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Environmental Restoration Program

OPERABLE UNIT 9 SITE SCOPING REPORT: VOLUME 8 ADDENDUM

MOUND PLANT
MIAMISBURG, OHIO

December 1994

Final

U.S. Department of Energy
Ohio Field Office

EG&G Mound Applied Technologies

MIAMISBURG
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Dear Messrs. Fischer and Nickel:

OU9 Site Scoping Report, Volume 8 (Final)

For your records I am providing copies of change pages for OU9 Site Scoping Report, Volume 8 (Final). DOE has forwarded copies of the revisions to your colleagues on the distribution list.

If you require any additional information, please contact me at (513) 865-3597.

Sincerely,

Arthur W. Kleinrath
Project Engineer Team Leader

cc w/attachment
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ENVIRONMENTAL RESTORATION PROGRAM

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U.S. DEPARTMENT OF ENERGY
OHIO FIELD OFFICE

ENVIRONMENTAL RESTORATION PROGRAM
EG&G MOUND APPLIED TECHNOLOGIES

FINAL

Signature Page

This report is an addendum to Volume 8 of a multiple-volume Site Scoping Report. Together, the reports provide background information pertinent to the remedial investigation/feasibility study (RI/FS) of the Mound Plant. Under the terms of the Federal Facility Agreement between the Department of Energy and US EPA, DOE submits this report to US EPA and Ohio EPA for approval.

US EPA and Ohio EPA approve this report only for the purposes of scoping the RI/FS, and approval does not imply concurrence with the interpretations presented herein. DOE will collect additional information during the RI/FS, and that data may supersede information contained in this report.

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CONTENTS

1. INTRODUCTION 1
1.1. SCOPE OF REPORT 3

2. SUMMARY AND DATA REVIEW 3
2.1. PLUTONIUM-238 IN VEGETABLES 4
2.2. PLUTONIUM-238 IN FISH 4
2.3. PLUTONIUM-238 IN GRASS 8
2.4. PLUTONIUM-238 IN MILK 8
2.5. TRITIUM IN VEGETABLES 8
2.6. TRITIUM IN FISH 14
2.7. TRITIUM IN GRASS 14
2.8. TRITIUM IN MILK 17

3. CONCLUSION 17

4. REFERENCES 17

APPENDIX A PLUTONIUM-238 IN VEGETABLES
APPENDIX B PLUTONIUM-238 IN FISH
APPENDIX C PLUTONIUM-238 IN GRASS
APPENDIX D PLUTONIUM-238 IN MILK
APPENDIX E TRITIUM IN VEGETABLES
APPENDIX F TRITIUM IN FISH
APPENDIX G TRITIUM IN GRASS
APPENDIX H TRITIUM IN MILK

FIGURES

1.1. Location of Mound Plant, Miamisburg, Ohio 2
2.1. Annual plutonium-238 concentrations in vegetables 5
2.2. Annual plutonium-238 concentrations in vegetables 6
2.3. Annual plutonium-238 concentrations in fish 7
2.4. Annual plutonium-238 concentrations in grass 9
2.5. Annual plutonium-238 concentrations in grass 10
2.6. Annual plutonium-238 concentrations in milk 11
2.7. Annual tritium concentrations in vegetables 12
2.8. Annual tritium concentrations in vegetables 13
2.9. Annual tritium concentrations in grass 15
2.10. Annual tritium concentrations in grass 16
2.11. Annual tritium concentrations in milk 18

ACRONYMS

CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
DOE	U.S. Department of Energy
EL	environmental levels
EPA	U.S. Environmental Protection Agency
ER	Environmental Restoration (Program)
FFA	Federal Facility Agreement
NPL	National Priority List (EPA)

1. INTRODUCTION

The U.S. Department of Energy (DOE) Mound Plant, Miamisburg, Ohio (Figure 1.1), was placed on the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, also known as Superfund) National Priorities List (NPL) on November 21, 1989 (54 Federal Register 48184). The placement of the Mound Plant on the NPL occurred as a consequence of historic disposal practices and releases of contaminants to the environment. Pursuant to its NPL status, the DOE signed a CERCLA Section 120 Federal Facility Agreement (FFA) with the U.S. Environmental Protection Agency (EPA) that became effective October 11, 1990 (Administrative Docket #VW-'90-C-075). The Ohio EPA became a signatory to the agreement in July 1993. The terms of the FFA require that the DOE develop and implement remedial investigations and feasibility studies and conduct interim remedial actions in order to ensure that environmental impacts associated with past and present activities at the site are thoroughly investigated and appropriate action is taken to protect the public health, welfare, and the environment.

The DOE Albuquerque Operations Office established the Environmental Restoration (ER) Program in 1984 to collect and assess environmental data in order to develop a conceptual site model, to assess both the nature and extent of contamination, and to identify potential exposure pathways and potential human and environmental receptors. In order to provide the EPA with sufficient information and data gathered during these previous investigations, a multivolume scoping report, providing background information, has been prepared. The Site Scoping Report provides descriptions and summaries of the current conditions and characteristics of Mound Plant and consists of the following volumes:

1. Groundwater Data: February 1987 - July 1990 with Addendum
2. Geologic Log and Well Information Report
2. Addendum - Stratigraphic and Lithologic Logs
3. Radiological Site Survey
4. Engineering Map Series
5. Topographic Map Series
6. Photo History
7. Waste Management
8. Environmental Monitoring Data
8. Addendum - Vegetation and Foodstuff
9. Annotated Bibliography
10. Permits and Enforcement Actions
11. Spills and Response Actions
12. Site Summary Report

A proper remedial investigation requires much information about a site. As an operating DOE facility, there is much environmental monitoring, site engineering, and site history information available. The Operable Unit 9 Site Scoping Reports were conceived as a means to collect, consolidate, and publish information available from the Mound Plant records. Planners and reviewers of the work conducted

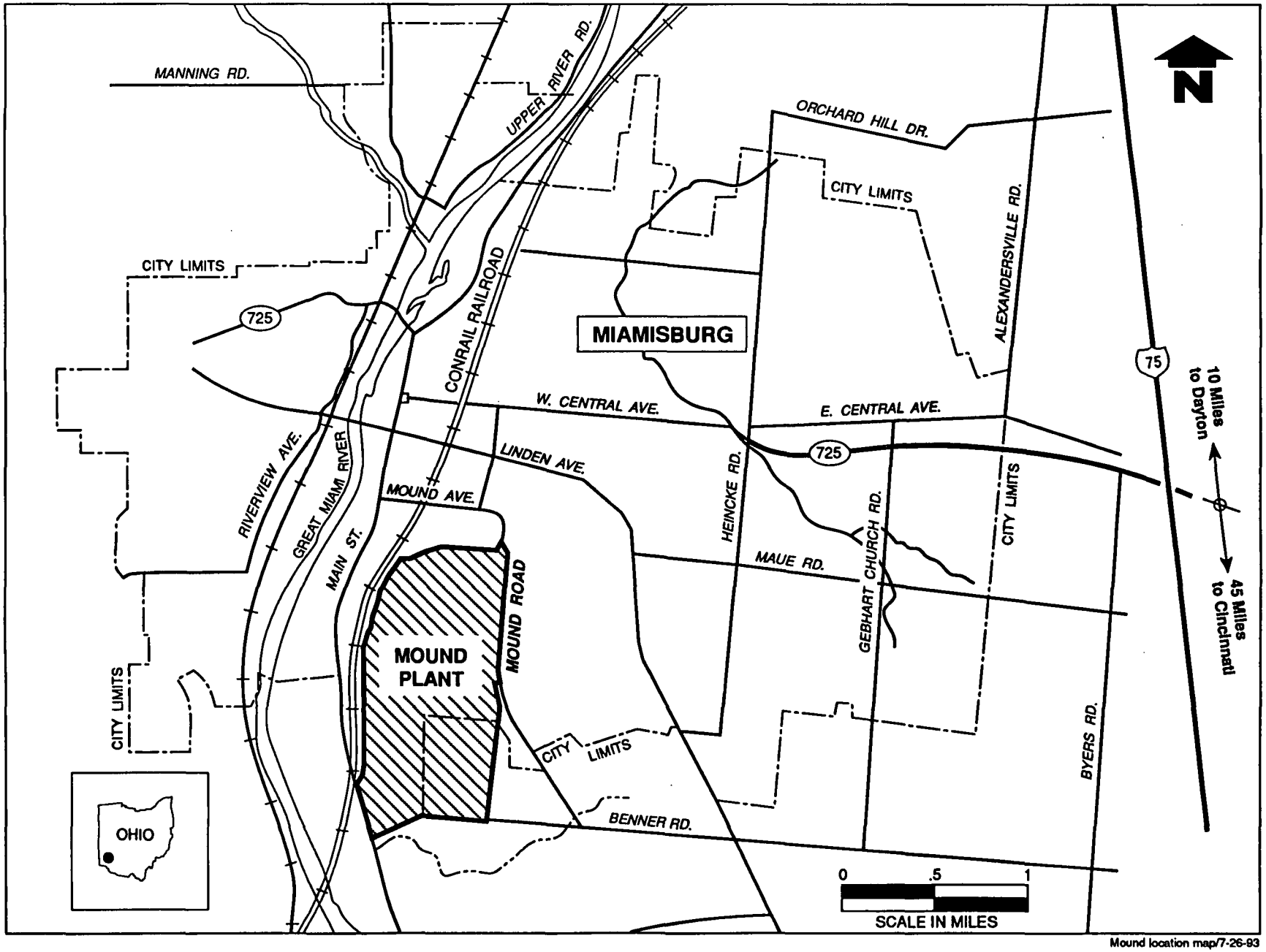

Figure 1.1. Location of Mound Plant, Miamisburg, Ohio.

in the Mound ER Program will find the Scoping Reports an invaluable chronicle of plant operations and environmental conditions.

1.1. SCOPE OF REPORT

This report is an addendum to the Mound Plant Operable Unit 9, Site Scoping Report: Volume 8 - Environmental Monitoring Data: 1976-1989 (DOE 1992). Volume 8 presented environmental monitoring data pertaining to plutonium-238, tritium, uranium-233 and -234, and uranium-238 concentrations in the Great Miami River water and silt, pond water and silt, and groundwater. This report presents analytical data pertaining to tritium and plutonium-238 concentrations in vegetation (grass) and foodstuff (fish, vegetables, and milk) in the years 1972 to 1991. This addendum summarizes data pertaining to vegetation and foodstuff. It extracts information from Mound Plant annual environmental monitoring reports, reiterating it in a consolidated fashion. This addendum makes no attempt to justify the appropriateness or sufficiency of the data included. Rather, the goal is to accurately summarize and consolidate the information. References to the original documents are provided.

Overviews of the environmental monitoring program at Mound Plant are presented in the Site Scoping Report: Volume 8 - Environmental Monitoring Data: 1976-1989 (DOE 1992) and Volume 7 - Waste Management (DOE 1993). Discussions of the analytical methods are also presented in Volume 7 - Waste Management.

2. SUMMARY AND DATA REVIEW

Beginning in 1972, Mound Plant began measuring the concentrations of plutonium-238 and tritium in vegetables and foodstuff. The methodology of calculating and presenting concentrations in the environmental monitoring reports has changed over the years. For the years 1972 to 1977, analytical results were simply reported as they were measured. A laboratory background concentration (blank value) was subtracted from the raw data to yield a net result. Beginning in 1978, background concentrations, referred to as environmental levels (EL) were routinely measured and subtracted from the net analytical results to yield an incremental result. For the years 1978 to 1989, if the incremental result was less than zero, the values were simply reported as zero. Beginning in 1990, possible negative values were reported in the environmental monitoring reports.

The data presentation in this report differs from the environmental monitoring reports. All data presented in this report consist of raw values with blank values subtracted. The ELs have not been subtracted from the data. This approach allows for a direct graphic comparison of the raw measured data and the environmental levels. Negative values indicate that the levels above instrumental backgrounds (blanks) are so low they cannot be measured with the technology available.

2.1. PLUTONIUM-238 IN VEGETABLES

Vegetable samples have been collected at seven locations in the vicinity of Mound Plant since 1986. These include Miamisburg, Centerville, Bellbrook, Trotwood, Franklin, Germantown, and Brookville. Data obtained from Brookville was used as the EL. Vegetable and grass samples were collected at four locations (Miamisburg, Centerville, Bellbrook, and various EL sites) from 1979 to 1985. Data from 1975 to 1978 was sparse and generally included only samples from Miamisburg and occasional unspecified ELs. All samples were analyzed for tritium and plutonium-238. The number of samples taken at each location varied from year to year.

Various vegetables were sampled from 1972 to 1978. Potatoes were sampled exclusively from 1979 onward. Figures 2.1 and 2.2 depict the average plutonium-238 concentrations plotted versus time, and Table A.1 (Appendix A) lists the average annual plutonium-238 concentrations. The available data (Appendix A) consist of original handwritten sheets for the years 1975 to 1985; computer printouts record the data from 1986 to 1991. The plutonium-238 concentration in vegetables for the six sample locations closely parallels the environmental level. The highest positive variance from the EL occurred at Miamisburg in 1980 and was 8×10^{-4} pico-Ci/g. Average annual concentrations range from a high of 20×10^{-4} pico-Ci/g in 1972 at Miamisburg to a low of -10×10^{-4} pico-Ci/g at Bellbrook in 1985. The average environmental levels range from a high of 6.5×10^{-4} pico-Ci/g in 1979 to a low of -8×10^{-4} pico-Ci/g in 1985. The sharp decline in concentrations in 1985 appears to be attributable to relatively high laboratory background readings.

2.2. PLUTONIUM-238 IN FISH

Fish samples have been collected at Miamisburg (Great Miami River) and Brookville (EL) and analyzed for plutonium-238 since 1978. Miamisburg was the only sampling location for fish from 1972 to 1977.

Figure 2.3 depicts the average plutonium-238 concentrations plotted versus time, and Table B.1 (Appendix B) lists the average annual plutonium-238 concentrations. The available data (Appendix B) consist of handwritten sheets from 1975 to 1985 and computer printouts from 1986 to 1991. The plutonium concentrations in fish from Miamisburg do not differ significantly from the EL. The highest positive variance from the EL was 4.1×10^{-4} pico-Ci/g in 1983. Miamisburg average annual concentrations range from a high of 60×10^{-4} pico-Ci/g in 1972 to a low of -0.1×10^{-4} pico-Ci/g in 1988. The average ELs range from a high of 5.2×10^{-4} pico-Ci/g in 1983 to a low of -1.4×10^{-4} pico-Ci/g in 1980.

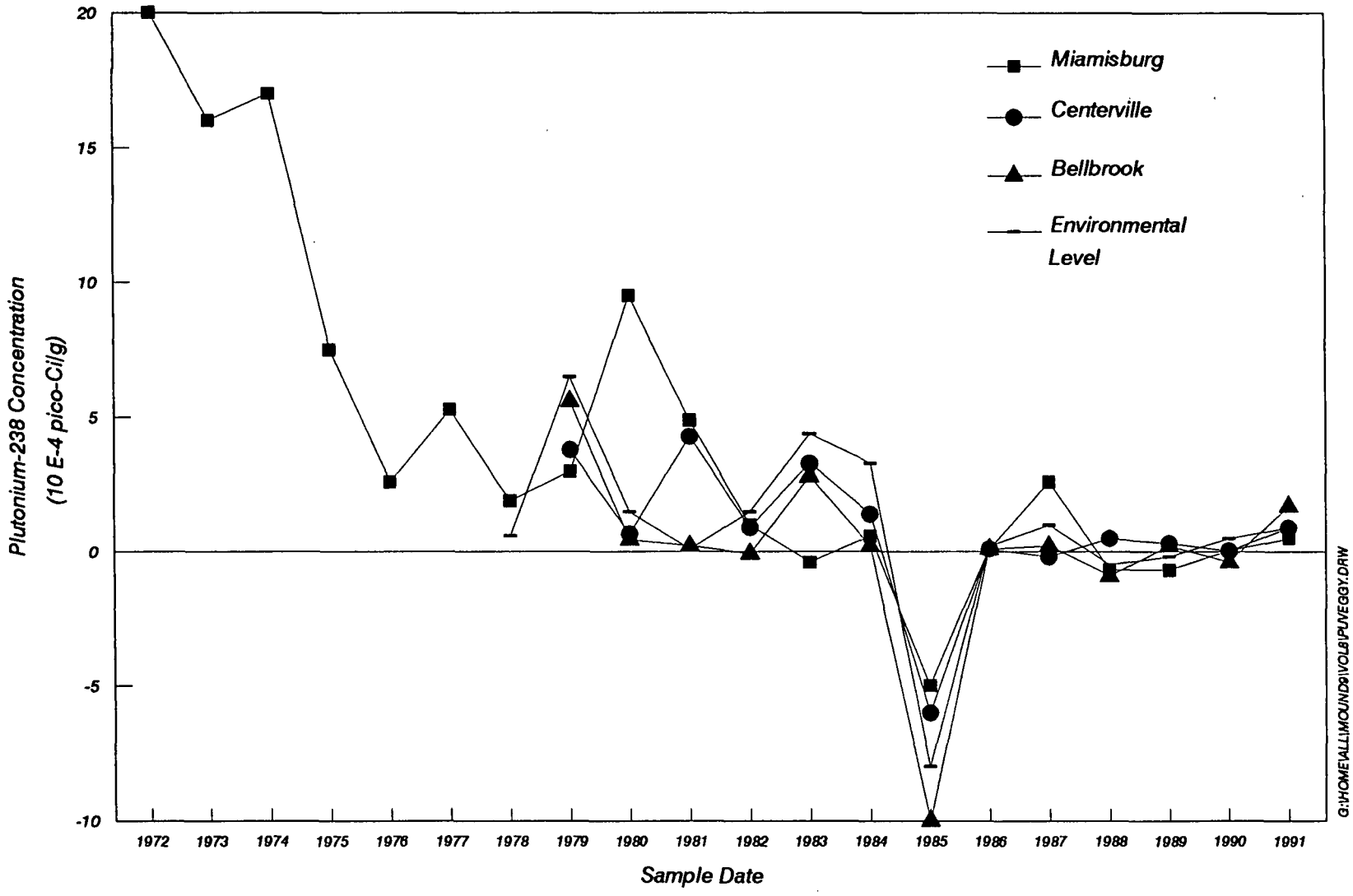

Figure 2.1. Annual Plutonium-238 Concentrations in Vegetables.

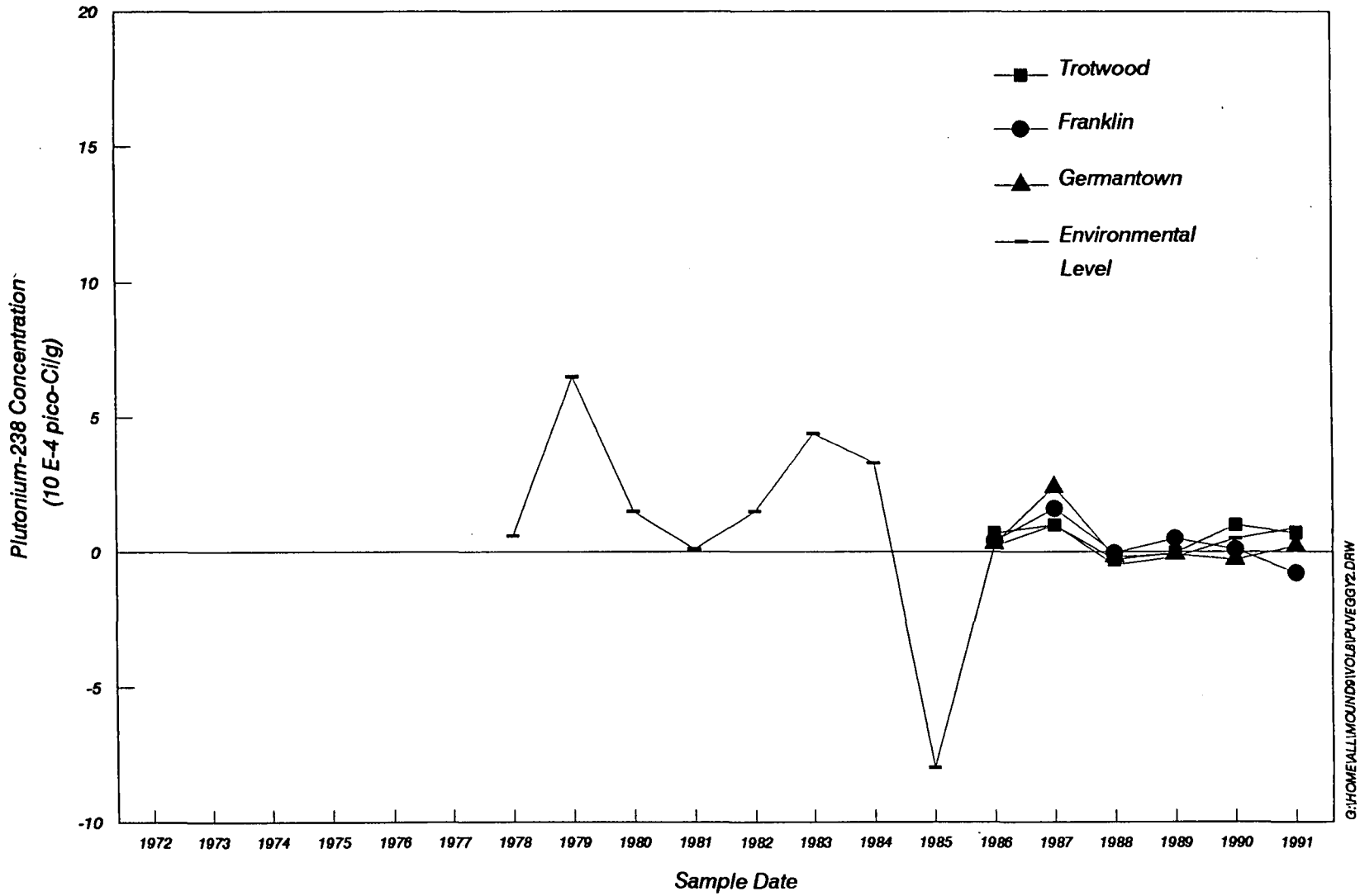

Figure 2.2. Annual Plutonium-238 Concentrations in Vegetables.

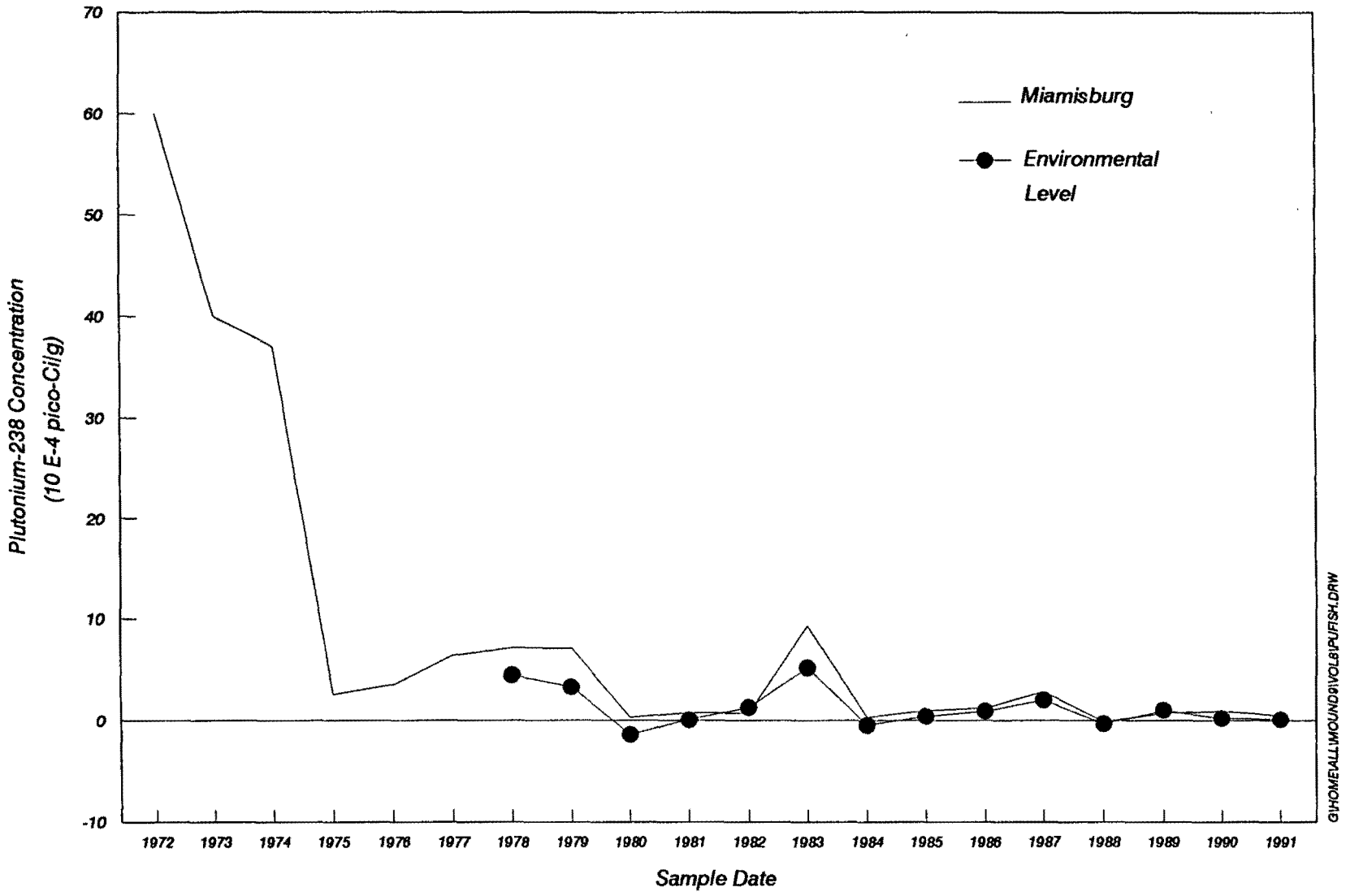

Figure 2.3. Annual Plutonium-238 Concentrations in Fish.

2.3. PLUTONIUM-238 IN GRASS

Grass samples have been collected at seven locations in the vicinity of Mound Plant since 1986. These include Miamisburg, Centerville, Bellbrook, Trotwood, Franklin, Germantown, and Brookville. Data obtained from Brookville were used as the EL. Vegetable and grass samples were collected at four locations (Miamisburg, Centerville, Bellbrook, and various EL sites) from 1979 to 1985. Data from 1975 to 1978 were sparse and generally included only samples from Miamisburg and occasional unspecified ELs. All samples were analyzed for plutonium-238. The number of samples taken at each location varied from year to year.

Figures 2.4 and 2.5 depict the average plutonium-238 concentrations plotted versus time, and Table C.1 (Appendix C) lists the average annual plutonium-238 concentrations. The available data (Appendix C) consist of handwritten sheets from 1975 to 1985 and computer printouts from 1986 to 1991. In general, the annual plutonium concentrations in the vicinity of Mound are similar to the EL. The largest positive variance from the EL was 197.5 x 10^{-4} pico-Ci/g at Miamisburg in 1976. Average annual concentrations ranged from a high of 225 x 10^{-4} pico-Ci/g at Miamisburg in 1976 to a low of -2.4 x 10^{-4} pico-Ci/g at Trotwood in 1986. The average ELs range from a high of 27.5 x 10^{-4} pico-Ci/g in 1976 to a low of -1.6 x 10^{-4} pico-Ci/g in 1986.

2.4. PLUTONIUM-238 IN MILK

Milk samples were collected at Miamisburg and analyzed for plutonium-238 from 1972 to 1978. An EL from an unspecified location was provided in 1978.

Figure 2.6 depicts the average plutonium-238 concentrations plotted versus time, and Table D.1 (Appendix D) lists the average annual plutonium-238 concentrations. The available data (Appendix D) consist of handwritten sheets from 1975 to 1978. Average annual concentrations ranged from a high of 34 x 10^{-4} pico-Ci/g in 1974 to a low of 0.88 x 10^{-4} pico-Ci/g in 1976. The only EL provided was 0.88 x 10^{-4} pico-Ci/g in 1978.

2.5. TRITIUM IN VEGETABLES

Figures 2.7 and 2.8 depict the average tritium concentrations plotted versus time and Table E.1 (Appendix E) lists the average annual tritium concentrations. The available data (Appendix E) consist of handwritten sheets from 1975 to 1985 and computer printouts from 1986 to 1991. Various vegetables were sampled from 1972 to 1974. Corn was the only vegetable sampled in 1975 and 1976. No vegetables were sampled in 1977. Corn and tomatoes were sampled in 1978 and tomatoes were sampled exclusively from 1979 to 1991. The tritium concentrations in the vicinity of Mound

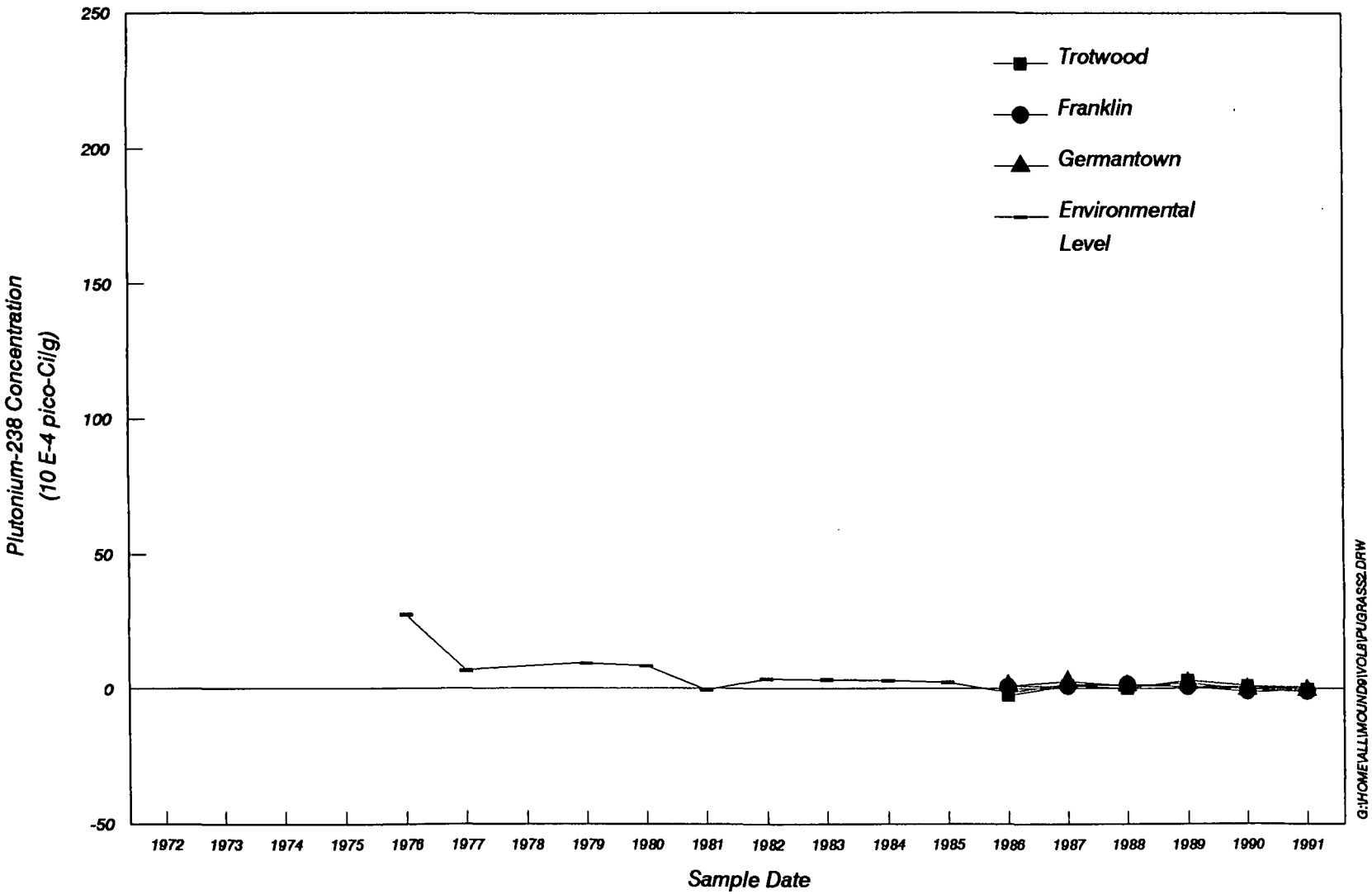

Figure 2.4. Annual Plutonium-238 Concentrations in Grass.

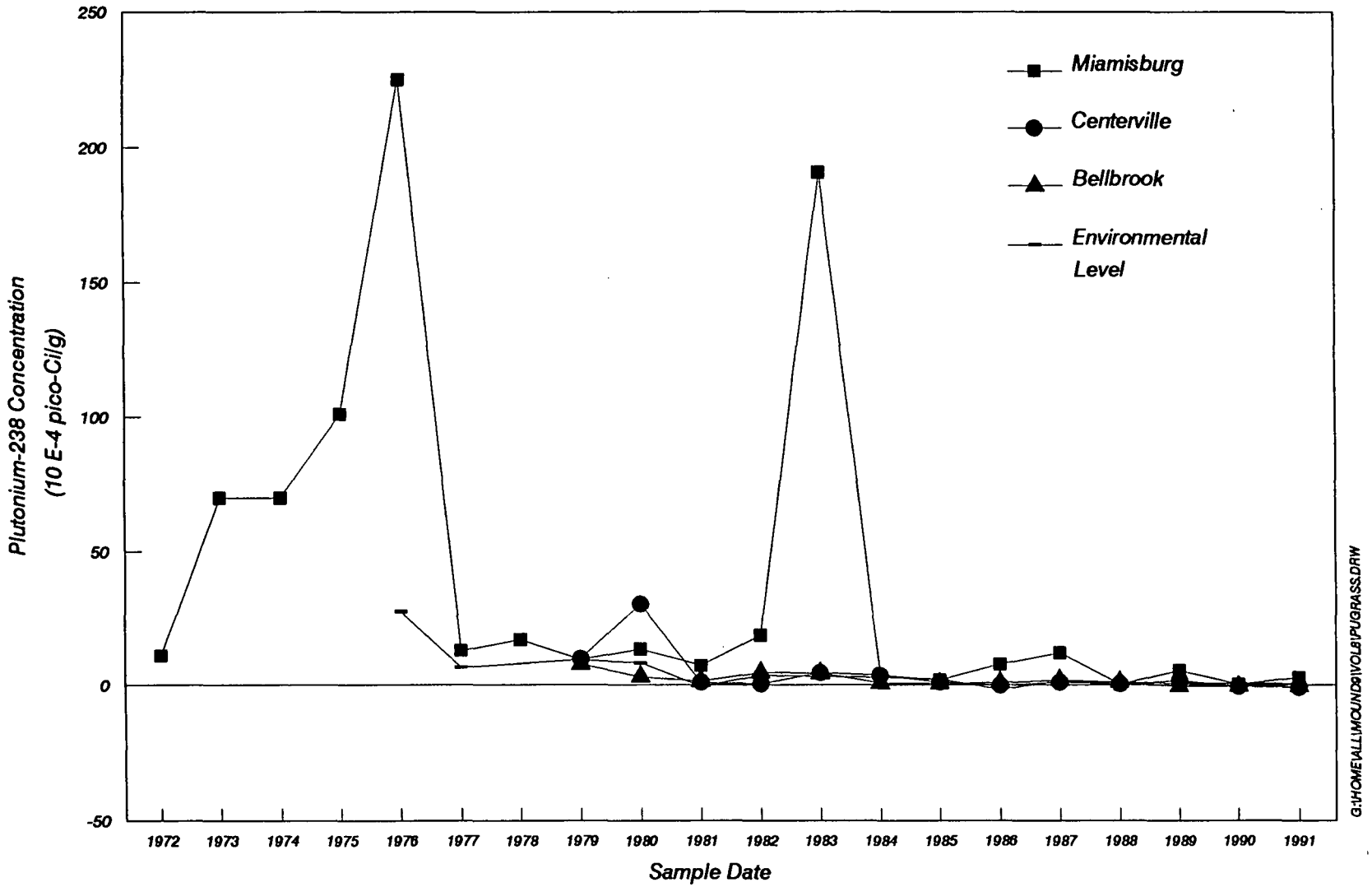

Figure 2.5. Annual Plutonium-238 Concentrations in Grass.

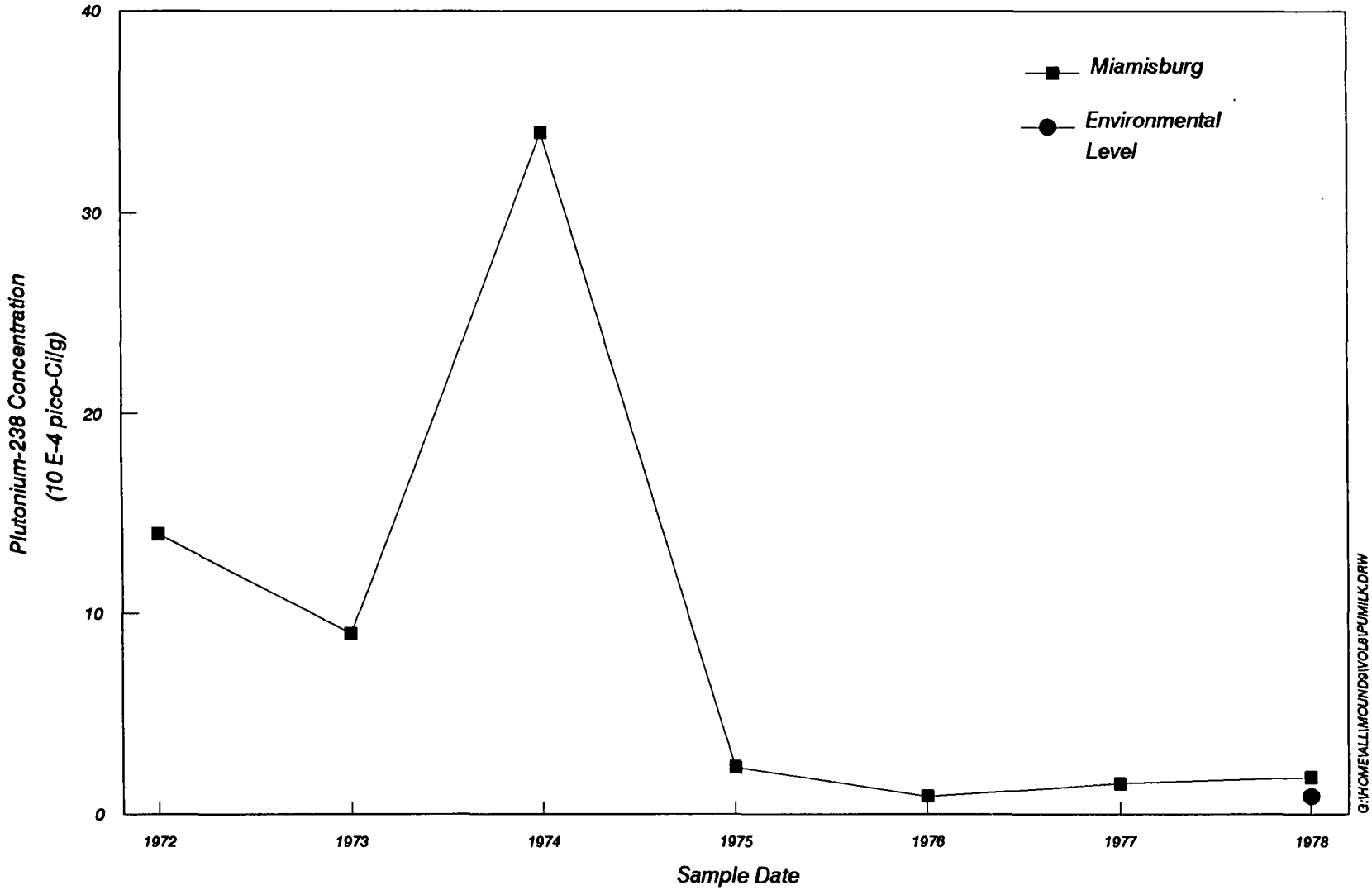

Figure 2.6. Annual Plutonium-238 Concentrations in Milk.

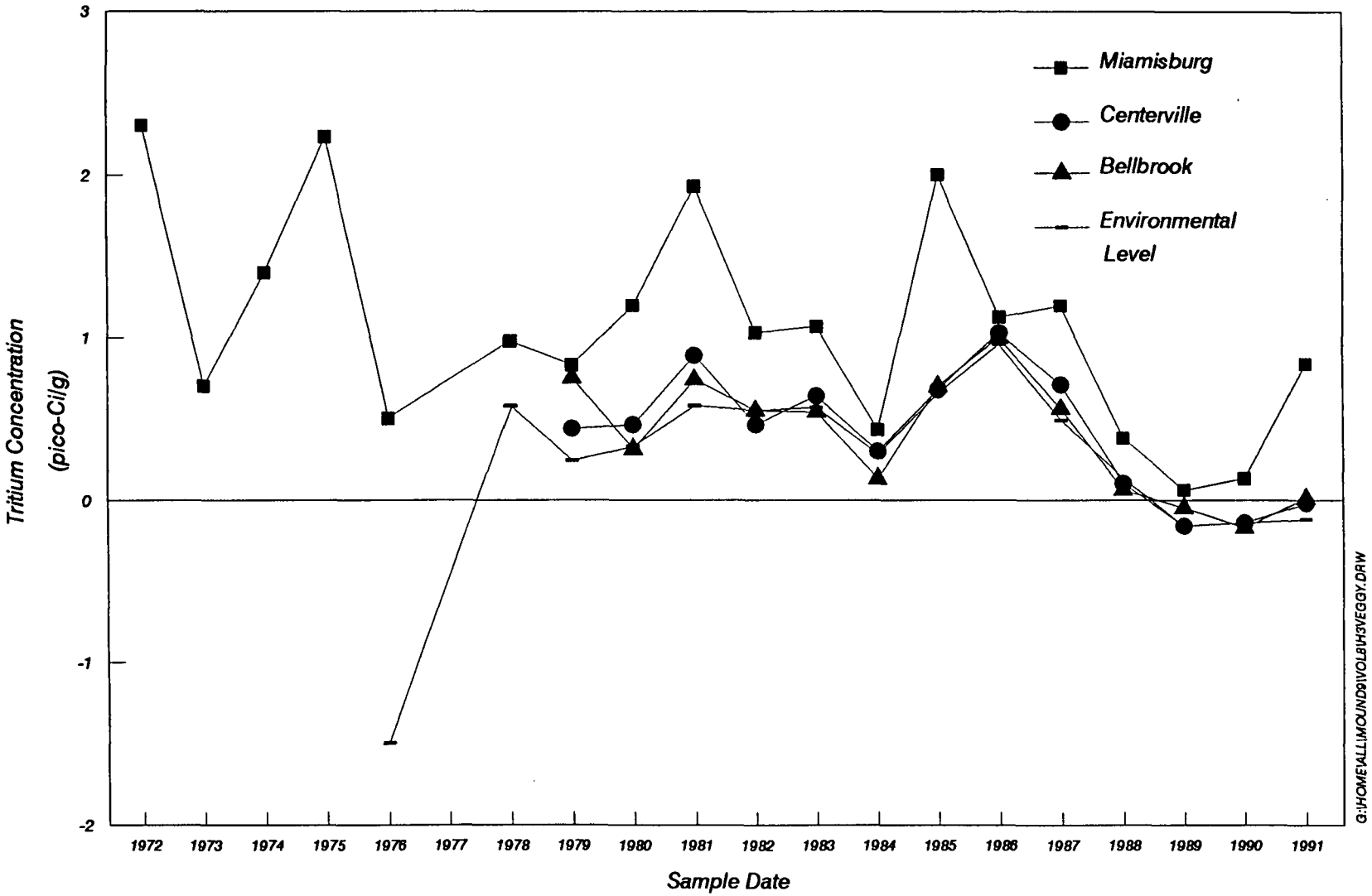

Figure 2.7. Annual Tritium Concentrations in Vegetables.

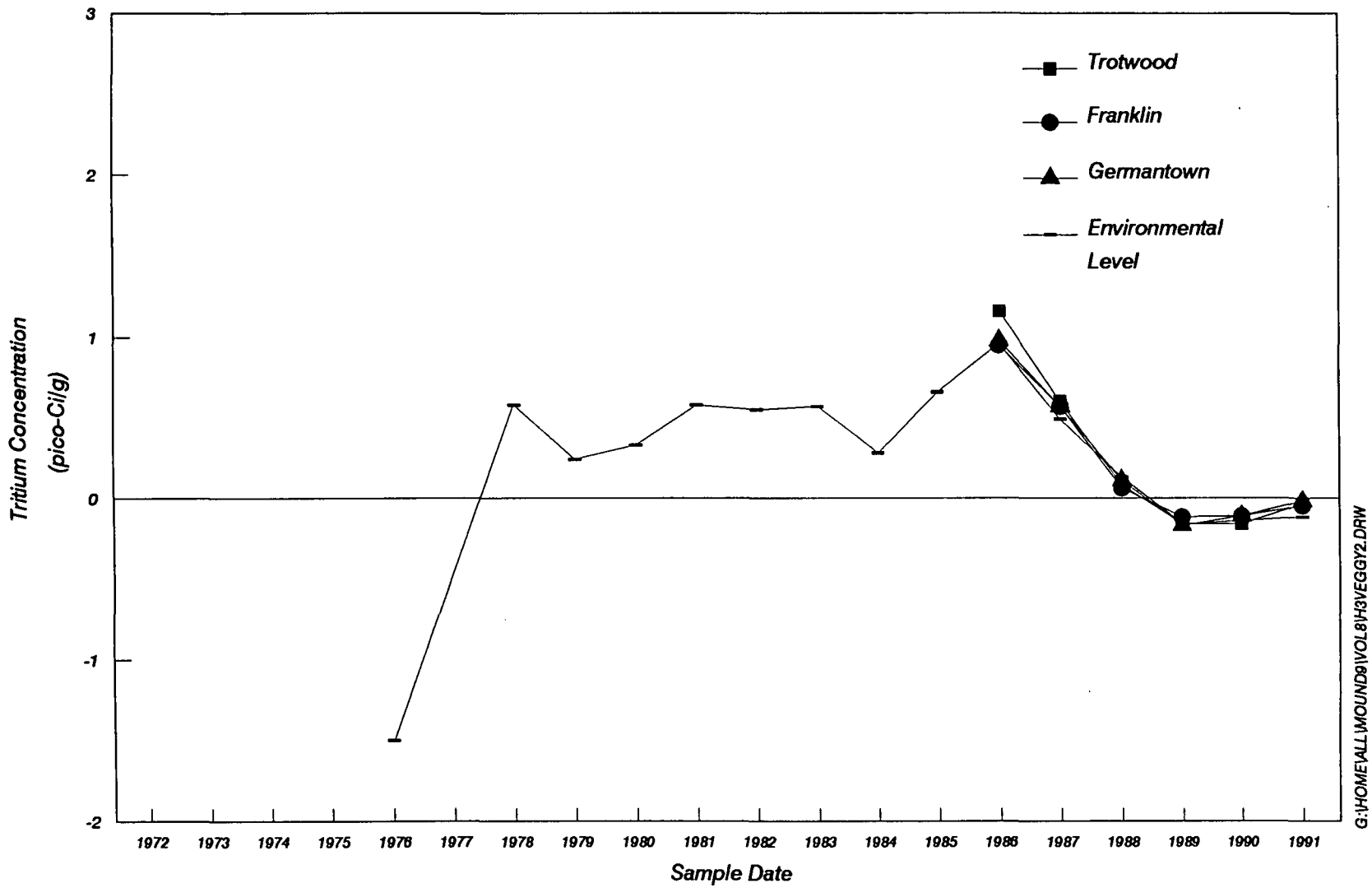

Figure 2.8. Annual Tritium Concentrations in Vegetables.

Plant are similar to the EL. The largest positive variance from the EL was 2.0 pico-Ci/g at Miamisburg in 1976. Average annual concentrations ranged from a high of 2.3 pico-Ci/g at Miamisburg in 1972 to a low of -0.17 pico-Ci/g at Germantown in 1989 and Bellbrook in 1990. The average ELs ranged from a high of 0.96 pico-Ci/g in 1986 to a low of -1.5 pico-Ci/g in 1976.

2.6. TRITIUM IN FISH

Analysis for tritium in fish has not been conducted since 1975. Fish samples were collected at Miamisburg (Great Miami River).

Table F.1 (Appendix F) lists the average annual tritium concentrations. The available data record (Appendix F) consists of a handwritten sheet from 1975. Fish samples were analyzed for tritium from 1972 to 1975; all were below the detection limits. These results indicate no significant tritium uptake in fish from Mound Plant operations. No plots are presented for tritium in fish due to the limited data set.

2.7. TRITIUM IN GRASS

Grass samples have been collected at seven locations in the vicinity of Mound Plant since 1986. These include Miamisburg, Centerville, Bellbrook, Trotwood, Franklin, Germantown, and Brookville. Data obtained from Brookville were used as the background or EL. Vegetable and grass samples were collected at four locations (Miamisburg, Centerville, Bellbrook, and various EL sites) from 1979 to 1985. Data from 1975 to 1978 were sparse and generally included only samples from Miamisburg and occasional unspecified ELs. All samples were analyzed for tritium. The number of samples taken at each location varied from year to year.

Figures 2.9 and 2.10 depict the average tritium concentrations plotted versus time, and Table G.1 (Appendix G) lists the average annual tritium concentrations. The available data (Appendix G) consist of handwritten sheets from 1978 to 1985 and computer printouts from 1986 to 1991. Grass samples were analyzed for tritium from 1978 onward. Average annual tritium concentrations show no significant difference from the EL. The largest positive variance from the EL was 9.22 pico-Ci/g at Miamisburg in 1983. Average annual concentrations ranged from a high of 49 pico-Ci/g at Miamisburg in 1972 to a low of -0.58 pico-Ci/g at Trotwood in 1989. The average ELs ranged from a high of 0.97 pico-Ci/g in 1991 to a low of -0.62 pico-Ci/g in 1987.

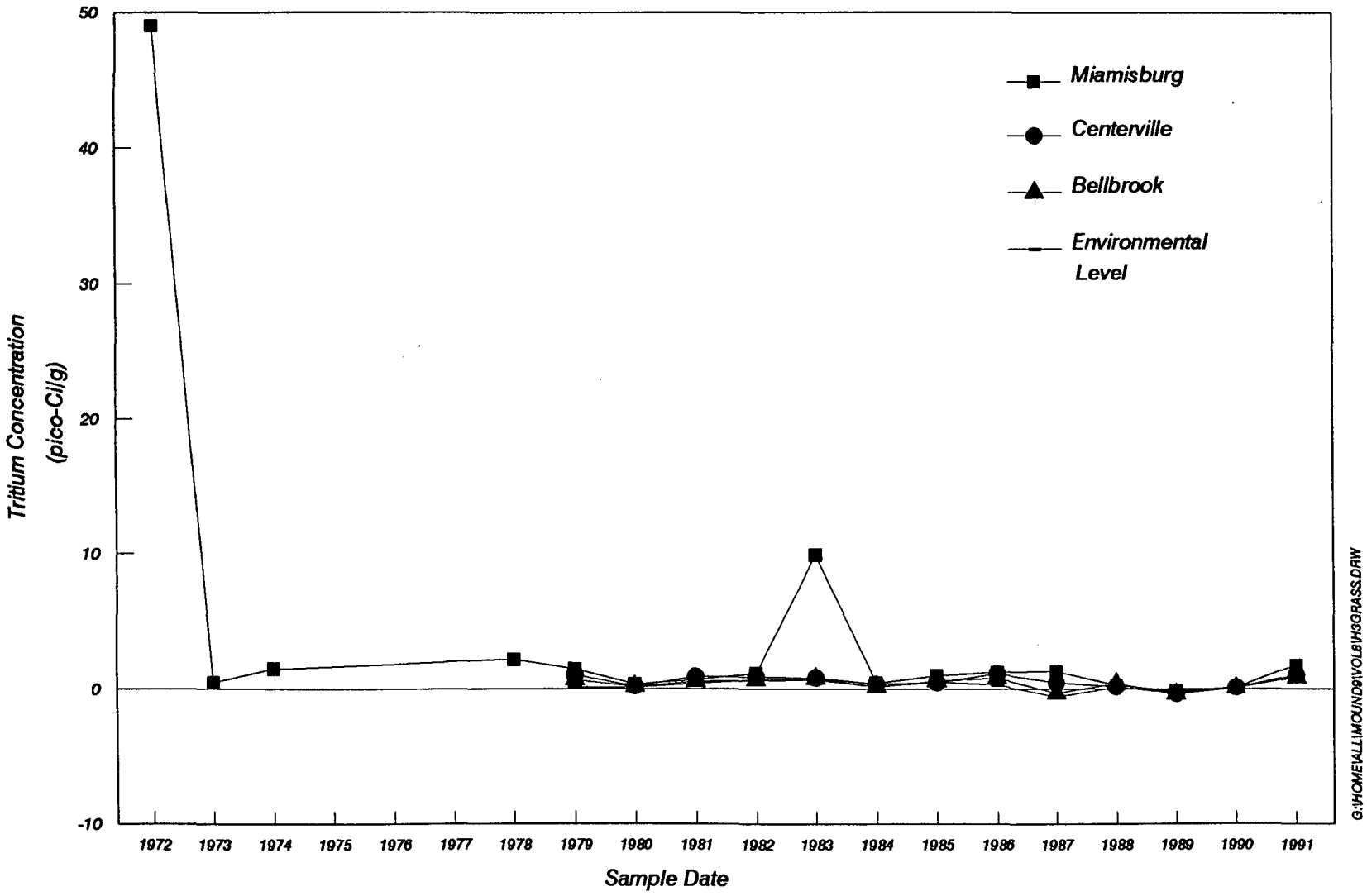

Figure 2.9. Annual Tritium Concentrations in Grass.

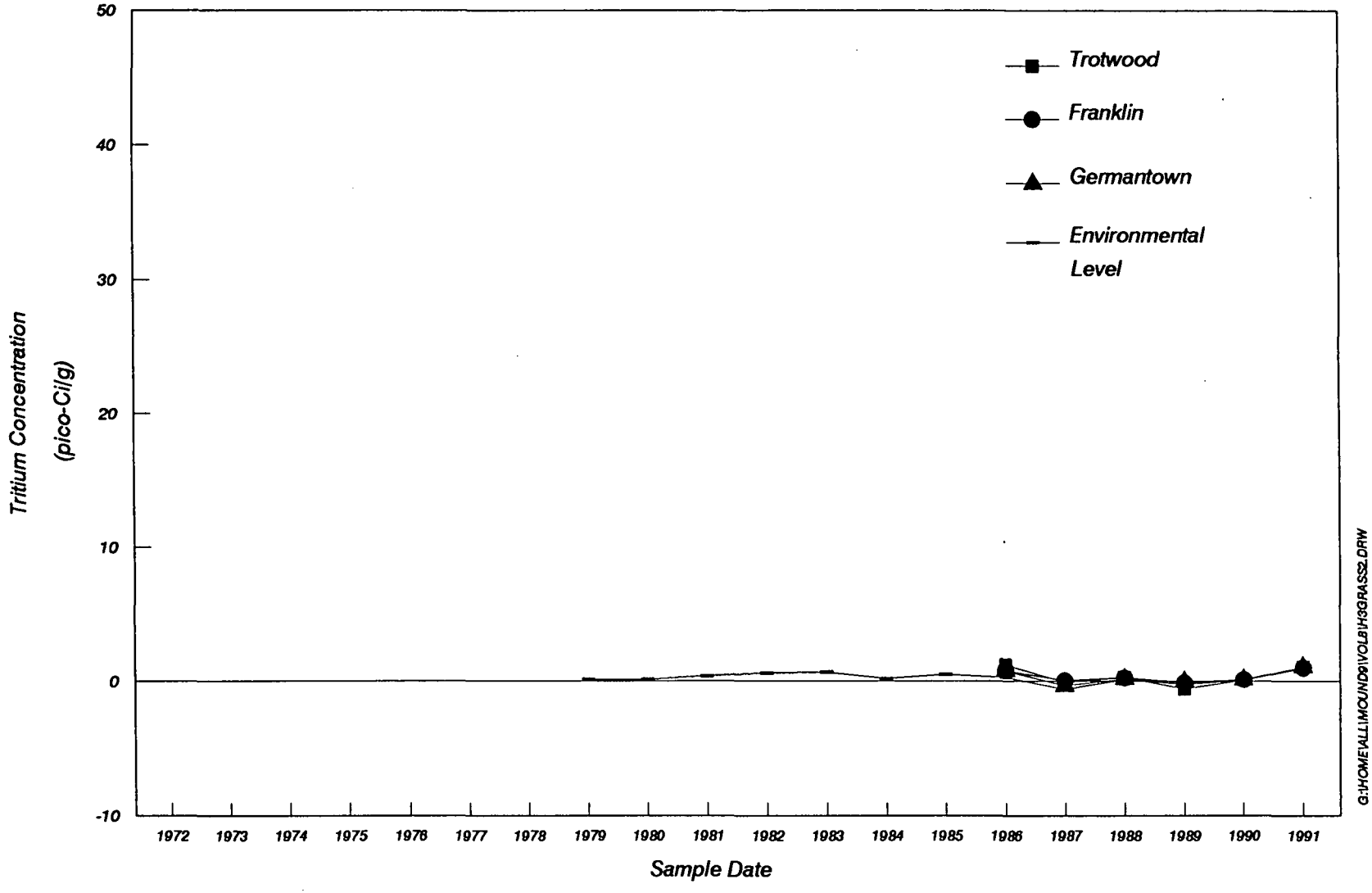

Figure 2.10. Annual Tritium Concentrations in Grass.

2.8. TRITIUM IN MILK

Milk samples were collected at Miamisburg and analyzed for tritium from 1972 to 1978. An EL from an unspecified location was provided in 1978.

Figure 2.11 depicts the average tritium concentrations plotted versus time, and Table H.1 (Appendix H) lists the average annual tritium concentrations. The available data (Appendix H) consist of handwritten sheets from 1975 to 1978. Average annual concentrations ranged from a high of 6.45 pico-Ci/g in 1975 to a low of 0.38 pico-Ci/g in 1977. The only EL provided was 0.33 pico-Ci/g in 1978. The four years of Miamisburg data, excluding 1975, show no significant difference from the environmental level provided for 1978.

3. CONCLUSION

The measured levels of plutonium-238 and tritium in foodstuffs and vegetation in the vicinity of Mound Plant appear to approximate the low ELs and are near the detection limits for plutonium-238 and tritium. Mound Plant has used state-of-the-art equipment, which appears to have resulted in detection limits 2 to 3 orders of magnitude lower than commercially available analysis. These advanced techniques allow Mound Plant to measure radioactivity concentrations so low they would be undetectable by commercial laboratories. The concentrations measured indicate no significant radioactivity contribution from Mound Plant to vegetation and foodstuffs in the surrounding area.

4. REFERENCES

Carfagno, D.G. and B.M. Farmer. 1990. "Environmental Monitoring at Mound: 1989 Report." EG&G Mound Applied Technologies report No. MLM-3634. Mound Plant, Miamisburg, Ohio. May 1990.

DOE. 1992. "Operable Unit 9 Site Scoping Report: Volume 8 - Environmental Monitoring Data 1976 - 1989 [Final]." U.S. Department of Energy, Albuquerque Field Office, Albuquerque, New Mexico. February 1992.

DOE. 1993. "Operable Unit 9 Site Scoping Report: Volume 7 - Waste Management [Final]." U.S. Department of Energy, Albuquerque Field Office, Albuquerque, New Mexico. February 1993.

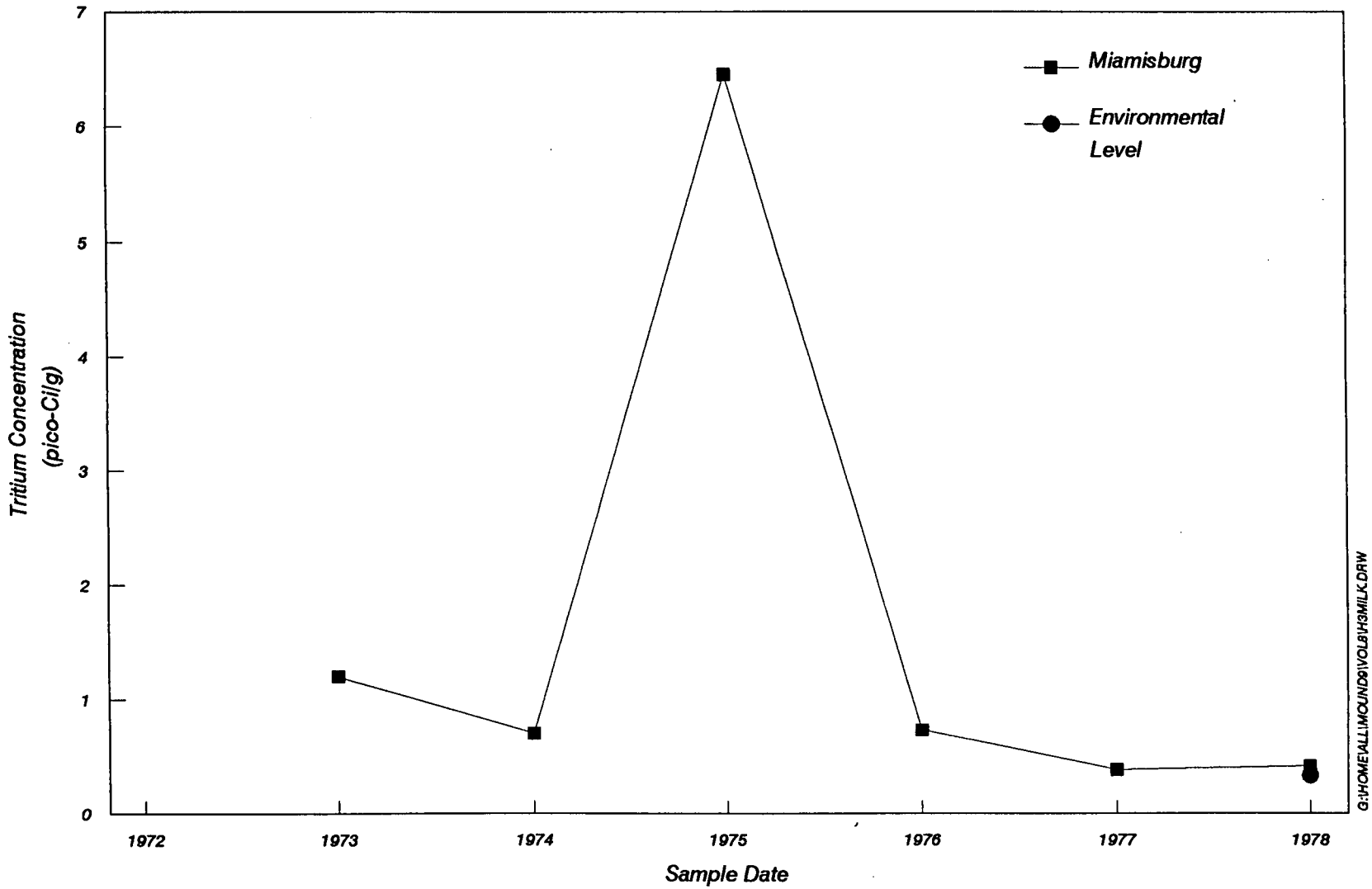

Figure 2.11. Annual Tritium Concentrations in Milk.

APPENDIX A

PLUTONIUM-238 IN VEGETABLES

Table A.1 Plutonium–238 Concentrations (x 10 E –4 pico–Ci/g)
in Vegetables (1972–1991)

	Location 1 Miamisburg			Location 2 Centerville			Location 3 Bellbrook			Location 4 EL			
Year	X	S	n	X	S	n	X	S	n	X	S	n	LDL
1972	20	NA	6	NS			NS			NS			0.15
1973	16	NA	2	NS			NS			NS			0.15
1974	17	NA	2	NS			NS			NS			6–30
1975	7.5	3.2	4	NS			NS			NS			2.2
1976	2.6	0.6	8	NS			NS			NS			2.19
1977	5.3	3.6	4	NS			NS			NS			7.5
1978	1.9	NA	1	NS			NS			0.6	NA	1	4.4
1979	3	0.8	4	3.8	1.9	4	5.6	2.4	4	6.5	4.1	4	9
1980	9.5	7.6	4	0.65	1.2	4	0.44	1.9	4	1.5	1.8	4	1
1981	4.9	2.8	4	4.3	3.6	4	0.2	3.5	4	0.1	1.9	4	2
1982	1	1.3	4	0.9	4.7	4	–0.08	0.8	4	1.5	3.2	4	4
1983	–0.4	3.4	4	3.3	6.2	4	2.8	3.3	4	4.4	8.6	4	2
1984	0.6	1.4	4	1.4	0.7	4	0.2	1.5	4	3.3	3.3	4	0.8
1985	–5	7	4	–6	6	4	–10	6	4	–8	4	4	6.5
1986	0.1	1.4	4	0.1	1.4	4	0.1	1.8	4	0.2	1	4	1.4
1987	2.6	2.4	4	–0.2	0.8	4	0.2	1.6	4	1	1	4	0.8
1988	–0.7	1.6	4	0.5	0.9	4	–0.9	1.9	4	–0.5	1.2	4	4
1989	–0.7	0.6	4	0.3	1	4	0.2	0.8	4	–0.2	1.2	4	0.4
1990	0.04	0.6	4	0.03	0.3	4	–0.4	0.6	4	0.5	0.4	4	1
1991	0.5	1.1	4	0.9	1	4	1.7	1	4	0.9	2.1	4	6

X = average concentration (x 10 E –4 pico–Ci/g)
S = standard deviation
n = number of samples
NS = not sampled
NA = not available or not applicable
EL = environmental level
LDL = lower detection limit

Table A.1 (page 2 of 2)

Year	Location 5 Trotwood			Location 6 Franklin			Location 7 Germantown			LDL
	X	S	n	X	S	n	X	S	n	
1972	NS			NS			NS			0.15
1973	NS			NS			NS			0.15
1974	NS			NS			NS			6–30
1975	NS			NS			NS			2.2
1976	NS			NS			NS			2.19
1977	NS			NS			NS			7.5
1978	NS			NS			NS			4.4
1979	NS			NS			NS			9
1980	NS			NS			NS			1
1981	NS			NS			NS			2
1982	NS			NS			NS			4
1983	NS			NS			NS			2
1984	NS			NS			NS			0.8
1985	NS			NS			NS			6.5
1986	0.7	1.6	4	0.4	1.6	4	0.3	1	4	1.4
1987	1	0.5	4	1.6	1.6	4	2.4	1.5	4	0.8
1988	−0.3	0.9	4	−0.03	2.3	4	−0.2	0.2	4	4
1989	−0.03	2.4	4	0.5	0.4	4	−0.1	1.4	4	0.4
1990	1	0.7	4	0.1	0.5	4	−0.3	0.6	4	1
1991	0.7	0.9	4	−0.8	0.9	4	0.2	0.8	4	6

X = average concentration (x 10 E −4 pico−Ci/g)
S = standard deviation
n = number of samples
NS = not sampled
NA = not available or not applicable
EL = environmental level
LDL = lower detection limit

3/20/76

Foodstuffs Data 1975

Fruits and Vegetables

	^{238}U	^{239}U
Corn	7.1703 pCi/100g (Hanford this Lotus)	1.0545/100g
	$.0717 \times 10^{-6}$ μci/g	$.0105 \times 10^{-6}$ μci/g
	$= 7.17 \times 10^{-8}$ μci/g	1.05×10^{-8} μci/g
tomatoes	.0863 pCi/100g	.0126 pCi/100g
	$.000863 \times 10^{-6}$ μci/g	$.000126 \times 10^{-6}$ μci/g
	$= .0863 \times 10^{-8}$ μci/g	$.0126 \times 10^{-8}$ μci/g
Beets	.0844 pCi/100g	.0126 pCi/100g
	$= .0844 \times 10^{-8}$ μci/g	$= .0126 \times 10^{-8}$ μci/g
peas	.0158 pCi/100g	.0226 pCi/100g
	$= .0218 \times 10^{-8}$ μci/g	$.0226 \times 10^{-8}$ μci/g

AVG $.0642 \times 10^{-8}$ μci/g

Fish

.0297 pCi/100g	.0126 pCi/100g
.0250 pCi/100g	.0126 pCi/100g
.0218 pCi/100g	.0126 pCi/100g
AVG	AVG
= .0255 pCi/100g	= .0126 pCi/100g
$= .0255 \times 10^{-8}$ μci/g	$= .0126 \times 10^{-8}$ μci/g

Plutonium 1975 in Kodiak Calculations 5/27/76

Corn Berun.

$^{238}Pu = .1068\ pCi = .1068 \times 10^{-6}\ \mu ci/100\ gram$

$= .1068 \times 10^{-8}\ \mu ci/gram$

plutonium-238 in foodstuffs and vegetation 1980

Sample type	Result	Quantity	Result ($\times 10^{-10}$ pci/g)	Avg	MDA	Std dev
turnip (T-1)	.0332 pci	100g	3.32			
turnip (T-2)	.0378 pci	100g	3.78			
turnip (T-1)	* .0219 pci	100 g	2.19	.0297 $\times 10^{-8}$	.022 $\times 10^{-8}$	.0024 $\times 10^{-8}$
turnip (T-2)	* .0219 pci	100g	2.19	2.87 $\times 10^{-10}$ pci/g	2.19 $\times 10^{-10}$ pci/g	2.4 $\times 10^{-10}$ pci/g
milk (L-M)	* .0219 pci	250 ml	.88	.0085 $\times 10^{-8}$	.0088 $\times 10^{-8}$	.0096 $\times 10^{-8}$
milk (G-M)	* .0219 pci	200 ml	.88	.88 $\times 10^{-10}$ pci/g	.88 $\times 10^{-10}$ pci/g	.96 $\times 10^{-10}$ pci/g
corn (CB-1)	* .0219 pci	100 g	2.19			
corn (CB-2)	* .0219 pci	100 g	2.19			
corn (CD-1)	.0282 pci	100 g	2.82	.0235 $\times 10^{-8}$	.022 $\times 10^{-8}$	.0024 $\times 10^{-8}$
corn (CD-2)	* .0219 pci	100 g	2.19	2.35 $\times 10^{-10}$ pci/g	2.19 $\times 10^{-10}$ pci/g	2.4 $\times 10^{-10}$ pci/g
fish (FB)	.0465 pci	100 g	4.65	.036 $\times 10^{-8}$	.022 $\times 10^{-8}$	.026 $\times 10^{-8}$
fish (FR)	.0244 pci	100 g	2.44	3.55 $\times 10^{-10}$ pci/g	2.19 $\times 10^{-10}$ pci/g	2.6 $\times 10^{-10}$ pci/g
grass (G-2)	1.1955 pci	4 g	298.88			
grass (G-BKG)	.1375 pci	5 g	27.50			
grass (G-4)	* .0219 pci	2.6 g	5.19			
grass (G-6)	1.0493 pci	4.8 g	218.60			
grass (G-8)	1.0105 pci	1.6 g	631.56			
grass (G-10)	.2841 pci	5.6 g	50.73			
grass (G-12)	.4457 pci	3.4 g	131.09			
grass (G-14)	.7923 pci	5.2 g	152.37	2.03 $\times 10^{-8}$	.0519 $\times 10^{-8}$	.17 $\times 10^{-8}$
grass (G-16)	1.8930 pci	5.8 g	310.86	202.98 $\times 10^{-10}$ pci/g	5.19 $\times 10^{-10}$ pci/g	16.64 $\times 10^{-10}$ pci/g

2/24/78

1977 Environmental Monitoring Data

^{238}Pu in Vegetables →

(1 Kg)
turnip → $\frac{.0248 \times 10^{-6}}{50\ g} \pm \frac{.0157 \times 10^{-6}}{50\ g} = 0.5 \pm .3 \times 10^{-9}$ pci/g
$<0.75 \pm .3 \times 10^{-9}$ pci/g

(1 Kg)
potatoes → $\frac{.1132 \times 10^{-6}}{100\ g} \pm \frac{.0407 \times 10^{-6}}{100\ g} = 1.1 \pm .4 \times 10^{-9}$ pci/g

(Lift model)
turnip → $\frac{.0213 \times 10^{-6}}{50\ g} \pm \frac{.0142 \times 10^{-6}}{50\ g} = 0.4 \pm .3 \times 10^{-9}$ pci/g
$<0.75 \pm .3 \times 10^{-9}$ pci/g

(Lift model)
potatoes → $\frac{.0102 \times 10^{-6}}{100\ g} \pm \frac{.0102 \times 10^{-6}}{100\ g} = 0.1 \pm 0.1 \times 10^{-9}$ pci/g
$<0.75 \pm 0.1 \times 10^{-9}$ pci/g

Avg $= <0.84 \pm 0.28 \times 10^{-9}$

LDL $= .03 \times 10^{-6}$ pci/sample $\pm .02 \times 10^{-6}$ counting stat @ 2σ
LDL $= \frac{.05 \times 10^{-6}\ \text{pci/sample}}{50\ g} = 1.0 \times 10^{-9}$ pci/g
LDL $= \frac{.05 \times 10^{-6}\ \text{pci/sample}}{100\ g} = 0.5 \times 10^{-9}$ pci/g

Avg LDL $= 0.75 \times 10^{-9}$ pci/g

Pu-238 in Foodstuffs and Vegetation - 1978 3/1/79

Environmental levels	Results
Milk - .0221 ± .0094 pCi/250 cc	Milk - .0454 ± .0137 pCi/260 cc

* LDL for Pu-238 in air = .0655 pCi ∴ Assume .0655/260 cc = .00026 pCi/cc = 2.6×10^{-10} μCi/cc

Vegetables	
turnips - .0088 ± .0051 pCi/150 g	turnips - .0287 ± .0112 pCi/150 g

* LDL for Pu-238 in air = .0655 pCi ∴ Assume .0655/260 cc = .00044 pCi/cc = 4.4×10^{-10} μCi/cc

Fish	
- .0216 ± .0130 50 gm	- .0203 ± .0122 35 g
- .0231 ± .0139 50 g	- .0298 ± .0160 35 g

* LDL for Pu-238 in air = .0655 pCi ∴ Assume .0655/35 g = .00187 $\times 10^{-6}$ μCi/g

1979 Pu-238 concentration in potatoes - 50 gram Sample 2/15/

(annual) Date	Miamisburg $\times 10^{-6}$ μci/g	Centerville $\times 10^{-6}$ μci/g	Bellbrook $\times 10^{-6}$ μci/g	(environmental level) Camden $\times 10^{-6}$ μci/g
1	0.00035	0.00059	0.00053	0.00116
2	0.00018	0.00042	0.00090	0.00052
3	0.00032	0.00013	0.00042	0.00019
4	0.00035	0.00036	0.00038	0.00073
$\bar{X}$	0.00030	0.00038	0.00056	0.00065
S	0.00008	0.00019	0.00024	0.00041
$S_{\bar{X}}$				
$\pm S_{\bar{X}}$	0.00013	0.00030	0.00038	0.00065

Plutonium - 238 (110-) [illegible] formodes 100 gram Sample [illegible] 1/7/01

Miamisburg			Centerville			Bellbrook			Environmental Level		
Sample pCi	Blank pCi	Net pCi	Sample pCi	Blank pCi	Net pCi	Sample pCi	Blank pCi	Net pCi	Sample pCi	Blank pCi	Net pCi
0.0681	0.0103	0.0578	0.0057	0.0103	-0.0046	0	0.0103	-0.0103	0.0128	0.0103	0.0025
0.0429	0.0119	0.0310	0.0131	0.0119	0.0012	0.0118	0.0119	-0.0001	0.0075	0.0119	-0.0044
0.0080	0.0090	-0.0010	0.0215	0.0090	0.0125	0.0258	0.0090	0.0168	0.0248	0.0090	0.0158
0.1053	0.0032	0.1021	0.0071	0.0032	0.0039	0.0056	0.0032	0.0024	0.0196	0.0032	0.0164
$\bar{X}$		0.0475			0.0033			0.0022			0.0076
S		0.0436			0.0071			0.0112			0.0102
n		4			4			4			4
$S_{\bar{X}}$		0.0694			0.0113			0.0178			0.0162

Pu-238 Results after Environmental Levels Subtracted in pCi/g - 50 gram Sample

$\bar{X}$	0.00080	E.L.	E.L.	0.00015
$S_{\bar{X}}$	0.00142	–	–	0.00032
MIN	E.L.	–	–	
MAX	0.00189	0.0001	0.0002	

1981
Pu-238 in Foodstuff -
Pu-238 in Potatoes - 40 gram Sample
Miamisburg

2/10/82

Gross pCi	Blank pCi	Net pCi	(10^{-9} µci/g)	
0.0355	0	0.0355	0.89	$\bar{x}$ = 0.49
0.0321	0.0157	0.0164	0.41	S = 0.28
0.0223	0.0055	0.0168	0.42	$t s_{\bar{x}}$ = 0.44
0.0230	0.0134	0.0096	0.24	

Centerville

Gross pCi	Blank pCi	Net pCi	(10^{-9} µci/g)	
0.0387	0	0.0387	0.97	$\bar{x}$ = 0.43
0.0271	0.0157	0.0114	0.29	S = 0.36
0.0178	0.0055	0.0123	0.31	$t s_{\bar{x}}$ = 0.57
0.0199	0.0134	0.0065	0.16	

Bellbrook

Gross pCi	Blank pCi	Net pCi	(10^{-9} µci/g)	
0.0214	0	0.0214	0.54	$\bar{x}$ = 0.02
0.0080	0.0157	-0.0077	-0.19	S = 0.35
0.004	0.0055	-0.0015	-0.04	$t s_{\bar{x}}$ = 0.57
0.0047	0.0134	-0.0087	-0.22	

Environmental Level

Gross pCi	Blank pCi	Net pCi	(10^{-9} µci/g)	
0.0025	0	0.0025	0.06	$\bar{x}$ = 0.01
0.0090	0.0157	-0.0067	-0.17	S = 0.19
0.016	0.0055	0.0105	0.26	$t s_{\bar{x}}$ = 0.32
0.009	0.0134	-0.0044	-0.11	

Pu-238 in Potatoes 1981 Summary

Location	(10^{-9} µci/g) CONC	(10^{-9} µci/g) EL CONC	(10^{-9} µci/g) MOUND IMPACT	(10^{-9} µci/g) MOUND IMPACT
Miamisburg	0.49 ± 0.44	0.01 ± 0.32	$0.48 \pm \sqrt{(0.44)^2+(0.32)^2}$	= 0.48 ± 0.54
Centerville	0.43 ± 0.57	0.01 ± 0.32	$0.42 \pm \sqrt{(0.57)^2+(0.32)^2}$	= 0.42 ± 0.65
Bellbrook	0.02 ± 0.57	0.01 ± 0.32	$0.01 \pm \sqrt{(0.57)^2+(0.32)^2}$	= 0.01 ± 0.65

1982 pu-238 in potatoes - 50 gram sample 1/28/83

Miamisburg

Gross pCi	Blank pCi	Net pCi/kg	Conc (10^{-9} pCi/g)	
0.0198	0.0148	0.005	0.1	$\bar{X}$ = 0.1
0.0338	0.0248	0.009	0.18	S = 0.13
0.0246	0.0291	-0.0045	-0.09	$S_{\bar{X}}$ = 0.06
0.0156	0.0062	0.0094	0.19	$TS_{\bar{X}}$ = 0.19

Centerville

Gross pCi	Blank pCi	Net pCi/50g	Conc (10^{-9} pCi/g)	
0.0385	0.0148	0.0237	0.47	$\bar{X}$ = 0.09
0.0028	0.0248	-0.022	-0.44	S = 0.47
N.S.	0.0291	N.S.	N.S.	$S_{\bar{X}}$ = 0.27
0.0185	0.0062	0.0123	0.25	$TS_{\bar{X}}$ = 1.16

Bell Brook

Gross pCi	Blank pCi	Net pCi/50g	Conc (10^{-9} pCi/g)	
0.0139	0.0148	-0.0009	0.02	$\bar{X}$ = -0.008
0.0271	0.0248	0.0023	0.05	S = 0.08
0.0224	0.0291	-0.0067	-0.13	$S_{\bar{X}}$ = 0.04
0.0079	0.0062	0.0017	0.03	$TS_{\bar{X}}$ = 0.13

Environmental Level

Gross pCi	Blank pCi	Net pCi/50g	Conc (10^{-9} pCi/g)	
0.0201	0.0148	0.0053	0.11	$\bar{X}$ = 0.15
0.0153	0.0248	-0.0095	-0.19	S = 0.32
0.0337	0.0291	0.0046	0.09	$S_{\bar{X}}$ = 0.16
0.0354	0.0062	0.0292	0.58	$TS_{\bar{X}}$ = 0.51

Pu-238 in potatoes 1982 Summary

Location	Conc (10^{-9} pCi/g)	EL (10^{-9} pCi/g)		Mound Impact (10^{-9} pCi/g)
Miamisburg	0.1 ± 0.2	0.15 ± 0.51	=	E.L.
Centerville	0.09 ± 1.2	"	=	E.L.
Bellbrook	N.D.	"	=	E.L.

1983 Pu-238 calculation in potatoes (50 gram sample) 2/14/84

Location	Gross pci	Blank pci	net pci/50 gram	net conc (10^{-6} pci/g)
Miamisburg	0.0296	0.01	0.0196	0.00039
	0.002	0.0144	-0.0124	-0.00025
	0.0021	0.0205	-0.0184	-0.00037
	0.0067	0.0099	-0.0032	-0.00006
			$\bar{x}$ =	-0.00004
			S =	0.00034
			$ts_{\bar{x}}$ =	0.00054
Centerville	0.0719	0.01	0.0619	0.00124
	0.0235	0.0144	0.0091	0.00018
	0.015	0.0205	-0.0055	-0.00011
	0.0094	0.0099	-0.0005	-0.00001
			$\bar{x}$ =	0.00033
			S =	0.00062
			$ts_{\bar{x}}$ =	0.00099
Bellbrook	0.0468	0.01	0.0368	0.00074
	0.0148	0.0144	0.0004	0.00001
	0.0239	0.0205	0.0034	0.00007
	0.0251	0.0099	0.0152	0.0003
			$\bar{x}$ =	0.00028
			S =	0.00033
			$ts_{\bar{x}}$ =	0.00053
Brookville (Environmental Lab)	0.0162	0.01	0.0062	0.00012
	0.0981	0.0144	0.0837	0.00167
	0.0047	0.0205	-0.0158	-0.00032
	0.0245	0.0099	0.0146	0.00029
		$\bar{x}$ = 0.0137		$\bar{x}$ = 0.00044
		S = 0.005		S = 0.00086
			$ts_{\bar{x}}$ =	0.00137

1984 Pu-238 CALCULATIONS in Pu-~~[illegible]~~ (40 gram samples) 12/3/8[illegible]

Location	Gross pCi	Blank pCi	Net pCi/40 grams	Net conc (10^{-6} mci/g)
Miamisburg	0.009	0.0094	−0.0004	−0.00001
	0.0187	0.008	0.0107	0.0002675
	0.0076	0.0061	0.0015	0.0000375
	0.0026	0.0046	−0.002	−0.00005
				$\bar{x}$ = 0.00006
				S = 0.00014
				$t S_{\bar{x}}$ = 0.00022
Centerville	0.0115	0.0094	0.0021	0.0000525
	0.0138	0.008	0.0058	0.000145
	0.0114	0.0061	0.0053	0.0001325
	0.0139	0.0046	0.0093	0.0002325
				$\bar{x}$ = 0.00014
				S = 0.00007
				$t S_{\bar{x}}$ = 0.00011
Bellbrook	0.0021	0.0094	−0.0073	−0.0001825
	0.0114	0.008	0.0034	0.000085
	0.0133	0.0061	0.0072	0.00018
	0.0047	0.0046	0.0001	0.0000025
				$\bar{x}$ = 0.00002
				S = 0.00015
				$t S_{\bar{x}}$ = 0.00024
Brookville (Environmental Level)	0.0179	0.0094	0.0085	0.0002125
	0.0142	0.008	0.0062	0.000155
	0.0111	0.0061	0.005	0.000125
	0.0377	0.0046	0.0331	0.0008275
		$\bar{x}$ = 0.007		$\bar{x}$ = 0.00033
		S = 0.002		S = 0.00033
				$t S_{\bar{x}}$ = 0.00053

1985 Pu-238 Calculations in potatoes 1/16/86

Location	Gross pCi	Blank pCi	Net pCi/40g	Net conc (10^{-6} mci/g)
Miamisburg	0.0186	0.015	0.0036	0.00009
	0.0031	0.048	-0.0449	-0.00112
	0.0527	0.0492	0.0035	0.00009
	-0.0106	0.0354	-0.046	-0.00115
				$\bar{x}$ = -0.0005
			T=3.182 df=3	S = 0.0007
				$tS_{\bar{x}}$ = 0.0011
Centerville	0.0097	0.015	-0.0053	-0.00013
	-0.0037	0.048	-0.0517	-0.00129
	0.021	0.0492	-0.0282	-0.00071
	0.0299	0.0354	-0.0055	-0.00014
				$\bar{x}$ = -0.0006
				S = 0.0006
				$tS_{\bar{x}}$ = 0.001
Bellbrook	0.0029	0.015	-0.0121	-0.0003
	-0.0041	0.048	-0.0521	-0.0013
	-0.0105	0.0492	-0.0597	-0.0015
	0.0055	0.0354	-0.0299	-0.0007
				$\bar{x}$ = -0.001
				S = 0.0006
				$tS_{\bar{x}}$ = 0.001
Brookville (Environmental Level)	0.007	0.015	-0.008	-0.0002
	0.0071	0.048	-0.0409	-0.00102
	0.0125	0.0492	-0.0367	-0.00092
	-0.0031	0.0354	-0.0385	-0.00096
		$\bar{x}$ = 0.0369		$\bar{x}$ = -0.0008
		S = 0.0159		S = 0.0004
				$tS_{\bar{x}}$ = 0.0006

1986 PU-238 IN POTATOES
fCi/G

	MIAMISBURG	CENTERVILLE	BELLBROOK	TROTWOOD	FRANKLIN	GERMANTOWN	BROOKVILLE
	0.13	-0.02	-0.23	-0.06	0.11	0.01	0.02
	0.13	0.20	0.12	0.28	0.23	0.08	0.16
	-0.10	-0.14	-0.01	0.11	-0.01	-0.10	-0.01
	-0.12	0.00	0.18	-0.06	-0.16	0.13	-0.07
N	4	4	4	4	4	4	4
AVERAGE	0.01	0.01	0.01	0.07	0.04	0.03	0.02
STD DEV	0.14	0.14	0.18	0.16	0.16	0.10	0.10
MINIMUM	-0.12	-0.14	-0.23	-0.06	-0.16	-0.10	-0.07
MAXIMUM	0.13	0.20	0.18	0.28	0.23	0.13	0.16
STD ERROR	0.22	0.22	0.29	0.26	0.26	0.15	0.15

INCREMENTAL
CONCENTRATION

AVERAGE	-0.01	-0.01	-0.01	0.04	0.02	0.01
MINIMUM	-0.15	-0.16	-0.25	-0.09	-0.18	-0.12
MAXIMUM	0.11	0.18	0.16	0.26	0.20	0.11
STD ERROR	0.27	0.27	0.33	0.30	0.30	0.22

PU-238 IN POTATOES 1986

LOCATION	GROSS pCi	BKG pCi	NET pCi	TOTAL WEIGHT (G)	CONC. (fCi/G)
MIAMISBURG	0.0064	0.0014	0.005	40	0.125
MIAMISBURG	0.0007	-0.0046	0.0053	40	0.1325
MIAMISBURG	-0.0007	0.0033	-0.004	40	-0.1
MIAMISBURG	-0.0049	0	-0.0049	40	-0.1225
CENTERVILLE	0.0005	0.0014	-0.0009	40	-0.0225
CENTERVILLE	0.0035	-0.0046	0.0081	40	0.2025
CENTERVILLE	-0.0021	0.0033	-0.0054	40	-0.135
CENTERVILLE	0	0	0	40	0
BELLBROOK	-0.0078	0.0014	-0.0092	40	-0.23
BELLBROOK	0	-0.0046	0.0046	40	0.115
BELLBROOK	0.0027	0.0033	-0.0006	40	-0.015
BELLBROOK	0.0071	0	0.0071	40	0.1775
TROTWOOD	-0.0011	0.0014	-0.0025	40	-0.0625
TROTWOOD	0.0065	-0.0046	0.0111	40	0.2775
TROTWOOD	0.0077	0.0033	0.0044	40	0.11
TROTWOOD	-0.0025	0	-0.0025	40	-0.0625
FRANKLIN	0.0059	0.0014	0.0045	40	0.1125
FRANKLIN	0.0044	-0.0046	0.009	40	0.225
FRANKLIN	0.0029	0.0033	-0.0004	40	-0.01
FRANKLIN	-0.0063	0	-0.0063	40	-0.1575

GERMANTOWN	0.0017	0.0014	0.0003	40	0.0075
GERMANTOWN	-0.0016	-0.0046	0.003	40	0.075
GERMANTOWN	-0.0006	0.0033	-0.0039	40	-0.0975
GERMANTOWN	0.0051	0	0.0051	40	0.1275
BROOKVILLE	0.0023	0.0014	0.0009	40	0.0225
BROOKVILLE	0.0016	-0.0046	0.0062	40	0.155
BROOKVILLE	0.0027	0.0033	-0.0006	40	-0.015
BROOKVILLE	-0.0029	0	-0.0029	40	-0.0725

1987 PU-238 IN POTATOES
fCi/G

	MIAMISBURG	CENTERVILLE	BELLBROOK	TROTWOOD	FRANKLIN	GERMANTOWN	BROOKVILLE
	0.05	-0.04	-0.15	0.11	-0.05	0.37	0.23
	0.42	-0.03	0.03	0.09	0.20	0.26	0.11
	0.06	-0.09	0.24	0.06	0.17	0.02	-0.03
	0.50	0.09	-0.02	0.17	0.32	0.31	0.09
N	4	4	4	4	4	4	4
AVERAGE	0.26	-0.02	0.02	0.10	0.16	0.24	0.10
STD DEV	0.24	0.08	0.16	0.05	0.16	0.15	0.10
MINIMUM	0.05	-0.09	-0.15	0.06	-0.05	0.02	-0.03
MAXIMUM	0.50	0.09	0.24	0.17	0.32	0.37	0.23
STD ERROR	0.38	0.12	0.26	0.07	0.25	0.24	0.16

INCREMENTAL
CONCENTRATION

AVERAGE	0.16	-0.11	-0.07	0.01	0.06	0.14
MINIMUM	-0.05	-0.19	-0.25	-0.04	-0.15	-0.08
MAXIMUM	0.41	-0.00	0.14	0.07	0.23	0.27
STD ERROR	0.42	0.20	0.31	0.18	0.30	0.29

PU-238 IN POTATOES 1987

LOCATION	GROSS pCi	BKG pCi	NET pCi	TOTAL WEIGHT (G)	CONC. (fCi/G)
MIAMISBURG	0.0008	-0.0015	0.0023	50	0.045
MIAMISBURG	0.0197	-0.0015	0.0212	50	0.423
MIAMISBURG	0.0013	-0.0015	0.0028	50	0.055
MIAMISBURG	0.0237	-0.0015	0.0252	50	0.503
CENTERVILLE	-0.0034	-0.0015	-0.0019	50	-0.039
CENTERVILLE	-0.0028	-0.0015	-0.0013	50	-0.027
CENTERVILLE	-0.006	-0.0015	-0.0046	50	-0.091
CENTERVILLE	0.0032	-0.0015	0.0047	50	0.093
BELLBROOK	-0.009	-0.0015	-0.0075	50	-0.151
BELLBROOK	0	-0.0015	0.0015	50	0.029
BELLBROOK	0.0106	-0.0015	0.0121	50	0.241
BELLBROOK	-0.0026	-0.0015	-0.0011	50	-0.023
TROTWOOD	0.0039	-0.0015	0.0054	50	0.107
TROTWOOD	0.003	-0.0015	0.0045	50	0.089
TROTWOOD	0.0014	-0.0015	0.0029	50	0.057
TROTWOOD	0.0068	-0.0015	0.0083	50	0.165
FRANKLIN	-0.004	-0.0015	-0.0026	50	-0.051
FRANKLIN	0.0083	-0.0015	0.0098	50	0.195
FRANKLIN	0.0069	-0.0015	0.0084	50	0.167
FRANKLIN	0.0147	-0.0015	0.0162	50	0.323

GERMANTOWN	0.0168	-0.0015	0.0183	50	0.365
GERMANTOWN	0.0116	-0.0015	0.0130	50	0.261
GERMANTOWN	-0.0007	-0.0015	0.0008	50	0.015
GERMANTOWN	0.0138	-0.0015	0.0153	50	0.305
BROOKVILLE	0.0098	-0.0015	0.0113	50	0.225
BROOKVILLE	0.0039	-0.0015	0.0054	50	0.107
BROOKVILLE	-0.0027	-0.0015	-0.0013	50	-0.025
BROOKVILLE	0.0028	-0.0015	0.0043	50	0.085

1988 PU-238 IN POTATOES
fCi/G

	MIAMISBURG	CENTERVILLE	BELLBROOK	TROTWOOD	FRANKLIN	GERMANTOWN	BROOKVILLE
	-0.15	-0.03	0.02	0.02	0.16	0.01	-0.08
	-0.23	0.16	-0.37	-0.16	0.13	-0.03	-0.03
	0.13	0.08	0.05	-0.03	-0.34	-0.02	-0.20
	-0.04	-0.01	-0.06	0.06	0.04	-0.04	0.10
N	4	4	4	4	4	4	4
AVERAGE	-0.07	0.05	-0.09	-0.03	-0.00	-0.02	-0.05
STD DEV	0.16	0.09	0.19	0.09	0.23	0.02	0.12
MINIMUM	-0.23	-0.03	-0.37	-0.16	-0.34	-0.04	-0.20
MAXIMUM	0.13	0.16	0.05	0.06	0.16	0.01	0.10
STD ERROR	0.25	0.14	0.31	0.15	0.37	0.03	0.20

INCREMENTAL
CONCENTRATION

AVERAGE	-0.02	0.10	-0.03	0.03	0.05	0.03
MINIMUM	-0.17	0.03	-0.32	-0.10	-0.28	0.02
MAXIMUM	0.19	0.21	0.11	0.11	0.22	0.06
STD ERROR	0.32	0.24	0.37	0.25	0.42	0.20

PU-238 IN POTATOES 1988

LOCATION	GROSS pCi	BKG pCi *	NET pCi	TOTAL WEIGHT (G)	CONC. (fCi/G)
MIAMISBURG	-0.0077	-0.0004	-0.0073	50	-0.1465
MIAMISBURG	-0.0118	-0.0004	-0.0114	50	-0.2285
MIAMISBURG	0.0062	-0.0004	0.0066	50	0.1315
MIAMISBURG	-0.0026	-0.0004	-0.0022	50	-0.0445
CENTERVILLE	-0.0018	-0.0004	-0.0014	50	-0.0285
CENTERVILLE	0.0074	-0.0004	0.0078	50	0.1555
CENTERVILLE	0.0036	-0.0004	0.0040	50	0.0795
CENTERVILLE	-0.0011	-0.0004	-0.0007	50	-0.0145
BELLBROOK	0.0008	-0.0004	0.0012	50	0.0235
BELLBROOK	-0.0189	-0.0004	-0.0185	50	-0.3705
BELLBROOK	0.0022	-0.0004	0.0026	50	0.0515
BELLBROOK	-0.0032	-0.0004	-0.0028	50	-0.0565
TROTWOOD	0.0007	-0.0004	0.0011	50	0.0215
TROTWOOD	-0.0083	-0.0004	-0.0079	50	-0.1585
TROTWOOD	-0.0017	-0.0004	-0.0013	50	-0.0265
TROTWOOD	0.0025	-0.0004	0.0029	50	0.0575
FRANKLIN	0.0078	-0.0004	0.0082	50	0.1635
FRANKLIN	0.0061	-0.0004	0.0065	50	0.1295
FRANKLIN	-0.0173	-0.0004	-0.0169	50	-0.3385
FRANKLIN	0.0015	-0.0004	0.0019	50	0.0375

GERMANTOWN	0	-0.0004	0.0004	50	0.0075
GERMANTOWN	-0.0019	-0.0004	-0.0015	50	-0.0305
GERMANTOWN	-0.0014	-0.0004	-0.0010	50	-0.0205
GERMANTOWN	-0.0022	-0.0004	-0.0018	50	-0.0365
BROOKVILLE	-0.0046	-0.0004	-0.0042	50	-0.0845
BROOKVILLE	-0.0017	-0.0004	-0.0013	50	-0.0265
BROOKVILLE	-0.0106	-0.0004	-0.0102	50	-0.2045
BROOKVILLE	0.0044	-0.0004	0.0048	50	0.0955

1989 PU-238 IN POTATOES
fCi/G

	MIAMISBURG	CENTERVILLE	BELLBROOK	TROTWOOD	FRANKLIN	GERMANTOWN	BROOKVILLE
	0.01	-0.09	-0.05	-0.24	0.08	-0.06	0.07
	-0.08	-0.02	0.01	0.33	0.04	-0.13	0.09
	-0.14	0.09	-0.01	-0.04	-0.01	-0.02	-0.16
	-0.08	0.12	0.14	-0.07	0.09	0.19	-0.09
N	4	4	4	4	4	4	4
AVERAGE	-0.07	0.03	0.02	-0.003	0.05	-0.01	-0.02
STD DEV	0.06	0.10	0.08	0.24	0.04	0.14	0.12
MINIMUM	-0.14	-0.09	-0.05	-0.24	-0.01	-0.13	-0.16
MAXIMUM	0.01	0.12	0.14	0.33	0.09	0.19	0.09
STD ERROR	0.10	0.16	0.13	0.38	0.07	0.22	0.19

INCREMENTAL
CONCENTRATION

AVERAGE	-0.05	0.05	0.04	0.02	0.07	0.01
MINIMUM	-0.12	-0.07	-0.03	-0.22	0.02	-0.11
MAXIMUM	0.03	0.14	0.16	0.36	0.11	0.21
STD ERROR	0.22	0.25	0.23	0.43	0.20	0.29

PU-238 IN POTATOES 1989

LOCATION	GROSS pCi	BKG pCi *	NET pCi	TOTAL WEIGHT (G)	CONC. (fCi/G)
MIAMISBURG	0.003	0.0026	0.0004	50	0.009
MIAMISBURG	-0.0013	0.0026	-0.0039	50	-0.077
MIAMISBURG	-0.0046	0.0026	-0.0072	50	-0.143
MIAMISBURG	-0.0013	0.0026	-0.0039	50	-0.077
CENTERVILLE	-0.0021	0.0026	-0.0047	50	-0.093
CENTERVILLE	0.0018	0.0026	-0.0008	50	-0.015
CENTERVILLE	0.007	0.0026	0.0045	50	0.089
CENTERVILLE	0.0086	0.0026	0.0061	50	0.121
BELLBROOK	0	0.0026	-0.0026	50	-0.051
BELLBROOK	0.0032	0.0026	0.0007	50	0.013
BELLBROOK	0.0019	0.0026	-0.0007	50	-0.013
BELLBROOK	0.0094	0.0026	0.0069	50	0.137
TROTWOOD	-0.0095	0.0026	-0.0121	50	-0.241
TROTWOOD	0.0192	0.0026	0.0166	50	0.333
TROTWOOD	0.0007	0.0026	-0.0019	50	-0.037
TROTWOOD	-0.0007	0.0026	-0.0033	50	-0.065
FRANKLIN	0.0063	0.0026	0.0038	50	0.075
FRANKLIN	0.0046	0.0026	0.0020	50	0.041
FRANKLIN	0.0022	0.0026	-0.0004	50	-0.007
FRANKLIN	0.0069	0.0026	0.0044	50	0.087
GERMANTOWN	-0.0015	0.0026	-0.0041	50	-0.081
GERMANTOWN	-0.0041	0.0026	-0.0067	50	-0.133
GERMANTOWN	0.0015	0.0026	-0.0011	50	-0.021
GERMANTOWN	0.0119	0.0026	0.0094	50	0.187
BROOKVILLE	0.0062	0.0026	0.0036	50	0.073
BROOKVILLE	0.0069	0.0026	0.0044	50	0.087
BROOKVILLE	-0.0052	0.0026	-0.0078	50	-0.155
BROOKVILLE	-0.0021	0.0026	-0.0047	50	-0.093

1990 PU-238 IN ROOT CROPS
fCi/G

	MIAMISBURG	CENTERVILLE	BELLBROOK	TROTWOOD	FRANKLIN	GERMANTOWN	BROOKVILLE
	-0.001	0.01	-0.11	0.08	0.03	-0.11	0.06
	0.05	-0.02	-0.03	0.16	-0.03	0.01	0.02
	0.04	0.04	-0.05	0.01	0.07	0.01	0.03
	-0.07	-0.01	0.02	0.14	-0.03	-0.04	0.10
N	4	4	4	4	4	4	4
AVERAGE	0.004	0.003	-0.04	0.10	0.01	-0.03	0.05
STD DEV	0.06	0.03	0.06	0.07	0.05	0.06	0.04
MINIMUM	-0.07	-0.02	-0.11	0.01	-0.03	-0.11	0.02
MAXIMUM	0.05	0.04	0.02	0.16	0.07	0.01	0.10
STD ERROR	0.09	0.04	0.09	0.11	0.08	0.09	0.06

INCREMENTAL
CONCENTRATION

AVERAGE	-0.05	-0.05	-0.09	0.05	-0.04	-0.08
MINIMUM	-0.12	-0.07	-0.17	-0.04	-0.09	-0.16
MAXIMUM	-0.01	-0.01	-0.03	0.11	0.01	-0.04
STD ERROR	0.11	0.07	0.11	0.12	0.10	0.11

PU-238 IN ROOT CROPS 1990

LOCATION	GROSS pCi	BKG pCi *	NET pCi	TOTAL WEIGHT (G)	CONC. (fCi/G)
MIAMISBURG	0.0007	0.0008	-0.0001	100	-0.0005
MIAMISBURG	0.0053	0.0008	0.0046	100	0.0455
MIAMISBURG	0.0052	0.0008	0.0045	100	0.0445
MIAMISBURG	-0.0064	0.0008	-0.0072	100	-0.0715
CENTERVILLE	0.0016	0.0008	0.0009	100	0.0085
CENTERVILLE	-0.0014	0.0008	-0.0022	100	-0.0215
CENTERVILLE	0.0046	0.0008	0.0039	100	0.0385
CENTERVILLE	-0.0007	0.0008	-0.0015	100	-0.0145
BELLBROOK	-0.0106	0.0008	-0.0114	100	-0.1135
BELLBROOK	-0.0019	0.0008	-0.0027	100	-0.0265
BELLBROOK	-0.0038	0.0008	-0.0046	100	-0.0455
BELLBROOK	0.0032	0.0008	0.0025	100	0.0245
TROTWOOD	0.0084	0.0008	0.0077	100	0.0765
TROTWOOD	0.0172	0.0008	0.0165	100	0.1645
TROTWOOD	0.0022	0.0008	0.0015	100	0.0145
TROTWOOD	0.0144	0.0008	0.0136	100	0.1365
FRANKLIN	0.0041	0.0008	0.0034	100	0.0335
FRANKLIN	-0.002	0.0008	-0.0028	100	-0.0275
FRANKLIN	0.0074	0.0008	0.0067	100	0.0665
FRANKLIN	-0.0026	0.0008	-0.0034	100	-0.0335
GERMANTOWN	-0.0102	0.0008	-0.0110	100	-0.1095
GERMANTOWN	0.0021	0.0008	0.0013	100	0.0135
GERMANTOWN	0.002	0.0008	0.0013	100	0.0125
GERMANTOWN	-0.0029	0.0008	-0.0037	100	-0.0365
BROOKVILLE	0.0065	0.0008	0.0058	100	0.0575
BROOKVILLE	0.0026	0.0008	0.0018	100	0.0185
BROOKVILLE	0.004	0.0008	0.0033	100	0.0325
BROOKVILLE	0.0111	0.0008	0.0104	100	0.1035

1991 PB-238 IN ROOT CROPS
FCi/G

	MIAMISBURG	CENTERVILLE	BELLBROOK	TROTWOOD	FRANKLIN	GERMANTOWN	BROOKVILLE
	0.22	0.12	0.11	0.05	0.01	0.12	0.37
	-0.002	0.20	0.12	-0.05	-0.07	0.06	0.14
	-0.03	-0.03	0.32	0.15	-0.20	-0.05	-0.05
	0.03	0.06	0.13	0.14	-0.05	-0.03	-0.08
N	4	4	4	4	4	4	4
AVERAGE	0.05	0.09	0.17	0.07	-0.08	0.02	0.09
STD DEV	0.11	0.10	0.10	0.09	0.09	0.08	0.21
MINIMUM	-0.03	-0.03	0.11	-0.05	-0.20	-0.05	-0.08
MAXIMUM	0.22	0.20	0.32	0.15	0.01	0.12	0.37
STD ERROR	0.18	0.16	0.16	0.15	0.14	0.13	0.33

INCREMENTAL
CONCENTRATION

AVERAGE	-0.04	-0.01	0.08	-0.02	-0.17	-0.07
MINIMUM	-0.13	-0.13	0.01	-0.14	-0.29	-0.15
MAXIMUM	0.12	0.11	0.23	0.06	-0.09	0.02
STD ERROR	0.38	0.37	0.37	0.36	0.36	0.35

PU-238 IN ROOT CROPS 1991

LOCATION	GROSS pCi	BKG pCi *	NET pCi	TOTAL WEIGHT (G)	CONC. (fCi/G)
MIAMISBURG	0.021	-0.0009	0.0220	100	0.2195
MIAMISBURG	-0.0011	-0.0009	-0.0002	100	-0.0015
MIAMISBURG	-0.004	-0.0009	-0.0031	100	-0.0305
MIAMISBURG	0.0017	-0.0009	0.0027	100	0.0265
CENTERVILLE	0.0111	-0.0009	0.0121	100	0.1205
CENTERVILLE	0.0193	-0.0009	0.0203	100	0.2025
CENTERVILLE	-0.0042	-0.0009	-0.0033	100	-0.0325
CENTERVILLE	0.005	-0.0009	0.0060	100	0.0595
BELLBROOK	0.01	-0.0009	0.0110	100	0.1095
BELLBROOK	0.0111	-0.0009	0.0121	100	0.1205
BELLBROOK	0.0313	-0.0009	0.0323	100	0.3225
BELLBROOK	0.0124	-0.0009	0.0133	100	0.1335
TROTWOOD	0.0036	-0.0009	0.0046	100	0.0455
TROTWOOD	-0.0056	-0.0009	-0.0047	100	-0.0465
TROTWOOD	0.0142	-0.0009	0.0152	100	0.1515
TROTWOOD	0.0132	-0.0009	0.0142	100	0.1415
FRANKLIN	0	-0.0009	0.0009	100	0.0095
FRANKLIN	-0.0082	-0.0009	-0.0073	100	-0.0725
FRANKLIN	-0.0205	-0.0009	-0.0196	100	-0.1955
FRANKLIN	-0.0056	-0.0009	-0.0047	100	-0.0465
GERMANTOWN	0.0107	-0.0009	0.0116	100	0.1165
GERMANTOWN	0.0054	-0.0009	0.0064	100	0.0635
GERMANTOWN	-0.0063	-0.0009	-0.0054	100	-0.0535
GERMANTOWN	-0.0037	-0.0009	-0.0028	100	-0.0275
BROOKVILLE	0.0361	-0.0009	0.0371	100	0.3705
BROOKVILLE	0.013	-0.0009	0.0139	100	0.1395
BROOKVILLE	-0.0062	-0.0009	-0.0053	100	-0.0525
BROOKVILLE	-0.0088	-0.0009	-0.0079	100	-0.0785

APPENDIX B

PLUTONIUM-238 IN FISH

Table B.1 Plutonium–238 Concentrations (x 10 E –4 pico–Ci/g) in Fish (1972–1991)

	Location 1 Miamisburg			Location 2 EL			
Year	X	S	n	X	S	n	LDL
1972	60	NA	1	NS			0.15
1973	40	NA	4	NS			0.15
1974	37	NA	3	NS			6–30
1975	2.55	0.32	3	NS			2.2
1976	3.55	1.11	2	NS			2.19
1977	6.43	2.03	4	NS			5.3
1978	7.16	1.36	2	4.47	0.15	2	19
1979	7.1	1.9	8	3.3	1.5	8	9
1980	0.27	2.42	8	–1.44	3.41	8	NA
1981	0.76	1.15	8	0.05	1.8	8	1
1982	0.7	2.5	8	1.3	1.9	8	2
1983	9.3	10.6	8	5.2	4.5	8	3
1984	0.26	2.39	8	–0.5	1.91	8	2
1985	1	3	8	0.4	2.7	8	2.6
1986	1.25	2.01	8	0.91	1.52	8	1.4
1987	2.8	0.5	4	2	0.8	4	0.6
1988	–0.1	0.4	4	–0.3	0.6	4	0.7
1989	0.7	0.4	4	1	2	4	1
1990	0.9	0.5	4	0.2	0.9	4	2
1991	0.5	0.9	4	0.1	0.5	4	3

X = average concentration (x 10 E –4 pico–Ci/g)
S = standard deviation
n = number of samples
NS = not sampled
NA = not available or not applicable
EL = environmental level
LDL = lower detection limit

3/20/76

Foodstuffs Data 1975

Fruits and Vegetables

	^{239}Pu	^{239}Pu
Corn	7.1703 pCi/100g (Pu-239 thru Curium)	1.0545/100g
	$.0717 \times 10^{-6}$ μci/g	$.0105 \times 10^{-6}$ μci/g
	$= 7.17 \times 10^{-8}$ μci/g	1.05×10^{-8} μci/g

	^{239}Pu	
tomatoes	.0863 pCi/100g	.0126 pCi/100g
	$.000863 \times 10^{-6}$ μci/g	$.000126 \times 10^{-6}$ μci/g
	$= .0863 \times 10^{-8}$ μci/g	$.0126 \times 10^{-8}$ μci/g
Beets	.0844 pCi/100g	.0126 pCi/100g
	$= .0844 \times 10^{-8}$ μci/g	$= .0126 \times 10^{-8}$ μci/g
peas	.0158 pCi/100g	.0226 pCi/100g
	$= .0218 \times 10^{-8}$ μci/g	$.0226 \times 10^{-8}$ μci/g

AVG $.0642 \times 10^{-8}$ μci/g

Fish	.0297 pCi/100g	.0126 pCi/100g
	.0250 pCi/100g	.0126 pCi/100g
	.0218 pCi/100g	.0126 pCi/100g
	AVG	AVG
	= .0255 pCi/100g	= .0126 pCi/100g
	$= .0255 \times 10^{-8}$ μci/cc	$= .0126 \times 10^{-8}$ μci/cc

Plutonium-238 in foodstuffs and vegetation 1980

Sample type	Result	Quantity	Result ($\times 10^{-10}$ pci/g)	Avg	MDA	Std dev
turnips (T-1)	.0332 pci	100 g	3.32			
turnips (T-2)	.0378 pci	100 g	3.78			
turnips (T-1)	* .0219 pci	100 g	2.19	.0297 $\times 10^{-8}$	.022 $\times 10^{-8}$	.0024 $\times 10^{-8}$
turnips (T-2)	* .0219 pci	100 g	2.19	2.87×10^{-10} pci/g	2.19×10^{-10} pci/g	2.4×10^{-10} pci/g
milk (L-M)	* .0219 pci	250 ml	.88	.0085 $\times 10^{-8}$	.0088 $\times 10^{-8}$	.0096 $\times 10^{-8}$
milk (G-M)	* .0219 pci	200 ml	.88	$.88 \times 10^{-10}$ pci/g	$.88 \times 10^{-10}$ pci/g	$.96 \times 10^{-10}$ pci/g
corn (CB-1)	* .0219 pci	100 g	2.19			
corn (CB-2)	* .0219 pci	100 g	2.19			
corn (CD-1)	.0282 pci	100 g	2.82	.0235 $\times 10^{-8}$	.022 $\times 10^{-8}$	.0024 $\times 10^{-8}$
corn (CD-2)	* .0219 pci	100 g	2.19	2.35×10^{-10} pci/g	2.19×10^{-10} pci/g	2.4×10^{-10} pci/g
fish (FB)	.0465 pci	100 g	4.65	.036 $\times 10^{-8}$	.022 $\times 10^{-8}$	.026 $\times 10^{-8}$
fish (FR)	.0244 pci	100 g	2.44	3.55×10^{-10} pci/g	2.19×10^{-10} pci/g	2.6×10^{-10} pci/g
grass (G-2)	1.1955 pci	4 g	298.88			
grass (G-BKG)	.1375 pci	50 g	27.50			
grass (G-4)	* .0219 pci	24 g	5.19			
grass (G-6)	1.0493 pci	48 g	218.60			
grass (G-8)	1.0105 pci	16 g	631.56			
grass (G-10)	.2841 pci	56 g	50.73			
grass (G-12)	.4457 pci	34 g	131.09			
grass (G-14)	.7923 pci	52 g	152.37	2.03 $\times 10^{-8}$	.0519 $\times 10^{-8}$	.17 $\times 10^{-8}$
grass (G-16)	1.8030 pci	58 g	310.86	202.98×10^{-10} pci/g	5.19×10^{-10} pci/g	16.64×10^{-10} pci/g

1977 Monitoring Report Data 2/27/78

^{239}Pu in Aquatic life

R-1 = $\frac{.0671 \times 10^{-6}\ \mu ci}{100\ gr.}$ = $6.7 \times 10^{-10}\ \mu ci/g \pm 1.4 \times 10^{-10}\ \mu ci/g$

$6.7 \times 10^{-10} \times 2.22 \times 10^{6} \times .3 \times 100 \pm 2\sqrt{\frac{.045}{2000} + \frac{.02}{3000}} = 2\sqrt{.000015 + .000007} = \frac{.0093}{2.22 \times 10^{6} \times .3 \times 100}$

B-1 = $\frac{.0512 \times 10^{-6}\ \mu ci}{100\ gr}$ = $5.1 \times 10^{-10}\ \mu ci/g \pm 1.3 \times 10^{-10}\ \mu ci/g$

$< 5.3 \times 10^{-10}\ \mu ci/g$

$5.1 \times 10^{-10} \times 2.22 \times 10^{6} \times .3 \times 100 ;\ 2\sqrt{\frac{.034}{2000} + \frac{.02}{2000}} \cdot 2\sqrt{.000011 + .000007} = \frac{.0085}{2.22 \times 10^{6} \times .3 \times 100}$

R-2 = $\frac{.0213 \times 10^{-6}\ \mu ci}{50\ gr.}$ = $4.3 \times 10^{-10}\ \mu ci/g \pm 1.2 \times 10^{-10}\ \mu ci/g$

$< 5.3 \times 10^{-10}\ \mu ci/g$

$4.3 \times 10^{-10} \times 2.22 \times 10^{6} \times .3 \times 100 ;\ 2\sqrt{\frac{.029}{2000} + \frac{.02}{2000}} = 2\sqrt{.000010 + .000017} = \frac{.0082}{2.22 \times 10^{6} \times .3 \times 100}$

B-2 = $\frac{.0480 \times 10^{-6}\ \mu ci}{50\ gr.}$ = $9.6 \times 10^{-10}\ \mu ci/g \pm 1.5 \times 10^{-10}\ \mu ci/g$

$9.6 \times 10^{-10} \times 2.22 \times 10^{6} \times .3 \times 100 ;\ 2\sqrt{\frac{.064}{2000} + \frac{.02}{2000}} = 2\sqrt{.00002 + .000007} = \frac{.01}{2.22 \times 10^{6} \times .3 \times 100}$

AVG = $< 6.7 \times 10^{-10} \pm 1.4 \times 10^{-10}\ \mu ci/g$

AVG weight = 75 grams

LDL = $.03 \times 10^{-6}$ µci/sample $\times 2.22 \times 10^{6} \times .3 \times$ = .02 c/m

from air Sample Blank $= 2\sqrt{\frac{.02\ c/m}{3000}}$ = .005 c/m

LDL = $\frac{.04 \times 10^{-6}\ \mu ci/sample}{75\ g}$ = $.00053 \times 10^{-6}$ = $6.3 \times 10^{-10}\ \mu ci$

Pu-238 in Foodstuffs and Vegetation - 1978 3/1/79

Environmental levels	Results
Milk - .0221 ± .0094 pCi/200 cc g	milk - .0464 ± .0137 pCi/260 cc

* LDL for pu-238 in air = .0655 pCi ∴ Assume .0655/260 cc = .00026 pCi/cc = 2.6×10^{-10} μCi/cc

Vegetables	
turnips - .0088 ± .0051 pCi/150 g	turnips - .0287 ± .0112 pCi/100 g

* LDL for pu-238 in air = .0655 pCi ∴ Assume .0655/260 cc = .00044 pCi/cc = 4.4×10^{-10} μCi/cc

Fish	
- .0216 ± .0130 50 gr	- .0203 ± .0122 35 g
- .0231 ± .0139 50 g	- .0298 ± .0160 35 g

* LDL for pu-238 in air = .0655 pCi ∴ Assume .0655/35 g = $.00187 \times 10^{-6}$ μCi/g

1979 Pu-238 concentrations in fish – 50 gram Sample

2/1.

Date		Below Mound Effluent ($\times 10^{-6}$ µci/g)	Brookville ($\times 10^{-6}$ µci/g)
Spring	1	0.00060	0.00035
	2	0.00070	0.00019
	3	0.00061	0.00067
	4	0.00063	0.00018
FALL	1	0.00046	0.00032
	2	0.00093	0.00028
	3	0.00104	0.00033
	4	0.00067	0.00029
	$\bar{X}$	0.00071	0.00033
	S	0.00019	0.00015
	$S_{\bar{X}}$		
	$tS_{\bar{X}}$	0.00016	0.00013

Net conc = $0.00071 \pm 0.00016 - 0.00033 - 0.00013 = 0.00038 \pm \sqrt{0.00000025 + 0.00000016} = 0.00038 \pm 0.00026$

Pu-238 in Fish (1980) (50 gram Samples) 7/26/81

	down stream River Effluent pCi			Environmental Level pCi		
	Sample	Blank	Net	Sample	Blank	Net
1st half	0.0258	0.0389	-0.0131	0.0025	0.0389	-0.0364
	0.0365	0.0199	0.0166	0.0280	0.0199	0.0081
	0.0211	0.0205	0.0006	0.0213	0.0205	0.0008
	0.0194	0.0358	-0.0164	0.0088	0.0358	-0.0270
	0.0203	0.0283	-0.0080	0.0077	0.0283	-0.0206
2nd half	0.0161	0.0059	0.0102	0.0181	0.0059	0.0122
	0.0176	0.0136	0.0040	0.0118	0.0136	-0.0018
	0.0168	0	0.0168	0.0071	0	0.0071
$\bar{X}$			0.0013			-0.0072
S			0.0129			0.0183
n			8			8
$S_{\bar{X}}$			0.0108			

1980 Results with Environmental Level Subtracted (pCi/g) from 50 g Sa

$\bar{X}$	0.000026
S	
n	
$S_{\bar{X}}$	0.00022
MIN	N.D.
MAX	0.0003

Environmental Level could not be detected above blank Reagent

1981
Pu-238 in Foodstuffs

2/10/02

Pu-238 in Fish - 40 gram Samples

Downstream

	Gross pCi	Blank pCi	net pCi	(10^{-9} µci/g)	
1st half -	0.0155	0.0063	0.0092	0.23	
	0.0023	0.0021	0.0002	0.005	$\bar{x} = 0.076$
	0.0073	0.0077	-0.0004	-0.01	$S = 0.115$
	0.0046	0.0057	-0.0011	-0.03	$t s_{\bar{x}} = 0.095$
2nd half -	0.0046	0.002	0.0026	0.07	
	0.0109	0.0124	-0.0015	- 0.04	
	0.0153	0.0097	0.0056	0.14	
	0.0286	0.019	0.0096	0.24	

Environmental Level

	Gross pCi	Blank pCi	net pCi	(10^{-9} µci/g)	
1st half -	0	0.0063	-0.0063	- 0.16	
	0.0069	0.0021	0.0048	0.12	$\bar{x} = 0.005$
	0.0068	0.0077	-0.0009	-0.02	$S = 0.18$
	0.0096	0.0057	0.0039	0.1	$t s_{\bar{x}} = 0.14$
2nd half -	0.014	0.002	0.012	0.3	
	0.011	0.0124	-0.0014	- 0.04	
	0.0111	0.0097	0.0014	0.04	
	0.0069	0.019	-0.0121	- 0.3	

Pu-238 in Fish (1981) Summary

downstream (10^{-9} µci/g)	E.L. (10^{-9} µci/g)	mound Impact (10^{-9} µci/g)
0.076 ± 0.095	0.005 ± 0.14	$0.071 \pm \sqrt{(0.095)^2 + (0.14)^2} = 0.071 \pm$

1982 Pu-238 in Fish - 40 gram sample 1/28/83

DOWNSTREAM

	Gross pCi	Blank pCi	Net pCi	Net Conc. (10^{-9} pCi/g)
1st half	0.0257	0.0044	0.0213	0.53
	0.0172	0.0086	0.0086	0.22
	0.0085	0.0187	-0.0102	-0.26
	0.0183	0.0084	0.0099	0.25
2nd half	0.0064	0.0047	0.0017	0.04
	0.0107	0.0131	-0.0024	-0.06
	0.0021	0.0046	-0.0025	-0.06
	0.0022	0.0062	-0.004	-0.1

$\bar{x} = 0.07$
$S = 0.25$
$S_{\bar{x}} = 0.09$
$tS_{\bar{x}} = 0.21$

ENVIRONMENTAL LEVEL

	Gross pCi	Blank pCi	Net pCi	Net Conc. (10^{-9} pCi/g)
1st half	0.0154	0.0044	0.011	0.23
	0.0149	0.0086	0.0063	0.16
	0.0136	0.0187	-0.0051	-0.13
	0.0106	0.0084	0.0022	0.06
2nd half	0.0221	0.0047	0.0174	0.44
	0.0146	0.0131	0.0015	0.04
Suspect outliers	0.1305	0.0046	~~0.1259~~	~~3.15~~
	0.0564	0.0062	~~0.0502~~	~~1.26~~

? contamination
Do not use

$\bar{x} = 0.13$
$S = 0.19$
$S_{\bar{x}} = 0.08$
$tS_{\bar{x}} = 0.21$

BLANK DATA — $\bar{x} = 0.0086$ pCi
$S = 0.005$

Pu-238 (1983) in Fish

4/19/84

Location	Gross pCi	Blank pCi	Net pCi/kogm	Conc. (10^{-6} pCi/g)
1st half Downstream	0.0904	0.0091	0.0813	0.00203
	0.1275	0.0339	0.0936	0.00234
	0.0956	0.0125	0.0832	0.00208
	0.0416	0.0155	0.0261	0.00065
2nd half Downstream	0.0220	0.0271	-0.0051	-0.00013
	0.0223	0.0274	-0.0051	-0.00013
	0.0162	0.0196	-0.0034	-0.00009
	0.0489	$\bar{x}_7$ (B.B.) ≅ 0.02	0.0289	0.00072
			$n = 8$	$\bar{Y}$ = 0.00093
			$\bar{X}$ = 0.0206	S = 0.00106
			S = 0.0084	$ts_{\bar{x}}$ = 0.00089
1st half (E.L.) Brookville	0.0646	0.0091	0.0555	0.00139
	0.0572	0.0339	0.0233	0.00058
	0.0208	0.0125	0.0083	0.00021
	0.0279	0.0155	0.0124	0.00031
2nd half (E.L.)	0.0524	0.0271	0.0253	0.00063
	0.0613	0.0274	0.0339	0.00085
	0.0237	0.0196	0.0041	0.0001
	0.0218	$\bar{x}_7$ ≈ 0.02	0.0018	0.00005
				$\bar{X}$ = 0.00052
				S = 0.00045
				$ts_{\bar{x}}$ = 0.00038

Pu-238 in Fish (1984)

11/13/84
12/3/84

LOCATION	GROSS pCi	BLANK pCi	NET pCi/40 gram	CONC (10^{-6} µci/g)
1st HALF downstream	0.0163	0.0183	-0.002	-0.00005
	0.0151	0.0177	-0.0026	-0.000065
	0.015	0.01	0.005	0.000125
	0.0058	0.0210	-0.0152	-0.00038
2nd HALF downstream	0.0263	0.0105	0.0158	0.000395
	0.0055	0.0109	-0.0054	-0.000135
	0.0086	0.0056	0.003	0.000075
	0.0145	0.0049	0.0096	0.00024
		$\bar{X}$ = 0.0124		$\bar{X}$ = 0.0000256
		S = 0.006		S = 0.0002387
				$t s_{\bar{x}}$ = 0.0002
1st HALF (E.L.) Brookville	0.0023	0.0183	-0.016	-0.0004
	0.0065	0.0177	-0.0112	-0.00028
	0.007	0.01	-0.003	-0.000075
	0.0215	0.021	0.0005	0.0000125
2nd HALF (EL) Brookville	0.0141	0.0105	0.0036	0.00009
	0.014	0.0109	0.0031	0.0000775
	0.0107	0.0056	0.0051	0.0001275
	0.0067	0.0049	0.0018	0.000045
				$\bar{X}$ = -0.0000503
				S = 0.0001914
				$t s_{\bar{x}}$ = 0.00016

1985 Pu-238 in Fish 1/16/86

Location	Gross pCi	Blank pCi	Net pCi/40 grams	Conc. (10^{-6} µci/g)
1st Half downstream	0.0344	0.0156	0.0188	0.00047
	0.0086	0.0173	-0.0087	-0.00022
	0.0124	0.0073	0.0051	0.00013
	0.0112	0.0078	0.0034	0.00009
2nd Half downstream	0.0328	0.0097	0.0231	0.00058
	0.0172	0.0122	0.005	0.00013
	0.0179	0.0244	-0.0065	-0.00016
	0.009	0.0058	0.0032	0.00008
				$\bar{x}$ = 0.0001
				S = 0.0003
				$+S_{\bar{x}}$ =
1st Half (E.L.) Brookville	0.0142	0.0156	-0.0014	0.00004
	0.0117	0.0173	-0.0056	-0.00014
	0.0168	0.0073	0.0095	0.00024
	0.0072	0.0078	-0.0006	0.00002
2nd Half (E.L.) Brookville	0.0208	0.0097	0.0111	0.00028
	0.0169	0.0122	0.0047	0.00012
	0.0036	0.0244	-0.0208	-0.00052
	0.0173	0.0058	0.0115	0.00029
		$\bar{x}$ = 0.0125		$\bar{x}$ = 0.00004
		S = 0.0063		S = 0.00027
				$+S_{\bar{x}}$ =

1986 PU-238 IN FISH

	DOWNSTREAM	BROOKVILLE
	-0.0625	0.19
	0.41	0.1825
	0.16	0.105
	-0.0575	0.185
	-0.06	-0.06
	0.16	-0.1875
	0.42	0.2675
	0.03	0.0425
N	8	8
AVERAGE	0.125	0.091
STD DEV	0.201	0.152
MINIMUM	-0.063	-0.188
MAXIMUM	0.420	0.268
STD ERROR	0.168	0.127

INCREMENTAL
CONCENTRATION

AVERAGE	0.034
MINIMUM	-0.153
MAXIMUM	0.329
STD ERROR	0.210

PU-238 IN FISH 1986

LOCATION	GROSS pCi	BKG pCi	NET pCi	TOTAL WEIGHT (G)	CONC. (fCi/G)
DOWNSTREAM	-0.0055	-0.003	-0.0025	40	-0.0625
DOWNSTREAM	0.0102	-0.0062	0.0164	40	0.41
DOWNSTREAM	0.0034	-0.003	0.0064	40	0.16
DOWNSTREAM	-0.003	-0.0007	-0.0023	40	-0.0575
DOWNSTREAM	0.0022	0.0046	-0.0024	40	-0.06
DOWNSTREAM	0.0071	0.0007	0.0064	40	0.16
DOWNSTREAM	0.0131	-0.0037	0.0168	40	0.42
DOWNSTREAM	0.0006	-0.0006	0.0012	40	0.03
BROOKVILLE	0.0046	-0.003	0.0076	40	0.19
BROOKVILLE	0.0011	-0.0062	0.0073	40	0.1825
BROOKVILLE	0.0012	-0.003	0.0042	40	0.105
BROOKVILLE	0.0067	-0.0007	0.0074	40	0.185
BROOKVILLE	0.0022	0.0046	-0.0024	40	-0.06
BROOKVILLE	-0.0068	0.0007	-0.0075	40	-0.1875
BROOKVILLE	0.007	-0.0037	0.0107	40	0.2675
BROOKVILLE	0.0011	-0.0006	0.0017	40	0.0425

1987 PU-238 IN FISH
fCi/G

	DOWNSTREAM	BROOKVILLE
	0.22	0.12
	0.32	0.24
	0.25	0.30
	0.31	0.14
N	4	4
AVERAGE	0.28	0.20
STD DEV	0.05	0.08
MINIMUM	0.22	0.12
MAXIMUM	0.32	0.30
STD ERROR	0.08	0.13

INCREMENTAL
CONCENTRATION

AVERAGE	0.08
MINIMUM	0.02
MAXIMUM	0.13
STD ERROR	0.16

PU-238 IN FISH 1987

LOCATION	GROSS pCi	BKG * pCi	NET pCi	TOTAL WEIGHT (G)	CONC. (fCi/G)
DOWNSTREAM	0.0085	-0.0027	0.0112	50	0.2244
DOWNSTREAM	0.0135	-0.0027	0.0162	50	0.3244
DOWNSTREAM	0.0098	-0.0027	0.0125	50	0.2504
DOWNSTREAM	0.013	-0.0027	0.0157	50	0.3144
BROOKVILLE	0.0031	-0.0027	0.0058	50	0.1164
BROOKVILLE	0.0091	-0.0027	0.0118	50	0.2364
BROOKVILLE	0.0123	-0.0027	0.0150	50	0.3004
BROOKVILLE	0.0045	-0.0027	0.0072	50	0.1444

* ONLY ONE BLANK ANALYZED, USED BLANKS FROM PU IN GRASS IN ADDITION TO FISH BLANK.

1988 PU-238 IN FISH
fCi/G

	DOWNSTREAM	BROOKVILLE
	-0.03	0.05
	0.04	-0.06
	-0.06	-0.07
	0.01	-0.02
N	4	4
AVERAGE	-0.01	-0.03
STD DEV	0.04	0.06
MINIMUM	-0.06	-0.07
MAXIMUM	0.04	0.05
STD ERROR	0.07	0.09

INCREMENTAL
CONCENTRATION

AVERAGE	0.01
MINIMUM	-0.03
MAXIMUM	0.06
STD ERROR	0.11

PU-238 IN FISH 1988

LOCATION	GROSS pCi	BKG * pCi	NET pCi	TOTAL WEIGHT (G)	CONC. (fCi/G)
DOWNSTREAM	-0.0017	0.0011	-0.0028	80	-0.03437
DOWNSTREAM	0.0042	0.0011	0.0031	80	0.039375
DOWNSTREAM	-0.0037	0.0011	-0.0048	80	-0.05937
DOWNSTREAM	0.0017	0.0011	0.0006	80	0.008125
BROOKVILLE	0.0054	0.0011	0.0044	80	0.054375
BROOKVILLE	-0.0038	0.0011	-0.0049	80	-0.06062
BROOKVILLE	-0.0047	0.0011	-0.0058	80	-0.07187
BROOKVILLE	-0.0008	0.0011	-0.0019	80	-0.02312

* AVERAGE BLANK

1989 PU-238 IN FISH
fCi/G

	DOWNSTREAM	BROOKVILLE
	0.02	0.34
	0.09	-0.09
	0.10	0.17
	0.06	-0.03
N	4	4
AVERAGE	0.07	0.10
STD DEV	0.04	0.20
MINIMUM	0.02	-0.09
MAXIMUM	0.10	0.34
STD ERROR	0.06	0.31

INCREMENTAL
CONCENTRATION

AVERAGE	-0.03
MINIMUM	-0.08
MAXIMUM	-0.00
STD ERROR	0.32

PU-238 IN FISH 1989

LOCATION	GROSS pCi	BKG * pCi	NET pCi	TOTAL WEIGHT (G)	CONC. (fCi/G)
DOWNSTREAM	0.0014	0.0006	0.0008	50	0.016
DOWNSTREAM	0.0052	0.0006	0.0046	50	0.092
DOWNSTREAM	0.0056	0.0006	0.0050	50	0.1
DOWNSTREAM	0.0034	0.0006	0.0028	50	0.056
BROOKVILLE	0.0177	0.0006	0.0171	50	0.342
BROOKVILLE	-0.0037	0.0006	-0.0043	50	-0.086
BROOKVILLE	0.0092	0.0006	0.0086	50	0.172
BROOKVILLE	-0.0007	0.0006	-0.0013	50	-0.026

* AVERAGE BLANK

1990 PU-238 IN FISH
fCi/G

	DOWNSTREAM	BROOKVILLE
	0.08	-0.07
	0.03	0.11
	0.16	-0.04
	0.08	0.08
N	4	4
AVERAGE	0.09	0.02
STD DEV	0.05	0.09
MINIMUM	0.03	-0.07
MAXIMUM	0.16	0.11
STD ERROR	0.08	0.14

INCREMENTAL
CONCENTRATION

AVERAGE	0.07
MINIMUM	0.01
MAXIMUM	0.14
STD ERROR	0.17

PU-238 IN FISH 1990

LOCATION	GROSS pCi	BKG * pCi	NET pCi	TOTAL WEIGHT (G)	CONC. (fCi/G)
DOWNSTREAM	0.0076	-0.0008	0.0084	100	0.08425
DOWNSTREAM	0.002	-0.0008	0.0028	100	0.02825
DOWNSTREAM	0.0147	-0.0008	0.0155	100	0.15525
DOWNSTREAM	0.0076	-0.0008	0.0084	100	0.08425
BROOKVILLE	-0.0082	-0.0008	-0.0074	100	-0.07375
BROOKVILLE	0.0105	-0.0008	0.0113	100	0.11325
BROOKVILLE	-0.0053	-0.0008	-0.0045	100	-0.04475
BROOKVILLE	0.0067	-0.0008	0.0075	100	0.07525

* AVERAGE BLANK

1991 PU-238 IN FISH
fCi/G

	DOWNSTREAM	BROOKVILLE
	0.02	0.03
	0.18	-0.06
	-0.03	0.02
	0.01	0.06
N	4	4
AVERAGE	0.05	0.01
STD DEV	0.09	0.05
MINIMUM	-0.03	-0.06
MAXIMUM	0.18	0.06
STD ERROR	0.14	0.08

INCREMENTAL
CONCENTRATION

AVERAGE	0.03
MINIMUM	-0.04
MAXIMUM	0.17
STD ERROR	0.16

PU-238 IN FISH 1991

LOCATION	GROSS pCi	BKG * pCi	NET pCi	TOTAL WEIGHT (G)	CONC. (fCi/G)
DOWNSTREAM	0.0026	0.00005	0.0026	105.5	0.024170
DOWNSTREAM	0.0189	0.00005	0.0189	105.5	0.178672
DOWNSTREAM	-0.0025	0.00005	-0.0026	98.5	-0.02588
DOWNSTREAM	0.0013	0.00005	0.0013	98.5	0.012690
BROOKVILLE	0.0037	0.00005	0.0037	110	0.033181
BROOKVILLE	-0.0062	0.00005	-0.0062	110	-0.05681
BROOKVILLE	0.0019	0.00005	0.0019	95.5	0.019371
BROOKVILLE	0.0055	0.00005	0.0055	95.5	0.057068

* AVERAGE BLANK

APPENDIX C

PLUTONIUM-238 IN GRASS

Table C.1 Plutonium–238 Concentrations (x 10 E –4 pico–Ci/g)
in Grass (1972–1991)

	Location 1 Miamisburg			Location 2 Centerville			Location 3 Bellbrook			Location 4 EL			
Year	X	S	n	X	S	n	X	S	n	X	S	n	LDL
1972	11	NA	8	NS			NS			NS			NA
1973	70	NA	32	NS			NS			NS			NA
1974	70	NA	12	NS			NS			NS			NA
1975	101	50.1	8	NS			NS			NS			9
1976	225	184	8	NS			NS			27.5	NA	1	5.19
1977	12.9	9	24	NS			NS			6.6	NA	1	6.6
1978	17	12	23	NS			NS			NS			9
1979	9.5	5.8	8	9.9	13.1	8	7.8	2.5	8	9.2	9.5	8	9
1980	13.4	10.6	8	30.3	19.7	8	3.1	6.3	8	8.2	6.2	8	7
1981	7.3	6.2	8	1	3.8	8	1.4	2.8	8	–0.4	2.5	8	6
1982	18.6	40.7	8	0.5	4.1	8	4.7	5.5	8	3.6	4.4	8	4
1983	190.8	20.7	8	4.7	7.6	8	4.4	2	8	3.2	2.3	8	1
1984	3.6	4.2	8	3.6	2.1	8	0.7	1.6	8	3	3.5	8	2
1985	1.9	2.1	8	1.2	1.4	8	0.7	1.9	8	2.3	2.1	8	3.1
1986	7.8	10.3	8	–0.2	3.5	8	1	3.5	8	–1.6	2.1	8	2.9
1987	12.1	6.4	8	1.1	1.6	8	1.9	1.7	8	1.6	2.2	8	0.9
1988	0.4	2.7	4	0.5	1	4	1.2	3.3	4	1.1	2	4	2
1989	5.3	1.8	4	1.7	0.6	4	–0.4	1	4	0.7	0.7	4	1
1990	0.3	0.4	4	–0.5	0.5	4	–0.4	2.2	4	0.6	3	4	2
1991	2.9	4.7	4	–0.8	0.6	4	–0.4	2.1	4	0.7	2.2	4	9

X = average concentration (x 10 E –4 pico–Ci/g)
S = standard deviation
n = number of samples
NS = not sampled
NA = not available or not applicable
EL = environmental level
LDL = lower detection limit

Table C.1 (page 2 of 2)

	Location 5 Trotwood			Location 6 Franklin			Location 7 Germantown			
Year	X	S	n	X	S	n	X	S	n	LDL
1972	NS			NS			NS			NA
1973	NS			NS			NS			NA
1974	NS			NS			NS			NA
1975	NS			NS			NS			9
1976	NS			NS			NS			5.19
1977	NS			NS			NS			6.6
1978	NS			NS			NS			9
1979	NS			NS			NS			9
1980	NS			NS			NS			7
1981	NS			NS			NS			6
1982	NS			NS			NS			4
1983	NS			NS			NS			1
1984	NS			NS			NS			2
1985	NS			NS			NS			3.1
1986	−2.4	0.9	8	0.9	3.4	8	1.1	1.7	8	2.9
1987	1.2	0.8	8	0.9	2.1	8	2.6	2.5	8	0.9
1988	0.2	2	4	1.7	2.3	4	1.2	3.3	4	2
1989	2.9	1.2	4	0.6	1.3	4	1.9	1.6	4	1
1990	1	2.4	4	−1.1	1.4	4	−0.3	1.8	4	2
1991	−0.3	1.5	4	−0.9	1	4	−0.6	3.4	4	9

X = average concentration (x 10 E −4 pico−Ci/g)
S = standard deviation
n = number of samples
NS = not sampled
NA = not available or not applicable
EL = environmental level
LDL = lower detection limit

2/26/26

Raw Data 1975

^{238}Pu	^{239}Pu
.2116 fci/20 g .0106 x 10^{-6} μci/g	.0868 fci/20 g .0043 x 10^{-6} μci/g
.1198 fci/24 g .0050 x 10^{-6} μci/g	.1578 fci/24 g .0066 x 10^{-6} μci/g
.24 fci/20 g .012 x 10^{-6} μci/g	.1116 fci/20 g .0056 x 10^{-6} μci/g
.1576 fci/30 g .0053 x 10^{-6} μci/g	.0889 fci/30 g .0030 x 10^{-6} μci/g
.2891 fci/27 g .0107 x 10^{-6} μci/g	.0326 fci/27 g .0012 x 10^{-6} μci/g
.2792 fci/34 g .0082 x 10^{-6} μci/g	.1381 fci/34 g .0041 x 10^{-6} μci/g
.1857 fci/25 g .0074 x 10^{-6} μci/g	.2171 fci/25 g .0087 x 10^{-6} μci/g
.5022 fci/23 g .0218 x 10^{-6} μci/g	.0773 fci/23 g .0034 x 10^{-6} μci/g
Avg = .0101 x 10^{-6} μci/g	Avg = .0046 x 10^{-6} μci/g
Avg = 1.01 x 10^{-8} μci/g	Avg = .46 x 10^{-8} μci/g

plutonium-239 in foodstuffs and vegetation 1980

Sample type	Result	Quantity	Result ($\times 10^{-10}$ pci/g)	Avg	MDA	Std dev
turnips (T-1)	.0332 pci	100 g	3.32			
turnips (T-2)	.0378 pci	100 g	3.78			
turnips (T-1)	* .0219 pci	100 g	2.19	$.0297 \times 10^{-9}$	$.022 \times 10^{-8}$	$.0024 \times 10^{-8}$
turnips (T-2)	* .0219 pci	100 g	2.19	2.87×10^{-10} pci/g	2.19×10^{-10} pci/g	2.4×10^{-10} pci/g
milk (L-M)	* .0219 pci	250 ml	.88	$.0085 \times 10^{-9}$	$.0088 \times 10^{-9}$	$.0096 \times 10^{-9}$
milk (G-M)	* .0219 pci	200 ml	.88	$.88 \times 10^{-10}$ pci/g	$.88 \times 10^{-10}$ pci/g	$.96 \times 10^{-10}$ pci/g
corn (CB-1)	* .0219 pci	100 g	2.19			
corn (CB-2)	* .0219 pci	100 g	2.19			
corn (CD-1)	.0282 pci	100 g	2.82	$.0235 \times 10^{-8}$	$.022 \times 10^{-8}$	$.0024 \times 10^{-8}$
corn (CD-2)	* .0219 pci	100 g	2.19	2.35×10^{-10} pci/g	2.19×10^{-10} pci/g	2.4×10^{-10} pci/g
fish (FB)	.0465 pci	100 g	4.65	$.036 \times 10^{-8}$	$.022 \times 10^{-8}$	$.026 \times 10^{-8}$
fish (FR)	.0244 pci	100 g	2.44	3.55×10^{-10} pci/g	2.19×10^{-10} pci/g	2.6×10^{-10} pci/g
grass (G-2)	1.1955 pci	4 g	298.88			
grass (G-BKg)	.1375 pci	5 g	27.50			
grass (G-4)	* .0219 pci	2 g	5.19			
grass (G-6)	1.0493 pci	4 g	218.60			
grass (G-8)	1.0105 pci	1.6 g	631.56			
grass (G-10)	.2841 pci	5.6 g	50.73			
grass (G-12)	.4457 pci	3.4 g	131.09			
grass (G-14)	.7923 pci	5.2 g	152.37	2.03×10^{-8}	$.0519 \times 10^{-8}$	$.17 \times 10^{-8}$
grass (G-16)	1.8030 pci	5.8 g	310.86	202.98×10^{-10} pci/g	5.19×10^{-10} pci/g	16.64×10^{-10} pci/g

1977 Environmental Monitoring Data 2/24/78

^{238}Pu in Grass → Avg = $13.09 \pm 6.2 \times 10^{-10}$ µci/g

Grass (Kentucky) annual = $\frac{.0755 \times 10^{-6}\ \mu ci}{63\ gm} \pm \frac{.0330 \times 10^{-6}\ \mu ci}{63\ gm} = 11.98 \pm 5.2 \times 10^{-10}$ µci/g

1ST HALF Grass

#10 = $\frac{.1603 \times 10^{-6}}{58\ g} \pm \frac{.1069 \times 10^{-6}}{58\ g} = 27.64 \pm 18.43 \times 10^{-10}$ µci/g

#11 = $\frac{0}{62\ g} \pm \frac{0}{62\ g} = < 6.6 \times 10^{-10}$ µci/g $\pm 5 \times 10^{-10}$ *

#12 = $\frac{0}{48\ g} \quad \frac{0}{48\ g} = < 6.6 \times 10^{-10}$ µci/g $\pm 5 \times 10^{-10}$ *

#13 = no data $\frac{}{61\ g} \quad \frac{}{61\ g} =$ _____

#14 = $\frac{0}{52\ g} \quad \frac{0}{52\ g} = < 6.6 \times 10^{-10}$ µci/g $\pm 5 \times 10^{-10}$ *

#15 = $\frac{.0461 \times 10^{-6}}{74\ g} \pm \frac{.0533 \times 10^{-6}}{74\ g} =$ ~~6.2 ± 7.2 × 10⁻¹⁰ µci/g~~ $< 6.6 \times 10^{-10} \pm 5 \times 10^{-10}$ *

#16 = $\frac{.0206 \times 10^{-6}}{67\ g} \pm \frac{.0376 \times 10^{-6}}{67\ g} =$ ~~3.07 ± 5.6 × 10⁻¹⁰ µci/g~~ $< 6.6 \times 10^{-10} \pm 5 \times 10^{-10}$ *

#17 = $\frac{.2588 \times 10^{-6}}{58\ g} \pm \frac{.0939 \times 10^{-6}}{58\ g} = 44.6 \pm 16.18 \times 10^{-10}$ µci/g

~~#18~~ #18 = $\frac{0}{57\ g} \pm \frac{0}{57\ g} = < 6.6 \times 10^{-10}$ µci/g $\pm 5 \times 10^{-10}$ *

2nd Half Grass

#10 = $\frac{.1525 \times 10^{-6}}{83\ g} \pm \frac{.0450 \times 10^{-6}}{83\ g} = 18.37 \pm 5.4 \times 10^{-10}$ µci/g

#11 = $.0962 \times 10^{-6} \pm .0533 \times 10^{-6}$ 11.87 $\pm 6.58 \times 10^{-10}$ µci/g

81 g 81 g

#12 = $\frac{.0487 \times 10^{-6}}{96\ g} \pm \frac{.0281 \times 10^{-6}}{96 g}$ = ~~6.07 ± 2.93 × 10⁻¹⁰ pci/g~~ $< 6.6 \times 10^{-10}$ pci/g ± 5×10^{-10} *

#13 = $\frac{.0925 \times 10^{-6}}{98\ g} \pm \frac{.0356 \times 10^{-6}}{98 g}$ = 9.44 ± 3.63×10^{-10} pci/g

#14 = $\frac{.1678 \times 10^{-6}}{75\ g} \pm \frac{.0194 \times 10^{-6}}{75 g}$ = 22.4 ± 2.59×10^{-10} pci/g

#15 = $\frac{.0961 \times 10^{-6}}{85\ g} \pm \frac{.0370 \times 10^{-6}}{85 g}$ = 11.3 ± 4.35×10^{-10} pci/g

#16 = $\frac{.1031 \times 10^{-6}}{100\ g} \pm \frac{.0421 \times 10^{-6}}{100 g}$ = 10.3 ± 4.2×10^{-10} pci/g

#17 = $\frac{.0777 \times 10^{-6}}{108\ g} \pm \frac{.0415 \times 10^{-6}}{108 g}$ = 7.2 ± 3.8×10^{-10} pci/g

2nd Half Share

610 = $\frac{.0764 \times 10^{-6}}{68 g} \pm \frac{.0279 \times 10^{-6}}{68 g}$ = 11.2 ± 4.1×10^{-10} pci/g

611 = $\frac{.0844 \times 10^{-6}}{63 g} \pm \frac{.0378 \times 10^{-6}}{63 g}$ = 13.4 ± 6.0×10^{-10} pci/g

612 = $\frac{.0665 \times 10^{-6}}{76 g} \pm \frac{.0243 \times 10^{-6}}{76 g}$ = 8.75 ± 3.2×10^{-10} pci/g

613 = $\frac{.1065 \times 10^{-6}}{89 g} \pm \frac{.0517 \times 10^{-6}}{89 g}$ = 11.97 ± 5.8×10^{-10} pci/g

614 = $\frac{.1124 \times 10^{-6}}{57 g} \pm \frac{.0530 \times 10^{-6}}{57 g}$ = 19.7 ± 9.3×10^{-10} pci/g

615 = $\frac{.0543 \times 10^{-6}}{86 g} \pm \frac{.0243 \times 10^{-6}}{86 g}$ = ~~6.3 ± 2.8 × 10⁻¹⁰ pci/g~~ $< 6.6 \times 10^{-10}$ ± 5×10^{-10} *

616 = $\frac{.2161 \times 10^{-6}}{101 g} \pm \frac{.0991 \times 10^{-6}}{101 g}$ = 21.4 ± 9.8×10^{-10} pci/g

617 = $\frac{.1411 \times 10^{-6}}{109 g} \pm \frac{.0576 \times 10^{-6}}{109 g}$ = 12.9 ± 5.3×10^{-10} pci/g

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LDL = $.03 \times 10^{-6}$ pci/sample ± $.02 \times 10^{-6}$ counting error @ 2σ avg weight = 76 grams

LDL = $\frac{.05 \times 10^{-6}\ \text{pci/sample}}{76\ \text{grams}}$ = 6.6×10^{-10} pci/g

-- available at the

Pu-238 in Foodstuffs + Vegetation – (GXMBS - pCi/g) 2/28/79

#10		Conc.	#11			#12			#13			#14			#15			#16			#17		
.2464	73	.0034	*.0655	69	*.0009	*.0682	86	*.0009	*.0655	57	*.0009	.0981	79	.0012	.2945	81	.0036	.0660	60	.0011	*.0655	80	*.0009
.1570	72	.0022	.1003	85	.0012	*.0655	96	*.0009	.0669	94	*.0009	*.0676	80	.0009	–	–	–	.0750	70	.0011	.0733	70	.0010
.1891	40	.0047	.0983	65	.0015	.3184	69	.0046	.1474	75	.0020	.1086	90	.0012	.2065	68	.0030	*.0655	50	*.0009	*.0655	35	*.0009

$\bar{x}$ = .34
= .1

** total Avg weight = 72 grams

∴ LDL = $\frac{0.0655\ pCi}{72\ grams}$ = .0009 pCi/g E.L. = 0 pCi/g

$\bar{X}$ = .0017
S = .0012
n = 23
$S_{\bar{x}}$ = .0003
$tS_{\bar{x}}$ = .0006

Avg Result = .0017 ± .0006 pCi/g = .0017 ± .0006 $\times 10^{-6}$ μCi/g

1979 Pu-238 Concentration in grass - 50 gram Sample 2/15/80

Date		Miamisburg $\times 10^{-6}$ pci/g	Centerville $\times 10^{-6}$ pci/g	Bellbrook* $\times 10^{-6}$ pci/g	(environmental level) Camden $\times 10^{-6}$ pci/g
Spring	1	0.00089	0.00085	0.00061	0.00057
	2	0.00174	0.00096	0.00051	0.00020
	3	0.00113	0.00033	0.00091	0.00078
	4	0.00042	0.00417	0.00077	0.00065
FALL	1	0.00141	0.00030	0.00131	0.00054
	2	0	0.00044	0.00064	0.00056
	3	0.00138	0.00042	0.00066	0.00081
	4	0.00062	0.00044	0.00083	0.00321
	$\bar{X}$	0.00095	0.00099	0.00078	0.00092
	S	0.00058	0.00131	0.00025	0.00095
	$S_{\bar{X}}$				
	$\pm S_{\bar{X}}$	0.00048	0.00110	0.00021	0.00077

NET CONCENTRATION

Miamisburg $= 0.00095 \pm 0.00048 - 0.00092 \pm 0.00077 = 0.00003 \pm \sqrt{.00000023 + 0.00000059} = 0.00003 \pm 0.0009$

Centerville $= 0.00099 \pm 0.0011 - 0.00092 \pm 0.00077 = 0.00007 \pm \sqrt{.00000121 + 0.00000059} = 0.00007 \pm 0.0013$

Bellbrook $= 0.00078 \pm 0.00021 - 0.00092 \pm 0.00077 =$ e.L.

Plutonium - 238 (1980) IN GRASS (50 gram Sample) 2/26/81

	Miamisburg			Centerville			Fairborn			ENVIRONMENTAL LEVEL		
	Sample pCi	Blank pCi	NET pCi	Sample pCi	Blank pCi	NET pCi	Sample pCi	Blank pCi	NET pCi	Sample pCi	Blank pCi	NET pCi
	0.0828	0.0055	0.0773	0.0272	0.0055	0.0217	0	0.0055	-0.0055	0.1163	0.0055	0.1108
1st half	0.0296	0.0086	0.0210	0.1538	0.0086	0.1452	0.0842	0.0086	0.0756	0.0588	0.0086	0.0502
	0.0461	0.0180	0.0281	0.2985	0.0180	0.2805	0.0250	0.0180	0.0070	0.0735	0.0180	0.0555
—	0.1186	0.0033	0.1153	0.0657	0.0033	0.0624	0.0194	0.0033	0.0161	0.0419	0.0033	0.0386
	0.1562	0.0156	0.1406	0.220	0.0156	0.2044	0.0452	0.0156	0.0296	0.0459	0.0156	0.0303
2nd half	0.0593	0.0637	-0.0044	0.0845	0.0637	0.0208	0.0202	0.0637	-0.0435	0.0420	0.0637	-0.0217
	0.0334	0.0070	0.0264	0.220	0.0070	0.2130	0.0257	0.0070	0.0187	0.0207	0.0070	0.0137
—	0.1412	0.0104	0.1308	0.2746	0.0104	0.2642	0.0371	0.0104	0.0267	0.0828	0.0104	0.0724
$\bar{X}$			0.0669			0.1515			0.0156			0.0437
S			0.0564			0.1054			0.0337			0.0394
n			8			8			8			8
$\bar{Y}$			0.0472			0.0881			0.0282			0.0329

Pu-238 results after Environmental levels subtracted in pCi/g (50 gram Sample)

$\bar{X}$	0.00046	0.00216	E.L.	0.00087
$S_{\bar{X}}$	0.00115	0.00188	—	0.00066
MIN	E.L.	E.L.	E.L.	
MAX	0.00272	0.00474	0.00064	

Pu-238 in Grass - 40 gram Sample 2/2/82

Miamisburg

	Gross pCi/40g	Blank pCi	Net pCi/40g	Net (10^{-6} µci/g)
1st half	0.0763	0.0077	0.0686	0.001715
	0.0877	0.0418	0.0459	0.001148
	0.0313	0.0434	-0.0121	-0.000303
	0.062	0.0229	0.0391	0.000978
2nd half	0.0214	0.0125	0.0089	0.000223
	0.0271	0.0101	0.017	0.000425
	0.0348	0.0092	0.0256	0.00064
	0.0475	0.0076	0.0399	0.000998

$\bar{X} = 0.000728$
$S = 0.000622$
$t s_{\bar{X}} = 0.00052$

Environmental Level	Gross pCi/40g	Blank pCi	Net pCi/40g	Net (10^{-6} µci/g)
1st half	0.0029	0.0077	-0.0048	-0.00012
	0.0255	0.0418	-0.0163	-0.000408
	0.0476	0.0434	0.0042	0.000105
	0.0279	0.0229	0.005	0.000125
2nd half	0.0293	0.0125	0.0168	0.00042
	0.0030	0.0101	-0.0071	-0.000178
	0.0029	0.0092	-0.0063	-0.000158
	0.0039	0.0076	-0.0037	-0.000093

$\bar{X} = -0.000038$
$S = 0.00025$
$t s_{\bar{Y}} = 0.00021$

1981
Pu-238 in GRASS - 40 gram SAMPLE

2/2/82

BELLBROOK

	Gross pCi/40 g	BLANK pCi	NET pCi/40 g	NET (10^{-6} µCi/g)
1ST HALF	0.0322	0.0077	0.0245	0.000613
	0.0564	0.0418	0.0146	0.000365
	0.0409	0.0434	-0.0025	-0.000063
	0.0268	0.0229	0.0039	0.000098
2ND HALF	0	0.0125	-0.0125	-0.000313
	0.0203	0.0101	0.0102	0.000255
	0.0159	0.0092	0.0067	0.000168
	0.0086	0.0076	0.001	0.000025

$\bar{X}$ = 0.000144
S = 0.00028
$+S_{\bar{X}}$ = 0.000237

CENTERVILLE

	Gross pCi/40 g	BLANK pCi	NET pCi/40 g	NET (10^{-6} µCi/g)
1ST HALF	0.0259	0.0077	0.0182	0.000455
	0.0242	0.0418	-0.0176	-0.00044
	0.0552	0.0434	0.0118	0.000295
	0.0133	0.0229	-0.0096	-0.00024
2nd HALF	0.0043	0.0125	-0.0082	-0.00021
	0.0111	0.0101	0.001	0.000025
	0.0182	0.0092	0.009	0.000225
	0.0341	0.0076	0.0265	0.000663

$\bar{X}$ = 0.000097
S = 0.000379
$TS_{\bar{X}}$ = 0.000307

1/28/83

Pu-238 in Grass - 40 gram Sample

Miamisburg

	Gross pCi	Blank pCi	Net pCi / 40 gram	Net Conc (10^{-6} µci/g)
1st half	0.5086	0.0329	0.4757	0.01189
	0.0363	0.0249	0.0114	0.00029
	0.027	0.005	0.022	0.00055
	0.0348	0.0153	0.0195	0.00049
2nd half	0.0244	0.0255	-0.0011	-0.00003
	0.0104	0.0073	0.0031	0.00008
	0.0462	0.0182	0.028	0.0007
	0.039	0.0035	0.0355	0.00089
		$\bar{X}$ = 0.0166		$\bar{X}$ = 0.00186
		S = 0.0108		S = 0.00407
				$S_{\bar{X}}$ = 0.00144
				$\pm S_{\bar{X}}$ = 0.00341

Centerville	Gross pCi	Blank pCi	Net pCi / 40 gram	Net Conc (10^{-6} µci/g)
1st half	0.0061	0.0329	-0.0268	-0.00067
	0.0111	0.0249	-0.0138	-0.00035
	0.0232	0.005	0.0182	0.00046
	0.023	0.0153	0.0077	0.00019
2nd half	0.0216	0.0255	-0.0039	-0.0001
	0.0085	0.0073	0.0012	0.00003
	0.0371	0.0182	0.0189	0.00047
	0.0194	0.0035	0.0159	0.0004
				$\bar{X}$ = 0.00005
				S = 0.00041
				$S_{\bar{X}}$ = 0.00015
				$\pm S_{\bar{X}}$ = 0.00035

Pu-238 in Grass (1983) 40 gram Sample 2/14/84

Bellbrook	Gross pCi	Blank pCi	Net pCi per 40 gram	Net Conc (10^{-6} µci/g)
1st half	0.0214	0.002	0.0194	0.00049
	0.0215	0.0072	0.0143	0.00036
	0.0278	0.0038	0.024	0.0006
	0.0333	0.0101	0.0232	0.00058
2nd half	0.0226	0.0108	0.0118	0.0003
	0.0352	0.0072	0.028	0.0007
	0.0085	0.0052	0.0033	0.00008
	0.024	0.0069	0.0171	0.00043
				$\bar{x}$ = 0.00044
				S = 0.0002
				$TS_{\bar{x}}$ = 0.00017

Centerville				
1st half	0.0058	0.002	0.0038	0.0001
	0.0324	0.0072	0.0252	0.00063
	0.0159	0.0038	0.0121	0.0003
	0.1011	0.0101	0.091	0.00228
2nd half	0.0116	0.0108	0.0008	0.00002
	0.0157	0.0072	0.0085	0.00021
	0.0031	0.0052	-0.0021	-0.00005
	0.018	0.0069	0.0111	0.00028
				$\bar{x}$ = 0.00047
				S = 0.00076
				$TS_{\bar{x}}$ = 0.00064

Miamisburg				
1st half	1.0609	0.002	1.0589	0.02647
	1.4086	0.0072	1.4014	0.03504
	2.0556	0.0038	2.0518	0.0513
	1.4771	0.0101	1.467	0.03668
	0.0411	0.0108	0.0303	0.00076
	0.0576	0.0072	0.0504	0.00126
	0.0268	0.0052	0.0216	0.00054
	0.0303	0.0069	0.0234	0.00059
				$\bar{x}$ = 0.01908
				S = 0.02069
				$TS_{\bar{x}}$ = 0.0173

Bellbrook

	Gross pCi	Blank pCi	net pCi/40 grams	net conc (10^{-6} µci/g)
1st half	0.0293	0.0329	-0.0036	-0.00009
	0.0936	0.0249	0.0687	0.00172
	0.0319	0.005	0.0269	0.00067
	0.0308	0.0153	0.0155	0.00039
2nd half	0.0418	0.0255	0.0163	0.00041
	0.0167	0.0073	0.0094	0.00024
	0.0208	0.0182	0.0026	0.00007
	0.0177	0.0035	0.0142	0.00036

$\bar{x} = 0.00047$
$S = 0.00055$
$S_{\bar{x}} = 0.0002$
$tS_{\bar{x}} = 0.00047$

Environmental Level	Gross pCi	Blank pCi	net pCi/40 grams	net conc. (10^{-6} µci/g)
1st half	0.0853	0.0329	0.0524	0.00131
	0.0387	0.0249	0.0138	0.00035
	0.0202	0.005	0.0152	0.00038
	0.0354	0.0153	0.0201	0.0005
2nd half	0.0202	0.0255	-0.0053	-0.00013
	0.0184	0.0073	0.0111	0.00028
	0.0157	0.0182	-0.0025	-0.00006
	0.0134	0.0035	0.0099	0.00025

$\bar{x} = 0.00036$
$S = 0.00044$
$S_{\bar{x}} = 0.00016$
$tS_{\bar{x}} = 0.00038$

Pu-238 in Grass (1974) 40 gram Sample

Bellbrook	Gross pCi	Blank pCi	Net pCi per 40 gram	Net conc (10^{-6} µci/g)
1st half	0.0279	0.0144	0.0135	0.00034
	0.018	0.0122	0.0058	0.00015
	0.0117	0.0074	0.0043	0.00011
	0.0084	0.0181	−0.0097	−0.00024
2nd half	0.0058	0.0038	0.002	0.00005
	0.0085	0.0024	0.0061	0.00015
	0.0094	0.0094	0	0
	0.0065	0.0055	0.001	0.00003
				$\bar{x}$ = 0.00007
				S = 0.00016
				$TS_{\bar{x}}$ = 0.00013

$x_{i\,min} = -0.00024$; $x_{i\,max} = 0.00034$

Centerville				
1st half	0.0178	0.0144	0.0034	0.00009
	0.0262	0.0122	0.014	0.00035
	0.0366	0.0074	0.0292	0.00073
	0.0368	0.0181	0.0187	0.00047
2nd half	0.0223	0.0038	0.0185	0.00046
	0.0188	0.0024	0.0164	0.00041
	0.0176	0.0094	0.0082	0.00021
	0.0118	0.0055	0.0063	0.00016
				$\bar{x}$ = 0.00036
				S = 0.00021
				$TS_{\bar{x}}$ = 0.00018

$x_{i\,min} = 0.00009$; $x_{i\,max} = 0.00073$

Miamisburg				
1st half	0.0079	0.0144	−0.0065	−0.00016
	0.0561	0.0122	0.0439	0.00110
	0.0135	0.0074	0.0061	0.00015
	0.0189	0.0181	0.0008	0.00002
2nd half	0.0195	0.0038	0.0157	0.00039
	0.0367	0.0024	0.0343	0.00086
	0.0183	0.0094	0.0089	0.00022
	0.0159	0.0055	0.0104	0.00026
				$\bar{x}$ = 0.00036
				S = 0.00042
				$TS_{\bar{x}}$ = 0.00035

$x_{i\,min} = -0.00016$; $x_{i\,max} = 0.0011$

(ENVIRONMENTAL LEVEL)

Brookville (E.L)	Gross pci	Blank pci	Net pci per 50 gram	Net Conc (cc-6 uci/g)
1st half	0.0202	0.002	0.0182	0.00046
	0.0112	0.0072	0.004	0.0001
	0.0101	0.0038	0.0063	0.00016
	0.0144	0.0101	0.0043	0.00011
2nd half	0.0302	0.0108	0.0194	0.00049
	0.0172	0.0072	0.01	0.00025
	0.0354	0.0052	0.0302	0.00076
	0.0167	0.0069	0.0098	0.00025
		$\bar{X}$ = 0.0067		$\bar{X}$ = 0.00032
		S = 0.003		S = 0.00023
				$t_{S\bar{X}}$ = 0.00019

Pu-238 in Grass 1985 1/16/85

	Gross pCi	Blank pCi	Net pCi/40 g	Net Conc. (10^{-6} μCi/g)
Bellbrook				
1st Half	0.0137	0.0046	0.0091	0.00023
	0.0123	0.0071	0.0052	0.00013
	0.0084	0.0069	0.0015	0.00004
	0.005	0.0089	−0.0039	−0.0001
2nd Half	0.0192	0.0068	0.0124	0.00031
	0.0241	0.0252	−0.0011	−0.00003
	0.0232	0.014	0.0092	0.00023
	0.0116	0.0206	−0.009	−0.00023
				$\bar{x}$ = 0.00007
				S = 0.00019
				$tS_{\bar{x}}$ = 0.00016
Centerville				
1st Half	0.0135	0.0046	0.0089	0.00022
	0.0096	0.0071	0.0025	0.00006
	0.0144	0.0069	0.0075	0.00019
	0.0124	0.0089	0.0035	0.00009
2nd Half	0.0203	0.0068	0.0135	0.00034
	0.0203	0.0252	−0.0049	−0.00012
	0.0165	0.014	0.0025	0.00006
	0.0252	0.0206	0.0046	0.00012
				$\bar{x}$ = 0.00012
				S = 0.00014
				$tS_{\bar{x}}$ = 0.00012
Miamisburg				
1st Half	0.0214	0.0046	0.0168	0.00042
	0.0222	0.0071	0.0151	0.00038
	0.0155	0.0069	0.0086	0.00022
	0.0149	0.0089	0.006	0.00015
2nd Half	0.0232	0.0068	0.0164	0.00041
	0.0213	0.0252	−0.0039	−0.0001
	0.0172	0.014	0.0032	0.00008
	0.0177	0.0206	−0.0029	−0.00007
				$\bar{x}$ = 0.00019
				S = 0.00021
				$TS_{\bar{x}}$ = 0.00018

ENVIRONMENTAL LEVEL

Brookville (EL.)	Gross pCi	Blank pCi	Net pCi Per 40 gram	Net conc (10^{-6} µCi/g)
1st half	0.0401	0.0144	0.0257	0.00064
	0.0448	0.0122	0.0326	0.00082
	0.0131	0.0074	0.0057	0.00014
	0.0114	0.0181	-0.0067	-0.00017
2nd half	0.0015	0.0038	-0.0023	-0.00006
	0.0252	0.0024	0.0228	0.00057
	0.0229	0.0094	0.0135	0.00034
	0.0108	0.0055	0.0053	0.00013
				$\bar{X}$ = 0.0003
				S = 0.00035
				$TS_{\bar{X}}$ = 0.00029

x_i MIN = -0.00017 ; x_i MAX = 0.00082

LDL =
0.0144
0.0122
0.0074
0.0181
0.0038
0.0024
0.0094
0.0055

$\bar{X}$ = 0.0092
S = 0.0054

	Gross pCi	Blank pCi	Net pCi/40 g	Net conc (10^{-6} µCi/g)
E.L. (Brookville)				
1ST HALF	0.0114	0.0046	0.0068	0.00017
	0.0126	0.0071	0.0055	0.00014
	0.0261	0.0069	0.0192	0.00048
	0.0094	0.0089	0.0005	0.00001
2ND HALF	0.0155	0.0068	0.0087	0.00022
	0.0412	0.0252	0.016	0.0004
	0.0332	0.014	0.0192	0.00048
	0.0166	0.0206	-0.004	-0.0001

$\bar{X} = 0.00023$

$\delta = 0.00021$

$TS_{\bar{X}} = 0.00018$

1986 PU-238 IN GRASS
fCi/G

	MIAMISBURG	CENTERVILLE	BELLBROOK	TROTWOOD	FRANKLIN	GERMANTOWN	BROOKVILLE
	0.55	-0.003	0.07	-0.15	-0.13	0.30	-0.30
	0.73	-0.21	0.33	-0.33	0.26	0.16	-0.09
	-0.31	-0.33	-0.38	-0.32	-0.25	-0.10	-0.34
	2.16	0.47	0.38	-0.17	0.49	0.07	0.11
N	4	4	4	4	4	4	4
AVERAGE	0.78	-0.02	0.10	-0.24	0.09	0.11	-0.16
STD DEV	1.03	0.35	0.35	0.09	0.34	0.17	0.21
MINIMUM	-0.31	-0.33	-0.38	-0.33	-0.25	-0.10	-0.34
MAXIMUM	2.16	0.47	0.38	-0.15	0.49	0.30	0.11
STD ERROR	1.63	0.56	0.55	0.15	0.54	0.27	0.33

INCREMENTAL
CONCENTRATION

AVERAGE	0.78	-0.02	0.10	-0.24	0.09	0.11
MINIMUM	-0.31	-0.33	-0.38	-0.33	-0.25	-0.10
MAXIMUM	2.16	0.47	0.38	-0.15	0.49	0.30
STD ERROR	1.63	0.56	0.55	0.15	0.54	0.27

PU-238 IN GRASS 1986

LOCATION	GROSS pCi	BKG pCi	NET pCi	TOTAL WEIGHT (G)	CONC. (fCi/G)
MIAMISBURG	0.03	0.0082	0.0218	40	0.545
MIAMISBURG	0.0385	0.0092	0.0293	40	0.7325
MIAMISBURG	0.0077	0.0202	-0.0125	40	-0.3125
MIAMISBURG	0.0924	0.006	0.0864	40	2.16
CENTERVILLE	0.0081	0.0082	-0.0001	40	-0.0025
CENTERVILLE	0.0007	0.0092	-0.0085	40	-0.2125
CENTERVILLE	0.0072	0.0202	-0.013	40	-0.325
CENTERVILLE	0.0249	0.006	0.0189	40	0.4725
BELLBROOK	0.0112	0.0082	0.003	40	0.075

BELLBROOK	0.0222	0.0092	0.013	40	0.325
BELLBROOK	0.005	0.0202	-0.0152	40	-0.38
BELLBROOK	0.0213	0.006	0.0153	40	0.3825
TROTWOOD	0.0022	0.0082	-0.006	40	-0.15
TROTWOOD	-0.0039	0.0092	-0.0131	40	-0.3275
TROTWOOD	0.0074	0.0202	-0.0128	40	-0.32
TROTWOOD	-0.0009	0.006	-0.0069	40	-0.1725
FRANKLIN	0.003	0.0082	-0.0052	40	-0.13
FRANKLIN	0.0195	0.0092	0.0103	40	0.2575
FRANKLIN	0.0102	0.0202	-0.01	40	-0.25
FRANKLIN	0.0255	0.006	0.0195	40	0.4875
GERMANTOWN	0.0201	0.0082	0.0119	40	0.2975
GERMANTOWN	0.0155	0.0092	0.0063	40	0.1575
GERMANTOWN	0.016	0.0202	-0.0042	40	-0.105
GERMANTOWN	0.009	0.006	0.003	40	0.075
BROOKVILLE	-0.0037	0.0082	-0.0119	40	-0.2975
BROOKVILLE	0.0055	0.0092	-0.0037	40	-0.0925
BROOKVILLE	0.0065	0.0202	-0.0137	40	-0.3425
BROOKVILLE	0.0105	0.006	0.0045	40	0.1125

1987 PU-238 IN GRASS
fCi/G

	MIAMISBURG	CENTERVILLE	BELLBROOK	TROTWOOD	FRANKLIN	GERMANTOWN	BROOKVILLE
	0.68	-0.08	0.29	0.18	0.06	0.34	0.36
	0.66	0.25	0.01	0.16	0.22	0.67	0.46
	0.65	0.37	0.05	0.11	-0.35	0.49	-0.21
	1.70	-0.07	0.21	0.06	0.05	0.40	0.19
	2.50	0.05	0.41	0.06	0.34	0.16	0.21
	1.11	0.22	0.03	0.01	-0.01	0.05	0.20
	0.97	0.10	0.42	0.25	0.28	-0.04	-0.13
	1.40	0.02	0.10	0.16	0.10	0.05	0.18
N	8	8	8	8	8	8	8
AVERAGE	1.21	0.11	0.19	0.12	0.09	0.26	0.16
STD DEV	0.64	0.16	0.17	0.08	0.21	0.25	0.22
MINIMUM	0.65	-0.08	0.01	0.01	-0.35	-0.04	-0.21
MAXIMUM	2.50	0.37	0.42	0.25	0.34	0.67	0.46
STD ERROR	0.34	0.13	0.14	0.06	0.18	0.21	0.19
INCREMENTAL CONCENTRATION							
AVERAGE	1.05	-0.05	0.03	-0.03	-0.07	0.11	
MINIMUM	0.49	-0.24	-0.15	-0.15	-0.50	-0.20	
MAXIMUM	2.34	0.21	0.27	0.09	0.18	0.51	
STD ERROR	0.57	0.23	0.23	0.20	0.26	0.28	

PU-238 IN GRASS 1987

LOCATION	GROSS pCi	BKG pCi	NET pCi	TOTAL WEIGHT (G)	CONC. (fCi/G)
MIAMISBURG	0.0276	0.0004	0.0272	40	0.680
MIAMISBURG	0.027	0.0004	0.0266	40	0.665
MIAMISBURG	0.0262	0.0004	0.0258	40	0.645
MIAMISBURG	0.0684	0.0004	0.068	40	1.700
MIAMISBURG	0.0975	-0.0026	0.1001	40	2.502
MIAMISBURG	0.042	-0.0026	0.0446	40	1.114
MIAMISBURG	0.0361	-0.0026	0.0387	40	0.967
MIAMISBURG	0.0533	-0.0026	0.0559	40	1.397
CENTERVILLE	-0.0028	0.0004	-0.0032	40	-0.080
CENTERVILLE	0.0104	0.0004	0.01	40	0.250
CENTERVILLE	0.0153	0.0004	0.0149	40	0.373
CENTERVILLE	-0.0025	0.0004	-0.0029	40	-0.073
CENTERVILLE	-0.0006	-0.0026	0.0020	40	0.049
CENTERVILLE	0.0063	-0.0026	0.0089	40	0.222
CENTERVILLE	0.0014	-0.0026	0.0040	40	0.099
CENTERVILLE	-0.0016	-0.0026	0.0010	40	0.024
BELLBROOK	0.012	0.0004	0.0116	40	0.290

BELLBROOK	0.0007	0.0004	0.0003	40	0.008
BELLBROOK	0.0023	0.0004	0.0019	40	0.048
BELLBROOK	0.0087	0.0004	0.0083	40	0.208
BELLBROOK	0.0137	-0.0026	0.0163	40	0.407
BELLBROOK	-0.0014	-0.0026	0.0012	40	0.029
BELLBROOK	0.0144	-0.0026	0.0170	40	0.424
BELLBROOK	0.0014	-0.0026	0.0040	40	0.099
TROTWOOD	0.0075	0.0004	0.0071	40	0.178
TROTWOOD	0.0068	0.0004	0.0064	40	0.160
TROTWOOD	0.0049	0.0004	0.0045	40	0.112
TROTWOOD	0.0029	0.0004	0.0025	40	0.062
TROTWOOD	0	-0.0026	0.0026	40	0.064
TROTWOOD	-0.0022	-0.0026	0.0004	40	0.009
TROTWOOD	0.0074	-0.0026	0.0100	40	0.249
TROTWOOD	0.0038	-0.0026	0.0064	40	0.159
FRANKLIN	0.0029	0.0004	0.0025	40	0.062
FRANKLIN	0.0093	0.0004	0.0089	40	0.223
FRANKLIN	-0.0134	0.0004	-0.0138	40	-0.345
FRANKLIN	0.0022	0.0004	0.0018	40	0.045
FRANKLIN	0.011	-0.0026	0.0136	40	0.339
FRANKLIN	-0.0031	-0.0026	-0.0005	40	-0.013
FRANKLIN	0.0088	-0.0026	0.0114	40	0.284
FRANKLIN	0.0013	-0.0026	0.0039	40	0.097
GERMANTOWN	0.014	0.0004	0.0136	40	0.340
GERMANTOWN	0.0271	0.0004	0.0267	40	0.668
GERMANTOWN	0.0201	0.0004	0.0197	40	0.493
GERMANTOWN	0.0164	0.0004	0.016	40	0.400
GERMANTOWN	0.0037	-0.0026	0.0063	40	0.157
GERMANTOWN	-0.0007	-0.0026	0.0019	40	0.047
GERMANTOWN	-0.0042	-0.0026	-0.0016	40	-0.041
GERMANTOWN	-0.0006	-0.0026	0.0020	40	0.049
BROOKVILLE	0.0146	0.0004	0.0142	40	0.355
BROOKVILLE	0.0188	0.0004	0.0184	40	0.460
BROOKVILLE	-0.0079	0.0004	-0.0083	40	-0.208
BROOKVILLE	0.008	0.0004	0.0076	40	0.190
BROOKVILLE	0.006	-0.0026	0.0086	40	0.214
BROOKVILLE	0.0053	-0.0026	0.0079	40	0.197
BROOKVILLE	-0.0076	-0.0026	-0.0050	40	-0.126
BROOKVILLE	0.0046	-0.0026	0.0072	40	0.179

1988 PU-238 IN GRASS
fCi/G

	MIAMISBURG	CENTERVILLE	BELLBROOK	TROTWOOD	FRANKLIN	GERMANTOWN	FAYETTEVILLE
	0.22	-0.08	0.29	0.22	0.09	-0.08	0.31
	0.18	0.09	0.50	-0.18	0.11	0.61	-0.17
	0.14	0.02	-0.21	-0.11	-0.03	0.07	0.13
	-0.36	0.16	-0.09	0.16	0.49	-0.10	0.19
N	4	4	4	4	4	4	4
AVERAGE	0.04	0.05	0.12	0.02	0.17	0.12	0.11
STD DEV	0.27	0.10	0.33	0.20	0.23	0.33	0.20
MINIMUM	-0.36	-0.08	-0.21	-0.18	-0.03	-0.10	-0.17
MAXIMUM	0.22	0.16	0.50	0.22	0.49	0.61	0.31
STD ERROR	0.43	0.16	0.53	0.31	0.36	0.52	0.32

INCREMENTAL
CONCENTRATION

AVERAGE	-0.07	-0.07	0.01	-0.09	0.05	0.01
MINIMUM	-0.48	-0.19	-0.32	-0.29	-0.15	-0.21
MAXIMUM	0.10	0.05	0.39	0.11	0.38	0.49
STD ERROR	0.54	0.36	0.61	0.45	0.48	0.61

PU-238 IN GRASS 1988

LOCATION	GROSS pCi	BKG pCi *	NET pCi	TOTAL WEIGHT (G)	CONC. (fCi/G)
MIAMISBURG	0.0057	-0.0029	0.0086	40	0.215
MIAMISBURG	0.0042	-0.0029	0.0071	40	0.1775
MIAMISBURG	0.0028	-0.0029	0.0057	40	0.1425
MIAMISBURG	-0.0174	-0.0029	-0.0145	40	-0.3625
CENTERVILLE	-0.006	-0.0029	-0.0031	40	-0.0775
CENTERVILLE	0.0007	-0.0029	0.0036	40	0.09
CENTERVILLE	-0.0022	-0.0029	0.0007	40	0.0175
CENTERVILLE	0.0034	-0.0029	0.0063	40	0.1575
BELLBROOK	0.0087	-0.0029	0.0116	40	0.29
BELLBROOK	0.0172	-0.0029	0.0201	40	0.5025
BELLBROOK	-0.0113	-0.0029	-0.0084	40	-0.21
BELLBROOK	-0.0064	-0.0029	-0.0035	40	-0.0875
TROTWOOD	0.0059	-0.0029	0.0088	40	0.22
TROTWOOD	-0.0099	-0.0029	-0.0070	40	-0.175
TROTWOOD	-0.0072	-0.0029	-0.0043	40	-0.1075
TROTWOOD	0.0036	-0.0029	0.0065	40	0.1625
FRANKLIN	0.0008	-0.0029	0.0037	40	0.0925
FRANKLIN	0.0014	-0.0029	0.0043	40	0.1075
FRANKLIN	-0.0042	-0.0029	-0.0013	40	-0.0325
FRANKLIN	0.0168	-0.0029	0.0197	40	0.4925

GERMANTOWN	-0.0062	-0.0029	-0.0033	40	-0.0825
GERMANTOWN	0.0213	-0.0029	0.0242	40	0.605
GERMANTOWN	0	-0.0029	0.0029	40	0.0725
GERMANTOWN	-0.0067	-0.0029	-0.0038	40	-0.095
FAYETTEVILLE	0.0093	-0.0029	0.0122	40	0.305
FAYETTEVILLE	-0.0096	-0.0029	-0.0067	40	-0.1675
FAYETTEVILLE	0.0022	-0.0029	0.0051	40	0.1275
FAYETTEVILLE	0.0045	-0.0029	0.0074	40	0.185

1989 PU-238 IN GRASS
fCi/G

	MIAMISBURG	CENTERVILLE	BELLBROOK	TROTWOOD	FRANKLIN	GERMANTOWN	BROOKVILLE
	0.79	0.22	-0.14	0.42	0.03	0.03	0.17
	0.51	0.22	0.05	0.21	-0.05	0.42	-0.01
	0.37	0.14	0.04	0.35	0.004	0.14	0.05
	0.47	0.11	-0.11	0.17	0.24	0.18	0.06
N	4	4	4	4	4	4	4
AVERAGE	0.53	0.17	-0.04	0.29	0.06	0.19	0.07
STD DEV	0.18	0.06	0.10	0.12	0.13	0.16	0.07
MINIMUM	0.37	0.11	-0.14	0.17	-0.05	0.03	-0.01
MAXIMUM	0.79	0.22	0.05	0.42	0.24	0.42	0.17
STD ERROR	0.29	0.09	0.15	0.19	0.20	0.26	0.12

INCREMENTAL
CONCENTRATION

AVERAGE	0.47	0.11	-0.11	0.22	-0.01	0.13
MINIMUM	0.30	0.04	-0.21	0.10	-0.12	-0.03
MAXIMUM	0.72	0.16	-0.02	0.35	0.18	0.35
STD ERROR	0.31	0.15	0.19	0.22	0.24	0.28

PU-238 IN GRASS 1989

LOCATION	GROSS pCi	BKG pCi *	NET pCi	TOTAL WEIGHT (G)	CONC. (fCi/G)
MIAMISBURG	0.0406	0.0011	0.0395	50	0.7895
MIAMISBURG	0.0264	0.0011	0.0253	50	0.5055
MIAMISBURG	0.0196	0.0011	0.0185	50	0.3695
MIAMISBURG	0.0245	0.0011	0.0234	50	0.4675
CENTERVILLE	0.0121	0.0011	0.0110	50	0.2195
CENTERVILLE	0.0122	0.0011	0.0111	50	0.2215
CENTERVILLE	0.0079	0.0011	0.0068	50	0.1355
CENTERVILLE	0.0066	0.0011	0.0055	50	0.1095
BELLBROOK	-0.0058	0.0011	-0.0069	50	-0.1385
BELLBROOK	0.0036	0.0011	0.0025	50	0.0495
BELLBROOK	0.0029	0.0011	0.0018	50	0.0355
BELLBROOK	-0.0042	0.0011	-0.0053	50	-0.1065
TROTWOOD	0.0221	0.0011	0.0210	50	0.4195
TROTWOOD	0.0117	0.0011	0.0106	50	0.2115
TROTWOOD	0.0185	0.0011	0.0174	50	0.3475
TROTWOOD	0.0094	0.0011	0.0083	50	0.1655
FRANKLIN	0.0026	0.0011	0.0015	50	0.0295
FRANKLIN	-0.0013	0.0011	-0.0024	50	-0.0485
FRANKLIN	0.0013	0.0011	0.0002	50	0.0035
FRANKLIN	0.0133	0.0011	0.0122	50	0.2435
GERMANTOWN	[illegible]	[illegible]	[illegible]	50	[illegible]
GERMANTOWN	0.0028	0.0011	0.0017	50	0.0335
GERMANTOWN	0.022	0.0011	0.0209	50	0.4175
GERMANTOWN	0.0083	0.0011	0.0072	50	0.1435
GERMANTOWN	0.0099	0.0011	0.0088	50	0.1755
BROOKVILLE	0.0095	0.0011	0.0084	50	0.1675
BROOKVILLE	0.0006	0.0011	-0.0005	50	-0.0105
BROOKVILLE	0.0036	0.0011	0.0025	50	0.0495
BROOKVILLE	0.0041	0.0011	0.0030	50	0.0595

1990 PU-238 IN GRASS
fCi/G

	MIAMISBURG	CENTERVILLE	BELLBROOK	TROTWOOD	FRANKLIN	GERMANTOWN	FAYETTEVILLE
	-0.003	0.01	-0.32	0.06	-0.22	-0.23	-0.20
	0.07	-0.12	-0.05	-0.09	0.08	0.05	-0.19
	-0.01	-0.07	-0.03	0.45	-0.22	-0.13	0.27
	0.07	-0.03	0.23	-0.01	-0.10	0.17	0.36
N	4	4	4	4	4	4	4
AVERAGE	0.03	-0.05	-0.04	0.10	-0.11	-0.03	0.06
STD DEV	0.04	0.05	0.22	0.24	0.14	0.18	0.30
MINIMUM	-0.01	-0.12	-0.32	-0.09	-0.22	-0.23	-0.20
MAXIMUM	0.07	0.01	0.23	0.45	0.08	0.17	0.36
STD ERROR	0.07	0.09	0.36	0.38	0.23	0.29	0.47

INCREMENTAL
CONCENTRATION

AVERAGE	-0.03	-0.11	-0.10	0.04	-0.18	-0.10
MINIMUM	-0.07	-0.18	-0.38	-0.16	-0.28	-0.29
MAXIMUM	0.01	-0.05	0.17	0.38	0.02	0.11
STD ERROR	0.48	0.48	0.59	0.61	0.52	0.55

PU-238 IN GRASS 1990

LOCATION	GROSS pCi	BKG pCi ±	NET pCi	TOTAL WEIGHT (G)	CONC. (fCi/G)
MIAMISBURG	0.0014	0.0016	-0.0001	50	-0.003
MIAMISBURG	0.0052	0.0016	0.0037	50	0.073
MIAMISBURG	0.0012	0.0016	-0.0004	50	-0.007
MIAMISBURG	0.005	0.0016	0.0035	50	0.069
CENTERVILLE	0.0022	0.0016	0.0007	50	0.013
CENTERVILLE	-0.0042	0.0016	-0.0058	50	-0.115
CENTERVILLE	-0.0017	0.0016	-0.0033	50	-0.065
CENTERVILLE	0	0.0016	-0.0016	50	-0.031
BELLBROOK	-0.0145	0.0016	-0.0161	50	-0.321
BELLBROOK	-0.0007	0.0016	-0.0023	50	-0.045
BELLBROOK	0	0.0016	-0.0016	50	-0.031
BELLBROOK	0.0129	0.0016	0.0114	50	0.227
TROTWOOD	0.0046	0.0016	0.0031	50	0.061
TROTWOOD	-0.0031	0.0016	-0.0047	50	-0.093
TROTWOOD	0.0238	0.0016	0.0223	50	0.445
TROTWOOD	0.0009	0.0016	-0.0007	50	-0.013
FRANKLIN	-0.0094	0.0016	-0.0110	50	-0.219
FRANKLIN	0.0056	0.0016	0.0041	50	0.081
FRANKLIN	-0.0094	0.0016	-0.0110	50	-0.219
FRANKLIN	-0.0035	0.0016	-0.0051	50	-0.101
GERMANTOWN	-0.01	0.0016	-0.0116	50	-0.231
GERMANTOWN	0.0039	0.0016	0.0024	50	0.047
GERMANTOWN	-0.0049	0.0016	-0.0065	50	-0.129
GERMANTOWN	0.0102	0.0016	0.0087	50	0.173
FAYETTEVILLE	-0.0082	0.0016	-0.0098	50	-0.195
FAYETTEVILLE	-0.008	0.0016	-0.0096	50	-0.191
FAYETTEVILLE	0.0151	0.0016	0.0136	50	0.271
FAYETTEVILLE	0.0197	0.0016	0.0182	50	0.363

1991 PM-2.5 IN GRAMS
PCI/G

	MIAMISBURG	CENTERVILLE	BELLBROOK	TROTWOOD	FRANKLIN	GERMANTOWN	BROOKVILLE
	0.63	-0.14	0.13	0.11	-0.01	0.37	0.14
	-0.09	-0.05	-0.30	-0.11	-0.20	-0.33	-0.02
	-0.14	-0.12	0.12	0.06	-0.17	-0.34	-0.17
	0.77	-0.01	-0.12	-0.20	0.00	0.06	0.33
N	4	4	4	4	4	4	4
AVERAGE	0.29	-0.08	-0.04	-0.03	-0.09	-0.06	0.07
STD DEV	0.47	0.06	0.21	0.15	0.10	0.34	0.22
MINIMUM	-0.14	-0.14	-0.30	-0.20	-0.20	-0.34	-0.17
MAXIMUM	0.77	-0.01	0.13	0.11	0.00	0.37	0.33
STD ERROR	0.75	0.10	0.33	0.23	0.16	0.25	0.34

INCREMENTAL
CONCENTRATION

AVERAGE	0.22	-0.15	-0.11	-0.10	-0.16	-0.13
MINIMUM	-0.21	-0.21	-0.37	-0.27	-0.27	-0.41
MAXIMUM	0.70	-0.08	0.06	0.04	-0.07	0.30
STD ERROR	0.83	0.36	0.47	0.41	0.23	0.54

PU-238 IN GRASS 1991

LOCATION	GROSS pCi	BKG pCi *	NET pCi	TOTAL WEIGHT (G)	CONC. (fCi/G)
MIAMISBURG	0.0251	0.0026	0.0225	10	0.63
MIAMISBURG	-0.0006	0.0026	-0.0032	10	-0.09
MIAMISBURG	-0.0024	0.0026	-0.0050	10	-0.14
MIAMISBURG	0.0299	0.0026	0.0273	10	0.77
CENTERVILLE	-0.0035	0.0026	-0.0061	10	-0.14
CENTERVILLE	0.0006	0.0026	-0.0020	10	-0.05
CENTERVILLE	-0.0025	0.0026	-0.0051	10	-0.12
CENTERVILLE	0.0023	0.0026	-0.0003	10	-0.01
BELLBROOK	0.0093	0.0026	0.0067	10	0.13
BELLBROOK	-0.0128	0.0026	-0.0154	10	-0.30
BELLBROOK	0.0087	0.0026	0.0061	10	0.12
BELLBROOK	-0.0036	0.0026	-0.0062	10	-0.12
TROTWOOD	0.0064	0.0026	0.0038	10	0.11
TROTWOOD	-0.001	0.0026	-0.0036	10	-0.11
TROTWOOD	0.0047	0.0026	0.0021	10	0.06
TROTWOOD	-0.0043	0.0026	-0.0069	10	-0.20
FRANKLIN	0.0021	0.0026	-0.0005	10	-0.01
FRANKLIN	-0.0058	0.0026	-0.0084	10	-0.20
FRANKLIN	-0.0044	0.0026	-0.0070	10	-0.17
FRANKLIN	0.0026	0.0026	0.0000	10	0.00
GERMANTOWN	0.0205	0.0026	0.0179	10	0.37
GERMANTOWN	-0.0134	0.0026	-0.0160	10	-0.33
GERMANTOWN	-0.0139	0.0026	-0.0165	10	-0.34
GERMANTOWN	0.0056	0.0026	0.0030	10	0.06
BROOKVILLE	0.0087	0.0026	0.0061	10	0.14
BROOKVILLE	0.0018	0.0026	-0.0008	10	-0.02
BROOKVILLE	-0.0047	0.0026	-0.0073	10	-0.17
BROOKVILLE	0.0166	0.0026	0.0140	10	0.33

APPENDIX D

PLUTONIUM-238 IN MILK

Table D.1 Plutonium–238 Concentrations
(x 10 E –4 pico–Ci/g) in Milk (1972–1978)

	(x 10 E –10 micro–ci/ml)						
	Miamisburg			EL			
Year	X	S	n	X	S	n	LDL
1972	14	NA	7	NS			0.15
1973	9	NA	12	NS			0.15
1974	34	NA	3	NS			6–30
1975	2.31	0.54	6	NS			2.2
1976	0.88	NA	1	NS			0.9
1977	1.51	0.63	3	NS			2
1978	1.82	NA	1	0.88	NA	1	2.6

X = average concentration (x 10 E –4 pico–Ci/g)
S = standard deviation
n = number of samples
NS = not sampled
NA = not available or not applicable
EL = environmental level
LDL = lower detection limit

Fro-STUFFS 1975 [illegible]

2nd half

	^{238}Pu	^{239}Pu	Volume
milk-1-	.0261 pCi	.0022 pCi	100 ml
milk-2-	.0192 pCi	.0065 pCi	100 ml
milk-3-	.0129 pCi	ND pCi	100 ml

1st half

	^{238}Pu	^{239}Pu	Volume
milk-1	.0279 pCi	.0080 pCi	100 ml
milk-2	.0275 pCi	.0050 pCi	100 ml
milk-3	.0252 pCi	.0008 pCi	100 ml

	Avg ^{238}Pu	Avg ^{239}Pu
milk #1	$.027 \times 10^{-8}$ μci/g	$.013 \times 10^{-8}$ μci/g
milk #2	$.023 \times 10^{-8}$ μci/g	$.013 \times 10^{-8}$ μci/g
milk #3	$.022 \times 10^{-8}$ μci/g	$.013 \times 10^{-8}$ μci/g

Avg = $.024 \times 10^{-8}$ Avg = $.013 \times 10^{-8}$ μci/g

plutonium-238 in foodstuffs and vegetation 1980

Sample type	Result	Quantity	Result ($\times 10^{-10}$ pci/g)	Avg	MDA	Std dev
turnips (T-1)	.0332 pci	100 g	3.32			
turnips (T-2)	.0378 pci	100 g	3.78			
turnips (T-1)	* .0219 pci	100 g	2.19	.0297 $\times 10^{-8}$	.022 $\times 10^{-8}$	.0024 $\times 10^{-8}$
turnips (T-2)	* .0219 pci	100 g	2.19	2.87 $\times 10^{-10}$ pci/g	2.19 $\times 10^{-10}$ pci/g	2.4 $\times 10^{-10}$ pci/g
milk (L-M)	* .0219 pci	250 ml	.88	.0085 $\times 10^{-8}$	.0088 $\times 10^{-8}$	.0096 $\times 10^{-8}$
milk (G-M)	* .0219 pci	200 ml	.88	.88 $\times 10^{-10}$ pci/g	.88 $\times 10^{-10}$ pci/g	.96 $\times 10^{-10}$ pci/g
corn (CB-1)	* .0219 pci	100 g	2.19			
corn (CB-2)	* .0219 pci	100 g	2.19			
corn (CD-1)	.0282 pci	100 g	2.82	.0235 $\times 10^{-8}$	.022 $\times 10^{-8}$	.0024 $\times 10^{-8}$
corn (CD-2)	* .0219 pci	100 g	2.19	2.35 $\times 10^{-10}$ pci/g	2.19 $\times 10^{-10}$ pci/g	2.4 $\times 10^{-10}$ pci/g
fish (FB)	.0465 pci	100 g	4.65	.036 $\times 10^{-8}$	.022 $\times 10^{-8}$	.026 $\times 10^{-8}$
fish (FR)	.0244 pci	100 g	2.44	3.55 $\times 10^{-10}$ pci/g	2.19 $\times 10^{-10}$ pci/g	2.6 $\times 10^{-10}$ pci/g
grass (G-2)	1.1955 pci	1 g	298.88			
grass (G-BFg)	.1375 pci	50 g	27.50			
grass (G-4)	* .0219 pci	2 g	5.19			
grass (G-6)	1.0493 pci	4.8 g	218.60			
grass (G-8)	1.0105 pci	1.6 g	631.56			
grass (G-10)	.2841 pci	5.6 g	50.73			
grass (G-12)	.4457 pci	3.4 g	131.09			
grass (G-14)	.7923 pci	5.2 g	152.37	2.03 $\times 10^{-8}$	.0519 $\times 10^{-8}$	.17 $\times 10^{-8}$
grass (G-16)	1.8030 pci	5.8 g	310.86	202.98 $\times 10^{-10}$ pci/g	5.19 $\times 10^{-10}$ pci/g	16.64 $\times 10^{-10}$ pci/g

1977 Environmental Monitoring Data

^{238}Pu in Milk (250 ml) sample

Grates - 1st half = $\frac{.0160 \times 10^{-6}\ \mu ci}{250\ ml\ g} \pm \frac{.0121 \times 10^{-6}\ \mu ci}{250\ ml\ g} = 0.64 \pm 0.48 \times 10^{-10}\ \mu ci/g$

$< 2.0 \times 10^{-10} \pm .5 \times 10^{-10}$

Grates - 2nd half = $\frac{.0450 \times 10^{-6}\ \mu ci}{250\ ml\ g} \pm \frac{.0218 \times 10^{-6}\ \mu ci}{250\ ml\ g} = 1.8 \pm 0.87 \times 10^{-10}\ \mu ci/g$

$< 2 \times 10^{-10} \pm .9 \times 10^{-10}$

local - 2nd half = $\frac{.0536 \times 10^{-6}\ \mu ci}{250\ ml\ g} \pm \frac{.0223 \times 10^{-6}\ \mu ci}{250\ ml\ g} = 2.1 \pm 0.89 \times 10^{-10}\ \mu ci/g$

AVG = $2.03 \times 10^{-10} \pm 0.8 \times 10^{-10}$

LDL = $.03 \times 10^{-6}\ \mu ci/sample \pm .02 \times 10^{-6}$ (Counting error at 2σ)

LDL = $\frac{.05 \times 10^{-6}\ \mu ci/sample}{250\ ml\ g} = 2.0 \times 10^{-10}\ \mu ci/ml\ g$

Pu-238 in Foodstuffs and Vegetation - 1978 3/1/79

Environmental levels	Results
pCi/g	pCi
MILK - .0221 ± .0094/200 cc	MILK - .0454 ± .0137/200 cc
* LDL FOR Pu-238 in AIR = .0655 pCi	∴ Assume .0655/200 cc = .00026 pCi/cc = 2.6×10^{-10} μCi/cc
Vegetables pCi	pCi
turnips - .0088 ± .0051/150 g	turnips - .0287 ± .0112/150 g
* LDL FOR Pu-238 in AIR = .0655 pCi	∴ Assume .0655/200 cc = .00044 pCi/cc = 4.4×10^{-10} μCi/cc
Fish pCi	
- .0216 ± .0130 50 gr	- .0203 ± .0122 35 g
- .0231 ± .0139 50 g	- .0298 ± .0160 35 g
* LDL FOR Pu-238 in AIR = .0655 pCi	∴ Assume .0655/35 g = .00187 $\times 10^{-6}$ μCi/g

APPENDIX E

TRITIUM IN VEGETABLES

Table E.1 Tritium Concentrations (pico–Ci/g)
in Vegetables (1972–1991)

	Location 1 Miamisburg			Location 2 Centerville			Location 3 Bellbrook			Location 4 EL			
Year	X	S	n	X	S	n	X	S	n	X	S	n	LDL
1972	2.3	NA	6	NS			NS			NS			0.1
1973	0.7	NA	2	NS			NS			NS			0.1
1974	1.4	NA	2	NS			NS			NS			0.1
1975	2.23	NA	1	NS			NS			NS			4.4
1976	0.5	0.5	2	NS			NS			−1.5	1.5	2	NA
1977	NS			NS			NS			NS			NS
1978	0.98	0.27	3	NS			NS			0.58	0.18	3	0.2
1979	0.83	0.09	4	0.44	0.03	4	0.75	0.02	4	0.24	0.02	4	0.02
1980	1.2	0.03	4	0.46	0.06	4	0.31	0.09	4	0.33	0.15	4	0.05
1981	1.93	0.14	4	0.89	0.1	4	0.74	0.24	4	0.58	0.04	4	0.07
1982	1.03	0.11	4	0.46	0.09	4	0.55	0.07	4	0.55	0.22	4	0.09
1983	1.07	0.1	4	0.64	0.11	4	0.54	0.12	4	0.57	0.05	4	0.07
1984	0.43	0.09	4	0.3	0.1	4	0.13	0.07	4	0.28	0.11	4	0.09
1985	2	0.08	4	0.68	0.02	4	0.7	0.07	4	0.66	0.06	4	0.03
1986	1.13	0.08	4	1.03	0.02	4	1	0.08	4	0.96	0.07	4	0.08
1987	1.2	0.16	4	0.71	0.11	4	0.56	0.12	4	0.49	0.06	4	0.05
1988	0.38	0.07	4	0.1	0.07	4	0.06	0.03	4	0.13	0.06	4	0.07
1989	0.06	0.03	4	−0.16	0.06	4	−0.05	0.05	4	−0.16	0.04	4	0.1
1990	0.13	0.03	4	−0.14	0.02	4	−0.17	0.03	4	−0.14	0.04	4	0.1
1991	0.84	NA	4	−0.02	NA	4	0.01	NA	4	−0.12	NA	NA	0.2

X = average concentration (pico–Ci/g)
S = standard deviation
n = number of samples
NS = not sampled
NA = not available or not applicable
EL = environmental level
LDL = lower detection limit

Table E.1 (page 2 of 2)

	Location 5 Trotwood			Location 6 Franklin			Location 7 Germantown			
Year	X	S	n	X	S	n	X	S	n	LDL
1972	NS			NS			NS			0.1
1973	NS			NS			NS			0.1
1974	NS			NS			NS			0.1
1975	NS			NS			NS			4.4
1976	NS			NS			NS			NA
1977	NS			NS			NS			NS
1978	NS			NS			NS			0.2
1979	NS			NS			NS			0.02
1980	NS			NS			NS			0.05
1981	NS			NS			NS			0.07
1982	NS			NS			NS			0.09
1983	NS			NS			NS			0.07
1984	NS			NS			NS			0.09
1985	NS			NS			NS			0.03
1986	1.16	0.04	4	0.95	0.09	4	0.98	0.13	4	0.08
1987	0.6	0.03	4	0.57	0.07	4	0.57	0.03	4	0.05
1988	0.08	0.03	4	0.06	0.05	4	0.11	0.07	4	0.07
1989	−0.16	0.04	4	−0.12	0.03	4	−0.17	0.02	4	0.1
1990	−0.16	0.01	4	−0.11	0.06	4	−0.11	0.05	4	0.1
1991	−0.04	NA	4	−0.05	NA	4	−0.02	NA	4	0.2

X = average concentration (pico−Ci/g)
S = standard deviation
n = number of samples
NS = not sampled
NA = not available or not applicable
EL = environmental level
LDL = lower detection limit

[redacted] Cesium in positive [illegible]

1975

fish = 2.4×10^{-6} pci/g → MDA = 4.4×10^{-6} pci/g
fish = 3.0×10^{-6} pci/g → MDA = 4.4×10^{-6} pci/g
fish = 3.0×10^{-6} pci/g → MDA = 4.4×10^{-6} pci/g
fish = 2.0×10^{-6} pci/g → MDA = 4.4×10^{-6} pci/g

corn = → MDA = 4.9×10^{-6} pci/g
corn = 2.23×10^{-6} pci/g → MDA = 4.9×10^{-6} pci/g

tomatoes = → MDA = 4.4×10^{-6} pci/g
tomatoes = → MDA = 4.4×10^{-6} pci/g

grass = 4.4×10^{-6} pci/g

milk = 9.3×10^{-6} → MDA = 10.5×10^{-6}
= 3.6×10^{-6} → MDA = 10.5×10^{-6}
= < MDA → MDA = 10.5×10^{-6}

```
 1
GENERAL TRITIUM CALCULATION PROGRAM
HOW MANY SAMPLES ARE TO BE ENTERED ? 4

SAMPLE VALUES IN GROSS COUNTS PER MINUTE?
104.3
104.4
100.9
99.0
COUNTING EFFICIENCIES OF EACH SAMPLE?
.2293
.2523
.2440
.2440
BACKGROUND IN COUNTS PER MINUTE?0.9
SAMPLE VOLUME 200ML
COUNTING TIME?100
```

DPM/G	2 STD. DEV	MDA		CORN
0.000001+0R-	0.000001	0.000001	#1	diffusion sorbel
0.000000+0R-	0.000001	0.000001	#2	
0.000000-0R-	0.000001	0.000001	#3	Background Samples >50 miles
- 0.000003+0R-	0.000001	0.000001	#4	

#

3/2/78

Tritium in Foodstuffs and Vegetation in 1978

Environmental	Gross Counts	Bkg	Net Count	EFF	Result $\times 10^{-6}$ µci/cc	Results: Gross counts	Bkg	Net Count	EFF	Results
Milk -	13.2	12	1.2	.1419	$1.2/(10)(.1419)(2.22\times10^6) = .38$	13.4	12	1.4	.1329	$= .47$
(10 cc)	12.9	12	0.9	.1462	$0.9/(10)(.1462)(2.22\times10^6) = .28$	13.1	12	1.1	.1413	$= .35$

LDL - Avg Bkg = 12, 200 min, $2\sqrt{\frac{12}{200}} = .49$ C/m

* Counting LDL only → $.49/(10)(.1441)(2.22\times10^6) = .15\times10^{-6}$ µci/cc

$\sqrt{(.57)^2+(.49)^2} = \sqrt{.26+.24} = .71$

$\bar{X} = .33 \pm .22 \times10^{-6}$ $= \sqrt{(.22)^2+(.23)^2} = .32$

* $LDL = .49/(10)(.1371)(2.22\times10^6) = .16\times10^{-6}$ µci/cc

$LDL = .2\times10^{-6}$ µci/cc

$\sqrt{(.57)^2+(.49)} = .71$

$\bar{X} = .41 \pm .23 \times10^{-6}$

Vegetables	Gross Count	Bkg	Net Count	EFF	Results $\times10^{-6}$ µci/g	Gross Count	Bkg	Net Count	EFF	Results $\times10^{-6}$
C	14.1	12.6	1.5	.1260	$1.5/(10)(.1260)(2.22\times10^6) = .54$	14.5	12.6	1.9	.1093	$1.9/(10)(.1093)(2.22\times10^6) = .78$
T	13.7	12.6	1.1	.1306	$1.1/(10)(.1306)(2.22\times10^6) = .38$	13.4	10.7	2.7	.0897	$2.7/(10)(.0897)(2.22\times10^6) = 1.$
T	15.1	12.6	2.5	.1396	$2.5/(10)(.1396)(2.22\times10^6) = .81$	13.0	10.7	2.3	.1316	$2.3/(10)(.1316)(2.22\times10^6) = .7$
				.1321					.1015	

LDL - Avg Bkg = 12.0, 200 min, = .49 C/m

$\sqrt{(.57)^2+(.49)^2} = \sqrt{.28+.24} = .72$

$\bar{X} = .58 \pm .25 \times10^{-6}$

$\sqrt{(.25)^2+(.29)^2} = .38$

* $LDL = \frac{.49}{(10)(.1211)(2.22\times10^6)} = .18\times10^{-6}$ µci/cc

$LDL = .2\times10^{-6}$ µci/ml

$\sqrt{(.52)^2+(.49)^2} = .71$

$\bar{X} = .98 \pm .29 \times10^{-6}$

tomatoes (1979) -(10 cc Sample volume) 2/4/80

Location	Sample weight	total Liquid	Gross Count Rate	BKG	NET c/m	EFF	Result pCi/g x10^-6
Harrisburg	50 g	25 cc	16.3	7.6	8.7	.2766	0.71
	50 g	25 cc	17.8	7.6	10.2	.2468	0.93
	50 g	30 cc	15.8	7.6	8.2	.2209	0.82
	50 g	30 cc	16.0	7.6	8.4	.2701	0.84
$\bar{x}$						.2661	0.83
S						.0132	0.09
$S_{\bar{x}}$							
$ts_{\bar{x}}$							0.14
Bellbrook	50 g	20 cc	17.9	7.6	10.3	.2404	0.77
	50 g	20 cc	16.8	7.6	9.2	.2299	0.72
	50 g	20 cc	17.3	7.6	9.7	.2404	0.73
	50 g	20 cc	17.4	7.6	9.8	.2323	0.76
$\bar{x}$						.2358	0.75
S						.0055	0.02
$S_{\bar{x}}$							
$ts_{\bar{x}}$							0.03
Centerville	50 g	20 cc	13.6	7.6	6.0	.2476	0.44
	50 g	20 cc	13.3	7.6	5.7	.2597	0.40
	50 g	20 cc	14.2	7.6	6.6	.2540	0.47
	50 g	20 cc	14.0	7.6	6.4	.2565	0.45
$\bar{x}$						.2545	0.44
S						.0051	0.03
$S_{\bar{x}}$							
$ts_{\bar{x}}$							0.05
Camden (ENV. Level)	50 g	20 cc	11.3	7.6	3.7	.2637	0.25
	50 g	20 cc	10.8	7.6	3.2	.2404	0.24
	50 g	20 cc	10.4	7.6	2.8	.2323	0.22
	50 g	20 cc	11.0	7.6	3.4	.2371	0.26
$\bar{x}$						.2434	0.24
S						.0140	0.02
$S_{\bar{x}}$							0.03

80 °H in TOMMTECC (10 cc Sample) 4/27/81

Sample	Miamisburg			Centerville			Bellbrook			Environmental level		
	Gross C/M	Blank C/M	Net C/M	Gross C/M	Blank C/M	Net C/M	Gross C/M	Blank C/M	Net C/M	Gross C/M	Blank C/M	Net C/M
1	16.5	5.9	10.6	9.9	5.9	4.0	9.8	5.9	3.9	8.0	5.9	2.1
2	17.0	5.7	11.3	9.3	5.7	3.6	7.7	5.7	2.0	8.2	5.7	2.5
3	16.9	5.3	11.6	9.7	5.3	4.4	9.5	5.3	4.2	8.5	5.3	3.2
4	17.0	5.3	11.7	9.5	5.3	4.2	7.9	5.3	2.6	9.4	5.3	4.1

Sample	Miamisburg			Centerville			Bellbrook			Environmental level		
	Net C/M	EFF.	d/M/cc	Net C/M	EFF.	d/M/cc	Net C/M	EFF.	d/M/cc	Net C/M	EFF	d/M/cc
1	10.6	0.2548	4.16	4.0	0.2442	1.64	3.9	0.2628	1.48	2.1	0.2768	0.76
2	11.3	0.2515	4.49	3.6	0.2488	1.45	2.0	0.2728	0.73	5.5	0.2615	2.10
3	11.6	0.2408	4.82	4.4	0.2442	1.80	4.2	0.2642	1.59	2.2	0.2642	0.83
4	11.7	0.2488	4.70	4.2	0.2455	1.71	2.6	0.2728	0.95	4.1	0.2642	1.55

Sample	Miamisburg (50 gram sample)			Centerville (50 gram sample)			Bellbrook (50 gram sample)			Environmental level (50 g		
	total cc	total d/M	10^{-6} µci/g	total cc	total d/M	10^{-6} µci/g	total cc	total d/M	10^{-6} µci/g	total cc	total d/M	10^{-6} µci
1	32	133.12	1.20	34	55.76	0.50	29	42.92	0.39	30	22.80	0.21
2	30	134.70	1.21	30	42.15	0.38	33	24.09	0.22	28	58.80	0.53
3	27	130.14	1.17	31	55.80	0.50	27	42.93	0.39	30	24.90	0.22
4	29	136.30	1.23	29	49.59	0.45	29	27.55	0.25	26	40.30	0.36
$\bar{X}$			1.20			0.46			0.31			0.32
S			0.03			0.06			0.09			0.15
n			4			4			4			4
			0.05			0.10			0.14			0.24

1981
~~1981~~ H_3O calculations in Vegetation 2/4/82

H_3O in tomatoes - 40 gram sample - 10 cc H_2O aliquot

Bellbrook

wet weight	dry weight	10 ml water	sample c/m/10cc	blank c/m	net c/m/mL	EFF	sample total c/m H_2O	40 g sample conc (10^{-6} µci/g)
40 g	2.8 g	37.2	9.7	6.8	0.29	0.2682	40.2	0.45
40 g	2.9 g	37.1	10.4	6.6	0.38	0.2488	56.7	0.64
40 g	3.1 g	36.9	12.0	6.7	0.53	0.2495	78.4	0.88
40 g	3.3 g	36.7	12.0	6.2	0.58	0.2455	86.7	0.98

$\bar{x} = 0.74$
$S = 0.24$
$S_{\bar{x}} = 0.38$

Centerville

40 g	4.3 g	35.7	11.7	6.8	0.49	0.2588	67.6	0.76
40 g	3.8 g	36.2	12.9	6.6	0.63	0.2582	88.3	0.99
40 g	3.4 g	36.6	12.3	6.7	0.56	0.2582	79.4	0.89
40 g	3.2 g	36.8	11.9	6.2	0.57	0.2555	82.1	0.92

$\bar{x} = 0.89$
$S = 0.1$
$S_{\bar{x}} = 0.16$

Miamisburg

40 g	3.6 g	36.4	18.4	6.8	1.16	0.2688	157.1	1.77
40 g	4.2 g	35.8	18.4	6.6	1.18	0.2588	163.2	1.84
40 g	3.3 g	36.7	19.0	6.7	1.23	0.2535	178.1	2.01
40 g	3.8 g	36.2	18.9	6.2	1.27	0.2488	184.8	2.08

$\bar{x} = 1.93$
$S = 0.14$
$S_{\bar{x}} = 0.22$

Environmental Level (Brookville)

40 g	3.0 g	37.0	10.0	6.8	0.32	0.2475	47.8	0.54
40 g	2.9 g	37.1	10.3	6.6	0.37	0.2482	55.3	0.62
40 g	3.4 g	36.6	10.0	6.7	0.33	0.2475	48.8	0.55
40 g	3.1 g	36.9	9.9	6.2	0.37	0.2482	55.0	0.62

$\bar{x} = 0.58$
$S = 0.04$
$TS_{\bar{x}} = 0.06$

2/1/83

1982 H_3O Calculation in tomatoes - 50 gm

Location	wet weight	dry weight	total water	Sample c/m/ml	BLANK c/m	net c/m/ml	EFF	Sample total c/m Hydration	50g Sample conc (10^{-6} µci/ml)
Bellbrook	50	10	40	10.2	6.1	0.41	0.2375	69.1	0.62
"	50	5	45	9.3	5.9	0.34	0.2588	59.1	0.53
"	50	10	40	10.3	6.4	0.39	0.2348	66.4	0.6
"	50	6	44	9.5	6.6	0.29	0.2495	51.1	0.46
								$\bar{x}$ =	0.55
								S =	0.07
								$S_{\bar{x}}$ =	0.04
								$TS_{\bar{x}}$ =	0.13
Centerville	50	1	49	9.1	6.1	0.3	0.2508	58.6	0.53
"	50	3	47	9.1	5.9	0.32	0.2588	58.1	0.52
"	50	2	48	9.1	6.4	0.27	0.2542	51.0	0.46
"	50	1	49	8.5	6.6	0.19	0.2555	36.4	0.33
								$\bar{x}$ =	0.46
								S =	0.09
								$S_{\bar{x}}$ =	0.05
								$TS_{\bar{x}}$ =	0.16
Miamisburg	50	3	47	11.8	6.1	0.57	0.2428	110.3	0.99
"	50	4	46	11.2	5.9	0.53	0.2475	98.5	0.89
"	50	3	47	12.4	6.4	0.6	0.2322	121.4	1.09
"	50	3	47	12.8	6.6	0.62	0.2322	125.5	1.13
								$\bar{x}$ =	1.03
								S =	0.11
								$S_{\bar{x}}$ =	0.05
								$TS_{\bar{x}}$ =	0.16
Environmental	50	5	45	10.2	6.1	0.41	0.2215	83.3	0.75
"	50	5	45	9.5	5.9	0.36	0.2268	71.4	0.64
"	50	5	45	9.5	6.4	0.31	0.2241	62.2	0.56
"	50	5	45	8.1	6.6	0.15	0.2655	25.4	0.23
								$\bar{x}$ =	0.55
								S =	0.22
								$S_{\bar{x}}$ =	0.11
								$TS_{\bar{x}}$ =	0.35

BLANK DATA $\bar{x}$ = 6.25 c/m
S = 0.31 c/m

1983 HTO in tomatoes

2/14/84

Location	Gross c/m	Bkg c/m	Net c/m	EFF	Net d/m per 10 mL	total water volume	total weight	Net d/m/g	Net (10^{-6} µci/g)
Harrisburg	14.2	7.2	7.0	0.248	28.2	45.9 ml	50 g	2.59	1.17
	13.4	7.5	5.9	0.251	23.5	46.0 ml	50 g	2.16	0.97
	13.0	7.0	6.0	0.249	24.1	46.1 ml	50 g	2.22	1.0
	13.8	7.1	6.7	0.248	27.0	46.1 ml	50 g	2.49	1.12
		$\bar{x}$ = 7.2		$\bar{x}$ = 0.249					$\bar{x}$ = 1.07
		S = 0.22		S = 0.001					S = 0.1
									$tS_{\bar{x}}$ = 0.16
Centerville	10.0	7.2	2.8	0.251	11.2	47.2 ml	50 g	1.06	0.48
	11.3	7.5	3.8	0.24	15.8	47.3 ml	50 g	1.49	0.67
	10.9	7.0	3.9	0.244	16.0	47.2 ml	50 g	1.51	0.68
	11.2	7.1	4.1	0.244	16.8	47.3 ml	50 g	1.59	0.72
				$\bar{x}$ = 0.245					$\bar{x}$ = 0.64
				S = 0.005					S = 0.11
									$tS_{\bar{x}}$ = 0.18
Bellbrook	11.0	7.2	3.8	0.236	16.1	47.4 ml	50 g	1.53	0.69
	9.9	7.5	2.4	0.25	9.6	47.5 ml	50 g	0.91	0.41
	9.9	7.0	2.9	0.25	11.6	47.6 ml	50 g	1.1	0.5
	10.4	7.1	3.3	0.249	13.3	47.7 ml	50 g	1.27	0.57
				$\bar{x}$ = 0.246					$\bar{x}$ = 0.54
				S = 0.007					S = 0.12
									$tS_{\bar{x}}$ = 0.19
E. L (Brookville)	10.3	7.2	3.1	0.246	12.6	48.0 ml	50 g	1.21	0.55
	10.3	7.5	2.8	0.237	11.8	48.2 ml	50 g	1.14	0.51
	10.4	7.0	3.4	0.249	13.7	48.0 ml	50 g	1.32	0.59
	10.6	7.1	3.5	0.244	14.3	48.1 ml	50 g	1.38	0.62
				$\bar{x}$ = 0.244					$\bar{x}$ = 0.57
				S = 0.005					S = 0.05
									$tS_{\bar{x}}$ = 0.08

1984 HTO in tomatoes

10/29/84

Location	Gross nCi/L	Bkg nCi/L	Net nCi/L	Net nCi/ml	Total H_2O volume (ml)	total weight (gm)	Net (10^{-6} µCi/g)
miamisburg	1.714	1.141	0.573	0.000573	38.2	40	0.55
	1.569	1.159	0.41	0.00041	38.6	40	0.4
	1.555	1.177	0.378	0.000378	38.3	40	0.36
	1.67	1.266	0.404	0.000404	38.4	40	0.39
		$\bar{x}$ = 1.186					$\bar{x}$ = 0.43
		S = 0.056					S = 0.09
							$tS_{\bar{x}}$ = 0.14
Centerville	1.616	1.141	0.475	0.000475	37.8	40	0.45
	1.4	1.159	0.241	0.000241	37.7	40	0.23
	1.452	1.177	0.275	0.000275	37.5	40	0.26
	1.546	1.266	0.28	0.00028	37.7	40	0.26
							$\bar{x}$ = 0.3
							S = 0.1
							$tS_{\bar{x}}$ = 0.16
Bellbrook	1.318	1.141	0.177	0.000177	38.0	40	0.17
	1.347	1.159	0.188	0.000188	37.9	40	0.18
	1.316	1.177	0.139	0.000139	38.1	40	0.13
	1.294	1.266	0.028	0.000028	38.0	40	0.03
							$\bar{x}$ = 0.13
							S = 0.07
							$tS_{\bar{x}}$ = 0.11
E.L. (Brookville)	1.474	1.141	0.333	0.000333	38.3	40	0.32
	1.59	1.159	0.431	0.000431	38.1	40	0.41
	1.414	1.177	0.237	0.000237	36.9	40	0.22
	1.437	1.266	0.171	0.000171	37.7	40	0.16
							$\bar{x}$ = 0.28
							S = 0.11
							$tS_{\bar{x}}$ = 0.18

HTO in Tomatoes - 1985 -

Location	Gross nCi/L	BKg nCi/L	NET nCi/L	Total H_2O volume (ml)	Total weight (g)	Concentration (nCi/g)
Miamisburg	2.85	0.59	2.26	35.9	40	0.002
	2.99	0.57	2.42	35.4	40	0.0021
	28	0.59	2.21	35.9	40	0.002
	2.71	0.56	2.15	35.5	40	0.0019
						$\bar{X}$ = 0.002
						S = 0.00008
						$tS_{\bar{X}}$ =
Centerville	1.28	0.59	0.69	37.9	40	0.00065
	1.31	0.57	0.74	37.6	40	0.0007
	1.33	0.59	0.74	37.8	40	0.0007
	1.28	0.56	0.72	37.6	40	0.00068
						$\bar{X}$ = 0.00068
						S = 0.00002
						$tS_{\bar{X}}$ =
Bellbrook	1.25	0.59	0.66	38.6	40	0.00064
	1.37	0.57	0.8	37.9	40	0.00076
	1.24	0.59	0.65	38.6	40	0.00063
	1.35	0.56	0.79	38.7	40	0.00076
						$\bar{X}$ = 0.0007
						S = 0.00007
						$tS_{\bar{X}}$ =
E.L. (Brookville)	1.35	0.59	0.76	38.2	40	0.00073
	1.21	0.57	0.64	37.8	40	0.0006
	1.3	0.59	0.71	38.4	40	0.00068
	1.21	0.56	0.65	37.6	40	0.00061
						$\bar{X}$ = 0.00066
						S = 0.00006
						$tS_{\bar{X}}$ =

1986 HTO IN TOMATOES
pCi/G

	MIAMISBURG	CENTERVILLE	BELLBROOK	TROTWOOD	FRANKLIN	GERMANTOWN	BROOKVILLE
	1.23	1.02	1.05	1.21	0.96	1.02	0.96
	1.05	1.05	1.00	1.16	1.06	0.98	0.99
	1.10	1.06	0.89	1.13	0.83	0.81	0.85
	1.16	1.01	1.05	1.13	0.96	1.11	1.02
N	4	4	4	4	4	4	4
AVERAGE	1.13	1.03	1.00	1.16	0.95	0.98	0.96
STD DEV	0.08	0.02	0.08	0.04	0.09	0.13	0.07
MINIMUM	1.05	1.01	0.89	1.13	0.83	0.81	0.85
MAXIMUM	1.23	1.06	1.05	1.21	1.06	1.11	1.02
STD ERROR	0.12	0.03	0.12	0.06	0.15	0.20	0.12

INCREMENTAL
CONCENTRATION

AVERAGE	0.18	0.08	0.04	0.20	.00	0.02
MINIMUM	0.09	0.06	-0.06	0.17	-0.12	-0.15
MAXIMUM	0.27	0.10	0.10	0.25	0.10	0.15
STD ERROR	0.17	0.12	0.17	0.13	0.19	0.23

HTO IN TOMATOES 1986

LOCATION	GROSS nCi/L	BKG nCi/L	NET nCi/L	TOTAL H2O VOLUME (ML)	TOTAL WEIGHT (G)	CONC. (pCi/G)
MIAMISBURG	2.09	0.82	1.27	48.3	50	1.22682
MIAMISBURG	1.94	0.85	1.09	48.1	50	1.04858
MIAMISBURG	2.08	0.93	1.15	47.9	50	1.1017
MIAMISBURG	2.07	0.86	1.21	48	50	1.1616
CENTERVILLE	1.9	0.82	1.08	47.3	50	1.02168
CENTERVILLE	1.95	0.85	1.1	47.5	50	1.045
CENTERVILLE	2.05	0.93	1.12	47.1	50	1.05504
CENTERVILLE	1.93	0.86	1.07	47.3	50	1.01222
BELLBROOK	1.92	0.82	1.1	47.8	50	1.0516
BELLBROOK	1.9	0.85	1.05	47.8	50	1.0038
BELLBROOK	1.87	0.93	0.94	47.5	50	0.893
BELLBROOK	1.96	0.86	1.1	47.9	50	1.0538
TROTWOOD	2.07	0.82	1.25	48.2	50	1.205
TROTWOOD	2.06	0.85	1.21	48.1	50	1.16402
TROTWOOD	2.11	0.93	1.18	47.8	50	1.12808
TROTWOOD	2.04	0.86	1.18	48	50	1.1328
FRANKLIN	1.83	0.82	1.01	47.6	50	0.96152
FRANKLIN	1.95	0.85	1.1	48	50	1.056
FRANKLIN	1.8	0.93	0.87	47.9	50	0.83346
FRANKLIN	1.87	0.86	1.01	47.7	50	0.96354

GERMANTOWN	1.89	0.82	1.07	47.7	50	1.02078
GERMANTOWN	1.88	0.85	1.03	47.7	50	0.98262
GERMANTOWN	1.77	0.93	0.84	48	50	0.8064
GERMANTOWN	2.01	0.86	1.15	48.1	50	1.1063
BROOKVILLE	1.83	0.82	1.01	47.7	50	0.96354
BROOKVILLE	1.89	0.85	1.04	47.6	50	0.99008
BROOKVILLE	1.82	0.93	0.89	47.8	50	0.85084
BROOKVILLE	1.93	0.86	1.07	47.7	50	1.02078

1987 HTO IN TOMATOES
pCi/G

	MIAMISBURG	CENTERVILLE	BELLBROOK	TROTWOOD	FRANKLIN	GERMANTOWN	BROOKVILLE
	1.12	0.60	0.51	0.56	0.66	0.54	0.46
	1.06	0.78	0.44	0.61	0.59	0.60	0.43
	1.19	0.64	0.58	0.62	0.56	0.60	0.56
	1.43	0.83	0.72	0.61	0.48	0.56	0.49
N	4	4	4	4	4	4	4
AVERAGE	1.20	0.71	0.56	0.60	0.57	0.57	0.49
STD DEV	0.16	0.11	0.12	0.03	0.07	0.03	0.06
MINIMUM	1.06	0.60	0.44	0.56	0.48	0.54	0.43
MAXIMUM	1.43	0.83	0.72	0.62	0.66	0.60	0.56
STD ERROR	0.26	0.18	0.19	0.04	0.12	0.05	0.09

INCREMENTAL
CONCENTRATION

AVERAGE	0.71	0.23	0.08	0.11	0.09	0.09
MINIMUM	0.57	0.11	-0.04	0.07	-0.003	0.05
MAXIMUM	0.94	0.35	0.23	0.13	0.17	0.11
STD ERROR	0.27	0.20	0.21	0.10	0.15	0.11

HTO IN TOMATOES 1987

LOCATION	GROSS C/M	GROSS D/M	BKG C/M	EFF	TOTAL H2O VOLUME (ML)	TOTAL WEIGHT (G)	CONC. (pCi/G)
MIAMISBURG	16.97	62.97	10	0.27	95.8	100	1.12
MIAMISBURG	16.68	61.86	10	0.27	95	100	1.06
MIAMISBURG	17.38	64.74	10	0.27	95.7	100	1.19
MIAMISBURG	18.94	70.73	10	0.27	94.9	100	1.43
CENTERVILLE	13.56	52.54	10	0.26	95.8	100	0.60
CENTERVILLE	14.7	57.26	10	0.26	94.6	100	0.78
CENTERVILLE	13.85	53.61	10	0.26	95.3	100	0.64
CENTERVILLE	14.98	58.11	10	0.26	95.6	100	0.83
BELLBROOK	13.19	48.82	10	0.27	95.2	100	0.51
BELLBROOK	12.76	47.34	10	0.27	95.8	100	0.44
BELLBROOK	13.64	50.6	10	0.27	95	100	0.58
BELLBROOK	14.51	53.66	10	0.27	95.3	100	0.72
TROTWOOD	13.53	49.62	10	0.27	95.8	100	0.56
TROTWOOD	13.81	50.95	10	0.27	96	100	0.61
TROTWOOD	13.92	50.99	10	0.27	95.6	100	0.62
TROTWOOD	13.87	50.68	10	0.27	96	100	0.61
FRANKLIN	14.27	51.24	10	0.28	95	100	0.66
FRANKLIN	13.86	50.2	10	0.28	93.9	100	0.59
FRANKLIN	13.62	49.4	10	0.28	94.5	100	0.56
FRANKLIN	13.1	47.75	10	0.27	94.7	100	0.48

GERMANTOWN	13.45	49.05	10	0.27	94.8	100	0.54
GERMANTOWN	13.87	50.17	10	0.28	95	100	0.60
GERMANTOWN	13.87	50.18	10	0.28	95.1	100	0.60
GERMANTOWN	13.63	49	10	0.28	94.6	100	0.56
BROOKVILLE	12.88	47.56	10	0.27	95.4	100	0.46
BROOKVILLE	12.72	46.88	10	0.27	94.6	100	0.43
BROOKVILLE	13.58	50.43	10	0.27	94.3	100	0.56
BROOKVILLE	13.1	48.55	10	0.27	95.1	100	0.49

1988 HTO IN TOMATOES
pCi/G

	MIAMISBURG	CENTERVILLE	BELLBROOK	TROTWOOD	FRANKLIN	GERMANTOWN	BROOKVILLE
	0.35	0.01	0.07	0.07	0.13	0.08	0.21
	0.36	0.15	0.06	0.07	0.06	0.09	0.09
	0.33	0.16	0.09	0.04	0.02	0.05	0.15
	0.48	0.07	0.02	0.12	0.05	0.20	0.07
N	4	4	4	4	4	4	4
AVERAGE	0.38	0.10	0.06	0.08	0.06	0.11	0.13
STD DEV	0.07	0.07	0.03	0.03	0.05	0.07	0.06
MINIMUM	0.33	0.01	0.02	0.04	0.02	0.05	0.07
MAXIMUM	0.48	0.16	0.09	0.12	0.13	0.20	0.21
STD ERROR	0.11	0.11	0.05	0.05	0.07	0.10	0.10

INCREMENTAL
CONCENTRATION

AVERAGE	0.25	-0.03	-0.07	-0.05	-0.07	-0.02
MINIMUM	0.20	-0.12	-0.11	-0.09	-0.11	-0.08
MAXIMUM	0.35	0.03	-0.04	-0.01	-0.004	0.07
STD ERROR	0.14	0.15	0.11	0.11	0.12	0.14

HTO IN TOMATOES 1988

LOCATION	GROSS C/M	GROSS D/M	BKG C/M	EFF	TOTAL H2O VOLUME (ML)	TOTAL WEIGHT (G)	CONC. (pCi/G)
MIAMISBURG	10.68	40.38	8.48	0.26	37.8	40	0.35
MIAMISBURG	10.68	40.87	8.48	0.26	37.9	40	0.36
MIAMISBURG	10.52	40.20	8.48	0.26	38	40	0.33
MIAMISBURG	11.39	44.40	8.48	0.26	37.8	40	0.48
CENTERVILLE	8.57	33.08	8.48	0.26	38.1	40	0.01
CENTERVILLE	9.37	35.81	8.48	0.26	38.3	40	0.15
CENTERVILLE	9.48	36.10	8.48	0.26	38	40	0.16
CENTERVILLE	8.88	34.30	8.48	0.26	38.2	40	0.07
BELLBROOK	8.88	33.81	8.48	0.26	38.9	40	0.07
BELLBROOK	8.88	31.70	8.48	0.28	38.7	40	0.06
BELLBROOK	9.06	33.30	8.48	0.27	38.8	40	0.09
BELLBROOK	8.61	32.41	8.48	0.27	38.8	40	0.02
TROTWOOD	8.92	34.50	8.48	0.26	38.7	40	0.07
TROTWOOD	8.92	34.77	8.48	0.26	38.5	40	0.07
TROTWOOD	8.72	33.94	8.48	0.26	38.8	40	0.04
TROTWOOD	9.19	34.72	8.48	0.26	38.7	40	0.12
FRANKLIN	9.24	35.90	8.48	0.26	38.2	40	0.13
FRANKLIN	8.86	33.52	8.48	0.26	38.1	40	0.06
FRANKLIN	8.59	32.52	8.48	0.26	38.3	40	0.02
FRANKLIN	8.77	33.59	8.48	0.26	38.1	40	0.05
GERMANTOWN	8.99	34.28	8.48	0.26	38	40	0.08
GERMANTOWN	9.04	34.88	8.48	0.26	37.9	40	0.09
GERMANTOWN	8.77	34.23	8.48	0.26	38.1	40	0.05
GERMANTOWN	9.70	37.21	8.48	0.26	38.1	40	0.20
BROOKVILLE	9.79	35.83	8.48	0.27	38.4	40	0.21
BROOKVILLE	9.04	34.50	8.48	0.26	38.3	40	0.09
BROOKVILLE	9.37	36.45	8.48	0.26	38.4	40	0.15
BROOKVILLE	8.92	34.10	8.48	0.26	38.2	40	0.07

1989 HTO IN TOMATOES
pCi/G

	MIAMISBURG	CENTERVILLE	BELLBROOK	TROTWOOD	FRANKLIN	GERMANTOWN	BROOKVILLE
	0.10	-0.14	-0.07	-0.12	-0.14	-0.19	-0.12
	0.03	-0.10	0.01	-0.15	-0.07	-0.15	-0.20
	0.04	-0.23	-0.11	-0.17	-0.12	-0.20	-0.18
	0.07	-0.15	-0.06	-0.22	-0.14	-0.16	-0.15
N	4	4	4	4	4	4	4
AVERAGE	0.06	-0.16	-0.05	-0.16	-0.12	-0.17	-0.16
STD DEV	0.03	0.06	0.05	0.04	0.03	0.02	0.04
MINIMUM	0.03	-0.23	-0.11	-0.22	-0.14	-0.20	-0.20
MAXIMUM	0.10	-0.10	0.01	-0.12	-0.07	-0.15	-0.12
STD ERROR	0.05	0.09	0.08	0.07	0.06	0.03	0.06

INCREMENTAL
CONCENTRATION

AVERAGE	0.22	0.01	0.11	-0.00	0.04	-0.01
MINIMUM	0.19	-0.07	0.06	-0.06	0.02	-0.03
MAXIMUM	0.26	0.06	0.18	0.04	0.095	0.01
STD ERROR	0.08	0.11	0.10	0.09	0.08	0.07

HTO IN TOMATOES 1989

LOCATION	GROSS C/M	GROSS D/M	BKG C/M	EFF	TOTAL H2O VOLUME (ML)	TOTAL WEIGHT (G)	CONC. (pCi/G)
MIAMISBURG	9.41	34.33	8.81	0.27	206.5	213.5	0.10
MIAMISBURG	8.99	32.86	8.81	0.27	206.5	213.5	0.03
MIAMISBURG	9.05	33.22	8.81	0.27	206.5	213.5	0.04
MIAMISBURG	9.24	33.79	8.81	0.27	206.5	213.5	0.07
CENTERVILLE	7.93	29.07	8.81	0.27	209	217.5	-0.14
CENTERVILLE	8.16	29.84	8.81	0.27	209	217.5	-0.10
CENTERVILLE	7.32	26.63	8.81	0.27	209	217.5	-0.23
CENTERVILLE	7.87	28.56	8.81	0.28	209	217.5	-0.15
BELLBROOK	8.37	30.46	8.81	0.27	222.2	229.3	-0.07
BELLBROOK	8.90	32.33	8.81	0.28	222.2	229.3	0.01
BELLBROOK	8.14	29.68	8.81	0.27	222.2	229.3	-0.11
BELLBROOK	8.44	30.73	8.81	0.27	222.2	229.3	-0.06
TROTWOOD	8.05	29.21	8.81	0.28	219.9	229	-0.12
TROTWOOD	7.86	28.43	8.81	0.28	219.9	229	-0.15
TROTWOOD	7.71	27.99	8.81	0.28	219.9	229	-0.17
TROTWOOD	7.42	27.07	8.81	0.27	219.9	229	-0.22
FRANKLIN	7.92	29.18	8.81	0.27	273.7	283.7	-0.14
FRANKLIN	8.38	30.72	8.81	0.27	273.7	283.7	-0.07
FRANKLIN	8.03	29.30	8.81	0.27	273.7	283.7	-0.12
FRANKLIN	7.93	29.21	8.81	0.27	273.7	283.7	-0.14
GERMANTOWN	7.64	27.73	8.81	0.28	221.5	228	-0.19
GERMANTOWN	7.86	28.54	8.81	0.28	221.5	228	-0.15
GERMANTOWN	7.57	27.44	8.81	0.28	221.5	228	-0.20
GERMANTOWN	7.78	28.17	8.81	0.28	221.5	228	-0.16
BROOKVILLE	8.08	29.59	8.81	0.27	262.1	271.4	-0.12
BROOKVILLE	7.51	27.25	8.81	0.28	262.1	271.4	-0.20
BROOKVILLE	7.68	27.87	8.81	0.28	262.1	271.4	-0.18
BROOKVILLE	7.84	28.70	8.81	0.27	262.1	271.4	-0.15

1990 HTO IN TOMATOES
pCi/G

	MIAMISBURG	CENTERVILLE	BELLBROOK	TROTWOOD	FRANKLIN	GERMANTOWN	BROOKVILLE
	0.15	-0.16	-0.21	-0.17	-0.07	-0.10	-0.12
	0.14	-0.16	-0.14	-0.15	-0.12	-0.18	-0.18
	0.10	-0.13	-0.17	-0.15	-0.05	-0.08	-0.17
	0.14	-0.12	-0.16	-0.17	-0.18	-0.09	-0.10
N	4	4	4	4	4	4	4
AVERAGE	0.13	-0.14	-0.17	-0.16	-0.11	-0.11	-0.14
STD DEV	0.03	0.02	0.03	0.01	0.06	0.05	0.04
MINIMUM	0.10	-0.16	-0.21	-0.17	-0.18	-0.18	-0.18
MAXIMUM	0.15	-0.12	-0.14	-0.15	-0.05	-0.08	-0.10
STD ERROR	0.04	0.03	0.04	0.01	0.09	0.07	0.06

INCREMENTAL
CONCENTRATION

AVERAGE	0.27	-0.0004	-0.03	-0.02	0.04	0.03
MINIMUM	0.24	-0.02	-0.06	-0.03	-0.04	-0.04
MAXIMUM	0.29	0.02	-0.001	-0.01	0.09	0.06
STD ERROR	0.07	0.07	0.07	0.06	0.11	0.09

HTO IN TOMATOES 1990

LOCATION	GROSS C/M	GROSS D/M	BKG C/M	EFF	TOTAL H2O VOLUME (ML)	TOTAL WEIGHT (G)	CONC. (pCi/G)
MIAMISBURG	9.00	35.53	8.11	0.25	206.5	213.5	0.15
MIAMISBURG	8.91	35.27	8.11	0.25	206.5	213.5	0.14
MIAMISBURG	8.66	34.28	8.11	0.25	206.5	213.5	0.10
MIAMISBURG	8.94	35.49	8.11	0.25	206.5	213.5	0.14
CENTERVILLE	7.21	28.79	8.11	0.25	209	217.5	-0.16
CENTERVILLE	7.19	28.81	8.11	0.25	209	217.5	-0.16
CENTERVILLE	7.35	29.34	8.11	0.25	209	217.5	-0.13
CENTERVILLE	7.41	29.51	8.11	0.25	209	217.5	-0.12
BELLBROOK	6.93	27.74	8.11	0.25	222.2	229.3	-0.21
BELLBROOK	7.29	29.07	8.11	0.25	222.2	229.3	-0.14
BELLBROOK	7.12	28.52	8.11	0.25	222.2	229.3	-0.17
BELLBROOK	7.19	28.55	8.11	0.25	222.2	229.3	-0.16
TROTWOOD	7.14	28.35	8.11	0.25	219.9	229	-0.17
TROTWOOD	7.24	28.78	8.11	0.25	219.9	229	-0.15
TROTWOOD	7.24	29.25	8.11	0.25	219.9	229	-0.15
TROTWOOD	7.15	28.80	8.11	0.25	219.9	229	-0.17
FRANKLIN	7.69	30.57	8.11	0.25	273.7	283.7	-0.07
FRANKLIN	7.41	29.45	8.11	0.25	273.7	283.7	-0.12
FRANKLIN	7.82	30.89	8.11	0.25	273.7	283.7	-0.05
FRANKLIN	7.07	28.10	8.11	0.25	273.7	283.7	-0.18
GERMANTOWN	7.51	29.82	8.11	0.25	221.5	228	-0.10
GERMANTOWN	7.06	28.14	8.11	0.25	221.5	228	-0.18
GERMANTOWN	7.65	30.42	8.11	0.25	221.5	228	-0.08
GERMANTOWN	7.59	30.25	8.11	0.25	221.5	228	-0.09
BROOKVILLE	7.40	28.87	8.11	0.26	262.1	271.4	-0.12
BROOKVILLE	7.08	27.81	8.11	0.25	262.1	271.4	-0.18
BROOKVILLE	7.13	28.07	8.11	0.25	262.1	271.4	-0.17
BROOKVILLE	7.52	29.59	8.11	0.25	262.1	271.4	-0.10

APPENDIX F

TRITIUM IN FISH

Table F.1 Tritium Concentrations (pico–Ci/g) in Fish (1972–1975)

	Location 1 Miamisburg			
Year	X	S	n	LDL
1972	< .1	NA	1	0.1
1973	1.4	NA	4	0.1
1974	< 1.2	NA	3	0.1
1975	2.6	0.42	4	4.4

X = average concentration (pico–Ci/g)
S = standard deviation
n = number of samples
LDL = lower detection limit

[redacted] [illegible] pesticide [illegible]

1975

fish = 2.4×10^{-6} µci/g → MDA = 4.4×10^{-6} µci/g
fish = 3.0×10^{-6} µci/g → MDA = 4.4×10^{-6} µci/g
fish = 3.0×10^{-6} µci/g → MDA = 4.4×10^{-6} µci/g
fish = 2.0×10^{-6} µci/g → MDA = 4.4×10^{-6} µci/g

corn = → MDA = 4.9×10^{-6} µci/g
corn = 2.23×10^{-6} µci/g → MDA = 4.9×10^{-6} µci/g

tomatoes = → MDA = 4.4×10^{-6} µci/g
tomatoes = → MDA = 4.4×10^{-6} µci/g

glass = 4.4×10^{-6} µci/g

milk = 9.3×10^{-6} → MDA = 10.5×10^{-6}
= 3.6×10^{-6} → MDA = 10.5×10^{-6}
= < MDA → MDA = 10.5×10^{-6}

APPENDIX G

TRITIUM IN GRASS

Table G.1 Tritium Concentrations (pico–Ci/g)
in Grass (1972–1991)

	Location 1 Miamisburg			Location 2 Centerville			Location 3 Bellbrook			Location 4 EL			
Year	X	S	n	X	S	n	X	S	n	X	S	n	LDL
1972	49	NA	8	NS			NS			NS			NA
1973	0.5	NA	32	NS			NS			NS			NA
1974	1.5	NA	12	NS			NS			NS			NA
1975	< 4.4	NA	8	NS			NS			NS			4.9
1976	NS			NS			NS			NS			NS
1977	NS			NS			NS			NS			NS
1978	2.15	1.73	26	NS			NS			NS			0.14
1979	1.46	0.44	8	1.02	0.24	8	0.67	0.24	8	0.14	0.05	8	0.03
1980	0.36	0.05	8	0.2	0.09	8	0.17	0.11	8	0.13	0.09	8	0.07
1981	0.67	0.13	8	0.91	0.16	8	0.55	0.17	8	0.38	0.09	8	0.08
1982	1.12	0.19	8	0.87	0.4	8	0.64	0.07	8	0.63	0.16	8	0.04
1983	9.91	2.62	8	0.82	0.15	8	0.79	0.07	8	0.69	0.1	8	0.09
1984	0.43	0.15	8	0.36	0.1	8	0.14	0.12	8	0.2	0.12	8	0.06
1985	0.96	0.1	8	0.5	0.11	8	0.58	0.06	8	0.53	0.09	8	0.02
1986	1.24	0.44	8	1.13	0.17	8	0.82	0.17	8	0.29	0.07	8	0.1
1987	1.28	0.49	8	0.46	1.27	8	−0.32	0.28	8	−0.62	0.59	8	0.1
1988	0.27	0.07	4	0.16	0.25	4	0.38	0.27	4	0.15	0.05	4	0.1
1989	−0.15	0.09	4	−0.36	0.05	4	−0.37	0.08	4	−0.23	0.04	4	0.1
1990	0.09	0.04	4	0.09	0.05	4	0.06	0.05	4	0.1	0.03	4	0.4
1991	1.75	0.16	4	0.99	0.09	4	0.85	0.05	4	0.97	0.11	4	0.1

X = average concentration (pico–Ci/g)
S = standard deviation
n = number of samples
NS = not sampled
NA = not available or not applicable
EL = environmental level
LDL = lower detection limit

Table G.1 (page 2 of 2)

	Location 5 Trotwood			Location 6 Franklin			Location 7 Germantown			
Year	X	S	n	X	S	n	X	S	n	LDL
1972	NS			NS			NS			NA
1973	NS			NS			NS			NA
1974	NS			NS			NS			NA
1975	NS			NS			NS			4.9
1976	NS			NS			NS			NS
1977	NS			NS			NS			NS
1978	NS			NS			NS			0.14
1979	NS			NS			NS			0.03
1980	NS			NS			NS			0.07
1981	NS			NS			NS			0.08
1982	NS			NS			NS			0.04
1983	NS			NS			NS			0.09
1984	NS			NS			NS			0.06
1985	NS			NS			NS			0.02
1986	1.23	0.17	8	0.82	0.1	8	0.77	0.16	8	0.1
1987	−0.07	0.04	8	0.03	0.31	8	−0.34	0.68	8	0.1
1988	0.3	0.19	4	0.27	0.19	4	0.17	0.09	4	0.1
1989	−0.58	0.09	4	−0.09	0.03	4	−0.04	0.04	4	0.1
1990	0.09	0.06	4	0.12	0.04	4	0.11	0.03	4	0.4
1991	1.06	0.12	4	1.02	0.05	4	1.07	0.05	4	0.1

X = average concentration (pico−Ci/g)
S = standard deviation
n = number of samples
NS = not sampled
NA = not available or not applicable
EL = environmental level
LDL = lower detection limit

tritium in Foodstuffs and Vegetation - 1978 3/1/79

GRAPS

Results

Sample	Gross count	BKG	Net count	EFF	cc	Result $\times 10^{-6}$ µCi/g
G10	18.2	13.3	4.9	.1166	10	1.89
11	17.9	13.3	4.6	.0950	10	2.18
12	18.1	13.3	4.8	.1170	10	1.85
13	20.7	13.3	7.4	.1063	10	3.14
14	26.1	13.3	12.8	.0814	10	7.08
15	18.3	15.3	3.0	.3184	1	4.24
16	18.4	13.3	5.1	.1346	10	1.71
17	25.3	13.3	12.0	.0963	10	5.61
17-1	24.3	13.3	11.0	.1043	10	4.75
10	15.3	11.4	3.9	.1526	10	1.11
10-1	13.9	11.4	2.5	.1765	10	.64
11	13.6	11.4	2.2	.1855	10	.53
12	15.0	11.4	3.6	.1313	10	1.24
13	15.3	11.4	3.9	.1964	10	.89
14	14.8	11.4	3.4	.2156	10	1.58
15	15.4	11.4	4.0	.1929	10	.93
16	16.2	11.4	4.8	.1176	10	1.84
17	15.0	11.4	3.6	.1737	10	.93
10	12.2	11.9	0.3	.1855	5	.15 (LDL)
11	16.0	11.9	4.1	.0940	4	4.9
12	11.9	11.9	0	.1710	10	0 (LDL)
13	14.1	8.7	5.4	.3388	5	1.44
14	14.3	8.7	5.6	.3497	4	1.80
15	[illegible]	8.7	4.3	.3570	3	1.84
16	11.2	8.7	2.5	.3577	3	1.07
17	13.9	8.7	5.2	.3083	3	2.53
				Avg =		2.15

$e = 2\sqrt{\frac{6.5}{200}} = \sqrt{(.57)^2 + (.48)^2} = .75$

$= 2.15 \pm .23 \times 10^{-6}$ µCi/g

$- 1.77 \pm .34 \times 10^{-6}$ µCi/g

$= .38 \pm .41 \times 10^{-6}$ µCi/g

$\sqrt{(.23)^2 + (.34)^2}$

	E.L.-1	15.9	11.4	4.5	.0671	10	3.34
(LDL)	E.L.-2	12.3	11.9	.4	.1855	5	.19

Avg = $1.77 \pm \sqrt{(.53)^2 + (.48)^2}$

Avg = $1.77 \pm .72 / (7.5)(.1263)(2.22 \times 10^6)$

Avg = $1.77 \pm .34$

$LDL = 2\sqrt{\frac{11.7}{200}} = \frac{.48}{(.8)(.1872)(2.22 \times 10^6)} = .14 \times 10^{-6}$ µCi/g

tritium in Grass (1979) 2/1/80

(10 gram Samples)

Bellbrook		Centerville (Spring)		Miamisburg		Camden (Fall)		Blank	
Gross C/m	EFF	Gross C/m	EFF	Gross C/m	EFF	Gross C/m	EFF	C/m	EFF
11.2	.2202	14.1	.2363	17.6	.2017	8.7	.2500	8.0	.2766
13.9	.2331	13.5	.2379	13.9	.2186	8.7	.2436	7.8	.2878
11.4	.2387	14.8	.2436	18.4	.2226	8.4	.2492	7.9	.2555
11.6	.2259	14.2	.2267	14.1	.2404	8.5	.2460	8.2	.2669
10.1	.2444	13.1	.2267	13.9	.2299	9.2	.2299	7.7	.2210
10.2	.2331	11.5	.2404	14.9	.2492	8.4	.2371	8.0	.2267
11.3	.2492	12.6	.2323	16.4	.2621	8.8	.2404	8.0	.2468
11.1	.2500	11.5	.2763	13.7	.2476	8.5	.2484	7.8	.2379

Net Results		pci/g ($\times 10^{-6}$)			pci/g ($\times 10^{-6}$)			pci/g ($\times 10^{-6}$)			pci/g (100)
3.3	.2202	.675	6.2	.2263	1.234	9.7	.2017	2.166	0.8	.2500	.144
6.0	.2331	1.159	5.6	.2379	1.060	6.0	.2186	1.236	0.8	.2436	.148
3.5	.2387	.660	6.9	.2436	1.276	10.5	.2226	2.125	0.5	.2492	.090
4.1	.2259	.818	6.3	.2267	1.252	6.2	.2404	1.162	0.6	.2460	.110
2.2	.2444	.405	5.2	.2267	1.033	6.0	.2299	1.176	1.3	.2290	.256
2.3	.2331	.444	3.6	.2404	.675	7.0	.2492	1.265	0.5	.2371	.095
3.4	.2492	.614	4.7	.2323	.911	8.5	.2621	1.461	0.9	.2404	.169
3.2	.2500	.597	3.6	.2763	.686	5.8	.2476	1.055	0.6	.2484	.109
$\bar{x}$	.2368	.669		.2338	1.016		.2340	1.456		.2430	.140
S	.0108	.237		.0068	.242		.0195	.441		.0072	.054
$S_{\bar{x}}$											
$+S_{\bar{x}}$		.198			.202			.369			.045

$\bar{x}$	7.9
S	0.16
$S_{\bar{x}}$	0.057
$+S_{\bar{x}}$	0.13

1980 H in grass (10 cc sample) 3/2/81

Sample	Miamisburg (50g)			Centerville (50g)			Bellbrook (50g)			Environmental Level (50g)		
	total cc	total d/m	10^{-6} μci/g	total cc	Total d/m	10^{-6} μci/g	total cc	total d/m	10^{-6} μci/g	total cc	total d/m	10^{-6} μci
1	30	48.60	0.44	25	23.0	0.21	29	22.04	0.20	30	24.0	0.22
2	26	38.48	0.35	27	36.99	0.33	31	36.89	0.33	32	24.96	0.22
3	29	35.38	0.32	25	24.0	0.22	35	36.40	0.33	29	20.79	0.19
4	27	38.34	0.35	28	35.28	0.32	27	16.74	0.15	30	24.3	0.22
5	28	45.08	0.41	23	16.33	0.15	25	11.50	0.10	24	7.92	0.07
6	23	46.0	0.41	24	8.4	0.08	23	5.52	0.05	26	9.88	0.09
7	26	32.5	0.29	22	11.44	0.10	23	5.29	0.05	24	4.32	0.04
8	24	36.24	0.33	27	17.82	0.16	27	14.58	0.13	25	1.75	0.02
$\bar{X}$		0.36			0.20			0.17			0.13	
S		0.05			0.09			0.11			0.09	
n		8			8			8			8	
$S_{\bar{X}}$		0.04			0.08			0.09			0.08	

Incremental Concentrations - (10^{-6} μci/g)

Location	$\bar{X}$ conc	E.L. conc	Incremental conc	Inc. Min	Inc. Max
Miamisburg	0.36 ± 0.04	0.13 ± 0.08	0.23 ± 0.09	0.16	0.31
Centerville	0.20 ± 0.08	0.13 ± 0.08	0.07 ± 0.11	E.L.	0.2
Bellbrook	0.17 ± 0.09	0.13 ± 0.08	0.04 ± 0.12	E.L.	0.2

Calculations in Vegetation 2/4/82

^3H_2O in grass - 40 gram Sample - 10 cc H_2O aliquot

Bellbrook (IMCP)

	wet weight	dry weight	total water	Sample c/m/10 cc	BLANK c/m	NET c/m/10ml	EFF	Sample total c/m per H_2O Ratio	40 g SAMPLE CONC (10^{-6} μci)
1st	40 g	11.2 g	28.2 g	9.3	6.2	0.31	0.2428	36.0	0.41
1st	40 g	10.9 g	29.1 g	8.9	6.1	0.28	0.2442	38.4	0.38
1st	40 g	11.7 g	28.3 g	9.7	6.0	0.37	0.2382	44.0	0.5
1st	40 g	11.1 g	28.9 g	9.3	6.1	0.32	0.2382	38.8	0.44
2nd	40 g	8.9 g	31.1 g	11.5	6.2	0.53	0.2048	80.5	0.91
2nd	40 g	10.1 g	29.9 g	11.0	6.7	0.43	0.2175	59.1	0.67
2nd	40 g	9.6 g	30.4 g	10.0	6.9	0.31	0.2155	43.7	0.49
2nd	40 g	9.3 g	30.7 g	9.6	5.9	0.37	0.2155	52.7	0.59

$\bar{X} = 0.55$
$S = 0.17$
$t S_{\bar{X}} = 0.14$

BLANK DATA
$\bar{X} = 6.26$ c/m
$S = 0.35$ c/m
$t S_{\bar{X}} = 0.28$ c/m

Centerville

	wet weight	dry weight	total water	Sample c/m/10cc	BLANK c/m	NET c/m/10ml	EFF	Sample total c/m per H_2O	40 g Sample conc (10^{-6} μci)
1st	40 g	15.1 g	24.9 g	12.5	6.2	0.63	0.2128	73.7	0.83
1st	40 g	15.7 g	24.3 g	12.4	6.1	0.63	0.2422	63.2	0.71
1st	40 g	14.2 g	25.8 g	13.4	6.0	0.74	0.2048	93.2	1.05
1st	40 g	14.0 g	26.0 g	11.8	6.1	0.57	0.2355	62.9	0.71
2nd	40 g	11.3 g	28.7 g	12.5	6.2	0.63	0.1815	99.6	1.12
2nd	40 g	12.0 g	25.0 g	12.7	6.7	0.6	0.2121	79.2	0.89
2nd	40 g	9.9 g	30.1 g	11.4	6.9	0.45	0.1716	78.9	0.89
2nd	40 g	11.2 g	28.8 g	12.2	5.9	0.63	0.1935	93.8	1.06

$\bar{X} = 0.91$
$S = 0.16$
$t S_{\bar{X}} = 0.14$

2/4/82

H_3O in Grass - 40 gram Sample - 10 cc H_2O Aliquot

Miamisburg

HALF	wet weight	dry weight	total H_2O	Sample c/m/10cc	BLANK c/m	net c/m/ml	EFF	H_2O Sample total c/m	40 g sample conc (10^{-6} µc
1st	40 g	12.2 g	27.8 g	9.9	6.2	0.37	0.2588	39.7	0.45
1st	40 g	12.0 g	28 g	10.2	6.1	0.41	0.2448	46.9	0.53
1st	40 g	11.2 g	28.8 g	11.5	6.0	0.55	0.2375	66.7	0.75
1st	40 g	11.8 g	28.2 g	11.1	6.1	0.5	0.2562	55.0	0.62
2nd	40 g	8.2 g	31.8 g	10.7	6.2	0.45	0.2215	64.6	0.73
2nd	40 g	8.0 g	32 g	11.5	6.7	0.48	0.2061	74.5	0.84
2nd	40 g	9.8 g	30.2 g	11.5	6.9	0.46	0.2342	59.3	0.67
2nd	40 g	10.4 g	29.6 g	10.7	5.9	0.48	0.2195	64.7	0.73

$\bar{X} = 0.67$
$S = 0.13$
$t s_{\bar{x}} = 0.09$

E.L. (Brookville)

HALF	wet weight	dry weight	total H_2O	Sample c/m/10cc	BLANK c/m	net c/m/ml	EFF	H_2O Sample total c/m	40 g sample conc (10^{-6} µc/ml)
1st	40 g	11.7 g	28.3 g	9.1	6.2	0.29	0.2608	31.5	0.35
1st	40 g	11.6 g	28.4 g	9.6	6.1	0.35	0.2348	42.3	0.48
1st	40 g	12.0 g	28.0 g	7.8	6.0	0.18	0.2582	19.5	0.22
1st	40 g	12.3 g	27.7 g	8.6	6.1	0.25	0.2355	29.4	0.33
2nd	40 g	10.3 g	29.7 g	9.4	6.2	0.32	0.2355	40.4	0.45
2nd	40 g	10.8 g	29.2 g	9.5	6.7	0.28	0.2288	35.7	0.4
2nd	40 g	11.0 g	29.0 g	9.2	6.9	0.23	0.2335	28.6	0.32
2nd	40 g	10.5 g	29.5 g	9.2	5.9	0.33	0.2375	41.0	0.46

$\bar{X} = 0.38$
$S = 0.09$
$t s_{\bar{x}} = 0.07$

1982 H_3O Calculations in grams - 40 gram Samples

Bellbrook

half	wet weight	dry weight	total water	Sample c/m/10 ml	Blank c/m	net c/m/ml	EFF	Sample Total dpm per H_2O mat.	40 g Sample (10 [illegible])
1st	40 g	6.7 g	33.3 g	10.5	6.1	0.44	0.2422	60.5	0.68
1st	40 g	6.8 g	33.2 g	10.1	6.6	0.35	0.2221	52.3	0.59
1st	40 g	7.5 g	32.5 g	10.2	6.0	0.42	0.2528	54.0	0.61
1st	40 g	7.8 g	32.2 g	10.2	6.5	0.37	0.2588	46.0	0.52
2nd	40 g	7.0 g	33.0 g	13.1	6.4	0.67	0.3682	60.0	0.68
2nd	40 g	6.8 g	33.2 g	12.8	6.4	0.64	0.3675	57.8	0.65
2nd	40 g	6.3 g	33.2 g	13.7	6.5	0.72	0.3622	66.0	0.74
2nd	40 g	6.4 g	33.6 g	12.7	6.6	0.61	0.3609	56.8	0.64

$\bar{X} = 0.64$
$S = 0.07$
$S_{\bar{X}} = 0.02$
$tS_{\bar{X}} = 0.05$

Centerville

half	wet weight	dry weight	Total water	Sample c/m/10 ml	Blank c/m	net c/m/ml	EFF	Sample total dpm per H_2O mat	40 g Sample (10 [illegible])
1st	40 g	10.4	29.6	17.3	6.1	1.12	0.2328	142.4	[illegible]
1st	40 g	11.1	28.9	13.3	6.6	0.67	0.2422	79.9	0.9
1st	40 g	10.5	29.5	12.1	6.0	0.61	0.2382	75.5	0.85
1st	40 g	10.6	29.4	16.1	6.5	0.96	0.2395	117.8	1.33
2nd	40 g	10.0	30.0	11.6	6.4	0.52	0.3248	48.0	0.54
2nd	40 g	10.0	30.0	12.7	6.4	0.63	0.3462	54.6	0.61
2nd	40 g	11.1	28.9	12.4	6.5	0.59	0.3395	50.2	0.57
2nd	40 g	10.4	29.6	12.1	6.6	0.55	0.3295	49.4	0.56

$\bar{X} = 0.87$
$S = 0.4$
$S_{\bar{X}} = 0.14$
$tS_{\bar{X}} = 0.33$

1/31/83

Miamisburg

half	wet weight	dry weight	total water	Sample c/m/10ml	Blank c/m	net c/m/ml	EFF	Sample total c/m per kg	40g sample conc (10^{-6} μci)
1st	40g	9.6 g	30.4 g	16.0	6.1	0.99	0.2308	130.4	1.47
1st	40g	10.8 g	29.2 g	15.3	6.6	0.87	0.2348	108.2	1.22
1st	40g	10.8 g	29.2 g	15.1	6.0	0.91	0.2488	106.8	1.2
1st	40g	10.0 g	30.0 g	15.0	6.5	0.85	0.2488	102.5	1.15
2nd	40g	9.0 g	31 g	16.6	6.4	1.02	0.3682	85.9	0.97
2nd	40g	7.1 g	32.9 g	17.3	6.4	1.09	0.3662	97.9	1.1
2nd	40g	8.5 g	31.5 g	17.0	6.5	1.05	0.3642	90.8	1.02
2nd	40g	7.9 g	32.1 g	15.1	6.6	0.85	0.3682	74.1	0.83

$\bar{X} = 1.12$
$S = 0.19$
$S_{\bar{X}} = 0.07$
$+S_{\bar{X}} = 0.17$

Environmental Level

half	wet weight	dry weight	total water	Sample c/m/10ml	Blank c/m	net c/m/ml	EFF	Sample total c/m per kg	40 Sample conc (10^{-6} μ
1st	40g	11.2	28.8	9.8	6.1	0.37	0.2362	45.1	0.2
1st	40g	10.6	29.4	10.0	6.6	0.34	0.2328	42.9	0.4
1st	40g	10.9	29.1	10.4	6.0	0.44	0.2195	58.3	0.6
1st	40g	10.0	30.0	10.1	6.5	0.36	0.2328	46.4	0.5
2nd	40g	9.2	30.8	13.3	6.4	0.69	0.2475	85.9	0.9
2nd	40g	9.8	30.2	12.9	6.4	0.65	0.3162	62.1	0.7
2nd	40g	10.0	30.0	12.6	6.5	0.61	0.3135	58.4	0.6
2nd	40g	11.1	28.9	10.5	6.6	0.39	0.2428	46.4	0.5

$\bar{X} = 0.63$
$S = 0.16$
$S_{\bar{X}} = 0.06$
$+S_{\bar{X}} = 0.14$

1983 ~~H~~ ^3H_2O in Grass

2/14/84

Location	Gross c/m	Bkg c/m	Net c/m	EFF	Net d/m/ml	total H_2O volume	total weight	net d/m/g	Net (10^{-6} µci/g)
Minnisburg (1st half)	83.6	6.6	77	0.188	410	27.5 ml	40 g	28.2	12.7
	81.2	6.9	74.3	0.161	461	26.7 ml	40 g	30.8	13.9
	71.4	6.9	64.5	0.178	362	27.6 ml	40 g	25.0	11.3
	77.8	7.2	70.6	0.199	355	27.1 ml	40 g	24.1	10.9
(2nd half)	53.3	6.8	46.5	0.189	246	28.6 ml	40 g	17.6	7.93
	48.2	6.4	41.8	0.194	215	29.4 ml	40 g	15.8	7.12
	50.6	6.9	43.7	0.177	247	28.9 ml	40 g	17.8	8.02
	49.0	6.6	42.4	0.187	227	29.1 ml	40 g	16.5	7.43
		$\bar{x}$ = 6.8		$\bar{x}$ = 0.184					$\bar{x}$ = 9.91
		S = 0.25		S = 0.0119					S = 2.62
									$ts_{\bar{x}}$ = 2.19
Centerville (1st half)	12.1	6.6	5.5	0.185	29.7	32.6 ml	40 g	2.42	1.09
	10.4	6.9	3.5	0.195	17.9	32.1 ml	40 g	1.44	0.65
	12.1	6.9	5.2	0.192	27.1	31.1 ml	40 g	2.11	0.95
	11.0	7.2	3.8	0.195	19.5	31.3 ml	40 g	1.53	0.69
(2nd half)	12.7	6.8	5.9	0.233	25.3	30.0 ml	40 g	1.9	0.86
	11.6	6.4	5.2	0.232	22.4	29.8 ml	40 g	1.67	0.75
	11.9	6.9	5.0	0.235	21.3	30.1 ml	40 g	1.6	0.72
	12.3	6.6	5.7	0.23	24.8	29.9 ml	40 g	1.85	0.83
		$\bar{x}$ =		$\bar{x}$ = 0.212					$\bar{x}$ = 0.82
		S =		S = 0.022					S = 0.15
									$ts_{\bar{x}}$ = 0.13

Location	Gross c/m	Bkg c/m	Net c/m	eff	Net dm/cm	total H_2O volume	total weight	Net (dm/g)	Net (10^{-6} µc
Bellbrook (1st half)	11.2	6.6	4.6	0.203	22.7	30	40 g	1.7	0.7
	12.3	6.9	5.4	0.208	26.0	30	40 g	1.95	0.88
	11.7	6.9	4.8	0.213	22.5	30	40 g	1.69	0.76
	11.6	7.2	4.4	0.21	21.0	30	40 g	1.58	0.71
(2nd half)	12.4	6.8	5.6	0.215	26.0	27.9	40 g	1.81	0.82
	12.4	6.4	6.0	0.212	28.3	28.2	40 g	2.0	0.9
	11.8	6.9	4.9	0.223	22.0	28.1	40 g	1.55	0.7
	11.8	6.6	5.2	0.222	23.4	28.2	40 g	1.65	0.7
		$\bar{x}$ =		$\bar{x}$ = 0.213					$\bar{x}$ = 0.7
		S =		S = 0.007					S = 0.0
									$tS_{\bar{x}}$ = 0.0
E.L. Brookville (1st half)	11.3	6.6	4.7	0.195	24.1	30	40 g	1.81	0.8
	10.6	6.9	3.7	0.218	17.0	29.5	40 g	1.25	0.5
	11.2	6.9	4.3	0.217	19.8	30	40 g	1.49	0.6
	10.5	7.2	3.3	0.203	16.3	29.6	40 g	1.21	0.5
	11.4	6.8	4.6	0.218	21.1	28.1	40 g	1.48	0.6
	11.8	6.4	5.4	0.216	25.0	28	40 g	1.75	0.7
	11.9	6.9	5.0	0.208	24.0	28.3	40 g	1.7	0.7
	11.2	6.6	4.6	0.222	20.7	28.1	40 g	1.45	0.6
		$\bar{x}$ =		$\bar{x}$ = 0.212					$\bar{x}$ = 0.6
		S =		S = 0.009					S = 0.1
									$tS_{\bar{x}}$ 0.0

1984 HTO in Grass

10/29/84

Location	Gross μCi/L	Bkg μCi/L	Net μCi/L	Net μCi/ml	total H_2O volume (ml)	total weight (gm)	Net (10^{-6} μCi/g)
Williamsburg (1st Half)	1.603	1.247	0.356	0.000356	25.9	40	0.23
	1.678	1.186	0.501	0.000501	27.8	40	0.35
	1.595	1.206	0.389	0.000389	28.3	40	0.28
	1.754	1.171	0.583	0.000583	27.0	40	0.39
(2nd Half)	1.843	1.194	0.649	0.000649	31.0	40	0.5
	1.665	1.127	0.538	0.000538	30.7	40	0.41
	1.971	1.199	0.772	0.000772	30.7	40	0.59
	2.0	1.148	0.852	0.000852	30.6	40	0.65
		$\bar{x}$ = 1.185					$\bar{x}$ = 0.43
		S = 0.037					S = 0.15
							$+s_{\bar{x}}$ = 0.13

Centerville (1st Half)	1.814	1.247	0.567	0.000567	29.2	40	0.41
	1.946	1.186	0.76	0.00076	27.6	40	0.52
	1.521	1.206	0.315	0.000315	26.9	40	0.21
	1.709	1.171	0.538	0.000538	27.4	40	0.37
(2nd Half)	1.462	1.194	0.268	0.000268	32.5	40	0.22
	1.637	1.127	0.51	0.00051	32.7	40	0.42
	1.63	1.199	0.431	0.000431	32.7	40	0.35
	1.6	1.148	0.452	0.000452	32.6	40	0.37
							$\bar{x}$ = 0.36
							S = 0.1
							$+s_{\bar{x}}$ = 0.08

Location	Gross nci/L	BKg nci/L	NET nci/L	NET nci/ml	total H_2O volume (ml)	total weight (gm)	NET (10^{-6} uci/g)
Bellbrook (1st Half)	1.205	1.247	⊖ 0.042	⊖0.000042	30.9	40	⊖ 0.03
	1.197	1.186	0.011	0.000011	28.5	40	0.008
	1.29	1.206	0.084	0.000084	29.0	40	0.06
	1.367	1.171	0.196	0.000196	28.2	40	0.14
(2nd Half)	1.432	1.194	0.238	0.000238	34.6	40	0.21
	1.409	1.127	0.282	0.000282	34.8	40	0.25
	1.388	1.199	0.189	0.000189	33.9	40	0.16
	1.527	1.148	0.379	0.000379	34.2	40	0.32
							$\bar{x}$ = 0.14
							S = 0.12
							$tS_{\bar{x}}$ = 0.1
Brookville (Environmental Level (1st Half)	1.496	1.247	0.249	0.000249	23.6	40	0.15
	1.783	1.186	0.597	0.000597	24.8	40	0.37
	1.693	1.206	0.487	0.000487	24.6	40	0.3
	1.627	1.171	0.456	0.000456	23.7	40	0.27
	1.497	1.194	0.303	0.000303	23.7	40	0.18
	1.428	1.127	0.301	0.000301	24.3	40	0.18
	1.173	1.199	⊖0.026	⊖0.000026	23.2	40	⊖ 0.02
	1.348	1.148	0.2	0.0002	25.3	40	0.13
							$\bar{x}$ = 0.2
							S = 0.12
							$tS_{\bar{x}}$ = 0.1

HTO IN GRASS 1.70.3

11/30/06

Location	Gross pCi/L	BKG pCi/L	NET pCi/L	total H_2O volume (ml)	total weight (g)	NET Concentration (pCi/g)
Miamisburg (1st half)	2.0	0.61	1.39	31.6	40	0.0011
	1.83	0.59	1.24	30.8	40	0.00095
	1.83	0.62	1.21	31.0	40	0.00094
	2.04	0.6	1.44	30.4	40	0.00109
(2nd half)	1.76	0.6	1.16	33.0	40	0.00096
	1.64	0.57	1.07	32.8	40	0.00088
	1.55	0.58	0.97	32.6	40	0.00079
	1.81	0.59	1.22	32.6	40	0.00099
						$\bar{x}$ = 0.00096
						S = 0.0001
						$tS_{\bar{x}}$ = 0.00008
Centerville (1st half)	1.45	0.61	0.84	27.7	40	0.00058
	1.4	0.59	0.81	27.2	40	0.00055
	1.39	0.62	0.77	28.4	40	0.00055
	1.49	0.6	0.89	28.6	40	0.00064
(2nd half)	1.42	0.6	0.82	25.3	40	0.00052
	1.09	0.57	0.52	25.4	40	0.00033
	1.13	0.58	0.55	24.4	40	0.00034
	1.35	0.59	0.76	24.4	40	0.00046
						$\bar{x}$ = 0.0005
						S = 0.00011
						$tS_{\bar{x}}$ = 0.00009

H3O in grass (1985)

- 2 -

Location	Gross pCi/L	Bkg pCi/L	Net pCi/L	Total Pro. volume (ml)	Total weight (g)	Net Concentration (pCi/g)
Bellbrook (1st half)	1.4	0.61	0.79	33.6	40	0.00066
	1.23	0.59	0.64	33.4	40	0.00053
	1.28	0.62	0.66	33.7	40	0.00056
	1.22	0.6	0.62	33.8	40	0.00052
(2nd half)	1.33	0.6	0.73	28.8	40	0.00053
	1.49	0.57	0.92	29.4	40	0.00068
	1.37	0.58	0.79	27.9	40	0.00055
	1.51	0.59	0.92	27.5	40	0.00063
						$\bar{x} = 0.00058$
						$S = 0.00006$
						$tS_{\bar{x}} = 0.00005$
E. L. Brookville (1st half)	1.2	0.61	0.59	31.2	40	0.00046
	1.78	0.59	0.59	31.8	40	0.00047
	1.23	0.62	0.61	31.5	40	0.00048
	1.19	0.6	0.59	31.4	40	0.00046
(2nd half)	1.36	0.6	0.76	28.7	40	0.00055
	1.58	0.57	1.01	29.1	40	0.00073
	1.34	0.58	0.76	27.7	40	0.00053
	1.34	0.59	0.75	27.6	40	0.00052
						$\bar{x} = 0.00053$
						$S = 0.00009$
						$tS_{\bar{x}} = 0.00008$

1986 HTO IN GRASS
pCi/G

	MIAMISBURG	CENTERVILLE	BELLBROOK	TROTWOOD	FRANKLIN	GERMANTOWN	BROOKVILLE
	1.69	1.26	0.95	1.38	0.94	0.83	0.35
	1.61	1.23	0.97	1.40	0.98	0.99	0.31
	1.64	1.28	0.94	1.32	0.85	0.97	0.36
	1.65	1.34	1.05	1.42	0.79	0.88	0.35
	0.93	0.99	0.67	1.03	0.66	0.65	0.25
	0.92	0.96	0.66	1.08	0.78	0.62	0.17
	0.70	1.04	0.71	1.07	0.76	0.62	0.28
	0.81	0.93	0.63	1.14	0.76	0.63	0.23
N	8	8	8	8	8	8	8
AVERAGE	1.24	1.13	0.82	1.23	0.82	0.77	0.29
STD DEV	0.44	0.17	0.17	0.17	0.10	0.16	0.07
MINIMUM	0.70	0.93	0.63	1.03	0.66	0.62	0.17
MAXIMUM	1.69	1.34	1.05	1.42	0.98	0.99	0.36
STD ERROR	0.37	0.14	0.14	0.14	0.09	0.14	0.06

INCREMENTAL
CONCENTRATION

AVERAGE	0.95	0.84	0.53	0.94	0.53	0.49
MINIMUM	0.41	0.64	0.34	0.74	0.37	0.33
MAXIMUM	1.40	1.06	0.76	1.13	0.69	0.70
STD ERROR	0.37	0.15	0.15	0.15	0.10	0.15

HTO IN GRASS 1986

LOCATION	GROSS nCi/L	BKG nCi/L	NET nCi/L	TOTAL H2O VOLUME (ML)	TOTAL WEIGHT (G)	CONC. (pCi/G)
MIAMISBURG	3.37	0.89	2.48	27.24	40	1.68888
	3.36	0.89	2.47	26	40	1.6055
	3.27	0.9	2.37	27.68	40	1.64004
	3.3	0.87	2.43	27.18	40	1.651185
	2.65	0.71	1.94	19.08	40	0.92538
	2.73	0.73	2	18.46	40	0.923
	2.61	0.7	1.91	14.56	40	0.69524
	2.62	0.68	1.94	16.64	40	0.80704
CENTERVILLE	2.77	0.89	1.88	26.9	40	1.2643
	2.66	0.89	1.77	27.8	40	1.23015
	2.74	0.9	1.84	27.74	40	1.27604
	2.76	0.87	1.89	28.46	40	1.344735
	2.21	0.71	1.5	26.47	40	0.992625
	2.22	0.73	1.49	25.65	40	0.955462
	2.23	0.7	1.53	27.27	40	1.043077
	2.15	0.68	1.47	25.37	40	0.932347
BELLBROOK	2.27	0.89	1.38	27.6	40	0.9522
	2.27	0.89	1.38	28	40	0.966
	2.27	0.9	1.37	27.5	40	0.941875
	2.3	0.87	1.43	29.3	40	1.047475
	1.65	0.71	0.94	28.33	40	0.665755
	1.64	0.73	0.91	29.15	40	0.663162
	1.72	0.7	1.02	27.98	40	0.71349

	1.6	0.68	0.92	27.33	40	0.63319
TROTWOOD	2.93	0.89	2.04	27.06	40	1.38006
	2.84	0.89	1.95	28.8	40	1.404
	2.77	0.9	1.87	28.34	40	1.324895
	2.8	0.87	1.93	29.5	40	1.423375
	2.1	0.71	1.39	29.7	40	1.032075
	2.11	0.73	1.38	31.24	40	1.07778
	2.12	0.7	1.42	30.24	40	1.07352
	2.14	0.68	1.46	31.15	40	1.136975
FRANKLIN	2.37	0.89	1.48	25.4	40	0.9398
	2.37	0.89	1.48	26.5	40	0.9805
	2.31	0.9	1.41	24.2	40	0.85305
	2.24	0.87	1.37	23	40	0.78775
	2.08	0.71	1.37	19.36	40	0.66308
	2.16	0.73	1.43	21.83	40	0.780422
	2.11	0.7	1.41	21.61	40	0.761752
	2.13	0.68	1.45	21.03	40	0.762337
GERMANTOWN	2.13	0.89	1.24	26.9	40	0.8339
	2.33	0.89	1.44	27.6	40	0.9936
	2.31	0.9	1.41	27.5	40	0.969375
	2.25	0.87	1.38	25.4	40	0.8763
	1.58	0.71	0.87	30.02	40	0.652935
	1.6	0.73	0.87	28.46	40	0.619005
	1.53	0.7	0.83	29.79	40	0.618142
	1.54	0.68	0.86	29.31	40	0.630165
BROOKVILLE	1.58	0.89	0.69	20.55	40	0.354487
	1.61	0.89	0.72	17.22	40	0.30996
	1.63	0.9	0.73	19.78	40	0.360985
	1.56	0.87	0.69	20.31	40	0.350347
	1.09	0.71	0.38	26.26	40	0.24947
	0.97	0.73	0.24	29.07	40	0.17442
	1.11	0.7	0.41	27.31	40	0.279927
	1	0.68	0.32	29.16	40	0.23328

1987 HTO IN GRASS
pCi/G

	MIAMISBURG	CENTERVILLE	BELLBROOK	TROTWOOD	FRANKLIN	GERMANTOWN	BROOKVILLE
	0.94	-0.65	-0.33	-0.01	-0.26	-0.99	-0.79
	0.92	-0.48	-0.67	-0.10	-0.27	-1.08	-1.27
	0.69	-0.54	-0.62	-0.02	-0.21	-0.95	-1.33
	0.76	-1.18	-0.62	-0.10	-0.27	-0.87	-1.21
	1.73	1.69	-0.11	-0.09	0.34	0.26	-0.14
	1.81	1.57	-0.01	-0.10	0.30	0.27	-0.06
	1.66	1.67	-0.08	-0.11	0.35	0.32	-0.09
	1.70	1.62	-0.09	-0.03	0.29	0.33	-0.04
N	8	8	8	8	8	8	8
AVERAGE	1.28	0.46	-0.32	-0.07	0.03	-0.34	-0.62
STD DEV	0.49	1.27	0.28	0.04	0.31	0.68	0.59
MINIMUM	0.69	-1.18	-0.67	-0.11	-0.27	-1.08	-1.33
MAXIMUM	1.81	1.69	-0.01	-0.01	0.35	0.33	-0.04
STD ERROR	0.41	1.06	0.24	0.04	0.26	0.57	0.50

INCREMENTAL
CONCENTRATION

AVERAGE	1.89	1.08	0.30	0.55	0.65	0.28
MINIMUM	1.31	-0.56	-0.05	0.50	0.35	-0.46
MAXIMUM	2.43	2.30	0.61	0.61	0.96	0.94
STD ERROR	0.64	1.17	0.55	0.50	0.56	0.75

HTO IN GRASS 1987

LOCATION	SAMPLE RESULT (LOG #1)	SAMPLE RESULT (LOG #2)	SAMPLE RESULT (C/M)	BACK-GROUND (C/M)	EFF	TOTAL H2O VOLUME (ML)	TOTAL WEIGHT (G)	CONC. (pCi/G)
MIAMISBURG	0.832	2.603	18.47	9.66	0.32	30.4	40	0.94
	0.838	2.537	18.60	9.66	0.33	30.1	40	0.92
	0.692	2.619	15.36	9.66	0.26	28.5	40	0.69
	0.752	2.638	16.69	9.66	0.29	27.5	40	0.76
	1.061	3.522	23.55	8.90	0.30	31.5	40	1.73
	1.07	3.533	23.75	8.90	0.30	32.8	40	1.81
	1.079	3.552	23.95	8.90	0.30	29.7	40	1.66
	1.072	3.51	23.80	8.90	0.31	31	40	1.70
CENTERVILLE	0.235	1.073	5.22	9.66	0.22	28.3	40	-0.65
	0.275	1.053	6.11	9.66	0.26	31.1	40	-0.48
	0.275	1.299	6.11	9.66	0.21	28.6	40	-0.54
	0.207	1.351	4.60	9.66	0.15	31.7	40	-1.18
	1.087	3.622	24.13	8.90	0.30	29.5	40	1.69
	1.045	3.459	23.20	8.90	0.30	29.5	40	1.57
	1.071	3.529	23.78	8.90	0.30	30.2	40	1.67
	1.079	3.576	23.95	8.90	0.30	28.8	40	1.62
BELLBROOK	0.328	1.299	7.28	9.66	0.25	30.7	40	-0.33
	0.248	1.163	5.51	9.66	0.21	30.6	40	-0.67
	0.286	1.525	6.35	9.66	0.19	31.1	40	-0.62
	0.28	1.427	6.22	9.66	0.20	31.4	40	-0.62
	0.342	1.133	7.59	8.90	0.30	23	40	-0.11
	0.398	1.304	8.84	8.90	0.31	25.7	40	-0.01
	0.36	1.167	7.99	8.90	0.31	23.3	40	-0.08

	0.354	1.158	7.86	8.90	0.31	23.7	40	-0.09
TROTWOOD	0.43	1.251	9.55	9.66	0.34	27.3	40	-0.01
	0.392	1.117	8.70	9.66	0.35	31.1	40	-0.10
	0.428	1.252	9.50	9.66	0.34	31.2	40	-0.02
	0.389	1.218	8.64	9.66	0.32	28.5	40	-0.10
	0.364	1.266	8.08	8.90	0.29	28.1	40	-0.09
	0.36	1.246	7.99	8.90	0.29	27.9	40	-0.10
	0.356	1.221	7.90	8.90	0.29	29.3	40	-0.11
	0.388	1.328	8.61	8.90	0.29	29.5	40	-0.03
FRANKLIN	0.338	1.279	7.50	9.66	0.26	28	40	-0.26
	0.338	1.41	7.50	9.66	0.24	26.6	40	-0.27
	0.357	1.372	7.93	9.66	0.26	28.1	40	-0.21
	0.334	1.269	7.41	9.66	0.26	27.6	40	-0.27
	0.523	1.725	11.61	8.90	0.30	33.8	40	0.34
	0.508	1.661	11.28	8.90	0.31	34.2	40	0.30
	0.529	1.732	11.74	8.90	0.31	33	40	0.35
	0.505	1.683	11.21	8.90	0.30	33.7	40	0.29
GERMANTOWN	0.257	1.977	5.71	9.66	0.13	28.9	40	-0.99
	0.243	1.838	5.39	9.66	0.13	29.6	40	-1.08
	0.255	1.876	5.66	9.66	0.14	28.8	40	-0.95
	0.272	1.987	6.04	9.66	0.14	29.1	40	-0.87
	0.515	1.684	11.43	8.90	0.31	27.6	40	0.26
	0.524	1.709	11.63	8.90	0.31	26.9	40	0.27
	0.541	1.785	12.01	8.90	0.30	27.5	40	0.32
	0.547	1.816	12.14	8.90	0.30	26.9	40	0.33
BROOKVILLE	0.223	1.061	4.95	9.66	0.21	31.4	40	-0.79
	0.214	1.38	4.75	9.66	0.14	31.1	40	-1.27
	0.219	1.692	4.86	9.66	0.13	31.9	40	-1.33
	0.226	1.685	5.02	9.66	0.13	31.1	40	-1.21
	0.341	1.118	7.57	8.90	0.31	28.1	40	-0.14
	0.374	1.229	8.30	8.90	0.30	26	40	-0.06
	0.357	1.173	7.93	8.90	0.30	26.3	40	-0.09
	0.382	1.247	8.48	8.90	0.31	25.4	40	-0.04

1988 HTO IN GRASS
pCi/G

	MIAMISBURG	CENTERVILLE	BELLBROOK	TROTWOOD	FRANKLIN	GERMANTOWN	FAYETTEVILLE
	0.35	-0.06	0.27	0.16	0.24	0.22	0.12
	0.20	0.05	0.22	0.58	0.53	0.05	0.13
	0.31	0.52	0.24	0.22	0.22	0.15	0.22
	0.23	0.11	0.79	0.25	0.10	0.26	0.10
N	4	4	4	4	4	4	4
AVERAGE	0.27	0.16	0.38	0.30	0.27	0.17	0.15
STD DEV	0.07	0.25	0.27	0.19	0.19	0.09	0.05
MINIMUM	0.20	-0.06	0.22	0.16	0.10	0.05	0.10
MAXIMUM	0.35	0.52	0.79	0.58	0.53	0.26	0.22
STD ERROR	0.11	0.40	0.43	0.30	0.30	0.14	0.09

INCREMENTAL
CONCENTRATION

AVERAGE	0.12	0.01	0.24	0.16	0.13	0.03
MINIMUM	0.05	-0.20	0.08	0.02	-0.05	-0.09
MAXIMUM	0.20	0.38	0.64	0.44	0.39	0.11
STD ERROR	0.14	0.41	0.44	0.31	0.31	0.17

HTO IN GRASS 1988

LOCATION	SAMPLE RESULT (LOG #1)	SAMPLE RESULT (LOG #2)	SAMPLE RESULT (C/M)	BACK-GROUND (C/M)	EFF	TOTAL H2O VOLUME (ML)	TOTAL WEIGHT (G)	CONC. (pCi/G)
MIAMISBURG	0.395	5.961	8.77	8.11	0.07	31.3	40	0.35
	0.393	3.542	8.72	8.11	0.11	31.6	40	0.20
	0.4	4.443	8.88	8.11	0.09	32	40	0.31
	0.388	5.11	8.61	8.11	0.08	30.9	40	0.23
CENTERVILLE	0.355	2.91	7.88	8.11	0.12	27	40	-0.06
	0.377	2.4	8.37	8.11	0.16	29.2	40	0.05
	0.441	4.04	9.79	8.11	0.11	30.2	40	0.52
	0.382	3.325	8.48	8.11	0.11	29.9	40	0.11
BELLBROOK	0.444	2.054	9.86	8.11	0.22	29.6	40	0.27
	0.4	3.308	8.88	8.11	0.12	31.3	40	0.22
	0.425	2.335	9.43	8.11	0.18	29.7	40	0.24
	0.581	2.83	12.90	8.11	0.21	30.1	40	0.79
TROTWOOD	0.411	2.266	9.12	8.11	0.18	26	40	0.16
	0.595	2.456	13.21	8.11	0.24	24.6	40	0.58
	0.441	1.822	9.79	8.11	0.24	28.3	40	0.22
	0.437	2.131	9.70	8.11	0.21	28.3	40	0.25
FRANKLIN	0.433	2.036	9.61	8.11	0.21	30	40	0.24
	0.535	2.41	11.88	8.11	0.22	28	40	0.53
	0.408	3.019	9.06	8.11	0.14	27.9	40	0.22
	0.396	1.669	8.79	8.11	0.24	29.6	40	0.10

GERMANTOWN	0.427	2.249	9.48	8.11	0.19	27.2	40	0.22
	0.38	1.987	8.44	8.11	0.19	28.6	40	0.05
	0.417	1.8	9.26	8.11	0.23	26.9	40	0.15
	0.445	2.017	9.88	8.11	0.22	28.8	40	0.26
FAYETTEVILLE	0.41	1.581	9.10	8.11	0.26	28.3	40	0.12
	0.415	1.64	9.21	8.11	0.25	27.1	40	0.13
	0.445	1.807	9.88	8.11	0.25	27.8	40	0.22
	0.4	1.731	8.88	8.11	0.23	27.9	40	0.10

1989 HTO IN GRASS
pCi/G

	MIAMISBURG	CENTERVILLE	BELLBROOK	TROTWOOD	FRANKLIN	GERMANTOWN	BROOKVILLE
	-0.08	-0.30	-0.28	-0.65	-0.10	-0.01	-0.19
	-0.28	-0.39	-0.39	-0.67	-0.08	-0.03	-0.28
	-0.13	-0.35	-0.35	-0.52	-0.05	-0.04	-0.23
	-0.09	-0.40	-0.48	-0.49	-0.12	-0.10	-0.25
N	4	4	4	4	4	4	4
AVERAGE	-0.15	-0.36	-0.37	-0.58	-0.09	-0.04	-0.23
STD DEV	0.09	0.05	0.08	0.09	0.03	0.04	0.04
MINIMUM	-0.28	-0.40	-0.48	-0.67	-0.12	-0.10	-0.28
MAXIMUM	-0.08	-0.30	-0.28	-0.49	-0.05	-0.01	-0.19
STD ERROR	0.15	0.07	0.13	0.15	0.04	0.06	0.06

INCREMENTAL
CONCENTRATION

AVERAGE	0.09	-0.12	-0.14	-0.35	0.15	0.19
MINIMUM	-0.05	-0.17	-0.24	-0.44	0.12	0.14
MAXIMUM	0.16	-0.06	-0.04	-0.25	0.182	0.23
STD ERROR	0.16	0.09	0.14	0.16	0.07	0.08

HTO IN GRASS 1989

LOCATION	GROSS C/M	GROSS D/M	BKG C/M	EFF	TOTAL H2O VOLUME (ML)	TOTAL WEIGHT (G)	CONC. (pCi/G)
MIAMISBURG	7.78	43.36	8.17	0.18	156.2	200	-0.08
MIAMISBURG	6.80	39.76	8.17	0.17	156.2	200	-0.28
MIAMISBURG	7.42	37.69	8.17	0.20	156.2	200	-0.13
MIAMISBURG	7.61	34.70	8.17	0.22	156.2	200	-0.09
CENTERVILLE	6.35	29.61	8.17	0.21	156.4	200	-0.30
CENTERVILLE	5.94	29.36	8.17	0.20	156.4	200	-0.39
CENTERVILLE	5.99	27.07	8.17	0.22	156.4	200	-0.35
CENTERVILLE	5.91	29.68	8.17	0.20	156.4	200	-0.40
BELLBROOK	6.56	32.53	8.17	0.20	153.05	200	-0.28
BELLBROOK	5.86	28.60	8.17	0.20	153.05	200	-0.39
BELLBROOK	6.19	32.14	8.17	0.19	153.05	200	-0.35
BELLBROOK	5.80	33.76	8.17	0.17	153.05	200	-0.48
TROTWOOD	5.41	37.65	8.17	0.14	150.88	200	-0.65
TROTWOOD	5.08	32.61	8.17	0.16	150.88	200	-0.67
TROTWOOD	5.46	30.96	8.17	0.18	150.88	200	-0.52
TROTWOOD	5.73	33.60	8.17	0.17	150.88	200	-0.49
FRANKLIN	7.25	27.09	8.17	0.27	126.7	200	-0.10
FRANKLIN	7.41	27.89	8.17	0.27	126.7	200	-0.08
FRANKLIN	7.69	29.35	8.17	0.26	126.7	200	-0.05
FRANKLIN	7.10	26.96	8.17	0.26	126.7	200	-0.12
GERMANTOWN	8.10	30.50	8.17	0.27	150.46	200	-0.01
GERMANTOWN	7.92	29.57	8.17	0.27	150.46	200	-0.03
GERMANTOWN	7.87	28.60	8.17	0.28	150.46	200	-0.04
GERMANTOWN	7.40	27.53	8.17	0.27	150.46	200	-0.10
BROOKVILLE	7.09	36.02	8.17	0.20	150.73	200	-0.19
BROOKVILLE	6.75	38.48	8.17	0.18	150.73	200	-0.28
BROOKVILLE	7.17	47.91	8.17	0.15	150.73	200	-0.23
BROOKVILLE	6.83	37.20	8.17	0.18	150.73	200	-0.25

1990 HTO IN GRASS
pCi/G

	MIAMISBURG	CENTERVILLE	BELLBROOK	TROTWOOD	FRANKLIN	GERMANTOWN	FAYETTEVILLE
	0.08	0.09	0.08	0.14	0.16	0.15	0.11
	0.11	0.16	0.13	0.005	0.13	0.11	0.10
	0.04	0.04	0.01	0.09	0.06	0.08	0.07
	0.12	0.07	0.02	0.13	0.14	0.10	0.14
N	4	4	4	4	4	4	4
AVERAGE	0.09	0.09	0.06	0.09	0.12	0.11	0.10
STD DEV	0.04	0.05	0.05	0.06	0.04	0.03	0.03
MINIMUM	0.04	0.04	0.01	0.005	0.06	0.08	0.07
MAXIMUM	0.12	0.16	0.13	0.14	0.16	0.15	0.14
STD ERROR	0.06	0.08	0.09	0.10	0.07	0.04	0.05

INCREMENTAL
CONCENTRATION

AVERAGE	-0.02	-0.02	-0.05	-0.01	0.02	0.01
MINIMUM	-0.07	-0.07	-0.10	-0.10	-0.05	-0.02
MAXIMUM	0.01	0.06	0.02	0.04	0.05	0.04
STD ERROR	0.07	0.10	0.10	0.11	0.08	0.06

HTO IN GRASS 1990

LOCATION	GROSS C/M	GROSS D/M	BKG C/M	EFF	TOTAL H2O VOLUME (ML)	TOTAL WEIGHT (G)	CONC. (pCi/G)
MIAMISBURG	7.66	33.46	7.12	0.23	113.88	159	0.08
MIAMISBURG	7.93	33.54	7.12	0.24	113.88	159	0.11
MIAMISBURG	7.37	33.99	7.12	0.22	113.88	159	0.04
MIAMISBURG	7.95	34.39	7.12	0.23	113.88	159	0.12
CENTERVILLE	7.79	29.86	7.12	0.26	122.33	166	0.09
CENTERVILLE	8.33	33.74	7.12	0.25	122.33	166	0.16
CENTERVILLE	7.39	31.86	7.12	0.23	122.33	166	0.04
CENTERVILLE	7.61	32.08	7.12	0.24	122.33	166	0.07
BELLBROOK	7.59	34.10	7.12	0.22	132.64	169	0.08
BELLBROOK	7.99	33.01	7.12	0.24	132.64	169	0.13
BELLBROOK	7.17	30.64	7.12	0.23	132.64	169	0.01
BELLBROOK	7.26	30.84	7.12	0.24	132.64	169	0.02
TROTWOOD	8.06	39.83	7.12	0.20	106.5	160	0.14
TROTWOOD	7.15	35.12	7.12	0.20	106.5	160	0.005
TROTWOOD	7.75	35.34	7.12	0.22	106.5	160	0.09
TROTWOOD	8.21	33.34	7.12	0.25	106.5	160	0.13
FRANKLIN	8.06	39.45	7.12	0.20	113.8	149	0.16
FRANKLIN	7.93	37.76	7.12	0.21	113.8	149	0.13
FRANKLIN	7.44	39.72	7.12	0.19	113.8	149	0.06
FRANKLIN	7.90	40.29	7.12	0.20	113.8	149	0.14
GERMANTOWN	7.99	41.11	7.12	0.19	105.7	146	0.15
GERMANTOWN	7.79	39.29	7.12	0.20	105.7	146	0.11
GERMANTOWN	7.66	36.36	7.12	0.21	105.7	146	0.08
GERMANTOWN	7.79	36.85	7.12	0.21	105.7	146	0.10
FAYETTEVILLE	8.01	30.21	7.12	0.27	135.68	187	0.11
FAYETTEVILLE	7.84	32.88	7.12	0.24	135.68	187	0.10
FAYETTEVILLE	7.61	32.15	7.12	0.24	135.68	187	0.07
FAYETTEVILLE	8.13	34.54	7.12	0.24	135.68	187	0.14

1991 HTO IN GRASS
pCi/G

	MIAMISBURG	CENTERVILLE	BELLBROOK	TROTWOOD	FRANKLIN	GERMANTOWN	BROOKVILLE
	1.53	1.04	0.93	0.94	1.03	1.04	0.93
	1.72	1.01	0.83	0.980	1.03	1.14	0.84
	1.92	1.05	0.86	1.13	1.08	1.08	1.05
	1.81	0.86	0.80	1.21	0.95	1.03	1.07
N	4	4	4	4	4	4	4
AVERAGE	1.75	0.99	0.85	1.06	1.02	1.07	0.97
STD DEV	0.16	0.09	0.05	0.12	0.05	0.05	0.11
MINIMUM	1.53	0.86	0.80	0.941	0.95	1.03	0.84
MAXIMUM	1.92	1.05	0.93	1.21	1.08	1.14	1.07
STD ERROR	0.26	0.14	0.09	0.20	0.09	0.07	0.17

INCREMENTAL
CONCENTRATION

AVERAGE	0.77	0.01	-0.12	0.09	0.05	0.10
MINIMUM	0.56	-0.12	-0.17	-0.03	-0.02	0.06
MAXIMUM	0.95	0.07	-0.05	0.23	0.11	0.16
STD ERROR	0.31	0.22	0.19	0.26	0.19	0.19

HTO IN GRASS 1991

LOCATION	GROSS C/M	GROSS D/M	BKG C/M	EFF	TOTAL H2O VOLUME (ML)	TOTAL WEIGHT (G)	CONC. (pCi/G)
MIAMISBURG	16.25	72.75	6.89	0.22	157.7	194.1	1.53
MIAMISBURG	17.38	77.97	6.89	0.22	157.7	194.1	1.72
MIAMISBURG	18.58	83.61	6.89	0.22	157.7	194.1	1.92
MIAMISBURG	17.95	80.10	6.89	0.22	157.7	194.1	1.81
CENTERVILLE	13.24	59.31	6.89	0.22	163.3	201.5	1.04
CENTERVILLE	13.13	58.15	6.89	0.23	163.3	201.5	1.01
CENTERVILLE	13.32	59.35	6.89	0.22	163.3	201.5	1.05
CENTERVILLE	12.11	54.39	6.89	0.22	163.3	201.5	0.86
BELLBROOK	13.06	58.54	6.89	0.22	140.6	189.1	0.93
BELLBROOK	12.43	55.40	6.89	0.22	140.6	189.1	0.83
BELLBROOK	12.62	56.54	6.89	0.22	140.6	189.1	0.86
BELLBROOK	12.24	54.65	6.89	0.22	140.6	189.1	0.80
TROTWOOD	12.83	55.92	6.89	0.23	155.3	192.3	0.94
TROTWOOD	13.01	57.32	6.89	0.23	155.3	192.3	0.98
TROTWOOD	13.85	61.61	6.89	0.22	155.3	192.3	1.13
TROTWOOD	14.36	63.78	6.89	0.23	155.3	192.3	1.21

FRANKLIN	13.17	58.64	6.89	0.22	151.9	186.2	1.03
FRANKLIN	13.23	58.70	6.89	0.23	151.9	186.2	1.03
FRANKLIN	13.49	60.19	6.89	0.22	151.9	186.2	1.08
FRANKLIN	12.70	56.53	6.89	0.22	151.9	186.2	0.95
GERMANTOWN	13.11	59.28	6.89	0.22	162.1	197.4	1.04
GERMANTOWN	13.63	62.15	6.89	0.22	162.1	197.4	1.14
GERMANTOWN	13.45	60.02	6.89	0.22	162.1	197.4	1.08
GERMANTOWN	13.12	58.94	6.89	0.22	162.1	197.4	1.03
BROOKVILLE	13.04	54.21	6.89	0.24	151.1	187.5	0.93
BROOKVILLE	12.32	52.62	6.89	0.23	151.1	187.5	0.84
BROOKVILLE	13.41	59.51	6.89	0.23	151.1	187.5	1.05
BROOKVILLE	13.50	60.20	6.89	0.22	151.1	187.5	1.07

APPENDIX H

TRITIUM IN MILK

Table H.1 Tritium Concentrations
(pico–Ci/g) in Milk (1972–1978)

	Location 1 Miamisburg			Location 2 EL			
Year	X	S	n	X	S	n	LDL
1972	< .1	NA	7	NS			0.1
1973	1.2	NA	12	NS			0.1
1974	0.7	NA	3	NS			0.1
1975	6.45	2.85	2	NS			10.5
1976	0.73	0.01	2	NS			0.29
1977	0.38	0.07	4	NS			0.16
1978	0.41	0.06	2	0.33	0.05	2	0.2

X = average concentration (pico–Ci/g)
S = standard deviation
n = number of samples
NS = not sampled
NA = not available or not applicable
EL = environmental level
LDL = lower detection limit

[illegible] — [illegible]

1975

fish = 2.4×10^{-6} µci/g → MDA = 4.4×10^{-6} µci/g
fish = 3.0×10^{-6} µci/g → MDA = 4.4×10^{-6} µci/g
fish = 3.0×10^{-6} µci/g → MDA = 4.4×10^{-6} µci/g
fish = 2.0×10^{-6} µci/g → MDA = 4.4×10^{-6} µci/g

corn = → MDA = 4.9×10^{-6} µci/g
corn = 2.23×10^{-6} µci/g → MDA = 4.9×10^{-6} µci/g

tomatoes = → MDA = 4.4×10^{-6} µci/g
tomatoes = → MDA = 4.4×10^{-6} µci/g

glass = 4.4×10^{-6} µci/g

milk = 9.3×10^{-6} = → MDA = 10.5×10^{-6}
= 3.6×10^{-6} → MDA = 10.5×10^{-6}
= < MDA → MDA = 10.5×10^{-6}

GENERAL TRITIUM [illegible]
HOW MANY SAMPLES [illegible] BE ENTERED ? 1

SAMPLE VALUES IN GROSS COUNTS PER MINUTE
14.5
14.7
COUNTING EFFICIENCIES OF EACH SAMPLE:
.1505
.1669
BACKGROUND IN COUNTS PER MINUTE: 12.0
SAMPLE VOLUME SIZE:10
COUNTING TIME:100

Milk

[illegible]	[illegible]	[illegible]	
0.000746+0R-	0.000107	0.000110	- Cerates #1
0.000720+0R-	0.000176	0.000177	- local market #2

#

Avg. Conc = .000733 ± .000290 .000294

$.73 \times 10^{-6}$ µci/ml

or

$.73 \times 10^{-6}$ µci/g

µci/L $\times 10^{-3}$ = µci/cc

$.746 \times 10^{-3}$ µci/L $\times 10^{-3}$ = µci/cc $\times 10^{-6}$

$$\frac{\frac{14.5}{.12}}{(10)(.1505)(2.22 \times 10^{6})} = .746 \times 10^{-6}$$

$$\sqrt{\frac{14.5}{100} + \frac{12.0}{100}} = \frac{1.03 \text{ cm}}{(.3)(10)(2.22 \times 10^{6})} = .737 \times 10^{-6}$$

1977 Environmental Monitoring Data 2/24/78

tritium in Milk (10 cc samples) (200 minutes)

	Gross count	BKG	NET COUNT	efficiency	Conc — μci/cc
L-1	13.1 c/m	12.3 c/m	.8	.1319	$\frac{.8}{(10)(.1319)(2.22\times10^6)} = .27\times10^{-6}$
L-2	13.8 c/m	12.3 c/m	1.5	.1492	$\frac{1.5}{(10)(.1492)(2.22\times10^6)} = .45\times10^{-6}$
G-1	13.6 c/m	12.3 c/m	1.3	.1363	$\frac{1.3}{(10)(.1363)(2.22\times10^6)} = .43\times10^{-6}$
G-2	13.5 c/m	12.3 c/m	1.2	.1472	$\frac{1.2}{(10)(.1472)(2.22\times10^6)} = .37\times10^{-6}$
Avg	13.5	12.3 c/m		.1412	$.38\times10^{-6}$ μci

$$LDL = 2\sqrt{\frac{12.3}{200}} = \frac{.50 \text{ c/m}}{(10)(.1412)(2.22\times10^6)} = .16\times10^{-6}$$

Counting Error Calculation

$$\text{Avg} = 2\sqrt{\frac{13.5}{200} + \frac{12.3}{200}} = 2\sqrt{.0675 + .0615} = \frac{.718}{(10)(.1412)(2.22\times10^6)} = .23\times10^{-6} \text{ μci/g}$$

3/2/78

Tritium in Foodstuffs and Vegetation in 1978

Environmental	Gross Counts	Bkg	Net Count	Eff	Result $\times 10^{-6}$ µci/cc	Results Gross counts	Bkg	Net Count	Eff	Results
Milk -	13.2	12	1.2	.1419	$1.2/(10)(.1419)(2.22\times10^6) = .38$	13.4	12	1.4	.1329	$= .47$
(10 cc)	12.9	12	0.9	.1462	$0.9/(10)(.1462)(2.22\times10^6) = .28$	13.1	12	1.1	.1413	$= .35$

LDL - Avg Bkg = 12, 200 min, $2\sqrt{\frac{12}{200}} = .49$ C/m

* Counting LDL only → $.49/(10)(.1441)(2.22\times10^6) = .15\times10^{-6}$ µci/cc

$\sqrt{(.57)^2+(.49)^2} = \sqrt{.26+.24} = .71$

$\bar{X} = .33 \pm .22 \times10^{-6}$ $= \sqrt{(.22)^2+(.23)^2} = .32$

* $LDL = .49/(10)(.1371)(2.22\times10^6) = .16\times10^{-6}$ µci/cc

$LDL = .2\times10^{-6}$ µci/cc

$\sqrt{(.57)^2+(.49)} = .71$

$\bar{X} = .41 \pm .23 \times10^{-6}$

Vegetables	Gross Count	Bkg	Net Count	Eff	Results $\times10^{-6}$ µci/g	Gross Count	Bkg	Net Count	Eff	Results $\times10^{-6}$ µci
C	14.1	12.6	1.5	.1260	$1.5/(10)(.1260)(2.22\times10^6) = .54$	14.5	12.6	1.9	.1093	$1.9/(10)(.1093)(2.22\times10^6) = .78$
T	13.7	12.6	1.1	.1306	$1.1/(10)(.1306)(2.22\times10^6) = .38$	13.4	10.7	2.7	.0997	$2.7/(10)(.0997)(2.22\times10^6) = 1.36$
T	15.1	12.6	2.5	.1390	$2.5/(10)(.1390)(2.22\times10^6) = .81$	13.0	10.7	2.3	.1316	$2.3/(10)(.1316)(2.22\times10^6) = .79$
				.1321					.1095	

LDL - Avg Bkg = 12.0, 200 min, = .49 C/m

$\sqrt{(.57)^2+(.49)^2} = \sqrt{.28+.24} = .72$

$\bar{X} = .58 \pm .25 \times10^{-6}$

$\sqrt{(.25)^2+(.29)^2} = .38$

* $LDL = \frac{.49}{(10)(.1211)(2.22\times10^6)} = .18\times10^{-6}$ µci/cc

$LDL = .2\times10^{-6}$ µci/ml

$\sqrt{(.52)^2+(.49)^2} = .71$

$\bar{X} = .98 \pm .29 \times10^{-6}$