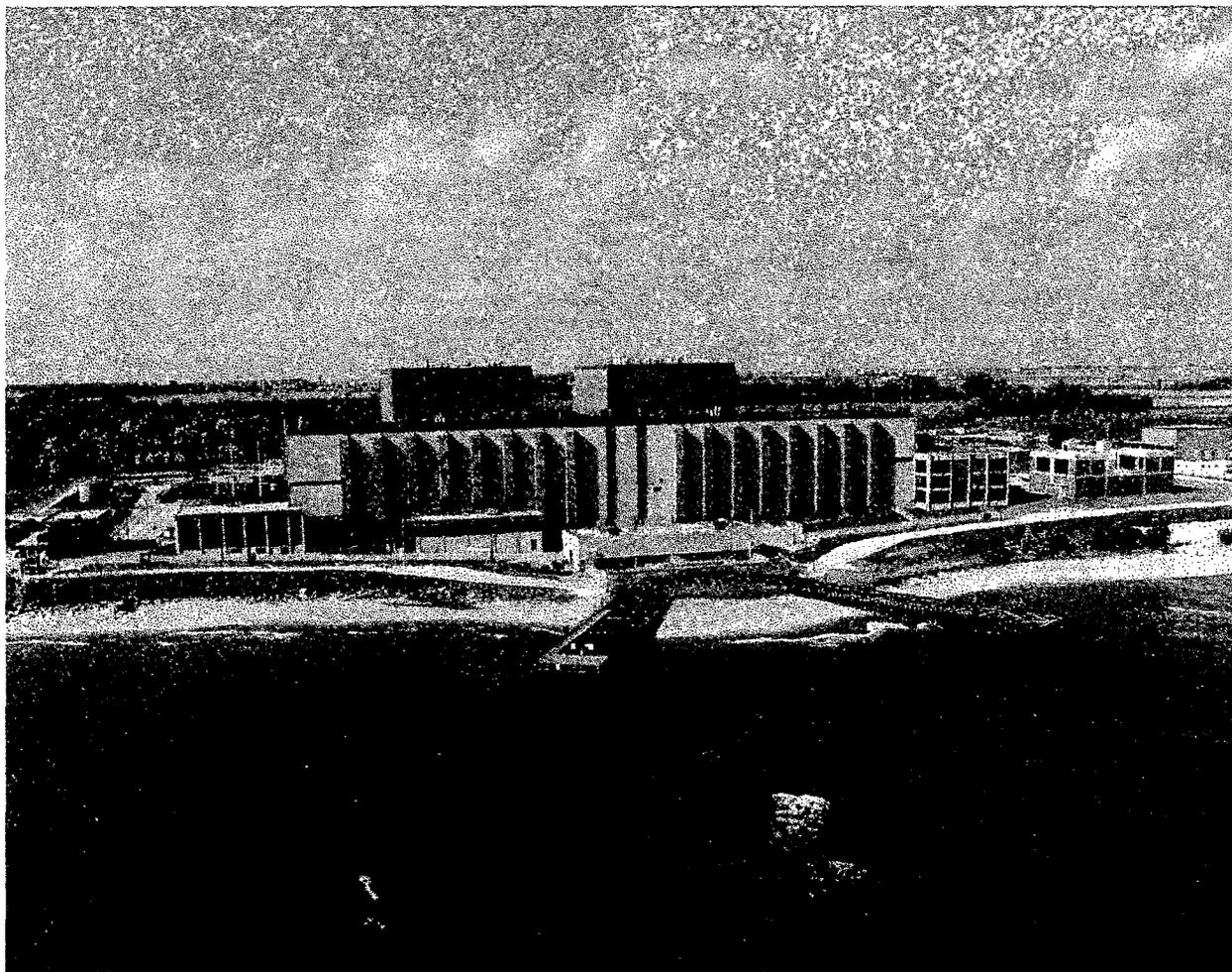


ANNUAL MONITORING REPORT 2001

NUCLEAR MANAGEMENT COMPANY, LLC POINT BEACH NUCLEAR PLANT



**January 1, 2001, through December 31, 2001
April 2002**

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EXECUTIVE SUMMARY

This Annual Monitoring Report for the period of January 1, 2001, through December 31, 2001, is submitted in accordance with Point Beach Nuclear Plant (PBNP) Units 1 and 2 Technical Specification 5.6.2 and filed under Dockets 50-266 and 50-301 for Facility Operating Licenses DPR-24 and DPR-27, respectively. The report presents the results of effluent and environmental monitoring programs, solid waste shipments, non-radioactive chemical releases, and circulating water system operation.

During 2001, the following amounts of radioactive material were released via the liquid and atmospheric pathways:

	Liquid	Atmospheric
Tritium (Ci)	588	79.6
Particulate (Ci)	0.14	0.002
Noble Gas (Ci)	-	3.0

(-) Noble gases in the liquids are added to the atmospheric release totals.

For the purpose of regulatory compliance with the effluent design objectives of Appendix I to 10 CFR 50, doses from effluents are calculated for the hypothetical maximally exposed individual (MEI) for each age group and compared to the Appendix I objectives. Doses less than or equal to the Appendix I values are considered to be evidence that PBNP releases are as low as reasonably achievable (ALARA). The maximum annual calculated doses are shown below and compared to the corresponding design objectives of 10 CFR 50, Appendix I.

LIQUID RELEASES

<u>Dose Category</u>	<u>Calculated Dose</u>	<u>Appendix I Dose</u>
Whole body dose	0.006 millirem	6 millirem
Organ dose	0.009 millirem	20 millirem

ATMOSPHERIC RELEASES

<u>Dose Category</u>	<u>Calculated Dose</u>	<u>Appendix I Dose</u>
Organ dose	0.03 millirem	30 millirem
Noble gas dose to the skin	0.0006 millirem	30 millirem
Noble gas dose to the whole body	0.0004 millirem	10 millirem
Noble gas beta air dose	0.0002 millirad	40 millirad
Noble gas gamma ray air dose	0.0004 millirad	20 millirad

The results show that during 2001, the doses from PBNP effluents were a small percentage (~ 0.1% at the most) of the Appendix I design objectives and therefore operation of PBNP continues to be ALARA.

In addition to collecting and analyzing environmental samples, a survey of land use with respect to the location of dairy cattle was made pursuant to Section 2.5 of the Environmental Manual. As in previous years, no dairy cattle were found to be grazing at the site boundary. Therefore, the assumption that cattle graze at the site boundary used in the evaluation of doses from PBNP effluents remains conservative.

The 2001 Radiological Environmental Monitoring Program (REMP) collected 464 samples for radiological analyses and 144 sets of thermoluminescent dosimeters (TLDs) to measure ambient radiation in the vicinity of PBNP and the Independent Spent Fuel Storage Installation (ISFSI). Air monitoring from six different sites showed only background radioactivity from naturally occurring radionuclides. Terrestrial monitoring consisting of soil, vegetation, and milk found no influence from PBNP. Similarly, samples from the aquatic environment, lake and well water, fish, and algae, revealed no buildup of PBNP radionuclides released in liquid effluents. The data analysis shows no plant effect on its environs.

As of December 2001, the ISFSI contained a total of 13 ventilated storage casks (VSC-24). During 2001, one cask was transferred to the ISFSI. The subset of the PBNP REMP samples used to evaluate the environmental impact of the PBNP ISFSI showed no environmental impact from its operation.

The environmental monitoring conducted during 2001 confirms that the effluent control program at PBNP ensures that its operations minimally impacts the environs.

Part A

EFFLUENT MONITORING

1.0 INTRODUCTION

The PBNP effluent monitoring program is designed to comply with federal regulations for ensuring the safe operation of PBNP with respect to releases of radioactive material to the environment and its subsequent impact on the public. 10 CFR 50.34a states that operations should be conducted to keep the levels of radioactive material in effluents to unrestricted areas as low as reasonably achievable (ALARA). In 10 CFR 50, Appendix I, the Nuclear Regulatory Commission (NRC) provides the numerical values for what it considers to be the appropriate ALARA design objectives to which the licensee's calculated effluent doses may be compared. These doses are a small fraction of the dose limits specified by 10 CFR 20.1301 and lower than the Environmental Protection Agency (EPA) limits specified in 40 CFR 190.

10 CFR 20.1302 directs PBNP to make the appropriate surveys of radioactive materials in effluents released to unrestricted and controlled areas. Liquid wastes are monitored by inline radiation monitors as well as by isotopic analyses of samples of the waste stream prior to discharge from PBNP. Airborne releases of radioactive wastes are monitored in a similar manner. Furthermore, for both liquid and atmospheric releases, the appropriate portions of the radwaste treatment systems are used as required to keep releases ALARA. Prior to release, results of isotopic analyses are used to adjust the release rate of discrete volumes of liquid and atmospheric wastes (from liquid waste holdup tanks and from gas decay tanks) such that the concentrations of radioactive material in the air and water beyond PBNP are below the PBNP Technical Specification concentration limits for liquid effluents and release rate limits for gaseous effluents.

Solid wastes are shipped offsite for disposal at NRC licensed facilities. The amount of radioactivity in the solid waste is determined prior to shipment in order to determine the proper shipping configuration as regulated by the Department of Transportation and the NRC.

Also operated at PBNP under the General License granted pursuant to 10 CFR 72.210 is an Independent Spent Fuel Storage Installation (ISFSI). The release of radioactive materials from the operation of the ISFSI must also comply with the limits of part 20 and the part 50 Appendix I design objectives. Per 10 CFR 72.44(d)(3), the results of radiological effluent monitoring are to be reported annually.* The dose criteria for effluents and direct radiation specified by 10 CFR 72.104 states that during normal operations and anticipated occurrences, the annual dose equivalent to any real individual

* Holders of a Part 72 license are allowed to submit the report required by 72.44(d)(3) concurrent with the effluent report required by 10 CFR 50.36a (a)(2). (Reference: 64 FR 33178)

beyond the controlled area must not exceed 25 mrem to the whole body, 75 mrem to the thyroid, and 25 mrem to any other organ. The dose from naturally occurring radon and its decay products are exempt. Because the loading of the storage casks occurs within the primary auxiliary building of PBNP, the doses from effluents due to the loading process will be assessed and quantified as part of the PBNP Radiological Effluent Control Program.

2.0 RADIOACTIVE LIQUID RELEASES

The release path to the environment contributing to radioactive liquid releases is circulating water discharge. A liquid waste treatment system in conjunction with administrative controls are used to minimize the impact on the environment and maintain doses to the public ALARA from the liquid releases.

2.1 Doses From Liquid Effluent

Doses from liquid effluent are calculated using the methodology of the Offsite Dose Calculation Manual (ODCM). These calculated doses use factors such as the amount of radioactive material released, the total volume of liquid, the total volume of dilution water, and usage factors (e.g., water and fish consumption, shoreline and swimming factors). These calculations produce a conservative estimation of the dose. For compliance with 10 CFR 50, Appendix I design objectives, the annual dose is calculated to the hypothetical maximally exposed individual (MEI). The MEI is assumed to reside at the site boundary in the highest χ/Q sector and is maximized with respect to occupancy, food consumption, and other uses of this area. As such, the MEI represents an individual with reasonable deviations from the average for the general population in the vicinity of PBNP. A comparison of the calculated doses to the 10 CFR 50, Appendix I design objectives is presented in Table 2-1. The conservatively calculated dose to the MEI is a very small fraction of the Appendix I design objective.

Table 2-1

Comparison of 2001 Liquid Effluent Calculated Doses to
10 CFR 50 Appendix I Design Objectives

Annual Limit [mrem]	Highest Total Calculated Dose [mrem]	% of Design Objective
6 (whole body)	0.006	0.1 %
20 (any organ)	0.009	0.05%

2.2 2001 Circulating Water Radionuclide Release Summary

Radioactive liquid releases via the circulating water discharge are summarized by individual source and total curies released on a monthly basis and presented in Table 2-2.

2.3 2001 Isotopic Composition of Circulating Water Discharges

The isotopic composition of circulating water discharges during the current reporting period is presented in Table 2-3.

2.4 Subsoil Drain System Releases Tritium Summary

The quarterly and annual results of monitoring the subsoil drains are presented in Table 2-4. No tritium was observed in any of the drains during 2001.

Table 2-2
Summary of Circulating Water Discharge
 January 1, 2001, through December 31, 2001

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Total Activity Released (Ci)												
Gamma Isotopic**	8.21E-03	2.13E-02	6.31E-03	1.31E-02	4.96E-02	3.09E-03	2.31E-02	3.60E-03	4.93E-03	1.17E-03	3.15E-03	3.09E-04
Gross Alpha	0.00E+00	0.00E+00	0.00E+00	9.59E-07	2.58E-06	7.55E-08	9.57E-07	0.00E+00	0.00E+00	1.48E-07	0.00E+00	2.55E-07
Tritium	4.21E+00	7.92E+01	2.69E+01	4.38E+01	3.80E+01	2.68E+00	1.00E+02	4.94E+01	1.40E+02	3.78E+00	7.83E+01	2.13E+01
Sr-89 / Sr-90	2.11E-05	1.44E-05	2.20E-09	1.47E-05	5.85E-07	2.00E-07	1.46E-05	2.94E-07	9.34E-07	2.09E-07	0.00E+00	2.08E-05
Total volume Released (gal)												
Processed Waste	2.73E+04	1.13E+05	3.55E+04	8.73E+04	9.09E+04	1.43E+04	9.37E+04	7.05E+04	1.18E+05	1.23E+04	4.07E+04	1.61E+04
Retention Pond	3.42E+06	3.47E+06	3.54E+06	2.99E+06	3.80E+06	3.81E+06	4.01E+06	3.94E+06	3.25E+06	5.56E+06	6.53E+06	5.50E+06
U1 SG Blowdown	1.74E+06	1.13E+06	2.57E+06	7.64E+05	2.72E+06	2.92E+06	2.62E+06	2.36E+06	2.52E+06	2.68E+06	2.56E+06	2.71E+06
U2 SG Blowdown	3.47E+06	2.26E+06	2.63E+06	2.11E+06	2.63E+06	2.50E+06	2.81E+06	2.59E+06	2.57E+06	2.68E+06	2.59E+06	2.68E+06
Total (gal)	8.66E+06	6.97E+06	8.78E+06	5.95E+06	9.25E+06	9.23E+06	9.54E+06	8.96E+06	8.46E+06	1.09E+07	1.17E+07	1.09E+07
Total (cc)	3.28E+10	2.64E+10	3.32E+10	2.25E+10	3.50E+10	3.50E+10	3.61E+10	3.39E+10	3.20E+10	4.14E+10	4.43E+10	4.13E+10
Dilution Water (cc)*												
	6.62E+13	5.98E+13	6.62E+13	5.66E+13	7.59E+13	1.06E+14	1.04E+14	1.14E+14	9.33E+13	1.01E+14	1.04E+14	8.94E+13
Average Diluted Discharge Concentration (uCi/cc)												
Gamma Isotopic	1.24E-10	3.56E-10	9.53E-11	2.31E-10	6.54E-10	2.90E-11	2.23E-10	3.16E-11	5.29E-11	1.16E-11	3.02E-11	3.46E-12
Gross Alpha	0.00E+00	0.00E+00	0.00E+00	1.69E-14	3.40E-14	7.09E-16	9.23E-15	0.00E+00	0.00E+00	1.47E-15	0.00E+00	2.85E-15
Tritium	6.35E-08	1.32E-06	4.06E-07	7.75E-07	5.01E-07	2.52E-08	9.67E-07	4.34E-07	1.50E-06	3.74E-08	7.50E-07	2.38E-07
Sr-89 / Sr-90	3.18E-13	2.41E-13	3.32E-17	2.60E-13	7.70E-15	1.87E-15	1.41E-13	2.58E-15	1.00E-14	2.06E-15	0.00E+00	2.33E-13
Maximum Discharge Concentration (uCi/cc) (based on one unit of dilution)												
Tritium	4.15E-06	2.00E-05	1.46E-05	2.69E-05	1.73E-05	2.44E-06	1.90E-05	1.44E-05	3.49E-06	3.49E-06	1.81E-05	1.27E-05
Gross Gamma	1.71E-08	3.35E-08	6.11E-09	3.69E-08	2.06E-08	1.75E-09	1.49E-08	2.97E-09	1.60E-09	1.60E-09	8.72E-10	2.06E-10

*Dual Unit Circulating Water Flow

**Includes Fe-55

Table 2-3
Isotopic Composition of Circulating Water Discharges (Curies)
 January 1, 2001, through December 31, 2001

Nuclide	Jan	Feb	Mar	Apr	May	Jun	Semi-Annual Total	Jul	Aug	Sep	Oct	Nov	Dec	Total
H-3	4.21E+00	7.92E+01	2.69E+01	4.38E+01	3.80E+01	2.68E+00	1.95E+02	1.00E+02	4.94E+01	1.40E+02	3.78E+00	7.83E+01	2.13E+01	5.88E+02
F-18	0.00E+00	4.36E-05	0.00E+00	1.22E-05	5.14E-04	1.20E-04	6.90E-04	1.44E-04	1.25E-04	3.15E-05	0.00E+00	0.00E+00	0.00E+00	9.90E-04
Cr-51	8.99E-05	0.00E+00	3.30E-04	8.89E-06	8.15E-03	0.00E+00	8.58E-03	4.65E-04	0.00E+00	3.57E-05	0.00E+00	0.00E+00	0.00E+00	9.08E-03
Mn-54	1.73E-05	1.50E-05	2.09E-05	3.04E-05	2.05E-04	1.83E-05	3.07E-04	8.54E-04	1.02E-04	1.68E-04	6.11E-05	1.67E-05	9.67E-06	1.52E-03
Fe-55	2.06E-04	1.02E-03	5.24E-04	1.48E-03	3.34E-03	2.88E-04	6.85E-03	1.31E-03	0.00E+00	3.34E-04	8.60E-05	1.36E-04	7.96E-05	8.80E-03
Fe-59	0.00E+00	0.00E+00	0.00E+00	6.19E-06	1.84E-04	0.00E+00	1.90E-04	2.86E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.18E-04
Co-57	5.20E-04	9.83E-05	2.77E-05	8.03E-05	1.18E-04	1.70E-05	8.62E-04	9.93E-05	2.80E-05	1.31E-05	4.02E-06	2.06E-05	0.00E+00	1.03E-03
Co-58	7.04E-03	1.90E-02	5.05E-03	1.08E-02	3.20E-02	2.11E-03	7.61E-02	7.55E-03	1.66E-03	1.84E-03	1.85E-04	2.66E-03	1.27E-04	9.01E-02
Co-60	1.98E-04	4.07E-04	1.55E-04	4.06E-04	1.44E-03	3.11E-04	2.92E-03	6.95E-03	1.04E-03	1.70E-03	6.05E-04	2.23E-04	8.10E-05	1.35E-02
Zn-65	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.07E-05	0.00E+00	1.07E-05	1.39E-04	1.44E-05	0.00E+00	1.23E-05	0.00E+00	0.00E+00	1.76E-04
Sr-89	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00						
Sr-90	2.11E-05	1.44E-05	2.20E-09	1.47E-05	5.85E-07	2.00E-07	5.10E-05	1.46E-05	2.94E-07	9.34E-07	2.09E-07	0.00E+00	2.08E-05	8.79E-05
Sr-92	0.00E+00	0.00E+00	0.00E+00	1.36E-06	0.00E+00	0.00E+00	0.00E+00	1.36E-06						
Nb-95	9.52E-05	3.28E-05	0.00E+00	6.07E-05	1.25E-03	9.69E-05	1.54E-03	1.88E-03	1.96E-04	1.75E-04	6.31E-05	2.65E-06	0.00E+00	3.86E-03
Nb-97	1.67E-06	0.00E+00	2.89E-07	0.00E+00	1.48E-05	0.00E+00	1.68E-05	0.00E+00	0.00E+00	2.49E-06	0.00E+00	0.00E+00	0.00E+00	1.92E-05
Zr-95	0.00E+00	3.21E-05	0.00E+00	7.08E-06	7.04E-04	4.12E-05	7.84E-04	7.54E-04	6.61E-05	6.50E-05	2.31E-05	0.00E+00	0.00E+00	1.69E-03
Zr-97	0.00E+00	0.00E+00	1.65E-06	0.00E+00	0.00E+00	0.00E+00	1.65E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.65E-06
Mo-99	0.00E+00	0.00E+00	0.00E+00	1.96E-06	0.00E+00	0.00E+00	0.00E+00	1.96E-06						
Tc-99m	4.44E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.44E-06	0.00E+00	0.00E+00	1.90E-06	0.00E+00	0.00E+00	0.00E+00	6.34E-06
Ag-110m	2.18E-05	4.40E-04	1.97E-04	8.69E-05	1.07E-03	7.61E-05	1.89E-03	2.06E-03	2.31E-04	3.09E-04	8.13E-05	7.77E-05	9.32E-06	4.66E-03
Sn-113	1.80E-05	0.00E+00	0.00E+00	0.00E+00	2.00E-04	1.11E-05	2.29E-04	1.04E-04	1.86E-06	1.59E-05	0.00E+00	0.00E+00	0.00E+00	3.51E-04
Sn-117m	0.00E+00	2.97E-05	0.00E+00	5.82E-06	2.52E-04	0.00E+00	2.87E-04	8.19E-05	8.67E-05	1.27E-04	0.00E+00	0.00E+00	0.00E+00	5.83E-04
Sb-122	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00						
Sb-124	0.00E+00	8.04E-05	4.78E-06	5.27E-06	9.97E-05	0.00E+00	1.90E-04	1.81E-04	2.91E-05	2.58E-05	0.00E+00	4.85E-06	0.00E+00	4.31E-04
Sb-125	0.00E+00	3.32E-05	0.00E+00	3.24E-05	3.34E-05	0.00E+00	9.90E-05	4.56E-04	1.47E-05	5.96E-05	3.49E-05	0.00E+00	0.00E+00	6.65E-04
Te-132	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00						
Cs-136	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.68E-06	0.00E+00	9.68E-06	0.00E+00	6.37E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.60E-05
Cs-137	2.08E-06	0.00E+00	0.00E+00	0.00E+00	1.98E-05	3.09E-06	2.49E-05	4.62E-05	0.00E+00	1.52E-05	3.87E-06	0.00E+00	2.84E-06	9.31E-05
Ba-139	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00						
Ba-140	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.31E-06	0.00E+00	0.00E+00	9.31E-06						
La-140	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00						
Ce-141	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.18E-06	0.00E+00	2.18E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.18E-06
alpha	0.00E+00	0.00E+00	0.00E+00	9.59E-07	2.58E-06	7.55E-08	3.61E-06	9.57E-07	0.00E+00	0.00E+00	1.48E-07	0.00E+00	2.55E-07	4.97E-06

Note: The Dissolved noble gases detected in liquid effluents (e.g., Xe-133 and Xe-135) are included in airborne release totals.

Table 2-4
Subsoil System Drains - Tritium Summary
 January 1, 2001, through December 31, 2001

	S-1	S-3	S-7	S-8	S-9	S-10
First Quarter						
H-3 (Ci)	0.00E+00	0.00E+00	0.00E+00	(-)	0.00E+00	0.00E+00
Flow (gal)	1.83E+06	4.22E+05	4.78E+05	0.00E+00	4.46E+04	1.14E+06
Second Quarter						
H-3 (Ci)	0.00E+00	0.00E+00	0.00E+00	(-)	0.00E+00	0.00E+00
Flow (gal)	8.21E+05	2.18E+06	7.24E+05	0.00E+00	1.08E+04	1.95E+06
Third Quarter						
H-3 (Ci)	0.00E+00	0.00E+00	0.00E+00	(-)	(-)	0.00E+00
Flow (gal)	1.31E+05	2.96E+05	8.58E+05	0.00E+00	0.00E+00	6.90E+05
Fourth Quarter						
H-3 (Ci)	0.00E+00	0.00E+00	0.00E+00	(-)	(-)	0.00E+00
Flow (gal)	3.01E+05	3.34E+05	9.94E+05	0.00E+00	0.00E+00	6.83E+05
Annual Totals						
H-3 (Ci)	0.00E+00	0.00E+00	0.00E+00	(-)	0.00E+00	0.00E+00
Flow (gal)	3.08E+06	3.23E+06	3.05E+06	0.00E+00	5.54E+04	4.47E+06

(-) Indicates no sample to analyze because of zero flow.

2.5 Land Application of Sewage Sludge

The Wisconsin Department of Natural Resources has approved the disposal of PBNP sewage by land application on various Wisconsin Electric Power Company properties surrounding PBNP. This sewage sludge, which may contain trace amounts of radionuclides, are to be applied in accordance with methodologies approved by the NRC on January 13, 1988, pursuant to 10 CFR 20.302(a). The approved methodology requires analyses prior to every disposal. Based upon an investigation of the source of the radionuclides, a combination of engineering modifications and administrative controls have eliminated plant generated radiological inputs to the sewage. This was verified by sludge analyses using the environmental lower level of detection (LLD) criteria, which found no byproduct radionuclides in the sludge after the controls and modifications were completed. Sludge is routinely monitored and no radionuclides attributable to PBNP have been found. There was no disposal of sewage by land application during 2001. All disposals were done at Green Bay Metropolitan Sewage Treatment Plant.

3.0 RADIOACTIVE AIRBORNE RELEASES

The release paths to the environment contributing to radioactive airborne release totals during this reporting period were the Auxiliary Building Vent Stack, Drumming Area Vent Stack, Unit 1 Containment Purge Stack, and Unit 2 Containment Purge Stack. A gaseous radioactive effluent treatment system in conjunction with administrative controls are used to minimize the impact on the environment from the airborne releases and maintain doses to the public ALARA.

3.1 Doses From Airborne Effluent

Doses from airborne effluent are calculated for the maximum exposed individual (MEI) following the methodology contained in the PBNP ODCM. These calculated doses use factors such as the amount of radioactive material released, the concentration at and beyond the site boundary, the average site weather conditions, the locations of the exposure pathways (e.g., cow milk, vegetable gardens and residences), and usage factors (e.g., breathing rates, food consumption). In addition to the MEI doses, the energy deposited by beta particles and gamma rays in air is calculated and compared to the corresponding Appendix I design objectives. A comparison of the annual Appendix I design objectives for atmospheric effluents to the highest organ dose and the noble gas doses calculated using ODCM methodology is listed in Table 3-1. The doses demonstrate that releases from PBNP to the atmosphere continue to be ALARA.

3.2 Radioactive Airborne Release Summary

Radioactivity released in airborne effluents for 2001 are summarized in Table 3-2.

3.3 Isotopic Airborne Releases

The monthly isotopic airborne releases for 2001, from which the airborne doses were calculated, are presented in Table 3-3.

Table 3-1
Comparison of 2001 Airborne Effluent Calculated Doses to 10 CFR 50 Appendix I Design Objectives

Category	Annual Appendix I Design Objective	January-December Calculated Dose	Percent of Appendix I Design Objective
Particulate	30 mrem/organ	0.03 mrem	0.1 %
Noble Gas	40 mrad (beta air)	0.0002 mrad	0.0005 %
Noble Gas	20 mrad (gamma air)	0.0004 mrad	0.002 %
Noble Gas	30 mrem (skin)	0.0006 mrem	0.002 %
Noble Gas	10 mrem (whole body)	0.0004 mrem	0.004 %

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Table 3-2
Radioactive Airborne Effluent Release Summary
 January 1, 2001, through December 31, 2001

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Total Noble Gases¹ (Ci)	1.77E-01	1.41E-01	1.49E-01	2.85E-01	9.36E-02	1.14E-01	9.64E-02	7.91E-02	5.32E-02	1.25E-01	9.16E-02	6.42E-02	1.47E+00
Total Radioiodines (Ci)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.67E-10	0.00E+00	0.00E+00	1.15E-09	0.00E+00	0.00E+00	1.41E-09
Total Particulates²(Ci)	5.66E-11	9.49E-04	0.00E+00	0.00E+00	0.00E+00	5.08E-14	2.85E-09	6.22E-04	1.03E-06	7.58E-08	2.50E-09	0.00E+00	1.57E-03
Alpha (Ci)	0.00E+00												
Strontium (Ci)	0.00E+00												
Gamma Emitters (Ci)	5.66E-11	9.49E-04	0.00E+00	0.00E+00	0.00E+00	5.08E-14	2.85E-09	6.22E-04	1.03E-06	7.58E-08	2.50E-09	0.00E+00	1.57E-03
Total Tritium (Ci)	7.82E+00	5.34E+00	6.09E+00	1.04E+01	5.11E+00	3.77E+00	4.03E+00	4.16E+00	1.14E+01	1.41E+01	3.91E+00	3.55E+00	7.96E+01
Max Hourly Release (Ci/sec)	1.83E-07	1.08E-07	9.56E-08	9.80E-08	7.80E-07	2.20E-07	1.38E-07	2.14E-07	9.32E-08	1.45E-07	9.83E-08	9.59E-08	(-)

¹ Includes noble gas contribution from liquid releases.

² Total is the sum of alpha, strontium, and others.

TABLE 3-3
Isotopic Composition of Airborne Releases
 January 1, 2001 through December 31, 2001

	Jan	Feb	Mar	Apr	May	Jun	Semi-	Jul	Aug	Sep	Oct	Nov	Dec	Total
Nuclide	(Ci)	(Ci)	(Ci)	(Ci)	(Ci)	(Ci)	Annual	(Ci)						
H-3	7.82E+00	5.34E+00	6.09E+00	1.04E+01	5.11E+00	3.77E+00	3.85E+01	4.03E+00	4.16E+00	1.14E+01	1.41E+01	3.91E+00	3.55E+00	7.96E+01
Ar-41	7.69E-02	9.08E-02	1.16E-01	4.61E-02	6.85E-02	8.56E-02	4.84E-01	7.68E-02	7.38E-02	4.94E-02	1.05E-01	8.01E-02	5.92E-02	9.28E-01
Kr-85m	0.00E+00	3.03E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.03E-04	0.00E+00	0.00E+00	0.00E+00	1.39E-04	0.00E+00	0.00E+00	4.42E-04
Kr-88	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.74E-03	2.75E-04	2.02E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.02E-03
Xe-131m	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.15E-04	0.00E+00	1.15E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.15E-04
Xe-133	9.56E-02	4.20E-02	2.74E-02	2.37E-01	6.67E-03	2.76E-02	4.36E-01	1.92E-02	5.22E-03	2.67E-03	1.77E-02	9.39E-03	4.20E-03	4.95E-01
Xe-138	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.77E-03	0.00E+00	8.77E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.77E-03
Total	1.77E-01	1.41E-01	1.49E-01	2.85E-01	9.36E-02	1.14E-01	9.59E-01	9.64E-02	7.91E-02	5.32E-02	1.25E-01	9.16E-02	6.42E-02	1.47E+00
F-18	0.00E+00	9.38E-04	0.00E+00	0.00E+00	0.00E+00	5.08E-14	9.38E-04	2.85E-09	6.22E-04	0.00E+00	7.58E-08	1.74E-09	0.00E+00	1.56E-03
Mn-54	0.00E+00	6.33E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.33E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.33E-06
Co-58	0.00E+00	4.99E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.99E-06	0.00E+00	0.00E+00	1.03E-06	0.00E+00	4.07E-10	0.00E+00	6.02E-06
Cs-137	5.66E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.66E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.66E-11

4.0 RADIOACTIVE SOLID WASTE SHIPMENTS

4.1 Types, Volumes, and Activity of Shipped Solid Waste

The following types, volumes, and activity of solid waste were shipped from PBNP for offsite disposal or burial during 2001. No irradiated fuel was shipped offsite. The volume, activity, and type of waste are listed in Table 4-1.

Table 4-1
Quantities and Types of Waste Shipped from PBNP

<u>Type of Waste</u>	<u>Quantity</u>	<u>Activity</u>
A. Spent resins, filter sludge, evaporator bottoms, etc.	22 m ³ 778 ft ³	120 Ci
B. Dry compressible waste, contaminated equipment, etc	285 m ³ 10047.5 ft ³	1 Ci
C. Irradiated components, control rods, etc.	N/A m ³ N/A ft ³	N/A Ci
D. Other (describe)	N/A m ³ N/A ft ³	N/A Ci

4.2 Major Nuclide Composition (by Type of Waste)

The major radionuclide content of the solid waste was determined by gamma isotopic analysis and by scaling to certain indicator radionuclides based on the measured isotopic content of representative waste stream samples. The estimated isotopic content is presented in Table 4-2.

Table 4-2
Estimated Solid Waste Major Radionuclide Composition

TYPE A		TYPE B		TYPE C	
Nuclide	Percent Abundance	Nuclide	Percent Abundance	Nuclide	Percent Abundance
H-3	0.95%	H-3	0.68%	N/A	N/A
C-14	0.01%	C-14	0.99%	N/A	N/A
Cr-51	0.09%	Fe-55	29.99%	N/A	N/A
Mn-54	0.01%	Co-58	29.54%	N/A	N/A
Fe-55	14.39%	Co-60	12.14%	N/A	N/A
Fe-59	0.00%	Ni-59	0.14%	N/A	N/A
Co-57	0.01%	Ni-63	20.11%	N/A	N/A
Co-58	17.29%	Sr-90	0.01%	N/A	N/A
Co-60	22.47%	Nb-95	1.32%	N/A	N/A
Ni-59	0.37%	Ag-110m	1.07%	N/A	N/A
N-63	31.23%	Sb-125	2.27%	N/A	N/A
Sr-90	0.19%	Cs-137	1.47%	N/A	N/A
Zr-95	0.05%	Pu-238	0.00%	N/A	N/A
Nb-95	0.09%	Pu-239	0.00%	N/A	N/A
Ag-110m	0.25%	Pu-241	0.23%	N/A	N/A
Sn-113	0.00%	Am-241	0.01%	N/A	N/A
Sb-124	0.00%	Cm-242	0.01%	N/A	N/A
Sb-125	0.01%	Cm-243	0.01%	N/A	N/A
Cs-137	5.02%			N/A	N/A
Ce-144	7.43%			N/A	N/A
Pu-238	0.00%			N/A	N/A
Pu-239	0.00%			N/A	N/A
Pu-241	0.118%			N/A	N/A
Pu-242	0.000%			N/A	N/A
Am-241	0.001%			N/A	N/A
Cm-242	0.001%			N/A	N/A
Cm-243	0.001%			N/A	N/A
Tc-99	0.021%			N/A	N/A

4.4 Solid Waste Disposition

There were 13 solid waste solid waste shipments from PBNP during 2001. The dates and destinations were:

**Table 4-3
PBNP Radioactive Waste Shipments**

<u>Date</u>	<u>Destination</u>	<u>Date</u>	<u>Destination</u>
03/21/01	Oak Ridge	07/25/01	Erwin
04/05/01	Oak Ridge	07/23/01	Oak Ridge
04/05/01	Oak Ridge	07/31/01	Oak Ridge
04/21/01	Oak Ridge	10/26/01	Oak Ridge
04/28/01	Oak Ridge	12/11/01	Oak Ridge
06/07/01	Oak Ridge	12/19/01	Oak Ridge
07/10/01	Oak Ridge		

5.0 NONRADIOACTIVE CHEMICAL RELEASES

5.1 Scheduled Chemical Waste Releases

Scheduled chemical waste releases to the circulating water system from January 1, 2001, to June 30, 2001, included $6.85\text{E}+05$ gallons of neutralized wastewater. The wastewater contained $6.50\text{E}+01$ pounds of suspended solids and $9.69\text{E}+03$ pounds of dissolved solids.

Scheduled chemical waste releases to the circulating water system from July 1, 2001, to December 31, 2001, included $5.72\text{E}+05$ gallons of neutralized wastewater. The wastewater contained $4.85\text{E}+00$ pounds of suspended solids and $7.39\text{E}+03$ pounds of dissolved solids.

Scheduled chemical waste releases are based on the average analytical results obtained from sampling a representative number of neutralizing tanks.

5.2 Miscellaneous Chemical Waste Releases

Miscellaneous chemical waste releases from the retention pond (based on effluent analyses) to the circulating water for January 1, 2001, to June 30, 2001, included $2.10\text{E}+07$ gallons of clarified wastewater. The wastewater contained $1.89\text{E}+03$ pounds of suspended solids.

Miscellaneous chemical waste releases from the retention pond (based on effluent analyses) to the circulating water for July 1, 2001, to December 31, 2001, included $2.88\text{E}+07$ gallons of clarified wastewater. The wastewater contained $2.67\text{E}+03$ pounds of suspended solids.

Miscellaneous chemical waste released directly to the circulating water, based on amount of chemicals used from January 1, 2001, to June 30, 2001, included $5.95\text{E}+04$ pounds of sodium bisulfite and $1.53\text{E}+04$ pounds of sodium hypochlorite.

Miscellaneous chemical waste released directly to the circulating water, based on amount of chemicals used from July 1, 2001, to December 31, 2001, included $1.61\text{E}+05$ pounds of sodium bisulfite and $4.16\text{E}+04$ pounds of sodium hypochlorite.

6.0 CIRCULATING WATER SYSTEM OPERATION

The circulating water system operation during this reporting period for periods of plant operation is described in Table 6-1.

**Table 6-1
Circulating Water System Operation for 2001**

	UNIT	JAN	FEB	MAR	APR	MAY	JUN
Average Volume Cooling	1	282.2	282.2	282.2	260.1	321.8	469.8
Water Discharge [million gal/day]**	2	282.2	282.2	282.2	428.6	387.7	467.5
Average Cooling Water	1	43	42	41	41*	47*	48
Intake Temperature [°F]	2	43	43	42	44	47	49
Average Cooling Water	1	74	75	74	64*	68*	69
Discharge Temperature [°F]	2	79	74	76	69	75	69
Average Ambient Lake Temperature [°F]		35	35	36	45	48	49

*Unit 1 shutdown from April 08, 2001 to May 07, 2001

** For days with cooling water discharge flow.

**Table 6-1(continued)
Circulating Water System Operation for 2001**

	UNIT	JUL	AUG	SEP	OCT	NOV	DEC
Average Volume Cooling	1	441.6	479.2	392.9	368.9	427.9	347.7
Water Discharge [million gal/day]**	2	442.2	489.9	494.1	492.6	487.0	418.7
Average Cooling Water	1	56	62	56*	48	43	40
Intake Temperature [°F]	2	57	63	54	48	44	40
Average Cooling Water	1	79	82	72*	75	67	68
Discharge Temperature [°F]	2	82	84	76	70	64	66
Average Ambient Lake Temperature [°F]		55	61	51	46	45	40

*Unit 1 shutdown from September 07, 2001, to September 13, 2001.

** For days with cooling water discharge flow.

Part B

Miscellaneous Reporting Requirements

7.0 ADDITIONAL REPORTING REQUIREMENTS

7.1 Revisions to the PBNP Effluent and Environmental Programs

Changes were made to the EM (Revision 16), RECM (Revision 3) and ODCM (Revision 14) during 2001. One complete copy of each revised manual is supplied with the submittal of this Annual Monitoring Report (AMR).

7.2 Interlaboratory Comparison Program

Environmental, Inc, Midwest Laboratory, the analytical laboratory contracted to perform the radioanalyses of the PBNP environmental samples, participated in the interlaboratory comparison studies administered by Environmental Resources Associates during 2001. The results of this comparison can be found in Appendix A of the AMR.

7.3 Special Circumstances

No special circumstances report regarding operation of the explosive gas monitor for the waste gas holdup system was needed during 2001.

7.4 Revisions to the 2000 Annual Monitoring Report

A calculation mistake was made in determining the Retention Pond flows for 2000. Corrections were made to Table 2-2, "Summary of Circulating Waster Discharge," and Table 2-3, "Isotopic Composition of Circulating Waster Discharges (Curies)," and can be found following this section. The corrections to the Retention Pond flows did not affect the estimated dose releases for liquid effluents during 2000.

Revised Table 2-2
Summary of Circulating Water Discharge
 January 1, 2000, through December 31, 2000

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Totals
Total Activity Released (Ci)													
Gamma Isotopic	4.16E-03	2.98E-03	3.28E-03	2.22E-04	2.89E-04	8.48E-03	2.24E-03	1.20E-03	2.53E-03	3.33E-02	1.06E-02	2.64E-02	9.56E-02
Gross Alpha	3.83E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.30E-07	0.00E+00	0.00E+00	4.12E-07	0.00E+00	0.00E+00	0.00E+00	5.07E-06
Tritium	5.36E+01	3.48E+01	1.09E+02	8.32E+01	1.03E+02	2.92E+01	7.80E+01	4.13E+01	1.04E+02	5.83E+01	7.46E+01	3.54E+01	8.04E+02
Sr-89 / Sr-90	3.10E-05	3.27E-05	0.00E+00	4.76E-05	5.26E-05	6.23E-05	2.59E-05	1.46E-05	1.59E-05	2.20E-06	2.65E-06	2.01E-05	3.08E-04
Total volume Released (gal)													
Processed Waste	4.77E+04	2.93E+04	1.23E+05	4.41E+04	5.66E+04	3.48E+04	5.22E+04	4.51E+04	1.09E+05	1.29E+05	1.19E+05	1.48E+05	9.37E+05
Retention Pond	9.11E+06	7.78E+06	8.70E+06	8.39E+06	9.15E+06	8.42E+06	3.50E+06	2.90E+06	2.53E+06	2.67E+06	2.26E+06	3.68E+06	6.91E+07
U1 SG Blowdown	3.37E+06	2.60E+06	2.98E+06	3.02E+06	3.52E+06	2.92E+06	2.55E+06	2.94E+06	2.55E+06	6.54E+05	3.51E+06	2.60E+06	3.32E+07
U2 SG Blowdown	2.66E+06	2.51E+06	2.67E+06	2.41E+06	2.72E+06	2.49E+06	2.56E+06	2.68E+06	2.43E+06	1.32E+06	0.00E+00	2.83E+06	2.73E+07
Total (gal)	1.52E+07	1.29E+07	1.45E+07	1.39E+07	1.54E+07	1.39E+07	8.66E+06	8.57E+06	7.62E+06	4.77E+06	5.88E+06	9.25E+06	1.31E+08
Total (cc)	5.75E+10	4.89E+10	5.48E+10	5.25E+10	5.85E+10	5.25E+10	3.28E+10	3.24E+10	2.88E+10	1.80E+10	2.23E+10	3.50E+10	4.94E+11
Dilution Water (cc)*													
	6.53E+13	5.76E+13	7.90E+13	1.11E+14	1.05E+14	1.11E+14	1.15E+14	1.15E+14	1.11E+14	7.94E+13	4.82E+13	6.54E+13	1.06E+15
Average Diluted Discharge Concentration (uCi/cc)													
Gamma Isotopic	6.37E-11	5.17E-11	4.15E-11	2.00E-12	2.75E-12	7.64E-11	1.94E-11	1.05E-11	2.28E-11	4.19E-10	2.20E-10	4.03E-10	
Gross Alpha	5.87E-14	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.48E-15	0.00E+00	0.00E+00	3.71E-15	0.00E+00	0.00E+00	0.00E+00	
Tritium	8.21E-07	6.04E-07	1.38E-06	7.50E-07	9.81E-07	2.63E-07	6.78E-07	3.59E-07	9.37E-07	7.35E-07	1.55E-06	5.41E-07	
Sr-89 / Sr-90	4.75E-13	5.68E-13	0.00E+00	4.29E-13	5.01E-13	5.61E-13	2.25E-13	1.27E-13	1.43E-13	2.77E-14	5.50E-14	3.07E-13	
Maximum Discharge Concentration (uCi/cc) (based on one unit of dilution)													
Tritium	2.83E-05	1.94E-05	2.88E-05	3.54E-05	5.02E-05	2.20E-05	2.88E-05	2.82E-05	3.71E-05	2.06E-05	3.38E-05	2.71E-05	
Gross Gamma	2.76E-09	1.96E-09	2.43E-09	2.10E-10	1.62E-10	3.61E-09	2.15E-09	4.25E-10	4.16E-10	2.93E-08	8.05E-09	2.80E-08	

*Dual Unit Circ Water Flow

Revised Table 2-3
Isotopic Composition of Circulating Water Discharges (Curies)
 January 1, 2000, through December 31, 2000

Nuclide	Jan	Feb	Mar	Apr	May	Jun	Semi-Annual	Jul	Aug	Sep	Oct	Nov	Dec	Total
							Total							
H-3	5.36E+01	3.48E+01	1.09E+02	8.32E+01	1.03E+02	2.92E+01	4.13E+02	7.80E+01	4.13E+01	1.04E+02	5.83E+01	7.46E+01	3.54E+01	8.04E+02
F-18			1.36E-04				1.36E-04				0.00E+00	0.00E+00	9.04E-05	2.26E-04
Cr-51	1.92E-04		4.08E-05			1.26E-04	3.59E-04				4.05E-03	8.52E-04	2.98E-03	8.24E-03
Mn-54	4.71E-06		6.14E-06	7.68E-06		1.53E-04	1.72E-04	3.91E-05	7.48E-06	1.07E-05	5.13E-05	7.96E-05	9.31E-05	4.53E-04
Fe-55	1.66E-04	0.00E+00	6.72E-04		1.67E-04	3.55E-03	4.56E-03	1.32E-03	8.40E-04	1.93E-03	1.42E-03	6.21E-04	4.98E-04	1.12E-02
Fe-59							0.00E+00				8.57E-05	0.00E+00	3.73E-05	1.23E-04
Co-57						1.61E-05	1.61E-05	2.76E-06			3.87E-05	1.30E-05	5.84E-05	1.29E-04
Co-58	3.86E-04	1.21E-04	5.72E-04	6.97E-05	2.69E-05	1.20E-03	2.38E-03	1.48E-04	4.97E-05	1.44E-04	2.60E-02	6.84E-03	2.00E-02	5.56E-02
Co-60	2.68E-04	3.14E-04	2.02E-04	1.19E-04	3.60E-05	2.66E-03	3.60E-03	6.01E-04	2.63E-04	2.57E-04	4.58E-04	1.47E-03	6.84E-04	7.33E-03
Zn-65							0.00E+00				8.01E-06	1.47E-05	1.21E-04	1.44E-04
Sr-89							0.00E+00						3.41E-06	3.41E-06
Sr-90	3.10E-05	3.27E-05		4.76E-05	5.26E-05	6.23E-05	2.26E-04	2.59E-05	1.46E-05	1.59E-05	2.20E-06	2.65E-06	1.67E-05	3.04E-04
Nb-95						1.07E-04	1.07E-04				2.50E-04	1.54E-04	5.61E-04	1.07E-03
Nb-97	4.47E-06		3.83E-06				8.30E-06				8.92E-06	1.23E-06	0.00E+00	2.93E-05
Zr-95						5.93E-05	5.93E-05				1.11E-04	8.35E-05	2.56E-04	5.11E-04
Ag-110m	4.34E-04	3.01E-04	1.58E-04	1.66E-05	1.64E-05	4.68E-04	1.39E-03	1.06E-04	4.22E-05	3.90E-05	6.98E-04	2.94E-04	3.43E-04	2.92E-03
Sn-113	9.93E-06	1.62E-06	7.24E-06			4.35E-05	6.23E-05				2.25E-05	1.63E-05	1.93E-05	1.20E-04
Sn-117m	6.76E-05	1.71E-05	3.57E-05	1.01E-06	3.44E-05		1.56E-04	6.03E-06			3.03E-05	4.09E-05	1.14E-04	3.47E-04
Sb-122							0.00E+00				5.90E-06	0.00E+00	0.00E+00	5.90E-06
Sb-124							0.00E+00				3.75E-06	2.42E-05	1.75E-04	2.03E-04
Sb-125	2.32E-03	1.91E-03	1.22E-03	7.91E-06	6.29E-06	6.80E-05	5.53E-03	9.22E-06			1.50E-05	3.75E-05	1.10E-04	5.70E-03
Te-132							0.00E+00				9.39E-06	1.80E-05		2.73E-05
I-131							0.00E+00						1.65E-04	1.65E-04
I-133							0.00E+00						2.68E-06	2.68E-06
Cs-136							0.00E+00				1.73E-05	0.00E+00		1.73E-05
Cs-137	3.06E-04	3.16E-04	2.22E-04		2.12E-06	2.75E-05	8.74E-04	3.48E-06	1.68E-06			2.99E-05	6.21E-06	9.15E-04
Ba-139							0.00E+00		5.37E-07			0.00E+00		5.37E-07
La-140							0.00E+00			1.45E-04		0.00E+00		1.45E-04
alpha	3.83E-06					8.30E-07	4.66E-06			4.12E-07				5.07E-06

Note: The Dissolved noble gases detected in liquid effluents (e.g., Xe-133 and Xe-135) are included in airborne release totals.

Part C

RADIOLOGICAL ENVIRONMENTAL MONITORING

8.0 INTRODUCTION

The objective of the PBNP Radiological Environmental Monitoring Program (REMP) is to measure ambient radiation levels and to collect air, water, vegetation, fish, and soil samples and analyze them for radionuclide content in order to determine whether the operation of PBNP or the ISFSI has radiologically impacted the surrounding environment. These measurements also serve as a check of the efficacy of PBNP effluent controls. The REMP fulfills the requirements of 10 CFR 20.1302, PBNP General Design Criterion (GDC) 17, GDC 64 of Appendix A to 10 CFR 50, and Sections IV.B.2 and IV.B.3 of Appendix I to 10 CFR 50 for the operation of the plant. Therefore, the REMP collects samples from various environmental media in order to provide data on measurable levels of radiation and radioactive materials in the principal pathways of environmental exposure.

A subset of the PBNP REMP samples, consisting of air, soil, and vegetation, also fulfills 10 CFR 72.44(d)(2) for operation of the ISFSI. Additionally, thermoluminescent dosimeters (TLDs) provide the means to measure changes in the ambient environmental radiation levels at sites near the ISFSI and at the PBNP site boundary to ensure that radiation levels from the ISFSI are maintained within the dose limits of 10 CFR 72.104. Because the ISFSI is within the PBNP site boundary, radiation doses from PBNP and the ISFSI, combined, must be used to assess compliance with 10 CFR 72.122 and 40 CFR 190. Therefore, radiological environmental monitoring for the ISFSI is provided by selected sampling sites, which are part of the PBNP REMP.

For the aquatic environment, the samples include water as well as the biological integrators, such as fish and filamentous algae. Because of their migratory behavior, fish are wide area integrators. In contrast, the filamentous algae periphyton are attached to shoreline rocks and concentrate nuclides from the water flowing by their point of attachment. Grab samples of lake water provide a snapshot of radionuclide concentrations at the time the sample is taken, where as analysis of fish and filamentous algae yield concentrations over time.

The air-grass-cow-milk exposure pathway unites the terrestrial and atmospheric environments. This pathway is important because of the many dairy farms around PBNP. Therefore, the REMP includes samples of air, general grasses, and milk from the PBNP environs. An annual land use survey is made to determine whether the assumptions on the location of dairy cattle remain conservative with respect to dose calculations for PBNP effluents. The dose calculations assume that the dairy cattle are located at the

south site boundary, the highest depositional sector. In addition, soil samples are collected and analyzed in order to monitor the potential for long-term buildup of radionuclides in the vicinity of PBNP.

For the measurement of ambient environmental radiation levels that may be affected by direct radiation from PBNP or by noble gas effluents, the REMP employs a series of TLDs situated around PBNP and the ISFSI.

9.0 PROGRAM DESCRIPTION

9.1 Results Reporting Convention

The PBNP REMP results in this report are reported directly as measured by a detector which can meet the required lower level of detection (LLD) as specified in Table 2-2 of the Environmental Manual. If all of the measured values with their respective uncertainties are not statistically different from zero, the result is reported as "Not Detectable" (ND), indicating no detectable level of activity present in the sample. If one or more result is statistically greater than zero, all the generated data is used to determine the statistical parameters.

The lower limit of detection (LLD) is an *a priori* concentration value that specifies the performance capability of the counting system used in the analyses of the REMP samples. The parameters for the *a priori* LLD are chosen such that only a five percent chance exists of falsely concluding a specific radionuclide is present when it is not present at the specified LLD. Based on detector efficiency and average background activity, the time needed to count the sample in order to achieve the desired LLD depends upon the sample size. Hence, the desired LLD may be achieved by adjusting various parameters. When a suite of radionuclides are required to be quantified in an environmental sample such as lake water, the count time used is that required to achieve the LLD for the radionuclide with the longest counting time. Therefore, in fulfilling the requirement for the most difficult to achieve radionuclide LLD, the probability of detecting the other radionuclides is increased because the counting time used is longer than that required to achieve the remaining radionuclide LLDs.

When the radionuclide of interest is not present in the sample, the statistical nature of radioactive decay will produce negative and positive results centered about zero. Excluding validly measured concentrations, whether negative or as small positive values below the LLD, artificially inflates the calculated average value. Therefore, all generated data are used to calculate, when applicable, the statistical parameters (i.e., average, standard deviation) presented in this report.

In interpreting the data, effects due to the plant must be distinguished from those due to other sources. A key interpretive aid in assessment of these effects is the

design of the PBNP REMP, which is based upon the indicator-control concept. Most types of samples are collected at both indicator locations (e.g., nearby, downwind, or down stream) and at control locations (e.g., distant, upwind, or upstream). A plant effect would be indicated if the radiation level at an indicator locations was significantly larger than that at the control location. The difference would have to be greater than could be accounted for by typical fluctuation in radiation levels arising from other sources.

9.2 Sampling Parameters

Samples are collected and analyzed at the frequency indicated in Table 9-1 from the locations described in Table 9-2 and shown in Figures 9-1, 9-2, and 9-3. (The latter two figures show sampling locations not shown in preceding figures due to space limitations. The PBNP REMP sampling site used to determine environmental impact around the ISFSI are found in Table 9-3. The minimum acceptable sample size is found in Table 9-4. In addition, Table 9-1 indicates the collection and analysis frequency of the ISFSI fence TLDs.

9.3 Deviations from Required Collection Frequency

Deviations from the collection frequency given in Table 9-1 are allowed because of hazardous conditions, automatic sampler malfunction, seasonal unavailability, and other legitimate reasons (Section 2.2.6 of the Environmental Manual). Table 9-5 list deviations from the scheduled sampling and frequency which occurred during the reporting period.

9.4 Assistance to the State of Wisconsin

The Radiation Protection Unit of the Wisconsin Department of Health and Family Services maintains a radiological environmental monitoring program in order to confirm the results from the Kewaunee Nuclear Power Plant and PBNP REMPs. As a courtesy and a convenience to the State of Wisconsin, PBNP personnel also collect certain environmental samples (Table 9-6) for the State from sites which are near PBNP sampling sites or are co-located. The results of the State monitoring program are available from the Radiation Protection Unit of the Wisconsin Department of Health and Family Services.

9.5 Program Modifications

The sampling sites related to the Nature Trail were removed from the Environmental Program during 2001 due to the closure of the trail. The sites and their titles are listed below. No additions were made to the REMP during 2001.

- E-34 Nature Trail, on a tree on East side at the beginning the trail
- E-35 Nature Trail, on tree on West side of trail near Fossil Fuels sign
- E-36 Nature Trail, on tree on West side of trail near "Earth Home Building" sign
- E-37 Nature Trail, on Northeast side of trail in clearing near "Brush Piles" sign.

Table 9-1
PBNP REMF Sample Analysis and Frequency

<u>Sample Type</u>	<u>Sample Codes</u>	<u>Analyses</u>	<u>Frequency</u>
Environmental Radiation Exposure	E-01, -02, -03, -04, -05 -06, -07, -08, -09, -12 -14, -15, -16, -17, -18, -20, -22, -23, -24, -25, -26, -27, -28, -29, -30, -31, -32, -38, -39, -TC	TLD	Quarterly
Vegetation	E-01, -02, -03, -04, -06, -08, -09, -20,	Gross Beta Gamma Isotopic Analysis	3x/yr as available
Algae	E-05, -12	Gross Beta Gamma Isotopic Analysis	3x/yr as available
Fish	E-13	Gross Beta Gamma Isotopic Analysis (Analysis of edible portions only)	3x/yr as available
Well Water	E-10	Gross Beta, H-3 Sr-89, 90, I-131 Gamma Isotopic Analysis (on total solids)	Quarterly
Lake Water	E-01, -05, -06, -33	Gross Beta H-3, Sr-89, 90 I-131 Gamma Isotopic Analysis (on total solids)	Monthly Quarterly composite of monthly collections Monthly Monthly
Milk	E-11, -19, -21	Sr-89, 90 I-131 Gamma Isotopic Analysis	Monthly
Air Filters	E-01, -02, -03, -04, -08, -20	Gross Beta I-131 Gamma Isotopic Analysis	Weekly (particulate) Weekly (charcoal) Quarterly (on composite particulate filters)
Soil	E-01, -02, -03, -04, -06, -08, -09, -20,	Gross Beta Gamma Isotopic Analysis	2x/yr
Shoreline Sediment	E-01, -05, -06, -12, -33,	Gross Beta Gamma Isotopic Analysis	2x/yr
ISFSI Ambient Radiation Exposure	North, East, South, West Fence Sections	TLD	Quarterly

Table 9-2
PBNP REMP Sampling Locations

<u>Location Code</u>	<u>Location Description</u>
E-01	Meteorological Tower
E-02	Site Boundary Control Center - East Side of Building
E-03	Tapawingo Road, about 0.4 Miles West of Lakeshore Road
E-04	North Boundary
E-05	Two Creeks Park
E-06	Point Beach State Park - Coast Guard Station
E-07	WPSC Substation on County V, about 0.5 Miles West of Hwy 42
E-08	Southeast Corner of the Intersection of Hwy 163 and Zander Road
E-09	Nature Conservancy
E-10	PBNP Site Well
E-11	Dairy Farm about 3.75 Miles West of Site
E-12	Discharge Flume/Pier
E-13	Pumphouse
E-14	South Boundary, about 0.2 miles East of Site Boundary Control Center
E-15	Southwest Corner of Site
E-16	WSW, Hwy 42, a residence about 0.25 miles North of Nuclear Road
E-17	North of Mishicot, Hwy 163 and Assman Road, Northeast Corner of Intersection
E-18	Northwest of Two Creeks at Zander and Tannery Roads
E-19	Local Dairy Farm, about 0.2 miles West of Hwy 42 on the North Side of Two Creeks Road
E-20	Reference Location, 17 miles Southwest, at Silver Lake College
E-21	Local Dairy Farm just South of Site on Lakeshore and Irish Roads
E-22	West Side of Hwy 42, about 0.25 miles North of Johanek Road
E-23	Greenfield Lane, about 4.5 Miles South of Site, 0.5 Miles East of Hwy 42
E-24	North Side of County Rt. V, near intersection of Saxonburg Road
E-25	South Side of County Rt. BB, about 0.5 miles West of Norman Road
E-26	804 Tapawingo Road, about 0.4 miles East of Hwy 163, North Side of Road
E-27	Intersection of Saxonburg and Nuclear Roads, Southwest Corner, about 4 Miles WSW
E-28	Nature Trail sign in parking lot on West side of EIC.
E-29	On tree on bluff overlooking Lake Michigan NE of Microwave Tower and due East of Met Tower.
E-30	NE corner at Intersection of Tapawingo and Lakeshore Roads.
E-31	On utility pole North side of Tapawingo Road closest to the gate at the West property line.
E-32	On a tree located at the junction of property lines, as indicated by trees and shrubs, about 1000 feet east of the west gate on Tapawingo Road and about 1200 feet south of Tapawingo Road. The location is almost under the power lines between the blue and gray transmission towers.
E-33	Lake Michigan shoreline accessed from the SE corner of KNPP parking lot. Sample S of creek.
E-38	Retention Pond fence, W side
E-39	Retention Pond fence, E side
E-TC	Transportation Control; Reserved for TLDs

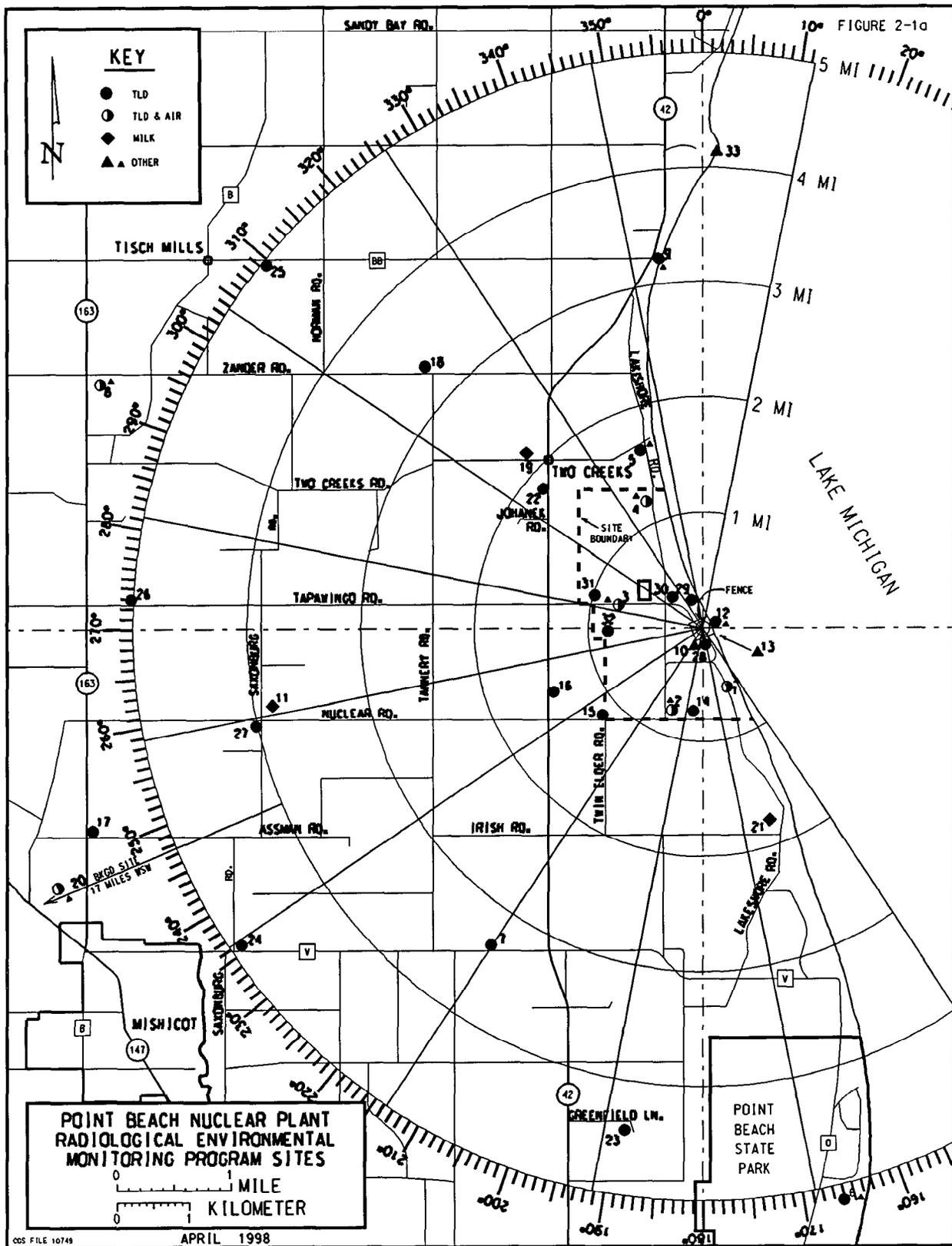
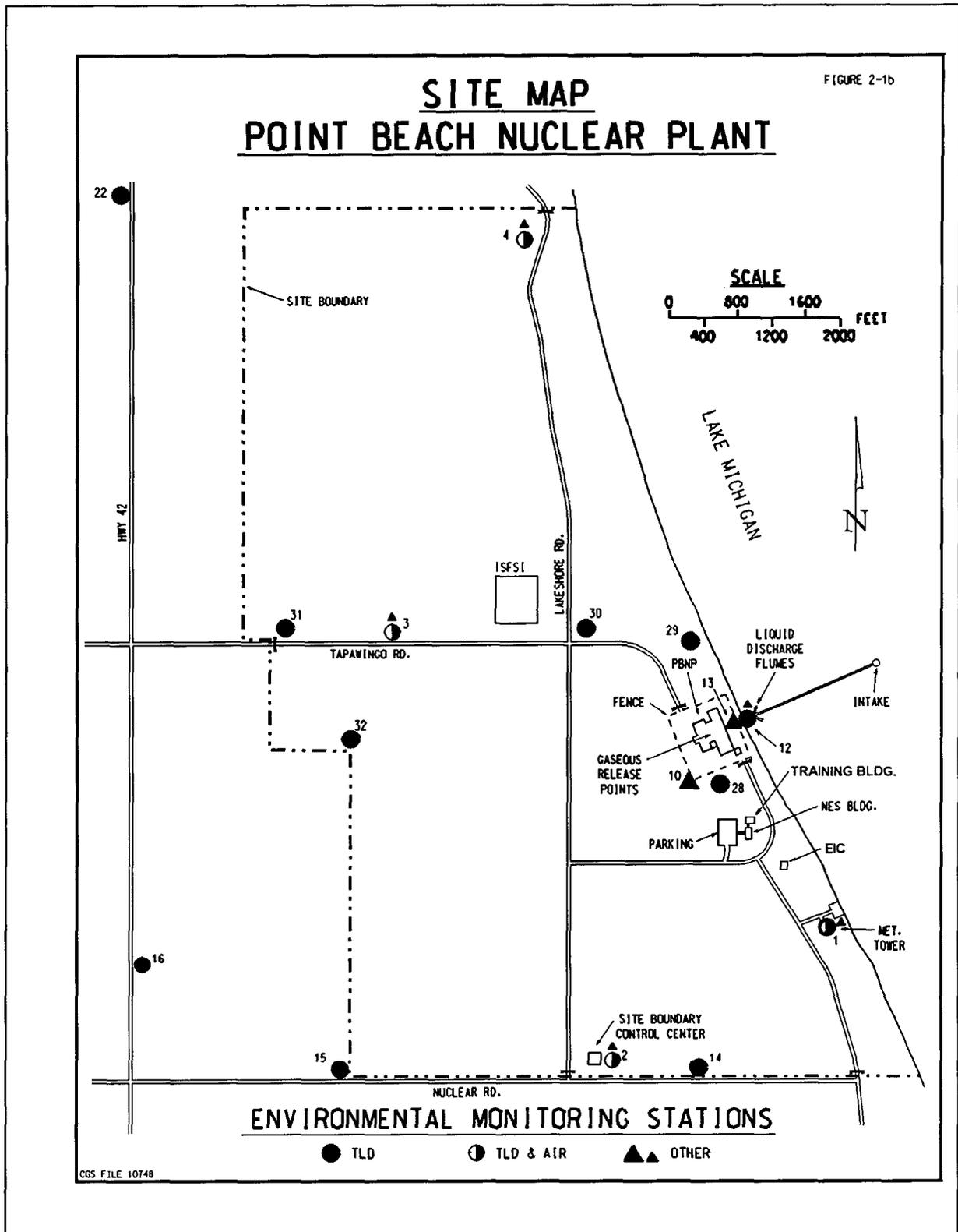


Figure 9-1
PBNP REMP Sampling Sites



**Figure 9-2
Map of REMP Sampling Sites Located Around PBNP**

**Table 9-3
ISFSI Sampling Sites**

<u>Ambient Radiation Monitoring (TLD)</u>	<u>Soil, Vegetation, and Airborne Monitoring</u>
E-03	E-02
E-28	E-03
E-30	E-04
E-31	
E-32	

**Table 9-4
Minimum Acceptable Sample Size**

<u>Sample Type</u>	<u>Size</u>
Vegetation	100-1000 grams
Lake Water	8 liters
Air Filters	250 m ³ (volume of air)
Well Water	8 liters
Milk	8 liters
Algae	100-1000 grams
Fish (edible portions)	1000 grams
Soil	500-1000 grams
Shoreline Sediment	500-1000 grams

Table 9-5
Deviations from Scheduled Sampling and Frequency

<u>Sample Type</u>	<u>Location</u>	<u>Collection Date or Period</u>	<u>Reason for not conducting REMP as required</u>	<u>Plans for Preventing Recurrence</u>
LW	E-01	2/14/2001	Ice buildup along lakeshore, personnel safety hazard.	Not applicable.
LW	E-06	2/14/2001	Ice buildup along lakeshore, personnel safety hazard.	Not applicable.
LW	E-33	2/14/2001	Ice buildup along lakeshore, personnel safety hazard.	Not applicable.
AP/AI	E-03	4/11/2001	Air sampler not running.	Problem with air sampler has been captured as part of the PBNP corrective action program.
AP/AI	E-04	5/9/2001	Air sampler not running.	Problem with air sampler has been captured as part of the PBNP corrective action program.
AP/AI	E-08	5/17/2001	Air sampler not running.	Problem with air sampler has been captured as part of the PBNP corrective action program.
AP/AI	E-08	5/22/2001	No power to air sampler.	Problem with air sampler has been captured as part of the PBNP corrective action program.
AP/AI	E-01	5/30/2001	Air sampler not running.	Problem with air sampler has been captured as part of the PBNP corrective action program.
AP/AI	E-01	6/12/2001	Air sampler not running.	Problem with air sampler has been captured as part of the PBNP corrective action program.
AP/AI	E-01	6/20/2001	Air sampler not running.	Problem with air sampler has been captured as part of the PBNP corrective action program.
LW	E-33	9/12/2001	No access due to National Security, access denied to non-Kewaunee Nuclear Plant employees.	Not applicable.
AP/AI	E-04	1/2/2002	Air sampler not running.	Problem with air sampler has been captured as part of the PBNP corrective action program.

Table 9-6
Sample Collections for State of Wisconsin

<u>Sample Type</u>	<u>Location</u>	<u>Frequency</u>
Lake Water	E-01	Weekly, Composited Monthly
Air Filters	E-07 E-08	Weekly
Fish	E-13	Quarterly, As Available
Precipitation	E-04 E-08	Twice a month, As Available
Milk	E-11 E-19	Monthly

9.6 Analytical Parameters

The types of analyses and their frequencies are given in Table 9-1. The LLDs for the various analyses are found in the Section 10 (Table 10-1) with the summary of the REMP results. All environmental LLDs listed in Table 2-2 of the Environmental Manual (also in Table 10-1) were achieved during 2001.

9.7 Brief Description of Analytical Parameters in Table 9-1

9.7.1 Gamma isotopic analysis

Gamma isotopic analysis consists of a computerized scan of the gamma ray spectrum from 80 keV to 2048 keV. Specifically included in the scan are Mn-54, Fe-59, Co-58, Co-60, Zr-95, Nb-95, Ru-103, Ru-106, I-131, Ba-La-140, Cs-134, Cs-137, Ce-141, and Ce-144. However, any other nuclear power plant produced radionuclides, which are detected, also are noted. Naturally occurring radionuclides such as Ra-226, Bi-214, Pb-212, Tl-208, Ac-228, Be-7, and K-40 are frequently detected in soil, sediment, and vegetation but are not normally reported. All radionuclides detected by gamma isotopic analysis are decay corrected to the time of collection.

9.7.2 Gross Beta Analysis

Gross beta analysis is a non-specific analysis that consists of measuring the total beta activity of the sample. No individual radionuclides are identifiable by this method. Gross beta analysis is a quick method of surveying samples for the presence of elevated activity that may require additional, immediate analyses.

9.7.3 Water Samples

Water samples include both Lake Michigan and well water. The Lake Michigan samples are collected along the shoreline at four locations north and south of PBNP. The well water is sampled from the on-site PBNP well. Gross beta and gamma isotopic analytical results for water are obtained by measurements on the solids remaining after evaporation of the unfiltered sample to dryness. Hence, the results are indicated as "on total solids" in Table 10-1.

9.7.4 Air Samples

Particulate air filters are allowed to decay at least 72 hours before gross beta measurements are made in order for naturally occurring radionuclides to become negligible part of the total activity. Gross beta measurements serve as a quick check for any unexpected activity that may require

immediate investigation. The particulate air filters are composited quarterly for analyses of long-lived radionuclides such as Cs-134 and Cs-137. Charcoal filters are counted as soon as possible so the I-131 will undergo only minimal decay prior to analyses.

In order to ensure that the air sampling pumps are operating satisfactorily, a gross leak check is performed weekly. On a quarterly frequency, a reference flow meter is connected across the face of the sampling pump with the particulate and charcoal filter in place. As necessary, the pump's flow rate is adjusted to correspond to that of the flow meter. The pumps are changed out annually for calibration and maintenance beyond what can be accomplished in the field.

9.7.5 Vegetation

Vegetation samples consist predominantly of green, growing plant material (grasses and weeds most likely to be eaten by cattle if they were present at the sampling site). Care is taken not to include any dirt associated with roots by cutting the vegetation off above the soil line.

9.7.6 Environmental Radiation Exposure

Environmental radiation exposure measurements for the first and second quarter were made with thermoluminescent dosimeters (TLDs). These TLDs consisted of three lithium fluoride chips sealed in black plastic. The TLDs absorb the energy deposited in them by gamma rays. The gamma rays may originate from PBNP produced radionuclides or from naturally occurring radionuclides. The TLDs remain at the monitoring site for roughly three months prior to analyses and the results are reported as mrem per 7 days. Because the TLDs are constantly bombarded by naturally occurring gamma radiation, even during shipment to and from PBNP, the amount of exposure during transportation is measured using transportation controls with each shipment of TLDs to and from the laboratory. The doses recorded on the transportation controls are subtracted from the monitoring TLDs in order to obtain the net *in situ* dose.

Third and fourth quarter measurements were made with TLD cards. The TLD card is a small passive detector which integrates exposure through the use of a crystalline phosphorus material, calcium sulfate containing dysprosium. Each TLD consists of a single Teflon sheet coated with calcium sulfate, which is read in four distinct quadrants to yield four values of exposure. This dosimeter design provides more precise exposure information by utilizing average of four values. The field exposure reported is the arithmetic average of the four exposure values obtained

minus the exposure received while the field TLD is in storage and transit. The TLD cards will be used in place of the TLD chips.

9.7.7 ISFSI Ambient Radiation Exposure

Although the ISFSI fence TLDs are not considered part of the REMP because of their location directly on site, their results can be used indirectly to determine whether the operation of the ISFSI is having an impact on the ambient environmental radiation beyond the site boundary. Impacts are determined by comparison of fence TLD results to the results of the monitoring at PBNP site boundary and other selected locations.

10.0 RESULTS

Summary of 2001 REMP Results

Radiological environmental monitoring conducted at PBNP from January 1, 2001, through December 31, 2001, consisted of analysis of air filters, milk, lake water, well water, soil, fish, shoreline sediments, algae, and vegetation as well as TLDs. The results are summarized in Table 10-1.

Table 10-1 contains the following information:

Sample:	Type of the sample medium
Description:	Type of measurement
LLD:	<i>a priori</i> lower limit of detection
N:	Number of samples analyzed
Average:	Average value \pm the standard deviation of N samples
High:	Highest measured value \pm its associated 2 sigma counting error
Units:	Units of measurement

Table 10-2 contains the ISFSI fence TLD results.

For certain analyses, an LLD which is lower than that required by REMP is used because the lower value derives from the counting time required to obtain the LLDs for radionuclides that are more difficult to detect. For these analyses, both LLDs are listed with the REMP LLD given in parentheses. The results are discussed in the narrative portion of this report (Section 11). Blank values have not been subtracted from the results presented in Table 10-1. A complete listing of all the individual results obtained from the contracted analytical laboratory and the laboratory's radioanalytical quality assurance results and Interlaboratory Crosscheck Program results are presented in the Appendix.

Table 10-1
Summary of Radiological Environmental Monitoring Results for 2001

Sample	Description	N	LLD (a)	Average ± Standard Deviation (b)	High ± 2 sigma	Units	
<i>TLD</i>	Environmental Radiation	124	1 mrem	1.06 ± 0.19	1.76 ± 0.04	mR/7days	
	Control (E-20)	4	1 mrem	1.03 ± 0.1	1.18 ± 0.03	mR/7days	
<i>Air</i>	Gross beta	252	0.01	0.023 ± 0.01	0.059 ± 0.005	pCi/m3	
	Control (E-20) Gross beta	52	0.01	0.024 ± 0.01	0.060 ± 0.005	pCi/m3	
	I-131	304	0.030 (0.07)	ND	-	pCi/m3	
	Cs-134	24	0.05	ND	-	pCi/m3	
	Cs-137	24	0.06	ND	-	pCi/m3	
	Other gamma emitters	24	0.1	ND	-	pCi/m3	
<i>Milk</i>	Sr-89	36	5	ND	-	pCi/L	
	Sr-90	36	1	1.2 ± 0.5	2.7 ± 0.6	pCi/L	
	I-131	36	0.5	ND	-	pCi/L	
	Cs-134	36	5 (15)	ND	-	pCi/L	
	Cs-137	36	5 (15)	ND	-	pCi/L	
	Ba-La-140	36	5 (15)	ND	-	pCi/L	
	Other gamma emitters	36	15	ND	-	pCi/L	
<i>Well</i>	Gross beta	4	4	ND	-	pCi/L	
<i>Water</i>	H-3	4	500 (3000)	ND	-	pCi/L	
	Sr-89	4	10	ND	-	pCi/L	
	Sr-90	4	1 (2)	ND	-	pCi/L	
	I-131	4	0.5 (2)	ND	-	pCi/L	
	Mn-54	4	10 (15)	ND	-	pCi/L	
	Fe-59	4	30	ND	-	pCi/L	
	Co-58	4	15	ND	-	pCi/L	
	Co-60	4	15	ND	-	pCi/L	
	Zn-65	4	30	ND	-	pCi/L	
	Zr-Nb-95	4	15	ND	-	pCi/L	
	Cs-134	4	15	ND	-	pCi/L	
	Cs-137	4	18	ND	-	pCi/L	
	Ba-La-140	4	15	ND	-	pCi/L	
	Other gamma emitters	4	30	ND	-	pCi/L	
	<i>Algae</i>	Gross beta	6	0.25	2.71 ± 1.05	4.65 ± 0.44	pCi/g
		Co-58	6	0.25	ND	-	pCi/g
Co-60		6	0.25	ND	-	pCi/g	
Cs-134		6	0.25	ND	-	pCi/g	
Cs-137		6	0.25	ND	-	pCi/g	

(a) The required LLD per the PBNP REMP is enclosed in the parentheses.

(b) "ND" indicates that the sample result are Not Detectable, i.e., not statistically different from zero.

Table 10-1 (continued)
Summary of Radiological Environmental Monitoring Results for 2001

Sample	Description	N	LLD (a)	Average ± Standard Deviation (b)	High ± 2 sigma	Units
<i>Lake Water</i>	Gross beta	44	4	2.94 ± 0.9	6.1 ± 0.8	pCi/L
	I-131	44	0.5 (2)	ND	-	pCi/L
	Mn-54	44	10 (15)	ND	-	pCi/L
	Fe-59	44	30	ND	-	pCi/L
	Co-58	44	15	ND	-	pCi/L
	Co-60	44	15	ND	-	pCi/L
	Zn-65	44	30	ND	-	pCi/L
	Zr-Nb-95	44	15	ND	-	pCi/L
	Cs-134	44	10 (15)	ND	-	pCi/L
	Cs-137	44	10 (18)	ND	-	pCi/L
	Ba-La-140	44	15	ND	-	pCi/L
	Other gamma emitters	44	30	ND	-	pCi/L
	Sr-89	44	5	ND	-	pCi/L
	Sr-90	44	1 (2)	0.60 ± 0.31	1.12 ± 0.46	pCi/L
	H-3	44	500 (3000)	ND	-	pCi/L
<i>Fish</i>	Gross beta	15	0.5	3.34 ± 0.88	5.22 ± 0.15	pCi/g
	Mn-54	15	0.13	ND	-	pCi/g
	Fe-59	15	0.26	ND	-	pCi/g
	Co-58	15	0.13	ND	-	pCi/g
	Co-60	15	0.13	ND	-	pCi/g
	Zn-65	15	0.26	ND	-	pCi/g
	Cs-134	15	0.13	ND	-	pCi/g
	Cs-137	15	0.15	ND	-	pCi/g
	Other gamma emitters	15	0.5	ND	-	pCi/g
<i>Shoreline</i>	Gross beta	10	2	8.35 ± 2.22	11.23 ± 1.55	pCi/g
<i>Sediment</i>	Cs-137	10	0.15	ND	-	pCi/g
<i>Soil</i>	Gross beta	18	2	23.48 ± 4.4	30.23 ± 3.21	pCi/g
	Cs-137	18	0.15	0.27 ± 0.2	0.96 ± 0.07	pCi/g
<i>Vegetation</i>	Gross beta	27	0.25	5.33 ± 1.1	8.27 ± 0.21	pCi/g
	I-131	27	0.06	ND	-	pCi/g
	Cs-134	27	0.06	ND	-	pCi/g
	Cs-137	27	0.08	ND	-	pCi/g

(a) The required LLD per the PBNP REMP is enclosed in the parentheses.

(b) "ND" indicates that the sample result are Not Detectable, i.e., not statistically different from zero.

Table 10-2
ISFSI Fence TLD Results for 2001

Fence Location	Average ± Standard Deviation
North	2.78 ± 0.07 mR/7 days
East	2.54 ± 0.14 mR/7 days
South	1.36 ± 0.12 mR/7 days
West	6.08 ± 0.22 mR/7 days

11.0 DISCUSSION

11.1 TLDs

The ambient radiation was measured in the general area of the site boundary, at an outer ring 4 – 5 miles from the plant, at special interest areas, and at one control location, roughly 17 miles Southwest of the plant. The average of these TLD results is 1.06 mR/7 days (indicator TLDs, all sites but the Control) and 1.03 mR/7 days at the control location. These results are not significantly different from each other nor from those observed from 1993 through 2000 (tabulated below in Table 11-1). Therefore, the operation of the plant has had no effect on the ambient gamma radiation.

Table 11-1
Average Indicator TLD Results from 1993 – 2001

Year	TLD Average	Units
1993	0.82	mR/7 days
1994	0.90	mR/7 days
1995	0.87	mR/7 days
1996	0.85	mR/7 days
1997	0.87	mR/7 days
1998	0.79	mR/7 days
1999	0.79	mR/7 days
2000	0.91	mR/7 days
2001	1.06	mR/7 days

The annual ISFSI fence TLD results listed in Table 11-3 show the anticipated slow trend upward due to the cask additions each year (one added in December 2001). The North and West fence TLDs continue to record higher doses than the S and E fence TLDs corresponding to the location of the storage units at the NW corner of the site (see Table 11-3). The overall increase in the West Fence TLD for the ISFSI was about 20%. Most of the indicator sites for the ISFSI (Table 11-2) show increases within the expected statistical variation, except E-03. A review

of the quarterly data for this sampling site show no appreciable variation for the first two quarters of 2001. However, the third quarter result for E-03 was 1.76 mR/7 days, which is outside of its average range. It appears that this noticeable change is due to the change in TLD types, because no additional casks were placed during the 3rd quarter of 2001 and indicator site E-30 (located close to the ISFSI) did not see the same increase magnitude. No impact on the ambient gamma radiation at or beyond the site boundary due to the operation of the ISFSI is indicated.

**Table 11-2
Average TLD Results Surrounding the ISFSI (mR/7 days)**

	Sampling Site					
	E-03	E-28	E-30	E-31	E-32	E-20
Pre-Operation*	0.93	0.87	0.81	0.93	0.98	0.88
1996	0.87	0.78	0.79	0.93	1.00	0.78
1997	0.91	0.89	0.84	0.89	0.97	0.79
1998	0.82	0.68	0.82	0.91	0.85	0.77
1999	0.88	0.83	0.80	0.90	0.99	0.78
2000	0.98	0.88	0.99	0.98	1.06	0.90
2001	1.31	0.95	1.02	1.10	1.04	1.03

*Pre-Operation data is the averages of the years 2/92 through 3/95.

**Table 11-3
Average ISFSI Fence TLD Results (mR/7 days)**

	Sampling Site			
	North	East	South	West
1995	1.29	1.28	1.10	1.26
1996	2.12	1.39	1.10	1.68
1997	2.05	1.28	1.00	1.66
1998	2.08	1.37	1.02	1.86
1999	2.57	1.84	1.11	3.26
2000	2.72	2.28	1.25	5.05
2001	2.78	2.54	1.36	6.08

11.2 Milk

Radionuclide concentrations in milk continue to be less than the LLD except for Sr-90, which have results that are greater than the required LLD. This radionuclide as well as Cs-137, which are still cycling through the environment, can be attributable to the large-scale atmospheric weapons tests of the 1960s, to

the less frequent testing in the 70s and 80s, as well as the Chernobyl accident. These results are common throughout the Great Lakes region and North America. The PBNP 2001 average Sr-90 of 1.2 ± 0.5 pCi/L compares favorably with the 2000 average of 1.2 ± 0.6 pCi/L, 1999 average of 1.0 ± 0.3 pCi/L and with the 1997 and 1998 averages, 1.2 ± 0.5 pCi/L and 1.1 ± 0.5 pCi/L, respectively, indicating little change. The milk data for 2001 show no radiological effects of the plant operation.

11.3 Air

The average annual gross beta concentrations in weekly airborne particulates were within uncertainty at the indicator and control locations (0.023 ± 0.01 and 0.024 ± 0.01 pCi/m³, respectively) and are similar to levels observed from 1993 through 2000. The results are tabulated below.

Table 11-4
Average Gross Beta Measurements in Air

Year	Average (pCi/m ³)
1993	0.022
1994	0.022
1995	0.021
1996	0.021
1997	0.021
1998	0.022
1999	0.024
2000	0.022
2001	0.023

No detectable amounts of I-131 were found.

Gamma spectroscopic analysis of quarterly composites of air particulate filters yielded similar results for indicator and control locations. Neither the indicator nor control locations show results, which on average, are significantly different than zero. Be-7, a naturally occurring radionuclide, was measured in quarterly composites of all samples with an average of 0.062 pCi/m³. This is comparable to the average of 0.064 pCi/m³ at the control site. Naturally occurring radionuclides are not required to be measured by the PBNP REMP, however, quantification of such nuclides serve as a means to monitor the internal consistency of the vendor's analytical program.

In summary, the air data for 2001 show that the operation of PBNP did not have an impact.

11.4 Lake Water

For the suite of REMP-specified gamma emitting radionuclides, measured concentrations continue to occur as small negative and positive values scattered around zero, indicating no radiological impact from the operation of PBNP. Sr-90 still persists from radioactive fallout. Tritium, in addition to being produced by water-cooled reactors such as PBNP, also is a naturally occurring radionuclide. The lake water samples collected and analyzed in 2001 for H-3 range from ND (non-detectable) to 227 pCi/L.

11.5 Algae

Filamentous algae attached to rocks along the Lake Michigan shoreline are known to concentrate radionuclides from the water with concentration factor over a thousand for certain radionuclides. Typically, the only fission product observed is Cs-137 with averages over years 1995 –2000 of 0.034, 0.050, 0.030, 0.027, 0.031, and 0.027. No observations above the LLD were made in 2001. The occurrence of Cs-137 in the environment can also be attributed to the fallout of events from the past such as weapons testing and nuclear accidents. Massive resuspension events due to wind stress redistributes Cs-137 throughout Lake Michigan and makes the Cs-137 more available to the algae. These events are visible on satellite photographs of the Lake. In 1976 after a Chinese weapons test, Cs-137 concentrations in algae reached 1.2 pCi/g. The concentrations of the naturally occurring radionuclides K-40 and Be-7 in the algae continue to be about 100 times higher than the Cs-137. The algae data indicate no plant effects during 2001.

11.6 Fish

No specified fission/corrosion radionuclide concentrations in fish greater than the required LLD were found in 2001. Positive results for Cs-137 was identified at the low levels in the edible portions of all 15 fish. The highest value of 0.069 pCi/g is considerably less than the high of 2.8 pCi/g as seen in PBNP samples obtained in the mid-1970s during the Chinese weapons tests. The concentration of naturally occurring K-40 is about 50-100 times higher than the highest Cs-137 concentration. There is no indication of a plant effect.

11.7 Well Water

All of the isotopic well water results are less than the required LLD. This indicates that PBNP effluents are not getting into the aquifer supplying drinking water to PBNP.

11.8 Soil

Cs-137 from weapons testing and the Chernobyl accident fallout continue to be present in soil samples at about 1% of the levels of naturally occurring K-40. As seen in the following table the average gross beta result is not significantly different from those values observed in the past. There is no indication of a plant effect.

Table 11-5
Average Gross Beta Concentrations in Soil

Year	Activity (pCi/g)
1993	23.6
1994	19.4
1995	18.0
1996	19.4
1997	22.8
1998	20.0
1999	23.1
2000	22.1
2001	23.5

11.9 Shoreline Sediment

Shoreline sediment consists of beach sand and other sediments washed up on the Lake Michigan shore. As in soil samples, the only non-naturally occurring radionuclide found in these samples is Cs-137 and its concentration (pCi/g) is at 1% or less of the naturally occurring concentrations of K-40. The Cs-137 concentrations of the shoreline sediment are about one-tenth of that found in soils. The shoreline sediment data indicate no radiological effects of the plant operation.

11.10 Vegetation

Although the naturally occurring radionuclides Be-7 and K-40 are found in all of the vegetation samples, the programmatically specified radionuclides are all below the required LLD. The Be-7 and K-40 concentrations are about 100 times higher than the Cs-137 concentrations. The sampling data gives no indication of a plant effect.

11.11 Land Use Census

In accordance with the requirements of Section 2.5 of the Environmental Manual, a visual verification of animals grazing in the vicinity of the Point Beach Nuclear Plant site boundary was completed on July 24, 2001, to ensure that the milk sampling locations remain as conservative as practicable. No significant change in the use of pasture lands was noted. Therefore, the existing milk sampling program continues to be acceptable.

12.0 REMP CONCLUSION

Based on the analytical results from the 464 environmental samples and from 144 sets of TLDs that comprised the PBNP REMP for 2001, PBNP effluents had no discernable, permanent effect on the surrounding environs. These results demonstrate that PBNP continues to have good controls on fuel integrity and the waste processing, and the control of effluents from PBNP continues to be acceptable pursuant to the ALARA criteria of 10 CFR 50.34a.

APPENDIX

Environmental, Inc. Midwest Laboratory
Final Report for the Pont Beach Nuclear Plant
Reporting Period: January – December 2001



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Midwest Laboratory
an Allegheny Technologies Co.

700 Landwehr Road • Northbrook, IL 60062-2310
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FINAL REPORT
TO
WISCONSIN ELECTRIC POWER COMPANY
MILWAUKEE, WISCONSIN

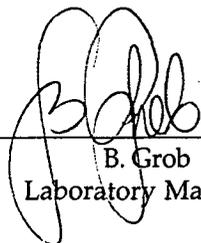
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM (REMP)
FOR
THE POINT BEACH NUCLEAR PLANT
TWO RIVERS, WISCONSIN

PREPARED AND SUBMITTED
BY
ENVIRONMENTAL, INC., MIDWEST LABORATORY

Project Number: 8006

Reporting Period: January -December, 2001

Reviewed and
Approved by _____


B. Grob
Laboratory Manager

Date 02-07-2002

Distribution: S. Scott, WEPCo (3 copies)

POINT BEACH NUCLEAR PLANT

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POINT BEACH NUCLEAR PLANT

1.0 INTRODUCTION

The following constitutes the final 2001 Monthly Progress Report for the Environmental Radiological Monitoring Program conducted at the Point Beach Nuclear Plant, Two Rivers, Wisconsin. Results of analyses are presented in the attached tables. Data tables reflect sample analysis results for both Technical Specification requirements and Special Interest locations and samples are randomly selected within the Program monitoring area to provide additional data for cross-comparisons.

For gamma isotopic analyses, the spectrum covers an energy range from 80 to 2048 KeV. Specifically included are Mn-54, Fe-59, Co-58, Co-60, Zn-65, Zr-95, Nb-95, Ru-103, Ru-106, I-131, Ba-La-140, Cs-134, Cs-137, Ce-141, and Ce-144. Naturally occurring gamma-emitters, such as K-40 and Ra daughters, are frequently detected in soil and sediment samples. Specific isotopes listed are K-40, Tl-208, Pb-212, Bi-214, Ra-226 and Ac-228. Unless noted otherwise, the results reported under "Other Gammas" are for Co-60 and may be higher or lower for other radionuclides.

All concentrations, except gross beta, are decay corrected to the time of collection.

All samples were collected within the scheduled period unless noted otherwise in the Listing of Missed Samples.

POINT BEACH NUCLEAR PLANT

2.0 LISTING OF MISSED SAMPLES

Sample Type	Location	Expected Collection Date	Reason
LW	E-01	2/14/01	Sample not received.
LW	E-06	2/14/01	Sample not received.
LW	E-33	2/14/01	Sample not received.
AP/AI	E-03	4/11/01	Air sampler pump not running.
AP/AI	E-04	5/9/01	Air sampler not running.
AP/AI	E-08	5/17/01	Air sampler not running.
AP/AI	E-08	5/22/01	No power to air sampler.
AP/AI	E-01	5/30/01	Air sampler not running.
AP/AI	E-01	6/12/01	Air sampler not running.
AP/AI	E-01	6/20/01	Air sampler not running.
LW	E-33	09/12/01	No access due to National Security; access denied to non-Kewaunee Nuclear Plant employees.
AP/AI	E-04	1/2/02	Air sampler not running.

NOTE: Page 3 is intentionally left out.

POINT BEACH NUCLEAR PLANT

Airborne particulates and charcoal canisters, analyses for gross beta and iodine-131.

Location: E-01, Meteorological Tower

Units: pCi/m³

Collection: Continuous, weekly exchange.

Date Collected	Vol. (m ³)	Gross Beta	I-131	Date Collected	Vol. (m ³)	Gross Beta	I-131
<u>Required LLD</u>		<u>0.010</u>	<u>0.030</u>			<u>0.010</u>	<u>0.030</u>
01-09-01	253	0.028 ± 0.004	-0.019 ± 0.009	07-12-01	391	0.019 ± 0.003	-0.006 ± 0.005
01-16-01	303	0.026 ± 0.004	-0.009 ± 0.007	07-18-01	256	0.021 ± 0.004	-0.004 ± 0.007
01-23-01	299	0.031 ± 0.004	-0.005 ± 0.005	07-24-01	261	0.034 ± 0.004	0.003 ± 0.007
01-30-01	302	0.019 ± 0.003	-0.008 ± 0.007	07-31-01	303	0.019 ± 0.003	-0.009 ± 0.008
02-06-01	306	0.023 ± 0.004	-0.013 ± 0.005	08-09-01	390	0.035 ± 0.003	0.003 ± 0.005
02-13-01	299	0.018 ± 0.003	0.007 ± 0.008	08-14-01	218	0.016 ± 0.004	-0.003 ± 0.011
02-22-01	391	0.032 ± 0.003	-0.004 ± 0.005	08-22-01	342	0.021 ± 0.003	0.003 ± 0.006
02-27-01	223	0.025 ± 0.004	0.005 ± 0.010	08-28-01	260	0.027 ± 0.004	-0.004 ± 0.009
03-06-01	293	0.029 ± 0.004	-0.007 ± 0.008	09-04-01	301	0.019 ± 0.003	0.003 ± 0.005
03-13-01	304	0.015 ± 0.003	-0.003 ± 0.008	09-12-01	359	0.015 ± 0.003	-0.002 ± 0.006
03-20-01	305	0.022 ± 0.003	0.003 ± 0.007	09-18-01	245	0.019 ± 0.004	-0.012 ± 0.009
03-27-01	309	0.018 ± 0.003	0.010 ± 0.006	09-25-01	302	0.023 ± 0.003	-0.005 ± 0.008
04-03-01	282	0.019 ± 0.004	-0.006 ± 0.008	10-03-01	358	0.023 ± 0.003	0.004 ± 0.006
<u>1st Quarter</u>				<u>3rd Quarter</u>			
Mean± s.d.		0.023 ± 0.006	-0.004 ± 0.008	Mean± s.d.		0.022 ± 0.006	-0.002 ± 0.005
04-11-01	322	0.013 ± 0.003	-0.006 ± 0.007	10-09-01	249	0.018 ± 0.004	-0.004 ± 0.007
04-18-01	282	0.015 ± 0.003	0.009 ± 0.008	10-16-01	304	0.023 ± 0.004	-0.007 ± 0.007
04-25-01	280	0.016 ± 0.003	0.005 ± 0.008	10-23-01	292	0.017 ± 0.003	-0.012 ± 0.007
05-03-01	322	0.026 ± 0.004	0.009 ± 0.007	10-31-01	347	0.022 ± 0.003	0.007 ± 0.006
05-09-01	242	0.016 ± 0.004	0.013 ± 0.010	11-07-01	307	0.026 ± 0.003	-0.007 ± 0.006
05-17-01	326	0.015 ± 0.003	0.007 ± 0.006	11-14-01	298	0.025 ± 0.003	0.009 ± 0.007
05-22-01	204	0.015 ± 0.004	-0.009 ± 0.011	11-19-01	216	0.050 ± 0.005	-0.001 ± 0.009
05-30-01	ND ^a	-	-	11-27-01	345	0.024 ± 0.003	0.001 ± 0.006
06-06-01	306	0.012 ± 0.003	-0.002 ± 0.007	12-04-01	301	0.026 ± 0.003	0.005 ± 0.006
06-12-01	ND ^a	-	-	12-11-01	306	0.032 ± 0.004	0.003 ± 0.007
06-20-01	ND ^a	-	-	12-18-01	301	0.038 ± 0.004	0.003 ± 0.006
06-26-01	268	0.019 ± 0.003	0.004 ± 0.008	12-26-01	344	0.026 ± 0.003	-0.009 ± 0.007
07-03-01	302	0.026 ± 0.004	-0.006 ± 0.008	01-02-02	304	0.024 ± 0.003	-0.007 ± 0.007
<u>2nd Quarter</u>				<u>4th Quarter</u>			
Mean± s.d.		0.017 ± 0.005	0.002 ± 0.008	Mean± s.d.		0.027 ± 0.009	-0.001 ± 0.007
<u>Cumulative Average</u>						0.023 ± 0.007	-0.001 ± 0.007

^a"ND" = No data; air sampler not running.

POINT BEACH NUCLEAR PLANT

Airborne particulates and charcoal canisters, analyses for gross beta and iodine-131.

Location: E-02, Site Boundary Control Center

Units: pCi/m³

Collection: Continuous, weekly exchange.

Date Collected	Vol. (m ³)	Gross Beta	I-131	Date Collected	Vol. (m ³)	Gross Beta	I-131
<u>Required LLD</u>		<u>0.010</u>	<u>0.030</u>			<u>0.010</u>	<u>0.030</u>
01-09-01	255	0.028 ± 0.004	0.008 ± 0.008	07-12-01	391	0.019 ± 0.003	-0.003 ± 0.006
01-16-01	303	0.026 ± 0.004	-0.019 ± 0.008	07-18-01	257	0.029 ± 0.004	0.011 ± 0.008
01-23-01	300	0.028 ± 0.004	-0.003 ± 0.006	07-24-01	252	0.040 ± 0.005	-0.012 ± 0.010
01-30-01	302	0.019 ± 0.003	-0.005 ± 0.007	07-31-01	303	0.016 ± 0.003	-0.010 ± 0.008
02-06-01	315	0.023 ± 0.004	0.001 ± 0.005	08-09-01	389	0.035 ± 0.003	0.002 ± 0.006
02-13-01	300	0.019 ± 0.003	-0.003 ± 0.006	08-14-01	218	0.013 ± 0.003	0.004 ± 0.011
02-22-01	390	0.031 ± 0.003	0.005 ± 0.005	08-22-01	341	0.019 ± 0.003	-0.014 ± 0.007
02-27-01	213	0.021 ± 0.004	-0.002 ± 0.011	08-28-01	261	0.027 ± 0.004	0.007 ± 0.008
03-06-01	303	0.029 ± 0.004	0.007 ± 0.007	09-04-01	301	0.016 ± 0.003	0.003 ± 0.006
03-13-01	304	0.014 ± 0.003	-0.008 ± 0.007	09-12-01	358	0.015 ± 0.003	-0.009 ± 0.007
03-20-01	303	0.018 ± 0.003	-0.003 ± 0.008	09-18-01	246	0.019 ± 0.004	-0.004 ± 0.006
03-27-01	300	0.019 ± 0.003	-0.002 ± 0.008	09-25-01	302	0.023 ± 0.003	-0.004 ± 0.008
04-03-01	302	0.017 ± 0.003	-0.004 ± 0.007	10-03-01	356	0.023 ± 0.003	-0.001 ± 0.006
<u>1st Quarter</u>				<u>3rd Quarter</u>			
Mean± s.d.		0.022 ± 0.005	-0.002 ± 0.007	Mean± s.d.		0.023 ± 0.008	-0.002 ± 0.008
04-11-01	333	0.012 ± 0.003	0.000 ± 0.006	10-09-01	252	0.023 ± 0.004	0.003 ± 0.007
04-18-01	293	0.014 ± 0.003	0.008 ± 0.008	10-16-01	302	0.025 ± 0.004	-0.014 ± 0.008
04-25-01	301	0.017 ± 0.003	0.008 ± 0.008	10-23-01	301	0.019 ± 0.003	0.012 ± 0.007
05-03-01	333	0.026 ± 0.003	0.009 ± 0.006	10-31-01	346	0.018 ± 0.003	-0.001 ± 0.006
05-09-01	243	0.017 ± 0.004	0.009 ± 0.008	11-07-01	297	0.028 ± 0.003	0.001 ± 0.006
05-17-01	323	0.019 ± 0.003	-0.001 ± 0.007	11-14-01	290	0.028 ± 0.003	0.004 ± 0.008
05-22-01	203	0.017 ± 0.004	0.000 ± 0.011	11-19-01	209	0.058 ± 0.005	-0.001 ± 0.010
05-30-01	344	0.010 ± 0.002	0.001 ± 0.006	11-27-01	336	0.023 ± 0.003	-0.008 ± 0.007
06-06-01	311	0.012 ± 0.003	-0.007 ± 0.007	12-04-01	291	0.024 ± 0.003	0.001 ± 0.007
06-12-01	253	0.019 ± 0.004	-0.003 ± 0.007	12-11-01	298	0.031 ± 0.004	0.004 ± 0.007
06-20-01	345	0.024 ± 0.003	-0.003 ± 0.006	12-18-01	292	0.038 ± 0.004	0.018 ± 0.006
06-26-01	281	0.018 ± 0.003	-0.007 ± 0.008	12-26-01	334	0.026 ± 0.003	0.005 ± 0.006
07-03-01	301	0.026 ± 0.004	0.004 ± 0.007	01-02-02	294	0.023 ± 0.003	0.011 ± 0.007
<u>2nd Quarter</u>				<u>4th Quarter</u>			
Mean± s.d.		0.018 ± 0.005	0.001 ± 0.006	Mean± s.d.		0.028 ± 0.010	0.003 ± 0.008
<u>Cumulative Average</u>						0.023 ± 0.008	0.000 ± 0.007

POINT BEACH NUCLEAR PLANT

Airborne particulates and charcoal canisters, analyses for gross beta and iodine-131.

Location: E-03, West Boundary

Units: pCi/m³

Collection: Continuous, weekly exchange.

Date Collected	Vol. (m ³)	Gross Beta	I-131	Date Collected	Vol. (m ³)	Gross Beta	I-131
<u>Required LLD</u>		<u>0.010</u>	<u>0.030</u>			<u>0.010</u>	<u>0.030</u>
01-09-01	262	0.028 ± 0.004	-0.013 ± 0.009	07-12-01	391	0.017 ± 0.003	0.009 ± 0.006
01-16-01	296	0.021 ± 0.004	0.008 ± 0.006	07-18-01	249	0.022 ± 0.004	-0.011 ± 0.008
01-23-01	299	0.033 ± 0.004	0.003 ± 0.005	07-24-01	249	0.034 ± 0.005	0.005 ± 0.008
01-30-01	302	0.018 ± 0.003	0.005 ± 0.007	07-31-01	301	0.018 ± 0.003	-0.003 ± 0.007
02-06-01	305	0.022 ± 0.004	0.002 ± 0.005	08-09-01	391	0.032 ± 0.003	-0.007 ± 0.005
02-13-01	299	0.019 ± 0.003	0.004 ± 0.008	08-14-01	217	0.014 ± 0.003	0.014 ± 0.010
02-22-01	391	0.030 ± 0.003	0.001 ± 0.005	08-22-01	343	0.018 ± 0.003	0.002 ± 0.007
02-27-01	213	0.028 ± 0.005	-0.009 ± 0.010	08-28-01	260	0.028 ± 0.004	0.002 ± 0.009
03-06-01	303	0.031 ± 0.004	-0.006 ± 0.008	09-04-01	301	0.020 ± 0.003	0.001 ± 0.006
03-13-01	304	0.014 ± 0.003	-0.002 ± 0.007	09-12-01	358	0.015 ± 0.003	-0.003 ± 0.007
03-20-01	304	0.023 ± 0.003	-0.001 ± 0.007	09-18-01	247	0.018 ± 0.004	0.001 ± 0.008
03-27-01	299	0.018 ± 0.003	-0.007 ± 0.008	09-25-01	302	0.024 ± 0.003	0.007 ± 0.007
04-03-01	302	0.018 ± 0.003	0.011 ± 0.008	10-03-01	355	0.022 ± 0.003	-0.003 ± 0.007
1st Quarter				3rd Quarter			
Mean± s.d.		0.023 ± 0.006	0.000 ± 0.007	Mean± s.d.		0.022 ± 0.006	0.001 ± 0.007
04-11-01		ND ^a	-	10-09-01	250	0.018 ± 0.004	0.007 ± 0.007
04-18-01	303	0.015 ± 0.003	-0.002 ± 0.007	10-16-01	305	0.023 ± 0.004	0.001 ± 0.008
04-25-01	301	0.019 ± 0.003	-0.005 ± 0.008	10-23-01	301	0.019 ± 0.003	0.000 ± 0.007
05-03-01	345	0.024 ± 0.003	0.011 ± 0.006	10-31-01	346	0.018 ± 0.003	-0.002 ± 0.006
05-09-01	268	0.016 ± 0.003	0.008 ± 0.009	11-07-01	306	0.024 ± 0.003	-0.001 ± 0.006
05-17-01	370	0.019 ± 0.003	0.004 ± 0.006	11-14-01	289	0.027 ± 0.003	0.007 ± 0.007
05-22-01	234	0.018 ± 0.003	-0.013 ± 0.009	11-19-01	215	0.059 ± 0.005	0.001 ± 0.009
05-30-01	347	0.010 ± 0.002	0.004 ± 0.006	11-27-01	346	0.024 ± 0.003	0.002 ± 0.006
06-06-01	306	0.010 ± 0.002	-0.002 ± 0.008	12-04-01	302	0.025 ± 0.003	-0.007 ± 0.007
06-12-01	254	0.012 ± 0.003	-0.007 ± 0.008	12-11-01	307	0.034 ± 0.004	0.004 ± 0.007
06-20-01	345	0.023 ± 0.003	0.003 ± 0.007	12-18-01	300	0.044 ± 0.004	-0.011 ± 0.006
06-26-01	260	0.018 ± 0.003	-0.005 ± 0.010	12-26-01	345	0.028 ± 0.004	-0.001 ± 0.006
07-03-01	300	0.026 ± 0.004	-0.003 ± 0.007	01-02-02	304	0.025 ± 0.003	-0.003 ± 0.008
2nd Quarter				4th Quarter			
Mean± s.d.		0.018 ± 0.005	-0.001 ± 0.007	Mean± s.d.		0.028 ± 0.012	0.000 ± 0.005
Cumulative Average						0.023 ± 0.008	0.000 ± 0.006

^a "ND" = No data; air sampler pump not running.

POINT BEACH NUCLEAR PLANT

Airborne particulates and charcoal canisters, analyses for gross beta and iodine-131.

Location: E-04, North Boundary

Units: pCi/m³

Collection: Continuous, weekly exchange.

Date Collected	Vol. (m ³)	Gross Beta	I-131	Date Collected	Vol. (m ³)	Gross Beta	I-131
<u>Required LLD</u>		<u>0.010</u>	<u>0.030</u>			<u>0.010</u>	<u>0.030</u>
01-09-01	248	0.025 ± 0.004	-0.005 ± 0.008	07-12-01	379	0.020 ± 0.003	0.003 ± 0.005
01-16-01	294	0.027 ± 0.004	0.005 ± 0.008	07-18-01	249	0.023 ± 0.004	0.010 ± 0.010
01-23-01	290	0.033 ± 0.004	-0.005 ± 0.005	07-24-01	262	0.034 ± 0.004	0.005 ± 0.008
01-30-01	293	0.017 ± 0.003	-0.003 ± 0.007	07-31-01	303	0.018 ± 0.003	0.002 ± 0.008
02-06-01	294	0.021 ± 0.004	-0.003 ± 0.005	08-09-01	377	0.036 ± 0.004	0.001 ± 0.006
02-13-01	292	0.020 ± 0.003	-0.002 ± 0.008	08-14-01	210	0.019 ± 0.004	0.008 ± 0.010
02-22-01	379	0.035 ± 0.004	-0.007 ± 0.006	08-22-01	331	0.019 ± 0.003	-0.003 ± 0.008
02-27-01	206	0.027 ± 0.005	0.005 ± 0.011	08-28-01	256	0.027 ± 0.004	-0.003 ± 0.006
03-06-01	294	0.038 ± 0.004	-0.006 ± 0.009	09-04-01	291	0.021 ± 0.004	0.001 ± 0.006
03-13-01	295	0.016 ± 0.003	0.002 ± 0.007	09-12-01	375	0.016 ± 0.003	0.003 ± 0.006
03-20-01	295	0.021 ± 0.003	0.005 ± 0.007	09-18-01	279	0.017 ± 0.003	0.015 ± 0.008
03-27-01	290	0.018 ± 0.003	0.003 ± 0.007	09-25-01	342	0.021 ± 0.003	-0.001 ± 0.008
04-03-01	293	0.016 ± 0.003	0.007 ± 0.008	10-04-01	470	0.022 ± 0.002	-0.004 ± 0.004
<u>1st Quarter</u>				<u>3rd Quarter</u>			
Mean± s.d.		0.024 ± 0.007	0.000 ± 0.005	Mean± s.d.		0.023 ± 0.006	0.003 ± 0.006
04-11-01	335	0.013 ± 0.003	0.004 ± 0.006	10-09-01	246	0.017 ± 0.004	0.010 ± 0.007
04-18-01	284	0.015 ± 0.003	0.001 ± 0.008	10-16-01	332	0.027 ± 0.004	-0.002 ± 0.007
04-25-01	272	0.013 ± 0.003	-0.005 ± 0.009	10-23-01	318	0.018 ± 0.003	0.002 ± 0.006
05-03-01	408	0.023 ± 0.003	-0.005 ± 0.005	10-31-01	352	0.018 ± 0.003	-0.005 ± 0.006
05-09-01		ND ^a	- -	11-07-01	307	0.024 ± 0.003	-0.013 ± 0.006
05-17-01	337	0.015 ± 0.002	0.005 ± 0.007	11-14-01	299	0.028 ± 0.003	0.011 ± 0.007
05-22-01	200	0.015 ± 0.004	0.005 ± 0.011	11-19-01	221	0.058 ± 0.005	-0.010 ± 0.011
05-30-01	355	0.011 ± 0.002	-0.009 ± 0.006	11-27-01	339	0.026 ± 0.003	0.001 ± 0.006
06-06-01	297	0.011 ± 0.003	0.002 ± 0.007	12-04-01	302	0.023 ± 0.003	0.002 ± 0.006
06-12-01	247	0.022 ± 0.004	0.009 ± 0.007	12-11-01	305	0.035 ± 0.004	0.000 ± 0.007
06-20-01	334	0.024 ± 0.003	0.003 ± 0.007	12-18-01	301	0.041 ± 0.004	0.003 ± 0.006
06-26-01	252	0.021 ± 0.003	-0.008 ± 0.009	12-26-01	345	0.031 ± 0.004	0.002 ± 0.006
07-03-01	291	0.026 ± 0.004	-0.010 ± 0.008	01-02-02		ND ^a	- -
<u>2nd Quarter</u>				<u>4th Quarter</u>			
Mean± s.d.		0.017 ± 0.005	-0.001 ± 0.006	Mean± s.d.		0.029 ± 0.012	0.000 ± 0.007
<u>Cumulative Average</u>						0.023 ± 0.009	0.001 ± 0.006

^a"ND"=No data; air sampler not running.

POINT BEACH NUCLEAR PLANT

Airborne particulates and charcoal canisters, analyses for gross beta and iodine-131.

Location: E-08, G.J. Francar Residence

Units: pCi/m³

Collection: Continuous, weekly exchange.

Date Collected	Vol. (m ³)	Gross Beta	I-131	Date Collected	Vol. (m ³)	Gross Beta	I-131
<u>Required LLD</u>		<u>0.010</u>	<u>0.030</u>			<u>0.010</u>	<u>0.030</u>
01-09-01	260	0.023 ± 0.004	-0.010 ± 0.008	07-12-01	391	0.017 ± 0.003	-0.006 ± 0.006
01-16-01	301	0.027 ± 0.004	-0.007 ± 0.007	07-18-01	257	0.025 ± 0.004	-0.014 ± 0.010
01-23-01	299	0.027 ± 0.004	0.006 ± 0.006	07-24-01	262	0.036 ± 0.005	-0.005 ± 0.009
01-30-01	302	0.019 ± 0.003	0.001 ± 0.007	07-31-01	304	0.020 ± 0.003	0.003 ± 0.007
02-06-01	302	0.018 ± 0.003	-0.009 ± 0.005	08-09-01	387	0.031 ± 0.003	0.010 ± 0.005
02-13-01	302	0.019 ± 0.003	0.003 ± 0.008	08-14-01	214	0.012 ± 0.003	0.004 ± 0.011
02-22-01	391	0.030 ± 0.003	0.002 ± 0.005	08-22-01	346	0.014 ± 0.002	-0.007 ± 0.006
02-27-01	212	0.026 ± 0.004	0.001 ± 0.010	08-28-01	261	0.025 ± 0.003	0.009 ± 0.008
03-06-01	304	0.032 ± 0.004	0.001 ± 0.007	09-04-01	299	0.018 ± 0.003	-0.004 ± 0.006
03-13-01	304	0.016 ± 0.003	-0.001 ± 0.007	09-12-01	355	0.014 ± 0.003	0.006 ± 0.005
03-20-01	305	0.021 ± 0.003	0.003 ± 0.007	09-18-01	251	0.017 ± 0.004	0.001 ± 0.009
03-27-01	309	0.015 ± 0.003	0.002 ± 0.007	09-25-01	300	0.024 ± 0.003	-0.007 ± 0.007
04-03-01	302	0.015 ± 0.003	-0.003 ± 0.008	10-03-01	346	0.020 ± 0.003	-0.004 ± 0.007
<u>1st Quarter</u>				<u>3rd Quarter</u>			
Mean± s.d.		0.022 ± 0.006	-0.001 ± 0.005	Mean± s.d.		0.021 ± 0.007	-0.001 ± 0.007
04-11-01	345	0.013 ± 0.003	0.001 ± 0.007	10-09-01	261	0.015 ± 0.004	-0.004 ± 0.007
04-18-01	303	0.012 ± 0.003	-0.002 ± 0.007	10-16-01	304	0.025 ± 0.004	0.001 ± 0.007
04-25-01	303	0.016 ± 0.003	0.003 ± 0.007	10-23-01	307	0.013 ± 0.003	-0.008 ± 0.006
05-03-01	343	0.023 ± 0.003	0.003 ± 0.006	10-31-01	342	0.019 ± 0.003	-0.005 ± 0.007
05-09-01	259	0.013 ± 0.003	0.007 ± 0.008	11-07-01	306	0.027 ± 0.003	0.006 ± 0.005
05-17-01		ND ^a	- -	11-14-01	298	0.028 ± 0.003	-0.009 ± 0.007
05-22-01		ND ^a	- -	11-19-01	214	0.055 ± 0.005	-0.007 ± 0.010
05-30-01	342	0.012 ± 0.002	-0.007 ± 0.006	11-27-01	347	0.024 ± 0.003	0.004 ± 0.007
06-06-01	307	0.010 ± 0.002	0.002 ± 0.007	12-04-01	302	0.025 ± 0.003	-0.010 ± 0.007
06-12-01	256	0.014 ± 0.003	-0.004 ± 0.008	12-11-01	306	0.032 ± 0.004	0.005 ± 0.007
06-20-01	344	0.022 ± 0.003	-0.002 ± 0.007	12-18-01	300	0.038 ± 0.004	-0.006 ± 0.005
06-26-01	260	0.019 ± 0.003	-0.001 ± 0.008	12-26-01	345	0.027 ± 0.003	-0.001 ± 0.006
07-03-01	300	0.025 ± 0.004	0.013 ± 0.007	01-02-02	304	0.022 ± 0.003	-0.007 ± 0.008
<u>2nd Quarter</u>				<u>4th Quarter</u>			
Mean± s.d.		0.016 ± 0.005	0.001 ± 0.005	Mean± s.d.		0.027 ± 0.011	-0.003 ± 0.006
<u>Cumulative Average</u>						0.022 ± 0.008	-0.001 ± 0.006

^a"ND"=No data; air sampler not running.

POINT BEACH NUCLEAR PLANT

Airborne particulates and charcoal canisters, analyses for gross beta and iodine-131.

Location: E-20, Silver Lake

Units: pCi/m³

Collection: Continuous, weekly exchange.

Date Collected	Vol. (m ³)	Gross Beta	I-131	Date Collected	Vol. (m ³)	Gross Beta	I-131
<u>Required LLD</u>		<u>0.010</u>	<u>0.030</u>			<u>0.010</u>	<u>0.030</u>
01-09-01	272	0.030 ± 0.004	-0.002 ± 0.009	07-12-01	439	0.019 ± 0.003	-0.003 ± 0.006
01-16-01	311	0.027 ± 0.004	0.009 ± 0.007	07-18-01	285	0.024 ± 0.004	-0.002 ± 0.008
01-23-01	327	0.035 ± 0.004	0.002 ± 0.005	07-24-01	258	0.039 ± 0.005	-0.008 ± 0.010
01-30-01	332	0.019 ± 0.003	0.008 ± 0.007	07-31-01	282	0.021 ± 0.003	0.003 ± 0.008
02-06-01	334	0.027 ± 0.004	0.003 ± 0.004	08-09-01	397	0.033 ± 0.003	0.001 ± 0.006
02-13-01	331	0.022 ± 0.003	-0.004 ± 0.007	08-14-01	217	0.013 ± 0.003	0.015 ± 0.009
02-22-01	429	0.033 ± 0.003	-0.002 ± 0.005	08-22-01	359	0.016 ± 0.002	-0.003 ± 0.006
02-27-01	233	0.028 ± 0.004	-0.008 ± 0.010	08-28-01	268	0.020 ± 0.003	-0.002 ± 0.008
03-06-01	335	0.034 ± 0.004	-0.001 ± 0.006	09-04-01	311	0.019 ± 0.004	-0.007 ± 0.007
03-13-01	335	0.017 ± 0.003	0.008 ± 0.006	09-12-01	356	0.015 ± 0.003	0.011 ± 0.007
03-20-01	333	0.019 ± 0.003	-0.005 ± 0.007	09-18-01	267	0.018 ± 0.004	0.014 ± 0.008
03-27-01	319	0.020 ± 0.003	0.002 ± 0.007	09-25-01	304	0.022 ± 0.003	-0.001 ± 0.007
04-03-01	333	0.019 ± 0.003	0.001 ± 0.006	10-04-01	401	0.022 ± 0.003	0.003 ± 0.005
<u>1st Quarter</u>				<u>3rd Quarter</u>			
Mean± s.d.		0.025 ± 0.006	0.001 ± 0.005	Mean± s.d.		0.022 ± 0.007	0.002 ± 0.007
04-11-01	379	0.015 ± 0.003	0.000 ± 0.006	10-09-01	223	0.019 ± 0.004	-0.022 ± 0.008
04-18-01	335	0.016 ± 0.003	0.004 ± 0.007	10-16-01	312	0.024 ± 0.004	0.010 ± 0.007
04-25-01	321	0.018 ± 0.003	0.004 ± 0.007	10-23-01	309	0.019 ± 0.003	0.010 ± 0.007
05-03-01	354	0.027 ± 0.003	0.002 ± 0.007	10-31-01	362	0.019 ± 0.003	0.010 ± 0.006
05-09-01	268	0.018 ± 0.004	-0.008 ± 0.008	11-08-01	345	0.029 ± 0.003	0.001 ± 0.005
05-17-01	354	0.022 ± 0.003	0.000 ± 0.006	11-14-01	271	0.025 ± 0.003	-0.007 ± 0.009
05-22-01	223	0.017 ± 0.003	-0.009 ± 0.010	11-19-01	219	0.060 ± 0.005	-0.009 ± 0.011
05-30-01	322	0.013 ± 0.002	-0.006 ± 0.006	11-27-01	356	0.029 ± 0.003	0.008 ± 0.007
06-06-01	319	0.010 ± 0.002	0.003 ± 0.006	12-04-01	312	0.027 ± 0.003	-0.003 ± 0.008
06-12-01	287	0.015 ± 0.003	0.002 ± 0.008	12-11-01	212	0.054 ± 0.006	0.002 ± 0.006
06-20-01	380	0.020 ± 0.003	-0.003 ± 0.006	12-18-01	309	0.043 ± 0.004	-0.001 ± 0.005
06-26-01	285	0.021 ± 0.003	-0.007 ± 0.008	12-26-01	355	0.030 ± 0.003	0.003 ± 0.007
07-03-01	329	0.026 ± 0.003	0.006 ± 0.008	01-02-02	313	0.024 ± 0.003	0.001 ± 0.007
<u>2nd Quarter</u>				<u>4th Quarter</u>			
Mean± s.d.		0.018 ± 0.005	-0.001 ± 0.005	Mean± s.d.		0.031 ± 0.013	0.000 ± 0.009
<u>Cumulative Average</u>						0.024 ± 0.010	0.000 ± 0.007

POINT BEACH NUCLEAR PLANT
 GAMMA EMITTERS IN QUARTERLY COMPOSITES OF
 AIR PARTICULATE FILTERS
 (Concentration pCi/m³)

Location	Lab Code Req. LLD	Be-7 -	Cs-134 (0.05)	Cs-137 (0.06)	Other Gammas ^a (0.10)
<u>1st Quarter</u>					
E-01	EAP- 2802	0.045 ± 0.013	-0.0006 ± 0.0008	-0.0004 ± 0.0080	0.0005 ± 0.0006
E-02	- 2803	0.052 ± 0.016	0.0000 ± 0.0006	0.0001 ± 0.0006	0.0000 ± 0.0008
E-03	- 2804	0.046 ± 0.014	0.0002 ± 0.0007	0.0003 ± 0.0005	0.0003 ± 0.0007
E-04	- 2805	0.067 ± 0.018	-0.0001 ± 0.0008	0.0008 ± 0.0006	0.0001 ± 0.0005
E-08	- 2806	0.052 ± 0.012	0.0000 ± 0.0005	0.0000 ± 0.0005	0.0005 ± 0.0006
E-20	- 2807	0.059 ± 0.015	0.0000 ± 0.0005	0.0003 ± 0.0007	0.0001 ± 0.0008
<u>2nd Quarter</u>					
E-01	EAP- 5821	0.057 ± 0.016	0.0003 ± 0.0008	0.0002 ± 0.0008	0.0006 ± 0.0011
E-02	- 5822	0.081 ± 0.016	0.0010 ± 0.0007	0.0003 ± 0.0006	0.0005 ± 0.0007
E-03	- 5823	0.066 ± 0.017	0.0002 ± 0.0008	-0.0002 ± 0.0008	0.0001 ± 0.0008
E-04	- 5824	0.098 ± 0.017	0.0002 ± 0.0005	0.0001 ± 0.0007	0.0000 ± 0.0008
E-08	- 5825	0.074 ± 0.019	0.0005 ± 0.0004	0.0009 ± 0.0008	-0.0010 ± 0.0011
E-20	- 5826	0.068 ± 0.013	-0.0004 ± 0.0006	0.0010 ± 0.0006	0.0004 ± 0.0004
<u>3rd Quarter</u>					
E-01	EAP- 9082	0.060 ± 0.016	-0.0004 ± 0.0006	0.0005 ± 0.0007	-0.0001 ± 0.0009
E-02	- 9083	0.083 ± 0.015	0.0004 ± 0.0005	-0.0001 ± 0.0006	0.0001 ± 0.0007
E-03	- 9084	0.059 ± 0.015	0.0001 ± 0.0007	0.0001 ± 0.0007	0.0002 ± 0.0006
E-04	- 9085	0.077 ± 0.015	0.0002 ± 0.0007	-0.0005 ± 0.0005	0.0000 ± 0.0005
E-08	- 9086	0.059 ± 0.016	0.0002 ± 0.0005	0.0001 ± 0.0006	0.0009 ± 0.0006
E-20	- 9087	0.071 ± 0.017	0.0002 ± 0.0006	-0.0001 ± 0.0006	-0.0004 ± 0.0007
<u>4th Quarter</u>					
E-01	EAP- 11821	0.049 ± 0.012	0.0005 ± 0.0007	-0.0001 ± 0.0006	0.0004 ± 0.0005
E-02	- 11822	0.058 ± 0.019	0.0011 ± 0.0008	-0.0001 ± 0.0008	0.0008 ± 0.0012
E-03	- 11823	0.048 ± 0.012	0.0004 ± 0.0008	-0.0004 ± 0.0006	-0.0001 ± 0.0009
E-04	- 11824	0.063 ± 0.017	0.0004 ± 0.0010	-0.0003 ± 0.0007	-0.0006 ± 0.0008
E-08	- 11825,6	0.048 ± 0.009	0.0004 ± 0.0004	-0.0003 ± 0.0006	0.0004 ± 0.0004
E-20	- 11827	0.056 ± 0.015	0.0002 ± 0.0006	-0.0001 ± 0.0008	0.0001 ± 0.0010

^a See Introduction

POINT BEACH NUCLEAR PLANT
RADIOACTIVITY IN MILK SAMPLES

(Monthly Collections)

Sample Description and Concentration (pCi/L)				
<u>E-11 Funk Dairy Farm</u>				
Collection Date	01-10-01	02-14-01	03-07-01	Required LLD
Lab Code	EMI-99	EMI-1059	EMI-1572,3	
Sr-89	-1.0 ± 1.3	-0.3 ± 0.9	-0.2 ± 0.7	5.0
Sr-90	1.9 ± 0.5	1.7 ± 0.4	1.6 ± 0.3	1.0
I-131	-0.04 ± 0.23	0.00 ± 0.18	0.21 ± 0.22	0.5
K-40	1304 ± 65	1584 ± 138	1412 ± 82	
Cs-134	0.8 ± 1.2	-0.5 ± 3.4	-0.3 ± 1.8	5.0
Cs-137	0.6 ± 1.0	-0.8 ± 2.5	1.3 ± 1.4	5.0
Ba-La-140	-2.1 ± 1.3	0.9 ± 3.0	-1.5 ± 1.5	5.0
Other Gammas ^a	0.6 ± 1.2	2.7 ± 4.2	-0.3 ± 1.6	15.0
				Required LLD
Collection Date	04-04-01	05-02-01	06-06-01	
Lab Code	EMI-2442	EMI-3392	EMI-4636	
Sr-89	0.3 ± 1.2	-0.4 ± 1.1	0.4 ± 0.9	5.0
Sr-90	1.9 ± 0.5	0.9 ± 0.4	0.9 ± 0.4	1.0
I-131	-0.10 ± 0.16	0.01 ± 0.17	-0.09 ± 0.16	0.5
K-40	1413 ± 123	1361 ± 124	1299 ± 143	
Cs-134	0.9 ± 2.3	-1.7 ± 2.3	-1.0 ± 3.4	5.0
Cs-137	-1.1 ± 2.2	1.3 ± 2.3	-0.7 ± 2.9	5.0
Ba-La-140	1.7 ± 2.3	0.3 ± 1.9	-1.3 ± 2.8	5.0
Other Gammas ^a	0.8 ± 2.6	-1.8 ± 2.3	1.7 ± 3.0	15.0

^a See Introduction.

POINT BEACH NUCLEAR PLANT
RADIOACTIVITY IN MILK SAMPLES

(Monthly Collections)

Sample Description and Concentration (pCi/L)

<u>E-11 Funk Dairy Farm</u>				
Collection Date	07-11-01	08-01-01	09-12-01	Required LLD
Lab Code	EMI-5913	EMI-6693,4	EMI-7917	
Sr-89	-0.7 ± 1.3	-0.8 ± 1.3	-0.8 ± 0.7	5.0
Sr-90	1.2 ± 0.4	1.4 ± 0.3	1.3 ± 0.4	1.0
I-131	0.17 ± 0.24	-0.25 ± 0.14	-0.10 ± 0.14	0.5
K-40	1467 ± 116	1356 ± 106	1417 ± 117	
Cs-134	-0.7 ± 2.4	0.4 ± 2.5	-0.3 ± 2.5	5.0
Cs-137	-1.3 ± 2.2	-1.2 ± 2.3	0.6 ± 2.2	5.0
Ba-La-140	1.3 ± 1.8	-1.3 ± 2.0	-0.4 ± 1.9	5.0
Other Gammas ^a	0.5 ± 2.3	0.3 ± 2.4	1.0 ± 2.4	15.0
Collection Date	10-10-01	11-07-01	12-05-01	Required LLD
Lab Code	EMI-9016	EMI-10207	EMI-10804	
Sr-89	0.4 ± 1.3	-0.9 ± 2.0	0.5 ± 1.5	5.0
Sr-90	0.8 ± 0.4	1.2 ± 0.4	0.9 ± 0.5	1.0
I-131	-0.14 ± 0.18	0.07 ± 0.16	-0.05 ± 0.17	0.5
K-40	1391 ± 80	1462 ± 130	1328 ± 124	
Cs-134	2.3 ± 1.7	1.7 ± 2.1	-1.3 ± 2.2	5.0
Cs-137	-0.5 ± 1.7	0.6 ± 2.3	-1.6 ± 2.7	5.0
Ba-La-140	0.4 ± 1.0	-4.0 ± 2.3	-0.1 ± 2.6	5.0
Other Gammas ^a	-0.5 ± 1.7	-0.3 ± 2.8	0.3 ± 2.9	15.0

^a See Introduction.

POINT BEACH NUCLEAR PLANT
RADIOACTIVITY IN MILK SAMPLES

(Monthly Collections)

Sample Description and Concentration (pCi/L)				
<u>E-19 Engelbrecht Dairy</u>				
Collection Date	01-10-01	02-14-01	03-07-01	Required LLD
Lab Code	EMI-100	EMI-1060	EMI-1574	
Sr-89	0.0 ± 1.9	-1.1 ± 1.0	0.5 ± 0.8	5.0
Sr-90	2.0 ± 0.6	2.0 ± 0.5	1.2 ± 0.3	1.0
I-131	-0.26 ± 0.19	0.11 ± 0.20	0.21 ± 0.22	0.5
K-40	1447 ± 84	1462 ± 166	1433 ± 120	
Cs-134	-1.9 ± 1.6	-0.9 ± 3.1	0.5 ± 2.4	5.0
Cs-137	-0.1 ± 1.4	-0.1 ± 2.9	0.6 ± 2.3	5.0
Ba-La-140	-1.3 ± 1.2	-2.8 ± 2.8	-1.5 ± 2.1	5.0
Other Gammas ^a	0.3 ± 1.6	0.6 ± 4.4	2.6 ± 2.1	15.0
Collection Date	04-04-01	05-02-01	06-06-01	Required LLD
Lab Code	EMI-2443	EMI-3393	EMI-4637	
Sr-89	-0.9 ± 1.4	-0.7 ± 1.0	0.2 ± 0.9	5.0
Sr-90	2.7 ± 0.6	1.5 ± 0.4	1.1 ± 0.4	1.0
I-131	-0.13 ± 0.18	-0.11 ± 0.17	0.09 ± 0.21	0.5
K-40	1391 ± 138	1229 ± 112	1233 ± 109	
Cs-134	2.8 ± 2.6	1.1 ± 2.4	-0.3 ± 2.2	5.0
Cs-137	-1.6 ± 2.7	1.2 ± 2.2	0.9 ± 1.9	5.0
Ba-La-140	0.2 ± 2.3	-0.6 ± 1.7	0.6 ± 1.9	5.0
Other Gammas ^a	-1.0 ± 2.3	-1.2 ± 2.8	-1.3 ± 2.2	15.0

^a See Introduction.

POINT BEACH NUCLEAR PLANT
RADIOACTIVITY IN MILK SAMPLES

(Monthly Collections)

Sample Description and Concentration (pCi/L)				
<u>E-19 Engelbrecht Dairy</u>				
Collection Date	07-11-01	08-01-01	09-12-01	Required LLD
Lab Code	EMI-5914	EMI-6695	EMI-7918	
Sr-89	0.4 ± 1.3	-0.2 ± 1.2	0.0 ± 0.8	5.0
Sr-90	1.0 ± 0.3	1.2 ± 0.4	1.4 ± 0.4	1.0
I-131	0.09 ± 0.22	-0.07 ± 0.13	-0.03 ± 0.14	0.5
K-40	1431 ± 122	1354 ± 116	1372 ± 115	
Cs-134	1.4 ± 2.1	0.5 ± 2.1	-1.0 ± 2.3	5.0
Cs-137	0.1 ± 2.1	1.0 ± 2.2	0.7 ± 2.3	5.0
Ba-La-140	-1.6 ± 2.1	-1.0 ± 2.3	1.0 ± 1.8	5.0
Other Gammas ^a	-0.5 ± 2.6	-0.4 ± 2.3	0.6 ± 2.2	15.0
Collection Date	10-10-01	11-07-01	12-05-01	Required LLD
Lab Code	EMI-9017	EMI-10208	EMI-10805	
Sr-89	-1.0 ± 1.2	-0.4 ± 2.0	-0.1 ± 1.5	5.0
Sr-90	1.3 ± 0.4	1.2 ± 0.4	1.4 ± 0.5	1.0
I-131	0.03 ± 0.22	0.11 ± 0.18	-0.08 ± 0.17	0.5
K-40	1382 ± 79	1486 ± 119	1344 ± 108	
Cs-134	0.8 ± 1.4	1.2 ± 2.4	-0.6 ± 2.2	5.0
Cs-137	2.0 ± 1.5	1.9 ± 2.1	0.4 ± 2.1	5.0
Ba-La-140	0.3 ± 1.4	-2.2 ± 2.0	0.5 ± 1.9	5.0
Other Gammas ^a	-1.4 ± 1.8	-0.3 ± 2.2	2.0 ± 1.7	15.0

^a See Introduction.

POINT BEACH NUCLEAR PLANT
RADIOACTIVITY IN MILK SAMPLES

(Monthly Collections)

Sample Description and Concentration (pCi/L)

<u>E-21 Strutz Dairy Farm</u>				
Collection Date	01-10-01	02-14-01	03-07-01	Required LLD
Lab Code	EMI-101	EMI-1061	EMI-1575	
Sr-89	0.6 ± 1.2	0.1 ± 0.8	0.3 ± 0.6	5.0
Sr-90	1.5 ± 0.4	1.1 ± 0.3	1.0 ± 0.3	1.0
I-131	0.10 ± 0.18	-0.07 ± 0.24	0.13 ± 0.20	0.5
K-40	1546 ± 78	1572 ± 120	1484 ± 113	
Cs-134	1.2 ± 1.5	-0.6 ± 2.3	0.7 ± 1.9	5.0
Cs-137	0.2 ± 1.1	1.1 ± 0.7	0.8 ± 1.7	5.0
Ba-La-140	0.2 ± 1.2	0.9 ± 2.1	0.3 ± 1.9	5.0
Other Gammas ^a	-0.3 ± 1.5	-0.3 ± 1.8	0.1 ± 2.2	15.0
Collection Date	04-04-01	05-02-01	06-06-01	Required LLD
Lab Code	EMI-2444	EMI-3394	EMI-4638	
Sr-89	0.7 ± 1.0	-0.5 ± 0.8	-0.3 ± 0.8	5.0
Sr-90	0.5 ± 0.3	0.8 ± 0.3	0.8 ± 0.3	1.0
I-131	-0.17 ± 0.20	0.04 ± 0.18	0.05 ± 0.15	0.5
K-40	1495 ± 97	1619 ± 113	1396 ± 117	
Cs-134	-0.5 ± 2.1	0.0 ± 2.1	0.8 ± 2.3	5.0
Cs-137	-0.6 ± 1.8	0.0 ± 1.9	0.7 ± 2.4	5.0
Ba-La-140	-0.2 ± 1.5	-0.3 ± 1.8	3.3 ± 2.1	5.0
Other Gammas ^a	-0.6 ± 2.0	0.8 ± 2.3	2.4 ± 2.8	15.0

^a See Introduction.

POINT BEACH NUCLEAR PLANT
RADIOACTIVITY IN MILK SAMPLES

(Monthly Collections)

Sample Description and Concentration (pCi/L)

<u>E-21 Strutz Dairy Farm</u>				Required
Collection Date	07-11-01	08-01-01	09-12-01	LLD
Lab Code	EMI-5915	EMI-6696	EMI-7919	
Sr-89	-0.5 ± 1.2	0.5 ± 0.6	0.2 ± 0.5	5.0
Sr-90	0.7 ± 0.3	0.6 ± 0.2	0.5 ± 0.3	1.0
I-131	0.13 ± 0.21	-0.12 ± 0.12	-0.16 ± 0.16	0.5
K-40	1421 ± 42	1421 ± 131	1389 ± 122	
Cs-134	0.5 ± 0.8	1.8 ± 2.6	0.3 ± 2.7	5.0
Cs-137	0.2 ± 0.8	-1.0 ± 2.6	0.7 ± 2.5	5.0
Ba-La-140	-1.3 ± 0.7	1.3 ± 2.5	1.6 ± 2.3	5.0
Other Gammas ^a	1.7 ± 0.8	0.5 ± 2.5	2.5 ± 2.2	15.0
Collection Date	10-10-01	11-07-01	12-05-01	Required
Lab Code	EMI-9018	EMI-10209	EMI-10806	LLD
Sr-89	-0.2 ± 1.1	1.2 ± 0.6	0.1 ± 1.0	5.0
Sr-90	0.8 ± 0.3	0.4 ± 0.3	0.3 ± 0.3	1.0
I-131	-0.19 ± 0.21	0.00 ± 0.15	0.12 ± 0.16	0.5
K-40	1454 ± 42	1544 ± 128	1483 ± 116	
Cs-134	-0.3 ± 0.9	-0.7 ± 2.5	0.0 ± 2.3	5.0
Cs-137	-0.3 ± 0.8	-1.0 ± 2.4	-0.5 ± 2.7	5.0
Ba-La-140	-10.1 ± 0.7	-0.2 ± 2.1	-1.0 ± 2.4	5.0
Other Gammas ^a	1.2 ± 0.8	1.3 ± 2.6	1.1 ± 2.0	15.0

^a See Introduction.

POINT BEACH NUCLEAR PLANT
RADIOACTIVITY IN WELL WATER SAMPLES, E-10

(Quarterly Collections)

	1st Qtr.	2nd Qtr.	3rd Qtr.		Req. LLD
Collection Date	02-26-01	04-11-01	07-11-01	10-11-01	
Lab Code	EWV-1389	EWV-2862	EWV-5917	EWV-9024	
Gross Beta	-0.3 ± 1.5	0.3 ± 1.9	2.1 ± 1.7	1.2 ± 1.5	4.0
H-3	49.0 ± 93.7	22.5 ± 81.1	10.6 ± 72.7	100.3 ± 81.3	500
Sr-89	-0.5 ± 0.7	-0.1 ± 0.5	0.0 ± 1.0	0.8 ± 0.8	5.0
Sr-90	0.4 ± 0.3	0.4 ± 0.3	0.0 ± 0.3	0.0 ± 0.2	1.0
I-131	-0.02 ± 0.22	-0.03 ± 0.16	0.08 ± 0.19	-0.07 ± 0.18	0.5
Mn-54	0.9 ± 2.9	1.1 ± 1.8	0.4 ± 0.8	1.1 ± 1.7	10
Fe-59	-2.5 ± 3.9	-5.1 ± 4.4	-1.3 ± 1.4	-1.4 ± 3.1	30
Co-58	-1.3 ± 2.3	0.2 ± 1.5	0.3 ± 0.8	0.7 ± 1.4	10
Co-60	-0.2 ± 2.4	-0.6 ± 2.0	-0.1 ± 0.8	1.2 ± 1.6	10
Zn-65	-0.1 ± 5.5	-1.5 ± 4.5	-10.0 ± 2.1	-6.1 ± 3.2	30
Zr-Nb-95	0.3 ± 2.7	-0.5 ± 1.9	-6.2 ± 0.9	0.2 ± 1.6	15
Cs-134	0.6 ± 2.4	0.2 ± 1.9	0.4 ± 0.9	1.4 ± 1.9	10
Cs-137	1.8 ± 2.1	-0.2 ± 2.1	0.2 ± 0.8	0.5 ± 1.8	10
Ba-La-140	-3.7 ± 3.3	-7.0 ± 1.8	-4.7 ± 0.9	-1.2 ± 1.7	15
Other Gammas ^a	0.3 ± 2.3	1.4 ± 2.2	-0.4 ± 0.7	-1.3 ± 1.8	30

^a Ru-103

POINT BEACH

Lake water, analyses for gross beta, iodine-131 and gamma emitting isotopes.

Location: E-01 (Meteorological Tower)

Collection: Monthly composites

Units: pCi/L

Lab Code	ELW-165	NS ^a	ELW-1880	ELW-2858	
Date Collected	1/10/01	2/14/01	3/14/01	4/11/01	Req. LLD
Gross beta	2.7 ± 0.6	-	2.3 ± 0.5	3.4 ± 0.7	4.0
I-131	0.22 ± 0.18	-	-0.06 ± 0.17	0.16 ± 0.18	0.5
Be-7	-0.5 ± 15.2	-	9.1 ± 13.5	9.6 ± 17.2	
Mn-54	-0.2 ± 1.6	-	2.1 ± 1.7	0.3 ± 2.2	10
Fe-59	-1.9 ± 2.8	-	1.0 ± 2.8	-5.2 ± 5.6	30
Co-58	-0.6 ± 1.4	-	0.3 ± 1.7	-0.8 ± 2.1	10
Co-60	-0.9 ± 1.7	-	0.6 ± 2.0	-1.3 ± 2.5	10
Zn-65	-0.4 ± 3.9	-	-0.8 ± 3.8	-1.0 ± 2.6	30
Zr-Nb-95	-1.1 ± 1.6	-	0.9 ± 1.6	-2.8 ± 2.3	15
Ru-103	-2.6 ± 1.8	-	-1.5 ± 1.7	-5.5 ± 2.1	15
Cs-134	0.7 ± 2.0	-	-0.8 ± 2.1	-1.3 ± 2.2	10
Cs-137	0.0 ± 1.7	-	-0.1 ± 1.6	1.1 ± 2.6	10
Ba-La-140	0.6 ± 1.6	-	-1.8 ± 2.1	-14.0 ± 4.0	15
Lab Code	ELW-3873	ELW-4890	ELW-5918	ELW-7054	
Date Collected	5/10/01	6/13/01	7/11/01	8/8/01	Req. LLD
Gross beta	2.8 ± 0.5	3.2 ± 0.7	2.0 ± 0.5	1.9 ± 0.5	4.0
I-131	0.02 ± 0.16	0.22 ± 0.26	-0.22 ± 0.19	0.05 ± 0.21	0.5
Be-7	-17.7 ± 17.8	13.5 ± 20.1	-7.1 ± 9.5	16.9 ± 31.9	
Mn-54	-0.7 ± 1.7	-0.4 ± 1.8	-0.3 ± 0.9	2.0 ± 3.4	10
Fe-59	-2.4 ± 3.9	1.9 ± 3.8	1.4 ± 1.9	0.8 ± 9.0	30
Co-58	-0.7 ± 1.8	-0.8 ± 2.2	-0.7 ± 0.8	-2.0 ± 4.2	10
Co-60	-0.5 ± 1.9	0.2 ± 1.9	-0.8 ± 0.9	3.3 ± 4.9	10
Zn-65	0.9 ± 3.6	-4.5 ± 4.2	-4.2 ± 2.1	-0.4 ± 8.1	30
Zr-Nb-95	-2.9 ± 2.1	0.4 ± 1.8	-1.1 ± 1.0	0.2 ± 3.3	15
Ru-103	-1.5 ± 2.1	-1.6 ± 2.0	-0.8 ± 1.1	-5.0 ± 3.4	15
Cs-134	-1.9 ± 2.0	1.8 ± 2.2	0.9 ± 1.0	1.5 ± 3.8	10
Cs-137	-0.4 ± 2.1	0.6 ± 2.2	0.0 ± 1.1	1.8 ± 4.1	10
Ba-La-140	3.1 ± 1.7	-0.1 ± 2.1	-0.4 ± 0.9	-1.3 ± 4.7	15
Lab Code	ELW-8013	ELW-9025	ELW-10488	ELW-11131	
Date Collected	9/13/01	10/9/01	11/14/01	12/12/01	Req. LLD
Gross beta	2.6 ± 0.7	3.2 ± 0.6	3.5 ± 0.7	3.2 ± 0.4	4.0
I-131	-0.04 ± 0.18	-0.20 ± 0.17	0.22 ± 0.26	0.20 ± 0.20	0.5
Be-7	23.4 ± 24.3	11.5 ± 10.9	0.4 ± 18.5	7.6 ± 32.6	
Mn-54	1.6 ± 3.0	-0.6 ± 1.4	-1.9 ± 2.8	-0.9 ± 4.1	10
Fe-59	0.8 ± 6.0	-1.7 ± 2.9	-6.0 ± 4.9	2.1 ± 7.5	30
Co-58	-1.5 ± 2.7	0.2 ± 1.4	1.1 ± 2.5	0.5 ± 3.6	10
Co-60	2.3 ± 2.6	0.3 ± 1.4	-1.7 ± 3.3	1.0 ± 5.1	10
Zn-65	-0.1 ± 5.2	-2.4 ± 3.5	1.0 ± 6.0	-4.0 ± 7.1	30
Zr-Nb-95	-2.2 ± 3.0	0.3 ± 1.4	-1.5 ± 2.3	-2.0 ± 4.0	15
Ru-103	-3.9 ± 2.9	-0.4 ± 1.3	0.9 ± 2.6	2.2 ± 3.2	15
Cs-134	0.0 ± 3.7	1.1 ± 1.5	2.2 ± 3.5	0.8 ± 4.3	10
Cs-137	-1.2 ± 3.5	-0.1 ± 1.5	0.9 ± 2.8	-0.4 ± 4.3	10
Ba-La-140	-5.9 ± 3.1	5.5 ± 4.9	1.2 ± 2.5	-2.0 ± 10.9	15

^aNS = No sample; sample not received.

POINT BEACH

Lake water, analyses for gross beta, iodine-131 and gamma emitting isotopes.

Location: E-05 (Two Creeks Park)

Collection: Monthly composites

Units: pCi/L

Lab Code	ELW-166	ELW-1062	ELW-1881	ELW-2859	Req. LLD
Date Collected	1/10/01	2/14/01	3/14/01	4/12/01	
Gross beta	2.3 ± 0.6	3.1 ± 0.5	2.3 ± 0.6	5.7 ± 0.8	4.0
I-131	-0.12 ± 0.16	0.12 ± 0.17	-0.08 ± 0.17	-0.03 ± 0.15	0.5
Be-7	-7.8 ± 11.3	-15.1 ± 17.0	11.2 ± 13.0	5.5 ± 16.1	
Mn-54	1.0 ± 1.1	-0.6 ± 2.0	-0.8 ± 1.6	-1.0 ± 1.6	10
Fe-59	-0.8 ± 2.1	2.7 ± 4.1	-1.8 ± 2.8	-2.7 ± 2.6	30
Co-58	0.9 ± 1.3	-1.4 ± 2.3	-0.9 ± 1.6	0.2 ± 1.4	10
Co-60	-0.7 ± 1.2	-1.8 ± 2.6	1.1 ± 1.8	-0.4 ± 1.8	10
Zn-65	-0.2 ± 2.7	0.6 ± 4.3	-0.2 ± 2.8	2.3 ± 3.0	30
Zr-Nb-95	0.0 ± 1.5	-2.2 ± 2.4	0.0 ± 1.5	0.1 ± 1.6	15
Ru-103	-1.1 ± 0.3	-0.3 ± 1.8	-0.1 ± 1.5	0.1 ± 1.9	15
Cs-134	0.1 ± 1.5	-1.4 ± 2.0	0.5 ± 1.9	1.4 ± 1.7	10
Cs-137	0.8 ± 1.3	1.6 ± 2.1	0.3 ± 1.7	1.0 ± 2.0	10
Ba-La-140	2.4 ± 1.4	1.8 ± 3.3	1.3 ± 1.5	-3.3 ± 1.7	15
Lab Code	ELW-3874	ELW-4891	ELW-5919	ELW-7143	Req. LLD
Date Collected	5/10/01	6/13/01	7/11/01	8/15/01	
Gross beta	2.4 ± 0.5	2.7 ± 0.6	3.6 ± 0.6	1.6 ± 0.6	4.0
I-131	-0.05 ± 0.15	-0.10 ± 0.16	0.03 ± 0.23	-0.02 ± 0.16	0.5
Be-7	-6.4 ± 15.1	18.2 ± 15.8	4.0 ± 8.2	21.4 ± 33.7	
Mn-54	0.8 ± 1.7	-0.3 ± 1.6	0.2 ± 0.8	6.6 ± 4.5	10
Fe-59	1.0 ± 2.9	2.0 ± 3.1	0.1 ± 1.5	-2.9 ± 9.2	30
Co-58	1.4 ± 1.5	-0.5 ± 1.7	0.0 ± 0.8	-3.7 ± 4.5	10
Co-60	-0.8 ± 1.7	-1.8 ± 1.7	0.1 ± 1.0	1.8 ± 4.6	10
Zn-65	1.5 ± 2.5	-4.9 ± 4.1	-3.5 ± 1.8	-4.5 ± 9.4	30
Zr-Nb-95	-1.4 ± 1.6	-1.0 ± 1.7	1.1 ± 0.9	-0.2 ± 3.4	15
Ru-103	-2.3 ± 1.6	-0.6 ± 1.7	0.1 ± 1.0	0.5 ± 3.0	15
Cs-134	0.5 ± 1.6	0.2 ± 2.2	0.8 ± 1.0	-2.8 ± 3.3	10
Cs-137	-0.7 ± 1.8	0.4 ± 1.9	0.5 ± 1.0	1.2 ± 3.8	10
Ba-La-140	-5.6 ± 1.9	2.7 ± 1.5	-2.2 ± 1.0	-6.5 ± 4.2	15
Lab Code	ELW-8014	ELW-9026	ELW-10489	ELW-11132	Req. LLD
Date Collected	9/12/01	10/10/01	11/14/01	12/12/01	
Gross beta	2.1 ± 0.6	3.2 ± 0.6	2.7 ± 0.6	2.8 ± 0.4	4.0
I-131	0.03 ± 0.21	-0.17 ± 0.16	0.08 ± 0.28	0.06 ± 0.23	0.5
Be-7	23.1 ± 23.4	-6.0 ± 17.4	1.0 ± 23.6	-16.1 ± 36.4	
Mn-54	2.6 ± 2.9	-0.1 ± 1.5	-0.4 ± 3.0	-1.9 ± 4.6	10
Fe-59	-3.1 ± 6.0	-2.1 ± 3.1	1.4 ± 5.8	-9.1 ± 11.3	30
Co-58	-0.7 ± 2.9	1.7 ± 1.8	1.8 ± 2.5	-4.1 ± 5.6	10
Co-60	1.2 ± 2.8	-0.8 ± 1.8	-2.4 ± 3.8	1.2 ± 5.6	10
Zn-65	2.6 ± 6.2	1.0 ± 3.6	0.8 ± 5.9	-4.1 ± 12.2	30
Zr-Nb-95	-2.0 ± 3.2	2.4 ± 1.7	1.4 ± 2.7	4.2 ± 4.9	15
Ru-103	0.7 ± 2.9	1.9 ± 1.9	-2.3 ± 2.6	-0.1 ± 4.1	15
Cs-134	3.2 ± 3.2	0.8 ± 1.7	-0.7 ± 3.2	0.5 ± 4.9	10
Cs-137	-1.3 ± 2.6	-0.2 ± 1.9	3.0 ± 2.9	-1.9 ± 4.6	10
Ba-La-140	2.1 ± 3.0	3.6 ± 1.7	-5.1 ± 3.3	-0.2 ± 7.4	15

POINT BEACH

Lake water, analyses for gross beta, iodine-131 and gamma emitting isotopes.

Location: E-06 (Coast Guard Station)

Collection: Monthly composites

Units: pCi/L

Lab Code	ELW-167	NS ^a	ELW-1882	ELW-2860	
Date Collected	1/10/01	2/14/01	3/14/01	4/12/01	Req. LLD
Gross beta	2.5 ± 0.6	-	4.1 ± 0.7	4.0 ± 0.7	4.0
I-131	-0.12 ± 0.20	-	-0.08 ± 0.20	0.01 ± 0.15	0.5
Be-7	12.7 ± 12.5	-	0.3 ± 10.6	-19.1 ± 17.5	
Mn-54	0.3 ± 1.6	-	-0.4 ± 1.3	-0.2 ± 1.7	10
Fe-59	-1.9 ± 3.3	-	-3.4 ± 2.6	0.7 ± 3.1	30
Co-58	0.5 ± 1.7	-	-0.6 ± 1.4	0.6 ± 1.6	10
Co-60	0.5 ± 1.6	-	-0.5 ± 1.7	-0.1 ± 1.6	10
Zn-65	0.4 ± 3.2	-	-1.9 ± 2.7	0.3 ± 3.1	30
Zr-Nb-95	-1.1 ± 2.1	-	-1.2 ± 1.3	-1.9 ± 1.9	15
Ru-103	-0.7 ± 1.5	-	0.6 ± 1.1	-0.5 ± 1.8	15
Cs-134	-1.7 ± 2.0	-	0.9 ± 1.4	0.4 ± 1.7	10
Cs-137	0.7 ± 1.4	-	-0.1 ± 1.2	0.6 ± 1.8	10
Ba-La-140	0.7 ± 2.5	-	-0.4 ± 1.5	-5.6 ± 1.9	15
Lab Code	ELW-3875	ELW-4892	ELW-5920,1	ELW-7144	
Date Collected	5/10/01	6/13/01	7/11/01	8/15/01	Req. LLD
Gross beta	2.3 ± 0.5	2.1 ± 0.6	3.1 ± 0.4	2.5 ± 0.5	4.0
I-131	0.17 ± 0.17	-0.08 ± 0.16	-0.01 ± 0.21	-0.06 ± 0.17	0.5
Be-7	-7.5 ± 13.5	-6.1 ± 16.1	0.8 ± 6.4	25.4 ± 33.9	
Mn-54	1.8 ± 1.5	0.4 ± 1.9	-0.5 ± 0.8	3.3 ± 4.2	10
Fe-59	-0.5 ± 3.7	0.2 ± 3.7	-3.1 ± 1.4	4.4 ± 6.6	30
Co-58	0.1 ± 1.5	0.5 ± 2.1	0.4 ± 0.7	3.7 ± 3.8	10
Co-60	-1.2 ± 2.0	1.5 ± 2.5	0.6 ± 0.8	3.6 ± 5.0	10
Zn-65	-3.4 ± 4.2	-1.3 ± 3.8	-2.0 ± 1.6	-6.0 ± 8.2	30
Zr-Nb-95	0.4 ± 1.7	1.3 ± 2.1	0.0 ± 0.8	1.1 ± 3.7	15
Ru-103	-0.7 ± 1.5	1.4 ± 2.0	-1.4 ± 0.7	-1.6 ± 3.8	15
Cs-134	-0.6 ± 2.2	0.6 ± 2.7	-0.6 ± 0.8	-1.2 ± 5.0	10
Cs-137	1.4 ± 1.9	-2.3 ± 2.5	0.2 ± 0.8	-3.0 ± 4.4	10
Ba-La-140	2.2 ± 2.4	-4.4 ± 2.4	-6.1 ± 0.9	5.3 ± 6.5	15
Lab Code	ELW-8015	ELW-9027,8	ELW-10490	ELW-11133	
Date Collected	9/12/01	10/10/01	11/15/01	12/12/01	Req. LLD
Gross beta	2.2 ± 0.6	2.6 ± 0.4	2.8 ± 0.6	2.5 ± 0.4	4.0
I-131	0.02 ± 0.26	-0.01 ± 0.20	-0.10 ± 0.27	0.01 ± 0.19	0.5
Be-7	7.6 ± 21.9	-7.0 ± 14.9	-16.2 ± 25.5	-14.5 ± 24.7	
Mn-54	-1.2 ± 2.7	1.0 ± 1.3	-2.1 ± 3.5	0.9 ± 3.3	10
Fe-59	-4.3 ± 6.0	-1.3 ± 2.9	-1.7 ± 5.4	0.6 ± 6.2	30
Co-58	0.6 ± 2.9	-2.0 ± 1.3	-3.4 ± 3.4	-1.3 ± 3.0	10
Co-60	3.0 ± 3.0	1.0 ± 1.6	-0.2 ± 4.3	0.5 ± 3.8	10
Zn-65	-2.4 ± 7.1	-0.2 ± 3.0	-6.6 ± 6.5	-1.2 ± 5.4	30
Zr-Nb-95	2.2 ± 2.8	1.1 ± 1.4	0.1 ± 2.7	0.7 ± 3.6	15
Ru-103	0.9 ± 2.8	-2.6 ± 2.3	-1.3 ± 3.0	1.1 ± 2.7	15
Cs-134	-1.5 ± 3.4	0.9 ± 1.8	3.2 ± 3.1	-2.7 ± 4.0	10
Cs-137	0.6 ± 3.2	0.8 ± 1.6	-3.0 ± 3.6	-2.1 ± 2.8	10
Ba-La-140	-0.8 ± 3.5	-3.5 ± 1.9	-3.1 ± 4.1	-2.4 ± 3.9	15

^aNS = No sample; sample not received.

POINT BEACH

Lake water, analyses for gross beta, iodine-131 and gamma emitting isotopes.

Location: E-33 (Nature Conservancy)

Collection: Monthly composites

Units: pCi/L

Lab Code	ELW-168	NS ^a	ELW-1883	ELW-2861	Req. LLD
Date Collected	1/10/01	2/14/01	3/14/01	4/12/01	
Gross beta	2.3 ± 0.6	-	2.8 ± 0.7	6.1 ± 0.8 ^b	4.0
I-131	0.05 ± 0.20	-	-0.07 ± 0.18	0.10 ± 0.17	0.5
Be-7	-6.6 ± 14.4	-	2.3 ± 7.4	0.4 ± 8.1	
Mn-54	-1.4 ± 1.3	-	-0.4 ± 1.0	-0.5 ± 0.8	10
Fe-59	-0.3 ± 3.1	-	-1.3 ± 1.7	0.3 ± 1.6	30
Co-58	0.1 ± 1.4	-	-0.5 ± 0.8	0.1 ± 0.8	10
Co-60	0.3 ± 2.0	-	-0.2 ± 1.0	0.1 ± 0.8	10
Zn-65	-1.4 ± 3.2	-	-0.8 ± 2.3	0.4 ± 1.6	30
Zr-Nb-95	1.0 ± 1.8	-	-1.4 ± 1.0	-0.4 ± 0.8	15
Ru-103	-0.1 ± 1.5	-	-0.7 ± 0.9	-2.4 ± 0.9	15
Cs-134	1.5 ± 1.8	-	1.1 ± 1.0	-0.5 ± 0.8	10
Cs-137	1.4 ± 1.5	-	0.3 ± 0.9	0.9 ± 0.9	10
Ba-La-140	5.4 ± 1.2	-	1.5 ± 1.1	-0.2 ± 1.0	15

Lab Code	ELW-3876	ELW-4893	ELW-5922	ELW-7145,6	Req. LLD
Date Collected	5/10/01	6/13/01	7/11/01	8/15/01	
Gross beta	2.0 ± 0.5	4.4 ± 0.8	2.7 ± 0.5	3.2 ± 0.4	4.0
I-131	0.11 ± 0.17	-0.09 ± 0.17	0.12 ± 0.19	-0.18 ± 0.23	0.5
Be-7	-17.6 ± 14.1	28.8 ± 16.0	-0.8 ± 9.4	-18.6 ± 27.2	
Mn-54	-0.1 ± 2.0	0.2 ± 1.8	-0.1 ± 1.2	0.2 ± 3.2	10
Fe-59	-2.8 ± 4.3	0.6 ± 3.7	-3.8 ± 2.1	0.9 ± 7.3	30
Co-58	-2.6 ± 2.0	-3.3 ± 2.0	0.4 ± 1.2	-0.1 ± 4.1	10
Co-60	-1.8 ± 2.5	2.2 ± 1.9	1.8 ± 1.3	-0.3 ± 4.3	10
Zn-65	-4.6 ± 5.0	-4.6 ± 4.2	-0.8 ± 2.3	-5.3 ± 5.7	30
Zr-Nb-95	-2.3 ± 2.2	-4.9 ± 2.0	-1.0 ± 1.2	3.3 ± 3.6	15
Ru-103	-1.8 ± 2.0	-0.2 ± 1.8	0.4 ± 1.1	0.3 ± 2.7	15
Cs-134	-0.2 ± 2.4	-0.6 ± 1.9	1.1 ± 1.4	-1.8 ± 4.4	10
Cs-137	0.4 ± 2.0	2.0 ± 2.2	0.4 ± 1.3	2.9 ± 3.9	10
Ba-La-140	-3.7 ± 1.9	6.8 ± 2.3	-3.7 ± 1.3	-2.8 ± 3.6	15

Lab Code	NS ^a	ELW-9029	ELW-10491	ELW-11134	
Date Collected	9/12/01	10/10/01	11/15/01	12/12/01	
Gross beta	-	2.7 ± 0.6	3.8 ± 0.7	3.3 ± 0.4	
I-131	-	-0.20 ± 0.21	0.21 ± 0.27	-0.16 ± 0.18	
Be-7	-	19.3 ± 6.8	-0.3 ± 28.1	4.7 ± 16.9	
Mn-54	-	-0.3 ± 6.3	1.7 ± 3.5	0.3 ± 1.4	
Fe-59	-	-0.1 ± 1.3	1.6 ± 7.0	1.5 ± 3.1	
Co-58	-	-0.8 ± 0.6	1.7 ± 3.2	2.2 ± 1.7	
Co-60	-	0.6 ± 0.7	1.5 ± 3.7	3.3 ± 2.1	
Zn-65	-	-1.0 ± 1.5	-7.4 ± 8.0	-1.1 ± 3.4	
Zr-Nb-95	-	1.1 ± 0.7	5.1 ± 3.3	0.3 ± 1.9	
Ru-103	-	0.2 ± 0.8	-2.2 ± 3.1	-0.5 ± 2.0	
Cs-134	-	-0.7 ± 0.8	-2.6 ± 3.9	0.3 ± 2.1	
Cs-137	-	-0.2 ± 0.8	-0.8 ± 3.2	-0.1 ± 2.2	
Ba-La-140	-	-2.9 ± 0.7	0.6 ± 4.2	-2.7 ± 2.3	

^a NS = No sample; sample not received.

^b Gross beta repeated with a result of 9.7±1.1 pCi/L.

POINT BEACH

Lake water, analyses for tritium, strontium-89 and strontium-90.

Collection: Quarterly composites of weekly grab samples

Units: pCi/L

Location		E-01 (Meteorological Tower)			
Period	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.	
Lab Code	ELW-2029	ELW-4948	ELW-8729	ELW-11408	
H-3	99 ± 94	162 ± 83	183 ± 88	48 ± 80	
Sr-89	0.53 ± 0.78	-0.51 ± 0.54	-0.98 ± 0.99	0.00 ± 1.23	
Sr-90	0.23 ± 0.40	0.78 ± 0.29	0.88 ± 0.37	0.16 ± 0.48	

Location		E-05 (Two Creeks Park)			
Period	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.	
Lab Code	ELW-2030	ELW-4949	ELW-8730	ELW-11409	
H-3	105 ± 94	227 ± 86	74 ± 83	99 ± 82	
Sr-89	-0.64 ± 0.69	0.73 ± 0.73	-0.89 ± 1.09	0.94 ± 1.23	
Sr-90	0.83 ± 0.34	0.48 ± 0.29	0.97 ± 0.39	0.10 ± 0.46	

Location		E-06 (Coast Guard Station)			
Period	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.	
Lab Code	ELW-2031	ELW-4950	ELW-8731	ELW-11410	
H-3	73 ± 93	227 ± 86	123 ± 85	48 ± 80	
Sr-89	-0.26 ± 0.71	-0.05 ± 0.57	0.63 ± 0.89	-1.84 ± 1.20	
Sr-90	0.77 ± 0.36	0.43 ± 0.30	0.45 ± 0.30	0.84 ± 0.45	

Location		E-33 (Nature Conservancy)			
Period	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.	
Lab Code	ELW-2032	ELW-4951	ELW-8732 ^a	ELW-11411	
H-3	-23 ± 89	151 ± 83	107 ± 85	107 ± 83	
Sr-89	-0.39 ± 0.75	0.27 ± 0.64	-0.44 ± 1.23	-2.38 ± 1.24	
Sr-90	0.82 ± 0.38	0.36 ± 0.32	0.45 ± 0.29	1.12 ± 0.46	

Note: pages 23 and 24 are intentionally left out.

^a Results reflect two collections during quarter; no sample for September. See Table 2.0, "Listing of Missed Samples."

POINT BEACH NUCLEAR PLANT

Fish, analyses for gross beta and gamma emitting isotopes.

Location: E-13

Collection: 3x / year

Units: pCi/g wet

Sample Description and Concentration					Required LLD
Collection Date	03-13-01	03-13-01	03-13-01	08-08-01	
Lab Code	EF-1793	EF-1794	EF-1795	EF-6957	
Type	German Brown	Lake Trout	Sucker	Salmon	
Ratio (wet/dry wt.)	1.56	1.62	1.35	3.53	
Gross Beta	2.94 ± 0.08	3.31 ± 0.08	2.00 ± 0.06	2.89 ± 0.08	0.5
K-40	2.78 ± 0.327	2.61 ± 0.242	2.19 ± 0.300	2.37 ± 0.251	
Mn-54	0.000 ± 0.008	0.001 ± 0.005	0.000 ± 0.006	0.004 ± 0.005	0.13
Fe-59	0.011 ± 0.015	0.008 ± 0.012	-0.003 ± 0.014	0.001 ± 0.008	0.26
Co-58	-0.001 ± 0.009	-0.001 ± 0.005	-0.004 ± 0.005	-0.003 ± 0.005	0.13
Co-60	-0.003 ± 0.008	0.000 ± 0.006	-0.003 ± 0.009	-0.003 ± 0.006	0.13
Zn-65	-0.002 ± 0.017	-0.025 ± 0.015	0.008 ± 0.014	0.005 ± 0.010	0.26
Ru-103	0.002 ± 0.007	0.000 ± 0.005	0.010 ± 0.007	-0.002 ± 0.005	0.5
Cs-134	-0.005 ± 0.008	0.002 ± 0.006	-0.003 ± 0.008	0.007 ± 0.006	0.13
Cs-137	0.003 ± 0.015	0.014 ± 0.006	0.033 ± 0.014	0.027 ± 0.009	0.15
Collection Date	08-08-01	08-08-01	08-08-01	09-14-01	
Lab Code	EF-6958	EF-6959	EF-6960	EF-8008	
Type	Salmon	Trout	Trout	Brown Trout	
Ratio (wet/dry wt.)	3.92	3.49	4.00	4.66	
Gross Beta	2.77 ± 0.10	3.81 ± 0.11	4.25 ± 0.15	2.86 ± 0.08	0.5
K-40	3.39 ± 0.288	3.18 ± 0.422	3.37 ± 0.324	2.87 ± 0.278	
Mn-54	-0.001 ± 0.004	0.000 ± 0.008	-0.002 ± 0.005	0.005 ± 0.004	0.13
Fe-59	0.003 ± 0.011	-0.031 ± 0.018	0.004 ± 0.012	0.001 ± 0.012	0.26
Co-58	0.003 ± 0.005	0.002 ± 0.007	-0.004 ± 0.005	-0.002 ± 0.005	0.13
Co-60	0.004 ± 0.006	0.003 ± 0.009	0.004 ± 0.005	0.006 ± 0.006	0.13
Zn-65	-0.014 ± 0.014	-0.015 ± 0.020	-0.024 ± 0.015	-0.003 ± 0.013	0.26
Ru-103	0.001 ± 0.005	-0.012 ± 0.008	-0.001 ± 0.004	0.004 ± 0.005	0.5
Cs-134	-0.001 ± 0.006	0.004 ± 0.008	0.004 ± 0.006	-0.004 ± 0.006	0.13
Cs-137	0.027 ± 0.011	0.042 ± 0.016	0.036 ± 0.011	0.047 ± 0.012	0.15

POINT BEACH NUCLEAR PLANT

Fish, analyses for gross beta and gamma emitting isotopes.

Location: E-13

Collection: 3x / year

Units: pCi/L

Sample Description and Concentration (pCi/g wet)					Required LLD
Collection Date	09-14-01	09-14-01	09-14-01	12-12-01	
Lab Code	EF-8009	EF-8010	EF-8011,2	EF-11078	
Type	Lake Trout	Smallmouth Bass	Whitefish	Whitefish	
Ratio (wet/dry wt.)	2.13	4.64	4.13	2.50	
Gross Beta	2.73 ± 0.11	3.19 ± 0.10	3.59 ± 0.08	5.22 ± 0.15	0.5
K-40	2.86 ± 0.287	3.41 ± 0.785	3.43 ± 0.348	3.28 ± 0.363	
Mn-54	0.001 ± 0.005	0.023 ± 0.020	-0.004 ± 0.011	0.001 ± 0.007	0.13
Fe-59	0.008 ± 0.010	-0.031 ± 0.042	0.008 ± 0.022	0.001 ± 0.015	0.26
Co-58	0.000 ± 0.004	-0.007 ± 0.022	-0.004 ± 0.010	-0.001 ± 0.007	0.13
Co-60	0.009 ± 0.006	-0.008 ± 0.025	-0.005 ± 0.013	0.001 ± 0.009	0.13
Zn-65	-0.006 ± 0.013	0.005 ± 0.045	-0.013 ± 0.023	-0.002 ± 0.019	0.26
Ru-103	-0.001 ± 0.004	-0.016 ± 0.017	-0.009 ± 0.009	0.003 ± 0.007	0.5
Cs-134	0.007 ± 0.006	0.000 ± 0.022	0.001 ± 0.011	0.006 ± 0.008	0.13
Cs-137	0.059 ± 0.015	0.045 ± 0.026	0.049 ± 0.015	0.042 ± 0.017	0.15
Collection Date	12-12-01	12-12-01	12-12-01		
Lab Code	EF-11079	EF-11080	EF-11081		
Type	Lake Trout	Sm. Brown Trout	Large Brown Trout		
Ratio (wet/dry wt.)	3.72	3.74	3.27		
Gross Beta	3.10 ± 0.11	2.57 ± 0.07	4.88 ± 0.16		
K-40	2.87 ± 0.291	3.21 ± 0.350	3.13 ± 0.238		
Mn-54	-0.001 ± 0.005	-0.001 ± 0.007	0.000 ± 0.004		
Fe-59	-0.013 ± 0.012	-0.029 ± 0.018	0.001 ± 0.009		
Co-58	-0.001 ± 0.006	0.002 ± 0.006	-0.001 ± 0.004		
Co-60	-0.001 ± 0.006	-0.002 ± 0.008	0.003 ± 0.004		
Zn-65	0.009 ± 0.014	0.015 ± 0.018	-0.001 ± 0.010		
Ru-103	-0.001 ± 0.004	0.004 ± 0.005	-0.003 ± 0.003		
Cs-134	0.003 ± 0.006	0.003 ± 0.007	-0.002 ± 0.005		
Cs-137	0.065 ± 0.015	0.069 ± 0.017	0.049 ± 0.009		

Note: Page 27 is intentionally left out.

POINT BEACH NUCLEAR PLANT
RADIOACTIVITY IN SHORELINE SEDIMENT SAMPLES

(Semiannual Collections)

Sample Description and Concentration (pCi/g dry)

Collection Date Lab Code	04-12-01 ESS-2878 ^a	04-12-01 ESS-2879	04-12-01 ESS-2880	Required LLD
Location	E-01	E-05	E-06	
Gross Beta	5.09 ± 1.68	6.05 ± 1.87	9.79 ± 2.19	2.0
Be-7	0.14 ± 0.056	0.062 ± 0.025	0.056 ± 0.034	
K-40	4.66 ± 0.16	3.90 ± 0.15	7.68 ± 0.30	-
Cs-137	0.024 ± 0.004	0.014 ± 0.005	0.031 ± 0.011	0.15
Tl-208	0.038 ± 0.007	0.046 ± 0.008	0.033 ± 0.010	-
Pb-212	0.11 ± 0.008	0.11 ± 0.009	0.11 ± 0.011	-
Bi-214	0.15 ± 0.016	0.16 ± 0.012	0.13 ± 0.025	-
Ra-226	0.38 ± 0.073	0.36 ± 0.080	0.30 ± 0.085	-
Ac-228	0.14 ± 0.022	0.11 ± 0.023	0.13 ± 0.032	-

Collection Date Lab Code	04-12-01 ESS-2881 ^b	04-12-01 ESS-2882	
Location	E-12	E-33	
Gross Beta	6.75 ± 1.81	9.91 ± 2.16	2.0
Be-7	0.020 ± 0.025	0.027 ± 0.023	
K-40	5.05 ± 0.18	7.85 ± 0.23	-
Cs-137	0.026 ± 0.006	0.026 ± 0.007	•0.15
Tl-208	0.035 ± 0.008	0.045 ± 0.008	-
Pb-212	0.098 ± 0.009	0.12 ± 0.009	-
Bi-214	0.11 ± 0.014	0.15 ± 0.013	-
Ra-226	0.27 ± 0.080	0.29 ± 0.077	-
Ac-228	0.10 ± 0.018	0.13 ± 0.030	-

^a Co-58 activity detected; result = 0.011±0.004 pCi/g dry. Repeat result = 0.009±0.004 pCi/g dry.

^b Co-58 activity detected; result = 0.014±0.006 pCi/g dry. Repeat result = 0.017±0.005 pCi/g dry.

POINT BEACH NUCLEAR PLANT
 RADIOACTIVITY IN SHORELINE SEDIMENT SAMPLES

(Semiannual Collections)

Sample Description and Concentration (pCi/g dry)

Collection Date	10-09-01	10-10-01	10-10-01	Required LLD
Lab Code	ESS-9102	ESS-9149	ESS-9150	
Location	E-01	E-05	E-06	
Gross Beta	7.52 ± 1.32	9.81 ± 1.37	11.23 ± 1.55	2.0
Be-7	0.056 ± 0.042	-0.020 ± 0.052	0.048 ± 0.054	
K-40	4.99 ± 0.34	8.39 ± 0.48	7.21 ± 0.44	-
Cs-137	0.040 ± 0.014	0.028 ± 0.014	0.044 ± 0.019	0.15
Tl-208	0.058 ± 0.016	0.048 ± 0.014	0.089 ± 0.018	-
Pb-212	0.19 ± 0.055	0.21 ± 0.059	0.24 ± 0.024	-
Bi-214	0.14 ± 0.037	0.20 ± 0.046	0.22 ± 0.040	-
Ra-226	0.27 ± 0.13	0.42 ± 0.14	0.48 ± 0.13	-
Ac-228	0.17 ± 0.047	0.19 ± 0.051	0.27 ± 0.073	-
Collection Date	10-11-01	10-10-01		
Lab Code	ESS-9103	ESS-9151		
Location	E-12	E-33		
Gross Beta	6.45 ± 1.21	10.89 ± 1.38		2.0
Be-7	0.020 ± 0.047	0.096 ± 0.049		-
K-40	5.84 ± 0.37	9.51 ± 0.49		-
Cs-137	0.028 ± 0.015	0.034 ± 0.017		0.15
Tl-208	0.033 ± 0.014	0.048 ± 0.020		-
Pb-212	0.15 ± 0.052	0.19 ± 0.055		-
Bi-214	0.14 ± 0.033	0.12 ± 0.031		-
Ra-226	0.35 ± 0.13	0.30 ± 0.13		-
Ac-228	0.13 ± 0.060	0.17 ± 0.057		-

POINT BEACH NUCLEAR PLANT
RADIOACTIVITY IN SOIL SAMPLES
(Semiannual Collections)

Sample Description and Concentration (pCi/g dry)				
Collection Date	05-22-01	05-23-01	05-23-01	Required
Lab Code	ESO-4171	ESO-4172	ESO-4173	LLD
Location	E-01	E-02	E-03	
Gross Beta	24.03 ± 2.71	21.32 ± 2.42	27.06 ± 2.73	2.0
Be-7	0.08 ± 0.14	0.23 ± 0.13	0.13 ± 0.05	
K-40	15.57 ± 1.10	16.87 ± 1.16	20.60 ± 0.42	-
Cs-137	0.23 ± 0.05	0.11 ± 0.03	0.23 ± 0.01	0.15
Tl-208	0.20 ± 0.04	0.15 ± 0.04	0.22 ± 0.02	-
Pb-212	0.52 ± 0.05	0.40 ± 0.04	0.62 ± 0.02	-
Bi-214	0.38 ± 0.08	0.32 ± 0.06	0.49 ± 0.03	-
Ra-226	1.31 ± 0.46	0.78 ± 0.32	1.25 ± 0.17	-
Ac-228	0.55 ± 0.12	0.60 ± 0.19	0.66 ± 0.07	-
Collection Date	05-23-01	05-23-01	05-22-01	
Lab Code	ESO-4174	ESO-4175	ESO-4176	
Location	E-04	E-06	E-08	
Gross Beta	27.98 ± 2.93	19.99 ± 2.41	21.88 ± 2.39	2.0
Be-7	0.06 ± 0.04	-0.06 ± 0.13	0.12 ± 0.12	
K-40	18.00 ± 0.38	11.74 ± 1.02	15.28 ± 1.01	-
Cs-137	0.18 ± 0.02	0.96 ± 0.07	0.32 ± 0.04	0.15
Tl-208	0.16 ± 0.02	0.06 ± 0.03	0.10 ± 0.03	-
Pb-212	0.50 ± 0.02	0.21 ± 0.04	0.26 ± 0.03	-
Bi-214	0.35 ± 0.02	0.13 ± 0.05	0.20 ± 0.05	-
Ra-226	1.04 ± 0.21	0.65 ± 0.29	0.58 ± 0.21	-
Ac-228	0.50 ± 0.05	0.26 ± 0.15	0.23 ± 0.10	-
Collection Date	05-23-01	05-22-01	05-23-01	
Lab Code	ESO-4177	ESO-4178	ESO-4179,80	
Location	E-09	E-20	E-37	
Gross Beta	26.84 ± 2.63	25.78 ± 2.67	25.67 ± 1.82	2.0
Be-7	0.09 ± 0.09	0.09 ± 0.09	0.11 ± 0.10	
K-40	20.84 ± 0.83	17.70 ± 0.84	16.20 ± 0.59	-
Cs-137	0.17 ± 0.03	0.34 ± 0.04	0.47 ± 0.03	0.15
Tl-208	0.18 ± 0.03	0.15 ± 0.03	0.15 ± 0.02	-
Pb-212	0.65 ± 0.10	0.47 ± 0.04	0.39 ± 0.03	-
Bi-214	0.44 ± 0.07	0.36 ± 0.07	0.36 ± 0.04	-
Ra-226	1.10 ± 0.26	0.73 ± 0.27	0.79 ± 0.51	-
Ac-228	0.69 ± 0.10	0.55 ± 0.11	0.49 ± 0.10	-

POINT BEACH NUCLEAR PLANT
RADIOACTIVITY IN SOIL SAMPLES
(Semiannual Collections)

Sample Description and Concentration (pCi/g dry)

Collection Date	10-24-01	10-24-01	10-24-01	Required
Lab Code	ESO-9689	ESO-9690	ESO-9691	LLD
Location	E-01	E-02	E-03	
Gross Beta	24.99 ± 3.05	25.18 ± 2.89	26.39 ± 2.91	2.0
Be-7	0.11 ± 0.13	-0.094 ± 0.08	0.12 ± 0.10	
K-40	17.95 ± 1.00	18.42 ± 0.81	17.67 ± 0.87	-
Cs-137	0.26 ± 0.04	0.22 ± 0.04	0.23 ± 0.04	0.15
Tl-208	0.23 ± 0.04	0.18 ± 0.03	0.20 ± 0.04	-
Pb-212	0.61 ± 0.04	0.53 ± 0.04	0.51 ± 0.04	-
Bi-214	0.44 ± 0.06	0.41 ± 0.06	0.44 ± 0.07	-
Ra-226	1.39 ± 0.32	0.75 ± 0.27	0.59 ± 0.29	-
Ac-228	0.74 ± 0.15	0.64 ± 0.11	0.57 ± 0.12	-

Collection Date	10-24-01	10-24-01	10-24-01	
Lab Code	ESO-9692	ESO-9693	ESO-9694	
Location	E-04	E-06	E-08	
Gross Beta	22.92 ± 2.89	11.26 ± 2.34	17.15 ± 2.44	2.0
Be-7	0.04 ± 0.07	-0.03 ± 0.08	0.09 ± 0.06	
K-40	15.41 ± 0.72	8.24 ± 0.60	12.16 ± 0.55	-
Cs-137	0.17 ± 0.03	0.03 ± 0.01	0.19 ± 0.03	0.15
Tl-208	0.13 ± 0.03	0.11 ± 0.03	0.11 ± 0.03	-
Pb-212	0.34 ± 0.03	0.27 ± 0.03	0.21 ± 0.03	-
Bi-214	0.28 ± 0.05	0.18 ± 0.05	0.22 ± 0.04	-
Ra-226	0.63 ± 0.19	0.50 ± 0.21	0.54 ± 0.16	-
Ac-228	0.49 ± 0.09	0.38 ± 0.09	0.33 ± 0.06	-

Collection Date	10-24-01	10-24-01	10-24-01	
Lab Code	ESO-9695	ESO-9696	ESO-9697	
Location	E-09	E-20	E-37	
Gross Beta	30.23 ± 3.21	22.85 ± 2.63	21.19 ± 2.43	2.0
Be-7	0.07 ± 0.09	0.01 ± 0.11	-0.12 ± 0.10	
K-40	20.08 ± 0.82	15.85 ± 1.03	15.68 ± 0.88	-
Cs-137	0.18 ± 0.04	0.20 ± 0.04	0.46 ± 0.04	0.15
Tl-208	0.18 ± 0.03	0.18 ± 0.04	0.11 ± 0.03	-
Pb-212	0.52 ± 0.04	0.48 ± 0.05	0.37 ± 0.04	-
Bi-214	0.42 ± 0.06	0.39 ± 0.10	0.34 ± 0.05	-
Ra-226	0.99 ± 0.27	0.82 ± 0.33	0.92 ± 0.26	-
Ac-228	0.67 ± 0.10	0.57 ± 0.18	0.46 ± 0.13	-

POINT BEACH NUCLEAR PLANT
RADIOACTIVITY IN VEGETATION SAMPLES
(Tri-Annual Collections)

Sample Description and Concentration (pCi/g wet)

Location	E-01	E-02	E-03	
Collection Date	05-23-01	05-23-01	05-23-01	
Lab Code	EG-4162	EG-4163	EG-4164	Req. LLD
Ratio (wet/dry)	5.17	5.18	6.53	-
Gross Beta	5.33 ± 0.16	5.91 ± 0.17	5.00 ± 0.14	0.25
Be-7	0.44 ± 0.19	0.21 ± 0.10	0.24 ± 0.14	0.25
K-40	4.67 ± 0.63	6.65 ± 0.63	5.60 ± 0.63	0.25
I-131	0.000 ± 0.008	0.002 ± 0.009	0.004 ± 0.008	0.060
Cs-134	-0.010 ± 0.015	0.009 ± 0.012	-0.007 ± 0.011	0.060
Cs-137	-0.004 ± 0.012	-0.004 ± 0.008	0.002 ± 0.010	0.080
Other Gammas ^a	0.009 ± 0.013	0.001 ± 0.014	-0.004 ± 0.012	0.060

Location	E-04	E-06	E-08	
Collection Date	05-23-01	05-23-01	05-23-01	
Lab Code	EG-4165	EG-4166	EG-4167	Req. LLD
Ratio (wet/dry)	5.63	4.05	3.71	-
Gross Beta	4.92 ± 0.17	4.83 ± 0.14	5.89 ± 0.17	0.25
Be-7	0.27 ± 0.10	0.60 ± 0.24	0.66 ± 0.27	0.25
K-40	4.66 ± 0.54	4.77 ± 0.60	6.08 ± 0.90	0.25
I-131	-0.011 ± 0.011	0.006 ± 0.009	-0.017 ± 0.014	0.060
Cs-134	0.008 ± 0.012	-0.003 ± 0.011	0.003 ± 0.017	0.060
Cs-137	0.009 ± 0.011	0.007 ± 0.010	0.010 ± 0.014	0.080
Other Gammas ^a	0.008 ± 0.012	0.002 ± 0.012	-0.005 ± 0.021	0.060

Location	E-09	E-20	E-37	
Collection Date	05-23-01	05-23-01	05-23-01	
Lab Code	EG-4168	EG-4169	EG-4170	Req. LLD
Ratio (wet/dry)	6.59	5.70	5.13	-
Gross Beta	3.21 ± 0.11	6.13 ± 0.18	5.12 ± 0.15	0.25
Be-7	0.29 ± 0.13	0.28 ± 0.17	0.29 ± 0.16	0.25
K-40	5.08 ± 0.69	6.43 ± 0.64	5.40 ± 0.63	0.25
I-131	0.001 ± 0.009	-0.008 ± 0.010	0.003 ± 0.009	0.060
Cs-134	0.012 ± 0.014	0.005 ± 0.012	-0.002 ± 0.012	0.060
Cs-137	-0.003 ± 0.011	0.007 ± 0.012	-0.005 ± 0.011	0.080
Other Gammas ^a	-0.002 ± 0.012	0.010 ± 0.013	0.00 ± 0.014	0.060

^a See Introduction.

POINT BEACH NUCLEAR PLANT
 RADIOACTIVITY IN VEGETATION SAMPLES
 (Tri-Annual Collections)

Sample Description and Concentration (pCi/g wet)

Location	E-01	E-02	E-03	
Collection Date	07-25-01	07-25-01	07-25-01	
Lab Code	EG-6415	EG-6416	EG-6417	Req. LLD
Ratio (wet/dry)	2.97	3.77	2.4	-
Gross Beta	6.99 ± 0.18	4.77 ± 0.15	5.34 ± 0.13	0.25
Be-7	10.70 ± 0.38	1.32 ± 0.40	1.23 ± 0.34	0.25
K-40	5.74 ± 0.89	4.35 ± 0.86	5.24 ± 0.86	0.25
I-131	0.016 ± 0.015	-0.013 ± 0.014	0.019 ± 0.014	0.060
Cs-134	0.012 ± 0.021	0.001 ± 0.019	-0.003 ± 0.022	0.060
Cs-137	0.001 ± 0.017	0.002 ± 0.019	0.001 ± 0.021	0.080
Other Gammas ^a	-0.004 ± 0.021	0.013 ± 0.021	0.009 ± 0.025	0.060

Location	E-04	E-06	E-08	
Collection Date	07-25-01	07-25-01	07-25-01	
Lab Code	EG-6418	EG-6419	EG-6420	Req. LLD
Ratio (wet/dry)	2.86	2.86	2.02	-
Gross Beta	4.17 ± 0.10	5.94 ± 0.14	5.61 ± 0.15	0.25
Be-7	0.61 ± 0.30	1.26 ± 0.30	1.98 ± 0.13	0.25
K-40	5.66 ± 0.72	5.87 ± 0.70	4.00 ± 0.16	0.25
I-131	-0.005 ± 0.014	-0.011 ± 0.013	-0.038 ± 0.004	0.060
Cs-134	0.008 ± 0.016	0.004 ± 0.017	0.000 ± 0.003	0.060
Cs-137	0.006 ± 0.013	0.014 ± 0.018	0.002 ± 0.004	0.080
Other Gammas ^a	-0.004 ± 0.019	0.005 ± 0.020	0.011 ± 0.004	0.060

Location	E-09	E-20	E-37	
Collection Date	07-25-01	07-25-01	07-25-01	
Lab Code	EG-6421	EG-6422	EG-6423	Req. LLD
Ratio (wet/dry)	1.92	2.40	4.43	-
Gross Beta	8.27 ± 0.21	5.39 ± 0.13	4.18 ± 0.14	0.25
Be-7	1.87 ± 0.23	1.06 ± 0.12	0.90 ± 0.23	0.25
K-40	5.32 ± 0.43	5.51 ± 0.21	6.02 ± 0.53	0.25
I-131	0.010 ± 0.007	0.048 ± 0.003	-0.001 ± 0.008	0.060
Cs-134	-0.001 ± 0.009	-0.003 ± 0.004	0.008 ± 0.010	0.060
Cs-137	-0.012 ± 0.009	0.005 ± 0.004	0.004 ± 0.009	0.080
Other Gammas ^a	0.008 ± 0.010	0.003 ± 0.003	0.008 ± 0.009	0.060

^a See Introduction.

POINT BEACH NUCLEAR PLANT
 RADIOACTIVITY IN VEGETATION SAMPLES
 (Tri-Annual Collections)

Sample Description and Concentration (pCi/g wet)				
Location	E-01	E-02	E-03	
Collection Date	10-24-01	10-24-01	10-24-01	
Lab Code	EG-9764	EG-9765	EG-9766	Req. LLD
Ratio (wet/dry)	3.46	3.15	3.62	-
Gross Beta	5.88 ± 0.28	4.30 ± 0.16	7.22 ± 0.24	0.25
Be-7	2.36 ± 0.40	3.58 ± 0.44	2.54 ± 0.34	0.25
K-40	2.95 ± 0.44	4.02 ± 0.78	5.87 ± 0.61	0.25
I-131	0.013 ± 0.015	0.007 ± 0.014	0.004 ± 0.011	0.060
Cs-134	0.004 ± 0.013	-0.008 ± 0.020	0.005 ± 0.011	0.060
Cs-137	0.031 ± 0.016	0.005 ± 0.018	0.006 ± 0.015	0.080
Other Gammas ^a	-0.010 ± 0.013	-0.005 ± 0.017	-0.008 ± 0.013	0.060
Location	E-04	E-06	E-08	
Collection Date	10-24-01	10-24-01	10-24-01	
Lab Code	EG-9767	EG-9768	EG-9770	Req. LLD
Ratio (wet/dry)	4.69	5.18	3.01	-
Gross Beta	6.21 ± 0.18	5.23 ± 0.17	4.88 ± 0.16	0.25
Be-7	1.44 ± 0.35	3.70 ± 0.47	3.90 ± 0.47	0.25
K-40	4.06 ± 0.73	4.78 ± 0.87	4.63 ± 0.78	0.25
I-131	-0.021 ± 0.019	0.012 ± 0.015	0.002 ± 0.017	0.060
Cs-134	-0.016 ± 0.020	-0.013 ± 0.022	0.003 ± 0.018	0.060
Cs-137	0.012 ± 0.016	0.003 ± 0.021	0.006 ± 0.019	0.080
Other Gammas ^a	-0.011 ± 0.025	0.012 ± 0.023	0.008 ± 0.016	0.060
Location	E-09	E-20	E-37	
Collection Date	10-24-01	10-24-01	10-24-01	
Lab Code	EG-9771	EG-9772	EG-9773	Req. LLD
Ratio (wet/dry)	3.52	6.51	4.67	-
Gross Beta	3.59 ± 0.15	4.14 ± 0.14	5.34 ± 0.18	0.25
Be-7	2.92 ± 0.29	0.90 ± 0.29	3.48 ± 0.46	0.25
K-40	3.82 ± 0.47	3.78 ± 0.61	5.27 ± 0.85	0.25
I-131	0.001 ± 0.010	0.022 ± 0.015	0.009 ± 0.016	0.060
Cs-134	0.011 ± 0.012	0.018 ± 0.017	0.001 ± 0.020	0.060
Cs-137	0.001 ± 0.011	-0.018 ± 0.018	0.008 ± 0.019	0.080
Other Gammas ^a	-0.001 ± 0.012	0.002 ± 0.015	0.003 ± 0.021	0.060

^a See Introduction.

POINT BEACH NUCLEAR PLANT

Aquatic Vegetation, analyses for gross beta and gamma emitting isotopes.

Collection: Semiannual

Units: pCi/g wet

Sample Description and Concentration

Collection Date	06-07-01	06-07-01	Required
Lab Code	ESL-4639	ESL-4640	LLD
Location	E-05	E-12	
Ratio (wet wt./dry wt.)	4.80	4.91	
Gross Beta	2.26 ± 0.25	2.16 ± 0.22	0.25
Be-7	1.18 ± 0.51	1.12 ± 0.61	-
K-40	1.92 ± 0.73	1.65 ± 0.83	-
Co-58	0.025 ± 0.034	0.036 ± 0.041	0.25
Co-60	0.011 ± 0.048	-0.032 ± 0.037	0.25
Cs-134	0.006 ± 0.037	0.012 ± 0.025	0.25
Cs-137	0.015 ± 0.035	-0.008 ± 0.033	0.25
Collection Date	08-01-01	08-01-01	
Lab Code	ESL-6772	ESL-6773	
Location	E-05	E-12	
Ratio (wet wt./dry wt.)	5.25	3.87	
Gross Beta	2.48 ± 0.17	3.06 ± 0.25	0.25
Be-7	0.80 ± 0.39	0.74 ± 0.43	-
K-40	1.27 ± 0.71	1.29 ± 0.62	-
Co-58	0.042 ± 0.035	0.028 ± 0.030	0.25
Co-60	0.043 ± 0.031	0.016 ± 0.030	0.25
Cs-134	-0.003 ± 0.030	-0.005 ± 0.027	0.25
Cs-137	-0.002 ± 0.031	0.014 ± 0.027	0.25
Collection Date	10-03-01	10-03-01	
Lab Code	ESL-8858	ESL-8859	
Location	E-05	E-12	
Ratio (wet wt./dry wt.)	3.34	5.72	
Gross Beta	4.65 ± 0.44	1.67 ± 0.15	0.25
Be-7	-0.038 ± 0.19	0.64 ± 0.31	-
K-40	2.37 ± 0.83	1.94 ± 0.87	-
Co-58	-0.010 ± 0.019	0.008 ± 0.027	0.25
Co-60	-0.001 ± 0.026	0.015 ± 0.037	0.25
Cs-134	0.015 ± 0.028	-0.007 ± 0.034	0.25
Cs-137	0.003 ± 0.024	0.037 ± 0.034	0.25

POINT BEACH NUCLEAR PLANT
AMBIENT GAMMA RADIATION (TLD)
1st. Quarter, 2001

Date Annealed:	12-28-00	Days in the field	90
Date Placed:	01-05-01	Days from Annealing	
Date Removed:	04-05-01	to Readout:	113
Date Read:	04-20-01		

Location	Days in Field	Total mR	Net mR	Net mR per 7 days
<u>Indicator</u>				
E-1	90	15.7 ± 0.7	12.3 ± 0.8	0.96 ± 0.06
E-2	90	17.7 ± 0.6	14.4 ± 0.7	1.12 ± 0.06
E-3	90	16.2 ± 0.5	12.8 ± 0.7	1.00 ± 0.05
E-4	90	16.0 ± 0.3	12.7 ± 0.5	0.99 ± 0.04
E-5	90	15.8 ± 1.1	12.4 ± 1.2	0.97 ± 0.09
E-6	90	15.3 ± 0.5	12.0 ± 0.6	0.93 ± 0.05
E-7	90	15.5 ± 1.1	12.2 ± 1.2	0.95 ± 0.09
E-8	90	14.8 ± 1.0	11.4 ± 1.0	0.89 ± 0.08
E-9	90	16.1 ± 0.3	12.7 ± 0.5	0.99 ± 0.04
E-12	90	15.3 ± 0.7	11.9 ± 0.8	0.93 ± 0.07
E-14	90	17.5 ± 1.1	14.1 ± 1.2	1.10 ± 0.09
E-15	90	19.2 ± 1.3	15.8 ± 1.3	1.23 ± 0.10
E-16	90	15.8 ± 1.2	12.5 ± 1.3	0.97 ± 0.10
E-17	90	14.9 ± 0.9	11.5 ± 1.0	0.90 ± 0.08
E-18	90	19.5 ± 0.6	16.1 ± 0.7	1.25 ± 0.06
E-22	90	16.6 ± 1.0	13.3 ± 1.1	1.03 ± 0.09
E-23	90	18.0 ± 0.5	14.6 ± 0.7	1.14 ± 0.05
E-24	90	16.0 ± 0.4	12.6 ± 0.6	0.98 ± 0.05
E-25	90	16.8 ± 1.1	13.4 ± 1.2	1.04 ± 0.09
E-26	90	14.6 ± 0.5	11.3 ± 0.7	0.88 ± 0.05
E-27	90	16.3 ± 0.6	12.9 ± 0.7	1.01 ± 0.05
E-28	90	16.7 ± 1.0	13.3 ± 1.1	1.04 ± 0.09
E-29	90	15.9 ± 1.2	12.5 ± 1.3	0.98 ± 0.10
E-30	90	16.5 ± 0.5	13.1 ± 0.7	1.02 ± 0.05
E-31	90	16.9 ± 0.9	13.6 ± 1.0	1.06 ± 0.07
E-32	90	16.3 ± 0.7	13.0 ± 0.8	1.01 ± 0.07
E-34	90	10.8 ± 0.4	7.5 ± 0.6	0.58 ± 0.05
E-35	90	11.0 ± 0.2	7.6 ± 0.5	0.59 ± 0.04
E-36	90	12.1 ± 0.8	8.7 ± 0.9	0.68 ± 0.07
E-38	90	16.0 ± 0.3	12.6 ± 0.5	0.98 ± 0.04
E-39	90	16.2 ± 0.4	12.9 ± 0.6	1.00 ± 0.05
<u>Control</u>				
E-20	90	16.0 ± 0.4	12.6 ± 0.6	0.98 ± 0.05
Mean±s.d.		15.9 ± 1.9	12.5 ± 1.9	0.97 ± 0.15
<u>In-Transit Exposure</u>				
Date Annealed		12-28-00	03-28-01	
Date Read		01-10-01	04-20-01	
<u>Total mR</u>				
ITC-1		3.6 ± 0.3	3.1 ± 0.2	
ITC-2		3.7 ± 0.2	3.1 ± 0.2	

POINT BEACH NUCLEAR PLANT
 AMBIENT GAMMA RADIATION (TLD)
 2nd Quarter, 2000

Date Annealed:	03-28-01	Days in the field	91
Date Placed:	04-05-01	Days from Annealing	
Date Removed:	07-05-01	to Readout:	143
Date Read:	08-18-01		

Location	Days in Field	Total mR	Net mR	Net mR per 7 days
<u>Indicator</u>				
E-1	91	15.8 ± 0.7	12.7 ± 0.8	0.98 ± 0.06
E-2	91	17.7 ± 0.4	14.6 ± 0.5	1.12 ± 0.04
E-3	91	15.9 ± 0.3	12.8 ± 0.4	0.98 ± 0.03
E-4	91	16.0 ± 0.8	12.9 ± 0.8	0.99 ± 0.06
E-5	91	15.0 ± 1.1	11.9 ± 1.1	0.92 ± 0.09
E-6	91	16.2 ± 0.4	13.1 ± 0.5	1.01 ± 0.04
E-7	91	15.3 ± 0.8	12.2 ± 0.9	0.94 ± 0.07
E-8	91	14.5 ± 0.5	11.4 ± 0.6	0.88 ± 0.04
E-9	91	16.0 ± 0.4	12.9 ± 0.5	0.99 ± 0.04
E-12	91	16.2 ± 0.7	13.1 ± 0.8	1.01 ± 0.06
E-14	91	17.3 ± 1.0	14.2 ± 1.0	1.09 ± 0.08
E-15	91	19.5 ± 0.5	16.4 ± 0.6	1.26 ± 0.04
E-16	91	15.7 ± 1.1	12.6 ± 1.1	0.97 ± 0.09
E-17	91	14.3 ± 0.4	11.2 ± 0.5	0.86 ± 0.04
E-18	91	19.5 ± 0.7	16.4 ± 0.8	1.26 ± 0.06
E-22	91	15.9 ± 1.4	12.8 ± 1.4	0.98 ± 0.11
E-23	91	17.9 ± 0.9	14.8 ± 0.9	1.14 ± 0.07
E-24	91	15.5 ± 0.9	12.4 ± 0.9	0.95 ± 0.07
E-25	91	16.4 ± 0.8	13.3 ± 0.9	1.02 ± 0.07
E-26	91	14.5 ± 0.5	11.4 ± 0.6	0.88 ± 0.04
E-27	91	16.4 ± 0.5	13.3 ± 0.6	1.02 ± 0.04
E-28	91	16.5 ± 0.9	13.4 ± 0.9	1.03 ± 0.07
E-29	91	16.4 ± 0.9	13.3 ± 0.9	1.02 ± 0.07
E-30	91	17.2 ± 1.0	14.1 ± 1.0	1.08 ± 0.08
E-31	91	16.1 ± 0.7	13.0 ± 0.8	1.00 ± 0.06
E-32	91	15.2 ± 0.9	12.1 ± 0.9	0.93 ± 0.07
E-34	91	11.0 ± 0.4	7.9 ± 0.5	0.61 ± 0.04
E-35	91	10.9 ± 0.3	7.8 ± 0.4	0.60 ± 0.03
E-36	91	13.3 ± 0.6	10.2 ± 0.7	0.78 ± 0.05
E-38	91	15.9 ± 0.5	12.8 ± 0.6	0.98 ± 0.04
E-39	91	15.6 ± 0.9	12.5 ± 0.9	0.96 ± 0.07
<u>Control</u>				
E-20	91	15.6 ± 1.1	12.5 ± 1.1	0.96 ± 0.09
Mean±s.d.		15.8 ± 1.8	12.7 ± 1.8	0.98 ± 0.14
<u>In-Transit Exposure^a</u>				
	Date Annealed	03-28-01		
	Date Read	04-20-01		
		<u>Total mR</u>		
	ITC-1	3.1 ± 0.2		
	ITC-2	3.1 ± 0.2		

^aNo 3rd quarter in-transit data available; switched from chips to cards beginning in 3rd quarter.

POINT BEACH NUCLEAR PLANT
 AMBIENT GAMMA RADIATION (TLD)
 3rd Quarter, 2001

Date Annealed:	06-29-01	Days in the field	91
Date Placed:	07-06-01	Days from Annealing	
Date Removed:	10-05-01	to Readout:	110
Date Read:	10-17-01		

Location	Days in Field	Total mR	Net mR	Net mR per 7 days
<u>Indicator</u>				
E-1	91	17.6 ± 0.1	12.8 ± 0.3	0.99 ± 0.02
E-2	91	21.4 ± 0.1	16.6 ± 0.3	1.28 ± 0.02
E-3	91	27.7 ± 0.4	22.9 ± 0.5	1.76 ± 0.04
E-4	91	22.3 ± 0.2	17.5 ± 0.4	1.35 ± 0.03
E-5	91	21.5 ± 0.3	16.7 ± 0.4	1.29 ± 0.03
E-6	91	20.1 ± 0.1	15.3 ± 0.3	1.18 ± 0.02
E-7	91	18.3 ± 0.3	13.5 ± 0.4	1.04 ± 0.03
E-8	91	18.2 ± 0.5	13.4 ± 0.6	1.03 ± 0.04
E-9	91	21.3 ± 0.4	16.5 ± 0.5	1.27 ± 0.04
E-12	91	17.1 ± 0.2	12.3 ± 0.4	0.95 ± 0.03
E-14	91	20.0 ± 0.2	15.2 ± 0.4	1.17 ± 0.03
E-15	91	20.9 ± 0.2	16.1 ± 0.4	1.24 ± 0.03
E-16	91	19.0 ± 0.3	14.2 ± 0.4	1.09 ± 0.03
E-17	91	20.5 ± 0.2	15.7 ± 0.4	1.21 ± 0.03
E-18	91	23.1 ± 0.5	18.3 ± 0.6	1.41 ± 0.04
E-22	91	21.5 ± 0.2	16.7 ± 0.4	1.29 ± 0.03
E-23	91	22.5 ± 0.4	17.7 ± 0.5	1.36 ± 0.04
E-24	91	22.2 ± 0.4	17.4 ± 0.5	1.34 ± 0.04
E-25	91	20.2 ± 0.2	15.4 ± 0.4	1.19 ± 0.03
E-26	91	18.4 ± 0.1	13.6 ± 0.3	1.05 ± 0.02
E-27	91	19.7 ± 0.3	14.9 ± 0.4	1.15 ± 0.03
E-28	95	17.6 ± 0.2	12.8 ± 0.4	0.95 ± 0.03
E-29	91	20.0 ± 0.1	15.2 ± 0.3	1.17 ± 0.02
E-30	91	17.5 ± 0.2	12.7 ± 0.4	0.98 ± 0.03
E-31	91	20.7 ± 0.3	15.9 ± 0.4	1.23 ± 0.03
E-32	91	18.8 ± 0.1	14.0 ± 0.3	1.08 ± 0.02
E-34	91	21.8 ± 0.4	17.0 ± 0.5	1.31 ± 0.04
E-35	91	17.8 ± 0.3	13.0 ± 0.4	1.00 ± 0.03
E-36	91	18.5 ± 0.4	13.7 ± 0.5	1.06 ± 0.04
E-38	91	27.6 ± 0.3	22.8 ± 0.4	1.76 ± 0.03
E-39	91	17.6 ± 0.1	12.8 ± 0.3	0.99 ± 0.02
<u>Control</u>				
E-20	91	20.1 ± 0.2	15.3 ± 0.4	1.18 ± 0.03
Mean±s.d.		20.4 ± 2.6	15.6 ± 2.6	1.20 ± 0.20
<u>In-Transit Exposure</u>				
	Date Annealed	06-29-01	09-28-01	
	Date Read	07-09-01	10-17-01	
		<u>Total mR</u>		
	ITC-1	4.4 ± 0.1	5.3 ± 0.1	
	ITC-2	4.2 ± 0.2	5.2 ± 0.2	

POINT BEACH NUCLEAR PLANT
 AMBIENT GAMMA RADIATION (TLD)
 4th Quarter, 2001

Date Annealed:	09-28-01	Days in the field	98
Date Placed:	10-04-01	Days from Annealing	
Date Removed:	01-10-02	to Readout:	117
Date Read:	01-23-02		

Location	Days in Field	Total mR	Net mR	Net mR per 7 days
<u>Indicator</u>				
E-1	98	21.6 ± 0.4	16.1 ± 0.5	1.15 ± 0.04
E-2	98	25.5 ± 0.3	20.0 ± 0.4	1.43 ± 0.03
E-3	98	26.7 ± 0.5	21.2 ± 0.6	1.51 ± 0.04
E-4	98	20.6 ± 0.3	15.1 ± 0.4	1.08 ± 0.03
E-5	98	22.5 ± 0.5	17.0 ± 0.6	1.21 ± 0.04
E-6	98	17.9 ± 0.4	12.4 ± 0.5	0.89 ± 0.04
E-7	98	17.4 ± 0.5	11.9 ± 0.6	0.85 ± 0.04
E-8	98	19.8 ± 0.2	14.3 ± 0.4	1.02 ± 0.03
E-9	98	20.5 ± 0.2	15.0 ± 0.4	1.07 ± 0.03
E-12	98	16.3 ± 0.2	10.8 ± 0.4	0.77 ± 0.03
E-14	98	20.3 ± 0.3	14.8 ± 0.4	1.06 ± 0.03
E-15	98	24.5 ± 0.2	19.0 ± 0.4	1.36 ± 0.03
E-16	98	19.7 ± 0.2	14.2 ± 0.4	1.01 ± 0.03
E-17	98	20.5 ± 0.2	15.0 ± 0.4	1.07 ± 0.03
E-18	98	22.3 ± 0.3	16.8 ± 0.4	1.20 ± 0.03
E-22	98	21.5 ± 0.1	16.0 ± 0.3	1.14 ± 0.02
E-23	98	22.1 ± 0.5	16.6 ± 0.6	1.19 ± 0.04
E-24	98	21.3 ± 0.3	15.8 ± 0.4	1.13 ± 0.03
E-25	98	21.2 ± 0.3	15.7 ± 0.4	1.12 ± 0.03
E-26	98	17.6 ± 0.3	12.1 ± 0.4	0.86 ± 0.03
E-27	98	20.2 ± 0.3	14.7 ± 0.4	1.05 ± 0.03
E-28	98	16.3 ± 0.4	10.8 ± 0.5	0.77 ± 0.04
E-29	98	21.1 ± 0.4	15.6 ± 0.5	1.11 ± 0.04
E-30	98	19.4 ± 0.3	13.9 ± 0.4	0.99 ± 0.03
E-31	98	20.8 ± 0.3	15.3 ± 0.4	1.09 ± 0.03
E-32	98	21.5 ± 0.3	16.0 ± 0.4	1.14 ± 0.03
E-34	98	23.4 ± 0.2	17.9 ± 0.4	1.28 ± 0.03
E-35	98	20.0 ± 0.3	14.5 ± 0.4	1.04 ± 0.03
E-36	98	20.6 ± 0.4	15.1 ± 0.5	1.08 ± 0.04
E-38	98	27.6 ± 0.5	22.1 ± 0.6	1.58 ± 0.04
E-39	98	19.2 ± 0.2	13.7 ± 0.4	0.98 ± 0.03
<u>Control</u>				
E-20	98	19.5 ± 0.2	14.0 ± 0.4	1.00 ± 0.03
Mean±s.d.		20.9 ± 2.6	15.4 ± 2.6	1.10 ± 0.18
<u>In-Transit Exposure</u>				
Date Annealed		09-28-01	12-26-01	
Date Read		10-17-01	01-14-02	
<u>Total mR</u>				
ITC-1		5.3 ± 0.1	5.7 ± 0.2	
ITC-2		5.2 ± 0.2	5.8 ± 0.1	



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APPENDIX A

INTERLABORATORY COMPARISON PROGRAM RESULTS

NOTE: Environmental, Inc., Midwest Laboratory participates in intercomparison studies administered by Environmental Resources Associates, and serves as a replacement for studies conducted previously by the U.S. EPA Environmental Monitoring Systems Laboratory, Las Vegas, Nevada. Results are reported in Appendix A. TLD Intercomparison results, in-house spikes, blanks, duplicates and mixed analyte performance evaluation program results are also reported. Appendix A is updated four times a year; the complete Appendix is included in March, June, September and December monthly progress reports only.

January, 2001 through December, 2001

Appendix A

Interlaboratory Comparison Program Results

Environmental, Inc., Midwest Laboratory, formerly Teledyne Brown Engineering Environmental Services Midwest Laboratory has participated in interlaboratory comparison (crosscheck) programs since the formulation of its quality control program in December 1971. These programs are operated by agencies which supply environmental type samples (e.g., milk or water) containing concentrations of radionuclides known to the issuing agency but not to participant laboratories. The purpose of such a program is to provide an independent check on a laboratory's analytical procedures and to alert it of any possible problems.

Participant laboratories measure the concentration of specified radionuclides and report them to the issuing agency. Several months later, the agency reports the known values to the participant laboratories and specifies control limits. Results consistently higher or lower than the known values or outside the control limits indicate a need to check the instruments or procedures used.

The results in Table A-1 were obtained through participation in the environmental sample crosscheck program for milk, water and air filters during the past twelve months. Data for previous years is available upon request.

This program was conducted by the U.S. Environmental Protection Agency Office of Research and Development National Exposure Research Laboratory Characterization Research Division-Las Vegas, Nevada.

The results in Table A-2 were obtained for Thermoluminescent Dosimeters (TLDs), via various International Intercomparisons of Environmental Dosimeters under the sponsorships listed in Table A-2. Results of crosscheck testing with Teledyne Brown Engineering are also listed.

Table A-3 lists results of the analyses on in-house "spiked" samples for the past twelve months. All samples are prepared using NIST traceable sources. Data for previous years available upon request.

Table A-4 lists results of the analyses on in-house "blank" samples for the past twelve months. Data for previous years available upon request.

Table A-5 list results of the in-house "duplicate" program for the past twelve months. Acceptance is based on the difference of the results being less than the sum of the errors. Data for previous years available upon request.

The results in Table A-6 were obtained through participation in the Mixed Analyte Performance Evaluation Program.

The results in Table A-7 were obtained through participation in the Environmental Measurement Laboratory Quality Assessment Program.

Attachment A lists acceptance criteria for "spiked" samples.

Out-of-limit results are explained directly below the result.

12-31-01

ATTACHMENT A

ACCEPTANCE CRITERIA FOR "SPIKED" SAMPLES

LABORATORY PRECISION: ONE STANDARD DEVIATION VALUES FOR VARIOUS ANALYSES^a

Analysis	Level	One Standard Deviation for single determinations
Gamma Emitters	5 to 100 pCi/liter or kg > 100 pCi/liter or kg	5.0 pCi/liter 5% of known value
Strontium-89 ^b	5 to 50 pCi/liter or kg > 50 pCi/liter or kg	5.0 pCi/liter 10% of known value
Strontium-90 ^b	2 to 30 pCi/liter or kg > 30 pCi/liter or kg	5.0 pCi/liter 10% of known value
Potassium-40	> 0.1 g/liter or kg	5% of known value
Gross alpha	20 pCi/liter > 20 pCi/liter	5.0 pCi/liter 25% of known value
Gross beta	100 pCi/liter > 100 pCi/liter	5.0 pCi/liter 5% of known value
Tritium	4,000 pCi/liter > 4,000 pCi/liter	1s = (pCi/liter) = 169.85 x (known) ^{0.0933} 10% of known value
Radium-226,-228	0.1 pCi/liter	15% of known value
Plutonium	0.1 pCi/liter, gram, or sample	10% of known value
Iodine-131, Iodine-129 ^b	55 pCi/liter >55 pCi/liter	6.0 pCi/liter 10% of known value
Uranium-238, Nickel-63 ^b Technetium-99 ^b	35 pCi/liter > 35 pCi/liter	6.0 pCi/liter 15% of known value
Iron-55 ^b	50 to 100 pCi/liter > 100 pCi/liter	10 pCi/liter 10% of known value
Others ^b	--	20% of known value

^a From EPA publication, "Environmental Radioactivity Laboratory Intercomparison Studies Program, Fiscal Year, 1981-1982, EPA-600/4-81-004.

^b Laboratory limit.

Table A-1. Interlaboratory Comparison Crosscheck program, Environmental Resource Associates (ERA)^a.

Lab Code	Sample Type	Date Collected	Analysis	Concentration in pCi/L ^b		
				Laboratory result ^c	ERA Result ^d	Control Limits
STW-897	WATER	Jan, 2001	Gr. Alpha	31.9 ± 2.1	45.7 ± 11.4	25.9 - 65.5
STW-897	WATER	Jan, 2001	Gr. Beta	25.3 ± 2.7	16.7 ± 5.0	8.0 - 25.4
STW-900	WATER	Feb, 2001	I-131	27.2 ± 0.8	28.3 ± 3.0	23.1 - 33.5
STW-902	WATER	Feb, 2001	Ra-226	4.0 ± 0.1	4.7 ± 0.7	3.4 - 5.9
STW-902	WATER	Feb, 2001	Ra-228	13.8 ± 0.4	14.4 ± 3.6	8.2 - 20.6
STW-902	WATER	Feb, 2001	Uranium	17.0 ± 0.3	20.4 ± 3.0	15.2 - 25.6
STW-903	WATER	Mar, 2001	H-3	17,400.0 ± 69.7	17,800.0 ± 1,780.0	14,700.0 - 20,900.0
STW-917	WATER	Apr, 2001	Gr. Alpha	57.4 ± 3.5	56.0 ± 14.0	31.8 - 80.2
STW-917	WATER	Apr, 2001	Ra-226	13.5 ± 0.4	17.7 ± 2.7	13.1 - 22.3
STW-917	WATER	Apr, 2001	Ra-228	10.1 ± 0.6	8.1 ± 2.0	4.6 - 11.6
STW-917	WATER	Apr, 2001	Uranium	14.2 ± 0.2	15.6 ± 3.0	10.4 - 20.8
STW-918	WATER	Apr, 2001	Co-60	27.9 ± 1.4	26.4 ± 5.0	17.7 - 35.1
STW-918	WATER	Apr, 2001	Cs-134	16.0 ± 0.4	16.9 ± 5.0	8.2 - 25.6
STW-918	WATER	Apr, 2001	Cs-137	195.4 ± 1.5	186.0 ± 9.3	170.0 - 202.0
STW-918	WATER	Apr, 2001	Gr. Beta	340.0 ± 51.0	343.0 ± 1.7	252.0 - 428.0
STW-918	WATER	Apr, 2001	Sr-89	62.8 ± 5.7	64.1 ± 5.0	55.5 - 72.8
STW-918	WATER	Apr, 2001	Sr-90	34.2 ± 1.6	33.8 ± 5.0	25.1 - 42.5
STW-919	WATER	Jun, 2001	Ba-133	37.8 ± 1.2	36.0 ± 5.0	27.3 - 44.7
STW-919	WATER	Jun, 2001	Co-60	49.9 ± 0.7	46.8 ± 5.0	38.1 - 55.5
STW-919	WATER	Jun, 2001	Cs-134	16.0 ± 1.4	15.9 ± 5.0	7.2 - 24.6
STW-919	WATER	Jun, 2001	Cs-137	208.0 ± 1.7	197.0 ± 9.9	180.0 - 214.0
STW-919	WATER	Jun, 2001	Zn-65	37.8 ± 0.7	36.2 ± 5.0	27.5 - 44.9
STW-920	WATER	Jun, 2001	Ra-226	14.6 ± 0.4	15.4 ± 2.3	11.4 - 19.4
STW-920	WATER	Jun, 2001	Ra-228	6.2 ± 0.2	4.5 ± 1.1	2.6 - 6.5
STW-920	WATER	Jun, 2001	Uranium	49.0 ± 1.0	55.7 ± 5.6	46.1 - 65.3
STW-921	WATER	Jul, 2001	Sr-89	19.8 ± 1.5	31.2 ± 5.0	22.5 - 39.9
Delay in processing may have attributed to deviation.						
Result of reanalysis; Sr-89, 35.3 ± 4.4 pCi/L. Sr-90, 25.0 ± 2.8 pCi/L.						
STW-921	WATER	Jul, 2001	Sr-90	26.3 ± 1.1	25.9 ± 5.0	17.2 - 34.6
STW-922	WATER	Jul, 2001	Gr. Alpha	23.3 ± 1.9	17.8 ± 5.0	9.1 - 26.5
STW-922	WATER	Jul, 2001	Gr. Beta	48.5 ± 4.6	53.0 ± 10.0	35.7 - 70.3
STW-924	WATER	Aug, 2001	H-3	2,680.0 ± 41.9	2,730.0 ± 356.0	2,110.0 - 3,350.0
STW-931	WATER	Sep, 2001	Ra-226	10.9 ± 0.2	10.8 ± 1.6	8.0 - 13.6
STW-931	WATER	Sep, 2001	Ra-228	9.7 ± 1.1	9.0 ± 2.2	5.1 - 12.8
STW-931	WATER	Sep, 2001	Uranium	11.2 ± 0.1	13.1 ± 3.0	7.9 - 18.3
STW-932	WATER	Oct, 2001	I-131	7.7 ± 0.3	7.7 ± 2.0	4.2 - 11.2
STW-933	WATER	Oct, 2001	Gr. Alpha	82.2 ± 4.0	97.5 ± 24.4	55.3 - 140.0
STW-933	WATER	Oct, 2001	Ra-226	9.5 ± 1.2	10.8 ± 1.6	8.0 - 13.6

Table A-1. Interlaboratory Comparison Crosscheck program, Environmental Resource Associates (ERA)^a.

Lab Code	Sample Type	Date Collected	Analysis	Concentration in pCi/L ^b		Control Limits
				Laboratory result ^c	ERA Result ^d	
STW-933	WATER	Oct, 2001	Ra-228	17.0 ± 0.8	15.6 ± 3.9	8.9 - 22.4
STW-933	WATER	Oct, 2001	Uranium	32.2 ± 1.4	37.2 ± 3.7	30.7 - 43.6
STW-934	WATER	Oct, 2001	Co-60	82.4 ± 0.9	78.4 ± 5.0	69.7 - 87.1
STW-934	WATER	Oct, 2001	Cs-134	52.2 ± 1.3	54.1 ± 5.0	45.4 - 62.8
STW-934	WATER	Oct, 2001	Cs-137	39.4 ± 0.6	37.9 ± 5.0	26.3 - 43.7
STW-934	WATER	Oct, 2001	Gr. Beta	166.0 ± 7.1	192.0 ± 28.8	142.0 - 242.0
STW-934	WATER	Oct, 2001	Sr-89	12.8 ± 0.8	16.7 ± 5.0	8.0 - 25.4
STW-934	WATER	Oct, 2001	Sr-90	6.8 ± 0.7	7.7 ± 5.0	-1.0 - 16.4
STW-935	WATER	Oct, 2001	Gr. Alpha	63.5 ± 2.5	64.0 ± 16.0	36.5 - 91.5
STW-935	WATER	Oct, 2001	Gr. Beta	26.0 ± 1.2	21.5 ± 5.0	12.8 - 30.2
STW-938	WATER	Nov, 2001	Ba-133	66.7 ± 1.2	69.3 ± 6.9	57.5 - 81.1
STW-938	WATER	Nov, 2001	Co-60	59.3 ± 0.6	59.7 ± 5.0	51.0 - 68.4
STW-938	WATER	Nov, 2001	Cs-134	86.7 ± 1.5	93.9 ± 5.0	85.2 - 103.0
STW-938	WATER	Nov, 2001	Cs-137	45.0 ± 1.0	42.0 ± 5.0	33.3 - 50.7
STW-938	WATER	Nov, 2001	Zn-65	80.7 ± 0.6	77.3 ± 7.7	63.9 - 90.7

^a Results obtained by Environmental, Inc., Midwest Laboratory as a participant in the environmental samples crosscheck program operated by Environmental Resources Associates (ERA).

^b All results are in pCi/L, except for elemental potassium (K) data in milk, which are in mg/L; air filter samples, which are in pCi/Filter.

^c Unless otherwise indicated, the laboratory result is given as the mean ± standard deviation for three determinations.

^d Results are presented as the known values, expected laboratory precision (1 sigma, 1 determination) and control limits as provided by ERA.

Table A-2. Crosscheck program results; Thermoluminescent Dosimeters. (TLDs).

Lab Code	TLD Type	Date	Measurement	mR		
				Known Value	Lab result ± 2 Sigma	Control Limits
<u>Teledyne Brown Engineering</u>						
2000-1	LiF-100 Chips	Mar, 2000	Reader 1, #1	17.8	14.4 \pm 0.2	12.46 - 23.14
2000-1	LiF-100 Chips	Mar, 2000	Reader 1, #2	35.5	32.4 \pm 0.1	24.85 - 46.15
2000-1	LiF-100 Chips	Mar, 2000	Reader 1, #3	62.2	61.8 \pm 0.9	43.54 - 80.86
<u>Teledyne Brown Engineering</u>						
2000-2	CaSO ₄ : Dy Cards	Mar, 2000	Reader 1, #1	17.8	21.3 \pm 0.3	12.46 - 23.14
2000-2	CaSO ₄ : Dy Cards	Mar, 2000	Reader 1, #2	35.5	40.1 \pm 1.9	24.85 - 46.15
2000-2	CaSO ₄ : Dy Cards	Mar, 2000	Reader 1, #3	62.2	69.9 \pm 3.5	43.54 - 80.86
Chips and cards irradiated by Teledyne Brown Engineering, Westwood, New Jersey, in March of 2000.						
<u>12th International Intercomparison</u>						
022-1	CaSO ₄ : Dy Cards	Jun, 2000	Field	161.0	184.9 \pm 1.9	112.70 - 209.30
022-1	CaSO ₄ : Dy Cards	Jun, 2000	Field 1	548.0	502.2 \pm 1.7	383.60 - 712.40
022-1	CaSO ₄ : Dy Cards	Jun, 2000	Field 2	391.0	412.0 \pm 2.9	273.70 - 508.30
022-1	CaSO ₄ : Dy Cards	Jun, 2000	Field 3	623.0	643.2 \pm 2.9	436.10 - 809.90
022-1	CaSO ₄ : Dy Cards	Jun, 2000	Lab, 1	391.0	442.8 \pm 2.5	273.70 - 508.30
<u>Environmental, Inc.</u>						
2001-1	CaSO ₄ : Dy Cards	Dec, 2001	Reader 1, #1	4.0	3.7 \pm 0.1	2.79 - 5.17
2001-1	CaSO ₄ : Dy Cards	Dec, 2001	Reader 1, #1	4.0	3.4 \pm 0.1	2.79 - 5.17
2001-1	CaSO ₄ : Dy Cards	Dec, 2001	Reader 1, #2	7.1	7.9 \pm 0.2	4.95 - 9.19
2001-1	CaSO ₄ : Dy Cards	Dec, 2001	Reader 1, #2	7.1	7.6 \pm 0.3	4.95 - 9.19
2001-1	CaSO ₄ : Dy Cards	Dec, 2001	Reader 1, #3	15.9	18.6 \pm 0.4	11.13 - 20.67
2001-1	CaSO ₄ : Dy Cards	Dec, 2001	Reader 1, #3	15.9	19.6 \pm 0.1	11.13 - 20.67
2001-1	CaSO ₄ : Dy Cards	Dec, 2001	Reader 1, #4	63.6	78.2 \pm 1.2	44.53 - 82.69
2001-1	CaSO ₄ : Dy Cards	Dec, 2001	Reader 1, #4	63.6	79.9 \pm 2.5	44.53 - 82.69

Table A-3. In-house "spike" samples.

Lab Code	Sample Type	Date Collected	Analysis	Concentration in pCi/L ^a		
				Laboratory results 2s, n=1 ^b	Known Activity	Control ^c Limits
SPAP-477	Air Filter	Jan, 2001	Cs-137	1.76 ± 0.02	1.68	1.01 - 2.35
SPW-479	Water	Jan, 2001	H-3	54702.00 ± 644.00	54549.00	43639.20 - 65458.80
SPW-481	Water	Jan, 2001	Gr. Alpha	58.08 ± 2.79	69.14	34.57 - 103.71
SPW-481	Water	Jan, 2001	Gr. Beta	213.83 ± 3.07	220.26	198.23 - 242.29
SPW-482	Water	Jan, 2001	Gr. Alpha	51.77 ± 2.18	69.14	34.57 - 103.71
SPW-482	Water	Jan, 2001	Gr. Beta	202.48 ± 2.98	220.26	198.23 - 242.29
SPW-483	Water	Jan, 2001	Ra-226	20.11 ± 0.34	20.86	14.60 - 27.12
SPW-483	Water	Jan, 2001	Ra-228	10.55 ± 2.02	19.43	13.60 - 25.26
Sample was lost during analysis.						
SPW-485	Water	Jan, 2001	Co-60	33.53 ± 3.40	31.13	21.13 - 41.13
SPW-485	Water	Jan, 2001	Cs-134	32.80 ± 2.54	30.81	20.81 - 40.81
SPW-485	Water	Jan, 2001	Cs-137	42.10 ± 5.60	36.00	26.00 - 46.00
SPW-485	Water	Jan, 2001	Sr-90	154.34 ± 3.49	137.66	110.13 - 165.19
SPAP-754	Air Filter	Jan, 2001	Gr. Beta	8.53 ± 0.02	7.88	-2.12 - 17.88
SPW-1037	Water	Feb, 2001	U-233/4	3.74 ± 0.10	4.17	2.50 - 5.84
SPW-1037	Water	Feb, 2001	U-238	3.81 ± 0.10	4.17	-7.83 - 16.17
SPW-1224	Water	Feb, 2001	Ra-226	21.25 ± 0.50	20.68	14.48 - 26.88
SPW-1224	Water	Feb, 2001	Ra-228	21.76 ± 2.65	19.27	13.49 - 25.05
SPW-1225	Water	Feb, 2001	Gr. Alpha	71.87 ± 3.07	69.14	34.57 - 103.71
SPW-1225	Water	Feb, 2001	Gr. Beta	36.30 ± 1.47	28.75	18.75 - 38.75
SPW-1272	Water	Feb, 2001	I-131	56.82 ± 0.71	63.05	50.44 - 75.66
SPW-1272	Water	Feb, 2001	I-131(g)	65.69 ± 10.21	63.05	53.05 - 73.05
SPVE-1274	Vegetation	Feb, 2001	I-131(g)	0.78 ± 0.05	0.76	0.45 - 1.06
SPCH-1276	Charcoal	Feb, 2001	I-131(g)	1.57 ± 0.05	1.58	0.95 - 2.21
SPMI-1270	Milk	Mar, 2001	Cs-134	31.89 ± 4.71	29.77	19.77 - 39.77
SPMI-1270	Milk	Mar, 2001	Cs-137	46.61 ± 8.81	35.90	25.90 - 45.90
The Cs-137 spike is suspect; A new cesium spike has been prepared.						
SPMI-1270	Milk	Mar, 2001	I-131(g)	81.92 ± 10.80	81.95	71.95 - 91.95
SPU-2901	Urine	Mar, 2001	H-3	51512.00 ± 1369.00	50189.00	40151.20 - 60226.80
SPW-2161	Water	Mar, 2001	Ra-228	29.92 ± 5.13	31.75	22.23 - 41.28
SPU-3128	Urine	Apr, 2001	H-3	2065.00 ± 408.00	2008.00	1317.37 - 2698.63
SPW-3129	Water	Apr, 2001	Gr. Alpha	37.94 ± 2.42	34.57	17.29 - 51.86

Table A-3. In-house "spike" samples.

Lab Code	Sample Type	Date Collected	Analysis	Concentration in pCi/L ^a		
				Laboratory results 2s, n=1 ^b	Known Activity	Control ^c Limits
SPW-3129	Water	Apr, 2001	Gr. Beta	117.83 ± 2.37	109.46	98.51 - 120.41
SPAP-3508	Air Filter	Apr, 2001	Gr. Beta	0.80 ± 0.01	0.78	-9.22 - 10.78
SPMI-3232	Milk	Apr, 2001	Cs-134	32.69 ± 6.50	33.96	23.96 - 43.96
SPMI-3232	Milk	Apr, 2001	Cs-137	44.20 ± 9.08	35.79	25.79 - 45.79
SPMI-3232	Milk	Apr, 2001	I-131	48.05 ± 0.90	56.68	45.34 - 68.02
SPMI-3232	Milk	Apr, 2001	I-131(g)	55.64 ± 11.39	56.68	46.68 - 66.68
SPMI-3232	Milk	Apr, 2001	Sr-90	143.77 ± 3.04	136.82	109.46 - 164.18
SPSO-3356	Soil	Apr, 2001	Co-60	18.49 ± 0.21	19.57	9.57 - 29.57
SPSO-3356	Soil	Apr, 2001	Cs-137	18.71 ± 0.24	16.61	6.61 - 26.61
SPAP-3359	Air Filter	Apr, 2001	Cs-137	1.80 ± 0.01	1.67	1.00 - 2.34
SPW-3376	Water	Apr, 2001	Co-60	48.17 ± 4.85	45.19	35.19 - 55.19
SPW-3376	Water	Apr, 2001	Cs-134	37.14 ± 3.90	33.96	23.96 - 43.96
SPW-3376	Water	Apr, 2001	Sr-90	159.84 ± 3.42	136.82	109.46 - 164.18
SPW-3377	Water	Apr, 2001	I-131	68.60 ± 2.63	85.02	68.02 - 102.02
SPW-3129/1	Water	May, 2001	Gr. Alpha	37.94 ± 2.42	34.57	17.29 - 51.86
SPW-3129/1	Water	May, 2001	Gr. Beta	117.83 ± 2.37	109.46	98.51 - 120.41
SPW-3129/2	Water	Jun, 2001	Gr. Alpha	34.42 ± 2.14	34.57	17.29 - 51.86
SPW-3129/2	Water	Jun, 2001	Gr. Beta	119.99 ± 2.45	109.46	98.51 - 120.41
SPVE-3303	Vegetation	Jun, 2001	I-131(g)	0.81 ± 0.03	0.86	0.51 - 1.20
SPSO-5701	Soil	Jul, 2001	Co-60	17.42 ± 0.19	19.05	9.05 - 29.05
SPSO-5701	Soil	Jul, 2001	Cs-137	16.03 ± 0.22	16.52	6.52 - 26.52
SPW-5779	Water	Jul, 2001	Co-60	250.05 ± 18.63	233.26	209.93 - 256.59
SPW-5779	Water	Jul, 2001	Cs-137	178.68 ± 19.89	175.91	158.32 - 193.50
SPW-5779	Water	Jul, 2001	Sr-90	72.12 ± 2.24	68.12	54.50 - 81.74
SPF-5781	Fish	Jul, 2001	Co-60	1.87 ± 0.08	1.79	1.07 - 2.51
SPF-5781	Fish	Jul, 2001	Cs-137	1.43 ± 0.07	1.39	0.83 - 1.95
SPW-5937	Water	Jul, 2001	H-3	51177.00 ± 631.00	50189.00	40151.20 - 60226.80
SPW-59441	Water	Jul, 2001	Ra-226	36.62 ± 1.74	34.46	24.12 - 44.80
SPW-59441	Water	Jul, 2001	Ra-228	41.46 ± 6.44	36.06	25.24 - 46.88
SPAP-5703	Air Filter	Jul, 2001	Cs-137	1.81 ± 0.02	1.67	1.00 - 2.34
SPW-3129/3	Water	Jul, 2001	Gr. Alpha	35.31 ± 3.04	34.75	17.38 - 52.13

Table A-3. In-house "spike" samples.

Lab Code	Sample Type	Date Collected	Analysis	Concentration in pCi/L ^a		
				Laboratory results 2s, n=1 ^b	Known Activity	Control ^c Limits
SPW-3129/3	Water	Jul, 2001	Gr. Beta	113.28 ± 3.65	109.46	98.51 - 120.41
SPMI-6145	Milk	Jul, 2001	Cs-137	188.45 ± 19.10	175.91	158.32 - 193.50
SPW-6604	Water	Jul, 2001	Gr. Alpha	35.36 ± 1.94	34.57	17.29 - 51.86
SPW-6604	Water	Jul, 2001	Gr. Beta	112.56 ± 2.46	108.82	97.94 - 119.70
SPW-9008	Water	Oct, 2001	H-3	48285.00 ± 606.10	50189.00	40151.20 - 60226.80
SPAP-9010	Air Filter	Oct, 2001	Cs-137	1.91 ± 0.01	1.67	1.00 - 2.34
SPW-10723	Water	Dec, 2001	U-233/4	40.12 ± 1.09	41.73	25.04 - 58.42
SPW-10723	Water	Dec, 2001	U-238	40.16 ± 1.09	41.73	29.21 - 54.25
SPAP-11550	Air Filter	Dec, 2001	Gr. Beta	1.58 ± 0.02	1.56	-8.44 - 11.56
SPW-11757	Water	Dec, 2001	Co-60	43.82 ± 3.14	41.36	31.36 - 51.36
SPW-11757	Water	Dec, 2001	Cs-134	24.11 ± 2.42	22.59	12.59 - 32.59
SPW-11757	Water	Dec, 2001	Cs-137	52.11 ± 4.40	50.89	40.89 - 60.89
SPMI-11759	Milk	Dec, 2001	Cs-134	28.03 ± 2.64	27.10	17.10 - 37.10
SPMI-11759	Milk	Dec, 2001	Cs-137	54.59 ± 5.08	50.89	40.89 - 60.89
SPF-11761	Fish	Dec, 2001	Cs-134	0.94 ± 0.02	0.90	0.54 - 1.26
SPF-11761	Fish	Dec, 2001	Cs-137	1.43 ± 0.04	1.43	0.86 - 2.00

^a All results are in pCi/L, except for elemental potassium (K) in milk, which are in mg/L.; air filter samples, which are in pCi/Filter; and food products, which are in pCi/kg.

^b Results are based on single determinations.

^c Control limits are based on Attachment A, Page A2 of this report.

NOTE: For fish, Jello is used for the spike matrix. For vegetation, coleslaw is used for the spike matrix.

Table A-4. In-house "blank" samples.

Lab Code	Sample Type	Sample Date	Analysis	Concentration pCi/L ^a		
				Laboratory results (4.66 Sigma)		Acceptance Criteria (4.66 Sigma)
				LLD	Activity ^b	
SPAP-478	AIR FILTER	Jan 2001	Co-60	< 1.12		< 100.0
SPAP-478	AIR FILTER	Jan 2001	Cs-134	< 1.66		< 100.0
SPAP-478	AIR FILTER	Jan 2001	Cs-137	< 2.46		< 100.0
SPW-480	WATER	Jan 2001	H-3	< 162.00	-1.86 ± 80.40	< 200.0
SPW-484	WATER	Jan 2001	Gr. Alpha	< 0.68		< 1.0
SPW-484	WATER	Jan 2001	Gr. Beta	< 1.35		< 3.2
SPW-484	WATER	Jan 2001	Ra-226	< 0.02	0.03 ± 0.01	< 1.0
SPW-484	WATER	Jan 2001	Ra-228	< 0.97	0.43 ± 0.50	< 2.0
SPW-486	WATER	Jan 2001	Co-60	< 2.68		< 10.0
SPW-486	WATER	Jan 2001	Cs-134	< 3.46		< 10.0
SPW-486	WATER	Jan 2001	Cs-137	< 5.43		< 10.0
SPW-486	WATER	Jan 2001	Sr-90	< 0.65	0.06 ± 0.31	< 1.0
SPAP-755	AIR FILTER	Jan 2001	Gr. Beta	< 1.60	0.16 ± 0.90	< 3.2
SPW-1038	WATER	Feb 2001	U-238	< 0.03		< 1.0
SPW-1038	WATER	Feb 2001	U-238	< 0.00		< 1.0
SPW-1223	WATER	Feb 2001	Gr. Alpha	< 0.46		< 1.0
SPW-1223	WATER	Feb 2001	Gr. Beta	< 1.50		< 3.2
SPW-1223	WATER	Feb 2001	Ra-226	< 0.02	0.03 ± 0.01	< 1.0
SPW-1223	WATER	Feb 2001	Ra-228	< 0.95	0.45 ± 0.49	< 2.0
SPMI-1268	MILK	Feb 2001	Cs-134	< 5.86		< 10.0
SPMI-1268	MILK	Feb 2001	Cs-137	< 3.02		< 10.0
SPMI-1268	MILK	Feb 2001	I-131(g)	< 7.46		< 20.0
SPW-1271	WATER	Feb 2001	Co-60	< 1.06		< 10.0
SPW-1271	WATER	Feb 2001	Cs-134	< 2.61		< 10.0
SPW-1271	WATER	Feb 2001	Cs-137	< 2.37		< 10.0
SPVE-1273	VEGETATION	Feb 2001	Cs-134	< 10.04		< 100.0
SPVE-1273	VEGETATION	Feb 2001	Cs-137	< 6.00		< 100.0
SPCH-1275	CHARCOAL CANISTER	Feb 2001	I-131(g)	< 0.01		< 9.6
SPW-2164	WATER	Mar 2001	Ra-226	< 0.02	0.05 ± 0.01	< 1.0
SPU-3126	URINE	Apr 2001	H-3	< 642.00	-66.00 ± 335.00	< 200.0

2.0 ml. sample volume.

Table A-4. In-house "blank" samples.

Lab Code	Sample Type	Sample Date	Analysis	Concentration pCi/L ^a		
				Laboratory results (4.66 Sigma)		Acceptance Criteria (4.66 Sigma)
				LLD	Activity ^b	
SPDW-3130	WATER	Apr 2001	Gr. Alpha	< 0.54	0.04 ± 0.38	< 1.0
SPDW-3130	WATER	Apr 2001	Gr. Beta	< 1.46	0.67 ± 1.04	< 3.2
SPMI-3233	MILK	Apr 2001	Cs-137	< 2.66		< 10.0
SPMI-3233	MILK	Apr 2001	I-131	< 0.26	-0.06 ± 0.14	< 0.5
SPMI-3233	MILK	Apr 2001	I-131(g)	< 3.91		< 20.0
SPMI-3233	MILK	Apr 2001	Sr-89	< 0.79	-0.32 ± 0.79	< 5.0
SPMI-3233	MILK	Apr 2001	Sr-90		1.18 ± 0.35	< 1.0
Low level of Sr-90 concentration in milk (1-5 pCi/L) is not unusual.						
SPSO-3357	SOIL	Apr 2001	Cs-134	< 14.77		< 100.0
SPSO-3357	SOIL	Apr 2001	Cs-137	< 11.72		< 100.0
SPAP-3358	AIR FILTER	Apr 2001	Cs-137	< 0.55		< 100.0
SPW-3375	WATER	Apr 2001	Co-60	< 2.90		< 10.0
SPW-3375	WATER	Apr 2001	Cs-134	< 3.71		< 10.0
SPW-3375	WATER	Apr 2001	I-131(g)	< 0.39	0.02 ± 0.22	< 20.0
SPW-3375	WATER	Apr 2001	Sr-90	< 0.56	0.05 ± 0.27	< 1.0
SPDW-3130	WATER	May 2001	Gr. Alpha	< 0.45	0.15 ± 0.34	< 1.0
SPDW-3130	WATER	May 2001	Gr. Beta	< 1.26	0.34 ± 0.95	< 3.2
SPDW-3130	WATER	Jun 2001	Gr. Alpha	< 0.44	0.09 ± 0.32	< 1.0
SPDW-3130	WATER	Jun 2001	Gr. Beta	< 1.46	0.66 ± 1.04	< 3.2
SPVE-3304	VEGETATION	Jun 2001	Co-60	< 7.06		< 100.0
SPVE-3304	VEGETATION	Jun 2001	Cs-134	< 11.56		< 100.0
SPVE-3304	VEGETATION	Jun 2001	Cs-137	< 8.30		< 100.0
SPSO-5702	SOIL	Jul 2001	Co-60	< 12.80		< 100.0
SPSO-5702	SOIL	Jul 2001	Cs-134	< 13.96		< 100.0
SPSO-5702	SOIL	Jul 2001	Cs-137	< 8.10		< 100.0
SPAP-5704	AIR FILTER	Jul 2001	Co-60	< 0.79		< 100.0
SPAP-5704	AIR FILTER	Jul 2001	Cs-134	< 0.84		< 100.0
SPAP-5704	AIR FILTER	Jul 2001	Cs-137	< 0.60		< 100.0
SPW-5780	WATER	Jul 2001	Co-60	< 1.86		< 10.0
SPW-5780	WATER	Jul 2001	Cs-134	< 2.46		< 10.0
SPW-5780	WATER	Jul 2001	Cs-137	< 3.77		< 10.0

Table A-4. In-house "blank" samples.

Lab Code	Sample Type	Sample Date	Analysis	Concentration pCi/L ^a		
				Laboratory results (4.66 Sigma)		Acceptance Criteria (4.66 Sigma)
				LLD	Activity ^b	
SPF-5782	FISH	Jul 2001	Co-60	< 5.64		< 100.0
SPF-5782	FISH	Jul 2001	Cs-134	< 7.51		< 100.0
SPW-5938	WATER	Jul 2001	H-3	< 163.22	-16.21 ± 85.07	< 200.0
SPW-59451	WATER	Jul 2001	Ra-226	< 0.01	0.04 ± 0.01	< 1.0
SPW-59451	WATER	Jul 2001	Ra-228	< 0.77	0.70 ± 0.44	< 2.0
SPDW-3130	WATER	Jul 2001	Gr. Alpha	< 0.54	0.36 ± 0.40	< 1.0
SPDW-3130	WATER	Jul 2001	Gr. Beta	< 2.27	-0.78 ± 1.35	< 3.2
SPMI-6146	MILK	Jul 2001	Sr-90	< 0.50	1.09 ± 0.36	< 1.0
Low level of Sr-90 concentration in milk (1-5 pCi/L) is not unusual.						
SPW-6605	WATER	Jul 2001	Gr. Beta	< 1.34	0.55 ± 1.01	< 3.2
SPW-9009	WATER	Oct 2001	H-3	< 160.00	-56.70 ± 76.50	< 200.0
SPAP-9011	AIR FILTER	Oct 2001	Co-60	< 0.76		< 100.0
SPAP-9011	AIR FILTER	Oct 2001	Cs-137	< 0.58		< 100.0
SPW-5780	WATER	Oct 2001	Sr-90	< 0.54	0.36 ± 0.30	< 1.0
SPW-10724	WATER	Dec 2001	U-238	< 0.13	0.04 ± 0.10	< 1.0
SPAP-11549	AIR FILTER	Dec 2001	Gr. Beta	< 0.00	0.01 ± 0.00	< 3.2
SPW-11756	WATER	Dec 2001	Cs-137	< 2.62		< 10.0
SPMI-11758	MILK	Dec 2001	Cs-137	< 4.00		< 10.0
SPMI-11758	MILK	Dec 2001	I-131(g)	< 16.57		< 20.0
SPF-11760	FISH	Dec 2001	Cs-137	< 7.96		< 100.0

^a Liquid sample results are reported in pCi/Liter, air filter sample results are in pCi/filter, charcoal sample results are in pCi/charcoal, and solid sample results are in pCi/kilogram.

^b The activity reported is the net activity result.

Table A-5. In-house "duplicate" samples.

Lab Codes	Sample Date	Analysis	Concentration in pCi/L ^a		
			First Result	Second Result	Averaged Result
AP-10675, 10676	Jan, 2001	Be-7	0.06 ± 0.02	0.06 ± 0.02	0.06 ± 0.01
AP-10803, 10804	Jan, 2001	Be-7	0.04 ± 0.01	0.04 ± 0.01	0.04 ± 0.01
AP-10833, 10834	Jan, 2001	Be-7	0.04 ± 0.01	0.04 ± 0.01	0.04 ± 0.01
WW-51, 52	Jan, 2001	H-3	362.60 ± 94.70	417.20 ± 96.80	389.90 ± 67.71
MI-72, 73	Jan, 2001	K-40	1,566.90 ± 196.80	1,372.40 ± 152.50	1,469.65 ± 124.49
MI-96, 97	Jan, 2001	K-40	1,418.30 ± 117.80	1,545.70 ± 162.50	1,482.00 ± 100.35
U-858, 859	Jan, 2001	Gr. Beta	2.17 ± 2.47	4.23 ± 2.74	3.20 ± 1.84
MI-389, 390	Jan, 2001	K-40	1,489.20 ± 141.10	1,463.30 ± 168.20	1,476.25 ± 109.77
DW-879, 880	Jan, 2001	Gr. Beta	2.63 ± 0.52	2.37 ± 0.50	2.50 ± 0.36
SWU-813, 814	Jan, 2001	Gr. Beta	2.48 ± 0.58	2.46 ± 0.63	2.47 ± 0.43
MI-708, 709	Feb, 2001	K-40	1,179.40 ± 103.00	1,280.40 ± 90.26	1,229.90 ± 68.48
MI-740, 741	Feb, 2001	I-131	0.01 ± 0.26	-0.12 ± 0.26	-0.05 ± 0.18
MI-740, 741	Feb, 2001	K-40	1,434.00 ± 156.50	1,435.00 ± 126.10	1,434.50 ± 100.49
MI-789, 790	Feb, 2001	K-40	1,584.30 ± 158.80	1,390.70 ± 136.50	1,487.50 ± 104.70
DW-901, 902	Feb, 2001	Gr. Beta	4.67 ± 1.08	5.54 ± 1.13	5.11 ± 0.78
SWU-1544, 1545	Feb, 2001	Gr. Beta	3.13 ± 0.63	2.33 ± 0.52	2.73 ± 0.41
DW-1426, 1427	Feb, 2001	Gr. Beta	2.05 ± 0.92	2.34 ± 0.93	2.20 ± 0.65
DW-1426, 1427	Feb, 2001	H-3	42.60 ± 94.23	131.31 ± 95.34	86.96 ± 67.02
WW-1476, 1477	Feb, 2001	H-3	53.06 ± 65.79	53.06 ± 93.03	53.06 ± 56.97
MI-1523, 1524	Mar, 2001	I-131	-0.01 ± 0.20	-0.10 ± 0.37	-0.06 ± 0.21
MI-1523, 1524	Mar, 2001	K-40	1,396.00 ± 184.80	1,576.00 ± 184.90	1,486.00 ± 130.71
MI-1572, 1573	Mar, 2001	K-40	1,499.20 ± 113.30	1,326.00 ± 118.80	1,412.60 ± 82.08
MI-1572, 1573	Mar, 2001	Sr-90	1.65 ± 0.44	1.51 ± 0.52	1.58 ± 0.34
SW-1648, 1649	Mar, 2001	K-40	297.80 ± 67.20	344.80 ± 82.30	321.30 ± 53.13
MI-1800, 1801	Mar, 2001	K-40	1,425.80 ± 183.30	1,372.20 ± 119.70	1,399.00 ± 109.46
SW-1779, 1780	Mar, 2001	Gr. Alpha	2.22 ± 0.73	2.14 ± 0.69	2.18 ± 0.50
SW-1779, 1780	Mar, 2001	Gr. Beta	6.28 ± 0.74	6.62 ± 0.70	6.45 ± 0.51
MI-1447, 1448	Mar, 2001	I-131	-0.65 ± 0.27	0.13 ± 0.55	-0.26 ± 0.31
MI-1447, 1448	Mar, 2001	K-40	1,496.20 ± 155.40	1,413.40 ± 169.60	1,454.80 ± 115.01
WW-2115, 2116	Mar, 2001	H-3	540.04 ± 111.84	500.85 ± 110.46	520.44 ± 78.59
SW-1698, 1699	Mar, 2001	Gr. Beta	6.07 ± 1.75	5.57 ± 1.85	5.82 ± 1.27
DW-2272, 2273	Mar, 2001	Gr. Beta	2.10 ± 0.86	1.63 ± 0.83	1.87 ± 0.60
WW-2356, 2357	Mar, 2001	Gr. Beta	1.22 ± 0.50	1.32 ± 0.47	1.27 ± 0.35
AP-2812, 2813	Mar, 2001	Be-7	0.07 ± 0.02	0.05 ± 0.01	0.06 ± 0.01
AP-2812, 2813	Mar, 2001	Be-7	0.07 ± 0.02	0.05 ± 0.01	0.06 ± 0.01
LW-2217, 2218	Mar, 2001	Gr. Beta	1.85 ± 0.51	2.23 ± 0.55	2.04 ± 0.37

Table A-5. In-house "duplicate" samples.

Lab Codes	Sample Date	Analysis	Concentration in pCi/L ^a		
			First Result	Second Result	Averaged Result
AP-2833, 2834	Mar, 2001	Be-7	0.04 ± 0.01	0.06 ± 0.02	0.05 ± 0.01
AP-3038, 3039	Mar, 2001	Be-7	0.07 ± 0.02	0.07 ± 0.02	0.07 ± 0.01
AP-3038, 3039	Mar, 2001	Be-7	0.06 ± 0.02	0.07 ± 0.01	0.07 ± 0.01
DW-2398, 2399	Mar, 2001	Gr. Beta	1.58 ± 0.89	1.81 ± 0.88	1.69 ± 0.63
LW-2467, 2468	Mar, 2001	Gr. Beta	2.52 ± 0.53	2.42 ± 0.53	2.47 ± 0.37
MI-2446, 2447	Apr, 2001	K-40	1,285.40 ± 177.10	1,376.00 ± 175.90	1,330.70 ± 124.81
AP-3017, 3018	Apr, 2001	Be-7	0.05 ± 0.01	0.05 ± 0.01	0.05 ± 0.00
SW-2423, 2424	Apr, 2001	K-40	255.60 ± 59.80	268.40 ± 65.40	262.00 ± 44.31
BS-3103, 3104	Apr, 2001	Gr. Beta	7.99 ± 1.80	8.17 ± 1.73	8.08 ± 1.25
SWU-3239, 3240	Apr, 2001	Gr. Beta	3.30 ± 0.60	4.30 ± 0.74	3.80 ± 0.48
SS-3322, 3323	Apr, 2001	K-40	15.99 ± 1.08	15.59 ± 1.01	15.79 ± 0.74
W-3990, 3991	Apr, 2001	Sr-89	91.35 ± 18.94	85.29 ± 23.99	88.32 ± 15.28
BS-4347, 4348	Apr, 2001	K-40	3,982.40 ± 489.60	3,255.80 ± 450.10	3,619.10 ± 332.53
BS-4347, 4348	Apr, 2001	K-40	3.26 ± 0.45	3.98 ± 0.49	3.62 ± 0.33
MI-3364, 3365	May, 2001	K-40	1,325.90 ± 160.20	1,453.20 ± 163.00	1,389.55 ± 114.27
SO-3385, 3386	May, 2001	Gr. Alpha	6.51 ± 3.09	9.01 ± 3.44	7.76 ± 2.31
SO-3385, 3386	May, 2001	Gr. Beta	24.63 ± 3.15	28.17 ± 3.12	26.40 ± 2.22
SO-3385, 3386	May, 2001	K-40	19.17 ± 1.08	17.94 ± 0.76	18.56 ± 0.66
CL-4068, 4069	May, 2001	K-40	1.09 ± 0.27	1.13 ± 0.23	1.11 ± 0.18
MI-3475, 3476	May, 2001	Gr. Beta	1,297.10 ± 114.60	1,433.60 ± 156.60	1,365.35 ± 97.03
WW-3545, 3546	May, 2001	Gr. Beta	1.57 ± 0.55	1.36 ± 0.53	1.47 ± 0.38
MI-3681, 3682	May, 2001	K-40	1,417.20 ± 125.70	1,496.20 ± 124.50	1,456.70 ± 88.46
SW-3702, 3703	May, 2001	Gr. Alpha	4.51 ± 1.66	3.22 ± 1.55	3.87 ± 1.13
SW-3702, 3703	May, 2001	Gr. Beta	8.74 ± 1.36	7.11 ± 1.38	7.93 ± 0.97
BS-4021, 4022	May, 2001	Cs-137	224.30 ± 30.20	205.90 ± 43.00	215.10 ± 26.27
BS-4021, 4022	May, 2001	H-3	842.00 ± 47.00	860.00 ± 48.00	851.00 ± 33.59
BS-4021, 4022	May, 2001	K-40	21,117.00 ± 953.00	21,629.00 ± 1,357.00	21,373.00 ± 829.10
BS-4021, 4022	May, 2001	Pu-238	80.30 ± 36.50	59.50 ± 22.00	69.90 ± 21.31
BS-4021, 4022	May, 2001	Pu-239/40	49.40 ± 31.80	41.10 ± 19.60	45.25 ± 18.68
BS-4021, 4022	May, 2001	Ra-226	7,436.00 ± 577.90	9,126.00 ± 751.90	8,281.00 ± 474.16
BS-4021, 4022	May, 2001	Sr-90	10.60 ± 2.71	16.80 ± 3.22	13.70 ± 2.10
F-3813, 3814	May, 2001	K-40	2.10 ± 0.17	2.30 ± 0.26	2.20 ± 0.16
G-4158, 4159	May, 2001	Be-7	0.37 ± 0.13	0.41 ± 0.14	0.39 ± 0.10
SO-4179, 4180	May, 2001	Ac-228	0.45 ± 0.13	0.52 ± 0.14	0.49 ± 0.10
SO-4179, 4180	May, 2001	Bi-214	0.31 ± 0.06	0.41 ± 0.06	0.36 ± 0.04
SO-4179, 4180	May, 2001	Cs-137	0.46 ± 0.05	0.47 ± 0.04	0.47 ± 0.03

Table A-5. In-house "duplicate" samples.

Lab Codes	Sample Date	Analysis	Concentration in pCi/L ^a		
			First Result	Second Result	Averaged Result
SO-4179, 4180	May, 2001	Gr. Beta	26.65 ± 2.63	24.68 ± 2.52	25.67 ± 1.82
SO-4179, 4180	May, 2001	K-40	16.35 ± 0.86	16.05 ± 0.82	16.20 ± 0.59
SO-4179, 4180	May, 2001	Pb-212	0.35 ± 0.04	0.43 ± 0.05	0.39 ± 0.03
SO-4179, 4180	May, 2001	Ra-226	0.56 ± 0.98	1.03 ± 0.31	0.79 ± 0.51
SO-4179, 4180	May, 2001	Tl-208	0.14 ± 0.03	0.17 ± 0.03	0.15 ± 0.02
BS-4233, 4234	May, 2001	Cs-137	0.03 ± 0.01	0.03 ± 0.02	0.03 ± 0.01
BS-4233, 4234	May, 2001	K-40	8.18 ± 0.48	7.80 ± 0.58	7.99 ± 0.38
SWU-4376, 4377	May, 2001	Gr. Beta	2.58 ± 0.55	2.94 ± 0.58	2.76 ± 0.40
DW-4449, 4450	May, 2001	Gr. Beta	2.83 ± 0.55	3.74 ± 0.65	3.29 ± 0.43
DW-4397, 4398	May, 2001	Gr. Beta	9.13 ± 1.26	10.20 ± 1.34	9.66 ± 0.92
MI-4114, 4115	May, 2001	K-40	1,325.90 ± 118.80	1,394.70 ± 133.10	1,360.30 ± 89.20
F-4284, 4285	May, 2001	K-40	2.23 ± 0.32	2.12 ± 0.35	2.18 ± 0.24
DW-4326, 4327	Jun, 2001	Gr. Beta	2.60 ± 0.97	1.47 ± 0.83	2.04 ± 0.64
MI-4470, 4471	Jun, 2001	K-40	1,514.50 ± 116.60	1,456.80 ± 130.90	1,485.65 ± 87.65
SW-4493, 4494	Jun, 2001	Gr. Beta	4.05 ± 1.23	4.64 ± 1.32	4.35 ± 0.90
BS-4725, 4726	Jun, 2001	Co-60	112.00 ± 24.30	84.50 ± 8.70	98.25 ± 12.91
BS-4725, 4726	Jun, 2001	Cs-137	3,083.10 ± 100.10	3,094.80 ± 35.30	3,088.95 ± 53.07
BS-4725, 4726	Jun, 2001	K-40	8,143.70 ± 640.40	8,083.80 ± 225.10	8,113.75 ± 339.40
MI-4775, 4776	Jun, 2001	K-40	1,362.20 ± 71.80	1,363.90 ± 73.40	1,363.05 ± 51.34
WW-5110, 5111	Jun, 2001	H-3	1,173.50 ± 129.10	1,046.80 ± 125.20	1,110.15 ± 89.92
G-5085, 5086	Jun, 2001	Be-7	0.89 ± 0.17	1.14 ± 0.39	1.02 ± 0.21
G-5085, 5086	Jun, 2001	K-40	5.13 ± 0.39	5.22 ± 0.70	5.17 ± 0.40
MI-5259, 5260	Jun, 2001	K-40	1,529.70 ± 122.70	1,406.20 ± 123.80	1,467.95 ± 87.15
MI-5259, 5260	Jun, 2001	Sr-90	1.69 ± 0.42	1.71 ± 0.44	1.70 ± 0.30
SWU-5422, 5423	Jun, 2001	Gr. Beta	2.59 ± 0.54	1.91 ± 0.52	2.25 ± 0.37
VE-5401, 5402	Jun, 2001	Gr. Beta	8.12 ± 0.24	8.88 ± 0.26	8.50 ± 0.18
VE-5401, 5402	Jun, 2001	K-40	6.55 ± 0.52	6.26 ± 0.65	6.40 ± 0.42
AP-5830, 5831	Jun, 2001	Be-7	0.08 ± 0.01	0.08 ± 0.01	0.08 ± 0.01
SW-5557, 5558	Jun, 2001	Gr. Beta	5.43 ± 1.70	5.96 ± 1.56	5.70 ± 1.15
AP-5851, 5852	Jun, 2001	Be-7	0.07 ± 0.02	0.07 ± 0.02	0.07 ± 0.01
SW-5636, 5637	Jun, 2001	Gr. Beta	4.75 ± 1.38	4.18 ± 1.34	4.47 ± 0.96
LW-5681, 5682	Jun, 2001	Gr. Beta	2.42 ± 0.37	2.18 ± 0.34	2.30 ± 0.25
G-5535, 5536	Jul, 2001	Be-7	0.99 ± 0.29	0.97 ± 0.54	0.98 ± 0.31
G-5535, 5536	Jul, 2001	Gr. Beta	7.62 ± 0.12	7.72 ± 0.12	7.67 ± 0.08
G-5535, 5536	Jul, 2001	K-40	7.26 ± 1.03	7.64 ± 0.93	7.45 ± 0.69
AP-5788, 5789	Jul, 2001	Be-7	0.08 ± 0.02	0.07 ± 0.02	0.08 ± 0.01

Table A-5. In-house "duplicate" samples.

Lab Codes	Sample Date	Analysis	Concentration in pCi/L ^a		
			First Result	Second Result	Averaged Result
AP-5872, 5873	Jul, 2001	Be-7	0.07 ± 0.02	0.08 ± 0.02	0.07 ± 0.01
AP-5893, 5894	Jul, 2001	Be-7	0.08 ± 0.02	0.08 ± 0.01	0.08 ± 0.01
AP-5809, 5810	Jul, 2001	Be-7	0.07 ± 0.02	0.06 ± 0.01	0.06 ± 0.01
SW-5724, 5725	Jul, 2001	Gr. Alpha	2.95 ± 0.70	2.89 ± 0.60	2.92 ± 0.46
SW-5724, 5725	Jul, 2001	Gr. Beta	8.79 ± 0.71	8.21 ± 0.65	8.50 ± 0.48
SW-5767, 5768	Jul, 2001	I-131	0.79 ± 0.31	0.61 ± 0.26	0.70 ± 0.20
LW-5920, 5921	Jul, 2001	Gr. Beta	3.06 ± 0.64	3.15 ± 0.58	3.11 ± 0.43
SO-6172, 6173	Jul, 2001	Cs-137	0.30 ± 0.05	0.32 ± 0.04	0.31 ± 0.03
SO-6172, 6173	Jul, 2001	K-40	18.20 ± 1.08	17.55 ± 0.82	17.88 ± 0.68
SO-6172, 6173	Jul, 2001	Sr-90	0.03 ± 0.01	0.05 ± 0.02	0.04 ± 0.01
MI-6353, 6354	Jul, 2001	K-40	966.35 ± 82.28	986.31 ± 91.91	976.33 ± 61.68
SW-6376, 6377	Jul, 2001	I-131	0.58 ± 0.16	0.81 ± 0.17	0.70 ± 0.12
VE-6424, 6425	Jul, 2001	Gr. Beta	2.52 ± 0.05	2.49 ± 0.05	2.51 ± 0.03
VE-6424, 6425	Jul, 2001	K-40	3.04 ± 0.26	3.12 ± 0.37	3.08 ± 0.23
MI-6445, 6446	Jul, 2001	K-40	1,407.40 ± 97.10	1,442.20 ± 189.60	1,424.80 ± 106.51
LW-6489, 6490	Jul, 2001	Gr. Beta	2.61 ± 0.57	2.79 ± 0.54	2.70 ± 0.39
MI-6533, 6534	Jul, 2001	K-40	1,498.60 ± 113.90	1,375.50 ± 129.60	1,437.05 ± 86.27
DW-6835, 6836	Jul, 2001	Gr. Beta	2.01 ± 0.59	2.36 ± 0.63	2.19 ± 0.43
MI-6693, 6694	Aug, 2001	K-40	1,294.30 ± 118.70	1,417.30 ± 176.50	1,355.80 ± 106.35
MI-6693, 6694	Aug, 2001	Sr-90	1.47 ± 0.42	1.23 ± 0.41	1.35 ± 0.29
WW-6952, 6953	Aug, 2001	Gr. Beta	5.49 ± 0.69	5.80 ± 0.69	5.64 ± 0.49
MI-6906, 6907	Aug, 2001	K-40	1,613.80 ± 218.50	1,532.70 ± 135.80	1,573.25 ± 128.63
VE-6973, 6974	Aug, 2001	K-40	4.21 ± 0.24	4.29 ± 0.64	4.25 ± 0.34
LW-7851, 7852	Aug, 2001	Gr. Beta	2.20 ± 0.48	2.12 ± 0.42	2.16 ± 0.32
MI-7001, 7002	Aug, 2001	K-40	1,453.80 ± 148.10	1,285.30 ± 190.50	1,369.55 ± 120.65
MI-7073, 7074	Aug, 2001	K-40	1,217.30 ± 80.83	1,218.30 ± 99.13	1,217.80 ± 63.95
LW-7145, 7146	Aug, 2001	Gr. Beta	2.77 ± 0.53	3.60 ± 0.59	3.19 ± 0.39
MI-7221, 7222	Aug, 2001	K-40	1,192.90 ± 95.40	1,388.90 ± 132.70	1,290.90 ± 81.72
MI-7221, 7222	Aug, 2001	Sr-90	2.10 ± 0.48	1.72 ± 0.47	1.91 ± 0.34
SWU-7527, 7528	Aug, 2001	Gr. Beta	17.51 ± 3.06	20.36 ± 3.31	18.93 ± 2.25
VE-7485, 7486	Aug, 2001	K-40	2.12 ± 0.47	2.47 ± 0.34	2.30 ± 0.29
DW-7506, 7507	Aug, 2001	Gr. Beta	4.25 ± 1.18	4.13 ± 1.12	4.19 ± 0.81
MI-7622, 7623	Sep, 2001	K-40	1,340.10 ± 111.10	1,290.80 ± 116.50	1,315.45 ± 80.49
MI-7664, 7665	Sep, 2001	K-40	1,408.10 ± 102.70	1,396.90 ± 114.30	1,402.50 ± 76.83
MI-7876, 7877	Sep, 2001	K-40	1,416.40 ± 192.30	1,318.00 ± 155.50	1,367.20 ± 123.65
G-7960, 7961	Sep, 2001	Be-7	1.27 ± 0.21	1.25 ± 0.25	1.26 ± 0.16

Table A-5. In-house "duplicate" samples.

Lab Codes	Sample Date	Analysis	Concentration in pCi/L ^a		
			First Result	Second Result	Averaged Result
G-7960, 7961	Sep, 2001	K-40	5.21 ± 0.57	5.70 ± 0.63	5.45 ± 0.43
F-8011, 8012	Sep, 2001	Cs-137	0.06 ± 0.02	0.04 ± 0.02	0.05 ± 0.01
F-8011, 8012	Sep, 2001	Gr. Beta	3.68 ± 0.12	3.50 ± 0.11	3.59 ± 0.08
F-8011, 8012	Sep, 2001	K-40	3.47 ± 0.49	3.38 ± 0.47	3.43 ± 0.34
MI-8149, 8150	Sep, 2001	K-40	1,551.70 ± 118.00	1,489.90 ± 123.60	1,520.80 ± 85.44
MI-8343, 8344	Sep, 2001	K-40	1,550.30 ± 170.60	1,368.10 ± 126.70	1,459.20 ± 106.25
VE-8319, 8320	Sep, 2001	Gr. Beta	3.37 ± 0.10	3.42 ± 0.11	3.39 ± 0.07
VE-8319, 8320	Sep, 2001	K-40	2.14 ± 0.46	2.24 ± 0.37	2.19 ± 0.29
AP-9069, 9070	Sep, 2001	Be-7	0.07 ± 0.02	0.07 ± 0.01	0.07 ± 0.01
AP-9566, 9567	Sep, 2001	Be-7	0.08 ± 0.02	0.09 ± 0.03	0.09 ± 0.02
VE-8700, 8701	Oct, 2001	Be-7	0.24 ± 0.10	0.19 ± 0.10	0.22 ± 0.07
VE-8700, 8701	Oct, 2001	K-40	2.03 ± 0.24	2.03 ± 0.21	2.03 ± 0.16
VE-8700, 8701	Oct, 2001	Sr-90	0.01 ± 0.00	0.01 ± 0.00	0.01 ± 0.00
AP-9048, 9049	Oct, 2001	Be-7	0.07 ± 0.01	0.07 ± 0.00	0.07 ± 0.01
DW-8636, 8637	Oct, 2001	Gr. Beta	4.74 ± 1.06	5.08 ± 1.21	4.91 ± 0.80
DW-8615, 8616	Oct, 2001	Gr. Beta	4.65 ± 0.58	4.28 ± 0.54	4.47 ± 0.40
AP-9090, 9091	Oct, 2001	Be-7	0.07 ± 0.01	0.07 ± 0.01	0.07 ± 0.01
AP-9166, 9167	Oct, 2001	Be-7	0.08 ± 0.02	0.08 ± 0.02	0.08 ± 0.01
AP-9187, 9188	Oct, 2001	Be-7	0.07 ± 0.01	0.05 ± 0.01	0.06 ± 0.01
VE-10562, 10563	Oct, 2001	Be-7	309.90 ± 158.80	348.30 ± 168.10	329.10 ± 115.62
VE-10562, 10563	Oct, 2001	K-40	6,407.10 ± 620.70	6,057.50 ± 660.40	6,232.30 ± 453.15
WW-8636, 8637	Oct, 2001	Gr. Beta	5.08 ± 1.20	4.74 ± 1.06	4.91 ± 0.80
DW-8894, 8895	Oct, 2001	Gr. Beta	4.28 ± 0.89	3.40 ± 0.90	3.84 ± 0.63
MI-9232, 9233	Oct, 2001	K-40	1,440.70 ± 46.60	1,424.80 ± 76.40	1,432.75 ± 44.75
VE-9518, 9519	Oct, 2001	K-40	1.91 ± 0.22	1.97 ± 0.39	1.94 ± 0.22
WW-10257, 10258	Nov, 2001	H-3	755.90 ± 102.50	684.70 ± 99.90	720.30 ± 71.57
VE-10333, 10334	Nov, 2001	Be-7	0.68 ± 0.26	0.99 ± 0.26	0.84 ± 0.18
VE-10333, 10334	Nov, 2001	K-40	6.10 ± 0.72	5.83 ± 0.72	5.97 ± 0.51
MI-10588, 10589	Nov, 2001	K-40	1,428.40 ± 114.70	1,445.50 ± 129.40	1,436.95 ± 86.46
DW-10688, 10689	Nov, 2001	Gr. Beta	3.49 ± 0.91	2.36 ± 0.76	2.93 ± 0.60
WW-10905, 10906	Dec, 2001	H-3	233.90 ± 90.60	226.30 ± 90.20	230.10 ± 63.92
SS-10953, 10954	Dec, 2001	Ac-228	1.10 ± 0.25	0.91 ± 0.16	1.00 ± 0.15
SS-10953, 10954	Dec, 2001	Bi-214	0.69 ± 0.08	0.75 ± 0.08	0.72 ± 0.06
SS-10953, 10954	Dec, 2001	Co-58	0.21 ± 0.05	0.18 ± 0.04	0.19 ± 0.03
SS-10953, 10954	Dec, 2001	Co-60	0.93 ± 0.06	0.94 ± 0.06	0.93 ± 0.04
SS-10953, 10954	Dec, 2001	Cs-137	0.13 ± 0.03	0.16 ± 0.03	0.14 ± 0.02

Table A-5. In-house "duplicate" samples.

Lab Codes	Sample Date	Analysis	Concentration in pCi/L ^a		
			First Result	Second Result	Averaged Result
SS-10953, 10954	Dec, 2001	K-40	9.91 ± 0.83	8.36 ± 0.80	9.13 ± 0.57
SS-10953, 10954	Dec, 2001	Pb-212	0.94 ± 0.05	0.91 ± 0.06	0.92 ± 0.04
SS-10953, 10954	Dec, 2001	Pb-214	0.83 ± 0.08	0.82 ± 0.07	0.83 ± 0.05
SS-10953, 10954	Dec, 2001	Ra-226	1.76 ± 0.37	1.67 ± 0.37	1.72 ± 0.26
SS-10953, 10954	Dec, 2001	Tl-208	0.34 ± 0.05	0.31 ± 0.05	0.32 ± 0.04
MI-11033, 11034	Dec, 2001	K-40	1,339.80 ± 128.70	1,435.80 ± 117.30	1,387.80 ± 87.07
MI-11033, 11034	Dec, 2001	Sr-90	1.31 ± 0.41	1.38 ± 0.37	1.35 ± 0.28
AP-11888, 11889	Dec, 2001	Be-7	0.06 ± 0.02	0.06 ± 0.02	0.06 ± 0.01

Duplicate analyses are performed on every twentieth sample received in-house. Results are not listed for those analyses with activities that measure below the LLD.

^a Results are reported in units of pCi/L, except for elemental potassium (K) in milk (mg/L), air filters (pCi/Filter), food products and vegetation (pCi/g), soil and sediments (pCi/kg).

Table A-6. Department of Energy's Mixed Analyte Performance Evaluation Program (MAPEP)^a.

Lab Code	Sample Type	Date Collected	Analysis	Concentration ^b		
				Laboratory result ^c	MAPEP Result ^d 1s, N=1	Control Limits
STSO-923	SOIL	Jan, 2001	Am-241			0.00 - 2.60
Included as false positive. Result of analyses; < 0.8 Bq/L.						
STSO-923	SOIL	Jan, 2001	Co-57	100.20 ± 3.50	103.00 ± 10.30	72.10 - 133.90
STSO-923	SOIL	Jan, 2001	Co-60	1,285.10 ± 5.30	1,270.00 ± 127.00	889.00 - 1,651.00
STSO-923	SOIL	Jan, 2001	Cs-134	81.10 ± 1.80	91.10 ± 9.11	63.77 - 118.43
STSO-923	SOIL	Jan, 2001	Cs-137	1,210.60 ± 6.60	1,240.00 ± 124.00	868.00 - 1,612.00
STSO-923	SOIL	Jan, 2001	K-40	732.60 ± 21.20	652.00 ± 65.20	456.40 - 847.60
STSO-923	SOIL	Jan, 2001	Mn-54	212.60 ± 6.70	203.00 ± 20.30	142.10 - 263.90
STSO-923	SOIL	Jan, 2001	Pu-238	110.70 ± 7.20	115.00 ± 11.50	80.50 - 149.50
STSO-923	SOIL	Jan, 2001	Pu-239/40	79.60 ± 5.90	83.40 ± 8.34	58.38 - 108.42
STSO-923	SOIL	Jan, 2001	Sr-90	159.80 ± 9.50	209.00 ± 20.90	146.30 - 271.70
STSO-923	SOIL	Jan, 2001	U-233/4	45.00 ± 3.90	60.00 ± 6.00	42.00 - 78.00
STSO-923	SOIL	Jan, 2001	U-238	165.60 ± 7.40	191.00 ± 19.10	133.70 - 248.30
STSO-923	SOIL	Jan, 2001	Zn-65	428.50 ± 10.90	382.00 ± 38.20	267.40 - 496.60

^a Results obtained by Environmental, Inc., Midwest Laboratory as a participant in the Department of Energy's Mixed Analyte Performance Evaluation Program, Idaho Operations office, Idaho Falls, Idaho.

^b All results are in Bq/kg or Bq/L as requested by the Department of Energy.

^c MAPEP results are presented as the known values and expected laboratory precision (1 sigma, 1 determination) and control limits as defined by the MAPEP.

Table A-7. Environmental Measurements Laboratory Quality Assessment Program (EML)^a.

Lab Code	Sample Type	Date Collected	Analysis	Concentration ^b		Control Limits ^d
				Laboratory result	EML Result ^c	
STSO-904	SOIL	Mar, 2001	Ac-228	45.600 ± 4.000	42.700	0.80 - 1.50
STSO-904	SOIL	Mar, 2001	Am-241	14.400 ± 0.500	14.800	0.63 - 2.64
STSO-904	SOIL	Mar, 2001	Bi-212	53.200 ± 3.100	42.000	0.45 - 1.23
Possible effect of shield background.						
STSO-904	SOIL	Mar, 2001	Bi-214	42.100 ± 7.700	32.600	0.78 - 1.50
STSO-904	SOIL	Mar, 2001	Cs-137	1,772.600 ± 79.800	1,740.000	0.80 - 1.29
STSO-904	SOIL	Mar, 2001	K-40	583.800 ± 52.600	468.000	0.80 - 1.37
STSO-904	SOIL	Mar, 2001	Pb-212	46.600 ± 8.500	41.500	0.74 - 1.36
STSO-904	SOIL	Mar, 2001	Pb-214	45.300 ± 8.600	34.300	0.76 - 1.53
STSO-904	SOIL	Mar, 2001	Pu-239/40	26.000 ± 0.800	25.600	0.71 - 1.33
STSO-904	SOIL	Mar, 2001	Sr-90	55.600 ± 2.200	69.000	0.61 - 3.91
STW-905	WATER	Mar, 2001	Am-241	2.150 ± 0.140	1.670	0.76 - 1.48
STW-905	WATER	Mar, 2001	Co-60	97.000 ± 0.800	98.200	0.80 - 1.20
STW-905	WATER	Mar, 2001	Cs-137	70.100 ± 4.000	73.000	0.80 - 1.20
STW-905	WATER	Mar, 2001	H-3	76.500 ± 5.500	79.300	0.74 - 2.29
STW-905	WATER	Mar, 2001	Pu-238	1.690 ± 0.070	1.580	0.74 - 1.22
STW-905	WATER	Mar, 2001	Pu-239/40	1.690 ± 0.070	1.640	0.75 - 1.26
STW-905	WATER	Mar, 2001	Sr-90	3.850 ± 0.130	4.400	0.64 - 1.50
STW-905	WATER	Mar, 2001	U-233/4	0.900 ± 0.050	1.040	0.80 - 1.40
STW-905	WATER	Mar, 2001	U-238	0.880 ± 0.050	1.040	0.80 - 1.29
STW-906	WATER	Mar, 2001	Gr. Alpha	1,724.600 ± 141.700	1,900.000	0.58 - 1.26
STW-906	WATER	Mar, 2001	Gr. Beta	1,246.400 ± 31.100	1,297.000	0.56 - 1.50
STAP-907	AIR FILTER	Mar, 2001	Am-241	0.470 ± 0.040	0.486	0.69 - 2.40
STAP-907	AIR FILTER	Mar, 2001	Co-60	20.110 ± 0.160	19.440	0.79 - 1.30
STAP-907	AIR FILTER	Mar, 2001	Cs-134	2.710 ± 0.150	2.830	0.74 - 1.21
STAP-907	AIR FILTER	Mar, 2001	Cs-137	9.860 ± 0.230	8.760	0.78 - 1.35
STAP-907	AIR FILTER	Mar, 2001	Mn-54	7.250 ± 0.220	6.520	0.80 - 1.36
STAP-907	AIR FILTER	Mar, 2001	Pu-238	0.230 ± 0.030	0.215	0.66 - 1.35
STAP-907	AIR FILTER	Mar, 2001	Pu-239/40	0.120 ± 0.020	0.136	0.69 - 1.29

Table A-7. Environmental Measurements Laboratory Quality Assessment Program (EML)^a.

Lab Code	Sample Type	Date Collected	Analysis	Concentration ^b		Control Limits ^d
				Laboratory result	EML Result ^c	
STAP-907	AIR FILTER	Mar, 2001	Sr-90	7.410 ± 0.150	7.100	0.55 - 2.05
STAP-907	AIR FILTER	Mar, 2001	U-233/4	0.050 ± 0.010	0.046	0.80 - 1.92
STAP-907	AIR FILTER	Mar, 2001	U-238	0.050 ± 0.010	0.046	0.80 - 1.59
STAP-908	AIR FILTER	Mar, 2001	Gr. Alpha	2.660 ± 0.020	3.970	0.57 - 1.47
STAP-908	AIR FILTER	Mar, 2001	Gr. Beta	2.300 ± 0.020	2.580	0.76 - 1.52
STVE-909	VEGETATION	Mar, 2001	Am-241	6.100 ± 0.200	6.170	0.72 - 2.34
STVE-909	VEGETATION	Mar, 2001	Cm-244	3.500 ± 0.500	3.690	0.61 - 1.61
STVE-909	VEGETATION	Mar, 2001	Co-60	28.500 ± 2.100	30.400	0.75 - 1.51
STVE-909	VEGETATION	Mar, 2001	Cs-137	795.500 ± 76.400	842.000	0.80 - 1.37
STVE-909	VEGETATION	Mar, 2001	K-40	592.600 ± 42.500	603.000	0.78 - 1.43
STVE-909	VEGETATION	Mar, 2001	Pu-239/40	8.500 ± 0.600	9.580	0.67 - 1.49
STVE-909	VEGETATION	Mar, 2001	Sr-90	1,239.600 ± 130.000	1,330.000	0.52 - 1.23
STW-925	WATER	Sep, 2001	Am-241	0.700 ± 0.100	0.760	0.76 - 1.48
STW-925	WATER	Sep, 2001	Co-60	206.700 ± 4.700	209.000	0.80 - 1.20
STW-925	WATER	Sep, 2001	Cs-137	46.600 ± 0.800	45.133	0.80 - 1.24
STW-925	WATER	Sep, 2001	H-3	254.100 ± 3.600	207.000	0.74 - 2.29
STW-925	WATER	Sep, 2001	Ni-63	50.900 ± 3.000	45.250	0.70 - 1.30
STW-925	WATER	Sep, 2001	Pu-238	1.100 ± 0.100	1.088	0.74 - 1.22
STW-925	WATER	Sep, 2001	Pu-239/40	1.600 ± 0.100	1.628	0.75 - 1.26
STW-925	WATER	Sep, 2001	Sr-90	4.100 ± 0.300	3.729	0.64 - 1.50
STW-925	WATER	Sep, 2001	Uranium	2.200 ± 0.200	2.372	0.73 - 1.37
STW-926	WATER	Sep, 2001	Gr. Alpha	1,220.000 ± 32.000	1,150.000	0.58 - 1.26
STW-926	WATER	Sep, 2001	Gr. Beta	8,461.000 ± 206.000	7,970.000	0.56 - 1.50
STSO-927	SOIL	Sep, 2001	Ac-228	68.100 ± 1.400	59.570	0.80 - 1.50
STSO-927	SOIL	Sep, 2001	Am-241	5.200 ± 1.300	4.432	0.63 - 2.64
STSO-927	SOIL	Sep, 2001	Bi-212	65.100 ± 1.600	62.067	0.45 - 1.23
STSO-927	SOIL	Sep, 2001	Bi-214	47.300 ± 4.700	36.900	0.78 - 1.50
STSO-927	SOIL	Sep, 2001	Cs-137	659.200 ± 10.800	612.330	0.80 - 1.29
STSO-927	SOIL	Sep, 2001	K-40	737.700 ± 16.600	623.330	0.80 - 1.37

Table A-7. Environmental Measurements Laboratory Quality Assessment Program (EML)^a.

Lab Code	Sample Type	Date Collected	Analysis	Concentration ^b		Control Limits ^d
				Laboratory result	EML Result ^c	
STSO-927	SOIL	Sep, 2001	Pb-212	64.700 ± 3.800	58.330	0.74 - 1.36
STSO-927	SOIL	Sep, 2001	Pb-214	53.700 ± 7.700	39.670	0.76 - 1.53
STSO-927	SOIL	Sep, 2001	Pu-239/40	9.300 ± 2.900	8.948	0.71 - 1.33
STSO-927	SOIL	Sep, 2001	Sr-90	27.400 ± 6.300	30.596	0.61 - 3.91
STSO-927	SOIL	Sep, 2001	Uranium	155.600 ± 7.800	194.230	0.62 - 1.35
STVE-928	VEGETATION	Sep, 2001	Am-241	7.000 ± 0.300	6.915	0.72 - 2.34
STVE-928	VEGETATION	Sep, 2001	Cm-244	4.300 ± 0.800	4.308	0.61 - 1.61
STVE-928	VEGETATION	Sep, 2001	Co-60	40.200 ± 0.900	35.300	0.75 - 1.51
STVE-928	VEGETATION	Sep, 2001	Cs-137	1,184.000 ± 2.800	1,030.000	0.80 - 1.37
STVE-928	VEGETATION	Sep, 2001	K-40	1,023.000 ± 44.100	898.670	0.78 - 1.43
STVE-928	VEGETATION	Sep, 2001	Pu-239/40	8.900 ± 1.400	11.022	0.67 - 1.49
STVE-928	VEGETATION	Sep, 2001	Sr-90	1,364.000 ± 18.400	1,612.800	0.52 - 1.23
STAP-929	AIR FILTER	Sep, 2001	Am-241	0.090 ± 30.000	0.088	0.69 - 2.40
STAP-929	AIR FILTER	Sep, 2001	Co-60	16.900 ± 0.300	17.500	0.79 - 1.30
STAP-929	AIR FILTER	Sep, 2001	Cs-134	11.800 ± 0.200	12.950	0.74 - 1.21
STAP-929	AIR FILTER	Sep, 2001	Cs-137	18.300 ± 0.300	17.100	0.78 - 1.35
STAP-929	AIR FILTER	Sep, 2001	Mn-54	85.400 ± 1.300	81.150	0.80 - 1.36
STAP-929	AIR FILTER	Sep, 2001	Pu-238	0.051 ± 0.010	0.071	0.66 - 1.35
STAP-929	AIR FILTER	Sep, 2001	Pu-239/40	0.220 ± 0.020	0.229	0.69 - 1.29
STAP-929	AIR FILTER	Sep, 2001	Sr-90	3.110 ± 0.060	3.481	0.55 - 2.05
STAP-929	AIR FILTER	Sep, 2001	Uranium	0.240 ± 0.050	0.222	0.80 - 2.54
STAP-930	AIR FILTER	Sep, 2001	Gr. Alpha	6.300 ± 0.100	5.362	0.57 - 1.47
STAP-930	AIR FILTER	Sep, 2001	Gr. Beta	13.800 ± 0.100	12.770	0.76 - 1.52

^a The Environmental Measurements Laboratory provides the following nuclear species : Air Filters, Soil, Vegetation and Water.

^b Results are reported in Bq/L with the following exceptions: Air Filter results are reported in Bq/Filter, Soil results are reported in Bq/Kg, Vegetation results are reported in Bq/Kg.

^c The EML result listed is the mean of replicate determinations for each nuclide ± the standard error of the mean.

^d Control limits are reported by EML as the ratio of Reported Value / EML value.

APPENDIX B

DATA REPORTING CONVENTIONS

Data Reporting Conventions

1.0. All activities, except gross alpha and gross beta, are decay corrected to collection time or the end of the collection period.

2.0. Single Measurements

Each single measurement is reported as follows: $x \pm s$

where: x = value of the measurement;

$s = 2s$ counting uncertainty (corresponding to the 95% confidence level).

In cases where the activity is less than the lower limit of detection L , it is reported as: $<L$, where L = the lower limit of detection based on $4.66s$ uncertainty for a background sample.

3.0. Duplicate analyses

3.1 Individual results: For two analysis results; $x_1 \pm s_1$ and $x_2 \pm s_2$

Reported result: $x \pm s$; where $x = (1/2)(x_1 + x_2)$ and $s = (1/2)\sqrt{s_1^2 + s_2^2}$

3.2. Individual results: $<L_1, <L_2$ Reported result: $<L$, where L = lower of L_1 and L_2

3.3. Individual results: $x \pm s, <L$ Reported result: $x \pm s$ if $x \geq L$; $<L$ otherwise.

4.0. Computation of Averages and Standard Deviations

4.1 Averages and standard deviations listed in the tables are computed from all of the individual measurements over the period averaged; for example, an annual standard deviation would not be the average of quarterly standard deviations. The average \bar{x} and standard deviation s of a set of n numbers $x_1, x_2 \dots x_n$ are defined as follows:

$$\bar{x} = \frac{1}{n} \sum x \qquad s = \sqrt{\frac{\sum (x - \bar{x})^2}{n-1}}$$

4.2 Values below the highest lower limit of detection are not included in the average.

4.3 If all values in the averaging group are less than the highest LLD, the highest LLD is reported.

4.4 If all but one of the values are less than the highest LLD, the single value x and associated two sigma error is reported.

4.5 In rounding off, the following rules are followed:

4.5.1. If the figure following those to be retained is less than 5, the figure is dropped, and the retained figures are kept unchanged. As an example, 11.443 is rounded off to 11.44.

4.5.2. If the figure following those to be retained is equal to or greater than 5, the figure is dropped and the last retained figure is raised by 1. As an example, 11.445 is rounded off to 11.45.

POINT BEACH NUCLEAR PLANT

APPENDIX C

Sampling Program and Locations

POINT BEACH NUCLEAR PLANT

Sample Type	Locations		Collection Type (and Frequency) ^b	Analysis (and Frequency) ^b
	No.	Codes (and Type) ^a		
Airborne Filters	6	E-1-4, 8, 20	Weekly	GB, GS, on QC for each location
Airborne Iodine	6	E-1-4, 8, 20	Weekly	I-131
Ambient Radiation (TLD's)	22	E-1-9, 12, 14-18, 20, 22-32, 34-36, 38,39	Quarterly	Ambient Gamma
Lake Water	5	E-1, 5, 6, 33	Monthly	GB, BS, I-131 on MC H-3, Sr-89-90 on QC
Well Water	1	E-10	Quarterly	GB, GS, H-3, Sr-89-90, I-131
Vegetation	8	E-1-4, 6, 9, 20	3x / year as available	GB, GS
Shoreline Silt	5	E-1, 5, 6, 8, 9, 12	2x / year	GB, GS
Soil	8	E-1-4, 6, 8, 9, 20	2x / year	GB, GS
Milk	3	E-11, 19, 21	Monthly	GS, I-131, Sr-89-90
Algae	2	E-5, 12	3x / year as available	GB, GS
Fish	1	E-13	3x / year as available	GB, GS (in edible portions)

SPECIAL COLLECTIONS AND ANALYSES

Airborne Filters	4 per month 1 per quarter	Sr-89, Sr-90 Sr-89, Sr-90 (comp.)
Liquid	1 per month	GA, Sr-89, Sr-90
Subsoil Water	4 per quarter	GA, GB, H-3, GS
Miscellaneous Water Samples	4-5 per year	Sr-89, Sr-90

^a Locations codes are defined in Table 2. Control Stations are indicated by (C). All other stations are indicators.

^b Analysis type is coded as follows: GB = gross beta, GA = gross alpha, GS = gamma spectroscopy, H-3 = tritium, Sr-89 = strontium-89, Sr-90 = strontium-90, I-131 = iodine-131. Analysis frequency is coded as follows: MC = monthly composite, QC = quarterly composite.