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Rocky Flats Plant

Monthly Environmental Monitoring Report

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APRIL 1986 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 April, 1986.

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.

Table I. 1986 Plutonium and Uranium Airborne Effluent Data

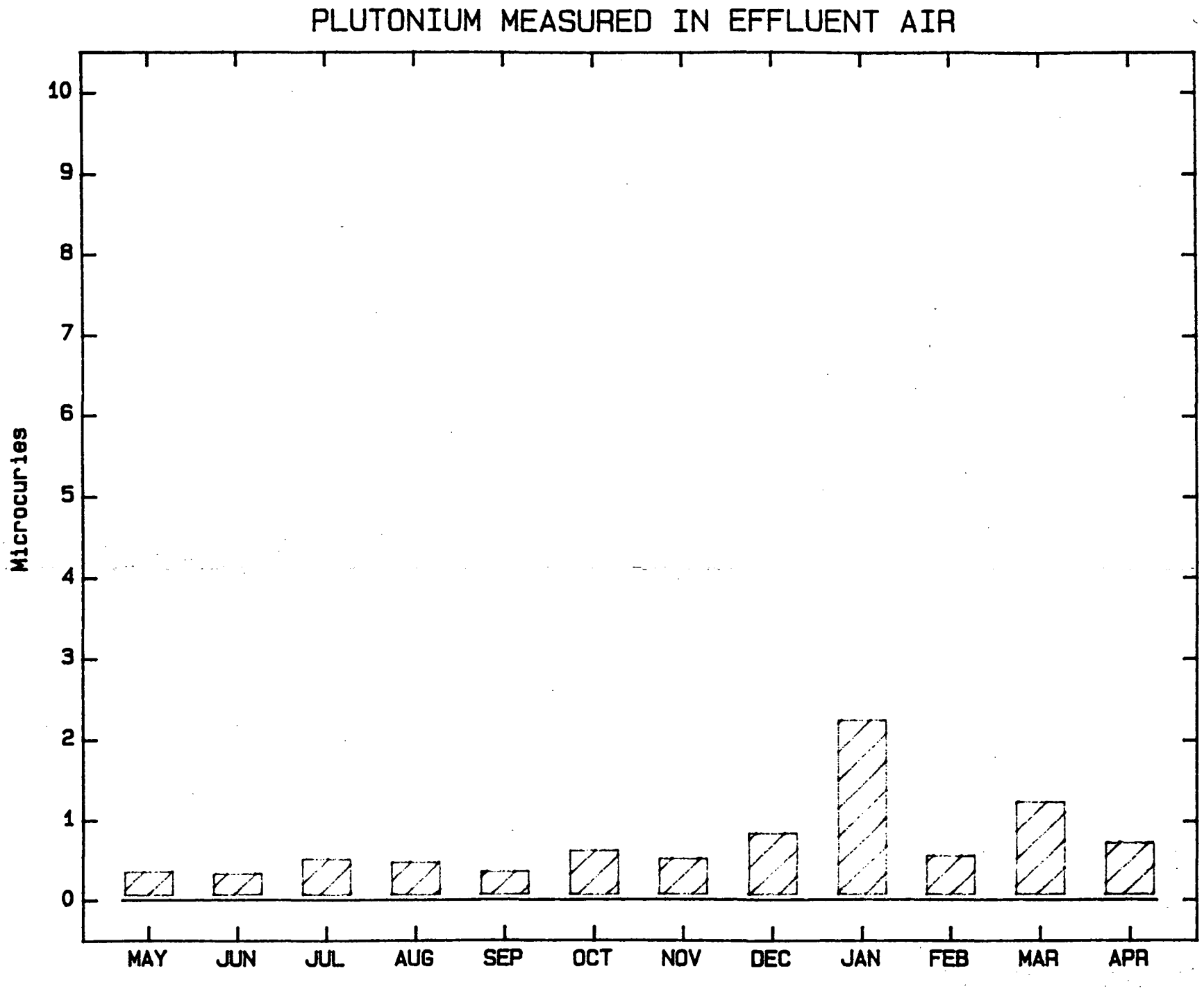
Month	Plutonium Release (uCi)	Plutonium CMax (pCi/m3)	Uranium Release (uCi)	Uranium CMax (pCi/m3)
CY 1985	9.11	0.156 ± 0.0303	38.24	0.924 ± 0.0206
January	2.30	0.047 ± 0.0082	2.44	0.007 ± 0.0007
February	0.62	0.002 ± 0.0003	1.48	0.009 ± 0.0007
March	1.30	0.008 ± 0.0012	1.04	0.004 ± 0.0003
April	0.79	0.019 ± 0.0042	1.87	0.008 ± 0.0009
Year to Date	5.01	0.047 ± 0.0082	6.83	0.009 ± 0.0007

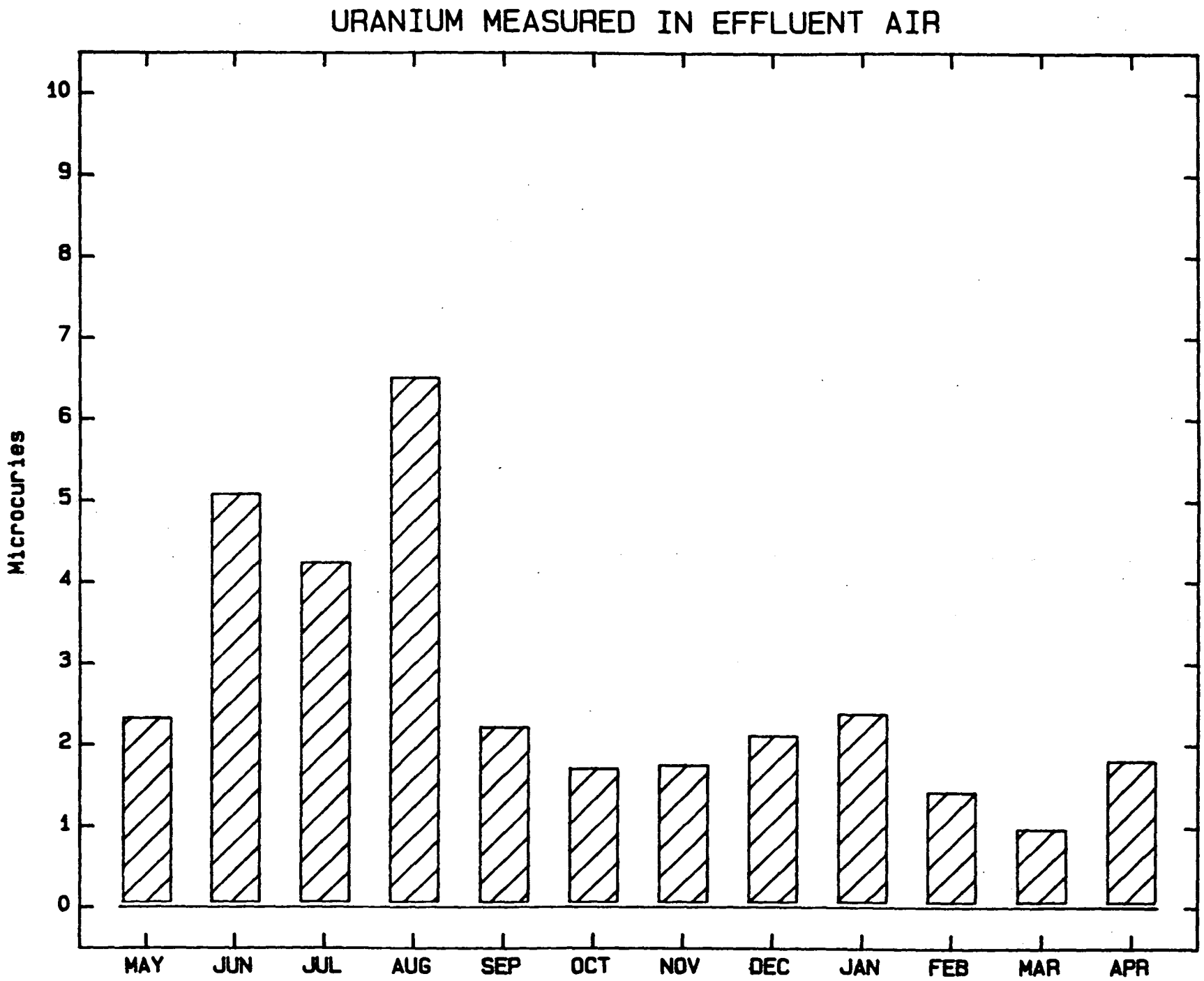
Table II. 1986 Tritium and Beryllium Airborne Effluent Data

Month	Tritium Release (Ci)	Tritium CMax (pCi/m3)	Beryllium Release (gms)	Beryllium CMax (ug/m3)
CY 1985	0.155	1360 ± 280	0.496	0.0169
January	0.010	70 ± 50	0.0037	0.00035
February	0.009	3210 ± 590	-0.0001	0.00005
March	0.008	5200 ± 640	-0.0159	0.00002
April	0.008	1535 ± 270	0.0295	0.00029
Year to Date	0.035	5200 ± 640	0.0172	0.00035

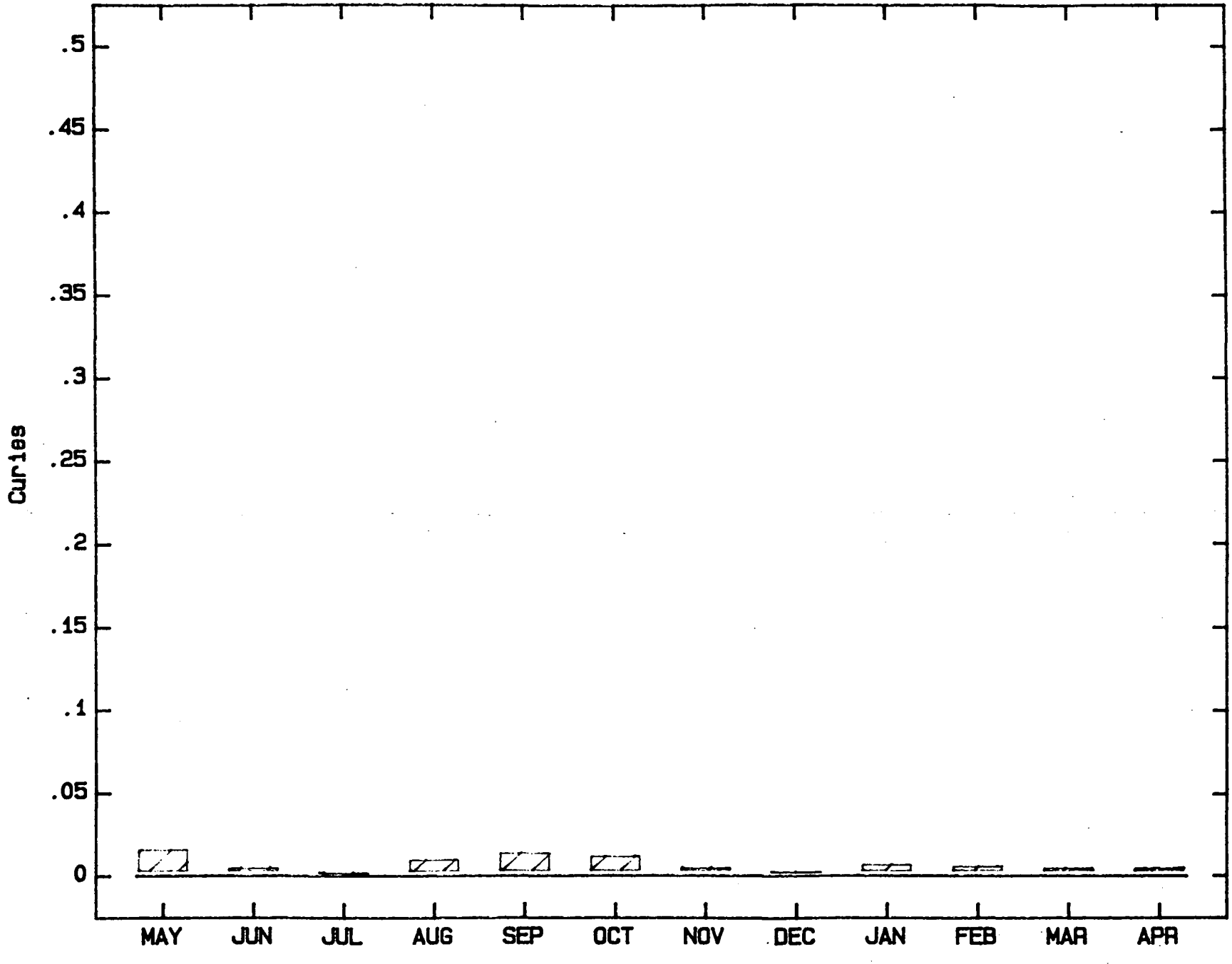
NOTE: Beryllium measured at the remaining 36 locations was below the screening level of 0.1 gram per month.

PLUTONIUM MEASURED IN EFFLUENT AIR




URANIUM MEASURED IN EFFLUENT AIR
Microcuries
0
1
2
3
4
5
6
7
8
9
10
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
JAN
FEB
MAR
APR

TRITIUM MEASURED IN EFFLUENT AIR



BERYLLIUM MEASURED IN EFFLUENT AIR

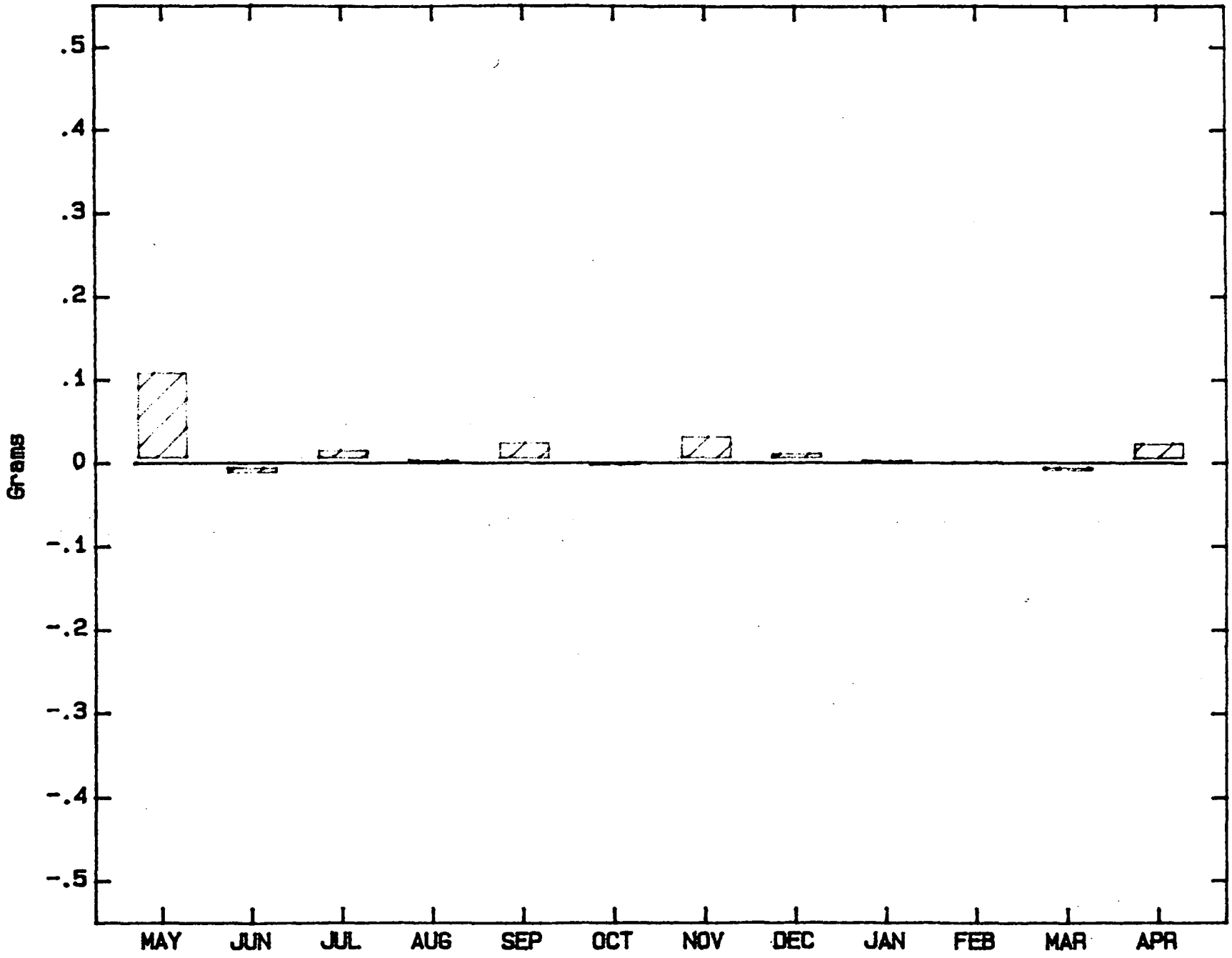


Table III. Plutonium at Selected Onsite Ambient Air Locations
(03/25/86-04/15/86)

Location	n	Volume(m^3)	Concentration (pCi/m^3) Lower Confidence Limit	Point Estimate	Upper Confidence Limit
S-5	2	25,000	0.000011	0.000015	0.000019
S-6	2	24,000	0.000010	0.000014	0.000018
S-7	2	23,000	0.000231	0.000263	0.000295
S-8	2	24,000	0.000363	0.000407	0.000451
S-9	2	23,000	0.000168	0.000189	0.000210

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	-50 ± 430
S-5	4	0 ± 420
S-16	4	320 ± 440

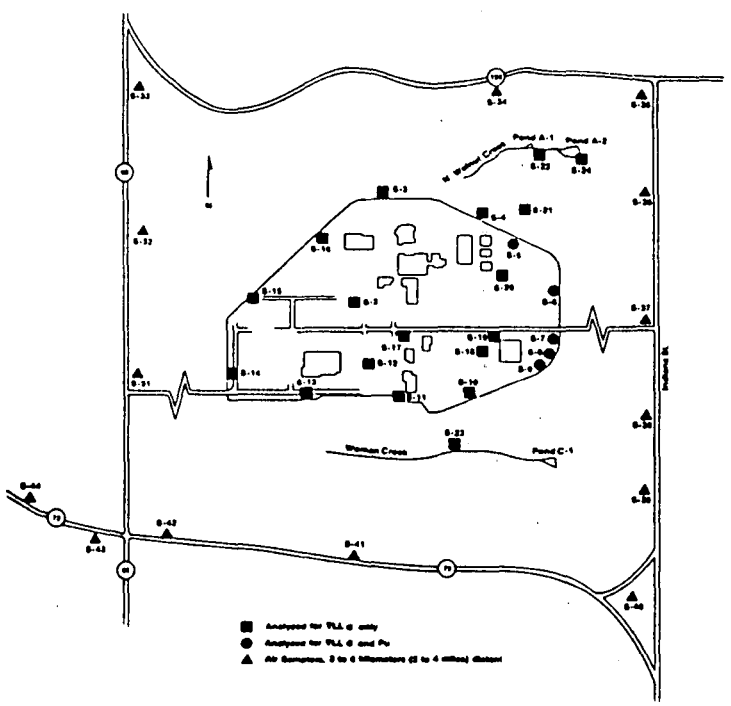


Table V. Plutonium in Perimeter Ambient Air
(03/25/86-04/22/86)

Location	n	Volume(m^3)	Concentration(pCi/m^3) Lower Confidence Limit	Point Estimate	Upper Confidence Limit
S-31	1	27,000	0.000004	0.000006	0.000008
S-32	1	25,000	-0.000001	0.000001	0.000003
S-33	1	33,000	-0.000001	0.000000	0.000001
S-34	1	24,000	-0.000001	0.000001	0.000003
S-35	1	23,000	0.000000	0.000002	0.000004
S-36	1	28,000	-0.000001	0.000000	0.000001
S-37	1	28,000	0.000001	0.000003	0.000005
S-38	1	21,000	0.000003	0.000005	0.000007
S-39	1	28,000	0.000000	0.000001	0.000002
S-40	1	18,000	0.000004	0.000006	0.000008
S-41	1	25,000	0.000000	0.000001	0.000002
S-42	1	27,000	0.000000	0.000001	0.000002
S-43	1	31,000	0.000000	0.000001	0.000002
S-44	1	27,000	-0.000001	0.000000	0.000001
Mean Point Estimate				0.000002	

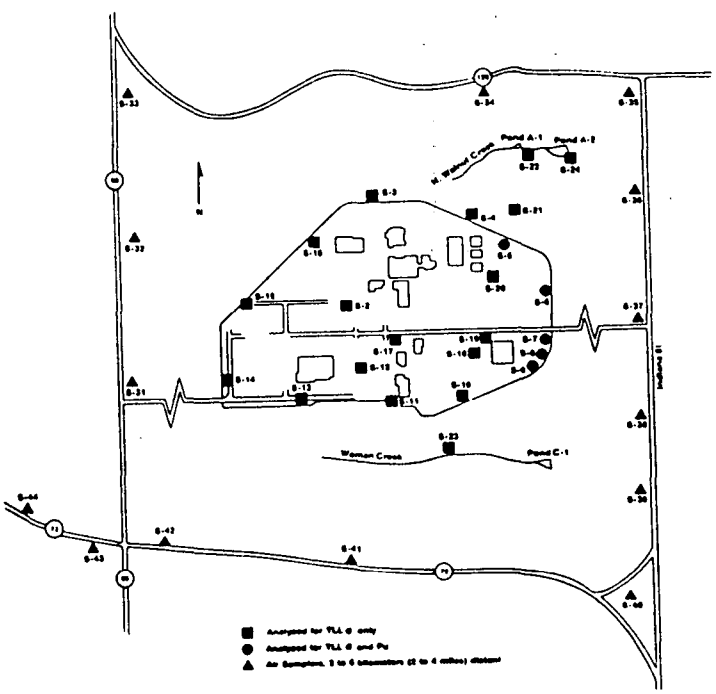
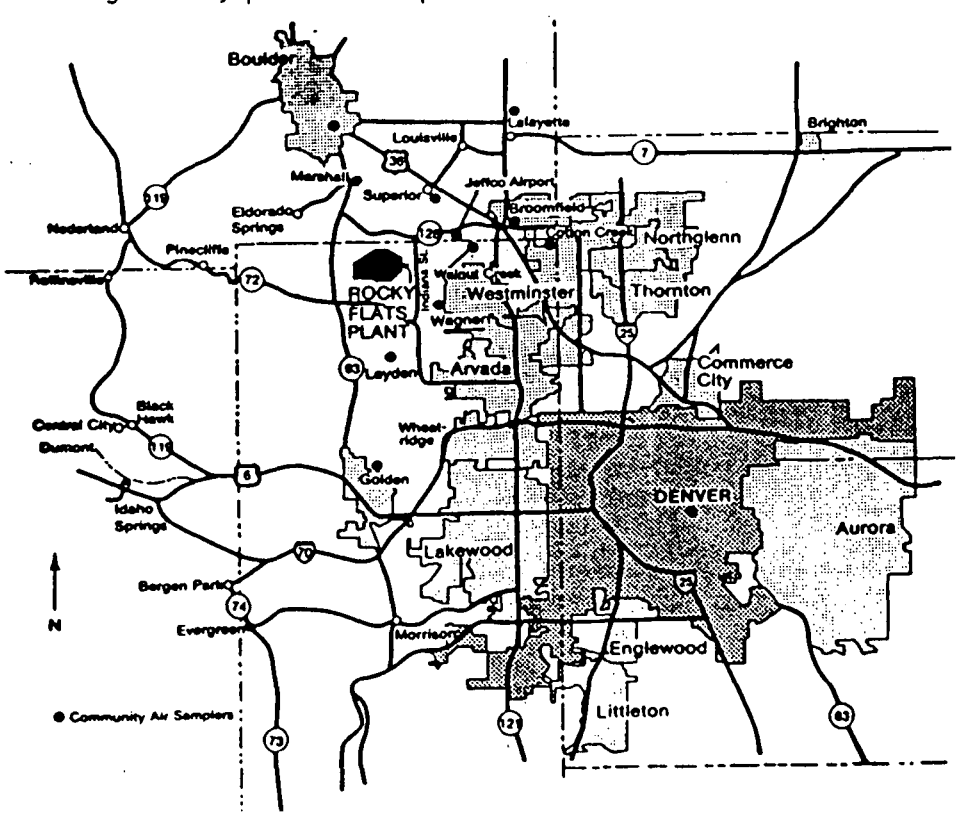


Table VI. Plutonium in Community Ambient Air
(03/26/86-04/22/86)

Location	n	Volume(m^3)	Concentration(pCi/m^3) Lower Confidence Limit	Point Estimate	Upper Confidence Limit
Marshall	1	27,000	0.000002	0.000003	0.000004
Jeffco Airport	1	27,000	0.000000	0.000001	0.000002
Superior	1	24,000	-0.000001	0.000000	0.000001
Boulder	1	31,000	0.000002	0.000003	0.000004
Lafayette	1	28,000	-0.000001	0.000000	0.000001
Broomfield	1	27,000	0.000000	0.000001	0.000002
Walnut Creek	1	27,000	0.000006	0.000008	0.000010
Wagner	1	25,000	-0.000001	0.000000	0.000001
Leyden	1	32,000	0.000000	0.000001	0.000002
Westminster	1	25,000	0.000007	0.000009	0.000011
Denver	1	31,000	-0.000001	0.000000	0.000001
Golden	0				
Lake Pointe	1	29,000	0.000001	0.000002	0.000003
Cotton Creek	1	28,000	-0.000001	0.000000	0.000001
Mean Point Estimate				0.000002	

S-61: Sample being rerun, planchette problem.



PLUTONIUM IN PERIMETER AND COMMUNITY AMBIENT AIR

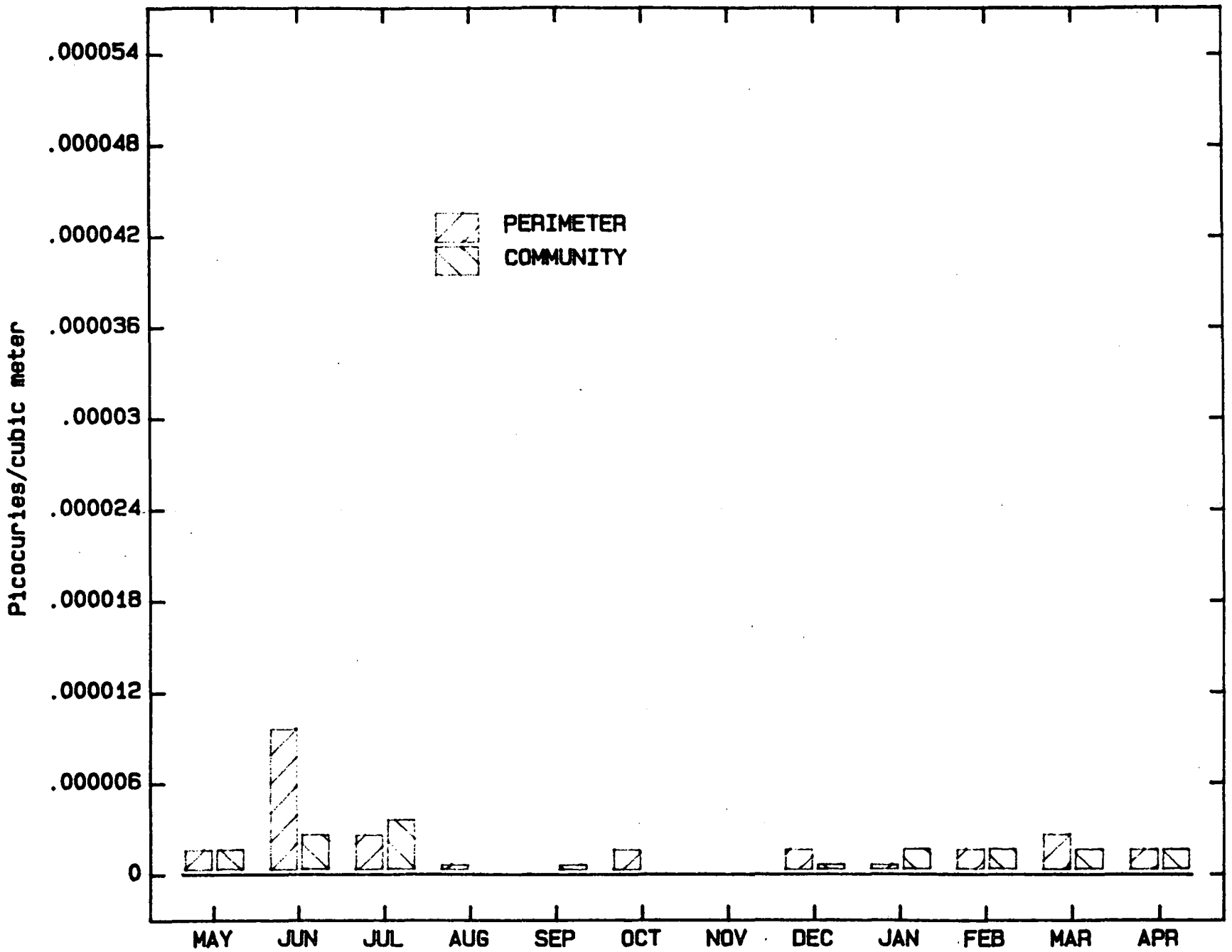


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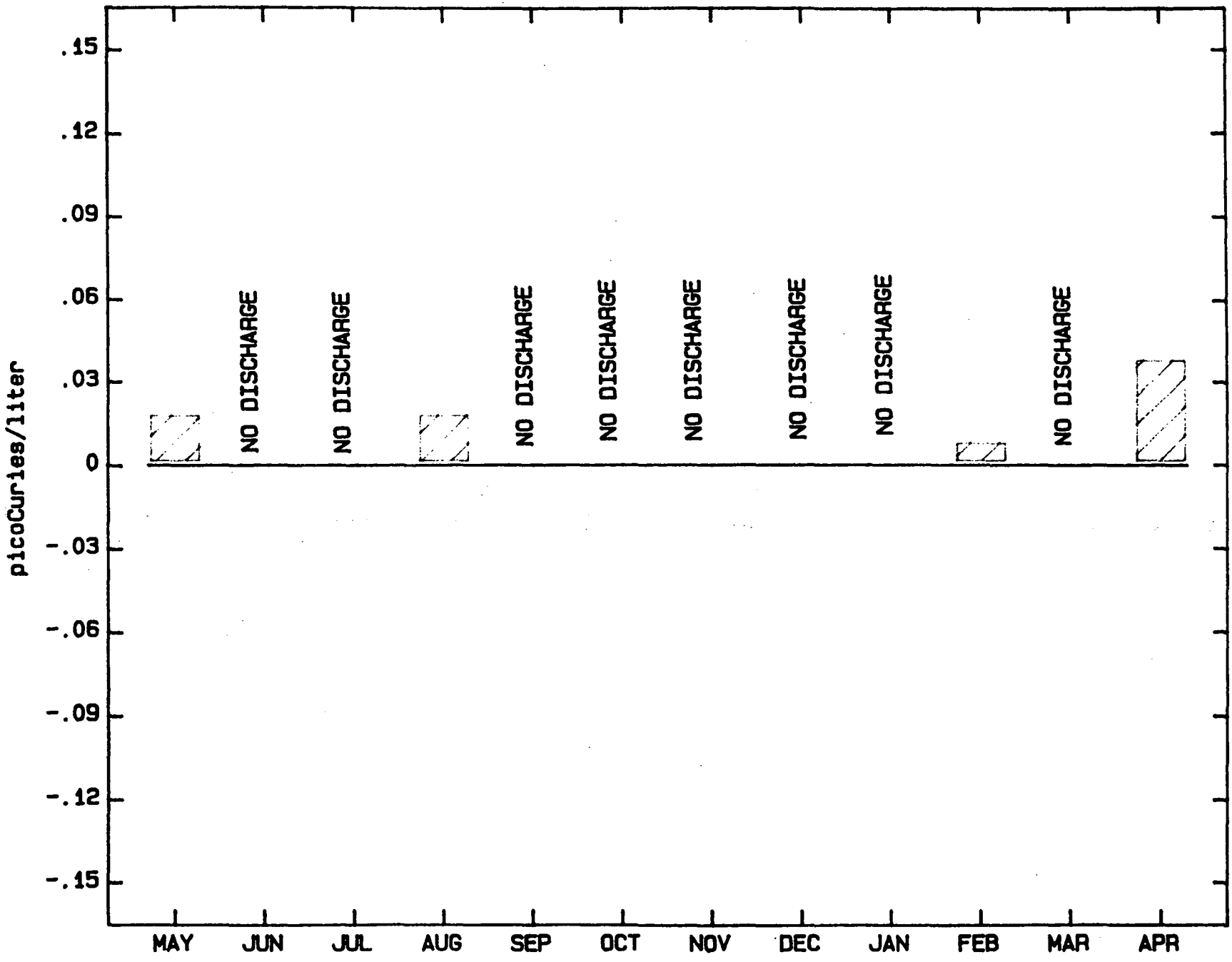
Table VII. Radioactive Water Sample Results

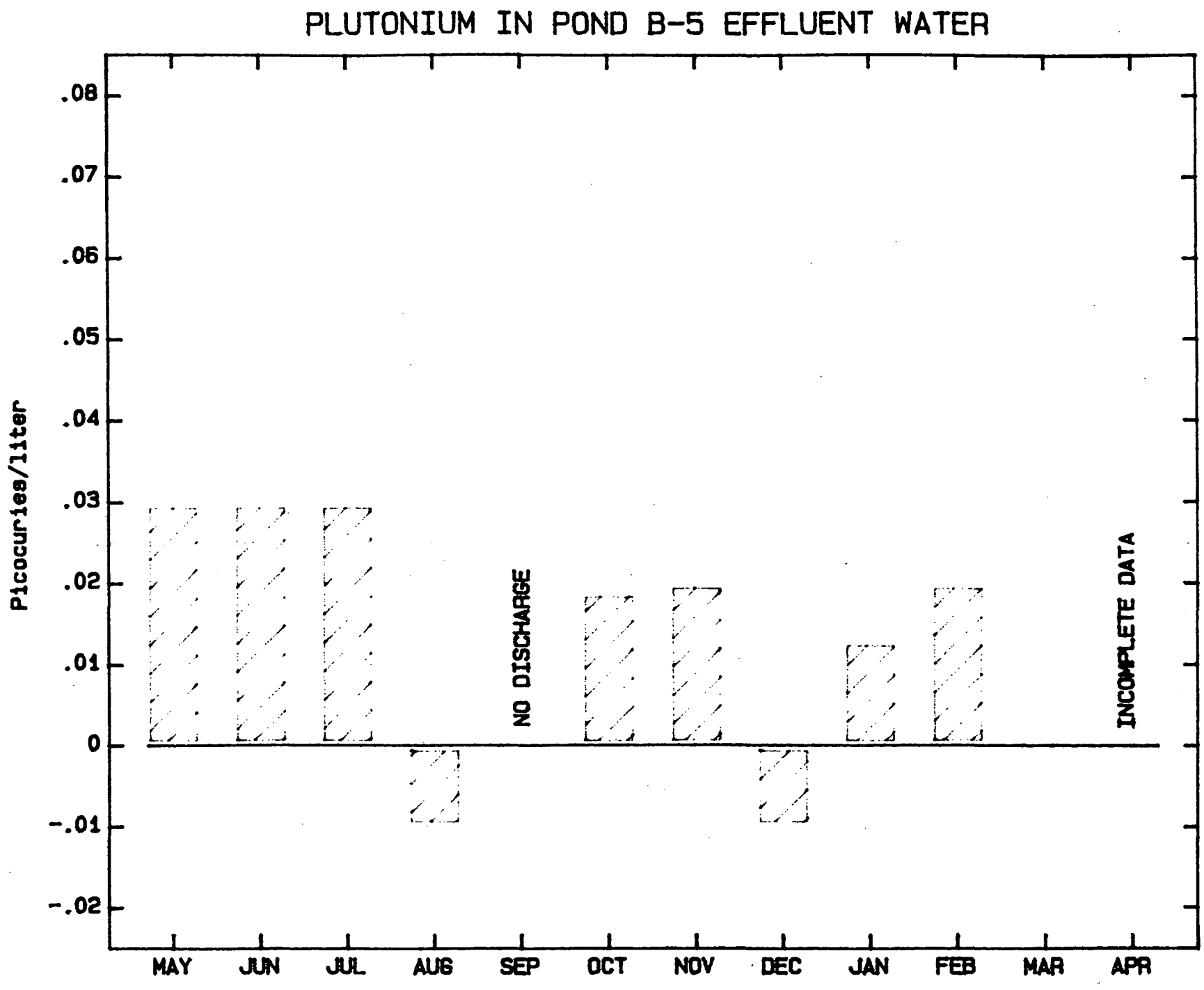
Holding Pond Outfall (pCi/l)

Location	Plutonium	Uranium	Americium
Pond A-4			
04/09/86 - 04/11/86	0.01 ± 0.02	1.7 ± 0.2	-0.02 ± 0.06
04/13/86 - 04/15/86	0.08 ± 0.03	5.6 ± 0.7	0.00 ± 0.01
Average Concentration	0.04 ± 0.02	3.6 ± 0.4	-0.01 ± 0.03
Pond B-5			
04/07/86 - 04/11/86	*	5.3 ± 0.5	0.01 ± 0.06
04/14/86 - 04/15/86	*	7 ± 1	0.00 ± 0.06
Average Concentration	*	6.2 ± 0.6	0.00 ± 0.04
Pond C-1			
03/28/86 - 04/04/86	0.04 ± 0.01	0.6 ± 0.1	-0.01 ± 0.06
04/04/86 - 04/11/86	0.005 ± 0.005	0.6 ± 0.1	0.00 ± 0.01
04/11/86 - 04/18/86	0.043 ± 0.009	1.0 ± 0.2	0.00 ± 0.01
04/18/86 - 04/25/86	0.009 ± 0.005	1.1 ± 0.2	0.00 ± 0.01
Average Concentration	0.024 ± 0.004	0.82 ± 0.08	0.00 ± 0.02
Pond C-2			
		No Discharge	
Walnut Creek at Indiana			
03/28/86 - 04/04/86	0.010 ± 0.007	9.2 ± 0.7	0.04 ± 0.06
04/04/86 - 04/11/86	0.023 ± 0.006	3.7 ± 0.3	0.01 ± 0.01
04/11/86 - 04/18/86	0.014 ± 0.005	2.8 ± 0.3	0.03 ± 0.01
04/18/86 - 04/25/86	0.002 ± 0.004	*	0.00 ± 0.01
Average Concentration	0.012 ± 0.003		0.02 ± 0.02

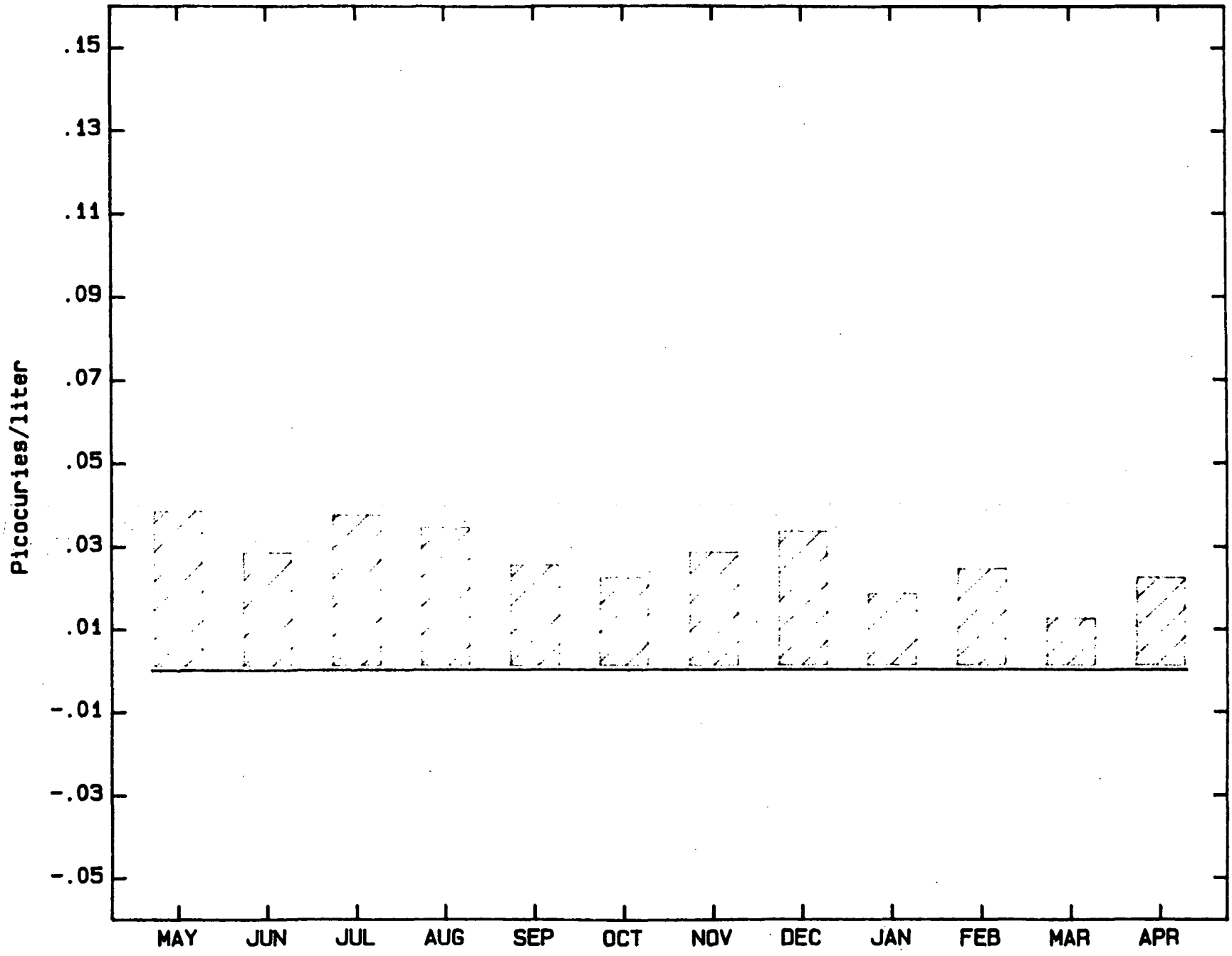
* Analysis incomplete.

PLUTONIUM IN POND A-4 EFFLUENT WATER

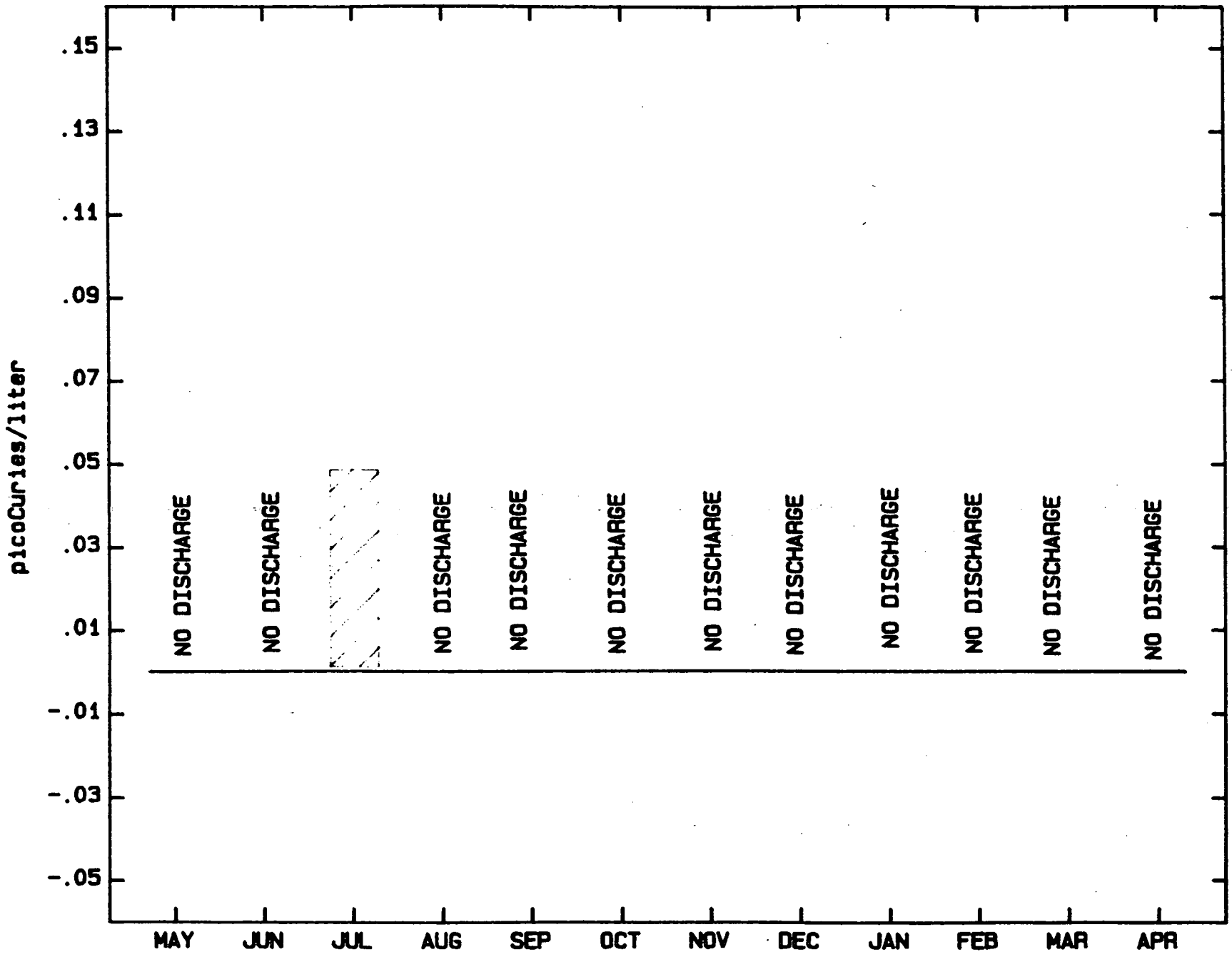


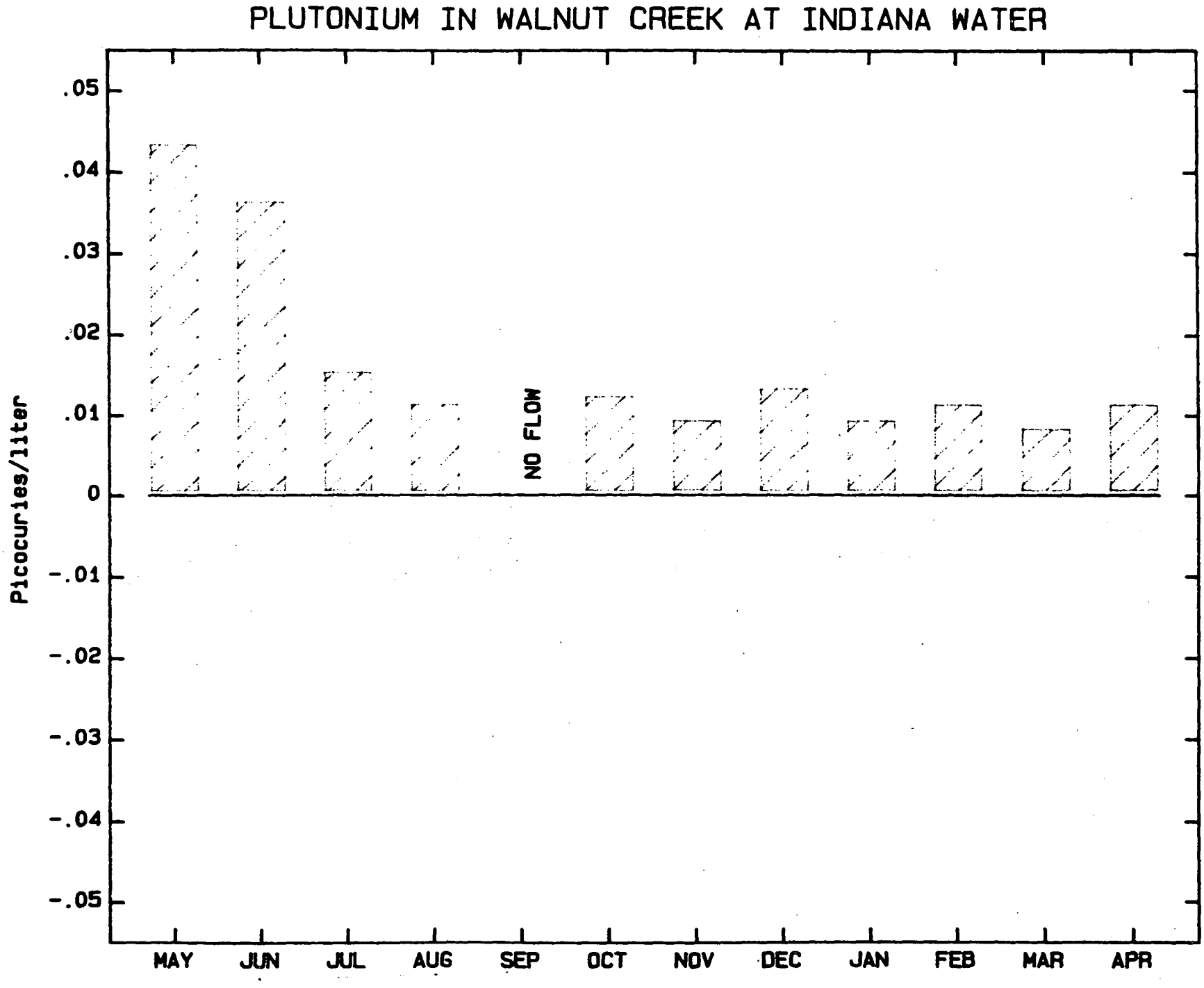

PLUTONIUM IN POND B-5 EFFLUENT WATER
Picocuries/liter
.08
.07
.06
.05
.04
.03
.02
.01
0
-.01
-.02
NO DISCHARGE
INCOMPLETE DATA
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
JAN
FEB
MAR
APR

PLUTONIUM IN POND C-1 EFFLUENT WATER



PLUTONIUM IN POND C-2 EFFLUENT WATER




PLUTONIUM IN WALNUT CREEK AT INDIANA WATER
Picocuries/liter
.05
.04
.03
.02
.01
0
-.01
-.02
-.03
-.04
-.05
NO FLOW
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
JAN
FEB
MAR
APR

APRIL 1986

Table VIII. Radioactive Water Sample Results

Reservoirs (pCi/l)

Location	n	Plutonium	Uranium	Americium
Great Western	1*	0.008 ± 0.007	3.1 ± 0.4	0.01 ± 0.02
Standley	1*	-0.003 ± 0.005	2.7 ± 0.3	0.01 ± 0.02

Community Tap Water (pCi/l)

Location	n	Plutonium	Uranium	Americium
Boulder	1*	0.002 ± 0.007	0.2 ± 0.1	0.02 ± 0.02
Broomfield	1*	-0.003 ± 0.005	1.4 ± 0.2	0.00 ± 0.02
Westminster	1*	0.007 ± 0.007	0.8 ± 0.1	0.05 ± 0.02

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

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Table IX. Radioactive Water Sample Results

Tritium (pCi/l)

Location	n	$C_{Minimum}$	$C_{Maximum}$	$C_{Average}$
Pond A-4	5	0 ± 400	800 ± 400	200 ± 200
Pond B-5	7	-100 ± 400	400 ± 400	100 ± 200
Pond C-1	4	-300 ± 500	600 ± 600	100 ± 200
Pond C-2	0		No Discharge	
Walnut Creek at Indiana	4	-300 ± 400	200 ± 400	0 ± 200
Boulder	3	100 ± 400	800 ± 400	500 ± 200
Broomfield	3	0 ± 400	300 ± 400	200 ± 200
Great Western	3	100 ± 400	300 ± 400	200 ± 200
Standley	3	-100 ± 400	200 ± 400	0 ± 200
Westminster	3	-200 ± 300	-200 ± 400	-200 ± 200

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Table X. Nonradioactive Water Sample Results

Nitrate (as N) at Great Western Reservoir

Sample Date	Nitrate (as N) (mg/l)
04/03/86	*
04/10/86	2.9
04/17/86	0.6
04/24/86	0.6

Nitrate (as N) at Standley Lake

Sample Date	Nitrate (as N) (mg/l)
04/03/86	*
04/10/86	<0.20
04/17/86	<0.20
04/24/86	<0.20

* No sampling because of snowstorm.

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Table XI. NPDES Permit Water Sample Results

Discharge 001 (Pond B-3)
No Discharge

Parameter		30-Day Average	Daily Maximum	Discharge Limitations 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)
Discharge between 04/02/86- 04/07/86
and 04/16/86 - 04/18/86

Parameters		30-Day Average	Daily Maximum	Discharge Limitations 30-Day* Average	Daily Maximum
Nitrates as N	mg/l	4.1	5.3	10	20
		Minimum	Maximum	Minimum	Maximum
pH	S.U.	7.5	7.8	6.0	9.0

Discharge 003 (RO Pilot Plant)
No Discharge

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

Discharge 004 (RO Plant)
No Discharge

		30-Day Average	Daily Maximum	Discharge Limitations 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.	6	7.5	8.0	-
Nitrates as N	mg/l	6	2.8	4.2	3.3
Nonvolatile Suspended Solids	mg/l	6	3.0	25.	12.

Discharge 006 (Pond B-5)

Parameter		n	$C_{Minimum}$	$C_{Maximum}$	$C_{Average}$
pH	S.U.	7	7.7	8.0	-
Nitrates as N	mg/l	7	<0.2	2.0	<1.4
Nonvolatile Suspended Solids	mg/l	7	1.0	38.	12.

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	S.U.	18	6.8	8.2	-
Nitrates as N	mg/l	18	<0.2	4.1	<1.3

Total Volume (gallons) = 125,220,000