

HEALTH PHYSICS ASSOCIATES LTD. COMPANY LIMITED BY INFORMATION SAFETY

to industry and the profession

March 26, 1980

Mr. Ken G. Calaway
Vice President
S. F. Appliances Ltd.
613 W. Washington Street
Morris, IL 60450

Dear Mr. Calaway:

Enclosed are two copies of a radiation survey
conducted at your plant.

If you have any questions, please feel free to
contact me.

Respectfully submitted,
HEALTH PHYSICS ASSOCIATES LTD.

R. M. Johnson
Consulting Health Physicist

RMJ:jep

Encl. (2)

Approved by

W. B. Rivkin
Vice President

A-58

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HEALTH PHYSICS ASSOCIATES LTD. CONSULTANTS IN RADIATION SAFETY

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RADIATION SAFETY SURVEY

Date of survey: March 4, 1980

Location of survey: S.F. Appliances Ltd.
613 W. Washington Street
Morris, Illinois 60450

Survey instruments used:

Victoreen 440	for gamma levels
Elscint GSM-1	for beta levels
Eberline PAC-4G	for alpha surface total
Surface wipes	for removable alpha
Staplex Hi Volume Air Sampler	for air supply

Areas Surveyed

Penthouse

Floor
Machine
Benches

2nd Floor

Sewing room
Store room
Test area

1st Floor

Office
storage area
Solution room
Lunch room

Basement

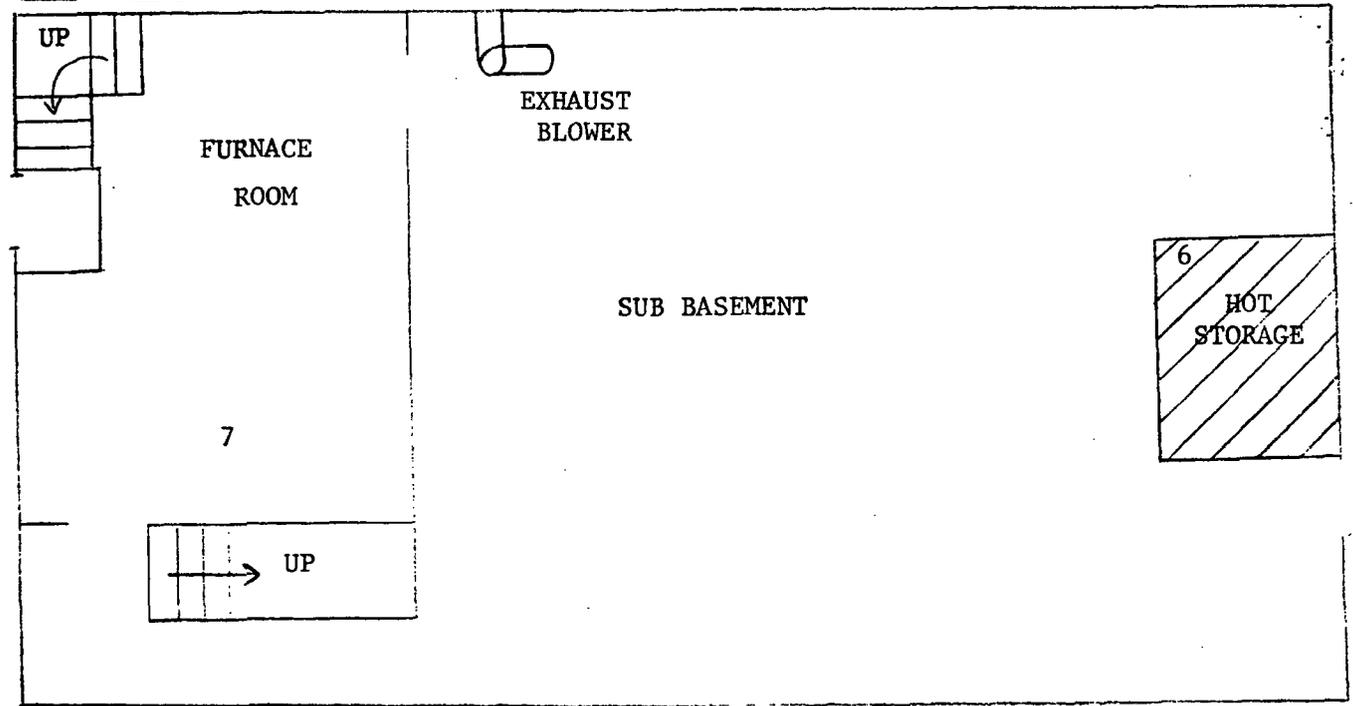
Chemical storage
Knitting

Sub Basement

Furnace room
Hot storage area

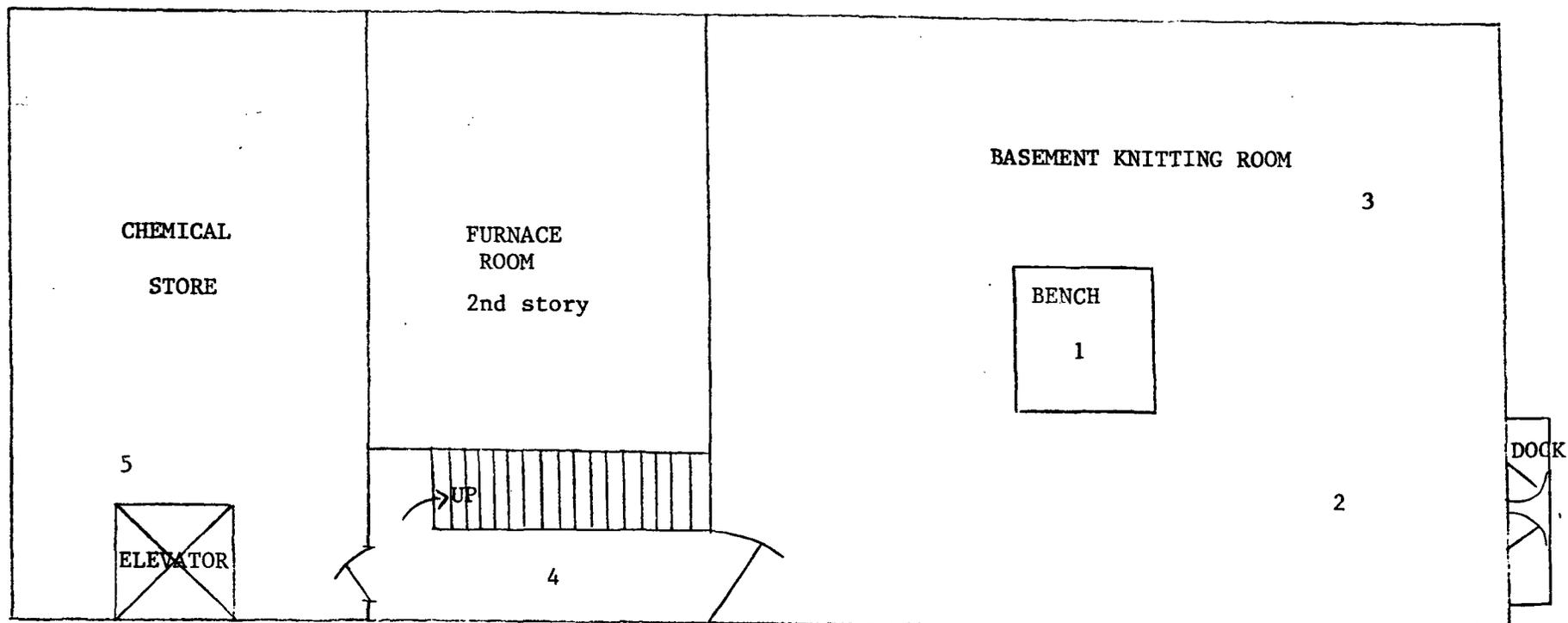
Results of Survey: Results of gamma total and removable alpha are given in the tables under each floor sketch. The air samples are also shown in the table.

SUB BASEMENT
PLAN



LOCATION	GROSS GAMMA mR/hr	TOTAL SURFACE ALPHA uCi 50 cm ² in cts/min	REMOVABLE ALPHA d/min/100 cm ²
6. Hot waste area floor	0.7	15,000	1571 / .0007 uCi_7
7. Furnace room floor	1.0	350	31

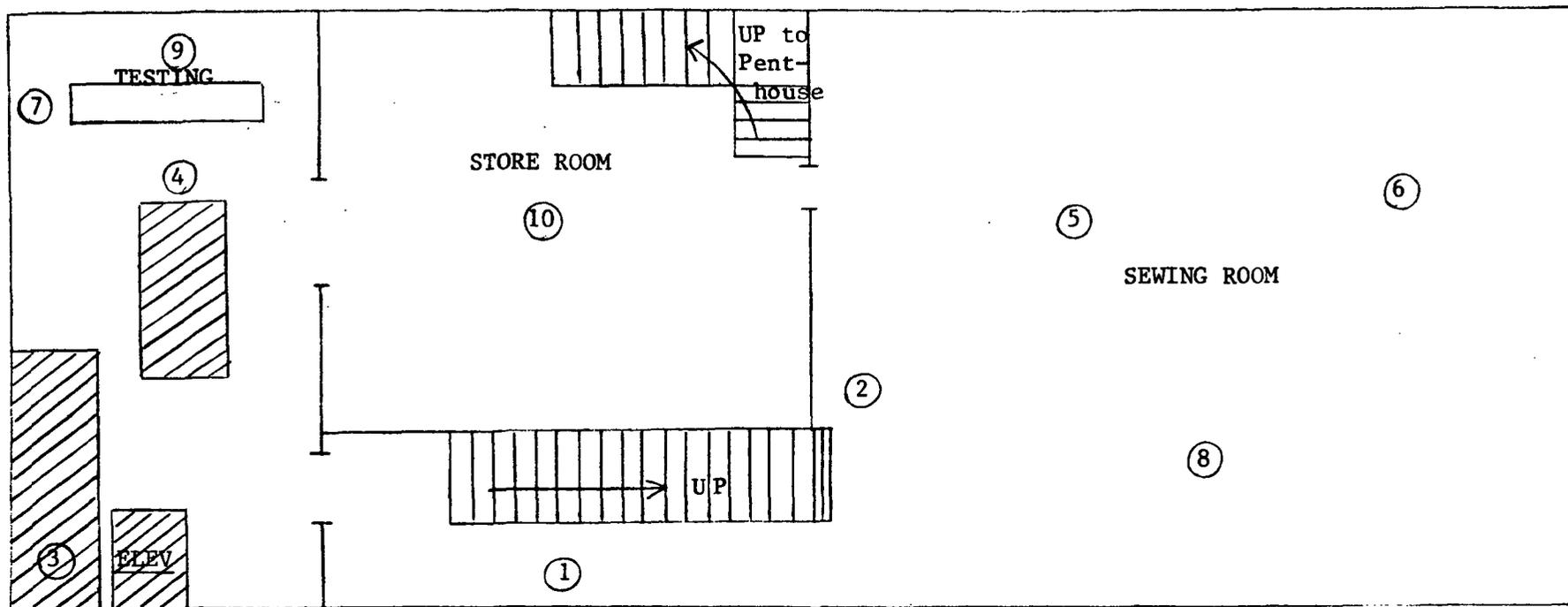
FIGURE 1



BASEMENT PLAN

LOCATION	GROSS GAMMA mR/hr	TOTAL ALPHA 50 cm ² in cts/min	REMOVABLE ALPHA d/min/100 cm ²
1. Bench	0.7	380	19
2. Floor	0.8	400	17
3. Boxes	1.0	320	39
4. Hall	0.2	430	12
5. Chemical storage	0.15	450	102

FIGURE 2

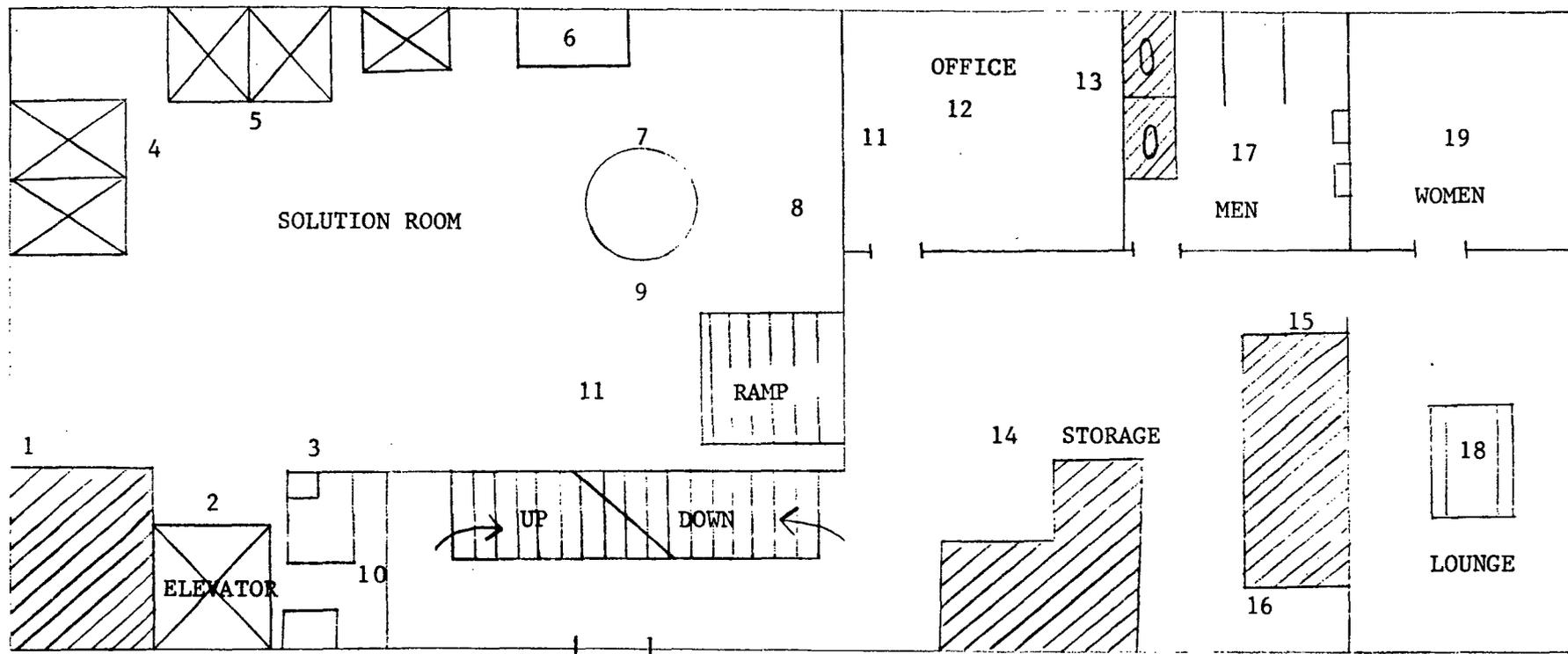


SECOND FLOOR

TABLE III

LOCATION	GROSS GAMMA mR/hr	SURFACE ALPHA 50 cm ² cts/min	REMOVABLE ALPHA CONTAMINATION d/min/100 cm ²
1. Hall	0.4	450	12
2. Cooler	0.4	300	-
3. Storage boxes	0.15	300	-
4. Storage boxes	1.5	400	377
5. Forming table	1.3	400	12
6. Pressing table	0.3	350	15
7. Bench	1.0	400	m
8. Floor	1.0	410	19
9. Testing bench	0.6	420	-
10. Storage room	1.3	400	156

FIGURE 3



FIRST FLOOR PLAN

TABLE I
SOLUTION ROOM

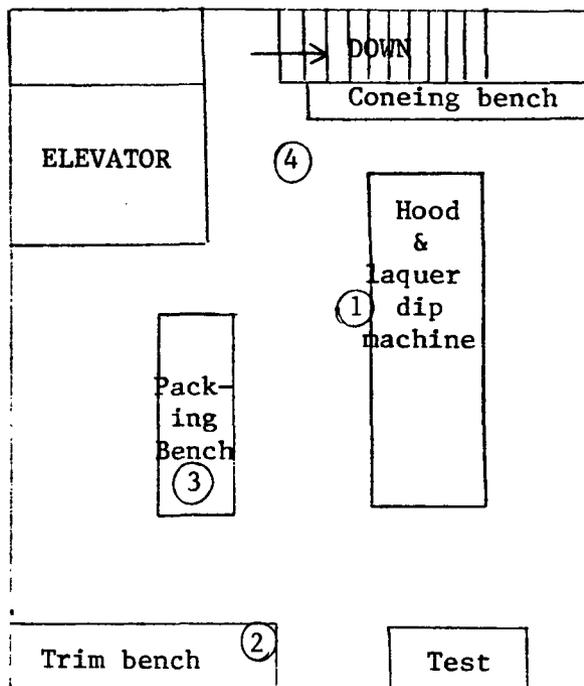
LOCATION	GROSS GAMMA in mR/hr	TOTAL SURFACE alpha/ct/min/ 50 cm ²	REMOVABLE ALPHA d/min/ 100 cm ²
1. Box storage	.2	8,000	M
2. Elevator door	.3	1,500	52
3. Box storage	.2	7,000	87
4. Oven door	.3	1,300	14
5. Oven door	.5	2,500	69
6. Bench top	.7	550	242
7. Solution drum	1.4	16K	352
8. Rack area	2.5	35K	747
9. Solution tank	1.0	550	52
10. Bench top	.4	350	193
11. Floor	.7		87

TABLE II
OFFICE AND LOUNGE AREAS

LOCATION	GROSS GAMMA in mR/hr	TOTAL SURFACE alpha/50 cm ² cts/min	REMOVABLE ALPHA d/min/ 100 cm ²
11. Desk	0.5	360	M
12. Desk	0.6	320	M
13. Floor	0.5	310	52
14. Storage area	1.0	1100	19
15. Hall	0.9	1100	33
16. Storage area boxes	.5	400	173
17. Men's room floor	.7	400	21
18. Lounge table	.5	300	M
19. Ladies' room floor	.6	340	31

FIGURE 4

PENTHOUSE PLAN



LOCATION	GROSS GAMMA in mR/hr	TOTAL SURFACE ALPHA per 50 cm ² in cts/min	REMOVABLE ALPHA d/min/100 cm ²
1. Hardening machine	0.20	2,000	83
2. Trim bench	0.25	400	-
3. Packing bench	0.40	460	40
4. Floor	0.55	470	117

FIGURE 5

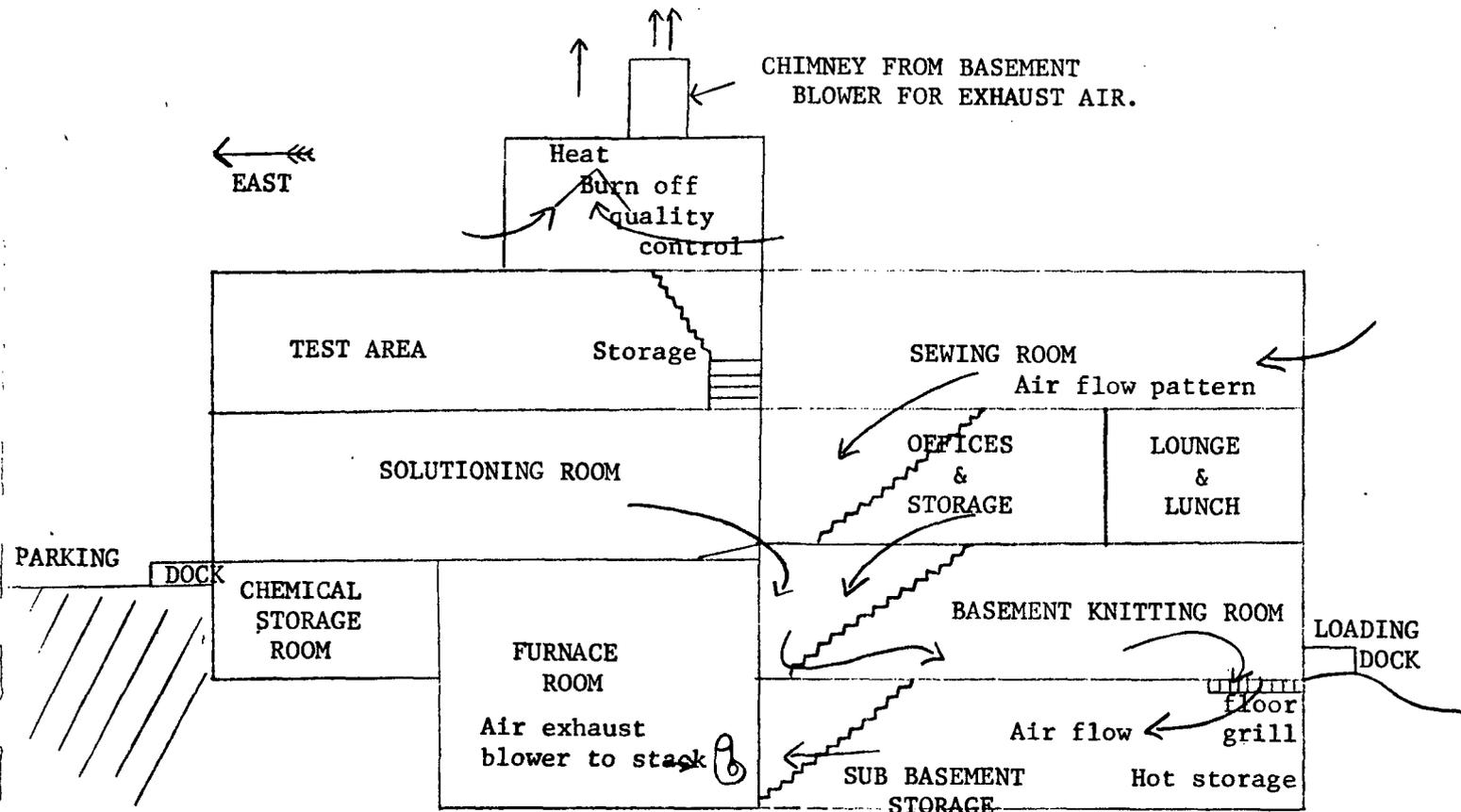


FIGURE 6

AIR SAMPLE REPORT

	1	2	3	4	5
LOCATION	TIME 765L/min.	VOLUME Liters	CONT. $\mu\text{Ci} \times 10^{-6}$	Ra228 $\mu\text{Ci}/\text{mi} \times 10^{-13}$	% MPC
1. Solution room	17 min.	12,997	6.0 ± 1.2	4.60 ± 0.8	1.15
2. Lunch room	33 min.	25,230	<1	<1	<1
3. Chemical store room	17 min.	12,997	12.8 ± 1.6	9.84 ± 1.2	2.46
4. Sewing room	20 min.	15,291	<1	<1	<1
5. Penthouse	16 min.	12,233	28.0 ± 2.4	22.88 ± 2.0	5.72

* Flow rate of Staplex 765 Liters/min.

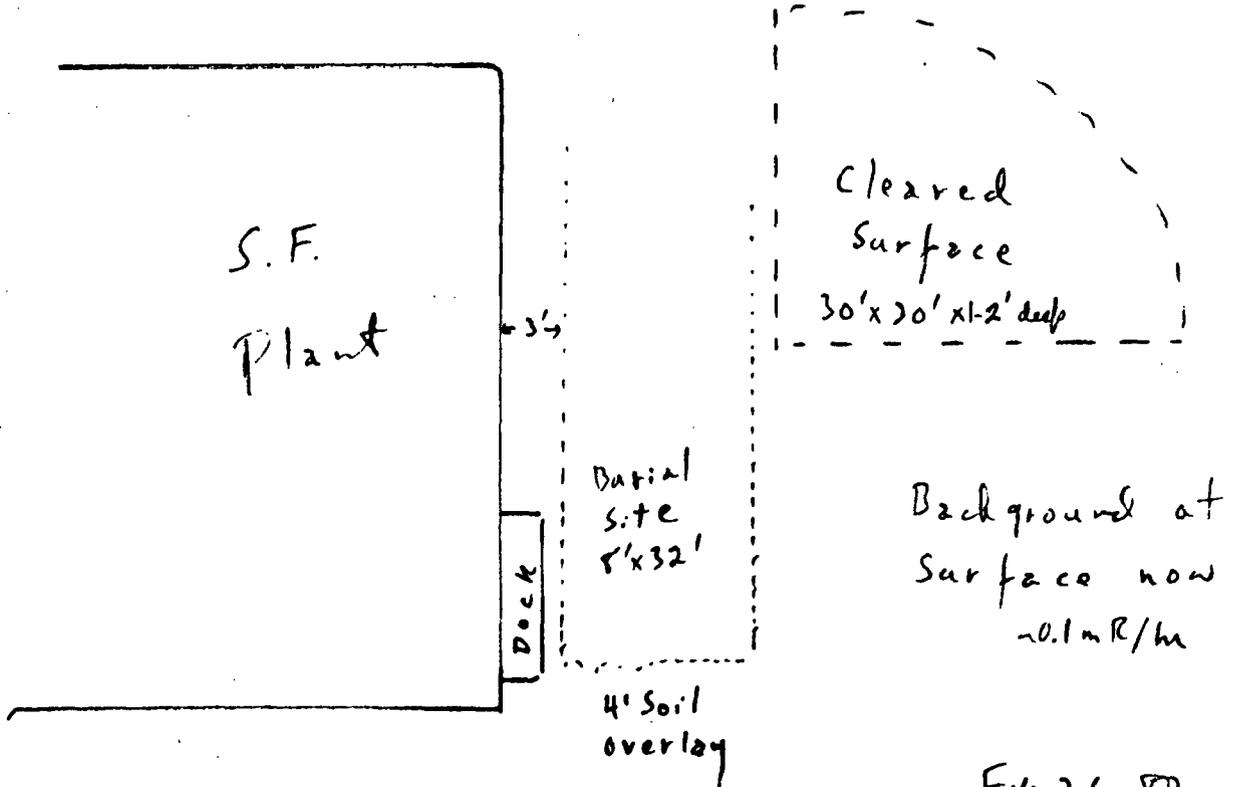
EXPLANATION OF COLUMN HEADINGS

COLUMN

- 1 - Sampling time at 765 liter/minute
- 2 - Volume by air sampled
- 3 - Total ^{228}Ra particulate detected on sample
- 4 - ^{228}Ra concentration in sampled air
- 5 - Percent of maximum permissible concentration of ^{228}Ra in controlled areas

BURIAL SITE LOCATION

February 1980



Feb. 26 80

Burial estimated at 1 Kg natural Thorium Nitrate
4 Kg/mCi. Therefore a maximum of 0.25 mCi is buried.

Permissible maximum burial = 1000 X Appendix C value
which is 1000 X 100 μ Ci = 100 mCi allowed [=400 Kg \bar{m}].