

State of Vermont

Environmental Radiation Surveillance Report



2003 Summary



**Vermont Department of Health
Office of Radiological Health**

ENVIRONMENTAL RADIATION SURVEILLANCE SUMMARY FOR 2003

ALL SAMPLES FOR THE YEAR 2003 ARE WITHIN THE EXPECTED HISTORICAL RANGE

Sample Media	Historical Range*		2003
Air Filter (pCi/m ³)	Gross Alpha		< LLD to 0.0071
	Gross Beta		< LLD to 0.0251
Biota (pCi/kg)	Plant	Cs-137	< LLD
		K-40	2,000 to 13,000
		Be-7	< LLD to 1,500
	Fungi	Cs-137	50 to 9,000
		K-40	1,000 to 12,000
		Be-7	< LLD
		Cs-134	< LLD to 45*
	Fern	Cs-137	< LLD to 540
		K-40	4,000 to 11,000
		Be-7	100 to 4,000
	Honey	Cs-137	< LLD to 200
		K-40	300 to 2,000
		Be-7	< LLD
Fish (pCi/kg)	Cs-137		< LLD to 100
	K-40		1,000 to 5,000
Iodine Cartridges (pCi/m ³)	I-131		< LLD
Milk (pCi/L)	I-131		< LLD
	K-40		1,200 to 2,000

Sample Media	Historical Range*		2003
Sediment (pCi/kg)	Cs-137	< LLD to 500	< LLD to 79
	K-40	6,000 to 22,000	10,400 to 12,400
	Be-7	< LLD to 5,000	< LLD
Soil (pCi/kg)	Cs-137	< LLD to 500	< LLD to 235
	K-40	7,000 to 20,000	11,400 to 17,900
	Be-7	< LLD to 600	< LLD to 289
Special Study Sediments (pCi/kg)	Be-7	< LLD to 3,000	< LLD to 1,810
	Co-60	< LLD to 2500	< LLD
	K-40	6,000 to 26,000	10,400 to 17,900
	Cs-137	< LLD to 500	60 to 167
TLD (mR/quarter)	Gross Gamma	0 to 12.5	0 to 8.0
Tritium in Water (nCi/L)	H-3	< LLD	< LLD
Water (pCi/L)	Alpha	< LLD to 15	< LLD to 7.8
	Beta	< LLD to 15	< LLD to 10.1

LLD = Lower Limit of Detection

NS = No Sample

* Due to Chernobyl event.

AIR SAMPLES 2003

All Air Samples for the Year 2003 are within the expected historical range.

The historical range for alpha is from less than the detection limit to 0.0071 pCi/m³. The samples for 2003 range from 0.0009 to 0.0050 pCi/m³.

The historical range for beta is from less than the detection limit to 0.0251 pCi/m³. The samples for 2003 range from 0.0048 to 0.0226 pCi/m³.

Air samples are taken at various fixed locations using a line powered piston type compressor operating at a rate of 1 cubic foot per minute nominal. The sample is collected on a fiberglass 2" diameter filter. Collection time is continuous with a nominal sampling period of four weeks. The air filters are analyzed for gross alpha and gross beta using an alpha/beta proportional counter. Results are reported in picoCuries per cubic meter of air with 2 sigma (standard deviation) value.

(picoCuries/Cubic Meter)

Sample Period	Windham County Courthouse		Brattleboro State Police	
	Alpha	Beta	Alpha	Beta
1/7 - 2/4/03	0.0029 ± 0.0010	0.0145 ± 0.0017	0.0017 ± 0.0007	0.0107 ± 0.0012
2/4 - 3/6/03	0.0049 ± 0.0009	0.0153 ± 0.0017	0.0038 ± 0.0007	0.0153 ± 0.0015
3/6 - 4/3/03	0.0040 ± 0.0011	0.0154 ± 0.0016	0.0030 ± 0.0008	0.0143 ± 0.0014
4/3 - 5/23/03	0.0030 ± 0.0007	0.0128 ± 0.0011	0.0026 ± 0.0006	0.0119 ± 0.0010
5/23 - 6/19/03	0.0020 ± 0.0009	0.0092 ± 0.0015	0.0020 ± 0.0008	0.0064 ± 0.0011
6/19 - 7/23/03	0.0034 ± 0.0009	0.0162 ± 0.0016	0.0028 ± 0.0008	0.0138 ± 0.0013
7/23 - 8/13/03	0.0028 ± 0.0011	0.0123 ± 0.0018	0.0017 ± 0.0008	0.0107 ± 0.0015
8/13 - 9/11/03	0.0047 ± 0.0009	0.0175 ± 0.0018	0.0028 ± 0.0006	0.0128 ± 0.0014
9/11 - 10/15/03	0.0049 ± 0.0011	0.0194 ± 0.0017	0.0033 ± 0.0008	0.0163 ± 0.0014
10/15 - 11/19/03	0.0043 ± 0.0010	0.0175 ± 0.0015	0.0034 ± 0.0008	0.0134 ± 0.0012
11/19 - 12/30/03	0.0046 ± 0.0010	0.0209 ± 0.0017	0.0039 ± 0.0007	0.0155 ± 0.0012
12/30 - 1/16/04	0.0049 ± 0.0015	0.0226 ± 0.0027	0.0011 ± 0.0008	0.0050 ± 0.0014

AIR SAMPLES 2003
(picoCuries/Cubic Meter)

Sample Period	Guilford Town Garage		Henry Transportation, Vernon	
	Alpha	Beta	Alpha	Beta
1/7 - 2/4/03	0.0030 ± 0.0009	0.0191 ± 0.0017	0.0021 ± 0.0007	0.0131 ± 0.0013
2/4 - 3/6/03	0.0036 ± 0.0007	0.0154 ± 0.0016	0.0048 ± 0.0007	0.0159 ± 0.0015
3/6 - 4/3/03	0.0043 ± 0.0011	0.0163 ± 0.0016	0.0038 ± 0.0009	0.0146 ± 0.0014
4/3 - 5/23/03	0.0027 ± 0.0006	0.0130 ± 0.0011	0.0028 ± 0.0006	0.0108 ± 0.0009
5/23 - 6/19/03	0.0023 ± 0.0009	0.0071 ± 0.0012	0.0020 ± 0.0008	0.0060 ± 0.0011
6/19 - 7/23/03	0.0029 ± 0.0008	0.0156 ± 0.0014	0.0025 ± 0.0007	0.0141 ± 0.0013
7/23 - 8/13/03	0.0027 ± 0.0010	0.0129 ± 0.0017	0.0019 ± 0.0009	0.0106 ± 0.0015
8/13 - 9/11/03	0.0042 ± 0.0008	0.0143 ± 0.0015	0.0026 ± 0.0006	0.0130 ± 0.0010
9/11 - 10/15/03	0.0043 ± 0.0010	0.0163 ± 0.0015	0.0036 ± 0.0008	0.0157 ± 0.0013
10/15 - 11/19/03	0.0036 ± 0.0009	0.0128 ± 0.0013	0.0029 ± 0.0007	0.0129 ± 0.0012
11/19 - 12/30/03	0.0040 ± 0.0008	0.0170 ± 0.0013	0.0033 ± 0.0006	0.0147 ± 0.0011
12/30 - 1/16/04	0.0036 ± 0.0013	0.0224 ± 0.0026	0.0030 ± 0.0011	0.0197 ± 0.0021

AIR SAMPLES 2003
(picoCuries/Cubic Meter)

Sample Period	Power Line River Crossing		Renaud Brothers (Puffers)	
	Alpha	Beta	Alpha	Beta
1/7 - 2/4/03	0.0036 ± 0.0009	0.0179 ± 0.0016	0.0028 ± 0.0008	0.0139 ± 0.0014
2/4 - 3/6/03	0.0050 ± 0.0008	0.0172 ± 0.0016	0.0050 ± 0.0008	0.0163 ± 0.0016
3/6 - 4/3/03	0.0038 ± 0.0010	0.0167 ± 0.0015	0.0040 ± 0.0010	0.0149 ± 0.0014
4/3 - 5/23/03	0.0032 ± 0.0006	0.0124 ± 0.0010	0.0033 ± 0.0006	0.0115 ± 0.0010
5/23 - 6/19/03	0.0024 ± 0.0009	0.0071 ± 0.0012	0.0020 ± 0.0008	0.0065 ± 0.0011
6/19 - 7/23/03	0.0029 ± 0.0008	0.0148 ± 0.0014	0.0037 ± 0.0009	0.0128 ± 0.0013
7/23 - 8/13/03	0.0024 ± 0.0010	0.0114 ± 0.0016	0.0021 ± 0.0009	0.0099 ± 0.0015
8/13 - 9/11/03	0.0041 ± 0.0008	0.0147 ± 0.0015	0.0031 ± 0.0007	0.0128 ± 0.0014
9/11 - 10/15/03	0.0030 ± 0.0008	0.0157 ± 0.0014	0.0027 ± 0.0008	0.0146 ± 0.0013
10/15 - 11/19/03	0.0013 ± 0.0006	0.0052 ± 0.0009	0.0026 ± 0.0007	0.0122 ± 0.0012
11/19 - 12/30/03	0.0038 ± 0.0007	0.0169 ± 0.0013	0.0040 ± 0.0008	0.0145 ± 0.0012
12/30 - 1/16/04	0.0042 ± 0.0013	0.0181 ± 0.0021	0.0030 ± 0.0011	0.0181 ± 0.0021

AIR SAMPLES 2003
(picoCuries/Cubic Meter)

Sample Period	Wilmington State Highway Garage	
	Alpha	Beta
1/7 - 2/4/03	0.0027 ± 0.0008	0.0132 ± 0.0013
2/4 - 3/6/03	0.0039 ± 0.0007	0.0129 ± 0.0013
3/6 - 4/3/03	0.0034 ± 0.0009	0.0128 ± 0.0013
4/3 - 5/23/03	0.0024 ± 0.0005	0.0098 ± 0.0009
5/23 - 6/19/03	0.0019 ± 0.0007	0.0061 ± 0.0011
6/19 - 7/23/03	0.0028 ± 0.0007	0.0119 ± 0.0012
7/23 - 8/13/03	0.0027 ± 0.0010	0.0103 ± 0.0015
8/13 - 9/11/03	0.0032 ± 0.0006	0.0124 ± 0.0013
9/11 - 10/15/03	0.0028 ± 0.0008	0.0139 ± 0.0013
10/15 - 11/19/03	0.0032 ± 0.0008	0.0128 ± 0.0012
11/19 - 12/30/03	0.0030 ± 0.0006	0.0113 ± 0.0010
12/30 - 1/16/04	0.0030 ± 0.0011	0.0182 ± 0.0020

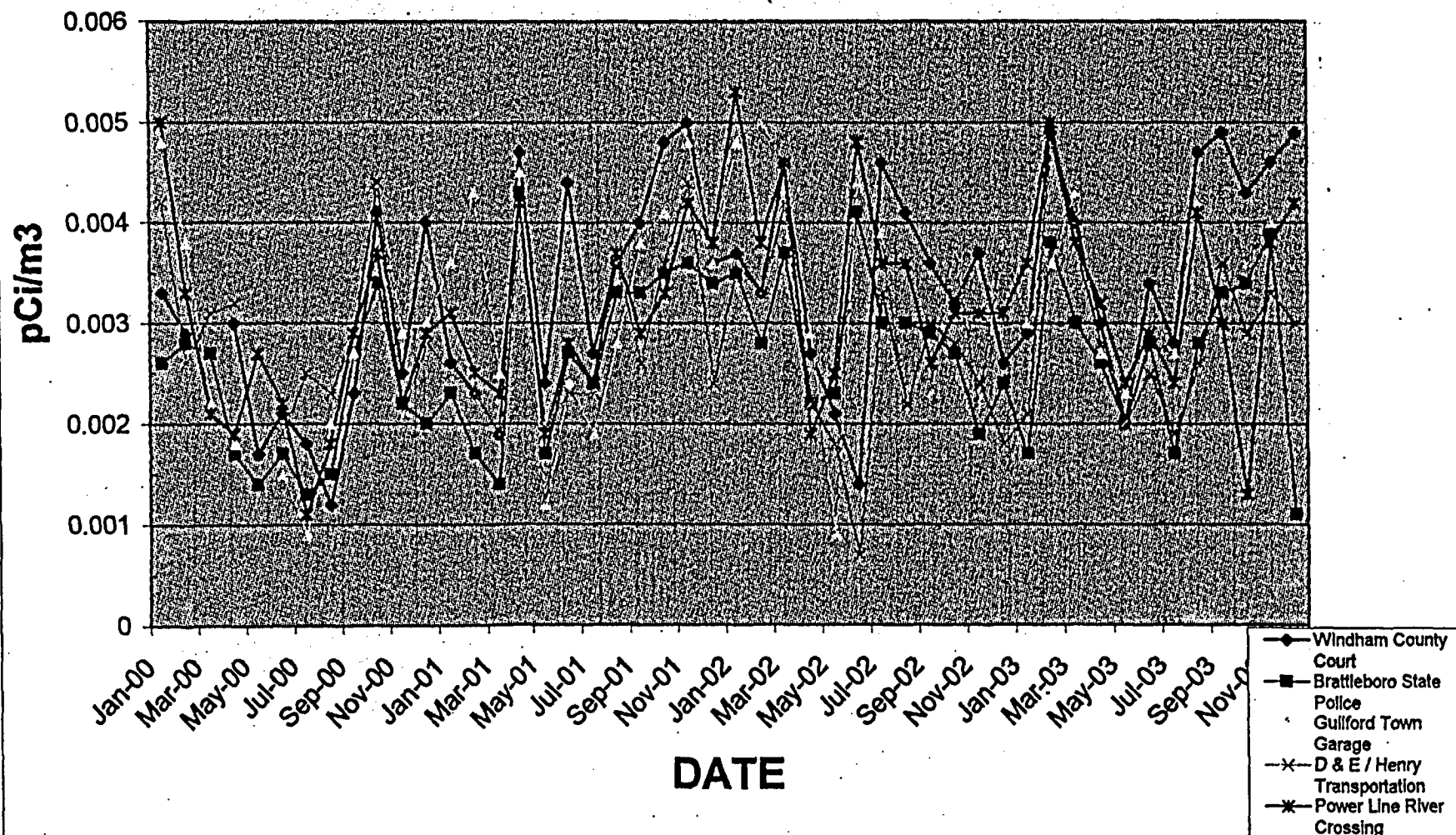
AIR SAMPLES 2003
(picoCuries/Cubic Meter)

Sample Period	Vernon Elementary School		Brattleboro Union High School	
	Alpha	Beta	Alpha	Beta
1/7 - 2/4/03	0.0025 ± 0.0008	0.0153 ± 0.0015	0.0021 ± 0.0007	0.0144 ± 0.0014
2/4 - 3/6/03	0.0046 ± 0.0008	0.0168 ± 0.0016	0.0046 ± 0.0007	0.0173 ± 0.0011
3/6 - 4/3/03	0.0036 ± 0.0010	0.0154 ± 0.0015	0.0038 ± 0.0010	0.0165 ± 0.0015
4/3 - 5/23/03	0.0028 ± 0.0006	0.0122 ± 0.0010	0.0030 ± 0.0006	0.0111 ± 0.0009
5/23 - 6/19/03	0.0017 ± 0.0008	0.0055 ± 0.0011	0.0018 ± 0.0008	0.0074 ± 0.0012
6/19 - 7/23/03	0.0019 ± 0.0007	0.0127 ± 0.0013	0.0030 ± 0.0008	0.0137 ± 0.0013
7/23 - 8/13/03	0.0016 ± 0.0009	0.0084 ± 0.0015	0.0029 ± 0.0010	0.0116 ± 0.0016
8/13 - 9/11/03	0.0029 ± 0.0006	0.0126 ± 0.0014	0.0037 ± 0.0007	0.0139 ± 0.0015
9/11 - 10/15/03	0.0034 ± 0.0009	0.0137 ± 0.0013	0.0030 ± 0.0008	0.0165 ± 0.0014
10/15 - 11/19/03	0.0032 ± 0.0008	0.0137 ± 0.0013	0.0009 ± 0.0005	0.0048 ± 0.0008
11/19 - 12/30/03	0.0040 ± 0.0007	0.0155 ± 0.0012	0.0037 ± 0.0007	0.0138 ± 0.0011
12/30 - 1/16/04	0.0028 ± 0.0011	0.0182 ± 0.0021	0.0031 ± 0.0011	0.0211 ± 0.0022

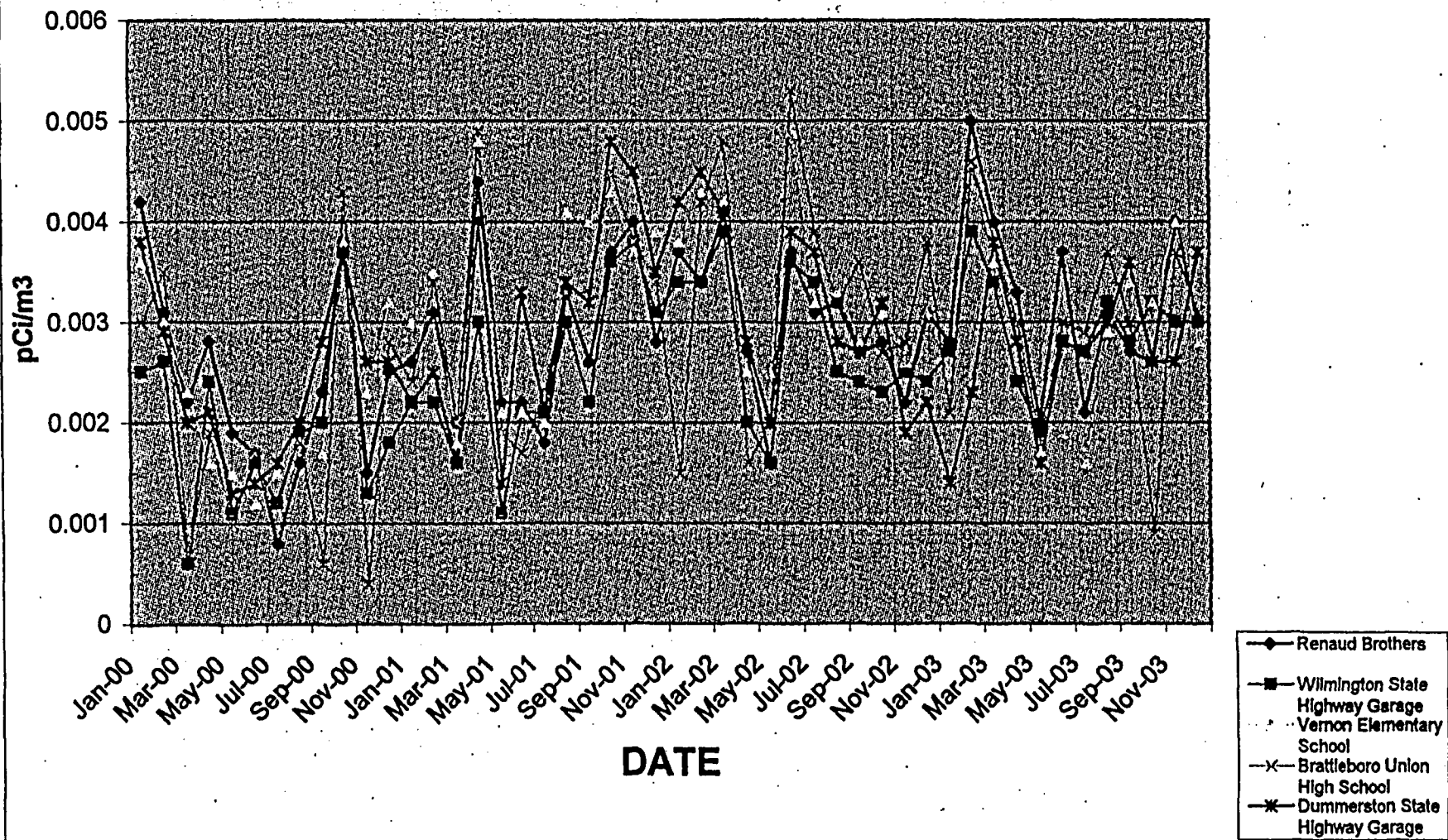
AIR SAMPLES 2003
(picoCuries/Cubic Meter)

Sample Period	Dummerston State Highway Garage	
	Alpha	Beta
1/7 - 2/4/03	0.0014 \pm 0.0006	0.0108 \pm 0.0013
2/4 - 3/6/03	0.0023 \pm 0.0006	0.0126 \pm 0.0014
3/6 - 4/3/03	0.0038 \pm 0.0010	0.0148 \pm 0.0014
4/3 - 5/23/03	0.0028 \pm 0.0006	0.0115 \pm 0.0010
5/23 - 6/19/03	0.0016 \pm 0.0007	0.0066 \pm 0.0012
6/19 - 7/23/03	0.0028 \pm 0.0008	0.0142 \pm 0.0014
7/23 - 8/13/03	0.0027 \pm 0.0010	0.0114 \pm 0.0016
8/13 - 9/11/03	0.0030 \pm 0.0007	0.0144 \pm 0.0015
9/11 - 10/15/03	0.0036 \pm 0.0009	0.0159 \pm 0.0014
10/15 - 11/19/03	0.0026 \pm 0.0007	0.0138 \pm 0.0013
11/19 - 12/30/03	0.0026 \pm 0.0006	0.0142 \pm 0.0012
12/30 - 1/16/04	0.0037 \pm 0.0012	0.0180 \pm 0.0021

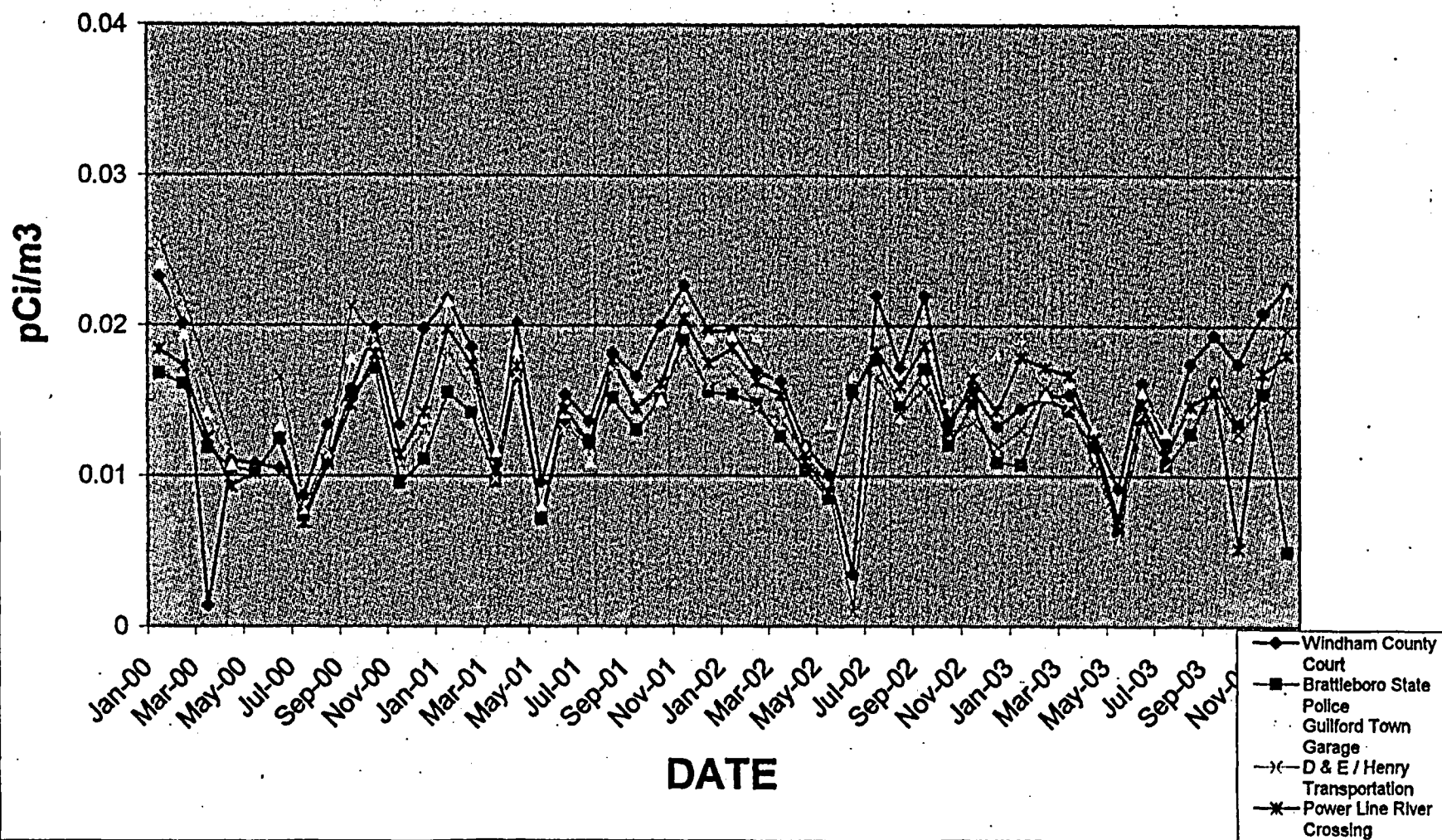
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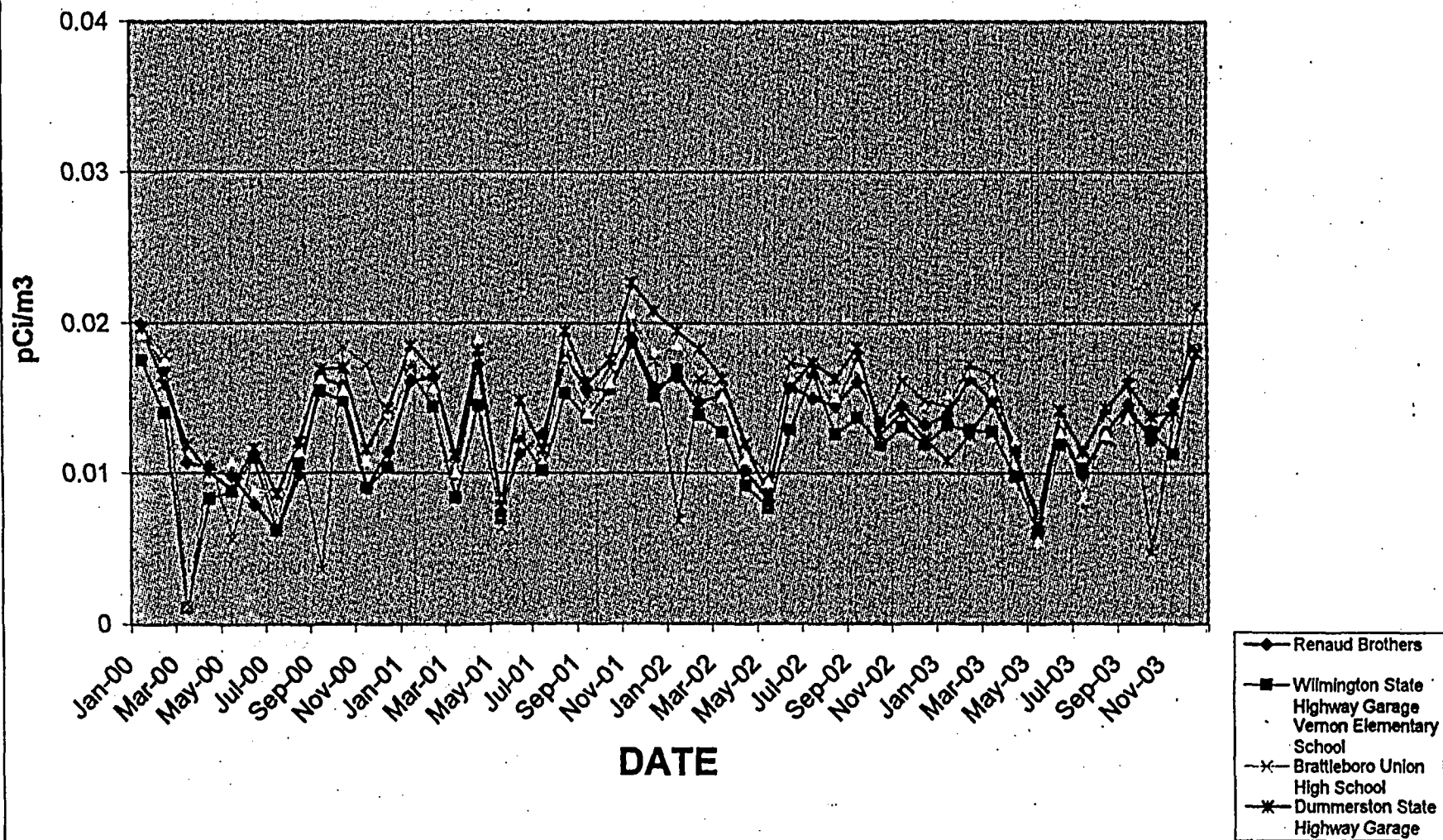
AIR SAMPLES - ALPHA



AIR SAMPLES - BETA



AIR SAMPLES - BETA



BIOTA 2003

All Biota for the Year 2003 are within the expected historical range.

The historical ranges for plant material:

Cesium-137* is less than the detection limit,

Potassium-40** is from 2,000 to 13,000 pCi/kg,

Beryllium-7*** is from less than the detection limit to 1,500 pCi/kg.

The plant sample for 2003 lies within these historical ranges. See table below.

The historical ranges for fungi:

Cesium-137 is 50 to 9,000 pCi/kg,

Potassium-40 is from 1,000 to 12,000 pCi/kg,

Beryllium-7 is less than the detection limit,

Cesium-134**** is from less than the detection limit to 45 pCi/kg.

The fungi sample for 2003 lies within these historical ranges. See table below.

The historical ranges for ferns:

Cesium-137 is from less than the detection limit to 540 pCi/kg,

Potassium-40 is from 4,000 to 11,000 pCi/kg,

Beryllium-7 is from 100 to 4,000 pCi/kg.

There was no fern sample for 2003.

The historical ranges for honey:

Cesium-137 is from less than the detection limit to 200 pCi/kg,

Potassium-40 is from 300 to 2,000 pCi/kg,

Beryllium-7 is less than the detection limit.

Honey is no longer sampled.

Occasional sampling, most often once a year, is done on forage or wild foods as available or needed. Samples are collected (usually in the Northwest quadrant) within a mile or two from the facility. These normally consist of ferns (fiddleheads), edible fungi (*Clavaria* sp., *Boleti* sp., *Russlae* sp., grapes, etc.) and grass. Sample sizes range from 250 to 1,000 grams. The samples are weighed, placed wet in reentrant beakers and analyzed in the Gamma Spectrometer System using a reverse germanium detector. Usual spectra include primordial radionuclides, archival Cesium-137 and occasional cosmogenic Beryllium-7. Reporting units are picoCuries per kilogram with 2 sigma (standard deviation) value.

Vernon - Rte 142 Indian Point Park (picoCuries/kilogram)

Season	Biota	Cesium-137**	Potassium-40**	Beryllium-7***
Summer (July)	Fungi	921 ± 100	2510 ± 670	ND
Summer (August)	Fungi	725 ± 71	1380 ± 340	ND

**Vernon – Northwest Fence of Vt. Yankee
(picoCuries/kilogram)**

Season	Biota	Cesium-137*	Potassium-40**	Beryllium-7***
Spring (June)	Grass	ND	5710 ± 540	362 ± 127
Fall (October)	Alfalfa	ND	6160 ± 670	720 ± 228

**Vernon – North of Vernon Elementary School
(picoCuries/kilogram)**

Season	Biota	Cesium-137*	Potassium-40**	Beryllium-7***
Spring (June)	Grass	ND	5460 ± 520	ND
Fall (September)	Grass	ND	5600 ± 500	568 ± 126

Samples were also evaluated for the radionuclides listed below. None were present in excess of the lower limits of detection.

Radionuclide	LLD	Radionuclide	LLD
Cr-51	69	Sb-126	18
Mn-54	15	I-131	27
Co-56	15	Cs-134	58
Co-60	21	Cs-136	18
Zn-65	18	Cs-137	5
Sr-85	86	Ce-139	93
Ru/Rh-103	32	Ce-141	98
Sb-124	18	Ce-144	98

* = Archival atmospheric testing

** = Terrestrial radioactivity

*** = Cosmogenic

**** = Chernobyl event

ND = Below Detection Limits

LLD = Lower Limit of Detection

FISH 2003

All Fish Samples for the Year 2003 are within the expected historical range.

The historical range for Cesium-137* is from less than the detection limit to 100 pCi/kg. The samples for 2003 range are less than the detection limit.

The historical range for Potassium-40** is from 1,000 to 5,000 pCi/kg. The samples for 2003 range from 2,000 to 2,360 pCi/kg.

Two locations (3-4 Vernon Pond and 3-8 Route 9 Highway bridge) provide fish samples in the Spring and Fall of about one kilogram for each sample. Fish are captured via an electroshock method. The fish are frozen whole, weighed, and chopped or blended (entire) for loading into a reentrant beaker. It is subsequently analyzed with a Gamma Spectrometer System using a reverse germanium detector. Radionuclides detected usually include naturally occurring Potassium-40, Thorium and Uranium with daughters, archival Cs-137 due to former open atmospheric nuclear tests, and occasional traces of cosmogenic Beryllium-7. Reporting units are picoCuries per kilogram with 2 sigma (standard deviation) value.

Spring (picoCuries/kilogram)

Site	Cesium-137 Wet Weight	Natural Potassium-40 Wet Weight
3-4	ND	2360 \pm 350
3-8	ND	2000 \pm 310

Fall (picoCuries/kilogram)

Site	Cesium-137 Wet Weight	Natural Potassium-40 Wet Weight
3-4	ND	2210 \pm 290
3-8	ND	2270 \pm 290

Samples were also evaluated for the radionuclides listed below. None were present in excess of the lower limits of detection (LLD) which are shown in pCi/kg.

Radionuclide	LLD	Radionuclide	LLD
Cr-51	69	Sb-126	18
Mn-54	15	I-131	27
Co-56	15	Cs-134	58
Co-60	21	Cs-136	18
Zn-65	18	Cs-137	5
Sr-85	86	Ce-139	93
Ru/Rh-103	32	Ce-141	98
Sb-124	18	Ce-144	98

* = Archival atmospheric testing

** = Terrestrial radioactivity

ND = Below Detection Limit

LLD = Lower Limit of Detection

IODINE CARTRIDGES 2003

All Iodine Cartridges for the Year 2003 are within the expected historical range.

The historical range for iodine-131 in air cartridges is less than the detection limit. The samples for 2003 were less than the detection limit.

Air samples are taken at various fixed locations using a line powered piston type compressor operating at a rate of 1 cubic foot per minute nominal. The sample is collected on a charcoal cartridge loaded with TEDA for iodine collection. The charcoal cartridge follows the filtration of air by a glass fiber filter in the air sampling train at all air sampling stations. Collection time is continuous with a nominal sampling period of four weeks. Response to Chernobyl iodine release was marked, proving the sensitivity to environmental trace levels of iodine of this system. The air cartridges are analyzed for Iodine-131 with the Gamma Spectrometer System using a reverse germanium detector. The nominal lower limit of detection is 2×10^{-5} pCi/l of air.

Sample Period	Dummerston Highway Garage	Vernon School	Renaud Bros Vernon	Brattleboro Union High School
January	X	X	X	X
February	X	X	X	X
March	X	X	X	X
April	X	X	X	X
May	X	X	X	X
June	X	X	X	X
July	X	X	X	X
August	X	X	X	X
September	X	X	X	X
October	X	X	X	X
November	X	X	X	X
December	X	X	X	X

Sample Period	Brattleboro State Police	Windham County Court
January	X	X
February	X	X
March	X	X
April	X	X
May	X	X
June	X	X
July	X	X
August	X	X
September	X	X
October	X	X
November	X	X
December	X	X

IODINE CARTRIDGES 2003

Sample Period	Powerline River Crossing	Guilford Highway Garage	Wilmington State Highway	D & E Henry's
January	X	X	X	X
February	X	X	X	X
March	X	X	X	X
April	X	X	X	X
May	X	X	X	X
June	X	X	X	X
July	X	X	X	X
August	X	X	X	X
September	X	X	X	X
October	X	X	X	X
November	X	X	X	X
December	X	X	X	X

X = No Evidence of Iodine-131

MILK 2003

All Milk Samples for the Year 2003 are within the expected historical range.

The historical range for Iodine-131 is less than the detection limit. The samples for 2003 are all less than the detection limit.

The historical range for Potassium-40* is from 1,200 to 2,000 pCi/L. The samples for 2003 range from 1,480 to 1,630 pCi/L.

Milk sampling is performed at a frequency of once per month. The samples are measured, placed into reentrant beakers and analyzed in the Gamma Spectrometer System using a reverse germanium detector. Usual spectra include terrestrial Potassium-40. The nominal detection limit for Iodine-131 is 10 picoCuries/liter. Significant indications of the presence of any other radionuclides are investigated and reported if found. Reporting units are picoCuries per liter with 2 sigma (standard deviation) value.

Blodgett Farm (picoCuries/liter)

Sample Period	Iodine-131	Potassium-40
January	ND	1560 \pm 120
February	ND	1500 \pm 110
March	ND	1580 \pm 140
April	ND	1580 \pm 120
May	ND	1590 \pm 140
June	ND	1530 \pm 110
July	ND	1530 \pm 120
August	ND	1590 \pm 120
September	ND	1560 \pm 130
October	ND	1570 \pm 120
November	ND	1480 \pm 110
December	ND	1600 \pm 120

Miller Farm
(picoCuries/liter)

Sample Period	Iodine-131	Potassium-40
January	ND	1630 \pm 130
February	ND	1540 \pm 120
March	ND	1630 \pm 120
April	ND	1580 \pm 140
May	ND	1520 \pm 110
June	ND	1580 \pm 140
July	ND	1550 \pm 130
August	ND	1510 \pm 120
September	ND	1510 \pm 130
October	ND	1330 \pm 120
November	ND	1590 \pm 140
December	ND	1480 \pm 130

* = Terrestrial Radioactivity
ND = Below Detection Limit

SEDIMENT 2003

All Sediment Samples for the Year 2003 are within the expected historical range.

The historical range for Cesium-137* is from less than the detection limit to 500 pCi/kg. The samples for 2003 range from less than the detection limit to 79 pCi/kg.

The historical range for Potassium-40** is from 6,000 to 22,000 pCi/kg. The samples for 2003 range from 10,400 to 12,400 pCi/kg.

The historical range for Beryllium-7*** is from less than the detection limit to 5,000 pCi/kg. The samples for 2003 are less than the detection limit.

Sediment samples are taken biannually in the spring and fall. A sediment sample is taken ranging from approximately 0.75 to 1.25 kilograms from the Connecticut River at three separate locations in the spring and fall of each year. The sample is dried, weighed on a top loaded balance and placed in a 500 milliliter HDPE bottle. The sample is counted on the Gamma Spectrometer System using a reverse germanium detector. A normal spectrum will include primordial radionuclides with daughters, and archival Cesium-137 from former open atmospheric nuclear testing. On occasion short-lived cosmogenic Beryllium-7 can be discerned. Reporting units are picoCuries per kilogram with 2 sigma (standard deviation) value.

SPRING (pCi/kilogram)

Site	Cesium-137	Potassium-40	Beryllium-7
3-3	79 \pm 25	10400 \pm 2500	ND
3-4	30 \pm 24	11300 \pm 1000	ND
3-8	64 \pm 18	11100 \pm 2700	ND

FALL pCi/kilogram

Site	Cesium-137	Potassium-40	Beryllium-7
3-3	ND	12400 \pm 3000	ND
3-4	64 \pm 29	10600 \pm 2500	ND
3-8	ND	10600 \pm 1200	ND

Samples were also evaluated for the radionuclides listed below. None were present in excess of the lower limits of detectability which are shown in pCi/kg.

Radionuclide	LLD	Radionuclide	LLD
Cr-51	69	Sb-126	18
Mn-54	15	I-131	27
Co-56	15	Cs-134	58
Co-60	21	Cs-136	18
Zn-65	18	Cs-137	5
Sr-85	86	Ce-139	93
Ru/Rh-103	32	Ce-141	98
Sb-124	18	Ce-144	98

* = Archival atmospheric testing

** = Terrestrial radioactivity

*** = Cosmogenic

ND = None Detected

LLD = Lower Limit of Detection

SOIL 2003

All Soil Samples for the Year 2003 are within the expected historical range.

The historical range for Cesium-137* is from less than the detection limit to 500 pCi/kg. The samples for 2003 range from less than the detection limit to 235 pCi/kg.

The historical range for Potassium-40** is from 7,000 to 20,000 pCi/kg. The sample for 2003 ranges from 11,400 to 17,900 pCi/kg.

The historical range for Beryllium-7*** is from less than the detection limit to 600 pCi/kg. The sample for 2003 ranges from less than the detection limit to 289 pCi/kg.

Occasional sampling, most often once a year, is done on other soils as available or needed. Samples are collected (usually in the Northwest quadrant) within a mile or two from the facility. Sample sizes range from 250 to 1,000 grams. The samples are weighed, dried and placed in 500 ml wide mouth HDPE bottles and analyzed on the Gamma Spectrometer System using a reverse germanium detector. Usual spectra include primordial radionuclides, archival Cesium-137 and occasional cosmogenic Beryllium-7. Reporting units are picoCuries per kilogram with 2 sigma (standard deviation) value.

Northwest Corner Vermont Yankee Fence (picoCuries/kilogram)

Season	Cesium-137*	Potassium-40	Beryllium-7**
Spring (June)	192 ± 41	17900 ± 1500	ND
Fall (October)	170 ± 30	13500 ± 1600	289 ± 166

Vermont Yankee (picoCuries/kilogram)

Date	Sample Type	Sample Location	Cesium-137*	Potassium-40	Beryllium-7**
12/18/2003	Returned Soil	01	70.8 ± 20.9	12100 ± 1400	ND
12/18/2003	Returned Soil	02	105 ± 27	15400 ± 3700	ND
12/18/2003	Returned Soil	03	97.5 ± 29.7	13500 ± 3200	ND
12/18/2003	Returned Soil	04	84.2 ± 25.2	15300 ± 1800	ND
12/18/2003	Returned Soil	05	72.0 ± 22.6	13100 ± 3100	ND
12/18/2003	Returned Soil	06	33.3 ± 21.2	15000 ± 3600	ND
12/18/2003	Returned Soil	07	58.8 ± 20.3	13200 ± 1500	ND
12/18/2003	Returned Soil	08	61.8 ± 23.3	14500 ± 1700	ND
12/18/2003	In-Situ Soil	SE-1T	ND	12800 ± 3000	ND
12/18/2003	In-Situ Soil	SE-1B	ND	13500 ± 1600	ND
12/18/2003	In-Situ Soil	E-2T	ND	14600 ± 3500	ND
12/18/2003	In-Situ Soil	E-2B	ND	13800 ± 1600	ND
12/18/2003	In-Situ Soil	NE-3T	ND	13400 ± 3200	ND
12/18/2003	In-Situ Soil	NE-3B	77.5 ± 21.2	16500 ± 1900	ND

Date	Sample Type	Sample Location	Cesium-137*	Potassium-40	Beryllium-7**
12/18/2003	In-Situ Soil	N-4T	115 ± 28	14200 ± 3400	ND
12/18/2003	In-Situ Soil	N-4B	ND	15000 ± 1700	ND
12/18/2003	In-Situ Soil	NW-5T	133 ± 27	12400 ± 3000	ND
12/18/2003	In-Situ Soil	NW-5B	142 ± 25	11400 ± 1300	ND
12/18/2003	In-Situ Soil	W-6T	235 ± 36	12700 ± 3100	ND
12/18/2003	In-Situ Soil	W-6B	106 ± 28	12600 ± 3100	ND
12/18/2003	In-Situ Soil	SW-7T	32.8 ± 17.4	12800 ± 3100	ND
12/18/2003	In-Situ Soil	SW-7B	ND	16100 ± 1900	ND
12/30/2003	Disturbed In-Situ Soil	SE-1	ND	13000 ± 1500	ND
12/30/2003	Disturbed In-Situ Soil	NE-3	ND	13300 ± 3200	ND
12/30/2003	Disturbed In-Situ Soil	SW-7	ND	14800 ± 3600	ND
12/30/2003	In-Situ Soil	E-8	ND	14000 ± 1600	ND
12/30/2003	In-Situ Soil	SE-9	ND	13400 ± 3200	ND

Samples were also evaluated for the radionuclides listed below. None were present in excess of the lower limits of detectability which are shown in pCi/kg.

Radionuclide	LLD	Radionuclide	LLD
Cr-51	69	Sb-126	18
Mn-54	15	I-131	27
Co-56	15	Cs-134	58
Co-60	21	Cs-136	18
Zn-65	18	Cs-137	5
Sr-85	86	Ce-139	93
Ru/Rh-103	32	Ce-141	98
Sb-124	18	Ce-144	98

* = Archival atmospheric testing

** = Terrestrial radioactivity

*** = Cosmogenic

ND = Below Detection Limits

LLD = Lower Limit of Detection

SPECIAL STUDY – SEDIMENT 2003
VERMONT YANKEE - NORTH STORM DRAIN OUTFALL

All Special Sediments for the Year 2003 are within the expected historical range.

The historical range for Beryllium-7** is from less than the detection limit to 3,000 pCi/kg. The samples for 2003 range from less than the detection limit to 1,810 pCi/kg.

The historical range for Cobalt-60*** is from less than the detection limit to 2,500 pCi/kg. The samples for 2003 were less than the detection limit.

The historical range for Potassium-40**** is from 6,000 to 26,000 pCi/kg. The samples for 2003 range from 10,400 to 17,900 pCi/kg.

The historical range for Cesium-137***** is from less than the detection limit to 500 pCi/kg. The samples for 2003 ranged from 60 to 167 pCi/kg.

Special sediment samples are taken biannually in the spring and fall. A sediment sample is taken ranging from approximately 0.75 to 1.25 kilograms from the Connecticut River at up to 40 separate locations in a grid around the discharge structure. The sample is dried, weighed on a top loaded balance and placed in a 500 milliliter HDPE bottle. The sample is counted on the Gamma Spectrometer System using a reverse germanium detector. A normal spectrum will include primordial radionuclides with daughters, and archival Cesium-137 from former open atmospheric nuclear testing. On occasion short-lived cosmogenic Beryllium-7 and Cobalt-60 can be discerned. Reporting units are picoCuries per kilogram with 2 sigma (standard deviation) value.

SPRING 2003
(picoCurie/kilogram)

Grid Location	Beryllium-7	Cobalt-60	Potassium-40	Cesium-137
S-1	ND	ND	17700 ± 1500	134 ± 29
S-2	ND	ND	16000 ± 3900	146 ± 37
S-3	*	*	*	*
S-4	*	*	*	*
S-5	*	*	*	*
T-1	ND	ND	17000 ± 1400	119 ± 34
T-2	ND	ND	16100 ± 3900	148 ± 33
T-3	ND	ND	12100 ± 1000	82 ± 22
T-4	*	*	*	*
T-5	*	*	*	*
U-1	ND	ND	10400 ± 2500	87 ± 24
U-2	ND	ND	11800 ± 1000	91 ± 25
U-3	ND	ND	12300 ± 3000	96 ± 21
U-4	ND	ND	12800 ± 1100	83 ± 22
U-5	*	*	*	*
V-1	*	*	*	*
V-2	*	*	*	*
V-3	*	*	*	*
V-4	ND	ND	12700 ± 3100	90 ± 23
V-5	ND	ND	12700 ± 1100	87 ± 19
W-1	*	*	*	*
W-2	*	*	*	*
W-3	*	*	*	*
W-4	ND	ND	11000 ± 2700	76 ± 20
W-5	ND	ND	12000 ± 1000	69 ± 20
X-1	*	*	*	*
X-2	*	*	*	*
X-3	*	*	*	*
X-4	*	*	*	*
X-5	*	*	*	*
Y-1	*	*	*	*
Y-2	*	*	*	*
Y-3	*	*	*	*
Y-4	*	*	*	*
Y-5	*	*	*	*
Z-1	*	*	*	*
Z-2	*	*	*	*
Z-3	*	*	*	*
Z-4	*	*	*	*
Z-5	*	*	*	*

FALL 2003
(picoCurie/kilogram)

Grid Location	Beryllium-7	Cobalt-60	Potassium-40	Cesium-137
S-1	ND	ND	17600 \pm 4200	108 \pm 45
S-2	ND	ND	17100 \pm 4100	142 \pm 41
S-3	*	*	*	*
S-4	*	*	*	*
S-5	*	*	*	*
T-1	1810 \pm 450	ND	13500 \pm 1600	60 \pm 25
T-2	965 \pm 351	ND	17100 \pm 2000	143 \pm 37
T-3	ND	ND	17900 \pm 4300	135 \pm 42
T-4	*	*	*	*
T-5	*	*	*	*
U-1	ND	ND	15800 \pm 3800	127 \pm 33
U-2	ND	ND	16500 \pm 1900	124 \pm 32
U-3	ND	ND	17100 \pm 4100	129 \pm 38
U-4	ND	ND	16900 \pm 2000	111 \pm 34
U-5	*	*	*	*
V-1	*	*	*	*
V-2	*	*	*	*
V-3	*	*	*	*
V-4	ND	ND	16200 \pm 3900	167 \pm 40
V-5	ND	ND	15100 \pm 1800	93 \pm 26
W-1	*	*	*	*
W-2	*	*	*	*
W-3	*	*	*	*
W-4	ND	ND	15600 \pm 3800	134 \pm 37
W-5	ND	ND	15600 \pm 1800	112 \pm 24
X-1	*	*	*	*
X-2	*	*	*	*
X-3	*	*	*	*
X-4	*	*	*	*
X-5	*	*	*	*
Y-1	*	*	*	*
Y-2	*	*	*	*
Y-3	*	*	*	*
Y-4	*	*	*	*
Y-5	*	*	*	*
Z-1	*	*	*	*
Z-2	*	*	*	*
Z-3	*	*	*	*
Z-4	*	*	*	*
Z-5	*	*	*	*

Samples were also evaluated for the radionuclides listed below. None were present in excess of the lower limits of detectability which are shown in pCi/kg.

Radionuclide	LLD	Radionuclide	LLD
Cr-51	69	Sb-126	18
Mn-54	15	I-131	27
Co-56	15	Cs-134	58
Co-60	21	Cs-136	18
Zn-65	18	Cs-137	5
Sr-85	86	Ce-139	93
Ru/Rh-103	32	Ce-141	98
Sb-124	18	Ce-144	98

* = Location not included for sampling

** = Cosmogenic

*** = Hot particles from Vermont Yankee Nuclear Power Plant

**** = Terrestrial radioactivity

***** = Archival atmospheric testing

ND = None Detected

LLD = Lower Limit of Detection

THERMOLUMINESCENT DOSIMETRY (TLD) DATA 2003

All TLDs for the Year 2003 are within the expected historical range.

The annual exposure at the boundary of Vermont Yankee is less than 20 mrem for 2003.

The historical range for TLDs ranges from 0 to 12.5 mR/quarter. The samples for 2003 range from 0 to 8.0 mR/quarter.

Thermoluminescent detectors are provided to the State of Vermont by Proxtonics, Inc. and are deployed for a quarterly sampling interval. This method samples direct gamma radiation in the environment. Detectors utilize crystals, which store energy from gamma and x-rays until analyzed for their cumulative energy exposure experience. Vermont has forty selected locations where direct radiation levels are measured for. Some of these sites are located where other types of samples are taken (e.g. air, milk, water, etc.). Levels of direct radiation from the natural environment are routinely detected at each site. Reporting units are milliRoentgens/quarter with 2 sigma (standard deviation) value. The exposure above background, as listed below, is the exposure for each location minus the average of the exposures at the Putney Town Clerk's Office in Putney and the Vermont State Highway Garage in Wilmington.

EXPOSURE RATES (milliRoentgens/quarter)

Location	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.	YEAR
Miller Farm, Vernon	0.3 ± 2.7	-0.8 ± 1.0	-1.9 ± 0.8	2.4 ± 0.8	2.7
Elementary School Exterior, Vernon *	0.1 ± 0.5	-1.1 ± 5.4	-1.5 ± 0.1	-2.1 ± 2.3	0.1
Elementary School Interior, Vernon	8.0 ± 0.3	0.7 ± 0.9	0.1 ± 0.4	3.8 ± 0.0	12.6
VY North Fence, Vernon	0.3 ± 3.2	2.4 ± 1.8	-8.6 ± 2.2	1.2 ± 2.3	3.9
VY Parking Lot Fence, Vernon	4.2 ± 0.8	3.8 ± 3.5	-0.8 ± 0.6	7.4 ± 3.2	15.4
Dummerston State Highway Garage (IFO)*	-0.9 ± 0.1	0.1 ± 1.7	-3.6 ± 0.6	-3.7 ± 1.6	0.1
VY Southwest Fence, Vernon	6.1 ± 2.9	1.8 ± 0.1	-4.3 ± 0.3	-2.1 ± 3.4	7.9
Renaud Bros. (Puffers), Vernon*	3.9 ± 0.0	0.4 ± 2.5	1.1 ± 3.6	2.7 ± 2.3	8.1
Tyler Hill & Franklin Road, Vernon	5.9 ± 1.0	-0.8 ± 3.0	-1.3 ± 5.4	-1.7 ± 2.3	5.9
Power Line River Crossing, Vernon *	3.9 ± 3.1	0.1 ± 2.2	-0.4 ± 0.4	-2.9 ± 0.2	4.0
Blodgett Farm, Vernon	0.8 ± 3.2	1.9 ± 3.4	-1.4 ± 1.0	1.2 ± 1.5	3.9
Brattleboro U.H.S., Brattleboro*	0.1 ± 0.2	-0.9 ± 2.2	-4.6 ± 7.2	-2.0 ± 2.1	0.1
Henry Transportation/D&E Tree, Guilford *	-1.6 ± 0.2	-0.3 ± 1.4	0.1 ± 2.6	-0.6 ± 1.3	0.1
Guilford Town Highway Garage, Guilford *	3.3 ± 3.9	-0.4 ± 3.8	-8.4 ± 1.6	1.2 ± 1.6	4.5

EXPOSURE RATES
(milliRoentgens/quarter)

Location	1 st Qtr.	2 nd Qtr.	3rd Qtr.	4th Qtr.	YEAR
Evans Farm, Guilford	-0.1 ± 0.5	-2.6 ± 0.6	-6.5 ± 0.4	-3.8 ± 0.2	0
Putney Town Clerk, Putney	-0.1 ± 0.7	-2.0 ± 0.8	-2.1 ± 4.5	-3.1 ± 1.3	-7.3****
State Highway Garage, Wilmington *	0.1 ± 0.1	2.0 ± 2.5	2.1 ± 2.1	3.1 ± 1.1	7.3****
West Brattleboro State Police*	-2.5 ± 0.4	-3.0 ± 4.4	-4.6 ± 1.2	-2.1 ± 1.6	0
Windham County Courthouse, Brattleboro*	-4.3 ± 0.2	-5.3 ± 2.2	-7.4 ± 0.5	-4.7 ± 0.1	0
Smead Lumber, Vernon	-3.0 ± 1.0	3.1 ± 2.6	-4.9 ± 2.2	-3.0 ± 2.1	3.1
Rte. 142 N & Pond Rd., Vernon	-0.6 ± 0.3	2.5 ± 1.1	-5.0 ± 2.0	-1.7 ± 0.0	2.5
Engle Dr., West Rd., Vernon	-1.4 ± 1.4	-0.6 ± 1.3	-3.1 ± 0.6	-2.6 ± 2.7	0
Fairman Rd., Vernon	-0.6 ± 3.1	-0.3 ± 0.5	-4.2 ± 0.0	-2.2 ± 0.4	0
Pond Rd. & Houghton Hill Rd., Vernon	-1.2 ± 0.7	-0.7 ± 5.5	-5.4 ± 1.7	-2.7 ± 1.9	0
Rte. 5, Wolosko, Guilford (10)	-1.5 ± 1.3	2.0 ± 4.7	-4.9 ± 1.4	-1.8 ± 3.9	2.0
Rte. 5, Andrews Cemetery, Guilford (40)	0.1 ± 2.8	1.5 ± 2.7	-2.9 ± 0.6	-2.4 ± 1.8	1.6
Rte. 5 & Tkaczyk Farm Rd., Guilford (11)	3.3 ± 1.7	0.4 ± 0.3	-3.1 ± 0.9	0.2 ± 1.2	3.9
Tyler Hill Rd., Vernon	-3.0 ± 2.6	-0.7 ± 0.5	-6.6 ± 0.1	-3.1 ± 2.2	0
Rte. 142 N of Transmission Line, Vernon	8.1 ± 21.3***	-1.0 ± 3.4	-4.7 ± 0.5	-2.2 ± 2.2	8.1
Rte. 5 & Guilford Ctr. Rd., Guilford (14)	0.9 ± 1.1	-2.0 ± 0.8	0.8 ± 2.3	-3.3 ± 3.6	1.7
Guilford Ctr Rd. & Tater Rd., Guilford	-0.9 ± 1.1	-1.5 ± 3.9	-3.0 ± 0.6	-0.1 ± 1.9	0
Weatherhead Hollow & Stony Hill Rds, Gfd	-3.5 ± 1.7	-2.2 ± 1.8	-1.9 ± 0.1	-4.1 ± 2.0	0
Huckle Hill Rd. N of VT/MA Border, Vernon	3.0 ± 0.8	2.1 ± 0.3	-4.8 ± 2.5	0.9 ± 0.5	6.0
Dummerston School, Dummerston, Rte. 5	-1.5 ± 0.0	0.7 ± 4.1	2.2 ± 1.4	-3.5 ± 2.7	2.9
Pond Rd., Vernon Rec. Area, Vernon	-4.3 ± 2.3	0.7 ± 1.9	-7.7 ± 0.6	-4.9 ± 0.6	0.7
Vernon Fire Dept., Vernon, Rte. 142	0.1 ± 2.4	0.2 ± 2.4	-3.2 ± 1.8	0.6 ± 1.2	0.9
Rte. 142 S & Pond Rd., Vernon	-0.3 ± 1.7	0.5 ± 3.9	-3.3 ± 1.0	-1.6 ± 2.7	0.5
Rte. 142 & Newton Rd., Vernon	-2.2 ± 0.6	-1.7 ± 2.5	-4.5 ± 0.8	-2.9 ± 0.1	0
Rte. 142 & Depot St., VT/MA Line, Vernon	1.4 ± 2.8	-1.0 ± 2.3	-0.7 ± 4.3	2.4 ± 0.8	3.8
Gov. Hunt Rd. at Vernon Elem. School	1.1 ± 0.8	0.2 ± 2.0	-0.3 ± 1.7	2.2 ± 2.3	3.5

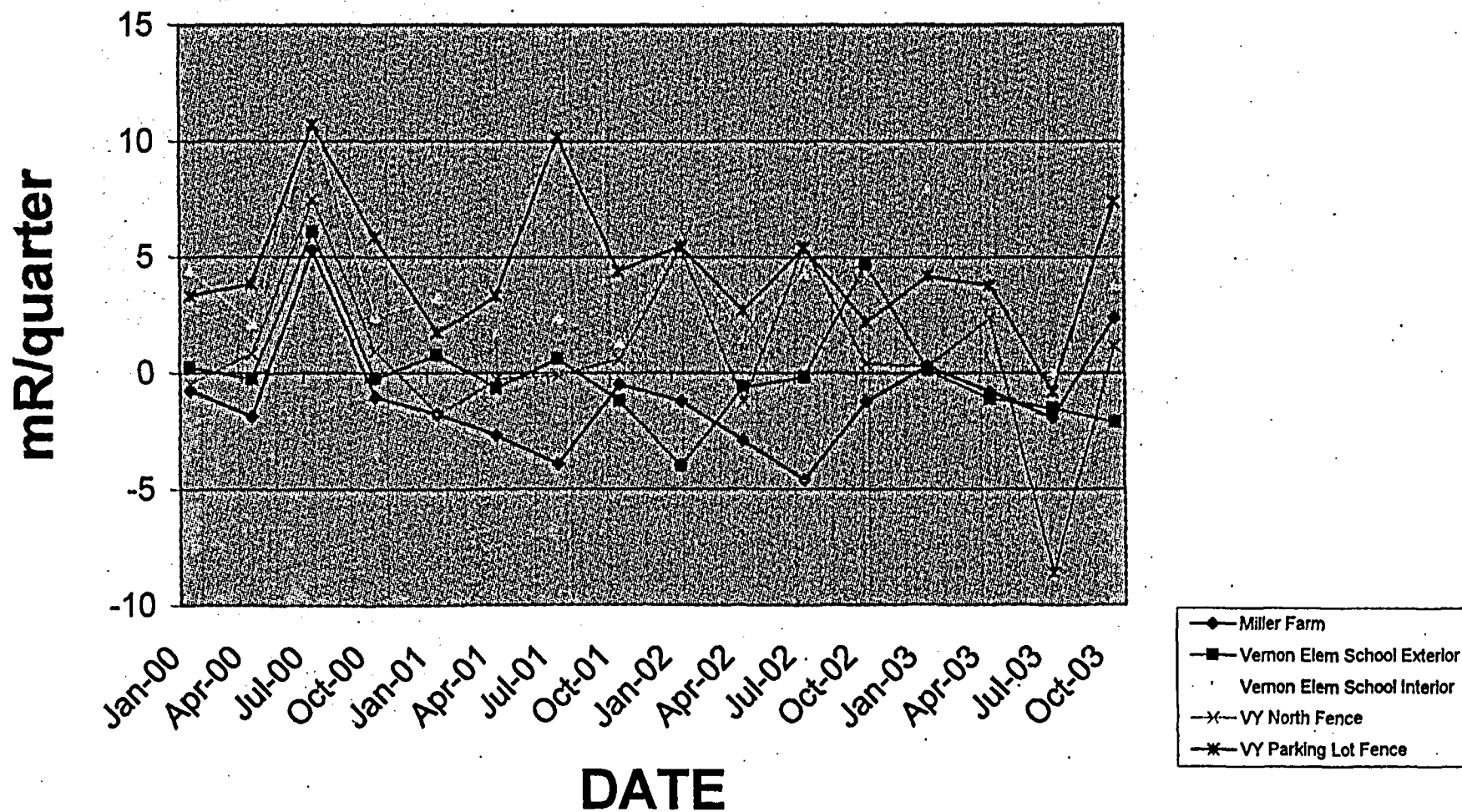
* = Collocated with Air Sampling Station

** = Dummerston School TLD was not found.

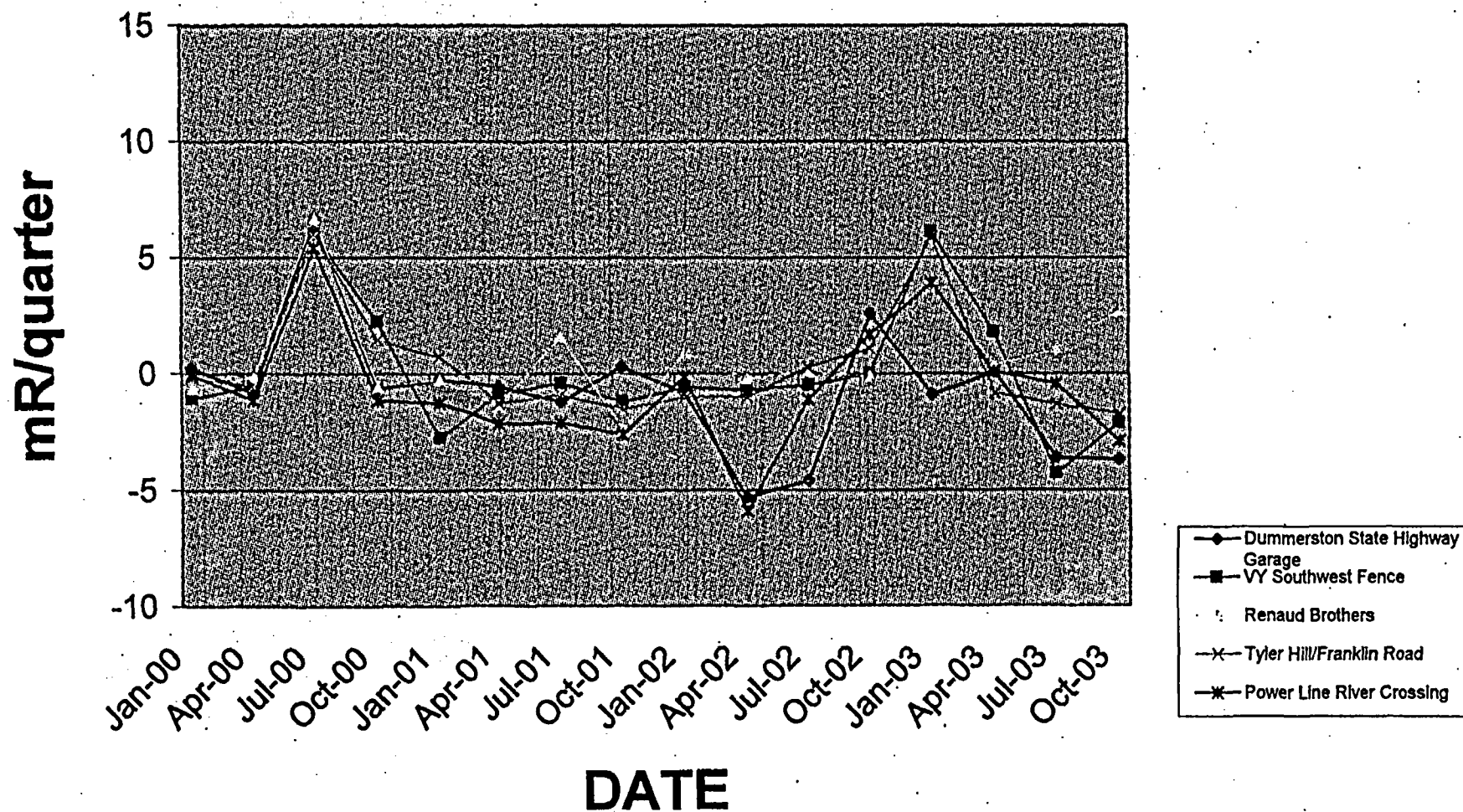
*** = Average of 2 readings, 19.3 and 34.4 mR.

**** = Used to determine average regional background.

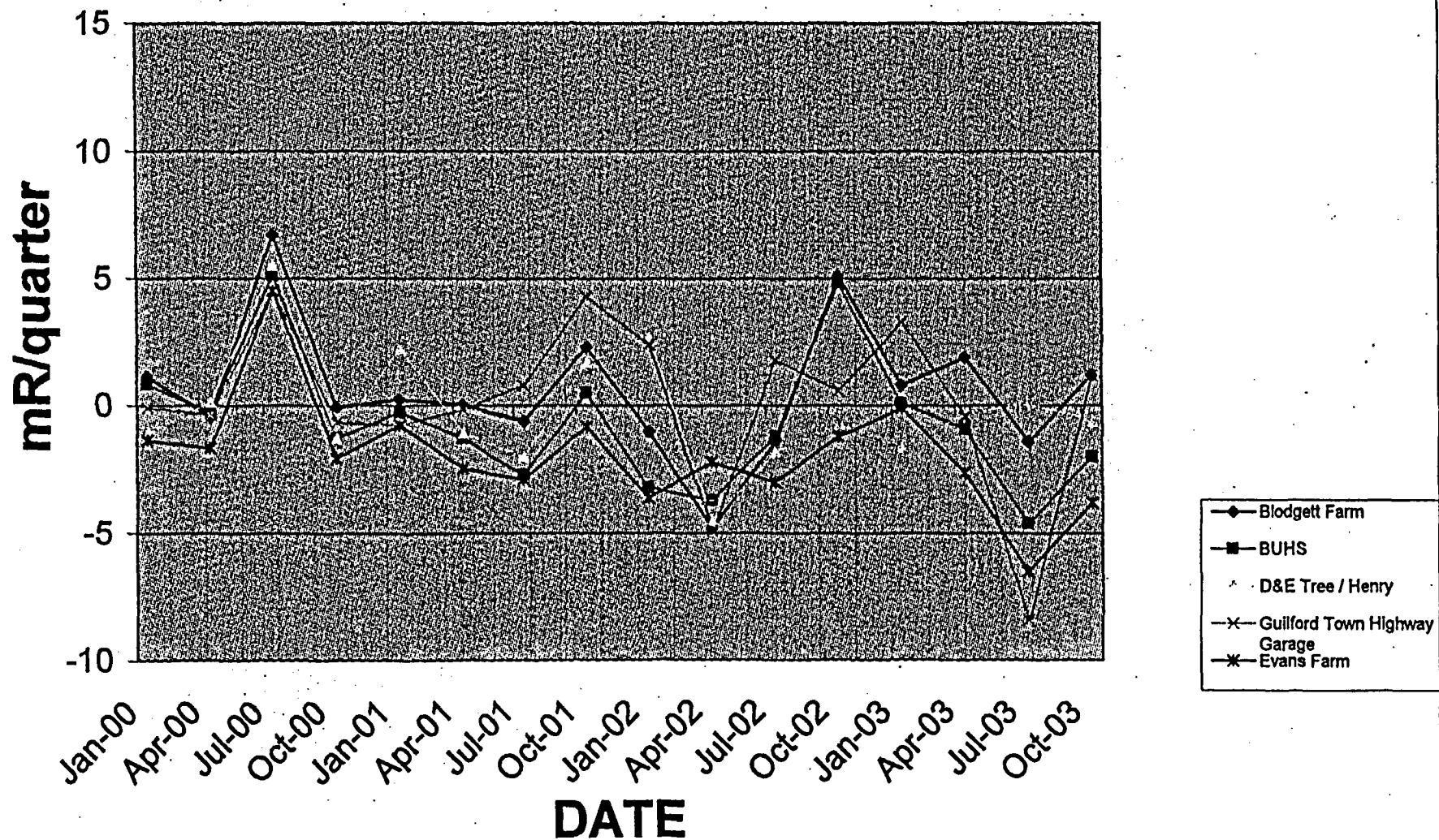
THERMOLUMINESCENT DOSIMETRY



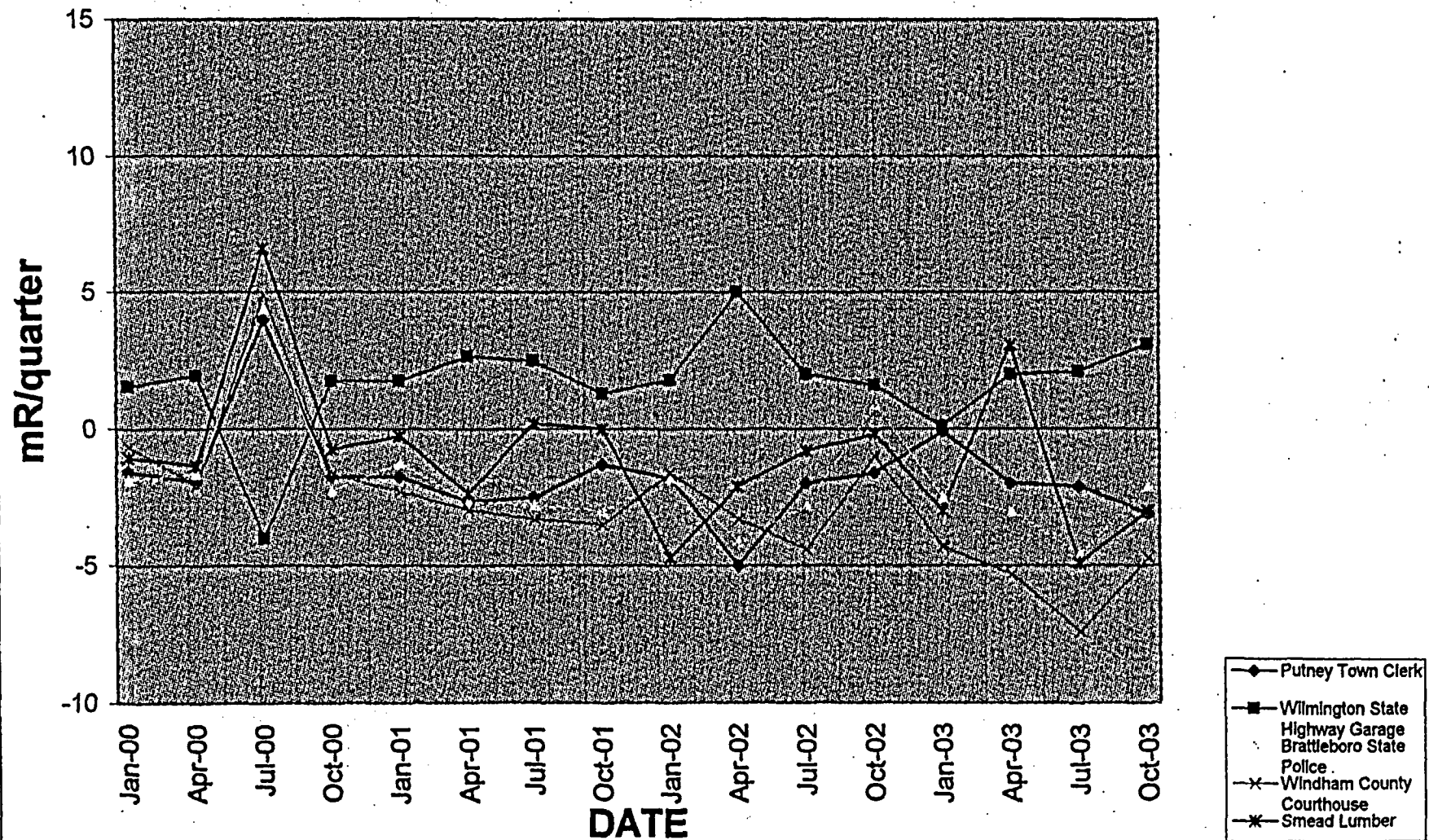
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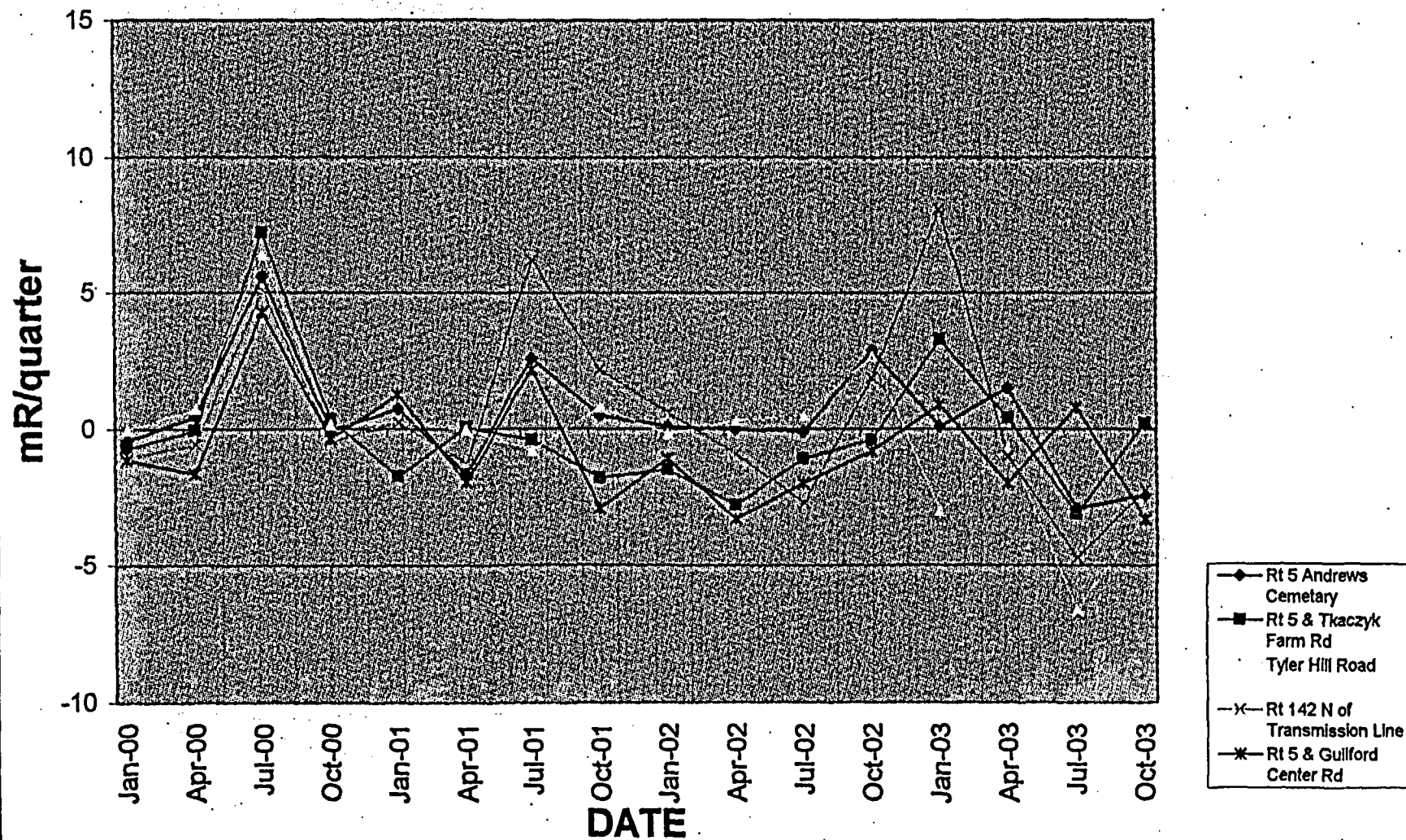
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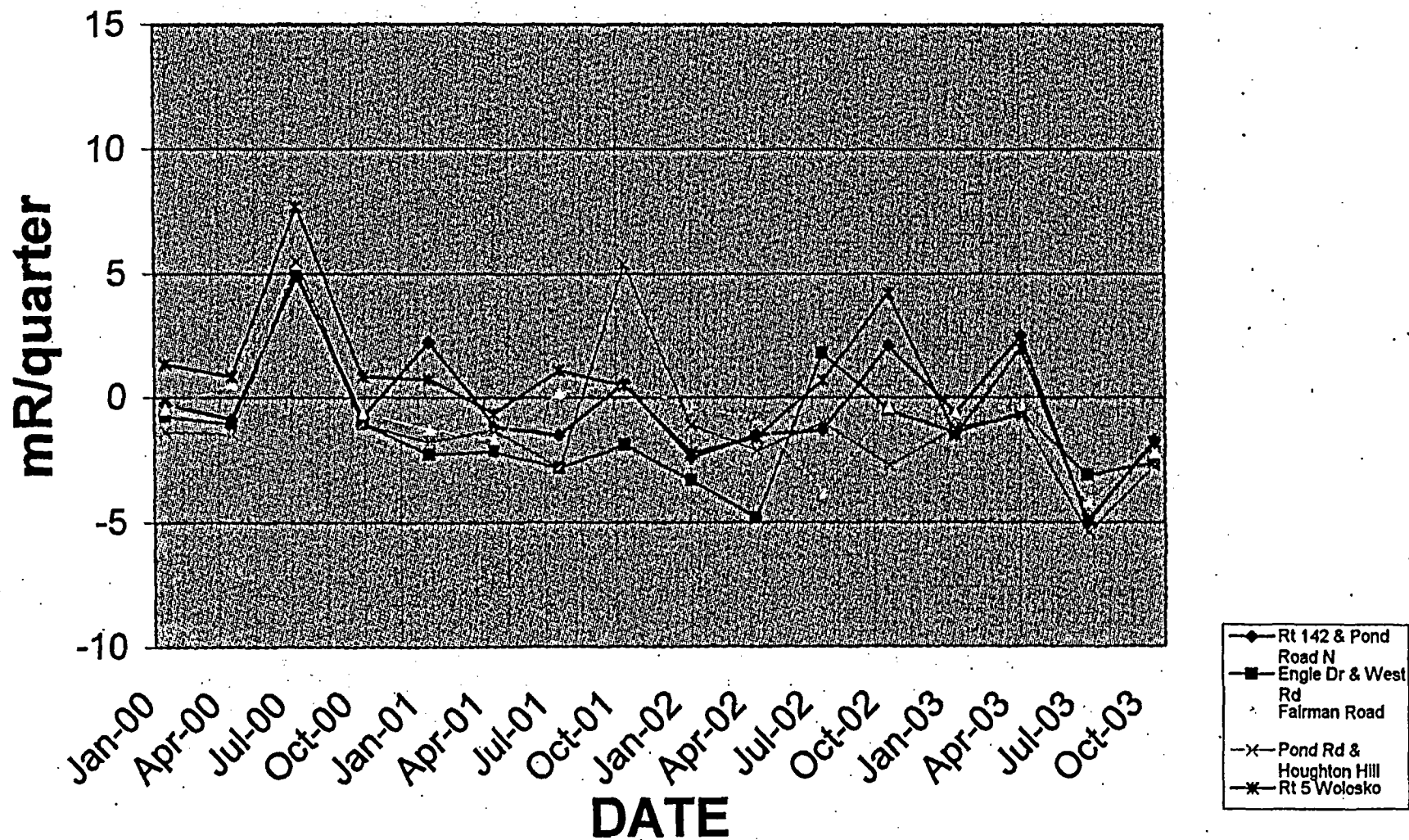
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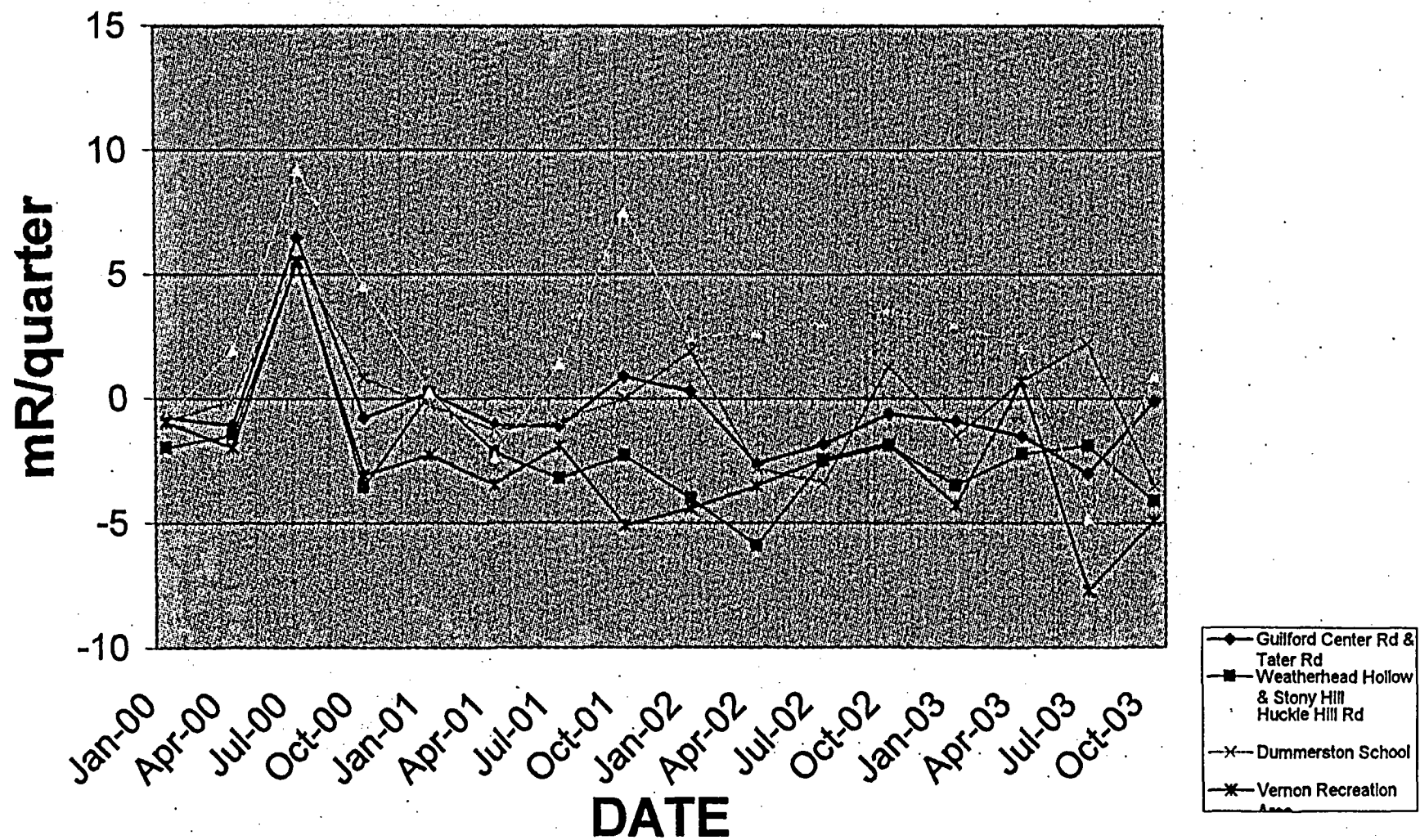
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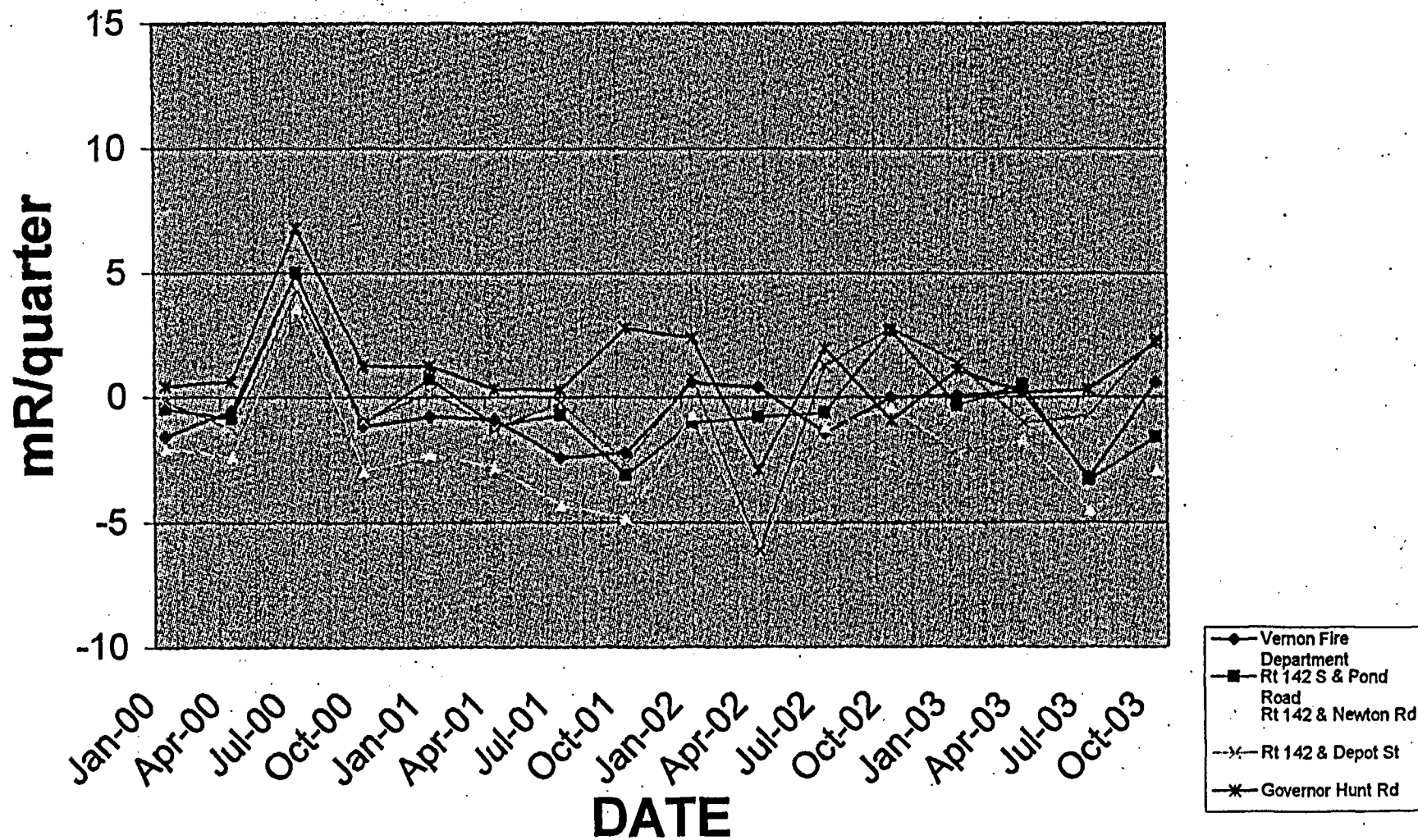
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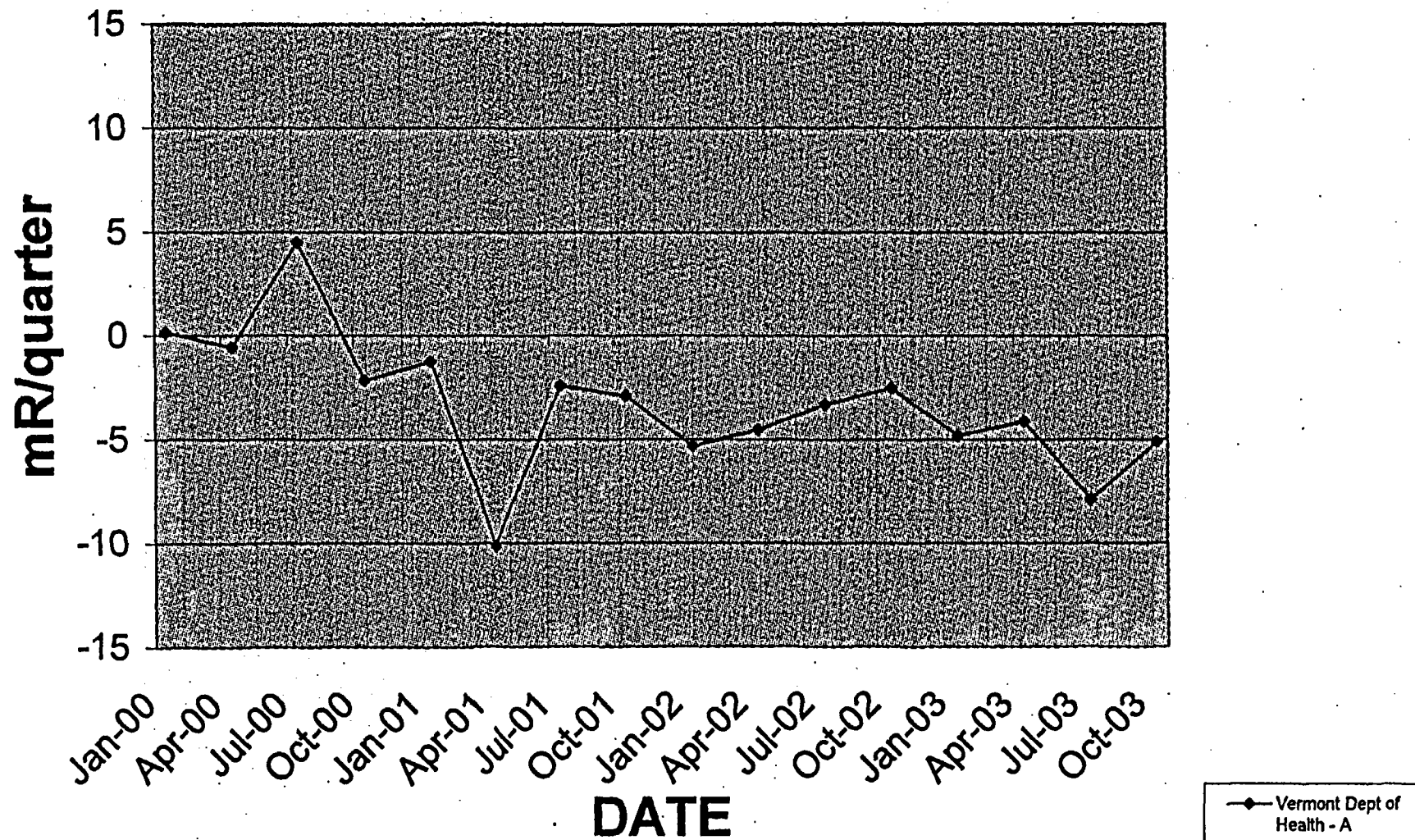
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TRITIUM IN WATER 2003
VERMONT YANKEE (CONNECTICUT RIVER)

All Tritium in Water Samples for the Year 2003 are within the expected historical range.

The historical range for tritium in water is less than the detection limit. The samples for 2003 are less than the detection limit.

As part of the water sampling effort, an aliquot of the monthly grab samples is analyzed for Hydrogen-3. Two locations are reported monthly for Hydrogen-3 content from the Connecticut River (upstream and downstream of the power station). The samples are analyzed by liquid scintillation counting. The detection limit for tritium is 0.5 nCi/l. Reporting units are nanoCuries/liter with 2 sigma (standard deviation) value.

WATER
(nanoCuries/liter)

Month	Downstream (3-4)	Upstream (3-8)
January	< 0.5	< 0.5
February	< 0.5	< 0.5
March	< 0.5	< 0.5
April	< 0.5	< 0.5
May	< 0.5	< 0.5
June	< 0.5	< 0.5
July	< 0.5	< 0.5
August	< 0.5	< 0.5
September	< 0.5	< 0.5
October	< 0.5	< 0.5
November	< 0.5	< 0.5
December	< 0.5	< 0.5

WATER SAMPLES 2003

All Water Samples for the Year 2003 are within the expected historical range.

The historical range for alpha is from less than the detection limit to 15 pCi/l. The samples for 2003 range from less than the detection limit to 7.8 pCi/l.

The historical range for beta is from less than the detection limit to 15 pCi/l. The samples for 2003 range from less than the detection limit to 10.1 pCi/l.

Water samples are collected monthly from 8 sites. One gallon of water is placed in a reentrant beaker and analyzed on the Gamma spectrometer system using a reverse germanium detector. Usual spectra include primordial radionuclides. Reporting units are picoCuries per liter with 2 sigma (standard deviation) value.

WATER (picoCuries/Liter)

Month	Test	Vernon School Well	NE Power Dam	VY Discharge	Brattleboro Town
January	Alpha	5.4 ± 1.2	< 2.6	3.0 ± 1.7	< 2.4
	Beta	3.0 ± 1.9	< 2.9	< 2.9	< 2.9
	Gamma	*	ND	ND	*
February	Alpha	7.3 ± 1.3	< 3.0	< 3.1	< 1.7
	Beta	4.2 ± 1.7	< 2.7	< 2.7	< 1.3
	Gamma	*	ND	ND	ND
March	Alpha	6.0 ± 1.1	< 2.9	< 2.9	< 1.6
	Beta	< 3.0	< 3.0	< 3.0	< 1.5
	Gamma	*	ND	ND	ND
April	Alpha	7.8 ± 1.3	< 1.8	< 2.8	< 1.7
	Beta	5.0 ± 1.8	3.2 ± 0.9	< 2.8	1.5 ± 0.9
	Gamma	*	ND	ND	ND
May	Alpha	6.4 ± 1.1	< 2.6	< 2.5	< 1.5
	Beta	6.2 ± 1.9	< 2.8	3.0 ± 1.8	< 2.3
	Gamma	*	ND	ND	ND
June	Alpha	7.0 ± 1.3	< 2.8	< 3.0	< 1.8
	Beta	3.3 ± 2.0	< 3.1	6.9 ± 2.0	1.9 ± 1.0
	Gamma	*	ND	ND	ND
July	Alpha	5.6 ± 1.2	< 2.1	< 2.8	< 1.5
	Beta	5.1 ± 1.9	< 3.0	< 2.9	< 1.5
	Gamma	ND	ND	ND	ND
August	Alpha	4.9 ± 1.0	< 2.5	< 2.5	< 2.4
	Beta	< 3.2	< 3.2	< 3.2	< 3.2
	Gamma	ND	ND	ND	ND

Month	Test	Vernon School Well	NE Power Dam	VY Discharge	Brattleboro Town
September	Alpha	6.5 ± 1.2	<2.8	3.3 ± 2.0	<2.6
	Beta	<3.4	<3.4	<3.4	<3.4
	Gamma	*	ND	ND	ND
October	Alpha	6.9 ± 1.1	<2.9	<3.0	<2.9
	Beta	3.5 ± 1.8	<2.8	<2.8	<2.8
	Gamma	*	ND	ND	ND
November	Alpha	5.8 ± 1.1	<2.2	<2.2	<2.2
	Beta	3.9 ± 1.8	<2.8	<2.8	<2.8
	Gamma	*	ND	ND	ND
December	Alpha	5.9 ± 1.2	<1.4	<1.5	<2.6
	Beta	3.1 ± 1.9	<1.5	<1.5	<3.0
	Gamma	ND	ND	ND	ND

WATER
(picoCuries/Liter)

Month	Test	Powerline River Crossing (3-3)	Island Park	Conn. River Upstream (3-8)	Conn. River Downstream (3-4)
January	Alpha	<2.6	No Sample	<2.6	<2.6
	Beta	<2.9	Taken**	<2.9	<2.9
	Gamma	*		*	*
February	Alpha	<3.1	No Sample	<3.1	<3.0
	Beta	<2.7	Taken**	<2.7	<2.7
	Gamma	ND		ND	ND
March	Alpha	<3.0	No Sample	<1.3	<3.0
	Beta	<3.0	Taken**	<1.5	<3.0
	Gamma	ND		ND	ND
April	Alpha	<2.9	<1.7	<2.9	<2.8
	Beta	<2.8	2.1 ± 0.9	<2.8	<2.8
	Gamma	ND	ND	ND	ND
May	Alpha	<1.5	<2.5	<1.5	<2.5
	Beta	<2.3	4.0 ± 1.8	<2.3	3.6 ± 1.8
	Gamma	ND	ND	ND	ND
June	Alpha	<3.0	<2.8	<2.9	<2.9
	Beta	10.1 ± 2.1	<3.1	<3.1	<3.1
	Gamma	ND	ND	ND	ND

Month	Tests	Powerline River Crossing (3-3)	Island Park	Conn. River Upstream (3-8)	Conn. River Downstream (3-4)
July	Alpha	< 2.6	< 2.8	< 2.6	< 2.7
	Beta	< 2.9	< 2.9	< 2.9	< 2.9
	Gamma	ND	ND	ND	ND
August	Alpha	< 2.6	< 2.5	< 2.5	< 2.5
	Beta	< 3.2	< 3.2	< 3.2	< 3.2
	Gamma	ND	ND	ND	ND
September	Alpha	< 2.8	< 2.9	< 2.9	< 2.8
	Beta	3.9 ± 2.1	< 3.4	< 3.4	< 3.4
	Gamma	ND	ND	ND	ND
October	Alpha	< 3.0	< 3.0	< 3.0	< 2.9
	Beta	< 2.8	< 2.8	< 2.8	< 2.8
	Gamma	ND	ND	ND	ND
November	Alpha	< 2.3	< 2.2	< 2.2	< 2.2
	Beta	< 2.8	< 2.8	< 2.8	< 2.8
	Gamma	ND	ND	ND	ND
December	Alpha	< 1.4	1.9 ± 1.1	< 1.5	< 1.5
	Beta	< 1.5	2.2 ± 1.0	< 1.5	< 1.5
	Gamma	ND	ND	ND	ND

* = Naturally Occurring Radionuclides

** = River was frozen at this location at the time of sampling.

ND = Below Detection Limits