Entergy Nuclear Operations, Inc.
Palisades Nuclear Plant
27780 Blue Star Memorial Highway
Covert, MI 49043

May 10, 2007

10 CFR 50, Appendix I
Technical Specification 5.6.2

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

Palisades Nuclear Plant
Dockets 50-255 and 72-7
License No. DPR-20

2006 Radiological Environmental Operating Report

Entergy Nuclear Operations, Inc., is submitting the attached Radiological Environmental Operating Report for the Palisades Nuclear Plant. This report was prepared in accordance with the requirements of 10 CFR 50, Appendix I, Sections IV.B.2, IV.B.3, IV.C, and Technical Specification 5.6.2. The period covered by the enclosed report is January 1, 2006, through December 31, 2006.

Summary of Commitments

This letter contains no new commitments and no revisions to existing commitments.

W. [signature] FOR CJ SCHWARZ

Christopher J. Schwarz
Site Vice President
Palisades Nuclear Plant

CC Administrator, Region III, USNRC
Project Manager, Palisades, USNRC
Resident Inspector, Palisades, USNRC

Enclosure

IE25
NMSS01

ENCLOSURE 1

ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT
JANUARY 1, 2006 THROUGH DECEMBER 31, 2006

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I. INTRODUCTION

The Radiological Environmental Operating Report provides a summary and data interpretation of the Palisades Nuclear Plant (PNP) Radiological Environmental Monitoring Program, as conducted during the 2006 reporting period. This report was prepared in accordance with the requirements of 10 CFR 50, Appendix I, Sections IV.B.2, IV.B.3, IV.C, and Technical Specification 5.6.2.

Detailed sample station identification and location information can be found in Attachment 2 of Health Physics Procedure HP 10.10, "Palisades Radiological Environmental Program Sample Collection and Shipment." HP 10.10 is included as Attachment C. The results of all environmental samples collected are evaluated as follows:

A. Air iodine and particulate and thermoluminescent dosimetry (TLD) data were statistically evaluated at the 95% confidence level. The data were compared against two criteria. The first criterion is the statistical difference, which indicates whether the sample results from near sites are greater than those from control sites, and whether or not the difference is significant (e.g., statistical "T-Test" of indicator vs. control results).

   If the T-Test concludes that the control and indicator populations are statistically different and the indicator populations are higher, then the evaluation level (twice the statistical difference) is computed. This is the minimum difference in the population means for which a corresponding difference in sample means will exceed the statistical difference with 95% confidence. If the evaluation level is exceeded, then correlation of the results with effluent releases is performed.

B. If a sufficient number of positive sample results were available (e.g., >1 control and > 1 indicator) then well water, lake water, sediment, fish, and other aquatic biota samples were evaluated using data mean comparisons and the PNP Offsite Dose Calculation Manual (ODCM), Appendix A, reporting limits.

II. NON-ROUTINE REPORTS

Non-routine reportable events did not occur during this reporting period.

III. DISCUSSION AND INTERPRETATION OF RESULTS

A. <u>Air Samples</u>

There were 258 air samples collected and analyzed for gross beta and I-131. Air iodine/particulate samples are collected weekly from five air-sampling locations. Air is metered into the sampling unit at an

approximate one cubic foot per minute flow rate through a Radeco 47-mm air filter (air particulate) and a HI-Q air iodine cartridge. Both filters are in-line with each other and housed within the same filter holder. Weekly samples were sent to Environmental, Inc., Midwest Laboratory for analysis.

Statistical analysis of the airborne particulate sample data, between the four near-site indicator locations and the control location, demonstrated no statistical difference. The mean values of gross beta results for indicator and control locations were 0.026 pCi/m^3, and 0.028 pCi/m^3, respectively. The control station 10-GR had the highest annual mean for gross beta results at 0.028 pCi/m^3. No trends in gross beta results are discernable when compared to previous years' sample results.

All I-131 activity results were below the Minimum Detectable Activity (MDA) levels.

B. Lake Water (Surface Water)

Palisades lake water inlet, South Haven Municipal Raw and Ludington lake water inlet water samples were collected daily and combined into monthly composite samples. One gallon of Palisades Lake-In (1-ST) and Ludington Lake-in (32-LP) and two gallons of South Haven Municipal Raw (25-SH) were sent to Environmental, Inc., Midwest Laboratory for analysis each month. No treatment of the water samples with preservative is required. Thirty-six monthly lake water composite samples collected from the three locations were analyzed for gross beta and tritium.

No statistical difference was found between the indicator and the control location samples and no PNP ODCM Appendix A reporting limits were exceeded.

C. Drinking Water

Water samples from South Haven Municipal Water System (25-SH Treated), and Ludington Lake-in (32-LP), were collected daily and combined into separate monthly composite samples. (The South Haven Treated is obtained at the PNP site.) One gallon of the Ludington Lake-in and South Haven treated samples (twenty-four total) were sent to Environmental, Inc., Midwest Laboratory for beta and tritium analysis. No treatment of water samples with preservative is required.

No statistical difference was found in the beta results between the indicator and the control location samples and no PNP ODCM Appendix A reporting limits were exceeded.

D. Well Water

Two one-gallon well samples are taken quarterly from each of the three monitoring wells adjacent to the steam generator storage facility (41-ST, 42-ST and 43-ST). Twelve total samples were sent to Environmental, Inc., Midwest Laboratory for beta and tritium analysis. No treatment of water samples with preservative is required.

Tritium was detected in the fourth quarter well # 15 sample (42-ST) at a level of 300 pCi/L. A gross beta value of 11.4 pCi/L was detected in the third quarter well # 16 sample (43-ST). As this value was greater than 10 pCi/L, a follow up gamma analysis was performed, and showed less than minimum detectable activity values for gamma emitters. Note that these wells are not associated with any drinking water supply.

E. Milk

Two one-gallon quantities of raw milk (grab sample) are obtained per sample location per month from dairy milk holding tanks. Each sample quantity is treated with a sodium bisulfate preservative prior to being sent to Environmental, Inc., Midwest Laboratory for analysis.

Forty-eight monthly milk samples were collected from the four dairy farms (stations 26-JH, 27-DH, 28-DC and 29-WS).

No milk analysis identified activity above the minimum detectable level, with the exception of naturally occurring potassium-40.

F. TLDs - Gamma Dose

Environmental gamma doses are measured quarterly by placement of TLDs at each designated location. Each TLD badge contains a 4-zone Calcium Sulfate ($CaSO_4$) wafer (the wafer includes an additional backup/reserve readout zone). Sensitivity for the multi-zone TLDs is 10 millirem, with a linear response of 0.1 millirem to 1000 rem.

The PNP gamma assessment program consists of 29 locations. There is a total of 16 inner ring TLDs, including one on-site, nine near-site and six steam generator storage facility locations. There are ten outer ring TLD locations (1.0 to 5.5 miles out) and three control TLDs (30 to 55 miles out). A 30^{th} TLD is placed in a lead storage cave (location number 22), and is used as a control for in-transit dose monitoring and subtraction.

There were 115 TLDs collected and analyzed during 2006. The one on-site TLD location (1-ST) serves as an individual reference TLD; however,

it was evaluated along with the inner ring (site boundary) TLDs in the statistical evaluation.

The TLD data evaluations were performed by comparing the inner ring TLDs (site boundary locations 1, 13-21 and 33-38), and the outer ring TLDs (locations 2-9, 23 and 24), against the control TLD locations (10, 11, 12).

For 2006, the quarterly average gamma readings (mR) were Inner Ring – 12.5, Outer Ring – 14.5 and Control – 14.8

The highest average dose was observed at outer ring station number 2 (5.6 miles south) with a dose of 17.6 mrem.

Statistical analysis demonstrated that inner ring vs. control TLDs were two different populations. However, the control mean was greater than the inner ring mean. There was no statistical difference between the outer ring and control populations. No trends are discernable when comparing inner ring with outer ring and control TLD results. Overall, outer ring TLD mean results are consistently higher than inner ring TLD mean results, and control station TLD mean results are slightly higher than outer ring mean results. (The likely reason for the lower results seen for the site perimeter locations is that these TLDs are placed in wooded areas and thus shielded to some degree from cosmic background radiation.)

G. Crops

Food crop samples are collected when available, and in season. Two principal area crops, apples and blueberries, are regularly collected. Approximately 1 kg of sample is placed in a sealable plastic bag for shipment to Environmental, Inc., Midwest Laboratory. No special treatment of the samples with a preservative is necessary.

Three crop samples were collected. Blueberries and apples were collected at indicator station 4-JS (3.5 miles SE), and apples at a control station located in the least prevalent wind direction, approximately 11 miles NNE. (Control blueberries were lost during shipment.).

No crop analysis identified activity above the Minimum Detectable Activity for either I-131 or gamma emitters.

H. Sediment

Sediment samples are collected semi-annually from each designated location. No treatment of the samples with a preservative is necessary prior to shipment to Environmental, Inc., Midwest Laboratory.

Four sediment samples were collected from two locations. Two were obtained from Palisades, 30-STN (0.5 miles north of discharge), and two from the Ludington Control Station (32-LP).

No sediment analysis identified any gamma activity.

I. Fish

Fish samples are collected semi-annually. Samples consist of two species of commercially and/or recreational important species near the plant discharge area. One sample of the same species in an area not influenced by plant discharge is collected. Each one-liter quantity of fish sample is prepared for shipment to Environmental, Inc., Midwest Laboratory. Each sample is frozen for preservation.

Seven individual fish samples were collected from two locations. Three indicator samples were obtained from Palisades (1-ST discharge) and four control samples were obtained from Ludington Station (32-LP).

Cs-137 was the only gamma emitter detected and was seen in two indicator samples and two control samples. The average values were 0.049 pCi/g and 0.044 pCi/g respectively. No trends in Cs-137 are discernable when compared to previous years' sample results. The ODCM reporting limit for Cs-137 is 2000 pCi/kg (2 pCi/gm).

J. Broad Leaf Vegetation

No broad leaf vegetation samples were collected from the surrounding PNP environs during 2006. The collection of broad leaf vegetation samples serves as a backup and/or alternative sampling medium in case any milk sampling location(s) become(s) unavailable.

K. Non-Routine Samples

There were no non-routine samples collected during this reporting period.

L. Gaseous and Liquid Radwaste Effluent Composite Samples

Both the gaseous and liquid radwaste effluent composite samples are collected monthly and sent to Teledyne Brown for analysis. No special sample treatment with a preservative is required prior to laboratory analysis. The liquid effluent composite sample is based on a specific amount of sample collected, per total batch volume release. The gaseous radwaste effluent weekly composite sample results are based on analyzing weekly stack gas filters.

Although not a direct reporting component in the PNP Annual Radiological Environmental Operating Report, results of the gaseous and liquid monthly radwaste effluent composite samples are evaluated against overall environmental trending data. This evaluation is the basis for determining isotopic dispersion and deposition patterns within the surrounding environs of PNP. All gaseous and liquid effluent results are compared to the PNP ODCM, Appendix A, reporting levels. All isotopic lower limits of detection (LLDs) were met.

IV. ASSESSMENT OF PALISADES OPERATION ENVIRONMENTAL IMPACT

In reviewing the 2006 PNP radiological environmental monitoring data, and comparing it to previous operational and pre-operational data, all trending parameters continue to indicate that the operation of PNP has minimal environmental impact. Most isotopic activity is at environmental background levels. Evidence of an overall environmental isotopic buildup (attributable to plant effluents) remains negligible as well. In most instances, sample analytical results were below previously established environmental background levels.

Table HP 10.4-1
Sample Data Summary

Palisades Nuclear Plant, Van Buren County, MI Docket 50-255
Annual Radiological Environmental Operating Report
January 1, 2006 to December 31, 2006

Medium	Collection Description	Location	Number of Samples Collected	Type of Analysis	Frequency of Analysis
Air	Continuous at appx 1 cfm	Stations 4, 5, 8, 9 and 10	258	Gross Beta, I-131	Weekly
Lake Water	1 gallon composite	Lake Intake and South Haven Raw	24	Gross Beta, Tritium (Tritium not done on South Haven Raw)	Monthly
Lake Water - Control	1 gallon composite	Ludington Lake In	12	Gross Beta, Tritium, Sr-89 and Sr-90	Monthly
Drinking Water	1 gallon composite	South Haven Municipal	12	Gross Beta, Tritium	Monthly
Well Water	2 gallons grab	Three sites adjacent to Interim Steam Generator Storage Facility	12	Gross Beta, Tritium	Quarterly
Milk	2 gallons grab	Shine Farm, D Hessey, D Carpenter & J Hay Dairy Farms	48	Gamma isotopic, I-131 and other isotopic	Monthly
TLD	Continuous	Inner Ring, Outer Ring, Controls	115	Gamma dose	Quarterly
Food Products	Grab	J Sarno and Control	3	Gamma isotopic and I-131	At time of harvest
Sediment	Grab	Discharge 1/2 mile north of Palisades and Ludington Control	4	Gamma isotopic	Semiannually
Fish	Grab	Discharge and Control	7	Gamma isotopic	Semiannually
Broadleaf Vegetation	Grab	NA - no samples taken			

Table HP 10.4-2
Sample Data Summary

Environmental Radiological Monitoring Program Summary

Name of Facility	Palisades Nuclear Plant	Docket No	50-255
Location of Facility (County, State)	Van Buren, Michigan	Reporting Period	Jan 1, 2006 to Dec 31, 2006

Medium or Pathway Sampled (Unit of Measure)	Type/Total Number of Analyses Performed	Lower Limit of Detection[a] (LLD)	All Indicator Locations Mean (f)[b] Range[b]	Name Distance & Direction	Mean (f)[b] Range[b]	Control Locations Mean (f)[b] Range[b]	Number of Reportable Occurrences
Air Particulates (pCi/m3)	I-131/258	0.03	<LLD	--	--	<LLD	0
	Gross Beta/258	0.01	0.026 (207/207) 0.011 - 0.048	GR-10 Grand Rapids 55 miles NNE	0.028 (51/51) 0.014 – 0.045	0.028 (51/51) 0.014 – 0.045	0
Lake Water (pCi/L)	Gross Beta/36	4.0	1.55 (24/24) 0.6 – 3.4	South Haven SH-25 5½ miles N	1.70 (12/12) 1.0 – 3.4	1.48 (12/12) 0.9 – 2.3	0
	Tritium/36	500	151 (1/24) 151 - 151	South Haven SH-25 5½ miles N	151 (1/12) 151 – 151	< LLD	0
Drinking Water (pCi/ml)	Gross Beta/24	4.0	1.70 (12/12) 1.0 – 2.8	South Haven Municipal	1.70 (12/12) 1.0 – 2.8	1.48 (12/12) 0.9 – 2.3	0
	Tritium/24	500	186 (5/12) 154 - 240	South Haven Municipal	186 (5/12) 154 - 240	< LLD	0

Table HP 10.4-2
Sample Data Summary

Medium or Pathway Sampled (Unit of Measure)	Type/Total Number of Analyses Performed	Lower Limit of Detection[a] (LLD)	All Indicator Locations Mean (f)[b] Range[b]	Name Distance & Direction	Mean (f)[b] Range[b]	Control Locations Mean (f)[b] Range[b]	Number of REPORTABLE OCCURENCES
Milk (pCi/L)	I-131/48 Cs-137/48 Other Gamma/48	1.0 18.0 15.0	<LLD <LLD <LLD	-- -- --	-- -- --	<LLD <LLD <LLD	0 0 0
Inner Ring TLD (Gamma mR)	Gamma Dose/75	10.0	12.5 (63/63) 9.9 – 15.6	Kalamazoo ST-11 35 miles E	16.4 (4/4) 15.0 – 17.8	14.8 (12/12) 12.6 – 17.8	0
Outer Ring (Gamma mR)	Gamma Dose/52	10.0	14.5 (40/40) 11.4 – 19.1	ST-02 5.6 miles S	17.6 (4/4) 16.5 – 19.1	14.8 (12/12) 12.6 – 17.8	0
Food Products (pCi/gm wet)	I-131/3 Gamma Spec/3	0.06 0.05 - 0.10	<LLD <LLD	-- --	-- --	<LLD <LLD	0 0
Sediment (pCi/gm dry)	Gamma Spec/4	0.05 to 0.18	<LLD	--	--	<LLD	0
Fish (pCi/gm wet)	Gamma Spec/7	0.10 to 0.26	0.049 (2/3) 0.036 – 0.062	Plant Discharge 1/2 mile N	0.062 (1/3) 0.062	0.044 (2/4) 0.029 – 0.059	0

a Nominal Lower Limit of Detection (LLD) as defined in table notation c of Table E-3
b Mean and range based on detectable measurements only. Fraction of detectable measurements at specific locations is indicated in parenthesis (f)

Table HP 10.4-3
Greatest Mean Sampling Location

January 1, 2006 to December 31, 2006
Table HP 10.4-3

Medium or Pathway Sampled (unit of measurement)	**Type of Analysis**	**Location**	**High**	**Low**	**Mean**
Air (pCi/m3)	I-131	NA	NA	NA	NA
	Gross Beta	GR-10	0.045	0.014	0.028
Lake Water (pCi/L)	Gross Beta	25-SH SHRAW	3.4	1.0	1.7
	Tritium	25-SH SHRAW	151	151	151
Drinking Water (pCi/L)	Gross Beta	25-SH Treated	2.8	1.0	1.7
	Tritium	25-SH Treated	240	154	186
Milk (pCi/L)	I-131	NA	NA	NA	NA
	Cs-137	NA	NA	NA	NA
	Other gamma	NA	NA	NA	NA
Inner Ring TLD (gamma mR)	Quarterly	ST-11 KZ	17.8	15.0	16.4
Outer Ring TLD (gamma mR)	Quarterly	ST-02 Outer Ring	19.1	16.5	17.6
Crops (pCi/g wet)	I-131	NA	NA	NA	NA
	Other Gamma	NA	NA	NA	NA
Sediment pCi/gm dry)	Gamma Emitters	NA	NA	NA	NA
Fish (pCi/gm wet)	Gamma Emitters	Discharge	0.062	0.036	0.049
Broadleaf Vegetation	Gross Beta Cs-137 Other Gamma	NA - no samples taken			

ATTACHMENT A
SAMPLE COLLECTION ANOMOLIES

Sample Affected	Location	Date	Problem	Evaluation
Air	5-PR	4/10/06	Sample not obtained	Air sample pump found not running. PNP corrective action report number 01023185 initiated.
Air	10-GR	4/23/06	Required LLD not attained	Sample not shipped to vendor in time to permit meeting the required LLD. PNP corrective action report number 01025707 initiated.
Air	10-GR	6/8/06	Sample not received at Palisades	Sample lost during shipment. PNP corrective action report number 01034669 initiated.
TLD	21-ST	9/30/06	TLD missing from holder	Likely a squirrel or chipmunk removed TLD from holder. PNP corrective action report number 01053121 initiated.
Air	10-GR	12/7/06	Weekly sample not taken	Weekly air sample ran two weeks prior to change-out. PNP corrective action report number 01066120 initiated.

ATTACHMENT B
PALISADES LAND USE CENSUS

The attached tables are the results of the PNP Land Use Census conducted on September 21, 2006.

Table 10.11-1 references the distance from PNP to the nearest residence, garden (greater than 500 square feet), beef/dairy cattle, and goat per meteorological sector.

Table 10.11-2 identifies the locations of the nearest residence, garden, beef/dairy cattle and goats within a five (5) mile radius of PNP per meteorological sector.

Table 10.11-3 lists the critical receptor locations used in calculation of the offsite doses by the GASPAR computer program.

The XOQ/DOQ values in the ODCM will be changed to reflect the changes noted in the Land Use Census. PNP uses the 1992-1996 meteorological data.

2006 PALISADES LAND USE CENSUS

TABLE 10.11-1

Distance to the nearest residence, garden, dairy/beef cattle and goat in each sector.

SECTOR	RESIDENCE	GARDEN	BEEF CATTLE	DAIRY COW	GOAT
NNE	1.1 mi	1.7 mi	>5 mi	>5 mi	>5mi
NE	1.2 mi	1.2 mi	>5 mi	>5 mi	>5 mi
ENE	1.3 mi	1.6 mi	>5 mi	>5 mi	>5 mi
E	1.0 mi	2.1 mi	>5 mi	>5 mi	>5 mi
ESE	1.0 mi	>5 mi	>5 mi	>5 mi	>5 mi
SE	1.0 mi	>5 mi	1.9 mi	>5 mi	>5 mi
SSE	0.7 mi	1.6 mi	>5 mi	>5 mi	4.8 mi
S	0.5 mi	4.0 mi	>5 mi	>5 mi	>5 mi
SSW	0.7 mi	>5 mi	>5 mi	>5 mi	>5 mi

2006 PALISADES LAND USE CENSUS
TABLE 10.11-2

Nearest Locations per Sector Within 5 Miles

Sector	Location Description	Item	How Many
NNE Ruggles Rd	State Park Manager	Residence	1
NNE 20th	0.1 mile south of Ruggles Rd SW corner of 20th and O fire lane	Garden	1
NE Blue Star Highway	Route 3, Box 133 (East side of highway)	Residence Garden	1 1
NE M-43	M-43, N side of road, between 12th and 16th (approximately 0.3 mile outside of the 5-mile limit)	Goats	Appx 20
ENE 24th avenue	Trailer-West 24th avenue, dead end at sand dune	Residence	1
ENE	22918 72nd street	Garden	1
E 77th	77th St., dead end of 77th St. near 28th Avenue intersection	Residence Covert Gen Co.	1
E 75th	27723 75th, 0.1 mile N of 28th (East side of road)	Garden	1
ESE 28th avenue	77401 28th avenue	Residence	1
SE/ESE 28th	77555 28th Avenue	Residence	1
SE 76th	SE Corner of 76th and 30th, east side of road	Cattle	4
SSE	80119 29th Avenue	Residence	1
SSE 77 ½	77 ½ St., 0.3 mile N of 32nd Ave, West side of 77 ½ St.	Garden	1
SSE 376th	376th, North side of road, 0.3 mile East of 76th	Goat	Appx 20

2006 PALISADES LAND USE CENSUS
TABLE 10.11-2

Nearest Locations per Sector within 5 Miles

Sector	Location Description	Item	How Many
S 29th Ave	Palisades Park, 0.5 mile West of 29th Ave and Blue Star Highway	Residence	1
S 78th	78th, 0.5 mile North of CR 376 west side of road	Garden	1
SSW 29th	29th Ave, at dead end of Palisades Park	Residence	1

2006 PALISADES LAND USE CENSUS

TABLE 10.11-3

Critical Receptor Items

Sector	Distance (miles)	Location/Description	Item
SSE	0.48	Site Boundary	N/A
S	0.5	Residence, Palisades Park, ½ mile west of 29th avenue and Blue Star Highway	Residence
NE	1.2	Route 3, Box 133 (East side of highway)	Garden
SE	1.9	SE Corner of 76th Street and 30th	Beef Cattle
SSE	4.8	376th, North side of road, 0.3 mile East of 76th	Goat

No dairy cattle are within the 5 mile radius of PNP

ATTACHMENT C

HEALTH PHYSICS PROCEDURE HP 10.10
"PALISADES RADIOLOGICAL ENVIRONMENTAL PROGRAM SAMPLE COLLECTION AND SHIPMENT"

33 Pages Follow

Procedure No HP 10.10
Revision 9
Effective Date 7/6/05

PALISADES NUCLEAR PLANT
HEALTH PHYSICS PROCEDURE

TITLE: PALISADES RADIOLOGICAL ENVIRONMENTAL PROGRAM SAMPLE COLLECTION AND SHIPMENT

Approved: JBBurnett / 7/1/05
Procedure Sponsor **Date**

New Procedure/Revision Summary:

Editorial to Revision 9

Specific Changes

TITLE: PALISADES RADIOLOGICAL ENVIRONMENTAL PROGRAM SAMPLE COLLECTION AND SHIPMENT

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TITLE: PALISADES RADIOLOGICAL ENVIRONMENTAL PROGRAM SAMPLE COLLECTION AND SHIPMENT

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ATTACHMENTS

TITLE: PALISADES RADIOLOGICAL ENVIRONMENTAL PROGRAM SAMPLE COLLECTION AND SHIPMENT

USER ALERT
INFORMATION USE PROCEDURE

The activities covered by this procedure may be performed from memory.

1.0 PURPOSE

To provide methodology for collection of environmental samples in support of the Radiological Environmental Monitoring Program (REMP).

2.0 REFERENCES

2.1 SOURCE DOCUMENTS

2.1.1 Reg Guide 4.15(7)

2.1.2 10CFR50, Appendix I

2.1.3 Palisades Administrative Procedure 7.08, "Palisades Radiological Environmental Monitoring Program"

2.1.4 REMP Sample Shipping Manual, Environmental Inc

2.1.5 Health Physics Procedure HP 10.1, "Radiological Environmental Monitoring Program Surveillance"

2.1.6 Offsite Dose Calculation Manual (ODCM)

2.1.7 Branch Technical Position (Revision 1, 1979), "Radiological Portion of the Environmental Monitoring Program"

2.2 REFERENCE DOCUMENTS

2.2.1 Palisades ODCM, Appendix A, Sections III.J, IV.C, and Tables E-1 and E-2

2.2.2 Palisades Administrative Procedure 10.46, "Plant Records"

2.2.3 Palisades Administrative Procedure 10.41, "Procedure and Policy Processes"

2.2.4 Health Physics Procedure HP 6.52, "Palisades (Onsite) Radiological Environmental Program Sample Collection"

2.2.5 Palisades Administrative Procedure 3.19, "Technical Specifications Programs"

3.0 PREREQUISITES

As indicated in procedure.

4.0 PRECAUTIONS AND LIMITATIONS

4.1 This procedure shall be applicable to Palisades/Chemistry & Radiation Protection, Environmental Department, and any contractual personnel assigned to collect or evaluate REMP samples.

4.2 Any revisions to this procedure shall be reviewed against Palisades ODCM Specifications to verify compliance to all requirements.

4.3 Deviations from the required sampling schedule shall be documented in the Annual Radiological Environmental Operating Report.

4.4 Every effort shall be made to complete corrective action on malfunctioning sampling equipment prior to the end of the next sampling period.

4.5 If it is not possible to obtain the required samples, suitable alternative media and locations shall be substituted within 30 days.

4.6 Samples shall be collected, prepared, and shipped for analysis in a timely manner to preserve integrity. Other specific handling precautions for sample media are indicated in Section 5.0 as required.

4.7 Obtain best available replacement sample for any missing sample. Some samples are not replaceable (TLDs, air samples, etc), however, water, milk, crop samples, etc, should be.

4.8 Document any missing samples or malfunctioning equipment on sample data collection sheets.

TITLE: PALISADES RADIOLOGICAL ENVIRONMENTAL PROGRAM SAMPLE COLLECTION AND SHIPMENT

5.0 PROCEDURE

USER ALERT
INFORMATION USE PROCEDURE

The activities covered by this procedure may be performed from memory.

5.1 CONTROL AND OVERSIGHT OF SAMPLING FOR THE RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

5.1.1 Sampling techniques described by this procedure must be strictly adhered with.

a. This includes use of tweezers for air sample media change out to ensure the collected media is not disturbed.

b. Recorded data should be verified including verification of transcribed data to avoid errors.

c. All deviations from performance requirements, unavailable samples, or other sampling anomalies must be reported to the C&RP Radiological Environmental Contact.

5.1.2 Failure of sample collectors to comply with sampling and reporting requirements may result in remedial training, or reassignment of sampling duties.

5.1.3 The C&RP Radiological Environmental Contact shall conduct periodic (annual) audits of air sampling activities performed by non-Palisades C&RP personnel.

a. These audits shall include observation of collection techniques, verification of procedural compliance, and review of equipment condition.

Included in the review of equipment condition, is to ensure that any fast growing trees and bushes in the vicinity of the station are removed, along with any branches extending over the top of the sampler. The goal is to keep every station away from the drip line (with the exception of station 9, which has an existing canopy 50 feet above the station).

b. Audits should specifically address air sample collection and should include observation of all individuals involved in sample changeout.

c. Results of the audits and any follow up action should be documented in the REMP file.

Collect samples using the following methodology in accordance with schedule and location data described in Attachments 1 and 2.

5.2 REMP AIR SAMPLE COLLECTION

5.2.1 Precautions

a. New filters and cartridges should be transported and handled such that potential contamination of them is minimized (ie, placed in clean plastic bags, etc).

b. If an air sampling unit is discovered not operating, attempt to find the cause and repair. If this cannot be done, replace applicable component and document on air sample collection data sheet.

c. Airflow meters shall be calibrated annually by General Meter. All in service calibrated meters will have affixed a valid calibration sticker/card stating date of calibration and calibration due date.

d. Airflow meters shall be changed out prior to the expiration of calibration dates.

e. Air station leakage shall be none detectable. If the replacement of air station components is required due to air leakage, document on air sample collection data sheet.

5.2.2 Prerequisites

a. Glass fiber (particulate) air filters

b. Charcoal cartridges for iodine sampling (prelabeled for each air sampler)

c. Glassine or plastic envelopes (prelabeled for each air sampler)

d. REMP Air Sample Data Sheet (containing installation data)

e. Replacement air sample meters (as required)

f. Tweezers

g. Stop Watch

h. Step Ladder

NOTE: The Control Station 10-GR, is changed out weekly by an independent collector, and mailed in separately. The prelabeling of cartridges and envelopes, detailed below, is not required for this station as sample mix-up is not possible. In addition, for control station, the Palisades Sample Collection Form and Records (Page 1 of Attachment 5) is completed by the Technician changing out the four local stations by transferring the recorded data provided by the independent collector.

5.2.3 Perform the following weekly at each sample location:

a. Open the protective cover on the air sample station and verify the sampling location number written on the inside of the door is the same as the prelabeled sample change-out package.

b. Verify that the meter serial number and calibration due date are correctly documented on Palisades Plant Environmental Monitor Operability Check and Sample Collection data form (Page 1 of Attachment 5).

c. Determine and record the "As Found Flow" rate (seconds for one cubic foot of volume).

d. Determine and record the "As Found Leak" rate by placing hand over filter housing inlet to form a seal. While holding hand over the inlet, determine if air leakage is evident by checking the air flow meter needle for movement (leakage). If no air leakage, record (N) in the "As Found Leak" column. If air leakage is indicated, determine the cause and repair as soon as possible.

e. Unplug or turn off the air pump and record the "REMOVED MONTH/DAY/YEAR," "REMOVED TIME," and "GAS METER READING REMOVED."

f. Remove the prelabeled charcoal cartridge and place in zip lock bag.

g. Using tweezers, carefully remove particulate filter from the sampler head and place in the prelabeled glassine envelope or plastic envelope.

h. Clean out any residue or moisture buildup in sampler head before replacement filter is installed. Check the condition of the sampler head o-rings. Replace cracked o-rings as necessary to prevent air leakage.

i. Install new particulate filter and charcoal cartridge and ensure that both are properly centered in sampler head to prevent air leakage. Ensure the fiber side of the particulate filter is facing out (smooth side facing inward).

j. Restart air pump. Place hand over the filter housing inlet to form a seal, determine if air leakage is evident by checking air flow meter needle movement. If no air leakage, record (N) in the "As Left Leak" column. If air leakage indicated, determine the cause of the leakage (filter not centered in holder properly or cracked o-ring) and correct problem as soon as possible, restoring system to no air leakage.

k. Determine and record "As Left" flow rate. If greater than 90 seconds are required for one cubic foot of volume, the sample pump is degrading. Replace pump as soon as possible to avoid failure to reach minimum sample volume. (5000 ft^3).

l. If an airflow meter must be replaced, record this in the "Comments" column. Record replacement meter data in the reading on the upcoming week's sample collection data sheet.

m. Close the protective cover on the air sample station.

n. Proceed to the next station. Date and sign the current week's data sheet upon completion of the entry of all current data.

o. Calculate and record "SAMPLE VOL (FT3)," ALSO ensure all pertinent data is recorded.

p. Transcribe the "REMOVED MONTH/DAY/YR" and "GAS METER READING REMOVED" taken in Step 5.2.3e to the "INSTALLED" reading columns on the sample collection sheet to be used for the upcoming week's air sample collection. Also transcribe the meter serial number and calibration due date to the upcoming week's sample collection sheet.

TITLE: PALISADES RADIOLOGICAL ENVIRONMENTAL PROGRAM
SAMPLE COLLECTION AND SHIPMENT

5.3 REMP LAKE (DRINKING) WATER SAMPLE COLLECTION - SOUTH HAVEN, MICHIGAN

5.3.1 Prerequisites

a. Two clean, one-gallon plastic containers labeled with sample type, location, amount, and date (or collection period)

b. Data Sheet (Attachment 3)

5.3.2 Perform the following sample collection monthly:

a. Leave two containers with the plant personnel at the South Haven Municipal Water Treatment Plant. New water sample containers should be left at the South Haven Water Treatment Plant upon pickup of end-of-month composite samples.

b. Instruct the plant personnel to add approximately 300 ml per day of raw water to containers labeled "RAW."

c. Return at end of month to collect containers. Obtain verbal verification that Step 5.3.2b was carried out. Note any deviations in "Remarks" column of data sheet.

d. Label containers with sample type, location, and collection period.

e. Package and ship samples per Attachment 4.

f. Record location, sample types, and amount on sample identification data sheet (Attachment 3).

5.4 STEAM GENERATOR STORAGE FACILITY MONITORING WELL WATER SAMPLE COLLECTION (QUARTERLY)

5.4.1 Prerequisites

a. Clean, one-gallon plastic containers

b. Data Sheet (Attachment 3)

5.4.2 Perform the following sample collection quarterly:

a. Begin pumping water, and allow water to run for approximately one minute to purge the lines.

b. Fill two clean, one-gallon plastic containers with well water from each sample location.

c. Label containers with sample type, location, and collection date.

d. Package and ship samples per Attachment 4.

e. Record on data sheet location, type, date, amount, and under "Remarks" any pertinent information.

5.5 REMP MILK SAMPLE COLLECTION

5.5.1 Precautions

a. Milk samples shall be sent to the laboratory as soon as possible because of the short half-life of I-131. Any undue delay may cause ODCM, Appendix A, Table E-3 analytical LLD requirements to be violated.

b. Obtain best available replacement sample for any missing milk sample(s). Identify new sample location(s) and update location in Attachment 2.

c. If milk samples are unavailable, then samples of three different kinds of broad leaf vegetation grown nearest to Palisades in each of two different offsite locations of the highest predicted average ground level D/Q (SE or SSE sectors near site), and one sample of each kind of similar broad leaf vegetation grown 15-30 km distant from Palisades in the least prevalent wind direction (NNE, NE or ENE sectors) may be used as replacement samples. The new sample locations shall be identified and the REMP procedures revised within 30 days to reflect sampling changes. Collect approximately one kilogram (2.2 lb) of each sample type.

5.5.2 Prerequisites

a. Two clean, plastic one-gallon containers for each sample location

b. Sodium bisulfite preservative (approximately 40 gm per gallon of milk required)

c. Data Sheet (Attachment 3)

5.5.3 Perform the following monthly at each specified sample collection location:

a. Obtain two one-gallon grab samples of raw milk as specified in Attachments 1 and 2.

b. Add approximately 40 gm of sodium bisulfite to each one-gallon container of milk and thoroughly mix. The sodium bisulfite can either be in prepared packets or "scooped" with a volumetric measure from its container.

c. Label containers with sample type, location, and date.

d. Package and ship samples as per Attachment 4.

e. Record on Sample Data Sheet, the location, type, date, and amount of samples. Under "Remarks," note any other pertinent information.

5.6 REMP AQUATIC BIOTA COLLECTION

5.6.1 Precautions

a. Collection to be coordinated between Radiological Services Department responsible Section and the Environmental Department. At least one individual in the collection party is required to have Michigan Department of Environmental Quality (MDEQ) Cultural and Scientific Fish Collectors Permit if gill net is used.

b. If logistical problems prevent use of a boat to set gill nets from the lake side of Palisades, then the nets can be set offshore from the site boundary (by wading). Notify Security prior to using offshore wading method for beach access.

TITLE: PALISADES RADIOLOGICAL ENVIRONMENTAL PROGRAM SAMPLE COLLECTION AND SHIPMENT

5.6.2 Prerequisites

a. Boat with required safety equipment, or waders

b. Gill nets with weights and floats

c. Plastic one-liter wide-mouth bottles

d. Data Sheet (Attachment 3)

e. Fillet knives

f. Black permanent felt markers for sample identification on containers

g. Notify district MDEQ Fisheries biologist prior to sample collection

5.6.3 Collect samples twice during the season of greatest abundance (typically May through October) as follows:

a. Gill nets are placed at the locations specified in Attachment 1 to collect at least two species of commercially and/or recreationally important fish in the vicinity of the Plant discharge area and the same species in an area not influenced by the Plant discharge (Ludington Pump Storage Plant or other Consumers Energy facility). One liter of flesh should be collected for each species caught for analysis accuracy.

b. Normally fish will be collected first from the vicinity of the discharge. REMP coordinator will then collect at least two of the same species at Ludington (control station). Or REMP coordinator will provide the Ludington collector with a list of the species collected in the vicinity of the discharge, with instructions to collect at least two of the same species.

c. Label all containers with sample type, location, and date.

d. Package and ship samples per Attachment 4.

e. Record on data sheet location, type, date, amount, and under "Remarks" indicate any pertinent information.

5.7 REMP SEDIMENT SAMPLE COLLECTION

5.7.1 Prerequisites

a. One-liter, wide-mouth plastic sample bottles

b. Data Sheet (Attachment 3)

5.7.2 Collect sediment samples semiannually at station 30, 0.5 miles north of discharge, and a control sample at the Ludington Pump Storage Plant.

a. Label containers with sample type, location, and date.

b. Package and ship samples per Attachment 4.

c. Record on Sample Data Sheet location, type, date, and amount of sample. Note any other pertinent information in the "Remarks" section.

5.8 REMP FOOD PRODUCT SAMPLE COLLECTION

a. Sample containers

b. Data Sheet (Attachment 3)

5.8.1 Collect food samples monthly during the harvest season, as per ODCM, Appendix A, Table E-1. One sample each of the two principal fruit crops blueberries and apples must be collected.

a. Collect approximately one kilogram (2.2 lb) of each sample type. Samples are not to be washed, shaken, or cleaned. Samples should not be collected from a single source, but at random from the entire orchard or field.

b. Label all containers with sample type, location, and date.

c. Package and ship samples per Attachment 4.

d. Record on data sheet location, type, date, amount, and under "Remarks" note any unusual conditions.

TITLE: PALISADES RADIOLOGICAL ENVIRONMENTAL PROGRAM SAMPLE COLLECTION AND SHIPMENT

5.9 REMP TLD SAMPLE COLLECTION

5.9.1 Prerequisites

a. TLDs

b. TLD Data Sheet (Attachment 5)

5.9.2 Quarterly at each sample location perform the following:

a. Upon receipt of TLDs from the laboratory contractor, all TLDs shall be inventoried and immediately placed in the lead cave. Note date of receipt and inventory on TLD data sheet.

b. Field TLDs shall only be removed from the lead cave for delivery to their proper locations. All control TLDs remain in the lead cave throughout the entire exposure period.

c. Remove and replace TLDs at each sample location.

d. For any missing TLDs, perform the following:

1. Search immediate area.

2. If lost TLD is found, collect it and perform standard change out procedure.

3. If lost TLD is not found, post the new TLD in proper location.

4. Record in "Remarks" column of data sheet any of the above circumstances.

e. Store collected field TLDs in lead cave along with control TLDs until ready for mailing to laboratory contractor. Mark "Do not x-ray" on TLD package.

f. Transportation control TLDs (Shield TLDs) are to be stored in a special lead shield provided by laboratory contractor after the field TLDs are posted.

Ensure that designated transportation control TLDs are included with the correct TLD package being mailed to laboratory contractor. Also ensure that laboratory contractor's TLD data sheet is completed and enclosed with shipment.

g. Record TLD collection date and the date that the TLDs are returned to the vendor. Initial/sign the data sheet (Attachment 5). Record the installation date for the new TLDs on the appropriate data sheet.

h. Package and ship samples per Attachment 4.

5.10 MISCELLANEOUS SAMPLES

5.10.1 Ludington - Control Station

NOTE: Sediment samples are also collected at Ludington Pump Storage Plant per Section 5.7 of this procedure.

a. Ludington Lake In composites are collected daily and shipped to Palisades on a monthly basis.

b. Palisades RETS/REMP personnel record appropriate data on the Sample Data Sheet for shipment to Environmental Inc.

5.10.2 Palisades Daily Samples

a. Palisades Lake In, Lake Out, Site Water, Service Water, and Turbine Sump effluent samples are collected on a daily basis per Palisades per Health Physics Procedure HP 6.52, "Palisades (Onsite) Radiological Environmental Program Sample Collection."

b. Palisades RETS/REMP personnel record appropriate data on the Sample Data Sheet and label all samples.

6.0 ACCEPTANCE CRITERIA

Proper completion of procedure.

7.0 ATTACHMENTS AND RECORDS

7.1 ATTACHMENTS

7.1.1 Attachment 1, "Environmental Sample Collection Schedule"

7.1.2 Attachment 2, "Sample Locations"

7.1.3 Attachment 3, "Sample Identification"

7.1.4 Attachment 4, "Sample Packaging and Shipment"

7.1.5 Attachment 5, "Palisades Sample Collection Forms and Records"

7.2 RECORDS

7.2.1 Distribution of Sample Collection Data Sheet as per Attachment 4.

7.2.2 All Radiological Environmental Monitoring Program Records shall be considered complete when the Annual Radiological Environmental Operating Report is submitted to the NRC. Records shall be retained in accordance with Palisades Administrative Procedure 10.46, "Plant Records."

8.0 SPECIAL REVIEWS

The scope of this procedure includes activities that require a PRC Review per Palisades Administrative Procedure 3.19, "Technical Specifications Programs," but do not require a 50.59 Review per Palisades Administrative Procedure 10.41, "Procedure and Policy Processes." Therefore, changes to this procedure require a PRC Review but do not require a 50.59 Review.

ENVIRONMENTAL SAMPLE COLLECTION SCHEDULE

Palisades Nuclear Plant

Exposure Pathway and/or Sample	Number of Samples and Locations*	Sample Type	Collection Frequency
Airborne:	4 – Within a 10 km - Radius	Continuous at approximately	Weekly
Particulates	1 - 25 to 89 km Distant	1 cfm (may be less due to dust loading)	
Iodines	Same as Particulates	Same as particulates	Weekly
Waterborne:	1 – Intake	Daily composite to obtain a	Monthly
Lake Water	1 - Intake (Ludington Control)	one-gallon sample	
Drinking Water	1 - S Haven Municipal System - Raw		
	1 – Domestic Water		
Well Water	**3 - Plant Site Locations	Two-gallon grab sample	Quarterly
Sediment	1 - 0.8 km North of discharge	One-liter grab sample	Semiannually
	1 - Ludington control		

**These are monitoring wells of the groundwater for the Steam Generator Storage Facility, this is not part of the environmental sampling program.

*If samples are unavailable at the specified location, an attempt should be made to sample at an alternate location (refer to Step 4.5).

ENVIRONMENTAL SAMPLE COLLECTION SCHEDULE

Palisades Nuclear Plant

Exposure Pathway and/or Sample	Number of Samples and Locations*	Sample Type	Collection Frequency
NOTE: Currently there are no dairy farms within a distance of 5 to 8 km from the Plant. However, milk samples will be obtained at 3 locations within a distance of 15 km when available. When milk samples are collected, broad leaf vegetation sampling is not required.			
Ingestion: Milk	3 - From 5 to 8 km 1 - Control from 15 to 30 km	Two-gallon grab sample	Monthly
Food Products	1 - Each of two principal fruit crops (blueberries and apples).	Two-pound grab sample	At time of harvest
Fish	2 - Location in vicinity of Plant discharge 2 - Ludington control or other CMS Energy facility	One-liter fish flesh from each available species, two species required. Obtain the same species from the control location.	Twice in season
Direct: TLD	1 -Onsite 16 - Site boundary 9 -Within 12 km radius 3 -Control stations 1 -Control in lead cave	Continuous	Quarterly

*If samples are unavailable at the specified location, an attempt should be made to sample at an alternate location (refer to Step 4.5).

SAMPLE LOCATIONS
Palisades Nuclear Plant

Station	Code		Location	Air Particulates	Air Iodine	Lake Water	Well Water	Milk	Food Products	Sediment	TLD	Fish
*1	ST	Palisades Nuclear Plant	Onsite, on tree near nw corner of bag crew bldg.			X					X	X
2	TH	RR 3 Coloma, MI 5.6 miles S	TLD located on 80th Street, west side on post, 200 feet south of the old air sample station.								X	
3	HS	76182 48th Ave Covert, MI 5.8 miles SSE	Along 48th Ave, 1/4 mile west of 76th St. In barnyard 50 yds off north side of road.								X	
4	JS	36197 M-140 Hwy Covert, MI 3-1/2 miles SE	Along 36th Ave, 1/2 mile east of M-140 15 ft off south side of road. TLD located in front yard of residence.	X	X				X		X	
5	PR	72723 CR 378 Covert, MI 3-1/2 miles ESE	Along CR 378, 3/4 mile east of M-140, 30 ft off north side of road. TLD located at Paul Rood residence, on tree in back yard just past driveway.	X	X						X	
6	RB	RR 3 South Haven, MI 4-1/2 miles NE	Along 12th Ave (CR 384), turn nw past maple grove, go 1/4 mile located in orchard on north side of road.								X	
7a	SN21	Emergency Siren 21 4.1 miles NNE	On Monroe Blvd, at corner of 11th Street.								X	
8	SP	State Park 1 mile N	Onsite along the dump road, north of Plant. One mile from main gate. Near State Park boundary, on side of road as road turns west.	X	X						X	
9	TP	Covert Township Park 1.5 miles SSW	Along 32nd Ave, 1/4 mile west of Blue Star Hwy. 5 ft off south side of road. TLD located at end of road, at entrance to HSarno residence, attached to emergency siren SN38.	X	X						X	
10	GR	Grand Rapids, MI 55 miles NNE	Grand Rapids Service Center, in storage area. Air sample on west side near shed. Control TLD 100 feet north of air sample station.	X	X						X	

SAMPLE LOCATIONS
Palisades Nuclear Plant

Station	Code		Location	Air Particulates	Air Iodine	Lake Water	Well Water	Milk	Food Products	Sediment	TLD	Fish
11	KZ	Kalamazoo, MI 35 miles E	Kalamazoo Service Center, in parking area on post in SE corner Control TLD.								X	
12	DG	Dowagiac, MI 30 miles SSE	TLD located at first farm past old air sampler station, same side of road.								X	
13	ST	Perimeter of Palisades NNE	Past #8 along dump road. Proceed west up dune path at right of containment test structure. At first crest, turn north and proceed up adjacent hill to #13 at top (approx 50 yds from crest). Near State Park fence line.								X	
14	ST	Perimeter of Palisades NE	Along dump road to point where fence divides old Blue Star Hwy, 25 yds to east of road.								X	
15	ST	Perimeter of Palisades E	North along Blue Star Hwy, 0.75 miles from access road, 10 ft off west side of road.								X	
16	ST	Perimeter of Palisades E	North along Blue Star Hwy, 0.4 miles from access road, 50 ft off west side of road.								X	
17	ST	Perimeter of Palisades ESE	Along access road, 25 yds south of southern power line, 15 yds off east side of road.								X	
18	ST	Perimeter of Palisades SE	20 yds from access road along south road. 40 yds off south road.								X	
19	ST	Perimeter of Palisades SSE	0.2 miles along south road from access road, 30 ft off north side of road.								X	
20	ST	Perimeter of Palisades S	0.4 miles along south road from access road, 20 ft off south side of road.								X	
21	ST	Perimeter of Palisades SSW	0.7 miles along south road from access road. 5 ft off east side of road. Near Lake Michigan Bluff.								X	

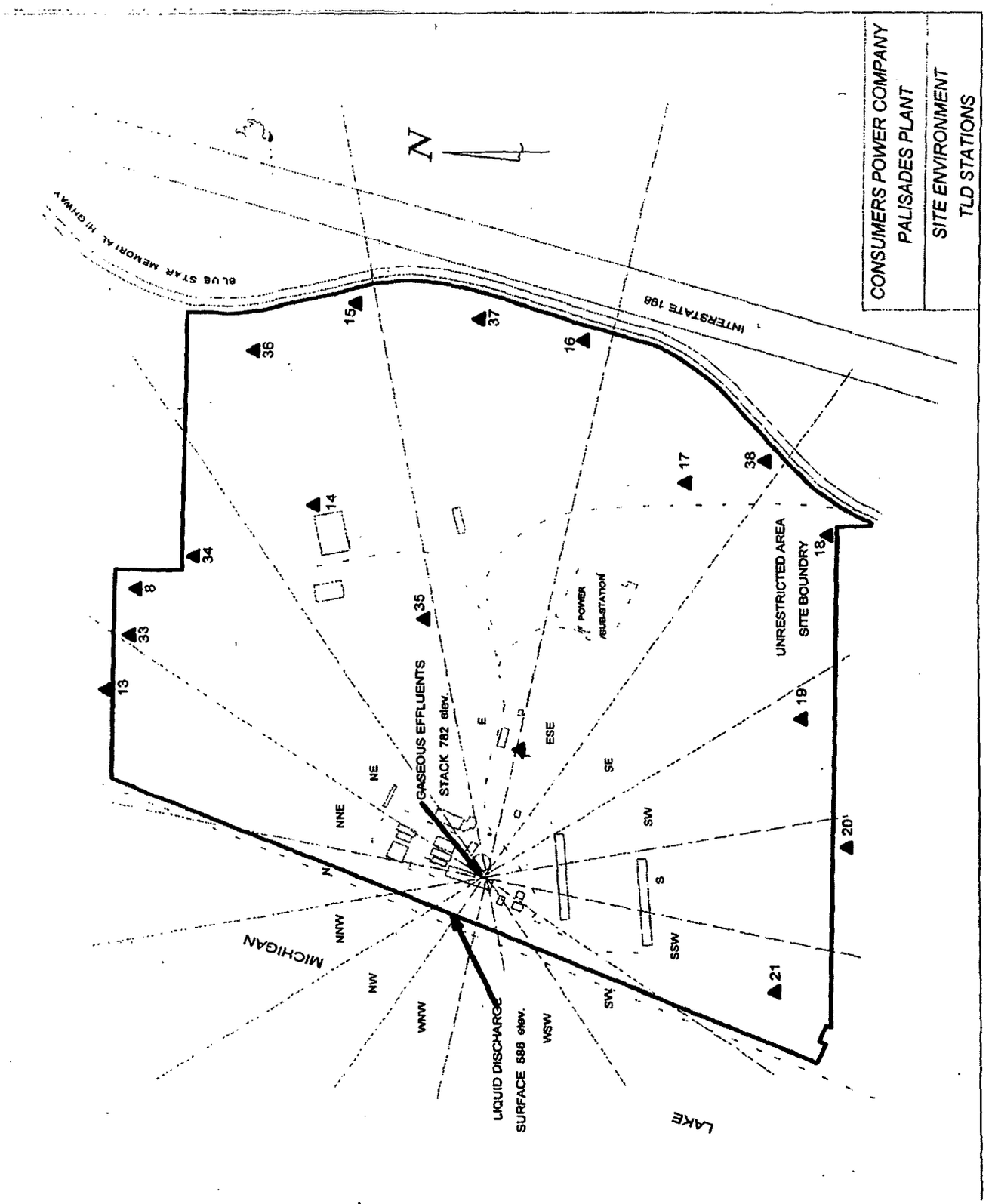
SAMPLE LOCATIONS
Palisades Nuclear Plant

Station	Code		Location	Air Particulates	Air Iodine	Lake Water	Well Water	Milk	Food Products	Sediment	TLD	Fish
22	MG	Mike Grogan 13 miles SSW	Control TLD in lead cave inside garage at RETS/REMP residence.								X	
23	SN19	Emergency Siren 19 3 miles ENE	On CR 380.								X	
24	SN26	Emergency Siren 26 6 miles E	On 67th Street.								X	
25	SH	South Haven, MI 5-1/2 miles NNE	South Haven Water Treatment Plant.			X						
26	JH	Joseph Hay 41799 CR 681 Bangor, MI 11.4 miles ESE						X				
27	DH	Dennis Hessey 26959 66th St South Haven, MI 6.6 miles E						X				
28	DC	Danny Carpenter 64015 M-43 Bangor, MI 7.25 miles E						X				
29	WS	William Shine 60364 M-43 West Bangor, MI 8.7 miles E						X				
30	STN	1/2 mile N of discharge								X		
32	LP	Ludington Pumped Storage 125 Miles N				X				X		X
33	ST	Perimeter of Palisades NE	Onsite along south side dump road, just 15 yards west of Air Station 8SP.								X	

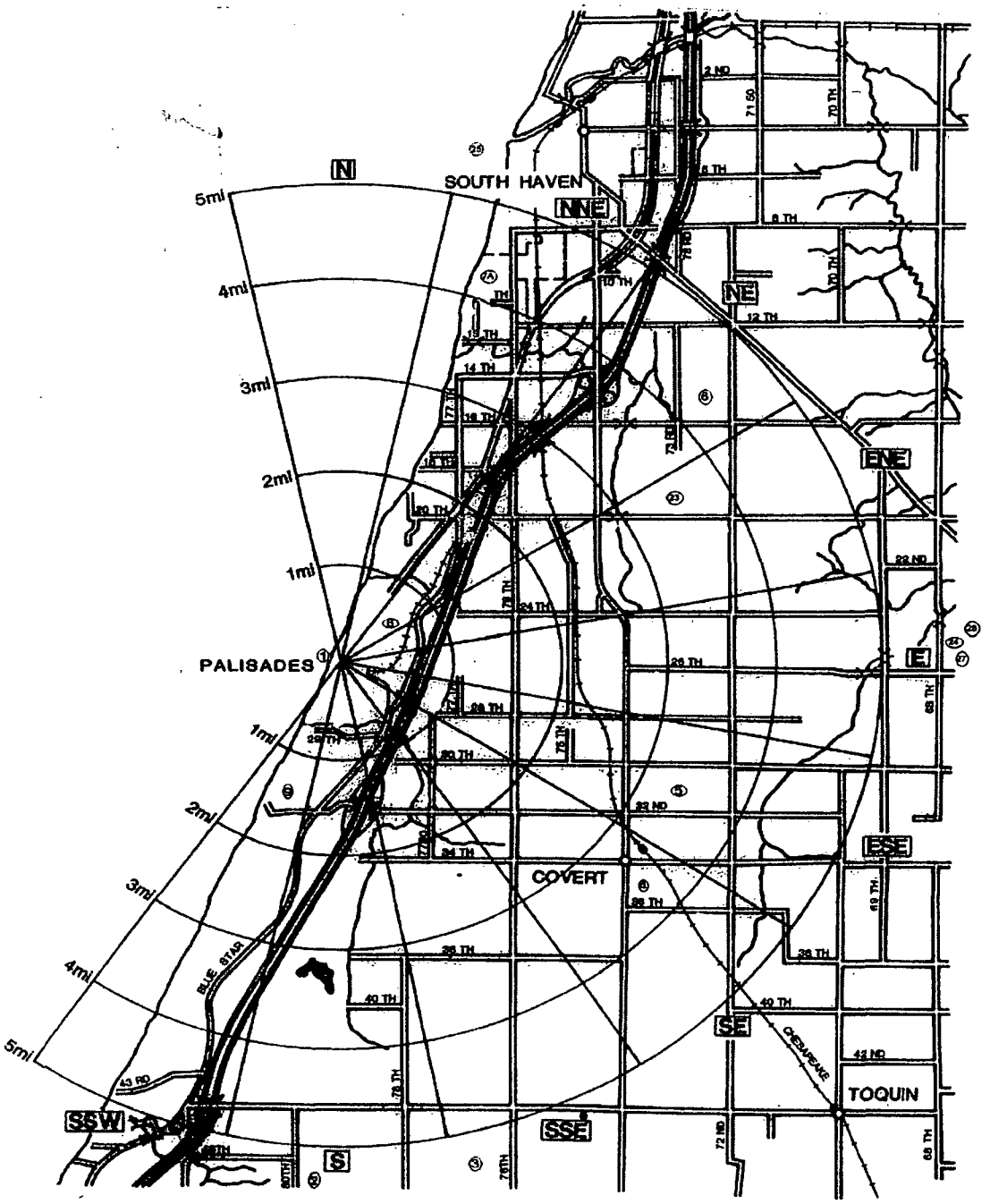
SAMPLE LOCATIONS
Palisades Nuclear Plant

Station	Code		Location	Air Particulates	Air Iodine	Lake Water	Well Water	Milk	Food Products	Sediment	TLD	Fish
34	ST	Perimeter of Palisades NE	Along dump road to area where fence divides old Blue Star Hwy, 25 yards east of road, near Station 14.								X	
35	ST	Perimeter of Palisades ENE	Located on the main post directly across the storeroom, near Training Building.								X	
36	ST	Perimeter of Palisades ENE	North along Blue Star Hwy, 0.9 miles from access road, 50 Ft off west side of road.								X	
37	ST	Perimeter of Palisades E	North along Blue Star Hwy, 0.6 miles from access road, 50 Ft off west side of road.								X	
38	ST	Perimeter of Palisades SE	North along Blue Star Hwy, 0.15 miles from access road, near old RR spur, 50 Ft off west side of road.								X	
41	ST	Plant Site Monitoring Well #14					X					
42	ST	Plant Site Monitoring Well #15					X					
43	ST	Plant Site Monitoring Well #16					X					
44	CN	Control Station NNE	11-12 miles, NNE of Plant, used as control station for crops.						X			

SAMPLE LOCATIONS
Palisades Nuclear Plant



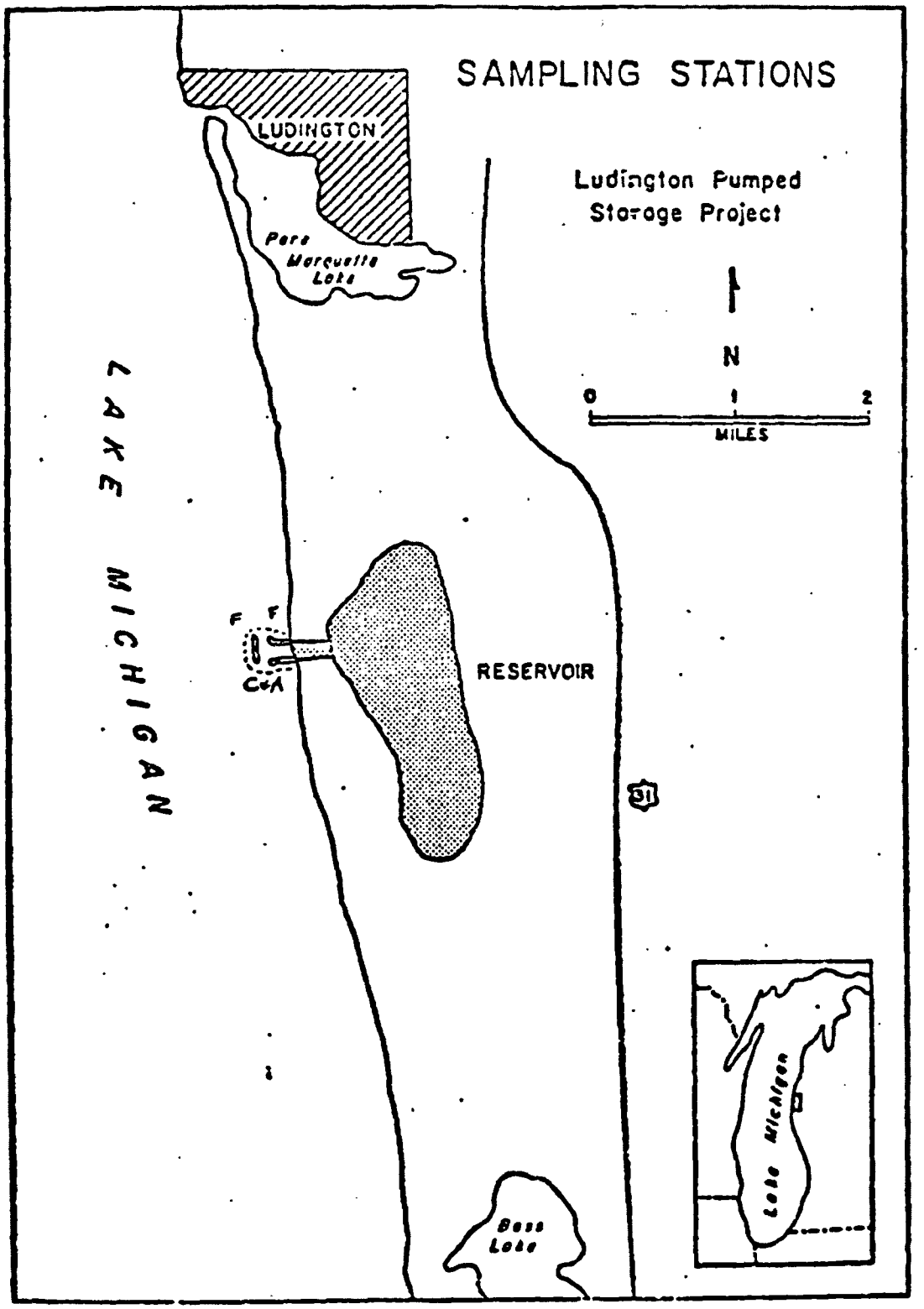
SAMPLE LOCATIONS
Palisades Nuclear Plant



NOT SHOWN (Control Locations)

10 Grand Rapids (55 mi NNE)
11 Kalamazoo (35 mi E)
12 Dowagiac (30 mi SSE)
22 Control TLD placed in lead cave off site
26 Joe Hay (JH – 11.4 mi ESE)

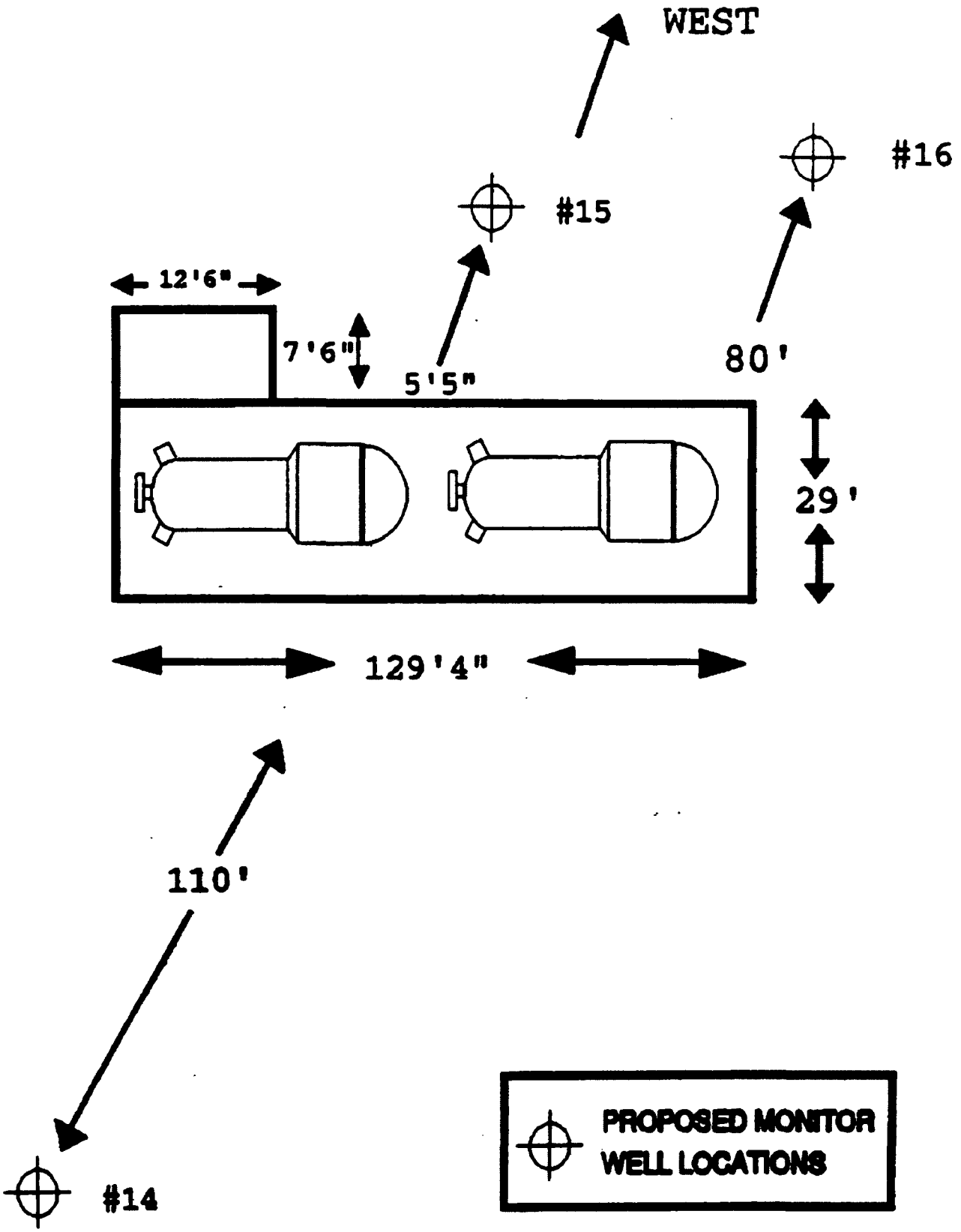
SAMPLE LOCATIONS
Palisades Nuclear Plant



SAMPLE LOCATIONS
Palisades Nuclear Plant

REMP SAMPLING	NUMBER	WELL STATUS	LOCATION
NO	#1	Abandon	NA
NO	#2	Abandon	North side of Support Building. Supports Plant site.
NO	#3	Abandon	Across from East-Radwaste (South Side) backup for well #2.
NO	#4	Abandon	NA
NO	#5	Abandon	NA
NO	#6	Active	Located ~ 145 ft west of Blue Star Hwy. Used for training trailers, well capped when not in service and well is outside of Westerly Groundwater Flow to Plant and interim storage facility.
NO	#7	Abandon	Just to the west & between outage building and interim storage facility: Water is nonpotable and used in warehouse restrooms (later to be used for fire system only).
NO	#8	Abandon	NA
NO	#9	Abandon	Located at junction of access and warehouse road, domestic water supply for warehouse when it is put in service.
NO	#10	Abandon	NA
NO	#11 #12 #13	Abandon Abandon Abandon	North of access road and east of construction road, supplies domestic water for outage building, all in one tie-in.
YES	#14	Active	East of Interim Storage Facility, used for REMP monitoring well.
YES	#15	Active	Southwest of Interim Storage Facility, used for REMP monitoring well.
YES	#16	Active	Northwest of Interim Storage Facility, used for REMP monitoring well.

SAMPLE LOCATIONS
Palisades Nuclear Plant



SAMPLE IDENTIFICATION

Date: _______________

Collector: _______________

_______________________ PLANT

Miscellaneous Radiological Environmental Samples

SAMPLE		DATE	TIME	AMOUNT	REMARKS
Location	Type				

SAMPLE IDENTIFICATION

PALISADES PLANT

Miscellaneous Radiological Environmental Samples

Date Shipped: _____

Location	Type	Date	Time	Amount	Remarks
Allen Karr	Milk			2 Gallons	
Danny Carpenter	Milk			2 Gallons	
Dennis Hessey	Milk			2 Gallons	
William Shine	Milk			2 Gallons	
South Haven	Raw Water	Monthly Composite -	NA	2 Gallons	
Site #14	Well Water			2 Gallons	
Site #15	Well Water			2 Gallons	
Site #16	Well Water			2 Gallons	
Lake In	Plant Water	Monthly Composite -	NA	1 Gallon	
Service Water	Plant Water	Monthly Composite -	NA	1 Gallon	
Plant Drinking Water	Plant Water	Monthly Composite -	NA	1 Gallon	
Ludington Lake	Control Sample	Monthly Composite -	NA	1 Gallon	

SAMPLE PACKAGING AND SHIPMENT

1. Label samples clearly per Attachment 3.

2. Seal all liquid, biota, fish, and sediment sample containers with tape to prevent leakage.

3. Ship liquid samples separately from air particulate and air iodine samples and TLDs.

4. Use sufficient packing material (ie, crumpled newspaper) to avoid possible sample container damage during shipment.

5. Package air filters in glassine or plastic envelopes.

6. For TLD shipments, make sure that laboratory contractor's own TLD data sheet is enclosed with package.

7. Ship milk samples as soon as possible. Be sure to add a sufficient amount of sodium bisulfite (40 grams) as preservative to each sample.

8. Ship food products as soon as possible after collection.

9. Ship fish frozen or packed in ice, or with a 10% formaldehyde solution added (preservative). Only 10 milliliters is required per sample. Samples should be shipped as soon as possible after processing.

10. Distribute copies of the Sample Collection Data Sheet(s) to the:

    Analytical Laboratory
    Radiological Services Department Environmental Contact (Palisades)

11. Send samples to the following address:

    Environmental Inc.
    Att: Laboratory Manager
    700 Landwehr Road
    Northbrook, IL 60062

12. Ship all samples to the laboratory contractor with minimal delay after collection so as to avoid elevated analytical levels of detection.

PALISADES SAMPLE COLLECTION FORMS AND RECORDS

PALISADES PLANT
ENVIRONMENTAL MONITOR OPERABILITY CHECK
AND SAMPLE COLLECTION

				GAS METER READING		METER SERIAL NO	FLOW TEST				REPLACEMENT METER			
							AS FOUND		AS LEFT		SERIAL NUMBER			
	INSTALLED (MO/DA/YR)	REMOVED (MO/DA/YR)	REMOVED TIME	INSTALLED (Ft 3)	REMOVED (Ft 3)	CAL DUE DATE	FLOW (SEC/Ft3)	LEAK (Y/N)	FLOW (SEC/Ft3)	LEAK (Y/N)	CAL DUE DATE	CALIB ACCURACY ACCEPTABLE	SAMPLE VOL (Ft 3)	COMMENTS
4JS														
5PR														
8SP														
9TP														
10GR														

TEST PERFORMED BY: _____ DATE: _____

REVIEWED BY: _____ DATE: _____

PALISADES SAMPLE COLLECTION FORMS AND RECORDS

CONSUMERS ENERGY
PALISADES ENVIRONMENTAL TLD REPORT

☐ QUARTERLY

Collector _____

STATION - LOCATION		INSTALLED		COLLECTED		REMARKS
		DATE	TIME	DATE	TIME	
C-1						
C-2						
ST1	ST					
ST2	TH					
ST3	HS					
ST4	JS					
ST5	PR					
ST6	RB					
ST7a	SN21					
ST8	SP					
ST9	TP					
ST10	GR					
ST11	KZ					
ST12	DG					
ST13	ST					
ST14	ST					
ST15	ST					
ST16	ST					
ST17	ST					
ST18	ST					
ST19	ST					
ST20	ST					
ST21	ST					
ST22	CVS					
ST23	SN19R					
ST24	SN26					
ST-33	ST					
ST-34	ST					
ST-35	ST					
ST-36	ST					
ST-37	ST					
ST-38	ST					
SH-1, SH-2	SH					
Date Received From Vendor (With Intransit TLDs) and Initials			Date TLDs Inventoried and Placed in Lead Cave (With Intransit TLDs) and Initials			Date TLDs Returned to Vendor For Analysis (With Intransit TLDs) and Initials

ATTACHMENT D

PALISADES FINAL REPORT
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM (REMP)
AS PROVIDED BY ENVIRONMENTAL, INC, MIDWEST LABORATORY

32 Pages Follow

Environmental, Inc.
Midwest Laboratory
an Allegheny Technologies Co.

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FINAL REPORT
TO
CONSUMERS ENERGY COMPANY
JACKSON, MICHIGAN

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM (REMP)
FOR
PALISADES NUCLEAR GENERATING PLANT

PREPARED AND SUBMITTED
BY
ENVIRONMENTAL INCORPORATED MIDWEST LABORATORY

Project Number: 8022

Reporting Period: January-December, 2006

Reviewed and
Approved by _____ Date 02-06-2007

B. Grob, M.S.
Laboratory Manager

Distribution: J. Burnett (1 copy)

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1.0 INTRODUCTION

The following constitutes the final 2006 Monthly Progress Report for the Radiological Environmental Monitoring Program conducted at the Consumers Energy Company, Palisades Nuclear Generating Plant. Results of completed analyses are presented in the attached tables.

For all gamma isotopic analyses, spectrum is computer scanned from 80 to 2048 KeV. Specifically included are Mn-54, Fe-59, Co-58, Co-60, Zn-65, Zr-95, Nb-95, I-131, Ba-La-140, Cs-134 and Cs-137. Naturally-occuring gamma-emitters, such as K-40 and Ra daughters, are frequently detected but not listed here. Data listed as "<" are at the 4.66 sigma level, others are 2 sigma.

All concentrations, except gross alpha and 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.

2.0 LISTING OF MISSED SAMPLES

Sample Type	Location	Expected Collection Date	Reason
AP/AI	5PR	04-10-06	Sample not obtained.
BS	Ludington	04-19-06	Sample not sent. (Sample received 07-06-06.)
AP/AI	10GR	05-17-06	Sample not not received from G.R.
F	Ludington	05-23-06	Sample not sent.
TLD	ST-21	09-30-06	TLD missing in field.
AP/AI	10GR	11-22-06	Sample not not received from G.R.

PALISADES

Table 1. Airborne particulates and charcoal canisters, analyses for gross beta and iodine-131.
Location: 4JS - Covert (3.5 mi. SE)
Units: pCi/m^3
Collection: Continuous, weekly exchange.

Date Collected	Volume (m^3)	Gross Beta	I-131	Date Collected	Volume (m^3)	Gross Beta	I-131
Required LLD		0.010	0.030			0.010	0.030
01-09-06	346	0.022 ± 0.003	< 0.011	07-10-06	320	0.029 ± 0.004	< 0.019
01-16-06	337	0.028 ± 0.004	< 0.011	07-17-06	317	0.027 ± 0.004	< 0.010
01-23-06	343	0.023 ± 0.003	< 0.007	07-24-06	320	0.025 ± 0.004	< 0.015
01-30-06	346	0.026 ± 0.003	< 0.018	07-31-06	314	0.040 ± 0.004	< 0.018
02-06-06	340	0.027 ± 0.004	< 0.052 [a]	08-07-06	314	0.028 ± 0.004	< 0.012
02-13-06	346	0.024 ± 0.003	< 0.021	08-14-06	317	0.025 ± 0.004	< 0.017
02-20-06	351	0.035 ± 0.004	< 0.026	08-21-06	317	0.035 ± 0.004	< 0.005
02-27-06	348	0.034 ± 0.004	< 0.017	08-28-06	314	0.036 ± 0.004	< 0.015
03-06-06	337	0.019 ± 0.003	< 0.012	09-05-06	371	0.023 ± 0.004	< 0.017
03-13-06	343	0.022 ± 0.003	< 0.026	09-11-06	263	0.040 ± 0.005	< 0.013
03-20-06	340	0.024 ± 0.003	< 0.025	09-18-06	320	0.028 ± 0.004	< 0.016
03-27-06	340	0.011 ± 0.003	< 0.022	09-25-06	323	0.023 ± 0.003	< 0.008
04-03-06	331	0.019 ± 0.003	< 0.013	10-02-06	337	0.025 ± 0.003	< 0.017
1st Qtr. Mean ± s.d.		0.024 ± 0.006	< 0.052	3rd Qtr. Mean ± s.d.		0.030 ± 0.006	< 0.019
04-10-06	337	0.024 ± 0.003	< 0.009	10-09-06	314	0.024 ± 0.004	< 0.013
04-17-06	329	0.031 ± 0.004	< 0.012	10-16-06	326	0.019 ± 0.003	< 0.007
04-24-06	329	0.017 ± 0.003	< 0.012	10-23-06	331	0.029 ± 0.004	< 0.014
05-01-06	334	0.023 ± 0.003	< 0.012	10-30-06	331	0.016 ± 0.003	< 0.013
05-08-06	331	0.019 ± 0.003	< 0.011	11-06-06	337	0.034 ± 0.004	< 0.011
05-15-06	334	0.016 ± 0.003	< 0.015	11-13-06	329	0.034 ± 0.004	< 0.018
05-22-06	331	0.012 ± 0.003	< 0.013	11-20-06	334	0.028 ± 0.004	< 0.013
05-30-06	368	0.030 ± 0.003	< 0.012	11-27-06	331	0.036 ± 0.004	< 0.018
06-05-06	278	0.021 ± 0.004	< 0.016	12-04-06	337	0.031 ± 0.004	< 0.013
06-12-06	323	0.021 ± 0.003	< 0.010	12-11-06	343	0.035 ± 0.004	< 0.015
06-19-06	320	0.026 ± 0.004	< 0.010	12-18-06	334	0.040 ± 0.004	< 0.010
06-26-06	323	0.022 ± 0.001	< 0.025	12-26-06	382	0.027 ± 0.003	< 0.013
07-03-06	320	0.029 ± 0.004	< 0.017	01-02-07	334	0.039 ± 0.004	< 0.012
2nd Qtr. Mean ± s.d.		0.022 ± 0.006	< 0.025	4th Qtr. Mean ± s.d.		0.030 ± 0.007	< 0.018
				Cumulative Average		0.027	
				Previous Annual Average		0.029	

[a] I-131 LLD not reached due to age of sample.

Table 1. Airborne particulates and charcoal canisters, analyses for gross beta and iodine-131.

Location: 5PR - Covert (3.5 mi. ESE)

Units: pCi/m^3

Collection: Continuous, weekly exchange.

Date Collected	Volume (m^3)	Gross Beta	I-131	Date Collected	Volume (m^3)	Gross Beta	I-131
Required LLD		0.010	0.030			0.010	0.030
01-09-06	351	0.024 ± 0.004	< 0.011	07-10-06	300	0.025 ± 0.004	< 0.020
01-16-06	346	0.025 ± 0.003	< 0.011	07-17-06	297	0.028 ± 0.004	< 0.011
01-23-06	351	0.023 ± 0.003	< 0.007	07-24-06	300	0.023 ± 0.004	< 0.016
01-30-06	337	0.027 ± 0.004	< 0.018	07-31-06	295	0.048 ± 0.005	< 0.020
02-06-06	334	0.024 ± 0.003	< 0.059 [a]	08-07-06	300	0.028 ± 0.004	< 0.013
02-13-06	340	0.021 ± 0.003	< 0.034 [a]	08-14-06	300	0.022 ± 0.004	< 0.017
02-20-06	346	0.030 ± 0.004	< 0.019	08-21-06	303	0.034 ± 0.004	< 0.006
02-27-06	340	0.035 ± 0.004	< 0.017	08-28-06	297	0.038 ± 0.004	< 0.016
03-06-06	340	0.023 ± 0.003	< 0.012	09-05-06	354	0.019 ± 0.004	< 0.026
03-13-06	337	0.024 ± 0.004	< 0.026	09-11-06	255	0.032 ± 0.005	< 0.013
03-20-06	133	0.029 ± 0.007	< 0.063 [b]	09-18-06	306	0.031 ± 0.004	< 0.017
03-27-06	312	0.013 ± 0.003	< 0.024	09-25-06	312	0.024 ± 0.004	< 0.009
04-03-06	300	0.024 ± 0.004	< 0.015	10-02-06	329	0.022 ± 0.003	< 0.018
1st Qtr. Mean ± s.d.		0.025 ± 0.005	< 0.063	3rd Qtr. Mean ± s.d.		0.029 ± 0.008	< 0.026
04-10-06		ND[c]		10-09-06	312	0.026 ± 0.004	< 0.013
04-17-06	297	0.029 ± 0.004	< 0.013	10-16-06	317	0.022 ± 0.003	< 0.007
04-24-06	297	0.021 ± 0.004	< 0.013	10-23-06	326	0.028 ± 0.004	< 0.014
05-01-06	309	0.027 ± 0.004	< 0.013	10-30-06	326	0.018 ± 0.003	< 0.013
05-08-06	306	0.022 ± 0.003	< 0.012	11-06-06	329	0.032 ± 0.004	< 0.012
05-15-06	312	0.019 ± 0.003	< 0.017	11-13-06	323	0.029 ± 0.004	< 0.018
05-22-06	312	0.016 ± 0.003	< 0.014	11-20-06	329	0.032 ± 0.004	< 0.013
05-30-06	343	0.031 ± 0.004	< 0.013	11-27-06	323	0.033 ± 0.004	< 0.019
06-05-06	261	0.025 ± 0.004	< 0.017	12-04-06	334	0.029 ± 0.004	< 0.013
06-12-06	303	0.024 ± 0.004	< 0.010	12-11-06	334	0.039 ± 0.004	< 0.015
06-19-06	306	0.024 ± 0.004	< 0.010	12-18-06	329	0.045 ± 0.004	< 0.008
06-26-06	306	0.022 ± 0.001	< 0.027	12-26-06	379	0.028 ± 0.003	< 0.013
07-03-06	300	0.032 ± 0.004	< 0.018	01-02-07	331	0.039 ± 0.004	< 0.012
2nd Qtr. Mean ± s.d.		0.024 ± 0.005	< 0.027	4th Qtr. Mean ± s.d.		0.031 ± 0.007	< 0.019
				Cumulative Average		0.027	
				Previous Annual Average		0.028	

[a] I-131 LLD not reached due to age of sample.

[b] Pump replaced.

[c] "ND" = No data; see Table 2.0, Listing of Missed Samples.

Table 1. Airborne particulates and charcoal canisters, analyses for gross beta and iodine-131.
Location: 8SP - State Park (1.0 mi. N)
Units: pCi/m^3
Collection: Continuous, weekly exchange.

Date Collected	Volume (m^3)	Gross Beta	I-131	Date Collected	Volume (m^3)	Gross Beta	I-131
Required LLD		0.010	0.030			0.010	0.030
01-09-06	374	0.022 ± 0.003	< 0.010	07-10-06	348	0.027 ± 0.003	< 0.017
01-16-06	351	0.030 ± 0.004	< 0.010	07-17-06	346	0.027 ± 0.004	< 0.010
01-23-06	379	0.023 ± 0.003	< 0.007	07-24-06	348	0.024 ± 0.003	< 0.014
01-30-06	374	0.025 ± 0.003	< 0.016	07-31-06	340	0.045 ± 0.004	< 0.017
02-06-06	371	0.023 ± 0.003	< 0.032 [a]	08-07-06	405	0.024 ± 0.003	< 0.010
02-13-06	379	0.024 ± 0.003	< 0.030	08-14-06	348	0.025 ± 0.003	< 0.015
02-20-06	385	0.028 ± 0.003	< 0.015	08-21-06	351	0.034 ± 0.004	< 0.005
02-27-06	379	0.034 ± 0.003	< 0.015	08-28-06	346	0.036 ± 0.004	< 0.013
03-06-06	374	0.019 ± 0.003	< 0.011	09-05-06	411	0.019 ± 0.003	< 0.011
03-13-06	374	0.022 ± 0.003	< 0.024	09-11-06	295	0.034 ± 0.004	< 0.011
03-20-06	368	0.021 ± 0.003	< 0.023	09-18-06	354	0.031 ± 0.004	< 0.014
03-27-06	377	0.015 ± 0.003	< 0.020	09-25-06	357	0.021 ± 0.003	< 0.007
04-03-06	360	0.023 ± 0.003	< 0.012	10-02-06	374	0.020 ± 0.003	< 0.015
1st Qtr. Mean ± s.d.		0.024 ± 0.005	< 0.032	3rd Qtr. Mean ± s.d.		0.028 ± 0.007	< 0.017
04-10-06	368	0.024 ± 0.003	< 0.008	10-09-06	348	0.024 ± 0.003	< 0.012
04-17-06	354	0.027 ± 0.003	< 0.011	10-16-06	354	0.019 ± 0.003	< 0.007
04-24-06	357	0.017 ± 0.003	< 0.011	10-23-06	368	0.027 ± 0.003	< 0.013
05-01-06	363	0.024 ± 0.003	< 0.011	10-30-06	371	0.017 ± 0.003	< 0.012
05-08-06	340	0.022 ± 0.003	< 0.011	11-06-06	374	0.033 ± 0.004	< 0.010
05-15-06	363	0.017 ± 0.003	< 0.014	11-13-06	363	0.026 ± 0.003	< 0.016
05-22-06	360	0.012 ± 0.003	< 0.012	11-20-06	371	0.030 ± 0.004	< 0.012
05-30-06	402	0.027 ± 0.003	< 0.011	11-27-06	368	0.032 ± 0.004	< 0.017
06-05-06	295	0.025 ± 0.004	< 0.015	12-04-06	377	0.031 ± 0.003	< 0.012
06-12-06	354	0.022 ± 0.003	< 0.009	12-11-06	377	0.034 ± 0.004	< 0.013
06-19-06	348	0.023 ± 0.003	< 0.009	12-18-06	368	0.039 ± 0.004	< 0.008
06-26-06	351	0.023 ± 0.001	< 0.023	12-26-06	419	0.028 ± 0.003	< 0.012
07-03-06	346	0.031 ± 0.004	< 0.016	01-02-07	374	0.038 ± 0.004	< 0.011
2nd Qtr. Mean ± s.d.		0.023 ± 0.005	< 0.023	4th Qtr. Mean ± s.d.		0.029 ± 0.007	< 0.017
				Cumulative Average		0.026	
				Previous Annual Average		0.028	

[a] I-131 LLD not reached due to age of sample.

Table 1. Airborne particulates and charcoal canisters, analyses for gross beta and iodine-131.

Location: 9TP - Covert Township Park (1.5 mi. SSW)

Units: pCi/m^3

Collection: Continuous, weekly exchange.

Date Collected	Volume (m^3)	Gross Beta	I-131	Date Collected	Volume (m^3)	Gross Beta	I-131
Required LLD		0.010	0.030			0.010	0.030
01-09-06	365	0.021 ± 0.003	< 0.011	07-10-06	334	0.026 ± 0.004	< 0.018
01-16-06	351	0.028 ± 0.003	< 0.010	07-17-06	334	0.027 ± 0.004	< 0.010
01-23-06	357	0.024 ± 0.003	< 0.007	07-24-06	334	0.025 ± 0.003	< 0.015
01-30-06	357	0.023 ± 0.003	< 0.017	07-31-06	331	0.040 ± 0.004	< 0.017
02-06-06	357	0.024 ± 0.003	< 0.042 [a]	08-07-06	292	0.030 ± 0.004	< 0.013
02-13-06	360	0.023 ± 0.003	< 0.026	08-14-06	334	0.024 ± 0.003	< 0.016
02-20-06	368	0.028 ± 0.003	< 0.020	08-21-06	337	0.029 ± 0.004	< 0.005
02-27-06	360	0.036 ± 0.004	< 0.016	08-28-06	334	0.035 ± 0.004	< 0.014
03-06-06	357	0.020 ± 0.003	< 0.011	09-05-06	130	0.020 ± 0.008	< 0.082 [b]
03-13-06	351	0.022 ± 0.003	< 0.025	09-11-06	275	0.028 ± 0.004	< 0.012 [c]
03-20-06	357	0.021 ± 0.003	< 0.023	09-18-06	340	0.032 ± 0.004	< 0.015
03-27-06	357	0.015 ± 0.003	< 0.021	09-25-06	351	0.023 ± 0.003	< 0.008
04-03-06	346	0.022 ± 0.003	< 0.013	10-02-06	365	0.020 ± 0.003	< 0.016
1st Qtr. Mean ± s.d.		0.024 ± 0.005	< 0.042	3rd Qtr. Mean ± s.d.		0.028 ± 0.006	< 0.082
04-10-06	354	0.022 ± 0.003	< 0.009	10-09-06	343	0.024 ± 0.003	< 0.012
04-17-06	340	0.028 ± 0.004	< 0.012	10-16-06	201	0.022 ± 0.005	< 0.012
04-24-06	334	0.017 ± 0.003	< 0.012	10-23-06	317	0.026 ± 0.004	< 0.015
05-01-06	348	0.021 ± 0.003	< 0.011	10-30-06	357	0.019 ± 0.003	< 0.012
05-08-06	343	0.026 ± 0.003	< 0.011	11-06-06	360	0.034 ± 0.004	< 0.011
05-15-06	346	0.016 ± 0.003	< 0.015	11-13-06	354	0.026 ± 0.003	< 0.016
05-22-06	346	0.014 ± 0.003	< 0.013	11-20-06	357	0.030 ± 0.004	< 0.012
05-30-06	326	0.031 ± 0.004	< 0.013	11-27-06	354	0.035 ± 0.004	< 0.017
06-05-06	292	0.026 ± 0.004	< 0.015	12-04-06	363	0.032 ± 0.004	< 0.012
06-12-06	337	0.025 ± 0.003	< 0.009	12-11-06	371	0.035 ± 0.004	< 0.013
06-19-06	334	0.025 ± 0.003	< 0.009	12-18-06	357	0.039 ± 0.004	< 0.006
06-26-06	337	0.020 ± 0.001	< 0.024	12-26-06	416	0.029 ± 0.003	< 0.012
07-03-06	331	0.026 ± 0.004	< 0.017	01-02-07	363	0.039 ± 0.004	< 0.011
2nd Qtr. Mean ± s.d.		0.023 ± 0.005	< 0.024	4th Qtr. Mean ± s.d.		0.030 ± 0.006	< 0.017
				Cumulative Average		0.026	
				Previous Annual Average		0.029	

[a] I-131 LLD not reached due to age of sample.

[b] Volume low; power off to sampler; GFI tripped.

[c] Pump not running but hot; replaced pump.

Table 1. Airborne particulates and charcoal canisters, analyses for gross beta and iodine-131.

Location: 10GR - Grand Rapids (55 mi. NNE)

Units: pCi/m^3

Collection: Continuous, weekly exchange.

Date Collected	Volume (m^3)	Gross Beta	I-131	Date Collected	Volume (m^3)	Gross Beta	I-131
Required LLD		0.010	0.030			0.010	0.030
01-04-06	346	0.023 ± 0.003	< 0.017	07-05-06	317	0.031 ± 0.004	< 0.029
01-12-06	394	0.023 ± 0.003	< 0.014	07-12-06	303	0.024 ± 0.004	< 0.017
01-19-06	354	0.024 ± 0.003	< 0.010	07-19-06	278	0.039 ± 0.005	< 0.027
01-25-06	286	0.039 ± 0.004	< 0.031 [a]	07-26-06	312	0.029 ± 0.004	< 0.029
				08-02-06	278	0.045 ± 0.005	< 0.021
02-03-06	430	0.024 ± 0.003	< 0.064 [a]				
02-08-06	269	0.026 ± 0.004	< 0.071 [a]	08-09-06	303	0.029 ± 0.004	< 0.027
02-16-06	391	0.026 ± 0.003	< 0.018	08-16-06	303	0.025 ± 0.004	< 0.008
02-22-06	309	0.038 ± 0.004	< 0.028	08-23-06	295	0.033 ± 0.004	< 0.024
03-01-06	348	0.027 ± 0.004	< 0.018	08-30-06	295	0.039 ± 0.005	< 0.064 [c]
03-10-06	419	0.019 ± 0.003	< 0.030	09-06-06	278	0.024 ± 0.004	< 0.020
03-15-06	244	0.029 ± 0.005	< 0.049 [a]	09-13-06	314	0.032 ± 0.004	< 0.025
03-22-06	337	0.034 ± 0.004	< 0.034 [a]	09-20-06	303	0.031 ± 0.004	< 0.013
03-30-06	377	0.014 ± 0.003	< 0.017	09-25-06	320	0.025 ± 0.004	< 0.028
1st Qtr. Mean ± s.d.		0.027 ± 0.007	< 0.071	3rd Qtr. Mean ± s.d.		0.031 ± 0.006	< 0.064
04-05-06	326	0.023 ± 0.003	< 0.013	10-04-06	334	0.021 ± 0.003	< 0.019
04-13-06	329	0.030 ± 0.004	< 0.017	10-11-06	329	0.021 ± 0.003	< 0.011
04-21-06	357	0.019 ± 0.003	< 0.015	10-18-06	337	0.019 ± 0.003	< 0.022
04-28-06	331	0.022 ± 0.003	< 0.015	10-25-06	340	0.023 ± 0.003	< 0.019
05-03-06	229	0.029 ± 0.005	< 0.023	11-01-06	351	0.026 ± 0.003	< 0.017
05-10-06	317	0.022 ± 0.004	< 0.025	11-09-06	377	0.038 ± 0.004	< 0.022
05-17-06		ND [b]		11-15-06	289	0.021 ± 0.004	< 0.022
05-24-06	385	0.024 ± 0.003	< 0.018	11-22-06		ND [b]	
05-31-06	303	0.037 ± 0.004	< 0.024	11-29-06	680	0.032 ± 0.002	[d] < 0.009
06-07-06	312	0.025 ± 0.004	< 0.016	12-06-06	346	0.035 ± 0.004	< 0.019
06-14-06	323	0.020 ± 0.003	< 0.015	12-13-06	348	0.031 ± 0.004	< 0.009
06-21-06	312	0.029 ± 0.002	< 0.040 [a]	12-20-06	343	0.043 ± 0.004	< 0.012
06-28-06	309	0.023 ± 0.004	< 0.027	12-27-06	346	0.035 ± 0.004	< 0.019
				01-03-07	343	0.039 ± 0.004	< 0.012
2nd Qtr. Mean ± s.d.		0.025 ± 0.005	< 0.040	4th Qtr. Mean ± s.d.		0.030 ± 0.008	< 0.022
				Cumulative Average		0.028	
				Previous Annual Average		0.031	

[a] LLD not reached due to age of sample.

[b] "ND" = no data; see Table 2.0, Listing of Missed Samples.

[c] LLD not reached due to age of sample; sample received 09-19-06.

[d] Two-week runtime.

PALISADES

Table 2. Gamma radiation, as measured by TLDs, quarterly exposure.
Units: mR/91 days[a]

	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.
Date Placed	01-03-06	03-30-06	06-30-06	09-30-06
Date Removed	03-30-06	06-30-06	09-30-06	01-03-07
Intransit (mR)	3.8 ± 0.3	1.7 ± 0.5	1.8 ± 0.3	1.6 ± 0.7
ST-01	12.1 ± 0.9	11.9 ± 0.6	12.9 ± 1.3	14.3 ± 1.0
ST-02	16.9 ± 0.8	16.5 ± 0.7	18.0 ± 1.0	19.1 ± 1.1
ST-03	14.1 ± 0.5	13.2 ± 0.5	14.9 ± 0.6	16.3 ± 0.8
ST-04	14.5 ± 0.8	14.5 ± 0.6	15.3 ± 0.6	17.3 ± 0.8
ST-05	15.1 ± 0.7	14.1 ± 0.6	15.3 ± 0.5	17.1 ± 0.8
ST-06	14.4 ± 0.8	12.3 ± 0.5	14.8 ± 0.5	15.4 ± 0.8
ST-07A	12.7 ± 0.5	11.4 ± 0.7	13.1 ± 0.4	14.2 ± 0.8
ST-08	12.8 ± 0.6	12.1 ± 0.7	13.4 ± 0.5	15.0 ± 0.8
ST-09	12.3 ± 0.6	11.7 ± 0.5	12.7 ± 0.6	14.7 ± 0.7
ST-10	13.8 ± 0.9	12.8 ± 0.6	14.3 ± 0.4	15.9 ± 0.8
ST-11	15.0 ± 0.8	16.1 ± 0.7	16.5 ± 0.8	17.8 ± 0.8
ST-12	12.9 ± 0.6	13.8 ± 0.6	12.6 ± 0.5	16.6 ± 0.8
ST-13	12.1 ± 0.8	11.4 ± 0.6	12.5 ± 0.8	13.9 ± 0.7
ST-14	12.0 ± 0.8	9.9 ± 0.5	10.9 ± 0.6	12.4 ± 0.7
ST-15	12.0 ± 1.4	10.8 ± 0.6	11.9 ± 1.1	13.5 ± 0.8
ST-16	12.4 ± 0.8	10.7 ± 0.7	11.4 ± 1.0	13.5 ± 0.8
ST-17	12.1 ± 0.5	10.6 ± 0.6	11.8 ± 0.5	13.1 ± 0.9
ST-18	13.1 ± 0.5	11.5 ± 0.6	12.8 ± 0.5	14.6 ± 0.8
ST-19	14.1 ± 0.6	11.5 ± 0.5	13.2 ± 0.4	14.5 ± 0.7
ST-20	12.0 ± 0.5	11.3 ± 0.6	11.9 ± 0.4	14.3 ± 0.7
ST-21	13.7 ± 0.4	10.5 ± 0.8	ND[b]	13.3 ± 0.9
ST-22	7.8 ± 0.4	6.2 ± 0.6	7.4 ± 0.5	7.3 ± 0.7
ST-23	13.8 ± 0.7	12.3 ± 0.6	13.7 ± 0.6	15.4 ± 0.8
ST-24	14.8 ± 0.9	13.6 ± 0.6	14.5 ± 0.5	16.7 ± 0.8
ST-33	12.0 ± 0.7	10.6 ± 0.7	12.7 ± 0.6	13.1 ± 0.9
ST-34	12.5 ± 0.6	10.9 ± 0.6	12.2 ± 0.5	13.5 ± 0.8
ST-35	14.9 ± 0.9	12.5 ± 0.7	14.5 ± 0.6	15.6 ± 1.0
ST-36	12.6 ± 1.1	11.1 ± 0.7	12.0 ± 0.4	13.5 ± 0.9
ST-37	12.9 ± 0.7	11.1 ± 0.6	12.6 ± 0.7	13.9 ± 1.0
ST-38	11.9 ± 1.3	10.9 ± 0.7	11.3 ± 0.7	13.3 ± 0.9
Mean ± s.d.	13.1 ± 1.6	11.9 ± 1.9	13.1 ± 2.0	14.6 ± 2.1
Control 1	6.8 ± 0.6	6.6 ± 0.6	6.6 ± 0.4	8.0 ± 0.7
Control 2	6.9 ± 0.5	6.8 ± 0.6	6.7 ± 0.4	8.3 ± 0.8

[a] Intransit exposure has been subtracted.
[b] "ND" = No data; TLD missing in field.

Table 3. Lake Water, analyses for gross alpha, gross beta and tritium.
Collection: Monthly composites of daily collections.
Units: pCi/L

Location		Intake	
Date Collected	Lab Code	Gross Beta	H-3
Required LLD		4.0	500
01-31-06	PALW -613	1.7 ± 0.4	< 182
02-28-06	PALW -1579	1.4 ± 0.4	< 161
03-31-06	PALW -2230	1.3 ± 0.4	< 137
04-30-06	PALW -3118	1.0 ± 0.4	< 163
05-31-06	PALW -3747	1.3 ± 0.4	< 134
06-30-06	PALW -4481	0.6 ± 0.4	< 166
07-31-06	PALW -5673	2.2 ± 0.8	< 162
08-31-06	PALW -6397	1.9 ± 0.7	< 187
09-30-06	PALW -7095	1.0 ± 0.4	< 162
10-31-06	PALW -8214	1.4 ± 0.4	< 145
11-30-06	PALW -8831	2.1 ± 0.7	< 176
12-31-06	PALW -9578	1.4 ± 0.4	< 147

Lake Water, analysis for gross beta.
Collection: Monthly composites of daily collections.
Units: pCi/L

Location		South Haven Municipal System (Raw)	
Date Collected	Lab Code	Gross Beta	H-3
Required LLD		4.0	500
01-13-06	PALW -1138	1.5 ± 0.4	
02-28-06	PALW -1353	1.1 ± 0.3	
03-31-06	PALW -2383	1.1 ± 0.3	
05-02-06	PALW -3120	1.7 ± 0.4	< 96[a]
05-31-06	PALW -4073	1.2 ± 0.3	151 ± 73
06-30-06	PALW -4970	1.0 ± 0.3	< 142
07-31-06	PALW -5674	2.3 ± 0.6	< 162
08-31-06	PALW -6398	1.8 ± 0.5	< 187
09-30-06	PALW -7097	3.4 ± 0.6	< 146
10-31-06	PALW -8217	1.3 ± 0.3	< 145
11-30-06	PALW -8833	1.8 ± 0.6	< 183
12-31-06	PALW -9581	1.6 ± 0.4	< 147

[a] Analysis added by station.

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Table 4. Well water, analyses for gross beta and tritium.
Collection: Monthly composites of daily collections.
Units: pCi/L

Location	South Haven Municipal System (Treated)		
Date Collected	Lab Code	Gross Beta	H-3
Required LLD		4.0	500
01-31-06	PAWW -614	2.3 ± 0.6	< 182
02-28-06	PAWW -1580	1.0 ± 0.3	< 162
03-31-06	PAWW -2232	1.5 ± 0.4	240 ± 80
04-30-06	PAWW -3121	1.4 ± 0.4	< 130
05-31-06	PAWW -3748	1.5 ± 0.4	154 ± 78
06-30-06	PAWW -4482	1.1 ± 0.3	194 ± 94
07-31-06	PAWW -5675	2.2 ± 0.6	165 ± 92
08-31-06	PAWW -6399	2.8 ± 0.6	< 187
09-30-06	PAWW -7098	1.9 ± 0.6	< 162
10-31-06	PAWW -8218	1.7 ± 0.4	178 ± 81
11-30-06	PAWW -8834	1.4 ± 0.5	< 183
12-31-06	PAWW -9582	1.6 ± 0.4	< 147

Table 5. Well water, analyses for gross beta and tritium.
Collection: Quarterly
Units: pCi/L

Location		Site Well #14	
Date Collected	Lab Code	Gross Beta	H-3
Required LLD		4.0	500
03-22-06	PAWW -1581	2.2 ± 0.4	< 161
05-25-06	PAWW -3749	3.2 ± 0.5	< 135
08-22-06	PAWW -5773	4.0 ± 0.6	< 132
10-27-06	PAWW -8219	5.7 ± 0.7	< 145

Location		Site Well #15	
Date Collected	Lab Code	Gross Beta	H-3
Required LLD		4.0	500
03-22-06	PAWW -1582	2.5 ± 0.4	< 161
05-25-06	PAWW -3750	5.5 ± 0.7	< 135
08-22-06	PAWW -5774	5.1 ± 0.6	< 132
10-27-06	PAWW -8220	5.6 ± 0.7	300 ± 86

NOTE: Gamma isotopic analysis required if gross beta exceeds 10 pCi/L. Results listed in Appendix C.

Table 5. Well water, analyses for gross beta and tritium.
Collection: Quarterly
Units: pCi/L

Location		Site Well #16	
Date Collected	Lab Code	Gross Beta	H-3
Required LLD		4.0	500
03-22-06	PAWW 1583,4	8.3 ± 0.5	< 161
05-25-06	PAWW 3751,2	9.4 ± 0.5	< 135
08-22-06	PAWW -5775 [a]	11.4 ± 0.8	< 145
10-27-06	PAWW -8221	5.0 ± 0.6	< 145

NOTE: Gamma isotopic analysis required if gross beta exceeds 10 pCi/L. Results listed in Appendix C.
[a] Gross beta recounted with a result of 13.5±1.3 pCi/L.

Table 6. Water, Ludington controls, analyses for gross beta, tritium and strontium.
Collection: Monthly composites of daily collections.
Units: pCi/L

Location		Ludington (Lake In)			
Date Collected	Lab Code	Gross Beta	H-3	Sr-89	Sr-90
Required LLD		4.0	500	5.0	1.0
01-31-06	PALW -1137	5.3 ± 0.6	< 160	< 0.9	< 0.6
03-01-06	PALW -1352	1.2 ± 0.3	< 159	< 0.8	< 0.7
03-31-06	PALW -2231	1.4 ± 0.4	< 137	< 0.6	< 0.4
05-02-06	PALW -3119	1.1 ± 0.3	< 163	< 0.7	< 0.6
05-31-06	PALW -4072	1.3 ± 0.3	< 129	< 0.7	< 0.7
07-10-06	PALW -4969	1.9 ± 0.4	< 173	< 0.6	< 0.5
08-01-06	PALW -5772	1.4 ± 0.4	< 132	< 0.7	< 0.6
09-05-06	PALW -6432	1.8 ± 0.6	< 187	< 0.8	< 0.5
10-02-06	PALW -7096	1.1 ± 0.3	< 162	< 0.9	< 0.6
11-01-06	PALW 8215,6	1.9 ± 0.4	< 145	< 0.6	< 0.4
12-04-06	PALW -8832	2.3 ± 0.6	< 183	< 0.8	< 0.6
01-04-07	PALW 9579,80	0.9 ± 0.2	< 147	< 0.6	< 0.5

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Table 7. In-Plant water, analyses for gross alpha, gross beta, strontium-89, strontium-90, tritium and gamma emitting isotopes.
Collection: Monthly composites
Units: uCi/mL

Location		Service Water		
Date Collected	Required	01-31-06	02-28-06	03-31-06
Lab Code	LLD	PACW-611	NS[b]	NS[b]
Gross Alpha	1.0 E-07	< 1.1 E-09	-	-
Gross Beta	1.0 E-09	3.5 ± 0.8 E-09	-	-
H-3	1.0 E-05	< 1.5 E-07	-	-
Sr-89	5.0 E-08	< 6.3 E-10	-	-
Sr-90	5.0 E-08	< 5.1 E-10	-	-
Cs-137	5.0 E-07	< 5.1 E-09	-	-
Others[a]	5.0 E-07	< 1.8 E-09	-	-

Date Collected	Required	04-30-06	05-31-06
Lab Code	LLD	NS[b]	NS[b]
Gross Alpha	1.0 E-07	-	-
Gross Beta	1.0 E-09	-	-
H-3	1.0 E-05	-	-
Sr-89	5.0 E-08	-	-
Sr-90	5.0 E-08	-	-
Cs-137	5.0 E-07	-	-
Others[a]	5.0 E-07	-	-

[a] Co-60

[b] "NS" = No sample; sample not sent.

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Table 7. In-Plant water, analyses for gross alpha, gross beta, strontium-89, strontium-90, tritium and gamma emitting isotopes.
Collection: Monthly composites
Units: uCi/mL

Location		Turbine Sump		
Date Collected	Required	01-31-06	02-28-06	03-31-06
Lab Code	LLD	PACW-612	NS[b]	NS[b]
Gross Alpha	1.0 E-07	< 6.7 E-10	-	-
Gross Beta	1.0 E-09	1.3 ± 0.6 E-09	-	-
H-3	1.0 E-05	1.6 ± 0.1 E-06	-	-
Sr-89	5.0 E-08	< 6.9 E-10	-	-
Sr-90	5.0 E-08	< 5.2 E-10	-	-
Cs-137	5.0 E-07	< 5.5 E-09	-	-
Others[a]	5.0 E-07	< 4.1 E-09	-	-

Date Collected	Required	04-30-06	05-31-06
Lab Code	LLD	NS[b]	NS[b]
Gross Alpha	1.0 E-07	-	-
Gross Beta	1.0 E-09	-	-
H-3	1.0 E-05	-	-
Sr-89	5.0 E-08	-	-
Sr-90	5.0 E-08	-	-
Cs-137	5.0 E-07	-	-
Others[a]	5.0 E-07	-	-

[a] Co-60

[b] "NS" = No sample; sample not sent.

Table 8. Milk, analyses for iodine-131 and gamma emitting isotopes,
Collection: Monthly

Location		JH - Joseph Hay Farm				
Date	Lab	Concentration (pCi/L)				
Collected	Code	I-131	K-40	Cs-134	Cs-137	Ba-La-140
Required LLD		1.0	-	15.0	18.0	15.0
01-10-06	PAMI 154,5	< 0.4	1312 ± 68	< 3.7	< 3.0	< 1.1
02-07-06	PAMI -606	< 0.2	1295 ± 102	< 4.6	< 3.5	< 1.8
03-07-06	PAMI -1218	< 0.2	1200 ± 141	< 4.7	< 5.8	< 2.0
04-11-06	PAMI -2339	< 0.2	1292 ± 143	< 4.8	< 3.8	< 4.3
05-09-06	PAMI -3126	< 0.3	1217 ± 105	< 4.1	< 4.5	< 1.9
06-12-06	PAMI -3889	< 0.3	1310 ± 119	< 4.3	< 3.2	< 2.6
07-18-06	PAMI -4855	< 0.2	1417 ± 120	< 3.7	< 3.3	< 3.6
08-08-06	PAMI -5345	< 0.2	1393 ± 120	< 4.9	< 4.2	< 1.8
09-05-06	PAMI -6041	< 0.4	1499 ± 114	< 4.6	< 3.5	< 3.1
10-10-06	PAMI -7040	< 0.4	1077 ± 110	< 3.5	< 3.4	< 3.5
11-07-06	PAMI -8095	< 0.3	1064 ± 107	< 3.3	< 4.9	< 2.2
12-05-06	PAMI -8734	< 0.3	1279 ± 102	< 3.0	< 3.3	< 2.7

Location		DC - Danny Carpenter Farm				
Date	Lab	Concentration (pCi/L)				
Collected	Code	I-131	K-40	Cs-134	Cs-137	Ba-La-140
Required LLD		1.0	-	15.0	18.0	15.0
01-10-06	PAMI -152	< 0.3	1237 ± 106	< 3.2	< 2.8	< 2.7
02-07-06	PAMI -604	< 0.2	1317 ± 110	< 4.3	< 3.4	< 4.0
03-07-06	PAMI -1216	< 0.3	1455 ± 152	< 5.6	< 5.6	< 5.4
04-11-06	PAMI -2337	< 0.2	1210 ± 52	< 1.8	< 2.2	< 2.4
05-09-06	PAMI -3123	< 0.3	1072 ± 115	< 4.4	< 3.8	< 3.6
06-12-06	PAMI 3886,7	< 0.3	1372 ± 81	< 3.1	< 3.5	< 1.8
07-18-06	PAMI -4853	< 0.5	1347 ± 92	< 2.2	< 3.1	< 3.1
08-08-06	PAMI -5343	< 0.5	1271 ± 108	< 3.4	< 3.4	< 2.3
09-05-06	PAMI -6039	< 0.4	1325 ± 112	< 3.0	< 3.5	< 2.1
10-10-06	PAMI 7037,8	< 0.4	1289 ± 82	< 3.9	< 3.5	< 3.3
11-07-06	PAMI -8093	< 0.3	1181 ± 126	< 2.9	< 2.7	< 3.1
12-05-06	PAMI -8732	< 0.3	1422 ± 123	< 4.5	< 4.5	< 2.8

Table 8. Milk, analyses for iodine-131 and gamma emitting isotopes,
Collection: Monthly

Location		DH - Dennis Hessey Farm				
Date	Lab	Concentration (pCi/L)				
Collected	Code	I-131	K-40	Cs-134	Cs-137	Ba-La-140
Required LLD		1.0	-	15.0	18.0	15.0
01-10-06	PAMI -153	< 0.2	1290 ± 114	< 2.8	< 3.3	< 2.4
02-07-06	PAMI -605	< 0.5	1185 ± 107	< 3.2	< 4.2	< 1.6
03-07-06	PAMI -1217	< 0.2	532 ± 73	< 2.8	< 1.6	< 2.1
04-11-06	PAMI -2338	< 0.2	1189 ± 111	< 3.0	< 3.7	< 2.4
05-09-06	PAMI 3124,5	< 0.4	1068 ± 76	< 3.5	< 3.4	< 1.9
06-12-06	PAMI -3888	< 0.2	1171 ± 109	< 3.2	< 3.2	< 1.2
07-19-06	PAMI -4854	< 0.2	1352 ± 116	< 3.9	< 3.7	< 2.6
08-08-06	PAMI -5344	< 0.2	1416 ± 84	< 2.5	< 2.7	< 1.6
09-05-06	PAMI -6040	< 0.5	1458 ± 111	< 2.6	< 3.5	< 2.4
10-10-06	PAMI -7039	< 0.2	1359 ± 117	< 3.4	< 2.6	< 1.6
11-07-06	PAMI -8094	< 0.3	1312 ± 118	< 2.5	< 3.2	< 3.3
12-05-06	PAMI -8733	< 0.3	1477 ± 115	< 2.8	< 3.4	< 1.7

Location		WS - William Shine Farm				
Date	Lab	Concentration (pCi/L)				
Collected	Code	I-131	K-40	Cs-134	Cs-137	Ba-La-140
Required LLD		1.0	-	15.0	18.0	15.0
01-10-06	PAMI -156	< 0.2	1665 ± 92	< 3.3	< 3.4	< 2.5
02-07-06	PAMI -607	< 0.4	1352 ± 106	< 3.1	< 3.5	< 3.0
03-07-06	PAMI -1219	< 0.2	1529 ± 159	< 4.3	< 1.9	< 2.8
04-11-06	PAMI -2340	< 0.2	1165 ± 58	< 2.2	< 2.5	< 1.8
05-09-06	PAMI -3127	< 0.3	1176 ± 102	< 2.2	< 4.6	< 1.7
06-12-06	PAMI -3890	< 0.3	1333 ± 143	< 3.4	< 3.1	< 3.3
07-19-06	PAMI -4856	< 0.2	1186 ± 103	< 2.6	< 3.6	< 2.1
08-08-06	PAMI -5346	< 0.4	1245 ± 114	< 2.7	< 3.8	< 2.6
09-05-06	PAMI -6042	< 0.4	1246 ± 104	< 3.4	< 4.4	< 2.5
10-10-06	PAMI -7041	< 0.4	1286 ± 118	< 2.9	< 3.9	< 3.0
11-07-06	PAMI -8096	< 0.3	1526 ± 120	< 3.2	< 4.2	< 2.0
12-05-06	PAMI -8735	< 0.3	1393 ± 124	< 3.7	< 4.9	< 2.7

Table 9. Food Crops, analyses for gross beta and gamma-emitting isotopes.
Collection: Semiannually, at the time of harvest.
Units: pCi/g wet

Location	J. Sarno Farm		
Lab Code	PAVE-6443	PAVE-6444	
Date Collected	8/31/2006	9/18/2006	Req. LLD
Sample Type	Blueberries	Apples	
Mn-54	< 0.004	< 0.017	0.08
Fe-59	< 0.014	< 0.035	0.10
Co-58	< 0.005	< 0.010	0.08
Co-60	< 0.007	< 0.018	0.05
Zn-65	< 0.008	< 0.026	0.10
Zr-Nb-95	< 0.009	< 0.023	0.10
I-131	< 0.278	< 0.030	0.06 [a]
Cs-134	< 0.008	< 0.014	0.08
Cs-137	< 0.009	< 0.010	0.08

[a] Required for broadleaf vegetation only.

Table 9. Food Crops, analyses for gross beta and gamma-emitting isotopes.
Collection: Semiannually, at the time of harvest.
Units: pCi/g wet

Location	Control Station	
Lab Code	PAVE-6618,9	
Date Collected	9/19/2006	Req. LLD
Sample Type	Apples	
Mn-54	< 0.006	0.08
Fe-59	< 0.007	0.10
Co-58	< 0.009	0.08
Co-60	< 0.006	0.05
Zn-65	< 0.007	0.10
Zr-Nb-95	< 0.011	0.10
I-131	< 0.029	0.06 [a]
Cs-134	< 0.005	0.08
Cs-137	< 0.008	0.08

[a] Required for broadleaf vegetation only.

Table 10. Fish, analyses for gross beta and gamma-emitting isotopes.
Collection: Semiannually
Units: pCi/g wet

Location	Discharge			
Lab Code	PAF-3764	PAF-5336	PAF-9574	
Date Collected	5/23/2006	8/3/2006	11/26/2006	Req. LLD
Sample Type	Carp	Perch	Steelhead	
Mn-54	< 0.015	< 0.012	< 0.015	0.13
Fe-59	< 0.036	< 0.043	< 0.046	0.26
Co-58	< 0.013	< 0.013	< 0.027	0.13
Co-60	< 0.009	< 0.015	< 0.012	0.13
Zn-65	< 0.021	< 0.030	< 0.043	0.26
Zr-Nb-95	< 0.023	< 0.014	< 0.028	0.10
Cs-134	< 0.015	< 0.012	< 0.009	0.13
Cs-137	< 0.017	0.062 ± 0.019	0.036 ± 0.021	0.15

Location	Ludington Pumped Storage Plant (Control)			
Lab Code	ND[a]	PAF-5334	PAF-5335	
Date Collected	5/23/2006	8/3/2006	8/3/2006	Req. LLD
Sample Type		Carp	Perch	
Mn-54	-	< 0.021	< 0.011	0.13
Fe-59	-	< 0.029	< 0.017	0.26
Co-58	-	< 0.015	< 0.019	0.13
Co-60	-	< 0.015	< 0.022	0.13
Zn-65	-	< 0.054	< 0.044	0.26
Zr-Nb-95	-	< 0.013	< 0.033	0.10
Cs-134	-	< 0.013	< 0.021	0.13
Cs-137	-	< 0.025	< 0.028	0.15

Location	Ludington Pumped Storage Plant (Control)		
Lab Code	PAF-9575[b]	PAF-9576	
Date Collected	7/16/2006	12/29/2006	Req. LLD
Sample Type	Chinook Salmon	Steelhead Trout	
Mn-54	< 0.010	< 0.010	0.13
Fe-59	< 0.165	< 0.023	0.26
Co-58	< 0.035	< 0.022	0.13
Co-60	< 0.007	< 0.015	0.13
Zn-65	< 0.029	< 0.025	0.26
Zr-Nb-95	< 0.298	< 0.022	0.10
Cs-134	< 0.009	< 0.016	0.13
Cs-137	0.059 ± 0.012	0.029 ± 0.016	0.15

[a] "ND" = No data; sample not sent.
[b] Certain LLDs not reached due to age of sample; received 01-16-07.

Table 11. Bottom sediment, analyses for gamma-emitting isotopes.
Collection: Semiannually
Units: pCi/g dry

Location	Palisades North Property		
Lab Code	PABS-3122	PABS-8803	
Date Collected	4/19/2006	11/9/2006	Req. LLD
Mn-54	< 0.017	< 0.020	0.08
Fe-59	< 0.052	< 0.061	0.10
Co-58	< 0.025	< 0.019	0.08
Co-60	< 0.013	< 0.022	0.05
Zn-65	< 0.052	< 0.061	0.10
Zr-Nb-95	< 0.035	< 0.025	0.10
Cs-134	< 0.029	< 0.019	0.15
Cs-137	< 0.015	< 0.017	0.18

Location	Ludington Control		
Lab Code	PABS-4480	PABS-9577	
Date Collected	6/16/2006	12/27/2006	Req. LLD
Mn-54	< 0.014	< 0.014	0.08
Fe-59	< 0.025	< 0.029	0.10
Co-58	< 0.014	< 0.013	0.08
Co-60	< 0.012	< 0.013	0.05
Zn-65	< 0.042	< 0.033	0.10
Zr-Nb-95	< 0.031	< 0.020	0.10
Cs-134	< 0.017	< 0.017	0.15
Cs-137	< 0.016	< 0.015	0.18

Table 12.1. Liquid Radwaste, analyses for gross alpha, tritium, strontium-89, strontium-90, plutonium-239 and gamma emitting isotopes.
Collection: Monthly
Units: uCi/ml

Lab Code	Required LLD	PARW-471	NS[a]	NS[a]
Date Collected	-	01-01-06	02-01-06	03-01-06
Gross Alpha	1.0 E-07	2.3 ± 0.5 E-08	-	-
H-3	1.0 E-05	5.19 ± 0.01 E-01	-	-
Sr-89	5.0 E-08	3.85 ± 0.8 E-08	-	-
Sr-90	5.0 E-08	3.61 ± 0.3 E-08	-	-
Pu-239	5.0 E-08	< 3.23 E-10	-	-
Cr-51	5.0 E-07	< 7.41 E-07	-	-
Mn-54	5.0 E-07	< 7.21 E-07	-	-
Fe-59	5.0 E-07	< 1.11 E-07	-	-
Co-58	5.0 E-07	1.87 ± 0.20 E-07	-	-
Co-60	5.0 E-07	7.91 ± 0.05 E-06	-	-
Zn-65	5.0 E-07	2.80 ± 0.46 E-08	-	-
Zr-95	5.0 E-07	< 6.94 E-08	-	-
Nb-95	5.0 E-07	1.07 ± 0.36 E-07	-	-
Ag-110m	5.0 E-07	5.83 ± 0.24 E-07	-	-
Sb-124	5.0 E-07	9.50 ± 1.00 E-07	-	-
Cs-134	5.0 E-07	8.52 ± 3.13 E-08	-	-
Cs-137	5.0 E-07	2.54 ± 0.21 E-07	-	-
Ba-140	5.0 E-07	< 7.86 E-07	-	-
La-140	5.0 E-07	< 6.94 E-08	-	-
Ce-141	5.0 E-07	< 9.46 E-08	-	-
Ce-144	5.0 E-07	< 2.30 E-07	-	-

[a] No sample received.

Table 12.1. Liquid Radwaste, analyses for gross alpha, tritium, strontium-89, strontium-90, plutonium-239 and gamma emitting isotopes.
Collection: Monthly
Units: uCi/ml

Lab Code	Required LLD	NS[a]	NS[a]
Date Collected	-	04-30-06	05-31-06
Gross Alpha	1.0 E-07	-	-
H-3	1.0 E-05	-	-
Sr-89	5.0 E-08	-	-
Sr-90	5.0 E-08	-	-
Pu-239	5.0 E-08	-	-
Cr-51	5.0 E-07	-	-
Mn-54	5.0 E-07	-	-
Fe-59	5.0 E-07	-	-
Co-58	5.0 E-07	-	-
Co-60	5.0 E-07	-	-
Zn-65	5.0 E-07	-	-
Zr-95	5.0 E-07	-	-
Nb-95	5.0 E-07	-	-
Ag-110m	5.0 E-07	-	-
Sb-124	5.0 E-07	-	-
Cs-134	5.0 E-07	-	-
Cs-137	5.0 E-07	-	-
Ba-140	5.0 E-07	-	-
La-140	5.0 E-07	-	-
Ce-141	5.0 E-07	-	-
Ce-144	5.0 E-07	-	-

[a] No sample received.

Table 12.2. Stack Filters, analyses for gross alpha, plutonium-239, strontium-89 and strontium-90.
Collection: Continuous, monthly exchange.
Units: pCi/filter

Location		Palisades			
Date Collected	Lab Code	Gross Alpha	Sr-89	Sr-90	Pu-239
Required LLD		10	10	10	10
01-31-06	PASP -548	< 0.5	< 6.7	< 3.4	< 4.8
02-28-06	NS[a]	-	-	-	-
03-31-06	NS[a]	-	-	-	-
04-30-06	NS[a]	-	-	-	-
05-31-06	NS[a]	-	-	-	-

[a] "NS" = No sample; sample not sent.

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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.

October, 2005 through September, 2006

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 $x_1, x_2 \ldots x_n$ 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 number following those to be retained is less than 5, the number is dropped, and the retained number s are kept unchanged. As an example, 11.443 is rounded off to 11.44.

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

APPENDIX C

SPECIAL ANALYSES

PALISADES

Appendix C: Gamma isotopic
Units: pCi/L

Lab Code	PAWW-5775
Date Collected	08-22-06
K-40	< 70.6
Mn-54	< 2.3
Fe-59	< 8.1
Co-58	< 4.8
Co-60	< 2.3
Zn-65	< 5.4
Zr-Nb-95	< 11.4
Cs-134	< 3.5
Cs-137	< 3.0
Ce-141	< 19.7
Ce-144	< 25.1

ATTACHMENT E

ENVIRONMENTAL, INC, MIDWEST LABORATORY, INTERLABORATORY COMPARISON PROGRAM RESULTS

17 Pages Follow

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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, 2006 through December, 2006

Appendix A

Interlaboratory Comparison Program Results

Environmental, Inc., Midwest Laboratory has participated in interlaboratory comparison (crosscheck) programs since the formulation of it's quality control program in December 1971. These programs are operated by agencies which supply environmental type samples 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.

Results in Table A-1 were obtained through participation in the environmental sample crosscheck program administered by Environmental Resources Associates, serving as a replacement for studies conducted previously by the U.S. EPA Environmental Monitoring Systems Laboratory, Las Vegas, Nevada.

The results in Table A-2 list results for thermoluminescent dosimeters (TLDs), via International Intercomparison of Environmental Dosimeters, when available, and internal laboratory testing.

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.

Attachment A lists acceptance criteria for "spiked" samples.

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

Attachment A

ACCEPTANCE CRITERIA FOR "SPIKED" SAMPLES

LABORATORY PRECISION: ONE STANDARD DEVIATION VALUES FOR VARIOUS ANALYSES[a]

Analysis	Level	One standard deviation for single determination
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	$\pm 1\sigma$ = (pCi/liter) = $169.85 \times (\text{known})^{0.0933}$ 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	Date	Analysis	Concentration (pCi/L) Laboratory Result[b]	ERA Result[c]	Control Limits	Acceptance
STW-1078	01/16/06	Sr-89	49.9 ± 3.5	50.2	41.5 - 58.9	Pass
STW-1078	01/16/06	Sr-90	31.5 ± 1.5	30.7	22.0 - 39.4	Pass
STW-1079	01/16/06	Ba-133	86.5 ± 4.1	95.0	78.6 - 111.0	Pass
STW-1079	01/16/06	Co-60	96.3 ± 4.1	95.3	86.6 - 104.0	Pass
STW-1079	01/16/06	Cs-134	22.6 ± 3.0	23.1	14.4 - 31.8	Pass
STW-1079	01/16/06	Cs-137	109.0 ± 5.9	111.0	101.0 - 121.0	Pass
STW-1079	01/16/06	Zn-65	198.0 ± 11.2	192.0	159.0 - 225.0	Pass
STW-1080	01/16/06	Gr. Alpha	10.8 ± 1.4	9.6	1.0 - 18.3	Pass
STW-1080	01/16/06	Gr. Beta	56.9 ± 1.9	61.9	44.6 - 79.2	Pass
STW-1081	01/16/06	Ra-226	4.3 ± 0.4	4.6	3.4 - 5.8	Pass
STW-1081	01/16/06	Ra-228	7.1 ± 1.8	6.6	3.7 - 9.5	Pass
STW-1081	01/16/06	Uranium	20.7 ± 0.5	22.1	16.9 - 27.3	Pass
STW-1088	04/10/06	Sr-89	29.0 ± 1.8	32.4	23.7 - 41.1	Pass
STW-1088	04/10/06	Sr-90	8.7 ± 1.0	9.0	0.3 - 17.7	Pass
STW-1089	04/10/06	Ba-133	10.3 ± 0.4	10.0	1.3 - 18.7	Pass
STW-1089	04/10/06	Co-60	114.0 ± 2.8	113.0	103.0 - 123.0	Pass
STW-1089	04/10/06	Cs-134	41.9 ± 1.4	43.4	34.7 - 52.1	Pass
STW-1089	04/10/06	Cs-137	208.0 ± 1.1	214.0	195.0 - 233.0	Pass
STW-1089	04/10/06	Zn-65	154.0 ± 0.8	152.0	126.0 - 178.0	Pass
STW-1090	04/10/06	Gr. Alpha	13.4 ± 1.1	21.3	12.1 - 30.5	Pass
STW-1090	04/10/06	Gr. Beta	27.7 ± 2.1	23.0	14.3 - 31.7	Pass
STW-1091	04/10/06	I-131	22.0 ± 0.3	19.1	13.9 - 24.3	Pass
STW-1092	04/10/06	H-3	7960.0 ± 57.0	8130.0	6720.0 - 9540.0	Pass
STW-1092	04/10/06	Ra-226	2.9 ± 0.4	3.0	2.2 - 3.8	Pass
STW-1092	04/10/06	Ra-228	20.9 ± 1.2	19.1	10.8 - 27.4	Pass
STW-1092	04/10/06	Uranium	68.6 ± 3.4	69.1	57.1 - 81.1	Pass
STW-1094	07/10/06	Sr-89	15.9 ± 0.7	19.7	11.0 - 28.4	Pass
STW-1094	07/10/06	Sr-90	24.3 ± 0.4	25.9	17.2 - 34.6	Pass
STW-1095	07/10/06	Ba-133	94.9 ± 8.9	88.1	72.9 - 103.0	Pass
STW-1095	07/10/06	Co-60	104.0 ± 1.8	99.7	91.0 - 108.0	Pass
STW-1095	07/10/06	Cs-134	48.7 ± 1.3	54.1	45.4 - 62.8	Pass
STW-1095	07/10/06	Cs-137	236.0 ± 3.0	238.0	217.0 - 259.0	Pass
STW-1095	07/10/06	Zn-65	126.0 ± 8.0	121.0	100.0 - 142.0	Pass
STW-1096	07/10/06	Gr. Alpha	10.9 ± 1.0	10.0	1.3 - 18.6	Pass
STW-1096	07/10/06	Gr. Beta	9.7 ± 0.4	8.9	0.2 - 17.5	Pass
STW-1097	07/10/06	Ra-226	11.0 ± 0.5	10.7	7.9 - 13.5	Pass
STW-1097	07/10/06	Ra-228	12.2 ± 0.8	10.7	6.1 - 15.3	Pass
STW-1097	07/10/06	Uranium	43.4 ± 0.1	40.3	33.3 - 47.3	Pass

TABLE A-1. Interlaboratory Comparison Crosscheck program, Environmental Resource Associates (ERA)[a].

Lab Code	Date	Analysis	Concentration (pCi/L) Laboratory Result[b]	ERA Result[c]	Control Limits	Acceptance
STW-1104	10/06/06	Sr-89	38.4 ± 1.3	39.9	31.2 - 45.7	Pass
STW-1104	10/06/06	Sr-90	15.5 ± 0.5	16.0	7.3 - 24.7	Pass
STW-1105	10/06/06	Ba-133	64.9 ± 2.8	70.2	58.1 - 82.3	Pass
STW-1105	10/06/06	Co-60	61.6 ± 1.0	62.3	53.6 - 71.0	Pass
STW-1105	10/06/06	Cs-134	29.0 ± 0.9	29.9	21.2 - 38.6	Pass
STW-1105	10/06/06	Cs-137	77.8 ± 2.4	78.2	69.5 - 86.9	Pass
STW-1105	10/06/06	Zn-65	293.0 ± 2.4	277.0	229.0 - 325.0	Pass
STW-1106	10/06/06	Gr. Alpha	23.9 ± 2.5	28.7	16.3 - 41.1	Pass
STW-1106	10/06/06	Gr. Beta	23.7 ± 1.4	20.9	12.2 - 29.6	Pass
STW-1107 [d]	10/06/06	I-131	28.4 ± 1.2	22.1	16.9 - 27.3	Fail
STW-1108	10/06/06	Ra-226	14.5 ± 0.5	14.4	10.7 - 18.1	Pass
STW-1108	10/06/06	Ra-228	6.6 ± 0.4	5.9	3.3 - 8.4	Pass
STW-1108	10/06/06	Uranium	2.9 ± 0.1	3.2	0.0 - 8.4	Pass
STW-1109	10/06/06	H-3	3000.0 ± 142.0	3050.0	2430.0 - 3670.0	Pass

[a] Results obtained by Environmental, Inc., Midwest Laboratory as a participant in the crosscheck program for proficiency testing in drinking water conducted by Environmental Resources Associates (ERA).

[b] Unless otherwise indicated, the laboratory result is given as the mean ± standard deviation for three determinations.

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

[d] The reported result was an average of three analyses, results ranged from 25.36 to 29.23 pCi/L. A fourth analysis was performed, result of analysis, 24.89 pCi/L.

TABLE A-2. Crosscheck program results; Thermoluminescent Dosimetry, (TLD, $CaSO_4$: Dy Cards).

Lab Code	Date	Description	Known Value (mR)	Lab Result ± 2 sigma (mR)	Control Limits	Acceptance
Environmental, Inc.						
2006-1	6/5/2006	30 cm	54.81	70.73 ± 0.69	38.37 - 71.25	Pass
2006-1	6/5/2006	60 cm	13.70	16.71 ± 1.89	9.59 - 17.81	Pass
2006-1	6/5/2006	60 cm	13.70	16.69 ± 0.94	9.59 - 17.81	Pass
2006-1	6/5/2006	90 cm	6.09	6.57 ± 0.82	4.26 - 7.92	Pass
2006-1	6/5/2006	120 cm	3.43	3.65 ± 0.22	2.40 - 4.46	Pass
2006-1	6/5/2006	120 cm	3.43	3.09 ± 0.33	2.40 - 4.46	Pass
2006-1	6/5/2006	150 cm	2.19	2.35 ± 0.38	1.53 - 2.85	Pass
2006-1	6/5/2006	150 cm	2.19	1.98 ± 0.10	1.53 - 2.85	Pass
2006-1	6/5/2006	180 cm	1.52	1.56 ± 0.26	1.06 - 1.98	Pass
Environmental, Inc.						
2006-2	11/6/2006	30 cm.	55.61	60.79 ± 1.32	38.93 - 72.29	Pass
2006-2	11/6/2006	40 cm.	31.28	35.93 ± 3.70	21.90 - 40.66	Pass
2006-2	11/6/2006	50 cm.	20.02	21.55 ± 1.20	14.01 - 26.03	Pass
2006-2	11/6/2006	60 cm.	13.90	14.90 ± 1.42	9.73 - 18.07	Pass
2006-2	11/6/2006	75 cm.	8.90	8.03 ± 0.51	6.23 - 11.57	Pass
2006-2	11/6/2006	90 cm.	6.18	6.88 ± 0.68	4.33 - 8.03	Pass
2006-2	11/6/2006	120 cm.	3.48	2.90 ± 0.20	2.44 - 4.52	Pass
2006-2	11/6/2006	150 cm.	2.22	1.99 ± 0.07	1.55 - 2.89	Pass
2006-2	11/6/2006	180 cm.	1.54	1.79 ± 0.94	1.08 - 2.00	Pass

TABLE A-3. In-House "Spike" Samples

Lab Code [b]	Date	Concentration (pCi/L)[a] Analysis	Laboratory results 2s, n=1 [c]	Known Activity	Control Limits [d]	Acceptance
SPW-301	1/20/2006	Fe-55	2700.10 ± 70.00	2502.50	2002.00 - 3003.00	Pass
SPAP-1224	3/7/2006	Cs-134	37.13 ± 3.70	39.52	29.52 - 49.52	Pass
SPAP-1224	3/7/2006	Cs-137	118.25 ± 8.97	119.30	107.37 - 131.23	Pass
SPAP-1224	3/7/2006	Gr. Beta	520.32 ± 7.42	455.00	364.00 - 637.00	Pass
SPW-1228	3/7/2006	H-3	70891.00 ± 719.00	75394.00	60315.20 - 90472.80	Pass
SPW-1230	3/7/2006	Cs-134	38.58 ± 2.10	39.51	29.51 - 49.51	Pass
SPW-1230	3/7/2006	Cs-137	59.44 ± 4.51	59.65	49.65 - 69.65	Pass
SPMI-1232	3/7/2006	Cs-134	41.20 ± 1.33	39.51	29.51 - 49.51	Pass
SPMI-1232	3/7/2006	Cs-137	57.82 ± 3.96	59.65	49.65 - 69.65	Pass
W-30906	3/9/2006	Gr. Alpha	24.24 ± 0.47	20.08	10.04 - 30.12	Pass
W-30906	3/9/2006	Gr. Beta	63.79 ± 0.48	65.73	55.73 - 75.73	Pass
SPW-2750	4/27/2006	Ni-63	116.00 ± 2.49	100.00	60.00 - 140.00	Pass
SPW-2869	5/1/2006	Fe-55	19473.00 ± 188.00	23332.00	18665.60 - 27998.40	Pass
SPAP-2871	5/1/2006	Cs-134	33.97 ± 1.10	37.50	27.50 - 47.50	Pass
SPAP-2871	5/1/2006	Cs-137	114.44 ± 2.81	118.90	107.01 - 130.79	Pass
SPW-2875	5/1/2006	H-3	71057.00 ± 730.20	75394.00	60315.20 - 90472.80	Pass
STSO-3155	5/1/2006	Co-60	7950.80 ± 67.29	7750.00	6975.00 - 8525.00	Pass
STSO-3155	5/1/2006	Cs-134	12.49 ± 0.13	11.59	1.59 - 21.59	Pass
STSO-3155	5/1/2006	Cs-137	14.10 ± 0.12	11.63	1.63 - 21.63	Pass
SPAP-2873	5/2/2006	Gr. Beta	1724.80 ± 4.51	1744.00	1395.20 - 2441.60	Pass
SPF-3183	5/10/2006	Cs-137	2.47 ± 0.03	2.38	1.43 - 3.33	Pass
SPF-3183	5/10/2006	Cs-134	0.73 ± 0.01	0.74	0.44 - 1.04	Pass
SPW-3460	5/26/2006	C-14	4009.60 ± 14.43	4741.00	2844.60 - 6637.40	Pass
W-60606	6/6/2006	Gr. Alpha	21.94 ± 0.46	20.08	10.04 - 30.12	Pass
W-60606	6/6/2006	Gr. Beta	58.17 ± 0.49	65.73	55.73 - 75.73	Pass
SPW-3988	6/16/2006	Cs-134	35.56 ± 1.40	36.00	26.00 - 46.00	Pass
SPW-3988	6/16/2006	Cs-137	60.23 ± 2.72	59.27	49.27 - 69.27	Pass
SPW-3988	6/16/2006	I-131(G)	94.01 ± 4.38	99.30	89.30 - 109.30	Pass
SPW-3988	6/16/2006	Sr-89	52.40 ± 4.23	58.16	46.53 - 69.79	Pass
SPW-3988	6/16/2006	Sr-90	45.35 ± 1.95	41.21	32.97 - 49.45	Pass
SPMI-3990	6/16/2006	Cs-134	35.52 ± 5.05	36.00	26.00 - 46.00	Pass
SPMI-3990	6/16/2006	Cs-137	56.78 ± 3.86	59.27	49.27 - 69.27	Pass
SPMI-3990	6/16/2006	I-131(G)	95.04 ± 5.05	99.30	89.30 - 109.30	Pass
SPMI-3991	6/16/2006	I-131	96.55 ± 0.87	99.30	79.44 - 119.16	Pass
SPW-4356	7/5/2006	I-131	80.88 ± 1.09	77.23	61.78 - 92.68	Pass
W-90506	9/5/2006	Gr. Alpha	23.11 ± 0.45	20.08	10.04 - 30.12	Pass
W-90506	9/5/2006	Gr. Beta	65.01 ± 0.51	65.73	55.73 - 75.73	Pass
SPAP-6950	9/30/2006	Cs-134	28.93 ± 1.56	32.65	22.65 - 42.65	Pass
SPAP-6950	9/30/2006	Cs-137	116.62 ± 2.97	117.75	105.98 - 129.53	Pass
SPAP-6952	9/30/2006	Gr. Beta	52.96 ± 0.14	53.50	42.80 - 74.90	Pass

TABLE A-3. In-House "Spike" Samples

Lab Code	Date	Concentration (pCi/L) Analysis	Laboratory results 2s, n=1[b]	Known Activity	Control Limits[c]	Acceptance
SPW-6954	9/30/2006	Cs-134	63.29 ± 8.24	65.30	55.30 - 75.30	Pass
SPW-6954	9/30/2006	Cs-137	60.41 ± 7.53	58.87	48.87 - 68.87	Pass
SPMI-6956	9/30/2006	Cs-134	69.26 ± 4.85	65.31	55.31 - 75.31	Pass
SPMI-6956	9/30/2006	Cs-137	61.35 ± 7.62	58.87	48.87 - 68.87	Pass
W-120106	12/1/2006	Gr. Alpha	22.40 ± 1.03	20.08	10.04 - 30.12	Pass
W-120106	12/1/2006	Gr. Beta	63.70 ± 1.14	65.73	55.73 - 75.73	Pass
SPAP-9476	12/29/2006	Gr. Beta	57.51 ± 0.14	53.16	42.53 - 74.42	Pass
SPAP-9478	12/29/2006	Cs-134	26.84 ± 1.23	30.06	20.06 - 40.06	Pass
SPAP-9478	12/29/2006	Cs-137	110.54 ± 3.12	117.10	105.39 - 128.81	Pass
SPW-9480	12/29/2006	H-3	68972.20 ± 748.00	72051.60	57641.28 - 86461.92	Pass
SPW-9483	12/29/2006	Tc-99	29.43 ± 0.84	32.98	20.98 - 44.98	Pass
SPW-9488	12/29/2006	Cs-134	61.35 ± 1.65	60.10	50.10 - 70.10	Pass
SPW-9488	12/29/2006	Cs-137	60.30 ± 2.76	56.80	46.80 - 66.80	Pass
SPMI-9490	12/29/2006	Cs-134	58.99 ± 5.43	60.10	50.10 - 70.10	Pass
SPMI-9490	12/29/2006	Cs-137	54.16 ± 7.85	56.80	46.80 - 66.80	Pass
SPF-9492	12/29/2006	Cs-134	0.64 ± 0.01	0.60	0.36 - 0.84	Pass
SPF-9492	12/29/2006	Cs-137	2.61 ± 0.03	2.34	1.40 - 3.28	Pass

[a] Liquid sample results are reported in pCi/Liter, air filters(pCi/filter), charcoal (pCi/m^3), and solid samples (pCi/g).

[b] Laboratory codes as follows: W (water), MI (milk), AP (air filter), SO (soil), VE (vegetation), CH (charcoal canister), F (fish).

[c] Results are based on single determinations.

[d] Control limits are based on Attachment A, Page A2 of this report.

NOTE: For fish, Jello is used for the Spike matrix. For Vegetation, cabbage is used for the Spike matrix.

TABLE A-4. In-House "Blank" Samples

Lab Code	Sample Type	Date	Analysis[b]	Concentration (pCi/L)[a]		
				Laboratory results (4.66σ)		Acceptance
				LLD	Activity[c]	Criteria (4.66 σ)
SPW-302	water	1/20/2006	Fe-55	1061	-91 ± 637	1000
SPAP-1225	Air Filter	3/7/2006	Gr. Beta	1.16	-0.512 ± 51.20	3.2
SPW-1231	water	3/7/2006	Cs-134	2.71		10
SPW-1231	water	3/7/2006	Cs-137	2.05		10
W-30906	water	3/9/2006	Gr. Alpha	0.037	0.005 ± 0.026	1
W-30906	water	3/9/2006	Gr. Beta	0.076	-0.016 ± 0.052	3.2
SPW-2751	water	4/27/2006	Ni-63	1.48	0.37 ± 0.91	20
SPW-2868	water	5/1/2006	Fe-55	18.07	4.33 ± 11.27	1000
SPW-2874	water	5/1/2006	H-3	166.00	-8.3 ± 86.9	200
SPAP-2872	Air Filter	5/2/2006	Gr. Beta	1.18	-3.65 ± 0.64	3.2
SPF-3154	Fish	5/10/2006	Cs-134	16.4		100
SPF-3154	Fish	5/10/2006	Cs-137	13.7		100
SPW-3461	water	5/26/2006	C-14	10.20	-7.9 ± 5.20	200
W-60606	water	6/6/2006	Gr. Alpha	0.05	0.013 ± 0.037	1
W-60606	water	6/6/2006	Gr. Beta	0.16	-0.044 ± 0.11	3.2
SPW-3989	water	6/16/2006	Cs-134	3.00		10
SPW-3989	water	6/16/2006	Cs-137	3.65		10
SPW-3989	water	6/16/2006	I-131	0.21	0.045 ± 0.14	0.5
SPW-3989	water	6/16/2006	I-131(G)	8.34		20
SPW-3989	water	6/16/2006	Sr-89	0.54	0.005 ± 0.45	5
SPW-3989	water	6/16/2006	Sr-90	0.58	-0.079 ± 0.26	1
SPMI-3991	Milk	6/16/2006	Cs-134	4.42		10
SPMI-3991	Milk	6/16/2006	Cs-137	3.88		10
SPMI-3991	Milk	6/16/2006	I-131	0.28	-0.22 ± 0.19	0.5
SPMI-3991	Milk	6/16/2006	I-131(G)	3.76		20
SPMI-3991	Milk	6/16/2006	Sr-89	0.61	-0.25 ± 0.76	5
SPMI-3991 [d]	Milk	6/16/2006	Sr-90	0.52	0.88 ± 0.34	1
W-90506	water	9/5/2006	Gr. Alpha	0.06	0.00 ± 0.04	1
W-90506	water	9/5/2006	Gr. Beta	0.16	0.05 ± 0.11	3.2
SPMI-6383	Milk	9/14/2006	Sr-89	0.97	-0.18 ± 0.92	5
SPMI-6383 [d]	Milk	9/14/2006	Sr-90	0.57	0.65 ± 0.33	1
SPAP-6949	Air Filter	9/30/2006	Cs-134	0.89		100
SPAP-6949	Air Filter	9/30/2006	Cs-137	0.91		100
SPAP-6951	Air Filter	9/30/2006	Gr. Beta	1.12	-0.54 ± 0.64	3.2
SPW-6953	water	9/30/2006	Cs-134	3.91		10
SPW-6953	water	9/30/2006	Cs-137	5.61		10
SPW-6953	water	9/30/2006	Sr-89	0.79	-0.14 ± 0.64	5
SPW-6953	water	9/30/2006	Sr-90	0.60	0.11 ± 0.29	1

TABLE A-4. In-House "Blank" Samples

Lab Code	Sample Type	Date	Analysis[b]	Concentration (pCi/L)[a]		
				Laboratory results (4.66σ)		Acceptance
				LLD	Activity[c]	Criteria (4.66 σ)
SPMI-6955	Milk	9/30/2006	Cs-134	2.86		10
SPMI-6955	Milk	9/30/2006	Cs-137	2.39		10
SPMI-6955	Milk	9/30/2006	I-131(G)	9.98		0.5
W-120106	water	12/1/2006	Gr. Alpha	0.11	0.066 ± 0.072	1
W-120106	water	12/1/2006	Gr. Beta	0.30	0.093 ± 0.16	3.2
SPAP-9477	Air Filter	12/29/2006	Gr. Beta	1.13	-0.37 ± 0.66	3.2
SPAP-9479	Air Filter	12/29/2006	Cs-137	0.87		100
SPW-9481	water	12/29/2006	H-3	146.2	63.2 ± 80.1	200
SPW-9483	water	12/29/2006	Tc-99	0.95	-1.20 ± 0.56	10
SPW-9489	water	12/29/2006	Cs-134	2.30		10
SPMI-9491	Milk	12/29/2006	Cs-134	3.10		10
SPMI-9491	Milk	12/29/2006	Cs-137	2.90		10
SPMI-9491	Milk	12/29/2006	I-131(G)	8.00		20
SPF-9493	Fish	12/29/2006	Cs-134	7.6		100
SPF-9493	Fish	12/29/2006	Cs-137	7.9		100

[a] Liquid sample results are reported in pCi/Liter, air filters(pCi/filter), charcoal (pCi/charcoal canister), and solid samples (pCi/kg).

[b] I-131(G); iodine-131 as analyzed by gamma spectroscopy.

[c] Activity reported is a net activity result. For gamma spectroscopic analysis, activity detected below the LLD value is not reported

[d] Low levels of Sr-90 are still detected in the environment. A concentration of (1-5 pCi/L) in milk is not unusual.

TABLE A-5. In-House "Duplicate" Samples

Lab Code	Date	Analysis	Concentration (pCi/L)[a] First Result	Second Result	Averaged Result	Acceptance
AP-7466, 7467	1/3/2006	Be-7	0.053 ± 0.015	0.057 ± 0.011	0.055 ± 0.009	Pass
AP-7513, 7514	1/3/2006	Be-7	0.033 ± 0.008	0.036 ± 0.008	0.035 ± 0.006	Pass
AP-7555, 7556	1/3/2006	Be-7	0.053 ± 0.007	0.054 ± 0.008	0.053 ± 0.005	Pass
MI-154, 155	1/10/2006	K-40	1254.20 ± 87.75	1369.60 ± 102.80	1311.90 ± 67.58	Pass
MI-217, 218	1/11/2006	K-40	1258.00 ± 118.00	1313.00 ± 98.00	1285.50 ± 76.69	Pass
MI-217, 218	1/11/2006	Sr-90	1.27 ± 0.37	0.92 ± 0.33	1.10 ± 0.25	Pass
MI-287, 288	1/17/2006	K-40	1383.10 ± 110.90	1457.80 ± 119.10	1420.45 ± 81.37	Pass
MI-287, 288	1/17/2006	Sr-90	0.74 ± 0.38	0.94 ± 0.37	0.84 ± 0.27	Pass
WW-314, 315	1/19/2006	Gr. Beta	9.21 ± 1.72	11.52 ± 1.93	10.37 ± 1.29	Pass
WW-314, 315	1/19/2006	H-3	168.64 ± 94.94	210.12 ± 96.51	189.38 ± 67.69	Pass
SWT-577, 578	1/31/2006	Gr. Beta	3.06 ± 0.66	3.68 ± 0.64	3.37 ± 0.46	Pass
SWU-598, 599	1/31/2006	Gr. Beta	2.03 ± 0.39	1.97 ± 0.40	2.00 ± 0.28	Pass
SWU-598, 599	1/31/2006	H-3	260.10 ± 98.20	134.10 ± 93.50	197.10 ± 67.80	Pass
F-3311, 3312 [b]	2/9/2006	Gr. Beta	4.12 ± 0.14	3.82 ± 0.13	3.97 ± 0.10	Fail
F-3311, 3312	2/9/2006	K-40	2.68 ± 0.37	2.76 ± 0.39	2.72 ± 0.27	Pass
SW-780, 781	2/14/2006	Gr. Alpha	4.09 ± 1.52	3.22 ± 1.37	3.66 ± 1.03	Pass
SW-780, 781	2/14/2006	Gr. Beta	5.91 ± 0.90	5.89 ± 0.92	5.90 ± 0.64	Pass
DW-934, 935	2/17/2006	I-131	0.35 ± 0.22	0.31 ± 0.25	0.33 ± 0.16	Pass
DW-1024, 1025	2/24/2006	I-131	0.24 ± 0.26	0.53 ± 0.24	0.39 ± 0.18	Pass
MI-1078, 1079	3/1/2006	Sr-90	1.42 ± 0.39	1.30 ± 0.62	1.36 ± 0.37	Pass
F-1357, 1358	3/10/2006	Gr. Beta	3.77 ± 0.07	3.71 ± 0.07	3.74 ± 0.05	Pass
F-1357, 1358	3/10/2006	K-40	2.46 ± 0.32	2.32 ± 0.44	2.39 ± 0.27	Pass
MI-1469, 1470	3/14/2006	K-40	1396.30 ± 120.80	1335.60 ± 113.80	1365.95 ± 82.98	Pass
CF-1538, 1539	3/21/2006	K-40	13.66 ± 0.81	13.97 ± 0.68	13.81 ± 0.53	Pass
WW-1583, 1584	3/22/2006	Gr. Beta	7.66 ± 0.73	8.87 ± 0.75	8.26 ± 0.52	Pass
DW-1955, 1956	3/27/2006	Gr. Beta	2.25 ± 0.60	3.15 ± 0.59	2.70 ± 0.42	Pass
MI-1760, 1761	3/29/2006	K-40	1271.00 ± 89.00	1378.00 ± 113.00	1324.50 ± 71.92	Pass
AP-2603, 2604	3/29/2006	Be-7	0.067 ± 0.015	0.056 ± 0.010	0.062 ± 0.009	Pass
E-1997, 1998	4/3/2006	Gr. Beta	1.82 ± 0.07	1.87 ± 0.07	1.85 ± 0.05	Pass
E-1997, 1998	4/3/2006	K-40	1.28 ± 0.15	1.24 ± 0.21	1.26 ± 0.13	Pass
AP-2818, 2819	4/3/2006	Be-7	0.06 ± 0.01	0.06 ± 0.01	0.06 ± 0.01	Pass
SWU-2863, 2864	4/3/2006	Gr. Beta	3.20 ± 1.26	4.77 ± 1.30	3.99 ± 0.91	Pass
SS-2389, 2390	4/11/2006	Gr. Beta	10.53 ± 0.96	9.38 ± 0.84	9.96 ± 0.64	Pass
SS-2389, 2390	4/11/2006	K-40	5.51 ± 0.42	5.79 ± 0.40	5.65 ± 0.29	Pass
DW-2773, 2774	4/21/2006	I-131	0.74 ± 0.23	0.53 ± 0.40	0.63 ± 0.23	Pass
SL-2932, 2933	5/1/2006	Be-7	1.28 ± 0.19	1.27 ± 0.17	1.28 ± 0.13	Pass
SL-2932, 2933	5/1/2006	Gr. Beta	6.09 ± 0.33	5.65 ± 0.31	5.87 ± 0.23	Pass
SL-2932, 2933	5/1/2006	K-40	3.13 ± 0.41	3.09 ± 0.36	3.11 ± 0.27	Pass
BS-3103, 3104	5/1/2006	Gr. Beta	8.27 ± 1.46	9.03 ± 1.59	8.65 ± 1.08	Pass
BS-3103, 3104	5/1/2006	K-40	6288.20 ± 585.20	5643.70 ± 599.80	5965.95 ± 418.99	Pass
MI-3037, 3038	5/2/2006	K-40	1238.90 ± 98.59	1301.00 ± 103.90	1269.95 ± 71.62	Pass
MI-3037, 3038	5/2/2006	Sr-90	1.76 ± 0.42	1.48 ± 0.42	1.62 ± 0.29	Pass

TABLE A-5. In-House "Duplicate" Samples

Lab Code	Date	Analysis	Concentration (pCi/L)[a] First Result	Second Result	Averaged Result	Acceptance
MI-3124, 3125	5/9/2006	K-40	1032.30 ± 91.12	1103.60 ± 120.50	1067.95 ± 75.54	Pass
SW-3145, 3146	5/9/2006	Gr. Alpha	4.85 ± 1.68	4.12 ± 1.62	4.48 ± 1.17	Pass
SW-3145, 3146	5/9/2006	Gr. Beta	8.94 ± 1.46	9.14 ± 1.36	9.04 ± 1.00	Pass
MI-3236, 3237	5/10/2006	K-40	1412.40 ± 119.10	1427.90 ± 127.70	1420.15 ± 87.31	Pass
F-3422, 3423	5/19/2006	H-3	8175.00 ± 252.00	8268.00 ± 253.00	8221.50 ± 178.54	Pass
G-3491, 3492	5/24/2006	Gr. Beta	8.89 ± 0.18	9.03 ± 0.19	8.96 ± 0.13	Pass
G-3491, 3492	5/24/2006	K-40	5.60 ± 0.71	6.30 ± 0.78	5.95 ± 0.53	Pass
SO-3539, 3540	5/24/2006	Gr. Beta	19.57 ± 1.99	18.98 ± 1.91	19.27 ± 1.38	Pass
SO-3539, 3540	5/24/2006	K-40	12.55 ± 0.89	11.49 ± 0.59	12.02 ± 0.53	Pass
WW-3751, 3752	5/25/2006	Gr. Beta	9.85 ± 0.79	8.96 ± 0.74	9.41 ± 0.54	Pass
F-3617, 3618	5/30/2006	K-40	2.42 ± 0.38	2.53 ± 0.37	2.47 ± 0.27	Pass
SL-3641, 3642	6/1/2006	Be-7	1.41 ± 0.19	1.31 ± 0.27	1.36 ± 0.17	Pass
SL-3641, 3642	6/1/2006	Gr. Beta	5.03 ± 0.18	5.30 ± 0.19	5.17 ± 0.13	Pass
SL-3641, 3642	6/1/2006	K-40	2.21 ± 0.26	2.14 ± 0.37	2.18 ± 0.23	Pass
MI-3886, 3887	6/12/2006	K-40	1424.20 ± 118.20	1318.80 ± 110.50	1371.50 ± 80.90	Pass
VE-3949, 3950	6/13/2006	Gr. Alpha	0.13 ± 0.06	0.16 ± 0.07	0.15 ± 0.05	Pass
VE-3949, 3950	6/13/2006	Gr. Beta	4.53 ± 0.19	4.47 ± 0.18	4.50 ± 0.13	Pass
VE-3949, 3950	6/13/2006	K-40	6.02 ± 0.66	5.33 ± 0.66	5.67 ± 0.47	Pass
BS-4016, 4017	6/13/2006	Co-60	0.18 ± 0.03	0.15 ± 0.03	0.16 ± 0.02	Pass
BS-4016, 4017	6/13/2006	Cs-137	1.97 ± 0.09	2.01 ± 0.09	1.99 ± 0.06	Pass
BS-4016, 4017	6/13/2006	K-40	11.03 ± 0.76	10.45 ± 0.78	10.74 ± 0.54	Pass
MI-3992, 3993	6/14/2006	K-40	1358.50 ± 166.40	1395.80 ± 122.70	1377.15 ± 103.37	Pass
LW-4175, 4176	6/16/2006	H-3	482.11 ± 90.25	397.50 ± 86.88	439.81 ± 62.63	Pass
W-4130, 4131	6/21/2006	H-3	401.50 ± 87.85	236.28 ± 80.89	318.89 ± 59.71	Pass
AV-4330, 4331	6/26/2006	K-40	1717.10 ± 244.30	1893.10 ± 223.30	1805.10 ± 165.49	Pass
SWU-4489, 4490	6/27/2006	Gr. Beta	1.70 ± 0.38	1.93 ± 0.38	1.82 ± 0.27	Pass
AP-4909, 4910	6/29/2006	Be-7	0.11 ± 0.01	0.11 ± 0.02	0.11 ± 0.01	Pass
AP-4952, 4953	6/29/2006	Be-7	0.08 ± 0.02	0.10 ± 0.02	0.09 ± 0.01	Pass
AP-4930, 4931	7/3/2006	Be-7	0.08 ± 0.02	0.07 ± 0.01	0.08 ± 0.01	Pass
E-4399, 4400	7/5/2006	Gr. Beta	1.85 ± 0.05	1.85 ± 0.05	1.85 ± 0.04	Pass
E-4399, 4400	7/5/2006	K-40	1.25 ± 0.19	1.24 ± 0.18	1.25 ± 0.13	Pass
G-4420, 4421	7/5/2006	Be-7	0.82 ± 0.20	0.61 ± 0.14	0.72 ± 0.12	Pass
G-4420, 4421	7/5/2006	Gr. Beta	13.20 ± 0.40	14.00 ± 0.40	13.60 ± 0.28	Pass
G-4420, 4421	7/5/2006	K-40	9.96 ± 0.44	10.06 ± 0.82	10.01 ± 0.47	Pass
DW-60432, 60433	7/6/2006	Gr. Alpha	3.24 ± 1.35	2.49 ± 1.33	2.87 ± 0.95	Pass
DW-60514, 60515	7/10/2006	Gr. Alpha	3.70 ± 1.12	3.09 ± 1.16	3.40 ± 0.81	Pass
DW-60449, 60450	7/11/2006	Gr. Alpha	6.87 ± 1.26	4.77 ± 1.09	5.82 ± 0.83	Pass
MI-4599, 4600	7/12/2006	K-40	1403.50 ± 118.80	1330.40 ± 116.50	1366.95 ± 83.20	Pass
MI-4599, 4600	7/12/2006	Sr-90	0.59 ± 0.34	0.70 ± 0.35	0.65 ± 0.24	Pass
MI-4667, 4668	7/12/2006	K-40	1286.60 ± 92.62	1358.60 ± 158.40	1322.60 ± 91.75	Pass
LW-4823, 4824	7/14/2006	Gr. Beta	1.75 ± 0.60	2.51 ± 0.59	2.13 ± 0.42	Pass

TABLE A-5. In-House "Duplicate" Samples

Lab Code	Date	Analysis	Concentration (pCi/L)[a] First Result	Second Result	Averaged Result	Acceptance
DW-60502, 60503	7/19/2006	Gr. Alpha	16.27 ± 2.49	21.41 ± 3.21	18.84 ± 2.03	Pass
DW-60526, 60527	7/21/2006	Gr. Alpha	14.06 ± 1.82	15.57 ± 1.77	14.82 ± 1.27	Pass
DW-60539, 60540	7/21/2006	Gr. Alpha	5.09 ± 0.95	6.23 ± 1.05	5.66 ± 0.71	Pass
MI-5125, 5126	7/25/2006	K-40	1480.60 ± 118.30	1402.60 ± 120.80	1441.60 ± 84.54	Pass
DW-60609, 60610	7/26/2006	Gr. Alpha	1.00 ± 1.10	2.70 ± 1.30	1.85 ± 0.85	Pass
DW-60621, 60622	7/31/2006	Gr. Alpha	3.70 ± 1.00	1.90 ± 0.80	2.80 ± 0.64	Pass
SL-5265, 5266	8/1/2006	Be-7	1.10 ± 0.46	1.38 ± 0.52	1.24 ± 0.35	Pass
SL-5265, 5266	8/1/2006	Sr-90	0.10 ± 0.03	0.16 ± 0.03	0.13 ± 0.02	Pass
SL-5265, 5266	8/1/2006	Gr. Beta	4.41 ± 0.41	3.46 ± 0.57	3.94 ± 0.35	Pass
SL-5265, 5266	8/1/2006	K-40	1.19 ± 0.52	0.87 ± 0.52	1.03 ± 0.37	Pass
VE-5286, 5287	8/1/2006	Be-7	1.21 ± 0.30	1.32 ± 0.20	1.27 ± 0.18	Pass
VE-5286, 5287	8/1/2006	Gr. Beta	9.67 ± 0.35	9.37 ± 0.35	9.52 ± 0.25	Pass
VE-5286, 5287	8/1/2006	K-40	6.25 ± 0.81	6.50 ± 0.48	6.38 ± 0.47	Pass
SW-5383, 5384	8/8/2006	Gr. Alpha	3.24 ± 1.35	2.94 ± 1.35	3.09 ± 0.96	Pass
SW-5383, 5384	8/8/2006	Gr. Beta	4.86 ± 0.86	5.46 ± 0.87	5.16 ± 0.61	Pass
SW-5971, 5972	8/8/2006	H-3	119.90 ± 78.14	144.41 ± 79.23	132.15 ± 55.64	Pass
VE-5404, 5405	8/10/2006	Be-7	0.77 ± 0.24	1.01 ± 0.26	0.89 ± 0.18	Pass
VE-5404, 5405	8/10/2006	K-40	4.71 ± 0.63	4.01 ± 0.58	4.36 ± 0.43	Pass
DW-5480, 5481	8/11/2006	H-3	169.08 ± 85.52	133.65 ± 83.96	151.36 ± 59.92	Pass
DW-60645, 60646	8/15/2006	Gr. Alpha	10.41 ± 1.78	10.97 ± 1.85	10.69 ± 1.28	Pass
W-5602, 5603	8/16/2006	H-3	2118.79 ± 151.55	2181.82 ± 153.09	2150.30 ± 107.71	Pass
DW-60634, 60635	8/18/2006	Gr. Alpha	12.99 ± 1.84	9.67 ± 1.61	11.33 ± 1.22	Pass
DW-60634, 60635	8/18/2006	Gr. Beta	10.51 ± 1.33	8.61 ± 1.18	9.56 ± 0.89	Pass
MI-5793, 5794	8/22/2006	K-40	1264.00 ± 115.00	1377.00 ± 121.00	1320.50 ± 83.47	Pass
SWU-6150, 6151	8/29/2006	Gr. Beta	1.84 ± 0.28	1.81 ± 0.28	1.82 ± 0.20	Pass
DW-60657, 60658	8/29/2006	Gr. Alpha	2.33 ± 0.80	2.90 ± 0.78	2.62 ± 0.56	Pass
CF-7450, 7451	9/5/2006	Be-7	0.78 ± 0.45	0.78 ± 0.27	0.78 ± 0.26	Pass
SL-6085, 6086	9/5/2006	Co-60	0.22 ± 0.03	0.21 ± 0.02	0.22 ± 0.02	Pass
SL-6085, 6086	9/5/2006	Gr. Beta	5.47 ± 0.69	4.63 ± 0.58	5.05 ± 0.45	Pass
SL-6085, 6086	9/5/2006	K-40	1.91 ± 0.28	2.06 ± 0.41	1.99 ± 0.25	Pass
DW-60695, 60696	9/11/2006	Gr. Alpha	3.93 ± 1.17	4.62 ± 1.12	4.28 ± 0.81	Pass
LW-6266, 6267	9/13/2006	Gr. Beta	3.09 ± 0.48	2.98 ± 0.48	3.03 ± 0.34	Pass
MI-6424, 6425	9/19/2006	Sr-90	0.78 ± 0.38	1.11 ± 0.37	0.95 ± 0.27	Pass
DW-60715, 60716	9/19/2006	Gr. Alpha	1.30 ± 1.00	2.23 ± 1.01	1.77 ± 0.71	Pass
SO-6597, 6598	9/22/2006	Cs-137	0.18 ± 0.04	0.18 ± 0.04	0.18 ± 0.03	Pass
SO-6597, 6598	9/22/2006	K-40	10.25 ± 0.66	10.11 ± 0.64	10.18 ± 0.46	Pass
SWU-6718, 6719	9/26/2006	Gr. Beta	3.45 ± 1.21	2.78 ± 1.19	3.12 ± 0.85	Pass
SO-6668, 6669	9/27/2006	Cs-137	0.13 ± 0.04	0.13 ± 0.02	0.13 ± 0.02	Pass
SO-6668, 6669	9/27/2006	K-40	13.04 ± 0.90	12.41 ± 0.54	12.72 ± 0.53	Pass

TABLE A-5. In-House "Duplicate" Samples

Lab Code	Date	Analysis	Concentration (pCi/L)[a] First Result	Second Result	Averaged Result	Acceptance
MI-6760, 6761	10/2/2006	K-40	1413.10 ± 113.20	1187.30 ± 155.20	1300.20 ± 96.05	Pass
G-6797, 6798	10/2/2006	Be-7	4.70 ± 0.31	4.56 ± 0.41	4.63 ± 0.26	Pass
G-6797, 6798	10/2/2006	Gr. Beta	6.89 ± 0.26	7.04 ± 0.24	6.97 ± 0.18	Pass
G-6797, 6798 [b]	10/2/2006	K-40	5.39 ± 0.35	4.36 ± 0.47	4.88 ± 0.29	Fail
AP-7531, 7532	10/3/2006	Be-7	0.07 ± 0.01	0.08 ± 0.01	0.08 ± 0.01	Pass
AP-7552, 7553	10/3/2006	Be-7	0.08 ± 0.02	0.08 ± 0.01	0.08 ± 0.01	Pass
AP-7573, 7574	10/3/2006	Be-7	0.08 ± 0.02	0.08 ± 0.01	0.08 ± 0.01	Pass
SO-7103, 7104	10/4/2006	Cs-137	0.25 ± 0.05	0.27 ± 0.06	0.26 ± 0.04	Pass
SO-7103, 7104	10/4/2006	K-40	12.95 ± 1.12	12.22 ± 1.07	12.58 ± 0.77	Pass
DW-60759, 60760	10/5/2006	Gr. Alpha	4.93 ± 0.97	5.04 ± 1.03	4.99 ± 0.71	Pass
MI-7037, 7038	10/10/2006	K-40	1326.10 ± 115.20	1251.40 ± 115.70	1288.75 ± 81.64	Pass
VE-7058, 7059	10/10/2006	Gr. Alpha	0.18 ± 0.11	0.32 ± 0.14	0.25 ± 0.09	Pass
VE-7058, 7059	10/10/2006	Gr. Beta	9.21 ± 0.34	8.83 ± 0.36	9.02 ± 0.25	Pass
VE-7058, 7059	10/10/2006	K-40	10.90 ± 0.65	10.42 ± 0.80	10.66 ± 0.52	Pass
SS-7079, 7080	10/10/2006	Cs-137	0.04 ± 0.01	0.04 ± 0.02	0.04 ± 0.01	Pass
SS-7079, 7080	10/10/2006	Gr. Beta	12.23 ± 2.46	11.76 ± 2.23	11.99 ± 1.66	Pass
SS-7079, 7080	10/10/2006	K-40	7.23 ± 0.36	7.37 ± 0.40	7.30 ± 0.27	Pass
MI-7208, 7209	10/11/2006	K-40	1295.20 ± 116.90	1386.90 ± 119.10	1341.05 ± 83.44	Pass
CF-7450, 7451	10/18/2006	K-40	20.40 ± 0.84	19.54 ± 0.99	19.97 ± 0.65	Pass
LW-7945, 7946	10/26/2006	Gr. Beta	1.30 ± 0.37	1.44 ± 0.36	1.37 ± 0.26	Pass
F-7971, 7972	10/29/2006	K-40	3.63 ± 0.54	3.33 ± 0.43	3.48 ± 0.34	Pass
SWU-8194, 8195	10/31/2006	Gr. Beta	1.84 ± 0.28	1.43 ± 0.28	1.64 ± 0.20	Pass
BS-8017, 8018	11/1/2006	Gr. Beta	10.54 ± 1.72	10.17 ± 1.73	10.36 ± 1.22	Pass
BS-8017, 8018	11/1/2006	K-40	10.00 ± 0.53	9.60 ± 0.69	9.80 ± 0.44	Pass
LW-8215, 8216	11/1/2006	Gr. Beta	2.23 ± 0.61	1.64 ± 0.37	1.93 ± 0.35	Pass
F-8345, 8346	11/2/2006	K-40	2.84 ± 0.42	2.89 ± 0.40	2.86 ± 0.29	Pass
BS-8366, 8367	11/2/2006	K-40	13.69 ± 0.66	13.61 ± 0.78	13.65 ± 0.51	Pass
MI-8083, 8084	11/6/2006	K-40	1295.00 ± 121.20	1374.80 ± 162.80	1334.90 ± 101.48	Pass
WW-8259, 8260	11/7/2006	H-3	337.00 ± 95.00	295.00 ± 93.00	316.00 ± 66.47	Pass
MI-8484, 8485	11/22/2006	K-40	1405.80 ± 87.06	1390.70 ± 103.60	1398.25 ± 67.66	Pass
SO-8619, 8620	11/27/2006	Cs-137	0.74 ± 0.08	0.69 ± 0.06	0.71 ± 0.05	Pass
SO-8619, 8620	11/27/2006	Gr. Alpha	16.54 ± 5.65	12.24 ± 4.90	14.39 ± 3.74	Pass
SO-8619, 8620	11/27/2006	Gr. Beta	24.99 ± 3.88	28.66 ± 3.95	26.82 ± 2.77	Pass
SO-8619, 8620	11/27/2006	K-40	12.21 ± 1.11	12.92 ± 0.83	12.57 ± 0.69	Pass
SWT-8641, 8642	11/29/2006	Gr. Beta	2.83 ± 0.47	2.89 ± 0.45	2.86 ± 0.33	Pass
SWT-9436, 9437	12/26/2006	Gr. Beta	2.39 ± 0.64	2.25 ± 0.60	2.32 ± 0.44	Pass

Note: 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 air filters (pCi/Filter), food products, vegetation, soil, sediment (pCi/g).

[b] 200 minute count time or longer, resulting in lower error.

TABLE A-6. Department of Energy's Mixed Analyte Performance Evaluation Program (MAPEP)[a].

Lab Code[c]	Date	Analysis	Concentration [b] Laboratory result	Known Activity	Control Limits [d]	Acceptance
STVE-1082	01/01/06	Am-241	0.16 ± 0.06	0.16	0.11 - 0.20	Pass
STVE-1082	01/01/06	Co-57	10.40 ± 0.20	8.58	6.00 - 11.15	Pass
STVE-1082	01/01/06	Co-60	5.00 ± 0.20	4.52	3.16 - 5.88	Pass
STVE-1082 [e]	01/01/06	Cs-134	< 0.20	0.00		Pass
STVE-1082	01/01/06	Cs-137	3.40 ± 0.20	3.07	2.15 - 4.00	Pass
STVE-1082	01/01/06	Mn-54	6.90 ± 0.20	6.25	4.37 - 8.12	Pass
STVE-1082 [f]	01/01/06	Pu-238	0.08 ± 0.03	0.14	0.10 - 0.18	Fail
STVE-1082	01/01/06	Pu-239/40	0.17 ± 0.03	0.16	0.11 - 0.21	Pass
STVE-1082	01/01/06	Sr-90	1.40 ± 0.20	1.56	1.09 - 2.03	Pass
STVE-1082	01/01/06	U-233/4	0.24 ± 0.05	0.21	0.15 - 0.27	Pass
STVE-1082	01/01/06	U-238	0.19 ± 0.04	0.22	0.15 - 0.28	Pass
STVE-1082	01/01/06	Zn-65	11.10 ± 0.50	9.80	6.86 - 12.74	Pass
STSO-1083	01/01/06	Am-241	54.60 ± 5.50	57.08	39.96 - 74.20	Pass
STSO-1083	01/01/06	Co-57	762.90 ± 12.70	656.29	459.40 - 853.18	Pass
STSO-1083	01/01/06	Co-60	504.90 ± 3.10	447.10	312.97 - 581.23	Pass
STSO-1083 [e]	01/01/06	Cs-134	< 1.70	0.00		Pass
STSO-1083	01/01/06	Cs-137	406.50 ± 3.70	339.69	237.78 - 441.60	Pass
STSO-1083	01/01/06	K-40	719.20 ± 18.40	604.00	422.80 - 785.20	Pass
STSO-1083	01/01/06	Mn-54	415.60 ± 4.80	346.77	242.74 - 450.80	Pass
STSO-1083	01/01/06	Ni-63	261.40 ± 14.70	323.51	226.46 - 420.56	Pass
STSO-1083	01/01/06	Pu-238	14.60 ± 2.90	61.15	42.81 - 79.50	Fail
STSO-1083	01/01/06	Pu-239/40	14.60 ± 2.40	45.85	32.09 - 59.61	Fail
STSO-1083	01/01/06	U-233/4	13.50 ± 1.70	37.00	25.90 - 48.10	Fail
STSO-1083	01/01/06	U-238	15.40 ± 1.80	38.85	27.20 - 50.50	Fail
STSO-1083	01/01/06	Zn-65	783.40 ± 7.00	657.36	460.15 - 854.57	Pass
STAP-1084	01/01/06	Gr. Alpha	0.26 ± 0.02	0.36	0.00 - 0.72	Pass
STAP-1084	01/01/06	Gr. Beta	0.51 ± 0.03	0.48	0.24 - 0.72	Pass
STAP-1085	01/01/06	Am-241	0.12 ± 0.02	0.09	0.07 - 0.12	Pass
STAP-1085	01/01/06	Co-57	4.32 ± 0.10	4.10	2.87 - 5.32	Pass
STAP-1085	01/01/06	Co-60	2.24 ± 0.16	2.19	1.53 - 2.84	Pass
STAP-1085	01/01/06	Cs-134	2.96 ± 0.19	2.93	2.05 - 3.81	Pass
STAP-1085	01/01/06	Cs-137	2.64 ± 0.20	2.53	1.77 - 3.29	Pass
STAP-1085 [f]	01/01/06	Pu-238	0.03 ± 0.01	0.07	0.05 - 0.09	Fail
STAP-1085 [e]	01/01/06	Pu-239/40	< 0.01	0.00		Pass
STAP-1085	01/01/06	Sr-90	0.77 ± 0.21	0.79	0.55 - 1.03	Pass
STAP-1085	01/01/06	U-233/4	0.03 ± 0.01	0.02	0.01 - 0.03	Pass
STAP-1085	01/01/06	U-238	0.02 ± 0.01	0.02	0.01 - 0.03	Pass
STAP-1085	01/01/06	Zn-65	3.94 ± 0.44	3.42	2.40 - 4.45	Pass

TABLE A-6. Department of Energy's Mixed Analyte Performance Evaluation Program (MAPEP)[a].

		Concentration [b]				
Lab Code[c]	Date	Analysis	Laboratory result	Known Activity	Control Limits [d]	Acceptance
STW-1086	01/01/06	Am-241	1.29 ± 0.05	1.30	0.91 - 1.69	Pass
STW-1086	01/01/06	Co-57	177.10 ± 1.00	166.12	116.28 - 215.96	Pass
STW-1086	01/01/06	Co-60	158.30 ± 1.00	153.50	107.45 - 199.55	Pass
STW-1086	01/01/06	Cs-134	96.40 ± 1.50	95.10	66.57 - 123.63	Pass
STW-1086 [e]	01/01/06	Cs-137	< 0.80	0.00		Pass
STW-1086	01/01/06	Fe-55	102.50 ± 18.10	129.60	90.72 - 168.48	Pass
STW-1086	01/01/06	H-3	956.60 ± 16.50	952.01	666.41 - 1238.00	Pass
STW-1086	01/01/06	Mn-54	335.30 ± 2.20	315.00	220.50 - 409.50	Pass
STW-1086	01/01/06	Ni-63	62.90 ± 3.60	60.34	42.24 - 78.44	Pass
STW-1086	01/01/06	Pu-238	0.96 ± 0.07	0.91	0.70 - 1.30	Pass
STW-1086 [e]	01/01/06	Pu-239/40	< 0.20	0.00		Pass
STW-1086	01/01/06	Sr-90	12.80 ± 1.60	13.16	9.21 - 17.11	Pass
STW-1086	01/01/06	Tc-99	22.30 ± 1.20	23.38	16.37 - 30.39	Pass
STW-1086	01/01/06	U-233/4	2.02 ± 0.12	2.09	1.46 - 2.72	Pass
STW-1086	01/01/06	U-238	2.03 ± 0.12	2.17	1.52 - 2.82	Pass
STW-1086	01/01/06	Zn-65	249.50 ± 3.40	228.16	159.71 - 296.61	Pass
STW-1087	01/01/06	Gr. Alpha	0.59 ± 0.10	0.58	0.00 - 1.16	Pass
STW-1087	01/01/06	Gr. Beta	1.69 ± 0.07	1.13	0.56 - 1.70	Pass
STVE-1098 [e]	07/01/06	Co-57	< 0.14	0.00		Pass
STVE-1098 [g]	07/01/06	Co-60	6.89 ± 0.17	5.81	4.06 - 7.55	Pass
STVE-1098	07/01/06	Cs-134	8.46 ± 0.16	7.49	5.24 - 9.73	Pass
STVE-1098	07/01/06	Cs-137	6.87 ± 0.29	5.50	3.85 - 7.14	Pass
STVE-1098	07/01/06	Mn-54	10.36 ± 0.29	8.35	5.85 - 10.86	Pass
STVE-1098	07/01/06	Zn-65	7.46 ± 0.50	5.98	4.19 - 7.78	Pass
STSO-1099	07/01/06	Am-241	130.00 ± 11.60	105.47	73.83 - 137.11	Pass
STSO-1099	07/01/06	Co-57	784.90 ± 3.80	676.33	473.43 - 879.23	Pass
STSO-1099	07/01/06	Co-60	2.10 ± 0.90	1.98	0.00 - 5.00	Pass
STSO-1099	07/01/06	Cs-134	500.70 ± 7.40	452.13	316.49 - 587.77	Pass
STSO-1099	07/01/06	Cs-137	624.20 ± 4.90	525.73	368.01 - 683.45	Pass
STSO-1099	07/01/06	K-40	701.30 ± 3.40	604.00	423.00 - 785.00	Pass
STSO-1099	07/01/06	Mn-54	699.20 ± 5.20	594.25	415.98 - 772.52	Pass
STSO-1099	07/01/06	Ni-63	614.40 ± 17.10	672.30	470.60 - 874.00	Pass
STSO-1099	07/01/06	Pu-238	79.90 ± 5.80	82.00	57.00 - 107.00	Pass
STSO-1099 [e]	07/01/06	Pu-239/40	< 0.70	0.00		Pass
STSO-1099	07/01/06	U-233/4	150.50 ± 5.90	152.44	106.71 - 198.17	Pass
STSO-1099	07/01/06	U-238	151.60 ± 6.00	158.73	111.11 - 206.35	Pass
STSO-1099	07/01/06	Zn-65	1021.90 ± 9.20	903.61	632.53 - 1175.00	Pass
STAP-1100	07/01/06	Am-241	0.16 ± 0.03	0.14	0.10 - 0.19	Pass
STAP-1100	07/01/06	Co-57	2.17 ± 0.06	2.58	1.81 - 3.36	Pass
STAP-1100	07/01/06	Co-60	1.38 ± 0.07	1.58	1.10 - 2.05	Pass
STAP-1100	07/01/06	Cs-134	2.52 ± 0.13	3.15	2.20 - 4.09	Pass

TABLE A-6. Department of Energy's Mixed Analyte Performance Evaluation Program (MAPEP)[a].

		Concentration [b]				
Lab Code[c]	Date	Analysis	Laboratory result	Known Activity	Control Limits [d]	Acceptance
STAP-1100	07/01/06	Cs-137	1.64 ± 0.08	1.81	1.26 - 2.35	Pass
STAP-1100	07/01/06	Mn-54	1.76 ± 0.18	1.92	1.34 - 2.50	Pass
STAP-1100	07/01/06	Pu-238	0.09 ± 0.02	0.12	0.08 - 0.15	Pass
STAP-1100	07/01/06	Sr-90	0.66 ± 0.21	0.62	0.43 - 0.81	Pass
STAP-1100	07/01/06	U-233/4	0.15 ± 0.02	0.13	0.09 - 0.17	Pass
STAP-1100	07/01/06	U-238	0.13 ± 0.02	0.14	0.10 - 0.18	Pass
STAP-1100 [e]	07/01/06	Zn-65	< 0.07	0.00		Pass
STAP-1101	07/01/06	Gr. Alpha	0.08 ± 0.03	0.29	0.00 - 0.58	Pass
STAP-1101	07/01/06	Gr. Beta	0.41 ± 0.05	0.36	0.18 - 0.54	Pass
STW-1102	07/01/06	Gr. Alpha	0.76 ± 0.07	1.03	0.00 - 2.07	Pass
STW-1102	07/01/06	Gr. Beta	1.23 ± 0.06	1.03	0.52 - 1.54	Pass
STW-1103	07/01/06	Am-241	1.86 ± 0.09	2.31	1.62 - 3.00	Pass
STW-1103	07/01/06	Co-57	224.10 ± 1.20	213.08	149.16 - 277.00	Pass
STW-1103	07/01/06	Co-60	49.40 ± 0.50	47.50	33.20 - 61.80	Pass
STW-1103	07/01/06	Cs-134	112.70 ± 0.90	112.82	78.97 - 146.66	Pass
STW-1103	07/01/06	Cs-137	206.60 ± 1.40	196.14	137.30 - 254.98	Pass
STW-1103	07/01/06	Fe-55	138.40 ± 5.40	165.40	115.80 - 215.00	Pass
STW-1103	07/01/06	H-3	446.50 ± 11.80	428.85	300.20 - 557.50	Pass
STW-1103 [e]	07/01/06	Mn-54	< 0.30	0.00		Pass
STW-1103	07/01/06	Ni-63	116.70 ± 3.60	118.62	83.03 - 154.21	Pass
STW-1103	07/01/06	Pu-238	1.27 ± 0.07	1.39	0.97 - 1.81	Pass
STW-1103	07/01/06	Pu-239/40	1.67 ± 0.08	1.94	1.36 - 2.52	Pass
STW-1103	07/01/06	Sr-90	16.40 ± 1.90	15.69	10.98 - 20.40	Pass
STW-1103	07/01/06	Tc-99	29.40 ± 1.10	27.15	19.00 - 35.29	Pass
STW-1103	07/01/06	U-233/4	1.97 ± 0.08	2.15	1.50 - 2.80	Pass
STW-1103	07/01/06	U-238	1.97 ± 0.08	2.22	1.55 - 2.89	Pass
STW-1103	07/01/06	Zn-65	192.50 ± 2.40	176.37	123.46 - 229.28	Pass

[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] Results are reported in units of Bq/kg (soil), Bq/L (water) or Bq/total sample (filters, vegetation).

[c] Laboratory codes as follows: STW (water), STAP (air filter), STSO (soil), STVE (vegetation).

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

[e] Included in the MAPEP as a false positive.

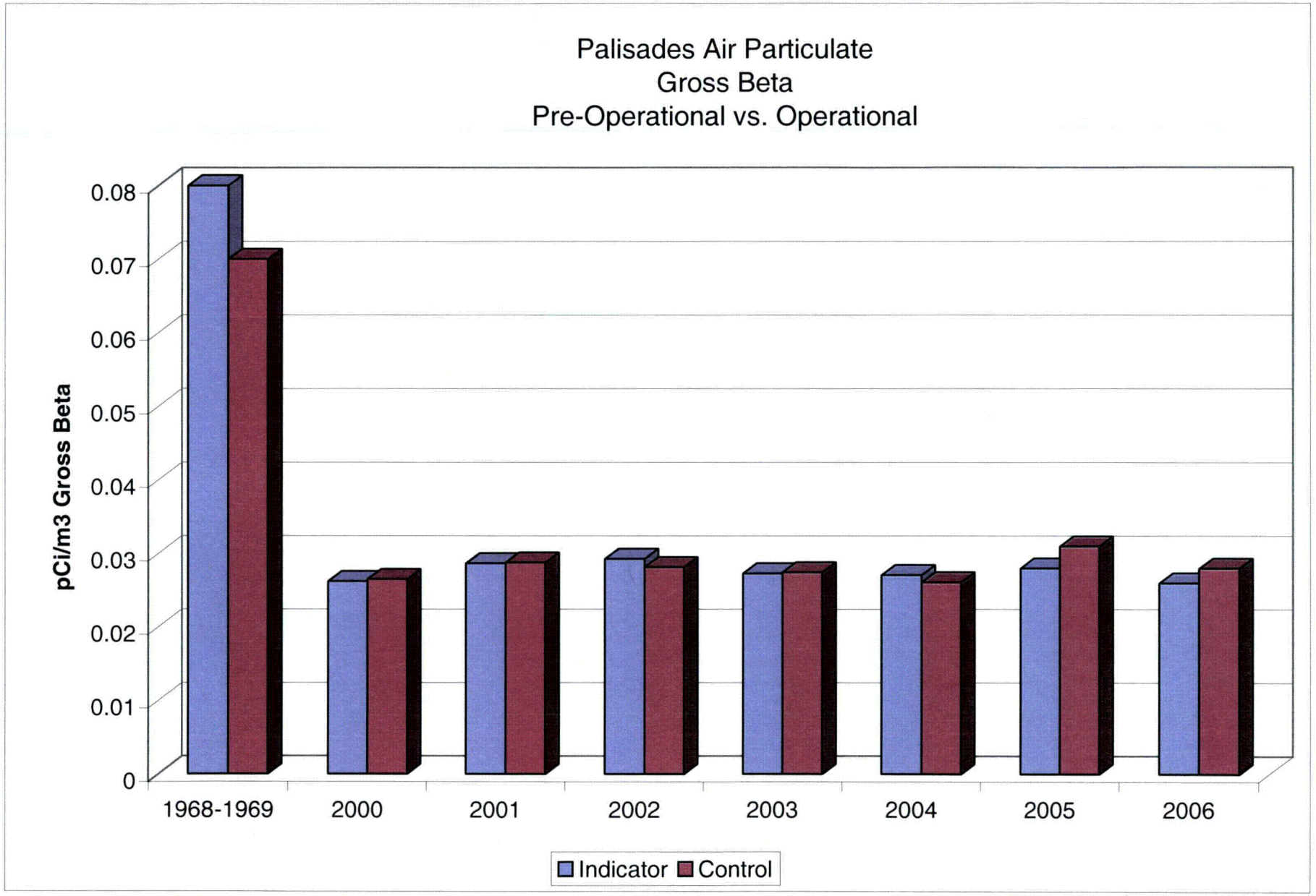
[f] Difficulties with the analyses for transuranics isotopes in solid samples (Filters, Soil and vegetation), were attributed to incomplete dissolution of the samples. Soil samples were repeated, results of reanalyses: Pu-238, 53.1 ± 5.3 bq/kg. Pu-239/240, 42.4 ± 4.7 bq/kg. U-233/4, 33.3 ± 3.5 bq/kg. U-238, 35.5 ± 3.6 bq/kg.

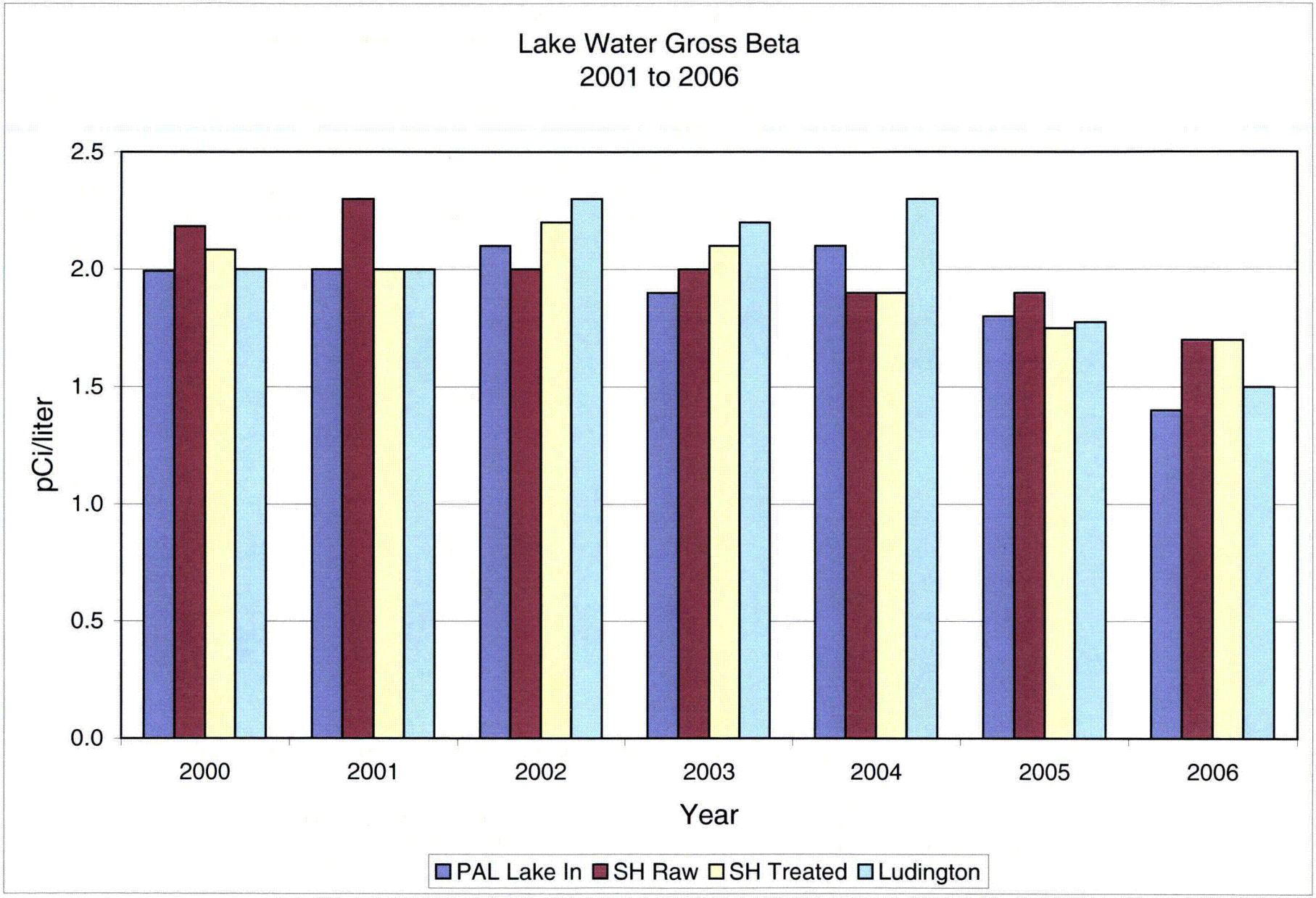
[g] The July vegetation sample was provided in two separate geometries, (100 ml. and 500 ml.). Results reported here used the 500 ml. standard size geometry. Results for the 100 ml. geometry showed approximately a 15% higher bias.

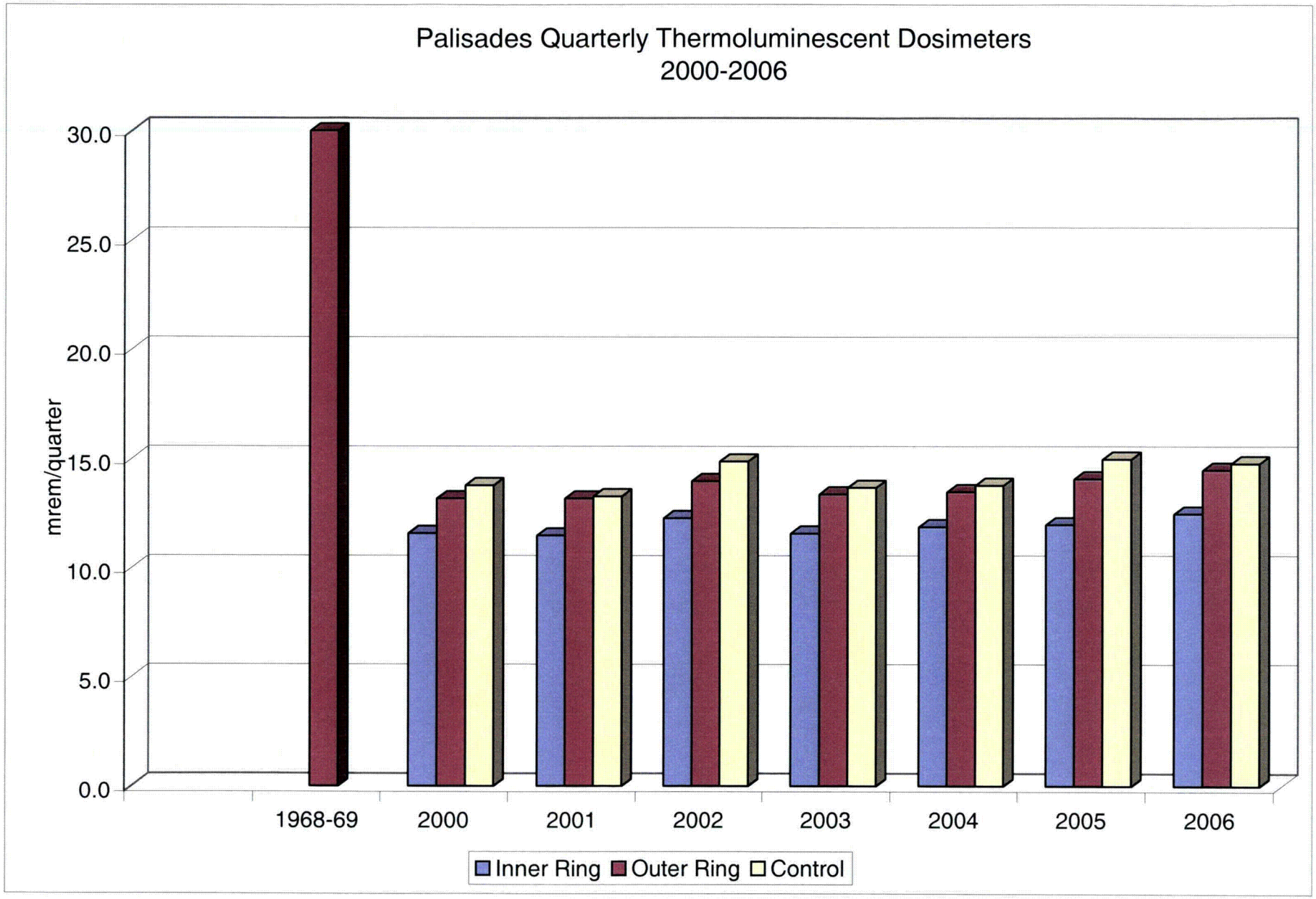
ATTACHMENT F

DATA GRAPHS

3 Pages Follow


Palisades Air Particulate
Gross Beta
Pre-Operational vs. Operational
pCi/m3 Gross Beta
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
1968-1969
2000
2001
2002
2003
2004
2005
2006
Indicator
Control


Lake Water Gross Beta
2001 to 2006
pCi/liter
2.5
2.0
1.5
1.0
0.5
0.0
2000
2001
2002
2003
2004
2005
2006
Year
PAL Lake In
SH Raw
SH Treated
Ludington


Palisades Quarterly Thermoluminescent Dosimeters
2000-2006
mrem/quarter
30.0
25.0
20.0
15.0
10.0
5.0
0.0
1968-69
2000
2001
2002
2003
2004
2005
2006
Inner Ring
Outer Ring
Control