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Aug. - 1985 EAC-417110-132

Rocky Flats Plant

Monthly Environmental Monitoring Report

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AUGUST 1985 ENVIRONMENTAL MONITORING REPORT
ROCKY FLATS PLANT

This is a summary of the effluent and environmental monitoring programs at Rocky Flats Plant for the month of August, 1985.

All average results of monitoring effluent and ambient samples complied with the applicable standards as specified in Executive Order 12088 (rules, regulations and requirements of the Department of Energy).

The data provided in this report are provided as a matter of comity, and should not be construed as an application for a permit or license, or in support of such an application. Approval of the Department of Energy should be obtained prior to publication of any data contained within this report.

For some of the parameters, the concentrations that are measured at or below the minimum detectable concentration (MDC) are assigned to MDC. The less than symbol (<) indicates MDC values and calculated values that include one or more MDC's.

Beginning in January 1981, the plutonium, uranium, americium, and beryllium measured concentrations are reported. These reported concentrations include values that are less than the corresponding calculated MDC's and in some cases, values less than zero. These negative values result when the measured value for the laboratory reagent blank is subtracted from an analytical result which was measured as a smaller value than the reagent blank.

Error terms in the form of a $\pm$ b are included with some of the data. For a single sample, "a" is the reagent-blank corrected value; and term "b" accounts for the statistical counting uncertainty for the associated reagent blanks. These error terms represent a minimum estimate of error for the data. Other analytical and sampling errors are being investigated. These terms will be included as they are determined.

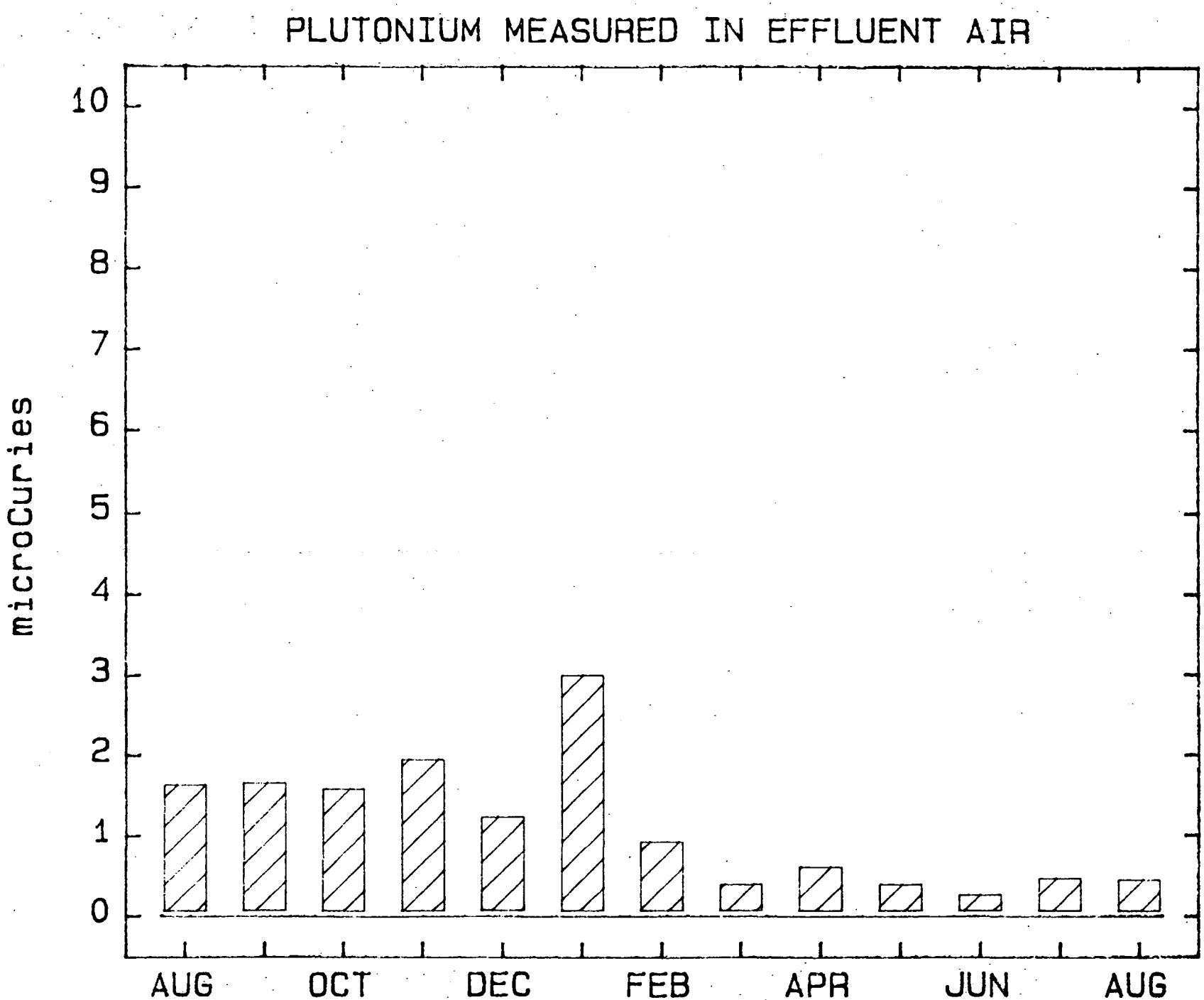
Table I. 1985 Plutonium and Uranium Airborne Effluent Data

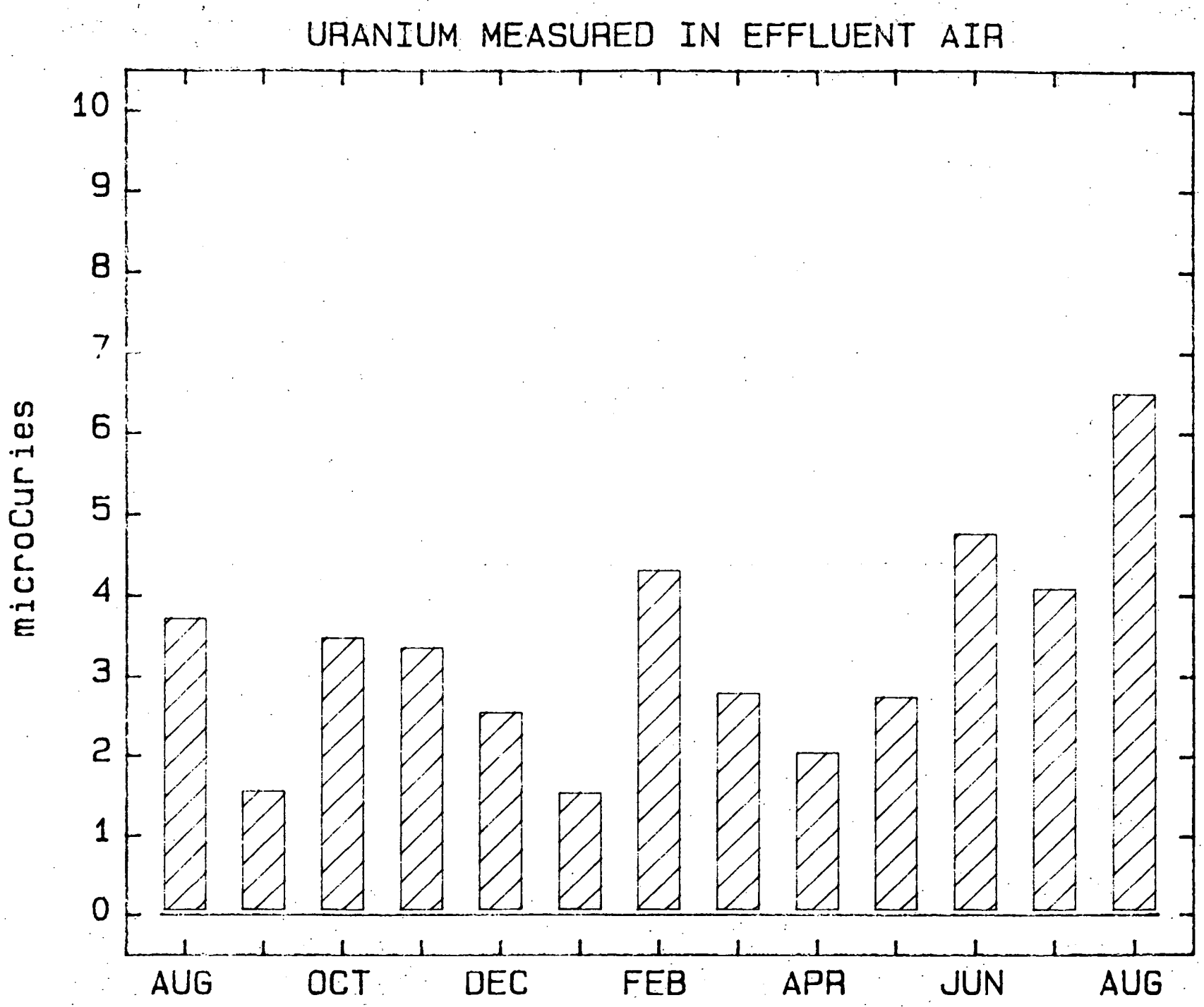
Month	Plutonium Release (uCi)	Plutonium CMax (pCi/m3)	Uranium Release (uCi)	Uranium CMax (pCi/m3)
CY 1984	12.65	0.243 ± 0.023	34.67	0.336 ± 0.0357
January	3.07	0.030 ± 0.006	1.61	0.051 ± 0.018
February	0.99	0.156 ± 0.030	4.39	0.924 ± 0.120
March	0.46	0.002 ± 0.0005	2.87	0.064 ± 0.013
April	0.68	0.002 ± 0.0004	2.12	0.004 ± 0.001
May	0.46	0.002 ± 0.0004	2.82	0.010 ± 0.003
June	0.33	0.003 ± 0.0004	4.84	0.287 ± 0.024
July	0.54	0.003 ± 0.0006	4.16	0.053 ± 0.018
August	0.53*	0.008 ± 0.0009	6.57*	0.023 ± 0.003
Year to Date	7.06	0.156 ± 0.030	22.81	0.924 ± 0.120

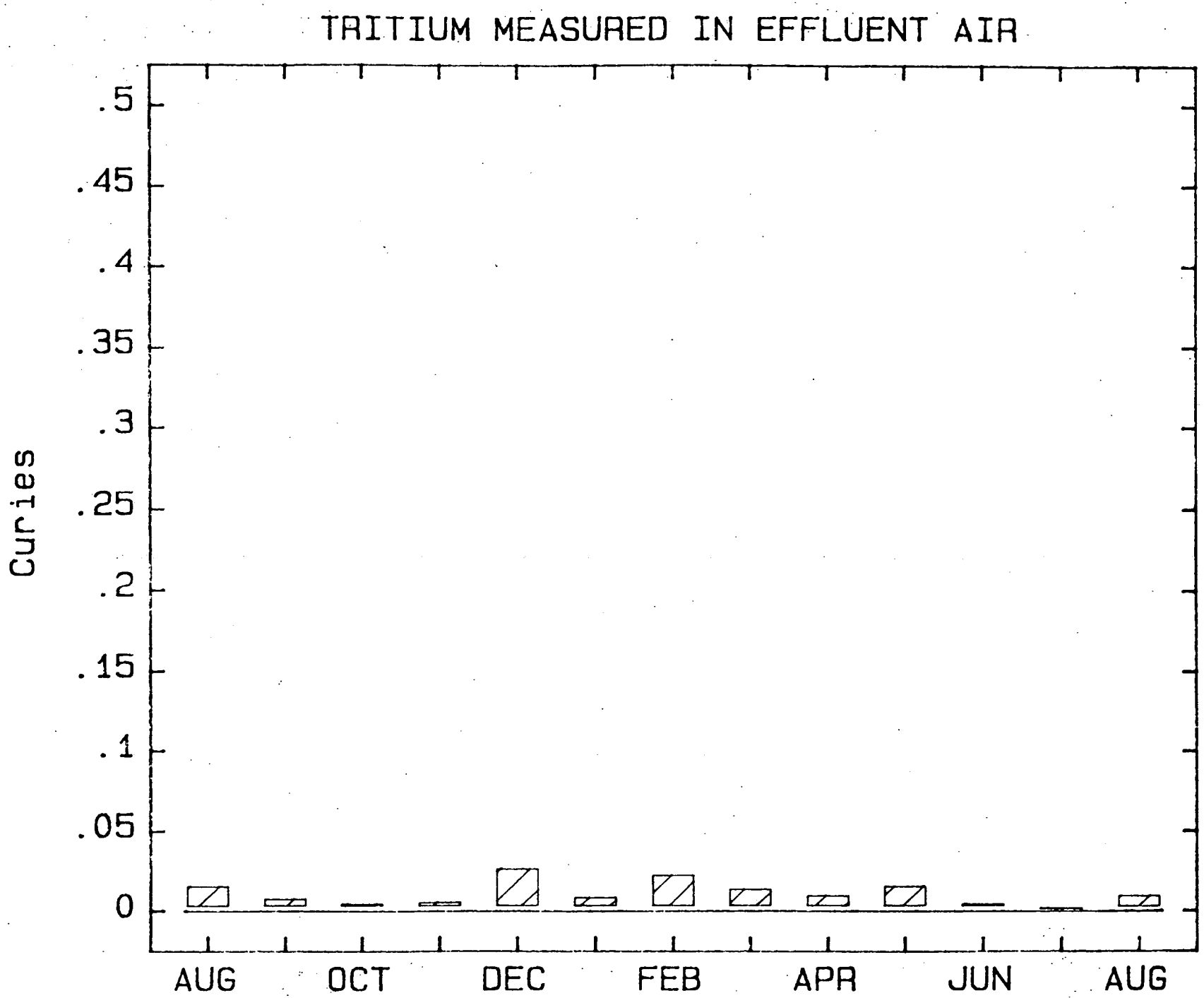
* Analysis incomplete, samples being rerun.

Table II. 1985 Tritium and Beryllium Airborne Effluent Data

Month	Tritium Release (Ci)	Tritium CMax (pCi/m3)	Beryllium Release (gms)	Beryllium CMax (ug/m3)
CY 1984	0.148	570 ± 140	0.327	0.0161
January	0.012	300 ± 80	0.026	0.0016
February	0.026	300 ± 100	0.093	0.0169
March	0.017	450 ± 200	0.030	0.0007
April	0.013	290 ± 60	0.142	0.0010
May	0.019	290 ± 70	0.115	0.0021
June	0.008	240 ± 80	-0.018	0.0023
July	0.003	270 ± 50	0.022	0.0002
August	0.013	270 ± 50	0.004	0.0001
Year to Date	0.111	450 ± 200	0.414	0.0169


PLUTONIUM MEASURED IN EFFLUENT AIR
microCuries
10
9
8
7
6
5
4
3
2
1
0
AUG
OCT
DEC
FEB
APR
JUN
AUG


URANIUM MEASURED IN EFFLUENT AIR
microCuries
10
9
8
7
6
5
4
3
2
1
0
AUG
OCT
DEC
FEB
APR
JUN
AUG


TRITIUM MEASURED IN EFFLUENT AIR
Curies
.5
.45
.4
.35
.3
.25
.2
.15
.1
.05
0
AUG
OCT
DEC
FEB
APR
JUN
AUG

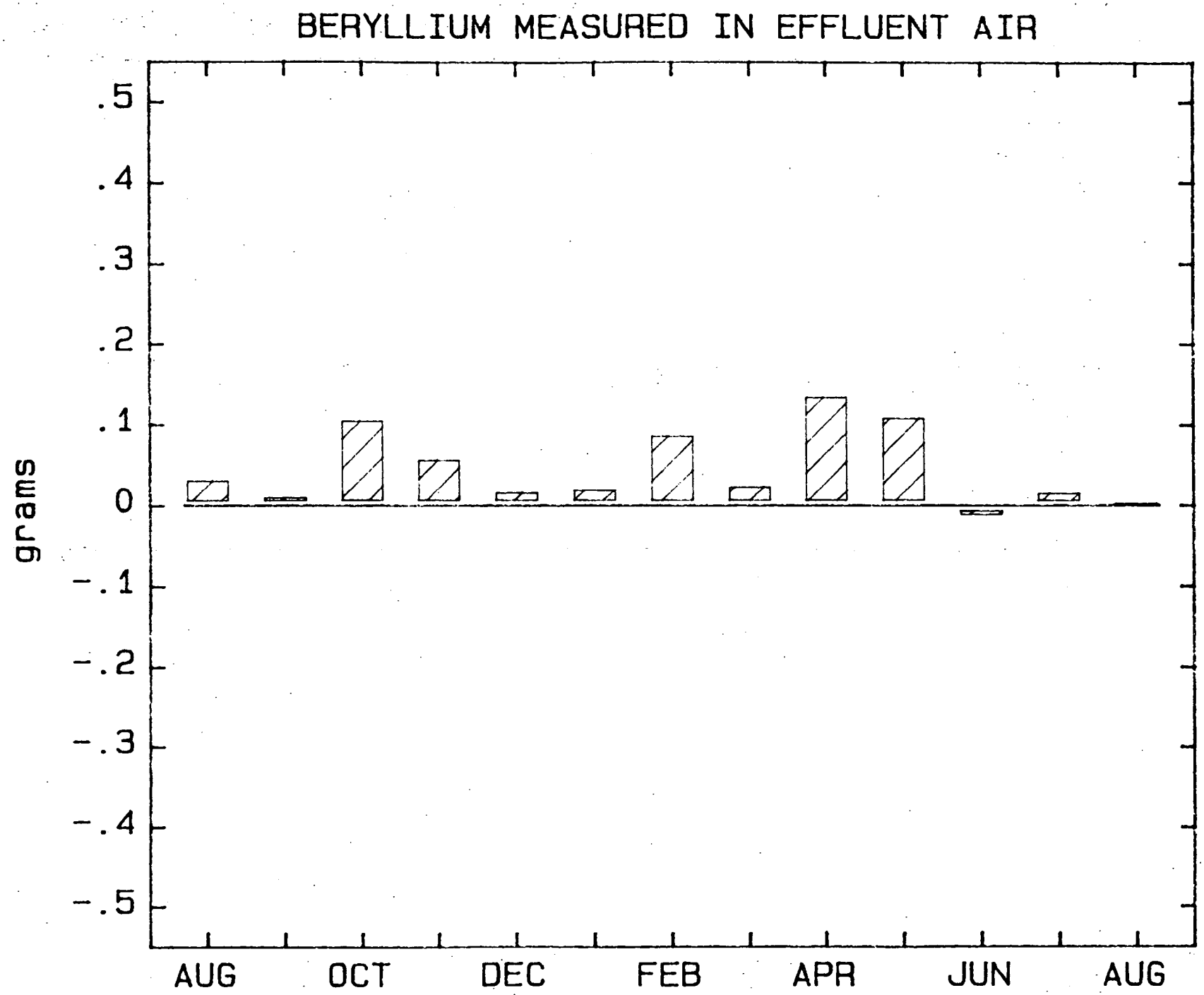

BERYLLIUM MEASURED IN EFFLUENT AIR
grams
.5
.4
.3
.2
.1
0
-.1
-.2
-.3
-.4
-.5
AUG
OCT
DEC
FEB
APR
JUN
AUG

Table III. Plutonium at Selected Onsite Ambient Air Locations (07/31/85-08/27/85)

Location	n	Volume(m^3)	Concentration (pCi/m^3) Lower Confidence Limit	Point Estimate	Upper Confidence Limit
S-5	2	24,000	0.000042	0.000055	0.000068
S-6	2	26,000	0.000051	0.000064	0.000077
S-7	2	31,000	0.000271	0.000303	0.000335
S-8	2	27,000	0.000314	0.000352	0.000390
S-9	2	27,000	0.000353	0.000390	0.000427

NOTE: Total long-lived alpha at the remaining 18 onsite ambient air samplers was below the screening level of 0.01 pCi/m3.

Table IV. Tritium in Ambient Air Water Vapor at Selected Onsite Locations

Location	n	Average Concentration (pCi/l)
S-4	2	- 20 ± 630
S-5	2	110 ± 640
S-16	2	360 ± 650

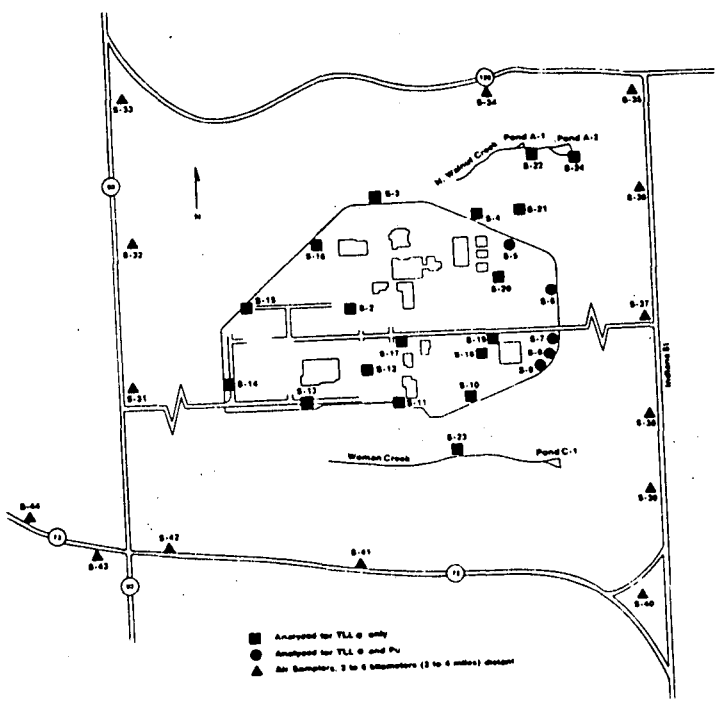


Table III. Plutonium at Selected Onsite Ambient Air Locations (07/02/85-07/31/85)

Location	n	Volume(m^3)	Concentration (pCi/m^3) Lower Confidence Limit	Point Estimate	Upper Confidence Limit
S-5	2	30,000	0.000025	0.000035	0.000045
S-6	2	29,000	0.000035	0.000048	0.000061
S-7	2	34,000	0.000196	0.000220	0.000244
S-8	2	30,000	0.001189	0.001306	0.001423
S-9	2	27,000	0.000450	0.000500	0.000550

NOTE: Total long-lived alpha at the remaining 18 onsite ambient air samplers was below the screening level of 0.01 pCi/m3.

Table IV. Tritium in Ambient Air Water Vapor at Selected Onsite Locations

Location	n	Average Concentration (pCi/l)
S-4	4	240 ± 590
S-5	5	290 ± 660
S-16	5	220 ± 610

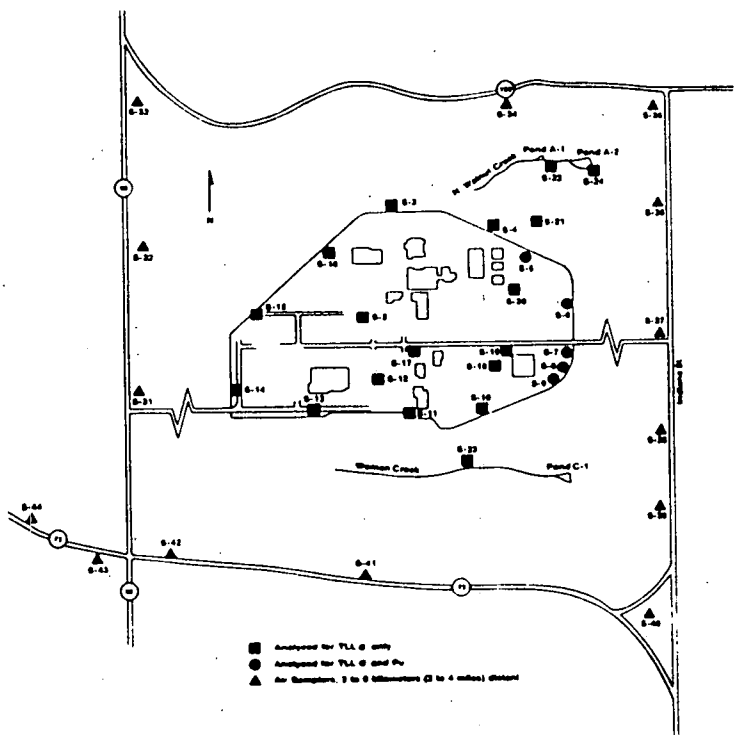


Table III. Plutonium at Selected Onsite Ambient Air Locations
(05/21/85-07/02/85)

Location	n	Volume(m^3)	Concentration (pCi/m^3) Lower Confidence Limit	Point Estimate	Upper Confidence Limit
S-5	2	24,000	0.000015	0.000030	0.000045
S-6	2	27,000	0.000045	0.000064	0.000083
S-7	2	24,000	0.000355	0.000445	0.000535
S-8	2	26,000	0.000474	0.000627	0.000780
S-9	2	16,000	0.000944	0.001169	0.001394

NOTE: Total long-lived alpha at the remaining 18 onsite ambient air samplers was below the screening level of 0.01 pCi/m3.

Table IV. Tritium in Ambient Air Water Vapor at Selected Onsite Locations

Location	n	Average Concentration (pCi/l)
S-4	4	280 ± 660
S-5	4	410 ± 660
S-16	4	130 ± 660

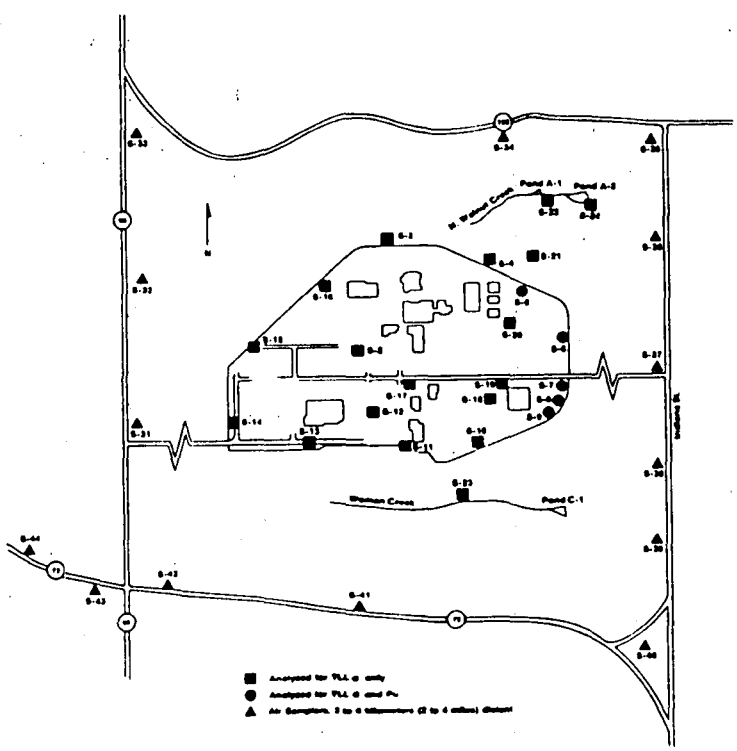


Table III. Plutonium at Selected Onsite Ambient Air Locations
(04/23/85-05/21/85)

Location	n	Volume(m^3)	Concentration (pCi/m^3) Lower Confidence Limit	Point Estimate	Upper Confidence Limit
S-5	2	29,000	0.000010	0.000022	0.000034
S-6	2	28,000	0.000113	0.000145	0.000177
S-7	2	26,000	0.000269	0.000339	0.000409
S-8	2	28,000	0.000278	0.000348	0.000418
S-9	2	22,000	0.000324	0.000404	0.000484

NOTE: Total long-lived alpha at the remaining 18 onsite ambient air samplers was below the screening level of 0.01 pCi/m3.

Table IV. Tritium in Ambient Air Water Vapor at Selected Onsite Locations

Location	n	Average Concentration (pCi/l)
S-4	5	230 ± 620
S-5	5	240 ± 670
S-16	5	290 ± 680

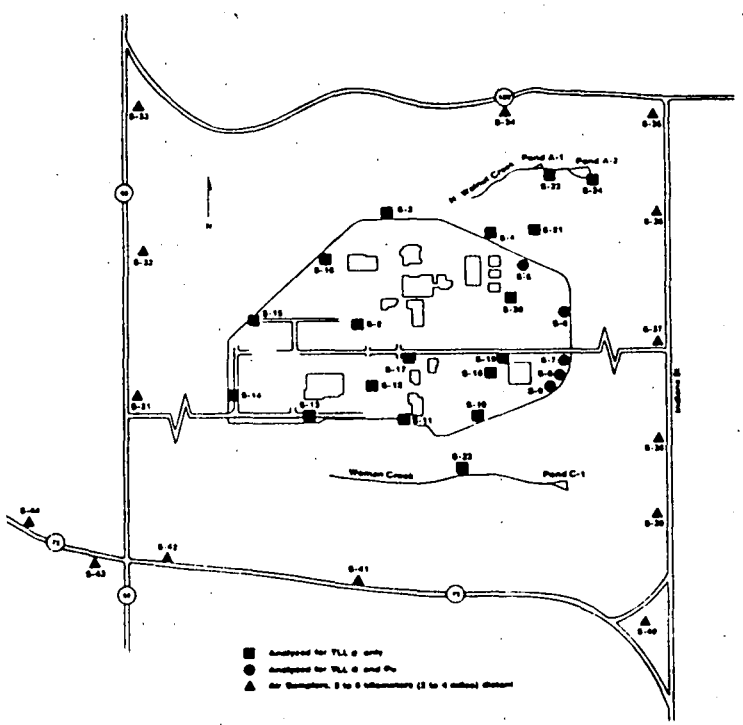


Table III. Plutonium at Selected Onsite Ambient Air Locations
(03/26/85-04/23/85)

Location	n	Volume(m^3)	Concentration (pCi/m^3) Lower Confidence Limit	Point Estimate	Upper Confidence Limit
S-5	2	29,000	0.000050	0.000072	0.000094
S-6	2	29,000	0.000038	0.000055	0.000072
S-7	2	27,000	0.000333	0.000414	0.000495
S-8	2	28,000	0.000372	0.000465	0.000558
S-9	2	28,000	0.000410	0.000526	0.000642

NOTE: Total long-lived alpha at the remaining 18 onsite ambient air samplers was below the screening level of 0.01 pCi/m3.

Table IV. Tritium in Ambient Air Water Vapor at Selected Onsite Locations

Location	n	Average Concentration (pCi/l)
S-4	2	540 ± 680
S-5	2	30 ± 650
S-16	3	200 ± 660

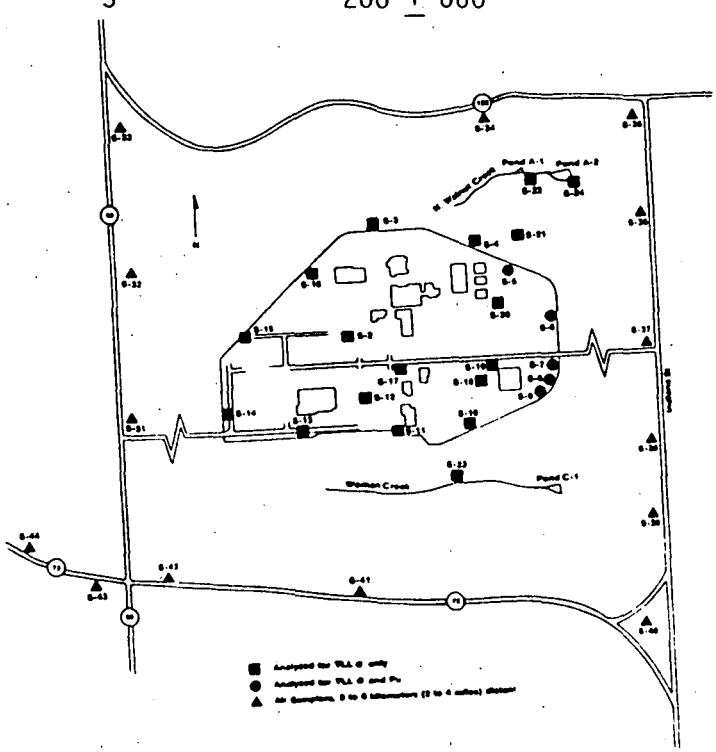


Table III. Plutonium at Selected Onsite Ambient Air Locations (02/26/85-03/26/85)

Location	n	Volume(m^3)	Concentration (pCi/m^3) Lower Confidence Limit	Point Estimate	Upper Confidence Limit
S-5	2	31,000	0.000013	0.000025	0.000037
S-6	2	31,000	0.000034	0.000049	0.000064
S-7	2	27,000	0.000242	0.000312	0.000382
S-8	2	30,000	0.000462	0.000582	0.000702
S-9	2	17,000	0.000355	0.000452	0.000549

NOTE: Total long-lived alpha at the remaining 18 onsite ambient air samplers was below the screening level of 0.01 pCi/m3.

Table IV. Tritium in Ambient Air Water Vapor at Selected Onsite Locations

Location	n	Average Concentration (pCi/l)
S-4	2	40 ± 640
S-5	2	630 ± 670
S-16	2	0 ± 640

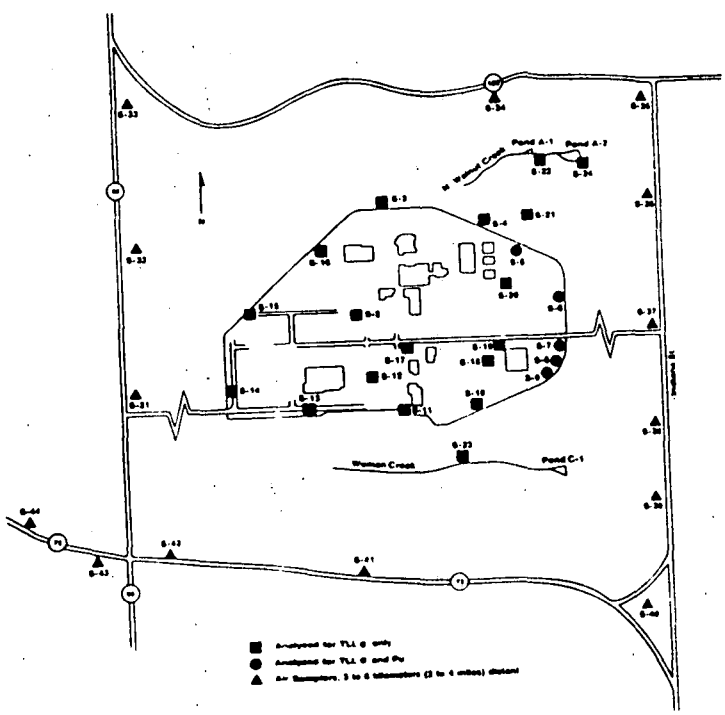


Table III. Plutonium at Selected Onsite Ambient Air Locations
(01/28/85-02/26/85)

Location	n	Volume(m^3)	Concentration (pCi/m^3) Lower Confidence Limit	Point Estimate	Upper Confidence Limit
S-5	2	31,000	0.000010	0.000022	0.000034
S-6	2	33,000	0.000005	0.000016	0.000027
S-7	2	31,000	0.000167	0.000221	0.000275
S-8	2	32,000	0.000148	0.000193	0.000238
S-9	2	21,000	0.000398	0.000512	0.000626

NOTE: Total long-lived alpha at the remaining 18 onsite ambient air samplers was below the screening level of 0.01 pCi/m3.

Table IV. Tritium in Ambient Air Water Vapor at Selected Onsite Locations

Location	n	Average Concentration (pCi/l)
S-4	3	-320 ± 550
S-5	3	-310 ± 550
S-16	2	-140 ± 640

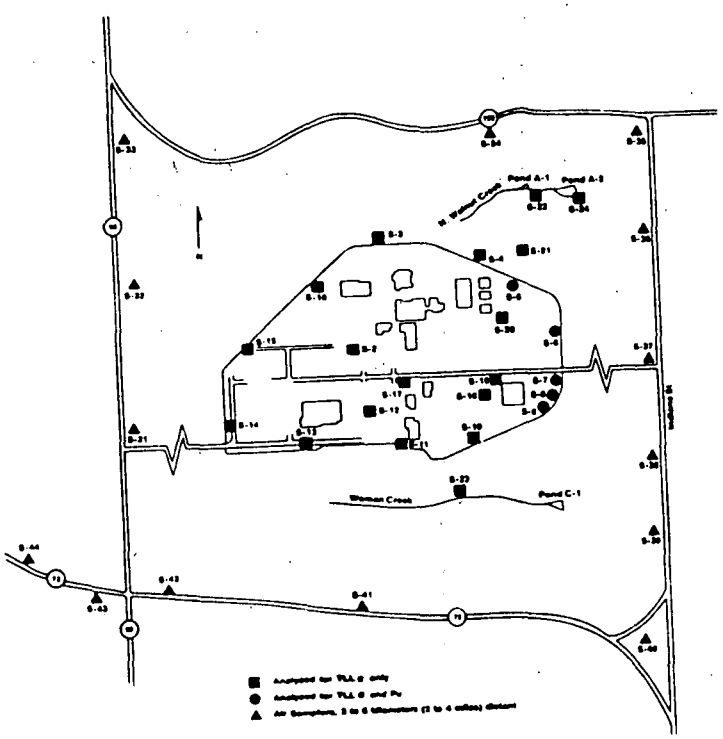


Table III. Plutonium at Selected Onsite Ambient Air Locations (01/02/85-01/28/85)

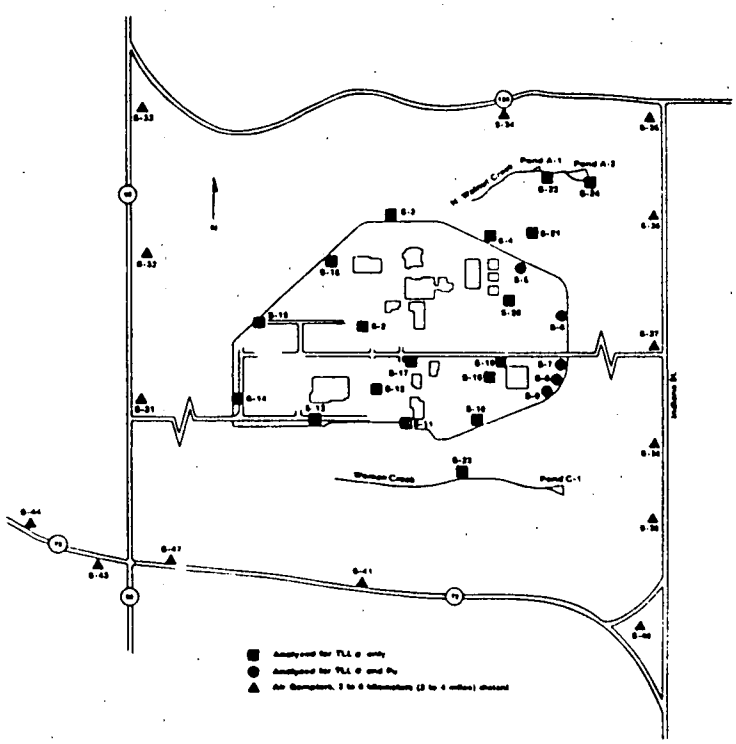
Location	n	Volume(m^3)	Concentration (pCi/m^3) Lower Confidence Limit	Point Estimate	Upper Confidence Limit
S-5	2	27,000	0.000002	0.000003	0.000004
S-6	2	30,000	0.000019	0.000033	0.000047
S-7	2	27,000	0.000083	0.000123	0.000163
S-8	2	29,000	0.000040	0.000063	0.000086
S-9	2	24,000	0.000028	0.000041	0.000054

NOTE: Total long-lived alpha at the remaining 18 onsite ambient air samplers was below the screening level of 0.01 pCi/m3.

Table IV. Tritium in Ambient Air Water Vapor at Selected Onsite Locations

Location	n	Average Concentration (pCi/l)
S-4	2	0 ± 450
S-5	1	-150 ± 450
S-16	0*	0 ± 0

* Sampler S-16 out of service.

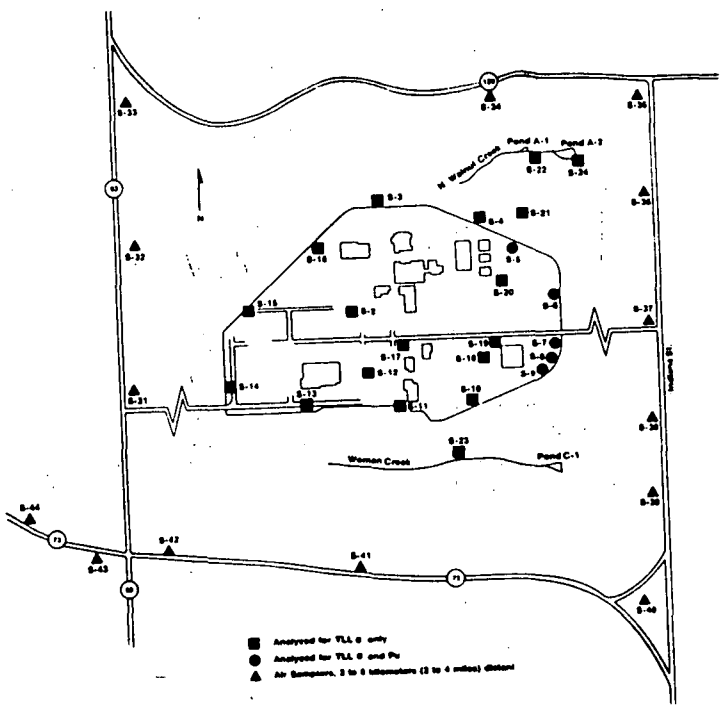


AUGUST 1985

Table V. Plutonium in Perimeter Ambient Air
(08/01/85-08/27/85)

Location	n	Volume(m^3)	Concentration(pCi/m^3) Lower Confidence Limit	Point Estimate	Upper Confidence Limit
S-31	1	29,000	-0.000004	0.000001	0.000006
S-32	1	25,000	-0.000005	0.000000	0.000005
S-33	1	30,000	-0.000003	0.000001	0.000005
S-34	1	28,000	-0.000004	0.000001	0.000006
S-35	1	21,000	-0.000008	-0.000002	0.000004
S-36	1	30,000	-0.000004	0.000000	0.000004
S-37	1	29,000	-0.000002	0.000003	0.000008
S-38	1	28,000	-0.000002	0.000003	0.000008
S-39	1	30,000	-0.000005	-0.000001	0.000003
S-40	1	29,000	-0.000006	-0.000002	0.000002
S-41	1	27,000	-0.000006	-0.000001	0.000004
S-42	1	23,000	-0.000004	0.000002	0.000008
S-43	1	30,000	-0.000001	0.000003	0.000007
S-44	1	27,000	-0.000001	0.000004	0.000009

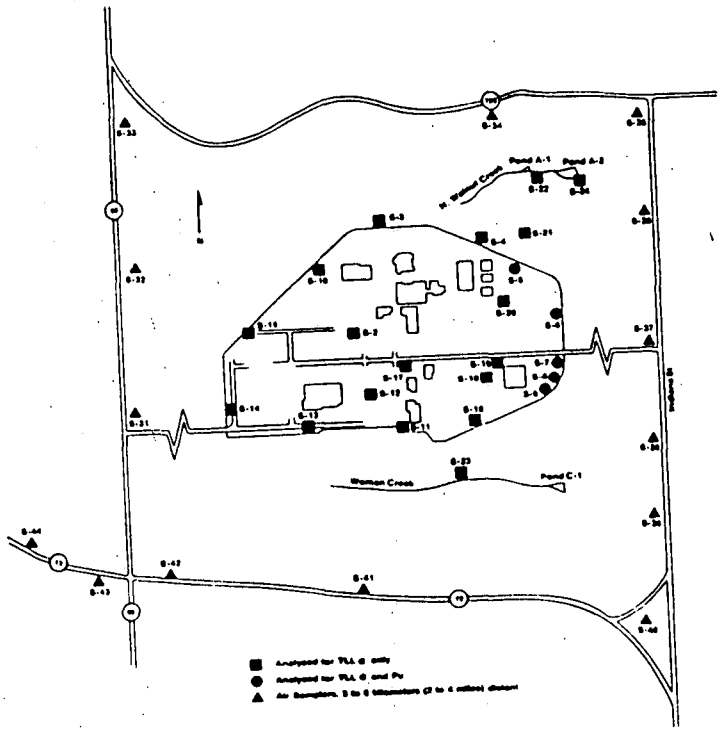
Average Concentration for Point Estimate 0.000001



JULY 1985

Table V. Plutonium in Perimeter Ambient Air
(06/18/85-08/01/85)

Location	n	Volume(m^3)	Concentration(pCi/m^3) Lower Confidence Limit	Point Estimate	Upper Confidence Limit
S-31	1	45,000	-0.000001	0.000002	0.000005
S-32	1	41,000	-0.000002	0.000001	0.000004
S-33	1	50,000	(+)0.000009	0.000012	0.000015
S-34	1	45,000	-0.000002	0.000001	0.000004
S-35	1	32,000	-0.000004	0.000000	0.000004
S-36	1	48,000	-0.000003	0.000000	0.000003
S-37	1	48,000	(+)0.000005	0.000008	0.000011
S-38	1	45,000	-0.000001	0.000002	0.000005
S-39	1	44,000	(+)0.000000	0.000003	0.000016
S-40	1	48,000	-0.000002	0.000001	0.000004
S-41	1	43,000	-0.000002	0.000001	0.000004
S-42	1	40,000	-0.000004	0.000001	0.000002
S-43	1	50,000	(+)0.000000	0.000003	0.000006
S-44	1	44,000	(+)0.000000	0.000003	0.000006
Average Concentration for Point Estimate				0.000003	



JUNE 1985

Table V. Plutonium in Perimeter Ambient Air
(05/21/85-06/18/85)

Location	n	Volume(m^3)	Concentration(pCi/m^3) Lower Confidence Limit	Point Estimate	Upper Confidence Limit
S-31	1	26,000	-0.000004	-0.000001	0.000006
S-32	1	25,000	-0.000006	0.000000	0.000006
S-33	1	30,000	-0.000005	0.000000	0.000005
S-34	1	28,000	-0.000003	0.000002	0.000007
S-35	1	18,000	-0.000009	-0.000001	0.000007
S-36	1	28,000	(+)0.000010	0.000017	0.000024
S-37	1	30,000	(+)0.000019	0.000027	0.000035
S-38	1	29,000	(+)0.000025	0.000031	0.000037
S-39	1	30,000	(+)0.000002	0.000008	0.000014
S-40	1	29,000	-0.000003	0.000002	0.000007
S-41	1	28,000	(+)0.000018	0.000026	0.000034
S-42	1	28,000	(+)0.000014	0.000021	0.000028
S-43	1	31,000	-0.000002	0.000003	0.000008
S-44	1	30,000	-0.000001	0.000004	0.000009

Average Concentration for Point Estimate 0.000010

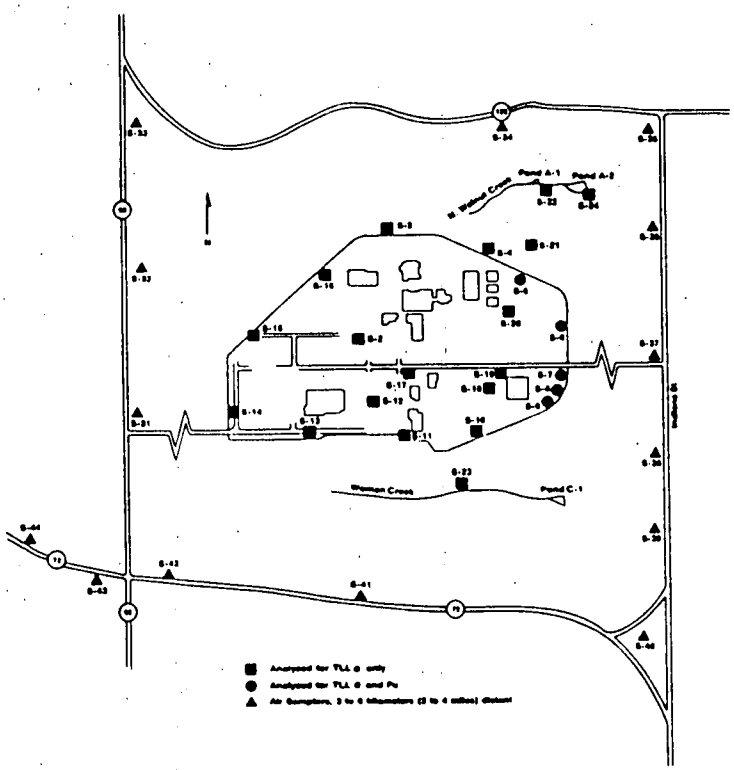
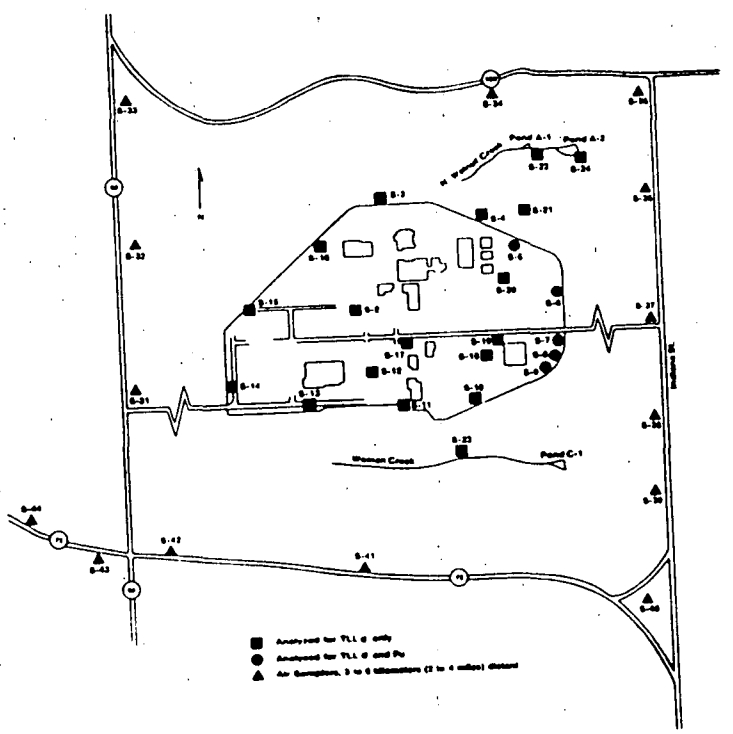


Table V. Plutonium in Perimeter Ambient Air
(04/23/85-05/21/85)

Location	n	Volume(m^3)	Concentration(pCi/m^3) Lower Confidence Limit	Point Estimate	Upper Confidence Limit
S-31	1	26,000	-0.000006	-0.000001	0.000004
S-32	1	25,000	-0.000005	0.000001	0.000007
S-33	1	30,000	-0.000005	-0.000001	0.000003
S-34	1	28,000	-0.000004	0.000001	0.000006
S-35	1	20,000	-0.000008	-0.000001	0.000006
S-36	1	28,000	-0.000004	0.000001	0.000006
S-37	1	29,000	(+)0.000007	0.000013	0.000019
S-38	1	30,000	-0.000004	0.000001	0.000006
S-39	1	30,000	-0.000006	-0.000001	0.000004
S-40	1	29,000	(+)0.000000	0.000005	0.000010
S-41	1	28,000	-0.000006	-0.000001	0.000004
S-42	1	28,000	-0.000001	0.000004	0.000009
S-43	1	31,000	(+)0.000004	0.000009	0.000014
S-44	1	30,000	-0.000006	-0.000002	0.000002

Average Concentration for Point Estimate 0.000002

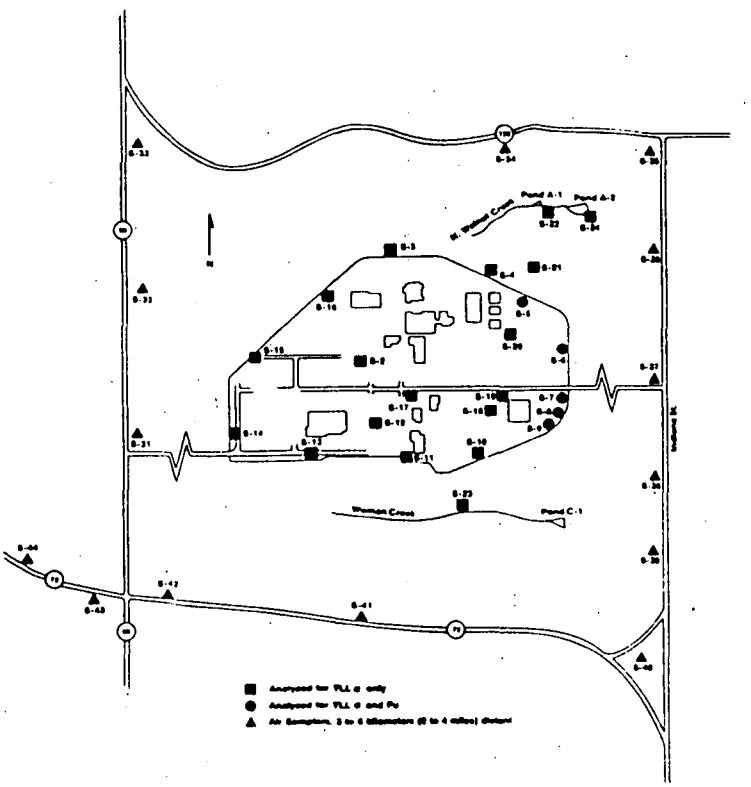


APRIL 1985

Table V. Plutonium in Perimeter Ambient Air
(03/26/85-04/23/85)

Location	n	Volume(m^3)	Concentration(pCi/m^3) Lower Confidence Limit	Point Estimate	Upper Confidence Limit
S-31	1	28,000	-0.000003	0.000002	0.000007
S-32	1	26,000	-0.000004	0.000001	0.000006
S-33	1	33,000	-0.000003	0.000001	0.000005
S-34	1	22,000	-0.000007	-0.000001	0.000005
S-35	1	21,000	-0.000007	0.000000	0.000007
S-36	1	30,000	-0.000002	0.000003	0.000008
S-37	1	31,000	-0.000001	0.000004	0.000009
S-38	1	30,000	-0.000001	0.000004	0.000009
S-39	1	32,000	-0.000004	0.000000	0.000004
S-40	1	30,000	-0.000005	0.000000	0.000005
S-41	1	29,000	-0.000007	-0.000001	0.000005
S-42	1	29,000	-0.000004	0.000001	0.000006
S-43	1	32,000	-0.000003	0.000001	0.000005
S-44	1	31,000	-0.000003	0.000002	0.000007

Average Concentration for Point Estimate 0.000001



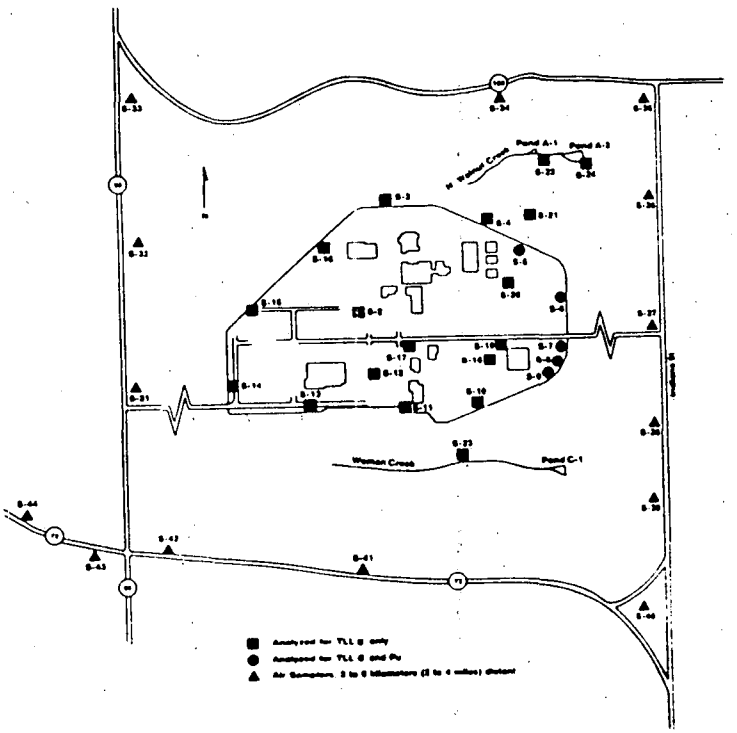
MARCH 1985

Table V. Plutonium in Perimeter Ambient Air
(02/26/85-03/26/85)

Location	n	Volume(m^3)	Concentration(pCi/m^3) Lower Confidence Limit	Point Estimate	Upper Confidence Limit
S-31	1	24,000	-0.000004	0.000002	0.000008
S-32	1	26,000	-0.000003	0.000003	0.000009
S-33	1	31,000	-0.000005	-0.000001	0.000003
S-34	1	29,000	-0.000004	0.000001	0.000006
S-35*		-	-	-	-
S-36	1	32,000	-0.000003	0.000001	0.000005
S-37	1	30,000	(+)0.000000	0.000005	0.000010
S-38	1	29,000	-0.000003	0.000002	0.000007
S-39	1	22,000	(+)0.000002	0.000009	0.000016
S-40	1	29,000	-0.000007	-0.000002	0.000003
S-41	1	21,000	-0.000008	-0.000002	0.000004
S-42	1	31,000	-0.000001	0.000004	0.000009
S-43	1	28,000	-0.000001	0.000005	0.000011
S-44	1	28,000	-0.000002	0.000003	0.000008

Average Concentration for Point Estimate 0.000002

* S-35: Insufficient chemical recovery for valid analysis.

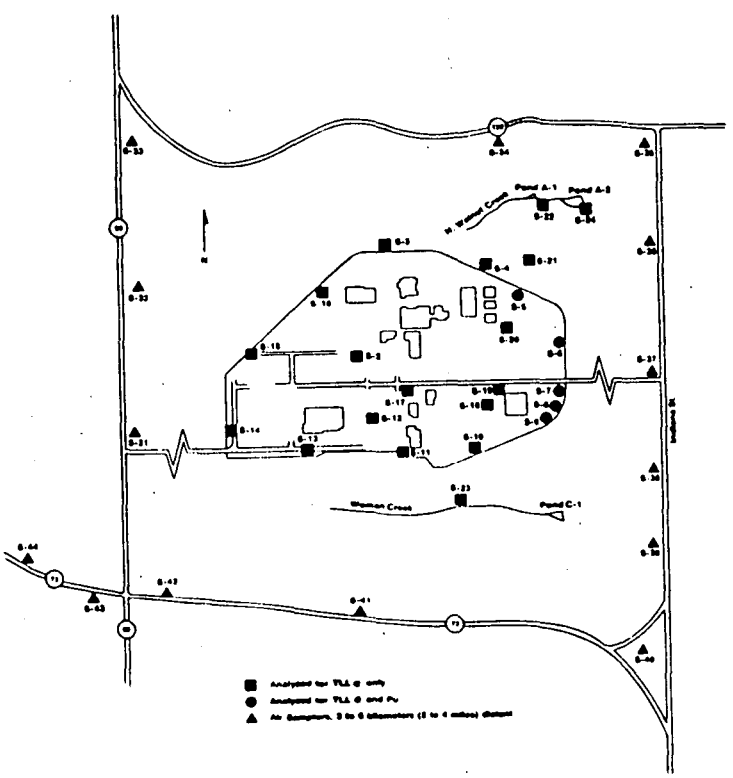


FEBRUARY 1985

Table V. Plutonium in Perimeter Ambient Air
(01/29/85-02/27/85)

Location	n	Volume(m^3)	Concentration(pCi/m^3) Lower Confidence Limit	Point Estimate	Upper Confidence Limit
S-31	1	26,000	-0.000005	0.000000	0.000005
S-32	1	28,000	-0.000008	-0.000003	0.000002
S-33	1	33,000	-0.000004	0.000000	0.000004
S-34	1	31,000	-0.000004	0.000000	0.000004
S-35	1	24,000	-0.000002	0.000005	0.000012
S-36	1	34,000	-0.000006	-0.000002	0.000002
S-37	1	32,000	-0.000001	0.000004	0.000009
S-38	1	31,000	-0.000001	0.000005	0.000011
S-39	1	23,000	-0.000007	-0.000001	0.000005
S-40	1	31,000	-0.000003	0.000002	0.000007
S-41	1	22,000	-0.000005	0.000001	0.000007
S-42	1	33,000	-0.000004	0.000000	0.000004
S-43	1	29,000	-0.000005	0.000000	0.000005
S-44	1	31,000	-0.000008	-0.000003	0.000002

Average Concentration for Point Estimate 0.000001



JANUARY 1985

Table V. Plutonium in Perimeter Ambient Air
(01/03/85-01/28/85)

Location	n	Volume(m^3)	Concentration(pCi/m^3) Lower Confidence Limit	Point Estimate	Upper Confidence Limit
S-31	1	27,000	-0.000006	-0.000001	0.000004
S-32	1	24,000	-0.000006	0.000000	0.000006
S-33	1	28,000	-0.000007	-0.000002	0.000003
S-34	1	28,000	-0.000005	0.000000	0.000005
S-35	1	23,000	-0.000006	0.000000	0.000006
S-36	1	29,000	-0.000005	0.000000	0.000005
S-37	1	28,000	-0.000004	0.000001	0.000006
S-38	1	26,000	-0.000007	-0.000002	0.000003
S-39	1	20,000	-0.000009	-0.000002	0.000005
S-40	1	23,000	-0.000009	-0.000003	0.000003
S-41	1	19,000	-0.000007	0.000001	0.000009
S-42	1	28,000	-0.000006	-0.000001	0.000004
S-43	1	25,000	-0.000007	-0.000002	0.000003
S-44	1	26,000	-0.000007	-0.000002	0.000003

Average Concentration for Point Estimate -0.000001

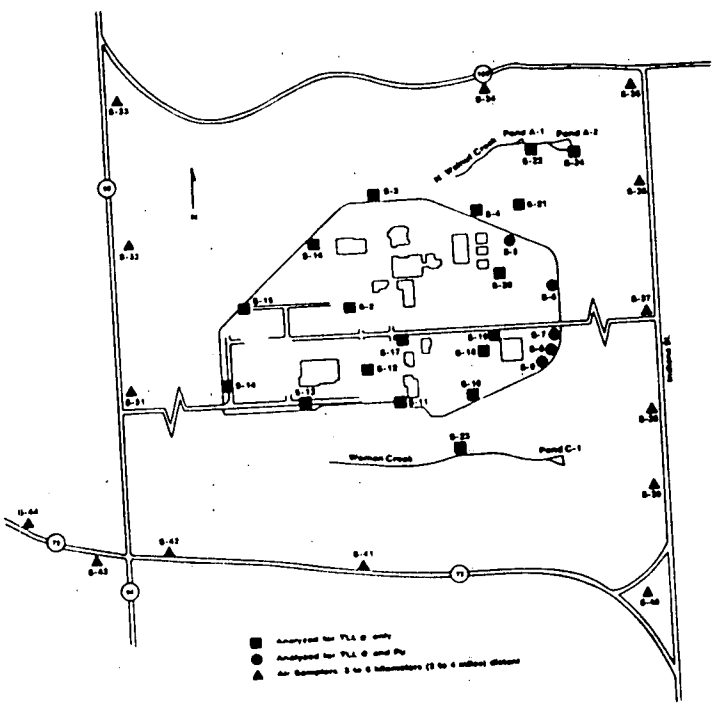


Table VI. Plutonium in Community Ambient Air
(08/01/85-08/28/85)

Location	n	Volume(m^3)	Concentration(pCi/m^3) Lower Confidence Limit	Point Estimate	Upper Confidence Limit
Marshall	1	28,000	-0.000006	-0.000001	0.000004
Jeffco Airport	1	28,000	-0.000004	0.000001	0.000006
Superior	1	25,000	-0.000006	-0.000001	0.000004
Boulder	1	30,000	-0.000003	0.000001	0.000005
Lafayette	1	28,000	-0.000005	0.000000	0.000005
Broomfield	1	29,000	-0.000005	-0.000001	0.000003
Walnut Creek	1	30,000	-0.000004	0.000000	0.000004
Wagner	1	28,000	-0.000004	0.000001	0.000006
Leyden	1	32,000	-0.000004	0.000000	0.000004
Westminster	1	24,000	-0.000003	0.000002	0.000007
Denver	1	28,000	-0.000004	0.000001	0.000006
Golden	1	25,000	-0.000002	0.000003	0.000008
Lake Pointe	1	33,000	-0.000005	-0.000001	0.000003
Cotton Creek	1	27,000	-0.000003	0.000002	0.000007

Average Concentration for Point Estimate 0.000000

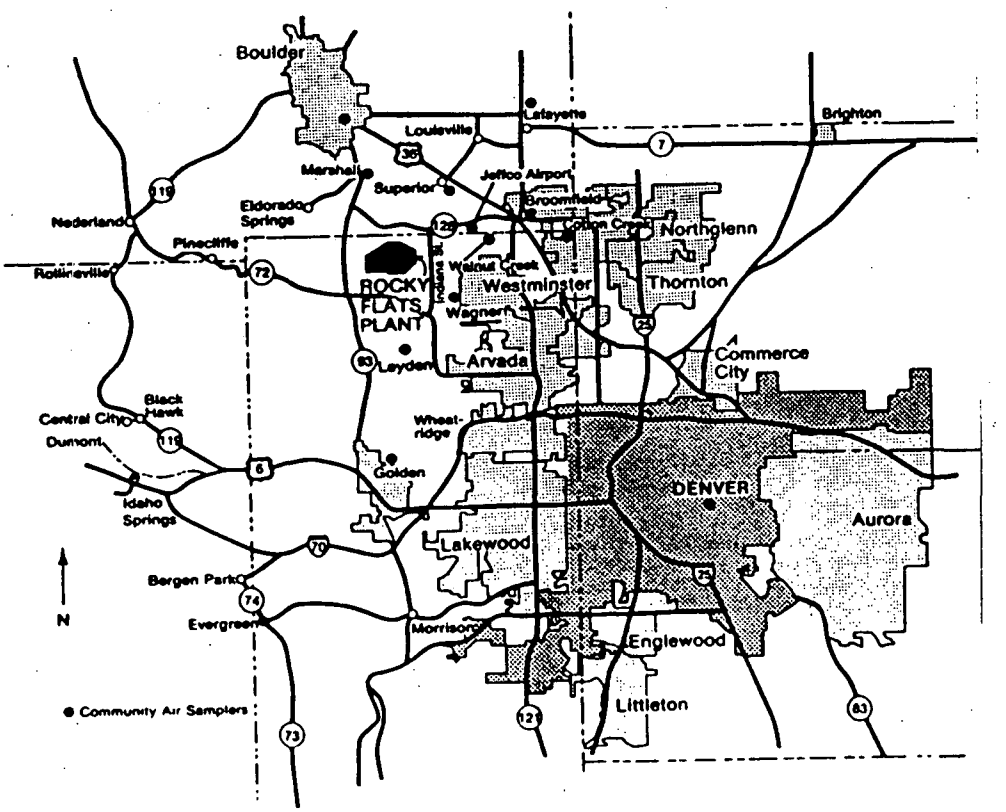


Table VI. Plutonium in Community Ambient Air
(06/18/85-08/01/85)

Location	n	Volume(m^3)	Concentration(pCi/m^3) Lower Confidence Limit	Point Estimate	Upper Confidence Limit
Marshall	1	44,000	-0.000001	0.000002	0.000005
Jeffco Airport	1	42,000	-0.000002	0.000001	0.000004
Superior	1	41,000	(+)0.000000	0.000003	0.000006
Boulder	1	47,000	-0.000002	0.000001	0.000004
Lafayette	1	43,000	(+)0.000017	0.000022	0.000027
Broomfield	1	45,000	-0.000001	0.000002	0.000005
Walnut Creek	1	47,000	(+)0.000001	0.000004	0.000007
Wagner	1	45,000	-0.000002	0.000001	0.000004
Leyden	1	50,000	-0.000004	-0.000001	0.000002
Westminster	1	33,000	(+)0.000011	0.000016	0.000021
Denver	1	28,000	-0.000005	0.000000	0.000005
Golden	1	39,000	(+)0.000001	0.000004	0.000007
Lake Pointe	1	50,000	-0.000001	0.000002	0.000005
Cotton Creek	1	37,000	-0.000003	0.000001	0.000005

Average Concentration for Point Estimate 0.000004

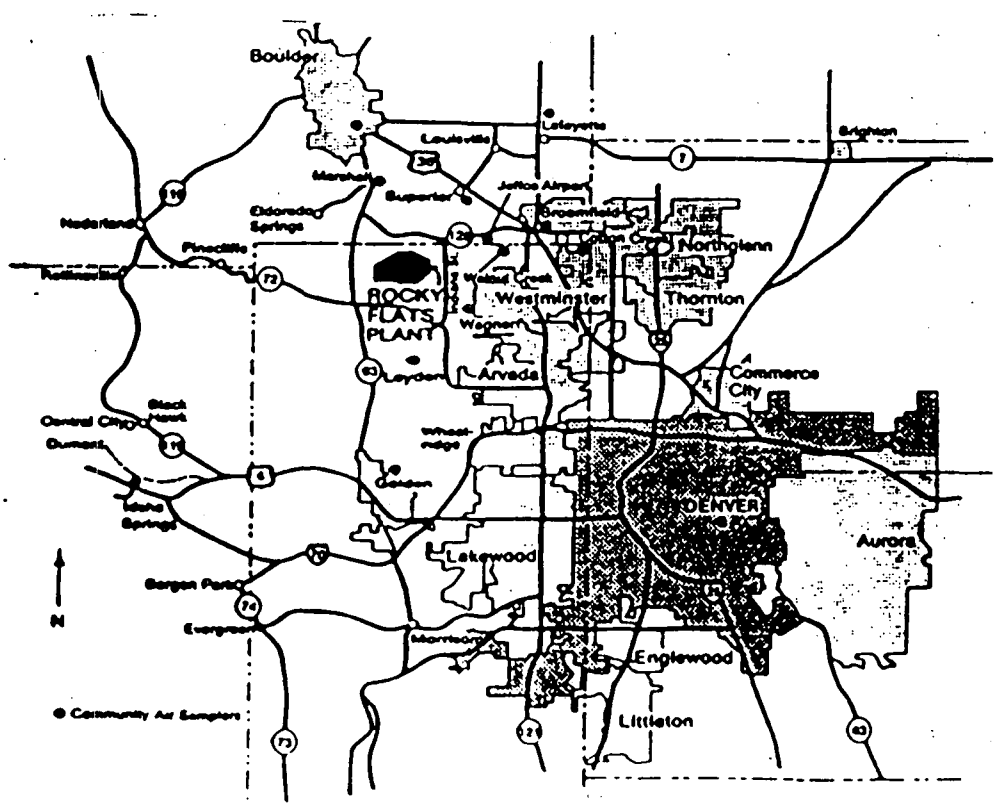


Table VI. Plutonium in Community Ambient Air
(05/22/85-06/19/85)

Location	n	Volume(m^3)	Concentration(pCi/m^3) Lower Confidence Limit	Point Estimate	Upper Confidence Limit
Marshall	1	27,000	-0.000005	0.000000	0.000005
Jeffco Airport	1	28,000	(+)0.000007	0.000014	0.000021
Superior	1	29,000	-0.000004	0.000001	0.000006
Boulder	1	29,000	-0.000006	-0.000001	0.000004
Lafayette	1	31,000	(+)0.000001	0.000006	0.000011
Broomfield	1	25,000	-0.000007	-0.000002	0.000003
Walnut Creek	1	28,000	(+)0.000000	0.000005	0.000010
Wagner	1	28,000	-0.000006	-0.000001	0.000004
Leyden	1	33,000	-0.000002	0.000002	0.000006
Westminster	1	26,000	-0.000001	0.000005	0.000011
Denver	1	17,000	-0.000003	0.000005	0.000013
Golden	1	27,000	-0.000004	0.000001	0.000006
Lake Pointe	1	30,000	(+)0.000003	0.000008	0.000013
Cotton Creek	1	25,000	-0.000002	0.000004	0.000010

Average Concentration for Point Estimate 0.000003

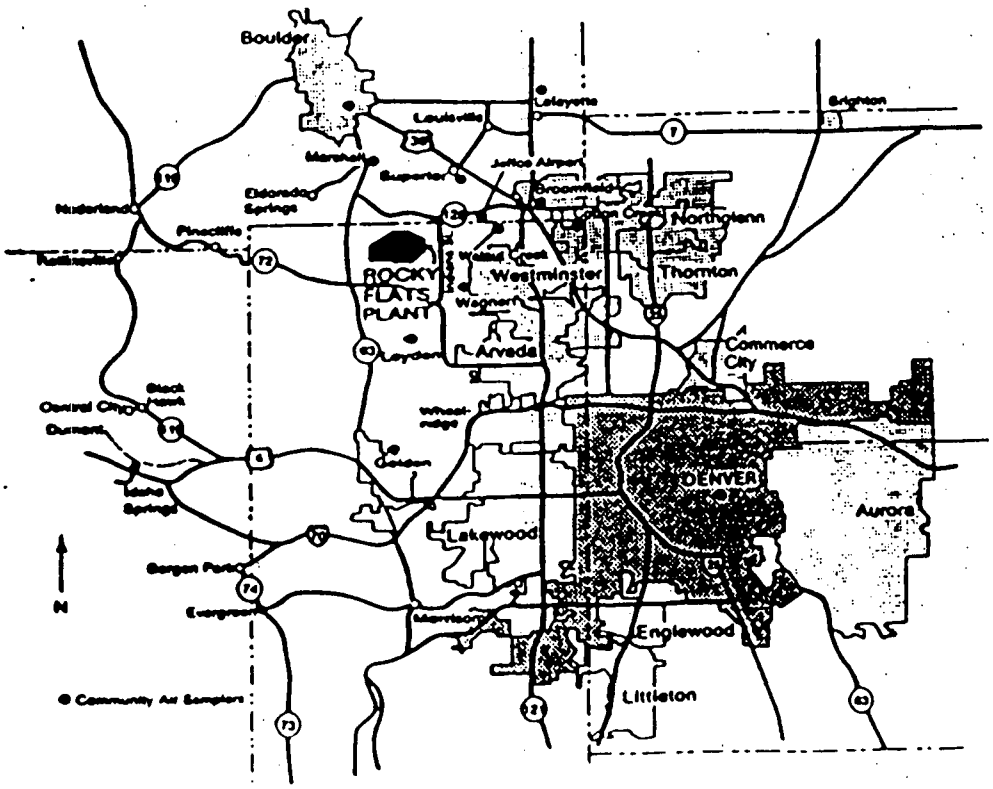


Table VI. Plutonium in Community Ambient Air
(04/24/85-05/22/85)

Location	n	Volume(m^3)	Concentration(pCi/m^3) Lower Confidence Limit	Point Estimate	Upper Confidence Limit
Marshall	1	28,000	-0.000003	0.000002	0.000007
Jeffco Airport	1	29,000	-0.000004	0.000001	0.000006
Superior	1	29,000	-0.000007	-0.000002	0.000003
Boulder	1	30,000	(+)0.000003	0.000008	0.000013
Lafayette	1	32,000	-0.000004	0.000000	0.000004
Broomfield	1	26,000	-0.000004	0.000001	0.000006
Walnut Creek	1	30,000	-0.000004	0.000001	0.000006
Wagner	1	28,000	-0.000003	0.000002	0.000007
Leyden	1	30,000	(+)0.000003	0.000009	0.000015
Westminster	1	26,000	-0.000003	0.000002	0.000007
Denver	1	24,000	-0.000003	0.000003	0.000009
Golden	1	27,000	-0.000005	0.000000	0.000005
Lake Pointe	1	30,000	-0.000005	0.000000	0.000005
Cotton Creek	1	28,000	-0.000004	0.000001	0.000006

Average Concentration for Point Estimate 0.000002

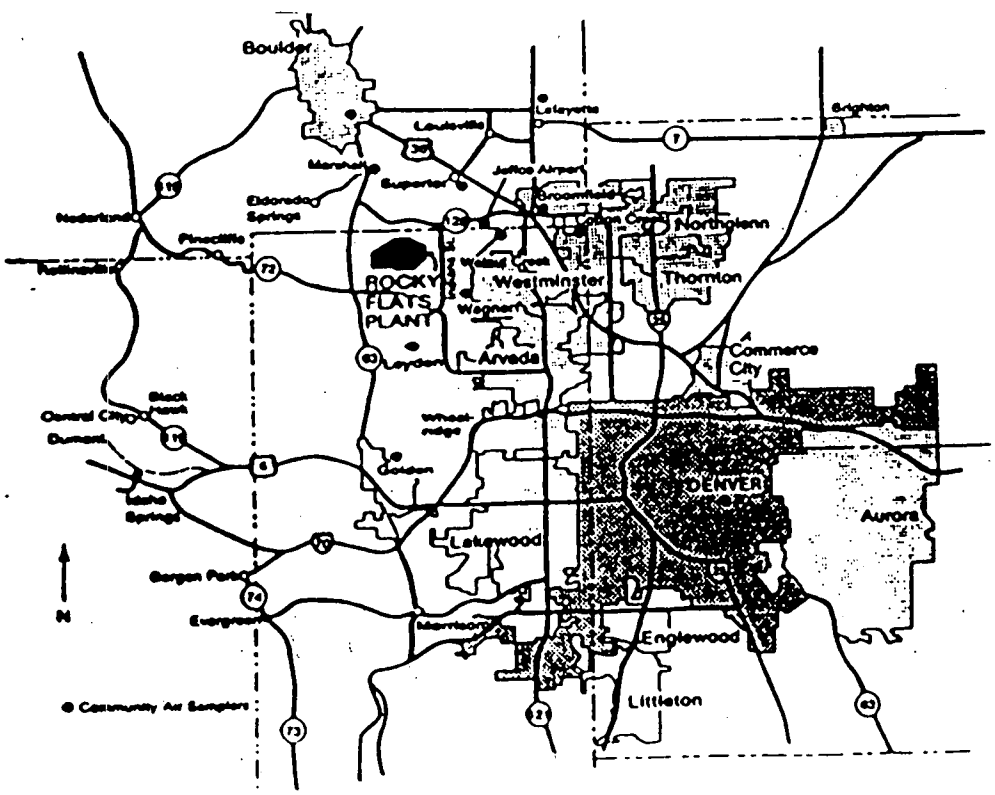


Table VI. Plutonium in Community Ambient Air
(03/27/85-04/24/85)

Location	n	Volume(m^3)	Concentration(pCi/m^3) Lower Confidence Limit	Point Estimate	Upper Confidence Limit
Marshall	1	28,000	-0.000001	0.000004	0.000009
Jeffco Airport	1	30,000	(+)0.000000	0.000005	0.000010
Superior	1	29,000	-0.000004	0.000001	0.000006
Boulder	1	30,000	-0.000002	0.000003	0.000008
Lafayette	1	29,000	-0.000003	0.000002	0.000007
Broomfield	1	27,000	-0.000008	-0.000002	0.000004
Walnut Creek	1	30,000	-0.000002	0.000003	0.000008
Wagner	1	29,000	(+)0.000004	0.000010	0.000016
Leyden	1	33,000	-0.000003	0.000001	0.000005
Westminster	1	27,000	-0.000002	0.000003	0.000008
Denver	1	31,000	-0.000002	0.000003	0.000008
Golden	1	22,000	(+)0.000000	0.000007	0.000014
Lake Pointe	1	28,000	-0.000002	0.000003	0.000008
Cotton Creek	1	8,000	-0.000021	-0.000004	0.000013

Average Concentration for Point Estimate 0.000003

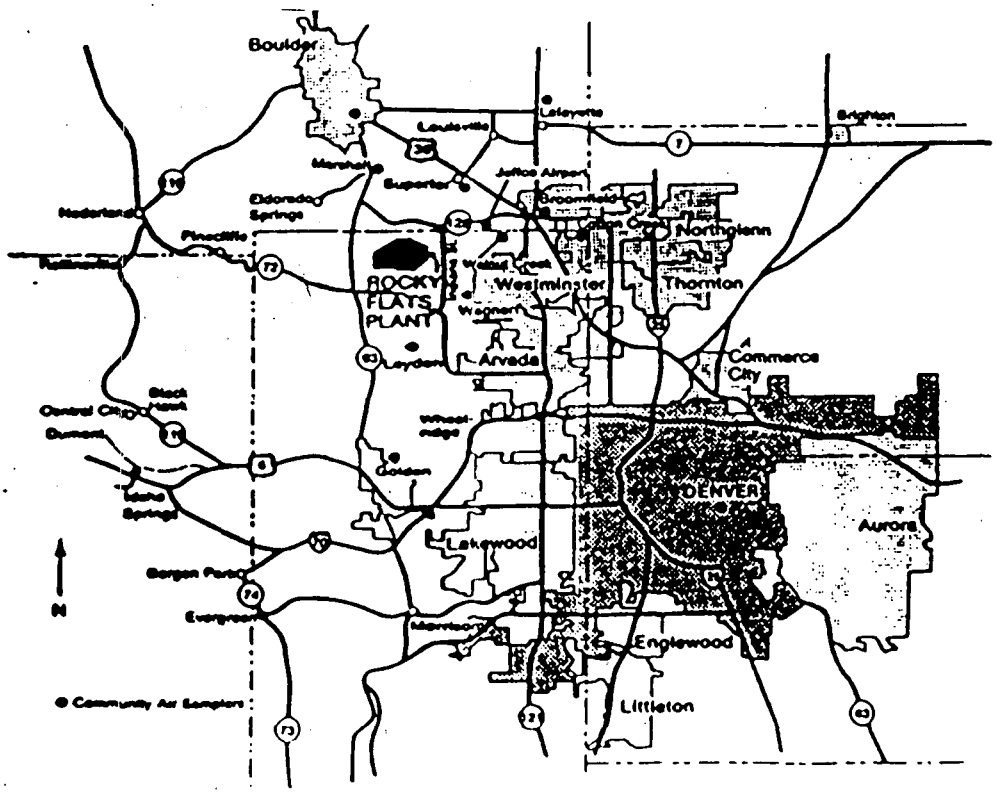
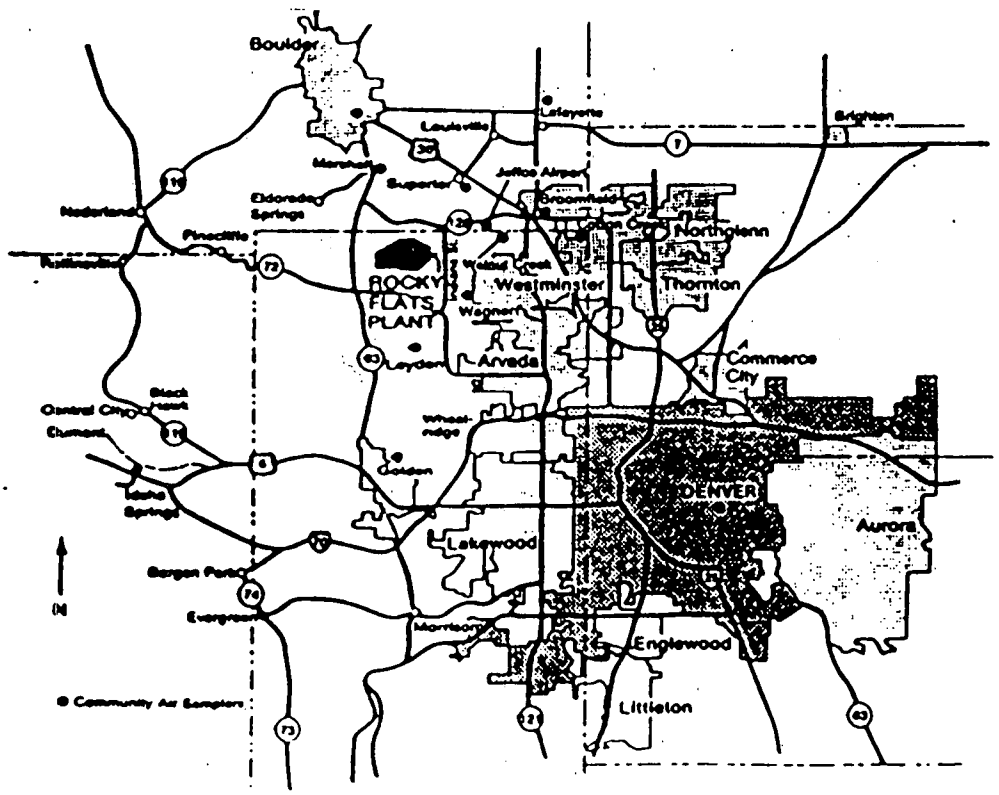


Table VI. Plutonium in Community Ambient Air
(02/27/85-03/27/85)

Location	n	Volume(m^3)	Concentration(pCi/m^3) Lower Confidence Limit	Point Estimate	Upper Confidence Limit
Marshall	1	26,000	-0.000004	0.000001	0.000006
Jeffco Airport	1	29,000	(+)0.000000	0.000005	0.000010
Superior	1	27,000	-0.000005	0.000000	0.000005
Boulder	1	32,000	-0.000005	-0.000001	0.000003
Lafayette	1	27,000	(+)0.000005	0.000011	0.000017
Broomfield	1	34,000	(+)0.000000	0.000004	0.000008
Walnut Creek	1	29,000	(+)0.000002	0.000008	0.000014
Wagner	1	29,000	(+)0.000002	0.000007	0.000012
Leyden	1	31,000	-0.000001	0.000004	0.000009
Westminster	1	27,000	(+)0.000010	0.000018	0.000026
Denver	1	27,000	-0.000002	0.000003	0.000008
Golden	1	27,000	-0.000006	-0.000001	0.000004
Lake Pointe	1	34,000	(+)0.000004	0.000009	0.000014
Cotton Creek*	-	-	-	-	-

Average Concentration for Point Estimate 0.000005

* Cotton Creek sampler out of service.

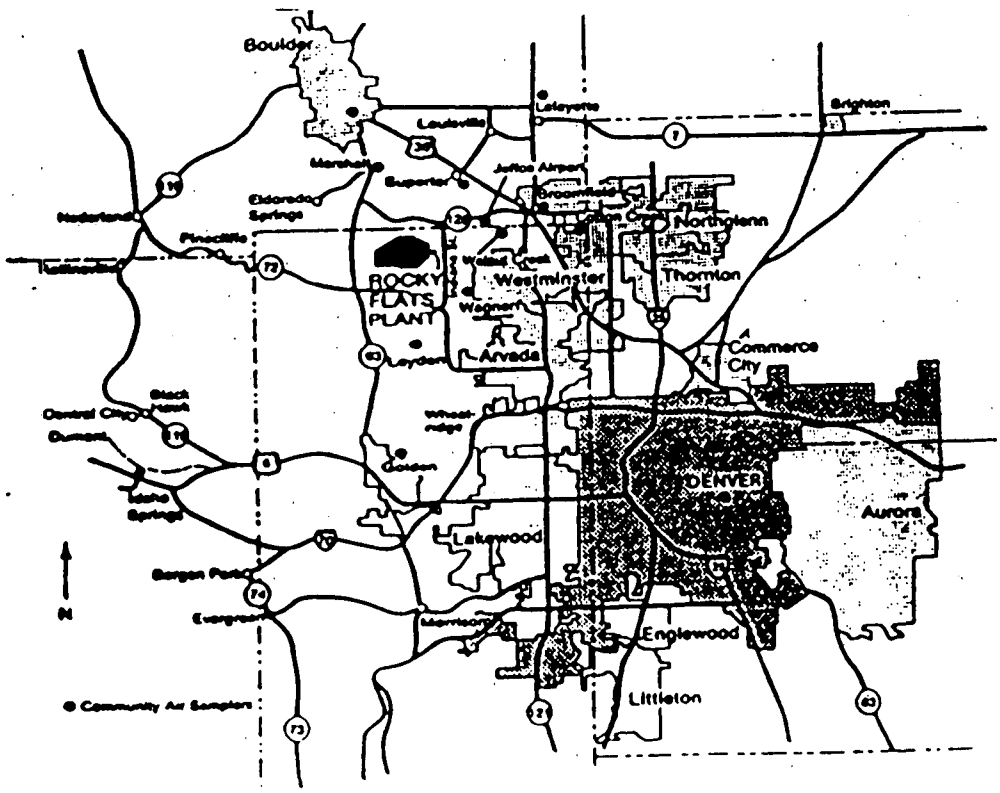


FEBRUARY 1985

Table VI. Plutonium in Community Ambient Air
(01/29/85-02/27/85)

Location	n	Volume(m^3)	Concentration(pCi/m^3) Lower Confidence Limit	Point Estimate	Upper Confidence Limit
Marshall	1	30,000	-0.000005	0.000000	0.000005
Jeffco Airport	1	31,000	-0.000002	0.000003	0.000008
Superior	1	28,000	-0.000003	0.000003	0.000009
Boulder	1	34,000	-0.000003	0.000001	0.000005
Lafayette	1	29,000	-0.000004	0.000001	0.000006
Broomfield	1	35,000	-0.000005	0.000001	0.000003
Walnut Creek	1	31,000	-0.000002	0.000003	0.000008
Wagner	1	30,000	-0.000007	0.000003	0.000001
Leyden	1	33,000	-0.000002	0.000002	0.000006
Westminster	1	26,000	(+)0.000002	0.000008	0.000014
Denver	1	27,000	-0.000003	0.000002	0.000007
Golden	1	30,000	-0.000004	0.000001	0.000006
Lake Pointe	1	40,000	-0.000003	0.000000	0.000003
Cotton Creek	1	19,000	-0.000007	0.000000	0.000007
Average Concentration for Point Estimate				0.000002	

* New Community Sampler installed for January 1985 at 100th Avenue and Simms Street (near Lake Pointe subdivision).



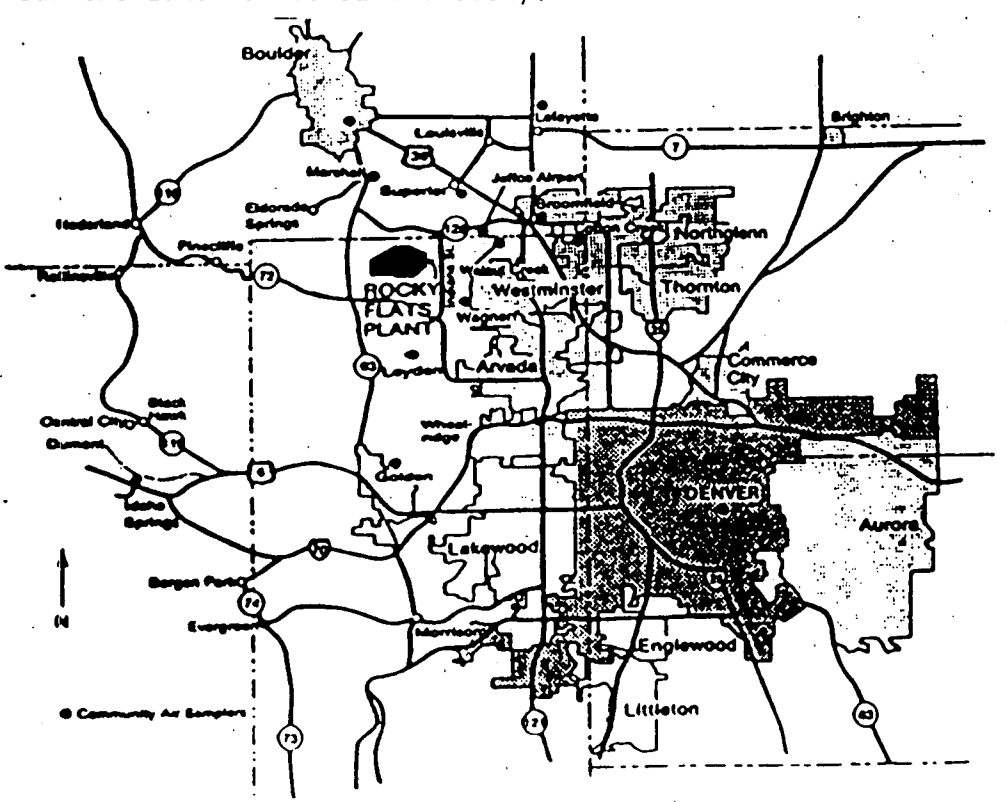
JANUARY 1985

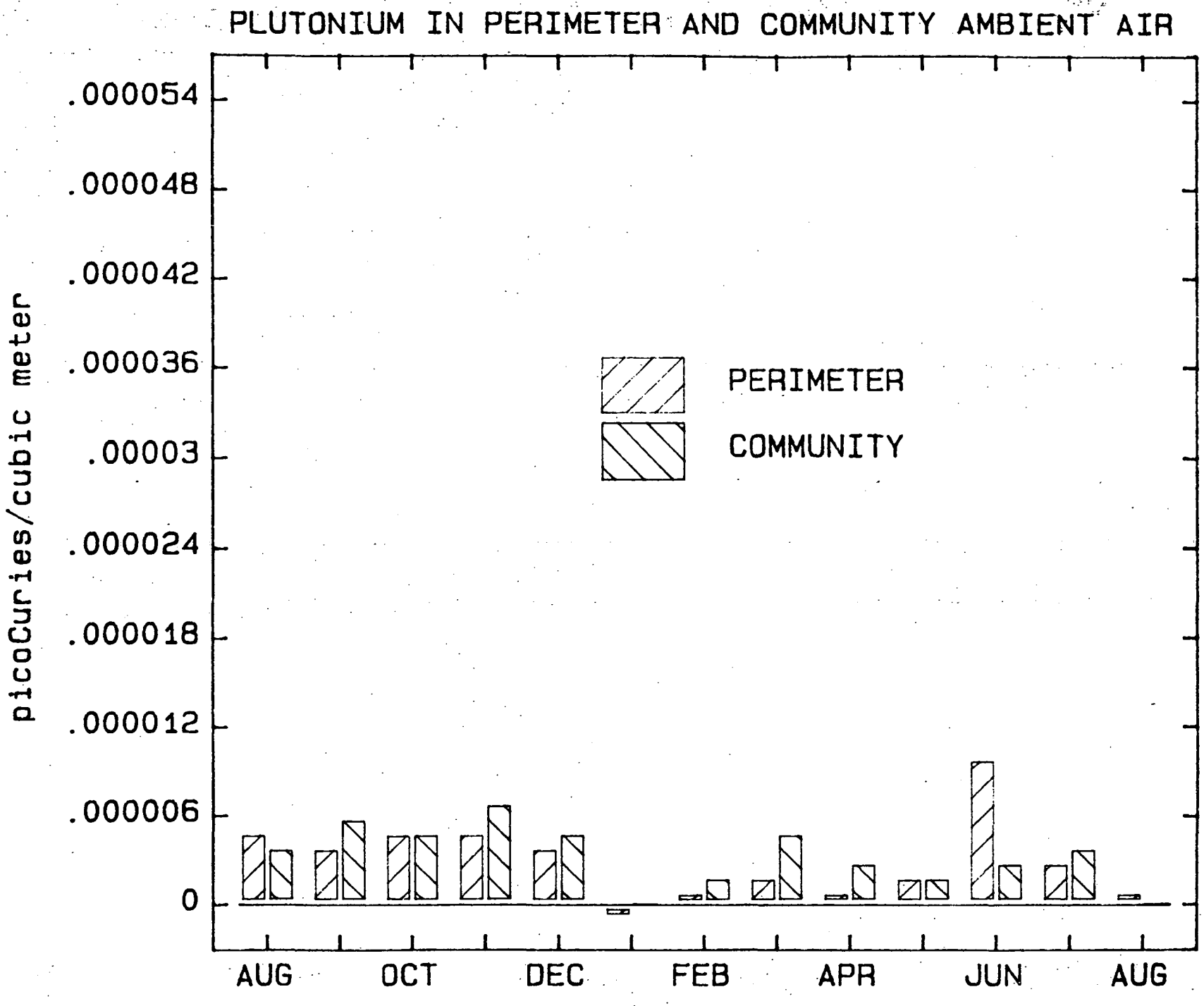
Table VI. Plutonium in Community Ambient Air
(01/03/85-01/29/85)

Location	n	Volume(m^3)	Concentration(pCi/m^3) Lower Confidence Limit	Point Estimate	Upper Confidence Limit
Marshall	1	25,000	-0.000007	-0.000002	0.000003
Jeffco Airport	1	29,000	-0.000005	0.000000	0.000005
Superior	1	26,000	-0.000004	0.000001	0.000006
Boulder	1	29,000	-0.000006	0.000001	0.000004
Lafayette	1	27,000	-0.000005	0.000000	0.000005
Broomfield	1	29,000	-0.000006	-0.000001	0.000004
Walnut Creek	1	29,000	-0.000004	0.000001	0.000006
Wagner	1	27,000	-0.000003	0.000002	0.000007
Leyden	1	25,000	-0.000003	0.000003	0.000009
Westminster	1	24,000	-0.000005	0.000001	0.000007
Denver	1	24,000	-0.000007	-0.000001	0.000005
Golden	1	26,000	-0.000007	-0.000002	0.000003
Lake Pointe*	1	37,000	-0.000005	-0.000001	0.000003
Cotton Creek	1	24,000	-0.000004	0.000002	0.000008

Average Concentration for Point Estimate 0.000000

* New Community Sampler installed for January 1985 at 100th Avenue and Simms Street (near the Lake Pointe subdivision).




PLUTONIUM IN PERIMETER AND COMMUNITY AMBIENT AIR
picoCuries/cubic meter
.000054
.000048
.000042
.000036
.00003
.000024
.000018
.000012
.000006
0
PERIMETER
COMMUNITY
AUG
OCT
DEC
FEB
APR
JUN
AUG

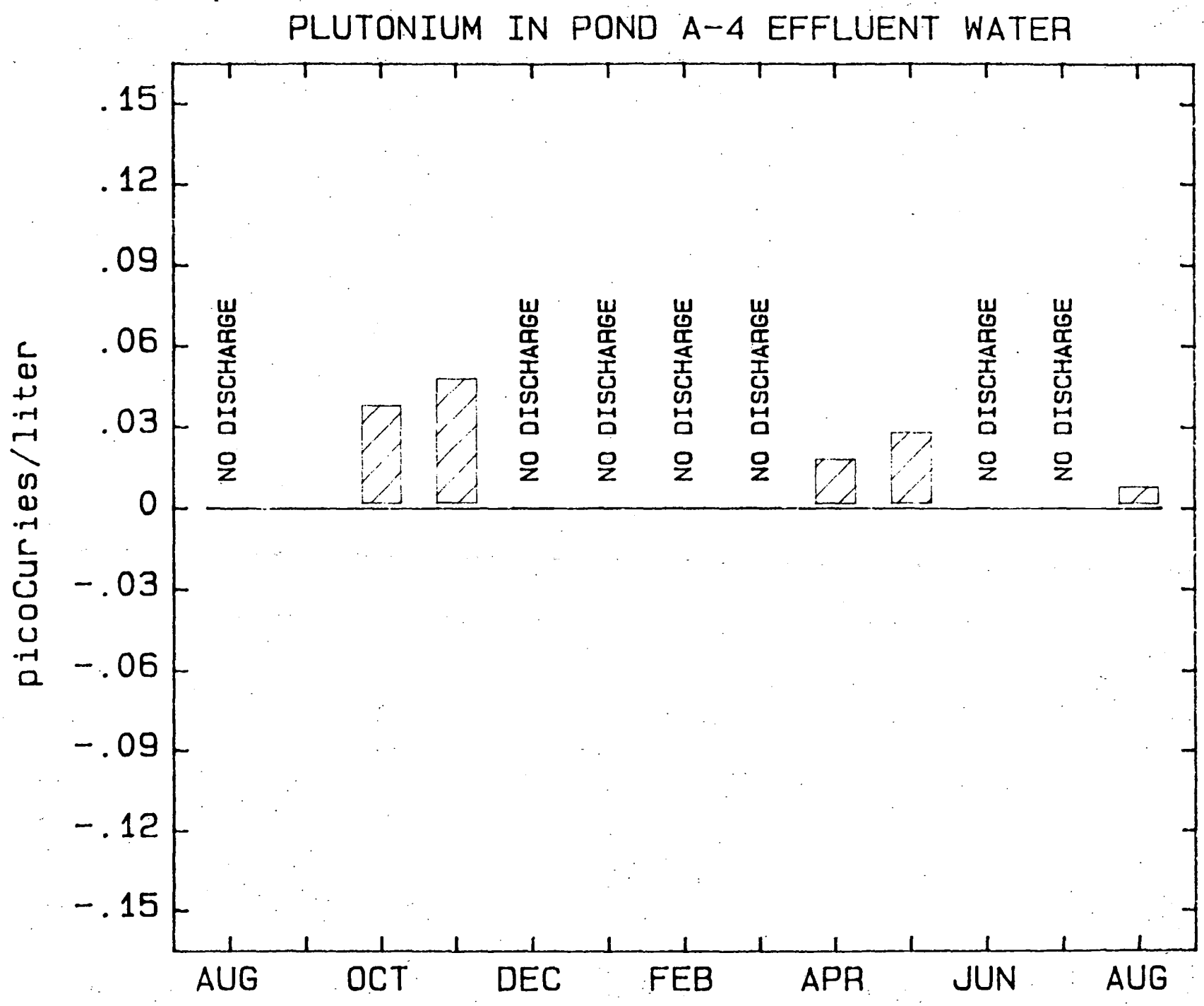
AUGUST 1985

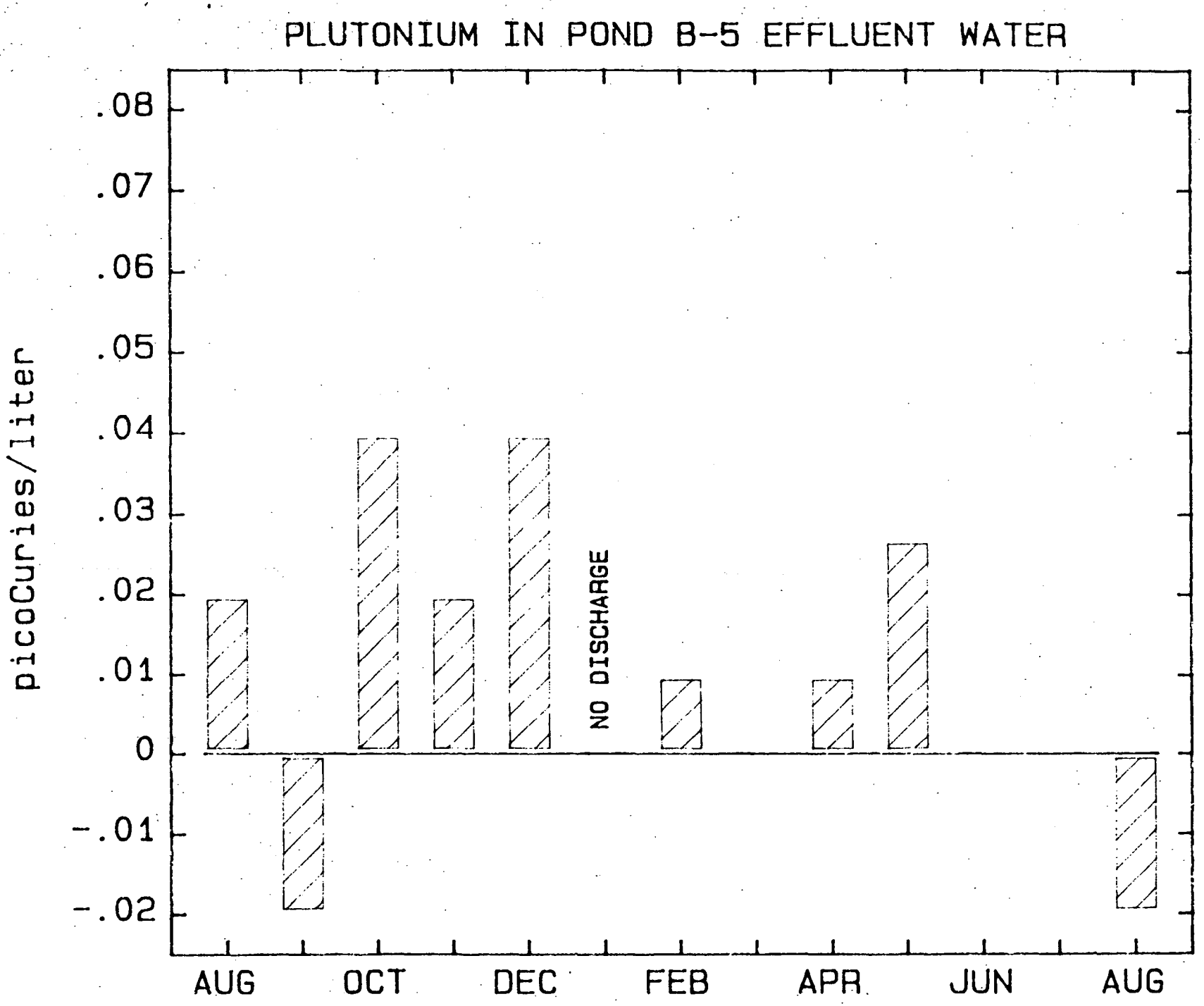
Table VII. Radioactive Water Sample Results

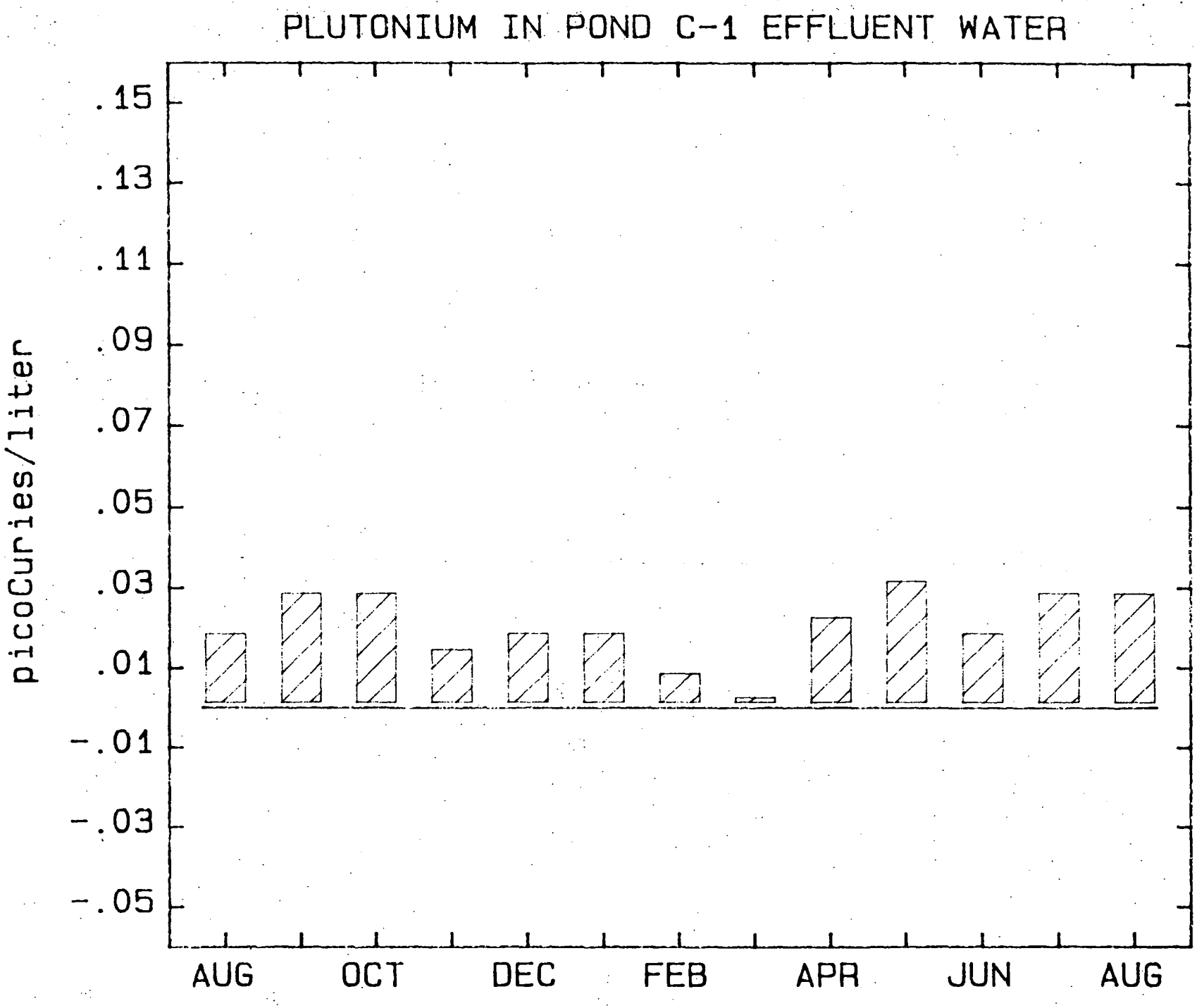
Holding Pond Outfall (pCi/l)

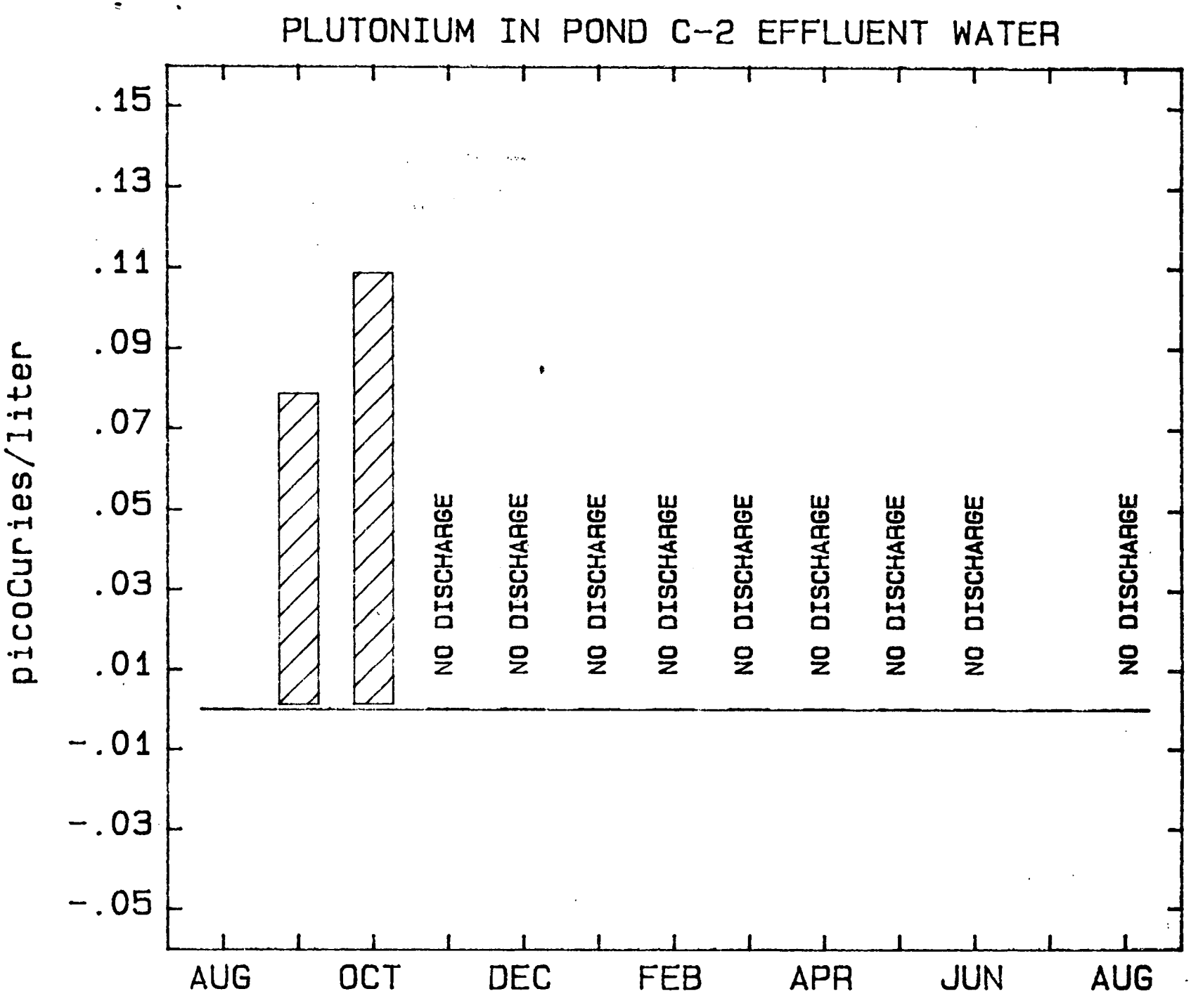
Location	Plutonium	Uranium	Americium
Pond A-4			
08/20/85 - 08/22/85	0.01 ± 0.04	5.2 ± 0.5	0.03 ± 0.05
Average Concentration	0.01 ± 0.04	5.2 ± 0.5	0.03 ± 0.05
Pond B-5			
08/20/85 - 08/22/85	-0.02 ± 0.03	5.6 ± 0.5	-0.03 ± 0.05
Average Concentration	-0.02 ± 0.03	5.6 ± 0.5	-0.03 ± 0.05
Pond C-1			
08/02/85 - 08/09/85	0.02 ± 0.02	6 ± 1	0.00 ± 0.01
08/09/85 - 08/16/85	0.04 ± 0.01	5.6 ± 0.4	0.02 ± 0.01
08/16/85 - 08/23/85	0.06 ± 0.01	6.4 ± 0.5	0.02 ± 0.01
08/23/85 - 08/30/85	0.02 ± 0.03	1.3 ± 0.2	0.00 ± 0.01
Average Concentration	0.03 ± 0.01	4.8 ± 0.3	0.010 ± 0.005
Pond C-2			
No Discharge			
Walnut Creek at Indiana			
08/02/85 - 08/09/85	0.01 ± 0.02	4 ± 1	0.01 ± 0.01
08/09/85 - 08/16/85	0.019 ± 0.008	4.5 ± 0.4	0.02 ± 0.01
08/16/85 - 08/23/85	0.012 ± 0.008	3.9 ± 0.3	0.00 ± 0.01
08/23/85 - 08/30/85	*	3.4 ± 0.3	0.01 ± 0.01
Average Concentration		4.0 ± 0.3	0.010 ± 0.005

* Analysis incomplete.


PLUTONIUM IN POND A-4 EFFLUENT WATER
picoCuries/liter
.15
.12
.09
.06
.03
0
-.03
-.06
-.09
-.12
-.15
NO DISCHARGE
NO DISCHARGE
NO DISCHARGE
NO DISCHARGE
NO DISCHARGE
NO DISCHARGE
NO DISCHARGE
AUG
OCT
DEC
FEB
APR
JUN
AUG


PLUTONIUM IN POND B-5 EFFLUENT WATER
picoCuries/liter
.08
.07
.06
.05
.04
.03
.02
.01
0
-.01
-.02
NO DISCHARGE
AUG
OCT
DEC
FEB
APR
JUN
AUG


PLUTONIUM IN POND C-1 EFFLUENT WATER
picoCuries/liter
.15
.13
.11
.09
.07
.05
.03
.01
-.01
-.03
-.05
AUG
OCT
DEC
FEB
APR
JUN
AUG


PLUTONIUM IN POND C-2 EFFLUENT WATER
picoCuries/liter
.15
.13
.11
.09
.07
.05
.03
.01
-.01
-.03
-.05
NO DISCHARGE
NO DISCHARGE
NO DISCHARGE
NO DISCHARGE
NO DISCHARGE
NO DISCHARGE
NO DISCHARGE
NO DISCHARGE
NO DISCHARGE
AUG
OCT
DEC
FEB
APR
JUN
AUG

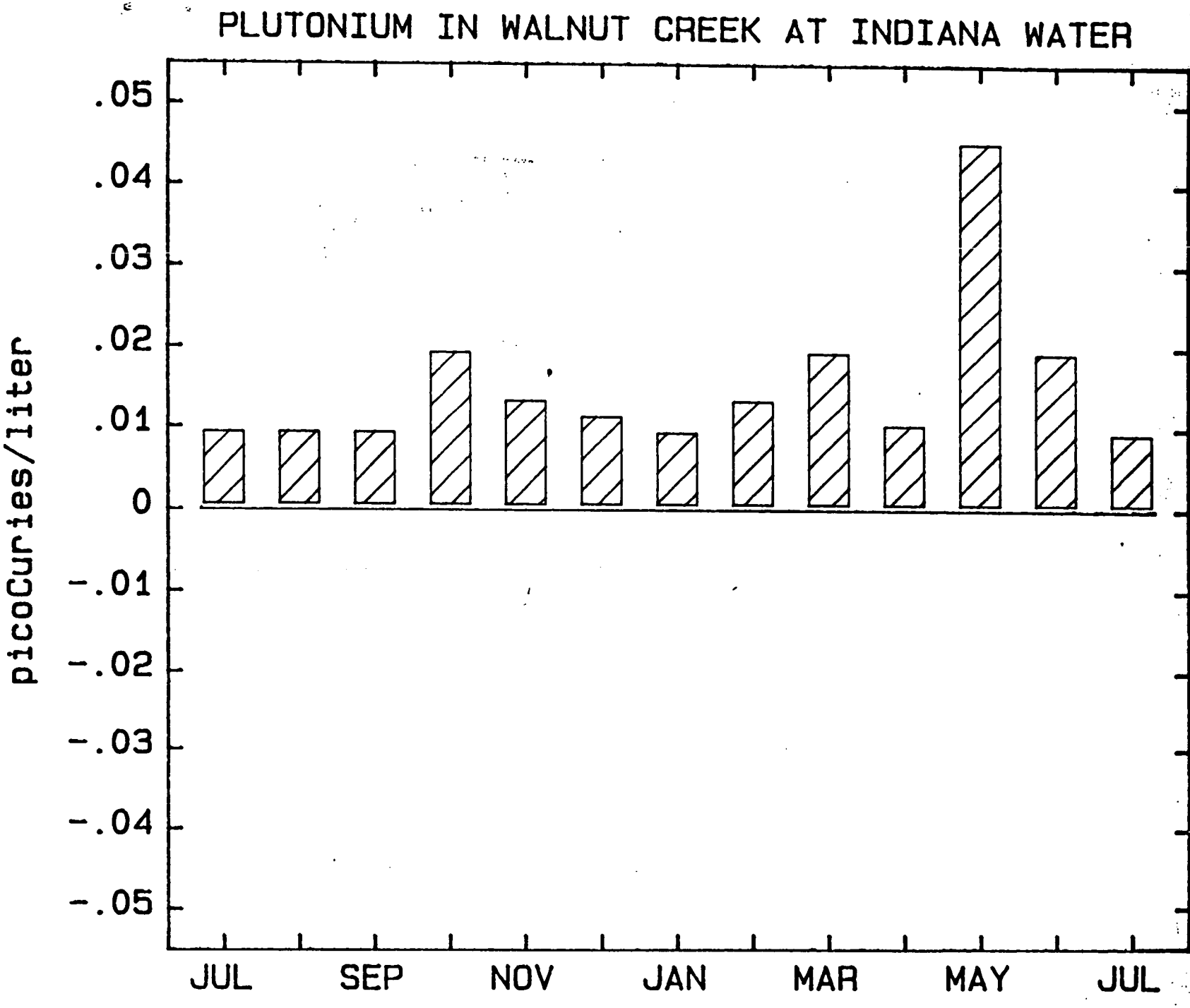

PLUTONIUM IN WALNUT CREEK AT INDIANA WATER
picoCuries/liter
.05
.04
.03
.02
.01
0
-.01
-.02
-.03
-.04
-.05
JUL
SEP
NOV
JAN
MAR
MAY
JUL

Table VIII. Radioactive Water Sample Results

Reservoirs (pCi/l)

Location	n	Plutonium	Uranium	Americium
Great Western	1*	0.000 ± 0.007	2.0 ± 0.2	0.00 ± 0.01
Standley	1*	0.01 ± 0.03	1.4 ± 0.1	0.02 ± 0.01

Community Tap Water (pCi/l)

Location	n	Plutonium	Uranium	Americium
Boulder	1*	0.015 ± 0.009	0.2 ± 0.1	0.01 ± 0.01
Broomfield	1*	0.010 ± 0.008	2.0 ± 0.3	0.00 ± 0.01
Westminster	1*	**	0.4 ± 0.1	0.02 ± 0.01

* Plutonium, uranium and americium analyses were performed on one sample composited from five weekly grab samples.

** Analysis incomplete.

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Table IX. Radioactive Water Sample Results

Tritium (pCi/l)

Location	n	$C_{Minimum}$	$C_{Maximum}$	$C_{Average}$
Pond A-4	3	-300 ± 600	200 ± 700	-100 ± 400
Pond B-5	3	-200 ± 600	400 ± 700	100 ± 400
Pond C-1	4	-100 ± 600	400 ± 600	100 ± 300
Pond C-2	0	No Discharge		
Walnut Creek at Indiana	4	0 ± 600	300 ± 700	200 ± 300
Boulder	5	-400 ± 600	600 ± 600	0 ± 300
Broomfield	5	-400 ± 600	800 ± 700	200 ± 300
Great Western	5	-500 ± 600	500 ± 600	0 ± 300
Standley	5	100 ± 600	900 ± 700	300 ± 300
Westminster	5	-100 ± 600	400 ± 600	100 ± 300

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Table X. Nonradioactive Water Sample Results

Nitrate (as N) at Great Western Reservoir

Sample Date	Nitrate (as N) (mg/l)
08/01/85	0.6
08/08/85	<0.2
08/15/85	<0.2
08/22/85	<0.2
08/29/85	<0.2

Nitrate (as N) at Standley Lake

Sample Date	Nitrate (as N) (mg/l)
08/01/85	0.3
08/08/85	0.2
08/15/85	0.2
08/22/85	0.2
08/29/85	<0.2

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Table XI. NPDES Permit Water Sample Results

Discharge 001 (Pond B-3)
No Discharge

Parameter		Discharge Limitations 30-Day Average	Daily Maximum	30-Day* Average	Daily Maximum
Biochem. Oxygen Demand,5 Day	mg/l	No Discharge		10	25
Total Suspended Soilds	mg/l			30	NA
Nitrates as N	mg/l			10	NA
Total Chromium	mg/l			0.05	0.1
Total Phosphorus	mg/l			8	NA
Oil and Grease, Visual				NA	NA
Total Residual Chlorine	mg/l			NA	0.5
Fecal Coliforms	#/100 ml			200	NA
		Minimum	Maximum	Minimum	Maximum
pH	S.U.			6.0	9.0

Discharge 002 (Pond A-3)
No Discharge

Parameters		Discharge Limitations 30-Day Average	Daily Maximum	30-Day* Average	Daily Maximum
Nitrates as N	mg/l	No Discharge		10	20
		Minimum	Maximum	Minimum	Maximum
pH	S.U.			6.0	9.0

Discharge 003 (RO Pilot Plant)
No Discharge

		Discharge Limitations Minimum	Maximum	Minimum	Maximum
pH	S.U.	No Discharge		6.0	9.0

Discharge 004 (RO Plant)
No Discharge

		Discharge Limitations 30-Day Average	Daily Maximum	30-Day* Average	Daily Maximum
Total Suspended Solids	mg/l	No Discharge		15	25
Total Organic Compounds	mg/l			22	30
Total Phosphorus	mg/l			8	12
Nitrates as N	mg/l			10	20
Total Chromium	mg/l			0.05	0.1
Total Residual Chlorine	mg/l			NA	0.5
		7-Day Average	30-Day Average	7-Day Average	30-Day Average
Fecal Coliform	#/100 ml			400	200
		Minimum	Maximum	Minimum	Maximum
pH	S.U.			6.0	9.0

* This limitation applies when a minimum of 3 consecutive samples are taken during separate weeks.

Tables XI. NPDES Permit Water Sample Results (Continued)

Discharge 005 (Pond A-4)

Parameter		n	$C_{Minimum}$	$C_{Maximum}$	$C_{Average}$
pH	S.U.	3	7.5	7.9	-
Nitrates as N	mg/l	3	<0.2	0.3	<0.2
Nonvolatile Suspended Solids	mg/l	3	1.0	36.	14.

Discharge 006 (Pond B-5)

Parameter		n	$C_{Minimum}$	$C_{Maximum}$	$C_{Average}$
pH	S.U.	3	7.4	8.1	-
Nitrates as n	mg/l	3	0.3	0.6	0.5
Nonvolatile Suspended Solids	mg/l	3	2.0	7.0	4.3

Discharge 007 (Pond C-2)
No Discharge

Parameter		n	$C_{Minimum}$	$C_{Maximum}$	$C_{Average}$
pH	S.U.		No Discharge		
Nitrates as N	mg/l				
Nonvolatile Suspended solids	mg/l				

Table XII. Nonradioactive Water Sample Results

Walnut Creek at Indiana Street

Parameter	n	$C_{Minimum}$	$C_{Maximum}$	$C_{Average}$
pH	20	7.6	8.3	-
Nitrates as N	20	<0.2	4.1	<0.4

Total Volume (gallons) = 4,561,000