2004	LLD	LLD	LLD
2005	LLD	LLD	LLD
2006	LLD	LLD	LLD
2007	LLD	LLD	LLD
2008	LLD	LLD	LLD
2009	LLD	LLD	LLD
2010	LLD	LLD	LLD

(a) 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 - 2010 were R1 off-site, R-2 off-site, R-3 off-site, and R-4 off-site.

TABLE 7-17

HISTORICAL ENVIRONMENTAL SAMPLE DATA ENVIRONMENTAL TLD (CONTROL) [(a)]

	DOSE (mrem per standard month)		
YEAR	MIN.	MAX.	MEAN
1969	(b)	(b)	(b)
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)*	4.8 (4.6)*
1991	3.8 (3.8)*	5.4 (5.3)*	4.5 (4.3)*
1992	2.6 (2.6)*	5.0 (4.7)*	4.1 (3.9)*
1993	3.4 (3.4)*	5.6 (5.2)*	4.4 (4.3)*
1994	3.1 (3.1)*	5.0 (4.6)*	4.1 (3.9)*
1995	3.4 (3.4)*	5.7 (4.9)*	4.4 (4.2)*
1996	3.4 (3.4)*	5.6 (5.6)*	4.3 (4.2)*
1997	3.7 (3.9)*	6.2 (5.2)*	4.7 (4.6)*
1998	3.7 (3.7)*	5.6 (4.8)*	4.4 (4.2)*
1999	3.6 (3.7)*	7.1 (4.7)*	4.6 (4.4)*
2000	3.7 (3.7)*	7.3 (5.5)*	4.7 (4.3)*
2001	3.6 (3.9)*	5.4 (5.0)*	4.4 (4.4)*
2002	3.4 (3.4)*	5.5 (5.2)*	4.3 (4.1)*
2003	3.4 (3.4)*	5.5 (4.8)*	4.2 (4.2)*
2004	3.3 (3.3)*	5.9 (5.9)*	4.3 (4.5)*
2005	3.3 (3.4)*	5.1 (4.5)*	4.1 (4.0)*
2006	3.3 (3.3)*	5.3 (4.4)*	4.1 (4.0)*
2007	3.2 (3.2)*	5.8 (5.3)*	4.4 (4.3)*
2008	3.3(3.3)*	5.1(4.8)*	4.1(4.0)*
2009	3.2(3.2)*	4.8(4.2)*	3.9(3.7)*
2010	2.7(2.7)*	4.6(4.1)*	3.9(3.6)*

(a) TLD #8, 14, 49, 111 and 113 where applicable.
(b) Data not available.
(*) TLD result based on the ODCM required locations (TLD #14 and 49).

TABLE 7-18

HISTORICAL ENVIRONMENTAL SAMPLE DATA
ENVIRONMENTAL TLD (SITE BOUNDARY) [(a)]

	DOSE (mrem per standard month)		
YEAR	MIN.	MAX.	MEAN
1985 [(b)]	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
1992	3.2	10.4	4.8
1993	3.3	11.6	5.3
1994	2.8	12.4	5.2
1995	3.5	9.6	5.4
1996	3.2	9.1	5.2
1997	3.5	10.2	5.9
1998	3.7	9.4	5.4
1999	3.3	12.3	5.8
2000	3.6	10.0	5.5
2001	3.6	10.3	5.7
2002	3.5	9.4	5.4
2003	3.2	8.9	5.4
2004	3.3	10.8	5.6
2005	3.4	9.2	5.5
2006	3.5	9.2	5.4
2007	3.2	9.0	5.6
2008	3.2	8.8	5.2
2009	3.1	11.7	5.4
2010	3.3	12.1	5.4

(a) TLD locations initiated in 1985 as required by the new Technical Specifications. Includes TLD numbers 7, 18, 23, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, and 87.

(b) Not required prior to 1985.

TABLE 7-19

HISTORICAL ENVIRONMENTAL SAMPLE DATA ENVIRONMENTAL TLD (OFF-SITE SECTORS) [(a)]

	DOSE (mrem per standard month)		
YEAR	MIN.	MAX.	MEAN
1985 (b)	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
1992	2.9	5.0	4.1
1993	3.4	6.3	4.5
1994	3.0	5.1	4.0
1995	3.2	5.2	4.2
1996	3.2	5.3	4.2
1997	3.5	5.8	4.5
1998	3.5	5.0	4.2
1999	3.6	5.6	4.4
2000	3.4	6.6	4.5
2001	3.6	5.4	4.4
2002	3.1	5.3	4.2
2003	3.4	4.8	4.1
2004	3.2	6.7	4.4
2005	3.2	4.7	4.0
2006	3.3	4.4	4.0
2007	3.1	5.1	4.2
2008	3.2	4.5	3.8
2009	3.3	4.5	3.9
2010	3.0	4.4	3.9

(a) TLD locations initiated in 1985 as required by the new Technical Specifications. Includes TLD numbers 88, 89, 90, 91, 92, 93, 94, and 95.

(b) No data available (not required prior to 1985)

TABLE 7-20

HISTORICAL ENVIRONMENTAL SAMPLE DATA ENVIRONMENTAL TLD (SPECIAL INTEREST) [a] [b]

	DOSE (mrem per standard month)		
YEAR	MIN.	MAX.	MEAN
1985[c]	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
1992	3.0	4.8	4.1
1993	3.2	5.8	4.5
1994	2.9	4.8	4.0
1995	3.4	4.9	4.3
1996	3.2	5.3	4.2
1997	3.5	5.4	4.5
1998	3.7	4.9	4.3
1999	3.6	5.5	4.4
2000	3.6	6.3	4.5
2001	3.8	5.0	4.3
2002	3.5	4.7	4.1
2003	3.4	5.0	4.2
2004	3.0	5.9	4.2
2005	3.4	4.7	3.9
2006	3.5	4.6	4.0
2007	3.0	5.1	4.2
2008	3.1	4.6	3.9
2009	3.1	4.5	3.8
2010	3.2	4.7	3.8

(a) TLD locations initiated in 1985 as required by the new Technical Specifications. TLD's included are numbers 15, 56, 58, 96, 97 and 98.

(b) TLD locations include critical residences and populated areas near the site.

(c) Not required prior to 1985.

TABLE 7-21

HISTORICAL ENVIRONMENTAL SAMPLE DATA
ENVIRONMENTAL TLD (ON-SITE INDICATOR) [(a)]

	DOSE (mrem per standard month)		
YEAR	MIN.	MAX.	MEAN
1969	(b)	(b)	(b)
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
1992	3.2	5.6	4.3
1993	3.1	13.6	5.2
1994	2.8	14.3	5.1
1995	3.5	28.6	6.2
1996	3.1	32.6	6.4
1997	3.5	28.8	7.7
1998	3.6	28.8	6.2
1999	3.3	28.4	6.6
2000	3.7	16.5	5.6
2001	3.8	14.5	5.6
2002	3.5	13.6	5.3
2003	3.2	12.9	5.3
2004	3.3	13.2	5.4
2005	3.4	14.1	5.4
2006	3.5	14.4	5.3
2007	3.2	14.8	5.6
2008	3.2	13.8	5.2
2009	3.1	13.6	4.9
2010	3.3	13.3	4.8

(a) 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 - 2010). Locations are existing or previous on-site environmental air monitoring locations.

(b) No data available.

TABLE 7-22

HISTORICAL ENVIRONMENTAL SAMPLE DATA
ENVIRONMENTAL TLD (OFF-SITE INDICATOR) [(a)]

	DOSE (mrem per standard month)		
YEAR	MIN.	MAX.	MEAN
1969	(b)	(b)	(b)
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
1992	3.1	5.2	4.1
1993	3.2	5.6	4.3
1994	3.0	5.0	4.1
1995	3.9	5.7	4.4
1996	3.3	5.5	4.1
1997	3.7	6.2	4.7
1998	3.9	5.6	4.4
1999	3.8	7.1	4.6
2000	3.8	7.3	4.6
2001	3.7	5.9	4.5
2002	3.6	5.5	4.4
2003	3.1	5.5	4.4
2004	3.2	6.5	4.5
2005	3.6	5.1	4.2
2006	3.9	5.3	4.2
2007	3.4	5.8	4.5
2008	3.3	5.1	4.1
2009	3.3	4.8	3.9
2010	3.5	4.6	3.8

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

TABLE 7-23

HISTORICAL ENVIRONMENTAL SAMPLE DATA
MILK (CONTROL) [a]

	Cs-137 (pCi/liter)			I-131 (pCi/liter)		
YEAR	MIN.	MAX.	MEAN	MIN.	MAX.	MEAN
1976	(b)	(b)	(b)	(b)	(b)	(b)
1977	(b)	(b)	(b)	(b)	(b)	(b)
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
1992	LLD	LLD	LLD	LLD	LLD	LLD
1993	LLD	LLD	LLD	LLD	LLD	LLD
1994	LLD	LLD	LLD	LLD	LLD	LLD
1995	LLD	LLD	LLD	LLD	LLD	LLD
1996	LLD	LLD	LLD	LLD	LLD	LLD
1997	LLD	LLD	LLD	LLD	LLD	LLD
1998	LLD	LLD	LLD	LLD	LLD	LLD
1999	LLD	LLD	LLD	LLD	LLD	LLD
2000	LLD	LLD	LLD	LLD	LLD	LLD
2001	LLD	LLD	LLD	LLD	LLD	LLD
2002	LLD	LLD	LLD	LLD	LLD	LLD
2003	LLD	LLD	LLD	LLD	LLD	LLD
2004	LLD	LLD	LLD	LLD	LLD	LLD
2005	LLD	LLD	LLD	LLD	LLD	LLD
2006	LLD	LLD	LLD	LLD	LLD	LLD
2007	LLD	LLD	LLD	LLD	LLD	LLD
2008	LLD	LLD	LLD	LLD	LLD	LLD
2009	LLD	LLD	LLD	LLD	LLD	LLD
2010	LLD	LLD	LLD	LLD	LLD	LLD

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

TABLE 7-24

HISTORICAL ENVIRONMENTAL SAMPLE DATA
MILK (INDICATOR) [a]

	Cs-137 (pCi/liter)			I-131 (pCi/liter)		
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
1992	LLD	LLD	LLD	LLD	LLD	LLD
1993	LLD	LLD	LLD	LLD	LLD	LLD
1994	LLD	LLD	LLD	LLD	LLD	LLD
1995	LLD	LLD	LLD	LLD	LLD	LLD
1996	LLD	LLD	LLD	LLD	LLD	LLD
1997	LLD	LLD	LLD	0.50	0.50	0.50
1998	LLD	LLD	LLD	LLD	LLD	LLD
1999	LLD	LLD	LLD	LLD	LLD	LLD
2000	LLD	LLD	LLD	LLD	LLD	LLD
2001	LLD	LLD	LLD	LLD	LLD	LLD
2002	LLD	LLD	LLD	LLD	LLD	LLD
2003	LLD	LLD	LLD	LLD	LLD	LLD
2004	LLD	LLD	LLD	LLD	LLD	LLD
2005	LLD	LLD	LLD	LLD	LLD	LLD
2006	LLD	LLD	LLD	LLD	LLD	LLD
2007	LLD	LLD	LLD	LLD	LLD	LLD
2008	LLD	LLD	LLD	LLD	LLD	LLD
2009	LLD	LLD	LLD	LLD	LLD	LLD
2010	LLD	LLD	LLD	LLD	LLD	LLD

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

TABLE 7-25

HISTORICAL ENVIRONMENTAL SAMPLE DATA
FOOD PRODUCTS (CONTROL) [a]

	Cs-137 (pCi/g (wet))		
YEAR	MIN.	MAX.	MEAN
1980[b]	0.02	0.02	0.02
1981	LLD	LLD	LLD
1982	LLD	LLD	LLD
1983	LLD	LLD	LLD
1984	LLD	LLD	LLD
1985[c]	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
1992	LLD	LLD	LLD
1993	0.007	0.007	0.007
1994	LLD	LLD	LLD
1995	LLD	LLD	LLD
1996	LLD	LLD	LLD
1997	LLD	LLD	LLD
1998	LLD	LLD	LLD
1999	LLD	LLD	LLD
2000	LLD	LLD	LLD
2001	LLD	LLD	LLD
2002	LLD	LLD	LLD
2003	LLD	LLD	LLD
2004	LLD	LLD	LLD
2005	LLD	LLD	LLD
2006	LLD	LLD	LLD
2007	LLD	LLD	LLD
2008	LLD	LLD	LLD
2009	LLD	LLD	LLD
2010	LLD	LLD	LLD

(a) Location was an available food product sample location in a least prevalent wind direction greater than ten miles from the site.
(b) Data comprised of broadleaf and non-broadleaf vegetation (1980 – 1984, 2007 - 2009).
(c) Data comprised of broadleaf vegetation only (1985 – 2006 and 2010).

TABLE 7-26

HISTORICAL ENVIRONMENTAL SAMPLE DATA
FOOD PRODUCTS (INDICATOR) [(a)]

	Cs-137 (pCi/g (wet))		
YEAR	MIN.	MAX.	MEAN
1976[(b)]	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[(c)]	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
1992	LLD	LLD	LLD
1993	LLD	LLD	LLD
1994	0.004	0.011	0.008
1995	0.010	0.012	0.011
1996	LLD	LLD	LLD
1997	0.012	0.012	0.012
1998	LLD	LLD	LLD
1999	0.008	0.008	0.008
2000	LLD	LLD	LLD
2001	LLD	LLD	LLD
2002	LLD	LLD	LLD
2003	LLD	LLD	LLD
2004	LLD	LLD	LLD
2005	LLD	LLD	LLD
2006	LLD	LLD	LLD
2007	LLD	LLD	LLD
2008	LLD	LLD	LLD
2009	LLD	LLD	LLD
2010	LLD	LLD	LLD

(a) Indicator locations were available downwind locations within ten miles of the site and with high radionuclide deposition potential.
(b) Data comprised of broadleaf and non-broadleaf vegetation (1976 – 1984, 2007 - 2009).
(c) Data comprised of broadleaf vegetation only (1985 – 2006 and 2010).

8.0 QUALITY ASSURANCE / QUALITY CONTROL PROGRAM

8.1 PROGRAM DESCRIPTION

The Offsite Dose Calculation Manuals (ODCM), for Nine Mile Point (NMP1) and Nine Mile Point (NMP2), Part II, Section 4.0 requires that the licensee participate in an Interlaboratory Comparison Program. The Interlaboratory Comparison Program shall include sample media for which samples are routinely collected and for which comparison samples are commercially available. Participation in an Interlaboratory Comparison Program ensures that independent checks on the precision and accuracy of the measurement of radioactive material in the environmental samples are performed as part of the Quality Assurance Program for environmental monitoring. To fulfill the requirement for an Interlaboratory Comparison Program, the James A. FitzPatrick Nuclear Power Plant (JAFNPP) Environmental Laboratory has engaged the services of Eckert & Ziegler Analytics, Incorporated in Atlanta, Georgia (Analytics).

Analytics supplies sample media as blind sample spikes, which contain certified levels of radioactivity unknown to the analysis laboratory. These samples are prepared and analyzed by the JAFNPP Environmental Laboratory using standard laboratory procedures. Analytics issues a statistical summary report of the results. The JAFNPP Environmental Laboratory uses predetermined acceptance criteria methodology for evaluating the laboratory's performance.

The JAFNPP Environmental Laboratory also analyzes laboratory blanks. The analysis of laboratory blanks provides a means to detect and measure radioactive contamination of analytical samples. The analysis of analytical blanks also provides information on the adequacy of background subtraction. Laboratory blank results are analyzed using control charts.

8.2 PROGRAM SCHEDULE

SAMPLE MEDIA	LABORATORY ANALYSIS	SAMPLE PROVIDER ANALYTICS
Water	Gross Beta	3
Water	Tritium	5
Water	I-131	4
Water	Mixed Gamma	4
Air	Gross Beta	3
Air	I-131	4
Air	Mixed Gamma	2
Milk	I-131	3
Milk	Mixed Gamma	3
Soil	Mixed Gamma	1
Vegetation	Mixed Gamma	2
TOTAL SAMPLE INVENTORY		**34**

8.3 ACCEPTANCE CRITERIA

Each sample result is evaluated to determine the accuracy and precision of the laboratory's analysis result. The sample evaluation method is discussed below.

8.3.1 SAMPLE RESULTS EVALUATION

Samples provided by Analytics are evaluated using what is specified as the NRC method. This method is based on the calculation of the ratio of results reported by the participating laboratory (QC result) to the Vendor Laboratory Known value (reference result).

An Environmental Laboratory analytical result is evaluated using the following calculation:

The value for the error resolution is calculated.

$$\text{The error resolution} = \frac{\text{Reference Result}}{\text{Reference Results Error (1 sigma)}}$$

Using the appropriate row under the Error Resolution column in Table 8-1 below, a corresponding Ratio of Agreement interval is given.

The value for the ratio is then calculated.

$$\text{Ratio of Agreement} = \frac{\text{QC Result}}{\text{Reference Result}}$$

If the value falls within the agreement interval, the result is acceptable.

TABLE 8-1
Ratio of Agreement

ERROR RESOLUTION	RATIO OF AGREEMENT
< 4	No Comparison
4 to 7	0.5 to 2.0
8 to 15	0.6 to 1.66
16 to 50	0.75 to 1.33
51 to 200	0.8 to 1.25
>200	0.85 to 1.18

This acceptance test is generally referred to as the "NRC" method. The acceptance criteria is contained in Procedure EN-CY-102 (JAFNPP). The NRC method generally results in an acceptance range of approximately ± 25% of the Known value when applied to sample results from the Eckert & Ziegler Analytics Interlaboratory Comparison Program. This method is used as the procedurally required assessment method and requires the generation of a deviation from QA/QC program report when results are unacceptable.

8.4 PROGRAM RESULTS SUMMARY

The Interlaboratory Comparison Program numerical results are provided on Table 8-2.

8.4.1 ECKERT & ZIEGLER ANALYTICS QA SAMPLES RESULTS

Thirty-four QA blind spike samples were analyzed as part of Analytics 2010 Interlaboratory Comparison Program. The following sample media were evaluated as part of the comparison program.

- Air Charcoal Cartridge: I-131
- Air Particulate Filter: Mixed Gamma Emitters, Gross Beta
- Water: I-131, Mixed Gamma Emitters, Tritium, Gross Beta
- Soil: Mixed Gamma Emitters
- Milk: I-131, Mixed Gamma Emitters
- Vegetation: Mixed Gamma Emitters

The JAF Environmental Laboratory performed 129 individual analyses on the 34 QA samples. Of the 129 analyses performed, 129 were in agreement using the NRC acceptance criteria for a 100% agreement ratio.

There were no nonconformities in the 2010 program.

TABLE 8-2
INTERLABORATORY INTERCOMPARISON PROGRAM
Gross Beta Analysis of Air Particulate Filter

DATE	SAMPLE ID NO.	MEDIUM	ANALYSIS	JAF ELAB RESULTS pCi ±1 sigma			REFERENCE LAB* pCi ±1 sigma			RATIO (1)	
06/17/2010	E7090-05	Filter	GROSS BETA	8.61E+01	±	2.30E+00	8.04E+01	±	1.34E+00	1.05	A
				8.15E+01	±	2.24E+00					
				8.63E+01	±	2.30E+00					
				Mean = 8.46E+01	±	1.31E+00					
06/17/2010	E7097-09	Filter	GROSS BETA	5.99E+01	±	1.92E+00	5.39E+01	±	9.01E-01	1.10	A
				5.89E+01	±	1.91E+00					
				5.98E+01	±	1.92E+00					
				Mean = 5.95E+01	±	1.11E+00					
12/09/2010	E7354-05	Filter	GROSS BETA	9.69E+01	±	1.39E+00	8.92E+01	±	1.49E+00	1.07	A
				9.46E+01	±	1.38E+00					
				9.39E+01	±	1.37E+00					
				Mean = 9.51E+01	±	7.98E-01					

(1) Ratio = Reported/Analytics.
* Sample provided by Analytics, Inc.
A=Acceptable
U=Unacceptable

TABLE 8-2 (Continued)
INTERLABORATORY INTERCOMPARISON PROGRAM
Tritium Analysis of Water

DATE	SAMPLE ID NO.	MEDIUM	ANALYSIS	JAF ELAB RESULTS pCi/liter ±1 sigma	REFERENCE LAB* pCi/liter ±1 sigma	RATIO (1)
3/18/2010	E7020-05	Water	H-3	3.48E+03 ± 1.53E+02	3.41E+03 ± 5.70E+01	1.03 A
				3.57E+03 ± 1.53E+02		
				3.53E+03 ± 1.53E+02		
				Mean = 3.53E+03 ± 8.83E+01		
06/17/2010	E7089-05	Water	H-3	1.14E+03 ± 1.33E+02	9.58E+02 ± 1.60E+01	1.13 A
				1.13E+03 ± 1.32E+02		
				1.04E+03 ± 1.32E+02		
				1.00E+03 ± 1.29E+02		
				1.07E+03 ± 1.30E+02		
				1.13E+03 ± 1.30E+02		
				Mean = 1.09E+03 ± 5.35E+01		
9/16/2010	E7187-05	Water	H-3	8.82E+02 ± 1.31E+02	8.96E+02 ± 1.50E+01	1.01 A
				8.54E+02 ± 1.31E+02		
				9.74E+02 ± 1.32E+02		
				Mean = 9.03E+02 ± 7.58E+01		
12/9/2010	E7329-09	Water	H-3	1.00E+04 ± 2.04E+02	9.96E+03 ± 1.66E+02	1.00 A
				1.00E+04 ± 2.04E+02		
				9.91E+03 ± 2.04E+02		
				Mean = 9.98E+03 ± 1.18E+02		
12/9/2010	E7330-09	Water	H-3	9.78E+03 ± 2.03E+02	9.96E+03 ± 1.66E+02	0.99 A
				9.83E+03 ± 2.03E+02		
				1.01E+04 ± 2.05E+02		
				Mean = 9.90E+03 ± 1.18E+02		

(1) Ratio = Reported/Analytics.
* Sample provided by Analytics, Inc.
A=Acceptable
U=Unacceptable

TABLE 8-2 (Continued)
INTERLABORATORY INTERCOMPARISON PROGRAM
Gross Beta Analysis of Water

DATE	SAMPLE ID NO.	MEDIUM	ANALYSIS	JAF ELAB RESULTS pCi/liter ±1 sigma				REFERENCE LAB* pCi/liter ±1 sigma			RATIO (1)	
03/18/2010	E7023-05	Water	GROSS BETA		2.58E+02	±	2.50E+00	2.60E+02	±	4.35E+00	0.98	A
					2.57E+02	±	2.50E+00					
					2.54E+02	±	2.50E+00					
				Mean =	2.56E+02	±	1.44E+00					
06/17/2010	E7095-05	Water	GROSS BETA		1.78E+02	±	2.10E+00	1.88E+02	±	3.14E+00	0.95	A
					1.78E+02	±	2.10E+00					
					1.79E+02	±	2.10E+00					
				Mean =	1.78E+02	±	1.21E+00					
09/16/2010	E7192-05	Water	GROSS BETA		2.30E+02	±	2.40E+00	2.18E+02	±	3.64E+00	1.04	A
					2.28E+02	±	2.40E+00					
					2.26E+02	±	2.40E+00					
					2.25E+02	±	2.40E+00					
				Mean =	2.27E+02	±	1.20E+00					

(1) Ratio = Reported/Analytics.
* Sample provided by Analytics, Inc.
A=Acceptable
U=Unacceptable

TABLE 8-2 (Continued)
INTERLABORATORY INTERCOMPARISON PROGRAM
I-131 Gamma Analysis of Air Charcoal

DATE	SAMPLE ID NO.	MEDIUM	ANALYSIS	JAF ELAB RESULTS pCi ±1 sigma				REFERENCE LAB* pCi ±1 sigma			RATIO (1)	
3/18/2010	E6993-09	Air			8.62E+01	±	2.23E+00					
					8.27E+01	±	2.88E+00					
			I-131		8.10E+01	±	1.81E+00	8.52E+01	±	1.42E+00	0.99	A
					8.90E+01	±	3.65E+00					
				Mean =	8.47E+01	±	1.37E+00					
06/17/2010	E7093-05	Air			7.94E+01	±	1.45E+00					
			I-131		7.64E+01	±	2.98E+00	7.98E+01	±	1.33E+00	0.99	A
					8.08E+01	±	3.07E+00					
				Mean =	7.89E+01	±	1.51E+00					
9/16/2010	E7191-05	Air			6.01E+01	±	1.25E+00					
			I-131		6.39E+01	±	2.24E+00	6.00E+01	±	1.00E+00	1.03	A
					6.06E+01	±	2.00E+00					
				Mean =	6.15E+01	±	1.08E+00					
9/16/2010	E7183-09	Air			6.09E+01	±	2.23E+00					
			I-131		6.19E+01	±	2.83E+00	5.97E+01	±	9.97E-01	1.03	A
					6.08E+01	±	2.98E+00					
				Mean =	6.12E+01	±	1.56E+00					

(1) Ratio = Reported/Analytics.
* Sample provided by Analytics, Inc.
A=Acceptable
U=Unacceptable

TABLE 8-2 (Continued)
INTERLABORATORY INTERCOMPARISON PROGRAM
Gamma Analysis of Water

DATE	SAMPLE ID NO.	MEDIUM	ANALYSIS	JAF ELAB RESULTS pCi/liter ±1 sigma	REFERENCE LAB* pCi/liter ±1 sigma	RATIO (1)	
3/18/2010	E7021-05	Water	Ce-141	2.73E+02 ± 7.49E+00	2.63E+02 ± 4.40E+00	1.04	A
				2.71E+02 ± 3.53E+00			
				2.75E+02 ± 7.24E+00			
				Mean = 2.73E+02 ± 3.67E+00			
			Cr-51	3.42E+02 ± 2.97E+01	3.64E+02 ± 6.08E+00	1.03	A
				3.84E+02 ± 1.29E+01			
				3.98E+02 ± 2.76E+01			
				Mean = 3.75E+02 ± 1.42E+01			
			Cs-134	2.03E+02 ± 5.40E+00	1.79E+02 ± 2.99E+00	1.09	A
				1.91E+02 ± 5.85E+00			
				1.91E+02 ± 3.29E+00			
				Mean = 1.95E+02 ± 2.87E+00			
			Cs-137	1.64E+02 ± 5.04E+00	1.59E+02 ± 2.66E+00	1.01	A
				1.56E+02 ± 5.67E+00			
				1.60E+02 ± 2.90E+00			
				Mean = 1.60E+02 ± 2.71E+00			
			Co-58	1.47E+02 ± 4.50E+00	1.44E+02 ± 2.40E+00	1.03	A
				1.46E+02 ± 5.39E+00			
				1.51E+02 ± 2.73E+00			
				Mean = 1.48E+02 ± 2.51E+00			
			Mn-54	2.24E+02 ± 5.62E+00	2.09E+02 ± 3.49E+00	1.07	A
				2.24E+02 ± 6.45E+00			
				2.22E+02 ± 3.37E+00			
				Mean = 2.23E+02 ± 3.07E+00			
			Fe-59	1.48E+02 ± 5.43E+00	1.38E+02 ± 2.31E+00	1.09	A
				1.54E+02 ± 6.52E+00			
				1.52E+02 ± 3.26E+00			
				Mean = 1.51E+02 ± 3.03E+00			
			Zn-65	2.92E+02 ± 1.02E+01	2.56E+02 ± 4.27E+00	1.09	A
				2.66E+02 ± 1.14E+01			
				2.77E+02 ± 5.88E+00			
				Mean = 2.79E+02 ± 5.45E+00			
			Co-60	1.85E+02 ± 3.89E+00	1.85E+02 ± 3.08E+00	1.03	A
				1.91E+02 ± 4.64E+00			
				1.92E+02 ± 2.41E+00			
				Mean = 1.90E+02 ± 2.17E+00			
			I-131**	7.11E+01 ± 7.18E-01	7.22E+01 ± 1.21E+00	1.02	A
				7.53E+01 ± 1.91E+00			
				7.43E+01 ± 1.79E+00			
				Mean = 7.36E+01 ± 9.05E-01			

(1) Ratio = Reported/Analytics.
* Sample provided by Analytics, Inc.
** Result determined by Resin Extraction/Gamma Spectral Analysis.
A=Acceptable
U=Unacceptable

TABLE 8-2 (Continued)
INTERLABORATORY INTERCOMPARISON PROGRAM
Gamma Analysis of Water

DATE	SAMPLE ID NO.	MEDIUM	ANALYSIS	JAF ELAB RESULTS pCi/liter ±1 sigma				REFERENCE LAB* pCi/liter ±1 sigma	RATIO (1)	
6/17/2010	E7096-09	Water	Ce-141		1.70E+02	±	3.17E+00	1.61E+02 ± 2.68E+00	1.07	A
					1.74E+02	±	2.83E+00			
					1.74E+02	±	5.76E+00			
				Mean =	1.73E+02	±	2.39E+00			
			Cr-51		5.26E+02	±	1.51E+01	4.94E+02 ± 8.25E+00	0.99	A
					5.12E+02	±	1.62E+01			
					4.31E+02	±	2.96E+01			
				Mean =	4.90E+02	±	1.23E+01			
			Cs-134		2.01E+02	±	2.33E+00	1.83E+02 ± 3.06E+00	1.08	A
					1.92E+02	±	2.77E+00			
					2.02E+02	±	5.04E+00			
				Mean =	1.98E+02	±	2.07E+00			
			Cs-137		2.26E+02	±	2.44E+00	2.18E+02 ± 3.65E+00	1.04	A
					2.22E+02	±	2.74E+00			
					2.30E+02	±	5.25E+00			
				Mean =	2.26E+02	±	2.13E+00			
			Co-58		1.57E+02	±	2.11E+00	1.47E+02 ± 2.46E+00	1.07	A
					1.55E+02	±	2.49E+00			
					1.61E+02	±	4.68E+00			
				Mean =	1.58E+02	±	1.90E+00			
			Mn-54		2.71E+02	±	2.63E+00	2.46E+02 ± 4.11E+00	1.10	A
					2.74E+02	±	3.01E+00			
					2.67E+02	±	5.56E+00			
				Mean =	2.71E+02	±	2.28E+00			
			Fe-59		1.89E+02	±	2.77E+00	1.73E+02 ± 2.89E+00	1.08	A
					1.91E+02	±	3.27E+00			
					1.80E+02	±	5.96E+00			
				Mean =	1.87E+02	±	2.45E+00			
			Zn-65		3.29E+02	±	4.42E+00	3.00E+02 ± 5.00E+00	1.11	A
					3.34E+02	±	5.42E+00			
					3.38E+02	±	1.01E+01			
				Mean =	3.34E+02	±	4.10E+00			
			Co-60		2.99E+02	±	2.06E+00	2.86E+02 ± 4.78E+00	1.05	A
					2.99E+02	±	2.44E+00			
					3.00E+02	±	4.55E+00			
				Mean =	2.99E+02	±	1.85E+00			
			I-131**		8.15E+01	±	2.25E+00	7.89E+01 ± 1.32E+00	1.03	A
					8.24E+01	±	2.76E+00			
					7.94E+01	±	4.13E+00			
				Mean =	8.11E+01	±	1.36E+00			

(1) Ratio = Reported/Analytics.
* Sample provided by Analytics, Inc.
** Result determined by Resin Extraction/Gamma Spectral Analysis.
A=Acceptable
U=Unacceptable

TABLE 8-2 (Continued)
INTERLABORATORY INTERCOMPARISON PROGRAM
Gamma Analysis of Water

DATE	SAMPLE ID NO.	MEDIUM	ANALYSIS	JAF ELAB RESULTS pCi/liter ±1 sigma				REFERENCE LAB* pCi/liter ±1 sigma			RATIO (1)	
9/16/2010	E7188-05	Water	Ce-141		1.77E+02	±	5.28E+00	1.65E+02	±	2.76E+00	1.09	A
					1.80E+02	±	5.73E+00					
					1.81E+02	±	3.26E+00					
				Mean =	1.79E+02	±	2.82E+00					
			Cr-51		3.44E+02	±	2.19E+01	2.97E+02	±	4.95E+00	1.06	A
					3.07E+02	±	2.85E+01					
					2.96E+02	±	1.48E+01					
				Mean =	3.16E+02	±	1.30E+01					
			Cs-134		1.22E+02	±	3.92E+00	1.18E+02	±	1.97E+00	1.05	A
					1.23E+02	±	5.49E+00					
					1.27E+02	±	2.77E+00					
				Mean =	1.24E+02	±	2.43E+00					
			Cs-137		1.26E+02	±	3.82E+00	1.20E+02	±	2.00E+00	1.05	A
					1.28E+02	±	5.01E+00					
					1.25E+02	±	2.61E+00					
				Mean =	1.26E+02	±	2.27E+00					
			Co-58		1.03E+02	±	3.43E+00	9.35E+01	±	1.56E+00	1.09	A
					1.02E+02	±	4.76E+00					
					1.02E+02	±	2.29E+00					
				Mean =	1.02E+02	±	2.10E+00					
			Mn-54		1.75E+02	±	4.26E+00	1.52E+02	±	2.53E+00	1.11	A
					1.70E+02	±	5.72E+00					
					1.62E+02	±	2.88E+00					
				Mean =	1.69E+02	±	2.56E+00					
			Fe-59		1.36E+02	±	4.41E+00	1.16E+02	±	1.93E+00	1.13	A
					1.31E+02	±	6.05E+00					
					1.25E+02	±	3.16E+00					
				Mean =	1.31E+02	±	2.71E+00					
			Zn-65		2.98E+02	±	8.60E+00	2.59E+02	±	4.32E+00	1.11	A
					2.99E+02	±	1.18E+01					
					2.69E+02	±	5.86E+00					
				Mean =	2.89E+02	±	5.24E+00					
			Co-60		2.31E+02	±	3.65E+00	2.17E+02	±	3.62E+00	1.06	A
					2.29E+02	±	4.92E+00					
					2.28E+02	±	2.54E+00					
				Mean =	2.29E+02	±	2.21E+00					
			I-131**		6.90E+01	±	1.37E+00	6.44E+01	±	1.08E+00	1.03	A
					6.42E+01	±	1.45E+00					
					6.61E+01	±	9.53E-01					
				Mean =	6.64E+01	±	7.37E-01					

(1) Ratio = Reported/Analytics.

* Sample provided by Analytics, Inc.

** Result determined by Resin Extraction/Gamma Spectral Analysis.

A=Acceptable

U=Unacceptable

TABLE 8-2 (Continued)
INTERLABORATORY INTERCOMPARISON PROGRAM
Gamma Analysis of Water

DATE	SAMPLE ID NO.	MEDIUM	ANALYSIS	JAF ELAB RESULTS pCi/liter ±1 sigma				REFERENCE LAB* pCi/liter ±1 sigma			RATIO (1)	
12/9/2010	E7331-09	Water			4.91E+02	±	2.87E+01					
					5.43E+02	±	3.76E+01					
			Cr-51		5.16E+02	±	2.87E+01	4.55E+02	±	7.59E+00	1.10	A
					4.58E+02	±	1.97E+01					
				Mean =	5.02E+02	±	1.47E+01					
					1.69E+02	±	5.25E+00					
					1.67E+02	±	6.23E+00					
			Cs-134		1.65E+02	±	4.60E+00	1.57E+02	±	2.62E+00	1.07	A
					1.74E+02	±	3.22E+00					
				Mean =	1.69E+02	±	2.47E+00					
					1.75E+02	±	4.94E+00					
					1.72E+02	±	5.94E+00					
			Cs-137		1.92E+02	±	4.68E+00	1.86E+02	±	3.10E+00	0.97	A
					1.80E+02	±	3.30E+00					
				Mean =	1.80E+02	±	2.40E+00					
					1.00E+02	±	4.24E+00					
					9.84E+01	±	4.80E+00					
			Co-58		8.82E+01	±	3.81E+00	9.00E+01	±	1.50E+00	1.06	A
					9.50E+01	±	2.65E+00					
				Mean =	9.54E+01	±	1.98E+00					
					1.27E+02	±	4.46E+00					
					1.28E+02	±	5.50E+00					
			Mn-54		1.35E+02	±	4.23E+00	1.19E+02	±	1.99E+00	1.09	A
					1.29E+02	±	3.09E+00					
				Mean =	1.30E+02	±	2.20E+00					
					1.45E+02	±	5.91E+00					
					1.52E+02	±	7.49E+00					
			Fe-59		1.63E+02	±	5.62E+00	1.31E+02	±	2.18E+00	1.16	A
					1.48E+02	±	3.96E+00					
				Mean =	1.52E+02	±	2.94E+00					
					1.84E+02	±	8.71E+00					
					1.98E+02	±	1.17E+01					
			Zn-65		1.78E+02	±	8.42E+00	1.74E+02	±	2.90E+00	1.08	A
					1.94E+02	±	5.99E+00					
				Mean =	1.89E+02	±	4.47E+00					
					3.10E+02	±	4.96E+00					
					3.17E+02	±	6.06E+00					
			Co-60		3.09E+02	±	4.57E+00	3.00E+02	±	5.01E+00	1.04	A
					3.11E+02	±	3.28E+00					
				Mean =	3.12E+02	±	2.41E+00					
					1.02E+02	±	4.19E+00					
			I-131**		1.02E+02	±	3.81E+00	1.00E+02	±	1.67E+00	1.01	A
					9.89E+01	±	3.51E+00					
				Mean =	1.01E+02	±	2.22E+00					

(1) Ratio = Reported/Analytics.
* Sample provided by Analytics, Inc.
** Result determined by Resin Extraction/Gamma Spectral Analysis.
A=Acceptable
U=Unacceptable

TABLE 8-2 (Continued)
INTERLABORATORY INTERCOMPARISON PROGRAM
Gamma Analysis of Milk

DATE	SAMPLE ID NO.	MEDIUM	ANALYSIS	JAF ELAB RESULTS pCi/liter ±1 sigma	REFERENCE LAB* pCi/liter ±1 sigma	RATIO (1)	
3/18/2010	E6994-09	MILK	Ce-141	2.68E+02 ± 5.38E+00	2.61E+02 ± 4.36E+00	1.04	A
				2.57E+02 ± 5.37E+00			
				2.68E+02 ± 1.13E+01			
				2.89E+02 ± 1.22E+01			
				Mean = 2.70E+02 ± 4.58E+00			
			Cr-51	3.55E+02 ± 2.53E+01	3.61E+02 ± 6.03E+00	0.93	A
				3.72E+02 ± 2.34E+01			
				3.55E+02 ± 5.27E+01			
				2.65E+02 ± 5.45E+01			
				Mean = 3.37E+02 ± 2.08E+01			
			Cs-134	1.79E+02 ± 3.95E+00	1.78E+02 ± 2.97E+00	1.00	A
				1.79E+02 ± 4.62E+00			
				1.88E+02 ± 9.01E+00			
				1.68E+02 ± 9.01E+00			
				Mean = 1.78E+02 ± 3.53E+00			
			Cs-137	1.60E+02 ± 3.88E+00	1.58E+02 ± 2.64E+00	1.02	A
				1.51E+02 ± 3.78E+00			
				1.64E+02 ± 8.33E+00			
				1.68E+02 ± 8.03E+00			
				Mean = 1.61E+02 ± 3.19E+00			
			Co-58	1.44E+02 ± 4.03E+00	1.43E+02 ± 2.38E+00	1.00	A
				1.39E+02 ± 3.85E+00			
				1.47E+02 ± 8.42E+00			
				1.43E+02 ± 7.40E+00			
				Mean = 1.43E+02 ± 3.13E+00			
			Mn-54	2.15E+02 ± 4.39E+00	2.07E+02 ± 3.46E+00	1.04	A
				2.22E+02 ± 4.68E+00			
				2.24E+02 ± 9.49E+00			
				2.01E+02 ± 8.96E+00			
				Mean = 2.15E+02 ± 3.64E+00			
			Fe-59	1.58E+02 ± 5.27E+00	1.37E+02 ± 2.29E+00	1.08	A
				1.44E+02 ± 5.27E+00			
				1.66E+02 ± 1.03E+01			
				1.25E+02 ± 9.91E+00			
				Mean = 1.48E+02 ± 4.03E+00			
			Zn-65	2.67E+02 ± 8.17E+00	2.54E+02 ± 4.24E+00	1.05	A
				2.75E+02 ± 8.77E+00			
				2.56E+02 ± 1.73E+01			
				2.70E+02 ± 1.75E+01			
				Mean = 2.67E+02 ± 6.84E+00			
			Co-60	1.79E+02 ± 3.25E+00	1.83E+02 ± 3.06E+00	0.99	A
				1.83E+02 ± 3.41E+00			
				1.81E+02 ± 6.73E+00			
				1.82E+02 ± 6.34E+00			
				Mean = 1.81E+02 ± 2.59E+00			
			I-131**	6.62E+01 ± 7.99E+00	7.40E+01 ± 1.24E+00	0.95	A
				7.40E+01 ± 4.47E+00			
				6.96E+01 ± 1.09E+01			
				Mean = 6.99E+01 ± 3.56E+00			

(1) Ratio = Reported/Analytics.
* Sample provided by Analytics, Inc.
** Result determined by Resin Extraction/Gamma Spectral Analysis.
A=Acceptable
U=Unacceptable

TABLE 8-2 (Continued)
INTERLABORATORY INTERCOMPARISON PROGRAM
Gamma Analysis of Milk

DATE	SAMPLE ID NO.	MEDIUM	ANALYSIS	JAF ELAB RESULTS pCi/liter ±1 sigma				REFERENCE LAB* pCi/liter ±1 sigma			RATIO (1)	
06/17/2010	E7091-05	MILK	Ce-141		1.25E+02	±	6.24E+00	1.10E+02	±	1.84E+00	1.08	A
					1.12E+02	±	3.98E+00					
					1.20E+02	±	3.14E+00					
				Mean =	1.19E+02	±	2.68E+00					
			Cr-51		3.59E+02	±	2.85E+01	3.39E+02	±	5.66E+00	1.03	A
					3.27E+02	±	2.01E+01					
					3.62E+02	±	1.54E+01					
				Mean =	3.49E+02	±	1.27E+01					
			Cs-134		1.42E+02	±	4.64E+00	1.26E+02	±	2.10E+00	1.07	A
					1.31E+02	±	3.44E+00					
					1.32E+02	±	2.43E+00					
				Mean =	1.35E+02	±	2.09E+00					
			Cs-137		1.49E+02	±	4.82E+00	1.50E+02	±	2.51E+00	1.00	A
					1.51E+02	±	3.23E+00					
					1.48E+02	±	2.48E+00					
				Mean =	1.49E+02	±	2.10E+00					
			Co-58		1.16E+02	±	4.40E+00	1.01E+02	±	1.69E+00	1.09	A
					1.06E+02	±	3.02E+00					
					1.09E+02	±	2.34E+00					
				Mean =	1.10E+02	±	1.94E+00					
			Mn-54		1.87E+02	±	5.30E+00	1.69E+02	±	2.82E+00	1.09	A
					1.84E+02	±	3.59E+00					
					1.82E+02	±	2.67E+00					
				Mean =	1.84E+02	±	2.31E+00					
			Fe-59		1.34E+02	±	5.61E+00	1.19E+02	±	1.98E+00	1.10	A
					1.24E+02	±	4.10E+00					
					1.34E+02	±	3.04E+00					
				Mean =	1.31E+02	±	2.53E+00					
			Zn-65		2.37E+02	±	8.94E+00	2.06E+02	±	3.44E+00	1.10	A
					2.17E+02	±	6.80E+00					
					2.25E+02	±	4.84E+00					
				Mean =	2.26E+02	±	4.08E+00					
			Co-60		1.97E+02	±	4.13E+00	1.97E+02	±	3.28E+00	1.02	A
					2.05E+02	±	2.91E+00					
					2.00E+02	±	2.21E+00					
				Mean =	2.01E+02	±	1.84E+00					
			I-131		9.92E+01	±	5.23E+00	9.69E+01	±	1.62E+00	0.92	A
					9.79E+01	±	3.75E+00					
					9.89E+01	±	2.61E+00					
			I-131**		7.87E+01	±	2.26E+00					
					8.03E+01	±	2.25E+00					
					7.97E+01	±	2.65E+00					
				Mean =	8.91E+01	±	1.35E+00					

(1) Ratio = Reported/Analytics.
* Sample provided by Analytics, Inc.
** Result determined by Resin Extraction/Gamma Spectral Analysis.
A=Acceptable
U=Unacceptable

TABLE 8-2 (Continued)
INTERLABORATORY INTERCOMPARISON PROGRAM
Gamma Analysis of Milk

DATE	SAMPLE ID NO.	MEDIUM	ANALYSIS		JAF ELAB RESULTS pCi/liter ± 1 sigma			REFERENCE LAB* pCi/liter ± 1 sigma			RATIO (1)	
9/16/2010	E7190-05	MILK	Ce-141		1.35E+02	±	4.99E+00	1.30E+02	±	2.17E+00	1.05	A
					1.40E+02	±	6.52E+00					
					1.34E+02	±	2.58E+00					
					1.35E+02	±	5.26E+00					
				Mean =	1.36E+02	±	2.52E+00					
			Cr-51		2.49E+02	±	2.21E+01	2.34E+02	±	3.90E+00	0.99	A
					2.27E+02	±	2.71E+01					
					2.33E+02	±	1.05E+01					
					2.16E+02	±	2.56E+01					
				Mean =	2.31E+02	±	1.11E+01					
			Cs-134		9.92E+01	±	4.27E+00	9.30E+01	±	1.55E+00	1.03	A
					8.97E+01	±	4.93E+00					
					9.70E+01	±	1.86E+00					
					9.80E+01	±	4.44E+00					
				Mean =	9.60E+01	±	2.03E+00					
			Cs-137		9.91E+01	±	3.97E+00	9.45E+01	±	1.58E+00	1.01	A
					9.37E+01	±	4.70E+00					
					9.49E+01	±	1.85E+00					
					9.23E+01	±	4.43E+00					
				Mean =	9.50E+01	±	1.95E+00					
			Co-58		8.06E+01	±	3.62E+00	7.37E+01	±	1.23E+00	1.03	A
					7.76E+01	±	4.54E+00					
					7.55E+01	±	1.63E+00					
					7.04E+01	±	4.30E+00					
				Mean =	7.60E+01	±	1.85E+00					
			Mn-54		1.22E+02	±	4.15E+00	1.19E+02	±	1.99E+00	1.03	A
					1.18E+02	±	5.14E+00					
					1.28E+02	±	2.02E+00					
					1.24E+02	±	5.06E+00					
				Mean =	1.23E+02	±	2.14E+00					
			Fe-59		9.75E+01	±	4.86E+00	9.11E+01	±	1.52E+00	1.14	A
					1.14E+02	±	6.59E+00					
					1.03E+02	±	2.32E+00					
					1.01E+02	±	5.87E+00					
				Mean =	1.04E+02	±	2.58E+00					
			Zn-65		2.16E+02	±	8.69E+00	2.04E+02	±	3.40E+00	1.01	A
					1.79E+02	±	1.13E+01					
					2.20E+02	±	3.99E+00					
					2.12E+02	±	1.05E+01					
				Mean =	2.07E+02	±	4.54E+00					
			Co-60		1.79E+02	±	3.90E+00	1.71E+02	±	2.85E+00	1.03	A
					1.82E+02	±	4.79E+00					
					1.73E+02	±	1.78E+00					
					1.70E+02	±	4.43E+00					
				Mean =	1.76E+02	±	1.95E+00					
			I-131**		8.62E+01	±	1.61E+00	9.41E+01	±	1.57E+00	0.91	A
					8.50E+01	±	1.23E+00					
					8.61E+01	±	1.67E+00					
				Mean =	8.58E+01	±	8.75E-01					

(1) Ratio = Reported/Analytics.
* Sample provided by Analytics, Inc.
** Result determined by Resin Extraction/Gamma Spectral Analysis.
A=Acceptable
U=Unacceptable

TABLE 8-2 (Continued)
INTERLABORATORY INTERCOMPARISON PROGRAM
Gamma Analysis of Air Particulate Filter

DATE	SAMPLE ID NO.	MEDIUM	ANALYSIS	JAF ELAB RESULTS pCi ±1 sigma	REFERENCE LAB* pCi ±1 sigma	RATIO (1)	
3/18/2010	E7022-05	FILTER	Ce-141	2.08E+02 ± 3.64E+00 2.18E+02 ± 3.88E+00 2.14E+02 ± 4.19E+00 Mean = 2.13E+02 ± 2.26E+00	2.04E+02 ± 3.40E+00	1.05	A
			Cr-51	2.97E+02 ± 1.61E+01 2.57E+02 ± 1.62E+01 3.07E+02 ± 1.80E+01 Mean = 2.87E+02 ± 9.69E+00	2.81E+02 ± 4.70E+00	1.02	A
			Cs-134	1.55E+02 ± 4.98E+00 1.50E+02 ± 5.13E+00 1.48E+02 ± 5.24E+00 Mean = 1.51E+02 ± 2.95E+00	1.38E+02 ± 2.31E+00	1.09	A
			Cs-137	1.25E+02 ± 3.96E+00 1.32E+02 ± 4.21E+00 1.21E+02 ± 4.14E+00 Mean = 1.26E+02 ± 2.37E+00	1.23E+02 ± 2.05E+00	1.02	A
			Co-58	1.16E+02 ± 3.89E+00 1.17E+02 ± 4.01E+00 1.18E+02 ± 3.93E+00 Mean = 1.17E+02 ± 2.28E+00	1.11E+02 ± 1.86E+00	1.05	A
			Mn-54	1.76E+02 ± 4.64E+00 1.84E+02 ± 5.17E+00 1.77E+02 ± 4.98E+00 Mean = 1.79E+02 ± 2.85E+00	1.62E+02 ± 2.70E+00	1.10	A
			Fe-59	1.22E+02 ± 4.88E+00 1.16E+02 ± 5.13E+00 1.23E+02 ± 5.25E+00 Mean = 1.20E+02 ± 2.94E+00	1.07E+02 ± 1.78E+00	1.12	A
			Zn-65	2.31E+02 ± 8.72E+00 2.28E+02 ± 9.46E+00 2.05E+02 ± 8.99E+00 Mean = 2.21E+02 ± 5.23E+00	1.98E+02 ± 3.30E+00	1.12	A
			Co-60	1.36E+02 ± 3.50E+00 1.37E+02 ± 3.73E+00 1.43E+02 ± 3.59E+00 Mean = 1.39E+02 ± 2.08E+00	1.43E+02 ± 2.38E+00	0.97	A

(1) Ratio = Reported/Analytics.
* Sample provided by Analytics, Inc.
A=Acceptable
U=Unacceptable

TABLE 8-2 (Continued)
INTERLABORATORY INTERCOMPARISON PROGRAM
Gamma Analysis of Air Particulate Filter

DATE	SAMPLE ID NO.	MEDIUM	ANALYSIS		JAF ELAB RESULTS pCi ±1 sigma			REFERENCE LAB* pCi ±1 sigma			RATIO (1)	
9/16/2010	E7189-05	FILTER	Ce-141		1.28E+02	±	2.65E+00	1.26E+02	±	2.10E+00	1.02	A
					1.30E+02	±	2.67E+00					
					1.26E+02	±	1.38E+00					
				Mean =	1.28E+02	±	1.34E+00					
			Cr-51		2.28E+02	±	1.35E+01	2.26E+02	±	3.77E+00	1.01	A
					2.28E+02	±	1.38E+01					
					2.31E+02	±	6.90E+00					
				Mean =	2.29E+02	±	6.83E+00					
			Cs-134		1.02E+02	±	3.84E+00	8.98E+01	±	1.50E+00	1.10	A
					9.09E+01	±	3.81E+00					
					1.04E+02	±	1.68E+00					
				Mean =	9.90E+01	±	1.89E+00					
			Cs-137		8.80E+01	±	3.28E+00	9.13E+01	±	1.52E+00	0.98	A
					8.79E+01	±	3.17E+00					
					9.29E+01	±	1.47E+00					
				Mean =	8.96E+01	±	1.60E+00					
			Co-58		7.25E+01	±	2.96E+00	7.12E+01	±	1.19E+00	1.03	A
					7.27E+01	±	2.96E+00					
					7.51E+01	±	1.38E+00					
				Mean =	7.34E+01	±	1.47E+00					
			Mn-54		1.24E+02	±	3.84E+00	1.15E+02	±	1.93E+00	1.09	A
					1.25E+02	±	3.94E+00					
					1.26E+02	±	1.76E+00					
				Mean =	1.25E+02	±	1.93E+00					
			Fe-59		1.02E+02	±	4.39E+00	8.81E+01	±	1.47E+00	1.17	A
					1.05E+02	±	4.56E+00					
					1.02E+02	±	1.92E+00					
				Mean =	1.03E+02	±	2.20E+00					
			Zn-65		2.24E+02	±	8.24E+00	1.97E+02	±	3.29E+00	1.14	A
					2.22E+02	±	8.46E+00					
					2.27E+02	±	3.58E+00					
				Mean =	2.24E+02	±	4.11E+00					
			Co-60		1.70E+02	±	3.58E+00	1.65E+02	±	2.75E+00	1.02	A
					1.63E+02	±	3.54E+00					
					1.70E+02	±	1.56E+00					
				Mean =	1.68E+02	±	1.76E+00					

(1) Ratio = Reported/Analytics.
* Sample provided by Analytics, Inc.
A=Acceptable
U=Unacceptable

TABLE 8-2 (Continued)
INTERLABORATORY INTERCOMPARISON PROGRAM
Gamma Analysis of Soil

DATE	SAMPLE ID NO.	MEDIUM	ANALYSIS	JAF ELAB RESULTS pCi/g ±1 sigma				REFERENCE LAB* pCi/g ±1 sigma			RATIO (1)	
6/17/2010	E7092-05	SOIL	Ce-141		2.89E-01	±	1.03E-02	2.51E-01	±	4.19E-03	1.05	A
					2.47E-01	±	1.73E-02					
					2.33E-01	±	2.38E-02					
					2.87E-01	±	1.09E-02					
				Mean =	2.64E-01	±	8.26E-03					
			Cr-51		8.52E-01	±	5.18E-02	7.71E-01	±	1.29E-02	1.13	A
					8.56E-01	±	9.65E-02					
					9.16E-01	±	5.34E-02					
				Mean =	8.75E-01	±	4.06E-02					
			Cs-134		3.19E-01	±	7.72E-03	2.86E-01	±	4.78E-03	1.15	A
					3.23E-01	±	1.48E-02					
					3.45E-01	±	2.16E-02					
					3.29E-01	±	8.49E-03					
				Mean =	3.29E-01	±	7.15E-03					
			Cs-137		4.44E-01	±	8.48E-03	4.32E-01	±	7.21E-03	1.05	A
					4.63E-01	±	1.71E-02					
					4.52E-01	±	2.36E-02					
					4.52E-01	±	9.04E-03					
				Mean =	4.53E-01	±	7.92E-03					
			Co-58		2.54E-01	±	6.62E-03	2.30E-01	±	3.84E-03	1.08	A
					2.62E-01	±	1.44E-02					
					2.36E-01	±	2.06E-02					
					2.37E-01	±	7.68E-04					
				Mean =	2.47E-01	±	6.50E-03					
			Mn-54		4.17E-01	±	8.49E-03	3.85E-01	±	6.43E-03	1.07	A
					3.97E-01	±	1.66E-02					
					4.15E-01	±	2.33E-02					
					4.21E-01	±	8.54E-03					
				Mean =	4.13E-01	±	7.76E-03					
			Fe-59		3.01E-01	±	9.44E-03	2.70E-01	±	4.51E-03	1.09	A
					3.01E-01	±	1.97E-02					
					2.71E-01	±	2.89E-02					
					3.03E-01	±	1.02E-02					
				Mean =	2.94E-01	±	9.41E-03					
			Zn-65		5.12E-01	±	1.43E-02	4.68E-01	±	7.82E-03	1.09	A
					4.94E-01	±	2.83E-02					
					5.36E-01	±	4.23E-02					
					5.07E-01	±	1.48E-02					
				Mean =	5.12E-01	±	1.37E-02					
			Co-60		4.74E-01	±	6.60E-03	4.47E-01	±	7.46E-03	1.05	A
					4.56E-01	±	1.36E-02					
					4.78E-01	±	1.93E-02					
					4.68E-01	±	6.79E-03					
				Mean =	4.69E-01	±	6.36E-03					

(1) Ratio = Reported/Analytics.
* Sample provided by Analytics, Inc.
A=Acceptable
U=Unacceptable

TABLE 8-2 (Continued)
INTERLABORATORY INTERCOMPARISON PROGRAM
Gamma Analysis of Vegetation

DATE	SAMPLE ID NO.	MEDIUM	ANALYSIS	JAF ELAB RESULTS pCi/g ±1 sigma				REFERENCE LAB* pCi/g ±1 sigma			RATIO (1)	
6/20/2010	E7094-05	VEG	Ce-141		2.06E-01	±	9.86E-03	2.21E-01	±	3.69E-03	0.94	A
					2.03E-01	±	1.14E-02					
					2.15E-01	±	6.10E-03					
				Mean =	2.08E-01	±	5.42E-03					
			Cr-51		5.72E-01	±	4.94E-02	6.80E-01	±	1.14E-02	0.88	A
					6.32E-01	±	6.34E-02					
					6.00E-01	±	3.30E-02					
				Mean =	6.01E-01	±	2.90E-02					
			Cs-134		2.68E-01	±	9.60E-03	2.52E-01	±	4.21E-03	1.08	A
					2.66E-01	±	1.36E-02					
					2.81E-01	±	7.29E-03					
				Mean =	2.72E-01	±	6.06E-03					
			Cs-137		2.83E-01	±	9.37E-03	3.01E-01	±	5.03E-03	0.95	A
					2.91E-01	±	1.23E-02					
					2.84E-01	±	6.37E-03					
				Mean =	2.86E-01	±	5.57E-03					
			Co-58		2.02E-01	±	8.49E-03	2.03E-01	±	3.39E-03	0.99	A
					2.09E-01	±	1.11E-02					
					1.89E-01	±	5.44E-03					
				Mean =	2.00E-01	±	5.00E-03					
			Mn-54		3.49E-01	±	1.04E-02	3.39E-01	±	5.66E-03	1.00	A
					3.36E-01	±	1.35E-02					
					3.34E-01	±	7.03E-03					
				Mean =	3.40E-01	±	6.14E-03					
			Fe-59		2.33E-01	±	1.17E-02	2.38E-01	±	3.97E-03	0.98	A
					2.25E-01	±	1.50E-02					
					2.39E-01	±	7.96E-03					
				Mean =	2.32E-01	±	6.87E-03					
			Zn-65		4.18E-01	±	1.89E-02	4.12E-01	±	6.88E-03	1.02	A
					4.27E-01	±	2.48E-02					
					4.16E-01	±	1.35E-02					
				Mean =	4.20E-01	±	1.13E-02					
			Co-60		3.77E-01	±	8.39E-03	3.94E-01	±	6.58E-03	0.97	A
					3.82E-01	±	1.12E-02					
					3.84E-01	±	5.81E-03					
				Mean =	3.81E-01	±	5.05E-03					

(1) Ratio = Reported/Analytics.
* Sample provided by Analytics, Inc.
A=Acceptable
U=Unacceptable

TABLE 8-2 (Continued)
INTERLABORATORY INTERCOMPARISON PROGRAM
Gamma Analysis of Vegetation

DATE	SAMPLE ID NO.	MEDIUM	ANALYSIS	JAF ELAB RESULTS pCi/g ±1 sigma				REFERENCE LAB* pCi/g ±1 sigma			RATIO (1)	
9/16/2010	E7184-09	VEG	Ce-141		4.78E-01	±	1.16E-02					
					5.20E-01	±	2.06E-02					
					5.09E-01	±	1.92E-02	4.79E-01	±	8.00E-03	1.05	A
					5.00E-01	±	1.45E-02					
				Mean =	5.02E-01	±	8.43E-03					
			Cr-51		8.81E-01	±	5.64E-02					
					9.73E-01	±	1.07E-01					
					9.45E-01	±	1.01E-01	8.59E-01	±	1.43E-02	1.08	A
					9.13E-01	±	6.68E-02					
				Mean =	9.28E-01	±	4.28E-02					
			Cs-134		3.98E-01	±	1.16E-02					
					3.54E-01	±	2.20E-02					
					3.88E-01	±	2.19E-02	3.42E-01	±	5.71E-03	1.13	A
					4.08E-01	±	1.40E-02					
				Mean =	3.87E-01	±	8.99E-03					
			Cs-137		3.61E-01	±	1.05E-02					
					3.42E-01	±	1.85E-02					
					3.41E-01	±	1.83E-02	3.47E-01	±	5.79E-03	1.01	A
					3.57E-01	±	1.30E-02					
				Mean =	3.50E-01	±	7.73E-03					
			Co-58		3.03E-01	±	1.01E-02					
					2.48E-01	±	1.75E-02					
					2.63E-01	±	1.83E-02	2.71E-01	±	4.53E-03	1.03	A
					3.07E-01	±	1.22E-02					
				Mean =	2.80E-01	±	7.47E-03					
			Mn-54		5.04E-01	±	1.23E-02					
					4.83E-01	±	2.12E-02					
					4.79E-01	±	2.12E-02	4.39E-01	±	7.33E-03	1.10	A
					4.68E-01	±	1.42E-02					
				Mean =	4.84E-01	±	8.85E-03					
			Fe-59		3.87E-01	±	1.39E-02					
					4.28E-01	±	2.64E-02					
					3.99E-01	±	2.48E-02	3.35E-01	±	5.59E-03	1.18	A
					3.66E-01	±	1.65E-02					
				Mean =	3.95E-01	±	1.05E-02					
			Zn-65		8.15E-01	±	2.57E-02					
					8.02E-01	±	4.46E-02					
					7.65E-01	±	4.48E-02	7.49E-01	±	1.25E-02	1.06	A
					7.82E-01	±	3.00E-02					
				Mean =	7.91E-01	±	1.86E-02					
			Co-60		6.60E-01	±	1.11E-02					
					6.69E-01	±	1.95E-02					
					6.87E-01	±	1.94E-02	6.28E-01	±	1.05E-02	1.06	A
					6.39E-01	±	1.25E-02					
				Mean =	6.64E-01	±	8.05E-03					

(1) Ratio = Reported/Analytics.
* Sample provided by Analytics, Inc.
A=Acceptable
U=Unacceptable

8.5 REFERENCES

1. Radioactivity and Radiochemistry, The Counting Room: Special Edition, 1994 Caretaker Publications, Atlanta, Georgia.

2. Data Reduction and Error Analysis for the Physical Sciences, Bevington P.R., McGraw Hill, New York (1969).