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DTE Energy

April 27, 2012
NRC-12-0029

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington D C 20555-0001

References: Fermi 2
NRC Docket No. 50-341
NRC License No. NPF-43

Subject: Annual Radiological Environmental Operating Report and Radioactive Effluent Release Report

In accordance with Technical Specifications 5.6.2 and 5.6.3, Detroit Edison hereby submits the Annual Radiological Environmental Operating Report and the Radioactive Effluent Release Report for Fermi 2. Enclosure 1 provides the 2011 Annual Radioactive Effluent Release Report. Enclosure 2 provides the 2011 Annual Radiological Environmental Operating Report. Both reports cover the time period from January 1 through December 31, 2011.

Should you have any questions regarding these reports, please contact Mr. Richard LaBurn, Manager - Radiation Protection at (734) 586-4974.

Sincerely,

Joseph H. Plona

Enclosures

cc: NRC Project Manager
NRC Resident Office
Reactor Projects Chief, Branch 4, Region III
Regional Administrator, Region III
Supervisor, Electric Operators,
Michigan Public Service Commission

ENCLOSURE 1
to
NRC-12-0029

2011 Annual Radioactive Effluent Release Report

Total Pages - 43

Enrico Fermi Atomic Power Plant, Unit 2
NRC Docket No. 50-341
NRC License No. NPF-43

FERMI 2 NUCLEAR POWER PLANT

DETROIT EDISON COMPANY

OPERATING LICENSE NO. NPF - 43

Fermi 2 - 2011 Annual
Radioactive Effluent Release Report

for the period of
January 1, 2011 through December 31, 2011

Prepared by:

Fermi 2
Radiological Engineering

Table of Contents

List of Tables *Page*

Executive Summary

This report is published to provide information regarding radioactive effluent monitoring at the Fermi 2 Nuclear Power Plant. The 2011 Annual Radioactive Effluent Release Report covers the period from January 1, 2011 through December 31, 2011.

The Radioactive Effluent Release Report is produced annually, as required by the Nuclear Regulatory Commission, to present detailed results of extensive monitoring of plant releases and offsite dose resulting from these releases. The data presented indicate that the operation of Fermi 2 results in offsite radiation exposures which are well below the applicable allowable levels set by the Nuclear Regulatory Commission (NRC) and the Environmental Protection Agency (EPA).

There were no releases of liquid radioactive effluents from Fermi 2 in 2011. There has not been a routine liquid radioactive discharge from Fermi 2 since 1994. Data on releases of radioactive isotopes in gaseous effluents, as well as regulatory limits and sampling methods for these releases, are contained in the body of the report and in Appendix A.

Regulatory limits for radioactive effluents pertain to allowable offsite doses rather than to quantities of radioactivity released. The highest potential single organ dose to a person living offsite due to iodines, particulates, tritium, and carbon-14 released from the plant was calculated to be 0.26 mrem, which is less than 2% of the applicable limit found in 10 CFR Part 50, Appendix I.

During 2011, no direct radiation dose to members of the public beyond the site boundary was attributed to the operation of Fermi 2, based on analysis of readings of thermoluminescent dosimeters (TLD) placed at various locations near the Fermi site. The offsite dose due to effluents is an extremely small fraction of the 40 CFR 190 limits. Therefore, the combined direct radiation and effluent dose due to Fermi 2 was in compliance with 40 CFR 190 in 2011.

Data on radioactivity contained in radwaste shipments to points offsite are contained in the body of the report and in Appendix A. The Offsite Dose Calculation Manual (ODCM) was not revised in 2011. Additional sections of the report address ODCM revisions, ODCM monitors which were out of service for more than 30 days in 2011, major changes in radwaste processing, the contents of outside temporary tanks, abnormal releases, and errata to previous years' reports (see page 13).

Appendix B of this report describes the Fermi Integrated Ground Water Protection Program. This program was established as part of the site's commitment to conformance with an industry-wide ground water protection initiative. This appendix also contains the results of 2011 quarterly ground water sampling, from approximately 40 monitor wells around Fermi 2 (ground water sampling has been performed under this program since the fall of 2007). Some of these monitor wells, primarily to the east and south of Fermi 2, have yielded sporadic and variable trace quantities of tritium that have been attributed to the recapture of tritium from the plant's gaseous effluent. Appendix C of this report provides data on tritium concentrations in rainwater samples collected onsite which represent this recapture phenomenon. Appendix D of this report contains the meteorological joint frequency distribution tables for 2011.

Introduction

During the normal operation of a nuclear power plant, most of the fission products are retained within the fuel and fuel cladding. However, small amounts of radioactive fission products and trace amounts of the component and structure surfaces which have been activated are present in the primary coolant water, as well as tritium and carbon-14. The five types of radioactive material released are noble gases, iodine, particulates, tritium, and carbon-14.

Noble Gases

Some of the fission products released in airborne effluents are radioactive isotopes of noble gases, such as xenon and krypton. These noble gases are released continuously at low levels while the reactor is operating. Noble gas releases to the environment are reduced by plant systems which delay release of these gases from the plant, which allows a portion of the noble gas activity to decay within plant systems prior to release.

Noble gases are biologically and chemically nonreactive. They do not concentrate in humans or other organisms. They contribute to human radiation dose by being an external source of radiation exposure to the body. They are readily dispersed in the atmosphere.

Iodines and Particulates

Fermi 2 is required to calculate offsite dose due to releases of iodine-131 and iodine-133, which are radioisotopes of iodine with half lives of 8 days and 1 day, respectively, and particulates with half-lives greater than 8 days in gaseous and liquid effluents, and tritium. The principal radioactive particulates released are fission products (e.g., yttrium-91m and barium-139) and activation products (e.g., cobalt-58 and cobalt-60). Annual releases of these radionuclides are well within industry norms. Factors such as their high chemical reactivity and solubility in water, combined with the high efficiency of gaseous and liquid processing and radwaste systems, minimize their discharge.

The main contribution of radioactive iodine to human radiation dose is to the thyroid gland, where the body concentrates iodine. This exposure results from inhalation or ingestion of these iodines. Radioactive cesiums and cobalts, when ingested or inhaled, contribute to radiation exposure of tissues such as the muscle, liver, and intestines. These iodines and particulates are also a source of external radiation exposure if deposited on the ground.

Tritium

Tritium, a radioactive isotope of hydrogen, is the predominant radionuclide in radioactive gaseous effluents. It is detected at Fermi 2 in ventilation exhaust samples. Tritium is also the predominant radionuclide in liquid effluents; however Fermi 2 has not conducted routine liquid radioactive waste discharges since 1994. Plant personnel are alert for evidence of unmonitored liquid tritium releases.

Carbon-14

The year 2011 is the second year for which U.S. nuclear power plants are expected to report releases of carbon-14 (C-14). The releases reported are based on calculations involving the thermal power rating of the unit and 2011 monthly capacity factors. The Fermi 2 UFSAR estimates annual gaseous C-14 releases of 9.88 curies. The calculation performed for this report estimated a total 2011 C-14 release of 16.1 curies. Since this calculation provides a higher, more conservative estimate, its results are used in this report.

Plant Effluent Monitoring

Effluents are strictly monitored to ensure that radioactivity released to the environment is as low as reasonably achievable and does not exceed regulatory limits. Effluent control includes the operation of monitoring systems, in-plant and environmental sampling and analyses programs, quality assurance programs for effluent and environmental programs, and procedures covering all aspects of effluent and environmental monitoring.

The radioactive waste treatment systems at Fermi 2 are designed to collect, process, and/or delay the release of liquid and gaseous wastes which contain radioactivity. For example, the 2.0 and 2.2 minute holdup pipes delay the release of radioactive gases so that radioactive decay can occur prior to release. The offgas system provides additional delay for such gases.

Radioactivity monitoring systems are used to verify that all releases are below regulatory limits. These instruments provide a continuous indication of the radioactivity present at the release points. Each instrument is equipped with alarms and indicators in the control room. The alarm setpoints are low enough to ensure that applicable limits will not be exceeded. In some cases, these alarms restrict the release. For example, several alarms cause building ventilation systems to be shut down and/or gaseous releases to be diverted to the standby gas treatment system.

All wastes are evaluated to identify the specific concentrations of radionuclides being released. Sampling and analysis provide a more sensitive and precise method of determining effluent composition than monitoring instruments.

A meteorological tower is located on the Fermi 2 site. It is linked to computers which record the meteorological data. These data are used in calculating dispersion and deposition factors, which are essentially dilution factors between plant release points and points offsite. Coupled with the effluent release data, these factors are used to calculate dose to the public.

Beyond the plant, devices maintained in conjunction with the Radiological Environmental Monitoring Program constantly sample the air in the surrounding environment. Frequent samples of other environmental media, such as water and vegetation, are also collected to verify that the station radiological effluent program is being appropriately implemented without impact to the surrounding environment.

Exposure Pathways to People

Radiological exposure pathways define the methods by which people may become exposed to radioactive material. The major pathways of concern are those which could cause the highest calculated radiation dose. These projected pathways are determined from the type and amount of radioactive material released, the environmental transport mechanism, and the use of the environment. The environmental transport mechanism includes consideration of physical factors, such as the hydrological and meteorological characteristics of the area.

An important factor in evaluating the exposure pathways is the use of the environment. This is evaluated in the annual Land Use Census. Many factors are considered, such as the locations of homes, gardens, and milk or meat animals in the area.

The release of radioactive gaseous effluents involves pathways such as external whole body exposure, deposition of radioactive material on plants, deposition on soil, inhalation and ingestion by animals raised for human consumption, and inhalation by humans. The release of radioactive material in liquid effluents involves pathways such as drinking water and fish consumption.

Although radionuclides can reach humans by many different pathways, some result in greater dose than others. The most significant pathway is the exposure pathway which will provide the greatest dose to a population, or to a specific individual. Identification of the most significant pathway depends on the radionuclides involved, the age and diet of the individual, and the location of the individual's residence. Doses delivered to the total body and to specific organs were calculated. The organ receiving the greatest dose is important in determining compliance with dose limits. The standard assumptions used in dose calculation result in conservative dose estimates.

Dose Assessment

Dose is energy deposited by radiation in an exposed individual. Whole body exposure to radiation involves the exposure of all organs. Most exposures due to external sources of radiation are of this type. Both non-radioactive and radioactive elements can enter the body through inhalation or ingestion. When they do, they are usually not distributed evenly. For example, iodine concentrates in the thyroid gland, cesium collects in muscle and liver tissue, and strontium collects in bone tissue.

The total dose to organs from a given radionuclide depends on the amount of radioactive material present in the organ and the amount of time that the radionuclide remains in the organ. Some radionuclides remain for very short times due to their rapid radioactive decay and/or elimination rate from the body, while other radionuclides may remain in the body for longer periods of time. The form of the radionuclide (soluble vs. insoluble) and the method of uptake also influence residence times in the body.

The maximum dose to the general public in the area surrounding Fermi 2 is calculated for periods of gaseous release and for each liquid release. The dose due to radioactive material released in gaseous effluents is calculated using factors such as the amount of radioactive material released, the concentration beyond the site boundary, the locations of exposure pathways (cow milk, goat milk, vegetable gardens and residences), and usage factors (inhalation and food consumption). The dose due to radioactive material released in liquid effluents is calculated using factors such as the total volume of liquid, the total volume of dilution water, near field dilution, and usage factors (water and fish consumption). These calculations produce a conservative estimation of the dose.

Radioactive Effluent Monitoring Results

This section summarizes the results of effluent monitoring and offsite dose calculation for the year 2011. Calculated offsite doses are compared with Nuclear Regulatory Commission limits, and these limits are summarized in Appendix A. Appendix A also contains a detailed discussion of the methods used to determine quantities of radioactivity released in effluents, the types of solid radwaste shipped offsite, as well as tables of individual radionuclides released in effluents and shipped as solid radwaste. There were no routine releases of liquid radioactive effluents from Fermi 2 in 2011. There has not been a routine liquid radioactive discharge from Fermi 2 since 1994.

The data in the following gaseous effluent tables represent continuous and batch releases. In 2011, there were two recorded containment purges in which radioactivity was detected. The total time for these purges was 1499 minutes. Based on recorded start and stop times, the shorter of these purges lasted 179 minutes, the longer lasted 1320 minutes, and the average purge length was 750 minutes. The amounts of radioactivity released in these purges is very small compared with the amounts released in continuous releases.

Table 1 - Fission and Activation Gases (Noble Gases) Summary

	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Release (curies)	2.31E+00	3.04E-01	5.70E-01	<4.8E-08*
Average Release Rate for Period (μCi/sec)	2.97E-01	3.87E-02	7.17E-02	NA

*For noble gas releases in the fourth quarter of 2011, the "less than" value in units of microcuries per cubic centimeter (μCi/cc) is used because noble gases were not detected; this value represents the lower limit of detection (LLD) of Xe-133 in a single sample. A definitive explanation for this lack of detection in the fourth quarter was not found; however noble gas detection capability is usually near LLD levels, and noble gases were again detected in the first quarter of 2012.

Table 2 - Radioiodines Summary

	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Total I-131 (curies)	4.42E-04	7.74E-04	6.97E-04	6.99E-04
Average Release Rate for Period (μCi/sec)	5.68E-05	9.85E-05	8.77E-05	8.79E-05

Table 3 - Particulates Summary

	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Particulates with half lives > 8 days (curies)	7.65E-05	4.37E-05	2.42E-05	2.44E-05
Average Release Rate for Period (μCi/sec)	9.83E-06	5.56E-06	3.04E-06	3.07E-06
Gross Alpha Radioactivity	<5.7E-15* uCi/cc	<5.7E-15* uCi/cc	<5.7E-15* uCi/cc	<5.7E-15* uCi/cc

*In the above table, the "less than" value in units of microcuries per cubic centimeter (μCi/cc) is used when no radioactivity was detected and represents the lower limit of detection (LLD) value for a single sample.

Table 4 - Tritium (H-3) and Carbon-14 (C-14) Summary

	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Total H-3 Release (curies)	1.68E+01	2.02E+01	2.40E+01	3.14E+01
Average H-3 Release Rate (μCi/sec)	2.16E+00	2.57E+00	3.02E+00	3.95E+00
Total C-14 Release (curies)	3.08E+00	4.34E+00	4.39E+00	4.32E+00
Average C-14 Release Rate (μCi/sec)	3.96E-01	5.52E-01	5.52E-01	5.43E-01

The offsite dose impact of the above releases was evaluated by calculating organ doses to the most highly exposed individual living near the plant due to I-131, I-133, H-3, C-14 and particulates with half lives greater than 8 days. This exposure is assumed to be occurring via the pathways of inhalation, vegetation ingestion, and direct radiation from material deposited on the ground. The results of this calculation are shown in the following table:

Table 5

Organ	2011 Gaseous Effluent Dose to Receptor with Highest Single Organ Dose
Bone	2.63E-01 mrem
Liver	7.33E-02 mrem
Thyroid	1.12E-01 mrem
Kidney	7.34E-02 mrem
Lung	7.32E-02 mrem
GI-LLI	7.33E-02 mrem
Total body	7.33E-02 mrem

The highest single organ dose is 2.63E-01 mrem to the bone. This is 1.8% of the federal limit of 15 mrem specified in 10 CFR 50, Appendix I.

In addition, gamma and beta air dose at the site boundary due to noble gases is calculated. In 2011, gamma air dose was 9.51E-04 mrad, 0.01% of the 10 mrad annual limit; beta air dose in 2011 was 4.23E-04 mrad, 0.002% of the 20 mrad annual limit.

Title 40, Part 190 of the Code of Federal Regulations requires that dose to an individual in the unrestricted area from the uranium fuel cycle, including direct radiation dose, be limited to 25 mrem/year to the total body and 75 mrem/year to the thyroid. During 2011, there was no direct radiation dose attributed to the operation of Fermi 2 beyond the site boundary, based on analysis of offsite TLD readings. Based on Table 5 above, the offsite dose due to effluents is 0.29% and 0.15% of 40 CFR 190 limits for the total body and thyroid, respectively. Therefore, Fermi 2 was in compliance with 40 CFR 190 in 2011.

Potential dose to visitors at Fermi 2 due to all radioactive effluents, including noble gases, was also calculated. The Offsite Dose Calculation Manual (ODCM) considers persons visiting the Fermi 2 Visitors Center (4 hours/year), and persons ice fishing on Lake Erie near the plant (240 hours/year), to be visitors. Using ODCM assumptions about these categories of visitors, the maximum potential dose to a visitor to Fermi 2 in 2011 was 3.06E-03 mrem to the maximally exposed organ (bone) and 2.14E-03 mrem to the total body. These doses are below the annual maximum offsite doses due to gaseous effluents shown in Table 5, and are very small fractions of the 100 mrem/year limit for individual members of the public due to licensed operation of the plant provided in 10 CFR 20.1301.

Summary of Radioactive Waste Shipments

The radioactivity and volume of Fermi 2 solid and other (oil and septic) waste shipped offsite is summarized in the following table:

Table 6 - Waste Shipped Offsite

Type of waste	Unit	12 month period	Est. total activity error, %
Spent resins, sludges, etc.	m^3 curies	1.31E+02 1.35E+03	± 25
Dry compressible waste, contaminated equipment, etc.	m^3 curies	8.55E+02 1.51E+00	± 25
Irradiated components, control rods, etc.	m^3 curies	0 0	N/A
Other: oil and septic waste	m^3 curies	2.14E+02 2.02E-02	± 25

Radioactive waste shipments from Fermi 2 in 2011 (to either disposal or to intermediate processors) are summarized in the following table:

Table 7 - Waste Shipments

Type of shipment/ solidification process	Number of shipments	Mode of transportation	Destination
Spent resin, sludges, etc.	26	Tractor trailer with cask	Energy Solutions, Oak Ridge, TN Energy Solutions, Kingston, TN` Energy Solutions, Clive, UT
Dry compressible waste, contaminated equipment, etc.	16	Tractor trailer	Energy Solutions, Oak Ridge, TN
Oil and septic waste	10	Tractor trailer	Energy Solutions, Oak Ridge, TN

Additional Required Information

Appendices

Appendix A, Effluent and Radwaste Data, provides more detailed data on radiological effluents and radwaste shipments. Appendix B contains a description of the Fermi 2 Integrated Groundwater Protection Program, 2011 sampling data for this program, and a discussion of sampling results. Appendix C contains data on tritium concentrations in rainwater collected onsite and explains the significance of these data. Appendix D contains meteorological joint frequency distributions of wind speed and wind direction by atmospheric stability class, for all of 2011.

ODCM Revisions

The ODCM was not revised in 2011.

ODCM Monitors Out of Service

The Radwaste Building SPING monitor was administratively removed from service on December 13, 2010. This monitor was not damaged. Radwaste Building ventilation was not in service for an extended period due to duct cleaning necessitated by a flooding event which occurred on December 1, 2010. (This event was described in the Abnormal Radiological Releases section of the 2010 Annual Radioactive Effluent Release Report.) The Radwaste Building SPING monitor was returned to service on May 13, 2011, after ventilation duct decontamination was completed.

Outside Temporary Tanks

In 2011 no outside temporary tank exceeded the 10 curie content limit for nuclides other than tritium and dissolved or entrained noble gases.

Major Changes to Radioactive Waste Systems

There were no major changes to radioactive waste systems in 2011.

Abnormal Radiological Releases

There were no abnormal radiological releases in 2011.

Errata/Corrections to Previous ARERRs

The 2010 ARERR reported an abnormal radiological release incident which occurred on December 1, 2010. The hard-to-detect nuclide Fe-55 was inadvertently omitted from the list of nuclides released, and it was not included in the offsite dose calculation. It is now calculated that 7.08E-05 curies of Fe-55 were released in this incident. However its inclusion in offsite dose calculations has a negligible effect: the reported maximum offsite dose due to this release (1.3E-06 mrem to the total body and a maximum organ dose of 4.5E-6 mrem to the GI tract) is unchanged.

Appendix A

Effluent and Radwaste Data

Regulatory Limits for Radioactive Effluents

The Nuclear Regulatory Commission (NRC) limits on liquid and gaseous effluents are incorporated into the Fermi 2 Offsite Dose Calculation Manual. These limits prescribe the maximum doses and dose rates due to radioactive effluents resulting from normal operation of Fermi 2. These limits are described in the following sections.

A. Gaseous Effluents

I. Dose rate due to radioactivity released in gaseous effluents to areas at and beyond the site boundary shall be limited to the following:

a) Noble gases

Less than or equal to 500 mrem/year to the total body.
Less than or equal to 3000 mrem/year to the skin.

b) Iodine-131, iodine-133, tritium, and for all radionuclides in particulate form with half lives greater than 8 days

Less than or equal to 1500 mrem/year to any organ.

II. Air dose due to noble gases to areas at and beyond the site boundary shall be limited to the following:

a) Less than or equal to 5 mrad for gamma radiation
Less than or equal to 10 mrad for beta radiation
- During any calendar quarter

b) Less than or equal to 10 mrad for gamma radiation
Less than or equal to 20 mrad for beta radiation
- During any calendar year

III. Dose to a member of the public from iodine-131, iodine-133, tritium, and all radionuclides in particulate form with half lives greater than 8 days in gaseous effluents released to areas at and beyond the site boundary shall be limited to the following:

a) Less than or equal to 7.5 mrem to any organ
- During any calendar quarter

b) Less than or equal to 15 mrem to any organ
- During any calendar year

Note: The calculated site boundary dose rates for Fermi 2 are based on identification of individual isotopes and on use of dose factors specific to each identified isotope or a highly conservative dose factor. Since individual isotopes are identified, average energy values are not used in these calculations, and therefore are not reported even though their use in these calculations is allowed by Regulatory Guide 1.21.

B. Liquid Effluents

I. The concentration of radioactive material released in liquid effluents to unrestricted areas shall be limited to ten times the concentrations specified in Title 10 of the Code of Federal Regulations (10 CFR) Part 20 (Standards for Protection Against Radiation), Appendix B, Table 2, Column 2 for radionuclides other than dissolved or entrained noble gases, as required by the Fermi 2 Offsite Dose Calculation Manual. For dissolved or entrained noble gases, the concentration shall be limited to 2E-4 (.0002) microcuries/ml total activity. This limit is based on the Xe-135 air submersion dose limit converted to an equivalent concentration in water as discussed in the International Commission on Radiological Protection (ICRP) Publication 2.

II. The dose or dose commitment to a member of the public from radioactive materials in liquid effluents released to unrestricted areas shall be limited to the following:

a) Less than or equal to 1.5 mrem to the total body
Less than or equal to 5 mrem to any organ
- During any calendar quarter

b) Less than or equal to 3 mrem to the total body
Less than or equal to 10 mrem to any organ
- During any calendar year

As noted previously, Fermi 2 did not perform radioactive liquid releases in 2011.

Measurements and Approximations of Total Activity in Radioactive Effluents

As required by NRC Regulatory Guide 1.21, this section describes the methods used to measure the total radioactivity in effluent releases and to estimate the overall errors associated with these measurements. The effluent monitoring systems are described in Chapter 11.4 of the Fermi 2 Updated Final Safety Analysis Report (UFSAR).

A. Gaseous Effluents

I. Fission and Activation Gases

Samples are obtained from each of the six plant radiation monitors which continuously monitor the five ventilation exhaust points. The fission and activation gases are quantified by gamma spectroscopy analysis of periodic samples.

The summary values reported are the sums of all fission and activation gases quantified at all monitored release points.

II. Radioiodines

Samples are obtained from each of the six plant radiation monitors which continuously monitor the five ventilation exhaust points. The radioiodines are entrained on charcoal and then quantified by gamma spectroscopy analysis. For each sample, the duration of sampling and continuous flow rate through the charcoal are used in determining the concentration of radioiodines. From the flow rate of the ventilation system, a rate of release can be determined.

The summary values reported are the sums of all radioiodines quantified at all continuously monitored release points.

III. Particulates

Samples are obtained from each of the six plant effluent radiation monitors which continuously monitor the five ventilation exhaust points. The particulates are collected on a filter and then quantified by gamma spectroscopy analysis.

For each sample, the duration of sampling and the continuous flow rate through the filter are used in determining the concentration of particulates. From the flow rate of the ventilation system, a rate of release can be determined.

Quarterly, the filters from each ventilation release point are composited and then radiochemically separated and analyzed for strontium (Sr)-89/90.

The summary values reported are the sums of all particulates quantified at all monitored release points.

IV. Tritium

Samples are obtained from each of the six plant effluent radiation monitors which continuously monitor the five ventilation exhaust points. The sample is passed through a bottle containing water and the gaseous tritium is collected in this water. Portions of the collecting water are analyzed for tritium using liquid scintillation counting techniques. For each sample, the duration of sample and sample flow rate is used to determine the concentration. From the flow rate of the ventilation system, a release rate can be determined.

In addition to tritium releases from the five ventilation exhaust points, gaseous tritium releases from the Condensate Storage Tank and Condensate Return Tank have been calculated. These releases are due to evaporation of tritiated water in these tanks which is released through tank vents. However this is not a significant release point for tritium, contributing well less than 1% of total tritium releases. These releases were calculated to total 8.8E-3 curies in 2011; adding them to reported tritium releases from the ventilation release points does not change the reported release quantities, which are greater than 10 curies in each quarter and are expressed to three significant digits.

The summary values reported are the sums of all tritium quantified at all monitored release points.

V. Gross Alpha

The gaseous particulate filters from the six plant effluent radiation monitors are stored for one week to allow for decay of naturally occurring alpha emitters. These filters are then analyzed for gross alpha radioactivity by gas proportional counting, and any such radioactivity found is assumed to be plant related. The quantity of alpha emitters released can then be determined from sample flow rate, sample duration, and stack flow rate.

The summary values reported are the sums of all alpha emitters quantified at all monitored release points.

VI. Carbon-14

Carbon-14 releases are calculated using a method published by the Electric Power Research Institute in December 2010. Plant rated thermal power and monthly capacity factors were used in the calculation of quarterly releases.

B. Liquid Effluents

The liquid radwaste processing system and the liquid effluent monitoring system are described in the Fermi 2 UFSAR. Fermi 2 did not perform any releases of radioactive liquid effluents in 2011.

C. Statistical Measurement Uncertainties

The statistical uncertainty of the measurements in this section has been calculated and summarized in the following table:

Measurement Type	Sample Type	One Sigma Uncertainty
Fission and Activation Gases	Gaseous	30%
Radioiodines	Gaseous	17%
Particulates	Gaseous	16%
Tritium	Gaseous	25%
Gross Alpha	Gaseous	16%

Gaseous Releases by Individual Nuclide

Values in the following tables which are preceded by the "less than" symbol represent the lower limit of detection (LLD) in units of microcuries per cubic centimeter (μCi/cc) for individual samples, and indicate that the nuclide in question was not detected in gaseous effluent samples in the indicated quarter of 2011. For quantities of gross alpha radioactivity, tritium, and carbon-14 in gaseous effluents, see Tables 3 and 4 on page 10 of this report.

A. Particulate Radionuclides (Curies)

Nuclide	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Mn-54	<5.4E-14	<5.4E-14	<5.4E-14	<5.4E-14
Co-58	<5.4E-14	<5.4E-14	<5.4E-14	<5.4E-14
Co-60	<1.1E-13	<1.1E-13	6.96E-06	<1.1E-13
Na-24	<2.8E-13	<2.8E-13	<2.8E-13	<2.8E-13
Cr-51	<3.0E-13	<3.0E-13	<3.0E-13	<3.0E-13
Zn-65	<5.4E-14	<5.4E-14	<5.4E-14	<5.4E-14
Zn-69m	<8.5E-14	<8.5E-14	<8.5E-14	<8.5E-14
Tc-99m	<2.1E-13	<2.1E-13	<2.1E-13	<2.1E-13
Ba-139	4.61E-02	3.65E-02	6.20E-02	5.25E-02
La-140	2.99E-05	2.85E-05	2.97E-05	<1.3E-13
Ba-140	2.09E-05	8.04E-06	3.91E-06	<5.5E-14
Y-91m	5.37E-03	3.16E-03	1.06E-02	9.97E-04
Rb-89	<5.6E-10	<5.6E-10	<5.6E-10	<5.6E-10
Cs-138	5.24E-03	1.61E-02	1.60E-02	<5.1E-11
As-76	6.03E-03	5.68E-05	<1.2E-13	<1.2E-13
Br-82	8.46E-06	1.06E-05	1.05E-05	2.42E-05
Mn-56	<1.1E-11	<1.1E-11	<1.1E-11	<1.1E-11
Sr-91	<2.8E-12	<2.8E-12	8.22E-05	<2.8E-12
Sr-89	2.20E-05	1.10E-05	4.96E-06	1.57E-05
Sr-90	6.76E-07	<3.7E-15	8.50E-07	<3.7E-15
Fe-55	3.29E-05	2.47E-05	7.53E-06	8.70E-06
Cs-134	<5.7E-14	<5.7E-14	<5.7E-14	<5.7E-14
Cs-137	<5.9E-14	<5.9E-14	<5.9E-14	<5.9E-14
Ce-141	<1.6E-14	<1.6E-14	<1.6E-14	<1.6E-14
Ce-143	<4.9E-14	<4.9E-14	<4.9E-14	<4.9E-14
Ce-144	<7.4E-14	<7.4E-14	<7.4E-14	<7.4E-14
Total	**6.29E-02**	**5.59E-02**	**8.87E-02**	**5.35E-02**

B. Noble Gases (Curies)

Nuclide	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Ar-41	6.56E-01	1.76E-01	2.40E-01	<4.1E-08
Kr-87	<1.5E-07	<1.5E-07	<1.5E-07	<1.5E-07
Kr-88	<1.3E-07	<1.3E-07	<1.3E-07	<1.3E-07
Kr-85m	1.64E-01	<6.2E-06	<6.2E-06	<6.2E-06
Xe-133	2.84E-03	2.52E-02	<4.8E-08	<4.8E-08
Xe-133m	<2.0E-07	<2.0E-07	<2.0E-07	<2.0E-07
Xe-135	2.17E-02	1.03E-01	<2.5E-08	<2.5E-08
Xe-135m	1.74E-01	<3.3E-06	3.30E-01	<3.3E-06
Xe-137	<2.0E-05	<2.0E-05	<2.0E-05	<2.0E-05
Xe-138	1.29E+00	<2.2E-05	<2.2E-05	<2.2E-05
Total	**2.31E+00**	**3.04E-01**	**5.70E-01**	**NA**

C. Radioiodines (Curies)

Nuclide	Quarter 1	Quarter 2	Quarter 3	Quarter 4
I-131	4.42E-04	7.74E-04	6.97E-04	6.99E-04
I-132	7.13E-04	3.66E-04	2.97E-04	1.15E-04
I-133	2.00E-03	4.12E-03	4.32E-03	2.73E-03
I-134	<1.8E-11	<1.8E-11	<1.8E-11	<1.8E-11
I-135	9.83E-04	6.86E-04	1.35E-03	<1.5E-11
Total	**4.14E-03**	**5.95E-03**	**6.66E-03**	**3.54E-03**

Shipments of Radwaste

Fermi 2 complies with the extensive federal regulations which govern radioactive waste shipments. Radioactive solid waste shipments from the Fermi 2 site consist of waste generated during water treatment, radioactive trash, irradiated components, etc. Shipment destinations are either a licensed burial site or intermediate processing facilities. Waste shipped to intermediate processing facilities is shipped directly from these facilities to a licensed burial site after processing. The following tables contain estimates of major nuclide composition, by class of waste, of Fermi 2 solid radwaste shipped offsite in 2011. Additionally, the last table contains estimates of nuclide composition and volume of liquid radwaste shipped offsite for incineration.

The waste volumes shown in these tables are the volumes shipped, not the final volumes sent for burial after processing.

a. **Spent resins, sludges, etc.** All waste in this category in 2011 was Class A waste and consisted of spent resins. It was shipped in shielded transportation casks (3 Type A, 4 Type B, and 19 General Design Bulk Packages), either directly to the Clive, UT burial facility or to an intermediate processor. Waste sent directly to a disposal facility was dewatered prior to shipment. All quantities were determined by measurement.

Spent Resins (Class A)

Isotope	Activity mCi	Percent
Ag-110m	7.08E+01	5.23E-03
Am-241	5.29E-02	3.91E-06
Ba-140	3.34E+00	2.47E-04
C-14	9.82E+02	7.26E-02
Cm-242	2.46E-03	1.82E-07
Cm-243	1.37E-01	1.01E-05
Cm-244	1.30E-01	9.61E-06
Co-57	8.90E+01	6.58E-03
Co-58	4.72E+03	3.49E-01
Co-60	2.39E+05	1.77E+01
Cr-51	3.52E+02	2.60E-02
Cs-134	1.11E+01	8.20E-04
Cs-137	1.02E+03	7.54E-02
Fe-55	9.70E+05	7.17E+01
Fe-59	5.47E+02	4.04E-02
H-3	2.25E+02	1.66E-02
I-129 (LLD)	8.52E+00	LLD
I-131	2.15E+00	1.59E-04
La-140	3.05E+00	2.25E-04
Mn-54	1.01E+05	7.46E+00
Nb-95	9.67E+00	7.15E-04
Ni-63	9.99E+03	7.38E-01
Pu-238	6.73E-02	4.97E-06
Pu-239	5.60E-02	4.14E-06
Pu-240	5.60E-02	4.14E-06
Pu-241	9.01E+00	6.66E-04
Sb-124	4.70E+01	3.47E-03
Sb-125	6.41E+01	4.74E-03
Sn-113	8.33E+00	6.16E-04
Sr-89	6.56E+01	4.85E-03
Sr-90	4.74E+01	3.50E-03
Tc-99	1.64E+01	1.21E-03
Zn-65	2.48E+04	1.83E+00
Total Activity	1.35E+06	1.00E+02
Volume Shipped (cubic meters)	1.31E+02	

b. **Dry compressible waste, contaminated equipment, etc**. Waste in this category in 2011 was shipped in strong tight containers (General Design Bulk Packages), and was classified as Dry Active Waste (DAW). All DAW waste was shipped to an intermediate processor for processing, e.g. compaction or incineration. All quantities were determined by measurement.

Dry Active Waste (Class A)

Isotope	Activity mCi	Percent
C-14 (LLD)	2.31E+01	LLD
Co-58	4.12E+00	2.73E-01
Co-60	1.34E+02	8.88E+00
Cr-51	1.38E+01	9.15E-01
Cs-137	2.65E+00	1.76E-01
Fe-55	1.17E+03	7.75E+01
Fe-59	4.69E+00	3.11E-01
H-3	4.91E+01	3.25E+00
I-129 (LLD)	3.30E+00	LLD
Mn-54	1.17E+02	7.75E+00
Ni-63	6.55E+00	4.34E-01
Tc-99 (LLD)	2.04E+01	LLD
Zn-65	6.94E+00	4.60E-01
Total Activity	1.51E+03	1.00E+02
Volume Shipped (cubic meters)	8.55E+02	

c. **Irradiated components, control rods, etc.:** No waste in this category

d. Other: One shipment of oil and nine shipments of septic waste were made to the Energy Solutions facility in Oak Ridge, TN for incineration. Septic waste was exempt from DOT regulations and was shipped in bulk tankers. Oil waste was shipped in a General Design Bulk Package. All quantities were determined by measurement.

Isotope	Activity mCi	Percent
Ag-110m	1.18E-10	5.84E-10
C-14 (LLD)	1.10E+01	LLD
Co-58	1.35E-02	6.68E-02
Co-60	3.60E-01	1.78E+00
Cr-51	1.04E-01	5.15E-01
Cs-137	1.34E-01	6.64E-01
Fe-55	1.47E-01	7.28E-01
Fe-59	1.37E-02	6.78E-02
H-3	1.93E+01	9.56E+01
I-129 (LLD)	6.84E-01	LLD
Mn-54	7.48E-02	3.70E-01
Sb-124	1.93E-02	9.56E-02
Sb-125	8.31E-03	4.11E-02
Tc-99 (LLD)	1.54E+01	LLD
Zn-65	2.04E-02	1.01E-01
Total Activity	2.02E+01	1.00E+02
Volume Shipped (cubic meters)	2.14E+02	

Appendix B

Ground Water Protection Program Data and Analysis

SUMMARY

Fermi personnel conclude that the occasional positive tritium sample results in ground water from the shallow and deep monitor wells is not due to a leak from plant systems. Tritium in ground water in the shallow aquifer is the result of washout and recapture of tritium in precipitation that has passed through gaseous effluent from monitored plant systems. Low-level tritium activity was only detected in ground water from the bedrock aquifer in one sample and this result is deemed spurious because none of the adjacent shallow aquifer wells have elevated tritium levels nor is there a credible source for licensed material in the bedrock aquifer.

PROGRAM OVERVIEW

Quarterly sampling and gauging of the Fermi 2 Integrated Ground Water Protection Program (IGWPP) monitor wells continued uninterrupted in 2011. Procedurally, each IGWPP specified monitor well is required to be sampled for tritium and plant-related gamma-emitting radioisotopes each quarter. Furthermore, once per year water from three monitor wells most likely to be contaminated by leaked or spilled material is analyzed for hard-to-detect (HTD) radionuclides (Fe-55, Sr-89, and Sr-90).

Samples analyzed for gamma-emitting radionuclides, as well as HTDs, are counted to environmental lower limits of detection (LLD) for each given radioisotope of interest, with the exception of La-140 and Ba-140 (due to their extremely short half-lives). For tritium there is no required limit of detection, beyond what is prescribed for ground water samples taken as part of the site's Radiological Environmental Monitoring Program (REMP). The REMP Lower Limit of Detection (LLD) is set at 2,000 pCi/L which is $1/10^{th}$ of the EPA's drinking water limit of 20,000 pCi/L. Fermi 2's contract laboratory achieved LLDs for tritium of 500 pCi/L, or less, for all ground-water samples taken during 2011.

In 2011 Fermi personnel continued to take an additional sample split for tritium analysis. These samples were analyzed for the presence of tritium by the Fermi chemistry laboratory. This process ensures more accurate data for shipping the samples to the offsite contract laboratory, but, more importantly, to quickly determine if abnormal levels of tritium are in site ground water as the result of a leak of tritiated process water.

RESULTS

Deep Wells (Table 1)
Tritium was not detected in samples of ground water from the Fermi 2 deep monitor wells, with the exception of a ground-water sample from monitor well EF2-07-015D (402 pCi/L). Plant-related gamma-emitting radioisotopes were not detected in any samples collected from deep monitor wells in 2011.

Shallow Wells (Table 2)
Most shallow monitor wells have consistently yielded results indicating that tritium is not present at the detection limit. Of the 29 shallow monitor wells that are sampled quarterly (periodic sample events), only 11 samples from seven wells produced results with tritium levels above the detection limit. The positive results were sporadic and variable with tritium activities all less than 1174 pCi/L (less than 1/10th the EPA drinking water limit for tritium). Plant-related gamma-emitting radioisotopes or hard-to-detect radioisotopes were not detected in any ground-water samples collected from shallow monitor wells in 2011.

Emergent Sample Events (Table 3)
In 2011 Fermi 2 performed several emergent sample events. The first emergent sample event (event: E-2011-G-01) was undertaken in response to unusual tritium activity in ground water from two monitor wells located north of the Fermi 2 Protected area, in the vicinity of the Circulating Water Pump House (CWPH). The unusual activity was identified in the screening samples analyzed on-site by Fermi Chemistry laboratory technicians within 48 hours of the samples being taken. Because of the proximity of the monitor wells to the liquid radioactive waste decant line Radiological Engineering personnel decided to resample the monitor wells that produced the ground water with the unusual activity (EF2-07-015S and EF2-07-016S) as well as a third monitor well (392S) in the vicinity. These ground water samples were analyzed by Fermi 2 Chemistry technicians and split samples were sent to the contract laboratory for analysis as well. Tritium was not detected in any of the samples taken during the course of this emergent sample event.

All subsequent emergent sample events (E-2011-G-02 through E-2011-G-07) were performed in response to the discovery of indications on a spare condensate line associated with the Fermi 2 Condensate Return Tank (CRT). Analytical results from these emergent sample events indicate that this condensate line has not begun to leak.

DISCUSSION

Results of tritium analysis of ground water sampled in 2011 have shown that ground water from many of the site's wells have never yielded a positive result. In 2011, positive ground water results for tritium ranged from 171 - 1174 pCi/L. Furthermore, since the Integrated Ground Water Protection Program was initiated in the Fall of 2007, plant-related gamma isotopes or hard-to-detect isotopes have never been indentified in ground-water samples from any of the monitor wells.

If the tritium found in ground water from shallow wells was attributable to a leaking plant system then one would expect the levels to be consistent, or steadily increase, over time; especially during the winter when there is, normally, less recharge from surface water. Instead the results show periodic low-level hits for tritium in ground water with no clear trend. This pattern is more consistent with what one would expect to see if the tritium was attributable to recapture in precipitation. Recapture of tritium emitted from nuclear power plant stacks in precipitation is well documented and these emissions are continuously monitored and reported annually by the utility as part of an approved effluents program. A tritium rain-water washout study performed at the Fermi site revealed that tritium is commonly found in rain water collected at the site. Tritium activity in rain water samples, taken at the site over a period of two months, ranged from ca. 400 pCi/L to 5,750 pCi/L.

In 2011 tritium was found at very low levels in ground water from one deep monitor well. The positive result (402 pCi/L) was from a third-quarter ground water sample from monitor well EF2-07-015D, located outside of the Fermi 2 Protected Area to the west of the CWPH. This positive result is considered spurious because no other samples collected from this monitor well in 2011 produced a positive result and the location of that monitor well is "upstream" from the Fermi 2 power block (local bedrock ground-water flow direction is from the northeast to southwest) which makes it highly improbable that that ground water could become contaminated with tritium from the plant.

Furthermore, deep monitor wells in the vicinity of Fermi 2 are screened 40-45 feet below ground surface in bedrock. An approximately 10-foot thick inorganic clay layer between surficial aquifer and the bedrock aquifer impedes flow to such a degree that the bedrock aquifer is saturated and under pressure to the point that ground water in deep monitor wells rises to a level several feet above the top of the clay layer. Plant components outside of buildings that contain tritiated water are either above ground in tanks or piping running through aggregate at or above the water table. If these components were to generate a leak the contamination would be evident by the presence of high levels of activity in nearby shallow monitor wells screened in the surficial aquifer. Furthermore, buildings completed in bedrock (e.g. Reactor Building, Turbine Building, and Radwaste Building), that contain contaminated systems, are so far below the potentiometric surface that, should they leak, ground water would flow into the building and therefore the leak could not be a source of contamination under any probable circumstance (for an evaluation of this see Fermi UFSAR, Chapter 2).

Under these conditions (hydrogeological and plant construction) it is highly improbable that any activity attributed to tritium in ground water from deep monitor wells is indicative of plant-related tritium because there is no known pathway for plant-related tritium to contaminate the bedrock aquifer. Furthermore, to date, detectible tritium activity in the surficial aquifer, when it occurs, is far too low to be a plausible source of tritium in the bedrock aquifer. Additionally, natural radioisotopes commonly found in bedrock, such as Pb-210, produce low-energy betas in a similar energy range as tritium and may cause spurious results. The low-level of activity in ground water from deep monitor wells may also be attributable to chemiluminescence due to natural compounds that occur in the hard water from the bedrock (Bass Islands Group) dolomite.

In 2011 several emergent sample events were conducted. The first event was performed in response to tritium activity in ground water samples taken from two monitor wells near the CWPH during the first quarter periodic sample event. Analysis of the samples taken during this emergent sample event did not detect any tritium. Furthermore, tritium was not detected in ground water samples from these wells during periodic sampling for the rest of 2011. Therefore, the samples that initially showed tritium activity were deemed spurious.

The other emergent sample events were performed to ensure that an at-risk spare condensate line from the CRT has not begun to leak. If this line developed a leak, that leak could be identified by analyzing ground water from adjacent monitor wells for tritium. To ensure that such a condition did not go undetected, Radiological Engineering personnel established an emergent sample routine to ensure the sentinel wells in the vicinity of the condensate tank area are sampled monthly (credit was taken for the months when the monitor wells were sampled as part of the quarterly, periodic, sample program). Based on the results of these samples, there is no indication of condensate leaking from this line at this time.

Data

Table 1: Deep Monitor Well Tritium Analysis Results for Year 2011 (Periodic [Quarterly] Sample Events).

MONITOR WELL	EVENT ID	QA TYPE	LAB ID	PARAMETER	PREFIX	VALUE	UNITS
EF2-07-001D	P-2011-G-Q1	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-001D	P-2011-G-Q2	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-001D	P-2011-G-Q3	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-001D	P-2011-G-Q4	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-003D	P-2011-G-Q1	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-003D	P-2011-G-Q2	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-003D	P-2011-G-Q3	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-003D	P-2011-G-Q4	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-004D	P-2011-G-Q1	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-004D	P-2011-G-Q2	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-004D	P-2011-G-Q3	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-004D	P-2011-G-Q4	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-006D	P-2011-G-Q1	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-006D	P-2011-G-Q2	DUPLICATE	GEL	H-3	<	LLD	PCI/L
EF2-07-006D	P-2011-G-Q2	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-006D	P-2011-G-Q3	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-006D	P-2011-G-Q4	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-008D	P-2011-G-Q1	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-008D	P-2011-G-Q2	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-008D	P-2011-G-Q3	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-008D	P-2011-G-Q4	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-009D	P-2011-G-Q1	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-009D	P-2011-G-Q2	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-009D	P-2011-G-Q3	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-009D	P-2011-G-Q4	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-015D	P-2011-G-Q1	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-015D	P-2011-G-Q2	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-015D	P-2011-G-Q3	NORMAL	GEL	H-3		402	PCI/L
EF2-07-015D	P-2011-G-Q4	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-020D	P-2011-G-Q1	Note 1					
EF2-07-020D	P-2011-G-Q2	Note 1					
EF2-07-020D	P-2011-G-Q3	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-020D	P-2011-G-Q4	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-029D	P-2011-G-Q1	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-029D	P-2011-G-Q2	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-029D	P-2011-G-Q3	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-029D	P-2011-G-Q4	NORMAL	GEL	H-3	<	LLD	PCI/L

Note 1: Monitor well could not be accessed because it was in a construction area.

Table 2: Shallow Monitor Well Tritium Analysis Results for Year 2011 (Periodic [Quarterly] Sample Events).

MONITOR WELL	EVENT ID	QA TYPE	LAB ID	PARAMETER	PREFIX	VALUE	UNITS
392S	P-2011-G-Q1	NORMAL	GEL	H-3	<	LLD	PCI/L
392S	P-2011-G-Q2	NORMAL	GEL	H-3	<	LLD	PCI/L
392S	P-2011-G-Q3	NORMAL	GEL	H-3	<	LLD	PCI/L
392S	P-2011-G-Q4	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-002S	P-2011-G-Q1	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-002S	P-2011-G-Q2	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-002S	P-2011-G-Q3	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-002S	P-2011-G-Q4	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-003S	P-2011-G-Q1	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-003S	P-2011-G-Q2	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-003S	P-2011-G-Q3	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-003S	P-2011-G-Q4	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-005S	P-2011-G-Q1	DUPLICATE	GEL	H-3	<	LLD	PCI/L
EF2-07-005S	P-2011-G-Q1	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-005S	P-2011-G-Q2	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-005S	P-2011-G-Q3	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-005S	P-2011-G-Q4	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-007S	P-2011-G-Q1	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-007S	P-2011-G-Q2	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-007S	P-2011-G-Q3	DUPLICATE	GEL	H-3	<	LLD	PCI/L
EF2-07-007S	P-2011-G-Q3	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-007S	P-2011-G-Q4	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-008S	P-2011-G-Q1	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-008S	P-2011-G-Q2	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-008S	P-2011-G-Q3	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-008S	P-2011-G-Q4	DUPLICATE	GEL	H-3	<	LLD	PCI/L
EF2-07-008S	P-2011-G-Q4	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-012S	P-2011-G-Q1	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-012S	P-2011-G-Q2	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-012S	P-2011-G-Q3	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-012S	P-2011-G-Q4	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-013S	P-2011-G-Q1	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-013S	P-2011-G-Q2	NORMAL	GEL	H-3		493	PCI/L
EF2-07-013S	P-2011-G-Q3	NORMAL	GEL	H-3		529	PCI/L
EF2-07-013S	P-2011-G-Q4	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-014S	P-2011-G-Q1	NORMAL	GEL	H-3		593	PCI/L
EF2-07-014S	P-2011-G-Q2	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-014S	P-2011-G-Q3	NORMAL	GEL	H-3		667	PCI/L
EF2-07-014S	P-2011-G-Q4	NORMAL	GEL	H-3		542	PCI/L
EF2-07-015S	P-2011-G-Q1	DUPLICATE	GEL	H-3	<	LLD	PCI/L
EF2-07-015S	P-2011-G-Q1	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-015S	P-2011-G-Q2	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-015S	P-2011-G-Q3	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-015S	P-2011-G-Q4	NORMAL	GEL	H-3	<	LLD	PCI/L

EF2-07-016S	P-2011-G-Q1	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-016S	P-2011-G-Q2	DUPLICATE	GEL	H-3	<	LLD	PCI/L
EF2-07-016S	P-2011-G-Q2	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-016S	P-2011-G-Q3	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-016S	P-2011-G-Q4	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-017S	P-2011-G-Q1	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-017S	P-2011-G-Q2	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-017S	P-2011-G-Q3	DUPLICATE	GEL	H-3	<	LLD	PCI/L
EF2-07-017S	P-2011-G-Q3	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-017S	P-2011-G-Q4	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-018S	P-2011-G-Q1	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-018S	P-2011-G-Q2	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-018S	P-2011-G-Q3	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-018S	P-2011-G-Q4	DUPLICATE	GEL	H-3	<	LLD	PCI/L
EF2-07-018S	P-2011-G-Q4	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-019S	P-2011-G-Q1	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-019S	P-2011-G-Q2	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-019S	P-2011-G-Q3	NORMAL	GEL	H-3		398	PCI/L
EF2-07-019S	P-2011-G-Q4	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-020S	P-2011-G-Q1	Note 1					
EF2-07-020S	P-2011-G-Q2	Note 1					
EF2-07-020S	P-2011-G-Q3	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-020S	P-2011-G-Q4	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-021S	P-2011-G-Q1	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-021S	P-2011-G-Q2	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-021S	P-2011-G-Q3	NORMAL	GEL	H-3		354	PCI/L
EF2-07-021S	P-2011-G-Q4	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-022S	P-2011-G-Q1	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-022S	P-2011-G-Q2	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-022S	P-2011-G-Q3	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-022S	P-2011-G-Q4	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-023S	P-2011-G-Q1	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-023S	P-2011-G-Q2	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-023S	P-2011-G-Q3	NORMAL	GEL	H-3		457	PCI/L
EF2-07-023S	P-2011-G-Q4	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-024S	P-2011-G-Q1	NORMAL	GEL	H-3		932	PCI/L
EF2-07-024S	P-2011-G-Q2	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-024S	P-2011-G-Q3	NORMAL	GEL	H-3		381	PCI/L
EF2-07-024S	P-2011-G-Q4	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-025S	P-2011-G-Q1	DUPLICATE	GEL	H-3	<	LLD	PCI/L
EF2-07-025S	P-2011-G-Q1	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-025S	P-2011-G-Q2	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-025S	P-2011-G-Q3	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-025S	P-2011-G-Q4	NORMAL	GEL	H-3		1090	PCI/L
EF2-07-026S	P-2011-G-Q1	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-026S	P-2011-G-Q2	DUPLICATE	GEL	H-3	<	LLD	PCI/L
EF2-07-026S	P-2011-G-Q2	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-026S	P-2011-G-Q3	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-026S	P-2011-G-Q4	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-027S	P-2011-G-Q1	NORMAL	GEL	H-3	<	LLD	PCI/L

EF2-07-027S	P-2011-G-Q2	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-027S	P-2011-G-Q3	DUPLICATE	GEL	H-3	<	LLD	PCI/L
EF2-07-027S	P-2011-G-Q3	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-027S	P-2011-G-Q4	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-028S	P-2011-G-Q1	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-028S	P-2011-G-Q2	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-028S	P-2011-G-Q3	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-028S	P-2011-G-Q4	DUPLICATE	GEL	H-3	<	LLD	PCI/L
EF2-07-028S	P-2011-G-Q4	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-029S	P-2011-G-Q1	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-029S	P-2011-G-Q2	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-029S	P-2011-G-Q3	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-029S	P-2011-G-Q4	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-031-S	P-2011-G-Q1	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-031-S	P-2011-G-Q2	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-031-S	P-2011-G-Q3	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-031-S	P-2011-G-Q4	Note 2					
MW-10	P-2011-G-Q1	NORMAL	GEL	H-3	<	LLD	PCI/L
MW-10	P-2011-G-Q2	NORMAL	GEL	H-3	<	LLD	PCI/L
MW-10	P-2011-G-Q3	NORMAL	GEL	H-3	<	LLD	PCI/L
MW-10	P-2011-G-Q4	NORMAL	GEL	H-3	<	LLD	PCI/L
MW-11	P-2011-G-Q1	NORMAL	GEL	H-3	<	LLD	PCI/L
MW-11	P-2011-G-Q2	NORMAL	GEL	H-3	<	LLD	PCI/L
MW-11	P-2011-G-Q3	NORMAL	GEL	H-3	<	LLD	PCI/L
MW-11	P-2011-G-Q4	NORMAL	GEL	H-3	<	LLD	PCI/L
MW-18	P-2011-G-Q1	NORMAL	GEL	H-3	<	LLD	PCI/L
MW-18	P-2011-G-Q2	NORMAL	GEL	H-3	<	LLD	PCI/L
MW-18	P-2011-G-Q3	NORMAL	GEL	H-3	<	LLD	PCI/L
MW-18	P-2011-G-Q4	DUPLICATE	GEL	H-3	<	LLD	PCI/L
MW-18	P-2011-G-Q4	NORMAL	GEL	H-3	<	LLD	PCI/L
MW-21	P-2011-G-Q1	NORMAL	GEL	H-3	<	LLD	PCI/L
MW-21	P-2011-G-Q2	NORMAL	GEL	H-3	<	LLD	PCI/L
MW-21	P-2011-G-Q3	NORMAL	GEL	H-3	<	LLD	PCI/L
MW-21	P-2011-G-Q4	NORMAL	GEL	H-3	<	LLD	PCI/L

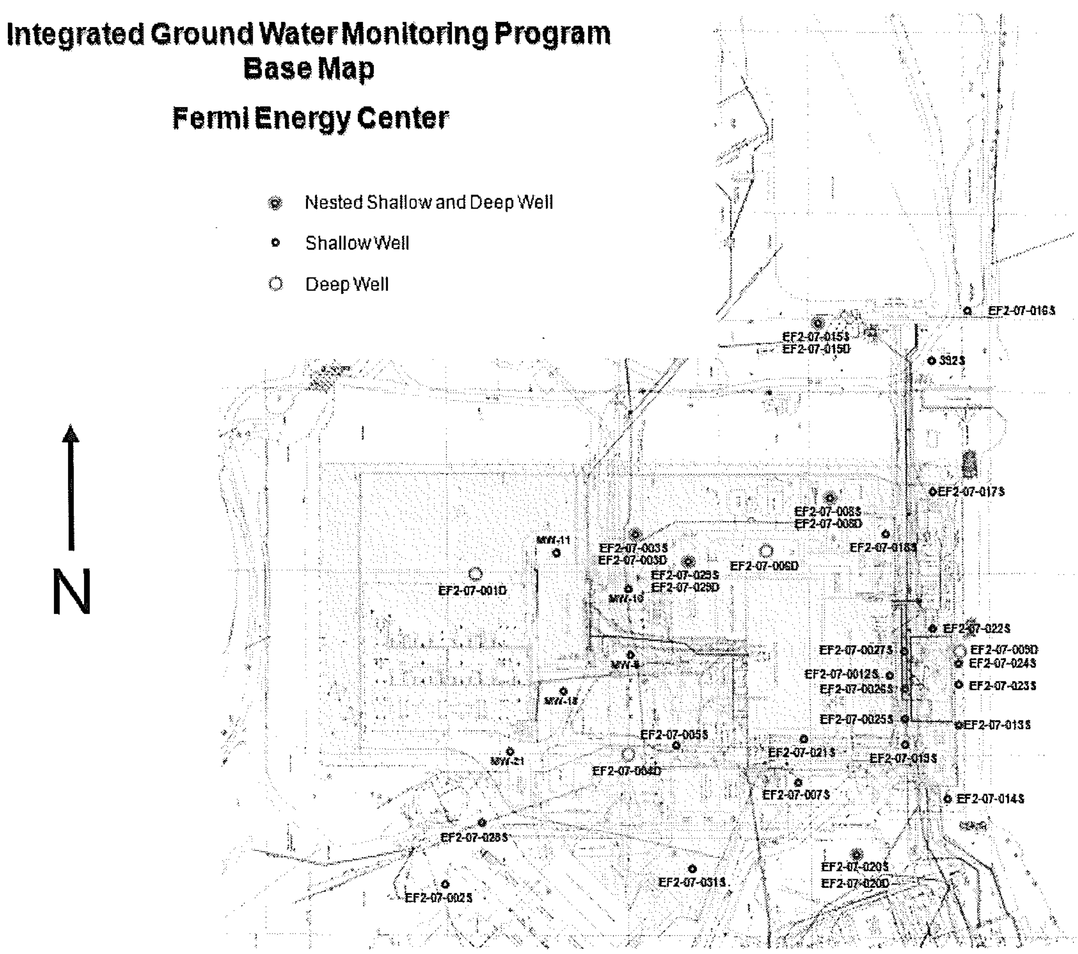
Note 1: Monitor well could not be accessed because it was in a construction area.
Note 2: Monitor well could not be accessed because the area was flooded due to excessive rainfall.

Table 3: Monitor Well Tritium Analysis Results for Year 2011 (Emergent Sample Events)

MONITOR WELL	EVENT ID	QA TYPE	LAB ID	PARAMETER	PREFIX	VALUE	UNITS
392S	E-2011-G-01	NORMAL	FERMI	H-3	<	LLD	PCI/L
392S	E-2011-G-01	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-013S	E-2011-G-02	NORMAL	FERMI	H-3		556	PCI/L
EF2-07-013S	E-2011-G-03	NORMAL	FERMI	H-3	<	LLD	PCI/L
EF2-07-013S	E-2011-G-04	NORMAL	FERMI	H-3	<	LLD	PCI/L
EF2-07-013S	E-2011-G-05	NORMAL	FERMI	H-3		771	PCI/L
EF2-07-013S	E-2011-G-06	NORMAL	FERMI	H-3		455	PCI/L
EF2-07-013S	E-2011-G-06	NORMAL	FERMI	H-3		455	PCI/L
EF2-07-013S	E-2011-G-07	NORMAL	FERMI	H-3		657	PCI/L
EF2-07-015S	E-2011-G-01	NORMAL	FERMI	H-3	<	LLD	PCI/L
EF2-07-015S	E-2011-G-01	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-016S	E-2011-G-01	NORMAL	FERMI	H-3	<	LLD	PCI/L
EF2-07-016S	E-2011-G-01	NORMAL	GEL	H-3	<	LLD	PCI/L
EF2-07-022S	E-2011-G-02	NORMAL	FERMI	H-3		1174	PCI/L
EF2-07-022S	E-2011-G-03	NORMAL	FERMI	H-3	<	LLD	PCI/L
EF2-07-022S	E-2011-G-04	NORMAL	FERMI	H-3	<	LLD	PCI/L
EF2-07-022S	E-2011-G-05	NORMAL	FERMI	H-3		171	PCI/L
EF2-07-022S	E-2011-G-06	NORMAL	FERMI	H-3	<	LLD	PCI/L
EF2-07-022S	E-2011-G-06	NORMAL	FERMI	H-3	<	LLD	PCI/L
EF2-07-022S	E-2011-G-07	NORMAL	FERMI	H-3		229	PCI/L
EF2-07-023S	E-2011-G-02	NORMAL	FERMI	H-3	<	LLD	PCI/L
EF2-07-023S	E-2011-G-03	NORMAL	FERMI	H-3	<	LLD	PCI/L
EF2-07-023S	E-2011-G-04	NORMAL	FERMI	H-3	<	LLD	PCI/L
EF2-07-023S	E-2011-G-05	NORMAL	FERMI	H-3		314	PCI/L
EF2-07-023S	E-2011-G-06	NORMAL	FERMI	H-3		285	PCI/L
EF2-07-023S	E-2011-G-06	NORMAL	FERMI	H-3		285	PCI/L
EF2-07-023S	E-2011-G-07	NORMAL	FERMI	H-3		343	PCI/L
EF2-07-024S	E-2011-G-02	NORMAL	FERMI	H-3		865	PCI/L
EF2-07-024S	E-2011-G-03	NORMAL	FERMI	H-3	<	LLD	PCI/L
EF2-07-024S	E-2011-G-04	NORMAL	FERMI	H-3	<	LLD	PCI/L
EF2-07-024S	E-2011-G-05	NORMAL	FERMI	H-3		600	PCI/L
EF2-07-024S	E-2011-G-06	NORMAL	FERMI	H-3		199	PCI/L
EF2-07-024S	E-2011-G-06	NORMAL	FERMI	H-3		199	PCI/L
EF2-07-024S	E-2011-G-07	NORMAL	FERMI	H-3		457	PCI/L
EF2-07-025S	E-2011-G-02	NORMAL	FERMI	H-3		649	PCI/L
EF2-07-025S	E-2011-G-03	NORMAL	FERMI	H-3	<	LLD	PCI/L
EF2-07-025S	E-2011-G-04	NORMAL	FERMI	H-3	<	LLD	PCI/L
EF2-07-025S	E-2011-G-05	NORMAL	FERMI	H-3		571	PCI/L
EF2-07-025S	E-2011-G-06	NORMAL	FERMI	H-3		398	PCI/L
EF2-07-025S	E-2011-G-06	NORMAL	FERMI	H-3		398	PCI/L
EF2-07-025S	E-2011-G-07	NORMAL	FERMI	H-3		828	PCI/L
EF2-07-026S	E-2011-G-02	NORMAL	FERMI	H-3		896	PCI/L
EF2-07-026S	E-2011-G-03	NORMAL	FERMI	H-3	<	LLD	PCI/L
EF2-07-026S	E-2011-G-04	NORMAL	FERMI	H-3	<	LLD	PCI/L

EF2-07-026S	E-2011-G-05	NORMAL	FERMI	H-3		485	PCI/L
EF2-07-026S	E-2011-G-06	NORMAL	FERMI	H-3		285	PCI/L
EF2-07-026S	E-2011-G-06	NORMAL	FERMI	H-3		285	PCI/L
EF2-07-026S	E-2011-G-07	NORMAL	FERMI	H-3	<	LLD	PCI/L
EF2-07-027S	E-2011-G-02	NORMAL	FERMI	H-3		680	PCI/L
EF2-07-027S	E-2011-G-03	NORMAL	FERMI	H-3	<	LLD	PCI/L
EF2-07-027S	E-2011-G-04	NORMAL	FERMI	H-3	<	LLD	PCI/L
EF2-07-027S	E-2011-G-05	NORMAL	FERMI	H-3		314	PCI/L
EF2-07-027S	E-2011-G-06	NORMAL	FERMI	H-3		228	PCI/L
EF2-07-027S	E-2011-G-06	NORMAL	FERMI	H-3		228	PCI/L
EF2-07-027S	E-2011-G-07	NORMAL	FERMI	H-3		371	PCI/L

Map of Current Monitor Well Locations



Appendix C

Rainwater Data and Analysis

Fermi 2 has documented the phenomenon of rainwater washout of gaseous effluents, in which tritium concentrations above background levels are routinely detected in rainwater samples collected on the Fermi 2 site. These positive samples are most often observed to the east of the Fermi plant, in prevailing wind direction from the plant and near the largest gaseous tritium release point--the turbine building ventilation exhaust vent. The Nuclear Regulatory Commission has also recognized this phenomenon of recapture of legally released gaseous effluents in NRC Regulatory Issue Summary 2008-03.

In order to continue to monitor this phenomenon, Fermi 2 collects rainwater samples and stormwater outfall samples at least once per quarter. These samples are analyzed for tritium, the radionuclide most likely to be detected. The table and map at the end of this appendix show tritium results and collection locations for 2011 rainwater samples. The following general points may be made about these data:

1) Higher rainwater tritium levels were detected east of the plant. This is to be expected based on the prevailing wind direction and proximity to the turbine building vent, as explained above. It is also consistent with the occasional detection of tritium in shallow groundwater wells, as mentioned in Appendix B.

2) Detection of tritium in rainwater samples is more frequent and at somewhat higher levels than in shallow groundwater wells. This is consistent with the dilution of rainwater tritium prior to its occurrence in groundwater wells.

3) Higher tritium levels seen at the stormwater outfall can be explained by runoff of relatively highly tritiated water from plant roofs (near plant vents).

4) Higher tritium levels in rainwater near the CST can be explained by periodic venting of tritiated water vapor from the CST and CRT (minor release points for tritium).

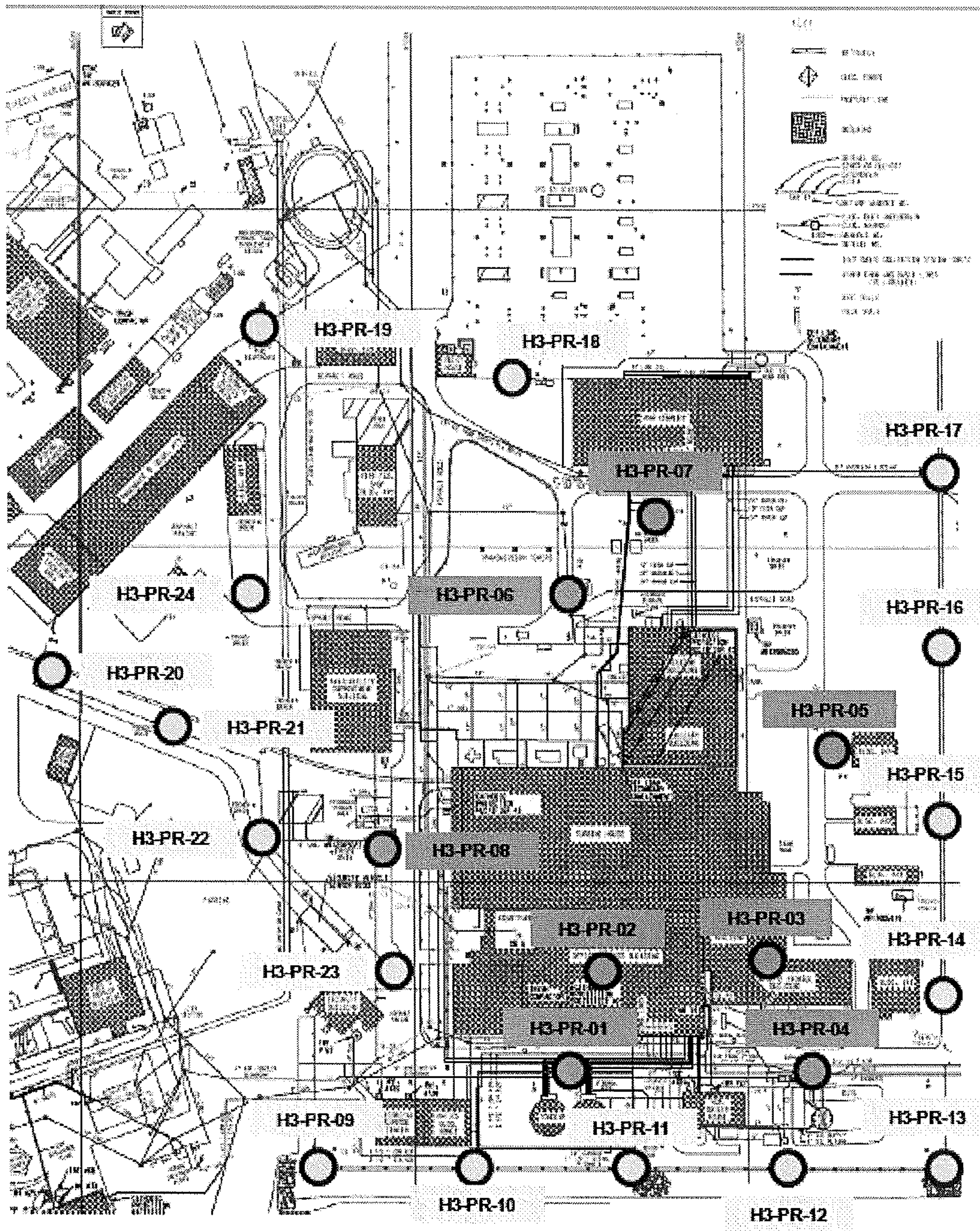
5) All rainwater and stormwater tritium concentrations were less than one tenth of the EPA drinking water limit. That is, the EPA considers water with tritium concentrations greater than 10 times the levels detected in Fermi rainwater to be safe for drinking.

The table on the following page presents 2011 rainwater and stormwater tritium analyses. The designation "< LLD" indicates that tritium in the sample was less than the calculated lower limit of detection for that sample.

SAMPLE LOCATION	SAMPLE_ID	SAMPLE DATE	PREFIX	H3 RESULT (pCI/L)
SOUTH OF CST (SNOW)	701573	2-Mar-11		309
EAST OF CST (SNOW)	701752	2-Mar-11		247
WEST OF CST (SNOW)	701754	2-Mar-11	<	LLD
NORTH OF CST (SNOW)	701755	2-Mar-11		403
H3-PR-01	701756	10-Mar-11		402
H3-PR-04	701757	10-Mar-11		433
H3-PR-14	701758	10-Mar-11		216
H3-PR-05	701759	10-Mar-11		247
H3-PR-07	701760	10-Mar-11	<	LLD
H3-PR-06	701761	10-Mar-11		525
H3-PR-08	701762	10-Mar-11		402
H3-PR-23	701763	10-Mar-11		370
H3-PR-24	701764	10-Mar-11	<	LLD
H3-PR-01	701890	17-Jun-11		1256
H3-PR-04	701891	17-Jun-11		1191
H3-PR-05	701892	17-Jun-11	<	LLD
H3-PR-06	701893	17-Jun-11	<	LLD
H3-PR-08	701895	17-Jun-11	<	LLD
H3-PR-14	701896	17-Jun-11		547
H3-PR-23	701897	17-Jun-11	<	LLD
H3-PR-24	701898	17-Jun-11	<	LLD
OUTFALL 002	701899	17-Jun-11	<	LLD
H3-PR-04	701951	12-Sep-11		797
H3-PR-05	701952	12-Sep-11		541
H3-PR-07	701953	12-Sep-11		228
H3-PR-08	701954	12-Sep-11		370
H3-PR-11(N)	701955	12-Sep-11		342
H3-PR-11(S)	701956	12-Sep-11		256
H3-PR-14	701957	12-Sep-11		740
H3-PR-23	701958	12-Sep-11	<	LLD
H3-PR-24	701959	12-Sep-11		399
OUTFALL 002	701960	12-Sep-11		541
OUTFALL 002	702030	15-Nov-11		1661
H3-PR-01	702031	15-Nov-11		394
H3-PR-04	702032	15-Nov-11	<	LLD
H3-PR-05	702033	15-Nov-11	<	LLD
H3-PR-06	702034	15-Nov-11	<	LLD
H3-PR-07	702035	15-Nov-11	<	LLD
H3-PR-08	702036	15-Nov-11		704
H3-PR-14	702037	15-Nov-11	<	LLD
H3-PR-23	702038	15-Nov-11		366
H3-PR-24	702039	15-Nov-11	<	LLD
PRECIP (S OF CRT)		15-Nov-11	<	LLD
PRECIP (S OF CST)		15-Nov-11		1663
OUTFALL 002	702049	13-Dec-11		484

The maps below shows the locations of the samples listed in the table on the preceding page:

RAIN WATER COLLECTION LOCATIONS



Appendix D

Meteorological Joint Frequency Distributions

Fermi 2 2011 Met Data

JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION ATMOSPHERIC STABILITY CLASS A

UMAX (M/S)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
0.34	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.012	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.012
1.12	0.035	0.070	0.046	0.023	0.023	0.035	0.012	0.012	0.012	0.012	0.012	0.023	0.070	0.058	0.070	0.035	0.545
2.01	0.128	0.116	0.139	0.046	0.081	0.267	0.267	0.128	0.255	0.255	0.232	0.313	0.545	0.522	0.359	0.209	3.861
2.91	0.186	0.035	0.162	0.139	0.371	0.777	0.765	0.649	0.649	0.533	0.394	0.580	0.638	0.893	1.009	0.406	8.186
3.80	0.232	0.104	0.104	0.267	0.336	0.661	0.742	0.533	0.348	0.696	0.545	0.290	0.394	0.719	0.545	0.545	7.062
5.14	0.162	0.162	0.093	0.383	0.301	0.475	0.139	0.058	0.012	0.765	0.394	0.325	0.128	0.301	0.406	0.151	4.256
6.48	0.070	0.128	0.000	0.128	0.197	0.070	0.035	0.000	0.000	0.209	0.116	0.035	0.046	0.070	0.023	0.012	1.136
8.27	0.000	0.023	0.000	0.046	0.023	0.000	0.000	0.000	0.000	0.058	0.070	0.000	0.000	0.000	0.000	0.000	0.220
10.51	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TOTAL	0.81	0.64	0.54	1.03	1.33	2.28	1.96	1.38	1.29	2.53	1.76	1.57	1.82	2.56	2.41	1.36	25.28

JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION ATMOSPHERIC STABILITY CLASS B

UMAX (M/S)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
0.34	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1.12	0.000	0.046	0.000	0.012	0.000	0.012	0.000	0.012	0.012	0.000	0.023	0.012	0.035	0.023	0.035	0.000	0.220
2.01	0.058	0.012	0.000	0.000	0.023	0.081	0.035	0.023	0.035	0.046	0.058	0.116	0.081	0.093	0.093	0.035	0.788
2.91	0.023	0.035	0.023	0.012	0.035	0.070	0.070	0.035	0.046	0.058	0.081	0.070	0.070	0.058	0.186	0.070	0.939
3.80	0.116	0.000	0.058	0.035	0.035	0.070	0.035	0.012	0.035	0.081	0.139	0.070	0.046	0.139	0.035	0.046	0.951
5.14	0.046	0.023	0.035	0.070	0.104	0.035	0.012	0.000	0.012	0.035	0.058	0.058	0.012	0.023	0.070	0.012	0.603
6.48	0.000	0.070	0.035	0.058	0.023	0.023	0.000	0.000	0.000	0.035	0.046	0.000	0.000	0.000	0.058	0.000	0.348
8.27	0.000	0.000	0.000	0.023	0.023	0.000	0.000	0.000	0.000	0.035	0.000	0.000	0.000	0.000	0.000	0.000	0.081
10.51	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TOTAL	0.24	0.19	0.15	0.21	0.24	0.29	0.15	0.08	0.14	0.29	0.41	0.32	0.24	0.34	0.48	0.16	3.93

JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION ATMOSPHERIC STABILITY CLASS C

UMAX (M/S)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
0.34	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1.12	0.012	0.023	0.012	0.000	0.000	0.000	0.000	0.000	0.012	0.012	0.000	0.035	0.046	0.000	0.023	0.035	0.209
2.01	0.070	0.035	0.012	0.000	0.046	0.058	0.035	0.046	0.035	0.035	0.093	0.139	0.093	0.093	0.093	0.058	0.939
2.91	0.070	0.070	0.058	0.023	0.058	0.093	0.000	0.046	0.012	0.081	0.058	0.081	0.058	0.070	0.151	0.151	1.078
3.80	0.058	0.046	0.081	0.070	0.023	0.046	0.012	0.000	0.012	0.104	0.058	0.070	0.023	0.116	0.023	0.081	0.823
5.14	0.093	0.035	0.058	0.116	0.070	0.035	0.000	0.023	0.000	0.093	0.278	0.162	0.012	0.000	0.023	0.035	1.032
6.48	0.000	0.012	0.035	0.035	0.023	0.000	0.000	0.000	0.000	0.012	0.012	0.000	0.000	0.000	0.000	0.000	0.128
8.27	0.046	0.012	0.000	0.000	0.023	0.012	0.000	0.000	0.000	0.023	0.012	0.000	0.000	0.000	0.000	0.000	0.128
10.51	0.000	0.000	0.000	0.000	0.012	0.000	0.000	0.000	0.000	0.012	0.000	0.000	0.000	0.000	0.000	0.000	0.023
TOTAL	0.35	0.23	0.26	0.24	0.26	0.24	0.05	0.12	0.07	0.37	0.51	0.49	0.23	0.28	0.31	0.36	4.36

JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION ATMOSPHERIC STABILITY CLASS D

UMAX (M/S)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
0.34	0.000	0.000	0.000	0.012	0.000	0.012	0.000	0.012	0.000	0.023	0.012	0.000	0.023	0.000	0.000	0.012	0.104
1.12	0.035	0.093	0.139	0.046	0.012	0.012	0.023	0.023	0.046	0.035	0.070	0.336	0.348	0.441	0.151	0.162	1.971
2.01	0.301	0.313	0.174	0.093	0.081	0.186	0.116	0.081	0.116	0.070	0.510	0.962	1.194	0.742	0.916	0.301	6.157
2.91	0.244	0.301	0.661	0.371	0.417	0.406	0.220	0.151	0.151	0.267	0.788	0.673	0.510	0.719	0.904	0.673	7.456
3.80	0.336	0.128	0.452	0.754	0.452	0.301	0.162	0.093	0.186	0.244	0.603	0.383	0.278	0.452	0.731	0.719	6.273
5.14	0.452	0.220	0.325	0.487	0.487	0.290	0.116	0.070	0.128	0.417	1.171	0.278	0.139	0.267	0.313	0.128	5.288
6.48	0.220	0.244	0.116	0.220	0.197	0.116	0.035	0.035	0.000	0.209	0.244	0.035	0.000	0.012	0.232	0.046	1.960
8.27	0.000	0.093	0.000	0.186	0.139	0.046	0.000	0.035	0.000	0.128	0.081	0.000	0.000	0.000	0.000	0.000	0.707
10.51	0.000	0.000	0.000	0.035	0.012	0.046	0.000	0.000	0.000	0.023	0.012	0.000	0.000	0.000	0.000	0.000	0.128
TOTAL	1.59	1.39	1.87	2.20	1.80	1.41	0.67	0.50	0.63	1.41	3.49	2.67	2.49	2.63	3.25	2.04	30.04

JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION ATMOSPHERIC STABILITY CLASS E

UMAX (M/S)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
0.34	0.000	0.000	0.000	0.000	0.012	0.000	0.000	0.023	0.012	0.000	0.012	0.023	0.000	0.046	0.000	0.000	0.128
1.12	0.116	0.116	0.093	0.081	0.046	0.058	0.046	0.093	0.104	0.116	0.290	0.638	0.707	0.649	0.209	0.093	3.455
2.01	0.255	0.290	0.220	0.162	0.244	0.174	0.151	0.197	0.510	0.557	1.044	1.044	0.591	1.102	1.229	0.464	8.233
2.91	0.174	0.035	0.209	0.255	0.267	0.220	0.186	0.487	0.417	0.858	0.626	0.209	0.209	0.441	0.232	0.336	5.160
3.80	0.104	0.046	0.081	0.116	0.348	0.255	0.209	0.383	0.313	0.545	0.209	0.093	0.023	0.035	0.081	0.139	2.980
5.14	0.116	0.000	0.058	0.000	0.093	0.128	0.220	0.151	0.174	0.487	0.151	0.000	0.000	0.000	0.081	0.012	1.670
6.48	0.000	0.058	0.000	0.000	0.046	0.046	0.035	0.058	0.000	0.104	0.035	0.000	0.000	0.000	0.012	0.000	0.394
8.27	0.000	0.000	0.000	0.000	0.012	0.012	0.000	0.023	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.046
10.51	0.000	0.000	0.000	0.000	0.000	0.023	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.023
TOTAL	0.77	0.54	0.66	0.61	1.07	0.92	0.85	1.41	1.53	2.67	2.37	2.01	1.53	2.27	1.84	1.04	22.09

JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION ATMOSPHERIC STABILITY CLASS F

UMAX (M/S)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
0.34	0.012	0.012	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.012	0.000	0.012	0.035	0.046	0.012	0.000	0.139
1.12	0.104	0.093	0.012	0.035	0.035	0.012	0.058	0.070	0.197	0.244	0.348	0.359	0.603	0.823	0.348	0.162	3.502
2.01	0.128	0.139	0.093	0.023	0.023	0.093	0.058	0.174	0.174	0.290	0.475	0.383	0.162	0.754	0.707	0.290	3.966
2.91	0.081	0.000	0.000	0.000	0.058	0.058	0.035	0.081	0.116	0.139	0.058	0.000	0.000	0.023	0.035	0.046	0.731
3.80	0.000	0.000	0.000	0.000	0.023	0.070	0.070	0.174	0.151	0.162	0.000	0.000	0.000	0.000	0.000	0.012	0.661
5.14	0.000	0.000	0.000	0.000	0.023	0.012	0.023	0.035	0.035	0.058	0.023	0.000	0.000	0.000	0.000	0.000	0.209
6.48	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.012	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.012
8.27	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10.51	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TOTAL	0.32	0.24	0.10	0.06	0.16	0.24	0.24	0.54	0.67	0.90	0.90	0.75	0.80	1.65	1.10	0.51	9.22

JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION ATMOSPHERIC STABILITY CLASS G

UMAX (M/S)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
0.34	0.000	0.012	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.012	0.000	0.023	0.012	0.023	0.012	0.000	0.093
1.12	0.046	0.023	0.023	0.012	0.023	0.023	0.000	0.046	0.081	0.058	0.070	0.162	0.591	0.812	0.186	0.151	2.308
2.01	0.186	0.058	0.012	0.023	0.000	0.012	0.035	0.035	0.012	0.046	0.278	0.197	0.220	0.545	0.035	0.174	1.867
2.91	0.070	0.000	0.000	0.000	0.012	0.046	0.058	0.128	0.023	0.023	0.000	0.000	0.000	0.023	0.000	0.000	0.383
3.80	0.012	0.000	0.000	0.000	0.012	0.023	0.035	0.139	0.081	0.023	0.000	0.000	0.000	0.000	0.000	0.000	0.325
5.14	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.104	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.104
6.48	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
8.27	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10.51	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TOTAL	0.31	0.09	0.03	0.03	0.05	0.10	0.13	0.45	0.20	0.16	0.35	0.38	0.82	1.40	0.23	0.32	5.08

END

ENCLOSURE 2
to
NRC-12-0029

2011 Annual Radiological Environmental Operating Report

Total Pages - 162

Enrico Fermi Atomic Power Plant, Unit 2
NRC Docket No. 50-341
NRC License No. NPF-43

FERMI 2 NUCLEAR POWER PLANT

DETROIT EDISON COMPANY

OPERATING LICENSE NO. NPF - 43

Fermi 2 - 2011 Annual
Radiological Environmental Operating Report

for the period of
January 1, 2011 through December 31, 2011

Prepared by:

Fermi 2
Radiological Engineering

Table of Contents — *Page*

List of Figures — *Page*

List of Tables — *Page*

Executive Summary

This Annual Radiological Environmental Operating Report is a detailed report on the Radiological Environmental Monitoring Program (REMP) conducted at Detroit Edison's Fermi 2 nuclear power plant from January 1 through December 31, 2011.

Samples collected as part of the REMP program were analyzed by GEL Laboratories, LLC. Radioactivity measurements for these samples are reported in terms of sample concentration or less than the Lab's Minimum Detectable Activity (MDA). Standard units of measure for reporting radioactivity are the Curie (Ci) for the amount of activity, and the Roentgen (R) for the amount of radiation exposure in free air. The unit of radioactivity used in this report is the picocurie (pCi). A picocurie is one-one trillionth of a curie. The unit of direct radiation used in this report is milliroentgen (mR). A milliroentgen is one-one thousandth of a roentgen. All radioactivity measurements for samples found to contain radioactivity are reported with a 2 sigma counting error, a standard counting practice.

The Radiological Environmental Monitoring Program is divided into four major parts. These four parts are direct radiation monitoring, atmospheric monitoring, terrestrial monitoring, and aquatic monitoring. The results of 2011 data showed that environmental radioactivity levels have not increased from background radioactivity levels detected prior to the operation of Fermi 2.

Direct radiation measurements were taken at 79 locations using thermoluminescent dosimeters (TLD). The average quarterly exposure was 14.3 mR/standard quarter for indicating locations. This average exposure is equivalent to the ambient radiation levels measured prior to the operation of Fermi 2.

Atmospheric monitoring results for 2011 showed radioactivity attributable to the nuclear accident at Fukushima, Japan. In addition, naturally occurring radioactivity was detected and was consistent with levels measured prior to the operation of Fermi 2. No radioactivity attributable to activities at Fermi 2 was detected greater than the MDA in any atmospheric samples during 2011.

Terrestrial monitoring results for 2011 of milk, groundwater, and leafy garden vegetable samples, showed only naturally occurring radioactivity and radioactivity associated with fallout from past atmospheric nuclear weapons testing. The radioactivity levels detected were consistent with levels measured prior to the operation of Fermi 2. No radioactivity attributable to activities at Fermi 2 was detected greater than the MDA in any terrestrial samples during 2011.

Aquatic monitoring results for 2011 of drinking water, surface water, sediment, and fish, showed only naturally occurring radioactivity and radioactivity associated with fallout from past atmospheric nuclear weapons testing and were consistent with levels measured prior to the operation of Fermi 2. No radioactivity attributable to activities at Fermi 2 was detected above the MDA in any aquatic samples during 2011.

REMP sampling did not identify any radioactivity above the MDA attributable to the operation of Fermi 2.

Radiological Environmental Monitoring Program Results

Direct Radiation Monitoring

Radiation is a normal component of the environment resulting primarily from natural sources, such as cosmic radiation and naturally occurring radionuclides; and to a lesser extent, from manmade sources such as fallout from past nuclear weapons testing. The earth is constantly bombarded by cosmic radiation in the form of high energy gamma rays and particulates. The earth's crust also contains natural radioactive material, such as uranium and potassium-40, which contributes to the background radiation. Direct radiation monitoring primarily measures ionizing radiation from cosmic and terrestrial sources.

Thermoluminescent Dosimeters

Fermi 2 uses thermoluminescent dosimeters (TLDs) to measure direct gamma radiation in the environs of Fermi 2. The TLDs are thoroughly tested to comply with NRC Regulatory Guide 4.13 and American National Standards Institute's (ANSI) publication N545-1975, which assure accurate measurements under varying environmental conditions before being placed in the field.

Fermi 2 has 79 TLD locations within a fifteen mile radius of the plant. Of the 79 TLD locations, 26 are located on-site and are not used for comparison with the control locations. These 26 TLDs are affected by Hydrogen Water Chemistry's sky shine and are not representative of off-site dose. Indicator TLDs are located within a ten mile radius of the plant and control TLDs are located at a distance that is outside the potential influence of the plant. While in the field, TLDs are exposed to background radiation and, if measurable, gaseous effluents and direct radiation from Fermi 2. Environmental TLDs are exchanged and processed on a quarterly basis. TLD data are reported in terms of milliroentgen per standard quarter (mR/std qtr), with a standard quarter being 91 days.

In 2011, the average exposure for TLDs at all off-site indicator locations was 14.3 mR/std qtr and for all control locations was 12.5 mR/std qtr. These exposures are consistent with preoperational and past operational measurements as shown in Figure 1.

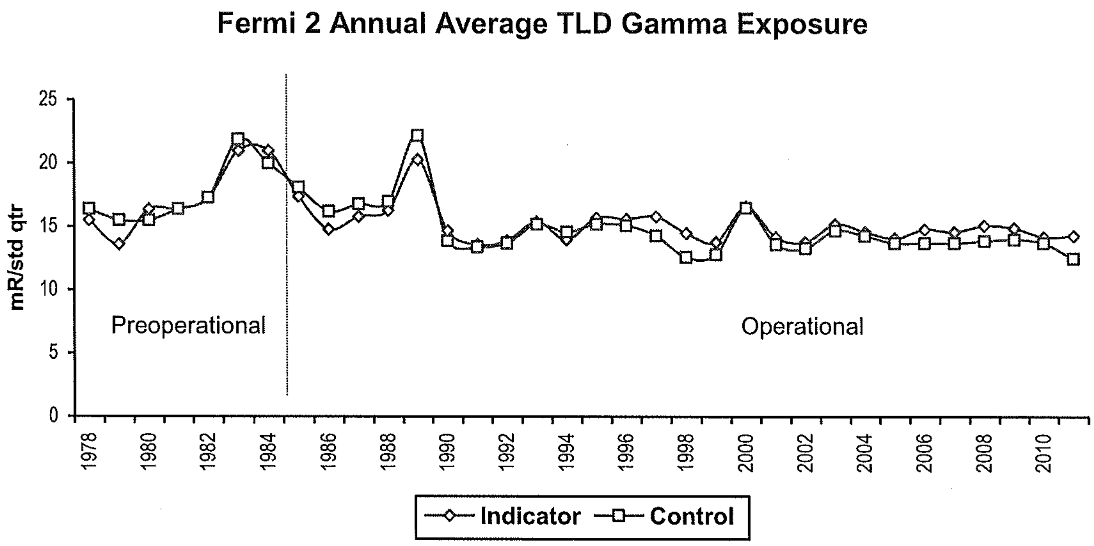


Figure 1 - Fermi 2 Annual Average TLD Gamma Exposure: The similarity between indicator and control results demonstrates that the operation of Fermi 2 has not caused any abnormal gamma exposure.

Atmospheric Monitoring

A potential exposure pathway to people is inhalation of airborne radioactive materials. Fermi 2 continuously samples the ambient air surrounding Fermi 2 for radioactivity. Air sampling began in 1979 during the preoperational program. At each sampling location, a mechanical air sampler is used to draw a continuous volume of air through two filters designed to collect particulates and radioiodines. Air samples are collected weekly and analyzed for gross beta radiation and iodine-131 gamma radiation. The particulate filters for each sampling location are combined on a quarterly basis to form a "composite sample" and are analyzed for gamma emitting radionuclides. There are four indicator sampling locations which were selected based on an evaluation of the predominant wind directions. A fifth sampling location is approximately fourteen miles west of the plant and is considered to be in a location unaffected by the operation of the plant. This is used as the control location.

Air Sampling

On October 16, 1980, the People's Republic of China conducted an atmospheric nuclear weapon test. The fallout from this test was detected in Fermi 2 preoperational environmental air samples in 1981 (see Figure 2). The average gross beta for 1981 was 1.60E-1 pCi/cubic meter for indicator samples and 2.40E-1 pCi/cubic meter for control samples which was a factor of ten times greater than background gross beta. Gamma spectroscopic analyses of the particulate filters indicated cesium-137, cerium-141, cerium-144, ruthenium-103, ruthenium-106, zirconium-95, niobium-95, manganese-54, and antimony-125 in the atmosphere as a result of this test. In 1986, as shown in Figure 2, there was a slight increase in gross beta activity and a 2.70E-1 pCi/cubic meter "spike" in the iodine-131 activity. These elevated levels in 1986 are attributed to the nuclear accident at Chernobyl on April 26, 1986. For all other years, the iodine-131 activity was below the lower limit of detection (LLD) of 7.0E-2 pCi/cubic meter.

On March 11, 2011, following the Tohoku earthquake and tsunami the Fukushima Daiichi Nuclear Power Plant in Japan, experienced a series of equipment failures, fuel-melt, and releases of radioactivity to the environment.

Within weeks of the accident, US nuclear power plant REMP programs and other monitoring stations detected the radioactivity from Japan mainly in the form of airborne iodine-131.

During the week of April 5, 2011, all five (5) of Fermi's air monitoring stations detected radioactivity greater than the MDA at an average airborne gross beta of 7.12E-2 pCi/cubic meter and 8.12E-2 pCi/cubic meter for iodine-131 due to the accident at Fukushima Daiichi Nuclear Power Plant.

During 2011, two hundred and fifty-four (254) particulate air filters and charcoal cartridges were collected and analyzed for gross beta activity and iodine-131 respectively. The average gross beta for indicator samples was 4.70E-2 pCi/cubic meter and 4.15E-2 pCi/cubic meter for control samples. None of the charcoal filters collected showed detectable levels of iodine-131greater than the MDA attributable to the operation of Fermi 2. The following table contains the annual average gross beta results of all five sample locations for 2011.

2011 Average Gross Beta Concentrations in Air Particulates (pCi/m^3)

Table 1

Station	Description (sector/distance)	Annual Average
API-1 (I)	Estral Beach (NE/1.4 mi.)	4.72E-2
API-2 (I)	Site Boundary (NNW/0.6 mi.)	4.51E-2
API-3 (I)	Site Boundary (NW/0.6 mi.)	4.49E-2
API-4 (C)	North Custer Rd. (W/14 mi.)	4.15E-2
API-5 (I)	Site Boundary (S/1.2 mi.)	5.06E-2

(I) = Indicator Station (C) = Control Station

Twenty (20) quarterly particulate filter composites were prepared and analyzed for gamma emitting radionuclides. Naturally occurring beryllium-7 was detected in both indicator and control samples and naturally occurring potassium-40 was detected in indicator samples.

In conclusion, the atmospheric monitoring data are consistent with preoperational and prior operational data and show no adverse long-term trends in the environment attributable to operation of Fermi 2 as illustrated in Figures 2 and 3.

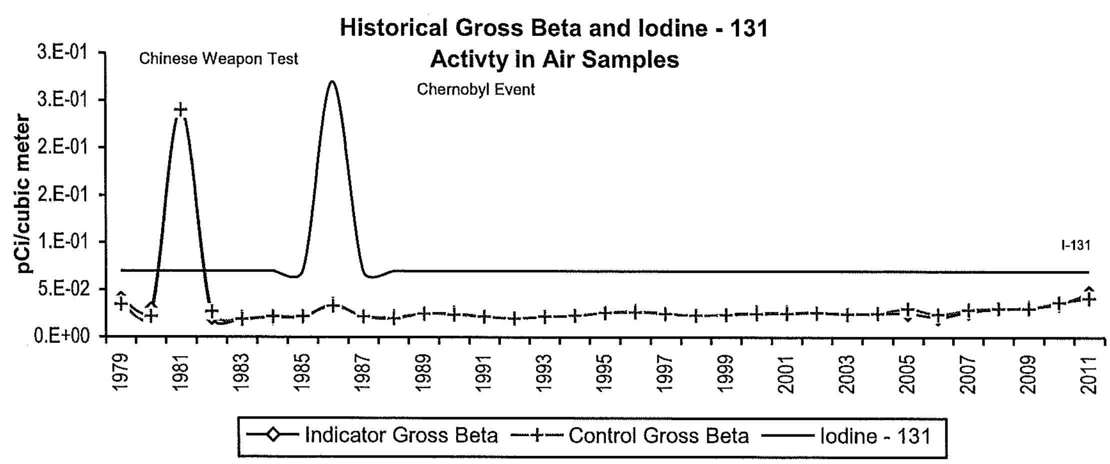


Figure 2 - Historical Gross Beta and Iodine-131 Activity in Air Samples; The similarity between indicator and control gross beta results demonstrates that the operation of Fermi 2 has had no adverse long-term trends in the environment. The lower limit of detection (LLD) for iodine-131 is 0.07 pCi/cubic meter.

Fermi 2 Air Particulate Gross Beta 2011

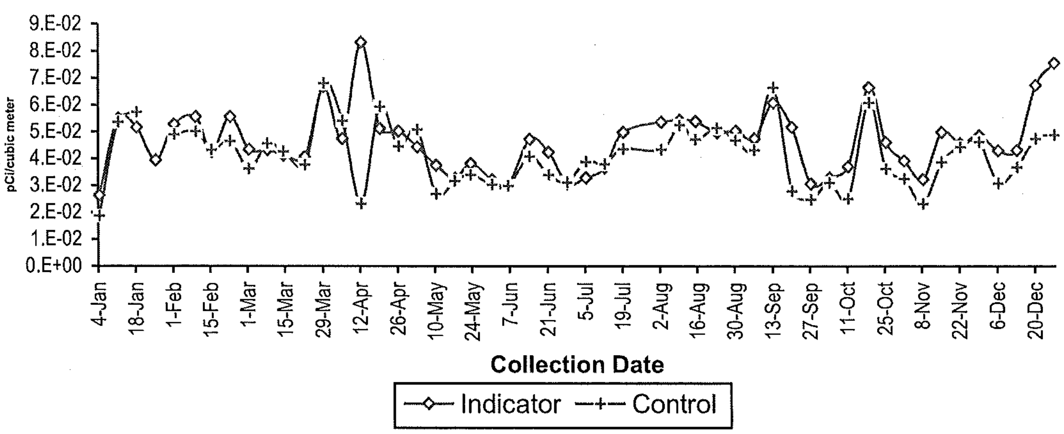


Figure 3 - Fermi 2 Air Particulate Gross Beta for 2011; the concentration of beta emitting radionuclides in airborne particulates samples was essentially identical at indicator and control locations. Gross beta activity varies throughout the year and is primarily an effect of seasonal precipitation. The end of March and start of April peaks were due to the Fukushima accident

Terrestrial Monitoring

Radionuclides released to the atmosphere may deposit on soil and vegetation, and therefore, may eventually be incorporated into the human food chain. To assess the impact of Fermi 2 operations to humans from the ingestion pathway, samples of milk, green leafy vegetables, and groundwater are collected and analyzed for radioactivity. The following sections discuss the type and frequency of terrestrial sampling, analyses performed, and a comparison of 2011 data to previous operational and preoperational data.

Milk Sampling

A major pathway in the human food chain is the consumption of milk from grazing animals (dairy cows or goats) due to biological concentration and the short turn around time in this pathway. Milk is collected from one indicator location and one control location semimonthly when animals are in the pasture, and monthly when the animals are on stored feed. The milk is analyzed for iodine-131, gamma emitting radionuclides, and strontium-89/90. At times when milk samples are not available, grass samples are collected at both the control milk sample location and the location where milk is not available. Grass samples are analyzed for iodine-131 and other gamma emitting radionuclides. During 2011, no grass samples were scheduled or collected for the REMP.

Milk sampling began in 1979 during the preoperational program. During this time period, milk samples were analyzed for iodine-131 and other gamma emitting radionuclides. Cesium-137 and naturally occurring potassium-40 were the only radionuclides detected in milk samples during the preoperational program. The cesium-137 concentration averaged 3.60E+0 pCi/liter and is due to past atmospheric nuclear weapons testing. In 1986, after the nuclear accident at Chernobyl, iodine-131 and cesium-137 were detected in both indicator and control milk samples. The average concentration was 3.70E+0 pCi/liter for iodine-131 and 6.60E+0 pCi/liter for cesium-137.

The analysis for strontium-89/90 began in 1988, and strontium-90 is routinely detected in both indicator and control milk samples because of past atmospheric nuclear weapons testing.

During 2011, thirty four (34) milk samples were collected and analyzed for iodine-131, gamma emitting radionuclides, and strontium-89/90. No iodine-131 or strontium-89/90was detected greater than the MDA in any of the samples.

Naturally occurring potassium-40 was detected in both indicator and control samples.

In 1970, the concentration of strontium-90 in Monroe County milk was 6.00E+0 pCi/liter according to the Michigan Department of Health's "Milk Surveillance," Radiation Data and Reports, Vol. 11-15, 1970-1974. Figure 4 shows the calculated radiological decay curve for the 1970 concentration of strontium-90 and the average concentrations since 1988. This graph illustrates that the inventory of strontium-90 in the local environment is decreasing with time and closely follows the calculated decay curve. This supports the determination that the inventory of strontium-90 in the environment is due to fallout from past atmospheric nuclear weapons testing and not the operation of Fermi 2.

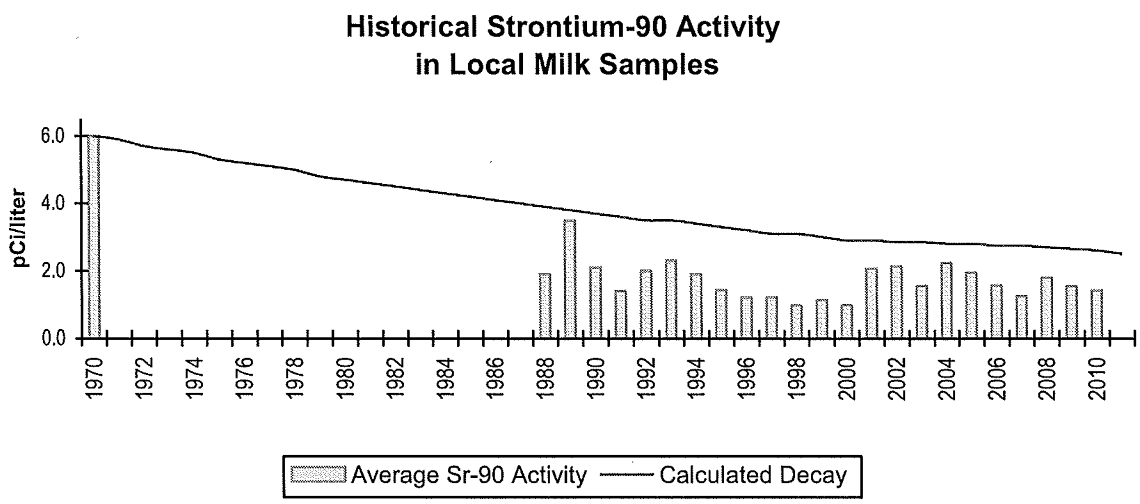


Figure 4 - Historical Strontium-90 Activity in Local Milk Samples; the concentration of strontium-90 in local milk samples is decreasing with time and is below the calculated decay curve. This supports the fact that strontium-90 in local milk is due to fallout from past atmospheric nuclear weapons testing and not the operation of Fermi 2.

Groundwater Sampling

In areas not served by municipal water systems, water supplies for domestic use are generally obtained from private wells. The network of private wells presently in use forms the source of water for domestic and livestock purposes in farms and homes west and north of the site. With the construction of new water plants and distribution systems, the water use trend in the area is from groundwater (local wells) to surface water (municipal water supply).

Groundwater is collected on a quarterly basis from four wells surrounding Fermi 2. The groundwater is analyzed for gamma emitting radionuclides and tritium. Sampling location GW-4, which is located approximately 0.6 miles west northwest, is designated as the control location because it is up-gradient and is least likely to be affected by the operation of the plant. The other three sampling locations are down-gradient from Fermi 2 and designated as indicator locations.

Groundwater sampling began in 1987, during the operational period of the REMP program. From 1987 to 1996, naturally occurring potassium-40, cesium-137, and tritium were detected in both indicator and control samples. The average concentration was 7.71E+0 pCi/liter for cesium-137 and 1.50E+2 pCi/liter for tritium. The presence of cesium-137 and tritium in groundwater samples is due to fallout from past atmospheric nuclear weapons testing leaching into the soil and becoming incorporated into the groundwater. From 1997 to 2008, only naturally occurring potassium-40 activity was detected in groundwater samples.

In 2011, sixteen (16) groundwater samples were collected and analyzed for gamma emitting radionuclides and tritium. During 2011, no samples detected any activity greater than the MDA.

Garden Sampling

Fermi 2 collects samples of broad leaf vegetables from indicator locations identified by the annual Land Use Census. Samples are also collected at a control location that is at a distance and direction which is considered to be unaffected by plant operations. Samples are collected once a month during the growing season (June through September) and are analyzed for iodine-131 and other gamma emitting radionuclides.

Vegetable sampling started in 1982. During the preoperational period from 1982 to 1985, only naturally occurring potassium-40 was detected in both indicator and control vegetable samples. During the operational period from 1985 to 1990 and 1994 to 1995, only naturally occurring potassium-40 was detected in both indicator and control vegetable samples. However, in 1991, 1992, and 1993, cesium-137 was detected in one indicator sample each year and had an average concentration of 1.2E+1 pCi/kilogram.

Cesium-137 may become incorporated into plants by either uptake from the soil or direct deposition on foliar surfaces. Since cesium-137 is normally not detected in gaseous effluent samples from Fermi 2, and there have been no recent atmospheric weapons testing or nuclear accidents, the incorporation of cesium-137 by direct deposition is highly unlikely. The most probable source of cesium-137 in vegetable samples is the uptake of previously deposited cesium-137, which has leached into the soil. This cesium activity is attributed to fallout from past atmospheric weapons testing and to the nuclear accident at Chernobyl.

During 2011, ten (10) vegetable samples were collected and analyzed for iodine-131 and other gamma emitting radionuclides. No iodine-131 was detected greater than the MDA in vegetable samples during 2011. The only gamma emitting radionuclide detected were naturally occurring potassium-40and beryllium-7 in both indicator and control samples.

Terrestrial monitoring results for 2011 of milk, groundwater and leafy garden vegetable samples, showed only naturally occurring radioactivity. The radioactivity levels detected were consistent with levels measured prior to the operation of Fermi 2 and no radioactivity attributable to activities at Fermi 2 was detected greater than the MDA in any terrestrial sample. In conclusion, the terrestrial monitoring data show no adverse trends in the terrestrial environment.

Aquatic Monitoring

Lake Erie, on which Fermi 2 borders, is used as a source for drinking water, as well as for recreational activities such as fishing, swimming, sunbathing, and boating. For this reason, Lake Erie and its tributaries are routinely monitored for radioactivity.

The aquatic monitoring portion of the REMP consists of sampling raw municipal drinking water, surface water, lake sediments, and fish for the presence of radioactivity. The following sections discuss the type and frequency of aquatic sampling, analyses performed, and a comparison of 2011 data to previous operational and preoperational data.

Drinking Water Sampling

Fermi 2 monitors drinking water at one control location and one indicator location using automatic samplers. The automatic samplers collect samples at time intervals that are very short (hourly) relative to the sample collection period (monthly) in order to assure that a representative sample is obtained. Indicator water samples are obtained at the Monroe water intake located approximately 1.1 miles south of the plant. Detroit municipal water is used for the control samples and is obtained at the Allen Park water intake located approximately 18.6 miles north of the plant. Drinking water samples are collected on a monthly basis and analyzed for gross beta, strontium-89/90, and gamma emitting radionuclides. The monthly samples for each location are combined on a quarterly basis and analyzed for tritium activity.

In late 1980, as shown in Figure 5, an atmospheric nuclear weapon test was conducted by the People's Republic of China. As a result of this test, the average gross beta for 1981 was 9.80E+0 pCi/liter for water samples. Figure 5 also shows that, except for the Chinese weapons testing, the historic drinking water sample data are below or slightly above the lower limit of detection (4.00E+0 pCi/liter) required by US Environmental Protection Agency (USEPA) National Interim Primary Drinking Water regulations. Even during the Chinese weapons testing, the drinking water samples did not exceed the USEPA maximum allowable criteria of 5.00E+1 pCi/liter gross beta. In 1980 and 1983, cesium-137 was detected in drinking water samples at levels ranging from 5.40E+0 pCi/liter to 1.90E+1 pCi/liter. Tritium was also detected during the preoperational program and had an average of 3.25E+2 pCi/liter. The presence of cesium-137 and detectable levels of tritium in these water samples is due to fallout from past atmospheric nuclear weapons testing and naturally occurring tritium.

From 1985 to 2010, the average annual gross beta activity for indicator samples was 4.09E+0 pCi/liter and 3.46E+0 pCi/liter for control samples. The analysis for strontium-89/90 began in 1988, and strontium-90 has in the past been detected in both indicator and control samples. The average strontium-90 activity for indicator samples was 7.25E-1 pCi/liter and 7.56E-1 pCi/liter for control samples during this time period. Tritium was also detected in both indicator and control drinking water samples during this time period. The average tritium activity for indicator samples was 2.52E+2 pCi/liter and 2.60E+2 pCi/liter for control samples. The presence of strontium-90 and detectable levels of tritium in these water samples is due to fallout from past atmospheric nuclear weapons testing and naturally occurring tritium.

In 2011, twenty-four (24) drinking water samples were collected and analyzed for gross beta, gamma emitting radionuclides, strontium-89/90, and tritium. Gross beta activity was detected in one indicator sample at 6.38E+0 pCi/liter and one control sample at 5.72E+0 pCi/liter. Naturally occurring potassium-40 was detected in one indicator sample. No strontium-89/90 activity was detected greater than the MDA in drinking water samples during 2011. Eight (8) quarterly composite drinking water samples were prepared and analyzed for tritium. No tritium activity was detected greater than the MDA in drinking water samples during 2011.

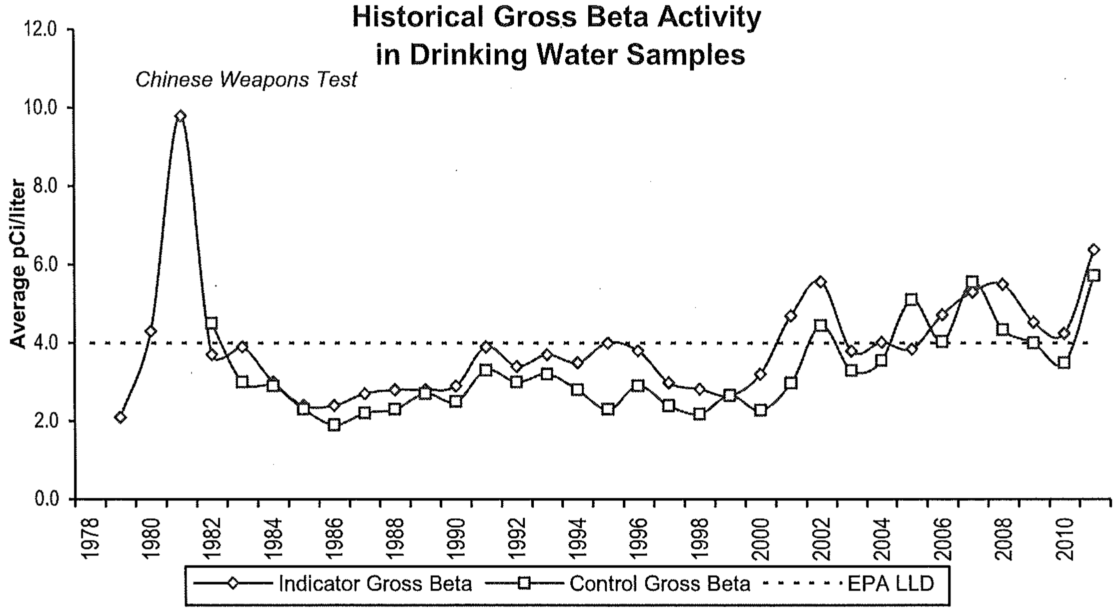


Figure 5 - Historical Gross Beta Activity in Drinking Water Samples. Since 1982, the annual concentrations of beta emitting radionuclides in drinking water samples collected from indicator locations have been consistent with those from control locations. This shows that Fermi 2 has had no measurable radiological impact on local drinking water.

Surface Water Sampling

Fermi 2 monitors surface water at two locations using automatic samplers. As with drinking water, surface water samples are collected at time intervals that are very short (hourly) relative to the sample collection period (monthly) in order to assure obtaining a representative sample. Indicator surface water samples are obtained at the Fermi 2 General Service Water building, located approximately 0.3 miles south southeast from Fermi 2. The control surface water samples are obtained from Trenton Channel Power Plant's cooling water intake on the Detroit River, which is approximately 11.7 miles north northeast of Fermi 2. Surface water samples are collected on a monthly basis and analyzed for strontium-89/90 and gamma emitting radionuclides. The monthly samples for each location are combined on a quarterly basis to form a quarterly composite sample and are analyzed for tritium.

Surface water sampling began in 1979, and the samples were analyzed for gamma emitting radionuclides and tritium. During this preoperational program, no gamma emitting radionuclides, except for naturally occurring potassium-40, were detected. Tritium was detected in both indicator and control samples during this time period and had an average concentration of 3.15E+2 pCi/liter. This tritium activity represents the background concentration due to naturally occurring tritium and tritium produced during past atmospheric nuclear weapons testing.

From 1985 to 2010, as part of the operational program, surface water samples were analyzed for gamma emitting radionuclides and tritium. The analysis for strontium-89/90 did not begin until 1988, and strontium-90 was detected in both indicator and control samples. The average strontium-90 concentration for this time period was 1.13E+0 pCi/liter. In 1990, two indicator samples showed detectable activity for cesium-137 at an average concentration of 1.20E+1 pCi/liter. The presence of cesium-137 and strontium-90 in these water samples is due to fallout from past atmospheric nuclear weapons testing. Tritium was detected in both indicator and control surface water samples during this time period at a concentration of 2.31E+2 pCi/liter. This tritium activity is consistent with background levels measured during the preoperational program.

In 2011, twenty-four (24) surface water samples were collected and analyzed for gamma emitting radionuclides and strontium-89/90. From these samples, eight (8) quarterly composite samples were prepared and analyzed for tritium. During 2011, no gamma emitting radionuclides, strontium-89/90 or tritium was detected greater than theMDA in surface water samples.

Sediment Sampling

Sediments often act as a sink (temporary or permanent) for radionuclides, but they may also become a source, as when they are resuspended during periods of increased turbulence or are dredged and deposited elsewhere. Sediment, in the vicinity of the liquid discharge point, represents the most likely site for accumulation of radionuclides in the aquatic environment, and with long-lived radionuclides, a gradual increase in radioactivity concentration would be expected over time if discharges occur. Sediment, therefore, provides a long-term indication of change that may appear in other sample media (i.e., water and fish samples).

Lake Erie shoreline and bottom sediments from five locations are collected on a semiannual basis (Spring and Fall) and are analyzed for gamma emitting radionuclides and strontium-89/90. There is one control location and four indicator locations. The control sample is collected near the Trenton Channel Power Plant's cooling water intake. The indicator samples are collected at Estral Beach, north of the Fermi 2 liquid discharge area, the shoreline at the end of Pointe Aux Peaux, and Indian Trails Community Beach.

During the preoperational program, there was not a control location, and indicator samples were analyzed for gamma emitting radionuclides. During the preoperational program, except for naturally occurring radionuclides, only cesium-137 was detected in sediment samples. For this time period, the average cesium-137 concentration was 3.27E+2 pCi/kilogram. The presence of cesium-137 in these sediment samples is due to fallout from past atmospheric nuclear weapons testing.

From 1985 to 2010, cesium-137, strontium-90, and naturally occurring radionuclides were detected in sediment samples. The average cesium-137 concentration was 1.22E+2 pCi/kilogram for all samples. The analysis for strontium-89/90 began in 1988, and strontium-90 has been routinely detected at similar concentrations in both indicator and control samples. The average strontium-90 activity for indicator samples was 1.80E+2 pCi/kilogram and 1.98E+2 pCi/kilogram for control samples. The presence of cesium-137 and strontium-90 in these sediment samples is due to fallout from past atmospheric nuclear weapons testing.

In 1990 and 1991, the Spring samples taken at the Fermi 2 liquid discharge line (Location S-2) showed activity for plant related radionuclides (manganese-54, cobalt-58, cobalt-60, and zinc-65) and was determined to be a result of liquid effluent from Fermi 2. The sample results were well below any regulatory reporting limits and were consistent with the activity released from the plant in liquid effluents as per the approved effluent program. The dose impact was negligible due to these effluents.

In 2011, ten (10) sediment samples were collected and analyzed for gamma emitting radionuclides and strontium 89/90. Cesium-137 was detected in one control sample with a concentration of 1.00E+2 pCi/kilogram. The presence of cesium-137 in sediment samples is due to fallout from past atmospheric nuclear weapons testing. Naturally occurring radionuclide potassium-40 was also detected in both indicator and control sediment samples for this sampling period.

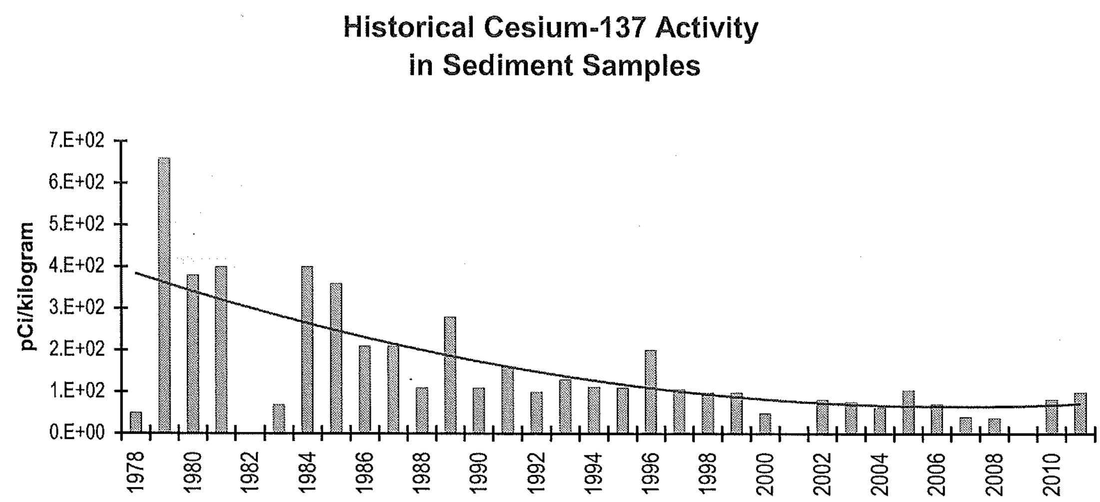


Figure 6 - Historical Cesium-137 Activity in Sediment Samples. As the calculated trend shows, the concentration of cesium-137 in Lake Erie sediments is decreasing with time. This supports the fact that cesium-137 in Lake Erie sediments is due to fallout from past atmospheric nuclear weapons testing and not the operation of Fermi 2.

Figure 6 shows the historical concentration of cesium-137 in sediment samples from 1978 to 2011. Using the data from these years, and the statistical method of least squares, an exponential curve can be calculated that represents the cesium-137 concentration in sediment. This curve has a negative slope which indicates the overall concentration of cesium-137 in the environment is decreasing with time. This supports the fact that the inventory of cesium-137 in the environment is due to fallout from past atmospheric nuclear weapons testing and not from the operation of Fermi 2.

Fish Sampling

Samples of fish are collected from Lake Erie at three locations on a semiannual basis. There are two control locations and one indicator location. The two control locations are offshore of Celeron Island and in Brest Bay. The indicator location is approximately 1200 feet offshore of the Fermi 2 liquid effluent discharge. Edible portions of the fish are analyzed for gamma emitting radionuclides and strontium-89/90.

During the preoperational program, fish samples were analyzed for gamma emitting radionuclides. Only cesium-137 and naturally occurring potassium-40 were detected during this time period. The average concentration of cesium-137 for indicator samples was 3.53E+1 pCi/kilogram and 4.20E+1 pCi/kilogram for control samples. The presence of cesium-137 in these fish samples is due to fallout from past atmospheric nuclear weapons testing.

From 1985 to 2010, cesium-137 and naturally occurring potassium-40 were detected in fish samples. The average cesium-137 concentration for indicator samples was 3.82E+1 pCi/kilogram and 3.92E+1 pCi/kilogram for control samples. The analysis for strontium-89/90 began in 1990, and strontium-90 was routinely detected at similar concentrations in both indicator and control samples. The average strontium-90 concentration for indicator samples was 3.84E+1 pCi/kilogram and 3.15E+1 pCi/kilogram for control samples. The presence of cesium-137 and strontium-90 in these fish samples is due to fallout from past atmospheric nuclear weapons testing.

In 2011, twenty-four (24) fish samples were collected and analyzed for gamma emitting radionuclides and strontium-89/90. Only naturally occurring potassium-40 was detected in both control and indicator fish samples for 2011.

Aquatic monitoring results for 2011 of water, sediment, and fish showed only naturally occurring radioactivity and radioactivity associated with fallout from past atmospheric nuclear weapons testing and were consistent with levels measured prior to the operation of Fermi 2. In conclusion, no radioactivity attributable to activities at Fermi 2 was detected greater than the MDA in any aquatic sample during 2011 and no adverse long-term trends are shown in the aquatic monitoring data.

Land Use Census

The Land Use Census is conducted in accordance with the Fermi 2 Offsite Dose Calculation Manual (ODCM), control 3.12.2, and satisfies the requirements of Section IV.B.3 of Appendix I to 10 CFR Part 50. This census identifies changes in the use of unrestricted areas to permit modifications to monitoring programs for evaluating doses to individuals from principal pathways of exposure. The pathways of concern are listed below:

- **Inhalation Pathway** - Internal exposure as a result of breathing radionuclides carried in the air.

- **Ground Exposure Pathway** - External exposure from radionuclides deposited on the ground.

- **Plume Exposure Pathway** - External exposure directly from a plume or cloud of radioactive material.

- **Vegetation Pathway** - Internal exposure as a result of eating vegetables which have absorbed deposited radioactive material or which have absorbed radionuclides through the soil.

- **Milk Pathway** - Internal exposure as a result of drinking milk which may contain radioactive material as a result of dairy animals grazing on a pasture contaminated by radionuclides.

- **Meat Pathway** - Internal exposure as a result of consuming meat which may contain radioactive material as a result of animals grazing on a pasture contaminated by radionuclides.

The Land Use Census is conducted during the growing season and is used to identify, within a radius of 5 miles, the location of the nearest residences, milk animals, meat animals, and gardens (greater than 50 square meters and containing broad leaf vegetation) in each of 16 meteorological sectors surrounding Fermi 2. Gardens greater than 50 square meters are the minimum size required to produce the quantity (26 kg/year) of leafy vegetables assumed in NRC Regulatory Guide 1.109 for consumption by a child. To determine this minimum garden size, the following assumptions were made: (1) 20% of the garden is used for growing broad leaf vegetation (i.e., lettuce and cabbage); and (2) a vegetation yield of 2 kg/square meter.

2011 Land Use Census Results

The Land Use Census is conducted in accordance with ODCM control 3.12.2 and satisfies the requirements of Section IV.B.3 of Appendix I to 10 CFR Part 50. This census identifies changes in the use of unrestricted areas to permit modifications to monitoring programs for evaluating doses to individuals from principal pathways of exposure. The annual Land Use Census is conducted during the growing season and is used to identify, within a radius of 5 miles, the location of the closest residences, milk animals, meat animals, and gardens in each of the 11 land based meteorological sectors surrounding Fermi 2.

The 2011 Land Use Census was performed during the month of August. The 2011 census data were obtained with the use of Global Positioning System (GPS) equipment. These data were compared to the 2010 data to determine any significant changes in the use of the land. The results of the census are tabulated in Tables 2 – 5 of this report.

No significant changes in the land use between 2010 and 2011 were found that would require changing the location of the "maximum exposed individual." There were no changes in the category of closest residences. There were slight changes in the meteorological sectors in the category of closest gardens. The changes were identifying slightly closer gardens in a few sectors. See Table 3 for these changes. The "maximum exposed individual" is located in the West-North-West sector and at one time participated in the REMP program. In the past few years this location did not have a garden, but in 2007-2008 a garden was planted at this location. In the category of closest milk locations, there were no changes. All milk locations that were identified are pets and, any milk produced, is not use for human consumption. There were no changes found in the category of closest meat locations. As with past surveys, this census identified new residential housing construction that shows a continuing trend of converting agricultural land to other uses in the area surrounding Fermi 2.

As stated above, there were no significant changes in the 2011 land use that would require changing the location of the "maximum exposed individual." For that reason, the location of "maximum exposed individual" remains the same and is described as follows:

Pathway	Sector	Azimuth (degrees)	Distance (miles)	Age Group	Maximum Organ
Ingestion (vegetation)	WNW	300.6	0.72	Adult	Thyroid

2011 LAND USE CENSUS
Closest Residences

Table 2

Sector	Year	Azimuth (degrees)	Distance (miles)	Change (miles)
N	2010	8.9	1.11	
	2011	8.9	1.11	0.00
NE	2010	34.7	1.10	
	2011	34.7	1.10	0.00
NNE	2010	16.6	1.08	
	2011	16.6	1.08	0.00
NNW	2010	334.9	1.09	
	2011	334.9	1.09	0.00
NW	2010	309.7	1.07	
	2011	309.7	1.07	0.00
S	2010	169.6	1.03	
	2011	169.6	1.03	0.00
SSW	2010	200.1	1.12	
	2011	200.1	1.12	0.00
SW	2010	229.3	1.26	
	2011	229.3	1.26	0.00
W	2010	259.2	1.19	
	2011	259.2	1.19	0.00
WNW(a)	2010	302.3	0.72	
	2011	302.3	0.72	0.00
WSW	2010	236.3	1.39	
	2011	236.3	1.39	0.00

(a) = Location of "maximum exposed individual"

2011 LAND USE CENSUS

Closest Gardens

Table 3

Sector	Year	Azimuth (degrees)	Distance (miles)	Change (miles)
N	2010	358.5	2.13	
	2011	0.1	1.61	-0.52
NE	2010	51.8	1.85	
	2011	51.8	1.85	0.00
NNE	2010	30.6	1.91	
	2011	27.9	1.84	-0.07
NNW	2010	332.1	2.57	
	2011	327.1	1.41	-1.16
NW	2010	315.5	1.51	
	2011	315.5	1.51	0.00
S	2010	170.0	1.01	
	2011	170.0	1.01	0.00
SSW	2010	201.9	1.59	
	2011	192.4	1.44	-0.15
SW	2009	None identified	None identified	
	2010	234.7	4.26	4.26
W	2010	266.7	1.70	
	2011	260.9	1.60	-0.10
WNW	2010	297.7	4.40	
	2011	287.5	4.38	-0.02
WSW	2010	250.5	2.38	
	2011	245.1	1.79	-0.59

2011 LAND USE CENSUS

Milk Locations

Table 4

Sector	Year	Azimuth (degrees)	Distance (miles)	Change (miles)	Type
N	2010	9.9	4.32		Goat
	2011	9.9	4.32	0.00	Goat
NE	2010	None identified	None identified		
	2011	None identified	None identified		
NNE	2010	None identified	None identified		
	2011	None identified	None identified		
NNW	2010	None identified	None identified		
	2011	None identified	None identified		
NW	2010	None identified	None identified		
	2011	None identified	None identified		
S	2010	None identified	None identified		
	2011	None identified	None identified		
SSW	2010	None identified	None identified		
	2011	None identified	None identified		
SW	2010	None identified	None identified		
	2011	None identified	None identified		
W	2010	None identified	None identified		
	2011	None identified	None identified		
WNW	2010	297.4	2.38		Goat
	2011	297.4	2.38	0.00	Goat
WSW	2010	None identified	None identified		
	2011	None identified	None identified		

2011 LAND USE CENSUS

Closest Meat Locations

Table 5

Sector	Year	Azimuth (degrees)	Distance (miles)	Change (miles)	Type
N	2010	None identified	None identified		
	2011	None identified	None identified		
NE	2010	None identified	None identified		
	2011	None identified	None identified		
NNE	2010	None identified	None identified		
	2011	None identified	None identified		
NNW	2010	338.2	4.36		Sheep
	2011	338.2	4.36	0.00	Sheep
NW	2010	321.4	3.02		Beef
	2011	321.4	3.02	0.00	Beef
S	2010	None identified	None identified		
	2011	None identified	None identified		
SSW	2010	None identified	None identified		
	2011	None identified	None identified		
SW	2010	None identified	None identified		
	2011	None identified	None identified		
W	2010	None identified	None identified		
	2011	None identified	None identified		
WNW	2010	287.5	1.65		Beef
	2011	287.5	1.65	0.00	Beef
WSW	2010	None identified	None identified		
	2011	None identified	None identified		

Appendix A

Sampling Locations

Direct Radiation Sample Locations

Table A-1

Station Number	Meteorological Sector/Azimuth (Degrees)	Distance from Reactor (Approx.)	Description	Collection Frequency	Type
T1	NE/38°	1.3 mi.	Estral Beach, Pole on Lakeshore 23 Poles S of Lakeview. (Special Area)	Q	I
T2	NNE/22°	1.2 mi.	Pole at termination of Brancheau St. (Special Area)	Q	I
T3	N/9°	1.1 mi.	Pole, NW corner of Swan Boat Club fence. (Special Area)	Q	I
T4	NNW/337°	0.6 mi.	Site boundary and Toll Rd. on Site fence by API #2.	Q	I
T5	NW/313°	0.6 mi.	Site boundary and Toll Rd. on Site fence by API #3.	Q	I
T6	WNW/294°	0.6 mi.	On Site fence at south end of N. Bullet Rd.	Q	I
T7	W/270°	14.0 mi.	Pole, at Michigan Gas substation on N. Custer Rd., 0.66 miles west of Doty Rd.	Q	C
T8	NW/305°	1.9 mi.	Pole on Post Rd. near NE corner of Dixie Hwy. and Post Rd.	Q	I
T9	NNW/334°	1.5 mi.	Pole, NW corner of Trombley and Swan View Rd.	Q	I
T10	N/6°	2.1 mi.	Pole, S side of Massarant- 2 poles W of Chinavare.	Q	I

I = Indicator *C = Control* *O = On-site* *Q = Quarterly*

Direct Radiation Sample Locations (Table A-1 continued)

Station Number	Meteorological Sector/Azimuth (Degrees)	Distance from Reactor (Approx.)	Description	Collection Frequency	Type
T11	NNE/23°	6.2 mi.	Pole, NE corner of Milliman and Jefferson.	Q	I
T12	NNE/29°	6.3 mi.	Pointe Mouille Game Area Field Office, Pole near tree, N area of parking lot.	Q	I
T13	N/356°	4.1 mi.	Labo and Dixie Hwy. Pole on SW corner with light.	Q	I
T14	NNW/337°	4.4 mi.	Labo and Brandon Pole on SE corner near RR.	Q	I
T15	NW/315°	3.9 mi.	Pole, behind building at the corner of Swan Creek and Mill St.	Q	I
T16	WNW/283°	4.9 mi.	Pole, SE corner of War and Post Rd.	Q	I
T17	W/271°	4.9 mi.	Pole, NE corner of Nadeau and Laprad near mobile home park.	Q	I
T18	WSW/247°	4.8 mi.	Pole, NE corner of Mentel and Hurd Rd.	Q	I
T19	SW/236°	5.2 mi.	Fermi siren pole on Waterworks Rd. NE corner of intersection - Sterling State Park Rd. Entrance Drive/Waterworks.	Q	I
T20	WSW/257°	2.7 mi.	Pole, S side of Williams Rd, 9 poles W of Dixie Hwy. (Special Area)	Q	I
T21	WSW/239°	2.7 mi.	Pole, N side of Pearl at Parkview Woodland Beach. (Special Area)	Q	I

I = Indicator *C = Control* *O = On-site* *Q = Quarterly*

Direct Radiation Sample Locations (Table A-1 continued)

Station Number	Meteorological Sector/Azimuth (Degrees)	Distance from Reactor (Approx.)	Description	Collection Frequency	Type
T22	S/172°	1.2 mi.	Pole, N side of Pointe Aux Peaux 2 poles W of Long - Site Boundary.	Q	I
T23	SSW/195°	1.1 mi.	Pole, S side of Pointe Aux Peaux 1 pole W of Huron next to Vent Pipe - Site Boundary.	Q	I
T24	SW/225°	1.2 mi.	Fermi Gate along Pointe Aux Peaux Rd. on fence wire W of gate Site Boundary.	Q	I
T25	WSW/252°	1.4 mi.	Pole, Toll Rd. - 12 poles S of Fermi Drive.	Q	I
T26	WSW/259°	1.1 mi.	Pole, Toll Rd. - 6 poles S of Fermi Drive.	Q	I
T27	SW/225°	6.8 mi.	Pole, NE corner of McMillan and East Front St. (Special Area)	Q	I
T28	SW/229°	10.6 mi.	Pole, N side of Mortar Creek between Hull and LaPlaisance.	Q	C
T29	WSW/237°	10.3 mi.	Pole, NE corner of S Dixie and Albain.	Q	C
T30	WSW/247°	7.8 mi.	E side S end of foot bridge, St. Mary's Park corner of Elm and Monroe St. (Special Area)	Q	I
T31	WSW/255°	9.6 mi.	1st pole W of entrance drive Milton "Pat" Munson Recreational Reserve on North Custer Rd.	Q	C

I = Indicator *C = Control* *O = On-site* *Q = Quarterly*

Direct Radiation Sample Locations (Table A-1 continued)

Station Number	Meteorological Sector/Azimuth (Degrees)	Distance from Reactor (Approx.)	Description	Collection Frequency	Type
T32	WNW/295°	10.3 mi.	Pole, corner of Stony Creek and Finzel Rd.	Q	I
T33	NW/317°	9.2 mi.	Pole, W side of Grafton Rd. 1 pole N of Ash and Grafton intersection.	Q	I
T34	NNW/338°	9.8 mi.	Pole, SW corner of Port Creek and Will-Carleton Rd.	Q	I
T35	N/359°	6.9 mi.	Pole, S Side of S Huron River Dr. across from Race St. (Special Area)	Q	I
T36	N/358°	9.1 mi.	Pole, NE corner of Gibraltar and Cahill Rd.	Q	I
T37	NNE/21°	9.8 mi.	Pole, S corner of Adams and Gibraltar across from Humbug Marina.	Q	I
T38	WNW/294°	1.7 mi.	Residence - 6594 N. Dixie Hwy.	Q	I
T39	S/176°	0.3 mi.	SE corner of Protected Area Fence (PAF).	Q	O
T40	S/170°	0.3 mi.	Midway along OBA - PAF.	Q	O
T41	SSE/161°	0.2 mi.	Midway between OBA and Shield Wall on PAF.	Q	O
T42	SSE/149°	0.2 mi.	Midway along Shield Wall on PAF.	Q	O
T43	SE/131°	0.1 mi.	Midway between Shield Wall and Aux Boilers on PAF.	Q	O
T44	ESE/109°	0.1 mi.	Opposite OSSF door on PAF.	Q	O

I = Indicator *C = Control* *O = On-site* *Q = Quarterly*

Direct Radiation Sample Locations (Table A-1 continued)

Station Number	Meteorological Sector/Azimuth (Degrees)	Distance from Reactor (Approx.)	Description	Collection Frequency	Type
T45	E/86°	0.1 mi.	NE Corner of PAF.	Q	O
T46	ENE/67°	0.2 mi.	NE side of barge slip on fence.	Q	O
T47	S/185°	0.1 mi.	South of Turbine Bldg. rollup door on PAF.	Q	O
T48	SW/235°	0.2 mi.	30 ft. from corner of AAP on PAF.	Q	O
T49	WSW/251°	1.1 mi.	Corner of Site Boundary fence north of NOC along Critical Path Rd.	Q	I
T50	W/270°	0.9 mi.	Site Boundary fence near main gate by the south Bullet Street sign.	Q	I
T51	N/3°	0.4 mi.	Site Boundary fence north of north Cooling Tower.	Q	O
T52	NNE/20°	0.4 mi.	Site Boundary fence at the corner of Arson and Tower.	Q	O
T53	NE/55°	0.2 mi.	Site Boundary fence east of South Cooling Tower.	Q	O
T54	S/189°	0.3 mi.	Pole next to Fermi 2 Visitors Center.	Q	O
T55	WSW/251°	3.3 mi.	Pole, north side of Nadeau Rd. across from Sodt Elementary School Marquee.	Q	I
T56	WSW/256°	2.9 mi.	Pole, entrance to Jefferson Middle School on Stony Creek Rd.	Q	I

I = Indicator *C = Control* *O = On-site* *Q = Quarterly*

Direct Radiation Sample Locations (Table A-1 continued)

Station Number	Meteorological Sector/Azimuth (Degrees)	Distance from Reactor (Approx.)	Description	Collection Frequency	Type
T57	W/260°	2.7 mi.	Pole, north side of Williams Rd. across from Jefferson High School entrance.	Q	I
T58	WSW/249°	4.9 mi.	Pole west of Hurd Elementary School Marquee.	Q	I
T59	NW/325°	2.6 mi.	Pole north of St. Charles Church entrance on Dixie Hwy.	Q	I
T60	NNW/341°	2.5 mi.	1st pole north of North Elementary School entrance on Dixie Hwy.	Q	I
T61	W/268°	10.1 mi.	Pole, SW corner of Stewart and Raisinville Rd.	Q	I
T62	SW/232°	9.7 mi.	Pole, NE corner of Albain and Hull Rd.	Q	I
T63	WSW/245°	9.6 mi.	Pole, NE corner of Dunbar and Telegraph Rd.	Q	I
T64	WNW/286°	0.2 mi.	West of switchgear yard on PAF.	Q	O
T65	NW/322°	0.1 mi.	PAF switchgear yard area NW of RHR complex.	Q	O
T66	NE/50°	0.1 mi.	Behind Bldg. 42 on PAF.	Q	O
T67	NNW/338°	0.2 mi.	Site Boundary fence West of South Cooling Tower.	Q	O
T68	WNW/303°	0.6 mi	Langton Rd. seven poles East of Leroux Rd.	Q	I
T69	NW/306°	0.8 mi	Langton Rd. five poles East of Leroux Rd.	Q	I
T70	NNW/333°	1.1 mi	Leroux Rd. last pole North of Fermi Dr.	Q	I
T71	WNW/300°	1.1 mi	Leroux Rd. six poles North of Fermi Dr.	Q	I

I = Indicator *C = Control* *O = On-site* *Q = Quarterly*

Direct Radiation Sample Locations (Table A-1 continued)

Station Number	Meteorological Sector/Azimuth (Degrees)	Distance from Reactor (Approx.)	Description	Collection Frequency	Type
ISFSI-1	WNW/302.3°	0.175 mi.	Center of west ISFSI fence.	Q	O
ISFSI-2	NW/310.2°	0.186 mi.	NW corner ISFSI fence.	Q	O
ISFSI-3	NW/313.2°	0.166 mi.	Center of north ISFSI fence.	Q	O
ISFSI-4	NW/315.6°	0.149 mi.	NE corner ISFSI fence.	Q	O
ISFSI-5	NW/305.4°	0.140 mi	Center of east ISFSI fence.	Q	O
ISFSI-6	WNW/294.1°	0.136 mi	SE corner ISFSI fence.	Q	O
ISFSI-7	WNW/293.0°	0.157 mi	Center of south ISFSI fence.	Q	O
ISFSI-8	WNW/293°	0.177 mi	SW corner ISFSI fence.	Q	O

I = Indicator *C = Control* *O = On-site* *Q = Quarterly*

Air Particulate and Air Iodine Sample Locations

Table A-2

Station Number	Meteorological Sector/Azimuth (Degrees)	Distance from Reactor (Approx.)	Description	Collection Frequency	Type
API-1	NE/39°	1.4 mi.	Estral Beach Pole on Lakeshore, 18 Poles S of Lakeview (Nearest Community with highest X/Q).	W	I
API-2	NNW/337°	0.6 mi.	Site Boundary and Toll Road, on Site Fence by T-4.	W	I
API-3	NW/313°	0.6 mi.	Site Boundary and Toll Road, on Site Fence by T-5.	W	I
API-4	W/270°	14.0 mi.	Pole, at Michigan Gas substation on N. Custer Rd., 0.66 miles west of Doty Rd.	W	C
API-5	S/188°	1.2 mi.	Pole, N corner of Pointe Aux Peaux and Dewey Rd.	W	I

I = Indicator *C = Control* *W = Weekly*

Milk Sample Locations

Table A-3

Station Number	Meteorological Sector/Azimuth (Degrees)	Distance from Reactor (Approx.)	Description	Collection Frequency	Type
M-2	NW/319°	5.4 mi.	Reaume Farm - 2705 E Labo.	M-SM	I
M-8	WNW/289°	9.9 mi.	Calder Dairy - 9334 Finzel Rd.	M-SM	C

I = Indicator *C = Control* *M = Monthly* *SM = Semimonthly*

Garden Sample Locations

Table A-4

Station Number	Meteorological Sector/Azimuth (Degrees)	Distance from Reactor (Approx.)	Description	Collection Frequency	Type
FP-1	NNE/21°	3.8 mi.	9501 Turnpike Highway.	M	I
FP-9	W/261°	10.9 mi.	4074 North Custer Road.	M	C

I = Indicator *C = Control* *M = Monthly (when available)*

Drinking Water Sample Locations

Table A-5

Station Number	Meteorological Sector/Azimuth (Degrees)	Distance from Reactor (Approx.)	Description	Collection Frequency	Type
DW-1	S/174°	1.1 mi.	Monroe Water Station N Side of Pointe Aux Peaux 1/2 Block W of Long Rd.	M	I
DW-2	N/8°	18.5 mi.	Detroit Water Station 14700 Moran Rd, Allen Park.	M	C

I = Indicator *C = Control* *M = Monthly*

Surface Water Sample Locations

Table A-6

Station Number	Meteorological Sector/Azimuth (Degrees)	Distance from Reactor (Approx.)	Description	Collection Frequency	Type
SW-2	NNE/20°	11.7 mi.	DECo's Trenton Channel Power Plant Intake Structure (Screenhouse #1).	M	C
SW-3	SSE/160°	0.2 mi.	DECO's Fermi 2 General Service Water Intake Structure.	M	I

I = Indicator *C = Control* *M = Monthly*

Groundwater Sample Locations

Table A-7

Station Number	Meteorological Sector/Azimuth (Degrees)	Distance from Reactor (Approx.)	Description	Collection Frequency	Type
GW-1	S/175°	0.4 mi.	Approx. 100 ft W of Lake Erie, EF-1 Parking lot near gas fired peakers.	Q	I
GW-2	SSW/208°	1.0 mi.	4 ft S of Pointe Aux Peaux (PAP) Rd. Fence 427 ft W of where PAP crosses over Stoney Point's Western Dike.	Q	I
GW-3	SW/226°	1.0 mi.	143 ft W of PAP Rd. Gate, 62 ft N of PAP Rd. Fence.	Q	I
GW-4	WNW/299°	0.6 mi.	42 ft S of Langton Rd, 8 ft E of Toll Rd. Fence.	Q	C

I = Indicator *C = Control* *Q = Quarterly*

Sediment Sample Locations

Table A-8

Station Number	Meteorological Sector/Azimuth (Degrees)	Distance from Reactor (Approx.)	Description	Collection Frequency	Type
S-1	SSE/165°	0.9 mi.	Pointe Aux Peaux, Shoreline to 500 ft offshore sighting directly to Land Base Water Tower.	SA	I
S-2	E/81°	0.2 mi.	Fermi 2 Discharge, approx. 200 ft offshore.	SA	I
S-3	NE/39°	1.1 mi.	Estral Beach, approx. 200 ft offshore, off North shoreline where Swan Creek and Lake Erie meet.	SA	I
S-4	WSW/241°	3.0 mi.	Indian Trails Community Beach.	SA	I
S-5	NNE/20°	11.7 mi.	DECo's Trenton Channel Power Plant intake area.	SA	C

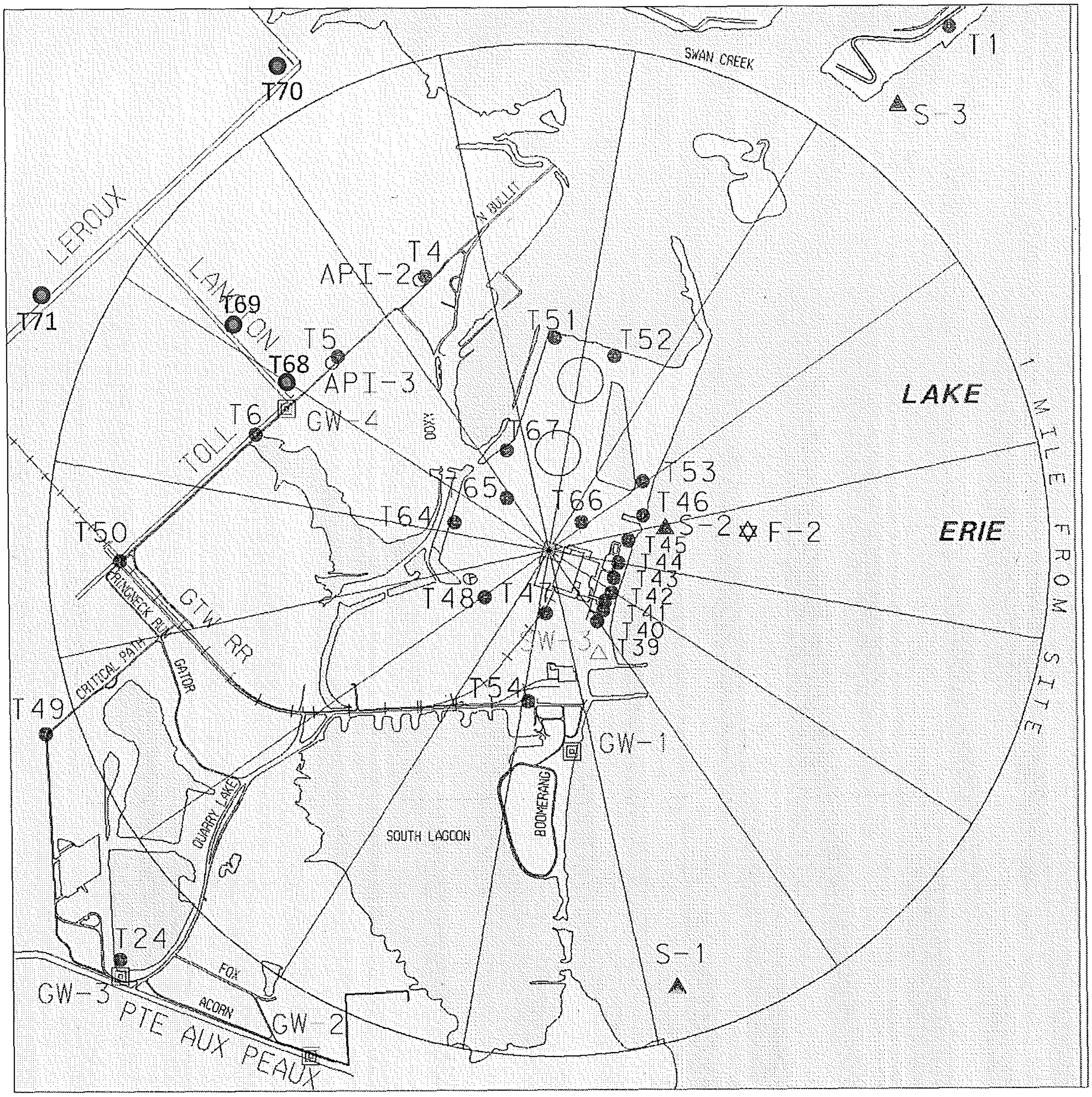
I = Indicator *C = Control* *SA = Semiannually*

Fish Sample Locations

Table A-9

Station Number	Meteorological Sector/Azimuth (Degrees)	Distance from Reactor (Approx.)	Description	Collection Frequency	Type
F-1	NNE/31°	9.5 mi.	Near Celeron Island.	SA	C
F-2	E/86°	0.4 mi.	Fermi 2 Discharge (approx. 1200 ft offshore).	SA	I
F-3	SW/227°	3.5 mi.	Brest Bay.	SA	C

I = Indicator *C = Control* *SA = Semiannually*



MAP - 1
SAMPLING LOCATIONS
BY STATION NUMBER
WITHIN 1 MILE

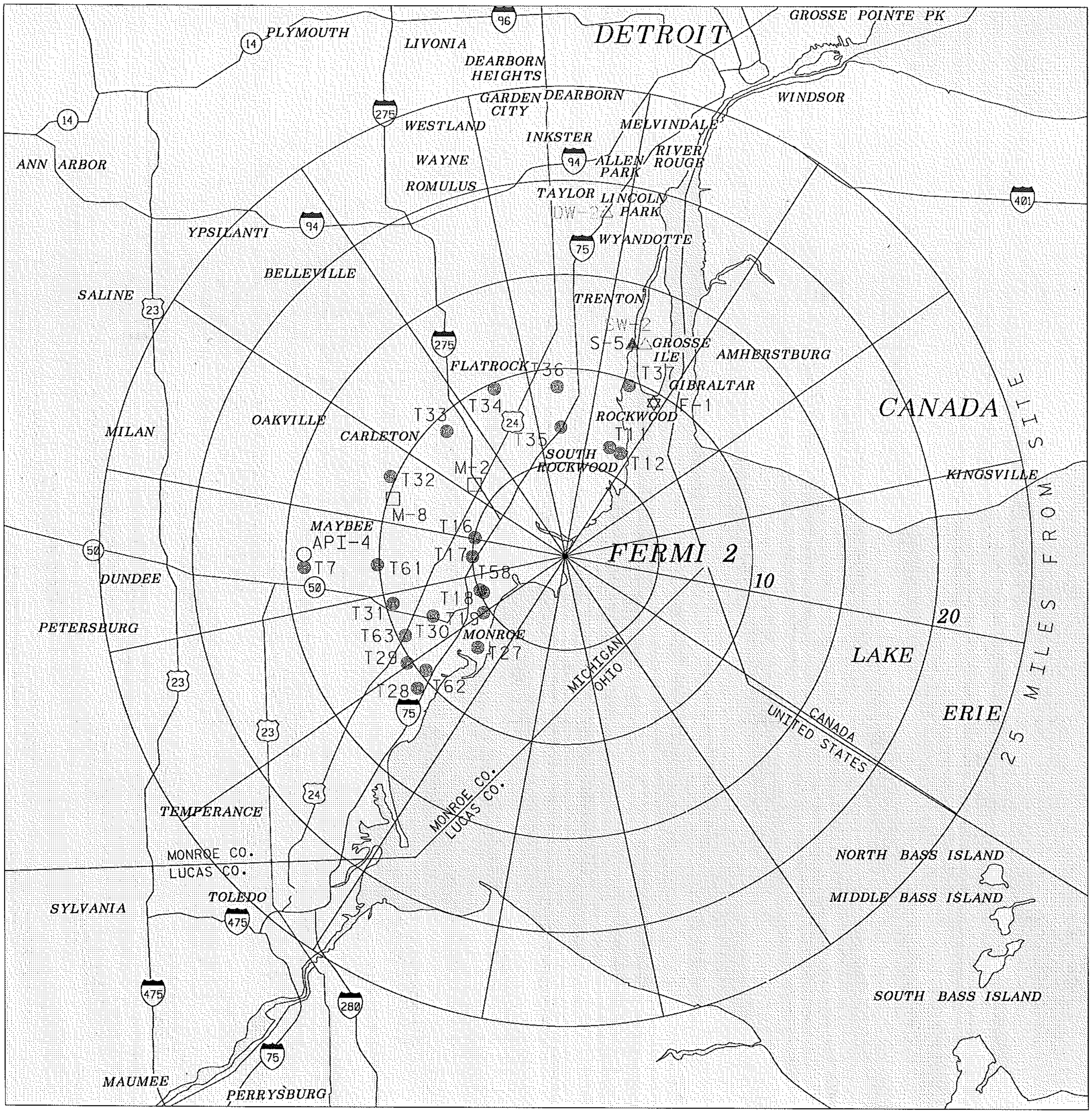
LEGEND

- T- DIRECT RADIATION
- API- AIR PARTICULATES/AIR IODINE
- S- SEDIMENTS
- DW/SW- DRINKING WATER/SURFACE WATER
- GW- GROUND WATER
- M- MILK
- FP- FOOD PRODUCTS
- F- FISH

N

0 0.5

SCALE IN MILES



MAP - 3
SAMPLING LOCATIONS
BY STATION NUMBER
(GREATER THAN 5 MILES)

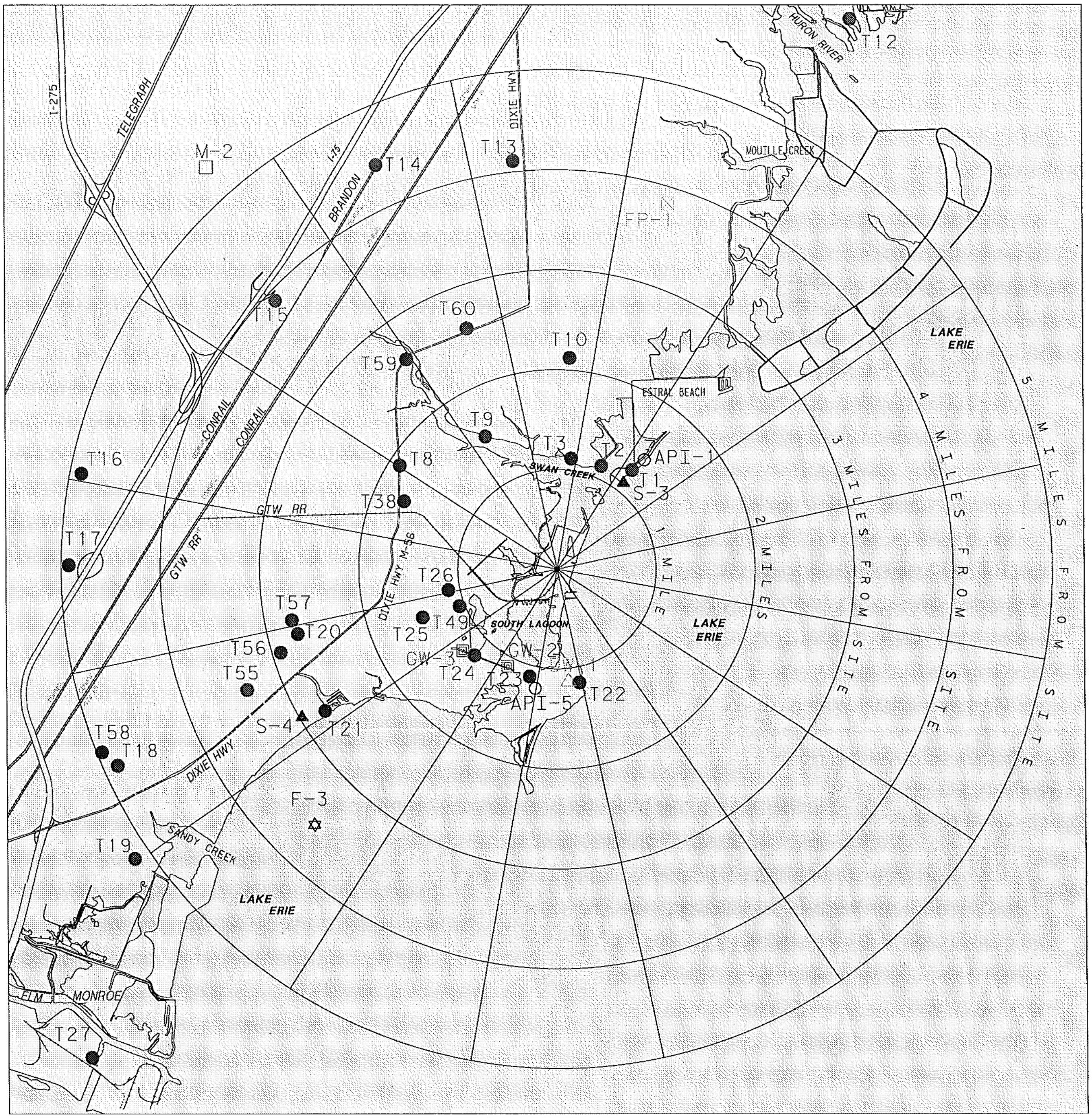
LEGEND

- T- DIRECT RADIATION
- API- AIR PARTICULATES OR AIR IODINE
- S- SEDIMENTS
- DW/SW- DRINKING WATER/SURFACE WATER
- GW- GROUND WATER
- M- MILK
- FP- FOOD PRODUCTS
- F- FISH

N

5 0 5 10

SCALE IN MILES



MAP - 2
SAMPLING LOCATIONS
BY STATION NUMBER
(1 To 5 MILES)

LEGEND

- T- DIRECT RADIATION
- API- AIR PARTICULATES/AIR IODINE
- S- SEDIMENTS
- DW/SW- DRINKING WATER/SURFACE WATER
- GW- GROUND WATER
- M- MILK
- FP- FOOD PRODUCTS
- F- FISH

N

0 1
SCALE IN MILES

Appendix B

Environmental Data Summary

Table B-1 Radiological Environmental Monitoring Program Summary

Name of Facility: Enrico Fermi Unit 2 Docket No.: 50-341 Reporting Period: January - December 2011
Location of Facility: 30 miles southeast of Detroit, Michigan (Frenchtown Township)

Sample Type (Units)	Type and Number of Analysis	LLD (b)	Indicator Locations Mean and Range (d)	Location with Highest Annual Mean		Control Locations Mean and Range (d)	Number of Non-routine Results (f)
				Location (e)	Mean and Range (d)		
Direct Radiation *mR/std qtr* (a)	Gamma (TLD) 205	1.0	14.3 (193/193) 10.6 to 20.5	T-49 (Indicator)	18.6 (4/4) 15.4 to 20.5	12.5 (12/12) 11.4 to 16.5	None
Airborne Particulates *pCi/cu. m.*	Gross Beta 254	1.00E-2	4.70E-2 (204/204) 2.55E-2 to 9.67E-2	API-5 (Indicator)	5.06E-2 (51/51) 2.97E-2 to 8.62E-2	4.15E-2 (50/50) 2.32E-2 to 6.E-2	None
	Gamma Spec. 20						
	Be-7	N/A	6.38E-2 (16/16) 5.06E-2 to 8.32E-2	API-5 (Indicator)	6.66E-2 (4/4) 5.99E-2 to 7.33E-2	5.77E-2 (4/4) 5.01E-2 to 6.47E-2	None
	K-40	N/A	1.34E-2 (3/16) 1.04E-2 to 1.87E-2	API-5 (Indicator)	1.50E-2 (2/4) 1.12E-2 to 1.87E-2	<MDA	None
	Mn-54	N/A	<MDA			<MDA	None
	Co-58	N/A	<MDA			<MDA	None
	Fe-59	N/A	<MDA			<MDA	None
	Co-60	N/A	<MDA			<MDA	None
	Zn-65	N/A	<MDA			<MDA	None
	Zr-95	N/A	<MDA			<MDA	None
	Nb-95	N/A	<MDA			<MDA	None
	Ru-103	N/A	<MDA			<MDA	None
	Ru-106	N/A	<MDA			<MDA	None
	Cs-134	5.00E-2	<MDA			<MDA	None
	Cs-137	6.00E-2	<MDA			<MDA	None
	Ba-140	N/A	<MDA			<MDA	None
	La-140	N/A	<MDA			<MDA	None
	Ce-141	N/A	<MDA			<MDA	None
	Ce-144	N/A	<MDA			<MDA	None
Airborne Iodine *pCi/cu. m.*	I-131 254	7.00E-2	6.87E-2 (7/204) 2.38E-2 to 1.34E-1	API-1 (Indicator)	6.32E-2 (3/51) 3.17E-2 to 1.34E-1	3.93E-2 (4/50) 3.99E-2 to 4.73E-2	None

Table B-1 Radiological Environmental Monitoring Program Summary (cont.)

Name of Facility: Enrico Fermi Unit 2 Docket No.: 50-341 Reporting Period: January - December 2011
Location of Facility: 30 miles southeast of Detroit, Michigan (Frenchtown Township)

Sample Type (Units)	Type and Number of Analysis	LLD (b)	Indicator Locations Mean and Range (d)	Location with Highest Annual Mean		Control Locations Mean and Range (d)	Number of Non-routine Results (f)
				Location (e)	Mean and Range (d)		
Milk *pCi/l*	I-131 34	1.00E+0	<MDA			<MDA	None
	Sr-89 34	N/A	<MDA			<MDA	None
	Sr-90	N/A	<MDA				None
	Gamma Spec. 34						
	Be-7	N/A	<MDA			<MDA	None
	K-40	N/A	1.49E+3 (17/17) 1.41E+3 to 1.56E+3	M-2 (Indicator)	1.49E+3 (17/17) 1.41E+3 to 1.56E+3	1.46E+3 (17/17) 1.36E+3 to 1.54E+3	None
	Mn-54	N/A	<MDA			<MDA	None
	Co-58	N/A	<MDA			<MDA	None
	Fe-59	N/A	<MDA			<MDA	None
	Co-60	N/A	<MDA			<MDA	None
	Zn-65	N/A	<MDA			<MDA	None
	Zr-95	N/A	<MDA			<MDA	None
	Nb-95	N/A	<MDA			<MDA	None
	Ru-103	N/A	<MDA			<MDA	None
	Ru-106	N/A	<MDA			<MDA	None
	Cs-134	1.50E+1	<MDA			<MDA	None
	Cs-137	1.80E+1	<MDA			<MDA	None
	Ba-140	1.50E+1	<MDA			<MDA	None
	La-140	1.50E+1	<MDA			<MDA	None
	Ce-141	N/A	<MDA			<MDA	None
	Ce-144	N/A	<MDA			<MDA	None
Vegetation *pCi/kg wet*	I-131 10	6.00E+1	<MDA			<MDA	None
	Gamma Spec. 10						
	Be-7	N/A	2.20E+2 (5/5) 9.33E+1 to 3.07E+2	FP-9 (Control)	3.40E+2 (5/5) 1.65E+2 to 5.92E+2	3.40E+2 (5/5) 1.65E+2 to 5.92E+2	None
	K-40	N/A	1.06E+3 (5/5) 9.33E+1 to 2.46E+3	FP-9 (Control)	2.71E+3 (5/5) 3.66E+0 to 4.27E+3	2.71E+3 (5/5) 3.66E+0 to 4.27E+3	None

Table B-1 Radiological Environmental Monitoring Program Summary (cont.)

Name of Facility: Enrico Fermi Unit 2 Docket No.: 50-341 Reporting Period: January - December 2011
Location of Facility: 30 miles southeast of Detroit, Michigan (Frenchtown Township)

Sample Type (Units)	Type and Number of Analysis	LLD (b)	Indicator Locations Mean and Range (d)	Location with Highest Annual Mean		Control Locations Mean and Range (d)	Number of Non-routine Results (f)
				Location (e)	Mean and Range(d)		
Vegetation (cont.) *pCi/kg wet*	Mn-54	N/A	<MDA			<MDA	None
	Co-58	N/A	<MDA			<MDA	None
	Fe-59	N/A	<MDA			<MDA	None
	Co-60	N/A	<MDA			<MDA	None
	Zn-65	N/A	<MDA			<MDA	None
	Zr-95	N/A	<MDA			<MDA	None
	Nb-95	N/A	<MDA			<MDA	None
	Ru-103	N/A	<MDA			<MDA	None
	Ru-106	N/A	<MDA			<MDA	None
	Cs-134	6.00E+1	<MDA			<MDA	None
	Cs-137	8.00E+1	<MDA			<MDA	None
	Ba-140	N/A	<MDA			<MDA	None
	La-140	N/A	<MDA			<MDA	None
	Ce-141	N/A	<MDA			<MDA	None
	Ce-144	N/A	<MDA			<MDA	None
Drinking Water *pCi/l*	Gross Beta 24	4.00E+0	6.38E+0 (1/12)	DW-1 (Indicator)	6.38E+0 (1/12)	5.72E+0 (1/12)	None
	Sr-89 24	N/A	<MDA			<MDA	None
	Sr-90	N/A	<MDA			<MDA	None
	Gamma Spec. 24						
	Be-7	N/A	<MDA			<MDA	None
	K-40	N/A	4.80E+1 (1/12)	DW-1 (Indicator)	4.80E+1 (1/12)	<MDA	None
	Cr-51	N/A	<MDA			<MDA	None
	Mn-54	1.50E+1	<MDA			<MDA	None
	Co-58	1.50E+1	<MDA			<MDA	None
	Fe-59	3.00E+1	<MDA			<MDA	None
	Co-60	1.50E+1	<MDA			<MDA	None
	Zn-65	3.00E+1	<MDA			<MDA	None
	Zr-95	1.50E+1	<MDA			<MDA	None
	Nb-95	1.50E+1	<MDA			<MDA	None

Table B-1 Radiological Environmental Monitoring Program Summary (cont.)

Name of Facility: Enrico Fermi Unit 2 Docket No.: 50-341 Reporting Period: January - December 2011
Location of Facility: 30 miles southeast of Detroit, Michigan (Frenchtown Township)

Sample Type (Units)	Type and Number of Analysis		LLD (b)	Indicator Locations Mean and Range (d)	Location with Highest Annual Mean		Control Locations Mean and Range (d)	Number of Non-routine Results (f)
					Location (e)	Mean and Range (d)		
Drinking Water (cont.) *pCi/l*	Ru-103		N/A	<MDA			<MDA	None
	Ru-106		N/A	<MDA			<MDA	None
	Cs-134		1.50E+1	<MDA			<MDA	None
	Cs-137		1.80E+1	<MDA			<MDA	None
	Ba-140		1.50E+1	<MDA			<MDA	None
	La-140		1.50E+1	<MDA			<MDA	None
	Ce-141		N/A	<MDA			<MDA	None
	Ce-144		N/A	<MDA			<MDA	None
	H-3	8	2.00E+3	<MDA			<MDA	None
Surface Water *pCi/l*	Sr-89	24	N/A	<MDA			<MDA	None
	Sr-90		N/A	<MDA			<MDA	None
	Gamma Spec.	24						
	Be-7		N/A	<MDA			<MDA	None
	K-40		N/A	<MDA			<MDA	None
	Cr-51		N/A	<MDA			<MDA	None
	Mn-54		1.50E+1	<MDA			<MDA	None
	Co-58		1.50E+1	<MDA			<MDA	None
	Fe-59		3.00E+1	<MDA			<MDA	None
	Co-60		1.50E+1	<MDA			<MDA	None
	Zn-65		3.00E+1	<MDA			<MDA	None
	Zr-95		1.50E+1	<MDA			<MDA	None
	Nb-95		1.50E+1	<MDA			<MDA	None
	Ru-103		N/A	<MDA			<MDA	None
	Ru-106		N/A	<MDA			<MDA	None
	Cs-134		1.50E+1	<MDA			<MDA	None
	Cs-137		1.80E+1	<MDA			<MDA	None
	Ba-140		1.50E+1	<MDA			<MDA	None
	La-140		1.50E+1	<MDA			<MDA	None
	Ce-141		N/A	<MDA			<MDA	None

Table B-1 Radiological Environmental Monitoring Program Summary (cont.)

Name of Facility: Enrico Fermi Unit 2 Docket No.: 50-341 Reporting Period: January - December 2011
Location of Facility: 30 miles southeast of Detroit, Michigan (Frenchtown Township)

Sample Type (Units)	Type and Number of Analysis	LLD (b)	Indicator Locations Mean and Range (d)	Location with Highest Annual Mean		Control Locations Mean and Range (d)	Number of Non-routine Results (f)
				Location (e)	Mean and Range (d)		
Surface Water (cont.) *pCi/l*	Ce-144	N/A	<MDA			<MDA	None
	H-3 8	2.00E+3	<MDA			<MDA	None
Groundwater *pCi/l*	Gamma Spec. 16						
	Be-7	N/A	<MDA			<MDA	None
	K-40	N/A	<MDA			<MDA	None
	Cr-51	N/A	<MDA			<MDA	None
	Mn-54	1.50E+1	<MDA			<MDA	None
	Co-58	1.50E+1	<MDA			<MDA	None
	Fe-59	3.00E+1	<MDA			<MDA	None
	Co-60	1.50E+1	<MDA			<MDA	None
	Zn-65	3.00E+1	<MDA			<MDA	None
	Zr-95	1.50E+1	<MDA			<MDA	None
	Nb-95	1.50E+1	<MDA			<MDA	None
	Ru-103	N/A	<MDA			<MDA	None
	Ru-106	N/A	<MDA			<MDA	None
	Cs-134	1.50E+1	<MDA			<MDA	None
	Cs-137	1.80E+1	<MDA			<MDA	None
	Ba-140	1.50E+1	<MDA			<MDA	None
	La-140	1.50E+1	<MDA			<MDA	None
	Ce-141	N/A	<MDA			<MDA	None
	Ce-144	N/A	<MDA			<MDA	None
	H-3 16	2.00E+3	<MDA			<MDA	None
Sediment *pCi/kg dry*	Sr-89 10	N/A	<MDA			<MDA	
	Sr-90	N/A	<MDA			<MDA	None
	Gamma Spec. 10						
	Be-7	N/A	<MDA				None
	K-40	N/A	1.12E+4 (8/8) 3.93E+2 to 1.77E+4	S-2 (Indicator)	1.44E+4 (2/2) 1.10E+4 to 1.77E+4	1.29E+4 (2/2) 1.23E+4 to 1.34E+4	None

Table B-1 Radiological Environmental Monitoring Program Summary (cont.)

Name of Facility: Enrico Fermi Unit 2 Docket No.: 50-341 Reporting Period: January - December 2011
Location of Facility: 30 miles southeast of Detroit, Michigan (Frenchtown Township)

Sample Type (Units)	Type and Number of Analysis	LLD (b)	Indicator Locations Mean and Range (d)	Location with Highest Annual Mean		Control Locations Mean and Range (d)	Number of Non-routine Results (f)
				Location (e)	Mean and Range (d)		
Sediment (cont.) *pCi/kg dry*	Mn-54	N/A	<MDA			<MDA	None
	Co-58	N/A	<MDA			<MDA	None
	Fe-59	N/A	<MDA			<MDA	None
	Co-60	N/A	<MDA			<MDA	None
	Zn-65	N/A	<MDA			<MDA	None
	Zr-95	N/A	<MDA			<MDA	None
	Nb-95	N/A	<MDA			<MDA	None
	Ru-103	N/A	<MDA			<MDA	None
	Ru-106	N/A	<MDA			<MDA	None
	Cs-134	1.50E+2	<MDA			<MDA	None
	Cs-137	1.80E+2	<MDA	S-5 (Control)	1.00E+2 (2/2) 8.29E+1 to 1.17E+2	1.00E+2 (2/2) 8.29E+1 to 1.17E+2	None
	Ba-140	N/A	<MDA			<MDA	None
	La-140	N/A	<MDA			<MDA	None
	Ce-141	N/A	<MDA			<MDA	None
	Ce-144	N/A	<MDA			<MDA	None
Fish *pCi/kg wet*	Sr-89 24	N/A	<MDA			<MDA	None
	Sr-90	N/A	<MDA			<MDA	None
	Gamma Spec. 24						
	Be-7	N/A	<MDA			<MDA	None
	K-40	N/A	2.67E+3 (9/9) 1.96E+3 to 3.40E+3	F-3 (Control)	2.93E+3 (10/10) 1.99E+3 to 3.73E+3	2.73E+3 (15/15) 1.99E+2 to 3.73E+3	None
	Mn-54	1.30E+2	<MDA			<MDA	None
	Co-58	1.30E+2	<MDA			<MDA	None
	Fe-59	2.60E+2	<MDA			<MDA	None
	Co-60	1.30E+2	<MDA			<MDA	None
	Zn-65	2.60E+2	<MDA			<MDA	None

Table B-1 Radiological Environmental Monitoring Program Summary (cont.)

Name of Facility: Enrico Fermi Unit 2 Docket No.: 50-341 Reporting Period: January - December 2011
Location of Facility: 30 miles southeast of Detroit, Michigan (Frenchtown Township)

Sample Type (Units)	Type and Number of Analysis	LLD (b)	Indicator Locations Mean and Range (d)	Location with Highest Annual Mean		Control Locations Mean and Range (d)	Number of Non-routine Results (f)
				Location (e)	Mean and Range (d)		
Fish (cont.)	Zr-95	N/A	<MDA			<MDA	None
pCi/kg wet	Nb-95	N/A	<MDA			<MDA	None
	Ru-103	N/A	<MDA			<MDA	None
	Ru-106	N/A	<MDA			<MDA	None
	Cs-134	1.30E+2	<MDA			<MDA	None
	Cs-137	1.50E+2	<MDA			<MDA	None
	Ba-140	N/A	<MDA			<MDA	None
	La-140	N/A	<MDA			<MDA	None
	Ce-141	N/A	<MDA			<MDA	None
	Ce-144	N/A	<MDA			<MDA	None

(a) Direct Radiation mean and range values are for off-site TLDs
(b) LLD = Fermi 2 ODCM LLD: nominal lower limit of detection based on 4.66 sigma error for background sample.
(c) <MDA = Less than the lab's minimum detectable activity which is less than the LLD.
(d) Mean and range based upon detectable measurements only. Fraction of detectable measurements at specified locations is indicated in parentheses (F).
(e)Locations are specified by Fermi 2 code and are described in Appendix A Sampling Locations.
(f) Non-routine results are those which are reportable according to Fermi 2 ODCM control 3.12.1.

Note: Other nuclides were considered in analysis results, but only those identifiable were reported in addition to ODCM listed nuclides.

Appendix C

Environmental Data Tables

FERMI 2
OFFSITE TLD ANALYSIS
(mR/Std Qtr)

STATION NUMBER	FIRST QUARTER	SECOND QUARTER	THIRD QUARTER	FOURTH QUARTER
T-1	11.80	12.29	14.08	12.37
T-2	11.17	11.74	13.70	12.73
T-3	10.55	11.23	13.80	11.63
T-4	12.92	13.31	16.56	13.96
T-5	13.73	14.52	16.74	14.20
T-6	14.08	14.32	16.51	14.34
T-7	13.44	14.66	16.50	15.11
T-8	14.52	14.89	16.53	16.13
T-9	12.62	13.66	15.38	13.31
T-10	12.98	14.84	16.59	15.01
T-11	12.75	12.74	14.51	13.02
T-12	11.99	12.05	14.96	11.67
T-13	14.69	15.48	17.68	14.78
T-14	(a)	(a)	16.07	14.98
T-15	12.61	12.68	14.23	12.92
T-16	15.45	16.41	19.06	16.25
T-17	11.73	11.98	13.91	12.57
T-18	12.44	13.40	15.88	13.20
T-19	14.46	14.64	16.47	15.70
T-20	14.24	14.20	16.63	14.52
T-21	12.21	12.46	15.07	12.50
T-22	13.30	13.85	16.58	13.88
T-23	12.42	13.27	14.70	13.61
T-24	12.18	12.50	14.85	12.83
T-25	14.90	15.45	18.02	15.92
T-26	15.44	15.92	17.96	16.19
T-27	10.57	11.32	13.12	11.10
T-28	11.57	12.44	14.62	12.73
T-29	11.44	11.89	14.74	11.76
T-30	13.19	13.50	15.21	13.42
T-31	12.88	13.40	15.69	13.23
T-32	13.88	14.96	17.46	13.81
T-33	11.50	12.06	13.60	11.90
T-34	13.12	13.47	15.50	13.57
T-35	11.90	12.55	15.14	13.15
T-36	12.02	13.71	14.53	13.22
T-37	14.06	14.63	14.96	13.36
T-38	14.63	15.24	17.84	15.23
T-49	15.39	18.66	20.46	19.79
T-50	13.79	14.06	16.50	15.38
T-55	14.61	13.99	16.66	14.83
T-56	12.68	12.92	15.52	14.13
T-57	15.14	16.47	18.28	16.24
T-58	11.97	12.45	13.73	13.12
T-59	11.66	13.43	14.36	12.94
T-60	13.64	14.11	16.47	15.14
T-61	14.76	14.66	16.86	15.10

(a) TLD missing, see Appendix D - Program Execution.

FERMI 2
OFFSITE TLD ANALYSIS (CONT.)
(mR/Std Qtr)

STATION NUMBER	FIRST QUARTER	SECOND QUARTER	THIRD QUARTER	FOURTH QUARTER
T-62	(a)	14.87	14.08	14.83
T-63	11.80	12.19	13.70	12.67
T-68	15.39	16.30	13.80	15.53
T-69	13.54	15.43	16.56	15.75
T-70	13.03	13.95	16.74	14.38
T-71	14.42	15.62	16.51	15.38

(a) TLD missing, see Appendix D - Program Execution.

ONSITE TLD ANALYSIS
(mR/Std Qtr)

STATION NUMBER	FIRST QUARTER	SECOND QUARTER	THIRD QUARTER	FOURTH QUARTER
T-39	36.42	19.26	19.86	16.96
T-40	28.84	16.39	16.92	15.81
T-41	62.29	27.47	26.10	23.71
T-42	50.81	25.85	25.53	23.28
T-43	69.05	29.49	29.75	26.32
T-44	66.70	30.01	26.42	23.42
T-45	32.15	17.64	17.84	15.79
T-46	28.34	17.08	18.40	17.93
T-47	70.83	31.82	29.71	28.24
T-48	(a)	21.74	22.62	20.53
T-51	12.32	9.49	12.57	10.53
T-52	12.32	11.78	14.19	12.63
T-53	20.01	14.37	16.56	14.50
T-54	14.91	12.22	14.23	14.46
T-64	18.71	13.28	14.62	13.12
T-65	20.70	16.01	16.14	14.28
T-66	90.33	38.05	36.17	32.73
T-67	15.48	12.68	15.35	13.13
ISFSI-1	17.45	(a)	15.12	19.77
ISFSI-2	16.13	12.82	14.95	12.13
ISFSI-3	19.12	14.08	14.71	19.34
ISFSI-4	19.53	13.92	14.65	14.17
ISFSI-5	22.66	15.16	15.98	14.31
ISFSI-6	16.40	12.44	13.27	12.55
ISFSI-7	21.52	13.92	15.16	13.42
ISFSI-8	17.80	13.48	15.40	13.11

(a) TLD missing, see Appendix D - Program Execution.

FERMI 2
AIR PARTICULATE GROSS BETA
(pCi/cubic meter)

API-1 FIRST QUARTER

Date	Activity		
4-Jan-11	4.92E-02	+/-	3.04E-03
11-Jan-11	5.15E-02	+/-	3.10E-03
18-Jan-11	4.09E-02	+/-	2.80E-03
25-Jan-11	4.39E-02	+/-	2.90E-03
1-Feb-11	6.09E-02	+/-	3.37E-03
9-Feb-11	4.49E-02	+/-	2.74E-03
15-Feb-11	6.40E-02	+/-	3.84E-03
22-Feb-11	4.63E-02	+/-	2.98E-03
1-Mar-11	4.51E-02	+/-	2.95E-03
8-Mar-11	4.38E-02	+/-	2.91E-03
14-Mar-11	3.61E-02	+/-	2.97E-03
22-Mar-11	6.30E-02	+/-	3.21E-03
29-Mar-11	3.62E-02	+/-	2.61E-03

API-1 SECOND QUARTER

Date	Activity		
5-Apr-11	9.67E-02	+/-	4.58E-03
12-Apr-11	5.54E-02	+/-	3.21E-03
19-Apr-11	5.82E-02	+/-	3.26E-03
26-Apr-11	5.03E-02	+/-	3.09E-03
3-May-11	3.09E-02	+/-	2.48E-03
10-May-11	3.01E-02	+/-	2.44E-03
17-May-11	3.90E-02	+/-	2.76E-03
23-May-11	2.77E-02	+/-	2.56E-03
31-May-11	2.88E-02	+/-	2.21E-03
6-Jun-11	5.21E-02	+/-	3.43E-03
14-Jun-11	3.89E-02	+/-	2.54E-03
21-Jun-11	2.67E-02	+/-	2.32E-03
28-Jun-11	3.25E-02	+/-	2.48E-03

FERMI 2
AIR PARTICULATE GROSS BETA
(pCi/cubic meter)

API-1 THIRD QUARTER

Date	Activity		
5-Jul-11	4.07E-02	+/-	2.79E-03
12-Jul-11	4.59E-02	+/-	2.96E-03
19-Jul-11	4.55E-02	+/-	2.95E-03
2-Aug-11	5.17E-02	+/-	3.40E-03
9-Aug-11	5.91E-02	+/-	3.86E-03
15-Aug-11	4.95E-02	+/-	3.89E-03
23-Aug-11	5.60E-02	+/-	3.49E-03
30-Aug-11	4.74E-02	+/-	3.47E-03
6-Sep-11	8.24E-02	+/-	4.48E-03
13-Sep-11	3.25E-02	+/-	2.88E-03
20-Sep-11	2.87E-02	+/-	2.72E-03
27-Sep-11	3.25E-02	+/-	2.87E-03

API-1 FOURTH QUARTER

Date	Activity		
4-Oct-11	3.44E-02	+/-	2.92E-03
11-Oct-11	7.19E-02	+/-	4.13E-03
19-Oct-11	4.43E-02	+/-	3.07E-03
25-Oct-11	3.32E-02	+/-	3.09E-03
1-Nov-11	2.76E-02	+/-	2.77E-03
8-Nov-11	4.35E-02	+/-	3.25E-03
15-Nov-11	4.32E-02	+/-	3.35E-03
22-Nov-11	4.81E-02	+/-	3.58E-03
29-Nov-11	3.65E-02	+/-	3.14E-03
6-Dec-11	5.36E-02	+/-	3.83E-03
13-Dec-11	7.24E-02	+/-	4.39E-03
20-Dec-11	8.95E-02	+/-	4.84E-03
27-Dec-11	4.25E-02	+/-	3.40E-03

FERMI 2
AIR PARTICULATE GROSS BETA
(pCi/cubic meter)

API-2 FIRST QUARTER

Date	Activity		
4-Jan-11	4.94E-02	+/-	3.02E-03
11-Jan-11	5.07E-02	+/-	3.12E-03
18-Jan-11	3.13E-02	+/-	2.43E-03
25-Jan-11	5.07E-02	+/-	3.07E-03
1-Feb-11	5.23E-02	+/-	3.08E-03
9-Feb-11	3.93E-02	+/-	2.53E-03
15-Feb-11	4.59E-02	+/-	3.27E-03
22-Feb-11	4.14E-02	+/-	2.76E-03
1-Mar-11	4.00E-02	+/-	2.73E-03
8-Mar-11	4.03E-02	+/-	2.73E-03
14-Mar-11	3.31E-02	+/-	2.87E-03
22-Mar-11	6.15E-02	+/-	3.14E-03
29-Mar-11	5.16E-02	+/-	3.13E-03

API-2 SECOND QUARTER

Date	Activity		
5-Apr-11	6.64E-02	+/-	3.51E-03
12-Apr-11	4.29E-02	+/-	2.82E-03
19-Apr-11	3.51E-02	+/-	2.68E-03
26-Apr-11	3.08E-02	+/-	2.44E-03
3-May-11	5.43E-02	+/-	3.20E-03
10-May-11	3.71E-02	+/-	2.65E-03
17-May-11	4.20E-02	+/-	3.02E-03
23-May-11	3.37E-02	+/-	2.75E-03
31-May-11	3.27E-02	+/-	2.32E-03
6-Jun-11	4.52E-02	+/-	3.17E-03
14-Jun-11	4.34E-02	+/-	2.65E-03
21-Jun-11	2.55E-02	+/-	2.21E-03
28-Jun-11	3.29E-02	+/-	2.59E-03

FERMI 2
AIR PARTICULATE GROSS BETA
(pCi/cubic meter)

API-2 THIRD QUARTER

Date	Activity		
5-Jul-11	3.26E-02	+/-	2.49E-03
12-Jul-11	5.20E-02	+/-	3.10E-03
19-Jul-11	7.37E-02	+/-	6.35E-03
2-Aug-11	5.00E-02	+/-	3.34E-03
9-Aug-11	5.50E-02	+/-	3.74E-03
15-Aug-11	3.88E-02	+/-	3.50E-03
23-Aug-11	4.86E-02	+/-	3.27E-03
30-Aug-11	5.18E-02	+/-	3.61E-03
6-Sep-11	7.72E-02	+/-	4.35E-03
13-Sep-11	3.18E-02	+/-	2.85E-03
20-Sep-11	3.19E-02	+/-	2.85E-03
27-Sep-11	3.74E-02	+/-	3.06E-03

API-2 FOURTH QUARTER

Date	Activity		
4-Oct-11	4.39E-02	+/-	3.27E-03
11-Oct-11	5.71E-02	+/-	3.71E-03
19-Oct-11	4.88E-02	+/-	3.21E-03
25-Oct-11	4.60E-02	+/-	3.61E-03
1-Nov-11	3.21E-02	+/-	2.94E-03
8-Nov-11	4.77E-02	+/-	3.40E-03
15-Nov-11	4.28E-02	+/-	3.33E-03
22-Nov-11	4.52E-02	+/-	3.48E-03
29-Nov-11	4.07E-02	+/-	3.31E-03
6-Dec-11	3.68E-02	+/-	3.34E-03
13-Dec-11	6.29E-02	+/-	4.09E-03
20-Dec-11	6.64E-02	+/-	4.20E-03
27-Dec-11	4.15E-02	+/-	3.35E-03

FERMI 2
AIR PARTICULATE GROSS BETA
(pCi/cubic meter)

API-3 FIRST QUARTER

Date	Activity		
4-Jan-11	4.57E-02	+/-	2.90E-03
11-Jan-11	4.27E-02	+/-	2.86E-03
18-Jan-11	3.30E-02	+/-	2.55E-03
25-Jan-11	5.49E-02	+/-	3.21E-03
1-Feb-11	4.65E-02	+/-	2.92E-03
9-Feb-11	3.90E-02	+/-	2.54E-03
15-Feb-11	5.69E-02	+/-	3.57E-03
22-Feb-11	4.11E-02	+/-	2.83E-03
1-Mar-11	4.26E-02	+/-	2.83E-03
8-Mar-11	4.06E-02	+/-	2.80E-03
14-Mar-11	4.44E-02	+/-	3.22E-03
22-Mar-11	6.92E-02	+/-	3.37E-03
29-Mar-11	4.93E-02	+/-	3.10E-03

API-3 SECOND QUARTER

Date	Activity		
5-Apr-11	8.34E-02	+/-	3.94E-03
12-Apr-11	5.29E-02	+/-	3.15E-03
19-Apr-11	5.37E-02	+/-	3.22E-03
26-Apr-11	4.82E-02	+/-	3.04E-03
3-May-11	2.88E-02	+/-	2.37E-03
10-May-11	3.06E-02	+/-	2.46E-03
17-May-11	3.47E-02	+/-	2.63E-03
23-May-11	3.08E-02	+/-	2.69E-03
31-May-11	2.97E-02	+/-	2.26E-03
6-Jun-11	4.36E-02	+/-	3.16E-03
14-Jun-11	4.45E-02	+/-	2.71E-03
21-Jun-11	3.35E-02	+/-	2.59E-03
28-Jun-11	3.23E-02	+/-	2.59E-03

FERMI 2
AIR PARTICULATE GROSS BETA
(pCi/cubic meter)

API-3 THIRD QUARTER

Date	Activity		
5-Jul-11	3.62E-02	+/-	2.63E-03
12-Jul-11	4.82E-02	+/-	3.01E-03
19-Jul-11	4.64E-02	+/-	3.02E-03
2-Aug-11	6.11E-02	+/-	4.26E-03
9-Aug-11	5.07E-02	+/-	3.37E-03
15-Aug-11	5.81E-02	+/-	3.84E-03
23-Aug-11	5.03E-02	+/-	3.92E-03
30-Aug-11	4.57E-02	+/-	3.18E-03
6-Sep-11	3.91E-02	+/-	3.19E-03
13-Sep-11	7.49E-02	+/-	4.29E-03
20-Sep-11	2.85E-02	+/-	2.71E-03
27-Sep-11	2.91E-02	+/-	2.73E-03

API-3 FOURTH QUARTER

Date	Activity		
4-Oct-11	2.86E-02	+/-	2.67E-03
11-Oct-11	5.48E-02	+/-	3.64E-03
19-Oct-11	4.51E-02	+/-	3.09E-03
25-Oct-11	3.63E-02	+/-	3.22E-03
1-Nov-11	2.70E-02	+/-	2.73E-03
8-Nov-11	4.28E-02	+/-	3.23E-03
15-Nov-11	4.32E-02	+/-	3.35E-03
22-Nov-11	4.11E-02	+/-	3.33E-03
29-Nov-11	4.56E-02	+/-	3.49E-03
6-Dec-11	3.82E-02	+/-	3.40E-03
13-Dec-11	5.79E-02	+/-	3.93E-03
20-Dec-11	7.20E-02	+/-	4.37E-03
27-Dec-11	3.66E-02	+/-	3.17E-03

FERMI 2
AIR PARTICULATE GROSS BETA
(pCi/cubic meter)

API-4 FIRST QUARTER

Date	Activity		
4-Jan-11	5.36E-02	+/-	3.14E-03
11-Jan-11	5.73E-02	+/-	3.23E-03
18-Jan-11	(a)		
25-Jan-11	4.90E-02	+/-	3.06E-03
1-Feb-11	5.01E-02	+/-	3.08E-03
9-Feb-11	4.33E-02	+/-	2.71E-03
15-Feb-11	4.65E-02	+/-	3.27E-03
22-Feb-11	3.62E-02	+/-	2.67E-03
1-Mar-11	4.56E-02	+/-	2.99E-03
8-Mar-11	4.27E-02	+/-	2.87E-03
14-Mar-11	3.77E-02	+/-	2.95E-03
22-Mar-11	6.81E-02	+/-	3.37E-03
29-Mar-11	5.41E-02	+/-	3.15E-03

API-4 SECOND QUARTER

Date	Activity		
5-Apr-11	2.32E-02	+/-	2.12E-03
12-Apr-11	5.94E-02	+/-	3.39E-03
19-Apr-11	4.46E-02	+/-	2.91E-03
26-Apr-11	5.08E-02	+/-	3.11E-03
3-May-11	2.70E-02	+/-	2.34E-03
10-May-11	3.17E-02	+/-	2.49E-03
17-May-11	3.40E-02	+/-	2.63E-03
23-May-11	3.04E-02	+/-	2.59E-03
31-May-11	2.99E-02	+/-	2.27E-03
6-Jun-11	4.09E-02	+/-	3.14E-03
14-Jun-11	3.40E-02	+/-	2.43E-03
21-Jun-11	3.12E-02	+/-	2.55E-03
28-Jun-11	3.89E-02	+/-	2.85E-03

(a) See Appendix D - Program Execution.

FERMI 2
AIR PARTICULATE GROSS BETA
(pCi/cubic meter)

API-4 THIRD QUARTER

Date	Activity		
5-Jul-11	3.80E-02	+/-	2.77E-03
12-Jul-11	4.36E-02	+/-	2.94E-03
19-Jul-11	4.34E-02	+/-	2.88E-03
2-Aug-11	5.25E-02	+/-	3.99E-03
9-Aug-11	4.72E-02	+/-	3.26E-03
15-Aug-11	5.14E-02	+/-	3.62E-03
23-Aug-11	4.69E-02	+/-	3.82E-03
30-Aug-11	4.33E-02	+/-	3.33E-03
6-Sep-11	6.65E-02	+/-	4.05E-03
13-Sep-11	2.80E-02	+/-	2.69E-03
20-Sep-11	2.48E-02	+/-	2.56E-03
27-Sep-11	3.11E-02	+/-	2.81E-03

API-4 FOURTH QUARTER

Date	Activity		
4-Oct-11	2.51E-02	+/-	2.52E-03
11-Oct-11	6.09E-02	+/-	3.82E-03
19-Oct-11	3.62E-02	+/-	2.79E-03
25-Oct-11	3.26E-02	+/-	3.06E-03
1-Nov-11	2.32E-02	+/-	2.57E-03
8-Nov-11	3.87E-02	+/-	3.07E-03
15-Nov-11	4.43E-02	+/-	3.39E-03
22-Nov-11	4.63E-02	+/-	3.52E-03
29-Nov-11	3.09E-02	+/-	2.92E-03
6-Dec-11	3.68E-02	+/-	3.21E-03
13-Dec-11	4.75E-02	+/-	3.59E-03
20-Dec-11	4.89E-02	+/-	3.63E-03
27-Dec-11	2.54E-02	+/-	2.67E-03

FERMI 2
AIR PARTICULATE GROSS BETA
(pCi/cubic meter)

API-5 FIRST QUARTER

Date	Activity		
4-Jan-11	7.58E-02	+/-	3.80E-03
11-Jan-11	6.15E-02	+/-	3.33E-03
18-Jan-11	5.29E-02	+/-	3.14E-03
25-Jan-11	6.12E-02	+/-	3.40E-03
1-Feb-11	6.24E-02	+/-	3.37E-03
9-Feb-11	4.71E-02	+/-	2.92E-03
15-Feb-11	5.50E-02	+/-	3.52E-03
22-Feb-11	4.46E-02	+/-	2.98E-03
1-Mar-11	4.53E-02	+/-	3.03E-03
8-Mar-11	4.05E-02	+/-	2.87E-03
14-Mar-11	4.86E-02	+/-	3.38E-03
22-Mar-11	7.25E-02	+/-	3.52E-03
29-Mar-11	5.26E-02	+/-	3.16E-03

API-5 SECOND QUARTER

Date	Activity		
5-Apr-11	8.62E-02	+/-	3.97E-03
12-Apr-11	5.33E-02	+/-	3.63E-03
19-Apr-11	5.38E-02	+/-	3.15E-03
26-Apr-11	4.79E-02	+/-	2.99E-03
3-May-11	3.58E-02	+/-	2.65E-03
10-May-11	3.29E-02	+/-	2.51E-03
17-May-11	3.72E-02	+/-	2.64E-03
23-May-11	3.65E-02	+/-	2.85E-03
31-May-11	2.97E-02	+/-	2.20E-03
6-Jun-11	4.78E-02	+/-	3.36E-03
14-Jun-11	4.27E-02	+/-	2.69E-03
21-Jun-11	3.70E-02	+/-	2.64E-03
28-Jun-11	3.39E-02	+/-	2.61E-03

FERMI 2
AIR PARTICULATE GROSS BETA
(pCi/cubic meter)

API-5 THIRD QUARTER

Date	Activity		
5-Jul-11	3.69E-02	+/-	2.67E-03
12-Jul-11	5.29E-02	+/-	3.37E-03
19-Jul-11	4.92E-02	+/-	3.05E-03
2-Aug-11	5.44E-02	+/-	4.04E-03
9-Aug-11	5.09E-02	+/-	3.37E-03
15-Aug-11	5.23E-02	+/-	3.66E-03
23-Aug-11	4.63E-02	+/-	3.78E-03
30-Aug-11	4.48E-02	+/-	3.15E-03
6-Sep-11	4.43E-02	+/-	3.37E-03
13-Sep-11	6.76E-02	+/-	4.09E-03
20-Sep-11	3.34E-02	+/-	2.91E-03
27-Sep-11	3.24E-02	+/-	2.87E-03

API-5 FOURTH QUARTER

Date	Activity		
4-Oct-11	4.15E-02	+/-	3.19E-03
11-Oct-11	8.23E-02	+/-	4.43E-03
19-Oct-11	4.60E-02	+/-	3.12E-03
25-Oct-11	4.11E-02	+/-	3.42E-03
1-Nov-11	4.26E-02	+/-	3.33E-03
8-Nov-11	6.51E-02	+/-	3.94E-03
15-Nov-11	5.32E-02	+/-	3.68E-03
22-Nov-11	5.94E-02	+/-	3.97E-03
29-Nov-11	4.93E-02	+/-	3.62E-03
6-Dec-11	4.39E-02	+/-	3.49E-03
13-Dec-11	7.61E-02	+/-	4.49E-03
20-Dec-11	7.44E-02	+/-	4.43E-03
27-Dec-11	4.68E-02	+/-	3.55E-03

FERMI 2
AIR IODINE – 131
(pCi/cubic meter)

API-1 FIRST QUARTER

Date	Activity			
4-Jan-11	<	2.00E-02		
11-Jan-11	<	1.50E-02		
18-Jan-11	<	1.65E-02		
25-Jan-11	<	2.62E-02		
1-Feb-11	<	1.82E-02		
9-Feb-11	<	1.73E-02		
15-Feb-11	<	2.38E-02		
22-Feb-11	<	1.32E-02		
1-Mar-11	<	3.59E-02		
8-Mar-11	<	1.71E-02		
14-Mar-11	<	3.30E-02		
22-Mar-11	(a)	3.17E-02	+/-	7.22E-03
29-Mar-11	<	2.62E-02		

API-1 SECOND QUARTER

Date	Activity			
5-Apr-11	(a)	1.34E-01	+/-	2.13E-02
12-Apr-11	(a)	2.38E-02	+/-	7.47E-03
19-Apr-11	<	3.40E-02		
26-Apr-11	<	4.04E-02		
3-May-11	<	2.44E-02		
10-May-11	<	2.57E-02		
17-May-11	<	1.98E-02		
23-May-11	<	2.55E-02		
31-May-11	<	1.85E-02		
6-Jun-11	<	2.86E-02		
14-Jun-11	<	1.87E-02		
21-Jun-11	<	3.10E-02		
28-Jun-11	<	3.55E-02		

(a) See Appendix D - Program Execution.

FERMI 2
AIR IODINE – 131
(pCi/cubic meter)

API-1 THIRD QUARTER

Date	Activity	
5-Jul-11	<	3.57E-02
12-Jul-11	<	2.07E-02
19-Jul-11	<	3.45E-02
2-Aug-11	<	2.22E-02
9-Aug-11	<	4.86E-02
15-Aug-11	<	2.84E-02
23-Aug-11	<	1.53E-02
30-Aug-11	<	1.47E-02
6-Sep-11	<	1.56E-02
13-Sep-11	<	2.32E-02
20-Sep-11	<	1.58E-02
27-Sep-11	<	2.61E-02

API-1 FOURTH QUARTER

Date	Activity	
4-Oct-11	<	2.23E-02
11-Oct-11	<	1.46E-02
19-Oct-11	<	1.49E-02
25-Oct-11	<	1.84E-02
1-Nov-11	<	1.45E-02
8-Nov-11	<	2.04E-02
15-Nov-11	<	3.87E-02
22-Nov-11	<	3.09E-02
29-Nov-11	<	2.43E-02
6-Dec-11	<	3.17E-02
13-Dec-11	<	1.82E-02
20-Dec-11	<	1.47E-02
27-Dec-11	<	3.25E-02

FERMI 2
AIR IODINE – 131
(pCi/cubic meter)

API-2 FIRST QUARTER

Date	Activity			
4-Jan-11	<	2.56E-02		
11-Jan-11	<	1.55E-02		
18-Jan-11	<	2.59E-02		
25-Jan-11	<	3.32E-02		
1-Feb-11	<	2.38E-02		
9-Feb-11	<	1.92E-02		
15-Feb-11	<	2.25E-02		
22-Feb-11	<	2.45E-02		
1-Mar-11	<	2.58E-02		
8-Mar-11	<	3.40E-02		
14-Mar-11	<	4.20E-02		
22-Mar-11	<	3.91E-02		
29-Mar-11	<	2.56E-02		

API-2 SECOND QUARTER

Date	Activity			
5-Apr-11	(a)	1.03E-01	+/-	1.49E-02
12-Apr-11	<	2.52E-02		
19-Apr-11	<	4.96E-02		
26-Apr-11	<	3.79E-02		
3-May-11	<	1.91E-02		
10-May-11	<	3.03E-02		
17-May-11	<	3.20E-02		
23-May-11	<	2.23E-02		
31-May-11	<	2.19E-02		
6-Jun-11	<	4.87E-02		
14-Jun-11	<	1.65E-02		
21-Jun-11	<	3.13E-02		
28-Jun-11	<	4.82E-02		

(a) See Appendix D - Program Execution.

FERMI 2
AIR IODINE – 131
(pCi/cubic meter)

API-2 THIRD QUARTER

Date	Activity	
5-Jul-11	<	2.97E-02
12-Jul-11	<	3.60E-02
19-Jul-11	<	4.17E-02
2-Aug-11	<	2.05E-02
9-Aug-11	<	3.40E-02
15-Aug-11	<	3.64E-02
23-Aug-11	<	1.67E-02
30-Aug-11	<	3.20E-02
6-Sep-11	<	1.83E-02
13-Sep-11	<	1.75E-02
20-Sep-11	<	1.99E-02
27-Sep-11	<	1.14E-02

API-2 FOURTH QUARTER

Date	Activity	
4-Oct-11	<	2.83E-02
11-Oct-11	<	1.89E-02
19-Oct-11	<	2.13E-02
25-Oct-11	<	1.66E-02
1-Nov-11	<	2.83E-02
8-Nov-11	<	2.05E-02
15-Nov-11	<	1.98E-02
22-Nov-11	<	2.75E-02
29-Nov-11	<	2.27E-02
6-Dec-11	<	3.54E-02
13-Dec-11	<	2.77E-02
20-Dec-11	<	4.58E-02
27-Dec-11	<	2.54E-02

FERMI 2
AIR IODINE - 131
(pCi/cubic meter)

API-3 FIRST QUARTER

Date	Activity			
4-Jan-11	<	2.78E-02		
11-Jan-11	<	2.01E-02		
18-Jan-11	<	2.02E-02		
25-Jan-11	<	2.48E-02		
1-Feb-11	<	2.36E-02		
9-Feb-11	<	1.56E-02		
15-Feb-11	<	3.14E-02		
22-Feb-11	<	1.92E-02		
1-Mar-11	<	2.76E-02		
8-Mar-11	<	1.98E-02		
14-Mar-11	<	4.28E-02		
22-Mar-11	(a)	4.22E-02	+/-	9.30E-03
29-Mar-11	(a)	5.48E-02	+/-	1.30E-02

API-3 SECOND QUARTER

Date	Activity			
5-Apr-11	(a)	9.13E-02	+/-	1.33E-02
12-Apr-11	<	3.39E-02		
19-Apr-11	<	4.23E-02		
26-Apr-11	<	4.59E-02		
3-May-11	<	3.30E-02		
10-May-11	<	3.96E-02		
17-May-11	<	2.41E-02		
23-May-11	<	3.67E-02		
31-May-11	<	2.61E-02		
6-Jun-11	<	1.78E-02		
14-Jun-11	<	1.60E-02		
21-Jun-11	<	4.22E-02		
28-Jun-11	<	6.91E-02		

(a) See Appendix D - Program Execution.

FERMI 2
AIR IODINE - 131
(pCi/cubic meter)

API-3 THIRD QUARTER

Date	Activity	
5-Jul-11	<	2.12E-02
12-Jul-11	<	2.18E-02
19-Jul-11	<	1.62E-02
2-Aug-11	<	3.30E-02
9-Aug-11	<	2.44E-02
15-Aug-11	<	3.97E-02
23-Aug-11	<	3.73E-02
30-Aug-11	<	2.23E-02
6-Sep-11	<	2.34E-02
13-Sep-11	<	1.60E-02
20-Sep-11	<	2.81E-02
27-Sep-11	<	3.15E-02

API-3 FOURTH QUARTER

Date	Activity	
4-Oct-11	<	2.50E-02
11-Oct-11	<	2.13E-02
19-Oct-11	<	2.54E-02
25-Oct-11	<	2.28E-02
1-Nov-11	<	2.21E-02
8-Nov-11	<	2.52E-02
15-Nov-11	<	4.50E-02
22-Nov-11	<	2.17E-02
29-Nov-11	<	1.87E-02
6-Dec-11	<	3.96E-02
13-Dec-11	<	2.60E-02
20-Dec-11	<	2.82E-02
27-Dec-11	<	2.55E-02

FERMI 2
AIR IODINE - 131
(pCi/cubic meter)

API-4 FIRST QUARTER

Date	Activity			
4-Jan-11	<	2.59E-02		
11-Jan-11	<	2.60E-02		
18-Jan-11		(a)		
25-Jan-11	<	1.48E-02		
1-Feb-11	<	2.39E-02		
9-Feb-11	<	1.49E-02		
15-Feb-11	<	2.70E-02		
22-Feb-11	<	1.67E-02		
1-Mar-11	<	2.70E-02		
8-Mar-11	<	1.93E-02		
14-Mar-11	<	2.87E-02		
22-Mar-11	(a)	3.99E-02	+/-	8.32E-03
29-Mar-11	(a)	4.73E-02	+/-	1.19E-02

API-4 SECOND QUARTER

Date	Activity			
5-Apr-11	(a)	2.79E-02	+/-	7.33E-03
12-Apr-11	(a)	4.20E-02	+/-	9.81E-03
19-Apr-11	<	3.68E-02		
26-Apr-11	<	4.01E-02		
3-May-11	<	3.27E-02		
10-May-11	<	5.78E-02		
17-May-11	<	3.21E-02		
23-May-11	<	3.61E-02		
31-May-11	<	1.52E-02		
6-Jun-11	<	2.07E-02		
14-Jun-11	<	2.84E-02		
21-Jun-11	<	2.82E-02		
28-Jun-11	<	3.23E-02		

(a) See Appendix D - Program Execution.

FERMI 2
AIR IODINE - 131
(pCi/cubic meter)

API-4 THIRD QUARTER

Date	Activity	
5-Jul-11	<	2.42E-02
12-Jul-11	<	4.78E-02
19-Jul-11	<	3.02E-02
2-Aug-11	<	3.06E-02
9-Aug-11	<	2.46E-02
15-Aug-11	<	3.86E-02
23-Aug-11	<	1.67E-02
30-Aug-11	<	3.20E-02
6-Sep-11	<	1.78E-02
13-Sep-11	<	1.89E-02
20-Sep-11	<	1.66E-02
27-Sep-11	<	1.76E-02

API-4 FOURTH QUARTER

Date	Activity	
4-Oct-11	<	1.54E-02
11-Oct-11	<	1.50E-02
19-Oct-11	<	2.01E-02
25-Oct-11	<	2.36E-02
1-Nov-11	<	1.90E-02
8-Nov-11	<	2.31E-02
15-Nov-11	<	3.10E-02
22-Nov-11	<	1.44E-02
29-Nov-11	<	1.01E-02
6-Dec-11	<	4.72E-02
13-Dec-11	<	2.58E-02
20-Dec-11	<	3.22E-02
27-Dec-11		3.73E-02

FERMI 2
AIR IODINE – 131
(pCi/cubic meter)

API-5 FIRST QUARTER

Date	Activity			
4-Jan-11	<	2.46E-02		
11-Jan-11	<	2.62E-02		
18-Jan-11	<	2.14E-02		
25-Jan-11	<	2.82E-02		
1-Feb-11	<	2.04E-02		
9-Feb-11	<	2.17E-02		
15-Feb-11	<	2.65E-02		
22-Feb-11	<	2.46E-02		
1-Mar-11	<	1.90E-02		
8-Mar-11	<	8.73E-03		
14-Mar-11	<	1.91E-02		
22-Mar-11	(a)	2.90E-02	+/-	8.78E-03
29-Mar-11	(a)	4.04E-02	+/-	8.98E-03

API-5 SECOND QUARTER

Date	Activity			
5-Apr-11	<	5.31E-02		
12-Apr-11	<	5.25E-02		
19-Apr-11	<	4.92E-02		
26-Apr-11	<	3.58E-02		
3-May-11	<	2.93E-02		
10-May-11	<	2.89E-02		
17-May-11	<	2.23E-02		
23-May-11	<	2.68E-02		
31-May-11	<	4.33E-02		
6-Jun-11	<	1.48E-02		
14-Jun-11	<	3.18E-02		
21-Jun-11	<	5.23E-02		
28-Jun-11	<	5.31E-02		

(a) See Appendix D - Program Execution.

FERMI 2
AIR IODINE – 131
(pCi/cubic meter)

API-5 THIRD QUARTER

Date	Activity	
5-Jul-11	<	2.27E-02
12-Jul-11	<	2.41E-02
19-Jul-11	<	1.78E-02
2-Aug-11	<	1.62E-02
9-Aug-11	<	1.63E-02
15-Aug-11	<	6.17E-02
23-Aug-11	<	3.62E-02
30-Aug-11	<	1.84E-02
6-Sep-11	<	2.74E-02
13-Sep-11	<	1.87E-02
20-Sep-11	<	2.40E-02
27-Sep-11	<	2.34E-02

API-5 FOURTH QUARTER

Date	Activity	
4-Oct-11	<	1.91E-02
11-Oct-11	<	1.81E-02
19-Oct-11	<	1.71E-02
25-Oct-11	<	2.05E-02
1-Nov-11	<	1.54E-02
8-Nov-11	<	2.50E-02
15-Nov-11	<	2.99E-02
22-Nov-11	<	2.43E-02
29-Nov-11	<	1.51E-02
6-Dec-11	<	3.26E-02
13-Dec-11	<	2.52E-02
20-Dec-11	<	2.73E-02
27-Dec-11	<	2.98E-02

FERMI 2
AIR PARTICULATE QUARTERLY COMPOSITE ANALYSIS

API-1 (indicator)
(pCi/cubic meter)

Nuclide	First Quarter				Second Quarter			
Ba-140	<	3.68E-02			<	6.47E-03		
Be-7		6.39E-02	+/-	1.30E-02		6.28E-02	+/-	8.67E-03
Ce-141	<	4.15E-03			<	6.22E-04		
Ce-144	<	5.98E-03			<	7.51E-04		
Co-58	<	2.18E-03			<	4.36E-04		
Co-60	<	1.62E-03			<	2.98E-04		
Cr-51	<	3.97E-02			<	5.96E-03		
Cs-134	<	2.04E-03			<	3.45E-04		
Cs-137	<	1.83E-03			<	3.73E-04		
Fe-59	<	7.56E-03			<	1.21E-03		
I-131	<	1.48E-01			<	3.67E-02		
K-40	<	2.29E-02			<	3.76E-03		
La-140	<	3.68E-02			<	6.47E-03		
Mn-54	<	1.86E-03			<	2.30E-04		
Nb-95	<	2.36E-03			<	4.58E-04		
Ru-103	<	2.44E-03			<	4.84E-04		
Ru-106	<	1.35E-02			<	2.29E-03		
Zn-65	<	4.20E-03			<	6.42E-04		
Zr-95	<	4.82E-03			<	7.72E-04		

API-1 (indicator)
(pCi/cubic meter)

Nuclide	Third Quarter				Fourth Quarter			
Ba-140	<	2.17E-02			<	9.53E-03		
Be-7		6.03E-02	+/-	7.95E-03		7.17E-02	+/-	6.15E-03
Ce-141	<	2.61E-03			<	1.34E-03		
Ce-144	<	3.73E-03			<	2.27E-03		
Co-58	<	1.21E-03			<	6.15E-04		
Co-60	<	9.13E-04			<	7.21E-04		
Cr-51	<	2.31E-02			<	1.24E-02		
Cs-134	<	7.80E-04			<	6.30E-04		
Cs-137	<	8.28E-04			<	5.11E-04		
Fe-59	<	4.69E-03			<	1.78E-03		
I-131	<	1.53E-01			<	2.73E-02		
K-40	<	1.83E-02			<	4.90E-03		
La-140	<	2.17E-02			<	9.53E-03		
Mn-54	<	9.91E-04			<	6.21E-04		
Nb-95	<	8.90E-04			<	8.15E-04		
Ru-103	<	2.21E-03			<	1.06E-03		
Ru-106	<	7.14E-03			<	4.87E-03		
Zn-65	<	2.32E-03			<	1.07E-03		
Zr-95	<	2.05E-03			<	1.13E-03		

FERMI 2
AIR PARTICULATE QUARTERLY COMPOSITE ANALYSIS

API-2 (indicator)
(pCi/cubic meter)

Nuclide	First Quarter				Second Quarter			
Ba-140	<	3.82E-02			<	1.92E-02		
Be-7		8.32E-02	+/-	1.40E-02		6.37E-02	+/-	6.69E-03
Ce-141	<	4.58E-03			<	2.27E-03		
Ce-144	<	5.23E-03			<	2.91E-03		
Co-58	<	2.22E-03			<	8.30E-04		
Co-60	<	1.96E-03			<	7.20E-04		
Cr-51	<	3.37E-02			<	1.55E-02		
Cs-134	<	2.27E-03			<	8.51E-04		
Cs-137	<	1.63E-03			<	6.42E-04		
Fe-59	<	6.80E-03			<	2.76E-03		
I-131	<	1.77E-01			<	1.03E-01		
K-40	<	3.25E-02				1.04E-02	+/-	3.11E-03
La-140	<	3.82E-02			<	1.92E-02		
Mn-54	<	1.47E-03			<	6.92E-04		
Nb-95	<	2.67E-03			<	1.05E-03		
Ru-103	<	3.60E-03			<	1.27E-03		
Ru-106	<	1.43E-02			<	5.23E-03		
Zn-65	<	4.02E-03			<	1.56E-03		
Zr-95	<	4.88E-03			<	1.81E-03		

API-2 (indicator)
(pCi/cubic meter)

Nuclide	Third Quarter				Fourth Quarter			
Ba-140	<	3.61E-02			<	7.35E-03		
Be-7		5.09E-02	+/-	1.24E-02		5.95E-02	+/-	5.56E-03
Ce-141	<	4.07E-03			<	1.36E-03		
Ce-144	<	4.35E-03			<	2.26E-03		
Co-58	<	1.22E-03			<	7.49E-04		
Co-60	<	1.95E-03			<	6.16E-04		
Cr-51	<	3.68E-02			<	9.39E-03		
Cs-134	<	1.63E-03			<	7.14E-04		
Cs-137	<	1.15E-03			<	4.82E-04		
Fe-59	<	3.65E-03			<	2.20E-03		
I-131	<	1.92E-01			<	3.00E-02		
K-40	<	2.01E-02			<	6.21E-03		
La-140	<	3.61E-02			<	7.35E-03		
Mn-54	<	9.97E-04			<	6.60E-04		
Nb-95	<	1.88E-03			<	8.10E-04		
Ru-103	<	3.03E-03			<	1.07E-03		
Ru-106	<	1.17E-02			<	4.45E-03		
Zn-65	<	3.38E-03			<	1.25E-03		
Zr-95	<	2.31E-03			<	1.29E-03		

FERMI 2
AIR PARTICULATE QUARTERLY COMPOSITE ANALYSIS

API-3 (indicator)
(pCi/cubic meter)

Nuclide	First Quarter				Second Quarter			
Ba-140	<	2.07E-02			<	1.96E-02		
Be-7		5.60E-02	+/-	1.27E-02		7.02E-02	+/-	6.41E-03
Ce-141	<	4.08E-03			<	1.81E-03		
Ce-144	<	5.09E-03			<	2.35E-03		
Co-58	<	2.72E-03			<	6.12E-04		
Co-60	<	2.03E-03			<	6.65E-04		
Cr-51	<	3.72E-02			<	1.60E-02		
Cs-134	<	1.57E-03			<	8.36E-04		
Cs-137	<	1.79E-03			<	5.49E-04		
Fe-59	<	5.23E-03			<	2.30E-03		
I-131	<	1.25E-01			<	8.75E-02		
K-40	<	2.57E-02			<	3.21E-03		
La-140	<	2.07E-02			<	1.96E-02		
Mn-54	<	1.71E-03			<	6.50E-04		
Nb-95	<	3.02E-03			<	8.74E-04		
Ru-103	<	3.08E-03			<	9.79E-04		
Ru-106	<	1.30E-02			<	4.79E-03		
Zn-65	<	2.46E-03			<	1.36E-03		
Zr-95	<	3.73E-03			<	1.65E-03		

API-3 (indicator)
(pCi/cubic meter)

Nuclide	Third Quarter				Fourth Quarter			
Ba-140	<	2.07E-02			<	1.38E-02		
Be-7		5.69E-02	+/-	8.45E-03		5.59E-02	+/-	7.26E-03
Ce-141	<	2.95E-03			<	1.57E-03		
Ce-144	<	3.56E-03			<	2.46E-03		
Co-58	<	1.17E-03			<	9.58E-04		
Co-60	<	1.06E-03			<	7.53E-04		
Cr-51	<	2.56E-02			<	1.37E-02		
Cs-134	<	7.50E-04			<	9.89E-04		
Cs-137	<	1.02E-03			<	8.07E-04		
Fe-59	<	2.71E-03			<	3.33E-03		
I-131	<	1.49E-01			<	3.70E-02		
K-40	<	1.51E-02			<	1.48E-02		
La-140	<	2.07E-02			<	1.38E-02		
Mn-54	<	4.75E-04			<	7.95E-04		
Nb-95	<	1.08E-03			<	1.22E-03		
Ru-103	<	2.22E-03			<	1.64E-03		
Ru-106	<	6.80E-03			<	7.54E-03		
Zn-65	<	2.11E-03			<	1.65E-03		
Zr-95	<	2.89E-03			<	1.76E-03		

FERMI 2
AIR PARTICULATE QUARTERLY COMPOSITE ANALYSIS

API-4 (control)
(pCi/cubic meter)

Nuclide	(a)First Quarter				Second Quarter			
Ba-140	<	3.68E-02			<	2.16E-02		
Be-7		5.01E-02	+/-	1.41E-02		5.81E-02	+/-	7.70E-03
Ce-141	<	4.24E-03			<	2.35E-03		
Ce-144	<	5.44E-03			<	2.83E-03		
Co-58	<	3.07E-03			<	1.09E-03		
Co-60	<	1.97E-03			<	7.87E-04		
Cr-51	<	3.72E-02			<	1.90E-02		
Cs-134	<	2.46E-03			<	8.17E-04		
Cs-137	<	1.55E-03			<	7.46E-04		
Fe-59	<	7.48E-03			<	3.50E-03		
I-131	<	1.71E-01			<	1.12E-01		
K-40	<	2.90E-02			<	7.11E-03		
La-140	<	3.68E-02			<	2.16E-02		
Mn-54	<	1.39E-03			<	6.79E-04		
Nb-95	<	1.55E-03			<	1.29E-03		
Ru-103	<	3.23E-03			<	1.48E-03		
Ru-106	<	1.35E-02			<	5.67E-03		
Zn-65	<	4.07E-03			<	1.45E-03		
Zr-95	<	5.91E-03			<	2.11E-03		

API-4 (control)
(pCi/cubic meter)

Nuclide	Third Quarter				Fourth Quarter			
Ba-140	<	3.88E-02			<	1.27E-02		
Be-7		6.47E-02	+/-	8.18E-03		5.78E-02	+/-	5.33E-03
Ce-141	<	2.68E-03			<	1.57E-03		
Ce-144	<	3.05E-03			<	2.31E-03		
Co-58	<	1.22E-03			<	7.95E-04		
Co-60	<	7.21E-04			<	7.54E-04		
Cr-51	<	2.33E-02			<	1.12E-02		
Cs-134	<	1.03E-03			<	6.71E-04		
Cs-137	<	7.50E-04			<	5.10E-04		
Fe-59	<	4.02E-03			<	2.29E-03		
I-131	<	1.14E-01			<	2.37E-02		
K-40	<	1.70E-02			<	4.63E-03		
La-140	<	3.88E-02			<	1.27E-02		
Mn-54	<	9.50E-04			<	5.62E-04		
Nb-95	<	1.29E-03			<	9.05E-04		
Ru-103	<	1.79E-03			<	9.97E-04		
Ru-106	<	6.93E-03			<	5.68E-03		
Zn-65	<	1.80E-03			<	1.20E-03		
Zr-95	<	2.37E-03			<	1.32E-03		

(a) See Appendix D - Program Execution.

FERMI 2
AIR PARTICULATE QUARTERLY COMPOSITE ANALYSIS

API-5 (Indicator)
(pCi/cubic meter)

Nuclide	First Quarter				Second Quarter			
Ba-140	<	1.59E-02			<	2.00E-02		
Be-7		6.49E-02	+/-	8.36E-03		6.83E-02	+/-	7.53E-03
Ce-141	<	2.81E-03			<	2.57E-03		
Ce-144	<	3.57E-03			<	2.83E-03		
Co-58	<	1.31E-03			<	1.03E-03		
Co-60	<	7.64E-04			<	5.55E-04		
Cr-51	<	1.98E-02			<	2.02E-02		
Cs-134	<	1.05E-03			<	9.00E-04		
Cs-137	<	9.69E-04			<	7.77E-04		
Fe-59	<	4.36E-03			<	2.82E-03		
I-131	<	8.17E-02			<	1.14E-01		
K-40		1.87E-02	+/-	5.88E-03	<	6.72E-03		
La-140	<	1.59E-02			<	2.00E-02		
Mn-54	<	9.77E-04			<	6.38E-04		
Nb-95	<	1.57E-03			<	1.27E-03		
Ru-103	<	1.81E-03			<	1.76E-03		
Ru-106	<	5.96E-03			<	5.99E-03		
Zn-65	<	1.81E-03			<	1.54E-03		
Zr-95	<	2.45E-03			<	2.13E-03		

API-5 (Indicator)
(pCi/cubic meter)

Nuclide	Third Quarter				Fourth Quarter			
Ba-140	<	3.32E-02			<	1.08E-02		
Be-7		5.99E-02	+/-	1.46E-02		7.33E-02	+/-	7.69E-03
Ce-141	<	3.68E-03			<	1.91E-03		
Ce-144	<	4.28E-03			<	3.10E-03		
Co-58	<	1.54E-03			<	9.27E-04		
Co-60	<	1.03E-03			<	7.25E-04		
Cr-51	<	3.08E-02			<	1.58E-02		
Cs-134	<	1.15E-03			<	8.58E-04		
Cs-137	<	7.39E-04			<	5.19E-04		
Fe-59	<	4.26E-03			<	2.64E-03		
I-131	<	1.80E-01			<	3.32E-02		
K-40	<	1.78E-02				1.12E-02	+/-	3.40E-03
La-140	<	3.32E-02			<	1.08E-02		
Mn-54	<	1.17E-03			<	6.88E-04		
Nb-95	<	1.50E-03			<	9.53E-04		
Ru-103	<	2.05E-03			<	1.24E-03		
Ru-106	<	1.04E-02			<	3.92E-03		
Zn-65	<	1.99E-03			<	1.40E-03		
Zr-95	<	2.87E-03			<	1.93E-03		

FERMI 2
MILK ANALYSIS

M-2 (Indicator)
(pCi/liter)

Nuclide	13-JAN				10-FEB				17-MAR			
Ba-140	<	1.19E+01			<	3.47E+00			<	2.75E+00		
Be-7	<	2.10E+01			<	1.73E+01			<	1.65E+01		
Ce-141	<	4.41E+00			<	3.60E+00			<	3.38E+00		
Ce-144	<	1.69E+01			<	1.42E+01			<	1.26E+01		
Co-58	<	2.58E+00			<	2.19E+00			<	2.12E+00		
Co-60	<	3.22E+00			<	2.75E+00			<	2.60E+00		
Cs-134	<	2.95E+00			<	2.77E+00			<	2.55E+00		
Cs-137	<	2.59E+00			<	2.33E+00			<	2.36E+00		
Fe-59	<	6.28E+00			<	5.19E+00			<	4.89E+00		
I-131	<	5.68E-01			<	7.55E-01			<	9.26E-01		
K-40		1.50E+03	+/-	8.08E+01		1.45E+03	+/-	7.18E+01		1.52E+03	+/-	7.36E+01
La-140	<	3.80E+00			<	3.47E+00			<	2.75E+00		
Mn-54	<	2.82E+00			<	2.20E+00			<	2.25E+00		
Nb-95	<	2.69E+00			<	2.37E+00			<	2.01E+00		
Ru-103	<	2.48E+00			<	2.24E+00			<	2.05E+00		
Ru-106	<	2.27E+01			<	1.95E+01			<	1.80E+01		
Sr-89	<	2.21E+00			<	1.87E+00			<	1.87E+00		
Sr-90	<	1.66E+00			<	1.71E+00			<	1.42E+00		
Zn-65	<	5.99E+00			<	5.82E+00			<	5.16E+00		
Zr-95	<	4.67E+00			<	3.89E+00			<	3.53E+00		

Nuclide	21-APR				12-MAY				26-MAY			
Ba-140	<	3.33E+00			<	5.40E+00			<	3.85E+00		
Be-7	<	2.13E+01			<	2.16E+01			<	2.44E+01		
Ce-141	<	3.89E+00			<	4.29E+00			<	4.97E+00		
Ce-144	<	1.44E+01			<	1.48E+01			<	1.85E+01		
Co-58	<	2.46E+00			<	2.54E+00			<	2.75E+00		
Co-60	<	2.99E+00			<	2.63E+00			<	3.41E+00		
Cs-134	<	2.87E+00			<	2.86E+00			<	3.56E+00		
Cs-137	<	2.66E+00			<	2.45E+00			<	2.85E+00		
Fe-59	<	6.03E+00			<	6.89E+00			<	6.81E+00		
I-131	<	5.43E-01			<	5.55E-01			<	9.48E-01		
K-40		1.48E+03	+/-	7.80E+01		1.47E+03	+/-	7.80E+01		1.54E+03	+/-	8.19E+01
La-140	<	3.33E+00			<	5.40E+00			<	3.85E+00		
Mn-54	<	2.46E+00			<	2.28E+00			<	2.89E+00		
Nb-95	<	2.57E+00			<	2.73E+00			<	2.81E+00		
Ru-103	<	2.25E+00			<	2.82E+00			<	2.82E+00		
Ru-106	<	2.15E+01			<	2.14E+01			<	2.39E+01		
Sr-89	<	1.06E+00			<	2.26E+00			<	2.13E+00		
Sr-90	<	1.31E+00			<	1.76E+00			<	1.52E+00		
Zn-65	<	6.54E+00			<	5.60E+00			<	7.00E+00		
Zr-95	<	4.29E+00			<	4.83E+00			<	4.92E+00		

FERMI 2
MILK ANALYSIS

M-2 (Indicator)
(pCi/liter)

Nuclide	9-JUN				23-JUN				14-JUL			
Ba-140	<	3.40E+00			<	3.01E+00			<	3.68E+00		
Be-7	<	1.83E+01			<	2.15E+01			<	2.01E+01		
Ce-141	<	3.58E+00			<	4.58E+00			<	4.39E+00		
Ce-144	<	1.43E+01			<	1.67E+01			<	1.67E+01		
Co-58	<	2.28E+00			<	2.57E+00			<	2.48E+00		
Co-60	<	2.81E+00			<	3.08E+00			<	3.59E+00		
Cs-134	<	3.03E+00			<	3.50E+00			<	3.34E+00		
Cs-137	<	2.45E+00			<	2.69E+00			<	2.46E+00		
Fe-59	<	5.81E+00			<	6.28E+00			<	6.58E+00		
I-131	<	7.22E-01			<	5.90E-01			<	5.96E-01		
K-40		1.45E+03	+/-	7.48E+01		1.52E+03	+/-	8.30E+01		1.56E+03	+/-	8.25E+01
La-140	<	3.40E+00			<	3.01E+00			<	3.68E+00		
Mn-54	<	2.07E+00			<	2.47E+00			<	2.76E+00		
Nb-95	<	2.29E+00			<	2.59E+00			<	2.62E+00		
Ru-103	<	2.21E+00			<	2.48E+00			<	2.45E+00		
Ru-106	<	2.02E+01			<	2.24E+01			<	2.24E+01		
Sr-89	<	2.82E+00			<	2.30E+00			<	2.30E+00		
Sr-90	<	1.63E+00			<	1.45E+00			<	1.71E+00		
Zn-65	<	5.33E+00			<	6.79E+00			<	6.97E+00		
Zr-95	<	4.36E+00			<	4.28E+00			<	4.60E+00		

Nuclide	28-JUL				11-AUG				25-AUG			
Ba-140	<	2.72E+00			<	3.65E+00			<	3.10E+00		
Be-7	<	1.79E+01			<	2.13E+01			<	1.57E+01		
Ce-141	<	3.61E+00			<	4.30E+00			<	3.35E+00		
Ce-144	<	1.47E+01			<	1.71E+01			<	1.34E+01		
Co-58	<	2.23E+00			<	2.49E+00			<	2.15E+00		
Co-60	<	2.68E+00			<	2.81E+00			<	2.29E+00		
Cs-134	<	2.68E+00			<	3.47E+00			<	2.50E+00		
Cs-137	<	2.45E+00			<	2.47E+00			<	2.21E+00		
Fe-59	<	5.35E+00			<	6.51E+00			<	4.78E+00		
I-131	<	5.31E-01			<	8.19E-01			<	9.58E-01		
K-40		1.53E+03	+/-	7.73E+01		1.41E+03	+/-	7.72E+01		1.44E+03	+/-	7.41E+01
La-140	<	2.72E+00			<	3.65E+00			<	3.10E+00		
Mn-54	<	2.17E+00			<	2.80E+00			<	2.08E+00		
Nb-95	<	2.15E+00			<	2.60E+00			<	2.13E+00		
Ru-103	<	2.01E+00			<	2.44E+00			<	1.88E+00		
Ru-106	<	1.91E+01			<	2.25E+01			<	1.70E+01		
Sr-89	<	1.93E+00			<	3.90E+00			<	3.83E+00		
Sr-90	<	1.76E+00			<	1.82E+00			<	1.91E+00		
Zn-65	<	5.74E+00			<	6.37E+00			<	5.46E+00		
Zr-95	<	3.84E+00			<	5.05E+00			<	3.57E+00		

FERMI 2
MILK ANALYSIS

M-2 (Indicator)
(pCi/liter)

Nuclide	8-SEP			22-SEP			13-OCT		
Ba-140	< 4.18E+00			< 3.27E+00			< 2.81E+00		
Be-7	< 2.17E+01			< 1.74E+01			< 1.73E+01		
Ce-141	< 4.75E+00			< 3.71E+00			< 3.97E+00		
Ce-144	< 1.75E+01			< 1.49E+01			< 1.60E+01		
Co-58	< 2.70E+00			< 2.12E+00			< 2.18E+00		
Co-60	< 3.10E+00			< 2.41E+00			< 2.69E+00		
Cs-134	< 3.18E+00			< 2.61E+00			< 2.75E+00		
Cs-137	< 2.69E+00			< 2.34E+00			< 2.41E+00		
Fe-59	< 6.45E+00			< 4.60E+00			< 4.81E+00		
I-131	< 1.00E+00			< 5.13E-01			< 6.12E-01		
K-40	1.51E+03	+/-	7.88E+01	1.51E+03	+/-	7.31E+01	1.42E+03	+/-	6.86E+01
La-140	< 4.18E+00			< 3.27E+00			< 2.81E+00		
Mn-54	< 2.75E+00			< 2.07E+00			< 2.17E+00		
Nb-95	< 2.89E+00			< 2.25E+00			< 2.24E+00		
Ru-103	< 2.90E+00			< 2.28E+00			< 2.30E+00		
Ru-106	< 2.27E+01			< 2.02E+01			< 1.92E+01		
Sr-89	< 1.70E+00			< 1.86E+00			< 1.94E+00		
Sr-90	< 1.71E+00			< 1.56E+00			< 1.64E+00		
Zn-65	< 6.54E+00			< 5.37E+00			< 5.38E+00		
Zr-95	< 4.81E+00			< 3.62E+00			< 3.98E+00		

Nuclide	10-NOV			15-DEC		
Ba-140	< 3.86E+00			< 2.45E+00		
Be-7	< 2.44E+01			< 1.65E+01		
Ce-141	< 4.52E+00			< 3.24E+00		
Ce-144	< 1.74E+01			< 1.29E+01		
Co-58	< 3.04E+00			< 1.98E+00		
Co-60	< 3.17E+00			< 1.99E+00		
Cs-134	< 3.55E+00			< 2.61E+00		
Cs-137	< 3.00E+00			< 2.04E+00		
Fe-59	< 6.30E+00			< 4.65E+00		
I-131	< 5.56E-01			< 5.43E-01		
K-40	1.46E+03	+/-	7.29E+01	1.50E+03	+/-	7.44E+01
La-140	< 3.86E+00			< 2.45E+00		
Mn-54	< 2.71E+00			< 1.94E+00		
Nb-95	< 3.09E+00			< 2.04E+00		
Ru-103	< 2.80E+00			< 2.00E+00		
Ru-106	< 2.45E+01			< 1.80E+01		
Sr-89	< 1.33E+00			< 2.32E+00		
Sr-90	< 1.51E+00			< 1.37E+00		
Zn-65	< 7.20E+00			< 4.97E+00		
Zr-95	< 5.23E+00			< 3.70E+00		

FERMI 2
MILK ANALYSIS

M-8 (Control)
(pCi/liter)

Nuclide	13-JAN				10-FEB				17-MAR			
Ba-140	<	1.11E+01			<	3.81E+00			<	3.19E+00		
Be-7	<	2.07E+01			<	2.35E+01			<	1.80E+01		
Ce-141	<	4.47E+00			<	4.45E+00			<	3.01E+00		
Ce-144	<	1.72E+01			<	1.71E+01			<	1.16E+01		
Co-58	<	2.49E+00			<	2.53E+00			<	2.33E+00		
Co-60	<	2.65E+00			<	3.14E+00			<	2.64E+00		
Cs-134	<	2.78E+00			<	3.05E+00			<	2.74E+00		
Cs-137	<	2.60E+00			<	2.93E+00			<	3.57E+00		
Fe-59	<	5.46E+00			<	6.06E+00			<	5.35E+00		
I-131	<	6.99E-01			<	5.58E-01			<	5.33E-01		
K-40		1.46E+03	+/-	7.41E+01		1.44E+03	+/-	8.10E+01		1.41E+03	+/-	7.02E+01
La-140	<	3.28E+00			<	3.81E+00			<	3.19E+00		
Mn-54	<	2.44E+00			<	2.75E+00			<	2.27E+00		
Nb-95	<	2.49E+00			<	2.47E+00			<	2.31E+00		
Ru-103	<	2.62E+00			<	2.40E+00			<	1.95E+00		
Ru-106	<	2.19E+01			<	2.30E+01			<	1.91E+01		
Sr-89	<	2.76E+00			<	1.47E+00			<	2.47E+00		
Sr-90	<	1.70E+00			<	1.87E+00			<	1.59E+00		
Zn-65	<	6.24E+00			<	6.21E+00			<	6.04E+00		
Zr-95	<	4.55E+00			<	5.03E+00			<	4.05E+00		

Nuclide	21-APR				12-MAY				26-MAY			
Ba-140	<	2.23E+00			<	5.24E+00			<	8.67E+00		
Be-7	<	1.82E+01			<	1.90E+01			<	4.31E+01		
Ce-141	<	3.63E+00			<	3.78E+00			<	6.01E+00		
Ce-144	<	1.41E+01			<	1.21E+01			<	2.32E+01		
Co-58	<	2.17E+00			<	2.56E+00			<	6.14E+00		
Co-60	<	2.50E+00			<	2.57E+00			<	6.63E+00		
Cs-134	<	2.79E+00			<	2.69E+00			<	7.86E+00		
Cs-137	<	2.28E+00			<	3.51E+00			<	6.27E+00		
Fe-59	<	5.22E+00			<	6.14E+00			<	1.32E+01		
I-131	<	6.84E-01			<	4.70E-01			<	1.95E+00		
K-40		1.50E+03	+/-	7.40E+01		1.53E+03	+/-	7.40E+01		1.47E+03	+/-	9.25E+01
La-140	<	2.23E+00			<	5.24E+00			<	8.67E+00		
Mn-54	<	2.22E+00			<	2.14E+00			<	5.37E+00		
Nb-95	<	2.16E+00			<	2.74E+00			<	5.39E+00		
Ru-103	<	2.32E+00			<	2.55E+00			<	5.08E+00		
Ru-106	<	2.00E+01			<	2.02E+01			<	4.60E+01		
Sr-89	<	1.50E+00			<	2.33E+00			<	1.79E+00		
Sr-90	<	1.60E+00			<	1.76E+00			<	1.62E+00		
Zn-65	<	5.48E+00			<	5.59E+00			<	1.24E+01		
Zr-95	<	3.82E+00			<	4.27E+00			<	9.58E+00		

FERMI 2
MILK ANALYSIS

M-8 (Control)
(pCi/liter)

Nuclide	9-JUN				23-JUN				14-JUL			
Ba-140	<	2.64E+00			<	4.07E+00			<	3.80E+00		
Be-7	<	1.79E+01			<	2.30E+01			<	2.29E+01		
Ce-141	<	4.05E+00			<	5.20E+00			<	4.72E+00		
Ce-144	<	1.58E+01			<	1.97E+01			<	1.91E+01		
Co-58	<	2.46E+00			<	2.80E+00			<	2.52E+00		
Co-60	<	2.85E+00			<	2.94E+00			<	3.29E+00		
Cs-134	<	2.90E+00			<	3.57E+00			<	3.22E+00		
Cs-137	<	2.48E+00			<	2.88E+00			<	3.09E+00		
Fe-59	<	5.31E+00			<	6.84E+00			<	7.32E+00		
I-131	<	9.42E-01			<	6.80E-01			<	5.89E-01		
K-40		1.52E+03	+/-	8.06E+01		1.52E+03	+/-	8.31E+01		1.44E+03	+/-	7.87E+01
La-140	<	2.64E+00			<	4.07E+00			<	3.80E+00		
Mn-54	<	2.35E+00			<	2.77E+00			<	2.59E+00		
Nb-95	<	2.39E+00			<	2.76E+00			<	3.10E+00		
Ru-103	<	2.31E+00			<	2.89E+00			<	2.65E+00		
Ru-106	<	1.97E+01			<	2.51E+01			<	2.53E+01		
Sr-89	<	3.28E+00			<	1.73E+00			<	2.36E+00		
Sr-90	<	1.79E+00			<	1.25E+00			<	1.76E+00		
Zn-65	<	5.85E+00			<	7.12E+00			<	7.31E+00		
Zr-95	<	4.05E+00			<	5.06E+00			<	5.49E+00		

Nuclide	28-JUL				11-AUG				25-AUG			
Ba-140	<	2.41E+00			<	3.18E+00			<	3.95E+00		
Be-7	<	1.74E+01			<	1.87E+01			<	1.99E+01		
Ce-141	<	3.94E+00			<	4.15E+00			<	4.03E+00		
Ce-144	<	1.56E+01			<	1.54E+01			<	1.57E+01		
Co-58	<	2.05E+00			<	2.24E+00			<	2.45E+00		
Co-60	<	2.56E+00			<	2.54E+00			<	2.66E+00		
Cs-134	<	2.43E+00			<	2.70E+00			<	3.04E+00		
Cs-137	<	2.01E+00			<	2.47E+00			<	2.54E+00		
Fe-59	<	4.55E+00			<	5.28E+00			<	5.66E+00		
I-131	<	9.80E-01			<	1.00E+00			<	7.54E-01		
K-40		1.54E+03	+/-	7.78E+01		1.46E+03	+/-	7.88E+01		1.36E+03	+/-	7.59E+01
La-140	<	2.41E+00			<	3.18E+00			<	3.95E+00		
Mn-54	<	2.11E+00			<	2.11E+00			<	2.51E+00		
Nb-95	<	2.11E+00			<	2.25E+00			<	2.66E+00		
Ru-103	<	2.09E+00			<	2.08E+00			<	2.44E+00		
Ru-106	<	1.82E+01			<	2.00E+01			<	2.19E+01		
Sr-89	<	1.89E+00			<	4.57E+00			<	3.15E+00		
Sr-90	<	1.44E+00			<	1.84E+00			<	1.84E+00		
Zn-65	<	4.64E+00			<	5.81E+00			<	6.74E+00		
Zr-95	<	3.63E+00			<	3.77E+00			<	4.54E+00		

FERMI 2
MILK ANALYSIS

M-8 (Control)
(pCi/liter)

Nuclide	8-SEP				22-SEP				13-OCT			
Ba-140	<	3.84E+00			<	3.28E+00			<	3.11E+00		
Be-7	<	2.01E+01			<	2.01E+01			<	2.09E+01		
Ce-141	<	3.84E+00			<	4.02E+00			<	4.28E+00		
Ce-144	<	1.43E+01			<	1.58E+01			<	1.67E+01		
Co-58	<	2.33E+00			<	2.38E+00			<	2.59E+00		
Co-60	<	2.80E+00			<	2.62E+00			<	2.59E+00		
Cs-134	<	2.91E+00			<	2.97E+00			<	3.22E+00		
Cs-137	<	3.01E+00			<	2.62E+00			<	2.50E+00		
Fe-59	<	5.61E+00			<	5.04E+00			<	5.93E+00		
I-131	<	9.02E-01			<	6.10E-01			<	8.38E-01		
K-40		1.41E+03	+/-	6.90E+01		1.48E+03	+/-	7.64E+01		1.43E+03	+/-	7.31E+01
La-140	<	3.84E+00			<	3.28E+00			<	3.11E+00		
Mn-54	<	2.27E+00			<	2.44E+00			<	2.32E+00		
Nb-95	<	2.11E+00			<	2.56E+00			<	2.79E+00		
Ru-103	<	2.35E+00			<	2.27E+00			<	2.59E+00		
Ru-106	<	2.02E+01			<	2.20E+01			<	2.16E+01		
Sr-89	<	1.76E+00			<	1.86E+00			<	1.70E+00		
Sr-90	<	1.72E+00			<	1.67E+00			<	1.61E+00		
Zn-65	<	5.97E+00			<	6.35E+00			<	6.11E+00		
Zr-95	<	3.98E+00			<	4.33E+00			<	4.54E+00		

Nuclide	10-NOV				15-DEC			
Ba-140	<	4.04E+00			<	3.99E+00		
Be-7	<	2.31E+01			<	2.05E+01		
Ce-141	<	4.71E+00			<	4.09E+00		
Ce-144	<	1.81E+01			<	1.62E+01		
Co-58	<	2.74E+00			<	2.89E+00		
Co-60	<	3.25E+00			<	3.54E+00		
Cs-134	<	3.35E+00			<	4.16E+00		
Cs-137	<	3.07E+00			<	2.91E+00		
Fe-59	<	6.98E+00			<	6.98E+00		
I-131	<	9.22E-01			<	4.76E-01		
K-40		1.42E+03	+/-	7.82E+01		1.47E+03	+/-	7.39E+01
La-140	<	4.04E+00			<	3.99E+00		
Mn-54	<	2.80E+00			<	3.01E+00		
Nb-95	<	3.00E+00			<	2.89E+00		
Ru-103	<	2.83E+00			<	2.56E+00		
Ru-106	<	2.44E+01			<	2.58E+01		
Sr-89	<	1.59E+00			<	1.21E+00		
Sr-90	<	1.74E+00			<	1.37E+00		
Zn-65	<	6.95E+00			<	7.09E+00		
Zr-95	<	5.02E+00			<	5.23E+00		

FERMI 2
VEGETABLE ANALYSIS

FP-1 (Indicator)
(pCi/kg wet)

Nuclide	28-JUL Broccoli			28-JUL Cabbage			28-JUL Lettuce		
Ba-140	< 1.59E+01			< 9.21E+00			< 9.16E+00		
Be-7	1.91E+02	+/-	3.37E+01	9.33E+01	+/-	2.51E+01	3.07E+02	+/-	3.74E+01
Ce-141	1.30E+01			< 9.37E+00			< 9.42E+00		
Ce-144	< 4.59E+01			< 3.38E+01			< 3.25E+01		
Co-58	< 8.87E+00			< 5.76E+00			< 6.13E+00		
Co-60	< 1.06E+01			< 8.02E+00			< 7.09E+00		
Cs-134	< 1.12E+01			< 7.26E+00			< 7.66E+00		
Cs-137	< 9.40E+00			< 6.45E+00			< 6.04E+00		
Fe-59	< 2.14E+01			< 1.42E+01			< 1.37E+01		
I-131	< 1.62E+01			< 1.16E+01			< 1.06E+01		
K-40	3.64E+03	+/-	1.92E+02	2.39E+03	+/-	1.34E+02	3.82E+03	+/-	2.07E+02
La-140	< 1.59E+01			< 9.21E+00			< 9.16E+00		
Mn-54	< 8.92E+00			< 6.02E+00			< 5.95E+00		
Nb-95	< 9.64E+00			< 6.31E+00			< 6.71E+00		
Ru-103	< 9.02E+00			< 5.95E+00			< 5.91E+00		
Ru-106	< 8.14E+01			< 5.64E+01			< 5.07E+01		
Zn-65	< 2.22E+01			< 1.56E+01			< 1.51E+01		
Zr-95	< 1.70E+01			< 1.10E+01			< 1.10E+01		

FP-1 (Indicator)
(pCi/kg wet)

Nuclide	25-AUG Broccoli			25-AUG Cabbage		
Ba-140	< 1.47E+01			< 1.15E+01		
Be-7	3.07E+02	+/-	3.98E+01	2.03E+02	+/-	3.94E+01
Ce-141	1.49E+01			< 1.24E+01		
Ce-144	< 5.55E+01			< 4.68E+01		
Co-58	< 1.03E+01			< 9.39E+00		
Co-60	< 1.23E+01			< 1.17E+01		
Cs-134	< 1.45E+01			< 1.03E+01		
Cs-137	< 1.26E+01			< 1.10E+01		
Fe-59	< 2.24E+01			< 2.16E+01		
I-131	< 1.70E+01			< 1.32E+01		
K-40	2.46E+03	+/-	1.69E+02	2.24E+03	+/-	1.48E+02
La-140	< 1.47E+01			< 1.15E+01		
Mn-54	< 1.07E+01			< 9.46E+00		
Nb-95	< 1.19E+01			< 9.39E+00		
Ru-103	< 9.82E+00			< 8.73E+00		
Ru-106	< 8.60E+01			< 8.47E+01		
Zn-65	< 2.66E+01			< 1.94E+01		
Zr-95	< 2.20E+01			< 1.60E+01		

FERMI 2
VEGETABLE ANALYSIS

FP-9 (Control)
(pCi/kg wet)

Nuclide	28-JUL Broccoli				28-JUL Cabbage				28-JUL Horseradish			
Ba-140	<	1.18E+01			<	1.32E+01			<	1.89E+01		
Be-7		1.87E+02	+/-	3.01E+01		1.65E+02	+/-	3.09E+01		4.09E+02	+/-	5.41E+01
Ce-141	<	1.08E+01			<	1.26E+01			<	1.27E+01		
Ce-144	<	3.97E+01			<	5.05E+01			<	4.43E+01		
Co-58	<	7.30E+00			<	8.10E+00			<	1.09E+01		
Co-60	<	9.08E+00			<	9.46E+00			<	1.25E+01		
Cs-134	<	9.03E+00			<	9.74E+00			<	1.32E+01		
Cs-137	<	7.66E+00			<	9.02E+00			<	1.91E+01		
Fe-59	<	1.76E+01			<	1.86E+01			<	2.62E+01		
I-131	<	1.26E+01			<	1.56E+01			<	1.76E+01		
K-40		4.27E+03	+/-	2.14E+02		3.68E+03	+/-	2.16E+02		3.66E+00	+/-	5.60E+00
La-140	<	1.18E+01			<	1.32E+01			<	1.89E+01		
Mn-54	<	7.38E+00			<	7.75E+00			<	1.10E+01		
Nb-95	<	7.46E+00			<	9.20E+00			<	1.16E+01		
Ru-103	<	6.77E+00			<	8.29E+00			<	1.01E+01		
Ru-106	<	6.25E+01			<	7.19E+01			<	9.30E+01		
Zn-65	<	1.89E+01			<	1.98E+01			<	2.63E+01		
Zr-95	<	1.39E+01			<	1.42E+01			<	2.02E+01		

FP-9 (Control)
(pCi/kg wet)

Nuclide	25-AUG Cabbage				25-AUG Horseradish			
Ba-140	<	1.26E+01			<	1.64E+01		
Be-7		3.47E+02	+/-	4.61E+01		5.92E+02	+/-	6.23E+01
Ce-141	<	1.21E+01			<	1.66E+01		
Ce-144	<	4.52E+01			<	5.69E+01		
Co-58	<	8.79E+00			<	1.05E+01		
Co-60	<	1.16E+01			<	1.27E+01		
Cs-134	<	1.27E+01			<	1.30E+01		
Cs-137	<	1.03E+01			<	1.15E+01		
Fe-59	<	2.16E+01			<	2.44E+01		
I-131	<	1.36E+01			<	1.76E+01		
K-40		2.88E+03	+/-	1.77E+02		2.71E+03	+/-	1.79E+02
La-140	<	1.26E+01			<	1.64E+01		
Mn-54	<	9.26E+00			<	1.10E+01		
Nb-95	<	8.69E+00			<	1.19E+01		
Ru-103	<	7.87E+00			<	9.58E+00		
Ru-106	<	8.85E+01			<	1.01E+02		
Zn-65	<	2.50E+01			<	2.46E+01		
Zr-95	<	1.57E+01			<	2.03E+01		

FERMI 2
DRINKING WATER ANALYSIS

DW-1 (Indicator)
(pCi/liter)

Nuclide	25-JAN				22-FEB				30-MAR			
Ba-140	<	4.75E+00			<	3.19E+00			<	3.88E+00		
Be-7	<	1.93E+01			<	1.67E+01			<	1.57E+01		
Ce-141	<	3.99E+00			<	3.37E+00			<	3.26E+00		
Ce-144	<	1.40E+01			<	1.42E+01			<	1.18E+01		
Co-58	<	2.35E+00			<	1.90E+00			<	1.65E+00		
Co-60	<	2.36E+00			<	2.02E+00			<	1.90E+00		
Cr-51	<	2.20E+01			<	1.62E+01			<	1.72E+01		
Cs-134	<	2.42E+00			<	2.39E+00			<	1.92E+00		
Cs-137	<	2.11E+00			<	2.10E+00			<	1.87E+00		
Fe-59	<	4.64E+00			<	4.16E+00			<	3.42E+00		
GR-B	<	3.31E+00			<	2.95E+00			<	2.68E+00		
K-40		4.80E+01	+/-	1.23E+01	<	2.70E+01			<	2.75E+01		
La-140	<	4.75E+00			<	3.19E+00			<	3.88E+00		
Mn-54	<	2.13E+00			<	1.86E+00			<	1.70E+00		
Nb-95	<	2.49E+00			<	2.19E+00			<	1.91E+00		
Ru-103	<	2.37E+00			<	2.01E+00			<	1.88E+00		
Ru-106	<	1.93E+01			<	1.83E+01			<	1.58E+01		
Sr-89	<	1.58E+00			<	1.36E+00			<	1.15E+00		
Sr-90	<	1.87E+00			<	1.04E+00			<	1.79E+00		
Zn-65	<	4.19E+00			<	4.06E+00			<	3.93E+00		
Zr-95	<	3.94E+00			<	3.41E+00			<	3.29E+00		

Nuclide	26-APR				31-MAY				28-JUN			
Ba-140	<	1.14E+01			<	3.67E+00			<	4.71E+00		
Be-7	<	2.65E+01			<	1.58E+01			<	1.99E+01		
Ce-141	<	5.57E+00			<	3.23E+00			<	3.33E+00		
Ce-144	<	1.47E+01			<	1.22E+01			<	1.06E+01		
Co-58	<	2.99E+00			<	1.84E+00			<	2.46E+00		
Co-60	<	2.89E+00			<	1.62E+00			<	2.71E+00		
Cr-51	<	3.25E+01			<	1.70E+01			<	2.01E+01		
Cs-134	<	3.13E+00			<	2.38E+00			<	2.81E+00		
Cs-137	<	4.37E+00			<	1.90E+00			<	2.57E+00		
Fe-59	<	7.76E+00			<	4.22E+00			<	5.95E+00		
GR-B	<	3.54E+00			<	3.29E+00			<	3.64E+00		
K-40	<	3.51E+01			<	1.53E+01			<	2.81E+01		
La-140	<	3.51E+01			<	3.67E+00			<	4.71E+00		
Mn-54	<	2.76E+00			<	1.73E+00			<	2.32E+00		
Nb-95	<	3.25E+00			<	1.97E+00			<	2.62E+00		
Ru-103	<	3.29E+00			<	1.92E+00			<	2.22E+00		
Ru-106	<	2.50E+01			<	1.76E+01			<	2.01E+01		
Sr-89	<	1.15E+00			<	1.74E+00			<	2.06E+00		
Sr-90	<	1.72E+00			<	1.59E+00			<	1.60E+00		
Zn-65	<	6.18E+00			<	4.31E+00			<	5.60E+00		
Zr-95	<	5.56E+00			<	3.52E+00			<	4.28E+00		

FERMI 2
DRINKING WATER ANALYSIS

DW-1 (Indicator)
(pCi/liter)

Nuclide	25-JUL				30-AUG				27-SEP			
Ba-140	<	4.10E+00			<	1.22E+00			<	6.25E+00		
Be-7	<	1.80E+01			<	5.21E+00			<	2.62E+01		
Ce-141	<	3.46E+00			<	1.66E+00			<	6.36E+00		
Ce-144	<	1.20E+01			<	4.84E+00			<	2.13E+01		
Co-58	<	1.82E+00			<	6.74E-01			<	2.96E+00		
Co-60	<	2.12E+00			<	7.06E-01			<	3.21E+00		
Cr-51	<	1.80E+01			<	6.45E+00			<	3.19E+01		
Cs-134	<	2.02E+00			<	7.77E-01			<	3.41E+00		
Cs-137	<	1.97E+00			<	7.18E-01			<	3.05E+00		
Fe-59	<	3.79E+00			<	1.43E+00			<	6.32E+00		
GR-B	<	3.39E+00			<	1.15E+00			<	3.42E+00		
K-40	<	1.92E+01			<	1.11E+01			<	2.91E+01		
La-140	<	4.10E+00			<	1.22E+00			<	6.25E+00		
Mn-54	<	1.75E+00			<	6.84E-01			<	2.95E+00		
Nb-95	<	1.96E+00			<	7.38E-01			<	3.34E+00		
Ru-103	<	2.04E+00			<	7.69E-01			<	3.38E+00		
Ru-106	<	1.66E+01			<	6.33E+00			<	2.66E+01		
Sr-89	<	2.23E+00			<	5.41E-01			<	1.23E+00		
Sr-90	<	1.73E+00			<	3.46E-01			<	1.64E+00		
Zn-65	<	3.59E+00			<	1.76E+00			<	6.29E+00		
Zr-95	<	3.57E+00			<	1.17E+00			<	5.35E+00		

Nuclide	26-OCT				29-NOV				27-DEC			
Ba-140	<	4.53E+00			<	2.77E+00			<	5.04E+00		
Be-7	<	1.97E+01			<	1.65E+01			<	1.94E+01		
Ce-141	<	4.64E+00			<	2.81E+00			<	3.21E+00		
Ce-144	<	1.72E+01			<	1.07E+01			<	1.13E+01		
Co-58	<	2.21E+00			<	2.18E+00			<	2.24E+00		
Co-60	<	2.68E+00			<	2.63E+00			<	2.70E+00		
Cr-51	<	2.54E+01			<	1.65E+01			<	2.06E+01		
Cs-134	<	2.72E+00			<	2.87E+00			<	2.96E+00		
Cs-137	<	2.45E+00			<	2.32E+00			<	2.42E+00		
Fe-59	<	5.36E+00			<	4.31E+00			<	5.15E+00		
GR-B	<	3.62E+00			<	2.76E+00				6.38E+00	+/-	1.36E+00
K-40	<	3.32E+01			<	3.04E+01			<	3.18E+01		
La-140	<	4.53E+00			<	2.77E+00			<	5.04E+00		
Mn-54	<	2.47E+00			<	2.14E+00			<	2.33E+00		
Nb-95	<	2.41E+00			<	2.32E+00			<	2.80E+00		
Ru-103	<	2.53E+00			<	1.93E+00			<	2.39E+00		
Ru-106	<	2.11E+01			<	1.96E+01			<	2.03E+01		
Sr-89	<	9.36E-01			<	1.48E+00			<	1.39E+00		
Sr-90	<	1.69E+00			<	1.80E+00			<	1.65E+00		
Zn-65	<	5.02E+00			<	5.24E+00			<	4.73E+00		
Zr-95	<	4.11E+00			<	3.87E+00			<	4.44E+00		

FERMI 2
DRINKING WATER ANALYSIS

DW-2 (Control)
(pCi/liter)

Nuclide	25-JAN				22-FEB				30-MAR			
Ba-140	<	3.77E+00			<	2.26E+00			<	4.29E+00		
Be-7	<	1.58E+01			<	1.51E+01			<	1.89E+01		
Ce-141	<	3.33E+00			<	3.41E+00			<	3.06E+00		
Ce-144	<	1.16E+01			<	1.33E+01			<	1.04E+01		
Co-58	<	1.78E+00			<	1.71E+00			<	2.16E+00		
Co-60	<	1.99E+00			<	1.96E+00			<	2.57E+00		
Cr-51	<	1.73E+01			<	1.75E+01			<	1.94E+01		
Cs-134	<	2.08E+00			<	2.29E+00			<	3.02E+00		
Cs-137	<	1.84E+00			<	2.13E+00			<	2.43E+00		
Fe-59	<	4.02E+00			<	3.77E+00			<	5.56E+00		
GR-B	<	3.12E+00			<	2.96E+00			<	3.01E+00		
K-40	<	2.62E+01			<	2.81E+01			<	2.88E+01		
La-140	<	3.77E+00			<	2.26E+00			<	4.29E+00		
Mn-54	<	1.87E+00			<	1.80E+00			<	2.34E+00		
Nb-95	<	1.94E+00			<	1.92E+00			<	2.47E+00		
Ru-103	<	1.98E+00			<	1.96E+00			<	2.17E+00		
Ru-106	<	1.61E+01			<	1.68E+01			<	1.93E+01		
Sr-89	<	1.88E+00			<	1.08E+00			<	1.45E+00		
Sr-90	<	1.54E+00			<	1.76E+00			<	1.85E+00		
Zn-65	<	3.80E+00			<	4.05E+00			<	4.89E+00		
Zr-95	<	3.43E+00			<	3.20E+00			<	4.11E+00		

Nuclide	26-APR				31-MAY				29-JUN			
Ba-140	<	1.11E+01			<	4.93E+00			<	4.07E+00		
Be-7	<	2.82E+01			<	2.40E+01			<	1.70E+01		
Ce-141	<	6.69E+00			<	4.13E+00			<	3.48E+00		
Ce-144	<	1.83E+01			<	1.63E+01			<	1.16E+01		
Co-58	<	3.19E+00			<	2.64E+00			<	1.78E+00		
Co-60	<	3.22E+00			<	2.13E+00			<	2.03E+00		
Cr-51	<	3.77E+01			<	2.37E+01			<	1.92E+01		
Cs-134	<	3.35E+00			<	2.96E+00			<	2.30E+00		
Cs-137	<	3.03E+00			<	2.94E+00			<	1.87E+00		
Fe-59	<	7.82E+00			<	6.05E+00			<	4.12E+00		
GR-B	<	3.64E+00			<	3.42E+00			<	3.31E+00		
K-40	<	2.73E+01			<	2.58E+01			<	2.45E+01		
La-140	<	1.11E+01			<	4.93E+00			<	4.07E+00		
Mn-54	<	3.00E+00			<	2.49E+00			<	1.81E+00		
Nb-95	<	3.52E+00			<	2.87E+00			<	1.79E+00		
Ru-103	<	3.77E+00			<	2.55E+00			<	1.95E+00		
Ru-106	<	2.55E+01			<	2.26E+01			<	1.58E+01		
Sr-89	<	1.25E+00			<	1.84E+00			<	1.67E+00		
Sr-90	<	1.82E+00			<	1.23E+00			<	1.67E+00		
Zn-65	<	6.19E+00			<	5.17E+00			<	3.71E+00		
Zr-95	<	5.83E+00			<	4.45E+00			<	3.43E+00		

FERMI 2
DRINKING WATER ANALYSIS

DW-2 (Control)
(pCi/liter)

Nuclide	25-JUL			30-AUG			27-SEP		
Ba-140	< 3.24E+00			< 4.79E+00			< 5.14E+00		
Be-7	< 1.38E+01			< 1.77E+01			< 2.00E+01		
Ce-141	< 3.20E+00			< 3.47E+00			< 4.58E+00		
Ce-144	< 1.11E+01			< 1.17E+01			< 1.58E+01		
Co-58	< 1.64E+00			< 2.22E+00			< 2.21E+00		
Co-60	< 1.61E+00			< 2.44E+00			< 2.64E+00		
Cr-51	< 1.74E+01			< 2.01E+01			< 2.42E+01		
Cs-134	< 1.98E+00			< 2.40E+00			< 2.80E+00		
Cs-137	< 1.80E+00			< 3.35E+00			< 2.31E+00		
Fe-59	< 3.61E+00			< 5.03E+00			< 5.17E+00		
GR-B	< 3.65E+00			< 3.64E+00			< 3.62E+00		
K-40	< 2.31E+01			< 2.74E+01			< 3.22E+01		
La-140	< 3.24E+00			< 4.79E+00			< 5.14E+00		
Mn-54	< 1.51E+00			< 2.06E+00			< 2.16E+00		
Nb-95	< 1.75E+00			< 2.39E+00			< 2.31E+00		
Ru-103	< 1.99E+00			< 2.33E+00			< 2.48E+00		
Ru-106	< 1.51E+01			< 1.77E+01			< 2.03E+01		
Sr-89	< 2.02E+00			< 2.53E+00			< 1.04E+00		
Sr-90	< 1.82E+00			< 1.99E+00			< 1.68E+00		
Zn-65	< 3.66E+00			< 4.25E+00			< 4.58E+00		
Zr-95	< 2.85E+00			< 3.82E+00			< 4.08E+00		

Nuclide	25-OCT			29-NOV			27-DEC		
Ba-140	< 3.91E+00			< 2.65E+00			< 2.88E+00		
Be-7	< 2.01E+01			< 1.63E+01			< 1.42E+01		
Ce-141	< 4.88E+00			< 3.50E+00			< 3.15E+00		
Ce-144	< 1.74E+01			< 1.41E+01			< 1.05E+01		
Co-58	< 2.12E+00			< 1.75E+00			< 1.50E+00		
Co-60	< 2.20E+00			< 1.99E+00			< 1.67E+00		
Cr-51	< 2.53E+01			< 1.62E+01			< 1.62E+01		
Cs-134	< 2.44E+00			< 2.57E+00			< 1.81E+00		
Cs-137	< 2.24E+00			< 2.11E+00			< 1.68E+00		
Fe-59	< 4.45E+00			< 3.60E+00			< 3.02E+00		
GR-B	< 3.77E+00			< 2.82E+00			5.72E+00	+/-	1.32E+0
K-40	< 2.95E+01			< 2.05E+01			< 1.51E+01		
La-140	< 3.91E+00			< 2.65E+00			< 2.88E+00		
Mn-54	< 2.09E+00			< 1.93E+00			< 1.36E+00		
Nb-95	< 2.42E+00			< 1.96E+00			< 1.68E+00		
Ru-103	< 2.48E+00			< 1.95E+00			< 1.75E+00		
Ru-106	< 2.03E+01			< 1.57E+01			< 1.37E+01		
Sr-89	< 1.62E+00			< 2.36E+00			< 1.99E+00		
Sr-90	< 1.60E+00			< 1.75E+00			< 1.31E+00		
Zn-65	< 4.43E+00			< 4.17E+00			< 2.92E+00		
Zr-95	< 3.59E+00			3.14E+00			< 2.72E+00		

FERMI 2
SURFACE WATER ANALYSIS

SW-2 (Control)
(pCi/liter)

Nuclide	25-JAN	24-FEB	30-MAR
Ba-140	< 3.48E+00	< 2.51E+00	< 3.66E+00
Be-7	< 1.60E+01	< 1.40E+01	< 1.71E+01
Ce-141	< 3.38E+00	< 2.62E+00	< 3.84E+00
Ce-144	< 1.18E+01	< 1.06E+01	< 1.26E+01
Co-58	< 1.98E+00	< 1.51E+00	< 1.84E+00
Co-60	< 1.65E+00	< 1.75E+00	< 1.86E+00
Cr-51	< 1.91E+01	< 1.42E+01	< 1.84E+01
Cs-134	< 2.23E+00	< 1.93E+00	< 2.37E+00
Cs-137	< 1.68E+00	< 1.63E+00	< 1.99E+00
Fe-59	< 3.89E+00	< 3.29E+00	< 3.61E+00
K-40	< 1.71E+01	< 1.65E+01	< 2.54E+01
La-140	< 3.48E+00	< 2.51E+00	< 3.66E+00
Mn-54	< 1.81E+00	< 1.55E+00	< 1.78E+00
Nb-95	< 1.94E+00	< 1.59E+00	< 2.01E+00
Ru-103	< 1.88E+00	< 1.65E+00	< 2.05E+00
Ru-106	< 1.51E+01	< 1.66E+01	< 1.68E+01
Sr-89	< 2.16E+00	< 2.10E+00	< 1.70E+00
Sr-90	< 1.65E+00	< 1.39E+00	< 1.69E+00
Zn-65	< 3.78E+00	< 3.28E+00	< 3.72E+00
Zr-95	< 3.28E+00	< 2.70E+00	< 3.43E+00

Nuclide	26-APR	31-MAY	28-JUN
Ba-140	< 1.22E+01	< 4.31E+00	< 4.08E+00
Be-7	< 2.78E+01	< 1.78E+01	< 1.86E+01
Ce-141	< 7.02E+00	< 3.81E+00	< 4.10E+00
Ce-144	< 1.92E+01	< 1.42E+01	< 1.36E+01
Co-58	< 2.75E+00	< 1.87E+00	< 2.12E+00
Co-60	< 3.41E+00	< 2.40E+00	< 2.28E+00
Cr-51	< 4.10E+01	< 2.03E+01	< 2.03E+01
Cs-134	< 3.11E+00	< 2.46E+00	< 2.70E+00
Cs-137	< 2.66E+00	< 2.08E+00	< 2.09E+00
Fe-59	< 7.63E+00	< 4.09E+00	< 4.68E+00
K-40	< 1.95E+01	< 2.87E+01	< 2.87E+01
La-140	< 1.22E+01	< 4.31E+00	< 4.08E+00
Mn-54	< 2.63E+00	< 2.22E+00	< 1.79E+00
Nb-95	< 3.33E+00	< 2.30E+00	< 2.20E+00
Ru-103	< 3.45E+00	< 2.28E+00	< 2.21E+00
Ru-106	< 2.21E+01	< 1.88E+01	< 1.80E+01
Sr-89	< 1.44E+00	< 1.52E+00	< 1.81E+00
Sr-90	< 1.83E+00	< 1.12E+00	< 1.86E+00
Zn-65	< 5.61E+00	< 4.60E+00	< 3.95E+00
Zr-95	< 6.03E+00	< 3.67E+00	< 3.39E+00

FERMI 2
SURFACE WATER ANALYSIS

SW-2 (Control)
(pCi/liter)

Nuclide	25-JUL	30-AUG	27-SEP
Ba-140	< 4.01E+00	< 6.07E+00	< 4.08E+00
Be-7	< 1.58E+01	< 2.32E+01	< 1.94E+01
Ce-141	< 3.63E+00	< 4.71E+00	< 4.61E+00
Ce-144	< 1.19E+01	< 1.60E+01	< 1.58E+01
Co-58	< 1.79E+00	< 2.56E+00	< 2.06E+00
Co-60	< 1.91E+00	< 2.98E+00	< 2.31E+00
Cr-51	< 1.91E+01	< 2.69E+01	< 2.34E+01
Cs-134	< 2.14E+00	< 3.12E+00	< 2.73E+00
Cs-137	< 1.79E+00	< 2.89E+00	< 2.23E+00
Fe-59	< 3.95E+00	< 4.60E+00	< 4.47E+00
K-40	< 1.64E+01	< 4.02E+01	< 2.23E+01
La-140	< 4.01E+00	< 6.07E+00	< 4.08E+00
Mn-54	< 1.69E+00	< 2.82E+00	< 1.96E+00
Nb-95	< 1.96E+00	< 2.78E+00	< 2.52E+00
Ru-103	< 2.09E+00	< 2.70E+00	< 2.33E+00
Ru-106	< 1.65E+01	< 2.51E+01	< 1.88E+01
Sr-89	< 1.98E+00	< 2.03E+00	< 1.96E+00
Sr-90	< 1.42E+00	< 1.77E+00	< 1.73E+00
Zn-65	< 3.68E+00	< 5.85E+00	< 4.09E+00
Zr-95	< 3.32E+00	< 4.82E+00	< 3.99E+00

Nuclide	25-OCT	29-NOV	27-DEC
Ba-140	< 5.33E+00	< 1.86E+00	< 3.96E+00
Be-7	< 2.41E+01	< 1.29E+01	< 1.71E+01
Ce-141	< 4.01E+00	< 2.70E+00	< 3.16E+00
Ce-144	< 1.32E+01	< 1.03E+01	< 1.16E+01
Co-58	< 2.85E+00	< 1.42E+00	< 2.13E+00
Co-60	< 3.25E+00	< 1.77E+00	< 1.98E+00
Cr-51	< 2.27E+01	< 1.38E+01	< 1.91E+01
Cs-134	< 3.30E+00	< 1.90E+00	< 2.49E+00
Cs-137	< 3.02E+00	< 1.72E+00	< 3.34E+00
Fe-59	< 6.74E+00	< 2.96E+00	< 4.19E+00
K-40	< 3.35E+01	< 2.28E+01	< 2.71E+01
La-140	< 5.33E+00	< 1.86E+00	< 3.96E+00
Mn-54	< 2.75E+00	< 1.48E+00	< 1.97E+00
Nb-95	< 3.23E+00	< 1.57E+00	< 2.19E+00
Ru-103	< 3.03E+00	< 1.46E+00	< 1.97E+00
Ru-106	< 2.27E+01	< 1.47E+01	< 1.79E+01
Sr-89	< 1.07E+00	< 2.35E+00	< 1.21E+00
Sr-90	< 1.57E+00	< 1.79E+00	< 1.62E+00
Zn-65	< 5.13E+00	< 3.14E+00	< 4.34E+00
Zr-95	< 4.35E+00	< 2.48E+00	< 3.78E+00

FERMI 2
SURFACE WATER ANALYSIS

SW-3 (Indicator)
(pCi/liter)

Nuclide	25-JAN	22-FEB	30-MAR
Ba-140	< 4.23E+00	< 2.34E+00	< 4.78E+00
Be-7	< 1.85E+01	< 1.56E+01	< 2.11E+01
Ce-141	< 3.75E+00	< 2.80E+00	< 4.09E+00
Ce-144	< 1.24E+01	< 1.16E+01	< 1.40E+01
Co-58	< 2.29E+00	< 1.75E+00	< 2.75E+00
Co-60	< 2.47E+00	< 2.01E+00	< 3.05E+00
Cr-51	< 2.10E+01	< 1.49E+01	< 2.39E+01
Cs-134	< 2.64E+00	< 1.89E+00	< 2.86E+00
Cs-137	< 3.78E+00	< 1.90E+00	< 2.80E+00
Fe-59	< 4.47E+00	< 3.29E+00	< 5.83E+00
K-40	< 2.34E+01	< 2.52E+01	< 3.69E+01
La-140	< 4.23E+00	< 2.34E+00	< 4.78E+00
Mn-54	< 2.19E+00	< 1.84E+00	< 2.35E+00
Nb-95	< 2.65E+00	< 1.96E+00	< 2.73E+00
Ru-103	< 2.43E+00	< 1.68E+00	< 2.67E+00
Ru-106	< 1.89E+01	< 1.53E+01	< 2.37E+01
Sr-89	< 1.75E+00	< 1.63E+00	< 1.22E+00
Sr-90	< 1.74E+00	< 1.48E+00	< 1.78E+00
Zn-65	< 4.24E+00	< 3.48E+00	< 5.07E+00
Zr-95	< 4.06E+00	< 2.87E+00	< 4.41E+00

Nuclide	26-APR	31-MAY	28-JUN
Ba-140	< 8.44E+00	< 4.30E+00	< 3.55E+00
Be-7	< 2.23E+01	< 2.04E+01	< 1.47E+01
Ce-141	< 5.57E+00	< 3.48E+00	< 3.30E+00
Ce-144	< 1.69E+01	< 1.31E+01	< 1.13E+01
Co-58	< 2.83E+00	< 2.26E+00	< 1.74E+00
Co-60	< 2.66E+00	< 3.05E+00	< 1.85E+00
Cr-51	< 3.44E+01	< 2.02E+01	< 1.77E+01
Cs-134	< 2.94E+00	< 2.79E+00	< 2.05E+00
Cs-137	< 2.57E+00	< 4.13E+00	< 1.77E+00
Fe-59	< 6.16E+00	< 4.80E+00	< 3.59E+00
K-40	< 3.36E+01	< 3.49E+01	< 2.31E+01
La-140	< 8.44E+00	< 4.30E+00	< 3.55E+00
Mn-54	< 2.36E+00	< 2.10E+00	< 1.44E+00
Nb-95	< 2.98E+00	< 2.36E+00	< 1.82E+00
Ru-103	< 3.15E+00	< 2.48E+00	< 1.93E+00
Ru-106	< 2.33E+01	< 1.92E+01	< 1.52E+01
Sr-89	< 1.07E+00	< 1.58E+00	< 2.39E+00
Sr-90	< 1.58E+00	< 1.19E+00	< 1.69E+00
Zn-65	< 4.51E+00	< 5.64E+00	< 3.33E+00
Zr-95	< 5.16E+00	< 4.11E+00	< 2.93E+00

FERMI 2
SURFACE WATER ANALYSIS

SW-3 (Indicator)
(pCi/liter)

Nuclide	25-JUL			30-AUG			27-SEP		
Ba-140	< 4.15E+00			< 4.87E+00			< 4.38E+00		
Be-7	< 1.86E+01			< 2.02E+01			< 1.81E+01		
Ce-141	< 4.31E+00			< 4.46E+00			< 4.23E+00		
Ce-144	< 1.42E+01			< 1.57E+01			< 1.43E+01		
Co-58	< 1.93E+00			< 2.40E+00			< 1.94E+00		
Co-60	< 1.73E+00			< 2.49E+00			< 2.21E+00		
Cr-51	< 2.15E+01			< 2.42E+01			< 2.26E+01		
Cs-134	< 2.23E+00			< 2.94E+00			< 2.36E+00		
Cs-137	< 1.97E+00			< 2.64E+00			< 2.16E+00		
Fe-59	< 3.94E+00			< 4.64E+00			< 4.49E+00		
K-40	< 2.53E+01			< 2.34E+01			< 3.01E+01		
La-140	< 4.15E+00			< 4.87E+00			< 4.38E+00		
Mn-54	< 1.77E+00			< 2.38E+00			< 1.95E+00		
Nb-95	< 1.88E+00			< 2.76E+00			< 2.26E+00		
Ru-103	< 2.16E+00			< 2.50E+00			< 2.25E+00		
Ru-106	< 1.61E+01			< 2.30E+01			< 1.77E+01		
Sr-89	< 3.36E+00			< 2.66E+00			< 1.83E+00		
Sr-90	< 1.65E+00			< 1.70E+00			< 1.51E+00		
Zn-65	< 3.84E+00			< 4.74E+00			< 4.67E+00		
Zr-95	< 3.34E+00			< 4.30E+00			< 3.81E+00		

Nuclide	25-OCT			29-NOV			27-DEC		
Ba-140	< 4.93E+00			< 2.54E+00			< 3.32E+00		
Be-7	< 2.15E+01			< 1.57E+01			< 1.56E+01		
Ce-141	< 3.73E+00			< 2.67E+00			< 3.47E+00		
Ce-144	< 1.33E+01			< 1.09E+01			< 1.20E+01		
Co-58	< 2.45E+00			< 1.72E+00			< 1.74E+00		
Co-60	< 2.80E+00			< 2.12E+00			< 1.76E+00		
Cr-51	< 2.33E+01			< 1.44E+01			< 1.83E+01		
Cs-134	< 2.96E+00			< 2.29E+00			< 2.33E+00		
Cs-137	< 3.96E+00			< 3.41E+00			< 1.93E+00		
Fe-59	< 5.17E+00			< 3.99E+00			< 3.76E+00		
K-40	< 3.62E+01			< 2.51E+01			< 2.49E+01		
La-140	< 4.93E+00			< 2.54E+00			< 3.32E+00		
Mn-54	< 2.41E+00			< 1.85E+00			< 1.62E+00		
Nb-95	< 2.39E+00			< 1.98E+00			< 2.02E+00		
Ru-103	< 2.60E+00			< 1.79E+00			< 1.97E+00		
Ru-106	< 2.17E+01			< 1.54E+01			< 1.57E+01		
Sr-89	< 1.01E+00			< 1.70E+00			< 1.66E+00		
Sr-90	< 1.78E+00			< 1.84E+00			< 1.66E+00		
Zn-65	< 4.98E+00			< 4.36E+00			< 3.46E+00		
Zr-95	< 4.46E+00			< 3.22E+00			< 3.11E+00		

FERMI 2
DRINKING AND SURFACE WATER QUARTERLY COMPOSITE SAMPLES

Tritium
(pCi/liter)

Station	First Quarter				Second Quarter			
DW-1	<	4.53E+02			<	4.19E+02		
DW-2	<	4.45E+02			<	4.14E+02		
SW-2	<	4.53E+02			<	4.21E+02		
SW-3	<	4.49E+02			<	4.04E+02		

Station	Third Quarter				Fourth Quarter			
DW-1	<	4.57E+02			<	3.13E+02		
DW-2	<	4.37E+02			<	3.14E+02		
SW-2	<	4.54E+02			<	3.16E+02		
SW-3	<	4.54E+02			<	3.15E+02		

FERMI 2
GROUNDWATER ANALYSIS

GW-1 (Indicator)
(pCi/liter)

Nuclide	First Quarter				Second Quarter			
Ba-140	<	3.03E+00			<	3.90E+00		
Be-7	<	1.38E+01			<	1.58E+01		
Ce-141	<	3.09E+00			<	3.53E+00		
Ce-144	<	1.10E+01			<	1.11E+01		
Co-58	<	1.75E+00			<	1.67E+00		
Co-60	<	1.76E+00			<	1.92E+00		
Cs-134	<	1.98E+00			<	1.91E+00		
Cs-137	<	1.51E+00			<	1.92E+00		
Fe-59	<	3.26E+00			<	3.70E+00		
H-3	<	2.65E+02			<	3.91E+02		
K-40	<	1.64E+01			<	2.47E+01		
La-140	<	3.03E+00			<	3.90E+00		
Mn-54	<	1.46E+00			<	1.70E+00		
Nb-95	<	1.59E+00			<	1.86E+00		
Ru-103	<	1.73E+00			<	1.92E+00		
Ru-106	<	1.41E+01			<	1.49E+01		
Zn-65	<	3.27E+00			<	3.07E+00		
Zr-95	<	2.95E+00			<	3.29E+00		

Nuclide	Third Quarter				Fourth Quarter			
Ba-140	<	1.12E+00			<	3.03E+00		
Be-7	<	4.65E+00			<	1.43E+01		
Ce-141	<	1.01E+00			<	3.07E+00		
Ce-144	<	3.49E+00			<	1.10E+01		
Co-58	<	5.39E-01			<	1.64E+00		
Co-60	<	5.68E-01			<	1.70E+00		
Cs-134	<	6.39E-01			<	1.82E+00		
Cs-137	<	5.52E-01			<	1.53E+00		
Fe-59	<	1.13E+00			<	3.28E+00		
H-3	<	1.04E+02			<	2.63E+02		
K-40	<	9.83E+00			<	1.36E+01		
La-140	<	1.12E+00			<	3.03E+00		
Mn-54	<	5.15E-01			<	1.51E+00		
Nb-95	<	5.36E-01			<	1.72E+00		
Ru-103	<	7.16E-01			<	1.75E+00		
Ru-106	<	4.99E+00			<	1.32E+01		
Zn-65	<	1.28E+00			<	3.28E+00		
Zr-95	<	9.63E-01			<	2.83E+00		

FERMI 2
GROUNDWATER ANALYSIS

GW-2 (Indicator)
(pCi/liter)

Nuclide	First Quarter	Second Quarter
Ba-140	< 3.75E+00	< 5.81E+00
Be-7	< 1.75E+01	< 1.93E+01
Ce-141	< 3.74E+00	< 3.52E+00
Ce-144	< 1.37E+01	< 1.13E+01
Co-58	< 2.05E+00	< 2.10E+00
Co-60	< 2.07E+00	< 2.31E+00
Cs-134	< 2.32E+00	< 2.50E+00
Cs-137	< 1.95E+00	< 3.28E+00
Fe-59	< 4.10E+00	< 4.81E+00
H-3	< 2.70E+02	< 3.80E+02
K-40	< 2.57E+01	< 2.54E+01
La-140	< 3.75E+00	< 5.81E+00
Mn-54	< 1.88E+00	< 2.13E+00
Nb-95	< 1.87E+00	< 2.25E+00
Ru-103	< 2.28E+00	< 2.31E+00
Ru-106	< 1.79E+01	< 1.83E+01
Zn-65	< 4.24E+00	< 4.33E+00
Zr-95	< 3.51E+00	< 3.95E+00

Nuclide	Third Quarter	Fourth Quarter
Ba-140	< 5.03E+00	< 5.49E+00
Be-7	< 1.94E+01	< 2.45E+01
Ce-141	< 3.44E+00	< 4.87E+00
Ce-144	< 1.25E+01	< 1.67E+01
Co-58	< 2.33E+00	< 2.92E+00
Co-60	< 2.75E+00	< 2.75E+00
Cs-134	< 2.91E+00	< 3.42E+00
Cs-137	< 2.49E+00	< 2.53E+00
Fe-59	< 5.90E+00	< 5.91E+00
H-3	< 3.30E+02	< 2.60E+02
K-40	< 3.30E+01	< 3.65E+01
La-140	< 5.03E+00	< 5.49E+00
Mn-54	< 2.47E+00	< 2.72E+00
Nb-95	< 2.72E+00	< 3.14E+00
Ru-103	< 2.51E+00	< 2.86E+00
Ru-106	< 2.11E+01	< 2.29E+01
Zn-65	< 5.48E+00	< 5.46E+00
Zr-95	< 4.61E+00	< 5.07E+00

FERMI 2
GROUNDWATER ANALYSIS

GW-3 (Indicator)
(pCi/liter)

Nuclide	First Quarter				Second Quarter			
Ba-140	<	3.83E+00			<	4.58E+00		
Be-7	<	1.99E+01			<	1.76E+01		
Ce-141	<	3.81E+00			<	3.85E+00		
Ce-144	<	1.39E+01			<	1.25E+01		
Co-58	<	1.98E+00			<	1.95E+00		
Co-60	<	2.30E+00			<	2.01E+00		
Cs-134	<	2.55E+00			<	2.21E+00		
Cs-137	<	2.27E+00			<	1.80E+00		
Fe-59	<	4.58E+00			<	3.73E+00		
H-3	<	2.67E+02			<	3.78E+02		
K-40	<	3.44E+01			<	1.52E+01		
La-140	<	3.83E+00			<	4.58E+00		
Mn-54	<	1.98E+00			<	1.76E+00		
Nb-95	<	2.34E+00			<	1.96E+00		
Ru-103	<	2.28E+00			<	2.19E+00		
Ru-106	<	1.82E+01			<	1.62E+01		
Zn-65	<	4.26E+00			<	3.60E+00		
Zr-95	<	3.98E+00			<	3.51E+00		

Nuclide	Third Quarter				Fourth Quarter			
Ba-140	<	3.99E+00			<	3.82E+00		
Be-7	<	1.62E+01			<	1.84E+01		
Ce-141	<	3.69E+00			<	3.96E+00		
Ce-144	<	1.27E+01			<	1.39E+01		
Co-58	<	2.01E+00			<	1.93E+00		
Co-60	<	1.96E+00			<	2.05E+00		
Cs-134	<	2.49E+00			<	2.42E+00		
Cs-137	<	1.85E+00			<	1.95E+00		
Fe-59	<	4.02E+00			<	4.01E+00		
H-3	<	3.40E+02			<	2.54E+02		
K-40	<	2.56E+01			<	2.80E+01		
La-140	<	3.99E+00			<	3.82E+00		
Mn-54	<	1.93E+00			<	1.96E+00		
Nb-95	<	2.01E+00			<	2.25E+00		
Ru-103	<	2.19E+00			<	2.20E+00		
Ru-106	<	1.63E+01			<	1.79E+01		
Zn-65	<	4.06E+00			<	3.89E+00		
Zr-95	<	3.28E+00			<	3.83E+00		

FERMI 2
GROUNDWATER ANALYSIS

GW-4 (Control)
(pCi/liter)

Nuclide	First Quarter				Second Quarter			
Ba-140	<	4.34E+00			<	4.46E+00		
Be-7	<	1.78E+01			<	1.95E+01		
Ce-141	<	4.12E+00			<	4.86E+00		
Ce-144	<	1.43E+01			<	1.50E+01		
Co-58	<	2.00E+00			<	1.83E+00		
Co-60	<	2.23E+00			<	1.92E+00		
Cs-134	<	2.53E+00			<	2.37E+00		
Cs-137	<	2.66E+00			<	1.86E+00		
Fe-59	<	4.60E+00			<	4.24E+00		
H-3	<	2.67E+02			<	3.89E+02		
K-40	<	2.78E+01			<	1.80E+01		
La-140	<	4.34E+00			<	4.46E+00		
Mn-54	<	2.08E+00			<	1.79E+00		
Nb-95	<	2.60E+00			<	2.05E+00		
Ru-103	<	2.40E+00			<	2.39E+00		
Ru-106	<	1.75E+01			<	1.68E+01		
Zn-65	<	4.51E+00			<	3.91E+00		
Zr-95	<	4.06E+00			<	3.62E+00		

Nuclide	Third Quarter				Fourth Quarter			
Ba-140	<	4.15E+00			<	4.03E+00		
Be-7	<	1.83E+01			<	1.73E+01		
Ce-141	<	3.27E+00			<	4.04E+00		
Ce-144	<	1.21E+01			<	1.41E+01		
Co-58	<	2.41E+00			<	2.07E+00		
Co-60	<	2.45E+00			<	2.09E+00		
Cs-134	<	2.62E+00			<	2.34E+00		
Cs-137	<	3.89E+00			<	2.01E+00		
Fe-59	<	4.29E+00			<	4.18E+00		
H-3	<	3.33E+02			<	2.64E+02		
K-40	<	2.28E+01			<	2.75E+01		
La-140	<	4.15E+00			<	4.03E+00		
Mn-54	<	1.99E+00			<	1.83E+00		
Nb-95	<	2.18E+00			<	1.91E+00		
Ru-103	<	2.29E+00			<	2.11E+00		
Ru-106	<	1.98E+01			<	1.65E+01		
Zn-65	<	4.11E+00			<	4.28E+00		
Zr-95	<	4.11E+00			<	3.71E+00		

FERMI 2
SEDIMENT ANALYSIS

S-1 (Indicator)
(pCi/kg dry)

Nuclide	1-JUN				9-NOV			
Ba-140	<	1.85E+02			<	6.96E+03		
Be-7	<	5.73E+02			<	1.12E+03		
Ce-141	<	9.59E+01			<	3.81E+02		
Ce-144	<	1.86E+02			<	2.47E+02		
Co-58	<	5.60E+01			<	8.85E+01		
Co-60	<	4.57E+01			<	4.38E+01		
Cs-134	<	6.27E+01			<	6.88E+01		
Cs-137	<	4.22E+01			<	4.74E+01		
Fe-59	<	1.26E+02			<	3.44E+02		
K-40		3.93E+02	+/-	6.68E+02		1.19E+04	+/-	7.40E+02
La-140	<	1.85E+02			<	6.96E+03		
Mn-54	<	4.19E+01			<	5.57E+01		
Nb-95	<	7.41E+01			<	1.18E+02		
Ru-103	<	6.10E+01			<	1.78E+02		
Ru-106	<	3.60E+02			<	3.94E+02		
Sr-89	<	1.98E+02			<	2.65E+02		
Sr-90	<	8.73E+01			<	1.03E+02		
Zn-65	<	1.15E+02			<	1.24E+02		
Zr-95	<	1.08E+02			<	2.06E+02		

S-2 (Indicator)
(pCi/kg dry)

Nuclide	1-JUN				9-NOV			
Ba-140	<	2.80E+02			<	9.01E+03		
Be-7	<	4.89E+02			<	1.08E+03		
Ce-141	<	1.09E+02			<	4.68E+02		
Ce-144	<	2.27E+02			<	3.21E+02		
Co-58	<	4.57E+01			<	9.55E+01		
Co-60	<	4.75E+01			<	4.74E+01		
Cs-134	<	4.73E+01			<	6.42E+01		
Cs-137	<	3.69E+01			<	4.84E+01		
Fe-59	<	1.53E+02			<	3.82E+02		
K-40		1.10E+04	+/-	7.13E+02		1.77E+04	+/-	9.68E+02
La-140	<	2.80E+02			<	9.01E+03		
Mn-54	<	3.52E+01			<	5.02E+01		
Nb-95	<	6.40E+01			<	1.37E+02		
Ru-103	<	5.84E+01			<	1.84E+02		
Ru-106	<	3.32E+02			<	4.18E+02		
Sr-89	<	2.56E+02			<	2.33E+02		
Sr-90	<	9.84E+01			<	1.82E+02		
Zn-65	<	1.03E+02			<	1.60E+02		
Zr-95	<	1.04E+02			<	2.14E+02		

FERMI 2
SEDIMENT ANALYSIS

S-3 (Indicator)
(pCi/kg dry)

Nuclide	12-MAY				19-NOV			
Ba-140	<	6.09E+02			<	7.16E+03		
Be-7	<	5.34E+02			<	8.37E+02		
Ce-141	<	1.47E+02			<	2.41E+02		
Ce-144	<	2.12E+02			<	1.80E+02		
Co-58	<	5.28E+01			<	9.00E+01		
Co-60	<	3.66E+01			<	6.33E+01		
Cs-134	<	4.04E+01			<	5.63E+01		
Cs-137	<	3.64E+01			<	4.83E+01		
Fe-59	<	1.63E+02			<	3.34E+02		
K-40		1.45E+04	+/-	7.89E+02		1.35E+04	+/-	8.59E+02
La-140	<	6.09E+02			<	7.16E+03		
Mn-54	<	4.01E+01			<	6.63E+01		
Nb-95	<	6.26E+01			<	1.24E+02		
Ru-103	<	8.19E+01			<	1.55E+02		
Ru-106	<	3.20E+02			<	4.37E+02		
Sr-89	<	2.33E+02			<	2.56E+02		
Sr-90	<	1.10E+02			<	1.69E+02		
Zn-65	<	9.41E+01			<	1.54E+02		
Zr-95	<	1.02E+02			<	1.92E+02		

S-4 (Indicator)
(pCi/kg dry)

Nuclide	20-MAY				12-NOV			
Ba-140	<	3.67E+02			<	2.45E+02		
Be-7	<	5.10E+02			<	5.05E+02		
Ce-141	<	1.51E+02			<	9.70E+01		
Ce-144	<	2.24E+02			<	1.94E+02		
Co-58	<	5.79E+01			<	4.93E+01		
Co-60	<	3.43E+01			<	3.07E+01		
Cs-134	<	5.19E+01			<	5.87E+01		
Cs-137	<	4.39E+01			<	3.89E+01		
Fe-59	<	1.84E+02			<	1.33E+02		
K-40		1.01E+04	+/-	6.97E+02		1.04E+04	+/-	6.72E+02
La-140	<	3.67E+02			<	2.45E+02		
Mn-54	<	4.05E+01			<	4.50E+01		
Nb-95	<	6.55E+01			<	5.91E+01		
Ru-103	<	7.24E+01			<	6.68E+01		
Ru-106	<	3.60E+02			<	3.39E+02		
Sr-89	<	2.52E+02			<	1.05E+02		
Sr-90	<	1.20E+02			<	8.78E+01		
Zn-65	<	1.08E+02			<	9.98E+01		
Zr-95	<	1.04E+02			<	8.81E+01		

FERMI 2
SEDIMENT ANALYSIS

S-5 (Control)
(pCi/kg dry)

Nuclide	20-MAY				21-OCT			
Ba-140	<	5.85E+02			<	7.05E+03		
Be-7	<	5.36E+02			<	1.49E+03		
Ce-141	<	1.38E+02			<	6.46E+02		
Ce-144	<	2.19E+02			<	3.03E+02		
Co-58	<	5.89E+01			<	1.10E+02		
Co-60	<	4.39E+01			<	3.66E+01		
Cs-134	<	4.79E+01			<	5.26E+01		
Cs-137		1.17E+02	+/-	1.79E+01		8.29E+01	+/-	1.71E+01
Fe-59	<	1.40E+02			<	4.84E+02		
K-40		1.34E+04	+/-	8.01E+02		1.23E+04	+/-	7.22E+02
La-140	<	5.85E+02			<	7.04E+03		
Mn-54	<	4.14E+01			<	5.11E+01		
Nb-95	<	7.23E+01			<	1.49E+02		
Ru-103	<	7.87E+01			<	2.61E+02		
Ru-106	<	3.38E+02			<	3.89E+02		
Sr-89	<	2.20E+02			<	2.71E+02		
Sr-90	<	1.59E+02			<	1.96E+02		
Zn-65	<	1.11E+02			<	1.43E+02		
Zr-95	<	1.23E+02			<	2.58E+02		

FERMI 2
FISH ANALYSIS

F-1 (Control)
(pCi/kg wet)

Nuclide	10-MAY Bass				10-MAY Perch				25-OCT Rock Bass			
Ba-140	<	2.17E+02			<	3.36E+01			<	3.99E+02		
Be-7	<	2.93E+02			<	4.66E+01			<	3.03E+02		
Ce-141	<	6.06E+01			<	1.11E+01			<	7.86E+01		
Ce-144	<	1.13E+02			<	2.09E+01			<	1.23E+02		
Co-58	<	3.59E+01			<	5.55E+00			<	3.41E+01		
Co-60	<	2.61E+01			<	4.85E+00			<	2.50E+01		
Cs-134	<	2.87E+01			<	4.72E+00			<	2.44E+01		
Cs-137	<	2.44E+01			<	4.38E+00			<	2.29E+01		
Fe-59	<	8.29E+01			<	1.47E+01			<	8.36E+01		
K-40		3.28E+03	+/-	2.31E+02		2.12E+03	+/-	1.18E+02		2.20E+03	+/-	2.46E+02
La-140	<	2.17E+02			<	3.36E+01			<	3.99E+02		
Mn-54	<	2.67E+01			<	3.73E+00			<	2.35E+01		
Nb-95	<	3.31E+01			<	5.42E+00			<	3.65E+01		
Ru-103	<	4.16E+01			<	6.46E+00			<	4.75E+01		
Ru-106	<	2.19E+02			<	3.61E+01			<	2.03E+02		
Sr-89	<	1.80E+02			<	2.02E+02			<	2.45E+02		
Sr-90	<	1.06E+02			<	1.54E+02			<	2.41E+02		
Zn-65	<	5.78E+01			<	9.34E+00			<	5.52E+01		
Zr-95	<	5.87E+01			<	1.08E+01			<	6.36E+01		

Nuclide	25-OCT Walleye				25-OCT Rock Bass			
Ba-140	<	7.41E+01			<	3.99E+02		
Be-7	<	4.76E+01			<	3.03E+02		
Ce-141	<	1.35E+01			<	7.86E+01		
Ce-144	<	2.03E+01			<	1.23E+02		
Co-58	<	6.22E+00			<	3.41E+01		
Co-60	<	4.53E+00			<	2.50E+01		
Cs-134	<	4.25E+00			<	2.44E+01		
Cs-137	<	3.45E+00			<	2.29E+01		
Fe-59	<	1.93E+01			<	8.36E+01		
K-40		2.50E+03	+/-	1.26E+02		2.20E+03	+/-	2.46E+02
La-140	<	7.41E+01			<	3.99E+02		
Mn-54	<	3.70E+00			<	2.35E+01		
Nb-95	<	6.02E+00			<	3.65E+01		
Ru-103	<	7.88E+00			<	4.75E+01		
Ru-106	<	3.09E+01			<	2.03E+02		
Sr-89	<	2.51E+02			<	2.45E+02		
Sr-90	<	1.68E+02			<	2.41E+02		
Zn-65	<	1.08E+01			<	5.52E+01		
Zr-95	<	1.07E+01			<	6.36E+01		

FERMI 2
FISH ANALYSIS

F-2 (Indicator)
(pCi/kg wet)

Nuclide	13-MAY Catfish			13-MAY Drum			13-MAY Sucker		
Ba-140	< 8.69E+01			< 2.02E+02			< 3.90E+01		
Be-7	< 1.33E+02			< 2.54E+02			< 5.56E+01		
Ce-141	< 2.33E+01			< 5.38E+01			< 1.36E+01		
Ce-144	< 4.79E+01			< 1.06E+02			< 2.78E+01		
Co-58	< 1.52E+01			< 2.74E+01			< 7.22E+00		
Co-60	< 1.19E+01			< 2.33E+01			< 5.69E+00		
Cs-134	< 1.30E+01			< 2.81E+01			< 5.75E+00		
Cs-137	< 1.86E+01			< 2.23E+01			< 5.73E+00		
Fe-59	< 3.87E+01			< 6.75E+01			< 1.85E+01		
K-40	2.31E+03	+/-	1.50E+02	2.12E+03	+/-	2.28E+02	3.15E+03	+/-	1.57E+02
La-140	< 8.69E+01			< 2.02E+02			< 3.90E+01		
Mn-54	< 1.16E+01			< 2.18E+01			< 5.55E+00		
Nb-95	< 1.62E+01			< 3.31E+01			< 7.27E+00		
Ru-103	< 1.65E+01			< 3.42E+01			< 8.34E+00		
Ru-106	< 9.60E+01			< 1.97E+02			< 4.58E+01		
Sr-89	< 1.91E+02			< 1.80E+02			< 2.45E+02		
Sr-90	< 1.23E+02			< 1.27E+02			< 2.48E+02		
Zn-65	< 2.40E+01			< 5.43E+01			< 1.41E+01		
Zr-95	< 2.56E+01			< 4.66E+01			< 1.31E+01		

Nuclide	13-MAY Bass			13-MAY Perch			13-MAY Walleye		
Ba-140	< 2.92E+01			< 3.24E+01			< 4.22E+01		
Be-7	< 5.13E+01			< 4.90E+01			< 6.66E+01		
Ce-141	< 1.32E+01			< 1.01E+01			< 1.65E+01		
Ce-144	< 2.44E+01			< 2.03E+01			< 3.29E+01		
Co-58	< 5.42E+00			< 5.00E+00			< 7.10E+00		
Co-60	< 4.68E+00			< 4.62E+00			< 5.52E+00		
Cs-134	< 5.20E+00			< 4.78E+00			< 6.46E+00		
Cs-137	< 4.72E+00			< 4.49E+00			< 5.94E+00		
Fe-59	< 1.48E+01			< 1.60E+01			< 2.20E+01		
K-40	2.37E+03	+/-	1.30E+02	2.39E+03	+/-	1.26E+02	3.40E+03	+/-	1.79E+02
La-140	< 2.92E+01			< 3.24E+01			< 4.22E+01		
Mn-54	< 4.32E+00			< 4.11E+00			< 5.82E+00		
Nb-95	< 5.60E+00			< 5.82E+00			< 7.88E+00		
Ru-103	< 6.81E+00			< 5.90E+00			< 8.97E+00		
Ru-106	< 3.65E+01			< 3.37E+01			< 5.00E+01		
Sr-89	< 2.47E+02			< 1.68E+02			< 1.77E+02		
Sr-90	< 1.55E+02			< 1.02E+02			< 1.52E+02		
Zn-65	< 1.05E+01			< 1.10E+01			< 1.47E+01		
Zr-95	< 9.83E+00			< 9.39E+00			< 1.35E+01		

FERMI 2
FISH ANALYSIS

F-2 (Indicator)
(pCi/kg wet)

Nuclide	1-NOV Garfish				1-NOV Silver Bass				1-NOV Walleye			
Ba-140	<	2.01E+02			<	9.12E+01			<	4.24E+01		
Be-7	<	2.22E+02			<	1.04E+02			<	4.28E+01		
Ce-141	<	4.69E+01			<	2.13E+01			<	1.15E+01		
Ce-144	<	8.77E+01			<	3.99E+01			<	1.92E+01		
Co-58	<	2.25E+01			<	1.10E+01			<	4.66E+00		
Co-60	<	1.96E+01			<	8.73E+00			<	3.82E+00		
Cs-134	<	2.06E+01			<	1.03E+01			<	4.10E+00		
Cs-137	<	1.82E+01			<	8.48E+00			<	3.15E+00		
Fe-59	<	6.25E+01			<	3.11E+01			<	1.56E+01		
K-40		2.93E+03	+/-	1.94E+02		1.96E+03	+/-	1.29E+02		3.39E+03	+/-	1.71E+02
La-140	<	2.01E+02			<	9.12E+01			<	4.24E+01		
Mn-54	<	1.92E+01			<	9.14E+00			<	3.50E+00		
Nb-95	<	2.63E+01			<	1.26E+01			<	5.07E+00		
Ru-103	<	3.11E+01			<	1.48E+01			<	6.17E+00		
Ru-106	<	1.64E+02			<	7.66E+01			<	2.76E+01		
Sr-89	<	2.49E+02			<	2.54E+02			<	2.61E+02		
Sr-90	<	1.94E+02			<	1.87E+02			<	1.66E+02		
Zn-65	<	3.81E+01			<	1.96E+01			<	9.37E+00		
Zr-95	<	4.31E+01			<	2.05E+01			<	9.09E+00		

FERMI 2
FISH ANALYSIS

F-3 (Control)
(pCi/kg wet)

Nuclide	16-MAY Bass				16-MAY Carp				16-MAY White Perch			
Ba-140	<	5.17E+01			<	2.54E+01			<	6.66E+01		
Be-7	<	8.28E+01			<	4.37E+01			<	1.10E+02		
Ce-141	<	1.81E+01			<	9.00E+00			<	2.39E+01		
Ce-144	<	3.60E+01			<	1.89E+01			<	5.15E+01		
Co-58	<	9.56E+00			<	4.71E+00			<	1.17E+01		
Co-60	<	9.32E+00			<	4.38E+00			<	1.06E+01		
Cs-134	<	8.02E+00			<	4.38E+00			<	1.10E+01		
Cs-137	<	8.89E+00			<	3.59E+00			<	1.01E+01		
Fe-59	<	2.86E+01			<	1.31E+01			<	3.08E+01		
K-40		3.24E+03	+/-	1.90E+02		1.99E+03	+/-	1.03E+02		2.43E+03	+/-	1.50E+02
La-140	<	5.17E+01			<	2.54E+01			<	6.66E+01		
Mn-54	<	7.37E+00			<	3.58E+00			<	1.02E+01		
Nb-95	<	1.04E+01			<	5.25E+00			<	1.30E+01		
Ru-103	<	1.19E+01			<	5.74E+00			<	1.56E+01		
Ru-106	<	6.28E+01			<	3.23E+01			<	8.56E+01		
Sr-89	<	1.93E+02			<	2.06E+02			<	1.62E+02		
Sr-90	<	1.15E+02			<	1.22E+02			<	1.05E+02		
Zn-65	<	2.05E+01			<	1.03E+01			<	2.14E+01		
Zr-95	<	1.59E+01			<	9.05E+00			<	2.35E+01		

Nuclide	16-MAY Walleye				16-MAY Yellow Perch				12-OCT Catfish			
Ba-140	<	5.37E+01			<	2.52E+02			<	1.06E+02		
Be-7	<	1.10E+02			<	4.09E+02			<	5.21E+01		
Ce-141	<	2.71E+01			<	7.67E+01			<	1.66E+01		
Ce-144	<	5.37E+01			<	1.54E+02			<	2.02E+01		
Co-58	<	1.25E+01			<	4.92E+01			<	5.78E+00		
Co-60	<	9.58E+00			<	3.81E+01			<	3.96E+00		
Cs-134	<	9.48E+00			<	4.67E+01			<	4.31E+00		
Cs-137	<	1.05E+01			<	3.79E+01			<	3.17E+00		
Fe-59	<	3.29E+01			<	1.22E+02			<	1.89E+01		
K-40		3.73E+03	+/-	2.18E+02		3.66E+03	+/-	3.01E+02		2.90E+03	+/-	1.48E+02
La-140	<	5.37E+01			<	2.52E+02			<	1.06E+02		
Mn-54	<	8.47E+00			<	4.01E+01			<	3.59E+00		
Nb-95	<	1.34E+01			<	5.35E+01			<	5.98E+00		
Ru-103	<	1.43E+01			<	5.82E+01			<	8.28E+00		
Ru-106	<	7.35E+01			<	3.46E+02			<	2.98E+01		
Sr-89	<	1.84E+02			<	1.33E+02			<	2.44E+02		
Sr-90	<	1.53E+02			<	1.23E+02			<	1.81E+02		
Zn-65	<	2.47E+01			<	9.02E+01			<	9.41E+00		
Zr-95	<	2.37E+01			<	8.99E+01			<	1.01E+01		

FERMI 2
FISH ANALYSIS

F-3 (Control)
(pCi/kg wet)

Nuclide	12-OCT Rock Bass				12-OCT White Bass				12-OCT White Perch			
Ba-140	<	6.48E+02			<	2.94E+02			<	7.49E+02		
Be-7	<	3.21E+02			<	1.50E+02			<	3.61E+02		
Ce-141	<	7.38E+01			<	3.67E+01			<	1.04E+02		
Ce-144	<	8.46E+01			<	4.49E+01			<	1.28E+02		
Co-58	<	3.37E+01			<	1.44E+01			<	3.72E+01		
Co-60	<	1.93E+01			<	9.69E+00			<	2.52E+01		
Cs-134	<	2.58E+01			<	1.16E+01			<	2.63E+01		
Cs-137	<	2.12E+01			<	8.70E+00			<	2.10E+01		
Fe-59	<	9.68E+01			<	4.49E+01			<	9.83E+01		
K-40		2.49E+03	+/-	2.34E+02		2.61E+03	+/-	1.54E+02		2.84E+03	+/-	2.32E+02
La-140	<	6.48E+02			<	2.94E+02			<	7.49E+02		
Mn-54	<	2.27E+01			<	9.25E+00			<	2.38E+01		
Nb-95	<	3.80E+01			<	1.58E+01			<	4.31E+01		
Ru-103	<	5.29E+01			<	2.18E+01			<	5.59E+01		
Ru-106	<	1.95E+02			<	8.43E+01			<	2.10E+02		
Sr-89	<	2.53E+02			<	2.67E+02			<	2.81E+02		
Sr-90	<	1.65E+02			<	2.39E+02			<	1.87E+02		
Zn-65	<	5.19E+01			<	2.25E+01			<	5.57E+01		
Zr-95	<	7.11E+01			<	2.75E+01			<	6.85E+01		

Nuclide	12-OCT Walleye			
Ba-140	<	1.08E+02		
Be-7	<	5.20E+01		
Ce-141	<	1.57E+01		
Ce-144	<	1.89E+01		
Co-58	<	5.48E+00		
Co-60	<	3.99E+00		
Cs-134	<	4.10E+00		
Cs-137	<	3.30E+00		
Fe-59	<	1.93E+01		
K-40		3.39E+03	+/-	1.54E+02
La-140	<	1.08E+02		
Mn-54	<	3.60E+00		
Nb-95	<	6.48E+00		
Ru-103	<	7.95E+00		
Ru-106	<	3.22E+01		
Sr-89	<	2.83E+02		
Sr-90	<	1.92E+02		
Zn-65	<	9.49E+00		
Zr-95	<	1.02E+01		

Appendix D

Environmental Program Exceptions

Environmental Program Exceptions

On occasions, samples cannot be collected. This can be due to a variety of events, such as equipment malfunction, loss of electrical power, severe weather conditions, or vandalism. In 2011, missed samples were a result of missing field TLDs and air sampling equipment failure. The following sections list all missed samples, changes and corrective actions taken during 2011. These missed samples did not have a significant impact on the execution of the REMP.

Direct Radiation Monitoring

All TLDs are placed in the field in inconspicuous locations to minimize the loss of TLDs due to vandalism. During 2011, three hundred sixteen (316) TLDs were placed in the field for the REMP program and all but five (5) TLDs were collected and processed.

- During the first quarter collection T-14, T-48, and T-62 were found missing and were replaced with the next quarter's TLDs.
- During the second quarter collection T-14 and ISFSI-1 were found missing and were replaced with the next quarter's TLDs.

Atmospheric Monitoring

During 2011, two hundred fifty-five (255) air samples were placed in the field and all but one (1) particulate filter and charcoal filter was collected and processed. There were no changes to the Atmospheric Monitoring program during 2011.

- On 1/18/2011, air sample located at API-4 was not collected due to fuse failure. The fuse was replaced and the equipment was reenergized. For this reason, the first quarter composite sample is considered less than representative.
- On 3/22/2011, 4/5/2011, and 4/12/2011, iodine-131 was detected at API-1 due to the Fukushima accident.
- On 4/5/2011, iodine-131 was detected at API-2 due to the Fukushima accident.
- On 3/22/2011, 3/29/2011, and 4/5/2011, iodine-131 was detected at API-3 due to the Fukushima accident.
- On 3/22/2011,3/29/2011, 4/5/2011, and 4/12/2011, iodine-131 was detected at API-4 due to the Fukushima accident.
- On 3/22/2011 and 3/29/2011, iodine-131 was detected at API-5 due to the Fukushima accident.

Terrestrial Monitoring - None

Milk Sampling - None

Garden Sampling - None

Groundwater Sampling - None

Aquatic Monitoring - None

Drinking Water Sampling - None

Surface Water Sampling - None

Sediment Sampling - None

Fish Sampling - None

Program Changes - None

Appendix E

Interlaboratory Comparison Data
GEL Laboratories'
Quality Assurance Programs

Interlaboratory Comparison Program for 2011

In an interlaboratory comparison program, participant laboratories receive from a commerce source, environmental samples of known activity concentration for analysis. After the samples have been analyzed by the laboratory, the manufacturer of the sample reports the known activity concentration of the samples to the laboratory. The laboratory compares its results to the reported concentrations to determine any significant deviations, investigates such deviations if found, and initiates corrective action if necessary. Participation in this program provides assurance that the contract laboratory is capable of meeting accepted criteria for radioactivity analysis. The following is GEL Laboratories' participation in an interlaboratory comparison program.

GEL | Laboratories LLC

2010 ANNUAL QUALITY ASSURANCE REPORT

FOR THE

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM (REMP)

JANUARY 2010 – DECEMBER 2010

GEL LABORATORIES, LLC
P.O. Box 30712, Charleston, SC 29417
843.556.8171

2010 ANNUAL QUALITY ASSURANCE REPORT

FOR THE

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM (REMP)

JANUARY 2010 – DECEMBER 2010

Prepared By: [signature] February 15, 2011
Martha J. Harrison Date
Quality Assurance Officer

Approved By: [signature] February 15, 2011
Robert L. Pullano Date
Director, Quality Systems

TABLE OF CONTENTS

TABLE OF CONTENTS (CONTINUED)

LIST OF TABLES

LIST OF FIGURES

8. IODINE-131 PERFORMANCE EVALUATION RESULTS AND % BIAS

2010 ANNUAL QUALITY ASSURANCE REPORT FOR THE RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM (REMP)

1. Introduction

GEL Laboratories, LLC (GEL) is a privately owned environmental laboratory dedicated to providing personalized client services of the highest quality. GEL was established as an analytical testing laboratory in 1981. Now a full service lab, our analytical divisions use state of the art equipment and methods to provide a comprehensive array of organic, inorganic, and radiochemical analyses to meet the needs of our clients.

At GEL, quality is emphasized at every level of personnel throughout the company. Management's ongoing commitment to good professional practice and to the quality of our testing services to our customers is demonstrated by their dedication of personnel and resources to develop, implement, assess, and improve our technical and management operations.

The purpose of GEL's quality assurance program is to establish policies, procedures, and processes to meet or exceed the expectations of our clients. To achieve this, all personnel that support these services to our clients are introduced to the program and policies during their initial orientation, and annually thereafter during company-wide training sessions.

GEL's primary goals are to ensure that all measurement data generated are scientifically and legally defensible, of known and acceptable quality per the data quality objectives (DQOs), and thoroughly documented to provide sound support for environmental decisions. In addition, GEL continues to ensure compliance with all contractual requirements, environmental standards, and regulations established by local, state and federal authorities.

GEL administers the QA program in accordance with the Quality Assurance Plan, GL-QS-B-001. Our Quality Systems include all quality assurance (QA) policies and quality control (QC) procedures necessary to plan, implement, and assess the work we perform. GEL's QA Program establishes a quality management system (QMS) that governs all of the activities of our organization.

This report entails the quality assurance program for the proficiency testing and environmental monitoring aspects of GEL for 2010. GEL's QA Program is designed to monitor the quality of analytical processing associated with environmental, radiobioassay, effluent (10 CFR Part 50), and waste (10 CFR Part 61) sample analysis.

This report covers the category of Radiological Environmental Monitoring Program (REMP) and includes:

- Intra-laboratory QC results analyzed during 2010.
- Inter-laboratory QC results analyzed during 2010 where known values were available.

2. Quality Assurance Programs for Inter-laboratory, Intra-laboratory and Third Party Cross-Check

In addition to internal and client audits, our laboratory participates in annual performance evaluation studies conducted by independent providers. We routinely participate in the following types of performance audits:

- Proficiency testing and other inter-laboratory comparisons.
- Performance requirements necessary to retain Certifications
- Evaluation of recoveries of certified reference and in-house secondary reference materials using statistical process control data.
- Evaluation of relative percent difference between measurements through SPC data.

We also participate in a number of proficiency testing programs for federal and state agencies and as required by contracts. It is our policy that no proficiency evaluation samples be analyzed in any special manner. Our annual performance evaluation participation generally includes a combination of studies that support the following:

- US Environmental Protection Agency Discharge Monitoring Report, Quality Assurance Program (DMR-QA). Annual national program sponsored by EPA for laboratories engaged in the analysis of samples associated with the NPDES monitoring program. Participation is mandatory for all holders of NPDES permits. The permit holder must analyze for all of the parameters listed on the discharge permit. Parameters include general chemistry, metals, BOD/COD, oil and grease, ammonia, nitrates, etc.

- Department of Energy Mixed Analyte Performance Evaluation Program (MAPEP). A semiannual program developed by DOE in support of DOE contractors performing waste analyses. Participation is required for all laboratories that perform environmental analytical measurements in support of environmental management activities. This program includes radioactive isotopes in water, soil, vegetation and air filters.

- ERA's MRAD-Multimedia Radiochemistry Proficiency test program. This program is for labs seeking certification for radionuclides in wastewater and solid waste. The program is conducted in strict compliance with USEPA National Standards for Water Proficiency study.

- ERA's InterLaB RadCheM Proficiency Testing Program for radiological analyses. This program completes the process of replacing the USEPA EMSL-LV Nuclear Radiation Assessment Division program discontinued in 1998. Laboratories seeking certification for radionuclide analysis in drinking water also use the study. This program is conducted in strict compliance with the USEPA National Standards for Water Proficiency Testing Studies. This program encompasses Uranium by EPA method 200.8 (for drinking water certification in Florida/Primary NELAP), gamma emitters, Gross Alpha/Beta, Iodine-131, naturally occurring radioactive isotopes, Strontium-89/90, and Tritium.

- ERA's Water Pollution (WP) biannual program for waste methodologies includes parameters for both organic and inorganic analytes.
- ERA's Water Supply (WS) biannual program for drinking water methodologies includes parameters for organic and inorganic analytes.
- New York State Department of Health Environmental Laboratory Approval Program Proficiency Testing Program for Potable Water (PW)
- Environmental Cross-Check Program administered by Eckert & Ziegler Analytics, Inc. This program encompasses radionuclides in water, soil, milk, naturally occurring radioactive isotopes in soil and air filters.

GEL procures single-blind performance evaluation samples from Eckert & Ziegler Analytics to verify the analysis of sample matrices processed at GEL. Samples are received on a quarterly basis. GEL's Third-Party Cross-Check Program provides environmental matrices encountered in a typical nuclear utility REMP. The Third-Party Cross-Check Program is intended to meet or exceed the inter-laboratory comparison program requirements discussed in NRC Regulatory Guide 4.15, revision 1. Once performance evaluation samples have been prepared in accordance with the instructions provided by the PT provider, samples are managed and analyzed in the same manner as environmental samples from GEL's clients.

3. Quality Assurance Program for Internal and External Audits

During each annual reporting period, at least one internal assessment is conducted in accordance with the pre-established schedule from Standard Operating Procedure for the Conduct of Quality Audits, GL-QS-E001. The annual internal audit plan is reviewed for adequacy and includes the scheduled frequency and scope of quality control actions necessary to GEL's QA program. Internal audits are conducted at least annually in accordance with a schedule approved by the Quality Systems Director. Supplier audits are contingent upon the categorization of the supplier, and may or may not be conducted prior to the use of a supplier or subcontractor. Type I suppliers and subcontractors, regardless of how they were initially qualified, are re-evaluated at least once every three years.

In addition, prospective customers audit GEL during pre-contract audits. GEL hosts several external audits each year for both our clients and other programs. These programs include environmental monitoring, waste characterization, and radiobioassay. The following list of programs may audit GEL at least annually or up to every three years depending on the program.

- NELAC, National Environmental Laboratory Accreditation Program
- DOECAP, U.S. Department of Energy Consolidated Audit Program
- DOELAP, U.S. Department of Energy Laboratory Accreditation Program
- DOE QSAS, U.S. Department of Energy, Quality Systems for Analytical Services
- ISO/IEC 17025

- A2LA, American Association for Laboratory Accreditation
- DOD ELAP, US Department of Defense Environmental Accreditation Program
- NUPIC, Nuclear Procurement Issues Committee
- South Carolina Department of Heath and Environmental Control (SC DHEC)

The annual radiochemistry laboratory internal audit (10-RAD-001) was conducted in March 2010. Four findings, one observation, and two recommendations resulted from this assessment. Each finding was closed and appropriate laboratory staff addressed each observation and recommendation. The internal audit closed in June 2010.

4. Performance Evaluation Acceptance Criteria for Environmental Sample Analysis

GEL utilized an acceptance protocol based upon two performance models. For those inter-laboratory programs that already have established performance criteria for bias (i.e., MAPEP, and ERA/ELAP), GEL will utilize the criteria for the specific program. For intra-laboratory or third party quality control programs that do not have a specific acceptance criteria (i.e. the Eckert-Ziegler Analytics Environmental Cross-check Program), results will be evaluated in accordance with GEL's internal acceptance criteria.

5. Performance Evaluation Samples

Performance Evaluation (PE) results and internal quality control sample results are evaluated in accordance with GEL acceptance criteria. The first criterion concerns bias, which is defined as the deviation of any one result from the known value. The second criterion concerns precision, which deals with the ability of the measurement to be replicated by comparison of an individual result with the mean of all results for a given sample set.

At GEL, we also evaluate our analytical performance on a regular basis through statistical process control acceptance criteria. Where feasible, this criterion is applied to both measures of precision and accuracy and is specific to sample matrix. We establish environmental process control limits at least annually.

For Radiochemistry analysis, quality control evaluation is based on static limits rather than those that are statistically derived. Our current process control limits are maintained in GEL's AlphaLIMS. We also measure precision with matrix duplicates and/or matrix spike duplicates. The upper and lower control limits (UCL and LCL respectively) for precision are plus or minus three times the standard deviation from the mean of a series of relative percent differences. The static precision criteria for radiochemical analyses are 0 - 20%, for activity levels exceeding the contract required detection limit (CRDL).

6. Quality Control Program for Environmental Sample Analysis

GEL's internal QA Program is designed to include QC functions such as instrumentation calibration checks (to insure proper instrument response), blank samples, instrumentation backgrounds, duplicates, as well as overall staff qualification analyses and statistical process controls. Both quality control and qualification analyses samples are used to be as similar as the matrix type of those samples submitted for analysis by the various laboratory clients. These performance test samples (or performance evaluation samples) are either actual sample submitted in duplicate in order to evaluate the precision of laboratory measurements, or fortified blank samples, which have been given a known quantity of a radioisotope that is in the interest to GEL's clients.

Accuracy (or Bias) is measured through laboratory control samples and/or matrix spikes, as well as surrogates and internal standards. The UCLs and LCLs for accuracy are plus or minus three times the standard deviation from the mean of a series of recoveries. The static limit for radiochemical analyses is 75 - 125%. Specific instructions for out-of-control situations are provided in the applicable analytical SOP.

GEL's Laboratory Control Standard (LCS) is an aliquot of reagent water or other blank matrix to which known quantities of the method analytes are added in the laboratory. The LCS is analyzed exactly like a sample, and its purpose is to determine whether the methodology is in control, and whether the laboratory is capable of making accurate and precise measurements. Some methods may refer to these samples as Laboratory Fortified Blanks (LFB). The requirement for recovery is between 75 and 125% for radiological analyses excluding drinking water matrix.

$$\text{Bias (\%)} = \frac{\text{(observed concentration)}}{\text{(known concentration)}} * 100\ \%$$

Precision is a data quality indicator of the agreement between measurements of the same property, obtained under similar conditions, and how well they conform to themselves. Precision is usually expressed as standard deviation, variance or range in either absolute or relative (percentage) terms.

GEL's laboratory duplicate (DUP or LCSD) is an aliquot of a sample taken from the same container and processed in the same manner under identical laboratory conditions. The aliquot is analyzed independently from the parent sample and the results are compared to measure precision and accuracy.

If a sample duplicate is analyzed, it will be reported as Relative Percent Difference (RPD). The RPD must be 20 percent or less, if both samples are greater than 5 times the MDC. If both results are less than 5 times MDC, then the RPD must be equal to or less than 100%. If one result is above the MDC and the other is below the MDC, then the RPD can be calculated using the MDC for the result of the one below the MDC. The RPD must be 100% or less. In the situation where both results are above the MDC but one result is greater than 5 times the MDC and the other is less than 5 times the MDC, the RPD must be less than or equal to 20%. If both results are below MDC, then the limits on % RPD are not applicable.

$$\text{Difference (\%)} = \frac{\text{(high duplicate result – low duplicate result)}}{\text{(average of results)}} * 100\ \%$$

7. Summary of Data Results

During 2010, forty-three radioisotopes associated with six matrix types were analyzed under GEL's Performance Evaluation program in participation with ERA, MAPEP, NYSDOH ELAP and Eckert & Ziegler Analytics. Matrix types were representative of client analyses performed during 2010. The list below contains the type of matrix evaluated by GEL.

- Air Filter
- Cartridge
- Water
- Milk
- Soil
- Vegetation

Graphs are provided in Figures 1-8 of this report to allow for the evaluation of trends or biases. These graphs include radioisotopes Cobalt-60, Cesium-137, Tritium, Strontium-90, Gross Alpha, Gross Beta, and Iodine-131. A summary of GEL's quality control for radiological analyses by isotopic analysis and matrix are represented in Table 8. Each LCS and DUP represents a batch of samples for each isotopic analysis. This summary contains the number of reportable quality control results for our clients.

8. Summary of Participation in the Eckert & Ziegler Analytics Environmental Cross-Check Program

During 2010, Eckert & Ziegler Analytics provided samples for 106 individual environmental analyses. Of the 106 analyses, 99% (105 out of 106) of all results fell within the PT provider's acceptance criteria. The only analytical failure occurred with the analysis of Iron-59 in milk. For the corrective action associated with the Iron-59 failure, refer to CARR110209-542 (Table 9).

9. Summary of Participation in the MAPEP Monitoring Program

During 2010, one set of MAPEP samples (MAPEP 22) was analyzed by the laboratory. Of the 66 analyses, 80% (53 out of 66) of all results fell within the PT provider's acceptance criteria. Thirteen analytical failures occurred: Plutonium-238 in water, Uranium-235 in filter, Uranium-238 in filter, Uranium-Total in filter, Americium-241 in filter, Cesium-134 in filter, Cesium-137 in filter, Cobalt-60 in filter, Manganese-54 in filter, Plutonium-239/240 in filter, Uranium-244/243 in filter, Uranium-238 in filter, and Uranium-238 in vegetation.

For the corrective action associated MAPEP 22, refer to CARR100617-496 (Table 9). The ICP-MS analysis of Uranium-235 and Uranium-238 failure was attributed to the use of the less vigorous digestion method (EPA Method 3050B). After contacting RESL, GEL discovered that they had used a more rigorous total dissolution process. The failure for Plutonium-238 was attributed to a data reviewer's error and lack of attention to detail to the region of interest that was not included in the data result. Approximately 400 additional counts should have been included. For the remaining isotopic failures, the error was attributed to analyst error and failure to follow the instructions from the PT provider.

10. Summary of Participation in the ERA MRaD PT Program

During 2010, the ERA MRad program provided samples (MRAD-12 and MRAD-13) for 175 individual environmental analyses. Of the 175 analyses, 96% (169 out of 176) of all results fell within the PT provider's acceptance criteria. Six analytical failures occurred: Uranium-234 in soil, Uranium-238 in soil, Uranium-238 in vegetation, Plutonium-238 in water, Uranium-238 in water, and Bismuth-212 in soil.

For the corrective actions associated with MRAD 12 and MRAD-13, refer to corrective actions CARR100617-497 and CARR101210-527, respectively (Table 9). For MRAD-12, the ICP-MS analysis of Uranium-235 and Uranium-238 failure was attributed to the use of the less vigorous digestion method (EPA Method 3050B). After contacting RESL, GEL discovered that they had used a more rigorous total dissolution process. For Uranium-238 in vegetation, air and water, the failure was attributed to method sensitivity by gamma spectroscopy. Future PT analysis will be performed using a more sensitive method.

For MRAD-13, the failure for Bismuth-212 was attributed to a reporting error. The actual result (1660 pCi/kg) was within the acceptance range. The failure of Iron-55 was attributed to matrix interference. An additional recount with a smaller aliquot and fresh reagent rinses removed the interferant.

11. Summary of Participation in the ERA PT Program

During 2010, the ERA program provided samples (RAD-80 and RAD-82) for 53 individual environmental analyses. Of the 53 analyses, 77% (41 out of 53) of all results fell within the PT provider's acceptance criteria. Twelve analytical failures occurred: Strontium-89 in water, Strontium-90 in water, Barium-133 in water, Cesium-134 in water, Cesium-137 in water, Cobalt-60 in water, Zinc-65 in water, Uranium (Natural) in water, Uranium (Nat) Mass in water, Strontium-90 in water, Cesium-134 in water, and Zinc-65 in water.

For the corrective actions associated with RAD-80 and RAD-82, refer to corrective actions CARR100318-487 and CARR100907-512, respectively (Table 9). For RAD-80, the Gross Alpha failure was attributed to a concentrated iron carrier. The Strontium-89 and Strontium-90 failures were attributed to the associated weights of the carriers utilized during the preparation and analysis.

For RAD-82, failures of the Gamma Emitters and the Naturals (Uranium) were attributed to analyst error and failure to follow the instructions from the PT provider. The failure of Strontium-89 and Strontium-90 was attributed to analyst error while diluting the sample.

12. Summary of Participation in the New York ELAP PT Program

During 2010, the NYSDOH ELAP PT program provided 30 individual tests for radiological analysis. Of the 30 analyses, 83% (25 out of 30) of the results were within the PT provider's acceptance criteria. Five analytical failures occurred: Cesium-134 in water, Iodine-131 in water (two), Strontium-89 in water, and Radium-226 in water.

For the corrective actions associated with NY-337, refer to corrective action CARR101203-525 (Table 9). For Cesium-134, Iodine-131, Strontium-89 and Strontium-90, and Radium-226, the failures could not be determined. The laboratory continues to monitor results of internal quality control samples.

In addition, GEL (Lab ID# E87156, Lab Code# SC00012) maintained primary NELAP accreditation from the Florida Department of Health for the following methods in potable water and non-potable water. The radiological analytes and methods are listed below.

- Gross Alpha: EPA 900.0, EPA 1984 00-02

- Gross Beta: EPA 900.0
- Iodine-131: DOE 4.5.2.3, EPA 901.1, EPA 902.0
- Photon Emitters: DOE 4.5.2.3, EPA 901.1
- Radioactive Cesium: DOE 4.5.2.3, EPA 901.1
- Tritium: EPA 906.0
- Radium-226: EPA 903.1, EPA 1984 Ra-04
- Radium-228: EPA 904.0, EPA 1976 PP.24
- Radon: SM 20 7500 Rn, DOE 1990 Sr-02
- Strontium-89: EPA 905.0
- Strontium-90: EPA 905.0
- Uranium (Activity): DOE 1990 U-02, ASTM D5174-97, 02

13. Quality Control Program for REMP Analyses

GEL's internal (intra-laboratory) quality control program evaluated 1590 individual analyses for bias and 1591 analyses for precision for standard REMP matrix and radionuclides. Of the 959 internal quality control analyses evaluated for bias, 100% met laboratory acceptance criteria. In addition, 100% of the 1591 results for precision were found to be acceptable. The results are summarized in Table 8.

GEL performs low-level analysis specifically for Tritium in water. A chart of low activity H-3 spike performance is provided in Figure 8. All 2010 analyses were within the acceptance criteria.

14. Corrective Action Request and Report (CARR)

There are two categories of corrective action at GEL. One is corrective action implemented at the analytical and data review level in accordance with the analytical SOP. The other is formal corrective action documented by the Quality Systems Team in accordance with GL-QS-E-002. A formal corrective action is initiated when a nonconformance reoccurs or is so significant that permanent elimination or prevention of the problem is required.

GEL includes quality requirements in most analytical standard operating procedures to ensure that data are reported only if the quality control criteria are met or the quality control measures that did not meet the acceptance criteria are documented. A formal corrective action is implemented according to GL-QS-E-002 for Conducting Corrective/Preventive Action and Identifying Opportunities for Improvement. Recording and documentation is performed following guidelines stated in GL-QS-E-012 for Client NCR Database Operation.

Any employee at GEL can identify and report a nonconformance and request that corrective action be taken. Any GEL employee can participate on a corrective action team as requested by the QS team or Group Leaders. The steps for conducting corrective action are detailed in GL-QS-E-002. In the event that correctness or validity of the laboratory's test results in doubt, the laboratory will take corrective action. If investigations show that the results have been impacted, affected clients will be informed of the issue in writing within five (5) calendar days of the discovery.

Table 9 provides the status of CARRs for radiological performance testing during 2010.

15. References

1. GEL Quality Assurance Plan, GL-QS-B-001
2. GEL Standard Operating Procedure for the Conduct of Quality Audits, GL-QS-E-001
3. GEL Standard Operating Procedure for Conducting Corrective/Preventive Action and Identifying Opportunities for Improvement, GL-QS-E-002
4. GEL Standard Operating Procedure for AlphaLIMS Documentation of Nonconformance Reporting and Dispositioning and Control of Nonconforming Items, GL-QS-E-004
5. GEL Standard Operating Procedure for Handling Proficiency Evaluation Samples, GL-QS-E-013
6. GEL Standard Operating Procedure for Quality Assurance Measurement Calculations and Processes, GL-QS-E-014
7. 40 CFR Part 136 Guidelines Establishing Test Procedures for the Analysis of Pollutants
8. ISO/IEC 17025-2005, General Requirements for the Competence of Testing and Calibration Laboratories
9. ANSI/ASQC E4-1994, Specifications and Guidelines for Quality Systems for Environmental Data Collection and Environmental Technology Programs, American National Standard
10. 2003 NELAC Standard, National Environmental Laboratory Accreditation Program
11. MARLAP, Multi-Agency Radiological Laboratory Analytical Protocols
12. 10 CFR Part 21, Reporting of Defects and Noncompliance
13. 10 CFR Part 50 Appendix B, Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants
14. 10 CFR Part 61, Licensing Requirements for Land Disposal and Radioactive Waste
15. NRC REG Guide 4.15 and NRC REG Guide 4.8

TABLE 1
2010 RADIOLOGICAL PROFICIENCY TESTING RESULTS AND ACCEPTANCE CRITERIA

Sample Number	Quarter / Year	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
RAD - 80	1st / 2010	Water	pCi/L	Barium-133	73.5	72.9	61.0 - 80.2	Acceptable
RAD - 80	1st / 2010	Water	pCi/L	Cesium-134	69.2	63.4	51.5 - 69.7	Acceptable
RAD - 80	1st / 2010	Water	pCi/L	Cesium-137	118.0	120	108 - 134	Acceptable
RAD - 80	1st / 2010	Water	pCi/L	Cobalt-60	87.7	90	81 - 101	Acceptable
RAD - 80	1st / 2010	Water	pCi/L	Gross Alpha	51.3	42.5	22.0 - 53.9	Acceptable
RAD - 80	1st / 2010	Water	pCi/L	Gross Beta	52.0	54.2	37.0 - 61.1	Acceptable
RAD - 80	1st / 2010	Water	pCi/L	Iodine-131	30.5	28.2	23.5 - 33.1	Acceptable
RAD - 80	1st / 2010	Water	pCi/L	Radium-226	16.9	17.8	13.2 - 20.3	Acceptable
RAD - 80	1st / 2010	Water	pCi/L	Radium-228	20.4	18.2	12.3 - 21.8	Acceptable
RAD - 80	1st / 2010	Water	pCi/L	Strontium-89	37.9	53.3	42.3 - 60.9	Not Acceptable
RAD - 80	1st / 2010	Water	pCi/L	Strontium-90	52.3	42.2	31.1 - 48.4	Not Acceptable
RAD - 80	1st / 2010	Water	pCi/L	Tritium	19200	18700	16400-20600	Acceptable
RAD - 80	1st / 2010	Water	pCi/L	Uranium (Nat)	49.0	50.2	40.7 - 55.8	Acceptable
RAD - 80	1st / 2010	Water	ug/L	Uranium (Nat) Mass	67.3	73.2	59.4 - 81.4	Acceptable
RAD - 80	1st / 2010	Water	pCi/L	Zinc-65	213.0	210	189 - 246	Acceptable
E6922-278	2nd / 2010	Cartridge	pCi	Iodine-131	9.02E+01	9.39E+01	0.96	Acceptable
E6924-278	2nd / 2010	Milk	pCi/L	Iodine-131	8.25E+01	8.73E+01	0.95	Acceptable
E6925-278	2nd / 2010	Water	pCi/L	Iodine-131	1.00E+02	9.61E+01	1.04	Acceptable
E6924-278	2nd / 2010	Milk	pCi/L	Iron-59	1.88E+02	1.78E+02	1.06	Acceptable
E6925-278	2nd / 2010	Water	pCi/L	Iron-59	1.94E+02	1.79E+02	1.08	Acceptable
E6924-278	2nd / 2010	Milk	pCi/L	Manganese-54	1.83E+02	1.78E+02	1.03	Acceptable
E6925-278	2nd / 2010	Water	pCi/L	Manganese-54	1.90E+02	1.79E+02	1.06	Acceptable
E6923-278	2nd / 2010	Milk	pCi/L	Strontium-89	9.73E+01	1.31E+02	0.75	Acceptable
E6923-278	2nd / 2010	Milk	pCi/L	Strontium-90	1.38E+01	1.79E+01	0.77	Acceptable
E6924-278	2nd / 2010	Milk	pCi/L	Zinc-65	3.68E+02	3.45E+02	1.07	Acceptable
E6925-278	2nd / 2010	Water	pCi/L	Zinc-65	3.72E+02	3.48E+02	1.07	Acceptable
E6924-278	2nd / 2010	Milk	pCi/L	Cerium-141	2.01E+02	2.02E+02	0.99	Acceptable
E6925-278	2nd / 2010	Water	pCi/L	Cerium-141	2.04E+02	2.04E+02	1.00	Acceptable
E6924-278	2nd / 2010	Milk	pCi/L	Cesium-134	2.41E+02	2.53E+02	0.95	Acceptable
E6925-278	2nd / 2010	Water	pCi/L	Cesium-134	2.56E+02	2.55E+02	1.00	Acceptable
E6924-278	2nd / 2010	Milk	pCi/L	Cesium-137	1.71E+02	1.79E+02	0.96	Acceptable
E6925-278	2nd / 2010	Water	pCi/L	Cesium-137	1.81E+02	1.81E+02	1.00	Acceptable
E6924-278	2nd / 2010	Milk	pCi/L	Cobalt-58	2.03E+02	2.11E+02	0.96	Acceptable
E6925-278	2nd / 2010	Water	pCi/L	Cobalt-58	2.19E+02	2.13E+02	1.03	Acceptable

Sample Number	Quarter / Year	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
E6924-278	2nd / 2010	Milk	pCi/L	Cobalt-60	2.47E+02	2.56E+02	0.97	Acceptable
E6925-278	2nd / 2010	Water	pCi/L	Cobalt-60	2.67E+02	2.58E+02	1.03	Acceptable
E6924-278	2nd / 2010	Milk	pCi/L	Cr-51	5.54E+02	5.48E+02	1.01	Acceptable
E6925-278	2nd / 2010	Water	pCi/L	Cr-51	5.78E+02	5.54E+02	1.04	Acceptable
E7054-278	2nd / 2010	Milk	pCi/L	Cerium-141	2.61E+02	2.61E+02	1.00	Acceptable
E7055-278	2nd / 2010	Water	pCi/L	Cerium-141	2.78E+02	2.63E+02	1.06	Acceptable
E7054-278	2nd / 2010	Milk	pCi/L	Cesium-134	1.76E+02	1.78E+02	0.99	Acceptable
E7055-278	2nd / 2010	Water	pCi/L	Cesium-134	1.85E+02	1.79E+02	1.03	Acceptable
E7054-278	2nd / 2010	Milk	pCi/L	Cesium-137	1.61E+02	1.58E+02	1.02	Acceptable
E7055-278	2nd / 2010	Water	pCi/L	Cesium-137	1.71E+02	1.59E+02	1.07	Acceptable
E7054-278	2nd / 2010	Milk	pCi/L	Cobalt-58	1.45E+02	1.43E+02	1.02	Acceptable
E7055-278	2nd / 2010	Water	pCi/L	Cobalt-58	1.51E+02	1.44E+02	1.05	Acceptable
E7054-278	2nd / 2010	Milk	pCi/L	Cobalt-60	1.90E+02	1.83E+02	1.04	Acceptable
E7055-278	2nd / 2010	Water	pCi/L	Cobalt-60	1.94E+02	1.85E+02	1.05	Acceptable
E7054-278	2nd / 2010	Milk	pCi/L	Cr-51	3.81E+02	3.61E+02	1.05	Acceptable
E7055-278	2nd / 2010	Water	pCi/L	Cr-51	3.86E+02	3.64E+02	1.06	Acceptable
E7052-278	2nd / 2010	Cartridge	pCi	Iodine-131	8.58E+01	8.54E+01	1.00	Acceptable
E7054-278	2nd / 2010	Milk	pCi/L	Iodine-131	6.91E+01	7.40E+01	0.93	Acceptable
E7055-278	2nd / 2010	Water	pCi/L	Iodine-131	8.12E+01	7.22E+01	1.12	Acceptable
E7054-278	2nd / 2010	Milk	pCi/L	Iron-59	1.60E+02	1.37E+02	1.17	Acceptable
E7055-278	2nd / 2010	Water	pCi/L	Iron-59	1.60E+02	1.38E+02	1.16	Acceptable
E7054-278	2nd / 2010	Milk	pCi/L	Manganese-54	2.10E+02	2.07E+02	1.01	Acceptable
E7055-278	2nd / 2010	Water	pCi/L	Manganese-54	2.30E+02	2.09E+02	1.1	Acceptable
E7053-278	2nd / 2010	Milk	pCi/L	Strontium-89	7.91E+01	9.28E+01	0.85	Acceptable
E7053-278	2nd / 2010	Milk	pCi/L	Strontium-90	1.12E+01	1.27E+01	0.88	Acceptable
E7054-278	2nd / 2010	Milk	pCi/L	Zinc-65	2.71E+02	2.54E+02	1.07	Acceptable
E7055-278	2nd / 2010	Water	pCi/L	Zinc-65	2.97E+02	2.56E+02	1.16	Acceptable
NY-332 3262	2nd / 2010	Water	pCi/L	Barium-133	27.8	25.6	20.6 - 30.5	Acceptable
NY-332 3262	2nd / 2010	Water	pCi/L	Cesium-134	14.8	14.0	10.7 - 17.3	Acceptable
NY-332 3262	2nd / 2010	Water	pCi/L	Cesium-137	124	123	112 - 134	Acceptable
NY-332 3262	2nd / 2010	Water	pCi/L	Cobalt-60	98.3	99.5	90.3 - 109	Acceptable
NY-332 3263	2nd / 2010	Water	pCi/L	Gross Alpha	33.0	26.8	15.0 - 38.6	Acceptable
NY-332 3263	2nd / 2010	Water	pCi/L	Gross Beta	64.6	54.0	41.3 - 66.7	Acceptable
NY-332 3264	2nd / 2010	Water	pCi/L	Iodine-131	23.4	26.4	21.9 - 31.0	Acceptable
NY-332 3264	2nd / 2010	Water	pCi/L	Iodine-131	26.8	26.4	21.9 - 31.0	Acceptable
NY-332 3265	2nd / 2010	Water	pCi/L	Radium-226	12.1	13.2	10.4 - 16.0	Acceptable
NY-332 3265	2nd / 2010	Water	pCi/L	Radium-228	9.90	8.91	6.08 - 11.7	Acceptable

Sample Number	Quarter / Year	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
NY-332 3261	2nd / 2010	Water	pCi/L	Strontium-89	46.7	41.9	33.4 - 50.4	Acceptable
NY-332 3261	2nd / 2010	Water	pCi/L	Strontium-90	33.9	34.8	27.1 - 42.5	Acceptable
NY-332 3266	2nd / 2010	Water	pCi/L	Tritium	9610	9490	8390 - 10600	Acceptable
NY-332 3265	2nd / 2010	Water	pCi/L	Uranium (activity)	48.81	44.7	37.9 - 51.4	Acceptable
NY-332 3262	2nd / 2010	Water	pCi/L	Zinc-65	146	139	121 - 156	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Actinium-228	1570	1850	1190 - 2600	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Americium-241	1130	1500	896 - 1930	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Americium-241	1120	1500	896 - 1930	Acceptable
MRAD-12	2nd / 2010	Vegetation	pCi/kg	Americium-241	2410	3140	1790 - 4310	Acceptable
MRAD-12	2nd / 2010	Vegetation	pCi/kg	Americium-241	3600	3140	1790 - 4310	Acceptable
MRAD-12	2nd / 2010	Air Filter	pCi/Filter	Americium-241	52.7	60.0	35.1 - 82.3	Acceptable
MRAD-12	2nd / 2010	Air Filter	pCi/Filter	Americium-241	76	60	35.1 - 82.3	Acceptable
MRAD-12	2nd / 2010	Water	pCi/L	Americium-241	79.1	95.6	65.5 - 129	Acceptable
MRAD-12	2nd / 2010	Water	pCi/L	Americium-241	123	95.6	65.5 - 129	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Bismuth-212	1430	1640	430 - 2450	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Bismuth-214	1080	1410	865 - 2030	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Cesium-134	3040	3110	2000 - 3740	Acceptable
MRAD-12	2nd / 2010	Vegetation	pCi/kg	Cesium-134	1750	1670	956 - 2310	Acceptable
MRAD-12	2nd / 2010	Air Filter	pCi/Filter	Cesium-134	504	436	284 - 540	Acceptable
MRAD-12	2nd / 2010	Water	pCi/L	Cesium-134	454	417	308 - 479	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Cesium-137	4330	4440	3400 - 5770	Acceptable
MRAD-12	2nd / 2010	Vegetation	pCi/kg	Cesium-137	1550	1470	1080 - 2040	Acceptable
MRAD-12	2nd / 2010	Air Filter	pCi/Filter	Cesium-137	785	701	527 - 921	Acceptable
MRAD-12	2nd / 2010	Water	pCi/L	Cesium-137	693	654	556 - 783	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Cobalt-60	2120	2140	1560 - 2870	Acceptable
MRAD-12	2nd / 2010	Vegetation	pCi/kg	Cobalt-60	2100	1970	1330 - 2830	Acceptable
MRAD-12	2nd / 2010	Air Filter	pCi/Filter	Cobalt-60	591	523	405 - 653	Acceptable
MRAD-12	2nd / 2010	Water	pCi/L	Cobalt-60	813	727	633 - 859	Acceptable
MRAD-12	2nd / 2010	Vegetation	pCi/kg	Curium-244	429	528	260 - 822	Acceptable
MRAD-12	2nd / 2010	Air Filter	pCi/Filter	Gross Alpha	68.2	79.6	41.3 - 120	Acceptable
MRAD-12	2nd / 2010	Air Filter	pCi/Filter	Gross Beta	72	70.4	43.4 - 103	Acceptable
MRAD-12	2nd / 2010	Air Filter	pCi/Filter	Iron-55	375	359	158 - 559	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Lead-212	1540	1520	980 - 2140	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Lead-214	1300	1440	862 - 2140	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Manganese-54	< 22.9	0	-----	Acceptable
MRAD-12	2nd / 2010	Vegetation	pCi/kg	Manganese-54	< 9.6	0.00	-----	Acceptable

Sample Number	Quarter / Year	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
MRAD-12	2nd / 2010	Air Filter	pCi/Filter	Manganese-54	< 5.07	0.00	-----	Acceptable
MRAD-12	2nd / 2010	Water	pCi/L	Manganese-54	< 7.7	0.00	-----	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Plutonium-238	1360	1330	761 - 1870	Acceptable
MRAD-12	2nd / 2010	Vegetation	pCi/kg	Plutonium-238	3090	3040	1640 - 4450	Acceptable
MRAD-12	2nd / 2010	Air Filter	pCi/Filter	Plutonium-238	63.9	64.1	44.0 - 84.3	Acceptable
MRAD-12	2nd / 2010	Water	pCi/L	Plutonium-238	79.5	109	82.4 - 135	Not Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Plutonium-239	1220	1260	860 - 1670	Acceptable
MRAD-12	2nd / 2010	Vegetation	pCi/kg	Plutonium-239	2830	2800	1740 - 3820	Acceptable
MRAD-12	2nd / 2010	Air Filter	pCi/Filter	Plutonium-239	56.6	56.7	41.1 - 73.4	Acceptable
MRAD-12	2nd / 2010	Water	pCi/L	Plutonium-239	103	105	81.2 - 130	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Potassium-40	11100	10900	7900 - 14800	Acceptable
MRAD-12	2nd / 2010	Vegetation	pCi/kg	Potassium-40	40800	34900	25100 - 49400	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Strontium-90	7870	8180	2960 - 13300	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Strontium-90	7870	8180	2960 - 13300	Acceptable
MRAD-12	2nd / 2010	Vegetation	pCi/kg	Strontium-90	7880	9120	5100 - 12100	Acceptable
MRAD-12	2nd / 2010	Air Filter	pCi/Filter	Strontium-90	178	187	82.3 - 291	Acceptable
MRAD-12	2nd / 2010	Water	pCi/L	Strontium-90	708	719	456 - 961	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Thorium-234	1600	1610	511 - 3070	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Uranium-234	1230	1620	1030 - 2010	Acceptable
MRAD-12	2nd / 2010	Vegetation	pCi/kg	Uranium-234	1680	1720	1180 - 2280	Acceptable
MRAD-12	2nd / 2010	Air Filter	pCi/Filter	Uranium-234	68.8	62.1	39.1 - 92.0	Acceptable
MRAD-12	2nd / 2010	Water	pCi/L	Uranium-234	62.4	61.4	46.3 - 79.2	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Uranium-234	< 1158	1620	1030 - 2010	Not Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Uranium-238	1600	1610	984 - 2040	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Uranium-238	908	1610	984 - 2040	Not Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Uranium-238	1440	1610	984 - 2040	Acceptable
MRAD-12	2nd / 2010	Vegetation	pCi/kg	Uranium-238	1604	1710	1200 - 2160	Acceptable
MRAD-12	2nd / 2010	Vegetation	pCi/kg	Uranium-238	1770	1710	1200 - 2160	Acceptable
MRAD-12	2nd / 2010	Vegetation	pCi/kg	Uranium-238	< 1240	1710	1200 - 2160	Not Acceptable
MRAD-12	2nd / 2010	Air Filter	pCi/Filter	Uranium-238	61.5	61.5	39.4 - 87.3	Acceptable
MRAD-12	2nd / 2010	Air Filter	pCi/Filter	Uranium-238	69.5	61.5	39.4 - 87.3	Acceptable
MRAD-12	2nd / 2010	Air Filter	pCi/Filter	Uranium-238	< 61.2	61.5	39.4 - 87.3	Acceptable
MRAD-12	2nd / 2010	Water	pCi/L	Uranium-238	67.9	60.9	46.5 - 75.5	Acceptable
MRAD-12	2nd / 2010	Water	pCi/L	Uranium-238	66.1	60.9	46.5 - 75.5	Acceptable
MRAD-12	2nd / 2010	Water	pCi/L	Uranium-238	< 155	60.9	46.5 - 75.5	Not Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Uranium-Total	2789	3300	1880 - 4460	Acceptable
MRAD-12	2nd / 2010	Vegetation	pCi/kg	Uranium-Total	3536	3510	2410 - 4530	Acceptable

Sample Number	Quarter / Year	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
MRAD-12	2nd / 2010	Soil	ug/kg	Uranium-Total (mass)	2920	4820	2650 - 6060	Acceptable
MRAD-12	2nd / 2010	Vegetation	ug/kg	Uranium-Total (mass)	5270	5120	3520 - 6610	Acceptable
MRAD-12	2nd / 2010	Vegetation	pCi/kg	Uranium-Total (mass)	5290	5120	3520 - 6610	Acceptable
MRAD-12	2nd / 2010	Air Filter	ug/Filter	Uranium-Total (mass)	183	184	114 - 264	Acceptable
MRAD-12	2nd / 2010	Air Filter	ug/Filter	Uranium-Total (mass)	208	184	114 - 264	Acceptable
MRAD-12	2nd / 2010	Air Filter	ug/Filter	Uranium-Total (mass)	175	184	114 - 264	Acceptable
MRAD-12	2nd / 2010	Water	ug/L	Uranium-Total (mass)	213	182	143 - 225	Acceptable
MRAD-12	2nd / 2010	Water	ug/L	Uranium-Total (mass)	198	182	143 - 225	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Zinc-65	2790	2470	1960 - 3310	Acceptable
MRAD-12	2nd / 2010	Vegetation	pCi/kg	Zinc-65	1630	1360	983 - 1860	Acceptable
MRAD-12	2nd / 2010	Air Filter	pCi/Filter	Zinc-65	462	389	269 - 539	Acceptable
MRAD-12	2nd / 2010	Water	pCi/L	Zinc-65	632	533	452 - 664	Acceptable
RAD - 82	3 rd / 2010	Water	pCi/L	Barium-133	112.0	89.1	75.0 - 98.0	Not Acceptable
RAD - 82	3 rd / 2010	Water	pCi/L	Cesium-134	115.0	88.3	72.4 -97.1	Not Acceptable
RAD - 82	3 rd / 2010	Water	pCi/L	Cesium-137	271	210	189 - 232	Not Acceptable
RAD - 82	3 rd / 2010	Water	pCi/L	Cobalt-60	98.4	72.8	65.5 - 82.5	Not Acceptable
RAD - 82	3 rd / 2010	Water	pCi/L	Gross Alpha	65.5	61.1	32.0 - 75.9	Acceptable
RAD - 82	3 rd / 2010	Water	pCi/L	Gross Beta	56.7	56.4	38.6 - 63.6	Acceptable
RAD - 82	3 rd / 2010	Water	pCi/L	Iodine-131	32.2	28.4	23.6 - 33.3	Acceptable
RAD - 82	3 rd / 2010	Water	pCi/L	Radium-226	15.9	17.1	12.7 - 19.6	Acceptable
RAD - 82	3 rd / 2010	Water	pCi/L	Radium-228	18.9	16.1	10.8 - 19.4	Acceptable
RAD - 82	3 rd / 2010	Water	pCi/L	Strontium-89	60.6	55.3	44.1 - 62.9	Acceptable
RAD - 82	3 rd / 2010	Water	pCi/L	Strontium-90	47.1	32.8	24.0 - 38.0	Not Acceptable
RAD - 82	3 rd / 2010	Water	pCi/L	Tritium	18500	19800	17300 - 21700	Acceptable
RAD - 82	3 rd / 2010	Water	pCi/L	Uranium (Nat)	58.0	49.6	40.2 - 55.1	Not Acceptable
RAD - 82	3 rd / 2010	Water	ug/L	Uranium (Nat) Mass	89.1	72.3	58.7 - 80.4	Not Acceptable
RAD - 82	3 rd / 2010	Water	pCi/L	Zinc-65	161	110	99.0 - 131	Not Acceptable
MAPEP-10-MaS22	3 rd / 2010	Soil	Bq/kg	Americium-241	0.07	0.00	-----	Acceptable
MAPEP-10-RdF22	3 rd / 2010	Filter	Bq/sample	Americium-241	0.2637	0.146	0.102 - 0.190	Not Acceptable
MAPEP-10-RdV22	3 rd / 2010	Vegetation	Bq/sample	Americium-241	0.179	0.225	0.158 - 0.293	Acceptable
MAPEP-10-MaS22	3 rd / 2010	Soil	Bq/kg	Cesium-134	744.67	733	513 - 953	Acceptable
MAPEP-10-RdF22	3 rd / 2010	Filter	Bq/sample	Cesium-134	4.323	2.13	1.49 - 2.77	Not Acceptable
MAPEP-10-RdV22	3 rd / 2010	Vegetation	Bq/sample	Cesium-134	3.098	4.39	3.07 - 5.71	Acceptable

GEL Laboratories LLC

P.O. Box 30712, Charleston, SC 29417

Sample Number	Quarter / Year	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
MAPEP-10-MaS22	3 rd / 2010	Soil	Bq/kg	Cesium-137	831.7	779	545 - 1013	Acceptable
MAPEP-10-RdF22	3 rd / 2010	Filter	Bq/sample	Cesium-137	3.070	1.53	1.07 - 1.99	Not Acceptable
MAPEP-10-RdV22	3 rd / 2010	Vegetation	Bq/sample	Cesium-137	2.185	3.06	2.14 - 3.98	Acceptable
MAPEP-10-MaS22	3 rd / 2010	Soil	Bq/kg	Cobalt-57	536.0	522	365 - 679	Acceptable
MAPEP-10-RdV22	3 rd / 2010	Vegetation	Bq/sample	Cobalt-57	0.009	0.00	-----	Acceptable
MAPEP-10-MaS22	3 rd / 2010	Soil	Bq/kg	Cobalt-60	670.3	622	435 - 809	Acceptable
MAPEP-10-RdF22	3 rd / 2010	Filter	Bq/sample	Cobalt-60	5.187	2.473	1.731 - 3.215	Not Acceptable
MAPEP-10-RdV22	3 rd / 2010	Vegetation	Bq/sample	Cobalt-60	3.076	3.27	2.29 - 4.25	Acceptable
MAPEP-10-GrF22	3 rd / 2010	Filter	Bq/sample	Gross Alpha	0.303	0.427	>0.0 - 0.854	Acceptable
MAPEP-10-GrF22	3 rd / 2010	Filter	Bq/sample	Gross Beta	1.433	1.29	0.65 - 1.94	Acceptable
MAPEP-10-MaS22	3 rd / 2010	Soil	Bq/kg	Iron-55	83.6	0.00	-----	Acceptable
MAPEP-10-MaS22	3 rd / 2010	Soil	Bq/kg	Manganese-54	940.7	849	594 - 1104	Acceptable
MAPEP-10-RdF22	3 rd / 2010	Filter	Bq/sample	Manganese-54	6.483	3.02	2.11 - 3.93	Not Acceptable
MAPEP-10-RdV22	3 rd / 2010	Vegetation	Bq/sample	Manganese-54	0.004	0.00	-----	Acceptable
MAPEP-10-MaS22	3 rd / 2010	Soil	Bq/kg	Nickel-63	489	477	334 - 620	Acceptable
MAPEP-10-MaS22	3 rd / 2010	Soil	Bq/kg	Plutonium-238	17.9	24	16.9 - 31.3	Acceptable
MAPEP-10-RdF22	3 rd / 2010	Filter	Bq/sample	Plutonium-238	0.010	0.0010	-----	Acceptable
MAPEP-10-RdV22	3 rd / 2010	Vegetation	Bq/sample	Plutonium-238	0.149	0.160	0.112 - 0.208	Acceptable
MAPEP-10-MaS22	3 rd / 2010	Soil	Bq/kg	Plutonium-239/240	0.21	0.00	-----	Acceptable
MAPEP-10-RdF22	3 rd / 2010	Filter	Bq/sample	Plutonium-239/240	0.164	0.0832	0.0582 - 0.1082	Not Acceptable
MAPEP-10-RdV22	3 rd / 2010	Vegetation	Bq/sample	Plutonium-239/240	0.0026	0.0008	-----	Acceptable
MAPEP-10-MaS22	3 rd / 2010	Soil	Bq/kg	Potassium-40	638.7	559	391 - 727	Acceptable
MAPEP-10-MaS22	3 rd / 2010	Soil	Bq/kg	Strontium-90	261.0	288	202 - 374	Acceptable
MAPEP-10-RdF22	3 rd / 2010	Filter	Bq/sample	Strontium-90	-0.004	0.00	-----	Acceptable
MAPEP-10-RdV22	3 rd / 2010	Vegetation	Bq/sample	Strontium-90	0.033	0.00	-----	Acceptable
MAPEP-10-MaS22	3 rd / 2010	Soil	Bq/kg	Technetium-99	-3.0	0.00	-----	Acceptable
MAPEP-10-MaS22	3 rd / 2010	Soil	Bq/kg	Uranium-234/233	65.27	60	42 -78	Acceptable
MAPEP-10-RdF22	3 rd / 2010	Filter	Bq/sample	Uranium-234/233	0.137	0.068	0.048 - 0.088	Not Acceptable
MAPEP-10-RdV22	3 rd / 2010	Vegetation	Bq/sample	Uranium-234/233	0.184	0.216	0.151 - 0.281	Acceptable
MAPEP-10-RdF22	3 rd / 2010	Filter	ug/sample	Uranium-235	0.0756	0.0381	0.0267 - 0.0495	Not Acceptable
MAPEP-10-RdV22	3 rd / 2010	Vegetation	ug/sample	Uranium-235	0.090	0.1250	0.0875 - 0.1625	Acceptable

Sample Number	Quarter / Year	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
MAPEP-10-MaS22	3 rd / 2010	Soil	Bq/kg	Uranium-238	70.23	64	45 - 83	Acceptable
MAPEP-10-RdF22	3 rd / 2010	Filter	ug/sample	Uranium-238	10.2	5.7	4.0 - 7.4	Not Acceptable
MAPEP-10-RdF22	3 rd / 2010	Filter	Bq/sample	Uranium-238	0.147	0.071	0.050 - 0.092	Not Acceptable
MAPEP-10-RdV22	3 rd / 2010	Vegetation	ug/sample	Uranium-238	12.5	17.9	12.5 - 23.3	Not Acceptable
MAPEP-10-RdV22	3 rd / 2010	Vegetation	Bq/sample	Uranium-238	0.184	0.223	0.156 - 0.290	Acceptable
MAPEP-10-RdF22	3 rd / 2010	Filter	ug/sample	Uranium-Total	10.2	5.7	4.0 - 7.4	Not Acceptable
MAPEP-10-RdV22	3 rd / 2010	Vegetation	ug/sample	Uranium-Total	13.9	18.0	12.6 - 23.4	Acceptable
MAPEP-10-MaS22	3 rd / 2010	Soil	Bq/kg	Zinc-65	-2.89	0.0	-----	Acceptable
MAPEP-10-RdF22	3 rd / 2010	Filter	Bq/sample	Zinc-65	-0.106	0.00	-----	Acceptable
MAPEP-10-RdV22	3 rd / 2010	Vegetation	Bq/sample	Zinc-65	6.844	7.10	4.97 - 9.23	Acceptable
E7119-278	3 rd / 2010	Milk	pCi/L	Cesium-134	1.37E+02	1.26E+02	1.09	Acceptable
E7119-278	3 rd / 2010	Milk	pCi/L	Cesium-137	1.68E+02	1.50E+02	1.12	Acceptable
E7119-278	3 rd / 2010	Milk	pCi/L	Cobalt-58	1.13E+02	1.01E+02	1.12	Acceptable
E7119-278	3 rd / 2010	Milk	pCi/L	Cobalt-60	2.14E+02	1.97E+02	1.09	Acceptable
E7119-278	3 rd / 2010	Milk	pCi/L	Cr-51	3.90E+02	3.39E+02	1.15	Acceptable
E7117-278	3 rd / 2010	Milk	pCi/L	Iodine-131	7.97E+01	8.02E+01	0.99	Acceptable
E7119-278	3 rd / 2010	Milk	pCi/L	Iodine-131	1.06E+02	9.69E+01	1.09	Acceptable
E7119-278	3 rd / 2010	Milk	pCi/L	Iron-59	1.55E+02	1.19E+02	1.30	Not Acceptable
E7119-278	3 rd / 2010	Milk	pCi/L	Manganese-54	1.99E+02	1.69E+02	1.18	Acceptable
E7118-278	3 rd / 2010	Milk	pCi/L	Strontium-89	7.95E+01	9.34E+01	0.85	Acceptable
E7118-278	3 rd / 2010	Milk	pCi/L	Strontium-90	1.57E+01	1.67E+01	0.94	Acceptable
E7119-278	3 rd / 2010	Milk	pCi/L	Zinc-65	2.40E+02	2.06E+02	1.17	Acceptable
090710N	3 rd / 2010	Water	pCi/L	Barium-133	86.9	92.9	78.3 - 102	Acceptable
090710N	3 rd / 2010	Water	pCi/L	Cesium-134	93.8	79.4	65.0 - 87.3	Not Acceptable
090710N	3 rd / 2010	Water	pCi/L	Cesium-137	55.5	54.6	49.1 - 62.9	Acceptable
090710N	3 rd / 2010	Water	pCi/L	Cobalt-60	120.0	117	105 - 131	Acceptable
090710N	3 rd / 2010	Water	pCi/L	Uranium (Nat)	34.9	33.8	27.3 - 37.8	Acceptable
090710N	3 rd / 2010	Water	ug/L	Uranium (Nat) Mass	48.6	49.3	39.8 - 55.1	Acceptable
090710N	3 rd / 2010	Water	pCi/L	Zinc-65	129	99.5	89.6 - 119	Not Acceptable
MAPEP-10-MaW22	3 rd / 2010	Water	Bq/L	Americium-241	1.0323	1.30	0.91 - 1.69	Acceptable
MAPEP-10-MaW22	3 rd / 2010	Water	Bq/L	Cesium-134	0.027	0.00	-----	Acceptable
MAPEP-10-MaW22	3 rd / 2010	Water	Bq/L	Cesium-137	63.1	60.6	42.4 - 78.8	Acceptable
MAPEP-10-MaW22	3 rd / 2010	Water	Bq/L	Cobalt-57	29.2	28.3	19.8 - 36.8	Acceptable
MAPEP-10-MaW22	3 rd / 2010	Water	Bq/L	Cobalt-60	-0.021	0.00	-----	Acceptable

GEL Laboratories LLC

P.O. Box 30712, Charleston, SC 29417

Sample Number	Quarter / Year	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
MAPEP-10-GrW22	3rd / 2010	Water	Bq/L	Gross Alpha	0.559	0.676	>0.0 - 1.352	Acceptable
MAPEP-10-GrW22	3rd / 2010	Water	Bq/L	Gross Beta	3.110	3.09	1.55 - 4.64	Acceptable
MAPEP-10-MaW22	3rd / 2010	Water	Bq/L	Iron-55	0.24	0.00	-----	Acceptable
MAPEP-10-MaW22	3rd / 2010	Water	Bq/L	Manganese-54	28.83	26.9	18.8 - 35.0	Acceptable
MAPEP-10-MaW22	3rd / 2010	Water	Bq/L	Nickel-63	57.7	59.9	41.9 - 77.9	Acceptable
MAPEP-10-MaW22	3rd / 2010	Water	Bq/L	Plutonium-238	1.213	1.93	1.35 - 2.51	Not Acceptable
MAPEP-10-MaW22	3rd / 2010	Water	Bq/L	Plutonium-239/240	0.026	0.009	-----	Acceptable
MAPEP-10-MaW22	3rd / 2010	Water	Bq/L	Strontium-90	-0.01	0.00	-----	Acceptable
MAPEP-10-MaW22	3rd / 2010	Water	Bq/L	Technetium-99	-0.4	0.00	-----	Acceptable
MAPEP-10-MaW22	3rd / 2010	Water	Bq/L	Tritium	107	90.8	63.6 - 118.0	Acceptable
MAPEP-10-MaW22	3rd / 2010	Water	Bq/L	Uranium-234/233	1.163	1.22	0.85 - 1.59	Acceptable
MAPEP-10-MaW22	3rd / 2010	Water	Bq/L	Uranium-238	1.223	1.25	0.88 - 1.63	Acceptable
MAPEP-10-MaW22	3rd / 2010	Water	Bq/L	Zinc-65	45.9	40.7	28.5 - 52.9	Acceptable
E7195-278	4th / 2010	Milk	pCi/L	Cerium-141	1.39E+02	1.30E+02	1.07	Acceptable
E7195-278	4th / 2010	Milk	pCi/L	Cesium-134	9.85E+01	9.30E+01	1.06	Acceptable
E7196-278	4th / 2010	Water	pCi/L	Cesium-134	1.22E+02	1.18E+02	1.03	Acceptable
E7195-278	4th / 2010	Milk	pCi/L	Cesium-137	9.87E+01	9.45E+01	1.04	Acceptable
E7196-278	4th / 2010	Water	pCi/L	Cesium-137	1.24E+02	1.20E+02	1.03	Acceptable
E7195-278	4th / 2010	Milk	pCi/L	Cobalt-58	7.02E+01	7.37E+01	0.95	Acceptable
E7196-278	4th / 2010	Water	pCi/L	Cobalt-58	9.63E+01	9.35E+01	1.03	Acceptable
E7195-278	4th / 2010	Milk	pCi/L	Cobalt-60	1.77E+02	1.71E+02	1.04	Acceptable
E7196-278	4th / 2010	Water	pCi/L	Cobalt-60	2.34E+02	2.17E+02	1.08	Acceptable
E7195-278	4th / 2010	Milk	pCi/L	Cr-51	2.48E+02	2.34E+02	1.06	Acceptable
E7196-278	4th / 2010	Water	pCi/L	Cr-51	3.12E+02	2.97E+02	1.05	Acceptable
E7193-278	4th / 2010	Cartridge	pCi	Iodine-131	5.97E+01	6.02E+01	0.99	Acceptable
E7195-278	4th / 2010	Milk	pCi/L	Iodine-131	1.01E+02	9.41E+02	1.07	Acceptable
E7196-278	4th / 2010	Water	pCi/L	Iodine-131	7.24E+01	6.44E+01	1.12	Acceptable
E7195-278	4th / 2010	Milk	pCi/L	Iron-59	1.02E+02	9.11E+01	1.12	Acceptable
E7196-278	4th / 2010	Water	pCi/L	Iron-59	1.42E+02	1.16E+02	1.23	Acceptable
E7195-278	4th / 2010	Milk	pCi/L	Manganese-54	1.20E+02	1.19E+02	1.01	Acceptable
E7196-278	4th / 2010	Water	pCi/L	Manganese-54	1.70E+02	1.52E+02	1.12	Acceptable
E7194-278	4th / 2010	Milk	pCi/L	Strontium-89	7.62E+01	9.28E+01	0.82	Acceptable
E7194-278	4th / 2010	Milk	pCi/L	Strontium-90	1.30E+01	1.47E+01	0.88	Acceptable
E7195-278	4th / 2010	Milk	pCi/L	Zinc-65	2.37E+02	2.04E+02	1.16	Acceptable
E7196-278	4th / 2010	Water	pCi/L	Zinc-65	2.97E+02	2.59E+02	1.15	Acceptable
NY-337 3762	4th / 2010	Water	pCi/L	Barium-133	50.5	50.9	43.3 - 59.4	Acceptable

Sample Number	Quarter / Year	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
NY-337 3762	4th / 2010	Water	pCi/L	Cesium-134	51.0	42.0	35.8 - 49.2	Not Acceptable
NY-337 3762	4th / 2010	Water	pCi/L	Cesium-137	29.3	27.3	22.4 - 32.1	Acceptable
NY-337 3762	4th / 2010	Water	pCi/L	Cobalt-60	13.6	13.2	9.72 - 16.7	Acceptable
NY-337 3763	4th / 2010	Water	pCi/L	Gross Alpha	32.8	41.6	24.3 - 58.9	Acceptable
NY-337 3763	4th / 2010	Water	pCi/L	Gross Beta	29.3	27.5	18.3 - 36.7	Acceptable
NY-337 3764	4th / 2010	Water	pCi/L	Iodine-131	13.4	18.2	14.7 - 21.7	Not Acceptable
NY-337 3764	4th / 2010	Water	pCi/L	Iodine-131	13.5	18.2	14.7 - 21.7	Not Acceptable
NY-337 3765	4th / 2010	Water	pCi/L	Radium-226	13.2	10.6	8.30 - 12.9	Not Acceptable
NY-337 3765	4th / 2010	Water	pCi/L	Radium-228	6.51	6.07	3.91 - 8.22	Acceptable
NY-337 3761	4th / 2010	Water	pCi/L	Strontium-89	47.8	61.3	51.3 - 71.4	Not Acceptable
NY-337 3761	4th / 2010	Water	pCi/L	Strontium-90	12.0	14.9	11.0 - 18.8	Acceptable
NY-337 3766	4th / 2010	Water	pCi/L	Tritium	14400	15300	13500 - 17000	Acceptable
NY-337 3765	4th / 2010	Water	pCi/L	Uranium (activity)	17.5	16.0	13.2 - 18.7	Acceptable
NY-337 3762	4th / 2010	Water	pCi/L	Zinc-65	134	122	104 - 138	Acceptable
100510N	4th / 2010	Water	pCi/L	Strontium-89	49.9	51.4	40.6 - 58.9	Acceptable
100510N	4th / 2010	Water	pCi/L	Strontium-90	35.4	41.3	30.4 - 47.5	Acceptable
RAD - 83	4th / 2010	Water	pCi/L	Strontium-90	41.5	43	31.7 - 49.3	Acceptable
112210H1	4th / 2010	Water	pCi/L	Barium-133	66.3	65.9	54.9 - 72.5	Acceptable
112210H1	4th / 2010	Water	pCi/L	Cesium-134	71.6	71.6	58.4 - 78.8	Acceptable
112210H1	4th / 2010	Water	pCi/L	Cesium-137	151	146	131 - 163	Acceptable
112210H1	4th / 2010	Water	pCi/L	Cobalt-60	90.2	84.5	76.0 - 95.3	Acceptable
112210H1	4th / 2010	Water	pCi/L	Zinc-65	207	186	167 - 219	Acceptable
112210H2	4th / 2010	Water	pCi/L	Plutonium-238	102.0	108	81.7 - 134	Acceptable
112210H2	4th / 2010	Water	pCi/L	Plutonium-239	77.6	86.3	66.8 - 107	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Actinium-228	1460	1830	1170 - 2580	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Americium-241	845	1120	669 - 1440	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Americium-241	928	1120	669 - 1440	Acceptable
MRAD-13	4th / 2010	Vegetation	pCi/kg	Americium-241	4000	4760	2710 - 6540	Acceptable
MRAD-13	4th / 2010	Air Filter	pCi/Filter	Americium-241	70.1	74.1	43.3 - 102	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Americium-241	164	176	120 - 238	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Americium-241	178	176	120 - 238	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Bismuth-212	< 538	2070	543 - 3100	Not Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Bismuth-214	818	983	603 - 1410	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Cesium-134	2230	2240	1440 - 2700	Acceptable
MRAD-13	4th / 2010	Vegetation	pCi/kg	Cesium-134	1200	1040	595 - 1440	Acceptable
MRAD-13	4th / 2010	Air Filter	pCi/Filter	Cesium-134	405	388	253 - 480	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Cesium-134	495	492	363 - 565	Acceptable

Sample Number	Quarter / Year	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
MRAD-13	4th / 2010	Soil	pCi/kg	Cesium-137	3400	3530	2700 - 4580	Acceptable
MRAD-13	4th / 2010	Vegetation	pCi/kg	Cesium-137	1420	1260	924 - 1750	Acceptable
MRAD-13	4th / 2010	Air Filter	pCi/Filter	Cesium-137	532	514	386 - 675	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Cesium-137	620	625	531 - 749	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Cobalt-60	4580	4780	3480 - 6420	Acceptable
MRAD-13	4th / 2010	Vegetation	pCi/kg	Cobalt-60	1130	1010	683 - 1450	Acceptable
MRAD-13	4th / 2010	Air Filter	pCi/Filter	Cobalt-60	531	479	371 - 598	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Cobalt-60	732	714	622 - 844	Acceptable
MRAD-13	4th / 2010	Air Filter	pCi/Filter	Gross Alpha	74.2	52.3	27.1 - 78.7	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Gross Alpha	145	146	64.8 - 216	Acceptable
MRAD-13	4th / 2010	Air Filter	pCi/Filter	Gross Beta	55.6	52.7	32.5 - 77.0	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Gross Beta	171	143	83.6 - 210	Acceptable
MRAD-13	4th / 2010	Air Filter	pCi/Filter	Iron-55	707	626	275 - 974	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Iron-55	1220	825	480 - 1100	Not Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Lead-212	1550	1640	1060 - 2310	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Lead-214	1030	969	580 - 1440	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Manganese-54	< 38.0	0.00	-----	Acceptable
MRAD-13	4th / 2010	Vegetation	pCi/kg	Manganese-54	< 39.8	0.00	-----	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Manganese-54	< 5	0.00	-----	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Plutonium-238	1170	1280	733 - 1800	Acceptable
MRAD-13	4th / 2010	Vegetation	pCi/kg	Plutonium-238	3740	4740	2560 - 6940	Acceptable
MRAD-13	4th / 2010	Air Filter	pCi/Filter	Plutonium-238	70.8	72.9	50.0 - 95.8	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Plutonium-238	157	162	122 - 201	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Plutonium-239	1070	1180	805 - 1570	Acceptable
MRAD-13	4th / 2010	Vegetation	pCi/kg	Plutonium-239	3590	4470	2770 - 6100	Acceptable
MRAD-13	4th / 2010	Air Filter	pCi/Filter	Plutonium-239	65.6	69.6	50.5 - 90.1	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Plutonium-239	136	148	114 - 183	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Potassium-40	10500	10700	7760 - 14500	Acceptable
MRAD-13	4th / 2010	Vegetation	pCi/kg	Potassium-40	29000	22600	16200 - 32000	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Strontium-90	10953	9270	3350 - 15100	Acceptable
MRAD-13	4th / 2010	Vegetation	pCi/kg	Strontium-90	9800	7810	4360 - 10400	Acceptable
MRAD-13	4th / 2010	Air Filter	pCi/Filter	Strontium-90	80.2	159	70.0 - 247	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Strontium-90	817	921	585 - 1230	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Thorium-234	1010	1340	425 - 2550	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Tritium	20900	21600	14100 - 31900	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Uranium-234	899	1360	862 - 1690	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Uranium-234	1190	1360	862 - 1690	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Uranium-234	1110	1360	862 - 1690	Acceptable

Sample Number	Quarter / Year	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
MRAD-13	4th / 2010	Vegetation	pCi/kg	Uranium-234	3600	4010	2750 - 5320	Acceptable
MRAD-13	4th / 2010	Air Filter	pCi/Filter	Uranium-234	73.5	71.8	45.2 - 106	Acceptable
MRAD-13	4th / 2010	Air Filter	pCi/Filter	Uranium-234	69.9	71.8	45.2 - 106	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Uranium-234	106	109	82.2 - 140	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Uranium-234	106	109	82.2 - 140	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Uranium-234	104	109	82.2 - 140	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Uranium-238	1010	1340	819 - 1700	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Uranium-238	1080	1340	819 - 1700	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Uranium-238	903	1340	819 - 1700	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Uranium-238	1090	1340	819 - 1700	Acceptable
MRAD-13	4th / 2010	Vegetation	pCi/kg	Uranium-238	4000	3980	2800 - 5030	Acceptable
MRAD-13	4th / 2010	Air Filter	pCi/Filter	Uranium-238	75.5	71.2	45.6 - 101	Acceptable
MRAD-13	4th / 2010	Air Filter	pCi/Filter	Uranium-238	66.8	71.2	45.6 - 101	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Uranium-238	107	108	82.5 - 134	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Uranium-238	114	108	82.5 - 134	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Uranium-238	108	108	82.5 - 134	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Uranium-Total	2027.4	2770	1580 - 3740	Acceptable
MRAD-13	4th / 2010	Soil	ug/kg	Uranium-Total	2093	2770	1580 - 3740	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Uranium-Total	2253	2770	1580 - 3740	Acceptable
MRAD-13	4th / 2010	Air Filter	pCi/Filter	Uranium-Total	149	146	74.6 - 232	Acceptable
MRAD-13	4th / 2010	Air Filter	pCi/Filter	Uranium-Total	142	146	74.6 - 232	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Uranium-Total	218	221	159 - 294	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Uranium-Total	226.8	221	159 - 294	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Uranium-Total	217	221	159 - 294	Acceptable
MRAD-13	4th / 2010	Soil	ug/kg	Uranium-Total (mass)	3240	4040	2220 - 5080	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Uranium-Total (mass)	2685	4040	2220 - 5080	Acceptable
MRAD-13	4th / 2010	Soil	ug/kg	Uranium-Total (mass)	3241	4040	2220 - 5080	Acceptable
MRAD-13	4th / 2010	Soil	ug/kg	Uranium-Total (mass)	2820	4040	2220 - 5080	Acceptable
MRAD-13	4th / 2010	Vegetation	ug/kg	Uranium-Total (mass)	12000	11900	8180 - 15400	Acceptable
MRAD-13	4th / 2010	Air Filter	ug/Filter	Uranium-Total (mass)	224.5	213	132 - 306	Acceptable
MRAD-13	4th / 2010	Air Filter	ug/Filter	Uranium-Total (mass)	201	213	132 - 306	Acceptable
MRAD-13	4th / 2010	Air Filter	ug/Filter	Uranium-Total (mass)	192	213	132 - 306	Acceptable
MRAD-13	4th / 2010	Water	ug/L	Uranium-Total (mass)	318	323	253 - 399	Acceptable
MRAD-13	4th / 2010	Water	ug/L	Uranium-Total (mass)	342	323	253 - 399	Acceptable
MRAD-13	4th / 2010	Water	ug/L	Uranium-Total (mass)	321	323	253 - 399	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Zinc-65	2420	2300	1820 - 3080	Acceptable

Sample Number	Quarter / Year	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
MRAD-13	4th / 2010	Vegetation	pCi/kg	Zinc-65	1380	1210	874 - 1650	Acceptable
MRAD-13	4th / 2010	Air Filter	pCi/Filter	Zinc-65	552	465	322 - 644	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Zinc-65	557	489	414 - 610	Acceptable
122810P	4th / 2010	Water	pCi/L	Barium-133	70.9	68.9	57.5 - 75.8	Acceptable
122810P	4th / 2010	Water	pCi/L	Cesium-134	43.0	43.2	34.5 - 47.5	Acceptable
122810P	4th / 2010	Water	pCi/L	Cesium-137	122	123	111 - 138	Acceptable
122810P	4th / 2010	Water	pCi/L	Cobalt-60	58.7	53.4	48.1 - 61.3	Acceptable
122810P	4th / 2010	Water	pCi/L	Zinc-65	116	102	91.8 - 122	Acceptable

TABLE 2
2010 ECKERT & ZIEGLER ANALYTICS PERFORMANCE EVALUATION RESULTS SUMMARY

Sample Number	Quarter / Year	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
E7054-278	2nd / 2010	Milk	pCi/L	Cerium-141	2.61E+02	2.61E+02	1.00	Acceptable
E7055-278	2nd / 2010	Water	pCi/L	Cerium-141	2.78E+02	2.63E+02	1.06	Acceptable
E6924-278	2nd / 2010	Milk	pCi/L	Cerium-141	2.01E+02	2.02E+02	0.99	Acceptable
E6925-278	2nd / 2010	Water	pCi/L	Cerium-141	2.04E+02	2.04E+02	1.00	Acceptable
E6924-278	2nd / 2010	Milk	pCi/L	Cerium-141	2.01E+02	2.02E+02	0.99	Acceptable
E6925-278	2nd / 2010	Water	pCi/L	Cerium-141	2.04E+02	2.04E+02	1.00	Acceptable
E7054-278	2nd / 2010	Milk	pCi/L	Cesium-137	1.61E+02	1.58E+02	1.02	Acceptable
E7055-278	2nd / 2010	Water	pCi/L	Cesium-137	1.71E+02	1.59E+02	1.07	Acceptable
E6924-278	2nd / 2010	Milk	pCi/L	Cesium-134	2.41E+02	2.53E+02	0.95	Acceptable
E6925-278	2nd / 2010	Water	pCi/L	Cesium-134	2.56E+02	2.55E+02	1.00	Acceptable
E6924-278	2nd / 2010	Milk	pCi/L	Cesium-134	2.41E+02	2.53E+02	0.95	Acceptable
E6925-278	2nd / 2010	Water	pCi/L	Cesium-134	2.56E+02	2.55E+02	1.00	Acceptable
E7054-278	2nd / 2010	Milk	pCi/L	Cesium-134	1.76E+02	1.78E+02	0.99	Acceptable
E7055-278	2nd / 2010	Water	pCi/L	Cesium-134	1.85E+02	1.79E+02	1.03	Acceptable
E6924-278	2nd / 2010	Milk	pCi/L	Cesium-137	1.71E+02	1.79E+02	0.96	Acceptable
E6925-278	2nd / 2010	Water	pCi/L	Cesium-137	1.81E+02	1.81E+02	1.00	Acceptable
E6924-278	2nd / 2010	Milk	pCi/L	Cesium-137	1.71E+02	1.79E+02	0.96	Acceptable
E6925-278	2nd / 2010	Water	pCi/L	Cesium-137	1.81E+02	1.81E+02	1.00	Acceptable
E7054-278	2nd / 2010	Milk	pCi/L	Chromium-51	3.81E+02	3.61E+02	1.05	Acceptable
E7055-278	2nd / 2010	Water	pCi/L	Chromium-51	3.86E+02	3.64E+02	1.06	Acceptable
E6924-278	2nd / 2010	Milk	pCi/L	Chromium-51	5.54E+02	5.48E+02	1.01	Acceptable

Sample Number	Quarter / Year	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
E6924-278	2nd / 2010	Milk	pCi/L	Chromium-51	5.54E+02	5.48E+02	1.01	Acceptable
E6925-278	2nd / 2010	Water	pCi/L	Chromium-51	5.78E+02	5.54E+02	1.04	Acceptable
E7054-278	2nd / 2010	Milk	pCi/L	Cobalt-58	1.45E+02	1.43E+02	1.02	Acceptable
E7055-278	2nd / 2010	Water	pCi/L	Cobalt-58	1.51E+02	1.44E+02	1.05	Acceptable
E6924-278	2nd / 2010	Milk	pCi/L	Cobalt-58	2.03E+02	2.11E+02	0.96	Acceptable
E6925-278	2nd / 2010	Water	pCi/L	Cobalt-58	2.19E+02	2.13E+02	1.03	Acceptable
E6924-278	2nd / 2010	Milk	pCi/L	Cobalt-58	2.03E+02	2.11E+02	0.96	Acceptable
E6925-278	2nd / 2010	Water	pCi/L	Cobalt-58	2.19E+02	2.13E+02	1.03	Acceptable
E7054-278	2nd / 2010	Milk	pCi/L	Cobalt-60	1.90E+02	1.83E+02	1.04	Acceptable
E7055-278	2nd / 2010	Water	pCi/L	Cobalt-60	1.94E+02	1.85E+02	1.05	Acceptable
E6924-278	2nd / 2010	Milk	pCi/L	Cobalt-60	2.47E+02	2.56E+02	0.97	Acceptable
E6925-278	2nd / 2010	Water	pCi/L	Cobalt-60	2.67E+02	2.58E+02	1.03	Acceptable
E6924-278	2nd / 2010	Milk	pCi/L	Cobalt-60	2.47E+02	2.56E+02	0.97	Acceptable
E6925-278	2nd / 2010	Water	pCi/L	Cobalt-60	2.67E+02	2.58E+02	1.03	Acceptable
E7052-278	2nd / 2010	Cartridge	pCi	Iodine-131	8.58E+01	8.54E+01	1.00	Acceptable
E7054-278	2nd / 2010	Milk	pCi/L	Iodine-131	6.91E+01	7.40E+01	0.93	Acceptable
E7055-278	2nd / 2010	Water	pCi/L	Iodine-131	8.12E+01	7.22E+01	1.12	Acceptable
E6922-278	2nd / 2010	Cartridge	pCi	Iodine-131	9.02E+01	9.39E+01	0.96	Acceptable
E6924-278	2nd / 2010	Milk	pCi/L	Iodine-131	8.25E+01	8.73E+01	0.95	Acceptable
E6925-278	2nd / 2010	Water	pCi/L	Iodine-131	1.00E+02	9.61E+01	1.04	Acceptable
E6922-278	2nd / 2010	Cartridge	pCi	Iodine-131	9.02E+01	9.39E+01	0.96	Acceptable
E6924-278	2nd / 2010	Milk	pCi/L	Iodine-131	8.25E+01	8.73E+01	0.95	Acceptable
E6925-278	2nd / 2010	Water	pCi/L	Iodine-131	1.00E+02	9.61E+01	1.04	Acceptable
E7054-278	2nd / 2010	Milk	pCi/L	Iron-59	1.60E+02	1.37E+02	1.17	Acceptable

Sample Number	Quarter / Year	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
E6924-278	2nd / 2010	Milk	pCi/L	Iron-59	1.88E+02	1.78E+02	1.06	Acceptable
E6925-278	2nd / 2010	Water	pCi/L	Iron-59	1.94E+02	1.79E+02	1.08	Acceptable
E6924-278	2nd / 2010	Milk	pCi/L	Iron-59	1.88E+02	1.78E+02	1.06	Acceptable
E6925-278	2nd / 2010	Water	pCi/L	Iron-59	1.94E+02	1.79E+02	1.08	Acceptable
E6924-278	2nd / 2010	Milk	pCi/L	Manganese-54	1.83E+02	1.78E+02	1.03	Acceptable
E6925-278	2nd / 2010	Water	pCi/L	Manganese-54	1.90E+02	1.79E+02	1.06	Acceptable
E6924-278	2nd / 2010	Milk	pCi/L	Manganese-54	1.83E+02	1.78E+02	1.03	Acceptable
E6925-278	2nd / 2010	Water	pCi/L	Manganese-54	1.90E+02	1.79E+02	1.06	Acceptable
E7054-278	2nd / 2010	Milk	pCi/L	Manganese-54	2.10E+02	2.07E+02	1.01	Acceptable
E7055-278	2nd / 2010	Water	pCi/L	Manganese-54	2.30E+02	2.09E+02	1.1	Acceptable
E7053-278	2nd / 2010	Milk	pCi/L	Strontium-89	7.91E+01	9.28E+01	0.85	Acceptable
E6923-278	2nd / 2010	Milk	pCi/L	Strontium-89	9.73E+01	1.31E+02	0.75	Acceptable
E6923-278	2nd / 2010	Milk	pCi/L	Strontium-89	9.73E+01	1.31E+02	0.75	Acceptable
E7053-278	2nd / 2010	Milk	pCi/L	Strontium-90	1.12E+01	1.27E+01	0.88	Acceptable
E6923-278	2nd / 2010	Milk	pCi/L	Strontium-90	1.38E+01	1.79E+01	0.77	Acceptable
E6923-278	2nd / 2010	Milk	pCi/L	Strontium-90	1.38E+01	1.79E+01	0.77	Acceptable
E6924-278	2nd / 2010	Milk	pCi/L	Zinc-65	3.68E+02	3.45E+02	1.07	Acceptable
E6925-278	2nd / 2010	Water	pCi/L	Zinc-65	3.72E+02	3.48E+02	1.07	Acceptable
E6924-278	2nd / 2010	Milk	pCi/L	Zinc-65	3.68E+02	3.45E+02	1.07	Acceptable
E6925-278	2nd / 2010	Water	pCi/L	Zinc-65	3.72E+02	3.48E+02	1.07	Acceptable
E7054-278	2nd / 2010	Milk	pCi/L	Zinc-65	2.71E+02	2.54E+02	1.07	Acceptable
E7055-278	2nd / 2010	Water	pCi/L	Zinc-65	2.97E+02	2.56E+02	1.16	Acceptable
E7119-278	3rd / 2010	Milk	pCi/L	Cerium-141	1.27E+02	1.10E+02	1.15	Acceptable

Sample Number	Quarter / Year	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
E7119-278	3 rd / 2010	Milk	pCi/L	Cesium-137	1.68E+02	1.50E+02	1.12	Acceptable
E7119-278	3 rd / 2010	Milk	pCi/L	Chromium-51	3.90E+02	3.39E+02	1.15	Acceptable
E7119-278	3 rd / 2010	Milk	pCi/L	Cobalt-58	1.13E+02	1.01E+02	1.12	Acceptable
E7119-278	3 rd / 2010	Milk	pCi/L	Cobalt-60	2.14E+02	1.97E+02	1.09	Acceptable
E7117-278	3 rd / 2010	Milk	pCi/L	Iodine-131	7.97E+01	8.02E+01	0.99	Acceptable
E7119-278	3 rd / 2010	Milk	pCi/L	Iodine-131	1.06E+02	9.69E+01	1.09	Acceptable
E7119-278	3 rd / 2010	Milk	pCi/L	Iron-59	1.55E+02	1.19E+02	1.30	Not Acceptable
E7119-278	3 rd / 2010	Milk	pCi/L	Manganese-54	1.99E+02	1.69E+02	1.18	Acceptable
E7118-278	3 rd / 2010	Milk	pCi/L	Strontium-89	7.95E+01	9.34E+01	0.85	Acceptable
E7118-278	3 rd / 2010	Milk	pCi/L	Strontium-90	1.57E+01	1.67E+01	0.94	Acceptable
E7119-278	3 rd / 2010	Milk	pCi/L	Zinc-65	2.40E+02	2.06E+02	1.17	Acceptable
E7195-278	4th / 2010	Milk	pCi/L	Cerium-141	1.39E+02	1.30E+02	1.07	Acceptable
E7196-278	4th / 2010	Water	pCi/L	Cerium-141	1.74E+02	1.65E+02	1.05	Acceptable
E7195-278	4th / 2010	Milk	pCi/L	Cesium-134	9.85E+01	9.30E+01	1.06	Acceptable
E7196-278	4th / 2010	Water	pCi/L	Cesium-134	1.22E+02	1.18E+02	1.03	Acceptable
E7195-278	4th / 2010	Milk	pCi/L	Cesium-137	9.87E+01	9.45E+01	1.04	Acceptable
E7196-278	4th / 2010	Water	pCi/L	Cesium-137	1.24E+02	1.20E+02	1.03	Acceptable
E7195-278	4th / 2010	Milk	pCi/L	Chromium-51	2.48E+02	2.34E+02	1.06	Acceptable
E7196-278	4th / 2010	Water	pCi/L	Chromium-51	3.12E+02	2.97E+02	1.05	Acceptable
E7195-278	4th / 2010	Milk	pCi/L	Cobalt-58	7.02E+01	7.37E+01	0.95	Acceptable
E7196-278	4th / 2010	Water	pCi/L	Cobalt-58	9.63E+01	9.35E+01	1.03	Acceptable
E7195-278	4th / 2010	Milk	pCi/L	Cobalt-60	1.77E+02	1.71E+02	1.04	Acceptable
E7196-278	4th / 2010	Water	pCi/L	Cobalt-60	2.34E+02	2.17E+02	1.08	Acceptable
E7193-278	4th / 2010	Cartridge	pCi	Iodine-131	5.97E+01	6.02E+01	0.99	Acceptable
E7195-278	4th / 2010	Milk	pCi/L	Iodine-131	1.01E+02	9.41E+02	1.07	Acceptable
E7196-278	4th / 2010	Water	pCi/L	Iodine-131	7.24E+01	6.44E+01	1.12	Acceptable
E7195-278	4th / 2010	Milk	pCi/L	Iron-59	1.02E+02	9.11E+01	1.12	Acceptable

Sample Number	Quarter / Year	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
E7195-278	4th / 2010	Milk	pCi/L	Manganese-54	1.20E+02	1.19E+02	1.01	Acceptable
E7196-278	4th / 2010	Water	pCi/L	Manganese-54	1.70E+02	1.52E+02	1.12	Acceptable
E7194-278	4th / 2010	Milk	pCi/L	Strontium-89	7.62E+01	9.28E+01	0.82	Acceptable
E7194-278	4th / 2010	Milk	pCi/L	Strontium-90	1.30E+01	1.47E+01	0.88	Acceptable
E7195-278	4th / 2010	Milk	pCi/L	Zinc-65	2.37E+02	2.04E+02	1.16	Acceptable
E7196-278	4th / 2010	Water	pCi/L	Zinc-65	2.97E+02	2.59E+02	1.15	Acceptable

TABLE 3
2010 DEPARTMENT OF ENERGY MIXED ANALYTE PERFORMANCE EVALUATION PROGRAM (MAPEP) RESULTS SUMMARY

Sample Number	Quarter / Year	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
MAPEP-10-MaS22	3 rd / 2010	Soil	Bq/kg	Americium-241	0.07	0.00	-----	Acceptable
MAPEP-10-MaS22	3 rd / 2010	Soil	Bq/kg	Cesium-134	744.67	733	513 - 953	Acceptable
MAPEP-10-MaS22	3 rd / 2010	Soil	Bq/kg	Cesium-137	831.7	779	545 - 1013	Acceptable
MAPEP-10-MaS22	3 rd / 2010	Soil	Bq/kg	Cobalt-57	536.0	522	365 - 679	Acceptable
MAPEP-10-MaS22	3 rd / 2010	Soil	Bq/kg	Cobalt-60	670.3	622	435 - 809	Acceptable
MAPEP-10-MaS22	3 rd / 2010	Soil	Bq/kg	Iron-55	83.6	0.00	-----	Acceptable
MAPEP-10-MaS22	3 rd / 2010	Soil	Bq/kg	Manganese-54	940.7	849	594 - 1104	Acceptable
MAPEP-10-MaS22	3 rd / 2010	Soil	Bq/kg	Nickel-63	489	477	334 - 620	Acceptable
MAPEP-10-MaS22	3 rd / 2010	Soil	Bq/kg	Plutonium-238	17.9	24	16.9 - 31.3	Acceptable
MAPEP-10-MaS22	3 rd / 2010	Soil	Bq/kg	Plutonium-239/240	0.21	0.00	-----	Acceptable
MAPEP-10-MaS22	3 rd / 2010	Soil	Bq/kg	Potassium-40	638.7	559	391 - 727	Acceptable
MAPEP-10-MaS22	3 rd / 2010	Soil	Bq/kg	Strontium-90	261.0	288	202 - 374	Acceptable
MAPEP-10-MaS22	3 rd / 2010	Soil	Bq/kg	Technetium-99	-3.0	0.00	-----	Acceptable
MAPEP-10-MaS22	3 rd / 2010	Soil	Bq/kg	Uranium-234/233	65.27	60	42 -78	Acceptable
MAPEP-10-MaS22	3 rd / 2010	Soil	Bq/kg	Uranium-238	70.23	64	45 - 83	Acceptable
MAPEP-10-MaS22	3 rd / 2010	Soil	Bq/kg	Zinc-65	-2.89	0.0	-----	Acceptable
MAPEP-10-MaW22	3 rd / 2010	Water	Bq/L	Americium-241	1.0323	1.30	0.91 - 1.69	Acceptable
MAPEP-10-MaW22	3 rd / 2010	Water	Bq/L	Cesium-134	0.027	0.00	-----	Acceptable
MAPEP-10-MaW22	3 rd / 2010	Water	Bq/L	Cesium-137	63.1	60.6	42.4 - 78.8	Acceptable
MAPEP-10-MaW22	3 rd / 2010	Water	Bq/L	Cobalt-57	29.2	28.3	19.8 - 36.8	Acceptable
MAPEP-10-MaW22	3 rd / 2010	Water	Bq/L	Cobalt-60	-0.021	0.00	-----	Acceptable
MAPEP-10-MaW22	3 rd / 2010	Water	Bq/L	Hydrogen-3	107	90.8	63.6 - 118.0	Acceptable
MAPEP-10-MaW22	3 rd / 2010	Water	Bq/L	Iron-55	0.24	0.00	-----	Acceptable
MAPEP-10-MaW22	3 rd / 2010	Water	Bq/L	Manganese-54	28.83	26.9	18.8 - 35.0	Acceptable
MAPEP-10-MaW22	3 rd / 2010	Water	Bq/L	Nickel-63	57.7	59.9	41.9 - 77.9	Acceptable
MAPEP-10-MaW22	3 rd / 2010	Water	Bq/L	Plutonium-238	1.213	1.93	1.35 - 2.51	Not Acceptable
MAPEP-10-MaW22	3 rd / 2010	Water	Bq/L	Plutonium-239/240	0.026	0.009	-----	Acceptable
MAPEP-10-MaW22	3 rd / 2010	Water	Bq/L	Strontium-90	-0.01	0.00	-----	Acceptable
MAPEP-10-MaW22	3 rd / 2010	Water	Bq/L	Technetium-99	-0.4	0.00	-----	Acceptable
MAPEP-10-MaW22	3 rd / 2010	Water	Bq/L	Uranium-234/233	1.163	1.22	0.85 - 1.59	Acceptable
MAPEP-10-MaW22	3 rd / 2010	Water	Bq/L	Uranium-238	1.223	1.25	0.88 - 1.63	Acceptable
MAPEP-10-MaW22	3 rd / 2010	Water	Bq/L	Zinc-65	45.9	40.7	28.5 - 52.9	Acceptable
MAPEP-10-GrW22	3 rd / 2010	Water	Bq/L	Gross Alpha	0.559	0.676	>0.0 - 1.352	Acceptable
MAPEP-10-GrW22	3 rd / 2010	Water	Bq/L	Gross Beta	3.110	3.09	1.55 - 4.64	Acceptable

Sample Number	Quarter / Year	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
MAPEP-10-RdF22	3rd / 2010	Filter	ug/sample	Uranium-238	10.2	5.7	4.0 - 7.4	Not Acceptable
MAPEP-10-RdF22	3rd / 2010	Filter	ug/sample	Uranium-Total	10.2	5.7	4.0 - 7.4	Not Acceptable
MAPEP-10-RdF22	3rd / 2010	Filter	Bq/sample	Americium-241	0.2637	0.146	0.102 - 0.190	Not Acceptable
MAPEP-10-RdF22	3rd / 2010	Filter	Bq/sample	Cesium-134	4.323	2.13	1.49 - 2.77	Not Acceptable
MAPEP-10-RdF22	3rd / 2010	Filter	Bq/sample	Cesium-137	3.070	1.53	1.07 - 1.99	Not Acceptable
MAPEP-10-RdF22	3rd / 2010	Filter	Bq/sample	Cobalt-57	0.0002	0.00	-----	Acceptable
MAPEP-10-RdF22	3rd / 2010	Filter	Bq/sample	Cobalt-60	5.187	2.473	1.731 - 3.215	Not Acceptable
MAPEP-10-RdF22	3rd / 2010	Filter	Bq/sample	Manganese-54	6.483	3.02	2.11 - 3.93	Not Acceptable
MAPEP-10-RdF22	3rd / 2010	Filter	Bq/sample	Plutonium-238	0.010	0.0010	-----	Acceptable
MAPEP-10-RdF22	3rd / 2010	Filter	Bq/sample	Plutonium-239/240	0.164	0.0832	0.0582 - 0.1082	Not Acceptable
MAPEP-10-RdF22	3rd / 2010	Filter	Bq/sample	Strontium-90	-0.004	0.00	-----	Acceptable
MAPEP-10-RdF22	3rd / 2010	Filter	Bq/sample	Uranium-234/233	0.137	0.068	0.048 - 0.088	Not Acceptable
MAPEP-10-RdF22	3rd / 2010	Filter	Bq/sample	Uranium-238	0.147	0.071	0.050 - 0.092	Not Acceptable
MAPEP-10-RdF22	3rd / 2010	Filter	Bq/sample	Zinc-65	-0.106	0.00	-----	Acceptable
MAPEP-10-GrF22	3rd / 2010	Filter	Bq/sample	Gross Alpha	0.303	0.427	>0.0 - 0.854	Acceptable
MAPEP-10-GrF22	3rd / 2010	Filter	Bq/sample	Gross Beta	1.433	1.29	0.65 - 1.94	Acceptable
MAPEP-10-RdV22	3rd / 2010	Vegetation	ug/sample	Uranium-235	0.090	0.1250	0.0875 - 0.1625	Acceptable
MAPEP-10-RdV22	3rd / 2010	Vegetation	ug/sample	Uranium-238	12.5	17.9	12.5 - 23.3	Not Acceptable
MAPEP-10-RdV22	3rd / 2010	Vegetation	ug/sample	Uranium-Total	13.9	18.0	12.6 - 23.4	Acceptable
MAPEP-10-RdV22	3rd / 2010	Vegetation	Bq/sample	Americium-241	0.179	0.225	0.158 - 0.293	Acceptable
MAPEP-10-RdV22	3rd / 2010	Vegetation	Bq/sample	Cesium-134	3.098	4.39	3.07 - 5.71	Acceptable
MAPEP-10-RdV22	3rd / 2010	Vegetation	Bq/sample	Cesium-137	2.185	3.06	2.14 - 3.98	Acceptable
MAPEP-10-RdV22	3rd / 2010	Vegetation	Bq/sample	Cobalt-57	0.009	0.00	-----	Acceptable
MAPEP-10-RdV22	3rd / 2010	Vegetation	Bq/sample	Cobalt-60	3.076	3.27	2.29 - 4.25	Acceptable
MAPEP-10-RdV22	3rd / 2010	Vegetation	Bq/sample	Manganese-54	0.004	0.00	-----	Acceptable
MAPEP-10-RdV22	3rd / 2010	Vegetation	Bq/sample	Plutonium-238	0.149	0.160	0.112 - 0.208	Acceptable
MAPEP-10-RdV22	3rd / 2010	Vegetation	Bq/sample	Plutonium-239/240	0.0026	0.0008	-----	Acceptable
MAPEP-10-RdV22	3rd / 2010	Vegetation	Bq/sample	Strontium-90	0.033	0.00	-----	Acceptable
MAPEP-10-RdV22	3rd / 2010	Vegetation	Bq/sample	Uranium-234/233	0.184	0.216	0.151 - 0.281	Acceptable
MAPEP-10-RdV22	3rd / 2010	Vegetation	Bq/sample	Uranium-238	0.184	0.223	0.156 - 0.290	Acceptable
MAPEP-10-RdV22	3rd / 2010	Vegetation	Bq/sample	Zinc-65	6.844	7.10	4.97 - 9.23	Acceptable

TABLE 4
2010 ERA PROGRAM PERFORMANCE EVALUATION RESULTS SUMMARY

Sample Number	Quarter / Year	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
RAD - 80	1st / 2010	Water	pCi/L	Barium-133	73.5	72.9	61.0 - 80.2	Acceptable
RAD - 80	1st / 2010	Water	pCi/L	Cesium-134	69.2	63.4	51.5 - 69.7	Acceptable
RAD - 80	1st / 2010	Water	pCi/L	Cesium-137	118.0	120	108 - 134	Acceptable
RAD - 80	1st / 2010	Water	pCi/L	Cobalt-60	87.7	90	81 - 101	Acceptable
RAD - 80	1st / 2010	Water	pCi/L	Zinc-65	213.0	210	189 - 246	Acceptable
RAD - 80	1st / 2010	Water	pCi/L	Gross Alpha	51.3	42.5	22.0 - 53.9	Acceptable
RAD - 80	1st / 2010	Water	pCi/L	Gross Beta	52.0	54.2	37.0 - 61.1	Acceptable
RAD - 80	1st / 2010	Water	pCi/L	Radium-226	16.9	17.8	13.2 - 20.3	Acceptable
RAD - 80	1st / 2010	Water	pCi/L	Radium-228	20.4	18.2	12.3 - 21.8	Acceptable
RAD - 80	1st / 2010	Water	pCi/L	Uranium (Nat)	49.0	50.2	40.7 - 55.8	Acceptable
RAD - 80	1st / 2010	Water	ug/L	Uranium (Nat) Mass	67.3	73.2	59.4 - 81.4	Acceptable
RAD - 80	1st / 2010	Water	pCi/L	Tritium	19200	18700	16400-20600	Acceptable
RAD - 80	1st / 2010	Water	pCi/L	Strontium-89	37.9	53.3	42.3 - 60.9	Not Acceptable
RAD - 80	1st / 2010	Water	pCi/L	Strontium-90	52.3	42.2	31.1 - 48.4	Not Acceptable
RAD - 80	1st / 2010	Water	pCi/L	Iodine-131	30.5	28.2	23.5 - 33.1	Acceptable
RAD - 82	3rd / 2010	Water	pCi/L	Barium-133	112.0	89.1	75.0 - 98.0	Not Acceptable
RAD - 82	3rd / 2010	Water	pCi/L	Cesium-134	115.0	88.3	72.4 -97.1	Not Acceptable
RAD - 82	3rd / 2010	Water	pCi/L	Cesium-137	271	210	189 - 232	Not Acceptable
RAD - 82	3rd / 2010	Water	pCi/L	Cobalt-60	98.4	72.8	65.5 - 82.5	Not Acceptable
RAD - 82	3rd / 2010	Water	pCi/L	Zinc-65	161	110	99.0 - 131	Not Acceptable
RAD - 82	3rd / 2010	Water	pCi/L	Gross Alpha	65.5	61.1	32.0 - 75.9	Acceptable
RAD - 82	3rd / 2010	Water	pCi/L	Gross Beta	56.7	56.4	38.6 - 63.6	Acceptable
RAD - 82	3rd / 2010	Water	pCi/L	Radium-226	15.9	17.1	12.7 - 19.6	Acceptable
RAD - 82	3rd / 2010	Water	pCi/L	Radium-228	18.9	16.1	10.8 - 19.4	Acceptable
RAD - 82	3rd / 2010	Water	pCi/L	Uranium (Nat)	58.0	49.6	40.2 - 55.1	Not Acceptable
RAD - 82	3rd / 2010	Water	ug/L	Uranium (Nat) Mass	89.1	72.3	58.7 - 80.4	Not Acceptable
RAD - 82	3rd / 2010	Water	pCi/L	Tritium	18500	19800	17300 - 21700	Acceptable
RAD - 82	3rd / 2010	Water	pCi/L	Strontium-89	60.6	55.3	44.1 - 62.9	Acceptable
RAD - 82	3rd / 2010	Water	pCi/L	Strontium-90	47.1	32.8	24.0 - 38.0	Not Acceptable
RAD - 82	3rd / 2010	Water	pCi/L	Iodine-131	32.2	28.4	23.6 - 33.3	Acceptable
090710N	3rd / 2010	Water	pCi/L	Barium-133	86.9	92.9	78.3 - 102	Acceptable
090710N	3rd / 2010	Water	pCi/L	Cesium-134	93.8	79.4	65.0 - 87.3	Not Acceptable
090710N	3rd / 2010	Water	pCi/L	Cesium-137	55.5	54.6	49.1 - 62.9	Acceptable
090710N	3rd / 2010	Water	pCi/L	Cobalt-60	120.0	117	105 - 131	Acceptable
090710N	3rd / 2010	Water	pCi/L	Zinc-65	129	99.5	89.6 - 119	Not Acceptable

Sample Number	Quarter / Year	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
090710N	3rd / 2010	Water	ug/L	Uranium (Nat) Mass	48.6	49.3	39.8 - 55.1	Acceptable
RAD - 83	4th / 2010	Water	pCi/L	Strontium-89	65.3	68.5	55.8 - 76.7	Acceptable
RAD - 83	4th / 2010	Water	pCi/L	Strontium-90	41.5	43	31.7 - 49.3	Acceptable
100510N	4th / 2010	Water	pCi/L	Strontium-89	49.9	51.4	40.6 - 58.9	Acceptable
100510N	4th / 2010	Water	pCi/L	Strontium-90	35.4	41.3	30.4 - 47.5	Acceptable
112210H1	4th / 2010	Water	pCi/L	Barium-133	66.3	65.9	54.9 - 72.5	Acceptable
112210H1	4th / 2010	Water	pCi/L	Cesium-134	71.6	71.6	58.4 - 78.8	Acceptable
112210H1	4th / 2010	Water	pCi/L	Cesium-137	151	146	131 - 163	Acceptable
112210H1	4th / 2010	Water	pCi/L	Cobalt-60	90.2	84.5	76.0 - 95.3	Acceptable
112210H1	4th / 2010	Water	pCi/L	Zinc-65	207	186	167 - 219	Acceptable
112210H2	4th / 2010	Water	pCi/L	Plutonium-238	102.0	108	81.7 - 134	Acceptable
112210H2	4th / 2010	Water	pCi/L	Plutonium-239	77.6	86.3	66.8 - 107	Acceptable
122810P	4th / 2010	Water	pCi/L	Barium-133	70.9	68.9	57.5 - 75.8	Acceptable
122810P	4th / 2010	Water	pCi/L	Cesium-134	43.0	43.2	34.5 - 47.5	Acceptable
122810P	4th / 2010	Water	pCi/L	Cesium-137	122	123	111 - 138	Acceptable
122810P	4th / 2010	Water	pCi/L	Cobalt-60	58.7	53.4	48.1 - 61.3	Acceptable
122810P	4th / 2010	Water	pCi/L	Zinc-65	116	102	91.8 - 122	Acceptable

TABLE 5
2010 ERA PROGRAM (MRAD) PERFORMANCE EVALUATION RESULTS SUMMARY

Sample Number	Quarter / Year	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
MRAD-12	2nd / 2010	Soil	pCi/kg	Actinium-228	1570	1850	1190 - 2600	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Americium-241	1130	1500	896 - 1930	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Bismuth-212	1430	1640	430 - 2450	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Bismuth-214	1080	1410	865 - 2030	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Cesium-134	3040	3110	2000 - 3740	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Cesium-137	4330	4440	3400 - 5770	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Cobalt-60	2120	2140	1560 - 2870	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Lead-212	1540	1520	980 - 2140	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Lead-214	1300	1440	862 - 2140	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Manganese-54	< 22.9	0	-----	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Potassium-40	11100	10900	7900 - 14800	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Thorium-234	1600	1610	511 - 3070	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Uranium-238	1600	1610	984 - 2040	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Zinc-65	2790	2470	1960 - 3310	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Strontium-90	7870	8180	2960 - 13300	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Uranium-234	< 1158	1620	1030 - 2010	Not Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Uranium-238	908	1610	984 - 2040	Not Acceptable
MRAD-12	2nd / 2010	Soil	ug/kg	Uranium-Total (mass)	2920	4820	2650 - 6060	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Strontium-90	7870	8180	2960 - 13300	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Americium-241	1120	1500	896 - 1930	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Plutonium-238	1360	1330	761 - 1870	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Plutonium-239	1220	1260	860 - 1670	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Uranium-234	1230	1620	1030 - 2010	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Uranium-238	1440	1610	984 - 2040	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Uranium-Total	2789	3300	1880 - 4460	Acceptable
MRAD-12	2nd / 2010	Soil	ug/kg	Uranium-Total (mass)	4350	4820	2650 - 6060	Acceptable
MRAD-12	2nd / 2010	Vegetation	pCi/kg	Uranium-238	1604	1710	1200 - 2160	Acceptable
MRAD-12	2nd / 2010	Vegetation	ug/kg	Uranium-Total (mass)	5270	5120	3520 - 6610	Acceptable
MRAD-12	2nd / 2010	Vegetation	pCi/kg	Americium-241	2410	3140	1790 - 4310	Acceptable
MRAD-12	2nd / 2010	Vegetation	pCi/kg	Curium-244	429	528	260 - 822	Acceptable
MRAD-12	2nd / 2010	Vegetation	pCi/kg	Plutonium-238	3090	3040	1640 - 4450	Acceptable
MRAD-12	2nd / 2010	Vegetation	pCi/kg	Plutonium-239	2830	2800	1740 - 3820	Acceptable
MRAD-12	2nd / 2010	Vegetation	pCi/kg	Uranium-234	1680	1720	1180 - 2280	Acceptable
MRAD-12	2nd / 2010	Vegetation	pCi/kg	Uranium-238	1770	1710	1200 - 2160	Acceptable

Sample Number	Quarter / Year	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
MRAD-12	2nd / 2010	Vegetation	pCi/kg	Uranium-Total (mass)	5290	5120	3520 - 6610	Acceptable
MRAD-12	2nd / 2010	Vegetation	pCi/kg	Americium-241	3600	3140	1790 - 4310	Acceptable
MRAD-12	2nd / 2010	Vegetation	pCi/kg	Cesium-134	1750	1670	956 - 2310	Acceptable
MRAD-12	2nd / 2010	Vegetation	pCi/kg	Cesium-137	1550	1470	1080 - 2040	Acceptable
MRAD-12	2nd / 2010	Vegetation	pCi/kg	Cobalt-60	2100	1970	1330 - 2830	Acceptable
MRAD-12	2nd / 2010	Vegetation	pCi/kg	Manganese-54	< 9.6	0.00	-----	Acceptable
MRAD-12	2nd / 2010	Vegetation	pCi/kg	Potassium-40	40800	34900	25100 - 49400	Acceptable
MRAD-12	2nd / 2010	Vegetation	pCi/kg	Uranium-238	< 1240	1710	1200 - 2160	Not Acceptable
MRAD-12	2nd / 2010	Vegetation	pCi/kg	Zinc-65	1630	1360	983 - 1860	Acceptable
MRAD-12	2nd / 2010	Vegetation	pCi/kg	Strontium-90	7880	9120	5100 - 12100	Acceptable
MRAD-12	2nd / 2010	Air Filter	pCi/Filter	Uranium-238	61.5	61.5	39.4 - 87.3	Acceptable
MRAD-12	2nd / 2010	Air Filter	ug/Filter	Uranium-Total (mass)	183	184	114 - 264	Acceptable
MRAD-12	2nd / 2010	Air Filter	pCi/Filter	Americium-241	52.7	60.0	35.1 - 82.3	Acceptable
MRAD-12	2nd / 2010	Air Filter	pCi/Filter	Plutonium-238	63.9	64.1	44.0 - 84.3	Acceptable
MRAD-12	2nd / 2010	Air Filter	pCi/Filter	Plutonium-239	56.6	56.7	41.1 - 73.4	Acceptable
MRAD-12	2nd / 2010	Air Filter	pCi/Filter	Uranium-234	68.8	62.1	39.1 - 92.0	Acceptable
MRAD-12	2nd / 2010	Air Filter	pCi/Filter	Uranium-238	69.5	61.5	39.4 - 87.3	Acceptable
MRAD-12	2nd / 2010	Air Filter	pCi/Filter	Uranium-Total	141	126	64.4 - 200	Acceptable
MRAD-12	2nd / 2010	Air Filter	ug/Filter	Uranium-Total (mass)	208	184	114 - 264	Acceptable
MRAD-12	2nd / 2010	Air Filter	pCi/Filter	Americium-241	76	60	35.1 - 82.3	Acceptable
MRAD-12	2nd / 2010	Air Filter	pCi/Filter	Cesium-134	504	436	284 - 540	Acceptable
MRAD-12	2nd / 2010	Air Filter	pCi/Filter	Cesium-137	785	701	527 - 921	Acceptable
MRAD-12	2nd / 2010	Air Filter	pCi/Filter	Cobalt-60	591	523	405 - 653	Acceptable
MRAD-12	2nd / 2010	Air Filter	pCi/Filter	Manganese-54	< 5.07	0.00	-----	Acceptable
MRAD-12	2nd / 2010	Air Filter	pCi/Filter	Uranium-238	< 61.2	61.5	39.4 - 87.3	Acceptable
MRAD-12	2nd / 2010	Air Filter	pCi/Filter	Zinc-65	462	389	269 - 539	Acceptable
MRAD-12	2nd / 2010	Air Filter	pCi/Filter	Strontium-90	178	187	82.3 - 291	Acceptable
MRAD-12	2nd / 2010	Air Filter	pCi/Filter	Iron-55	375	359	158 - 559	Acceptable
MRAD-12	2nd / 2010	Air Filter	ug/Filter	Uranium-Total (mass)	175	184	114 - 264	Acceptable
MRAD-12	2nd / 2010	Air Filter	pCi/Filter	Gross Alpha	68.2	79.6	41.3 - 120	Acceptable
MRAD-12	2nd / 2010	Air Filter	pCi/Filter	Gross Beta	72	70.4	43.4 - 103	Acceptable
MRAD-12	2nd / 2010	Water	pCi/L	Uranium-238	67.9	60.9	46.5 - 75.5	Acceptable
MRAD-12	2nd / 2010	Water	ug/L	Uranium-Total (mass)	213	182	143 - 225	Acceptable
MRAD-12	2nd / 2010	Water	pCi/L	Americium-241	79.1	95.6	65.5 - 129	Acceptable
MRAD-12	2nd / 2010	Water	pCi/L	Plutonium-238	79.5	109	82.4 - 135	Not Acceptable
MRAD-12	2nd / 2010	Water	pCi/L	Plutonium-239	103	105	81.2 - 130	Acceptable
MRAD-12	2nd / 2010	Water	pCi/L	Uranium-234	62.4	61.4	46.3 - 79.2	Acceptable
MRAD-12	2nd / 2010	Water	pCi/L	Uranium-238	66.1	60.9	46.5 - 75.5	Acceptable
MRAD-12	2nd / 2010	Water	pCi/L	Uranium-Total	131.5	125	90.0 - 166	Acceptable

Sample Number	Quarter / Year	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
MRAD-12	2nd / 2010	Water	pCi/L	Americium-241	123	95.6	65.5 - 129	Acceptable
MRAD-12	2nd / 2010	Water	pCi/L	Cesium-134	454	417	308 - 479	Acceptable
MRAD-12	2nd / 2010	Water	pCi/L	Cesium-137	693	654	556 - 783	Acceptable
MRAD-12	2nd / 2010	Water	pCi/L	Cobalt-60	813	727	633 - 859	Acceptable
MRAD-12	2nd / 2010	Water	pCi/L	Manganese-54	< 7.7	0.00	-----	Acceptable
MRAD-12	2nd / 2010	Water	pCi/L	Uranium-238	< 155	60.9	46.5 - 75.5	Not Acceptable
MRAD-12	2nd / 2010	Water	pCi/L	Zinc-65	632	533	452 - 664	Acceptable
MRAD-12	2nd / 2010	Water	pCi/L	Strontium-90	708	719	456 - 961	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Actinium-228	1460	1830	1170 - 2580	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Americium-241	845	1120	669 - 1440	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Bismuth-212	< 538	2070	543 - 3100	Not Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Bismuth-214	818	983	603 - 1410	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Cesium-134	2230	2240	1440 - 2700	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Cesium-137	3400	3530	2700 - 4580	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Cobalt-60	4580	4780	3480 - 6420	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Lead-212	1550	1640	1060 - 2310	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Lead-214	1030	969	580 - 1440	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Manganese-54	< 38.0	0.00	-----	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Potassium-40	10500	10700	7760 - 14500	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Thorium-234	1010	1340	425 - 2550	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Uranium-238	1010	1340	819 - 1700	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Zinc-65	2420	2300	1820 - 3080	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Americium-241	928	1120	669 - 1440	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Plutonium-238	1170	1280	733 - 1800	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Plutonium-239	1070	1180	805 - 1570	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Uranium-234	899	1360	862 - 1690	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Uranium-238	1080	1340	819 - 1700	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Uranium-Total	2027.4	2770	1580 - 3740	Acceptable
MRAD-13	4th / 2010	Soil	ug/kg	Uranium-Total (mass)	3240	4040	2220 - 5080	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Uranium-234	1190	1360	862 - 1690	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Uranium-238	903	1340	819 - 1700	Acceptable
MRAD-13	4th / 2010	Soil	ug/kg	Uranium-Total	2093	2770	1580 - 3740	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Uranium-Total (mass)	2685	4040	2220 - 5080	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Uranium-234	1110	1360	862 - 1690	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Uranium-238	1090	1340	819 - 1700	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Uranium-Total	2253	2770	1580 - 3740	Acceptable
MRAD-13	4th / 2010	Soil	ug/kg	Uranium-Total (mass)	3241	4040	2220 - 5080	Acceptable
MRAD-13	4th / 2010	Soil	ug/kg	Uranium-Total (mass)	2820	4040	2220 - 5080	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Strontium-90	10953	9270	3350 - 15100	Acceptable

Sample Number	Quarter / Year	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
MRAD-13	4th / 2010	Vegetation	pCi/kg	Plutonium-238	3740	4740	2560 - 6940	Acceptable
MRAD-13	4th / 2010	Vegetation	pCi/kg	Plutonium-239	3590	4470	2770 - 6100	Acceptable
MRAD-13	4th / 2010	Vegetation	pCi/kg	Uranium-234	3600	4010	2750 - 5320	Acceptable
MRAD-13	4th / 2010	Vegetation	pCi/kg	Uranium-238	4000	3980	2800 - 5030	Acceptable
MRAD-13	4th / 2010	Vegetation	pCi/kg	Uranium-Total	7834	8180	5620 - 10600	Acceptable
MRAD-13	4th / 2010	Vegetation	ug/kg	Uranium-Total (mass)	12000	11900	8180 - 15400	Acceptable
MRAD-13	4th / 2010	Vegetation	pCi/kg	Cesium-134	1200	1040	595 - 1440	Acceptable
MRAD-13	4th / 2010	Vegetation	pCi/kg	Cesium-137	1420	1260	924 - 1750	Acceptable
MRAD-13	4th / 2010	Vegetation	pCi/kg	Cobalt-60	1130	1010	683 - 1450	Acceptable
MRAD-13	4th / 2010	Vegetation	pCi/kg	Manganese-54	< 39.8	0.00	-----	Acceptable
MRAD-13	4th / 2010	Vegetation	pCi/kg	Potassium-40	29000	22600	16200 - 32000	Acceptable
MRAD-13	4th / 2010	Vegetation	pCi/kg	Zinc-65	1380	1210	874 - 1650	Acceptable
MRAD-13	4th / 2010	Vegetation	pCi/kg	Strontium-90	9800	7810	4360 - 10400	Acceptable
MRAD-13	4th / 2010	Air Filter	pCi/Filter	Uranium-234	73.5	71.8	45.2 - 106	Acceptable
MRAD-13	4th / 2010	Air Filter	pCi/Filter	Uranium-238	75.5	71.2	45.6 - 101	Acceptable
MRAD-13	4th / 2010	Air Filter	pCi/Filter	Uranium-Total	149	146	74.6 - 232	Acceptable
MRAD-13	4th / 2010	Air Filter	ug/Filter	Uranium-Total (mass)	224.5	213	132 - 306	Acceptable
MRAD-13	4th / 2010	Air Filter	pCi/Filter	Americium-241	70.1	74.1	43.3 - 102	Acceptable
MRAD-13	4th / 2010	Air Filter	pCi/Filter	Plutonium-238	70.8	72.9	50.0 - 95.8	Acceptable
MRAD-13	4th / 2010	Air Filter	pCi/Filter	Plutonium-239	65.6	69.6	50.5 - 90.1	Acceptable
MRAD-13	4th / 2010	Air Filter	pCi/Filter	Uranium-234	69.9	71.8	45.2 - 106	Acceptable
MRAD-13	4th / 2010	Air Filter	pCi/Filter	Uranium-238	66.8	71.2	45.6 - 101	Acceptable
MRAD-13	4th / 2010	Air Filter	pCi/Filter	Uranium-Total	142	146	74.6 - 232	Acceptable
MRAD-13	4th / 2010	Air Filter	ug/Filter	Uranium-Total (mass)	201	213	132 - 306	Acceptable
MRAD-13	4th / 2010	Air Filter	pCi/Filter	Cesium-134	405	388	253 - 480	Acceptable
MRAD-13	4th / 2010	Air Filter	pCi/Filter	Cesium-137	532	514	386 - 675	Acceptable
MRAD-13	4th / 2010	Air Filter	pCi/Filter	Cobalt-60	531	479	371 - 598	Acceptable
MRAD-13	4th / 2010	Air Filter	pCi/Filter	Manganese-54	< 3.58	0.00	-----	Acceptable
MRAD-13	4th / 2010	Air Filter	pCi/Filter	Zinc-65	552	465	322 - 644	Acceptable
MRAD-13	4th / 2010	Air Filter	pCi/Filter	Strontium-90	80.2	159	70.0 - 247	Acceptable
MRAD-13	4th / 2010	Air Filter	pCi/Filter	Iron-55	707	626	275 - 974	Acceptable
MRAD-13	4th / 2010	Air Filter	ug/Filter	Uranium-Total (mass)	192	213	132 - 306	Acceptable
MRAD-13	4th / 2010	Air Filter	pCi/Filter	Gross Alpha	74.2	52.3	27.1 - 78.7	Acceptable
MRAD-13	4th / 2010	Air Filter	pCi/Filter	Gross Beta	55.6	52.7	32.5 - 77.0	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Uranium-234	106	109	82.2 - 140	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Uranium-238	107	108	82.5 - 134	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Uranium-Total	218	221	159 - 294	Acceptable
MRAD-13	4th / 2010	Water	ug/L	Uranium-Total (mass)	318	323	253 - 399	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Americium-241	164	176	120 - 238	Acceptable

Sample Number	Quarter / Year	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
MRAD-13	4th / 2010	Water	pCi/L	Plutonium-239	136	148	114 - 183	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Uranium-234	106	109	82.2 - 140	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Uranium-238	114	108	82.5 - 134	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Uranium-Total	226.8	221	159 - 294	Acceptable
MRAD-13	4th / 2010	Water	ug/L	Uranium-Total (mass)	342	323	253 - 399	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Americium-241	178	176	120 - 238	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Cesium-134	495	492	363 - 565	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Cesium-137	620	625	531 - 749	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Cobalt-60	732	714	622 - 844	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Manganese-54	< 5	0.00	-----	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Zinc-65	557	489	414 - 610	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Strontium-90	817	921	585 - 1230	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Uranium-234	104	109	82.2 - 140	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Uranium-238	108	108	82.5 - 134	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Uranium-Total	217	221	159 - 294	Acceptable
MRAD-13	4th / 2010	Water	ug/L	Uranium-Total (mass)	321	323	253 - 399	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Iron-55	1220	825	480 - 1100	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Gross Alpha	145	146	64.8 - 216	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Gross Beta	171	143	83.6 - 210	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Tritium	20900	21600	14100 - 31900	Acceptable

TABLE 6
2010 NEW YORK STATE DEPARTMENT OF HEALTH ENVIRONMENTAL LABORATORY APPROVAL PROGRAM (NYSDOH ELAP) PROFICIENCY TEST RESULTS SUMMARY

Sample Number	Quarter / Year	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
NY-332 3263	2nd / 2010	Water	pCi/L	Gross Alpha	33.0	26.8	15.0 - 38.6	Acceptable
NY-332 3263	2nd / 2010	Water	pCi/L	Gross Beta	64.6	54.0	41.3 - 66.7	Acceptable
NY-332 3262	2nd / 2010	Water	pCi/L	Cesium-134	14.8	14.0	10.7 - 17.3	Acceptable
NY-332 3262	2nd / 2010	Water	pCi/L	Barium-133	27.8	25.6	20.6 - 30.5	Acceptable
NY-332 3262	2nd / 2010	Water	pCi/L	Zinc-65	146	139	121 - 156	Acceptable
NY-332 3262	2nd / 2010	Water	pCi/L	Cobalt-60	98.3	99.5	90.3 - 109	Acceptable
NY-332 3262	2nd / 2010	Water	pCi/L	Cesium-137	124	123	112 - 134	Acceptable
NY-332 3264	2nd / 2010	Water	pCi/L	Iodine-131	23.4	26.4	21.9 - 31.0	Acceptable
NY-332 3264	2nd / 2010	Water	pCi/L	Iodine-131	26.8	26.4	21.9 - 31.0	Acceptable
NY-332 3261	2nd / 2010	Water	pCi/L	Strontium-89	46.7	41.9	33.4 - 50.4	Acceptable
NY-332 3261	2nd / 2010	Water	pCi/L	Strontium-90	33.9	34.8	27.1 - 42.5	Acceptable
NY-332 3266	2nd / 2010	Water	pCi/L	Tritium	9610	9490	8390 - 10600	Acceptable
NY-332 3265	2nd / 2010	Water	pCi/L	Radium-226	12.1	13.2	10.4 - 16.0	Acceptable
NY-332 3265	2nd / 2010	Water	pCi/L	Radium-228	9.90	8.91	6.08 - 11.7	Acceptable
NY-332 3265	2nd / 2010	Water	pCi/L	Uranium (activity)	48.81	44.7	37.9 - 51.4	Acceptable
NY-337 3763	4th / 2010	Water	pCi/L	Gross Alpha	32.8	41.6	24.3 - 58.9	Acceptable
NY-337 3763	4th / 2010	Water	pCi/L	Gross Beta	29.3	27.5	18.3 - 36.7	Acceptable
NY-337 3762	4th / 2010	Water	pCi/L	Cesium-134	51.0	42.0	35.8 - 49.2	Not Acceptable
NY-337 3762	4th / 2010	Water	pCi/L	Cesium-137	29.3	27.3	22.4 - 32.1	Acceptable
NY-337 3762	4th / 2010	Water	pCi/L	Cobalt-60	13.6	13.2	9.72 - 16.7	Acceptable
NY-337 3762	4th / 2010	Water	pCi/L	Zinc-65	134	122	104 - 138	Acceptable
NY-337 3762	4th / 2010	Water	pCi/L	Barium-133	50.5	50.9	43.3 - 59.4	Acceptable
NY-337 3764	4th / 2010	Water	pCi/L	Iodine-131	13.4	18.2	14.7 - 21.7	Not Acceptable
NY-337 3764	4th / 2010	Water	pCi/L	Iodine-131	13.5	18.2	14.7 - 21.7	Not Acceptable
NY-337 3761	4th / 2010	Water	pCi/L	Strontium-89	47.8	61.3	51.3 - 71.4	Not Acceptable
NY-337 3761	4th / 2010	Water	pCi/L	Strontium-90	12.0	14.9	11.0 - 18.8	Acceptable
NY-337 3766	4th / 2010	Water	pCi/L	Tritium	14400	15300	13500 - 17000	Acceptable
NY-337 3765	4th / 2010	Water	pCi/L	Radium-226	13.2	10.6	8.30 - 12.9	Not Acceptable
NY-337 3765	4th / 2010	Water	pCi/L	Radium-228	6.51	6.07	3.91 - 8.22	Acceptable
NY-337 3765	4th / 2010	Water	pCi/L	Uranium (activity)	17.5	16.0	13.2 - 18.7	Acceptable

FIGURE 1
COBALT-60 PERFORMANCE EVALUATION RESULTS AND % BIAS

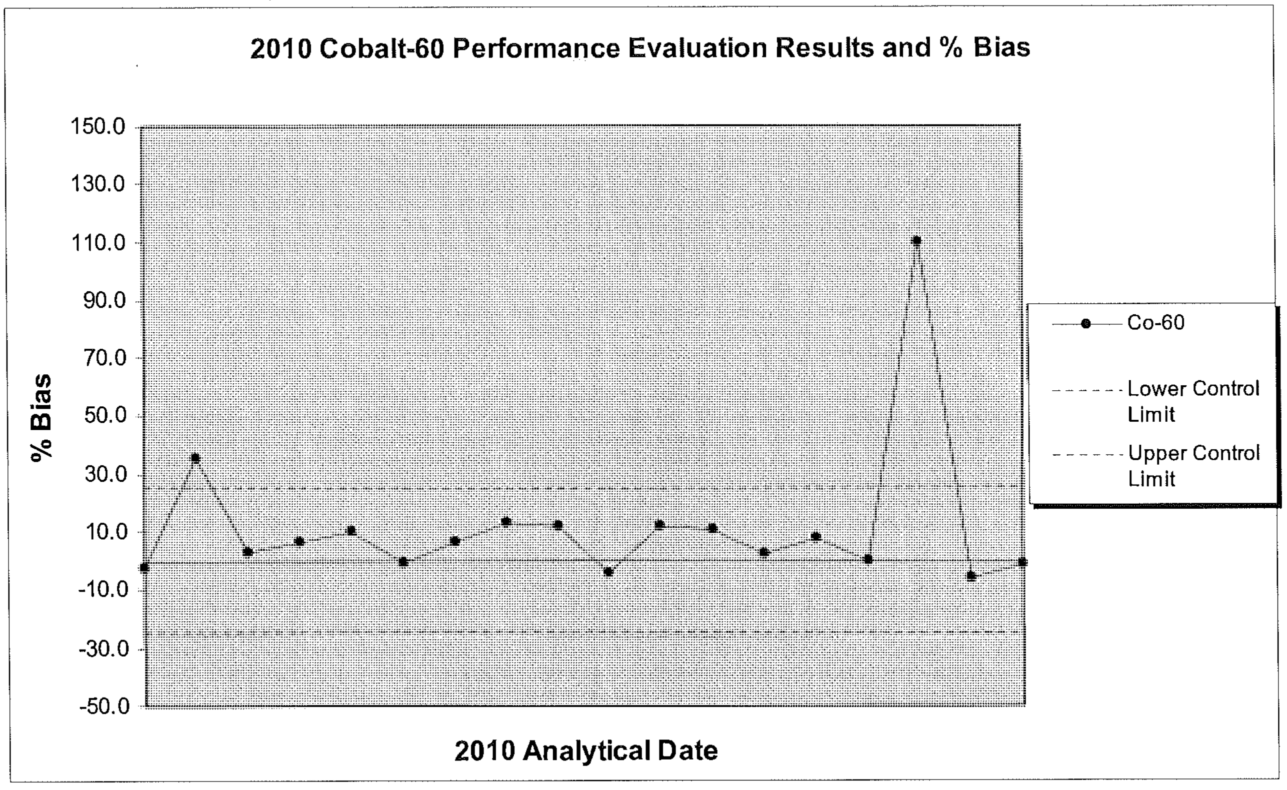


FIGURE 2
CESIUM-137 PERFORMANCE EVALUATION RESULTS AND % BIAS

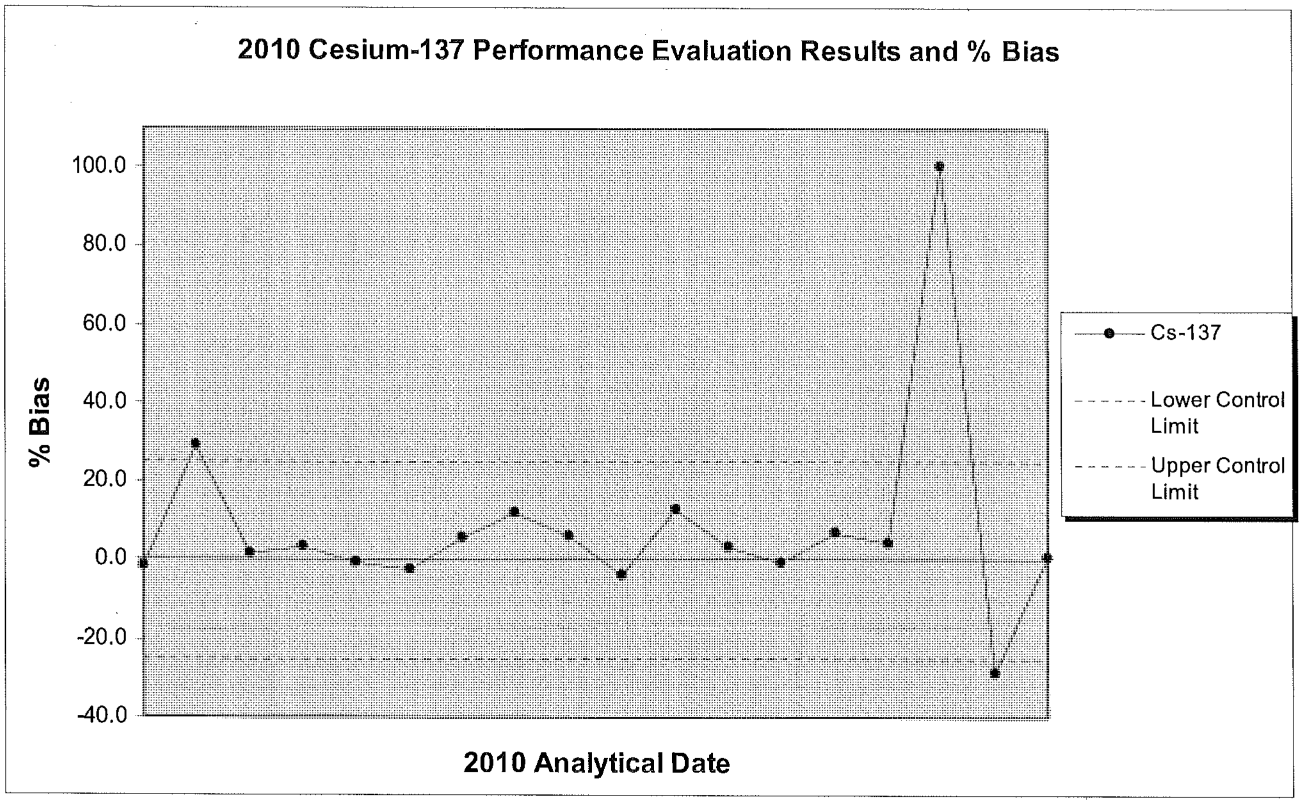


FIGURE 3
TRITIUM PERFORMANCE EVALUATION RESULTS AND % BIAS

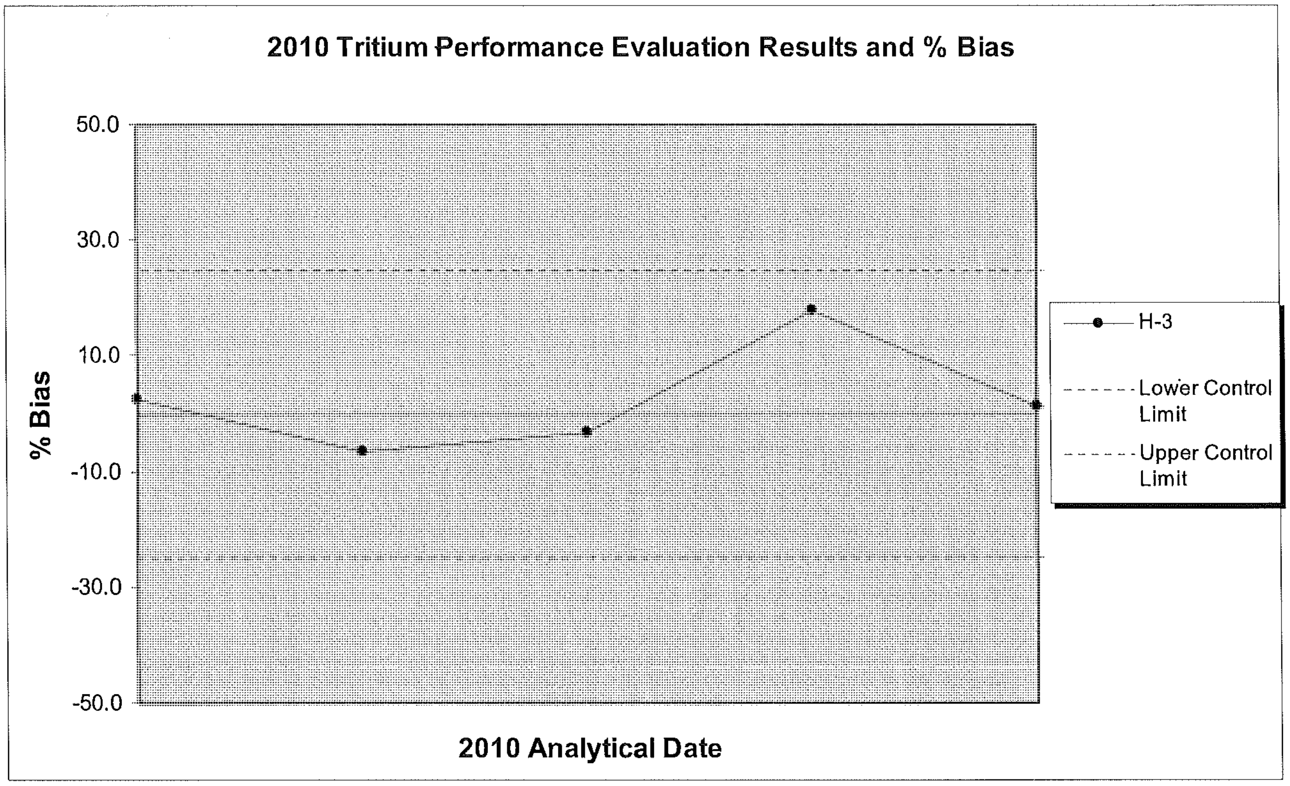


FIGURE 4
STRONTIUM-90 PERFORMANCE EVALUATION RESULTS AND % BIAS

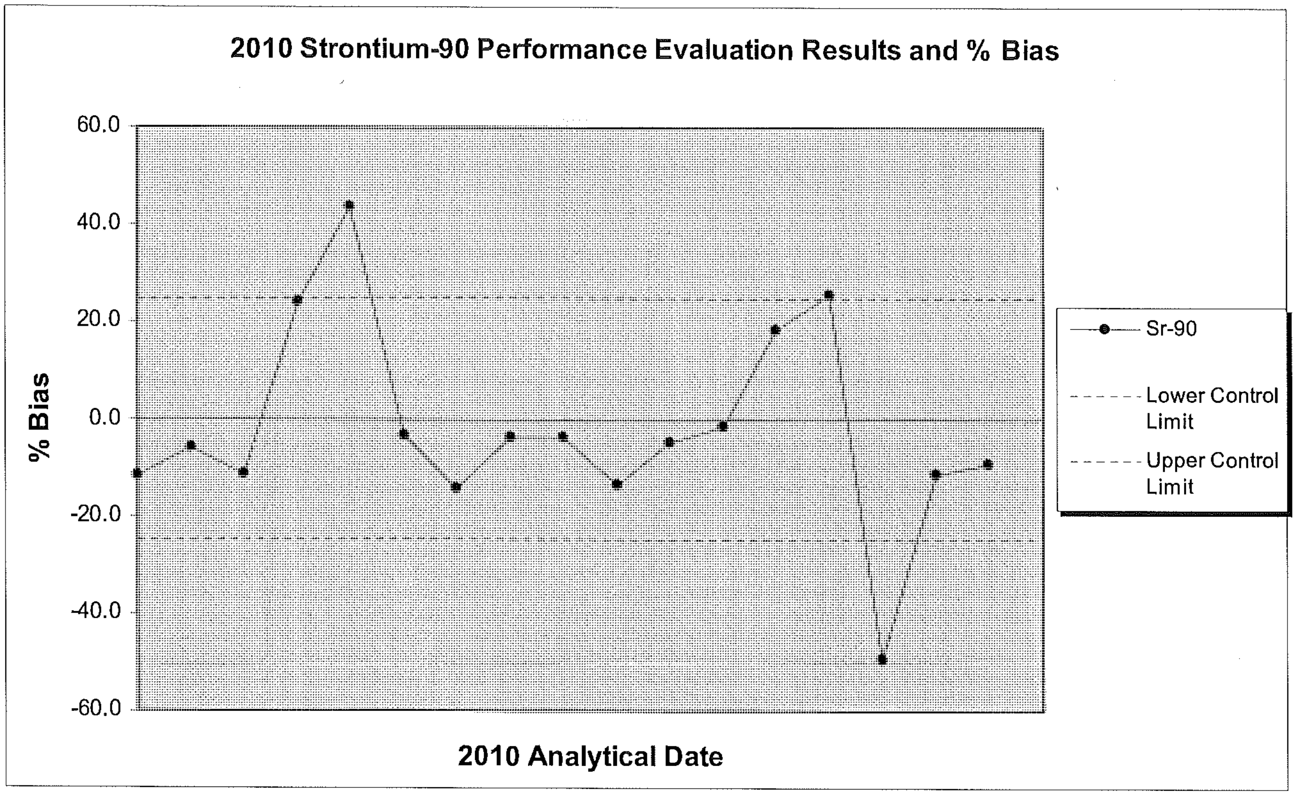


FIGURE 5
GROSS ALPHA PERFORMANCE EVALUATION RESULTS AND % BIAS

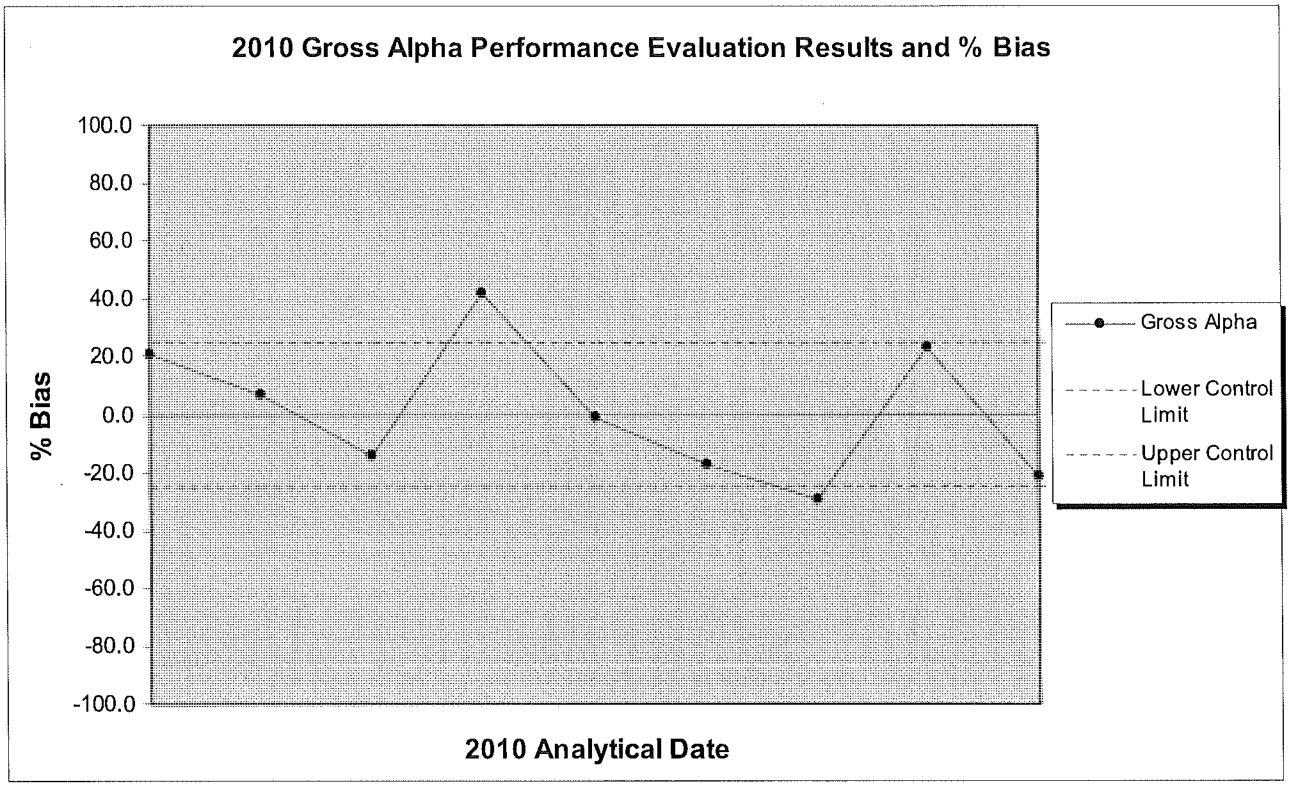


FIGURE 6
GROSS BETA PERFORMANCE EVALUATION RESULTS AND % BIAS

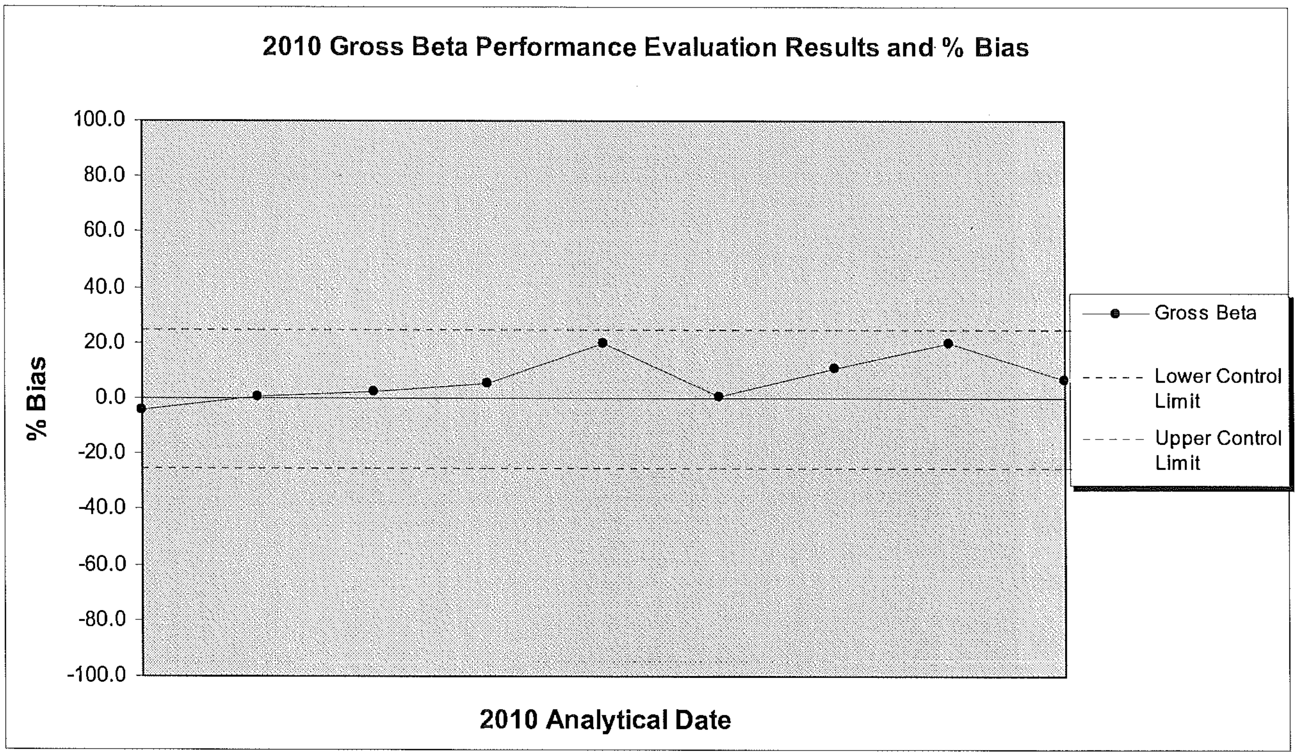


FIGURE 7
IODINE-131 PERFORMANCE EVALUATION RESULTS AND % BIAS

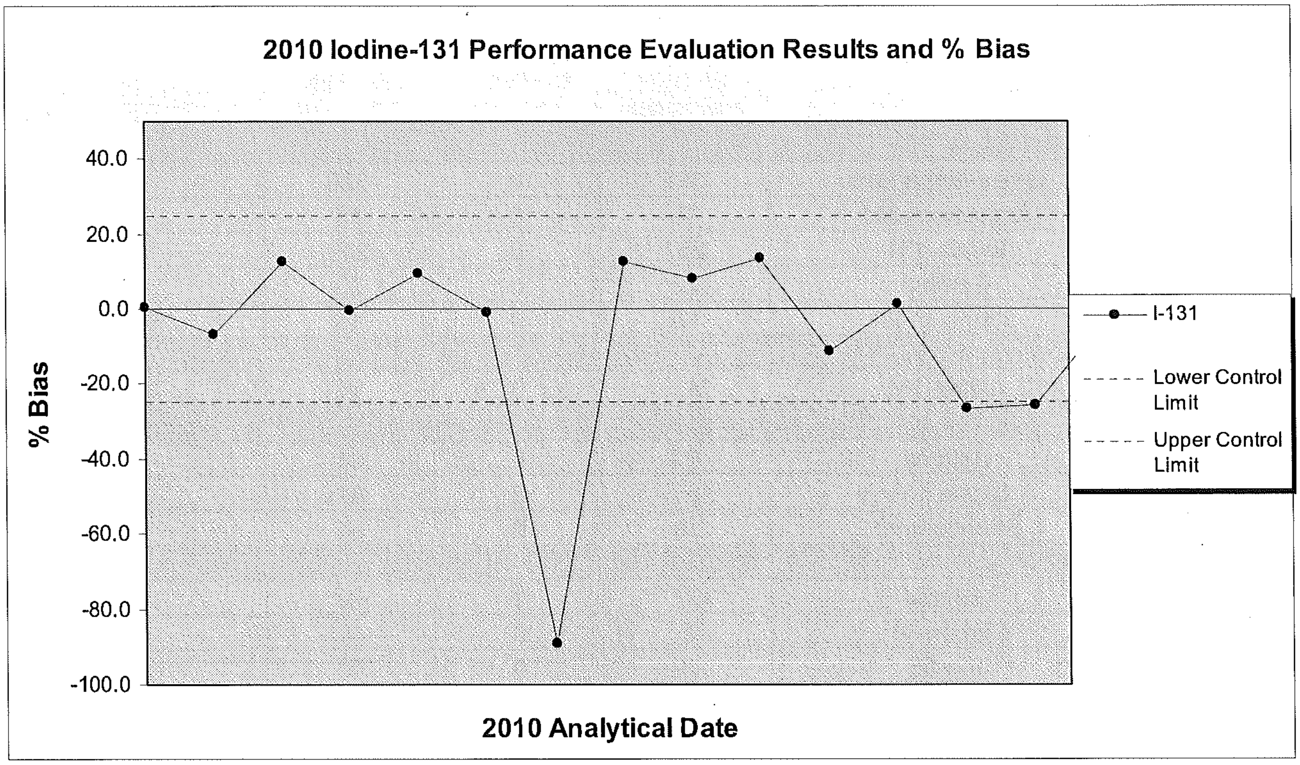


TABLE 7
GEL 2010 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM (REMP)
INTRA-LABORATORY DATA SUMMARY: BIAS AND PRECISION BY MATRIX

2010	Bias Criteria (+/- 25%) Laboratory Control Sample (LCS)		Precision Criteria (% RPD[1]) Duplicate (DUP or LCSD)	
	WITHIN CRITERIA	OUTSIDE CRITERIA	WITHIN CRITERIA	OUTSIDE CRITERIA
Air Particulate				
Gross Alpha/Beta	325	0	326	0
Americium-241	16	0	16	0
Iodine-131	247	0	249	0
Gamma	23	0	23	0
Strontium-90	15	0	15	0
Air Cartridge				
Iodine-131	11	0	11	0
Milk				
Gamma	63	0	64	0
Iodine-131	61	0	61	0
Strontium-90	33	0	34	0
Solid				
Gamma	27	0	29	0
Carbon-14	2	0	2	0
Iron-55	3	0	3	0
Nickel-63	3	0	3	0
Strontium-90	11	0	11	0
Tissue				
Gamma	38	0	36	0
Strontium-90	3	0	3	0
Vegetation				
Gamma (Including Iodine)	59	0	61	0
Strontium-90	3	0	3	0
Water				
Carbon-14	2	0	2	0
Gross Alpha/Beta	98	0	99	0
Gamma	177	0	170	0
Iodine-131	46	0	47	0
Iron-55	33	0	33	0
Nickel-63	35	0	35	0
Strontium-90	80	0	81	0
Tritium	176	0	174	0
Total:	1590	0	1591	0

Note 1: The RPD must be 20 percent or less, if both samples are greater than 5 times the MDC. If both results are less than 5 times MDC, then the RPD must be equal to or less than 100%. If one result is above the MDC and the other is below the MDC, then the RPD can be calculated using the MDC for the result of the one below the MDC. The RPD must be 100% or less. In the situation where both results are above the MDC but one result is greater than 5 times the MDC and the other is less than 5 times the MDC, the RPD must be less than or equal to 20%. If both results are below MDC, then the limits on % RPD are not applicable.

TABLE 8
GEL 2010 RADIOLOGICAL INTRA-LABORATORY DATA SUMMARY: BIAS AND PRECISION BY MATRIX

ANALYSIS	INSTRUMENT	LCS FILTER	DUP FILTER	LCS SWIPE	DUP SWIPE	LCS SOLID	DUP SOLID	LCS OIL	DUP OIL
Americium-241	Alpha Spec	2	2	47	38	485	477	13	12
Americium-243	Alpha Spec	2	2	1	0	53	50	2	2
Carbon-14	Liquid Scintillation	4	3	38	32	98	99	9	9
Gamma (long list of isotopes)	Gamma Spec	283	272	47	42	770	792	27	27
Gross Alpha/Beta	Gas Flow	111	135	20	18	20	18	42	42
Iodine-129	Gamma Spec	99	88	28	28	28	28	9	9
Iodine-131	Gamma Spec	6	4	0	0	0	0	0	0
Iron-55	Liquid Scintillation	89	8	30	24	46	48	8	8
Isotopic Plutonium	Alpha Spec and Liquid Scintillation	212	186	82	66	687	683	12	11
Isotopic Strontium	Gas Flow	165	136	41	34	365	367	1	1
Isotopic Thorium	Alpha Spec	82	59	0	0	371	372	0	0
Isotopic Uranium	Alpha Spec and ICP-MS	137	112	13	10	713	697	24	24
Lead-210	Gas Flow	44	26	0	0	33	34	0	0
Nickel-59	Gamma Spec	65	60	28	22	64	64	7	7
Nickel-63	Liquid Scintillation	95	89	39	30	75	74	8	8
Neptunium-237	Alpha Spec	67	59	32	23	107	107	10	9
Polonium-210	Alpha Spec	18	6	0	0	5	6	0	0
Promethium-137	Liquid Scintillation	8	5	0	0	12	11	0	0
Radium-226	Lucas Cell	44	31	0	0	167	175	0	0
Radium-228	Gas Flow	29	25	0	0	129	124	0	0
Technetium-99	Liquid Scintillation	87	75	32	24	142	145	12	12
Tritium	Liquid Scintillation	90	76	42	24	358	359	19	19
ANALYSIS	INSTRUMENT	LCS SLUDGE	DUP SLUDGE	LCS MISC SOLID	DUP MISC SOLID	LCS MISC LIQUID	DUP MISC LIQUID	LCS LIQUID	DUP LIQUID
Americium-241	Alpha Spec	4	4	231	220	22	19	383	335
Americium-243	Alpha Spec	1	1	21	21	5	4	12	11
Carbon-14	Liquid Scintillation	5	5	110	108	34	33	218	175
Gamma (long list of isotopes)	Gamma Spec	17	18	260	256	72	68	747	820
Gross Alpha/Beta	Gas Flow	27	27	112	109	87	80	1169	1180
Iodine-129	Gamma Spec	1	1	88	88	21	21	162	94
Iodine-131	Gamma Spec	0	0	0	0	0	0	11	14
Iron-55	Liquid Scintillation	3	3	74	72	42	43	123	103
Isotopic Plutonium	Alpha Spec or Liquid Scintillation	7	7	143	137	77	70	108	95
Isotopic Strontium	Gas Flow	13	13	61	60	80	76	16	12
Isotopic Thorium	Alpha Spec	13	13	145	132	8	8	289	359
Isotopic Uranium	Alpha Spec	24	24	102	87	39	36	640	557
Lead-210	Gas Flow	0	0	0	0	0	0	114	108
Nickel-59	Gamma Spec	0	0	68	66	9	9	76	63
Nickel-63	Liquid Scintillation	5	5	74	72	50	51	172	143
Neptunium-237	Alpha Spec	3	3	0	0	16	15	193	168
Polonium-210	Alpha Spec	0	0	1	1	0	0	3	3
Promethium-137	Liquid Scintillation	1	1	5	5	3	3	6	2
Radium-226	Lucas Cell	2	2	25	25	5	5	502	505
Radium-228	Gas Flow	0	0	27	28	1	1	432	426
Technetium-99	Liquid Scintillation	15	15	179	175	39	40	41	41
Tritium	Liquid Scintillation	9	9	125	122	8	8	898	824

TABLE 9
GEL 2010 CORRECTIVE ACTION SUMMARY

GEL CORRECTIVE ACTION IDENTIFICATION	STATUS: OPEN/ CLOSED	ISSUE	Cause and Disposition
CARR110209-542	OPEN	Eckert & Ziegler Analytics Fe-59 Failure in Milk	Monitoring in progress
CARR100617-496	CLOSED	MAPEP Series 22 PT Failures	The ICP-MS analysis of Uranium-235 and Uranium-238 failure was attributed to the use of the less vigorous digestion method (EPA Method 3050B). After contacting RESL, GEL discovered that they had used a more rigorous total dissolution process. The failure for Plutonium-238 was attributed to a data reviewer's error and lack of attention to detail to the region of interest that was not included in the data result. Approximately 400 additional counts should have been included. All analysts have been retrained on attention to detail of the ROI. For the remaining isotopic failures, the error was attributed to analyst error and failure to follow the instructions from the PT provider.
CARR100617-497	CLOSED	MRAD 12 PT Failures	The ICP-MS analysis of Uranium-235 and Uranium-238 failure was attributed to the use of the less vigorous digestion method (EPA Method 3050B). After contacting RESL, GEL discovered that they had used a more rigorous total dissolution process. For Uranium-238 in vegetation, air and water, the failure was attributed to method sensitivity by gamma spectroscopy. Future PT analysis will be performed using a more sensitive method.
CARR101210-527	CLOSED	MRAD 13 PT Failures	The failure for Bismuth-212 was attributed to a reporting error. The actual result (1660 pCi/kg) was within the acceptance range. The failure of Iron-55 was attributed to matrix interference. An additional recount with a smaller aliquot and fresh reagent rinses removed the interferant.

CARR100318-487	CLOSED	RAD-80 PT Failures	The Gross Alpha failure was attributed to a concentrated iron carrier. The Strontium-89 and Strontium-90 failures were attributed to the associated weights of the carriers utilized during the preparation and analysis.
CARR100907-512	CLOSED	RAD-82 PT Failures	Failures of the Gamma Emitters and the Naturals (Uranium) were attributed to analyst error and failure to follow the instructions from the PT provider. The failure of Strontium-89 and Strontium-90 was attributed to analyst error while diluting the sample. All analysts were retrained to the proper processes.
CARR101203-525	CLOSED	NY-337 PT Failures	For Cesium-134, Iodine-131, Strontium-89 and Strontium-90, and Radium-226, the failures could not be determined. The laboratory continues to monitor results of internal quality control samples.