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T.R. Jones
Manager, Licensing IPEC

May 15, 2007

Re: Indian Point Units 1, 2 & 3
Docket Nos. 50-3, 50-247, 50-286
NL-07-064

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Subject: **Indian Point Nuclear Power Plants Units 1, 2 and 3**
Annual Radiological Environmental Operating Report for 2006

Dear Sir or Madam;

Enclosed please find one copy of the Indian Point Site Annual Radiological Environmental Operating Report for the period January 1, 2006 to December 31, 2006. No commitments are being made by this report.

This report is submitted in accordance with facility Technical Specification section 5.6.2 for DPR-5, DPR-26, and DPR-64, Indian Point Unit Nos.1, 2 and 3 respectively.

Should you or your staff have any questions, please contact Mr. Dennis Loope, Radiation Protection Manager at 914-736-8401.

Sincerely,

T.R. Jones
Manager, Licensing
Entergy, Indian Point Energy Center

Enclosure

cc: See next page

IE25
NMSS01

cc:

Mr. John P. Boska, Senior Project Manager, NRC NRR DORL
Mr. Samuel J. Collins, Regional Administrator, NRC Region I
NRC Resident Inspector's Office, Indian Point 2
Mr. Paul Eddy, NYS Department of Public Service
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Records & Documents

ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT

ENTERGY NUCLEAR NORTHEAST

INDIAN POINT NUCLEAR GENERATING STATION
UNITS 1, 2, AND 3

Docket No. 50-003 Indian Point Unit 1 (IP1)
Docket No. 50-247 Indian Point Unit 2 (IP2)
Docket No. 50-286 Indian Point Unit 3 (IP3)

January 1 - December 31, 2006

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SECTION I

EXECUTIVE SUMMARY

1.0 EXECUTIVE SUMMARY

This Annual Radiological Environmental Operating Report (AREOR) contains descriptions and results of the 2006 Radiological Environmental Monitoring Program (REMP) for the Indian Point site. The Indian Point site consists of Units 1, 2 and 3. Units 1, 2 and 3 are owned by Entergy Nuclear Northeast. Unit 1 was retired as a generating facility in 1974, and as such, its reactor is no longer operated.

The REMP is used to measure the direct radiation and the airborne and waterborne pathway activity in the vicinity of the Indian Point site. Direct radiation pathways include radiation from buildings and plant structures, airborne material that might be released from the plant, cosmic radiation, fallout, and the naturally occurring radioactive materials in soil, air and water. Analysis of thermoluminescent dosimeters (TLDs), used to measure direct radiation, indicated that there were no increased radiation levels attributable to plant operations.

The airborne pathway includes measurements of air, precipitation, drinking water, and broad leaf vegetation samples. The airborne pathway measurements indicated that there was no increased radioactivity attributable to 2006 Indian Point Station operation.

The waterborne pathway consists of Hudson River water, fish and invertebrates, aquatic vegetation, bottom sediment, and shoreline soil. Measurements of the media comprising the waterborne pathway indicated that there was no adverse radiological impact to the surrounding environment attributed to Indian Point Station operations.

This report contains a description of the REMP and the conduct of that program as required by the IPEC Offsite Dose Calculation Manuals, herein referred to as ODCM. This 2006 AREOR also contains summaries and discussions of the results of the 2006 program, trend analyses, potential impact on the environment, land use census, and interlaboratory comparisons.

During 2006, a total of 1342 analyses were performed. Table B-1 presents a summary of the collected sample results. The actual sampling frequency in 2006 was higher than required, due to the inclusion of additional sample locations and media.

An investigation of groundwater contamination with tritium and other radionuclides has been ongoing since 2005 and continued throughout 2006. This investigation of potential onsite sources of contamination is not the focus of this Annual Radiological Environmental Operating Report; however, in 2006, Entergy agreed to several changes in the REMP to assure that all pathways were being evaluated.

Specifically, two groundwater sample wells (non-drinking water) were designated as "boundary wells" and were sampled as special water samples for tritium and strontium-90. These wells were designated as REMP sample stations 104 and 105. In addition, a change was made to the existing fish and invertebrate samples and shoreline sediment samples. The locations and frequency remained the same; however, strontium-90 was added to the required analyses. These additions were committed to in 2006 and the sampling/analysis was conducted in 2006. Starting in 2007, these changes will be identified in the ODCM.

Based on recent site hydrology evaluations and the addition of a number of groundwater sampling wells, two new groundwater wells (MW-40 and MW-51) were installed. These wells were specifically designed for groundwater monitoring and were placed in locations that would be representative of groundwater near the site boundary. Since the installation of these new wells, the remaining four locations (REMP sampling stations 99, 100, 101, and 102) sampled as "special water" were no longer considered as necessary, because they did not provide optimal information on groundwater concentrations. These four locations continued to be sampled throughout 2006, but will be eliminated as REMP sample locations starting in 2007.Special water sample results for 2006 are summarized in Tables B-20 and B-21.

In summary, the levels of radionuclides in the environment surrounding Indian Point were within the historical ranges, i.e., previous levels resulting from natural and anthropogenic sources for the detected radionuclides. Further, Indian Point operations in 2006 did not result exposure to the public greater than environmental background levels.

SECTION 2

INTRODUCTION

2.0 INTRODUCTION

2.1 Site Description

The Indian Point site occupies 239 acres on the east bank of the Hudson River on a point of land at Mile Point 42.6. The site is located in the Village of Buchanan, Westchester County, New York. Three nuclear reactors, Indian Point Unit Nos. 1, 2 and 3, and associated buildings occupy approximately 35 acres. Unit 1 has been retired as a generating facility. Units 1, 2, and 3 are owned and operated by Entergy Nuclear Northeast.

2.2 Program Background

Environmental monitoring and surveillance have been conducted at Indian Point since 1958, which was four years prior to the start-up of Unit 1. The pre-operational program was designed and implemented to determine the background radioactivity and to measure the variations in activity levels from natural and other sources in the vicinity, as well as fallout from nuclear weapons tests. Thus, as used in this report, background levels consist of those resulting from both natural and anthropogenic sources of environmental radioactivity. Accumulation of this background data permits the detection and assessment of environmental activity attributable to plant operations.

2.3 Program Objectives

The current environmental monitoring program is designed to meet two primary objectives:

1. To enable the identification and quantification of changes in the radioactivity of the area, and

2. To measure radionuclide concentrations in the environment attributable to operations of the Indian Point site.

To identify changes in activity, the environmental sampling schedule requires that analyses be conducted for specific environmental media on a regular basis. The radioactivity profile of the environment is established and monitored through routine evaluation of the analytical results obtained.

The REMP designates sampling locations for the collection of environmental media for analysis. These sample locations are divided into indicator and control locations. Indicator locations are established near the site, where the presence of environmental radioactivity of plant origin is most likely to be detected. Control locations are established farther away (and upwind/upstream, where applicable) from the site, where the level would not generally be affected by plant discharges. The use of indicator and control locations enables the identification of potential sources of detected radioactivity, thus meeting one of the program objectives.

Verification of expected radionuclide concentrations resulting from effluent releases attributable to the site is another program objective. Verifying projected concentrations through the REMP is difficult since the environmental concentrations resulting from plant releases are consistently too small to be detected. Plant related radionuclides were detected in 2006; however, residual radioactivity from atmospheric weapons tests and naturally occurring radioactivity were the predominant sources of radioactivity in the samples collected. Analysis of the 2006 REMP sample results supports the premise that radiological effluents were well below regulatory limits.

SECTION 3

PROGRAM DESCRIPTION

3.0 PROGRAM DESCRIPTION

To achieve the objectives of the REMP and ensure compliance with the ODCM, sampling and analysis of environmental media are performed as outlined in Table A-1 and described in section 3.3.

3.1 Sample Collection

Entergy Nuclear Northeast Nuclear Environmental Monitoring (NEM) personnel perform collection of environmental samples for the Indian Point site.

Assistance in the collection of fish and invertebrate samples was provided by a contracted environmental vendor, Normandeau Associates, Inc.

3.2 Sample Analysis

The analysis of Indian Point environmental samples is performed by the James A. Fitzpatrick Nuclear Power Plant (JAFNPP) Environmental Laboratory in Fulton, New York. The JAFNPP lab at Fulton currently analyzes all samples. In addition, some water and well samples were analyzed at another EPA certified laboratory.

3.3 Sample Collection and Analysis Methodology

3.3.1 Direct Radiation

Direct gamma radiation is measured using integrating calcium sulfate thermoluminescent dosimeters (TLDs), which provide cumulative measurements of radiation exposure (i.e., total integrated exposures in milliroentgen, mR) for a given period. The area surrounding the Indian Point site is divided into 16 compass sectors. Each sector has two TLD sample locations. The inner ring is located near the site boundary at approximately 1 mile (1.6 km). The outer ring is located at approximately 5 miles (8 km) from the site (6.7- 8.0 km), see Figures A-1 and A-2.

An additional TLD sample site is located at Roseton (20.7 miles north) as a control, and there are eight other TLD sample locations of special interest. In total, there are 41 TLD sample sites, designated DR-1 through DR-41, with two TLDs at each site. TLDs are collected and processed on a quarterly basis. The results are reported as mR per standard quarter (91 days). The mR reported is the average of the two TLDs from each sample site.

3.3.2 Airborne Particulates and Radioiodine

Air samples were taken at nine locations varying in distance from 0.28 to 20.7 miles (0.4 to 33 km) from the plant. These locations represent one control at sampling station 23 (A5) and eight indicator locations. These indicator locations are at sampling stations 4 (A1), 5 (A4), 22, 27, 29, 44, 94 (A2), and 95 (A3). The locations are shown on Figures A-1, A-2, and A-3. The air samples are collected continuously by means of fixed air particulate filters followed by in-line charcoal cartridges. Both are changed on a weekly basis. The filter and cartridge samples are analyzed for gross beta and radioiodine, respectively. In addition, gamma spectroscopy analysis (GSA) is performed on quarterly composites of the air particulate filters.

3.3.3 Hudson River Water

Hudson River water sampling is performed continuously at the intake structure (sampling station 9, Wa1) and at a point exterior to the discharge canal where Hudson River water and water from the discharge canal mix (sampling station 10, Wa2); see Figure A-1. An automatic sampling apparatus is used to take representative samples. On a weekly basis, accumulated samples are taken from both sample points. These weekly river water samples are composited for monthly gamma spectroscopy analysis, and quarterly for tritium analysis.

3.3.4 Drinking Water

Samples of drinking water are collected monthly from the Camp Field Reservoir (3.4 miles NE, sample station 7, sample designation Wb1) and New Croton Reservoir (6.3 Mi SE, sample station 8); see Figure A-3. Each monthly sample is approximately 4 liters and is analyzed for gamma-emitting radionuclides, gross beta, and I-131. They are also composited quarterly and analyzed for tritium.

3.3.5 Hudson River Shoreline Soil

Shoreline soil samples are collected at three indicator and two control locations along the Hudson River. The indicator locations are at sampling stations 53 (Wc1), 28, and 17. The control locations are at sampling stations 50 (Wc2) and 84. Figures A-1, A-2, and A-3 show these locations. The samples are gathered at a level above low tide and below high tide and are approximately 2-kg grab samples. These samples are collected at greater than 90 days apart and are analyzed by gamma spectroscopy and for strontium-90.

3.3.6 Broad Leaf Vegetation

Broad leaf vegetation samples are collected from three locations during the growing season. The indicator locations are sampling stations 94 (Ic2) and 95 (Ic1), and the control location is at Roseton, sampling station 23 (Ic3). See Figures A-1 and A-2. The samples are collected monthly, when available, and analyzed by gamma spectroscopy. These samples consist of at least 1 kg of leafy vegetation and are used in the assessment of the food product and milk ingestion pathways.

3.3.7 Fish and Invertebrates

Fish and invertebrate samples are obtained from the Hudson River at locations upstream and downstream of the plant discharge. The indicator location (downstream sample point) is designated as sampling station 25 (Ib1) and the control location (upstream) is at Roseton, sampling station 23 (Ib2). See Figures A-1 and A-2. These samples are collected in season or semiannually if they are not seasonal. The fish and invertebrates sampled are analyzed by gamma spectroscopy and for strontium-90.

3.3.8 Hudson River Aquatic Vegetation

During the spring and summer, aquatic vegetation samples are collected from the Hudson River at two indicator locations (sampling stations 17 and 28) and one control location (84); see Figure A-3. Samples of aquatic vegetation are obtained depending on sample availability. These samples are analyzed by gamma spectroscopy.

3.3.9 Hudson River Bottom Sediment

Bottom sediment and benthos are sampled at four locations, three indicator locations (sampling stations 10, 17, and 28) and one control location (84), along the Hudson River, once each spring and summer; see Figure A-3. These samples are obtained using a Peterson grab sampler or similar instrument. The bottom sediment samples are analyzed by gamma spectroscopy. Although not required, in 2006, four samples were also analyzed for Sr-90.

3.3.10 Precipitation

Precipitation samples are continuously collected at one indicator location (sampling station 44) and one control location (23); see Figure A-3. They are collected in sample bottles designed to hinder evaporation. They are composited quarterly and analyzed for tritium. They are also analyzed by gamma spectroscopy.

3.3.11 Soil

Soil samples are collected from two indicator locations (sampling stations 94 and 95), and one control location (23) on an annual basis; see Figure A-3. They are approximately 2 kg in size and consist of about twenty 2-inch deep cores. The soil samples are analyzed by gamma spectroscopy.

3.3.12 Special Water Samples

Six locations were sampled as "special water" in 2006. These locations include four locations that were sampled in 2006, but will be eliminated from the sample matrix starting in 2007. Based on recent site hydrology evaluations and the addition of a number of groundwater sampling wells, two new groundwater wells (MW-40 and MW-51) were installed. These wells were specifically designed for groundwater monitoring and were placed in locations that would be representative of groundwater near the site boundary. Since the installation of these new wells, the remaining four locations sampled as "special water" were no longer considered as necessary, because they did not provide optimal information on groundwater concentrations. These four locations continued to be sampled throughout 2006, but will be eliminated as REMP sample locations starting in 2007. These sample locations are described as follows: the Algonquin outfall (non-drinking surface water, location 99), the gypsum plant outfall (non-drinking surface water, location 100), the Trap Rock Quarry (non-drinking surface water, location 101), and the 5th Street Well (non-drinking ground water, location 102). The above special water locations were sampled monthly and analyzed for tritium and gamma spectroscopy.

Two groundwater sample wells (non-drinking water) were installed and developed in 2006. These wells were designated as "boundary wells" and were sampled as special water samples for tritium and strontium-90 on a quarterly basis. These wells were designated as REMP sample stations 104 (MW-40) and 105 (MW-51). The locations of the special water samples are shown in Figure A-3.

3.3.13 Land Use Census

Each year a land use census consisting of milch animal and residence surveys is conducted during the growing season to determine the current utilization of land within 5 miles (8 km) of the site. These surveys are used to determine whether there are changes in existing conditions that warrant changing the sampling program.

The milch animal census is used to identify animals producing milk for human consumption within 5 miles (8 km) of Indian Point. The census consists of visual field surveys of the areas where a high probability of milch animals exists and confirmation through personnel such as feed suppliers who deal with farm animals and dairy associations (See Tables B-22 and B-23). Although there are presently no animals producing milk for human consumption within 5 miles (8 km) of the site, the census is performed to determine if a milk-sampling program needs to be conducted.

A residence census is also performed to identify the nearest residence(s) to the site in each of the 16 sectors surrounding Indian Point. See Table B-23.

A garden census was not performed, as the ODCM allows sampling of vegetation in two sectors near the site boundary in lieu of a garden census.

3.4 Statistical Methodology

There are a number of statistical calculation methodologies used in evaluating the data from the Indian Point REMP. These methods include determination of Lower Limits of Detection (LLD) and Critical Levels (L_c), and estimation of the mean and associated propagated error.

3.4.1 Lower Limit of Detection (LLD) and Critical Level (L_c)

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

The Nuclear Regulatory Commission (NRC) specifies the maximum acceptable LLDs for each radionuclide in specific media. The LLDs are determined by taking into account overall measurement methods. The equation used to calculate the LLD is:

$$LLD = 4.66\ K\ S_b,$$

where: S_b = standard deviation of the background count rate,

and

K consists of variables, which account for such parameters as:
- Instrument characteristics (e.g., efficiency)
- Sample size
- Counting time
- Media density (self-absorption)
- Radioactive decay
- Chemical yield

In the ODCM program, LLDs are used to ensure that minimum acceptable detection capabilities for the counting system are met with specified statistical confidence levels (95% detection probability with 5% probability of a false negative). The LLD is defined as an "a priori" (before the fact) limit representing the capability of a measurement process and not as an "a posteriori" (after the fact) limit for a particular measurement. Table A-2 presents the RETS required LLDs for specific media and radionuclides as specified by the NRC. The LLDs actually achieved are usually much lower since the RETS required LLDs represent the maximum allowed.

The critical level (L_c) is defined as that net sample counting rate which has a 5% probability of being exceeded when the actual sample activity is zero (e.g., when counting background only). It is determined using the following equation.

$$L_c = k_a \, S_b \, (1 + T_b/T_s)^{0.5} \text{ in cpm}$$

where:
k_a = 1.645 (corresponds to a 95% confidence level)
S_b = standard deviation of the background count rate = $(R_b/T_b)^{0.5}$
R_b = background count rate (cpm)
T_b = background count time (min)
T_s = sample count time (min)

For the REMP, net sample results which are less than the L_c value are considered not detected, and the L_c value is reported as the "less than" value, unless otherwise noted. Values above the L_c are considered positively detected radioactivity in the environmental media of interest (with a 5% chance of false positive).

3.4.2 Determination of Mean and Propagated Error

In accordance with program policy, recounts of positive samples are performed. When the initial count reveals the presence of radioactivity, which may be attributed to plant operations, at a value greater than the L_c, two recounts are performed to verify the positive results. The recounts are not performed on; air samples with positive results from gross beta analysis, since the results are always positive due to natural background radioactive material in the air, or tritium in water samples, since an outside contractor provides these activities. When a radionuclide is positively identified in two or more counts, the analytical result for the radionuclide is reported as the mean of the positive detections and the associated propagated error for that mean. In cases where more than one sample result is available, the mean of the sample results and the estimated error for the mean are reported in the Annual Report.

The mean (X) and propagated error (PE) are calculated using the following equations:

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

where: X_i = value of each individual observation
N = number of observations

$$PE = \frac{\sqrt{\sum_{i=1}^{N} (ERR_i)^2}}{N}$$

where: ERR_i = 1 sigma error of the individual analysis
N = number of observations

3.4.3 Table Statistics

The averages shown in the summary table (Table B-2) are the averages of the positive values in accordance with the NRC's Branch Technical Position (BTP) to Regulatory Guide 4.8 (Reference 11). Samples with "<" values are not included in the averages.

It should be noted that this statistic for the mean using only positive values tends to strongly bias the average high, particularly when only a few of the data are measurably positive. The REMP data show few positive values; thus the corresponding means are biased high. Exceptions to this include direct radiation measured by TLDs and gross beta radioactivity in air, which show positive monitoring results throughout the year.

In the data tables B-6 through B-21, values shown are based on the L_c value, unless otherwise noted. If a radionuclide was detected at or above the L_c value in two or more counts, the mean and error are calculated as per Section 3.4.2, and reported in the data table. Values listed as "<" in the data tables are the L_c values for that sample, unless otherwise noted. If multiple counts were performed on a sample and a radionuclide's values are "< L_c " each time, the largest critical level is reported in the data table.

The historical data tables contain the annual averages of the positive values for each year. The historical averages are calculated using only the positive values presented for 1996 through 2006. The 2006 average values are included in these historic tables for purposes of comparison.

3.5 Program Units

The Radiological Environmental Monitoring Program uses standard radiological units to express program results, described as follows:

Becquerel is a measure of radioactive material, abbreviated Bq, from the International System of Units (SI). A Becquerel is one atom disintegration per second. A Becquerel will normally be used with a volume or mass to express the radioactive concentration of some sample material.

Cubic meter is a metric volume slightly larger than a cubic yard. It is abbreviated m3 and is used in this report as the unit for the volume of air.

Curie is the basic unit used to describe the intensity of radioactivity. The curie is equal to 37 billion disintegrations per second.

Kilogram is a metric unit of mass; it is equivalent to 2.2 pounds. Kilogram is abbreviated kg and can be expressed as kg-wet or kg-dry. The wet or dry designation denotes whether the sample is dried or not before it is counted.

Liter is a metric unit of volume slightly larger than a quart. It is abbreviated L and is used as the volume for liquids.

Microsievert (uSv) is the SI unit for measure of radiation dose to humans. It is equal to 0.1 mrem.

Millirem is a measure of radiation dose to humans, abbreviated mrem; it is 1/1000 of a rem. Millirem expressed for some period of time is the dose rate. Milliroentgen is different in that it is a measure of radiation in air. Normal background radiation dose is approximately 300 mrem per year.

Milliroentgen is a measure of radiation exposure, abbreviated mR; it is 1/1000 of a roentgen. Milliroentgen for some period of time is the exposure rate.

Milliroentgen (mR) per standard quarter is used for direct radiation or Thermoluminescent Dosimeter (TLD) results.

Picocurie is a measure of radioactive material (pCi). A picocurie is 2.22 atom disintegrations per minute. A picocurie will normally be used with a volume or mass to express the radioactive concentration of some sample material.

Picocuries per cubic meter (pCi/m^3) is the concentration for air samples.

Picocuries per kilogram (pCi/kg) is the expression used to express concentration for REMP vegetation, soil, shoreline soil, and bottom sediment samples.

Picocuries per liter (pCi/L) is used to express concentration for liquid samples such as, precipitation, drinking water, and river water samples.

Standard quarter is a measure of time (91 days). It is used as the unit of time for expression of mR for the direct radiation measurements from TLDs.

SECTION 4

RESULTS AND DISCUSSION

4.0 RESULTS AND DISCUSSION

The 2006 Radiological Environmental Monitoring Program (REMP) was conducted in accordance with Indian Point's Offsite Dose Calculation Manuals ODCM. The ODCM contains requirements for the number and distribution of sampling locations, the types of samples to be collected, and the types of analyses to be performed for measurement of radioactivity.

The REMP at Indian Point includes measurements of radioactivity levels in the following environmental pathways.

Hudson River-water
Shoreline soil
Fish and invertebrates
Aquatic vegetation
Bottom sediment
Airborne Particulates and Radioiodine
Precipitation
Drinking Water
Terrestrial Broad Leaf Vegetation
Direct Gamma Radiation
Soil
Special Water (groundwater or surface water)

An annual land use and milch animal census is also part of the REMP.

To evaluate the contribution of plant operations to environmental radioactivity levels, other man-made and natural sources of environmental radioactivity, as well as the aggregate of past monitoring data, must be considered. It is not merely the detection of a radionuclide, but the evaluation of the location, magnitude, source, and history of its detection that determines its significance. Therefore, we have reported the data collected in 2006 and assessed the significance of the findings.

A summary of the results of the 2006 REMP is presented in Table B-2. This table lists the mean and range of all positive results obtained for each of the media sampled at ODCM indicator and control locations. Discussions of these results and their evaluations are provided below.

The radionuclides detected in the environment can be grouped into three categories: (1) naturally occurring radionuclides; (2) radionuclides resulting from weapons testing and other non-plant related, anthropogenic sources; and (3) radionuclides that could be related to plant operations.

Naturally Occurring Radionuclides

The environment contains a broad inventory of naturally occurring radionuclides which can be classified as, cosmic ray induced (e.g., Be-7, H-3) or geologically derived (e.g., Ra-226 and progeny, Th-228 and progeny, K-40). These radionuclides constitute the majority of the background radiation source and thus account for a majority of the annual background dose detected. Since the detected concentrations of these radionuclides were consistent at indicator and control locations, and unrelated to plant operations, their presence is noted only in the data tables and will not be discussed further.

Residual Radioactivity from Atmospheric Weapons Testing

The second group of radionuclides detected in 2006 consists of those resulting from past weapons testing in the earth's atmosphere. Such testing in the 1950's and 1960's resulted in a significant atmospheric radionuclide inventory, which, in turn, contributed to the concentrations in the lower atmosphere and ecological systems. Although reduced in frequency, atmospheric weapons testing continued into the 1980's. The resultant radionuclide inventory, although diminishing with time (e.g., through radioactive decay and natural dispersion processes), remains detectable.

Cs-137 is present in the environment from atmospheric weapons testing and to a lesser extent from the Chernobyl accident in 1986. Cs-134 is produced by weapons testing in much lower quantities. Because Cs-134 has a short half-life relative to Cs-137, Cs-134 from Chernobyl is not likely to be present in 2006.

Strontium-90 (Sr-90) is also present in the environment from atmospheric testing debris. There is also Sr-90 in the environment from the Chernobyl accident in 1986; however, this quantity is not significant compared to atmospheric weapons testing (Reference 31).

According to Eisenbud and Gesell (Reference 3), tap water in New York City was monitored during the period of weapons testing and reached a peak of 2.12 pCi/liter in 1963. The U.S. EPA Environmental Radiation Ambient Monitoring System program monitors concentrations of Sr-90 in drinking water at 78 sites. For 1995, the U.S. EPA reported Sr-90 concentrations at 78 locations, and the mean of the positive values (13 of 78) was 0.32 pCi/liter. Sites with above-average concentrations included Detroit and Niagara Falls, with Sr-90 concentrations of 0.4 and 0.5 pCi/liter, respectively (Reference 32).

Radioactivity Potentially of Plant Origin
The final group of radionuclides detected through the 2006 REMP comprises those that may be attributable to current plant operations. During 2006, Cs-137, Sr-90, and tritium (H-3) were the only potentially plant-related radionuclides detected in some environmental samples.

H-3 may be present in the local environment due to either natural occurrence, other man-made sources, or as a result of plant operations. Small amounts of H-3 were detected in one of four quarterly composite samples from the discharge mixing zone (386 pCi/Liter). This composite sample was detected at a value lower than the required Lower Limit of Detection (3000 pCi/Liter).

In 2006, the detected radionuclide(s) attributable to past atmospheric weapons testing consisted of Cs-137 and Sr-90 in some media. The levels detected for Cs-137 were consistent with the historical levels of radionuclides resulting from weapons tests as measured in previous years. Prior to 2006, Sr-90 analysis had not been conducted since the 1984, so comparison to recent historical levels is not possible. However, the low levels detected in the environment are consistent with decayed quantities of activity from atmospheric weapons testing.

Sr-90 was detected in 4 fish and invertebrate samples, 3 in the control samples and one in the indicator samples. Since the levels detected were comparable in the indicator and control location samples, atmospheric weapons' testing is the likely cause. Five out of 18 special water samples indicated Sr-90 at levels close to the level of detection, at an average of 0.78 pCi/liter. All of these detections are considered to be due to residual atmospheric weapons tests.

I-131 is also produced in fission reactors, but can result from non-plant related anthropogenic sources, e.g., medical administrations, such as in previous annual reports. I-131 was not detected in 2006.

Co-58 and Co-60 are activation/corrosion products also related to plant operations. They are produced by neutron activation in the reactor core. As Co-58 has a much shorter half-life, its absence "dates" the presence of Co-60 as residual from releases of both nuclides in the past. When significant concentrations of Co-60 are detected but no Co-58, there is an increased likelihood that the Co-60 is due to residual Co-60 from past operations. There was no Co-58 or Co-60 detected in the 2006 REMP, though they (Co-58 and Co-60) can be observed in historical tables.

In the following sections, a summary of the results of the 2006 REMP is presented by sample medium, and the significance of any positive findings discussed. It should be noted that naturally occurring radionuclides are omitted from the summary table (Table B-2) and further discussion.

4.1 Direct Radiation

The environmental TLDs used to measure the direct radiation were TLDs supplied and processed by the JAFNPP Environmental Laboratory. The laboratory uses a Panasonic TLD system. In 2006, the TLD program produced a consistent picture of ambient background radiation levels in the vicinity of the Indian Point Station. A summary of the annual TLD data is provided in Table B-2 and all the TLD data are presented in Tables B-3, B-4 and B-5. TLD sample site DR-40 is the control site for the direct radiation (DR) series of measurements.

Table B-3 provides the quarterly and annual average reported doses in mR per standard quarter for each of the direct radiation sample points, DR-1 through DR-41. The table also provides the sector for each of the DR sample points. Table B-4 provides the mean, standard deviation, minimum and maximum values in mR per standard quarter for the years 1996 through 2005. The 2006 means are also presented in Table B-4. Table B-5 presents the 2006 TLD data for the inner ring and outer ring of TLDs.

The 2006 mean value for the direct radiation sample points was 14.1 mR per standard quarter. The mean value for the period 2000 through 2006 was 14.2 mR per standard quarter. At those locations where the 2006 mean value was higher, they are within historical bounds for the respective locations.

The DR sample locations are arranged so that there are two concentric rings of TLDs around the Indian Point site. The inner ring (DR-1 to DR-16) is close to the site boundary. The outer ring (DR-17 to DR-32) has a radius of approximately 5 miles from the three Indian Point units. The results for these two rings of TLDs are provided in Table B-5. The annual average for the inner ring was 13.9 mR per standard quarter and also average for the outer ring was 14.3 mR per standard quarter. The control location average for 2006 was 17.5 mR per standard quarter.

Table C-1 and Figure C-1 present the 10-year historical averages for the inner and outer rings of TLDS. The 2006 averages are consistent with the historical data. The 2006 and previous years' data show that there is no measurable direct radiation in the environment due to the operation of the Indian Point site.

4.2 Airborne Particulates and Radioiodine

An annual summary of the results of the 2006 air particulate filter and charcoal cartridge analyses is presented in Table B-2. As shown, there were no radionuclides detected in the air attributable to plant operations.

The results of the analyses of weekly air particulate filter samples for gross beta activity are presented in Table B-6, and the results of the gamma spectroscopy analyses of the quarterly composites of these samples are in Table B-7.

Gross beta activity was found in air particulate samples throughout the year at all indicator and control locations. The average gross beta activity for the eight indicator air sample locations was 0.013 pCi/m^3 and the average for the control location was 0.013 pCi/m^3. The activities detected were consistent for all locations, with no significant differences in gross beta activity in any sample due to location. Gamma spectroscopy analyses of the quarterly composite air samples showed that no reactor-related nuclides were detected and that only naturally-occurring radionuclides were present at detectable levels.

The mean annual gross beta concentrations and Cs-137 concentrations in air for the past 10 years are presented in Table C-2. From this table and Figure C-2, it can be seen that the average 2006 gross beta concentration was consistent with historical levels. Cs-137 has not been detected since 1987. This is consistent with the trend of decreasing ambient Cs-137 concentrations in recent years.

The charcoal cartridge analytical results are presented in Table B-8. "Less than" values are presented as sample critical level (L_c). There was no I-131 detected (LLD = 0.07 pCi/m^3) in the charcoal cartridge samples, which is consistent with historical trends.

From the data, it can be seen that no airborne radioactivity attributable to the operation of Indian Point was detected in 2006.

4.3 Hudson River Water

A summary of the radionuclides detected in the Hudson River water is contained in Table B-2. Data resulting from analysis of monthly Hudson River water samples for gamma emitters, and H-3 analysis of quarterly composites, are presented in Tables B-9 and B-10, respectively.

No radionuclides other than those that are naturally occurring and tritium were detected in the Hudson River Water samples. Tritium, whose presence is likely to be due to plant operations, has been detected in the past as depicted in Table C-3, and was detected in one of four composite samples from the discharge canal at 386 ± 136 pCi/l, slightly above LLD. These tritium levels are well below the required LLD of 3000 pCi/L. Additionally, table C-3 indicates the absence of Cs-137 which is consistent with historical data.

4.4 Drinking Water

The annual program summary table (Table B-2) contains a summary of the 2006 drinking water sample analysis results. Results of the gamma spectroscopy analyses of the monthly drinking water samples are in Table B-11 and results of tritium analysis of quarterly composites are in Table B-12. Other than naturally occurring radionuclides, no radionuclides were detected in drinking water samples.

A summary and illustration of historic trends of drinking water are provided in Table C-4 and Figure C-4, respectively. An examination of the data indicates that operation of the Indian Point units had no detectable radiological impact on drinking water.

4.5 Hudson River Shoreline Soil

A summary of the radionuclide concentrations detected in the shoreline soil samples is contained in Table B-2. Table B-13 contains the results of the gamma spectroscopic and strontium-90 analyses of the shoreline soil samples.

In addition to the naturally occurring nuclides, Cs-137 was identified in the Hudson River shoreline soil samples in 2006. Cs-137 was detected at the Verplank location in both samples from that location, for a total of two positive values out of eight samples from indicator locations. Cs-137 was detected at the control location (Manitou Inlet) in one out of two samples. The average concentration for the indicator locations that had positive indication of Cs-137 was 147 pCi/kg-dry with a maximum concentration of 158 pCi/kg-dry. The control location with one positive sample indicated 65 pCi/kg-dry.

An historical look at Cs-137 detected in shoreline soil at indicator and control locations can be viewed in Table C-5 and Figure C-5. Cs-137 has been and continues to be present in this media, both at indicator and control locations, at a consistent level over the past ten years. Cs-134 and Cs-137 are both discharged from the plant in similar quantities. The lack of Cs-134 activity is an indication that the primary source of the Cs-137 in the shoreline soil is legacy contamination from weapons fallout.

4.6 Broad Leaf Vegetation

Table B-2 contains a summary of the broad leaf vegetation sample analysis results. Data from analysis of the 2006 samples are presented in Table B-14. Analyses of broad leaf vegetation samples revealed only naturally occurring nuclides.

Table C-6 contains an historical summary and Figure C-6 is an illustration of the broad leaf vegetation analysis results. The detection of low levels of Cs-137 has occurred sporadically at both indicator and control locations at relatively low concentrations for the past ten years; however, Cs-137 was not detected in 2006.

4.7 Fish and Invertebrates

A summary of the fish and invertebrate sample analysis results is presented in Table B-2. Table B-15 contains the results of the analysis of fish and invertebrate samples for 2006. Sr-90 was added to the analyte list in 2006, and it was detected in one indicator sample (fish) and three control samples (2 fish, 1 invertebrate). Other than these detections, fish and invertebrate samples showed only radionuclides of natural origin. Because the Sr-90 detection was both at the indicator and control locations, and the values at the control station, approximately 20 miles upstream, were approximately the same as that of the indicator station, the source of the Sr-90 is considered to be residual fallout from weapons testing.

A summary of historical fish and invertebrate analytical data is presented in Table C-7 and illustrated in Figure C-7. Data are consistent with historical trends.

4.8 Aquatic Vegetation

A summary of the aquatic sample analysis results is presented in Table B-2. Table B-16 contains the results of the analysis of aquatic vegetation samples for 2006. Cs-137 was detected at one of 4 indicator station samples, and at one of 3 control station samples. The concentration of Cs-137 in the indicator sample was slightly higher than that of the control, but was almost the same value. Cs-134 was not detected in any aquatic vegetation samples. While it is possible that the Cs-137 is from plant origin, the lack of Cs-134 suggests that the primary source of the Cs-137 is residual weapons test fallout.

This detection of Cs-137 in aquatic vegetation at both indicator and control locations is consistent with historical levels.

4.9 Hudson River Bottom Sediment

A summary of the Hudson River bottom sediment analysis results is presented in Table B-2. Table B-17 contains the results of the analysis of bottom sediment samples for 2006. Cs-137 was detected at 7 of 10 indicator station samples, and at one of 3 control station samples. Cs-134 was not detected in any bottom sediment samples. The lack of Cs-134 suggests that the primary source of the Cs-137 in bottom sediment is from historical plant releases at least several years old and from residual weapons test fallout.

While not required by the ODCM, Sr-90 was analysis was conducted at 3 indicator locations and one control location in August 2006. Sr-90 was not identified in any of the samples.

This detection of Cs-137 in bottom sediment has been generally decreasing over the last 10 years, and Cs-134 has not been detected in bottom sediment since 2002. The data for 2006 are consistent with but slightly lower than historical levels.

4.10 Precipitation

A summary of the precipitation sample analysis results is presented in Table B-2. Table B-18 contains the results of the precipitation samples for 2006. Other than naturally occurring radionuclides, no radionuclides were detected in precipitation samples.

A review of historical data over the last 10 years indicates tritium had been detected in both indicator and control precipitation samples in 1997; however, there have been no instances of positive values since that time.

4.11 Soil

A summary of the soil sample analysis results is presented in Table B-2. Table B-19 contains the results of the soil samples for 2006. Other than naturally occurring radionuclides, no radionuclides were detected in precipitation samples. This is consistent with historical results over the last 10 years.

4.12 Special Water

A summary of the special water samples for 2006 is contained in Table B-2. Data resulting from analysis of the special water samples for gamma emitters, tritium analysis, and Sr-90 are presented in Table B-20 for existing ODCM sample locations and in Table B-21 for those ODCM locations that will be effective in 2007.

Eighteen samples were analyzed for Sr-90, and 5 of these showed detectable Sr-90. All of these results (range 0.49 – 1.26 pCi/liter) were well below the reporting level. As described in Section 4.0, all of these detections are considered to be due to residual atmospheric weapons tests. Other than the above, only naturally occurring radionuclides were detected in the special water samples.

4.13 Land Use Census

Environmental Monitoring Land Use Census
Methodology:

A comprehensive survey of the of the 5 mile (8 kilometer) area surrounding the Indian Point Site was conducted during the 2006 Spring, Summer and Fall months in accordance with the ODCM.

Visual inspections were made of the 5-mile area around the Indian Point Site during routine sample collections and emergency plan equipment inspections in the area throughout the year.

Information was obtained from the New York Agricultural Statistic Service on milching animals within the 5-mile area surrounding Indian Point Energy Center.

An extensive land survey was conducted of the 5-mile area in an attempt to identify new residential areas, commercial developments and to identify milch animals in pasture. Previous locations were visited and verified by dispatching Nuclear Environmental Technicians to the various locations.

Note: These actions were taken while performing quarterly environmental badge change out and field inspections through out the 4 surrounding counties.

- Orange County was surveyed during through the summer and fall.
- Rockland County was surveyed during summer and fall.
- Putnam County was surveyed during the summer and fall.
- Westchester County was surveyed during the spring and summer and fall.

Note: An aerial survey was not conducted of the 5-mile area this year.

Results:
A census was performed in the vicinity of Indian Point in 2006. This census consisted of a milch animal and a residence census. Results of this census are presented in Tables B-22 and B-23.

The results of the 2006 census were generally same as the 2005 census results. There were no animals producing milk for human consumption found within 5 miles (8 km) of the plant or listed in the New York Agricultural Statistic

Service. The second part of this census revealed that the two nearest residences in different sectors are located 0.44 miles (0.71 km) ESE and 0.73 miles (1.13 km) S of the plant. The 2006 land use census indicated there were no new residences that were closer in proximity to IPEC.

The Indian Point REMP does not include a garden census. ODCM allows the sampling of broad leaf vegetation in two sectors at the site boundary in lieu of performing a garden census. Analysis results are discussed in section 4.6 and presented in Table B-14, Table C-6 and Figure C-6.

4.14 Conclusion

The Radiological Environmental Monitoring Program is conducted each year to determine the radiological impact of Indian Point operations on the environment. The preceding discussions of the results of the 2006 REMP reveal that operations at the station did not result in an adverse impact on the environment.

The 2006 REMP results demonstrate the relative contributions of different radionuclide sources, both natural and anthropogenic, to the environmental concentrations. The results indicate that the fallout from previous atmospheric weapons testing continues to cause sporadic detection of Cs-137 and Sr-90 in environmental samples. There are infrequent detections of plant related radionuclides in the environs; however, the radiological effects are very low and are significantly less than those from natural background and other anthropogenic sources.

SECTION 5

REFERENCES

5.0 REFERENCES

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APPENDIX A

ENVIRONMENTAL SAMPLING AND ANALYSIS REQUIREMENTS

APPENDIX A

Environmental media are sampled at the locations specified in Table A-1 and shown in Figures A-1, A-2, and A-3. The samples are analyzed according to criteria established in the ODCM. These requirements include: methods of sample collection; types of sample analysis; minimum sample size required; lower limit of detection, which must be attained for each medium, sample, or analysis type, and environmental concentrations requiring special reports.

Table A-1 provides the sampling station number, location, sector, distance from Indian Point, sample designation code, and sample type. This table gives the complete listing of sample locations used in the 2006 REMP.

Three maps are provided to show the locations of REMP sampling. Figure A-1 shows the sampling locations within two miles of Indian Point. Figures A-2 and A-3 show the sampling locations within ten miles of Indian Point.

The ODCM required lower limits of detection (LLD) for Indian Point sample analyses are presented in Table A-2. These required lower limits of detection are not the same as the lower limits of detection or critical levels actually achieved by the laboratory. The laboratory's lower limits of detection and critical levels must be equal to or lower than the required levels presented in Table A-2.

Table A-3 provides the reporting level for radioactivity in various media. Sample results that exceed these levels and are due to plant operations require that a special report be submitted to the NRC.

In addition to the sampling outlined in Table A-1, there is an environmental surveillance requirement that an annual land use and milch animal census be performed. See Tables B-22 and B-23 for the milch animal and land use census.

TABLE A-1
INDIAN POINT REMP SAMPLING STATION LOCATIONS

SAMPLING STATION	SAMPLE DESIGNATION	LOCATION	DISTANCE	SAMPLE TYPES
3	DR8	Service Center Building	Onsite - 0.35 Mi (SSE) at 158°	Direct Gamma
4	A1 A1	Algonquin Gas Line	Onsite - 0.28 Mi (SW) at 234°	Air Particulate Radioiodine
5	A4 A4 DR10	NYU Tower	Onsite - 0.88 Mi (SSW) at 208°	Air Particulate Radioiodine Direct Gamma
7	Wb1	Camp Field Reservoir	3.4 Mi (NE) at 51°	Drinking Water
8	**	New Croton Reservoir	6.3 Mi (SE) at 124°	Drinking Water
9	Wa1	Plant Inlet (Hudson River Intake)*	Onsite - 0.16 Mi (W) at 273°	HR Water
10	Wa2 **	Discharge Canal (Mixing Zone)	Onsite - 0.3 Mi (WSW) at 249°	HR Water HR Bottom Sediment
14	DR7	Water Meter House	Onsite - 0.3 Mi (SE) at 133°	Direct Gamma
17	** ** **	Off Verplanck	1.5 Mi (SSW) at 202.5°	HR Aquatic Vegetation HR Shoreline Soil HR Bottom Sediment
20	DR38	Cortlandt Yacht Club (AKA Montrose Marina)	1.5 Mi (S) at 180°	Direct Gamma
22	** **	Lovett Power Plant	1.6 Mi (WSW) at 244°	Air Particulate Radioiodine
23	** A5 A5 DR40 Ic3 ** Ib2	Roseton*	20.7 Mi (N) at 357°	Precipitation Air Particulate, Radioiodine Direct Gamma Broad Leaf Vegetation Soil Fish & Invertebrates
25	Ib1	Downstream	Downstream	Fish & Invertebrates
27	** ** DR41	Croton Point	6.36 Mi (SSE) at 156°	Air Particulate Radioiodine Direct Gamma
28	** DR4 ** **	Lent's Cove	0.45 Mi (ENE) at 069°	HR Shoreline Soil Direct Gamma HR Bottom Sediment HR Aquatic Vegetation
29	** ** DR39	Grassy Point	3.37 Mi (SSW) at 196°	Air Particulate Radioiodine Direct Gamma

* = Control location
** = Locations listed do not have sample designation locations specified in the ODCM
HR = Hudson River R/S = Reuter Stokes

TABLE A-1
INDIAN POINT REMP SAMPLING STATION LOCATIONS

SAMPLING STATION	SAMPLE DESIGNATION	LOCATION	DISTANCE	SAMPLE TYPES
33	DR33	Hamilton Street (Substation)	2.88 Mi (NE) at 053°	Direct Gamma
34	DR9	South East Corner of site	Onsite - 0.52 Mi (S) at 179°	Direct Gamma
35	DR5	Broadway & Bleakley Avenue	Onsite - 0.37 Mi (E) at 092°	Direct Gamma
38	DR34	Furnace Dock (Substation)	3.43 Mi (SE) at 141°	Direct Gamma
44	** ** **	Peekskill Gas Holder Bldg	1.84 Mi (NE) at 052°	Precipitation Air Particulate Radioiodine
50	Wc2	Manitou Inlet*	4.48 Mi (NNW) at 347°	HR Shoreline Soil
53	Wc1 DR11	White Beach	0.92 Mi (SW) at 226°	HR Shoreline Soil Direct Gamma
56	DR37	Verplanck - Broadway & Sixth Street	1.25 Mi (SSW) at 202°	Direct Gamma
57	DR1	Roa Hook	2 Mi (N) at 005°	Direct Gamma
58	DR17	Route 9D - Garrison	5.41 Mi (N) at 358°	Direct Gamma
59	DR2	Old Pemart Avenue	1.8 Mi (NNE) at 032°	Direct Gamma
60	DR18	Gallows Hill Road & Sprout Brook Road	5.02 Mi (NNE) at 029°	Direct Gamma
61	DR36	Lower South Street & Franklin Street	1.3 Mi (NE) at 052°	Direct Gamma
62	DR19	Westbrook Drive (near the Community Center)	5.03 Mi (NE) at 062°	Direct Gamma
64	DR20	Lincoln Road - Cortlandt (School Parking Lot)	4.6 Mi (ENE) at 067°	Direct Gamma
66	DR21	Croton Avenue - Cortlandt	4.87 Mi (E) at 083°	Direct Gamma
67	DR22	Colabaugh Pond Road - Cortlandt	4.5 Mi (ESE) at 114°	Direct Gamma
69	DR23	Mt. Airy & Windsor Road	4.97 Mi (SE) at 127°	Direct Gamma
71	DR25	Warren Ave - Haverstraw	4.83 Mi (S) at 188°	Direct Gamma
72	DR26	Railroad Avenue & 9W - Haverstraw	4.53 Mi (SSW) at 203°	Direct Gamma
73	DR27	Willow Grove Road & Captain Faldermeyer Drive	4.97 Mi (SW) at 226°	Direct Gamma
74	DR12	West Shore Drive - South	1.59 Mi (WSW) at 252°	Direct Gamma
75	DR28	Palisades Parkway	4.65 Mi (NW) at 310°	Direct Gamma
76	DR13	West Shore Drive - North	1.21 Mi (W) at 276°	Direct Gamma
77	DR29	Palisades Parkway	4.15 Mi (W) at 272°	Direct Gamma
78	DR14	Rt. 9W across from R/S #14	1.2 Mi (WNW) at 295°	Direct Gamma

* = Control location
** = Locations listed do not have sample designation locations specified in the ODCM
HR = Hudson River R/S = Reuter Stokes

TABLE A-1
INDIAN POINT REMP SAMPLING STATION LOCATIONS

SAMPLING STATION	SAMPLE DESIGNATION	LOCATION	DISTANCE	SAMPLE TYPES
79	DR30	Anthony Wayne Park	4.57 Mi (WNW) at 296°	Direct Gamma
80	DR15	Route 9W South of Ayers Road	1.02 Mi (NW) at 317°	Direct Gamma
81	DR31	Palisades Pkwy - Lake Welch Exit	4.96 Mi (WSW) at 255°	Direct Gamma
82	DR16	Ayers Road	1.01 Mi (NNW) at 334°	Direct Gamma
83	DR32	Route 9W - Fort Montgomery	4.82 Mi (NNW) at 339°	Direct Gamma
84	** ** **	Cold Spring *	10.88 Mi (N) at 356°	HR Aquatic Vegetation HR Shoreline Soil HR Bottom Sediment
88	DR6	R/S Pole #6	0.32 Mi (ESE) at 118°	Direct Gamma
89	DR35	Highland Ave & Sprout Brook Road (near rock cut)	2.89 Mi (NNE) at 025°	Direct Gamma
90	DR3	Charles Point	0.88 Mi (NE) at 047°	Direct Gamma
92	DR24	Warren Road - Cortlandt	3.84 Mi (SSE) at 149°	Direct Gamma
94	A2 A2 Ic2 **	IPEC Training Center	Onsite- 0.39 Mi (S) at 193°	Air Particulate Radioiodine Broad Leaf Vegetation Soil
95	A3 A3 Ic1 **	Meteorological Tower	Onsite - 0.46 Mi (SSW) at 208°	Air Particulate Radioiodine Broad Leaf Vegetation Soil
99 (a)	**	Algonquin Outfall	Onsite - 0.34 Mi (SW) at 237°	Special Water
100 (a)	**	Gypsum Plant Outfall	Onsite - 0.34 Mi (SW) at 237°	Special Water
101 (a)	**	5th Street Well - Verplanck	1 .3 Mi (S) at 202°	Special Water
102 (a)	**	Trap Rock Quarry	0.7 Mi (SSW) at 208°	Special Water
104 (b)	**	MW-40 Boundary Well, lower parking lot	Onsite - 0.21 mi (SW)	Special Water
105 (b)	**	MW-51 Boundary Well, middle parking lot	Onsite - 0.18 mi (SSW)	Special Water

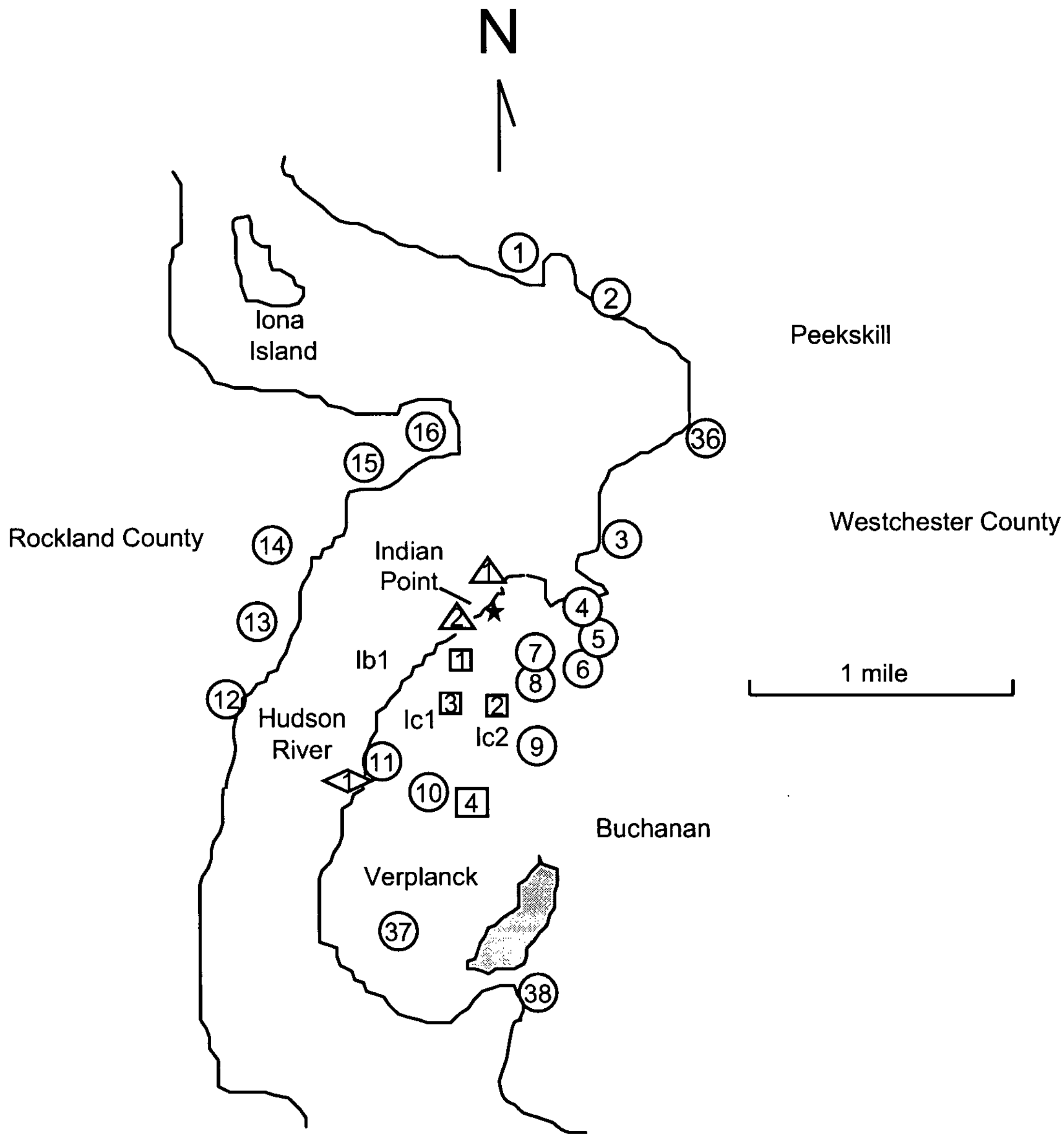
(a) *Location was eliminated from the required sample list at the end of 2006*

(b) Location was sampled in 2006 and was added to the ODCM as a required boundary groundwater sample location starting in 2007.

* = Control location
** = Locations listed do not have sample designation locations specified in the ODCM
HR = Hudson River R/S = Reuter Stokes

FIGURE A-1

SAMPLING LOCATIONS
Within Two Miles of Indian Point



Key:

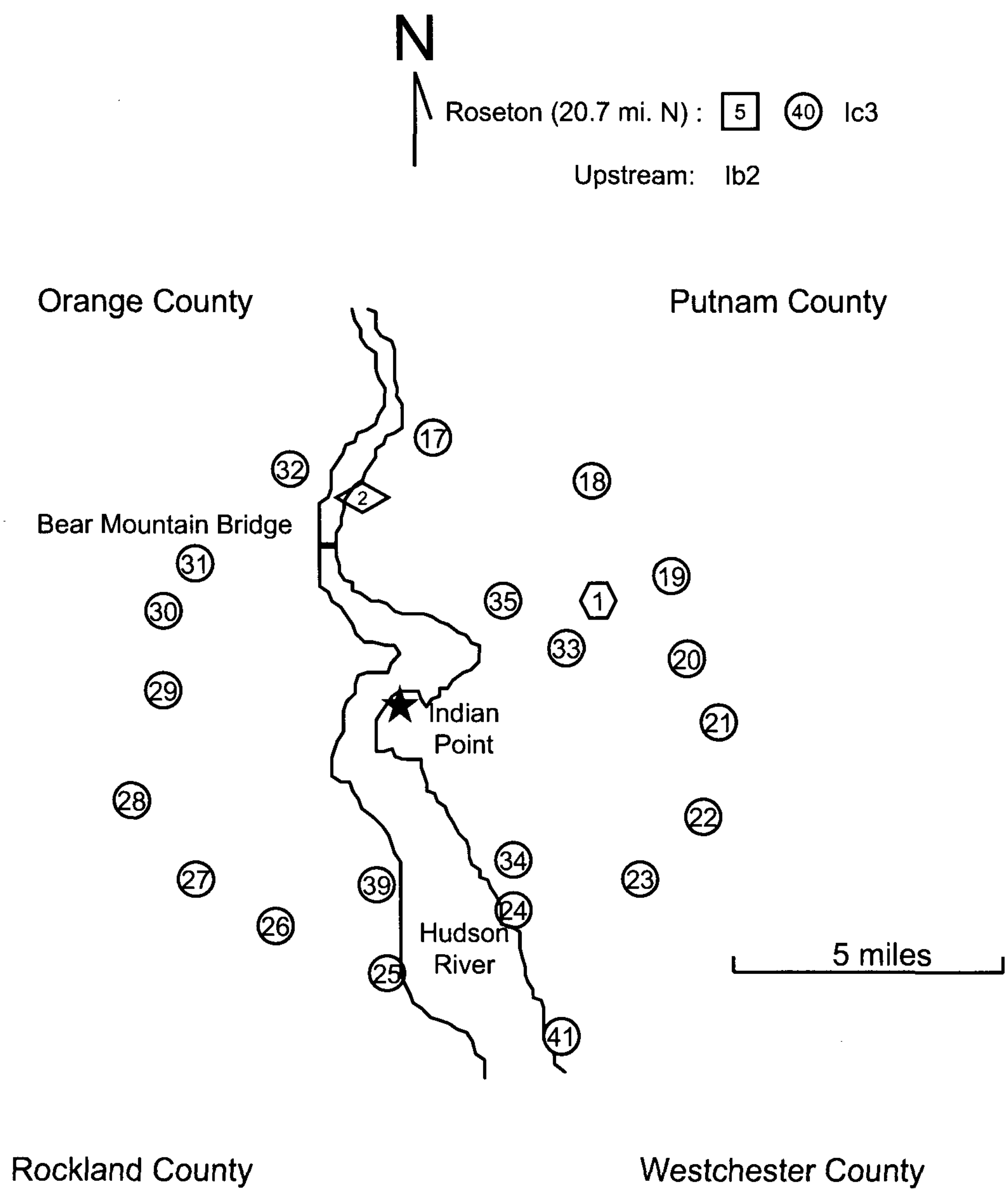
- △ - Waterborne: Surface (HR) Wa#
- ○ - Direct Radiation Sample Location DR#
- □ - Air Particulate & Radioiodine A#
- ◇ - HR Shoreline Sediment Wc#

Ic# - Broadleaf Vegetation

Ib1 - Fish and Invertebrates (where available downstream)

FIGURE A-2

SAMPLING LOCATIONS
Within 10 Miles of Indian Point

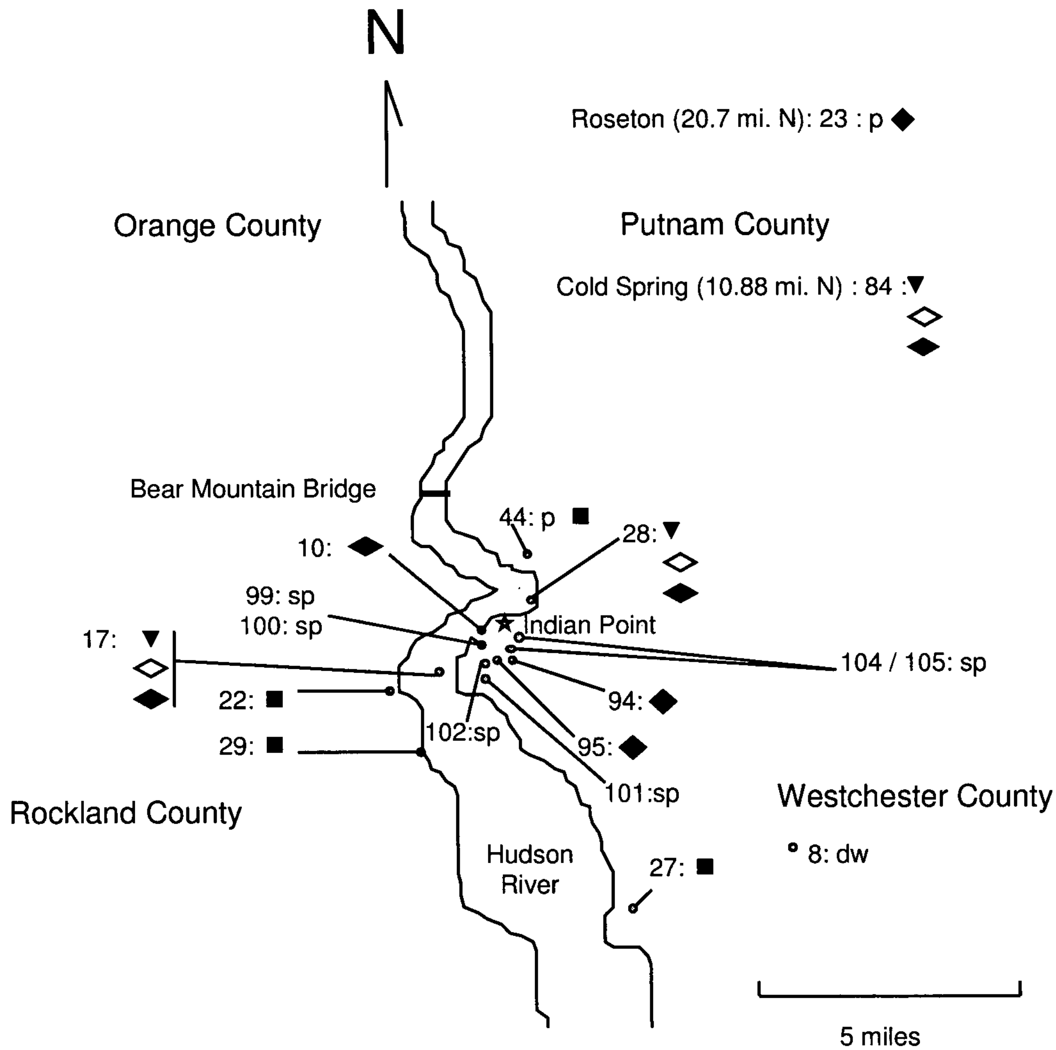


Key:
- ○ - Direct Radiation Sample Location DR#
- □ - Air Particulate & Radioiodine A#
- ◇ - HR Shoreline Sediment Wc#
- ⬡ - Waterborne: Drinking Wb#

Ic3 - Broadleaf Vegetation
Ib2 - Fish and Invertebrates (where available upstream)

FIGURE A-3

SAMPLING LOCATIONS
Additional Sampling Locations



Key:

■ - Air Particulate & Radioiodine
▼ - Aquatic Vegetation
◆ - HR Bottom Sediment
p - Precipitation
◇ - HR Shoreline Sediment
◆ - Soil
sp - Special Water
dw – Drinking Water

TABLE A-2

LOWER LIMIT OF DETECTION (LLD) REQUIREMENTS FOR ENVIRONMENTAL SAMPLE ANALYSIS [a] [b]

ANALYSIS	WATER (pCi/L)	AIRBORNE PARTICULATES OR GASES (pCi/m3)	FISH (pCi/kg, wet)	MILK (pCi/L)	FOOD PRODUCTS (pCi/kg, wet)	SEDIMENT (pCi/kg, wet)
Gross β	4	0.01				
H-3	2,000 [c]					
Mn-54	15		130			
Fe-59	30		260			
Co-58	15		130			
Co-60	15		130			
Zn-65	30		260			
Zr-Nb-95	15					
I-131	1 [d]	0.07		1	60	
Cs-134	15	0.05	130	15	60	150
Cs-137	18	0.06	150	18	80	180
Ba-La-140	15			15		
Sr-90	1[e]		5[e]			5,000[e]

(a) This list shows required LLD's, but other radionuclides are considered. Other identifiable peaks from gamma spectroscopy shall also be analyzed and reported in the Annual Radiological Environmental Operating Report.

(b) Required detection capabilities for thermoluminescent dosimeters used for environmental measurements are given in Regulatory Guide 4.13 (Reference 27).

(c) LLD for drinking water samples. If no drinking water pathway exists, a value of 3000 pCi/L may be used.

(d) LLD for drinking water samples. If no drinking water pathway exists, a value of 15 pCi/L may be used.

(e) The requirement to analyze for Sr-90 in fish/invertebrates and shoreline soil was committed to and accomplished in 2006. The ODCM did not list the required LLD's or reporting criteria until after the end of calendar year 2006. The Sr-90 water LLD is only for special water samples locations 104 and 105 (see Table A-1)
The 5 pCi/kg LLD is for fish and invertebrates, and the 5000 pCi/kg LLD is for shoreline sediment.

TABLE A-3

REPORTING LEVELS FOR RADIOACTIVITY CONCENTRATIONS IN ENVIRONMENTAL SAMPLES

ANALYSIS	WATER (pCi/L)	AIRBORNE PARTICULATES OR GASES (pCi/m^3)	FISH (pCi/kg, wet)	MILK (pCi/L)	FOOD PRODUCTS (pCi/kg, wet)
H-3	20,000 [(a)]				
Mn-54	1,000		30,000		
Fe-59	400		10,000		
Co-58	1,000		30,000		
Co-60	300		10,000		
Zn-65	300		20,000		
Zr-Nb-95	400				
I-131	2 [(b)]	0.9		3	100
Cs-134	30	10	1,000	60	1,000
Cs-137	50	20	2,000	70	2,000
Ba-La-140	200			300	
Sr-90 [(c)]	8		40		

(a) For drinking water samples. This is the 40 CFR Part 141 value. If no drinking water pathway exists, a value of 30,000 pCi/L may be used.

(b) If no drinking water pathway exists, a value of 20 pCi/L may be used.

(c) The requirement to analyze for Sr-90 in selected special water samples, fish/invertebrates, and shoreline soil was committed to and accomplished in 2006. The ODCM did not list the required LLD's or reporting criteria until after the end of calendar year 2006.

APPENDIX B

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM RESULTS SUMMARY

APPENDIX B

B.1 2006 Annual Radiological Environmental Monitoring Program Summary

The results of the 2006 radiological environmental sampling program are presented in Tables B-2 through B-21. Table B-2 is a summary table of the sample results for 2006. The format of this summary table conforms to the reporting requirements of the ODCM, NRC Regulatory Guide 4.8 (Reference 2), and NRC Branch Technical Position to Regulatory Guide 4.8 (Reference 11). In addition, the data obtained from the analysis of samples are provided in Tables B-3 through B-21.

REMP samples were analyzed by various counting methods as appropriate. The methods are; gross beta, gamma spectroscopy analysis, liquid scintillation, radiochemical analysis, and TLD processing. Gamma spectroscopy analysis was performed for the following radionuclides; Be-7, K-40, Mn-54, Co-58, Co-60, Fe-59, Zn-65, Zr-95, Nb-95, Ru-103, Ru-106, I-131, Cs-134, Cs-137, Ba/La-140, Ce-141, Ce-144, Ra-226 and Ac/Th-228. Radiochemical analyses were performed for I-131 and Sr-90 for specific media and locations as required in the ODCM.

B.2 Land Use Census

In accordance with Sections IP2-D3.5.2 and IP3-2.8 of the ODCM, a land use census was conducted to identify the nearest milch animal and the nearest residence. The results of the milch animal and land use censuses are presented in Tables B-22 and B-23, respectively. In lieu of identifying and sampling the nearest garden of greater than $50m^2$, at least three kinds of broad leaf vegetation were sampled near the site boundary in two sectors and at a designated control location (results are presented in Table B-14).

B.3 Sampling Deviations

During 2006, environmental sampling was performed for 12 media types addressed in the ODCM and direct radiation. A total of 1342 samples/measurements were obtained. Of the scheduled samples, 98.5% were collected and analyzed for the program. Sampling deviations are summarized in Table B-1; discussions of the reasons for the deviations are provided in Table B-1a for air samples, B-1b for TLDs and B-1c for other environmental media.

B.4 Analytical Deviations

There were no analytical deviations for 2006.

B.5 Special Reports

No special reports were required under the REMP.

TABLE B-1

SUMMARY OF SAMPLING DEVIATIONS
2006

MEDIA	TOTAL SCHEDULED SAMPLES	NUMBER OF DEVIATIONS*	SAMPLING EFFICIENCY %	REASON FOR DEVIATION
MEDIA				
PARTICULATES IN AIR	466	10	97.9%	See Table B-1b
CHARCOAL FILTER	464	10	97.8%	See Table B-1b
TLD	164	0	100%	N/A
HUDSON RIVER WATER	32	1	96.9%	N/A
DRINKING WATER	48	0	100%	N/A
SHORELINE SOIL	10	0	100%	N/A
BROAD LEAF VEGETATION	54	0	100%	N/A
FISH & INVERTEBRATES	20	0	100%	N/A
AQUATIC VEGETATION	7	0	100%	N/A
HUDSON RIVER BOTTOM SEDIMENT	13	0	100%	N/A
SOIL	3	0	100%	N/A
PRECIPITATION	8	0	100%	N/A
SPECIAL WATER SAMPLES	74	0	100%	N/A
TOTALS	1363	21	98.5%	

TOTAL NUMBER OF ANALYSES REPORTED = 1342

* Samples not collected or unable to be analyzed.

TABLE B-1a / B-1b/B-1c

TABLE B-1a 2006 Air Sampling Deviations		
STATION	WEEK	PROBLEM / ACTIONS TO PREVENT RECURRENCE
LOVETT	1/9/2006	The hour meter stopped working. Meter replaced.
LOVETT	1/23/2006	The air sample at Lovett Power Station lost 22 hours sometime this past week. When we changed the air sample everything was working as it should.
N.Y.U.	6/6/2006	When we went to change out the weekly air sample at N.Y.U. location the pump was not running. After investigation we found out that the fuse was blown. We replaced the fuse and restarted the air sample, it is back in service. We lost 4.61 days of sample.
IPEC training center	7/11/2006	The air sample at IPEC training center lost 20.9 hours sometime this past week. The air sample ran for 171.1 hours out of 192 hours for the week. When we changed the air sample everything was working as it should.
LOVETT	7/17/2006	The air sample at Lovett Power Station lost power last Monday at 1030. We lost the entire week of sample. The power was isolated by plant personnel to shut off two space heaters. They did not realize that the air sample was on the same circuit. The power was restored to the sampler. Coaching performed to prevent reoccurrence.
ROSETON	7/31/2006	The Roseton air sample lost about 68 hours of sample last week when the GFI malfunctioned.
GRASSY POINT	8/21/2006	The Grassy Point air sample lost 9 hours of sample last week. The most likely scenario is that the air sampler lost power.
LOVETT	10/10/2006	The Lovett air sample lost 113 hours of sample time last week. When investigating we found that circuit breaker was tripped. The Lovett operator reset the breaker.
LOVETT	11/6/2006	The air sample at Lovett Power Station lost 36.8 hours sometime this past week. When we changed the air sample everything was working as it should.
GRASSY POINT	11/27/2006	The Grassy Point air sample lost 93.1 hours of sample last week. The most likely scenario is that the air sampler lost power.

TABLE B-1b 2006 TLD Deviations		
STATION	QUARTER	PROBLEM / ACTIONS TO PREVENT RECURRENCE
None	NONE	NONE

TABLE B-1c 2006 Other Media Deviations		
STATION	SAMPLE SCHEDULE	PROBLEM / ACTIONS TO PREVENT RECURRENCE
Hudson River Intake	4/14/2006	The Hudson River Intake sample pump failed some time during the week so we had to take a grab sample and then replace the pump.

TABLE B-2
ODCM ANNUAL SUMMARY - 2006

MEDIUM (UNITS) SEE TABLE	TYPE AND TOTAL NUMBER OF ANALYSIS PERFORMED	LLD (b)	INDICATOR LOCATIONS: MEAN (a) RANGE	LOCATION OF HIGHEST ANNUAL MEAN: LOCATIONS AND DESIGNATION MEAN (a) RANGE	CONTROL LOCATION: MEAN (a) RANGE	NUMBER OF NON-ROUTINE REPORTS
DIRECT RADIATION (mR / standard quarter) B-3	TLD Reads 164	N/A	*14.0 (160/160) / 9.3 - 19.9*	Palisades Parkway 4.65 Mi (NW) at 310° DR28 19.3 *(4/4) / 18.8 - 19.8*	*17.5 (4/4) / 16.0 - 18.8*	0
AIR PARTICULATES AND RADIOIODINE (pCi/m^3) B-6, B-7, B-8	GB (466)		*0.013 (414/416) / 0.001 - 0.028*	#22 Lovett Power Plant 1.6 Mi (WSW) at 244° 0.013 (51/52) / 0.005-0.026	*0.013 (52/52) / 0.003-0.024*	0
	I-131 (419)	0.07	<Lc	<Lc	<Lc	0
	GSA (36) Cs-134	0.05	<Lc	<Lc	<Lc	0
	GSA (36) Cs-137	0.06	<Lc	<Lc	<Lc	0
SURFACE HUDSON RIVER WATER (pCi/L) B-9, B-10	H-3 (8)	3000 (c)	386 (1/4) 386	#10 DISCHARGE CANAL (MIXING ZONE) 386 (1/4) / 386	<Lc	0
	GSA (24)					
	Mn-54	15	<Lc	<Lc	<Lc	0
	Co-58	15	<Lc	<Lc	<Lc	0
	Fe-59	30	<Lc	<Lc	<Lc	0
	Co-60	15	<Lc	<Lc	<Lc	0
	Zn-65	30	<Lc	<Lc	<Lc	0
	Zr/Nb-95	15	<Lc	<Lc	<Lc	0
	I-131	15	<Lc	<Lc	<Lc	0
	Cs-134	15	<Lc	<Lc	<Lc	0
	Cs-137	18	<Lc	<Lc	<Lc	0
	Ba/La-140	15	<Lc	<Lc	<Lc	0

(a) Positive values above L_c
(b) Required *a priori* LLD; see Table A-2
(c) Not a drinking water pathway; the required LLD is 3000 pCi/L

TABLE B-2
ODCM ANNUAL SUMMARY - 2006

MEDIUM (UNITS) SEE TABLE	TYPE AND TOTAL NUMBER OF ANALYSIS PERFORMED	LLD (b)	INDICATOR LOCATIONS: MEAN (a) RANGE	LOCATION OF HIGHEST ANNUAL MEAN: LOCATIONS AND DESIGNATION MEAN (a) RANGE	CONTROL LOCATION: MEAN (a) RANGE	NUMBER OF NON-ROUTINE REPORTS
DRINKING WATER (pCi/L) B-11, B-12	GB (48)	4	*2.59 (24/24) / 1.68 - 4.10*	New Croton Reservoir 6.3 Mi (SE) at 124° 2.74 (12/12)/ 2.00 - 4.10	N/A	0
	H-3 (8)	2000	<Lc	<Lc	N/A	0
	GSA (12)					
	Mn-54	15	<Lc	<Lc	N/A	0
	Co-58	15	<Lc	<Lc	N/A	0
	Fe-59	30	<Lc	<Lc	N/A	0
	Co-60	15	<Lc	<Lc	N/A	0
	Zn-65	30	<Lc	<Lc	N/A	0
	Zr/Nb-95	15	<Lc	<Lc	N/A	0
	I-131	15	<Lc	<Lc	N/A	0
	Cs-134	15	<Lc	<Lc	N/A	0
	Cs-137	18	<Lc	<Lc	N/A	0
	Ba/La-140	15	<Lc	<Lc	N/A	0
SHORELINE SOIL (pCi/kg - dry) B-13	GSA (8)					
	Cs-134	150	<Lc	<Lc	<Lc	0
	Cs-137	180	*147 (2/8) / 135.9 - 158.0*	#17 Off Verplanck 1.5 Mi (SSW) at 202.5° 147 *(2/2) / 135.9 - 158.0*	*64.9 (1/2) / 64.9 - 64.9*	0
	Sr-90	5000	<Lc	<Lc	<Lc	0

(a) Positive values above L_c
(b) Required *a priori* LLD; see Table A-2
(c) Not a drinking water pathway; the required LLD is 3000 pCi/L

TABLE B-2
ODCM ANNUAL SUMMARY - 2006

MEDIUM (UNITS) SEE TABLE	TYPE AND TOTAL NUMBER OF ANALYSIS PERFORMED	LLD (b)	INDICATOR LOCATIONS: MEAN (a) RANGE	LOCATION OF HIGHEST ANNUAL MEAN: LOCATIONS AND DESIGNATION MEAN (a) RANGE	CONTROL LOCATION: MEAN (a) RANGE	NUMBER OF NON-ROUTINE REPORTS
BROADLEAF VEGETATION (pCi/kg - wet) B-14	GSA (54)					
	I-131	60	<Lc	<Lc	<Lc	0
	Co-60	N/A	<Lc	<Lc	<Lc	0
	Cs-134	60	<Lc	<Lc	<Lc	0
	Cs-137	80	<Lc	<Lc	<Lc	0
FISH AND INVERTEBRATES (pCi/kg - wet) B-15	GSA (20)					
	Mn-54	130	<Lc	<Lc	<Lc	0
	Co-58	130	<Lc	<Lc	<Lc	0
	Fe-59	260	<Lc	<Lc	<Lc	0
	Co-60	130	<Lc	<Lc	<Lc	0
	Zn-65	260	<Lc	<Lc	<Lc	0
	Cs-134	130	<Lc	<Lc	<Lc	0
	Cs-137	150	<Lc	<Lc	<Lc	0
	Sr-90 (19)	5	*18.8 (1/10) / 18.8 - 18.8*	*#25 Downstream 18.8 (1/10) / 18.8 - 18.8*	#23 Roseton 10.9 Mi (N) at 356° 18.5 *(3/9) / 13.9 - 24.5*	0
AQUATIC VEGETATION (pCi/kg - WET)	GSA(7)					
	Co-60	NONE	<Lc	<Lc	<Lc	0
	I-131	100	<Lc	<Lc	<Lc	0
	Cs-134	100	<Lc	<Lc	<Lc	0
	Cs-137	100	*28.2 (1/4) / 28.2 - 28.2*	#28 Lents Cove 0.45 Mi (ENE) at 069° 28.2 (1/2) / 28.2 - 28.2	#84 Cold Spring 20.7 Mi (N) at 356° 24.6 *(1/3) / 24.6 - 24.6*	0

(a) Positive values above L_c
(b) Required *a priori* LLD; see Table A-2
(c) Not a drinking water pathway; the required LLD is 3000 pCi/L

TABLE B-2
ODCM ANNUAL SUMMARY - 2006

MEDIUM (UNITS) SEE TABLE	TYPE AND TOTAL NUMBER OF ANALYSIS PERFORMED	LLD (b)	INDICATOR LOCATIONS: MEAN (a) RANGE	LOCATION OF HIGHEST ANNUAL MEAN: LOCATIONS AND DESIGNATION MEAN (a) RANGE	CONTROL LOCATION: MEAN (a) RANGE	NUMBER OF NON-ROUTINE REPORTS
BOTTOM SEDIMENT (pCi/kg - DRY)	GSA(13)					
	Co-60	NONE	<Lc	<Lc	<Lc	0
	Cs-134	150	<Lc	<Lc	<Lc	0
	Cs-137	180	*282 (7/10) / 136 - 449*	#28 Lents Cove 0.45 Mi (ENE) at 069° 317 (2/3) / 259 - 375	#84 Cold Spring 20.7 Mi (N) at 356° 66 *(1/3) / 66 - 66*	0
SOIL (pCi/kg - DRY)	GSA(3)					
	Co-60	NONE	<Lc	<Lc	<Lc	0
	Cs-134	150	<Lc	<Lc	<Lc	0
	Cs-137	180	<Lc	<Lc	<Lc	0
PRECIPITATION (pCi/L)	GSA(8)					
	H-3	3000 (c)	<Lc	<Lc	<Lc	0
	Co-60	15	<Lc	<Lc	<Lc	0
	Cs-134	15	<Lc	<Lc	<Lc	0
	Cs-137	18	<Lc	<Lc	<Lc	0
SPECIAL WATER (pCi/L)	GSA(74)					
	H-3 (66)	3000 (c)	<Lc	<Lc	N/A	0
	Co-60 (74)	15	<Lc	<Lc	N/A	0
	Cs-134 (74)	15	<Lc	<Lc	N/A	0
	Cs-137 (74)	18	<Lc	<Lc	N/A	0
	Sr-90 (18)	1	*0.78 (5/18) / 0.49 - 1.26*	#105 Monitoring Well #51 Onsite 0.84 (1/9) / 0.84 - 0.84	N/A	0

(a) Positive values above L_c
(b) Required *a priori* LLD; see Table A-2
(c) Not a drinking water pathway; the required LLD is 3000 pCi/L

TABLE B-3

2006 DIRECT RADIATION, QUARTERLY DATA
(mR per STANDARD QUARTER)

Station ID	Sector	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter	AVG	Yearly
DR-01	N	15.2 ± 1.0	15.3 ± 0.6	15.3 ± 0.6	15.3 ± 0.8	15.3	61
DR-02	NNE	13.1 ± 0.7	15.4 ± 1.0	13.0 ± 0.7	14.8 ± 0.7	14.1	56
DR-03	NE	10.4 ± 0.5	12.2 ± 0.6	11.0 ± 0.5	12.2 ± 1.1	11.4	46
DR-04	ENE	12.1 ± 0.7	13.7 ± 0.8	12.7 ± 0.6	13.7 ± 0.8	13.0	52
DR-05	ENE	12.3 ± 0.7	13.8 ± 0.6	13.0 ± 0.6	15.0 ± 1.1	13.5	54
DR-06	ESE	12.2 ± 0.8	13.9 ± 0.7	13.1 ± 0.6	14.8 ± 0.8	13.5	54
DR-07	SE	14.0 ± 0.8	15.8 ± 0.9	14.7 ± 0.6	16.8 ± 0.9	15.3	61
DR-08	SSE	11.7 ± 0.7	13.1 ± 1.0	11.8 ± 0.6	13.7 ± 0.7	12.6	50
DR-09	S	11.7 ± 0.8	13.1 ± 0.8	12.5 ± 0.5	14.2 ± 1.6	12.9	51
DR-10	SSW	13.0 ± 0.8	14.7 ± 0.6	13.7 ± 0.7	14.9 ± 0.9	14.1	56
DR-11	SW	9.3 ± 0.6	11.5 ± 0.6	10.5 ± 0.8	11.2 ± 0.7	10.6	43
DR-12	WSW	16.9 ± 0.8	16.5 ± 0.9	16.4 ± 0.6	17.6 ± 1.2	16.9	67
DR-13	WSW	19.3 ± 2.1	18.4 ± 0.9	18.3 ± 1.3	19.9 ± 1.2	19.0	76
DR-14	WNW	13.0 ± 0.9	13.4 ± 0.9	13.1 ± 0.7	13.2 ± 0.6	13.2	53
DR-15	NW	12.7 ± 1.0	13.0 ± 0.9	13.2 ± 0.5	13.2 ± 0.6	13.0	52
DR-16	NNW	14.8 ± 0.8	14.7 ± 0.9	15.0 ± 0.9	14.2 ± 1.0	14.7	59
DR-17	N	15.2 ± 0.7	14.9 ± 0.7	16.2 ± 1.5	15.0 ± 0.7	15.3	61
DR-18	NNE	13.4 ± 0.7	15.0 ± 0.8	13.5 ± 0.7	15.5 ± 0.9	14.4	57
DR-19	NE	13.8 ± 0.6	15.4 ± 1.1	13.8 ± 0.6	15.7 ± 0.7	14.7	59
DR-20	ENE	11.9 ± 0.8	13.3 ± 0.5	12.3 ± 0.6	14.8 ± 1.1	13.1	52
DR-21	E	12.8 ± 0.6	14.5 ± 0.9	12.9 ± 0.6	14.8 ± 0.9	13.7	55
DR-22	ESE	10.1 ± 0.6	12.1 ± 0.5	11.4 ± 0.4	12.3 ± 0.6	11.5	46
DR-23	SE	12.9 ± 0.8	14.1 ± 0.6	13.5 ± 0.7	16.0 ± 1.7	14.1	56
DR-24	SSE	13.0 ± 0.8	15.2 ± 0.8	14.2 ± 0.7	14.5 ± 0.7	14.3	57
DR-25	S	11.5 ± 0.6	12.9 ± 0.8	12.5 ± 0.7	11.9 ± 0.6	12.2	49
DR-26	SSW	13.3 ± 0.9	13.7 ± 0.9	13.8 ± 0.7	13.9 ± 0.6	13.7	55
DR-27	SW	13.3 ± 0.7	13.9 ± 0.6	13.4 ± 0.5	13.4 ± 0.8	13.5	54
DR-28	NW	19.3 ± 1.1	18.8 ± 1.1	19.1 ± 0.6	19.8 ± 1.3	19.3	77
DR-29	W	14.0 ± 0.7	14.1 ± 1.0	13.9 ± 0.6	14.3 ± 0.6	14.1	56
DR-30	SNS	14.6 ± 0.9	14.2 ± 1.1	14.5 ± 0.8	14.5 ± 0.8	14.4	58
DR-31	WSW	18.2 ± 1.2	18.4 ± 1.1	16.2 ± 0.7	16.5 ± 0.9	17.3	69
DR-32	NNW	12.5 ± 0.7	12.9 ± 0.6	12.8 ± 0.6	13.4 ± 0.7	12.9	52
DR-33	NE	12.7 ± 0.7	14.3 ± 0.8	12.5 ± 0.6	14.8 ± 1.1	13.6	54
DR-34	SE	12.1 ± 1.1	13.1 ± 1.0	11.9 ± 0.6	13.7 ± 0.7	12.7	51
DR-35	NNE	12.7 ± 0.8	14.3 ± 0.8	12.4 ± 0.8	14.1 ± 0.8	13.4	54
DR-36	NE	13.2 ± 0.7	15.5 ± 0.9	14.3 ± 1.6	15.8 ± 0.8	14.7	59
DR-37	SSW	12.2 ± 0.5	13.2 ± 0.9	12.3 ± 0.5	14.3 ± 0.9	13.0	52
DR-38	S	11.8 ± 0.5	13.8 ± 0.8	12.5 ± 0.6	14.3 ± 0.9	13.1	52
DR-39	SSW	14.5 ± 0.7	14.6 ± 0.6	14.6 ± 0.8	15.4 ± 0.9	14.8	59
DR-40**	N	16.0 ± 0.7	17.6 ± 1.0	17.7 ± 0.7	18.8 ± 0.9	17.5	70
DR-41	SSE	12.3 ± 1.4	13.1 ± 0.5	12.0 ± 0.7	13.7 ± 0.8	12.8	51
AVERAGE		13.3 ±	14.3 ±	13.6 ±	14.7 ±	14.0	56

* Data not available

** Control Location

TABLE B-4

DIRECT RADIATION, 1996 THROUGH 2006 DATA

(mR per Standard Quarter)

Station ID	Mean (1996-2005)	Standard Deviation (1996-2005)	Minimum Value (1996-2005)	Maximum Value (1996-2005)	2006 Average
DR-01	15.5	1.5	12.3	20.7	15.3
DR-02	16.5	2.8	12.3	23.3	14.1
DR-03	12.0	1.0	9.3	14.4	11.4
DR-04	13.4	1.4	11.1	16.3	13.0
DR-05	13.6	1.1	11.4	15.6	13.5
DR-06	13.4	1.3	10.8	16.3	13.5
DR-07	15.9	1.8	13.0	21.7	15.3
DR-08	13.0	1.2	10.1	16.3	12.6
DR-09	12.8	2.4	0.1	16.7	12.9
DR-10	13.7	2.1	5.3	16.8	14.1
DR-11	11.3	1.2	9.5	15.6	10.6
DR-12	16.4	1.6	12.7	19.8	16.9
DR-13	18.9	1.7	15.3	24.6	19.0
DR-14	13.6	1.4	11.1	17.4	13.2
DR-15	13.6	1.7	11.4	19.0	13.0
DR-16	14.7	1.6	11.4	18.4	14.7
DR-17	14.7	1.5	11.5	18.0	15.3
DR-18	14.2	1.4	10.8	17.4	14.4
DR-19	15.0	1.5	12.2	18.2	14.7
DR-20	13.6	1.4	11.4	16.8	13.1
DR-21	13.8	1.3	11.4	18.0	13.7
DR-22	11.7	1.3	9.6	15.9	11.5
DR-23	14.0	1.3	11.4	17.1	14.1
DR-24	13.8	1.4	10.8	16.2	14.3
DR-25	12.4	1.1	9.9	14.9	12.2
DR-26	13.8	1.2	11.7	17.0	13.7
DR-27	13.7	1.3	10.2	16.8	13.5
DR-28	15.7	1.9	12.2	22.5	19.3
DR-29	17.0	2.5	9.0	21.9	14.1
DR-30	16.1	2.3	9.9	23.8	14.4
DR-31	18.2	2.4	12.3	24.6	17.3
DR-32	13.3	1.5	9.9	17.7	12.9
DR-33	11.0	2.3	7.2	15.6	13.6
DR-34	13.4	1.5	9.9	17.6	12.7
DR-35	14.4	1.6	11.1	18.0	13.4
DR-36	15.4	2.2	12.3	25.5	14.7
DR-37	13.8	1.4	11.7	18.0	13.0
DR-38	12.9	1.4	10.3	17.9	13.1
DR-39	15.6	1.5	12.7	19.4	14.8
DR-40**	15.6	1.9	12.6	20.3	17.5
DR-41	11.5	1.8	10.8	19.4	12.8
Average	14.2				14.1

* Data not available

** Control Location

TABLE B-5

2006 DIRECT RADIATION
INNER AND OUTER RINGS
(mR per Standard Quarter)

Inner Ring ID	Outer Ring ID	Sector	Inner Ring Annual Average	Outer Ring Annual Average
DR-01	DR-17	N	15.3	15.3
DR-02	DR-18	NNE	14.1	14.4
DR-03	DR-19	NE	11.4	14.7
DR-04	DR-20	ENE	13.0	13.1
DR-05	DR-21	E	13.5	13.7
DR-06	DR-22	ESE	13.5	11.5
DR-07	DR-23	SE	15.3	14.1
DR-08	DR-24	SSE	12.6	14.3
DR-09	DR-25	S	12.9	12.2
DR-10	DR-26	SSW	14.1	13.7
DR-11	DR-27	SW	10.6	13.5
DR-12	DR-28	WSW	16.9	19.3
DR-13	DR-29	W	19.0	14.1
DR-14	DR-30	WNW	13.2	14.4
DR-15	DR-31	NW	13.0	17.3
DR-16	DR-32	NNW	14.7	12.9
Average			13.9	14.3

TABLE B-6

GROSS BETA ACTIVITY IN AIRBORNE PARTICULATE SAMPLES-2006

($pCi/m^3 \pm 1\sigma$)

STATION #

Week	End Date	4	5	94	95	23**
1	01/10/06	0.013 +- 0.001	0.011 +- 0.001	0.008 +- 0.001	0.009 +- 0.001	0.008 +- 0.001
2	01/17/06	0.011 +- 0.001	0.011 +- 0.001	0.012 +- 0.001	0.012 +- 0.001	0.013 +- 0.001
3	01/24/06	0.012 +- 0.001	0.014 +- 0.001	0.011 +- 0.001	0.012 +- 0.001	0.017 +- 0.002
4	01/31/06	0.014 +- 0.001	0.017 +- 0.001	0.012 +- 0.001	0.011 +- 0.001	0.015 +- 0.001
5	02/07/06	0.009 +- 0.001	0.007 +- 0.001	0.009 +- 0.001	0.010 +- 0.001	0.009 +- 0.001
6	02/14/06	0.010 +- 0.001	0.009 +- 0.001	0.011 +- 0.001	0.012 +- 0.001	0.016 +- 0.001
7	02/21/06	0.016 +- 0.001	0.014 +- 0.001	0.016 +- 0.001	0.015 +- 0.001	0.024 +- 0.002
8	02/28/06	0.021 +- 0.002	0.017 +- 0.001	0.017 +- 0.001	0.019 +- 0.001	0.016 +- 0.002
9	03/06/06	0.009 +- 0.001	0.009 +- 0.001	0.007 +- 0.001	0.008 +- 0.001	0.012 +- 0.001
10	03/14/06	0.011 +- 0.001	0.009 +- 0.001	0.013 +- 0.001	0.008 +- 0.001	0.009 +- 0.001
11	03/21/06	0.011 +- 0.001	0.012 +- 0.001	0.011 +- 0.001	0.012 +- 0.001	0.015 +- 0.001
12	03/28/06	0.007 +- 0.001	0.006 +- 0.001	0.007 +- 0.001	0.006 +- 0.001	0.006 +- 0.001
13	04/04/06	0.017 +- 0.001	0.020 +- 0.002	0.020 +- 0.002	0.020 +- 0.001	0.020 +- 0.002
14	04/11/06	0.011 +- 0.001	0.010 +- 0.001	0.013 +- 0.001	0.013 +- 0.001	0.011 +- 0.001
15	04/18/06	0.011 +- 0.001	0.011 +- 0.001	0.010 +- 0.001	0.010 +- 0.001	0.011 +- 0.001
16	04/25/06	0.006 +- 0.001	0.005 +- 0.001	0.006 +- 0.001	0.006 +- 0.001	0.008 +- 0.001
17	05/02/06	0.010 +- 0.001	0.012 +- 0.001	0.012 +- 0.001	0.013 +- 0.001	0.013 +- 0.001
18	05/09/06	0.012 +- 0.001	0.007 +- 0.001	0.012 +- 0.001	0.013 +- 0.001	0.009 +- 0.001
19	05/16/06	0.003 +- 0.001	0.001 +- 0.001	0.005 +- 0.001	0.003 +- 0.001	0.004 +- 0.001
20	05/23/06	0.006 +- 0.001	0.004 +- 0.001	0.005 +- 0.001	0.005 +- 0.001	0.005 +- 0.001
21	05/30/06	0.015 +- 0.001	0.016 +- 0.001	0.014 +- 0.001	0.014 +- 0.001	0.015 +- 0.001
22	06/06/06	0.011 +- 0.001	0.014 +- 0.003	0.009 +- 0.001	0.007 +- 0.001	0.007 +- 0.001
23	06/13/06	0.003 +- 0.001	0.002 +- 0.001	0.002 +- 0.001	0.003 +- 0.001	0.005 +- 0.001
24	06/20/06	0.013 +- 0.001	0.012 +- 0.001	0.012 +- 0.001	0.012 +- 0.001	0.012 +- 0.001
25	06/27/06	0.013 +- 0.001	0.014 +- 0.001	0.012 +- 0.001	0.012 +- 0.001	0.010 +- 0.001
26	07/03/06	0.013 +- 0.001	0.011 +- 0.001	0.012 +- 0.001	0.013 +- 0.001	0.012 +- 0.001

* Sample deviation.
** Control location.

TABLE B-6

GROSS BETA ACTIVITY IN AIRBORNE PARTICULATE SAMPLES-2006

($pCi/m^3 \pm 1\sigma$)

STATION #

Week	End Date	4	5	94	95	23**
27	7/11/2006	0.016 +- 0.001	0.018 +- 0.001	0.013 +- 0.001	0.016 +- 0.001	0.015 +- 0.001
28	07/18/06	0.016 +- 0.001	0.014 +- 0.001	0.016 +- 0.001	0.012 +- 0.001	0.015 +- 0.001
29	07/25/06	0.014 +- 0.001	0.013 +- 0.001	0.014 +- 0.001	0.012 +- 0.001	0.015 +- 0.001
30	08/01/06	0.016 +- 0.001	0.013 +- 0.001	0.016 +- 0.001	0.013 +- 0.001	0.009 +- 0.002
31	08/08/06	0.018 +- 0.002	0.020 +- 0.002	0.018 +- 0.001	0.017 +- 0.001	0.013 +- 0.002
32	08/15/06	0.013 +- 0.001	0.013 +- 0.001	0.012 +- 0.001	0.016 +- 0.001	0.015 +- 0.001
33	08/22/06	0.014 +- 0.001	0.011 +- 0.001	0.011 +- 0.001	0.013 +- 0.001	0.015 +- 0.001
34	08/29/06	0.014 +- 0.001	0.014 +- 0.001	0.012 +- 0.001	0.011 +- 0.001	0.014 +- 0.001
35	09/05/06	0.005 +- 0.001	0.005 +- 0.001	0.003 +- 0.001	0.005 +- 0.001	0.006 +- 0.001
36	09/12/06	0.015 +- 0.001	0.014 +- 0.001	0.018 +- 0.001	0.015 +- 0.001	0.016 +- 0.002
37	09/19/06	0.008 +- 0.001	0.009 +- 0.001	0.011 +- 0.001	0.008 +- 0.001	0.010 +- 0.001
38	09/26/06	0.014 +- 0.001	0.012 +- 0.001	0.013 +- 0.001	0.013 +- 0.001	0.015 +- 0.001
39	10/03/06	0.013 +- 0.002	0.012 +- 0.002	0.016 +- 0.002	0.015 +- 0.002	0.014 +- 0.002
40	10/10/06	0.020 +- 0.002	0.019 +- 0.002	0.021 +- 0.002	0.019 +- 0.002	0.017 +- 0.002
41	10/17/06	0.014 +- 0.001	0.015 +- 0.001	0.014 +- 0.001	0.015 +- 0.001	0.012 +- 0.001
42	10/24/06	0.012 +- 0.001	0.010 +- 0.001	0.010 +- 0.001	0.011 +- 0.001	0.015 +- 0.001
43	10/31/06	0.010 +- 0.001	0.010 +- 0.001	0.008 +- 0.001	0.006 +- 0.001	0.003 +- 0.001
44	11/07/06	0.026 +- 0.002	0.024 +- 0.002	0.020 +- 0.001	0.023 +- 0.002	0.020 +- 0.002
45	11/14/06	0.019 +- 0.001	0.013 +- 0.001	0.015 +- 0.001	0.013 +- 0.001	0.021 +- 0.002
46	11/20/06	0.015 +- 0.002	0.009 +- 0.002	0.014 +- 0.002	0.013 +- 0.002	0.010 +- 0.001
47	11/28/06	0.022 +- 0.001	0.017 +- 0.001	0.018 +- 0.001	0.019 +- 0.001	0.017 +- 0.001
48	12/05/06	0.017 +- 0.001	0.019 +- 0.002	0.022 +- 0.002	0.019 +- 0.002	0.024 +- 0.002
49	12/12/06	0.026 +- 0.002	0.028 +- 0.002	0.024 +- 0.002	0.027 +- 0.002	0.022 +- 0.002
50	12/19/06	0.022 +- 0.002	0.021 +- 0.002	0.024 +- 0.002	0.020 +- 0.002	0.024 +- 0.002
51	12/26/06	0.013 +- 0.001	0.017 +- 0.001	0.016 +- 0.001	0.018 +- 0.002	0.018 +- 0.001
52	01/02/07	0.012 +- 0.001	0.013 +- 0.001	0.015 +- 0.001	0.010 +- 0.001	0.014 +- 0.001

* Sample deviation.
** Control location.

TABLE B-6

GROSS BETA ACTIVITY IN AIRBORNE PARTICULATE SAMPLES-2006

($pCi/m^3 \pm 1\sigma$)

STATION #

Week	End Date	22	27	29	44
1	01/09/06	0.007 +- 0.001	0.008 +- 0.001	0.009 +- 0.001	0.009 +- 0.001
2	01/17/06	0.012 +- 0.001	0.011 +- 0.001	0.010 +- 0.001	0.015 +- 0.001
3	01/23/06	0.010 +- 0.001	0.009 +- 0.001	0.012 +- 0.001	0.016 +- 0.002
4	01/30/06	0.013 +- 0.001	0.011 +- 0.001	0.012 +- 0.001	0.012 +- 0.001
5	02/06/06	0.008 +- 0.001	0.009 +- 0.001	0.007 +- 0.001	0.007 +- 0.001
6	02/13/06	0.012 +- 0.001	0.011 +- 0.001	0.012 +- 0.001	0.008 +- 0.001
7	02/21/06	0.015 +- 0.001	0.019 +- 0.001	0.010 +- 0.001	0.018 +- 0.001
8	02/27/06	0.022 +- 0.002	0.019 +- 0.001	0.020 +- 0.001	0.020 +- 0.002
9	03/06/06	0.010 +- 0.001	0.010 +- 0.001	0.012 +- 0.001	0.012 +- 0.001
10	03/13/06	0.009 +- 0.001	0.012 +- 0.001	0.010 +- 0.001	0.011 +- 0.001
11	03/20/06	0.011 +- 0.001	0.013 +- 0.001	0.013 +- 0.001	0.011 +- 0.001
12	03/27/06	0.006 +- 0.001	0.007 +- 0.001	0.005 +- 0.001	0.006 +- 0.001
13	04/03/06	0.016 +- 0.001	0.018 +- 0.001	0.017 +- 0.001	0.021 +- 0.002
14	04/10/06	0.010 +- 0.001	0.010 +- 0.001	0.010 +- 0.001	0.013 +- 0.001
15	04/17/06	0.011 +- 0.001	0.011 +- 0.001	0.013 +- 0.001	0.011 +- 0.001
16	04/24/06	0.006 +- 0.001	0.008 +- 0.001	0.006 +- 0.001	0.007 +- 0.001
17	05/01/06	0.013 +- 0.001	0.011 +- 0.001	0.009 +- 0.001	0.008 +- 0.001
18	05/08/06	0.010 +- 0.001	0.008 +- 0.001	0.010 +- 0.001	0.008 +- 0.001
19	05/15/06	0.006 +- 0.001	0.003 +- 0.001	0.006 +- 0.001	0.004 +- 0.001
20	05/22/06	0.007 +- 0.001	0.006 +- 0.001	0.008 +- 0.001	0.006 +- 0.001
21	05/30/06	0.014 +- 0.001	0.015 +- 0.001	0.014 +- 0.001	0.012 +- 0.001
22	06/05/06	0.011 +- 0.001	0.009 +- 0.001	0.008 +- 0.001	0.008 +- 0.001
23	06/12/06	0.005 +- 0.001	0.004 +- 0.001	0.004 +- 0.001	0.005 +- 0.001
24	06/19/06	0.012 +- 0.001	0.016 +- 0.001	0.013 +- 0.001	0.011 +- 0.001
25	06/26/06	0.017 +- 0.001	0.012 +- 0.001	0.014 +- 0.001	0.014 +- 0.001
26	07/03/06	0.009 +- 0.001	0.011 +- 0.001	**No Sample**	0.012 +- 0.001

* Sample deviation.
** Control location.

TABLE B-6

GROSS BETA ACTIVITY IN AIRBORNE PARTICULATE SAMPLES-2006

(pCi/m^3 ± 1σ)

STATION #

Week	End Date	22	27	29	44
27	07/10/06	0.016 +- 0.001	0.015 +- 0.001	0.016 +- 0.001	0.016 +- 0.001
28	07/17/06	**No Sample**	0.015 +- 0.001	0.014 +- 0.001	0.016 +- 0.001
29	*07/24/06*	*0.015 +- 0.001*	*0.013 +- 0.001*	*0.017 +- 0.001*	*0.015 +- 0.001*
30	07/31/06	0.016 +- 0.001	0.017 +- 0.001	0.015 +- 0.001	0.015 +- 0.001
31	08/07/06	0.019 +- 0.002	0.018 +- 0.001	0.018 +- 0.001	0.021 +- 0.002
32	08/14/06	0.014 +- 0.001	0.016 +- 0.001	0.013 +- 0.001	0.012 +- 0.001
33	08/21/06	0.014 +- 0.002	0.012 +- 0.001	0.015 +- 0.001	0.014 +- 0.001
34	08/28/06	0.017 +- 0.002	0.014 +- 0.001	0.014 +- 0.001	0.013 +- 0.001
35	09/05/06	0.006 +- 0.001	0.006 +- 0.001	0.005 +- 0.001	0.006 +- 0.001
36	09/11/06	0.017 +- 0.002	0.013 +- 0.001	0.013 +- 0.001	0.015 +- 0.002
37	09/18/06	0.011 +- 0.001	0.010 +- 0.001	0.011 +- 0.001	0.008 +- 0.001
38	09/25/06	0.016 +- 0.001	0.013 +- 0.001	0.011 +- 0.001	0.013 +- 0.001
39	10/02/06	0.016 +- 0.002	0.016 +- 0.002	0.014 +- 0.001	0.016 +- 0.002
40	10/10/06	0.026 +- 0.005	0.018 +- 0.002	0.016 +- 0.001	0.018 +- 0.002
41	10/16/06	0.011 +- 0.001	0.014 +- 0.001	0.016 +- 0.001	0.015 +- 0.002
42	10/23/06	0.015 +- 0.001	0.015 +- 0.001	0.013 +- 0.001	0.015 +- 0.001
43	10/30/06	0.005 +- 0.001	0.009 +- 0.001	0.006 +- 0.001	0.007 +- 0.001
44	11/06/06	0.021 +- 0.002	0.020 +- 0.001	0.018 +- 0.001	0.021 +- 0.002
45	11/13/06	0.020 +- 0.002	0.014 +- 0.001	0.017 +- 0.001	0.019 +- 0.001
46	11/20/06	0.012 +- 0.002	0.015 +- 0.002	0.010 +- 0.001	0.012 +- 0.002
47	11/27/06	0.020 +- 0.002	0.020 +- 0.001	0.015 +- 0.002	0.015 +- 0.001
48	12/04/06	0.022 +- 0.002	0.022 +- 0.002	0.023 +- 0.001	0.023 +- 0.002
49	12/11/06	0.022 +- 0.002	0.028 +- 0.002	0.024 +- 0.001	0.024 +- 0.002
50	*12/18/06*	*0.021 +- 0.002*	*0.021 +- 0.002*	*0.023 +- 0.001*	*0.023 +- 0.002*
51	12/26/06	0.015 +- 0.001	0.015 +- 0.001	0.015 +- 0.001	0.016 +- 0.001
52	01/02/07	0.016 +- 0.001	0.014 +- 0.001	0.016 +- 0.001	0.012 +- 0.001

* Sample deviation.
** Control location.

TABLE B-7
CONCENTRATIONS OF GAMMA EMITTERS IN QUARTERLY COMPOSITES OF AIR PARTICULATE SAMPLES - 2006

(RESULTS IN UNITS OF pCi/m3 (x 10^{-3}) ± 1σ)

1ST QUARTER 2006

ISOTOPE	ALGONQUIN STA-4	NYU TOWER STA-5	CROTON PT STA-27	IPEC TRAINING STA-94	MET TOWER STA-95
Be-7*	64.97±12.4	103.3±12.89	102.1±11.61	101.4±11.93	88.52±11.1
K-40*	<8.04	<5.73	<3.99	41.33±9.01	<3.8
Mn-54	<0.51	<0.45	<0.36	<0.77	<0.56
Co-58	<1.01	<1.09	<0.36	<1.00	<1.05
Fe-59	<3.13	<2.61	<2.58	<3.84	<2.86
Co-60	<0.80	<0.65	<0.56	<1.19	<0.72
Zn-65	<2.55	<1.3	<1.39	<1.91	<1.54
Zr-95	<1.63	<1.6	<1.69	<0.78	<0.93
Nb-95	<0.94	<1.07	<1.24	<0.91	<0.76
Ru-103	<1.16	<0.96	<0.46	<1.17	<1.13
Ru-106	<4.54	<7.66	<5.32	<4.15	<7.94
I-131	<7	<4.29	<6.27	<7.59	<5.73
Cs-134	<0.73	<0.44	<0.58	<1.1	<0.83
Cs-137	<0.63	<0.42	<0.38	<0.65	<0.43
BaLa-140	<7.11	<4.34	<4.08	<4.70	<5.76
Ce-141	<1.18	<1.35	<1	<1.14	<1.39
Ce-144	<2.19	<2.58	<1.93	<2.37	<2.84
Ra-226*	<7.63	<7.83	<6.41	<8.89	<7.44
Ac/Th-228*	<1.89	<2.18	<2.06	<1.78	<1.03

BOLD PRINT INDICATES REPORTED LLD VALUES

* Indicates naturally occurring.
** "Less than" values expressed as Critical Level (Lc), unless otherwise noted.
*** Reported as sample LLD.

TABLE B-7
CONCENTRATIONS OF GAMMA EMITTERS IN QUARTERLY COMPOSITES OF AIR PARTICULATE SAMPLES - 2006
(RESULTS IN UNITS OF pCi/m3 (x 10^{-3}) $\pm 1\sigma$)

1ST QUARTER 2006

ISOTOPE	LOVETT STA-22	ROSETON STA-23	GRASSY PT STA-29	PEEKSKILL STA-44
Be-7*	91.6±11.63	85.03±10.28	72.7±6.14	91.21±11.82
K-40*	<6.28	<3.75	15.52±3.76	36.81±10.13
Mn-54	**<0.56**	<0.48	<0.22	<0.8
Co-58	<0.97	**<0.76**	<0.32	<0.92
Fe-59	**<2.86**	<3.19	<1.43	<2.29
Co-60	**<0.62**	<0.49	<0.22	<0.5
Zn-65	<1.41	<1.56	<0.83	<1.25
Zr-95	<1.28	<0.75	<0.66	<2.56
Nb-95	<0.86	<0.58	<0.49	<1.48
Ru-103	<1.29	<0.52	<0.38	<1.38
Ru-106	<7.48	<4.92	<3.07	<4.27
I-131	<4.13	<6.73	<3.58	<7.23
Cs-134	<0.47	<0.63	<0.28	<0.8
Cs-137	<0.4	<0.32	<0.09	<0.48
BaLa-140	<6.99	<3.41	**<3.01**	**<5.00**
Ce-141	<1.06	<1	<0.53	<1.41
Ce-144	<1.51	<2.19	<0.95	<1.78
Ra-226*	<6.76	<6.18	<3.19	<8.82
Ac/Th-228*	**<1.57**	<1.35	<0.8	<2.59

BOLD PRINT INDICATES REPORTED LLD VALUES

* Indicates naturally occurring.
** "Less than" values expressed as Critical Level (Lc), unless otherwise noted.
*** Reported as sample LLD.

TABLE B-7
CONCENTRATIONS OF GAMMA EMITTERS IN QUARTERLY COMPOSITES OF AIR PARTICULATE SAMPLES - 2006

(RESULTS IN UNITS OF pCi/m3 (x 10^{-3}) ± 1σ)

2ND QUARTER 2006

ISOTOPE	ALGONQUIN STA-4	NYU TOWER STA-5	CROTON PT STA-27	IPEC TRAINING STA-94	MET TOWER STA-95
Be-7*	88.81±12.92	105.7±15.52	109±10.01	82.66±12.08	84.12±11.52
K-40*	<6.31	<10.51	<4.34	**<5.51**	**<4.81**
Mn-54	<0.44	<0.67	<0.44	<0.36	<0.43
Co-58	<0.88	<0.69	<0.62	**<0.72**	<0.75
Fe-59	<3.62	**<3**	<2.15	<2.55	**<2.25**
Co-60	**<0.64**	<0.70	<0.33	<0.95	**<0.77**
Zn-65	<1.92	<1.32	<1.4	**<0.97**	<2.24
Zr-95	<1.9	<1.14	<0.82	**<1.56**	<1.08
Nb-95	**<0.9**	<0.94	<0.82	**<1.05**	<1.41
Ru-103	**<1.65**	<0.84	<0.79	<1.02	<1.47
Ru-106	<7.1	<6.17	<3.92	<4.72	**<8.06**
I-131	<8.76	<7.57	<5.29	<6.06	<7.04
Cs-134	<1.18	<1.02	<0.3	<0.88	<1.28
Cs-137	<0.81	<0.63	<0.37	<0.59	**<0.65**
BaLa-140	<8.68	**<6.25**	**<4.92**	**<5.61**	<4.42
Ce-141	<1.81	<1.44	<0.79	<1.14	<1.56
Ce-144	<3.27	<1.77	<1.44	<2.09	**<3.32**
Ra-226*	<11.21	<8.33	<6.17	<8.95	<8.54
Ac/Th-228*	<1.6	<1.55	<1.56	**<1.55**	<3.14

BOLD PRINT INDICATES REPORTED LLD VALUES

* Indicates naturally occurring.
** "Less than" values expressed as Critical Level (Lc), unless otherwise noted.
*** Reported as sample LLD.

TABLE B-7
CONCENTRATIONS OF GAMMA EMITTERS IN QUARTERLY COMPOSITES OF AIR PARTICULATE SAMPLES - 2006
(RESULTS IN UNITS OF pCi/m3 (x 10^{-3}) ± 1σ)

2ND QUARTER 2006

ISOTOPE	LOVETT STA-22	ROSETON STA-23	GRASSY PT STA-29	PEEKSKILL STA-44
Be-7*	73.28±10.34	97.65±13.18	91.57±10.43	102.7±13
K-40*	<4.27	<5.69	**18.51±6.84**	**<4.44**
Mn-54	<0.39	<0.45	<0.59	<0.61
Co-58	<0.65	<0.45	<0.43	<0.76
Fe-59	<2.12	<3.93	<1.87	<3.61
Co-60	<0.4	<0.84	<0.4	<0.77
Zn-65	<1.13	<0.99	<1.23	<1.21
Zr-95	<0.86	<2.1	<0.93	<2.05
Nb-95	<1.16	**<1.1**	<0.94	<1.11
Ru-103	<0.94	<1.11	<0.99	<1.31
Ru-106	<5.01	<5.83	<2.43	<8.62
I-131	<4.56	<4.24	<4.01	<10.82
Cs-134	<0.47	<0.55	<0.53	<1.03
Cs-137	<0.72	<0.66	<0.47	<0.66
BaLa-140	**<4.64**	<5.32	<4.14	<4.52
Ce-141	<0.87	<1	<0.84	<1.91
Ce-144	<1.48	<1.67	<1.90	<3.35
Ra-226*	<5.16	<8.84	<8.79	<11.32
Ac/Th-228*	<1.09	<1.26	<2.33	<1.94

BOLD PRINT INDICATES REPORTED LLD VALUES

* Indicates naturally occurring.
** "Less than" values expressed as Critical Level (Lc), unless otherwise noted.
*** Reported as sample LLD.

TABLE B-7
CONCENTRATIONS OF GAMMA EMITTERS IN QUARTERLY COMPOSITES OF AIR PARTICULATE SAMPLES - 2006
(RESULTS IN UNITS OF pCi/m3 (x 10^{-3}) ± 1σ)

3RD QUARTER 2006

ISOTOPE	ALGONQUIN STA-4	NYU TOWER STA-5	CROTON PT STA-27	IPEC TRAINING STA-94	MET TOWER STA-95
Be-7*	133.3±14.18	86±12.25	119.1±13.87	113±13.88	108.4±15.98
K-40*	<4.21	**<4.93**	**<5.28**	<4.26	<8.25
Mn-54	<0.78	**<0.79**	<0.6	<0.59	<0.57
Co-58	<1.03	<0.79	<0.98	<1.19	<0.86
Fe-59	<4.54	<2.31	<2.47	<4.04	**<3.55**
Co-60	<0.48	<0.7	<1.05	<0.43	**<0.88**
Zn-65	<0.85	<1.42	<1.32	<2.02	**<2.01**
Zr-95	<1.25	<1.35	<0.87	<1.3	<2.24
Nb-95	<0.73	**<1.58**	<0.72	<1.64	<1.07
Ru-103	<1.15	<1.23	<0.86	<1.07	<1.32
Ru-106	<6.15	<4.19	<4.52	<6.8	<4.34
I-131	<4.61	<6.81	<5.9	<7.79	<7.44
Cs-134	<0.6	<0.72	<0.85	<1.04	<0.66
Cs-137	<0.62	<0.39	<0.5	<0.5	<0.81
BaLa-140	<4.92	<7	<7.47	**<7.33**	**<8.44**
Ce-141	<1.28	<1.09	<1.52	<2.13	<1.25
Ce-144	<2.44	<2.30	<2.22	<3.23	<1.98
Ra-226*	<9.03	<5.88	<9.31	<8.3	<7.14
Ac/Th-228*	<1.66	<2.21	<2.74	<2.65	<2.1

BOLD PRINT INDICATES REPORTED LLD VALUES

* Indicates naturally occurring.
** "Less than" values expressed as Critical Level (Lc), unless otherwise noted.
*** Reported as sample LLD.

TABLE B-7
CONCENTRATIONS OF GAMMA EMITTERS IN QUARTERLY COMPOSITES OF AIR PARTICULATE SAMPLES - 2006
(RESULTS IN UNITS OF pCi/m3 (x 10^{-3}) ± 1σ)

3RD QUARTER 2006

ISOTOPE	LOVETT STA-22	ROSETON STA-23	GRASSY PT STA-29	PEEKSKILL STA-44
Be-7*	108.4±14.94	140.4±15.98	100.8±10.6	122.1±14
K-40*	**<7.05**	<5.49	31.17±7.32	<4.94
Mn-54	<0.55	<0.5	<0.53	<0.45
Co-58	<0.56	<0.71	<0.54	<0.92
Fe-59	<3.06	<2.77	<2.38	<2.70
Co-60	<0.8	<0.63	<0.5	<0.57
Zn-65	<1.97	<1.03	<0.89	<1.41
Zr-95	<1.23	<1.48	**<1.73**	<1.66
Nb-95	<1.03	<1.23	<1.54	<2.11
Ru-103	<1.36	<1.34	<0.78	<1.01
Ru-106	<4.15	<3.51	<2.86	<5.11
I-131	<5.45	<8.26	<6.35	<8.02
Cs-134	<0.39	<0.66	<0.62	<0.84
Cs-137	<0.51	<0.33	<0.41	<0.47
BaLa-140	<5.97	<6.28	<3.79	<5.15
Ce-141	<1.1	<1.32	<1.07	<1.23
Ce-144	<2.64	<1.49	<1.47	<2.19
Ra-226*	<7.84	<9.43	<7.67	<7.16
Ac/Th-228*	<3.1	<2.42	<1.5	<1.27

BOLD PRINT INDICATES REPORTED LLD VALUES

* Indicates naturally occurring.
** "Less than" values expressed as Critical Level (Lc), unless otherwise noted.
*** Reported as sample LLD.

TABLE B-7
CONCENTRATIONS OF GAMMA EMITTERS IN QUARTERLY COMPOSITES OF AIR PARTICULATE SAMPLES - 2006
(RESULTS IN UNITS OF pCi/m3 (x 10^{-3}) ± 1σ)

REPORTING UNITS IN: pCi/m3(x10-3) — 4TH QUARTER 2006

ISOTOPE	ALGONQUIN STA-4	NYU TOWER STA-5	CROTON PT STA-27	IPEC TRAINING STA-94	MET TOWER STA-95
Be-7*	87.84±15.74	88.35±12.34	83.57±11.09	90.58±11.41	98.61±12.11
K-40*	<8.1	**<5.42**	<5.56	47.12±9.24	**<5.40**
Mn-54	<0.55	<0.35	<0.53	<0.48	<0.37
Co-58	<0.78	<1.19	<0.86	<0.8	<1.01
Fe-59	<5.9	**<2.86**	<3.3	<2.93	<2.46
Co-60	**<0.87**	<0.5	<0.88	<0.78	<0.7
Zn-65	**<1.96**	<1.01	<1.54	<1.78	<1.74
Zr-95	<1.25	<1.43	<1.26	**<1.4**	<1.38
Nb-95	<1.19	<1.17	<1.03	<1.33	**<0.92**
Ru-103	<2.09	<0.91	<0.92	**<1.13**	<1.01
Ru-106	<6.01	<4.49	<6.81	<7.68	<2.98
I-131	<7.62	<4.7	<4.55	<5.15	<5.47
Cs-134	<0.92	<1.03	<0.66	<0.62	<0.32
Cs-137	<0.69	<0.72	<0.49	<0.45	<0.47
BaLa-140	**<7.74**	<4.76	<4.2	<4.30	**<8**
Ce-141	<1.61	<1.21	<1.34	<1.1	<1.34
Ce-144	<1.58	<2.45	<2.24	<2.78	<2.06
Ra-226*	<10.4	<7.43	<6.55	<8.07	<9.33
Ac/Th-228*	**<2.91**	<1.95	<1.72	<1.9	<2.21

BOLD PRINT INDICATES REPORTED LLD VALUES

* Indicates naturally occurring.
** "Less than" values expressed as Critical Level (Lc), unless otherwise noted.
*** Reported as sample LLD.

TABLE B-7
CONCENTRATIONS OF GAMMA EMITTERS IN QUARTERLY COMPOSITES OF AIR PARTICULATE SAMPLES - 2006
(RESULTS IN UNITS OF pCi/m3 (x 10^{-3}) ± 1σ)

4TH QUARTER 2006

ISOTOPE	LOVETT STA-22	ROSETON STA-23	GRASSY PT STA-29	PEEKSKILL STA-44
Be-7*	90.24±14.29	92.86±14.9	93.31±10.07	96.03±12.34
K-40*	<4.92	**<7.94**	<3.51	<6.33
Mn-54	<0.48	<0.77	<0.23	<0.29
Co-58	<0.96	<1.33	<0.71	<0.4
Fe-59	<3.22	**<3.91**	<2.45	<2.21
Co-60	**<0.49**	<0.85	<0.33	<0.68
Zn-65	**<1.63**	<1.36	<0.93	<1.67
Zr-95	<1.9	<1.43	<0.66	**<1.46**
Nb-95	<1.56	<1.01	<0.58	<0.98
Ru-103	<1.71	<0.88	<0.49	**<1.07**
Ru-106	<10.06	<5.89	<4.14	<7.02
I-131	<9.32	<7.57	<4.39	<8.68
Cs-134	<1.38	<0.64	<0.5	<0.88
Cs-137	<0.81	<0.39	<0.21	<0.46
BaLa-140	**<6.49**	<7.68	<3.65	<4
Ce-141	<2.14	<2.04	<0.83	<0.93
Ce-144	<3.48	<2.06	<1.72	<1.83
Ra-226*	<10.14	<9.72	<5.81	<4.66
Ac/Th-228*	**<2.48**	<3.49	<2.01	<3.23

BOLD PRINT INDICATES REPORTED LLD VALUES

* Indicates naturally occurring.
** "Less than" values expressed as Critical Level (Lc), unless otherwise noted.
*** Reported as sample LLD.

TABLE B-8
I-131 ACTIVITY IN CHARCOAL CARTRIDGE SAMPLES - 2006*

(pCi/m3 ± 1σ)

Week #	End Date	4	5	94	95	23**	22	27	29	44
1	1/10/2006	< 0.008	< 0.010	< 0.008	< 0.009	< 0.021	< 0.008	< 0.011	< 0.012	< 0.010
2	1/17/2006	< 0.013	< 0.011	< 0.014	< 0.007	< 0.017	< 0.008	< 0.012	< 0.004	< 0.010
3	1/24/2006	< 0.009	< 0.008	< 0.006	< 0.007	< 0.015	< 0.012	< 0.011	< 0.010	< 0.012
4	1/31/2006	< 0.012	< 0.009	< 0.005	< 0.016	< 0.009	< 0.008	< 0.010	< 0.009	< 0.013
5	2/7/2006	< 0.014	< 0.019	< 0.021	< 0.020	< 0.010	< 0.008	< 0.007	< 0.006	< 0.006
6	2/14/2006	< 0.015	< 0.009	< 0.009	< 0.004	< 0.011	< 0.009	< 0.007	< 0.004	< 0.010
7	2/21/2006	< 0.015	< 0.014	< 0.013	< 0.006	< 0.013	< 0.009	< 0.007	< 0.007	< 0.007
8	2/28/2006	< 0.011	< 0.009	< 0.010	< 0.012	< 0.011	< 0.006	< 0.012	< 0.013	< 0.009
9	3/6/2006	< 0.013	< 0.009	< 0.013	< 0.023	< 0.016	< 0.010	< 0.017	< 0.007	< 0.013
10	3/14/2006	< 0.009	< 0.005	< 0.013	< 0.010	< 0.015	< 0.011	< 0.006	< 0.012	< 0.012
11	3/21/2006	< 0.013	< 0.012	< 0.007	< 0.013	< 0.014	< 0.008	< 0.010	< 0.012	< 0.006
12	3/28/2006	< 0.013	< 0.012	< 0.010	< 0.007	< 0.008	< 0.007	< 0.012	< 0.010	< 0.008
13	4/4/2006	< 0.014	< 0.013	< 0.009	< 0.014	< 0.013	< 0.009	< 0.012	< 0.006	< 0.014
14	4/11/2006	< 0.011	< 0.009	< 0.010	< 0.007	< 0.008	< 0.006	< 0.007	< 0.004	< 0.012
15	4/18/2006	< 0.013	< 0.010	< 0.011	< 0.008	< 0.013	< 0.006	< 0.010	< 0.010	< 0.012
16	4/25/2006	< 0.008	< 0.004	< 0.010	< 0.007	< 0.009	< 0.008	< 0.008	< 0.004	< 0.010
17	5/2/2006	< 0.008	< 0.007	< 0.009	< 0.010	< 0.006	< 0.010	< 0.012	< 0.008	< 0.009
18	5/9/2006	< 0.006	< 0.010	< 0.009	< 0.008	< 0.013	< 0.015	< 0.005	< 0.008	< 0.011
19	5/16/2006	< 0.008	< 0.010	< 0.011	< 0.009	< 0.011	< 0.006	< 0.007	< 0.010	< 0.011
20	5/23/2006	< 0.012	< 0.014	< 0.012	< 0.007	< 0.012	< 0.009	< 0.007	< 0.006	< 0.009
21	5/30/2006	< 0.013	< 0.010	< 0.008	< 0.009	< 0.007	< 0.011	< 0.008	< 0.005	< 0.008
22	6/6/2006	< 0.014	< 0.016	< 0.009	< 0.008	< 0.017	< 0.007	< 0.009	< 0.007	< 0.012
23	6/13/2006	< 0.012	< 0.008	< 0.009	< 0.010	< 0.008	< 0.010	< 0.008	< 0.004	< 0.009
24	6/20/2006	< 0.007	< 0.009	< 0.005	< 0.005	< 0.008	< 0.011	< 0.009	< 0.004	< 0.005
25	6/27/2006	< 0.015	< 0.011	< 0.006	< 0.004	< 0.014	< 0.011	< 0.011	< 0.006	< 0.012
26	7/3/2006	< 0.011	< 0.013	< 0.016	< 0.010	< 0.019	< 0.010	< 0.017	< 0.004	< 0.009
27	7/11/2006	< 0.009	< 0.011	< 0.012	< 0.008	< 0.006	< 0.007	< 0.007	< 0.008	< 0.013
28	7/18/2006	< 0.011	< 0.012	< 0.014	< 0.011	< 0.010	No Sampl	< 0.008	< 0.008	< 0.011
29	7/25/2006	< 0.007	< 0.006	< 0.008	< 0.006	< 0.010	< 0.007	< 0.005	< 0.009	< 0.007
30	8/1/2006	< 0.008	< 0.005	< 0.005	< 0.014	< 0.017	< 0.019	< 0.008	< 0.007	< 0.008
31	8/8/2006	< 0.014	< 0.009	< 0.005	< 0.011	< 0.010	< 0.008	< 0.007	< 0.012	< 0.010
32	8/15/2006	< 0.011	< 0.016	< 0.012	< 0.011	< 0.019	< 0.019	< 0.014	< 0.012	< 0.017
33	8/22/2006	< 0.005	< 0.011	< 0.009	< 0.007	< 0.015	< 0.014	< 0.015	< 0.008	< 0.008
34	8/29/2006	< 0.008	< 0.009	< 0.009	< 0.015	< 0.008	< 0.011	< 0.010	< 0.006	< 0.011
35	9/5/2006	< 0.012	< 0.008	< 0.005	< 0.008	< 0.007	< 0.006	< 0.008	< 0.007	< 0.009
36	9/12/2006	< 0.008	< 0.009	< 0.013	< 0.006	< 0.011	< 0.010	< 0.010	< 0.004	< 0.011
37	9/19/2006	< 0.014	< 0.016	< 0.010	< 0.010	< 0.013	< 0.008	< 0.009	< 0.009	< 0.012
38	9/26/2006	< 0.012	< 0.015	< 0.012	< 0.018	< 0.012	< 0.015	< 0.025	< 0.007	< 0.013
39	10/3/2006	< 0.012	< 0.008	< 0.006	< 0.012	< 0.006	< 0.009	< 0.010	< 0.007	< 0.004
40	10/10/2006	< 0.009	< 0.009	< 0.008	< 0.006	< 0.009	< 0.028	< 0.010	< 0.003	< 0.010
41	10/17/2006	< 0.010	< 0.007	< 0.009	< 0.012	< 0.010	< 0.015	< 0.009	< 0.007	< 0.011
42	10/24/2006	< 0.008	< 0.013	< 0.006	< 0.011	< 0.012	< 0.012	< 0.006	< 0.005	< 0.011
43	10/31/2006	< 0.011	< 0.012	< 0.006	< 0.009	< 0.012	< 0.013	< 0.007	< 0.004	< 0.009
44	11/7/2006	< 0.011	< 0.011	< 0.006	< 0.008	< 0.017	< 0.015	< 0.009	< 0.007	< 0.010
45	11/14/2006	< 0.012	< 0.010	< 0.008	< 0.004	< 0.010	< 0.010	< 0.014	< 0.008	< 0.012
46	11/20/2006	< 0.012	< 0.011	< 0.012	< 0.014	< 0.010	< 0.010	< 0.014	< 0.008	< 0.013
47	11/28/2006	< 0.006	< 0.008	< 0.009	< 0.010	< 0.016	< 0.015	< 0.013	< 0.014	< 0.010
48	12/5/2006	< 0.009	< 0.011	< 0.011	< 0.008	< 0.009	< 0.009	< 0.013	< 0.004	< 0.014
49	12/12/2006	< 0.009	< 0.012	< 0.014	< 0.004	< 0.011	< 0.009	< 0.015	< 0.011	< 0.023
50	12/19/2006	< 0.013	< 0.007	< 0.014	< 0.011	< 0.005	< 0.005	< 0.012	< 0.007	< 0.009
51	12/26/2006	< 0.007	< 0.011	< 0.013	< 0.013	< 0.011	< 0.006	< 0.014	< 0.006	< 0.011
52	1/2/2007	< 0.026	< 0.010	< 0.009	< 0.007	< 0.011	< 0.009	< 0.009	< 0.008	< 0.008

"Less than" values expressed as sample Critical Level (L_c) unless otherwise noted.
* Sample deviation.
** Control location.

TABLE B-9

CONCENTRATIONS OF GAMMA EMMITERS IN HUDSON RIVER WATER SAMPLES** - 2006

(pCi/L ± 1σ)

#9 PLANT INLET (HUDSON RIVER INTAKE)

Radionuclide	January	February	March	April	May	June
Be-7*	<17.03	<13.26	<14.94	<18.32	<10.49	<8.19
K-40*	170.2±21.74	95.44±13.69	172±15.9	331.8±27.21	84.52±13.06	125.4±6.91
Mn-54	<1.87	<1.25	<1.21	<2.14	<1.13	<0.69
Co-58	<1.93	<1.34	<1.69	<1.61	<1.26	<0.82
Fe-59	<6.14	<4.17	<4.72	<6.46	<4.89	<2.32
Co-60	<2.05	<1.31	<1.27	<2.47	<1.35	<0.7
Zn-65	<4.3	<3.08	<2.91	<4.98	<2.99	<0.98
Zr-95	<3.6	<2.39	<2.99	<3.69	<2.72	<1.56
Nb-95	<2.23	<1.74	<2.23	<2.28	<1.61	<1.12
Ru-103	<2.53	<1.78	<2.15	<2.42	<1.95	<0.77
Ru-106	<17.51	<12.07	<14.46	<22.94	<12.45	<7.37
I-131	<7.04	<4.74	<7.12	<6.42	<5.18	<6.04
Cs-134	<1.49	<1.32	<1.63	<1.36	<1.35	<0.51
Cs-137	<1.78	<1.18	<1.37	<1.62	<1.15	<0.65
Ba/La-140	<6.58	<4.1	<4.8	<5.42	<4.39	<2.72
Ce-141	<3.31	<2.9	<3.19	<3.89	<1.72	<2.36
Ce-144	<9.26	<8.68	<9.8	<13.1	<8.9	<6.4
Ra-226*	182.3±27.36	181.2±24.34	81.02±26.68	120.9±37.51	125.8±20.15	101.9±13.22
Ac/Th-228*	14.53±5.36	<4.42	<4.8	<6.15	<3.52	9.34±1.79

#10 DISCHARGE CANAL (MIXING ZONE)

Radionuclide	January	February	March	April	May	June
Be-7*	<13.61	<16.36	<10.51	<14.29	<14.01	<11.95
K-40*	159.5±15.7	411.4±21.56	138.5±10.67	137.7±16.18	309.6±21.35	118.8±11.85
Mn-54	<1.31	<1.61	<1.08	<1.27	<1.52	<0.97
Co-58	<1.58	<1.59	<1.21	<1.72	<1.79	<1.17
Fe-59	<4.42	<4.86	<3.36	<4.37	<4.37	<4.12
Co-60	<1.32	<1.57	<0.9	<1.21	<1.67	<1.13
Zn-65	<3.45	<3.5	<1.34	<1.91	<3.34	<2.11
Zr-95	<2.9	<2.93	<2.05	<2.51	<3	<2.46
Nb-95	<1.87	<2.24	<1.41	<1.81	<2.06	<1.77
Ru-103	<1.79	<2.24	<1.54	<2.04	<2.21	<1.76
Ru-106	<13.78	<14.05	<10.93	<15	<16.18	<10.83
I-131	<5.44	<6.72	<5.74	<5.73	<5.89	<7.0
Cs-134	<0.79	<1.01	<0.73	<1.07	<1.02	<1.07
Cs-137	<1.25	<1.53	<1	<1.3	<1.37	<1.11
Ba/La-140	<3.98	<4.84	<3.4	<3.38	<5.01	<4.86
Ce-141	<3.06	<3.66	<2.9	<3.81	<3.22	<2.76
Ce-144	<9.66	<11.5	<9.49	<12.3	<10.5	<7.49
Ra-226*	<32.63	49.22±28.57	86.53±21.17	112.6±28.44	93.7±28.84	47.16±20.35
Ac/Th-228*	<4.61	13.88±4.37	13.31±2.98	13.52±4.21	9.57±4.26	<3.66

* Indicates naturally occurring.

** "Less than" values expressed as Critical Level (L_c).

TABLE B-9

CONCENTRATIONS OF GAMMA EMMITERS IN HUDSON RIVER WATER SAMPLES** - 2006

(pCi/L ± 1σ)

#9 PLANT INLET (HUDSON RIVER INTAKE)

Radionuclide	July	August	September	October	November	December
Be-7*	<15.9	<12.9	<13	<14.68	<15.84	<12.90
K-40*	134.6±16.74	154.3±12.19	189.8±15.24	181.2±17.99	136.6±17.32	180 ± 16.4
Mn-54	<1.45	<1.09	<1.13	<1.2	<1.59	<1.39
Co-58	<1.88	<1.37	<1.31	<1.61	<1.64	<1.58
Fe-59	<5.54	<3.58	<3.58	<4.69	<5.27	<4.42
Co-60	<1.42	<1.1	<1.08	<1.46	<1.67	<1.47
Zn-65	<3.3	<2.98	<2.48	<3.48	<3.64	<3.04
Zr-95	<2.72	<2.42	<2.52	<3.02	<2.89	<2.65
Nb-95	<2.07	<1.54	<2	<2.09	<2.35	<2.18
Ru-103	<2.14	<1.81	<1.91	<2.08	<2.36	<2.10
Ru-106	<13.93	<13.49	<14.33	<14.3	<15.74	<15.90
I-131	<5.76	<5.63	<6.61	<6.61	<6.94	<7.12
Cs-134	<1.64	<0.91	<1.49	<1.57	<1.62	<1.52
Cs-137	<1.45	<1.2	<1.35	<1.75	<1.62	<1.50
Ba/La-140	<5.1	<3.22	<4.7	<4.47	<5.22	<4.82
Ce-141	<3.33	<3.28	<2.97	<2.14	<2.35	<3.17
Ce-144	<10.7	<10.8	<8.58	<10.6	<11.2	<9.54
Ra-226*	59.63±28.26	101±20.57	77.36±20.66	53.11±26.67	<33.13	53.5 ± 24.5
Ac/Th-228*	<4.39	9.06±3.23	<4.11	7.7±4.12	<5.12	11.1 ± 3.36

#10 DISCHARGE CANAL (MIXING ZONE)

Radionuclide	July	August	September	October	November	December
Be-7*	<15.62	<15.69	<14.99	<14.36	<13.13	<15.80
K-40*	126.2±16.7	295.8±22.76	347.8±20.57	138.4±14.44	148.3±14.33	295 ± 17.6
Mn-54	<1.42	<1.49	<1.32	<1.55	<1.27	<1.12
Co-58	<1.65	<1.86	<1.73	<1.47	<1.36	<1.59
Fe-59	<5.53	<5.47	<4.59	<4.56	<4.19	<5.06
Co-60	<1.94	<1.65	<1.32	<1.14	<1.27	<1.20
Zn-65	<3.76	<4.52	<3.14	<1.82	<2.64	<3.45
Zr-95	<2.94	<3.36	<3.02	<2.68	<2.87	<2.73
Nb-95	<2.28	<2.28	<2.43	<1.93	<1.99	<2.02
Ru-103	<2.38	<2.37	<2.31	<2.1	<1.9	<2.23
Ru-106	<16.34	<17.14	<14.7	<14.39	<15.13	<14.00
I-131	<7.02	<7.05	<6.84	<6.62	<6.53	<7.01
Cs-134	<1.77	<1.94	<1.46	<1.13	<1.0	<1.45
Cs-137	<1.59	<1.53	<1.43	<1.28	<1.36	<1.50
Ba/La-140	<4.65	<4.84	<4.22	<3.57	<4.7	<4.45
Ce-141	<3.47	<3.54	<3.63	<4.11	<2.86	<2.57
Ce-144	<10.8	<11.4	<11.2	<12.4	<9.07	<10.6
Ra-226*	78.97±28.82	103.6±30.38	87.23±24.55	113.8±25.15	62.18±21.31	61.9 ± 27.8
Ac/Th-228*	<5.23	<5.34	7.4±3.48	16.16±3.59	7.61±3.43	9.51 ± 3.40

* Indicates naturally occurring.

** "Less than" values expressed as Critical Level (L_c).

TABLE B-10
CONCENTRATION OF TRITIUM IN HUDSON RIVER WATER SAMPLES*- 2006

(QUARTERLY COMPOSITES)
(pCi/L ± 1σ)

#9 PLANT INLET (HUDSON RIVER INTAKE)
(Control Location)

Radionuclide	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
TRITIUM 2006	<453	<453	<442	<457

#10 DISCHARGE CANAL (MIXING ZONE)

Radionuclide	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
TRITIUM 2006	<453	<453	386 ± 136	<457

* "Less than" values expressed as Critical Level (L_c).

TABLE B-11
RADIOACTIVITY CONCENTRATIONS IN DRINKING WATER SAMPLES - 2006
(pCi/L ± 1σ)

Camp Field Reservoir

ISOTOPE	January	February	March	April	May	June
Gross Beta	1.71 ± 0.50	1.68 ± 0.45	2.78 ± 0.49	2.4 ± 0.5	2.9 ± 0.5	2.4 ± 0.5
Be-7*	<33.55	<22.46	<22.07	<20.82	<20.93	<24.49
K-40*	166±51.42	166.2±28.4	162.1±34	120.5±27.54	175.3±30.6	330.7±42.76
Mn-54	<5.58	<2.28	<2.63	<2.53	<2.64	<2.46
Co-58	<4.62	<2.37	<2.87	<2.26	<2.48	<2.71
Fe-59	<9.7	<6.46	<9.14	<5.17	<6.76	<10.46
Co-60	<2.83	<2.09	<2.81	<3.35	<2.51	<3.41
Zn-65	<7.81	<6.02	<5.76	<2.62	<6.74	<7.14
Zr-95	<6.14	<4.16	<3.45	<3.91	<4.22	<5.1
Nb-95	<4.94	<3.07	<2.4	<2.7	<2.97	<3.68
Ru-103	<3.74	<2.86	<3.28	<2.94	<2.73	<3.33
Ru-106	<41.74	<30.42	<26.55	<28.24	<25.35	<22.67
I-131	<0.233	<0.509	<0.302	<0.306	<0.306	<0.287
Cs-134	<4.76	<3.11	<2.89	<2.76	<2.87	<3.53
Cs-137	<3.1	<2.01	<2.76	<2.59	<2.49	<2.71
Ba/La-140	<4.73	<3.31	<3.55	<2.67	<2.76	<3.6
Ce-141	<5.43	<4.61	<4.9	<3.7	<4.13	<4.6
Ce-144	<26.5	<19.5	<19.9	<16.1	<17.4	<19.9
Ra-226*	<83.16	131.3±50.11	<65.89	121.3±48.55	<61.11	<61.89
Ac-228*	<13.22	<7.6	<9.48	<9.03	<10.34	<13.17

Results reported as < are CL values

Camp Field Reservoir

ISOTOPE	July	August	September	October	November	December
Gross Beta	2.3 ± 0.5	3.4 ± 0.5	2.8 ± 0.5	1.9 ± 0.5	3.2 ± 0.5	1.8 ± 0.5
Be-7*	<21.26	<20.21	<27.38	<22.41	<23.65	<26.11
K-40*	240.4±39.47	<35.25	<32.7	189±32.67	208.4±35.35	163±36.44
Mn-54	<3.25	<2.54	<3.14	<2.8	<2.72	<3.49
Co-58	<3.4	<3.11	<3.15	<2.15	<2.65	<3.13
Fe-59	<10.58	<6.47	<9.58	<5.16	<6.2	<6.47
Co-60	<3.61	<2.48	<3.8	<2.28	<1.42	<3.2
Zn-65	<5.75	<3.93	<6.54	<5.03	<6.05	<4.02
Zr-95	<5.05	<4.58	<5.31	<4.18	<5.5	<5.21
Nb-95	<3.64	<3.91	<3.8	<2.57	<3.05	<3.33
Ru-103	<3.59	<2.96	<3.85	<2.95	<3.15	<3.48
Ru-106	<34.09	<36.61	<35.48	<23.07	<25.71	<28.66
I-131	<0.314	<0.312	<0.395	<0.377	<0.382	<0.389
Cs-134	<2.82	<2.39	<2.67	<2.66	<1.78	<2.35
Cs-137	<3.55	<3.01	<3.16	<2.37	<2.84	<3.1
Ba/La-140	<5.86	<3.54	<5.92	<3.26	<2.51	<4.17
Ce-141	<5.55	<4.84	<4.91	<4.29	<4.27	<6.88
Ce-144	<19.5	<18.3	<20.6	<18.0	<18.2	<26.9
Ra-226*	186.5±60.74	177.8±46.95	<73.51	<54.61	<67.83	<85.84
Ac-228*	<11.24	<12.52	<9.57	<8.62	<10.13	<9.43

* Indicates naturally occurring.

TABLE B-11
RADIOACTIVITY CONCENTRATIONS IN DRINKING WATER SAMPLES - 2006
(pCi/L ± 1σ)

New Croton Reservoir

ISOTOPE	January	February	March	April	May	June
Gross Beta	2.98 ± 0.53	2.15 ± 0.47	2.39 ± 0.46	2.7 ± 0.5	3.0 ± 0.5	2.1 ± 0.5
Be-7*	<23.85	<19.28	<26.39	<25.46	<25.28	<15.78
K-40*	194.6±38.28	137±28.9	205.1±41.99	<39.48	162.7±34.53	<17.94
Mn-54	<2.8	<3	<3.91	<3.88	<2.6	<2.67
Co-58	<2.36	<2.31	<3.46	<3.55	<2.28	<2.08
Fe-59	<5	<5.11	<9.47	<4.97	<5.81	<3.13
Co-60	<3.05	<2.83	<3.75	<4.53	<1.93	<2.69
Zn-65	<6.76	<7.6	<7.96	<11.43	<7.46	<5.03
Zr-95	<4.77	<4.19	<5.72	<4.95	<6.35	<4.87
Nb-95	<3.75	<2.45	<3.07	<3.89	<3.61	<2.03
Ru-103	<2.77	<2.71	<3.32	<3.37	<3.38	<3.28
Ru-106	<32.57	<25.94	<33.43	<34.71	<24.88	<27.17
I-131	<0.205	<0.491	<0.232	<0.241	<0.325	<0.276
Cs-134	<3.06	<1.41	<3.52	<2.77	<2.48	<2.76
Cs-137	<2.96	<2.54	<3.48	<3.38	<2.29	<1.53
Ba/La-140	<4.09	<3.61	<3.29	<5.17	<3.89	<4.72
Ce-141	<4.75	<3.98	<4.29	<6.21	<4.17	<4.32
Ce-144	<19.7	<17.1	<17.6	<23.6	<17.4	<15
Ra-226*	<82.04	128.1±46.81	187.1±48.24	<74.38	138.6±45.51	<54.98
Ac-228*	<11.22	<9.94	<10.94	<10.58	<8.51	<7.65

New Croton Reservoir

ISOTOPE	July	August	September	October	November	December
Gross Beta	3.0 ± 0.5	2.5 ± 0.5	2.0 ± 0.5	3.7 ± 0.6	2.2 ± 0.5	4.1 ± 0.5
Be-7*	<20.82	<30.02	<31.2	<23.95	<20.12	<25.26
K-40*	131.1±28.22	<36.75	138.7±32.04	<28.11	280.3±31.52	265.9±49.51
Mn-54	<2.2	<3.27	<3.2	<2.93	<2.36	<3.65
Co-58	<1.96	<2.8	<2.58	<1.94	<2.36	<3.65
Fe-59	<9.6	<5.63	<10.54	<7.53	<6.81	<7.46
Co-60	<3.97	<3.94	<3.9	<3.02	<2.21	<5.55
Zn-65	<4.94	<8.09	<7.88	<5.62	<5.51	<10.07
Zr-95	<5.03	<4.51	<5.76	<4.31	<4.48	<5.09
Nb-95	<3.82	<3.07	<3.31	<2.18	<2.61	<3.4
Ru-103	<2.98	<4.04	<3.92	<3.06	<2.51	<3.88
Ru-106	<27.42	<37.96	<29.49	<26.6	<24.84	<29.96
I-131	<0.302	<0.303	<0.35	<0.377	<0.342	<0.377
Cs-134	<2.33	<2.47	<3.8	<3.69	<2.58	<3.81
Cs-137	<2.23	<4.25	<3.62	<2.99	<2.62	<3.5
Ba/La-140	<2.97	<3.01	<2.61	<3.74	<2.73	<5.08
Ce-141	<4.21	<4.88	<5.06	<4.21	<4.35	<4.74
Ce-144	<21.3	<24.7	<24.3	<17.4	<17.4	<25.7
Ra-226*	<68.87	<76.54	<68.7	<62.35	<65.36	154.2±79.36
Ac-228*	<9.14	<8.61	<11.79	<9.14	<9.37	<11.55

* Indicates naturally occurring.

TABLE B-12
CONCENTRATION OF TRITIUM IN DRINKING WATER SAMPLES*- 2006

(QUARTERLY COMPOSITES)
(pCi/L ± 1σ)

CAMP FIELD RESERVOIR

Radionuclide	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
TRITIUM	< 466	< 499	< 451	< 456

NEW CROTON RESERVOIR

Radionuclide	1ST Quarter	2ND Quarter	3RD Quarter	4TH Quarter
TRITIUM	< 466	< 499	< 451	< 456

* "Less than" values expressed as Critical Level (L_c).

TABLE B-13
SHORELINE SOIL SAMPLES** 2006
(pCi/Kg ,dry ± 1σ)

April 2006

ISOTOPE	OFF VERPLANK	LENTS COVE	MANITOU INLET	WHITE BEACH	COLD SPRING
Be-7*	<128.20	<209.30	<211.90	<89.22	<162.50
K-40*	15820 ± 529.4	17140 ± 632.3	14440 ± 585.3	8410 ± 361.1	36580 ± 985.6
Mn-54	<15.06	<24.09	<25.61	<10.34	<25.09
Co-58	<18.12	<27.83	<27.97	<10.80	<22.79
Fe-59	<58.11	<76.34	<72.46	<42.61	<85.47
Co-60	<16.85	<30.87	<23.48	<13.70	<33.89
Zn-65	<25.23	<32.98	<38.42	<40.78	<83.67
Zr-95	<30.63	<46.52	<49.28	<20.88	<39.80
Nb-95	<18.68	<21.45	<20.33	<14.85	<25.29
Ru-103	<15.99	<27.23	<28.83	<11.55	<19.52
Ru-106	<181.20	<282.10	<278.20	<106.50	<295.80
I-131	<21.26	<35.71	<35.74	<14.50	<31.65
Cs-134	<17.43	<32.05	<29.11	<13.75	<26.12
Cs-137	135.9 ± 18.05	<25.95	<28.14	<12.53	<23.74
BaLa-140	<28.60	<36.49	<46.94	<16.39	<24.93
Ce-141	<26.08	<41.92	<39.57	<18.77	<33.86
Ce-144	<107.00	<168.00	<158.00	<59.00	<121.00
Ra-226*	912.2 ± 304.9	3584 ± 465.9	3456 ± 471.5	898.8 ± 186.9	823.6 ± 341.8
Ac/Th-228*	553.3 ± 63.46	1534 ± 118.9	1359 ± 107.4	111.1 ± 42.99	471.6 ± 92.48

August 2006

ISOTOPE	OFF VERPLANK	LENTS COVE	MANITOU INLET	WHITE BEACH	COLD SPRING
Be-7*	<372.1	<734.4	<252.6	<124.2	<275
K-40*	25200±1203	20700±1522	19670±802.3	14490±560.7	46540±1046
Mn-54	<34.48	<61.09	<38.83	<14.66	<36.88
Co-58	<39.52	<85.76	<36.74	<16.84	<34.22
Fe-59	<128.2	<176.8	<96.59	<64.34	<107.1
Co-60	<52.81	<64.82	<34.59	<21.09	<39.62
Zn-65	<107.8	<120.3	<53.08	<31.39	<55.58
Zr-95	<78.17	<172.2	<51.57	<28.63	<60.32
Nb-95	<52.85	<108.1	<23.95	<22.82	<41.76
Ru-103	<38.78	<74.45	<31	<16.11	<40.31
Ru-106	<435.5	<699.1	<331.3	<141.1	<376.4
I-131	<68.66	<148.5	<51.5	<27.23	<53.16
Cs-134	<44.88	<53.96	<26.05	<19.17	<25.94
Cs-137	158 ± 23.6	<75.86	64.9 ± 19.5	<14.11	<35.46
BaLa-140	<71.37	<68.76	<50.78	<28.74	<45.02
Ce-141	<59.17	<171.5	<48.1	<24.1	<64.89
Ce-144	<240.00	<668.00	<200.00	<99.70	<273.00
Ra-226*	2136±604.2	6453±1779	3544±615.2	1335±255.7	2429±576.6
Ac/Th-228*	905.8±139.6	1433±296.6	1180±136.7	117±52	974.2±118.2
Sr-89	**<3.60**	**<3.20**	**<5.00**	**<1.20**	**<2.50**
Sr-90	**<0.16**	**<0.15**	**<0.24**	**<0.24**	**<0.23**

BOLD PRINT INDICATES REPORTED LLD VALUES

* Indicates naturally occurring.
** "Less than" values expressed as Critical Level (L_c).
*** Indicates the average of the positive sample results reported for samples with recounts performed.

TABLE B-14
CONCENTRATIONS OF GAMMA EMITTERS IN BROAD LEAF VEGETATION*** - 2006
(pCi/Kg, wet ± 1σ)

#23 Roseton**

May

Radionuclide	SWAMP CABBAGE	COMMON MULLEN	MOTHERWORT
Be-7*	295.9±57.43	588±80.95	103.5±41.36
K-40*	3021±214.4	4514±262.1	4159±182.9
Mn-54	<6.16	<8.58	<7.63
Co-58	<6.85	<7.16	<6.63
Fe-59	<31.98	<27.02	<18.44
Co-60	<6.09	<11.42	<9.43
Zn-65	<22.94	<27.71	<17.29
Zr-95	<11.77	<17.94	<11.24
Nb-95	<10.97	<11.19	<7.5
Ru-103	<7.69	<8.31	<6.53
Ru-106	<72.43	<108.2	<72.18
I-131	<9.84	<11.33	<7.21
Cs-134	<8.94	<6.7	<4.53
Cs-137	<9.4	<8.7	<6.18
Ba/La-140	<11.44	<9.61	<6.56
Ce-141	<11.39	<12.14	<10.05
Ce-144	<49.80	<48.70	<43.30
Ra-226*	<154.7	<194.3	<137.4
Ac/Th-228*	<28.48	<26.86	<21.01

June

Radionuclide	RAGWEED	MULLEN	BURDOCK
Be-7*	686.9±120.4	365.7±120.3	1081±92.42
K-40*	7115±473.9	4582±402	5985±281.1
Mn-54	<19.82	<17.81	<9.51
Co-58	<18.15	<17.86	<11.24
Fe-59	<45.74	<47.44	<33.84
Co-60	<19.65	<22.95	<13.72
Zn-65	<36.25	<31.84	<14.39
Zr-95	<20.55	<30.96	<22.09
Nb-95	<20.06	<17.81	<11.45
Ru-103	<13.85	<16.56	<9.26
Ru-106	<146.4	<195.2	<117.4
I-131	<17.59	<20.09	<11.34
Cs-134	<19.39	<20.35	<7.96
Cs-137	<13.82	<21.52	<9.53
Ba/La-140	<13.29	<25.27	<9.96
Ce-141	<19.4	<23.34	<12.18
Ce-144	<77.10	<81.30	<52.00
Ra-226*	448.6±182.8	365.2±221.6	<196.2
Ac/Th-228*	<60.26	<69.3	<34.72

July

Radionuclide	RAGWEED	MULLEN	BURDOCK
Be-7*	1186±143.1	1227±142.1	1200±119.9
K-40*	8270±480.8	6804±424.4	5572±336.2
Mn-54	<12.08	<15.92	<11.6
Co-58	<14.87	<16.88	<8.49
Fe-59	<53.4	<47.09	<27.36
Co-60	<15.98	<12.59	<12.48
Zn-65	<38.83	<42.77	<29.27
Zr-95	<18.93	<24.1	<21.38
Nb-95	<15.4	<15.18	<13.55
Ru-103	<12.63	<15.68	<13.65
Ru-106	<172.8	<148.1	<103.8
I-131	<15.62	<17.61	<12.83
Cs-134	<21.86	<17.69	<12.55
Cs-137	<13.64	<15.79	<9.66
Ba/La-140	<17.45	<9.73	<10.88
Ce-141	<18.83	<24.73	<16.96
Ce-144	<74.70	<94.70	<62.30
Ra-226*	<248.4	<308.5	386.6±156.4
Ac/Th-228*	<59.8	<56.41	<43.88

Aug

Radionuclide	CATABA	RAG WEED	BURDOCK
Be-7*	621.4±101.2	705.1±163.1	2329±119.9
K-40*	3120±294.9	8606±619.7	7714±292.6
Mn-54	<11.77	<25.09	<10.48
Co-58	<14.37	<25.99	<10.16
Fe-59	<33.3	<57.13	<30.76
Co-60	<15.47	<24.14	<11.09
Zn-65	<36.29	<61.08	<33.64
Zr-95	<17.84	<27.35	<16.56
Nb-95	<12.96	<21.12	<8.93
Ru-103	<13.18	<16.87	<9.84
Ru-106	<137	<227.1	<96.4
I-131	<14.44	<20.2	<10.77
Cs-134	<18.82	<19.26	<7.61
Cs-137	<12.14	<23.07	<9.81
Ba/La-140	<14.6	<23.93	<7.62
Ce-141	<13.82	<25.89	<15.65
Ce-144	<65.40	<110.00	<73.60
Ra-226*	725.2±199	511.6±298.2	<194.1
Ac/Th-228*	<63.94	<74.64	<36.53

* Indicates naturally occurring.
** Indicates control location.
*** "Less than" values expressed as Critical Level (L_c).

TABLE B-14
CONCENTRATIONS OF GAMMA EMITTERS IN BROAD LEAF VEGETATION*** - 2006
(pCi/Kg, wet ± 1σ)

#23 Roseton (continued)**

September

Radionuclide	RAGWEED	CATALBA	CLEAR WEED
Be-7*	1746±139.1	705.8±129.5	701.6±92.5
K-40*	7395±344.7	3420±297.9	4157±234.2
Mn-54	<10.88	<11	<9.93
Co-58	<13.48	<13.78	<11.3
Fe-59	<39.58	<46.36	<34.75
Co-60	<17.98	<19.34	<9.94
Zn-65	<30.94	<29.28	<16.56
Zr-95	<23.65	<28.83	<22.1
Nb-95	<12.41	<18.43	<12.43
Ru-103	<12.35	<12.85	<9.06
Ru-106	<123.1	<161	<102.7
I-131	<26.01	<26.09	<21.79
Cs-134	<17.45	<15.05	<8.02
Cs-137	<14.68	<17.17	<10.47
Ba/La-140	<24.3	<27.74	<15.12
Ce-141	<17.41	<21.11	<19.87
Ce-144	<63.90	<69.60	<75.10
Ra-226*	315.1±191.1	<249.9	<242.2
Ac/Th-228*	<56.56	<45.4	<36.21

October

Radionuclide	RAGWEED	CATALBA	MULLEN
Be-7*	4049±266.3	1894±167.1	1211±107.1
K-40*	7337±557	3064±292.6	5748±264.5
Mn-54	<15.75	<10.3	<12
Co-58	<14.42	<9.68	<10.06
Fe-59	<72.71	<46.79	<32.64
Co-60	<23.43	<14.46	<11.84
Zn-65	<47.59	<24.34	<29.95
Zr-95	<26.45	<26.51	<17.87
Nb-95	<20.75	<13.38	<10.27
Ru-103	<20.33	<12.33	<11.22
Ru-106	<226.8	<127.4	<119.5
I-131	<22	<15.01	<12.78
Cs-134	<26.08	<17.31	<17.46
Cs-137	<19.02	<17.46	<10.99
Ba/La-140	<22.4	<20.58	<8.6
Ce-141	<23.44	<18.87	<17.47
Ce-144	<100.00	<66.50	<73.80
Ra-226*	<360.6	<281.3	<224.8
Ac/Th-228*	<66.18	<40.36	<41.71

* Indicates naturally occurring.
** Indicates control location.
*** "Less than" values expressed as Critical Level (L_c).

TABLE B-14
CONCENTRATIONS OF GAMMA EMITTERS IN BROAD LEAF VEGETATION*** - 2006
(pCi/Kg, wet ± 1σ)

#94 IPEC Training Center

May

Radionuclide	COMMEN MULLEN	RAGWEED	MOTHERWORT
Be-7*	1183±157.8	180±57.3	<65.19
K-40*	5363±470.2	6236±310.1	5052±240
Mn-54	<16.69	<10.07	<11.02
Co-58	<20.36	<8.57	<8.27
Fe-59	<53.13	<25.53	<25.84
Co-60	<21.27	<9.57	<9.5
Zn-65	<47.43	<25.99	<21.16
Zr-95	<38.69	<17.77	<12.81
Nb-95	<20.14	<10.13	<7.71
Ru-103	<16.22	<7.69	<6.89
Ru-106	<166.7	<81.34	<82.67
I-131	<23	<6.47	<9.52
Cs-134	<23.93	<8.62	<6.11
Cs-137	<17.6	<7.7	<8.13
Ba/La-140	<19.19	<9.25	<10.19
Ce-141	<25.23	<11.29	<12.44
Ce-144	<80.80	<45.80	<51.90
Ra-226*	561.4±261.1	<155.7	<172.9
Ac/Th-228*	<68.77	<35.94	<30.82

June

Radionuclide	BURDOCK	MULLEN	RAGWEED
Be-7*	1180±86.52	1381±136.3	738.2±93.05
K-40*	7516±268.4	4873±347.3	7813±348.3
Mn-54	<10.5	<12.46	<10.95
Co-58	<10.99	<15.03	<12.48
Fe-59	<27.61	<42.74	<30.79
Co-60	<9.97	<15.29	<14.69
Zn-65	<13.54	<35.1	<24.03
Zr-95	<16.52	<21.35	<20.64
Nb-95	<9.17	<14.67	<11.73
Ru-103	<9.09	<13.66	<10.35
Ru-106	<96.88	<146.5	<127.5
I-131	<10.69	<15.03	<11.73
Cs-134	<6.98	<16.42	<8.02
Cs-137	<9.64	<14.26	<11.11
Ba/La-140	<12.43	<15.71	<12.27
Ce-141	<14.66	<17.39	<12.96
Ce-144	<59.60	<80.20	<52.00
Ra-226*	<203.8	<284.5	<221.9
Ac/Th-228*	<34.67	<52.26	<44.97

July

Radionuclide	RAGWEED	MULLEN	BURDOCK
Be-7*	881.2±99.99	1511±209.9	1233±142.8
K-40*	8159±372.7	6582±552.6	6866±437.9
Mn-54	<11.35	<27.64	<7.86
Co-58	<11.33	<29.56	<13.1
Fe-59	<42.27	<60.49	<41.7
Co-60	<11.02	<36.13	<15.63
Zn-65	<33.26	<56.7	<44.21
Zr-95	<25.42	<31.27	<24.89
Nb-95	<11.36	<25.23	<15.55
Ru-103	<12.01	<20.81	<12.69
Ru-106	<112	<205.8	<152.6
I-131	<11.13	<20.72	<11.95
Cs-134	<14.2	<25.42	<17.74
Cs-137	<11.12	<23.58	<15.81
Ba/La-140	<16.54	<25.37	<17.23
Ce-141	<15.68	<27.71	<16.11
Ce-144	<74.70	<90.10	<67.60
Ra-226*	<224.5	<394.9	<234.4
Ac/Th-228*	<51.72	<99.02	<54.68

Aug

Radionuclide	RAGWEED	BURDOCK	GRAPE LEAVES
Be-7*	2137±180	1261±129.9	457.9±121.2
K-40*	10080±568.6	7051±369.5	2935±314.3
Mn-54	<20.63	<15.28	<13.04
Co-58	<17.98	<17.09	<14.72
Fe-59	<61.86	<46.24	<45.23
Co-60	<24.08	<17.98	<18.59
Zn-65	<52.09	<47.3	<31.81
Zr-95	<31.55	<23.86	<29.57
Nb-95	<18.33	<14.36	<17.34
Ru-103	<16.61	<13.7	<13.23
Ru-106	<142	<181.7	<133.5
I-131	<15.19	<15.35	<13.7
Cs-134	<25.16	<15.28	<10.48
Cs-137	<20.43	<16.18	<14.13
Ba/La-140	<19.76	<18.14	<22.11
Ce-141	<23.1	<23.85	<15.05
Ce-144	<84.50	<105.00	<74.80
Ra-226*	<350.7	411.3±242.4	556.5±207.3
Ac/Th-228*	<75.84	<51.55	<73.37

#94 IPEC Training Center (continued)

September

Radionuclide	RAGWEED	GRAPE LEAVES	MILK WEED
Be-7*	2941±176	2379±168.4	1137±131.3
K-40*	7382±359.5	5668±352.5	6774±356.1
Mn-54	<15.08	<15.13	<8.3
Co-58	<15.76	<12.12	<10.79
Fe-59	<49.05	<50.97	<40.54
Co-60	<17.94	<18.08	<13.01
Zn-65	<35.99	<39.1	<29.82
Zr-95	<24.85	<24.39	<16.56
Nb-95	<17.05	<16.56	<16.85
Ru-103	<17.61	<13.37	<14.45
Ru-106	<150	<148.5	<105.5
I-131	<24.52	<26.22	<23.2
Cs-134	<12.3	<19.83	<17.59
Cs-137	<14.6	<11.06	<12.96
Ba/La-140	<23.33	<22.14	<23.75
Ce-141	<24.67	<19.2	<20.26
Ce-144	<94.70	<71.20	<80.10
Ra-226*	<326.9	<320.4	<259.1
Ac/Th-228*	<49.55	<55.03	<53.78

October

Radionuclide	RAGWEED	GRAPE LEAVES	JEWEL WEED
Be-7*	4939±185.4	3840±226.2	1335±103.4
K-40*	7677±346.8	5877±426.5	4932±267.3
Mn-54	<12.92	<20.37	<8.92
Co-58	<12.89	<17.9	<8.44
Fe-59	<36.59	<53.63	<25.32
Co-60	<14.14	<17.53	<9
Zn-65	<38.88	<42.03	<30.79
Zr-95	<22.21	<24.57	<16.48
Nb-95	<10.77	<14.65	<9.4
Ru-103	<11.21	<14.96	<6.66
Ru-106	<134.1	<145.5	<88.76
I-131	<13.84	<17.42	<8
Cs-134	<7.67	<15.92	<11.43
Cs-137	<12.74	<16.28	<7.73
Ba/La-140	<9.92	<22.54	<10.74
Ce-141	<15.62	<20.07	<10.97
Ce-144	<58.20	<72.50	<49.20
Ra-226*	620.7±194.2	<328.3	<173
Ac/Th-228*	<50.66	<62.03	<28.99

* Indicates naturally occurring.
** Indicates control location.
*** "Less than" values expressed as Critical Level (L_c).

TABLE B-14
CONCENTRATIONS OF GAMMA EMITTERS IN BROAD LEAF VEGETATION*** - 2006
(pCi/Kg, wet ± 1σ)

#95 Meteorological Tower

May

Radionuclide	MOTHER-WORT	BURDOCK	RAGWEED
Be-7*	139.2±69.03	557.8±67.3	423.6±80.95
K-40*	4338±236.4	4597±250.7	6084±341.7
Mn-54	<12.29	<6.76	<9.99
Co-58	<8.83	<8.26	<10.81
Fe-59	<32.19	<26.8	<27.1
Co-60	<12.21	<8.49	<14.02
Zn-65	<28.72	<24.96	<28.82
Zr-95	<15.74	<10.88	<16.12
Nb-95	<9.6	<8.77	<7.5
Ru-103	<9.86	<7.32	<8.28
Ru-106	<103	<68.49	<104.2
I-131	<10.75	<8.43	<11.04
Cs-134	<8.59	<8.07	<10.08
Cs-137	<9.98	<8.96	<9.32
Ba/La-140	<10.77	<9.51	<11.28
Ce-141	<16.96	<9.42	<12.87
Ce-144	<64.70	<41.60	<47.30
Ra-226*	<186.9	<153.7	<172.8
Ac/Th-228*	<34.92	<25.09	<33.1

June

Radionuclide	POKE WEED	RAGWEED	MULLEN
Be-7*	<78.04	1218±116.8	924.5±162.1
K-40*	6183±317.3	8653±376.4	5771±464.5
Mn-54	<9.81	<14.56	<17.19
Co-58	<9.79	<15.32	<18.65
Fe-59	<32.27	<44.57	<50.56
Co-60	<13.84	<13.98	<28.04
Zn-65	<22.12	<20.98	<48.75
Zr-95	<14.36	<21.47	<29.41
Nb-95	<10.57	<14.55	<18.76
Ru-103	<9.13	<11.43	<17.43
Ru-106	<112.5	<150.1	<199.4
I-131	<10.43	<15.57	<16.64
Cs-134	<10.62	<10.6	<26.43
Cs-137	<12.42	<12.63	<18.55
Ba/La-140	<8.72	<13.59	<19.48
Ce-141	<14.06	<20.6	<23.74
Ce-144	<57.50	<82.20	<96.50
Ra-226*	<211.3	<287.7	<388.4
Ac/Th-228*	<38.45	<49.57	<68.67

July

Radionuclide	RAGWEED	BURDOCK	MULLEN
Be-7*	925.5±136.9	744.8±88.23	976.2±121.9
K-40*	7941±509.5	7422±348.8	6505±406.5
Mn-54	<11.42	<9.44	<11.52
Co-58	<16.86	<9.73	<14.52
Fe-59	<43.51	<25.96	<28.98
Co-60	<13.19	<10.89	<15.26
Zn-65	<44.7	<24.99	<34.25
Zr-95	<22.27	<15.88	<12.65
Nb-95	<13.47	<11.09	<14.42
Ru-103	<14.21	<10.27	<11.44
Ru-106	<124.1	<111.2	<150.4
I-131	<11.62	<7.84	<15.11
Cs-134	<18.66	<11.43	<22.54
Cs-137	<13.28	<10.73	<18.43
Ba/La-140	<21.77	<13.25	<17.61
Ce-141	<18.06	<11.24	<16.85
Ce-144	<68.40	<51.20	<66.90
Ra-226*	<284.2	251.4±130	<276.2
Ac/Th-228*	<59.68	<33.28	<55

Aug

Radionuclide	RAGWEED	GRAPE LEAVES	MULLEN
Be-7*	1018±136.2	559.5±121.2	1741±167
K-40*	8845±499.5	6533±411.9	8710±489.4
Mn-54	<17.43	<15.82	<19.6
Co-58	<14.44	<15.67	<17.51
Fe-59	<47.25	<37.1	<62.36
Co-60	<20.62	<19.32	<21.4
Zn-65	<44.02	<50.6	<52.84
Zr-95	<30.02	<30.73	<35.3
Nb-95	<17.52	<17.35	<19.95
Ru-103	<16.13	<16.22	<18.85
Ru-106	<156.9	<179.1	<203.2
I-131	<16.76	<16.22	<18.27
Cs-134	<20.88	<23.62	<25.75
Cs-137	<15.9	<18.15	<18
Ba/La-140	<20.85	<20.59	<28.19
Ce-141	<18.06	<21.88	<22.84
Ce-144	<70.70	<75.10	<93.20
Ra-226*	356.6±214.5	<365.7	510.4±295
Ac/Th-228*	<69.37	<72.75	<106.7

#95 Meteorological Tower (continued)

Sept

Radionuclide	GRAPE LEAVES	RAGWEED	COTTONWOOD
Be-7*	505.6±129.2	2113±147.4	2116±175.7
K-40*	3569±317.1	7448±372.2	8903±477.3
Mn-54	<14.96	<15.48	<12.27
Co-58	<17.13	<16.28	<15.13
Fe-59	<54.09	<42.77	<58.83
Co-60	<18.89	<17.55	<14.92
Zn-65	<19.5	<39.69	<36.27
Zr-95	<28.59	<25.16	<30.54
Nb-95	<19.69	<16.84	<13.97
Ru-103	<15.68	<12.31	<16.58
Ru-106	<205.6	<161.1	<164.7
I-131	<26.88	<27.14	<22.59
Cs-134	<23.17	<21.73	<18.35
Cs-137	<18.43	<15.28	<16.42
Ba/La-140	<22.17	<19.76	<28.52
Ce-141	<24.38	<19.48	<20.8
Ce-144	<77.30	<64.00	<71.80
Ra-226*	<318.6	<280.9	<266.6
Ac/Th-228*	<50.84	<56.64	<51.16

October

Radionuclide	RAGWEED	BITTERSWEET	MULLEN
Be-7*	5310±239.2	1002±111.6	2144±125.1
K-40*	8631±445.8	4798±282.7	8272±340.8
Mn-54	<13.38	<11	<11.89
Co-58	<13.72	<11.22	<11.39
Fe-59	<48.64	<36.27	<32.76
Co-60	<16.19	<12.52	<15.04
Zn-65	<33.17	<28.93	<32.82
Zr-95	<29	<23.06	<21.9
Nb-95	<13.01	<13.14	<11.47
Ru-103	<13.26	<9.44	<10.89
Ru-106	<174.8	<108.6	<116.1
I-131	<16.58	<13.18	<11.43
Cs-134	<22.13	<16.86	<12.73
Cs-137	<15.96	<11.98	<11.43
Ba/La-140	<13.68	<18.41	<13.34
Ce-141	<19.82	<15.95	<12.57
Ce-144	<78.10	<71.10	<62.50
Ra-226*	<317.5	539.6±197.5	709.9±163.7
Ac/Th-228*	<47.64	<44.97	<45

* Indicates naturally occurring.
** Indicates control location.
*** "Less than" values expressed as Critical Level (L_c).

2006 TABLE B-15
CONCENTRATIONS OF RADIONUCLIDES IN FISH AND INVERTEBRATE SAMPLES
(pCi/Kg, wet ± 1σ)

#23 Roseton
(control)

Radionuclide	WHITE PERCH	SUNFISH	CATFISH
Be-7*	<220.8	<125.2	<187.8
K-40*	3914±357	2036±197.6	4030±316.5
Mn-54	<17.05	<12.37	<12.93
Co-58	<23.02	<14.81	<17.64
Fe-59	<76.52	<58.84	<54.47
Co-60	<12.64	<11.69	<16.54
Zn-65	<45.05	<28.37	<39.61
Zr-95	<35.93	<23.25	<41.65
Nb-95	<31.22	<21.24	<23.36
Ru-103	<29.41	<16.3	<27.25
Ru-106	<183	<109.5	<162.8
I-131	<301.5	<155.2	<244
Cs-134	<19.76	<10.05	<12.26
Cs-137	<18.52	<11.42	<14.74
Ba/La-140	<119.1	<64.55	<94.41
Ce-141	<46.72	<21.81	<33.91
Ce-144	<97.80	<53.00	<80.60
Ra-226*	<313.9	<235.5	<284.6
Ac-228*	<66.06	<36	<58.11
Sr-89	**<4100**	**<3800**	**<4400**
Sr-90	**<230**	**<260**	**<240**
Sr-89 (reanalysis)	**<1700**	**<5800**	**<2200**
Sr-90 (reanalysis)	**<12.0**	**<19.0**	**<9.1**
DATE	April 2006	April 2006	April 2006

Radionuclide	WHITE PERCH	SUNFISH	CATFISH
Be-7*	<269	<323.1	<308.6
K-40*	4128±353	4235±356.9	4752±474.3
Mn-54	<21.2	<19.59	<29.67
Co-58	<32.79	<21.77	<37.92
Fe-59	<104	<102.9	<96.49
Co-60	<24.21	<21.24	<26.06
Zn-65	<53.36	<47.01	<65.62
Zr-95	<46.67	<51.54	<67.29
Nb-95	<54.03	<38.59	<49.4
Ru-103	<32.31	<40.56	<57.15
Ru-106	<234.2	<203.5	<270.4
I-131	<1126	<1293	<1577
Cs-134	<16.93	<20.19	<25.78
Cs-137	<17.11	<21.9	<19.61
Ba/La-140	<356.1	<296.00	<419.2
Ce-141	<39.2	<57.00	<87.2
Ce-144	<96.20	<104.00	<120.00
Ra-226*	720.9±264.2	430 ± 272	<426.6
Ac-228*	<77.66	<84.50	<82.06
Sr-89	**<1900**	**<1900**	**<1100**
Sr-90	24.5 ± 2.9	17.1 ± 3.1	**<7.6**
DATE	September 2006	September 2006	September 2006

BOLD PRINT INDICATES REPORTED LLD VALUES

* Indicates naturally occurring.

2006 TABLE B-15
CONCENTRATIONS OF RADIONUCLIDES IN FISH AND INVERTEBRATE SAMPLES
(pCi/Kg, wet ± 1σ)

	#23 Roseton (control)		
Radionuclide	STRIPED BASS	AMERICAN EEL	BLUE CRAB
Be-7*	<243.3	<262	<326.6
K-40*	4379±347.9	3466±299	4366±251.5
Mn-54	<18.45	<19.7	<24.02
Co-58	<20.28	<27.51	<30.02
Fe-59	<100.6	<107	<99.26
Co-60	<17.05	<16.43	<19.84
Zn-65	<43.91	<44.02	<29.83
Zr-95	<40.99	<45.91	<59.3
Nb-95	<28	<38.17	<48.06
Ru-103	<41.9	<39.71	<45.64
Ru-106	<220.8	<214.5	<220.7
I-131	<1151	<1138	<1483
Cs-134	<16.96	<15.74	<15.13
Cs-137	<16.57	<15.82	<19.3
Ba/La-140	<340.5	<287.2	<301
Ce-141	<54.19	<54.92	<77.75
Ce-144	<104	<89.9	<137
Ra-226*	<317.2	622.8±229.5	1607±288.7
Ac-228*	<66.63	<55.74	186.5±58.9
Sr-89	**<1000**	**<930**	**<2200**
Sr-90	**<5.0**	**<5.0**	13.6 ± 3.6
DATE	September 2006	September 2006	September 2006

BOLD PRINT INDICATES REPORTED LLD VALUES

* Indicates naturally occurring.

2006 TABLE B-15
CONCENTRATIONS OF RADIONUCLIDES IN FISH AND INVERTEBRATE SAMPLES
(pCi/Kg, wet ± 1σ)

#25 Downstream (Hudson River)

(indicator)

Radionuclide	WHITE PERCH	CAT FISH	STRIPED BASS	AMERICAN EEL
Be-7*	<248.8	<210.2	<214.8	<242.3
K-40*	5599±419.7	4319±313	4135±379.6	4713±447.8
Mn-54	<19.44	<22.33	<19.92	<24.42
Co-58	<32.97	<24.28	<19.84	<28.99
Fe-59	<86.15	<66.88	<72.53	<101
Co-60	<18.74	<19.55	<21.09	<21.89
Zn-65	<56.75	<42.74	<49.41	<60.86
Zr-95	<51.49	<43.19	<43.25	<49.07
Nb-95	<34.68	<31.31	<36.62	<33.62
Ru-103	<38.01	<31.9	<33.91	<26.03
Ru-106	<265.3	<202.4	<236.4	<253.7
I-131	<393.4	<338.5	<303.7	<255.4
Cs-134	<26.23	<23.84	<22.24	<20.62
Cs-137	<21	<19.68	<20.2	<22.67
Ba/La-140	<147.9	<109.3	<91.38	<136
Ce-141	<45.45	<50.84	<41.79	<51.02
Ce-144	<106.00	<117.00	<101.00	<118.00
Ra-226*	<440.8	676.3±302.1	<343.9	607.3±289.8
Ac-228*	<84.54	<61.42	<63.41	<86.21
Sr-89	**<4000**	**<3700**	**<3900**	**<4100**
Sr-90	**<270**	**<270**	**<270**	**<240**
Sr-89 (reanalysis)	**<1800**	**<2200**	**<1500**	**<1500**
Sr-90 (reanalysis)	**<8.8**	**<10.0**	**<11.0**	**<12.0**
DATE	April 2006	April 2006	April 2006	April 2006

Radionuclide	SUNFISH	WHITE PERCH	SUNFISH	CATFISH
Be-7*	<256.2	<364.9	<247.4	<331.00
K-40*	6454±537.8	5203±437.8	6833±394.7	4450 ± 278
Mn-54	<24.27	<26.87	<21.18	<19.90
Co-58	<39.14	<29.18	<30.92	<26.20
Fe-59	<95.85	<105.8	<112.4	<116.00
Co-60	<31.67	<17.13	<16.82	<17.60
Zn-65	<54.66	<72.99	<55.65	<47.20
Zr-95	<61.03	<69.84	<54.74	<51.90
Nb-95	<57.87	<61.65	<52.84	<57.20
Ru-103	<40.5	<44.46	<43.07	<47.00
Ru-106	<305.6	<240.5	<238.6	<248.00
I-131	<324.8	<1022	<989.6	<3240.00
Cs-134	<25.79	<15.29	<19.42	<12.60
Cs-137	<27.4	<22.26	<22.69	<17.30
Ba/La-140	<149.8	<390.4	<280	<484.00
Ce-141	<55.24	<71.93	<63.44	<89.10
Ce-144	<129.00	<71.90	<108.00	<132.00
Ra-226*	1062±394.1	<432.9	695.3±312.8	906 ± 279
Ac-228*	<107.4	<94.52	141.6±50.75	<69.30
Sr-89	**<4100**	**<2000**	**<4100**	**<1100**
Sr-90	**<210**	18.8 ± 2.9	**<15.1**	**<6.4**
Sr-89 (reanalysis)	**<1800**	NA	NA	NA
Sr-90 (reanalysis)	**<9.2**	NA	NA	NA
DATE	April 2006	Sept 2006	Sept 2006	Sept 2006

BOLD PRINT INDICATES REPORTED LLD VALUES

* Indicates naturally occurring.

2006 TABLE B-15
CONCENTRATIONS OF RADIONUCLIDES IN FISH AND INVERTEBRATE SAMPLES
(pCi/Kg, wet ± 1σ)

#25 Downstream (Hudson River)
(indicator)

Radionuclide	STRIPED BASS	AMERICAN EEL	BLUE CRAB
Be-7*	<285.5	<333.5	<237.9
K-40*	5573±440.2	3657±319.7	2735±309.2
Mn-54	<22.91	<24.63	<18.11
Co-58	<25.12	<33.19	<28.92
Fe-59	<102	<104.7	<99.31
Co-60	<20.65	<23.31	<23.22
Zn-65	<44.8	<55.94	<54.6
Zr-95	<53.04	<56.03	<52.16
Nb-95	<54.47	<58.7	<49.71
Ru-103	<52.81	<52.31	<34.65
Ru-106	<234.2	<281.1	<206.1
I-131	<1045	<1048	<781.1
Cs-134	<23.01	<17.61	<20.57
Cs-137	<20.63	<21.9	<20.65
Ba/La-140	<236.7	<273.4	<367.4
Ce-141	<55.09	<84.61	<57.22
Ce-144	<124.00	<156.00	<85.10
Ra-226*	<388.5	1044±339.8	<299.3
Ac-228*	<79.88	102.1±65.99	<51.58
Sr-89	NA	<1100	<1200
Sr-90	NA	<7.1	<5.7
DATE	Sept 2006	Sept 2006	Sept 2006

BOLD PRINT INDICATES REPORTED LLD VALUES

* Indicates naturally occurring.

2006 TABLE B-16
CONCENTRATIONS OF GAMMA EMITTERS IN AQUATIC VEGETATION
(pCi/Kg, wet ± 1 sigma)

June 2006

Radionuclide	LENTS COVE MYRO	VERPLANK MYRO	COLD SPRING** MYRO	COLD SPRING** CYPRUS
Be-7*	109 ± 50.4	<54.7	433 ± 48.3	111 ± 36.8
K-40*	3700 ± 175	2090 ± 153	3180 ± 148	2640 ± 144
Mn-54	<6.15	<7	<5.69	<4.65
Co-58	<6.05	<8.09	<5.86	<6.3
Fe-59	<21.3	<26.3	<18.5	<17
Co-60	<9.45	<6.75	<6.54	<6.66
Zn-65	<21.3	<21.9	<18.1	<18.1
Zr-95	<13.5	<13.1	<10.9	<8.88
Nb-95	<7.66	<9.18	<6.00	<7.64
Ru-103	<6.51	<6.86	<6.20	<5.71
Ru-106	<79.40	<66.70	<68.00	<54.40
I-131	<9.72	<10.40	<9.89	<8.22
Cs-134	<5.00	<6.62	<4.45	<6.23
Cs-137	28.2 ± 4.10	<9.26	24.6 ± 3.98	<5.55
Ba/La-140	<25.80	<9.05	<8.47	<7.29
Ce-141	<10.60	<10.90	<9.62	<7.93
Ce-144	<5.72	<39.30	<39.50	<29.90
Ra-226*	411 ± 110	<134.00	260 ± 125	371 ± 87.4
Ac-228*	98.9 ± 26.0	<23.80	149 ± 23.9	<20.30

September 2006

Radionuclide	LENTS COVE MYRO	VERPLANK MYRO	COLD SPRING MYRO**
Be-7*	287.3 ± 89.25	391.6 ± 95.96	<95.44
K-40*	2791 ± 263.4	2448 ± 277.1	3089 ± 208.9
Mn-54	<10.95	<13.92	<13.05
Co-58	<12.69	<13.33	<12.21
Fe-59	<38.64	<32.45	<28.56
Co-60	<10.43	<19.20	<12.00
Zn-65	<39.80	<45.04	<13.44
Zr-95	<26.50	<23.71	<20.60
Nb-95	<13.41	<15.18	<11.46
Ru-103	<11.41	<13.16	<12.85
Ru-106	<78.78	<115.50	<106.80
I-131	<15.47	<21.48	<16.38
Cs-134	<13.61	<10.39	<9.44
Cs-137	<11.19	<10.73	<10.45
Ba/La-140	<24.65	<21.79	<10.10
Ce-141	<18.56	<16.17	<19.89
Ce-144	<61.30	<70.10	<77.40
Ra-226*	<174.70	<290.30	388 ± 188.3
Ac-228*	<49.61	118.9 ± 41.89	159.4 ± 34.29

* Indicates naturally occurring.
** Indicates control location.
*** "Less than" values expressed as Critical Level (L_c).

2006 TABLE B-17
CONCENTRATIONS OF RADIONUCLIDES IN BOTTOM SEDIMENT
(pCi/Kg, ± 1 sigma)

April 2006

Radionuclide	OFF VERPLANCK	OFF VERPLANCK	LENT'S COVE	LENT'S COVE	DISCHARGE CANAL
Be-7*	<223.4	<128.2	<309	<209.3	<199.8
K-40*	20130±681.7	15820 ± 529.4	18790±920.5	17140 ± 632.3	18420±819.4
Mn-54	<28.13	<15.06	<39.16	<24.09	<26.52
Co-58	<31.21	<18.12	<33.09	<27.83	<24.81
Fe-59	<74.05	<58.11	<110.4	<76.34	<83.12
Co-60	<23.75	<16.85	<37.21	<30.87	<30.81
Zn-65	<42.75	<25.23	<92.31	<32.98	<83.63
Zr-95	<47.28	<30.63	<75.35	<46.52	<43.19
Nb-95	<27.93	<18.68	<50.96	<21.45	<29.96
Ru-103	<27.94	<15.99	<29.49	<27.23	<22.07
Ru-106	<284	<181.2	<374.4	<282.1	<185.7
I-131	<48.23	<21.26	<46.06	<35.71	<36.34
Cs-134	<21.29	<17.43	<32.22	<32.05	<32.6
Cs-137	327.7±29.09	135.9 ± 18.05	258.6±40.95	<25.95	165±28
BaLa-140	<39.35	<28.6	<44.88	<36.49	<35.4
Ce-141	<47.05	<26.08	<50.99	<41.92	<34.45
Ce-144	<195	<107	<201	<168	<130
Ra-226*	1753±542.9	912.2 ± 304.9	1752±589.4	3584 ± 465.9	1168±360.2
AcTh-228*	924.3±114.4	553.3 ± 63.46	725.2±130.8	1534 ± 118.9	334.5±82.02

April 2006

Radionuclide	COLD SPRING	COLD SPRING	WHITE BEACH	MANITOU INLET
Be-7*	<222	<162.5	<89.22	<211.9
K-40*	34900 ± 938	36580 ± 985.6	8410 ± 361.1	14440 ± 585.3
Mn-54	<26.60	<25.09	<10.34	<25.61
Co-58	<26.10	<22.79	<10.80	<27.97
Fe-59	<83.30	<85.47	<42.61	<72.46
Co-60	<29.00	<33.89	<13.70	<23.48
Zn-65	<73.80	<83.67	<40.78	<38.42
Zr-95	<44.40	<39.80	<20.88	<49.28
Nb-95	<30.30	<25.29	<14.85	<20.33
Ru-103	<24.10	<19.52	<11.55	<28.83
Ru-106	<280.00	<295.80	<106.50	<278.20
I-131	<37.30	<31.65	<14.50	<35.74
Cs-134	<33.40	<26.12	<13.75	<29.11
Cs-137	65.7 ± 20.4	<23.74	<12.53	<28.14
BaLa-140	<33.60	<24.93	<16.39	<46.94
Ce-141	<36.20	<33.86	<18.77	<39.57
Ce-144	<149.00	<121.00	<59.00	<158.00
Ra-226*	2200 ± 446	823.6 ± 341.8	898.8 ± 186.9	3456 ± 471.5
AcTh-228*	633 ± 101	471.6 ± 92.48	111.1 ± 42.99	1359 ± 107.4

August 2006

Radionuclide	OFF VERPLANCK	DISCHARGE CANAL	LENT'S COVE	COLD SPRING
Be-7*	<502.8	<247.2	<515	<362.00
K-40*	30680±1825	18390±1034	18910±1394	34400 ± 1410
Mn-54	<59.61	<25.31	<55.66	<34.10
Co-58	<81.95	<39.6	<63.82	<46.70
Fe-59	<226.3	<100.3	<169.1	<161.00
Co-60	<58.01	<29.89	<44.08	<51.70
Zn-65	<173	<68.61	<138.3	<156.00
Zr-95	<113.3	<45.3	<122.1	<87.00
Nb-95	<77.89	<50.24	<94.26	<50.70
Ru-103	<77.24	<37.51	<73.29	<40.40
Ru-106	<566.5	<309.5	<468.9	<460.00
I-131	<137.6	<63.21	<127.6	<80.40
Cs-134	<64.86	<33.54	<59.23	<30.90
Cs-137	449 ± 44.0	261 ± 24.0	375 ± 41.4	<30.40
BaLa-140	<160.3	<42.73	<143.5	<71.90
Ce-141	<105.3	<52.76	<86.68	<58.90
Ce-144	<290.00	<197.00	<289.00	<210.00
Ra-226*	1902±903.1	<599.3	3585±910	1540 ± 624
AcTh-228*	1329±273.1	330.9±116.9	1238±217	709 ± 180
Sr-89	**<2.50**	**<4.70**	**<2.00**	**<1.80**
Sr-90	**<0.22**	**<0.22**	**<0.20**	**<0.17**

BOLD PRINT INDICATES REPORTED LLD VALUES
* Indicates naturally occurring. ** Indicates control location
*** "Less than" values expressed as Critical Level (L_c).

2006 - TABLE B-18
CONCENTRATIONS OF RADIONUCLIDES IN PRECIPITATION - 2006
(pCi/l, ± 1 sigma)

	1ST QTR 2006	2nd QTR 2006	3rd QTR 2006	4th QTR 2006
Radionuclide	**ROSETON**	**ROSETON**	**ROSETON**	**ROSETON**
Be-7*	<31.24	<60.65	<194.4	<49.53
K-40*	144.5±28.91	238.5±63.28	<42.87	290.3±60.11
Mn-54	<2.93	<5.06	<8.17	<4.17
Co-58	<3.4	<7.56	<24.02	<5.7
Fe-59	<11.79	<19.27	<48.79	<13.91
Co-60	<3.4	<5.43	<3.37	<3.48
Zn-65	<7.05	<8.4	<16.72	<10.72
Zr-95	<7.38	<12.28	<30.89	<10.94
Nb-95	<6.32	<8.25	<41.52	<9.71
Ru-103	<4.56	<9.04	<34.24	<8.26
Ru-106	<28.71	<50.57	<52.3	<45.7
I-131	<19.21	<44.1	<199.2	<47.01
Cs-134	<2.74	<5.08	<5.02	<6.34
Cs-137	<2.25	<3.83	<4.8	<4.91
BaLa-140	<16.22	<41.49	<115.7	<34.11
Ce-141	<9.14	<16.68	<64.73	<17.88
Ce-144	<18.9	<30.2	<45.4	<32.9
Ra-226*	107.7±36.23	<90.02	<91.65	<97.02
AcTh-228*	<9.76	<16.86	<12.88	<13.65
H-3	<467	<459	<456	<448

	1ST QTR 2006	2nd QTR 2006	3rd QTR 2006	4th QTR 2006
Radionuclide	**PEEKSKILL GAS HOLDER**	**PEEKSKILL GAS HOLDER**	**PEEKSKILL GAS HOLDER**	**PEEKSKILL GAS HOLDER**
Be-7*	<43.93	<50.38	<65.58	<41.45
K-40*	330±42.47	200.7±47.14	<75.09	150.2±40.18
Mn-54	<3.81	<4.19	<4.45	<2.72
Co-58	<4.81	<4.35	<6.12	<4.46
Fe-59	<18.58	<12.56	<23.69	<13.47
Co-60	<3.61	<3.04	<3.39	<3.34
Zn-65	<9.27	<8.89	<19.09	<9.32
Zr-95	<7.73	<10.26	<9.93	<9.37
Nb-95	<6.72	<11.52	<11.07	<8.98
Ru-103	<6.21	<8.09	<9.23	<5.89
Ru-106	<33.05	<36.8	<55.6	<31.9
I-131	<31.1	<30.7	<48.14	<22.55
Cs-134	<2.35	<4.3	<5.3	<3.61
Cs-137	<2.72	<2.94	<5.17	<3.54
BaLa-140	<26.2	<19.28	<43.88	<21.51
Ce-141	<10.78	<13.67	<18.8	<12.14
Ce-144	<23.4	<30.4	<35.3	<26.5
Ra-226*	<72.35	<70.17	<118.1	<65.09
AcTh-228*	<12.06	<11.67	<13.3	<9.06
H-3	<467	<459	<456	<448

* Indicates naturally occurring.
** Indicates control location.
*** "Less than" values expressed as Critical Level (L_c).

2006 - TABLE B-19
CONCENTRATIONS OF GAMMA EMITTERS IN SOIL - 2006
(pCi/Kg, ± 1 sigma)

Radionuclide	ROSETON	MET TOWER	TRAINING BLDG
Be-7*	831±212.3	<158.9	1136±190.2
K-40*	12710±704.7	7365±413.7	14550±807.7
Mn-54	<27.87	<22.2	<21.55
Co-58	<28.06	<18.02	<24.03
Fe-59	<66.3	<49.25	<94.95
Co-60	<36.18	<18.85	<25.81
Zn-65	<34.56	<53.18	<76.91
Zr-95	<43.38	<30.31	<45.06
Nb-95	<35.23	<17.23	<31.03
Ru-103	<25.81	<20.4	<23.03
Ru-106	<272.8	<186.8	<211.2
I-131	<34.72	<21.36	<31.13
Cs-134	<26.23	<17.11	<15.94
Cs-137	<26.51	<22.1	<33.74
Ba/La-140	<27.36	<15.18	<35.06
Ce-141	<43.15	<31.68	<37.85
Ce-144	<176	<143	<136
Ra-226*	1329±596.6	<406.4	<571.3
Ac-228*	826.9±110.5	260.8±56.06	360±105.7

* Indicates naturally occurring.

** Indicates control location.

*** "Less than" values expressed as Critical Level (L_c).

2006 TABLE B-20
RADIOACTIVITY CONCENTRATIONS IN SPECIAL WATER - EXISTING ODCM LOCATIONS
(pCi/L ± 1σ)

Jan 2006

ISOTOPE	ALGONQUIN OUTFALL	GYPSUM PLANT STREAM	TRAP ROCK QUARRY	5TH STREET WELL
GROSS BETA	10.59 ± 0.84	9.10 ± 1.30	3.72 ± 0.60	5.96 ± 0.62
Be-7*	<26.16	<36.63	<17.27	<29.95
K-40*	177.9±46.27	287.7±50.55	146.9±29.52	218.5±45.36
Mn-54	<4.75	<4.79	<2.08	<3.77
Co-58	<4.9	<4.15	<2.41	<4.18
Fe-59	<7.03	<8.12	<5.6	<10.84
Co-60	<3.2	<4.27	<2.37	<3.94
Zn-65	<9.56	<5.9	<5.76	<4.92
Zr-95	<5.54	<5.39	<3.6	<6.12
Nb-95	<4.82	<2.6	<2.22	<2.71
Ru-103	<3.53	<4.01	<2.66	<3.94
Ru-106	<35.93	<40.37	<19.93	<35.6
I-131	<5.09	<6.7	<2.55	<0.27
Cs-134	<3.69	<5.5	<2.63	<3.57
Cs-137	<4.19	<4.32	<2.54	<4.91
Ba/La-140	<4.44	<5.53	<2.33	<5.56
Ce-141	<5.79	<7.82	<3.93	<6.28
Ce-144	<22.80	<30.60	<16.00	<23.40
Ra-226*	<73.02	<109.4	16.9	214.2±66.45
Ac-228*	<11.43	<12.44	<8.7	<16.64
H-3	<469	<469	<469	NA

Feb 2006

ISOTOPE	ALGONQUIN OUTFALL	GYPSUM PLANT STREAM	TRAP ROCK QUARRY	WATER METER	5TH STREET WELL GSA
GROSS BETA	6.23 ± 0.71	10.60 ± 0.76	3.02 ± 0.59	0.97 ± 0.41	3.66 ± 0.54
Be-7*	<25.42	<36	<18.38	<18.66	<23.65
K-40*	115±26.56	421.7±42.62	201.3±34.58	177.3±40.03	142.2±32.89
Mn-54	<2.79	<4.44	<2.46	<3.35	<3.01
Co-58	<2.86	<2.08	<2.13	<3.56	<2.68
Fe-59	<7.4	<9.65	<8.8	<7.53	<8
Co-60	<2.53	<4.3	<2.11	<3.53	<3.12
Zn-65	<4.13	<5.58	<6.6	<8.21	<5.33
Zr-95	<4.98	<6.98	<4.47	<4.52	<4.49
Nb-95	<2.1	<3.09	<2.52	<2.91	<2.01
Ru-103	<2.67	<4.37	<3.12	<2.97	<3.19
Ru-106	<32.64	<34.53	<22.52	<35.3	<40.36
I-131	<2.65	<4.5	<2.73	<4.12	0.55
Cs-134	<2.63	<2.78	<1.46	<3.07	<3.15
Cs-137	<3.35	<2.32	<3.15	<3.31	<2.93
Ba/La-140	<4.02	<4.9	<3.1	<4.73	<4.07
Ce-141	<4.78	<8.72	<4.18	<4.87	<5.5
Ce-144	<20.70	<36.60	<16.50	<17.50	<22.00
Ra-226*	<73.25	272.4±93.91	<64.25	138.9±56.48	<79.63
Ac-228*	<9.01	<15.72	<9.95	<9.51	<10.59
H-3	<469	<469	<469	<469	<460

* Indicates naturally occurring.
** "Less than" values expressed as Critical Level (L_c).
*** Indicates the average of the positive sample results reported for samples with recounts performed.

2006 TABLE B-20
RADIOACTIVITY CONCENTRATIONS IN SPECIAL WATER - EXISTING ODCM LOCATIONS
(pCi/L ± 1σ)

Feb (2) 2006

ISOTOPE	ALGONQUIN OUTFALL	GYPSUM PLANT STREAM	TRAP ROCK QUARRY
GROSS BETA	6.84 ± 1.16	12.17 ± 1.43	10.36 ± 0.77
Be-7*	<24.62	<31.96	<31.38
K-40*	185.7±31.84	<39.73	422.3±45.98
Mn-54	<2.93	<3.69	<3.17
Co-58	<3.63	<2.02	<3.02
Fe-59	<8.93	<10.13	<10.69
Co-60	<3.23	<3.95	<3.84
Zn-65	<4.27	<5.49	<8.49
Zr-95	<5.12	<6.58	<4.75
Nb-95	<2.45	<3.84	<3.28
Ru-103	<3.5	<3.53	<3.46
Ru-106	<24.37	<40.28	<31.44
I-131	<3.3	<4.33	<3.4
Cs-134	<3.66	<3.83	<3.14
Cs-137	<3.21	<2.21	<3.07
Ba/La-140	<4.09	<5.42	<4.61
Ce-141	<6.19	<7.71	<5.79
Ce-144	<25.80	<32.80	<22.30
Ra-226*	<86.48	<95.77	146.7±67.26
Ac-228*	<12.2	<13.92	<9.69
H-3	<454	<454	<454

Mar 2006

ISOTOPE	ALGONQUIN OUTFALL	GYPSUM PLANT STREAM	TRAP ROCK QUARRY	5TH STREET WELL GSA
GROSS BETA	2.57 ± 1.07	5.73 ± 1.25	6.77 ± 0.69	6.54 ± 0.60
Be-7*	<17.99	<12.9	<20.24	<31.72
K-40*	365.3±33.68	171.1±20.21	135.8±26.66	410.5±47.62
Mn-54	<2.51	<1.43	<2.22	<4.54
Co-58	<2.62	<1.45	<2.29	<3.95
Fe-59	<6.56	<5.78	<5.94	<8.85
Co-60	<2.9	<2.02	<2.9	<3.93
Zn-65	<3.1	<2.84	<3.57	<5.43
Zr-95	<4.04	<3.72	<5.57	<5.81
Nb-95	<1.67	<1.99	<3.19	<2.48
Ru-103	<2.53	<2.35	<2.34	<4.06
Ru-106	<26.73	<22.09	<27.7	<32.57
I-131	<2.85	<2.94	<2.86	<0.28
Cs-134	<2.47	<1.55	<2.28	<2.57
Cs-137	<2.6	<1.3	<2.49	<4.9
Ba/La-140	<3.36	<2.77	<3.46	<3.83
Ce-141	<4.02	<5.58	<3.81	<7.51
Ce-144	<17.30	<24.30	<16.70	<30.50
Ra-226*	<67.35	<73.36	<57.69	<96.99
Ac-228*	<9.17	<8.38	<8.71	<13.81
H-3	<463	<463	<463	<466

* Indicates naturally occurring.
** "Less than" values expressed as Critical Level (L_c).
*** Indicates the average of the positive sample results reported for samples with recounts performed.

2006 TABLE B-20
RADIOACTIVITY CONCENTRATIONS IN SPECIAL WATER - EXISTING ODCM LOCATIONS
(pCi/L ± 1σ)

Apr 2006

ISOTOPE	ALGONQUIN OUTFALL	GYPSUM PLANT STREAM	TRAP ROCK QUARRY	5TH STREET WELL MONTHLY
GROSS BETA	4.9 ± 1.0	7.1 ± 1.2	8.0 ± 0.7	8.3 ± 0.7
Be-7*	<32.3	<36.01	<17.17	<24.46
K-40*	141.8±42.38	177±35.41	153.2±24.91	350.5±41.36
Mn-54	<3.48	<3.37	<2.41	<3.29
Co-58	<3.35	<2.62	<1.8	<3.59
Fe-59	<10.81	<11.28	<4.6	<9.25
Co-60	<3.27	<3.88	<2.36	<3.53
Zn-65	<5.04	<5.17	<6.18	<4.26
Zr-95	<6.3	<6.42	<4.24	<5.74
Nb-95	<4.59	<3.05	<2.35	<2.13
Ru-103	<3.82	<3.81	<2.45	<3.28
Ru-106	<32.74	<38.64	<24.92	<32.55
I-131	<3.86	<5.17	<2.34	<0.29
Cs-134	<4.07	<2.91	<1.85	<1.95
Cs-137	<3.98	<2.54	<2.46	<3.2
Ba/La-140	<5.04	<4.41	<2.61	<3.6
Ce-141	<6.42	<8.02	<3.58	<5.82
Ce-144	<21.50	<35.00	<16.20	<23.00
Ra-226*	<81.46	<123.8	132.6±38.88	<75.65
Ac-228*	<14.83	<16.61	<8.52	<12.56
H-3	<451	<451	<451	<461

May 2006

ISOTOPE	ALGONQUIN OUTFALL	GYPSUM PLANT STREAM	TRAP ROCK QUARRY	5TH STREET WELL GSA
GROSS BETA	6.6 ± 1.1	6.3 ± 1.2	8.7 ± 0.7	7.8 ± 0.7
Be-7*	<20.91	<33.46	<14.92	<35.1
K-40*	150.4±31.57	252.8±40.87	107.9±19.98	<40.62
Mn-54	<2.52	<4.16	<2.06	<4.45
Co-58	<2.77	<4.47	<2.06	<4.46
Fe-59	<7.22	<9.91	<5.35	<7.05
Co-60	<2.97	<3.87	<2.46	<3.37
Zn-65	<2.83	<5.08	<5.68	<3.97
Zr-95	<5.22	<6.75	<3.66	<5.72
Nb-95	<3.88	<3.11	<2.08	<2.53
Ru-103	<2.8	<4.11	<2.02	<3.68
Ru-106	<29.32	<39.06	<23.6	<38.52
I-131	<3.31	<4.44	<2.69	<0.41
Cs-134	<2.87	<2.72	<1.48	<2.32
Cs-137	<2.01	<3.85	<2.2	<3.86
Ba/La-140	<3.62	<6.05	<2.16	<5.38
Ce-141	<4.85	<7.16	<3.91	<8.36
Ce-144	<21.00	<30.30	<16.70	<36.90
Ra-226*	<69.34	<110.3	<55.11	<116.2
Ac-228*	<10.5	<16.52	14.17±5.81	<15.4
H-3	<446	<446	<446	<466

* Indicates naturally occurring.

** "Less than" values expressed as Critical Level (L_c).

*** Indicates the average of the positive sample results reported for samples with recounts performed.

2006 TABLE B-20
RADIOACTIVITY CONCENTRATIONS IN SPECIAL WATER - EXISTING ODCM LOCATIONS
(pCi/L ± 1σ)

Jun 2006

ISOTOPE	ALGONQUIN OUTFALL	GYPSUM PLANT STREAM	TRAP ROCK QUARRY	5TH STREET WELL GSA
GROSS BETA	5.3 ± 1.1	17.2 ± 1.5	7.9 ± 0.7	7.6 ± 0.7
Be-7*	<22.37	<21.92	<18.8	<19.95
K-40*	305.6±36.61	165.1±32.1	<34.77	161.5±27.97
Mn-54	<2.73	<2.59	<2.53	<2.32
Co-58	<2.58	<2.53	<2.26	<2.45
Fe-59	<6.12	<8.24	<6.69	<7
Co-60	<2.34	<3.02	<2.53	<1.82
Zn-65	<3.47	<5.13	<3.22	<5.54
Zr-95	<4.19	<5.12	<3.54	<3.91
Nb-95	<2.78	<2.26	<2.54	<4.24
Ru-103	<2.77	<3.15	<2.99	<3.26
Ru-106	<28.04	<27.42	<25.79	<25.33
I-131	<3.43	<3.42	<3.12	<0.33
Cs-134	<2.53	<2.89	<2.3	<2.72
Cs-137	<3.43	<2.5	<2.59	<2.83
Ba/La-140	<3.8	<3.49	<3.56	<3.94
Ce-141	<4.68	<3.97	<4.42	<4.53
Ce-144	<21.80	<17.40	<17.50	<18.60
Ra-226*	<75.78	95.41±49.95	158.1±44.89	<55.92
Ac-228*	<8.48	<9.49	<9.03	<8.34
H-3	<459	<459	<459	NA

Jul 2006

ISOTOPE	ALGONQUIN OUTFALL	GYPSUM PLANT STREAM	TRAP ROCK QUARRY	5TH STREET WELL GSA
GROSS BETA	6.1 ± 1.2	5.4 ± 0.7	6.0 ± 0.7	8.8 ± 0.7
Be-7*	<19.46	<19.48	<13.85	<34.04
K-40*	281.9±28.04	350±35.55	129.3±22.08	378.1±43.99
Mn-54	<2.44	<2.85	<1.61	<4
Co-58	<2.48	<1.88	<2.16	<4.29
Fe-59	<5.21	<6.21	<5.42	<9.06
Co-60	<2.23	<3.34	<2.24	<4.56
Zn-65	<3.09	<6.84	<5.28	<5.47
Zr-95	<4.6	<3.92	<3.34	<6.82
Nb-95	<1.73	<3.06	<2.06	<2.5
Ru-103	<2.79	<3.01	<2.35	<3.84
Ru-106	<21.92	<30.91	<22.96	<35.21
I-131	<2.67	<3.03	<2.2	<0.32
Cs-134	<2.46	<1.81	<2.29	<2.33
Cs-137	<2.63	<2.34	<2.01	<2.32
Ba/La-140	<2.99	<3.92	<2.94	<4.78
Ce-141	<4.68	<4.24	<3.3	<6.71
Ce-144	<19.50	<19.00	<15.10	<28.80
Ra-226*	67.68±40.21	132.7±55.11	98.04±36.67	<102.4
Ac-228*	<8.55	<9.71	<7.67	<15.67
H-3	<458	<458	<458	NA

* Indicates naturally occurring.
** "Less than" values expressed as Critical Level (L_c).
*** Indicates the average of the positive sample results reported for samples with recounts performed.

2006 TABLE B-20
RADIOACTIVITY CONCENTRATIONS IN SPECIAL WATER - EXISTING ODCM LOCATIONS
(pCi/L ± 1σ)

Aug 2006

ISOTOPE	ALGONQUIN OUTFALL	GYPSUM PLANT STREAM	TRAP ROCK QUARRY	5TH STREET WELL GSA
GROSS BETA				8.3 ± 0.7
Be-7*	<24.75	<30.89	<25.46	<30.48
K-40*	296.4±45.24	62.95±35.97	342.2±40.29	178.9±41.26
Mn-54	<3.48	<3.66	<2.25	<2.91
Co-58	<3.86	<3.74	<2.41	<4.63
Fe-59	<8.95	<9.78	<7.18	<7.96
Co-60	<3.84	<3.8	<3.77	<2.78
Zn-65	<4.22	<4.27	<6.31	<5.42
Zr-95	<5.93	<6.6	<5.03	<6.56
Nb-95	<3.48	<2.94	<2.86	<2.23
Ru-103	<3.38	<3.93	<3.4	<3.67
Ru-106	<35.95	<41.09	<25.78	<44.73
I-131	<3.98	<5.02	<3.23	<0.38
Cs-134	<2.06	<3.89	<3.04	<4.24
Cs-137	<3.82	<2.13	<3.13	<4.14
Ba/La-140	<3.64	<5.26	<4.5	<4.63
Ce-141	<5.58	<7.5	<5.02	<7.95
Ce-144	<22.30	<31.50	<19.40	<28.90
Ra-226*	<81.68	149.4±80.59	<75.9	<105.5
Ac-228*	<15.62	<14.66	<10.27	<14.01
H-3	<445	<445	<445	NA

Sep 2006

ISOTOPE	ALGONQUIN OUTFALL	GYPSUM PLANT STREAM	TRAP ROCK QUARRY	5TH STREET WELL GSA
GROSS BETA	5.3 ± 1.2	6.2 ± 1.3	3.5 ± 0.5	7.6 ± 0.7
Be-7*	<24.75	<30.89	<25.46	<30.26
K-40*	296.4±45.24	62.95±35.97	342.2±40.29	294.6±46.97
Mn-54	<3.48	<3.66	<2.25	<3.72
Co-58	<3.86	<3.74	<2.41	<3.33
Fe-59	<8.95	<9.78	<7.18	<8.19
Co-60	<3.84	<3.8	<3.77	<3.63
Zn-65	<4.22	<4.27	<6.31	<5.11
Zr-95	<5.93	<6.6	<5.03	<6.71
Nb-95	<3.48	<2.94	<2.86	<3.23
Ru-103	<3.38	<3.93	<3.4	<3.97
Ru-106	<35.95	<41.09	<25.78	<40.41
I-131	<3.98	<5.02	<3.23	<0.38
Cs-134	<2.06	<3.89	<3.04	<3.02
Cs-137	<3.82	<2.13	<3.13	<3.49
Ba/La-140	<3.64	<5.26	<4.5	<3.82
Ce-141	<5.58	<7.5	<5.02	<6.27
Ce-144	<22.30	<31.50	<19.40	<27.30
Ra-226*	<81.68	149.4±80.59	<75.9	<105
Ac-228*	<15.62	<14.66	<10.27	<12.44
H-3	<445	<445	<445	NA

* Indicates naturally occurring.

** "Less than" values expressed as Critical Level (L_c).

*** Indicates the average of the positive sample results reported for samples with recounts performed.

2006 TABLE B-20
RADIOACTIVITY CONCENTRATIONS IN SPECIAL WATER - EXISTING ODCM LOCATIONS
(pCi/L ± 1σ)

Oct 2006

ISOTOPE	ALGONQUIN OUTFALL	GYPSUM PLANT STREAM	TRAP ROCK QUARRY	IP 5TH STREET WELL GSA
GROSS BETA	15.5 ± 1.5	5.8 ± 1.2	3.0 ± 0.5	7.5 ± 0.7
Be-7*	<23.03	<30.14	<27.61	<27.22
K-40*	257.2±43.05	185.4±40.17	202.9±43.66	137±25.91
Mn-54	<3.44	<4.29	<2.8	<2.82
Co-58	<3.27	<2.49	<3.37	<3.06
Fe-59	<11.56	<9.39	<8.6	<6.33
Co-60	<3.6	<4.51	<3.12	<2.83
Zn-65	<3.76	<5.47	<7.44	<3.83
Zr-95	<5.43	<6.62	<5.65	<5.07
Nb-95	<4.37	<3.11	<3.76	<2.29
Ru-103	<3.4	<4.01	<3.9	<2.85
Ru-106	<35.35	<39.27	<26.05	<28.43
I-131	<3.9	<4.63	<3.27	<0.40
Cs-134	<2.59	<3.7	<4.5	<2.18
Cs-137	<3.52	<3.73	<3.21	<1.8
Ba/La-140	<5.11	<3.71	<3.88	<2.66
Ce-141	<5.49	<7.8	<5.25	<6.27
Ce-144	<21.90	<33.30	<19.60	<28.00
Ra-226*	<91.8	<105.2	<70.63	<84.19
Ac-228*	<12.03	<13.85	<9.94	<10.84
H-3	<456	<456	<456	NA

Nov 2006

ISOTOPE	ALGONQUIN OUTFALL	GYPSUM PLANT STREAM	TRAP ROCK QUARRY	IP 5TH STREET WELL GSA
GROSS BETA	3.9 ± 1.1	12.7 ± 1.4	7.3 ± 0.7	8.7 ± 0.7
Be-7*	<27.91	<22.86	<18.89	<23.12
K-40*	106.8±29.75	159.8±35.08	295.5±34.84	115.3±22.3
Mn-54	<2.99	<2.86	<2.68	<2.58
Co-58	<2.67	<2.02	<2.41	<2.58
Fe-59	<8.31	<7.03	<5.46	<5.97
Co-60	<3.56	<2.66	<2.59	<2.61
Zn-65	<3.37	<6.26	<3	<3.4
Zr-95	<5.26	<3.89	<4.37	<4.35
Nb-95	<1.95	<3.21	<3.05	<2.03
Ru-103	<3.08	<2.66	<3.05	<2.96
Ru-106	<25.27	<31.14	<27.56	<28.89
I-131	<3.4	<2.83	<2.7	<0.35
Cs-134	<2.97	<1.78	<2.58	<1.94
Cs-137	<2.54	<3.14	<2.78	<2.76
Ba/La-140	<3.26	<2.8	<2.72	<3.13
Ce-141	<5.17	<3.66	<4.65	<6.12
Ce-144	<20.90	<17.00	<20.40	<27.00
Ra-226*	<76.61	<65.4	<68.2	<73.76
Ac-228*	<9.31	<7.17	<9.37	<8.96
H-3	<449	<449	<449	NA

* Indicates naturally occurring.
** "Less than" values expressed as Critical Level (L_c).
*** Indicates the average of the positive sample results reported for samples with recounts performed.

2006 TABLE B-20
RADIOACTIVITY CONCENTRATIONS IN SPECIAL WATER - EXISTING ODCM LOCATIONS
(pCi/L $\pm$ 1σ)

Dec 2006

ISOTOPE	ALGONQUIN OUTFALL	GYPSUM PLANT STREAM	TRAP ROCK QUARRY	IP 5TH STREET WELL GSA
GROSS BETA	6.5 ± 1.2	10.0 ± 1.3	9.2 ± 0.7	8.0 ± 0.7
Be-7*	<24.09	<33.63	<21.89	<29.62
K-40*	180.8±28.14	305.4±48.22	182.4±38.94	138.3±37.12
Mn-54	<3.04	<2.83	<1.99	<3.64
Co-58	<2.82	<3.75	<3.14	<4.34
Fe-59	<6.61	<10	<6.98	<9.12
Co-60	<2.62	<3.97	<2.68	<4.05
Zn-65	<4.8	<7.43	<6.81	<4.12
Zr-95	<5.17	<4.54	<5.18	<6.52
Nb-95	<3.43	<4.32	<3.23	<2.73
Ru-103	<3.26	<4.01	<3.68	<3.32
Ru-106	<28.62	<37.89	<29.32	<41.99
I-131	<3.37	<3.67	<4.24	<0.39
Cs-134	<1.91	<2.23	<2.23	<4.87
Cs-137	<2.86	<3.52	<2.82	<3.74
Ba/La-140	<3.33	<3.46	<3.33	<3.91
Ce-141	<4.07	<7.05	<5	<7
Ce-144	<27.10	<27.90	<25.10	<31.10
Ra-226*	<79.98	<102.3	<77.29	<107.5
Ac-228*	<9.76	<13.13	<10.67	<12.07
H-3	<449	<449	<449	NA

Dec (2) 2006

ISOTOPE	ALGONQUIN OUTFALL	GYPSUM PLANT STREAM	TRAP ROCK QUARRY
GROSS BETA	7.7 ± 1.2	13.5 ± 1.3	9.3 ± 0.7
Be-7*	<25.98	<23.72	<29.34
K-40*	160.2±37.61	159.2±26.75	255.7±39.96
Mn-54	<3.11	<1.98	<3.41
Co-58	<4.03	<2.51	<3.22
Fe-59	<5.39	<6.69	<10.06
Co-60	<3.05	<3.01	<2.9
Zn-65	<7.54	<8.11	<6.32
Zr-95	<4.77	<5.06	<5.15
Nb-95	<4.92	<3.06	<4.15
Ru-103	<3.09	<2.85	<3.37
Ru-106	<33.58	<28.49	<34.44
I-131	<5.1	<3.75	<3.42
Cs-134	<3.25	<2.1	<3.8
Cs-137	<3.07	<3.05	<2.36
Ba/La-140	<4.5	<4.18	<4.27
Ce-141	<5.6	<5.51	<6.25
Ce-144	<20.80	<23.90	<25.10
Ra-226*	<71.88	<68.8	<87.41
Ac-228*	<10.36	<7.92	<12.45
H-3	<449	<448	<449

* Indicates naturally occurring.
** "Less than" values expressed as Critical Level (L_c).
*** Indicates the average of the positive sample results reported for samples with recounts performed.

2006 TABLE B-21
RADIOACTIVITY CONCENTRATIONS IN SPECIAL WATER - NEW ODCM LOCATIONS
(pCi/L ± 1σ)

Monitoring Well #40 (MW-40)

ISOTOPE	2/9/06	4/11/06	5/22/06	6/20/06	7/5/06
Be-7	<38.02	<25.84	<24.37	<23.86	<41.21
K-40	159.8±34.43	132 ± 34.5	145.2±23.42	213.1±37.41	112.2±33.1
Mn-54	<2.41	<2.78	<2.53	<2.95	<2.33
Co-58	<3.53	<2.75	<2.34	<2.89	<2.11
Fe-59	<8.71	<9.6	<6.89	<10.76	<10.93
Co-60	<4.03	<4.12	<2.46	<4.92	<3.65
Zn-65	<6.02	<5.3	<3.09	<5.15	<5.83
Zr-95	<6.47	<7.12	<4.58	<6.83	<6.77
Nb-95	<4.18	<2.59	<2.13	<2.55	<4.09
Ru-103	<4.38	<4.33	<2.9	<3.9	<4.86
Ru-106	<35.83	<41.9	<24.66	<40.52	<42.21
I-131	<6.56	<5.84	<4.77	<5.57	<7.05
Cs-134	<4.22	<3.01	<1.92	<4.58	<3.01
Cs-137	<2.22	<2.56	<1.54	<2.46	<2.48
Ba/La-140	<6.03	**<5.26**	<4.11	<5.72	<5.69
Ce-141	<8.87	<11.7	<5.29	<9.25	<11.52
Ce-144	<33.90	<49.2	<21.00	<33.50	<43.70
Ra-226	<109.4	<151.6	<71.64	<125.4	<133.3
Ac-228	<14.47	<16.25	<8.98	<17.51	<13.66
H-3	<473	<452	<446	<499	<452
Sr-89	NA	**<62**	**<14**	**<180**	**<24**
Sr-90	NA	0.49 ± 0.13	0.65 ± 0.12	**<4.1**	**<0.89**

Monitoring Well #40 (MW-40)

ISOTOPE	7/11/06	8/9/06	9/12/06	11/21/06	12/6/06
Be-7	<21.57	<25.21	<20.37	<18.92	<41.95
K-40	308.5±40.51	139.7±31.81	92.2 ± 29.4	148 ± 24.5	<42.42
Mn-54	<2.52	<2.48	<2.19	<2.94	<2.50
Co-58	<2.44	<2.39	<2.36	<1.68	<2.52
Fe-59	<10.9	<10.33	<9.70	<8.02	<10.72
Co-60	<4.73	<4.01	<3.71	<2.49	<3.86
Zn-65	<5.78	<5.94	<4.84	<4.09	<5.63
Zr-95	<7.09	<6.69	<6.74	<5.33	<7.03
Nb-95	<2.54	<2.5	<2.98	<2.79	<3.15
Ru-103	<4.12	<4.69	<3.97	<3.24	<4.40
Ru-106	<39.08	<40.1	<32.80	<28.94	<37.52
I-131	<5.38	<6.86	<6.10	<6.82	<6.20
Cs-134	<3.16	<2.93	<3.91	<2.11	<3.93
Cs-137	<2.58	<2.47	<2.18	<1.72	<2.58
Ba/La-140	<5.86	<5.47	<5.92	<5.12	<5.68
Ce-141	<8.64	<11.31	<8.25	<7.98	<9.72
Ce-144	<36.30	<45.40	<32.40	<29.60	<38.00
Ra-226	<133.6	<129	<103.30	<84.88	<137.80
Ac-228	<16.18	<14.46	<14.69	<9.46	<16.00
H-3	<452	<447	<452	<450	<460
Sr-89	NA	**<27**	**<53**	NA	NA
Sr-90	0.68 ± 0.11	**<0.73**	**<0.75**	**<0.78**	1.26 ± 0.26

BOLD PRINT INDICATES REPORTED LLD VALUES

* Indicates naturally occurring.

** "Less than" values expressed as Critical Level (L_c).

*** Avg of positive results for recounts

2006 TABLE B-21
RADIOACTIVITY CONCENTRATIONS IN SPECIAL WATER - NEW ODCM LOCATIONS
(pCi/L ± 1σ)

Monitoring Well #51 (MW-51)

ISOTOPE	4/11/06	5/30/06	6/20/06	7/5/06	7/10/06
Be-7	<32.64	<26.28	<22.49	<18.9	<39.39
K-40	153.1 ± 26.9	73.76±33.3	132.6±32.39	292.3±36.79	178.2±41.87
Mn-54	<2.15	<2.74	<2.57	<3.89	<2.89
Co-58	<2.37	<2.95	<2.74	<2.08	<2.9
Fe-59	<8.76	<10.18	<10.47	<9.85	<11.51
Co-60	<3.4	<4.38	<4.31	<4.11	<4.94
Zn-65	<4.54	<5.42	<5.03	<4.68	<6.74
Zr-95	<6.23	<7.27	<7.16	<6.85	<5.16
Nb-95	<3.02	<2.76	<3.08	<2.79	<3.29
Ru-103	<3.84	<4.46	<4.32	<3.8	<4.87
Ru-106	<34.18	<44.28	<37.97	<34.6	<43.15
I-131	<6.57	<6.29	<4.94	<6.59	<6.7
Cs-134	<2.45	<3.1	<4.26	<2.61	<4.78
Cs-137	<1.96	<2.56	<2.61	<2.01	<2.57
Ba/La-140	<5.55	<5.69	<5.83	<6.63	<6.61
Ce-141	<9.51	<12.14	<9.06	<7.87	<10.83
Ce-144	<38.4	<51.30	<38.30	<30.00	<43.60
Ra-226	<113.9	<159.6	<121.9	<107.4	<142.4
Ac-228	<13.04	<17.49	<16.95	<13.55	<17.77
H-3	<452	<446	<499	<452	<452
Sr-89	**<39**	**<26**	**<32**	**<31**	NA
Sr-90	**<0.45**	**<0.43**	**<0.71**	**<0.89**	**<1.5**

Monitoring Well #51 (MW-51)

ISOTOPE	8/10/06	9/12/06	11/21/06	12/6/06
Be-7	<21.58	<21.93	<18.31	<23.14
K-40	185±34.09	189 ± 38.8	129 ± 27.1	<49.48
Mn-54	<2.48	<2.70	<2.69	<2.21
Co-58	<2.36	<2.58	<2.17	<2.32
Fe-59	<10.54	<10.66	<8.15	<9.30
Co-60	<4.79	<4.41	<3.14	<3.64
Zn-65	<5.88	<5.16	<4.16	<5.24
Zr-95	<7.13	<6.92	<5.91	<6.37
Nb-95	<2.52	<2.67	<2.69	<2.15
Ru-103	<4.1	<3.89	<3.64	<4.39
Ru-106	<39.35	<39.10	<28.27	<35.88
I-131	<6.06	<7.24	<6.95	<7.04
Cs-134	<3.1	<3.90	<3.22	<2.91
Cs-137	<2.3	<2.11	<1.95	<2.53
Ba/La-140	<6.21	<6.69	<6.12	<5.35
Ce-141	<8.83	<9.11	<7.37	<11.19
Ce-144	<35.80	<31.60	<26.30	<44.70
Ra-226	<129	<114.50	<84.05	<123.20
Ac-228	<16.4	<15.81	<11.33	<15.90
H-3	<447	<452	<450	<460
Sr-89	**<26**	**<53**	NA	NA
Sr-90	**<0.72**	**<0.78**	**<0.75**	0.84 ± 0.26

BOLD PRINT INDICATES REPORTED LLD VALUES

* Indicates naturally occurring.
** "Less than" values expressed as Critical Level (L_c).
*** Avg of positive results for recounts

TABLE B-22
MILCH ANIMAL CENSUS
2006

THERE ARE NO ANIMALS PRODUCING MILK FOR HUMAN CONSUMPTION WITHIN FIVE MILES OF INDIAN POINT.

TABLE B-23
LAND USE CENSUS
2006

A comprehensive survey of the of the 5 mile (8 kilometer) area surrounding the Indian Point Site was conducted during the 2006 Spring, Summer and Fall months in accordance with the ODCM Section D 3.5 *Radiological Environmental Monitoring Land Use Census*
Methodology:

Visual inspections were made of the 5-mile area around the Indian Point Site during routine sample collections and emergency plan equipment inspections in the area throughout the year.

Obtained information from the New York Agricultural Statistic Service on milching animals within the 5-mile area surrounding Indian Point Energy Center.

An extensive land survey was conducted of the 5-mile area in an attempt to identify new residential areas, commercial developments and to identify milch animals in pasture. Previous locations were visited and verified by dispatching Nuclear Environmental Technicians to the various locations.

Note: This was done while performing quarterly environmental badge change out and field inspections through out the 4 surrounding counties.

• Orange County was surveyed during through the summer and fall.

• Rockland County was surveyed during summer and fall with approx.

• Putnam County was surveyed during the summer and fall.

• Westchester County was surveyed during the summer and summer and fall.

Note: An aerial survey was not conducted of the 5-mile area this year.

Results:

The 2006 land use census indicated there were no new residences that were closer in proximity to IPEC.
NEM performed a complete nearest residence survey with updated distances.
No milch animals were observed during this reporting period within the 5-mile zone or listed in the New York Agricultural Statistic Service.

TABLE B-23
LAND USE CENSUS
2006

INDIAN POINT ENERGY CENTER

UNRESTRICTED AREA BOUNDARY
AND NEAREST RESIDENCES 2006

Sector	Compass Point	Distance to site Boundary from Unit 2 Plant Vent (meters)	Distance to site Boundary from Unit 3 Plant Vent (meters)	Distance to nearest resident, from Unit 1 superheater (meters)	Address of nearest resident, Dec 2004 Census
1	N	RIVER	RIVER	1788.1	41 River Road Tomkins Cove
2	NNE	RIVER	RIVER	3111.3	Chateau Rive Apts. John St. Peekskill
3	NE	550	636	1907.3	122 Lower South St. Peekskill
4	ENE	600	775	1478.2	1018 Lower South St. Peekskill
5	E	662	785	1370.9	1103 Lower South St. Peekskill
6	ESE	569	622	715.2	461 Broadway Buchanan
7	SE	553	564	1168.2	223 First St. Buchanan
8	SSE	569	551	1239.7	5 Pheasant's Run Buchanan
9	S	700	566	1132.5	320 Broadway Verplanck
10	SSW	755	480	1573.5	240 Eleventh St. Verplanck
11	SW	544	350	3015.9	29 Church St. Tomkins Cove
12	WSW	RIVER	RIVER	2169.6	9 West Shore Dr. Tomkins Cove
13	W	RIVER	RIVER	1918.7	712 Rt. 9W Tomkins Cove
14	WNW	RIVER	RIVER	1752.4	770 Rt. 9W Tomkins Cove
15	NW	RIVER	RIVER	1692.7	807 Rt. 9W Tomkins Cove
16	NNW	RIVER	RIVER	1609.3	4 River Rd. Tomkins Cove

APPENDIX C

HISTORICAL TRENDS

APPENDIX C

The past ten years of historical data for various radionuclides and media are presented both in tabular form and in graphical form to facilitate the comparison of 2006 data with historical values. Although other samples were taken and analyzed, values were only tabulated and plotted where positive indications were present. Averaging only the positive values in these tables can result in a biased high value, especially, when the radionuclide is detected in only one or two quarters for the year.

TABLE C-1

DIRECT RADIATION ANNUAL SUMMARY
1996 - 2006

Average Quarterly Dose (mR/Quarter)			
Year	Inner Ring	Outer Ring	Control Location
1996	14.0	14.0	16.0
1997	15.0	15.0	18.0
1998	14.0	15.0	16.0
1999	15.0	15.0	16.0
2000	14.0	15.0	16.0
2001	15.0	15.0	17.0
2002	15.0	15.0	14.0
2003	14.3	13.9	14.7
2004	13.0	13.0	14.0
2005	14.1	14.1	15.9
2006	13.9	14.3	17.5
Historical Average 1996-2005	14.3	14.5	15.9

FIGURE C-1
DIRECT RADIATION
1996 to 2006

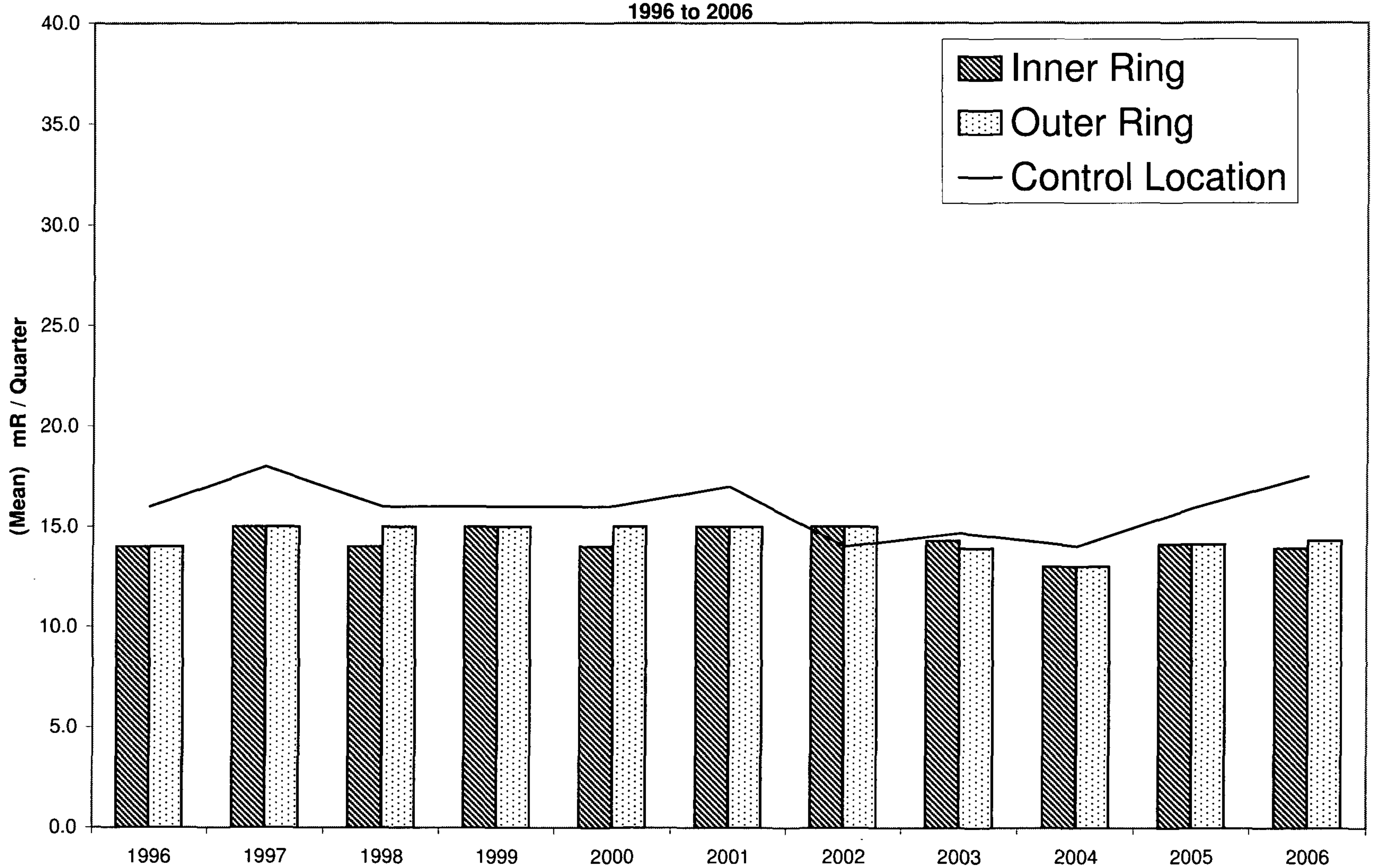


TABLE C-2

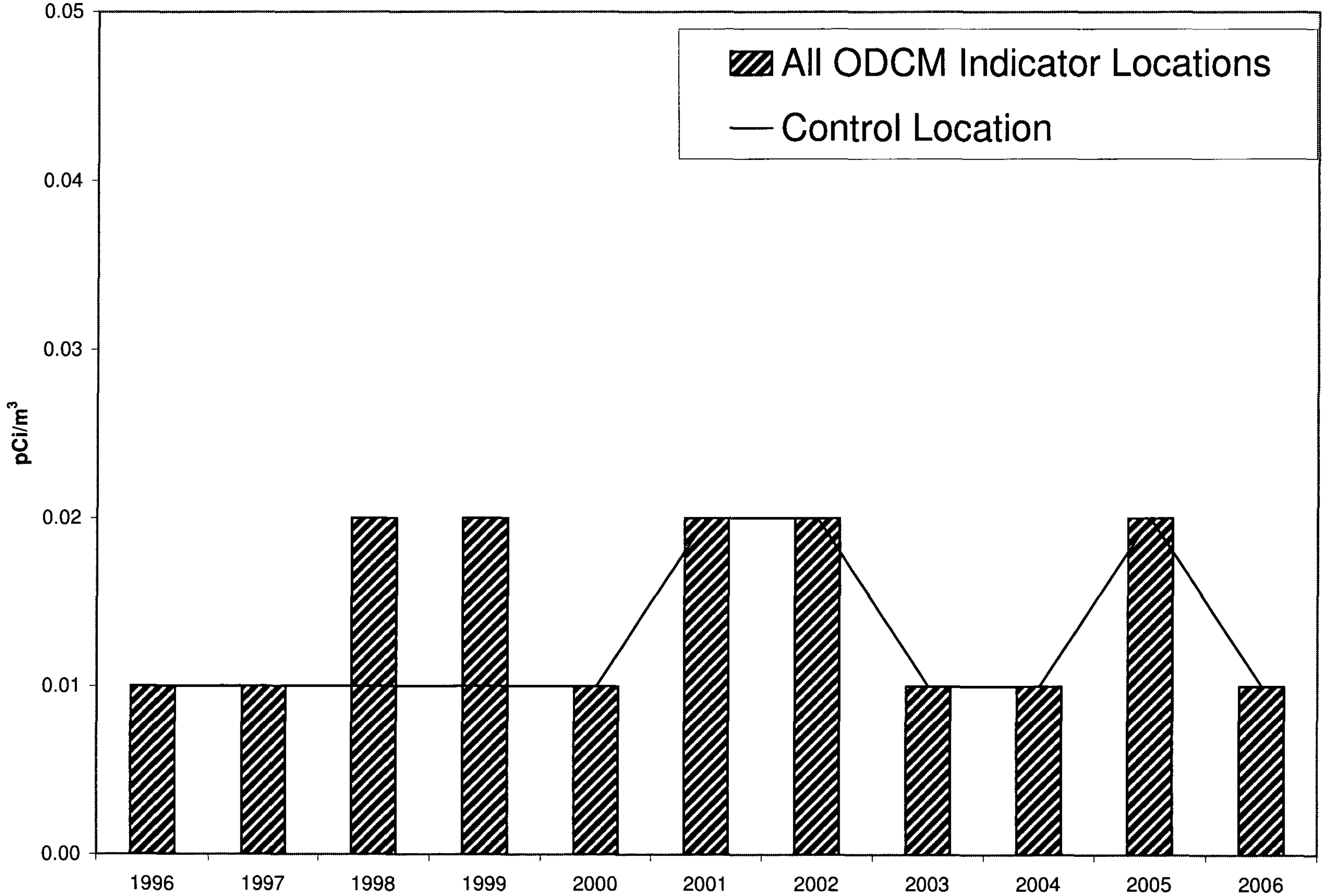
RADIONUCLIDES IN AIR
1996 to 2006
(pCi/m^3)

Year	Gross Beta: All ODCM Indicator Locations	Gross Beta: Control Location	Cs-137: All ODCM Indicator Locations	Cs-137: Control Location
1996	0.01	0.01	< L_c	< L_c
1997	0.01	0.01	< L_c	< L_c
1998	0.02	0.01	< L_c	< L_c
1999	0.02	0.01	< L_c	< L_c
2000	0.01	0.01	< L_c	< L_c
2001	0.02	0.02	< L_c	< L_c
2002	0.02	0.02	< L_c	< L_c
2003	0.01	0.01	< L_c	< L_c
2004	0.01	0.01	< L_c	< L_c
2005	0.02	0.02	< L_c	< L_c
2006	**0.01**	**0.01**	**< Lc**	**< Lc**
Historical Average 1996-2005	0.02	0.01	< L_c	< L_c

Critical Level (L_c) is less than the ODCM required LLD.

<L_c indicates no positive values above sample critical level.

FIGURE C-2
RADIONUCLIDES IN AIR - GROSS BETA
1996 to 2006



* Includes ODCM and non-ODCM indicator locations.

Gross Beta ODCM required LLD = 0.01 pCi/m^3

TABLE C-3

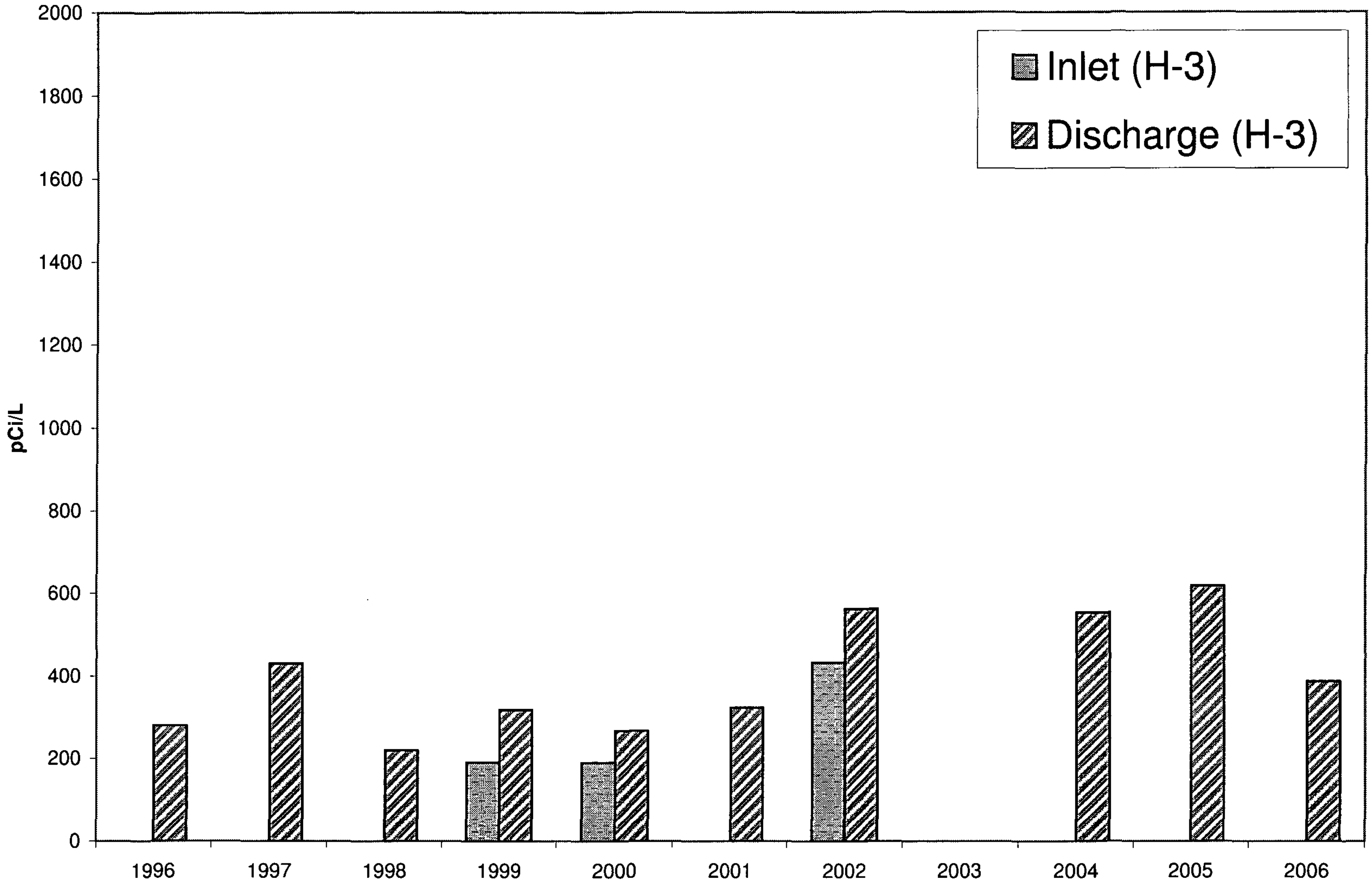
RADIONUCLIDES IN HUDSON RIVER WATER
1996 to 2006
(pCi/L)

	Tritium (H-3)		Cs-137	
Year	**Inlet**	**Discharge**	**Inlet**	**Discharge**
1996	< L_c	280	< L_c	< L_c
1997	< L_c	430	< L_c	< L_c
1998	< L_c	220	< L_c	< L_c
1999	191	318	< L_c	< L_c
2000	190	267	< L_c	< L_c
2001	< L_c	323	< L_c	< L_c
2002	432	562	< L_c	< L_c
2003	< L_c	< L_c	< L_c	< L_c
2004	< L_c	553	< L_c	< L_c
2005	< L_c	618	< L_c	< L_c
2006	**< Lc**	**386**	**< Lc**	**< Lc**
Historical Average 1996-2005	271	397	**< Lc**	**< Lc**

Critical Level (L_c) is less than the ODCM required LLD.

<L_c indicates no positive values above sample critical level.

FIGURE C-3
HUDSON RIVER WATER - TRITIUM
1996 to 2006



Tritium ODCM required LLD = 3000 pCi/L

TABLE C-4

RADIONUCLIDES IN DRINKING WATER
1996 to 2006
(pCi/L)

Year	Tritium (H-3)	Cs-137
1996	< L_c	< L_c
1997	< L_c	< L_c
1998	< L_c	< L_c
1999	< L_c	< L_c
2000	< L_c	< L_c
2001	< L_c	< L_c
2002	< L_c	< L_c
2003	< L_c	< L_c
2004	< L_c	< L_c
2005	< L_c	< L_c
2006	**< Lc**	**< Lc**
Historical Average 1996-2005	< L_c	< L_c

Critical Level (L_c) is less than the ODCM required LLD.
<L_c indicates no positive values above sample critical level.

FIGURE C-4
DRINKING WATER - TRITIUM
1996 to 2006

Tritium ODCM required LLD = 2000 pCi/L

TABLE C-5

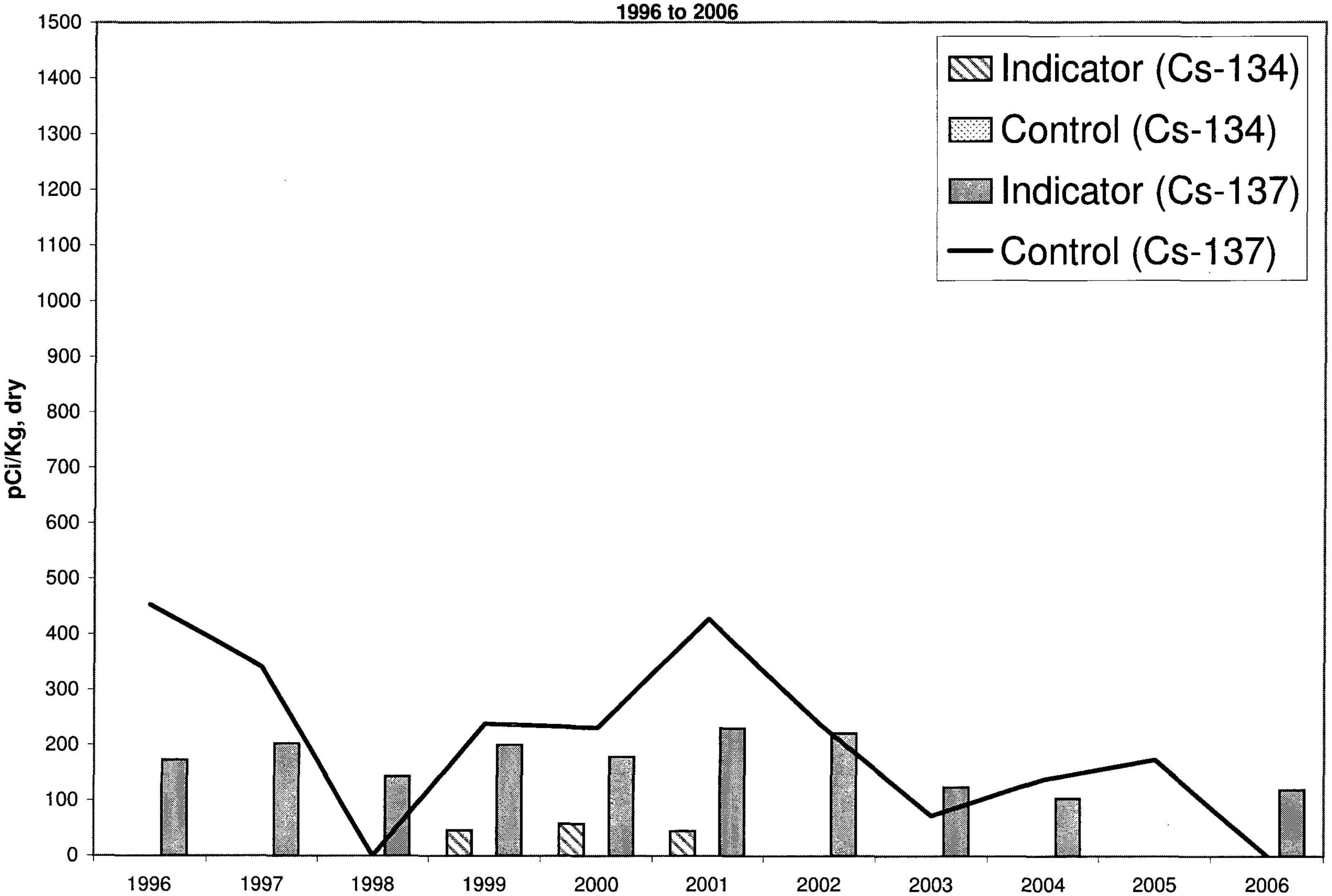
RADIONUCLIDES IN SHORELINE SOIL
1996 to 2006
(pCi/Kg, dry)

	Cs-134		Cs-137	
Year	Indicator	Control	Indicator	Control
1996	< L_c	< L_c	173	453
1997	< L_c	< L_c	203	340
1998	< L_c	< L_c	143	< L_c
1999	46	< L_c	200	238
2000	58	< L_c	179	231
2001	45	< L_c	230	427
2002	< L_c	< L_c	221	238
2003	< L_c	< L_c	124	73
2004	< L_c	< L_c	104	138
2005	< L_c	< L_c	< L_c	174
2006	**< Lc**	**< Lc**	**119.6**	**< Lc**
Historical Average 1996-2005	50	< Lc	175	257

Critical Level (L_c) is less than the RETS required LLD.

<L_c indicates no positive values above sample critical level.

FIGURE C-5
RADIONUCLIDES IN SHORELINE SOIL
1996 to 2006



Cs-134 ODCM required LLD = 150 pCi/Kg, dry
Cs-137 ODCM required LLD = 175 pCi/Kg, dry

TABLE C-6

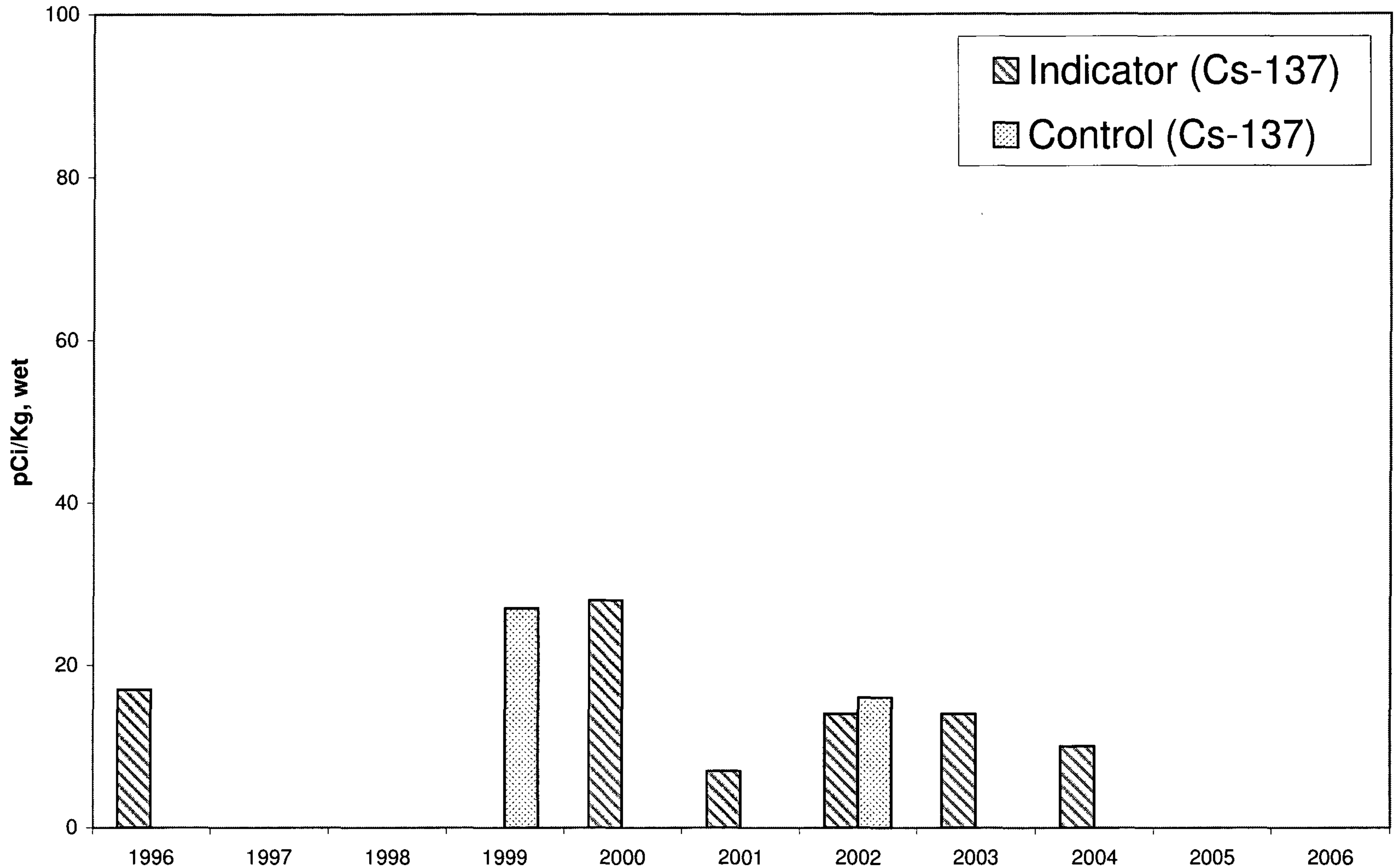
RADIONUCLIDES IN BROAD LEAF VEGETATION
1996 to 2006
(pCi/Kg, wet)

	Cs-137	
Year	**Indicator**	**Control**
1996	17	< L_c
1997	< L_c	< L_c
1998	< L_c	< L_c
1999	< L_c	27
2000	28	< L_c
2001	7	< L_c
2002	14	16
2003	14	< L_c
2004	10	< L_c
2005	< L_c	< L_c
2006	**< Lc**	**< Lc**
Historical Average 1996-2005	15	22

Critical Level (L_c) is less than the ODCM required LLD.

<L_c indicates no positive values above sample critical level.

FIGURE C-6
BROAD LEAF VEGETATION - Cs-137
1996 to 2006



ODCM required LLD = 80 pCi/Kg, wet

TABLE C-7

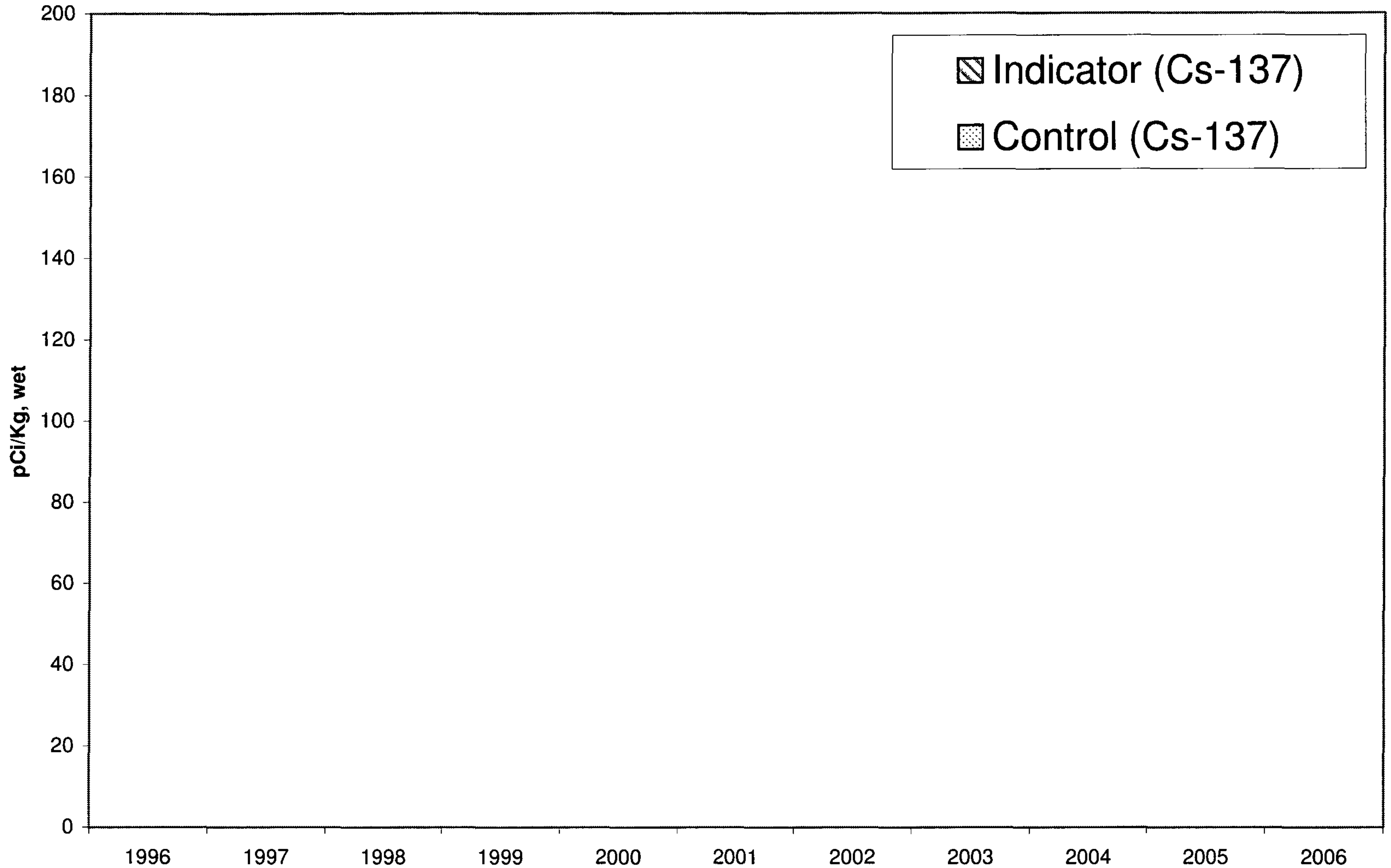
RADIONUCLIDES IN FISH AND INVERTEBRATES
1996 to 2006

	Cs-137	
Year	**Indicator**	**Control**
1996	< L_c	< L_c
1997	< L_c	< L_c
1998	< L_c	< L_c
1999	< L_c	< L_c
2000	< L_c	< L_c
2001	< L_c	< L_c
2002	< Lc	< Lc
2003	< L_c	< L_c
2004	< L_c	< L_c
2005	< L_c	< L_c
2006	**< Lc**	**< Lc**
Historical Average 1996-2005	< Lc	< Lc

Critical Level (L_c) is less than the ODCM required LLD.

<L_c indicates no positive values above sample critical level.

FIGURE C-7
FISH AND INVERTEBRATES - Cs-137
1995 to 2005



Cs-137 ODCM required LLD = 150 pCi/Kg, wet

APPENDIX D

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM
QUALITY ASSURANCE – QUALITY CONTROL PROGRAM

D) QA/QC PROGRAM

1) PROGRAM DESCRIPTION

The Offsite Dose Calculation Manual (ODCM), Part 1, Section 5.3 requires that the licensee participate in an Interlaboratory Comparison Program. The Interlaboratory Comparison Program shall include sample media for which samples are routinely collected and for which comparison samples are commercially available. Participation in an Interlaboratory Comparison Program ensures that independent checks on the precision and accuracy of the measurement of radioactive material in the environmental samples are performed as part of the Quality Assurance Program for environmental monitoring. To fulfill the requirement for an Interlaboratory Comparison Program, the JAF Environmental Laboratory has engaged the services of two independent laboratories to provide quality assurance comparison samples. The two laboratories are Analytics, Incorporated in Atlanta, Georgia and the U.S. Department of Commerce's National Institute of Standards and Technology (NIST) in Gaithersburg, Maryland.

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

In addition to the Analytics Program, the JAF Environmental Laboratory participates in the NEI/NIST Measurement Assurance Program. In 1987, the nuclear industry established a Measurement Assurance Program at the National Bureau of Standards (now the National Institute of Standards and Technology) to provide sponsoring nuclear utilities an independent verification, traceable to NIST, of their capability to make accurate measurements of radioactivity, as described in NRC Regulatory Guide 4.15. The program includes distribution to sponsoring utilities, approximately six times a year. The samples are prepared by NIST to present specific challenges to participating laboratories. NIST supplies sample media as blind sample spikes. These samples are prepared and analyzed by the JAF Environmental Laboratory and the results are submitted to the Entergy Nuclear Northeast representative, who uses predetermined acceptance criteria methodology for evaluating the laboratory's performance. The performance results along with the NIST Report of Test (Certifies what activities are present in the sample) are forwarded to the laboratory.

2) PROGRAM SCHEDULE

SAMPLE MEDIA	LABORATORY ANALYSIS	SAMPLE PROVIDER ANALYTICS
Water	Gross Beta	1
Water	Tritium	4
Water	I-131	2
Water	Mixed Gamma	2
Air	Gross Beta	2
Air	I-131	2
Air	Mixed Gamma	3
Milk	I-131	2
Milk	Mixed Gamma	2
Soil	Mixed Gamma	1
Vegetation	Mixed Gamma	1
TOTAL SAMPLE INVENTORY		**22**

3) ACCEPTANCE CRITERIA

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

a) SAMPLE RESULTS EVALUATION

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

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

The value for the error resolution is calculated.

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

Using the appropriate row under the Error Resolution column in Table 8.3.1 below, a corresponding Ratio of Agreement interval is given.

The value for the ratio is then calculated.

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

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

TABLE 8.3.1

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

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

4) PROGRAM RESULTS SUMMARY

The Interlaboratory Comparison Program numerical results are provided on Table 8-1.

a) ANALYTICS QA SAMPLES RESULTS

Twenty QA blind spike samples were analyzed as part of Analytics 2006 Interlaboratory Comparison Program. The following sample media were evaluated as part of the comparison program.

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

The JAF Environmental Laboratory performed 84 individual analyses on the 20 QA samples. Of the 84 analyses performed, 82 were in agreement using the NRC acceptance criteria for a 97.6% agreement ratio.

There were two non-conformities in the 2006 program.

(i) ANALYTICS SAMPLE NONCONFORMITIES

Analytics Sample E4882-05, Ce-141 in Water
Nonconformity No. 2006-01

A spiked mixed gamma in water sample supplied by Analytics, Inc., was analyzed in accordance with standard laboratory procedures. The sample contained a total of ten radionuclides for analysis. Ten of the ten radionuclides present were quantified. Nine of the ten radionuclides were quantified within the acceptable range. The mean result for Ce-141 was determined to be outside the QA Acceptance Criteria resulting in a sample nonconformity. The water sample was analyzed three times using three different detectors. An average Ce-141 value of 64.8 pCi/L was reported. The known result for the sample was 86.8 pCi/L as determined by the supplier. One of the three reported results was 72 pCi/L and resulted in an agreement when compared to the known of 86.8 pCi/L with a ratio of 0.83. The remaining 2 individual results were outside the acceptance criteria and had ratios to the known that ranged from 0.67 and 0.74. All of the analysis had relatively low count rate, which ranged from 3.9 counts per minute to 4.9 counts per minute.

An evaluation of the Ce-141 result was performed. The detector calibrations were reviewed to determine if the efficiency determination in the lower end (<500 KeV) of the calibration curve exhibited any anomalies. The efficiency curve evaluation showed that shape of the curve and the corresponding efficiency coefficients were within the normal range and compared favorably with the previous calibration. The spectrum and peak search results were examined with no abnormalities identified. Ce-141 decays by beta minus with a 32.5 day half-life and a gamma ray energy of 145 KeV with a yield of 48%. No significant secondary gamma energies are produced in the Ce-141 decay scheme.

The combination of low sample activity and low net counts most likely resulted in an inaccurate sample result. The nonconforming analytical results for this sample media and radionuclide are not routine and does not indicate a programmatic deficiency in the analysis of Ce-141 in water samples or other environmental media. Confidence in the accurate analysis of Ce-141 can be demonstrated by other Ce-141 analytical results. The Ce-141 results for the other Quality Assurance samples analyzed as part of the 2006 Interlaboratory Comparison Program were all acceptable and are summarized below. These results demonstrate that at the time of sample analysis the gamma spectral analysis system was performing properly and was in control.

2006 Ce-141 Results

Sample ID	Medium	JAF	Reference	Ratio
E4883-05	Filter pCi/filter	58.6 ± 1.6	61.4 ± 1	0.95
E5002-05	Milk pCi/liter	185.7 ± 4.0	184 ± 3.1	1.01
E5003-05	Soil pCi/g	0.241 ± 0.008	0.214 ± 0.004	1.13
E5005-05	Vegetation pCi/g	0.209 ± 0.007	0.223 ± 0.004	0.94
E5076-05	Water pCi/liter	94.2 ± 2.61	88.0 ± 1.47	1.07
E5077-05	Filter pCi/filter	80.3 ± 1.41	78.6 ± 1.13	1.02
E5078-05	Milk pCi/liter	86.7 ± 2.76	86.0 ± 1.44	1.01
E4963-09 *	Milk pCi/liter	98.4 ± 3.95	104 ± 1.5	0.94
E4997-09 *	Water pCi/liter	160 ± 19	149 ± 2.5	1.07
E5073-09 *	Vegetation pCi/g	0.162 ± 0.003	0.153 ± 0.002	1.06
E5170-09 *	Water pCi/liter	284.3 ± 5.6	286 ± 5.0	0.99

Mean Ratio = 1.02

* Provided by laboratory client, NOT reported in Annual Report

These results demonstrate that at the time of sample analysis the gamma spectral analysis system was performing properly and was in control. Historical results from the 2005 Interlaboratory Comparison program demonstrated the laboratory's ability to analyze Ce-141 accurate in low level environmental sample media. These results are summarized below:

2005 Ce-141 Results

Sample ID	Medium	JAF	Reference	Ratio
E-4488-05	Water pCi/liter	235±6	221±4	1.06
E-4713-05	Water pCi/liter	291±4	282±5	1.03
E-4489-05	Filter pCi/filter	157±3	155±3	1.01
E-4714-05	Filter pCi/filter	176±3	165±3	1.07
E-4585	Soil pCi/kg	173±2	182±3	0.95
E-4584-05	Milk pCi/liter	101±5	92±2	1.09
E-4715-05	Milk pCi/liter	237±4	233±4	1.02
E-4587	Vegetation pCi/kg	178±9	174±3	1.02
NIST 1801-20	Filter pCi/filter	1.89E5±475	1.96E5±2176	0.96
NIST-1800-10	Water pCi/G	1.47E5±441	1.48E5±1125	0.99
			Mean Ratio =	1.02

The mean ratio for these samples relative to the known (reference) value was 1.02. The 2006 nonconformity is considered to be an isolated instance. The Ce-141 results for 2005 and 2006 program demonstrate that there is no systematic error or persistent low bias present in the analysis of samples for Ce-141 in water or other environmental sample media. No corrective actions were implemented as a result of this nonconformity.

Analytics Sample E5221-05, Gross Beta in Water
Nonconformity No. 2006-02

A water sample, spiked with Cs-137, supplied by Analytics was analyzed for gross beta activity in accordance with standard laboratory procedures. Half of the 1 liter sample provided was evaporated such that any remaining residue would remain in a 2 inch stainless steel planchet. The planchet was then counted 3 times on a low background counter (LBC). An average Gross Beta value of 173 pCi/L was determined and reported for the sample. The known value for the sample was 249 pCi/L as determined by Analytics. The acceptable ratio of agreement for this sample was determined to be 0.8 to 1.25. The calculated ratio of sample results divided by the known value was 0.69, which fell outside the QA Acceptance Criteria. An investigation into the QA nonconformity was initiated.

A thorough review of all raw data and calculations used to determine the reported gross beta value was conducted with no errors noted. The original stainless steel planchet was then reanalyzed on a different LBC with no appreciable difference in the resulting gross beta value.

The remaining 500ml of E5221-05 was then analyzed by gamma spectroscopy, which confirmed Analytics known Cs-137 activity. Following the confirmation of the samples Cs-137 concentration, a duplicate gross beta analysis was performed on the remaining sample in accordance with standard laboratory procedures. A value of 245 pCi/L was obtained on the backup gross beta analysis, equivalent to 98% recovery of the known value.

Based on the difference between the initial and backup results, it is believed that some of the sample residue was removed from the original stainless steel planchet prior to counting. The missing material equates to 26cpm or 68dpm. All equipment used to process the original sample was checked for loose radioactive material, none was detected. The following procedure revision has been submitted to address this nonconformity: Add "Use caution when evaporating samples. Boiling or spattering may cause substantial sample losses and cross-contamination."

Historical Water Gross Beta Results

Sample ID	Medium	JAF	Reference	Ratio
QAP-58 (2003)	Water Bq/liter	588±7	627±10	0.937
QAP-59 (2003)	Water Bq/liter	1796±17	1948±195	0.922
QAP-0403 (2004)	Water Bq/liter	1105±17	1170±117	0.944
A19773-05 (2005)	Water pCi/ml	1802±2	1830±46	0.985
E4458-80 (2005)	Water pCi/L	260±1.4	268±8.9	0.970
			Mean Ratio =	0.95

The mean ratio for these samples relative to the known (reference) value was 0.95. The 2006 nonconformity is considered to be an isolated instance. The results for 2003 through 2005 demonstrate that there is no systematic error present in the analysis of samples for gross beta in water.

b) NIST QA SAMPLES RESULTS

In 2006, JAF Environmental Laboratory participated in the NEI/NIST Measurement Assurance Program. Two QA blind spike samples were analyzed. The following sample media were evaluated as part of the comparison program.

- Air Particulate Filter: Mixed Gamma Emitters
- Water: I-131, Tritium

The JAF Environmental Laboratory performed 7 individual analyses on the two QA samples. Of the 7 analyses performed, 7 were in agreement using the NRC acceptance criteria for a 100% agreement ratio.

There were no non-conformities in the 2006 program.

c) NUMERICAL RESULTS TABLES

TABLE D-1
INTERLABORATORY INTERCOMPARISON PROGRAM
Gross Beta Analysis of Air Particulate Filter

DATE	SAMPLE ID NO.	MEDIUM	ANALYSIS	JAF LAB pCi/filter ±1 sigma	REFERENCE LAB* pCi/filter ±2 sigma	RATIO (1)	EVALUATION
6/8/2006	E5001-05	Filter	Gross Beta	64.8 ± 1.20	60.0 ± 2.00	1.08	Acceptable
12/7/2006	E5171-05	Filter	Gross Beta	99.5 ± 1.45	86.0 ± 2.87	1.16	Acceptable

(1) Ratio = Reported/Analytics (See Section 8.3).
* Sample provided by Analytics, Inc.

Tritium Analysis of Water

DATE	SAMPLE ID NO.	MEDIUM	ANALYSIS	JAF LAB pCi/liter ±1 sigma	REFERENCE LAB* pCi/liter ±2 sigma	RATIO (1)	EVALUATION
3/23/2006	E4881-05	Water	H-3	4530 ± 107	4210 ± 140	1.08	Acceptable
7/14/2006	E5059-05	Water	H-3	933 ± 84	750 ± 25	1.24	Acceptable
9/14/2006	E5080-05	Water	H-3	832 ± 82	903 ± 30	0.92	Acceptable

(1) Ratio = Reported/Analytics (See Section 8.3).
* Sample provided by Analytics, Inc.

Gross Beta Analysis of Water

DATE	SAMPLE ID NO.	MEDIUM	ANALYSIS	JAF LAB pCi/liter ±1 sigma	REFERENCE LAB* pCi/liter ±2 sigma	RATIO (1)	EVALUATION
12/7/2006	E5221-05	Water	Gross Beta	173.0 ± 2.18	249 ± 8.29	0.69	Not Acceptable

(1) Ratio = Reported/Analytics (See Section 8.3).
* Sample provided by Analytics, Inc.

I-131 Gamma Analysis of Air Charcoal

DATE	SAMPLE ID NO.	MEDIUM	ANALYSIS	JAF LAB pCi ±1 sigma	REFERENCE LAB* pCi ±2 sigma	RATIO (1)	EVALUATION
6/8/2006	E5004-05	Air	I-131	63.3 ± 2.42	66.0 ± 2.20	0.96	Acceptable
9/14/2006	E5079-05	Air	I-131	97.2 ± 2.5	91.9 ± 3.06	1.06	Acceptable

(1) Ratio = Reported/Analytics (See Section 8.3).
* Sample provided by Analytics, Inc.

TABLE D-1 (Continued)
INTERLABORATORY INTERCOMPARISON PROGRAM
Gamma Analysis of Water

DATE	SAMPLE ID NO.	MEDIUM	ANALYSIS	JAF LAB pCi/liter ±1 sigma			REFERENCE LAB* pCi/liter ±2 sigma			RATIO (1)	EVALUATION
3/23/2006	E4882-05	Water	Ce-141	64.8	±	3.7	86.8	±	2.9	0.75	Not Acceptable
			Cr-51	263.0	±	17.8	234.0	±	7.8	1.12	Acceptable
			Cs-134	107.0	±	3.4	101.0	±	3.4	1.06	Acceptable
			Cs-137	71.8	±	2.9	74.3	±	2.5	0.97	Acceptable
			Co-58	79.0	±	3.1	87.5	±	2.9	0.90	Acceptable
			Mn-54	85.1	±	3.1	78.1	±	2.6	1.09	Acceptable
			Fe-59	79.5	±	3.6	72.4	±	2.4	1.10	Acceptable
			Zn-65	156.0	±	6.3	148.0	±	4.9	1.05	Acceptable
			Co-60	104.0	±	2.5	107.0	±	3.6	0.97	Acceptable
			I-131**	71.9	±	0.9	67.4	±	2.3	1.07	Acceptable
9/14/2006	E5076-05	Water	Ce-141	94.2	±	2.6	88.0	±	2.9	1.07	Acceptable
			Cr-51	288.7	±	13.1	288.0	±	9.6	1.00	Acceptable
			Cs-134	94.1	±	1.9	87.0	±	2.9	1.08	Acceptable
			Cs-137	173.0	±	2.4	179.0	±	6.0	0.97	Acceptable
			Co-58	115.0	±	2.1	112.0	±	3.7	1.03	Acceptable
			Mn-54	124.3	±	2.1	115.0	±	3.8	1.08	Acceptable
			Fe-59	47.9	±	1.9	44.7	±	1.5	1.07	Acceptable
			Zn-65	148.0	±	3.9	148.0	±	4.9	1.00	Acceptable
			Co-60	139.0	±	1.7	137.0	±	4.6	1.01	Acceptable
			I-131**	86.1	±	1.2	79.9	±	2.66	1.08	Acceptable

(1) Ratio = Reported/Analytics (See Section 8.3).
* Sample provided by Analytics, Inc.
** Result determined by Resin Extraction/Gamma Spectral Analysis.

TABLE D-1 (Continued)
INTERLABORATORY INTERCOMPARISON PROGRAM
Gamma Analysis Milk

DATE	SAMPLE ID NO.	MEDIUM	ANALYSIS	JAF LAB pCi/liter ±1 sigma			REFERENCE LAB* pCi/liter ±2 sigma			RATIO (1)	EVALUATION
6/8/2006	E5002-05	Milk	Ce-141	185.7	±	4.0	184.0	±	6.1	1.01	Acceptable
			Cr-51	257.7	±	16.9	259.0	±	8.6	0.99	Acceptable
			Cs-134	128.0	±	3.0	127.0	±	4.2	1.01	Acceptable
			Cs-137	112.7	±	2.8	117.0	±	3.9	0.96	Acceptable
			Co-58	98.8	±	2.6	100.0	±	3.3	0.99	Acceptable
			Mn-54	153.3	±	3.2	146.0	±	4.9	1.05	Acceptable
			Fe-59	94.8	±	3.4	93.6	±	3.1	1.01	Acceptable
			Zn-65	191.0	±	6.0	185.0	±	6.2	1.03	Acceptable
			Co-60	127.3	±	2.3	129.0	±	4.3	0.99	Acceptable
			I-131**	61.9	±	0.9	63.2	±	2.1	0.98	Acceptable
9/14/2006	E5078-05	Milk	Ce-141	86.7	±	2.8	86.0	±	2.9	1.01	Acceptable
			Cr-51	285.3	±	14.2	282.0	±	9.4	1.01	Acceptable
			Cs-134	89.5	±	2.2	85.0	±	2.8	1.05	Acceptable
			Cs-137	170.0	±	2.4	175.0	±	5.8	0.97	Acceptable
			Co-58	105.0	±	2.3	109.0	±	3.7	0.96	Acceptable
			Mn-54	117.7	±	2.2	113.0	±	3.8	1.04	Acceptable
			Fe-59	47.5	±	2.4	43.7	±	1.5	1.09	Acceptable
			Zn-65	147.7	±	4.2	145.0	±	4.8	1.02	Acceptable
			Co-60	129.3	±	1.8	134.0	±	4.5	0.97	Acceptable
			I-131**	72.7	±	1.3	73.8	±	2.46	0.99	Acceptable

(1) Ratio = Reported/Analytics (See Section 8.3).
* Sample provided by Analytics, Inc.
** Result determined by Resin Extraction/Gamma Spectral Analysis.

TABLE D-1 (Continued)
INTERLABORATORY INTERCOMPARISON PROGRAM
Gamma Analysis of Air Particulate Filters

DATE	SAMPLE ID NO.	MEDIUM	ANALYSIS	JAF LAB pCi/filter ±1 sigma			REFERENCE LAB* pCi/filter ±2 sigma			RATIO (1)	EVALUATION
3/23/2006	E4883-05	Filter	Ce-141	58.6	±	1.60	61.4	±	2.05	0.95	Acceptable
			Cr-51	169.0	±	10.3	166.0	±	5.52	1.02	Acceptable
			Cs-134	74.0	±	3.90	71.5	±	2.38	1.03	Acceptable
			Cs-137	51.8	±	2.10	52.5	±	1.75	0.99	Acceptable
			Co-58	60.5	±	2.40	61.9	±	2.06	0.98	Acceptable
			Mn-54	61.5	±	2.40	55.3	±	1.84	1.11	Acceptable
			Fe-59	55.6	±	2.90	51.3	±	1.71	1.08	Acceptable
			Zn-65	115.0	±	5.50	104.0	±	3.48	1.11	Acceptable
			Co-60	72.5	±	2.10	75.6	±	2.52	0.96	Acceptable
9/14/2006	E5077-05	Filter	Ce-141	80.3	±	1.41	78.6	±	2.62	1.02	Acceptable
			Cr-51	266.3	±	9.88	257.0	±	8.57	1.04	Acceptable
			Cs-134	84.1	±	2.03	77.7	±	2.59	1.08	Acceptable
			Cs-137	159.7	±	2.24	160.0	±	5.33	1.00	Acceptable
			Co-58	101.3	±	2.03	99.8	±	3.33	1.01	Acceptable
			Mn-54	112.0	±	2.01	103.0	±	3.42	1.09	Acceptable
			Fe-59	46.1	±	1.98	39.9	±	1.33	1.15	Acceptable
			Zn-65	147.7	±	4.09	132.0	±	4.41	1.12	Acceptable
			Co-60	119.7	±	1.71	122.0	±	4.07	0.98	Acceptable

(1) Ratio = Reported/Analytics (See Section 8.3).
* Sample provided by Analytics, Inc.

Gamma Analysis of Soil

DATE	SAMPLE ID NO.	MEDIUM	ANALYSIS	JAF LAB pCi/gram ±1 sigma			REFERENCE LAB* pCi/gram ±2 sigma			RATIO (1)	EVALUATION
6/8/2006	E5003-05	Soil	Ce-141	0.241	±	0.008	0.214	±	0.007	1.13	Acceptable
			Cr-51	0.349	±	0.036	0.302	±	0.010	1.16	Acceptable
			Cs-134	0.162	±	0.006	0.147	±	0.005	1.10	Acceptable
			Cs-137	0.249	±	0.007	0.237	±	0.008	1.05	Acceptable
			Co-58	0.114	±	0.004	0.117	±	0.004	0.97	Acceptable
			Mn-54	0.185	±	0.006	0.170	±	0.006	1.09	Acceptable
			Fe-59	0.120	±	0.007	0.109	±	0.004	1.10	Acceptable
			Zn-65	0.236	±	0.010	0.216	±	0.007	1.09	Acceptable
			Co-60	0.155	±	0.004	0.150	±	0.005	1.04	Acceptable

(1) Ratio = Reported/Analytics (See Section 8.3).
* Sample provided by Analytics, Inc.

TABLE D-1 (Continued)
INTERLABORATORY INTERCOMPARISON PROGRAM
Gamma Analysis of Vegetation

DATE	SAMPLE ID NO.	MEDIUM	ANALYSIS	JAF LAB pCi/gram ±1 sigma			REFERENCE LAB* pCi/gram ±2 sigma			RATIO (1)	EVALUATION
6/8/2006	E5005-05	Vegetation	Ce-141	0.209	±	0.007	0.223	±	0.007	0.94	Acceptable
			Cr-51	0.293	±	0.034	0.315	±	0.011	0.93	Acceptable
			Cs-134	0.159	±	0.007	0.154	±	0.005	1.03	Acceptable
			Cs-137	0.127	±	0.006	0.143	±	0.005	0.89	Acceptable
			Co-58	0.109	±	0.006	0.122	±	0.004	0.90	Acceptable
			Mn-54	0.160	±	0.006	0.178	±	0.006	0.90	Acceptable
			Fe-59	0.105	±	0.008	0.114	±	0.004	0.92	Acceptable
			Zn-65	0.207	±	0.013	0.225	±	0.008	0.92	Acceptable
			Co-60	0.140	±	0.005	0.156	±	0.005	0.90	Acceptable

(1) Ratio = Reported/Analytics (See Section 8.3).
* Sample provided by Analytics, Inc.

TABLE D-1 (Continued)
INTERLABORATORY INTERCOMPARISON PROGRAM
Analysis of water

DATE	SAMPLE ID NO.	MEDIUM	ANALYSIS	JAF LAB pCi/gram ±1 sigma			REFERENCE LAB* pCi/gram ±2 sigma			RATIO (1)	EVALUATION
2/15/2006	1831-3	Water	I-131	2.06E+06	±	2.77E+04	2.09E+06	±	1.47E+04	0.99	Acceptable
			H-3	1.12E+06	±	3.11E+03	1.11E+06	±	8.86E+03	1.01	Acceptable

(1) Ratio = Reported/NIST (See Section 8.3).
* Sample provided by NIST

Gamma Analysis of Filter

DATE	SAMPLE ID NO.	MEDIUM	ANALYSIS	JAF LAB pCi/filter ±1 sigma			REFERENCE LAB* pCi/filter ±2 sigma			RATIO (1)	EVALUATION
6/8/2006	1851-16	Filter	Mn-54	3.08E+04	±	158	2.80E+04	±	280	1.10	Acceptable
			Co-57	3.74E+04	±	94	3.36E+04	±	336	1.11	Acceptable
			Fe-59	1.01E+05	±	1418	8.91E+04	±	891	1.13	Acceptable
			Se-75	5.24E+04	±	508	5.61E+04	±	561	0.93	Acceptable
			Cs-134	3.00E+04	±	143	2.76E+04	±	276	1.09	Acceptable

(1) Ratio = Reported/NIST (See Section 8.3).
* Sample provided by NIST

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