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 2012 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

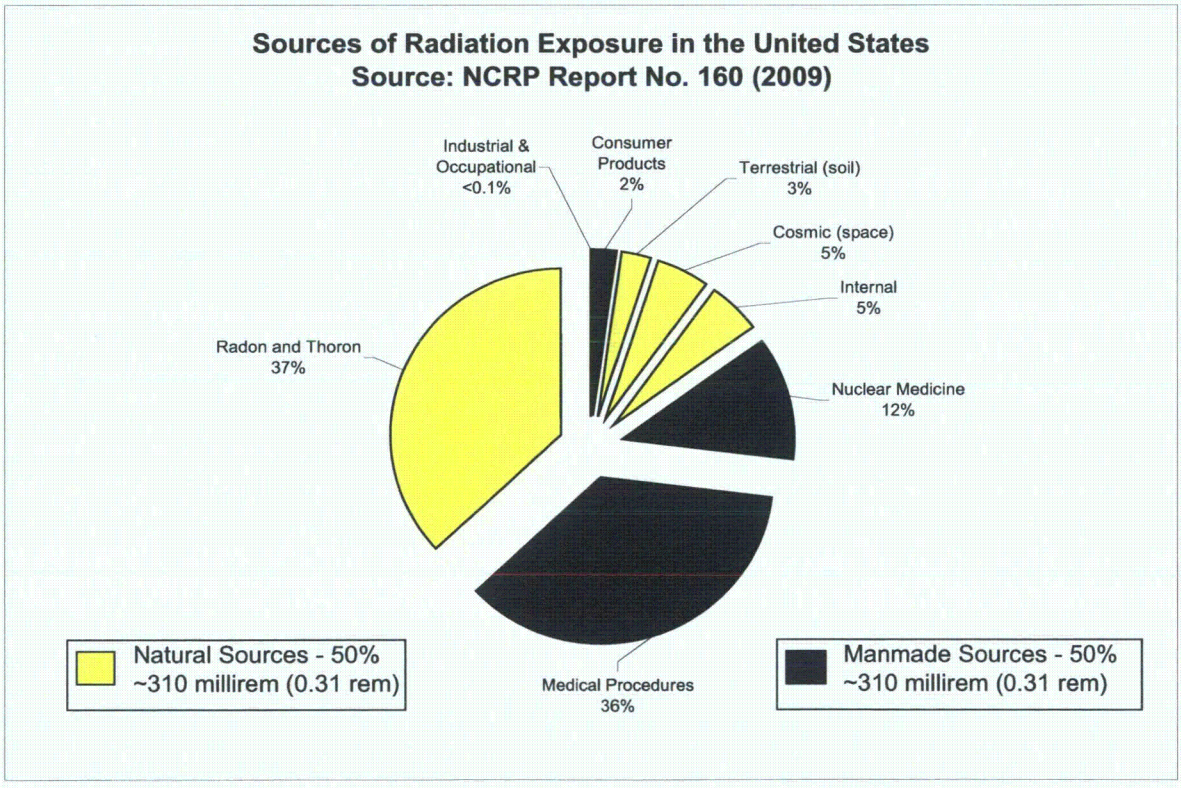
type of ionizing radiation. The dose equivalent is measured in rem (roentgen equivalent man). In terms of environmental radiation, the rem is a large unit. Therefore, a smaller unit, the millirem (mrem) is often used. One millirem (mrem) is equal to 0.001 of a rem.

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 2012 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 have been found in the Chernobyl and Fukushima Daiichi Nuclear Power Station fallout. This commonality makes a determination of the source of these radionuclides that may be detected in environmental samples difficult to determine.

   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 2012, 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 48 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 48 mrem per year, as a background dose, is significantly greater than any possible doses as a result of routine operations at the site during 2012.

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 environmental 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 2012 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 2012 sampling period.

Sampling for groundwater, as found in Section D 3.5.1 of the NMP2 ODCM, was not required during 2012. There was no groundwater source in 2012 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 2012.

5.1.1 SHORELINE SEDIMENT RESULTS

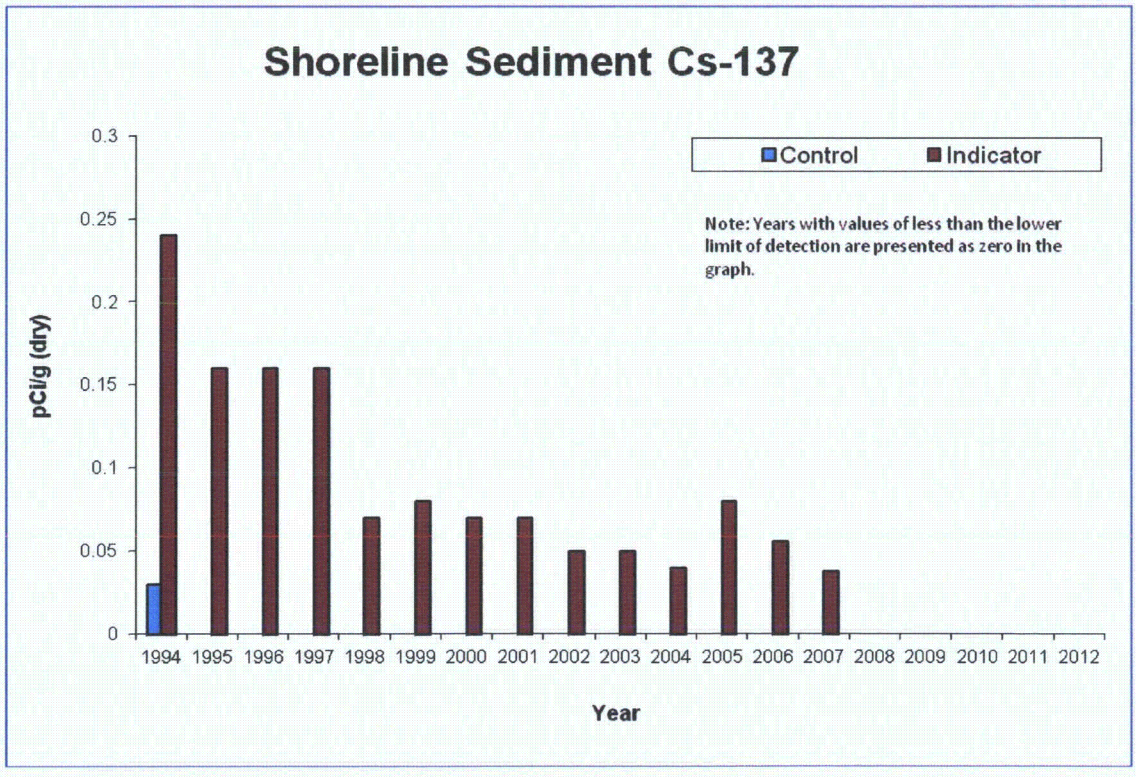
A. Results Summary

Shoreline sediment samples were obtained in April and November of 2012 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 2012 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 2012.

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 2012. The results for the 2012 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 2012 shoreline sediment samples.

The following is a graph of the average Cs-137 concentration in shoreline sediment samples over the previous eighteen years. This graph illustrates a general downward trend in the Cs-137 concentrations since 1994.



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 November 2012. The results of these sample collections are presented in Section 6.0, Table 6-1, Concentrations of Gamma Emitters in Shoreline Sediment Samples - 2012. K-40 was the only significant radionuclide detected in the sediment samples.

C. Dose Evaluation

The calculated potential whole body and skin dose which may result from the measured Cs-137 concentrations in previous 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 2012 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 2012 Cs-137 concentration of <0.086 pCi/g (dry) (<LLD).

Using these conservative parameters, the potential dose to the maximum exposed individual (teenager) would be 0.00029 mrem/year to the whole body and 0.00034 mrem/year to the skin. This calculated dose is very small and is insignificant when compared to the natural background annual exposure of approximately 48 mrem as measured by control Thermoluminescent dosimeters (TLDs) in the vicinity of the site.

D. Data Trends

Cs-137 was not detected at the indicator or the control samples locations in 2012. The average Cs-137 concentration (LLD) for the shoreline sediment indicator sample for 2012 was <0.085 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 0.04

pCi/g (dry) in 2007 to a low value of <0.043 pCi/g (dry) measured in 2009. 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 2002 through 2011, 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 2008 thru 2012. 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, Historical Environmental Sample Data, Shoreline Sediment (Control) and 7-2, Historical Environmental Sample Data, Shoreline Sediment (Indicator), 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 2012 sample program. Species collected were: Smallmouth Bass, Brown Trout, Chinook Salmon and Walleye. The analytical results for the 2012 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 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 2012 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 2012 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 36 years. Cs-137 was not detected in fish samples collected in 2003 to 2012 from indicator locations. The period of 2001 through 2012 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, Concentration of Gamma Emitters in Fish Samples- 2012, shows individual results for all the samples collected in 2012 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. Chinook salmon, Smallmouth Bass and Brown Trout were collected.

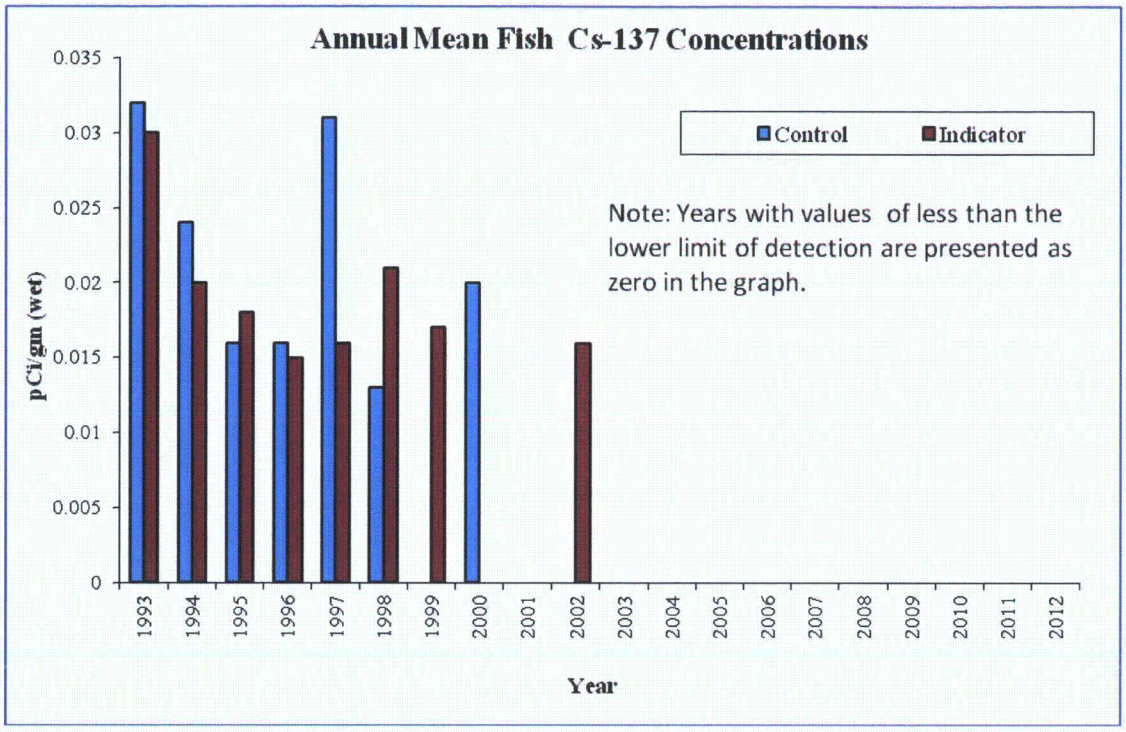
Cs-137 was not detected in any of the fish species collected for the 2012 sample program.

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 2012 fish samples demonstrates that there is no attributable dose to man from operations at the site through the aquatic pathway.

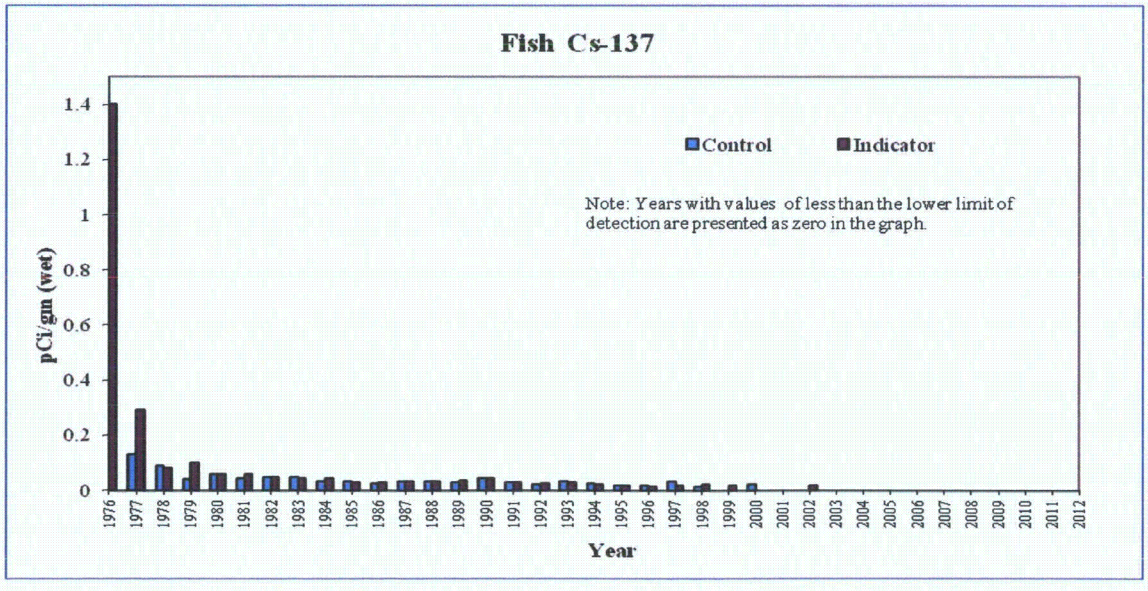
D. Data Trends

The Cs-137 data for fish samples over the previous five years (2007 through 2011) 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 2012 and the previous twenty years.



The ten-year data trend shows a consistent decrease in the level of Cs-137 measured in fish between 2001 and 2012. The 2001 through 2012 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, Historical Environmental Sample Data, Fish (Control) and 7-4, Historical Environmental Sample Data, Fish (Indicator), show the 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 2012 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 2012 REMP program. The results for the 2012 samples showed no positive detection for tritium in samples taken during 2012.

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 2012 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 2012 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 2012 results had LLD values that ranged from <367 pCi/l to <400 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 <367 pCi/l to <400 pCi/l.

Tritium was not detected in any of the twelve optional Lake Ontario samples collected in the 2012 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 2012 sample program:

Sample Location	Tritium Concentration pCi/liter		
	Minimum	Maximum	Mean (Annual)
JAFNPP Inlet (Indicator)*	<367	<400	<379
Oswego Generating Station Inlet (Control)*	<367	<400	<380
NMP1 Inlet	<375	<400	<386
NMP2 Inlet	<367	<400	<380
Oswego City Water Supply	<367	<400	<380

* 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, Table 6-3, Concentration of Tritium in Surface Water Samples – 2012 and Table 6-4, Concentration of Gamma Emitters in Surface Water Samples -2012.

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 2012 LLD concentration of <400 pCi/l, the calculated dose would be less than 0.041 mrem to the child whole body and less than 0.041 mrem to the child liver (critical age group/organ).

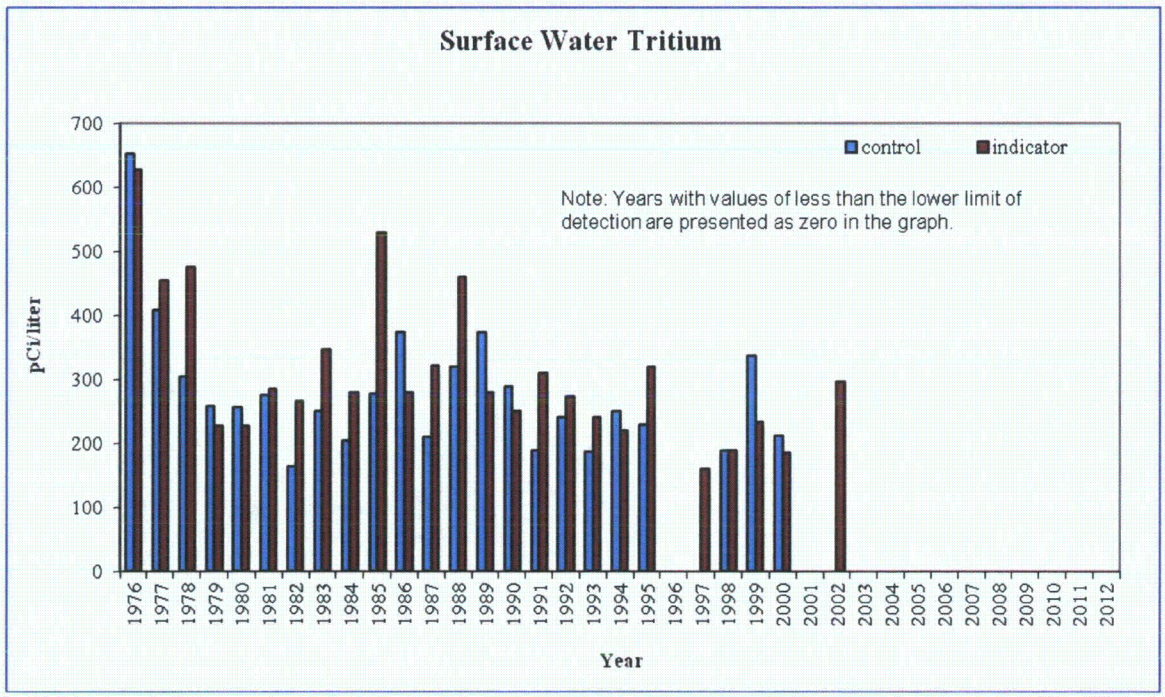
D. Data Trends

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 2012 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 2007 to 2011 was <LLD pCi/l for the control and the indicator location. The mean 2012 tritium concentrations were <380 pCi/l for the control and <379 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, 2002 through 2011, are 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 37 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, Historical Environmental Sample Data Surface Water (Control) and 7-6, Historical Environmental Sample data Surface Water (Indicator), show the historical environmental sample data for surface water Co-60 and Cs-137. Tables 7-7, Historical Environmental Sample Data, Surface Water Tritium (Control) and 7-8, Historical Environmental Sample Data, Surface Water Tritium (Indicator) show historical the 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 165 tritium samples were collected for the 2012 sample program using eighteen indicator locations and three control locations. All samples results for 2012 groundwater monitoring wells were less than the LLD for tritium. Four positive tritium results were observed from the NMP2 storm drain system which contains precipitation water. The positive tritium results were attributed to atmospheric rainout/washout events. The positive tritium results ranged from 402 +/- 117 pCi/l to 908 +/- 208 pCi/l.

A total of 165 samples were collected for plant-related gamma-emitters, and twelve strontium-90 (Sr-90) samples were collected for the 2012 sample program using nine indicator locations and three control locations. All samples results for 2012 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 2012 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 2012 sample program were analysed to a LLD of 500 pCi/l. The tritium results for the control locations and the groundwater monitor well indicator locations were less than the established LLD.

The NMP2 storm drain system indicator location results ranged from <298 to 908 +/- 208 pCi/l.

C. Dose Evaluation

Sampling for groundwater, as found in Section D 3.5.1 of the NMP2 ODCM, was not required during 2012. There was no groundwater source in 2012 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 2012.

To assess the dose associated with tritium identified in the NMP2 storm drain system. The following assumptions were made:

- NMP2 storm drain system was used as a drinking water source
- Tritium identified 4 weeks during the year, fractional year 0.077
- Maximum tritium concentration 908 +/- 208 pCi/l
- 510 liters of water consumed per year

The theoretical dose to the whole body and maximum organ using the maximum value and Regulatory Guide 1.109 methodology were determined. The calculated dose would be 0.007 mrem to the child whole body and less than 0.007 mrem to the child liver (critical age group/organ).

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 2012. Historical data for groundwater tritium is presented in Section 7.0, Tables 7-9, Historical Environmental Sample Data, Surface Water Tritium (Control) and 7-10, Historical Environmental Sample Data, Surface Water Tritium (Indicator).

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 2012 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 2012 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 2012 was 0.016 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 2012 was 0.016 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 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 2012 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.

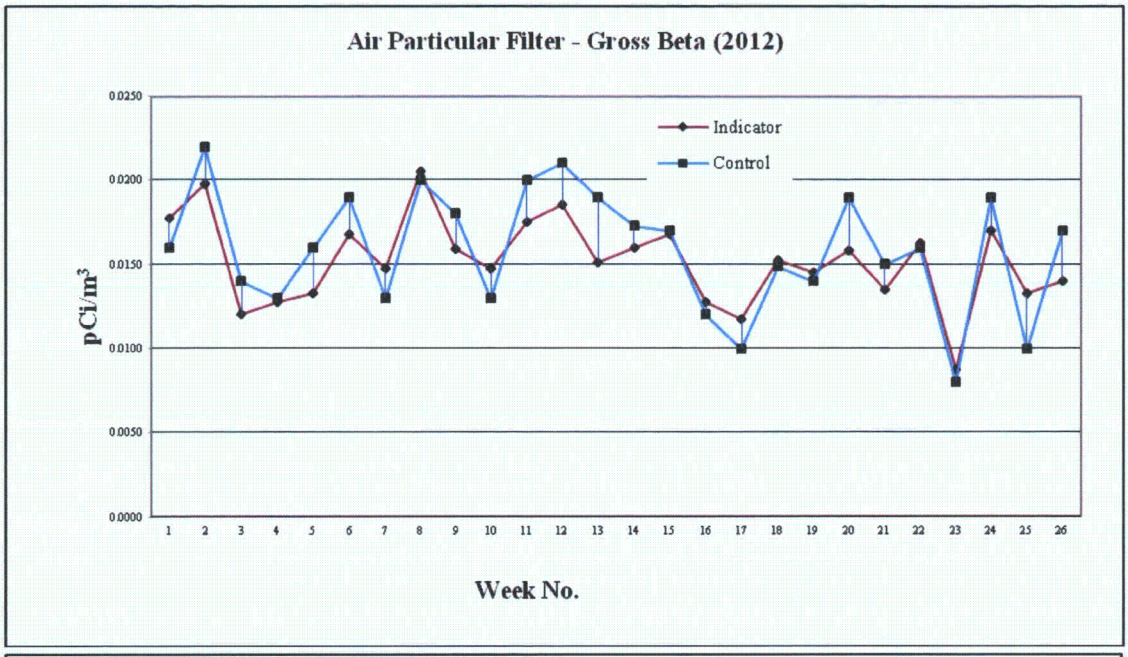
Gross beta analysis requires that the samples be counted no sooner than 24 hours after collection. This allows for the decay of short half-life naturally-occurring radionuclides, thereby increasing the sensitivity of the analysis for plant-related radionuclides.

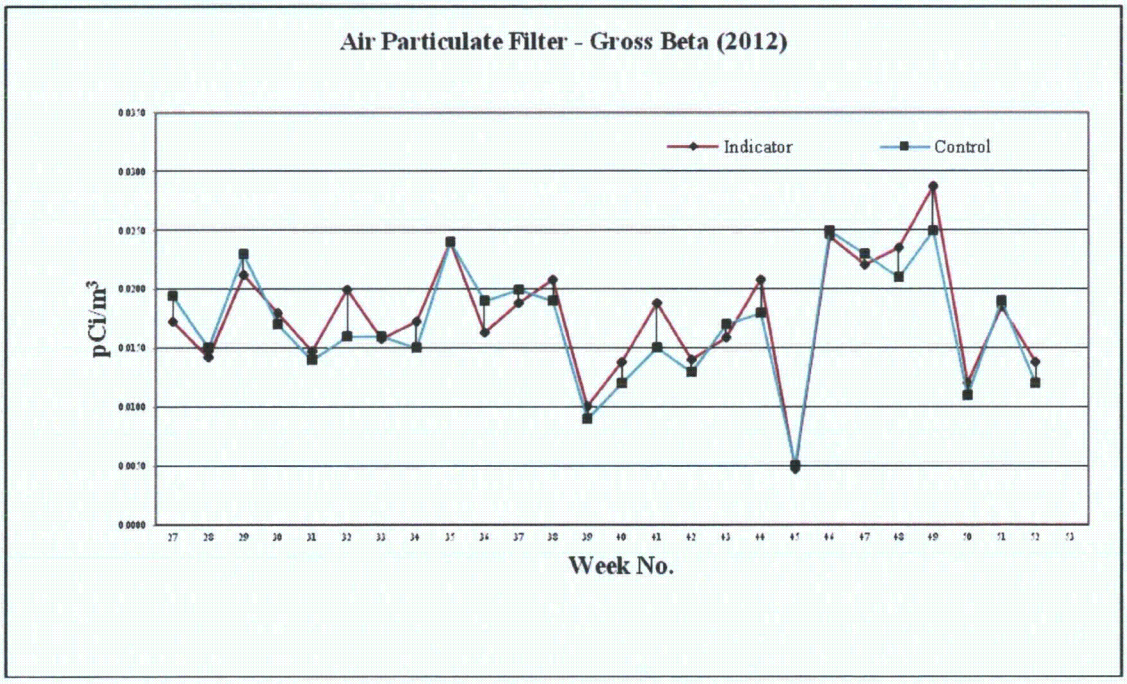
Section 6.0, Tables 6-5, Environmental Airborne Particulate Samples – Offsite Sample Locations – 2012, and 6-6, Environmental Airborne Particulate Samples – Onsite Sample Locations – 2012, present the weekly gross beta activity results for samples collected from the off-site and on-site locations.

The mean annual gross beta indicator concentrations for the ODCM indicator stations (R-1, R-2, R-3 and R-4) was 0.016 pCi/m^3. The off-site ODCM control station (R-5) annual mean gross beta concentration was 0.016 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	0.031	0.016
R-2	0.005	0.028	0.016
R-3	0.004	0.029	0.016
R-4	0.005	0.027	0.016
Summary (R1 – R4)	0.004	0.031	0.016
R-5 (Control)	0.005	0.025	0.016

The mean weekly gross beta concentrations measured in 2012 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.

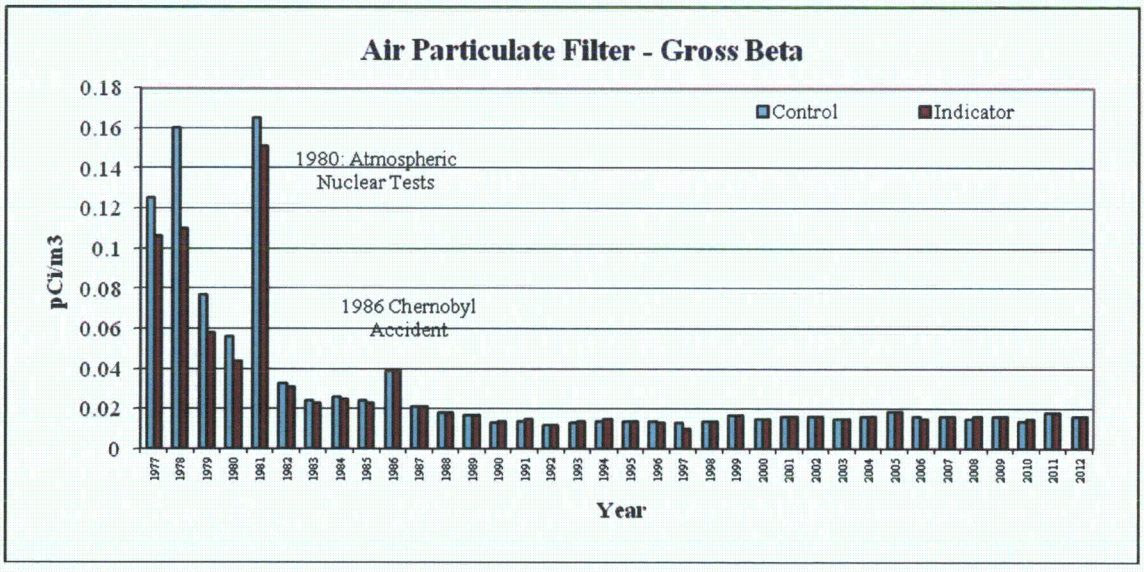
C. Dose Evaluation

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.

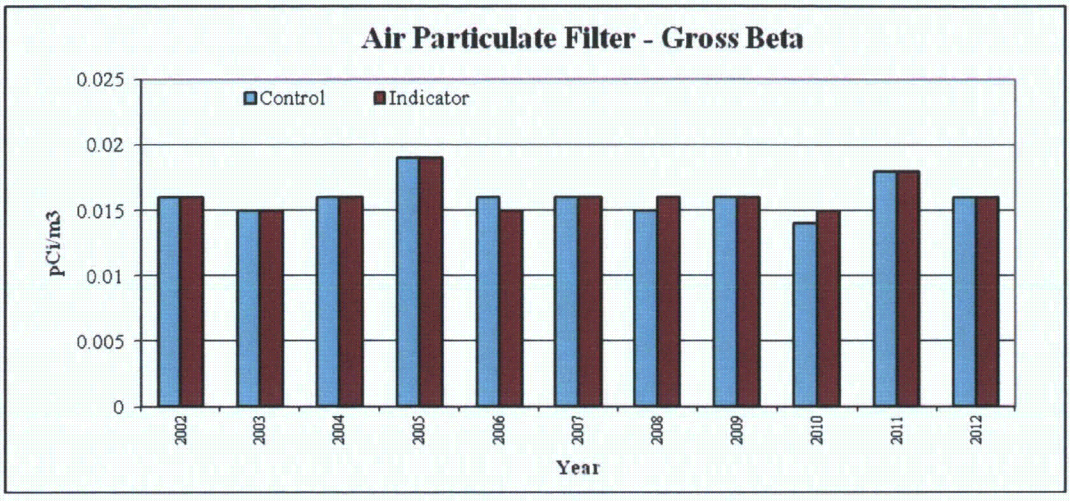
D. Data Trends

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 2012 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 2002 through 2012 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, Historic Environmental Sample Data, Air Particulate Gross Beta (Control) and 7-12, Historic Environmental Sample Data, Air Particulate Gross Beta (Indicator).

5.2.2 AIRBORNE RADIOIODINE (I-131)

A. Results Summary

I-131 was not detected in any of the 780 samples analyzed for the 2012 program.

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.

The analytical data for radioiodine are presented in Section 6.0, Tables 6-7, Environmental Charcoal Cartridge Samples – Offsite Sample Locations – 2012 and 6-8, Environmental Charcoal Cartridge Samples – Onsite Sample Locations – 2012.

C. Dose Evaluation

The calculated dose as a result of I-131 was not detected during 2012. The I-131 sampling program demonstrated no offsite dose to man from this pathway as a result of operation of the plants located at Nine Mile Point.

D. Data Trends

No radioiodine had been detected in samples collected from the air sampling locations required by the ODCM from 1987 to 2010. In 2011, I-131 was detected at all 15 sampling locations over a three week period. The positive detections were the result of the trans-Pacific transport of airborne releases from Fukushima Daiichi Nuclear Power Station fallout following the Tohoku earthquake. During 2012 no I-131 was detected in any of the samples collected for the sampling location required by the ODCM.

There has been no positive detection of I-131 in air samples collected over the last ten years that could be attributed to the operation of the Nine Mile Point Site. This demonstrates that there is no measurable environmental impact or positive trend for iodine buildup due to plant operations during the period from 2002 through 2012. I-131 has previously been detected in samples collected during the last twenty five year period in 1986, 1987 and 2011. The 1986 detection of I-131 was the result of the Chernobyl accident, the 1987 detection was the result of plant operations and the 2011 detection of I-131 was the result of the Fukushima Daiichi Nuclear Power Station accident.

I-131 has been detected in the past at the control location. 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 to 1981, 1983 to 1985 and 1987 to 2010. I-131 was detected at the control location during 1982 at a maximum concentration of 0.039 pCi/m^3, 1986 a maximum concentration of 0.151 $pCi/m^3$and during 2011 at a maximum concentration of 0.093 pCi/m^3.

I-131 has been detected in samples collected from the on-site indicator locations during 1976 to 1978, 1980 to 1983, 1986 to 1987 and 2011. 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. The Fukushima Daiichi Nuclear Power Station accident resulted in I-131 being detected in a total of 3 weekly samples collected during the 2011 sample program. The 2011 measured concentrations ranged from a minimum of 0.021 pCi/m^3 to a maximum of 0.11 pCi/m^3. Each positive detection of I-131 in samples collected in 2011 was the direct result of the Fukushima Daiichi Nuclear Power Station accident.

Historical data for I-131 are presented in Section 7.0, Tables 7-15, Historic Environmental Sample Data, Air Radioiodine (Control) and 7-16, Historic Environmental Sample Data, Air Radioiodine (Indicator).

5.2.3 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 2012.

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 2012 showed no detectable activity of plant related radionuclides.

The results of the quarterly composite samples are presented in Section 6.0, Table 6-9, Concentration of Gamma in Quarterly Composites of JAFNPP/NMPNS Site Air Particulate Samples - 2012.

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 2012. 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 2012 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, Historic Environmental Sample Data, Air Particulate (Control) and 7-14, Historic Environmental Sample Data Air, Particulate (Indicator).

5.2.4 DIRECT RADIATION THERMOLUMINESCENT DOSIMETERS (TLD)

A. Results Summary

TLDs are used to measure direct radiation (gamma dose) in the environment. As part of the 2012 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 2012. 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 2012 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)	3.5	11.8	4.9
Site Boundary (Inner Ring) * (1)	3.6	4.8	4.1
Off-site Sectors (Outer Ring) *	3.5	4.6	4.0
Special Interest * (2)	3.4	4.7	4.0
Control * (3)	3.6	4.3	3.9

* 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 2012 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 and the ISFSI used at NMPNS and JAFNPP 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 2012, 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: On-site, 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 2012 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 3.5 to 11.8 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 3.6 to 24.3 mrem per standard month.

3. Results for TLDs located on-site near the Energy Information Center and its associated shoreline ranged from 4.1 to 5.8 mrem per standard month.

Site Boundary TLD results ranged from 3.6 to 10.6 mrem per standard month in 2012. 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 10.6 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 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 3.6 to 4.8 mrem per standard month resulting in an average dose rate of 4.1 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 3.5 to 4.6 mrem per standard month with an average dose rate of 4.0 mrem per standard month.

Special Interest TLDs from all locations ranged from 3.4 to 4.7 mrem per standard month with an annual average dose rate of 4.0 mrem per standard month.

The Control TLD group required by the ODCM utilizes locations positioned well beyond the site. 2012 Control TLD results ranged from 3.6 to 5.0 mrem per standard month with an annual average dose rate of 4.0 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, Direct Radiation Measurement Results – 2012.

C. Dose Evaluation

2012 annual mean dose rates for each geographic location required by the ODCM are as follows:

Site Boundary:	4.1 mrem per standard month	(TLDs: 78, 79, 80, 81, 82, 83, 84, 7 and 18)
Off-site Sectors:	4.0 mrem per standard month	(TLDs: 88, 89, 90, 91, 92, 93, 94 and 95)
Special Interest:	4.0 mrem per standard month	(TLDs: 15, 56, 58, 96, 97 and 98)
Control:	3.9 mrem per standard month	(TLDs 14 and 49)

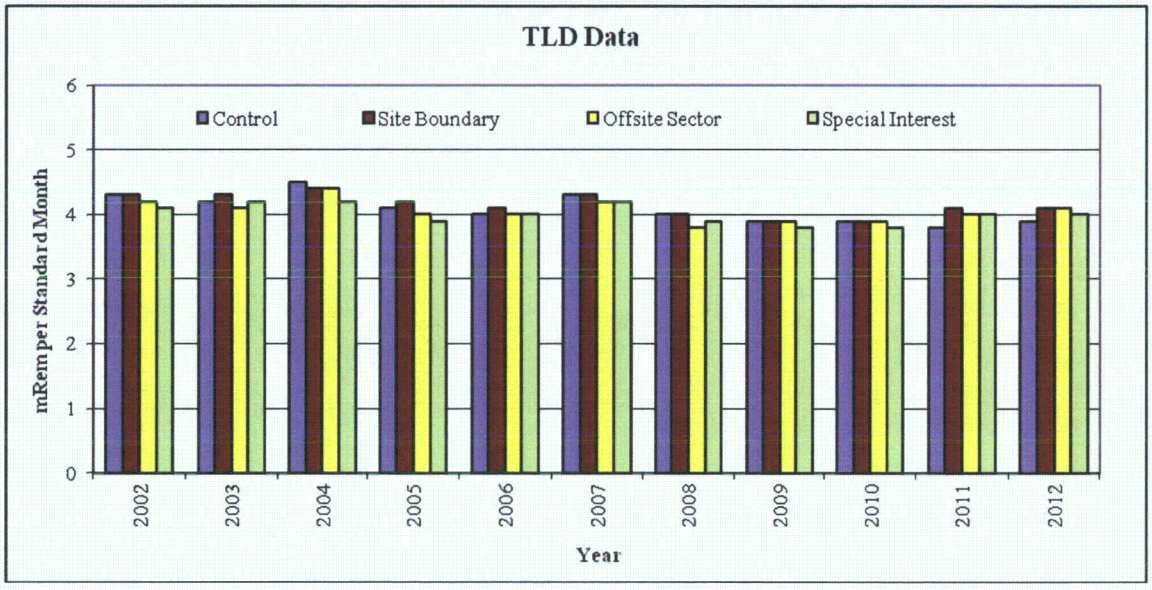
The measured mean dose rate in the proximity of the closest resident was 4.4 mrem per standard month (TLD #s: 108, 109), which is consistent with the control measurements of 3.9 mrem per standard month.

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 2002 through 2012:



TLDs located at the site boundary averaged 4.1 mrem per standard month during 2012 (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 4.0 mrem per standard month during 2012. 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 4.0 mrem per standard month during 2012 which is consistent with the previous five-year average of 3.9 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. 2012 control results from all Control TLDs averaged 3.9 mrem per standard month, consistent with the previous five-year average of 4.0 mrem

per standard month. The 2012 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 2012 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 2012 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 2012. 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 2012 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 location 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 2012. 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 and Control location #77 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 2012 as a result of I-131 not having been detected in samples collected during November and December of 2010, 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 2012 are provided in Section 6.0, Table 6-11, Concentration of Iodine-131 and Gamma Emitters in Milk – 2012.

Iodine 131 was not detected in any indicator or control milk samples analyzed during 2012. All I-131 milk results were reported as Lower Limits of Detection (LLD). No plant-related radionuclides were detected in any milk sample collected in 2012. 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 2012.

The results of the milk samples are presented in Section 6.0, Table 6-11, Concentration of Iodine-131 and Gamma Emitters in Milk 2012.

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 2012 data to historical results over the operating life of the plants shows that Cs-137 and I-131 levels in milk 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, Historical Environmental Sample Data, Milk (Control) and 7-24, Historical Environmental Sample Data, Milk (Indicator).

5.2.6 FOOD PRODUCTS (VEGETATION)

A. Results Summary

There were no plant-related radionuclides detected in the 16 food product samples collected and analyzed for the 2012 program.

Detectable levels of naturally occurring K–40 were measured in all control and most of the indicator samples collected for the 2012 program. Be-7 a naturally-occurring radionuclide, was also detected intermittently in samples collected in 2012. These results are consistent with the levels measured in previous years.

The results of the 2012 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 2012 did not include any varieties considered to be 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 was collected. Non-edible vegetation consisting of brussel sprout leaves, corn leaves, horseradish leaves, rhubarb leaves, tomatoes leaves, cabbage leaves, grape leaves and squash leaves were collected for the 2012 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. At least one sample from each garden location was analyzed for Carbon-14.

The analysis of food product samples collected during 2012 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, Concentration of Gamma Emitters and C-14 in Food Products - 2012.

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 2012 sample programs.

Historical data of food product results are presented in Section 7.0, Tables 7-25, Historical Environmental Sample Data, Food Products (Control) and 7-26, Historical Environmental Sample Data, Food Products (Indicator).

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 2012, a milk animal census, a nearest resident census, and a garden census were performed.

The results of the closest residence census conducted in 2012 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 2012. See Table 3.3-1 for 2012 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 278 cows and no goats based on the 2012 land use census. The number of cows has decreased by 74, when compared to the 2010 census. The results of the milk animal census are found in Section 6.0, Table 6-13, Milk Animal Census - 2012.

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, Residence Census - 2012. There were no changes identified in the 2012 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.

5.2.8 DIRECT RADIATION, INDEPENDENT SPENT FUEL STORAGE INSTALLATION (ISFSI)

A. Results Summary

TLDs are used to measure direct radiation (gamma dose) at the site boundary and Optically Stimulated Luminescence Dosimeters (OSLDs) are used to measure direct radiation (gamma dose) in the localized environment of the ISFSI pad. Sixteen TLDs are located around the site, one in each of the sixteen compass sectors, and fourteen OSDLs are located around the perimeter of the ISFSI pad and specific areas of interest. OSLDs were placed at these locations prior to loading the first storage casks for baseline dose rate determination in the general area of the pad.

On September 17, 2012, the ISFSI facility was placed in service with the installation of the first storage cask on the pad. Five subsequent storage casks were moved to the storage facility on October 12, 2012, October 19, 2012, October 29, 2012, November 5, 2012 and November 17, 2012. The total number of casks in storage is six.

The implementation and loading of the ISFSI project has resulted in no increase in dose at the site boundary or to the public. The analysis of offsite doses from direct radiation measurements, presented in Section 5.2.4 of this report, concludes that there is no significant difference in annual dose to the public at or beyond the site boundary. The measured annual dose rate at the nearest residence to the site was consistent with the dose rates measured at the site boundary and the offsite control locations. The results for the Site Boundary, Offsite Sectors, and Special Interest (offsite) were well within expected normal variation when compared to the Control TLD results. The results for the 2012 environmental TLD monitoring program indicate that there is no significant increase in dose rates as a result of operations at the site. The implementation of the ISFSI at the NMPNS plant did not measurably increase the ambient radiation exposure rate at or beyond the site boundary. The lack of a dose rate increase at or beyond the site boundary is consistent with design calculations performed to evaluate compliance with 10 CFR72.104(a).

The measured results of the 2012 TLD monitoring program demonstrate compliance with the offsite dose limits to members of the public specified in 40CFR190 and 10CFR72.104(a).

B. Program Design

An array of ten OSLD locations were established around the perimeter of the ISFSI pad and four OSLD locations were placed in specific areas of interest twelve months prior to facility usage. These pre-operational OSLDs were used for baseline dose rate determination. The OSLDs are placed, collected and read each quarter. Two dosimeters are placed at each location and the average of the two dosimeters is reported. The quarterly results are compared to baseline data to assess the contribution to ambient dose rates in the vicinity of the storage facility from casks as they are placed on the storage pad.

C. Dose Evaluation

The pre-operation minimum and maximum dose rate were 2.9 and 6.3 mrem per standard month, respectively. During 2012 the maximum dose rate of 5.6 mrem per standard month was measured at

OSLD location 241, north of the ISFSI. The lowest measured dose rate was 3.2 mrem per standard month was measured at OSLD location 244, northeast of the ISFSI.

The following table presents the pre-operation dose rate data and the operational dose rate data for 2012:

OSLD Number	Sector	Pre-Operation	2012
		mrem per Standard Month	mrem per Standard Month
233	WNW	3.5	4.1
234	WSW	2.9	3.5
235	S	4.2	3.7
236	SSE	3.8	3.6
237	SE	3.0	3.2
238	ESE	3.5	4.1
239	E	4.0	3.5
240	NE	3.6	4.6
241	N	5.1	5.6
242	NE	6.3	5.4
243	NNW	4.8	4.3
244	NE	4.6	3.2
245	NE	4.0	4.1
246	ENE	4.8	5.4

An evaluation of Site Boundary TLDs and Control TLDs dose rate results for 2012 shows that there is no increase in dose rate at or beyond the site boundary as result of the operation of NMPNS and JAFNPP. A detailed discussion of this evaluation is found in Section 5.2.4. The Environmental TLD results for this period show no significant difference in control and site boundary dose rates compared to 2011.

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 2012 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 or the operations of the ISFSI. 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, the 1986 accident at the Chernobyl Nuclear Power Plant, and the March 11, 2012 accident at Fukushima Daiichi Nuclear Power Stations.

The results for the 2012 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 2012. 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 48 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 2012 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.

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

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

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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.

16. Institute of Nuclear Power Operations, Special Report on the Nuclear Accident at the Fukushima Daiichi Nuclear Power Station, INPO 11-005, November 2012.

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 (Lower Limit of Detection) 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 – 2012
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) *	04/26/12	21560 ± 1077	< 86.9	< 67.4	< 85.8	< 251.1	< LLD
	11/06/12	20110 ± 1103	< 99.5	< 79.7	< 84.1	< 300.4	< LLD
Lang's Beach (06, Control)	04/26/12	9028 ± 734	< 63.9	< 50.4	< 48.1	< 251.4	< LLD
	11/06/12	10430 ± 655	< 68.4	< 37.0	< 57.3	< 170.8	< 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 – 2012
FITZPATRICK * (03)***
Results in Units of pCi/kg (wet) ± 1 Sigma

Date	Description	GAMMA EMITTERS								
		K-40	Mn-54	Co-58	Fe-59	Co-60	Cs-134	Cs-137	Zn-65	Others †
5/15/2012	BROWN TROUT	3693 ± 385	< 43	< 43	< 109	< 47	< 31	< 33	< 84	< LLD
5/15/2012	SMALL MOUTH BASS	4989 ± 404	< 43	< 42	< 109	< 41	< 44	< 33	< 98	< LLD
5/15/2012	WALLEYE	4825 ± 439	< 58	< 54	< 190	< 52	< 52	< 44	< 137	< LLD
9/13/2012	BROWN TROUT	4215 ± 342	< 40	< 44	< 119	< 37	< 48	< 34	< 115	< LLD
9/13/2012	SMALL MOUTH BASS	5031 ± 394	< 38	< 37	< 120	< 37	< 31	< 39	< 99	< LLD
9/13/2012	CHINOOK SALMON	5738 ± 461	< 45	< 42	< 132	< 44	< 52	< 44	< 129	< 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 – 2012
NINE MILE POINT * (02)***
Results in Units of pCi/kg (wet) ± 1 Sigma

Date	Description	GAMMA EMITTERS								
		K-40	Mn-54	Co-58	Fe-59	Co-60	Cs-134	Cs-137	Zn-65	Others †
5/15/2012	BROWN TROUT	3636 ± 401	< 34	< 48	< 177	< 48	< 46	< 40	< 93	< LLD
5/15/2012	SMALL MOUTH BASS	4102 ± 386	< 44	< 52	< 133	< 45	< 37	< 34	< 82	< LLD
5/15/2012	WALLEYE	4597 ± 414	< 51	< 59	< 135	< 43	< 47	< 45	< 93	< LLD
9/13/2012	BROWN TROUT	5797 ± 472	< 53	< 54	< 158	< 50	< 45	< 45	< 139	< LLD
9/13/2012	SMALL MOUTH BASS	4013 ± 378	< 37	< 44	< 104	< 44	< 45	< 45	< 95	< LLD
9/13/2012	CHINOOK SALMON	4356 ± 398	< 45	< 42	< 125	< 38	< 41	< 41	< 111	< 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 – 2012
OSWEGO HARBOR (CONTROL) * (00)***
Results in Units of pCi/kg (wet) ± 1 Sigma

Date	Description	GAMMA EMITTERS								
		K-40	Mn-54	Co-58	Fe-59	Co-60	Cs-134	Cs-137	Zn-65	Others †
5/15/2012	BROWN TROUT	5961 ± 508	< 56	< 71	< 222	< 52	< 64	< 59	< 145	< LLD
5/15/2012	SMALL MOUTH BASS	4540 ± 383	< 35	< 37	< 133	< 42	< 38	< 36	< 111	< LLD
5/17/2012	WALLEYE	4408 ± 400	< 41	< 48	< 126	< 51	< 52	< 39	< 100	< LLD
9/13/2012	BROWN TROUT	4357 ± 369	< 28	< 32	< 108	< 45	< 35	< 38	< 88	< LLD
9/13/2012	SMALLMOUTH BASS	3491 ± 313	< 33	< 44	< 94	< 48	< 50	< 35	< 97	< LLD
9/13/2012	CHINOOK SALMON	3219 ± 356	< 43	< 35	< 114	< 53	< 34	< 28	< 96	< 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 – 2012
(QUARTERLY COMPOSITE SAMPLES)
Results in Units of pCi/l ± 1 Sigma

STATION CODE	PERIOD	DATE		TRITIUM
FITZPATRICK* (03, INLET)***	First Quarter	12/28/11	03/28/12	< 400
	Second Quarter	03/28/12	06/27/12	< 367
	Third Quarter	06/27/12	09/28/12	< 372
	Fourth Quarter	09/28/12	01/02/13	< 376
OSWEGO STEAM STATION* (08, CONTROL)***	First Quarter	12/30/11	03/30/12	< 400
	Second Quarter	03/30/12	06/29/12	< 367
	Third Quarter	06/29/12	09/28/12	< 375
	Fourth Quarter	09/28/12	01/04/13	< 376
NINE MILE POINT UNIT 1** (09, INLET)***	First Quarter	12/30/11	03/30/12	< 400
	Second Quarter	03/30/12	06/29/12	< 392
	Third Quarter	06/29/12	09/28/12	< 375
	Fourth Quarter	09/28/12	01/04/13	< 376
NINE MILE POINT UNIT 2** (11, INLET)***	First Quarter	12/30/11	03/30/12	< 400
	Second Quarter	03/30/12	06/29/12	< 367
	Third Quarter	06/29/12	09/28/12	< 375
	Fourth Quarter	09/28/12	01/04/13	< 376
OSWEGO CITY WATER** (10)***	First Quarter	12/30/11	03/30/12	< 400
	Second Quarter	03/30/12	06/29/12	< 367
	Third Quarter	06/29/12	09/28/12	< 375
	Fourth Quarter	09/28/12	01/04/13	< 376

* 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 – 2012
OSWEGO STEAM STATION * (08, CONTROL)***
Results in Units of pCi/liter ± 1 Sigma

Date	1/27/2012	3/2/2012	3/30/2012	4/27/2012	6/1/2012	6/29/2012
NUCLIDE						
I-131	< 0.89	< 0.88	< 0.99	< 0.83	< 0.95	< 0.95
Cs-134	< 3.33	< 2.18	< 2.39	< 3.06	< 2.16	< 4.61
Cs-137	< 2.78	< 3.65	< 3.08	< 2.52	< 2.80	< 3.56
Zr-95	< 5.06	< 6.84	< 6.61	< 5.23	< 6.43	< 8.62
Nb-95	< 3.27	< 4.72	< 4.91	< 3.55	< 3.95	< 5.47
Co-58	< 3.06	< 4.13	< 4.14	< 3.00	< 3.25	< 4.78
Mn-54	< 2.89	< 4.19	< 3.11	< 2.74	< 2.81	< 3.38
Fe-59	< 7.48	< 11.4	< 11.7	< 9.68	< 10.1	< 12.5
Zn-65	< 6.15	< 8.28	< 8.74	< 6.52	< 7.18	< 10.2
Co-60	< 3.22	< 3.59	< 3.90	< 2.53	< 3.26	< 3.57
K-40	116.6 ± 13.5	229.1 ± 21.0	237 ± 21.0	142.3 ± 15.4	< 33.8	290.8 ± 23.9
Ba/La-140	< 7.13	< 10.7	< 11.1	< 7.18	< 10.5	< 12.4
Date	8/3/2012	8/31/2012	9/28/2012	11/2/2012	11/30/2012	1/4/2013
NUCLIDE						
I-131	< 0.91	< 0.56	< 0.46	< 0.84	< 0.65	< 0.81
Cs-134	< 2.81	< 1.95	< 2.71	< 2.40	< 4.31	< 2.32
Cs-137	< 2.73	< 3.02	< 3.71	< 2.94	< 3.59	< 2.99
Zr-95	< 5.67	< 5.54	< 7.89	< 7.39	< 7.96	< 5.04
Nb-95	< 3.83	< 3.98	< 5.37	< 5.53	< 5.06	< 4.03
Co-58	< 2.91	< 3.21	< 4.70	< 4.57	< 4.73	< 3.22
Mn-54	< 2.68	< 3.00	< 3.59	< 3.54	< 3.92	< 2.89
Fe-59	< 9.54	< 9.59	< 12.3	< 12.0	< 12.7	< 7.99
Zn-65	< 5.75	< 6.87	< 9.30	< 10.0	< 9.63	< 4.02
Co-60	< 2.34	< 2.62	< 4.03	< 3.98	< 4.11	< 2.53
K-40	119.5 ± 12.9	114.5 ± 14.2	306.4 ± 24.5	204.4 ± 21.3	279.1 ± 23.4	136.1 ± 14.8
Ba/La-140	< 8.12	< 8.60	< 12.3	< 14.2	< 11.8	< 9.43

* 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 – 2012
OSWEGO CITY WATER (10)*****
Results in Units of pCi/liter ± 1 Sigma

Date	1/27/2012	3/2/2012	3/30/2012	4/27/2012	6/1/2012	6/29/2012
NUCLIDE						
I-131	< 13.7	< 12.0	< 9.47	< 12.4	< 12.9	< 10.8
Cs-134	< 2.57	< 3.61	< 1.84	< 2.52	< 1.97	< 2.81
Cs-137	< 3.76	< 2.50	< 2.64	< 3.76	< 2.78	< 2.40
Zr-95	< 7.67	< 5.67	< 5.56	< 8.53	< 5.52	< 6.01
Nb-95	< 5.09	< 3.85	< 3.80	< 4.95	< 3.89	< 3.36
Co-58	< 4.10	< 3.34	< 3.29	< 4.26	< 3.72	< 2.97
Mn-54	< 3.37	< 3.27	< 2.74	< 3.77	< 2.94	< 2.34
Fe-59	< 12.7	< 11.2	< 7.93	< 12.1	< 9.05	< 9.50
Zn-65	< 7.68	< 6.98	< 6.19	< 10.5	< 6.67	< 6.05
Co-60	< 3.48	< 3.10	< 2.93	< 4.44	< 2.33	< 2.60
K-40	264.8 ± 22.4	< 33.1	174.8 ± 15.1	337.9 ± 24.8	103.3 ± 13.3	117.7 ± 13.9
Ba/La-140	< 13.2	< 11.2	< 7.1	< 11.3	< 10.3	< 7.89
Date	8/3/2012	8/31/2012	9/28/2012	11/2/2012	11/30/2012	1/4/2013
NUCLIDE						
I-131	< 11.1	< 14.7	< 14.2	< 11.9	< 10.4	< 11.1
Cs-134	< 1.73	< 2.34	< 3.33	< 1.93	< 1.91	< 1.96
Cs-137	< 2.33	< 3.85	< 3.08	< 2.52	< 2.88	< 2.56
Zr-95	< 4.25	< 6.79	< 5.81	< 4.64	< 5.06	< 5.06
Nb-95	< 3.34	< 4.90	< 4.36	< 3.33	< 3.13	< 3.59
Co-58	< 2.63	< 4.50	< 3.17	< 3.02	< 2.95	< 3.36
Mn-54	< 2.40	< 3.32	< 3.41	< 2.80	< 2.44	< 2.34
Fe-59	< 7.74	< 13.1	< 10.3	< 7.47	< 7.04	< 7.17
Zn-65	< 5.38	< 8.75	< 4.01	< 6.10	< 6.59	< 3.90
Co-60	< 2.26	< 3.93	< 3.13	< 2.84	< 2.47	< 2.44
K-40	20.9 ± 8.5	288.8 ± 22.4	377.3 ± 21.5	179.4 ± 15.1	178.5 ± 14.2	194.2 ± 15.0
Ba/La-140	< 7.21	< 11.2	< 8.81	< 9.14	< 7.68	< 8.93

** 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 – 2012
FITZPATRICK* (03, INLET)***
Results in Units of pCi/liter ± 1 Sigma

Date	1/31/2012	2/29/2012	3/28/2012	4/28/2012	5/30/2012	6/27/2012
NUCLIDE						
I-131	< 0.58	< 0.63	< 0.65	< 0.56	< 0.51	< 0.71
Cs-134	< 3.51	< 3.60	< 2.09	< 2.27	< 3.88	< 1.98
Cs-137	< 3.15	< 3.85	< 2.80	< 2.70	< 3.06	< 3.09
Zr-95	< 5.96	< 6.67	< 5.53	< 5.66	< 6.00	< 6.13
Nb-95	< 3.91	< 4.69	< 3.40	< 3.44	< 2.93	< 3.63
Co-58	< 3.25	< 3.35	< 3.60	< 3.09	< 2.99	< 3.31
Mn-54	< 3.15	< 3.05	< 3.17	< 2.45	< 3.05	< 2.36
Fe-59	< 10.3	< 10.9	< 8.14	< 8.84	< 10.7	< 8.69
Zn-65	< 9.20	< 8.24	< 6.58	< 6.92	< 6.87	< 7.66
Co-60	< 3.15	< 3.57	< 3.08	< 2.86	< 3.09	< 2.97
K-40	94.2 ± 15.6	101.5 ± 15.9	45.9 ± 12.5	< 28.2	< 29.9	< 30.9
Ba/La-140	< 7.37	< 6.38	< 5.71	< 6.70	< 6.81	< 6.53
Date	7/31/2012	8/31/2012	9/28/2012	10/31/2012	11/27/2012	1/2/2013
NUCLIDE						
I-131	< 0.59	< 0.48	< 0.55	< 0.65	< 0.63	< 0.65
Cs-134	< 4.97	< 3.85	< 1.99	< 2.01	< 2.06	< 3.45
Cs-137	< 3.61	< 3.36	< 2.97	< 3.16	< 2.68	< 3.02
Zr-95	< 7.98	< 5.75	< 6.29	< 5.73	< 5.37	< 6.70
Nb-95	< 6.05	< 4.17	< 3.99	< 3.82	< 3.52	< 4.24
Co-58	< 3.57	< 3.67	< 3.18	< 3.35	< 3.16	< 3.74
Mn-54	< 3.36	< 3.14	< 2.76	< 3.22	< 2.92	< 3.33
Fe-59	< 16.6	< 11.2	< 8.28	< 7.81	< 8.61	< 10.3
Zn-65	< 5.22	< 8.26	< 3.61	< 4.40	< 7.18	< 8.48
Co-60	< 3.84	< 2.74	< 2.91	< 2.80	< 2.86	< 2.99
K-40	< 49.6	79.2 ± 15.1	41.0 ± 11.2	< 28.2	34.3 ± 9.8	208.2 ± 18.4
Ba/La-140	< 10.6	< 7.37	< 6.18	< 7.65	< 5.73	< 7.34

* 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 – 2012
NINE MILE POINT UNIT 1 ** (09, INLET)***
Results in Units of pCi/liter ± 1 Sigma

Date	1/27/2012	3/2/2012	3/30/2012	4/27/2012	6/1/2012	6/29/2012
NUCLIDE						
I-131	< 9.27	< 9.30	< 10.2	< 8.35	< 10.8	< 12.9
Cs-134	< 1.77	< 1.56	< 3.48	< 2.49	< 2.93	< 3.48
Cs-137	< 2.16	< 2.39	< 2.44	< 2.77	< 2.86	< 2.60
Zr-95	< 4.67	< 4.85	< 5.70	< 5.20	< 5.67	< 6.10
Nb-95	< 3.06	< 2.97	< 3.40	< 3.56	< 3.39	< 4.37
Co-58	< 2.68	< 2.49	< 3.24	< 2.86	< 3.00	< 3.54
Mn-54	< 2.25	< 2.44	< 2.99	< 2.45	< 2.47	< 2.89
Fe-59	< 6.41	< 7.90	< 10.1	< 6.54	< 8.25	< 9.55
Zn-65	< 5.59	< 5.10	< 7.30	< 6.34	< 3.62	< 7.07
Co-60	< 2.41	< 2.26	< 4.05	< 2.67	< 2.60	< 3.68
K-40	22.2 ± 8.5	35.7 ± 10.0	34.2 ± 12.3	121.7 ± 13.3	84.2 ± 13.1	67.3 ± 13.6
Ba/La-140	< 5.78	< 6.60	< 9.69	< 7.63	< 7.18	< 12.3
Date	8/3/2012	8/31/2012	9/28/2012	11/2/2012	11/30/2012	1/4/2013
NUCLIDE						
I-131	< 11.8	< 10.7	< 10.4	< 13.6	< 11.6	< 11.6
Cs-134	< 1.93	< 1.69	< 1.62	< 2.46	< 2.00	< 3.42
Cs-137	< 2.61	< 2.09	< 2.39	< 2.44	< 2.83	< 2.80
Zr-95	< 4.98	< 4.47	< 5.27	< 6.65	< 5.84	< 5.49
Nb-95	< 3.31	< 3.06	< 3.27	< 4.06	< 3.30	< 3.78
Co-58	< 2.83	< 2.91	< 2.57	< 3.30	< 3.22	< 3.34
Mn-54	< 3.08	< 2.44	< 2.58	< 3.16	< 2.67	< 2.73
Fe-59	< 8.74	< 6.63	< 6.04	< 8.83	< 11.2	< 9.84
Zn-65	< 3.98	< 2.45	< 5.09	< 3.99	< 7.23	< 6.77
Co-60	< 2.21	< 2.47	< 2.45	< 3.18	< 2.56	< 3.26
K-40	164.4 ± 13.7	42.6 ± 9.0	52.5 ± 9.0	< 37.2	< 29.2	42.6 ± 12.7
Ba/La-140	< 7.83	< 5.81	< 6.02	< 10.6	< 9.98	< 10.5

** 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 – 2012
NINE MILE POINT UNIT 2 ** (11, INLET)***
Results in Units of pCi/liter ± 1 Sigma

Date	1/27/2012	3/2/2012	3/30/2012	4/27/2012	6/1/2012	6/29/2012
NUCLIDE						
I-131	< 9.73	< 10.20	< 12.83	< 8.08	< 11.99	< 12.95
Cs-134	< 1.67	< 1.76	< 4.26	< 1.70	< 2.09	< 2.01
Cs-137	< 2.59	< 2.38	< 3.64	< 2.26	< 2.97	< 2.69
Zr-95	< 5.08	< 5.89	< 7.40	< 4.65	< 5.56	< 5.25
Nb-95	< 3.48	< 3.54	< 5.00	< 2.93	< 3.72	< 3.51
Co-58	< 3.05	< 3.06	< 3.97	< 2.41	< 3.50	< 3.02
Mn-54	< 2.57	< 2.84	< 3.49	< 2.25	< 3.08	< 2.47
Fe-59	< 8.36	< 7.19	< 12.53	< 6.82	< 8.56	< 8.24
Zn-65	< 7.02	< 5.91	< 9.07	< 5.37	< 6.11	< 3.78
Co-60	< 2.71	< 2.30	< 4.51	< 2.32	< 2.62	< 3.03
K-40	102.8 ± 12.92	83.3 ± 12.06	232.8 ± 23.54	33.3 ± 9.91	175.6 ± 16.09	216.1 ± 15.30
Ba/La-140	< 7.46	< 7.75	< 11.94	< 5.92	< 7.59	< 8.77
Date	8/3/2012	8/31/2012	9/28/2012	11/2/2012	11/30/2012	1/4/2013
NUCLIDE						
I-131	< 11.38	< 11.75	< 12.27	< 11.59	< 10.14	< 14.63
Cs-134	< 1.72	< 2.16	< 3.23	< 1.73	< 1.67	< 2.41
Cs-137	< 2.33	< 2.66	< 2.73	< 2.06	< 2.45	< 3.12
Zr-95	< 4.91	< 5.59	< 5.02	< 4.49	< 4.93	< 7.87
Nb-95	< 2.53	< 4.30	< 3.57	< 3.40	< 2.55	< 5.94
Co-58	< 2.94	< 3.06	< 3.43	< 2.75	< 3.11	< 4.23
Mn-54	< 2.52	< 3.04	< 2.75	< 2.19	< 2.54	< 3.38
Fe-59	< 6.64	< 11.41	< 8.24	< 7.37	< 5.76	< 12.68
Zn-65	< 2.95	< 6.95	< 7.01	< 5.45	< 3.04	< 9.49
Co-60	< 2.53	< 3.18	< 3.11	< 2.23	< 2.80	< 3.75
K-40	26.68 ± 8.62	76.03 ± 14.01	113.4 ± 14.26	30.99 ± 8.56	30.02 ± 8.19	217.7 ± 20.08
Ba/La-140	< 7.26	< 8.70	< 7.52	< 7.58	< 6.82	< 12.02

** Optional Sample Location

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

TABLE 6-5

ENVIRONMENTAL AIRBORNE PARTICULATE SAMPLES - OFF-SITE SAMPLE LOCATIONS - 2012

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 **
01/04/12	0.018 ± 0.001	0.016 ± 0.001	0.018 ± 0.001	0.019 ± 0.001	0.016 ± 0.001	0.015 ± 0.001	0.019 ± 0.001	0.020 ± 0.001	0.017 ± 0.001
01/10/12	0.019 ± 0.002	0.019 ± 0.002	0.020 ± 0.002	0.021 ± 0.002	0.022 ± 0.002	0.018 ± 0.002	0.021 ± 0.002	0.020 ± 0.002	0.022 ± 0.002
01/17/12	0.011 ± 0.001	0.011 ± 0.001	0.012 ± 0.001	0.014 ± 0.001	0.014 ± 0.001	0.013 ± 0.001	0.013 ± 0.001	0.010 ± 0.001	0.014 ± 0.001
01/24/12	0.011 ± 0.001	0.013 ± 0.001	0.013 ± 0.001	0.014 ± 0.001	0.013 ± 0.001	0.013 ± 0.001	0.012 ± 0.001	0.013 ± 0.001	0.015 ± 0.001
01/31/12	0.015 ± 0.001	0.013 ± 0.001	0.011 ± 0.001	0.014 ± 0.001	0.016 ± 0.001	0.013 ± 0.001	0.016 ± 0.001	0.016 ± 0.001	0.013 ± 0.001
02/07/12	0.015 ± 0.001	0.018 ± 0.001	0.017 ± 0.001	0.017 ± 0.001	0.019 ± 0.001	0.019 ± 0.001	0.018 ± 0.001	0.016 ± 0.001	0.021 ± 0.001
02/14/12	0.012 ± 0.001	0.014 ± 0.001	0.017 ± 0.001	0.016 ± 0.001	0.013 ± 0.001	0.014 ± 0.001	0.015 ± 0.001	0.016 ± 0.001	0.014 ± 0.001
02/21/12	0.019 ± 0.001	0.020 ± 0.001	0.021 ± 0.001	0.022 ± 0.001	0.020 ± 0.001	0.016 ± 0.001	0.023 ± 0.002	0.018 ± 0.001	0.033 ± 0.002
02/28/12	0.015 ± 0.001	0.016 ± 0.001	0.016 ± 0.001	0.017 ± 0.001	0.018 ± 0.001	0.019 ± 0.001	0.019 ± 0.001	0.015 ± 0.001	0.014 ± 0.001
03/06/12	0.014 ± 0.001	0.014 ± 0.001	0.017 ± 0.001	0.014 ± 0.001	0.013 ± 0.001	0.013 ± 0.001	0.011 ± 0.001	0.014 ± 0.001	0.015 ± 0.001
03/13/12	0.017 ± 0.001	0.017 ± 0.001	0.017 ± 0.001	0.019 ± 0.001	0.020 ± 0.001	0.016 ± 0.001	0.018 ± 0.001	0.018 ± 0.001	0.019 ± 0.001
03/20/12	0.019 ± 0.001	0.020 ± 0.001	0.017 ± 0.001	0.018 ± 0.001	0.021 ± 0.001	0.018 ± 0.001	0.021 ± 0.001	0.017 ± 0.001	0.020 ± 0.001
03/27/12	0.014 ± 0.001	0.015 ± 0.001	0.015 ± 0.001	0.017 ± 0.001	0.019 ± 0.001	0.017 ± 0.001	0.016 ± 0.001	0.015 ± 0.001	0.017 ± 0.001
04/03/12	0.015 ± 0.001	0.018 ± 0.001	0.015 ± 0.001	0.016 ± 0.001	0.017 ± 0.001	0.016 ± 0.001	0.015 ± 0.001	0.018 ± 0.001	0.019 ± 0.001
04/10/12	0.017 ± 0.001	0.016 ± 0.001	0.018 ± 0.001	0.016 ± 0.001	0.017 ± 0.001	0.015 ± 0.001	0.014 ± 0.001	0.016 ± 0.001	0.015 ± 0.001
04/17/12	0.015 ± 0.001	0.012 ± 0.001	0.010 ± 0.001	0.014 ± 0.001	0.012 ± 0.001	0.012 ± 0.001	0.015 ± 0.001	0.013 ± 0.001	0.014 ± 0.001
04/24/12	0.011 ± 0.001	0.012 ± 0.001	0.012 ± 0.001	0.012 ± 0.001	0.010 ± 0.001	0.012 ± 0.001	0.009 ± 0.001	0.008 ± 0.001	0.011 ± 0.001
05/01/12	0.014 ± 0.001	0.014 ± 0.001	0.018 ± 0.001	0.015 ± 0.001	0.015 ± 0.001	0.016 ± 0.001	0.019 ± 0.001	0.014 ± 0.001	0.014 ± 0.001
05/08/12	0.014 ± 0.001	0.016 ± 0.001	0.014 ± 0.001	0.014 ± 0.001	0.014 ± 0.001	0.015 ± 0.001	0.013 ± 0.001	0.015 ± 0.001	0.015 ± 0.001
05/15/12	0.018 ± 0.001	0.014 ± 0.001	0.015 ± 0.001	0.016 ± 0.001	0.019 ± 0.001	0.017 ± 0.001	0.017 ± 0.001	0.019 ± 0.001	0.016 ± 0.001
05/22/12	0.015 ± 0.001	0.012 ± 0.001	0.015 ± 0.001	0.012 ± 0.001	0.015 ± 0.001	0.013 ± 0.001	0.012 ± 0.001	0.014 ± 0.001	0.011 ± 0.001
05/30/12	0.015 ± 0.001	0.017 ± 0.001	0.016 ± 0.001	0.017 ± 0.001	0.016 ± 0.001	0.017 ± 0.001	0.017 ± 0.001	0.018 ± 0.001	0.018 ± 0.001
06/05/12	0.008 ± 0.001	0.009 ± 0.001	0.008 ± 0.001	0.010 ± 0.001	0.008 ± 0.001	0.008 ± 0.001	0.007 ± 0.001	0.007 ± 0.001	0.006 ± 0.001
06/12/12	0.014 ± 0.001	0.018 ± 0.001	0.017 ± 0.001	0.019 ± 0.001	0.019 ± 0.001	0.017 ± 0.001	0.017 ± 0.001	0.017 ± 0.001	0.019 ± 0.001
06/19/12	0.013 ± 0.001	0.016 ± 0.001	0.011 ± 0.001	0.013 ± 0.001	0.010 ± 0.001	0.013 ± 0.001	0.010 ± 0.001	0.012 ± 0.001	0.012 ± 0.001
06/26/12	0.013 ± 0.001	0.015 ± 0.001	0.013 ± 0.001	0.015 ± 0.001	0.017 ± 0.001	0.016 ± 0.001	0.016 ± 0.001	0.015 ± 0.001	0.015 ± 0.001

* Sample location required by ODCM

** Optional sample location

TABLE 6-5 (Continued)
ENVIRONMENTAL AIRBORNE PARTICULATE SAMPLES - OFF-SITE SAMPLE LOCATIONS - 2012
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 **
07/03/12	0.017 ± 0.001	0.018 ± 0.001	0.015 ± 0.001	0.019 ± 0.001	0.019 ± 0.001	0.016 ± 0.001	0.019 ± 0.001	0.017 ± 0.001	0.020 ± 0.001
07/10/12	0.013 ± 0.001	0.014 ± 0.001	0.017 ± 0.001	0.013 ± 0.001	0.015 ± 0.001	0.016 ± 0.001	0.017 ± 0.001	0.013 ± 0.001	0.017 ± 0.001
07/17/12	0.021 ± 0.001	0.023 ± 0.002	0.022 ± 0.001	0.019 ± 0.001	0.023 ± 0.002	0.023 ± 0.002	0.025 ± 0.002	0.020 ± 0.001	0.025 ± 0.002
07/24/12	0.020 ± 0.001	0.019 ± 0.001	0.017 ± 0.001	0.016 ± 0.001	0.017 ± 0.001	0.017 ± 0.001	0.020 ± 0.001	0.017 ± 0.001	0.020 ± 0.001
07/31/12	0.016 ± 0.001	0.013 ± 0.001	0.016 ± 0.001	0.014 ± 0.001	0.014 ± 0.001	0.016 ± 0.001	0.016 ± 0.001	0.017 ± 0.001	0.015 ± 0.001
08/07/12	0.021 ± 0.001	0.019 ± 0.001	0.022 ± 0.001	0.018 ± 0.001	0.016 ± 0.001	0.019 ± 0.001	0.015 ± 0.001	0.019 ± 0.001	0.018 ± 0.001
08/14/12	0.015 ± 0.001	0.017 ± 0.001	0.016 ± 0.001	0.015 ± 0.001	0.016 ± 0.001	0.016 ± 0.001	0.017 ± 0.001	0.015 ± 0.001	0.016 ± 0.001
08/21/12	0.016 ± 0.001	0.017 ± 0.001	0.018 ± 0.001	0.018 ± 0.001	0.015 ± 0.001	0.017 ± 0.001	0.019 ± 0.001	0.016 ± 0.001	0.017 ± 0.001
08/28/12	0.026 ± 0.002	0.023 ± 0.002	0.024 ± 0.002	0.023 ± 0.002	0.024 ± 0.002	0.024 ± 0.002	0.025 ± 0.002	0.027 ± 0.002	0.025 ± 0.002
09/05/12	0.017 ± 0.001	0.016 ± 0.001	0.016 ± 0.001	0.016 ± 0.001	0.019 ± 0.001	0.018 ± 0.001	0.016 ± 0.001	0.019 ± 0.001	0.019 ± 0.001
09/11/12	0.020 ± 0.002	0.018 ± 0.002	0.018 ± 0.002	0.019 ± 0.002	0.020 ± 0.002	0.016 ± 0.001	0.018 ± 0.002	0.018 ± 0.002	0.023 ± 0.002
09/18/12	0.022 ± 0.002	0.022 ± 0.002	0.020 ± 0.001	0.019 ± 0.001	0.019 ± 0.001	0.021 ± 0.001	0.020 ± 0.001	0.020 ± 0.001	0.020 ± 0.001
09/25/12	0.012 ± 0.001	0.008 ± 0.001	0.011 ± 0.001	0.009 ± 0.001	0.009 ± 0.001	0.010 ± 0.001	0.011 ± 0.001	0.011 ± 0.001	0.010 ± 0.001
10/02/12	0.015 ± 0.001	0.015 ± 0.001	0.012 ± 0.001	0.013 ± 0.001	0.012 ± 0.001	0.015 ± 0.001	0.016 ± 0.001	0.015 ± 0.001	0.012 ± 0.001
10/09/12	0.019 ± 0.001	0.018 ± 0.001	0.021 ± 0.001	0.017 ± 0.001	0.015 ± 0.001	0.018 ± 0.001	0.019 ± 0.001	0.017 ± 0.001	0.020 ± 0.001
10/16/12	0.015 ± 0.001	0.013 ± 0.001	0.014 ± 0.001	0.014 ± 0.001	0.013 ± 0.001	0.013 ± 0.001	0.012 ± 0.001	0.015 ± 0.001	0.015 ± 0.001
10/23/12	0.017 ± 0.001	0.016 ± 0.001	0.016 ± 0.001	0.014 ± 0.001	0.017 ± 0.001	0.016 ± 0.001	0.017 ± 0.001	0.019 ± 0.001	0.016 ± 0.001
10/30/12	0.022 ± 0.002	0.019 ± 0.001	0.020 ± 0.001	0.022 ± 0.002	0.018 ± 0.001	0.018 ± 0.001	0.022 ± 0.002	0.018 ± 0.001	0.018 ± 0.001
11/06/12	0.005 ± 0.001	0.005 ± 0.001	0.004 ± 0.001	0.005 ± 0.001	0.005 ± 0.001	0.006 ± 0.001	0.006 ± 0.001	0.007 ± 0.001	0.004 ± 0.001
11/13/12	0.024 ± 0.001	0.023 ± 0.002	0.024 ± 0.002	0.027 ± 0.002	0.025 ± 0.002	0.026 ± 0.002	0.026 ± 0.002	0.025 ± 0.002	0.027 ± 0.002
11/20/12	0.022 ± 0.002	0.023 ± 0.002	0.023 ± 0.002	0.020 ± 0.001	0.023 ± 0.002	0.024 ± 0.002	0.024 ± 0.002	0.022 ± 0.001	0.025 ± 0.002
11/28/12	0.021 ± 0.001	0.024 ± 0.001	0.027 ± 0.002	0.022 ± 0.001	0.021 ± 0.001	0.022 ± 0.001	0.021 ± 0.001	0.026 ± 0.002	0.026 ± 0.002
12/04/12	0.031 ± 0.002	0.028 ± 0.002	0.029 ± 0.002	0.027 ± 0.002	0.025 ± 0.002	0.024 ± 0.002	0.026 ± 0.002	0.029 ± 0.002	0.025 ± 0.002
12/11/12	0.011 ± 0.001	0.012 ± 0.001	0.012 ± 0.001	0.013 ± 0.001	0.011 ± 0.001	0.013 ± 0.001	0.010 ± 0.001	0.012 ± 0.001	0.012 ± 0.001
12/18/12	0.017 ± 0.001	0.019 ± 0.001	0.019 ± 0.001	0.019 ± 0.001	0.019 ± 0.001	0.017 ± 0.001	0.021 ± 0.001	0.020 ± 0.001	0.022 ± 0.002
12/26/12	0.016 ± 0.001	0.014 ± 0.001	0.012 ± 0.001	0.013 ± 0.001	0.012 ± 0.001	0.014 ± 0.001	0.013 ± 0.001	0.016 ± 0.001	0.014 ± 0.001

* Sample location required by ODCM

** Optional sample location

TABLE 6-6

ENVIRONMENTAL AIRBORNE PARTICULATE SAMPLES - ON-SITE SAMPLE LOCATIONS - 2012

GROSS BETA ACTIVITY pCi/ m^3 ± 1 Sigma

Week End Date	D-1 **	G **	H **	I **	J **	K **
01/03/12	0.018 ± 0.001	0.016 ± 0.001	0.014 ± 0.001	0.015 ± 0.001	0.016 ± 0.001	0.014 ± 0.001
01/09/12	0.022 ± 0.002	0.021 ± 0.002	0.021 ± 0.002	0.023 ± 0.002	0.022 ± 0.002	0.025 ± 0.002
01/16/12	0.013 ± 0.001	0.012 ± 0.001	0.011 ± 0.001	0.013 ± 0.001	0.011 ± 0.001	0.014 ± 0.001
01/23/12	0.015 ± 0.001	0.016 ± 0.001	0.013 ± 0.001	0.012 ± 0.001	0.011 ± 0.001	0.016 ± 0.001
01/30/12	0.016 ± 0.001	0.016 ± 0.001	0.015 ± 0.001	0.016 ± 0.001	0.014 ± 0.001	0.019 ± 0.001
02/06/12	0.018 ± 0.001	0.016 ± 0.001	0.019 ± 0.001	0.019 ± 0.001	0.015 ± 0.001	0.015 ± 0.001
02/13/12	0.018 ± 0.001	0.016 ± 0.001	0.015 ± 0.001	0.015 ± 0.001	0.013 ± 0.001	0.016 ± 0.001
02/20/12	0.020 ± 0.001	0.019 ± 0.001	0.018 ± 0.001	0.018 ± 0.001	0.019 ± 0.001	0.018 ± 0.001
02/27/12	0.017 ± 0.001	0.016 ± 0.001	0.015 ± 0.001	0.015 ± 0.001	0.018 ± 0.001	0.013 ± 0.001
03/05/12	0.017 ± 0.001	0.014 ± 0.001	0.015 ± 0.001	0.015 ± 0.001	0.014 ± 0.001	0.017 ± 0.001
03/12/12	0.020 ± 0.001	0.019 ± 0.001	0.016 ± 0.001	0.019 ± 0.001	0.016 ± 0.001	0.019 ± 0.001
03/19/12	0.021 ± 0.001	0.019 ± 0.001	0.020 ± 0.001	0.023 ± 0.002	0.018 ± 0.001	0.019 ± 0.001
03/26/12	0.014 ± 0.001	0.015 ± 0.001	0.015 ± 0.001	0.014 ± 0.001	0.018 ± 0.001	0.017 ± 0.001
04/02/12	0.018 ± 0.001	0.018 ± 0.001	0.014 ± 0.001	0.017 ± 0.001	0.019 ± 0.001	0.016 ± 0.001
04/09/12	0.017 ± 0.001	0.017 ± 0.001	0.015 ± 0.001	0.016 ± 0.001	0.015 ± 0.001	0.016 ± 0.001
04/16/12	0.014 ± 0.001	0.014 ± 0.001	0.011 ± 0.001	0.015 ± 0.001	0.014 ± 0.001	0.014 ± 0.001
04/23/12	0.013 ± 0.001	0.013 ± 0.001	0.013 ± 0.001	0.014 ± 0.001	0.013 ± 0.001	0.012 ± 0.001
04/30/12	0.012 ± 0.001	0.013 ± 0.001	0.012 ± 0.001	0.013 ± 0.001	0.014 ± 0.001	0.012 ± 0.001
05/07/12	0.017 ± 0.001	0.016 ± 0.001	0.017 ± 0.001	0.016 ± 0.001	0.016 ± 0.001	0.015 ± 0.001
05/14/12	0.018 ± 0.001	0.015 ± 0.001	0.017 ± 0.001	0.014 ± 0.001	0.015 ± 0.001	0.015 ± 0.001
05/21/12	0.015 ± 0.001	0.015 ± 0.001	0.013 ± 0.001	0.015 ± 0.001	0.015 ± 0.001	0.015 ± 0.001
05/29/12	0.015 ± 0.001	0.017 ± 0.001	0.018 ± 0.001	0.016 ± 0.001	0.015 ± 0.001	0.015 ± 0.001
06/04/12	0.013 ± 0.001	0.012 ± 0.001	0.011 ± 0.001	0.013 ± 0.001	0.012 ± 0.001	0.012 ± 0.001
06/11/12	0.014 ± 0.001	0.012 ± 0.001	0.013 ± 0.001	0.012 ± 0.001	0.012 ± 0.001	0.013 ± 0.001
06/18/12	0.014 ± 0.001	0.012 ± 0.001	0.015 ± 0.001	0.015 ± 0.001	0.012 ± 0.001	0.015 ± 0.001
06/25/12	0.016 ± 0.001	0.014 ± 0.001	0.016 ± 0.001	0.016 ± 0.001	0.016 ± 0.001	0.014 ± 0.001

** Optional sample location

TABLE 6-6 (Continued)

ENVIRONMENTAL AIRBORNE PARTICULATE SAMPLES - ON-SITE SAMPLE LOCATIONS - 2012

GROSS BETA ACTIVITY pCi/ m^3 ± 1 Sigma

Week End Date	D-1 **	G **	H **	I **	J **	K **
07/02/12	0.018 ± 0.001	0.017 ± 0.001	0.014 ± 0.001	0.017 ± 0.001	0.016 ± 0.001	0.015 ± 0.001
07/09/12	0.013 ± 0.001	0.014 ± 0.001	0.015 ± 0.001	0.015 ± 0.001	0.013 ± 0.001	0.013 ± 0.001
07/16/12	0.021 ± 0.001	0.020 ± 0.001	0.005 ± 0.001	0.020 ± 0.001	0.018 ± 0.001	0.021 ± 0.001
07/23/12	0.018 ± 0.001	0.013 ± 0.001	0.015 ± 0.001	0.015 ± 0.001	0.017 ± 0.001	0.014 ± 0.001
07/30/12	0.020 ± 0.001	0.017 ± 0.001	0.016 ± 0.001	0.018 ± 0.001	0.016 ± 0.001	0.016 ± 0.001
08/06/12	0.025 ± 0.002	0.020 ± 0.001	0.021 ± 0.001	0.022 ± 0.002	0.021 ± 0.001	0.023 ± 0.002
08/13/12	0.014 ± 0.001	0.014 ± 0.001	0.015 ± 0.001	0.014 ± 0.001	0.013 ± 0.001	0.016 ± 0.001
08/20/12	0.016 ± 0.001	0.015 ± 0.001	0.015 ± 0.001	0.017 ± 0.001	0.016 ± 0.001	0.017 ± 0.001
08/27/12	0.024 ± 0.002	0.020 ± 0.001	0.023 ± 0.002	0.026 ± 0.002	0.023 ± 0.002	0.023 ± 0.001
09/04/12	0.020 ± 0.001	0.020 ± 0.001	0.017 ± 0.001	0.019 ± 0.001	0.018 ± 0.001	0.018 ± 0.001
09/10/12	0.018 ± 0.002	0.018 ± 0.002	0.017 ± 0.001	0.016 ± 0.001	0.017 ± 0.002	0.016 ± 0.001
09/17/12	0.018 ± 0.001	0.017 ± 0.001	0.020 ± 0.001	0.020 ± 0.001	0.018 ± 0.001	0.017 ± 0.001
09/24/12	0.015 ± 0.001	0.011 ± 0.001	0.012 ± 0.001	0.012 ± 0.001	0.014 ± 0.001	0.013 ± 0.001
10/01/12	0.016 ± 0.001	0.013 ± 0.001	0.013 ± 0.001	0.015 ± 0.001	0.015 ± 0.001	0.014 ± 0.001
10/08/12	0.022 ± 0.002	0.017 ± 0.001	0.018 ± 0.001	0.019 ± 0.001	0.018 ± 0.001	0.017 ± 0.001
10/15/12	0.012 ± 0.001	0.013 ± 0.001	0.013 ± 0.001	0.014 ± 0.001	0.016 ± 0.001	0.017 ± 0.001
10/22/12	0.013 ± 0.001	0.013 ± 0.001	0.013 ± 0.001	0.015 ± 0.001	0.014 ± 0.001	0.013 ± 0.001
10/29/12	0.022 ± 0.002	0.021 ± 0.001	0.021 ± 0.001	0.021 ± 0.001	0.025 ± 0.002	0.021 ± 0.001
11/05/12	0.005 ± 0.001	0.005 ± 0.001	0.006 ± 0.001	0.005 ± 0.001	0.003 ± 0.001	0.006 ± 0.001
11/12/12	0.024 ± 0.002	0.025 ± 0.002	0.023 ± 0.001	0.018 ± 0.001	0.024 ± 0.002	0.026 ± 0.002
11/19/12	0.025 ± 0.002	0.020 ± 0.001	0.021 ± 0.001	0.020 ± 0.001	0.022 ± 0.001	0.020 ± 0.001
11/26/12	0.028 ± 0.002	0.027 ± 0.002	0.027 ± 0.002	0.028 ± 0.002	0.030 ± 0.002	0.030 ± 0.002
12/03/12	0.024 ± 0.002	0.028 ± 0.002	0.021 ± 0.001	0.022 ± 0.002	0.023 ± 0.002	0.022 ± 0.002
12/10/12	0.017 ± 0.001	0.013 ± 0.001	0.016 ± 0.001	0.014 ± 0.001	0.017 ± 0.001	0.017 ± 0.001
12/17/12	0.022 ± 0.001	0.018 ± 0.001	0.020 ± 0.001	0.020 ± 0.001	0.020 ± 0.001	0.020 ± 0.001
12/26/12	0.015 ± 0.001	0.013 ± 0.001	0.013 ± 0.001	0.013 ± 0.001	0.012 ± 0.001	0.013 ± 0.001

** Optional sample location

TABLE 6-7
ENVIRONMENTAL CHARCOAL CARTRIDGE SAMPLES - OFF-SITE SAMPLE LOCATIONS – 2012
I-131 ACTIVITY pCi/ m3 ± 1 Sigma

Week End Date	R-1 *	R-2 *	R-3 *	R-4 *	R-5 *	D-2 **	E **	F **	G **
01/04/12	< 0.017	< 0.013	< 0.022	< 0.017	< 0.021	< 0.012	< 0.018	< 0.023	< 0.022
01/10/12	< 0.024	< 0.021	< 0.022	< 0.022	< 0.020	< 0.024	< 0.023	< 0.018	< 0.017
01/17/12	< 0.014	< 0.017	< 0.014	< 0.022	< 0.018	< 0.024	< 0.019	< 0.013	< 0.010
01/24/12	< 0.025	< 0.017	< 0.016	< 0.019	< 0.026	< 0.019	< 0.020	< 0.020	< 0.012
01/31/12	< 0.017	< 0.017	< 0.016	< 0.015	< 0.019	< 0.021	< 0.021	< 0.015	< 0.010
02/07/12	< 0.018	< 0.019	< 0.013	< 0.019	< 0.018	< 0.022	< 0.012	< 0.017	< 0.018
02/14/12	< 0.020	< 0.016	< 0.015	< 0.019	< 0.020	< 0.014	< 0.014	< 0.024	< 0.012
02/21/12	< 0.019	< 0.015	< 0.017	< 0.015	< 0.020	< 0.018	< 0.017	< 0.020	< 0.014
02/28/12	< 0.019	< 0.016	< 0.020	< 0.023	< 0.020	< 0.027	< 0.023	< 0.015	< 0.010
03/06/12	< 0.018	< 0.016	< 0.020	< 0.021	< 0.017	< 0.020	< 0.021	< 0.016	< 0.009
03/13/12	< 0.025	< 0.015	< 0.014	< 0.016	< 0.014	< 0.023	< 0.021	< 0.019	< 0.022
03/20/12	< 0.019	< 0.016	< 0.010	< 0.016	< 0.025	< 0.022	< 0.021	< 0.026	< 0.021
03/27/12	< 0.018	< 0.010	< 0.021	< 0.030	< 0.019	< 0.015	< 0.015	< 0.019	< 0.023
04/03/12	< 0.023	< 0.016	< 0.016	< 0.016	< 0.026	< 0.021	< 0.018	< 0.019	< 0.016
04/10/12	< 0.018	< 0.015	< 0.020	< 0.019	< 0.016	< 0.018	< 0.021	< 0.019	< 0.020
04/17/12	< 0.015	< 0.018	< 0.020	< 0.018	< 0.020	< 0.028	< 0.026	< 0.014	< 0.015
04/24/12	< 0.018	< 0.016	< 0.019	< 0.019	< 0.013	< 0.024	< 0.017	< 0.012	< 0.022
05/01/12	< 0.021	< 0.020	< 0.014	< 0.020	< 0.019	< 0.018	< 0.013	< 0.012	< 0.023
05/08/12	< 0.012	< 0.020	< 0.021	< 0.018	< 0.017	< 0.014	< 0.015	< 0.020	< 0.018
05/15/12	< 0.014	< 0.003	< 0.012	< 0.020	< 0.019	< 0.014	< 0.023	< 0.020	< 0.012
05/22/12	< 0.017	< 0.021	< 0.022	< 0.011	< 0.020	< 0.017	< 0.015	< 0.018	< 0.016
05/30/12	< 0.014	< 0.018	< 0.015	< 0.012	< 0.016	< 0.014	< 0.012	< 0.018	< 0.017
06/05/12	< 0.025	< 0.020	< 0.015	< 0.014	< 0.020	< 0.026	< 0.023	< 0.018	< 0.026
06/12/12	< 0.019	< 0.019	< 0.019	< 0.021	< 0.020	< 0.018	< 0.021	< 0.021	< 0.023
06/19/12	< 0.020	< 0.016	< 0.015	< 0.020	< 0.023	< 0.019	< 0.021	< 0.019	< 0.020
06/26/12	< 0.020	< 0.015	< 0.014	< 0.021	< 0.018	< 0.017	< 0.017	< 0.017	< 0.021

TABLE 6-7 (Continued)
ENVIRONMENTAL CHARCOAL CARTRIDGE SAMPLES - OFF-SITE SAMPLE LOCATIONS – 2012
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 **
07/03/12	< 0.017	< 0.020	< 0.017	< 0.014	< 0.018	< 0.020	< 0.015	< 0.009	< 0.020
07/10/12	< 0.019	< 0.017	< 0.016	< 0.021	< 0.023	< 0.016	< 0.012	< 0.019	< 0.020
07/17/12	< 0.024	< 0.021	< 0.014	< 0.019	< 0.019	< 0.019	< 0.026	< 0.014	< 0.023
07/24/12	< 0.015	< 0.017	< 0.016	< 0.015	< 0.016	< 0.014	< 0.020	< 0.021	< 0.011
07/31/12	< 0.016	< 0.024	< 0.020	< 0.019	< 0.023	< 0.019	< 0.023	< 0.017	< 0.021
08/07/12	< 0.016	< 0.004	< 0.014	< 0.015	< 0.021	< 0.018	< 0.017	< 0.019	< 0.015
08/14/12	< 0.019	< 0.015	< 0.015	< 0.014	< 0.022	< 0.023	< 0.014	< 0.016	< 0.018
08/21/12	< 0.020	< 0.012	< 0.016	< 0.018	< 0.017	< 0.023	< 0.018	< 0.015	< 0.010
08/28/12	< 0.021	< 0.018	< 0.020	< 0.020	< 0.015	< 0.015	< 0.020	< 0.014	< 0.014
09/05/12	< 0.023	< 0.014	< 0.014	< 0.018	< 0.024	< 0.018	< 0.020	< 0.019	< 0.012
09/11/12	< 0.023	< 0.020	< 0.013	< 0.021	< 0.014	< 0.023	< 0.020	< 0.020	< 0.014
09/18/12	< 0.022	< 0.015	< 0.012	< 0.009	< 0.018	< 0.024	< 0.016	< 0.022	< 0.015
09/25/12	< 0.018	< 0.020	< 0.018	< 0.023	< 0.014	< 0.019	< 0.016	< 0.015	< 0.015
10/02/12	< 0.013	< 0.018	< 0.025	< 0.019	< 0.016	< 0.017	< 0.020	< 0.017	< 0.018
10/09/12	< 0.020	< 0.016	< 0.022	< 0.021	< 0.021	< 0.019	< 0.021	< 0.026	< 0.017
10/16/12	< 0.015	< 0.012	< 0.019	< 0.015	< 0.024	< 0.021	< 0.012	< 0.017	< 0.013
10/23/12	< 0.018	< 0.019	< 0.020	< 0.017	< 0.021	< 0.016	< 0.026	< 0.017	< 0.024
10/30/12	< 0.025	< 0.028	< 0.019	< 0.019	< 0.024	< 0.021	< 0.021	< 0.020	< 0.018
11/06/12	< 0.026	< 0.017	< 0.018	< 0.014	< 0.021	< 0.022	< 0.016	< 0.017	< 0.022
11/13/12	< 0.018	< 0.019	< 0.021	< 0.020	< 0.021	< 0.014	< 0.015	< 0.021	< 0.024
11/20/12	< 0.021	< 0.017	< 0.015	< 0.020	< 0.024	< 0.016	< 0.020	< 0.019	< 0.021
11/28/12	< 0.013	< 0.017	< 0.018	< 0.015	< 0.019	< 0.016	< 0.020	< 0.017	< 0.021
12/04/12	< 0.022	< 0.021	< 0.019	< 0.026	< 0.022	< 0.025	< 0.018	< 0.020	< 0.022
12/11/12	< 0.020	< 0.016	< 0.021	< 0.017	< 0.021	< 0.019	< 0.016	< 0.013	< 0.016
12/18/12	< 0.018	< 0.018	< 0.022	< 0.026	< 0.010	< 0.010	< 0.018	< 0.018	< 0.016
12/26/12	< 0.019	< 0.016	< 0.015	< 0.018	< 0.015	< 0.019	< 0.016	< 0.017	< 0.019

* ODCM Required Sample Location

** Optional Sample Location

TABLE 6-8
ENVIRONMENTAL CHARCOAL CARTRIDGE SAMPLES - ON-SITE SAMPLE LOCATIONS – 2012
I-131 ACTIVITY pCi/ m^3 ± 1 Sigma

Week End Date	D-1 **	G **	H **	I **	J **	K **
01/03/12	< 0.024	< 0.025	< 0.021	< 0.019	< 0.024	< 0.020
01/09/12	< 0.026	< 0.028	< 0.016	< 0.026	< 0.022	< 0.017
01/16/12	< 0.022	< 0.016	< 0.012	< 0.021	< 0.020	< 0.019
01/23/12	< 0.018	< 0.016	< 0.017	< 0.022	< 0.011	< 0.024
01/30/12	< 0.015	< 0.017	< 0.016	< 0.015	< 0.018	< 0.021
02/06/12	< 0.019	< 0.020	< 0.014	< 0.015	< 0.015	< 0.015
02/13/12	< 0.021	< 0.010	< 0.014	< 0.020	< 0.023	< 0.022
02/20/12	< 0.021	< 0.013	< 0.019	< 0.022	< 0.027	< 0.030
02/27/12	< 0.013	< 0.015	< 0.014	< 0.015	< 0.022	< 0.021
03/05/12	< 0.025	< 0.015	< 0.021	< 0.019	< 0.020	< 0.020
03/12/12	< 0.022	< 0.022	< 0.018	< 0.024	< 0.019	< 0.022
03/19/12	< 0.021	< 0.019	< 0.019	< 0.021	< 0.020	< 0.023
03/26/12	< 0.020	< 0.014	< 0.022	< 0.016	< 0.012	< 0.021
04/02/12	< 0.017	< 0.015	< 0.010	< 0.019	< 0.014	< 0.024
04/09/12	< 0.019	< 0.019	< 0.016	< 0.020	< 0.020	< 0.021
04/16/12	< 0.019	< 0.017	< 0.018	< 0.019	< 0.020	< 0.019
04/23/12	< 0.016	< 0.021	< 0.022	< 0.018	< 0.027	< 0.023
04/30/12	< 0.016	< 0.019	< 0.029	< 0.016	< 0.020	< 0.020
05/07/12	< 0.017	< 0.021	< 0.023	< 0.024	< 0.018	< 0.019
05/14/12	< 0.011	< 0.017	< 0.018	< 0.017	< 0.026	< 0.020
05/21/12	< 0.020	< 0.013	< 0.025	< 0.016	< 0.016	< 0.021
05/29/12	< 0.013	< 0.018	< 0.020	< 0.017	< 0.022	< 0.016
06/04/12	< 0.015	< 0.016	< 0.024	< 0.028	< 0.019	< 0.019
06/11/12	< 0.016	< 0.016	< 0.015	< 0.018	< 0.018	< 0.020
06/18/12	< 0.024	< 0.018	< 0.023	< 0.020	< 0.026	< 0.016
06/25/12	< 0.018	< 0.015	< 0.014	< 0.022	< 0.022	< 0.018

** Optional Sample Location

TABLE 6-8 (Continued)
ENVIRONMENTAL CHARCOAL CARTRIDGE SAMPLES - ON-SITE SAMPLE LOCATIONS – 2012
I-131 ACTIVITY pCi/ m^3 ± 1 Sigma

Week End Date	D-1 **	G **	H **	I **	J **	K **
07/02/12	< 0.018	< 0.012	< 0.017	< 0.018	< 0.017	< 0.012
07/09/12	< 0.024	< 0.016	< 0.012	< 0.019	< 0.021	< 0.019
07/16/12	< 0.017	< 0.023	< 0.013	< 0.020	< 0.015	< 0.020
07/23/12	< 0.026	< 0.024	< 0.022	< 0.020	< 0.024	< 0.022
07/30/12	< 0.018	< 0.010	< 0.019	< 0.021	< 0.019	< 0.012
08/06/12	< 0.013	< 0.012	< 0.015	< 0.022	< 0.023	< 0.017
08/13/12	< 0.022	< 0.014	< 0.019	< 0.021	< 0.021	< 0.019
08/20/12	< 0.016	< 0.018	< 0.019	< 0.012	< 0.019	< 0.019
08/27/12	< 0.022	< 0.017	< 0.017	< 0.014	< 0.026	< 0.015
09/04/12	< 0.009	< 0.020	< 0.020	< 0.019	< 0.019	< 0.015
09/10/12	< 0.018	< 0.016	< 0.014	< 0.024	< 0.024	< 0.025
09/17/12	< 0.017	< 0.015	< 0.020	< 0.027	< 0.014	< 0.015
09/24/12	< 0.021	< 0.020	< 0.015	< 0.015	< 0.020	< 0.021
10/01/12	< 0.022	< 0.024	< 0.028	< 0.018	< 0.021	< 0.019
10/08/12	< 0.016	< 0.015	< 0.018	< 0.022	< 0.020	< 0.023
10/15/12	< 0.019	< 0.016	< 0.011	< 0.018	< 0.021	< 0.018
10/22/12	< 0.019	< 0.021	< 0.020	< 0.021	< 0.023	< 0.020
10/29/12	< 0.022	< 0.016	< 0.017	< 0.021	< 0.015	< 0.018
11/05/12	< 0.019	< 0.022	< 0.022	< 0.029	< 0.019	< 0.028
11/12/12	< 0.028	< 0.011	< 0.023	< 0.014	< 0.021	< 0.028
11/19/12	< 0.025	< 0.023	< 0.023	< 0.019	< 0.013	< 0.023
11/26/12	< 0.018	< 0.023	< 0.019	< 0.016	< 0.020	< 0.021
12/03/12	< 0.019	< 0.010	< 0.015	< 0.023	< 0.021	< 0.022
12/10/12	< 0.015	< 0.019	< 0.026	< 0.015	< 0.015	< 0.020
12/17/12	< 0.019	< 0.018	< 0.023	< 0.025	< 0.020	< 0.017
12/26/12	< 0.015	< 0.015	< 0.016	< 0.017	< 0.017	< 0.015

** Optional sample location

TABLE 6-9
CONCENTRATIONS OF GAMMA EMITTERS IN QUARTERLY COMPOSITES
OF JAF/NMPNS SITE AIR PARTICULATE SAMPLES - 2012
Results in Units of 10E-3 pCi/ m^3 ± 1 Sigma

OFFSITE SAMPLE LOCATIONS - 1ST QTR 2012

Nuclide	R-1 *	R-2 *	R-3 *	R-4 *	R-5 *	D-2 **	E **	F **	G **
Be-7	79.8 ± 11.7	90.6 ± 10.7	80.2 ± 10.2	97.8 ± 12.4	106.1 ± 12.9	104.6 ± 11.2	115.5 ± 13.2	100.9 ± 11.7	73.4 ± 10.7
Cs-134	< 1.8	< 2.0	< 1.7	< 2.7	< 1.7	< 1.3	< 1.9	< 1.9	< 1.2
Cs-137	< 0.7	< 1.1	< 0.7	< 1.2	< 0.8	< 1.3	< 1.4	< 0.9	< 0.9
Zr-95	< 4.1	< 3.7	< 0.9	< 3.4	< 4.5	< 4.1	< 4.4	< 3.3	< 3.1
Nb-95	< 2.8	< 3.0	< 2.0	< 3.2	< 2.6	< 3.6	< 3.6	< 0.6	< 0.7
Co-58	< 1.9	< 2.7	< 2.3	< 1.9	< 2.1	< 1.1	< 1.6	< 2.3	< 1.4
Mn-54	< 1.7	< 1.9	< 0.4	< 1.9	< 1.8	< 1.0	< 1.5	< 1.6	< 1.2
Zn-65	< 5.0	< 3.2	< 3.4	< 2.9	< 1.0	< 3.9	< 4.7	< 2.8	< 3.3
Co-60	< 2.4	< 2.1	< 1.9	< 0.6	< 1.5	< 1.5	< 2.2	< 1.8	< 1.5
K-40	48.6 ± 9.4	< 11.9	< 24.5	< 25.1	36.5 ± 8.6	< 15.2	22.2 ± 8.3	< 15.2	< 5.2

OFFSITE SAMPLE LOCATIONS - 2ND QTR 2012

Nuclide	R-1 *	R-2 *	R-3 *	R-4 *	R-5 *	D-2 **	E **	F **	G **
Be-7	116.5 ± 13.1	132.6 ± 13.2	144.2 ± 14.4	137.6 ± 13.2	136.6 ± 13.7	118.4 ± 12.3	141.0 ± 14.7	121.4 ± 12.3	105.9 ± 12.3
Cs-134	< 1.6	< 1.7	< 2.4	< 1.3	< 1.2	< 1.9	< 1.8	< 1.5	< 1.8
Cs-137	< 1.2	< 1.2	< 1.5	< 1.1	< 0.7	< 0.7	< 1.6	< 0.9	< 0.9
Zr-95	< 3.0	< 2.6	< 4.0	< 2.9	< 3.0	< 3.0	< 3.4	< 3.3	< 3.0
Nb-95	< 0.7	< 2.5	< 3.6	< 2.7	< 2.9	< 2.5	< 2.2	< 0.6	< 2.5
Co-58	< 2.0	< 1.2	< 2.8	< 1.4	< 1.7	< 1.6	< 1.9	< 1.4	< 1.4
Mn-54	< 1.4	< 1.3	< 0.4	< 1.2	< 1.2	< 1.3	< 1.6	< 1.0	< 1.2
Zn-65	< 2.6	< 4.4	< 1.0	< 3.0	< 1.0	< 3.1	< 3.7	< 3.0	< 2.6
Co-60	< 1.5	< 1.7	< 1.6	< 1.2	< 1.5	< 1.2	< 2.0	< 1.1	< 0.5
K-40	< 21.7	< 12.3	42.0 ± 10.0	< 15.2	< 5.2	< 12.3	36.2 ± 10.4	< 15.0	< 21.7

* ODCM Required Sample Loction

** Optional Sample Location

TABLE 6-9 (continued)
CONCENTRATIONS OF GAMMA EMITTERS IN QUARTERLY COMPOSITES
OF JAF/NMPNS SITE AIR PARTICULATE SAMPLES - 2012
Results in Units of 10E-3 pCi/ m^3 ± 1 Sigma

OFFSITE SAMPLE LOCATIONS - 3RD QTR 2012

Nuclide	R-1 *	R-2 *	R-3 *	R-4 *	R-5 *	D-2 **	E **	F **	G **
Be-7	101.6 ± 11.4	128.2 ± 13.1	103.0 ± 12.1	84.1 ± 12.8	113.7 ± 13.3	108.4 ± 13.0	102.7 ± 13.5	92.6 ± 11.6	108.6 ± 12.0
Cs-134	< 1.8	< 0.9	< 1.4	< 1.7	< 2.1	< 2.2	< 1.9	< 1.9	< 1.8
Cs-137	< 1.0	< 0.7	< 1.2	< 1.8	< 1.4	< 1.5	< 1.7	< 1.8	< 1.5
Zr-95	< 3.0	< 3.0	< 3.4	< 4.4	< 6.3	< 3.9	< 2.7	< 3.6	< 3.9
Nb-95	< 3.0	< 2.0	< 2.1	< 3.6	< 4.0	< 2.5	< 2.8	< 3.3	< 3.0
Co-58	< 1.8	< 1.7	< 1.2	< 1.5	< 2.4	< 1.8	< 2.6	< 2.1	< 1.8
Mn-54	< 0.3	< 1.2	< 0.3	< 1.0	< 1.6	< 1.5	< 2.0	< 1.6	< 1.9
Zn-65	< 2.5	< 4.3	< 2.4	< 2.9	< 3.9	< 4.3	< 4.4	< 3.8	< 3.0
Co-60	< 1.5	< 1.8	< 0.5	< 2.6	< 2.2	< 1.4	< 2.1	< 1.4	< 1.2
K-40	< 4.6	< 18.4	< 4.5	< 16.6	< 18.7	< 11.9	50.9 ± 11.0	< 14.6	< 15.1

OFFSITE SAMPLE LOCATIONS - 4TH QTR 2012

Nuclide	R-1 *	R-2 *	R-3 *	R-4 *	R-5 *	D-2 **	E **	F **	G **
Be-7	68.0 ± 9.4	63.3 ± 9.3	51.5 ± 9.9	54.1 ± 9.8	76.6 ± 10.2	50.7 ± 9.7	42.5 ± 8.1	64.7 ± 10.8	44.9 ± 9.3
Cs-134	< 1.8	< 1.9	< 1.7	< 1.9	< 2.3	< 1.2	< 1.9	< 2.1	< 1.8
Cs-137	< 0.9	< 1.2	< 1.5	< 1.6	< 1.4	< 1.0	< 0.9	< 1.7	< 1.2
Zr-95	< 3.0	< 2.6	< 4.0	< 4.4	< 2.8	< 0.9	< 3.7	< 2.7	< 3.0
Nb-95	< 2.0	< 3.6	< 3.3	< 2.5	< 3.6	< 2.5	< 3.0	< 2.2	< 2.5
Co-58	< 2.0	< 1.8	< 3.2	< 2.5	< 1.2	< 1.7	< 2.0	< 2.5	< 2.2
Mn-54	< 1.2	< 1.4	< 1.9	< 1.4	< 0.3	< 1.0	< 0.9	< 1.7	< 1.3
Zn-65	< 2.6	< 4.3	< 4.2	< 4.9	< 3.9	< 2.6	< 3.1	< 5.9	< 4.3
Co-60	< 1.4	< 1.5	< 1.6	< 1.4	< 0.4	< 1.4	< 1.2	< 1.6	< 1.1
K-40	< 5.1	< 4.4	< 16.5	39.5 ± 9.0	< 14.8	< 5.1	< 4.5	< 16.5	< 19.2

* ODCM Required Sample Loction

** Optional Sample Location

TABLE 6-9 (continued)
CONCENTRATIONS OF GAMMA EMITTERS IN QUARTERLY COMPOSITES
OF JAF/NMPNS SITE AIR PARTICULATE SAMPLES - 2012
Results in Units of 10E-3 pCi/ m^3 ± 1 Sigma

ONSITE SAMPLE LOCATIONS - 1ST QTR 2012

Nuclide	D-1 **	G **	H **	I **	J **	K **
Be-7	82.3 ± 11.4	90.4 ± 10.8	81.2 ± 10.3	97.9 ± 12.4	104.1 ± 13.0	78.3 ± 10.5
Cs-134	< 2.1	< 1.3	< 1.2	< 1.7	< 2.2	< 1.6
Cs-137	< 1.3	< 1.1	< 0.7	< 1.2	< 0.8	< 1.3
Zr-95	< 3.4	< 2.9	< 3.1	< 5.0	< 3.8	< 3.7
Nb-95	< 3.2	< 2.8	< 3.6	< 3.7	< 3.8	< 2.7
Co-58	< 2.7	< 1.7	< 1.4	< 2.8	< 2.4	< 1.4
Mn-54	< 1.8	< 1.7	< 1.6	< 1.6	< 0.4	< 1.4
Zn-65	< 4.1	< 4.0	< 4.7	< 4.9	< 2.7	< 2.3
Co-60	< 2.1	< 1.5	< 0.5	< 1.6	< 1.9	< 1.1
K-40	34.8 ± 8.7	< 17.7	< 14.8	< 17.0	< 19.0	< 14.9

ONSITE SAMPLE LOCATIONS - 2ND QTR 2012

Nuclide	D-1 **	G **	H **	I **	J **	K **
Be-7	105.5 ± 11.6	114.9 ± 12.2	101.1 ± 11.8	132.4 ± 14.7	133.9 ± 13.3	123.0 ± 12.8
Cs-134	< 1.2	< 1.2	< 1.3	< 2.2	< 1.2	< 1.0
Cs-137	< 1.3	< 1.5	< 1.6	< 1.0	< 1.1	< 0.7
Zr-95	< 3.5	< 3.3	< 2.7	< 4.5	< 4.1	< 3.2
Nb-95	< 2.0	< 2.8	< 2.5	< 2.9	< 3.1	< 2.6
Co-58	< 2.0	< 1.4	< 2.1	< 0.5	< 2.1	< 1.4
Mn-54	< 1.0	< 1.4	< 1.4	< 1.5	< 1.3	< 1.3
Zn-65	< 3.3	< 3.0	< 2.5	< 5.7	< 3.5	< 2.3
Co-60	< 1.4	< 1.8	< 1.2	< 2.9	< 0.5	< 1.6
K-40	< 18.5	< 11.9	< 15.7	< 16.8	< 5.4	< 4.3

** Optional Sample Location

TABLE 6-9 (continued)
CONCENTRATIONS OF GAMMA EMITTERS IN QUARTERLY COMPOSITES
OF JAF/NMPNS SITE AIR PARTICULATE SAMPLES - 2012
Results in Units of 10E-3 pCi/ m^3 ± 1 Sigma

ONSITE SAMPLE LOCATIONS - 3RD QTR 2012

Nuclide	D-1 **	G **	H **	I **	J **	K **
Be-7	114.8 ± 13.3	105.8 ± 11.4	95.2 ± 13.0	120.5 ± 13.7	113.6 ± 12.8	102.2 ± 11.3
Cs-134	< 1.5	< 1.7	< 2.7	< 1.7	< 2.5	< 1.7
Cs-137	< 0.9	< 0.9	< 1.0	< 1.4	< 1.1	< 1.2
Zr-95	< 2.4	< 3.7	< 4.4	< 5.2	< 2.7	< 2.4
Nb-95	< 2.0	< 3.0	< 2.8	< 3.4	< 3.1	< 2.5
Co-58	< 2.4	< 1.6	< 1.5	< 2.4	< 2.1	< 0.5
Mn-54	< 1.0	< 1.7	< 1.4	< 1.9	< 1.6	< 1.0
Zn-65	< 3.3	< 3.6	< 5.2	< 5.0	< 4.4	< 1.0
Co-60	< 0.5	< 1.2	< 0.5	< 2.4	< 1.7	< 2.1
K-40	< 14.4	< 12.2	< 21.2	< 18.6	< 15.4	< 18.2

ONSITE SAMPLE LOCATIONS - 4TH QTR 2012

Nuclide	D-1 **	G **	H **	I **	J **	K **
Be-7	67.1 ± 10.0	47.4 ± 8.5	61.4 ± 10.4	66.3 ± 9.9	56.7 ± 9.0	72.8 ± 9.8
Cs-134	< 1.4	< 1.3	< 2.1	< 1.8	< 1.6	< 1.8
Cs-137	< 0.7	< 0.7	< 1.6	< 1.3	< 1.3	< 0.8
Zr-95	< 3.0	< 3.4	< 4.8	< 2.1	< 2.8	< 3.2
Nb-95	< 2.5	< 3.0	< 4.3	< 2.1	< 3.3	< 2.7
Co-58	< 2.4	< 1.6	< 2.2	< 2.3	< 2.0	< 2.0
Mn-54	< 1.2	< 1.1	< 1.7	< 1.4	< 1.4	< 1.4
Zn-65	< 3.2	< 3.6	< 5.1	< 3.9	< 3.5	< 3.1
Co-60	< 1.4	< 1.2	< 2.0	< 1.8	< 1.5	< 2.2
K-40	< 5.1	< 12.1	< 16.2	< 22.2	< 14.4	< 14.6

** Optional Sample Location

TABLE 6-10
DIRECT RADIATION MEASUREMENT RESULTS – 2012
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	10.42 ± 0.43	11.79 ± 0.57	9.31 ± 0.38	9.85 ± 0.42	69° at 0.2 miles
4	D2 Onsite	4.45 ± 0.25	4.15 ± 0.24	4.44 ± 0.19	4.38 ± 0.28	140° at 0.4 miles
5	E Onsite	4.38 ± 0.28	4.06 ± 0.23	4.70 ± 0.21	4.25 ± 0.18	175° at 0.4 miles
6	F Onsite	3.58 ± 0.14	3.48 ± 0.23	4.17 ± 0.22	3.72 ± 0.16	210° at 0.5 miles
7*	G Onsite	3.85 ± 0.14	3.55 ± 0.23	4.02 ± 0.26	3.74 ± 0.21	250° at 0.7 miles
8*	R-5 Offsite Control	4.89 ± 0.22	4.36 ± 0.26	4.97 ± 0.26	4.62 ± 0.19	42° at 16.4 miles
9	D1 Offsite	4.07 ± 0.29	3.65 ± 0.23	4.17 ± 0.28	3.99 ± 0.25	80° at 11.4 miles
10	D2 Offsite	3.86 ± 0.15	3.58 ± 0.20	3.96 ± 0.17	4.01 ± 0.23	117° at 9.0 miles
11	E Offsite	4.02 ± 0.20	3.61 ± 0.24	4.28 ± 0.28	4.04 ± 0.19	160° at 7.2 miles
12	F- Offsite	4.12 ± 0.19	3.66 ± 0.24	4.28 ± 0.20	4.11 ± 0.20	190° at 7.7 miles
13	G Offsite	4.09 ± 0.21	3.77 ± 0.29	4.27 ± 0.23	3.93 ± 0.23	225° at 5.3 miles
14*	DeMass Rd SW Oswego - Control	4.11 ± 0.18	3.58 ± 0.19	4.33 ± 0.27	3.90 ± 0.18	226° at 12.6 miles
15*	Pole 66 W Boundary - Bible Camp	3.64 ± 0.15	3.39 ± 0.21	3.84 ± 0.17	3.73 ± 0.24	237° at 0.9 miles
18*	Energy Info Center - Lamp Post SW	4.27 ± 0.20	4.06 ± 0.22	4.81 ± 0.25	4.31 ± 0.21	265° at 0.4 miles
19	East Boundary - JAF Pole 9	4.57 ± 0.21	3.78 ± 0.23	4.65 ± 0.30	4.45 ± 0.20	81° at 1.3 miles
23*	H Onsite	4.98 ± 0.21	4.74 ± 0.32	4.92 ± 0.21	5.00 ± 0.32	70° at 0.8 miles
24	I Onsite	4.29 ± 0.19	3.89 ± 0.23	4.37 ± 0.23	4.30 ± 0.17	98° at 0.8 miles
25	J Onsite	4.34 ± 0.23	3.83 ± 0.30	4.29 ± 0.19	4.20 ± 0.27	110° at 0.9 miles
26	K Onsite	4.19 ± 0.18	3.65 ± 0.28	4.29 ± 0.21	4.17 ± 0.22	132° at 0.5 miles
27	N Fence N of Switchyard JAF	17.61 ± 1.16	19.42 ± 1.22	16.51 ± 0.63	13.36 ± 0.84	60° at 0.4 miles
28	N Light Pole N of Screenhouse JAF	19.08 ± 0.86	20.58 ± 1.02	17.52 ± 0.73	18.12 ± 0.86	68° at 0.5 miles
29	N Fence N of W Side	19.21 ± 1.49	24.29 ± 1.87	17.76 ± 0.86	16.24 ± 0.55	65° at 0.5 miles
30	N Fence (NW) JAF	9.97 ± 0.65	12.19 ± 1.04	9.69 ± 0.50	8.78 ± 0.37	57° at 0.4 miles
31	N Fence (NW) NMP-1	7.29 ± 0.30	7.00 ± 0.40	7.00 ± 0.28	7.47 ± 0.44	276° at 0.2 miles
39	N Fence Rad Waste-NMP-1	11.11 ± 0.47	10.91 ± 0.58	11.52 ± 1.16	11.95 ± 0.53	292° at 0.2 miles
47	N Fence (NE) JAF	6.02 ± 0.38	6.82 ± 0.38	5.84 ± 0.30	5.77 ± 0.27	69° at 0.6 miles
49*	Phoenix NY-Control	3.73 ± 0.18	3.61 ± 0.23	3.86 ± 0.18	3.95 ± 0.16	163° at 19.8 miles
51	Liberty & Bronson Sts E of OSS	4.20 ± 0.29	3.97 ± 0.26	4.30 ± 0.24	4.32 ± 0.25	233° at 7.4 miles
52	E 12th & Cayuga Sts Oswego School	3.64 ± 0.26	3.69 ± 0.24	3.94 ± 0.17	4.02 ± 0.24	227° at 5.8 miles
53	Broadwell & Chestnut Sts Fulton HS	4.05 ± 0.10	4.11 ± 0.28	4.49 ± 0.21	4.33 ± 0.25	183° at 13.7 miles
54	Liberty St & Co Rt 16 Mexico HS	3.78 ± 0.26	3.76 ± 0.23	3.79 ± 0.26	4.06 ± 0.26	115° at 9.3 miles
55	Gas Substation Co Rt 5-Pulaski	3.92 ± 0.21	3.83 ± 0.21	4.07 ± 0.30	4.18 ± 0.19	75° at 13.0 miles
56*	Rt 104-New Haven Sch (SE Corner)	3.90 ± 0.26	3.77 ± 0.23	3.92 ± 0.25	4.05 ± 0.19	123° at 5.3 miles
58*	Co Rt 1A-Alcan (E of E Entrance Rd)	4.39 ± 0.21	4.32 ± 0.28	4.18 ± 0.23	4.71 ± 0.20	220° at 3.1 miles
75*	Unit 2 N Fence N of Reactor Bldg	7.12 ± 0.37	6.67 ± 0.39	7.54 ± 0.30	7.85 ± 0.35	5° at 0.1 miles
76*	Unit 2 N Fence N of Change House	5.39 ± 0.19	5.14 ± 0.39	5.66 ± 0.27	6.11 ± 0.24	25° at 0.1 miles
77*	Unit 2 N Fence N of Pipe Bldg	6.22 ± 0.26	6.22 ± 0.30	6.24 ± 0.30	6.82 ± 0.27	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 – 2012
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	4.34 ± 0.18	4.27 ± 0.25	4.48 ± 0.22	4.56 ± 0.20	90° at 1.0 miles
79*	Co Rt 29 Pole #63 02 mi S of Lake Rd	3.92 ± 0.20	3.87 ± 0.22	4.15 ± 0.26	4.17 ± 0.21	115° at 1.1 miles
80*	Co Rt 29 Pole #54 07 mi S of Lake Rd	4.55 ± 0.21	4.02 ± 0.22	4.23 ± 0.21	4.22 ± 0.19	133° at 1.4 miles
81*	Miner Rd Pole #16 05 mi W of Rt 29	4.05 ± 0.17	3.79 ± 0.23	4.04 ± 0.19	4.20 ± 0.19	159° at 1.6 miles
82*	Miner Rd Pole # 1-1/2 11 mi W of Rt 29	4.05 ± 0.16	3.84 ± 0.43	4.09 ± 0.26	4.06 ± 0.24	181° at 1.6 miles
83*	Lakeview Rd Tree 045 mi N of Miner Rd	3.65 ± 0.22	3.67 ± 0.24	4.16 ± 0.24	4.00 ± 0.19	200° at 1.2 miles
84*	Lakeview Rd N Pole #6117 200ft N of Lake Rd	3.98 ± 0.20	3.89 ± 0.21	4.28 ± 0.26	4.28 ± 0.25	225° at 1.1 miles
85*	Unit 1 N Fence N of W Side of Screen House	9.81 ± 0.50	10.22 ± 0.57	10.08 ± 0.51	10.56 ± 0.48	294° at 0.2 miles
86*	Unit 2 N Fence N of W Side of Screen House	7.45 ± 0.35	7.23 ± 0.46	8.28 ± 0.49	8.81 ± 0.50	315° at 0.1 miles
87*	Unit 2 N Fence N of E Side of Screen House	7.73 ± 0.28	7.20 ± 0.39	8.24 ± 0.42	9.16 ± 0.37	341° at 0.1 miles
88*	Hickory Grove Rd Pole #2 06 mi N of Rt 1	4.14 ± 0.22	3.79 ± 0.22	3.87 ± 0.20	4.19 ± 0.28	97° at 4.5 miles
89*	Leavitt Rd Pole #16 04 mi S of Rt1	4.33 ± 0.25	4.15 ± 0.23	4.42 ± 0.22	4.64 ± 0.25	111° at 4.1 miles
90*	Rt 104 Pole #300 150 ft E of Keefe Rd	4.01 ± 0.21	3.73 ± 0.20	3.99 ± 0.22	4.09 ± 0.18	135° at 4.2 miles
91*	Rt 51A Pole #59 08 mi W of Rt 51	3.83 ± 0.18	3.70 ± 0.30	3.83 ± 0.18	4.17 ± 0.25	156° at 4.8 miles
92*	Maiden Lane Rd Power Pole 06 mi S of Rt 104	4.47 ± 0.19	4.25 ± 0.22	4.45 ± 0.20	4.64 ± 0.23	183° at 4.4 miles
93*	Rt 53 Pole 1-1 120 ft S of Rt 104	4.04 ± 0.25	3.95 ± 0.26	3.99 ± 0.21	4.46 ± 0.25	205° at 4.4 miles
94*	Rt 1 Pole #82 250 ft E of Kocher Rd (Co Rt 63)	3.81 ± 0.17	3.54 ± 0.22	3.64 ± 0.18	4.01 ± 0.19	223° at 4.7 miles
95*	Alcan W access Rd Joe Fultz Blvd Pole #21	3.66 ± 0.17	3.53 ± 0.20	3.61 ± 0.19	3.82 ± 0.21	237° at 4.1 miles
96*	Creamery Rd 03 mi S of Middle Rd Pole 1-1/2	3.92 ± 0.27	3.96 ± 0.23	3.82 ± 0.16	4.08 ± 0.16	199° at 3.6 miles
97*	Rt 29 Pole #50 200ft N of Miner Rd	4.23 ± 0.30	3.90 ± 0.21	3.85 ± 0.22	4.17 ± 0.22	143° at 1.8 miles
98	Lake Rd Pole #145 0.15 mi E of Rt 29	4.15 ± 0.21	3.99 ± 0.23	4.21 ± 0.26	4.37 ± 0.22	101° at 1.2 miles
99	NMP Rd 04 mi N of Lake Rd Env Station R1	4.38 ± 0.29	4.16 ± 0.25	4.25 ± 0.21	4.53 ± 0.23	88° at 1.8 miles
100	Rt 29 & Lake Rd Env Station R2	4.32 ± 0.17	4.11 ± 0.23	4.12 ± 0.19	4.41 ± 0.19	104° at 1.1 miles
101	Rt 29 07 mi S of Lake Rd Env Station R3	3.88 ± 0.25	3.65 ± 0.20	3.90 ± 0.18	4.07 ± 0.21	132° at 1.5 miles
102	EOF/Env Lab Rt 176 E Driveway Lamp Post	4.30 ± 0.27	3.77 ± 0.21	4.23 ± 0.19	4.19 ± 0.18	175° at 11.9 miles
103	EIC East Garage Rd Lamp Post	4.61 ± 0.23	4.46 ± 0.23	4.46 ± 0.26	4.81 ± 0.20	267° at 0.4 miles
104	Parkhurst Rd Pole #23 01 mi S of Lake rd	4.47 ± 0.25	3.91 ± 0.24	3.88 ± 0.18	4.37 ± 0.22	102° at 1.4 miles
105	Lake view Rd Pole #36 05 mi S of Lake Rd	4.41 ± 0.23	4.09 ± 0.23	4.15 ± 0.18	4.35 ± 0.21	198° at 1.4 miles
106	Shoreline Cove W of NMP-1 Tree on W Edge	5.14 ± 0.30	5.00 ± 0.29	5.28 ± 0.25	5.44 ± 0.24	274° at 0.3 miles
107	Shoreline Cove W of NMP-1 30 ft SSW of #106	5.17 ± 0.31	4.66 ± 0.34	5.78 ± 0.68	5.09 ± 0.26	272° at 0.3 miles
108	Lake Rd Pole #142 300 ft E of Rt 29 S	4.70 ± 0.17	4.18 ± 0.23	3.99 ± 0.22	4.49 ± 0.19	104° at 1.1 miles
109	Tree North of Lake Rd 300 ft E of Rt 29 N	4.80 ± 0.17	4.06 ± 0.22	4.23 ± 0.21	4.55 ± 0.23	103° at 1.1 miles
111	State Route 38 Sterling NY - Control	4.17 ± 0.19	3.77 ± 0.23	3.87 ± 0.22	3.89 ± 0.22	166° at 26.4 miles
112	EOF/Env Lab Oswego County Airport	4.58 ± 0.48	3.85 ± 0.23	3.91 ± 0.18	4.12 ± 0.25	175° at 11.9 miles
113	Baldwinsville NY - Control	4.02 ± 0.21	3.66 ± 0.24	3.65 ± 0.20	3.95 ± 0.16	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 – 2012
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 †
04/10/12	< 0.604	< 9.61	< 7.47	1477 ± 93.4	< 9.71	<LLD
04/23/12	< 0.694	< 7.90	< 8.75	1374 ± 78.1	< 7.43	<LLD
05/07/12	< 0.968	< 6.54	< 7.43	1372 ± 78.6	< 9.36	<LLD
05/21/12	< 0.555	< 5.01	< 5.75	1630 ± 86.0	< 4.87	<LLD
06/04/12	< 0.831	< 8.10	< 7.47	1414 ± 92.1	< 13.98	<LLD
06/18/12	< 0.802	< 6.81	< 7.43	1553 ± 81.1	< 6.53	<LLD
07/09/12	< 0.632	< 7.19	< 7.57	1555 ± 82.2	< 5.97	<LLD
07/23/12	< 0.580	< 6.54	< 5.15	1669 ± 83.7	< 5.32	<LLD
08/06/12	< 0.771	< 9.41	< 7.47	1487 ± 94.4	< 6.81	<LLD
08/20/12	< 0.602	< 5.80	< 5.37	1505 ± 81.2	< 5.30	<LLD
09/10/12	< 0.623	< 7.43	< 6.32	1598 ± 82.2	< 6.99	<LLD
09/24/12	< 0.880	< 4.25	< 5.47	1496 ± 69.3	< 5.35	<LLD
10/08/12	< 0.864	< 4.66	< 7.30	1586 ± 84.5	< 7.87	<LLD
10/22/12	< 0.759	< 7.13	< 8.79	1799 ± 106.8	< 11.06	<LLD
11/05/12	< 0.669	< 3.87	< 6.23	1511 ± 68.9	< 6.07	<LLD
11/19/12	< 0.698	< 7.43	< 7.64	1515 ± 83.6	< 8.28	<LLD
12/03/12	< 0.790	< 7.61	< 7.65	1496 ± 94.9	< 9.73	<LLD
12/17/12	< 0.910	< 8.06	< 6.58	1603 ± 85.6	< 7.90	<LLD

* Sample Location is required by the ODCM.
** 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 – 2012
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 †
04/10/12	< 0.720	< 8.36	< 6.18	1578 ± 84.7	< 6.86	<LLD
04/23/12	< 0.662	< 7.77	< 5.77	1529 ± 70.1	< 4.08	<LLD
05/07/12	< 0.822	< 3.87	< 6.32	1761 ± 74.4	< 5.40	<LLD
05/21/12	< 0.619	< 7.43	< 6.49	1672 ± 85.0	< 5.95	<LLD
06/04/12	< 0.773	< 6.25	< 5.96	1788 ± 87.2	< 4.58	<LLD
06/18/12	< 0.705	< 11.73	< 8.18	1869 ± 106.6	< 11.05	<LLD
07/09/12	< 0.789	< 3.57	< 5.05	1678 ± 72.4	< 5.74	<LLD
07/23/12	< 0.741	< 4.04	< 5.96	1561 ± 70.9	< 6.93	<LLD
08/06/12	< 0.634	< 6.11	< 6.98	1623 ± 83.1	< 8.61	<LLD
08/20/12	< 0.783	< 4.89	< 8.84	1791 ± 89.7	< 7.35	<LLD
09/10/12	< 0.773	< 3.38	< 5.67	1492 ± 69.5	< 4.99	<LLD
09/24/12	< 0.795	< 5.46	< 8.18	1790 ± 103.9	< 5.96	<LLD
10/08/12	< 0.647	< 4.63	< 5.96	1398 ± 66.7	< 5.73	<LLD
10/22/12	< 0.797	< 3.98	< 4.93	1382 ± 67.1	< 5.37	<LLD
11/05/12	< 0.746	< 4.94	< 5.56	1455 ± 73.8	< 5.95	<LLD
11/19/12	< 0.733	< 3.69	< 5.16	1675 ± 73.6	< 4.07	<LLD
12/03/12	< 0.795	< 3.98	< 4.58	1664 ± 72.5	< 5.39	<LLD
12/17/12	< 0.662	< 8.78	< 6.65	1575 ± 98.6	< 8.91	<LLD

* Sample Location is required by the ODCM.
** 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 - 2012
Results in Units of pCi/kg (wet) ± 1 sigma

Location ***	Date	Description	Be-7	K-40	I-131	Cs-134	Cs-137	Zn-65	C-14	Others †
C2* Flack	09/06/12	HORSERADISH LEAVES	553 ± 63.6	4957 ± 187	< 23.6	< 13.1	< 17.0	< 48.9	††	< LLD
	09/06/12	SQUASH LEAVES	1226 ± 57.3	2496 ± 109	< 15.2	< 8.64	< 10.5	< 32.3	< 1210	< LLD
	09/06/12	TOMATOES	< 56.6	2421 ± 101	< 10.5	< 5.35	< 6.10	< 25.9	††	< LLD
	09/06/12	RHUBARB LEAVES	444 < 35.6	4202 ± 116	< 14.3	< 7.16	< 9.28	< 14.9	††	< LLD

Location ***	Date	Description	Be-7	K-40	I-131	Cs-134	Cs-137	Zn-65	C-14	Others †
133* Culeton	09/06/12	KALE	< 125.7	< 224	< 22.8	< 11.8	< 14.8	< 21.5	††	< LLD
	09/06/12	ZUCCHINI	1085 ± 58.5	3890 ± 140	< 15.1	< 9.76	< 11.5	< 33.2	< 966	< LLD
	09/06/12	TOMATOES	< 66.4	3355 ± 122	< 12.6	< 6.78	< 9.45	< 30.3	††	< LLD
	09/06/12	RHUBARB LEAVES	171 ± 22.4	2925 ± 89.8	< 10.0	< 5.38	< 6.25	< 16.7	††	< LLD

Location ***	Date	Description	Be-7	K-40	I-131	Cs-134	Cs-137	Zn-65	C-14	Others †
144* Whaley	09/06/12	CORN LEAVES	1410 ± 91.9	5246 ± 210	< 30.9	< 16.4	< 20.3	< 53.8	††	< LLD
	09/06/12	SQUASH LEAVES	1090 ± 54.0	2481 ± 107	< 12.0	< 12.3	< 9.6	< 24.0	††	< LLD
	09/06/12	TOMATOES	< 54.5	2377 ± 83.8	< 8.59	< 5.38	< 7.30	< 20.9	††	< LLD
	09/06/12	CABBAGE	402 < 55.2	4066 ± 166	< 20.0	< 11.90	< 14.70	< 46.6	< 963	< LLD

Location ***	Date	Description	Be-7	K-40	I-131	Cs-134	Cs-137	Zn-65	C-14	Others †
48** Kronenbitter	09/06/12	GRAPE LEAVES	801 ± 55.0	3454 ± 138	< 17.6	< 14.3	< 13.7	< 20.6	< 1110	< LLD
	09/06/12	TOMATOES	< 64.9	3588 ± 103	< 10.9	< 6.2	< 7.8	< 13.1	††	< LLD

Location ***	Date	Description	Be-7	K-40	I-131	Cs-134	Cs-137	Zn-65	C-14	Others †
484** O'Connor	09/06/12	CABBAGE	137 ± 53.5	3332 ± 172	< 24.4	< 14.1	< 18.0	< 27.9	< 1030	< LLD
	09/06/12	TOMATOES	< 99.2	2893 ± 127	< 17.2	< 9.0	< 12.5	< 30.8	††	< LLD

* Sample Location Required by the ODCM
** Sample location is Optional
*** Corresponds to Sample Location noted on Figure 3.3-5
† Plant Related Radionuclides
†† C-14 analysis not perfomed on this sample.

TABLE 6-13

MILK ANIMAL CENSUS 2012

Town or Area[a]	Location Designation[1]	Degrees[2]	Distance[2] (Miles)	Number of Milk Animals (Cows)
New Haven	9	98°	4.8	40
	64	108°	7.8	35
	78	128°	8.0	0
Mexico	14	125°	9.1	52
	60	91°	9.5	0
	55*	97°	8.8	53
	21	112°	10.4	0
	72	100°	9.6	38
Granby (Control)	77**	190°	16.0	60

MILKING ANIMAL TOTALS: 278
(including control locations)

MILKING ANIMAL TOTALS: 218
(excluding control locations)

NOTES:

* Milk sample location

** Milk sample control location

(1) Reference Figure 3.3-4

(2) Degrees and distance are based on NMP-2 Reactor Building centerline

(a) Census performed out to a distance of approximately 10 miles

TABLE 6-14
RESIDENCE CENSUS 2012

Meteorological Sector	Location	Map Location[(1)]	Direction[(2)]	Distance[(2)]
N	*	-	-	-
NNE	*	-	-	-
NE	*	-	-	-
ENE	*	-	-	-
E	116 Lake Road	A	100°	1.3 miles
ESE	161 Lake Road	B	104°	1.1 miles
SE	1216 County Route 29	C	125°	1.4 miles
SSE	268 Miner Road	D	158°	1.7 miles
S	356 Miner Road	E	171°	1.6 miles
SSW	281 Lakeview Road	F	208°	1.2 miles
SW	319 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
(1) Corresponds to Figure 3.3-6
(2) Direction and distance are based on NMPNS Reactor Building centerline