Dominion Nuclear Connecticut, Inc.
Millstone Power Station
Rope Ferry Road
Waterford, CT 06385

Dominion[SM]

APR 30 2012

U.S. Nuclear Regulatory Commission
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Docket Nos.	50-245
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	NPF-49

DOMINION NUCLEAR CONNECTICUT, INC.
MILLSTONE POWER STATION UNITS 1, 2, AND 3
2011 ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT

This letter transmits the Annual Radiological Environmental Operating Report for the Millstone Power Station, for the period January 2011 through December 2011. This satisfies the provisions of Section 5.7.2 of Millstone Power Station Unit 1 Permanently Defueled Technical Specifications (PDTS), and Sections 6.9.1.6a and 6.9.1.3 of the Millstone Power Station Units 2 and 3 Technical Specifications, respectively.

If you have any questions or require additional information, please contact Mr. William D. Bartron at (860) 444 4301.

Sincerely,

R. K. MacManus
Director, Nuclear Station Safety and Licensing

FSME20
IE25
FSME
NRR

Attachments: 1

Commitments made in this letter:

1. None.

cc: U.S. Nuclear Regulatory Commission
Region I
475 Allendale Road
King of Prussia, PA 19406-1415

S. J. Giebel
NRC Project Manager Millstone Unit 1
U.S. Nuclear Regulatory Commission
Two White Flint North, Mail Stop T-8 F5
11545 Rockville Pike
Rockville, MD 20852-2738

L. A. Kauffman
NRC Inspector
U.S. Nuclear Regulatory Commission
Region I
475 Allendale Road
King of Prussia, PA 19406-1415

J. D. Noggle
NRC Inspector
U.S. Nuclear Regulatory Commission
Region I
475 Allendale Road
King of Prussia, PA 19406-1415

J. S. Kim
NRC Project Manager
U.S. Nuclear Regulatory Commission
One White Flint North, Mail Stop 08-C2A
11555 Rockville Pike
Rockville, MD 20852-2738

NRC Senior Resident Inspector
Millstone Power Station

(2copies)
Director
Bureau of Air Management
Monitoring & Radiation Division
Department of Energy and Environmental Protection
79 Elm Street
Hartford, CT 06106-5127

A. Honnellio
Regional Radiation Representative
(EPA Region 1, Boston)
U. S. Environmental Protection Agency (Region 1)
5 Post Office Square Suite 100
Boston, MA 02109

G. Allen Jr.
Department of Health and Human Services
U. S. Food and Drug Administration
90 Madison St. Room 402
Worcester, MA 01608

R. Stein
Chairman Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

P. Kelley
Waterford-East Lyme Shellfish Commission
Waterford Town Hall
Waterford, CT 06385

J. A. Martinez
American Nuclear Insurers
95 Glastonbury Blvd.
Glastonbury, CT 06033

D. Carey
Connecticut Department of Agriculture
Aquaculture Division
P. O. Box 97
Millford, CT 06460

D. Steward
First Selectman Town of Waterford
Waterford Town Hall
Waterford, CT 06385

P. M. Formica
First Selectman Town of East Lyme
PO Box 519
Niantic, CT 06357

University Of Connecticut Library
Serials Department
Storrs, CT 06268

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ATTACHMENT 1

2011 ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT

MILLSTONE POWER STATION UNITS 1, 2, AND 3
DOMINION NUCLEAR CONNECTICUT, INC. (DNC)

Millstone Power Station

2011
Radiological Environmental Operating Report

January 1, 2011 – December 31, 2011

Dominion Nuclear Connecticut, Inc.

Unit	License	Docket
1	DPR-21	50-245
2	DPR-65	50-336
3	NPF-49	50-423

Dominion

ANNUAL
RADIOLOGICAL ENVIRONMENTAL
OPERATING REPORT

MILLSTONE POWER STATION

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

2011

Millstone Power Station Unit 1, DOCKET NO. 50-245
Millstone Power Station Unit 2, DOCKET NO. 50-336
Millstone Power Station Unit 3, DOCKET NO. 50-423

Dominion Nuclear Connecticut, Inc.
Waterford, Connecticut

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EXECUTIVE SUMMARY

INTRODUCTION

This report summarizes the results of the Radiological Environmental Monitoring Program (REMP) conducted in the vicinity of MPS during the period from January 1 to December 31, 2011. This document has been prepared in accordance with the requirements of the MPS Units 1, 2 and 3 (MPS1, 2 and 3) Technical Specifications.

The REMP has been established to monitor the radiation and radioactivity released to the environment as a result of MPS's operation. This program, initiated in April 1967, includes the collection, analysis, and evaluation of radiological data in order to assess the impact of MPS on the environment and on the general public.

SAMPLING AND ANALYSIS

The environmental sampling media collected in the vicinity of MPS and at distant locations included terrestrial samples in the form of air particulate filters, charcoal cartridges, soil, cow and goat milk, pasture grass, hay, well water, broadleaf vegetation, fruits and vegetables; and aquatic samples in the form of seawater, bottom sediment, aquatic flora, fish, mussels, oysters, clams and lobster.

During 2011, there were 1119 samples collected from the atmospheric, aquatic, and terrestrial environments. In addition, 174 exposure measurements were obtained using environmental thermoluminescent dosimeters (TLDs). A description of all discrepancies from the sample collection requirements in the Millstone Radiological Effluent Monitoring and Offsite Dose Calculation Manual (REMODCM) is presented in the Notes for the Data Tables of this report.

There were 1247 analyses performed on the environmental media samples. Teledyne Brown Engineering, Inc. of Knoxville, Tennessee performed the analyses as required by the MPS REMODCM.

LAND USE CENSUS

The annual land use census in the vicinity of MPS was conducted as required by the MPS REMODCM during 2011. Although broadleaf sampling may be used in lieu of a garden census, gardens were included in the 2011 census. Only vegetable gardens having an area of more than 500 square feet need to be identified. Due to the difficulty of measuring individual gardens, the nearest garden within each directional sector identified by a drive-by survey is listed in Appendix A. No new dairy animals within 10 miles of the MPS were located during the census. Monthly broad leaf sampling was also performed; it may be used in lieu of the garden census.

RADIOLOGICAL IMPACT TO THE ENVIRONMENT

The predominant radioactivity for many samples was from non-plant related sources, such as fallout from nuclear weapons tests and naturally occurring radionuclides.

There was no plant related activity detected in any of the terrestrial samples collected as part of the MPS REMP.

Several aquatic samples did show plant related activity. Monitoring of seawater in the area of the discharge indicated the presence of the tritium, a station related radionuclide. Tritium was only found onsite inside the mixing zone of the quarry discharge at levels that were expected from routine plant operation. Radioactive iodine was found in three flora (seaweed) samples, one at the discharge point and two in Jordon Cove just east of the discharge point. In addition, radioactive silver (Ag-110m) was found in four samples taken in the Millstone Quarry prior to the discharge point. No radioactivity was found in edible seafood sampled beyond the discharge point.

Offsite ambient radiation measurements using environmental TLDs beyond the site boundary ranged between 39 and 96 milliRoentgens per year. The range of ambient radiation levels observed with the TLDs is consistent with natural background radiation levels for Connecticut.

Several REMP samples during 2011 identified detectable positive radioactivity that could be attributed to the trans-Pacific transport of airborne releases from Fukushima, Japan following the March 11, 2011 Tohoku earthquake. Discussions in the report for each sample type containing such radioactivity explain why the radioactivity is not related to the operations of MPS.

RADIOLOGICAL IMPACT TO THE GENERAL PUBLIC

During 2011, radiation doses to the general public as a result of MPS's operation continued to be well below the federal limits and much less than the dose due to other sources of man-made (e.g., X-rays, medical) and naturally-occurring (e.g., cosmic, radon) radiation.

The calculated total body dose to the maximally exposed member of the general public from radioactive effluents and ambient radiation resulting from MPS operations for 2011 was approximately 0.2 mrem* for the year. This conservative estimate is well below the Environmental Protection Agency's (EPA) annual dose limit to any member of the general public and is a fraction of a percent of the typical dose received from natural and other sources of man-made radiation.

* The term 'mrem' used in this report is a unit of radiation dose. The letter 'm' is for 'milli', or one-thousandth of a 'rem.' The word 'rem' is an acronyn for roentgen equivalent man. One rem is equal to a rad multiplied by factors to account for type of radiation and distribution within the body. The word 'rad' is an acronyn for radiation absorbed dose. One rad is equal to the absorption of 100 ergs of energy per gram of tissue.

CONCLUSIONS

The 2011 REMP for MPS resulted in the collection and analysis of over a thousand environmental samples and measurements. The data obtained were used to determine the impact of MPS's operation on the environment and on the general public.

An evaluation of direct radiation measurements, environmental sample analyses, and dose calculations indicates all applicable federal criteria were met. Furthermore, radiation levels and resulting doses from station operation were a small fraction of those attributed to natural and man-made background radiation.

Based on this information, there is no significant radiological impact on the environment or on the general public due to MPS's operation.

1. INTRODUCTION

This section provides an overview of the MPS REMP. It also includes background information to allow a reader to have an informed understanding of radiation and nuclear power operation.

1.1 Overview

The REMP for 2011 performed by Dominion Nuclear Connecticut (DNC) for MPS is discussed in this report. Since the operation of a nuclear power plant results in the release of small amounts of radioactivity and low levels of radiation, the Nuclear Regulatory Commission (NRC) requires a program be established to monitor radiation and radioactivity in the environment (Reference 1). This report, published annually per MPS's Technical Specifications (section 5.7.2 for MPS1, section 6.9.1.6 for MPS2 and Section 6.9.1.3 for MPS3), summarizes the results of measurements of radiation and radioactivity in the environment in the vicinity of the MPS and at distant locations during the period January 1 to December 31, 2011.

The REMP consists of taking radiation measurements and collecting samples from the environment, analyzing them for radioactivity content, and interpreting the results. With emphasis on the critical radiation exposure pathways to humans, samples from the aquatic, atmospheric, and terrestrial environments are collected. These samples include, but are not limited to: air, soil, cow and goat milk, pasture grass, hay, well water, broadleaf vegetation, fruits, vegetables, seawater, bottom sediment, aquatic flora, fish, mussels, oysters, clams and lobster. Thermoluminescent dosimeters (TLDs) are placed in the environment to measure gamma radiation levels. The TLDs are processed and the environmental samples are analyzed to measure the very low levels of radiation and radioactivity present in the environment as a result of MPS operation and other natural and man-made sources. These results are reviewed by MPS's radiological staff and have been reported semiannually or annually to the NRC and others for over 30 years.

In order to more fully understand how a nuclear power plant impacts humans and the environment, background information on radiation and radioactivity, natural and man-made sources of radiation, reactor operations, radioactive effluent controls, and radiological impact on humans is provided. It is believed that this information will assist the reader in understanding the radiological impact on the environment and humans from the operation of MPS.

1.2 Radiation and Radioactivity

All matter is made of atoms. An atom is the smallest component into which matter can be broken down and still maintain all its chemical properties. Nuclear radiation is energy, in the form of waves or particles that is given off from atoms in an excited state (e.g., unstable, radioactive atoms).

Radioactive material exists naturally and has always been a part of our environment. The earth's crust, for example, contains radioactive uranium, radium, thorium, and potassium. Some radioactivity is a result of nuclear weapons testing. Examples of radioactive fallout that is normally present in environmental samples are cesium-137 and strontium-90. Some examples of radioactive materials released from a nuclear power plant are cesium-137, iodine-131, strontium-90, and cobalt-60.

Radiation is measured in units of mrem, much like temperature is measured in degrees. A mrem (mrem) is a measure of the biological effect of the energy deposited in tissue. The letter 'm' is for 'milli', or one-thousandth of a 'rem.' The word 'rem' is an acronyn for roentgen equivalent man. One rem is equal to a 'rad' multiplied by factors to account for type of radiation and distribution within the body. The word 'rad' is an acronyn for radiation absorbed dose. One rad is equal to the absorption of 100 ergs of energy per gram of tissue. The natural and man-made radiation dose received in one year by the average American is 300 to 600 mrem (References 2, 3, 4, and 5). The per capita dose has increased substantially since the mid 1980's because of the increased usage of medical procedures involving exposure to radiation (see Reference 3).

Radioactivity is measured in Curies. Levels of radioactivity commonly seen in the environment are typically a small fraction of a Curie, therefore radioactivity in the environment is typically measured in picocuries. One picocurie (pCi) is equal to 0.037 disintegrations per second (2.22 disintegrations per minute).

1.3 Sources of Radiation

As mentioned previously, naturally occurring radioactivity has always been a part of our environment. Table 1.3 shows the sources and doses of radiation from natural and man-made sources.

Table 1.3
Radiation Sources and Corresponding Doses [1]

NATURAL		MAN-MADE	
Source	Radiation Dose (mrem/year)	Source	Radiation Dose (mrem/year)
Internal, inhalation[2]	228	Medical[3]	300
External, space	33	Consumer[4]	13
Internal, ingestion	29	Industrial, security, [5]	0.3
External, terrestrial	21	Occupational	0.5
		Weapons Fallout	< 1
		Nuclear Power Plants	< 1
Approximate Total	311	Approximate Total	314

(1) information from References 3 and 4
(2) from radon and thoron
(3) includes computerized tomography (147 mrem), nuclear medicine (77 mrem), interventional fluoroscopy (43 mrem) and conventional radiography and fluoroscopy (33 mrem)
(4) primarily from cigarette smoking (4.6 mrem), commercial air travel (3.4 mrem), building materials (3.5 mrem) and mining and agriculture (0.8 mrem)
(5) Industrial, security, medical, educational and research

Cosmic radiation (external, space) from the sun and outer space penetrates the earth's atmosphere and continuously bombards us with rays and charged particles. Some of this cosmic radiation interacts with gases and particles in the atmosphere, making them radioactive. These radioactive byproducts from cosmic ray bombardment are referred to as cosmogenic radionuclides. Isotopes such as beryllium-7 and carbon-14 are formed in this way. Exposure to cosmic and cosmogenic sources of radioactivity results in about 30 mrem of radiation dose per year.

Additionally, natural radioactivity is in our body and in the food we eat (about 30 mrem/year), the ground we walk on (about 20 mrem/year) and the air we breathe (about 230 mrem/year). The majority of a person's annual dose results from exposure to radon and thoron in the air we breathe. These gases and their radioactive decay products arise from the decay of naturally occurring uranium, thorium and radium in the soil and building products such as brick, stone, and concrete. Radon and thoron levels vary greatly with location, primarily due to changes in the concentration of uranium and thorium in the soil. Residents at some locations in Colorado, New York, Pennsylvania, New Jersey and even Connecticut have a higher annual dose as a result of higher levels of radon/thoron gases in these areas. In total, these various sources of naturally-occurring radiation and radioactivity contribute to a total dose of about 310 mrem per year.

In addition to natural radiation, we are normally exposed to radiation from a number of man-made sources. The single largest doses from man-made sources result from therapeutic and diagnostic applications of x-rays and radiopharmaceuticals. The annual dose to an individual in the United States from medical and dental exposure is approximately 300 mrem. Consumer products/uses, such cigarettes, building materials and commercial air travel contribute about 10 mrem/year. Much smaller doses result from weapons fallout (less than 1 mrem/year) and nuclear power plants (less than 1 mrem/year). Typically, the average person in the United States receives approximately 310 mrem per year from man-made sources.

1.4 Nuclear Reactor Operations

MPS generates about 2100 megawatts of electricity at full power, which provides approximately one-third of the power consumed in the State of Connecticut. MPS2 and MPS3 are pressurized water reactors (MPS1, which is permanently shutdown, was a boiling water reactor). The nuclear station is located on an approximate 500-acre site about 5 kilometers (three miles) west of New London, Connecticutt. Commercial operation of MPS2 began in December 1975 and MPS3 in May 1986.

MPS was operational during most of 2011, with the exception of a refueling outage at MPS2 in April and at MPS3 in October. The annual capacity factors for MPS2 was 85.6% and for MPS3 was 87.6%.

Nuclear-generated electricity is produced by many of the same techniques used for conventional oil and coal-generated electricity. Both systems use heat to boil water in order to produce steam. The steam turns a turbine, which turns a generator, producing electricity. In both cases, the steam passes through a condenser where it changes back into water and re-circulates back through the system. The cooling water source for MPS is the Niantic Bay.

The key difference between nuclear power and conventional power is the source of heat used to boil the water. Conventional plants burn fossil fuels in a boiler, while nuclear plants use uranium fission in a nuclear reactor.

Inside the reactor, a nuclear reaction called fission takes place. Particles, called neutrons, strike the nucleus of a uranium-235 atom, causing it to split into fragments called radioactive fission products. The splitting of the atoms releases both heat and more neutrons. The newly-released neutrons then collide with and split other uranium atoms, thus making more heat and releasing even more neutrons, and on and on until the uranium fuel is depleted or spent. This process is called a chain reaction. When this chain reaction is self sustaining, the reactor is called "critical."

The operation of a nuclear reactor results in the release of small amounts of radioactivity and low levels of radiation. The radioactivity originates from two major sources, radioactive fission products and radioactive activation products. Radioactive fission products, as illustrated in Figure 1.4-1 (Reference 6), originate from the fissioning of the nuclear fuel. These fission products get into the reactor coolant from their release by minute amounts of uranium on the outside surfaces of the fuel cladding, by diffusion through the fuel pellets and cladding and, on occasion, through defects or failures in the fuel cladding. These fission products circulate along with the reactor coolant water and will deposit on the internal surfaces of pipes and equipment. The radioactive fission products on the pipes and equipment emit radiation. Examples of some fission products are krypton-85 (Kr-85), strontium-90 (Sr-90), iodine-131 (I-131), xenon-133 (Xe-133), and cesium-137 (Cs-137).

Nuclear Fission

Fission is the splitting of atoms (e.g., uranium-235) by a neutron to release heat and more neutrons, creating a chain reaction. Radiation and fission products are by-products of the process.

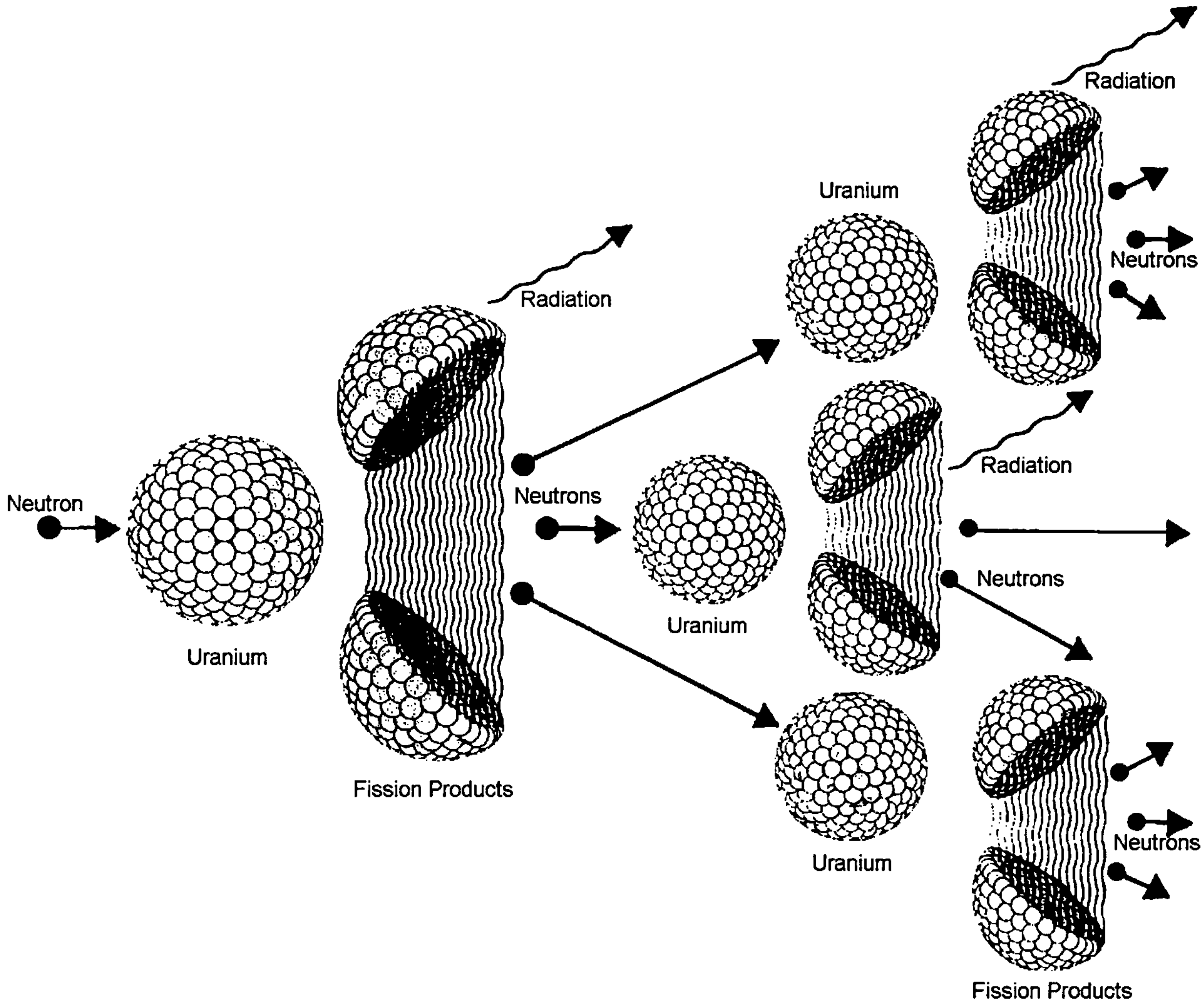


Figure 1.4-1
Radioactive Fission Product Formation

Radioactive activation products (see Figure 1.4-2), on the other hand, originate from two sources. The first is by neutron bombardment of the hydrogen, oxygen and other gas (helium, argon, nitrogen) molecules in the reactor cooling water. The second is a result of the fact that the internals of any piping system or component are subject to minute yet constant corrosion from the reactor cooling water. These minute metallic particles (for example: nickel, iron, cobalt, or magnesium) are transported through the reactor core into the fuel region, where neutrons may react with the nuclei of these particles, producing radioactive products. So, activation products are nothing more than ordinary naturally-occurring atoms that are made unstable or radioactive by neutron bombardment. These activation products circulate along with the reactor coolant water and will deposit on the internal surfaces of pipes and equipment. The radioactive activation products on the pipes and equipment emit radiation. Examples of some activation products are manganese-54 (Mn-54), iron-59 (Fe-59), cobalt-60 (Co-60), and zinc-65 (Zn-65).

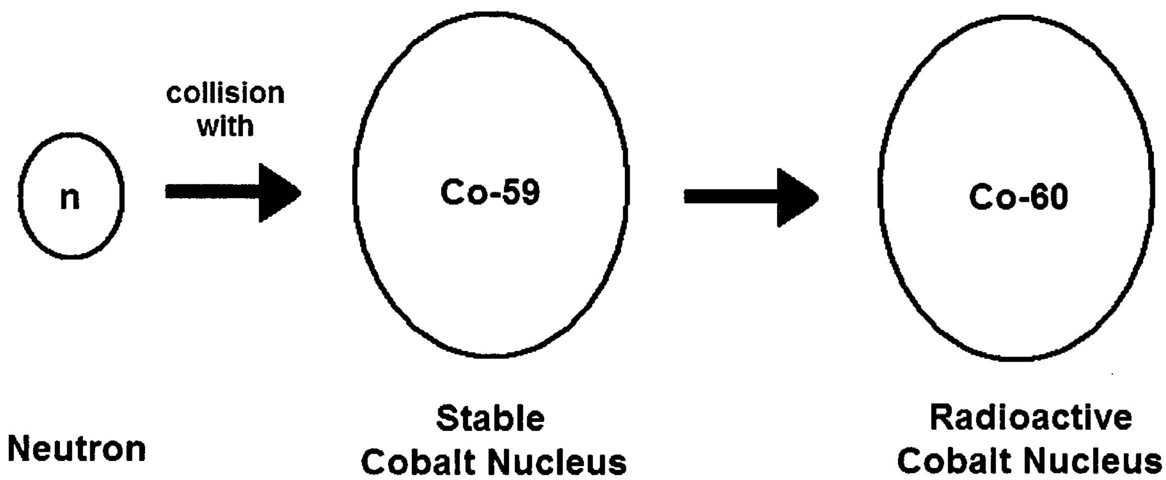


Figure 1.4-2
Radioactive Activation Product Formation

At MPS there are five independent protective barriers that confine these radioactive materials. These five barriers, which are shown in Figure 1.4-3 (Reference 6), are:

- fuel pellets;
- fuel cladding;
- reactor vessel and associated piping and equipment;
- primary containment and,
- secondary containment (enclosure building).

SIMPLIFIED DIAGRAM OF A PRESSURIZED WATER REACTOR

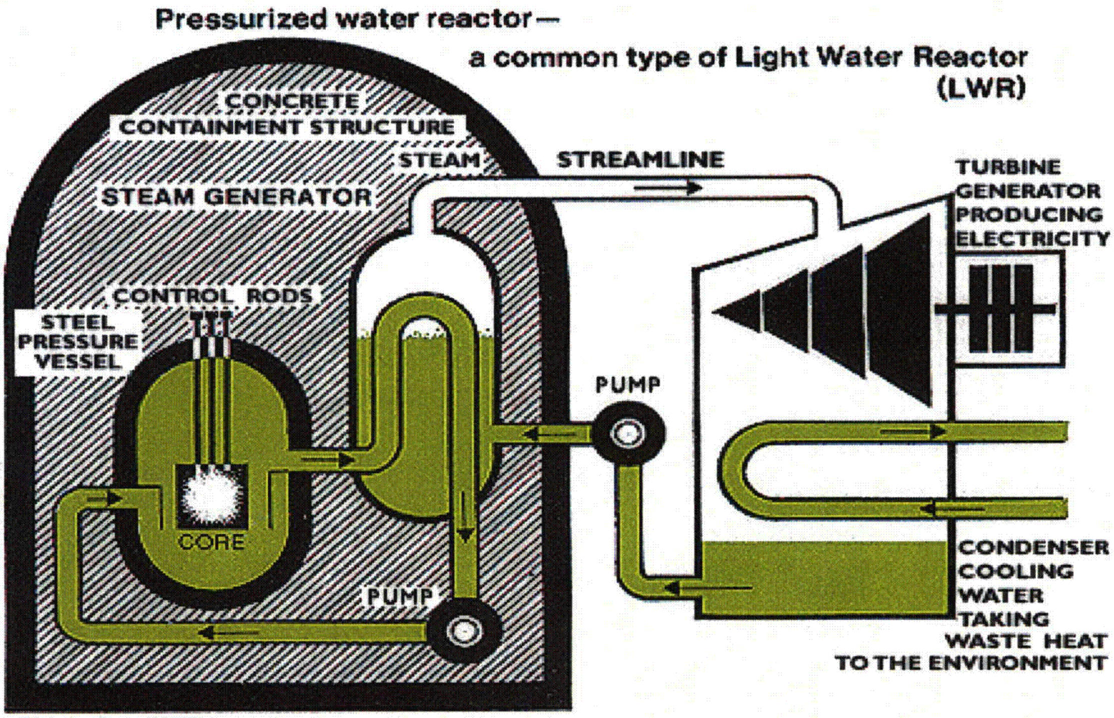


Figure 1.4-3

The ceramic uranium fuel pellets provide the first barrier. Most of the radioactive fission products are either physically trapped or chemically bound between the uranium atoms, where they will remain. However, a few fission products that are volatile or gaseous may diffuse through the fuel pellets into small gaps between the pellets and the fuel cladding.

The second barrier, the fuel cladding, consists of zirconium alloy tubes that confine the fuel pellets. The small gaps between the fuel and the cladding contain the noble gases and volatile iodines that are types of radioactive fission products. This radioactivity can diffuse to a small extent through the fuel cladding into the reactor coolant water.

The third barrier consists of the reactor pressure vessel, steel piping and equipment that confine the reactor cooling water. The reactor pressure vessel, which holds the reactor fuel, is typically a steel tank 40 feet high by 14 feet in diameter with walls about five to nine inches thick. These vessels and associated piping provide containment for radioactivity in the primary coolant and the reactor core. However, during the course of operations and maintenance, small amounts of radioactive fission and activation products can escape through valve leaks or upon breaching of the primary coolant system for maintenance.

The fourth barrier is the primary containment. It is a cylindrical enclosure with approximately five-foot thick steel reinforced concrete walls lined by steel on the inside. Small amounts of radioactivity may be released from primary containment during operation to maintain proper containment pressure and during maintenance and refueling outages.

The fifth barrier is the secondary containment or enclosure building. The enclosure building is a steel building that surrounds the primary containment. This barrier is an additional safety feature at MPS's reactor units to contain radioactivity that may escape from the primary containment. This enclosure building is equipped with a filtered ventilation system that is used when needed to reduce the radioactivity that escapes from the primary containment.

The five barriers confine most of the radioactive fission and activation products. However, small amounts of radioactivity do escape via mechanical failures and maintenance on valves, piping, and equipment associated with the reactor cooling water system. The small amounts of radioactive liquids and gases that do escape the various containment systems are further controlled by the liquid purification and ventilation filtration systems. Also, prior to a release to the environment, control systems exist to collect and purify the radioactive effluents in order to reduce releases to the environment to as low as is reasonably achievable. The control of radioactive effluents at MPS will be discussed in more detail in the next section.

1.5 Radioactive Effluent Control

The small amounts of radioactive liquids and gases that might escape the first two barriers are purified in the liquid and gaseous waste treatment systems, then monitored for radioactivity, and released only if the radioactivity levels are below the federal release limits.

Radioactivity released from the liquid effluent system to the environment is limited, controlled, and monitored by a variety of systems and procedures which include:

- reactor water cleanup system;
- liquid radwaste treatment system;
- sampling and analysis of the liquid radwaste tanks; and,
- liquid waste effluent discharge radioactivity monitor.

The purpose of the reactor water cleanup system is to continuously purify the reactor cooling water by removing radioactive atoms and non-radioactive impurities that may become activated by neutron bombardment. A portion of the reactor coolant water is diverted from the primary coolant system and is directed through ion exchange resins where radioactive elements, dissolved and suspended in the water, are removed through chemical processes. The net effect is a substantial reduction of the radioactive material that is present in the primary coolant water and consequently the amount of radioactive material that might escape from the system.

Reactor cooling water that might escape the primary cooling system and other radioactive water sources are collected in floor and equipment drains. These drains direct this radioactive liquid waste to large holdup tanks. The liquid waste collected in the tanks is purified again using the liquid radwaste treatment system, which consists of a filter and ion exchange resins.

Processing of liquid radioactive waste results in large reductions of radioactive liquids discharged into Niantic Bay. Wastes processed through liquid radwaste treatment can be purified and when necessary the processed liquid is re-used in plant systems.

Prior to release, the radioactivity in the liquid radwaste tank is sampled and analyzed to determine if the level of radioactivity is below the release limits and to quantify the total amount of radioactive liquid effluent that would be released. If the levels are below the federal release limits, the tank is drained to the liquid effluent discharge header.

This liquid waste effluent discharge line is provided with a shielded radioactivity monitor. This detector is connected to a radiation level meter and a recorder in the Control Room. The radiation alarm is set so that the detector will alarm before radioactivity levels exceed the release limits. The liquid effluent discharge header has an isolation valve. If an alarm is received, the liquid effluent discharge valve will automatically close, thereby terminating the release to the Niantic Bay and preventing any liquid radioactivity from being released that may exceed the release limits. An audible alarm notifies the Control Room operator that this has occurred.

Some liquid waste sources, which have a low potential for containing radioactivity, and/or may contain very low levels of contamination, may be discharged directly to the Long Island Sound. One such source of liquid is the turbine building sump. However, periodic representative samples are collected for analysis of radioactivity content to track the amounts of radioactivity being discharged.

Another means for adjusting liquid effluent concentrations to below federal limits is by mixing plant cooling water from the condenser with the liquid effluents in the discharge canal. This larger volume of cooling water further lowers the radioactivity levels to below the release concentration limits.

The preceding discussion illustrates that many controls exist to reduce the radioactive liquid effluents released to the Niantic Bay to as far below the release limits as is reasonably achievable.

Radioactive releases from the radioactive gaseous effluent system to the environment are limited, controlled, and monitored by a variety of systems and procedures which include:

- containment building ventilation system;
- containment building radioactivity monitors;
- sampling and analysis of containment building vent and purge effluents;
- process gas treatment system;
- auxiliary building (and engineered safeguards and fuel building for MPS3) ventilation system;
- stack and vent effluent radioactivity monitors;
- sampling and analysis of stack and vent effluents;
- process radiation monitors; and
- steam jet air ejector (SJAE) monitor

The primary sources of gaseous radioactive waste are degassing of the primary coolant, gaseous liquid drains, and gaseous vents. Additional sources of gaseous waste activity include ventilation air released from the auxiliary building and purging and venting of the containment building. The radiation level meter and recorders for the effluent radioactivity monitors are located in the Control Room. The plant process computer aids in tracking the monitor readings. To supplement the information continuously provided by the detector, air samples are taken periodically from the containment, stack and vents. These samples are analyzed to quantify the total amount of tritium and radioactive gaseous and particulate effluents released.

Gases from the primary coolant are held up in waste gas decay tanks for decay at MPS2. Gaseous waste at MPS3 is purified through a process gas system, consisting of high-efficiency particulate air filters and charcoal adsorber beds. Gases from periodic venting of the MPS2 containment are released through a similar process system (Enclosure Building Filtration System) while gases from the MPS3 containment vacuum pumps are released without treatment. If necessary, MPS3 containment air can be filtered by an internal particulate and charcoal treatment system. Containment purges (purge is the forced ventilation process while containment vents are pressure releases) for MPS2 are filtered by high-efficiency particulate filters while at MPS3 these are not normally filtered. If necessary, particulate and charcoal filters can be used for these purges.

The auxiliary building ventilation system provides for ventilation of the auxiliary building and enclosure building (and service building and contiguous areas, waste disposal building, and fuel building for MPS3, for MPS2 these are all part of the auxiliary building). Normally, the air from the ventilation of these areas will exhaust through the ventilation vent (which has a particulate filter for MPS2). If exhaust from these areas reaches a predetermined level, the ventilation flow can be diverted by operator control to a particulate and charcoal filtration system.

Therefore, for both liquid and gaseous releases, radioactive effluent control systems exist to collect and purify the radioactive effluents in order to reduce releases to the environment to as low as is reasonably achievable. The effluents are always monitored, sampled and analyzed to make sure that radioactivity levels are below the release limits. If the release limits are being approached, isolation valves in some of the waste effluent lines will automatically shut to stop the release, or Control Room operators can implement procedures to ensure that federal regulatory limits are always met.

1.6 Radiological Impact on Humans

The final step in the effluent control process is the determination of the radiological dose impact to humans and comparison with the federal dose limits to the public. This step is performed in three stages. As mentioned previously, the purpose of continuous radiation monitoring and periodic sampling and analysis is to measure the quantities of radioactivity being released to determine compliance with the radioactivity release limits. This is the first stage for assessing releases to the environment.

The second stage is calculations of the dose impact to the general public from MPS's radioactive effluents are performed. The purpose of these calculations is to periodically assess the doses to the general public resulting from radioactive effluents to ensure that these doses are being maintained as far below the federal dose limits as is reasonably achievable. This is the second stage for assessing releases to the environment.

The types and quantities of radioactive liquid and gaseous effluents released from MPS during each given year are reported to the NRC annually in the Radiological Effluent Release Report (RERR). Similar to this report, the RERR is submitted annually to the NRC. Section 5 of this report discusses the detailed dose calculations from the RERR and provides a comparison to REMP dose calculations. The liquid and gaseous effluents were well below the federal release limits and were a small percentage of the MPS REMODCM effluent control limits.

The measurements of the physical and chemical nature of the effluents are used to determine how the radionuclides will interact with the environment and how they can result in radiation exposure to humans. The environmental interaction mechanisms depend upon factors such as the hydrological (water) and meteorological (atmospheric) characteristics in the area. Information on the water flow, wind speed, wind direction, and atmospheric mixing characteristics are used to estimate how radioactivity will distribute and disperse in the ocean and the atmosphere.

The most important type of information that is used to evaluate the radiological impact on humans is data on the use of the environment. Information on fish and shellfish consumption, boating usage, beach usage, locations of cows and goats, locations of residences, locations of gardens, drinking water supplies, and other usage information are utilized to estimate the amount of radiation and radioactivity received by the general public.

The radiation exposure pathway to humans is the path radioactivity takes from its release point at MPS to its effect on man. The movement of radioactivity through the environment and its transport to humans is portrayed in Figure 1.6.

EXAMPLES OF MPS'S RADIATION EXPOSURE PATHWAYS

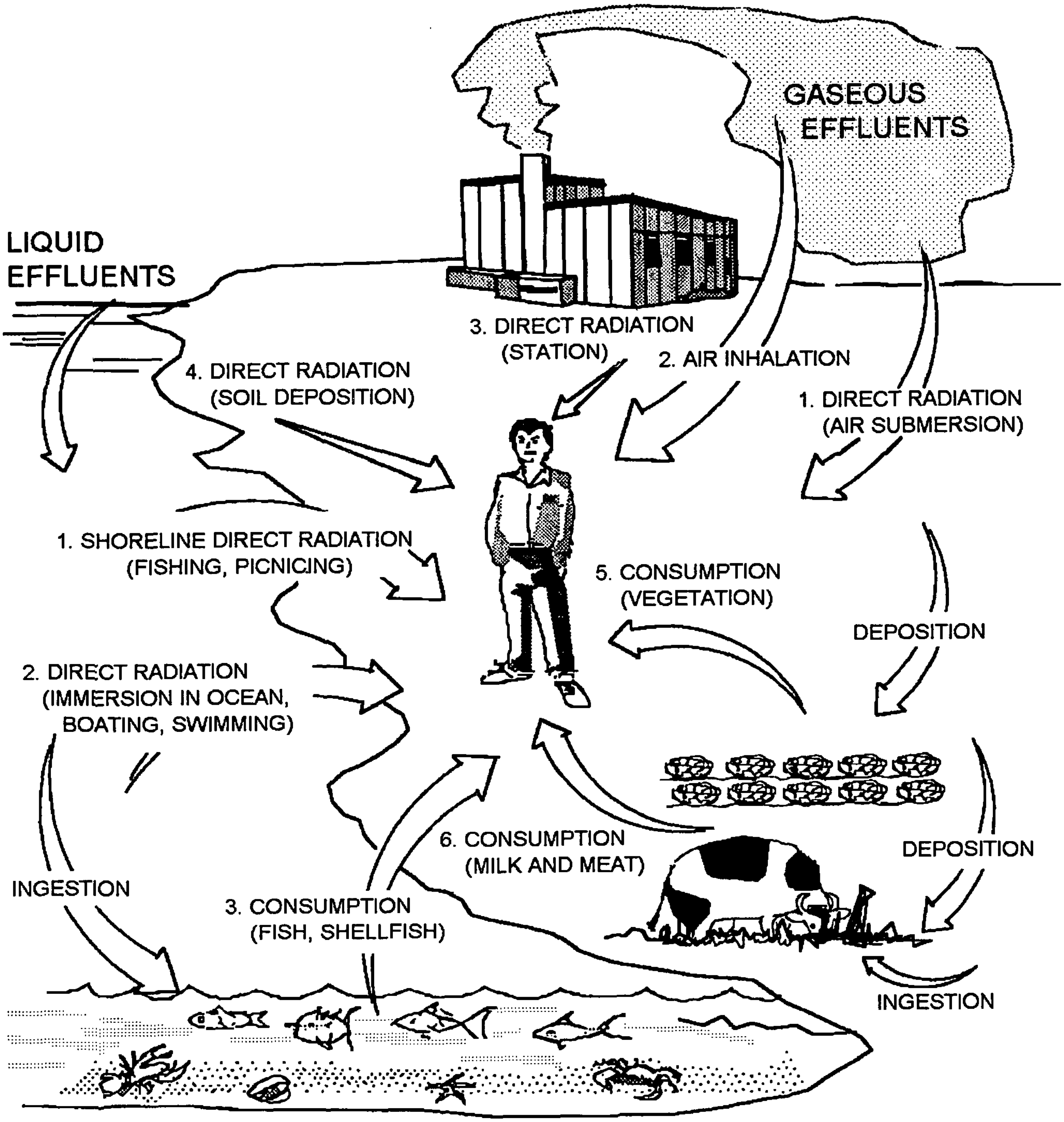


Figure 1.6
Radiation Exposure Pathways

There are three major pathways in which liquid effluents affect humans:

- external radiation from liquid effluents that deposit and accumulate on the shoreline;
- external radiation from immersion in ocean water containing radioactive liquids; and,
- internal radiation from consumption of fish and shellfish containing radioactivity absorbed from the liquid effluents.

There are six major ways in which gaseous effluents affect humans:

- external radiation from an airborne plume of radioactivity;
- internal radiation from inhalation of airborne radioactivity;
- external radiation from deposition of radioactive effluents on soil;
- ambient (direct) radiation from contained sources at the power plant;
- internal radiation from consumption of vegetation containing radioactivity deposited on the vegetation from airborne deposition and absorbed from the soil due to ground deposition of radioactive effluents; and,
- internal radiation from consumption of milk and meat containing radioactivity deposited on forage that is eaten by cattle and other livestock.

In addition, ambient (direct) radiation emitted from contained sources of radioactivity at MPS contributes to radiation exposure in the vicinity of the plant. For example, small amounts of ambient radiation result from low-level radioactive waste being processed and stored at the site prior to shipping and disposal. Also, the operation of the Independent Spent Fuel Storage Installation (ISFSI) which began in 2005 results in very small amounts of direct radiation at the site boundary.

The radiological dose impact on humans is based both on effluent analyses and modeling and on direct measurements of radiation and radioactivity in the environment. When MPS-related radioactivity is detected in samples that represent a plausible exposure pathway, the resulting dose from such exposure is assessed (see Sections 4 and 5). However, the operation of MPS results in releases of only small amounts of radioactivity, and, as a result of dilution in the atmosphere and ocean, even the most sensitive radioactivity measurement and analysis techniques cannot usually detect these tiny amounts of radioactivity above that which is naturally present in the environment. Therefore, radiation doses are calculated using radioactive effluent release data and computerized dose calculations that are based on conservative NRC-recommended models that tend to result in over-estimates of the resulting dose. These computerized dose calculations are performed by DNC personnel. These computer codes use the guidelines and methodology set forth by the NRC in Regulatory Guide 1.109 (Reference 7). The dose calculations are documented and described in detail in the MPS's REMODCM (Reference 8), which has been reviewed by the NRC.

It should be emphasized that because of the conservative assumptions made in the computer code calculations, the maximum hypothetical dose to an individual is considerably higher than the dose that would actually be received by a real individual.

After dose calculations are performed, the results are compared to the federal dose limits for the public. The two federal agencies that are charged with the responsibility of protecting the public from radiation and radioactivity are the NRC and the EPA.

The NRC, in 10 CFR 20.1301 (Reference 9) limits the levels of radiation to unrestricted areas resulting from the possession or use of radioactive materials such that they limit any individual to a dose of:

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

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

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

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

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

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

The dose to a member of the general public from iodine-131, tritium, and all particulate radionuclides with half-lives greater than 8 days in gaseous effluents is limited to:

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

The EPA, in 40 CFR 190.10 Subpart B (Reference 11), sets forth the environmental standards for the uranium fuel cycle. During normal operation, the annual dose to any member of the public, at or beyond the site boundary, from the entire uranium fuel cycle shall be limited to:

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

The summary of the 2011 radiological impact for MPS and comparison with the EPA dose limits and Appendix I guidelines is presented in Section 5 of this report.

The third stage of assessing releases to the environment is the REMP. The description and results of the REMP at MPS during 2011 is discussed in Sections 2 through 4 of this report.

2. PROGRAM DESCRIPTION

2.1 Sampling Schedule and Locations

The sample locations and the sample types and frequency of analysis are given in Tables 2-1 and 2-2 and Figures 2.1, 2.2 and 2.3. The program as described on Table 2-2 only lists the required samples as specified in the REMODCM. However, in order to identify the locations of the extra samples, all locations (both required and extra) are listed in Table 2-1 and shown on the figures.

Table 2-1 Environmental Monitoring Program Sampling Types and Locations

Location Number*	Location Name	Direction & Distance From Release Point**	Sample Types
1-I	On-site - Old Millstone Rd.	0.6 Mi, NNW	TLD, Air Particulate, Iodine, Vegetation
2-I	On-site - Weather Shack	0.3 Mi, S	TLD, Air Particulate, Iodine
3-I	On-site - Bird Sanctuary	0.3 Mi, NE	TLD, Air Particulate, Iodine, Soil
4-I	On-site - Albacore Drive	1.0 Mi, N	TLD, Air Particulate, Iodine, Soil
5-I	MP3 Discharge	0.1 Mi, SSE	TLD
6-I	Quarry Discharge	0.3 Mi, SSE	TLD
7-I	Environmental Lab Dock	0.3 Mi, SE	TLD
8-I	Environmental Lab	0.3 Mi, SE	TLD
9-I	Bay Point Beach	0.4 Mi, W	TLD
10-I	Pleasure Beach	1.2 Mi, E	TLD, Air Particulate, Iodine, Vegetation
11-I	New London Country Club	1.6 Mi, ENE	TLD, Air Particulate, Iodine
12-C	Fisher's Island, NY	8.0 Mi, ESE	TLD
13-C	Mystic, CT	11.5 Mi, ENE	TLD
14-C	Ledyard, CT	12.0 Mi, NE	TLD, Soil
15-C	Norwich, CT	14.0 Mi, N	TLD, Air Particulate, Iodine
16-C	Old Lyme, CT	8.8 Mi, W	TLD
17-I	Site Boundary	0.5 Mi, NE	Vegetation
18-X	Cow	10.4 Mi, NW	Milk
21-I	Goat Location #1	2.0 Mi, N	Milk
24-C	Goat Location #3	29.0 Mi, NNW	Milk
25-I	Within 10 Miles	Nearest garden	Fruits & Vegetables
26-C	Beyond 10 Miles	Beyond 10 Miles	Fruits & Vegetables
27-I	Niantic	1.7 Mi, WNW	TLD, Air Particulate, Iodine
28-I	Two Tree Island	0.8 Mi, SSE	Mussels, Fish***
29-I	West Jordan Cove	0.4 Mi, NNE	Clams, Fish***
29-X	West Jordan Cove	0.4 Mi, NNE	Bottom Sediment, Fucus
30-I	Niantic Shoals	1.5 Mi, NNW	Mussels
31-I	Niantic Shoals	1.8 Mi, NW	Bottom Sediment, Oysters
32-I	Vicinity of Discharge	< 0.1 Mi	Bottom Sediment, Oysters, Lobster, Fish***, Seawater
32-X	Vicinity of Discharge	< 0.1 Mi	Fucus
33-I	Seaside Point	1.8 Mi, ESE	Bottom Sediment
33-X	Seaside Point	1.8 Mi, ESE	Fucus
34-I	Thames River Yacht Club	4.0 Mi, ENE	Bottom Sediment
34-X	Thames River Yacht club	4.0 Mi, ENE	Oysters
35-I	Niantic Bay	0.3 Mi, WNW	Lobster, Fish***
35-X	Niantic Bay	0.3 Mi, WNW	Bottom Sediment, Clams, Fucus
36-X	Black Point	3.0 Mi, WSW	Fucus
37-C	Giant's Neck	3.5 Mi, WSW	Bottom Sediment, Oysters, Seawater
37-X	Giant's Neck	3.5 Mi, WSW	Lobster
38-I	Waterford Shellfish Bed #1	1.0 Mi, NW	Clams
39-X	Jordan Cove Bar	0.8 Mi, NE	Bottom Sediment, Clams

*Key: **I** - Indicator **C** - Control **X** - Extra - sample not required by REMODCM
**The release points are the Site Stack for terrestrial locations and the quarry cut for aquatic locations.
*** Flounder and another type of fish, each required to be sampled at two seperate locations.

Location Number*	Location Name	Direction & Distance From Release Point**	Sample Types
41-I	Myrock Avenue	3.2 Mi, ENE	TLD
42-I	Billow Road	2.4 Mi, WSW	TLD
43-I	Black Point	2.6 Mi, SW	TLD
44-I	Onsite - Schoolhouse	0.1 Mi, NNE	TLD
45-I	Onsite Access Road	0.5 Mi, NNW	TLD
46-I	Old Lyme - Hillcrest Ave.	4.6 Mi, WSW	TLD
47-I	East Lyme - W. Main St.	4.5 Mi, W	TLD
48-I	East Lyme - Corey Rd.	3.4 Mi, WNW	TLD
49-I	East Lyme - Society Rd.	3.6 Mi, NW	TLD
50-I	East Lyme - Manwaring Rd.	2.1 Mi, W	TLD
51-I	East Lyme - Smith Ave.	1.5 Mi, NW	TLD
52-I	Waterford - River Rd.	1.1 Mi, NNW	TLD
53-I	Waterford-Gardiners Wood Rd	1.4 Mi, NNE	TLD
55-I	Waterford - Magonk Point	1.8 Mi, ESE	TLD
56-I	New London - Mott Ave.	3.7 Mi, E	TLD
57-I	New London - Ocean Ave.	3.6 Mi, ENE	TLD
59-I	Waterford -Miner Ave.	3.4 Mi, NNE	TLD
60-I	Waterford - Parkway South	4.0 Mi, N	TLD
61-I	Waterford - Boston Post Rd.	4.3 Mi, NNW	TLD
62-I	East Lyme - Columbus Ave.	1.9 Mi, WNW	TLD
63-I	Waterford - Jordon Cove Rd.	0.8 Mi, NE	TLD
64-I	Waterford - Shore Rd.	1.1 Mi, ENE	TLD
65-I	Waterford - Bank St.	3.2 Mi, NE	TLD
66-X	NAP Parking Lot - Fit Center	0.4 Mi, NW	TLD
67-X	Golden Spur	4.7 Mi, NNW	Bottom Sediment
69-X	Pleasure Beach	0.8 Mi, E	Bottom Sediment
71-I	1-MW-XFMR-03	Onsite	Well Water
72-I	MW-GPI-1	Onsite	Well Water
73-X	Site Switchyard Fence	0.3 Mi, N	TLD
74-X	Ball Field Foul Pole	0.6 Mi, N	TLD
75-X	Waterford – Windward Way & Shotgun	0.5 Mi, NE	TLD
76-X	ISFSI-1	Up-gradient of ISFSI	Well Water
77-X	ISFSI-2A	Down-gradient of ISFSI	Well Water
78-X	ISFSI-3	Down-gradient of ISFSI	Well Water
79-I	M3-MW-1	Onsite	Well Water
80-I	S12-MW-2	Onsite	Well Water
81-I	S2-MW-1	Onsite	Well Water
82-I	MW-GPI-2	Onsite	Well Water
83-X	MW-GPI-3	Onsite	Well Water
84-X	MW-GPI-4	Onsite	Well Water
85-X	MW-GPI-5	Onsite	Well Water
86-X	MW-GPI-6	Onsite	Well Water
88-I	DEP Dock	Onsite	Oysters
90-X	Thames River	4 Mi, E	Fucus
91-X	MW-GPI-8	Onsite	Well Water
92-X	MW-GPI-9	Onsite	Well Water
RI-X	Ram Island		Oysters

*Key: **I** - Indicator **C** - Control **X** - Extra - sample not required by the REMODCM
**The release points are the Site Stack for terrestrial locations and the quarry cut for aquatic locations.

Table 2-2 Required Sampling Frequency & Type of Analysis

	Exposure Pathway and/or Sample	No. of Locations	Sampling & Collection Frequency	Type of Analysis
1.	Gamma Dose - Environmental TLD	40[a]	Quarterly	Gamma Dose - Quarterly
2.	Airborne Particulate	8	Continuous sampler - weekly filter change	Gross Beta - Weekly Gamma Spectrum - Quarterly on composite (by location), and on individual sample if gross beta is greater than 10 times the mean of the weekly control station's gross beta results
3.	Airborne Iodine	8	Continuous sampler - weekly canister change	I-131 - Weekly
4.	Vegetation	5	One sample near middle and one near end of growing season	Gamma Isotopic on each sample
5.	Milk	2	Semimonthly when animals are on pasture; monthly at other times.	Gamma Isotopic and I-131 on each sample; Sr-89 and Sr-90 on quarterly composite
5a.	Pasture Grass	2	Sample as necessary to substitute for unavailable milk	Gamma Isotopic and I-131 on each sample
6.	Sea Water	2	Continuous sampler with a monthly collection at indicator location. Quarterly at control location - Composite of 6 weekly grab samples.	Gamma Isotopic and Tritium on each sample.
6a.	Well Water	6	Semiannual	Gamma Isotopic and Tritium on each sample
7.	Bottom Sediment	5	Semiannual	Gamma Isotopic on each sample
7a.	Soil	3	Annually	Gamma Isotopic on each sample
8.	Fin Fish - Flounder and one other type of edible fin fish	2	Quarterly	Gamma Isotopic on each sample
9.	Mussels (edible portion)	2	Quarterly	Gamma Isotopic on each sample
10.	Oysters (edible portion)	4	Quarterly	Gamma Isotopic on each sample
11.	Clams (edible portion)	2	Quarterly	Gamma Isotopic on each sample
12.	Lobster (edible portion)	2	Quarterly	Gamma Isotopic on each sample

(a) Two or more TLDs or TLD with two or more elements per location.

Figure 2.1 Millstone Power Station Sampling Locations

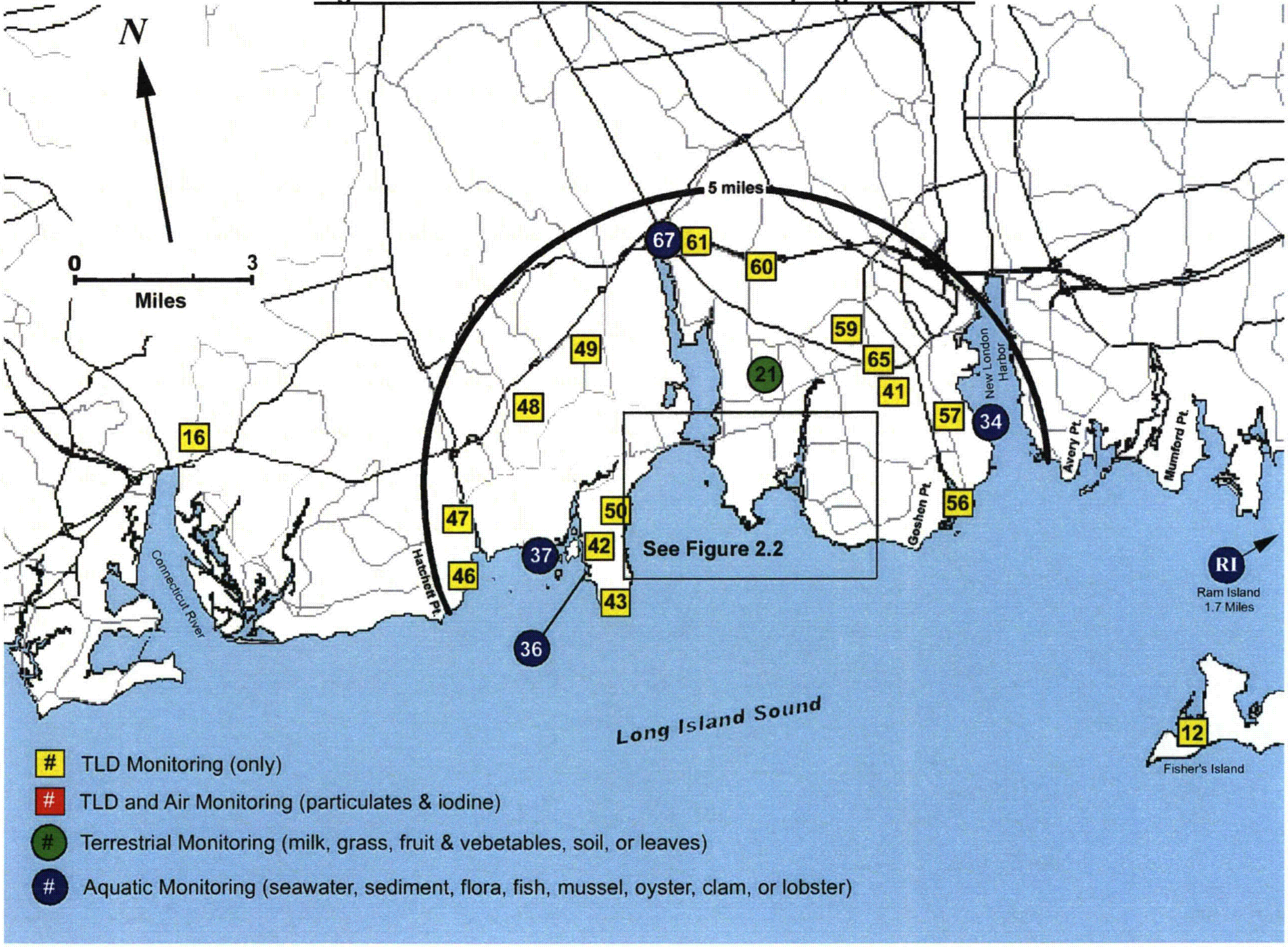


Figure 2.2 Millstone Power Station Sampling Locations (Within 2 miles)

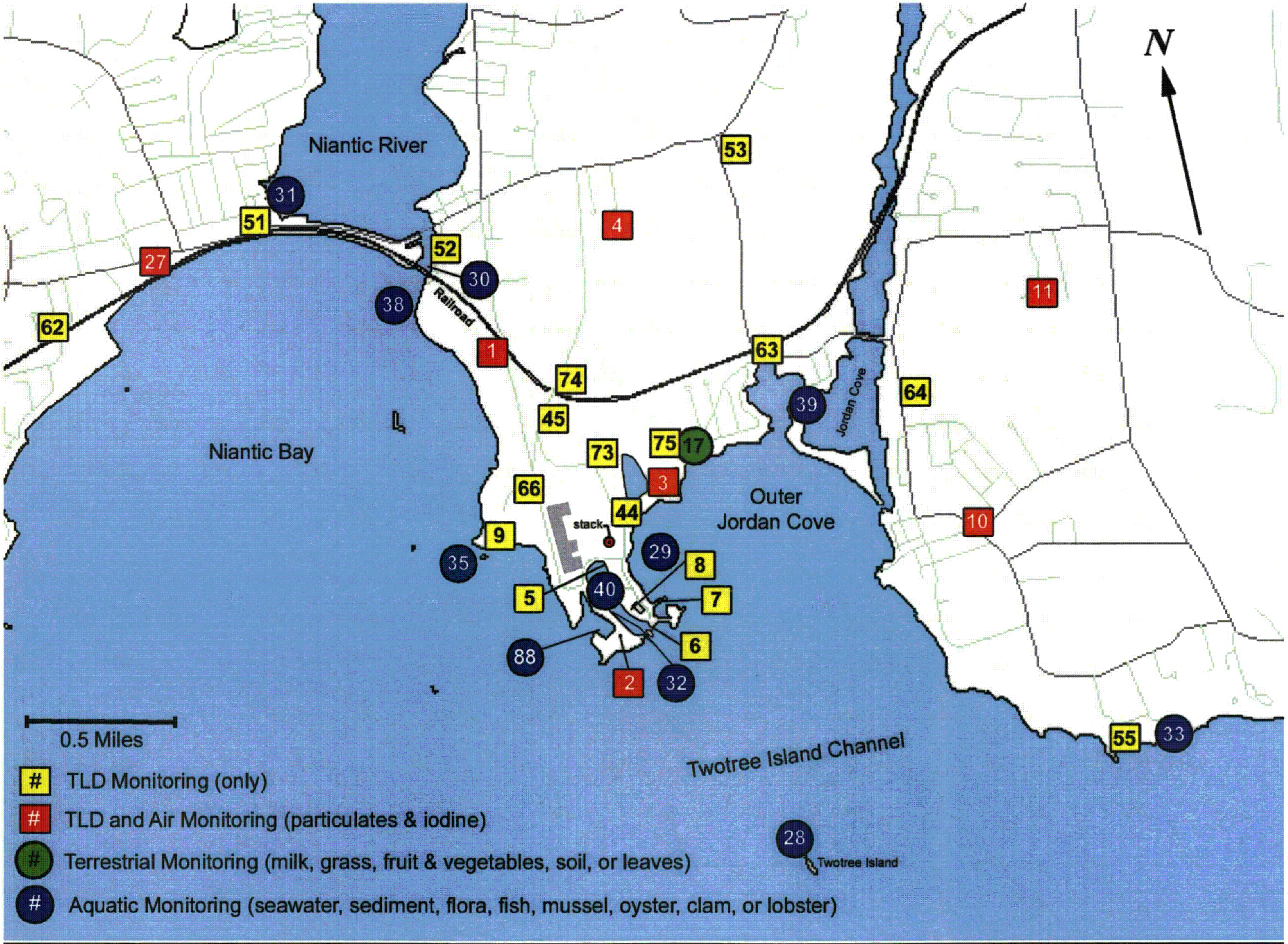


Figure 2.3 Millstone Power Station Sampling Wells

2.2 Samples Collected During Report Period

The following table summarizes the number of samples of each type collected and analyzed during 2011:

Sample Type	Number of Technical Specification Required Samples	Number of Technical Specification Required Samples Analyzed	Number of Extra Samples Analyzed
Gamma Exposure (Environmental TLD)	160	158[1]	16
Air Particulates	416	412[1]	0
Air Iodine	416	412[1]	0
Soil	3	3	0
Cow and Goat Milk	38	5[2]	18
Pasture Grass/Feed	Variable[3]	33	5
Fruit and Vegetables	4	4	3
Broad Leaf Vegetation	6	6	0
Well Water	12	12	47
Sea Water	16	16	0
Bottom Sediment	10	10	9
Aquatic Flora	0	0	24
Fish	16	10[4]	0
Mussels	8	4[4]	0
Oysters	16	16	9
Clams	8	8	8
Lobster	8	8	3
Total All Types	**1,137**	**1,117**	**142**

[1] See notes at end of Section 3 for details on loss of some TLDs and air samples.
[2] Pasture grass or feed sampled as necessary to substitute for unavailable milk.
[3] Depends upon availability of milk samples
[4] Due to sample unavailability, not all required fish and shellfish samples could be obtained

3. RADIOCHEMICAL RESULTS

3.1 Summary Table

In accordance with the REMODCM, Section I.F.1, a summary table of the radiochemical results has been prepared and is presented on the following pages. The mean and range recorded are based only upon detectable measurements. There were no non-routine measurements in 2011.

A more detailed analysis of the data is given in Section 4.0 where a discussion of the variations in the data explains many aspects that are not evident in the Summary Table because of the basic limitation of data summaries. The data summaries include the extra ("X") samples collected throughout the year. These samples are taken to enhance the monitoring program, or are the results of special studies.

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY
Millstone Power Station
Dockets 50-245, 50-336 & 50-423

Medium or Pathway Sampled *(Units)*	Analysis Type	Total Number	LLD*	Indicator Locations Mean (Range)	Location with Highest Mean Number	Distance Direction	Mean (Range)	Control Locations Mean Range
Direct Radiation *TLD (uR/hr)*	**Gamma Dose**	174	-	7.7 (4.5 - 11.0)	8	0.3 Mi. SE	10.8 (10.4 - 11.0)	7.7 (5.7 - 9.4)
Air Iodine *(1e-3 pCi/m^3)*	**I-131**	412	70	79.8 (51.2 - 105)	2	0.3 Mi. S	105	60.2 (57.6 - 62.7)
Air Particulate *(1e-3 pCi/m^3)*	**GR-B**	412	10	15.5 (4.8 - 31.5)	27	1.7 Mi. WNW	15.7 (5.0 - 27.8)	15.2 (4.9 - 30.8)
	GAMMA	48						
	BE-7		-	126 (84 - 225)	4	1.0 Mi. N	142 (96 - 225)	128 (90 - 287)
	Other Gammas		-	<LLD			-	<LLD
Soil *(pCi/g dry)*	**GAMMA**	3						
	K-40		-	15.3 (14.5 - 16.0)	3	0.03 Mi. NE	16.0 1 sample	14.2 1 sample
	CS-137		0.18	0.373 (0.288 - 0.458)	14	12.0 Mi. NE	0.677 1 sample	0.677 1 sample
	Other Gammas		-	<LLD			-	<LLD
Milk *(pCi/l)*	**GAMMA**	23						
	K-40		-	920 (686 - 1230)	24	29.0 Mi. NNW	1360 1 sample	1360 1 sample
	Other Gammas		-	<LLD			-	<LLD
Pasture Grass/Hay *(pCi/g wet)*	**GAMMA**	38						
	BE-7		-	2.64 (0.294 - 6.92)	18	10.4 Mi. NW	3.17 1 sample	2.80 (0.622 - 6.58)
	K-40		-	7.52 (3.65 - 13.9)	18	10.4 Mi. NW	8.77 (7.33 - 10.2)	7.49 (2.75 - 21.6)
	CS-137		0.08	0.021 (1/21)	24	29.0 Mi. NNW	0.048 (0.030 - 0.059)	0.048 (0.030 - 0.059)
	Other Gammas		-	<LLD			-	<LLD
Well Water *(pCi/l)*	**H-3**	59	-	<LLD			-	-
	GAMMA	59						
	K-40		-	61.9 (56.6 - 72.1)	71	Onsite	72.1 1 sample	-
	Other Gammas		-	<LLD			-	<LLD

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY
Millstone Power Station
Dockets 50-245, 50-336 & 50-423

Medium or Pathway Sampled (Units)	Analysis Type	Total Number	LLD*	Indicator Locations Mean (Range)	Location with Highest Mean Number	Distance Direction	Mean (Range)	Control Locations Mean Range
Fruits & Vegetables *(pCi/g wet)*	**GAMMA**	7						
	BE-7		-	0.521 (0.280 - 0.832)	25	Within 10 Miles	0.521 (0.28 - 0.832)	<LLD
	K-40		-	2.39 (0.987 - 4.38)	26	Beyond 10 miles	2.76 (0.929 - 5.90)	2.76 (0.929 - 5.90)
	Th-232 decay chain*		-	0.040 (1/7)	25	Within 10 Miles	0.040	<LLD
	* The highest result for Th-232 and it's two daughters, Th-228 and Act-228.							
	Other Gammas		-	<LLD			-	<LLD
Broad Leaf Vegetation *(pCi/g wet)*	**GAMMA**	6						
	BE-7		-	1.98 (0.905 - 5.76)	17	0.5 Mi. NE	2.58 (1.15 - 5.76)	-
	K-40		-	3.50 (1.92 - 5.70)	10	1.2 Mi. E	3.76 (2.63 - 5.34)	-
	CS-137		0.08	0.061 (0.045- 0.070)	17	0.5 Mi. NE	0.061 (0.045 - 0.070)	-
	Other Gammas		-	<LLD			-	<LLD
Sea Water *(pCi/l)*	**H-3**	16	-	665 (214 - 2260)	32	< 0.1 Mi	665 (214 - 2260)	<LLD
	GAMMA	16						
	K-40		-	264 (211 - 310)	32	< 0.1 Mi	264 (211 - 310)	258 (213 - 296)
	Other Gammas		-	<LLD			-	<LLD
Bottom Sediment *(pCi/g dry)*	GAMMA	19						
	K-40		-	15.7 (6.27 - 18.5)	39	0.8 Mi. NE	18.5 1 sample	14.2 (13.9 - 14.4)
	CS-137		0.18	0.123 1 sample	39	0.8 Mi. NE	0.123 1 sample	<LLD
	Other Gammas		-	<LLD			-	<LLD
Flora *(pCi/g wet)*	**GAMMA**	24						
	BE-7		-	0.169 (0.113 - 0.236)	90	4.0 Mi. E	0.342 1 sample	0.342 1 sample
	K-40		-	7.11 (5.36 - 8.70)	32	< 0.1 Mi	7.85 (7.43 - 8.70)	7.38 (6.57 - 8.26)
	I-131		0.06	0.055 (0.043 - 0.072)	32	< 0.1 Mi	0.072 1 sample	<LLD
	Th-232 decay chain*		-	0.077 (.052 - 0.110)	33	1.8 Mi. ESE	0.110 1 sample	0.051 (0.048 - 0.053)
	* The highest result for Th-232 and it's two daughters, Th-228 and Act-228.							
	Other Gammas		-	<LLD			-	<LLD

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY
Millstone Power Station
Dockets 50-245, 50-336 & 50-423

Medium or Pathway Sampled (Units)	Analysis Type	Total Number	LLD*	Indicator Locations	Location with Highest Mean			Control Locations
				Mean (Range)	Number	Distance Direction	Mean (Range)	Mean Range
Fish - Flounder *(pCi/g wet)*	GAMMA K-40	4	-	4.3 (3.7 - 4.8)	32	< 0.1 Mi	4.7 (4.5 - 4.8)	-
	Other Gammas		-	<LLD			-	<LLD
Fish - Other *(pCi/g wet)*	GAMMA K-40	6	-	3.8 (3.3 - 4.6)	35	0.3 Mi. WNW	4.1 (3.8 - 4.6)	-
	Other Gammas		-	<LLD			-	<LLD
Mussels *(pCi/g wet)*	GAMMA K-40	4	-	2.4 (2.3 - 2.5)	30	1.5 Mi. NNW	2.4 (2.3 - 2.5)	-
	Other Gammas		-	<LLD			-	<LLD
Oysters *(pCi/g wet)*	GAMMA K-40	23	-	1.8 (1.1 - 2.7)	31	1.8 Mi. NW	2.1 (2.0 - 2.2)	1.5 (1.3 - 1.6)
	AG-110M		-	0.1 (0.1 - 0.1)	32	< 0.1 Mi	0.1 (0.1 - 0.1)	<LLD
	Other Gammas		-	<LLD			-	<LLD
Clams *(pCi/g wet)*	GAMMA K-40	16	-	2.0 (1.4 - 2.8)	39	0.8 Mi. NE	2.1 (2.0 - 2.4)	-
	Other Gammas		-	<LLD			-	<LLD
Lobster *(pCi/g wet)*	GAMMA K-40	11	-	2.4 (1.4 - 2.8)	37	3.5 Mi. WSW	2.6 (1.8 - 3.0)	2.6 (1.8/3.0)
	Other Gammas		-	<LLD			-	<LLD

NOTES FOR SUMMARY TABLE

* For gamma measurements the Minimum Detectable Level (MDL) $\simeq$ the Lower Limit of Detection (LLD) / 2.33. For all others, MDL = 2 x (the standard deviation of the background). These MDLs are based on the absence of large amounts of interfering activity (excluding naturally occurring radionuclides). Deviations by factors of 3 to 4 can occur.

The LLD at a confidence level of 95% is the smallest concentration of radioactive material in a sample that will be detected with a 5% probability of falsely concluding that a blank observation represents a "real" signal.

For a particular measurement system (which may include radiochemical separation):

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

where,

LLD	is the lower limit of detection as defined above (as pCi per unit mass or volume)
S_b	is the standard deviation of the background counting rate or of the counting rate of a blank sample as appropriate (as counts per minute)
E	is the counting efficiency (as counts per transformation)
V	is the sample size (in units of mass or volume)
2.22	is the number of transformation per minute per picoCurie
Y	is the fractional radiochemical yield (when applicable)
Δ	is the radioactive decay constant for the particular radionuclide
λt	is the elapsed time between sample collection (or end of the sample collection period) and time of counting

The LLD is defined as "a priori" (before the fact) limit representing the capability of a measurement system and not an "a posteriori" (after the fact) limit for a particular measurement.

Analyses was performed in such a manner that the stated LLDs were achieved under routine conditions. Occasionally background fluctuations, unavoidably small sample sizes, the presence of interfering nuclides, or other uncontrollable circumstances may have rendered these a priori LLDs unachievable. In such cases, the contributing factors are identified and described in this report. As shown in the equation above, for composite samples taken over a period of time, the LLD is decayed to the end of the sample period.

The listed I-131 LLD for all the vegetation samples is for leafy vegetables.
The I-131, Ba-140 and La-140 LLDs for the water samples are from end of sample period.

3.2 Data Tables

The data reported in this section are strictly counting statistics. The reported error is two times the standard deviation (2σ) of the net activity. Unless otherwise noted, the overall error (counting, sample size, chemistry, errors, etc.) is estimated to be 2 to 5 times that listed. Results are considered positive when the measured value exceeds 1.5 times the listed 2σ error (i.e., the measured value exceeds 3σ). Any errors listed as zero are the artifact that there were no background counts in the area of the peak for these nuclides.

Because of counting statistics, negative values, zeros and numbers below the Minimum Detectable Level (MDL) are statistically valid pieces of data. For the purposes of this report, in order to indicate any background biases, all the valid data are presented. This practice was recommended by Health and Safety Laboratory (HASL) ("Reporting of Analytical Results from HASL," letter by Leo B. Higginbotham), NUREG 0475 and NUREG/CR-4007 (Sept. 1984). In instances where zeros are listed after significant digits, this is an artifact of the computer data-handling program.

Data are given according to sample type as indicated below.

1. Gamma Exposure Rate
2. Air Particulates, Gross Beta Radioactivity
3. Air Particulates, Weekly I-131
4. Air Particulates, Quantitative Gamma Spectra
5. Air Particulates, Quarterly Strontium*
6. Soil
7. Milk - Dairy Farms
8. Milk - Goat Farms
9. Pasture Grass
10. Well Water
11. Reservoir Water or Deer Meat*
12. Fruits & Vegetables
13. Broad Leaf Vegetation
14. Seawater
15. Bottom Sediment
16. Aquatic Flora
17. Fin Fish
18. Mussels
19. Oysters
20. Clams
21. Scallops*
22. Lobster

* This type of sampling or analysis was not performed.

TABLE 1
QUARTERLY
GAMMA EXPOSURE RATE (uR/hr)*

LOCATIONS

PERIOD	1	(+/-)	2	(+/-)	3	(+/-)	4	(+/-)	5	(+/-)	6	(+/-)	7	(+/-)	8	(+/-)	9	(+/-)	10	(+/-)	11	(+/-)
1Q	7.9	0.2	9.7	0.3	7.4	0.4	7.4	0.2	8.4	0.4	8.0	0.3	5.1	0.23	10.4	0.3	8.4	0.3	10.7	0.3	6.6	0.2
2Q	8.0	0.4	9.6	0.5	7.6	0.5	7.8	0.4	9.2	0.4	7.8	0.4	4.5	0.27	11.0	0.5	9.0	0.5	10.7	0.6	6.6	0.3
3Q	8.1	0.2	9.5	0.3	7.3	0.3	7.5	0.3	8.8	0.4	7.7	0.3	See Note A		10.9	0.3	8.6	0.3	10.7	0.5	6.4	0.4
4Q	8.4	0.2	10.5	0.3	7.4	0.4	8.1	0.3	9.3	0.4	7.8	0.2	6.2	0.35	10.8	0.3	9.2	0.2	11.0	0.3	6.6	0.2

PERIOD	12C	(+/-)	13C	(+/-)	14C	(+/-)	15C	(+/-)	16C	(+/-)	27	(+/-)	41	(+/-)	42	(+/-)	43	(+/-)	44	(+/-)	45	(+/-)
1Q	7.2	0.4	8.5	0.4	7.9	0.6	7.5	0.2	5.7	0.2	8.9	0.4	6.8	0.3	6.6	0.3	6.4	0.3	7.5	0.3	7.0	0.3
2Q	7.0	0.3	8.8	0.5	9.2	0.4	7.6	0.4	6.2	0.3	8.1	0.4	6.6	0.3	7.3	0.4	6.8	0.3	8.5	0.5	7.2	0.4
3Q	7.4	0.2	8.5	0.4	8.7	0.3	7.4	0.2	6.2	0.3	8.0	0.2	6.8	0.2	7.3	0.3	6.5	0.2	7.8	0.4	7.5	0.4
4Q	See Note B		8.8	0.3	9.4	0.3	7.8	0.3	6.2	0.2	8.3	0.3	6.7	0.4	7.3	0.3	6.6	0.2	8.0	0.2	6.9	0.3

PERIOD	46	(+/-)	47	(+/-)	48	(+/-)	49	(+/-)	50	(+/-)	51	(+/-)	52	(+/-)	53	(+/-)	55	(+/-)	56	(+/-)	57	(+/-)
1Q	8.1	0.3	7.2	0.3	8.7	0.3	6.1	0.2	7.2	0.3	6.3	0.3	7.2	0.3	7.0	0.2	7.5	0.2	7.2	0.4	7.1	0.3
2Q	8.1	0.6	7.2	0.4	9.1	0.4	6.9	0.3	7.6	0.3	6.4	0.4	7.2	0.3	7.2	0.4	7.3	0.6	6.9	0.3	6.9	0.4
3Q	8.1	0.5	8.2	0.2	9.2	0.3	8.0	0.7	8.0	0.2	6.6	0.3	7.0	0.3	7.2	0.3	7.5	0.4	7.1	0.3	7.3	0.2
4Q	8.2	0.2	7.7	0.2	9.3	0.4	6.8	0.2	7.6	0.3	6.1	0.2	7.0	0.2	7.3	0.2	7.4	0.2	6.9	0.2	7.3	0.4

PERIOD	59	(+/-)	60	(+/-)	61	(+/-)	62	(+/-)	63	(+/-)	64	(+/-)	65	(+/-)	66X	(+/-)	73X	(+/-)	74X	(+/-)	75X	(+/-)
1Q	7.3	0.5	6.4	0.2	6.7	0.4	7.6	0.3	8.7	0.3	7.1	0.3	8.1	0.3	7.0	0.4	9.1	0.3	7.6	0.2	6.5	0.4
2Q	7.3	0.4	6.5	0.4	7.0	0.6	7.7	0.4	7.6	0.4	7.5	0.4	8.0	0.5	6.9	0.4	8.8	0.4	7.5	0.3	6.7	38.0
3Q	7.7	0.3	7.7	0.7	7.2	0.3	8.1	0.2	8.6	0.4	7.3	0.3	8.3	0.4	7.0	0.3	9.2	0.4	7.3	0.2	6.6	0.3
4Q	7.8	0.2	6.6	0.2	7.1	0.2	7.6	0.4	8.2	0.3	7.3	0.2	8.3	0.2	6.7	0.2	9.2	0.2	7.3	0.2	6.9	0.3

* READINGS ARE THE AVERAGE OF MULTI CASO4TM PHOSPHOR ELEMENTS WITHIN ONE PANASONIC TLD BADGE
ERRORS ARE 1 SIGMA AND INCLUDE COUNTING, TRANSIT, READER AND FADE UNCERTAINTIES

TABLE 2
AIR PARTICULATES
GROSS BETA RADIOACTIVITY
(pCi/m³)

LOCATIONS

PERIOD ENDING	01	(+/-)	02	(+/-)	03	(+/-)	04	(+/-)	10	(+/-)	11	(+/-)	15C	(+/-)	27	(+/-)
01/04/11	0.023	0.004	0.025	0.004	0.026	0.005	0.028	0.004	0.024	0.004	0.025	0.004	0.022	0.004	0.026	0.005
01/11/11	0.018	0.004	0.019	0.004	0.019	0.005	0.017	0.004	0.016	0.004	0.018	0.004	0.016	0.004	0.018	0.004
01/18/11	0.012	0.003	0.013	0.003	0.014	0.004	0.010	0.003	0.013	0.003	0.013	0.003	0.012	0.003	0.014	0.003
01/25/11	0.017	0.004	0.019	0.004	0.017	0.004	0.019	0.004	0.017	0.004	0.012	0.003	0.015	0.004	0.019	0.004
02/01/11	0.024	0.004	0.025	0.004	0.021	0.004	0.024	0.004	0.021	0.004	0.022	0.004	0.024	0.004	0.023	0.004
02/08/11	0.016	0.004	0.011	0.004	0.014	0.004	0.020	0.004	0.015	0.004	0.013	0.004	0.017	0.004	0.016	0.004
02/15/11	0.017	0.003	0.016	0.003	0.020	0.004	0.014	0.003	0.015	0.003	0.021	0.004	0.018	0.003	0.017	0.003
02/22/11	0.014	0.004	0.016	0.004	0.015	0.004	0.012	0.004	0.012	0.004	0.015	0.004	0.016	0.004	0.018	0.004
03/01/11	0.015	0.004	0.013	0.003	0.018	0.004	0.014	0.003	0.015	0.003	0.014	0.004	0.013	0.003	0.018	0.004
03/08/11	0.015	0.003	0.015	0.003	0.016	0.003	0.015	0.003	0.017	0.003	0.015	0.003	0.016	0.003	0.017	0.003
03/15/11	0.012	0.004	0.011	0.003	0.009	0.004	0.012	0.004	0.013	0.004	0.013	0.004	0.014	0.004	0.013	0.004
03/22/11	0.010	0.003	0.012	0.003	0.009	0.003	0.011	0.003	0.011	0.003	0.013	0.003	0.011	0.003	0.009	0.003
03/29/11	0.030	0.004	0.028	0.004	0.032	0.005	0.028	0.004	0.031	0.004	0.031	0.005	0.031	0.004	0.028	0.005
04/05/11	0.025	0.004	0.021	0.004	0.023	0.004	0.021	0.003	0.021	0.003	0.025	0.004	0.022	0.004	0.021	0.004
04/12/11	0.022	0.004	0.017	0.004	0.024	0.005	0.025	0.004	0.023	0.004	0.024	0.004	0.021	0.004	0.023	0.005
04/19/11	0.013	0.004	0.020	0.004	0.014	0.004	0.016	0.004	0.015	0.004	0.015	0.004	0.015	0.004	0.013	0.004
04/26/11	0.017	0.004	0.016	0.004	0.017	0.004	0.016	0.004	0.017	0.004	0.014	0.004	0.017	0.004	0.013	0.004
05/03/11	0.005	0.003	0.006	0.003	0.004	0.003	0.006	0.003	0.006	0.003	0.004	0.003	0.005	0.003	0.005	0.003
05/10/11	0.014	0.004	0.014	0.004	0.011	0.003	0.011	0.003	0.014	0.004	0.012	0.004	0.012	0.003	0.013	0.003
05/17/11	0.006	0.002	0.007	0.003	0.006	0.002	0.006	0.002	0.005	0.002	0.006	0.002	0.005	0.002	0.006	0.002
05/24/11	0.003	0.003	0.006	0.004	0.005	0.003	0.005	0.003	0.008	0.004	0.006	0.004	0.008	0.003	0.005	0.003
05/31/11	0.014	0.003	0.017	0.003	0.016	0.003	0.015	0.003	0.018	0.003	0.015	0.003	0.016	0.003	0.016	0.003
06/07/11	0.012	0.003	0.013	0.003	0.011	0.003	0.010	0.003	0.012	0.003	0.012	0.003	0.010	0.003	0.012	0.003
06/14/11	0.012	0.003	0.011	0.003	0.011	0.003	0.014	0.004	0.015	0.003	0.015	0.004	0.013	0.003	0.014	0.003
06/21/11	0.013	0.003	0.011	0.003	0.012	0.003	0.013	0.003	0.009	0.003	0.015	0.003	0.010	0.003	0.013	0.003
06/28/11	0.008	0.003	0.008	0.003	0.009	0.003	0.007	0.003	0.008	0.003	0.008	0.003	0.008	0.003	0.009	0.003

SAMPLE DATES MAY VARY BY A FEW DAYS - See Note C

TABLE 2
AIR PARTICULATES
GROSS BETA RADIOACTIVITY
(pCi/m³)

LOCATIONS

PERIOD ENDING	01	(+/-)	02	(+/-)	03	(+/-)	04	(+/-)	10	(+/-)	11	(+/-)	15C	(+/-)	27	(+/-)
07/05/11	0.019	0.004	0.014	0.004	0.017	0.004	0.014	0.004	0.018	0.004	0.016	0.004	0.016	0.004	0.016	0.004
07/12/11	0.019	0.004	0.020	0.005	0.015	0.004	0.016	0.004	0.019	0.005	0.019	0.005	0.019	0.004	0.016	0.004
07/19/11	0.017	0.004	0.018	0.004	0.014	0.003	0.013	0.003	0.013	0.003	0.013	0.004	0.015	0.003	0.014	0.003
07/26/11	0.020	0.004	0.017	0.004	0.018	0.004	0.021	0.004	0.021	0.004	0.019	0.004	0.018	0.004	0.020	0.004
08/02/11	0.013	0.003	0.014	0.003	0.013	0.003	0.010	0.003	0.012	0.003	0.014	0.003	0.013	0.003	0.014	0.003
08/09/11	0.015	0.004	0.014	0.004	0.015	0.004	0.014	0.004	0.015	0.004	0.012	0.003	0.017	0.004	0.015	0.004
08/16/11	0.014	0.003	0.015	0.003	0.014	0.003	0.017	0.003	0.015	0.003	0.011	0.003	0.013	0.003	0.012	0.003
08/23/11	0.015	0.003	0.014	0.003	0.013	0.003	0.017	0.003	0.014	0.003	0.015	0.003	0.014	0.003	0.013	0.003
08/30/11	0.012	0.004	0.015	0.004	0.013	0.004	0.016	0.005	0.017	0.005	0.013	0.004	0.012	0.003	0.018	0.004
09/06/11	0.014	0.004	0.017	0.004	0.011	0.004	See Note D		0.015	0.005	0.015	0.005	0.014	0.003	0.013	0.003
09/13/11	0.011	0.003	0.013	0.003	0.013	0.004			0.012	0.003	0.010	0.003	0.012	0.003	0.016	0.004
09/20/11	0.022	0.004	0.017	0.003	0.029	0.004			0.017	0.004	0.019	0.003	0.019	0.004	0.025	0.004
09/27/11	0.009	0.003	0.009	0.003	0.012	0.004			0.011	0.004	0.011	0.003	0.010	0.003	0.010	0.003
10/04/11	0.017	0.003	0.015	0.003	0.020	0.004	0.022	0.004	0.016	0.004	0.015	0.003	0.015	0.003	0.017	0.004
10/11/11	0.023	0.004	0.025	0.004	0.023	0.004	0.024	0.004	0.024	0.004	0.031	0.004	0.024	0.004	0.024	0.004
10/18/11	0.013	0.003	0.012	0.003	0.014	0.003	0.012	0.003	0.009	0.003	0.013	0.003	0.010	0.003	0.013	0.003
10/25/11	0.011	0.003	0.014	0.003	0.013	0.004	0.013	0.004	0.013	0.004	0.009	0.003	0.011	0.003	0.014	0.004
11/01/11	0.011	0.003	0.011	0.003	0.011	0.003	0.009	0.003	0.013	0.003	0.011	0.003	0.006	0.003	0.008	0.003
11/08/11	0.013	0.003	0.011	0.003	0.013	0.003	0.016	0.003	0.012	0.003	0.014	0.003	0.016	0.003	0.016	0.003
11/15/11	0.020	0.004	0.022	0.004	0.021	0.004	0.024	0.004	0.017	0.003	0.020	0.004	0.024	0.004	0.021	0.004
11/22/11	0.016	0.003	0.016	0.003	0.016	0.003	0.015	0.004	0.014	0.003	0.015	0.003	0.015	0.003	0.014	0.003
11/29/11	0.016	0.003	0.016	0.003	0.015	0.003	0.017	0.003	0.015	0.003	0.017	0.003	0.015	0.003	0.011	0.003
12/06/11	0.015	0.003	0.012	0.003	0.014	0.003	0.010	0.003	0.015	0.003	0.011	0.003	0.013	0.003	0.011	0.003
12/13/11	0.013	0.003	0.017	0.003	0.018	0.003	0.017	0.003	0.020	0.003	0.019	0.003	0.017	0.003	0.016	0.003
12/20/11	0.021	0.004	0.024	0.003	0.020	0.004	0.021	0.004	0.021	0.003	0.021	0.003	0.023	0.004	0.023	0.004
12/27/11	0.014	0.003	0.016	0.003	0.014	0.003	0.013	0.003	0.016	0.003	0.013	0.003	0.014	0.003	0.017	0.004
01/03/12	0.016	0.003	0.014	0.003	0.019	0.004	0.018	0.004	0.017	0.004	0.016	0.003	0.014	0.003	0.019	0.004

SAMPLE DATES MAY VARY BY A FEW DAYS - See Note C

TABLE 3
AIRBORNE IODINE
(pCi/m³)

LOCATION

PERIOD ENDING*	01	(+/-)	02	(+/-)	03	(+/-)	04	(+/-)	10	(+/-)	11	(+/-)	15C	(+/-)	27	(+/-)
01/04/11	-0.023	0.032	-0.023	0.031	-0.025	0.035	-0.021	0.029	0.004	0.030	0.005	0.033	0.005	0.034	0.005	0.036
01/11/11	-0.006	0.017	-0.006	0.018	-0.007	0.019	-0.006	0.017	0.003	0.020	0.004	0.020	0.004	0.021	0.004	0.022
01/18/11	-0.002	0.010	-0.002	0.009	-0.002	0.010	-0.002	0.009	0.005	0.014	0.005	0.015	0.006	0.015	0.006	0.016
01/25/11	-0.005	0.027	-0.005	0.026	-0.005	0.028	-0.005	0.025	-0.007	0.022	-0.008	0.023	-0.007	0.023	-0.008	0.024
02/01/11	-0.022	0.021	-0.021	0.020	-0.025	0.023	-0.021	0.019	-0.005	0.030	-0.005	0.032	-0.005	0.033	-0.005	0.035
02/08/11	0.005	0.032	0.005	0.031	0.006	0.035	0.005	0.030	0.002	0.017	0.002	0.018	0.003	0.024	0.003	0.026
02/15/11	-0.010	0.024	-0.010	0.023	-0.011	0.026	-0.009	0.022	0.002	0.036	0.002	0.038	0.002	0.037	0.002	0.041
02/22/11	-0.007	0.014	-0.007	0.014	-0.007	0.015	-0.006	0.013	-0.004	0.017	-0.005	0.018	-0.004	0.018	-0.005	0.020
03/01/11	0.029	0.035	0.028	0.034	0.028	0.036	0.027	0.034	-0.007	0.021	-0.007	0.021	-0.007	0.021	-0.008	0.023
03/08/11	0.012	0.030	0.011	0.029	0.013	0.033	0.011	0.029	0.013	0.031	0.013	0.033	0.013	0.031	0.014	0.035
03/15/11	0.002	0.017	0.002	0.016	0.002	0.018	0.002	0.016	0.014	0.028	0.015	0.030	0.014	0.029	0.016	0.032
03/22/11	0.022	0.029	0.022	0.029	0.024	0.031	0.021	0.028	0.009	0.023	0.009	0.024	0.009	0.023	0.010	0.026
03/29/11	0.061	0.025	0.048	0.039	0.058	0.027	0.056	0.029	0.039	0.026	0.051	0.026	0.063	0.028	0.088	0.041
04/05/11	0.104	0.038	0.105	0.046	0.079	0.049	0.097	0.033	0.069	0.039	0.104	0.040	0.058	0.032	0.085	0.034
04/12/11	0.042	0.029	0.030	0.025	0.053	0.036	0.067	0.037	0.046	0.026	0.046	0.043	0.008	0.023	0.094	0.034
04/19/11	0.006	0.019	-0.003	0.017	-0.002	0.025	0.008	0.015	0.022	0.015	0.024	0.022	0.011	0.019	0.004	0.014
04/26/11	0.007	0.040	0.007	0.040	0.006	0.041	0.007	0.039	-0.013	0.042	-0.014	0.044	-0.013	0.042	-0.012	0.039
05/03/11	-0.002	0.036	-0.002	0.036	-0.002	0.033	-0.002	0.035	-0.016	0.030	-0.017	0.030	-0.016	0.029	-0.015	0.027
05/10/11	-0.004	0.030	-0.004	0.030	-0.004	0.027	-0.004	0.030	0.024	0.030	0.025	0.031	0.023	0.029	0.022	0.027
05/17/11	0.013	0.033	0.013	0.033	0.012	0.030	0.013	0.033	0.002	0.037	0.002	0.039	0.002	0.037	0.002	0.035
05/24/11	-0.030	0.041	-0.030	0.041	-0.028	0.039	-0.031	0.042	-0.001	0.034	-0.001	0.036	-0.001	0.034	-0.001	0.032
05/31/11	0.028	0.035	0.029	0.035	0.026	0.032	0.028	0.034	0.007	0.027	0.007	0.029	0.006	0.027	0.006	0.026
06/07/11	-0.038	0.035	-0.038	0.034	-0.035	0.032	-0.037	0.034	-0.026	0.047	-0.027	0.048	-0.025	0.045	-0.024	0.044
06/14/11	0.013	0.032	0.013	0.032	0.012	0.029	0.013	0.032	0.017	0.035	0.018	0.038	0.017	0.034	0.016	0.033
06/21/11	0.011	0.031	0.011	0.031	0.010	0.028	0.011	0.031	0.012	0.032	0.012	0.034	0.011	0.030	0.011	0.030
06/28/11	0.004	0.028	0.004	0.028	0.004	0.025	0.004	0.028	-0.008	0.033	-0.009	0.035	-0.008	0.031	-0.007	0.031

* Results during periods from 3/29/11 to 4/12/11 are positive due to radioactivity from Fukushima, Japan. See discussion in Section 4.3.

SAMPLE DATES MAY VARY BY A FEW DAYS - See Note C

TABLE 3
AIRBORNE IODINE
(pCi/m^3)

LOCATION

PERIOD ENDING	01	(+/-)	02	(+/-)	03	(+/-)	04	(+/-)	10	(+/-)	11	(+/-)	15C	(+/-)	27	(+/-)
07/05/11	-0.004	0.038	-0.004	0.038	-0.003	0.033	-0.004	0.037	-0.012	0.040	-0.013	0.042	-0.011	0.038	-0.011	0.038
07/12/11	-0.002	0.035	-0.002	0.036	-0.002	0.032	-0.002	0.035	-0.040	0.052	-0.038	0.049	-0.030	0.047	-0.030	0.047
07/19/11	-0.004	0.022	-0.004	0.022	-0.003	0.020	-0.004	0.022	0.002	0.032	0.002	0.034	0.001	0.030	0.001	0.030
07/26/11	0.018	0.028	0.018	0.028	0.016	0.026	0.018	0.028	0.005	0.024	0.006	0.025	0.005	0.022	0.005	0.022
08/02/11	0.021	0.022	0.021	0.022	0.019	0.021	0.021	0.022	-0.008	0.027	-0.007	0.023	-0.007	0.025	-0.007	0.025
08/09/11	-0.004	0.025	-0.005	0.025	-0.004	0.023	-0.004	0.025	-0.011	0.036	-0.009	0.030	-0.010	0.033	-0.010	0.033
08/16/11	-0.003	0.020	-0.003	0.020	-0.002	0.018	-0.001	0.009	0.007	0.022	0.005	0.018	0.006	0.020	0.003	0.009
08/23/11	0.008	0.040	0.008	0.040	0.007	0.035	0.008	0.039	0.002	0.039	0.001	0.033	0.002	0.038	0.002	0.037
08/30/11	-0.002	0.015	-0.002	0.015	-0.002	0.016	-0.002	0.011	-0.003	0.018	-0.002	0.015	-0.002	0.013	-0.002	0.013
09/06/11	0.005	0.011	0.005	0.011	0.005	0.011	See Note D		0.003	0.006	-0.007	0.010	-0.005	0.007	-0.003	0.004
09/13/11	-0.001	0.006	-0.001	0.006	-0.001	0.007			-0.007	0.010	-0.001	0.005	-0.007	0.009	-0.006	0.009
09/20/11	0.032	0.030	0.032	0.030	0.034	0.032			0.029	0.036	0.023	0.029	0.027	0.032	0.027	0.033
09/27/11	-0.001	0.008	-0.001	0.009	-0.001	0.009			0.000	0.005	-0.001	0.011	-0.002	0.012	-0.001	0.005
10/04/11	0.000	0.013	0.000	0.013	0.000	0.014	0.000	0.006	-0.002	0.007	-0.002	0.006	-0.002	0.007	-0.001	0.004
10/11/11	-0.002	0.020	-0.002	0.021	-0.003	0.024	-0.002	0.023	-0.006	0.025	-0.005	0.020	-0.005	0.022	-0.006	0.023
10/18/11	0.000	0.021	0.000	0.020	0.001	0.025	0.000	0.023	0.026	0.032	0.021	0.026	0.023	0.028	0.024	0.030
10/25/11	-0.001	0.011	-0.001	0.010	-0.001	0.013	-0.001	0.012	0.005	0.016	0.004	0.013	0.005	0.014	0.005	0.015
11/01/11	-0.011	0.013	-0.009	0.012	-0.011	0.013	-0.012	0.015	0.005	0.016	0.005	0.016	0.005	0.017	0.006	0.018
11/08/11	0.010	0.029	0.008	0.026	0.009	0.029	0.011	0.032	-0.004	0.033	-0.003	0.032	-0.004	0.035	-0.004	0.038
11/15/11	-0.005	0.027	-0.005	0.026	-0.005	0.026	-0.006	0.030	0.005	0.027	0.005	0.028	0.005	0.029	0.005	0.031
11/22/11	-0.019	0.028	-0.018	0.027	-0.019	0.029	-0.022	0.032	0.000	0.018	0.000	0.018	0.000	0.019	0.000	0.020
11/29/11	0.005	0.024	0.005	0.023	0.005	0.024	0.005	0.027	0.000	0.024	0.001	0.025	0.001	0.026	0.001	0.028
12/06/11	0.000	0.015	0.000	0.014	0.000	0.015	0.000	0.017	-0.002	0.019	-0.003	0.019	-0.003	0.020	-0.003	0.021
12/13/11	-0.009	0.025	-0.008	0.023	-0.009	0.025	-0.010	0.029	-0.002	0.030	-0.002	0.031	-0.003	0.033	-0.003	0.036
12/20/11	-0.006	0.024	-0.006	0.022	-0.006	0.024	-0.007	0.027	0.018	0.026	0.018	0.027	0.019	0.029	0.021	0.032
12/27/11	0.018	0.032	0.016	0.028	0.019	0.032	0.021	0.036	-0.024	0.033	-0.023	0.031	-0.024	0.033	-0.026	0.036
01/03/12	0.013	0.026	0.011	0.023	0.013	0.026	0.015	0.030	-0.005	0.038	-0.005	0.037	-0.005	0.038	-0.006	0.043

SAMPLE DATES MAY VARY BY A FEW DAYS - See Note C

TABLE 4A
AIR PARTICULATES
GAMMA SPECTRA - QTR 1
(pCi/m³)

LOCATION	DATE PERIOD	Be-7	(+/-)	Mn-54	(+/-)	Co-58	(+/-)	Co-60	(+/-)	Zn-65	(+/-)	Nb-95	(+/-)	Zr-95	(+/-)
01	12/28/10 - 03/01/11	0.111	0.043	-0.0005	0.0019	-0.0011	0.0035	0.0003	0.0016	0.0025	0.0049	0.0032	0.0040	-0.0013	0.0065
02	12/28/10 - 03/01/11	0.160	0.062	-0.0004	0.0024	0.0025	0.0049	-0.0005	0.0020	-0.0019	0.0065	0.0009	0.0053	0.0062	0.0103
03	12/28/10 - 03/01/11	0.091	0.068	-0.0014	0.0025	0.0005	0.0053	0.0000	0.0021	0.0057	0.0064	0.0000	0.0057	0.0036	0.0100
04	12/28/10 - 03/01/11	0.107	0.046	-0.0003	0.0016	0.0000	0.0035	0.0001	0.0015	0.0045	0.0047	0.0011	0.0035	0.0058	0.0064
10	12/28/10 - 03/01/11	0.144	0.059	0.0008	0.0023	-0.0025	0.0055	0.0014	0.0018	-0.0022	0.0048	0.0020	0.0058	0.0018	0.0100
11	12/28/10 - 03/01/11	0.137	0.080	-0.0014	0.0021	-0.0048	0.0048	-0.0015	0.0016	0.0020	0.0056	-0.0020	0.0043	0.0010	0.0076
15C	12/28/10 - 03/01/11	0.094	0.049	-0.0011	0.0015	-0.0020	0.0032	0.0000	0.0015	-0.0012	0.0035	0.0036	0.0030	-0.0013	0.0057
27	12/28/10 - 03/01/11	0.111	0.044	0.0001	0.0016	-0.0020	0.0034	-0.0003	0.0014	0.0042	0.0041	0.0015	0.0036	-0.0049	0.0074
01	03/01/11 - 03/29/11	0.094	0.065	-0.0003	0.0037	-0.0058	0.0047	0.0005	0.0035	-0.0074	0.0078	0.0020	0.0051	0.0028	0.0095
02	03/01/11 - 03/29/11	0.134	0.057	0.0005	0.0036	-0.0012	0.0053	-0.0023	0.0034	0.0042	0.0092	0.0001	0.0047	0.0079	0.0092
03	03/01/11 - 03/29/11	0.148	0.066	-0.0032	0.0044	-0.0011	0.0058	-0.0001	0.0030	0.0020	0.0111	0.0021	0.0061	0.0061	0.0105
04	03/01/11 - 03/29/11	0.127	0.076	-0.0005	0.0032	-0.0017	0.0052	-0.0012	0.0032	0.0009	0.0082	-0.0009	0.0048	-0.0062	0.0083
10	03/01/11 - 03/29/11	0.119	0.074	-0.0014	0.0030	-0.0035	0.0062	-0.0014	0.0043	-0.0008	0.0086	-0.0001	0.0050	-0.0018	0.0093
11	03/01/11 - 03/29/11	0.124	0.074	0.0006	0.0043	0.0013	0.0053	-0.0015	0.0033	-0.0024	0.0098	0.0019	0.0054	0.0025	0.0098
15C	03/01/11 - 03/29/11	0.090	0.056	0.0000	0.0029	-0.0009	0.0047	-0.0005	0.0035	-0.0023	0.0071	-0.0026	0.0044	0.0016	0.0078
27	03/01/11 - 03/29/11	0.100	0.070	-0.0008	0.0028	-0.0018	0.0050	0.0032	0.0039	-0.0008	0.0067	0.0071	0.0050	-0.0117	0.0081

LOCATION		Ru-103	(+/-)	Ru-106	(+/-)	Cs-134	(+/-)	Cs-137	(+/-)	Ba-140	(+/-)	Ce-141	(+/-)	Ce-144	(+/-)
01	12/28/10 - 03/01/11	-0.0114	0.0081	0.0197	0.0164	0.0018	0.0015	-0.0007	0.0014	-0.2060	1.5000	-0.0057	0.0136	-0.0024	0.0080
02	12/28/10 - 03/01/11	0.0052	0.0124	-0.0026	0.0198	0.0020	0.0021	0.0001	0.0019	0.8200	1.8500	0.0017	0.0177	0.0042	0.0103
03	12/28/10 - 03/01/11	0.0045	0.0109	-0.0019	0.0215	-0.0012	0.0023	-0.0011	0.0017	0.2520	1.9400	-0.0184	0.0162	-0.0050	0.0103
04	12/28/10 - 03/01/11	-0.0002	0.0076	0.0037	0.0131	0.0013	0.0016	0.0005	0.0013	-0.2420	1.3200	-0.0092	0.0145	-0.0019	0.0075
10	12/28/10 - 03/01/11	0.0038	0.0114	-0.0193	0.0223	0.0009	0.0022	0.0003	0.0019	-1.1800	1.6900	-0.0107	0.0198	-0.0047	0.0108
11	12/28/10 - 03/01/11	-0.0063	0.0096	0.0167	0.0175	0.0005	0.0024	-0.0001	0.0020	0.0897	1.5700	-0.0124	0.0167	-0.0029	0.0096
15C	12/28/10 - 03/01/11	-0.0017	0.0061	-0.0030	0.0144	0.0004	0.0012	-0.0002	0.0011	-0.7310	1.1600	0.0040	0.0132	-0.0059	0.0070
27	12/28/10 - 03/01/11	-0.0066	0.0080	-0.0071	0.0146	0.0005	0.0016	-0.0012	0.0015	0.4200	1.3100	-0.0005	0.0140	-0.0059	0.0076
01	03/01/11 - 03/29/11	0.0073	0.0067	0.0063	0.0275	0.0016	0.0039	0.0021	0.0031	0.2360	0.2210	0.0032	0.0107	0.0017	0.0166
02	03/01/11 - 03/29/11	0.0000	0.0000	0.0026	0.0313	0.0011	0.0036	0.0041	0.0035	-0.0855	0.2240	-0.0093	0.0112	-0.0079	0.0158
03	03/01/11 - 03/29/11	0.0036	0.0078	-0.0059	0.0354	-0.0012	0.0039	0.0021	0.0043	-0.2010	0.2580	0.0130	0.0126	-0.0026	0.0177
04	03/01/11 - 03/29/11	0.0005	0.0058	0.0079	0.0299	0.0007	0.0033	-0.0016	0.0030	-0.1810	0.2080	0.0020	0.0094	0.0079	0.0149
10	03/01/11 - 03/29/11	0.0088	0.0066	-0.0108	0.0314	-0.0004	0.0034	-0.0009	0.0031	0.1060	0.2160	-0.0024	0.0092	-0.0105	0.0164
11	03/01/11 - 03/29/11	0.0029	0.0085	-0.0037	0.0289	0.0014	0.0033	-0.0016	0.0031	0.1680	0.2130	-0.0153	0.0116	-0.0162	0.0169
15C	03/01/11 - 03/29/11	0.0020	0.0068	-0.0103	0.0277	0.0001	0.0028	0.0013	0.0027	0.0245	0.1850	0.0010	0.0097	0.0047	0.0143
27	03/01/11 - 03/29/11	-0.0041	0.0068	-0.0115	0.0313	0.0002	0.0028	0.0010	0.0028	0.2480	0.2650	-0.0009	0.0114	0.0053	0.0157

TABLE 4B
AIR PARTICULATES
GAMMA SPECTRA - QTR 2
(pCi/m³)

LOCATION	DATE PERIOD	Be-7	(+/-)	Mn-54	(+/-)	Co-58	(+/-)	Co-60	(+/-)	Zn-65	(+/-)	Nb-95	(+/-)	Zr-95	(+/-)
01	03/29/11 - 05/31/11	0.109	0.047	-0.0008	0.0019	0.0012	0.0032	0.0011	0.0024	-0.0009	0.0047	-0.0025	0.0040	0.0030	0.0056
02	03/29/11 - 05/31/11	0.104	0.039	-0.0004	0.0021	-0.0002	0.0024	-0.0002	0.0017	0.0005	0.0036	-0.0018	0.0026	0.0012	0.0042
03	03/29/11 - 05/31/11	0.084	0.033	-0.0001	0.0022	-0.0018	0.0032	-0.0011	0.0023	0.0035	0.0056	0.0034	0.0032	-0.0020	0.0060
04	03/29/11 - 05/31/11	0.096	0.030	0.0005	0.0017	-0.0014	0.0026	-0.0002	0.0018	0.0000	0.0031	0.0009	0.0023	-0.0007	0.0044
10	03/29/11 - 05/31/11	0.118	0.039	0.0012	0.0019	0.0018	0.0035	-0.0015	0.0026	-0.0038	0.0051	-0.0002	0.0032	0.0043	0.0055
11	03/29/11 - 05/31/11	0.144	0.051	0.0022	0.0026	0.0011	0.0036	0.0016	0.0025	0.0015	0.0067	0.0021	0.0048	-0.0007	0.0077
15C	03/29/11 - 05/31/11	0.105	0.040	0.0001	0.0019	0.0007	0.0035	-0.0015	0.0021	0.0043	0.0054	0.0017	0.0033	0.0002	0.0056
27	03/29/11 - 05/31/11	0.111	0.045	-0.0013	0.0024	-0.0003	0.0038	0.0010	0.0021	0.0068	0.0063	0.0007	0.0046	0.0008	0.0074
01	05/31/11 - 06/28/11	0.171	0.089	-0.0027	0.0065	0.0060	0.0120	0.0010	0.0064	0.0086	0.0118	-0.0009	0.0107	-0.0004	0.0183
02	05/31/11 - 06/28/11	0.143	0.068	-0.0016	0.0036	0.0012	0.0057	0.0000	0.0035	0.0104	0.0093	-0.0046	0.0062	0.0056	0.0113
03	05/31/11 - 06/28/11	0.135	0.092	0.0003	0.0055	0.0001	0.0087	-0.0005	0.0063	0.0083	0.0154	-0.0050	0.0081	0.0077	0.0145
04	05/31/11 - 06/28/11	0.225	0.080	0.0027	0.0036	-0.0013	0.0054	0.0009	0.0032	0.0080	0.0083	-0.0015	0.0057	0.0013	0.0102
10	05/31/11 - 06/28/11	0.139	0.101	0.0022	0.0045	-0.0066	0.0086	0.0039	0.0045	0.0034	0.0120	0.0002	0.0080	0.0102	0.0141
11	05/31/11 - 06/28/11	0.155	0.099	0.0015	0.0071	0.0013	0.0086	0.0064	0.0081	-0.0003	0.0155	0.0119	0.0118	-0.0075	0.0202
15C	05/31/11 - 06/28/11	0.287	0.082	-0.0035	0.0048	-0.0074	0.0069	0.0011	0.0039	-0.0059	0.0089	0.0033	0.0059	-0.0097	0.0108
27	05/31/11 - 06/28/11	0.077	0.105	0.0007	0.0037	-0.0019	0.0068	-0.0024	0.0037	0.0036	0.0091	0.0007	0.0071	0.0046	0.0130

LOCATION		Ru-103	(+/-)	Ru-106	(+/-)	Cs-134	(+/-)	Cs-137	(+/-)	Ba-140	(+/-)	Ce-141	(+/-)	Ce-144	(+/-)
01	03/29/11 - 05/31/11	-0.0001	0.0053	-0.0028	0.0176	0.0003	0.0019	0.0016	0.0023	-0.1250	0.1330	0.0004	0.0067	-0.0054	0.0086
02	03/29/11 - 05/31/11	-0.0022	0.0046	0.0073	0.0163	0.0027	0.0019	0.0020	0.0020	-0.0159	0.1350	-0.0061	0.0068	0.0036	0.0092
03	03/29/11 - 05/31/11	-0.0003	0.0045	0.0006	0.0155	-0.0002	0.0024	-0.0002	0.0021	-0.1560	0.1690	-0.0043	0.0059	0.0071	0.0087
04	03/29/11 - 05/31/11	-0.0019	0.0047	-0.0140	0.0159	0.0021	0.0020	0.0025	0.0016	0.0596	0.1430	-0.0014	0.0064	-0.0029	0.0093
10	03/29/11 - 05/31/11	-0.0051	0.0043	-0.0028	0.0199	0.0023	0.0023	0.0009	0.0018	0.1300	0.1770	0.0035	0.0065	-0.0002	0.0085
11	03/29/11 - 05/31/11	-0.0042	0.0070	-0.0164	0.0233	0.0012	0.0029	0.0029	0.0027	0.0650	0.1990	0.0009	0.0082	0.0047	0.0126
15C	03/29/11 - 05/31/11	0.0037	0.0041	0.0062	0.0188	0.0018	0.0021	0.0011	0.0020	0.0210	0.1450	-0.0018	0.0063	0.0062	0.0087
27	03/29/11 - 05/31/11	-0.0026	0.0058	-0.0153	0.0237	0.0030	0.0013	0.0006	0.0023	0.1100	0.1940	-0.0060	0.0093	-0.0147	0.0124
01	05/31/11 - 06/28/11	-0.0128	0.0152	-0.0173	0.0545	0.0044	0.0063	0.0005	0.0050	0.0153	0.5610	0.0079	0.0212	0.0059	0.0244
02	05/31/11 - 06/28/11	-0.0006	0.0100	0.0236	0.0352	0.0030	0.0042	0.0008	0.0036	0.1110	0.4200	0.0009	0.0117	-0.0061	0.0141
03	05/31/11 - 06/28/11	0.0103	0.0136	-0.0029	0.0468	-0.0013	0.0053	0.0033	0.0049	-0.3490	0.5730	0.0021	0.0187	-0.0087	0.0242
04	05/31/11 - 06/28/11	0.0012	0.0083	0.0083	0.0302	0.0015	0.0033	0.0027	0.0033	0.0086	0.3470	-0.0045	0.0118	-0.0194	0.0153
10	05/31/11 - 06/28/11	-0.0098	0.0130	-0.0042	0.0414	0.0003	0.0056	0.0069	0.0045	-0.1040	0.4740	0.0021	0.0168	-0.0176	0.0212
11	05/31/11 - 06/28/11	0.0069	0.0208	-0.0299	0.0717	0.0070	0.0071	0.0005	0.0066	0.0435	0.6950	-0.0066	0.0236	0.0315	0.0291
15C	05/31/11 - 06/28/11	0.0021	0.0093	-0.0239	0.0360	0.0024	0.0044	-0.0002	0.0042	0.3600	0.3820	0.0028	0.0163	0.0092	0.0183
27	05/31/11 - 06/28/11	0.0047	0.0099	-0.0094	0.0361	-0.0014	0.0048	0.0011	0.0038	0.3760	0.4180	-0.0049	0.0161	-0.0150	0.0191

TABLE 4C
AIR PARTICULATES
GAMMA SPECTRA - QTR 3
(pCi/m³)

LOCATION	Be-7	(+/-)	Mn-54	(+/-)	Co-58	(+/-)	Co-60	(+/-)	Zn-65	(+/-)	Nb-95	(+/-)	Zr-95	(+/-)
01	0.115	0.039	0.0000	0.0013	-0.0015	0.0021	-0.0018	0.0015	-0.0007	0.0038	0.0009	0.0030	-0.0043	0.0052
02	0.107	0.036	0.0008	0.0018	-0.0008	0.0033	-0.0013	0.0013	0.0026	0.0038	-0.0005	0.0034	-0.0003	0.0051
03	0.125	0.042	-0.0002	0.0014	0.0007	0.0024	0.0003	0.0011	0.0034	0.0034	0.0008	0.0024	0.0005	0.0047
04	0.169	0.048	-0.0004	0.0017	-0.0002	0.0037	0.0017	0.0021	0.0019	0.0040	0.0031	0.0033	-0.0011	0.0063
10	0.109	0.046	0.0006	0.0011	-0.0002	0.0022	0.0004	0.0009	0.0002	0.0025	0.0006	0.0020	0.0000	0.0029
11	0.127	0.042	0.0004	0.0016	0.0000	0.0033	-0.0002	0.0015	0.0027	0.0040	0.0000	0.0027	0.0013	0.0051
15C	0.098	0.037	0.0002	0.0010	-0.0014	0.0015	-0.0020	0.0014	-0.0022	0.0024	0.0017	0.0023	-0.0009	0.0022
27	0.108	0.040	-0.0013	0.0018	-0.0013	0.0027	-0.0013	0.0017	-0.0001	0.0040	0.0013	0.0029	0.0002	0.0053

LOCATION	Ru-103	(+/-)	Ru-106	(+/-)	Cs-134	(+/-)	Cs-137	(+/-)	Ba-140	(+/-)	Ce-141	(+/-)	Ce-144	(+/-)
01	0.0003	0.0040	0.0083	0.0103	0.0017	0.0014	0.0001	0.0012	0.2560	0.2860	0.0003	0.0067	0.0003	0.0062
02	-0.0041	0.0054	-0.0006	0.0152	0.0015	0.0019	-0.0006	0.0014	-0.1650	0.3710	-0.0010	0.0074	-0.0013	0.0066
03	0.0013	0.0038	-0.0021	0.0115	0.0019	0.0013	-0.0005	0.0011	-0.1030	0.2800	-0.0077	0.0058	0.0007	0.0056
04	0.0047	0.0053	0.0037	0.0133	0.0025	0.0018	-0.0004	0.0015	-0.1120	0.3960	0.0045	0.0083	0.0043	0.0073
10	0.0003	0.0033	-0.0002	0.0095	-0.0012	0.0011	0.0001	0.0006	-0.2600	0.2390	-0.0015	0.0049	-0.0034	0.0047
11	0.0006	0.0045	-0.0056	0.0117	0.0011	0.0016	0.0002	0.0011	0.0859	0.3420	0.0032	0.0072	-0.0100	0.0068
15C	0.0017	0.0026	-0.0001	0.0090	-0.0003	0.0009	0.0000	0.0009	0.2130	0.1810	-0.0025	0.0042	-0.0001	0.0037
27	-0.0012	0.0050	-0.0018	0.0129	0.0020	0.0017	0.0006	0.0013	-0.0917	0.3370	0.0016	0.0081	0.0041	0.0079

TABLE 4D
AIR PARTICULATES
GAMMA SPECTRA - QTR 4
(pCi/M³)

LOCATION	DATE	Be-7	(+/-)	Mn-54	(+/-)	Co-58	(+/-)	Co-60	(+/-)	Zn-65	(+/-)	Nb-95	(+/-)	Zr-95	(+/-)
01	09/27/11 - 01/03/12	0.113	0.028	-0.0004	0.0010	-0.0001	0.0017	-0.0003	0.0012	0.0010	0.0029	0.0014	0.0021	-0.0009	0.0033
02	09/27/11 - 01/03/12	0.118	0.031	-0.0002	0.0009	-0.0009	0.0016	-0.0007	0.0008	-0.0001	0.0022	0.0021	0.0016	-0.0001	0.0032
03	09/27/11 - 01/03/12	0.105	0.033	0.0000	0.0010	0.0003	0.0017	0.0004	0.0011	0.0030	0.0034	0.0009	0.0018	0.0008	0.0029
04	09/28/11 - 01/03/12	0.130	0.044	0.0005	0.0014	-0.0024	0.0021	-0.0006	0.0013	0.0007	0.0035	0.0016	0.0021	-0.0020	0.0038
10	09/27/11 - 01/03/12	0.141	0.023	0.0000	0.0007	-0.0008	0.0012	-0.0002	0.0007	0.0033	0.0022	0.0012	0.0015	-0.0005	0.0024
11	09/27/11 - 01/03/12	0.098	0.032	0.0009	0.0012	0.0000	0.0022	-0.0005	0.0010	0.0024	0.0038	0.0008	0.0027	0.0003	0.0039
15C	09/27/11 - 01/03/12	0.094	0.037	-0.0017	0.0021	0.0019	0.0033	0.0004	0.0019	0.0032	0.0044	0.0022	0.0029	0.0004	0.0049
27	09/27/11 - 01/03/12	0.108	0.037	0.0008	0.0014	-0.0003	0.0020	0.0000	0.0011	-0.0033	0.0035	-0.0005	0.0024	-0.0009	0.0039

LOCATION	DATE	Ru-103	(+/-)	Ru-106	(+/-)	Cs-134	(+/-)	Cs-137	(+/-)	Ba-140	(+/-)	Ce-141	(+/-)	Ce-144	(+/-)
01	09/27/11 - 01/03/12	-0.0008	0.0027	0.0006	0.0087	0.0014	0.0012	0.0001	0.0010	-0.0513	0.1390	-0.0009	0.0038	0.0014	0.0037
02	09/27/11 - 01/03/12	-0.0011	0.0025	-0.0071	0.0082	0.0011	0.0012	0.0000	0.0008	-0.0925	0.1240	0.0006	0.0039	0.0016	0.0044
03	09/27/11 - 01/03/12	0.0005	0.0028	0.0052	0.0081	0.0009	0.0012	0.0011	0.0009	0.0655	0.1360	-0.0030	0.0039	-0.0008	0.0041
04	09/28/11 - 01/03/12	-0.0006	0.0039	-0.0022	0.0099	0.0014	0.0013	-0.0001	0.0012	-0.0001	0.1730	0.0000	0.0059	-0.0002	0.0067
10	09/27/11 - 01/03/12	-0.0006	0.0020	-0.0041	0.0067	0.0008	0.0010	0.0002	0.0007	0.0050	0.0993	0.0028	0.0033	-0.0028	0.0036
11	09/27/11 - 01/03/12	0.0000	0.0032	-0.0087	0.0112	0.0019	0.0016	-0.0007	0.0012	-0.0891	0.1670	-0.0005	0.0047	-0.0084	0.0054
15C	09/27/11 - 01/03/12	0.0066	0.0049	-0.0098	0.0153	0.0027	0.0022	0.0000	0.0014	-0.0832	0.2210	-0.0053	0.0059	-0.0002	0.0065
27	09/27/11 - 01/03/12	0.0024	0.0035	-0.0049	0.0119	0.0014	0.0018	-0.0001	0.0013	-0.0672	0.1790	-0.0040	0.0058	0.0044	0.0062

TABLE 5
AIR PARTICULATES
Strontium

Analyses for strontium in air particulate filters were not analyzed in 2011. See discussion in Section 4.5.

TABLE 6
SOIL
(pCi/g dry wt.)

LOCATION	COLLECTION DATE	Be-7	(+/-)	K-40	(+/-)	Cr-51	(+/-)	Mn-54	(+/-)	Co-58	(+/-)	Fe-59	(+/-)
03	07/20/2011	-0.14	0.32	16.00	1.36	0.00	0.33	0.02	0.04	-0.01	0.03	-0.01	0.08
04	07/20/2011	-0.20	0.29	14.50	1.14	0.19	0.31	0.04	0.03	-0.01	0.03	-0.06	0.07
14C	07/20/2011	-0.30	0.36	14.20	1.41	0.02	0.36	-0.02	0.05	0.00	0.04	-0.07	0.09

LOCATION	COLLECTION DATE	Co-60	(+/-)	Zn-65	(+/-)	Nb-95	(+/-)	Zr-95	(+/-)	Ru-103	(+/-)	Ru-106	(+/-)
03	07/20/2011	-0.02	0.04	-0.03	0.10	0.03	0.04	-0.01	0.06	0.02	0.04	-0.01	0.31
04	07/20/2011	0.01	0.04	0.01	0.08	0.04	0.04	0.00	0.06	-0.01	0.03	-0.16	0.29
14C	07/20/2011	0.00	0.05	0.03	0.10	0.02	0.05	-0.01	0.08	-0.03	0.04	0.16	0.38

LOCATION	COLLECTION DATE	Sb-125	(+/-)	Cs-134	(+/-)	Cs-137	(+/-)	Ce-141	(+/-)	Ce-144	(+/-)	Th-232 decay chain*	(+/-)
03	07/20/2011	-0.05	0.11	0.00	0.04	0.46	0.09	0.02	0.06	-0.32	0.25	1.10	0.21
04	07/20/2011	0.03	0.09	-0.01	0.04	0.29	0.07	-0.01	0.06	-0.14	0.23	1.42	0.26
14C	07/20/2011	-0.08	0.11	-0.02	0.05	0.68	0.10	0.02	0.06	-0.13	0.23	1.28	0.11

* The highest result for Th-232 and it's two daughters, Th-228 and Act-228, is reported.

TABLE 7
Cow Milk
(pCi/l)

LOCATION	COLLECTION DATE	Sr-89	(+/-)	Sr-90	(+/-)	K-40	(+/-)	I-131	(+/-)	Cs-134	(+/-)	Cs-137	(+/-)	Ba-140	(+/-)	La-140	(+/-)
18	02/16/2011					1250	90	0.10	0.37	1.6	2.9	0.8	2.5	-1.3	11.6	-3.8	3.2
18	03/24/2011	-0.94	4.36	0.84	0.70	1100	134	-0.05	0.16	-2.6	4.0	0.0	4.0	4.0	23.1	-2.5	6.8
18	04/07/2011					1150	140	0.53	0.49	-1.7	4.0	1.1	3.8	-6.1	25.1	2.4	5.5
18	04/21/2011					1220	46	-0.03	0.25	-0.6	1.2	1.2	1.2	-1.6	7.8	1.7	2.3
18	05/05/2011					1210	145	0.05	0.37	1.1	4.6	-1.8	4.1	7.5	23.3	-2.1	6.9
18	05/18/2011					1240	152	-0.46	0.29	-1.0	3.2	-0.5	3.6	-0.5	24.2	-4.5	6.8
18	06/09/2011					1320	150	-0.17	0.22	-5.2	4.2	-2.7	4.1	6.1	27.6	-5.0	6.5
18	06/30/2011	5.35	4.60	1.24	0.81	1180	172	-0.32	0.38	-5.5	5.3	1.2	5.0	-11.2	27.7	-4.8	8.1
18	07/14/2011					1360	157	-0.24	0.34	-5.3	4.1	-0.4	4.3	8.1	16.9	2.9	6.0
18	07/28/2011					1360	152	0.20	0.37	0.6	3.8	1.0	4.0	-1.8	14.0	-0.9	5.1
18	08/03/2011					1090	122	-0.12	0.31	1.2	3.3	2.9	3.7	18.0	15.4	-2.5	4.6
18	08/18/2011					1080	112	0.07	0.29	-0.2	2.0	2.2	1.7	2.0	7.3	0.3	2.9
18	09/08/2011					1230	170	-0.05	0.30	-4.5	4.8	3.4	5.1	-2.3	17.6	1.3	4.7
18	09/28/2011	0.00	4.56	0.27	0.80	1500	196	-0.16	0.32	5.5	5.9	-2.4	6.9	-25.4	30.7	1.8	10.1
18	10/11/2011					1040	132	-0.55	0.34	0.6	4.0	-1.9	3.9	-16.6	19.8	1.2	4.9
18	10/25/2011					1260	43	0.08	0.35	0.2	1.2	1.5	1.1	0.8	7.3	-1.2	2.0
18	11/08/2011					1220	136	0.21	0.36	0.1	3.2	-0.6	3.2	-3.3	14.2	1.3	3.8
18	12/22/2011	0.65	4.28	0.52	0.76	1270	148	-6.82	10.90	-0.3	4.1	1.3	3.7	3.0	21.4	4.5	8.4

TABLE 8
GOAT MILK
(pCi/l)

LOCATION	COLLECTION DATE	Sr-89	(+/-)	Sr-90	(+/-)	K-40	(+/-)	I-131	(+/-)	Cs-134	(+/-)	Cs-137	(+/-)	Ba-140	(+/-)	La-140	(+/-)
21	06/30/2011	See Note E		See Note E		1230	195	0.18	0.41	2.9	4.6	3.9	4.9	-12.0	34.0	4.5	9.7
21	07/28/2011					686	125	0.52	0.39	-1.0	3.8	2.1	3.7	13.7	15.3	0.1	5.2
21	08/05/2011					845	148	-0.16	0.48	-0.9	3.1	2.2	3.5	4.7	30.2	4.4	9.6
24C	05/18/2011	3.54	5.63	0.19	0.64	1260	127	-0.23	0.47	-4.1	5.1	8.0	7.6	-1.0	39.2	-6.9	11.0
24C	08/03/2011	See Note E		See Note E		1360	152	-0.29	0.44	-5.9	3.6	2.2	4.2	-5.6	17.1	-3.8	5.5

TABLE 9
PASTURE GRASS / HAY
(pCi/g wet wt.)
Location 18

COLLECTION DATE	Be-7	(+/-)	K-40	(+/-)	Cr-51	(+/-)	Mn-54	(+/-)	Co-58	(+/-)	Fe-59	(+/-)	Co-60	(+/-)
10/11/2011	3.170	0.224	7.33	0.38	0.082	0.113	-0.004	0.009	0.003	0.010	0.009	0.024	-0.013	0.011
10/11/2011	-0.079	0.143	10.20	0.74	-0.024	0.137	0.006	0.016	0.004	0.016	-0.013	0.038	-0.011	0.023

COLLECTION DATE	Zn-65	(+/-)	Nb-95	(+/-)	Zr-95	(+/-)	Ru-103	(+/-)	Ru-106	(+/-)	Sb-125	(+/-)	I-131	(+/-)
10/11/2011	-0.019	0.022	-0.002	0.011	0.005	0.019	0.006	0.011	-0.004	0.081	-0.014	0.025	-0.027	0.036
10/11/2011	-0.011	0.051	0.007	0.019	0.003	0.028	0.004	0.015	0.033	0.140	0.000	0.039	-0.007	0.032

COLLECTION DATE	Cs-134	(+/-)	Cs-137	(+/-)	Ba-140	(+/-)	La-140	(+/-)	Ce-141	(+/-)	Ce-144	(+/-)	Th-232 decay chain*	(+/-)
10/11/2011	-0.026	0.010	0.007	0.010	0.015	0.071	-0.004	0.018	-0.020	0.021	-0.040	0.063	0.043	0.038
10/11/2011	-0.004	0.017	-0.023	0.018	0.081	0.094	0.013	0.029	-0.003	0.024	0.010	0.088	0.050	0.063

* The highest result for Th-232 and it's two daughters, Th-228 and Act-228, is reported.

TABLE 9
PASTURE GRASS / HAY
(pCi/g wet wt.)
Location 21

COLLECTION DATE	Be-7	(+/-)	K-40	(+/-)	Cr-51	(+/-)	Mn-54	(+/-)	Co-58	(+/-)	Fe-59	(+/-)	Co-60	(+/-)
01/18/2011	0.294	0.124	11.40	0.39	-0.028	0.113	-0.005	0.010	-0.011	0.011	0.013	0.024	-0.001	0.017
02/16/2011	-0.001	0.092	9.76	0.54	0.004	0.087	0.001	0.011	-0.003	0.011	-0.032	0.027	-0.007	0.015
03/24/2011	0.021	0.069	12.70	0.50	-0.051	0.086	-0.001	0.007	-0.001	0.008	-0.009	0.021	-0.004	0.011
04/07/2011	-0.049	0.079	11.60	0.59	0.022	0.096	0.003	0.009	0.006	0.011	0.007	0.027	-0.001	0.015
04/21/2011	0.039	0.048	13.90	0.55	0.021	0.059	0.003	0.005	0.004	0.005	0.000	0.014	-0.006	0.010
05/05/2011	2.220	0.333	6.69	0.68	-0.039	0.126	-0.006	0.015	-0.006	0.014	0.005	0.036	-0.009	0.018
05/18/2011	1.250	0.205	4.57	0.40	0.021	0.101	0.001	0.009	-0.003	0.009	0.005	0.029	0.005	0.013
06/14/2011	1.660	0.349	4.58	0.70	0.025	0.136	-0.017	0.017	0.009	0.020	0.019	0.048	0.009	0.023
06/30/2011	1.150	0.229	3.77	0.40	0.074	0.126	0.000	0.011	-0.009	0.011	-0.007	0.026	-0.002	0.012
07/14/2011	1.410	0.300	3.65	0.66	0.019	0.148	0.007	0.018	0.001	0.020	0.015	0.037	0.008	0.022
07/28/2011	1.290	0.200	3.85	0.40	0.023	0.101	-0.005	0.011	-0.001	0.010	-0.023	0.022	0.000	0.012
08/05/2011	1.310	0.246	4.80	0.39	-0.011	0.111	0.003	0.011	-0.006	0.011	-0.008	0.022	-0.006	0.012
08/18/2011	3.840	0.259	5.17	0.36	-0.005	0.100	-0.006	0.010	-0.001	0.010	-0.008	0.021	-0.001	0.012
09/15/2011	6.460	0.401	4.70	0.47	-0.068	0.125	-0.001	0.012	0.001	0.011	-0.016	0.027	-0.009	0.015
09/28/2011	3.040	0.289	5.12	0.44	0.016	0.099	-0.006	0.011	-0.008	0.010	-0.017	0.024	-0.010	0.013
10/11/2011	6.720	0.309	5.19	0.36	0.012	0.111	0.003	0.009	-0.002	0.008	0.000	0.022	-0.012	0.011
10/26/2011	6.920	0.383	4.09	0.40	0.022	0.122	-0.001	0.009	0.005	0.010	0.004	0.026	0.000	0.010
11/08/2011	0.972	0.357	11.90	0.82	-0.057	0.171	0.003	0.016	0.008	0.018	0.015	0.036	-0.012	0.019
12/22/2011	0.482	0.146	13.00	0.43	0.067	0.106	0.004	0.011	-0.007	0.011	-0.009	0.025	0.003	0.012

COLLECTION DATE	Zn-65	(+/-)	Nb-95	(+/-)	Zr-95	(+/-)	Ru-103	(+/-)	Ru-106	(+/-)	Sb-125	(+/-)	I-131	(+/-)
01/18/2011	-0.002	0.026	0.016	0.013	0.006	0.019	-0.021	0.012	0.092	0.093	0.000	0.029	-0.007	0.035
02/16/2011	-0.021	0.029	-0.003	0.010	-0.009	0.018	-0.009	0.011	0.016	0.085	0.011	0.026	0.009	0.020
03/24/2011	0.005	0.018	0.008	0.009	0.006	0.014	0.002	0.009	0.005	0.066	0.022	0.019	0.044	0.034
04/07/2011	-0.033	0.028	0.000	0.010	0.006	0.019	-0.011	0.010	-0.019	0.085	0.010	0.024	0.010	0.029
04/21/2011	-0.011	0.014	-0.002	0.005	-0.005	0.010	0.003	0.006	-0.032	0.047	0.003	0.014	-0.007	0.018
05/05/2011	-0.043	0.038	0.001	0.016	-0.018	0.027	-0.010	0.014	-0.040	0.125	-0.021	0.039	0.036	0.022
05/18/2011	0.000	0.022	-0.003	0.011	0.004	0.017	-0.004	0.011	0.024	0.072	-0.005	0.024	0.006	0.034
06/14/2011	0.031	0.050	-0.006	0.021	0.005	0.033	0.013	0.018	0.122	0.153	-0.019	0.042	0.019	0.030
06/30/2011	0.002	0.025	0.015	0.014	0.007	0.020	-0.001	0.012	-0.088	0.090	-0.005	0.029	-0.030	0.039
07/14/2011	0.045	0.040	-0.009	0.021	-0.029	0.034	0.000	0.018	0.146	0.169	0.034	0.049	-0.043	0.027
07/28/2011	-0.039	0.028	-0.004	0.011	-0.007	0.021	0.008	0.011	-0.066	0.109	-0.028	0.029	0.004	0.018
08/05/2011	-0.022	0.026	0.000	0.011	-0.004	0.019	-0.001	0.012	0.055	0.096	0.009	0.028	-0.009	0.032
08/18/2011	-0.013	0.023	0.006	0.010	0.020	0.018	-0.001	0.011	-0.028	0.082	0.012	0.028	0.001	0.019
09/15/2011	-0.024	0.032	0.006	0.012	0.002	0.019	-0.004	0.012	0.036	0.094	-0.002	0.030	0.007	0.032
09/28/2011	0.016	0.024	-0.003	0.012	-0.002	0.020	0.003	0.012	-0.109	0.093	-0.011	0.031	-0.018	0.020
10/11/2011	-0.022	0.025	-0.005	0.010	-0.003	0.017	-0.004	0.010	0.024	0.086	0.008	0.024	-0.021	0.035
10/26/2011	-0.040	0.022	0.004	0.011	-0.014	0.019	-0.007	0.012	0.007	0.095	-0.021	0.026	-0.005	0.032
11/08/2011	0.003	0.042	-0.014	0.018	0.005	0.029	0.004	0.016	0.079	0.171	-0.005	0.047	0.016	0.032
12/22/2011	-0.013	0.026	0.013	0.011	0.010	0.019	-0.011	0.012	-0.060	0.094	0.012	0.027	0.018	0.030

TABLE 9
PASTURE GRASS / HAY
(pCi/g wet wt.)
Location 21

COLLECTION DATE	Cs-134	(+/-)	Cs-137	(+/-)	Ba-140	(+/-)	La-140	(+/-)	Ce-141	(+/-)	Ce-144	(+/-)	Th-232 decay chain*	(+/-)
01/18/2011	-0.005	0.012	0.021	0.013	0.049	0.075	-0.023	0.022	-0.007	0.018	-0.021	0.061	0.116	0.027
02/16/2011	-0.013	0.010	0.008	0.011	-0.012	0.051	-0.005	0.011	-0.005	0.015	-0.016	0.055	0.042	0.050
03/24/2011	0.001	0.008	0.006	0.008	-0.023	0.063	0.009	0.016	-0.004	0.015	0.033	0.047	0.004	0.025
04/07/2011	-0.007	0.011	0.008	0.010	-0.016	0.063	0.009	0.016	0.000	0.018	0.013	0.058	0.001	0.037
04/21/2011	-0.002	0.005	0.001	0.005	0.021	0.035	0.003	0.008	0.007	0.011	-0.021	0.037	-0.036	0.014
05/05/2011	0.001	0.016	-0.020	0.016	0.001	0.069	-0.019	0.017	-0.029	0.024	0.040	0.096	0.064	0.059
05/18/2011	-0.008	0.010	0.007	0.009	0.034	0.071	-0.011	0.020	0.001	0.019	0.020	0.063	0.013	0.037
06/14/2011	-0.015	0.020	0.013	0.019	0.040	0.099	-0.012	0.029	0.010	0.030	0.007	0.113	0.027	0.078
06/30/2011	-0.008	0.011	0.009	0.012	0.000	0.073	0.000	0.014	0.008	0.023	-0.041	0.079	0.053	0.051
07/14/2011	0.010	0.021	0.027	0.021	-0.069	0.082	0.001	0.019	0.003	0.025	-0.093	0.106	0.044	0.062
07/28/2011	0.008	0.012	0.010	0.013	0.018	0.048	-0.006	0.012	-0.026	0.021	-0.047	0.077	0.047	0.044
08/05/2011	0.004	0.011	0.012	0.011	0.049	0.073	0.002	0.017	-0.020	0.021	-0.089	0.074	0.036	0.029
08/18/2011	-0.001	0.011	0.002	0.010	-0.007	0.050	-0.005	0.014	0.001	0.018	0.029	0.070	0.022	0.043
09/15/2011	-0.007	0.012	0.003	0.012	0.017	0.072	-0.028	0.023	-0.007	0.020	-0.034	0.068	0.045	0.044
09/28/2011	0.002	0.010	-0.005	0.011	0.034	0.053	0.000	0.019	-0.014	0.020	-0.063	0.082	0.055	0.026
10/11/2011	0.000	0.009	0.006	0.010	0.047	0.068	0.003	0.022	-0.017	0.019	-0.022	0.057	0.085	0.070
10/26/2011	0.004	0.011	0.015	0.011	-0.067	0.070	0.000	0.019	-0.008	0.021	0.039	0.068	0.032	0.029
11/08/2011	0.003	0.020	-0.002	0.016	-0.068	0.091	-0.007	0.020	-0.047	0.029	0.014	0.104	0.232	0.064
12/22/2011	-0.008	0.012	0.002	0.011	-0.014	0.069	-0.020	0.018	0.007	0.023	-0.026	0.073	0.026	0.034

* The highest result for Th-232 and it's two daughters, Th-228 and Act-228, is reported.

TABLE 9
PASTURE GRASS / HAY
(pCi/g wet wt.)
Location 24

COLLECTION DATE	Be-7	(+/-)	K-40	(+/-)	Cr-51	(+/-)	Mn-54	(+/-)	Co-58	(+/-)	Fe-59	(+/-)	Co-60	(+/-)
01/18/2011	0.121	0.168	11.60	0.46	-0.029	0.125	0.002	0.012	-0.005	0.012	0.002	0.028	-0.007	0.014
02/16/2011	-0.037	0.058	9.57	0.40	0.009	0.062	0.002	0.007	-0.007	0.007	-0.008	0.018	0.011	0.011
03/24/2011	0.035	0.066	6.95	0.26	0.045	0.082	0.006	0.006	0.004	0.007	-0.010	0.018	-0.003	0.008
04/07/2011	0.119	0.098	21.60	0.50	0.026	0.109	-0.006	0.010	-0.001	0.011	0.007	0.027	0.009	0.014
04/21/2011	3.350	0.177	4.72	0.28	-0.018	0.070	0.005	0.007	-0.003	0.007	-0.002	0.016	0.000	0.008
05/05/2011	0.857	0.253	5.64	0.57	-0.080	0.123	0.004	0.012	0.003	0.012	0.002	0.031	0.005	0.016
06/14/2011	2.200	0.311	5.02	0.62	0.041	0.151	-0.001	0.016	-0.006	0.015	0.023	0.031	0.000	0.019
06/30/2011	1.500	0.212	4.48	0.46	-0.021	0.130	0.000	0.011	0.004	0.012	0.010	0.029	-0.011	0.013
07/14/2011	0.622	0.281	5.62	0.79	0.054	0.162	0.008	0.022	0.005	0.023	-0.009	0.049	0.002	0.028
07/28/2011	1.410	0.262	5.47	0.56	-0.073	0.116	-0.005	0.013	0.008	0.013	-0.004	0.028	0.009	0.016
08/15/2011	2.290	0.307	13.60	0.75	0.013	0.159	-0.004	0.015	-0.013	0.018	-0.014	0.035	-0.004	0.020
09/15/2011	1.910	0.205	4.56	0.38	0.062	0.100	-0.001	0.009	-0.001	0.008	0.003	0.021	0.009	0.011
09/28/2011	1.970	0.236	5.69	0.45	0.001	0.090	0.002	0.010	0.005	0.010	-0.012	0.023	0.000	0.011
10/11/2011	2.740	0.195	5.75	0.34	0.019	0.109	0.001	0.008	0.002	0.009	0.007	0.021	0.002	0.010
10/25/2011	5.120	0.282	6.21	0.38	-0.018	0.110	0.006	0.009	0.000	0.010	-0.021	0.025	-0.006	0.012
11/08/2011	6.580	0.406	8.15	0.61	-0.020	0.124	0.006	0.013	-0.001	0.013	0.009	0.030	-0.011	0.017
12/22/2011	5.780	0.378	2.75	0.40	-0.056	0.143	0.007	0.013	-0.001	0.012	0.020	0.027	0.009	0.012

COLLECTION DATE	Zn-65	(+/-)	Nb-95	(+/-)	Zr-95	(+/-)	Ru-103	(+/-)	Ru-106	(+/-)	Sb-125	(+/-)	I-131	(+/-)
01/18/2011	0.002	0.031	0.017	0.013	0.021	0.021	-0.005	0.014	-0.004	0.109	-0.015	0.031	-0.025	0.037
02/16/2011	0.000	0.021	-0.002	0.008	-0.009	0.013	-0.006	0.008	-0.036	0.060	-0.012	0.018	-0.017	0.014
03/24/2011	0.010	0.018	0.006	0.008	-0.001	0.014	-0.010	0.008	0.019	0.058	-0.006	0.018	0.014	0.036
04/07/2011	-0.050	0.027	-0.003	0.011	-0.007	0.020	0.014	0.012	0.089	0.091	-0.007	0.027	0.019	0.032
04/21/2011	-0.026	0.016	0.001	0.006	0.002	0.012	-0.002	0.007	-0.006	0.057	-0.003	0.017	0.031	0.029
05/05/2011	-0.041	0.033	0.008	0.015	-0.010	0.020	-0.002	0.014	0.039	0.121	0.008	0.037	0.008	0.021
06/14/2011	-0.004	0.041	0.003	0.016	0.009	0.027	-0.014	0.015	-0.142	0.143	-0.016	0.042	0.035	0.032
06/30/2011	-0.022	0.025	-0.013	0.013	-0.010	0.023	0.004	0.013	0.084	0.103	0.027	0.029	-0.006	0.035
07/14/2011	-0.041	0.064	0.021	0.029	0.011	0.042	0.007	0.021	-0.150	0.194	-0.010	0.057	0.004	0.031
07/28/2011	-0.001	0.027	0.011	0.015	-0.015	0.024	0.008	0.013	0.074	0.132	-0.003	0.035	-0.003	0.020
08/15/2011	-0.008	0.039	0.023	0.017	0.000	0.028	-0.010	0.017	0.037	0.136	-0.027	0.046	-0.020	0.034
09/15/2011	-0.017	0.023	-0.002	0.009	-0.005	0.018	0.007	0.011	-0.025	0.076	0.004	0.025	-0.021	0.028
09/28/2011	-0.017	0.026	-0.001	0.010	-0.007	0.018	-0.004	0.010	-0.059	0.088	0.007	0.026	0.004	0.018
10/11/2011	-0.033	0.022	-0.009	0.009	-0.002	0.016	-0.007	0.011	-0.012	0.080	0.017	0.025	-0.023	0.036
10/25/2011	-0.017	0.023	0.005	0.009	0.022	0.017	0.001	0.011	-0.072	0.082	-0.017	0.027	0.005	0.033
11/08/2011	-0.014	0.034	0.003	0.013	0.000	0.023	0.002	0.013	0.008	0.107	-0.019	0.032	0.022	0.027
12/22/2011	-0.049	0.032	0.001	0.014	-0.002	0.023	0.000	0.012	-0.013	0.094	0.005	0.034	0.005	0.034

TABLE 9
PASTURE GRASS / HAY
(pCi/g wet wt.)
Location 24

COLLECTION DATE	Cs-134	(+/-)	Cs-137	(+/-)	Ba-140	(+/-)	La-140	(+/-)	Ce-141	(+/-)	Ce-144	(+/-)	Th-232 decay chain*	(+/-)
01/18/2011	-0.048	0.013	0.059	0.022	0.029	0.084	-0.013	0.022	-0.009	0.023	-0.003	0.078	0.045	0.030
02/16/2011	-0.005	0.008	0.005	0.007	-0.001	0.035	0.002	0.009	0.008	0.011	-0.006	0.042	0.010	0.017
03/24/2011	-0.002	0.007	0.012	0.011	-0.009	0.064	-0.023	0.018	0.003	0.014	-0.003	0.042	0.033	0.015
04/07/2011	0.002	0.011	0.030	0.012	0.031	0.073	-0.002	0.018	-0.002	0.019	0.012	0.068	0.088	0.037
04/21/2011	0.001	0.008	0.007	0.007	0.012	0.036	-0.003	0.008	-0.003	0.013	0.024	0.047	0.022	0.034
05/05/2011	0.008	0.014	0.012	0.014	0.069	0.064	-0.001	0.013	0.011	0.021	0.056	0.090	0.012	0.025
06/14/2011	-0.008	0.014	-0.007	0.016	0.014	0.079	-0.006	0.015	-0.024	0.028	0.016	0.112	0.011	0.067
06/30/2011	0.006	0.012	0.020	0.013	-0.013	0.077	-0.004	0.021	0.018	0.023	-0.005	0.079	0.009	0.045
07/14/2011	-0.017	0.026	0.025	0.025	-0.027	0.095	0.018	0.031	0.019	0.033	0.089	0.134	-0.061	0.095
07/28/2011	0.003	0.014	0.003	0.013	0.001	0.062	0.000	0.015	-0.005	0.023	-0.038	0.099	0.019	0.048
08/15/2011	-0.030	0.019	0.056	0.027	-0.056	0.089	0.009	0.024	0.001	0.031	-0.064	0.106	0.049	0.124
09/15/2011	-0.008	0.010	-0.001	0.009	0.044	0.057	-0.011	0.019	0.002	0.017	0.004	0.062	0.044	0.059
09/28/2011	0.002	0.016	0.007	0.009	-0.010	0.048	0.003	0.011	-0.019	0.019	0.020	0.074	0.029	0.061
10/11/2011	0.001	0.010	0.001	0.009	-0.048	0.068	-0.006	0.017	-0.020	0.020	0.061	0.063	0.029	0.059
10/25/2011	-0.022	0.010	0.014	0.009	-0.025	0.067	0.008	0.019	-0.007	0.019	-0.017	0.067	0.030	0.037
11/08/2011	-0.005	0.014	0.014	0.013	0.029	0.067	-0.004	0.019	-0.005	0.022	-0.009	0.081	0.059	0.064
12/22/2011	-0.005	0.014	-0.006	0.012	0.002	0.076	0.005	0.017	-0.002	0.023	0.003	0.087	0.056	0.048

* The highest result for Th-232 and it's two daughters, Th-228 and Act-228, is reported.

TABLE 10
WELL WATER
(pCi/l)

LOCATION	COLLECTION DATE	H-3	(+/-)	Be-7	(+/-)	K-40	(+/-)	Cr-51	(+/-)	Mn-54	(+/-)	Co-58	(+/-)	Fe-59	(+/-)
71	03/09/2011	366.0	612.0	-1.57	15.80	2.66	27.20	-5.68	19.60	1.68	1.59	0.09	1.69	1.52	3.77
71	06/22/2011	353.0	1040.0	14.70	34.00	25.00	58.70	-23.30	31.70	1.34	3.78	0.47	3.82	1.45	7.33
71	09/14/2011	188.0	466.0	6.65	19.20	72.10	38.10			1.40	2.06	-0.96	2.10	-2.33	4.47
71	12/12/2011	135.0	265.0	-3.76	35.30	42.40	72.30	10.30	38.30	-1.18	3.70	-0.45	3.93	3.07	8.19
72	03/09/2011	88.3	563.0	5.52	15.60	1.77	41.00	-24.50	19.40	-0.14	1.46	-0.63	1.59	0.42	3.45
72	06/08/2011	-371.0	441.0	7.59	10.50	6.56	43.60	0.89	13.90	-0.02	0.85	-0.09	1.02	-0.65	2.40
72	09/07/2011	-10.1	574.0	2.12	24.20	43.10	53.30	-2.39	31.10	-0.91	2.53	-2.69	2.88	-3.22	6.08
72	12/12/2011	-3580.0	790.0	3.85	11.50	-4.58	19.30	-11.90	15.60	0.40	1.11	-0.91	1.24	0.08	2.70
76	03/08/2011	89.3	570.0	4.96	13.80	-5.80	29.10	-7.64	16.10	-0.06	1.55	-0.59	1.65	2.23	3.49
76	06/07/2011	-373.0	437.0	6.78	7.94	31.00	29.50	1.10	11.10	-0.01	0.67	0.32	0.74	-0.90	1.57
76	09/20/2011	-95.1	513.0	-15.90	28.90	47.30	57.80	-0.63	29.10	-2.23	3.15	-1.27	3.28	-2.58	6.47
76	12/08/2011	-218.0	432.0	-21.70	32.10	-16.60	49.30	-17.50	32.30	-0.66	3.54	0.56	3.14	0.49	6.67
77	03/08/2011	206.0	563.0	3.24	14.40	-6.56	25.70	-0.68	19.00	0.20	1.50	-1.47	1.57	1.13	3.48
77	06/07/2011	469.0	499.0	1.70	7.33	-0.01	22.20	1.95	9.09	0.09	0.72	-0.07	0.66	0.20	1.79
77	09/20/2011	300.0	529.0	10.40	33.50	23.60	53.40	-9.83	38.50	-0.80	3.85	-1.13	4.15	-9.14	6.96
77	12/08/2011	-9.8	440.0	-5.43	33.10	58.40	49.70	-47.50	32.80	-2.47	3.45	-2.02	3.54	1.17	6.63
78	03/08/2011	128.0	560.0	10.40	14.50	14.20	31.90	-13.00	18.00	-0.70	1.34	0.50	1.38	-0.59	3.13
78	06/07/2011	67.5	536.0	4.66	7.96	66.90	39.80	1.74	11.70	-0.28	0.65	-0.13	0.74	-0.84	2.01
78	09/22/2011	0.0	527.0	-22.00	23.60	-14.40	42.40	-1.60	24.90	1.57	3.08	-1.14	3.20	-1.48	6.95
78	12/08/2011	69.2	452.0	19.90	32.60	56.00	63.40	21.00	36.30	-0.93	3.47	-3.00	3.52	-1.23	6.96
79	03/07/2011	31.1	529.0	-0.07	11.80	56.60	31.60	-0.08	15.60	0.10	1.17	0.43	1.27	-1.23	2.82
79	06/08/2011	119.0	476.0	4.59	8.56	-79.50	23.10	-5.84	9.72	-0.31	0.66	0.10	0.98	-1.05	2.12
79	09/07/2011	344.0	596.0	-4.97	26.20	-10.30	44.40	0.21	30.40	-0.14	2.53	-1.15	3.02	0.01	5.43
79	12/12/2011	-1520.0	871.0	4.88	9.52	8.49	19.80	-5.18	11.70	-0.33	0.97	0.04	1.05	-1.02	2.38
80	03/07/2011	252.0	573.0	6.73	15.40	-6.95	30.60	-12.90	17.40	0.46	1.57	0.03	1.82	-0.88	4.23
80	06/13/2011	145.0	625.0	-0.86	21.40	58.70	47.10	2.15	29.20	-2.43	2.29	0.77	2.60	1.15	5.07
80	09/26/2011	384.0	846.0	6.42	19.80	42.90	44.30	-7.12	22.80	0.36	1.99	-0.73	2.08	-0.31	4.34
80	12/14/2011	-3150.0	813.0	14.00	15.20	21.40	24.80	5.33	18.50	1.05	1.36	-1.25	1.59	-0.31	3.82
81	03/09/2011	247.0	517.0	5.64	15.00	14.00	28.00	-9.32	18.00	0.01	1.63	-1.29	1.61	-3.05	3.49
81	06/13/2011	992.0	670.0	13.90	24.60	-8.31	40.10	1.66	28.60	2.50	2.44	-0.24	2.60	1.39	5.42
81	09/26/2011	380.0	631.0	-22.70	22.80	-15.50	27.30	20.80	23.90	-2.35	2.38	1.44	2.58	0.53	4.45
81	12/14/2011	-2930.0	809.0	0.10	10.90	-0.72	17.90	-18.80	14.00	0.14	1.00	-0.01	1.13	1.39	2.36
82	03/09/2011	254.0	576.0	5.06	16.10	27.90	28.00	0.66	19.80	-2.70	1.65	0.45	1.65	2.28	3.71
82	06/08/2011	-138.0	455.0	6.27	8.09	51.40	44.70	3.20	11.20	-0.02	0.75	0.17	0.83	-0.19	2.05
82	09/26/2011	413.0	629.0	-8.30	28.70	28.10	54.40	-3.06	28.30	-3.29	3.26	-1.83	3.70	2.50	7.09
82	12/12/2011	-2910.0	822.0	-3.34	11.30	-4.59	19.40	8.80	14.20	0.24	1.07	-0.37	1.15	-2.18	2.61

TABLE 10
WELL WATER
(pCi/l)

LOCATION	COLLECTION DATE	Co-60	(+/-)	Zn-65	(+/-)	Nb-95	(+/-)	Zr-95	(+/-)	Ru-103	(+/-)	Ru-106	(+/-)	Sb-125	(+/-)
71	03/09/2011	0.75	1.47	-7.09	3.45	-0.31	1.85	1.14	3.21	-0.22	2.18	-1.99	15.20	3.13	4.35
71	06/22/2011	-0.02	3.28	-0.89	9.30	-1.70	4.29	2.90	6.63	-3.03	4.31	-26.10	32.50	-3.01	9.33
71	09/14/2011	-0.62	1.83	-1.63	4.97	-0.18	2.25	-2.25	3.94	-0.03	2.49	1.26	18.40		
71	12/12/2011	-2.13	4.19	-3.78	11.30	2.68	4.76	4.07	6.80	-0.21	4.39	-18.30	37.40	0.69	10.20
72	03/09/2011	-1.78	1.70	-1.04	3.03	-0.19	1.63	0.49	2.91	0.95	2.05	14.00	13.90	-4.31	4.15
72	06/08/2011	-0.04	0.81	0.06	1.73	0.02	1.16	1.88	1.91	-0.16	1.18	5.37	8.51	0.08	2.36
72	09/07/2011	0.70	2.43	1.27	5.78	3.09	3.66	3.01	5.06	0.97	3.26	16.80	23.20	-2.19	7.56
72	12/12/2011	0.53	1.07	1.75	2.50	1.49	1.25	-0.60	2.12	1.19	1.76	-6.51	10.40	1.99	3.36
76	03/08/2011	-1.28	1.37	-1.71	3.64	-1.16	1.68	1.25	2.89	-0.74	1.84	-5.89	13.10	-1.17	3.58
76	06/07/2011	0.42	0.69	-0.03	1.42	0.39	0.81	-1.97	1.74	0.01	1.13	0.56	6.24	0.57	1.82
76	09/20/2011	-1.57	2.74	2.77	6.98	5.97	4.16	4.96	5.14	0.12	3.40	5.07	27.90	4.38	9.73
76	12/08/2011	-1.19	3.31	0.64	6.46	2.22	3.75	-0.45	6.22	0.49	3.52	-2.12	30.10	-1.66	10.20
77	03/08/2011	-0.03	1.40	0.10	3.10	1.14	1.70	-1.14	2.74	0.51	1.95	3.62	12.60	-0.57	4.04
77	06/07/2011	0.02	0.68	-1.08	1.20	-0.93	0.75	1.07	1.31	-1.18	0.96	-1.73	4.97	-0.659	1.560
77	09/20/2011	-1.36	3.90	1.99	9.29	10.80	4.79	1.46	6.86	-1.74	4.29	-26.60	35.00	0.347	11.700
77	12/08/2011	-1.27	3.54	1.39	7.92	7.24	4.40	3.12	3.87	0.85	3.61	-11.80	30.70	-3.260	10.400
78	03/08/2011	-0.69	1.29	-1.24	2.70	-0.69	1.53	-0.08	2.75	-2.20	1.98	5.12	13.20	0.82	3.77
78	06/07/2011	0.00	0.65	0.17	0.93	0.75	1.03	1.16	1.55	-0.20	1.02	0.08	6.00	2.36	2.25
78	09/22/2011	-0.87	3.26	0.86	6.20	1.05	2.94	-1.61	4.37	-1.01	3.17	-12.10	26.30	-4.22	8.31
78	12/08/2011	0.31	3.82	0.19	7.22	2.90	4.19	1.96	6.00	-0.96	4.27	-1.28	33.10	-2.58	10.80
79	03/07/2011	-0.07	1.13	-2.09	2.38	0.39	1.31	0.45	2.25	-1.01	1.54	-4.72	11.20	-0.85	3.20
79	06/08/2011	0.06	0.97	-0.06	1.33	0.07	0.83	-0.48	1.67	-0.44	1.00	-3.53	7.13	-0.89	1.86
79	09/07/2011	-2.59	2.65	-4.74	5.59	1.38	3.05	0.17	5.62	-2.87	3.38	8.24	22.30	1.27	7.52
79	12/12/2011	0.37	0.96	-6.52	2.21	0.41	1.09	1.31	1.86	-0.84	1.44	-6.42	8.67	-1.14	2.53
80	03/07/2011	1.28	1.66	-8.78	4.14	0.43	1.91	-2.11	3.16	-2.29	2.15	-16.10	14.10	-1.46	4.07
80	06/13/2011	-0.66	2.57	-0.93	4.79	-2.38	2.85	-2.23	4.76	-1.63	3.12	-0.01	20.80	-3.29	6.54
80	09/26/2011	-0.50	1.94	2.58	4.11	1.24	2.29	0.43	3.66	-2.25	2.40	-12.70	16.90	0.55	5.66
80	12/14/2011	0.09	1.36	-0.01	3.24	1.80	1.68	3.53	2.99	0.25	2.03	5.76	13.40	0.88	3.93
81	03/09/2011	-0.50	1.39	-1.06	3.71	1.96	1.77	1.69	2.87	-0.99	2.00	-1.52	14.10	-2.11	4.20
81	06/13/2011	1.89	2.08	-5.30	5.41	-1.02	3.00	-0.04	4.95	-0.17	3.01	10.80	21.50	1.90	6.84
81	09/26/2011	0.57	2.21	2.41	5.41	5.45	3.06	0.74	3.90	-1.76	2.74	-6.55	19.80	3.15	7.37
81	12/14/2011	1.14	0.98	1.42	2.32	1.88	1.38	-1.94	1.97	1.42	1.44	-1.36	10.20	-3.42	3.10
82	03/09/2011	1.31	1.53	-7.98	3.73	1.88	1.91	-0.59	3.15	-1.27	2.05	5.44	13.20	2.16	4.26
82	06/08/2011	-0.23	0.69	-0.67	1.28	0.45	0.83	0.00	0.00	-0.53	0.99	1.28	7.19	0.69	2.12
82	09/26/2011	0.81	3.92	3.65	7.31	5.15	4.35	-1.53	6.25	0.18	3.61	-3.02	30.70	-0.28	9.01
82	12/12/2011	-0.34	1.05	1.07	2.46	-0.70	1.27	-0.97	2.14	-1.63	1.53	2.34	10.20	-1.27	3.05

TABLE 10
WELL WATER
(pCi/l)

LOCATION	COLLECTION DATE	I-131	(+/-)	Cs-134	(+/-)	Cs-137	(+/-)	Ba-140	(+/-)	La-140	(+/-)	Th-232 decay chain*	(+/-)
71	03/09/2011	1.85	7.30	-0.07	1.73	-1.03	2.00	-1.87	14.30	2.38	4.31	6.26	4.58
71	06/22/2011	1.43	7.62	1.13	3.75	1.97	4.11	-7.68	19.90	-10.60	8.01	1.84	13.70
71	09/14/2011	3.42	5.84	-0.36	2.44	-1.26	2.09	-12.10	13.90	0.34	4.44	-0.54	4.77
71	12/12/2011	2.51	8.75	2.38	4.09	-0.61	4.49	27.30	24.10	5.22	6.85	-11.30	14.40
72	03/09/2011	-1.28	7.49	0.71	2.26	1.08	1.55	-9.55	13.50	3.73	4.21	1.31	6.27
72	06/08/2011	-5.81	8.71	0.53	0.80	0.13	1.03	4.08	13.60	-0.33	3.88	3.89	5.69
72	09/07/2011	-3.12	8.19	0.47	3.02	-1.27	2.56	-8.69	16.20	-3.56	4.63	7.08	8.38
72	12/12/2011	-0.39	6.03	0.23	1.26	0.19	1.14	-5.42	10.50	0.42	3.29	2.66	4.86
76	03/08/2011	1.75	6.47	-2.99	1.54	-0.48	1.45	-12.20	12.80	-3.97	4.70	2.97	6.60
76	06/07/2011	-1.11	7.70	-0.23	0.64	-0.15	0.68	0.65	9.35	1.70	2.44	-3.50	4.71
76	09/20/2011	-2.62	5.70	-0.25	3.41	-2.00	3.32	-2.72	15.30	2.21	5.33	7.61	6.83
76	12/08/2011	-1.69	5.08	-0.61	3.66	0.59	4.02	6.22	16.90	-0.69	4.48	1.01	8.23
77	03/08/2011	-6.03	7.37	0.38	1.57	0.36	1.54	0.88	13.30	-2.49	4.46	4.19	3.40
77	06/07/2011	0.35	7.73	-0.06	0.55	-0.24	0.69	2.74	9.28	-0.47	2.76	-4.42	2.20
77	09/20/2011	0.82	7.01	0.75	4.41	-1.16	4.08	-5.16	19.10	-1.30	5.61	5.80	8.09
77	12/08/2011	-0.93	5.02	-0.40	3.66	-4.86	3.75	-14.20	16.10	0.49	5.00	-4.06	8.00
78	03/08/2011	2.76	7.30	-0.66	1.54	0.51	1.41	4.88	13.60	-0.72	3.92	1.52	9.98
78	06/07/2011	2.41	7.94	-0.13	0.62	0.35	0.72	7.83	10.90	0.20	2.19	-5.23	2.40
78	09/22/2011	1.99	4.26	0.21	2.99	-0.46	3.01	5.02	14.10	-3.02	5.70	4.36	6.73
78	12/08/2011	-1.76	5.20	-1.55	4.10	-0.75	4.32	-2.75	16.80	-2.20	4.40	1.37	8.60
79	03/07/2011	1.81	6.03	-0.24	1.39	-0.03	1.21	0.62	11.00	-1.86	3.28	5.83	8.47
79	06/08/2011	1.85	7.14	-0.39	0.63	0.06	0.72	1.87	10.70	1.36	3.27	-5.36	2.34
79	09/07/2011	4.52	7.79	0.62	2.72	-0.40	2.85	-8.34	17.00	-4.17	6.54	-5.07	5.33
79	12/12/2011	0.04	4.34	0.69	1.11	-1.16	1.22	-0.40	8.87	-0.60	2.87	0.64	2.41
80	03/07/2011	5.99	7.24	-1.27	1.70	0.54	1.65	4.18	15.00	-2.08	4.91	0.66	2.69
80	06/13/2011	-7.64	8.49	0.38	2.69	-1.01	2.41	-0.37	16.40	-1.40	4.42	2.00	5.92
80	09/26/2011	-1.57	8.92	-0.87	2.21	-0.25	2.05	3.33	16.80	4.47	5.33	2.09	4.25
80	12/14/2011	-2.02	7.93	0.14	1.63	0.87	1.47	-13.80	13.80	0.82	4.23	1.31	6.09
81	03/09/2011	0.51	7.42	-0.79	1.58	-0.90	1.50	1.51	13.60	-1.93	4.46	4.13	3.36
81	06/13/2011	-0.10	8.44	-0.94	2.72	0.44	2.67	0.78	18.00	-2.08	5.10	11.50	12.30
81	09/26/2011	-0.69	5.19	0.53	2.52	0.26	2.63	-4.42	13.10	-0.54	4.32	15.50	5.67
81	12/14/2011	-3.55	4.57	0.16	1.33	0.14	1.09	2.16	8.83	0.69	2.53	2.55	2.81
82	03/09/2011	6.61	8.01	0.27	1.97	0.17	1.73	-9.74	15.60	0.63	4.96	0.61	6.36
82	06/08/2011	-4.66	7.06	0.52	0.63	-0.03	0.80	2.26	10.60	2.28	3.24	5.77	6.08
82	09/26/2011	-1.62	6.41	1.77	3.44	-1.05	3.45	-3.76	17.50	-1.07	6.02	14.40	7.03
82	12/12/2011	1.13	5.47	0.48	1.26	0.05	1.17	-0.82	10.20	-2.80	3.22	1.11	7.43

* The highest result for Th-228 and Act-228 is reported.

TABLE 10
WELL WATER
(pCi/l)

LOCATION	COLLECTION DATE	H-3	(+/-)	Be-7	(+/-)	K-40	(+/-)	Cr-51	(+/-)	Mn-54	(+/-)	Co-58	(+/-)	Fe-59	
83	03/16/2011	-71.7	625.0	15.90	17.70	20.80	25.30	12.40	15.60	0.29	1.40	-0.52	1.49	0.36	3.18
83	06/15/2011	135.0	623.0	4.44	29.10	3.35	44.60	-27.00	36.50	-3.02	2.85	-4.31	3.31	2.02	5.76
83	09/12/2011	-19.3	452.0	4.53	10.20	57.10	24.20			0.07	1.14	-1.16	1.20	1.97	2.60
83	12/12/2011	211.0	265.0	2.80	10.70	-3.65	20.00	-7.76	13.80	-1.95	1.09	-0.47	1.22	1.77	2.64
84	03/21/2011	402.0	633.0	1.58	22.50	49.60	38.40	-2.98	28.80	-0.45	2.40	0.76	2.93	0.28	4.91
84	06/15/2011	361.0	638.0	2.40	27.70	32.00	49.10	-11.00	33.70	-0.86	2.79	1.37	3.32	0.27	6.97
84	09/12/2011	-153.0	452.0	4.53	10.20	57.10	24.20			0.07	1.14	-1.16	1.20	1.97	2.60
84	12/12/2011	-2550.0	835.0	-12.90	31.60	-47.30	54.60	-18.30	38.00	0.90	3.02	-0.90	3.66	-5.47	8.50
85	03/14/2011	-10.2	625.0	-6.37	13.30	11.10	23.20	-1.46	16.90	-1.44	1.44	-2.13	1.51	-1.08	3.12
85	06/20/2011	-19.9	993.0	-1.56	34.30	8.18	61.50	2.87	41.80	0.40	4.22	-0.02	3.80	-0.18	7.83
85	09/27/2011	298.0	628.0	9.18	29.80	2.37	71.70	6.17	33.60	-0.48	3.38	-2.71	3.58	-0.47	6.15
86	03/14/2011	624.0	661.0	0.18	12.60	37.30	29.60	-2.46	16.40	-0.44	1.33	-0.22	1.37	1.68	3.06
86	06/20/2011	942.0	1080.0	-13.00	30.10	-7.33	48.10	-9.54	33.80	0.52	2.39	0.78	3.32	-0.41	5.47
86	09/27/2011	447.0	636.0	11.40	29.80	24.50	55.00	-17.10	32.30	-0.40	3.23	-2.74	3.66	2.73	6.40
86	12/21/2011	139.0	645.0	9.41	11.10	1.09	19.00	4.12	14.90	-0.16	1.05	-0.53	1.15	1.45	2.62
91	03/07/2011	-62.4	515.0	5.57	16.20	-5.58	26.90	-11.90	21.20	-0.38	1.59	0.12	1.71	2.30	3.79
91	06/15/2011	243.0	625.0	-2.31	26.20	35.50	50.70	-2.95	30.50	-0.35	2.52	-3.04	2.85	-2.10	5.50
91	09/14/2011	34.6	541.0	-6.89	11.00	-15.00	26.30			0.28	1.08	0.35	1.24	1.36	2.87
91	12/14/2011	-3210.0	799.0	0.92	11.30	-13.10	19.50	1.58	13.10	-0.31	1.16	-1.19	1.16	1.15	2.69
92	03/07/2011	392.0	582.0	-12.00	14.90	19.60	34.40	3.46	20.10	-0.79	1.45	0.59	1.80	-0.25	3.73
92	06/13/2011	69.5	616.0	2.06	30.30	76.60	59.20	13.40	32.90	1.00	2.90	-2.53	3.60	0.39	7.93
92	09/26/2011	10.2	812.0	-1.39	20.50	7.48	30.80	-30.20	26.60	0.23	2.09	0.00	0.00	-2.23	4.71
92	12/14/2011	-993.0	901.0	8.24	10.80	-9.76	22.20	-1.50	12.40	-0.16	1.14	0.50	1.25	2.88	2.83

TABLE 10
WELL WATER
(pCi/l)

LOCATION	COLLECTION DATE	Co-60	(+/-)	Zn-65	(+/-)	Nb-95	(+/-)	Zr-95	(+/-)	Ru-103	(+/-)	Ru-106	(+/-)	Sb-125	
83	03/16/2011	0.35	1.33	-6.80	2.91	2.25	1.51	1.04	2.68	-1.03	1.73	-3.57	12.80	1.18	3.79
83	06/15/2011	0.48	2.45	5.99	6.63	0.96	3.95	-4.56	6.17	0.08	3.72	-18.50	25.10	6.06	9.03
83	09/12/2011	-0.65	1.04	-1.78	2.74	1.15	1.34	1.95	2.09	-1.87	1.36	4.70	10.10		
83	12/12/2011	0.04	1.35	0.54	2.47	1.63	1.23	1.38	2.15	-0.89	1.61	-4.53	9.60	-0.32	3.04
84	03/21/2011	0.42	2.29	-3.12	5.47	0.03	2.68	-1.24	4.87	0.45	2.93	-8.40	20.70	1.24	7.08
84	06/15/2011	-0.30	2.96	1.76	5.47	0.49	3.30	3.68	5.70	-2.06	3.60	6.99	23.80	4.56	7.83
84	09/12/2011	-0.65	1.04	-1.78	2.74	1.15	1.34	1.95	2.09	-1.87	1.36	4.70	10.10	-0.61	2.44
84	12/12/2011	-1.57	4.21	2.93	6.09	3.86	3.98	0.43	6.36	-0.94	3.99	-3.32	29.50	-16.60	9.09
85	03/14/2011	-0.31	1.28	0.38	3.04	3.94	1.78	0.79	2.67	-0.60	1.93	0.05	11.50	2.03	3.69
85	06/20/2011	0.92	3.60	7.40	6.93	-0.86	4.30	-3.70	6.72	-1.30	4.01	-22.00	33.60	8.59	10.60
85	09/27/2011	0.40	3.66	-3.61	8.42	9.84	4.24	0.20	5.45	-2.41	3.55	-6.56	31.50	9.49	10.60
86	03/14/2011	0.70	1.27	-0.70	3.24	1.03	1.51	-2.47	2.60	-3.06	1.64	-1.94	11.80	-0.98	3.55
86	06/20/2011	-0.87	3.39	2.96	6.16	0.07	4.01	-1.82	5.51	2.22	4.11	-17.10	29.60	5.11	9.41
86	09/27/2011	1.28	3.31	2.53	9.01	7.05	4.53	-1.94	6.04	-4.51	3.88	7.99	27.80	-6.84	9.84
86	12/21/2011	-0.27	1.03	-4.63	2.38	1.01	1.19	0.53	2.06	-0.32	1.65	1.96	9.72	-0.82	3.15
91	03/07/2011	-0.49	1.48	-4.99	3.29	1.86	1.83	-1.47	3.06	-0.64	2.14	2.13	14.10	4.46	4.61
91	06/15/2011	1.29	2.84	1.68	6.05	2.11	2.94	-0.30	4.68	4.15	3.51	8.27	23.60	8.76	7.69
91	09/14/2011	0.21	1.15	-5.84	2.71	0.46	1.27	2.34	2.05	-1.10	1.52	5.02	10.40	0.02	3.21
91	12/14/2011	-0.44	1.13	-3.00	2.48	1.08	1.28	1.93	2.13	-2.07	1.55	-10.00	10.30	0.20	2.94
92	03/07/2011	-0.63	1.63	-1.82	3.41	-0.22	1.78	-0.13	2.98	-0.38	1.99	2.17	14.00	-1.86	4.33
92	06/13/2011	2.14	2.86	5.70	7.20	0.01	3.68	-4.76	6.11	-0.95	3.53	-3.68	27.00	5.96	8.02
92	09/26/2011	-0.64	1.95	0.98	4.09	2.23	2.40	-0.68	3.72	-0.46	2.50	3.00	18.00	1.60	5.70
92	12/14/2011	1.62	1.21	-0.24	2.96	-0.26	1.34	0.93	2.26	-0.73	1.67	3.60	10.20	1.51	3.04

TABLE 10
WELL WATER
(pCi/l)

LOCATION	COLLECTION DATE	I-131	(+/-)	Cs-134	(+/-)	Cs-137	(+/-)	Ba-140	(+/-)	La-140	(+/-)	Th-232 decay chain*	(+/-)
83	03/16/2011	0.93	4.55	-1.28	1.49	-0.82	1.72	-1.42	10.40	2.01	3.33	1.99	2.99
83	06/15/2011	-3.13	9.17	1.45	3.02	-1.39	2.91	-10.50	21.40	0.91	5.69	-10.50	12.00
83	09/12/2011	3.52	3.94	-0.92	1.19	-0.57	1.11	-3.88	8.84	-2.57	3.09	17.70	12.60
83	12/12/2011	-0.11	5.20	0.55	1.19	-0.31	1.14	-11.20	9.60	-0.28	3.22	1.50	5.34
84	03/21/2011	2.35	7.82	0.93	2.59	0.30	2.69	0.25	18.60	-1.97	5.33	0.62	7.62
84	06/15/2011	-0.39	9.12	-0.48	3.16	-2.38	2.96	10.30	20.70	0.22	6.23	4.66	7.44
84	09/12/2011	3.52	3.94	-0.92	1.19	-0.57	1.11	-3.88	8.84	-2.57	3.09	1.35	2.42
84	12/12/2011	-0.38	8.16	0.80	3.21	-4.20	3.94	7.18	21.20	-2.66	5.26	-8.17	12.80
85	03/14/2011	4.38	5.38	0.68	1.41	-0.98	1.64	-3.03	10.60	0.50	3.55	1.18	2.68
85	06/20/2011	-5.39	9.46	0.66	3.70	-2.45	3.91	8.72	23.60	0.79	7.54	6.75	14.50
85	09/27/2011	-0.54	6.43	0.59	3.57	3.18	3.48	9.52	17.40	2.05	5.64	17.40	8.68
86	03/14/2011	2.25	5.50	-0.53	1.45	-0.64	1.34	6.30	10.30	0.66	3.30	3.37	3.27
86	06/20/2011	-2.32	8.72	2.05	3.25	1.61	3.24	4.87	18.40	-5.16	6.33	17.80	13.70
86	09/27/2011	-0.28	6.44	2.49	4.13	-2.73	3.81	-11.10	17.20	5.79	6.17	13.40	8.62
86	12/21/2011	-4.51	6.47	-0.08	1.15	-0.27	1.10	4.36	10.60	-0.36	3.42	1.27	5.52
91	03/07/2011	-1.78	9.01	-1.06	1.93	0.82	1.59	-10.60	15.70	5.69	4.74	7.35	3.85
91	06/15/2011	2.28	8.48	1.15	2.95	-0.67	2.80	-7.84	19.00	0.24	4.99	8.83	7.12
91	09/14/2011	1.26	3.96	0.16	1.26	-0.43	1.29	-3.36	8.88	-1.20	2.64	2.24	3.24
91	12/14/2011	-3.75	4.53	0.00	1.21	0.07	1.23	-6.98	9.10	-1.17	2.97	0.40	5.00
92	03/07/2011	-6.01	8.34	-0.10	1.63	-1.04	1.60	-3.26	14.00	0.14	4.39	2.66	3.95
92	06/13/2011	0.74	8.90	-0.86	3.41	-2.28	3.07	-6.76	21.10	-5.36	7.33	4.80	5.38
92	09/26/2011	-7.08	9.05	0.02	2.10	-0.48	2.30	2.53	17.70	4.97	5.22	2.03	4.53
92	12/14/2011	0.66	4.27	-0.07	1.18	-0.85	1.19	1.23	9.47	-0.09	3.14	1.05	2.16

* The highest result for Th-228 and Act-228 is reported.

TABLE 11

RESERVOIR WATER or DEER MEAT

Reservoir water and deer meat were not sampled in 2011. See discussion in Section 4.11.

TABLE 12
FRUITS & VEGETABLES
(pCi/g wet wt.)
LOCATION 25

DATE	TYPE	Be-7	(+/-)	K-40	(+/-)	Cr-51	(+/-)	Mn-54	(+/-)	Co-58	(+/-)	Fe-59	(+/-)	Co-60	(+/-)
06/16/2011	Lettuce	0.451	0.193	3.000	0.442	0.045	0.116	0.006	0.013	-0.003	0.012	-0.013	0.027	0.001	0.013
06/23/2011	Strawberries	0.045	0.054	0.987	0.166	0.052	0.064	0.002	0.005	-0.006	0.005	-0.002	0.012	-0.003	0.005
07/14/2011	Lettuce	0.301	0.204	4.380	0.652	0.070	0.177	-0.011	0.020	-0.001	0.021	-0.007	0.044	-0.004	0.026
08/04/2011	Blueberries	0.207	0.126	1.470	0.310	-0.089	0.125	0.000	0.013	0.012	0.014	-0.014	0.024	0.010	0.013
08/10/2011	Lettuce	0.280	0.047	2.490	0.134	-0.032	0.048	0.002	0.006	-0.002	0.005	-0.004	0.012	-0.003	0.006
09/08/2011	Lettuce	0.832	0.061	2.930	0.146	-0.007	0.030	-0.001	0.003	-0.001	0.003	0.003	0.007	0.001	0.004
09/08/2011	Peaches	0.036	0.030	1.500	0.094	-0.004	0.021	0.000	0.003	0.002	0.003	0.003	0.006	0.000	0.003

DATE	TYPE	Zn-65	(+/-)	Nb-95	(+/-)	Zr-95	(+/-)	Ru-103	(+/-)	Ru-106	(+/-)	Sb-125	(+/-)	I-131	(+/-)
06/16/2011	Lettuce	-0.004	0.026	0.009	0.012	0.024	0.021	0.006	0.013	-0.053	0.112	0.012	0.033	0.014	0.022
06/23/2011	Strawberries	0.011	0.011	0.010	0.008	-0.005	0.010	0.000	0.007	0.003	0.041	-0.002	0.013	-0.012	0.029
07/14/2011	Lettuce	0.015	0.053	0.030	0.022	0.018	0.032	-0.011	0.020	0.053	0.180	0.016	0.056	-0.003	0.032
08/04/2011	Blueberries	0.002	0.034	0.009	0.015	-0.008	0.025	0.000	0.014	0.014	0.130	-0.001	0.041	-0.007	0.022
08/10/2011	Lettuce	0.028	0.013	0.000	0.005	0.000	0.010	0.003	0.006	0.007	0.051	0.002	0.014	-0.003	0.010
09/08/2011	Lettuce	-0.013	0.009	-0.003	0.004	-0.001	0.006	-0.004	0.003	-0.002	0.030	-0.001	0.009	-0.002	0.005
09/08/2011	Peaches	-0.018	0.007	0.000	0.003	0.000	0.005	-0.001	0.003	0.021	0.023	0.000	0.007	0.003	0.004

DATE	TYPE	Cs-134	(+/-)	Cs-137	(+/-)	Ba-140	(+/-)	La-140	(+/-)	Ce-141	(+/-)	Ce-144	(+/-)	Th-232 decay chain*	(+/-)
06/16/2011	Lettuce	0.012	0.013	0.008	0.015	-0.017	0.054	-0.001	0.017	-0.011	0.021	-0.010	0.078	0.005	0.024
06/23/2011	Strawberries	0.000	0.005	-0.002	0.005	-0.005	0.049	0.005	0.016	0.007	0.011	-0.035	0.034	0.009	0.011
07/14/2011	Lettuce	0.003	0.021	-0.015	0.022	0.009	0.092	0.019	0.022	-0.013	0.034	0.021	0.141	0.077	0.078
08/04/2011	Blueberries	-0.002	0.015	0.007	0.015	-0.020	0.061	-0.018	0.017	-0.003	0.023	-0.041	0.094	0.060	0.033
08/10/2011	Lettuce	0.018	0.012	0.006	0.006	0.011	0.027	0.000	0.008	0.008	0.008	-0.051	0.037	0.040	0.026
09/08/2011	Lettuce	-0.002	0.004	0.003	0.004	0.005	0.015	-0.004	0.005	-0.001	0.005	0.010	0.019	0.030	0.019
09/08/2011	Peaches	-0.001	0.003	0.001	0.003	-0.004	0.012	-0.003	0.004	-0.001	0.004	0.004	0.015	0.005	0.005

* The highest result for Th-232 and it's two daughters, Th-228 and Act-228, is reported.

TABLE 12
FRUITS & VEGETABLES
(pCi/g wet wt.)
LOCATION 26

DATE	TYPE	Be-7	(+/-)	K-40	(+/-)	Cr-51	(+/-)	Mn-54	(+/-)	Co-58	(+/-)	Fe-59	(+/-)	Co-60	(+/-)
06/16/2011	Strawberries	0.137	0.101	5.900	0.614	-0.081	0.125	-0.008	0.014	0.002	0.012	0.013	0.033	0.004	0.017
06/16/2011	Spinach	0.138	0.138	1.800	0.393	0.027	0.127	-0.013	0.013	-0.002	0.015	0.009	0.021	0.006	0.014
07/14/2011	Lettuce	0.080	0.127	3.420	0.550	0.008	0.128	-0.001	0.018	0.007	0.019	0.005	0.039	0.011	0.021
08/10/2011	Lettuce	0.033	0.023	3.050	0.094	0.006	0.019	0.001	0.002	-0.002	0.002	-0.001	0.004	0.000	0.003
09/08/2011	Lettuce	0.008	0.019	1.430	0.087	0.009	0.021	-0.001	0.002	0.000	0.002	-0.004	0.005	0.002	0.003
09/08/2011	Apples	0.046	0.029	0.929	0.103	-0.021	0.029	0.003	0.003	0.001	0.003	-0.004	0.007	0.000	0.004

DATE	TYPE	Zn-65	(+/-)	Nb-95	(+/-)	Zr-95	(+/-)	Ru-103	(+/-)	Ru-106	(+/-)	Sb-125	(+/-)	I-131	(+/-)
06/16/2011	Strawberries	-0.031	0.033	0.007	0.016	0.009	0.024	0.005	0.013	-0.077	0.118	0.020	0.030	-0.005	0.025
06/16/2011	Spinach	0.017	0.034	-0.016	0.017	0.022	0.027	-0.010	0.014	-0.023	0.134	0.014	0.039	0.010	0.026
07/14/2011	Lettuce	-0.003	0.040	0.010	0.020	-0.013	0.028	0.012	0.015	-0.050	0.127	0.016	0.043	-0.007	0.022
08/10/2011	Lettuce	-0.006	0.005	0.002	0.002	-0.001	0.004	-0.001	0.002	0.012	0.017	-0.002	0.005	-0.001	0.004
09/08/2011	Lettuce	0.004	0.005	0.002	0.002	0.000	0.004	-0.001	0.002	-0.007	0.020	-0.001	0.006	-0.001	0.003
09/08/2011	Apples	-0.004	0.009	0.000	0.003	-0.003	0.006	-0.003	0.003	-0.006	0.029	0.004	0.009	-0.004	0.005

DATE	TYPE	Cs-134	(+/-)	Cs-137	(+/-)	Ba-140	(+/-)	La-140	(+/-)	Ce-141	(+/-)	Ce-144	(+/-)	Th-232 decay chain*	(+/-)
06/16/2011	Strawberries	0.003	0.013	-0.009	0.013	0.008	0.068	0.008	0.018	0.018	0.022	0.072	0.084	0.000	0.024
06/16/2011	Spinach	0.000	0.014	-0.004	0.014	0.001	0.072	0.005	0.019	-0.003	0.024	0.026	0.089	0.002	0.024
07/14/2011	Lettuce	-0.002	0.016	-0.006	0.017	0.001	0.066	-0.023	0.022	0.010	0.025	0.024	0.107	0.022	0.030
08/10/2011	Lettuce	-0.001	0.002	0.001	0.002	0.010	0.010	-0.002	0.003	0.005	0.006	-0.003	0.014	0.003	0.016
09/08/2011	Lettuce	0.000	0.003	0.001	0.003	-0.010	0.010	0.001	0.003	0.003	0.006	-0.003	0.015	0.007	0.006
09/08/2011	Apples	0.001	0.004	0.000	0.003	0.001	0.014	0.000	0.005	-0.001	0.005	-0.004	0.022	0.022	0.008

* The highest result for Th-232 and it's two daughters, Th-228 and Act-228, is reported.

TABLE 13
BROADLEAF VEGETATION
(pCi/g wet wt.)
LOCATION 1

COLLECTION DATE	Be-7	(+/-)	K-40	(+/-)	Cr-51	(+/-)	Mn-54	(+/-)	Co-58	(+/-)	Fe-59	(+/-)	Co-60	(+/-)
05/24/2011	1.420	0.163	3.520	0.268	0.038	0.042	0.001	0.004	0.001	0.004	-0.004	0.010	0.000	0.004
06/21/2011	0.905	0.269	3.270	0.437	0.129	0.166	0.003	0.016	-0.002	0.016	0.020	0.039	-0.002	0.015
07/12/2011	1.050	0.305	4.100	0.614	0.115	0.153	0.000	0.016	0.003	0.015	0.012	0.032	-0.013	0.018
08/09/2011	1.350	0.183	4.920	0.435	-0.070	0.087	0.001	0.009	0.004	0.009	0.002	0.025	-0.001	0.011
09/26/2011	2.910	0.281	1.920	0.329	0.072	0.137	-0.012	0.012	0.010	0.013	0.014	0.026	-0.006	0.013
10/06/2011	3.490	0.413	2.900	0.502	-0.003	0.180	-0.016	0.017	-0.007	0.019	-0.015	0.035	-0.007	0.017

COLLECTION DATE	Zn-65	(+/-)	Nb-95	(+/-)	Zr-95	(+/-)	Ru-103	(+/-)	Ru-106	(+/-)	Sb-125	(+/-)	I-131	(+/-)
05/24/2011	0.002	0.008	-0.004	0.004	0.006	0.008	0.003	0.005	0.012	0.035	0.006	0.008	0.015	0.029
06/21/2011	-0.051	0.035	0.003	0.017	-0.016	0.027	0.012	0.018	0.175	0.138	0.036	0.039	-0.012	0.014
07/12/2011	-0.040	0.042	-0.010	0.018	0.033	0.024	0.005	0.016	0.077	0.163	-0.025	0.042	-0.023	0.029
08/09/2011	-0.018	0.026	-0.006	0.009	0.002	0.017	-0.002	0.009	0.015	0.086	-0.006	0.023	0.021	0.018
09/26/2011	-0.028	0.032	0.017	0.014	-0.002	0.021	0.005	0.014	0.053	0.110	0.008	0.035	0.014	0.030
10/06/2011	-0.030	0.047	0.007	0.018	0.008	0.033	-0.017	0.019	-0.171	0.177	-0.028	0.059	-0.009	0.031

COLLECTION DATE	Cs-134	(+/-)	Cs-137	(+/-)	Ba-140	(+/-)	La-140	(+/-)	Ce-141	(+/-)	Ce-144	(+/-)	Th-232 decay chain*	(+/-)
05/24/2011	0.002	0.003	0.005	0.004	0.002	0.047	-0.010	0.012	-0.008	0.008	0.017	0.019	0.015	0.016
06/21/2011	-0.015	0.017	0.020	0.017	0.151	0.120	0.007	0.027	-0.001	0.032	-0.015	0.096	0.000	0.053
07/12/2011	0.002	0.016	-0.009	0.015	0.014	0.068	0.005	0.020	-0.011	0.026	-0.006	0.104	0.067	0.045
08/09/2011	-0.020	0.010	0.015	0.011	-0.018	0.049	-0.011	0.015	-0.025	0.013	-0.022	0.049	0.044	0.044
09/26/2011	-0.001	0.015	0.007	0.013	0.020	0.071	0.009	0.020	-0.005	0.026	-0.024	0.090	0.096	0.052
10/06/2011	-0.036	0.021	-0.009	0.018	0.075	0.085	0.000	0.022	0.001	0.037	-0.061	0.134	0.061	0.075

* The highest result for Th-232 and it's two daughters, Th-228 and Act-228, is reported.

TABLE 13
BROADLEAF VEGETATION
(pCi/g wet wt.)
LOCATION 10

COLLECTION DATE	Be-7	(+/-)	K-40	(+/-)	Cr-51	(+/-)	Mn-54	(+/-)	Co-58	(+/-)	Fe-59	(+/-)	Co-60	(+/-)
05/24/2011	0.942	0.144	3.060	0.242	0.022	0.042	0.002	0.003	-0.010	0.004	0.002	0.010	-0.001	0.004
06/21/2011	0.410	0.280	4.720	0.538	-0.047	0.184	0.002	0.014	0.004	0.018	0.004	0.035	0.005	0.017
07/12/2011	0.952	0.223	3.930	0.529	-0.047	0.146	0.000	0.015	-0.010	0.016	0.001	0.034	0.014	0.017
08/09/2011	1.000	0.137	5.340	0.357	-0.047	0.061	0.003	0.007	-0.004	0.007	-0.005	0.016	-0.001	0.010
09/26/2011	1.740	0.254	2.850	0.383	0.009	0.114	0.000	0.013	-0.010	0.014	-0.011	0.025	0.011	0.013
10/06/2011	2.350	0.335	2.630	0.539	-0.134	0.151	-0.009	0.016	-0.001	0.019	-0.010	0.027	0.001	0.016

COLLECTION DATE	Zn-65	(+/-)	Nb-95	(+/-)	Zr-95	(+/-)	Ru-103	(+/-)	Ru-106	(+/-)	Sb-125	(+/-)	I-131	(+/-)
05/24/2011	0.003	0.007	0.002	0.003	-0.002	0.007	-0.001	0.005	0.031	0.028	0.000	0.008	-0.019	0.028
06/21/2011	-0.035	0.037	0.005	0.017	0.014	0.030	0.006	0.018	-0.005	0.143	0.036	0.038	-0.012	0.013
07/12/2011	0.007	0.040	0.016	0.016	0.009	0.023	0.011	0.016	-0.011	0.135	0.021	0.042	0.008	0.030
08/09/2011	-0.024	0.020	-0.003	0.008	0.003	0.013	-0.003	0.007	0.037	0.063	0.009	0.019	0.004	0.014
09/26/2011	0.004	0.031	0.019	0.017	-0.021	0.020	0.002	0.014	-0.046	0.108	-0.006	0.034	-0.015	0.032
10/06/2011	0.019	0.037	0.008	0.014	0.027	0.029	0.000	0.016	0.099	0.142	-0.023	0.042	-0.025	0.029

COLLECTION DATE	Cs-134	(+/-)	Cs-137	(+/-)	Ba-140	(+/-)	La-140	(+/-)	Ce-141	(+/-)	Ce-144	(+/-)	Th-232 decay chain*	(+/-)
05/24/2011	0.000	0.003	0.005	0.004	-0.006	0.043	0.004	0.012	0.006	0.007	0.003	0.020	0.013	0.018
06/21/2011	-0.001	0.017	0.024	0.017	0.087	0.113	-0.011	0.024	0.013	0.031	-0.045	0.104	0.016	0.041
07/12/2011	0.013	0.014	0.008	0.016	0.010	0.072	0.006	0.021	0.004	0.028	-0.037	0.101	0.048	0.031
08/09/2011	-0.008	0.006	0.014	0.010	-0.019	0.038	-0.006	0.011	-0.009	0.011	-0.019	0.043	0.100	0.046
09/26/2011	0.008	0.013	0.005	0.014	-0.002	0.072	-0.020	0.023	-0.008	0.022	-0.017	0.082	0.052	0.027
10/06/2011	0.001	0.019	-0.002	0.017	0.006	0.076	0.000	0.013	-0.027	0.030	0.063	0.130	0.065	0.122

* The highest result for Th-232 and it's two daughters, Th-228 and Act-228, is reported.

TABLE 13
BROADLEAF VEGETATION
(pCi/g wet wt.)
LOCATION 17

COLLECTION DATE	Be-7	(+/-)	K-40	(+/-)	Cr-51	(+/-)	Mn-54	(+/-)	Co-58	(+/-)	Fe-59	(+/-)	Co-60	(+/-)
05/24/2011	1.500	0.159	2.950	0.236	0.014	0.043	0.002	0.004	-0.001	0.003	0.006	0.009	-0.002	0.003
06/21/2011	1.150	0.298	2.610	0.418	-0.013	0.191	-0.004	0.014	-0.015	0.015	0.008	0.037	0.002	0.016
07/12/2011	1.270	0.297	3.840	0.595	0.139	0.182	0.013	0.017	0.007	0.016	-0.009	0.038	0.014	0.019
08/09/2011	1.590	0.146	5.700	0.325	-0.012	0.071	0.003	0.007	-0.004	0.007	0.009	0.017	-0.001	0.009
09/26/2011	4.210	0.361	2.060	0.376	-0.012	0.137	-0.010	0.012	-0.003	0.012	0.005	0.023	0.006	0.011
10/06/2011	5.760	0.470	2.660	0.444	0.013	0.194	-0.003	0.017	-0.017	0.017	0.042	0.032	-0.002	0.019

COLLECTION DATE	Zn-65	(+/-)	Nb-95	(+/-)	Zr-95	(+/-)	Ru-103	(+/-)	Ru-106	(+/-)	Sb-125	(+/-)	I-131	(+/-)
05/24/2011	-0.006	0.007	0.001	0.003	-0.004	0.006	0.001	0.004	-0.013	0.027	-0.001	0.007	-0.012	0.028
06/21/2011	-0.051	0.040	-0.004	0.017	-0.016	0.025	0.009	0.020	-0.048	0.139	-0.019	0.042	0.009	0.014
07/12/2011	-0.056	0.048	0.006	0.020	-0.007	0.030	-0.008	0.019	-0.027	0.150	0.015	0.049	0.024	0.032
08/09/2011	-0.012	0.019	0.009	0.007	0.007	0.013	-0.001	0.008	-0.034	0.064	0.001	0.020	0.000	0.016
09/26/2011	0.003	0.025	0.005	0.013	0.005	0.020	-0.001	0.014	0.013	0.106	0.029	0.037	-0.021	0.032
10/06/2011	0.018	0.036	0.004	0.017	-0.008	0.029	0.010	0.020	0.025	0.164	-0.002	0.055	-0.006	0.034

COLLECTION DATE	Cs-134	(+/-)	Cs-137	(+/-)	Ba-140	(+/-)	La-140	(+/-)	Ce-141	(+/-)	Ce-144	(+/-)	Th-232 decay chain*	(+/-)
05/24/2011	0.001	0.003	0.070	0.014	-0.009	0.046	-0.001	0.008	-0.004	0.009	-0.012	0.019	0.026	0.039
06/21/2011	0.002	0.016	0.019	0.018	0.085	0.124	0.002	0.041	-0.019	0.034	0.018	0.102	0.062	0.064
07/12/2011	0.001	0.020	-0.012	0.020	-0.056	0.087	0.008	0.024	0.021	0.030	0.038	0.118	0.047	0.189
08/09/2011	-0.007	0.008	0.001	0.007	0.024	0.041	0.009	0.011	0.002	0.014	-0.015	0.050	0.029	0.031
09/26/2011	0.001	0.014	0.069	0.034	0.065	0.070	-0.002	0.017	-0.004	0.025	0.043	0.099	0.123	0.052
10/06/2011	0.005	0.018	0.045	0.027	0.088	0.089	-0.034	0.022	-0.012	0.039	0.057	0.149	0.198	0.075

* The highest result for Th-232 and it's two daughters, Th-228 and Act-228, is reported.

TABLE 14
SEA WATER
(pCi/l)
LOCATION 32

DATE	H-3	(+/-)	Be-7	(+/-)	K-40	(+/-)	Cr-51	(+/-)	Mn-54	(+/-)	Co-58	(+/-)	Fe-59	(+/-)
01/25/2011	381	178	3.51	19.30	306	68			0.54	2.50	0.08	2.30	-0.37	5.62
02/22/2011	250	106	13.90	25.00	271	69	-14.40	30.50	-1.17	2.53	0.49	2.77	-2.98	5.86
03/29/2011	483	130	-17.80	22.20	310	63	-27.50	29.10	-0.53	2.31	-2.36	2.50	-3.25	5.34
04/26/2011	931	157	9.44	8.88	275	27	8.96	11.80	0.28	0.74	-0.05	0.96	-0.60	2.07
05/26/2011	214	119	5.93	8.48	271	49	1.76	10.30	0.28	0.65	0.07	0.65	0.10	1.89
06/28/2011	428	130	4.57	21.10	228	61	5.48	26.10	-0.70	1.87	-1.63	2.42	0.53	4.68
07/26/2011	522	132	12.70	32.50	211	135	5.84	36.90	5.20	3.67	0.17	4.07	-0.89	9.04
08/30/2011	421	128	9.67	30.00	242	87	17.30	29.90	-1.71	2.94	3.99	3.16	0.45	6.40
09/27/2011	1130	182	-3.77	22.30	262	61	-17.00	24.80	1.49	2.14	0.20	2.52	0.95	5.70
10/25/2011	2260	287	24.00	35.60	267	94	-2.55	39.40	2.83	3.74	-2.84	4.70	-6.28	9.29
11/29/2011	299	176	19.40	36.00	234	89	3.97	34.30	3.08	3.89	2.75	3.94	-1.42	7.71
12/27/2011	65	112	3.12	25.10	289	63	-6.12	31.00	-0.59	2.60	0.04	2.42	5.00	5.74

DATE	Co-60	(+/-)	Zn-65	(+/-)	Nb-95	(+/-)	Zr-95	(+/-)	Ru-103	(+/-)	Ru-106	(+/-)	Sb-125	(+/-)
01/25/2011	1.79	2.83	-1.91	6.28	2.05	2.73	-0.66	4.27	-0.25	2.73	0.44	22.10		
02/22/2011	0.79	3.10	-0.73	5.80	0.28	2.86	1.98	5.06	-2.70	3.45	2.12	25.70	-3.46	8.18
03/29/2011	2.80	2.18	-3.86	5.74	2.45	2.61	1.84	4.07	0.40	2.86	-4.27	19.50	-1.79	6.18
04/26/2011	0.97	0.82	-0.87	1.85	-1.22	1.01	-0.14	1.77	0.07	1.20	-1.54	7.17	-0.94	2.02
05/26/2011	-0.09	0.78	0.70	1.87	0.05	0.90	0.53	1.73	0.07	1.10	3.89	6.51	1.73	2.10
06/28/2011	0.36	2.37	-3.28	5.01	0.72	2.45	-0.49	3.86	0.90	2.97	-8.00	19.00	-3.64	6.20
07/26/2011	-2.55	4.43	-2.27	9.35	-0.59	4.22	0.00	0.00	-1.10	5.14	8.37	38.20	-4.43	9.81
08/30/2011	0.20	3.22	-10.40	7.09	1.32	3.27	3.23	5.21	-2.06	4.08	-2.20	24.80	1.99	9.72
09/27/2011	-1.56	2.32	-4.99	5.43	0.89	2.34	-1.83	4.17	-2.51	2.73	-16.30	19.90	2.46	5.91
10/25/2011	-1.31	4.46	2.73	6.91	4.20	4.78	1.07	7.34	1.92	4.43	4.20	36.00	5.16	13.70
11/29/2011	-0.04	4.34	-0.81	10.00	-0.80	3.94	-1.38	7.21	0.63	4.20	35.00	32.80	3.14	9.84
12/27/2011	1.38	2.93	3.29	6.62	1.01	3.06	-0.71	4.64	0.96	3.44	-4.19	22.40	0.19	7.59

DATE	I-131	(+/-)	Cs-134	(+/-)	Cs-137	(+/-)	Ba-140	(+/-)	La-140	(+/-)	Th-232 decay chain*	(+/-)
01/25/2011	-1.05	4.84	-1.42	2.84	0.43	2.75	-9.18	12.80	-0.56	4.67	4.66	5.98
02/22/2011	5.05	6.89	-5.20	2.87	-1.25	2.82	-2.40	16.80	1.38	5.07	3.20	14.40
03/29/2011	-4.10	8.40	0.70	2.42	1.37	2.29	-11.70	18.00	-4.32	5.62	4.95	9.43
04/26/2011	-9.98	8.43	-0.01	0.81	-0.68	1.00	-1.34	11.90	-2.81	3.81	1.39	2.34
05/26/2011	4.38	5.92	-0.15	0.66	0.59	0.78	-8.65	9.08	0.61	2.09	3.36	4.42
06/28/2011	4.12	8.07	0.19	2.34	-0.04	2.09	8.82	17.10	0.50	5.19	4.78	9.01
07/26/2011	-0.69	7.62	1.25	4.13	0.27	4.77	-20.00	20.90	1.05	7.76	3.37	6.47
08/30/2011	4.67	6.59	1.21	3.48	-0.56	3.32	-6.88	18.10	-1.55	4.64	10.50	11.90
09/27/2011	2.80	8.06	-1.59	2.18	0.08	2.20	-12.30	15.90	-1.43	6.25	4.07	8.74
10/25/2011	3.28	7.30	-0.95	4.22	-4.98	4.40	12.30	22.40	0.20	6.52	3.19	8.44
11/29/2011	0.36	6.51	-1.78	4.73	1.84	4.14	7.31	18.60	3.79	7.74	1.74	15.20
12/27/2011	1.95	6.22	0.06	3.44	-2.39	3.07	3.18	16.50	0.50	4.56	2.29	6.04

* The highest result for Th-228 and Act-228 is reported.

TABLE 14
SEA WATER
(pCi/l)
LOCATION 37

DATE	H-3	(+/-)	Be-7	(+/-)	K-40	(+/-)	Cr-51	(+/-)	Mn-54	(+/-)	Co-58	(+/-)	Fe-59	(+/-)
03/08/2011	32	139	2.52	23.90	226	60	18.60	27.50	0.36	2.25	1.47	2.80	-0.71	5.82
06/07/2011	-87	84	-1.60	11.40	213	37	4.84	13.30	-0.92	1.23	0.02	1.32	1.94	3.19
08/30/2011	-23	103	-16.70	37.50	296	96	-1.48	41.20	1.48	3.90	-2.34	4.18	-0.43	6.55
12/06/2011	42	116	-4.23	30.00	295	69	-15.70	34.10	-0.84	2.85	1.65	3.17	-1.14	7.18

DATE	Co-60	(+/-)	Zn-65	(+/-)	Nb-95	(+/-)	Zr-95	(+/-)	Ru-103	(+/-)	Ru-106	(+/-)	Sb-125	(+/-)
03/08/2011	0.69	2.43	-0.11	5.46	-0.58	2.87	-0.14	5.42	-0.46	3.02	-2.72	23.80	3.28	6.96
06/07/2011	0.88	1.33	0.31	2.97	-0.04	1.34	0.76	2.42	-0.58	1.57	0.21	10.70	0.31	3.02
08/30/2011	1.05	3.80	-13.10	10.30	-1.59	4.08	0.60	6.68	2.00	4.45	35.20	35.60	-2.78	11.30
12/06/2011	0.32	3.22	-6.36	7.19	0.04	3.27	-0.49	4.68	-0.36	3.58	-7.06	26.90	-2.27	7.60

DATE	I-131	(+/-)	Cs-134	(+/-)	Cs-137	(+/-)	Ba-140	(+/-)	La-140	(+/-)	Th-232 decay chain*	(+/-)
03/08/2011	-4.86	7.56	-4.63	2.84	-1.14	2.39	-13.40	18.20	2.72	5.03	12.70	8.73
06/07/2011	-1.14	5.30	-4.78	1.27	-0.69	1.18	6.17	10.70	-0.72	3.43	-0.85	2.41
08/30/2011	3.27	8.04	-5.76	5.29	-1.44	4.39	-5.44	23.40	-2.12	5.97	9.99	16.50
12/06/2011	-15.90	10.80	-2.41	3.15	-1.17	2.86	9.02	19.00	-0.59	6.98	2.75	11.30

* The highest result for Th-228 and Act-228 is reported.

TABLE 15
BOTTOM SEDIMENT
(pCi/g dry wt.)

LOCATION	COLLECTION DATE	Be-7		K-40		Cr-51		Mn-54		Co-58		Fe-59	
			(+/-)		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)
29	06/27/2011	-0.309	0.278	6.27	0.86	-0.047	0.369	0.008	0.025	0.003	0.031	-0.020	0.063
29	11/22/2011	0.197	0.333	17.70	1.65	0.084	0.276	0.019	0.035	-0.002	0.038	0.064	0.091
31	03/02/2011	-0.114	0.250	16.30	1.21	-0.154	0.268	0.015	0.025	-0.028	0.025	0.009	0.067
31	08/31/2011	0.038	0.276	18.00	1.42	0.041	0.282	0.005	0.031	-0.019	0.033	-0.012	0.069
32	11/22/2011	0.195	0.337	15.40	1.65	-0.001	0.352	-0.004	0.044	0.017	0.038	-0.043	0.087
33	03/02/2011	-0.095	0.215	15.70	1.23	0.118	0.237	-0.016	0.026	0.010	0.027	0.002	0.071
33	08/31/2011	0.262	0.200	15.70	1.15	0.096	0.201	-0.009	0.026	-0.008	0.027	0.020	0.055
34	02/14/2011	-0.047	0.197	14.90	1.08	0.202	0.228	-0.006	0.021	0.005	0.025	0.011	0.061
34	08/31/2011	0.091	0.170	13.90	1.02	-0.065	0.172	-0.015	0.019	-0.007	0.021	0.000	0.050
35	06/27/2011	0.199	0.381	12.50	1.50	-0.231	0.516	0.011	0.045	0.010	0.049	0.013	0.115
35	12/20/2011	0.163	0.333	15.90	1.33	0.354	0.409	-0.015	0.034	-0.046	0.037	0.006	0.083
37	03/19/2011	0.239	0.219	13.90	0.96	0.101	0.256	-0.006	0.024	-0.011	0.026	-0.030	0.061
37	09/01/2011	0.233	0.170	14.40	1.01	-0.058	0.161	0.001	0.020	-0.009	0.021	-0.009	0.045
39	06/27/2011	0.018	0.835	16.90	2.61	0.519	1.020	0.047	0.077	-0.063	0.077	-0.247	0.209
39	12/14/2011	0.179	0.309	18.50	1.41	0.026	0.326	-0.003	0.036	-0.016	0.034	0.002	0.080
67	03/19/2011	0.070	0.206	18.30	1.22	0.043	0.273	-0.026	0.027	0.022	0.026	-0.012	0.066
67	09/01/2011	0.400	0.290	17.30	1.30	-0.041	0.231	-0.011	0.033	-0.016	0.032	-0.087	0.081
69	03/02/2011	-0.062	0.219	16.90	1.22	0.082	0.260	-0.006	0.026	-0.004	0.024	0.024	0.069
69	08/31/2011	0.026	0.192	17.90	1.15	0.065	0.197	0.010	0.023	-0.005	0.027	-0.035	0.058

TABLE 15
BOTTOM SEDIMENT
(pCi/g dry wt.)

LOCATION	COLLECTION DATE	Co-60	(+/-)	Zn-65	(+/-)	Nb-95	(+/-)	Zr-95	(+/-)	Ru-103	(+/-)	Ru-106	(+/-)
29	06/27/2011	0.003	0.032	-0.069	0.071	0.015	0.032	0.005	0.051	-0.006	0.033	-0.030	0.208
29	11/22/2011	0.058	0.053	-0.009	0.098	-0.003	0.043	0.014	0.065	-0.016	0.037	0.253	0.326
31	03/02/2011	0.013	0.034	0.001	0.070	0.003	0.029	-0.046	0.046	0.008	0.029	0.004	0.209
31	08/31/2011	0.017	0.043	0.064	0.075	-0.026	0.035	0.010	0.059	0.007	0.032	0.009	0.299
32	11/22/2011	-0.022	0.050	-0.077	0.089	-0.023	0.049	0.099	0.069	-0.006	0.041	-0.375	0.362
33	03/02/2011	0.003	0.036	-0.036	0.079	0.009	0.029	0.000	0.046	-0.005	0.026	0.050	0.216
33	08/31/2011	0.004	0.034	-0.029	0.071	0.021	0.026	-0.010	0.043	-0.003	0.025	-0.064	0.220
34	02/14/2011	-0.020	0.032	-0.017	0.073	0.022	0.027	0.037	0.044	-0.001	0.023	0.237	0.188
34	08/31/2011	-0.001	0.027	-0.095	0.056	-0.010	0.021	0.011	0.037	-0.005	0.020	-0.086	0.175
35	06/27/2011	0.026	0.050	-0.024	0.108	-0.001	0.053	0.037	0.073	0.015	0.047	-0.182	0.310
35	12/20/2011	-0.032	0.040	0.018	0.088	0.040	0.042	0.043	0.067	-0.014	0.041	0.155	0.288
37	03/19/2011	0.020	0.032	-0.030	0.065	0.014	0.026	-0.003	0.046	0.009	0.027	0.023	0.208
37	09/01/2011	0.012	0.028	-0.066	0.056	0.002	0.020	-0.003	0.037	0.008	0.019	-0.014	0.156
39	06/27/2011	0.019	0.104	-0.046	0.216	-0.026	0.092	0.022	0.155	-0.032	0.106	-0.153	0.666
39	12/14/2011	0.057	0.040	0.033	0.090	0.035	0.039	-0.011	0.063	0.021	0.039	-0.037	0.292
67	03/19/2011	-0.021	0.033	-0.010	0.066	-0.003	0.032	-0.016	0.048	0.000	0.027	-0.091	0.199
67	09/01/2011	-0.020	0.041	-0.132	0.086	-0.013	0.033	-0.011	0.056	-0.007	0.030	-0.105	0.252
69	03/02/2011	-0.049	0.031	-0.082	0.070	0.006	0.030	0.011	0.051	0.018	0.025	0.021	0.222
69	08/31/2011	0.044	0.030	-0.124	0.068	0.032	0.024	0.005	0.044	0.004	0.024	-0.059	0.192

TABLE 15
BOTTOM SEDIMENT
(pCi/g dry wt.)

LOCATION	COLLECTION DATE	Ag-110M	(+/-)	Sb-125	(+/-)	I-131	(+/-)	Cs-134	(+/-)	Cs-137	(+/-)	Th-232 decay chain*	(+/-)
29	06/27/2011	-0.017	0.027	0.034	0.068	-0.111	0.186	0.020	0.026	0.013	0.027	0.460	0.087
29	11/22/2011	0.016	0.036	-0.007	0.095	0.039	0.057	-0.011	0.036	0.066	0.037	1.550	0.124
31	03/02/2011	0.003	0.025	0.011	0.068	0.050	0.086	0.006	0.025	-0.017	0.026	0.696	0.174
31	08/31/2011	0.001	0.032	0.070	0.080	0.071	0.057	0.020	0.034	0.012	0.034	0.949	0.154
32	11/22/2011	-0.003	0.042	-0.038	0.098	-0.005	0.069	-0.016	0.044	0.001	0.048	1.220	0.120
33	03/02/2011	-0.002	0.024	0.017	0.058	0.049	0.080	0.000	0.028	-0.005	0.025	0.242	0.077
33	08/31/2011	-0.007	0.024	-0.021	0.066	-0.012	0.042	-0.007	0.024	0.033	0.028	0.350	0.075
34	02/14/2011	-0.018	0.022	0.015	0.054	-0.006	0.073	-0.013	0.024	0.002	0.023	0.182	0.100
34	08/31/2011	-0.007	0.019	0.032	0.052	-0.010	0.035	0.017	0.020	0.017	0.021	0.194	0.044
35	06/27/2011	-0.020	0.040	0.037	0.101	-0.020	0.224	0.006	0.037	0.010	0.046	0.919	0.228
35	12/20/2011	0.018	0.032	0.019	0.083	0.081	0.160	-0.010	0.036	0.014	0.034	1.190	0.101
37	03/19/2011	-0.006	0.022	0.003	0.057	0.013	0.088	0.005	0.027	0.014	0.024	0.206	0.048
37	09/01/2011	-0.001	0.018	0.035	0.050	0.011	0.035	-0.014	0.021	-0.002	0.020	0.209	0.082
39	06/27/2011	-0.028	0.090	-0.173	0.198	-0.131	0.481	0.036	0.081	0.129	0.091	0.931	0.240
39	12/14/2011	0.012	0.038	-0.132	0.094	0.009	0.066	-0.007	0.039	0.123	0.070	1.040	0.102
67	03/19/2011	-0.004	0.027	-0.030	0.066	0.023	0.095	-0.005	0.026	0.004	0.028	0.394	0.170
67	09/01/2011	0.008	0.030	-0.025	0.072	0.002	0.051	0.011	0.029	0.043	0.037	0.512	0.189
69	03/02/2011	-0.018	0.022	0.020	0.054	0.033	0.081	0.003	0.025	0.011	0.026	0.278	0.081
69	08/31/2011	-0.006	0.022	0.040	0.060	-0.007	0.044	-0.006	0.025	-0.003	0.023	0.249	0.086

* The highest result for Th-232 and it's two daughters, Th-228 and Act-228, is reported.

TABLE 16
AQUATIC FLORA - FUCUS
(pCi/g wet wt.)

LOCATION	COLLECTION DATE	Be-7	(+/-)	K-40	(+/-)	Cr-51	(+/-)	Mn-54	(+/-)	Co-58	(+/-)	Fe-59	(+/-)
29	03/23/2011	0.133	0.055	5.99	0.16	-0.027	0.039	-0.001	0.003	-0.002	0.004	0.007	0.010
29	06/07/2011	0.054	0.029	8.42	0.21	-0.011	0.037	0.000	0.002	0.002	0.003	-0.004	0.008
29	09/27/2011	0.236	0.031	6.68	0.08	-0.006	0.027	0.000	0.002	-0.001	0.002	-0.002	0.006
29	12/14/2011	0.127	0.111	6.54	0.56	-0.062	0.100	-0.004	0.011	0.000	0.012	0.014	0.029
32	03/23/2011	0.048	0.035	7.43	0.18	-0.019	0.040	0.001	0.004	-0.001	0.004	-0.011	0.010
32	05/25/2011	0.039	0.027	7.72	0.19	-0.014	0.035	0.002	0.002	0.012	0.004	-0.003	0.008
32	08/10/2011	0.064	0.076	7.53	0.46	-0.019	0.070	0.006	0.009	0.004	0.010	-0.010	0.023
32	11/07/2011	0.081	0.137	8.70	0.85	-0.026	0.146	0.012	0.017	0.003	0.015	0.041	0.045
33	02/14/2011	0.097	0.072	6.73	0.38	-0.002	0.069	0.009	0.009	0.013	0.009	-0.008	0.021
33	05/25/2011	0.113	0.047	6.51	0.14	0.019	0.035	0.001	0.002	-0.002	0.002	-0.001	0.006
33	08/20/2011	0.299	0.201	7.37	0.69	0.003	0.119	0.007	0.013	-0.002	0.014	-0.013	0.035
33	11/08/2011	0.145	0.133	6.35	0.62	0.098	0.121	0.000	0.014	0.004	0.014	-0.029	0.035
35	03/19/2011	0.086	0.058	8.08	0.22	-0.064	0.066	0.002	0.006	-0.001	0.007	-0.003	0.020
35	05/25/2011	0.198	0.074	7.40	0.18	-0.008	0.037	0.001	0.002	0.001	0.003	-0.003	0.008
35	08/20/2011	0.080	0.090	6.40	0.48	0.033	0.097	0.000	0.009	-0.003	0.010	0.001	0.022
35	11/08/2011	-0.075	0.153	6.99	0.77	0.059	0.148	0.009	0.016	0.001	0.015	0.007	0.035
36	03/19/2011	0.180	0.055	7.88	0.20	0.022	0.057	0.000	0.005	0.001	0.005	0.009	0.014
36	06/07/2011	0.152	0.055	7.03	0.17	-0.027	0.036	-0.001	0.002	0.000	0.002	0.002	0.006
36	09/28/2011	0.126	0.101	7.05	0.44	-0.098	0.112	-0.005	0.009	0.003	0.012	0.013	0.025
36	11/08/2011	-0.052	0.153	5.36	0.72	-0.110	0.124	0.005	0.018	-0.005	0.020	-0.042	0.044
90	02/14/2011	0.116	0.087	6.57	0.26	-0.005	0.054	0.001	0.005	-0.004	0.006	0.008	0.013
90	05/25/2011	0.058	0.046	6.95	0.15	0.016	0.035	0.003	0.002	-0.001	0.003	0.003	0.007
90	08/20/2011	0.116	0.129	7.72	0.61	0.002	0.132	-0.009	0.015	-0.006	0.015	0.010	0.033
90	11/08/2011	0.342	0.200	8.26	0.86	-0.003	0.150	0.002	0.018	-0.003	0.020	0.042	0.039

TABLE 16
AQUATIC FLORA - FUCUS
(pCi/g wet wt.)

LOCATION	COLLECTION DATE	Co-60	(+/-)	Zn-65	(+/-)	Nb-95	(+/-)	Zr-95	(+/-)	Ru-103	(+/-)	Ru-106	(+/-)
29	03/23/2011	0.003	0.004	0.005	0.009	0.004	0.004	0.002	0.007	0.003	0.004	-0.024	0.029
29	06/07/2011	0.001	0.003	0.002	0.006	0.001	0.003	-0.001	0.005	0.001	0.003	0.000	0.020
29	09/27/2011	0.000	0.002	0.000	0.005	0.000	0.002	0.000	0.004	-0.001	0.003	-0.017	0.015
29	12/14/2011	-0.017	0.017	-0.045	0.031	0.003	0.012	0.015	0.022	0.001	0.011	0.005	0.089
32	03/23/2011	0.007	0.005	0.006	0.010	0.002	0.004	-0.008	0.007	-0.002	0.004	-0.010	0.032
32	05/25/2011	0.001	0.003	0.000	0.005	0.001	0.003	0.002	0.005	0.002	0.003	0.009	0.019
32	08/10/2011	-0.007	0.012	-0.072	0.029	-0.001	0.010	0.009	0.016	0.007	0.008	-0.047	0.071
32	11/07/2011	-0.007	0.024	0.020	0.041	-0.014	0.018	0.004	0.032	0.008	0.016	-0.114	0.150
33	02/14/2011	0.001	0.011	-0.019	0.022	0.001	0.009	-0.001	0.015	0.005	0.008	0.026	0.072
33	05/25/2011	-0.002	0.003	0.006	0.005	0.001	0.003	0.001	0.005	0.000	0.003	-0.008	0.020
33	08/20/2011	0.016	0.020	-0.024	0.042	0.009	0.016	-0.015	0.029	0.001	0.015	-0.020	0.126
33	11/08/2011	0.000	0.018	-0.001	0.038	-0.002	0.013	0.005	0.024	-0.007	0.013	-0.083	0.128
35	03/19/2011	0.001	0.009	0.007	0.017	-0.003	0.007	-0.005	0.013	0.005	0.007	-0.002	0.055
35	05/25/2011	0.001	0.003	0.000	0.005	0.000	0.003	-0.005	0.005	0.000	0.004	0.024	0.019
35	08/20/2011	-0.006	0.014	-0.023	0.026	0.000	0.010	0.009	0.017	-0.002	0.011	0.044	0.079
35	11/08/2011	-0.012	0.021	-0.002	0.043	-0.004	0.016	0.001	0.028	-0.022	0.018	-0.020	0.145
36	03/19/2011	0.001	0.006	0.003	0.014	-0.002	0.005	0.000	0.009	-0.006	0.006	0.015	0.041
36	06/07/2011	0.000	0.002	0.002	0.005	0.001	0.002	-0.002	0.004	-0.001	0.003	-0.002	0.018
36	09/28/2011	0.009	0.014	-0.013	0.024	-0.005	0.011	0.005	0.020	0.009	0.011	-0.056	0.086
36	11/08/2011	-0.006	0.025	-0.039	0.052	0.012	0.019	0.001	0.033	-0.005	0.018	-0.126	0.172
90	02/14/2011	0.002	0.007	-0.022	0.014	0.002	0.005	0.001	0.010	0.001	0.006	0.026	0.044
90	05/25/2011	0.001	0.003	0.002	0.006	0.000	0.003	0.000	0.005	-0.001	0.003	-0.009	0.018
90	08/20/2011	0.002	0.017	0.006	0.036	-0.002	0.014	0.024	0.025	-0.008	0.014	-0.029	0.102
90	11/08/2011	0.034	0.028	0.011	0.047	-0.008	0.019	-0.018	0.033	-0.028	0.020	-0.001	0.170

TABLE 16
AQUATIC FLORA - FUCUS
(pCi/g wet wt.)

LOCATION	COLLECTION DATE	Ag-110M	(+/-)	Sb-125	(+/-)	I-131	(+/-)	Cs-134	(+/-)	Cs-137	(+/-)	Th-232 decay chain*	(+/-)
29	03/23/2011	-0.001	0.003	0.003	0.008	0.049	0.020	0.000	0.003	0.002	0.003	0.052	0.027
29	06/07/2011	0.000	0.002	0.002	0.006	0.017	0.031	0.000	0.002	0.002	0.002	0.045	0.034
29	09/27/2011	-0.002	0.002	0.001	0.004	0.043	0.026	0.000	0.002	0.002	0.002	0.076	0.010
29	12/14/2011	-0.001	0.010	-0.008	0.032	0.016	0.019	0.003	0.013	0.001	0.012	0.105	0.071
32	03/23/2011	0.005	0.004	-0.001	0.009	0.072	0.024	0.000	0.004	-0.003	0.004	0.063	0.029
32	05/25/2011	0.003	0.002	-0.002	0.005	0.032	0.032	0.000	0.002	0.001	0.002	0.058	0.035
32	08/10/2011	0.006	0.008	0.005	0.022	0.024	0.015	-0.006	0.009	-0.013	0.010	0.058	0.057
32	11/07/2011	0.005	0.017	0.003	0.038	-0.013	0.027	-0.005	0.016	0.007	0.017	0.042	0.036
33	02/14/2011	0.005	0.008	-0.005	0.020	0.017	0.017	0.002	0.008	-0.004	0.009	0.076	0.060
33	05/25/2011	0.000	0.002	0.001	0.005	0.003	0.031	0.001	0.002	0.003	0.002	0.034	0.025
33	08/20/2011	0.002	0.015	0.006	0.030	0.023	0.028	-0.005	0.016	-0.008	0.016	0.110	0.082
33	11/08/2011	-0.004	0.013	0.007	0.036	-0.036	0.025	-0.013	0.016	0.001	0.014	0.110	0.068
35	03/19/2011	0.001	0.006	0.003	0.015	0.000	0.033	0.009	0.006	0.012	0.006	0.083	0.027
35	05/25/2011	-0.002	0.002	0.005	0.006	0.006	0.035	0.001	0.002	-0.001	0.002	0.029	0.016
35	08/20/2011	-0.003	0.010	0.005	0.024	0.008	0.022	-0.021	0.011	-0.001	0.011	0.024	0.063
35	11/08/2011	-0.011	0.015	-0.007	0.047	0.015	0.027	-0.001	0.018	0.008	0.018	0.078	0.112
36	03/19/2011	-0.004	0.005	0.001	0.012	0.042	0.028	-0.003	0.005	0.003	0.005	0.043	0.037
36	06/07/2011	0.001	0.002	-0.003	0.005	0.017	0.030	0.000	0.002	0.002	0.002	0.031	0.026
36	09/28/2011	-0.004	0.010	-0.010	0.025	0.015	0.033	-0.009	0.011	0.002	0.010	0.005	0.021
36	11/08/2011	-0.008	0.017	-0.014	0.040	0.013	0.028	-0.018	0.018	-0.006	0.018	0.045	0.071
90	02/14/2011	-0.004	0.005	0.006	0.014	0.020	0.014	-0.010	0.005	0.001	0.005	0.053	0.030
90	05/25/2011	-0.002	0.002	0.001	0.005	0.038	0.033	-0.002	0.002	0.002	0.002	0.048	0.026
90	08/20/2011	-0.005	0.012	0.021	0.035	0.041	0.032	-0.010	0.012	0.005	0.013	0.038	0.060
90	11/08/2011	0.001	0.020	0.008	0.045	-0.010	0.031	-0.031	0.018	-0.006	0.022	0.079	0.096

* The highest result for Th-232 and it's two daughters, Th-228 and Act-228, is reported.

TABLE 17A
FISH - FLOUNDER
(pCi/g wet wt.)

LOCATION	COLLECTION DATE	Be-7	(+/-)	K-40	(+/-)	Cr-51	(+/-)	Mn-54	(+/-)	Co-58	(+/-)	Fe-59	(+/-)
32	05/10/2011	0.024	0.040	4.46	0.33	0.026	0.054	0.001	0.004	0.002	0.004	0.009	0.010
32	10/11/2011	0.000	0.053	4.84	0.41	-0.008	0.068	0.000	0.005	-0.005	0.005	0.003	0.015
35	05/10/2011	-0.001	0.054	4.20	0.34	0.018	0.071	0.003	0.005	0.000	0.006	0.008	0.016
35	10/11/2011	-0.013	0.073	3.72	0.22	0.023	0.094	0.003	0.007	0.000	0.007	-0.002	0.017

LOCATION	COLLECTION DATE	Co-60	(+/-)	Zn-65	(+/-)	Nb-95	(+/-)	Zr-95	(+/-)	Ru-103	(+/-)	Ru-106	(+/-)
32	05/10/2011	-0.002	0.004	-0.004	0.009	0.001	0.005	0.001	0.008	0.003	0.006	0.012	0.031
32	10/11/2011	-0.002	0.005	0.000	0.012	-0.001	0.006	-0.001	0.011	0.000	0.007	0.012	0.044
35	05/10/2011	0.002	0.006	-0.002	0.009	-0.005	0.006	-0.005	0.011	-0.001	0.007	0.013	0.040
35	10/11/2011	0.000	0.007	-0.030	0.016	-0.020	0.015	-0.003	0.013	0.002	0.009	-0.012	0.062

LOCATION	COLLECTION DATE	Ag-110M	(+/-)	Sb-125	(+/-)	I-131	(+/-)	Cs-134	(+/-)	Cs-137	(+/-)	Th-232 decay chain*	(+/-)
32	05/10/2011	0.000	0.003	0.006	0.010	-0.004	0.038	-0.001	0.004	0.000	0.004	0.011	0.057
32	10/11/2011	0.000	0.005	-0.003	0.013	-0.006	0.049	0.000	0.005	0.000	0.006	0.039	0.032
35	05/10/2011	0.002	0.005	0.000	0.012	-0.048	0.049	-0.002	0.005	0.005	0.005	-0.044	0.013
35	10/11/2011	-0.010	0.006	0.006	0.018	0.031	0.052	-0.002	0.008	0.006	0.007	0.005	0.014

* The highest result for Th-232 and it's two daughters, Th-228 and Act-228, is reported.

TABLE 17B
FISH - OTHER
(pCi/g wet wt.)

LOCATION	COLLECTION DATE	Be-7	(+/-)	K-40	(+/-)	Cr-51	(+/-)	Mn-54	(+/-)	Co-58	(+/-)	Fe-59	(+/-)
32	05/10/2011	0.008	0.050	3.94	0.39	-0.003	0.063	0.002	0.005	0.002	0.005	-0.010	0.013
32	07/21/2011	0.083	0.162	3.32	0.47	0.141	0.189	-0.001	0.015	0.006	0.018	-0.012	0.034
32	10/20/2011	-0.096	0.124	3.39	0.47	-0.131	0.137	0.014	0.015	0.004	0.016	0.032	0.035
35	06/21/2011	0.047	0.157	4.56	0.60	0.054	0.180	0.012	0.019	0.011	0.021	0.023	0.042
35	09/12/2011	0.029	0.157	4.01	0.56	0.021	0.188	-0.003	0.016	-0.009	0.019	0.019	0.040
35	10/11/2011	-0.025	0.060	3.75	0.19	0.005	0.082	-0.007	0.006	0.000	0.007	-0.006	0.016

LOCATION	COLLECTION DATE	Co-60	(+/-)	Zn-65	(+/-)	Nb-95	(+/-)	Zr-95	(+/-)	Ru-103	(+/-)	Ru-106	(+/-)
32	05/10/2011	0.001	0.005	0.000	0.011	0.006	0.006	0.007	0.011	-0.002	0.007	0.011	0.043
32	07/21/2011	0.012	0.017	0.026	0.039	-0.008	0.016	0.008	0.030	0.009	0.021	0.011	0.151
32	10/20/2011	-0.004	0.016	0.026	0.041	0.020	0.016	0.025	0.028	-0.001	0.015	0.005	0.125
35	06/21/2011	-0.007	0.022	-0.079	0.047	0.020	0.021	0.020	0.034	-0.015	0.022	-0.032	0.171
35	09/12/2011	0.014	0.019	0.020	0.034	-0.012	0.021	-0.014	0.036	0.011	0.019	-0.074	0.165
35	10/11/2011	0.002	0.006	0.001	0.015	-0.006	0.013	0.002	0.012	-0.004	0.008	0.022	0.052

LOCATION	COLLECTION DATE	Ag-110M	(+/-)	Sb-125	(+/-)	I-131	(+/-)	Cs-134	(+/-)	Cs-137	(+/-)	Th-232 decay chain*	(+/-)
32	05/10/2011	0.001	0.004	0.001	0.013	-0.017	0.045	0.000	0.005	-0.008	0.009	0.034	0.024
32	07/21/2011	-0.017	0.017	-0.015	0.047	0.019	0.054	-0.005	0.017	0.007	0.018	0.024	0.081
32	10/20/2011	-0.006	0.014	0.009	0.036	-0.029	0.045	-0.001	0.015	0.007	0.015	-0.023	0.025
35	06/21/2011	0.004	0.019	0.037	0.051	-0.003	0.041	0.010	0.023	0.001	0.022	0.101	0.060
35	09/12/2011	0.010	0.017	-0.062	0.049	0.026	0.051	-0.004	0.016	0.000	0.019	0.032	0.050
35	10/11/2011	-0.005	0.005	-0.001	0.015	0.006	0.056	-0.003	0.007	0.003	0.006	0.016	0.011

* The highest result for Th-232 and it's two daughters, Th-228 and Act-228, is reported.

TABLE 18
MUSSELS
(pCi/g wet wt.)

LOCATION	COLLECTION DATE	Be-7	(+/-)	K-40	(+/-)	Cr-51	(+/-)	Mn-54	(+/-)	Co-58	(+/-)	Fe-59	(+/-)
30	03/30/2011	0.027	0.095	2.33	0.25	-0.077	0.116	0.002	0.009	-0.002	0.009	-0.014	0.021
30	05/10/2011	0.000	0.054	2.45	0.27	-0.064	0.083	-0.003	0.005	-0.002	0.005	-0.006	0.012
30	11/30/2011	0.082	0.235	0.63	0.65	0.187	0.199	0.018	0.019	0.003	0.017	-0.013	0.041
31	09/13/2011	0.107	0.303	0.20	0.63	0.004	0.301	0.006	0.035	0.020	0.032	-0.024	0.063

LOCATION	COLLECTION DATE	Co-60	(+/-)	Zn-65	(+/-)	Nb-95	(+/-)	Zr-95	(+/-)	Ru-103	(+/-)	Ru-106	(+/-)
30	03/30/2011	0.000	0.009	-0.016	0.019	0.010	0.010	0.008	0.017	0.006	0.012	-0.019	0.081
30	05/10/2011	-0.004	0.004	0.013	0.010	-0.002	0.006	-0.003	0.010	-0.002	0.006	-0.016	0.042
30	11/30/2011	0.004	0.025	0.002	0.038	0.005	0.020	0.026	0.047	-0.021	0.024	0.035	0.204
31	09/13/2011	0.024	0.028	0.005	0.067	0.012	0.031	-0.012	0.051	0.014	0.040	0.014	0.240

LOCATION	COLLECTION DATE	Ag-110M	(+/-)	Sb-125	(+/-)	I-131	(+/-)	Cs-134	(+/-)	Cs-137	(+/-)	Th-232 decay chain*	(+/-)
30	03/30/2011	-0.002	0.009	0.000	0.024	-0.020	0.053	-0.042	0.010	-0.005	0.009	0.056	0.055
30	05/10/2011	-0.002	0.004	0.000	0.012	-0.006	0.047	0.000	0.005	0.001	0.005	-0.020	0.012
30	11/30/2011	-0.017	0.019	0.038	0.057	0.002	0.038	0.001	0.019	-0.001	0.023	0.042	0.107
31	09/13/2011	0.013	0.022	0.035	0.108	-0.057	0.066	0.003	0.033	0.006	0.033	0.005	0.069

* The highest result for Th-232 and it's two daughters, Th-228 and Act-228, is reported.

TABLE 19
OYSTERS
(pCi/g wet wt.)

LOCATION	COLLECTION DATE	Be-7	(+/-)	K-40	(+/-)	Cr-51	(+/-)	Mn-54	(+/-)	Co-58	(+/-)	Fe-59	(+/-)
31	02/23/2011	-0.007	0.168	1.98	0.42	-0.114	0.181	0.005	0.016	0.001	0.018	0.013	0.038
31	06/15/2011	0.083	0.168	2.23	0.49	-0.090	0.164	-0.010	0.017	0.011	0.017	-0.022	0.034
31	08/24/2011	0.052	0.251	2.01	0.73	-0.145	0.243	0.009	0.029	-0.004	0.024	0.012	0.047
31	12/28/2011	0.049	0.174	1.84	0.42			0.004	0.018	0.000	0.019	0.002	0.040
32	02/16/2011	-0.026	0.145	2.21	0.44	-0.103	0.152	-0.006	0.016	0.002	0.018	0.011	0.036
32	06/15/2011	0.029	0.170	1.31	0.43	-0.035	0.186	0.005	0.016	0.000	0.016	-0.012	0.036
32	07/07/2011	0.205	0.211	1.95	0.56	0.108	0.221	0.011	0.021	0.006	0.021	-0.011	0.041
32	11/15/2011	0.008	0.066	1.14	0.27	-0.072	0.074	0.002	0.006	0.003	0.007	-0.004	0.015
32	12/28/2011	-0.089	0.163	2.23	0.40			0.006	0.017	0.008	0.018	-0.003	0.039
34	02/14/2011	-0.014	0.158	1.84	0.44	0.195	0.188	0.012	0.017	-0.009	0.017	-0.005	0.040
34	06/15/2011	-0.154	0.141	2.05	0.44	-0.003	0.173	0.003	0.017	-0.001	0.016	-0.018	0.037
34	09/20/2011	-0.023	0.113	1.43	0.34	-0.104	0.123	-0.011	0.013	-0.017	0.014	-0.023	0.027
34	11/21/2011	0.012	0.096	1.82	0.45	0.012	0.128	-0.004	0.010	-0.002	0.011	-0.007	0.022
36	02/16/2011	-0.029	0.171	1.54	0.46	0.028	0.192	-0.010	0.019	-0.012	0.019	-0.001	0.041
37	02/16/2011	0.106	0.168	1.58	0.48	-0.030	0.188	-0.003	0.021	-0.006	0.019	0.000	0.044
37	06/07/2011	0.023	0.061	1.52	0.24	-0.068	0.084	0.003	0.005	0.000	0.005	0.010	0.013
37	09/30/2011	-0.137	0.181	1.56	0.49	-0.193	0.194	0.004	0.020	-0.014	0.021	-0.012	0.041
37	11/22/2011	0.062	0.154	1.29	0.40	0.072	0.194	-0.008	0.016	-0.012	0.017	-0.019	0.038
68	02/16/2011	0.156	0.187	1.30	0.52	0.032	0.199	0.006	0.022	0.007	0.023	0.023	0.045
68	06/28/2011	0.047	0.078	2.07	0.30	0.007	0.092	0.006	0.009	0.002	0.009	0.000	0.018
68	08/24/2011	-0.016	0.222	2.70	0.78	-0.045	0.274	-0.013	0.025	-0.021	0.025	0.046	0.053
68	11/30/2011	0.075	0.094	2.12	0.54	0.103	0.101	0.008	0.011	0.007	0.010	-0.008	0.020
88	06/15/2011	-0.019	0.158	1.76	0.44	-0.025	0.181	-0.005	0.017	-0.011	0.018	-0.022	0.036
88	09/19/2011	-0.078	0.128	1.26	0.29	0.079	0.141	0.000	0.013	-0.008	0.014	0.001	0.028
88	11/15/2011	0.050	0.061	1.63	0.20	0.003	0.070	0.000	0.007	-0.007	0.007	-0.018	0.016

TABLE 19
OYSTERS
(pCi/g wet wt.)

LOCATION	COLLECTION DATE	Co-60	(+/-)	Zn-65	(+/-)	Nb-95	(+/-)	Zr-95	(+/-)	Ru-103	(+/-)	Ru-106	(+/-)
31	02/23/2011	0.020	0.019	-0.013	0.046	0.006	0.021	0.009	0.034	0.006	0.023	0.070	0.154
31	06/15/2011	0.005	0.017	-0.044	0.045	0.007	0.019	0.021	0.030	0.021	0.019	-0.026	0.143
31	08/24/2011	-0.005	0.027	-0.083	0.067	-0.014	0.032	-0.018	0.054	-0.002	0.029	0.011	0.279
31	12/28/2011	-0.005	0.019	0.007	0.044	0.010	0.020	-0.006	0.037	0.014	0.020	-0.110	0.175
32	02/16/2011	0.013	0.020	-0.047	0.045	0.027	0.020	-0.010	0.032	0.008	0.019	0.006	0.159
32	06/15/2011	-0.007	0.017	-0.090	0.042	0.012	0.020	-0.010	0.032	0.005	0.021	0.021	0.158
32	07/07/2011	0.004	0.020	-0.010	0.041	0.029	0.025	0.018	0.043	0.002	0.026	0.059	0.187
32	11/15/2011	0.002	0.007	0.006	0.013	0.007	0.008	0.005	0.013	-0.001	0.008	0.017	0.061
32	12/28/2011	0.009	0.019	-0.073	0.041	0.024	0.019	0.030	0.033	-0.002	0.021	-0.076	0.157
34	02/14/2011	-0.001	0.019	-0.022	0.045	0.015	0.020	-0.001	0.031	0.000	0.019	-0.081	0.149
34	06/15/2011	-0.004	0.018	-0.012	0.042	0.000	0.017	0.007	0.031	-0.003	0.019	0.087	0.133
34	09/20/2011	-0.008	0.014	0.012	0.032	0.034	0.016	0.002	0.023	0.008	0.014	0.033	0.108
34	11/21/2011	-0.003	0.013	0.009	0.019	0.012	0.012	0.005	0.022	-0.003	0.013	0.010	0.095
36	02/16/2011	-0.008	0.021	-0.019	0.041	0.036	0.021	-0.001	0.036	-0.001	0.023	0.012	0.170
37	02/16/2011	0.004	0.022	-0.082	0.048	-0.004	0.021	0.010	0.033	-0.006	0.022	0.057	0.171
37	06/07/2011	0.002	0.005	-0.003	0.010	-0.001	0.006	-0.003	0.010	0.003	0.008	-0.020	0.041
37	09/30/2011	0.008	0.022	-0.001	0.050	0.009	0.022	0.025	0.038	0.004	0.024	-0.093	0.187
37	11/22/2011	0.011	0.017	-0.062	0.038	-0.001	0.018	0.023	0.029	0.002	0.023	-0.022	0.153
68	02/16/2011	-0.001	0.020	-0.043	0.057	0.014	0.023	0.016	0.038	-0.004	0.023	-0.015	0.191
68	06/28/2011	0.009	0.009	-0.002	0.015	0.000	0.009	-0.009	0.017	-0.007	0.010	0.018	0.071
68	08/24/2011	-0.005	0.028	-0.023	0.064	-0.021	0.029	0.021	0.046	0.005	0.031	-0.014	0.263
68	11/30/2011	0.000	0.013	0.018	0.026	0.004	0.012	-0.017	0.020	0.000	0.014	-0.045	0.089
88	06/15/2011	0.008	0.015	0.022	0.043	0.017	0.020	0.002	0.035	0.001	0.021	0.030	0.154
88	09/19/2011	0.003	0.014	0.004	0.032	0.009	0.018	-0.030	0.025	-0.004	0.015	-0.002	0.129
88	11/15/2011	0.002	0.007	0.000	0.015	0.004	0.008	0.005	0.013	-0.002	0.008	-0.006	0.057

TABLE 19
OYSTERS
(pCi/g wet wt.)

LOCATION	COLLECTION DATE	Ag-110M	(+/-)	Sb-125	(+/-)	I-131	(+/-)	Cs-134	(+/-)	Cs-137	(+/-)	Th-232 decay chain*	(+/-)
31	02/23/2011	-0.007	0.015	-0.033	0.047	0.031	0.056	-0.017	0.020	0.005	0.017	0.019	0.044
31	06/15/2011	-0.014	0.017	-0.009	0.044	0.030	0.054	0.001	0.019	0.020	0.017	0.004	0.030
31	08/24/2011	0.018	0.025	0.033	0.075	-0.011	0.046	-0.013	0.030	-0.038	0.028	0.012	0.049
31	12/28/2011	-0.005	0.016			0.014	0.050	0.006	0.020	0.006	0.019	-0.027	0.033
32	02/16/2011	0.056	0.017	0.022	0.045	0.013	0.045	-0.009	0.018	0.013	0.018	0.012	0.041
32	06/15/2011	0.070	0.029	-0.051	0.046	-0.013	0.059	0.015	0.020	-0.021	0.021	0.006	0.034
32	07/07/2011	0.092	0.037	0.045	0.062	0.024	0.058	-0.004	0.024	0.009	0.029	0.066	0.081
32	11/15/2011	0.112	0.016	0.012	0.018	0.007	0.026	0.000	0.007	0.004	0.007	0.027	0.024
32	12/28/2011	0.001	0.017			0.024	0.052	-0.025	0.021	-0.016	0.019	0.135	0.062
34	02/14/2011	0.005	0.017	0.014	0.050	-0.012	0.061	0.008	0.020	-0.003	0.017	0.005	0.032
34	06/15/2011	-0.003	0.015	0.007	0.040	-0.025	0.055	-0.011	0.019	0.003	0.016	0.018	0.060
34	09/20/2011	0.009	0.012	0.016	0.037	0.010	0.028	-0.012	0.015	-0.011	0.014	0.071	0.026
34	11/21/2011	0.002	0.008	0.008	0.031	-0.009	0.045	-0.004	0.009	0.001	0.010	-0.007	0.021
36	02/16/2011	-0.009	0.018	0.001	0.051	0.006	0.054	-0.001	0.022	0.005	0.021	0.090	0.042
37	02/16/2011	-0.009	0.017	0.019	0.048	-0.035	0.055	0.011	0.019	0.021	0.020	0.035	0.044
37	06/07/2011	0.001	0.004	-0.006	0.014	-0.035	0.069	0.006	0.005	0.003	0.005	0.021	0.021
37	09/30/2011	-0.009	0.019	-0.043	0.053	0.024	0.057	0.008	0.024	0.008	0.022	0.012	0.052
37	11/22/2011	0.005	0.016	-0.009	0.046	0.005	0.057	-0.062	0.020	-0.012	0.018	-0.004	0.068
68	02/16/2011	-0.007	0.019	-0.008	0.058	-0.041	0.058	0.009	0.025	0.004	0.021	0.015	0.040
68	06/28/2011	0.002	0.008	0.013	0.020	0.012	0.043	-0.004	0.008	0.004	0.008	-0.013	0.049
68	08/24/2011	0.000	0.025	0.049	0.072	0.008	0.048	0.000	0.030	-0.005	0.026	-0.016	0.052
68	11/30/2011	-0.002	0.009	-0.006	0.028	-0.006	0.023	-0.003	0.010	0.009	0.012	0.002	0.027
88	06/15/2011	-0.006	0.016	-0.005	0.045	0.023	0.058	0.010	0.019	-0.017	0.019	0.060	0.039
88	09/19/2011	0.003	0.013	0.008	0.039	0.010	0.031	0.008	0.016	-0.012	0.015	0.030	0.026
88	11/15/2011	0.001	0.006	0.002	0.018	-0.001	0.024	0.003	0.007	0.001	0.007	0.017	0.014

* The highest result for Th-232 and it's two daughters, Th-228 and Act-228, is reported.

TABLE 20
CLAMS
(pCi/g wet wt.)

LOCATION	COLLECTION DATE	Be-7	(+/-)	K-40	(+/-)	Cr-51	(+/-)	Mn-54	(+/-)	Co-58	(+/-)	Fe-59	(+/-)
29	03/23/2011	0.044	0.046	2.030	0.156	0.026	0.053	-0.003	0.005	0.001	0.005	-0.002	0.011
29	06/08/2011	0.013	0.048	2.120	0.235	0.048	0.063	0.002	0.004	0.001	0.005	0.000	0.011
29	09/12/2011	-0.066	0.163	1.370	0.527	0.012	0.199	0.012	0.017	-0.002	0.016	-0.016	0.029
29	11/08/2011	0.002	0.205	2.760	0.677	-0.009	0.230	-0.011	0.025	0.005	0.021	0.001	0.053
35	03/23/2011	0.004	0.066	1.850	0.226	0.004	0.080	-0.009	0.007	-0.006	0.008	-0.009	0.016
35	06/16/2011	-0.107	0.139	1.920	0.483	-0.060	0.180	-0.012	0.016	-0.006	0.017	-0.007	0.036
35	09/12/2011	0.160	0.174	1.490	0.421	0.017	0.199	0.016	0.021	-0.005	0.021	-0.027	0.045
35	11/04/2011	-0.022	0.157	1.380	0.422	-0.033	0.185	0.025	0.019	-0.010	0.019	-0.005	0.042
38	03/23/2011	0.018	0.064	1.780	0.199	0.029	0.077	-0.003	0.007	0.003	0.007	-0.023	0.016
38	06/16/2011	-0.022	0.134	1.960	0.398	0.159	0.163	-0.004	0.013	-0.007	0.014	0.020	0.032
38	09/12/2011	0.012	0.224	2.760	0.651	0.035	0.233	0.009	0.024	-0.003	0.026	0.040	0.049
38	11/04/2011	0.154	0.185	1.850	0.633	0.133	0.230	0.005	0.021	0.019	0.025	0.051	0.045
39	03/23/2011	0.037	0.062	2.080	0.189	-0.029	0.072	-0.002	0.006	0.002	0.006	0.000	0.014
39	06/16/2011	0.100	0.151	1.970	0.411	0.027	0.162	0.013	0.015	-0.009	0.015	0.014	0.035
39	09/28/2011	0.093	0.148	2.010	0.392	-0.013	0.188	0.009	0.016	-0.008	0.018	-0.008	0.038
39	12/02/2011	0.003	0.082	2.440	0.247	-0.047	0.113	0.006	0.008	0.001	0.009	0.012	0.019

TABLE 20
CLAMS
(pCi/g wet wt.)

LOCATION	COLLECTION DATE	Co-60	(+/-)	Zn-65	(+/-)	Nb-95	(+/-)	Zr-95	(+/-)	Ru-103	(+/-)	Ru-106	(+/-)
29	03/23/2011	-0.001	0.005	-0.013	0.011	0.004	0.006	-0.002	0.010	0.002	0.006	-0.007	0.045
29	06/08/2011	0.002	0.004	0.004	0.010	0.004	0.006	-0.002	0.010	-0.008	0.006	-0.003	0.039
29	09/12/2011	0.016	0.018	0.008	0.034	0.000	0.020	-0.027	0.036	-0.008	0.020	-0.012	0.162
29	11/08/2011	0.018	0.028	-0.032	0.055	0.004	0.024	0.025	0.045	-0.003	0.028	0.207	0.249
35	03/23/2011	0.006	0.008	0.016	0.018	0.006	0.008	0.003	0.014	0.002	0.008	0.004	0.065
35	06/16/2011	0.017	0.017	-0.012	0.036	0.021	0.017	0.009	0.030	-0.011	0.019	0.039	0.150
35	09/12/2011	0.011	0.022	0.008	0.045	-0.013	0.022	0.020	0.039	-0.015	0.022	-0.185	0.180
35	11/04/2011	0.017	0.018	-0.013	0.043	0.009	0.019	-0.021	0.034	-0.006	0.019	-0.054	0.164
38	03/23/2011	-0.001	0.007	0.000	0.017	0.002	0.008	0.003	0.013	0.000	0.008	-0.045	0.060
38	06/16/2011	0.000	0.015	-0.061	0.032	-0.007	0.016	-0.031	0.027	-0.001	0.017	-0.125	0.135
38	09/12/2011	0.019	0.031	-0.015	0.055	-0.021	0.030	0.021	0.045	-0.001	0.027	0.023	0.261
38	11/04/2011	0.003	0.023	-0.040	0.049	0.013	0.024	-0.003	0.040	0.008	0.025	0.113	0.210
39	03/23/2011	0.004	0.007	-0.006	0.014	-0.001	0.007	0.007	0.012	0.003	0.008	0.025	0.055
39	06/16/2011	0.003	0.017	-0.019	0.038	0.002	0.018	0.001	0.029	-0.011	0.018	0.087	0.140
39	09/28/2011	0.003	0.016	-0.035	0.037	0.014	0.018	-0.001	0.031	-0.004	0.021	0.043	0.149
39	12/02/2011	0.006	0.010	-0.029	0.020	0.003	0.010	-0.002	0.017	-0.012	0.011	0.034	0.075

TABLE 20
CLAMS
(pCi/g wet wt.)

LOCATION	COLLECTION DATE	Ag-110M	(+/-)	Sb-125	(+/-)	I-131	(+/-)	Cs-134	(+/-)	Cs-137	(+/-)	Th-232 decay chain*	(+/-)
29	03/23/2011	-0.003	0.005	0.019	0.013	0.000	0.019	-0.006	0.006	-0.004	0.005	0.029	0.019
29	06/08/2011	0.001	0.004	0.004	0.010	0.026	0.053	-0.001	0.004	-0.002	0.005	0.014	0.016
29	09/12/2011	0.001	0.016	-0.016	0.049	-0.052	0.055	0.001	0.017	-0.014	0.019	0.018	0.077
29	11/08/2011	-0.011	0.021	0.006	0.060	0.013	0.038	-0.003	0.024	0.001	0.025	0.080	0.096
35	03/23/2011	-0.001	0.007	-0.009	0.018	-0.020	0.028	-0.002	0.008	0.005	0.007	0.022	0.018
35	06/16/2011	0.004	0.015	-0.001	0.046	-0.019	0.055	-0.009	0.020	-0.008	0.016	0.052	0.078
35	09/12/2011	-0.021	0.020	0.047	0.048	-0.031	0.056	0.013	0.019	0.018	0.021	0.016	0.080
35	11/04/2011	-0.008	0.018	0.027	0.048	-0.007	0.045	-0.022	0.020	0.010	0.020	0.020	0.043
38	03/23/2011	-0.007	0.006	0.009	0.018	0.000	0.026	-0.001	0.008	0.007	0.007	0.037	0.034
38	06/16/2011	-0.008	0.013	-0.033	0.038	0.042	0.050	0.009	0.015	0.004	0.015	-0.012	0.028
38	09/12/2011	0.010	0.022	-0.006	0.058	0.015	0.051	-0.025	0.031	-0.004	0.024	-0.008	0.111
38	11/04/2011	-0.003	0.021	0.023	0.057	-0.018	0.058	-0.005	0.026	0.006	0.023	0.015	0.087
39	03/23/2011	-0.007	0.006	-0.001	0.017	0.002	0.025	-0.001	0.007	-0.001	0.006	0.016	0.016
39	06/16/2011	0.001	0.015	0.018	0.040	0.020	0.054	-0.007	0.018	0.007	0.016	0.026	0.036
39	09/28/2011	-0.010	0.016	-0.004	0.043	-0.006	0.058	-0.046	0.020	-0.004	0.017	-0.003	0.032
39	12/02/2011	0.003	0.008	0.000	0.024	-0.003	0.042	-0.014	0.010	-0.001	0.009	0.040	0.063

* The highest result for Th-232 and it's two daughters, Th-228 and Act-228, is reported.

TABLE 21

SCALLOPS

Scallops were not sampled in 2011. See discussion in Section 4.21.

TABLE 22
LOBSTERS
(pCi/g wet wt.)

LOCATION	COLLECTION DATE	Be-7	(+/-)	K-40	(+/-)	Cr-51	(+/-)	Mn-54	(+/-)	Co-58	(+/-)	Fe-59	(+/-)
32	03/18/2011	-0.051	0.067	1.97	0.22	-0.044	0.083	0.002	0.006	0.000	0.008	0.001	0.017
32	05/04/2011	-0.021	0.059	2.63	0.28	-0.009	0.071	0.001	0.006	0.003	0.007	-0.008	0.015
32	08/08/2011	0.009	0.078	2.82	0.26	0.022	0.099	0.009	0.009	0.002	0.010	-0.001	0.021
32	11/08/2011	0.255	0.280	2.78	0.94	-0.060	0.368	-0.011	0.041	0.010	0.043	0.055	0.082
35	03/30/2011	0.043	0.086	2.64	0.38	0.052	0.099	0.003	0.009	0.001	0.009	0.018	0.021
35	05/04/2011	-0.021	0.041	2.41	0.24	0.025	0.063	0.002	0.004	0.003	0.004	-0.006	0.010
35	08/08/2011	0.054	0.103	1.36	0.37	-0.132	0.135	0.002	0.010	-0.001	0.010	0.014	0.024
35	11/08/2011	0.033	0.264	2.37	0.92	-0.024	0.295	0.013	0.030	0.009	0.035	0.103	0.070
37	02/23/2011	0.079	0.156	1.82	0.52	-0.260	0.155	0.002	0.017	0.000	0.017	0.011	0.035
37	06/27/2011	0.072	0.087	2.87	0.40	0.015	0.121	0.011	0.011	-0.004	0.012	0.001	0.026
37	11/22/2011	0.008	0.077	3.02	0.27	0.042	0.097	-0.002	0.008	0.002	0.009	-0.004	0.021

LOCATION	COLLECTION DATE	Co-60	(+/-)	Zn-65	(+/-)	Nb-95	(+/-)	Zr-95	(+/-)	Ru-103	(+/-)	Ru-106	(+/-)
32	03/18/2011	0.001	0.007	-0.015	0.017	0.001	0.008	-0.001	0.014	-0.005	0.009	0.000	0.061
32	05/04/2011	0.000	0.006	-0.004	0.013	0.003	0.007	0.000	0.012	-0.008	0.008	0.009	0.052
32	08/08/2011	-0.001	0.009	0.021	0.021	0.004	0.010	-0.003	0.017	0.002	0.010	0.027	0.080
32	11/08/2011	0.016	0.034	-0.051	0.079	0.004	0.037	0.025	0.060	0.000	0.038	-0.282	0.358
35	03/30/2011	0.000	0.010	-0.001	0.018	0.003	0.010	-0.004	0.018	0.005	0.011	-0.014	0.076
35	05/04/2011	0.001	0.004	-0.003	0.010	-0.003	0.005	0.002	0.008	0.000	0.006	0.011	0.035
35	08/08/2011	-0.013	0.011	-0.019	0.022	0.001	0.013	-0.009	0.022	-0.002	0.013	0.026	0.100
35	11/08/2011	-0.034	0.032	-0.046	0.081	-0.008	0.032	-0.044	0.049	-0.013	0.038	-0.234	0.291
37	02/23/2011	-0.004	0.020	-0.010	0.036	0.016	0.022	0.028	0.031	-0.005	0.017	0.035	0.148
37	06/27/2011	0.001	0.012	0.014	0.019	0.000	0.013	0.012	0.018	0.001	0.012	-0.012	0.089
37	11/22/2011	-0.009	0.011	0.003	0.019	-0.005	0.009	0.011	0.016	-0.002	0.010	-0.020	0.067

TABLE 22
LOBSTERS
(pCi/g wet wt.)

LOCATION	COLLECTION DATE	Ag-110M	(+/-)	Sb-125	(+/-)	I-131	(+/-)	Cs-134	(+/-)	Cs-137	(+/-)	Th-232 decay chain*	(+/-)
32	03/18/2011	-0.008	0.007	0.002	0.017	0.013	0.040	-0.003	0.008	-0.002	0.007	0.025	0.016
32	05/04/2011	0.000	0.005	-0.001	0.015	0.022	0.041	0.003	0.006	0.003	0.006	0.044	0.022
32	08/08/2011	0.001	0.008	-0.001	0.023	0.009	0.028	0.005	0.009	0.004	0.009	0.037	0.085
32	11/08/2011	-0.008	0.036	-0.025	0.101	-0.026	0.062	-0.073	0.039	-0.005	0.043	0.012	0.060
35	03/30/2011	0.004	0.008	-0.004	0.022	-0.002	0.046	0.000	0.009	0.004	0.008	0.005	0.028
35	05/04/2011	-0.002	0.004	0.005	0.011	-0.003	0.030	-0.003	0.004	0.003	0.004	0.019	0.017
35	08/08/2011	0.002	0.011	0.006	0.032	0.015	0.039	-0.001	0.011	0.001	0.012	0.021	0.106
35	11/08/2011	-0.034	0.032	-0.016	0.082	-0.045	0.061	0.008	0.036	0.031	0.033	-0.017	0.058
37	02/23/2011	0.010	0.015	-0.035	0.043	0.025	0.049	-0.013	0.019	-0.023	0.018	0.003	0.034
37	06/27/2011	0.004	0.010	-0.001	0.023	-0.002	0.056	0.005	0.009	0.011	0.010	-0.034	0.026
37	11/22/2011	-0.002	0.007	0.002	0.020	0.017	0.051	-0.049	0.008	-0.003	0.008	-0.003	0.039

* The highest result for Th-232 and it's two daughters, Th-228 and Act-228, is reported.

NOTES FOR DATA TABLES

A	Third quarter TLD for Location #7 was lost during a storm. It was replaced for the fourth quarter.
B	Fourth quarter TLD for Location #12 was lost when the utility pole on which it was mounted was replaced.
C	Collection Dates for Air Particulates and Iodine are listed as Monday through Sunday, however the typical change-out days are on Tuesdays.
D	Air Particulates and Iodines had loss of power at Location #4 during September due to a storm. Temporary power was used starting in October and permanent power was restored later in the year.
E	The REMODCM requires quarterly analyses for Sr-89 and Sr-90 on goat milk from two separate locations. Normally the sample for these analyses are composited from monthly or semi-monthly samples taken each quarter. Because of unavailability, only three milk samples were collected from Location #21 and only two milk samples were collected from Location #24 during year. Except for the second quarter at Location #24, the samples were consumed during gamma analyses and there was insufficient volume left to perform the quarterly Sr-89 and Sr-90 analyses.

4. DISCUSSION OF RESULTS

This section summarizes the results of the analyses on the REMP samples. DNC has carefully examined the data throughout the year and has presented in this section all cases where station related radioactivity could be detected. The results are compared with previous environmental surveillance data.

Few impacts of the station operation on the environment were observed. Sub-sections contain a description of each particular media or potential exposure pathway. Naturally occurring nuclides such as Be-7, K-40, and Th-232 (and it's daughters Th-228 and Ac-228) were detected in numerous samples. Be-7, which is produced by cosmic processes, was observed predominantly in airborne and vegetation samples. Th-232 and daughter results were variable and are generally at levels higher than plant related radionuclides.

Cs-137 and Sr-90 were observed at levels similar to those of past years. The levels of Cs-137 and Sr-90 detected were the result of atmospheric nuclear weapons testing in the 1960's.

Some REMP samples during 2011 identified detectable concentrations of isotopes that could be credibly attributed to the trans-Pacific transport of airborne releases from Fukushima, Japan following the March 11, 2011 Tohoku earthquake.

4.1 Gamma Exposure Rate (Table 1)

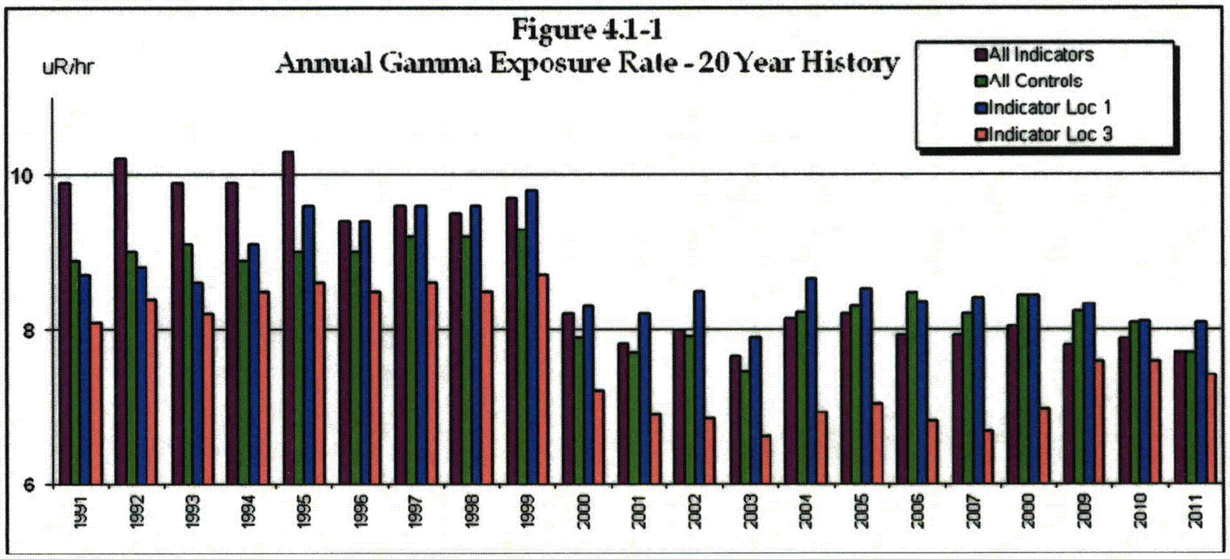
Gamma exposure rate is determined from the integrated exposure measured over a calendar quarter using TLDs. Prior to 1990, Victoreen CaF_2(Mn) glass bulb dosimeters were used for these measurements. In 1990, these were replaced by Harshaw CaF_2(Mn) chips. In 2000, the CaF_2(Mn) TLDs, were replaced with the $CaSO_4$(Tm) Panasonic model UD-804 ASx TLDs.

The dosimeters are strategically placed at a number of on-site locations, as well as at inner and outer off-site locations. Starting in 2001, the collection of TLDs was changed from monthly to quarterly and additional measurement locations were incorporated into the REMP requirements listed in the REMODCM (Reference 8). Three more locations were added in mid-2003 to prepare for monitoring the potential effect from the ISFSI. Two Dry Cask Containers were loaded in the first quarter 2005. Three containers were loaded in mid 2006, three in October 2007, three in April 2009, and three in October 2010. None were loaded in 2008 or in 2011. The exposure rate measurements at the three additional TLD locations remain basically unchanged from the background measurements performed prior to any cask loading (six quarter background average mid 2003 – 2004: 9.1 uR/hour at location 73X, 7.4 uR/hour at location 74X and 6.7 uR/hour at location 75X). The unit uR stands for 'micro (u)-roentgen' with a 'micro' being one-millionth of a roentgen. A roentgen is the quantity of radiation equal to 87.6 ergs of energy per gram of air.

Table 1 lists the exposure rate measurements for all 44 monitored locations. Trends similar to those of past years are apparent. These measurements demonstrate the general variations in background radiation between the various on-site and off-site locations and include gamma exposure from all sources of radioactivity. For example, the Weather Shack (location 02), MPS3 Discharge (location 05), Environmental Laboratory (location 08), Bay Point Beach (location 09), Pleasure Beach (location 10), Corey Road (location 48), and Site Switchyard Fence (location 73) experience higher exposure rates due to their proximity to granite beds and stonewalls. In addition, the Mystic (location 13C) and Ledyard (location 14C) control locations experience relatively higher background exposure rate than the other control locations at Fisher's Island, Norwich and Old Lyme (locations 12C, 15C and 16C).
The only appreciable effect seen in the recent TLD data is that attributable to the variation in the background radiation that is consistent with previous years. Figure 4.1-1 shows a historical trend of TLD exposure rate measurements, comparing an annual average of all indicator TLDs, an annual average of all control TLDs, and the annual average of the two most critical indicator locations which are used to represent the two closest site boundary residences in the North-northwest and Northeast directions. Examination of the average measurements since 1990, shows interesting site changes and site characteristics. For example, the average of all indicator locations for the period when MPS1 was still in operation (through 1995) exhibit the effects of N-16 BWR turbine building sky-shine to immediate areas onsite. As discussed in previous annual reports, the effects of sky-shine at onsite monitoring stations were increased exposure rates as high as 6 uR/hr at certain onsite locations. The elevated exposure rates from sky-shine decreased rapidly with distance to levels indistinguishable from normal background measurements at even the nearest offsite monitoring stations. Also apparent in Figure 4.1-1 is the replacement of the historical Victoreen TLD monitoring system with the Panasonic system in year 2000. The difference in response between the two systems is very apparent, with the new Panasonic TLDs reading 15% to 20% lower. This lower response is consistent for all locations, including both indicator and control locations.

Figure 4.1-1 also relates the difference in critical indicator locations 1 and 3 and the annual average of all indicator TLDs to the annual average of the control TLDs collected and measured during coincident periods throughout the year. As discussed earlier, the exposure measurements of many indicator locations onsite (and two of the control locations) are influenced by natural background exposure differences caused by the many granite outcroppings typical of the local area. Figure 4.1-1 shows the annual average at indicator location 1 is slightly higher in gamma exposure rate than the average control gamma exposure rate. An opposite trend is shown for location 3. These differences are the result of the differences in granite at these locations. Location 3 was moved in the second quarter 2009 to minimize the effect of tree covering for the air sampler also located at this location. The 2009 to 2011 data for location 3 shows an increase likely attributable to the being closer to granite at the new location.

In 2005 and 2006, there was a small increase noted at locations 5 and 8 caused by storage of the MPS2 replaced reactor head. As expected, this increase exhibited a decreasing trend because of radioactive decay. The head was shipped offsite for disposal in the fourth quarter 2006; the measured levels at these two locations have returned to the background levels measured prior to the head being placed in the storage area. Although not measurable, any resulting site boundary doses are bounded by dose rates from the radwaste storage areas and are discussed in Section 5.



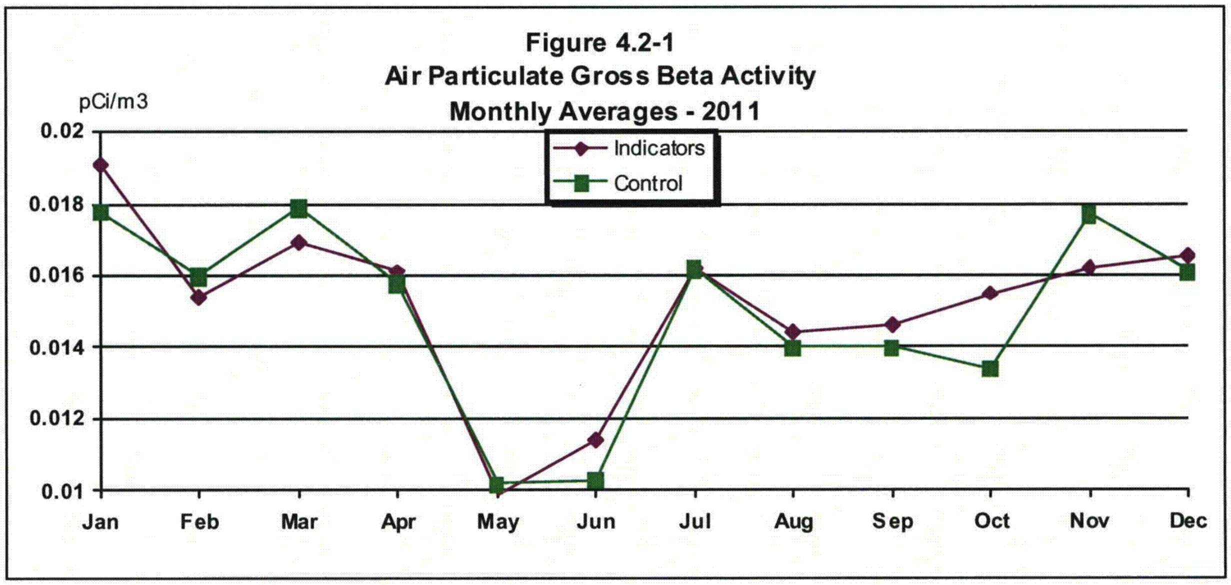
4.2 Air Particulate Gross Beta Radioactivity (Table 2)

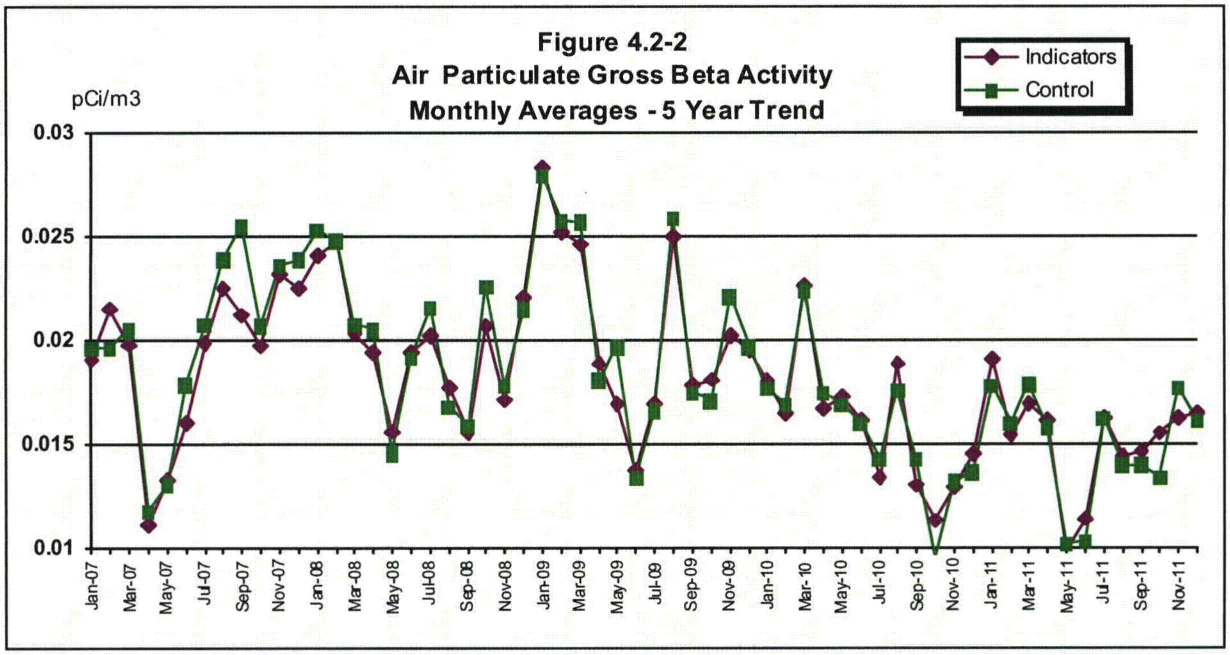
Air is continuously sampled at seven inner ring (0 to 2 miles) locations and one control location (14 miles N) by passing it through glass fiber particulate filters. These samples are collected weekly and analyzed for gross beta radioactivity. Results are shown on Figure 4.2-1 and Table 2. Gross beta activity remained at levels similar to that seen over the last decade. Inner and control monitoring locations continue to show no significant variation in measured activities (see Figure 4.2-2). This indicates that any station contribution is not measurable.

There was a noticable increase in periods ending March 29, April 5 and April 12 at all locations including the control location #15. Although the detectable radioactivity could be attributed to operation of MPS, they are not a result of station operation given the following facts:

(1) The quantities of radioactive airborne effluents from MPS during other weeks in 2011 did not increase significantly compared to this three week period.
(2) The quantities of radioactive airborne effluents from MPS during 2011 did not increase significantly compared to the year 2010.
(3) The radioactivity detected in the indicator samples was also identified in the control sample.
(4) The periods of increased radioactivity coincide with that of I-131 (see next section).

As such, the atypical detection of radioactivity in both indicator and control samples is credibly attributed to the trans-Pacific transport of airborne releases from Fukushima, Japan following the March 11, 2011 Tohoku earthquake and is not related to the operations of MPS.





4.3 Airborne Iodine (Table 3)

Charcoal cartridges are included at all of the air particulate monitoring stations for the collection of atmospheric iodine. These cartridges are analyzed on a weekly basis for I-131. The only detectable levels of I-131 seen in 2011 were for the periods ending March 29, April 5 and April 12. Although the detectable concentrations of I-131 could be related to operation of MPS, they are not a result of station operation given the following facts:

(1) The quantities of radioactive airborne effluents from MPS during other weeks in 2011 did not increase significantly compared to this three week period.

(2) The quantities of radioactive airborne effluents from MPS during 2011 did not increase significantly compared to the year 2010.

(3) The radioactivity detected in the indicator samples was also identified in the control sample at Location #15.

(4) The periods of increased I-131 coincide with that of beta radioactivity (see previous section).

As such, the atypical detection of these radionuclides in both indicator and control samples is credibly attributed to the trans-Pacific transport of airborne releases from Fukushima, Japan following the March 11, 2011 Tohoku earthquake and is not related to the operations of MPS.

4.4 Air Particulate Gamma (Table 4A-D)

The air particulate samples that are utilized for the weekly gross beta analyses are composited quarterly and analyzed for gamma emitting isotopes. The first two quarters were divided to see if there were any detectable activity due to the accident at Fukushima as was seen in gross beta radioactivity and I-131 (see Sections 4.2 and 4.3). There was no noticable increase in the March or April/May results, the same period when there was an increased in gross beta radioactivity and I-131. This suggests that the increased radioactivity from Fukushima was from I-131. The results, as shown in Tables 4A - 4D, indicate the presence of naturally occurring Be-7, which is produced by cosmic radiation. No other positive results are seen. These analyses indicate the lack of station effects.

4.5 Air Particulate Strontium (Table 5)

Prior to 1989 Table 5 was used for listing the data for measurements of Sr-89 and Sr-90 in quarterly composite air particulate filters. The historical data indicated the lack of any detectable station related activity. Since these analyses are not listed in NUREG-1301 (Reference 15), these measurements were discontinued. In the event of widespread station related contamination or other unusual events, these measurements could be made. Historically, when world events created conditions that caused detectable measurements of these nuclides, there was no difference noted between indicator and control locations. This further confirms that any of the detectable levels for these nuclides were not plant related.

4.6 Soil (Table 6)

MPS resumed collection of soil as a required media type in 2001. Prior to 2001, it had not been sampled for over fifteen years. These samples were discontinued due to the fact that, previous sample results never indicated any station related detectable activity. Similarly, since 2001, no station detectable activity has been seen in these samples. The results of these samples, allows for the determination of baseline activity levels in soil. This is particularly important for Cs-137, since significant levels from past weapons testing fallout remain in the soil. Baseline levels should be useful in the future, when site characterization and decommissioning of the station become the focus during preparations for License termination. This media is collected annually from one control and two indicator locations.

4.7 Cow Milk (Table 7)

Typically, the most sensitive indicator of fission product existence in the terrestrial environment is the radiological analysis of milk samples. Milk is a widely consumed food, therefore it is usually one of the most critical exposure pathways. Since 1996 all dairy (cow) farms close enough to MPS to be considered an indicator location (i.e. conservatively within 10 miles, reference 15 specifies within 5 miles) have ceased operation. One cow milk location at 10.4 miles from the plant is sampled as an extra (i.e.; not required) sample and results are shown in Table 7. Sr-89 and Sr-90 results in the June 30 sample and the I-131 result in the April 7 sample may be an indication of positive radioactivity but the results are not statistically significant enough to warrant that judgement. Any positive results could be attributed to Fukushima (see discussions in Sections 4.3 and 4.4).

4.8 Goat Milk (Table 8)

When available, these samples are collected twice per month during grazing season and once per month during the rest of the year. Because of limited availability of goat milk only five samples were collected during 2011. Per requirements, pasture grass or feed is collected as a substitute when milk is not available (see 4.9. Pasture Grass and Feed). Each sample is analyzed for I-131 and gamma emitting nuclides. Although not required by the REMODCM, samples from each location are composited quarterly and analyzed for strontium. Only one strontium analysis was performed in 2011 because of limited availability of sample.

Goat milk samples are typically a more sensitive indicator of fission products in the terrestrial environment than cow milk samples. It should be noted that the uptake of radionuclides in milk is dependent on a number of parameters. These include: metabolism of these animals, feeding habits, farming practices and feed type. Unlike previous years, Cs-137 and Sr-90 were not observed in goat milk. During past weapons testing periods, samples taken at certain milk locations indicated higher uptake of fallout than others. This was especially apparent in past samples collected in the immediate area around MPS (see previous Annual Operating Reports). One of these sites, located at 5.2 Mi. NNE of MPS (previous location 22, sampled from 1994 through 2004), exhibited a trend of showing higher Sr-90 and Cs-137 concentrations than at some of the other locations (including ones located closer to MPS). MPS and regulatory authorities (e.g., see Reference 17) have carefully reviewed past and present data. The presence of the Sr-90 and Cs-137 is the result of residual radioactivity deposited into the environment from the fallout of past nuclear weapons testing. The facts that lead to this conclusion are presented in Section 6.0. These facts include: effluent release totals for these isotopes show insufficient quantities to account for such measurements; Sr-89 and Cs-134 which are chemically similar and generally released in comparable quantities were not detected, and a trend since the early 1960's that shows a consistent declining presence of Cs-137 and Sr-90 in milk from Connecticut.

The 2011 results indicate no detectable I-131 in this media. The sample taken July 28 at Location #21 suggests a positive I-131 but the MDC for the analysis of this sample was higher than the sample result (0.70 pCi/l vs. 0.52 pCi/l). In the 1970's and 1980's low levels of plant related I-131 were seen in some of these samples. However, for over 19 years, no plant related detectable levels of I-131 have been seen in goat milk samples. The only other occasions where I-131 was detected were fallout episodes from the Chinese Weapons Tests of the mid to late 1970's and Chernobyl Accident in 1986. There was no detectable I-131 from the Fukushima event; but, samples were not available in late March and early April when radioactivity from Fukushima was detected in other environmental samples (see discussions in Sections 4.2 and 4.3).

4.9 Pasture Grass and Feed (Table 9)

When the routine milk samples are unavailable, samples of pasture grass are required as a replacement. These samples may also be taken to further investigate the levels of radioactivity in milk. During the winter months and early spring, insufficient growth often prohibits sampling of pasture grass. Feed (e.g., hay or grain) is typically sampled whenever pasture grass is not available.

No station effects are noted in these samples. Cosmic produced Be-7 was observed in the majority of the pasture grass samples and many of the hay samples. Due to its relatively short half-life (52 days), it was not detected in the several of the "older" hay samples. Naturally occurring K-40 was approximately two times higher in hay compared to pasture grass samples.

4.10 Well Water (Table 10)

These samples were discontinued in 1985, because no detectable station activity was ever observed in these samples. However, based upon lessons learned at other nuclear plants, including several undergoing decommissioning, sampling was resumed at several locations starting in the fourth quarter 2003. Three additional locations were added in 2005 to monitor potential leakage from the ISFSI. Due to the heightened sensitivity on this potential pathway, three more locations were added in 2006, five more in the summer of 2008 and two more in the Fall of 2010. One of the newer wells, location 86 (GPI 6 – inside the MPS3 RCA between the Boron and Waste Test Tank berm and the Fuel Building) indicated a positive tritium (H-3) result (2310 +/- 250 pCi/liter) on August 28, 2008. This was the first sample from this new well. The temporary well located nearby also indicated positive levels (see 2008 Annual Radiological Environmental Operating Report and the 2008 Radiological Effluent Report) due to penetrations in the berm and a leaky pressure gauge for one of the Boron Recovery Tanks. The penetrations have been sealed and the pressure gauge repaired. The H-3 levels have since become undetectable at this location.

The H-3 result at Location 81 on June 13 (992 +/- 670 pCi/l) was below it's MDC of 1020 pCi/l. Consistent with the data of previous years, there were no incidents of any station activity detected in these samples.

4.11 Reservoir Water or Deer Meat (Table 11)

Reservoir water samples are special samples not required by the REMP. Previous data has shown the lack of detectable station activity in this media. This fact and the extremely unlikely possibility of observing routine station effluents in this media have resulted in discontinuing these samples. In the event of widespread station related contamination, these samples may be collected.

Deer meat was a new sample type initiated at the end of 2010 but has been discontinued.

4.12 Fruits and Vegetables (Table 12)

Consistent with past years, this media did not show any station effects. Naturally occurring Be-7 was detected in some samples and K-40 in all samples.

4.13 Broad Leaf Vegetation (Table 13)
Consistent with past years, this media did not show any station effects. All samples had detectable levels of cosmic produced Be-7 and naturally occurring K-40 at levels consistent with previous years. Occasionally these samples indicate positive levels of Cs-137. This can be attributed to fallout from weapons testing which has been widespread in terrestrial samples for many years.

This media can be an early and sensitive indicator of releases from the station for both unplanned releases and normal operations. Therefore, to enhance program-monitoring effectiveness, samples of broadleaf vegetation are collected monthly during the growing season, May - October, even though requirements are to collect this media twice a year.

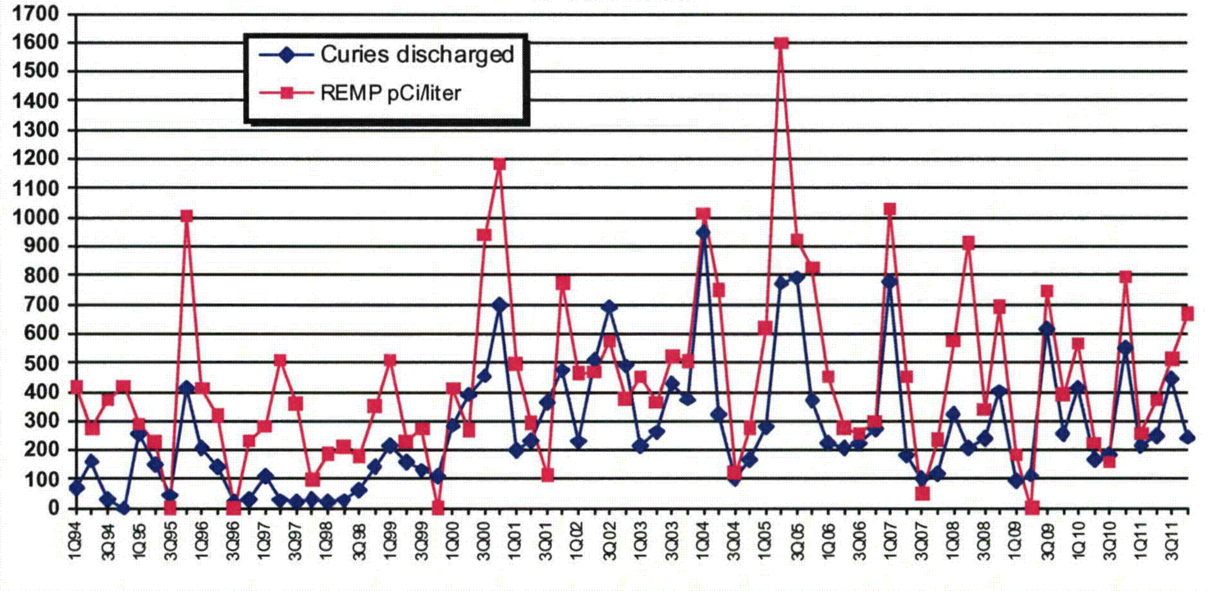
4.14 Seawater (Table 14)
The guidance in Reference 15 specifies one sample upstream (control – beyond significant influence of the discharge) and one sample downstream (indicator – beyond but near the mixing zone) for surface water samples. Historically the downstream sample for MPS has been located in the vicinity of discharge (location 32 – see Reference 8) which is prior to the mixing zone. This location was chosen since it was readily accessible and not affected by cold weather conditions. Operation of an automatic sampler at the indicator location is necessary for providing a representative sample. Although samples obtained at this location actually monitor the undiluted discharge activity, it provides for an excellent check on the radioactive effluent monitoring program. Any dose consequences can be assessed by use of the appropriate dilution factors. It's not as necessary to have a continuous sampler at the control location due to the historical relative consistency noted in seawater background activity near the MPS.

A technician collects an aliquot from the automatic sampler at Location 32 on a weekly frequency. These samples are composited for monthly analyses. In September 1999, MPS increased the required analysis frequency for this composite sample to monthly to increase monitoring effectiveness. For the Control Location, Giant's Neck (Location 37C), six weekly grab samples are obtained for quarterly compositing. In 2003, the LLD for H-3 (tritium) at the indicator location (32) was lowered by approximately a factor of four to further enhance monitoring effectiveness. This lower LLD was continued through 2011.

Naturally occurring K-40 was the only detectable gamma activity seen in several of these samples. Results for Co-58 on Aug 30 and for Co-60 on March 29, although greater than the 2σ error, were less than their MDC. Measured plant related levels of H-3 in seawater from the immediate vicinity of discharge (location 32) were observed in all samples except in December. Both MPS2, in April, and MPS3, in October had refueling outages. Tritium releases are typically higher near these outages due to the need for increased liquid processing during these times. As mentioned above, these samples are taken directly from liquid effluent flow prior to dilution into the Long Island Sound. Dilution studies performed for this discharge have determined that a dilution factor of 3 is appropriate to estimate concentrations immediately outside the quarry within a near-field area.

Tritium builds up in the reactor coolant during each fuel cycle. It is generated during plant operation from fission and neutron reactions. Between 1992 and 2002, H-3 was not typically detected. However, due to the enhanced detection sensitivity, H-3 levels are now often detected at the indicator location. Figure 4.14-1 shows an eighteen-year trend of H-3 releases in the MPS liquid effluents versus the measured environmental concentrations from the vicinity of discharge location.

Figure 4.14-1
H-3 Curies Released versus Seawater Concentration
18 Year Trend



4.14 <u>Bottom Sediment (Table 15)</u>

There was no plant related radioactivity detected in bottom sediment samples in 2011. Naturally occurring K-40 is seen in all samples Some results are greater than their 2σ error but all are less than the MDC.

Bottom sediment is not a significant dose pathway to man, especially at areas not typically used by the public. Examinations of other aquatic media, including seafood, sampled from near these locations (discussions that follow) do not show any detectable Co-60 or Cs-137.

4.15 <u>Aquatic Flora (Table 16)</u>

Although sampling of this media is not required, it provides useful information since it a very sensitive indicator of radioactivity in the environment. Naturally occurring Be-7 and Th-232 decay chain appears in some samples and K-40 in all samples. Low levels of man-made radioactivity (e.g., Mn-54, Co-58, Co-60, Zn-65, I-131 and Ag-110m) have been detected in the past. Since 2000, levels have decreased to undetectable for all nuclides except for I-131. Some results are greater than their 2σ error but less than the MDC. The results for Co-58 on May 25 for Location #32 (Vicinity of Discharge) was greater than the MDC but further analyses determined that it was a false positive identification.

Seaweed has a significant bioaccumulation factor for iodine which makes it an extremely sensitive indicator of iodine in the environment. Three positive, plant-related I-131 measurements were noted in 2011, one on March 23 at Location #32 which is Vicinity of Discharge and two on March 23 and September 27 at Location #29 which is in Jordon Cove just downstream of discharge. The measurements are consistent with I-131 seen in liquid effluents reported for the first three quarters of 2011. Release of I-131 in liquid effluents were well below regulatory limits and environment concentrations are comparable to some prior years at the same locations.

4.16 Fish (Tables 17A and 17B)

4.16.1 Flounder (Table 17A)

The activity in Flounder is the same as that seen for the past decade. No activity was observed except for the naturally occurring K-40.

4.16.2 Fish - Other (Table 17B)

The activity in other fish is the same as that seen for the past decade. No activity was observed in this media except for naturally occurring K-40.

4.17 Mussels (Table 18)

Similar to the last several years, this sampling media showed no activity except for the naturally occurring K-40.

4.18 Oysters (Table 19)

All locations utilize oysters stocked in trays. The oysters used for stocking these trays have been obtained from Ram Island for the last several years. To confirm that the stocked oysters are not initially contaminated, the oysters from Ram Island are also analyzed. The stocked trays are kept at most of the sampling areas to guarantee samples and facilitate sample collection. Historically, native oysters were sampled at the quarry (location 40X), which was an extra location. Due to safety concerns about diving operations, sampling at location 40X was suspended after the 2nd quarter 2007 samples. Similarly, due to other safety concerns, location 32 was moved to a more accessible area in the middle of the quarry. Although it is labeled as vicinity of the discharge, it was previously located at the end of the quarry.

MPS related Ag-110m was detected in samples from location 32. This has been an historical occurrence (see discussion below).

For several previous years, high levels of Zn-65 were observed in oysters. This was caused by their high capacity for accumulating zinc. Studies have shown that oysters can accumulate as much as 50 times or more the amount of zinc compared to most other seafood (Wolfe, 1979). A remarkable correlation existed between the Zn-65 concentration measured in the native quarry oysters and the amount of Zn-65 discharged into the environment. However, since the permanent shutdown of MPS1 in 1996, the amount of Zn-65 in liquid effluents has decreased significantly. Starting in 2001, no Zn-65 has been detected in either the liquid effluents or in oysters. Figure 4.19-1, shows a historical trend that existed between Zn-65 releases and measured concentrations in quarry oysters. The decreasing trend in effluent radioactive releases is apparent in both the curies released and the measured concentrations in oysters.

Figure 4.19-2 shows the trend of Ag-110m concentration in quarry oysters compared to the liquid effluents discharged. Similar to Zn-65, the correlation between Ag-110m discharged and the Ag-110m concentration measured in the native quarry oysters is apparent. Section 5 provides for a comparison of doses based upon effluent measurements (method 1) to doses based upon environmental measurements (method 2). Per regulatory guidance (reference 7), the bioaccumulation factors for both Zn and Ag were adjusted based upon several years of historical data to account for the higher measured uptakes. These adjustments have typically shown good agreement between the two methods, with method 1 usually being conservative. The 2006 and 2007 data indicate an unusual trend (see Section 5, Table 5-2). Method 2 (REMP dose assessment) indicates higher doses than method 1 (effluent dose assessment). Due to significant effluent reductions over the last several years, the low resulting doses (less than 0.01 mrem) make this comparison difficult and subject to significant error. Trending of these comparisons is routinely performed and adjustments are made, if appropriate.

The location of the quarry is on-site and not available for public use. No MPS activity was observed at locations beyond the MPS discharge area. Therefore, the actual concentration of the nuclides in oysters available for public consumption is much less than the levels found inside the quarry. The near-field dilution factor for liquid discharges from the Millstone Quarry discharge is a factor of 3.

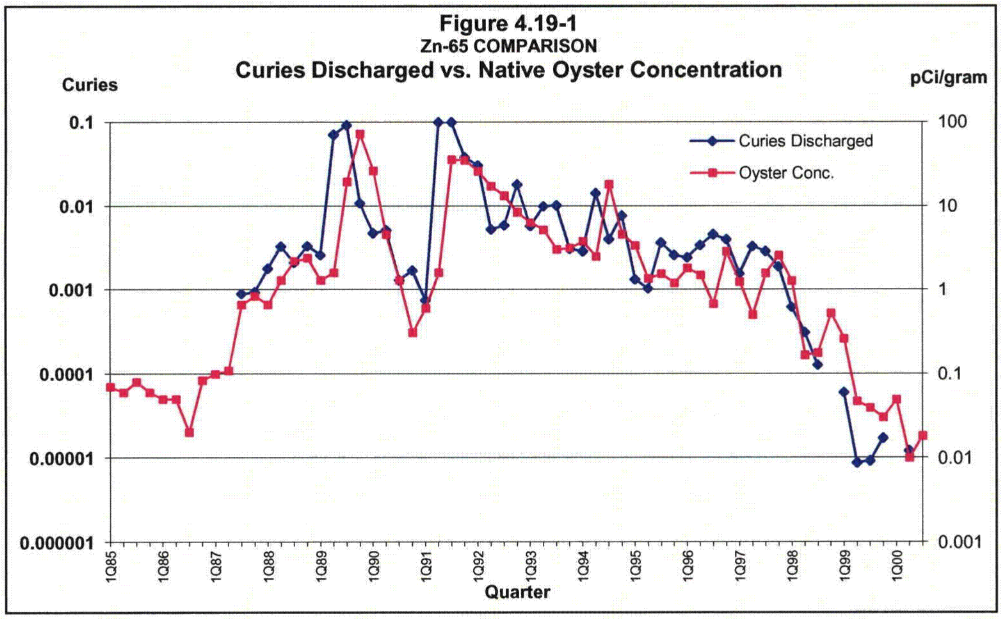
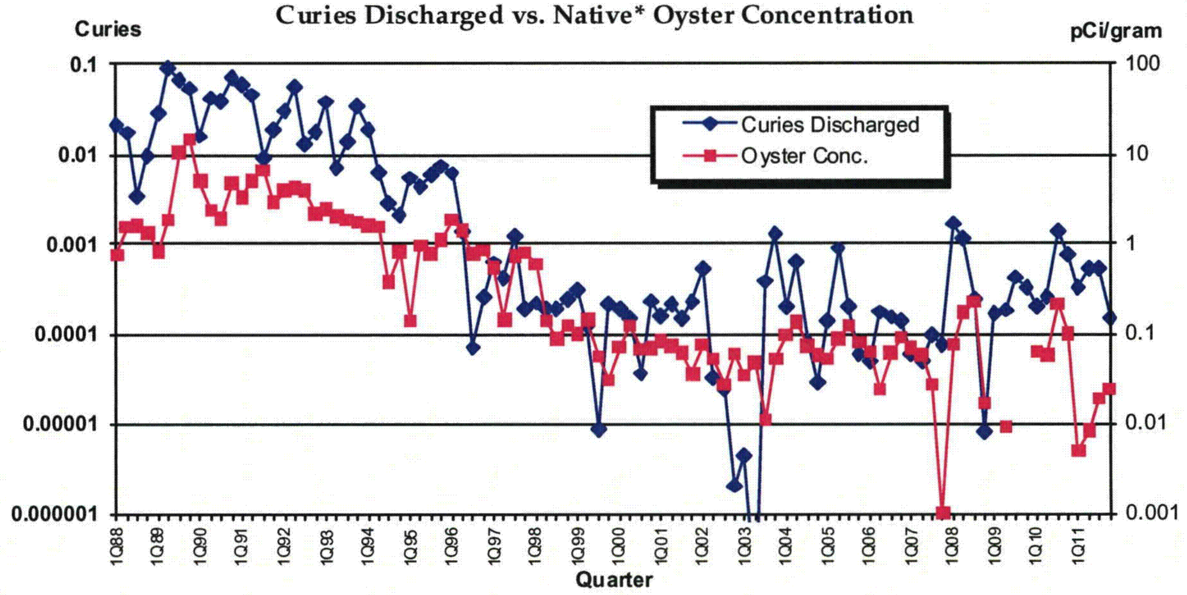


Figure 4.19-2
Ag-110m COMPARISON
Curies Discharged vs. Native* Oyster Concentration



* Native oysters until 3Q 2007; because of diver safety issues now the only oysters sampled in the Quarry are stocked in trays similar to what has historically been performed at all the other locations.

4.20 Clams (Table 20)

Occasionally this media indicates the presence of station related radioactivity. No activity was observed except for the naturally occurring K-40.

4.21 Scallops (Table 21)

Scallops are not required by the REMP. However, attempts are made to sample this media to confirm station effects because scallops could be available for public consumption. No scallop samples have been available for several years.

4.22 Lobsters (Table 22)

No activity was observed except for the naturally occurring K-40.

5. OFFSITE DOSE EQUIVALENT COMMITMENTS

The off-site dose consequences (dose equivalent commitments) of the station's radioactive liquid and airborne effluents have been evaluated using two methods.

The first method utilizes calculations of direct dose from sources onsite and the station's measured radioactive discharges as input parameters into conservative models to simulate the transport mechanism through the environment to man. This results in the calculation of the maximum dose consequences to individuals. The results of these computations have been submitted to the NRC in the RERR written in accordance with the REMODCM. This method, which is usually conservative (i.e., computes higher doses than that which actually occur), has the advantage of approximating an upper bound to the dose consequences. This is important in those cases where the actual dose consequence cannot be measured because they are so small as to be well below the capabilities of conventional monitoring techniques.

The second method utilizes the actual measurements of the concentrations of radioactivity in various environmental media (e.g., fish, shellfish) and then computes the dose consequences resulting from the consumption of these foods.

The results of both methods are compared in Table 5.1 for those pathways where a potential dose consequence exists and a comparison is possible. The doses presented in this table are calculated at the location of maximum effect from the MPS effluents for that pathway and for the critical age group. For example, the external gamma dose from gaseous effluents is calculated for the site boundary location which is not only the nearest but also has the greatest directional wind frequency and fish and shellfish doses are calculated assuming they are from an area within 500 feet of the station discharge.

The majority of the whole body dose is due to a conservative determination of dose (≈0.22 mrem) to the nearest resident as a result of direct radiation from on-site radioactive waste operation/storage facilities and continuous occupancy. Since the maximum dose consequence to an individual is at the location of highest dose consequence, doses will be less for all other locations. The average whole body dose to an individual within 50 miles historically is on the order of 1000 times less than the maximum individual whole body dose.

In order to provide perspective on the doses in Table 5.1, the standards on the allowable maximum dose to an individual of the general public are given in 40 CFR 190 as 25 mrem whole body, 75 mrem thyroid, and 25 mrem to any other organ. These standards are a fraction of the normal background radiation dose of approximately 311 mrem per year and are designed to be inconsequential in regard to public health and safety. Since station related doses are even a smaller fraction of natural background, they have insignificant public health consequences. In fact, the station related doses to the maximum individual are less than 10% of the variation in natural background.

TABLE 5.1

COMPARISON OF DOSE CALCULATION METHODS

Millstone Power Station

2011 Annual Dose (mrem)

Pathway	Individual	Organ	Method 1 [1]				Method 2 [1]
			MPS1 (BWR)	MPS2 (PWR)	MPS3 (PWR)	Station Total	Station
Airborne Effluents							
1. External Gamma Dose (gamma air) [8]	Max[2]	Whole Body	0.00000	0.00121	0.00016	0.00137	ND[3]
2. Whole Body Dose (internal and external)	Max[2]	Whole Body	0.005	0.140	0.125	0.270	ND
3. Inhalation, vegetables, meat and milk	Max[2]	Thyroid	0.005	0.148	0.126	0.279	ND
4. Inhalation, vegetables, meat and milk	Max[2]	Max Organ	0.005	0.692	0.588	1.285	ND
Direct Dose							
Nearest Residence	Max[2]	Whole Body	N/A	N/A	N/A	~0.22[4]	<0.4[5,8]

TABLE 5.1 (Cont.)

COMPARISON OF DOSE CALCULATION METHODS

Millstone Power Station

2011 Annual Dose (mrem)

Pathway	Max Individual	Organ	Method 1 (1)				Method 2 (1)
			MPS1 (BWR)	MPS2 (PWR)	MPS3 (PWR)	Station Total	Station
Liquid Effluents							
1. Fish	* Adult	Whole Body	0.00000	0.00050	0.00048	0.00098	ND(3)
	Teen	"	0.00000	0.00046	0.00043	0.00089	
	Child	"	0.00000	0.00052	0.00044	0.00096	
	* Adult	GI(LLI)(6)	0.00000	0.00253	0.00317	0.00570	ND
	Teen	"	0.00000	0.00185	0.00158	0.00343	
	Child	"	0.00000	0.00073	0.00068	0.00141	
	Adult	Bone	0.00000	0.00295	0.00126	0.00421	ND
	Teen	"	0.00000	0.00308	0.00132	0.00440	
	* Child	"	0.00000	0.00403	0.00172	0.00575	
2. Shellfish	Adult	Whole Body	0.00000	0.00051	0.00039	0.00090	0.00002(7)
	Teen	"	0.00000	0.00053	0.00039	0.00092	0.00002
	* Child	"	0.00000	0.00069	0.00047	0.00116	0.00002
	* Adult	GI(LLI)	0.00000	0.00430	0.00322	0.00752	0.0110
	Teen	"	0.00000	0.00308	0.00229	0.00537	0.0077
	Child	"	0.00000	0.00117	0.00088	0.00205	0.0028
	Adult	Bone	0.00000	0.00334	0.00151	0.00485	0.00003
	Teen	"	0.00000	0.00348	0.00158	0.00506	0.00003
	* Child	"	0.00000	0.00473	0.00214	0.00687	0.00003

Notes:

1. Except for direct dose, method 1 uses measured station discharges and meteorological data as input parameters to transport-to-man models that conservatively calculate dose to people; method 2 uses actual measured concentrations in environmental media to estimate the dose.
2. Maximum individual - The maximum individual dose is the dose to the most critical age group at the location of maximum concentration of MPS related activity. The dose to the average individual is much less than the maximum individual dose.
3. ND - Not Detectable - No MPS related activity could be detected above natural background or above the minimum detectable level (MDL).
4. The dominant source of direct dose from the MPS is from storage and movement of radioactive waste. Each facility is monitored onsite by the Radiation Protection Department using TLDs. The exposure measured for each facility TLD was corrected for distance to the nearest site boundary residence. The resultant exposure was conservatively multiplied by 1.5 to account for sky-shine. These maximum estimated doses from each facility were summed for a cumulative site commitment of approximately 0.22 mrem.
5. Measured dose was derived from monthly TLD readings. There are two residences that qualify as the closest residence; each has a TLD near enough to use as an estimate to each residence. The one with the highest average dose rate was used to estimate the direct dose to the closest residence. A background dose rate was subtracted. This background was derived from the average of the five control TLD locations. This method is very conservative assuming natural exposure influences, such as granite, are actually plant related exposure. This method provides a bounding high value. The exposure measurements of the select indicator locations are influenced by natural background exposure differences caused by the many granite out-croppings typical of the MPS area. Historical data has shown that TLD sample locations in the vicinity of granite can be dramatically influenced by natural radioactivity contained within the granite.
6. GI - Gastrointestinal Tract.
7. Based on measured levels of Ag-110m in the native quarry oysters. A measured near field dilution factor of 3 was used to adjust for the fact that these oysters are on-site and inaccessible to the public. This factor adjusts the measured on-site concentration to that which could occur to a public accessible off-site location after dilution of the effluent by the Long Island Sound. The measured levels in the stocked oysters within the quarry were about one-half the native quarry oysters. For conservatism, it was assumed the maximum individual consumed primarily oysters (activity in clams was much lower than in the oysters).
8. Based upon the conservatively assuming no correction for building shielding and occupancy.

6. DISCUSSION

The evaluation of the effects of MPS operation on the environment requires the careful consideration of many factors. Those factors depend upon the media being affected. They include MPS release rates, effluent dispersion, occurrence of nuclear weapons tests, seasonal variability of fallout, local environment, and locational variability of fallout. Additional factors affecting the uptake of radionuclides in milk include soil conditions (mineral content, pH, etc.), quality of fertilization, quality of land management (e.g., irrigation), pasturing habits of animals, and type of pasturage. Any of these factors could cause significant variations in the measured radioactivity. A failure to consider these factors could cause erroneous conclusions.

Consider, for example, the problem of deciphering the effect of MPS releases on the radioactivity measured in milk samples. Some of these fission products, such as I-131 and Sr-89 are relatively short-lived. Therefore they can result from MPS effluents, nuclear weapons tests or nuclear incidents (e.g. Chernobyl, Fukushima). Sr-89's lifetime is longer than I-131's, therefore it will remain around for much longer periods of time. The even longer-lived fission products, Sr-90 and Cs-137, cause more of a concern. These isotopes are still remaining from the weapons testing era of the 1960's. This results in measurable amounts of Sr-90 and Cs-137 appearing in past milk samples. Distinguishing between this "background" of fallout activity and MPS effects is of prime interest for a REMP.

In reviewing the historical Sr-90 and Cs-137 measured in cow and goat milk in the areas around MPS, a casual observer could notice that in some cases the levels of these isotopes are higher at farms closer to the MPS than at those further away from the MPS. The MPS's effluents might at first appear to be responsible. However, the investigation of the following facts proves this conclusion wrong.

(1) Nuclear power stations measure many fission products, including Sr-90 and Cs-137 in their releases. Based on these measurements and proven models developed by the NRC, concentrations in the environment can be calculated. These calculations (generally conservative, see Section 5.0) show that insufficient quantities of Sr-90 and Cs-137 have been released from the plants to yield the measured concentrations in milk.
(2) Over the many years of MPS operation, Sr-89 has often been released in comparable quantity to Sr-90. Since they are chemically similar, comparable levels should have been detected in milk if the Sr-90 was MPS related. No MPS related Sr-89 has ever been detected in milk samples.
(3) Similar to Sr-89, Cs-134 can be used as an indication of MPS related Cs-137. Although not as conclusive as Sr-89, the lack of any measurable Cs-134 in any of the milk samples suggests that the Cs-137 is not MPS related. This is further confirmed by the evaluation of the air particulate data. The only occurrences of detectable Cs-134 in milk resulted from the Chernobyl incident.
(4) Dairy milk sampling in Connecticut began in the 1960's, several years prior to MPS operation. The highest levels of weapons fallout related Sr-90 and Cs-137 (see Figures 6-1 and 6-2), were measured in the years prior to MPS operation. Samples taken in the immediate areas have always shown higher levels of weapons related fallout than samples taken from the Central Connecticut Region (CT Pooled Milk). Radioactivity levels of fallout related Sr-90 and Cs-137 have decreased significantly since the 1964 Nuclear Test Ban Treaty due to decay.

(5) Local variability of Sr-90 and Cs-137 in milk is common throughout the United States. Due to the variability in soil conditions, pasturing methods, rainfall, etc., it is the rule rather than the exception. Therefore, it is not surprising that certain farms have higher levels of radioactivity than other farms. In fact, in the past there are some cases where the farms further from the MPS have higher Sr-90 and Cs-137 values than the farms that are closer to the MPS.

(6) In the past when a goat farm operated near MPS (2.0 Mi - ENE), the highest levels of Sr-90 and Cs-137 were typically indicated. This same farm also experienced the highest levels of short-lived activity from the 1976 and 1977 Chinese Tests and the 1986 Chernobyl accident. This indicates that for some unknown reason this farm had the ability for higher reconcentration. Special studies performed at this and other farms failed to find any link to the MPS.

Based on these facts, the observation that the MPS effluents are responsible is evidently false. The cause must be one or more of the other variables.

Dominion has carefully examined the data throughout the years and has presented in this report all cases where MPS related radioactivity could be detected. An analysis of the potential exposure to the maximum individual from any MPS related activity has been performed and shows that in all cases the exposure is insignificant.

The Connecticut Department of Energy and Environmental Protection (DEEP) performs an independent check on certain environmental program analyses. The results of their analyses are comparable to the results from this program's analyses. These comparisons can be used as a cross-reference to verify measured MPS activity. DEEP performed a comprehensive review of all the historical MPS data in 2006 (reference 17). It concluded that "the collective sampling in and around Millstone Power Station show expected levels of residual fallout from weapons testing and the Chernobyl event and are unrelated to the operation of the Millstone Power Station."

Figure 6-1 Strontium-90 in Milk

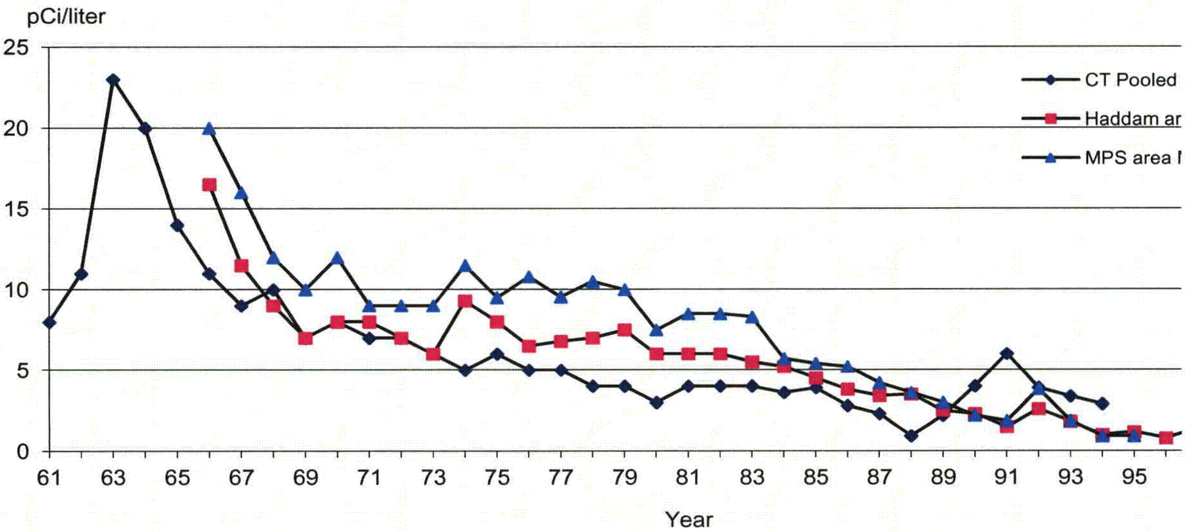
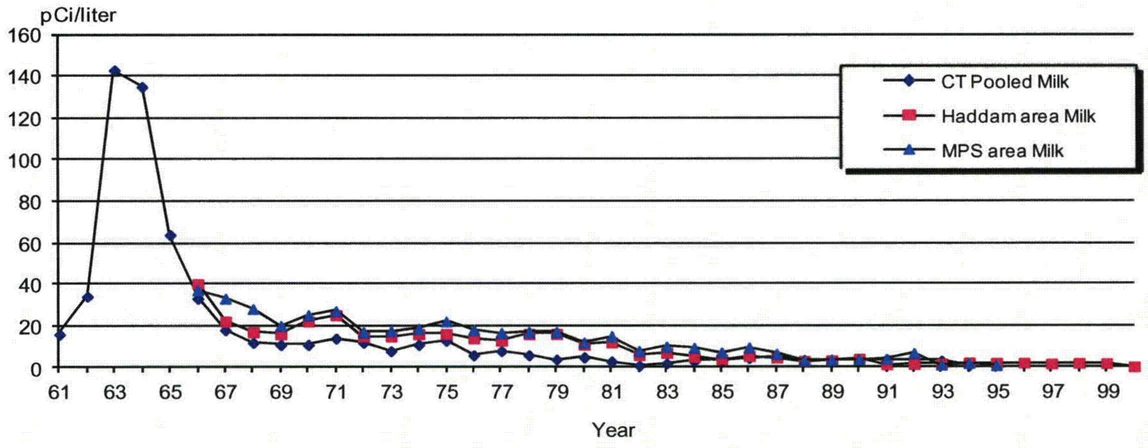


Figure 6-2 Cesium-137 in Milk



Dairy milk is no longer available in the MPS area, Haddam Neck no longer collects milk, and CT Pooled milk has not been collected by the State of CT since 1994. Graphs provided to show historical trends.

CY Start-up occurred:	July 24, 1967	MPS2 Start-up occurred:	December, 1975
MPS1 Start-up occurred:	October 26, 1970	MPS3 Start-up occurred:	January 23, 1986

7. REFERENCES

1) United States of America, Code of Federal Regulations, Title 10, Part 50, Appendix A Criteria 64.
2) Donald T. Oakley, "Natural Radiation Exposure in the United States." U. S. Environmental Protection Agency, ORP/SID 72-1, June 1972.
3) National Council on Radiation Protection and Measurements, Report No. 160, "Ionizing Radiation Exposures of the Population of the United States," March 2009.
4) National Council on Radiation Protection and Measurements, Report No. 94, "Exposure of the Population of the United States and Canada from Natural Background Radiation," December 1987.
5) United States Nuclear Regulatory Commission, Regulatory Guide 8.29, "Instructions Concerning Risks from Occupational Radiation Exposure," Revision 0, July 1981.
6) Millstone Training Brochure.
7) United States Nuclear Regulatory Commission, Regulatory Guide 1.109, "Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR Part 50, Appendix I," Revision 1, October 1977.
8) Millstone Power Station Radiological Effluent Monitoring and Offsite Dose Calculation Manual, Revision 026-02, March 15, 2011.
9) United States of America, Code of Federal Regulations, Title 10, Part 20.1301.
10) United States of America, Code of Federal Regulations, Title 10, Part 50, Appendix I.
11) United States of America, Code of Federal Regulations, Title 40, Part 190.
12) United States Nuclear Regulatory Commission, Regulatory Guide 4.1, "Program for Monitoring Radioactivity in the Environs of Nuclear Power Plants," Revision 1, April 1975.
13) ICN/TracerLab, "Millstone Nuclear Power Station Pre-operational Environmental Radiation Survey Program, Quarterly Reports," April 1967 to June 1970.
14) International Commission of Radiological Protection, Publication No. 43, "Principles of Monitoring for the Radiation Protection of the Population," May 1984.
15) United States Nuclear Regulatory Commission, NUREG-1301, "Offsite Dose Calculation Manual Guidance: Standard Radiological Effluent Controls for Pressurized Water Reactors," April 1991.
16) United States Nuclear Regulatory Commission, Branch Technical Position, "An Acceptable Radiological Environmental Monitoring Program," Revision 1, November 1979.
17) Reassessment of Millstone Power Station's Environmental Monitoring Data, Connecticut Department of Environmental Protection, Division of Radiation, March 2006.
18) Nuclear Regulatory Commission Regulatory Guide 4.1, Radiological Environmental Monitoring for Nuclear Power Plants, Revision 2, June 2009.

APPENDIX A

LAND USE CENSUS FOR 2011

INTRODUCTION

The annual land use census in the vicinity of MPS was conducted as required by the MPS REMODCM. Typically the cow milk locations are identified by a review of the annual registration information obtained from the State of Connecticut Department of Agriculture. Gardens are located by a drive-by during the harvest season. Although broadleaf sampling was performed and may be used in lieu of a garden census, gardens were included in the 2011 census. Only vegetable gardens having an area of more than 500 square feet need to be identified. In order to reduce some of the conservatism of the dose modeling, a more detailed census was initiated in 2010 to identify locations of fruits. Due to the difficulty of measuring individual gardens, the nearest garden within each directional sector identified by a drive-by survey is listed. Goat locations are more difficult to determine, but best efforts are made to consult goat association records, contact previous owners and or drive-bys, if necessary.

RESULTS

Tables A-1 through A-3 indicate information from the latest land use census. No new dairy animals within 10 miles of the MPS were located during the census. Several changes were identified, these include:

- Several locations changed since the distances were more accurately determined
- ten new cow dairy locations were identified, all beyond 20 miles (only locations within 20 miles are identified in Table A-1)
- several new gardens were identified

These changes indicate that no changes were required in the current sampling locations.

The dose modeling incorporates the above listed changes.

TABLE A-1

Dairy Cows Within 20 miles of Millstone Power Station - 2011

Direction	Distance (Miles)	Location
N	14.9	Norwich
N	18.0	Bozrah
N	18.5	Franklin
N	19.2	Norwich
N	19.4	North Franklin
N	19.4	Franklin
N	19.6	North Franklin
NNE	15.1	Preston
NNE	15.8	Preston
NNE	16.2	Preston
NNE	16.3	Norwich
NNE	17.5	Preston
NNE	17.8	Preston
NE	13.5	Ledyard
NE	13.6	Ledyard
NE	14.4	Ledyard
NE	14.4	North Stonington
NE	14.4	Preston
NE	19.2	North Stonington
NE	19.2	North Stonington
ENE	17.9	North Stonington
WNW	10.5	Lyme
NW	10.4	Lyme
NW	12.6	Salem
NNW	12.2	Salem
NNW	19.5	Lebanon
NNW	19.6	Lebanon

Note: None of these cow farms are used for sampling since all farms are greater than ten miles from plant (NUREG 1301, Reference 15, uses a cutoff distance of 5 miles)

TABLE A-2

Dairy Goats Within 20* miles of Millstone Power Station - 2011

Direction	Distance (Miles)	Location (Sample Location)
N	2.1	Waterford **(LOCATION 21)****
N	11.1	Oakdale
NE	2.8	Waterford (**LOCATION 22)*****
ENE	11.8	Stonington
ENE	12.8	Stonington
WNW	17.6	Haddam
NW	16.9	East Haddam
NNW	12.2	Salem
NNW	18.1	Colchester
NNW	20.8	Colchester
NNW	28.6	Hebron **(LOCATION 24)**

* plus one control location at 28.6 miles

** primarily for cheese, occasionally milk for drinking

*** not milking, raised for meat only, pigs also at this location

TABLE A-3

2011 Resident/Garden Survey

Downwind Direction	Resident		Garden		Fruit	
	miles	meters	miles	meters	miles	meters
N	0.97	1,570	0.98 *	1,580	1.9	2,980
NNE	0.53	850	0.55	890	12	19,750
NE	0.46	740	0.50	800	12	19,830
ENE	0.97	1,570	0.97 *	1,570	9.6	15,510
E	0.90	1,450	0.95 *	1,530	–	–
ESE	1.1	1,700	1.2	1,970	–	–
SE	N/A	N/A	N/A	N/A	N/A	N/A
SSE	N/A	N/A	N/A	N/A	N/A	N/A
S	N/A	N/A	N/A	N/A	N/A	N/A
SSW	N/A	N/A	N/A	N/A	N/A	N/A
SW	2.3	3,680	2.5 *	3,950	–	–
WSW	2.0	3,190	2.0 *	3,190	–	–
W	1.8	2,850	1.9	3,090	11	17,830
WNW	1.6	2,500	1.7	2,740	5.3	8,450
NW	0.52	840	1.5 *	2,390	5.5	8,770
NNW	0.51	820	0.76	1,220	–	–

* new locations

APPENDIX B

SUMMARY OF INTERLABORATORY COMPARISONS

INTRODUCTION

This appendix covers the Intercomparison Program of the Teledyne Brown Engineering Laboratory as required by technical specifications for each MPS unit. Teledyne uses QA/QC samples provided by Eckert & Ziegler Analytics, by the Environmental Resource Associates (ERA) Proficiency Test (PT) Program and by the Department of Energy (DOE) Mixed Analyte Performance Evaluation Program (MAPEP) to monitor the quality of analytical processing associated with the REMP. The suite of samples are comparable with the pre-1996 US EPA Interlaboratory Cross-Check Program in terms of sample number, matrices, and nuclides. It includes:

- milk for gamma (9 nuclides) analyses once per quarter
- milk for low level Iodine-131 analyses once per quarter
- milk for Sr-89 and Sr-90 analyses once per quarter
- water for gamma (9 nuclides) once per quarter
- water for low level Iodine-131 analyses twice per year
- water for tritium analyses once per quarter
- water for Sr-90 analyses once per quarter
- water for gamma Sr-89 analyses twice per year
- air filter for gamma (9 nuclides) analyses once per quarter
- air filter for gross beta analysis twice per year
- charcoal filter for I-131 once per quarter
- air filter for Sr-90 analyses twice per year
- soil for gamma (10 nuclides) analyses twice per year
- vegetation for gamma (6 nuclides) analyses twice per year
- vegetation for Sr-90 analyses twice per year

RESULTS

Intercomparison program results are evaluated using the laboratory's internal bias acceptance criterion. Teledyne Brown's acceptance criterion is defined as within 20% of the known value. Sample results which are less or greater than 20% of the known value but within 30% is acceptable with warning. Samples results outside 30% of the known value are not acceptable. All sample analyses which are not acceptable are investigated. Teledyne Brown Engineering Intercomparison Program results are included on pages B-3 through B-6 for 2011.

A total of 180 analysis results were obtained by Teledyne Brown Engineering with 173 within acceptable criteria, a 96% success rate. Results of investigations are noted at the end of the following tables.

TELEDYNE BROWN ENGINEERING, INC. ENVIRONMENTAL LABORATORY
2011 ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM

Month/Year	Identification Number	Matrix	Nuclide	Units	Reported Value (a)	Known Value (b)	Ratio (c) TBE/Analytics	Evaluation (d)
March 2011	E7460-396	Milk	Sr-89	pCi/L	98.8	97.4	1.01	A
			Sr-90	pCi/L	15.2	15.8	0.96	A
	E7461-396	Milk	I-131	pCi/L	92.9	96.9	0.96	A
			Cr-51	pCi/L	398	298	1.34	N (1)
			Cs-134	pCi/L	130	130	1.00	A
			Cs-137	pCi/L	232	205	1.13	A
			Co-58	pCi/L	121	113	1.07	A
			Mn-54	pCi/L	289	266	1.09	A
			Fe-59	pCi/L	201	175	1.15	A
			Zn-65	pCi/L	287	261	1.10	A
			Co-60	pCi/L	186	172	1.08	A
	E7463-396	AP	Cr-51	pCi	243	215	1.13	A
			Cs-134	pCi	85.0	94.2	0.90	A
			Cs-137	pCi	168	148	1.14	A
			Co-58	pCi	89.2	81.8	1.09	A
			Mn-54	pCi	171	192	0.89	A
			Fe-59	pCi	129	126	1.02	A
			Zn-65	pCi	159	189	0.84	A
			Co-60	pCi	132	124	1.06	A
	E7462-396	Charcoal	I-131	pCi	96.5	96.3	1.00	A
June 2011	E7851-396	Milk	Sr-89	pCi/L	96.7	103	0.94	A
			Sr-90	pCi/L	13.8	15.6	0.88	A
	E7852-396	Milk	I-131	pCi/L	110	103.0	1.07	A
			Ce-141	pCi/L	68.1	79.9	0.85	A
			Cr-51	pCi/L	186	206	0.90	A
			Cs-134	pCi/L	164	190	0.86	A
			Cs-137	pCi/L	140	138	1.01	A
			Co-58	pCi/L	141	152	0.93	A
			Mn-54	pCi/L	136	138	0.99	A
			Fe-59	pCi/L	128	123	1.04	A
			Zn-65	pCi/L	263	261	1.01	A
			Co-60	pCi/L	189	195	0.97	A
	E7854-396	AP	Ce-141	pCi	49.9	42.9	1.16	A
			Cr-51	pCi	95.6	110	0.87	A
			Cs-134	pCi	104	102	1.02	A
			Cs-137	pCi	83.8	74.0	1.13	A
			Co-58	pCi	90.7	81.3	1.12	A
			Mn-54	pCi	74.5	73.9	1.01	A
			Fe-59	pCi	62.0	66.1	0.94	A
			Zn-65	pCi	140	140	1.00	A
			Co-60	pCi	119	104	1.14	A
	E7853-396	Charcoal	I-131	pCi	76.2	86.1	0.89	A

(1) Sample appears to be biased high. Corrective Action evaluated after the 2nd Quarter Analytics PE sample; no action required. NCR 11-13

(a) Teledyne Brown Engineering reported result.

(b) The Analytics known value is equal to 100% of the parameter present in the standard as determined by gravimetric and/or volumetric measurements made during standard preparation.

(c) Ratio of Teledyne Brown Engineering to Analytics results.

(d) Analytics evaluation based on TBE internal QC limits: A= Acceptable. Reported result falls within ratio limits of 0.80-1.20. W-Acceptable with warning. Reported result falls within 0.70-0.80 or 1.20-1.30. N = Not Acceptable. Reported result falls outside the ratio limits of < 0.70 and > 1.30.

TELEDYNE BROWN ENGINEERING, INC. ENVIRONMENTAL LABORATORY
2011 ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM

Month/Year	Identification Number	Matrix	Nuclide	Units	Reported Value (a)	Known Value (b)	Ratio (c) TBE/Analytics	Evaluation (d)
September 2011	E8070-396	Milk	Sr-89	pCi/L	102	90.8	1.12	A
			Sr-90	pCi/L	13.2	14.7	0.90	A
	E8071-396	Milk	I-131	pCi/L	74.2	89.2	0.83	A
			Ce-141	pCi/L	66.9	66.7	1.00	A
			Cr-51	pCi/L	249	226	1.10	A
			Cs-134	pCi/L	116	128	0.91	A
			Cs-137	pCi/L	106	114	0.93	A
			Co-58	pCi/L	95.4	97.5	0.98	A
			Mn-54	pCi/L	147	151	0.97	A
			Fe-59	pCi/L	53.1	54.8	0.97	A
			Zn-65	pCi/L	175	180	0.97	A
			Co-60	pCi/L	150	157	0.96	A
	E8073-396	AP	Ce-141	pCi	66.6	67.5	0.99	A
			Cr-51	pCi	263	229	1.15	A
			Cs-134	pCi	139	130	1.07	A
			Cs-137	pCi	110	115	0.96	A
			Co-58	pCi	108	98.6	1.10	A
			Mn-54	pCi	152	153	0.99	A
			Fe-59	pCi	57.5	55.5	1.04	A
			Zn-65	pCi	190	183	1.04	A
			Co-60	pCi	156	159	0.98	A
	E8072-396	Charcoal	I-131	pCi	77.6	80.6	0.96	A
December, 2011	E8230-396	Milk	Sr-89	pCi/L	93.3	93.1	1.00	A
			Sr-90	pCi/L	12.7	15.4	0.82	A
	E8231-396	Milk	I-131	pCi/L	82.5	90.2	0.91	A
			Cr-51	pCi/L	465	566	0.82	A
			Cs-134	pCi/L	142	171	0.83	A
			Cs-137	pCi/L	185	210	0.88	A
			Co-58	pCi/L	177	221	0.80	A
			Mn-54	pCi/L	208	241	0.86	A
			Fe-59	pCi/L	164	183	0.90	A
			Zn-65	pCi/L	259	291	0.89	A
			Co-60	pCi/L	224	270	0.83	A
	E8233-396	AP	Cr-51	pCi	344	368	0.93	A
			Cs-134	pCi	105	111	0.95	A
			Cs-137	pCi	129	137	0.94	A
			Co-58	pCi	145	144	1.01	A
			Mn-54	pCi	137	157	0.87	A
			Fe-59	pCi	119	119	1.00	A
			Zn-65	pCi	145	190	0.76	W
			Co-60	pCi	168	176	0.95	A
December 2011	E8232-396	Charcoal	I-131	pCi	100	89.5	1.12	A

(a) Teledyne Brown Engineering reported result.

(b) The Analytics known value is equal to 100% of the parameter present in the standard as determined by gravimetric and/or volumetric measurements made during standard preparation.

(c) Ratio of Teledyne Brown Engineering to Analytics results.

(d) Analytics evaluation based on TBE internal QC limits: A= Acceptable. Reported result falls within ratio limits of 0.80-1.20. W-Acceptable with warning. Reported result falls within 0.70-0.80 or 1.20-1.30. N = Not Acceptable. Reported result falls outside the ratio limits of < 0.70 and > 1.30.

TELEDYNE BROWN ENGINEERING, INC. ENVIRONMENTAL LABORATORY
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Month/Year	Identification Number	Media	Nuclide	Units	Reported Value (a)	Known Value (b)	Control Limits	Evaluation (c)
May 2011	RAD-85	Water	Sr-89	pCi/L	59.8	63.2	51.1 - 71.2	A
			Sr-90	pCi/L	42.5	42.5	31.3 - 48.8	A
			Ba-133	pCi/L	73.3	75.3	63.0 - 82.8	A
			Cs-134	pCi/L	64.9	72.9	59.5 - 80.2	A
			Cs-137	pCi/L	74.6	77.0	69.3 - 87.4	A
			Co-60	pCi/L	87.8	88.8	79.9 - 100	A
			Zn-65	pCi/L	103	98.9	89.0 - 118	A
			Gr-A	pCi/L	64.1	50.1	26.1 - 62.9	N (1)
			Gr-B	pCi/L	51.8	49.8	33.8 - 56.9	A
			I-131	pCi/L	27.4	27.5	22.9 - 32.3	A
			U-Nat	pCi/L	38.5	39.8	32.2 - 44.4	A
			H-3	pCi/L	10057	10200	8870 - 11200	A
	MRAD-14	Filter	Gr-A	pCi/filter	79.7	74.3	38.5 - 112	A
November 2011	RAD-87	Water	Sr-89	pCi/L	81.0	69.7	56.9 - 77.9	N (2)
			Sr-90	pCi/L	35.5	41.4	30.2 - 47.2	A
			Ba-133	pCi/L	90.7	96.9	81.8 - 106	A
			Cs-134	pCi/L	36.6	33.4	26.3 - 36.7	A
			Cs-137	pCi/L	44.7	44.3	39.4 - 51.7	A
			Co-60	pCi/L	118.7	119	107 - 133	A
			Zn-65	pCi/L	80.2	76.8	68.9 - 92.5	A
			Gr-A	pCi/L	34.2	53.2	27.8 - 66.6	A
			Gr-B	pCi/L	39.3	45.9	30.9 - 53.1	A
			I-131	pCi/L	22.9	27.5	22.9 - 32.3	A
			U-Nat	pCi/L	46.8	48.6	39.4 - 54.0	A
			H-3	pCi/L	15733	17400	15200 - 19100	A
	MRAD-15	Filter	Gr-A	pCi/filter	44.6	58.4	30.3 - 87.8	A
March 2011	11-MaW24	Water	Cs-134	Bq/L	19.1	21.5	15.1 - 28.0	A
			Cs-137	Bq/L	29.0	29.4	20.6 - 38.2	A
			Co-57	Bq/L	0.139		(1)	A
			Co-60	Bq/L	23.9	24.6	17.2 - 32.0	A
			H-3	Bq/L	265	243	170 - 316	A
			Mn-54	Bq/L	31.8	31.6	22.1 - 41.1	A
			K-40	Bq/L	94.8	91	64 - 118	A
			Sr-90	Bq/L	9.64	8.72	6.10 - 11.34	A
			Zn-65	Bq/L	-0.142		(1)	A
	11-GrW24	Water	Gr-A	Bq/L	0.767	1.136	0.341 - 1.931	A
			Gr-B	Bq/L	3.43	2.96	1.48 - 4.44	A
	11-MaS24	Soil	Cs-134	Bq/kg	612	680	476 - 884	A
			Cs-137	Bq/kg	772	758	531 - 985	A
			Co-57	Bq/kg	910	927	649 - 1205	A
			Co-60	Bq/kg	500	482	337 - 627	A
			Mn-54	Bq/kg	0.607		(1)	A
			K-40	Bq/kg	569	540	378 - 702	A
			Sr-90	Bq/kg	NR	160	112 - 208	N (2)
			Zn-65	Bq/kg	1497	1359	951 - 1767	A

(1) The solids on the planchet exceeded 100 mg, which was beyond the range of the efficiency curve. NCR 11-08
(2) Sr-89 TBE to known ratio of 1.16 fell within acceptable range of ± 20%. No action required. NCR 11-16
(a) Teledyne Brown Engineering reported result.
(b) The ERA known value is equal to 100% of the parameter present in the standard as determined by gravimetric and/or volumetric measurements made during standard preparation.
(c) ERA evaluation: A=acceptable. Reported result falls within the Warning Limits. NA=not acceptable. Reported result falls outside of the Control Limits. CE=check for Error. Reported result falls within the Control Limits and outside of the Warning Limit.

TELEDYNE BROWN ENGINEERING, INC. ENVIRONMENTAL LABORATORY
2011 ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM

Month/Year	Identification Number	Media	Nuclide	Units	Reported Value (a)	Known Value (b)	Acceptance Range	Evaluation (c)
Mar-2011	11-RdF24	AP	Cs-134	Bq/sampl	3.26	3.49	2.44 - 4.54	A
			Cs-137	Bq/sampl	2.36	2.28	1.60 - 2.96	A
			Co-57	Bq/sampl	3.30	3.33	2.33 - 4.33	A
			Co-60	Bq/sampl	0.0765		(1)	A
			Mn-54	Bq/sampl	2.84	2.64	1.85 - 3.43	A
			Sr-90	Bq/sampl	NR	1.36	0.95 - 1.77	N (2)
			Zn-65	Bq/sampl	3.30	3.18	2.23 - 4.13	A
	11-GrF24	AP	Gr-B	Bq/sampl	1.23	1.323	0.662 - 1.985	A
	11-RdV24	Vegetation	Cs-134	Bq/sampl	4.97	5.50	3.85 - 7.15	A
			Cs-137	Bq/sampl	0.0356		(1)	A
			Co-57	Bq/sampl	10.8	9.94	6.96 - 12.92	A
			Co-60	Bq/sampl	4.89	4.91	3.44 - 6.38	A
			Mn-54	Bq/sampl	6.42	6.40	4.48 - 8.32	A
			Sr-90	Bq/sampl	NR	2.46	1.72 - 3.20	N (2)
			Zn-65	Bq/sampl	3.07	2.99	2.09 - 3.89	A
September 2011	11-MaW25	Water	Cs-134	Bq/L	16.0	19.1	13.4 - 24.8	A
			Cs-137	Bq/L	0.0043		(1)	A
			Co-57	Bq/L	33.1	36.6	25.6 - 47.6	A
			Co-60	Bq/L	26.9	29.3	20.5 - 38.1	A
			H-3	Bq/L	1011	1014	710 - 1318	A
			Mn-54	Bq/L	23.2	25.0	17.5 - 32.5	A
			K-40	Bq/L	147	156	109 - 203	A
			Sr-90	Bq/L	15.8	14.2	9.9 - 18.5	A
			Zn-65	Bq/L	27.3	28.5	20.0 - 37.1	A
September 2011	11-GrW25	Water	Gr-B	Bq/L	5.87	4.81	2.41 - 7.22	A
	11-MaS25	Soil	Cs-134	Bq/kg	-0.213		(1)	A
			Cs-137	Bq/kg	1110	979	685 - 1273	A
			Co-57	Bq/kg	1290	1180	826 - 1534	A
			Co-60	Bq/kg	731	644	451 - 837	A
			Mn-54	Bq/kg	987	848	594 - 1102	A
			K-40	Bq/kg	753	625	438 - 813	W
			Sr-90	Bq/kg	276	320	224 - 416	A
			Zn-65	Bq/kg	1870	1560	1092 - 2028	A
September 2011	11-RdF25	AP	Cs-134	Bq/sampl	-0.043		(1)	A
			Cs-137	Bq/sampl	3.09	2.60	1.82 - 3.38	A
			Co-57	Bq/sampl	5.36	5.09	3.56 - 6.62	A
			Co-60	Bq/sampl	3.41	3.20	2.24 - 4.16	A
			Mn-54	Bq/sampl	0.067		(1)	A
			Sr-90	Bq/sampl	1.84	1.67	1.17 - 2.17	A
			Zn-65	Bq/sampl	5.17	4.11	2.88 - 5.34	W
	11-GrF25	AP	Gr-B	Bq/sampl	-0.01		(1)	A
	11-RdV25	Vegetation	Cs-134	Bq/sampl	0.0081		(1)	A
			Cs-137	Bq/sampl	4.94	4.71	3.30 - 6.12	A
			Co-57	Bq/sampl	0.0639		(1)	A
			Co-60	Bq/sampl	3.36	3.38	2.37 - 4.39	A
			Mn-54	Bq/sampl	5.89	5.71	4.00 - 7.42	A
			Sr-90	Bq/sampl	1.31	1.26	0.88 - 1.64	A
			Zn-65	Bq/sampl	6.54	6.39	4.47 - 8.31	A

(1) False positive test.
(2) Evaluated as failed due to not reporting a previously reported analyte. NCR 11-11
(3) The filter for Gross Alpha was counted on the wrong side. Recounted on the correct side resulted in acceptable results. NCR 11-11
(a) Teledyne Brown Engineering reported result.
(b) The MAPEP known value is equal to 100% of the parameter present in the standard as determined by gravimetric and/or volumetric measurements made during standard preparation.
(c) DOE/MAPEP evaluation: A=acceptable, W=acceptable with warning, N=not acceptable.