

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



APR 30 2001

Docket Nos. 50-245  
50-336  
50-423  
B18395

U.S. Nuclear Regulatory Commission  
Attention: Document Control Desk  
Washington, DC 20555

**Millstone Nuclear Power Station, Unit Nos. 1, 2, and 3**  
**2000 Annual Radiological Environmental Operating Report**

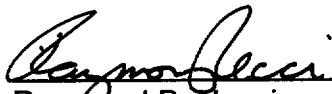
The purpose of this correspondence is to submit the Millstone Nuclear Power Station Annual Radiological Environmental Operating Report in accordance with the requirements of Section 5.7.2 of the Millstone Unit No. 1 Defueled Technical Specifications and of Sections 6.9.1.6a and 6.9.1.3 of the Unit No. 2 and Unit No. 3 Technical Specifications, respectively.

There are no regulatory commitments contained within this letter.

If you have any questions concerning this submittal, please contact Mr. David A. Smith at (860) 437-5840.

Very truly yours,

DOMINION NUCLEAR CONNECTICUT, INC.

  
\_\_\_\_\_  
Raymond P. Necci  
Vice President - Nuclear Technical Services

Enclosure (1)

cc: H. J. Miller, Region I Administrator  
J. B. Hickman, NRC Project Manager, Millstone Unit No. 1  
P. C. Cataldo, Resident Inspector, Millstone Unit No. 2  
D. S. Collins, NRC Project Manager, Millstone Unit No. 2  
S. R. Jones, Senior Resident Inspector, Millstone Unit No. 2  
V. Nerses, NRC Senior Project Manager, Millstone Unit No. 3  
A. C. Cerne, Senior Resident Inspector, Millstone Unit No. 3

IE25  
11

Docket Nos. 50-245  
50-336  
50-423  
B18395

Enclosure 1

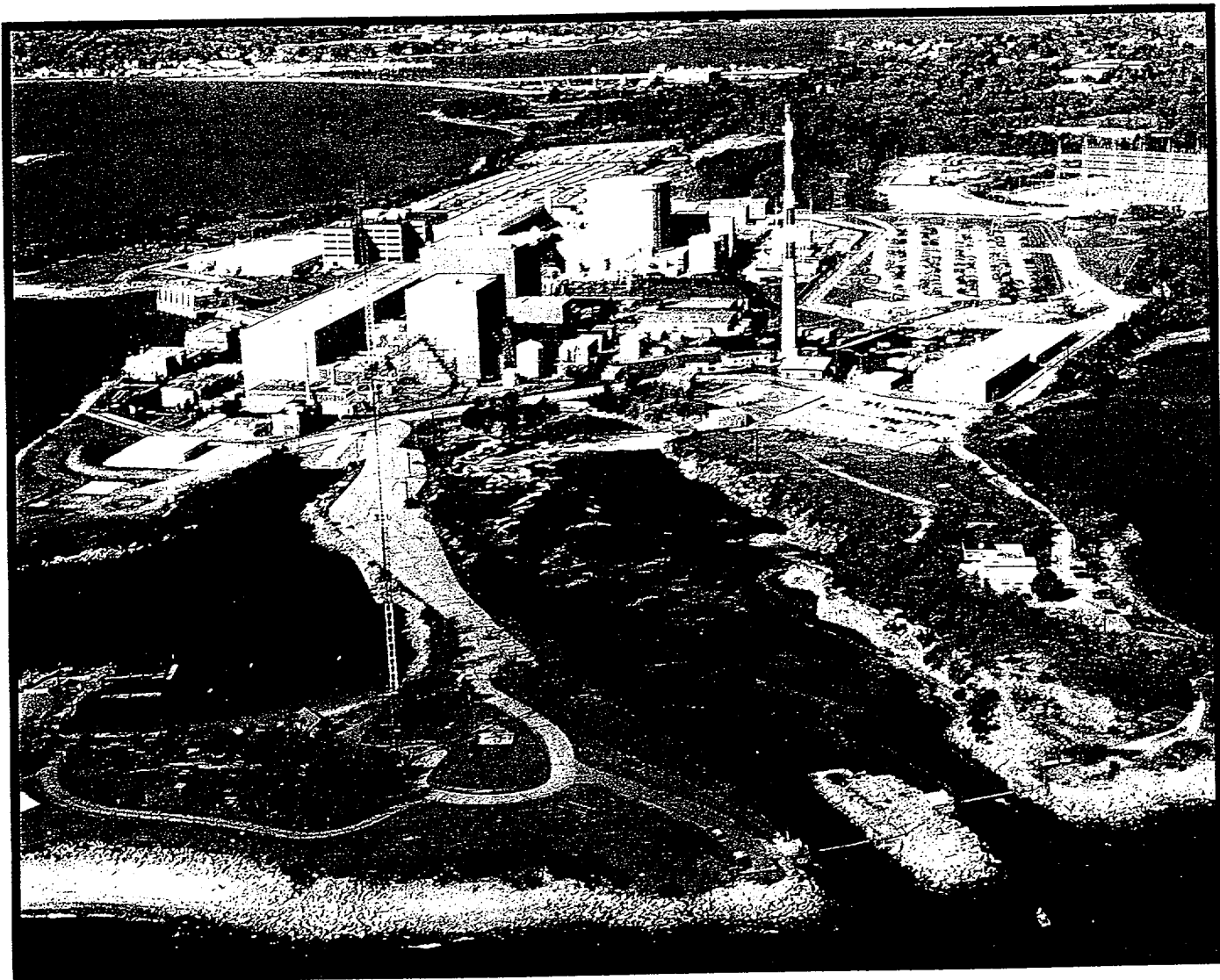
Millstone Nuclear Power Station, Unit Nos. 1, 2, and 3

Annual Radiological Environmental Operating Report  
Radiological Environmental Monitoring Program  
January 1, 2000 - December 31, 2000

# Millstone Power Station

## *Annual Radiological Environmental Operating Report*

JANUARY 1, 2000 - DECEMBER 31, 2000



By  
Dominion Nuclear Connecticut, Inc.  
Waterford, Connecticut



**Dominion**

**ANNUAL  
RADIOLOGICAL ENVIRONMENTAL  
OPERATING REPORT**

**MILLSTONE POWER STATION**

**RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM**

**2000**

**MILLSTONE UNIT 1, DOCKET NO. 50-245  
MILLSTONE UNIT 2, DOCKET NO. 50-336  
MILLSTONE UNIT 3, DOCKET NO. 50-423**

**By the**

**Dominion Nuclear Connecticut, Inc.  
Waterford, Connecticut**

~ *TABLE OF CONTENTS* ~

<b>1. EXECUTIVE SUMMARY</b>	<b>1-1</b>
<b>2. PROGRAM DESCRIPTION</b>	<b>2-1</b>
2.1. Sampling Schedule and Locations	2-1
2.2. Samples Collected During Report Period	2-7
<b>3. RADIOCHEMICAL RESULTS</b>	<b>3-1</b>
3.1. Summary Table	3-1
3.2. Data Tables	3-20
<b>4. DISCUSSION OF RESULTS</b>	<b>4-1</b>
4.1. Gamma Exposure Rate (Table 1)	4-1
4.2. Air Particulate Gross Beta Radioactivity (Table 2)	4-3
4.3. Airborne Iodine (Table 3)	4-3
4.4. Air Particulate Gamma (Table 4A-D)	4-5
4.5. Air Particulate Strontium	4-5
4.6. Soil	4-5
4.7. Cow Milk (Table 7)	4-5
4.8. Goat Milk (Table 8)	4-6
4.9. Pasture Grass and Feed (Table 9)	4-7
4.10. Well Water	4-7
4.11. Reservoir Water	4-7
4.12. Fruits and Vegetables (Table 12)	4-7
4.13. Broad Leaf Vegetation (Table 13)	4-8
4.14. Seawater (Table 14)	4-8
4.15. Bottom Sediment (Table 15)	4-9
4.16. Aquatic Flora (Table 16)	4-10
4.17. Fish (Tables 17A and 17B)	4-10
4.18. Mussels (Table 18)	4-10
4.19. Oysters (Table 19)	4-10
4.20. Clams (Table 20)	4-12
4.21. Scallops	4-12
4.22. Lobsters (Table 22)	4-12
<b>5. OFFSITE DOSE EQUIVALENT COMMITMENTS</b>	<b>5-1</b>
<b>6. DISCUSSION</b>	<b>6-1</b>
<b>APPENDIX A LAND USE CENSUS FOR 2000</b>	<b>A-1</b>
<b>APPENDIX B NNECO QA PROGRAM</b>	<b>B-1</b>
<b>APPENDIX C SUMMARY OF INTERLABORATORY COMPARISONS</b>	<b>C-1</b>

## *Executive Summary*



## **1. EXECUTIVE SUMMARY**

The radiological environmental monitoring program for the Millstone Power Station was continued for the period January through December 2000, in compliance with the Technical Specifications and the Radiological Effluent Monitoring and Offsite Dose Calculation Manual. This annual report was prepared by the Nuclear Fuel Safety Analysis group of Dominion Nuclear Connecticut, Inc. (DNC). Sample collection and preparation were performed by Select Energy Environmental Services. Gamma exposure rate measurements and laboratory analyses were performed by Duke Engineering and Services Environmental Laboratory (DESEL).

Thermoluminescent dosimeters (TLDs) were used to measure direct gamma exposure in the vicinity of the station and as far away as 14 miles. Radiochemical and radiological counting analyses of samples were performed to detect the presence of any station related radioactivity. Samples included air particulate and iodine filters, goat milk, pasture grass, broad leaf vegetation, fruits, vegetables, sea water, bottom sediment, aquatic flora, fish, mussels, oysters, clams, and lobsters. In evaluating the results of these analyses it is necessary to consider the variability of natural and man-made sources of radioactivity, distribution in the environment and uptake in environmental media. This variability is dependent on many factors including station release rates, past spatial variability of radioactive fallout from nuclear weapons tests and on-going redistribution of the fallout, contribution from cosmically produced radioactivity, soil characteristics, farming practices, and feed type. Significant variations in measured levels of radioactivity could be caused by any one of these factors. Therefore, these factors need to be considered in order to properly explain any variations in radiation detected and to distinguish between natural and nuclear station related radioactivity.

Millstone Unit 1 is permanently shutdown. Unit 2 had a scheduled refueling outage from April 21 through June 1 and operated in 2000 with a capacity factor of 81.9%. Millstone Unit 3 operated in 2000 with a capacity factor of 99.9%. The radioactive releases of gaseous effluents in 2000 were comparable to years when one or more units operated for the majority of the year. Radioactive releases in liquid effluents have shown a decreasing trend since 1989, partly due to enhanced processing of liquid radioactive waste and goals to minimize effluent radioactive releases.

No station effects were detected in terrestrial media. The predominant radioactivity, except for a few aquatic sample results, was that from outside sources, such as fallout from nuclear weapons tests and naturally occurring radionuclides. Monitoring of the aquatic environment in the area of the discharge indicated the presence of the following station related radionuclides: Cobalt-58, Silver-110m and Cesium-137. Of particular

note is the absence of detectable Zn-65 in aquatic media. Zn-65 has been one of the predominant plant related radionuclides detected, especially in oysters, since the late 1980's. With the decommissioning of Millstone Unit 1, the source of Zn-65 has significantly diminished. Due to the decreasing trend in liquid effluent releases, a corresponding decreasing trend is observed in measured levels of radionuclides in the environment. Doses from the 2000 measured levels are well below those required by each Unit's Safety Technical Specifications (10CFR50 Appendix I, Design Guidelines).

As usual, Cesium-137 and Strontium-90 were measured in goat milk. These levels are a result of nuclear weapons testing in the 1960's and not the result of station operation. This can be concluded because insufficient quantities of these isotopes have been released by the station to account for the measured concentrations and the presence of these isotopes have been consistently declining since the early 1960's after signing of the Nuclear Test Ban Treaty.

The radiation dose (dose equivalent commitment) to the general public from the station's discharges has been evaluated by two methods. One method utilizes the measured station's discharges and conservative transport models and the other utilizes the measured concentrations of radioactivity in the environmental media. The maximum whole body dose (station boundary) that could occur to a member of the general public as a result of station operation was 1.032 millirem. This includes a conservative contribution of 1 millirem from direct exposure due to the temporary storage or processing of radioactive waste onsite and 0.032 millirem from station effluents. This dose (1.032 millirem) is 4.1 percent of the standard (i.e., 25 millirem to the whole body at the station site boundary) as set by the Environmental Protection Agency on the maximum allowable dose to an individual of the general public. The average whole body dose calculated for a member of the public residing within 50 miles of the station is 0.000026 millirem, or 0.00010 percent of the same standard. The standards of the Environmental Protection Agency are a small fraction (less than 10 percent) of the 284 mrem per year normal Connecticut resident background radiation (NCRP94) and are designed to be inconsequential in regard to public health and safety. Station related doses are even a smaller fraction of the natural background. Therefore, the station related doses have insignificant public health consequences.



## **2. PROGRAM DESCRIPTION**

### **2.1. *Sampling Schedule and Locations***

The sample locations and the sample types and frequency of analysis are given in Tables 2-1 and 2-2 and Figures 2.1-1 and 2.1-2. The program as described here includes both required samples as specified in the Radiological Effluent Monitoring and Offsite Dose Calculation Manual and any extra samples.

**Table 2-1 Environmental Monitoring Program Sampling Types and Locations**

Location Number*	Location Name	Direction & Distance From Release Point**	Sample Types
1-I	On-site - Old Millstone Rd.	0.6 Mi, NNW	TLD, Air Particulate, Iodine, Vegetation
2-I	On-site - Weather Shack	0.3 Mi, S	TLD, Air Particulate, Iodine
3-I	On-site - Bird Sanctuary	0.3 Mi, NE	TLD, Air Particulate, Iodine
4-I	On-site - Albacore Drive	1.0 Mi, N	TLD, Air Particulate, Iodine
5-I	MP3 Discharge	0.1 Mi, SSE	TLD
6-I	Quarry Discharge	0.3 Mi, SSE	TLD
7-I	Environmental Lab Dock	0.3 Mi, SE	TLD
8-I	Environmental Lab	0.3 Mi, SE	TLD
9-I	Bay Point Beach	0.4 Mi, W	TLD
10-I	Pleasure Beach	1.2 Mi, E	TLD, Air Particulate, Iodine
11-I	New London Country Club	1.6 Mi, ENE	TLD, Air Particulate, Iodine
12-C	Fisher's Island, NY	8.7 Mi, ESE	TLD
12-X	Fisher's Island, NY	8.7 Mi, ESE	Air Particulate
13-C	Mystic, CT	11.5 Mi, ENE	TLD
14-C	Ledyard, CT	12.0 Mi, NE	TLD
15-C	Norwich, CT	14.0 Mi, N	TLD, Air Particulate, Iodine
16-C	Old Lyme, CT	8.8 Mi, W	TLD
17-I	Site Boundary	0.5 Mi, NE	Vegetation
18-I	Pleasure Beach	1.2 Mi, E	Vegetation
21-I	Goat Location #1	2.0 Mi, N	Milk
22-I	Goat Location #2	5.2 Mi, NNE	Milk
23-X	Goat Location #3 (1/99-9/99)	2.0 Mi, ENE	Milk
24-C	Goat Location #4	29.0 Mi, NNW	Milk
25-I	Within 10 Miles	Within 10 Miles	Fruits & Vegetables
26-C	Beyond 10 Miles	Beyond 10 Miles	Fruits & Vegetables
27-I	Niantic	1.7 Mi, WNW	TLD, Air Particulate, Iodine
28-I	Two Tree Island	0.8 Mi, SSE	Mussels
29-I	West Jordan Cove	0.4 Mi, NNE	Clams
30-X	Golden Spur	4.7 Mi, NNW	Bottom Sediment
31-I	Niantic Shoals	1.8 Mi, NW	Bottom Sediment, Oysters
		1.5 Mi, NNW	Mussels
31-X	Niantic Shoals	1.8 Mi, NW	Scallops
32-I	Vicinity of Discharge	-----	Bottom Sediment, Oysters, Lobster, Fish, Seawater
32-X	Vicinity of Discharge	-----	Fucus
33-I	Seaside Point	1.8 Mi, ESE	Bottom Sediment
33-X	Seaside Point	1.8 Mi, ESE	Fucus
34-I	Thames River Yacht Club	4.0 Mi, ENE	Bottom Sediment
34-X	Thames River Yacht club	4.0 Mi, ENE	Oysters

\*Key: I - Indicator C - Control X - Extra - sample not required

\*\*The release points are the MP1 stack for terrestrial locations and the quarry cut for aquatic locations.

Location Number*	Location Name	Direction & Distance From Release Point**	Sample Types
35-I	Niantic Bay	0.3 Mi, WNW	Lobster, Fish
35-X	Niantic Bay	0.3 Mi, WNW	Bottom Sediment, Seawater, Clams
36-I	Black Point	3.0 Mi, WSW	Oysters
36-X	Black Point	3.0 Mi, WSW	Bottom Sediment, Fucus
37-C	Giant's Neck	3.5 Mi, WSW	Bottom Sediment, Oysters, Seawater
37-X	Giant's Neck	3.5 Mi, WSW	Lobster
38-I	Waterford Shellfish Bed #1	1.0 Mi, NW	Clams
39-X	Jordon Cove Bar	0.8 Mi, NE	Clams
40-X	Quarry	-----	Fish, Oysters
50-X	Myrock Avenue	3.2 Mi, ENE	TLD
54-X	Billow Road	2.4 Mi, WSW	TLD
55-X	Black Point	2.6 Mi, SW	TLD
98-X	Ion Chamber Shack	0.5 Mi, NE	TLD
99-X	Schoolhouse	0.1 Mi, NNE	TLD

\*Key: I - Indicator C - Control X - Extra - sample not required

\*\*The release points are the MP1 stack for terrestrial locations and the quarry cut for aquatic locations.

**Table 2-2 Sampling Frequency & Type of Analysis**

	Exposure Pathway and/or Sample	No. of Locations	Sampling & Collection Frequency	Type of Analysis
1.	Gamma Dose - Environmental TLD	17	Monthly	Gamma Dose - Monthly
2.	Airborne Particulate	8	Continuous sampler - weekly filter change	Gross Beta - Weekly Gamma Spectrum - Quarterly on composite (by location), and on individual sample if gross beta is greater than 10 times the mean of the weekly control station's gross beta results
3.	Airborne Iodine	8	Continuous sampler - weekly canister change	I-131 - Weekly
4.	Vegetation	5	One sample near middle and one near end of growing season	Gamma Isotopic on each sample
5.	Milk	3	Monthly	Gamma Isotopic and I-131 on each sample; Sr-89 and Sr-90 on quarterly composites
5a.	Pasture Grass	4	Sample as necessary to substitute for unavailable milk	Gamma Isotopic and I-131 on each sample
6.	Sea Water	2	Continuous sampler with a quarterly collection at indicator location.  Quarterly at control location - Composite of 6 weekly grab samples.	Gamma Isotopic and Tritium on each sample.
7.	Bottom Sediment	5	Semiannual	Gamma Isotopic on each sample
8.	Fin Fish-Flounder and one other type of edible fin fish	2	Quarterly	Gamma Isotopic on each sample
9.	Mussels (edible portion)	2	Quarterly	Gamma Isotopic on each sample
10.	Oysters (edible portion)	4	Quarterly	Gamma Isotopic on each sample
11.	Clams (edible portion)	2	Quarterly	Gamma Isotopic on each sample
12.	Lobster (edible portion)	2	Quarterly	Gamma Isotopic on each sample

**Figure 2.1-1 Millstone Sampling Locations**



**Figure 2.1-2 Millstone Sampling Locations (Within 2 miles)**



## 2.2. Samples Collected During Report Period

The following table summarizes the number of samples of each type collected and analyzed during 2000:

<u>Sample Type</u>	<u>Number of Technical Specification Required Samples</u>	<u>Number of Technical Specification Required Samples Analyzed</u>	<u>Number of Extra Samples Analyzed</u>
Gamma Exposure (Environmental TLD)	204	203 <sup>1</sup>	56
Air Particulates	424	424	53
Air Iodine	424	424	0
Goat Milk	36	14 <sup>2,3</sup>	0
Pasture Grass	Variable <sup>2</sup>	22	12
Fruit and Vegetables	8	8	1
Broad Leaf Vegetation	6	6	16
Sea Water	8	8	12
Bottom Sediment	10	10	14
Aquatic Flora	0	0	17
Fish	16	13 <sup>4</sup>	4
Mussels	8	8	0
Oysters	16	16	7
Clams	8	8	8
Scallops	0	0	0
Lobster	8	8	4
<b>Total All Types</b>	<b>1,176</b>	<b>1,172</b>	<b>204</b>

<sup>1</sup>Fishers Island TLD was collected in January, however readout was permanently lost.

<sup>2</sup>Pasture grass sampled as necessary to substitute for unavailable milk.

<sup>3</sup>Due to sample unavailability, less than required milk samples were collected

<sup>4</sup>First quarter sample of Flounder and Other fish were unavailable from the vicinity of discharge location (32). Second quarter sample of Flounder from location (35) was unavailable. Multiple attempts were made to collect these samples.

### **3. RADIOCHEMICAL RESULTS**

#### **3.1. *Summary Table***

In accordance with the Radiological Effluent Monitoring Manual (REMM), Section I.F.1, a summary table of the radiochemical results has been prepared and is presented in Table 3-1.

In the determination of the mean, the data was handled as recommended by the Health and Safety Laboratory, Idaho and NUREG/CR-4007 (Sept. 1984): all valid data, including negative values and zeros were used in the determination of the mean (see Part 3.2).

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



TABLE 3-1  
ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY  
MILLSTONE NUCLEAR POWER STATION, UNITS 1, 2 AND 3  
DOCKETS 50-245, 50-336 AND 50-423  
JANUARY - DECEMBER 2000

PAGE 3-2

MEDIUM OR PATHWAY SAMPLED	ANALYSIS AND TOTAL NUMBER OF ANALYSES PERFORMED	LOWER LIMIT OF DETECTION (LLD) (A)	ALL INDICATOR	LOCATION WITH HIGHEST ANNUAL MEAN		CONTROL	# OF NRM (C)
			LOCATIONS MEAN (RANGE)(B)	LOCATION #, DISTANCE AND DIRECTION	MEAN (RANGE)(B)	LOCATIONS MEAN (RANGE)(B)	
GAMMA DOSE (UR/HR)	200, 59 (D)	1.5	8.1 ( 3.7 - 12.3)	LOC # 8 0.3 MILES SE	11.6 (10.3 - 12.3)	7.9 ( 4.1 - 10.3)	0
AIR PARTICULATE AND IODINE (PCI/M3)	<u>371,106</u> BETA	0.01 (E)	0.019 (0.003 - 0.056)	LOC # 12 8.7 MILES ESE	0.020 (0.005 - 0.051)	0.020 (0.005 - 0.051)	0
	<u>GAMMA 371,53</u> I-131	0.07	0.001 (-0.033 - 0.044)	LOC # 11 1.6 MILES ENE	0.003 (-0.018 - 0.019)	-0.000 (-0.025 - 0.022)	0
	<u>GAMMA 28, 8</u> BE-7	--	0.077 ( 0.039 - 0.110)	LOC # 10 1.2 MILES E	0.088 ( 0.055 - 0.103)	0.077 ( 0.044 - 0.117)	0
	CO-60	--	0.000 (-0.001 - 0.001)	LOC # 3 0.3 MILES NE	0.001 ( 0.000 - 0.001)	0.000 ( 0.000 - 0.000)	0
	ZR-95	--	-0.000 (-0.003 - 0.002)	LOC # 3 0.3 MILES NE	0.001 ( 0.000 - 0.002)	-0.000 (-0.006 - 0.003)	0
	NB-95	--	-0.001 (-0.008 - 0.007)	LOC # 1 0.6 MILES NNW	0.001 ( 0.000 - 0.001)	-0.002 (-0.008 - 0.003)	0
	RU-103	--	0.000 (-0.003 - 0.003)	LOC # 1 0.6 MILES NNW	0.001 (-0.001 - 0.003)	-0.000 (-0.003 - 0.001)	0
	CS-134	0.05 (F)	0.000 (-0.001 - 0.001)	LOC # 3 0.3 MILES NE	0.001 ( 0.000 - 0.001)	0.000 ( 0.000 - 0.000)	0
	CS-137	0.06	0.000 ( 0.000 - 0.001)	LOC # 1 0.6 MILES NNW	0.000 ( 0.000 - 0.001)	0.000 ( 0.000 - 0.001)	0
	<u>SR 4, 2</u> SR-89	--	-2.6 ( -12 - 2.2)	LOC # 22 5.2 MILES NNE	1.1 ( 0.0 - 2.2)	-6.7 ( -11 - -2.4)	0
GOAT MILK (PCI/L)	SR-90	--	15.3 ( 2.2 - 44.4)	LOC # 22 5.2 MILES NNE	27.7 (11.0 - 44.4)	1.1 ( 1.1 - 1.2)	0

TABLE 3-1  
ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY  
MILLSTONE NUCLEAR POWER STATION, UNITS 1, 2 AND 3  
DOCKETS 50-245, 50-336 AND 50-423  
JANUARY - DECEMBER 2000

PAGE 3-3

MEDIUM OR PATHWAY SAMPLED	ANALYSIS AND TOTAL NUMBER OF ANALYSES PERFORMED	LOWER LIMIT OF DETECTION (LLD) (A)	ALL INDICATOR LOCATIONS MEAN (RANGE)(B)	LOCATION WITH HIGHEST ANNUAL MEAN		CONTROL LOCATIONS MEAN (RANGE)(B)	# OF NRM (C)
				LOCATION #, DISTANCE AND DIRECTION	MEAN (RANGE)(B)		
	IODINE 10, 4 I-131	1	0.08 ( -0.00 - 0.17)	LOC # 21 2 MILES N	0.08 ( -0.00 - 0.17)	0.08 ( 0.02 - 0.12)	0
	GAMMA 10, 4 CS-134	15	-0.5 ( -4.2 - 1.3)	LOC # 24C 29 MILES NNW	0.9 ( -0.3 - 2.5)	0.9 ( -0.3 - 2.5)	0
	CS-137	18	12.1 ( 1.3 - 36.2)	LOC # 22 5.2 MILES NNE	13.7 ( 1.3 - 36.2)	3.8 ( 2.3 - 6.8)	0
	BA-140	70	-1 ( -4 - 2)	LOC # 24C 29 MILES NNW	0 ( -1 - 2)	0 ( -1 - 2)	0
	LA-140	25	-1.1 ( -4.3 - 2.6)	LOC # 24C 29 MILES NNW	0.3 ( -1.7 - 2.0)	0.3 ( -1.7 - 2.0)	0
PASTURE GRASS (PCI/G)	GAMMA 26, 8 I-131	0.06	0.007 (-0.006 - 0.027)	LOC # 22 5.2 MILES NNE	0.010 (-0.006 - 0.027)	0.004 (-0.007 - 0.015)	0
	CS-134	0.06	0.010 (-0.033 - 0.036)	LOC # 22 5.2 MILES NNE	0.014 ( 0.001 - 0.027)	0.007 (-0.025 - 0.033)	0
	CS-137	0.08	0.012 (-0.029 - 0.068)	LOC # 22 5.2 MILES NNE	0.017 (-0.019 - 0.068)	0.012 (-0.001 - 0.048)	0
	BA-140	--	-0.006 (-0.072 - 0.051)	LOC # 23 2 MILES ENE	-0.000 (-0.060 - 0.051)	-0.021 (-0.090 - 0.059)	0
	LA-140	--	-0.007 (-0.083 - 0.059)	LOC # 23 2 MILES ENE	-0.002 (-0.069 - 0.059)	-0.024 (-0.103 - 0.067)	0
FRUITS AND VEGETABLES (PCI/G)	GAMMA 5, 4 BE-7	--	0.05 (-0.00 - 0.10)	LOC # 25 <10 MILES	0.05 (-0.00 - 0.10)	0.02 (-0.04 - 0.05)	0
	K-40	--	1.95 ( 0.76 - 3.81)	LOC # 25 <10 MILES	1.95 ( 0.76 - 3.81)	1.93 ( 1.20 - 3.22)	0

TABLE 3-1  
ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY  
MILLSTONE NUCLEAR POWER STATION, UNITS 1, 2 AND 3  
DOCKETS 50-245, 50-336 AND 50-423  
JANUARY - DECEMBER 2000

PAGE 3-4

MEDIUM OR PATHWAY SAMPLED	ANALYSIS AND TOTAL NUMBER OF ANALYSES PERFORMED	LOWER LIMIT OF DETECTION (LLD) (A)	ALL INDICATOR LOCATIONS	LOCATION WITH HIGHEST ANNUAL MEAN		CONTROL LOCATIONS	# OF NRM (C)
			MEAN (RANGE)(B)	LOCATION #, DISTANCE AND DIRECTION	MEAN (RANGE)(B)	MEAN (RANGE)(B)	
MN-54	--	--	0.001 (-0.001 - 0.004)	LOC # 25 <10 MILES	0.001 (-0.001 - 0.004)	0.001 ( 0.000 - 0.001)	0
CO-58	--	--	0.001 (-0.005 - 0.012)	LOC # 25 <10 MILES	0.001 (-0.005 - 0.012)	-0.001 (-0.004 - 0.004)	0
CO-60	--	--	0.006 ( 0.001 - 0.009)	LOC # 25 <10 MILES	0.006 ( 0.001 - 0.009)	0.005 ( 0.001 - 0.012)	0
ZR-95	--	--	-0.000 (-0.009 - 0.006)	LOC # 26C >10 MILES	0.001 (-0.003 - 0.005)	0.001 (-0.003 - 0.005)	0
NB-95	--	--	0.004 ( 0.002 - 0.008)	LOC # 25 <10 MILES	0.004 ( 0.002 - 0.008)	0.003 ( 0.000 - 0.008)	0
RU-103	--	--	-0.001 (-0.004 - 0.003)	LOC # 26C >10 MILES	-0.001 (-0.001 - 0.000)	-0.001 (-0.001 - 0.000)	0
I-131	0.06 (G)	0.06 (G)	0.001 (-0.002 - 0.004)	LOC # 26C >10 MILES	0.002 (-0.004 - 0.011)	0.002 (-0.004 - 0.011)	0
CS-134	0.06	0.06	0.001 (-0.003 - 0.004)	LOC # 25 <10 MILES	0.001 (-0.003 - 0.004)	-0.000 (-0.006 - 0.004)	0
CS-137	0.08	0.08	0.000 (-0.007 - 0.006)	LOC # 25 <10 MILES	0.000 (-0.007 - 0.006)	-0.001 (-0.006 - 0.000)	0
RA-226	--	--	0.042 (-0.201 - 0.169)	LOC # 25 <10 MILES	0.042 (-0.201 - 0.169)	-0.020 (-0.101 - 0.098)	0
TH-228	--	--	0.018 ( 0.011 - 0.029)	LOC # 25 <10 MILES	0.018 ( 0.011 - 0.029)	0.017 ( 0.003 - 0.031)	0
BROADLEAF VEGETATION (PCI/G)	GAMMA 22, BE-7	--	0.53 ( 0.09 - 1.26)	LOC # 1 0.6 MILES NNW	0.81 ( 0.35 - 1.26)	. ( . - . )	0

TABLE 3-1  
ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY  
MILLSTONE NUCLEAR POWER STATION, UNITS 1, 2 AND 3  
DOCKETS 50-245, 50-336 AND 50-423  
JANUARY - DECEMBER 2000

PAGE 3-5

MEDIUM OR PATHWAY SAMPLED	ANALYSIS AND TOTAL NUMBER OF ANALYSES PERFORMED	LOWER LIMIT OF DETECTION (LLD) (A)	ALL INDICATOR LOCATIONS	LOCATION WITH HIGHEST ANNUAL MEAN		CONTROL LOCATIONS MEAN (RANGE)(B)	# OF NRM (C)
			MEAN (RANGE)(B)	LOCATION #, DISTANCE AND DIRECTION	MEAN (RANGE)(B)		
K-40		--	2.99 (1.52 - 5.44)	LOC # 18 1.2 MILES E	3.48 (1.85 - 5.44)	( . - . )	0
MN-54		--	-0.000 (-0.008 - 0.006)	LOC # 17 0.5 MILES NE	0.002 (-0.002 - 0.006)	( . - . )	0
CO-58		--	-0.001 (-0.006 - 0.006)	LOC # 18 1.2 MILES E	0.001 (-0.002 - 0.006)	( . - . )	0
CO-60		--	0.003 (-0.008 - 0.013)	LOC # 1 0.6 MILES NNW	0.004 (-0.008 - 0.013)	( . - . )	0
ZR-95		--	0.000 (-0.019 - 0.017)	LOC # 18 1.2 MILES E	0.006 (-0.001 - 0.017)	( . - . )	0
NB-95		--	0.003 (-0.006 - 0.018)	LOC # 1 0.6 MILES NNW	0.005 (-0.001 - 0.018)	( . - . )	0
RU-103		--	-0.000 (-0.013 - 0.007)	LOC # 1 0.6 MILES NNW	0.000 (-0.002 - 0.005)	( . - . )	0
I-131	0.06		0.002 (-0.011 - 0.015)	LOC # 18 1.2 MILES E	0.006 (0.000 - 0.015)	( . - . )	0
CS-134	0.06		0.002 (-0.005 - 0.010)	LOC # 1 0.6 MILES NNW	0.004 (-0.004 - 0.010)	( . - . )	0
CS-137	0.08		0.017 (-0.007 - 0.152)	LOC # 1 0.6 MILES NNW	0.041 (-0.002 - 0.152)	( . - . )	0
RA-226		--	0.247 (-0.420 - 1.920)	LOC # 17 0.5 MILES NE	0.519 (0.000 - 1.674)	( . - . )	0
TH-228		--	0.036 (-0.073 - 0.169)	LOC # 18 1.2 MILES E	0.046 (0.005 - 0.128)	( . - . )	0

TABLE 3-1  
ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY  
MILLSTONE NUCLEAR POWER STATION, UNITS 1, 2 AND 3  
DOCKETS 50-245, 50-336 AND 50-423  
JANUARY - DECEMBER 2000

PAGE 3-6

MEDIUM OR PATHWAY SAMPLED	ANALYSIS AND TOTAL NUMBER OF ANALYSES PERFORMED	LOWER LIMIT OF DETECTION (LLD) (A)	ALL INDICATOR LOCATIONS MEAN (RANGE)(B)	LOCATION WITH HIGHEST ANNUAL MEAN		CONTROL LOCATIONS MEAN (RANGE)(B)	# OF NRM (C)
				LOCATION #, DISTANCE AND DIRECTION	MEAN (RANGE)(B)		
SEAWATER (PCI/L)	GAMMA 20, 4 K-40	--	295 ( 218 - 354)	LOC # 39 0.8 MILES NE	301 ( 269 - 345)	277 ( 248 - 314)	0
	MN-54	15	-0.1 ( -2.3 - 1.4)	LOC # 32 0 MILES N/A	0.2 ( -0.9 - 1.4)	-0.8 ( -1.8 - 0.4)	0
	CO-58	15	-0.7 ( -3.1 - 1.6)	LOC # 37C 3.5 MILES WSW	0.0 ( -1.1 - 2.9)	0.0 ( -1.1 - 2.9)	0
	FE-59	30	-0.6 ( -8.7 - 3.9)	LOC # 32 0 MILES N/A	0.1 ( -4.0 - 3.9)	-0.3 ( -4.5 - 1.5)	0
	CO-60	15	0.3 ( -1.5 - 2.0)	LOC # 35 0.3 MILES WNW	0.6 ( 0.2 - 1.1)	-0.6 ( -1.9 - -0.0)	0
	ZN-65	30	-2.5 ( -25.2 - 7.3)	LOC # 39 0.8 MILES NE	-0.4 ( -3.2 - 1.9)	-3.4 ( -12.9 - 2.2)	0
	ZR-95	30	0.1 ( -4.2 - 1.8)	LOC # 32 0 MILES N/A	0.6 ( -0.8 - 1.8)	-0.9 ( -3.5 - 0.5)	0
	NB-95	15	0.0 ( -4.0 - 3.4)	LOC # 32 0 MILES N/A	0.5 ( -4.0 - 3.4)	-0.4 ( -0.9 - 0.2)	0
	I-131	--	-0 ( -4 - 3)	LOC # 32 0 MILES N/A	0 ( -2 - 3)	-1 ( -3 - 1)	0
	CS-134	15	-0.2 ( -2.0 - 3.0)	LOC # 37C 3.5 MILES WSW	0.4 ( -0.5 - 1.0)	0.4 ( -0.5 - 1.0)	0
	CS-137	18	-0.4 ( -2.1 - 1.9)	LOC # 35 0.3 MILES WNW	-0.3 ( -1.1 - 1.9)	-0.4 ( -0.9 - 0.1)	0
	BA-140	60 (H)	-1 ( -3 - 3)	LOC # 39 0.8 MILES NE	0 ( -2 - 3)	-1 ( -3 - 0)	0

TABLE 3-1  
ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY  
MILLSTONE NUCLEAR POWER STATION, UNITS 1, 2 AND 3  
DOCKETS 50-245, 50-336 AND 50-423  
JANUARY - DECEMBER 2000

PAGE 3-7

MEDIUM OR PATHWAY SAMPLED	ANALYSIS AND TOTAL NUMBER OF ANALYSES PERFORMED	LOWER LIMIT OF DETECTION (LLD) (A)	ALL INDICATOR LOCATIONS MEAN (RANGE)(B)	LOCATION WITH HIGHEST ANNUAL MEAN		CONTROL LOCATIONS MEAN (RANGE)(B)	# OF NRM (C)
				LOCATION #, DISTANCE AND DIRECTION	MEAN (RANGE)(B)		
	LA-140	15 (H)	-1 ( -4 - 3)	LOC # 39 0.8 MILES NE	0 ( -2 - 3)	-1 ( -4 - 0)	0
	TRITIUM 20, 4 H-3	2000	318 ( -654 - 1488)	LOC # 32 0 MILES N/A	646 ( -654 - 1488)	-92 ( -532 - 381)	0
BOTTOM SEDIMENT (PCI/G)	GAMMA 22, 2 K-40	--	13.2 ( 9.2 - 19.8)	LOC # 34 4 MILES ENE	15.3 (14.8 - 15.9)	14.6 (13.4 - 15.9)	0
	MN-54	--	0.01 (-0.07 - 0.07)	LOC # 31 1.8 MILES NW	0.05 ( 0.03 - 0.07)	0.01 (-0.00 - 0.02)	0
	CO-58	--	-0.01 (-0.05 - 0.02)	LOC # 37C 3.5 MILES WSW	0.02 ( 0.02 - 0.02)	0.02 ( 0.02 - 0.02)	0
	CO-60	--	0.01 (-0.10 - 0.06)	LOC # 32 0 MILES N/A	0.03 ( 0.01 - 0.05)	0.01 (-0.00 - 0.02)	0
	ZR-95	--	0.03 (-0.03 - 0.14)	LOC # 30 4.7 MILES NNW	0.08 ( 0.02 - 0.14)	0.04 ( 0.03 - 0.05)	0
	NB-95	--	-0.00 (-0.06 - 0.03)	LOC # 30 4.7 MILES NNW	0.01 ( 0.01 - 0.01)	0.01 (-0.01 - 0.02)	0
	I-131	--	0.01 (-0.10 - 0.22)	LOC # 32 0 MILES N/A	0.05 (-0.03 - 0.22)	0.03 (-0.02 - 0.07)	0
	CS-134	0.15	0.01 (-0.04 - 0.05)	LOC # 30 4.7 MILES NNW	0.03 ( 0.02 - 0.04)	-0.00 (-0.02 - 0.02)	0
	CS-137	0.18	0.02 (-0.08 - 0.37)	LOC # 30 4.7 MILES NNW	0.20 ( 0.04 - 0.37)	0.01 (-0.00 - 0.01)	0
	RA-226	--	0.96 (-0.78 - 3.84)	LOC # 30 4.7 MILES NNW	2.10 ( 1.07 - 3.13)	0.91 ( 0.64 - 1.18)	0

TABLE 3-1  
ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY  
MILLSTONE NUCLEAR POWER STATION, UNITS 1, 2 AND 3  
DOCKETS 50-245, 50-336 AND 50-423  
JANUARY - DECEMBER 2000

PAGE 3-8

MEDIUM OR PATHWAY SAMPLED	ANALYSIS AND TOTAL NUMBER OF ANALYSES PERFORMED	LOWER LIMIT OF DETECTION (LLD) (A)	ALL INDICATOR LOCATIONS	LOCATION WITH HIGHEST ANNUAL MEAN		CONTROL LOCATIONS	# OF NRM (C)
			MEAN (RANGE)(B)	LOCATION #, DISTANCE AND DIRECTION	MEAN (RANGE)(B)	MEAN (RANGE)(B)	
AQUATIC FLORA (FUCUS) (PCI/G)	TH-228	--	1.30 ( 0.04 - 5.30)	LOC # 31 1.8 MILES NW	3.49 ( 2.37 - 4.61)	0.95 ( 0.15 - 1.76)	0
	GAMMA 17, . BE-7	--	0.04 (-0.04 - 0.22)	LOC # 33 1.8 MILES ESE	0.13 ( 0.03 - 0.22)	. ( . - . )	0
	K-40	--	5.7 ( 4.7 - 7.7)	LOC # 32 0 MILES N/A	6.5 ( 5.5 - 7.7)	. ( . - . )	0
	CR-51	--	-0.00 (-0.09 - 0.13)	LOC # 33 1.8 MILES ESE	0.06 (-0.02 - 0.13)	. ( . - . )	0
	MN-54	--	0.00 (-0.01 - 0.02)	LOC # 36 3 MILES WSW	0.01 (-0.00 - 0.02)	. ( . - . )	0
	CO-58	--	0.00 (-0.01 - 0.02)	LOC # 32 0 MILES N/A	0.01 (-0.00 - 0.02)	. ( . - . )	0
	FE-59	--	-0.00 (-0.03 - 0.04)	LOC # 35 0.3 MILES WNW	0.00 (-0.02 - 0.04)	. ( . - . )	0
	CO-60	--	0.00 (-0.02 - 0.02)	LOC # 36 3 MILES WSW	0.01 ( 0.01 - 0.02)	. ( . - . )	0
	ZN-65	--	-0.01 (-0.05 - 0.03)	LOC # 36 3 MILES WSW	0.01 (-0.01 - 0.03)	. ( . - . )	0
	ZR-95	--	0.00 (-0.02 - 0.01)	LOC # 33 1.8 MILES ESE	0.01 ( 0.01 - 0.01)	. ( . - . )	0
	NB-95	--	0.00 (-0.01 - 0.01)	LOC # 33 1.8 MILES ESE	0.01 ( 0.00 - 0.01)	. ( . - . )	0
	RU-103	--	0.00 (-0.01 - 0.01)	LOC # 32 0 MILES N/A	0.00 (-0.00 - 0.01)	. ( . - . )	0

TABLE 3-1  
 ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY  
 MILLSTONE NUCLEAR POWER STATION, UNITS 1, 2 AND 3  
 DOCKETS 50-245, 50-336 AND 50-423  
 JANUARY - DECEMBER 2000

PAGE 3-9

MEDIUM OR PATHWAY SAMPLED	ANALYSIS AND TOTAL NUMBER OF ANALYSES PERFORMED	LOWER LIMIT OF DETECTION (LLD) (A)	ALL INDICATOR LOCATIONS	LOCATION WITH HIGHEST ANNUAL MEAN		CONTROL LOCATIONS	# OF NRM (C)
			MEAN (RANGE)(B)	LOCATION #, DISTANCE AND DIRECTION	MEAN (RANGE)(B)	MEAN (RANGE)(B)	
	RU-106	--	0.00 (-0.07 - 0.12)	LOC # 35 0.3 MILES WNW	0.05 ( 0.01 - 0.12)	( . - . )	0
	AG-110M	--	0.00 (-0.01 - 0.03)	LOC # 36 3 MILES WSW	0.01 ( 0.00 - 0.02)	( . - . )	0
	I-131	--	0.00 (-0.04 - 0.03)	LOC # 32 0 MILES N/A	0.02 ( 0.00 - 0.03)	( . - . )	0
	CS-134	--	0.00 (-0.01 - 0.02)	LOC # 33 1.8 MILES ESE	0.01 ( 0.00 - 0.02)	( . - . )	0
	CS-137	--	0.00 (-0.02 - 0.02)	LOC # 35 0.3 MILES WNW	0.01 ( 0.00 - 0.01)	( . - . )	0
	RA-226	--	0.08 (-0.17 - 0.33)	LOC # 35 0.3 MILES WNW	0.17 ( 0.06 - 0.33)	( . - . )	0
	TH-228	--	0.05 ( 0.02 - 0.08)	LOC # 36 3 MILES WSW	0.06 ( 0.05 - 0.07)	( . - . )	0
FISH (ALL TYPES) (PCI/G)	<u>GAMMA 17, .</u> BE-7	--	0.01 (-0.12 - 0.16)	LOC # 35 0.3 MILES WNW	0.03 (-0.11 - 0.16)	( . - . )	0
	K-40	--	3.2 ( 2.1 - 4.4)	LOC # 40 0 MILES N/A	4.0 ( 3.2 - 4.4)	( . - . )	0
	CR-51	--	0.01 (-0.23 - 0.18)	LOC # 40 0 MILES N/A	0.11 ( 0.03 - 0.18)	( . - . )	0
	MN-54	0.13	0.00 (-0.01 - 0.03)	LOC # 32 0 MILES N/A	0.00 (-0.00 - 0.03)	( . - . )	0
	CO-58	0.13	-0.00 (-0.03 - 0.02)	LOC # 32 0 MILES N/A	0.00 (-0.01 - 0.02)	( . - . )	0



TABLE 3-1  
 ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY  
 MILLSTONE NUCLEAR POWER STATION, UNITS 1, 2 AND 3  
 DOCKETS 50-245, 50-336 AND 50-423  
 JANUARY - DECEMBER 2000

PAGE 3-10

MEDIUM OR PATHWAY SAMPLED	ANALYSIS AND TOTAL NUMBER OF ANALYSES PERFORMED	LOWER LIMIT OF DETECTION (LLD) (A)	ALL INDICATOR LOCATIONS	LOCATION WITH HIGHEST ANNUAL MEAN		CONTROL LOCATIONS	# OF NRM (C)
			MEAN (RANGE)(B)	LOCATION #, DISTANCE AND DIRECTION	MEAN (RANGE)(B)	MEAN (RANGE)(B)	
FE-59		0.26	0.02 (-0.03 - 0.06)	LOC # 40 0 MILES N/A	0.03 (-0.00 - 0.06)	( . - . )	0
CO-60		0.13	0.00 (-0.01 - 0.02)	LOC # 40 0 MILES N/A	0.01 (-0.01 - 0.02)	( . - . )	0
ZN-65		0.26	-0.01 (-0.04 - 0.03)	LOC # 32 0 MILES N/A	0.00 (-0.02 - 0.03)	( . - . )	0
ZR-95	--		0.01 (-0.03 - 0.04)	LOC # 40 0 MILES N/A	0.01 (-0.01 - 0.04)	( . - . )	0
NB-95	--		0.00 (-0.02 - 0.03)	LOC # 40 0 MILES N/A	0.01 (-0.01 - 0.02)	( . - . )	0
RU-103	--		-0.00 (-0.01 - 0.03)	LOC # 35 0.3 MILES WNW	0.00 (-0.01 - 0.03)	( . - . )	0
RU-106	--		-0.01 (-0.28 - 0.15)	LOC # 32 0 MILES N/A	0.01 (-0.07 - 0.06)	( . - . )	0
AG-110M	--		-0.00 (-0.03 - 0.03)	LOC # 35 0.3 MILES WNW	-0.00 (-0.03 - 0.03)	( . - . )	0
I-131	--		0.01 (-0.08 - 0.09)	LOC # 35 0.3 MILES WNW	0.01 (-0.08 - 0.06)	( . - . )	0
CS-134	0.13		0.00 (-0.06 - 0.03)	LOC # 35 0.3 MILES WNW	0.01 (-0.01 - 0.03)	( . - . )	0
CS-137	0.15		0.00 (-0.02 - 0.02)	LOC # 40 0 MILES N/A	0.00 (-0.01 - 0.01)	( . - . )	0
RA-226	--		0.20 (-0.29 - 0.71)	LOC # 32 0 MILES N/A	0.41 (-0.08 - 0.71)	( . - . )	0

TABLE 3-1  
ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY  
MILLSTONE NUCLEAR POWER STATION, UNITS 1, 2 AND 3  
DOCKETS 50-245, 50-336 AND 50-423  
JANUARY - DECEMBER 2000

PAGE 3-11

MEDIUM OR PATHWAY SAMPLED	ANALYSIS AND TOTAL NUMBER OF ANALYSES PERFORMED	LOWER LIMIT OF DETECTION (LLD) (A)	ALL INDICATOR LOCATIONS	LOCATION WITH HIGHEST ANNUAL MEAN		CONTROL LOCATIONS	# OF NRM (C)
			MEAN (RANGE)(B)	LOCATION #, DISTANCE AND DIRECTION	MEAN (RANGE)(B)	MEAN (RANGE)(B)	
TH-228	--	--	-0.00	LOC # 32	0.02	.	0
			(-0.11 - 0.07)	0 MILES N/A	(-0.04 - 0.06)	( . - . )	
MUSSELS (PCI/G)	GAMMA 8, . BE-7	--	-0.01	LOC # 31	-0.00	.	0
			(-0.13 - 0.07)	1.5 MILES NNW	(-0.13 - 0.07)	( . - . )	
K-40	--	--	1.4	LOC # 31	1.4	.	0
			( 1.1 - 1.8)	1.5 MILES NNW	( 1.2 - 1.8)	( . - . )	
CR-51	--	--	-0.03	LOC # 28	0.01	.	0
			(-0.23 - 0.12)	0.8 MILES SSE	(-0.16 - 0.12)	( . - . )	
MN-54	0.13	0.13	-0.00	LOC # 28	-0.00	.	0
			(-0.02 - 0.02)	0.8 MILES SSE	(-0.02 - 0.02)	( . - . )	
CO-58	0.13	0.13	-0.00	LOC # 28	0.00	.	0
			(-0.02 - 0.02)	0.8 MILES SSE	(-0.02 - 0.02)	( . - . )	
FE-59	0.26	0.26	0.02	LOC # 28	0.04	.	0
			(-0.02 - 0.06)	0.8 MILES SSE	( 0.02 - 0.06)	( . - . )	
CO-60	0.13	0.13	-0.00	LOC # 31	0.00	.	0
			(-0.01 - 0.01)	1.5 MILES NNW	(-0.01 - 0.01)	( . - . )	
ZN-65	0.26	0.26	-0.02	LOC # 31	-0.02	.	0
			(-0.04 - 0.01)	1.5 MILES NNW	(-0.04 - 0.01)	( . - . )	
ZR-95	--	--	0.01	LOC # 28	0.01	.	0
			(-0.01 - 0.02)	0.8 MILES SSE	(-0.01 - 0.02)	( . - . )	
NB-95	--	--	-0.00	LOC # 31	0.00	.	0
			(-0.02 - 0.01)	1.5 MILES NNW	(-0.02 - 0.01)	( . - . )	
RU-103	--	--	0.00	LOC # 31	0.00	.	0
			(-0.01 - 0.01)	1.5 MILES NNW	(-0.00 - 0.01)	( . - . )	

TABLE 3-1  
 ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY  
 MILLSTONE NUCLEAR POWER STATION, UNITS 1, 2 AND 3  
 DOCKETS 50-245, 50-336 AND 50-423  
 JANUARY - DECEMBER 2000

PAGE 3-12

MEDIUM OR PATHWAY SAMPLED	ANALYSIS AND TOTAL NUMBER OF ANALYSES PERFORMED	LOWER LIMIT OF DETECTION (LLD) (A)	ALL INDICATOR LOCATIONS	LOCATION WITH HIGHEST ANNUAL MEAN		CONTROL LOCATIONS	# OF NRM (C)
			MEAN (RANGE)(B)	LOCATION #, DISTANCE AND DIRECTION	MEAN (RANGE)(B)	MEAN (RANGE)(B)	
	RU-106	--	0.04 (-0.19 - 0.17)	LOC # 28 0.8 MILES SSE	0.11 ( 0.04 - 0.17)	( . - . )	0
	AG-110M	--	-0.00 (-0.02 - 0.01)	LOC # 28 0.8 MILES SSE	0.00 (-0.01 - 0.01)	( . - . )	0
	I-131	--	0.00 (-0.03 - 0.03)	LOC # 31 1.5 MILES NNW	0.00 (-0.03 - 0.03)	( . - . )	0
	CS-134	0.13	0.00 (-0.01 - 0.01)	LOC # 31 1.5 MILES NNW	0.01 (-0.01 - 0.01)	( . - . )	0
	CS-137	0.15	-0.00 (-0.03 - 0.02)	LOC # 28 0.8 MILES SSE	0.01 (-0.00 - 0.02)	( . - . )	0
	RA-226	--	0.20 (-0.04 - 0.55)	LOC # 31 1.5 MILES NNW	0.23 (-0.04 - 0.50)	( . - . )	0
	TH-228	--	-0.00 (-0.06 - 0.07)	LOC # 31 1.5 MILES NNW	0.02 (-0.04 - 0.07)	( . - . )	0
OYSTERS (PCI/G)	GAMMA 19, 4 BE-7	--	-0.02 (-0.16 - 0.18)	LOC # 37C 3.5 MILES WSW	0.04 (-0.13 - 0.20)	0.04 (-0.13 - 0.20)	0
	K-40	--	1.6 ( 1.0 - 2.1)	LOC # 34 4 MILES ENE	1.9 ( 1.7 - 2.1)	1.7 ( 1.1 - 2.4)	0
	CR-51	--	0.02 (-0.10 - 0.12)	LOC # 32 0 MILES N/A	0.08 ( 0.05 - 0.12)	0.03 (-0.03 - 0.11)	0
	MN-54	0.13	0.00 (-0.02 - 0.02)	LOC # 40 0 MILES N/A	0.01 ( 0.00 - 0.01)	0.00 (-0.00 - 0.01)	0
	CO-58	0.13	0.00 (-0.03 - 0.02)	LOC # 40 0 MILES N/A	0.01 ( 0.01 - 0.02)	0.01 ( 0.00 - 0.01)	0

TABLE 3-1  
ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY  
MILLSTONE NUCLEAR POWER STATION, UNITS 1, 2 AND 3  
DOCKETS 50-245, 50-336 AND 50-423  
JANUARY - DECEMBER 2000

PAGE 3-13

MEDIUM OR PATHWAY SAMPLED	ANALYSIS AND TOTAL NUMBER OF ANALYSES PERFORMED	LOWER LIMIT OF DETECTION (LLD) (A)	ALL INDICATOR LOCATIONS	LOCATION WITH HIGHEST ANNUAL MEAN		CONTROL LOCATIONS	# OF NRM (C)
			MEAN (RANGE)(B)	LOCATION #, DISTANCE AND DIRECTION	MEAN (RANGE)(B)	MEAN (RANGE)(B)	
FE-59		0.26	0.00 (-0.05 - 0.04)	LOC # 40 0 MILES N/A	0.02 ( 0.01 - 0.04)	-0.01 (-0.01 - 0.00)	0
CO-60		0.13	0.00 (-0.01 - 0.03)	LOC # 32 0 MILES N/A	0.01 (-0.00 - 0.03)	-0.01 (-0.02 - 0.00)	0
ZN-65		0.26	-0.01 (-0.05 - 0.05)	LOC # 40 0 MILES N/A	0.02 ( 0.00 - 0.05)	-0.04 (-0.07 - -0.02)	0
ZR-95	--	--	0.01 (-0.02 - 0.03)	LOC # 40 0 MILES N/A	0.02 (-0.00 - 0.03)	0.00 ( 0.00 - 0.01)	0
NB-95	--	--	0.00 (-0.02 - 0.04)	LOC # 40 0 MILES N/A	0.02 ( 0.01 - 0.04)	0.00 (-0.00 - 0.00)	0
RU-103	--	--	-0.00 (-0.03 - 0.01)	LOC # 31 1.8 MILES NW	-0.00 (-0.02 - 0.01)	-0.01 (-0.02 - 0.01)	0
RU-106	--	--	-0.02 (-0.23 - 0.21)	LOC # 40 0 MILES N/A	-0.00 (-0.04 - 0.03)	-0.00 (-0.13 - 0.15)	0
AG-110M	--	--	0.03 (-0.02 - 0.12)	LOC # 40 0 MILES N/A	0.08 ( 0.07 - 0.12)	-0.00 (-0.03 - 0.01)	0
I-131	--	--	0.01 (-0.02 - 0.04)	LOC # 34 4 MILES ENE	0.01 ( 0.01 - 0.02)	0.01 (-0.02 - 0.04)	0
CS-134	0.13		0.00 (-0.02 - 0.03)	LOC # 40 0 MILES N/A	0.00 (-0.01 - 0.02)	-0.00 (-0.01 - 0.01)	0
CS-137	0.15		-0.01 (-0.04 - 0.02)	LOC # 31 1.8 MILES NW	0.01 (-0.01 - 0.02)	-0.01 (-0.02 - 0.01)	0
RA-226	--	--	0.10 (-0.41 - 0.91)	LOC # 31 1.8 MILES NW	0.19 (-0.21 - 0.91)	0.13 (-0.19 - 0.46)	0

TABLE 3-1  
 ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY  
 MILLSTONE NUCLEAR POWER STATION, UNITS 1, 2 AND 3  
 DOCKETS 50-245, 50-336 AND 50-423  
 JANUARY - DECEMBER 2000

PAGE 3-14

MEDIUM OR PATHWAY SAMPLED	ANALYSIS AND TOTAL NUMBER OF ANALYSES PERFORMED	LOWER LIMIT OF DETECTION (LLD) (A)	ALL INDICATOR	LOCATION WITH HIGHEST ANNUAL MEAN		CONTROL	# OF NRM (C)
			LOCATIONS MEAN (RANGE)(B)	LOCATION #, DISTANCE AND DIRECTION	MEAN (RANGE)(B)	LOCATIONS MEAN (RANGE)(B)	
TH-228	--	--	0.02 (-0.06 - 0.09)	LOC # 34 4 MILES ENE	0.04 (-0.01 - 0.09)	0.00 (-0.08 - 0.09)	0
CLAMS (PCI/G)	GAMMA 16, . BE-7	--	0.00 (-0.07 - 0.15)	LOC # 35 0.3 MILES WNW	0.02 (-0.04 - 0.15)	( . - . )	0
K-40	--	--	1.8 ( 1.1 - 2.4)	LOC # 29 0.4 MILES NNE	2.0 ( 1.4 - 2.3)	( . - . )	0
CR-51	--	--	0.01 (-0.22 - 0.15)	LOC # 39 0.8 MILES NE	0.04 ( 0.02 - 0.07)	( . - . )	0
MN-54	0.13	0.13	-0.00 (-0.02 - 0.01)	LOC # 29 0.4 MILES NNE	-0.00 (-0.02 - 0.01)	( . - . )	0
CO-58	0.13	0.13	-0.00 (-0.02 - 0.02)	LOC # 29 0.4 MILES NNE	0.00 (-0.01 - 0.02)	( . - . )	0
FE-59	0.26	0.26	0.01 (-0.04 - 0.04)	LOC # 29 0.4 MILES NNE	0.01 (-0.01 - 0.04)	( . - . )	0
CO-60	0.13	0.13	0.00 (-0.02 - 0.02)	LOC # 39 0.8 MILES NE	0.01 ( 0.00 - 0.02)	( . - . )	0
ZN-65	0.26	0.26	-0.02 (-0.06 - 0.04)	LOC # 35 0.3 MILES WNW	0.00 (-0.02 - 0.03)	( . - . )	0
ZR-95	--	--	0.00 (-0.04 - 0.04)	LOC # 38 1 MILES NW	0.02 (-0.00 - 0.04)	( . - . )	0
NB-95	--	--	-0.00 (-0.02 - 0.01)	LOC # 38 1 MILES NW	0.01 ( 0.00 - 0.01)	( . - . )	0
RU-103	--	--	-0.00 (-0.01 - 0.01)	LOC # 35 0.3 MILES WNW	0.01 (-0.00 - 0.01)	( . - . )	0

TABLE 3-1  
ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY  
MILLSTONE NUCLEAR POWER STATION, UNITS 1, 2 AND 3  
DOCKETS 50-245, 50-336 AND 50-423  
JANUARY - DECEMBER 2000

PAGE 3-15

MEDIUM OR PATHWAY SAMPLED	ANALYSIS AND TOTAL NUMBER OF ANALYSES PERFORMED	LOWER LIMIT OF DETECTION (LLD) (A)	ALL INDICATOR LOCATIONS	LOCATION WITH HIGHEST ANNUAL MEAN		CONTROL LOCATIONS	# OF NRM (C)
			MEAN (RANGE)(B)	LOCATION #, DISTANCE AND DIRECTION	MEAN (RANGE)(B)	MEAN (RANGE)(B)	
	RU-106	--	-0.03 (-0.13 - 0.11)	LOC # 39 0.8 MILES NE	0.01 (-0.08 - 0.10)	( . - . )	0
	AG-110M	--	-0.01 (-0.04 - 0.02)	LOC # 39 0.8 MILES NE	-0.01 (-0.01 - 0.01)	( . - . )	0
	I-131	--	-0.00 (-0.04 - 0.07)	LOC # 29 0.4 MILES NNE	0.03 (-0.00 - 0.07)	( . - . )	0
	CS-134	0.13	-0.00 (-0.02 - 0.01)	LOC # 35 0.3 MILES WNW	0.00 ( 0.00 - 0.01)	( . - . )	0
	CS-137	0.15	-0.00 (-0.03 - 0.03)	LOC # 35 0.3 MILES WNW	0.00 (-0.00 - 0.02)	( . - . )	0
	RA-226	--	0.12 (-0.28 - 0.71)	LOC # 35 0.3 MILES WNW	0.33 (-0.01 - 0.71)	( . - . )	0
	TH-228	--	0.02 (-0.05 - 0.07)	LOC # 29 0.4 MILES NNE	0.04 ( 0.02 - 0.07)	( . - . )	0
LOBSTER (PCI/G)	GAMMA 12, . BE-7	--	-0.02 (-0.11 - 0.13)	LOC # 32 0 MILES N/A	0.02 (-0.08 - 0.13)	( . - . )	0
	K-40	--	2.3 ( 1.7 - 3.1)	LOC # 35 0.3 MILES WNW	2.6 ( 2.3 - 3.1)	( . - . )	0
	CR-51	--	0.01 (-0.22 - 0.16)	LOC # 35 0.3 MILES WNW	0.02 (-0.10 - 0.09)	( . - . )	0
	MN-54	0.13	-0.01 (-0.03 - 0.01)	LOC # 37C 3.5 MILES WSW	-0.01 (-0.02 - 0.01)	( . - . )	0
	CO-58	0.13	-0.00 (-0.02 - 0.02)	LOC # 35 0.3 MILES WNW	-0.00 (-0.01 - 0.02)	( . - . )	0

TABLE 3-1  
ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY  
MILLSTONE NUCLEAR POWER STATION, UNITS 1, 2 AND 3  
DOCKETS 50-245, 50-336 AND 50-423  
JANUARY - DECEMBER 2000

PAGE 3-16

MEDIUM OR PATHWAY SAMPLED	ANALYSIS AND TOTAL NUMBER OF ANALYSES PERFORMED	LOWER LIMIT OF DETECTION (LLD) (A)	ALL INDICATOR LOCATIONS MEAN (RANGE)(B)	LOCATION WITH HIGHEST ANNUAL MEAN		CONTROL LOCATIONS MEAN (RANGE)(B)	# OF NRM (C)
				LOCATION #, DISTANCE AND DIRECTION	MEAN (RANGE)(B)		
FE-59		0.26	-0.01 (-0.06 - 0.03)	LOC # 35 0.3 MILES WNW	-0.00 (-0.01 - 0.01)	( . - . )	0
CO-60		0.13	0.00 (-0.01 - 0.02)	LOC # 32 0 MILES N/A	0.01 (-0.01 - 0.02)	( . - . )	0
ZN-65		0.26	-0.03 (-0.09 - 0.02)	LOC # 37C 3.5 MILES WSW	-0.02 (-0.07 - 0.02)	( . - . )	0
ZR-95	--	--	-0.01 (-0.04 - 0.02)	LOC # 37C 3.5 MILES WSW	-0.00 (-0.01 - 0.01)	( . - . )	0
NB-95	--	--	-0.01 (-0.03 - 0.03)	LOC # 37C 3.5 MILES WSW	-0.00 (-0.03 - 0.02)	( . - . )	0
RU-103	--	--	-0.00 (-0.02 - 0.02)	LOC # 35 0.3 MILES WNW	0.00 (-0.00 - 0.01)	( . - . )	0
RU-106	--	--	0.00 (-0.23 - 0.19)	LOC # 32 0 MILES N/A	0.03 (-0.10 - 0.19)	( . - . )	0
AG-110M	--	--	0.00 (-0.03 - 0.03)	LOC # 32 0 MILES N/A	0.00 (-0.02 - 0.02)	( . - . )	0
I-131	--	--	-0.01 (-0.09 - 0.03)	LOC # 37C 3.5 MILES WSW	0.01 (-0.02 - 0.03)	( . - . )	0
CS-134	0.13		0.00 (-0.02 - 0.02)	LOC # 35 0.3 MILES WNW	0.00 (-0.01 - 0.01)	( . - . )	0
CS-137	0.15		-0.00 (-0.02 - 0.01)	LOC # 35 0.3 MILES WNW	0.00 (-0.01 - 0.01)	( . - . )	0
RA-226	--	--	0.22 (-0.20 - 0.69)	LOC # 37C 3.5 MILES WSW	0.39 ( 0.23 - 0.69)	( . - . )	0

TABLE 3-1  
 ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY  
 MILLSTONE NUCLEAR POWER STATION, UNITS 1, 2 AND 3  
 DOCKETS 50-245, 50-336 AND 50-423  
 JANUARY - DECEMBER 2000

PAGE 3-17

MEDIUM OR PATHWAY SAMPLED	ANALYSIS AND TOTAL NUMBER OF ANALYSES PERFORMED	LOWER LIMIT OF DETECTION (LLD) (A)	ALL INDICATOR LOCATIONS MEAN (RANGE)(B)	LOCATION WITH HIGHEST ANNUAL MEAN		CONTROL LOCATIONS MEAN (RANGE)(B)	# OF NRM (C)
				LOCATION #, DISTANCE AND DIRECTION	MEAN (RANGE)(B)		
TH-228	--		0.01 (-0.04 - 0.07)	LOC # 32 0 MILES N/A	0.03 (-0.01 - 0.06)	. ( . - . )	0



### NOTES FOR TABLE 3-1

- A. For gamma measurements the (Minimum Detectable Level) MDL's  $\approx$  LLD, 2.33. For all others, MDL = 2 x (the standard deviation of the background). These MDL's are based on the absence of large amounts of interfering activity (excluding naturally occurring radionuclides). Deviations by about factors of 3 to 4 can occur.

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

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

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

where

LLD is the lower limit of detection as defined above (as pCi per unit mass or volume)

$S_b$  is the standard deviation of the background counting rate or of the counting rate of a blank sample as appropriate (as counts per minute)

$E$  is the counting efficiency (as counts per transformation)

$V$  is the sample size (in units of mass or volume)

2.22 is the number of transformation per minute per picocurie

$Y$  is the fractional radiochemical yield (when applicable)

$\lambda$  is the radioactive decay constant for the particular radionuclide

$\Delta t$  is the elapsed time between sample collection (or end of the sample collection period) and time of counting

It should be recognized that LLD is a defined *a priori* (before the fact) limit representing the capability of a measurement system and not an *a posteriori* (after the fact) limit for a particular measurement.

Analyses shall be performed in such a manner that the stated LLDs will be achieved under routine conditions. Occasionally background fluctuations, unavoidably small sample sizes, the presence of interfering nuclides, or other uncontrollable circumstances may render these *a priori* LLDs unachievable. In such cases, the contributing factors will be identified and described in the *Annual Radiological Environmental Operating Report*. As shown in the equation above, for composite samples taken over a period of time, the LLD is decayed to the end of the sample period.

- B. Analytical results are handled as recommended by HASL ("*Reporting of Analytical Results from HASL*," letter by Leo B. Higginbotham) and

NUREG/CR-4007 (Sept. 1984). Negative values were used in the determination of mean.

- C. Nonroutine reported measurements (NRM's). These are results of samples that exceed the report levels of Table E-2 of the *Radiological Effluent Monitoring Manual*.
- D. First number is the number of indicator measurements, the second is the number of control measurements.
- E. Assuming 270 m<sup>3</sup>
- F. Assuming 1080 m<sup>3</sup>
- G. LLD for leafy vegetables.
- H. LLD from the end of the sample period.

### 3.2. Data Tables

The data reported in this section are strictly counting statistics. The reported error is two times the standard deviation ( $2\sigma$ ) of the net activity. Unless otherwise noted, the overall error (counting, sample size, chemistry, errors, etc.) is estimated to be 2 to 5 times that listed. Results are considered positive when the measured value exceeds 1.5 times the listed  $2\sigma$  error (i.e., the measured value exceeds  $3\sigma$ ).

Because of counting statistics, negative values, zeros and numbers below the Minimum Detectable Level (MDL) are statistically valid pieces of data. For the purposes of this report, in order to indicate any background biases, all the valid data are presented. In instances where zeros are listed after significant digits, this is an artifact of the computer data handling program.

Data are given according to sample type as indicated below.

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

\* This type of sampling or analysis was not performed, therefore there is no table.

TABLE 1  
MONTHLY  
GAMMA EXPOSURE RATE (UR/HR) \*

## LOCATIONS

PERIOD	1	2	3	4	5	6	7	8	9	10	11
JAN 00	9.1 .2	10.2 .2	8.0 .2	8.7 .2	10.0 .1	9.4 .1	7.1 .1	11.6 .1	9.8 .3	8.8 .1	7.8 .1
FEB 00	7.8 .5	9.2 .4	7.1 .2	8.0 .2	8.4 .4	7.8 .2	6.1 .4	10.5 .5	8.3 .2	7.3 .2	6.5 .4
MAR 00	8.9 .5	9.9 .5	7.3 .4	8.0 .6	9.1 .4	8.1 .6	5.7 .4	11.5 .5	9.0 .4	7.7 .9	6.6 .4
APR 00	8.5 .6	9.8 .6	7.7 .9	7.8 .6	9.6 .5	8.0 .4	5.5 .5	12.0 .7	8.8 .4	7.6 .6	6.9 .3
MAY 00	8.7 .6	9.9 .5	7.2 .4	8.7 .4	10.0 .3	8.8 .3	5.6 .7	12.2 .4	9.3 .6	7.9 .2	7.4 .6
JUN 00	8.1 .7	9.5 1 A	6.9 .6	8.0 .7	9.4 .7	8.4 .7	5.3 .8	11.0 .7	9.5 .7	7.4 .6	6.5 .5
JUL 00	8.7 .5	10.5 .4	7.4 .5	8.5 .4	9.8 .5	9.2 .1	6.2 .5	12.1 .7	9.5 .4	7.7 .5	6.9 .3
AUG 00	6.9 .3	8.2 .6	5.6 .2	6.7 .3	7.7 .4	7.0 .2	3.7 .2	10.3 .7	8.3 .5	6.3 .2	5.5 .5
SEP 00	8.2 .3	9.8 .4	7.4 .3	8.7 .4	9.4 .3	8.7 .3	5.2 .2	12.3 .5	9.6 .3	8.0 .4	6.9 .5
OCT 00	8.8 .3	10.0 .7	7.3 .5	8.1 .4	10.1 .4	8.6 .5	4.9 .3	11.8 .4	9.6 .5	7.8 .4	7.0 .2
NOV 00	7.8 .3	8.8 .4	6.4 .3	8.1 .6	8.0 .4	8.2 .4	4.5 .3	11.1 .8	8.9 .5	7.4 .5	6.3 .4
DEC 00	8.7 .3	9.9 .5	7.7 .4	8.3 .3	9.3 .3	9.1 .5	6.3 .6	12.3 .5	9.6 .5	8.3 .4	7.1 .3

PERIOD	12C	13C	14C	15C	16C	27	50X	54X	55X	98X	99X
JAN 00	. . C	9.5 .2	10.3 .1	8.4 .0	7.0 .2	8.3 .1	8.0 .1	8.3 .2	7.7 .1	8.9 .0	9.8 .1
FEB 00	7.1 .3	7.5 .5	8.5 .3	6.9 .5	5.7 .1	7.1 .7	6.2 .3	7.4 .2	6.5 .4	8.1 .1	7.8 .3
MAR 00	4.1 .6	8.3 .7	9.6 .5	7.7 .4	6.2 .5	7.1 .3	7.2 .3	8.1 .4	6.7 .3	8.0 .6	9.7 .6
APR 00	7.5 .5	8.2 .4	9.3 .4	8.1 .5	5.8 .2	7.2 .4	7.1 .4	8.0 .4	7.3 .6	8.6 .5	9.6 .3
MAY 00	7.8 .6	8.8 .3	9.8 .5	8.1 .3	6.6 .5	7.5 .3	7.0 .4	8.2 .4	7.4 .3	8.6 .5	9.3 .3
JUN 00	8.3 .8	8.3 .6	9.4 .8	7.6 .6	6.3 .7	7.4 .8	6.5 .6	7.4 .6	6.1 .5	7.1 .5	8.8 .7
JUL 00	8.4 .5	9.4 .5	9.4 .6	8.5 .4	6.7 .3	7.4 .5	7.7 .4	8.5 .4	8.0 .5	9.0 .5	10.3 .5
AUG 00	6.7 .7	7.4 .4	8.4 .4	6.8 .2	4.9 .2	6.4 .3	5.7 .2	6.8 .3	5.8 .4	6.7 .5	8.4 .2
SEP 00	7.6 .2	8.4 .4	10.2 .3	8.5 .3	6.8 .5	7.2 .6	6.9 .2	8.4 .4	7.2 .2	8.3 .4	9.4 .5
OCT 00	7.1 .2	8.6 .3	10.0 .6	8.0 .5	6.1 .7	7.6 .6	. . D	8.5 .3	6.9 .3	. . E	9.1 .3
NOV 00	9.9 .9	8.3 .7	9.2 1 B	7.9 .5	6.0 .6	7.0 .4	6.4 .3	7.8 .4	6.1 .4	. .	8.7 .3
DEC 00	8.1 .3	8.9 .3	9.6 .7	8.0 .3	6.6 .3	7.8 .3	7.5 .3	8.2 .4	7.4 .6	. .	9.3 .4

\* ERRORS LISTED ARE 1 SIGMA OF THE STANDARD DEVIATION OF TWO MEASUREMENTS.

A: ACTUAL ERROR = 1.16.

B: ACTUAL ERROR = 1.15.

C: TLD READOUT WAS LOST IN DATA TRANSFER FROM READOUT MACHINE. NO DATA FOR THIS LOCATION IN JAN.

D: TLD NOT COLLECTED IN OCTOBER. THE EXPOSURE RATE IN NOVEMBER IS FOR A TWO MONTH PERIOD.

E: THIS LOCATION WAS DISCONTINUED IN OCTOBER WITH THE DECOMMISSIONING OF THE ION CHAMBER SHACK.

TABLE 2  
AIR PARTICULATES  
GROSS BETA RADIOACTIVITY  
(PCI/M3)

PERIOD ENDING	L O C A T I O N S																	
	1	2	3	4	10	11	12X	15C	27									
	(+/-)	(+/-)	(+/-)	(+/-)	(+/-)	(+/-)	(+/-)	(+/-)	(+/-)									
JAN04	0.024	0.004	0.025	0.004	0.024	0.004	0.026	0.004	0.024	0.004	0.025	0.004	0.033	0.004	0.027	0.004	0.027	0.004
JAN10	0.028	0.005	0.024	0.004	0.026	0.004	0.029	0.004	0.031	0.005	0.025	0.004	0.025	0.004	0.030	0.004	0.031	0.004
JAN17	0.024	0.004	0.019	0.004	0.025	0.004	0.024	0.004	0.024	0.004	0.025	0.004	0.023	0.004	0.025	0.004	0.025	0.004
JAN24	0.034	0.005	0.028	0.004	0.028	0.005	0.032	0.005	0.035	0.005	0.029	0.004	0.022	0.003	0.030	0.005	0.032	0.004
JAN31	0.029	0.004	0.030	0.004	0.033	0.004	0.034	0.004	0.035	0.005	0.035	0.004	0.037	0.004	0.033	0.004	0.035	0.004
FEB07	0.028	0.004	0.024	0.004	0.030	0.004	0.023	0.004	0.024	0.004	0.027	0.004	0.022	0.003	0.028	0.006	0.029	0.004
FEB14	0.027	0.004	0.023	0.004	0.031	0.004	0.027	0.004	0.029	0.004	0.029	0.004	0.033	0.004	0.042	0.007	0.028	0.004
FEB22	0.027	0.004	0.028	0.004	0.028	0.004	0.027	0.004	0.032	0.004	0.029	0.004	0.028	0.004	0.027	0.004	0.032	0.004
FEB28	0.024	0.004	0.027	0.004	0.025	0.004	0.024	0.004	0.025	0.004	0.023	0.004	0.024	0.003	0.027	0.004	0.024	0.004
MAR07	0.015	0.003	0.016	0.003	0.017	0.004	0.019	0.004	0.018	0.004	0.018	0.004	0.016	0.003	0.018	0.004	0.019	0.003
MAR13	0.016	0.004	0.014	0.004	0.014	0.004	0.016	0.004	0.016	0.004	0.014	0.004	0.017	0.003	0.018	0.004	0.018	0.003
MAR21	0.022	0.004	0.015	0.003	0.017	0.004	0.020	0.004	0.016	0.004	0.017	0.004	0.020	0.003	0.021	0.004	0.021	0.003
MAR28	0.019	0.004	0.017	0.004	0.020	0.004	0.019	0.004	0.016	0.004	0.016	0.004	0.017	0.003	0.019	0.004	0.020	0.004
APR04	0.011	0.003	0.019	0.004	0.011	0.003	0.016	0.003	0.013	0.003	0.016	0.003	0.017	0.003	0.018	0.004	0.016	0.003
APR11	0.014	0.004	0.017	0.004	0.012	0.004	0.014	0.004	0.013	0.004	0.015	0.004	0.016	0.003	0.015	0.004	0.014	0.004
APR18	0.020	0.004	0.018	0.004	0.013	0.004	0.020	0.004	0.017	0.004	0.021	0.004	0.020	0.003	0.018	0.004	0.019	0.004
APR25	0.006	0.004	0.005	0.003	0.008	0.004	0.007	0.004	0.004	0.004	0.006	0.004	0.006	0.003	0.006	0.004	0.007	0.003
MAY01	0.017	0.004	0.018	0.004	0.019	0.004	0.017	0.004	0.017	0.005	0.018	0.004	0.009	0.003	0.014	0.005	0.017	0.004
MAY09	0.024	0.004	0.025	0.004	0.023	0.004	0.018	0.003	0.023	0.004	0.028	0.004	0.024	0.004	0.025	0.004	0.028	0.004
MAY16	0.011	0.003	0.011	0.003	0.011	0.003	0.009	0.003	0.011	0.003	0.011	0.003	0.011	0.003	0.013	0.003	0.010	0.003
MAY23	0.015	0.003	0.017	0.003	0.016	0.003	0.017	0.003	0.014	0.003	0.016	0.003	0.017	0.003	0.015	0.003	0.014	0.003
MAY30	0.010	0.003	0.011	0.003	0.010	0.003	0.009	0.003	0.009	0.003	0.010	0.003	0.010	0.003	0.009	0.003	0.009	0.003
JUN06	0.009	0.003	0.010	0.003	0.007	0.003	0.011	0.003	0.009	0.003	0.008	0.003	0.009	0.003	0.013	0.003	0.011	0.003
JUN13	0.020	0.004	0.022	0.004	0.024	0.004	0.020	0.004	0.021	0.004	0.021	0.004	0.022	0.004	0.021	0.004	0.017	0.004
JUN19	0.013	0.004	0.011	0.003	0.012	0.004	0.012	0.003	0.010	0.003	0.015	0.004	0.011	0.003	0.015	0.004	0.013	0.003
JUN26	0.014	0.003	0.016	0.003	0.011	0.003	0.012	0.003	0.016	0.003	0.016	0.003	0.014	0.003	0.018	0.003	0.016	0.003

SAMPLE DATES MAY VARY BY A COUPLE OF DAYS.

TABLE 2  
AIR PARTICULATES  
GROSS BETA RADIOACTIVITY  
(PCI/M3)

PERIOD ENDING	L O C A T I O N S																	
	1	2	3	4	10	11	12X	15C	27									
	(+/-)	(+/-)	(+/-)	(+/-)	(+/-)	(+/-)	(+/-)	(+/-)	(+/-)									
JUL03	0.015	0.004	0.019	0.004	0.014	0.004	0.015	0.004	0.015	0.004	0.017	0.004	0.016	0.004	0.016	0.004	0.016	0.004
JUL10	0.016	0.004	0.016	0.004	0.015	0.004	0.012	0.003	0.015	0.004	0.013	0.004	0.016	0.003	0.014	0.004	0.014	0.003
JUL18	0.013	0.003	0.013	0.003	0.013	0.003	0.014	0.003	0.013	0.003	0.010	0.003	0.011	0.003	0.016	0.003	0.011	0.003
JUL25	0.011	0.003	0.013	0.004	0.011	0.004	0.013	0.004	0.013	0.004	0.011	0.004	0.013	0.003	0.013	0.004	0.012	0.003
AUG01	0.004	0.003	0.006	0.003	0.007	0.003	0.006	0.003	0.003	0.003	0.005	0.003	0.005	0.003	0.006	0.003	0.004	0.003
AUG08	0.018	0.003	0.020	0.004	0.014	0.003	0.015	0.003	0.016	0.003	0.015	0.003	0.019	0.003	0.019	0.004	0.016	0.003
AUG15	0.016	0.004	0.018	0.004	0.016	0.004	0.015	0.004	0.017	0.004	0.013	0.004	0.018	0.004	0.010	0.004	0.017	0.004
AUG22	0.011	0.004	0.010	0.004	0.010	0.004	0.008	0.004	0.011	0.004	0.010	0.004	0.011	0.003	0.010	0.004	0.009	0.003
AUG30	0.018	0.003	0.024	0.004	0.023	0.004	0.020	0.003	0.021	0.003	0.023	0.004	0.021	0.004	0.020	0.003	0.024	0.003
SEP05	0.016	0.004	0.018	0.004	0.018	0.004	0.015	0.004	0.016	0.004	0.018	0.004	0.015	0.003	0.015	0.004	0.013	0.003
SEP12	0.024	0.004	0.024	0.004	0.022	0.004	0.023	0.004	0.024	0.004	0.022	0.004	0.024	0.003	0.022	0.004	0.024	0.003
SEP19	0.018	0.003	0.018	0.003	0.017	0.004	0.019	0.003	0.020	0.004	0.019	0.003	0.016	0.004	0.021	0.004	0.019	0.003
SEP26	0.017	0.004	0.019	0.004	0.012	0.004	0.015	0.004	0.020	0.004	0.018	0.004	0.015	0.004	0.019	0.004	0.016	0.004
OCT03	0.019	0.004	0.018	0.004	0.021	0.004	0.018	0.004	0.015	0.004	0.018	0.004	0.018	0.003	0.019	0.004	0.018	0.004
OCT10	0.018	0.003	0.021	0.004	0.024	0.004	0.023	0.004	0.022	0.004	0.019	0.003	0.028	0.005	0.020	0.004	0.022	0.003
OCT17	0.047	0.005	0.051	0.005	0.056	0.007	0.053	0.005	0.045	0.005	0.045	0.005	0.051	0.005	0.042	0.005	0.045	0.005
OCT24	0.022	0.004	0.020	0.003	0.023	0.003	0.023	0.004	0.024	0.004	0.024	0.004	0.024	0.004	0.023	0.004	0.025	0.003
OCT31	0.029	0.004	0.025	0.004	0.034	0.004	0.030	0.005	0.031	0.005	0.031	0.004	0.037	0.005	0.032	0.005	0.030	0.004
NOV07	0.015	0.003	0.014	0.003	0.016	0.003	0.014	0.003	0.015	0.003	0.013	0.003	0.013	0.003	0.011	0.003	0.015	0.003
NOV14	0.007	0.003	0.004	0.003	0.007	0.003	0.009	0.003	0.005	0.003	0.006	0.003	0.007	0.003	0.008	0.003	0.007	0.003
NOV21	0.026	0.004	0.026	0.004	0.028	0.004	0.030	0.004	0.026	0.004	0.029	0.004	0.031	0.004	0.024	0.004	0.030	0.004
NOV28	0.013	0.003	0.010	0.003	0.012	0.003	0.012	0.003	0.015	0.003	0.014	0.003	0.018	0.004	0.014	0.003	0.010	0.003
DEC05	0.016	0.003	0.018	0.004	0.019	0.003	0.018	0.004	0.018	0.004	0.018	0.004	0.022	0.004	0.019	0.004	0.019	0.003
DEC12	0.013	0.003	0.016	0.003	0.015	0.003	0.017	0.003	0.015	0.003	0.015	0.003	0.023	0.004	0.015	0.004	0.017	0.003
DEC19	0.017	0.003	0.019	0.003	0.019	0.003	0.016	0.003	0.019	0.004	0.020	0.004	0.025	0.004	0.019	0.004	0.018	0.003
DEC26	0.033	0.004	0.039	0.005	0.037	0.005	0.035	0.004	0.035	0.005	0.035	0.004	0.043	0.005	0.030	0.005	0.036	0.004
DEC31	0.015	0.003	0.015	0.003	0.016	0.003	0.014	0.003	0.012	0.003	0.016	0.003	0.020	0.005	0.012	0.003	0.016	0.003

SAMPLE DATES MAY VARY BY A COUPLE OF DAYS.

TABLE 3  
AIRBORNE IODINE  
I-131 (PCI/M3)

PERIOD ENDING	L O C A T I O N S															
	1	2	3	4	10	11	15c	27								
	(+/-)	(+/-)	(+/-)	(+/-)	(+/-)	(+/-)	(+/-)	(+/-)								
JAN 04	0.016	0.019	0.000	0.019	-0.005	0.018	0.002	0.019	0.004	0.021	0.007	0.018	0.008	0.020	0.005	0.019
JAN 10	0.020	0.017	-0.002	0.019	-0.008	0.020	0.003	0.021	-0.001	0.021	-0.002	0.018	0.012	0.021	0.000	0.020
JAN 17	-0.009	0.016	0.000	0.016	-0.016	0.017	0.010	0.019	-0.001	0.017	0.010	0.019	-0.005	0.017	0.001	0.016
JAN 24	-0.013	0.016	0.013	0.019	0.018	0.017	0.019	0.020	-0.007	0.018	0.003	0.021	0.004	0.019	0.005	0.016
JAN 31	0.002	0.015	0.013	0.017	-0.010	0.018	-0.008	0.018	0.005	0.019	0.016	0.018	-0.002	0.015	0.006	0.016
FEB 07	0.009	0.017	-0.010	0.015	-0.007	0.018	0.011	0.013	-0.016	0.018	0.004	0.015	0.003	0.021	-0.003	0.016
FEB 14	-0.004	0.014	0.008	0.017	0.000	0.016	0.000	0.014	0.010	0.016	-0.007	0.015	0.002	0.018	-0.003	0.013
FEB 22	-0.008	0.015	0.007	0.014	-0.014	0.017	-0.013	0.015	-0.003	0.015	0.003	0.015	-0.010	0.015	0.005	0.015
FEB 28	0.016	0.017	0.013	0.022	0.009	0.019	0.004	0.020	0.007	0.022	0.001	0.020	-0.006	0.025	-0.007	0.020
MAR 07	-0.020	0.017	0.012	0.015	0.009	0.016	0.009	0.017	0.003	0.016	0.003	0.018	-0.007	0.019	-0.002	0.017
MAR 13	0.011	0.020	-0.013	0.020	-0.005	0.020	0.009	0.018	0.003	0.021	-0.006	0.014	-0.013	0.021	0.000	0.016
MAR 21	-0.008	0.016	-0.010	0.017	-0.004	0.014	0.015	0.018	-0.017	0.018	-0.018	0.018	0.005	0.017	0.022	0.017
MAR 28	0.002	0.017	0.019	0.018	-0.003	0.018	-0.007	0.019	0.007	0.018	0.005	0.017	0.018	0.020	-0.003	0.016
APR 04	0.003	0.016	-0.012	0.017	0.001	0.017	0.010	0.017	0.002	0.018	0.003	0.018	-0.006	0.019	0.006	0.015
APR 11	0.000	0.018	-0.009	0.019	0.008	0.018	-0.002	0.017	0.000	0.017	0.009	0.016	-0.002	0.019	0.008	0.017
APR 18	-0.006	0.019	0.001	0.017	0.002	0.014	0.004	0.015	-0.001	0.015	0.007	0.015	0.006	0.016	-0.003	0.014
APR 25	0.002	0.018	0.002	0.015	-0.010	0.014	-0.006	0.015	-0.006	0.015	-0.002	0.016	0.001	0.015	-0.002	0.013
MAY 01	0.000	0.016	-0.001	0.018	0.001	0.017	-0.003	0.020	0.000	0.019	-0.005	0.019	0.000	0.019	0.007	0.016
MAY 09	0.007	0.018	0.024	0.018	0.011	0.020	-0.015	0.019	0.006	0.025	-0.005	0.024	0.001	0.024	-0.016	0.025
MAY 16	0.017	0.022	-0.012	0.022	0.007	0.023	-0.006	0.022	-0.014	0.024	0.009	0.022	0.018	0.024	-0.007	0.023
MAY 23	0.007	0.019	0.001	0.020	0.007	0.022	-0.009	0.022	0.010	0.024	-0.004	0.020	0.000	0.022	-0.011	0.019
MAY 30	0.000	0.017	-0.006	0.016	0.009	0.016	0.005	0.016	0.017	0.019	0.006	0.016	0.018	0.016	-0.003	0.016
JUN 06	-0.003	0.016	0.011	0.016	0.022	0.018	0.006	0.016	-0.017	0.018	0.003	0.015	-0.001	0.018	-0.006	0.016
JUN 13	-0.001	0.015	-0.005	0.017	-0.001	0.015	0.011	0.016	0.019	0.018	0.009	0.016	0.011	0.016	0.008	0.017
JUN 19	0.015	0.021	0.007	0.021	-0.017	0.019	0.004	0.021	0.003	0.022	0.016	0.021	-0.001	0.021	0.002	0.020
JUN 26	-0.002	0.016	-0.002	0.019	-0.008	0.018	0.000	0.020	0.000	0.019	0.019	0.019	-0.006	0.020	0.011	0.020

SAMPLE DATES MAY VARY BY A COUPLE OF DAYS.

TABLE 3  
AIRBORNE IODINE  
I-131 (PCI/M3)

PERIOD ENDING	L O C A T I O N S															
	1		2		3		4		10		11		15c		27	
	(+/-)		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)	
JUL 03	0.007	0.017	0.001	0.017	-0.003	0.017	0.005	0.016	0.000	0.016	0.003	0.018	-0.004	0.018	-0.003	0.017
JUL 10	-0.007	0.018	0.015	0.016	-0.011	0.018	0.005	0.018	-0.006	0.017	0.002	0.018	-0.004	0.018	-0.006	0.016
JUL 18	0.008	0.017	0.008	0.019	-0.011	0.017	-0.005	0.017	-0.008	0.017	0.010	0.020	-0.006	0.019	-0.017	0.018
JUL 25	0.000	0.015	-0.002	0.017	0.003	0.014	-0.005	0.015	-0.008	0.014	-0.003	0.014	0.001	0.011	-0.017	0.018
AUG 01	-0.010	0.022	0.015	0.023	0.011	0.022	-0.001	0.023	0.011	0.025	0.003	0.024	-0.002	0.024	0.010	0.022
AUG 08	-0.007	0.017	-0.011	0.019	0.004	0.020	0.001	0.018	0.006	0.019	0.000	0.018	0.005	0.020	-0.011	0.017
AUG 15	-0.010	0.017	0.009	0.020	-0.009	0.019	0.001	0.019	0.007	0.019	0.000	0.017	0.010	0.019	-0.010	0.019
AUG 22	-0.005	0.015	-0.006	0.013	0.008	0.018	-0.004	0.017	0.008	0.016	-0.004	0.017	0.003	0.017	0.015	0.015
AUG 30	0.000	0.017	0.013	0.019	0.003	0.018	0.007	0.018	0.010	0.017	-0.003	0.016	0.003	0.017	-0.011	0.016
SEP 05	0.000	0.018	-0.018	0.018	0.004	0.019	0.008	0.018	0.004	0.017	-0.003	0.014	-0.001	0.018	-0.015	0.018
SEP 12	0.003	0.018	0.017	0.022	-0.003	0.023	-0.008	0.022	-0.001	0.022	0.004	0.022	0.022	0.022	-0.022	0.022
SEP 19	0.006	0.019	-0.010	0.018	-0.003	0.019	-0.009	0.018	0.008	0.020	0.001	0.018	-0.012	0.019	0.005	0.017
SEP 26	0.009	0.017	0.002	0.020	-0.014	0.020	-0.009	0.018	0.001	0.019	0.011	0.020	-0.001	0.019	-0.001	0.017
OCT 03	-0.001	0.017	-0.017	0.018	0.001	0.017	0.001	0.015	0.004	0.016	0.007	0.015	-0.007	0.018	0.006	0.016
OCT 10	0.003	0.014	-0.006	0.017	0.001	0.016	-0.003	0.014	0.007	0.016	0.011	0.015	0.005	0.014	-0.001	0.014
OCT 17	-0.011	0.017	0.007	0.014	0.003	0.014	-0.007	0.015	0.001	0.016	0.014	0.018	-0.006	0.018	-0.002	0.017
OCT 24	-0.012	0.018	0.007	0.020	-0.004	0.021	0.000	0.018	0.009	0.017	0.011	0.019	0.000	0.020	0.011	0.016
OCT 31	-0.010	0.022	0.021	0.021	-0.007	0.020	-0.013	0.023	0.011	0.023	-0.003	0.021	0.012	0.021	0.004	0.018
NOV 07	-0.013	0.036	-0.033	0.034	0.044	0.035	0.024	0.041	-0.006	0.033	0.010	0.036	-0.014	0.032	-0.026	0.033
NOV 14	-0.006	0.031	-0.003	0.033	-0.002	0.024	0.016	0.028	0.010	0.026	0.019	0.031	-0.016	0.032	-0.011	0.027
NOV 21	0.016	0.025	0.024	0.030	0.000	0.012	-0.001	0.017	0.004	0.016	0.011	0.019	0.002	0.019	-0.002	0.016
NOV 28	0.006	0.018	0.009	0.019	0.011	0.016	-0.008	0.018	0.017	0.019	0.000	0.017	0.009	0.018	-0.016	0.017
DEC 05	-0.006	0.018	-0.002	0.018	-0.001	0.018	-0.019	0.021	-0.008	0.020	-0.014	0.019	-0.025	0.021	0.008	0.017
DEC 12	0.001	0.017	0.008	0.018	-0.007	0.017	-0.011	0.018	-0.009	0.020	0.000	0.017	-0.015	0.019	0.026	0.018
DEC 19	0.004	0.012	0.008	0.018	0.002	0.015	-0.001	0.017	0.001	0.016	-0.005	0.017	-0.003	0.019	0.008	0.016
DEC 26	0.003	0.020	-0.004	0.019	0.005	0.019	0.011	0.018	0.000	0.021	0.017	0.018	-0.002	0.021	0.011	0.018
DEC 31	0.018	0.022	-0.004	0.020	-0.023	0.022	-0.005	0.023	-0.008	0.023	-0.012	0.021	-0.013	0.022	-0.009	0.021

SAMPLE DATES MAY VARY BY A COUPLE OF DAYS.



TABLE 4A  
AIR PARTICULATES  
GAMMA SPECTRA - QTR 1  
(PCI/M3)

## ANALYSES

LOCATION	BE-7		CO-60		ZR-95		NB-95		RU-103	
	(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)	
1	0.110	0.033	0.0000	0.0009	0.0002	0.0024	0.0000	0.0027	0.0000	0.0024
2	0.110	0.035	0.0004	0.0010	0.0007	0.0022	0.0024	0.0033	0.0000	0.0028
3	0.090	0.034	0.0000	0.0010	0.0003	0.0029	0.0000	0.0043	-0.0010	0.0025
4	0.089	0.034	0.0000	0.0012	-0.0010	0.0027	0.0005	0.0039	0.0000	0.0020
10	0.090	0.034	0.0000	0.0013	-0.0010	0.0034	-0.0010	0.0028	0.0026	0.0026
11	0.089	0.033	0.0000	0.0006	-0.0010	0.0025	-0.0030	0.0036	0.0010	0.0024
12X	0.099	0.031	0.0003	0.0010	0.0000	0.0012	0.0000	0.0024	0.0008	0.0017
15C	0.117	0.037	0.0003	0.0005	0.0000	0.0033	0.0000	0.0037	-0.0010	0.0029
27	0.095	0.034	0.0004	0.0009	0.0000	0.0034	-0.0010	0.0036	0.0010	0.0015

LOCATION	RU-106		CS-134		CS-137		BA-140		CE-141	
	(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)	
1	-0.0030	0.0066	0.0000	0.0008	0.0000	0.0008	-0.0070	0.0157	0.0000	0.0022
2	0.0033	0.0069	0.0000	0.0008	0.0000	0.0009	-0.0230	0.0348	0.0007	0.0028
3	0.0000	0.0091	0.0008	0.0009	0.0001	0.0011	0.0149	0.0277	-0.0020	0.0038
4	0.0014	0.0091	-0.0010	0.0010	0.0000	0.0007	0.0240	0.0357	-0.0010	0.0028
10	-0.0030	0.0059	0.0006	0.0011	0.0000	0.0009	-0.0080	0.0371	-0.0020	0.0033
11	0.0066	0.0076	0.0000	0.0010	0.0000	0.0010	0.0148	0.0209	0.0001	0.0038
12X	0.0000	0.0072	0.0000	0.0009	0.0004	0.0008	-0.0090	0.0270	0.0000	0.0028
15C	0.0060	0.0092	0.0000	0.0009	0.0005	0.0008	-0.0180	0.0361	-0.0020	0.0028
27	-0.0010	0.0096	0.0004	0.0008	0.0003	0.0004	0.0078	0.0155	0.0000	0.0029

TABLE 4B  
AIR PARTICULATES  
GAMMA SPECTRA - QTR 2  
(PCI/M3)

## A N A L Y S E S

LOCATION	BE-7		CO-60		ZR-95		NB-95		RU-103	
	(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)	
1	0.078	0.026	0.0006	0.0007	0.0018	0.0028	0.0000	0.0016	0.0017	0.0017
2	0.099	0.028	0.0002	0.0004	0.0000	0.0014	0.0002	0.0018	0.0000	0.0009
3	0.087	0.025	0.0004	0.0009	0.0010	0.0021	0.0014	0.0024	0.0005	0.0019
4	0.081	0.025	0.0004	0.0008	0.0000	0.0022	0.0000	0.0027	0.0015	0.0020
10	0.103	0.030	0.0000	0.0005	0.0000	0.0025	0.0000	0.0017	0.0000	0.0017
11	0.099	0.028	0.0000	0.0012	0.0000	0.0019	0.0008	0.0011	0.0000	0.0016
12X	0.092	0.033	0.0000	0.0010	0.0026	0.0029	-0.0030	0.0033	0.0000	0.0019
15C	0.077	0.020	0.0000	0.0005	0.0000	0.0013	0.0004	0.0015	0.0004	0.0012
27	0.070	0.028	0.0000	0.0011	0.0000	0.0022	-0.0010	0.0026	0.0000	0.0016

LOCATION	RU-106		CS-134		CS-137		BA-140		CE-141	
	(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)	
1	0.0042	0.0091	0.0005	0.0008	0.0002	0.0007	0.0036	0.0111	0.0000	0.0025
2	-0.0060	0.0093	0.0001	0.0009	0.0001	0.0006	-0.0070	0.0188	0.0000	0.0021
3	-0.0030	0.0082	0.0002	0.0008	0.0005	0.0006	0.0000	0.0110	0.0001	0.0025
4	0.0021	0.0088	0.0000	0.0008	0.0000	0.0007	-0.0020	0.0142	-0.0010	0.0025
10	0.0031	0.0064	0.0000	0.0006	0.0000	0.0005	-0.0070	0.0194	0.0002	0.0020
11	0.0008	0.0055	0.0005	0.0008	0.0000	0.0007	0.0000	0.0152	0.0000	0.0023
12X	0.0054	0.0060	0.0001	0.0008	0.0003	0.0006	-0.0310	0.0362	0.0000	0.0028
15C	-0.0050	0.0054	0.0002	0.0006	0.0000	0.0005	-0.0040	0.0114	0.0000	0.0017
27	-0.0050	0.0073	0.0000	0.0009	0.0000	0.0005	0.0074	0.0147	0.0000	0.0021

TABLE 4C  
AIR PARTICULATES  
GAMMA SPECTRA - QTR 3  
(PCI/M3)

## A N A L Y S E S

LOCATION	BE-7		CO-60		ZR-95		NB-95		RU-103	
	(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)	
1	0.078	0.045	0.0000	0.0013	0.0000	0.0033	0.0006	0.0086	0.0033	0.0051
2	0.041	0.050	0.0000	0.0009	-0.0010	0.0035	-0.0050	0.0092	-0.0010	0.0043
3	0.041	0.042	0.0007	0.0010	0.0019	0.0045	-0.0030	0.0069	0.0006	0.0055
4	0.072	0.040	0.0001	0.0009	0.0000	0.0027	-0.0040	0.0064	-0.0010	0.0046
10	0.103	0.040	0.0002	0.0010	0.0000	0.0040	0.0071	0.0089	0.0012	0.0041
11	0.042	0.034	0.0002	0.0008	0.0012	0.0045	0.0000	0.0058	0.0006	0.0060
12X	0.044	0.026	0.0000	0.0007	-0.0010	0.0043	-0.0080	0.0064	-0.0030	0.0042
15C	0.057	0.044	0.0000	0.0007	-0.0060	0.0043	-0.0070	0.0095	0.0000	0.0042
27	0.075	0.041	0.0000	0.0010	-0.0030	0.0039	-0.0010	0.0089	-0.0020	0.0049

LOCATION	RU-106		CS-134		CS-137		BA-140		CE-141	
	(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)	
1	-0.0020	0.0087	0.0006	0.0008	0.0000	0.0009	-0.1130	0.1797	0.0011	0.0072
2	0.0057	0.0077	0.0003	0.0011	0.0002	0.0007	0.0000	0.1475	0.0067	0.0073
3	-0.0010	0.0089	0.0004	0.0008	0.0000	0.0010	-	-	0.0017	0.0077
4	-0.0100	0.0082	0.0000	0.0009	0.0001	0.0010	0.0134	0.2084	-0.0010	0.0067
10	-0.0050	0.0097	0.0010	0.0009	0.0003	0.0008	0.1039	0.1470	-0.0020	0.0068
11	-0.0040	0.0072	0.0000	0.0008	0.0000	0.0009	0.1008	0.2468	-0.0070	0.0064
12X	-0.0020	0.0082	0.0001	0.0007	0.0000	0.0010	-0.0240	0.2062	0.0040	0.0068
15C	0.0013	0.0084	0.0002	0.0012	0.0000	0.0010	0.0090	0.1714	0.0025	0.0074
27	-0.0040	0.0089	0.0000	0.0010	0.0000	0.0009	-0.0620	0.2196	-0.0080	0.0062

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

## ANALYSES

LOCATION	BE-7		CO-60		ZR-95		NB-95		RU-103	
	(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)	
1	0.062	0.027	0.0000	0.0010	-0.0010	0.0031	0.0014	0.0036	-0.0010	0.0025
2	0.069	0.031	0.0000	0.0009	0.0012	0.0028	0.0016	0.0041	-0.0020	0.0027
3	0.039	0.029	0.0009	0.0011	0.0011	0.0015	0.0000	0.0032	0.0000	0.0023
4	0.073	0.034	0.0005	0.0011	-0.0010	0.0031	0.0000	0.0048	0.0007	0.0033
10	0.055	0.036	-0.0010	0.0014	0.0005	0.0041	-0.0050	0.0061	-0.0030	0.0033
11	0.059	0.037	0.0008	0.0014	0.0000	0.0043	-0.0080	0.0053	0.0004	0.0029
12X	0.086	0.039	0.0002	0.0009	0.0000	0.0037	-0.0020	0.0029	0.0000	0.0026
15C	0.044	0.032	0.0000	0.0006	0.0022	0.0028	0.0027	0.0060	-0.0010	0.0032
27	0.057	0.034	0.0001	0.0011	-0.0010	0.0025	0.0012	0.0047	0.0000	0.0027

LOCATION	RU-106		CS-134		CS-137		BA-140		CE-141	
	(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)	
1	-0.0100	0.0084	0.0000	0.0010	0.0005	0.0009	0.0010	0.0265	-0.0020	0.0033
2	-0.0040	0.0090	0.0000	0.0006	0.0001	0.0004	-0.0220	0.0449	-0.0008	0.0030
3	-0.0010	0.0082	0.0007	0.0009	0.0000	0.0010	0.0114	0.0396	0.0032	0.0040
4	-0.0010	0.0084	0.0007	0.0010	0.0000	0.0012	-0.0140	0.0631	-0.0010	0.0040
10	0.0004	0.0076	0.0000	0.0012	0.0000	0.0013	-0.0120	0.0540	-0.0020	0.0050
11	-0.0020	0.0085	0.0000	0.0012	0.0000	0.0015	0.0117	0.0701	0.0017	0.0048
12X	0.0015	0.0096	0.0000	0.0009	0.0000	0.0011	-0.0120	0.0447	0.0026	0.0037
15C	0.0041	0.0066	0.0002	0.0009	0.0000	0.0008	-0.0260	0.0526	-0.0010	0.0039
27	-0.0070	0.0112	0.0000	0.0008	0.0001	0.0010	0.0108	0.0571	0.0013	0.0037

TABLE 8  
GOAT'S MILK  
(PCI/L)

LOCATION	COLLECTION DATE	SR-89		SR-90		I-131		CS-134		CS-137		BA-140		LA-140	
		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)	
21	04/26/00	.	.	.	.	0.07	0.16	0.2	3.1	6.2	4.4	-2	4	-2.7	4.3
21	05/04/00	.	.	.	.	0.01	0.14	1.3	2.5	6.6	4.0	-2	4	-2.5	4.8
21	06/28/00	-1.0	4.1	3.8	0.8	-0.00	0.26	-1.7	3.2	12.0	4.7	-4	4	-4.3	5.0
21	07/19/00	.	.	.	.	0.17	0.38	-4.2	4.4	15.5	6.2	2	6	2.6	7.4
21	08/16/00	-12	5.8	2.2	1.1	0.16	0.24	-0.7	2.7	12.2	4.4	-1	4	-0.9	4.1
22	04/26/00	.	.	.	.	0.02	0.27	-2.2	5.1	2.1	3.9	-3	6	-3.7	6.6
22	05/04/00	.	.	.	.	0.14	0.18	0.8	2.3	1.3	2.7	0	3	0.3	3.8
22	06/28/00	0.0	3.5	11.0	1.5	0.17	0.41	1.3	3.2	19.5	5.5	-1	4	-0.8	4.9
22	08/16/00	.	.	.	.	-0.00	0.15	-0.3	2.5	36.2	5.0	-0	3	-0.3	3.4
22	09/26/00	2.2	5.6	44.4	3.9	0.07	0.33	0.4	2.7	9.5	4.0	1	5	1.1	5.8
24C	03/23/00	-2.4	4.3	1.2	0.8	0.08	0.13	-0.1	3.2	3.5	3.6	2	6	2.0	6.6
24C	06/28/00	.	.	A	.	0.02	0.28	1.5	3.4	2.3	3.3	1	5	1.6	5.3
24C	07/19/00	.	.	.	.	0.08	0.34	2.5	2.9	6.8	3.1	-1	4	-1.7	4.2
24C	08/16/00	-11	5.7	1.1	1.0	0.12	0.19	-0.3	2.7	2.6	3.2	-1	4	-0.7	4.8

PASTURE GRASS OR FEED WAS SAMPLED AS A SUBSTITUTE FOR UNAVAILABLE GOAT MILK.

A: DUE TO LABORATORY OVERSIGHT, QUARTERLY SAMPLE ANALYSES FOR SR-89/90 WERE FORGOTTEN.  
THE LABORATORY HAS IMPLEMENTED PROCEDURE STEPS TO PREVENT RECURRENCE.

TABLE 9  
PASTURE GRASS \*  
(PCI/G WET WT.)

LOCATION	COLLECTION DATE	BE-7		K-40		CR-51		MN-54		CO-58		FE-59	
		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)	
21	01/19/00	0.27	0.27	11.56	0.92	-0.11	0.32	0.016	0.032	0.019	0.032	0.068	0.123
21	02/23/00	0.11	0.19	10.32	0.89	-0.01	0.22	-0.026	0.025	0.014	0.024	0.058	0.088
21	03/23/00	-0.07	0.21	13.99	0.84	-0.14	0.25	-0.016	0.025	0.003	0.026	-0.029	0.070
21	09/26/00	0.52	0.43	15.08	1.24	0.21	0.37	-0.004	0.036	-0.032	0.040	0.101	0.099
21	10/25/00	0.46	0.30	13.43	1.02	-0.27	0.26	-0.003	0.029	-0.029	0.029	0.011	0.071
21	11/15/00	0.43	0.36	14.44	1.10	-0.15	0.37	-0.031	0.031	-0.010	0.034	0.061	0.089
21	12/20/00	0.12	0.26	14.34	0.95	-0.18	0.31	-0.008	0.030	-0.002	0.032	-0.063	0.074
22	01/19/00	0.13	0.14	10.65	0.67	0.16	0.29	-0.015	0.026	0.003	0.028	-0.018	0.081
22	02/23/00	0.02	0.17	12.19	0.72	0.00	0.20	-0.016	0.021	0.031	0.039	-0.015	0.059
22	03/23/00	0.00	0.21	3.49	0.73	-0.21	0.24	0.008	0.028	-0.006	0.026	0.014	0.087
22	07/19/00	0.69	0.12	5.64	0.32	0.05	0.11	0.001	0.009	0.001	0.015	-0.021	0.025
22	10/25/00	0.90	0.40	14.12	0.89	-0.09	0.38	-0.003	0.028	0.016	0.032	0.001	0.080
22	11/15/00	0.37	0.27	15.18	1.07	-0.26	0.35	0.037	0.031	-0.018	0.032	0.043	0.086
22	12/20/00	0.15	0.23	12.12	0.97	0.02	0.26	-0.001	0.028	-0.005	0.028	-0.065	0.068
23X	01/19/00	0.02	0.26	15.15	0.80	0.28	0.36	-0.012	0.028	-0.021	0.033	0.034	0.099
23X	02/23/00	0.10	0.20	14.49	0.82	-0.03	0.24	-0.016	0.023	0.003	0.024	0.036	0.072
23X	03/23/00	-0.04	0.21	13.19	0.82	0.14	0.26	0.018	0.025	0.019	0.026	-0.066	0.071
23X	04/26/00	0.46	0.06	5.47	0.25	0.04	0.04	-0.005	0.006	-0.005	0.006	0.001	0.014
23X	05/17/00	0.18	0.10	5.84	0.32	-0.05	0.08	0.004	0.009	0.006	0.009	0.001	0.020
23X	06/28/00	0.14	0.08	3.99	0.32	-0.09	0.08	0.001	0.010	-0.001	0.009	-0.001	0.021
23X	07/19/00	0.30	0.11	6.31	0.37	-0.06	0.10	0.002	0.010	0.011	0.010	-0.010	0.027
23X	08/16/00	0.66	0.11	3.50	0.30	-0.01	0.06	0.000	0.009	0.001	0.008	-0.013	0.019
23X	09/26/00	0.40	0.27	4.45	0.73	-0.03	0.20	-0.017	0.023	-0.014	0.023	-0.044	0.056
23X	10/25/00	1.48	0.14	3.84	0.27	-0.06	0.09	0.000	0.009	-0.003	0.009	0.018	0.022
23X	11/15/00	0.51	0.36	10.37	0.84	-0.08	0.37	0.001	0.028	-0.001	0.032	-0.015	0.082
23X	12/20/00	0.18	0.27	12.14	0.92	0.23	0.33	-0.004	0.029	0.019	0.034	0.034	0.073
24C	01/19/00	0.65	0.28	16.80	0.67	-0.11	0.28	0.022	0.021	0.000	0.024	0.025	0.075
24C	02/23/00	0.24	0.19	11.67	0.77	-0.04	0.22	-0.015	0.025	0.000	0.024	-0.058	0.086
24C	04/26/00	0.19	0.20	14.02	0.98	-0.11	0.21	-0.008	0.028	-0.014	0.024	0.027	0.058
24C	05/17/00	0.09	0.03	2.49	0.14	0.00	0.03	0.001	0.004	0.001	0.003	-0.002	0.009
24C	09/26/00	0.10	0.27	12.74	0.97	-0.17	0.34	0.014	0.030	0.027	0.036	-0.023	0.082
24C	10/25/00	3.12	0.51	14.66	1.17	-0.07	0.39	-0.015	0.036	0.013	0.037	0.027	0.098
24C	11/15/00	1.21	0.40	9.07	0.81	0.15	0.39	0.006	0.028	-0.034	0.033	-0.045	0.078
24C	12/20/00	0.27	0.29	11.87	1.02	-0.07	0.29	-0.019	0.030	0.015	0.028	0.002	0.077

\* SAMPLES TAKEN AS A SUBSTITUTE FOR UNAVAILABLE GOAT MILK.

TABLE 9  
PASTURE GRASS \*  
(PCI/G WET WT.)

LOCATION	COLLECTION DATE	CO-60		ZN-65		ZR-95		NB-95		RU-103		RU-106	
		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)	
21	01/19/00	0.000	0.037	-0.028	0.069	0.021	0.056	-0.020	0.040	-0.003	0.035	0.206	0.278
21	02/23/00	-0.005	0.029	-0.037	0.060	-0.025	0.045	-0.046	0.045	-0.009	0.025	-0.097	0.227
21	03/23/00	-0.005	0.026	0.050	0.108	0.023	0.041	0.031	0.044	-0.003	0.026	0.265	0.237
21	09/26/00	0.001	0.041	-0.063	0.116	-0.009	0.067	0.003	0.046	0.022	0.040	-0.100	0.331
21	10/25/00	0.003	0.033	0.011	0.219	0.023	0.052	0.075	0.068	0.017	0.029	0.132	0.240
21	11/15/00	0.022	0.036	-0.027	0.098	-0.006	0.059	-0.026	0.045	0.021	0.037	-0.119	0.270
21	12/20/00	0.014	0.031	-0.027	0.107	0.021	0.053	0.031	0.032	0.034	0.033	-0.205	0.296
22	01/19/00	0.032	0.024	0.014	0.090	-0.015	0.045	0.069	0.055	-0.023	0.029	-0.334	0.247
22	02/23/00	-0.015	0.020	0.013	0.074	-0.019	0.036	0.020	0.053	-0.025	0.022	-0.131	0.198
22	03/23/00	-0.028	0.031	-0.116	0.062	-0.005	0.046	-0.006	0.030	-0.005	0.026	-0.023	0.245
22	07/19/00	-0.001	0.009	-0.006	0.034	0.010	0.016	-0.010	0.019	-0.002	0.011	-0.027	0.086
22	10/25/00	-0.017	0.027	0.021	0.152	0.026	0.056	0.025	0.059	-0.031	0.036	-0.268	0.266
22	11/15/00	-0.033	0.030	-0.073	0.072	0.019	0.056	0.021	0.043	0.004	0.035	0.085	0.258
22	12/20/00	0.027	0.033	-0.029	0.157	0.031	0.051	0.017	0.055	-0.004	0.029	-0.067	0.258
23X	01/19/00	-0.005	0.026	0.069	0.096	-0.024	0.053	0.018	0.039	-0.028	0.035	0.023	0.257
23X	02/23/00	0.002	0.023	-0.044	0.057	0.002	0.040	0.003	0.028	0.013	0.025	-0.054	0.213
23X	03/23/00	0.000	0.024	-0.050	0.060	0.001	0.043	0.032	0.073	0.001	0.026	-0.051	0.239
23X	04/26/00	-0.001	0.007	-0.010	0.021	0.003	0.010	-0.001	0.006	0.001	0.005	0.039	0.053
23X	05/17/00	-0.001	0.009	0.001	0.021	-0.005	0.015	0.008	0.008	-0.006	0.009	-0.017	0.084
23X	06/28/00	0.004	0.011	0.008	0.046	0.011	0.016	0.003	0.011	-0.001	0.009	-0.037	0.082
23X	07/19/00	-0.007	0.011	0.000	0.024	-0.011	0.017	0.001	0.013	0.000	0.011	0.037	0.082
23X	08/16/00	0.002	0.009	0.007	0.020	0.001	0.013	0.001	0.008	-0.001	0.007	0.040	0.068
23X	09/26/00	0.013	0.026	-0.018	0.076	-0.023	0.035	-0.012	0.032	-0.006	0.023	-0.030	0.208
23X	10/25/00	-0.002	0.009	0.037	0.051	0.003	0.015	0.017	0.015	0.006	0.009	-0.040	0.077
23X	11/15/00	0.005	0.026	-0.029	0.101	-0.049	0.053	0.011	0.093	-0.026	0.036	-0.067	0.259
23X	12/20/00	0.010	0.029	0.006	0.107	-0.026	0.053	0.002	0.039	0.001	0.033	-0.010	0.283
24C	01/19/00	0.005	0.020	-0.021	0.073	0.040	0.040	-0.037	0.048	0.000	0.027	-0.188	0.191
24C	02/23/00	0.016	0.030	-0.028	0.060	-0.007	0.042	-0.019	0.028	0.008	0.024	0.200	0.223
24C	04/26/00	-0.019	0.032	-0.070	0.067	0.030	0.045	-0.023	0.030	-0.025	0.024	0.037	0.235
24C	05/17/00	0.000	0.004	-0.008	0.009	0.001	0.006	-0.001	0.004	0.003	0.003	-0.013	0.031
24C	09/26/00	-0.001	0.032	-0.176	0.263	0.007	0.056	-0.041	0.071	-0.018	0.033	-0.138	0.287
24C	10/25/00	-0.032	0.039	-0.046	0.088	-0.045	0.064	-0.031	0.047	0.036	0.042	0.001	0.319
24C	11/15/00	0.009	0.027	-0.031	0.139	0.035	0.053	0.086	0.102	-0.006	0.036	0.034	0.256
24C	12/20/00	0.000	0.033	0.080	0.132	0.054	0.055	-0.061	0.057	-0.011	0.031	0.076	0.272

\* SAMPLES TAKEN AS A SUBSTITUTE FOR UNAVAILABLE GOAT MILK.

TABLE 9  
PASTURE GRASS \*  
(PCI/G WET WT.)

LOCATION	COLLECTION DATE	I-131		CS-134		CS-137		BA-140		LA-140		CE-141	
		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)	
21	01/19/00	0.001	0.021	0.015	0.030	0.036	0.035	0.029	0.107	0.033	0.123	0.005	0.049
21	02/23/00	0.001	0.011	0.029	0.025	0.061	0.031	-0.038	0.057	-0.044	0.066	-0.083	0.046
21	03/23/00	0.005	0.018	0.030	0.027	0.023	0.027	0.006	0.050	0.007	0.058	0.007	0.091
21	09/26/00	0.003	0.018	0.036	0.037	-0.001	0.035	-0.029	0.113	-0.034	0.130	0.000	0.058
21	10/25/00	0.023	0.026	-0.007	0.028	-0.029	0.029	-0.023	0.077	-0.026	0.089	-0.032	0.043
21	11/15/00	0.019	0.026	0.007	0.029	-0.011	0.028	-0.072	0.147	-0.083	0.169	0.008	0.045
21	12/20/00	0.001	0.018	-0.033	0.031	-0.023	0.032	0.039	0.066	0.045	0.076	0.053	0.078
22	01/19/00	-0.006	0.010	0.019	0.027	0.036	0.030	-0.020	0.075	-0.023	0.086	-0.004	0.051
22	02/23/00	0.000	0.010	0.011	0.022	-0.019	0.022	-0.021	0.043	-0.024	0.050	0.052	0.068
22	03/23/00	0.004	0.016	0.023	0.027	0.068	0.038	-0.031	0.062	-0.036	0.071	0.023	0.031
22	07/19/00	0.009	0.020	0.004	0.010	-0.004	0.009	0.011	0.029	0.013	0.033	-0.011	0.028
22	10/25/00	0.027	0.030	0.001	0.029	0.000	0.028	-0.039	0.110	-0.045	0.126	-0.022	0.094
22	11/15/00	0.027	0.028	0.016	0.028	0.008	0.028	-0.005	0.135	-0.006	0.156	0.026	0.043
22	12/20/00	0.009	0.024	0.027	0.029	0.031	0.030	0.043	0.077	0.049	0.088	0.041	0.065
23X	01/19/00	0.010	0.024	0.002	0.030	0.015	0.029	-0.009	0.102	-0.011	0.118	-0.028	0.061
23X	02/23/00	0.001	0.013	0.006	0.024	-0.008	0.024	-0.021	0.053	-0.025	0.061	0.024	0.075
23X	03/23/00	0.002	0.010	0.012	0.027	0.026	0.026	0.005	0.052	0.006	0.060	0.023	0.069
23X	04/26/00	0.000	0.008	0.005	0.006	0.000	0.006	-0.001	0.009	-0.001	0.010	0.000	0.006
23X	05/17/00	-0.001	0.010	0.001	0.010	0.001	0.014	0.001	0.016	0.001	0.018	0.001	0.018
23X	06/28/00	0.001	0.008	0.002	0.009	0.012	0.008	-0.008	0.018	-0.009	0.020	0.003	0.010
23X	07/19/00	0.013	0.022	-0.007	0.010	0.001	0.010	-0.001	0.033	-0.001	0.038	-0.001	0.014
23X	08/16/00	0.003	0.008	0.006	0.009	0.007	0.013	0.008	0.015	-0.004	0.009	-0.004	0.009
23X	09/26/00	0.003	0.010	0.011	0.025	-0.025	0.027	0.034	0.062	0.039	0.072	0.007	0.027
23X	10/25/00	0.019	0.027	0.005	0.010	0.044	0.012	-0.004	0.020	-0.004	0.023	-0.007	0.023
23X	11/15/00	0.000	0.020	0.016	0.029	0.029	0.032	-0.060	0.106	-0.069	0.122	0.039	0.095
23X	12/20/00	0.004	0.019	0.018	0.032	0.038	0.030	0.051	0.078	0.059	0.090	0.039	0.098
24C	01/19/00	0.013	0.017	-0.002	0.021	0.016	0.021	-0.044	0.083	-0.050	0.095	-0.007	0.049
24C	02/23/00	0.004	0.012	0.033	0.025	0.000	0.025	0.049	0.053	0.056	0.061	0.016	0.037
24C	04/26/00	0.005	0.019	-0.008	0.028	0.014	0.029	-0.036	0.052	-0.041	0.060	0.005	0.037
24C	05/17/00	0.001	0.004	0.001	0.003	-0.001	0.005	-0.001	0.006	0.000	0.004	-0.001	0.004
24C	09/26/00	0.001	0.014	-0.025	0.032	0.000	0.032	0.059	0.078	0.067	0.090	-0.012	0.078
24C	10/25/00	0.015	0.026	0.019	0.034	0.048	0.033	-0.031	0.150	-0.035	0.173	-0.032	0.067
24C	11/15/00	-0.007	0.017	0.021	0.030	0.012	0.028	-0.074	0.118	-0.085	0.136	0.056	0.088
24C	12/20/00	0.002	0.017	0.016	0.031	0.005	0.029	-0.090	0.084	-0.103	0.097	-0.050	0.079

\* SAMPLES TAKEN AS A SUBSTITUTE FOR UNAVAILABLE GOAT MILK.



TABLE 9  
PASTURE GRASS \*  
(PCI/G WET WT.)

LOCATION	COLLECTION DATE	CE-144		RA-226		TH-228	
		(+/ -)		(+/ -)		(+/ -)	
21	01/19/00	0.032	0.113	2.656	0.483	0.222	0.106
21	02/23/00	0.063	0.093	2.219	0.613	0.288	0.120
21	03/23/00	-0.055	0.114	0.572	1.032	0.172	0.116
21	09/26/00	0.043	0.131	0.316	0.340	0.138	0.206
21	10/25/00	-0.008	0.107	0.462	0.825	0.134	0.131
21	11/15/00	-0.053	0.110	-0.385	0.848	-0.007	0.197
21	12/20/00	0.004	0.138	-0.388	1.207	0.282	0.192
22	01/19/00	0.014	0.115	-0.025	0.811	-0.239	0.126
22	02/23/00	-0.032	0.094	0.403	0.971	0.118	0.110
22	03/23/00	-0.063	0.100	0.440	0.824	0.130	0.127
22	07/19/00	-0.023	0.042	0.255	0.342	0.010	0.052
22	10/25/00	0.025	0.126	-0.779	1.100	0.099	0.143
22	11/15/00	-0.010	0.109	-0.773	0.810	0.113	0.133
22	12/20/00	-0.082	0.103	-0.066	0.824	0.034	0.177
23X	01/19/00	-0.050	0.124	-0.040	0.883	0.078	0.114
23X	02/23/00	0.072	0.104	0.642	1.066	0.128	0.122
23X	03/23/00	0.071	0.112	0.670	1.029	0.069	0.176
23X	04/26/00	0.009	0.022	0.101	0.166	0.039	0.027
23X	05/17/00	-0.007	0.039	0.123	0.323	0.003	0.051
23X	06/28/00	-0.028	0.032	-0.066	0.242	0.019	0.046
23X	07/19/00	-0.004	0.035	0.068	0.264	0.044	0.047
23X	08/16/00	0.008	0.029	-0.089	0.194	0.030	0.045
23X	09/26/00	-0.041	0.077	-0.077	0.414	0.052	0.089
23X	10/25/00	0.042	0.039	-0.149	0.321	0.019	0.052
23X	11/15/00	-0.134	0.127	-0.435	1.120	0.100	0.171
23X	12/20/00	-0.062	0.133	0.576	1.211	0.019	0.173
24C	01/19/00	-0.065	0.092	-0.257	0.673	0.054	0.112
24C	02/23/00	-0.049	0.094	0.538	0.662	0.152	0.147
24C	04/26/00	-0.034	0.099	2.729	0.426	0.281	0.143
24C	05/17/00	-0.011	0.012	0.054	0.089	0.037	0.015
24C	09/26/00	-0.092	0.137	-0.427	1.142	-0.004	0.176
24C	10/25/00	-0.172	0.125	-0.189	0.974	0.334	0.119
24C	11/15/00	0.080	0.126	0.660	1.056	0.360	0.104
24C	12/20/00	-0.088	0.110	0.154	0.880	0.152	0.117

\* SAMPLES TAKEN AS A SUBSTITUTE FOR UNAVAILABLE GOAT MILK.

TABLE 12  
FRUITS & VEGETABLES  
(PCI/G WET WT.)

LOCATION	COLLECTION DATE	TYPE	BE-7		K-40		CR-51		MN-54		CO-58		FE-59	
			(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)	
25	06/23/00	LETTUCE	0.07	0.07	3.81	0.26	-0.04	0.08	0.003	0.008	-0.005	0.008	0.003	0.020
25	06/23/00	STRAWBERRIES	0.03	0.05	1.34	0.17	-0.04	0.06	0.000	0.005	-0.005	0.005	0.005	0.013
25	06/27/00	LETTUCE	0.06	0.09	1.81	0.30	0.03	0.10	0.000	0.012	0.012	0.010	-0.001	0.021
25	09/15/00	APPLES	-0.00	0.07	0.76	0.19	0.05	0.09	0.004	0.007	0.003	0.008	0.011	0.018
25	09/15/00	LETTUCE	0.10	0.08	2.02	0.20	-0.04	0.07	-0.001	0.007	0.002	0.007	0.004	0.017
26C	06/23/00	LETTUCE	0.05	0.05	3.22	0.19	0.03	0.05	0.001	0.005	0.004	0.005	0.009	0.013
26C	06/23/00	STRAWBERRIES	0.05	0.04	1.20	0.12	0.00	0.04	0.000	0.004	0.001	0.004	0.002	0.009
26C	09/15/00	APPLES	0.01	0.06	1.32	0.18	0.01	0.07	0.000	0.006	-0.003	0.007	0.004	0.014
26C	09/15/00	CABBAGE	-0.04	0.07	1.97	0.27	0.01	0.09	0.001	0.009	-0.004	0.009	0.019	0.020

LOCATION	COLLECTION DATE	TYPE	CO-60		ZN-65		ZR-95		NB-95		RU-103		RU-106	
			(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)	
25	06/23/00	LETTUCE	0.004	0.008	-0.006	0.020	-0.009	0.013	0.008	0.009	-0.001	0.008	-0.003	0.075
25	06/23/00	STRAWBERRIES	0.007	0.006	-0.007	0.012	0.006	0.010	0.003	0.006	0.003	0.006	-0.007	0.056
25	06/27/00	LETTUCE	0.008	0.012	0.009	0.032	-0.002	0.018	0.002	0.012	-0.004	0.010	-0.069	0.100
25	09/15/00	APPLES	0.009	0.009	0.007	0.024	0.000	0.014	0.002	0.009	0.000	0.009	-0.063	0.082
25	09/15/00	LETTUCE	0.001	0.007	-0.008	0.017	0.004	0.013	0.004	0.008	-0.001	0.007	-0.019	0.067
26C	06/23/00	LETTUCE	0.003	0.006	-0.009	0.013	-0.003	0.010	0.000	0.006	0.000	0.006	-0.001	0.054
26C	06/23/00	STRAWBERRIES	0.001	0.004	0.000	0.010	0.001	0.008	0.002	0.005	-0.001	0.004	0.007	0.042
26C	09/15/00	APPLES	0.002	0.007	0.001	0.033	0.001	0.013	0.001	0.009	0.000	0.007	-0.033	0.063
26C	09/15/00	CABBAGE	0.012	0.011	-0.029	0.022	0.005	0.015	0.008	0.010	-0.001	0.009	0.023	0.081

TABLE 12  
FRUITS & VEGETABLES  
(PCI/G WET WT.)

LOCATION	COLLECTION DATE	TYPE	I-131		CS-134		CS-137		BA-140		LA-140		CE-141	
			(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)	
25	06/23/00	LETTUCE	0.000	0.021	-0.001	0.011	0.006	0.008	0.005	0.013	0.005	0.014	0.001	0.015
25	06/23/00	STRAWBERRIES	-0.001	0.016	0.004	0.006	-0.002	0.006	-0.007	0.010	-0.008	0.012	-0.009	0.013
25	06/27/00	LETTUCE	0.004	0.021	-0.003	0.012	0.004	0.012	-0.002	0.018	-0.003	0.021	-0.011	0.016
25	09/15/00	APPLES	-0.002	0.026	0.002	0.008	-0.007	0.009	0.002	0.017	0.002	0.020	-0.003	0.013
25	09/15/00	LETTUCE	0.002	0.024	0.001	0.007	0.002	0.008	-0.008	0.015	-0.009	0.017	0.004	0.014
26C	06/23/00	LETTUCE	-0.004	0.014	0.002	0.006	0.000	0.006	0.001	0.009	0.001	0.011	0.010	0.008
26C	06/23/00	STRAWBERRIES	0.002	0.012	0.000	0.004	0.000	0.004	-0.001	0.007	-0.001	0.008	0.005	0.008
26C	09/15/00	APPLES	0.001	0.021	0.004	0.006	-0.006	0.007	0.003	0.012	0.003	0.014	0.000	0.012
26C	09/15/00	CABBAGE	0.011	0.026	-0.006	0.010	0.000	0.009	0.001	0.019	0.002	0.022	-0.002	0.012

LOCATION	COLLECTION DATE	TYPE	CE-144		RA-226		TH-228	
			(+/ -)		(+/ -)		(+/ -)	
25	06/23/00	LETTUCE	0.014	0.041	-0.201	0.320	0.013	0.049
25	06/23/00	STRAWBERRIES	-0.017	0.028	0.169	0.148	0.016	0.027
25	06/27/00	LETTUCE	0.026	0.049	0.043	0.358	0.023	0.055
25	09/15/00	APPLES	-0.007	0.039	0.115	0.241	0.029	0.033
25	09/15/00	LETTUCE	0.000	0.036	0.082	0.236	0.011	0.038
26C	06/23/00	LETTUCE	0.015	0.027	-0.036	0.180	0.011	0.034
26C	06/23/00	STRAWBERRIES	0.011	0.021	-0.101	0.140	0.023	0.022
26C	09/15/00	APPLES	-0.002	0.033	0.098	0.184	0.031	0.025
26C	09/15/00	CABBAGE	-0.017	0.039	-0.042	0.252	0.003	0.037

TABLE 13  
BROADLEAF VEGETATION  
(PCI/G WET WT.)

LOCATION	COLLECTION DATE	BE-7		K-40		CR-51		MN-54		CO-58		FE-59	
		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)	
1	04/24/00	1.26	0.08	3.96	0.21	0.02	0.06	-0.001	0.006	0.000	0.006	-0.004	0.013
1	05/03/00	0.59	0.11	4.35	0.28	-0.01	0.08	-0.002	0.008	-0.003	0.008	0.000	0.019
1	05/24/00	0.37	0.07	1.52	0.16	-0.02	0.06	-0.008	0.005	-0.002	0.006	0.000	0.013
1	06/05/00	0.35	0.10	2.98	0.26	-0.01	0.08	-0.001	0.008	0.002	0.009	0.003	0.019
1	07/06/00	0.76	0.15	2.74	0.36	0.07	0.10	0.004	0.013	-0.004	0.011	0.017	0.026
1	08/14/00	0.97	0.12	2.94	0.28	-0.05	0.07	0.000	0.009	0.002	0.008	-0.006	0.019
1	09/06/00	0.88	0.12	2.59	0.26	0.04	0.08	0.003	0.009	0.000	0.009	-0.005	0.022
1	10/11/00	1.26	0.13	2.60	0.29	0.02	0.08	0.002	0.010	-0.004	0.009	-0.022	0.022
17	05/03/00	0.25	0.10	4.45	0.27	0.04	0.09	-0.002	0.008	-0.003	0.008	-0.001	0.019
17	05/24/00	0.42	0.08	1.84	0.16	-0.01	0.05	0.002	0.005	-0.003	0.005	-0.008	0.012
17	06/05/00	0.20	0.11	2.95	0.30	0.02	0.10	0.004	0.011	0.002	0.011	-0.017	0.024
17	07/06/00	0.40	0.11	2.35	0.24	0.00	0.08	-0.002	0.008	-0.006	0.009	0.000	0.018
17	08/14/00	0.57	0.09	1.76	0.19	-0.04	0.07	0.000	0.007	-0.001	0.007	-0.012	0.016
17	09/06/00	0.50	0.13	2.22	0.26	-0.02	0.09	0.006	0.009	-0.001	0.009	0.000	0.020
17	10/11/00	0.57	0.10	2.30	0.23	0.01	0.06	0.005	0.008	-0.004	0.006	0.005	0.018
18	05/03/00	0.09	0.07	5.44	0.25	-0.05	0.06	-0.003	0.007	-0.002	0.007	0.017	0.017
18	05/24/00	0.16	0.06	1.85	0.19	-0.05	0.05	0.001	0.005	0.000	0.005	-0.001	0.012
18	06/05/00	0.23	0.12	4.42	0.40	0.02	0.09	-0.003	0.012	0.001	0.010	0.009	0.025
18	07/06/00	0.36	0.11	2.93	0.28	0.05	0.09	-0.004	0.009	0.000	0.010	0.007	0.021
18	08/14/00	0.24	0.08	3.12	0.23	-0.07	0.07	-0.004	0.008	0.003	0.007	-0.005	0.017
18	09/06/00	0.39	0.10	2.68	0.28	-0.01	0.07	-0.001	0.008	0.006	0.008	-0.013	0.019
18	10/11/00	0.85	0.12	3.91	0.29	0.01	0.10	-0.001	0.009	0.000	0.010	-0.006	0.023

TABLE 13  
BROADLEAF VEGETATION  
(PCI/G WET WT.)

LOCATION	COLLECTION DATE	CO-60		ZN-65		ZR-95		NB-95		RU-103		RU-106	
		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)	
1	04/24/00	0.002	0.006	0.015	0.026	0.002	0.010	0.001	0.007	0.001	0.006	-0.040	0.053
1	05/03/00	-0.008	0.009	-0.009	0.026	-0.013	0.016	-0.001	0.010	0.000	0.009	-0.002	0.077
1	05/24/00	0.005	0.006	-0.004	0.019	0.001	0.010	0.006	0.011	-0.002	0.006	-0.020	0.051
1	06/05/00	0.001	0.008	0.000	0.030	-0.019	0.015	0.001	0.009	0.000	0.009	-0.055	0.081
1	07/06/00	0.013	0.014	0.015	0.024	-0.001	0.021	0.000	0.012	-0.002	0.011	0.028	0.107
1	08/14/00	0.009	0.009	0.017	0.034	-0.008	0.015	0.001	0.010	-0.002	0.008	0.004	0.077
1	09/06/00	0.009	0.009	-0.011	0.030	0.012	0.015	0.014	0.011	0.000	0.009	-0.026	0.086
1	10/11/00	0.005	0.011	-0.029	0.023	-0.003	0.015	0.018	0.015	0.005	0.009	-0.030	0.080
17	05/03/00	0.006	0.009	-0.003	0.018	0.003	0.014	-0.001	0.010	0.003	0.009	0.004	0.076
17	05/24/00	-0.003	0.006	0.033	0.030	0.001	0.010	-0.003	0.007	0.000	0.006	-0.011	0.050
17	06/05/00	0.007	0.011	-0.034	0.029	-0.006	0.017	0.003	0.020	0.007	0.011	-0.007	0.104
17	07/06/00	-0.001	0.009	-0.002	0.021	-0.005	0.014	-0.006	0.015	-0.013	0.009	-0.046	0.082
17	08/14/00	0.004	0.006	-0.015	0.023	-0.002	0.012	-0.003	0.013	-0.001	0.007	0.008	0.065
17	09/06/00	-0.004	0.009	0.005	0.031	0.002	0.015	0.007	0.011	0.000	0.009	0.028	0.085
17	10/11/00	0.006	0.009	0.004	0.065	0.003	0.013	-0.004	0.009	0.003	0.007	0.018	0.066
18	05/03/00	0.000	0.007	-0.009	0.024	-0.001	0.011	0.004	0.008	-0.002	0.007	-0.025	0.061
18	05/24/00	0.003	0.007	-0.025	0.014	0.007	0.010	-0.002	0.006	0.000	0.005	0.034	0.047
18	06/05/00	-0.001	0.012	-0.001	0.028	-0.001	0.019	-0.002	0.013	0.002	0.010	0.014	0.096
18	07/06/00	0.008	0.010	-0.015	0.034	0.017	0.016	0.011	0.010	-0.002	0.009	-0.005	0.085
18	08/14/00	-0.002	0.007	-0.027	0.019	0.001	0.012	0.004	0.008	-0.003	0.007	-0.042	0.069
18	09/06/00	0.001	0.009	0.002	0.027	0.012	0.014	0.004	0.009	-0.002	0.008	0.020	0.071
18	10/11/00	0.000	0.010	-0.055	0.068	0.004	0.016	0.010	0.011	0.006	0.010	-0.117	0.089

TABLE 13  
BROADLEAF VEGETATION  
(PCI/G WET WT.)

LOCATION	COLLECTION DATE	I-131		CS-134		CS-137		BA-140		LA-140		CE-141	
		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)	
1	04/24/00	0.003	0.014	0.006	0.006	-0.001	0.006	0.003	0.010	0.004	0.012	0.003	0.013
1	05/03/00	0.000	0.003	0.006	0.008	-0.002	0.009	0.001	0.015	0.001	0.017	-0.018	0.018
1	05/24/00	-0.004	0.015	0.005	0.006	0.008	0.007	0.008	0.011	0.009	0.012	-0.002	0.013
1	06/05/00	0.008	0.016	0.010	0.010	0.065	0.013	0.002	0.012	0.002	0.014	0.007	0.017
1	07/06/00	-0.004	0.023	-0.004	0.012	0.152	0.021	0.010	0.024	0.012	0.027	-0.010	0.013
1	08/14/00	0.006	0.017	0.001	0.009	0.027	0.012	0.003	0.017	0.003	0.020	0.005	0.010
1	09/06/00	0.008	0.022	0.006	0.010	0.016	0.012	-0.014	0.016	-0.016	0.019	-0.006	0.019
1	10/11/00	-0.003	0.025	0.004	0.009	0.059	0.014	-0.021	0.020	-0.024	0.023	-0.004	0.017
17	05/03/00	0.001	0.004	0.001	0.008	0.003	0.009	0.016	0.017	0.018	0.020	0.001	0.012
17	05/24/00	0.003	0.016	-0.004	0.006	0.000	0.005	0.004	0.011	0.004	0.012	0.004	0.011
17	06/05/00	-0.006	0.022	0.000	0.012	0.007	0.011	0.008	0.015	0.009	0.018	0.011	0.021
17	07/06/00	0.001	0.021	-0.002	0.011	0.018	0.011	0.005	0.015	0.006	0.018	-0.039	0.019
17	08/14/00	-0.007	0.021	0.009	0.007	0.004	0.007	-0.012	0.014	-0.014	0.016	-0.028	0.016
17	09/06/00	-0.011	0.024	-0.005	0.010	0.010	0.010	0.012	0.018	0.014	0.021	0.003	0.015
17	10/11/00	0.005	0.021	0.001	0.007	-0.004	0.007	-0.017	0.019	-0.019	0.021	-0.006	0.010
18	05/03/00	0.000	0.002	-0.002	0.007	0.003	0.007	-0.003	0.014	-0.004	0.016	-0.015	0.015
18	05/24/00	0.007	0.013	0.000	0.005	0.002	0.006	0.003	0.012	0.003	0.014	0.007	0.006
18	06/05/00	0.015	0.019	0.002	0.011	-0.005	0.012	-0.011	0.020	-0.012	0.023	-0.003	0.011
18	07/06/00	0.001	0.021	-0.002	0.012	0.004	0.011	-0.006	0.017	-0.007	0.019	-0.036	0.020
18	08/14/00	0.009	0.017	0.000	0.008	0.005	0.007	0.004	0.012	0.005	0.014	-0.005	0.016
18	09/06/00	0.001	0.018	0.005	0.009	-0.007	0.008	-0.010	0.018	-0.012	0.020	-0.011	0.014
18	10/11/00	0.010	0.031	0.001	0.010	0.003	0.010	0.008	0.020	0.009	0.022	-0.009	0.027

TABLE 13  
BROADLEAF VEGETATION  
(PCI/G WET WT.)

LOCATION	COLLECTION DATE	CE-144		RA-226		TH-228	
-----	-----	-----		-----		-----	
		(+/-)		(+/-)		(+/-)	
1	04/24/00	-0.036	0.026	0.146	0.296	0.068	0.025
1	05/03/00	-0.011	0.037	0.122	0.274	0.021	0.020
1	05/24/00	-0.005	0.026	-0.051	0.188	0.028	0.027
1	06/05/00	-0.007	0.040	0.001	0.309	0.014	0.049
1	07/06/00	0.017	0.045	-0.420	0.301	-0.007	0.062
1	08/14/00	-0.002	0.032	0.051	0.230	0.054	0.056
1	09/06/00	0.002	0.042	1.920	0.206	0.125	0.039
1	10/11/00	-0.004	0.035	-0.061	0.275	0.045	0.030
17	05/03/00	-0.028	0.038	0.063	0.263	0.009	0.047
17	05/24/00	0.002	0.025	0.149	0.187	0.018	0.031
17	06/05/00	-0.015	0.048	0.000	0.367	0.169	0.043
17	07/06/00	-0.003	0.038	0.171	0.298	0.005	0.049
17	08/14/00	-0.017	0.031	1.674	0.150	-0.018	0.042
17	09/06/00	-0.020	0.041	1.554	0.200	0.022	0.055
17	10/11/00	0.006	0.027	0.025	0.201	-0.073	0.044
18	05/03/00	-0.004	0.029	0.049	0.230	0.039	0.030
18	05/24/00	0.003	0.020	0.044	0.129	0.024	0.021
18	06/05/00	-0.059	0.041	0.217	0.271	0.128	0.055
18	07/06/00	0.008	0.042	-0.083	0.316	0.005	0.047
18	08/14/00	0.006	0.035	0.003	0.259	0.024	0.046
18	09/06/00	0.012	0.031	0.074	0.195	0.050	0.051
18	10/11/00	-0.027	0.042	-0.220	0.372	0.051	0.035

TABLE 14  
SEA WATER  
(PCI/L)

LOCATION	COLLECTION DATE	K-40		CR-51		MN-54		CO-58		FE-59		CO-60	
		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)	
32	02/03/00	309	44	1	16	-0.9	1.4	-0.2	1.3	0.9	4.8	-0.8	1.6
32	03/01/00	338	43	-7	15	-0.3	1.4	-0.9	1.2	1.0	4.5	0.1	1.4
32	03/29/00	291	46	-1	16	-0.2	1.5	-1.5	1.3	3.9	4.6	0.8	1.9
32	04/26/00	291	52	-8	19	0.5	1.6	-1.4	1.8	1.9	4.4	0.4	2.2
32	06/01/00	313	35	3	11	0.4	1.2	-0.1	1.1	-0.5	2.5	-0.8	1.3
32	06/27/00	244	34	-12	14	-0.1	1.3	-0.0	1.2	0.1	2.9	0.2	1.5
32	07/26/00	297	31	-14	14	-0.1	1.0	-0.5	1.1	-1.8	2.6	0.3	1.3
32	08/31/00	218	60	14	26	1.4	2.3	-0.6	2.0	-4.0	6.1	0.5	2.5
32	09/27/00	354	58	0	22	1.4	2.2	-3.1	2.5	-1.4	5.0	-0.8	1.9
32	11/02/00	321	57	-6	28	0.3	2.3	-0.8	2.3	0.9	5.2	-0.5	2.2
32	12/08/00	308	53	-13	19	0.8	1.6	-0.7	1.7	0.7	4.3	2.0	2.0
32	12/27/00	289	69	11	27	-0.9	2.5	1.6	2.7	0.0	7.0	1.9	2.9
35X	03/15/00	290	38	-3	15	0.3	1.3	0.1	1.4	-0.6	4.0	0.2	1.3
35X	06/09/00	267	32	-4	13	-0.4	1.0	-0.5	1.2	-0.7	2.8	0.6	1.3
35X	09/07/00	292	46	1	19	-0.8	1.4	-2.3	1.6	-1.2	3.4	0.6	1.9
35X	12/27/00	276	78	18	37	-2.3	3.0	-1.0	3.5	-8.7	8.4	1.1	3.6
37C	03/16/00	255	42	-12	15	-1.0	1.6	-1.1	1.4	0.6	4.7	-0.2	1.9
37C	06/06/00	248	34	-1	12	0.4	1.3	-1.1	1.2	1.1	3.0	-0.5	1.3
37C	08/24/00	289	36	-4	15	-0.7	1.1	-0.5	1.3	1.5	2.8	-0.0	1.5
37C	11/16/00	314	78	1	25	-1.8	3.4	2.9	3.1	-4.5	7.4	-1.9	4.3
39X	03/15/00	269	36	0	13	-0.6	1.2	-0.0	1.2	-0.2	3.8	0.0	1.3
39X	06/09/00	286	34	-10	13	0.2	1.2	-0.7	1.2	1.1	2.8	0.0	1.3
39X	09/07/00	304	51	-2	20	0.5	1.7	-0.4	1.8	-3.4	4.5	-1.5	2.1
39X	12/26/00	345	60	-4	29	-1.3	2.3	0.0	2.3	-0.7	5.2	1.2	2.6



TABLE 14  
SEA WATER  
(PCI/L)

LOCATION	COLLECTION DATE	ZN-65		ZR-95		NB-95		RU-103		RU-106		I-131	
		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)	
32	02/03/00	-5.9	6.8	1.5	2.7	-0.0	1.8	1.3	1.8	1	14	1	4
32	03/01/00	-1.8	6.3	1.1	2.8	3.4	2.4	-1.7	1.6	7	13	1	3
32	03/29/00	-2.5	3.9	1.2	2.7	0.8	1.7	-1.0	1.8	-10	15	-1	3
32	04/26/00	2.6	4.4	-0.8	3.9	0.7	2.1	-1.5	2.2	4	18	0	4
32	06/01/00	-0.1	6.1	1.8	2.0	0.0	1.2	-0.9	1.2	6	11	-1	2
32	06/27/00	-3.3	2.7	-0.6	2.1	0.2	1.4	-1.4	1.4	-2	12	-1	3
32	07/26/00	-0.4	5.6	0.9	2.0	1.4	2.1	-1.3	1.3	-2	11	-0	4
32	08/31/00	-2.9	6.0	1.3	4.3	1.1	2.9	-1.0	2.8	1	24	1	6
32	09/27/00	-7.0	12.8	1.3	3.9	-0.2	2.5	-2.2	2.5	-13	20	-1	5
32	11/02/00	7.3	12.0	-0.8	3.9	-4.0	3.0	-1.5	2.7	-3	22	3	8
32	12/08/00	-2.9	4.5	-0.7	3.7	0.1	2.3	-2.3	2.3	13	18	-2	4
32	12/27/00	-1.0	5.8	1.0	3.7	2.4	3.1	0.7	2.5	-18	27	1	8
35X	03/15/00	-0.7	3.2	0.1	2.3	-1.3	1.5	-0.2	1.5	4	13	1	3
35X	06/09/00	-3.4	2.8	-0.6	2.2	-0.1	1.5	-0.2	1.4	0	11	-1	4
35X	09/07/00	-0.8	8.5	0.3	2.9	-0.6	1.8	-1.4	1.7	14	15	-3	4
35X	12/27/00	-25.2	10.3	-4.2	5.6	0.4	4.6	-2.7	3.8	-9	28	-4	9
37C	03/16/00	-1.5	3.7	-0.2	2.6	-0.9	1.5	-1.6	2.1	-13	15	1	3
37C	06/06/00	2.2	6.5	0.5	2.0	0.2	1.3	-0.9	1.4	-2	12	-0	3
37C	08/24/00	-1.3	5.4	-0.2	2.6	-0.3	2.1	-0.6	1.5	-4	12	-3	4
37C	11/16/00	-12.9	8.0	-3.5	4.7	-0.6	3.3	-2.0	2.9	10	25	1	6
39X	03/15/00	-1.4	2.9	0.8	2.1	0.2	1.4	-0.4	1.8	-6	13	-1	3
39X	06/09/00	1.9	6.3	-0.2	2.3	-0.9	2.3	-0.9	1.4	-8	12	-2	4
39X	09/07/00	-3.2	4.6	-1.2	3.6	-1.4	2.4	-0.9	1.9	0	19	0	5
39X	12/26/00	1.1	4.5	-0.1	4.3	-1.8	4.7	-2.0	2.9	1	20	3	8

TABLE 14  
SEA WATER  
(PCI/L)

LOCATION	COLLECTION DATE	CS-134		CS-137		BA-140		LA-140		RA-226		TH-228	
		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)	
32	02/03/00	-0.7	1.7	0.3	1.7	-2	3	-3	3	-8.1	46.1	3.8	6.9
32	03/01/00	-0.6	1.5	1.2	1.7	-2	2	-2	3	-13.1	45.3	5.5	5.7
32	03/29/00	-0.7	1.6	-0.8	1.8	-3	2	-3	3	-16.6	49.1	-2.8	5.7
32	04/26/00	3.0	7.7	-1.4	2.1	-1	3	-2	3	58.7	47.7	-0.5	7.2
32	06/01/00	-0.1	1.1	-1.1	1.3	-2	1	-3	2	-20.2	35.8	3.6	4.5
32	06/27/00	-0.2	1.3	0.1	1.4	-1	2	-1	2	-17.0	38.4	-2.1	4.7
32	07/26/00	0.5	1.1	-0.3	1.2	-1	2	-1	3	2.7	34.3	-3.5	4.1
32	08/31/00	-0.5	2.6	-1.7	2.8	1	5	1	6	68.4	55.3	-5.2	9.2
32	09/27/00	0.0	2.3	-0.2	2.2	-2	4	-2	4	-11.4	83.2	-6.3	8.3
32	11/02/00	-0.6	2.5	0.0	2.5	0	5	1	6	31.1	75.7	-4.7	9.2
32	12/08/00	-0.6	1.9	-0.8	2.0	2	3	3	4	12.3	57.4	1.0	7.7
32	12/27/00	-2.0	2.8	-1.0	3.2	-2	6	-2	7	20.0	87.0	-0.0	10.2
35X	03/15/00	-0.4	1.5	-0.9	1.4	-1	2	-1	2	13.7	50.8	-2.4	5.5
35X	06/09/00	0.7	1.2	-1.0	1.3	-1	2	-1	3	-8.6	33.9	-4.1	5.0
35X	09/07/00	0.6	1.8	-1.1	1.8	-3	3	-4	4	-0.7	50.2	-0.6	6.3
35X	12/27/00	0.1	3.8	1.9	3.7	-2	6	-2	6	-8.8	100.9	1.5	11.8
37C	03/16/00	-0.5	1.5	-0.9	1.7	-0	2	-0	3	-27.3	47.2	-3.3	6.9
37C	06/06/00	0.7	1.2	0.1	1.4	-1	2	-1	2	-4.8	37.6	1.5	5.4
37C	08/24/00	0.2	1.3	-0.2	1.4	0	2	0	2	-19.2	50.0	1.0	4.7
37C	11/16/00	1.0	2.9	-0.5	3.2	-3	4	-4	4	16.5	85.4	7.2	12.1
39X	03/15/00	1.2	1.3	0.7	1.4	-0	2	-0	2	85.6	30.9	-0.6	5.3
39X	06/09/00	-0.7	1.2	-0.9	1.3	3	2	3	3	21.0	41.0	2.3	5.0
39X	09/07/00	-1.9	1.6	0.6	2.2	-2	3	-2	4	9.3	58.5	-1.0	6.9
39X	12/26/00	-0.5	2.5	-2.1	2.7	-0	5	-0	6	71.4	58.2	-5.8	7.7

LOCATION	COLLECTION DATE	H-3	
-----	-----	-----	(+/-)
32	02/03/00	-654	711
32	03/01/00	948	749
32	03/29/00	283	702
32	04/26/00	194	740
32	06/01/00	522	679
32	06/27/00	94	688
32	07/26/00	1338	738
32	08/31/00	764	707
32	09/27/00	720	718
32	11/02/00	1057	734
32	12/08/00	1488	737
32	12/27/00	1004	768
35X	03/15/00	64	732
35X	06/09/00	-246	600
35X	09/07/00	-380	685
35X	12/27/00	-210	714
37C	03/16/00	-532	701
37C	06/06/00	217	610
37C	08/24/00	381	700
37C	11/16/00	-436	720
39X	03/15/00	-227	714
39X	06/09/00	-183	600
39X	09/07/00	-93	693
39X	12/26/00	-124	701

TABLE 15  
BOTTOM SEDIMENT  
(PCI/G DRY WT.)

LOCATION	COLLECTION DATE	BE-7		K-40		CR-51		MN-54		CO-58		FE-59	
		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)	
30X	04/12/00	-0.10	0.30	14.3	1.9	0.02	0.31	0.02	0.04	-0.02	0.03	0.06	0.13
30X	10/18/00	0.32	0.58	12.5	1.9	-0.27	0.54	0.01	0.05	0.00	0.05	0.02	0.16
31	04/12/00	-0.03	0.52	10.4	1.8	-0.02	0.58	0.07	0.08	-0.04	0.05	-0.14	0.17
31	10/18/00	-0.13	0.56	13.1	2.4	0.00	0.70	0.03	0.08	0.02	0.06	-0.04	0.14
32	03/15/00	0.05	0.30	11.8	1.5	-0.22	0.39	0.05	0.04	-0.01	0.04	-0.00	0.13
32	06/13/00	0.30	0.36	11.7	1.4	-0.20	0.29	0.01	0.03	0.00	0.03	-0.02	0.10
32	09/07/00	0.02	0.25	11.8	1.4	0.20	0.26	-0.01	0.03	-0.01	0.03	-0.00	0.11
32	12/27/00	-0.04	0.30	19.8	1.4	0.24	0.36	0.03	0.04	0.00	0.03	0.02	0.12
33	04/12/00	-0.19	0.26	12.8	1.9	-0.09	0.30	0.01	0.04	0.00	0.03	0.06	0.10
33	10/18/00	-0.14	0.54	16.3	3.1	0.18	0.53	0.04	0.06	0.01	0.06	-0.06	0.20
34	04/12/00	0.02	0.27	14.8	1.7	0.10	0.27	0.01	0.04	-0.02	0.03	0.07	0.11
34	10/18/00	0.06	0.52	15.9	2.8	-0.05	0.54	-0.04	0.06	-0.02	0.04	0.01	0.25
35	03/15/00	0.43	0.53	11.0	1.1	0.28	0.68	0.04	0.05	-0.01	0.05	0.15	0.15
35	06/09/00	0.15	0.34	9.5	1.4	-0.20	0.39	0.02	0.03	0.01	0.04	0.01	0.13
35	09/07/00	0.65	0.34	9.2	1.0	0.13	0.33	-0.02	0.03	-0.03	0.03	-0.03	0.09
35	12/27/00	0.35	0.39	10.0	1.2	0.03	0.50	0.02	0.05	-0.05	0.04	-0.00	0.12
36X	04/12/00	0.04	0.20	13.9	1.2	-0.08	0.23	0.01	0.02	0.01	0.02	-0.00	0.09
36X	10/18/00	-0.03	0.47	15.4	1.9	-0.22	0.55	-0.07	0.06	-0.05	0.07	-0.05	0.14
37C	04/12/00	0.06	0.15	13.4	1.4	-0.03	0.23	-0.00	0.02	0.02	0.03	0.01	0.07
37C	10/18/00	0.07	0.34	15.9	1.7	-0.17	0.42	0.02	0.04	0.02	0.04	0.02	0.07
39X	03/15/00	0.05	0.24	14.8	1.3	0.07	0.31	0.00	0.02	0.01	0.03	0.01	0.10
39X	06/09/00	0.04	0.25	13.3	1.2	-0.08	0.27	0.02	0.03	-0.00	0.03	-0.02	0.08
39X	09/07/00	0.22	0.19	14.0	1.1	-0.10	0.21	0.00	0.02	-0.00	0.02	-0.03	0.08
39X	12/26/00	-0.02	0.18	13.6	1.0	0.02	0.18	0.01	0.02	0.00	0.02	0.03	0.05

TABLE 15  
BOTTOM SEDIMENT  
(PCI/G DRY WT.)

LOCATION	COLLECTION DATE	CO-60		ZN-65		ZR-95		NB-95		RU-103		RU-106	
		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)	
30X	04/12/00	-0.00	0.04	-0.07	0.10	0.02	0.05	0.01	0.04	0.00	0.03	0.11	0.31
30X	10/18/00	0.04	0.05	-0.06	0.13	0.14	0.12	0.01	0.08	0.03	0.06	-0.07	0.49
31	04/12/00	-0.09	0.06	-0.17	0.15	0.05	0.14	-0.03	0.08	0.03	0.07	0.43	0.65
31	10/18/00	0.06	0.07	-0.17	0.19	0.06	0.15	0.02	0.08	-0.02	0.06	-0.74	0.64
32	03/15/00	0.01	0.04	-0.08	0.11	-0.00	0.06	0.03	0.05	-0.01	0.04	0.08	0.34
32	06/13/00	0.03	0.04	-0.09	0.09	0.02	0.06	0.01	0.04	0.01	0.03	-0.02	0.24
32	09/07/00	0.05	0.04	-0.03	0.08	0.00	0.05	0.01	0.04	-0.01	0.03	-0.08	0.26
32	12/27/00	0.04	0.04	0.03	0.14	0.05	0.07	-0.02	0.04	0.00	0.03	0.10	0.31
33	04/12/00	0.02	0.04	-0.14	0.11	-0.01	0.05	0.01	0.04	-0.00	0.03	0.08	0.35
33	10/18/00	-0.10	0.10	-0.15	0.20	0.01	0.09	-0.00	0.08	0.01	0.05	-0.58	0.61
34	04/12/00	0.02	0.03	0.11	0.19	-0.02	0.05	0.00	0.05	0.02	0.03	0.18	0.28
34	10/18/00	0.03	0.05	-0.02	0.17	-0.03	0.11	-0.02	0.08	-0.02	0.05	0.30	0.46
35	03/15/00	-0.02	0.05	-0.19	0.19	0.07	0.11	-0.06	0.08	-0.05	0.06	-0.31	0.46
35	06/09/00	0.03	0.04	-0.08	0.09	0.01	0.08	-0.03	0.05	-0.02	0.04	-0.04	0.37
35	09/07/00	0.03	0.03	0.02	0.16	0.05	0.06	0.01	0.04	0.01	0.03	-0.04	0.29
35	12/27/00	0.01	0.05	-0.06	0.20	0.09	0.09	-0.02	0.06	-0.03	0.05	0.14	0.40
36X	04/12/00	0.02	0.03	-0.00	0.13	0.03	0.04	-0.03	0.03	-0.01	0.02	-0.05	0.22
36X	10/18/00	-0.04	0.05	-0.07	0.34	0.05	0.09	0.03	0.12	0.03	0.05	0.18	0.42
37C	04/12/00	-0.00	0.03	-0.05	0.08	0.03	0.05	-0.01	0.03	0.01	0.02	-0.04	0.21
37C	10/18/00	0.02	0.03	-0.13	0.10	0.05	0.09	0.02	0.05	-0.02	0.04	-0.12	0.36
39X	03/15/00	0.01	0.03	-0.06	0.07	0.01	0.05	0.01	0.05	-0.01	0.03	-0.07	0.26
39X	06/09/00	0.01	0.03	0.02	0.13	0.03	0.05	0.01	0.03	0.00	0.03	0.15	0.23
39X	09/07/00	0.00	0.02	0.00	0.06	0.01	0.04	-0.03	0.03	0.01	0.02	0.02	0.19
39X	12/26/00	0.00	0.02	-0.01	0.06	0.04	0.03	-0.02	0.03	-0.00	0.02	-0.04	0.18

TABLE 15  
BOTTOM SEDIMENT  
(PCI/G DRY WT.)

LOCATION	COLLECTION DATE	AG-110M		I-131		CS-134		CS-137		RA-226		TH-228	
		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)	
30X	04/12/00	0.02	0.05	0.03	0.06	0.02	0.06	0.04	0.05	1.07	0.75	0.57	0.20
30X	10/18/00	0.01	0.06	0.03	0.15	0.04	0.05	0.37	0.10	3.13	1.58	1.27	0.26
31	04/12/00	0.01	0.09	-0.01	0.11	-0.01	0.06	-0.08	0.08	1.59	1.89	4.61	0.35
31	10/18/00	0.03	0.09	-0.10	0.19	0.05	0.08	0.09	0.07	0.11	1.45	2.37	0.38
32	03/15/00	-0.01	0.04	0.22	0.18	0.02	0.03	0.00	0.03	-0.18	0.70	0.40	0.13
32	06/13/00	-0.01	0.04	0.02	0.06	0.02	0.05	0.03	0.03	0.26	0.67	0.57	0.14
32	09/07/00	0.03	0.04	-0.03	0.09	-0.02	0.04	0.01	0.04	0.59	0.86	0.65	0.14
32	12/27/00	-0.01	0.04	-0.03	0.09	-0.01	0.03	0.02	0.04	1.17	0.76	2.64	0.17
33	04/12/00	-0.01	0.05	-0.07	0.06	-0.04	0.06	-0.03	0.04	1.45	0.72	0.38	0.18
33	10/18/00	-0.03	0.09	-0.08	0.16	-0.03	0.06	-0.02	0.06	0.91	0.99	0.22	0.38
34	04/12/00	-0.00	0.05	0.03	0.05	0.01	0.03	-0.02	0.03	0.22	0.56	0.28	0.17
34	10/18/00	0.06	0.09	-0.05	0.18	0.04	0.04	-0.01	0.06	-0.10	1.17	0.04	0.28
35	03/15/00	0.00	0.05	0.04	0.33	0.04	0.05	0.00	0.05	3.84	1.68	5.30	0.25
35	06/09/00	0.00	0.04	-0.07	0.10	0.01	0.04	0.00	0.04	-0.78	1.23	1.49	0.21
35	09/07/00	0.01	0.04	0.02	0.09	0.00	0.03	0.00	0.04	2.52	0.99	2.03	0.16
35	12/27/00	-0.02	0.05	0.11	0.13	-0.02	0.04	0.00	0.05	2.38	1.02	3.58	0.23
36X	04/12/00	0.01	0.03	0.00	0.04	0.00	0.02	0.02	0.03	-0.08	0.55	0.35	0.11
36X	10/18/00	0.00	0.08	-0.06	0.15	0.03	0.06	-0.05	0.07	0.17	1.14	0.30	0.21
37C	04/12/00	0.01	0.03	-0.02	0.04	0.02	0.04	-0.00	0.03	0.64	0.77	0.15	0.13
37C	10/18/00	-0.00	0.05	0.07	0.12	-0.02	0.05	0.01	0.04	1.18	0.97	1.76	0.20
39X	03/15/00	0.03	0.04	0.09	0.16	-0.01	0.02	-0.01	0.03	0.17	0.70	0.34	0.12
39X	06/09/00	-0.01	0.04	0.03	0.08	0.01	0.02	0.01	0.03	1.87	0.67	0.69	0.13
39X	09/07/00	-0.04	0.02	0.02	0.07	0.02	0.03	0.00	0.02	0.22	0.43	0.28	0.09
39X	12/26/00	0.01	0.03	0.00	0.06	0.00	0.02	0.01	0.02	0.51	0.40	0.24	0.09

TABLE 16  
AQUATIC FLORA-FUCUS  
(PCI/G WET WT.)

LOCATION	COLLECTION DATE	BE-7		K-40		CR-51		MN-54		CO-58		FE-59	
		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)	
32X	02/15/00	- .009	0.139	7.0	0.7	- .066	0.170	0.003	0.019	- .004	0.018	- .028	0.051
32X	03/15/00	0.051	0.096	5.5	0.5	0.035	0.101	0.007	0.013	- .002	0.012	0.002	0.032
32X	06/27/00	- .007	0.064	5.8	0.3	- .047	0.074	0.001	0.008	0.023	0.009	0.006	0.028
32X	09/20/00	0.057	0.076	6.3	0.7	- .089	0.095	- .003	0.011	0.000	0.011	0.009	0.036
32X	12/18/00	- .037	0.157	7.7	1.0	0.018	0.210	- .008	0.020	0.013	0.022	- .006	0.052
33X	04/12/00	0.224	0.164	5.4	0.5	- .018	0.121	0.003	0.012	- .004	0.011	- .007	0.029
33X	10/18/00	0.032	0.184	5.9	0.9	0.133	0.170	0.009	0.016	- .012	0.019	0.000	0.055
35X	03/15/00	0.122	0.117	4.7	0.6	- .039	0.098	0.003	0.012	0.000	0.013	0.044	0.040
35X	06/09/00	- .015	0.065	5.6	0.6	- .045	0.094	0.006	0.009	0.010	0.009	- .016	0.031
35X	09/07/00	0.024	0.063	6.3	0.4	0.007	0.067	- .003	0.007	0.003	0.006	- .013	0.023
35X	12/27/00	- .016	0.108	5.0	0.9	- .014	0.157	0.012	0.014	0.000	0.016	0.000	0.042
36X	04/12/00	0.006	0.102	5.7	0.5	0.026	0.112	- .004	0.011	0.000	0.011	0.022	0.031
36X	10/18/00	0.000	0.222	5.1	1.1	0.052	0.244	0.019	0.029	0.003	0.027	- .019	0.048
39X	03/15/00	0.108	0.106	5.4	0.7	0.074	0.109	0.008	0.015	0.002	0.013	- .024	0.049
39X	06/09/00	0.031	0.058	5.3	0.4	0.023	0.055	0.001	0.007	- .003	0.007	0.001	0.019
39X	09/07/00	- .005	0.042	4.7	0.3	- .007	0.052	- .005	0.005	0.007	0.005	0.012	0.015
39X	12/26/00	0.141	0.141	6.0	1.0	- .048	0.140	0.003	0.017	- .001	0.016	0.000	0.049

TABLE 16  
AQUATIC FLORA-FUCUS  
(PCI/G WET WT.)

LOCATION	COLLECTION DATE	CO-60		ZN-65		ZR-95		NB-95		RU-103		RU-106	
		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)	
32X	02/15/00	0.008	0.019	-.036	0.054	0.012	0.027	-.010	0.019	-.003	0.015	-.009	0.142
32X	03/15/00	0.012	0.013	-.038	0.031	0.004	0.021	0.013	0.013	0.012	0.011	0.059	0.113
32X	06/27/00	0.003	0.009	0.003	0.018	0.007	0.013	0.002	0.009	0.005	0.009	-.047	0.075
32X	09/20/00	-.006	0.015	-.031	0.036	0.003	0.019	-.003	0.013	-.002	0.009	0.041	0.097
32X	12/18/00	-.002	0.024	-.035	0.056	0.003	0.043	-.007	0.026	0.007	0.020	0.029	0.193
33X	04/12/00	0.000	0.013	-.027	0.037	0.006	0.020	0.010	0.014	-.004	0.016	-.065	0.104
33X	10/18/00	0.019	0.025	-.047	0.061	0.014	0.038	0.002	0.026	-.006	0.019	-.064	0.212
35X	03/15/00	-.015	0.017	-.007	0.041	-.023	0.021	-.001	0.013	0.001	0.010	0.040	0.117
35X	06/09/00	0.013	0.012	-.009	0.028	-.010	0.020	0.003	0.014	0.007	0.012	0.009	0.086
35X	09/07/00	-.005	0.006	-.010	0.021	0.000	0.013	-.001	0.008	0.001	0.007	0.012	0.060
35X	12/27/00	0.014	0.014	-.012	0.046	0.002	0.021	-.003	0.019	0.002	0.014	0.120	0.139
36X	04/12/00	0.007	0.012	-.007	0.026	0.010	0.019	0.008	0.014	-.004	0.013	-.026	0.108
36X	10/18/00	0.020	0.026	0.028	0.079	-.016	0.039	-.010	0.041	0.004	0.031	-.071	0.260
39X	03/15/00	-.001	0.014	-.003	0.036	0.008	0.019	-.002	0.014	-.002	0.011	-.051	0.133
39X	06/09/00	0.003	0.006	0.001	0.020	0.003	0.011	0.002	0.009	0.000	0.006	-.018	0.054
39X	09/07/00	0.000	0.005	-.010	0.014	0.003	0.008	0.002	0.006	-.001	0.006	-.007	0.039
39X	12/26/00	-.001	0.022	0.007	0.056	0.007	0.027	-.001	0.015	-.006	0.017	0.062	0.156



TABLE 16  
AQUATIC FLORA-FUCUS  
(PCI/G WET WT.)

LOCATION	COLLECTION DATE	AG-110M		I-131		CS-134		CS-137		RA-226		TH-228	
		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)	
32X	02/15/00	0.027	0.025	0.035	0.035	-.006	0.094	0.002	0.017	0.163	0.506	0.050	0.074
32X	03/15/00	0.006	0.017	0.032	0.023	-.001	0.013	-.007	0.013	-.101	0.326	0.041	0.063
32X	06/27/00	-.001	0.011	0.019	0.022	-.002	0.012	-.004	0.008	-.074	0.186	0.044	0.036
32X	09/20/00	-.012	0.015	0.024	0.028	0.003	0.012	0.006	0.009	0.229	0.159	0.049	0.051
32X	12/18/00	0.004	0.029	0.000	0.075	-.003	0.024	0.013	0.017	0.110	0.362	0.083	0.084
33X	04/12/00	-.009	0.015	0.019	0.035	0.002	0.013	0.000	0.013	0.029	0.261	0.031	0.054
33X	10/18/00	0.012	0.032	-.037	0.054	0.019	0.021	0.006	0.019	-.166	0.349	0.076	0.077
35X	03/15/00	0.009	0.019	0.004	0.022	0.000	0.015	0.008	0.015	0.331	0.197	0.039	0.051
35X	06/09/00	0.000	0.011	-.035	0.035	0.002	0.011	0.007	0.009	0.220	0.164	0.016	0.043
35X	09/07/00	0.003	0.010	-.010	0.031	0.000	0.007	0.005	0.006	0.089	0.165	0.027	0.026
35X	12/27/00	0.014	0.024	-.015	0.048	0.005	0.018	0.009	0.018	0.057	0.226	0.073	0.078
36X	04/12/00	0.002	0.017	-.003	0.030	-.005	0.012	0.001	0.010	0.142	0.316	0.051	0.052
36X	10/18/00	0.016	0.036	0.033	0.081	-.008	0.026	-.018	0.026	0.098	0.601	0.073	0.105
39X	03/15/00	-.006	0.019	0.025	0.022	0.002	0.013	-.005	0.014	0.195	0.217	0.061	0.056
39X	06/09/00	-.010	0.009	0.029	0.022	-.007	0.007	-.001	0.006	0.084	0.144	0.019	0.027
39X	09/07/00	0.000	0.007	-.017	0.022	-.002	0.005	0.005	0.005	0.070	0.059	0.050	0.028
39X	12/26/00	0.000	0.028	-.023	0.037	0.004	0.014	0.016	0.016	-.088	0.251	0.032	0.085

TABLE 17A  
FISH-FLOUNDER  
(PCI/G WET WT.)

LOCATION	COLLECTION DATE	BE-7		K-40		CR-51		MN-54		CO-58		FE-59	
		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)	
32	04/11/00 A	0.018	0.202	2.8	0.7	- .221	0.213	- .003	0.021	- .012	0.023	0.034	0.049
32	07/05/00	0.022	0.241	3.8	0.9	0.144	0.243	0.027	0.026	0.001	0.028	- .026	0.076
32	10/11/00	0.079	0.249	2.7	0.7	0.020	0.282	0.000	0.025	0.003	0.031	0.000	0.060
35	01/18/00	0.043	0.255	4.3	1.0	- .136	0.300	- .007	0.023	0.009	0.023	0.052	0.096
35	07/05/00 B	0.014	0.175	3.3	0.6	- .231	0.224	- .001	0.019	- .033	0.024	- .016	0.047
35	10/11/00	- .106	0.218	2.3	0.6	- .076	0.290	- .012	0.025	- .018	0.027	0.037	0.058

LOCATION	COLLECTION DATE	CO-60		ZN-65		ZR-95		NB-95		RU-103		RU-106	
		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)	
32	04/11/00 A	- .005	0.023	0.013	0.047	- .011	0.042	- .010	0.026	0.000	0.026	0.060	0.170
32	07/05/00	0.013	0.020	- .023	0.041	0.020	0.054	0.014	0.027	- .014	0.026	- .023	0.254
32	10/11/00	0.004	0.030	0.013	0.062	- .018	0.039	0.000	0.037	- .005	0.026	- .070	0.235
35	01/18/00	0.012	0.023	- .007	0.076	0.044	0.050	- .004	0.032	- .008	0.026	0.044	0.211
35	07/05/00 B	0.004	0.019	- .015	0.044	0.018	0.031	0.021	0.027	- .001	0.024	0.108	0.178
35	10/11/00	0.003	0.028	0.015	0.168	- .027	0.049	- .022	0.061	0.031	0.032	- .021	0.222

LOCATION	COLLECTION DATE	AG-110M		I-131		CS-134		CS-137		RA-226		TH-228	
		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)	
32	04/11/00 A	- .030	0.026	- .036	0.075	- .003	0.021	0.022	0.021	0.476	0.635	- .040	0.093
32	07/05/00	0.000	0.035	0.089	0.098	0.020	0.029	0.000	0.023	0.559	0.389	0.028	0.096
32	10/11/00	0.006	0.035	- .033	0.179	0.009	0.025	- .009	0.025	0.327	0.659	- .012	0.112
35	01/18/00	- .012	0.030	0.037	0.070	- .012	0.024	0.002	0.026	- .290	0.524	- .115	0.093
35	07/05/00 B	0.016	0.028	- .012	0.074	- .005	0.021	0.001	0.017	0.073	0.553	0.031	0.068
35	10/11/00	- .032	0.040	0.059	0.150	0.026	0.027	- .019	0.028	0.445	0.437	- .075	0.104

A: FIRST QUARTER SAMPLE WAS UNAVAILABLE AFTER MULTIPLE ATTEMPTS TO OBTAIN SAMPLES.

B: SECOND QUARTER SAMPLE WAS UNAVAILABLE AFTER MULTIPLE ATTEMPTS TO OBTAIN SAMPLES.

TABLE 17B  
FISH-OTHER  
(PCI/G WET WT.)

LOCATION	COLLECTION DATE	TYPE	BE-7		K-40		CR-51		MN-54		CO-58		FE-59	
			(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)	
32	04/11/00 A	SKATE	-0.04	0.17	2.50	0.79	-0.14	0.25	0.003	0.023	0.020	0.029	0.009	0.058
32	07/05/00	SKATE	0.07	0.15	4.14	0.68	-0.01	0.23	-0.002	0.014	-0.003	0.016	0.005	0.039
32	10/11/00	SKATE	-0.12	0.19	2.33	0.57	0.14	0.26	0.003	0.017	-0.003	0.021	-0.006	0.050
35	03/15/00	OTHER	0.16	0.18	3.45	0.78	-0.09	0.20	0.026	0.022	0.011	0.023	0.018	0.095
35	04/11/00	SKATE	0.06	0.16	2.09	0.56	0.06	0.24	-0.010	0.019	0.011	0.022	0.034	0.049
35	07/05/00	SKATE	0.04	0.18	2.65	0.70	0.09	0.25	-0.001	0.019	-0.009	0.021	0.021	0.068
35	10/11/00	SKATE	0.00	0.20	2.18	0.61	0.11	0.28	0.005	0.018	-0.021	0.024	0.013	0.053
40X	01/19/00	OTHER	-0.04	0.16	4.19	0.70	0.03	0.18	-0.012	0.019	0.006	0.022	-0.001	0.049
40X	04/11/00	BLACKFISH	-0.06	0.26	4.05	0.88	0.16	0.26	0.021	0.029	-0.015	0.023	0.059	0.056
40X	07/19/00	BLACKFISH	0.00	0.13	4.39	0.65	0.18	0.17	-0.012	0.017	-0.007	0.019	0.030	0.040
40X	12/08/00	OTHER	0.08	0.21	3.22	0.70	0.06	0.25	0.015	0.022	0.011	0.022	0.030	0.069

LOCATION	COLLECTION DATE	TYPE	CO-60		ZN-65		ZR-95		NB-95		RU-103		RU-106	
			(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)	
32	04/11/00 A	SKATE	-0.002	0.028	0.008	0.067	-0.004	0.047	0.004	0.029	0.011	0.031	0.061	0.245
32	07/05/00	SKATE	-0.003	0.016	-0.017	0.037	0.021	0.034	0.009	0.026	-0.009	0.020	-0.012	0.188
32	10/11/00	SKATE	-0.001	0.019	0.028	0.111	0.008	0.037	0.019	0.031	-0.004	0.029	0.044	0.205
35	03/15/00	OTHER	0.008	0.026	-0.042	0.065	-0.015	0.048	-0.008	0.027	-0.008	0.022	-0.015	0.192
35	04/11/00	SKATE	0.000	0.022	-0.044	0.054	0.040	0.040	0.026	0.028	-0.004	0.025	-0.096	0.239
35	07/05/00	SKATE	-0.013	0.028	-0.042	0.053	0.000	0.032	0.007	0.026	-0.002	0.022	-0.099	0.202
35	10/11/00	SKATE	0.008	0.016	-0.018	0.140	-0.008	0.047	-0.022	0.030	0.002	0.030	-0.026	0.160
40X	01/19/00	OTHER	0.016	0.017	-0.033	0.057	0.000	0.032	-0.007	0.021	-0.011	0.021	-0.130	0.170
40X	04/11/00	BLACKFISH	0.005	0.034	-0.030	0.065	0.039	0.047	0.023	0.036	-0.008	0.025	0.151	0.175
40X	07/19/00	BLACKFISH	-0.012	0.023	-0.010	0.047	-0.009	0.034	0.022	0.021	0.004	0.015	-0.281	0.172
40X	12/08/00	OTHER	0.015	0.025	-0.023	0.048	0.020	0.043	0.007	0.037	0.010	0.026	0.060	0.209

A: FIRST QUARTER SAMPLE WAS UNAVAILABLE AFTER MULTIPLE ATTEMPTS TO OBTAIN SAMPLES.

TABLE 17B  
FISH-OTHER  
(PCI/G WET WT.)

LOCATION	COLLECTION DATE	TYPE	AG-110M		I-131		CS-134		CS-137		RA-226		TH-228	
			(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)	
32	04/11/00 A	SKATE	0.018	0.034	-0.028	0.092	-0.007	0.025	-0.007	0.026	-0.081	0.489	0.059	0.118
32	07/05/00	SKATE	-0.005	0.021	-0.017	0.081	-0.009	0.019	-0.002	0.021	0.477	0.332	0.012	0.069
32	10/11/00	SKATE	-0.023	0.024	0.076	0.132	0.002	0.022	0.016	0.027	0.709	0.413	0.049	0.068
35	03/15/00	OTHER	0.014	0.024	0.000	0.063	0.005	0.020	0.010	0.017	-0.042	0.534	-0.031	0.094
35	04/11/00	SKATE	0.032	0.029	0.000	0.070	0.017	0.022	0.018	0.022	0.482	0.654	-0.063	0.066
35	07/05/00	SKATE	-0.009	0.026	0.061	0.091	0.023	0.023	-0.002	0.024	-0.063	0.598	0.007	0.102
35	10/11/00	SKATE	-0.012	0.030	-0.079	0.129	0.000	0.018	-0.018	0.024	-0.217	0.420	0.060	0.090
40X	01/19/00	OTHER	0.013	0.031	0.032	0.040	0.009	0.020	-0.013	0.025	0.090	0.562	0.071	0.070
40X	04/11/00	BLACKFISH	0.004	0.026	0.045	0.087	-0.059	0.033	0.009	0.029	0.192	0.467	-0.048	0.103
40X	07/19/00	BLACKFISH	0.001	0.024	0.013	0.040	-0.011	0.021	0.008	0.020	0.372	0.353	-0.003	0.086
40X	12/08/00	OTHER	-0.023	0.033	-0.080	0.193	-0.004	0.018	0.013	0.020	-0.109	0.435	0.013	0.085

A: FIRST QUARTER SAMPLE WAS UNAVAILABLE AFTER MULTIPLE ATTEMPTS TO OBTAIN SAMPLES.

TABLE 18  
MUSSELS  
(PCI/G WET WT.)

LOCATION	COLLECTION DATE	BE-7		K-40		CR-51		MN-54		CO-58		FE-59	
		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)	
28	02/23/00	0.053	0.182	1.4	0.6	0.058	0.165	-.019	0.023	-.019	0.019	0.062	0.061
28	05/12/00	0.033	0.173	1.5	0.5	-.163	0.208	-.021	0.017	0.017	0.021	0.043	0.047
28	08/19/00	-.055	0.199	1.1	0.5	0.119	0.183	0.019	0.021	0.013	0.020	0.023	0.062
28	12/29/00	-.060	0.159	1.3	0.4	0.023	0.141	0.004	0.016	-.001	0.015	0.022	0.040
31	02/07/00	0.068	0.166	1.2	0.5	0.071	0.159	-.015	0.021	0.010	0.019	0.019	0.042
31	05/12/00	0.000	0.189	1.2	0.5	-.032	0.215	-.005	0.027	-.016	0.021	0.008	0.045
31	08/19/00	-.132	0.223	1.5	0.6	-.052	0.239	-.005	0.026	-.010	0.023	-.015	0.071
31	12/27/00	0.047	0.183	1.8	0.5	-.229	0.214	0.007	0.020	0.000	0.021	0.000	0.050

LOCATION	COLLECTION DATE	CO-60		ZN-65		ZR-95		NB-95		RU-103		RU-106	
		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)	
28	02/23/00	-.010	0.025	-.035	0.031	0.019	0.038	-.023	0.027	-.008	0.019	0.117	0.227
28	05/12/00	0.008	0.025	-.017	0.053	-.007	0.035	-.001	0.024	0.002	0.024	0.167	0.183
28	08/19/00	-.006	0.028	-.013	0.051	0.017	0.045	0.004	0.026	0.005	0.024	0.123	0.189
28	12/29/00	0.004	0.014	-.020	0.041	0.017	0.033	0.000	0.019	-.004	0.019	0.043	0.183
31	02/07/00	-.014	0.023	-.013	0.042	0.004	0.031	0.008	0.019	0.000	0.017	0.003	0.215
31	05/12/00	-.002	0.025	-.021	0.062	-.005	0.033	0.013	0.028	-.004	0.022	-.193	0.199
31	08/19/00	0.010	0.025	0.014	0.061	-.002	0.045	-.018	0.035	-.004	0.024	0.017	0.243
31	12/27/00	0.007	0.025	-.042	0.047	0.021	0.037	0.009	0.024	0.013	0.023	0.048	0.153

TABLE 18  
MUSSELS  
(PCI/G WET WT.)

LOCATION	COLLECTION DATE	AG-110M		I-131		CS-134		CS-137		RA-226		TH-228	
		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)	
28	02/23/00	-.008	0.034	0.003	0.037	0.003	0.025	-.003	0.024	-.010	0.387	-.026	0.097
28	05/12/00	0.007	0.028	-.013	0.055	-.002	0.018	0.019	0.024	0.547	0.434	-.020	0.063
28	08/19/00	-.003	0.028	-.013	0.093	-.014	0.018	0.024	0.026	0.063	0.369	-.058	0.100
28	12/29/00	0.007	0.025	0.025	0.042	0.006	0.016	0.001	0.015	0.055	0.404	0.013	0.064
31	02/07/00	-.019	0.029	-.025	0.039	-.005	0.026	-.027	0.025	0.357	0.354	0.005	0.081
31	05/12/00	-.008	0.032	0.000	0.059	0.015	0.025	-.014	0.021	-.041	0.445	0.073	0.081
31	08/19/00	0.004	0.038	0.033	0.079	0.004	0.025	-.030	0.025	0.102	0.534	-.041	0.091
31	12/27/00	0.001	0.025	0.008	0.057	0.010	0.021	0.002	0.022	0.499	0.414	0.041	0.091

TABLE 19  
OYSTERS  
(PCI/G WET WT.)

LOCATION	COLLECTION DATE	BE-7		K-40		CR-51		MN-54		CO-58		FE-59	
		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)	
31	02/11/00	- .032	0.147	1.6	0.6	0.044	0.219	0.012	0.018	- .005	0.014	0.011	0.072
31	05/12/00	0.078	0.186	1.7	0.6	0.071	0.203	- .005	0.018	- .011	0.018	0.006	0.042
31	09/20/00	- .108	0.193	1.4	0.5	0.054	0.174	0.021	0.023	0.011	0.023	- .005	0.041
31	11/01/00	- .100	0.183	1.9	0.6	- .091	0.216	- .005	0.021	- .020	0.022	- .025	0.043
32	02/11/00	0.035	0.206	1.3	0.6	0.061	0.207	- .002	0.018	- .020	0.025	0.015	0.078
32	05/12/00	- .155	0.199	1.6	0.5	0.091	0.196	0.003	0.021	0.025	0.024	0.014	0.040
32	09/20/00	0.176	0.150	1.0	0.4	0.118	0.176	0.002	0.022	0.002	0.016	0.000	0.042
32	11/01/00	- .018	0.154	1.1	0.6	0.049	0.183	- .005	0.019	0.009	0.024	- .015	0.048
34X	05/12/00 A	0.000	0.174	1.7	0.6	0.000	0.203	- .015	0.025	- .001	0.024	- .007	0.051
34X	09/20/00	0.069	0.173	1.8	0.5	- .024	0.196	- .001	0.023	- .007	0.020	0.000	0.040
34X	11/01/00	- .077	0.218	2.1	0.7	- .034	0.248	0.000	0.023	0.009	0.023	- .046	0.053
36	02/23/00	0.000	0.171	1.3	0.6	- .015	0.196	0.017	0.016	- .032	0.024	0.015	0.079
36	05/25/00	0.022	0.122	1.5	0.4	0.057	0.139	0.008	0.015	0.000	0.016	0.011	0.031
36	08/24/00	- .104	0.125	1.4	0.4	- .064	0.177	0.000	0.020	- .017	0.018	0.023	0.044
36	12/29/00	0.000	0.176	1.8	0.6	- .044	0.198	0.000	0.018	0.020	0.019	0.000	0.050
37C	02/11/00	- .037	0.178	1.9	0.7	0.017	0.212	0.000	0.025	0.010	0.018	- .008	0.083
37C	06/23/00	- .126	0.168	1.5	0.4	0.012	0.180	0.005	0.014	0.008	0.018	- .009	0.041
37C	09/20/00	0.111	0.148	1.1	0.6	0.110	0.191	0.014	0.025	0.000	0.020	0.000	0.051
37C	11/01/00	0.204	0.193	2.4	0.7	- .031	0.265	- .003	0.019	0.005	0.018	- .006	0.052
40X	02/04/00	- .018	0.223	2.0	0.6	- .097	0.229	0.011	0.027	0.012	0.026	0.026	0.083
40X	05/09/00	- .076	0.181	1.7	0.5	0.037	0.200	0.009	0.019	0.023	0.021	0.010	0.039
40X	08/23/00	0.033	0.186	1.3	0.5	0.105	0.230	0.003	0.020	0.006	0.023	0.037	0.055
40X	11/22/00	- .070	0.200	1.3	0.5	0.010	0.190	0.009	0.019	0.012	0.021	0.010	0.044

A: FIRST QUARTER SAMPLE AT LOCATION 34X WAS MISSING.

TABLE 19  
OYSTERS  
(PCI/G WET WT.)

LOCATION	COLLECTION DATE	CO-60		ZN-65		ZR-95		NB-95		RU-103		RU-106	
		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)	
31	02/11/00	-.001	0.020	-.029	0.054	-.002	0.037	-.006	0.027	0.006	0.023	-.198	0.198
31	05/12/00	-.006	0.026	-.033	0.050	-.003	0.031	-.001	0.022	0.004	0.021	-.068	0.223
31	09/20/00	-.012	0.021	-.011	0.053	0.020	0.032	0.011	0.024	-.019	0.023	-.006	0.162
31	11/01/00	0.005	0.020	-.041	0.054	0.026	0.037	0.007	0.026	0.009	0.027	0.210	0.235
32	02/11/00	-.001	0.017	-.027	0.051	0.002	0.026	-.005	0.025	-.002	0.019	-.062	0.217
32	05/12/00	0.026	0.026	0.047	0.061	0.032	0.039	0.000	0.023	-.004	0.022	-.006	0.180
32	09/20/00	0.006	0.020	0.009	0.039	0.024	0.033	0.009	0.024	-.008	0.019	0.115	0.169
32	11/01/00	0.020	0.022	-.035	0.038	-.015	0.033	-.020	0.025	0.000	0.023	-.228	0.234
34X	05/12/00 A	0.007	0.020	0.007	0.036	0.001	0.040	-.024	0.025	-.002	0.022	-.034	0.200
34X	09/20/00	-.004	0.024	-.016	0.044	0.002	0.037	-.005	0.027	-.025	0.019	-.043	0.187
34X	11/01/00	0.008	0.017	-.050	0.056	0.001	0.043	0.010	0.025	0.013	0.025	-.025	0.180
36	02/23/00	0.003	0.023	0.022	0.056	0.009	0.034	0.013	0.027	-.006	0.022	-.033	0.266
36	05/25/00	0.015	0.013	-.015	0.032	0.018	0.030	-.003	0.018	0.004	0.016	0.034	0.157
36	08/24/00	0.002	0.019	-.028	0.047	0.004	0.033	0.013	0.020	-.007	0.019	-.052	0.134
36	12/29/00	0.006	0.019	-.025	0.048	0.006	0.041	-.002	0.020	0.000	0.016	-.051	0.182
37C	02/11/00	0.004	0.015	-.043	0.065	0.000	0.035	-.002	0.024	-.009	0.022	0.048	0.171
37C	06/23/00	0.000	0.019	-.016	0.040	0.011	0.033	-.001	0.018	-.014	0.021	0.153	0.163
37C	09/20/00	-.005	0.016	-.021	0.052	0.006	0.041	0.003	0.024	-.016	0.025	-.129	0.209
37C	11/01/00	-.021	0.029	-.066	0.058	0.000	0.046	0.000	0.028	0.009	0.026	-.089	0.229
40X	02/04/00	0.019	0.027	0.049	0.064	0.030	0.044	0.036	0.033	0.012	0.029	0.011	0.205
40X	05/09/00	-.011	0.015	0.010	0.047	-.004	0.028	0.010	0.028	-.010	0.023	-.013	0.184
40X	08/23/00	-.005	0.024	0.018	0.071	0.018	0.036	0.012	0.033	-.010	0.024	0.028	0.184
40X	11/22/00	0.004	0.019	0.000	0.054	0.023	0.037	0.031	0.023	-.012	0.024	-.040	0.220

A: FIRST QUARTER SAMPLE AT LOCATION 34X WAS MISSING.



TABLE 19  
OYSTERS  
(PCI/G WET WT.)

LOCATION	COLLECTION DATE	AG-110M		I-131		CS-134		CS-137		RA-226		TH-228	
		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)	
31	02/11/00	0.016	0.026	0.000	0.049	0.002	0.035	0.014	0.025	- .207	0.491	- .028	0.076
31	05/12/00	- .015	0.020	0.017	0.056	0.004	0.017	- .005	0.025	0.908	0.400	0.047	0.090
31	09/20/00	- .005	0.035	- .016	0.037	- .002	0.019	0.022	0.020	0.061	0.543	- .013	0.080
31	11/01/00	0.017	0.029	0.034	0.070	- .002	0.027	- .010	0.026	- .020	0.574	- .020	0.089
32	02/11/00	0.087	0.050	- .004	0.047	- .003	0.021	- .029	0.029	0.229	0.375	0.045	0.077
32	05/12/00	0.019	0.038	0.009	0.056	0.016	0.020	- .022	0.031	0.150	0.665	0.010	0.071
32	09/20/00	0.016	0.028	0.015	0.033	0.012	0.018	- .022	0.024	0.226	0.454	0.004	0.069
32	11/01/00	0.008	0.034	0.011	0.053	- .015	0.026	- .012	0.024	- .033	0.410	0.063	0.066
34X	05/12/00 A	- .003	0.028	0.019	0.060	0.000	0.022	- .008	0.020	- .073	0.470	- .013	0.085
34X	09/20/00	0.010	0.029	0.011	0.043	0.006	0.021	0.006	0.021	0.070	0.564	0.045	0.089
34X	11/01/00	0.021	0.040	0.011	0.064	- .005	0.022	0.004	0.025	- .192	0.387	0.085	0.085
36	02/23/00	- .012	0.027	- .010	0.036	0.026	0.038	- .010	0.027	0.012	0.517	0.023	0.094
36	05/25/00	0.000	0.022	- .012	0.024	0.015	0.015	- .002	0.015	- .120	0.322	- .063	0.062
36	08/24/00	- .004	0.022	0.006	0.041	- .010	0.019	- .002	0.020	- .145	0.517	0.019	0.065
36	12/29/00	- .003	0.028	- .004	0.049	- .023	0.018	0.000	0.019	0.433	0.340	0.022	0.084
37C	02/11/00	- .028	0.030	0.000	0.053	0.008	0.020	- .012	0.025	0.459	0.414	0.088	0.084
37C	06/23/00	- .004	0.022	- .009	0.061	- .007	0.016	- .009	0.019	- .189	0.347	- .043	0.068
37C	09/20/00	0.012	0.030	- .015	0.049	- .006	0.019	- .015	0.025	0.179	0.592	0.041	0.077
37C	11/01/00	0.007	0.027	0.044	0.058	- .007	0.017	0.010	0.025	0.084	0.588	- .075	0.079
40X	02/04/00	0.072	0.030	0.000	0.063	- .010	0.027	- .011	0.050	0.597	0.456	0.002	0.090
40X	05/09/00	0.123	0.026	0.040	0.073	- .003	0.020	- .036	0.063	- .414	0.551	- .015	0.061
40X	08/23/00	0.067	0.025	- .013	0.067	0.015	0.019	- .014	0.024	0.816	0.463	0.057	0.093
40X	11/22/00	0.069	0.022	0.000	0.068	0.016	0.019	0.007	0.018	- .410	0.520	0.024	0.058

A: FIRST QUARTER SAMPLE AT LOCATION 34X WAS MISSING.

TABLE 20  
CLAMS  
(PCI/G WET WT.)

LOCATION	COLLECTION DATE	BE-7		K-40		CR-51		MN-54		CO-58		FE-59	
		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)	
29	02/17/00	- .018	0.175	1.9	0.6	0.147	0.209	- .016	0.025	- .008	0.022	0.043	0.056
29	05/12/00	0.073	0.170	2.3	0.7	- .080	0.184	- .005	0.025	0.016	0.022	0.014	0.046
29	08/19/00	0.036	0.190	1.4	0.5	0.000	0.242	0.013	0.017	- .001	0.023	0.007	0.049
29	12/26/00	- .016	0.197	2.3	0.7	0.000	0.228	0.002	0.018	0.007	0.016	- .006	0.043
35	03/15/00	0.000	0.147	2.0	0.6	0.080	0.189	- .006	0.023	0.001	0.022	0.011	0.072
35	06/09/00	0.150	0.180	1.1	0.4	0.016	0.228	- .010	0.016	- .015	0.023	0.006	0.052
35	09/07/00	- .038	0.162	1.7	0.6	- .223	0.204	0.006	0.023	0.000	0.020	- .022	0.055
35	12/29/00	- .023	0.121	1.3	0.4	0.011	0.148	0.003	0.016	0.001	0.015	0.037	0.025
38	02/17/00	- .056	0.173	2.4	0.7	- .102	0.216	0.008	0.020	- .019	0.023	0.007	0.063
38	05/12/00	0.055	0.152	2.1	0.5	0.041	0.170	- .001	0.017	0.010	0.018	0.029	0.032
38	08/19/00	- .038	0.165	1.4	0.6	- .035	0.231	0.003	0.027	0.000	0.023	- .015	0.055
38	12/29/00	- .015	0.162	1.4	0.6	0.069	0.172	- .020	0.018	- .012	0.023	0.006	0.049
39X	02/17/00	0.013	0.152	1.8	0.5	0.038	0.190	0.011	0.021	- .005	0.019	- .009	0.041
39X	05/12/00	0.034	0.109	2.1	0.5	0.053	0.165	- .008	0.012	0.003	0.013	- .004	0.037
39X	08/19/00	- .071	0.167	1.5	0.5	0.066	0.214	0.003	0.024	0.025	0.025	0.029	0.049
39X	12/26/00	- .023	0.138	1.5	0.4	0.022	0.165	- .011	0.017	- .010	0.015	- .040	0.033

TABLE 20  
CLAMS  
(PCI/G WET WT.)

LOCATION	COLLECTION DATE	CO-60		ZN-65		ZR-95		NB-95		RU-103		RU-106	
		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)	
29	02/17/00	-.013	0.019	-.013	0.052	-.037	0.035	0.000	0.025	0.002	0.023	-.079	0.203
29	05/12/00	-.003	0.029	-.027	0.062	0.039	0.042	-.008	0.025	-.004	0.022	0.074	0.215
29	08/19/00	0.005	0.025	-.012	0.055	0.032	0.038	0.010	0.027	0.002	0.031	-.025	0.169
29	12/26/00	0.012	0.027	-.060	0.062	-.011	0.035	-.012	0.030	0.006	0.025	-.043	0.213
35	03/15/00	-.005	0.023	0.000	0.055	-.012	0.038	-.021	0.028	0.006	0.022	-.133	0.202
35	06/09/00	-.015	0.022	0.028	0.049	0.016	0.032	0.000	0.030	-.002	0.023	-.130	0.188
35	09/07/00	0.011	0.022	0.000	0.053	0.001	0.042	0.000	0.026	0.007	0.019	-.036	0.210
35	12/29/00	-.006	0.017	-.019	0.038	-.004	0.029	0.008	0.018	0.010	0.019	0.028	0.171
38	02/17/00	0.001	0.031	-.063	0.055	0.024	0.037	0.009	0.022	0.007	0.021	0.114	0.238
38	05/12/00	0.016	0.018	-.021	0.041	0.005	0.029	0.015	0.018	-.007	0.017	-.108	0.144
38	08/19/00	0.010	0.031	0.036	0.048	-.004	0.042	0.007	0.025	-.002	0.018	-.061	0.136
38	12/29/00	-.001	0.021	0.000	0.048	0.037	0.035	0.003	0.021	-.006	0.017	-.077	0.200
39X	02/17/00	0.000	0.021	-.022	0.052	-.044	0.032	-.006	0.019	-.013	0.019	0.098	0.182
39X	05/12/00	0.005	0.016	-.038	0.039	0.007	0.031	-.003	0.018	0.004	0.015	0.084	0.164
39X	08/19/00	0.014	0.018	0.000	0.058	0.006	0.041	0.011	0.030	-.002	0.021	-.085	0.157
39X	12/26/00	0.017	0.022	-.057	0.039	0.001	0.030	-.014	0.018	-.014	0.015	-.065	0.167

TABLE 20  
CLAMS  
(PCI/G WET WT.)

LOCATION	COLLECTION DATE	AG-110M		I-131		CS-134		CS-137		RA-226		TH-228	
		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)	
29	02/17/00	-.039	0.025	0.017	0.063	-.006	0.026	-.009	0.024	-.014	0.344	0.025	0.091
29	05/12/00	-.011	0.026	-.004	0.052	0.001	0.024	-.002	0.017	0.322	0.430	0.027	0.087
29	08/19/00	0.010	0.027	0.066	0.083	0.010	0.018	0.010	0.026	-.053	0.443	0.022	0.085
29	12/26/00	0.014	0.035	0.033	0.067	-.010	0.025	-.010	0.021	0.470	0.382	0.067	0.094
35	03/15/00	-.006	0.030	-.040	0.062	0.000	0.016	-.001	0.020	0.424	0.379	0.041	0.083
35	06/09/00	-.032	0.025	-.027	0.083	0.006	0.024	0.018	0.023	0.183	0.549	-.034	0.074
35	09/07/00	0.004	0.035	-.011	0.072	0.011	0.021	0.000	0.023	0.706	0.434	0.019	0.090
35	12/29/00	-.002	0.020	-.026	0.047	0.001	0.019	0.002	0.016	-.012	0.420	0.053	0.068
38	02/17/00	0.020	0.031	-.028	0.066	-.021	0.026	-.013	0.020	-.066	0.458	0.002	0.091
38	05/12/00	-.015	0.027	0.009	0.044	0.002	0.015	-.029	0.019	-.277	0.482	0.042	0.067
38	08/19/00	-.012	0.027	-.034	0.079	-.006	0.020	0.028	0.026	-.161	0.385	0.012	0.099
38	12/29/00	-.023	0.028	0.004	0.055	0.011	0.023	-.014	0.021	0.431	0.366	0.009	0.077
39X	02/17/00	0.005	0.024	0.062	0.058	-.014	0.031	-.020	0.019	-.015	0.488	0.026	0.075
39X	05/12/00	-.013	0.023	-.012	0.041	-.015	0.015	0.003	0.017	0.127	0.320	0.012	0.056
39X	08/19/00	-.014	0.031	0.006	0.078	0.013	0.021	0.000	0.019	0.053	0.566	-.048	0.084
39X	12/26/00	-.004	0.023	-.017	0.045	-.006	0.014	0.009	0.017	-.153	0.338	0.030	0.059

TABLE 22  
LOBSTER  
(PCI/G WET WT.)

LOCATION	COLLECTION DATE	BE-7		K-40		CR-51		MN-54		CO-58		FE-59	
		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)	
32	02/24/00	0.020	0.217	2.8	0.8	-.083	0.198	0.000	0.032	-.011	0.028	0.016	0.087
32	05/25/00	0.000	0.181	2.1	0.6	0.013	0.214	-.013	0.023	-.003	0.022	-.011	0.058
32	08/24/00	-.080	0.120	1.7	0.5	0.000	0.153	0.001	0.014	-.015	0.013	0.033	0.040
32	12/29/00	0.127	0.167	1.8	0.6	0.081	0.232	-.029	0.027	0.017	0.025	-.065	0.063
35	02/23/00	-.112	0.184	2.3	0.6	0.043	0.230	-.020	0.025	-.009	0.024	-.013	0.078
35	05/25/00	-.040	0.200	2.5	0.8	-.101	0.261	-.003	0.028	-.010	0.031	-.008	0.059
35	08/24/00	0.000	0.170	2.3	0.5	0.064	0.213	-.007	0.021	0.016	0.019	0.013	0.050
35	12/19/00	-.083	0.208	3.1	0.7	0.088	0.235	-.006	0.026	0.000	0.026	0.006	0.064
37X	02/23/00	0.058	0.125	2.6	0.5	0.031	0.166	0.005	0.018	-.009	0.015	0.002	0.042
37X	05/25/00	0.047	0.209	2.5	0.8	0.019	0.293	-.021	0.034	-.004	0.024	-.054	0.063
37X	08/24/00	-.106	0.141	2.2	0.5	-.222	0.203	-.007	0.016	-.021	0.017	0.019	0.046
37X	12/29/00	-.058	0.217	2.1	0.6	0.156	0.247	-.008	0.025	-.010	0.025	-.002	0.057

LOCATION	COLLECTION DATE	CO-60		ZN-65		ZR-95		NB-95		RU-103		RU-106	
		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)		(+/ -)	
32	02/24/00	0.020	0.040	-.072	0.077	0.020	0.038	0.026	0.028	-.010	0.022	0.041	0.230
32	05/25/00	0.012	0.022	-.063	0.067	-.036	0.036	-.022	0.022	-.015	0.023	-.099	0.204
32	08/24/00	-.001	0.018	-.027	0.038	-.007	0.028	-.004	0.020	0.012	0.016	-.008	0.164
32	12/29/00	-.006	0.028	-.047	0.071	-.019	0.030	-.019	0.027	-.004	0.027	0.188	0.205
35	02/23/00	0.006	0.026	-.019	0.056	0.000	0.043	-.001	0.027	0.008	0.024	-.037	0.247
35	05/25/00	-.002	0.029	-.091	0.076	-.010	0.041	-.016	0.034	0.003	0.027	-.092	0.305
35	08/24/00	0.007	0.021	-.021	0.048	-.005	0.030	-.009	0.020	0.000	0.017	-.074	0.191
35	12/19/00	-.008	0.020	0.021	0.055	-.027	0.042	-.014	0.027	-.003	0.023	0.084	0.213
37X	02/23/00	0.005	0.019	-.024	0.043	0.008	0.038	-.011	0.016	0.000	0.016	0.120	0.175
37X	05/25/00	0.004	0.026	-.074	0.087	-.011	0.050	-.026	0.036	0.018	0.033	-.228	0.270
37X	08/24/00	-.009	0.028	0.018	0.036	-.011	0.028	0.016	0.023	-.013	0.021	-.014	0.161
37X	12/29/00	-.001	0.022	-.005	0.063	-.001	0.040	0.014	0.045	-.007	0.023	0.152	0.205

TABLE 22  
LOBSTER  
(PCI/G WET WT.)

LOCATION	COLLECTION DATE	AG-110M		I-131		CS-134		CS-137		RA-226		TH-228	
		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)		(+/-)	
32	02/24/00	0.023	0.038	0.007	0.039	0.013	0.027	0.007	0.030	- .200	0.453	0.040	0.110
32	05/25/00	- .006	0.022	- .002	0.037	- .010	0.024	- .015	0.027	- .147	0.448	0.041	0.097
32	08/24/00	0.021	0.021	- .029	0.039	0.001	0.015	0.002	0.020	0.388	0.283	- .014	0.049
32	12/29/00	- .019	0.036	0.005	0.066	- .008	0.020	0.004	0.024	0.196	0.586	0.060	0.100
35	02/23/00	- .006	0.030	- .006	0.046	0.004	0.039	0.008	0.023	- .089	0.636	- .001	0.095
35	05/25/00	0.028	0.048	- .041	0.044	- .009	0.028	0.014	0.030	0.279	0.512	0.010	0.120
35	08/24/00	- .005	0.026	- .007	0.057	0.002	0.021	- .011	0.020	0.357	0.592	- .041	0.070
35	12/19/00	- .002	0.032	- .094	0.078	0.007	0.025	- .009	0.024	0.329	0.406	0.027	0.094
37X	02/23/00	- .009	0.027	0.012	0.035	- .015	0.020	0.002	0.021	0.691	0.365	- .006	0.062
37X	05/25/00	0.016	0.046	- .017	0.050	- .001	0.025	0.013	0.034	0.282	0.730	- .020	0.130
37X	08/24/00	- .026	0.025	0.018	0.048	0.003	0.017	- .011	0.020	0.225	0.247	- .030	0.071
37X	12/29/00	0.002	0.032	0.035	0.071	0.016	0.029	- .020	0.028	0.375	0.734	0.073	0.088

#### **4. DISCUSSION OF RESULTS**

This section summarizes the results of the analyses of environmental media sampled. DNC has carefully examined the data throughout the year and has presented in this section all cases where station related radioactivity could be detected and compared the results with previous environmental surveillance data. Few impacts of the station operation on the environment were observed. Sub-sections contain a description of each particular media or potential exposure pathway.

Naturally occurring nuclides such as Be-7, K-40, Ra-226 and Th-228 were detected in numerous samples. Be-7, which is produced by cosmic processes, was observed predominantly in airborne and vegetation samples. Ra-226 and Th-228 results were variable and are generally at levels higher than plant related radionuclides.

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

##### **4.1. *Gamma Exposure Rate (Table 1)***

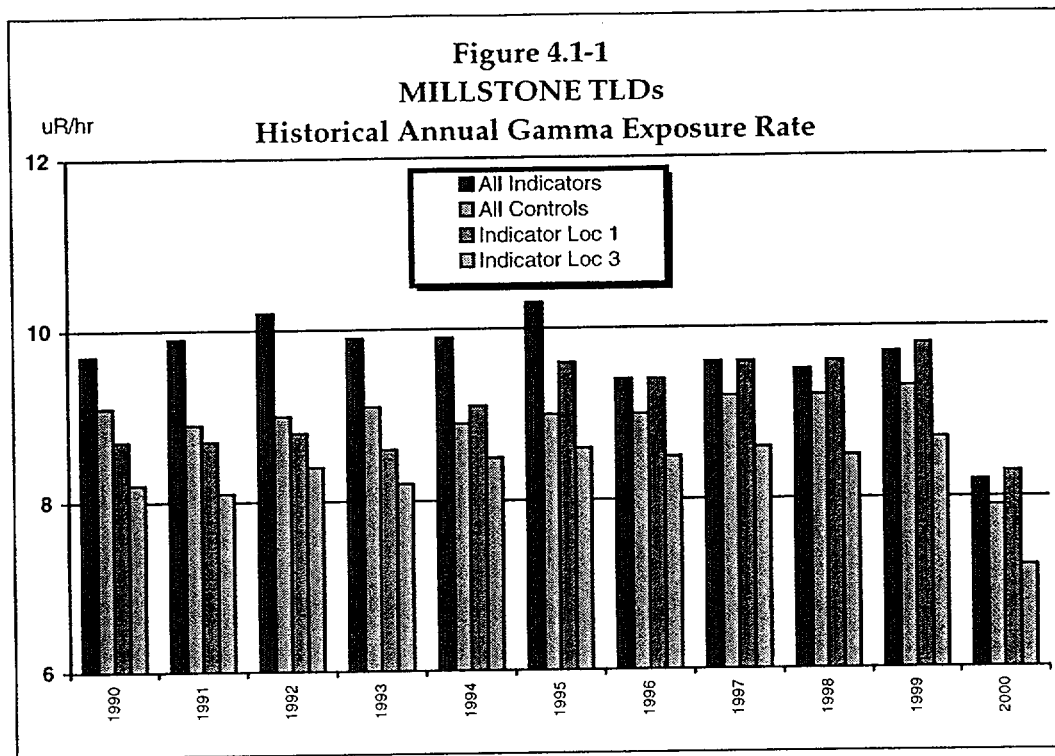
Gamma exposure from all sources of radioactivity is measured over periods of approximately one month using thermoluminescent dosimeters (TLDs). In 2000, the TLDs (Victoreen glass bulb  $\text{CaF}_2(\text{Mn})$ ) which have historically been used to measure radioactivity around Millstone for over 20 years were replaced with Panasonic model UD-804 ASx TLDs. The changeover occurred in February. The Victoreen glass bulb type TLDs were subject to inherent self-irradiation which was experimentally measured for each dosimeter. The results in Table 1 for January have been adjusted for this effect. This correction for field dosimeters averaged approximately 1 mR/hr. The new Panasonic dosimeters have a lower response per exposure than the Victoreen dosimeters. Results for 2000 show a 15% to 20% lower response when compared to trended results for previous years. This 15% to 20% lower response is consistent for all locations, including both indicator and control locations.

The dosimeters are strategically placed at a number of on-site locations, as well as at inner and outer off-site locations. The exposure rate measurements in Table 1 exhibit the same trends as those of past years. These measurements demonstrate the general variations in background radiation between the various on-site and off-site locations and include gamma exposure from all sources of radioactivity. For example, the Weather Shack (location 02) and Environmental Laboratory (location 08) experience higher exposure

rates due to their proximity to granite beds, in addition the Ledyard control location (location 14C) experiences relatively higher background exposure rates than the other control locations at Mystic, Norwich, and Old Lyme (locations 13C, 15C, and 16C). The only appreciable effect seen in the TLD data is that attributable to the variation in the background radiation which is consistent with previous years.

Figure 4.1-1 shows a historical trend of TLD exposure rate measurements, comparing an annual average of all indicator TLDs, an annual average of all control TLDs, and the annual average of the two most critical indicator locations which are used to represent the two closest site boundary residences in the North-northwest and Northeast directions. Examination of the average measurements since 1990 show interesting site changes and site characteristics. For example, the average of all indicator locations up through 1995 when Unit 1 was still in operation display the effects of N-16 BWR turbine building skyshine to immediate areas onsite. As discussed in previous annual reports, the effects of skyshine at onsite monitoring stations were increases as high as 6  $\mu\text{R/hr}$  at certain locations. Skyshine decreased rapidly with distance and was indistinguishable from normal background measurements at the closest offsite monitoring stations. Also apparent in Figure 4.1-1 is the replacement of the Victoreen TLD monitoring system with the Panasonic system in year 2000. The difference in response between the two systems is very apparent with the new Panasonic TLDs reading 15% to 20% lower. The figure also relates the difference in critical indicator locations (1) and (3) and the annual average of all indicator TLDs to the annual average of the control TLDs collected and measured during coincident periods throughout the year. The exposure measurements of many indicator locations onsite are under the influence of natural background exposure differences caused by the many granite out-croppings typical of the Millstone area. Historical data evaluation has shown that TLD sample locations in the vicinity of granite can be dramatically influenced by natural radioactivity contained within the granite. As shown in Figure 4.1-1, the annual average of the indicator TLDs and one of the critical indicator locations are slightly higher in gamma exposure rate than the average control gamma exposure rate. This difference is the result of the nearby granite. For conservatism, if the difference were the result of plant operation (e.g., storage of radioactive waste on-site, gaseous effluents, etc.) an assessment of the resulting dose consequences assuming constant year-round residency is shown in Section 5 as not exceeding 3.5 mrem.



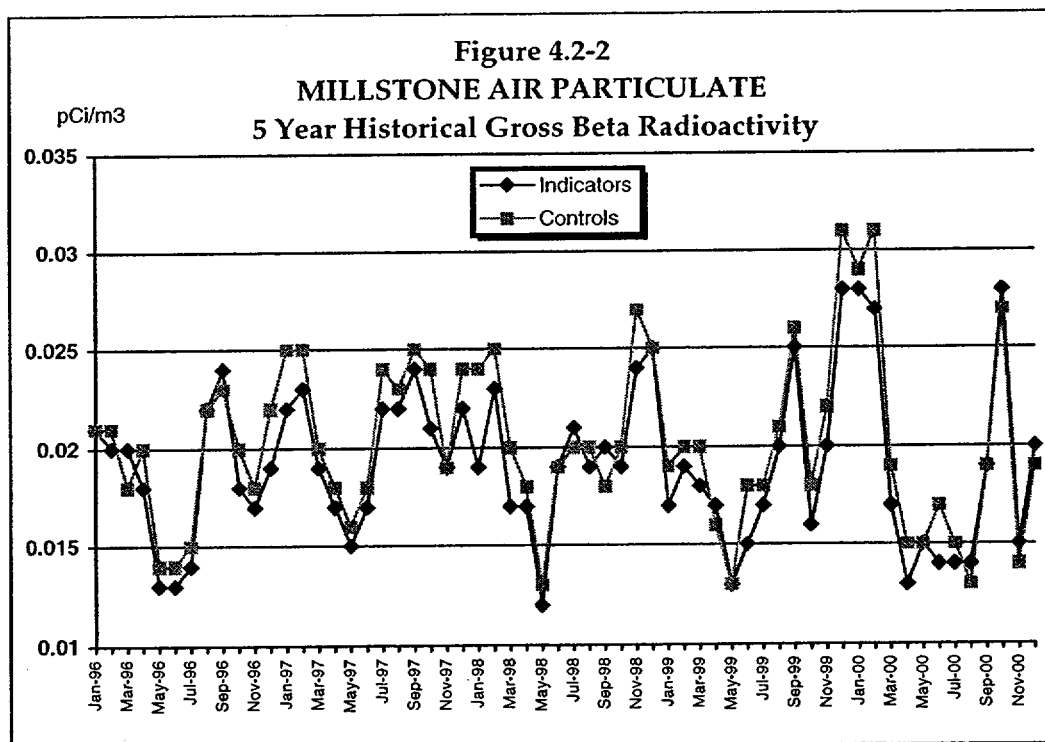
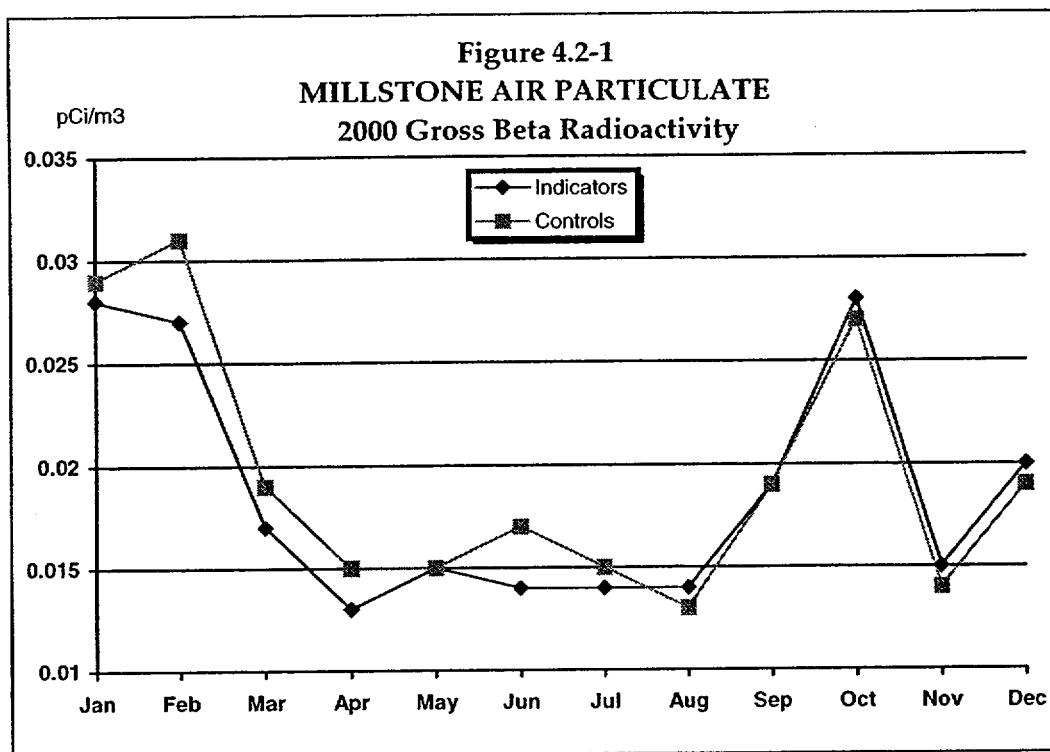


#### 4.2. Air Particulate Gross Beta Radioactivity (Table 2)

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

#### 4.3. Airborne Iodine (Table 3)

Charcoal cartridges are included at all of the Radiological Effluent Monitoring Manual (REMM) required air particulate stations for the collection of atmospheric iodine. These cartridges are analyzed on a weekly basis for I-131. No detectable levels of I-131 were seen in the 2000 charcoal samples.



#### **4.4. Air Particulate Gamma (Table 4A-D)**

The air particulate samples that are utilized for the weekly gross beta analyses are composited and analyzed quarterly for gamma emitting isotopes. The results, as shown in Tables 4A - 4D, indicate the presence of naturally occurring Be-7, which is produced by cosmic processes. No other positive results were seen. These analyses indicate the lack of station effects.

#### **4.5. Air Particulate Strontium**

Table 5 in past years was used to report the measurement of Sr-89 and Sr-90 in quarterly composited air particulate filters. Because previous data has shown the lack of detectable station activity in this media, the requirement for these measurements was removed from the Radiological Effluent Monitoring Manual (REMM) and analyses have been discontinued. The fact that milk samples are a much more sensitive indicator of fission product existence in the environment, prompted the decision for discontinuation. In the event of widespread station related contamination or special events such as the Chernobyl incident, these measurements may be made. Historically, when world events created conditions to cause these measurements to be detectable, no difference was noted between indicator and control locations. This further confirms that detectable levels were not plant related.

#### **4.6. Soil**

Soil samples are special samples not required by the REMM. Previous data has shown the lack of detectable station activity in this media resulting in the discontinuation of these samples in 1985. In the event of widespread station related contamination or special studies, these samples may be collected.

#### **4.7. Cow Milk (Table 7)**

The most sensitive indicator of fission product existence in the terrestrial environment is usually milk samples. This, in combination with the fact that milk is a widely consumed food, results in this pathway being the most critical. Unfortunately, since early 1996 all dairy (cow) farms close enough (i.e. within 10 miles) to Millstone to be considered an indicator location have been out of business. Therefore, the sampling of cow milk has stopped until such time that a new dairy farm goes into business. Each

year a Land Use Census is used to identify locations of milk animals that should be included in the monitoring program. It is performed annually and is maintained by observations, door-to-door surveys and consulting with local agriculture authorities. The 2000 census can be seen in Appendix A. If and when a new dairy farm business starts within a distance to be considered an indicator location to measure levels of station radioactivity, the collection of cow milk will resume.

#### **4.8. Goat Milk (Table 8)**

Goat milk samples can be a more sensitive indicator of fission products in the terrestrial environment than cow milk samples. This is dependent on a number of parameters, including: metabolism of these animals, feeding habits, and feed type. During past weapons testing periods, samples taken at certain locations indicated higher uptake than others. This was especially apparent in the immediate area around Millstone from past samples obtained from indicator location 23 (2 Mi. ENE). Historically, location 23 showed higher Sr-90 and Cs-137 concentrations. Another sampling site, location 22 (5.2 Mi. NNE), sampled only since 1994, also exhibits a similar trend. See Section 6.0 for further discussion of Sr-90 and Cs-137 in goat milk.

Collection of samples from location (23) are not required by the REMM. A farm continues to exist, however milk from goats has been unavailable since October of 1999. Due to the long history of collecting samples at this location and the significance of this location always showing high environmental concentrations of Sr-90 and Cs-137 in past milk and pasture grass samples, attempts were made all year to collect either milk (if available) or pasture grass. Milk from location (23) continued to be unavailable all throughout the year.

Positive indications of Sr-89 and Cs-134 were not observed in any goat milk samples, nor Cs-134 in grass or feed samples. Therefore, detailed analysis of the data has concluded that the Sr-90 and Cs-137 levels are from weapons testing fallout. No station related I-131 was seen in this media. For over a decade, no detectable levels of I-131 have been seen in goat milk samples except for the period immediately following the Chernobyl accident.

Previous data over many years has shown the lack of station related strontium activity in this media. Therefore, since 1996, the strontium analysis frequency has been reduced from monthly to quarterly. The monthly samples collected within each quarter from

each sample location are composited and analyzed at the end of each quarter.

#### **4.9. Pasture Grass and Feed (Table 9)**

When the routine milk samples are unavailable, samples of pasture grass are required as a replacement during the months of April through December. These samples may also be taken to further investigate the levels of radioactivity in milk. During the winter months and early spring, insufficient growth prohibits sampling of pasture grass as a replacement sample. Feed (e.g., hay) is sampled whenever pasture grass is unavailable. Extra samples of pasture grass were obtained throughout the year at location (23) due to this location historically showing high environmental concentrations of Cs-137 due to residual weapons testing fallout. No station effects were seen in pasture grass and feed samples. Similar to that observed in goat milk, the Cs-137 values at indicator and control locations are comparable and would indicate that the levels observed are the result of residual weapons testing fallout.

#### **4.10. Well Water**

Well water samples are not required by the REMM. Data from 1973-1985 has shown the lack of detectable station activity in this media. Therefore, the sampling of well water was discontinued in 1985. In the event of widespread station related contamination, these samples may be collected.

#### **4.11. Reservoir Water**

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

#### **4.12. Fruits and Vegetables (Table 12)**

Consistent with past years, this media did not show any station effects. Naturally occurring K-40 was detected in most samples. Since there was no fresh fallout, no other nuclides were detected.

#### **4.13. Broad Leaf Vegetation (Table 13)**

Consistent with past years, this media did not show any station effects. Positive indications of Cs-137 were observed in samples from two locations (01) and (17). Location (01) shows higher levels of Cs-137, however, these levels are comparable to those observed in past years from either sample location (01) or (17) and are due to fallout.

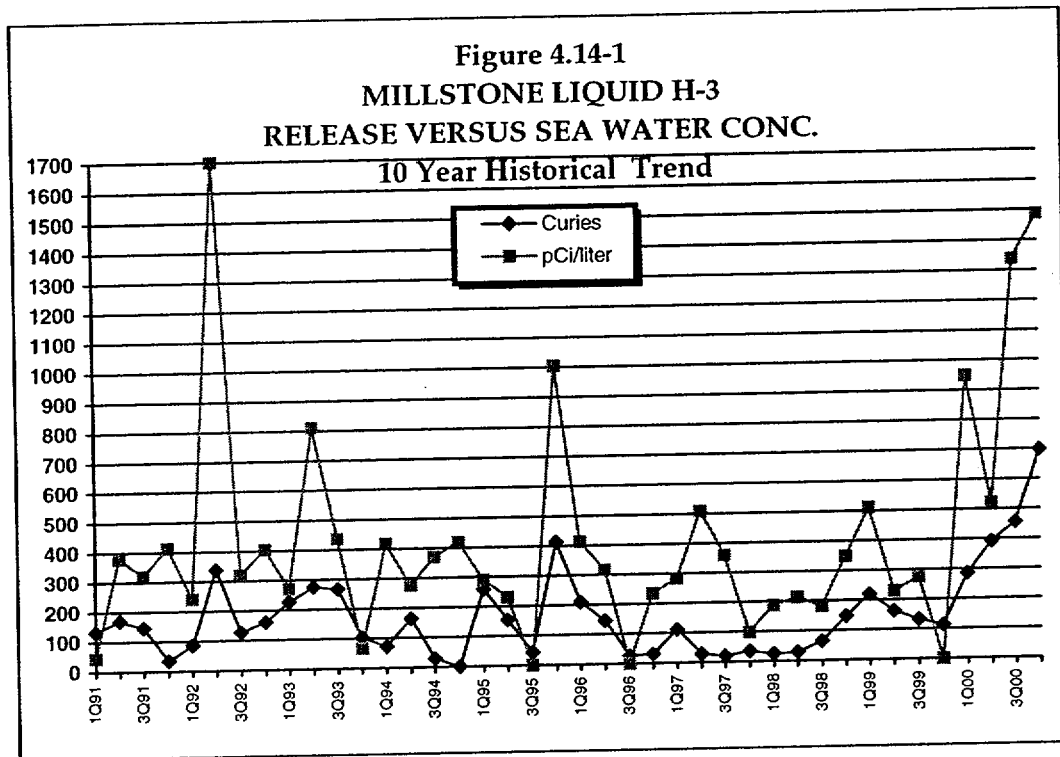
This media can show early and sensitive indication of releases from the station from both unplanned releases and normal operations. Therefore, to enhance program monitoring effectiveness, samples of broadleaf vegetation are collected monthly during the growing season, April - October, even though requirements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

The analysis of this media for strontium was discontinued in 1997. Data from past years has shown the lack of station related strontium activity in this media.

#### **4.14. Seawater (Table 14)**

These samples are required to be sampled quarterly and are composites. Samples from the vicinity of discharge (32) are continuous composites and from Giants Neck (37C) are composites of weekly grab samples. Millstone has been analyzing the composite samples from the vicinity of discharge on a monthly basis to increase monitoring effectiveness even though the requirement remains as a quarterly sample. Naturally occurring K-40 was seen in all samples. Station related tritium (H-3) was observed from the vicinity of discharge sample location (32) during various periods throughout the year. Figure 4.14-1 shows a ten year trend of tritium releases in Millstone liquid effluents versus measured environmental concentrations from the vicinity of discharge location. As can be noted from the figure, since the restart of Unit 3 in 1998 and Unit 2 in 1999, tritium releases in liquid effluents have risen to levels at or above those observed during the pre-shutdown period. Tritium is generated during operation from fission and neutron reactions. Tritium builds up in the reactor coolant in each fuel cycle. In year 2000, Millstone Unit 3 operated continuously with a large amount of RCS dilution which contributed greatly to the increased levels of H-3 in liquid effluents. Measured plant related levels of H-3 in sea water from

the immediate vicinity of discharge have been observed throughout the operation of Millstone's nuclear units. The sample is taken directly from liquid effluent flow prior to dilution into Long Island Sound. Dilution studies performed on this discharge have determined that a dilution factor of 3 is appropriate to estimate concentrations immediately outside the quarry within a near-field area. After dilution, the concentration of tritium expected in the immediate area of the Sound would approach undetectable levels at the required LLD.



#### 4.15. Bottom Sediment (Table 15)

Cs-137 was detected in one sample from Golden Spur (30X). This is consistent with previous data. The absence of detectable Cs-134 and the relative distance and direction indicate that this Cs-137 is not plant related. The Golden Spur area is a fresh water area and the levels of Cs-137 at this location are comparable to those observed in river water sediments (see past Connecticut Yankee Annual Radiological Environmental Operating Reports). No indications of plant related activity were observed.

#### **4.16. Aquatic Flora (Table 16)**

Station related Co-58 was seen in one sample from the vicinity of discharge. The level observed is comparable to levels measured in past years. No other station related radioactivity was detected.

Sampling of this media provides useful information because it is very sensitive to station discharges. However, since seaweed is not consumed, other media are utilized in the determination of dose consequences (e.g., see Shellfish and Fish results).

#### **4.17. Fish (Tables 17A and 17B)**

##### **4.17.1. Flounder (Table 17A)**

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

##### **4.17.2. Fish - Other (Table 17B)**

The activity in other fish is the same as that seen for the past decade. No activity was observed in this media except for naturally occurring radionuclides, including samples taken from within the quarry.

#### **4.18. Mussels (Table 18)**

This sampling media showed no station related radioactivity at all locations.

#### **4.19. Oysters (Table 19)**

All locations, except for the quarry, utilize stocked oysters. Trays are kept at these sampling areas to guarantee samples and facilitate sample collection. Native oysters are sampled at the quarry (location 40X) which is an extra location.

Station related Ag-110m was observed in samples from within the station discharge area (locations 32 and 40X). In general, the quarry oysters show the highest activity. Although location 32 is labelled as vicinity of the discharge, it is actually at the end of the quarry. No station related activity was observed in samples from beyond the station discharge area.



In years past, high levels of Zn-65 were typically observed in oysters caused by their distinct capacity to accumulate zinc. Studies have shown that oysters can accumulate as much as 50 times or more the amount of zinc compared to most other seafoods (Wolfe, 1979). A remarkable dependency has existed between the amount of Zn-65 discharged into the environment and the Zn-65 concentration measured in the native quarry oysters. However, since the permanent shutdown of Millstone Unit 1 in 1996, the discharges of Zn-65 in liquid effluents have dropped off dramatically over the years due to no more production from Unit 1 operation. During operation, Unit 1 was injecting zinc into the reactor coolant to reduce the plateout of Co-60 on piping walls. In 2000, only a trace amount of Zn-65 was detected in the second quarter liquid discharges from Millstone. As shown in Figure 4.19-1, Zn-65 concentration in quarry oysters has closely followed the amount of curies of Zn-65 discharged. The decreasing trend in effluent radioactive releases is apparent in both the curies released and the measured concentrations in oysters. Native oysters are sampled within the quarry.

Figure 4.19-2 shows a similar trend of Ag-110m concentration in quarry oysters compared with liquid effluent curies of Ag-110m discharged. Again, the dependency between Ag-110m discharged and the Ag-110m concentration measured in the native quarry oysters is apparent. The historical sensitivity between station measured effluent discharges of Zn-65 and Ag-110m when compared to environmental measured concentrations has provided a basis for Millstone to adjust the bio-accumulation factors for Zn-65 and Ag-110m used in the standard industry effluent dose consequence codes. See Section 5 of this year's and previous years' Annual Radiological Environmental Operating Reports for a comparison of the two methods which has allowed for such adjustments in the past (i.e., dose from the station's measured radioactive discharges input into conservative models versus actual measurements of the concentrations of radioactivity in environmental media to calculate annual dose commitment from consumption).

Because no station activity was observed at locations beyond the station discharge area and since the two locations in the quarry are on-site and not available for public use, the actual concentration of radionuclides in oysters available for public consumption is much less. The near-field dilution factor for liquid discharges from the Millstone quarry discharge is a factor of 3. The dose consequence of the station related radioactivity via this pathway is discussed in Section 5.0.

#### **4.20. Clams (Table 20)**

Occasionally this media indicates the presence of station related radioactivity.

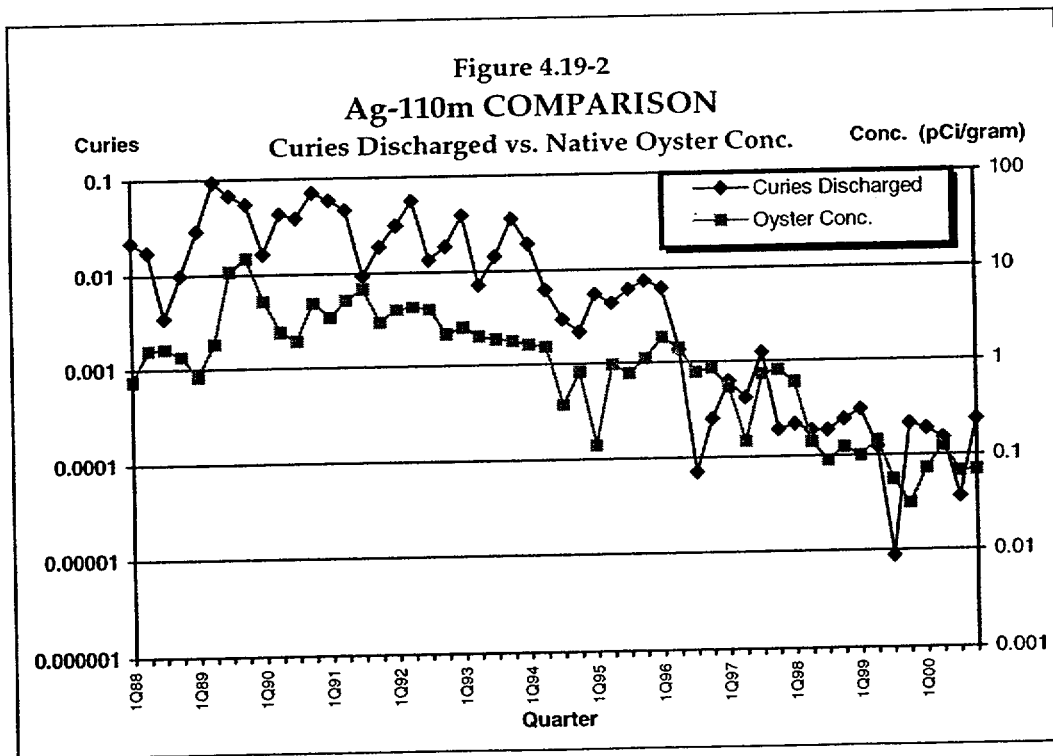
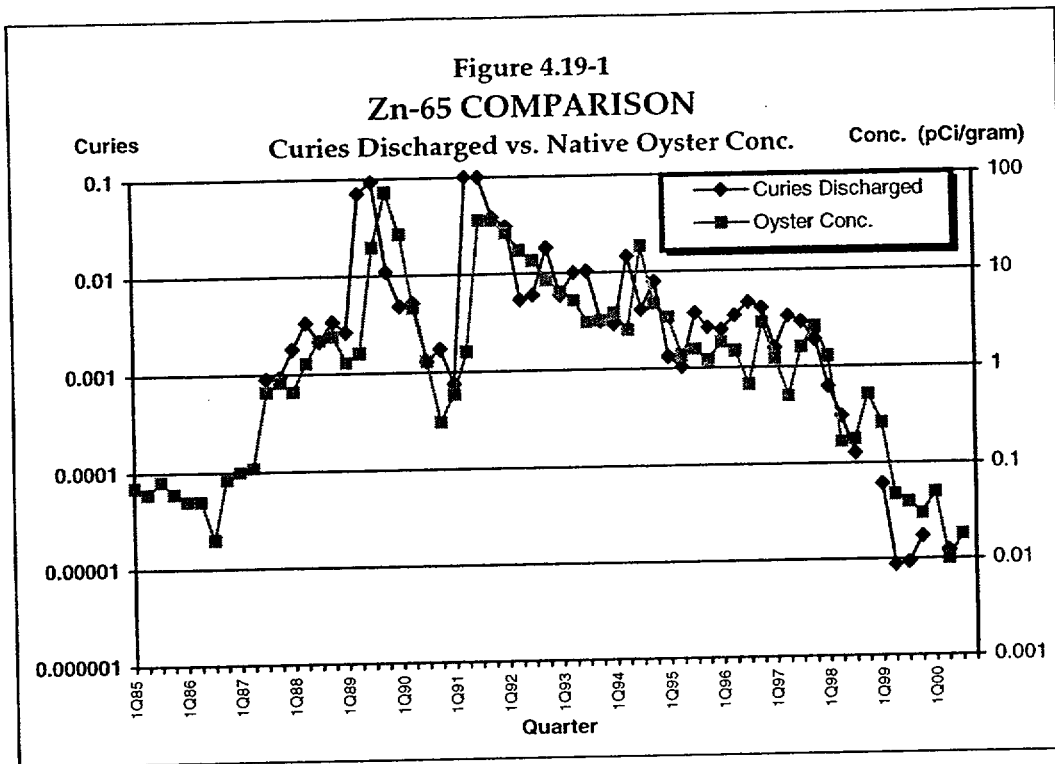
No station related radioactivity was observed in any of the clam samples taken in 2000.

#### **4.21. Scallops**

Scallops are not required by the REMM. However, attempts are made to sample this media to confirm station effects because scallops are available for public consumption. No scallop samples were available in 2000.

#### **4.22. Lobsters (Table 22)**

No station related radioactivity was detected in this sample media in 2000.



## **5. OFFSITE DOSE EQUIVALENT COMMITMENTS**

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

The first method utilizes calculations of direct dose from sources onsite and the stations' measured radioactive discharges as input parameters into conservative models to simulate the transport mechanism through the environment to man. This results in the calculation of the maximum dose consequences to individuals and the 0 to 50 mile population dose commitment. The results of these computations have been submitted to the NRC in the Radioactive Effluent Release Report written in accordance with the Radiological Effluent Monitoring Manual, Section I.F.2. This method, which is usually conservative (i.e., computes higher doses than that which actually occur) has the advantage of approximating an upper bound to the dose consequences. This is important in those cases where the actual dose consequence cannot be measured because they are so small as to be well below the capabilities of conventional monitoring techniques.

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

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

Summarizing the data in Table 5.1:

### **MAXIMUM TOTAL INDIVIDUAL DOSES :**

**WHOLE BODY = 1.032 mrem**

**GI(LLI) = 0.012 mrem**

The organ GI(LLI) dose is essentially all attributable to the liquid pathway. The whole body dose is predominantly due to a conservative determination of dose to the nearest resident as a result of possible direct radiation from on-site radioactive waste operation/storage facilities and continuous occupancy (~1 mrem). The whole body and maximum organ

dose attributable from station effluents includes conservative assessments using Method 2.

Since the maximum dose consequence to an individual is at the location of highest dose consequence, doses will be less for all other locations. The average dose to an individual within 50 miles from the site cannot be calculated using the second method. However, the first method yields the following results for the period January-December 2000 for the average individual:

ANNUAL AVERAGE WHOLE BODY DOSE :

DUE TO AIRBORNE EFFLUENTS = 0.000011 mrem

DUE TO LIQUID EFFLUENTS = 0.000015 mrem

Thus, it can be seen that the average whole body dose to an individual is much less than the maximum whole body dose to an individual as shown in Table 5.1.

In order to provide perspective on the doses in Table 5.1, the standards for 2000 on the allowable maximum dose to an individual of the general public are given in 40CFR190 as 25 mrem whole body, 75 mrem thyroid, and 25 mrem to any other organ. These standards are a fraction of the normal background radiation dose of approximately 284 mrem per year and are designed to be inconsequential in regard to public health and safety. Since station related doses are even a smaller fraction of natural background, they have insignificant public health consequences. In fact, the station related doses to the maximum individual are less than 10% of the variation in natural background in Connecticut.

**TABLE 5.1**  
**COMPARISON OF DOSE CALCULATION METHODS**  
**MILLSTONE POWER STATION**  
**2000 Annual Dose (millirem)**

Pathway	Individual	Organ	Method 1 <sup>(1)</sup>				Method 2 <sup>(1)</sup>
			Unit 1 (BWR)	Unit 2 (PWR)	Unit 3 (PWR)	Station Total	Station
<i>Airborne Effluents</i>							
1. External Gamma Dose	Max <sup>(2)</sup>	Whole Body	0.018	0.0054	0.0073	0.031	ND <sup>(7)</sup>
<i>Direct Dose</i>							
Nearest Residence	Max <sup>(2)</sup>	Whole Body	N/A	N/A	N/A	~1 <sup>(4)</sup>	<3.5 <sup>(5)</sup>

**TABLE 5.1 (Cont.)**  
**COMPARISON OF DOSE CALCULATION METHODS**  
**MILLSTONE POWER STATION**  
**2000 Annual Dose (millirem)**

Pathway	Max Individual	Organ	Method 1 <sup>(1)</sup>				Method 2 <sup>(1)</sup>
			Unit 1 (BWR)	Unit 2 (PWR)	Unit 3 (PWR)	Station Total	Station
<i>Liquid Effluents</i>							
1. Fish	* Adult	Whole Body	0.000022	0.00019	0.00045	0.00066	ND <sup>(3)</sup>
	Teen	"	0.000015	0.00016	0.00037	0.00055	
	Child	"	0.000010	0.00015	0.00034	0.00050	
	* Adult	GI(LLI) <sup>(6)</sup>	0.000025	0.0017	0.0018	0.0035	ND
	Teen	"	0.000018	0.0012	0.0013	0.0025	
	Child	"	0.000007	0.0005	0.0006	0.0011	
	* Adult	Liver	0.000036	0.00033	0.00064	0.0010	ND
	Teen	"	0.000038	0.00033	0.00057	0.0009	
	Child	"	0.000035	0.00030	0.00051	0.0008	
2. Shellfish	Adult	Whole Body	0.000067	0.00017	0.00023	0.00047	0.00001 <sup>(8)</sup>
	Teen	"	0.000067	0.00017	0.00022	0.00046	0.00001
	* Child	"	0.000073	0.00020	0.00025	0.00052	0.00001
	* Adult	GI(LLI)	0.00013	0.0017	0.0014	0.0032	0.0083 <sup>(8)</sup>
	Teen	"	0.00009	0.0012	0.0010	0.0023	0.0057
	Child	"	0.00003	0.0004	0.0004	0.0008	0.0020
	Adult	Liver	0.00014	0.00035	0.00050	0.0010	0.00002 <sup>(8)</sup>
	* Teen	"	0.00014	0.00037	0.00051	0.0010	0.00002
	Child	"	0.00012	0.00036	0.00050	0.0010	0.00002

Notes:

1. Except for direct dose, method 1 uses measured station discharges and meteorological data as input parameters to transport-to-man models which conservatively calculate dose to people; method 2 uses actual measured concentrations in environmental media to estimate the dose.
2. Maximum individual - The maximum individual dose is the dose to the most critical age group at the location of maximum concentration of station related activity. The dose to the average individual is much less than the maximum individual dose.
3. ND - Not Detectable - No station related activity could be detected above natural background or above the minimum detectable level (MDL).
4. The dominant source of direct dose from the station is from operation/storage of radioactive waste facilities. Storage of radioactive waste in each of four areas designated onsite is limited to ensure that the maximum direct dose from each area at the site boundary does not exceed one millirem. Therefore the maximum dose from storage of radioactive waste onsite is less than four millirem. Each facility is monitored onsite by the Radiation Protection Department using TLDs. The average yearly exposure for each facility TLD was corrected for distance to the nearest site boundary. The resultant exposure was conservatively doubled to account for skyshine. These maximum estimated doses from each facility were summed for a cumulative site commitment of approximately 1 millirem.
5. Measured dose was derived from monthly TLD readings. There are two residences which qualify as the closest residence, each has a TLD near enough to use as an estimate the residence. The one with the highest average dose rate was used to estimate the direct dose to the closest residence. A background dose rate was subtracted. This background was derived from the average of the five control TLD locations. This method is very conservative. The exposure measurements of the select indicator locations are influenced by natural background exposure differences caused by the many granite out-croppings typical of the Millstone area. Historical data evaluation has shown that TLD sample locations in the vicinity of granite can be dramatically influenced by natural radioactivity contained within the granite.
6. GI (LLI) - Gastrointestinal Tract - Lower Large Intestine.
7. ND - Not Detectable - measurements for 2000 show no detectable station related activity. TLD's cannot detect levels which are such a small fraction of natural background.
8. Based on measured levels in quarry native oysters. A measured near field dilution factor of 3 was used to adjust for the fact that quarry oysters are on-site and inaccessible to the public. This factor adjusts the measured on-site concentration to that which could occur to a public accessible off-site location after dilution of the effluent by the Long Island Sound.



## 6. DISCUSSION

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

Consider, for example, the problem of deciphering the effect of station releases on the radioactivity measured in milk samples. This is an important problem because this product is widely consumed and fission products readily concentrate in this media. Some of these fission products, such as I-131 and Sr-89 are relatively short-lived. Therefore they result from either station effluents, nuclear weapons tests or nuclear incidents (e.g. Chernobyl). Sr-89's lifetime is longer than I-131's, therefore it must be remembered that it will remain around for much longer periods of time. Problems are caused by the long-lived fission products, Sr-90 and Cs-137. These isotopes are still remaining from the high weapons testing era of the 1960's. This results in measurable amounts of Sr-90 and Cs-137 appearing in milk samples. Distinguishing between this "background" of fallout activity and station effects is a difficult problem.

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

- (1) The stations accurately measure many fission products, including Sr-90 and Cs-137 in their releases. Based on these measurements and proven models developed by the Nuclear Regulatory Commission, concentrations in the environment can be calculated. These calculations (generally conservative, see Section 5.0) show that insufficient quantities of Sr-90 and Cs-137 have been released from the stations to yield the measured concentrations in milk.
- (2) Over the many years of station operation, Sr-89 has often been released in comparable quantity to Sr-90. Since they are chemically similar, comparable levels should have been detected in milk if the Sr-

90 was station related. No station related Sr-89 has been detected in milk samples.

- (3) Similar to Sr-89, Cs-134 can be used as an indication of station related Cs-137. Although not as conclusive as Sr-89, the lack of any measurable Cs-134 in any of the milk samples suggests that the Cs-137 is not station related. This is further confirmed by the evaluation of the air particulate data. The only occurrences of detectable Cs-134 in milk resulted from the Chernobyl incident.
- (4) Dairy milk sampling began in the 1960's, several years prior to station operation. The highest levels of weapons fallout related Sr-90 and Cs-137 (see Figures 6-1 and 6-2), were measured in the years prior to station operation. Samples taken in the immediate station areas have always shown higher levels of weapons related fallout than samples taken from the Central Connecticut Region (CT Pooled Milk). Radioactivity levels of fallout related Sr-90 and Cs-137 have decreased significantly since the 1964 Nuclear Test Ban Treaty due to decay.
- (5) Local variability of Sr-90 and Cs-137 in milk is common throughout the United States. Due to the variability in soil conditions, pasturing methods, rainfall, etc., it is the rule rather than the exception. Therefore, it is not surprising that certain farms have higher levels of radioactivity than other farms. In fact, there are some cases where the farms further from the station have higher Sr-90 and Cs-137 values than the farms that are closer to the station.
- (6) The Millstone goat farm with the highest levels of Sr-90 and Cs-137 has also experienced the highest levels of short-lived activity from the 1976 and 1977 Chinese Tests and the 1986 Chernobyl accident. This indicates that for some unknown reason this farm has the ability for higher reconcentration. Special studies performed at this and other farms failed to find any link to the station.

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

Northeast Utilities has carefully examined the data throughout the year and has presented in this report all cases where station related radioactivity can be detected. An analysis of the potential exposure to the population from any station related activity has been performed and shows that in all cases the exposure is insignificant.

Throughout the year, the Connecticut Department of Environmental Protection performs a parallel environmental program. The results of their analyses are compared to the results from this program's analyses. The comparisons are tracked and used as a cross-reference to verify measured station activity. During 2000, both programs showed similar results.

Figure 6-1 Strontium-90 in Milk

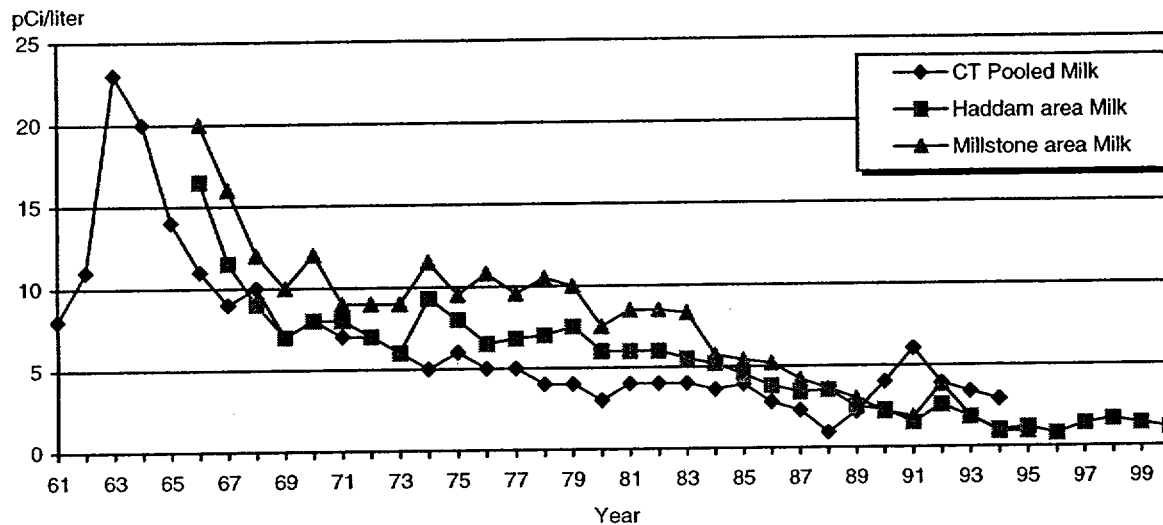
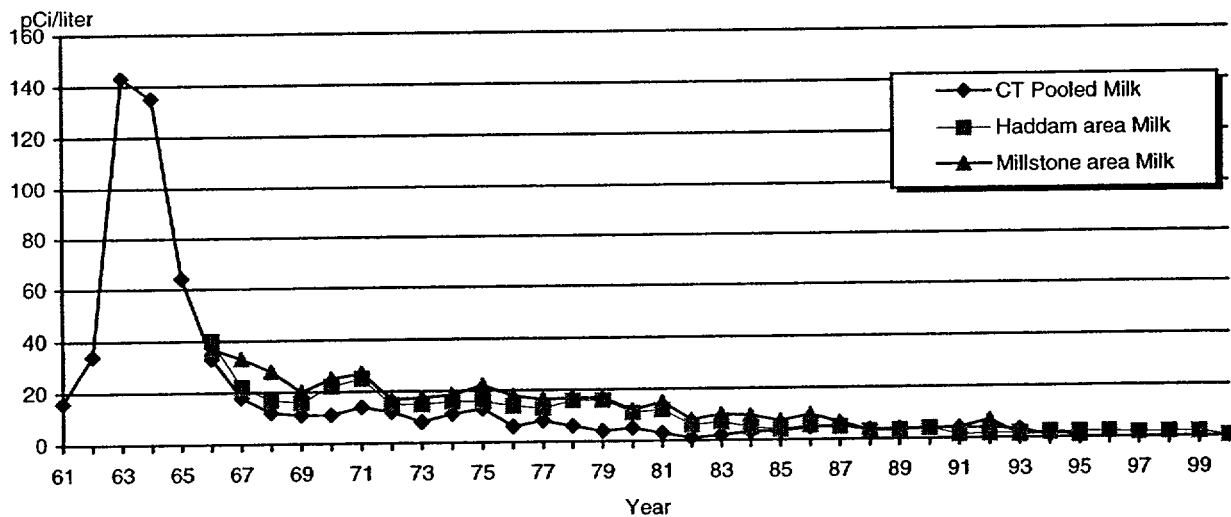


Figure 6-2 Cesium-137 in Milk



Dairy milk is no longer available in the Millstone area and CT Pooled milk has not been collected by the State of CT since 1994.

CY Start-up occurred: July 24, 1967  
 MP1 Start-up occurred: October 26, 1970  
 MP2 Start-up occurred: October 17, 1975  
 MP3 Start-up occurred: January 23, 1986

## **APPENDIX A**

### **LAND USE CENSUS FOR 2000**

**TABLE A-1**

**Dairy Cows Within 15 miles of Millstone Point- 2000**

<u>Direction</u>	<u>Distance</u>	<u>Name and Address</u>	<u># of Cows</u>
N	14 M	Kevin Dubicki Wawecus Farm Dairy 226 Wawecus Hill Rd. Norwich, CT 06360	50
NE	13.5 M	Henry Morgan Morgan Farm 512 Shewville Rd. Ledyard, CT 06339	60
WNW	11 M	John Tiffany II Tiffany Farms 156 Sterling City Road Lyme, CT 06371	80
NNW	11.5 M	Eugene Wilczewski Salem Valley Farm Dairy 200 Darling Road Salem, CT 06420	50
NNW	13 M	Stuart Gadbois Maegog Farms 40 Old Colchester Rd. Salem, CT 06420	205

*Note: No cow farms on this list are used for sampling, all farms are greater than ten miles distance from plant.*

**TABLE A-2**

**Dairy Goats Within 20 miles of Millstone Point- 2000**

<u>Direction</u>	<u>Distance</u>	<u>Name and Address</u>	<u># of Goats</u>
N	2 M	Mrs. John Mingo 69 Spithead Road Waterford, CT 06385	7
NNE	5.2 M	Allen Moran 122 Dayton Rd. Waterford, CT 06385	8
NE	10.6 M	Laura Behan 189 Quaker Farm Rd. Mystic, CT 06355	6
NE	8.6 M	Arthur Hiles 2 Daboll Rd. Groton, CT 06340	*
ENE	2 M	Berton Smith 16 Braman Rd. Waterford, CT 06385	0
ENE	13.1 M	Phyllis Borges 212 Deans Mill Road Stonington, CT 06378	3
ENE	15.3 M	Veronica Ploof 73 Palmerneck Road Pawcatuck, CT 06379	7
ENE	16.4 M	Grace White 1 Providence NL Tpk. North Stonington, CT 06359	8
WNW	18.1 M	Virginia Marshall 178 Old Chester Rd. Haddam, CT 06438	5
NW	17.3 M	Kelsey Humble 98 Ballahack Rd. East Haddam, CT 06423	5
NNW	18.5 M	Theodore Powell 31 O'Connell Road Colchester, CT 06415	*
NNW	29 M**	Kathy Waters 215 Burnt Hill Road Hebron, CT 06248	35

\* Unable To Contact As Of This Time

\*\* Control station listed, distance greater than 20 miles from Millstone

**TABLE A-3**  
**2000 Resident Survey<sup>⊖</sup>**

<b><u>Downwind</u></b> <b><u>Direction</u></b>	<b><u>Distance to</u></b> <b><u>Closest Resident</u></b> <b><u>(meters)</u></b>
N	1714
NNE	800
NE	740
ENE	1560
E	1500
ESE	1850
SE	N/A
SSE	N/A
S	N/A
SSW	N/A
SW	3770
WSW	3360
W	3100
WNW	2770
NW	2460
NNW	1100

\* N/A - not applicable (over water sectors).

---

<sup>⊖</sup> Distances were measured in 2000 using GPS.

**TABLE A-4**  
**2000 Garden Survey<sup>⊖</sup>**

<u>Downwind Direction</u>	<u>Distance to Closest Garden (meters)</u>
N	1725
NNE	805
NE	745
ENE	1565
E	1505
ESE	1805
SE	N/A
SSE	N/A
S	N/A
SSW	N/A
SW	4355
WSW	3405
W	3215
WNW	2775
NW	2635
NNW	1465

\* N/A - not applicable (over water sectors).

---

<sup>⊖</sup> Distances were measured in 2000 using GPS.



## **APPENDIX B**

### **NNECO QA PROGRAM**

## **INTRODUCTION**

Northeast Nuclear Energy Company (NNECO) acting as the agent for Connecticut Yankee Atomic Power Company (CYAPCO), maintains a independent non-required quality assurance (QA) program as part of the radiological environmental monitoring program (REMP). The QA program consists of contractor appraisals, quality control samples, and quality control testing of environmental TLDs.

### **NNECO QA PROGRAM**

Appraisals are conducted on services provided by the primary (Duke) radioanalysis contractor, Select Energy Environmental Services (SE-ES), and on the NNECO Radiological Engineering Section (RES). During 2000 the program requirement to conduct an appraisal of the primary contractor laboratory was satisfied by participation in the annual audit by the Laboratory Quality Control Audit Committee (LQCAC), a joint effort by clients serviced by the contractor. The primary contractor, SE-ES, and RES are also audited by other organizations such as the Millstone and Connecticut Yankee Nuclear Oversight Departments.

The NNECO QA Program quality control tests consist of spikes of various sample media, duplicate samples, and TLD spikes.

Sample spikes are a check on the accuracy of results of the contractor's radioanalyses. Duplicate samples test the contractor's precision, or reproducibility of results, by comparing analytical results of split samples. The number and type of NNECO QA Program quality control samples as well as acceptance criteria are defined in NNECO Radiological Engineering Instruction RAB B-3, "Quality Control of Radiological Environmental Monitoring Program Sample Analyses." An investigation is conducted of any result or trend which does not satisfy acceptance criteria.

Spike comparisons are used to test environmental TLDs. Spike testing involves the exposure of four TLDs each month. Readouts of the spiked TLDs are compared to the known radiation exposure. The comparison results must satisfy acceptance criteria in NNECO Radiological Engineering Instruction RAB B-2, "Quality Control of the Environmental TLD Monitoring Program." An investigation is conducted on any result or trend which does not satisfy acceptance criteria.

### **OTHER QA PROGRAMS**

The NNECO QA Program is a "good practice" effort to monitor REMP radioanalysis performance. Other QA programs performed in 2000 and credited as required QA practices include:

1. Duke's internal QA program. In addition to the NNECO quality control samples the radioanalysis contractor has it's own quality control samples. In total, at least five percent of the contractor's sample analyses include quality control samples.
2. Duke's interlaboratory comparison program with an independent third party, Analytics, Inc. Results of the Analytics intercomparison are contained in Appendix C. Primary contractor participation in an interlaboratory comparison program is required by station Technical Specifications. The Analytics comparison satisfies this requirement.
3. Duke's participation in National Institute of Standards and Technology (NIST) Measurement Assurance Program (MAP) and DOE's Environmental Measurements Laboratory QAP Program. Duke participates in these interlaboratory QA programs because of other clients' needs, not because of nuclear power station environmental sample analyses

### **RESULTS OF NNECO QA PROGRAM FOR CONTRACTOR SAMPLE RADIOANALYSES**

The NNECO QA Program indicated that Duke's environmental radiological analysis program was adequate in 2000. Of 38 QA samples, 36 passed criteria, a 95% success rate. Criteria for passing is that the sample analysis result be within 20% of the known spike except in the case of Sr-89 or Sr-90 spikes in milk which have to be within 30% of the known spike. To allow more tolerance for lower activity spikes an alternate criterion is used. If the two sigma error range of the analyzed result includes the known spike value the result passes.

One water QC sample exceeded the criteria at plus 21% of the known Mn-54 and Co-60 spikes. A water sample gamma spike fails if two or more radionuclides exceed criteria (of four or more radionuclides). Five other radionuclide spikes in the same sample were within criteria ranging from -13% to 13% difference from the known spike. Six other water QC samples after this failed sample passed in 2000 with only one out of 32 spiked radionuclides exceeding criteria at minus 24%.

One milk QC sample exceeded the criteria at plus 22% of the known I-131 spike. This analysis involves chemical separation of iodine in milk in order to detect a lower level of radioactive iodine. It appears that the spike was not prepared properly. A goat milk QC sample prepared at the same time also exceeded the known I-131 spike by plus 22%. This sample passed criteria because the known spike level was within the two-sigma error of the sample result.

## **APPENDIX C**

### **SUMMARY OF INTERLABORATORY COMPARISONS**

## **INTRODUCTION**

This appendix covers the Intercomparison Program of the Duke Engineering and Services Environmental Laboratory (DESEL) as required by technical specifications for each Millstone unit. DESEL uses QA/QC samples provided by Analytics, Inc to monitor the quality of analytical processing associated with the Radiological Environmental Monitoring Program (REMP). The suite of Analytics QA/QC samples are designed to be comparable with the pre-1996 US EPA Interlaboratory Cross-Check Program in terms of sample number, matrices, and nuclides. It was modified to more closely match the media mix presently being processed by DESEL and includes:

- milk for gamma (9 nuclides) and low-level (LL) Iodine-131 analyses once per quarter,
- milk for Sr-89 and Sr-90 analyses during the 1st and 3rd quarters,
- water for gamma (9 nuclides) and low-level (LL) Iodine-131 analyses during the 1st and 3rd quarters,
- water tritium analysis during the 2nd and 4th quarters,
- air filter for gamma (8 nuclides) analyses during the 2nd quarter, and
- air filter for gross beta analysis during the 2nd and 4th quarter.

In addition to the Analytics Intercomparison Program, DESEL also participates in two other intercomparison programs which include radionuclides and media similar to those required by the Haddam Neck program. These two programs are the National Institute of Standards and Technology (NIST) Measurement Assurance Program (MAP) and the U.S. DOE Environmental Measurements Laboratory (EML) Quality Assessment Program (QAP).

## **RESULTS**

Intercomparison program results are evaluated using DESEL's internal bias acceptance criterion. The criterion is defined as within 25% of the known strontium value for samples containing both Sr-89 and Sr-90 and within 15% of the known value for other radionuclides, or within two sigma of the known value. Any sample analysis result which does not pass the criteria is investigated by DESEL. NNECO's acceptance criteria is 20% of the known except for Sr-89 and Sr-90 analyses which is 30% of the known, or within two sigma of the known value.

Analytics Intercomparison Program results are included on pages C-3 through C-8 for the fourth quarter of 1999 through the third quarter of 2000. Cumulative percent error in difference from the known was plotted for these results as shown on page C-5. Fifty five percent (55%) of the results were within 5% of the known, 88% were within 10% of the known, 96% were within DESEL's criteria, and all but one analysis were within NNECO's criteria.

**DESEL 2000 ANALYTICS RADIOLOGICAL ENVIRONMENTAL CROSS-CHECK  
PERFORMANCE EVALUATION**

Sample Number	Quarter/ Year	Sample Media	Nuclide	Units	Reported Value	Known Value	Ratio DESEL/ Analytics	Evaluation
E1994-162	4th/99	Filter	Sr-89	pCi	107	114	0.94	Agreement
E1994-162	4th/99	Filter	Sr-90	pCi	52	54	0.96	Agreement
E1995-162	4th/99	Filter	Gross Alpha	pCi	19	20	0.95	Agreement
E1995-162	4th/99	Filter	Gross Beta	pCi	134	123	1.09	Agreement
E1996-162	4th/99	Water	H-3	pCi/L	6940	8015	0.87	Agreement
E1997-162	4th/99	Milk	I-131LL	pCi/L	77	77	1.00	Agreement
E1997-162	4th/99	Milk	I-131	pCi/L	76	77	0.99	Agreement
E1997-162	4th/99	Milk	Ce-141	pCi/L	127	117	1.09	Agreement
E1997-162	4th/99	Milk	Cr-51	pCi/L	268	322	0.83	Non-Agreement(1)
E1997-162	4th/99	Milk	Cs-134	pCi/L	136	138	0.99	Agreement
E1997-162	4th/99	Milk	Cs-137	pCi/L	112	106	1.06	Agreement
E1997-162	4th/99	Milk	Co-58	pCi/L	117	121	0.97	Agreement
E1997-162	4th/99	Milk	Mn-54	pCi/L	109	111	0.98	Agreement
E1997-162	4th/99	Milk	Fe-59	pCi/L	113	104	1.09	Agreement
E1997-162	4th/99	Milk	Zn-65	pCi/L	214	206	1.04	Agreement
E1997-162	4th/99	Milk	Co-60	pCi/L	155	146	1.06	Agreement

(1) CR 00-31 Issued

**DESEL 2000 ANALYTICS RADIOLOGICAL ENVIRONMENTAL CROSS-CHECK  
PERFORMANCE EVALUATION**

Sample Number	Quarter/ Year	Sample Media	Nuclide	Units	Reported Value	Known Value	Ratio DESEL/ Analytics	Evaluation
E2127-162	1st/00	Water	I-131LL	pCi/L	76.63	74	1.04	Agreement
E2127-162	1st/00	Water	I-131	pCi/L	70	74	0.95	Agreement
E2127-162	1st/00	Water	Ce-141	pCi/L	426	427	1.00	Agreement
E2127-162	1st/00	Water	Cr-51	pCi/L	205	238	0.86	Agreement
E2127-162	1st/00	Water	Cs-134	pCi/L	135	139	0.97	Agreement
E2127-162	1st/00	Water	Cs-137	pCi/L	126	128	0.98	Agreement
E2127-162	1st/00	Water	Co-58	pCi/L	46	44	1.05	Agreement
E2127-162	1st/00	Water	Mn-54	pCi/L	165	159	1.04	Agreement
E2127-162	1st/00	Water	Fe-59	pCi/L	94	92	1.02	Agreement
E2127-162	1st/00	Water	Zn-65	pCi/L	191	196	0.97	Agreement
E2127-162	1st/00	Water	Co-60	pCi/L	117	116	1.01	Agreement
E2128-162	1st/00	Water	Gross Alpha	pCi/L	60	82	0.73	Non-Agreement(2)
E2128-162	1st/00	Water	Gross Beta	pCi/L	223	210	1.06	Agreement
E2129-162	1st/00	Water	U-234	pCi/L	62	57	1.09	Agreement
E2129-162	1st/00	Water	U-235	pCi/L	2.5	2.7	0.93	Agreement
E2129-162	1st/00	Water	U-238	pCi/L	64	59	1.08	Agreement
E2129-162	1st/00	Water	Pu-238	pCi/L	80	73	1.10	Agreement
E2129-162	1st/00	Water	Pu-239	pCi/L	69	62	1.11	Agreement
E2129-162	1st/00	Water	Ra-226	pCi/L	87	89	0.98	Agreement
E2129-162	1st/00	Water	Ra-228	pCi/L	77	66	1.17	Non-Agreement(2)

(2) CR 00-26 Issued

**DESEL 2000 ANALYTICS RADIOLOGICAL ENVIRONMENTAL CROSS-CHECK  
PERFORMANCE EVALUATION**

Sample Number	Quarter/ Year	Sample Media	Nuclide	Units	Reported Value	Known Value	Ratio DESEL/ Analytics	Evaluation
E2130-162	1st/00	Milk	I-131LL	pCi/L	86	84	1.02	Agreement
E2130-162	1st/00	Milk	I-131	pCi/L	84	84	1.00	Agreement
E2130-162	1st/00	Milk	Ce-141	pCi/L	483	460	1.05	Agreement
E2130-162	1st/00	Milk	Cr-51	pCi/L	279	256	1.09	Agreement
E2130-162	1st/00	Milk	Cs-134	pCi/L	145	150	0.97	Agreement
E2130-162	1st/00	Milk	Cs-137	pCi/L	138	138	1.00	Agreement
E2130-162	1st/00	Milk	Co-58	pCi/L	43	47	0.91	Agreement
E2130-162	1st/00	Milk	Mn-54	pCi/L	166	171	0.97	Agreement
E2130-162	1st/00	Milk	Fe-59	pCi/L	103	99	1.04	Agreement
E2130-162	1st/00	Milk	Zn-65	pCi/L	197	208	0.95	Agreement
E2130-162	1st/00	Milk	Co-60	pCi/L	124	125	0.99	Agreement
E2131-162	1st/00	Milk	Sr-89	pCi/L	90	90	1.00	Agreement
E2131-162	1st/00	Milk	Sr-90	pCi/L	57	59	0.97	Agreement



**DESEL 2000 ANALYTICS RADIOLOGICAL ENVIRONMENTAL CROSS-CHECK  
PERFORMANCE EVALUATION**

Sample Number	Quarter/ Year	Sample Media	Nuclide	Units	Reported Value	Known Value	Ratio DESEL/ Analytics	Evaluation
E2214-162	2nd/00	Filter	Ce-141	pCi	75	80	0.94	Agreement
E2214-162	2nd/00	Filter	Cr-51	pCi	242	243	1.00	Agreement
E2214-162	2nd/00	Filter	Cs-134	pCi	89	105	0.85	Agreement
E2214-162	2nd/00	Filter	Cs-137	pCi	230	219	1.05	Agreement
E2214-162	2nd/00	Filter	Co-58	pCi	119	120	0.99	Agreement
E2214-162	2nd/00	Filter	Mn-54	pCi	143	136	1.05	Agreement
E2214-162	2nd/00	Filter	Fe-59	pCi	63	58	1.09	Agreement
E2214-162	2nd/00	Filter	Zn-65	pCi	182	170	1.07	Agreement
E2214-162	2nd/00	Filter	Co-60	pCi	159	163	0.98	Agreement
E2215-162	2nd/00	Filter	Sr-89	pCi	87	109	0.80	Agreement
E2215-162	2nd/00	Filter	Sr-90	pCi	62	66	0.94	Agreement
E2216-162	2nd/00	Filter	Gross Alpha	pCi	25	24	1.04	Agreement
E2216-162	2nd/00	Filter	Gross Beta	pCi	97	93	1.04	Agreement
E2217-162	2nd/00	Water	H-3	pCi/L	10627	11400	0.93	Agreement

**DESEL 2000 ANALYTICS RADIOLOGICAL ENVIRONMENTAL CROSS-CHECK  
PERFORMANCE EVALUATION**

Sample Number	Quarter/Year	Sample Media	Nuclide	Units	Reported Value	Known Value	Ratio DESEL/Analytics	Evaluation
E2218-162	2nd/00	Milk	I-131LL	pCi/L	81	81	1.00	Agreement
E2218-162	2nd/00	Milk	I-131	pCi/L	86	81	1.06	Agreement
E2218-162	2nd/00	Milk	Ce-141	pCi/L	75	69	1.09	Agreement
E2218-162	2nd/00	Milk	Cr-51	pCi/L	236	211	1.12	Agreement
E2218-162	2nd/00	Milk	Cs-134	pCi/L	85	91	0.93	Agreement
E2218-162	2nd/00	Milk	Cs-137	pCi/L	199	190	1.05	Agreement
E2218-162	2nd/00	Milk	Co-58	pCi/L	98	104	0.94	Agreement
E2218-162	2nd/00	Milk	Mn-54	pCi/L	122	118	1.03	Agreement
E2218-162	2nd/00	Milk	Fe-59	pCi/L	52	50	1.04	Agreement
E2218-162	2nd/00	Milk	Zn-65	pCi/L	136	148	0.92	Agreement
E2218-162	2nd/00	Milk	Co-60	pCi/L	151	142	1.06	Agreement
E2359-162	3rd/00	Water	I-131LL	pCi/L	72	75	0.95	Agreement
E2359-162	3rd/00	Water	I-131	pCi/L	79	75	1.05	Agreement
E2359-162	3rd/00	Water	Ce-141	pCi/L	192	191	1.00	Agreement
E2359-162	3rd/00	Water	Cr-51	pCi/L	219	230	0.95	Agreement
E2359-162	3rd/00	Water	Cs-134	pCi/L	121	128	0.95	Agreement
E2359-162	3rd/00	Water	Cs-137	pCi/L	225	218	1.03	Agreement
E2359-162	3rd/00	Water	Co-58	pCi/L	58	60	0.97	Agreement
E2359-162	3rd/00	Water	Mn-54	pCi/L	92	89	1.04	Agreement
E2359-162	3rd/00	Water	Fe-59	pCi/L	56	54	1.03	Agreement
E2359-162	3rd/00	Water	Zn-65	pCi/L	129	134	0.97	Agreement
E2359-162	3rd/00	Water	Co-60	pCi/L	247	246	1.01	Agreement

**DESEL 2000 ANALYTICS RADIOLOGICAL ENVIRONMENTAL CROSS-CHECK  
PERFORMANCE EVALUATION**

Sample Number	Quarter/ Year	Sample Media	Nuclide	Units	Reported Value	Known Value	Ratio DESEL/ Analytics	Evaluation
E2362-162	3rd/00	Milk	I-131LL	pCi/L	66	58	1.14	Agreement
E2362-162	3rd/00	Milk	I-131	pCi/L	69	58	1.20	Non-Agreement(3)
E2362-162	3rd/00	Milk	Ce-141	pCi/L	176	164	1.07	Agreement
E2362-162	3rd/00	Milk	Cr-51	pCi/L	195	198	0.99	Agreement
E2362-162	3rd/00	Milk	Cs-134	pCi/L	108	110	0.98	Agreement
E2362-162	3rd/00	Milk	Cs-137	pCi/L	193	188	1.02	Agreement
E2362-162	3rd/00	Milk	Co-58	pCi/L	50	51	0.99	Agreement
E2362-162	3rd/00	Milk	Mn-54	pCi/L	81	77	1.05	Agreement
E2362-162	3rd/00	Milk	Fe-59	pCi/L	50	47	1.06	Agreement
E2362-162	3rd/00	Milk	Zn-65	pCi/L	117	115	1.02	Agreement
E2362-162	3rd/00	Milk	Co-60	pCi/L	212	212	1.00	Agreement
E2363-162	3rd/00	Milk	Sr-89	pCi/L	65	74	0.88	Agreement
E2363-162	3rd/00	Milk	Sr-90	pCi/L	41	39	1.06	Agreement

(3) CR 01-07 issued