ENVIRONMENTAL MONITORING

SEMIANNUAL REPORT

JULY 1, 1965 TO DECEMBER 31, 1965

AND

ANNUAL REPORT

1965

by

J. D. Moore
C. J. Schwering

APPROVED: R E Alexander

R. E. Alexander
Supervisor, Radiation Safety Unit

CONTENTS

TABLES

FIGURES

ABSTRACT

Environmental monitoring at Atomics International is performed by the Radiation Safety Unit of the Health, Safety and Radiation Services Department. Soil, vegetation, water, and air are routinely sampled up to a distance of 10 miles from Atomics International property. The environmental radioactivity reported herein is attributed to naturally occurring fluctuations, not to Atomics International operations.

Figure 1. Atomics International World Headquarters

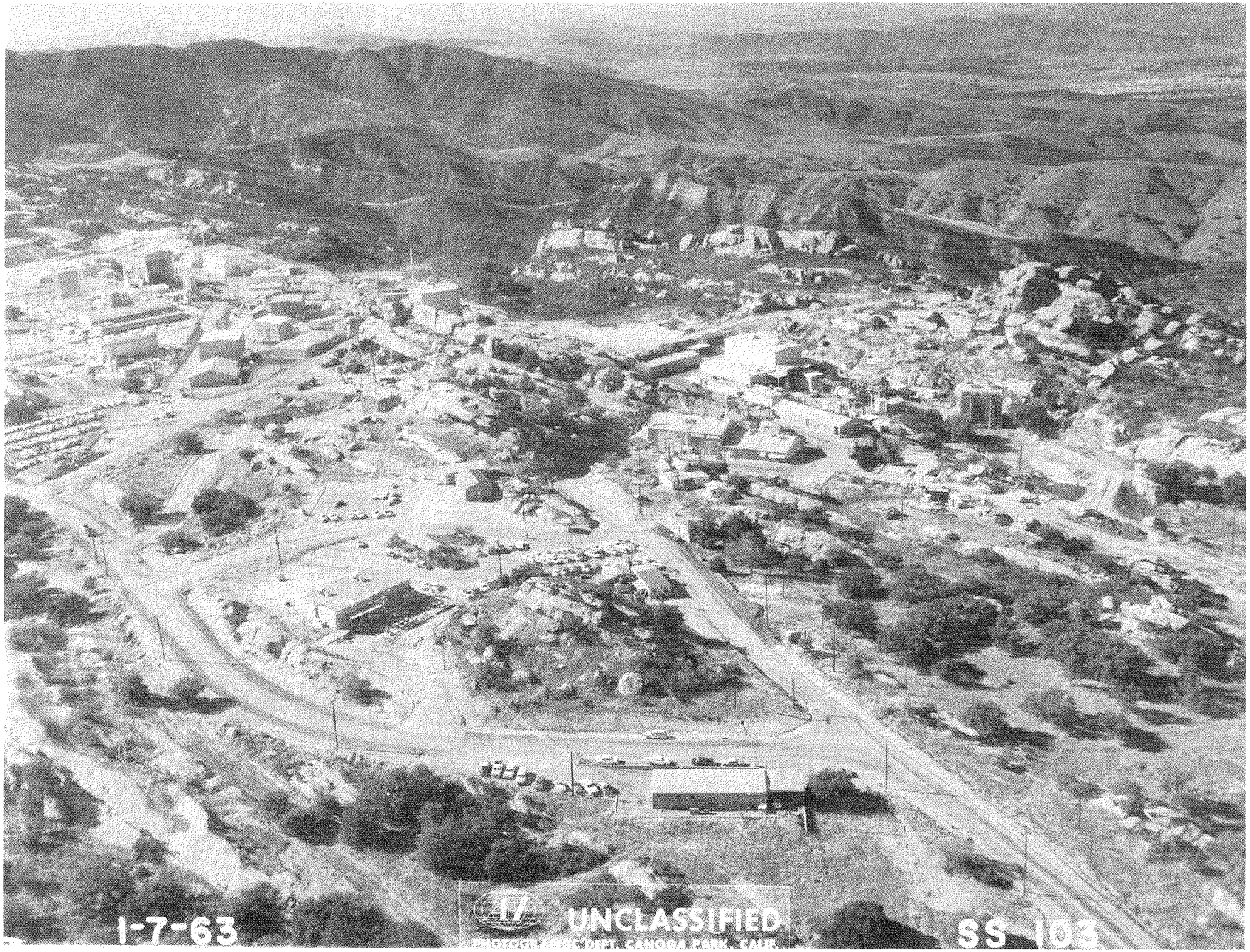


Figure 2. Atomics International Nuclear Development Field Laboratory

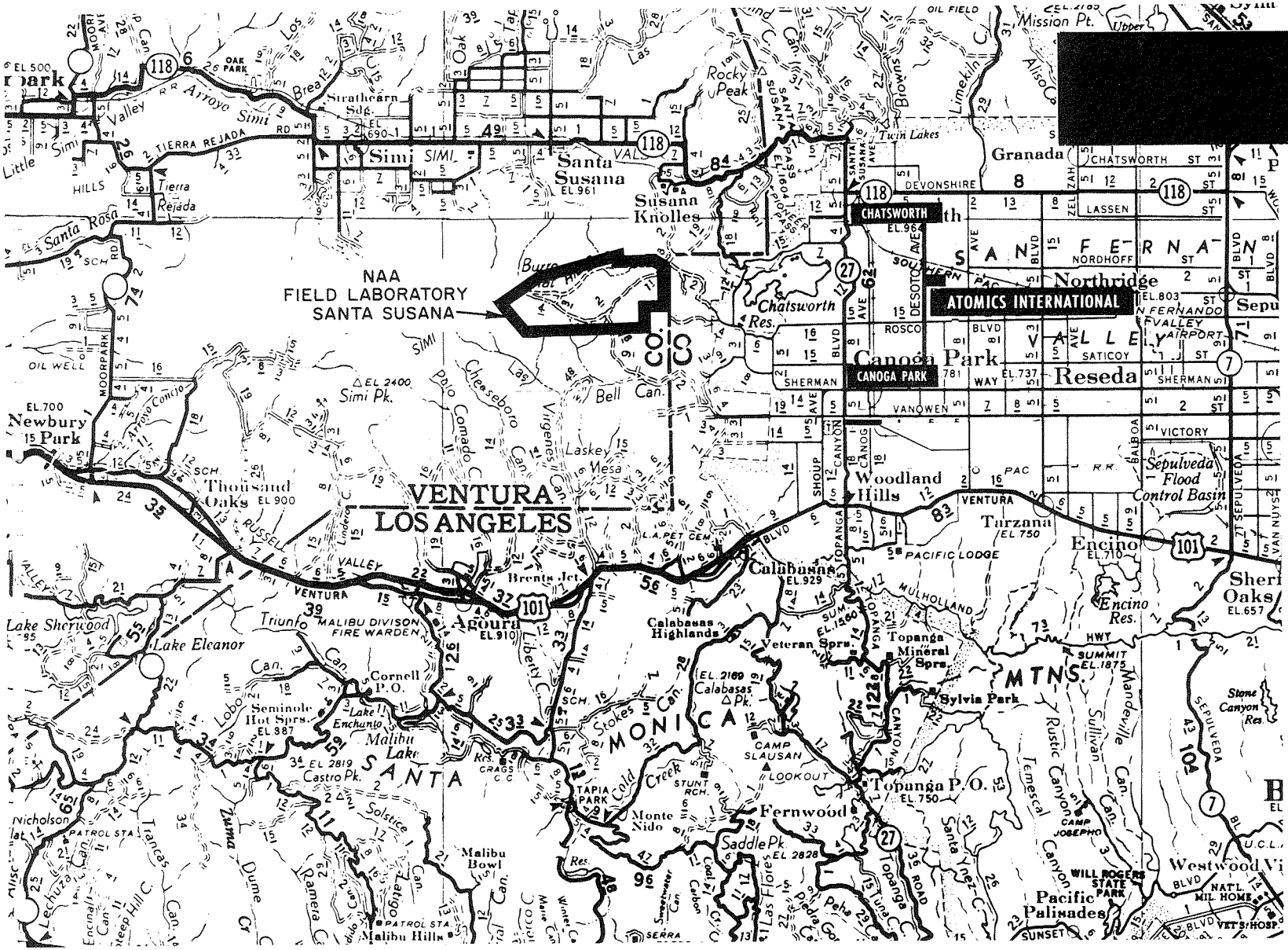


Figure 3. Map of Headquarters and Nuclear Development Field Laboratory Environs

I. SUMMARY

Atomics International, a Division of North American Aviation, Incorporated, has been engaged in atomic energy research and development since 1946. The Company designs, develops, and constructs nuclear reactors for central station and compact power plants and for medical, industrial, and scientific applications.

The Company occupies modern facilities in Canoga Park, California, approximately 23 miles northwest of downtown Los Angeles (Figure 1). The 290-acre Nuclear Development Field Laboratory (Figure 2), equipped with extensive facilities for the support of advanced nuclear studies, is located in the Simi Hills of Ventura County approximately 29 miles northwest of downtown Los Angeles. The location of the above sites in relation to nearby communities is shown in Figure 3.

The basic concept of radiological hazard control at Atomics International requires total containment of radioactive materials and, through rigid operational controls, minimizes effluent releases and external radiation levels. The environmental monitoring program provides a check on the effectiveness of the company's radiological safety procedures and of engineering safeguards incorporated into facility design.

The environs of Atomics International Headquarters and Nuclear Development Field Laboratory (NDFL) are surveyed monthly to determine the concentration of radioactivity in typical surface soil, vegetation, and water samples. Also, continuous environmental air monitoring at the sites provides information concerning airborne particulate radioactivity. This report summarizes environmental monitoring results for the last six months of 1965 and compares the data with previous years.

Soil and vegetation are sampled monthly. Sampling stations located within the boundaries of Atomics International's sites are referred to as "on-site"stations. The remaining stations, located within a 10 mile radius of the sites, are referred to as "off-site" stations.

A. ENVIRONMENTAL RADIOACTIVITY DATA - 1965

The average radioactivity concentrations in soil and vegetation samples are presented in Tables I and II.

TABLE I
SOIL RADIOACTIVITY DATA - 1965
I.a. SEMIANNUAL AVERAGES

Area	Activity	First Half - 1965		Last Half - 1965	
		No. Samples	Average uuc/gram	No. Samples	Average uuc/gram
On Site	α	72	0.49	72	0.43 to 0.44
	β-γ	72	40	72	32
Off Site	α	70	0.50 to 0.51	72	0.43 to 0.45
	β-γ	70	30	72	27

I. b. MONTHLY AVERAGES
uuc/gram

	Activity	J	F	M	A	M	J	J	A	S	O	N	D
On Site	α	0.48	0.55	0.45	0.57	0.47	0.40	0.55 to 0.57	0.50	0.39 to 0.41	0.41	0.41	0.32 to 0.36
	β-γ	41	37	39	39	48	37	32	33	32	30	36	28
Off Site	α	0.46 to 0.48	0.47	0.67	0.49	0.50 to 0.52	0.40 to 0.42	0.47	0.45 to 0.47	0.36 to 0.40	0.46 to 0.48	0.42 to 0.44	0.41 to 0.43
	β-γ	32 to 33	29	32	33	30	27	26	28	27	27	27	25

TABLE II
VEGETATION RADIOACTIVITY DATA - 1965
II. a. SEMIANNUAL AVERAGES

Area	Activity	First Half - 1965		Last Half - 1965	
		No. Samples	Average uuc/gram/ash	No. Samples	Average uuc/gram/ash
On Site	α	72	0.61 to 0.62	72	0.48 to 0.50
	β-γ	72	177	72	146
Off Site	α	70	0.78	72	0.45 to 0.46
	β-γ	70	156	72	121

II. b. MONTHLY AVERAGES
uuc/gram/ash

	Activity	J	F	M	A	M	J	J	A	S	O	N	D
On Site	α	1.09	0.69	0.43	0.67	0.57	0.22 to 0.25	0.31 to 0.34	0.40 to 0.41	0.39 to 0.40	0.52 to 0.53	0.67 to 0.69	0.62
	β-γ	171	150	161	182	160	238	153	140	144	147	149	141
Off Site	α	1.69	0.71	0.56	0.73	0.60	0.35	0.54	0.31 to 0.32	0.31	0.39	0.70 to 0.71	0.45
	β-γ	151	134	138	211	158	141	122	113	114	121	145	114

Process water used at the NDFL is obtained from wells and stored in 50,000 gallon tanks. Potable water is delivered to the site by a vendor and is not analyzed. Well water is sampled monthly from the supply system at two locations. The average well water radioactivity is presented in Table III.

TABLE III
WELL WATER RADIOACTIVITY DATA - 1965
III. a. SEMIANNUAL AVERAGES

Location	Activity	First Half - 1965		Last Half - 1965	
		No. Samples	Average uuc/liter	No. Samples	Average uuc/liter
NDFL	α	12	0.22	12	0.20 to 0.22
	β-γ	12	6.3 to 6.5	12	5.5

III. b. MONTHLY AVERAGES
uuc/liter

Activity	J	F	M	A	M	J	J	A	S	O	N	D
α	0.29	0.20	0.17	0.34	0.20	0.10	0.64	0.17 to 0.20	0.20	0.05 to 0.07	0.07 to 0.09	0.09
β-γ	8.2	3.8	4.6	6.1	13.6	1.5 to 2.8	5.5	5.7	4.8	3.9	6.8	6.2

Soil, vegetation, and water are sampled monthly at Chatsworth Reservoir, which is operated by the Los Angeles City Department of Water and Power. Soil and vegetation radioactivity data for the reservoir are averaged into data presented in Tables I, II, VI, and VII. The average radioactivity in lake surface and supply inlet water samples is presented in Table IV.

TABLE IV
CHATSWORTH RESERVOIR WATER RADIOACTIVITY DATA - 1965
IV. a. SEMIANNUAL AVERAGES

Samples	Activity	First Half - 1965		Last Half - 1965	
		No. Samples	Average uuc/liter	No. Samples	Average uuc/liter
Lake Surface	α	6	0.53	5	0.81
	β-γ	6	9.8	5	7.3
Supply Inlet	α	6	0.44	6	0.78
	β-γ	6	12.2	6	5.5 to 5.9

IV. b. MONTHLY AVERAGES
uuc/liter

	Activity	J	F	M	A	M	J	J	A	S	O	N	D
Lake Surface	α	0.69	0.76	0.10	0.81	0.16	0.64	1.50	0.72	0.94	0.46	*	0.42
	β-γ	10	6.6	9.5	12	11	9.5	4.7	9.5	6.8	7.3	*	8.2
Supply Inlet	α	0.68	0.39	0.07	0.89	0.14	0.46	1.94	0.51	0.53	0.50	0.68	0.56
	β-γ	44	3.9	6.2	11	3.3	5.4	6.6	6.1	4.0	0 to 2.5	8.6	7.6

*No sample due to low reservoir

Sampling of environmental air for particulate radioactivity is performed continuously at both the Headquarters and NDFL sites. Air is drawn through a filter which is counted, after a 72-hour decay period, for long-lived radioactivity. The average concentration of long-lived beta emitters is presented in Table V.

TABLE V
AIRBORNE RADIOACTIVITY DATA - 1965
SEMIANNUAL AVERAGES

		First Half - 1965		Last Half - 1965	
Site	Activity	No. Samples	Average uuc/M^3	No. Samples	Average uuc/M^3
Canoga	β-γ	182	2.0	301	0.12
NDFL	β-γ	69	1.9	993	0.09

Tables I and II show a decrease, during the last six months, in alpha and beta-gamma radioactivity in soil and vegetation. Table III shows no significant change in NDFL well water alpha radioactivity and a slight decrease in well water beta-gamma radioactivity during the last six months of the year. Table IV shows that alpha radioactivity in Chatsworth Reservoir lake surface and supply water increased and that beta-gamma radioactivity decreased during the same period. Reservoir water originates primarily as run-off from the Sierra Mountains at a considerable distance from the local area, and, since both NDFL well water and reservoir water radioactivities are similar, the radioactivity in well water is not attributed to Atomics International operations.

Table V shows significant decreases in averaged airborne radioactivity during the last six months of 1965. This decrease is attributed to a reduction in fallout from nuclear weapons testing.

B. COMPARISON OF ENVIRONMENTAL RADIOACTIVITY DATA FOR 1965 WITH PREVIOUS YEARS

This section summarizes the environmental monitoring

results for the calendar year 1965. Also, the annual averages for the years 1957 through 1964 are included for comparison. The averaged annual radioactivity in soil and vegetation is presented in Tables VI and VII.

TABLE VI
SOIL RADIOACTIVITY DATA - 1957 THROUGH 1965
VI. a. ALPHA RADIOACTIVITY

Year	On Site		Off Site	
	No. Samples	Average uuc/gram	No. Samples	Average uuc/gram
1965	144	0.46	142	0.46 to 0.47
1964	152	0.44 to 0.46	299	0.40 to 0.44
1963	156	0.41 to 0.43	455	0.38 to 0.42
1962	147	0.42 to 0.44	453	0.35 to 0.41
1961	120	0.30 to 0.37	458	0.24 to 0.33
1960	115	0.34 to 0.41	362	0.27 to 0.37
1959	107	0.43	377	0.32
1958	80	0.27	309	0.26
1957	64	0.32	318	0.35

VI. b. BETA - GAMMA RADIOACTIVITY

Year	On Site		Off Site	
	No. Samples	Average uuc/gram	No. Samples	Average uuc/gram
1965	144	36	142	29
1964	146	32	293	26
1963	156	45	455	42
1962	147	48	453	47
1961	120	34	458	23
1960	114	23	360	19
1959	107	15	379	14
1958	84	21	318	10
1957	72	11	354	10

TABLE VII
VEGETATION RADIOACTIVITY DATA - 1957 THROUGH 1965
VII a. ALPHA RADIOACTIVITY

Year	On Site		Off Site	
	No. Samples	Average uuc/gram/ash	No. Samples	Average uuc/gram/ash
1965	144	0.55 to 0.56	142	0.61
1964	154	0.49 to 0.50	293	0.50 to 0.51
1963	156	0.43 to 0.44	456	0.36 to 0.37
1962	147	0.44 to 0.45	453	0.42 to 0.44
1961	120	0.32 to 0.35	459	0.26 to 0.29
1960	115	0.31 to 0.35	362	0.21 to 0.25
1959	96	0.29	293	0.18
1958	65	0.57	250	0.39
1957	58	1.1	304	0.89

VII. b. BETA - GAMMA RADIOACTIVITY

Year	On Site		Off Site	
	No. Samples	Average uuc/gram/ash	No. Samples	Average uuc/gram/ash
1965	144	162	142	138
1964	148	211	299	181
1963	156	465	456	388
1962	147	500	453	406
1961	120	224	459	246
1960	113	137	358	136
1959	107	212	380	168
1958	84	683	318	356
1957	70	208	351	200

The annual average radioactivity in NDFL well water is presented in Table VIII.

TABLE VIII

WELL WATER RADIOACTIVITY DATA - 1957 THROUGH 1965

Year	Alpha		Beta-Gamma	
	No. Samples	Average uuc/liter	No. Samples	Average uuc/liter
1965	24	0.21 to 0.22	24	5.9 to 6.0
1964	23	0.16 to 0.18	23	5.1 to 5.3
1963	24	0.17 to 0.18	24	6.9 to 7.0
1962	24	0.20 to 0.21	24	12
1961	24	0.06 to 0.09	24	2.2 to 3.6
1960	22	0.06 to 0.09	22	1.0 to 2.7
1959	18	0.08	16	1.6
1958	13	0.16	18	4.7
1957	--	--	17	13

The annual average radioactivity in Chatsworth Reservoir water is presented in Table IX.

TABLE IX

CHATSWORTH RESERVOIR WATER RADIOACTIVITY DATA-
1957 THROUGH 1965

Year	Lake Surface			Supply Inlet		
	No. Samples	Average uuc/liter α	β-γ	No. Samples	Average uuc/liter α	β-γ
1965	11	0.65	8.7	12	0.61	8.8 to 9.1
1964	18	0.71	10	12	0.49	8.8
1963	37	0.84	18	12	0.57 to 0.58	9.0 to 9.2
1962	41	0.66 to 0.67	19	12	0.50	13
1961*	38	0.52	11	10	0.28	7.7 to 8.0

*The gross annual average excludes January and February since the reservoir water Sampling Stations indicated in Table XI were established in March 1961.

Some of the data presented in Tables I, II, III, IV, VI, VII, VIII, and IX are presented as a range within which lies the true average. This is necessary when one or more of the samples contains an "undetectable" amount of radioactivity. In these instances, two values are determined. The lowest assumes that the "undetectable" samples contain no radioactivity; the highest assumes that these samples contain radioactivity equal to the appropriate minimum detection limit specified in Table XII.

The annual average concentration of long-lived airborne radioactivity at Headquarters and the NDFL is presented in Table X.

TABLE X
AIRBORNE RADIOACTIVITY DATA - 1957 THROUGH 1965
β-γ

	Headquarters		NDFL	
Year	No. Samples	Average uuc/M^3	No. Samples	Average uuc/M^3
1965	483	0.83	1062	0.21
1964	355	2.7	Insufficient Data	
1963	360	6.6	292	4.7
1962	343	7.3	314	5.6
1961	313	4.2	176	3.6
1960	182	0.24	44	0.44
1959	215	2.5	257	0.93
1958	366	4.9	164	2.7
1957	63	1.6	141	2.7

Tables VI through X show moderate alpha and beta-gamma radioactivity increases in all sample types except for vegetation beta-gamma, Chatsworth Reservoir surface water, and environmental air. As indicated in the discussion of data for the last half of 1965, the radioactivity detected during 1965 is not attributed to Atomics International operations; rather it is felt to have been produced after September 1, 1961 by nuclear detonations.

II. ENVIRONMENTAL MONITORING PROGRAM

A. GENERAL DESCRIPTION

Soil and vegetation sample collection and analysis were initiated in 1952 in the Downey, California area where the company was initially located. Environmental sampling was subsequently extended to the proposed Sodium Reactor Experiment (SRE) site in May of 1954. In addition, sampling was conducted in the Burro Flat area, southwest of SRE, where many radiological operations are currently in operation. The Downey area survey was terminated when the company relocated to Canoga Park. The primary purpose of the environmental monitoring program is to survey environmental radioactively adequately to ensure that Atomics International operations do not contribute measurably to environmental radioactivity.

A recent study of past data showed that this purpose could be achieved with a less extensive environmental monitoring program than that which existed until July, 1964. Therefore, beginning with that month, the number of sampling stations was reduced considerably, as indicated in the data tables of this report. The location of sampling stations is shown in Figures 4, 5, 6, and 7, and in Table XI.

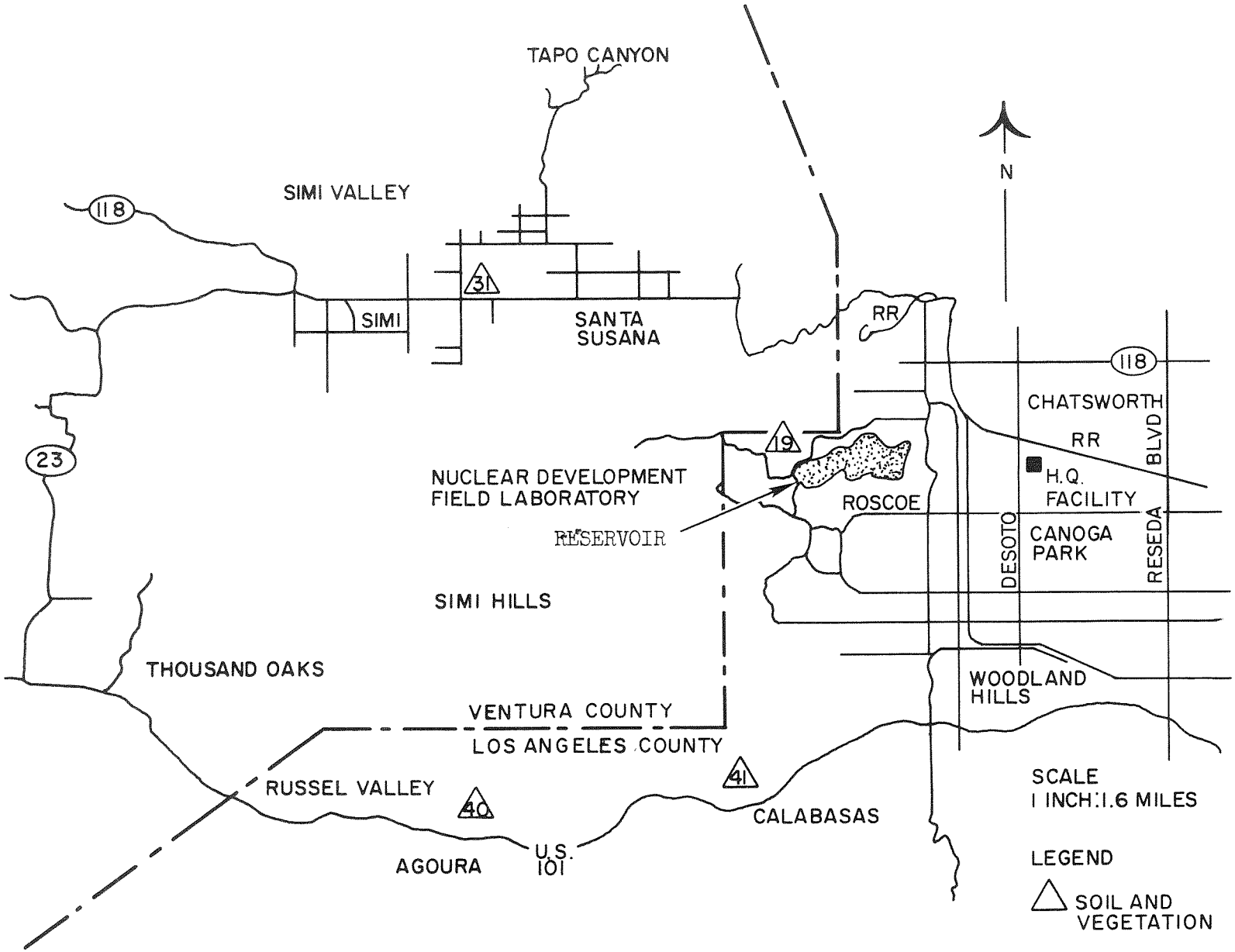
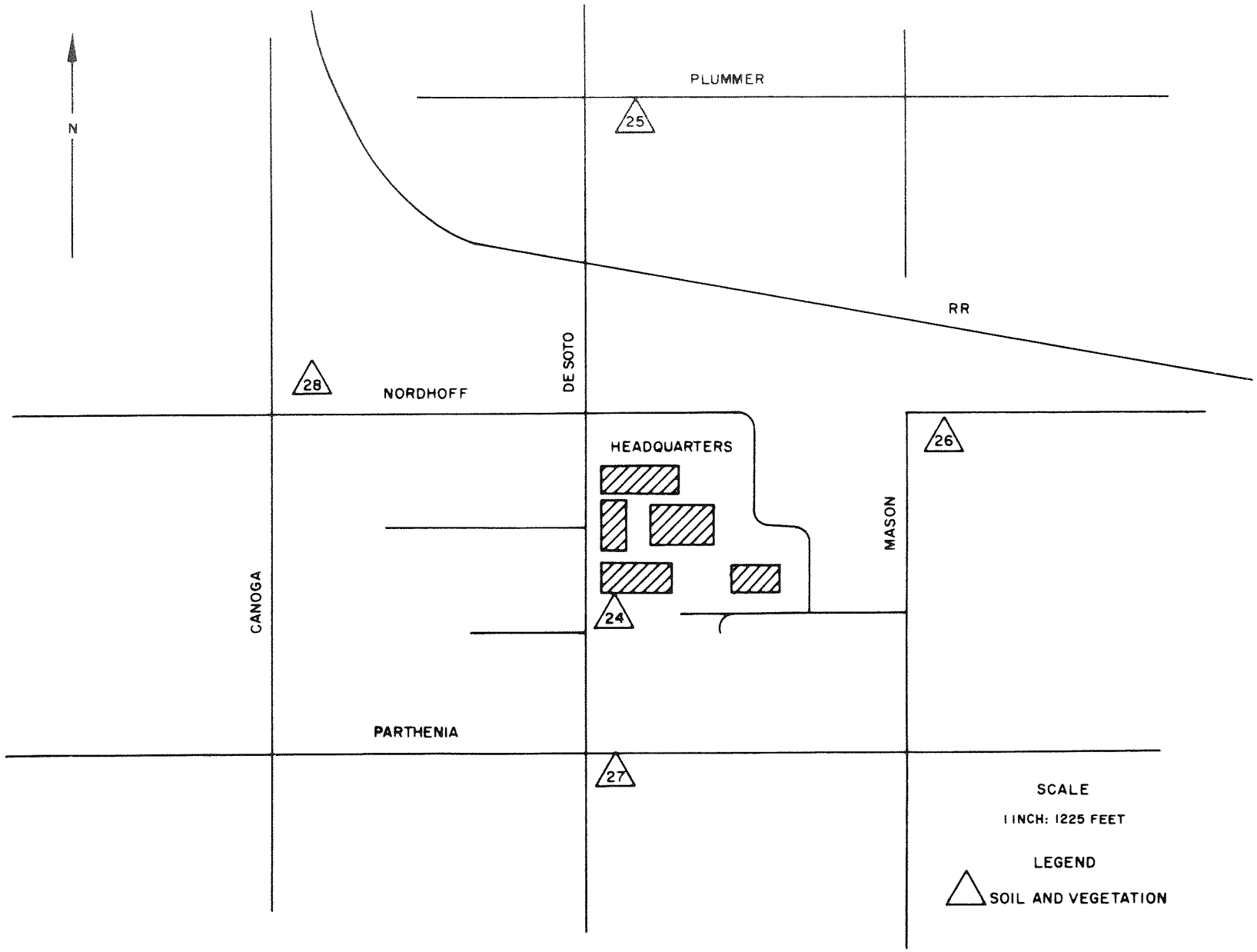


Figure 4. Map of Reseda, Canoga Park, Simi Valley, and Russell Valley Sampling Stations



Map of Headquarters Vicinity Sampling Stations

Figure 5

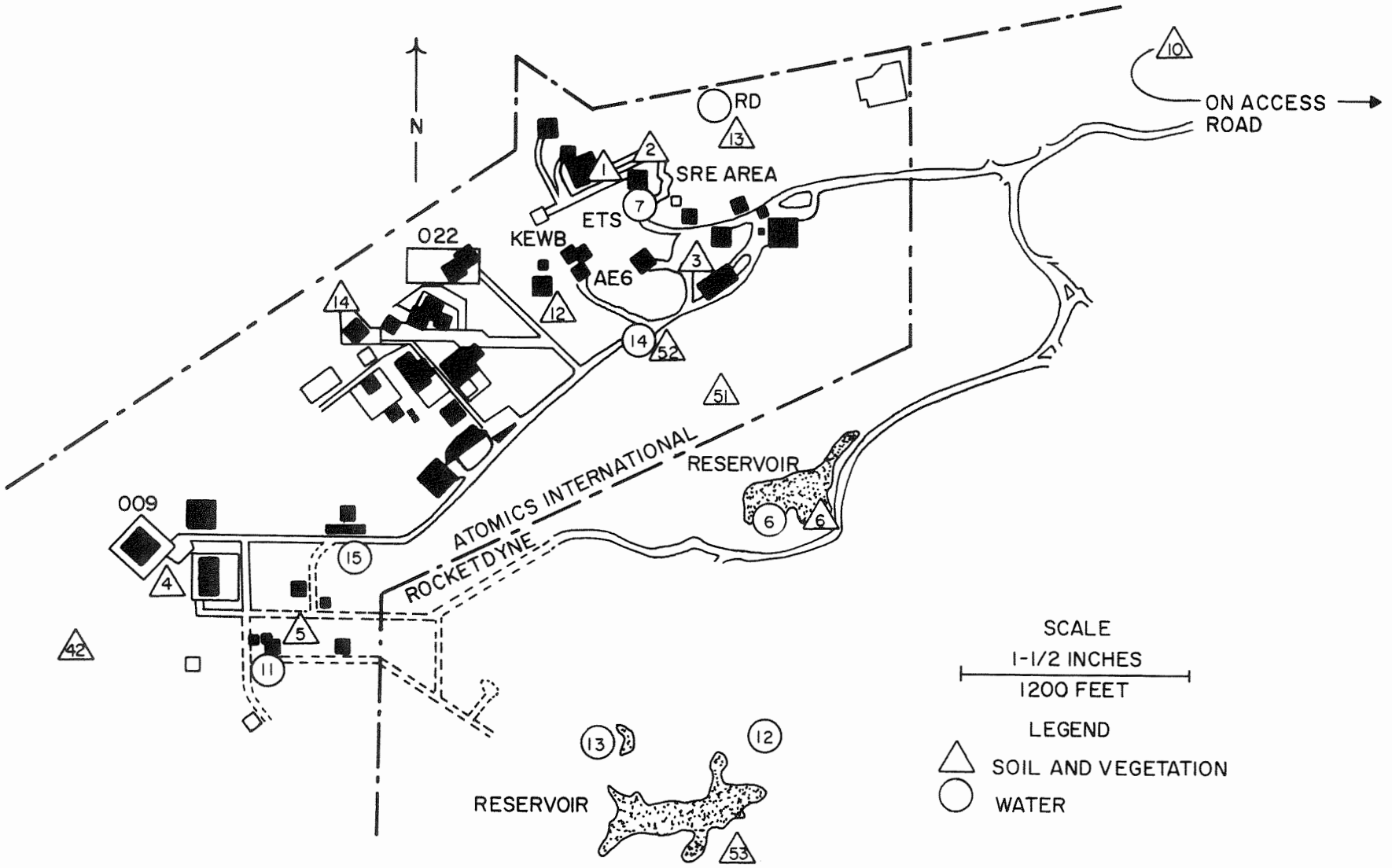
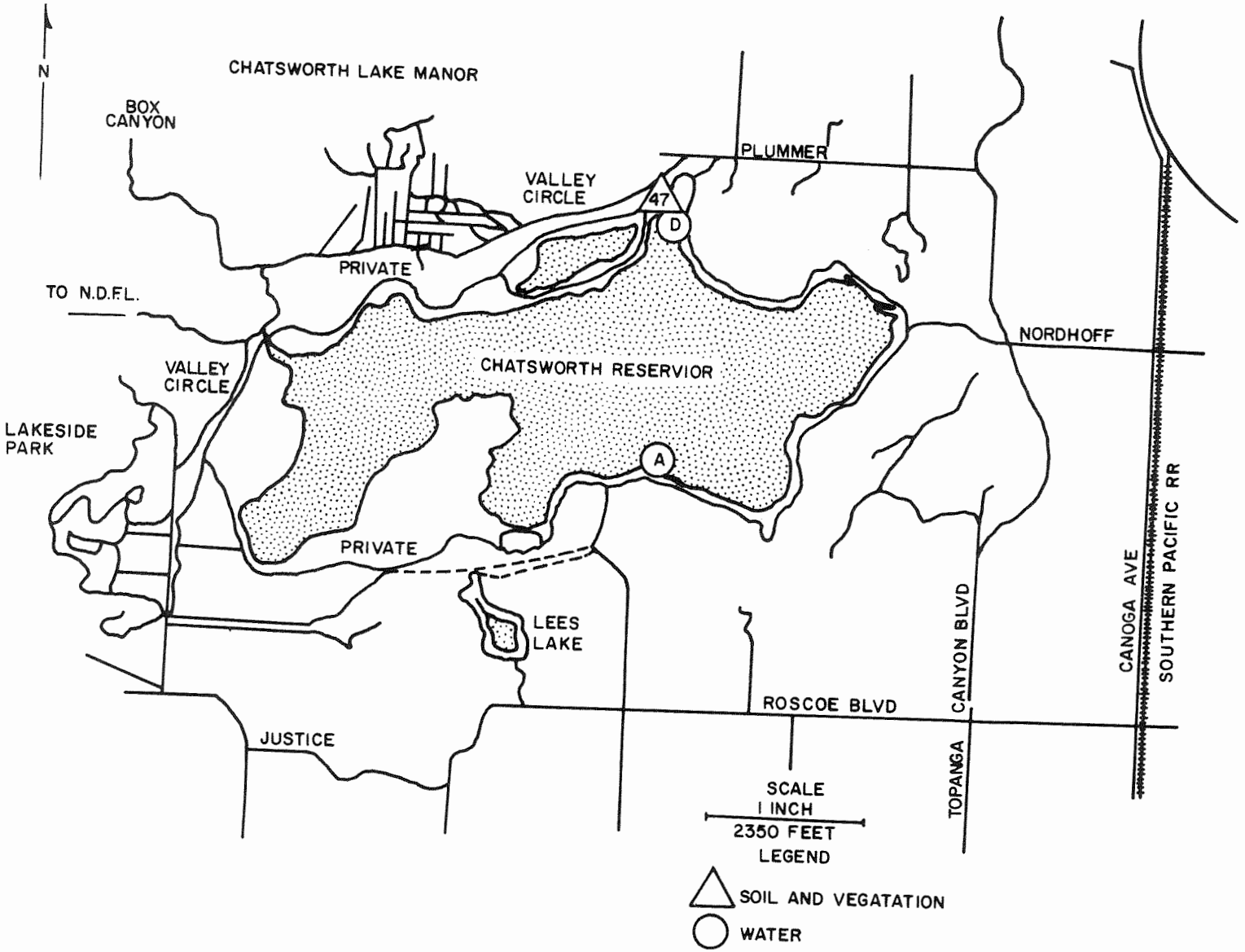


Figure 6. Map of NDFL Sampling Stations



Map of Chatsworth Reservoir Sampling Stations

Figure 7

TABLE XI

SAMPLE STATION LOCATIONS

STATION	LOCATION
SV-1	SRE Reactor, NDFL
SV-2	SRE Perimeter Drainage Ditch, NDFL
SV-3	Bldg. 064 Parking Lot, NDFL
SV-4	Bldg. 020, NDFL
SV-5	Bldg. 0363, NDFL
SV-6	Rocketdyne, PFL
SV-10	Santa Susana Site Access Road
SV-12	KEWB Reactor, NDFL
SV-13	Sodium Cleaning Pad, NDFL
SV-14	Canyon Below Bldg. 022, NDFL
SV-19	Santa Susana Site Entrance
SV-24	Headquarters
SV-25	DeSoto Avenue and Plummer Street
SV-26	Nordhoff Street and Mason Avenue
SV-27	DeSoto Avenue and Parthenia Street
SV-28	Canoga Avenue and Nordhoff Street
SV-31	Simi Valley, Los Angeles Avenue and Sycamore Road
SV-40	Agoura
SV-41	Calabasas
SV-42	Non-Radioactive Materials Disposal Area, NDFL
SV-47	Chatsworth Reservoir - North Side
SV-51	Adjacent to Bldg. 029, NDFL
SV-52	Burro Flat Drainage Control Pond G. St. and 17th ST., NDFL
SV-53	Top of Bell Canyon Below Rocketdyne Delta Pond Spillway, PFL
W R.D.	SRE Retention Dam, NDFL
W 6	Rocketdyne Retention Reservoir, PFL
W 7	Well Water From E. T. B., NDFL
W 11	Well Water from Bldg. 363, NDFL
W 12	Rocketdyne Retention Reservoir, PFL
W 13	Rocketdyne Retention Reservoir, PFL

STATION	LOCATION
W 14	Burro Flat Drainage Control Pond, G. Street and 17th Street, NDFL
W 15	Burro Flat Drainage Channel Adjacent to Bldg. 383. (Collects drainage from Bldg. 009, 020, and 100 areas)
W A	Chatsworth Reservoir, South Side
W D	Chatsworth Reservoir, Supply Inlet

B. SAMPLING AND PREPARATION METHODS

SOIL

Surface soil types available for sampling range from decomposed granite to clay and loam. Samples are taken from the top 1/2-inch layer of ground surface. The soil samples are packaged and sealed in plastic containers and returned to the laboratory for analysis.

Sample preparation consists of transferring the soils to pyrex beakers and drying in a muffle furnace at 500°C for approximately eight hours. After cooling, the soil is sieved to obtain uniform particle size. One-gram aliquots of the sieved soil are weighed and transferred to stainless-steel planchets. The soil is wetted in the planchet with acetone, agitated to obtain uniform sample thickness, re-dried, and counted.

VEGETATION

Vegetation samples obtained in the field are of the same plant type wherever possible, generally sunflower or wild tobacco plant leaves. These types maintain a more active growth rate during the dry season than does most natural vegetation indigenous to the local area. Vegetation leaves are stripped from plants and placed in ice cream cartons for transfer to the laboratory for analysis. Plant root systems are not normally analyzed.

Vegetation samples are first washed with tap water to remove foreign matter, and then thoroughly rinsed with distilled water. Washed vegetation is placed in porcelain crucibles and ashed in a muffle furnace at 500°C for approximately eight hours, producing a completely burned

ash. Three-hundred milligram aliquots of pulverized ash from each crucible are weighed and transferred to stainless-steel planchets for counting.

WATER

Samples of well water are obtained monthly at the NDFL and water is also obtained from the Chatsworth Reservoir. The water is drawn into 1-liter polyethylene bottles and transferred to the laboratory.

Five-hundred ml. of water are evaporated to dryness in crystallizing dishes at approximately 90°C. The residue salts are transferred to stainless-steel planchets, wetted with distilled water to produce a uniform sample distribution, re-dried under infra-red lamps, and counted.

AIR

Environmental air sampling is conducted continuously at the Headquarters and NDFL sites with automatic air samplers operating on 24-hour sampling cycles. Airborne particulate radioactivity is collected on HV-70 filter paper which is automatically changed at the end of each sampling period. The filter is removed from the sampler and counted after the radioactivity is allowed to decay for at least 72 hours. The volume of a typical daily environmental air sample is approximately 29 cubic meters. The minimum detection limit, calculated at 2σ counter background, is on the order of 0.03 uuc/M^3.

When abnormally high airborne radioactivities are observed, the radioactivity decay is plotted to determine the presence of short-lived isotopes other than naturally occurring radon, thoron, and daughters. If fall-out is suspected, the decay

characteristics are observed for a period of from several days to several weeks. If the radioactivity decays as a function of $t^{-1.2}$, the data curve is extrapolated in order to determine the date of origin. This date is compared with the dates of publicized nuclear detonations to determine if the abnormal airborne radioactivity was caused by such detonations.

A graph of long-lived airborne radioactivity concentrations detected at the Headquarters facility during 1961, 1962, 1963, 1964 and the 1965 reporting period is presented in Figure 8. Air sample data for the NDFL are averaged into the portion of the graph covering the last half of 1965. Airborne radioactivity concentrations present subsequent to the nuclear test series in 1958 had decreased to relatively insignificant levels until the resumption of atmospheric testing of nuclear weapons by the USSR in the fall of 1961. The graph shows a rapid increase from mid-September to November, 1961. Concentrations during 1962 had decreased considerably by the end of June and remained low until mid-October when transient peaks occurred and continued through July, 1963. Since that period, concentrations remained low until January, 1965 when the destruction of KIWI at the Nevada Test Site caused a spike to appear on the graph. However, it was but a few days later that the activity dropped to a low level again and has so remained throughout the year with minor daily variations.

Also indicated on the graph are days on which rainfall was recorded at the Headquarters facility weather station. This illustrates the effect of precipitation on airborne radioactivity levels. In general, during periods of precipitation, the airborne radioactivity decreased somewhat

due to the combined effects of particulate removal from the air by rainfall and wind conditions associated with precipitation in the local area.

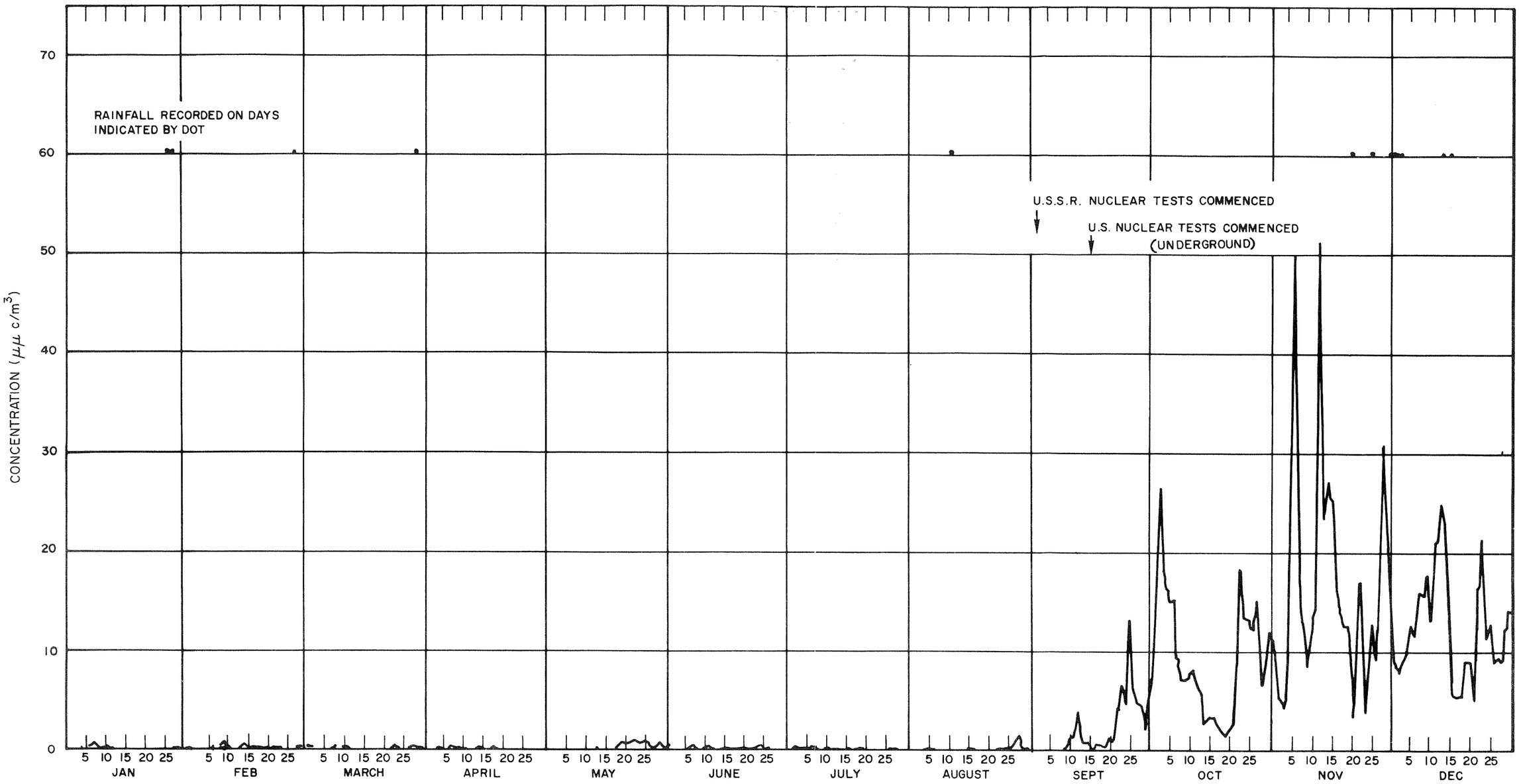


Figure 8. Long-Lived Airborne Particulate Radioactivity Atomics International Headquarters — 1961

In practice, KCl is sieved and divided into aliquots, increasing each in 100 milligram increments from 100 to 1200 milligrams. These aliquots are placed in stainless-steel planchets of the type used for soil and vegetation samples and counted in the proportional counting system. The ratio of sample activity to observed net counting rate for each aliquot is plotted as a function of aliquot weight (See Figure 9). The correction factor (ratio) corresponding to each soil or vegetation sample weight is obtained from this graph and multiplied by the net sample counting rate to obtain sample activity (dpm). This method has been proved usable by applying it to variously sized aliquots of uniformly mixed environmental samples and observing that the resultant specific activities fall within the expected statistical counting error.

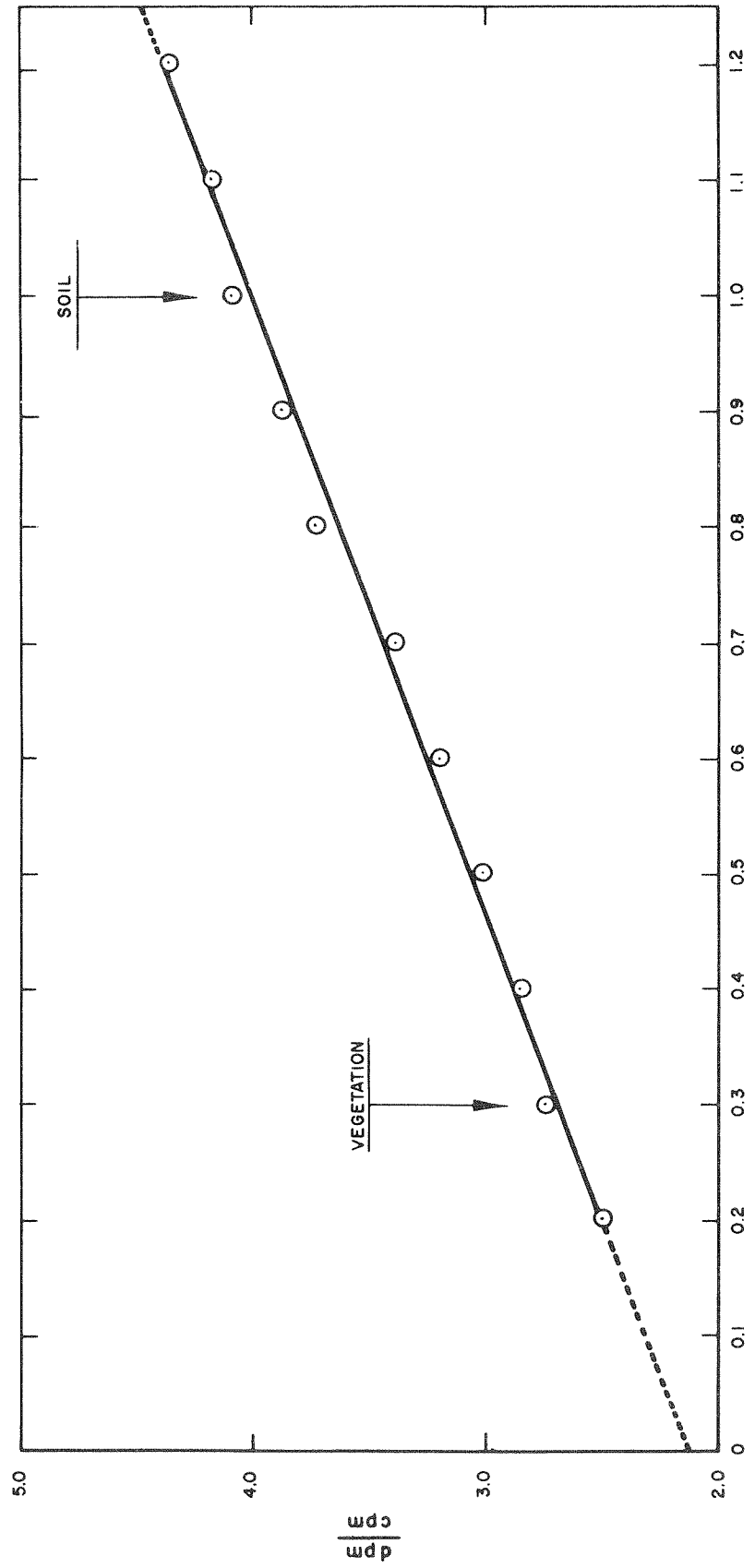


Figure 9. Self-Absorption Correction Graph

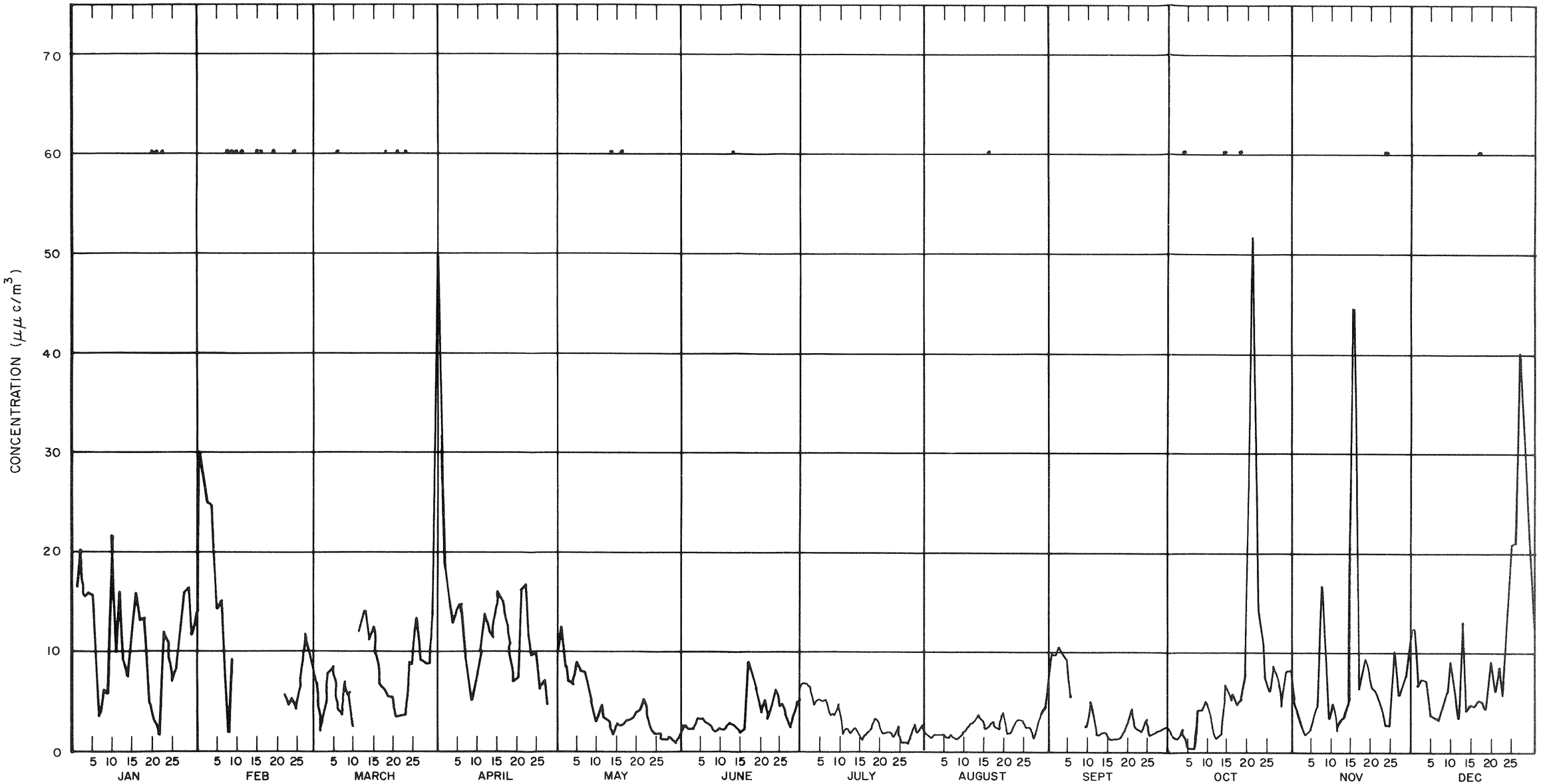


Figure 8. Long-Lived Airborne Particulate Radioactivity Atomics International Headquarters — 1962

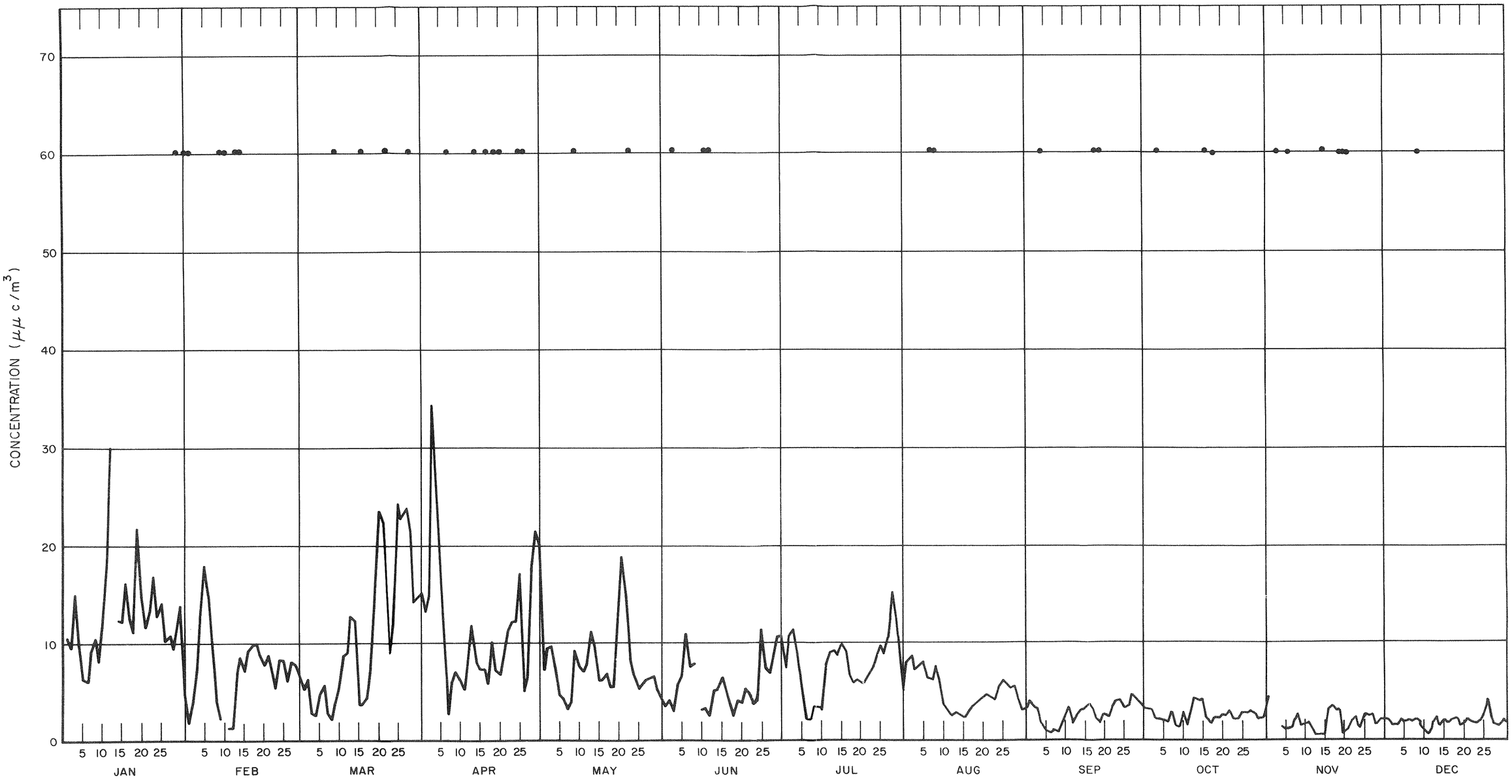


Figure 8. Long-Lived Airborne Particulate Radioactivity Atomics International Headquarters – 1963

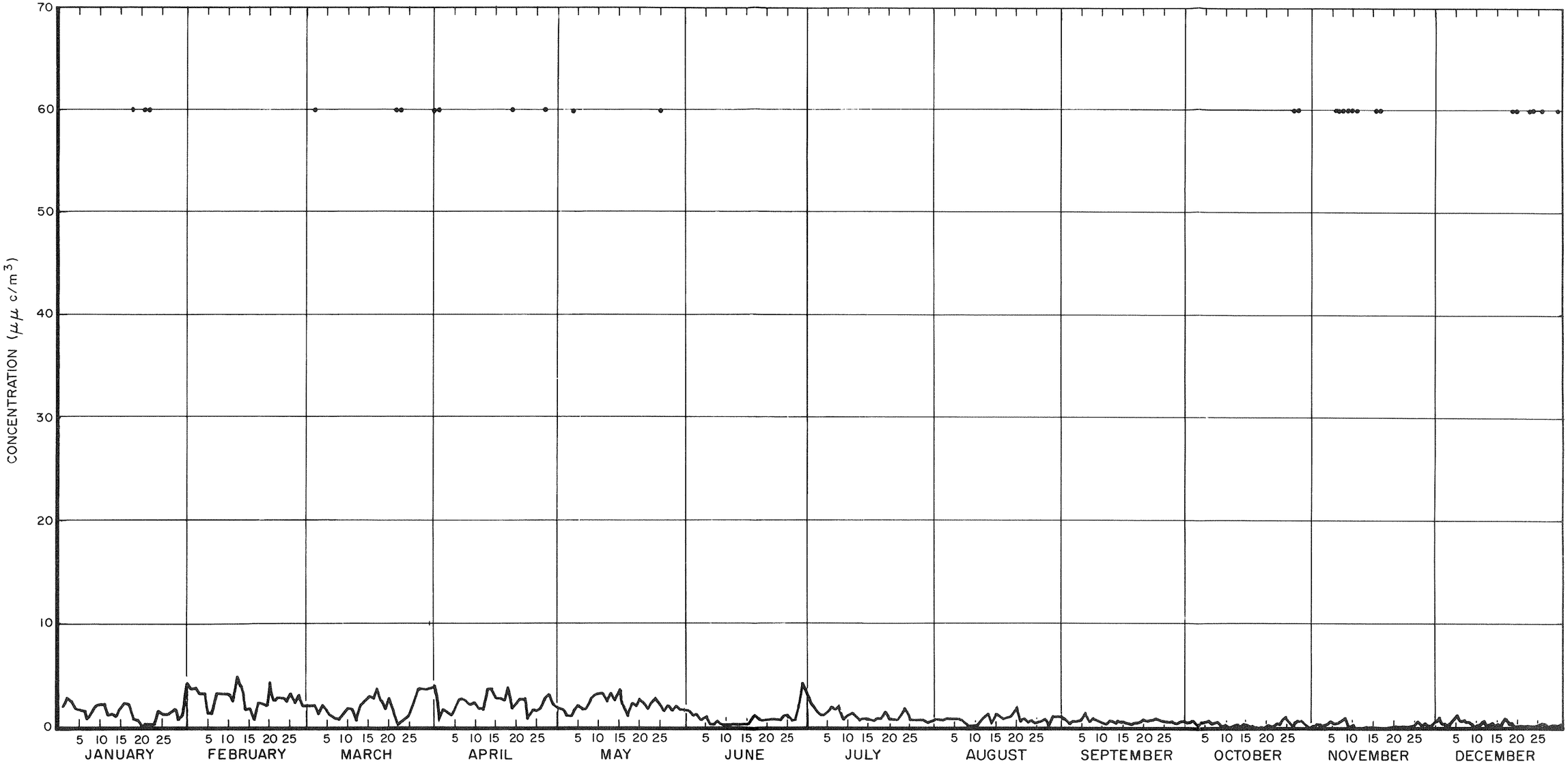


FIGURE 8 LONG-LIVED AIRBORNE PARTICULATE RADIOACTIVITY
ATOMICS INTERNATIONAL HEADQUARTERS - 1964

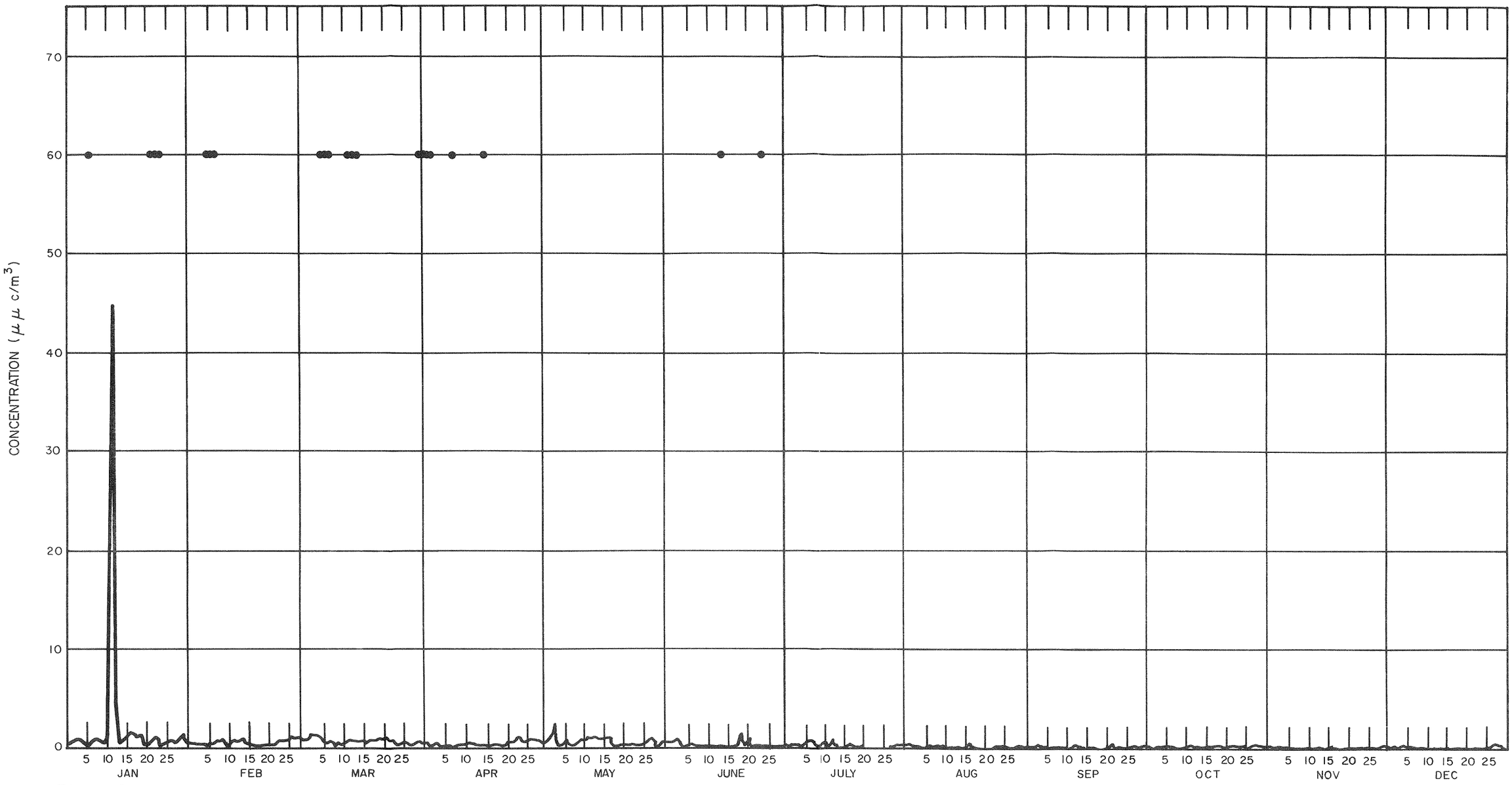


Figure 8. Long-Lived Airborne Particulate Radioactivity Atomics International Headquarters - 1965

C. COUNTING AND CALIBRATION PROCEDURES

Environmental soil, vegetation, air, and water samples are counted for alpha and beta-gamma radioactivity in automatic proportional counting systems. The sample-detector configuration provides nearly a 2π geometry. The detector has a thin window and is continually purged with a 90% argon, 10% methane counting gas. A pre-set count mode of operation is used for all samples; however, an overriding pre-set time is also used for alpha counting to prevent the unnecessarily long counting of samples with extremely low activities. The minimum detection limits shown in Table XII were determined using typical values for pre-set count, pre-set time, system efficiencies, background count rates (approximately 0.03 cpm α and 12 cpm $\beta-\gamma$), and sample size.

TABLE XII
MINIMUM DETECTION LIMITS

Sample	Activity	Minimum Detection Limits*
Soil	α	0.24 ± 0.048 (uuc/gram)
	$\beta-\gamma$	6.9 ± 1.1 (uuc/gram)
Vegetation	α	0.086 ± 0.089 (uuc/gram)
	$\beta-\gamma$	13.8 ± 2.1 (uuc/gram)
Water	α	0.052 ± 0.054 (uuc/liter)
	$\beta-\gamma$	2.5 ± 1.3 (uuc/liter)

*Standard Error

Counting system efficiencies are routinely determined using Radium D+E+F (with and without alpha absorbers) and K^{40}. Potassium-40, in the form of standard reagent grade KCl, is used to simulate soil and vegetation samples for purposes of calibration. It has a compound specific activity of approximately 830 dpm per gram of KCl and a beta energy of 1.33 mev. Its

advantages are purity, long half-life, crystalline form, and low cost. A seeming disadvantage is its beta energy which is somewhat higher than that expected in environmental samples; however, the error introduced by this higher energy has been proven insignificant.

In practice, KCl is sieved and divided into aliquots, increasing each in 100 milligram increments from 100 to 1200 milligrams. These aliquots are placed in stainless-steel planchets of the type used for soil and vegetation samples and counted in the proportional counting system. The ratio of sample activity to observed net counting rate for each aliquot is plotted as a function of aliquot weight (See Figure 9). The correction factor (ratio) corresponding to each soil or vegetation sample weight is obtained from this graph. The product of the correction factor and the net sample counting rate yields the sample activity (dpm). This method has been proved usable by applying it to variously sized aliquots of uniformly mixed environmental samples and observing that the resultant specific activities fall within the expected statistical counting error.

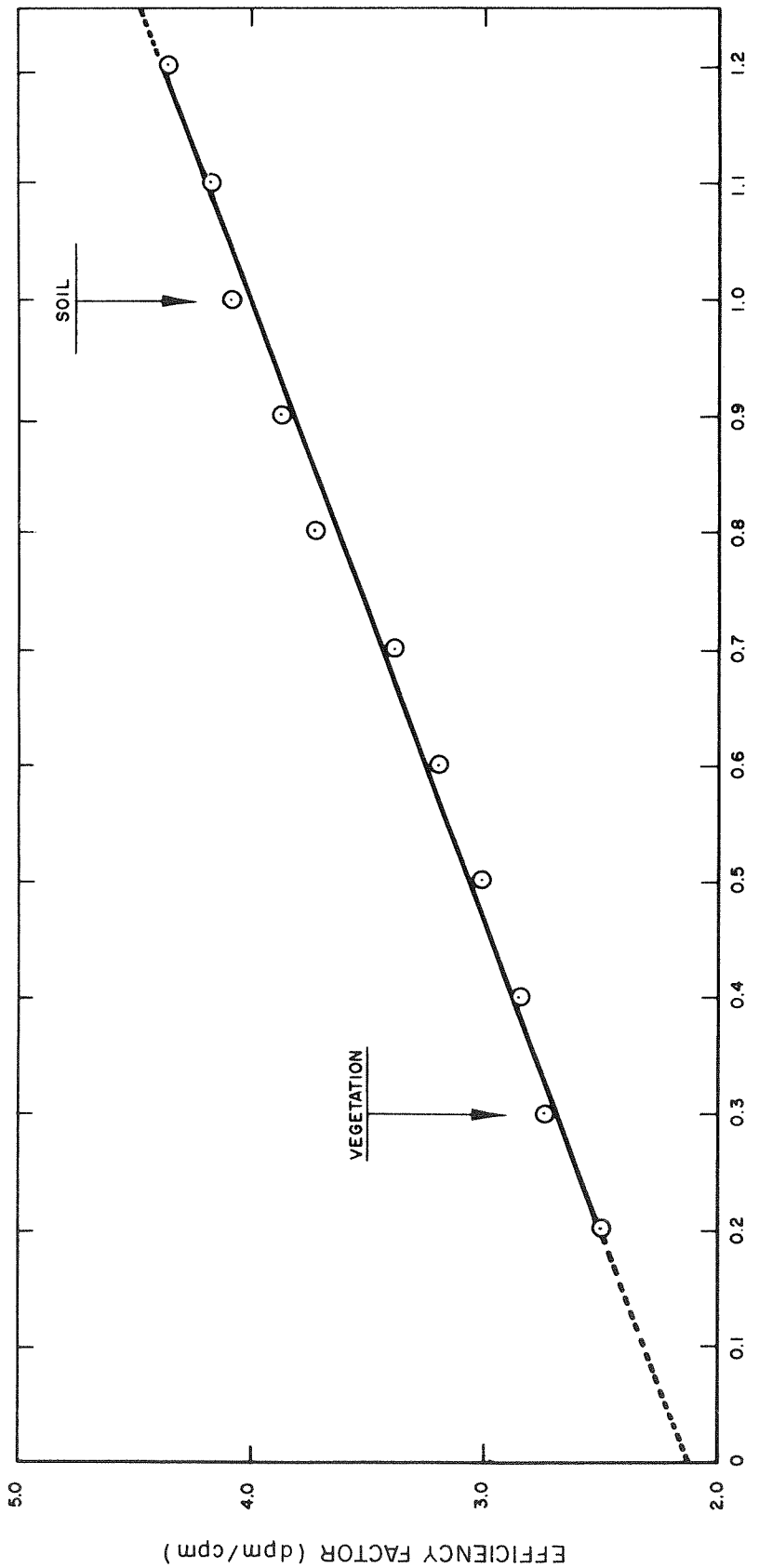


Figure 9. Self-Absorption Correction Graph