19 JUL 1983

Docket No. 40-0086

License No. STC-422

State of New Jersey
Department of Environmental Protection
ATTN: Mr. Steven G. Kuhrtz, Director
Division of Environmental Quality
John Fitch Plaza
Trenton, New Jersey 08625

Gentlemen:

This is in response to your letter dated April 8, 1983, regarding the W. R. Grace and Company property in Wayne, New Jersey. We appreciate the copy of your survey which was enclosed with your letter, and we share your concern for the safety of the residents in the area surrounding this property and for the adequacy of the activities discussed in your letter.

The important point that should be stressed, however, is that based on the results of our studies, which are not significantly different from your results, we have concluded that there is no immediate hazard to the health and safety of nearby residents from the thorium contamination on this property. None the less, our Headquarters Licensing staff has met with the W. R. Grace and Company, Davison Chemical Division, to discuss appropriate corrective action for this property and the other nearby contaminated properties. We will keep your staff informed of our progress in this area.

We understand the concerns and fears of the residents in this area and look forward to continued cooperation by the State of New Jersey in jointly working to resolve them as rapidly as practical. If I could be of any further assistance in this matter please advise.

Sincerely,

Original Signed By:
Thomas T. Martin

Thomas T. Martin, Director
Division of Engineering and
Technical Programs

cc:
Public Document Room (PDR)
Nuclear Safety Information Center (NSIC)
State of New Jersey

ITEM # 295 B1293

bcc:
Region I Docket Room (w/concurrences)
Bill Crow, NMSS

RI:DETP	RI:DETP	RI:SLO	RI:DETP	RI:NMSS
Kinneman/pja	Joyner	Brenneman	Martin	Crow
7/8/83	7/12/83	7/13	7/14	by phone

OFFICIAL RECORD COPY

IE07

Prepared by
Oak Ridge Associated Universities

Prepared for
Division of Fuel Cycle and Material Safety

U.S. Nuclear Regulatory Commission

RADIOLOGICAL SURVEY OF THE W. R. GRACE PROPERTY WAYNE, NEW JERSEY

ADDENDUM

P. W. FRAME

Radiological Site Assessment Program
Manpower Education, Research, and Training Division

FINAL REPORT

September 1983

40-86

RADIOLOGICAL SURVEY
OF THE
W.R. GRACE PROPERTY
WAYNE, NEW JERSEY

ADDENDUM

Prepared for

Division of Fuel Cycle and Material Safety
U.S. Nuclear Regulatory Commission

RECEIVED
SEP 28 1983
U.S. NUCLEAR REGULATORY COMMISSION
NMSS
Mail Section

P.W. Frame

Project Staff

J.D. Berger
R.D. Condra
C.F. Weaver

Prepared by

Radiological Site Assessment Program
Manpower Education, Research, and Training Division
Oak Ridge Associated Universities
Oak Ridge, Tennessee 37830

DOCKETED
USNRC
SEP 30 1983
NMSS
MAIL SECTION
DOCKET CLERK

FINAL REPORT

September 1983

This report is based on work performed under Interagency Agreement DOE No. 40-770-80 NRC Fin. No. A-9093-0 between the U.S. Nuclear Regulatory Commission and the U.S. Department of Energy. Oak Ridge Associated Universities performs complementary work under contract number DE-AC05-76OR00033 with the U.S. Department of Energy.

22891

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WAYNE, NEW JERSEY

ADDENDUM

INTRODUCTION

In 1948, Rare Earths, Inc., began processing monazite sand at its facility at 868 Black Oak Ridge Road, Wayne, New Jersey (Figures 1 and 2), to extract thorium and rare earths. The facility was acquired by the Davison Chemical Division of W.R. Grace and Co. in 1957. Processing activities continued until July 1971 when the plant was permanently closed. The buildings are currently leased to, and occupied by, Electro-Nucleonics, Inc.

At the request of the Nuclear Regulatory Commission (NRC) Division of Fuel Cycle and Material Safety, a radiological survey of the W.R. Grace plant was performed by the Radiological Site Assessment Program of Oak Ridge Associated Universities (ORAU), Oak Ridge, Tennessee, in July and August 1982. Due to the public concern regarding this site, the survey report was released before analyses of samples from ground water monitoring wells were completed.[1] This addendum presents the analyses of samples from these wells.

PROCEDURES

Six permanent monitoring wells were installed in December 1982 by W.R. Grace and Co.; their locations are indicated on Figure 3. Four of these wells (no.'s 2, 3, 5, and 6) are at locations on the property where earlier survey measurements and sampling had indicated high concentrations of thorium in subsurface soil or elevated gross alpha concentrations in water samples from boreholes. Wells 1 and 4 were drilled on the western edge of the property - assumed to be the direction of normal groundwater flow. An artesian well (A) is also located on the site.

On January 12, 1983, representatives of the Nuclear Regulatory Commission and W.R. Grace measured the depth to the water table in each well and purged the wells by pumping to dryness. On the following day (January 13) the depth to the water table was measured again and 3.8 liter samples were collected from each of the six monitoringwells and at two depths in the artesian well. Data concerning water depths and relative well elevations are presented in Table 1.

Each sample was split between the NRC and W.R. Grace. The NRC samples were sent to the Radiological Site Assessment Program of Oak Ridge Associated Universities for analysis. The analytical procedures were as follows: Samples were rough-filtered through Whatman No. 2 filter paper. Remaining suspended solids were removed by filtration through 0.45 μm pore size membrane filters. The filtrate was acidified by the addition of 20 ml of concentrated nitric acid. Fifty milliliters of each sample was evaporated to dryness and counted on a Tennelec Model LB5100 low background proportional counter. Samples with gross alpha concentrations exceeding the minimum detectable activity (MDA) levels of the procedures were analyzed for Ra-226 and Ra-228 using the standard technique EPA 600/4-75-008 (rev) and for Th-228, Th-230, Th-232, U-234, U-235, and U-238 using the standard alpha spectroscopy procedures EMSL-LV-0539-17.

RESULTS

Radionuclide concentrations measured in monitoring well samples collected from the W.R. Grace property are presented in Table 2. It should be noted that all of the shallow well samples collected during this survey contained high concentrations of dissolved solids (believed to be primarily phosphates). Complete removal of these dissolved materials could not be achieved, thus resulting in poor detection sensitivities and relatively large statistical measurement errors.

Samples from wells 5 and 6 contained gross alpha concentrations of 239 pCi/l and 183 pCi/l, respectively. These wells are located within the portion of the property where burials were performed and where high concentrations of thorium and uranium have been identified in both surface and subsurface soil. The Ra-228 concentrations in these water samples were 64.3 pCi/l and 59.9 pCi/l, respectively. Radium-226 levels in these samples were 2.13 pCi/l and 1.95 pCi/l, respectively. In the sample from well 5, alpha spectroscopy identified high levels of Th-228 and Th-232 (178 pCi/l and 107 pCi/l, respectively) and lower concentrations of U-234 and U-238 (16 pCi/l and 24 pCi/l, respectively). The sample from well 6 did not contain detectable levels of the thorium isotopes; however, it did contain higher concentrations of U-234 (82 pCi/l) and U-238 (93 pCi/l). These differences in ratios of thorium and uranium concentrations may be due to differences in the chemical composition of residues buried in the vicinity of the two wells.

Wells 2 and 3, located to the west of the burial sites, contained detectable concentrations of gross alpha activity (5.19 pCi/l and 4.75 pCi/l, respectively). Concentrations of Ra-226 and Ra-228 were lower than in the samples from wells 5 and 6. Concentrations of thorium and uranium isotopes were either below the detection limits or were questionable, due to relatively large errors.

The samples from wells 1 and 4 near the extreme western edge of the W.R. Grace property and from the artesian well did not contain detectable gross alpha or gross beta concentrations.

The Environmental Protection Agency (EPA) has established interim standards for community drinking water systems. These standards are 15 pCi/l, gross alpha; 50 pCi/l, gross beta; and 5 pCi/l, combined Ra-226 and Ra-228.[2] No standards have yet been established by EPA for isotopes of thorium and uranium. Although the two wells located in the burial area yielded samples exceeding these EPA interim standards, samples from the other four monitoring

wells and the on-site artesian well are within these standards. These results indicate that significant concentrations of radionuclides are not migrating from the site via the ground water. This conclusion is substantiated by the analyses of samples collected from off-site wells in Pompton Plains and Wayne area presented in an earlier report.[3]

SUMMARY

At the request of the Nuclear Regulatory Commission, the ORAU Radiological Site Assessment Program performed analyses of water samples, collected from monitoring wells on the W.R. Grace site in Wayne, New Jersey. These analyses supplement the radiological survey conducted at that site during July and August 1982.

Samples from wells located in the burial areas contain radionuclide concentrations exceeding EPA standards. The major radionuclides identified in these samples are Ra-228, Ra-226, and isotopes of thorium and uranium. Concentrations in samples from other wells on the property are much lower and within the EPA standards. These findings and the results of off-site well sampling conducted earlier indicate that ground water is not a significant pathway of radionuclide migration from the W.R. Grace site.

REFERENCES

1. P.W. Frame. Radiological Survey of the W.R. Grace Property, Wayne, New Jersey. Oak Ridge Associated Universities, Oak Ridge, TN, January 1983.

2. Title 40, Code of Federal Regulations, Part 141, Interim Primary Drinking Water Regulations, July 1976.

3. P.W. Frame. Radiological Survey of Sheffield Brook, Wayne, New Jersey. Oak Ridge Associated Universities, Oak Ridge, TN. October 1982.

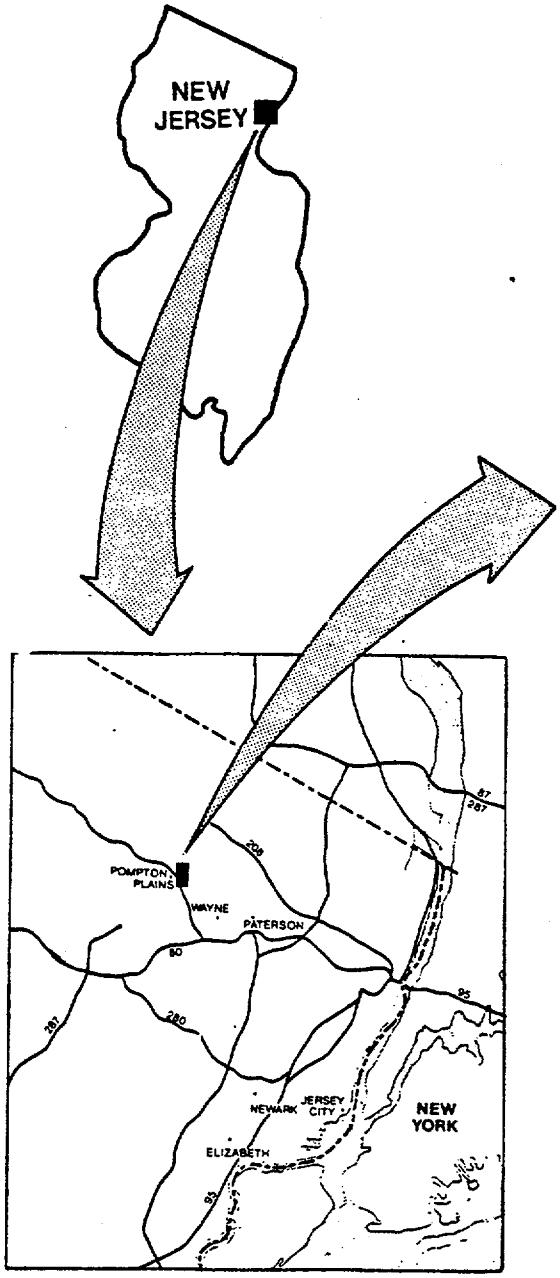

FIGURE 1. Map of Northeastern New Jersey Indicating the Location of the W.R. Grace Property.

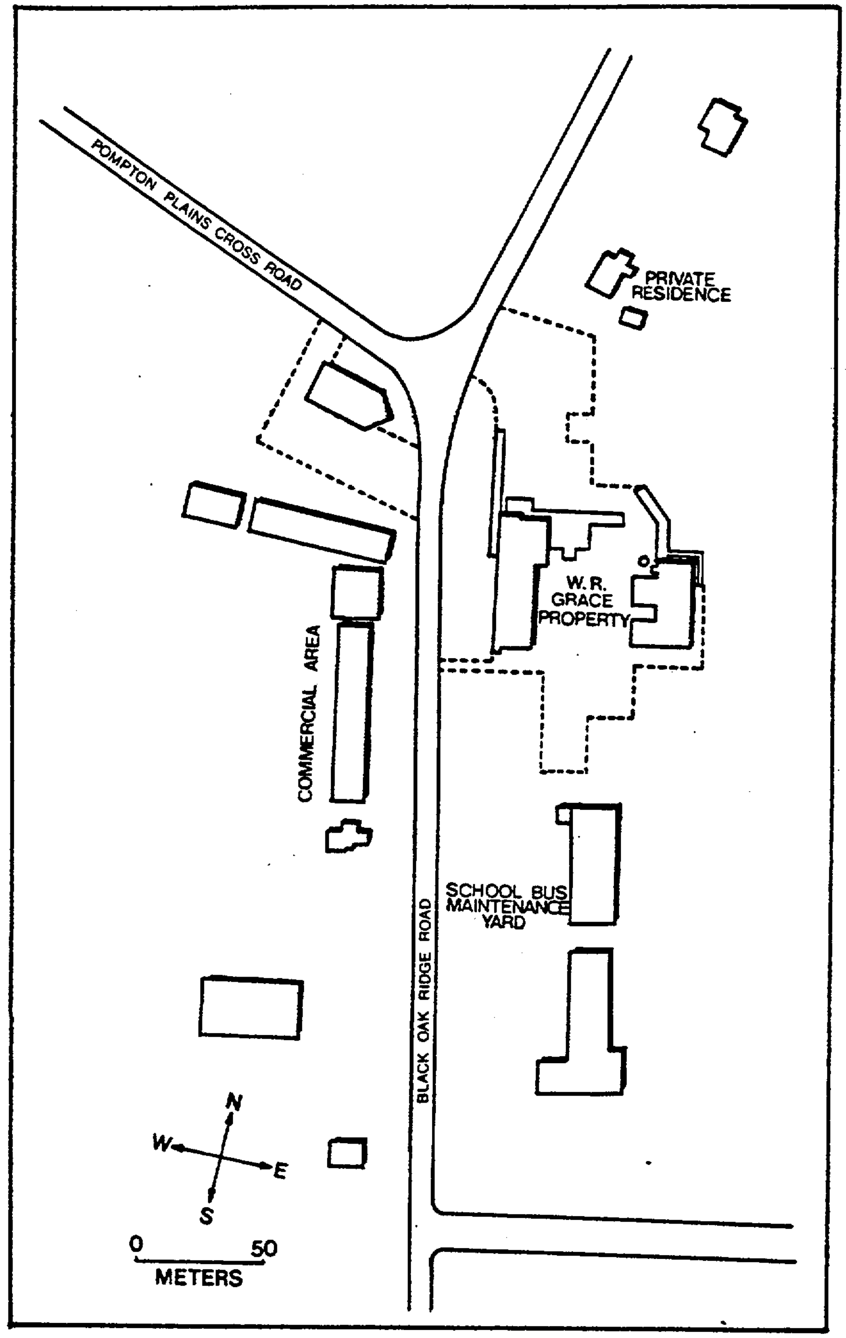

FIGURE 2. Portion of Wayne, New Jersey, Indicating the Locations of the W.R. Grace Property and Adjacent Properties. (Dotted lines indicate paved areas.)

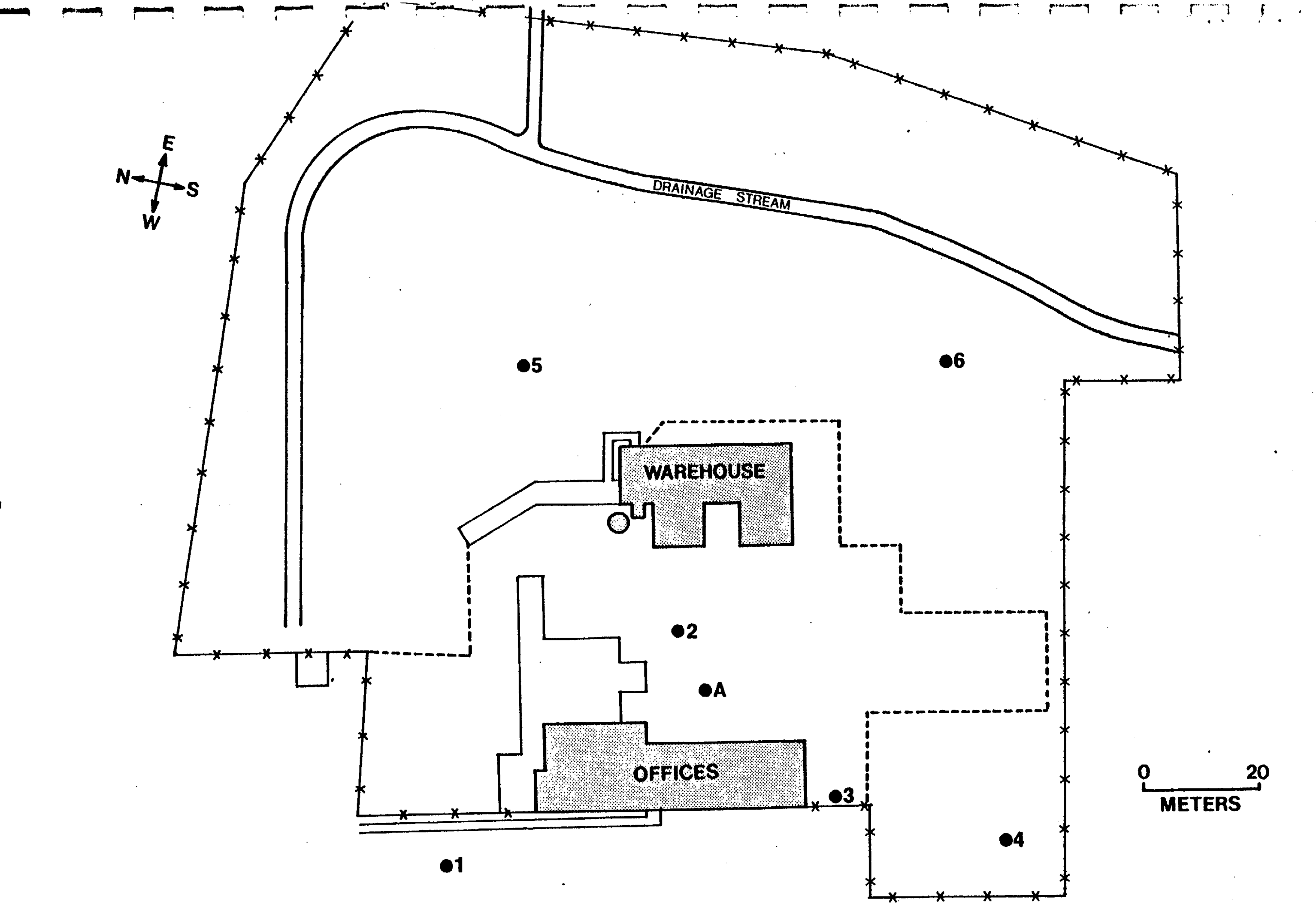

FIGURE 3. Plan View of the W.R. Grace Property Indicating the Location of the Sampling Wells.

TABLE 1

TECHNICAL INFORMATION PERTAINING TO MONITORING WELLS

Well Location[a]	Relative Ground Surface Elevation (m)	Depth of Well Screen Below Ground Surface (m)	Depth of Water Table Below Ground Surface (m)		Nearest ORAU Borehole[b]
			1/12/83	1/13/83	
1	0	1.5-3.0	1.6	1.6	B42
2	1.5	1.5-3.0	0.4	1.0	B39
3	1.7	1.1-2.6	0.3	0.8	B38
4	2.6	4.6-6.1	1.4	4.2	B35
5	4.7	2.7-4.2	1.1	1.1	B16
6	5.9	4.6-6.1	1.1	2.3	B29
A(Artesian)	2.2	N/A	0	0	--

∞

[a] Refer to Figure 3.
[b] As described in the W.R. Grace site survey report (see Ref. 1).

TABLE 2

RADIONUCLIDE CONCENTRATIONS IN ON-SITE WELL WATER SAMPLES

Well Location[a]	Depth of Sampling (m)	Radionuclide Concentrations (pCi/l or x 10^{-9} µCi/ml) Gross Alpha	Gross Beta	Ra-226	Ra-228	Th-228	Th-230	Th-232	U-234	U-235	U-238
1	3.1	<1.96	<2.76	---[c]	---	---	---	---	---	---	---
2	3.1	5.19 ± 2.32[b]	11.7 ± 2.6	0.07 ± 0.03	0.20 ± 0.20	<2.6	<2.6	<2.3	<2.7	<1.9	<2.7
3	2.6	4.75 ± 2.29	4.76 ± 2.44	0.11 ± 0.04	0.53 ± 0.27	<2.6	<2.6	<2.5	1.0 ± 2.7	<1.9	0.8 ± 2.4
4	6.2	<1.69	<2.67	---	---	---	---	---	---	---	---
5	4.3	239 ± 26	228 ± 18	2.13 ± 0.15	64.3 ± 1.0	178 ± 12	16 ± 4	107 ± 10	16 ± 6	1.2 ± 2.3	24 ± 7
6	6.2	183 ± 47	242 ± 47	1.95 ± 0.14	59.9 ± 1.0	<2.6	<2.6	<2.5	82 ± 36	7.5 ± 14.6	93 ± 38
A(Artes.)	Surface	<1.68	<2.67	---	---	---	---	---	---	---	---
A "	58.5	<1.69	<2.67	---	---	---	---	---	---	---	---

a Refer to Figure 3.
b Error is 2σ based on counting statistics.
c Dash indicates analysis not performed.

SEP 26 1983

Expert Concrete Pumping Company
ATTN: Randy Apfelbaum
Sales Representative
21-21 43rd Avenue
Long Island City, NY 11101

Dear Mr. Apfelbaum:

This refers to your letter dated June 10, 1983. I apologize for the long delay in replying, but your letter was misplaced and I have only now found it.

While I am involved in the investigation of the W. R. Grace property near Black Oak Ridge Road in Wayne, New Jersey, I am not responsible for the planning or execution of remedial action at that site. The W. R. Grace and Company representative responsible for this site is Burton Mobley, P.O. Box 2117, Baltimore, Maryland 21203. I suggest that you contact Mr. Mobley if you should desire to discuss the use of your products at this site.

Thank you for providing the interesting information concerning your product.

Sincerely,

Original Signed By:
John D. Kinneman

John D. Kinneman, Chief
Nuclear Materials Section A

RI:DETP
Kinneman/lp
9/26/83

B1295

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09/01/83

ITEM # 297

ORNL SITES - SUMMARY

License No.:	C-04391	ORNL Score:	6
Docket No.:	040-03516		
Licensee:	W.R. Grace and Company	Review Status:	**Complete**
Site Address(es):	3 Hanover Square Room 1309 New York, NY		
Site Contact:	Jim Mull		
Telephone No.:	(718) 797-7641		
SDMP Site:	no		
Related License(s):	~~SMC-00207~~ none		
NRC Reviewer:	Andrew J. Schwartz		
Review Abstract:	Licensed for possession and resale of 2,933 pounds of ultra pure and nuclear grade thorium or thorium 232. The license was superseded by New York State Registration No. 0559 on 5/28/59; therefore, no further action is necessary by the ORNL Identified Sites Program.		
Recommendations:	None.		

Summary: License No. C-04391 was issued 10/30/58 for possession and resale of 2,933 pounds of ultra pure and nuclear grade thorium or thorium 232. The material was to be shipped to Germany for use in reactors. The license was superseded by New York State Registration No. 0559 on 5/28/59; therefore, no further action is necessary by the ORNL Identified Sites Program. The registration was terminated 5/62.

Reviewed by: Andrew Schwartz **Date** 7/7/94

Approved by: [signature] **Date** 7/12/94

B1296

ITEM # 298

2

STATE OF NEW YORK, DEPARTMENT OF LABOR

Division of Industrial Hygiene
80 Centre Street, New York 13, N. Y.

Registration No. 0559 (etc)
Date Registered 5-28-59

REGISTRATION OF SOURCES OF RADIATION

(SEE OVER FOR INSTRUCTIONS)

1. NAME OF OWNER
W. R. Grace & Co. Ore & Metal Department

2. ADDRESS IN FULL
3 Hanover Square New York

COUNTY
New York

3. CONFINES OF INSTALLATION
Room 1309 3 Hanover Square New York

4. INDUSTRY

5. TOTAL NO. OF WORKERS EXPOSED TO RADIATION IN THIS INSTALLATION none

6. ARE THE SOURCES NOW BEING REPORTED ON THIS FORM A PART OF AN INSTALLATION PREVIOUSLY REGISTERED WITH THE DIVISION OF INDUSTRIAL HYGIENE? ☐ YES ☒ NO
IF YES, WHAT IS OUR REGISTRATION NUMBER FOR THAT INSTALLATION?

7. RADIATION PRODUCING EQUIPMENT (USE ADDITIONAL SHEETS IF NECESSARY)

a. Number		b. Description of Each Radiation Producing Machine or Unit	c. Purpose or Use	d. No. of Workers Exposed
Fixed	Mobile			
		NONE		

STATE OF NEW YORK DEPARTMENT OF LABOR
REGISTERED
UNDER RU[illegible] 33 OF INDUSTRIAL CODE
DIVISION OF INDUSTRIAL HYGIENE
Date: 5-28-59 By: R. K.

8. RADIOACTIVE MATERIALS (USE ADDITIONAL SHEETS IF NECESSARY)

a. Types	b. Fixed	b. Mobile	c. Sealed	c. Un-Sealed	d. Source Strength	e. Estimated Quantity Used Annually	f. Maximum Quantity on Hand	g. Purpose or Use	h. No. of Workers Exposed
Thorium Oxide, Nuclear Grade	Radiation Source material is retained at the above location for only short periods awaiting transhipment, during which time the material is not repacked or reprocessed. During 1958 we received 30 lbs. of Thorium Oxide, and this material was packed in accordance with the regulations as set forth by the A.E.C. Because of these extenuating circumstances no specific member of our staff has ~~xxx~~ been designated to be in charge of radiation protection.								none

9. NAME, TITLE AND BUSINESS ADDRESS OF PERSON IN CHARGE OF RADIATION PROTECTION

Qualifications

R. H. Lawrence
(R. H. Lawrence)
W. R. GRACE & CO.

May 27, 1959
Date

IH-312 (2-59)

DOCKET NO. 40-3516

W. R. GRACE & CO.

HANOVER SQUARE NEW YORK

SAN FRANCISCO PORTLAND, ORE.
LOS ANGELES SEATTLE
WASHINGTON, D.C. NEW ORLEANS

BOLIVIA CHILE COLOMBIA
ECUADOR PERU

COSTA RICA EL SALVADOR
GUATEMALA NICARAGUA PANAMA

ARGENTINA VENEZUELA

ENGLAND

P.O. BOX 286, CHURCH STREET STATION
NEW YORK 8, N. Y.

CABLE ADDRESS "GRACE"

NEW YORK, October 30, 1958

Mr. N. Doulos
U. S. Atomic Energy Commission
Division of Licensing and Regulations
Washington 25, D. C.

Dear Mr. Doulos:

Confirming today's telephone conversation we hereby wish to formally apply for the right to receive from our subsidiary, Davison Chemical Company, Erwin, Tennessee, and store for export pending the receipt of end use statement and import certificate from Degussa, Frankfurt a/Main the following quantities of reactor materials:

2866 lbs. thorium oxide ultra pure
67 lbs. thorium oxide nuclear grade
2933

We would appreciate it if you would issue promptly the license for us to receive the above mentioned quantities. Our formal export license application on form AEC 7 will be filed with you as soon as the documentation from Germany has been received and we are ready to make the export of the above mentioned reactor materials.

Very truly yours,

W. R. GRACE & CO.

R H Lawrence

Ore & Metal Department

RHLawrence/mm

NOV ...

mau

3297

ITEM # 299

040-03516

EXPERT SYSTEM LICENSE EVALUATION
REPORT FOR LICENSE C-04391

NAME OF LICENSEE: W. R. GRACE AND CO.
LISTED SITE: NO EXACT LOCATION GIVEN;PROBABLY IN NEW YORK, NY
--- TYPE OF ACTIVITY OR FACILITY: OTHER TYPE OF FACILITY

DESCRIPTION OF FIRST SITE AT WHICH C-04391 WAS USED
NO EXACT LOCATION IS GIVEN EXCEPT IT IS A NEW YORK, NY LOCATION.

Description of LICENSEE ACTIVITY UNDER THIS LICENSE

LICENSEE POSSESSED THE MATERIAL UNTIL THE NECESSARY ARRANGEMENTS WERE MADE AND THEM OBTAINED EXPORT LICENSES TO SHIP THE MATERIAL TO THE CUSTOMER.

The final score for SITE CONTAMINATION is: 6

MATERIALS INFORMATION FOR THIS LICENSE

--Information on type and form of materials--

Material--	--Form--
THORIUM OR TH232	Loose material

For evaluation purposes, amounts of the following materials were obtained

---Material--	--Form--	Amount	Unit	Score
THORIUM OR TH232	LOOSE	2933.00	LB	8.3

INITIAL SITE SCORE, based on LOOSE material possession limits: 8

FINAL DECISION FOR LOOSE MATERIALS:
MODERATE PRIORITY FOR REVIEW

The final SCORE for SITE CONTAMINATION is: 6

S E Q U E N C E O F R E C O R D E D R E A S O N I N G

1. There was one identifiable site with this license.

2. FIRST SITE: There was insufficient information in file to determine the likelihood of release to atmosphere or to environment from activities at this site.

3. FIRST SITE: Description of activity was inadequate to determine whether building at site could have been left with significant contamination. No change in score.

4. The evaluator judged that the activity carried out under this license at this site made decontamination at closeout INAPPROPRIATE.

B/28

5. FIRST SITE: There is evidence in the file indicating that turnover of the materials under this license was not frequent. This

ITEM # 300 (b)

may be due to issuance of the license using limits applicable to a year or to the entire period of the license. Score=score*.8

6. FIRST SITE: Based on previous answers, the license as used at site is a candidate to use protective clothing, glove boxes, hoods, or a hot cell. The reviewer found no evidence that any of the above were used at this site.

7. FIRST SITE: There was some documentation of materials disposition, but not complete. Score=score*0.9

8. FIRST SITE: Because the score for this site is below 20 at this point, a closeout survey would not necessarily have been warranted.

9. FIRST SITE: There was no closeout survey for this site. The score will not be altered, since the current score for this site is below 20

10. FIRST SITE: There was NOT an NRC FINAL INSPECTION of the facility. Score not changed.

COMMENTS FOR LICENSE EVALUATION
Description of LICENSEE ACTIVITY UNDER THIS LICENSE

LICENSEE POSSESSED THE MATERIAL UNTIL THE NECESSARY ARRANGEMENTS WERE MADE AND THEM OBTAINED EXPORT LICENSES TO SHIP THE MATERIAL TO THE CUSTOMER.

Reviewer's comments concerning potential TURNOVER OF MATERIALS
FROM INFORMATION IN THE LETTER OF 10-30-58, IT APPEARS THAT THE AMOUNT OF MATERIAL ON THE LICENSE IS THE TOTAL AMOUNT OF MATERIAL.

Reviewer's comments concerning potential CONTAMINATION
ONLY LETTER APPLICATIONS AND THE LICENSE ISSUED ON 10-30-58 ARE IN THIS FILE AND THEY DO NOT GIVE ADEQUATE INFORMATION.

- GENERAL COMMENTS ENTERED BY THE REVIEWER CONCERNING THE EVALUATION -
-- THE MATERIAL WAS ULTRA PURE AND NUCLEAR GRADE THORIUM OXIDE TO BE
-- EXPORTED TO GERMANY FOR USE AS REACTOR MATERIALS. THE LICENSEE
-- APPLIED FOR RENEWAL OF THE EXPIRED LICENSE BY LETTER OF 1-17-62 FOR
-- SHIPMENT WEIGHTS OF 10,000 LBS EACH WHICH WOULD NOT INVOLVE
-- REPACKAGING OR REPROCESSING OF THE MATERIAL AT THE SITE. AEC
-- ACKNOWLEDGED THE RECEIPT OF THE RENEWAL REQUEST, BUT THERE IS NO
-- EVIDENCE IN THIS FILE THAT A RENEWAL WAS GRANTED.

END OF COMMENTS FOR LICENSE EVALUATION

--- EXPERT SYSTEM EVALUATION WAS BASED ON THE ---
---- FOLLOWING INVENTORY RECORD -----

Docket Number: 40-03516 REGION RESPONSIBLE: I
LICENSEE NAME: W. R. GRACE AND CO.
STREET ADDRESS: P.O. BOX 286 AT CHURCH ST STATION NY,NY
FIPS state code (principal operation): NY
Site used: NO EXACT LOCATION GIVEN;PROBABLY IN NEW YORK, NY

Disposition information present: LICENSEE LETTER STATING DISPOSITION
Contents of letter:
This license was listed as expired on 11/30/59
COMMENTS: FOR STORAGE & RESALE OF 2933 LBS. OF THORIUM OXIDE
JOB NUMBER: 1700 BOX NUMBER: 11

Date of last evaluation or revision: 10/01/93 Reviewer: PAB

Reviewer's comments concerning license C-04391

THE MATERIAL WAS ULTRA PURE AND NUCLEAR GRADE THORIUM OXIDE TO BE EXPORTED TO GERMANY FOR USE AS REACTOR MATERIALS. THE LICENSEE APPLIED FOR RENEWAL OF THE EXPIRED LICENSE BY LETTER OF 1-17-62 FOR SHIPMENT WEIGHTS OF 10,000 LBS EACH WHICH WOULD NOT INVOLVE REPACKAGING OR REPROCESSING OF THE MATERIAL AT THE SITE. AEC ACKNOWLEDGED THE RECEIPT OF THE RENEWAL REQUEST, BUT THERE IS NO EVIDENCE IN THIS FILE THAT A RENEWAL WAS GRANTED.

EXPERT SYSTEM EVALUATION WAS BASED ON THE INVENTORY RECORD IN JOB 1700, BOX 11

Docket 40-03516

Licensee: W. R. GRACE AND CO.
Address: P.O. BOX 286 AT CHURCH ST STATION NY,NY Zip:
State of operation: NY
Disposition information present: LICENSEE LETTER STATING DISPOSITION
Contents of letter:
10-30-58 & 1-17-62:POSSESSION TIME IS SHORT-WILL EXPORT THE MATERIAL
Matl. Transfrd to: SOME TO FRANKFURT, GERMANY
License to which transferred:
This license was listed as expired on 11/30/59
Remarks:FOR 2,933 LBS. OF TH OXIDE FOR STORAGE AND RESALE
JOB NUMBER: 1700 BOX NUMBER: 11

Date of last evaluation or revision: 10/01/93 Reviewer: PAB

8/299

ITEM # 301

10

EXPERT SYSTEM LICENSE EVALUATION
EVALUATION REPORT FOR LICENSE C-04391

Licensee: W. R. GRACE AND CO.
Site of operation: NO EXACT LOCATION GIVEN;PROBABLY IN NEW YORK, NY

DESCRIPTION OF ACTIVITY OR FACILITY: OTHER TYPE OF FACILITY

------------------ MATERIALS INFORMATION FOR THIS LICENSE ------------------

--Information on type and form of materials--

Material--	--Form--
THORIUM OR TH232	Loose material

For evaluation purposes, amounts of the following materials were obtained

---Material--	--Form--	Amount	Unit	Score
THORIUM OR TH232	LOOSE	2933.00	LB	8.3

INITIAL SITE SCORE, based on LOOSE material possession limits: 8

DESCRIPTION OF FIRST SITE AT WHICH C-04391 WAS USED

NO EXACT LOCATION IS GIVEN EXCEPT IT IS A NEW YORK, NY LOCATION.

Description of THE LICENSEE ACTIVITY AUTHORIZED by this license

LICENSEE POSSESSED THE MATERIAL UNTIL THE NECESSARY ARRANGEMENTS WERE MADE AND THEY OBTAINED EXPORT LICENSES TO SHIP THE MATERIAL TO THE CUSTOMER.

1. There was one identifiable site with this license.
2. FIRST SITE: There was insufficient information in file to determine the likelihood of release to atmosphere or to environment from activities at this site.
3. FIRST SITE: Description of activity was inadequate to determine whether building at site could have been left with significant contamination. No change in score.

--- continued on next page ---

Reviewer's comments concerning potential CONTAMINATION

ONLY LETTER APPLICATIONS AND THE LICENSE ISSUED ON 10-30-58 ARE IN THIS FILE AND THEY DO NOT GIVE ADEQUATE INFORMATION.

4. The evaluator judged that the activity carried out under this license at this site made decontamination at closeout INAPPROPRIATE.
5. FIRST SITE: Nature/magnitude of operation should cause small turnover of materials Score=score*0.8

Reviewer's comments concerning potential TURNOVER OF MATERIALS

FROM INFORMATION IN THE LETTER OF 10-30-58, IT APPEARS THAT THE AMOUNT OF MATERIAL ON THE LICENSE IS THE TOTAL AMOUNT OF MATERIAL.

6. FIRST SITE: Based on previous answers, the license as used at site is a candidate to use protective clothing, glove boxes, hoods, or a hot cell. The reviewer found no evidence that any of the above were used at this site.
7. FIRST SITE: There was some documentation of materials disposition, but not complete. Score=score*0.9
8. FIRST SITE: Because the score for this site is below 20 at this point, a closeout survey would not necessarily have been warranted.
9. FIRST SITE: There was no closeout survey for this site. The score will not be altered, since the current score for this site is below 20
10. FIRST SITE: There was NOT an NRC FINAL INSPECTION of the facility.

FINAL DECISION FOR LOOSE MATERIALS:
MODERATE PRIORITY FOR REVIEW

The final SITE SCORE for this license is: 6.0

--- continued on next page ---

UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON 25, D. C.

IN REPLY REFER TO:
40-3516
LAL:HD

SOURCE MATERIAL LICENSE

License No. G-4391

Dated: October 30, 1956.

W. R. Grace & Co.
P.O. Box 286, Church St. Sta.
New York 8, N.Y.

Attention: Mr. R. H. Lawrence
Ore & Metal Department

Gentlemen:

Pursuant to the Atomic Energy Act of 1954 and Section 40.21 of the Code of Federal Regulations, Title 10 - Atomic Energy, Chapter 1, Part 40 - Control of Source Material, you are hereby licensed to receive possession of and title to, at your New York location, two thousand nine hundred and thirty three (2,933) pounds of thorium oxide for storage and resale.

You are further licensed to transfer and deliver possession of and title to refined source material to any person licensed by the Atomic Energy Commission, within the limits of his license.

As a condition of this license, you are required to maintain records of your inventories, receipts and transfers of refined source material.

This license is subject to all the provisions of the Atomic Energy Act of 1954 now or hereafter in effect and to all valid rules and regulations of the U. S. Atomic Energy Commission, including 10 CFR 20, "Standards For Protection Against Radiation."

Neither this license nor any right under this license shall be assigned or otherwise transferred in violation of the provisions of the Atomic Energy Act of 1954.

This license shall expire November 30, 1959.

CC: Docket Officer
Document Room
S/H
M.M. Mann, Insp.

FOR THE ATOMIC ENERGY COMMISSION

B/3/00

J. C. Delaney
Chief, Materials Section
Licensing Branch
Division of Licensing and Regulation

Director ______
Approved ______

ITEM # 302

DOCKET NO. 40-3516

W. R. GRACE & CO.

HANOVER SQUARE NEW YORK

SAN FRANCISCO PORTLAND, ORE.
LOS ANGELES SEATTLE
WASHINGTON, D.C. NEW ORLEANS

BOLIVIA CHILE COLOMBIA
ECUADOR PERU

COSTA RICA EL SALVADOR
GUATEMALA NICARAGUA PANAMA

ARGENTINA VENEZUELA

ENGLAND

P.O. BOX 286, CHURCH STREET STATION
NEW YORK 8, N. Y.

CABLE ADDRESS "GRACE"

L&R File Copy

NEW YORK, January 17, 1962

U. S. Atomic Energy Commission
Division of Licensing & Regulation
Washington 25, D.C.

Attention: Mr. Lyall Johnson

Gentlemen: RENEWAL OF SOURCE MATERIAL LICENSE NO. C-4391

We have been advised that our source material license No. C-4391 has expired and in accordance with the revised regulation 10 CFR 40, "Licensing of Source Material", effective February 14, 1961, we hereby request that our license be renewed to cover receipt, possession and transfer of nuclear source material.

We ask that the maximum quantity of each shipment be established at 10,000 lbs., and we will comply with the regulation that we will not repackage or reprocess the material while it is in our possession. The period of possession is very short as arrangements are made for transshipment immediately upon receipt of the material. We shall request separately that the Atomic Energy Commission issue an export license for the quantity of each shipment.

In anticipation of your answer to our request, we thank you for your cooperation.

Very truly yours,

W.R.GRACE & CO.

Ore & Mining Division

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DOCKETED USAEC
Licensing & Regulation
1962
Docket Clerk

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ITEM # 303

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UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON 25, D.C.

JAN 2 2 1962

IN REPLY REFER TO:
40-3516
LAR:JCD

W. R. Grace & Company
P. O. Box 286
Church Street Station
New York 8, New York

Attention: Mr. A. E. Compagno

Gentlemen:

This will acknowledge receipt of your request dated January 17, 1962, for renewal of License C-4391 which expired November 30, 1959.

Enclosed is a copy each of AEC Regulations 10 CFR 20 and 10 CFR 40, entitled "Standards for Protection Against Radiation" and "Licensing of Source Material", respectively. Compliance with Part 20 is made a condition of all specific material licenses issued by the Commission. An application for a specific license should be submitted using Form AEC-2, copies of which are enclosed, in accordance with the instructions provided with the form.

Please note however, Section 40.22(a)(4) of the regulation 10 CFR 40 which establishes a general license for the use and transfer of certain quantities of source material by certain categories of persons provided they do not use and transfer more than 15 pounds of source material (for example, 375 pounds of thorium magnesium alloy containing 4% thorium, or about 17.6 pounds of U_3O_8) at any one time and provided they do not receive more than 150 pounds of source material (for example, 3,750 pounds of thorium magnesium alloy containing 4% thorium, or about 176 pounds of U_3O_8) during a single calendar year pursuant to this general license. As provided by Section 40.20, a general license is effective without the filing of an application with the Commission or the issuance of licensing documents to particular persons. If your proposed requirements and use of source material are within the purview of the general license provisions, you would not require a specific AEC license for possession and use of source material.

Very truly yours,

Donald A. Nussbaumer, Chief
Source & Special Nuclear Materials Branch
Division of Licensing & Regulation

Enclosures:
10 CFR 20 & 40
Form AEC-2

Formal

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ITEM # 304

UNITED STATES

ATO..IC ENERGY COMMISSION

WASHINGTON 25, D. C.

Rare Earths, Inc.
An Affiliate of Davison Chemical Company
Division of W. R. Grace & Son
Box 488
Pompton Plains, New Jersey

SOURCE MATERIAL LICENSE

License No. C-3623

Dated:

Attention: Mr. Richard L. Stone

Gentlemen:

Pursuant to the Atomic Energy Act of 1954 and Section 40.21 of the Code of Federal Regulations, Title 10 - Atomic Energy, Chapter 1, Part 40 - Control of Source Material, you are hereby licensed to receive possession of and title to fifty (50) pounds of refined source material* during the term of this license for use in experimental work relating to the recovery of uranium from magnesium fluoride scrap.

You are further licensed to transfer and deliver possession of and title to refined source material to any person licensed by the Atomic Energy Commission, within the limits of his license.

This license is subject to all the provisions of the Atomic Energy Act of 1954 now or hereafter in effect and to all valid rules and regulations of the U. S. Atomic Energy Commission. Except as herein provided, it is subject also to the provisions of the Commission's proposed regulations, published in the Federal Register July 16, 1955, Title 10, Code of Federal Regulations, Part 20, entitled "Standards for Protection Against Radiation" until such time as said proposed regulations or revisions thereof shall become effective regulations of the Commission. Notwithstanding Section 20.24(f) of said standards, labeling shall not be required for laboratory containers such as beakers, flasks and test tubes, used transiently in laboratory procedures during presence of the user.

Neither this license nor any right under this license shall be assigned or otherwise transferred in violation of the provisions of the Atomic Energy Act of 1954.

This license shall expire on January 1, 1958.

FOR THE ATOMIC ENERGY COMMISSION

DICTATED ________

APPROVED ________

Lyall Johnson
Chief, Licensing Branch
Division of Civilian Application

*uranium-magnesium fluoride slag

ITEM # 305

B/303

Docket No. 04000038

SEP 22 1978

MEMORANDUM FOR: W. R. Grace File

FROM: John D. Kinneman, Radiation Specialist
FF & MS Branch

SUBJECT: MEETING BETWEEN DOE AND W. R. GRACE ON SEPTEMBER 5, 1978

On September 5, 1978, I attended a meeting at the Department of Energy Headquarters in Germantown, Maryland, regarding the W. R. Grace site in Curtis Bay, Maryland. Present at the meeting were:

DOE

Division of Environmental Control Engineering

R. W. Ramsey R. E. Allen

Aerospace

A. Wallo

Office of General Council

W. L. Brown

W. R. Grace (Davidson Chemical Division)

J. W. Hardwiche, Attorney
J. Merryman, Jr., Plant Manager, Curtis Bay
F. V. Shaw, Environmental Projects
S. M. Kim, Consultant (Radiation Management Corp.)

NRC

W. T. Crow, Licensing
J. D. Kinneman, Region I IE

W. R. Grace representatives had requested the meeting because they had located an area at their Curtis Bay, Maryland facility which they believed had become contaminated with radioactive material as a result of AEC contract activities.

The W. R. Grace representatives had previously forwarded a copy of AEC Contract AT (29-6)-993 and several amendments to DOE representatives. This contract was for the extraction of thorium and rare earths from monazite sand. DOE representatives indicated

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(2)

they had been unable to locate additional information in DOE (AEC) files regarding this contract. DOE representatives opened the meeting with a brief account of the Formerly Utilized MED/AEC Sites Remedial Action Program.

W. R. Grace representatives indicated that the plant at Curtis Bay, Maryland, presently processes rare earths for commercial purposes. No license is required for receipt of this material because of the low concentrations of source material in the rare earths. However, one part of the process produces a radioactive sludge. No data concerning the composition of this sludge was presented. This sludge had been dumped in a land fill area on W. R. Grace property over a period of years. The State of Maryland had become aware of this practice about 1 - 2 years ago and W. R. Grace removed the material by contracting with Chem Nuclear Corp. at a cost of approximately one million dollars. It was not clear whether W. R. Grace had been required to take this action or simply agreed to do it at the suggestion of the State.

Grace representatives indicated that this expensive activity had stirred the recollection of company employees who recalled that radioactive material from a previous project had been dumped at another site on the Curtis Bay property during the 1950's. An investigation by the company revealed that this activity was the processing of monazite sands under AEC contract during 1956-7.

Company representatives indicated that the processing of the sands had proceeded full time for about six months after the contract began and then intermittently for about an additional six months. The contract was then terminated by mutual agreement of the company and AEC because the extraction process was not working well and the associated AEC project was cancelled. When the process was in operation, filter cake containing gangue and other waste products was dumped in trenches at one site on the Grace property. When the contract was terminated, some equipment was also transported to the same site and buried.

Grace representatives did not offer any estimate of the quantity of radioactive material buried at the site. They did indicate that from radiological surveys, the area covers about four acres with the radioactive material extending from one to eight feet from the surface, for a total of about 500,000 cubic feet. Radiation levels are approximately one to ten millirem per hour with hot spots up to fifteen millirem per hour.

Based on a simple ratio with the size of the previous area, W. R. Grace estimated it would cost \$12 - \$25 million to remove this material.

Grace representatives described the area as approximately one-half mile from the nearest public road within the 260 acre Grace property. No Grace employees' duties bring them to the site frequently and the site is checked once a shift by Company security.

W. R. Grace representatives indicated that to their knowledge no work had ever been done at the Curtis Bay site under the AEC/NRC license (STA-422) authorizing activities with source material at Curtis Bay, Maryland, and Pompton Plains, New Jersey.

DOE representatives indicated that it appeared that the site described by Grace representatives qualified for evaluation as part of the Formerly Utilized MED/AEC Sites Program.

W. R. Grace representatives and DOE representatives agreed to do the following:

1. By October 1, 1978, W. R. Grace will submit to DOE

   a. a complete radiological survey of the disposal area; and

   b. a summary or commentary of activities at the plant during the time when radioactive waste was placed at this specific site.

2. Within a month of receiving this information, DOE will have their contractor evaluate the survey and will decide on the need for a visit to the site;

3. DOE will notify W. R. Grace of the result of this evaluation and of a schedule for additional surveys if necessary (since the site is secure and not occupied, this would probably not be done for 6 - 24 months); and

4. Both W. R. Grace and DOE agreed to contact representatives of the State of Maryland and inform them concerning the results of the meeting and ~~the status~~ of the site.

John D. Kinneman
Radiation Specialist

JOB ANALYSIS SHEET

OPERATOR ______ 16 ______ 7 MEN/SHIFT 1 SHIFTS/DAY

BALL MILL OPERATOR

Operation or operating area	time per oper	oper per shift	time per shift (min)	No. of slps.	CONCENTRATION d/m /M³ Low	High	Avg.	AVGE CONC X TOTAL TIME
1. BALL MILL AREA			170	3	3	124	63	10710
2. FURNACE ROOM			170	3	3	5	4	680
3. FURNACE - BARE OX			60	3	3	9	6	360
4. TANK #4 #5 AREA			60	3	4	1	6	360
5. LUNCH ROOM			50	2	2	12	7	280
		ET	510				TXC =	12390

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$\frac{(TXC)}{(T)}$ $\frac{12390}{510}$ = 24.3% d/m/M³ ______ times max. per. conc.

Exh. A

TL 110 d/m m³

Operation or working area	time per oper	oper per shift	time per shift (min)	No of samples	CONCENTRATION $d/m/M^3$ Low	High	Avg.	AVGE CONC x TOTAL TIME
1. [illegible] AREA			170	3	3	124	63	10710
2. FURNACE [illegible]			110	3	3	5	4	660
3. FURNACE AREA [illegible]			60	3	3	9	6	360
4. TANK [illegible] #5 AREA			60	3	4	6	6	360
5. LUNCH ROOM			50	2	2	12	7	280
		ΣT	510				TXC Σ	12390

$\frac{(TXC)}{(T)}$ $\frac{12390}{510}$ = 24.3% $d/m/M^3$ ______ times max. per. conc.

DECONTAMINATION PROCEDURES

Personal decontamination methods to be used are dependent upon the contaminating material and the area of the person contaminated. Generally the following procedure is to be used immediately.

First notify Health Physics; specific measures will then be carried out by this office. Thorough washing with soap and water and then rinsing off with large quantities of water is the best general decontamination method for the hands and other parts of the body. For well localized contamination, however, it is recommended that the area be washed off and cleansed with swabs and later, if necessary, by using a general washing. This avoids the dangerous procedure of spreading the contamination needlessly.

The following specific measures should be followed with the guidance of Health Physics:

(a) For general hand washing: the hands should be washed two to three minutes in tepid water using mild soap. Rinse thoroughly and repeat a maximum of four times. If the required degree of decontamination is not then reached, proceed with (b).

(b) Using a soft brush, wash and rinse three times in 8 minutes of which no less than 6 minutes should be spent in scrubbing. Use only light pressure so as not to abrade the skin. Rinse thoroughly and monitor.

Generally, persons with any wounds or cuts will not be permitted to work in a radioactive area, unless specific approval is obtained from Health Physics. Any wounds, cuts or bruises received while working with, in or near radioactive materials should be flushed with water immediately and must be referred to the Health Physics Department immediately so that more specific measures can be taken.

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ITEM # 308

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Equipme[illegible] may be decontaminated by was[illegible]g with detergent and water until the desired permissible level of activity is obtained. Other chemicals which may be used include ammonium citrate, trisodium phosphate and ammonium bi-fluoride. Equipment once contaminated, must be treated in the exact same method as other primary radioactive materials. Health Physics will supervise the decontamination of this material and equipment.

Health Physics will also monitor contaminated areas and determine the most practical method decontamination. The method used will include those mentioned under equipment and personal decontamination in addition to washing, surface stripping and repainting.

ITEM # 309 CONTAMINATION CONTROL

The processing of monazite ores results in potential health hazards to both the employees and to the plant community. The control of in-plant hazards require the evaluation of employees' exposures. The sources of the exposures are external radiation from thorium and its daughter products and small amounts of uranium, taken into the body by inhalation or ingestion of airborne activity or surface contamination. To control the potential hazards to the plant community it is necessary to determine and control the quantity of uranium and thorium with its daughter products released from the plant. This includes liquid and gaseous effluents, solid waste material and contamination on material or personnel leaving the plant area.

In the interest of general personal protection, all personnel working in the vicinity of operations in which a potential dust hazard exists are required to wear respirators.

All personnel working in the plant processing areas are required to undergo a clothing change prior to reporting to their work areas. On arrival at the plant, operators enter the clean area (west side of the locker room), undress and place their street clothes in their assigned lockers. They then pass into the process area (east side of the locker room) and put on their process clothing and safety shoes. At the end of their shift, operators return their process clothing to their lockers in the east locker room and pass into the west locker room.

Supervisory personnel and those individuals who have occasion to visit the processing areas are issued smocks and overshoes. These are worn at all times while the individual is in the processing area. They are maintained on hangers immediately adjacent to the chemical control laboratory. Plant visitors follow the same procedure described for supervisory personnel.

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Controls have been established to insure that equipment and materials leaving the plant are not significantly contaminated. Prior to the release of any material, written approval must be obtained from the Health Physics office. All radioactive material brought onto the plant site will be monitored by the Health Physics department to insure that maximum permissable concentrations of radioactivity are not exceeded. Records of incoming and outgoing materials are maintained in the office.

RADIATION SURVEYS

1. Air Samples

The extent of airborne contamination in the Rare Earth Processing Plant site is monitored by sampling the air in different parts of the plant with a Staplex Hi-Volume Air Sampler, equipped with a T.F.A. #41 filter, and determining the radioactive content of the dust accumulated on the filter. The procedure employed consists of sampling the air in a particular locality at the rate of 20 cu. ft. per minute for a period of 5 minutes, allowing the collected dust to age 48 hours to permit the decay of radon and thoron, counting the sample in a proportional counter-scaler arrangement and converting the resulting reading to uc/ml.

Air samples are taken by each of two different schemes. In the first instance, each of the positions designated as air sampling stations in exhibit #l are monitored at least once each month while other areas are monitored once every two months. In the second scheme, each operator station is monitored during a period of production. In the latter case a complete survey is conducted at least once every two months. In addition to these two systematic sampling methods, the Health Physicist makes a number of spot checks of the air count when he, during the course of his daily routine health inspection, feels that a particular operation or area requires such attention.

In the event that it is found that the air count in a particular area exceeds the following tolerance limits, the Health Physicist has the authority to cause a cessation of the applicable operation (s) until correctional measures have been taken.

TOLERANCE LIMITS FOR RESTRICTED AREAS

Thorium	5×10^{-11} uc/ml
Uranium	5×10^{-11} uc/ml

Reports of the surveys of airborne contamination are prepared by the Health Physicist and distributed to the plant manager and department heads.

LOCATIONS OF AIR SAMPLING STATIONS

1. Restricted Areas

   a) Shipping Room - in the center of the room, five feet from the east wall.

   b) Pulverizing Room - in the center of the room.

   c) Calcining Furnace - midway between press number 4 and the furnace.

   d) Thorium Refining - in the hallway near the rear south side entrance.

   e) Thorium Crystallization Unit - in the center of the room.

   f) Process storage - in the center of the room.

   g) Ball Mill - in the center of the room.

   h) Monazite Storage Area - three feet from the center of the south wall.

   i) Lunch Room - in the center of the room.

   j) Thorium Hydroxide Storage - on the south side of barrels.

   k) Development Laboratory - in the center of the room.

   l) Sulfonation Kettle Area - midway along the south wall of the room.

2. Unrestricted Areas

   a) North west corner of property line.

   b) Midway along south property line.

   c) Southwest corner of property line.

2. Liquid Waste - Plant Effluent

The waste treatment plant treats all liquid wastes issuing from the plant. The waste involved consists of wash water, floor washings and surface run-off from the adjacent plant property.

The process involves the use of an average of 18,000 gallons of water per day. All of the washes are discharged into a common 1,000 gallon sump equipped with two automatically controlled force pumps which pump the waste to a retention tank. Each pump has capacity to handle the peak load and is installed so that the second pump starts in case of extreme demand or failure of the first. Signals are installed in a control house to indicate the proper function of the pumps.

The retention tank has a capacity of 50,000 gallons which provides a minimum of 48 hours average retention of the wastes. In addition to the purpose of acting as a reservoir, or constant head installation, the tank provides means of blending effluents of widely varying pH so that the automatic pH controlling equipment may function more efficiently. The incoming wastes flow through a distributing channel in the tank and effluent, after initial settling, is removed from the midpoint of the tank and flows by gravity to a mixing tank. A draw-off is provided at the bottom of the tank to pump accumulated solids to the sludge filter press.

An 8,000 gallon mixing tank, equipped with a gate agitator receives effluent from the retention tank at its midpoint. A pH electrode assembly is in circuit with the mixing tank and electrically connected to a mechanically operated diaphragm valve. Two storage tanks are provided to feed either 50% sulphuric acid or 50% caustic soda solution through the automatic diaphragm valve to the mixing tank as called for by the pH controller. Again signals are

provided to indicate proper functioning of the valve and chemical supply tanks as well as a recording chart which indicates the pH of the mixing tank. The mixing tank effluent is piped to a 2,000 gallon Hardinge thickener at pH 5.8 - 6.2.

The Hardinge thickener provides a clear overflow to a final clarification tank and adjusted to give a 20% solids underflow which is pumped to a sludge filter press in the control house.

The final clarification tank of 50,000 gallon capacity provides an average 48 hours of retention time for the effluent before discharge from the system. The main function of this tank is to provide sufficient time for post precipitation of solids after pH adjustment. A draw off is provided at the bottom of the tank to pump accumulated solids to the sludge filter press.

The sludge filter is of the plate and frame type with a capacity of 6 cubic ft. of cake. Approximately 60 cubic feet of sludges, or 3,500 lbs. are removed weekly. These sludges are hauled to a dump on the property.

The system was designed to operate automatically. Twelve man hours per day are devoted to the maintenance, cleaning and control of the operation. The entire operation is under the supervision of the plant chemist who checks the performance of the equipment, and samples prepared by the shift operator.

A log is maintained which indicates satisfactory operation of the system for pH and turbidity control. The pH of the effluent is maintained between 5.0 and 8.0 according to the permit granted by the New Jersey State Department of Health who have approved the design and mode of operation of the system. We have found through experience that the system operates more satisfactorily at lower pH values since the precipitate formed by neutralization settles more rapidly assuring a clearer effluent.

The effluent is sampled daily at the overflow of the Hardinge thickener and at the Weir in the control house. Sampling at the Hardinge thickener in the system provides an average 48 hour retention time before discharge and will indicate the quality of the effluent entering the final clarification tank. Sampling at the Weir provides a check on the amount of contamination which has settled out of the effluent in the final clarification tank or if there is any additional contamination being added to the effluent through the accumulation of sludges in the clarification tank.

The samples are immediately taken to the laboratory together with the completed "plant effluent form". Upon completion of analysis of the sample the Health Physicist reviews the analytical results and compares them with the maximum permissable concentration. The effluent is then graded according to the following standards:

PLANT EFFLUENT STANDARDS

Grade of Effluent	Sample Position and % Hardinge Overflow		M.P.C. Weir	Disposition
A	33	=	33	Excellent effluent
B	33-66	=	33-66	Satisfactory effluent
C	0-66	=	33-66	Possible contamination from final effluent tank
D	33-66	=	33-66	Indicates buildup of contamination. Notify Plant Manager.
E	66-100	=	66-100	Continued contamination. Notify Plant Manager
E	66-100	=	66-100	Further build up from final effluent tank.
F	66-100	=	66-100	Increasing contamination from plant process. Alert Plant Manager. Additional analysis.

(continued)

Grade of Effluent	Sample Position and % Hardinge Overflow		M. P. C. Weir	Disposition
F	/ 100	=	66-100	Shut down departments discharging effluents.
F	/ 100	=	/ 100	Shut down departments discharging effluents and hold up effluent.

Copies of analysis of effluent grade D or lower must be immediately presented to the Plant Manager

On the final day of each month the Health Physicist prepares a "Monthly Report of Material Discharged into the Pompton River" in which he presents the high, low and average amounts of process effluent discharged during the preceding month and the high, low and average concentrates expressed as a percentage of the maximum permissible concentration. The original and two copies of the report will be sent to the Plant Manager and one copy retained by the originator.

All effluent and river samples are monitored with a Proportional counter, decade scaler circuit by methods outlined in Appendix B.

3. Personnel Monitoring

All employees who have reason to enter the processing areas are required to wear film badges. These badges, supplied by the St. John X-Ray Laboratory, are read every week and a report of the readings by name and badge number if furnished the health physicist. The health physicist prepares a report of the exposure readings which is sent to the plant manager.

New film badges are issued by the health physics office each week. Film badges are not carried home or left in process areas but are hung in their assigned spaces on film badge racks.

Individual work activities are so scheduled that an operator is not subject to radiation in excess of 300 mr/week. In the event of a reading exceeding 150 mr/week as shown by a film badge report, the area supervisor is notified, the individual's work program reviewed and the results of the review filed with the weekly film badge report.

4. External Radiation Surveys

A radiological survey of the entire Rare Earths Processing Plant is made by the health physicist once each month. To facilitate such surveys, the plant has been subdivided into a series of monitoring areas. A diagram of these areas is shown in Exhibit #2 (Appendix). Each area is surveyed carefully and the highest radiation level in the area is recorded. In the event that the radiation level in any part of a given area exceeds 5 mr/hr the portion of the area indicating such a level is posted with a radiation sign. Any area with a radiation level in excess of 10/mr/hr is so enclosed that only limited access to authorized personnel is available.

A report describing the results of each radiological survey is prepared by the health physicist and is forwarded to the plant manager. Such surveys are conducted using a Geiger counter manufactured by the Anton Electronic Laboratories, Inc., Brooklyn, New York, Model #5.

DECONTAMINATION PROCEDURES

Personal decontamination methods to be used are dependent upon the contaminating material and the area of the person contaminated. Generally the following procedure is to be used immediately.

First notify Health Physics; specific measures will then be carried out by this office. Thorough washing with soap and water and then rinsing off with large quantities of water is the best general decontamination method for the hands and other parts of the body. For well localized contamination, however, it is recommended that the area be washed off and cleansed with swabs and later, if necessary, by using a general washing. This avoids the dangerous procedure of spreading the contamination needlessly.

The following specific measures should be followed with the guidance of Health Physics:

(a) For general hand washing: the hands should be washed two to three minutes in tepid water using mild soap. Rinse thoroughly and repeat a maximum of four times. If the required degree of decontamination is not then reached, proceed with (b).

(b) Using a soft brush, wash and rinse three times in 8 minutes of which no less than 6 minutes should be spent in scrubbing. Use only light pressure so as not to abrade the skin. Rinse thoroughly and monitor.

Generally, persons with any wounds or cuts will not be permitted to work in a radioactive area, unless specific approval is obtained from Health Physics. Any wounds, cuts or bruises received while working with, in or near radioactive materials should be flushed with water immediately and must be referred to the Health Physics Department immediately so that more specific measures can be taken.

Equipment may be decontaminated by washing with detergent and water until the desired permissible level of activity is obtained. Other chemicals which may be used include ammonium citrate, trisodium phosphate and ammonium bi-fluoride. Equipment once contaminated, must be treated in the exact same method as other primary radioactive materials. Health Physics will supervise the decontamination of this material and equipment.

Health Physics will also monitor contaminated areas and determine the most practical method decontamination. The method used will include those mentioned under equipment and personal decontamination in addition to washing, surface stripping and repainting.

WASTE DISPOSAL

Waste materials are a natural result of the manufacturing process at the Rare Earth Processing Plant. Procedures have been established to collect, handle and dispose of the material. The general methods of waste disposal are:

(a) Transfer - This must be to an authorized recipient, whether he be a licensee, a commercial disposal facility or the Atomic Energy Commission.

(b) Burial - Is at a minimum depth of four feet, successive burials are separated by distance of at least six feet and not more than twelve burials are made in any year. Finally the total quantity of licensed material buried at any one location and times does not exceed, at the time of burial, 50,000 microcurai of natural thorium or uranium. The contractor or licensee must own the land used for these burials and must limit access to this property to prevent hazard to casual personnel.

(c) Discharge - Concentrations of licensed or other radioactive material released as an effluent into an unrestricted area must not exceed specifications set forth in AEC Regulations Title 10, Part 20. The amendment of a license will be issued if the applicant demonstrates that it is not likely that any individual will be exposed to concentrations in excess of those set forth in the regulation. Concentrations in effluents may be averaged over periods not greater than one year. The established procedure for effluent retention and disposal is outlined under Radiation Surveys, Plant Effluent.

MEDICAL EXAMINATIONS

The Rare Earth Processing Plant has a medical protection program and maintains medical records and radiation exposure records of each employee. This medical program in itself can only be an added precaution for radiation control and will be most valuable in maintaining the general health of the workers. The clinical systems of radiation damage occur only with a considerable over-exposure therefore the responsibility for prevention of radiation damage rests entirely on the personnel monitoring and control systems.

At the present time there are only a limited number of medical tests available for radiation protection. Most exposure information is still obtained from personnel and area monitoring. Any radiation program is a failure if clinical evidence of radiation damage appears. Thus medical tests are not as much a part of a protection program as they are a confirmation that some acute over-exposure has occurred.

Semi-annually each employee of the Rare Earth Processing Plant receives a complete blood count. Annually each employee receives a full chest x-ray. Additional examinations are performed at the termination of any employment or where candidates for employment exhibit or make known symptoms of normal disease which may also be attributed later to radiation exposure.

ADMINISTRATIVE FORMS

RARE EARTH DIVISION

DAVISON CHEMICAL COMPANY

POMPTON PLAINS, NEW JERSEY

HEALTH PHYSICS DEPARTMENT

AREA MONITORING SURVEY DATA SHEET

R.E.P.P WAYNE TWP., NEW JERSEY

DATE ____________________

BUILDING OR AREA ________________________________

NATURE OF SUSPECTED ACTIVITY ____

MONITORED BY ____________________

INSTRUMENT USED ________________________________

LOCATION	Distance From Source	Radiation Level	REMARKS

SURVEY OF RADIOLOGICAL AIR-BORNE CONTAMINATION

Location	Date	Time	Type of Survey	Results

Date ____________________   ____________________

INCINERATION PERMIT

Date ______________________

THIS FORM UPON COMPLETION, SURVEY AND SIGNATURE OF THE HEALTH-PHYSICS OFFICER AUTHORIZES THE FOLLOWING ITEM (S) TO BE BURNED IN THE TRASH BURNING AREA:

ITEMS

(1) ____

(2) ____

(3) ____

(4) ____

DATE TO BE INCINERATED ______________________

APPROVED BY ______________________
Department Manager

MONITORED BY ______________________
Health-Physics Department

RARE EARTH DIVISI

PROPERTY PASS

Date ____________________

THIS AUTHORIZES (Name)____ TO

REMOVE THE FOLLOWING ITEM (S) OF COMPANY PROPERTY FROM THE PLANT:

ITEMS AND NUMBER OF EACH

(1)____

(2)____

(3)____

( ) PERMANENT REMOVAL

( ) TEMPORARY REMOVAL

DATE TO BE RETURNED ______________

DATE RETURNED ____________________

APPROVED BY_________________

MONITORED BY________________
Health Physics Dept.

HEALTH PHYSICS DEPARTMENT
RARE EARTH DIVISION

DUST RESPIRATOR INSPECTION REPORT

DATE OF INSPECTION ______________________

OPERATOR	CLASS	CONDITION OF RESPIRATOR GOOD	FAIR	UNSATISFACTORY

By ______________________________
Health Physics Department

R.E.P.P WAYNE TWP., NEW JERSEY

RECORD OF DISCHARGE OF PROCESS EFFLUENTS TO THE POMPTON RIVER

Date	Volume	Plant Sample No.	Lab. Sample No.	Percent MPC	pH	Remarks

JOB ANALYSIS SHEET

HEALTH AND SAFETY DEPT.

R.E.P.P., WAYNE TWP., N.J.

Operator ______________________________ ____________Shift

Job Description ______________________

TIME	OPERATION OR OPERATING AREA	$d/m/m^3$ CONCENTRATION (L) (H) (AVG)
8:00		
:10		
:20		
:30		
:40		
:50		
9:00		
:10		
:20		
:30		
:40		
:50		
10:00		
:10		
:20		
:30		
:40		
:50		
11:00		
:10		
:20		
:30		
:40		
:50		
12:00	LUNCH	
1:00		
1:00		
:10		
:20		
:30		
:40		
:50		
2:00		
:10		
:20		
:30		
:40		
:50		
3:00		
:10		
:20		
:30		
:40		
:50		
4:00		
:10		
:20		
:30		
:40		
:50		
5:00		

JOB ANALYSIS SHEET

OPERATOR ____________________ ______ MEN/SHIFT ______ SHIFTS/DAY

Operation or Operating Area	Time per Oper.	Oper. per Shift	Time per Shift (min)	No. of slps.	CONCENTRATION M^3	AVGE CONC X TOTAL TIME

(TXC) / (T) ____________________ d/m/M^3 ____________________ times max. per. conc.

CONTACTS FOR EMERGENCY USE

OPERATIONS SUPERVISOR

R. M. Mandle

Home Phone ____________

OPERATIONS ASSISTANT

H. J. Sweitzer

Home Phone ____________

HEALTH PHYSICS

P. J. Garino

Home Phone ____________

MEDICAL OFFICER

Dr. S. T. Bernson

Office Phone ____________

PLANT AREA FIRE

(1) Report fire alarm.
(2) Use fire extinguisher.
(3) Notify Operations Supervisors and Health Physicist.

PROCEDURES FOR THE MEASUREMENT OF RADIOACTIVITY

Health-Physics Department

Davison Chemical Company
Pompton Plains, N. J.

ALPHA COUNTING

TABLE OF CONTENTS

ALPHA COUNTING

ANALYSIS: Counting Procedure

The operations noted below are performed daily before any samples are counted.

1. Thoroughly clean the sample chamber with ethyl alcohol (C_2H_5OH).

2. To determine the background, place a blank filter paper (Whatman #41, 1-1/8 inch diameter) on the pedestal. In scintillation counters, fasten the blank in place with a plastic ring. In the proportional counter, place the blank on the middle of the pedestal. Whenever possible, allow the blank to count overnight. Record the time at which the counting was started. To determine the counts per minute, divide the total count by the count time (in minutes). This figure is recorded on the card provided.

   Example: Background (bkgd) count was 235 counts in 18-1/2 hours.

   18 x 60 = 1080 / 30 = 1110 = count time in minutes.

   235 / 1110 = .21 c/m bkgd.

   When it is impossible to count the background overnight, if may be counted in the morning. The background is then counted for 10 minutes.

   Example: Counter registered 4 counts in 15 minutes. Time in minutes was 15.

   4 /-15 = 27 c/m background.

3. The geometry is calculated after the background is counted. This is done by placing the alpha standard (496 d/m) in the chamber.

   A. In scintillation counters, the standard is counted for 640 counts and the time recorded. The standard is counted three times and the geometry is calculated from the average of the three.

B. In the proportional counter, the standard is counted for two minutes and the count recorded. This operation is repeated three times and the average count is used to calculate the geometry.

The geometry is calculated as follows: The counts per minute of the standard is divided by the known disintegrations of the standard.

Example: The counts per minute of the standard was 239. The d/m of the standard is 496.

Therefore: $239 \div 496 = .48$ or 48% geometry.

Record this figure on the card with the background.

If the geometry drops to 35% or lower in scintillation counters or below 45% in the proportional counter, the counter should be checked by the instrument repair man.

ALPHA COUNTING

ANALYSIS: Plateaus

1. Place the alpha standard (496 d/m) in the sample chamber of the counter.

2. Find the lowest operating voltage of the counter.

3. At this voltage make three counts

   A. In scintillation counters, make three 640 counts.

   B. In the proportional counter, make three-minute counts.

   Record these figures.

4. Make three counts every 25 volts in scintillation counters and every 20 volts in the proportional counter.

5. Continue in this manner until the count becomes too fast. That is, until the scintillation counters record 640 counts in less than 1.50 minutes or the proportional counter records more than 1200 counts per three minutes.

6. Ascertain the average counts per minute by the following methods:

   A. In scintillation counters, add the three count times and divide by 3 to find the average count time. Then divide 640 by the average count time to determine average c/m.

   Example: At 950 volts the count times were 3.28, 3.50 and 2.98.

   3.28 / 3.50 / 2.98 = 9.76

   9.76 ÷ 3 = 3.25

   640 ÷ 3.25 = 197, the average counts/minute

   B. In the proportional counter, add the three counts and divide by 9 to find average counts/minute. 9 is used because there were 3 counts and each count was for 3 minutes.

   Example: At 840 volts the counts were 608, 626 and 599.

   608 / 626 / 599 = 1833

   1833 / 9 = 204, the average count/min.

7. The average counts are then plotted on graph paper against the voltage. By using French curves, a curve is drawn.

8. The operating voltage is chosen from the plateau or straight line on the graph. The operating voltage is usually 1/3 to 2/3 of the way across the plateau.

9. Plateaus should be run once every three months. If major repairs are made on the counter, or if the geometry is too low, spot checks should be made on the plateau. If the spot checks show much variance, an entire new plateau should be run.

ALPHA COUNTING

ANALYSIS: Alpha Air Dust

Procedure

1. The background and geometry should be taken daily before counting any samples. Directions for taking background and geometry appear in preparations for alpha counting.

2. The sample is placed on the pedestal and fastened with a plastic ring. Samples are counted either for 32 counts or for 15 minutes, whichever comes first. If a 32 count is reached in less than 0.05 minutes, it is advisable to recount it for a 64 count.

3. Types of Samples Counted:

   A. Uranium air dust samples – 4 to 5 hours should elapse from the time of sampling to the time of counting. This is to allow for the decay of radon gas.

   B. Thorium alpha samples - at least 24 hours should elapse between time of sampling and time of counting. This allows for the decay of thoron and other daughter products.

ALPHA COUNTING

ANALYSIS: Alpha Air Dust

Calculations

A. To determine counts per minute, divide the total count by the count time in minutes, then subtract the background of the counter. When referring to c/m, it is assumed that the background has been subtracted.

This formula is $\frac{\text{count}}{\text{time}} - \text{bkgd.} = \text{c/m}$

Count = total count Time = time in minutes.

Example: Sample 7B counted 32 counts in 7.38 minutes.

The counter background was .12 c/m.

$32 \div 7.38 = 4.35$

$4.35 - .12 = 4.23$ c/m

B. To determine d/m, this formula is used:

$$\text{d/m} = \frac{\text{c/m}}{\text{geom.}}$$

Example: Sample 7B c/m = 4.23 Geom. is 48%

$$\frac{4.23}{.48} = 8.81$$

C. To determine d/m/M^3. Air dust samples are usually reported in this way. This formula is used:

$$\text{d/m/M} = \frac{\text{d/m}}{(.7)^{*} \quad (\text{Q})^{**}}$$

*.7 is the absorption factor for the filter paper in air dust samples.
**Q is the amount of air sampled in cubic meters.

Example: Sample 7B: d/m = 8.81

Q is .6 Absorption factor is .7

$$\text{d/m/M} = \frac{8.81}{.7 \times .6} = 20.98$$

ALPHA COUNTING

ANALYSIS: Counting Planchets

1. Before a planchet is used, it is counted for five minutes to determine the background of the planchet.

2. Planchets are always counted in the proportional counter. The planchet is placed in the middle of the pedestal. The sample is counted for 15 min. unless the count is very fast. Then the counter may be shut off at any time. (It is better to turn off the proportional counter on an even minute rather than a fraction of a minute, since calculating is easier with even minutes).

3. Planchets should be counted as soon as possible after they are dried, except for Radium at equilibrium, i.e. 40 days.

ALPHA COUNTING

ANALYSIS: Plant Effluent

Procedure

1. Sample

   A. Plate 5 ml. of the sample directly.

   B. Calculate d/m/ml in the usual way. (See Calculations)

2. Liquid Phase

   A. Place a 10 ml. aliquot of the sample in a centrifuge tube.

   B. Centrifuge for 15 minutes.

   C. Carefully plate the liquid on a stainless steel planchet 2" in diameter.

   D. Allow it to dry thoroughly and count in the proportional counter for 30 minutes.

   E. Calculate d/m/ml in the usual manner. (See Calculations)

3. Solid Phase

   A. The solid which remains in the bottom of the centrifuge tube is plated on a stainless steel planchet 2" in diameter.

   B. The centrifuge tube is rinsed with water and the rinsing is plated on the planchet.

   C. Allow the planchet to dry thoroughly and count it for 30 minutes in the proportional counter.

   D. Calculate d/m/ml in the usual manner. (See Calculations)

ALPHA COUNTING

ANALYSIS: Alpha Activity in Murky Water

Procedure

(Clear water samples are plated directly onto stainless steel planchets. A 5 ml. aliquot is generally used.)

Method for Murky Water Samples

1. Place an aliquot of the sample (20-100 ml.) in a beaker.
2. Add an approximately equal amount (20-100 ml.) of Nitric Acid (HNO_3) to the aliquot.
3. Place the beaker on a medium heat hot plate and evaporate until about 5-10 ml. of aliquot remains.
4. Remove from the hot plate and allow the beaker to cool.
5. Add about 25 ml. of Nitric Acid (HNO_3) to the aliquot.
6. Return to the hot plate, and allow the aliquot to evaporate until about 5-10 ml. remain.
7. Repeat steps 4-6 until the aliquot is clear.
8. Plate a small amount of the aliquot on a low background stainless steel planchet by means of a dropper. Dry on a low heat hot plate. Add another small amount of aliquot and allow it to dry. Continue in this manner until all of the aliquot is plated.
9. Rinse the beaker with a small amount of water (6-25 drops) and plate the rinsing on the planchet.
10. Allow the planchet to dry thoroughly.
11. Count in a low background proportional counter for 15 minutes.

ALPHA COUNTING

Calculations

1. To determine counts per minute, divide the total count by the count time in minutes and subtract the background of the planchet.

   $$c/m = \frac{\text{total count}}{\text{count time}} - \text{bkgd.}$$

   Example: 20 ml. of a sample was plated on a planchet. The background of the planchet was one count in five minutes or .20 counts per minute. The aliquot counted 7 counts in 15 minutes.

   $$c/min = \frac{7}{15} - .20 = 0.27$$

2. To determine disintegrations per minute, divide the counts per minute by the geometry.

   $$d/m = \frac{c/m}{\text{geom.}}$$

   Example: The c/m of a sample was 0.27. The geometry of the counter was 50%.

   $$d/m = \frac{0.27}{.50} = 0.54$$

3. To determine d/m/ml the d/m is divided by the sample aliquot.

   $$d/m/ml = \frac{d/m}{\text{aliquot}}$$

   Example: 20 ml. of a sample had a d/m of 0.54

   $$d/m/ml = \frac{0.54}{20} = 0.027$$

BETA COUNTING

TABLE OF CONTENTS:

BETA COUNTING

ANALYSIS: Counting Procedure

I. Background

A. The background of the beta counter is taken daily. It is always taken on the same shelf of the counting chamber on which the samples are counted.

1. The inside of the chamber and the counting shelf are thoroughly cleaned with ethyl alcohol (C_2H_5OH).
2. The shelf is placed in the second slot (or on whichever shelf the samples are to be counted.)
3. A thin aluminum absorber .001" thick is placed on the first shelf (or the shelf above the one on which the samples are to be counted). (This is done to remove the low energy RaD beta rays and the RaF alpha rays).
4. The empty shelf is then counted for fifteen minutes.
5. The total count is then divided by the count time to determine background in c/min.

$$c/m \text{ bkgd} = \frac{C}{T} = c/m \text{ bkgd.}$$

Example: The total count of a fifteen minute background was 125.

$$c/m \text{ bkgd} = 125 \div 15 = 7.3 \; c/m \text{ bkgd.}$$

II. Geometry

A. The geometry is taken twice a week on the same shelf of the counting chamber on which the samples are to be counted. If another shelf is to be used, the geometry is taken on that shelf, before the sample is counted.

1. The Radium D and E source is placed on the counting shelf in the second slot of the counting chamber.

2. A thin aluminum absorber (.001" thick) is placed on the first shelf or the shelf above the one on which the samples are to be counted.

3. The source is counted for three, three minute counts.

4. The three counts are then added and the result is divided by nine and the background of the counter subtracted to determine the average c/m.

   Example: Radium D and E source counted 5300, 5282, and 5199 in three, three minute counts. The background of the counter was 7.3 c/m.

   Average c/m = 5300 / 5282 / 5199 = 15781 ÷ 9 = 1753.4 - 7.3 = 1746.1 c/m.

5. The d/s of the source at the time of counting is determined by use of the graph prepared for each source. This number is multiplied by 60 to determine d/m of the source. The average c/m of the source is divided by the known d/m of the source and the result is the geometry of the counter.

   Example: The source had a known d/s of 488 at the time of counting. 488 x 60 = 29280 d/m. The average c/m of the standard was 1746.1. Geo. = 1746.1 / 29280 = 6.0% geometry.

BETA COUNTING

ANALYSIS: Plateaus

Procedure

1. Place the Radium D/ E standard on the second shelf of the counting chamber of the beta counter.

2. Find the lowest operating voltage of the counter.

3. Three, three minute counts are taken at this voltage.

4. Record the total count and the voltage.

5. Make three counts every twenty-five volts until the count becomes too fast. (That is, until the count is so fast that not all of the counts are registered.)

6. Ascertain the average counts per minute by adding the three counts and dividing by nine. Nine is used because there were three counts and each count was for three minutes.

   Example: At 700 volts the counts were 5200, 5169, and 5310.

   $5200 + 5169 + 5310 = 15,679$

   Average c/m = $15,679 \div 9 = 1742$ c/m (average)

7. The average c/m's are then plotted on graph paper (20 x 20 sqs./in) against the voltage. By using French curves, a curve is drawn.

8. The operating voltage is chosen from the plateau or straight line on the graph. The operating voltage is 1/3 to 2/3 of the way across the plateau.

9. Plateaus should be run once every three months. If major repairs are made on the counter, or if the geometry is too low, spot checks should be made on the plateau. If the spot checks show much variance from the plateau, an entire new plateau should be run.

ANALYSIS: Beta Activity in Gumpaper

Procedure

1. The entire gumpaper sample is placed in a clean 150 ml. porcelain crucible (Reference: Cleaning porcelain crucibles)
2. The crucible is placed in the muffle furnace (800-900 ^{o}F) until the gumpaper is completely ashed (approximately 20-30 minutes).
3. The crucible is removed from the furnace and allowed to cool.
4. The sides of the crucible are scraped with a spatula to remove the ash. The ash is then transferred to a plastic planchet, 1-1/4 in. diameter.
5. The crucible is rinsed with a small amount of distilled water (10-30 m.). Two to five drops of Nitric Acid (HNO_3) is added.
6. The crucible is returned to the muffle furnace until the rinsing has evaporated.
7. The crucible is removed from the furnace and allowed to cool.
8. The residue of the rinsing is added to the sample in the planchet. (Repeat steps 5-8 until the crucible is clean)
9. Record the time and date on which the sample was counted and report it along with the results.
10. Report as d/m sample.

ANALYSIS: Beta Activity in Gumpaper

Calculations

1. To determine counts per minute (c/m): divide the total count by the count time and subtract the background of the counter.

   Example: Gumpaper 330-1 counted 1029 counts in 15 minutes.

   The background of the counter was 8/1 c/m.

   $c/m = 1029 \div 15 = 68.6 - 8.1 = 60.5$ c/m

2. To determine disintegrations per minute per sample (d/m/sample), divide the c/m by the geometry of the counter.

   Example: Gumpaper #330-1 had a c/m of 60.5. The geometry of the counter was 7.1%.

   $d/m/sample = 60.5 / .071 = 852$ d/m/sample.

ANALYSIS: Beta Activity in Liquids

Procedure

1. The background of a stainless steel planchet 2" diameter cupped planchet) is determined by counting it for five minutes in the counting chamber of the beta counter on the same shelf as the sample is to be counted.
2. The planchet is placed on a transite board on a medium heat hot plate.
3. The sample is plated, a milliliter at a time on the planchet. An aliquot of 1-5 ml. is usually used.
4. When the sample is completely dried, count it for 30 minutes on the second shelf of the counting chamber of the beta counter.
5. Record the time and date on which the sample was counted and report this along with the results.
6. Report the results as d/m/ml.

BETA COUNTING

ANALYSIS: Beta Activity in Liquids

Calculations

1. To determine the counts per minute (c/m): divide the total count by the time counted and subtract the background of the planchet.

   $c/m = \frac{C}{T} - \text{background} = c/m$

   Example: 3 ml. of water sample #PR 421-1 had a total count of 768 in 30 minutes. The planchet had a background of 37 counts in 5 minutes.

   Bkgd. = 37 ÷ 5 = 7.4 c/m.

   c/m = 768 ÷ 30 = 25.6 - 7.4 (bkgd.) = 18.2 c/m.

2. To find disintegrations per minute (d/m): divide the c/m by the geometry of the counter.

   $d/m = \frac{c/m}{geo.} = d/m$

   Example: 3 ml. of water sample #PR 421-1 had a c/m of 18.2

   The geometry of the counter was 6.3%.

   d/m = 18.2 ÷ .063 = 289 d/m.

3. To determine disintegrations per minute per milliliter (d/m/ml): divide the d/m by the aliquot of sample used.

   $d/m/ml = \frac{d/m}{aliquot} = d/m/ml$

   Example: 3 ml. of water sample #PR 421-1 had a d/m of 289.

   d/m/ml = 289 ÷ 3 = 96.3 d/m/ml.

BETA COUNTING

ANALYSIS: Beta Pleated Filters

Procedure

1. The filter is cut in half and one half is used as an aliquot. (Reference: Cleaning porcelain crucibles).

   The aliquot is placed in a 150 ml. clean porcelain crucible.

2. The crucible is placed in a muffle furnace (approximately $1000^{\circ}F$) until the pleated filter is ashed. (Approximately 1-1/2 hours)

3. The crucible is removed from the furnace and allowed to cool.

4. By means of a stirring rod crumble the ash to a fine powder. If a fine enough powder is not obtained, a mortar and pestle may be used to break up the ash. The ash is then placed in a plastic planchet 1-1/4 in. diameter.

5. The sample is then counted on the second shelf of the beta counting chamber for fifteen minutes. (See beta counting procedure).

6. Record the time and date on which the sample was counted and report it along with the result.

7. Report the results as beta d/m/sample.

ANALYSIS: Beta Pleated Filters

Calculations

1. To determine counts per minute (c/m): divide the total count by the count time and subtract the background of the counter.

   Example: 1/2 of pleated filter #412-1 had a total count of 562 counts in 15 minutes. The background of the counter was 8.5 c/m.

   c/m = 562 ÷ 15 = 37.5 - 8.5 c/m (bkgd.) = 29.0 c/m

2. To calculate disintegrations per minute (d/m): divide the c/m by the geometry of the counter.

   $$d/m = \frac{c/m}{geo.} = d/m$$

   Example: 1/2 of pleated filter #412-1 had a c/m of 29.0.

   The geometry of the counter was 6.4%.

   d/m = 29.0 ÷ .064 = 453.1 d/m

3. To determine beta disintegrations per minute per sample (d/m/sample): multiply the d/m by 2 since 1/2 of the entire sample was used.

   d/m/sample = d/m x 2 = d/m/sample.

   Example: 1/2 of pleated filter #412-1 had a d/m of 453.1.

   d/m/sample = 453.1 x 2 = 706.2 d/m/sample.

BETA COUNTING

ANALYSIS: Beta Activity in Solids

Procedure

1. On the analytical balance, weigh a plastic planchet 1-1/4 in. diameter. Record the weight.
2. Carefully place an aliquot of the sample (enough to cover the bottom of the planchet) into the planchet.
3. Reweigh the planchet and the sample and record the second weight.
4. Count the sample in the beta counter on the second shelf of the counting chamber for fifteen minutes.
5. Record the time and the date on which the sample was counted and report this along with the results.
6. Report the results in d/m/gram.

ANALYSIS: Beta Activity in Solids

Calculations

1. To determine counts per minute (c/m): divide the total count by the count time and subtract the background of the counter.

Example: An aliquot of mud sample #712 counted 27198 counts in 15 minutes. The background of the counter was 8.1 c/m.

c/m = 27198 ÷ 15 = 1813.2 - 8.1 = 1805.1 c/m

2. To determine disintegrations per minute (d/m): divide the c/m by the geometry of the counter.

$$d/m = \frac{c/m}{geo.} = d/m$$

Example: An aliquot of mud sample #712 had a c/m of 1805.1.

The geometry of the counter was 6.2%.

d/m = 1805.1 ÷ .062 = 29115 d/m.

3. To determine disintegrations per minute per gram (d/m/gram): Subtract the first weight of the plastic planchet from the second weight (planchet + sample) to find the weight of the sample. Divide 1 by the weight of the sample (this is the factor for converting to grams). Multiply the d/m by the factor to obtain d/m/gram.

d/m/gram = d/m x factor = d/m/gram.

Example: The first weight of a plastic planchet was 0.3561 grams.

The second weight, (sample + planchet) was 0.7678 grams.

The d/m of the sample was 29115.

0.7678g. - 0.3561g. = 0.4117g. (weight of sample)

1 ÷ 0.4117g. = 2.43 (factor)

d/m/gram = 29115 x 2.43 = 70749 d/m/gram.

State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF ENVIRONMENTAL QUALITY
BUREAU OF RADIATION PROTECTION
380 SCOTCH ROAD, TRENTON, N. J. 03628

February 11, 1981

Dr. William E. Mott
U. S. Department of Engery
Mail Stop E-201
Washington, D. C. 20545

Dear Dr. Mott:

Recently, the attached information was provided to me by Mr. Armin Wille of W. R. Grace. Could you check your records and determine whether or not this site was or should be evaluated by the DOE under FUSRAP?

Sincerely,

Jeanette Eng

Jeanette Eng, Director
Radiation Decontamination Assessment
Bureau of Radiation Protection

J :cab
Enclosure: Document

B/308

ITEM # 310

121

township of wayne

475 Valley Road
Wayne, New Jersey 07470
(201) 694-1800
Police Department
(201) 694-0600

July 23, 1982

United States Attorney
Newark,
New Jersey

Dear Sir:

Enclosed is a certified copy of Resolution No. 205 of 1982 adopted by the Municipal Council of the Township of Wayne at a regular meeting held on July 21, 1982.

Very truly yours,

John R. O'Brien

John R. O'Brien
Clerk

JRO/dlm
enc.

cc: Passaic County Prosecutor
Attorney General of New Jersey
United States Attorney in Newark, New Jersey
Congressman Robert A. Roe
Senator William Bradley
Senator Nicholas Brady
Senator Joseph Bubba
Assemblyman Newton Miller
Assemblyman S. M. Terry LaCorte

TOWNSHIP OF WAYNE
COUNTY OF PASSAIC
STATE OF NEW JERSEY
1982
RESOLUTION NO. 205

A motion was made by Robert Pacca seconded by Frederick Bauer that the following resolution be adopted:

REQUEST FOR FURTHER INVESTIGATION - ELECTRONUCLEONICS - W.R. GRACE

WHEREAS, it has been acknowledged that the so called W. R. Grace site on Black Oak Ridge Road contains thorium buried thereon, which burial took place over a number of years; and

WHEREAS, it is known that W. R. Grace did own and may presently lease said premises to a company known as Electroneucleonics; and

WHEREAS, over one month ago, several residents and Councilmen requested that the Administration provide the Council and residents with copies of all certificates of occupancy for said premises; and

WHEREAS, the Certificate of Occupancy for Electroneucleonics has never been furnished; and

WHEREAS, the harboring of a large amount of thorium (said to be 19,000 pounds) at said site probably constitutes a public nuisance (irregardless of whether or not said thurium was buried legally); and

WHEREAS, the Township Council has been advised that Electroneucleonics may presently be using radioactive materials at said site, one of the sources for said information being a Dunn and Bradstreet Report; and

WHEREAS, said thorium is also located in several other off-site areas in Wayne Township; and

WHEREAS, the people of Wayne Township, and particularly those residents living in areas adjacent to said site are concerned for their health;

NOW, THEREFORE BE IT RESOLVED BY THE MUNICIPAL COUNCIL OF WAYNE TOWNSHIP, As Follows:

1. The Passaic County Prosecutor, the Attorney General of New Jersey and the United States Attorney in Newark, New Jersey are hereby requested to conduct immediate investigations into the present use being made of the premises occupied by Electroneucleonics with a particular view to determining whether or not the past and present use of said premises was and/or is violative of State and Federal Laws, and with particular reference to whether the present use of said premises constitutes a public nuisance such as may be stopped and enjoined.

2. Copies of the resolution shall be mailed to the Passaic County Prosecutor, the Attorney General of New Jersey and the United States Attorney in Newark, New Jersey and to Congressman Roe, Senators Brady and Bradley, and Senator Bubba, Assemblymen Miller and LaCorte.

BE IT FURTHER RESOLVED that the Wayne Township Attorney and the Business Administrator are requested to investigate the present and past uses made of the premises in question by W. R. Grace and Electroneucleonics and to ascertain whether or not W. R. Grace and Electroneucleonics at any time violated any of the following:

1. Certificates of Occupancy granted to W. R. Grace;
2. Certificates of Occupancy granted to Electroneucleonics;
3. The variance granted to W. R. Grace; including as to whether Electroneucleonics has in any way violated the permission granted to W. R. Grace by said variance.

ROLL CALL:

AYES: Joyce Amabile, Frederick Bauer, William Hanse, Joseph Loffredo, Robert Pacca, Bert Tucker, David Waks, Gary Webb, Joseph DiDonato

NAYS: None

ABSENT: None

THIS IS TO CERTIFY THAT THE FOREGOING IS A TRUE AND EXACT COPY OF A RESOLUTION ADOPTED BY THE MUNICIPAL COUNCIL OF THE TOWNSHIP OF WAYNE AT A REGULAR MEETING HELD ON JULY 21, 1982.

JOHN R. O'BRIEN
CLERK

MAY 21 1982

Docket No. 40-00086
License No. STA-422

The Honorable Robert A. Roe
United States House of Representatives
Washington, D. C. 20515

Dear Congressman Roe:

I am pleased to address the three issues identified in your letter of April 23, 1982. These issues concerned the W. R. Grace and Company property and surrounding area in Wayne, New Jersey, where NRC surveys have indicated that radiation levels and surface soil radioactive contamination exceed normal background.

The first issue that you raised concerned the potential long-term effect of exposure to the contaminated soil if removal is not necessary, particularly to children who play in the soil and may ingest small quantities of it. The NRC is currently gathering and evaluating the information necessary to make a recommendation regarding whether the contaminated soil should be removed. A recommendation that removal of the contaminated soil is not necessary would be based on a conclusion that exposures from all routes and to all individuals will be acceptably low. The information being collected includes data from detailed radiation surveys and analyses of soil samples collected in the area by our contractor, Oak Ridge Associated Universities. The data for the area of the Sheffield Brook is expected to be available in September of this year and the data for the W. R. Grace and Company property should be available about two months later. However, preliminary surveys by NRC inspectors indicate that: 1) it is very unlikely that any individual will exceed the recommended dose limits for individual members of the general public, 2) no radiation levels above normal background exist in any residence, and 3) areas where radiation levels are above normal background are near the rear boundaries of the properties. We will not have sufficient information to fully determine the degree of hazard associated with ingesting small quantities of the contaminated soil until our contractor has completed the analysis of the samples collected during the field work. However, analysis of several samples of water from the Brook has not revealed radioactive contamination in the water. This indicates that the contamination is probably insoluble and would not long remain in the body if it were ingested. In addition, the actual concentration of radioactive material in surface soil is quite low. Therefore, we conclude that any hazard associated with exposure to the contaminated soil during the time required to complete our investigation is insignificant.

The second issue concerns whether the contamination affects nearby water supplies, particularly at the vegetable farm in the area. As noted above, preliminary indications are that the material is insoluble. Therefore, we do not expect that the material will affect water supplies. A sample of well

ITEM # 32

B/310

5.214

water from one of the residences near the Sheffield Brook has been analyzed and was below the standards set by the U. S. Environmental Protection Agency for radioactive materials in drinking water. Additional water samples taken at the vegetable farm and from other nearby wells are being analyzed by Oak Ridge Associated Universities. We will inform you of the results of these additional analyses when they become available. In addition, ground level surveys made on the farm by NRC inspectors have not identified any areas of contaminated soil within the limits of the portable instrument used.

The third issue concerns who will bear the expense for removal of the contaminated soil, if its removal is determined to be necessary. Until the detailed surveys mentioned above are complete, it is not possible to provide a complete answer to this question. W. R. Grace and Company still owns the property on which the radioactive material was processed. The U. S. Department of Energy may have authority for remedial action, as the result of work performed under a contract between Rare Earths, Inc., predecessor to W. R. Grace and Company, and the former U. S. Atomic Energy Commission.

We realize that these issues are of significant concern to you and your constituents, and are working to resolve them. We are pleased to be of service to you and your constituents in this matter and will keep you informed of our progress.

Sincerely,

(Signed) William J. Dircks

William J. Dircks
Executive Director For Operations

Distribution:
EDO 11852
SECY 82-0474
Docket No. 40-00086
PDR
V. Stello
R. DeYoung
R. Minogue
J. Davis
G. Cunningham
L. Underwood
R. Haynes, RI
T. Martin, RI
J. Kinneman, RI
J. Joyner, RI
M. Campbell, RI
Region I Docket File

EDO wjd
WJDircks
5/19/82

OCA

5/ /82

RI:DETP
Campbell
5/19/82

RI:DETP
Kinneman

RI:DETP
Joyner

RI:DETP
Martin

RI:DRA
Allan

RI:RA
Haynes

B/311

Oversized drawings

B/311

Shipley C-151

UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON 25, D.C.

IN REPLY REFER TO:
DLR:DFH
Docket No. 40-86

... 1961

Distribution:
C. W. Tully, RM, w/encl. (2)w/cy ltrs dtd
N. Doulos, L&R, w/encl. (3) 7/3-6&8/2/61
Compl., w/encl. & cy ltrs dtd 7/3 & 8/2/61

NOV 22 1961

W. R. Grace & Company
Davison Chemical Division
P. O. Box 488
Pompton Plains, New Jersey

Attention: Mr. Richard Mandle
Plant Manager

Gentlemen:

Inclosed is Source Material License No. STA-422.

In the amendments to your application for license renewal dated February 11, 1960, you indicate that respiratory equipment will be used by personnel in mill areas where dust is generated. Please note that Section 20.103(c)(1), 10 CFR 20, does not authorize the use of protective equipment in determining whether an individual is exposed to an airborne concentration in excess of Appendix B, Table 1, 10 CFR 20, without special approval. If you desire to take advantage of respirators in determining the exposure of individuals to airborne radioactivity, a specific request should be made supported by the information specified in Section 20.102(c)(3). The use of respirators need not have special approval if their use is intended for emergency situations or if they are used in areas in which the concentration of airborne radioactivity is within the limits specified in 10 CFR 20.

Very truly yours,

Donald A. Nussbaumer, Chief
Source and Special Nuclear Materials Branch
Division of Licensing and Regulation

NYOO COMPLIANCE

Enclosure:
STA-422

6 B/3/12

DEC 4 1961

RECEIVED

ITEM #. 314

Form AEC—410
(1–61)

UNITED STATES
ATOMIC ENERGY COMMISSION

SOURCE MATERIAL LICENSE

Pursuant to the Atomic Energy Act of 1954, and Title 10, Code of Federal Regulations, Chapter 1, Part 40, "Licensing of Source Material," and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, possess and import the source material designated below; to use such material for the purpose(s) and at the place(s) designated below; and to deliver or transfer such material to persons authorized to receive it in accordance with the regulations in said Part. This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954 and is subject to all applicable rules, regulations, and orders of the Atomic Energy Commission, now or hereafter in effect, including Title 10, Code of Federal Regulations, Chapter 1, Part 20, "Standards for Protection Against Radiation," and to any conditions specified below.

Licensee

1. Name W. R. Grace & Company
Davison Chemical Division
2. Address Pompton Plains, New Jersey

3. License No. STA-422

4. Expiration Date October 31, 1964

5. Docket No. 40-86

6. Source Material

Thorium

7. Maximum quantity of source material which licensee may possess at any one time under this license

Unlimited

CONDITIONS

8. Authorized use (Unless otherwise specified, the authorized place of use is the licensee's address stated in Item 2 above.)

a. Thorium ore processing in accordance with the procedures described in the licensee's application dated February 11, 1960, and the amendments thereto dated April 11, June 20, July 29, 1960, July 3 and 6, and August 2, 1961, all hereinafter referred to as the application, except to the extent that the application refers to superseded provisions of the Commission's Regulation, "Standards for Protection Against Radiation" 10 CFR 20.

b. Pursuant to Section 20.106(a) and 20.302 of 10 CFR Part 20, approval is hereby granted for incineration of source material in accordance with the procedures described in the licensee's letter dated July 3, 1961.

For the U. S. ATOMIC ENERGY COMMISSION

Date of issuance NOV 22 1961

Donald A. Nussbaumer
Division of Licensing and Regulation

U.S. GOVERNMENT PRINTING OFFICE:1961—O-581691

FORM NY-99
REV. 8-1-59

UNITED STATES ATOMIC ENERGY COMMISSION
NEW YORK OPERATIONS OFFICE

HEALTH AND SAFETY LABORATORY
376 HUDSON STREET
NEW YORK 14, N. Y.

SAMPLE REQ. D 1483

DATE SENT
DATE RECEIVED 7-2-64
DATE REPORTED 7/13/64

PLANT: W.R Grace

MAILING ADDRESS: Pompton Plains N.J.

Counter Standardized w/ Thorium-230 Stds.

ROUTE RESULTS TO:

ANALYZE FOR: Th (nat) α

TYPE OF SAMPLE:

METHOD OF DETERMINATION: α scintillation

SAMPLE NO.	DATE	HOUR START	HOUR STOP	SAMPLE DESCRIPTION	SAMPLING RATE	SAMPLING TIME	d/m		RESULTS
0 1	7/1/64	11:30 Am		AIR collect. Receiving Room 5 min @ 18 cfm.			6.26		
1 2	"			air collect Mandles office 8 min @ 15 cfm.			13.1		
2 3				air collect Ball mill Room 7 min at 20 cfm.			13.0		
3 4				AIR collect Centrifuge Area 6 min @ 16 cfm.			5.83		
4 5				Smear analytical LAB floor 100 cm²			87		
5 6				Smear manager office floor "			65		
6 7				Smear ball mill room floor "			1225		
7 8				Smear outside ball mill room floor "			527		
8 9				Smear 3rd floor counting room floor "			58.4		
9 10				Smear floor upstair office entrance "			81.		

COLLECTED BY: E. Epstein

ANALYZED BY: J. Hoskins

SURVEYOR TO RETAIN LAST COPY—RETURN ALL OTHERS TO HEALTH AND SAFETY LABORATORY

GPO 959255

FORM NY-99
REV. 8-1-59

UNITED STATES ATOMIC ENERGY COMMISSION
NEW YORK OPERATIONS OFFICE

HEALTH AND SAFETY LABORATORY
376 HUDSON STREET
NEW YORK 14, N. Y.

SAMPLE REQ. **D 1480**

DATE SENT
DATE RECEIVED 7-2-64
DATE REPORTED 7/13/64

PLANT: W. R Grace

MAILING ADDRESS:

Counter Standardized U/Th-230 Stds. And U

TYPE OF SAMPLE:

METHOD OF DETERMINATION: α Scintillation

ROUTE RESULTS TO: Compliance

ANALYZE FOR: Th (not)

SAMPLE NO.	DATE	HOUR START	HOUR STOP	SAMPLE DESCRIPTION	SAMPLING RATE	SAMPLING TIME	αd/m		RESULTS
0 11	7/1/64	2:00 PM		smear stairs to office			54		
1 12	7/1/64			* soil sample from sludge burial area.			166 d/m/gram.		
2									
3				~~* To be repeated at a later date~~ disregard.					
4				JWA.					
5									
6									
7									
8									
9									

COLLECTED BY: E. Epstein

ANALYZED BY: J W Harkins

SURVEYOR TO RETAIN LAST COPY—RETURN ALL OTHERS TO HEALTH AND SAFETY LABORATORY

GPO 959255

FORM NY-99
REV. 2-4-52

Exhibit A

UNITED STATES ATOMIC ENERGY COMMISSION
NEW YORK OPERATIONS OFFICE
HEALTH AND SAFETY DIVISION
70 COLUMBUS AVENUE
NEW YORK 23, N. Y.

SAMPLE REQ. NO. B 1777
DATE SENT
DATE RECEIVED 12-2-59
DATE REPORTED 12-2-59

PLANT: R.E. N.J.
MAILING ADDRESS: N.Y.O.O.
TYPE OF SAMPLE: SMEAR - AIR
METHOD OF DETERMINATION: Alpha Scint. Count.
ROUTE RESULTS TO: P Klevin INSPECTION
ANALYZE FOR: THORIUM

SAMPLE NO.	DATE	~~HOUR~~	SAMPLE DESCRIPTION	SAMPLING M³ RATE	SAMPLING TIME	SAMPLING TOTAL	SAMPLE TAKEN	TOTAL COUNT	COUNT TIME	COUNTS PER MIN.	RESULTS d/m/m³	
T-205	11/25	3 30 PM	Rare Earth waste press area. No operations in progress	27.5 L/MIN	34 MIN	935.0 L		11	15	0.56	2	3.6
T-207	11/25	3 30 PM	Meso THORIUM area waste silica press. No operations in progress	27.5 L/MIN	18 MIN	495 L		124	15	8.04	60	3.7
T-206	11/25	3 30 PM	Storage area hopper feeding to Ball mill. No operations in progress	32.5 L/MIN	29 MIN	942.5 L		80	15	5.13	20	3.6
											d/m	
T-299	11/25	3 30 PM	4 in² area off Hardings Ball mill casing (Smear)		16 IN²	~~[illegible]~~		964	5	192.17	540/100cm²	2.8
T-201	11/25	3 30 PM	Smear off hand rail from grinding mill to storage			8 IN²		215	5	42.37	120	2.8
											~240 d/m/100cm²	
T-202	11/25	3 30 PM	Smear of floor by hopper from TH(OH) press (drum storage area)			16 IN²		568	5	112.97	320	2.8
											~320 d/m/100cm²	
T-203	11/25	3 30 PM	waste silica press (meso TH) (piece sample of paper)		(sample size)	paper (1 6/8")		347	5	68.77	190	2.8
T-204	11/25	3 30 PM	Rare Earth waste press from surface of wooden hopper ledge			16 IN²		941	16	58.18	160 d/m/100cm²	2.8

COLLECTED BY: W Lorenz
ANALYZED BY: S.G. + A.O'B. J Alercio

SURVEYOR TO RETAIN LAST COPY—RETURN ALL OTHERS TO HEALTH AND SAFETY DIVISION

ATOMIC ENERGY COMMISSION

Davison Chemical Company (Div. of W. R. Grace & Co.)

DOCKET NO. 40-86

DOCUMENTS

DATE	DESCRIPTION
June 22, 1960	Ltr. frm. Davison Chem. Co. acknowledging our ltr. of June 6, requ ing the status of their appl. for approval to release source mater to unrestricted areas and info. concerning plant operations.
August 3, 1960	Ltr. 7/29/60 frm. Davison Chem. Co. trans: two booklets dealing wi their operation at Pompton Plains, N. J. (1) Booklet giving pertin info concerning the plant, its operation and the surrounding area. Health Physics Manual. (1 cy. ea. rec'd Based on this info. and t ltr. of June 20, they req the approval to discharge the plant eff into the storm sewer on Black Oak Ridge Road as provided in Part 2 Title 10, Section 20.301, "Waste Disposal".
w/Witty July 10, 1961	Ltr. 7-6-61 fm Davison Chemical Co supplementing their ltrs. of - and 7-13-60, re plant operations and disposal of plant effluents.
w/Davis July 12, 1961	Ltr. 7-3-61 fm Davison Chemical Co. requesting permission to burn more than 100 lbs of burlap bags which contained monazite sand an have been emptied as thoroughly as possible--and filter cloths use process equipment and similar combustible matls. under favorable ological conditons.

Mr. Johnson: 7/18

This file has been in Rad. Safety for over a year and the last 2 items were sent down on buck slips. That is why they are not in files.

Reba

59

Form AEC—410
(1-61)

UNITED STATES
ATOMIC ENERGY COMMISSION

SOURCE MATERIAL LICENSE

Pursuant to the Atomic Energy Act of 1954, and Title 10, Code of Federal Regulations, Chapter 1, Part 40, "Licensing of Source Material," and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, possess and import the source material designated below; to use such material for the purpose(s) and at the place(s) designated below; and to deliver or transfer such material to persons authorized to receive it in accordance with the regulations in said Part. This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954 and is subject to all applicable rules, regulations, and orders of the Atomic Energy Commission, now or hereafter in effect, including Title 10, Code of Federal Regulations, Chapter 1, Part 20, "Standards for Protection Against Radiation," and to any conditions specified below.

Licensee	
1. Name	W. R. Grace & Company Davison Chemical Division
2. Address	Pompton Plains, New Jersey
3. License No.	STA-422
4. Expiration Date	October 31, 1964
5. Docket No.	40-86
6. Source Material	Thorium
7. Maximum quantity of source material which licensee may possess at any one time under this license	Unlimited

CONDITIONS

8. Authorized use (Unless otherwise specified, the authorized place of use is the licensee's address stated in Item 2 above.)

a. Thorium ore processing in accordance with the procedures described in the licensee's application dated February 11, 1960, and the amendments thereto dated April 11, June 20, July 29, 1960, July 3 and 6, and August 2, 1961, all hereinafter referred to as the application, except to the extent that the application refers to superseded provisions of the Commission's Regulation, "Standards for Protection Against Radiation" 10 CFR 20.

b. Pursuant to Section 20.106(a) and 20.302 of 10 CFR Part 20, approval is hereby granted for incineration of source material in accordance with the procedures described in the licensee's letter dated July 3, 1961.

2

ITEM # 315

For the U. S. ATOMIC ENERGY COMMISSION

3/3/

Date of issuance NOV 22 1961

Donald A. Nussbaumer
Division of Licensing and Regulation

☆ U.S. GOVERNMENT PRINTING OFFICE:1961—O-581691

60

COPY

ATOMIC ENERGY COMMISSION

Davison Chemical Company
(Div. of W. R. Grace & Co.)

DOCKET NO. 40-86

DOCUMENTS

DATE	DESCRIPTION
June 22, 1960	Ltr. fm. Davison Chem. Co. acknowledging our ltr. of June 6, requesting the status of their appl. for approval to release source material to unrestricted areas and info. concerning plant operations.
August 2, 1960	Ltr. 7/29/60 fm. Davison Chem. Co. trans: two booklets dealing with their operation at Pompton Plains, N. J. (1) Booklet giving pertinent info concerning the plant, its operation and the surrounding area. (2) Health Physics Manual. (1 cy. ea. rec'd. Based on this info. and their ltr. of June 20, they req the approval to discharge the plant effluent into the storm sewer on Black Oak Ridge Road as provided in Part 20, Title 10, Section 20.301, "Waste Disposal".
w/Wetty July 10, 1961	Ltr. 7-6-61 fm Davison Chemical Co supplementing their ltrs. of 6-20 and 7-13-60, re plant operations and disposal of plant effluents.
w/Sailor July 12, 1961	Ltr. 7-3-61 fm Davison Chemical Co. requesting permission to burn no more than 100 lbs of burlap bags which contained monazite sand and have been emptied as thoroughly as possible--and filter cloths used process equipment and similar combustible matls. under favorable meteorological conditons.

Mrs. Johnson: 7/18
This file has been in Rad. Safety for over a year and the last 2 items were sent down on buck slips. That is why they are not in files.
Reba

59

UNITED STATES
ATOMIC ENERGY COMMISSION
DIVISION OF COMPLIANCE
REGION I
376 HUDSON STREET
NEW YORK 14, NEW YORK

TELEPHONE: YUKON 9-1000
Ext. 283

IN REPLY REFER TO:
CO:I:EE

June 24, 1964

W. R. Grace & Company
Davison Chemical Company
P.O. Box 488
Pompton Plains, New Jersey

License No. STA-422

Attention: Mr. Richard Mandle, Manager

Gentlemen:

The Division of Compliance, Region I, is charged with the responsibility of assuring compliance by the holders of licenses with the Atomic Energy Act of 1954, the applicable rules and regulations of the Atomic Energy Commission, and the terms and conditions of the licenses themselves.

Our representative, Mr. Eugene Epstein plans to visit you at about 10:30 a.m. on Wednesday, July 1, 1964 , for the purpose of making an inspection of your facilities.

This inspection will be directed primarily to the status of your compliance with 10 CFR 30, "Licensing of Byproduct Material," and/or 10 CFR 40, "Control of Source Material," and 10 CFR 20, "Standards for Protection Against Radiation."

We request that you have available at the time of inspection the various records called for by the foregoing regulations, particularly those contained in 10 CFR 20.401(a) and (b).

Very truly yours,

Robert W. Kirkman, Director
Region I, Division of Compliance

B/3/4

ITEM # 3/6

2

Form AEC-592
(5-63)

II-B

UNITED STATES ATOMIC ENERGY COMMISSION
DIVISION OF COMPLIANCE

1. LICENSEE	2. REGIONAL OFFICE
W. R. GRACE AND COMPANY Davison Chemical Division P. O. Box 488 Pompton Plains, New Jersey	U. S. Atomic Energy Commission Region I, Division of Compliance 376 Hudson Street New York, New York 10014
3. LICENSE NUMBER STA-422	4. DATE(S) OF INSPECTION July 1, 1964 (Reinspection)

5. The following activities under your license (identified in Item No. 3 above) appear to be in noncompliance with AEC regulations or license requirements, as indicated.

(a) Surveys to determine concentrations of removable surface contamination existing in restricted and unrestricted areas of the licensee's facility were not made, contrary to the statements made on page 19 of the licensee's Health Physics Manual, dated 1/1/60, included as part of License Condition 8(a).

(b) Quantities of natural thorium in excess of 1000 times the quantity listed in Appendix C, 10 CFR 20 were buried at one location, contrary to the provisions of 10 CFR 20.304(a), "Disposal by burial in soil".

ITEM # 317 B/3/5

Supplementary page None attached.

Eugene Epstein
AEC Compliance Inspector

7/17/64
Date

ORIGINAL: LICENSEE. COPIES: ☐ CO REGION ☐ CO HEADQUARTERS ☐ L&R HEADQUARTERS.

U.S. GOVERNMENT PRINTING OFFICE: 1963—O-665311

GRACE

CHEMICALS DIVISION
RARE EARTHS

W. R. GRACE & CO.
DAVISON CHEMICAL DIVISION
BALTIMORE 3, MD.

REPLY TO:
P.O. BOX 188
POMPTON PLAINS,
NEW JERSEY
TEMPLE 5-3060

July 24, 1964

United States Atomic Energy Commission
Region I, Division of Compliance
376 Hudson Street
New York, New York

Attention: Mr. Robert W. Kirkman, Director

Gentlemen:

In reference to your letter CO:I:EE, dated July 17, 1964, we wish to advise you of our position with respect to the items listed on Form AEC-592 for our License Number STA-422.

With respect to item (a), the objective expressed in pages 18 and 19 of our Health Physics Manual dated 1/1/60, has been carried out by the Health Physics Department of this plant. We have monitored equipment leaving the plant site to insure that surface contamination has been removed. We will, however, carry out periodic surveys to determine the concentration of removable surface contamination existing within the restricted and unrestricted areas of the plant site. The object of these surveys will be to monitor the cross-contamination within the plant. The results will be recorded in units of activity, i.e. microcuries of thorium removable per square foot of surface area, which appears to be compatible with standards of measurement set out in 10 CFR 20.

With respect to item (b), the current method of thorium sludge burial was suggested and later observed and approved by your representative, Mr. Paul Klevin, during an inspection on June 29, 1961. We agree however that the intent of the regulation is to minimize excessive local concentrations of source material and that this intent would be more satisfactorily accomplished by excavating individual monthly burial pits, rather than the single trench and multiple back-fill system we are now using. Therefore, we will excavate individual pits for the accumulation of less than 50,000 microcuries of natural thorium so that the pit is well separated from any adjacent burial as set forth in 10 CFR 20.

Very truly yours,

Richard M. Mandle

Richard M. Mandle
Plant Manager

8/3/6

RMM:MCB

ITEM # 318

DRAFT
EPSTEIN:rc
7/14/64

PART 40 INSPECTION

INSPECTOR: Eugene Epstein

W. R. GRACE & COMPANY
Davison Chemical Division
P. O. Box 488
Pompton Plains, New Jersey

License No. STA-422

14

Date of Inspection: July 1, 1964 (Announced Reinspection)

Persons Accompanying Inspector:

New Jersey authorities were notified, but no representative appeared.

Persons Contacted:

Mr. Richard Mandle, Plant Manager
Mr. ~~Donald~~ C. Hubbard, Manager, Division of Industrial Relations, W. R. Grace, Irwin, Tennessee
Mr. Peter Garino, Plant Chemist and RSO

NOTE: PARAGRAPHS 5A-5H REFERRING TO PROCESSING ARE TO BE CONSIDERED COMPANY CONFIDENTIAL.

REPORT DETAILS

Background Information

1. An initial inspection of the licensee's facility was performed November 25, 1959. Items of noncompliance were noted and it was felt that a hazard existed and a follow-up inspection was warranted. A follow-up inspection was conducted on June 29, 1961 and no items of noncompliance were noted.

Organization and Administration

2. The Rare Earths Division of ~~W. R. Grace and Company~~ the Davison Chemical Company, a subdivision of W.R Grace and Company is engaged totally in the manufacturing of polishing compounds for the optical trade. Optical polishing compounds are reportedly obtained from the refining of monazite sands. Mr. R. Mandle, Plant Manager, stated they intend to be completely out of the monazite sand refining process within the next six months. He stated that new polishing compounds have been developed which do not contain source material. He stated currently

B/3/7

ITEM # 3/9

use of monazite sand is 33% of all processing and will be gradually phased out. Mr. Peter Garino, a graduate chemist, acts as RSO. Garino took a two week course in methods of radiation detection, counting and surveys at the Grace Col Plant at Irwin Tennessee. Garino reports directly to Mandle, Plant Manager. Mandle stated a total of 14 employees, 7 production workers are located at the facility at Pompton Plains

Facilities and Uses of Byproduct Material

3. The scope of the license was reviewed with Garino. The licensee is permitted to have Thorium in unliminted quantities for thorium ore processing.

4. Garino was noted to maintain a monthly inventory. The inventory as of 7/1/64 showed the possession of the following

    4854 pounds Thorium (nat) in monazite sand; 3% enrichment

    1005 pounds as thorium nitrate

    58 pounds as thorimm oxide

Gariho stated the final prodnt cerium oxide powder contains from 0.1 to 0.2% natural thorium.

Company Confidential Processing Methods

5. Garino described the manufacturing process as follows:

   A. Monazite ore is received as #60 mesh and is reduced to #200 mesh in a closed circuit ball mill.

   B. The 200 mesh material is acidulated in large outside tanks with concentrated suphuric acid.

   C. The mixture is heated and decomposed with phosphoric acids and rare earth crystals are formed.

   D. The crystal mixture is then centrifuged.

   E. Crystals are redissolved.

   F. The water removed from the centrifuge in step D above contains 99% of the thorium which is precipitated as thorium phosphate dake.

G. The redissolved rare earth crystals, are further refined by treatment with sodium fluoride. This causes any remaining thorium to precipitate as thorium fluoride.

H. The thorium fluoride and the thorium phosphate are considered waste products according to Mandle. He stated that in prior years there was amarket for the waste materials which were sent to the American Potash Company for further refimement. Mandle stated there is no longer a market for refined natural thorium and thorium is considered as a waste product other than the small quantity retained in the optical polishing compound.

6. The facilities used consist of a separate room for ball mill operations which Garino stated creates the most dust. A storage area, a centrifuge area, a filter press area and numerous wooden tanks 12 feet high and 10-12 feet in diameter.

7. The rear of the licensee's property, open fields for a distance of 300 feet is used for burial of thorium wastes.

8. The inspector noted that in order to go from the second floor offices to the counting laboratory or to other offices a person had to pass over the open heating and decomposing area by means of a catwalk and enter the filtration area where thorium phosphate cake was being formed. The inspector also noted workmen wearing work clothes and shoes entering the offices as they went to various manufacturing areas. Mandle stated this was a bad arrangment, but that they were cramped for space.

9. Mandle stated that operating personnel, however, do remove their work clothing and work shoes when leaving the plant. He stated they wear respirators for the ball mill operations

which produce high concentrations of dust. He stated personnel enter the ball mill area for only 15 minutes daily for loading and unloading. Mandle stated that 7 persons handle materials over two shifts daily. He stated that from 2000-2500 lbs of monazite sand is processed daily over 30 weeks during the year.

Instrumentation and Calibration

10. The licensee had on hand an Anton #Model 5 GM survey meter with a range of 0-100 mr/hr. He also had a Nuclear Corporation gas flow proportional counter and a Radiation Instrument Corp. decade scaler. He stated the survey meter is sent to Lionel Corporation the successor to Anton Instrument for calibration at six month intervals. He stated the proportional counter is calibrated using an external uranium oxide standard.

Radiation Safety Precautions and Procedures
Instructions

11. The licensee has written instructions entitled "Health Physics Manual, Davison Chemical Company, Pompton Plains, New Jersey". The manual was noted to contain provisions describing radiation dose limits, airborne concentrations limits, air sampling, definition and location of restricted areas, water effluent control, personnel monitoring and waste disposal. Mandle stated all plant personnel were given a copy and instructed in its provisions as well as pertinent federal regulations.

12. Mandle had on hand a file containing a copy of the license together with copies of 10 CFR 20 and 40. He stated the file was available to all users upon request.

Surveys

13. Garino stated he makes direct physical surveys using the Anton GM survey meter monthly. He was noted to maintain records of these surveys. The last survey record dated 6/25/64 reported radiation levels in restricted areas, at 3 feet

distance from surfaces of 3.5 mr/hr in the monazite storage area and 1 mr/hr at three feet from the surface of a sludge pile in the rear of an open field. Garino reported maximum radiation levels of 0.15 mr/hr to exist at the fence line of the licensee's property, the boundary of the unrestricted area. A chain link fence, 8 feet high was noted to encircle the entire property of the licensee.

14. Independent surveys were made by the inspector using a serial #3532 Precision Instrument thin end window GM survey meter calibrated 6/5/64 and a serial #1624 Juno ionization chamber also calibrated 6/5/64. Radiation levels were noted as follows:

At the surface of a stack of paper bags containing monazite sand - 8.0 mr/hr

At a rope barrier 2 feet in front of the stack - 1.0 mr/hr

At the surface of the ball mill - 2 mr/hr

At the surface of the centrifuge - 10 mr/hr

At the surface of the filter press - 10 mr/hr

At the surface of a pile of thorium waste in the rear of the licensee's facility - 20 mr/hr and 3 mr/hr at 18" distance - restricted area

At the fence line - 0.05 mr/hr

15. The inspector noted that all the floor surfaces were dusty in both restricted manufacturing areas and in unrestricted offices. The radiation levels at 1 cm distance from floor surface in manufacturing areas was from 1.0 - 1.5 mr/hr with the beta-gamma shield off, and from 0.05 - 0.2 mr at 1 cm distance in unrestricted offices.

16. Mandle stated he realized there was widespread removable contamination due to dust, spillage of materials and tramping back and forth. He stated the building has been used for thorium processing for the past 17 years. He also stated the building is a converted dairy barn with the entire low floor and part of the second floor completely open without partitions and that dust from the monazite sands and processing is strewn about by natural convection.

17. Gariho stated they have not made any surveys or taken any smear samples to determine the amount and location of removable contamination existing in the licensee's facility, in restricted & unrestricted areas or on any of the production equipment. Lic. Cond. 8(a) requires use of materials according to an application dated 7/24/60. The application refers to the licensee's "Health Physics Manual". Pg 19. of the manual states that "Health Physics will monitor contaminated areas"

18. The inspector took smear samples by wiping surfaces in restricted and unrestricted areas with filter paper. The filter paper smears were counted for alpha activity by HASL, NYO, who reported activityas follows:

Unrestricted Analytical	-	87 alpha dpm/100 cm^2
Unrestricted Office	-	65 alpha dpm/100 cm^2
Unrestricted 3rd floor counting room	-	58.4 alpha dpm/100 cm^2
Unrestricted Office entrance	-	81.0 alpha dpm/100 cm^2
Restricted Ball Mill Room Floor	-	1225 alpha dpm/100 cm^2
Restricted area outside Ball Mill Room	-	527 alpah dpm/100 cm^2

19. The above information indicates widespread low level contamination in the restricted Ball Mill Room and surrounding areas.

Air Surveys

20. Garino stated he performs air surveys by collecting air at a rate of 100 ft^3/min for five minutes using a Staplex high volume air sampled with Whatman 41 filter paper. Garino stated he samples air in the restricted and unrestricted areas as tated on page 11 of the licensee's written procedures. The maximum concentration reported by Garino in a restricted area occurs in the Ball Mill Room and was noted as 1.7×10^{-11} uc for insoluble Th (nat). Other restricted areas had a maximum reported air concentration of 3.5×10^{-12} uc/ml air for insoluble Th (nat) occurring in the monazite storage area. Unrestricted areas, the office, lunch room and control laboratory had maximum concentrations of Th (nat) of 1.7×10^{-12} uc/ml air. Air sampling, according to Garino, is done on a weekly basis.

21. The inspector took several air samples using a Staplex Air Sampler and Whatman 41 filter paper. The activity collected on the filter paper was counted for alpha by HASL,NYO. The results as reported by HASL are as follows:

Restricted Monazite Sand Storage Area	-	1.1×10^{-12} $\frac{\text{uc th}}{\text{ml air}}$
Unrestricted Upstairs Office	-	1.7×10^{-12} $\frac{\text{uc th}}{\text{ml air}}$
Restricted Ball Mill Room	-	1.4×10^{-12} $\frac{\text{uc th}}{\text{ml air}}$
Restricted Centrifuge Area	-	1.0×10^{-12} $\frac{\text{uc th}}{\text{ml air}}$

Waste Disposal

22. Liquid Effluent

The licensee's property is bcated on a hill with the rear of the property approximately 30 feet higher than the front of the property bordering on Black Oak Ridge Road. Garino stated

that all drainage from waste burial pits located at the top of the hill drains into a concrete sump of the licensee's property. The effluent in the sump is pumped into a mixing tank equipped with an automatic ph adjustment designed to keep ph at 7.0. The adjusted effluent is then pumped to a settling tank and then to a settling pond where samples are taken for counting. If any activity is detected, this effluent is then sent to a filter to remove any particulate. Garino samples water effluent before any discard to the sewerage system. He was noted to maintain records of these disposals showing no activity over background.

23. Waste acids from acidification process containing phosphates is treated with silica to destroy fluorides and the residual is sent to the Agricultural Chemical Corp., Amenia, New York as fertilizer. Garino samples and counts all liquid before transfer. The records of these assays show no activity over background.

<u>Solids</u>

24. Garino stated that all other waste is disposed of by burial on the licensee's property at the top of the hill. Garino stated that thorium cake as phosphate and thorium fluoride sludge is buried in pits from 12 to 15 feet deep and from 6 to 10 feet wide.

25. Garino stated that each pit contains waste from 3 to 4 weeks of processing. He stated a pit is dug and waste as it accumulates is dumped into the pit. He stated that earth is mixed with the waste as the pit is being filled and that a minimum of 6' of earth fill covers earth pit. Garine stated that four pits were dug and filled in 1965 and that a total of 11,654 pounds total of natural thorium was dumped into the four pits. He stated and

records show that from 2900-3000 pounds of thorium (natural) was buried in each pit. According to 10 CFR 20.5(c)(1) 2900 pounds of thorium (natural) is equivalent to 146,000 uc. 10 CFR 20.304(a) permits the burial in one location of 50,000 uc natural thorium. The records also show that during 1964 a total of 7003 poundsof natural thorium have been buried in three pits with 2300 to 2400 pounds of thorium per location. This quantity per pit also exceeds the limits imposed by 10 CFR 20.304 for one location. Records were noted to be maintained showing the location, date of burial and quantity buried.

Effluents to the Atmosphere

26. Garino stated that effluent from the furnace is sent through a water scrubber which removes particulate. He stated all release is as insoluble thorium particulate. He stated, however, that the scrubber cannot be used on all phases of the furnace oper_tion because a concrete like substance would form which would ruin all equipment. He stated that since the entire rear of the building is open and ventilation is mainly by natural convection, he has taken air surveys using the high volume Staplex Sampler, and has never detected concentrations in air greater than 1.9×10^{-12} uc/Th nat/ml air, at the top of the furnace during operations. He stated the scrubber would reduce this value still further.

Storage of Material

27. The entire building is surrounded by a chain link fence 8 feet high. Entrance to the building must lead to the office. The building is occupied 24 hours daily. Monazite sand is stored in a huge pile in 100 pound paper bags in the rear of the manufacturing area. There does not appear any likelihood of unauthorized removal of material.

Receipt of Materials

28. Garino stated that Monazite sand is received from all over the world and sold through brokers located in New York, N. Y. Records were noted to be maintained showing kind, quantity and date of receipt.

Personnel Monitoring

29. St. John's X-Ray Corporation film badges which are processed monthly are used for personnel monitoring. Records are maintained on film badge processor's reports as well as Form AEC-5. The records were examined from 1962 to date of inspection and show that furnace operators receive maximum

Posting and Labeling

30. The inspector noted that all processing rooms were posted with signs reading "Caution - Airborne Radioactivity Area", "Caution - Radiation Area", and "Caution - Radioactive Materials", all with conventional symbol. The storage pile was similarly posted.

License Conditions

31. The specific documents referred to in license conditions 8A and 8B were reviewed with Garino and compliance was noted.

Items of Noncompliance

32. 10 CFR 20.201(b) - in that the licensee has not made any surveys or any evaluation to determine the quantity of removable contamination existing throughout his facility. (See paragraphs ____________ of the report details.)

33. 20.304(a) - in that the licensee has exceeded the quantity of natural thorium he may dispose of by burial in any one location. (See paragraphs__________ of the report details.)

Conference with Management

34. A conference regarding the items of noncompliance was held immediately following the inspection. Attending the conference were Mr. Richard Mandle, Plant Manager and Mr. Donald Hubbard, Manager, Division of Industrial Relations, Davison Chemical Co., Irwin, Tennessee. Mandle indicated his willingness to comply with the regulations. He stated that he believed that surface contamination should be evaluated and that they would apply for an exemption or an amendment to 10 CFR 20.304(a) to pemit burial at one location of natural thorium in amounts greater than 50,000 uc.

35. The inspector believes that a hazard does not exist from the above items of noncompliance and no follow-up inspection will be made. Management appeared familiar with the hazards connected with processing natural thorium and efforts to comply with the regulations were noted.

FORM NY-99
REV. 8-1-59

UNITED STATES ATOMIC ENERGY COMMISSION
NEW YORK OPERATIONS OFFICE

HEALTH AND SAFETY LABORATORY
376 HUDSON STREET
NEW YORK 14, N. Y.

SAMPLE REQ. **D 1483**

DATE SENT
DATE RECEIVED 7-2-64
DATE REPORTED 7/13/64

PLANT: W.R Grace
MAILING ADDRESS: Pompton Plains N.J
ROUTE RESULTS TO:

Counter Standardized w/Thorium-230 Stds.

ANALYZE FOR: Th (nat) α

TYPE OF SAMPLE:
METHOD OF DETERMINATION: α scintillation

SAMPLE NO.	DATE	HOUR START	HOUR STOP	SAMPLE DESCRIPTION	SAMPLING RATE	SAMPLING TIME	d/m		RESULTS
0 1	7/1/64	11:30 Am		Air collect. Receiving Room 5 min @ 18 c.f.m.			6.26		
1 2	"			air collect Manager's office 6 min @ 15 cfm			13.1		
2 3				air collect Ball mill Room 7 min at 20 cfm			13.0		
3 4				air collect Centrifuge Area 6 min @ 16 cfm			5.83		
4 5				Smear analytical Lab floor 100 cm²			87		
5 6				Smear manager office floor "			65		
6 7				Smear ball mill room floor "			1225		
7 8				Smear outside ball mill room floor "			527		
8 9				Smear 3rd floor counting room floor "			58.4		
9 10				Smear floor upstairs office [illegible]			81.		

COLLECTED BY: E. Epstein

ANALYZED BY: J. Harkins

SURVEYOR TO RETAIN LAST COPY—RETURN ALL OTHERS TO HEALTH AND SAFETY LABORATORY

GPO 959255

FORM NY-99
REV. 8-1-59

UNITED STATES ATOMIC ENERGY COMMISSION
NEW YORK OPERATIONS OFFICE

HEALTH AND SAFETY LABORATORY
376 HUDSON STREET
NEW YORK 14, N. Y.

SAMPLE REQ. D 1480

DATE SENT
DATE RECEIVED 7-2-64
DATE REPORTED 7/13/64

PLANT: W. R. Grace

MAILING ADDRESS:

Counter Standardized U/Th-230 Stds. And U

TYPE OF SAMPLE:

METHOD OF DETERMINATION: α scintillation

ROUTE RESULTS TO: Compliance

ANALYZE FOR: Th (not)

SAMPLE NO.	DATE	HOUR START	HOUR STOP	SAMPLE DESCRIPTION	SAMPLING RATE	SAMPLING TIME	αd/m		RESULTS
0 11	7/1/64	2:00 P.M.		smear stairs to office			54		
1 12	7/1/64			* soil sample from sludge burial area.			166 d/m/gram.		
2									
3				~~* To be repeated at a later date~~ discarded.					
4				JWA.					
5									
6									
7									
8									
9									

COLLECTED BY: E. Epstein

ANALYZED BY: J W Harkins

SURVEYOR TO RETAIN LAST COPY—RETURN ALL OTHERS TO HEALTH AND SAFETY LABORATORY

GPO 959255

Exhibit A

FORM NY-99
REV. 2-4-52

UNITED STATES ATOMIC ENERGY COMMISSION
NEW YORK OPERATIONS OFFICE
HEALTH AND SAFETY DIVISION
70 COLUMBUS AVENUE
NEW YORK 23, N. Y.

SAMPLE REQ. NO. B 1777
DATE SENT
DATE RECEIVED 12-2-59
DATE REPORTED 12-2-59

PLANT: R.E N.J.
MAILING ADDRESS: N.Y.O.O.
TYPE OF SAMPLE: SMEAR - AIR
METHOD OF DETERMINATION: Alpha Scint. Count.
ROUTE RESULTS TO: P Klevin INSPECTION
ANALYZE FOR: THORIUM

SAMPLE NO.	DATE	~~HOUR~~	SAMPLE DESCRIPTION	SAMPLING M^3 RATE	TIME	TOTAL	SAMPLE TAKEN	TOTAL COUNT	COUNT TIME	COUNTS PER MIN.	RESULTS d/m/m^3	
T-205	11/25	3 30 PM ~~34~~	Rare Earth waste press area. No operations in progress	27.5 L/MIN	34 MIN	935.0 L		11	15	0.56	2	3.6
T-207	11/25	3 30 PM	Meso THORIUM area waste silica press. No operations in progress	27.5 L/MIN	18 MIN	.495 L		124	.15	8.04	60	3.7
T-206	11/25	3 30 PM	Storage area Hopper feeding to Ball mill. No operations in progress	32.5 L/MIN	29 MIN	942.5 L		80	15	5.13	20	3.6
											d/m	
T-299	11/25	3 30 PM	4 in^2 area off Hardings Ball mill casing (Smear)		16 IN^2	[illegible]		964	5	192.17	540/~~100 cm~~^{2}	2.8
T-201	11/25	3 30 PM	smear off hand rail from grinding mill to storage			8 IN^2		215	5	42.37	120 ~240 d/m/100 cm^2	2.8
T-202	11/25	3 30 PM	smear of floor by hopper from TH(OH) press (drum storage area)			16 IN^2		568	5	112.97	320 ~320 d/m/100 cm^2	2.8
T-203	11/25	3 30 PM	waste silica press (meso TH) (press sample of paper)		(sample paper size)	($1\frac{1}{8}$")		347	5	68.77	190	2.8
T-204	11/25	3 30 PM	Rare Earth waste press from surface of wooden hopper ledge			16 IN^2		941	16	58.18	160 d/m/cm^2	2.8

COLLECTED BY: W Lorenz

ANALYZED BY: Sic. + A.O'B. J Alercio

SURVEYOR TO RETAIN LAST COPY—RETURN ALL OTHERS TO HEALTH AND SAFETY DIVISION

JUL 17 1964

Ext. 283

CO:I:EE

W. R. Grace & Company
Davison Chemical Division
P. O. Box 488
Pompton Plains, New Jersey

Attention: Mr. Richard Mandle, Plant Manager

Gentlemen:

This letter relates to the discussion Mr. Eugene Epstein of this office held with Mr. R. Mandle following the inspection conducted on July 1, 1964 of the activities authorized under AEC Source Material License No. STA-422.

As noted during the discussion, it appears that certain of your activities were not conducted in full compliance with AEC requirements, and with conditions of the license. The items and references to the pertinent requirements are listed in Item 5 of the attached Form AEC-592.

The purpose of this letter is to give you an opportunity to advise us in writing of your position concerning these items and of any corrective steps you have taken or plan to take with respect to the items listed on the attached form and the date all corrective action was or will be completed. Your reply should be sent to us within 20 days of the date of this letter to ensure that it will receive proper attention in our further evaluation of this matter.

Should you have any question concerning this matter, you may communicate directly with this office.

Very truly yours,

ITEM # 320

Robert W. Kirkman, Director
Region I, Division of Compliance

3/31/8

~~Enclosure:~~
Form AEC-592

bcc; CO:HQ
~~SLR:HQ w/inspection notes~~

OFFICE ▶	COMPLIANCE		
SURNAME ▶	EPSTEIN:nm EE	CLEVELAND	KIRKMAN
DATE ▶	7/17/64		

63

Form AEC-318 (Rev. 9-53)

U. S. GOVERNMENT PRINTING OFFICE 16—62761-3

Region I, Division of Compliance
Routing Slip

To: 1. Epstein
Inspector

[x] Response by licensee adequate EE.

[ ] Response by licensee inadequate

Comment on Inadequacy

2. RGF
Reviewer

2

[x] Concurrence

[ ] Non Concurrence

Comment on Non Concurrence

3. RGF
Supervisor

gm - 7/29/64

B/319

ITEM # 321

MEMO ROUTE SLIP
Form AEC-93 (Rev. May 14, 1947)

See me about this.	For concurrenc	For action.
Note and return.	For signature.	For information.

TO (Name and unit)	INITIALS / DATE	REMARKS
R. G. Page, Chief Enforcement Branch SLR		~~Re: W. R. Grace and Company, Pompton Plains, N. J.,~~ ~~License No. STA-422~~ ~~Attached is a copy of the reply received from~~
L. Dubinski, Assistant Director for Materials CO:HQ		~~subject licensee regarding Form AEC-592.~~ ~~We feel this reply is adequate.~~
		Enclosure: cy ltr dtd 7/24/64 w/enclosure

FROM (Name and unit)	REMARKS
R. W. Kirkman, Director, Region I, Division of Compliance	
PHONE NO. X-381 · DATE 7/28/64	

65

USE OTHER SIDE FOR ADDITIONAL REMARKS GPO 643 16-77649-1

GRACE

CHEMICALS DIVISION
RARE EARTHS

W. R. GRACE & CO.
DAVISON CHEMICAL DIVISION
BALTIMORE 3, MD.

REPLY TO:
P.O. BOX 198
POMPTON PLAINS,
NEW JERSEY
TEmple 5-3060

September 18, 1964

U. S. Atomic Energy Commission
Washington, D. C. 20545

Attention: Director, Division of Licensing and Regulation

Gentlemen:

Reference: 40-86 For Div of Compliance

We enclose Form AEC-2, in quadruplicate, for renewal of Source Material License Number STA-422, which expires on October 31, 1964.

If you wish additional information, please let us know.

Very truly yours,

Richard L. Stone

Richard L. Stone

RLS:CT
Encl.

DOCKETED
USAEC
SEP 21 1964
REGULATORY
MAIL SECTION
DOCKET CLERK

1964 SEP 21 PM 12 35

RECEIVED

B/320

ITEM # 322

ACKNOWLEDGED

4610

40-86

FORM AEC-2
(2-61)
Previous editions are obsolete.

FORM APPROVED
BUREAU OF BUDGET NO. 38-R002.8.

UNITED STATES ATOMIC ENERGY COMMISSION

APPLICATION FOR SOURCE MATERIAL LICENSE

For Div of Compliance

Pursuant to the regulations in Title 10, Code of Federal Regulations, Chapter 1, Part 40, application is hereby made for a license to receive, possess, use, transfer, deliver or import into the United States, source material for the activity or activities described.

1. (*Check one*)
   - ☐ (*a*) New license
   - ☐ (*b*) Amendment to License No.
   - ☒ (*c*) Renewal of License No. STA-422
   - ☐ (*d*) Previous License No.

2. NAME OF APPLICANT: W. R. GRACE & COMPANY, DAVISON CHEMICAL DIVISION

3. PRINCIPAL BUSINESS ADDRESS: P.O. BOX 188, POMPTON PLAINS, NEW JERSEY

4. STATE THE ADDRESS(ES) AT WHICH SOURCE MATERIAL WILL BE POSSESSED OR USED

868 Black Oak Ridge Road, Wayne, New Jersey

5. BUSINESS OR OCCUPATION: Chemical Manufacturer

6. (*a*) IF APPLICANT IS AN INDIVIDUAL, STATE CITIZENSHIP: DNA

(*b*) AGE: DNA

7. DESCRIBE PURPOSE FOR WHICH SOURCE MATERIAL WILL BE USED

Thorium ore processing

2

8. STATE THE TYPE OR TYPES, CHEMICAL FORM OR FORMS, AND QUANTITIES OF SOURCE MATERIAL YOU PROPOSE TO RECEIVE, POSSESS, USE, OR TRANSFER UNDER THE LICENSE

(*a*) TYPE	(*b*) CHEMICAL FORM	(*c*) PHYSICAL FORM (*Including % U or Th.*)	(*d*) MAXIMUM AMOUNT AT ANY ONE TIME (*in pounds*)
NORMAL URANIUM			
URANIUM DEPLETED IN THE U-235 ISOTOPE			
THORIUM	Insoluble salts	Monazite, Thorite, etc, up to 20% ThO_2	Unlimited requested

(*e*) MAXIMUM TOTAL QUANTITY OF SOURCE MATERIAL YOU WILL HAVE ON HAND AT ANY TIME (*in pounds*)

Requesting "Unlimited" per previous license dated 11/22/61.

9. DESCRIBE THE CHEMICAL, PHYSICAL, METALLURGICAL, OR NUCLEAR PROCESS OR PROCESSES IN WHICH THE SOURCE MATERIAL WILL BE USED, INDICATING THE MAXIMUM AMOUNT OF SOURCE MATERIAL INVOLVED IN EACH PROCESS AT ANY ONE TIME, AND PROVIDING A THOROUGH EVALUATION OF THE POTENTIAL HAZARDS ASSOCIATED WITH EACH STEP OF THOSE OPERATIONS.

See our application dated 2/11/60, and the amendments thereto dated 4/11, 6/20 and 7/29/1960, 7/3, 7/6 and 8/2/61, except to the extent that the application refers to superseded provisions of the Commissions Regulation 10CFR20. See also our letter to AEC dated 7/3/61, re; incineration of source material.

10. DESCRIBE THE MINIMUM TECHNICAL QUALIFICATIONS INCLUDING TRAINING AND EXPERIENCE THAT WILL BE REQUIRED OF APPLICANT'S SUPERVISORY PERSONNEL INCLUDING PERSON RESPONSIBLE FOR RADIATION SAFETY PROGRAM (OR OF APPLICANT IF APPLICANT IS AN INDIVIDUAL).

See our letters to Division of Licensing and Regulations dated 4/11 and 7/13/60, plus attachments.
See previous AEC License STA-422, dated 11/22/61 and AEC letter dated 11/22/61, Docket No. 40-86.

11. DESCRIBE THE EQUIPMENT AND FACILITIES WHICH WILL BE USED TO PROTECT HEALTH AND MINIMIZE DANGER TO LIFE OR PROPERTY AND RELATE THE USE OF THE EQUIPMENT AND FACILITIES TO THE OPERATIONS LISTED IN ITEM 9; INCLUDE: (*a*) RADIATION DETECTION AND RELATED INSTRUMENTS (including film badges, dosimeters, counters, air-monitoring and other survey equipment as appropriate. The description of radiation detection instruments should include the type of radiation detected and the range(s) of each instrument.)

See 9 and 10, above

(*b*) METHOD, FREQUENCY, AND STANDARDS USED IN CALIBRATING INSTRUMENTS LISTED IN (*a*) ABOVE (for film badges, specify method of calibrating and processing, or name supplier.)

See 9 and 10, above

B/321

ITEM # 323

4610

11(c). VENTILATION EQUIPMENT WHICH WILL BE USED IN OPERATIONS WHICH PRODUCE DUST, FUMES, MISTS, GASES, ETC.

See 9 and 10, above

12. DESCRIBE PROPOSED PROCEDURES TO PROTECT HEALTH AND MINIMIZE DANGER TO LIFE AND PROPERTY AND RELATE THESE PROCEDURES TO THE OPERATIONS LISTED IN ITEM 9; INCLUDE:
(a) PROCEDURES FOR USE OF NUCLEAR MATERIALS AND SAFETY FEATURES AND PROCEDURES TO AVOID NONNUCLEAR ACCIDENTS, SUCH AS FIRE, EXPLOSION, ETC., IN SOURCE MATERIAL STORAGE AND PROCESSING AREAS.

See 9 and 10, above

(b) EMERGENCY PROCEDURES IN THE EVENT OF ACCIDENTS WHICH MIGHT INVOLVE SOURCE MATERIAL.

See 9 and 10, above

(c) DETAILED DESCRIPTION OF RADIATION SURVEY PROGRAM AND PROCEDURES.

See 9 and 10, above

13. WASTE PRODUCTS: *If none will be generated, state "None" opposite (a), below. If waste products will be generated, check here* ☐ *and explain on a supplemental sheet:*
(*a*) Quantity and type of radioactive waste that will be generated. **See 9 and 10, above**
(*b*) Detailed procedures for waste disposal.

14. IF PRODUCTS FOR DISTRIBUTION TO THE GENERAL PUBLIC UNDER AN EXEMPTION CONTAINED IN 10 CFR 40 ARE TO BE MANUFACTURED, USE A SUPPLEMENTAL SHEET TO FURNISH A DETAILED DESCRIPTION OF THE PRODUCT, INCLUDING:
(*a*) PERCENT SOURCE MATERIAL IN THE PRODUCT AND ITS LOCATION IN THE PRODUCT.
(*b*) PHYSICAL DESCRIPTION OF THE PRODUCT INCLUDING CHARACTERISTICS, IF ANY, THAT WILL PREVENT INHALATION OR INGESTION OF SOURCE MATERIAL THAT MIGHT BE SEPARATED FROM THE PRODUCT.
(c) BETA AND BETA PLUS GAMMA RADIATION LEVELS (*Specify instrument used, date of calibration and calibration technique used*) AT THE SURFACE OF THE PRODUCT AND AT 12 INCHES.
(*d*) METHOD OF ASSURING THAT SOURCE MATERIAL CANNOT BE DISASSOCIATED FROM THE MANUFACTURED PRODUCT.

CERTIFICATE

(*This item must be completed by applicant*)

15. *The applicant, and any official executing this certificate on behalf of the applicant named in Item 1, certify that this application is prepared in conformity with Title 10, Code of Federal Regulations, Part 40, and that all information contained herein, including any supplements attached hereto, is true and correct to the best of our knowledge and belief.*

W. R. GRACE & COMPANY
DAVISON CHEMICAL DIVISION
(*Applicant named in Item 2*)

Dated **9-19-64**

BY: Richard M. Mandle
Richard M. Mandle

Plant Manager
(*Title of certifying official authorized to act on behalf of the applicant*)

WARNING: 18 U.S.C. Section 1001; Act of June 25, 1948; 62 Stat. 749; makes it a criminal offense to make a willfully false statement or representation to any department or agency of the United States as to any matter within its jurisdiction.

GPO: 1962—O-659930

UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

OCT 1 2 1964

DML:DHH
40-86

3

W. R. Grace & Company
Davison Chemical Division
P. O. Box 188
Pompton Plains, New Jersey

Attention: Mr. Richland L. Stone

Gentlemen:

Enclosed is AEC Source Material License No. STA-422,

as renewed.

Very truly yours,

Donald A. Nussbaumer, Chief
Source and Special Nuclear Materials Branch
Division of Materials Licensing

DISTRIBUTION:
Doc. Rm.
Br. & Div. rfs
Compliance
Suppl.
N. Doulos, ML (3)
D. Harmon, ML
State Health(Lic. only)

B/322

70

ITEM # 324

Form AEC—410
(1-61)

UNITED STATES
ATOMIC ENERGY COMMISSION

SOURCE MATERIAL LICENSE

Pursuant to the Atomic Energy Act of 1954, and Title 10, Code of Federal Regulations, Chapter 1, Part 40, "Licensing of Source Material," and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, possess and import the source material designated below; to use such material for the purpose(s) and at the place(s) designated below; and to deliver or transfer such material to persons authorized to receive it in accordance with the regulations in said Part. This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954 and is subject to all applicable rules, regulations, and orders of the Atomic Energy Commission, now or hereafter in effect, including Title 10, Code of Federal Regulations, Chapter 1, Part 20, "Standards for Protection Against Radiation," and to any conditions specified below.

Licensee	
1. Name W. R. Grace & Company Davison Chemical Division 2. Address P. O. Box 188 Pompton Plains, New Jersey	3. License No. STA-422, as renewed 4. Expiration Date October 31, 1967 5. Docket No. 40-86
6. Source Material Thorium	7. Maximum quantity of source material which licensee may possess at any one time under this license Unlimited

CONDITIONS

8. Authorized use (Unless otherwise specified, the authorized place of use is the licensee's address stated in Item 2 above.)

Thorium ore processing in accordance with the procedures described in the licensee's applications dated April 11, June 20, and July 29, 1960; July 3, July 5, and August 2, 1961; and September 18, 1964; except (1) as otherwise provided by conditions of this license and (2) that exemption or specific authorizations pursuant to Commission regulations are not authorized unless provided by conditions of this license.

9. Authorized Place of Use: The licensee's facility located at Pompton Plains, New Jersey.

10. Pursuant to Sections 20.106(a) and 20.302, 10 CFR 20 the licensee is hereby authorized to incinerate source material in accordance with the procedures described in the licensee's letter dated July 3, 1961.

U. S. ATOMIC ENERGY COMMISSION

SOURCE

MATERIAL LICENSE

Supplementary Sheet

License Number STA-422, as renewed

11. The licensee is hereby exempt from the requirements of Section 20.203(e)(2) and 20.203(f)(2), 10 CFR 20, for areas and containers within his plant provided all entrances to the plant are comspicuously posted in accordance with Section 20.203(e)(2) and with the words, "Any area or container within this plant may contain radioactive material."

For the U. S. Atomic Energy Commission

Date OCT 12 1964

by

Division of Licensing and Regulation
Washington 25, D. C.

ca

February 5, 1965

2

FROM: Peter J. Garino

TO: File

SUBJECT: SHIPMENT OF RADIOACTIVE MATERIAL

This shipment of Radioactive Material consisting of thorium-containing products, has been inspected by me and complies with all conditions of the regulation 73.393

Total number of units loaded 24

Milliroentgens per hour 10 ft from sides of truck 2 mr/hr.

Milliroentgens per hour 5 ft from ends of truck 1 mr/hr.

Milliroentgens per hour at driver's position in truck --1.5 mr/hr.

Driver notified of location limit yes

Released Feb. 12, 1965 1965, at Pompton Plains, N.J.

P. J. Garino
Peter J. Garino
Health Physicist
W. R. GRACE & CO.
DAVISON CHEMICAL DIVISION

B/323

ITEM # 325

66

Region I, Division of Compliance
Routing Slip

To: 1. Epstein
Inspector

- [x] Response by licensee adequate EE.
- [ ] Response by licensee inadequate

Comment on Inadequacy

2. RJG
Reviewer

- [x] Concurrence
- [ ] Non Concurrence

Comment on Non Concurrence

3. RJG
Supervisor

Jm - 1/29/64

DOCKET NO. 40-86

For Div. of Compliance Region I

GRACE

W. R. GRACE & CO.
DAVISON CHEMICAL DIVISION
BALTIMORE, MD.

CHEMICALS DIVISION
RARE EARTHS

Reply to:
P. O. BOX 188
POMPTON PLAINS
NEW JERSEY 07444
835-3060

October 7, 1966

United States Atomic Energy Commission
Source & Special Nuclear Materials Branch
Division of Materials Licensing
Washington, D. C. 20545

ATTENTION: Mr. Donald A. Nussbaumer, Chief

Gentlemen:

In reply to your letter DML:ND STA-422, 40-86 dated September 23, 1966, we have reviewed the subject amendment to Section 20.203 (f) of 10 CFR 20.

We concur that because of the changes in the amendment, our present exemption will no longer be appropriate.

Very truly yours,

Peter J. Garino
Health Physicist

PJG:ct
cc: Mr. R.L. Stone

OCT 10 1966

B/324

ITEM # 326

UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

IN REPLY REFER TO:
[illegible]
40-68
STA-422, Amendment No. 1

NOV 4 - 1966

W. R. Grace & Company
Davison Chemical Division
P. O. Box 188
Pompton Plains, New Jersey 07444

Attention: Mr. Peter J. Garino
Health Physicist

Gentlemen:

In accordance with your application dated October 7, 1966, Item 11 of AEC Source Material License No. STA-422 is hereby amended as follows:

"11. The licensee is hereby exempt from the requirements of Section 20.203(e)(2) of 10 CFR 20 for areas within his plant provided all entrances to the plant are conspicuously posted in accordance with Section 20.203 (e)(2) and with the words, 'Any area within this plant may contain radioactive material'."

Very truly yours,

Don F. Harmon
Source & Special Nuclear Materials Branch
Division of Materials Licensing

DISTRIBUTION:
Suppl.
Doc. Room
Compliance, Region I
State Health
H. Doulos, ML 3
Br. RF
Div. RF

NOV 1 11 35 AM '66

B1325

ITEM # 327

UNITED STATES
ATOMIC ENERGY COMMISSION
DIVISION OF COMPLIANCE
REGION I
376 HUDSON STREET
NEW YORK 14, NEW YORK

TELEPHONE: YUKON 9-1000
Ext. 384

IN REPLY REFER TO:
CO:I:WBG

November 15, 1966

W. R. Grace and Company
Davison Chemical Division
P. O. Box 488
Pompton Plains, New Jersey 07444

Attention: Mr. Peter Garino

Re Lic.: STA-422

Gentlemen:

The Division of Compliance, Region I, is charged with the responsibility of assuring compliance by the holders of licenses with the Atomic Energy Act of 1954, the applicable rules and regulations of the Atomic Energy Commission, and the terms and conditions of the licenses themselves.

Our representative, Mr. William B. Grant plans to visit you at about 9:00 am on Thursday, November 17, 1966, for the purpose of making an inspection of your facilities.

This inspection will be directed primarily to the status of your compliance with 10 CFR 20, "Standards for Protection Against Radiation", and the applicable provisions of 10 CFR 30, 32, 33, 34, 35, 40, and 70.

We request that you have available at the time of the inspection the various records called for by the foregoing regulations, particularly those contained in 10 CFR 20.401 (a) and (b).

Very truly yours,

Robert W. Kirkman, Director
Region I, Division of Compliance

B1326

ITEM # 328

Form AEC-591
(6/1/65)

UNITED STATES ATOMIC ENERGY COMMISSION
DIVISION OF COMPLIANCE

INSPECTION FINDINGS AND LICENSEE ACKNOWLEDGMENT

I-II

1. LICENSEE	2. REGIONAL OFFICE
W. R. Grace & Co. Davison Chemical Division P. O. Box 188 Pompton Plains, New Jersey 07444	U. S. Atomic Energy Commission Division of Compliance, Region 1 376 Hudson Street New York, New York 10014
3. LICENSE NUMBER(S) STA 422	4. DATE OF INSPECTION November 17, 1966 (Reinspection)

5. INSPECTION FINDINGS

- [x] A. No item of noncompliance was found.
- [ ] B. Rooms or areas were not properly posted to indicate the presence of a RADIATION AREA. 10 CFR 20.203(b) or 34.42
- [ ] C. Rooms or areas were not properly posted to indicate the presence of a HIGH RADIATION AREA. 10 CFR 20.203(c) (1) or 34.42
- [ ] D. Rooms or areas were not properly posted to indicate the presence of an AIRBORNE RADIOACTIVITY AREA. 10 CFR 20.203(d)
- [ ] E. Rooms or areas were not properly posted to indicate the presence of RADIOACTIVE MATERIAL. 10 CFR 20.203(e)
- [ ] F. Containers were not properly labeled to indicate the presence of RADIOACTIVE MATERIAL. 10 CFR 20.203(f) (1) or (f) (2)
- [ ] G. Storage ~~containers were not properly labeled to show the quantity, date of measurement, or kind of radioactive material in the containers. 10 CFR 20.203(f) (4)~~
- [ ] H. A current copy of 10 CFR 20, a copy of the license, or a copy of the operating procedures was not properly posted or made available. 10 CFR 20.206(b)
- [ ] I. Form AEC-3 was not properly posted. 10 CFR 20.206(c)
- [ ] J. Records of the radiation exposure of individuals were not properly maintained. 10 CFR 20.401(a) or 34.33(b)
- [ ] K. Records of surveys or disposals were not properly maintained. 10 CFR 20.401(b) or 34.43(d)
- [ ] L. Records of receipt, transfer, disposal, export or inventory of licensed material were not properly maintained. 10 CFR 30.51, 40.61 or 70.51
- [ ] M. Records of leak tests were not maintained as prescribed in your license, or 10 CFR 34.25(c)
- [ ] N. Records of inventories were not maintained. 10 CFR 34.26
- [ ] O. Utilization logs were not maintained. 10 CFR 34.27

William B. Grant

William B. Grant
(AEC Compliance Inspector)

6. LICENSEE'S ACKNOWLEDGMENT

The AEC Compliance Inspector has explained and I understand the items of noncompliance listed above. The items of noncompliance will be corrected within the next 30 days.

ITEM # 329

B/327

(Date)

(Licensee Representative — Title or Position)

COPIES: ☐ LICENSEE; ☐ COMPLIANCE REGION; ☐ DIV. OF ST. & LIC. REL.; ☐ DIV. OF COMPLIANCE

13 pd

OPTIONAL FORM NO. 10
MAY 1962 EDITION
GSA FPMR (41 CFR) 101-11.6

UNITED STATES GOVERNMENT

Memorandum

TO : Files

THRU: Paul R. Nelson, Senior Radiation Specialist
Region I, Division of Compliance

DATE: November 30, 1966

FROM : William B. Grant, Radiation Specialist
Region I, Division of Compliance

SUBJECT: W. R. GRACE AND CO.
DAVISON CHEMICAL DIVISION
P. O. BOX 188
POMPTON PLAINS, NEW JERSEY 07444
LICENSE NO.: STA-422

Inspector's Evaluation

This licensee has corrected deficiencies found during the previous inspection and no apparent health and safety irregularities exist.

The management staff has been associated with the ore processing facility for a number of years and are apparently well aware of the hazards connected with the operation and are succeeding in their attempts to keep these hazards minimal. Both Sweitzer and Garino exhibited a willingness to comply with the regulations in a completely cooperative attitude.

A six month addition to the reinspection frequency is recommended. A Category I, Priority 2 - inspect 5/68.

ITEM # 330

B1328

BUREAU OF EXPLOSIVES

ASSOCIATION OF AMERICAN RAILROADS
63 VESEY STREET
NEW YORK, N. Y. 10007

FILE NUMBER

T. C. GEORGE, DIRECTOR AND CHIEF INSPECTOR

25-3 §73.392(c)

WFB-M

January 12, 1967

Davison Chemical Company
W. R. Grace & Company
Pompton Plains, New Jersey

2

Gentlemen: Attention: Mr. Peter J. Garino

This letter confirms the decisions reached during my recent visit to your facility.

It is our opinion that thorium phosphate sludge consisting of approximately 10% thorium with a high acid content is "low specific activity material" as defined by §73.391(c)(1) of the Interstate Commerce Commission Regulations.

Further, the shipment of this material in 55 gallon used open head steel drums with new ICC Specification 2U-55 gallon drum liners and/or new 55 gallon open head fiber drums with new ICC Specification 2U-55 gallon drum liners is, in our opinion, authorized under the provisions of §73.392(c) of the Interstate Commerce Commission Regulations. You are reminded that this paragraph of the Regulations specifically requires that the gamma radiation, or equivalent, not exceed 2 milliroentgens per hour in any normally occupied position in the tractor cab. Further, the vehicle must be placarded in accordance with §77.823 of the Interstate Commerce Commission Regulations.

It is our understanding that shipments shall be made utilizing vehicles which are operated under the control and direction of the Davison Chemical Company and shipments will be made from your facility in truckload lots.

For your information, I am attaching a copy of the pertinent sections of the Regulations.

It was indeed a pleasure to visit your facility and

B1329

ITEM # 331

JAN 13 1967

ATTACHMENT "B"

I want to thank you for the hospitality extended to me.

Yours truly,

T. C. George
Director and Chief Inspector

By W. F. Black
Technical Assistant

Attach.
cc: Inspector James

ATTACHMENT "B"

Form AEC—410
(11-61)

UNITED STATES
ATOMIC ENERGY COMMISSION

SOURCE MATERIAL LICENSE

Pursuant to the Atomic Energy Act of 1954, and Title 10, Code of Federal Regulations, Chapter 1, Part 40, "Licensing of Source Material," and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, possess and import the source material designated below; to use such material for the purpose(s) and at the place(s) designated below; and to deliver or transfer such material to persons authorized to receive it in accordance with the regulations in said Part. This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954 and is subject to all applicable rules, regulations, and orders of the Atomic Energy Commission, now or hereafter in effect, including Title 10, Code of Federal Regulations, Chapter 1, Part 20, "Standards for Protection Against Radiation," and to any conditions specified below.

Licensee	
1. Name W. R. Grace & Company Davison Chemical Division 2. Address P. O. Box 188 Pompton Plains, New Jersey	3. License No. STA-422, as renewed 4. Expiration Date October 31, 1967 5. Docket No. 40-86
6. Source Material Thorium	7. Maximum quantity of source material which licensee may possess at any one time under this license Unlimited

CONDITIONS

8. Authorized use (Unless otherwise specified, the authorized place of use is the licensee's address stated in Item 2 above.)

Thorium ore processing in accordance with the procedures described in the licensee's applications dated April 11, June 20, and July 29, 1960; July 3, July 5, and August 2, 1961; and September 18, 1964; except (1) as otherwise provided by conditions of this license and (2) that exemption or specific authorizations pursuant to Commission regulations are not authorized unless provided by conditions of this license.

9. Authorized Place of Use: The licensee's facility located at Pompton Plains, New, Jersey.

10. Pursuant to Sections 20.106(a) and 20.302, 10 CFR 20 the licensee is hereby authorized to incinerate source material in accordance with the procedures described in the licensee's letter dated July 3, 1961.

B/330

ITEM # 332

DRAFT
GRANT:cj
11/29/66

Reviewed by: [illegible]
Date: 1/24/67

Clear

BACK- UP FOR AEC-591

PART 40 INSPECTION

W. R. GRACE AND CO.
Davison Chemical Division
P. O. Box 188
Pompton Plains, New Jersey 07444

Inspector: William B. Grant

License No.: STA-422

Date of Inspection: November 17, 1966 - Announced Reinspection

Persons Accompanying Inspector:

None - New Jersey Department of Public Health Notified

13

Persons Contacted:

Mr. Hugh Sweitzer, Plant Manager
Mr. Peter Garino, Plant Chemist and RSO

DETAILS

Background Information

1. The most recent inspection of the licensee's facility was conducted on July 1, 1964. Items of noncompliance noted were as follows:

   a. Failure to make surveys to determine concentrations of removable surface contamination existing in unrestricted and restricted areas. The current status of compliance was reviewed with Garino and compliance was noted. (See paragraph 16 of report details.)

   b. Quantities of natural thorium in excess of 1,000 times Appendix C, 10 CFR 20 were buried in one location. The current status of compliance was discussed with Garino and compliance was noted. (See paragraph 24 of report details.)

ITEM # 333

B/331

Organization and Administration

2. The Pompton Plains plant is one of the Davison Chemical Division of the W. R. Grace and Co. The plant manufactures polishing compounds for use in the optical trade and other glass manufacturing. These polishing compounds are reportedly obtained from the refining monazite ore.

3. Mr. Peter Garino, Plant Chemist and RSO, reports directly to Mr. Hugh Sweitzer, Plant Manager. Mr. Garino is a graduate chemist and has taken a two week course in methods of radiation protection at the Grace plant in Erwin, Tennessee. Garino stated that out of 32 employees, 18 are considered production workers and actually work with thorium containing ore.

Facilities and Uses of Byproduct Material

4. The Pompton Plains plant is a two story brick building containing the production area, an office, and lab space. The plant facilities are located on Black Oak Ridge Road (Route 202M). The production area consists of monazite ore storage, ball mill, filter press, rare oxide, chloride, and thorium refining areas. Facilities for change, lockers, and building services are located on the first floor of the plant. The employee lunchroom is located in a 20 foot trailer located approximately 40 feet from the main building on the opposite side of the truck loading platform and driveway. A waste treatment facility, sludge storage, and waste burial area are located in the rear of the licensee's property and approximately 200 - 300 feet from the residential areas in the rear of the plant. The inspector noted that the entire facility was surrounded by an 8 foot high chain link fence which restricts the area to entrance at the office and of the facility.

5. The scope of the license was reviewed with Garino. The licensee is permitted to have thorium in unlimited quantities for thorium ore processing. Garino stated that the facility is currently processing approximately 50 tons of monazite ore per month and this ore contains approximately 3% thorium oxide.

He stated that thorium is a waste product of the company's processing methods which are intended to remove the rare earth oxide from the original ore with an approximate 93% purity. Garino stated that the final rare earth oxide powder contains trace amounts of natural thorium ~~ore~~ (from 0.1 - 0.2%.)

6. Garino was noted to maintain a monthly inventory. The inventory as of October 1, 1966 showed the possession of the following: 3,494 pounds of thorium (natural) in monazite sand - 3% enrichment; 9,392 pounds of thorium oxide in waste sludge.

7. Garino stated the final rare earth oxide powder contains trace amounts (0.1 to 0.2%) natural thorium.

8. Garino described the manufacturing process and it is as outlined in paragraph 5a - h of the previous inspection report, dated 7/14/64. According to Garino, the process is still classified as company confidential.

9. The facilities used in the manufacture of the rare earth oxide from monazite ore consist of: a separate room for the ball mill operations which Garino stated is a very dusty operation; a sulfonation kettle area; calcining furnace; centrifuge area; filter press area; thorium crystalization unit; and a monazite storage area.

10. Garino stated that the plant produces approximately 30,000 pounds of rare earth oxides from 50 tons of ore per month and that the process also produces about 1500 pounds of THO_2.

11. According to Garino, all personnel working in the vicinity of operations in which a potential dust hazard exists are required to wear respirators. All personnel working in the plant processing areas are required to undergo a clothing change prior to reporting to the work areas. On arrival at the plant, operators ~~under~~ enter the clean area (west side of locker room), undress and

place their street clothes in their assigned lockers. They then pass into the process area (east side of locker room) and put on their process clothing and safety shoes. At the end of their shift, operators return their process clothing to their lockers in the east locker room and pass to the west locker room. Garino stated that supervisory personnel and individuals who occasionally visit the processing areas, including visitors, are issued smocks and overshoes. The inspector noted that these are maintained on hangers immediately adjacent to the chemical control laboratory in the office area at the plant. The inspector donned a smock and shoe covers prior to entering the processing area.

Radiation Safety Precautions and Procedures

Instructions

12. The licensee has written instructions entitled, "Health Physics Manual, Davison Chemical Co., Pompton Plains, New Jersey". The manual contains information as to the reason and importance of the control of radioactive materials, the areas of responsibility for the health physics department, and a definition of terms. The manual also lists maximum permissible levels and concentrations, methods of contamination control, radiation surveys, decontamination procedures, description of waste disposal, explanation of medical examinations, procedures for measurement of radioactivity (alpha and beta), sample administrative forms, and emergency contacts. Garino stated that all new employees receive a two hour indoctrination lecture from the plant manager and that Garino periodically lectures on safety, cleanliness and use of the clothes change area.

13. Garino had on hand a copy of the license and copies of 10 CFR 20, 30 and 40. He stated that the file was available to all workers upon request.

Surveys

14. Garino stated that he makes direct physical surveys using an Anton Model 5 survey meter quarterly. He stated that ~~when~~ these surveys are made in 13

locations in the plant and burial sites, and less frequently at the fence line location. It was noted that records of the surveys were maintained. The last survey record, dated September 28, 1966, reported radiation levels at waist level at 3.5 mr/hr in the monazite storage area, 2.5 mr/hr at the surface of the thorium press, .5 - 1 mr/hr in the sludge burial area, 1.5 mr/hr in the shipping room and 0.05 - 0.75 mr/hr at the fence lines.

15. Independent surveys were made by the inspector using Serial No. 5682 Precision Instrument end window GM survey meter calibrated 11/1/66. all restricted areas
Radiation levels were noted as follows:

At the surface of pile of bags containing monazite sand - 7 mr/hr.

At rope barrier approximately 2 feet from stack - 1 mr/hr.

At the surface of the ball mill - 2 mr/hr.

At the surface of the filter press - 7 mr/hr.

At the surface of the centrifuge - 10 mr/hr.

18 inches from pile of thorium waste in rear of licensee's facility - 1.5 - 2 mr/hr.

16. Garino stated that they have made surveys in the form of smear samples to determine the amount and location of removable contamination existing in the licensee's facility. According to Garino, the samples have been taken on three month intervals since the last inspection. Records were noted to be maintained of the results of these samples and the results for the last survey performed September 28, 1966 revealed the following results:

Location	Results in μc/square foot
Sales Office - desk	background
floor	1.8×10^{-6}
Polishing Lab - desk	2.2×10^{-10}
floor	6.8×10^{-5}
Engineering Office - desk	4.2×10^{-6}
floor	3.7×10^{-5}
Shipping Room - table	3.5×10^{-6}
floor	8.4×10^{-6}

Location	Results in μc/square foot
Ball Mill Room - floor	3.6×10^{-3}
door	2.8×10^{-4}
Old Calcining Furnace - floor	6.7×10^{-6}
wall	2.4×10^{-6}
Monazite Storage - floor	6.8×10^{-4}
door	8.8×10^{-6}
Shipping Platform	background
Entrance - stairs	1.4×10^{-6}
Locker Room - floor	3.8×10^{-6}

Air Surveys

17. Garino stated that he performs air surveys by collecting air at the rate of 20 cubic feet per minute for five minutes using a Staplex high volume air sampler with Whatman 41 filter paper. Garino stated that samples are taken in restricted and unrestricted areas on a quarterly basis. According to Garino, the samples are counted in a Nuclear Corporation gas flow proportional counter, used in conjunction with a RIDL scaler. Records were noted to be maintained of these samples. The most recent sample data collected September 14, 1966 was as follows:

Location	Results in μc/ml	
Shipping Room	1.8×10^{-12}	
Pulverizer Room	2.5×10^{-12}	
Calcining Furnace	1.8×10^{-12}	
Process Storage Area	1.2×10^{-12}	
Ball Mill Room	4.1×10^{-12}	(Mill running, but no occupancy)
Monazite Storage Area	3.0×10^{-12}	
Lunchroom	1.1×10^{-12}	
Control Lab	1.5×10^{-12}	

Location	Results in uc/ml
Sulfonation Kettle	2.4×10^{-12}
Northwest Fence Line	background
Southwest Corner Fence Line	background
Midway Point Fence Line	background

Waste Disposal

Liquid Effluent

18. The waste treatment plant treats all liquid wastes from the plant. The waste includes wash water, floor washings, and surface runoff from the adjacent plant property.

19. Garino stated that the process involves the use of an average of 35,000 gallons of water per day. All waste water is discharged to a common 1,000 gallon sump equipped with two automatically controlled pumps which force the waste in_to a 50,000 gallon retention tank. Each pump has capacity to handle the peak loak and is installed so that the second pump starts in the case of extreme demand or failure of the first. The retention tank provides a minimum of 48 hours average retention of waste and, in addition, acts as a mixing and clarification tank. The incoming wastes flow through a distributing channel in the tank and the effluent, after initial settling, is removed from the mid part of the tank, and flows by gravity to a mixing tank. A draw off is provided at the bottom of the retention tank to pump accumulated solids to the sludge filter press. Garino stated that the 8,000 gallon mixing tank is equipped with a gate agitator which travels at approximately five revolutions per minute. A pH electro d assembly is in the center of the mixing tank and electrically connected to a mechanically operated diaphram valve. Two storage tanks are provided to feed either sulphuric acid or caustic soda solution through the automatic diaphram valve to

the mixing tank as called for by the pH controller. Effluent from the mixing tank is piped to a 2,000 gallon Hardinge thickener at a pH of 5.8 - 6.2.

20. The Hardinge thickener provides a clear overflow to the final clarification tank and is adjusted to give a 20% solids overflow which is pumped to the sludge filter press in the control house.

21. The final clarification tank of 50,000 gallons capacity provides an average of 48 hours retention time for the effluent before discharge from the system. The main function of this tank provides sufficient time for post precipitation of solids after pH adjustment. A drawoff is provided at the bottom of the tank to pump accumulated solids to the sludge filter press.

22. The system is designed to operate automatically, part of the normal maintenance, cleaning and control operation. The entire operation is under the supervision of Garino in his capacity of Plant Chemist. Garino stated that he samples the effluent daily at the overflow of the hardinge thickener and at the weir in the control house. Garino stated that sampling at the hardinge thickener provides an average of 48 hours retention time before discharge and will indicate quality of effluent entering the clarification tank. Sampling at the weir provides a check on the amount of contamination which has settled out of the effluent in the final clarification tank, or if there is any additional contamination being added to the effluent to the accumulation of sludges in the clarification tank.

23. Records of samples taken at both stages of the effluent stream were noted to be kept on the "Plant Effluent Form". Review of these records showed the average daily discharge to the Pompton River to be 2.0×10^{-7}

μc/ml, which is approximately 20% the MPC of 1×10^{-6} μc/ml for natural thorium.

Solids

24. Garino stated that all other waste is either disposed of by burial on the licensee's property or is held in storage until it can be transferred to a disposal site. According to Garino and as indicated in disposal records, the licensee buries 992 pounds of thorium phosphate per month. Garino stated that a pit is dug and the waste is dumped into the pit. He stated that earth is mixed with the waste as the pit is being filled and that a minimum of six feet of earth fill covers the pit. Garino stated that, according to 10 CFR 20.5(c)(1) and 10 CFR 20.304(a), they are permitted to bury in one location only 1,000 pounds or 50,000 μc natural thorium. He stated that their processes produce approximately 1500 pounds of thorium (natural) per month. He stated that they currently have 9,392 pounds of this thorium sludge in a storage pit in the back of the property. Garino stated that he is in the process of investigating possible disposal sites for this waste and in all probability it will be shipped to either Grace's Chattanooga, Tennessee plant or Nuclear Fuel Services, West Valley, New York, a Grace subsidiary. Records were noted to be maintained showing the location, date of burial, and quantity buried monthly since the period of the last inspection.

Instrumentation and Calibration

25. The licensee had on hand an Anton Model No. 5 GM survey meter with a range of 0 - 100 mr/hr. He also had a Nucor gas flow proportional counter and an RIDL scaler. Garino stated that the GM survey meter is used for all direct survey measurements and that all smears and/or water samples are counted in the gas flow proportional counter. He stated that the survey meter is sent to Lionell Corporation for calibration at six month intervals. He said that the proportional counter is checked for calibration using U_3O_8 National Bureau of Standards

uranium oxide standard of 1.8 dps and an Am-241 source of 1.07 x 10^4 dpm (2/65).

Storage of Material

26. It was noted that the entire building is surrounded by chain link fence eight feet high. The pedestrian entrance through the fence was noted to be carefully marked directing visitors to the office area. Garino stated that during working hours, unaccompanied visitors are not allowed in the production area and the workmen are instructed to direct all such people to the office. Garino stated that the plant gates are locked during non-working hours. It was noted that the monazite sand is stored in large piles under a roofed shed in the rear of the manufacturing area. The sand is in 100 pound paper sacks and, therefore, it does not appear that there is any likelihood for unauthorized removal of the material.

Receipt of Materials

27. According to Garino, monazite sand is received from all over the world. Records were noted to be maintained showing kind, quantity, and date of receipt.

Personnel Monitoring

28. St. John's X-ray Corporation, Califon, New Jersey supplies film badges which are processed on a monthly basis for personnel in the plant. Records are maintained on the film badge processor's reports as well as Form AEC-5. The records were examined from the date of the last inspection to October 1966. The records showed a typical exposure to be less than 20 mrem per month.

Posting and Labeling

29. The inspector noted that there were signs posted at the entrance gates and at all outside doors of the plant reading "Any area within this plant may contain radioactive material". The storage pile was posted with a sign reading "Caution - Radioactive Materials". All processing rooms were posted with signs reading "Caution - Airborne Radioactivity Area". All signs had the conventional symbol and color.

License Conditions

30. The specific documents referred to in License Condition 8A were reviewed with Garino and compliance was noted.

31. In accordance with License Condition 10, the licensee is authorized to incinerate source materials in accordance with procedures described in his letter dated July 3, 1961. Garino stated that no incineration has taken place during the period since the last inspection.

32. License Condition 11, as amended November 4, 1966, was discussed with Garino and compliance was noted, as stated in paragraph 29.

Management Discussion

33. A conference was held with Mr. Hugh Sweitzer, Plant Manager, and Garino immediately following the inspection. The inspector stated that in his opinion the problem of disposition of the thorium sludge was one that the company would have to solve in the near future. The inspector added that the company must assure themselves that the transferee has a license from the USAEC or an agreement state to possess the material transferred to them. Sweitzer indicated his willingness to comply with the regulations and stated that he would insure a proper transfer.

34. The inspector believes that management of this company is ~~surrounded~~ familiar with

the hazards connected with processing natural thorium and efforts to comply with regulations were noted.

SAMUEL MARCUS
ALBERT E. LEVY
WILLIAM V. MARCUS

ISADORE ROSENBLOOM
HARRY C. CHASHIN
MAX D. FORREST
JOHN SELAWSKY
HARRY STEINBERG
GEORGE M. FIELDMAN
SEYMOUR GELZER

MARCUS & LEVY
COUNSELLORS AT LAW
COLT BUILDING
5 COLT STREET
PATERSON, N. J. 07505

Telephone 684-6630
(Area Code 201)

N. Y. OFFICE

595 MADISON AVENUE
NEW YORK, N. Y. 10022

PLAZA 2-5580
(Area Code 212)

March 10, 1967

Atomic Energy Commission
New York Operations Office
376 Hudson Street
New York City, New York

Attention: Mr. Robert Kirkman,
Compliance Division

Gentlemen:

In the process of handling a Workmen's Compensation matter for a client who is employed at the Davison Chemical Division of WR Grace, Co., Wayne, New Jersey, it is necessary to inquire with regard to the existence of any radioactive materials used at this plant during July, August 1965.

Our client sustained burns at that time to his right hand, and the information which we request is with regard to this injury. He states to us that the burns are from "acid and radioactive sand at 360° F".

Thanking you for whatever cooperation you may be able to furnish us, we remain

Very truly yours,

Marcus & Levy

MARCUS & LEVY

IR/hm

20 [illegible]

EXT. 388

CO:I:AFR

20 Mar 67

Marcus and Levy
Colt Building
5 Colt Street
Paterson, New Jersey 07505

Subject: YOUR INQUIRY DATED MARCH 10, 1967

Gentlemen:

Information available at this office, pertinent to your inquiry, is as follows:

W. R. Grace and Company, Davison Chemical Division, Post Office Box 188, Pompton Plains, New Jersey was issued AEC source material license no. STA-422 October 12, 1964, with an expiration date of October 31, 1967. The licensee is authorized to possess an unlimited quantity of thorium. We do not know what radioactive materials were used at the plant during July and August 1965.

Very truly yours,

Robert W. Kirkman, Director
Region I, Division of Compliance

ITEM # 334 B/332

OFFICE ▶	COMPLIANCE					
SURNAME ▶	RYAN:maz	KIRKMAN				
DATE ▶	3/20/67					

Form AEC-318 (Rev. 9-53) U. S. GOVERNMENT PRINTING OFFICE 16—62761-3

FORM AEC-2
(3-64)
Previous editions are obsolete.

FORM APPROVED
BUREAU OF BUDGET NO. 38-R002.

UNITED STATES ATOMIC ENERGY COMMISSION

APPLICATION FOR SOURCE MATERIAL LICENSE

Pursuant to the regulations in Title 10, Code of Federal Regulations, Chapter 1, Part 40, application is hereby made for a license to receive, possess, use, transfer, deliver or import into the United States, source material for the activity or activities described.

1. (*Check one*)
   - ☐ (*a*) New license
   - ☐ (*b*) Amendment to License No. STA-422
   - ☒ (*c*) Renewal of License No.
   - ☐ (*d*) Previous License No.

2. NAME OF APPLICANT W. R. GRACE & Co.
Davison Chemical Division

3. PRINCIPAL BUSINESS ADDRESS
Pompton Plains, N. J.

4. STATE THE ADDRESS(ES) AT WHICH SOURCE MATERIAL WILL BE POSSESSED OR USED
868 Black Oak Ridge Road, Wayne, N. J.

For Div. of Compliance Reg I

5. BUSINESS OR OCCUPATION
Chemical Manufacturer

6. (a) IF APPLICANT IS AN INDIVIDUAL, STATE CITIZENSHIP

(b) AGE

7. DESCRIBE PURPOSE FOR WHICH SOURCE MATERIAL WILL BE USED
Thorium Ore processing

2

Docket No. 40-86
Tech No. T01
Docketed SEP 21 1967 [initials]

8. STATE THE TYPE OR TYPES, CHEMICAL FORM OR FORMS, AND QUANTITIES OF SOURCE MATERIAL YOU PROPOSE TO RECEIVE, POSSESS, USE, OR TRANSFER UNDER THE LICENSE

(*a*) TYPE	(*b*) CHEMICAL FORM	(*c*) PHYSICAL FORM (*Including % U or Th.*)	(*d*) MAXIMUM AMOUNT AT ANY ONE TIME (*in pounds*)
NATURAL URANIUM			
URANIUM DEPLETED IN THE U-235 ISOTOPE			
THORIUM (ISOTOPE)	Insoluble salts	Monazite, Thorite, etc. up to 20% ThO_2	Unlimited requested

(*e*) MAXIMUM TOTAL QUANTITY OF SOURCE MATERIAL YOU WILL HAVE ON HAND AT ANY TIME (*in pounds*)
Requesting "Unlimited" per previous license dated 11/22/61

9. DESCRIBE THE CHEMICAL, PHYSICAL, METALLURGICAL, OR NUCLEAR PROCESS OR PROCESSES IN WHICH THE SOURCE MATERIAL WILL BE USED, INDICATING THE MAXIMUM AMOUNT OF SOURCE MATERIAL INVOLVED IN EACH PROCESS AT ANY ONE TIME, AND PROVIDING A THOROUGH EVALUATION OF THE POTENTIAL RADIATION HAZARDS ASSOCIATED WITH EACH STEP OF THOSE PROCESSES.
See our application dated 2/11/60, and the amendments thereto dated 4/11,6/20 and 7/29/1960, 7/3,7/4,and 5/2/61, except to the extent that the application refers to superseded provisions of the Commissions Regulation 10CFR20. See also our letter to AEC dated 7/3/61, re: incineration of source material

10. DESCRIBE THE MINIMUM TECHNICAL QUALIFICATIONS INCLUDING TRAINING AND EXPERIENCE THAT WILL BE REQUIRED OF APPLICANT'S SUPERVISORY PERSONNEL INCLUDING PERSON RESPONSIBLE FOR RADIATION SAFETY PROGRAM (OR OF APPLICANT IF APPLICANT IS AN INDIVIDUAL).
See our letter to division of Licensing and Regulations dated 4/11 and 7/13/60, plus attachments.
See previous AEC License STA-422 dated 11/22/61 and AEC letter dated 11/22/61, Docket No. 40-86

11. DESCRIBE THE EQUIPMENT AND FACILITIES WHICH WILL BE USED TO PROTECT HEALTH AND MINIMIZE DANGER TO LIFE OR PROPERTY AND RELATE THE USE OF THE EQUIPMENT AND FACILITIES TO THE OPERATIONS LISTED IN ITEM 9; INCLUDE: (a) RADIATION DETECTION AND RELATED INSTRUMENTS (including film badges, dosimeters, counters, air sampling, and other survey equipment as appropriate. The description of radiation detection instruments should include the instrument characteristics such as type of radiation detected, window thickness, and the range(s) of each instrument).

See 9 and 10 above

(*b*) METHOD, FREQUENCY, AND STANDARDS USED IN CALIBRATING INSTRUMENTS LISTED IN (*a*) ABOVE, INCLUDING AIR SAMPLING EQUIPMENT (for film badges, specify method of calibrating and processing, or name supplier).

See 9 and 10 above

2421

-16

ITEM # 335

B|333

11(c). VENTILATION EQUIPMENT WHICH WILL BE USED IN OPERATIONS WHICH PRODUCE DUST, FUMES, MISTS, OR GASES, INCLUDING PLAN VIEW SHOWING TYPE AND LOCATION OF HOOD AND FILTERS, MINIMUM VELOCITIES MAINTAINED AT HOOD OPENINGS AND PROCEDURES FOR TESTING SUCH EQUIPMENT.

See 9 and 10 above

12. DESCRIBE PROPOSED PROCEDURES TO PROTECT HEALTH AND MINIMIZE DANGER TO LIFE AND PROPERTY AND RELATE THESE PROCEDURES TO THE OPERATIONS LISTED IN ITEM 9; INCLUDE: (a) SAFETY FEATURES AND PROCEDURES TO AVOID NONNUCLEAR ACCIDENTS, SUCH AS FIRE, EXPLOSION, ETC., IN SOURCE MATERIAL STORAGE AND PROCESSING AREAS.

See 9 and 10 above

(b) EMERGENCY PROCEDURES IN THE EVENT OF ACCIDENTS WHICH MIGHT INVOLVE SOURCE MATERIAL.

See 9 and 10 above

(c) DETAILED DESCRIPTION OF RADIATION SURVEY PROGRAM AND PROCEDURES.

See 9 and 10 above

13. WASTE PRODUCTS: *If none will be generated, state "None" opposite (a), below. If waste products will be generated, check here* ☐ *and explain on a supplemental sheet:*

(a) Quantity and type of radioactive waste that will be generated. **See 9 and 10 above**

(b) Detailed procedures for waste disposal.

14. IF PRODUCTS FOR DISTRIBUTION TO THE GENERAL PUBLIC UNDER AN EXEMPTION CONTAINED IN 10 CFR 40 ARE TO BE MANUFACTURED, USE A SUPPLEMENTAL SHEET TO FURNISH A DETAILED DESCRIPTION OF THE PRODUCT, INCLUDING:

(a) PERCENT SOURCE MATERIAL IN THE PRODUCT AND ITS LOCATION IN THE PRODUCT.

(b) PHYSICAL DESCRIPTION OF THE PRODUCT INCLUDING CHARACTERISTICS, IF ANY, THAT WILL PREVENT INHALATION OR INGESTION OF SOURCE MATERIAL THAT MIGHT BE SEPARATED FROM THE PRODUCT.

(c) BETA AND BETA PLUS GAMMA RADIATION LEVELS (*Specify instrument used, date of calibration and calibration technique used*) AT THE SURFACE OF THE PRODUCT AND AT 12 INCHES.

(d) METHOD OF ASSURING THAT SOURCE MATERIAL CANNOT BE DISASSOCIATED FROM THE MANUFACTURED PRODUCT.

CERTIFICATE

(*This item must be completed by applicant*)

15. *The applicant, and any official executing this certificate on behalf of the applicant named in Item 2, certify that this application is prepared in conformity with Title 10, Code of Federal Regulations, Part 40, and that all information contained herein, including any supplements attached hereto, is true and correct to the best of our knowledge and belief.*

W. R. Grace & Co.
Davison Chemical Division

(*Applicant named in Item 2*)

Dated **9/19/67**

BY: H. J. Sweitzer
Hugh J. Sweitzer
(*Print or type name under signature*)

Plant Manager

(*Title of certifying official authorized to act on behalf of the applicant*)

WARNING: 18 U.S.C. Section 1001; Act of June 25, 1948; 62 Stat. 749; makes it a criminal offense to make a willfully false statement or representation to any department or agency of the United States as to any matter within its jurisdiction.

U.S. GOVERNMENT PRINTING OFFICE: 1964—O-706-977 817—427—2

Form Approved: Budget Bureau No. 41-R1398.2 - Modèle approuvé; Bureau du Budget No. 41-R1398.2

Form FC-826 (10-24-55)

UNITED STATES OF AMERICA (ETATS-UNIS D'AMERIQUE)
DEPARTMENT OF COMMERCE (MINISTERE DU COMMERCE)
BUREAU OF FOREIGN COMMERCE (BUREAU DU COMMERCE EXTERIEUR)

IMPORT CERTIFICATE
(CERTIFICAT D'IMPORTATION)

(Declaration of Destination on Selected U. S. Imports)
(Déclaration de Destination concernant l'importation aux Etats-Unis de certains Produits selectionnés)

FOR OFFICIAL USE ONLY
(Réservé au service administratif)

Import Certificate No.(Certificat d'importation No.) NY31641 WG

Not valid unless official seal of Department of Commerce appears in this space. (Non valide a moins qu'un sceau officiel du Departement du Commerce ne soit appose dans cet espace.)

NOTE

Read instructions on the reverse side before completing and submitting this form. (Lire les instructions au verso avant de remplir et de présenter la présente formule.)

This certificate not acceptable to the Foreign Government unless presented within ~~90 days~~ from date of certification by Department of Commerce official. (Le present certificat ne sera pas accepte par le gouvernement etranger interesse a moins d'etre presente dans les ~~90 jours~~ qui suivront la date de la certification donnee par le fonctionnaire competent du Ministere du Commerce.)

1. Name of U. S. importer or principal in the transaction

Address (Street, City, Zone, State)
W. R. Grace & Company
P. O. Box 188
Pompton Plains, N. J. 07444

(Nom de l'importateur ou du commettant des Etats-Unis figurant dans la transaction)

2. Foreign exporter's name and address (Nom et adresse de l'exportateur étranger)
Th. Goldschmidt A.G.
Postfach 17
Essen 1, W Germany

3. Country of exportation (Pays d'exportation)
WEST Germany

4. Commodities to be imported (Produits devant être importés)

Quantity (Quantité) (a)	Commodity description (See Special Instructions for Item 4) Description des produits (Consultez les instructions speciales pour question 4) (b)	~~Schedule A number (Numéro de la liste A)~~ U.S.I.D. ANNO. (c)	Total price and point of delivery (Prix total et lieu de livraison) (d)
		U.S.I.D. ANNO. NUMBER	
21 metric tons	Monazite Sand	6014500	$3675.00 FOB Rotterdam
OK Cell 11/16/67	A.E.C. License No. STA-422 5		

5. Representation and undertaking of U. S. importer or principal

The undersigned hereby represents that he has undertaken to import into the United States of America under a U. S. Consumption Entry or U. S. Warehouse Entry the commodities in quantities described above, or, if the commodities are not so imported into the United States of America, that he will not divert, transship, or reexport them to another destination except with explicit approval of the Bureau of Foreign Commerce. The undersigned also undertakes to notify the U. S. Department of Commerce immediately of any changes of fact or intention set forth herein. If a delivery verification is required, the undersigned also undertakes to obtain such verification and make disposition of it in accordance with such requirement.

Déclaration et engagement de l'importateur ou du commettant des Etats-Unis

Le soussigné déclare par les présentes qu'il a pris l'engagement d'importer aux Etats-Unis d'Amérique, en vertu d'une Déclaration américaine de Mise en Consommation, ou d'une Déclaration américaine d'Entrée en entrepôt, la quantité de produits ci-dessus, et que, dans le cas où ces produits ne seraient pas ainsi importés aux Etats-Unis d'Amérique, il ne les détournera, ne les transbordera, ni ne les réexportera à destination d'un autre lieu, si ce n'est avec l'approbation formelle du Bureau of Foreign Commerce. Le soussigné prend également l'engagement d'aviser le Ministère du Commerce des Etats-Unis de tous changements survenus quant aux faits ou à l'intention énoncés dans la présente déclaration. Si demande est faite d'une confirmation de la livraison, le soussigné prend également l'engagement d'obtenir cette confirmation et d'en disposer de la manière prescrite par cette demande.

Type or Print (Prière d'écrire à la machine ou en caractères d'imprimerie) W. R. Grace & Co.
Name of Firm or Corporation (Nom de la Firme ou de la Société)

Type or Print (Prière d'écrire à la machine ou en caractères d'imprimerie) Manager - Rare Earths
Name and Title of Authorized Official (Nom et titre de l'agent ou employé autorisé)

[signature]
Signature of Authorized Official (Signature de l'agent ou employé autorisé)

9/25/67
Date of Signature (Date de la signature)

B1334

FOR OFFICIAL USE ONLY (Réservé au service administratif)

Certification: This is to certify that the above declaration was made to the U. S. Department of Commerce through the undersigned designated official thereof and that a copy of this certificate is placed in the official files.

Certification: Il est certifié par les présentes que la déclaration ci-dessus a été faite au Ministère du Commerce des Etats-Unis par l'intermédiaire du fonctionnaire compétent soussigné de ce Ministère et qu'une copie de ce certificat a été placée dans les archives officielles.

SEP 26 1967
Date (Date)

L. Giordano
Designated Commerce Official (Fonctionnaire compétent du Ministère du Commerce)

QUADRUPLICATE COPY

Comm-DC 36956

ITEM # 336

INSTRUCTIONS

GENERAL

Submit this form in triplicate (3) (in quadruplicate (4) for commodities classified as "source material," "special nuclear material," or "facilities for the production or utilization of special nuclear material," as defined and described in the Atomic Energy Act of 1954, and regulations of the Atomic Energy Commission). The fourth copy of this form should be retained for record purposes, and when the original is signed and numbered by the designated Commerce Official, the Import Certificate Number should be entered on the fourth copy. This will facilitate entering the correct Import Certificate Number on a delivery verification if a delivery verification is requested by the foreign exporter. (If the form is required to be submitted in quadruplicate, a separate blank form should be used to provide a record copy.)

Blank forms are obtainable at any Department of Commerce Field Office or from the Bureau of Foreign Commerce, Washington 25, D. C. The completed form may be submitted for certification and validation to the Operations Division, Bureau of Foreign Commerce, Washington 25, D.C., or to one of the following listed Field Offices of the Department of Commerce:

Boston	Houston	Pittsburgh
Buffalo	Jacksonville	Portland
Chicago	Los Angeles	San Francisco
Cincinnati	Miami	Savannah
Cleveland	New Orleans	Seattle
Dallas	New York	
Detroit	Philadelphia	

In the case of items enumerated in the United States Munitions List (22 Code of Federal Regulations 74) covering arms, ammunition, and implements of war, communicate with the Office of Munitions Control, Department of State.

SPECIFIC

Item 1 - The full name of the U. S. importer or U. S. principal in the transaction must be shown. (The U. S. principal in the transaction is that person subject to the jurisdiction of the U. S. who is in a position to make the representations and undertakings set forth in Item 5.)

Item 2 - Name and full address of foreign exporter must be shown.

Item 3 - By "country of exportation" is meant the country that will issue the export license or other authorization for exportation.

Item 4 - Number and unit of quantity must be shown in accordance with Schedule A,* and/or in normal commercial terms. Commodity description must be shown in normal commercial terms and should include composition, type, size, gauge, grade, horsepower, manufacturer's name, serial number, as well as brand or trade names, catalog numbers, or other trade characteristics which will aid in exact recognition of commodities. Indicate status of equipment or material such as new or used. The total price must be shown in the customary form such as f.o.b. (factory), f.a.s. (named port), c.i.f., or other form.

Item 5 - Where the representation is made that the commodities will be brought into the United States under a U. S. Consumption or Warehouse Entry, the temporary unlading of goods in a foreign trade zone which are intended for subsequent entry into the economy of the United States is not precluded. The U. S. Department of Commerce shall be notified immediately of any changes of fact or intention set forth on this form. Such notification shall be in writing and should include the Import Certificate Number. There must be shown the name of firm or corporation on whose behalf this document is filed. If signed by an agent of the importer, such agency must be indicated in the space marked "Type or Print Name and Title of Authorized Official."

Where the commodities are not imported into the U.S. under such Customs entries, permission to divert, transship or reexport the commodities must be obtained from the Department of Commerce.

*Schedule A, Statistical Classification of Commodities Imported into the United States, for sale by the Superintendent of Documents, United States Government Printing Office, Washington 25, D. C.

PENALTIES FOR FALSE STATEMENTS

The U.S. Code, Title 18 (Crimes and Criminal Procedure), Section 1001, formerly Section 80, makes it a criminal offense to make a wilfully false statement or representation to any department or agency of the United States as to any matter within its jurisdiction. Maximum penalties under this provision are $10,000 fine or imprisonment for 5 years or both.

Any person who causes or attempts to cause diversion, transshipment, or reexportation of commodities contrary to his representations made on the Import Certificate, is subject to administrative action which may result in disqualification from eligibility to obtain a certified Import Certificate from the Department of Commerce; in suspension, revocation, and denial of export privileges under the Export Control Act; and in exclusion from practice before the Bureau of Foreign Commerce.

REGULATIONS COVERING USE OF THIS FORM

The United States regulation covering 'Mutual Assistance on U. S. Imports and Exports (As Applied to Selected U. S. Imports)' is set forth in Part 368 of the Comprehensive Export Schedule, which is available for reference at any Department of Commerce Field Office. In addition, a reprint of the regulations may be obtained, free of charge, from any of these offices or from the Department of Commerce, Washington, D. C.

. .m Approved: Budget Bureau No. 41-R1398.2 - Modèle app. Bureau du Budget No. 41-R1398.2

orm FC-926 (10-24-55)

UNITED STATE[S] [OF AME]RICA (ETATS-UNIS D'AMERIQUE)
DEPARTMENT [OF CO]MMERCE (MINISTERE DU COMMERCE)
BUREAU OF FOREIGN COMMERCE (BUREAU DU COMMERCE EXTERIEUR)

[F]OR OFFICIAL USE ONLY
(Réser[v]é au service administratif)

IMPORT CERTIFICATE
(CERTIFICAT D'IMPORTATION)

(Declaration of Destination on Selected U. S. Imports)
(Déclaration de Destination concernant l'importation aux Etats-Unis de certains Produits selectionnés)

Import Certificate No.(Certificat d'importation No.)
NY31856 MA

Not valid unless official seal of Department of Commerce appears in this space. (Non valide a moins qu'un sceau officiel du Departement du Commerce ne soit appose dans cet espace.)

NOTE

Read instructions on the reverse side before completing and submitting this form. (Lire les instructions au verso avant de remplir et de présenter la présente formule.) 6 months
This certificate not acceptable to the Foreign Government unless presented within 90 days from date of certification by Department of Commerce official. (Le present certificat ne sera pas accepte par le gouvernement etranger interesse a moins d'etre presente dans les [6 mois] qui suivront la date de la certification donnée par le fonctionnaire competent du Ministere du Commerce.)

1. Name of U. S. importer or principal in the transaction
Address (Street, City, Zone, State)
PHILIPP BROTHERS Division of
Engelhard Minerals & Chemicals Corp
299 Park Avenue
New York, New York 10017
(Nom de l'importateur ou du commettant des Etats-Unis figurant dans la transaction)

2. Foreign exporter's name and address (Nom et adresse de l'exportateur etranger)
Malex Corp. Ltd.
2 Weld Road
Kuala Lumpur, Malaysia

3. Country of exportation (Pays d'exportation)
MALAYSIA

4. Commodities to be imported (Produits devant être importés)

Quantity (Quantité) (a)	Commodity description (See Special Instructions for Item 4) Description des produits (Consultez les instructions speciales pour question 4) (b)	Schedule A number (Numéro de la liste A) (c)	Total price and point of delivery (Prix total et lieu de livraison) (d)
220 Metric Tons	MALAYSIAN MONAZITE SAND This Import Certificate replaces Import Certificate No. NY31801MK dated Nov. 7, 1967 which is considered cancelled. E.A. Norbone 11/24/67	U.S.I.D. #601.4500	$33,000.00 CIF CHARLESTON S. C.

5. Representation and undertaking of U. S. importer or principal
The undersigned hereby represents that he has undertaken to import into the United States of America under a U. S. Consumption Entry or U. S. Warehouse Entry the commodities in quantities described above, or, if the commodities are not so imported into the United States of America, that he will not divert, transship, or reexport them to another destination except with explicit approval of the Bureau of Foreign Commerce. The undersigned also undertakes to notify the U. S. Department of Commerce immediately of any changes of fact or intention set forth herein. If a delivery verification is required, the undersigned also undertakes to obtain such verification and make disposition of it in accordance with such requirement.

Déclaration et engagement de l'importateur ou du commettant des Etats-Unis
Le soussigné déclare par les présentes qu'il a pris l'engagement d'importer aux Etats-Unis d'Amérique, en vertu d'une Déclaration américaine de Mise en Consommation, ou d'une Déclaration américaine d'Entrée en entrepôt, la quantité de produits ci-dessus, et que, dans le cas où ces produits ne seraient pas ainsi importés aux Etats-Unis d'Amérique, il ne les détournera, ne les transbordera, ni ne les réexportera à destination d'un autre lieu, si ce n'est avec l'approbation formelle du Bureau of Foreign Commerce. Le soussigné prend également l'engagement d'aviser le Ministère du Commerce des Etats-Unis de tous changements survenus quant aux faits ou à l'intention énoncés dans la présente déclaration. Si demande est faite d'une confirmation de la livraison, le soussigné prend également l'engagement d'obtenir cette confirmation et d'en disposer de la manière prescrite par cette demande.

Type or Print (Prière d'écrire à la machine ou en caractères d'imprimerie)
PHILIPP BROTHERS Division of
Engelhard Minerals &
Chemicals Corporation
Name of Firm or Corporation (Nom de la Firme ou de la Société)

Type or Print (Prière d'écrire à la machine ou en caractères d'imprimerie)
M. Feingold
Assistant Traffic Manager /ck
Name and Title of Authorized Official (Nom et titre de l'agent ou employé autorisé)

Signature of Authorized Official (Signature de l'agent ou employé autorisé)

November 6, 1967
Date of Signature (Date de la signature)

FOR OFFICIAL USE ONLY (Réservé au service administratif)

Certification: This is to certify that the above declaration was made to the U. S. Department of Commerce through the undersigned designated official thereof and that a copy of this certificate is placed in the official files.

Certification: Il est certifié par les présentes que la déclaration ci-dessus a été faite au Ministère du Commerce des Etats-Unis par l'intermédiaire du fonctionnaire compétent soussigné de ce Ministère et qu'une copie de ce certificat a été placée dans les archives officielles.

NOV 2 4 1967
Date (Date)

Elena A Norbone
Designated Commerce Official (Fonctionnaire compétent du Ministère du Commerce)

QUADRUPLICATE COPY

Comm-DC 36956

COPY COPY

EXHIBIT B

January 6, 1959

R. M. Mandle

FILES

Survey of Plant for St. John X-Ray Lab

Monazite Storage area	2-10 mr/hr
Ball Mill area	1 mr/hr
Monazite transfer drums	3 mr/hr
Centrifuge and Press #5	1-2 mr/hr
Barrels stored by tank #31	1-2 mr/hr
Crystal Dissolve Tank	1 mr/hr
Tank #1	1 mr/hr
Tank #2	1 mr/hr
Tank #3	0.5-1mr/hr
Tank #4-5	0.1-0.2 mr/hr
Packing room	0.2-0.3 mr/hr
WTP near Press	0.5 mr/hr

Dr. Isenberger - Califon 49

Badges - 150 for $85.00 - Send holders and film. Enter numbers on reports and return them to St. John. They process and notify. We keep film and reports.

New AEC regulations require a 13 week accumulation - Mr. Isenberger suggests we purchase and load two films and keep one of them in for 13 week period.

Holders $1.50 each.

R.M.M.

MCB:l

COPY COPY

EXHIBIT C

Survey of Plant
(New batteries installed in Geiger Counter)

Control Lab	0.15
Sample-Thorite	6
Sample - Indian Sand	2.5
Sample - Idaho Sand	1.0
Area between office and lab	0.15
Background in front of plant	0.1 - 0.3
Sump in front Th shed	0.5
Barrels along fence	3.5 - 5
Barrels near Milling Bldg.	3.5 - 5
Monazite Storage	6
$Th(OH)_4$ under Whittney Press	8

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555

301-492-7000

John K
I phoned Crow 8/24 + gave our approval options. J

FACSIMILE SERVICE REQUEST

DATE ______

MESSAGE TO: 1. Faith Brenneman + 2. James Joyner

TELECOPY NUMBER: ______

AUTOMATIC: YES NO

VERIFICATION NUMBER: ______

NO. OF PAGES ______ PLUS INSTRUCTION SHEET RETURN COPIES YES ( ) NO ( )

STATE & CITY: ______

MESSAGE FROM: ______

TELECOPY NUMBER 301-427-4298 RAPIFAX AUTOMATIC

301-427-4403 3M VRC AUTOMATIC

VERIFICATION NUMBER: 301-427-4287 ROOM #100

BUILDING ______ OFFICE PHONE ______ MAIL STOP ______

CLASS OF SERVICE ______ OVERNIGHT ______ 4 HOUR ______ 2 HOUR

______ 1 HOUR ______ IMMEDIATE

SPECIAL INSTRUCTION:

Received/Time/Date	Transmitted/Time/Date
8/8 3:35	B/335 ITEM # 593

3

The Honorable Marilyn L. Bouquard
U. S. House of Representatives
Washington, D.C. 20515

Dear Congresswoman Bouquard:

I am pleased to respond to your and Congressman Roe's letter of August 10, 1982, to Chairman Palladino regarding an expanded radiation survey of the Wayne Township area. The Department of Energy (DOE) has agreed to consider the W. R. Grace/Rare Earths, Inc., site for inclusion in their Formerly Utilitized Action Program (see attached letter). Also, my staff informs me that Dr. Mott of DOE met with Congressman Roe on August 18, 1982, and that he agreed to perform the requested expanded survey within three to four weeks.

If I can be of any further assistance to you in this matter, please feel free to call.

Sincerely,

William J. Dircks
Executive Director for Operations

Enclosure: Ltr from
W. E. Mott to R. G. Page
dtd 6/21/82

cc: Dr. W. E. Mott

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SECY (3)	

RI *	RI*
FBrenneman	JKinneman
8/20/82	8/20/82

*See previous concurrence copy

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The Honorable Robert A. Roe
U. S. House of Representatives
Washington, D.C. 20515

Dear Congressman Roe:

I am pleased to respond to your and Congresswoman Bouquard's letter of August 10, 1982, to Chairman Palladino regarding an expanded radiation survey of the Wayne Township area. The Department of Energy (DOE) has agreed to consider the W. R. Grace/Rare Earths, Inc., site for inclusion in their Formerly Utilitized Action Program (see attached letter). Also, my staff informs me that Dr. Mott of DOE met with you on August 10, 1982, and that he agreed to perform the requested expanded survey within three to four weeks.

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GCunningham, EDD	JKinneman, RI	RI*	RI*
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EDO R/F		8/20/82	8/20/82
SECY (3)			

*See previous concurrence copy

FCUP*	FCUF*	FC *	FC*	NMSS*	NMSSS	EDO
WTCrow/al	RGPage	DRChapell	RECunningham	DMausshardt	MDGDavis	WJDircks
8/20/82	8/20/82	8/20/82	8/20/82	8/23/82	8/ /82	8/ /82

UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

IN REPLY REFER TO:
DML:CEF
40-86

OCT 6 1967

10/6/1967

W. R. Grace & Company
Davison Chemical Division
Pompton Plains, New Jersey 07444

Attention: Mr. Hugh J. Sweitzer
Plant Manager

Gentlemen:

This refers to your application dated September 19, 1967, requesting renewal of Source Material License No. STA-422.

Your initial application for a source material license was filed more than six years ago and during this time there have been considerable correspondence and amendments pertaining to the license. Therefore, we are requesting that a new application, complete in itself, without reference to previous applications, be submitted within thirty (30) days from the date of this letter on the enclosed Form AEC-2 in accordance with the instructions provided with the form. We believe that the submission of such a consolidated application will enable the Commission staff to evaluate it and subsequent amendments more expeditiously. Also, since the application becomes a condition of the license, such a consolidated application will facilitate an understanding of the terms and conditions of the license.

Your renewal application was filed thirty (30) days prior to the expiration date of the license. Accordingly, pursuant to Section 40.43 of 10 CFR 40, your license shall not expire until your renewal application has been finally determined by the Commission.

Very truly yours,

Don F. Harmon
Source & Special Nuclear Materials Branch
Division of Materials Licensing

DISTRIBUTION:
Document Room
Compliance, Reg. 1
Subject file
Br. reading file
Div. reading file

Enclosure:
Form AEC-2

B/326

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ITEM # 338

DOCKET NO. 40-86

For Div. of Compliance

GRACE

CHEMICALS DIVISION
RARE EARTHS

W. R. GRACE & CO.
DAVISON CHEMICAL DIVISION
BALTIMORE, MD.

Reg I

Reply to:
P. O. BOX 188
POMPTON PLAINS
NEW JERSEY 07444
835-3060

2

Nov. 3, 1967

Mr. Don F. Harmon
Source & Special Nuclear Materials Branch
Division of Materials Licensing
4915 St. Elmo Ave.
Bethesda, Md.

Dear Sir;

In reference to DML:CEM, we request that the enclosed process discription relating to the break-up of monazite sands be treated as company confidential material and that this process discription be withheld from the Commissions public document room.

Thanking you for your consideration in this matter;

Soncerely;

Hugh J. Sweitzer

NOV 6 1967

B/337

ITEM # 339

10. In order to insure continued compliance with Part 20, Title 10, Mr. Peter Garino, a graduate chemist, is responsible for health and safety at the Pompton Plains plant.

Mr. Don Hubbard will serve as a consultant and advise Mr. Garino regarding the necessary radiation protection program at Pompton Plains. Mr. Hubbard has been actively associated with radiation protection since 1949. After serving from 1949 to 1957 as Health Physicist for Union Carbide Nuclear Co. at the Oak Ridge National Laboratory, he became a Radiation Specialist with the AEC Inspection Division at Oak Ridge. Since 1959 he has been associated with the Davison Chemical Division, W. R. Grace & Co.

In addition, Controls for Radiation, Inc., Cambridge, Massachusetts has been retained to carry out certain tests and to assist generally with implementing the radiation protection program.

11 through 13 - See attached Health Physics Manual

14. Rare Earth compounds containing less than 0.25% Th as impurity.

GRACE

W. R. GRACE & CO.
DAVISON CHEMICAL DIVISION
BALTIMORE, MD.

CHEMICALS DIVISION
RARE EARTHS

February 13, 1968

Reply to:
P. O. BOX 188
POMPTON PLAINS
NEW JERSEY 07444
835-3060

DOCKET NO. 40-86

Mr. D. F. Harmon
U.S. Atomic Energy Commission
4915 St. Elmo Avenue
Bethesda, Maryland

For Div. of Compliance

Dear Mr. Harmon:

With reference to DML:CEM, 40-86 and subsequest telephone comversation, we are enclosing a process description which describes our process and is suitable for filing in the public document room.

We are also enclosing two additional copies of our health physics manual.

Sincerely,

Peter J. Garino

Peter J. Garino

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PJG:db

FEB 14 1968
U.S. ATOMIC ENERGY COMMISSION

B/328

ITEM # 340

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84

DOCKET NO. 40-86

W. R. GRACE & CO.

Process for Breaking Monazite Sands Into Rare Earth and Thorium Compounds

Monazite sands are essentially an orthophosphate of rare earths and thorium. The sands vary in composition according to the locality of origin and method of concentration. The monazite occurs as crystalline occlusions in pegmatites of parent rock, and is normally associated with other heavy minerals such as ilmenite, rutile, zircon and garnet.

A chemical separation process is used to break the monazite and produce rare earth fractions relatively free from thorium, and a thorium fraction relatively free of rare earths.

<u>FIRST OPERATION Digestion of the Monazite</u> (Sulfonation Reaction)

The first operation of the process involves digestion of the finely ground monazite sands with hot concentrated sulphuric acid. The rate of the reaction of the monazite sand with the sulfuric acid, or sulfonation, increases with finer particle size of the monazite sand and higher reaction temperatures. The reaction starts as a fluid mixture of the two components. As the reaction proceeds it gradually becomes more viscous and finally putty-like due to the formation of voluminous anhydrous rare earth sulfate crystals. The phosphate content of the monazite goes into solution as phosphoric acid. Further agitation will cause sufficient thinning of the mixture to allow discharge from the cast iron reactor. The reaction may be considered complete at the end of four to six hours.

<u>SECOND OPERATION</u>

The second operation involves the crude separation of the thorium sulfate from the rare earth sulfate. At the end of the sulfonation reaction, the hot charge is quenched in a tank containing water and wash streams from subsequent process steps. The wash streams contain sufficient water to dilute the free acid in the sulfonation and also provide water hydration for rare earth sulfates from the sulfonation.

The hydrated rare earth sulfates are pumped through a filter press to remove the sulfuric acid.

THIRD OPERATION Rare Earth Removal from Acid Streams

The thorium-rich acid liquors, or top acid, contain a small quantity of the original rare earths contained in the monazite. These rare earths are stripped from the acid by the addition of sodium sulfate which forms insoluble acid rare earth double salt. This double salt contains some occluded thorium and, therefore, must be processed to properly distribute the rare earth and thorium values. The double salt is separated from the acid liquor, then called stripped acid, by means of a drum filter. The acid rare earth double salt is converted to water insoluble rare earth hydroxide by treating it with boiling caustic soda. The caustic soda and soluble salts are removed by hot water washes and the thickened rare earth hydroxide is then mixed with the filtered rare earth sulfate in operation isx.

FOURTH OPERATION Thorium Separation from the Acid Stream

The thorium is removed from the stripped acid by addition of either sodium fluoride or hydrofluoric acid which causes insoluble thorium fluoride to precipitate from the acid. The thorium fluoride is separated from the acid and the acid is saved for disposal. The thorium fluoride is then water washed in the Shriver thickener. The washed product is then dried and packed as thorium fluoride product.

FIFTH OPERATION

The hydrated rare earth sulfates (Operation 2) are filtered and counter-concurrently washed with the rare earth process wash liquors before these liquors are sent to the quench tank. This operation serves to remove the bulk of the phosphoric acid and sulphuric acid from the rare earth sulfates so that in operation six they contain a minimum acid contamination, since acid interferes with the thorium separation.

SIX OPERATION Removal of Thorium from Rare Earths

The thickened rare earth hydroxide from operation 3 is mixed with the soluble rare earth sulfates from operation 5 and filtrate from operation 8. The rare earth values go into solution as neutral rare earth sulfates and the gangue and thorium remain soluble as thorium phosphate. Complete removal of thorium from the rare earths is accomplished by maintaining the pH of this solution at 5.5. The phosphate cake is removed by filtration and the polished rare earth liquors are sent to the second precipitation tank (operation 8).

Process...(Continued)

SEVENTH OPERATION Recovery of Thorium and Rare Earths from Gangue

The thorium phosphate cake in operation six is combined with the gangue from the precoat drum filter in operation two and is countercurrently treated with a dilute sulphuric acid solution to solubilize the rare earth and thorium values leaving insoluble residues. These residues are of two types; one consisting of heavy minerals and unreacted monazite; the other consisting of finely divided silica, calcium sulfate, filter-aid, etc. The heavy minerals and monazite are recovered as the underflow of a cyclone classifier and the finely divided material is removed by filtration and after washing is sent to the dump. The acidified rare earth and thorium liquors are recycled as washes through the crude rare earth filter to the sulfonator quench tanks.

EIGHTH OPERATION Formation of Rare Earth Double Sulfate

In the double sulfate precipitation tank, neutral rare earth sulfate liquors from operation six are treated with sodium sulfate to form rare earth double sulfates. This salt forms as a dense precipitate and is removed from the slurry by settling and filtration. The filtrate is collected and treated with soda ash to pH eight, which causes the soluble yttrium earths to precipitate. The yttrium earths are filtered and stored, the filtrate from the operation goes to the plant waste.

Exposure Evaluation

Since this is a batch type operation, the maximum amount of source material present at any step in the process is determined by the percentage of naturallyoccuring thorium in the monazite sand. Because of the low percentage of radioactive material to the total mass of the batch and the nature of this material, the maximum radiation levels are such that an employee would not receive an exposure in excess of the limits set forth in Title 10, Part 20, par. 20.101 during the regular course of his work activity.

HEALTH PHYSICS MANUAL

W. R. GRACE & CO.

POMPTON PLAINS

NEW JERSEY

JANUARY 1, 1967

PREPARED BY

PETER J. GARINO

TABLE OF CONTENTS

INTRODUCTION

It is important for any organization using radioactive materials to establish a program that will insure the safety of its personnel and the inhabitants of the surrounding area, and compliance with local, state and federal regulations. The Pompton Plains Plant of the Davison Chemical Company has established the radiological safety program described below. Its success depends upon the cooperation of each individual.

The Health-Physics Department has three areas of prime responsibility. They are: the day-to-day evaluation of radiation exposure; the reduction of exposure by any applicable control measures; and, the monitoring of all materials and effluents discharged from the plant site. The fact that all exposure levels are maintained below maximum permissible levels is an indication that the control procedures are working, but since any unwarranted exposure is foolish, the efforts to maintain radiation levels as low as possible in these three areas of responsibility should be paramount.

A prime factor in the control of radiation exposure is the proper training of operating personnel. It is a part of the Health-Physics Department's responsibility to see that every individual knows what he is working with, what the hazards are, and what measures are being taken to insure his safety. The employee must be trained in safe techniques and know what to do in case of accident. Finally he must be made to realize that observance of safety rules and personnel monitoring requirements are just as much a part of the job as the actual operation performed.

Thorium, small amounts of uranium and their compounds occur naturally in monazite or thorite. Chemical separation produces a mixture of thorium ^{232} and thorium ^{288} plus the uranium disintegration products in radioactive equilibrium, and may drive off the active daughter creating an airborne hazard. Thorium decays slowly to form thoron gas which then decays to form stable lead, with the emission of alpha and beta activity.

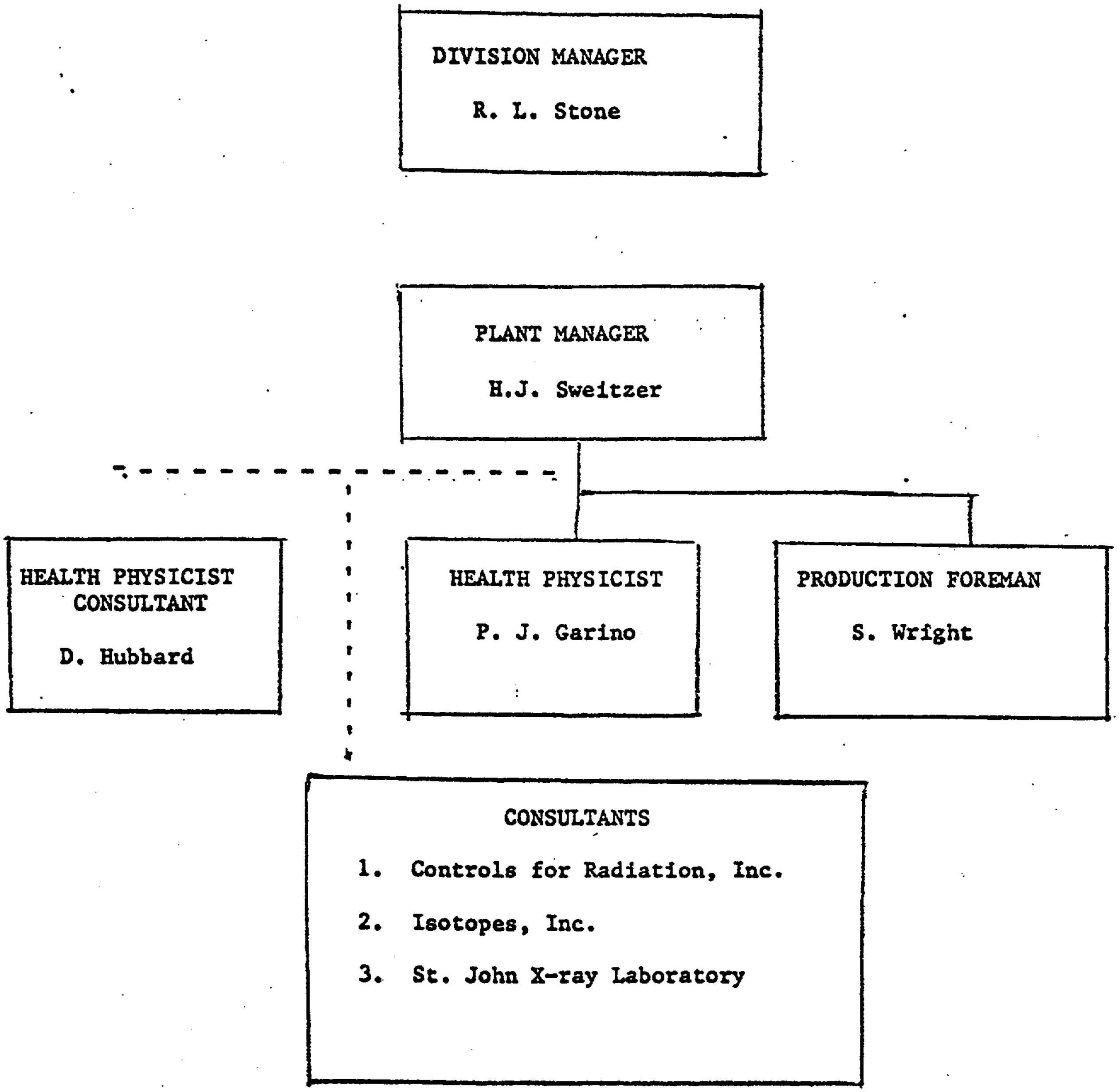
Fifty to seventy-five years of experience in refining thoria from monazite has produced no noticeable evidence of radiation injury or chemical toxicity. Industrial exposure averaged 10^{-10} uc/cc during this period.

Certain recent animal toxicity data indicates radiation dosage from thorium might better be compared to that of plutonium than to uranium. Calculations based on these and other animal data suggest that permissible occupational exposure to thorium should be reduced to 2×10^{-12} uc/cc for 40 hours per week. However, the most recent review on the subject strongly supports the uranium comparison and retention of the present limits. The National Committee on Radiation Protection has recognized this disparity and has proposed 3×10^{-11} uc/cc as a temporary permissible level with the recommendation that exposure levels be kept as low as operationally possible.

This manual contains general safety procedures and rules which must be followed by all employees, methods of analysis, administrative forms, and diagrams of the plant and surrounding area.

The basic purpose of these safety procedures is to prevent entry of radioactive material into the body by ingestion, inhalation, or other modes, to minimize exposure of personnel to external radiation, and to limit the cross contamination of areas and equipment.

RADIOLOGICAL SAFETY ORGANIZATION



DEFINITION OF TERMS

Controlled area
Any area, access to which is controlled by the licensee.

Spreadable activity
Airborne activity or activity on any object which may be transferred to a piece of filter paper which is lightly rubbed on the surface.

Non-spreadable activity
Fixed contamination which cannot be transferred to the smear paper.

Maximum permissable dose (MPD)
That amount of ionizing radiation, which in the light of present knowledge, is not expected to cause appreciable bodily injury to a person at any time during his lifetime.

Maximum permissable concentration(MPC)
In restricted areas this is limited to 3×10^{-11} microcuries per milliliter of air. This is equivalent to ~~110~~ 130 alpha disintegrations per minute per cubic meter of air.

Roentgen
The quantity of X or gamma-radiation such that the associated corpuscular emmission per 0.001293 gram of air (1cc of dry air at standard conditions) produce, in air, ions, carrying one electro-static unit or quantity of electricity of either sign.

Roentgen Equivalent Man (REM)
The amount of ionizing radiation that will produce the same biological effect as that produced by one roentgen of high voltage X radiation.

Radioactivity
Process whereby certain nuclides undergo spontaneous disintegration, liberating energy through alpha or beta particles or gamma Photons or a combination of these.

Radiological Safety Officer (RSO)
A person trained in that branch of radiological science dealing with the protection of personnel from the harmful effects of ionizing radiation.

Definition of Terms

Radioactive Units	-	Measured in disintegrations per unit time or in curies. A commonly used submultiple of the currie is the micro curie (One uc = .000001c = 3.7×10^4 dpr = 2.2×10^6 dpm)
Restricted area	-	An area, access to which is controlled by the licensee
Radiation	-	Any or all of the following: alpha rays, beta rays, gamma rays, X-rays, neutrons, high speed electrons, high speed protons and other atomic particles.

MAXIMUM PERMISSIBLE LEVELS AND CONCENTRATIONS (cont.)

PERMISSIBLE CONCENTRATIONS IN AIR AND WATER ABOVE NATURAL BACKGROUND

MATERIAL	TABLE I [a]		TABLE II [a]	
	Column 1 Air	Column 2 Water	Column 1 Air	Column 2 Water
Th-natural (soluble)	3×10^{-11}	3×10^{-5}	1.0×10^{-12}	1.0×10^{-6}
Th-natural (unsoluble)	3×10^{-11}	3×10^{-4}	1.0×10^{-12}	1.0×10^{-5}
U-natural (soluble)	7×10^{-11}	5×10^{-4}	3×10^{-12}	2×10^{-5}
U-natural (unsoluble)	6×10^{-11}	5×10^{-4}	2×10^{-12}	2×10^{-5}

a Table I applies to restricted areas, Table II to unrestricted areas.

The processing of monazite ores results in potential health hazards to both the employees and to the plant community. The control of in-plant hazards require the evaluation of employees' exposures. The sources of the exposures are external radiation from thorium and its daughter products and small amounts of uranium, taken into the body by inhalation or ingestion of airborne activity or surface contamination. To control the potential hazards to the plant community it is necessary to determine and control the quantity of uranium and thorium with its daughter products released from the plant. This includes liquid and gaseous effluents, solid waste material and contamination on material or personnel leaving the plant area.

In the interest of general personal protection, all personnel working in the vicinity of operations in which a potential dust hazard exists are required to wear respirators.

All personnel working in the plant processing areas are required to undergo a clothing change prior to reporting to their work areas. On arrival at the plant, operators enter the clean area (west side of the locker room), undress and place their street clothes in their assigned lockers. They then pass into the process area (east side of the locker room) and put on their process clothing and safety shoes. At the end of their shift, operators return their process clothing to their lockers in the east locker room and pass into the west locker room.

Supervisory personnel and those individuals who have occasion to visit the processing areas are issued smocks and overshoes. These are worn at all times while the individual is in the processing area. They are maintained on hangers immediately adjacent to the chemical control laboratory. Plant visitors follow the same procedure described for supervisory personnel.

Controls have been established to insure that equipment and materials leaving the plant are not significantly contaminated. Prior to the release of any material, written approval must be obtained from the Health Physics office. All radioactive material brought onto the plant site will be monitored by the Health Physics department to insure that maximum permissable concentrations of radioactivity are not exceeded. Records of incoming and outgoing materials are maintained in the office.

RADIATION SURVEYS

1. Air Samples

The extent of airborne contamination in the Rare Earth Processing Plant site is monitored by sampling the air in different parts of the plant with a Staplex Hi-Volume Air Sampler, equipped with a T.F.A. #41 filter, and determining the radioactive content of the dust accumulated on the filter. The procedure employed consists of sampling the air in a particular locality at the rate of 20 cu. ft. per minute for a period of 5 minutes, allowing the collected dust to age 48 hours to permit the decay of radon and thoron, counting the sample in a proportional counter-scaler arrangement and converting the resulting reading to uc/ml.

Air samples are taken by each of two different schemes. In the first instance, each of the positions designated as air sampling stations in exhibit #1 are monitored at least once quarterly while other areas are monitored once every six months. In the second scheme, each operator station is monitored during a period of production. In the latter case a complete survey is conducted in event of a process change. In addition to these two systematic sampling methods, the Health Physicist makes a number of spot checks of the air count when he, during the course of his daily routine health inspection, feels that a particular operation or area requires such attention.

In the event that it is found that the air count in a particular area exceeds the following tolerance limits, the Health Physicist has the authority to cause a cessation of the applicable operation (s) until correctional measures have been taken.

TOLERANCE LIMITS FOR RESTRICTED AREAS

Thorium	3×10^{-11} uc/ml.
Uranium	7×10^{-11} uc/ml

Reports of the surveys of airborne contamination are prepared by the Health Physicist and distributed to the plant manager and department heads.

LOCATIONS OF AIR SAMPLING STATIONS

1. Restricted Areas

   a) Shipping Room - in the center of the room, five feet from the east wall.

   b) Pulverizing Room - in the center of the room.

   c) Calcining Furnace - midway between press number 4 and the furnace.

   d) Thorium Refining - in the hallway near the rear south side entrance.

   e) Thorium Crystallization Unit - in the center of the room.

   f) Process storage - in the center of the room.

   g) Ball Mill - in the center of the room.

   h) Monazite Storage Area - three feet from the center of the south wall.

   i) Lunch Room - in the center of the room.

   j) Thorium Hydroxide Storage - on the south side of barrels.

   k) Development Laboratory - in the center of the room.

   l) Sulfonation Kettle Area - midway along the south wall of the room.

2. Unrestricted Areas

   a) North west corner of property line.

   b) Midway along south property line.

   c) Southwest corner of property line.

2. Liquid Waste - Plant Effluent

The waste treatment plant treats all liquid wastes issuing from the plant. The waste involved consists of wash water, floor washings and surface run-off from the adjacent plant property.

The process involves the use of an average of 18,000 gallons of water per day. All of the washes are discharged into a common 1,000 gallon sump equipped with two automatically controlled force pumps which pump the waste to a retention tank. Each pump has capacity to handle the peak load and is installed so that the second pump starts in case of extreme demand or failure of the first. Signals are installed in a control house to indicate the proper function of the pumps.

The retention tank has a capacity of 50,000 gallons which provides a minimum of 48 hours average retention of the wastes. In addition to the purpose of acting as a reservoir, or constant head installation, the tank provides means of blending effluents of widely varying pH so that the automatic pH controlling equipment may function more efficiently. The incoming wastes flow through a distributing channel in the tank and effluent, after initial settling, is removed from the midpoint of the tank and flows by gravity to a mixing tank. A draw-off is provided at the bottom of the tank to pump accumulated solids to the sludge filter press.

An 8,000 gallon mixing tank, equipped with a gate agitator receives effluent from the retention tank at its midpoint. A pH electrode assembly is in circuit with the mixing tank and electrically connected to a mechanically operated diaphragm valve. Two storage tanks are provided to feed either 50% sulphuric acid or 50% caustic soda solution through the automatic diaphragm valve to the mixing tank as called for by the pH controller. Again signals are

provided to indicate proper functioning of the valve and chemical supply tanks as well as a recording chart which indicates the pH of the mixing tank. The mixing tank effluent is piped to a 2,000 gallon Hardinge thickener at pH 5.8 - 6.2.

The Hardinge thickener provides a clear overflow to a final clarification tank and adjusted to give a 20% solids underflow which is pumped to a sludge filter press in the control house.

The final clarification tank of 50,000 gallon capacity provides an average 48 hours of retention time for the effluent before discharge from the system. The main function of this tank is to provide sufficient time for post precipitation of solids after pH adjustment. A draw off is provided at the bottom of the tank to pump accumulated solids to the sludge filter press.

The sludge filter is of the plate and frame type with a capacity of 6 cubic ft. of cake. Approximately 60 cubic feet of sludges, or 3,500 lbs. are removed weekly. These sludges are hauled to a dump on the property.

The system was designed to operate automatically. Twelve man hours per day are devoted to the maintenance, cleaning and control of the operation. The entire operation is under the supervision of the plant chemist who checks the performance of the equipment, and samples prepared by the shift operator.

A log is maintained which indicates satisfactory operation of the system for pH and turbidity control. The pH of the effluent is maintained between 5.0 and 8.0 according to the permit granted by the New Jersey State Department of Health who have approved the design and mode of operation of the system. We have found through experience that the system operates more satisfactorily at lower pH values since the precipitate formed by neutralization settles more rapidly assuring a clearer effluent.

The effluent is sampled daily at the overflow of the Hardinge thickener and at the Weir in the control house. Sampling at the Hardinge thickener in the system provides an average 48 hour retention time before discharge and will indicate the quality of the effluent entering the final clarification tank. Sampling at the Weir provides a check on the amount of contamination which has settled out of the effluent in the final clarification tank or if there is any additional contamination being added to the effluent through the accumulation of sludges in the clarification tank.

The samples are immediately taken to the laboratory together with the completed "plant effluent form". Upon completion of analysis of the sample the Health Physicist reviews the analytical results and compares them with the maximum permissable concentration. The effluent is then graded according to the following standards:

PLANT EFFLUENT STANDARDS

Grade of Effluent	Sample Position and % Hardinge Overflow		M.P.C. Weir	Disposition
A	33	=	33	Excellent effluent
B	33-66	=	33-66	Satisfactory effluent
C	0-66	=	33-66	Possible contamination from final effluent tank
D	33-66	=	33-66	Indicates buildup of contamination. Notify Plant Manager.
E	66-100	=	66-100	Continued contamination. Notify Plant Manager
E	66-100	=	66-100	Further build up from final effluent tank.
F	66-100	=	66-100	Increasing contamination from plant process. Alert Plant Manager. Additional analysis.

(continued)

Grade of Effluent	Sample Position and % Hardinge Overflow		M.P.C. Weir	Disposition
F	/ 100	=	66-100	Shut down departments discharging effluents.
F	/ 100	=	/ 100	Shut down departments discharging effiuents and hold up effluent.

Copies of analysis of effluent grade D or lower must be immediately presented to the Plant Manager

On the final day of each month the Health Physicist prepares a "Monthly Report of Material Discharged into the Pompton River" in which he presents the high, low and average amounts of process effluent discharged during the preceding month and the high, low and average concentrates expressed as a percentage of the maximum permissible concentration. The original and two copies of the report will be sent to the Plant Manager and one copy retained by the originator.

All effluent and river samples are monitored with a Proportional counter, decade scaler circuit by methods outlined in Appendix B.

RADIATION SURVEYS

3. Personnel Monitoring

All employees who have reason to enter the processing areas are required to wear film badges. These badges, supplied by the St. John X-Ray Laboratory, are read every month and a report of the readings by name and badge number if furnished the health physicist. The health physicist prepares a report of the exposure readings which is sent to the plant manager.

New film badges are issued by the health physics office each week. Film badges are not carried home or left in process areas but are hung in their assigned spaces on film badge racks.

Individual work activities are so scheduled that an operator is not subject to radiation in excess of 1.25 rem/qr. In the event of a reading exceeding 1.25 rem/qr. as shown by a film badge report, the area supervisor is notified, the individual's work program reviewed and the results of the review filed with the weekly film badge report.

4. External Radiation Surveys

A radiological survey of the entire Rare Earths Processing Plant is made by the health physicist quarterly. To facilitate such surveys, the plant has been subdivided into a series of monitoring areas. A diagram of these areas is shown in Exhibit #2 (Appendix). Each area is surveyed carefully and the highest radiation level in the area is recorded. In the event that the radiation level in any part of a given area exceeds 5 mr/hr the portion of the area indicating such a level is posted with a radiation sign. Any area with a radiation level in excess of 10/mr/hr is so enclosed that only limited access to authorized personnel is available.

A report describing the results of each radiological survey is prepared by the health physicist and is forwarded to the plant manager. Such surveys are conducted using a Geiger counter manufactured by the Anton Electronic Laboratories, Inc., Brooklyn, New York, Model #5.

DECONTAMINATION PROCEDURES

Personal decontamination methods to be used are dependent upon the contaminating material and the area of the person contaminated. Generally the following procedure is to be used immediately.

First notify Health Physics; specific measures will then be carried out by this office. Thorough washing with soap and water and then rinsing off with large quantities of water is the best general decontamination method for the hands and other parts of the body. For well localized contamination, however, it is recommended that the area be washed off and cleansed with swabs and later, if necessary, by using a general washing. This avoids the dangerous procedure of spreading the contamination needlessly.

The following specific measures should be followed with the guidance of Health Physics:

(a) For general hand washing: the hands should be washed two to three minutes in tepid water using mild soap. Rinse thoroughly and repeat a maximum of four times. If the required degree of decontamination is not then reached, proceed with (b).

(b) Using a soft brush, wash and rinse three times in 8 minutes of which no less than 6 minutes should be spent in scrubbing. Use only light pressure so as not to abrade the skin. Rinse thoroughly and monitor.

Generally, persons with any wounds or cuts will not be permitted to work in a radioactive area, unless specific approval is obtained from Health Physics. Any wounds, cuts or bruises received while working with, in or near radioactive materials should be flushed with water immediately and must be referred to the Health Physics Department immediately so that more specific measures can be taken.

Equipment may be decontaminated by washing with detergent and water until the desired permissible level of activity is obtained. Other chemicals which may be used include ammonium citrate, trisodium phosphate and ammonium bi-fluoride. Equipment once contaminated, must be treated in the exact same method as other primary radioactive materials. Health Physics will supervise the decontamination of this material and equipment.

Health Physics will also monitor contaminated areas and determine the most practical method decontamination. The method used will include those mentioned under equipment and personal decontamination in addition to washing, surface stripping and repainting.

WASTE DISPOSAL

Waste materials are a natural result of the manufacturing process at the Rare Earth Processing Plant. Procedures have been established to collect, handle and dispose of the material. The general methods of waste disposal are:

(a) Transfer - This must be to an authorized recipient, whether he be a licensee, a commercial disposal facility or the Atomic Energy Commission.

(b) Burial - Is at a minimum depth of four feet, successive burials are separated by distance of at least six feet and not more than twelve burials are made in any year. Finally the total quantity of licensed material buried at any one location and times does not exceed, at the time of burial, 50,000 microcurai of natural thorium or uranium. The contractor or licensee must own the land used for these burials and must limit access to this property to prevent hazard to casual personnel.

(c) Discharge - Concentrations of licensed or other radioactive material released as an effluent into an unrestricted area must not exceed specifications set forth in AEC Regulations Title 10, Part 20. The amendment of a license will be issued if the applicant demonstrates that it is not likely that any individual will be exposed to concentrations in excess of those set forth in the regulation. Concentrations in effluents may be averaged over periods not greater than one year. The established procedure for effluent retention and disposal is outlined under Radiation Surveys, Plant Effluent.

MEDICAL EXAMINATIONS

The Rare Earth Processing Plant has a medical protection program and maintains medical records and radiation exposure records of each employee. This medical program in itself can only be an added precaution for radiation control and will be most valuable in maintaining the general health of the workers. The clinical systems of radiation damage occur only with a considerable over-exposure therefore the responsibility for prevention of radiation damage rests entirely on the personnel monitoring and control systems.

At the present time there are only a limited number of medical tests available for radiation protection. Most exposure information is still obtained from personnel and area monitoring. Any radiation program is a failure if clinical evidence of radiation damage appears. Thus medical tests are not as much a part of a protection program as they are a confirmation that some acute over-exposure has occurred.

Semi-annually each employee of the Rare Earth Processing Plant receives a complete blood count. Annually each employee receives a full chest x-ray. Additional examinations are performed at the termination of any employment or where candidates for employment exhibit or make known symptoms of normal disease which may also be attributed later to radiation exposure.

ADMINISTRATIVE FORMS

RARE EARTH DIVISION

DAVISON CHEMICAL COMPANY

POMPTON PLAINS, NEW JERSEY

HEALTH PHYSICS DEPARTMENT

AREA MONITORING SURVEY DATA SHEET

R.E.P.P WAYNE TWP., NEW JERSEY

DATE ____________________

BUILDING OR AREA ____________________

NATURE OF SUSPECTED ACTIVITY ____________________

MONITORED BY ____________________

INSTRUMENT USED ____________________

LOCATION	Distance From Source	Radiation Level	REMARKS

SURVEY OF RADIOLOGICAL AIR-BORNE CONTAMINATION

Location	Date	Time	Type of Survey	Results

Date ______________________

INCINERATION PER

Date ______________________

THIS FORM UPON COMPLETION, SURVEY AND SIGNATURE OF THE HEALTH-PHYSICS OFFICER AUTHORIZES THE FOLLOWING ITEM (S) TO BE BURNED IN THE TRASH BURNING AREA:

ITEMS

(1) ____

(2) ____

(3) ____

(4) ____

DATE TO BE INCINERATED ______________________

APPROVED BY ______________________
Department Manager

MONITORED BY ______________________
Health-Physics Department

RARE EARTH DIVISI)

PROPERTY PASS

Date ____________________

THIS AUTHORIZES (Name) ____ TO

REMOVE THE FOLLOWING ITEM (S) OF COMPANY PROPERTY FROM THE

PLANT:

ITEMS AND NUMBER OF EACH

(1) ____

(2) ____

(3) ____

( ) PERMANENT REMOVAL

( ) TEMPORARY REMOVAL

DATE TO BE RETURNED ______________

DATE RETURNED ____________________

APPROVED BY _________________

MONITORED BY ________________
Health Physics Dept.

HEALTH PHYSICS DEPARTMENT
RARE EARTH DIVISION

DUST RESPIRATOR INSPECTION REPORT

DATE OF INSPECTION ____________________

OPERATOR	CLASS	CONDITION OF RESPIRATOR GOOD	FAIR	UNSATISFACTORY

By ______________________________
Health Physics Department

R.E.P.P WAYNE TWP., NEW JERSEY

RECORD OF DISCHARGE OF PROCESS EFFLUENTS TO THE POMPTON RIVER

Date	Volume	Plant Sample No.	Lab. Sample No.	Percent MPC	pH	Remarks

HEALTH AND SAFETY DEP[illegible]

R.E.P.P., WAYNE TWP., N.J.

Operator ______________________ ______________ Shift

Job Description ______________________

TIME	OPERATION OR OPERATING AREA	$d/m/m^3$ CONCENTRATION (L) (H) (AVG)
8:00		
:10		
:20		
:30		
:40		
:50		
9:00		
:10		
:20		
:30		
:40		
:50		
10:00		
:10		
:20		
:30		
:40		
:50		
11:00		
:10		
:20		
:30		
:40		
:50		
12:00	LUNCH	
1:00		
1:00		
:10		
:20		
:30		
:40		
:50		
2:00		
:10		
:20		
:30		
:40		
:50		
3:00		
:10		
:20		
:30		
:40		
:50		
4:00		
:10		
:20		
:30		
:40		
:50		
5:00		

JOB ANALYSIS SHEET

OPERATOR ____________________ ______MEN/SHIFT ______SHIFTS/DAY

Operation or Operating Area	Time per Oper.	Oper. per Shift	Time per Shift (min)	No. of slps.	CONCENTRATION M^3	AVGE CONC X TOTAL TIME

(TXC) / (T) ____________________ d/m/M^3 ____________________ times max. per. conc.

CONTACTS FOR EMERGENCY USE

OPERATIONS SUPERVISOR

H. J. Sweitzer

Home Phone 835-5119

OPERATIONS ASSISTANT

Spencer Wright

Home Phone 786-1375

HEALTH PHYSICS

P. J. Garino

Home Phone 694-0877

MEDICAL OFFICER

Dr. S. T. Bernson

Office Phone 835-2400

PLANT AREA FIRE

(1) Report fire alarm.
(2) Use fire extinguisher.
(3) Notify Operations Supervisors and Health Physicist.

PROCEDURES FOR THE MEASUREMENT OF RADIOACTIVITY

Health-Physics Department

Davison Chemical Company
Pompton Plains, N. J.

ALPHA COUNTING

TABLE OF CONTENTS

ALPHA COUNTING

ANALYSIS: Counting Procedure

The operations noted below are performed daily before any samples are counted.

1. Thoroughly clean the sample chamber with ethyl alcohol (C_2H_5OH).

2. To determine the background, place a blank filter paper (Whatman #41, 1-1/8 inch diameter) on the pedestal. In scintillation counters, fasten the blank in place with a plastic ring. In the proportional counter, place the blank on the middle of the pedestal. Whenever possible, allow the blank to count overnight. Record the time at which the counting was started. To determine the counts per minute, divide the total count by the count time (in minutes). This figure is recorded on the card provided.

   Example: Background (bkgd) count was 235 counts in 18-1/2 hours.

   18 x 60 = 1080 ≠ 30 = 1110 = count time in minutes.

   235 ≠ 1110 = .21 c/m bkgd.

   When it is impossible to count the background overnight, if may be counted in the morning. The background is then counted for 10 minutes.

   Example: Counter registered 4 counts in 15 minutes. Time in minutes was 15.

   4 ≠-15 = 27 c/m background.

3. The geometry is calculated after the background is counted. This is done by placing the alpha standard (496 d/m) in the chamber.

   A. In scintillation counters, the standard is counted for 640 counts and the time recorded. The standard is counted three times and the geometry is calculated from the average of the three.

B. In the proportional counter, the standard is counted for two minutes and the count recorded. This operation is repeated three times and the average count is used to calculate the geometry.

The geometry is calculated as follows: The counts per minute of the standard is divided by the known disintegrations of the standard.

Example: The counts per minute of the standard was 239. The d/m of the standard is 496.

Therefore: 239 ÷ 496 = .48 or 48% geometry.

Record this figure on the card with the background.

If the geometry drops to 35% or lower in scintillation counters or below 45% in the proportional counter, the counter should be checked by the instrument repair man.

ALPHA COUNTING

ANALYSIS: Plateaus

1. Place the alpha standard (496 d/m) in the sample chamber of the counter.

2. Find the lowest operating voltage of the counter.

3. At this voltage make three counts

   A. In scintillation counters, make three 640 counts.

   B. In the proportional counter, make three-minute counts.

   Record these figures.

4. Make three counts every 25 volts in scintillation counters and every 20 volts in the proportional counter.

5. Continue in this manner until the count becomes too fast. That is, until the scintillation counters record 640 counts in less than 1.50 minutes or the proportional counter records more than 1200 counts per three minutes.

6. Ascertain the average counts per minute by the following methods:

   A. In scintillation counters, add the three count times and divide by 3 to find the average count time. Then divide 640 by the average count time to determine average c/m.

   Example: At 950 volts the count times were 3.28, 3.50 and 2.98.

   3.28 + 3.50 + 2.98 = 9.76

   9.76 ÷ 3 = 3.25

   640 ÷ 3.25 = 197, the average counts/minute

   B. In the proportional counter, add the three counts and divide by 9 to find average counts/minute. 9 is used because there were 3 counts and each count was for 3 minutes.

   Example: At 840 volts the counts were 608, 626 and 599.

   608 + 626 + 599 = 1833

   1833 / 9 = 204, the average count/min.

7. The average counts are then plotted on graph paper against the voltage. By using French curves, a curve is drawn.

8. The operating voltage is chosen from the plateau or straight line on the graph. The operating voltage is usually 1/3 to 2/3 of the way across the plateau.

9. Plateaus should be run once every three months. If major repairs are made on the counter, or if the geometry is too low, spot checks should be made on the plateau. If the spot checks show much variance, an entire new plateau should be run.

ALPHA COUNTING

ANALYSIS: Alpha Air Dust

Procedure

1. The background and geometry should be taken daily before counting any samples. Directions for taking background and geometry appear in preparations for alpha counting.

2. The sample is placed on the pedestal and fastened with a plastic ring. Samples are counted either for 32 counts or for 15 minutes, whichever comes first. If a 32 count is reached in less than 0.05 minutes, it is advisable to recount it for a 64 count.

3. Types of Samples Counted:

   A. Uranium air dust samples - 4 to 5 hours should elapse from the time of sampling to the time of counting. This is to allow for the decay of radon gas.

   B. Thorium alpha samples - at least 24 hours should elapse between time of sampling and time of counting. This allows for the decay of thoron and other daughter products.

ALPHA COUNTING

ANALYSIS: Alpha Air Dust

Calculations

A. To determine counts per minute, divide the total count by the count time in minutes, then subtract the background of the counter. When referring to c/m, it is assumed that the background has been subtracted.

This formula is $\frac{\text{count}}{\text{time}} - \text{bkgd.} = \text{c/m}$

Count = total count   Time = time in minutes.

Example: Sample 7B counted 32 counts in 7.38 minutes.

The counter background was .12 c/m.

$32 \div 7.38 = 4.35$

$4.35 - .12 = 4.23$ c/m

B. To determine d/m, this formula is used:

$$d/m = \frac{c/m}{\text{geom.}}$$

Example: Sample 7B c/m = 4.23   Geom. is 48%

$$\frac{4.23}{.48} = 8.81$$

C. To determine $d/m/M^3$. Air dust samples are usually reported in this way. This formula is used:

$$d/m/M = \frac{d/m}{(.7)^* \quad (Q)^{**}}$$

*.7 is the absorption factor for the filter paper in air dust samples.
**Q is the amount of air sampled in cubic meters.

Example: Sample 7B: d/m = 8.81

Q is .6 Absorption factor is .7

$$d/m/M = \frac{8.81}{.7 \times .6} = 20.98$$

ALPHA COUNTING

ANALYSIS: Counting Planchets

1. Before a planchet is used, it is counted for five minutes to determine the background of the planchet.

2. Planchets are always counted in the proportional counter. The planchet is placed in the middle of the pedestal. The sample is counted for 15 min. unless the count is very fast. Then the counter may be shut off at any time. (It is better to turn off the proportional counter on an even minute rather than a fraction of a minute, since calculating is easier with even minutes).

3. Planchets should be counted as soon as possible after they are dried, except for Radium at equilibrium, i.e. 40 days.

ALPHA COUNTING

ANALYSIS: Plant Effluent

Procedure

1. Sample

   A. Plate 5 ml. of the sample directly.

   B. Calculate d/m/ml in the usual way. (See Calculations)

2. Liquid Phase

   A. Place a 10 ml. aliquot of the sample in a centrifuge tube.

   B. Centrifuge for 15 minutes.

   C. Carefully plate the liquid on a stainless steel planchet 2" in diameter.

   D. Allow it to dry thoroughly and count in the proportional counter for 30 minutes.

   E. Calculate d/m/ml in the usual manner. (See Calculations)

3. Solid Phase

   A. The solid which remains in the bottom of the centrifuge tube is plated on a stainless steel planchet 2" in diameter.

   B. The centrifuge tube is rinsed with water and the rinsing is plated on the planchet.

   C. Allow the planchet to dry thoroughly and count it for 30 minutes in the proportional counter.

   D. Calculate d/m/ml in the usual manner. (See Calculations)

ALPHA COUNTING

ANALYSIS: Alpha Activity in Murky Water

Procedure

(Clear water samples are plated directly onto stainless steel planchets. A 5 ml. aliquot is generally used.)

Method for Murky Water Samples

1. Place an aliquot of the sample (20-100 ml.) in a beaker.
2. Add an approximately equal amount (20-100 ml.) of Nitric Acid (HNO_3) to the aliquot.
3. Place the beaker on a medium heat hot plate and evaporate until about 5-10 ml. of aliquot remains.
4. Remove from the hot plate and allow the beaker to cool.
5. Add about 25 ml. of Nitric Acid (HNO_3) to the aliquot.
6. Return to the hot plate, and allow the aliquot to evaporate until about 5-10 ml. remain.
7. Repeat steps 4-6 until the aliquot is clear.
8. Plate a small amount of the aliquot on a low background stainless steel planchet by means of a dropper. Dry on a low heat hot plate. Add another small amount of aliquot and allow it to dry. Continue in this manner until all of the aliquot is plated.
9. Rinse the beaker with a small amount of water (6-25 drops) and plate the rinsing on the planchet.
10. Allow the planchet to dry thoroughly.
11. Count in a low background proportional counter for 15 minutes.

ALPHA COUNTING

Calculations

1. To determine counts per minute, divide the total count by the count time in minutes and subtract the background of the planchet.

$$c/m = \frac{\text{total count}}{\text{count time}} - \text{bkgd.}$$

Example: 20 ml. of a sample was plated on a planchet. The background of the planchet was one count in five minutes or .20 counts per minute. The aliquot counted 7 counts in 15 minutes.

$$c/\text{min} = \frac{7}{15} - .20 = 0.27$$

2. To determine disintegrations per minute, divide the counts per minute by the geometry.

$$d/m = \frac{c/m}{\text{geom.}}$$

Example: The c/m of a sample was 0.27. The geometry of the counter was 50%.

$$d/m = \frac{0.27}{.50} = 0.54$$

3. To determine d/m/ml the d/m is divided by the sample aliquot.

$$d/m/ml = \frac{d/m}{\text{aliquot}}$$

Example: 20 ml. of a sample had a d/m of 0.54

$$d/m/ml = \frac{0.54}{20} = 0.027$$

BETA COUNTING

TABLE OF CONTENTS:

BETA COUNTING

ANALYSIS: Counting Procedure

I. Background

A. The background of the beta counter is taken daily. It is always taken on the same shelf of the counting chamber on which the samples are counted.

1. The inside of the chamber and the counting shelf are thoroughly cleaned with ethyl alcohol (C_2H_5OH).

2. The shelf is placed in the second slot (or on whichever shelf the samples are to be counted.)

3. A thin aluminum absorber .001" thick is placed on the first shelf (or the shelf above the one on which the samples are to be counted). (This is done to remove the low energy RaD beta rays and the RaF alpha rays).

4. The empty shelf is then counted for fifteen minutes.

5. The total count is then divided by the count time to determine background in c/min.

$$\text{c/m bkgd} = \frac{C}{T} = \text{c/m bkgd.}$$

Example: The total count of a fifteen minute background was 125.

$$\text{c/m bkgd} = 125 \div 15 = 7.3 \text{ c/m bkgd.}$$

II. Geometry

A. The geometry is taken twice a week on the same shelf of the counting chamber on which the samples are to be counted. If another shelf is to be used, the geometry is taken on that shelf, before the sample is counted.

1. The Radium D and E source is placed on the counting shelf in the second slot of the counting chamber.

2. A thin aluminum absorber (.001" thick) is placed on the first shelf or the shelf above the one on which the samples are to be counted.

3. The source is counted for three, three minute counts.

4. The three counts are then added and the result is divided by nine and the background of the counter subtracted to determine the average c/m.

   Example: Radium D and E source counted 5300, 5282, and 5199 in three, three minute counts. The background of the counter was 7.3 c/m.

   Average c/m = 5300 + 5282 + 5199 = 15781 ÷ 9 = 1753.4 - 7.3 = 1746.1 c/m.

5. The d/s of the source at the time of counting is determined by use of the graph prepared for each source. This number is multiplied by 60 to determine d/m of the source. The average c/m of the source is divided by the known d/m of the source and the result is the geometry of the counter.

   Example: The source had a known d/s of 488 at the time of counting. 488 x 60 = 29280 d/m. The average c/m of the standard was 1746.1. Geo. = 1746.1 ÷ 29280 = 6.0% geometry.

ANALYSIS: Plateaus

Procedure

1. Place the Radium D/ E standard on the second shelf of the counting chamber of the beta counter.

2. Find the lowest operating voltage of the counter.

3. Three, three minute counts are taken at this voltage.

4. Record the total count and the voltage.

5. Make three counts every twenty-five volts until the count becomes too fast. (That is, until the count is so fast that not all of the counts are registered.)

6. Ascertain the average counts per minute by adding the three counts and dividing by nine. Nine is used because there were three counts and each count was for three minutes.

   Example: At 700 volts the counts were 5200, 5169, and 5310.

   $5200 + 5169 + 5310 = 15,679$

   Average c/m $= 15,679 \div 9 = 1742$ c/m (average)

7. The average c/m's are then plotted on graph paper (20 x 20 sqs./in) against the voltage. By using French curves, a curve is drawn.

8. The operating voltage is chosen from the plateau or straight line on the graph. The operating voltage is 1/3 to 2/3 of the way across the plateau.

9. Plateaus should be run once every three months. If major repairs are made on the counter, or if the geometry is too low, spot checks should be made on the plateau. If the spot checks show much variance from the plateau, an entire new plateau should be run.

ANALYSIS: Beta Activity in Gumpaper

Procedure

1. The entire gumpaper sample is placed in a clean 150 ml. porcelain crucible (Reference: Cleaning porcelain crucibles)

2. The crucible is placed in the muffle furnace (800-900 °F) until the gumpaper is completely ashed (approximately 20-30 minutes).

3. The crucible is removed from the furnace and allowed to cool.

4. The sides of the crucible are scraped with a spatula to remove the ash. The ash is then transferred to a plastic planchet, 1-1/4 in. diameter.

5. The crucible is rinsed with a small amount of distilled water (10-30 m.). Two to five drops of Nitric Acid (HNO_3) is added.

6. The crucible is returned to the muffle furnace until the rinsing has evaporated.

7. The crucible is removed from the furnace and allowed to cool.

8. The residue of the rinsing is added to the sample in the planchet. (Repeat steps 5-8 until the crucible is clean)

9. Record the time and date on which the sample was counted and report it along with the results.

10. Report as d/m sample.

ANALYSIS: Beta Activity in Gumpaper

Calculations

1. To determine counts per minute (c/m): divide the total count by the count time and subtract the background of the counter.

   Example: Gumpaper 330-1 counted 1029 counts in 15 minutes.

   The background of the counter was 8/1 c/m.

   c/m = 1029 ÷ 15 = 68.6 - 8.1 = 60.5 c/m

2. To determine disintegrations per minute per sample (d/m/sample), divide the c/m by the geometry of the counter.

   Example: Gumpaper #330-1 had a c/m of 60.5. The geometry of the counter was 7.1%.

   d/m/sample = 60.5 / .071 = 852 d/m/sample.

ANALYSIS: Beta Activity in Liquids

Procedure

1. The background of a stainless steel planchet 2" diameter cupped planchet) is determined by counting it for five minutes in the counting chamber of the beta counter on the same shelf as the sample is to be counted.
2. The planchet is placed on a transite board on a medium heat hot plate.
3. The sample is plated, a milliliter at a time on the planchet. An aliquot of 1-5 ml. is usually used.
4. When the sample is completely dried, count it for 30 minutes on the second shelf of the counting chamber of the beta counter.
5. Record the time and date on which the sample was counted and report this along with the results.
6. Report the results as d/m/ml.

BETA COUNTING

ANALYSIS: Beta Activity in Liquids

Calculations

1. To determine the counts per minute (c/m): divide the total count by the time counted and subtract the background of the planchet.

   $c/m = \frac{C}{T} - \text{background} = c/m$

   Example: 3 ml. of water sample #PR 421-1 had a total count of 768 in 30 minutes. The planchet had a background of 37 counts in 5 minutes.

   Bkgd. = 37 ÷ 5 = 7.4 c/m.

   c/m = 768 ÷ 30 = 25.6 - 7.4 (bkgd.) = 18.2 c/m.

2. To find disintegrations per minute (d/m): divide the c/m by the geometry of the counter.

   $d/m = \frac{c/m}{\text{geo.}} = d/m$

   Example: 3 ml. of water sample #PR 421-1 had a c/m of 18.2

   The geometry of the counter was 6.3%.

   d/m = 18.2 ÷ .063 = 289 d/m.

3. To determine disintegrations per minute per milliliter (d/m/ml): divide the d/m by the aliquot of sample used.

   $d/m/ml = \frac{d/m}{\text{aliquot}} = d/m/ml$

   Example: 3 ml. of water sample #PR 421-1 had a d/m of 289.

   d/m/ml = 289 ÷ 3 = 96.3 d/m/ml.

ANALYSIS: Beta Pleated Filters

Procedure

1. The filter is cut in half and one half is used as an aliquot. (Reference: Cleaning porcelain crucibles).

   The aliquot is placed in a 150 ml. clean porcelain crucible.

2. The crucible is placed in a muffle furnace (approximately 1000°F) until the pleated filter is ashed. (Approximately 1-1/2 hours)

3. The crucible is removed from the furnace and allowed to cool.

4. By means of a stirring rod crumble the ash to a fine powder. If a fine enough powder is not obtained, a mortar and pestle may be used to break up the ash. The ash is then placed in a plastic planchet 1-1/4 in. diameter.

5. The sample is then counted on the second shelf of the beta counting chamber for fifteen minutes. (See beta counting procedure).

6. Record the time and date on which the sample was counted and report it along with the result.

7. Report the results as beta d/m/sample.

BETA COUNTING

ANALYSIS: Beta Pleated Filters

Calculations

1. To determine counts per minute (c/m): divide the total count by the count time and subtract the background of the counter.

   Example: 1/2 of pleated filter #412-1 had a total count of 562 counts in 15 minutes. The background of the counter was 8.5 c/m.

   c/m = 562 ÷ 15 = 37.5 - 8.5 c/m (bkgd.) = 29.0 c/m

2. To calculate disintegrations per minute (d/m): divide the c/m by the geometry of the counter.

   $$d/m = \frac{c/m}{geo.} = d/m$$

   Example: 1/2 of pleated filter #412-1 had a c/m of 29.0.

   The geometry of the counter was 6.4%.

   d/m = 29.0 ÷ .064 = 453.1 d/m

3. To determine beta disintegrations per minute per sample (d/m/sample): multiply the d/m by 2 since 1/2 of the entire sample was used.

   d/m/sample = d/m x 2 = d/m/sample.

   Example: 1/2 of pleated filter #412-1 had a d/m of 453.1.

   d/m/sample = 453.1 x 2 = 706.2 d/m/sample.

BETA COUNTING

ANALYSIS: Beta Activity in Solids

Procedure

1. On the analytical balance, weigh a plastic planchet 1-1/4 in. diameter. Record the weight.
2. Carefully place an aliquot of the sample (enough to cover the bottom of the planchet) into the planchet.
3. Reweigh the planchet and the sample and record the second weight.
4. Count the sample in the beta counter on the second shelf of the counting chamber for fifteen minutes.
5. Record the time and the date on which the sample was counted and report this along with the results.
6. Report the results in d/m/gram.

BETA COUNTING

ANALYSIS: Beta Activity in Solids

Calculations

1. To determine counts per minute (c/m): divide the total count by the count time and subtract the background of the counter.

   Example: An aliquot of mud sample #712 counted 27198 counts in 15 minutes. The background of the counter was 8.1 c/m.

   c/m = 27198 ÷ 15 = 1813.2 - 8.1 = 1805.1 c/m

2. To determine disintegrations per minute (d/m): divide the c/m by the geometry of the counter.

   $$d/m = \frac{c/m}{geo.} = d/m$$

   Example: An aliquot of mud sample #712 had a c/m of 1805.1.

   The geometry of the counter was 6.2%.

   d/m = 1805.1 ÷ .062 = 29115 d/m.

3. To determine disintegrations per minute per gram (d/m/gram): Subtract the first weight of the plastic planchet from the second weight (planchet / sample) to find the weight of the sample. Divide 1 by the weight of the sample (this is the factor for converting to grams). Multiply the d/m by the factor to obtain d/m/gram.

   d/m/gram = d/m x factor = d/m/gram.

   Example: The first weight of a plastic planchet was 0.3561 grams.

   The second weight, (sample / planchet) was 0.7678 grams.

   The d/m of the sample was 29115.

   0.7678g. - 0.3561g. = 0.4117g. (weight of sample)

   1 ÷ 0.4117g. = 2.43 (factor)

   d/m/gram = 29115 x 2.43 = 70749 d/m/gram.

COPY

Form AEC—410
(1-61)

UNITED STATES
ATOMIC ENERGY COMMISSION

SOURCE MATERIAL LICENSE

Pursuant to the Atomic Energy Act of 1954, and Title 10, Code of Federal Regulations, Chapter 1, Part 40, "Licensing of Source Material," and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, possess and import the source material designated below; to use such material for the purpose(s) and at the place(s) designated below; and to deliver or transfer such material to persons authorized to receive it in accordance with the regulations in said Part. This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954 and is subject to all applicable rules, regulations, and orders of the Atomic Energy Commission, now or hereafter in effect, including Title 10, Code of Federal Regulations, Chapter 1, Part 20, "Standards for Protection Against Radiation," and to any conditions specified below.

Licensee	
1. Name W. R. Grace & Company Davison Chemical Division 2. Address Post Office Box 188 Pompton Plains, New Jersey 07444	3. License No. STA-422, as renewed 4. Expiration Date February 28, 1973 5. Docket No. 40-86
6. Source Material Thorium	7. Maximum quantity of source material which licensee may possess at any one time under this license Unlimited

CONDITIONS

8. Authorized use (Unless otherwise specified, the authorized place of use is the licensee's address stated in Item 2 above.)

   Thorium ore processing in accordance with the procedures described in the licensee's application dated November 3, 1967, and supplement dated February 13, 1968.

9. The licensee is hereby exempt from the requirements of Subparagraph 20.203 (e)(2) of 10 CFR 20 for areas within his plant provided all entrances are conspicuously posted in accordance with Subparagraph 20.203(e)(2) and with the words, "Any area within this plant may contain radioactive material."

10. Authorized place of use: The licensee's facility
    868 Black Oak Ridge Road
    Wayne, New Jersey

For the U. S. ATOMIC ENERGY COMMISSION

Date of issuance FEB 2 6 1968

Don F. Harmon
Division of Materials Licensing

★U. S. GOVERNMENT PRINTING OFFICE : 1962 O - 632985

85

COPY

UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

IN REPLY REFER TO:
DML:CEM
40-86

FEB 26 1968

W. R. Grace & Company
Davison Chemical Division
Post Office Box 188
Pompton Plains, New Jersey 07444

Attention: Mr. Peter J. Garino
Health Physicist

Gentlemen:

Enclosed is Source Material License No. STA-422, as renewed. Also enclosed is the process description filed with your application dated November 3, 1967, which was superseded by your revised process description submitted February 13, 1968.

Very truly yours,

Don F. Harmon
Source & Special Nuclear Materials Branch
Division of Materials Licensing

DISTRIBUTION:
Document Room w/encl.
State Health (license only)
Subject File w/encl.
Compliance, Reg. I, w/encl.
N. Doulos, DML, w/encls.
Br. Reading File w/encl.
Div. Reading File w/o encl.

Enclosure:
License No. STA-422

86

DIVISION OF COMPLIANCE
Memo Route Slip

____ Action ____ Information ____ Concurrence ____ Review
____ Comment ____ Note & Return ____ Per Our Telecon ____ File

Cleveland

R. W. Kirkman Region I	X
J. G. Davis Region II	
B. H. Grier Region III	
D. I. Walker Region IV	
R. W. Smith Region V	

SUBJECT: PHILIPP BROTHERS DIVISION OF ENGELHARD MINERALS AND CHEMICALS CORPORATION U. S. IMPORT CERTIFICATE NO. NY-31856-MA

With a letter dated November 24, 1967, from the Department of Commerce, we received a copy of an import certificate showing that Philipp Brothers, Division of Engelhard Minerals and Chemicals Corp., imported from Malex Corp., Malaysia, 220 metric tons of monazite sand. As you know, paragraph 40.13(b) of 10 CFR 20 exempts persons who import unrefined and unprocessed ore containing source material from the regulations in 10 CFR 40 and from the requirements for a license. Since monazite is a mineral occurring in sand deposits and usually contains thorium, no specific license is apparently needed to import this material. It is suggested, however, that an inquiry be made to determine the status and ultimate disposition of the material in question and more specifically to ascertain whether the material has been or will be refined or processed by the importer. A copy of the import certificate is attached for your information. Neither Philipp Brothers nor Engelhard Minerals and Chemical Corp., holds a specific AEC source material license.

Attachment:
Copy Import Certificate
No. NY-31856-MA

Maybe they are going to reinforce the new Madison Square Garden with the stuff!

FROM: Jack R. Roeder
Jack R. Roeder, CO:HQ

DATE: DEC 5 1967

87

J. R. Roeder, Chief, Materials Inspection & Enforcement Branch, Div. of Compliance, HQ

FEB 26 1968

A. F. Ryan, Investigation Specialist
Region I, Division of Compliance

PHILIPP BROTHERS DIVISION OF
ENGELHARD MINERALS AND CHEMICALS CORP.
YOUR MEMO OF DECEMBER 5, 1967

In accordance with your request of December 5, 1967, I called at Philipp Brothers Division of Engelhard Minerals and Chemicals Corporation on January 17, 1968. I was informed by Benjamin B. Bollag, Metal Trader, that the monazite sand covered in the import certificate, attached to your memorandum, was imported for Davidson Chemical Co., a division of W. R. Grace. Bollag stated that Philipp Brothers does not do any processing whatever and is merely the import agent for the Davidson Chemical Company.

Records available at this office indicate that Davidson Chemical Company either has or has had two source material licenses, one, SMB-306, place of use - Erwin, Tennessee, and STA-422, place of use - Pompton Plains, New Jersey.

No further action will be taken in connection with this matter unless requested by you.

OFFICE ▶	COMPLIANCE					
SURNAME ▶	RYAN:mg					
DATE ▶	2/21/68					

Form AEC-318 (Rev. 9-53)

U.S. GOVERNMENT PRINTING OFFICE: 1966—O-214-629

98

REGION I, DIVISION OF COMPLIANCE
NEWARK, NEW JERSEY

~~SPECIAL LIMITED~~ INSPECTION

1. Name and address of licensee:
[illegible]

2. Date of Inspection: [illegible]

3. Type of Inspection: [illegible]

4. License number(s), docket number(s), number and date of last amendment for each license. Category and Priority of each license:
[illegible]

5. Date of previous inspection: [illegible]

6. Is "Company Confidential," or proprietory, or classified information contained in report?

Yes ________ No X

(Specify paragraphs)

7. Scope of inspection:
[illegible]

8. [illegible]
Inspector

[illegible]
Date of Report

[signature]
Reviewer

6/6/69
Date of Review

89

Licensee: _________________

Summary this portion which involves the processing of [illegible] containing Th-nat remains essentially unchanged from the previous inspection except for the discontinuance of [illegible] in [illegible].

Noncompliance and Safety Items

Contrary to 10 CFR 20.401(a) records [illegible] were not maintained.
(See [illegible])

Unusual Occurrences

NONE

Status of Previously Reported Noncompliance or Safety Items

NONE

Management Interview W [illegible]

The inspector informed [illegible] that [illegible]

[illegible]

Management Int. [illegible] :

The Investigator told them about [illegible] [illegible] which would seem to [illegible] for this type of operation — [illegible] and working in different areas. Both [illegible] interest in this instrument and indicated that one might be [illegible].

Both indicated a [illegible] and that [illegible] in the future.

Licensee: [illegible]

DETAILS

A. **Participants**

[illegible]

B. **Scope of Licensee Program**

[illegible]

C. **Organization**

[illegible]

D. **Administrative Control**

[illegible]

E. **Use of Material**

[illegible]

E cont'd | A previous description indicates in a letter from the [illegible] dated 2/1/74 [illegible] [illegible] in the [illegible] [illegible] [illegible] [illegible] indicated that [illegible] not [illegible] contained in [illegible]

[illegible] stated that [illegible] 5% of the present [illegible] contains [illegible] contains only [illegible]% thereof,) and that all is [illegible] of the [illegible] that the [illegible] [illegible] to their operations.

Licensee: W R Grace & Co, Davison Div

F. Facilities

Facilities are described in license application supplement dated 2/13/68 and report of previous inspection which was conducted Nov 17, 1966.

G. Equipment (Radiation Monitoring)

① RIDL Scaler and internal gas flow proportional counter (calibrated ~ 1/year by Garino using standards.)

② Anton #5 G M Counter (scale - 0 to .5) (ranges - X1, X10, X100) calibrated by manufacturer ~ 12/67. Has .2mr/HR check source which Garino uses to insure inst. is working properly.

H. Radiological Safety Procedures

Procedures are included in license application supplement dated 2/13/68

I. Personnel Monitoring and Exposure to External Radiation monthly film badges are supplied by St. Johns and AEC-5's are maintained by Garino. Inspector's review of the records indicated the following.

YEAR	QTR	RESULT (mrem)
1966	4	avg- 50 to 60; high 735
1967	1	" " " " 975
	2	" " " " 530
	3	" " " " 275
	4	" " " " 160

(over) →

I. Cont/d

YEAR	QTR	RESULTS (mrem)
1968	1→3	avg 50 to 60, high 600 in 1st qtr (high monthly of 220)

All highs were to who operates the Flouride press.

Licensee: W. R. Grace + Co. Davison Div.

J. Exposure of Employees to Concentrations of Radioactive Materials

Garino stated that he takes air samples with a Staplex High Volume air sampler (20 ft^3/min for 5 min) at the places listed in the H.P. manual 1/1/67 (incorporated as procedures in L.C. 8.). Procedures state that samples are to be taken quarterly. Inspector's review of records indicates no records of air samples between 7/66 and 6/67. A copy of the last survey record is included as attachment "A" (over)→

K. Effluents to Unrestricted Areas

(See J for air samples)

A description of the liquid effluent system is given in paragraphs 18 thru 23 of the report of the inspection conducted on Nov 17, 1966. Daily samples are taken at the final release point and sample counts are averaged over a month. (over)→

L. Disposals

Garino stated that since 1966 the ores cake waste mentioned in E has been transferred to Chattanooga plant for burial-storage. Material is shipped in closed steel drums (700 lbs ea.) on trucks rented from D + L Transportation Co., Butler, N.J. This is the only use of these trucks while under contract. Garino had current copies of the DOT regulations and had contacted the Bureau of (over)→

M. Miscellaneous Surveys, Evaluations and Records

Garino maintained receipt, transfer, disposal and inventory records.

Garino performs quarterly radiation surveys and maintains records of these. GM survey inst. is used. Highest radiation level was 3' from monazite storage area ~3.5 mr/hr on last survey.

Garino performs semiannual contamination surveys with wipes which are counted on gas flow proportional counter. Records are kept in units of [illegible]?

(Go → S.)

J. Cont'd)

Garino stated that he had taken the samples but must have misplaced the records. Garino stated that samples are taken during active processing of [illegible]. Garino stated that the maximum man time in the Ball Mill Room was ~ $\frac{1}{2}$ hr/day. Records indicate that restricted areas are below MPC of 3×10^{-11} μci/cc. Garino stated and records indicated that samples at the boundaries of the restricted areas showed no detectable alpha contamination. There are no stacks or fume hoods which would warrant sampling.

K Cont'd)

Recorded results indicate levels of ~ 2×10^{-7} μci/cc which is 20% of MPC.

L Cont'd)

Explosives. (See letter - Attachment "3".)

DOT Reg 173.391 (C)(1) states thorium [illegible] chemical compounds are [illegible] "low [illegible] material." Garino stated that he had [illegible] for contamination upon loading and trucks after [illegible]. (See TE 5.)

Licensee: W.R. Grace + Co. Davison Div.

N. **Special License Conditions**

All appeared to be complied with.

O. **Posting and Labeling**

Gerino had copies of license conditions and regulations Part 20 and 40. Gerino stated that the Co. subscribes to the F.R. Gerino stated that all men are instructed in the pertinent sections of these documents.

I reviewed I.C. 9. All posting & labeling appeared to be adequate. The Ball Mill area is posted with a CARA sign + standard radiation symbol.

P. **Independent Measurements**

NONE

Q. **Operations Observed**

TOURED FACILITIES AND WORK IN PROGRESS.
RSO PERFORMED RADIATION SURVEY - INSPECTOR NOTED LEVELS WHICH AGREED WITH HIS RECORDED ONES.

R. **Incidents, Overexposures, Theft or Loss, Equipment Malfunction**

NONE

Licensee: W. R. Grace & Co. Davison Div.

S. Other Information or Continuation from Previous Paragraphs

L. Cont'd! Garino stated that necessary surveys (10 mr/HR at 6' from external surface of vehicle and 2 mr/HR in cab of vehicle) for radiation were taken. Inspector noted that these survey records were not maintained for shipments on 2-3 drums on 9/9/68 thru 9/12/68. Garino stated that he must have given them to the driver.

M. Cont'd! Records indicate levels of up to 10^{-3} uci/ft² in the monazite storage area and the Ball Mill area and 10^{-7} uci/ft² in the shipping platform and office area. Garino stated, in reply to the Inspector's question, that he records these levels but has no action or guide levels established as to when clean-up procedures would be used. After some discussion, the Inspector left Garino a copy of N.Y. State Dept of Labor Surface Contamination Limits to use as a guide.

In line with contamination control, Garino stated, ~~that~~ after contacting a few workers, that most of the workers changed took home their work clothes for washing. He later stated that the persons most likely to have contaminated clothes washed them in a clotheswasher provided for this purpose

(over) →

m cont'd.

By the Co. Garino stated that he would perform surveys, ~~and~~ evaluate the adequacy of the present procedures and make a record of his determinations. The Inspector stated that this would be looked for in the next ~~[illegible]~~ inspection.

GENERAL – AIR-SAMPLES

SURVEY OF RADIOLOGICAL AIR-BORNE CONTAMINATION

Location	Date	Time	Type of Survey	Results	
				ALPHA COUNTS	$\mu c/ml$ Th.
PLANT SHIPPING ROOM	9/8/68	9:15 AM	AIRBORN ALPHA FILTRATION RATE 20 CU. FT. MIN. 100 CU. FT. SAMPLED	11	1.1×10^{-12} $\mu c/ml$
PULVERIZING ROOM	" "	9:30 AM.	" "	10	9.1×10^{-13} $\mu c/ml$
CALCINING FURNACE	" "	10:15 AM.	" "	17	1.5×10^{-12} $\mu c/ml$
PROCESS STORAGE AREA	" "	10:30 AM	" "	14	1.3×10^{-12} $\mu c/ml$
BALL MILL ROOM	" "	10:45 AM.	" "	71	6.5×10^{-12} $\mu c/ml$
MONAZITE STORAGE AREA	" "	11:00 AM	" "	17	1.5×10^{-12} $\mu c/ml$

Date 9/13/68

[signature]

ATTACHMENT "A"

GENERAL AIR SAMPLES

SURVEY OF RADIOLOGICAL AIR-BORNE CONTAMINATION

Location	Date	Time	Type of Survey	Results	
			AIRBORN ALPHA STAPLEX FILTER	ALPHA COUNTS	uc/ml Th.
CONTROL LAB	9/8/68	11:15 AM	" "	17	1.5×10^{-12}
SULFINATION KETTLE	" "	11:30 AM	" "	40	3.6×10^{-12}
LUNCH ROOM	" "	11:45 AM	" "	11	1.1×10^{-12}

Date 9/13/68

ATTACHMENT A

REGION I, DIVISION OF COMPLIANCE
NEWARK, NEW JERSEY

~~SPECIAL LIMITED~~ INSPECTION

1. Name and address of licensee:
W. R. Grace + Company
Davison Chemical Division
Post Office Box 188
Pompton Plains, New Jersey 07444

2. Date of Inspection: 12/4/68

3. Type of Inspection: REINSPECTION (ANNOUNCED)

4. License number(s), docket number(s), number and date of last amendment for each license. Category and Priority of each license:

STA-422 FEB 26, 1968 I-II

5. Date of previous inspection: 11/17/66

6. Is "Company Confidential," or proprietory, or classified information contained in report?

Yes ______ No X

(Specify paragraphs)

7. Scope of inspection:

PARTS 20 + 40

10

ITEM # 341

8. J. P. Stohr
Inspector

12/20/68
Date of Report

RES
Reviewer

6/6/69
Date of Review

B1339

39

Licensee: W.R. Grace & Co., Davison Div.

Summary This operation which involves the processing of monazite ores containing Th nat remains essentially unchanged from the previous inspections except for the discontinuence of waste burial on site.

Noncompliance and Safety Items

1. Contrary to 10 CFR 20.401(b), records of all surveys were not maintained.
(See ✓ + Mang. Intv.)

Unusual Occurrences

NONE

Status of Previously Reported Noncompliance or Safety Items

NONE

Management Interview w Carino and Smeitzer.

The Inspector informed them that there would be one item of noncompliance - failure to keep all survey records - the air concentration records in particular.

(Over) →

Licensee: W.R. Grace + Co, Davison Div

DETAILS

A. **Participants**

Peter Garino, Plant Chemist + RSO
HUGH Sweitzer, Plant Manager

B. **Scope of Licensee Program**

Licensee is engaged in the refining of monazite sands for the production of rare earth, optical polishing compounds. This plant together with a sister plant in Chatanooga, Tenn. are the largest producers of these compounds in the world. The monazite sands contain ~ 3% nat. Th by weight.

C. **Organization**

Donald Brooks, W.R. Grace + Co President
Richard L. Stone, V. Pres. + Davison Div. Manager
Hugh Sweitzer, Plant Manager
27 to 36 people employed at this plant, 20 of whom are issued film badges.

D. **Administrative Control**

① 8' chain link fence - restricts entire property with signs posted as per L.C. # 9
② RSO and Foreman instruct employees in radiation safety procedures, such as no eating in work areas, washing before leaving work area and wearing of special uniforms while working.
③ RSO takes periodic radiation + contamination surveys.

E. **Use of Material**

Garino stated that ~ 2500 lbs of monazite are processed per day. This yields ~ 75 lbs of nat. Th as Thorium fluoride in 500 lbs of sludge. The sludge is in the form of "press cake" which is transferred to the Chatanooga Plant for disposal.

(over)

Licensee: W R Grace & Co, Davison Div

F. **Facilities**

Facilities are described in license application supplement dated 2/13/68 and report of previous inspection ~~[illegible]~~ which was conducted Nov 17, 1966.

G. **Equipment** (Radiation Monitoring)

1. RIDL Scaler and internal gas flow proportional counter (calibrated ~ 1/year by Garine using standards
2. Auton #5 G M Counter (scale - 0 to .5) (ranges - X1, X10, X100) calibrated by manufacturer ~ 12/67 Has .2mr/HR check source which Garine uses to insure inst. is working properly.

H. **Radiological Safety Procedures**

Procedures are included in license application supplement dated 2/13/68

I. **Personnel Monitoring and Exposure to External Radiation**

monthly film badges are supplied by St. Johns and AEC-5's are maintained by Garine. Inspector's review of the record indicated the following.

YEAR	QTR	RESULT (mrem)
1966	4	avg - 50 thru ; high 735
1967	1	" " " ; " 975
	2	" " " ; " 530
	3	" " " ; " 275
	4	" " " ; " 160

(over) →

I. Cont/d

YEAR	QTR	RESULTS (mrem)
1968	1→3	avg 50 to 60, high 600 in 1st qtr (high monthly of 220)

All highs were to who operates the Flouride press.

Licensee: W. R. Grace & Co., Davison Div.

J. **Exposure of Employees to Concentrations of Radioactive Materials**

Garino stated that he takes air samples with a Taylor high volume air sampler (20 ft³/min for 5 min) at the places listed in the H. P. manual 1/1/67 (incorporated as procedures in L.C. 8). Procedures state that samples are to be taken quarterly. Inspector's review of records indicates no records of air samples between 1/66 and 6/67. A copy of the last survey record is included as attachment "A" (over)→

K. **Effluents to Unrestricted Areas**

(See J for air samples)

A description of the liquid effluent system is given in paragraphs 18 thru 23 of the report of the inspection conducted on Nov 17, 1966. Daily samples are taken at the final release point and sample counts are averaged over a month. (over)→

L. **Disposals**

Garino stated that since 1/66 the "cross cake" waste mentioned in E has been transferred to Chattanooga plant for burial-storage. Material is shipped in closed steel drums (700 lbs ea.) on trucks rented from D & L Transportation Co., Butler, N.J. This is the sole use of these trucks which are under contract. Garino had current copies of the DOT regulations and had contacted the Bureau of (over)→

M. **Miscellaneous Surveys, Evaluations and Records**

Garino maintains receipt, transfer, disposal and inventory records.

Garino performs quarterly radiation surveys and maintains records of these. GM survey inst. is used. Highest radiation level was 3' from monazite storage area ~ 3.5 mr/hr on last survey.

Garino performs semiannual contamination surveys with swipes which are counted on gasflow proportional counter. Records are kept in units of uci/ft.²

(over S.)

Licensee: W.R. Grace + Co. Davison Div.

N. Special License Conditions

All appeared to be complied with.

O. Posting and Labeling

Gavino had copies of license, procedures, and regulations Part 20 and 40. Gavino stated that the Co. subscribes to the FR. Gavino stated that all men are instructed in the pertinent sections of these documents.

I viewed i.e. 4. All posting + labeling appeared to be adequate. The Ball Mill area is posted with a CARA sign + standard radiation symbol.

P. Independent Measurements

NONE

Q. Operations Observed

TOURED FACILITIES AND WORK IN PROGRESS.
RSO PERFORMED RADIATION SURVEY - INSPECTOR NOTED LEVELS WHICH AGREED WITH HIS RECORDED ONES.

R. Incidents, Overexposures, Theft or Loss, Equipment Malfunction

NONE

Licensee: W. R. Grace + Co, Davison Div.

S. Other Information or Continuation from Previous Paragraphs

L. Cont'd. Garino stated that necessary surveys (10 mr/HR at 6' from external surface of vehicle and 2 mr/HR in cab of vehicle) for radiation were taken. Inspector noted that these survey records were not maintained for shipment of 27 drums on 9/9/68 thru 9/12/68. Garino stated that he must have given them to the driver.

M. Cont'd. Records indicate levels of up to 10^{-3} uci/ft² in the monazite storage area and the Ball Mill area and 10^{-7} uci/ft² in the shipping platform and office area. Garino stated, in reply to the Inspector's question, that he recorded these levels but had no action or guide levels established ~~when~~ as to when clean-up procedures would be used. After some discussion, the Inspector left Garino a copy of N.Y. State Dept of Labor Surface Contamination Limits to use as a guide.

~~In~~ line with contamination control Garino stated, ~~that~~ after contacting a few workers, that most of the workers ~~changed~~ took home their work clothes for washing. He later stated that the persons most likely to have contaminated clothes washed them in a clotheswasher provided for this purpose

(over)

General - Air-Samples

SURVEY OF RADIOLOGICAL AIR-BORNE CONTAMINATION

Location	Date	Time	Type of Survey	Results	
			Airborne Alpha Filtration Rate 20 cu. ft. min. 100 cu. ft. sampled	Alpha counts	uc/ml Th.
Plant shipping room	9/8/68	9:15 AM		11	1.1×10^{-12} uc/ml
Pulverizing Room	" "	9:30 AM.	" "	10	9.1×10^{-13} uc/ml
Calcining Furnace	" "	10:15 AM.	" "	17	1.5×10^{-12} uc/ml
Process Storage Area	" "	10:30 AM	" "	14	1.3×10^{-12} uc/ml
Ball Mill Room	" "	10:45 AM.	" "	71	6.5×10^{-12} uc/ml
Monazite Storage Area	" "	11:00 AM	" "	17	1.5×10^{-12} uc/ml

Date 9/13/68

Peter J [signature]

ATTACHMENT "A"

GENERAL AIR SAMPLES

SURVEY OF RADIOLOGICAL AIR-BORNE CONTAMINATION

Location	Date	Time	Type of Survey	Results	
			AIRBORNE ALPHA STAPLEX FILTER	ALPHA COUNTS	uc/ml TL.
CONTROL LAB	9/8/68	11:15 AM	" "	17	1.5×10^{-12}
SULFONATION KETTLE	" "	11:30 AM	" "	40	3.6×10^{-12}
LUNCH ROOM	" "	11:45 AM	" "	11	1.1×10^{-12}

Date 9/13/68

Pete J Damro

ATTACHMENT "A"

Form AEC-591
(7/67)

U[illegible]ED STATES ATOMIC ENERGY COMMISS[illegible]

DIVISION OF COMPLIANCE

DEC 6 1968

INSPECTION FINDINGS AND LICENSEE ACKNOWLEDGMENT

I - II

1. LICENSEE	2. REGIONAL OFFICE
W. R. Grace & Company Davison Chemical Division Post Office Box 188 Pompton Plains, New Jersey 07444	U. S. ATOMIC ENERGY COMMISSION Division of Compliance, Region I 970 Broad Street Newark, N.J. 07102
3. LICENSE NUMBER(S) STA-422	4. DATE OF INSPECTION [illegible] RI

5. INSPECTION FINDINGS

- ☐ A. No item of noncompliance was found.
- ☐ B. Rooms or areas were not properly posted to indicate the presence of a RADIATION AREA. 10 CFR 20.203(b) or 34.42
- ☐ C. Rooms or areas were not properly posted to indicate the presence of a HIGH RADIATION AREA. 10 CFR 20.203(c) (1) or 34.42
- ☐ D. Rooms or areas were not properly posted to indicate the presence of an AIRBORNE RADIOACTIVITY AREA. 10 CFR 20.203(d)
- ☐ E. Rooms or areas were not properly posted to indicate the presence of RADIOACTIVE MATERIAL. 10 CFR 20.203(e)
- ☐ F. Containers were not properly labeled to indicate the presence of RADIOACTIVE MATERIAL. 10 CFR 20.203(f) (1) or (f) (2)
- ☐ G. A current copy of 10 CFR 20, a copy of the license, or a copy of the operating procedures was not properly posted or made available. 10 CFR 20.206(b)
- ☐ H. Form AEC-3 was not properly posted. 10 CFR 20.206(c)
- ☐ I. Records of the radiation exposure of individuals were not properly maintained. 10 CFR 20.401(a) or 34.33(b)
- ☒ J. Records of surveys or disposals were not properly maintained. 10 CFR 20.401(b) or 34.43(d)
- ☐ K. Records of receipt, transfer, disposal, export or inventory of licensed material were not properly maintained. 10 CFR 30.51, 40.61 or 70.51
- ☐ L. Records of leak tests were not maintained as prescribed in your license, or 10 CFR 34.25(c)
- ☐ M. Records of inventories were not maintained. 10 CFR 34.26
- ☐ N. Utilization logs were not maintained. 10 CFR 34.27

[signature]
(AEC Compliance Inspector)

6. LICENSEE'S ACKNOWLEDGMENT

The AEC Compliance Inspector has explained and I understand the items of noncompliance listed above. The items of noncompliance will be corrected within the next 30 days.

B1340

12/17/68
(Date)

[signature] Plt. Mgr.
(Licensee Representative — Title or Position)

ORIGINAL: LICENSEE. COPIES: ☐ CO REGION ☐ CO HEADQUARTERS ☐ CO ENFORCEMENT

DEC 19 1968

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ITEM # 342

TO RSC 12/20/68

From JPS

2

Inspector's Evaluation

W. R. Grace + Co.

Davison Chemical Division

Post Office Box 188

Pompton Plains, New Jersey 07444

Lic # STA-422

No problems of great significance were found during this inspection, however, there were several areas which appeared somewhat weak. The weaknesses seemed to stem from the RSO's limited experience.

There were no established action or guide levels as to when loose contamination would be cleaned up. Workers wearing special clothing for contamination protection took it home for washing. The RSO had never heard of lapel air samplers for true breathing zone evaluation.

I feel that, as a result of discussions during the inspection, these areas will

ITEM # 343

B/341

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be reenforced, as both the RSO and management appeared quite willing to cooperate.

A reinspection is recommended for 6/7

JAN 6 1969

J. R. Roeder, Chief, Materials Inspection & Enforcement Branch
Division of Compliance, Headquarters

COMPLIANCE INQUIRY MEMORANDUM
W. R. GRACE & COMPANY
POMPTON PLAINS, NEW JERSEY
LICENSE NO. STA-422
TRANSPORTATION OCCURRENCE - Spill of Natural Thorium in Unrefined Ore (Monazite Sand)

On December 30, 1968 at 4:45 PM Mr. W. R. Lorenz, Radiation Specialist, CO:I, received a telephone call from Mr. Peter Garino, R.S.O. for subject licensee, who reported the following transporation occurrence.

On the morning of December 30, 1968, a shipment of eight 100 lbs bags of monazite sand was being transported by the Acme Transfer Company (a trucking company) for the Associated Metals and Minerals Co., N.Y., N.Y. The sand was imported from Australia. The bags were loaded on pallets.

On U. S. Route 23, 3 miles north of the U.S. Route 46 intersection in Wayne, N.J., seven of the eight bags fell off the truck. The bags were discovered by the local police, who began contacting the local chemical companies to find the owner. The bags were labeled "Caution-Radioactive Materials".

The W. R. Grace Company identified the bags as belonging to it, and Mr. Garino was sent to retrieve them. Upon arriving at the site, a reporter from the "Wayne Today" daily newspaper was at the scene taking pictur of the accident. The reporter became aware of the accident from monitoring police calls.

Mr. Garino said six of the seven bags were intact, and approximately 5 lbs of the seventh bag spilled. The sand, including that which spilled, was transported back to the company plant. The radiation level measured on contact with the bags was reported at 1.75 mr/hr using a 0-50 mr/hr Anton Model No. 5 G-M type survey meter. The area after cleaning was measured at contact at 0.2 mr/hr. Mr. Garino assured the reporter that the activity was extremely low and that there was no physical danger to anyone who came in contact with the road.

ITEM # 344

B/3422

OFFICE ▶	CO:I					
SURNAME ▶	Lorenz Lorenz:bc	Ryan	Cleveland			
DATE ▶	1/3/69	1/3/69				

Form AEC-318 (Rev. 9-53) U. S. GOVERNMENT PRINTING OFFICE 16—62761-3

The accident was reported by Garino to his main office in Baltimore. The Baltimore office suggested that our office be notified.

On December 31, 1968 Garino was asked via telephone if the bags of monazite sand received at his plant resembled those found on a street in Newark, N.J., on December 16, 1968 (ref: CTM dated December 24, 1968). He confirmed the bags received by Grace bore the same markings as those found in Newark, but stated his belief the latter bags were not consigned to Grace, since they were expecting no material at that time and had got no shipment with some bags missing.

NYO Public Information Officer, NJ State Health Department and CO:HQ were informed of this occurrence on December 31, 1968. Mr. Charles Amato of NJ Health stated his intent to have a representative visit the scene to confirm there was no residual contamination and to ensure the local reporter had an accurate understanding of the lack of hazard associated with the spill.

There appears to be no hazard associated with this spill; the material appears to be exempt from AEC regulation (10CFR40.13(b)); and this office plans no further action. It may be appropriate for CO:HQ to inform the Department of Transportation of this spill for their information.

R. S. Cleveland
Senior Radiation Specialist

UNITED STATES
ATOMIC ENERGY COMMISSION
DIVISION OF COMPLIANCE
REGION I
970 BROAD STREET
NEWARK, NEW JERSEY 07102

201 645-3962

December 6, 1968

W. R. Grace & Company
Davison Chemical Division
Post Office Box 188
Pompton Plains, New Jersey 07444

Re: License No.: STA-422

Attention: Mr. Hugh Sweitzer

Gentlemen:

Enclosed you will find four copies of Form AEC-591 which list the items of noncompliance noted during our inspection of December 4, 1968 . Please sign all copies, retain the original for your files and return the three carbon copies in the enclosed self-addressed envelope. You will receive no additional correspondence concerning this inspection.

Your cooperation is appreciated.

Very truly yours,

Robert W. Kirkman
Director

Enclosure:
AEC-591 (4 cys)
w/addressed envelope

11

Item J, 20.401 (b)

B/343

ITEM # 345

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Form AEC-591
(7/57)

ED STATES ATOMIC ENERGY COM

DIVISION OF COMPLIANCE

I - II

INSPECTION FINDINGS AND LICENSEE ACKNOWLEDGMENT

1. LICENSEE	2. REGIONAL OFFICE
[illegible]	[illegible]
3. LICENSE NUMBER(S)	**4. DATE OF INSPECTION**
STA-422	[illegible] 1970 RI

5. INSPECTION FINDINGS

- ☒ A. No item of noncompliance was found.
- ☐ B. Rooms or areas were not properly posted to indicate the presence of a RADIATION AREA. 10 CFR 20.203(b) or 34.42
- ☐ C. Rooms or areas were not properly posted to indicate the presence of a HIGH RADIATION AREA. 10 CFR 20.203(c) (1) or 34.42
- ☐ D. Rooms or areas were not properly posted to indicate the presence of an AIRBORNE RADIOACTIVITY AREA. 10 CFR 20.203(d)
- ☐ E. Rooms or areas were not properly posted to indicate the presence of RADIOACTIVE MATERIAL. 10 CFR 20.203(e)
- ☐ F. Containers were not properly labeled to indicate the presence of RADIOACTIVE MATERIAL. 10 CFR 20.203(f) (1) or (f) (2)
- ☐ G. A current copy of 10 CFR 20, a copy of the license, or a copy of the operating procedures was not properly posted or made available. 10 CFR 20.206(b)
- ☐ H. Form AEC-3 was not properly posted. 10 CFR 20.206(c)
- ☐ I. Records of the radiation exposure of individuals were not properly maintained. 10 CFR 20.401(a) or 34.33(b)
- ☐ J. Records of surveys or disposals were not properly maintained. 10 CFR 20.401(b) or 34.43(d)
- ☐ K. Records of receipt, transfer, disposal, export or inventory of licensed material were not properly maintained. 10 CFR 30.51, 40.61 or 70.51
- ☐ L. Records of leak tests were not maintained as prescribed in your license, or 10 CFR 34.25(c)
- ☐ M. Records of inventories were not maintained. 10 CFR 34.26
- ☐ N. Utilization logs were not maintained. 10 CFR 34.27

[illegible signature]

(AEC Compliance Inspector)

6. LICENSEE'S ACKNOWLEDGMENT

The AEC Compliance Inspector has explained and I understand the items of noncompliance listed above. The items of noncompliance will be corrected within the next 30 days.

(Date) *(Licensee Representative — Title or Position)*

ORIGINAL: LICENSEE. COPIES: ☐ CO REGION ☐ CO HEADQUARTERS ☐ CO ENFORCEMENT

92

EE

STA-422

GRACE

W. R. GRACE & CO.
DAVISON CHEMICAL DIVISION
POMPTON PLAINS, N.J.

April 6, 1971

RECEIVED APR 8 1971 U.S. ATOMIC ENERGY COMMISSION Regulatory Mail Section

U. S. Atomic Energy Commission
Material Licensing Section
Washington, D. C. 20545

For Div of Compliance

DOCKET NO. 40-86

Gentlemen:

With reference to License No. 40-86, Category of License 2A, we will discontinue processing monazite ore April 7, 1971, at this location. Under these circumstances, we wish to apply for a storage license only and wish to be billed accordingly.

Sincerely,

Peter J. Garino (da)

Peter J. Garino

PJG:db

cc: U.S. Atomic Energy Commission
Central Accounts Branch
Washington, D. C. 20545

DOCKETED USAEC APR 8 1971 REGULATORY MAIL SECTION DOCKET CLERK

B/344

ITEM # 344

93

To. Paul R. Nelson, Sr. Radiation Specialist cc: 101 CO:I

Subject: Memo to File. Evaluation Re.
W. R. Grace Pompton Plains NJ Lic STA-422

Licensees operations and facilities have not changed in six years. No hazard appears to exist from processing low grade monazite ores. Facilities although generating dust are not occupied during such operations. Licensee personnel appear to take precautions to reduce uptake and minimize exposure.

The license is properly categorized as I with priority II. An extension of six months in reinspection frequency is recommended ~~To~~ The next inspection will be scheduled during 6/72.

Eugene Epstein

9

ITEM # 347

B1345

W. R. Grace & Company.

Davison Chemical Division.

Post Office Box # 188

Pompton Plains, N.J. 07444

Lic # STA-422. date of inspection. 12/29/70.

Docket No. 40-86. inspector E. Epstein

I-II. announced - reinspection.

pts 20-40.

~~date~~

report by Eugene Epstein, date 1/4/71

~~rep~~ reviewed by [signature] date 6/25/71

for: P.R. Nelson

Accompanied by - None - State authorities were notified

Persons Contacted.

Mr. Peter Garino, R.S.O.

Mr Richard Stone, Vice President, Special Products Division -

Report Details:

Background Information:

1. The licensee was last inspected on 12/4/68. The results of the inspection were reported using Form AEC-591 with one item of noncompliance set forth for 10CFR 20.401(b), "failure to maintain records of surveys" The inspector noted that this item was corrected. Records of ~~air~~ surveys to determine air concentrations in restricted and unrestricted areas, smear surveys, direct physical surveys and analysis of water effluents were noted to be fully maintained with indicated ~~to~~ results fully documented.

Facilities and uses of Material.

2 Records of receipt indicate that the licensee has on hand 100000 lbs monazite ore from Ceylon, and Australia containing 3 to 3.5% Thorium (natural). They

The refined thorium is added to cerium oxide polishing compound to create a product having 0.25 Th by wt. in final product as purified ~~containing 1/4 of one percent natural thorium by weight,~~ the thorium. ~~is added to cerium oxide to create~~ hardness.

(3) The process is fully described in the licensees letter dated 2/13/68. Briefly it consists of the following.

(a) Monazite ore is attacked with conc. sulphuric acid in reaction kettles 4-6 hrs.

(b) The reaction is quenched with water

(c) contents of kettle are precipitated as rare earth sulphates.

rare earth product 50-60% of activity ↙ ↘ 40-50% waste of activity

redissolved in water and precipitated as. Sodium sulfates	waste sulfates. are reprecipitated as fluorides
↓	↓
neutralization ~~of~~ with NaOH	filter press
↓	↓
rare earth hydrate.	removed and packaged and sent to Grace Chattanooga Tenn. for use in Gasoline Cracking Catalyst.
↓	
Calcining furnace	
↓	
pulverization in Ball mill.	
↓	
Product,	

4 The inspector noted and Garino confirmed that there is only one stack exhausting air from the installation for the sulphuric acid addition phase only. The kettle fumes are drawn off by means of ~~negative~~

all other areas of use had only natural convection as ventilation

5 Garino stated however that personnel do not stand in the acid treatment room or in the Ball Mill Room during operations. These rooms are closed off during operations and personnel are specifically instructed not to enter.

Surveys:

6 Garino stated that he takes surveys of all operations quarterly. He stated all operations are standard with no deviation and have not changed in the last six years. The surveys include determination of air concentrations in restricted ~~and~~ area, air concentrations in outside unrestricted areas, smear surveys, direct physical radiation surveys and evaluation of activity in water effluent.

7 Survey records ~~were reviewed ___~~ from the date of the last inspection were reviewed and show the following:

Restricted Area Air Concentrations

8 The Ball mill and Sulphuric Acid areas have the highest concentrations. The Ball mill gives alpha activity in ~~___~~ air of a maximum of 6.9×10^{-12} uci/ml air. The ~~Acid~~ Sulfuric Acid Areas gives a maximum of 3.7×10^{-12} uci alpha/ml air. 10 other areas show activity less than

✓ what is the Appendix B value?

Outside Unrestricted areas.

9 Concentrations of alpha activity on the outside of the facility taken at 12 locations always show less than 1×10^{-14} uci alpha / ml air

Smear Surveys.

10 Smears are taken of some 20 areas and reported in units of uci/ft^2. Unrestricted office areas have removable activity of 4.8×10^{-7} to 6.4×10^{-8} uci/ft^2 and restricted areas have activity ranging ~~2×10~~ 2.8×10^{-3} uci/ft^2 in the Storage Room and ~~to~~ 6.2×10^{-4} in the ball mill room and sulfonation room. 2.8×10^{-3} uci/ft^2 is equivalent to 1.3×10^{3} dpm/100cm^2.

Direct Physical Surveys.

(11) Radiation levels according to records at process apparatus range from 1.5 ~~mr/hr~~ mrad/hr ~~at~~ one ~~1~~ ft from the ball mill to ~~2mr/ft~~ 2 mrad/hr at ~~two~~ one foot from the sulfonation kettle. General plant background was noted to be approximately 0.3-0.45 mrad/hr. according to records.

Inspectors Readings.

12 The inspector using a Eberline portable alpha Scintillation meter model PAC-1-SA made a survey of alpha activity in various sections of the plant which seemed entirely covered with a layer of dust. The following ~~results~~ alpha readings were noted

Surface of Oliver filter press 500 cpm/70 cm^2

floor ball mill room 7000 cpm/70 cm² .

Sulfonation kettle surface 2600 cpm/70 cm²
Sulfonation room floor 3000 dpm/70 cm² .
floor locker room 2500 "

Rare earth conveyor belt. 6000 cpm/70 cm² .

Lunchroom trailer 200-400 cpm/70 cm² .

office floors 100-300 cpm/70 cm² .

13 Radiation levels were measured by the inspector using and Eberline E-120 GM survey meter with an end window open probe. Radiation background in the restricted facility was noted as .3-.4 mrad/hr. Radiation levels from apparatus at contact ran from 5-10 mrad/hr. Radiation levels in unrestricted ~~areas did~~ office areas did not exceed 0.05 mrad/hr.

Waste Disposal -

14 All solid waste is packaged and shipped to W.R. Grace. Chattanooga Tennessee, where they are reclaimed and used to manufacture Thorium gas cracking catalyst.

Liquid waste is sent to the on site plant water waste treatment prior to disposal to the Pompton River. Garino stated that waste water treatment consists of the following:

(1) Neutralizing ph.

(2) settling bed for suspended solids

(5) Supernatant liquid from final 55000 tank is disposed to Pompton River after passing over a measuring weir.

15 Garino stated that waste flow is adjusted to a release of 25000 gallons/day. ~~The average daily~~ He stated he takes daily samples at the weir and evaporates one ml. of the effluent to dryness. Activity is counted using a RIDL gas flow proportional counter and scaler. Daily activity does not exceed 2.3 dpm/ml/day.

$$\frac{2.3 \text{ dpm}}{4.4\times10^{6} \text{ dpm/uc}} = 5.2\times10^{-7} \text{ uci/}\cancel{\text{ml}} \text{ water}$$

This is below the limit ~~of~~ ~~5.2×10^{-7}~~ 1×10^{-6} uci/cc expressed in Appendix B, table II Col 2.

Posting & Labeling:

16 The inspector noted that the ~~sulfonation area~~ Sulfuric Acid Room ? Ball mill Room and Stock Room were posted with signs reading "Caution Airborne Radioactivity Area" w symbol as well as signs reading Caution Radiation Area and "Caution ~~Radioactivity~~ Radioactive Materials" w Symbol. The stock room had signs indicating quantity on hand. Form AEC-3, Notice to Employees was noted posted at the entrance to the the restricted area.

17 <u>License Conditions.</u>

Cond #8. ~~Place of use was found to be at the licensee's address as stated in item 2 of the license.~~ ~~and~~ Processing ~~is~~ was noted to be in accordance with the application dtd 1/3/67 and supplement of 2/13/68

Cond 9. The licensee was noted to comply with 20.203(e)(2).

Cond 10. Place of use was noted to be at the listed address.

<u>Management Review.</u>

18. The status of the inspection was discussed with Mr Richard Stone, Vice President Special Products Division, and form AEC-591 clear was issued. The inspector suggested a urine bioassay program be adopted in view of the constant presence of dust and removable contamination. He readily agreed and stated the would institute a semiannual bioassay to determine any possible uptake by workers.

OPTIONAL FORM NO. 10
MAY 1962 EDITION
GSA FPMR (41 CFR) 101-11.6

UNITED STATES GOVERNMENT

Memorandum

TO : P. R. Nelson, Senior Radiation Specialist DATE: April 21, 1971

FROM : C. F. Stearns, Radiation Specialist CFS

SUBJECT: W. R. Grace & Company
Pompton Plains, New Jersey
License Number STA-422

In a telephone call to CO:I, on April 8, 1971, Richard Stone, Vice President, Special Products Division, stated that all production using licensed material has been discontinued at subject licensee's Davison Chemical division plant, at Wayne, N.J. He further stated that a letter had been sent to the Commission, requesting that the license henceforth authorize only storage of the finished product. (See copy of letter, in the license folder, dated 4/6/71, from the licensee to DML.)

Stone stated that no radioactive material will be possessed, except what might be contained in the finished product. He stated that the facilities where radioactive material had been used will not be abandoned; however, there will be no further use of the facilities for even non-radioactive purposes, except for the continued use of a sales office on an upper floor.

Stone stated that the only radioactive material used has been thorium. When asked by Stone how low contamination levels must be in an unrestricted area, Stearns suggested 1000 dpm/100cm as an unofficial value which should be a conservative criterion for an unrestricted area, since it has been used by the Commission as a guideline for abandonded facilities. Stone stated that levels might already be that low, as a result of cleaning operations which have already been carried out. He stated, however, that further cleaning and surveys will be performed, as required.

No further action by this office is recommended at this time.

ITEM # 3483 346

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5010-108

APR 2 3 1971

DISTRIBUTION:
Document Room
Docket File
Branch R/F
Division R/F
RLLayfield's R/F
CO, REGION I
ACabell DR:ADM
State Health
CLHilliard

DML:MB:RLL
40-86
STA-422, Amendment No. 1

W. R. Grace and Company
Davison Chemical Division
ATTN: Mr. Peter J. Garino
P.O. Box 188
Pompton Plains, New Jersey 07444

Gentlemen:

In accordance with your application dated April 6, 1971, and pursuant to Title 10, Code of Federal Regulations, Part 40, Source Material License No. STA-422 is hereby amended to authorize storage only. This license does not authorize processing in any manner.

All other conditions of this license shall remain the same.

Since this license now authorizes storage only, the fee for this license, pursuant to Section 170.31, 10 CFR 170, copy enclosed, is forty (40) dollars. Please submit this amount in accordance with the license fee invoice previously sent to you.

FOR THE ATOMIC ENERGY COMMISSION

Original signed by
Robert L. Layfield

Robert L. Layfield
Materials Branch
Division of Materials Licensing

Enclosure:
10 CFR Part 170

CRESS:tlc	DML	DML
T30 R04	RLLayfield:tlc	CRBuchanan
4/21/71	4/21/71	4/ /71

ITEM # 349

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DEC 27 1972

W. R. Grace & Company
Davison Chemical Division
Post office box 188
Pompton Plains, New Jersey 07444

SUBJECT: NOTICE OF LICENSE EXPIRATION

Gentlemen:

Notice is given that Source Material License No. STA-422 expires on February 28, 1973.

If you desire to continue your program using source material(s), an application for renewal of the license should be filed with this office. It is to your advantage to file such an application at least thirty (30) days before the expiration date of your existing license. The application should be submitted using Form AEC-2 (copy enclosed), in accordance with the instructions provided with the form. Your program will then be covered by your existing license until action is taken on your application for license renewal (Title 10, Code of Federal Regulations, Part 40, Section 40.43(b)). If an application is received less than 30 days prior to the expiration date of your license and cannot be processed before your existing license expires, this could result in your possessing source material without a valid license.

If you do not wish to renew your license, please complete the enclosed form "Certification of Status of Source Material Activities under United States Atomic Energy Commission Source Material License No. STA-422" and return it to this office.

If you have obtained an amendment which has extended the expiration date of the above license or if a new license has been issued which supersedes the above license, please disregard this notice.

This notice of your license expiration is sent for your convenience and it should not be interpreted that similar notices will be sent in the future. The responsibility for timely submission of an application for license renewal remains with the licensee.

Sincerely,

James C. Malaro

James C. Malaro, Chief
Materials Branch
Directorate of Licensing

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Enclosures:
1. 10 CFR Parts 20 and 40
2. Form AEC-2
3. "Certification ..."

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ITEM # 350

REGULATORY OPERATIONS

DOCKET NO. 40-86

UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

RECEIVED JAN 22 1973

CERTIFICATION OF STATUS OF SOURCE MATERIAL ACTIVITIES
UNDER UNITED STATES ATOMIC ENERGY COMMISSION LICENSE NO.

REGJ

LICENSEE: W. R. Grace & Co., Davison Chemical Division

ADDRESS: P. O. Box 188, Pompton Plains, N. J. 07444

The licensee and any individual executing this certification on behalf of the licensee certify that (check appropriate item(s) below):

_____ No source materials have been procured and/or possessed by licensee.

All source materials procured and/or possessed by licensee under source material license No. STA-422

X (1) have been or will be, prior to expiration of the above license, transferred to W. R. Grace & Co., Davison Chemical Division
(Institution, firm, hospital, person etc.)
4000 N. Hawthorne Street, Chattanooga, Tennessee 37406

which has source material license No. S-3306 L3

_____ (2) have been or will be disposed of in compliance with 10 CFR 20 prior to expiration of this license.

X (3) will be possessed under the general license of Section 40.22, 10 CFR 40.

_____ (4) Other _____

Richard L. Stone

Certifying Official
Richard L. Stone, Vice President
Date: January 16, 1973

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Please return three copies to:
U. S. Atomic Energy Commission
Division of Materials Licensing
Washington, D. C. 20545

518

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ITEM # 351

To: File   License STA-422
Dec 6, 1973

Telecon to Mobley of W.R. Grace - Baltimore Md. Corporate Office - 8-301-597-3311 - or 727-3900 Ext 363.

Mobley stated they wished to decontaminate plant and plant site at Pompton Plains. Purpose is to sell completely to Nucleonics Incorporated - Dick Mandel, President who presently has an office on site. Stated that F. Davis of DML had forwarded him the Guide for Release Limits. Also they have obtained Paul Clevin (Former AEC) as a consultant for the work. Have also had Health Physics Services (Consultant) provide report of required decon work at plant for release

B/350

ITEM # 352

The Nucleonics Inc. wants possession of deconed plant by Feb. 1, 1974. They are to contact someone to perform decon work next week.

STA-422 expired on Feb 28, 1973. Mobley stated a check for $80.^{00} was forwarded in Feb for renewal. (No application) He now knows this did not renew license & wanted to know if he should get license. Said I would call him back.

Material has been buried on site - he does not know what is above ground.

Said I would call him on Dec 7.

R. Smith

To: File STA-422

Called J. Metzger on Dec 6, 1973 Re: W.R. Grace —

Jack will call me Dec 7. He agrees we should keep the license active but will check. Said no problem with leaving buried material on property. May require some marking for deeded record.

R. Smith

B/351

ITEM # 353

12-7-73

Telecon from Metzger:

Grace sent letter on Dec, 7, 1972, explaining need for certificate of status of materials. (Letter not in RO:I file).
We have certificate.

Licensing goofed in not asking for condition of facility and release requirements.

Jack suggests Grace apply for storage license if have licensable quantities. Attn: J. L. Rouse, Room 308 B - East West Towers. — Rouse briefed on case.

Told him I would call Grace as they are willing to cooperate in any way.

R Smith

B/352

ITEM # 354

Dec. 7, 1973

To: File License STA-422

Telecon to Mr. Burton L. Mobley, Supervisor of Environmental Control, this date —

Mobley will prepare application for Source Material license which I am forwarding this date.

He was also notified that the RO:I contact for him is Robert McClintock. Was notified to send RO:I copy of close out surveys and contact McClintock upon completion of surveys with as much lead time as possible.

The necessity of survey info regarding underground lines, ventilation stacks & ducts and records to substantiate waste burial with Part 20 were discussed.

Rated as very cooperative of our needs.

ITEM # 355

B/353

R. Smith

98

12-7-73

Telecon from Metzger:

Grace sent letter on Dec. 7, 1972, explaining need for certificate & status & materials. (Not letter in RO:I file).
We have certificate.

Licensing goofed in not asking for condition of facility and release requirements.

Jack suggests Grace apply for storage license if have licensable quantities. Attn: J. L. Rouse - Room 308 B - East West Towers. — Rouse briefed on case.

Told him I would call Grace as they are willing to cooperate in any way.

R Smith

To: File STA-4.22

Called J. Metzger on Dec 6, 1973 Re: W.R. Grace —

Jack will call me Dec 7. He agrees we should keep the license active but will check. Said no problem with leaving buried material on property. May require some marking for recorded record.

R. Smith

To: File License STA-422
Dec 6, 1973

Telecon to Mobley of W.R. Grace - Baltimore Md. Corporate Office - 8-301-597-3311 - 727-3900 Ext 363.

Mobley stated they wished to decontaminate plant and plant site at Pompton Plains. Purpose is to sell completely to Nucleonics Incorporated - Dick Mandel, President who presently has an office on site. Stated that F. Davis of DML had forwarded him the Guide for Release Limits. Also they have obtained Paul Clevin (Former AEC) as a consultant for the work. Have also had Health Physics Services (consultant) provide report of required decon work at plant for release

ITEM # 356

B/354

The Nucleonics Inc. wants possession of decon'ed plant by Feb. 1, 1974. They are to contact someone to perform decon work next week.

STA-422 expired on Feb 28, 1973. Mobley stated a check for $80.00 was forwarded in Feb. for renewal. (No application) He now knows this did not renew license & wanted to know if he should get license. Said I would call him back.

Material has been buried on site - he does not know what is above ground.

Said I would call him on Dec 7.

R. Smith

REGULATORY [illegible]

I

GRACE W.R.GRACE & CO., [illegible]
CHARLES & BALTIMORE STREETS, BALTIMORE, MD. 21203 301: 727-3900

December 7, 1973

RECEIVED DEC 20 1973

Director of Licensing
U.S. Atomic Energy Commission
Washington, D.C. 20545

Att.: Mr. L. Rouse
Room 308-B
East-West Towers

Gentlemen:

I am attaching an application for renewal of our AEC Storage License, STA 422.

W. R. Grace & Company operated a monazite processing plant at Pompton Plains, New Jersey, under an AEC Source Material License, No. STA 422. The plant was closed and by amendment of our Source Material License on 23 April 1971, it was converted to a Storage Facility Only. This license expired on 28 February 1973, although a check for $80.00 was sent to the AEC prior to 28 February for renewal of the license. Apparently we neglected to submit the proper Application for Renewal form along with the check. I am attaching a photo-copy of our check No. 12703 and your invoice No. L-2430-73. 4

I have been in touch with Mr. Ray Smith of the AEC Compliance Office in King of Prussia, Pa., who advised that we renew our license before attempting to have the facility released for unrestricted use. He has turned our Relicensing and Release of Facilities case over to Mr. McClintock of that office. Mr. Frank Davis of the Licensing Office has provided us with the "Guidelines for Decontamination--- and Release---".

We are most anxious to complete the decontamination and release of this facility promptly, as we have a buyer for the property if he can move in by 1 February 1974.

I realize that it will be difficult to complete the decontamination, survey, and inspection, and get all the paper work done by 1 February. Because of the urgency of completing this project, we have engaged Mr. Paul Klevin, a former AEC compliance inspector, as consultant, and we plan to contract out the decontamination job. We will keep in close touch with Mr. McClintock so as to lose no time between

B/385

Called [illegible] explained [illegible]

ITEM # 357

0044

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Director of Licensing, U.S.Atomic Energy Comm. 20545
Att. Mr. L. Rouse

completion of the decontamination and the compliance inspection. I am anxious to keep in close liaison also with your office to ensure that we do all our paper work correctly the first time around.

I presume the $80.00 payment made in February will cover the cost of renewing our Source Material License with the April 1971 amendment, so we have not sent another check.

If the attached application is in any way unsatisfactory or incomplete, please call me at (301) 727-3900 Ext. 363 in Baltimore. I have kept a copy of the Application Form and will either provide the information required over the telephone or send in a corrected application.

Thank you for your attention to our problem.

Very truly yours,

W. R. GRACE & CO., DAVISON DIVISION

B. L. Mobley

B. L. Mobley
Supervisor, Environmental Control

BLM:GW

CC: Mr. R. McClintock
U.S. AEC, Compliance Division
631 Park Avenue
King of Prussia, Pa. 19406

FORM APPROVED
BUREAU OF BUDGET NO. 38-R0002.

UNITED STATES ATOMIC ENERGY COMMISSION

APPLICATION FOR SOURCE MATERIAL LICENSE

... regulations in Title 10, Code of Federal Regulations, Chapter 1, Part 40, application is hereby ... receive, possess, use, transfer, deliver or import into the United States, source material ... activities described.

... New License
... to License No. ______
... of License No. ______
... License No. ______

2. NAME OF APPLICANT
W. R.Grace & Co., Davison Chem. Div.

3. PRINCIPAL BUSINESS ADDRESS
10 E. Baltimore Street
Baltimore, Maryland 21202

... AT WHICH SOURCE MATERIAL WILL BE POSSESSED OR USED
... Ridge Road, Wayne Township, N.J. (Mailing Address: ... x 188, Pompton Plains, N.J. 07444)

... OCCUPATION
... Chemicals Mfg.

6. (a) IF APPLICANT IS AN INDIVIDUAL, STATE CITIZENSHIP

(b) AGE

... PURPOSE FOR WHICH SOURCE MATERIAL WILL BE USED
... now closed; license amended to Storage License. When in operation ... product was cerium oxide polishing powder. See earlier ... AEC-2 on file for further details.

... TYPE OR TYPES, CHEMICAL FORM OR FORMS, AND QUANTITIES OF SOURCE MATERIAL YOU PROPOSE TO RECEIVE, ... OR TRANSFER UNDER THE LICENSE

... TYPE	(b) CHEMICAL FORM	(c) PHYSICAL FORM (*Including % U or Th.*)	(d) MAXIMUM AMOUNT AT ANY ONE TIME (*in pounds*)
URANIUM	--	--	--
...	--	--	--
... ISOTOPE)	Please refer to original Form AEC-2		

... MAXIMUM TOTAL QUANTITY OF SOURCE MATERIAL YOU WILL HAVE ON HAND AT ANY TIME (*in pounds*)

See original Form AEC-2

... THE CHEMICAL, PHYSICAL, METALLURGICAL, OR NUCLEAR PROCESS OR PROCESSES IN WHICH THE SOURCE MATERIAL WILL ... STATING THE MAXIMUM AMOUNT OF SOURCE MATERIAL INVOLVED IN EACH PROCESS AT ANY ONE TIME, AND PROVIDING ... EVALUATION OF THE POTENTIAL RADIATION HAZARDS ASSOCIATED WITH EACH STEP OF THOSE PROCESSES.

See original Form AEC-2

Applicant ________
Check No. 18738
Amount 480
Date of Check 1-11-74
... Rec'd 1-7-74
Received By ... [signature]

... THE MINIMUM TECHNICAL QUALIFICATIONS INCLUDING TRAINING AND EXPERIENCE THAT WILL BE REQUIRED OF AP... SUPERVISORY PERSONNEL INCLUDING PERSON RESPONSIBLE FOR RADIATION SAFETY PROGRAM (OR OF APPLICANT IF ... IS AN INDIVIDUAL).

See original Form AEC-2

... EQUIPMENT AND FACILITIES WHICH WILL BE USED TO PROTECT HEALTH AND MINIMIZE DANGER TO LIFE OR PROPERTY ... OF THE EQUIPMENT AND FACILITIES TO THE OPERATIONS LISTED IN ITEM 9; INCLUDE: (a) RADIATION DETECTION ... INSTRUMENTS (including film badges, dosimeters, counters, air sampling, and other survey equipment as appropriate. The description of ... instruments should include the instrument characteristics such as type of radiation detected, window thickness, and the range(s) of each in-

See original Form AEC-2

... AND STANDARDS USED IN CALIBRATING INSTRUMENTS LISTED IN (a) ABOVE, INCLUDING AIR SAMPLING ... badges, specify method of calibrating and processing, or name supplier).

See original Form AEC-2

11(c) VENTILATION EQUIPMENT WHICH WILL BE USED IN OPERATIONS WHICH PRODUCE DUST, FUMES, MISTS, OR GASES, INCLUDING PLAN VIEW SHOWING TYPE AND LOCATION OF HOOD AND FILTERS, MINIMUM VELOCITIES MAINTAINED AT HOOD OPENINGS AND PROCEDURES FOR TESTING SUCH EQUIPMENT

See original Form AEC-2

12. DESCRIBE PROPOSED PROCEDURES TO PROTECT HEALTH AND MINIMIZE DANGER TO LIFE AND PROPERTY AND RELATE THESE PROCEDURES TO THE OPERATIONS LISTED IN ITEM 9; INCLUDE: (a) SAFETY FEATURES AND PROCEDURES TO AVOID NONNUCLEAR ACCIDENTS, SUCH AS FIRE, EXPLOSION, ETC., IN SOURCE MATERIAL STORAGE AND PROCESSING AREAS

See original Form AEC-2

(b) EMERGENCY PROCEDURES IN THE EVENT OF ACCIDENTS WHICH MIGHT INVOLVE SOURCE MATERIAL.

See original Form AEC-2

(c) DETAILED DESCRIPTION OF RADIATION SURVEY PROGRAM AND PROCEDURES.

See original Form AEC-2. For proposed cleanup, Applied Health Physics, Inc., (Robt. Gallagher, Pres.) has been hired as consultant to conduct complete radiation survey.

13. WASTE PRODUCTS: *If none will be generated, state "None" opposite (a), below. If waste products will be generated, check here* ☐ *and explain on a supplemental sheet:*

(*a*) Quantity and type of radioactive waste that will be generated.
(*b*) Detailed procedures for waste disposal.

See original Form AEC-2.

14. IF PRODUCTS FOR DISTRIBUTION TO THE GENERAL PUBLIC UNDER AN EXEMPTION CONTAINED IN 10 CFR 40 ARE TO BE MANUFACTURED, USE A SUPPLEMENTAL SHEET TO FURNISH A DETAILED DESCRIPTION OF THE PRODUCT, INCLUDING:

(*a*) PERCENT SOURCE MATERIAL IN THE PRODUCT AND ITS LOCATION IN THE PRODUCT.
(*b*) PHYSICAL DESCRIPTION OF THE PRODUCT INCLUDING CHARACTERISTICS, IF ANY, THAT WILL PREVENT INHALATION OR INGESTION OF SOURCE MATERIAL THAT MIGHT BE SEPARATED FROM THE PRODUCT.
(*c*) BETA AND BETA PLUS GAMMA RADIATION LEVELS (*Specify instrument used, date of calibration and calibration technique used*) AT THE SURFACE OF THE PRODUCT AND AT 12 INCHES.
(*d*) METHOD OF ASSURING THAT SOURCE MATERIAL CANNOT BE DISASSOCIATED FROM THE MANUFACTURED PRODUCT.

CERTIFICATE

(*This item must be completed by applicant*)

15. *The applicant, and any official executing this certificate on behalf of the applicant named in Item 2, certify that this application is prepared in conformity with Title 10, Code of Federal Regulations, Part 40, and that all information contained herein, including any supplements attached hereto, is true and correct to the best of our knowledge and belief.*

W. R. Grace & Co.
Davison Chemical Division
(*Applicant named in Item 2*)

Dated December 14, 1973

BY: [signature]
(*Print or type name under signature*)

Burton L. Mobley
Supervisor, Environmental Control
(*Title of certifying official authorized to act on behalf of the applicant*)

WARNING: 18 U.S.C. Section 1001; Act of June 25, 1948; 62 Stat. 749; makes it a criminal offense to make a willfully false statement or representation to any department or agency of the United States as to any matter within its jurisdiction.

☆ U.S. GOVERNMENT PRINTING OFFICE · 1969—O-795-054

UNITED STATES
ATOMIC ENERGY COMMISSION
DIRECTORATE OF REGULATORY OPERATIONS
REGION 1
631 PARK AVENUE
KING OF PRUSSIA, PENNSYLVANIA 19406

DEC 7 1973

W. R. Grace & Company
Davison Chemical Division
Attention: Mr. Burton L. Mobley
Supervisor of Environmental Control
10 East Baltimore Street
Baltimore, Maryland 21202

Gentlemen:

This refers to my telephone discussion on December 7, 1973, with Mr. Mobley, of your staff, concerning the possession and storage of radioactive material at Pompton Plains, New Jersey. The storage of material was formerly authorized by Amendment No. 1 of AEC Source Material License No. STA-422 which expired February 28, 1973.

As stated in my telephone discussion, you are requested to apply for a source material license for storage. To facilitate licensing action, a Form AEC-2, "Application for Source Material License", is enclosed for your use, together with copies of the applicable AEC regulations. A letter including an explanation of the license fee of eighty dollars ($80.00) which you submitted during February, 1973 should accompany the application. The completed application should be forwarded to the U.S. Atomic Energy Commission, Directorate of Licensing, Attention of Mr. L. C. Rouse, Washington, D. C. 20545.

Please notify this office of the date of your application and also of any delays experienced in submitting the application by December 28, 1973.

Should you have any further questions concerning this matter, please feel free to discuss them with Mr. Robert McClintock or me.

Sincerely,

Raymond H. Smith
Investigation Specialist

Enclosures:
1. Form AEC-2
2. AEC Regulations 10 CFR 20,40, and 170.

ITEM # 358

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OFFICE ▶	CRESS					
SURNAME ▶	Smith:pdb	McClintock	Nelson			
DATE ▶	12-7-73	12/7/73	12/7/73			

Form AEC-318 (Rev. 9-53) AECM 0240

GRACE W.R.GRACE & CO.,DAVISON CHEMICAL DIVISION
CHARLES & BALTIMORE STREETS, BALTIMORE, MD. 21203 ■ 301:727-3900

January 3, 1974

Mr. Doug Weiss
Atomic Energy Commission
Business Management Branch
Washington, D. C. 20545

Dear Mr. Weiss:

In response to your telephone call of December 26, 1973, to Mr. Fred Shaw of our office, I am sending a company check for eighty dollars ($80.00) for renewal of our AEC Source Material License No. STA-422 (amended to a Material Storage License) for our Pompton Plains, New Jersey, property. I submitted Form AEC-2 to Mr. L. Rouse, Directorate of Licensing, on December 14, 1973.

We are presently negotiating with a contractor for decontamination and cleanup of this property preparatory to obtaining a "Release of Facilities" from the AEC. We propose to sell the property in early February, 1974.

Our license was inadvertently allowed to expire on February 28, 1973, by failing to send Form AEC-2 with our check. The invoice for renewal, dated January 24, 1973, stated the renewal period as 02/05/73-02/04/74. Although there is this discrepancy in dates, I understand that a proportional part of the current renewal fee will be refundable based on completion of our Release of Facilities application. We will notify you upon this completion.

Very truly yours,

B. L. Mobley

B. L. Mobley
Supervisor
Environmental Control

BLM:nbs

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GRACE

Polyfibron Division

W.R. Grace & Co.-Conn.
Harmony Street
Adams, MA 01220

(413) 743-0546
Fax: (413) 743-7941

July 22, 1992

Betsy Ullrich
Senior Health Physicist
U. S. Nuclear Regulatory Commission
Region I
475 Allendale Road
King of Prussia, PA. 19406

Dear Ms. Ullrich:

This is to formally notify you that Mr. Stephen R. Jones has replaced Mr. Henry A. Johnson as the W. R. Grace Radiological Safety Officer for our Adams facility. This took place effective January 1990.

If you wish any further information, please feel free to contact me.

Sincerely,

W. R. GRACE & CO.

Alexander W. Nagy

Alexander W. Nagy
Assistant Plant Manager

AWN:sml

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ITEM # 360

JAN 3 - 1974

W. R. Grace & Company
Davison Chemical Division
ATTN: Fred Shaw
Charles & Baltimore Streets
Baltimore, Maryland 21203

Gentlemen:

This refers to Mr. B. L. Mobley's letter of December 14, 1973, and your phone conversation on December 26, 1973, with Mr. Doug Weiss of this office concerning renewal of License STA-422.

The license expired February 28, 1973. An application fee, therefore, of $80 is required as specified in Section 170.31 (2C) of Part 170, copy enclosed. Payment should be made to the U.S. Atomic Energy Commission and mailed to my attention.

Payment of Invoice L-2430-73 dated January 24, 1973, did not automatically renew License STA-422. An application for renewal must be filed before the license expires, or an application for reissuance must be submitted with the required fee. (See Section 170.31 Footnote 3).

We will be pleased to process your request to reissue the license upon receipt of the above fee.

Sincerely,

Signed, C. James Holloway, Jr.

for William O. Miller
Business Management Branch
Office of Administration
Regulation

Enclosure:
10 CFR 170

$80 rec'd 1/8/74

DISTRIBUTION:
License File
BMB R/F
RMiller, DRA

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OFFICE ▶	DRA:BMGT	DRA:BMGT	ITEM # 361
SURNAME ▶	DWeiss:mlf	WOMiller	
DATE ▶	1/3/74	1/ /74	

Form AEC-318 (Rev. 9-53) AECM 0240 GPO 643-16-81465-1 445-678

UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

2-26-74

James F. Wagner, Chief
Central Accounts Branch
Office of the Controller

XXXXXXXX REFUND OF APPLICATION FEE - W. R. Grace & Company

Applicant submitted Check 18738 on 1-7-74 for $80, as an application fee for a source material license. Please refund $80 to:

W. R. Grace and Company
Charles & Baltimore Street
Baltimore, Maryland 21203

AttN: B.L. Mobley

License STA-422 expired 2-28-73; however, applicant possesses the source material under the general license provisions of 10CFR40 Section 40.22. The application should not have been filed (as suggested by Region-1) and the application fee should not have been collected.

Doug Weiss
Business Management Branch
Office of Administration - Regulation

Attachment:

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ITEM # 362

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116885

HEALTH PHYSICS REPORT

for

W. R. GRACE COMPANY
Wayne, New Jersey

Radiological Survey Following
Decontamination of Facilities

June 18, 1974

Prepared by
Maryanne McClosky
Maryanne McClosky
Health Physicist

ITEM # 363

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PART I

INTRODUCTION

W. R. Grace Company engaged Applied Health Physics, Inc. of Bethel Park, Pennsylvania to carry out decontamination of their Davison Chemical Division facilities located at Pompton Plains, New Jersey. An earlier survey conducted by Applied Health Physics, Inc. personnel revealed contamination of buildings and the property by various thorium - containing materials. See Part II. Decontamination at the site began on March 11, 1974 and continued through July 18, 1974.

The goal of the decontamination work was to attain certain limits and conditions prior to the release of these premises for unrestricted use. Appendix A presents these guidelines for unrestricted use.

A qualified consultant, Mr. Paul B. Klevin, was engaged by W. R. Grace Company to provide an expert's opinion on the progress and course of the decontamination, as well as to assure compliance with the state of New Jersey and United States Atomic Energy Commission regulations.

The overall ground area of the W. R. Grace Plant at Wayne, New Jersey is 6.4 acres. The frontage is on Black Oak Ridge Road with chain link fence boundaries north and south, as shown on Figure 1. A small brook runs east and north of the area, providing the eastern property line.

HEALTH PHYSICS REPORT

for

W. R. GRACE COMPANY
Wayne, New Jersey

RESULTS of RADIOLOGICAL EVALUATION

of

THORIUM ORE WASTE DISPOSAL PROBLEM

Prepared by

Maryanne McClosky
Health Physicist

PART II

(Survey prior to Decontamination)

RESULTS OF RADIOLOGICAL EVALUATION of THORIUM ORE WASTE DISPOSAL PROBLEM

INTRODUCTION

W. R. Grace Company has operated a plant in Wayne, New Jersey for a number of years. The plant is located on Black Oak Ridge Road and has been non-operative for the past few years. Currently, the plant lies empty, except for a few pieces of equipment and materials left onsite. Optical polishing compounds were manufactured at this plant. Some of this raw material contained natural thorium and various rare earths, especially cerium. Possession and use of these naturally occurring radioactive materials (e.g., natural thorium) necessitated that W. R. Grace obtain a source material license from the U. S. Atomic Energy Commission and comply with US-AEC regulations.

This survey was conducted as a prelude to decontamination, which must be carried out since W. R. Grace Company plans to sell this property. Federal and state regulations specify the conditions and limits which must be achieved prior to release of facilities and equipment for unrestricted use by non-licensed parties. See Appendix A. W. R. Grace has engaged the services of a qualified consultant, Mr. Paul B. Klevin, to advise them as to the procedures they must follow in order to assure compliance with the applicable regulations and safety standards.

RADIATION SURVEY

On December 11, 1973, Applied Health Physics, Inc. was informed by Mr. Klevin and Mr. B. L. Mobley of W. R. Grace Company that the plant contained thorium at various locations within the buildings and had been buried on the site.

Applied Health Physics was requested to survey the buildings and grounds, and to report their findings.

The radiation monitoring started December 12, 1973, with the preliminary survey for alpha and gamma radiation. Instrumentation used by our health physics personnel consisted of a calibrated gas proportional alpha survey meter (Eberline Model PAC-3G) and a portable gamma scintillation spectrometer (Eberline Model PRM 5-3).

The contamination consisted primarily of fine dusts scattered through the buildings, and various isolated pockets of activity; e.g., as in trenches. On-site burial accounted for outdoor activity in varying degrees. A complete outdoor survey could not be accomplished due to inclement weather.

Besides using the forementioned radiation survey meters, our surveys also included the collection of smears to evaluate removable contamination; liquid and sludge samples of various materials were collected for estimates of removable and fixed activities. Maps and drawings made at the time of the sampling indicate precisely where various measurements and samplings of materials were obtained. Results of alpha-gamma radiation survey are summarized for certain locations on Table 1.

Gamma and alpha measurements were taken at surface level. These data are presented in Figures 6 and 7. As indicated in Table 1, surface alpha measurements range from 0 to 88,000 disintegrations per minute. The area of the alpha survey meter probe is 68 cm^2. This data can only estimate the "fixed" activity, since alpha radiation cannot penetrate even a thin covering of dust or other non-radioactive materials. The actual amount of radionuclides in terms of dpm per gram of contaminated surface may be significantly greater than that measured and reported. Figures 1-5 show conditions at the time of our initial survey, December 12, 1973. Additional photographs were taken January 21, 1974, during the course of our site survey. These photos will be retained on file.

Results of the alpha content of sample are listed in Tables 2 and 3. The highest reading for removable contamination was found to be 1,948 d/m/100 cm^2, while other values averaged 500 d/m/100 cm^2. The liquid and sludge samples gave estimates of concentrations of contamination ranging from 2,000 to 10,000 d/m/gram of material. The isotopic content of these samples was determined and found primarily to be natural thorium with traces of radium (0.6 $\pm$ 1 nano-Ci per gram). This was done by gamma spectroscopy; the thorium content of settled dusts inside the plant is 20.0 $\pm$ 1.0 mg Th/g sample.

On January 21, 1974, an employee was seen vacuuming these dust laden areas without respiratory protection and using a bag-type industrial vacuum cleaner which created significant airborne dusts. Mr. Klevin requested the termination of this operation, and the results are shown on Figure 7.

CONCLUSIONS

Waste slags and ores containing thorium are buried at various areas of the plant site. See Figure 6. These locations could not be determined precisely due to lack of sufficient information concerning burial. Furthermore, during January, 1974, earth moving equipment was used to level certain portions of the plant property where source material had been buried. These areas were surveyed January 21 and 22, 1974, and the results are shown in Figure 7. Certain deposits were found to be only partially buried. These locations were detected by gamma scintillation and a few samples were collected.

The results of the various radiological surveys are the basis for the following conclusions:

1. The maximum amount of removable alpha radioactivity exceeds within certain portions of the plant as well as on the plant property the recommended limit of 1,000 dpm per 100 cm^2. Radioactive source materials should be removed, so that acceptable limits are met at these locations. Appendix A contains radioactivity limits for un-

restricted release of facilities and equipment.

2. Clothing, equipment, and fixtures are now in place which harbors radioactive contamination. For example, fans, coveralls, benches etc. which no longer serve a useful purpose should be disposed of in a manner that results in minimal contamination to clean areas and complies with applicable regulations.

3. The ground floor of the main building, as well as the floors of smaller places have buildup of thorium concentration due to seepage and deposition over the years. These surfaces should be thoroughly cleansed, or removed, depending on the economics of decontamination, versus feasibility of disposal. The floor conditions in certain areas are so bad as to necessitate disposal.

4. Drain lines and trenches were found to have high (10^4dpm/gram) concentrations of licensed material. These and other water routes are to be areas of attention when clean-up takes place.

5. All removal, repackaging or transfer of licensed radioactive materials must be done under the direct supervision of health physics personnel who are experienced in this type of decontamination and waste disposal work.

TABLE 1

RESULTS OF ALPHA-GAMMA RADIATION SURVEYS

Location	Alpha DPM/100 cm^2	Gamma DPM/100 cm^2	mr/hr
Storage area - 2nd. Level	660	1.55×10^6	0.15
Press room wall - 2nd Level	2.64×10^4	5.18×10^6	0.6
7-K Blending & Storage - 2nd Level	1.93×10^3	3.11×10^6	0.3
Drying Room - 2nd Level	3.08×10^3	2.07×10^6	0.2
Sulfonation, 1&2 Tank Rooms	1.76×10^4	5.18×10^6	0.6
Open Storage area, wall	8.80×10^4	1.04×10^7	1.1
Storage area, drain	2.20×10^4	6.21×10^6	0.8
Waste Treatment Room	1.93×10^4	1.04×10^6	0.15
Background (outdoors)	None	6.21×10^5	<0.1

TABLE 2

RESULTS OF ALPHA RADIATION ANALYSES
OF THORIUM BOTTLE SAMPLES

Sample Number	Area*	Weight (gram)	Total Alpha Activity (d/m/gram)
529	1-0-1	0.3843	1.2×10^4
514	1-J	0.4626	7.0×10^3
522	1-M-1	0.2938	1.6×10^4
504	1-F	0.3304	1.22×10^4
502	1-B	1.0586	280
512	1-J	0.4935	3.66×10^3
505	1-F	0.0877	8.22×10^3
511	1-J	0.3001	6.50×10^3
513	1-J	0.4882	1.43×10^3
527	1-0-1	0.7708	7.36×10^3
528	1-0-1	0.0638	2.23×10^4
532	1-Q-1	0.1215	3.47×10^3
526	1-0-1	0.0262	1.04×10^4
506	1-F	0.0224	5.14×10^3
531	1-Q-1	0.0679	8.20×10^3
521	1-M-1	0.0916	2.42×10^3
523	1-M-1	0.1792	1.95×10^3
501	1-B	0.0771	6.38×10^3
510	1-G	0.1095	1.105×10^4
503	1-B	0.0078	7.24×10^3
530	1-Q-1	0.0538	2.19×10^3
525	1-0-1	0.4199	119
508	1-G	0.1856	4.69×10^3
507	1-G	0.0942	5.43×10^3
509	1-G	0.1995	1.05×10^4
524	1-M-1	0.8390	1.18×10^3
537	2-E	1.3249	348
520	2-B	0.0846	7.44×10^4
546	2-F	0.0423	1.81×10^4
539	2-E	0.0925	1.15×10^4
547	2-H	0.0596	1.48×10^3
515	2-C	0.1076	1.89×10^3
545	2-F	0.0670	2.76×10^3
541	2-E	1.1860	84
543	2-F	0.0929	1.15×10^3
549	2-I	0.0380	3.75×10^4
518	2-C	0.0306	2.83×10^3
548	2-I	0.0581	2.13×10^3
533	2-D	0.1035	610
536	2-E	1.1921	519
544	2-F	0.1916	30.5
535	2-D	0.0276	2.44×10^3
516	2-C	0.0352	1.14×10^3
542	2-F	2.0742	463

TABLE 2, Continued

Sample Number	Area*	Weight (gram)	Total Alpha Activity (d/m/gram)
534	2-D	0.0145	4.85×10^3
538	2-E	0.8977	5.05×10^3
462	SOIL-2K	0.0465	1.35×10^3
554	SOIL-2K	0.2396	198
552	SOIL-2K	0.0127	1.80×10^3
551	SOIL-2K	0.0711	1.03×10^5
461	SOIL-2K	0.1337	0
519	2-C	1.3668	115
517	2-C	1.3013	2.14×10^3
555	SOIL-2K	0.5752	925

NOTES:

1) The areas can be found on the individual drawings.

2) The standard deviations of the activities are within 2 sigma.

TABLE 3

RESULTS OF ALPHA RADIATION ANALYSES
OF THORIUM SMEAR SAMPLES

Sample Number	Area*	Total Alpha Activity (d/m/100cm^2)
285	BLANK	1.9
287	1-A	17.1
289	1-A	3.8
291	1-B	0
292	1-B	22.8
293	1-B	22.8
295	1-B	11.4
297	1-B	15.2
299	1-B	26.5
301	1-B	9.5
303	1-B	13.3
305	1-B	17.1
307	1-B	22.8
309	1-C	19.0
311	1-C	17.1
313	1-D	9.5
315	1-D	9.5
317	1-D	24.7
319	1-F	9.5
321	1-F	9.5
323	1-F	9.5
325	1-G	81.5
326	1-G	157
327	1-G	165
328	1-G	150
329	1-G	74
330	1-G	72.1
331	1-G	302
332	1-H	32.4
334	1-H	24.7
336	1-H	28.5
338	1-I	17.1
340	1-I	9.5
342	1-J	74
343	1-J	17.1
344	1-J	74
345	1-J	28.5
346	1-J	26.5
347	1-J	74
348	1-J	26.5
349	1-J	30.5
350	1-J	20.9
351	1-J	19
352	1-J	30.5
353	1-J	28.5
359	1-K	64.7
360	1-K	60.8

TABLE 3, Continued

Sample Number	Area*	Total Alpha Activity (d/m/100cm^2)
361	1-K	53.2
362	1-K	49.5
364	1-L	156
365	1-L	160
366	1-L	47.5
367	1-L	13.3
368	1-L	9.5
369	1-L	11.4
370	1-1	62.7
371	1-M-1	57.2
372	1-M-1	57.2
373	1-M-1	57.2
374	1-M-1	38.0
375	1-M-1	34.2
376	1-M-1	36.1
377	1-M-1	49.5
378	1-M-1	45.5
379	1-M-1	45.5
380	1-M-1	45.5
381	1-M-1	37.6
382	1-M-1	30.5
383	1-M-1	38.0
384	1-N-1	24.7
385	1-N-1	15.2
386	1-N-1	3.8
388	1-N-1	11.4
389	1-N-1	15.2
391	1-0-1	30.5
394	1-0-1	28.5
395	1-0-1	30.5
396	1-0-1	30.5
397	1-0-1	34.2
398	1-0-1	15.2
399	1-0-1	11.4
400	1-0-1	15.2
402	1-0-1	30.5
403	1-P-1	20.9
404	1-P-1	26.5
405	1-P-1	47.5
409	1-Q-1	77.9
410	1-Q-1	34.2
411	1-Q-1	41.8
412	1-Q-1	34.2
413	1-Q-1	224
414	1-Q-1	116
415	1-Q-1	169
416	1-Q-1	98.6
417	1-R-1	24.7
418	1-R-1	9.5
419	1-R-1	15.2

TABLE 3, Continued

Sample Number	Area*	Total Alpha Activity (d/m/100cm^2
420	1-R-1	24.7
421	1-R-1	30.5
422	1-R-1	93
423	1-R-1	176
424	1-R-1	76
425	1-R-1	123.5
426	1-R-1	43.8
427	1-R-1	39.9
428	1-R-1	15.2
429	1-R-1	24.7
430	1-R-1	13.3
431	1-R-1	17.1
432	1-R-1	17.1
439	2-A	358
440	2-A	103
441	2-A	224
449	2-B	795
450	2-B	1,948
451	2-B	402
452	2-B	64.7
445	2-C	65.7
446	2-C	74
447	2-C	38
448	2-C	19
454	2-D	30.5
456	2-J	3.8
459	2-J	3.8
460	2-J	9.5
463	2-K	13.3
464	2-K	15.2
465	2-K	11.4
466	2-K	13.3

TABLE 4

ANALYSIS OF SAMPLES TAKEN FROM W. R. GRACE COMPANY
(The collection points are noted on Figure 6)

Sample	Dry Weight (grams)	Net CPM	DPM/GRAM	uCuries/GRAM
#1 Dump Sump	2.3243	1,851.1	$1.50x10^3$	$6.8x10^{-4}$
#2 Ball Mill Sump	3.2258	1,609.6	949	$4.2x10^{-4}$
#3 Driveway Sump	1.4697	1,479.6	$1.89x10^3$	$9.3x10^{-4}$
#4 Well Sump	1.1283	658.1	$1.14x10^3$	$5.2x10^{-4}$

APPENDIX A

RADIOACTIVITY LIMITS FOR UNRESTRICTED RELEASE

of

FACILITIES and EQUIPMENT

1. The maximum amount of fixed alpha radioactivity in disintegrations per minute per 100 square centimeters on buildings or equipment should not exceed <u>25,000</u> dpm.

2. The <u>average</u> amount of <u>fixed</u> alpha radioactivity in disintegrations per minute per 100 square centimeters on buildings or equipment should not exceed <u>5,000</u> dpm.

3. The maximum amount of <u>removable</u> (capable of being removed by wiping the surface with a filter paper or soft absorbent paper) alpha radioactivity in disintegrations per minute per 100 square centimeters on buildings or equipment should not exceed <u>1,000</u> dpm.

4. (a) The <u>maximum</u> level at one centimeter from the most highly contaminated surface of a building or piece of equipment measured with an open-window beta-gamma survey meter through a tissue equivalent absorber of not more than seven milligrams per square centimeter should not exceed <u>1.0</u> millirad per hour.

   (b) The <u>average</u> radiation level at one centimeter from the contaminated surface of the building or equipment measured in the same manner should not exceed <u>0.2</u> millirad per hour.

5. The contamination limits for abandonment of facilities involving U-233 or plutonium should not exceed 1/10 of the limits in items 1,2 and 3 above.

NOTES: A. A reasonable effort should be made to minimize the contamination present.

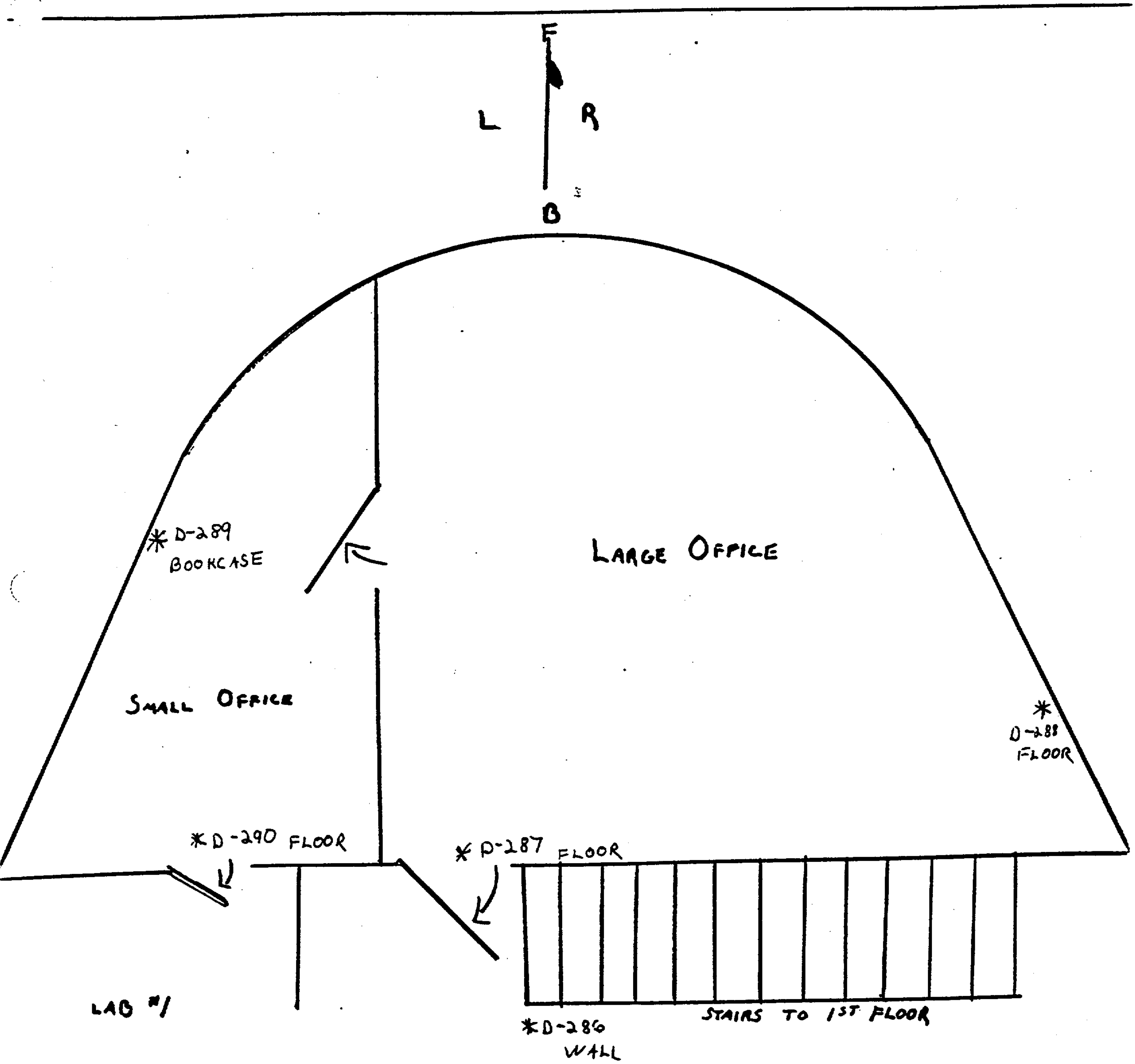
B. Surfaces of premises, equipment or scrap likely to be contaminated, and of such size, construction, or location as to make the surface <u>inaccessible</u> for purposes of measurement, shall be presumed to be contaminated in excess of the levels specified above.

C. Premises, equipment or scrap having contaminated surfaces which have been <u>covered by painting</u>, metal plating or other covering material should be presumed to be contaminated in excess of the levels specified above, unless it can be established that the contamination was below the above levels prior to applying the covering.

APPENDIX B

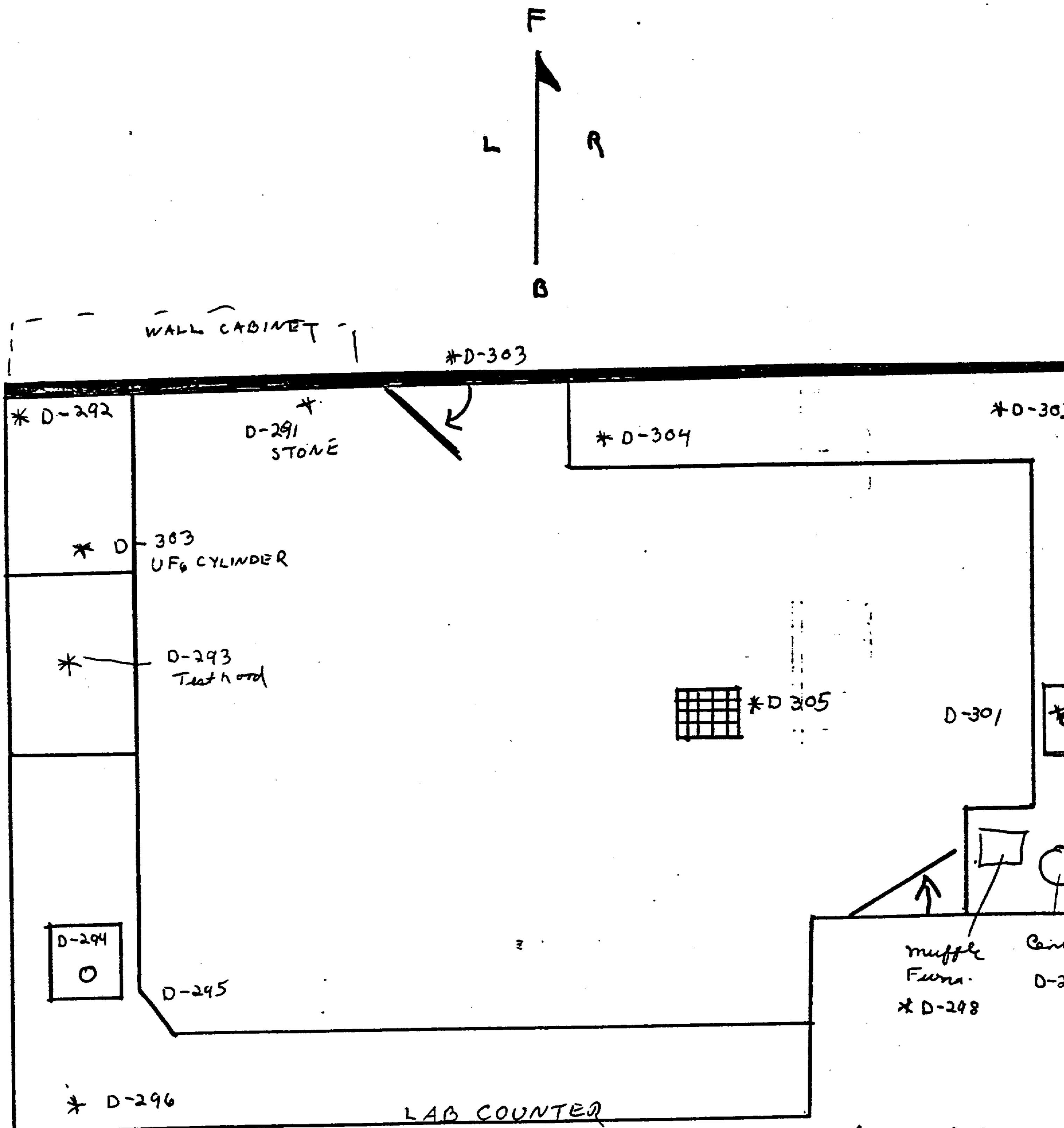
Locations of Various
Samples taken at
W. R. Grace Company

NOTE: These locations can be found on Figure 7

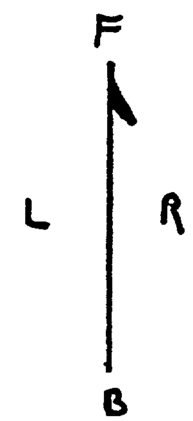


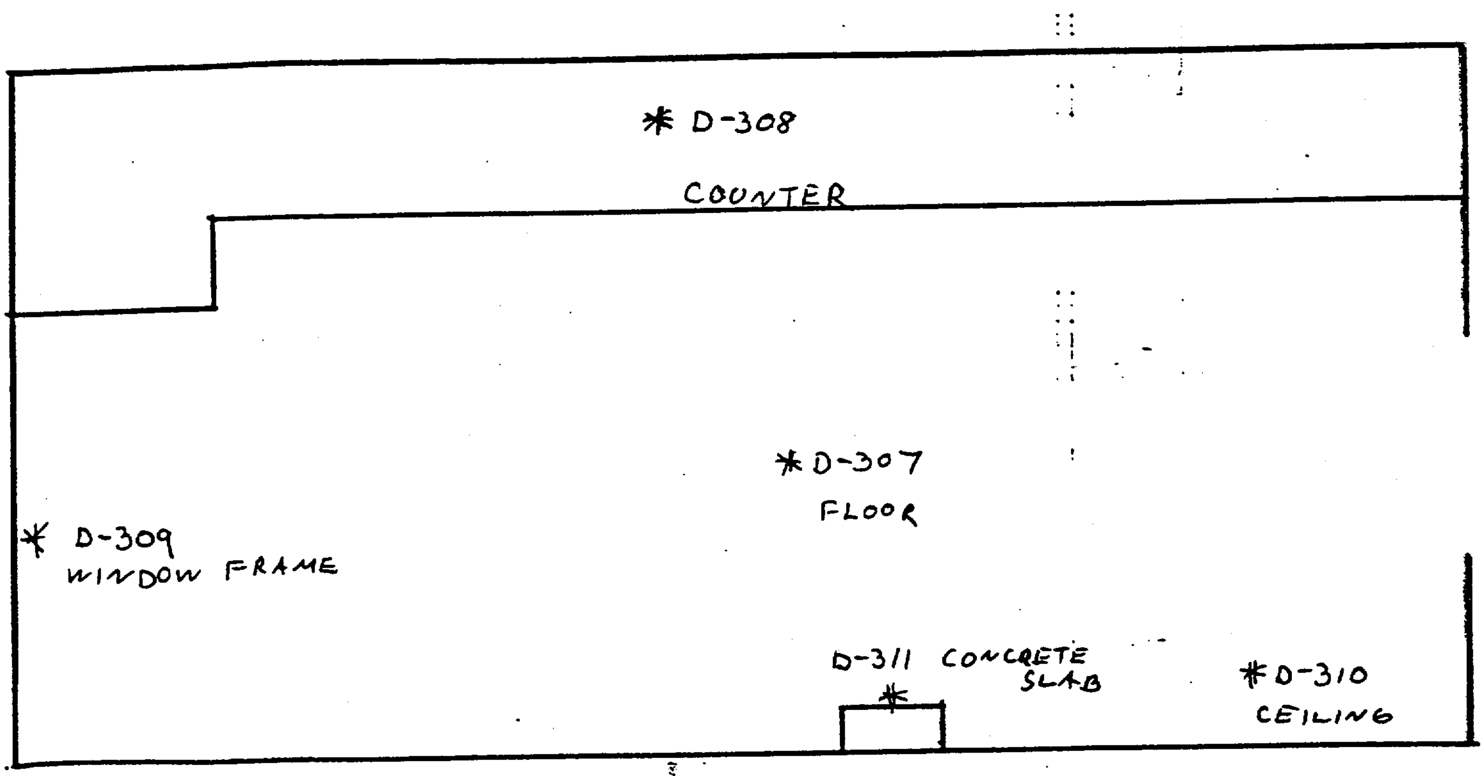
AREA I-A

OFFICES
2ND. FLOOR, MAIN B



AREA I-B
LAB No. 1
2ND. FLOOR, MAIN R

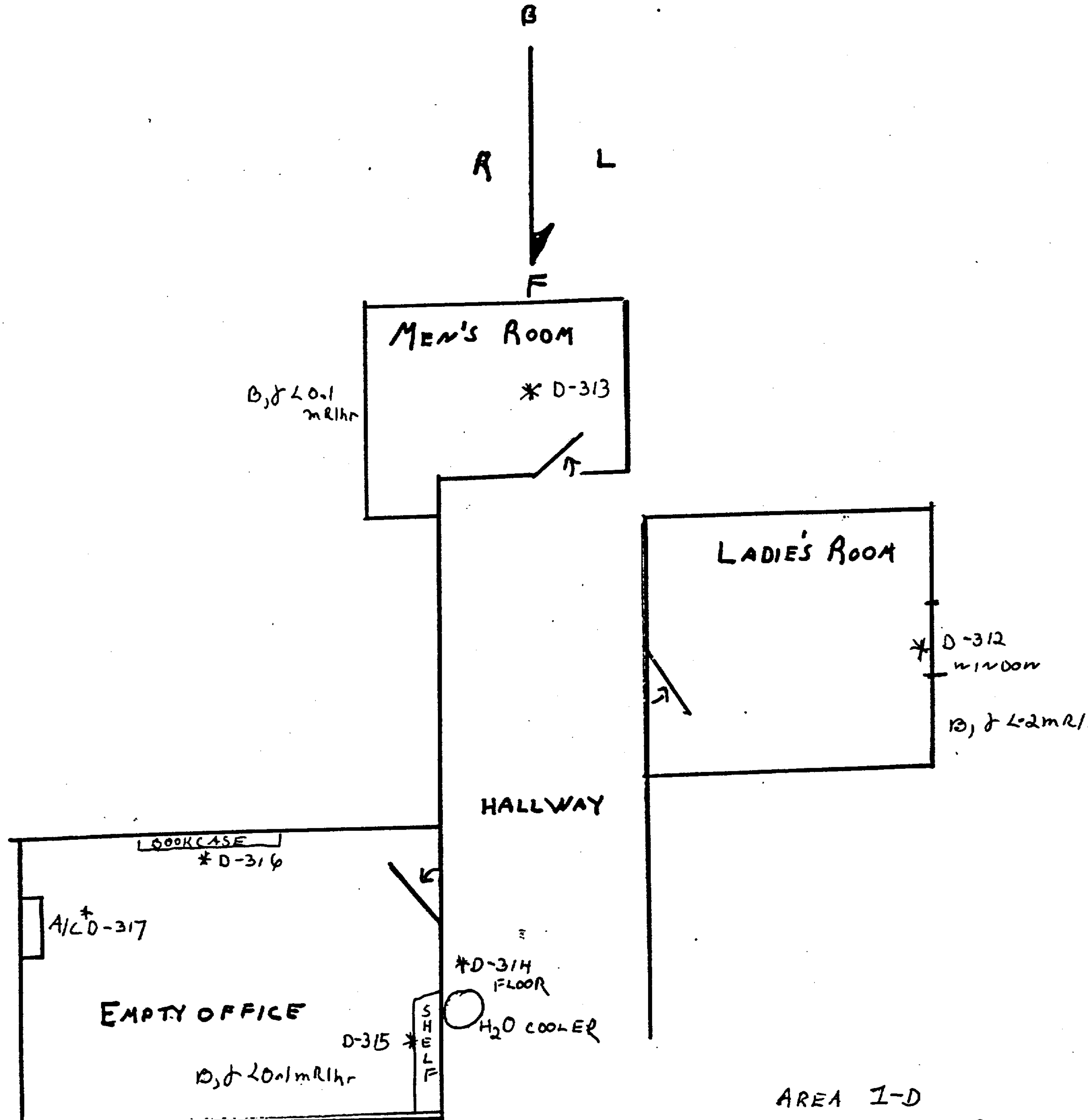




AREA 1-C

SAMPLE PREPARATION ROOM

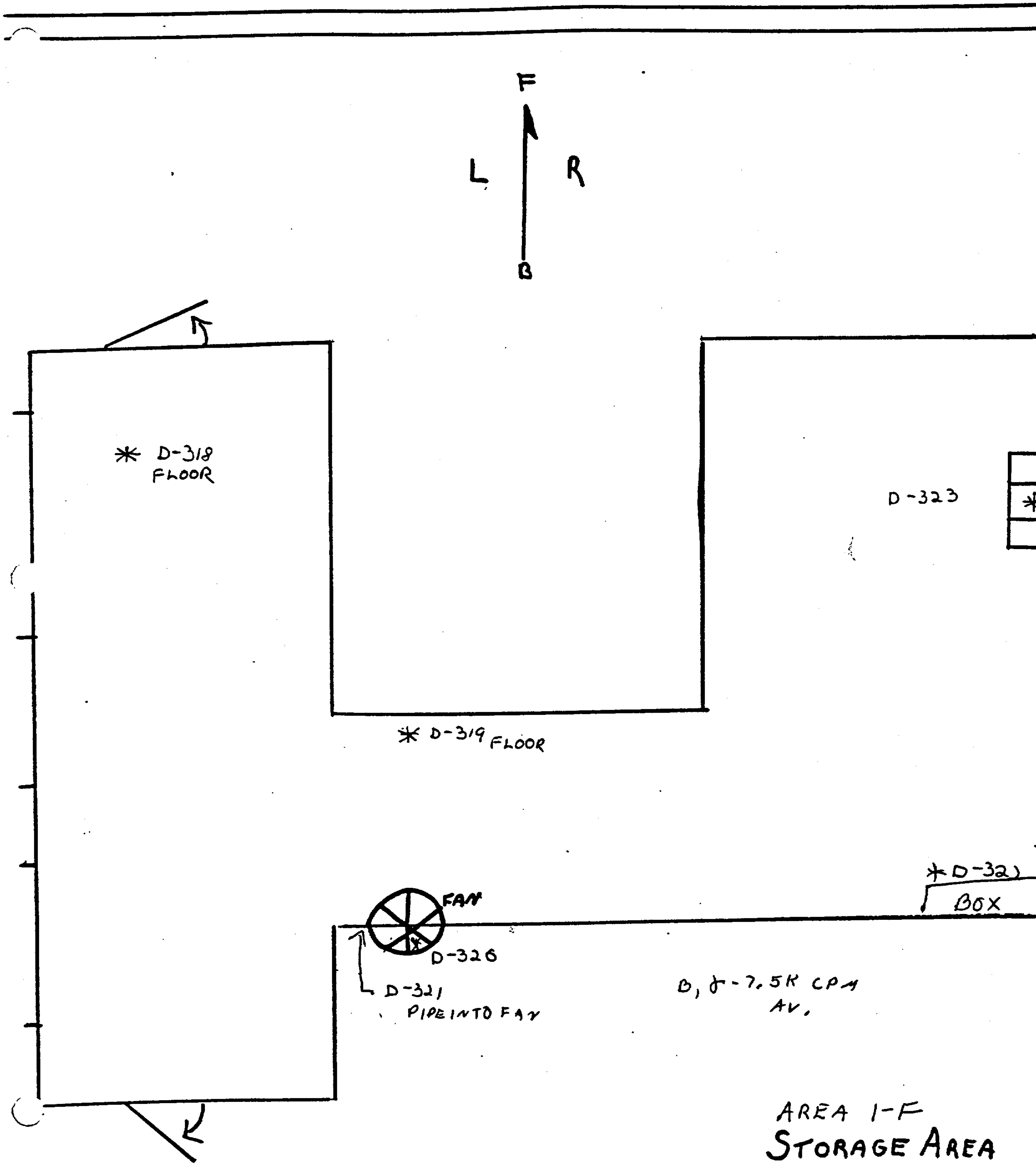
2ND. FLOOR, MAIN BLDG.



AREA 1-D

HALL, LADIE'S & MEN'S ROOM,
EMPTY OFFICE

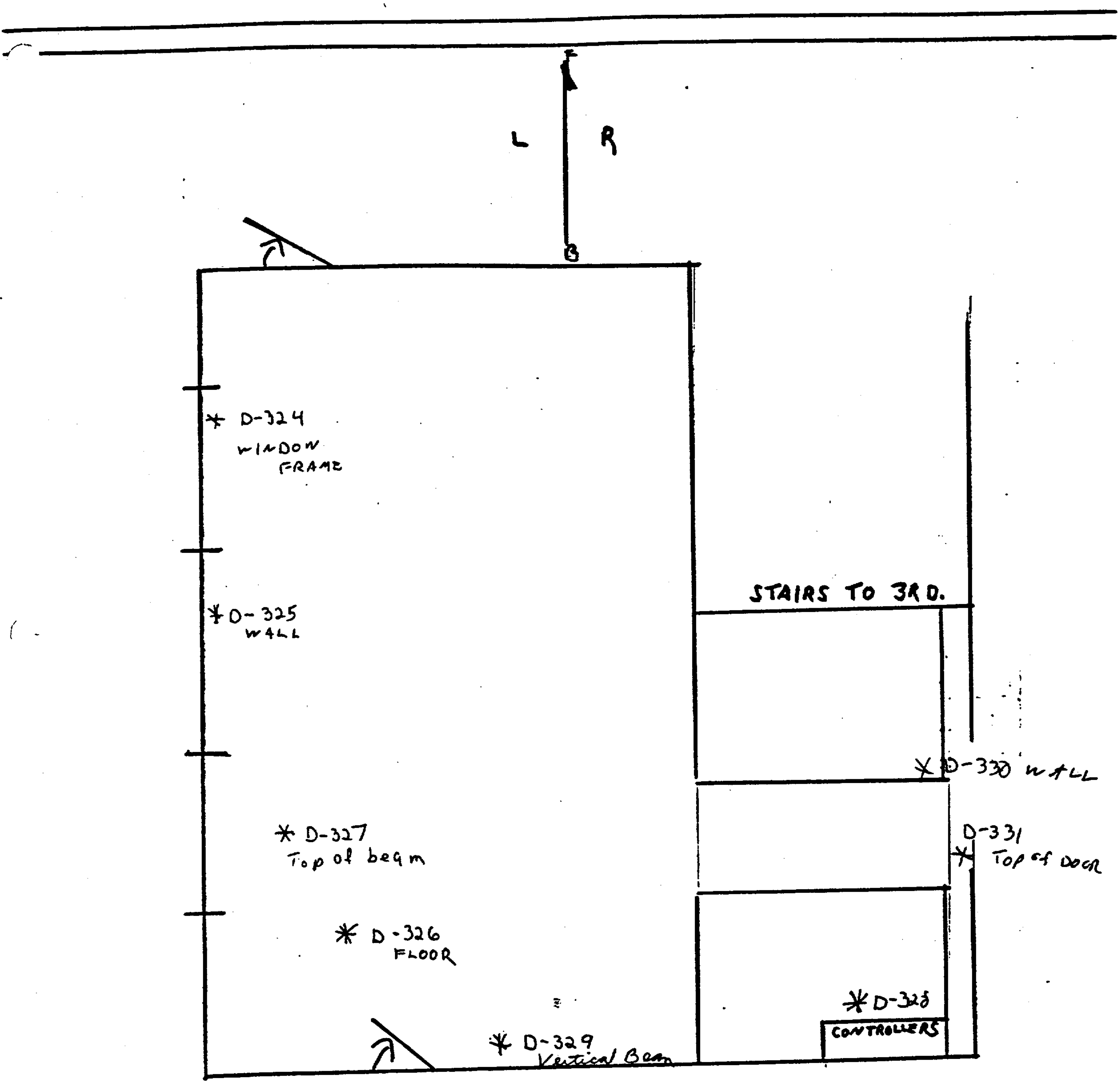
2ND. FLOOR MAIN BLDG.



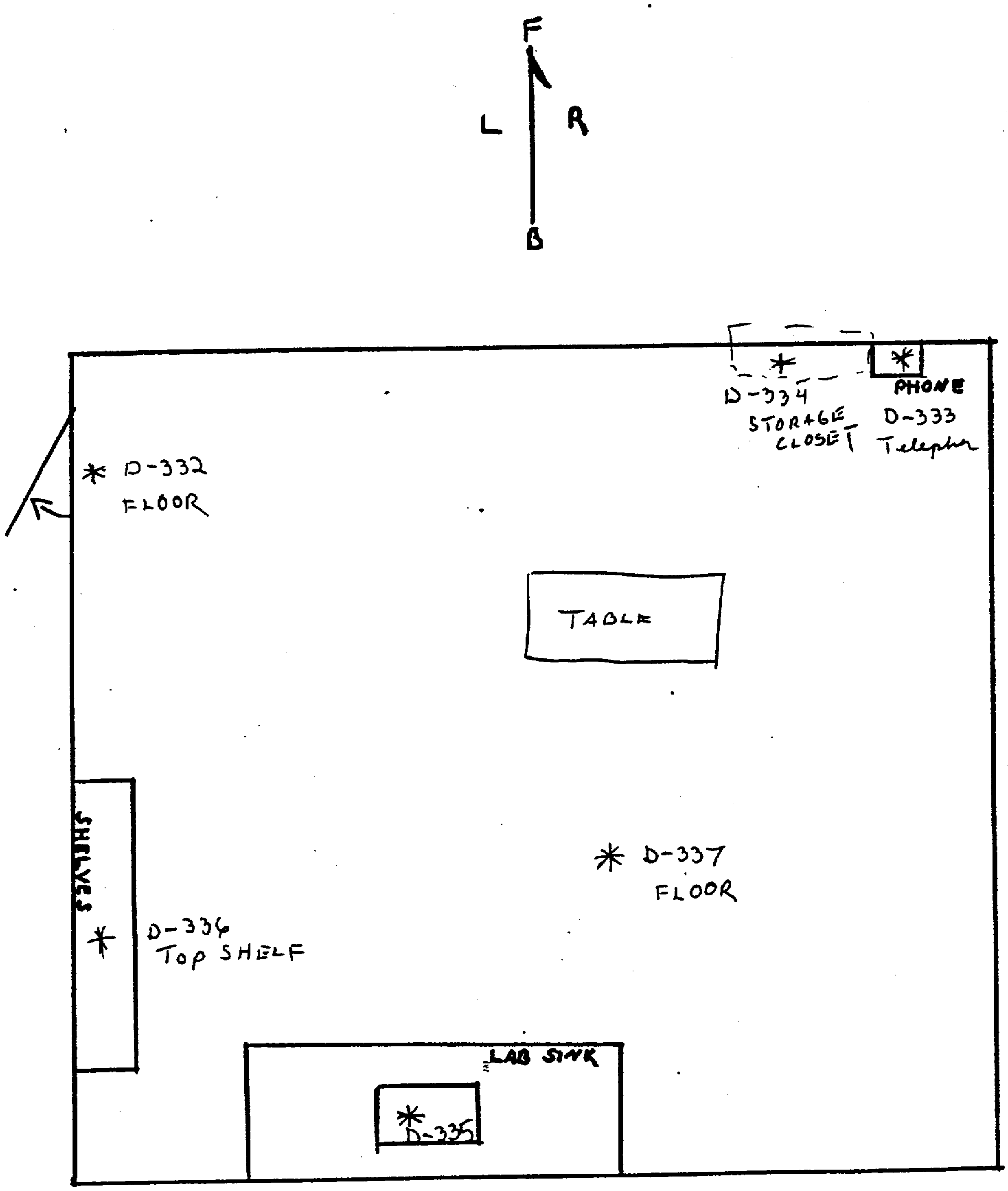
AREA 1-F

STORAGE AREA

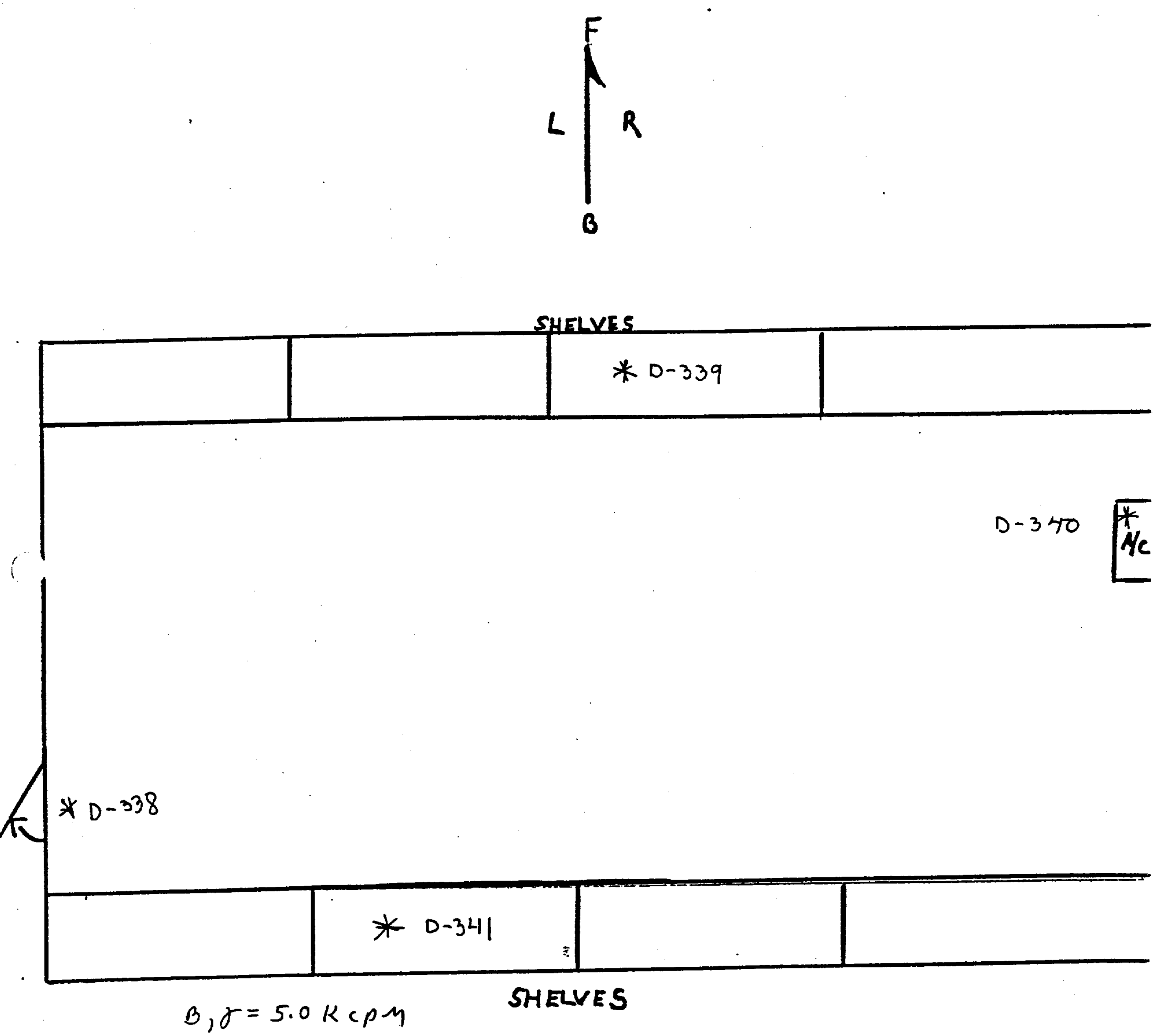
2ND LEVEL, MAIN Bl



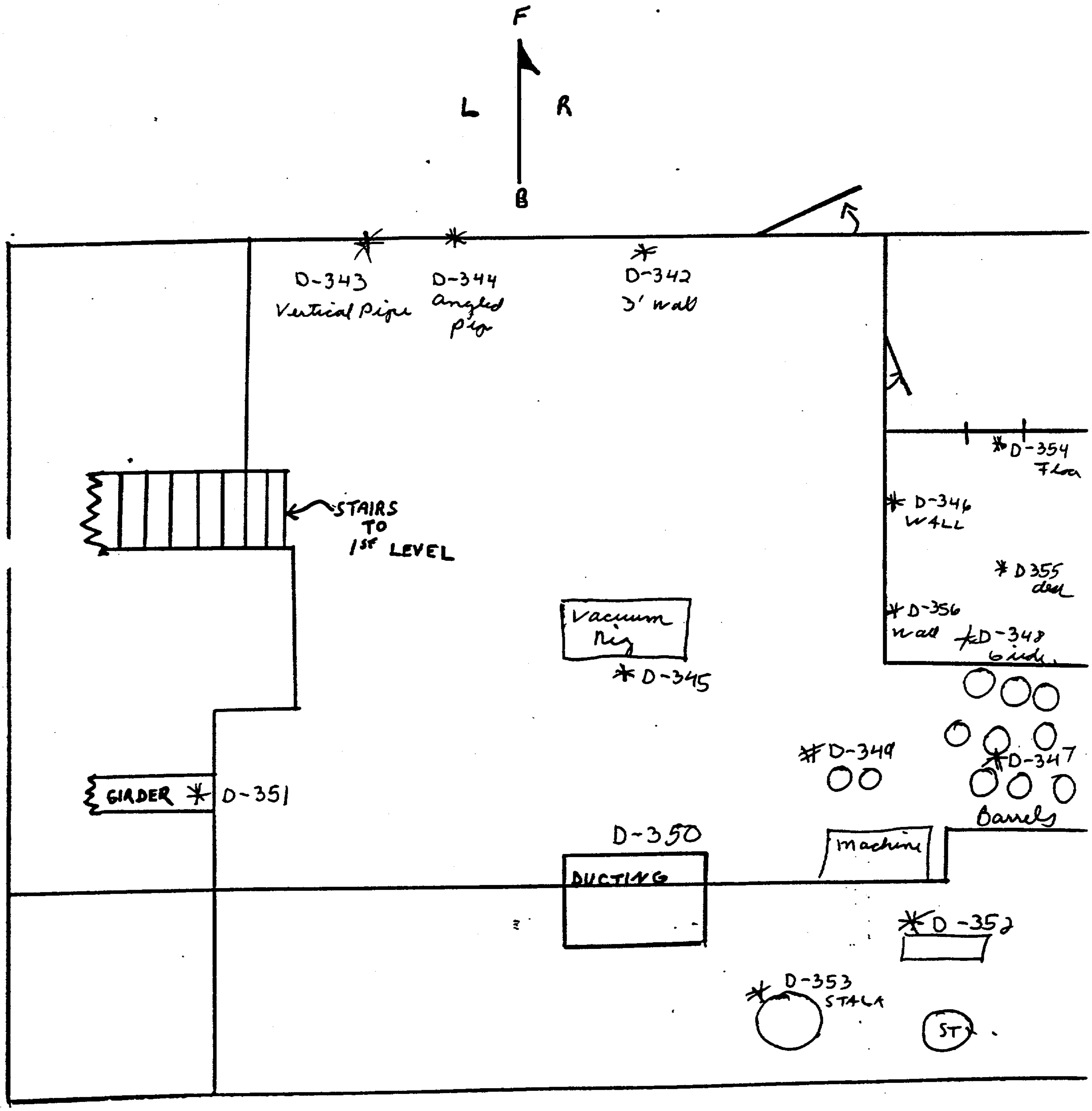
AREA I-G
PRESS ROOM & SULFONATION RO
2ND FLOOR, MAIN BLDG.



AREA I-H
TEST LAB #2
2ND LEVEL, MAIN B.



Area 1-I
Conference Room #1
2nd. Floor, Main Bldg

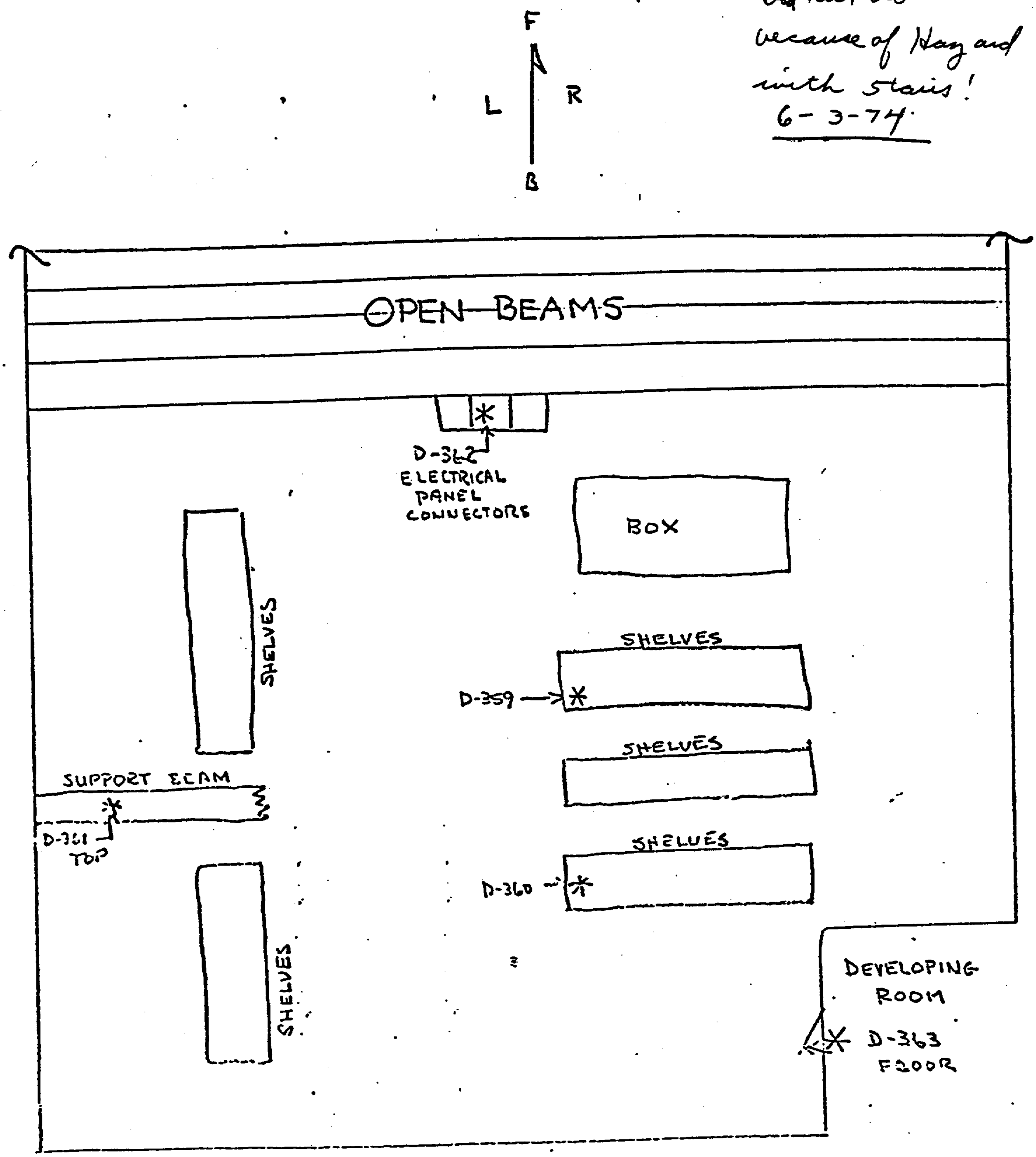


AREA 1-J
7-K BLENDING & STORAGE

2ND LEVEL, MAIN BLC

#10

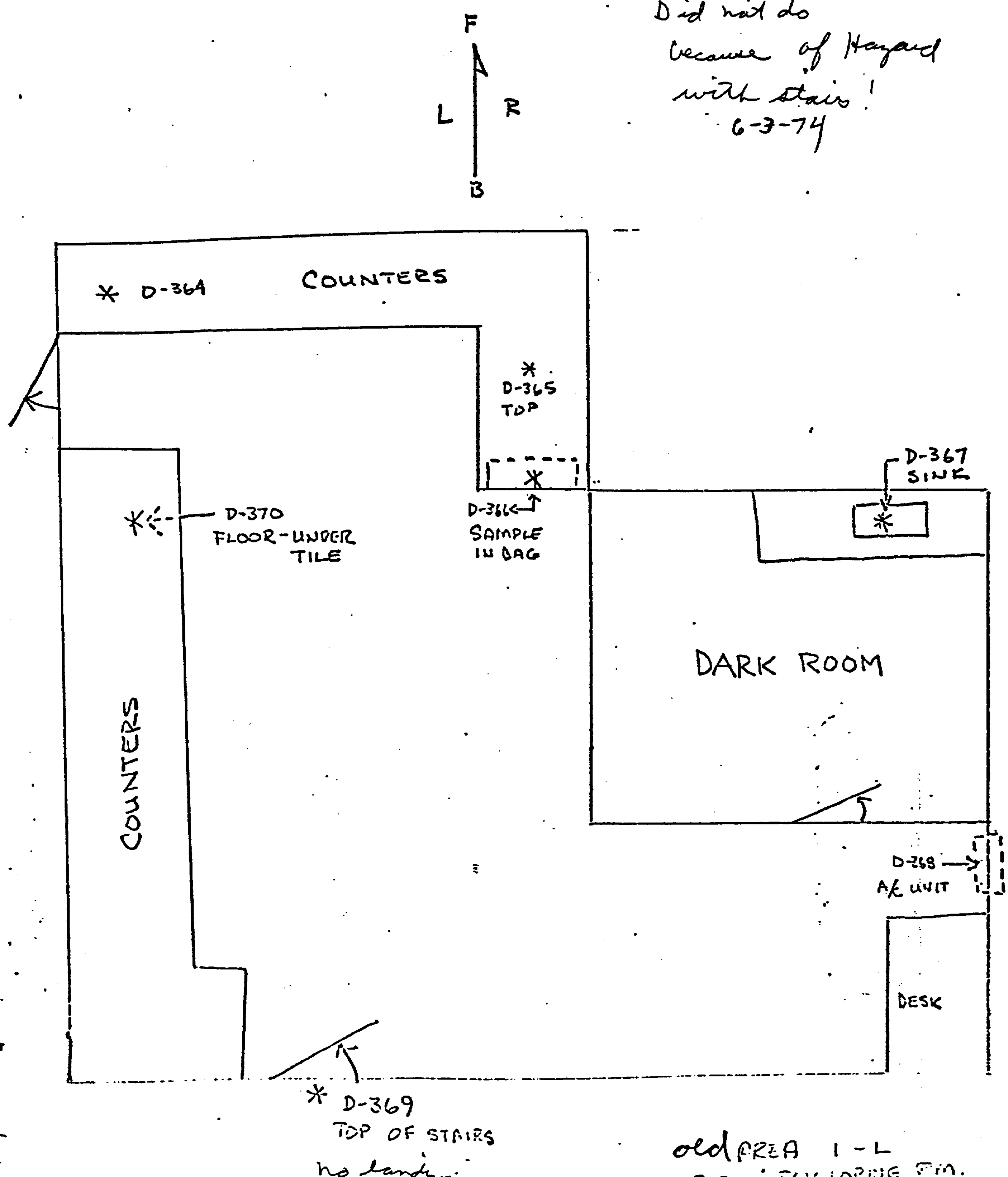
Did not do because of Hay and with stairs!
6-3-74



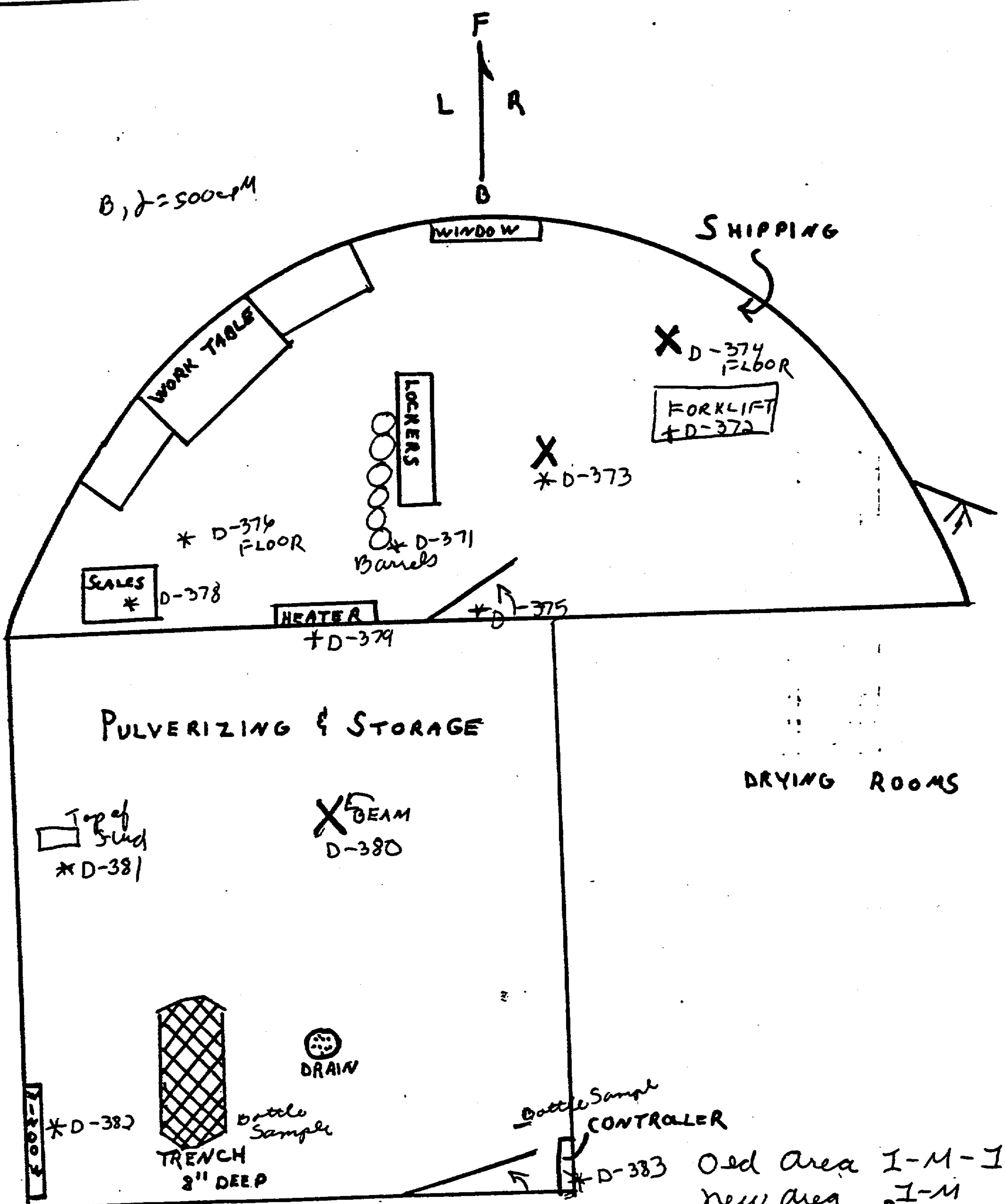
GENERAL AREA
B,G - 12.5 K CFM

old AREA # 1-K

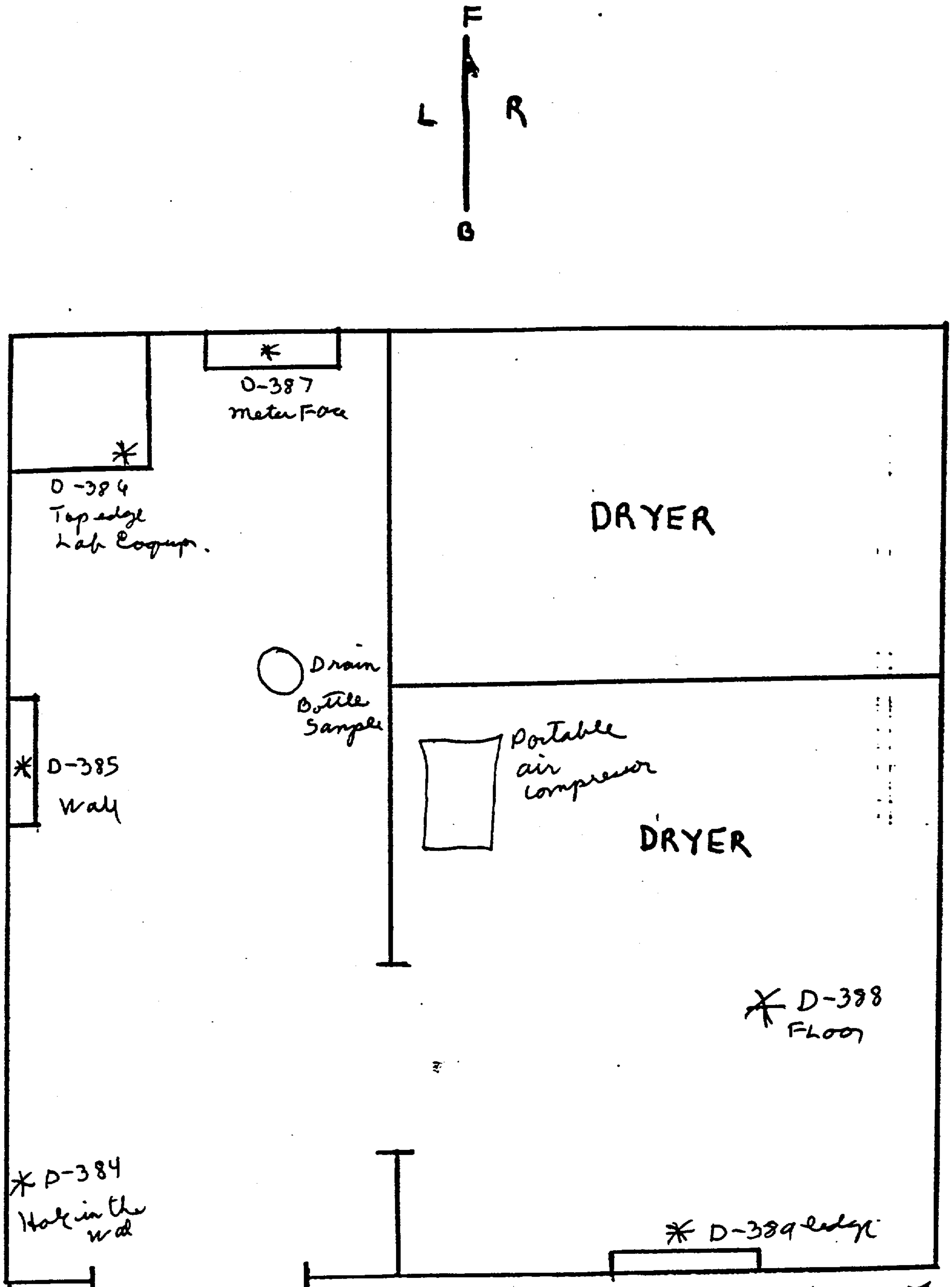
Did not do
because of Hazard
with stairs!
6-3-74



old AREA 1-L
DARK & DEVELOPING RM.

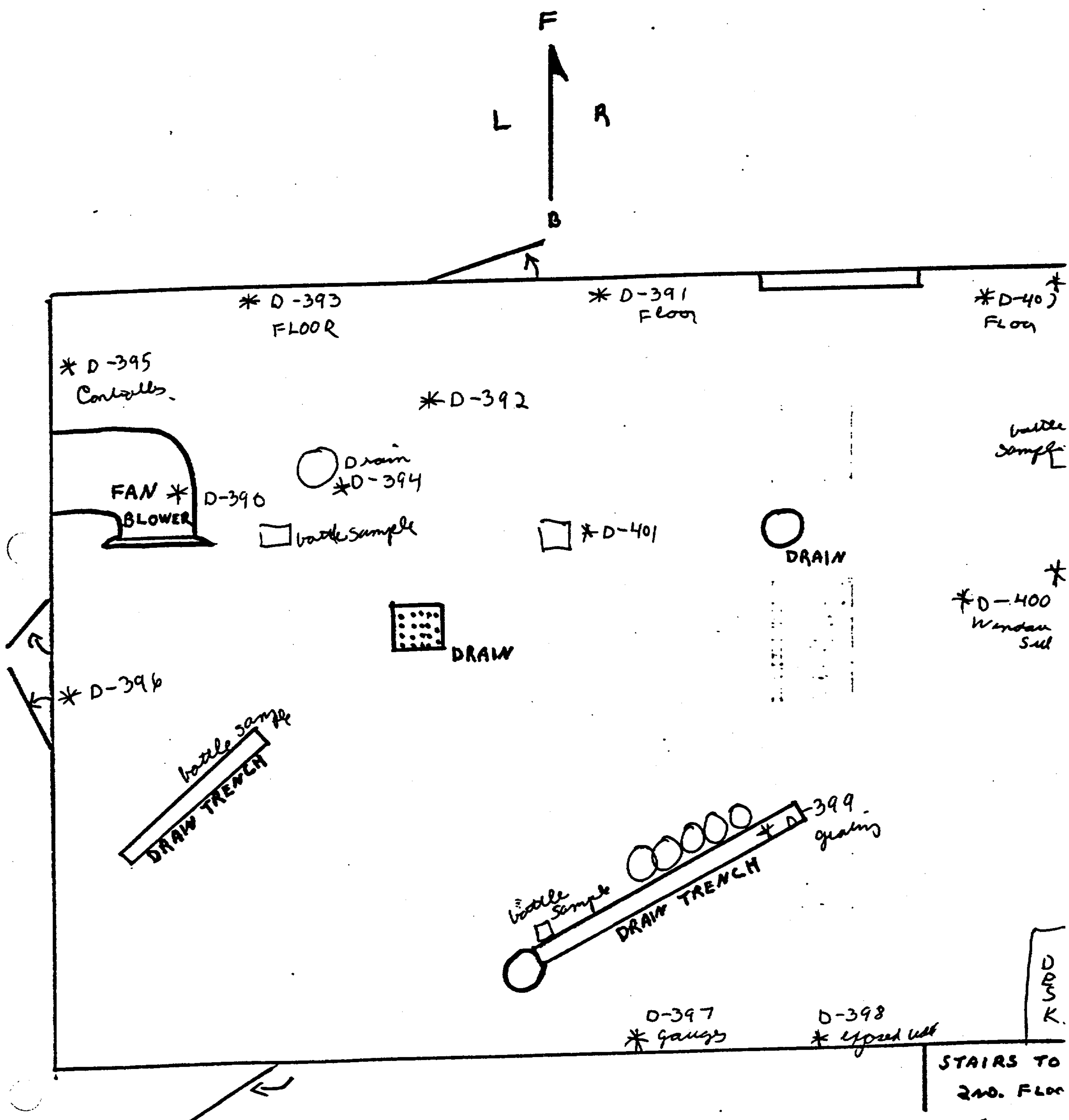


Old area I-M-I
new area I-M
SHIPPING, PULVERIZING
CERIUM OXIDE STORAGE
1ST FLOOR, MAIN BLDG.

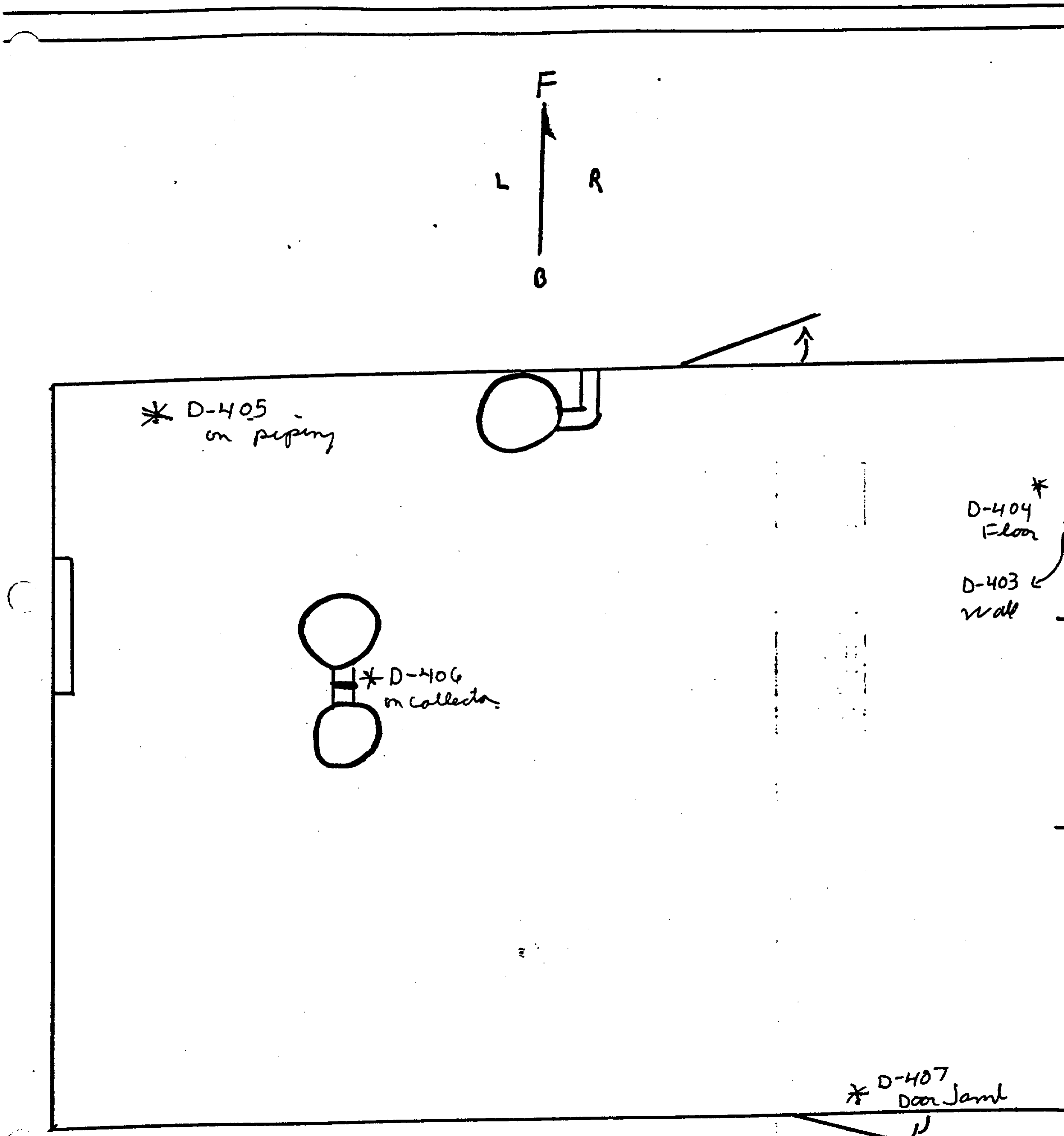


old area I-N-I
new area I-N
DRYING ROOMS

1ST. FLOOR MAIN BLDG.

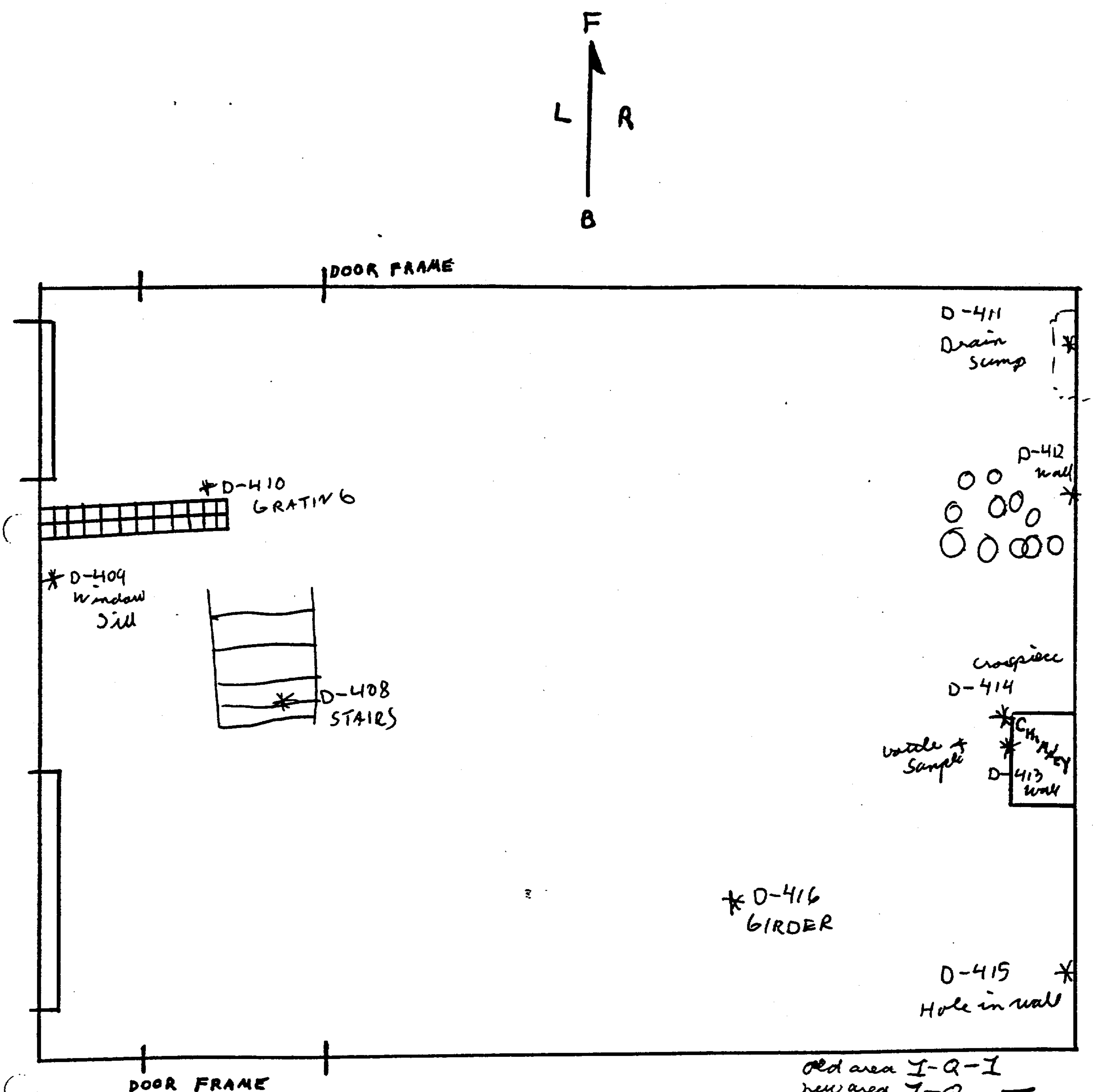


old area I-O-I
new area I-O
FURNACE & PRESS ROOM
1ST. FLOOR. MAIN BLDG.



old area I-P-I
new area I-P

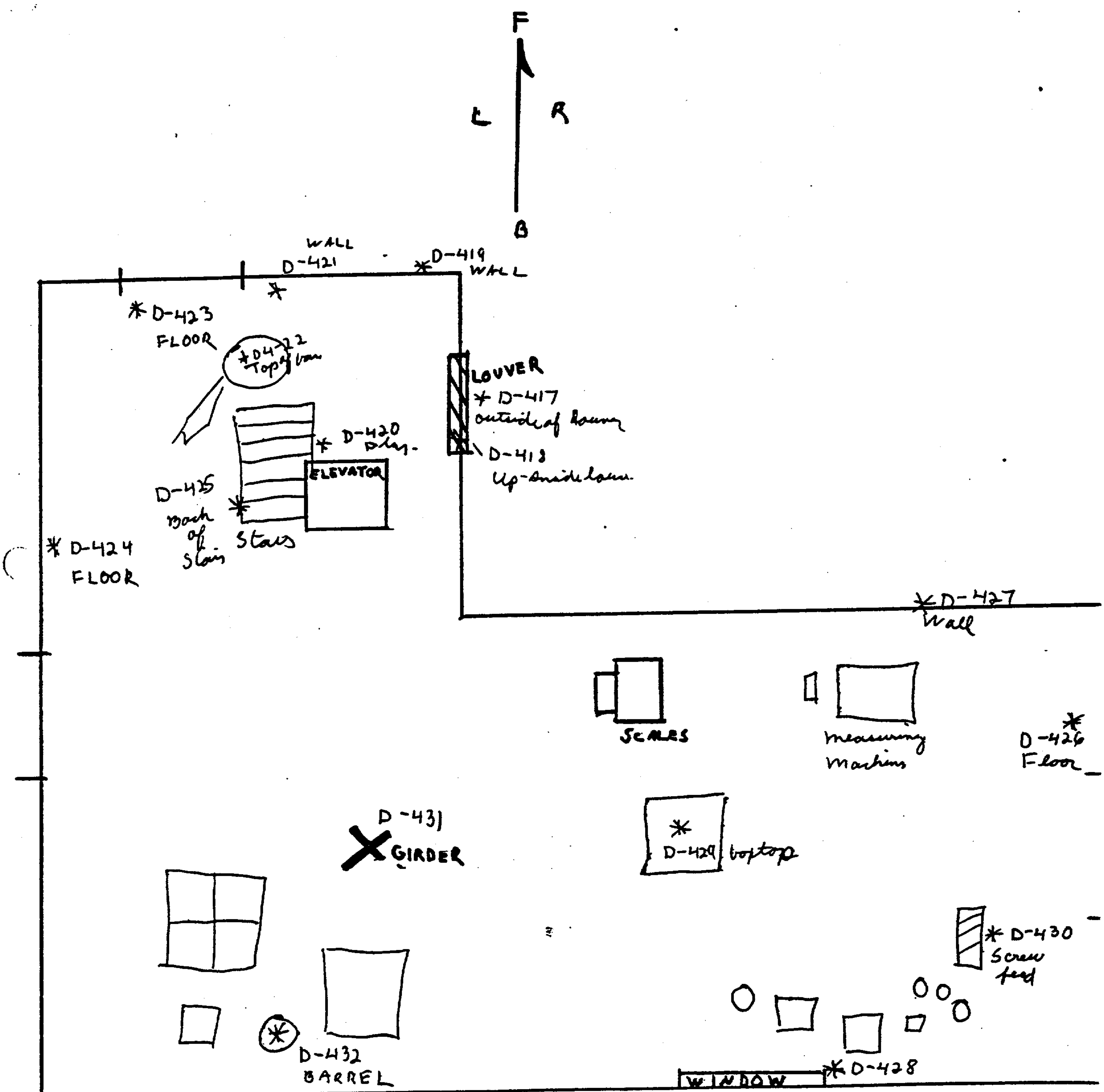
SHARPLES COLLECTOR RO
1ST FLOOR, MAIN BLI



old area I-Q-1
new area I-Q

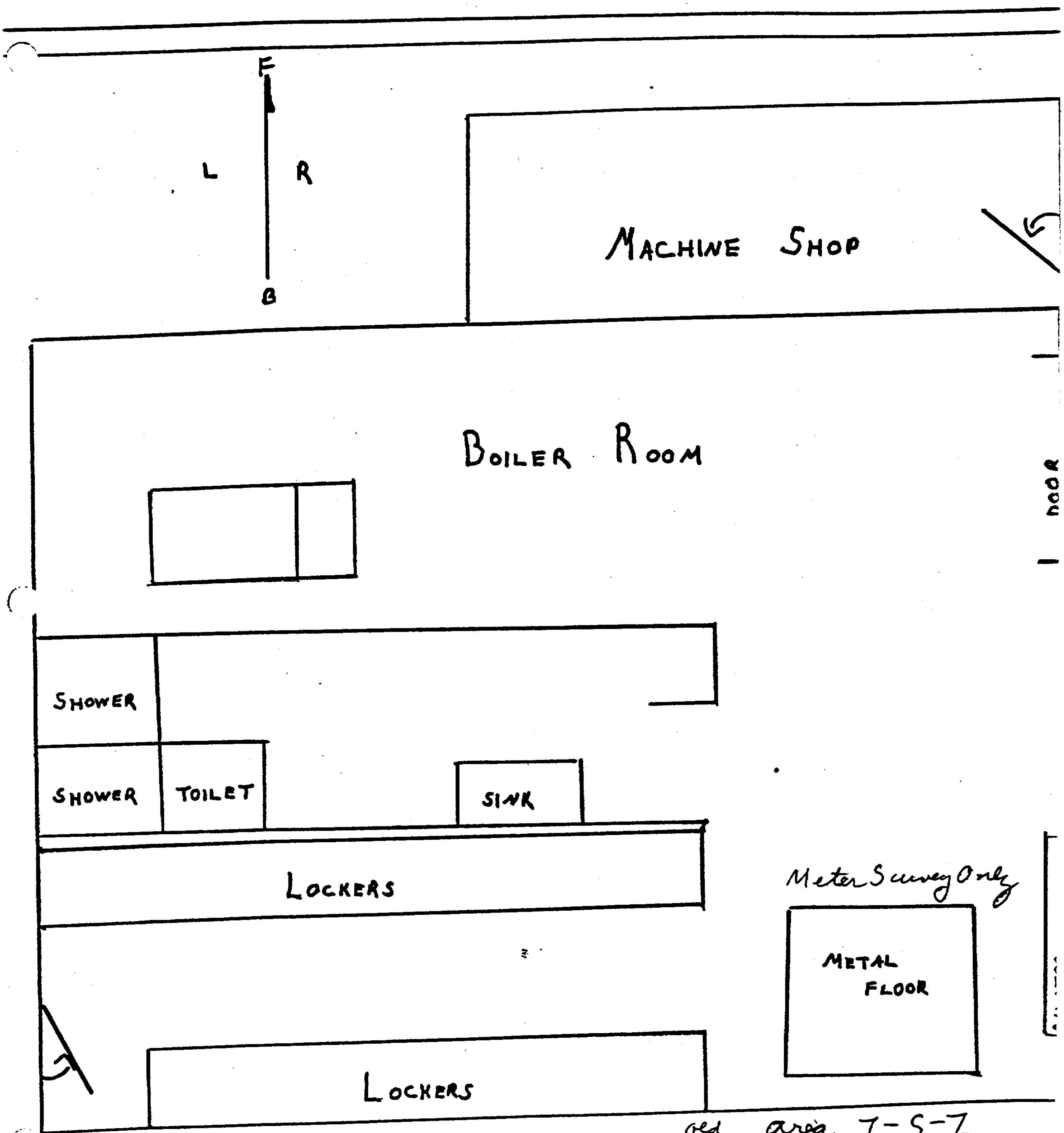
1 & 2 SULFONATION TANK ROOMS

FIRST FLOOR, MAIN Bl



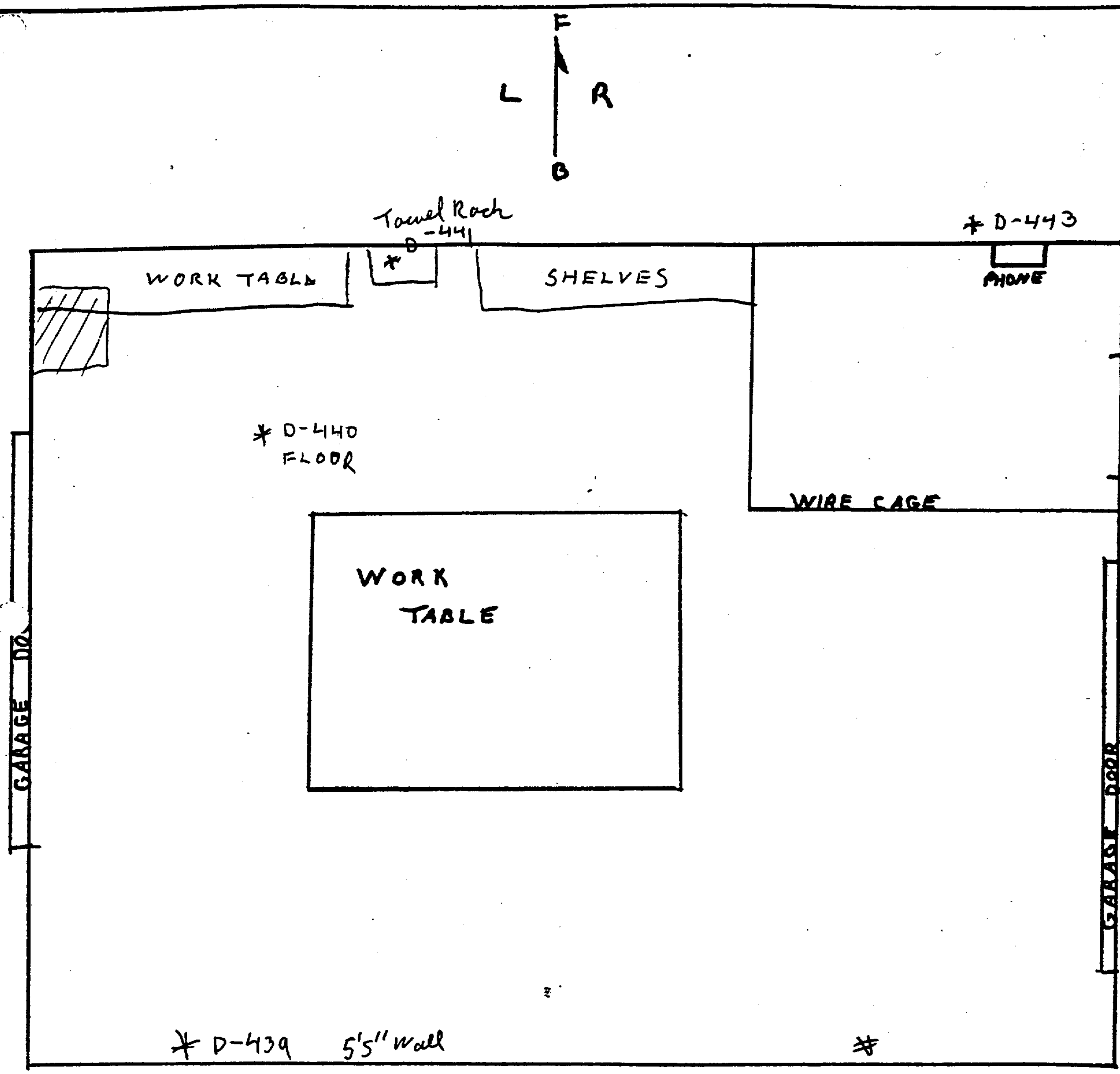
old area I-R-I
new area I-R
7-K BASTACITE ROOM

1ST LEVEL, MAIN BLDG.

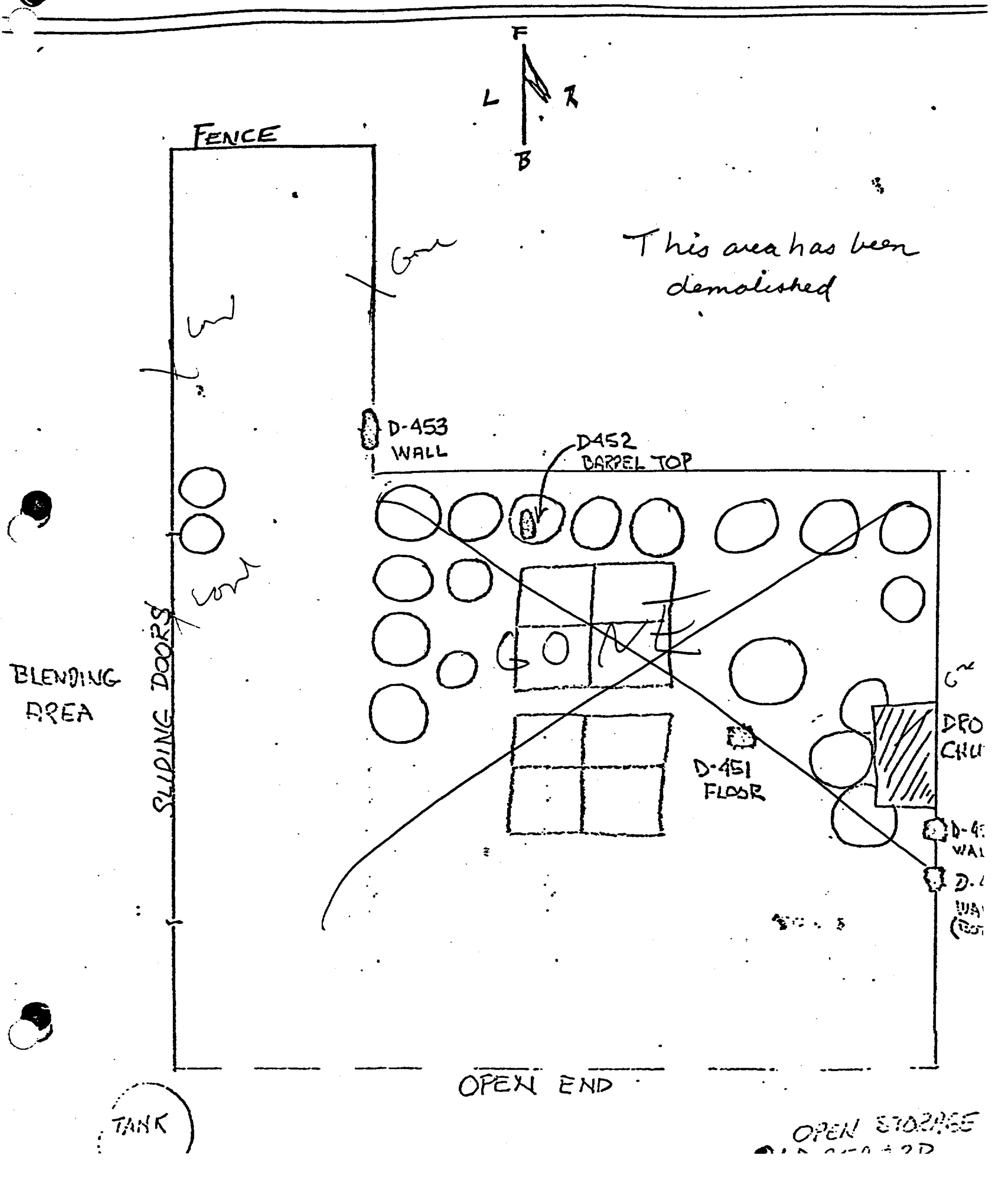


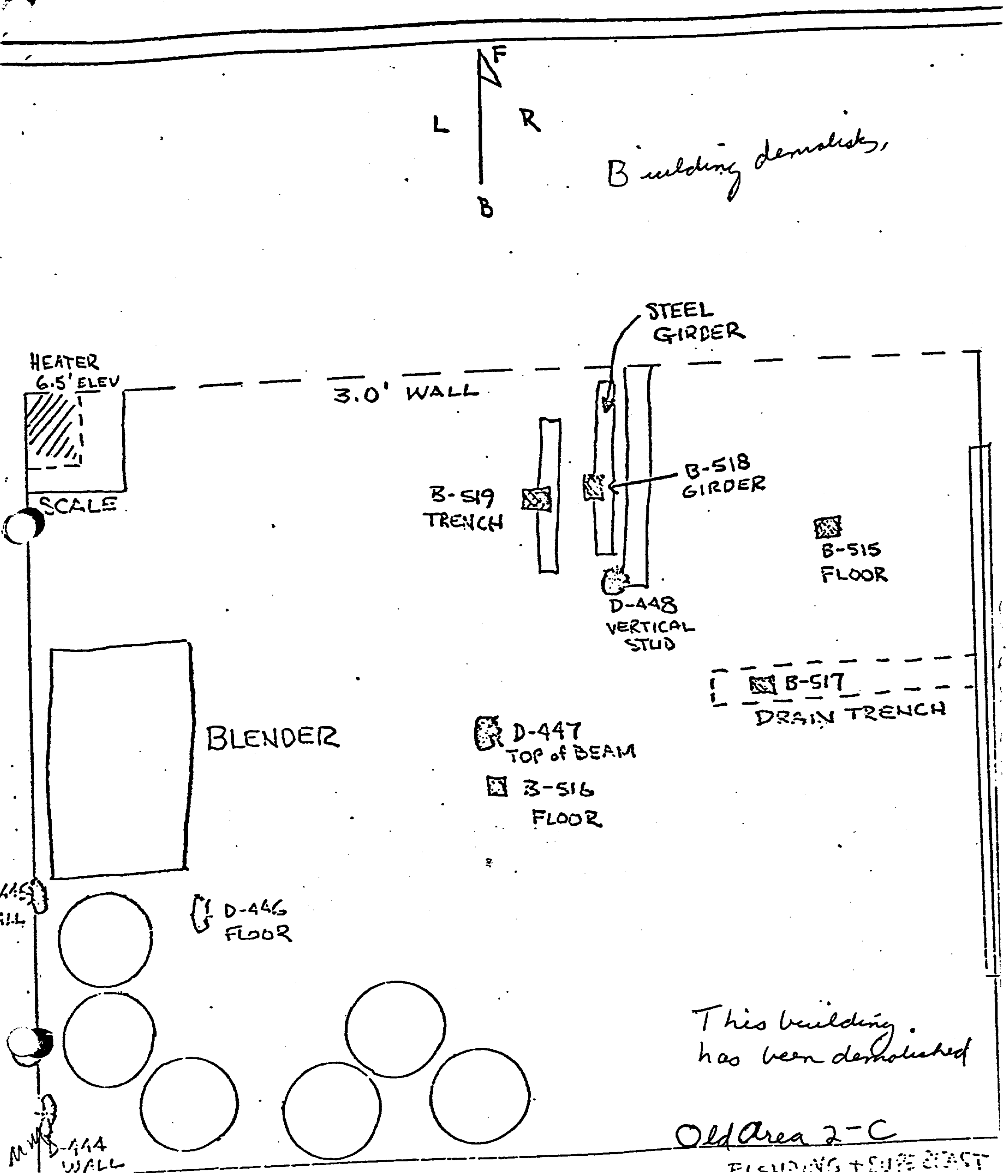
old area I-S-7
new area I-S
LOCKER & BOILER ROOM

MACHINE SHOP
1ST. FLOOR, MAIN BLD

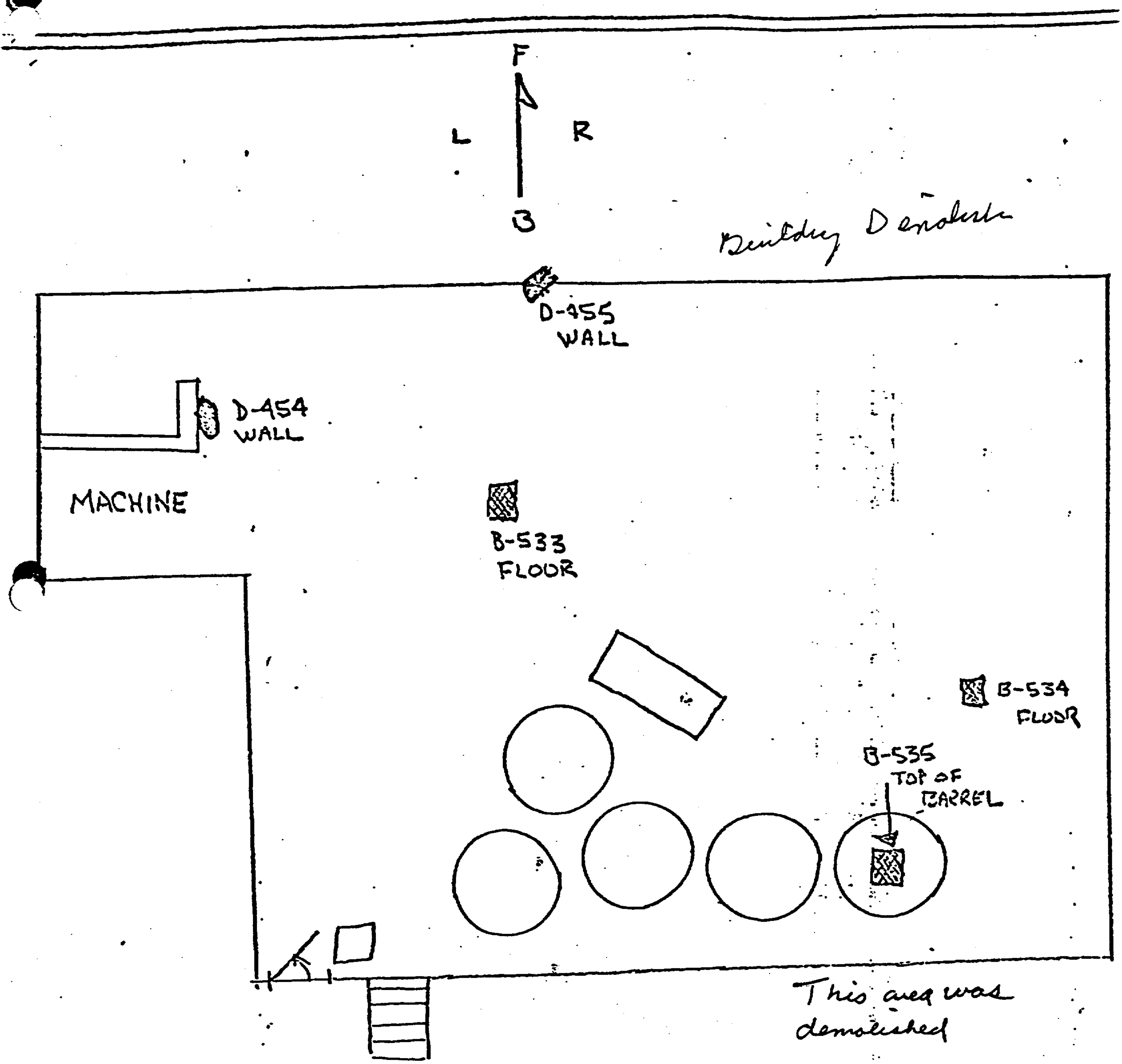


AREA 2-A
WORKSHOP BUILDING


F
L
R
B
FENCE
This area has been demolished
Gone
Gone
Gone
D-453
WALL
D452
BARREL TOP
GONE
D-451
FLOOR
SLIDING DOORS
BLENDING
AREA
OPEN END
TANK
OPEN STORAGE



F
L
R
B
Building demolished,
STEEL GIRDER
HEATER 6.5' ELEV
3.0' WALL
SCALE
B-519 TRENCH
B-518 GIRDER
B-515 FLOOR
D-448 VERTICAL STUD
B-517
DRAIN TRENCH
BLENDER
D-447 TOP of BEAM
B-516 FLOOR
D-446 FLOOR
D-444 WALL
This building has been demolished
Old Area 2-C

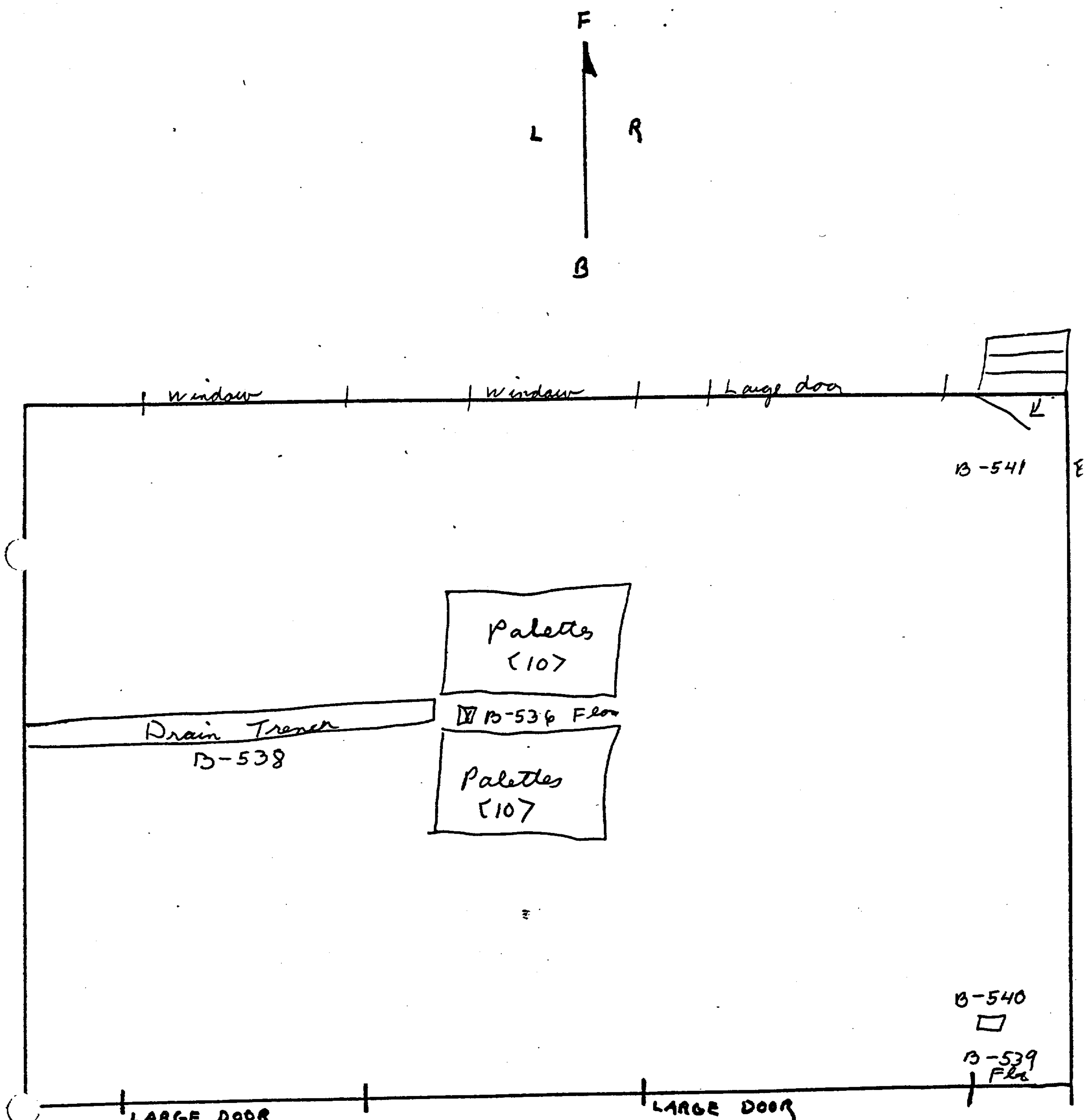


Old area #2-D

STORAGE AREA [illegible]

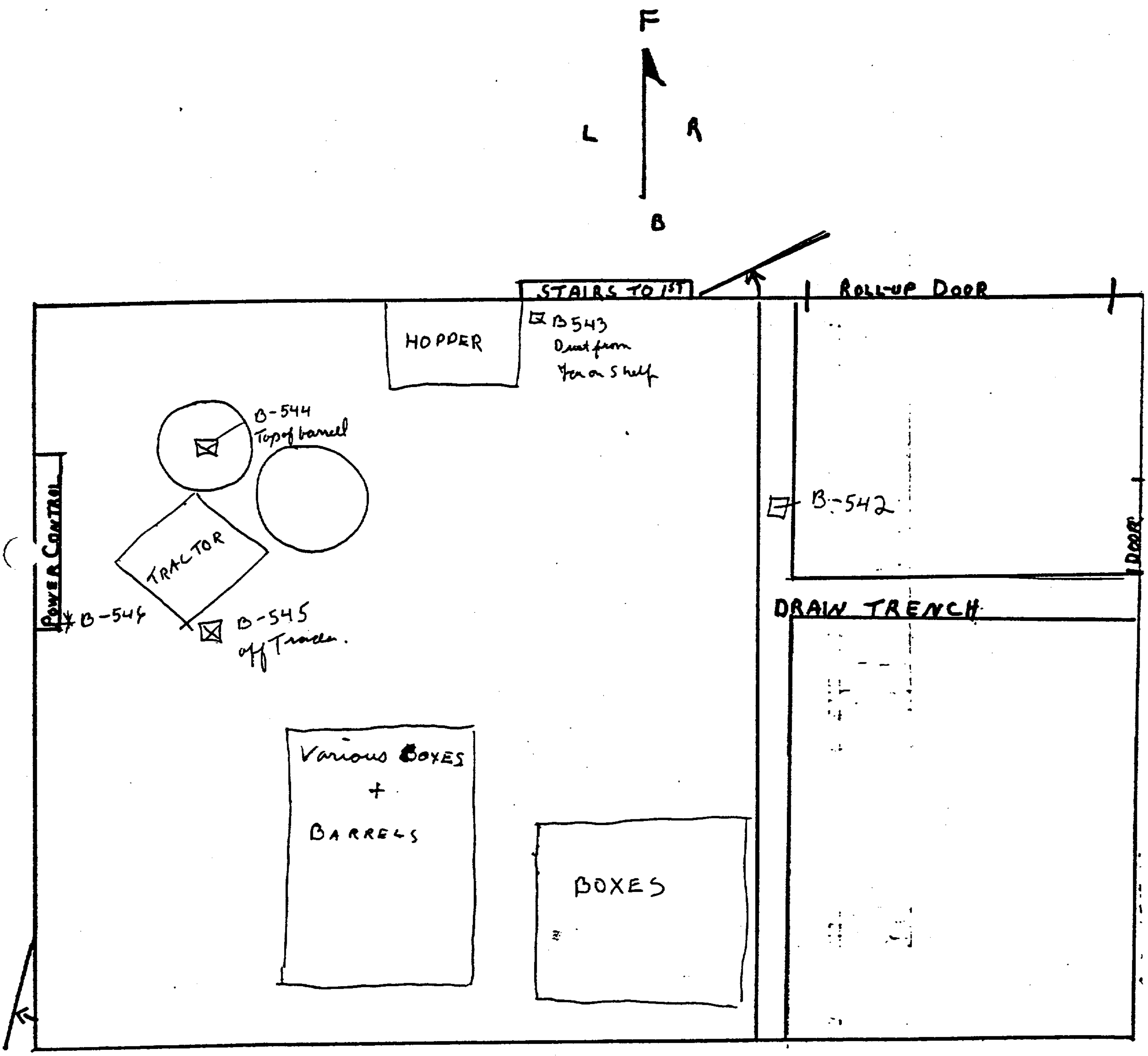
[illegible]

MM



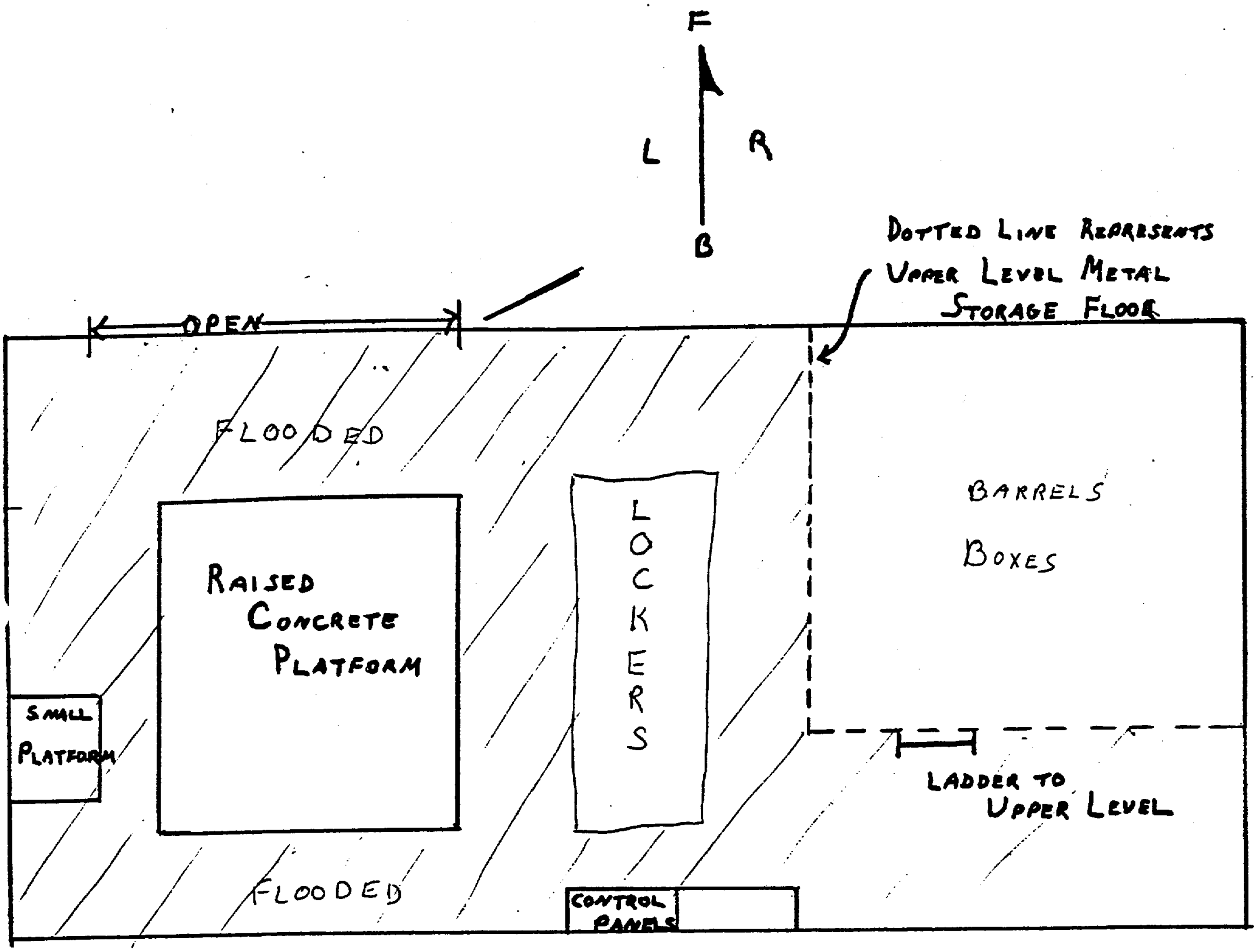
Area-2E
ELECTRONUCLEONICS STORAGE

LEFT OF BALL MILL



OLD AREA 2F
NEW AREA 2-C

BALL MILL
2ND LEVEL STOR

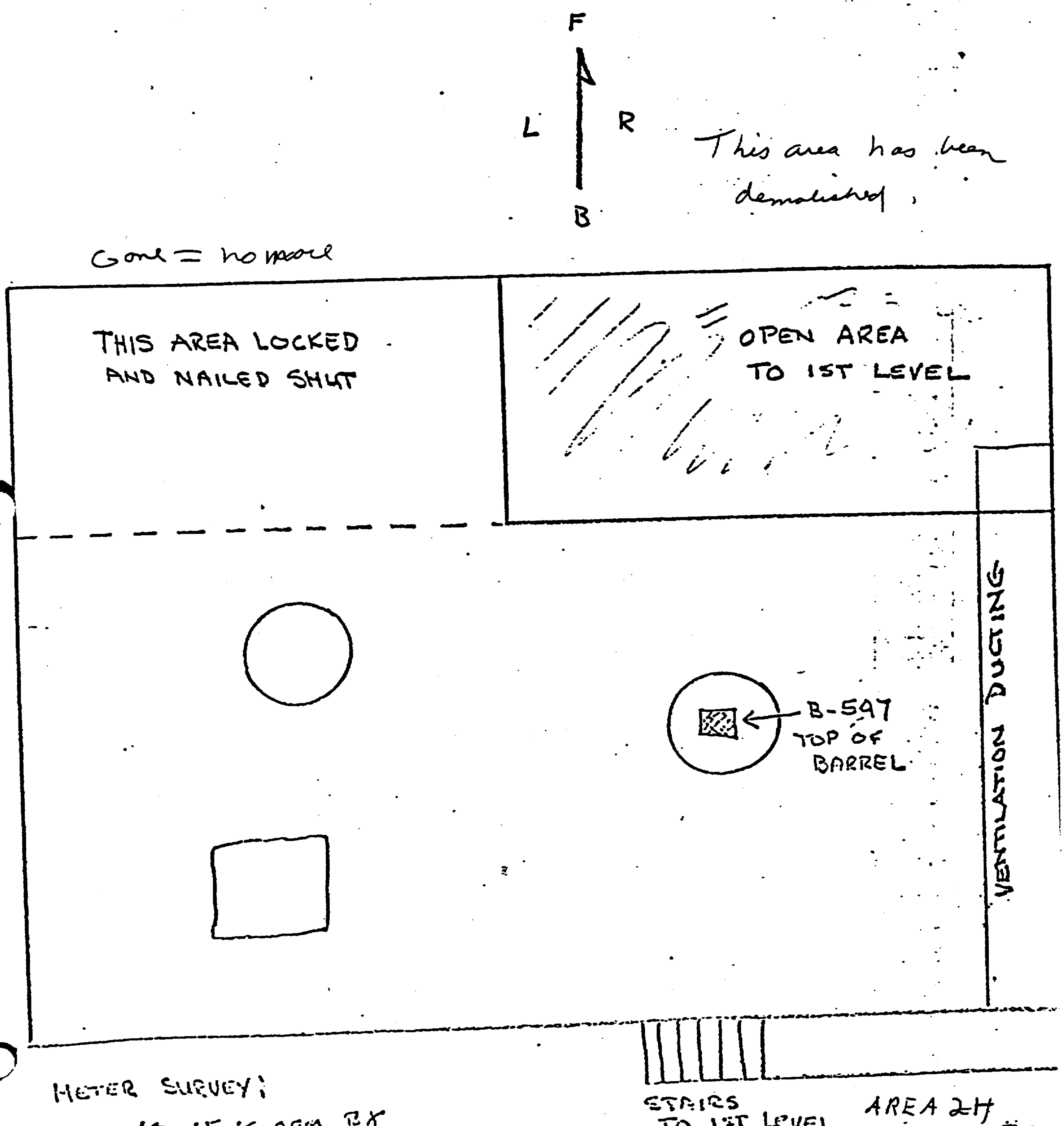


OLD AREA 2-G
NEW (LEVEL) 2-D
AREA

COMPRESSOR ROOM

This area has been demolished.

Gone = no more



AREA 2H

#21

METER SURVEY:

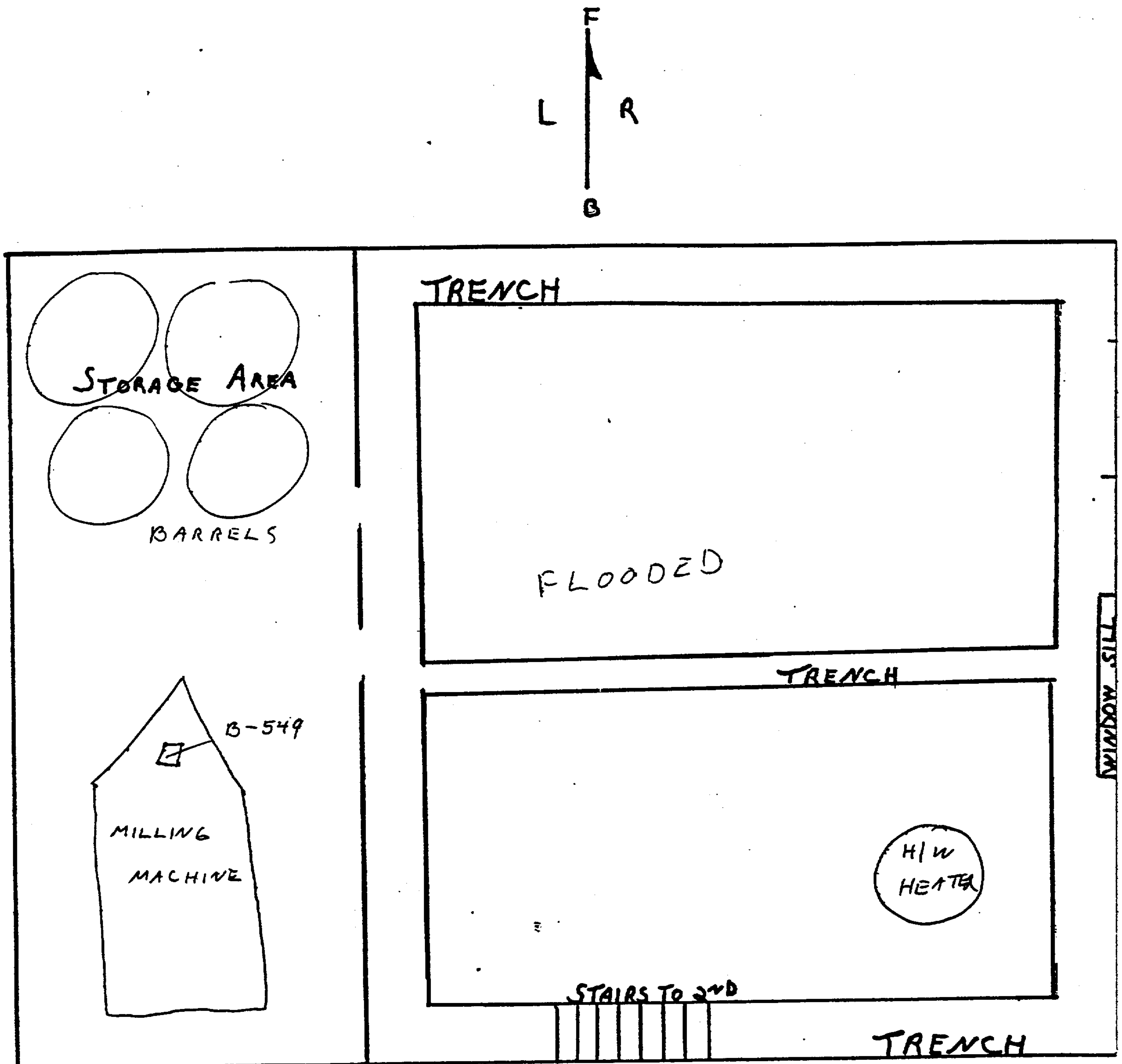
10-15 K CPM β,γ

400 CPM α

MM

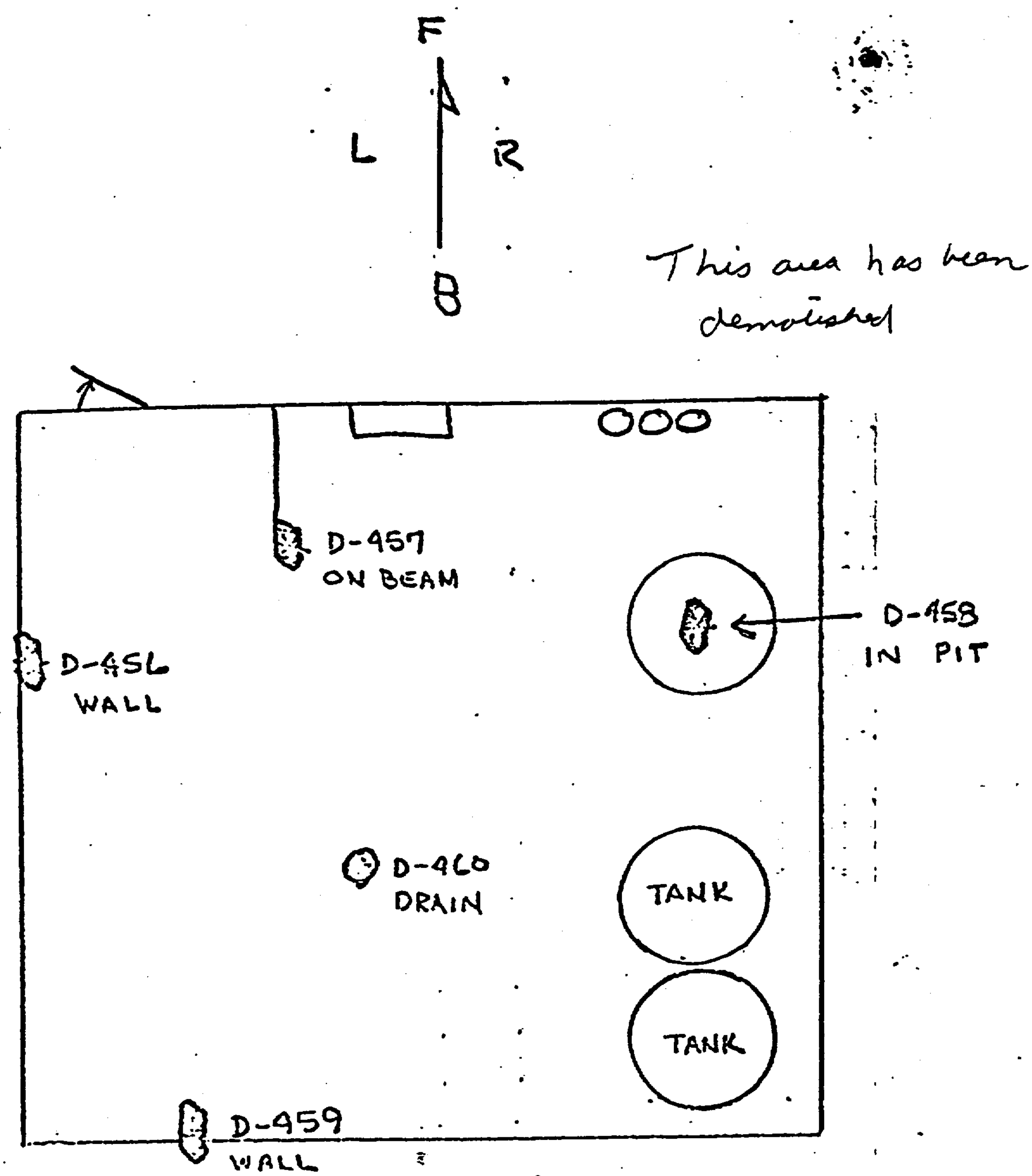
Ball Mill

[illegible]



OLD AREA 2-I
NEW AREA 2-C

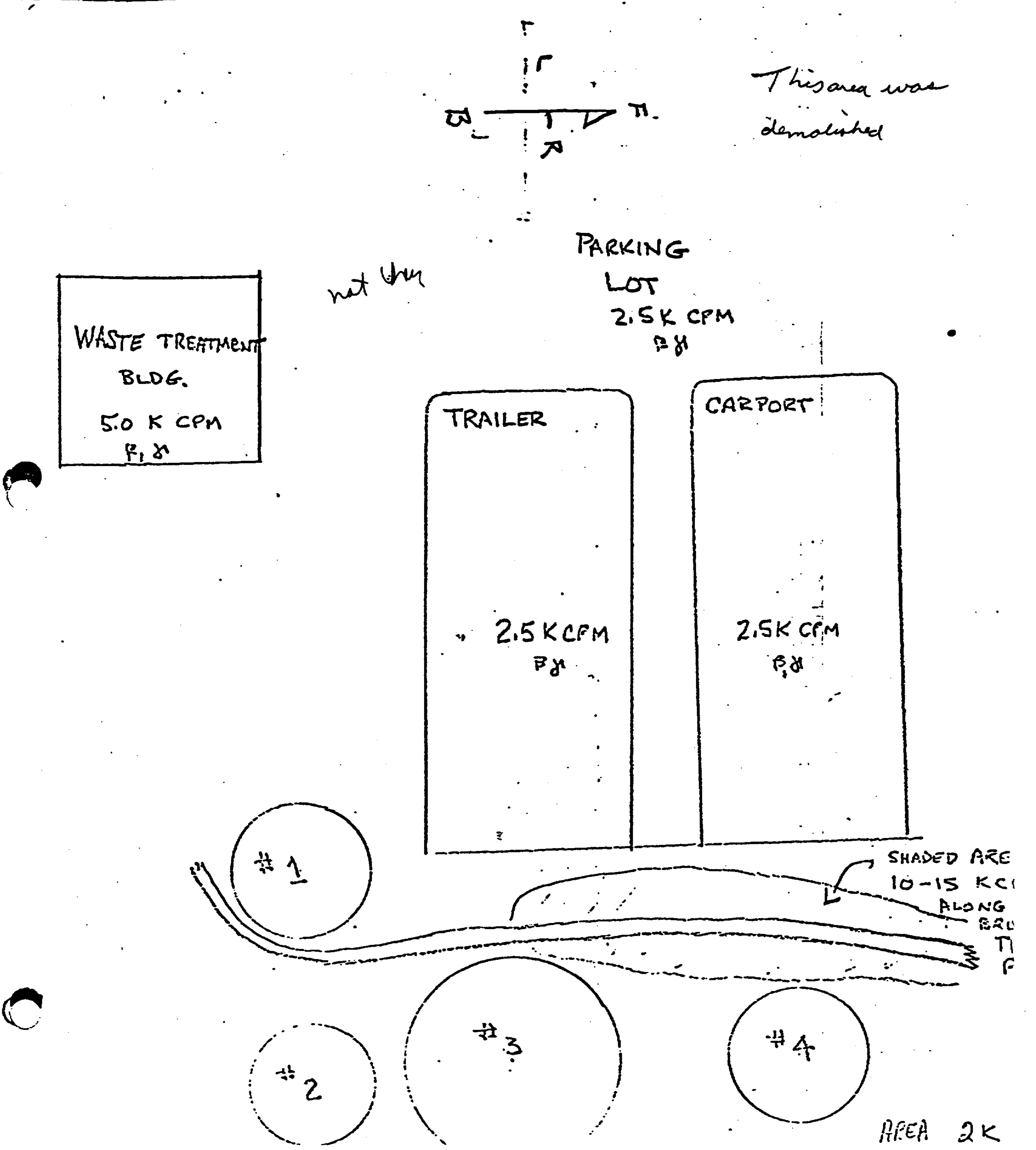
BALL MILL
LOWER OPERATIO.



AREA-2J

Waste Treatment Plant
Area 2-J

NM Good



This area was demolished
PARKING
LOT
2.5K CPM
β,γ
not there
WASTE TREATMENT
BLDG.
5.0 K CPM
β,γ
TRAILER
2.5 K CPM
β,γ
CARPORT
2.5K CPM
β,γ
SHADED ARE
10-15 KC
ALONG
#1
#2
#3
#4
AREA 2K

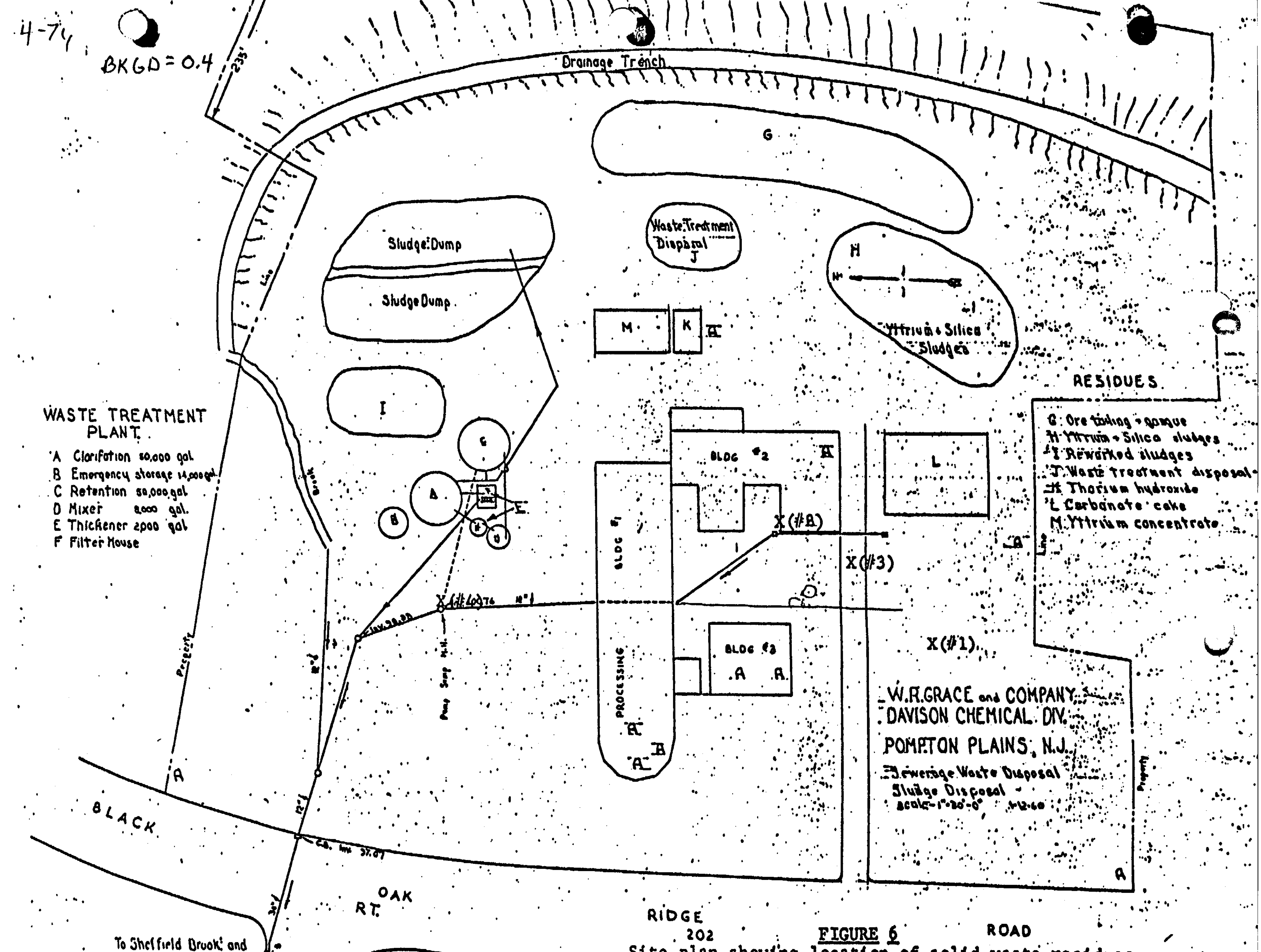


FIGURE 6

Site plan showing location of solid waste residues.

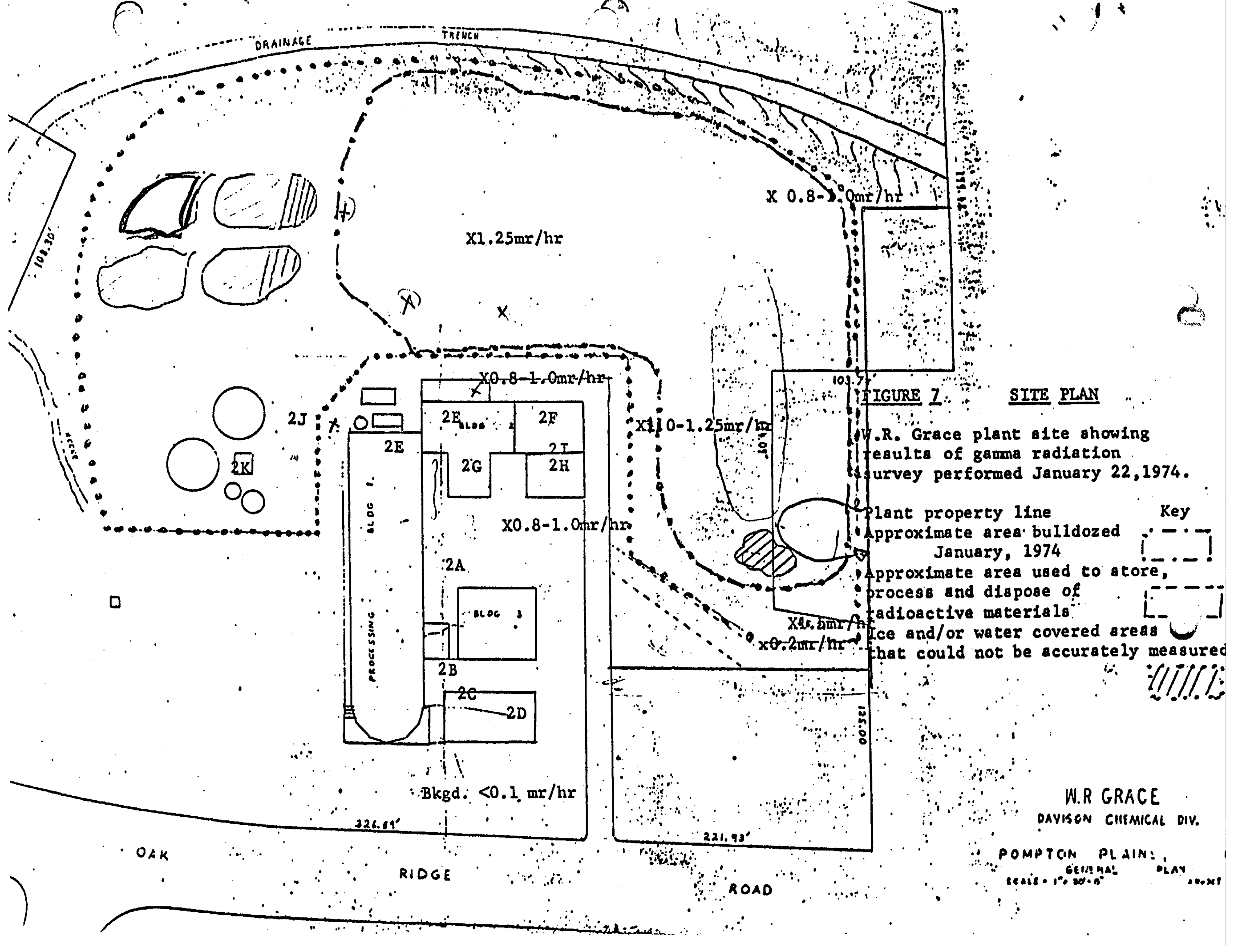


FIGURE 7. SITE PLAN

W.R. Grace plant site showing results of gamma radiation survey performed January 22,1974.

PART III

DECONTAMINATION

The various areas at the W. R. Grace Plant are described below in relation to what type of decontamination work was performed on them. The reference to the area, such as 1-A, is in keeping with the nomenclature found later in Part IV of this report. Mr. Stephen M. Sorensen of Applied Health Physics, Inc., supervised work at the site. Respiratory equipment was worn where necessary to insure proper health and safety protection of personnel. Air samples were periodically taken to determine air concentrations of natural thorium.

W. R. Grace's Offices (1-A) - These rooms were vacuumed cleaned of natural thorium with an X-100 absolute filter.

Lab #1 (1-B) - The following were removed from this room: muffle furnace, centrifuge, UF_6 cylinder and a stone. The lab was vacuumed, damp wiped with water, spray detergent and paper towels. The floor was damp mopped with detergent and water.

Sample Preparation Room (1-C) - This room was vacuumed, damp wiped and damp mopped.

Hallway, Restrooms and Office (1-D) - The water cooler in the hallway was removed. The area was then vacuumed, damp wiped and mopped.

Grinding and Polishing Test Lab (1-E) - This lab is still in use and was only vacuumed cleaned.

Storage Level (1-F) - Equipment was removed as part of the decontamination. The first layer of fiberboard flooring on the left side catwalk was removed. The walls, ceiling, and remaining floor were cleaned with a high pressure steam cleaner and detergent.

Press and Sulfonation Rooms (1-G) - The left front floor was removed as indicated on the diagram. Brickwork under the windows was removed. The area was completely steam cleaned and finished with a final high pressure washing.

Test Lab #2 (1-H) - A sink was removed after attempts to clean it failed. The room was damp washed, vacuumed, and wiped.

Conference Room #1 (1-I) - This room was vacuumed, damp wiped and mopped.

7-K Blending and Storage (1-J) - All equipment and furniture were removed from rooms on the right front side. Barrels and equipment were removed from the rest of the area. This area was cleaned with steam and high pressure water before a final wipedown.

Conference Room #2 (1-K) - This room was vacuumed, damp wiped and mopped.

Hallway (1-L) - This area was vacuumed and damp mopped. The stairs to the first level were steam cleaned.

Shipping, Pulverizing, Cerium Oxide Storage (1-M) - These rooms were vacuumed and the shipping room is still in use.

Drying Rooms (1-N) - A catch box from the upstairs labs was removed and buried, along with another box. These rooms were vacuumed cleaned and the hallway was washed.

Furnace and Press Room (1-0) - This room now contains electronucleonics equipment. Other equipment was removed as part of the decontamination. The drain trenches were dug out by hand and flushed with water. A fan blower and piping were removed and sent to South Pittsburg, Tennessee (a W. R. Grace facility). The shaded area on the diagram in Part IV shows where approximately 1/8 to 1/4 inch of concrete was removed with electric chisels. The walls and ceiling were steam cleaned. The floors were cleaned with high pressure water.

Sharples Collection Room (1-P) - Equipment was removed for cleaning, then replaced. The walls and floors were washed with high pressure water.

1&2 Sulfonation Tank Rooms (1-Q) - All equipment, the stairs, and two steel beam crosspieces were removed and buried. Concrete flooring in 7/8 of this area was removed to a level of 34 inches below the building footer. All drains going to the left outside of the area were enlarged with electric chisels. Brickwork on the left wall was removed to a height of 5.5 feet. Brickwork on the backwall was removed to a height of 10 feet. Brickwork on the chimney and backwall was removed up to the second level of the building. The front wall remains intact. The complete area was hydroblitzed after removal of debris. The floor was backfilled with clean soil for safety purposes. Demolition and cleaning in this room lasted approximately 3 weeks due to mashing of the sources of radioactivity.

7-K Bastacite Room (1-R) - All equipment was removed with the exception of the scale and screw feeds. Brickwork on the forward right wall was removed to a height of 3 feet with an electric chisel. Brickwork on the back left wall between the doors was removed to a height of 6 feet. The shaded areas on the diagram in Part IV show where 1/8 inch of concrete was removed with an electric chisel. The screw feed was completely dug out and hydroblitzed.

Locker and Boiler Rooms (1-S) - These rooms were washed with a hydroblitz and the boiler room was vacuum cleaned.

Workshop Building (2-A) - Shelves, a towel rack and cabinet were removed. This building was washed with a hydroblitz. Approximately 1/8 inch of concrete was removed as indicated in Part IV.

Ball-Mill (2-B) - All equipment was removed and anything was buried that was to be discarded by W. R. Grace. The drain trenches were dug and jack-

hammered to a depth of 2 feet. Shaded areas on the figure in Part IV indicate where concrete was chipped. The whole area was vacuumed and washed. Concrete on the wall below the rollup door on the front portion was removed with electric chisels.

Ball Mill (2-C) - All equipment and boxes were removed. The second level was completely taken out. Drain trenches were jackhammered to a depth of 2 feet and widened. All debris in this building was removed. The complete area was hydroblitzed.

Compressor Building (2-D) - Lockers, barrels, boxes, and equipment found in this area were removed. As indicated in Part IV, concrete in the shaded areas was removed a depth of 1/8 to 1/4 inch with electric chisels. The complete area was hydroblitzed.

Attic, Third level of Main Building - All debris, equipment, boxes, barrels, with the exception of metal shelving were removed. All areas were vacuumed clean and damp mopped.

Electronucleonic Storage - This area was jackhammered and hydroblitzed. Material found below the concrete floor was removed.

On-site Waste Disposal

W. R. Grace Company received permission to bury material disposed of in the decontamination onsite. The clearance granted by the State of New Jersey was for the burial to be in eight holes, each containing a maximum of no more than 997 pounds per hole. Figure I of Part III shows where the burial sites are located on the premises of W. R. Grace. All holes are 10 feet in diameter, 20 feet deep and spaced 6 feet apart. As part of burial, the holes are to be covered with 4 feet of topsoil. The tanks and waste treatment building on site were demolished and buried along with all debris and sludge resulting from the decontamination work.

Digging and filling of each hole proceeded as follows:

<u>Hole #1</u> - dug and filled between April 22-26, 1974 by J. Baum, Inc. with 100 pounds of material.

<u>Hole #2</u> - dug and filled between April 22-26, 1974 by V. Ottilio & Sons, Inc. with 75 pounds of material.

<u>Hole #3</u> - dug and filled by V. Ottilio & Sons, Inc. between April 22-26, 1974 with 75 pounds of material.

<u>Hole #4</u> - dug and filled on May 1, 1974 with 50 pounds of material by J. Baum, Inc.

<u>Hole #5</u> - dug and filled by J. Baum, Inc. on May 21, 1974 with 500 pounds of material.

<u>Hole #6</u> - dug and filled with 700 pounds of disposal material on May 22, 1974, by J. Baum, Inc.

<u>Hole #7</u> - dug and filled June 1 through 10, 1974 by J. Baum, Inc. with 100 pounds of material.

<u>Hole #8</u> - dug and filled June 10 through 28, 1974 by J. Baum, Inc. with 100 pounds of material.

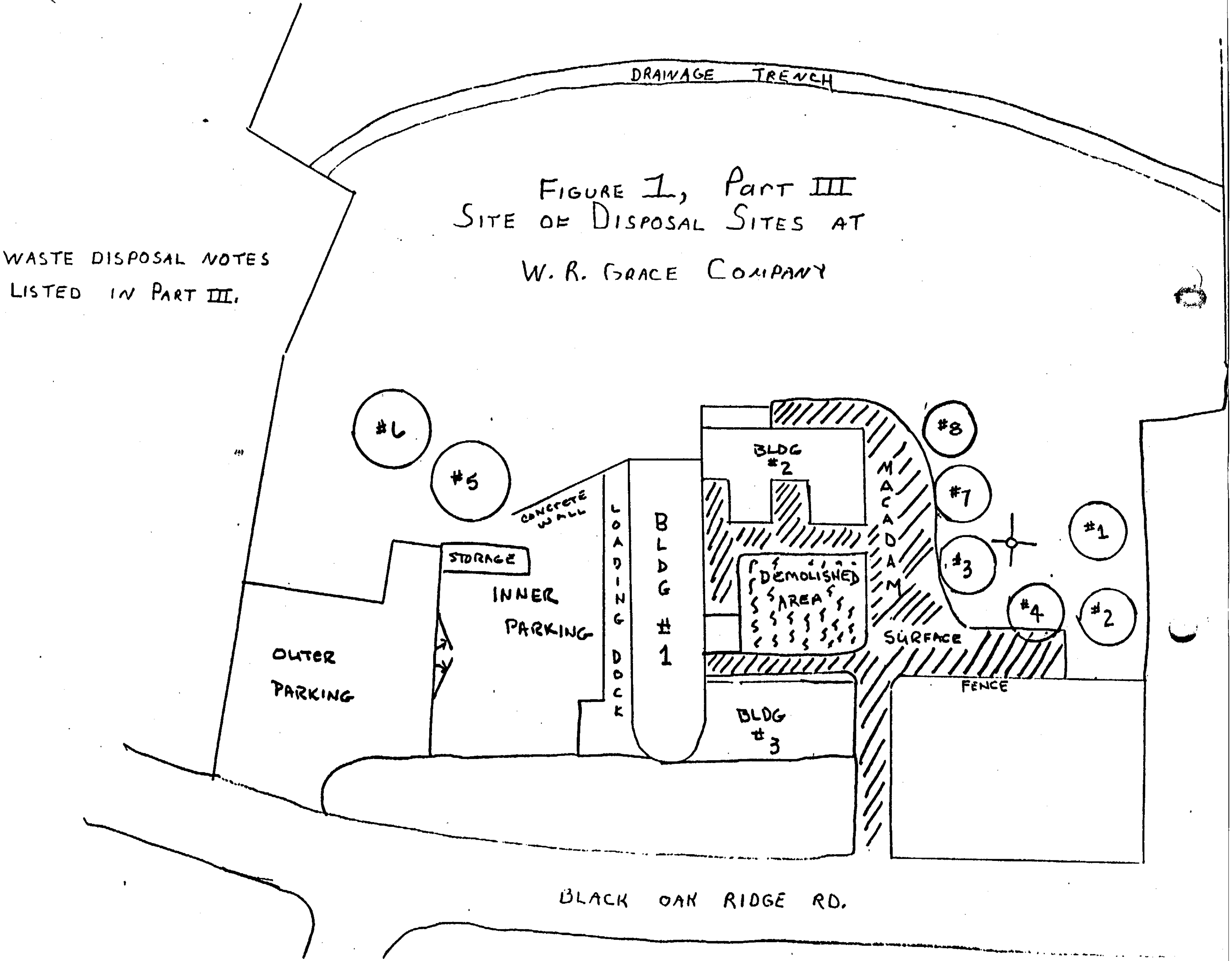


FIGURE 1, PART III
SITE OF DISPOSAL SITES AT
W. R. GRACE COMPANY
WASTE DISPOSAL NOTES
LISTED IN PART III.
DRAINAGE TRENCH
#6
#5
#8
#7
#1
#3
#4
#2
BLDG #2
MACADAM
SURFACE
CONCRETE WALL
LOADING DOCK
BLDG #1
STORAGE
INNER PARKING
OUTER PARKING
DEMOLISHED AREA
FENCE
BLDG #3
BLACK OAK RIDGE RD.

PART IV

Radiation Survey after Decontamination

On June 3 through 5 and on June 27, 1974 a final radiation survey was performed following decontamination of the W. R. Grace Company plant site at Wayne, New Jersey. The main building, three of the smaller areas, and part of the grounds were ready for inspection by Applied Health Physics, Inc. personnel. Decontamination was still in progress, due to unforeseen developments. This survey was completed on June 27, 1974 when all work was finished. Certain areas found to contain radioactive materials were resurveyed after further cleaning. These "hot" areas, noted both on Table 1 and certain parts of Figure 1 were cleaned and are now found to be within acceptable limits.

Some of the buildings surveyed prior to decontamination were torn down entirely; this is the result of heavy non-removable thorium-bearing material depositions and ground depositions. The demolished structures are: blending and superfast furnace, open storage, storage off blending area, waste treatment plant, and ball-mill 2nd floor operation. In addition, holding tanks and a trailer were removed. One area which could not be surveyed was the third level of the main building. Part of the stairs and landing were removed which posed a safe access problem. A survey in this area was not critical since the survey prior to decontamination (Part II of this report) showed that radiation and contamination levels were within acceptable limits. The buildings and grounds were monitored with a beta-gamma GM survey meter (Victoreen Model 491; Probe Model 491). All readings were taken at a distance of 1 centimeter from the cleansed surfaces. Background levels were in the range of 0.05 to 0.1 mr/hr inside the buildings and 0.1 to 0.4 mr/hr

outdoors on site.

Smear samples were taken to evaluate removable alpha contamination. These were counted on-site and at the office of Applied Health Physics, Inc., Bethel Park, Pa. with a windowless gas-flow proportional counter (NMC, Model PC-3A). Analysis of these smears appears in Appendix B of Part IV.

The location of the smears and meter readings are located on each individual room diagram, which are collectively known as Figure 1. These results are then summarized in Table I.

Survey Results

On June 3-5, 1974, the beta-gamma radiation levels of the decontaminated surfaces were around the average level of 0.2 mr/hr set for building surfaces and equipment. The places reading 0.8 mr/hr or greater were noted in this report, and the information was relayed to the field supervisor for further decontamination work. The survey conducted on June 27, 1974 showed that the radiation levels in these areas, after cleaning, gave readings of 0.2 mr/hr or less. These corrected readings are in parentheses in Figure 1.

Of the smear samples, the highest found was 107 $\pm$ 7.4 dpm/100 cm^2 in the workshop area. This June 4, 1974 result is approximately a factor of ten below the accepted limits for removable alpha radioactivity as found in Appendix A. All of the smears are far below this limit of 1,000 dpm/100 cm^2 set for removable alpha activity.

The results of the property survey taken on June 24, 1974 are contained in Figure II. It should be realized that a covering of soil is still needed on some parts of the site in order for this work to be considered finished. A survey is therefore needed when this work is done.

Conclusion

From the results of the decontamination survey, the property is ready for unlimited occupancy, with the exception of some work that is incomplete outdoors. After this work is done, a survey undertaken by Applied Health Physics, Inc., personnel should verify that this property meets all the requirements set forth by the State of New Jersey and the United States Atomic Energy Commission for release of decontaminated facilities.

ADDENDUM

On July 18, 1974, the grounds were surveyed after all soil was put in place over the burial sites and smoothed. Figure III shows the results of this survey. The W. R. Grace Co. property now is within the radioactivity contamination limits set forth by the United States Atomic Energy Commission and the State of New Jersey.

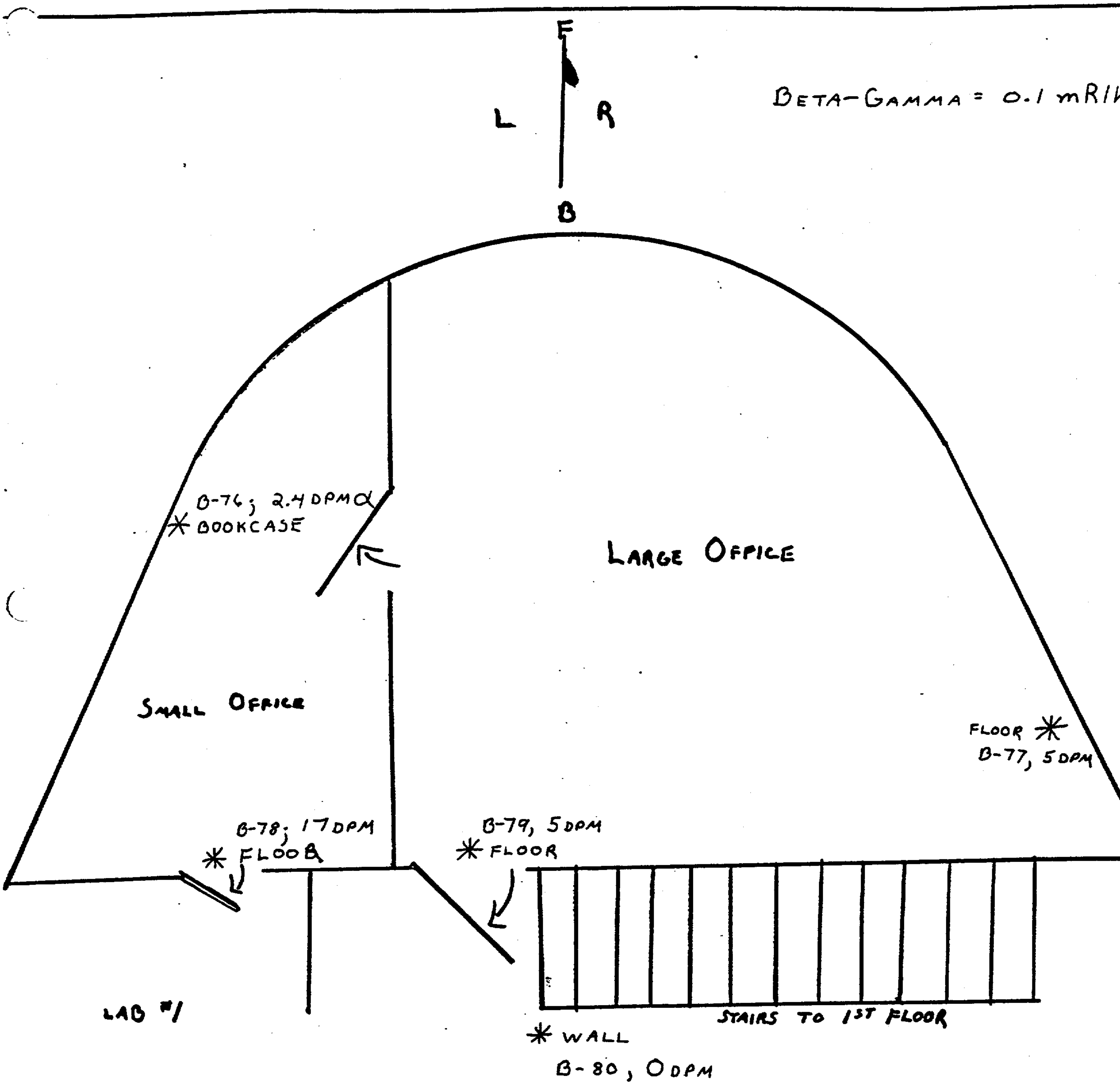
FIGURE 1

Key to Following Diagrams:

*= Location of smear sample e.g.;
B-78 is the sample number
17 DPM is the removable alpha
DPM/100 CM^2.

Meter reading of the room is in the upper right corner, except for "hot" spots as indicated.

BETA-GAMMA = 0.1 mR/h

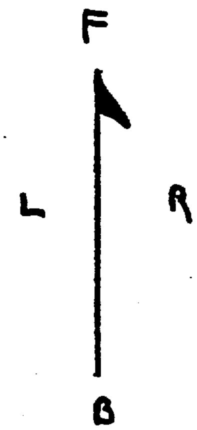


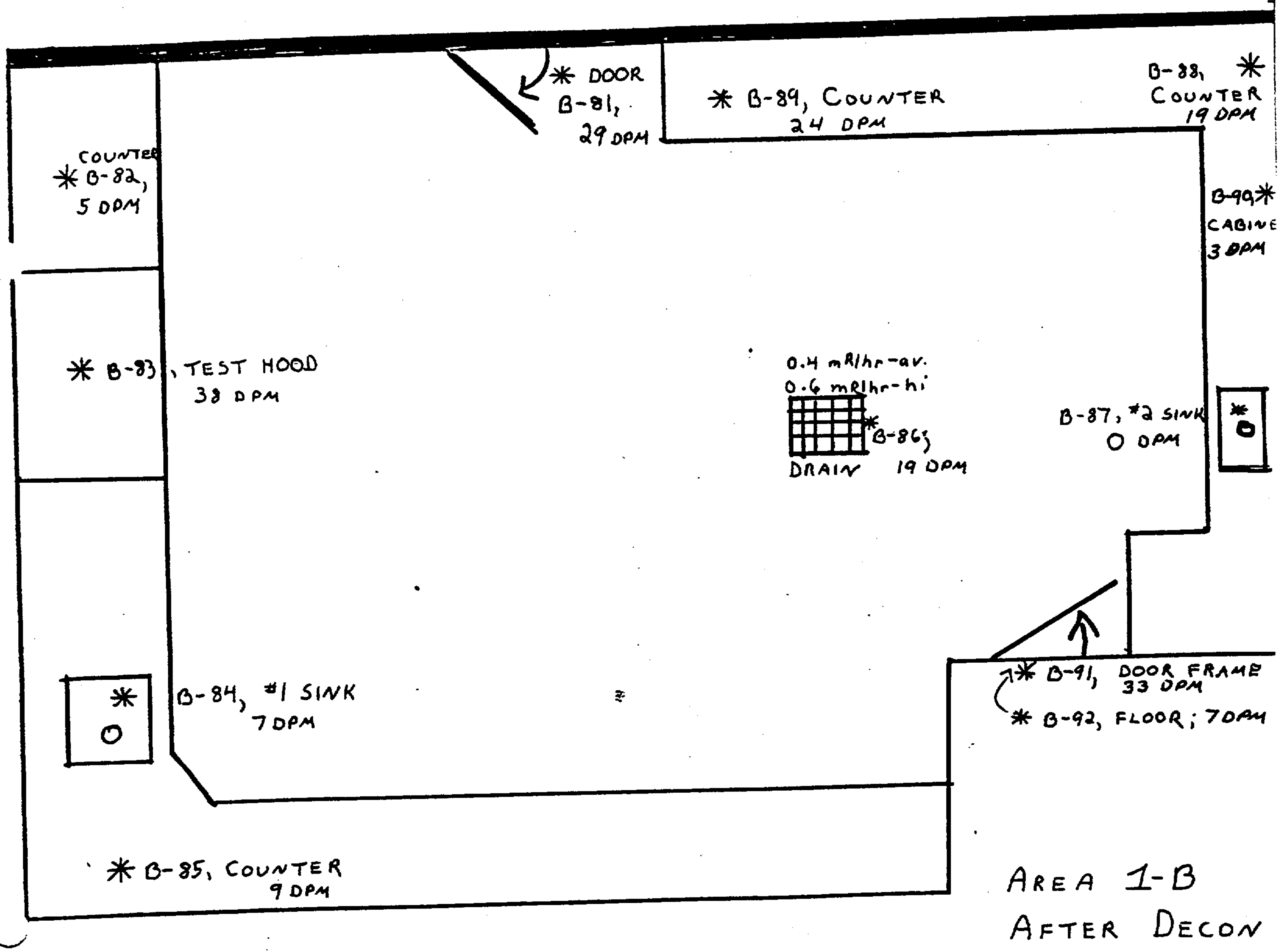
AREA 1-A

AFTER DECON.

OFFICES
2ND. FLOOR, MAIN

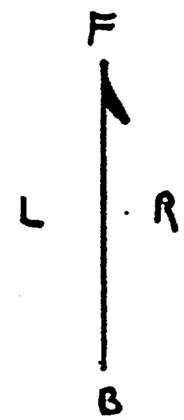
BETA - GAMMA = 0.1 mR/hr a
0.2 mR/hr h

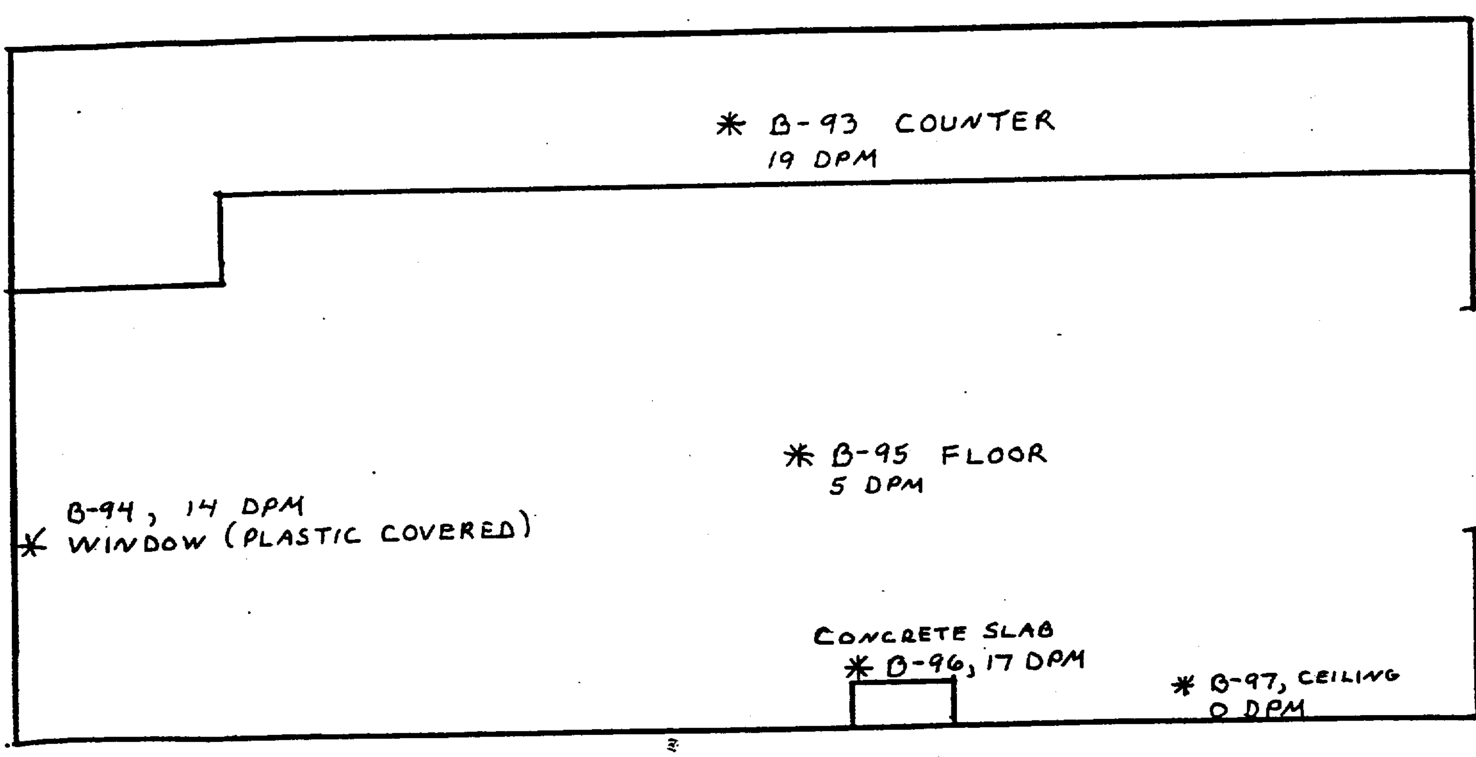




AREA 1-B
AFTER DECON
LAB No. 1
2ND. FLOOR, MAIN BL

BETA-GAMMA = 0.1 mR/hr

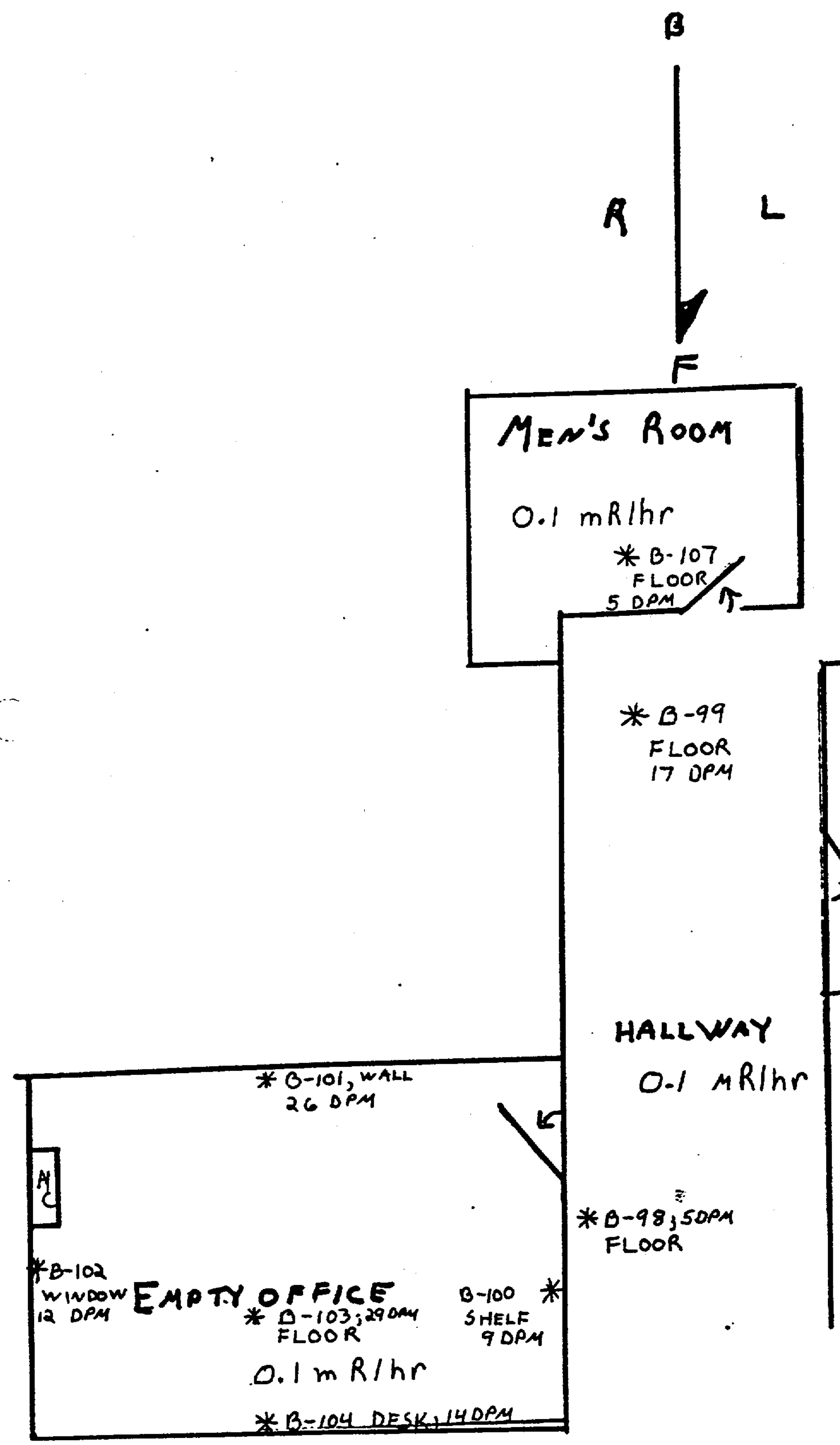




AREA 1-C
AFTER DECON.

SAMPLE PREPARATION ROOM
2ND. FLOOR, MAIN BLDG.

BETA-GAMMA 0.1 mRI

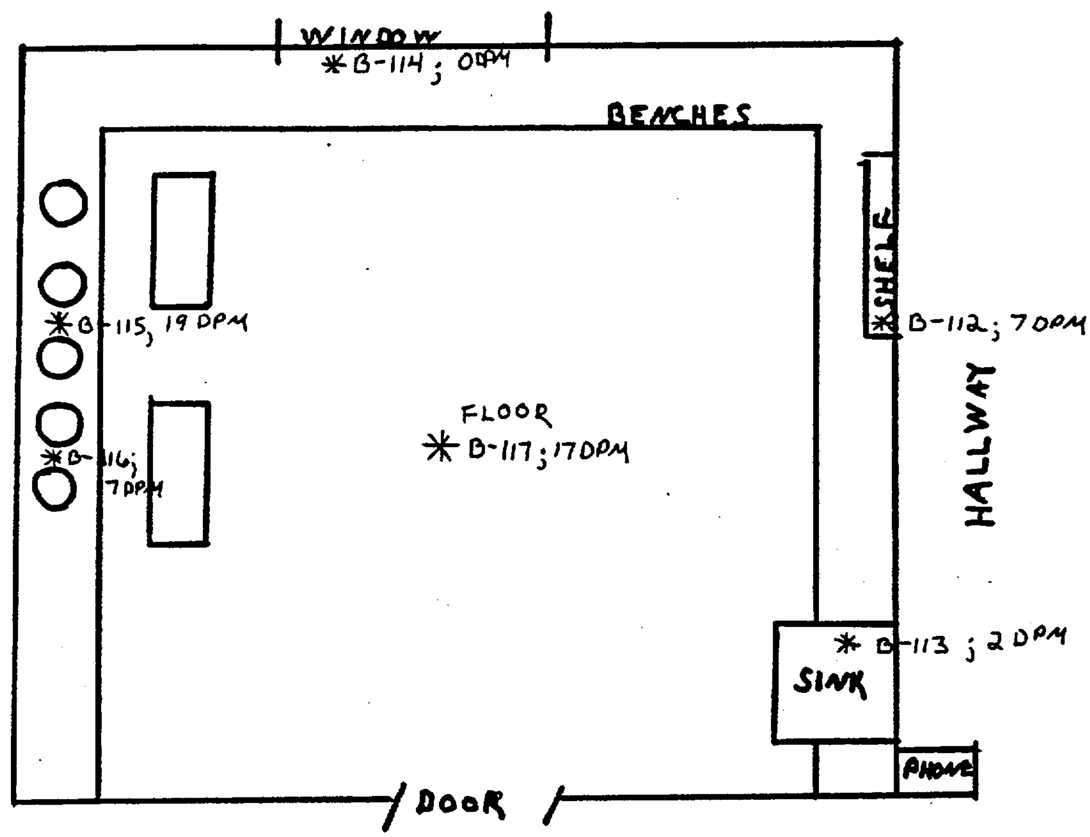


AREA 1-D
AFTER DECON.

HALL, LADIE'S & MEN'S ROOM,
EMPTY OFFICE

2ND. FLOOR MAIN BLDG.

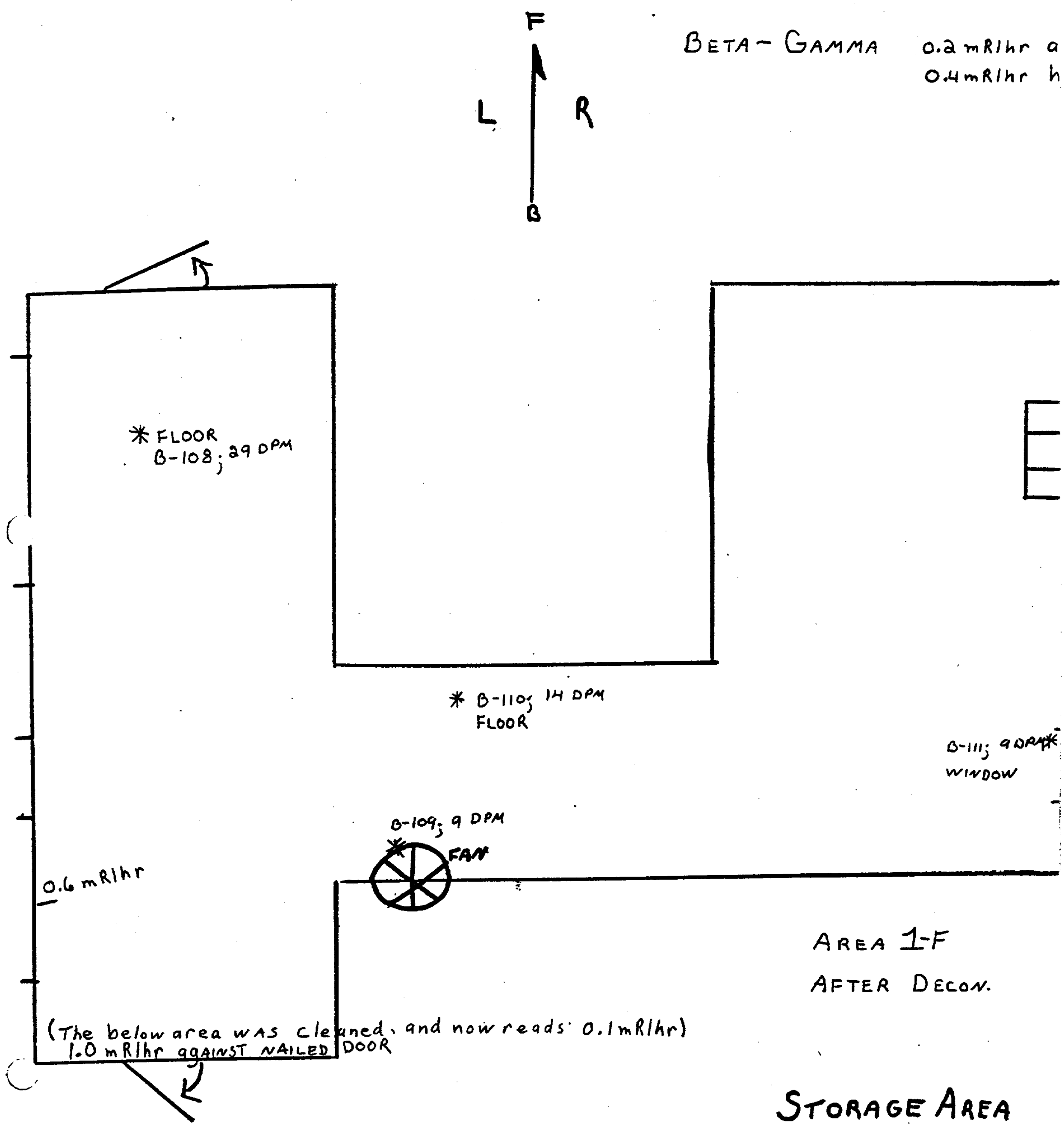
BETA-GAMMA 0.05 mR/hr
0.4 mR/hr



AREA 1-E
AFTER DECON.

GRINDING & POLISHING TEST LAB
2ND FLOOR MAIN BLDG.

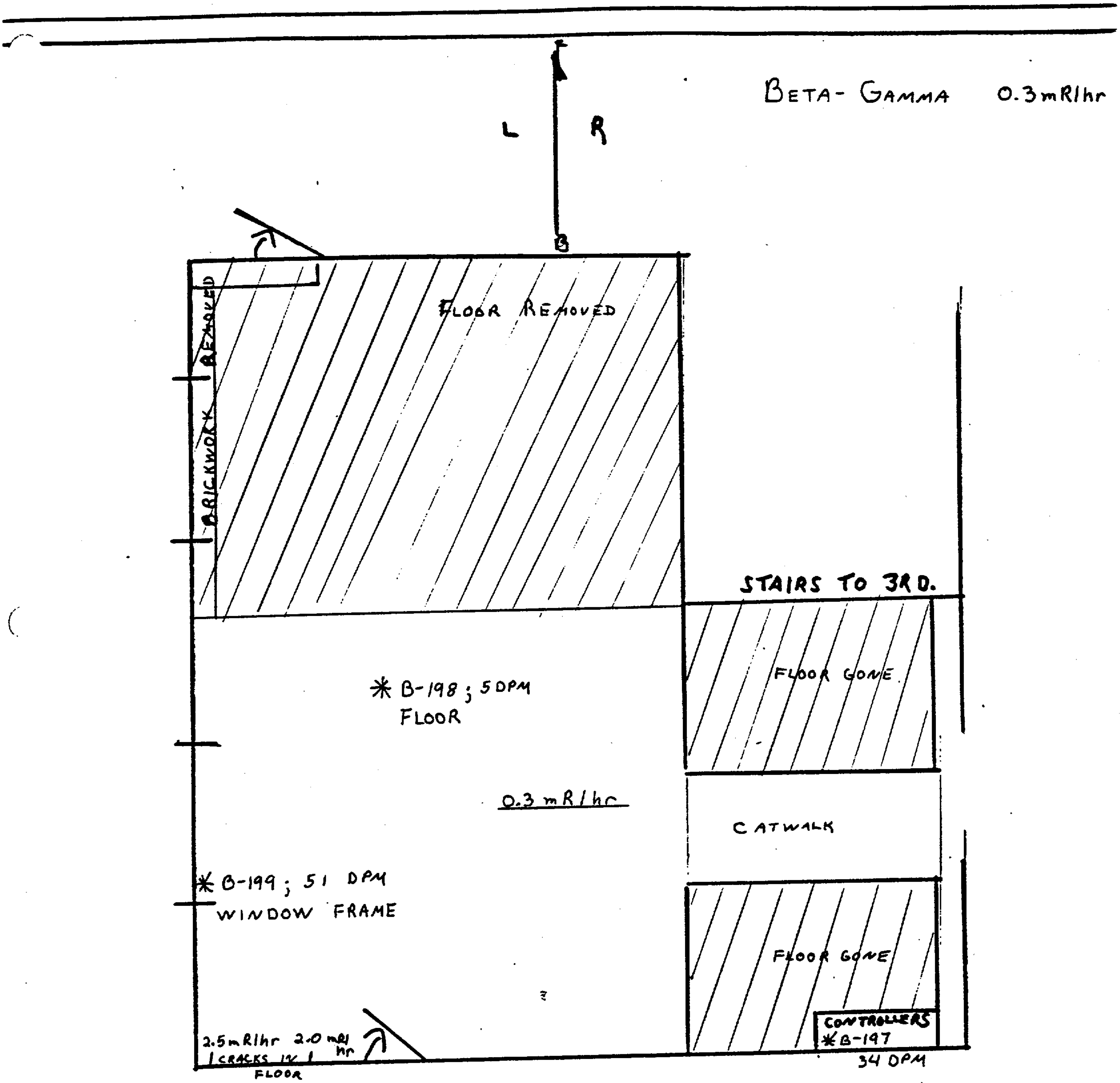
BETA-GAMMA 0.2 mR/hr a
0.4 mR/hr h



AREA 1-F
AFTER DECON.

STORAGE AREA
2ND LEVEL, MAIN BL

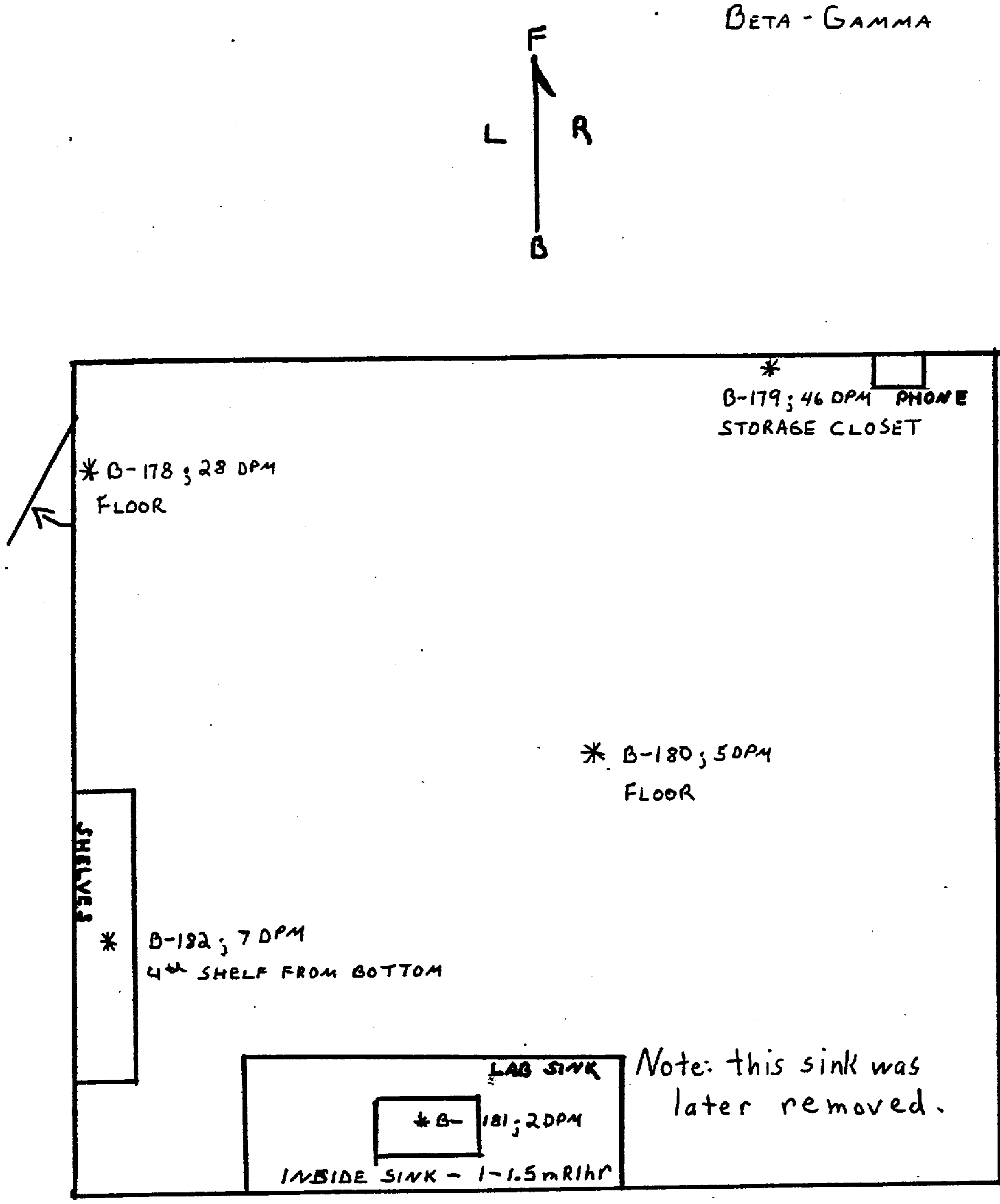
BETA-GAMMA 0.3mR/hr



AREA I-G.
AFTER DECON.

PRESS ROOM & SULFONATION RO
2nd FLOOR, MAIN BLDG.

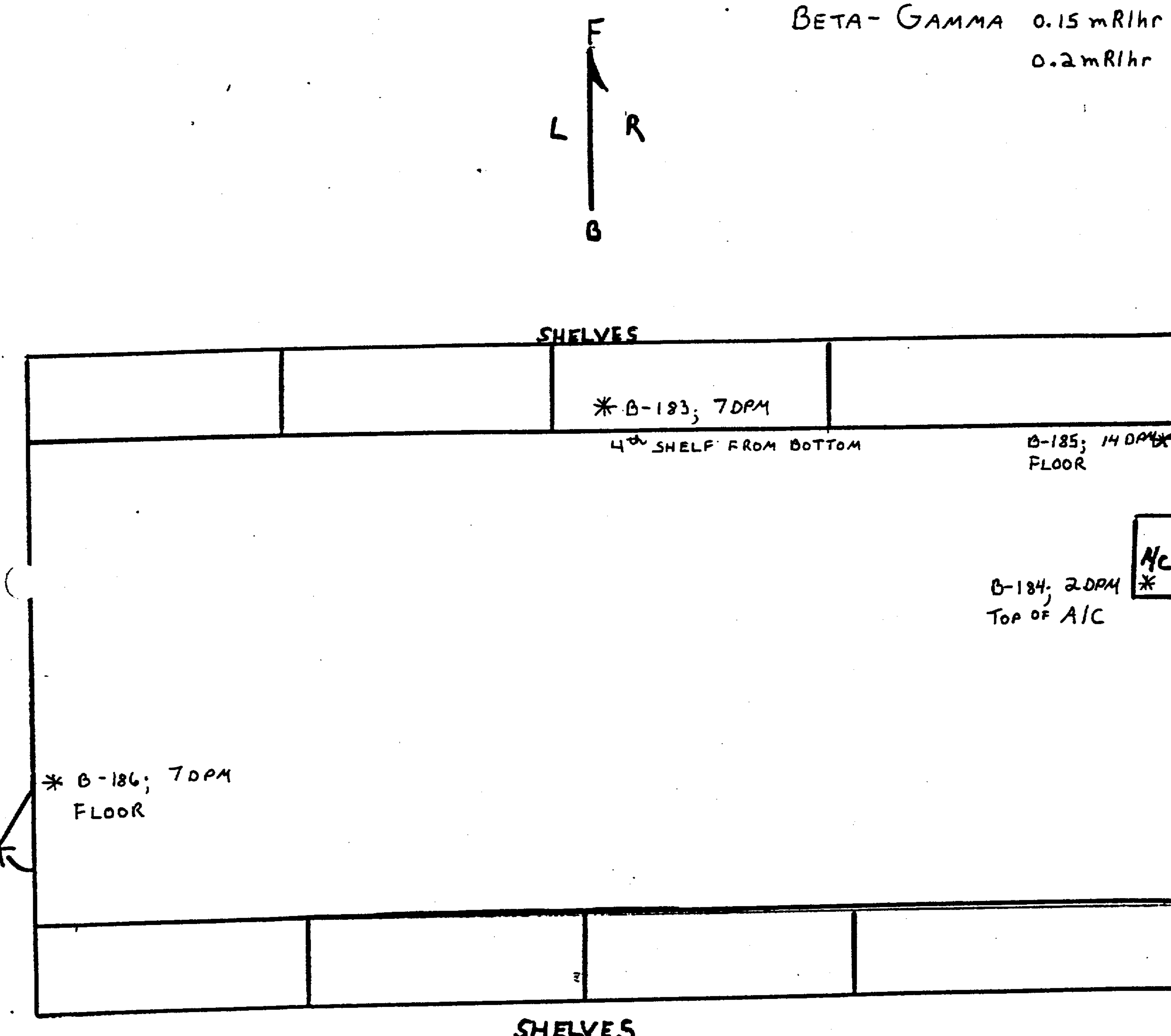
BETA - GAMMA 0.15 mR/hr
0.2 mR/hr



AREA 1-H
AFTER DECON.
TEST LAB #2

2ND LEVEL, MAIN B

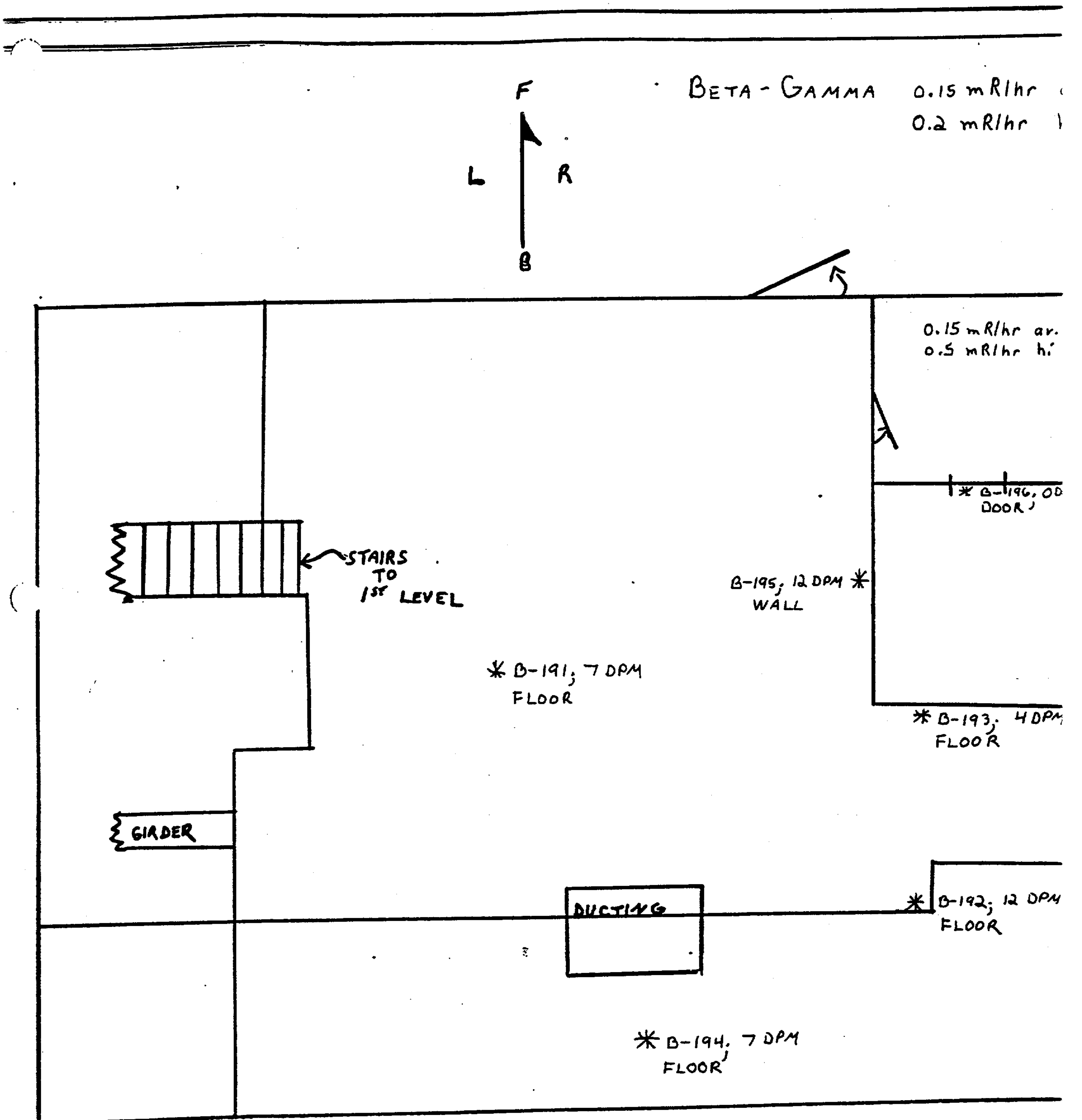
BETA- GAMMA 0.15 mR/hr
0.2mR/hr



AREA 1-I

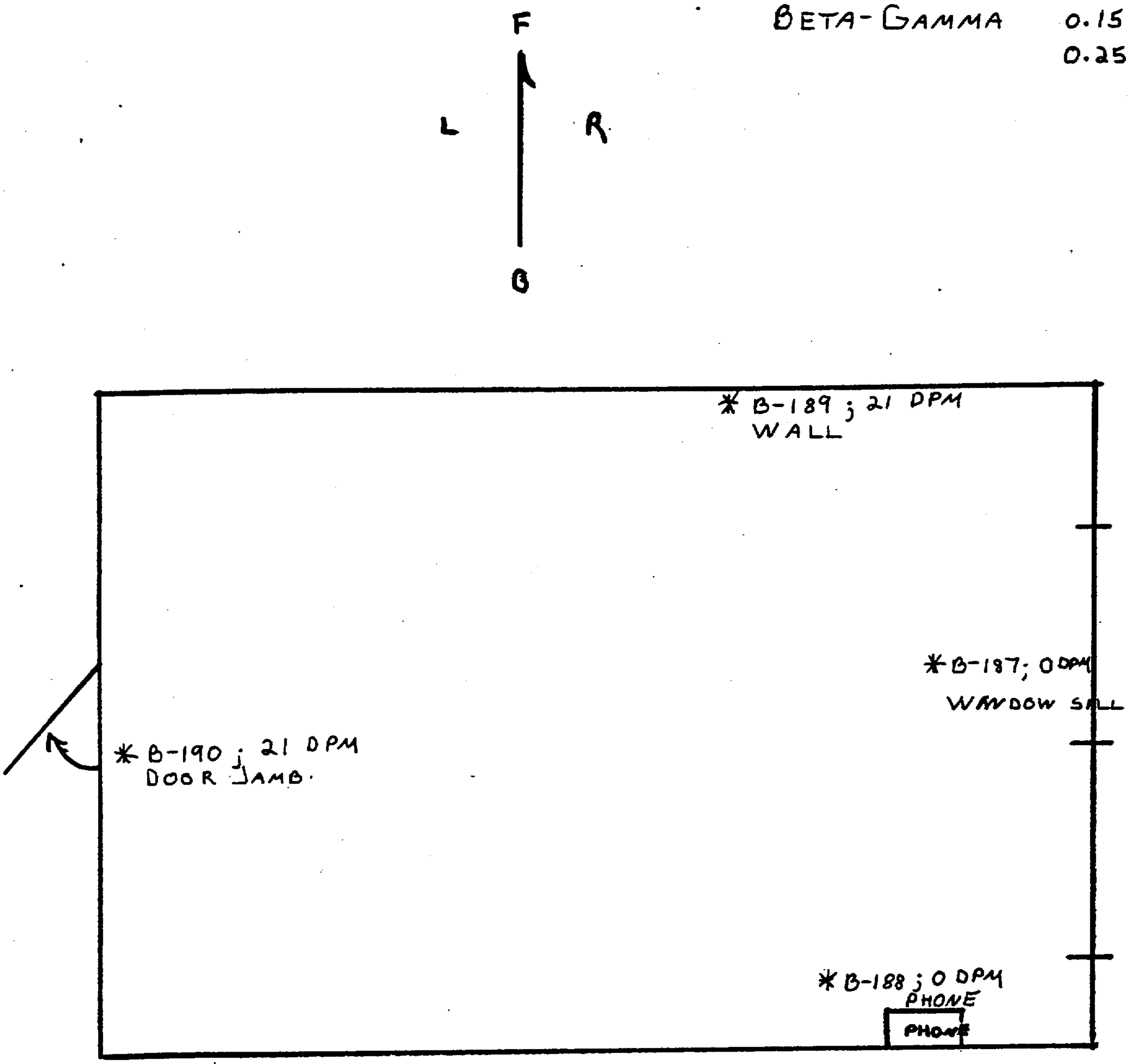
AFTER DECON.

CONFERENCE ROOM #1
2ND. FLOOR, MAIN BLDG.



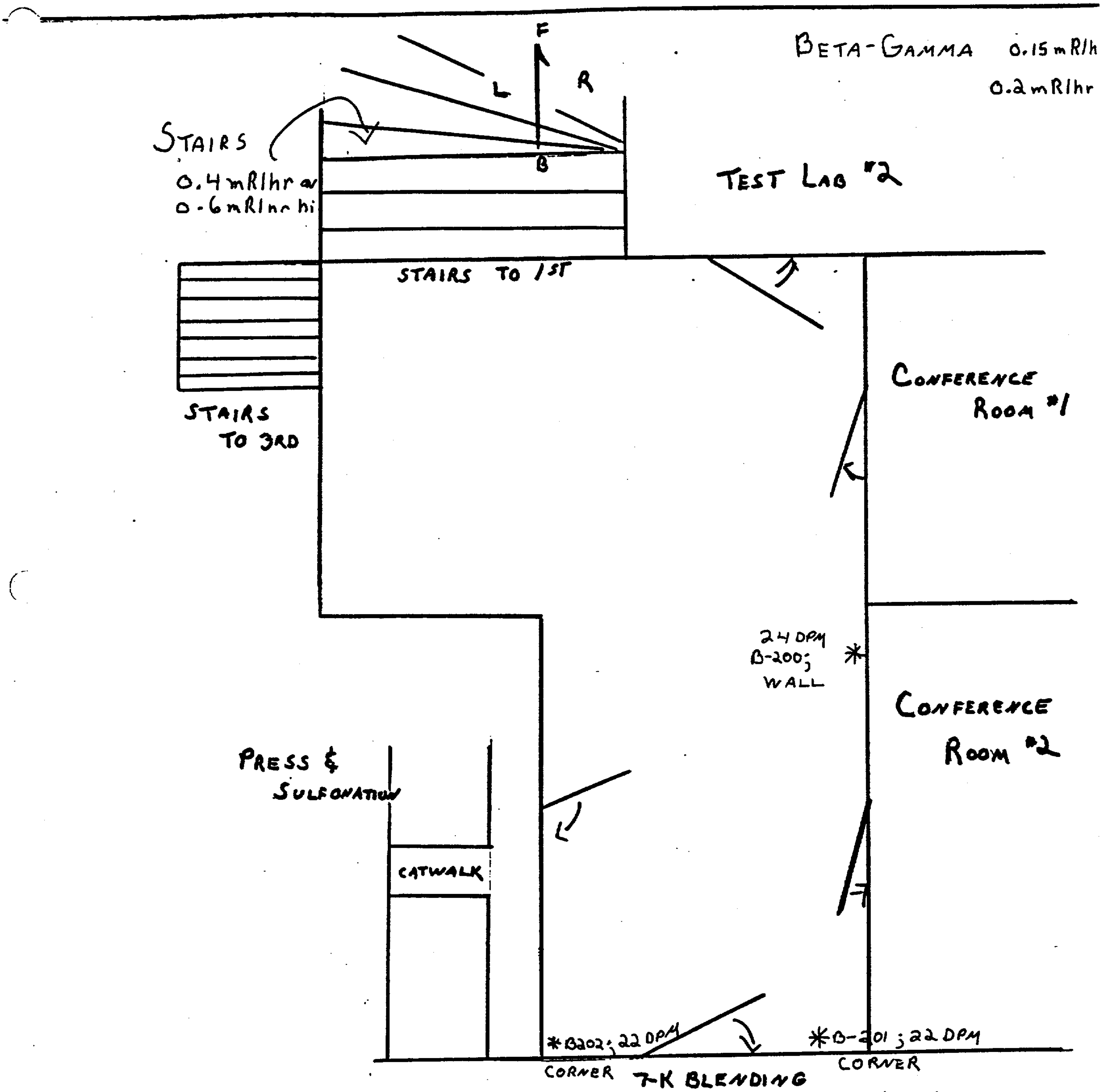
AREA 1J, AFTER DECON.
7-K BLENDING & STORAG
2ND LEVEL, MAIN BL

BETA-GAMMA 0.15 mR/hr
0.25 mR/hr

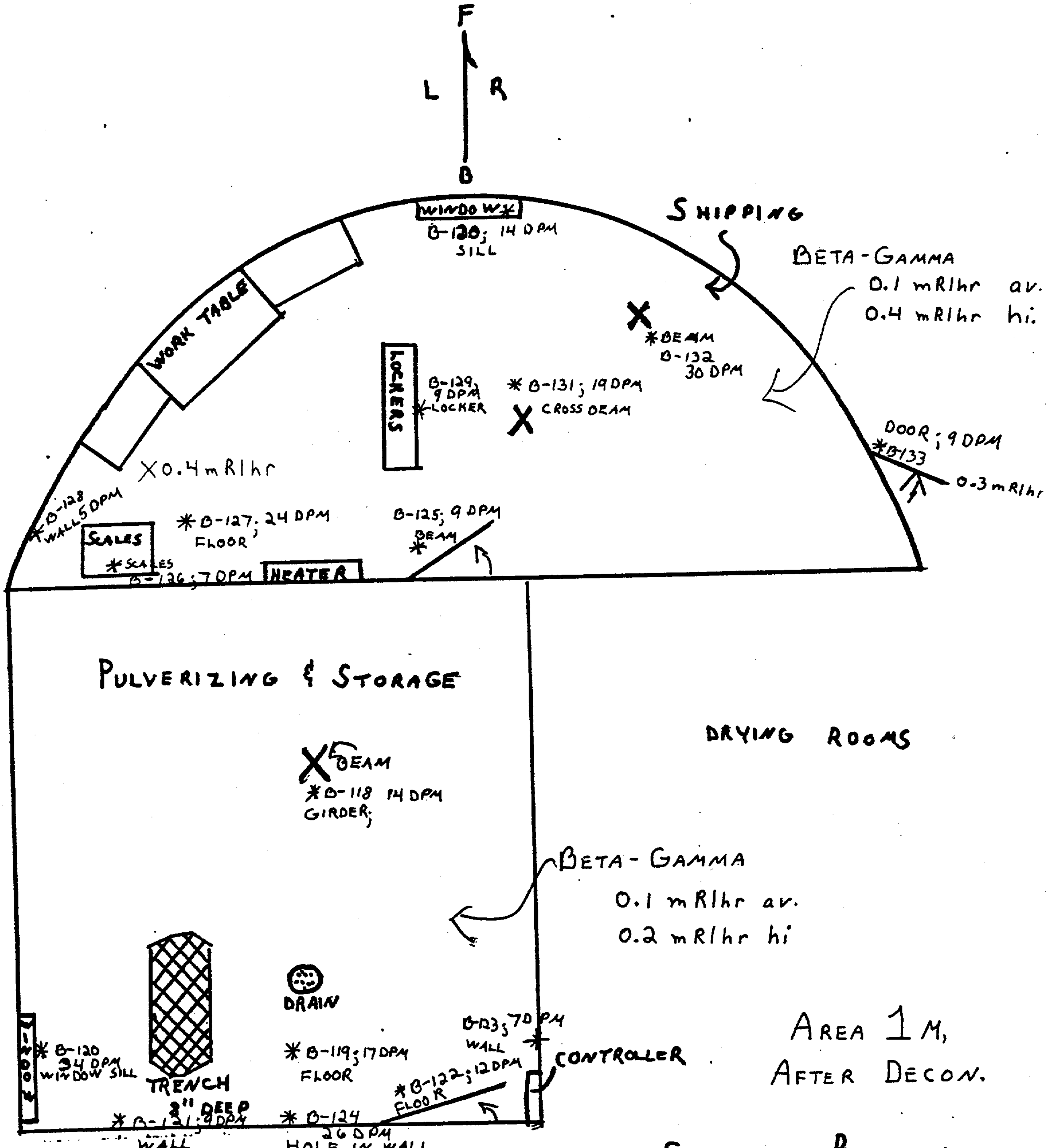


AREA 1K
AFTER DECON.

CONFERENCE ROOM #2
2ND FLOOR, MAIN BLDG



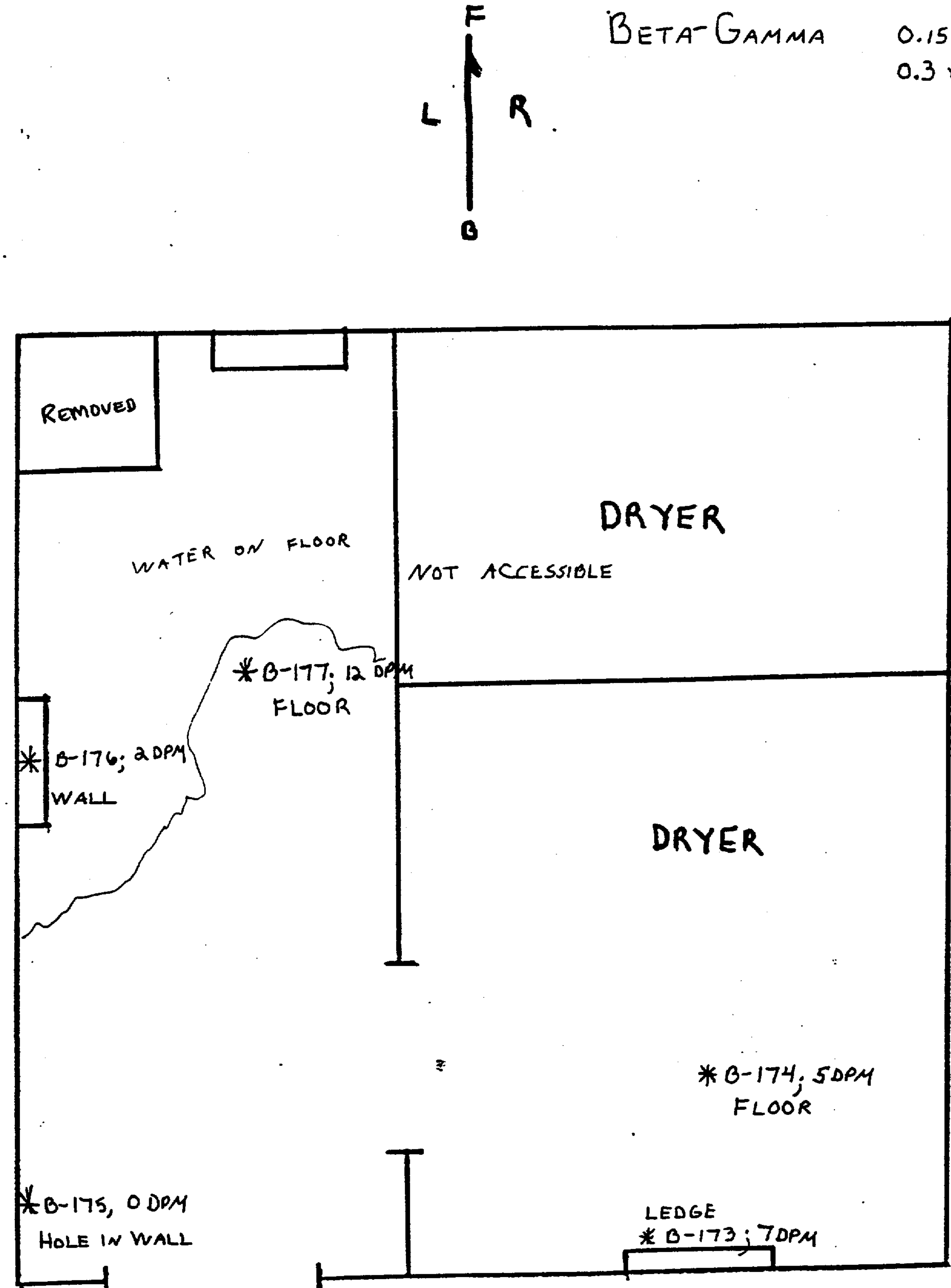
AREA 1-L
AFTER DECON.
SECOND FLOOR HALLWAY
MAIN BLDG



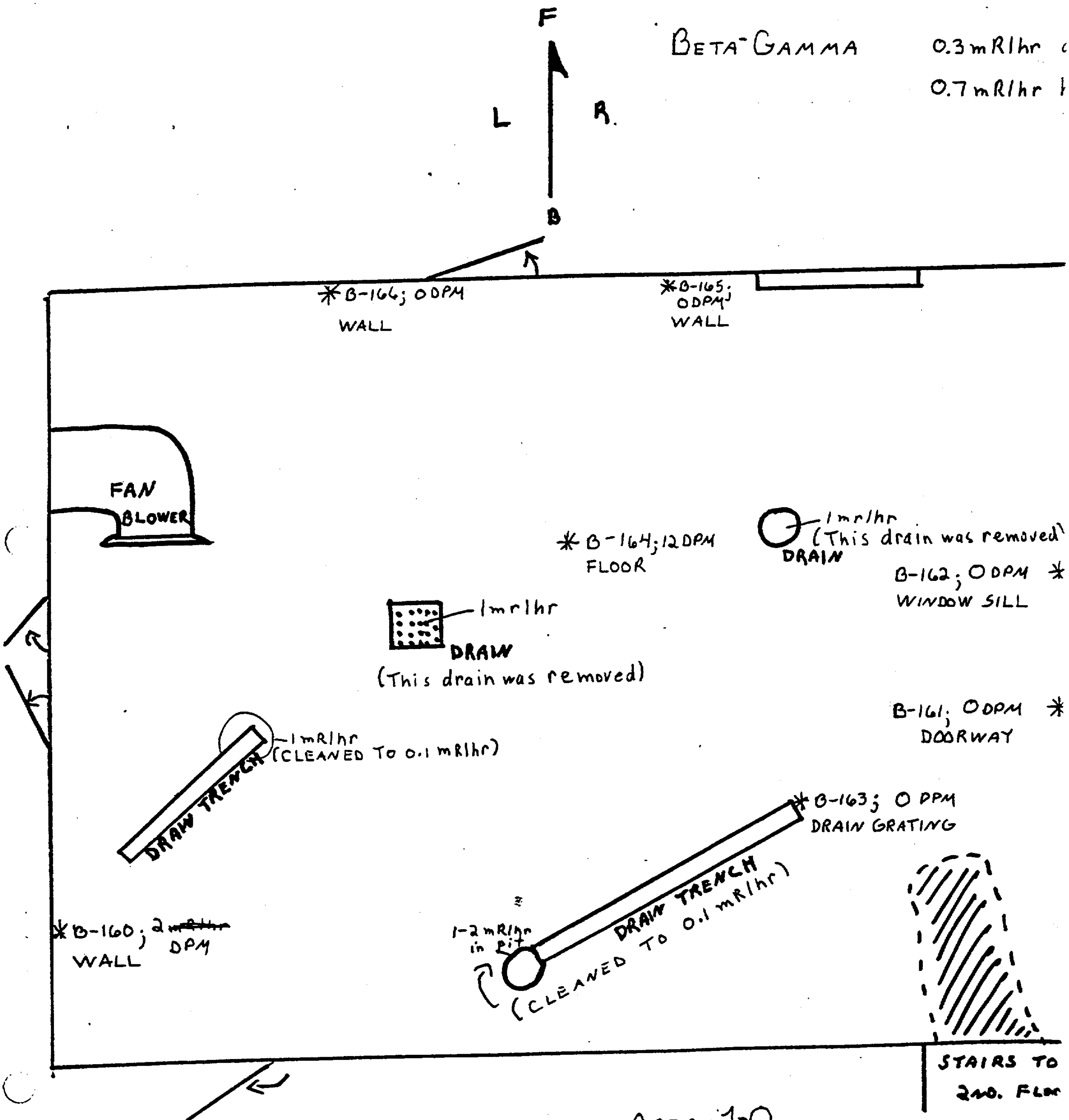
AREA 1M,
AFTER DECON.

SHIPPING, PULVERIZING
CERIUM OXIDE STORAGE
1ST FLOOR, MAIN BLDG.

Beta-Gamma 0.15 mR/hr av.
0.3 mR/hr hi



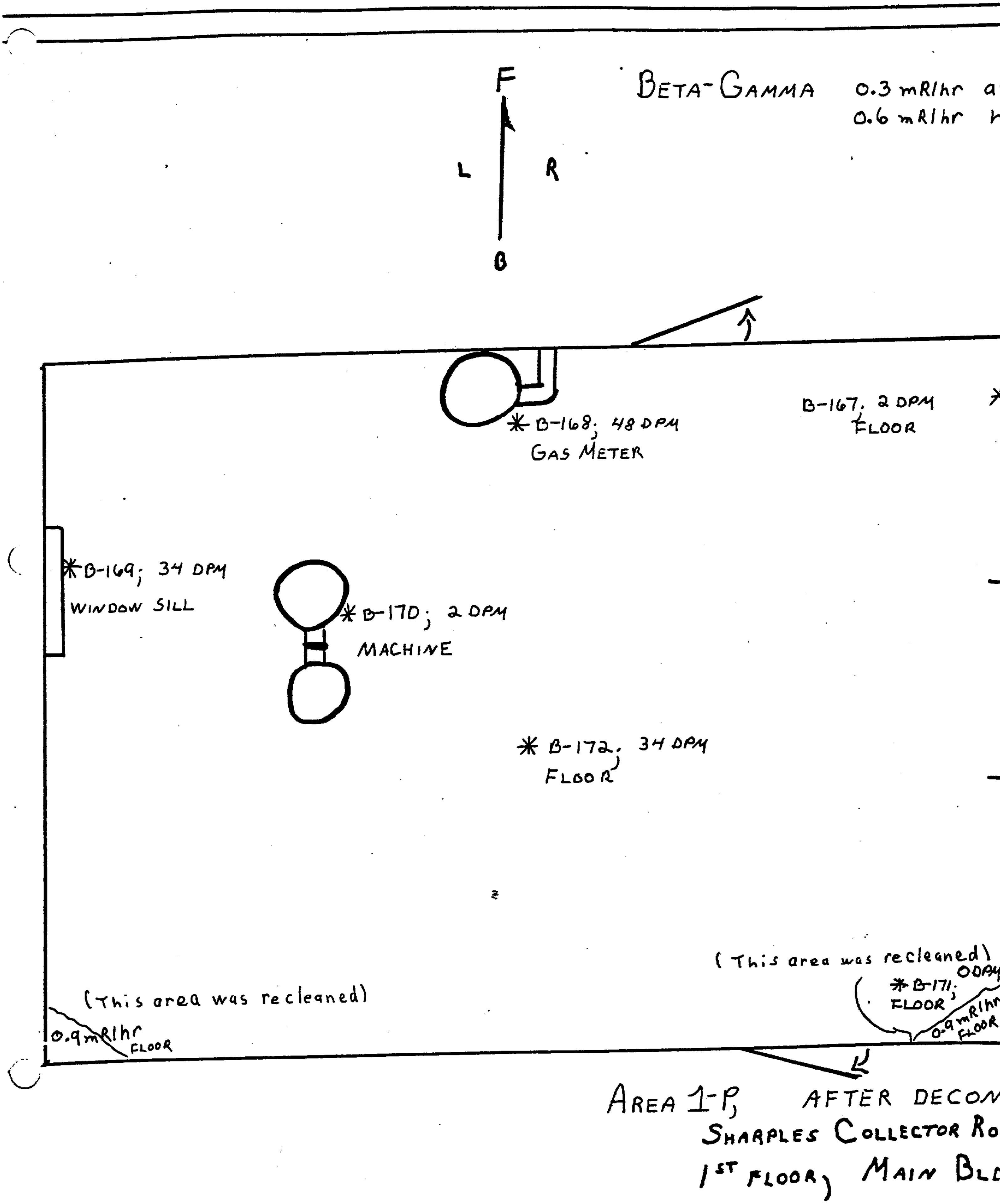
Area I N, after Decon
Drying Rooms
1st. Floor Main Bldg.



AREA-1-0

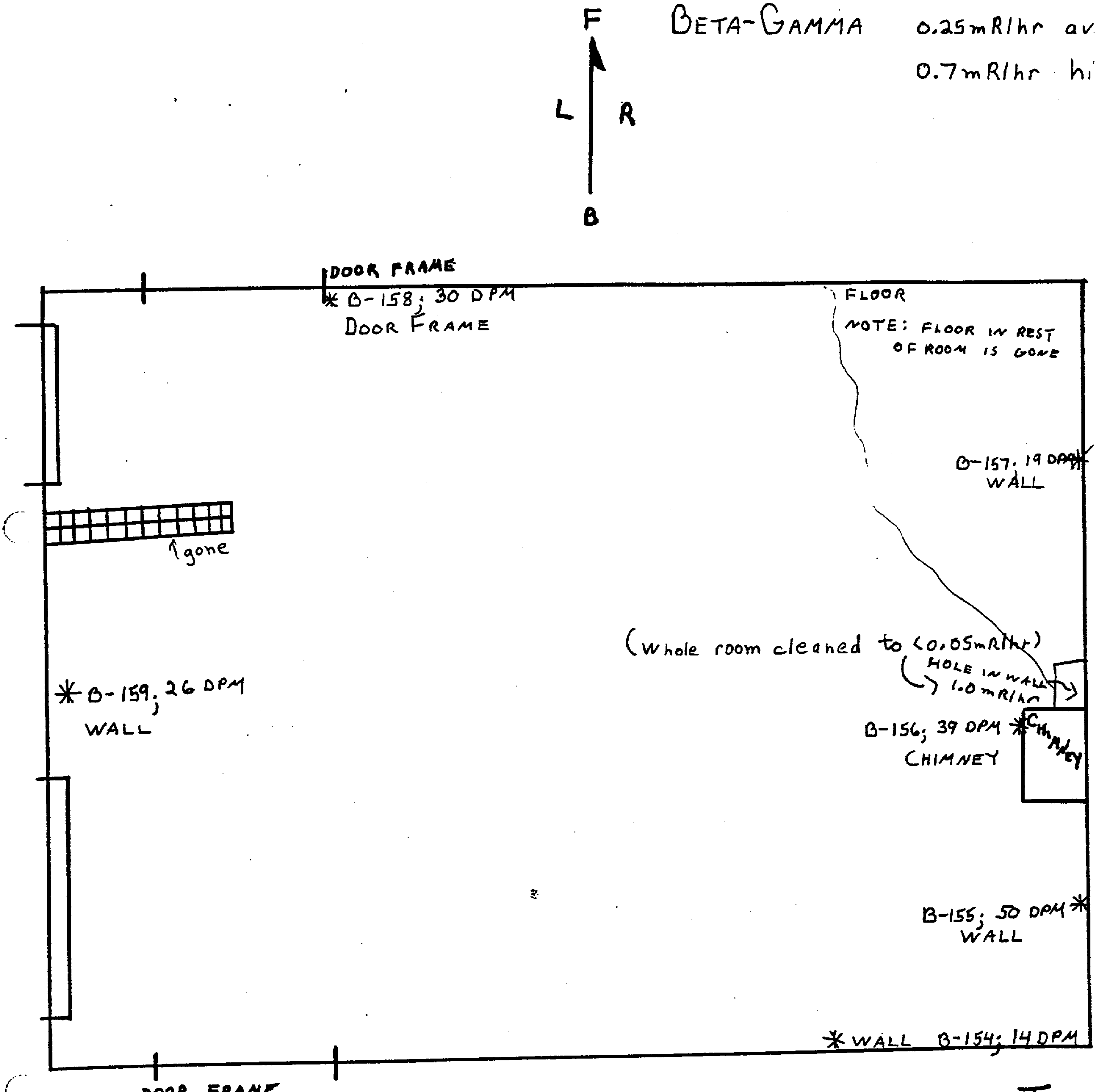
AFTER DECON.

FURNACE & PRESS ROOM
1st. FLOOR. MAIN BLDG


F
L
R
B
BETA-GAMMA 0.3 mR/hr av
0.6 mR/hr h
B-167, 2 DPM
FLOOR
B-168; 48 DPM
GAS METER
B-169; 34 DPM
WINDOW SILL
B-170; 2 DPM
MACHINE
B-172; 34 DPM
FLOOR
(This area was recleaned)
0.9 mR/hr
FLOOR
(This area was recleaned)
B-171; 0 DPM
FLOOR
0.9 mR/hr
FLOOR
AREA 1-P, AFTER DECON
SHARPLES COLLECTOR RO
1ST FLOOR, MAIN BLD

BETA-GAMMA 0.25 mR/hr av

0.7 mR/hr hi

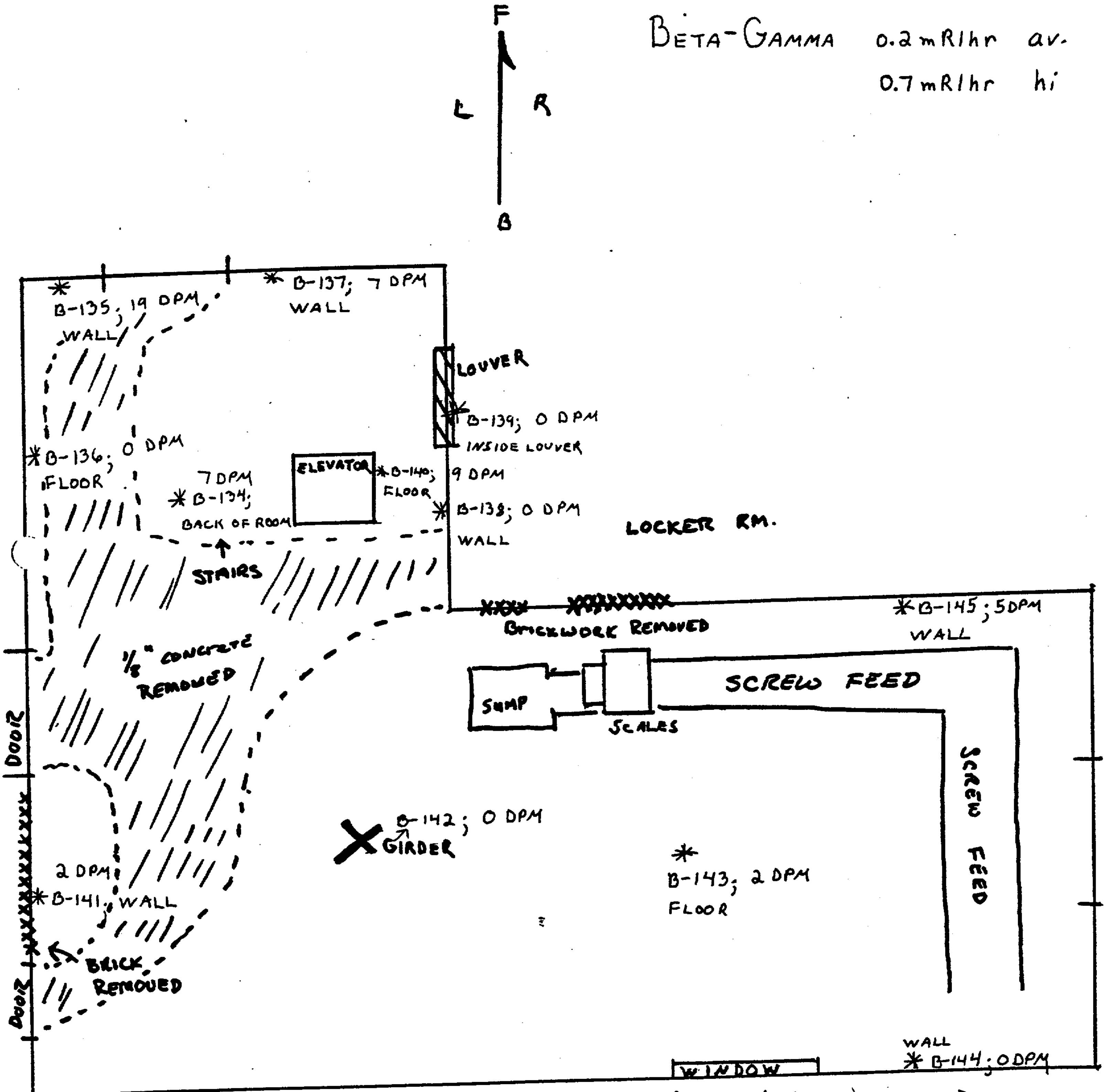


AREA 1Q,
AFTER DECON.

1 & 2 SULFONATION TANK ROOM

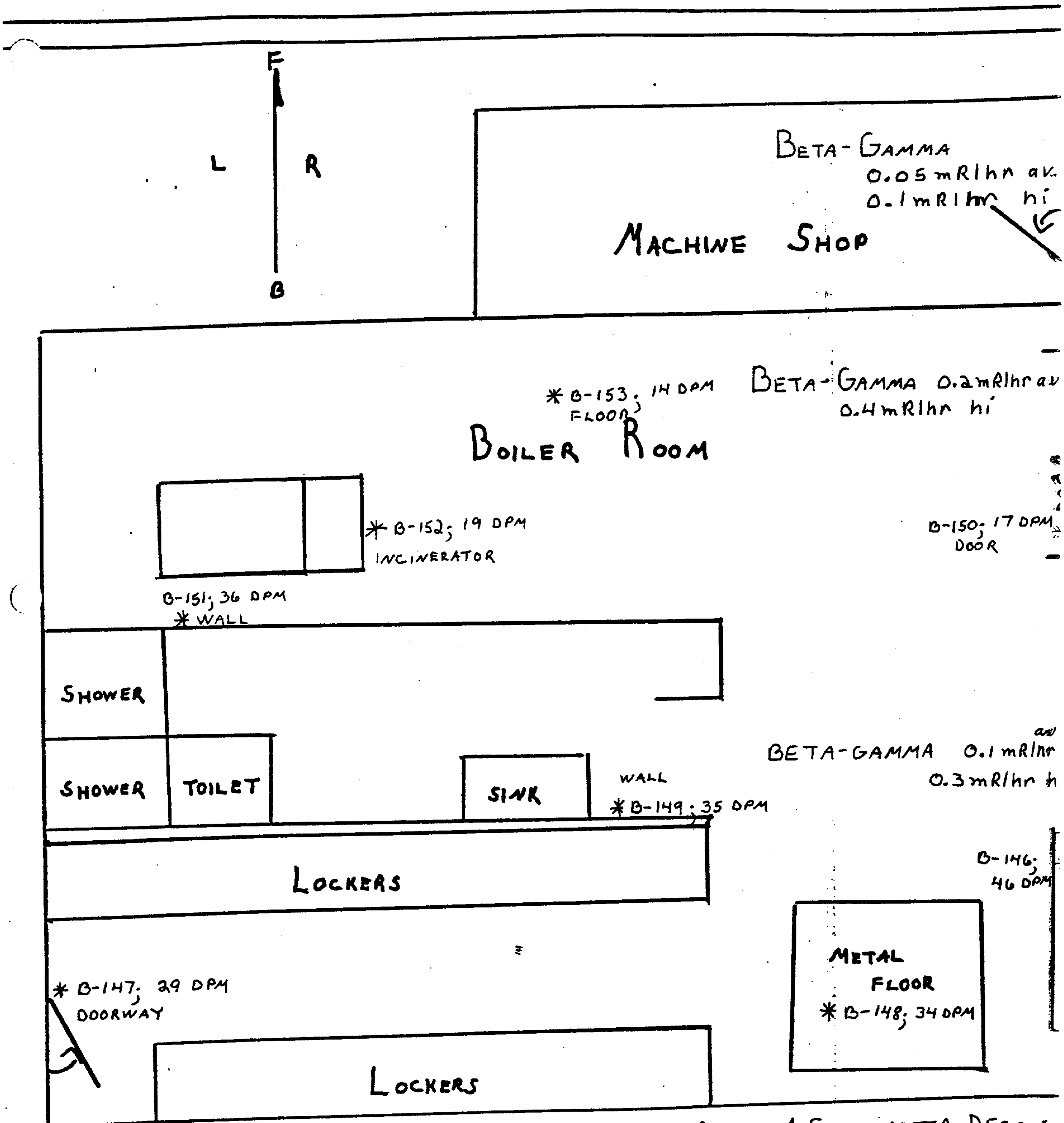
FIRST FLOOR, MAIN B

Beta-Gamma 0.2 mR/hr av.
0.7 mR/hr hi



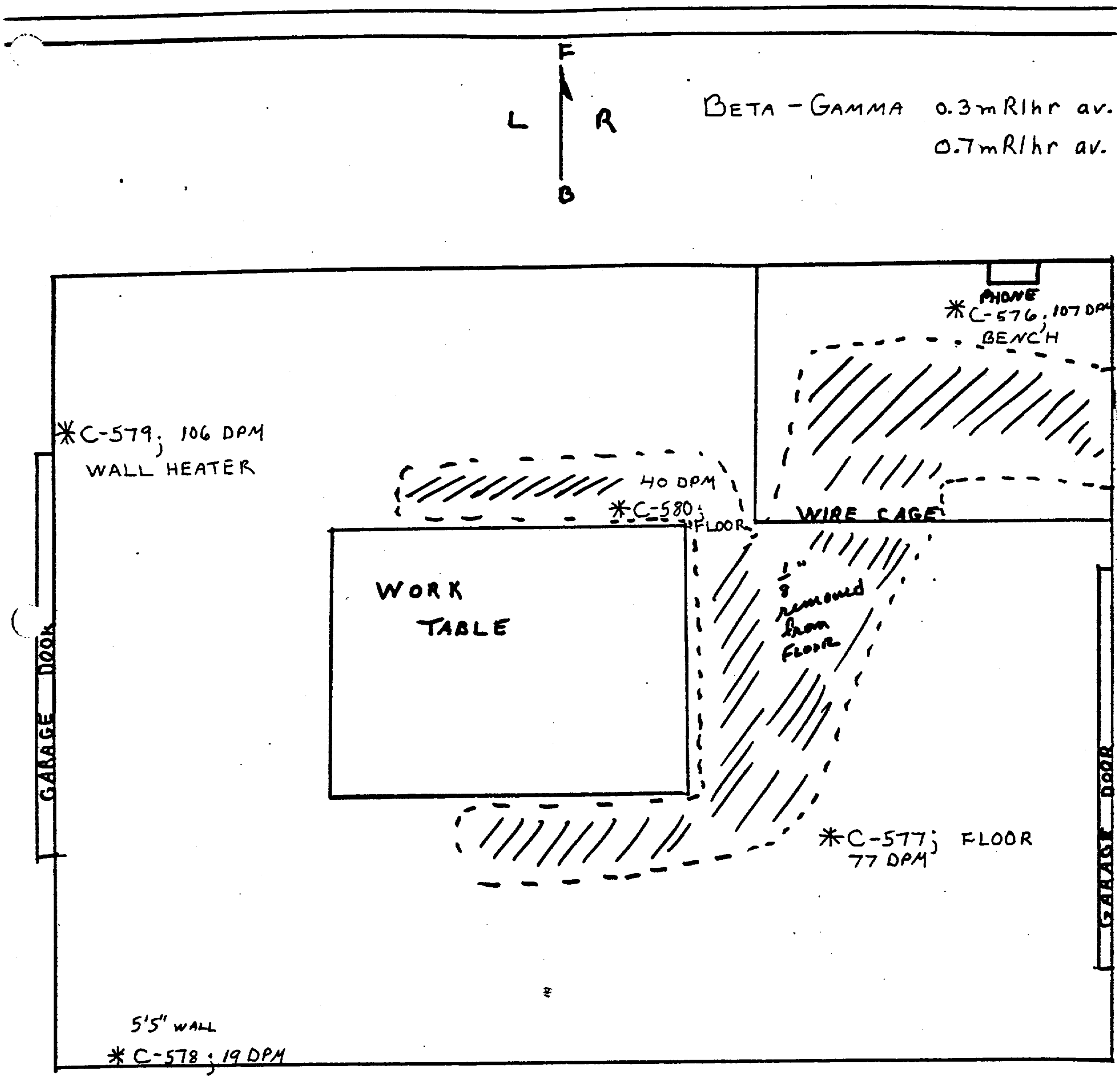
Area 1-R, after Decon.
7-K Bastacite Room

1st Level, Main Bldg.



AREA 1-5, AFTER DECON.
LOCKER & BOILER ROOM

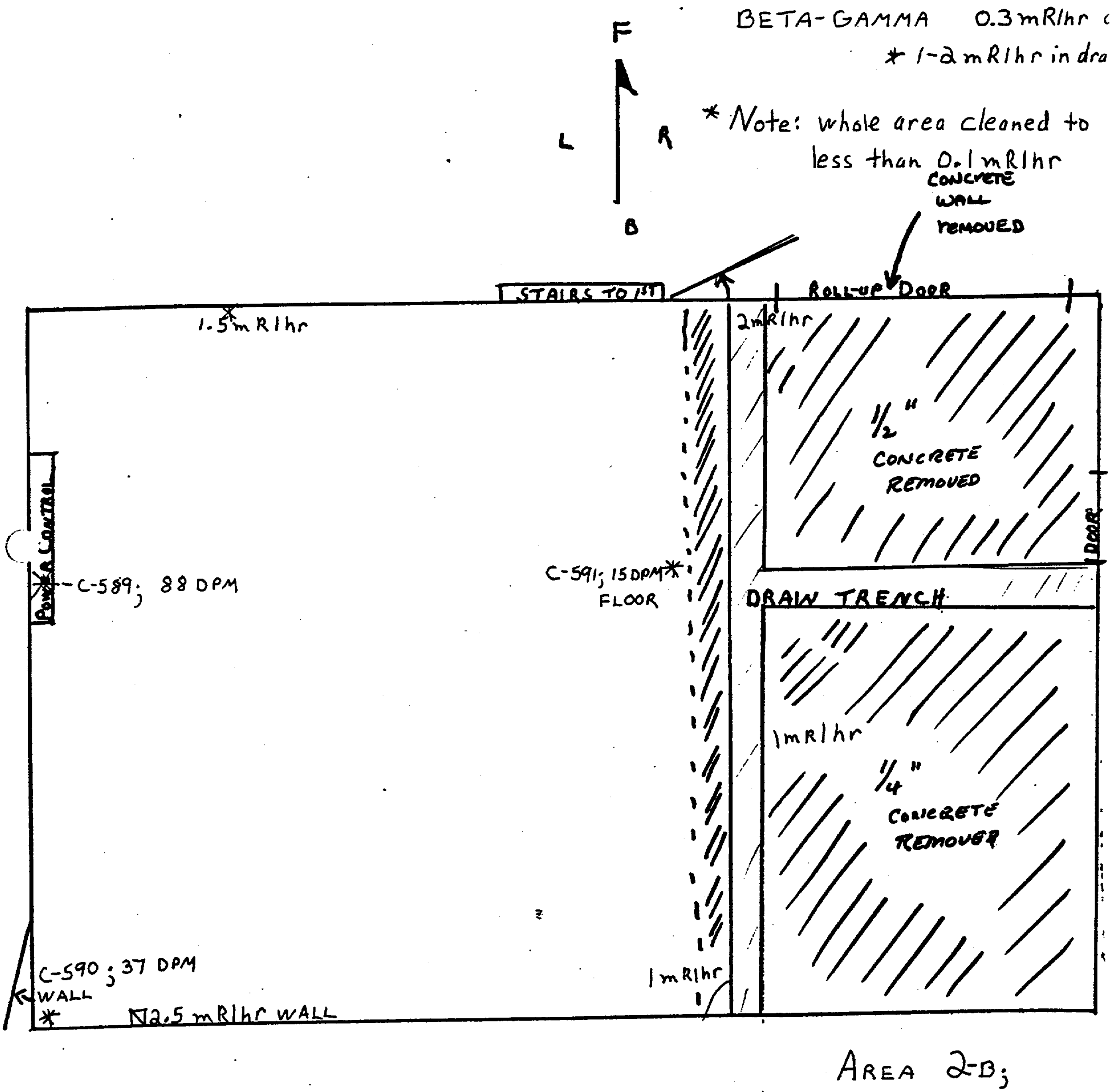
MACHINE SHOP
1ST. FLOOR, MAIN BLG



AREA 2-A

AFTER DECON.

WORKSHOP BUILDING



AREA 2-B;

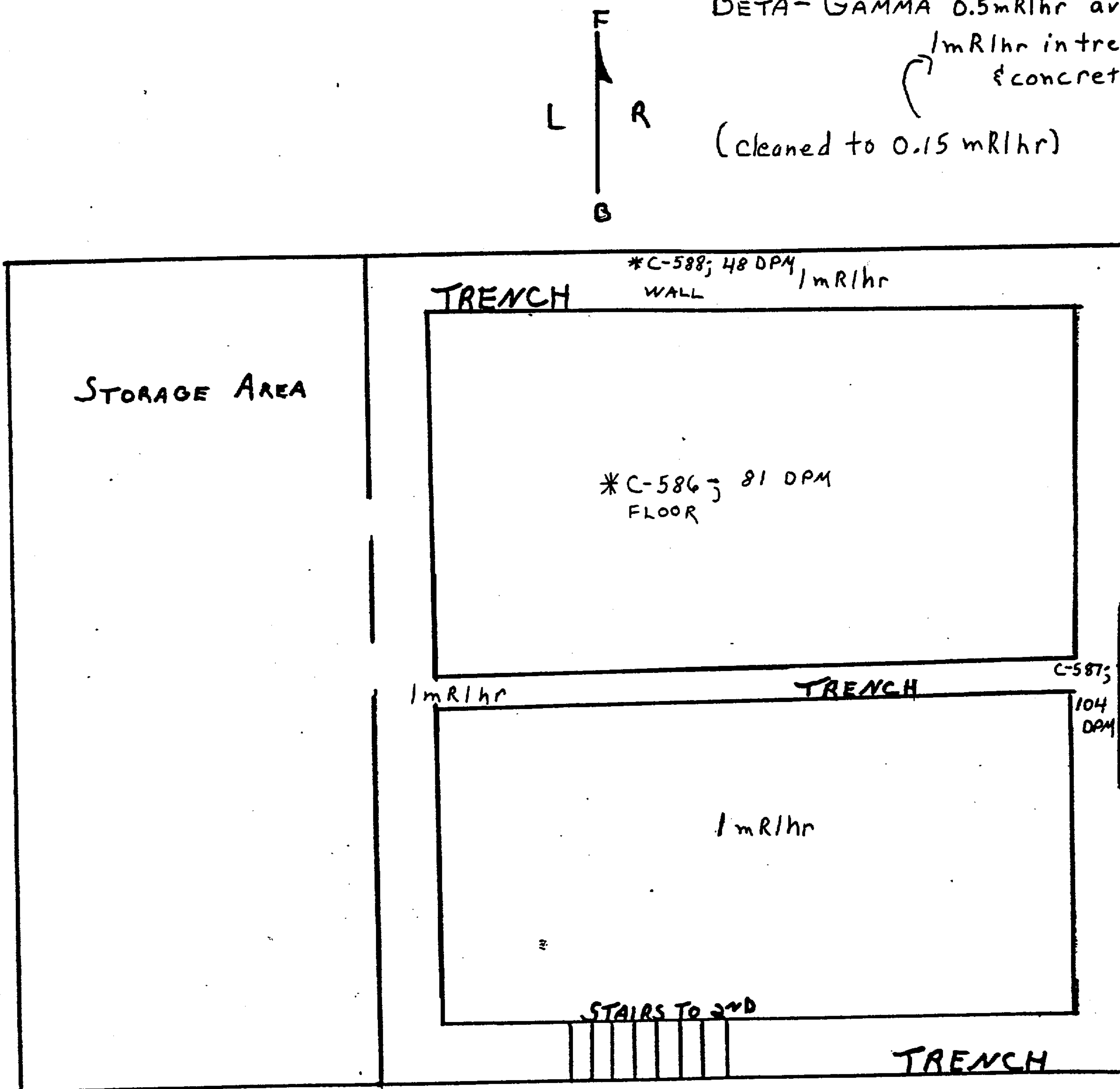
AFTER DECON.

BLDG # 2

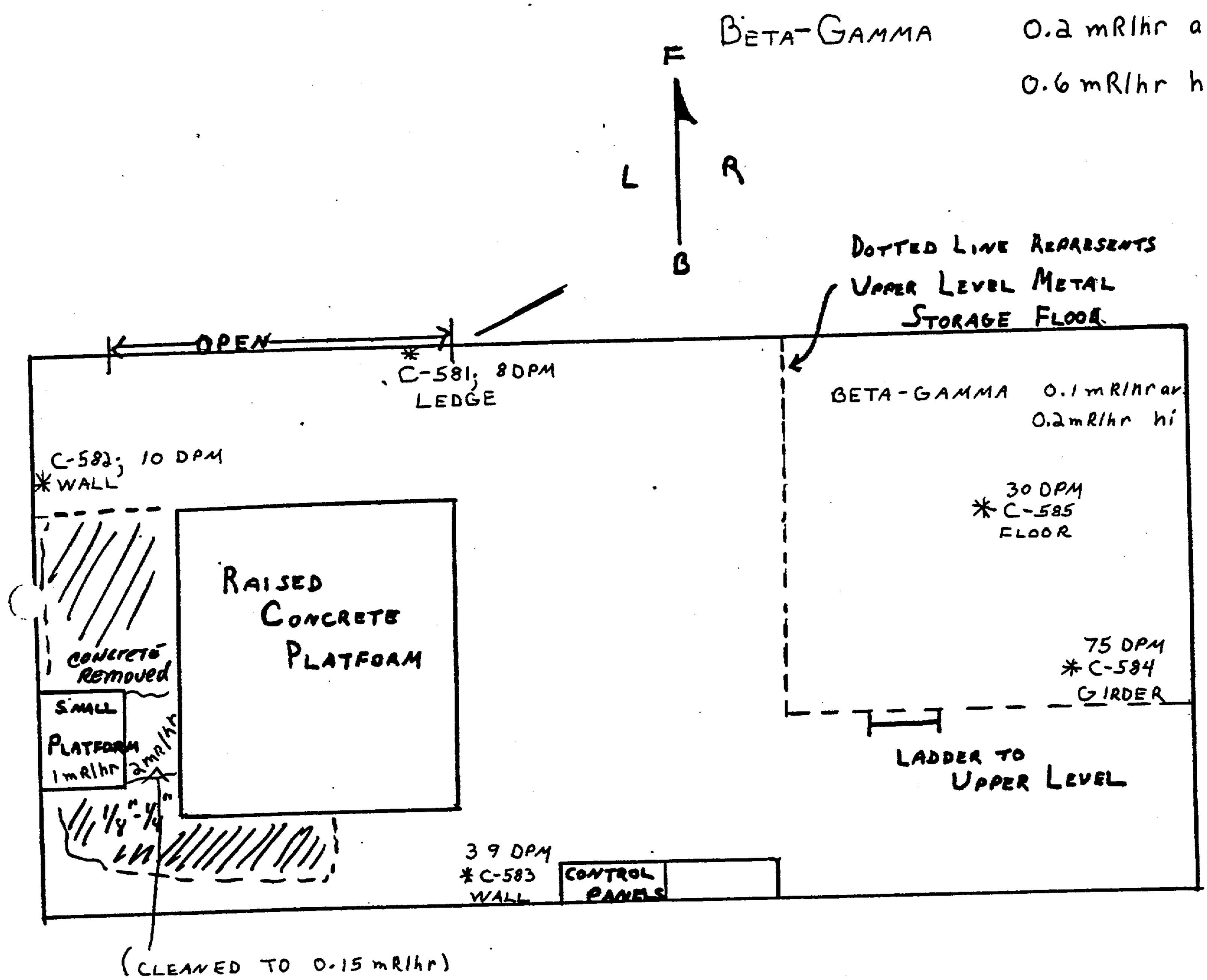
BALL MILL

2ND LEVEL STOR

Beta-Gamma 0.5mR/hr av.
1mR/hr in trer
& concrete
(cleaned to 0.15 mR/hr)



AREA 2-C
AFTER DECON.
BALL MILL
LOWER OPERATI



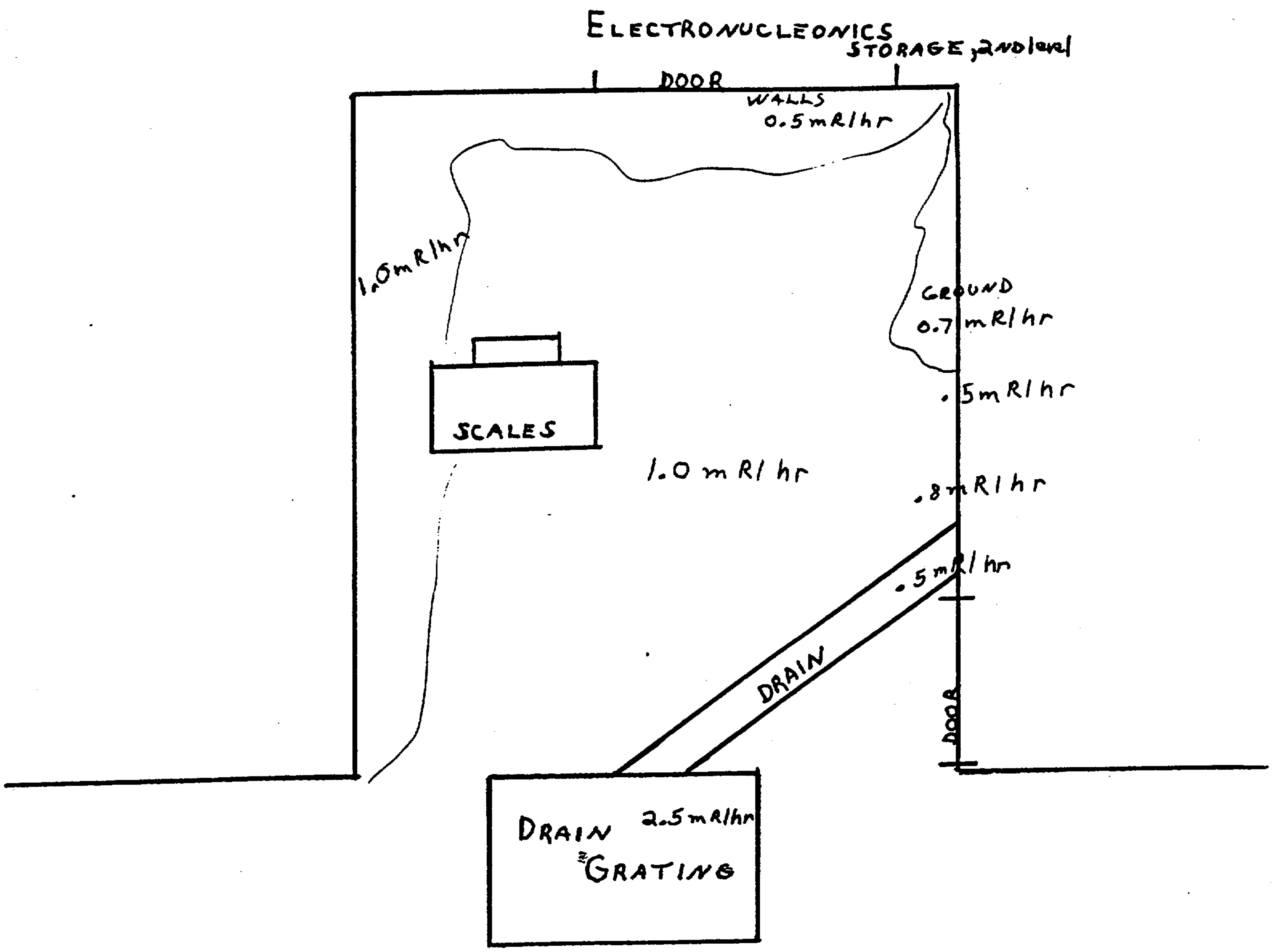
AREA 2-D

AFTER DECON.

COMPRESSOR ROOM

BETA-GAMMA BELOW

NOTE: whole area was cleaned to less than .15 mR/hr, av.



AREA 2-E

AFTER PRELIMINARY DECON.

OUTSIDE,

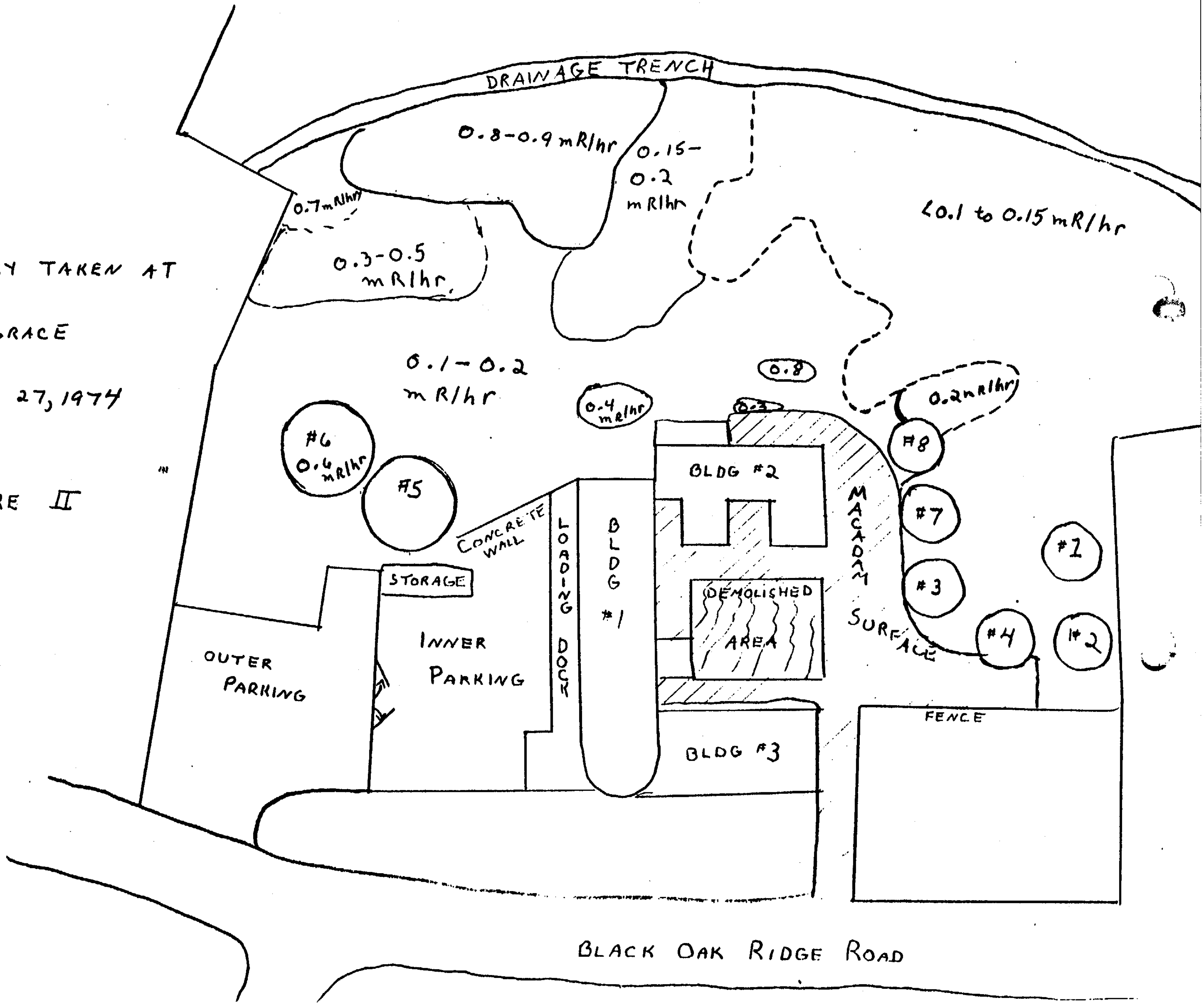
3 BUILDINGS

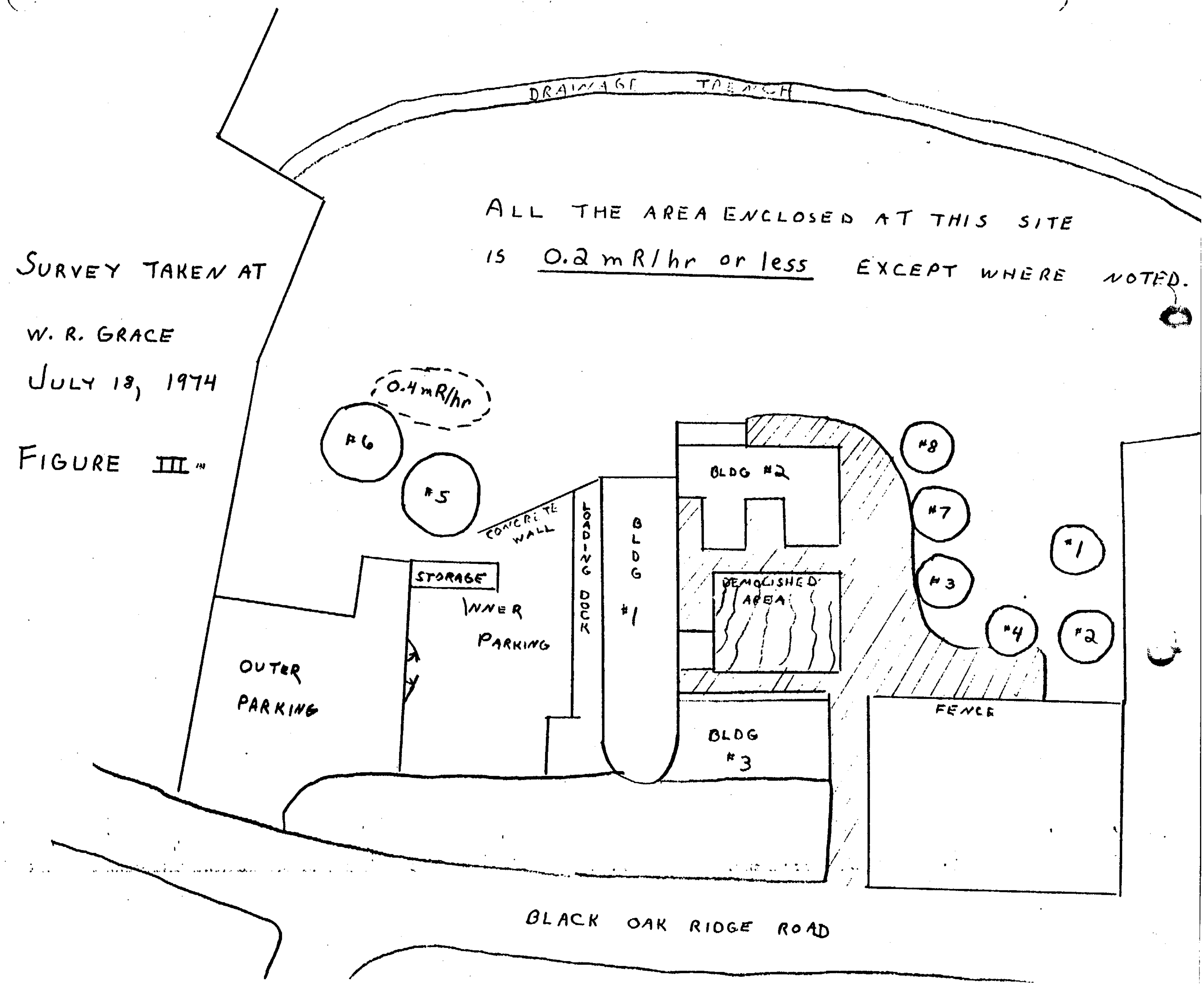
Survey taken at

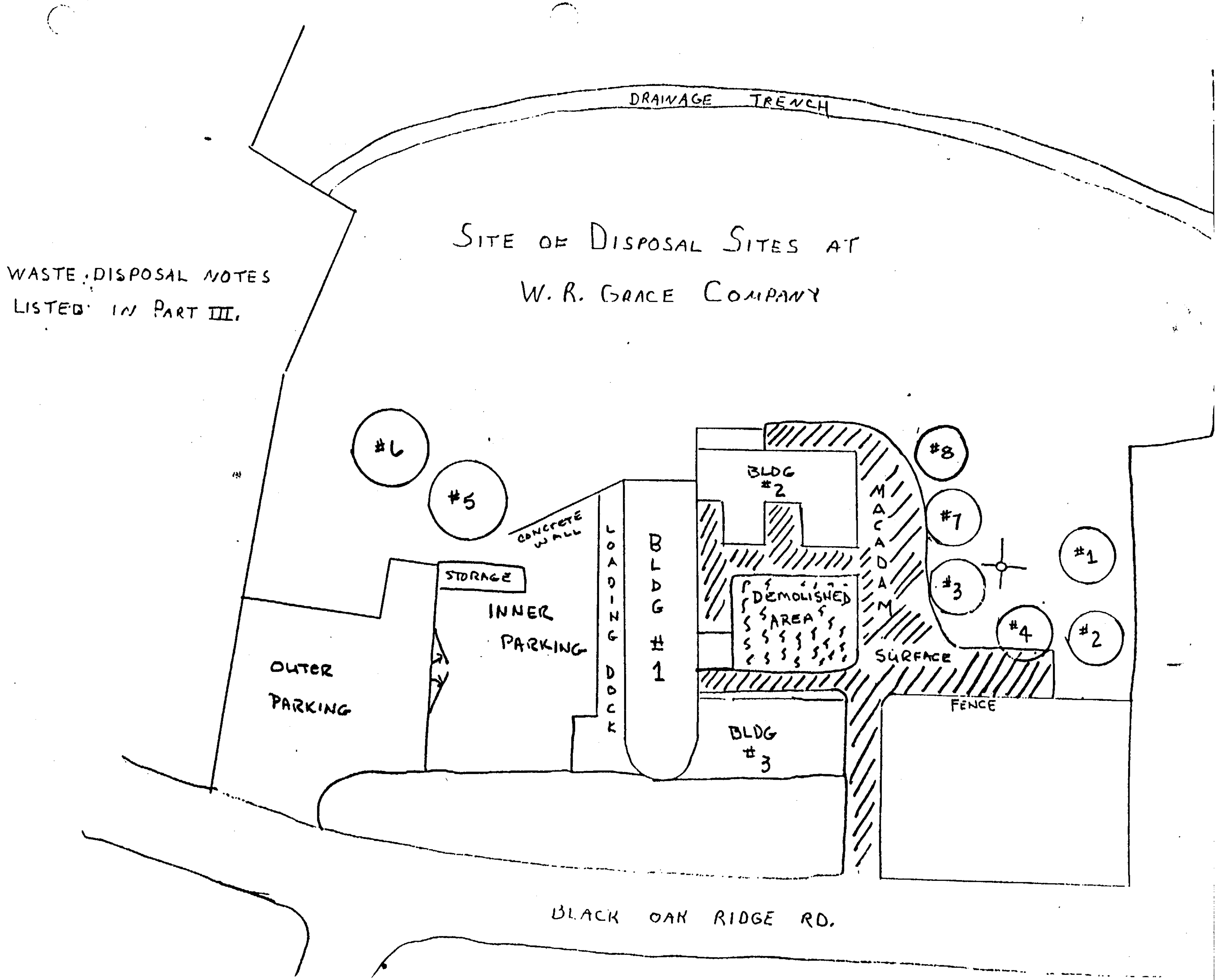
W. R. Grace

June 27, 1974

Figure II




SURVEY TAKEN AT
W. R. GRACE
JULY 18, 1974
FIGURE III
ALL THE AREA ENCLOSED AT THIS SITE
IS 0.2 mR/hr or less EXCEPT WHERE NOTED.
0.4 mR/hr
#6
#5
#8
#7
#3
#1
#4
#2
CONCRETE WALL
LOADING DOCK
BLDG #1
BLDG #2
DEMOLISHED AREA
STORAGE
INNER PARKING
OUTER PARKING
BLDG #3
FENCE
BLACK OAK RIDGE ROAD



SITE OF DISPOSAL SITES AT
W. R. GRACE COMPANY
WASTE DISPOSAL NOTES
LISTED IN PART III.
DRAINAGE TRENCH
#6
#5
#8
#7
#1
#3
#4
#2
CONCRETE WALL
STORAGE
INNER PARKING
OUTER PARKING
LOADING DOCK
BLDG #1
BLDG #2
BLDG #3
DEMOLISHED AREA
MACADAM
SURFACE
FENCE
BLACK OAK RIDGE RD.

APPENDIX A

Radioactivity Limits

for

Unrestricted Release

of

Equipment

RADIOACTIVITY LIMITS FOR UNRESTRICTED RELEASE

of

FACILITIES and EQUIPMENT

1. The maximum amount of fixed alpha radioactivity in disintegrations per minute per 100 square centimeters on buildings or equipment should not exceed 25,000 dpm.

2. The average amount of fixed alpha radioactivity in disintegrations per minute per 100 square centimeters on buildings or equipment should not exceed 5,000 dpm.

3. The maximum amount of removable (capable of being removed by wiping the surface with a filter paper or soft absorbent paper) alpha radioactivity in disintegrations per minute per 100 square centimeters on buildings or equipment should not exceed 1,000 dpm.

4. (a) The maximum level at one centimeter from the most highly contaminated surface of a building or piece of equipment measured with an open-window beta-gamma survey meter through a tissue equivalent absorber of not more than seven milligrams per square centimeter should not exceed 1.0 millirad per hour.

   (b) The average radiation level at one centimeter from the contaminated surface of the building or equipment measured in the same manner should not exceed 0.2 millirad per hour.

5. The contamination limits for abandonment of facilities involving U-233 or plutonium should not exceed 1/10 of the limits in items 1, 2 and 3 above.

NOTES: A. A reasonable effort should be made to minimize the contamination present.

B. Surfaces of premises, equipment or scrap likely to be contaminated, and of such size, construction, or location as to make the surface inaccessible for purposes of measurement, shall be presumed to be contaminated in excess of the levels specified above.

C. Premises, equipment or scrap having contaminated surfaces which have been covered by painting, metal plating or other covering material should be presumed to be contaminated in excess of the levels specified above, unless it can be established that the contamination was below the above levels prior to applying the covering.

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APPENDIX B

Analyses

of

Removable Contamination

APPLIED HEALTH PHYSICS, Inc.

Health Physics Laboratory Report: Analyses of Removable Contamination

Client: W. R. GRACE COMPANY W.O. #______ Date:______ Page # 1 of 8

Description of survey:______

Surveyed by: M.McClosky/R. Slayton Date: 6/3/74 Suspected Activity: Natural Thorium

Counted with: ☐ GM detector ☐ Scintillation detector ☒ Gas Proportional detector

Counter Mfg: NMC Model PC-3A s/n 620(W.R. Grace)

Background of detector before counting: α 8.8cpm β______

Background of detector after counting: α 7.4 β______

Efficiency of detector: α 42% β______ Counted by: RJS 6/4/74

SER. NO.	SAMPLE IDENTIFICATION Time	Location	Alpha Ctg. Time	c/m Gross	c/m Net	d/m	d/m/100cm²	Beta-Gamma Ctg. Time	c/m Gross	c/m Net	d/m	d/m/cm²
B-76		W.R.Grace - Main Office Book Case	2 Min.	18	1	2.4	± 1.6					
77		Floor	"	21	2	5	± 1.8					
78		"	"	29	7	17	± 3					
79		"	"	19	2	5	± 1.8					
80		Wall	"	15	0	0	± 0.9					
81		Large Lab - Door	"	40	12	29	± 3.9					
82		" - Counter	"	20	2	5	± 1.8					
83		" - Test Hood	"	48	16	38	± 4.5					
84		" - #1 Sink	"	23	3	7	± 2.1					
85		" Corner Counter	"	24	4	9	± 2.3					
86		" Drain	"	33	8	19	± 3.2					
87		" #2 Sink	"	14	0	0	± 0.9					
88		" Counter	"	33	8	19	± 3.2					
89		" "	"	36	10	24	± 3.6					
90		" Cabinet	"	17	1	3	± 1.5					
91		" Ledge	"	43	14	33	± 4.2					
92		" Floor	"	23	3	7	± 2.1					
93		Sample Preparation Room - Counter	"	32	8	19	± 3.2					
94		Sample Preparation Room - Window - Plastic covered	"	27	6	14	± 2.8					
95		Sample Preparation Room - Floor	"	21	2	5	± 1.8					

APPLIED HEALTH PHYSICS, Inc.

Health Physics Laboratory Report: Analyses of Removable Contamination

Client: W.R. GRACE COMPANY W.O. # ______ Date ______ Page # 2 of

Description of survey: ______

Surveyed by: M.McClosky/R. Slayton Date: 6/3/74 Suspected Activity: Natural Thorium

Counted with: ☐ GM detector ☐ Scintillation detector ☒ Gas Proportional detector

Counter Mfg: NMC Model PC-3A s/n 620(W.R. Grace)

Background of detector before counting: α 8.8 cpm β ______
Background of detector after counting: α 7.4 β ______
Efficiency of detector: α 42% β ______ Counted by: RJS 6-4-74

SER. NO.	SAMPLE IDENTIFICATION Time	SAMPLE IDENTIFICATION Location	Alpha Ctg. Time	Alpha c/2m Gross	Alpha c/m Net	Alpha d/m	Alpha d/m/100cm²	Beta-Gamma Ctg. Time	Beta-Gamma c/m Gross	Beta-Gamma c/m Net	Beta-Gamma d/m	Beta-Gamma d/m cm²
96		Sample Preparation Room - Concrete Slab	2 Min.	30	7	17	± 3					
97		Sample Preparation Room - Ceiling	"	10	0	0	±0.9					
98		Small Hallway - Floor	"	20	2	5	±1.8					
99		Small Hallway - Floor	"	29	7	17	± 3					
100		Empty Office - Shelf	"	24	4	9	±2.3					
1		" - Wall	"	38	11	26	±3.7					
102		" - Window	"	26	5	12	±2.6					
103		" - Floor	"	40	12	29	±3.9					
104		" - Desk	"	28	6	14	±2.3					
105		Ladies' Room-Window Frame	"	32	8	19	±3.2					
106		" - Door	"	39	12	29	±3.9					
107		Men's Room - Floor	"	20	2	5	±1.8					
108		Storage Area, 2nd Level - Floor	"	40	12	29	±3.9					
109		Storage Area, 2nd Level - Fan	"	23	4	9	±2.3					
110		Storage Area, 2nd Level - Floor	"	28	6	14	±2.3					
111		Storage Area, 2nd Level - Window	"	24	4	9	±2.3					
112		Grinding-Polishing Test Lab - Shelf	"	21	3	7	±2.1					
113		Grinding-Polishing Test Lab - Sink	"	18	1	2	±1.3					
114		Grinding-Polishing Test Lab - Bench	"	15	0	0	±0.9					
115		Grinding-Polishing Test Lab - Bet. 2nd & 3rd Vat	"	32	8	19	±3.2					
5		Grinding-Polishing Test Lab - 4th & 5th Vat	"	21	3	7	±2.1					
117		Grinding-Polishing Test Lab - Floor	"	29	7	17	±3					
118		Shipping, Pulverizing Cerium Oxide Storage-Girder	"	27	6	14	±2.3					

AHP: HP102

APPLIED HEALTH PHYSICS, Inc.

Health Physics Laboratory Report: Analyses of Removable Contamination

Client: W.R. GRACE W.O.#____ Date:____ Page # 3 of

Description of survey:

Surveyed by: M. McClosky/R. Slayton Date: 6-3-74 Suspected Activity: Natural Thorium

Counted with: ☐ GM detector ☐ Scintillation detector ☒ Gas Proportional detector

Counter Mfg: NMC Model PC-3A s/n 620 (W.R. Grace)

Background of detector before counting: α 8.8cpm β

Background of detector after counting: α 7.4 β

Efficiency of detector: α 42% β Counted by: RJS 6-4-74

SER. NO.	SAMPLE IDENTIFICATION Time	Location	Alpha Ctg. Time	Alpha c/2m Gross	Alpha c/m Net	Alpha d/m	Alpha d/m/100cm²	Beta-Gamma Ctg. Time	Beta-Gamma c/m Gross	Beta-Gamma c/m Net	Beta-Gamma d/m	Beta-Gamma d/m cm²
119		Shipping, Pulverizing Cerium Oxide Storage-Floor	2 min	29	7	17	± 3					
120		Shipping, Pulverizing Window Cerium Oxide Storage-Sill	"	47	15	34	± 4.2					
121		Shipping, Pulverizing Cerium Oxide Storage-Wall	"	23	4	9	± 2.3					

APPLIED HEALTH PHYSICS, I.

Health Physics Laboratory Report: Analyses of Removable Contamination

Client: W.R. GRACE W.O. # Date: Page # 4 of

Description of survey:

Surveyed by: M. McClosky/R. Slayton Date: 6-3-74 Suspected Activity: Natural Thorium

Counted with: ☐ GM detector ☐ Scintillation detector ☒ Gas Proportional detector

Counter Mfg: NMC Model PC-3A s/n 620 (W.R. Grace)

Background of detector before counting: α 10 β

Background of detector after counting: α 9 β

Efficiency of detector: α 42% β Counted by: RS, MM 6-5-74

SER. NO.	SAMPLE IDENTIFICATION Time	Location	Alpha Ctg. Time	Alpha c/2m Gross	Alpha c/m Net	Alpha d/m	Alpha d/m/100cm²	Beta-Gamma Ctg. Time	Beta-Gamma c/m Gross	Beta-Gamma c/m Net	Beta-Gamma d/m	Beta-Gamma d/m cm²
B-122		Shipping, Pulverizing Cerium Oxide Storage-Floor	2 min	28	5	12	±2.6					
B-123		Shipping, Pulverizing Cerium Oxide Storage-Wall	"	24	3	7	±2.1					
124		Shipping, Pulverizing Cerium Oxide Storage- Hole in Wall	"	39	11	26	±3.7					
125		Shipping, Pulverizing Cerium Oxide Storage-Beam	"	26	4	9	±2.3					
1[illegible]		Shipping, Pulverizing Cerium Oxide Storage-Scales	"	23	3	7	±2.1					
127		Shipping, Pulverizing Cerium Oxide Storage-Floor	"	37	10	24	±3.6					
128		Shipping, Pulverizing Cerium Oxide Storage-Wall	"	22	2	5	±1.9					
129		Shipping, Pulverizing Cerium Oxide Storage-Locker	"	25	4	9	±2.3					
130		Shipping, Pulverizing Cerium Oxide Storage- Window Sill	"	30	6	14	±2.8					
131		Shipping, Pulverizing Cerium Oxide Storage-Cross Beam	"	33	8	19	±3.2					
132		Shipping, Pulverizing Cerium Oxide Storage-Beam	"	44	13	30	±3.9					
133		Shipping, Pulverizing Cerium Oxide Storage-Door	"	26	4	9	±2.3					
134		First Level 7-K Bastasite Room-Back of Room	"	24	3	7	±2.1					
135		First Level 7-K Bastasite Room-Wall	"	34	8	19	±3.2					
136		First Level 7-K Bastasite Room-Floor	"	15	0	0	±0.97					
137		First Level 7-K Bastasite Room-Wall	"	24	3	7	±2.1					
138		First Level 7-K Bastasite Room-Wall	"	13	0	0	±0.97					
139		First Level 7-K Bastasite Room-Inside Louver	"	16	0	0	±0.97					
140		First Level 7-K Bastasite Room-Floor	"	25	4	9	+2.3					
141		First Level 7-K Bastasite Room-Wall	"	19	1	2	±1.4					
142		First Level 7-K Bastasite Room-Girder	"	14	0	0	±0.97					
143		First Level 7-K Bastasite Room-Floor	"	20	1	2	±1.4					

APPLIED HEALTH PHYSICS, Inc.

Health Physics Laboratory Report: Analyses of Removable Contamination

Client: W.R. GRACE W.O. # ______ Date: ______

Description of survey: ______

Surveyed by: M. McClosky/R. Slayton Date: 6-3-74 Suspected Activity: Natural Thorium

Counted with: ☐ GM detector ☐ Scintillation detector ☒ Gas Proportional detector

Counter Mfg: NMC Model PC-3A s/n 620 (W.R. Grace)

Background of detector before counting: α 10 β ______

Background of detector after counting: α 9 β ______

Efficiency of detector: α 42% β ______ Counted by: RS,MM 6-5-74

SER. NO.	SAMPLE IDENTIFICATION Time	Location	Alpha Ctg. Time	c/2m Gross	c/m Net	d/m	d/m/100cm²	Beta-Gamma Ctg. Time	c/m Gross	c/m Net	d/m	d/m/cm²
44		First Level 7-K Bastasite Room-Wall	2 min	18	0	0	±0.97					

AHP: HP102

APPLIED HEALTH PHYSICS, Inc.

Health Physics Laboratory Report: Analyses of Removable Contamination

Client: W.R. GRACE W.O. # ______ Date: ______ Page # 6 of 8

Description of survey: ______

Surveyed by: M.McClosky/R. Slayton Date: 6-3-74 Suspected Activity: Natural Thorium

Counted with: ☐ GM detector ☐ Scintillation detector ☒ Gas Proportional detector

Counter Mfg: NMC Model PC-3A s/n 620 (W.R. Grace)

Background of detector before counting: α 4.0 β ______

Background of detector after counting: α 10 β ______

Efficiency of detector: α 42% β ______ Counted by: MM 6-5-74

SER. NO.	Time	Location	Alpha Ctg. Time	Alpha c/2m Gross	Alpha c/m Net	Alpha d/m	Alpha d/m/100cm^2	Beta-Gamma Ctg. Time	Beta-Gamma c/m Gross	Beta-Gamma c/m Net	Beta-Gamma d/m	Beta-Gamma d/m/cm^2
-145	10:00 A.M.	First Level 7-K Bastasite Room-Wall	2 min	17	2	5	±1.8					
46		Locker & Boiler Room-Radiator		55	21	46	±4.9					
47		Locker & Boiler Room-Doorway		37	12	29	±3.9					
48		Locker & Boiler Room-Metal Floor		43	15	34	±4.2					
49		Locker & Boiler Room-Wall		46	16	35	±4.3					
[illegible]		Locker & Boiler Room-Door		27	7	17	±3.0					
51		Locker & Boiler Room-Wall		48	17	36	±4.3					
52		Locker & Boiler Room-Incinerator		29	8	19	±3.2					
53		Locker & Boiler Room-Floor		26	6	14	±2.8					
54		1 & 2 Sulfonation Tank Room-Wall		25	6	14	±2.8					
55		1 & 2 Sulfonation Tank Room-Wall		60	23	50	±5.1					
56		1 & 2 Sulfonation Tank Room-Chimney		49	18	39	±4.5					
57		1 & 2 Sulfonation Tank Room-Wall		29	8	19	±3.2					
58		1 & 2 Sulfonation Tank Room-Door Frame		39	13	30	±3.9					
59		1 & 2 Sulfonation Tank Room-Wall		36	11	26	±3.7					
160		Furnace & Press Room-Wall		15	1	2	±1.3					
161		Furnace & Press Room-Doorway		7	0	0	±0.8					
162		Furnace & Press Room-Window Sill		13	0	0	±0.8					
163		Furnace & Press Room-Drain Grating		13	0	0	±0.8					
164		Furnace & Press Room-Floor		24	5	12	±2.6					
16[illegible]		Furnace & Press Room-Wall		10	0	0	±0.8					
166		Furnace & Press Room-Wall		12	0	0	±0.8					
167		Sharples Collector Room-Floor		15	1	2	±1.3					

APPLIED HEALTH PHYSICS, Inc.

Health Physics Laboratory Report: Analyses of Removable Contamination

Client: W.R. GRACE W.O.#_____ Date:_____ Page # 7 of [illegible]

Description of survey: _____

Surveyed by: M.McClosky/R. Slayton Date: 6-3-74 Suspected Activity: Natural Thorium

Counted with: ☐ GM detector ☐ Scintillation detector ☒ Gas Proportional detector

Counter Mfg: NMC Model PC-3A s/n 620 (W.R. Grace)

Background of detector before counting: α 7.0 β _____

Background of detector after counting: α 4.0 β _____

Efficiency of detector: α 42% β _____ Counted by: MM 6-5-74

SER. NO.	SAMPLE IDENTIFICATION: Time	SAMPLE IDENTIFICATION: Location	Alpha: Ctg. Time	Alpha: c/2m Gross	Alpha: c/m Net	Alpha: d/m	Alpha: d/m/100cm²	Beta-Gamma: Ctg. Time	Beta-Gamma: c/m Gross	Beta-Gamma: c/m Net	Beta-Gamma: d/m	Beta-Gamma: d/m/cm²
)-168	9:00 A.M.	Sharples Collector Room-Gas Meter	2 min	52	20	48	±4.9					
169		Sharples Collector Room-Window Sill		26	14	34	±4.2					
170		Sharples Collector Room-Machine		13	1	2	±1.2					
171		Sharples Collector Room-Floor		12	0	0	±0.7					
172		Sharples Collector Room-Floor		26	14	34	±4.2					
1[illegible]		Drying Rooms-Ledge		17	3	7	±2.0					
174		" " Floor		15	2	5	±1.7					
175		" " Hole in wall		10	0	0	±0.7					
176		" " Wall		14	1	2	±1.2					
177		" " Floor		21	5	12	±2.6					
178		Test Lab #2 Floor		37	12	28	±3.8					
179		" " " Storage Closet		31	19	46	±4.8					
180		" " " Floor		15	2	5	±1.7					
181		" " " Lab Sink		14	1	2	±1.2					
182		" " " Shelf		19	3	7	±2.0					
183		Conference Room #1-Bookshelf		19	3	7	±2.0					
184		Conference Room #1-Top of A/C		14	1	2	±1.2					
185		Conference Room #1-Floor		23	6	14	±2.7					
186		Conference Room #1-Floor		17	3	7	±2.0					
187		Conference Room #2-Window Sill		11	0	0	±0.7					
1[illegible]		Conference Room #2-Phone		12	0	0	±0.7					
189		Conference Room #2-Wall		30	9	21	±3.3					
190		Conference Room #2-Door Jamb		30	9	21	±3.3					

APPLIED HEALTH PHYSICS, [illegible]

Health Physics Laboratory Report: Analyses of Removable Contamination

Client: W.R. GRACE W.O.# ______ Date: ______ Page # 8 of 8

Description of survey: ______

Surveyed by: M.McClosky/R. Slayton Date: ______ Suspected Activity: Natural Thorium

Counted with: ☐ GM detector ☐ Scintillation detector ☒ Gas Proportional detector

Counter Mfg: NMC Model PC-3A s/n 620(W.R. Grace)

Background of detector before counting: α 8.8cpm β ______

Background of detector after counting: α 7.4cpm β ______

Efficiency of detector: α 42% β ______ Counted by: RJS 6-4-74

SER. NO.	SAMPLE IDENTIFICATION Time	Location	Alpha Ctg. Time	c/2m Gross	c/m Net	d/m	d/m/100cm²	Beta-Gamma Ctg. Time	c/m Gross	c/m Net	d/m	d/m/cm²
B-191	3:30 P.M.	2nd Level Z-K Blending & Storage- Floor	2 min	25	3	7	±2.0					
192		2nd Level Z-K Blending & Storage- Floor		28	5	12	±1.3					
193		2nd Level Z-K Blending & Storage- Floor		31	6	4	±1.7					
194		2nd Level Z-K Blending & Storage- Floor		22	3	7	±2.1					
195		2nd Level Z-K Blending & Storage- Wall		27	5	12	±2.6					
[illegible]		2nd Level Z-K Blending & Storage- Door		16	0	0	±0.9					
197		Press & Sulfonation Room- Controller		55	14	34	±4.2					
198		Press & Sulfonation Room- Floor		21	2	5	±1.8					
199		Press & Sulfonation Room- Window Frame		60	21	51	±5.1					
200		Main Bldg. Rear 2nd Floor Hallway- Wall		29	10	24	±3.5					
201		Main Bldg. Rear 2nd Floor Hallway- Corner		35	9	22	±3.4					
202		Main Bldg. Rear 2nd Floor Hallway- Corner		34	9	22	±3.4					

APPLIED HEALTH PHYSICS, Inc.

Health Physics Laboratory Report: Analyses of Removable Contamination

Client: W.R. GRACE W.O.# ________ Date: 6-4-74 Page # 1 of 1

Description of survey: ________

Surveyed by: M.McCCelosky/R. Slayton Date: 6/3/74 Suspected Activity: Natural Thorium

Counted with: ☐ GM detector ☐ Scintillation detector ☒ Gas Proportional detector

Counter Mfg: NMC Model PC-3A s/n 620 (W.R. Grace)

Background of detector before counting: α 8.2 cpm β ________

Background of detector after counting: α 8.8 β ________

Efficiency of detector: α 42% β ________ Counted by: RJS 6-4-74

ER. NO.	SAMPLE IDENTIFICATION		Alpha					Beta-Gamma				
	Time	Location	Ctg. Time	c/2m Gross	c/m Net	d/m	d/m/100cm²	Ctg. Time	c/m Gross	c/m Net	d/m	d/m/cm²
576	11:20 P.M.	Outside Work Shop-Bench	2 min	107	45	107	±7.4					
577		" " " Floor		77	30	77	±6.3					
578		" " " 5' 5" Wall		33	8	19	±3.2					
579		" " " Wall Heater		106	45	106	±7.3					
580		" " " Floor		51	17	40	±4.6					
5[illegible]		Compressor Room- Ledge		24	4	8	±2.2					
582		" " Wall		25	4	10	±2.4					
583		" " Wall		50	17	39	±4.5					
584		" " Girder		80	32	75	±6.2					
585		" " Storage Floor		42	13	30	±3.9					
586		Ball Mill Lower Operation- Floor		85	34	81	±6.4					
587		Ball Mill Lower Operation- Window Sill		104	44	104	±7.3					
588		Ball Mill Lower Operation- Wall		57	20	48	±4.9					
589		Ball Mill 2nd Level Storage- Power Supply		91	37	88	±6.7					
590		Ball Mill 2nd Level Storage- Wall		48	16	37	±4.4					
591		Ball Mill 2nd Level Storage- Floor		30	7	15	±2.9					

TABLE I

RESULTS OF DECONTAMINATION RADIATION FINAL SURVEY

Location	Reference	Beta-Gamma Meter Survey mR/hr		Alpha Removable Contamination DPM/100 cm^2	
		average	high	average	high
W. R. Grace Office, 2nd level, Main Bldg.	1-A	0.1	0.1	6 ± 1.8	17 ± 3
Lab #1, 2nd level, Main Bldg.	1-B	0.1	0.2	16 ± 2.7	38 ± 4.5
Floor Drain, 2nd level, Main Bldg.	1-B	0.4	0.6	---	19 ± 3.2
Sample Preparation Room, 2nd level, Main Bldg.	1-C	0.1	0.1	11 ± 2.3	19 ± 3.2
Small Hallway, 2nd level, Main Bldg.	1-D	0.1	0.1	7 ± 2.4	17 ± 3
Men's Room, 2nd level, Main Bldg.	1-D	0.1	0.1	---	5 ± 1.8
Ladies' Room, 2nd level, Main Bldg.	1-D	0.1	0.1	24 ± 3.6	29 ± 3.9
Empty Office, 2nd level, Main Bldg.	1-D	0.1	0.1	18 ± 3	29 ± 3.9
Grinding & Polishing Test Lab, 2nd level, Main Bldg.	1-E	0.05	0.4	9 ± 2.1	19 ± 3.2
Storage level, 2nd level, Main Bldg.	1-F	0.2	0.4	15 ± 2.7	29 ± 3.9
against nailed door		---	1.0	---	---
Press Room & Sulfonation Room, 2nd level, Main Bldg.	1-G	0.3	2.0 (back corner)	30 ± 3.7	51 ± 5.1
Test Lab #2, 2nd level, Main Bldg.	1-H	0.15	0.2	18 ± 2.7	46 ± 4.8

Continued on next page

TABLE I

RESULTS OF DECONTAMINATION RADIATION FINAL SURVEY

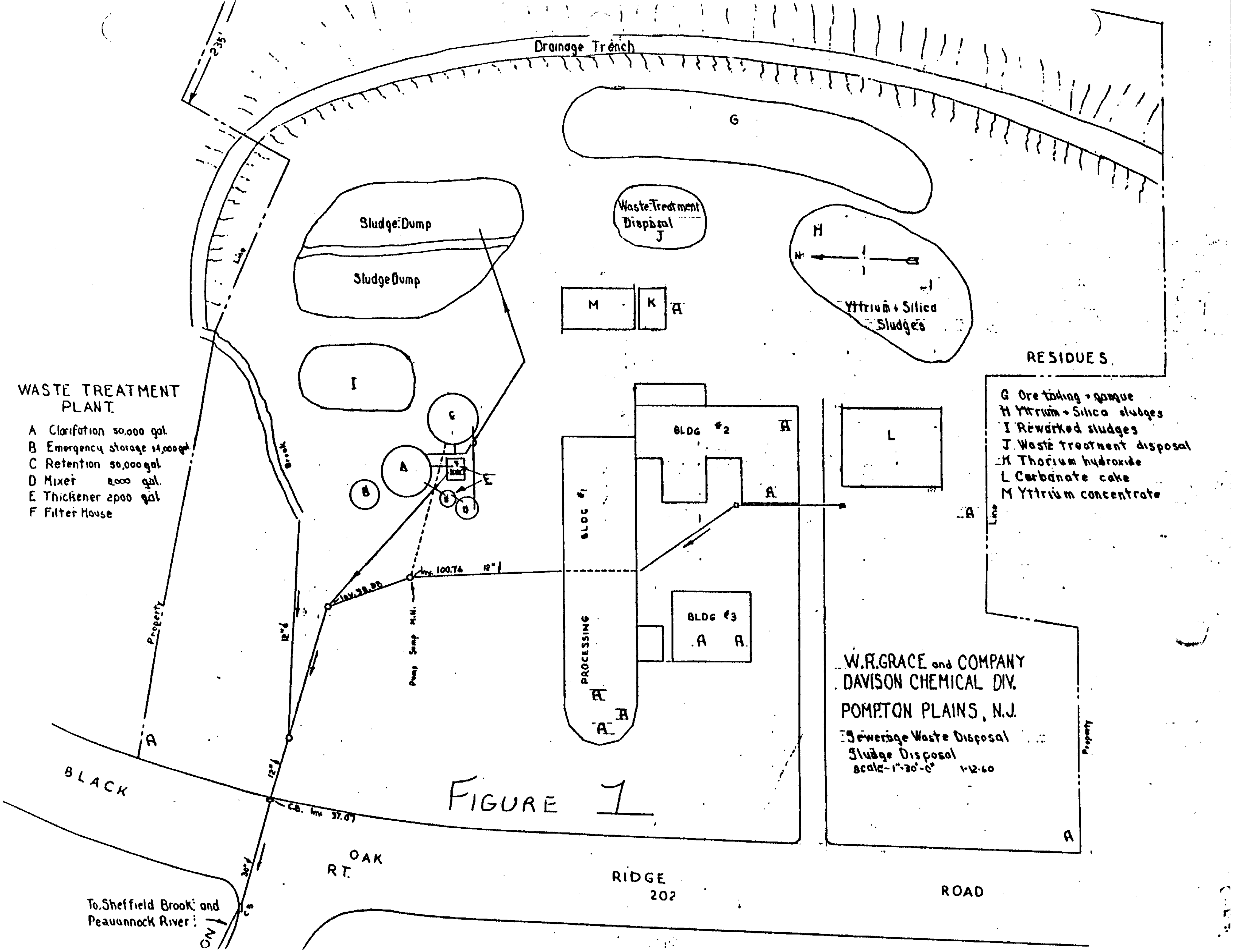
Location	Reference	Beta-Gamma Meter Survey mR/hr		Alpha Removable Contamination DPM/100 cm^2	
		average	high	average	high
Conference Room #1, 2nd level, Main Bldg.	1-I	0.15	0.2	8 ± 2.0	14 ± 2.7
7-K Blending & Storage, 2nd level, Main Bldg.	1-J	0.15	0.2	7 ± 1.8	12 ± 2.6
Conference Room #2, 2nd level, Main Bldg.	1-K	0.15	0.25	11 ± 2.0	21 ± 3.3
Hallway, 2nd level, Main Bldg.	1-L	0.15	0.2	23 ± 3.4	24 ± 3.5
stairs to 1st level		0.4	0.6	---	---
Shipping, Pulverizing, Cerium Oxide Storage, 1st level, Main Bldg.	1-M	0.1	0.4	15 ± 2.8	34 ± 4.2
Drying Rooms, 1st level, Main Bldg.	1-N	0.15	0.3	5.2 ± 1.6	12 ± 2.6
Furnace & Press Room, 1st level, Main Bldg.	1-O	0.3	0.7	2 ± 1.3	12 ± 2.6
four drains		---	1.0	---	---
Sharples Collector Room, 1st level, Main Bldg.	1-P	0.3	0.6	20 ± 2.8	48 ± 4.9
two corners		---	0.9	---	---
1 & 2 Sulfonation Tank Rooms, 1st level, Main Bldg.	1-Q	0.25	0.7	30 ± 3.9	50 ± 5.8
brick wall		---	1.0	---	---
7-K Bastacite Room, 1st level, Main Bldg.	1-R	0.2	0.7	4 ± 1.6	19 ± 3.2

Continued on next page

TABLE I

RESULTS OF DECONTAMINATION RADIATION FINAL SURVEY

Location	Reference	Beta-Gamma Meter Survey mR/hr		Alpha Removable Contamination DPM/100 cm^2	
		average	high	average	high
Locker Room, 1st level, Main Bldg.	1-S	0.1	0.3	36 ± 4.3	46 ± 4.9
Boiler Room, 1st level, Main Bldg.	1-S	0.2	0.4	22 ± 3.3	36 ± 4.3
Machine Shop, 1st level, Main Bldg.	1-S	0.05	0.1	---	---
Workshop Bldg.	2-A	0.3	0.7	70 ± 5.8	107 ± 7.4
Ball Mill, 2nd level, Storage	2-B	0.3	(1.0-2.0) (drains)	47 ± 4.7	88 ± 6.7
Ball Mill, Lower Operation	2-C	0.5	1.0 (trench & concrete)	77 ± 6.2	104 ± 7.3
Compressor Bldg., 1st and 2nd levels	2-D	0.2	0.6	32 ± 3.8	75 ± 6.2
small concrete slab		---	2.0	---	---
Outside of Electronucleonic Storage	2-E	1.0	---	---	---



Drainage Trench
235'
G
Waste Treatment Disposal J
H
Sludge Dump
Sludge Dump
M
K
A
Yttrium + Silica Sludges
RESIDUES
G Ore tailing + gangue
H Yttrium + Silica sludges
I Reworked sludges
J Waste treatment disposal
K Thorium hydroxide
L Carbonate cake
M Yttrium concentrate
WASTE TREATMENT PLANT
A Clarifation 50,000 gal.
B Emergency storage 14,000 gal
C Retention 50,000 gal
D Mixer 2,000 gal.
E Thickener 2000 gal
F Filter House
I
C
A
E
BLDG #2
BLDG #1
PROCESSING
BLDG #3
L
Inv. 100.76
12" ∅
Inv. 98.98
Pump Sump M.H.
12" ∅
Property Line
Brook
W.R. GRACE and COMPANY
DAVISON CHEMICAL DIV.
POMPTON PLAINS, N.J.
Sewerage Waste Disposal
Sludge Disposal
scale - 1" = 30'-0" 1-12-60
Property
Line
BLACK OAK RIDGE ROAD
RT. 202
C.B. Inv. 97.07
30" ∅
To Sheffield Brook and Peauannock River

FIGURE 1

40 86

GRACE W.R.GRACE & CO., DAVISON CHEMICAL DIVISION
CHARLES & BALTIMORE STREETS, BALTIMORE, MD. 21203 ■ 301:727-3900

July 26, 1974

RECEIVED
AUG 1 1974

Mr. Bernard Singer,
Chief, Materials Licensing
United States Atomic Energy Commission
Washington, D. C. 20545

Ref: License STA-422

Dear Mr. Singer:

W. R. Grace & Co. presently holds an AEC Storage License, STA-422, for property located at 868 Black Oak Ridge Road, Wayne Township, New Jersey. We have recently completed decontamination of these facilities, using the services of Applied Health Physics, Inc., Bethel Park, Pennsylvania. Their report of the decontamination is attached. We have supplied a copy of this report to Mr. McClintock at King of Prussia and have scheduled a compliance inspection for Thursday, August 1, 1974.

This is our request for release of these facilities for unrestricted use and termination of our storage license. I trust that the Applied Health Physics report meets the requirements of your Guidelines dated April 22, 1970.

Assuming a satisfactory compliance inspection, I would like to ask you to give priority to the Release if possible. We have a buyer for the property and are most anxious to arrange a closing date with him.

Very truly yours,

B. L. Mobley

B. L. Mobley
Supervisor
Environmental Control

BLM:nbs

Attachment: AHP Report

No action taken - per Douglas Collins 8/1/74

105

UNITED STATES GOVERNMENT

STA-422
Docket 40-86

2-Way Memo

Subject: RO, Region I, Close out Survey W.R. Grace + Co. Davison Chemical Division Pompton Plains, N.J.

DATE OF MESSAGE: Aug 6, 1974

DATE OF REPLY:

INSTRUCTIONS

Use routing symbols whenever possible.
SENDER:
Forward original and one copy.
Conserve space.
RECEIVER:
Reply below the message, keep one copy, return one copy.

To: B. Singer
→ D. Collins

FOLD — FOLD

USE BRIEF, INFORMAL LANGUAGE

I received a call from Gene Epstein, Inspector RO, I concerning their close-out survey of the above facility. He says the place is in poor shape and can't be released without further decontamination. It does not meet our criteria for release for unrestricted use. Epstein quoted the following examples:

1. a drain 4 ft underground read 1 mr/hr at the surface 2 inches above ground using a survey meter with 7 mg/cm² window.
2. Smear samples taken at 57 different locations averaged 18,000 dpm/cm² alpha with hot spots of 74,000 dpm/cm² of alpha.

From: Buchanan

5027 – 102

1. TO BE RETAINED BY ADDRESSEE

OPTIONAL FORM 27
OCTOBER 1962
GSA FPMR (41 CFR) 101—11.6

UNITED STATES GOVERNMENT

2-Way Memo

Subject: W. R. Grace

DATE OF MESSAGE 08/6/74
DATE OF REPLY

INSTRUCTIONS

Use routing symbols whenever possible.
SENDER:
Forward original and one copy. Conserve space.
RECEIVER:
Reply below the message, keep one copy, return one copy.

To: B. Singer
D. Collins

FOLD — USE BRIEF, INFORMAL LANGUAGE — FOLD

3. Removable alpha contamination averaged 800 dpm/cm²
4. Soil and water samples have been taken and sent to ARCO for analysis — should have results in 2 weeks.

The inspector recommended further decontamination and suggested the licensee tear out certain areas for disposal. His report will be available in about 2 weeks.
I told him we would do nothing until we could be assured that facility was clean enough for release.

From: Buchanan

OPTIONAL FORM 27
OCTOBER 1962
GSA FPMR (41 CFR) 101-11.6

5027-102 1. TO BE RETAINED BY ADDRESSEE

40-86

REGULATORY OPERATIONS

GRACE W.R.GRACE & CO., [illegible] CHEMICAL DIVISION
CHARLES & BALTIMORE STREETS, BALTIMORE, MD. 21203 301:727-3900

September 16, 1974

Mr. Bernard Singer, Chief
Materials Licensing
United States Atomic Energy Commission
Washington, D. C. 20545

Ref. License STA-422

Dear Mr. Singer:

On July 26, 1974, I sent you what turned out to be a "Draft" report from Applied Health Physics, Inc., on the decontamination work done at our Pompton Plains (Wayne Township), New Jersey, facilities. Today I received a final report from them and am forwarding it to you.

Mr. Epstein, of the Compliance Section at King of Prussia, inspected the premises on August 1-2 and found several small areas that needed further cleaning. These were corrected, and he is scheduled to return for another inspection on September 20.

As in my letter of July 26, we are requesting release of these facilities for unrestricted use and termination of our storage license.

I would again like to ask you to give priority to the release if possible. Our prospective buyer is anxious to move in. Thank you.

Very truly yours,

B. L. Mobley

B. L. Mobley
Supervisor
Environmental Control

BLM:nbs

Attachment: AHP Report

1890

107

DATE Sept. 18, 1974

DOCKET NO. 40-86

AEC PUBLIC DOCUMENT ROOM AND OTHERS

We will furnish the following document(s) when additional copies are made available:

Health Physics Report for W.R. Grace & Company

Appendix A

Radiation Readings

Area	DPM/100 cm² alpha	Beta-gamma
Bld 1 area 1-D	12,500	0.1-.2 mr/hr
	11,000	
	5000	
	8240	
	11000	
Bld 1 Lab Area 1-B.	35000	0.1 to .35 mr/hr
	50000	
	12500	
Catwalk Bld 1	25000	
	30000	0.8 mr/hr average
	40000	
	25000	
	25000	
	20000	
	30000	
	20000	
	15000	
Suffocation Room Bld 1 floor	10000	
	15000	0.2-.5 mr/hr
	18000	
	20000	

.38

Bld. 1 Wall of Sulfonation Room.	3000	
	35000	0.2 -.5 mr/hr.
	55000	
	50 000	
	5000	
	22500	
EHD Storage Room BLD 1.	5000	
	12500	
	5000	0.1-.2 mr/hr.
	10 000	
	5000	
	2500	
	2000	
3rd floor Lab. Bdg. 1	9000	0.1-.2 mr/hr.
	6000	
	5000	
3r floor Library. Bld 1	2000	0.1 mr/hr.
Kettle Area Bld 1	500	
	2500	0.08 ~~0.2~~ mr/hr.
	16000	

Garnet ~~Ar~~ Storage Area Bld. 1	7500	
	9000	
	12500	
	10 000	0.1 - 1.5 - 2.0 mr/hr.
	12500	
	200000	
	300000	
	85000	
	30000	
~~Ball Mill Bdg.~~		
Ball Mill Bldg.	6000	
	10000	.1 - 1.0 mr/hr.
	12500	
	2500	
	17500	
Grinding Bld.	4500	.3 - 1.4 mr/hr.
	500	
	3000	

~~OLD Compressor Bld.~~

OLD Compresore ~~Maintenance~~ Bld.	12,500	.3 - 1.0 mr/h.
	25000	
	30000	
OLD Maintenance Bld.	10000	
	7500	.3 - 0.8 mr/hr.
	5000	
	250	
	1000	
	15000	
	15000	

Appendix B

Removable Contamination

Area	dpm α / 100 cm^2	dpm β-γ / 100 cm^2
Office Area	7.5	26
1-D Bld-1	12.5	51
	25.0	42
	40.5	53
	22.5	2.6
Laboratory	17.5	13
1-B Bld-1	20.0	84
	25.0	126
	47.5	20
	20.0	113
	35.0	69
Catwalk	65.0	126
Bld-1	62.5	73
	50.4	130
	107.5	180
Filter Press Pad	147.5	340
Bld 1	10.0	13

Sulfonation Room Floor Bld-1	45	71
	35	402
	77.5	100
	40	20
	37.5	20
Sulfonation Room Wall Bld-1	165	131
	0	0
	20	55
End Storage Room Bld-1	24	91
	24	0
	45	0
3rd Floor Lab. Bld-1.	42	53
	12	124
	25	208
Library 3rd floor Bld-1	42	37
Garret Storage Area Bld-1	92	58
	360	595
Ball Mill Bldg.	30	0
	20	62

OLD Compressor Bldg. –	242	648
	145	320
~~OLD Maintenance Bld~~		
OLD Maintenance Bld –	107	262
	115	337
	197	390
Parking lot	7	0
~~Plat~~ Loading Platform	15	47
Grinding Ball Mill	15	0
area	47	197.

U.S. ATOMIC ENERGY COMMISSION
IDAHO OPERATIONS OFFICE
ANALYTICAL CHEMISTRY BRANCH

ROUTINE ___ SPECIAL ___

SAMPLE RECORD SHEET

SERIAL NO. [illegible]

SAMPLE FROM: RO: I

COLLECTED BY: Eugene Epstein

DATE SUBMITTED: 8/5/74

SAMPLES RECEIVED: 8/12/74

ANALYSIS COMPLETED: 9/9/74

ANALYZED BY: [illegible]

SAMPLE NO.	DATE	HOUR	SAMPLE DESCRIPTION	ANAL. FOR	INST. USED	QUANT. USED	TIME CNTD.	COUNT TIME	TOTAL COUNT	GROSS COUNT	BKGD. C	NET COUNT		RESULTS
[illegible]	8/1		Soil, Burial Ground	U nat		1.2	[illegible]	[illegible]	[illegible]	[illegible]	0.4	[illegible]		[illegible]
			No. 1	Th nat		0.5	[illegible]	[illegible]	[illegible]	[illegible]	18.[illegible]	[illegible]		[illegible]
						(1.5)								
[illegible]			Soil, Burial Ground	U nat		1.1				3.4	0.4	3.0		[illegible]
			No. 2	Th nat		0.5				19.3	[illegible]	[illegible]		[illegible]
						(1.5)								
[illegible]			Soil, Burial Ground	U Nat		1.1				32.0	0.4	[illegible]		[illegible]
			No. 3	Th nat		0.5				26.0	14.8	[illegible]		[illegible]
						(1.5)								
[illegible]			Soil, Burial Ground	U Nat		1.3				3.0	0.4	2.6		[illegible]
			No. 4	Th nat		0.5				22.0	15.8	[illegible]		[illegible]
						(1.5)								
[illegible]			Soil, Burial Ground	U Nat		1.1				[illegible]	0.4	[illegible]		[illegible]
			No. 5	Th nat		0.5				[illegible]	18.[illegible]	[illegible]		[illegible]

[illegible]

[illegible]

HEALTH PHYSICS REPORT

for

W. R. GRACE COMPANY
Wayne, New Jersey

Radiological Survey Following
Decontamination of Facilities

116885

June 18, 1974

Prepared by
Maryanne McClosky
Maryanne McClosky
Health Physicist

B/361

ITEM # 363

Applied HEALTH PHYSICS INC.

104

PART I

INTRODUCTION

W. R. Grace Company engaged Applied Health Physics, Inc. of Bethel Park, Pennsylvania to carry out decontamination of their Davison Chemical Division facilities located at Pompton Plains, New Jersey. An earlier survey conducted by Applied Health Physics, Inc. personnel revealed contamination of buildings and the property by various thorium - containing materials. See Part II. Decontamination at the site began on March 11, 1974 and continued through July 18, 1974.

The goal of the decontamination work was to attain certain limits and conditions prior to the release of these premises for unrestricted use. Appendix A presents these guidelines for unrestricted use.

A qualified consultant, Mr. Paul B. Klevin, was engaged by W. R. Grace Company to provide an expert's opinion on the progress and course of the decontamination, as well as to assure compliance with the state of New Jersey and United States Atomic Energy Commission regulations.

The overall ground area of the W. R. Grace Plant at Wayne, New Jersey is 6.4 acres. The frontage is on Black Oak Ridge Road with chain link fence boundaries north and south, as shown on Figure 1. A small brook runs east and north of the area, providing the eastern property line.

HEALTH PHYSICS REPORT

for

W. R. GRACE COMPANY
Wayne, New Jersey

RESULTS of RADIOLOGICAL EVALUATION

of

THORIUM ORE WASTE DISPOSAL PROBLEM

Prepared by

Maryanne McClosky
Health Physicist

PART II

(Survey prior to Decontamination)

RESULTS OF RADIOLOGICAL EVALUATION of THORIUM ORE WASTE DISPOSAL PROBLEM

INTRODUCTION

W. R. Grace Company has operated a plant in Wayne, New Jersey for a number of years. The plant is located on Black Oak Ridge Road and has been non-operative for the past few years. Currently, the plant lies empty, except for a few pieces of equipment and materials left onsite. Optical polishing compounds were manufactured at this plant. Some of this raw material contained natural thorium and various rare earths, especially cerium. Possession and use of these naturally occurring radioactive materials (e.g., natural thorium) necessitated that W. R. Grace obtain a source material license from the U. S. Atomic Energy Commission and comply with US-AEC regulations.

This survey was conducted as a prelude to decontamination, which must be carried out since W. R. Grace Company plans to sell this property. Federal and state regulations specify the conditions and limits which must be achieved prior to release of facilities and equipment for unrestricted use by non-licensed parties. See Appendix A. W. R. Grace has engaged the services of a qualified consultant, Mr. Paul B. Klevin, to advise them as to the procedures they must follow in order to assure compliance with the applicable regulations and safety standards.

RADIATION SURVEY

On December 11, 1973, Applied Health Physics, Inc. was informed by Mr. Klevin and Mr. B. L. Mobley of W. R. Grace Company that the plant contained thorium at various locations within the buildings and had been buried on the site.

Applied Health Physics was requested to survey the buildings and grounds, and to report their findings.

The radiation monitoring started December 12, 1973, with the preliminary survey for alpha and gamma radiation. Instrumentation used by our health physics personnel consisted of a calibrated gas proportional alpha survey meter (Eberline Model PAC-3G) and a portable gamma scintillation spectrometer (Eberline Model PRM 5-3).

The contamination consisted primarily of fine dusts scattered through the buildings, and various isolated pockets of activity; e.g., as in trenches. On-site burial accounted for outdoor activity in varying degrees. A complete outdoor survey could not be accomplished due to inclement weather.

Besides using the forementioned radiation survey meters, our surveys also included the collection of smears to evaluate removable contamination; liquid and sludge samples of various materials were collected for estimates of removable and fixed activities. Maps and drawings made at the time of the sampling indicate precisely where various measurements and samplings of materials were obtained. Results of alpha-gamma radiation survey are summarized for certain locations on Table 1.

Gamma and alpha measurements were taken at surface level. These data are presented in Figures 6 and 7. As indicated in Table 1, surface alpha measurements range from 0 to 88,000 disintegrations per minute. The area of the alpha survey meter probe is 68 cm^2. This data can only estimate the "fixed" activity, since alpha radiation cannot penetrate even a thin covering of dust or other non-radioactive materials. The actual amount of radionuclides in terms of dpm per gram of contaminated surface may be significantly greater than that measured and reported. Figures 1-5 show conditions at the time of our initial survey, December 12, 1973. Additional photographs were taken January 21, 1974, during the course of our site survey. These photos will be retained on file.

Results of the alpha content of sample are listed in Tables 2 and 3. The highest reading for removable contamination was found to be 1,948 d/m/100 cm^2, while other values averaged 500 d/m/100 cm^2. The liquid and sludge samples gave estimates of concentrations of contamination ranging from 2,000 to 10,000 d/m/gram of material. The isotopic content of these samples was determined and found primarily to be natural thorium with traces of radium (0.6 $\pm$ 1 nano-Ci per gram). This was done by gamma spectroscopy; the thorium content of settled dusts inside the plant is 20.0 $\pm$ 1.0 mg Th/g sample.

On January 21, 1974, an employee was seen vacuuming these dust laden areas without respiratory protection and using a bag-type industrial vacuum cleaner which created significant airborne dusts. Mr. Klevin requested the termination of this operation, and the results are shown on Figure 7.

CONCLUSIONS

Waste slags and ores containing thorium are buried at various areas of the plant site. See Figure 6. These locations could not be determined precisely due to lack of sufficient information concerning burial. Furthermore, during January, 1974, earth moving equipment was used to level certain portions of the plant property where source material had been buried. These areas were surveyed January 21 and 22, 1974, and the results are shown in Figure 7. Certain deposits were found to be only partially buried. These locations were detected by gamma scintillation and a few samples were collected.

The results of the various radiological surveys are the basis for the following conclusions:

1. The maximum amount of removable alpha radioactivity exceeds within certain portions of the plant as well as on the plant property the recommended limit of 1,000 dpm per 100 cm^2. Radioactive source materials should be removed, so that acceptable limits are met at these locations. Appendix A contains radioactivity limits for un-

restricted release of facilities and equipment.

2. Clothing, equipment, and fixtures are now in place which harbors radioactive contamination. For example, fans, coveralls, benches etc. which no longer serve a useful purpose should be disposed of in a manner that results in minimal contamination to clean areas and complies with applicable regulations.

3. The ground floor of the main building, as well as the floors of smaller places have buildup of thorium concentration due to seepage and deposition over the years. These surfaces should be thoroughly cleansed, or removed, depending on the economics of decontamination, versus feasibility of disposal. The floor conditions in certain areas are so bad as to necessitate disposal.

4. Drain lines and trenches were found to have high (10^4dpm/gram) concentrations of licensed material. These and other water routes are to be areas of attention when clean-up takes place.

5. All removal, repackaging or transfer of licensed radioactive materials must be done under the direct supervision of health physics personnel who are experienced in this type of decontamination and waste disposal work.

TABLE 1

RESULTS OF ALPHA-GAMMA RADIATION SURVEYS

Location	Alpha DPM/100 cm^2	Gamma DPM/100 cm^2	mr/hr
Storage area - 2nd. Level	660	1.55×10^6	0.15
Press room wall - 2nd Level	2.64×10^4	5.18×10^6	0.6
7-K Blending & Storage - 2nd Level	1.93×10^3	3.11×10^6	0.3
Drying Room - 2nd Level	3.08×10^3	2.07×10^6	0.2
Sulfonation, 1&2 Tank Rooms	1.76×10^4	5.18×10^6	0.6
Open Storage area, wall	8.80×10^4	1.04×10^7	1.1
Storage area, drain	2.20×10^4	6.21×10^6	0.8
Waste Treatment Room	1.93×10^4	1.04×10^6	0.15
Background (outdoors)	None	6.21×10^5	<0.1

TABLE 2

RESULTS OF ALPHA RADIATION ANALYSES
OF THORIUM BOTTLE SAMPLES

Sample Number	Area*	Weight (gram)	Total Alpha Activity (d/m/gram)
529	1-0-1	0.3843	$1.2x10^4$
514	1-J	0.4626	$7.0x10^3$
522	1-M-1	0.2938	$1.6x10^4$
504	1-F	0.3304	$1.22x10^4$
502	1-B	1.0586	280
512	1-J	0.4935	$3.66x10^3$
505	1-F	0.0877	$8.22x10^3$
511	1-J	0.3001	$6.50x10^3$
513	1-J	0.4882	$1.43x10^3$
527	1-0-1	0.7708	$7.36x10^3$
528	1-0-1	0.0638	$2.23x10^4$
532	1-Q-1	0.1215	$3.47x10^3$
526	1-0-1	0.0262	$1.04x10^4$
506	1-F	0.0224	$5.14x10^3$
531	1-Q-1	0.0679	$8.20x10^3$
521	1-M-1	0.0916	$2.42x10^3$
523	1-M-1	0.1792	$1.95x10^3$
501	1-B	0.0771	$6.38x10^3$
510	1-G	0.1095	$1.105x10^4$
503	1-B	0.0078	$7.24x10^3$
530	1-Q-1	0.0538	$2.19x10^3$
525	1-0-1	0.4199	119
508	1-G	0.1856	$4.69x10^3$
507	1-G	0.0942	$5.43x10^3$
509	1-G	0.1995	$1.05x10^4$
524	1-M-1	0.8390	$1.18x10^3$
537	2-E	1.3249	348
520	2-B	0.0846	$7.44x10^4$
546	2-F	0.0423	$1.81x10^4$
539	2-E	0.0925	$1.15x10^4$
547	2-H	0.0596	$1.48x10^3$
515	2-C	0.1076	$1.89x10^3$
545	2-F	0.0670	$2.76x10^3$
541	2-E	1.1860	84
543	2-F	0.0929	$1.15x10^3$
549	2-I	0.0380	$3.75x10^4$
518	2-C	0.0306	$2.83x10^3$
548	2-I	0.0581	$2.13x10^3$
533	2-D	0.1035	610
536	2-E	1.1921	519
544	2-F	0.1916	30.5
535	2-D	0.0276	$2.44x10^3$
516	2-C	0.0352	$1.14x10^3$
542	2-F	2.0742	463

TABLE 2, Continued

Sample Number	Area*	Weight (gram)	Total Alpha Activity (d/m/gram)
534	2-D	0.0145	4.85×10^3
538	2-E	0.8977	5.05×10^3
462	SOIL-2K	0.0465	1.35×10^3
554	SOIL-2K	0.2396	198
552	SOIL-2K	0.0127	1.80×10^3
551	SOIL-2K	0.0711	1.03×10^5
461	SOIL-2K	0.1337	0
519	2-C	1.3668	115
517	2-C	1.3013	2.14×10^3
555	SOIL-2K	0.5752	925

NOTES:
1) The areas can be found on the individual drawings.
2) The standard deviations of the activities are within 2 sigma.

TABLE 3

RESULTS OF ALPHA RADIATION ANALYSES
OF THORIUM SMEAR SAMPLES

Sample Number	Area*	Total Alpha Activity (d/m/100cm^2)
285	BLANK	1.9
287	1-A	17.1
289	1-A	3.8
291	1-B	0
292	1-B	22.8
293	1-B	22.8
295	1-B	11.4
297	1-B	15.2
299	1-B	26.5
301	1-B	9.5
303	1-B	13.3
305	1-B	17.1
307	1-B	22.8
309	1-C	19.0
311	1-C	17.1
313	1-D	9.5
315	1-D	9.5
317	1-D	24.7
319	1-F	9.5
321	1-F	9.5
323	1-F	9.5
325	1-G	81.5
326	1-G	157
327	1-G	165
328	1-G	150
329	1-G	74
330	1-G	72.1
331	1-G	302
332	1-H	32.4
334	1-H	24.7
336	1-H	28.5
338	1-I	17.1
340	1-I	9.5
342	1-J	74
343	1-J	17.1
344	1-J	74
345	1-J	28.5
346	1-J	26.5
347	1-J	74
348	1-J	26.5
349	1-J	30.5
350	1-J	20.9
351	1-J	19
352	1-J	30.5
353	1-J	28.5
359	1-K	64.7
360	1-K	60.8

TABLE 3, Continued

Sample Number	Area*	Total Alpha Activity (d/m/100cm^2)
361	1-K	53.2
362	1-K	49.5
364	1-L	156
365	1-L	160
366	1-L	47.5
367	1-L	13.3
368	1-L	9.5
369	1-L	11.4
370	1-1	62.7
371	1-M-1	57.2
372	1-M-1	57.2
373	1-M-1	57.2
374	1-M-1	38.0
375	1-M-1	34.2
376	1-M-1	36.1
377	1-M-1	49.5
378	1-M-1	45.5
379	1-M-1	45.5
380	1-M-1	45.5
381	1-M-1	37.6
382	1-M-1	30.5
383	1-M-1	38.0
384	1-N-1	24.7
385	1-N-1	15.2
386	1-N-1	3.8
388	1-N-1	11.4
389	1-N-1	15.2
391	1-0-1	30.5
394	1-0-1	28.5
395	1-0-1	30.5
396	1-0-1	30.5
397	1-0-1	34.2
398	1-0-1	15.2
399	1-0-1	11.4
400	1-0-1	15.2
402	1-0-1	30.5
403	1-P-1	20.9
404	1-P-1	26.5
405	1-P-1	47.5
409	1-Q-1	77.9
410	1-Q-1	34.2
411	1-Q-1	41.8
412	1-Q-1	34.2
413	1-Q-1	224
414	1-Q-1	116
415	1-Q-1	169
416	1-Q-1	98.6
417	1-R-1	24.7
418	1-R-1	9.5
419	1-R-1	15.2

TABLE 3, Continued

Sample Number	Area*	Total Alpha Activity (d/m/100cm^2
420	1-R-1	24.7
421	1-R-1	30.5
422	1-R-1	93
423	1-R-1	176
424	1-R-1	76
425	1-R-1	123.5
426	1-R-1	43.8
427	1-R-1	39.9
428	1-R-1	15.2
429	1-R-1	24.7
430	1-R-1	13.3
431	1-R-1	17.1
432	1-R-1	17.1
439	2-A	358
440	2-A	103
441	2-A	224
449	2-B	795
450	2-B	1,948
451	2-B	402
452	2-B	64.7
445	2-C	65.7
446	2-C	74
447	2-C	38
448	2-C	19
454	2-D	30.5
456	2-J	3.8
459	2-J	3.8
460	2-J	9.5
463	2-K	13.3
464	2-K	15.2
465	2-K	11.4
466	2-K	13.3

TABLE 4

ANALYSIS OF SAMPLES TAKEN FROM W. R. GRACE COMPANY
(The collection points are noted on Figure 6)

Sample	Dry Weight(grams)	Net CPM	DPM/GRAM	uCuries/GRAM
#1 Dump Sump	2.3243	1,851.1	1.50×10^3	6.8×10^{-4}
#2 Ball Mill Sump	3.2258	1,609.6	949	4.2×10^{-4}
#3 Driveway Sump	1.4697	1,479.6	1.89×10^3	9.3×10^{-4}
#4 Well Sump	1.1283	658.1	1.14×10^3	5.2×10^{-4}

APPENDIX A

RADIOACTIVITY LIMITS FOR UNRESTRICTED RELEASE

of

FACILITIES and EQUIPMENT

1. The maximum amount of fixed alpha radioactivity in disintegrations per minute per 100 square centimeters on buildings or equipment should not exceed 25,000 dpm.

2. The average amount of fixed alpha radioactivity in disintegrations per minute per 100 square centimeters on buildings or equipment should not exceed 5,000 dpm.

3. The maximum amount of removable (capable of being removed by wiping the surface with a filter paper or soft absorbent paper) alpha radioactivity in disintegrations per minute per 100 square centimeters on buildings or equipment should not exceed 1,000 dpm.

4. (a) The maximum level at one centimeter from the most highly contaminated surface of a building or piece of equipment measured with an open-window beta-gamma survey meter through a tissue equivalent absorber of not more than seven milligrams per square centimeter should not exceed 1.0 millirad per hour.

   (b) The average radiation level at one centimeter from the contaminated surface of the building or equipment measured in the same manner should not exceed 0.2 millirad per hour.

5. The contamination limits for abandonment of facilities involving U-233 or plutonium should not exceed 1/10 of the limits in items 1,2 and 3 above.

NOTES: A. A reasonable effort should be made to minimize the contamination present.

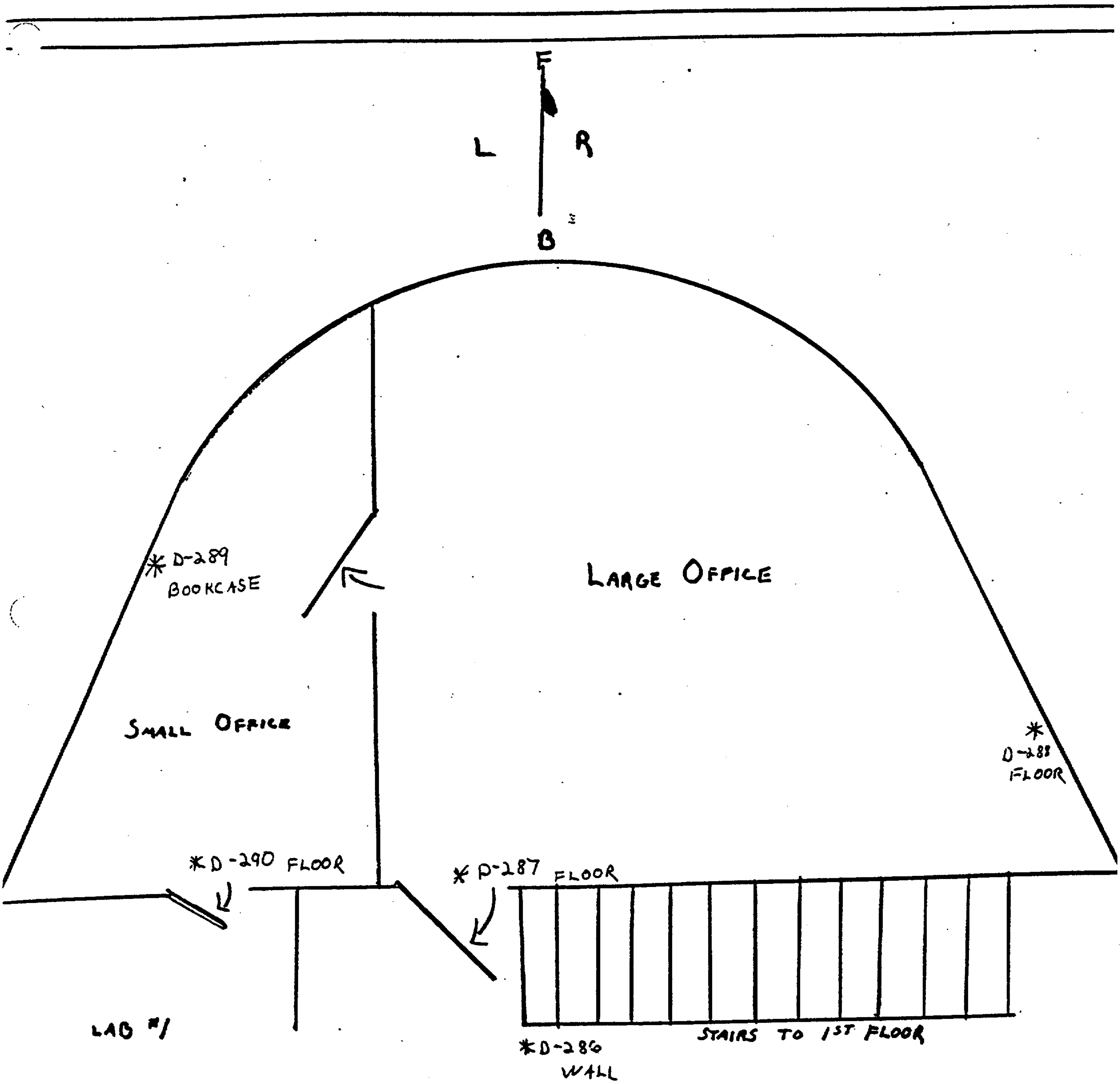
B. Surfaces of premises, equipment or scrap likely to be contaminated, and of such size, construction, or location as to make the surface inaccessible for purposes of measurement, shall be presumed to be contaminated in excess of the levels specified above.

C. Premises, equipment or scrap having contaminated surfaces which have been covered by painting, metal plating or other covering material should be presumed to be contaminated in excess of the levels specified above, unless it can be established that the contamination was below the above levels prior to applying the covering.

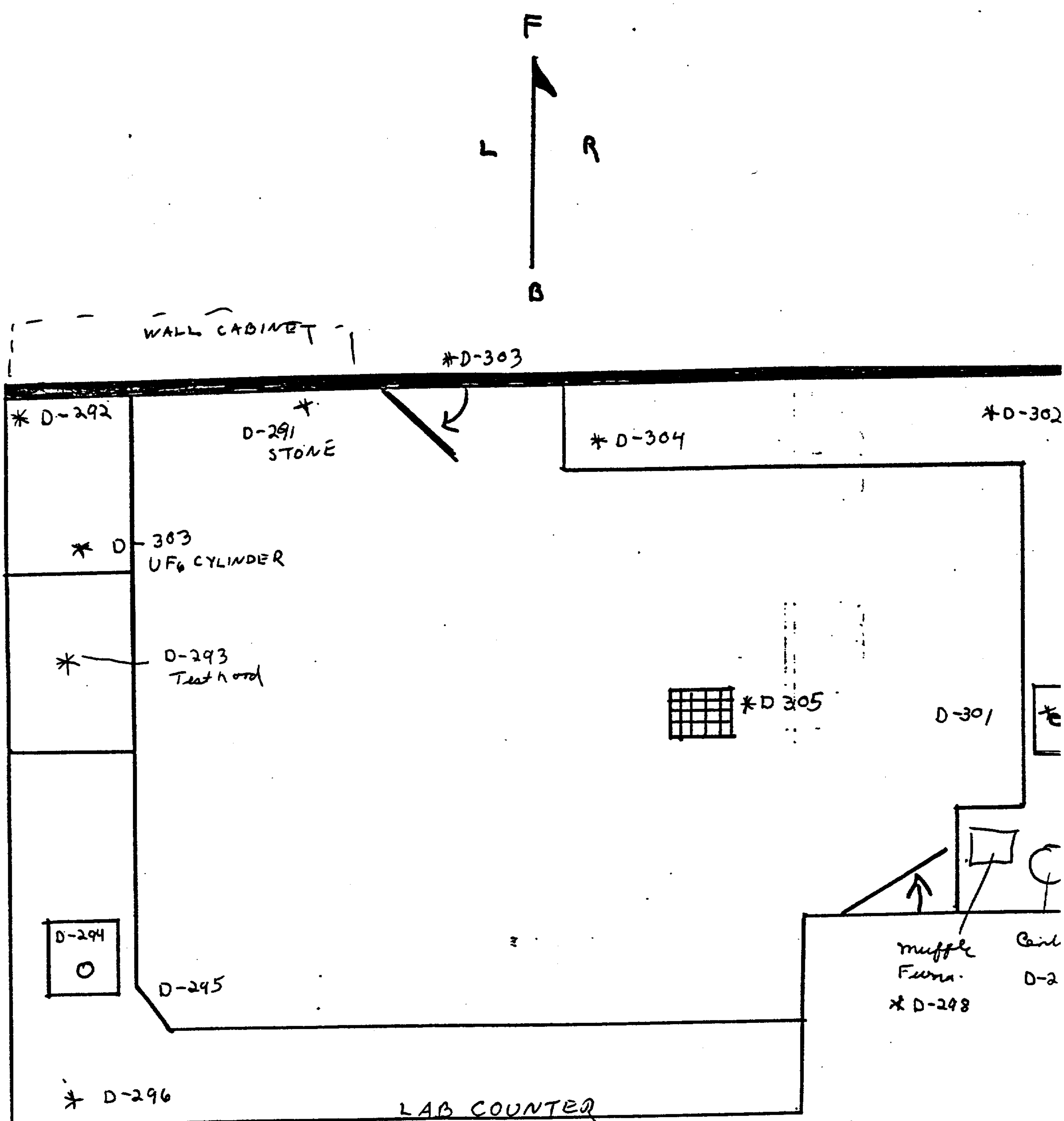
APPENDIX B

Locations of Various
Samples taken at
W. R. Grace Company

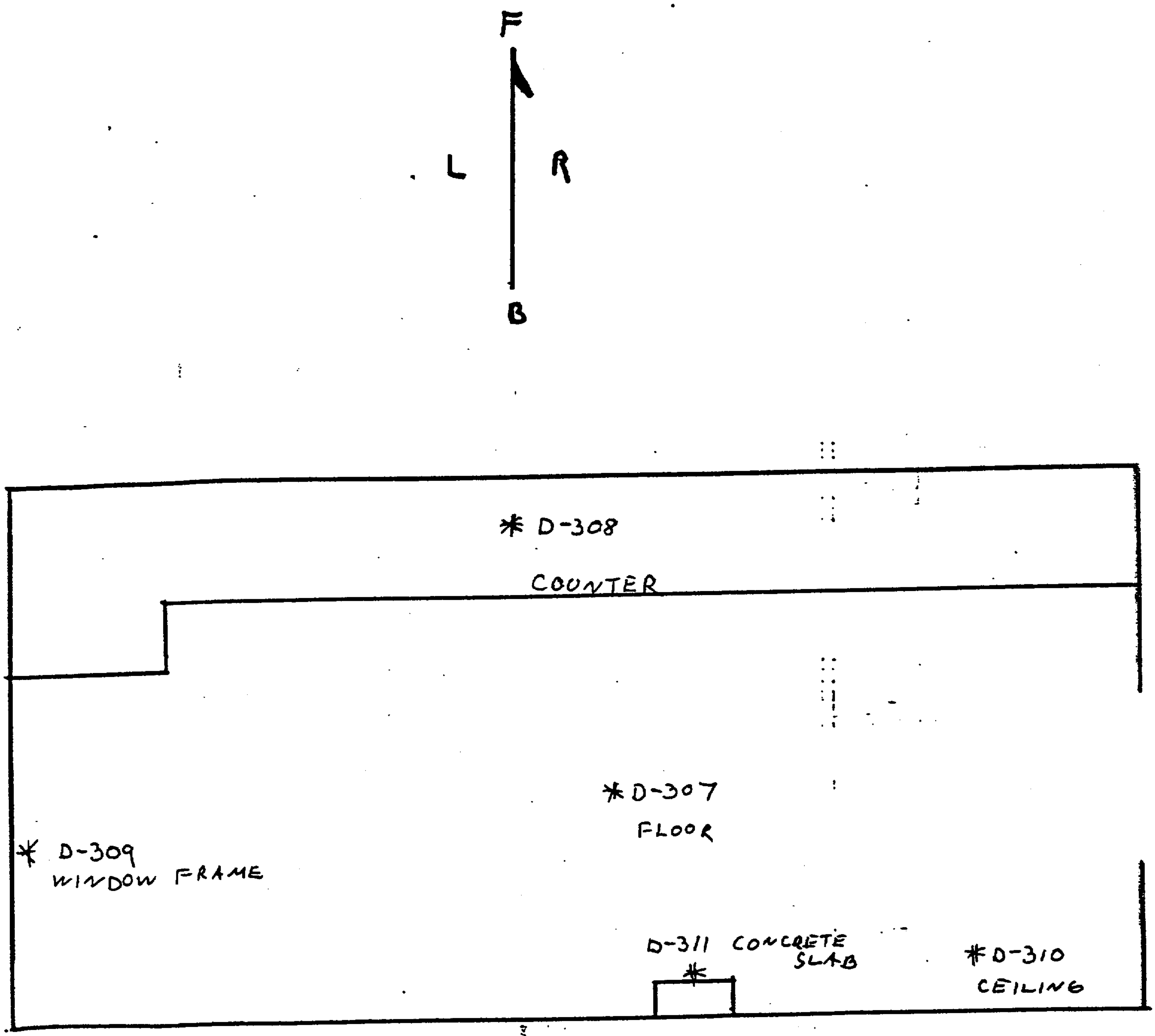
NOTE: These locations can be found on Figure 7



AREA I-A
OFFICES
2ND. FLOOR, MAIN B



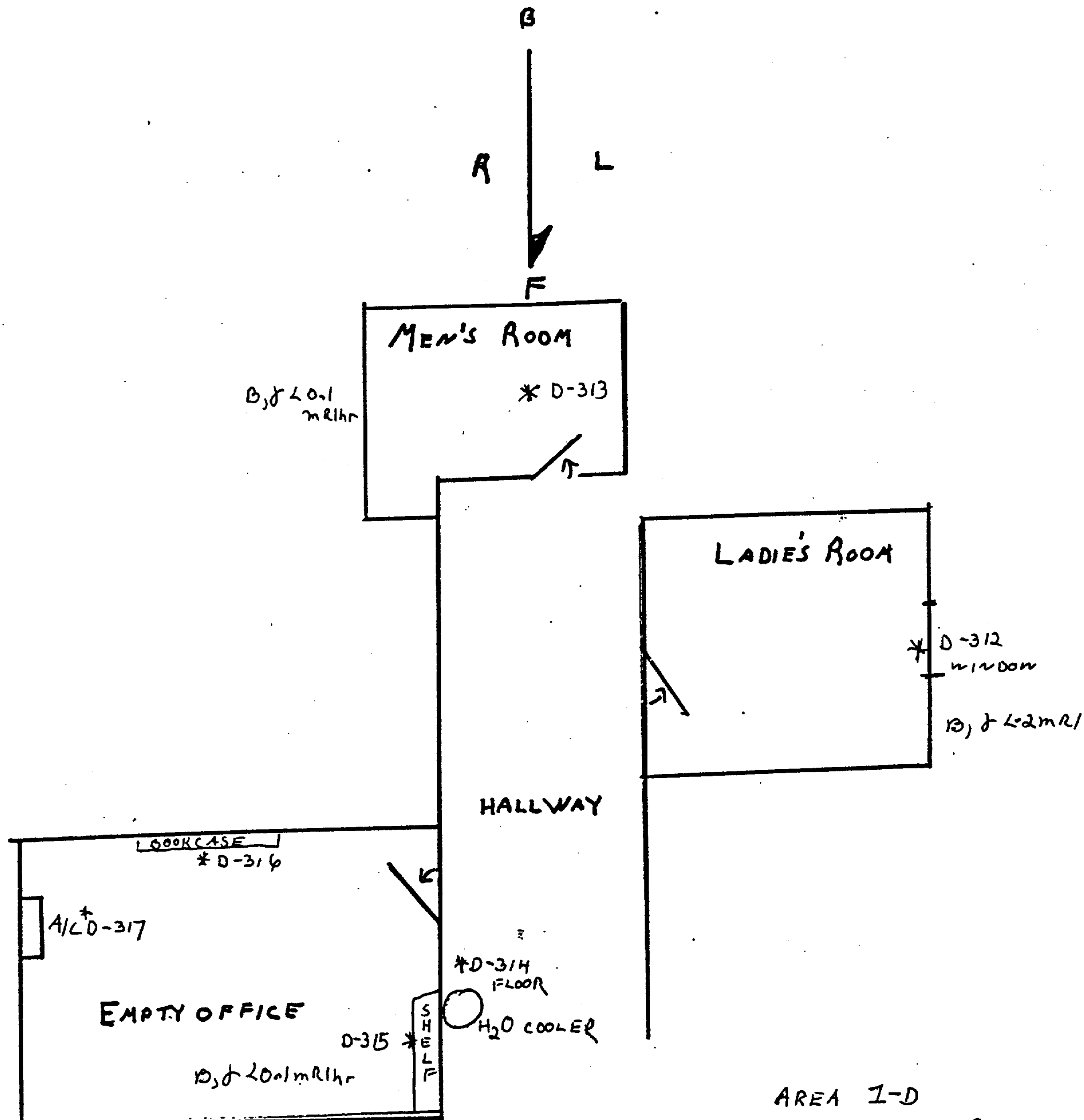
AREA I-B
LAB No. 1
2ND. FLOOR, MAIN B



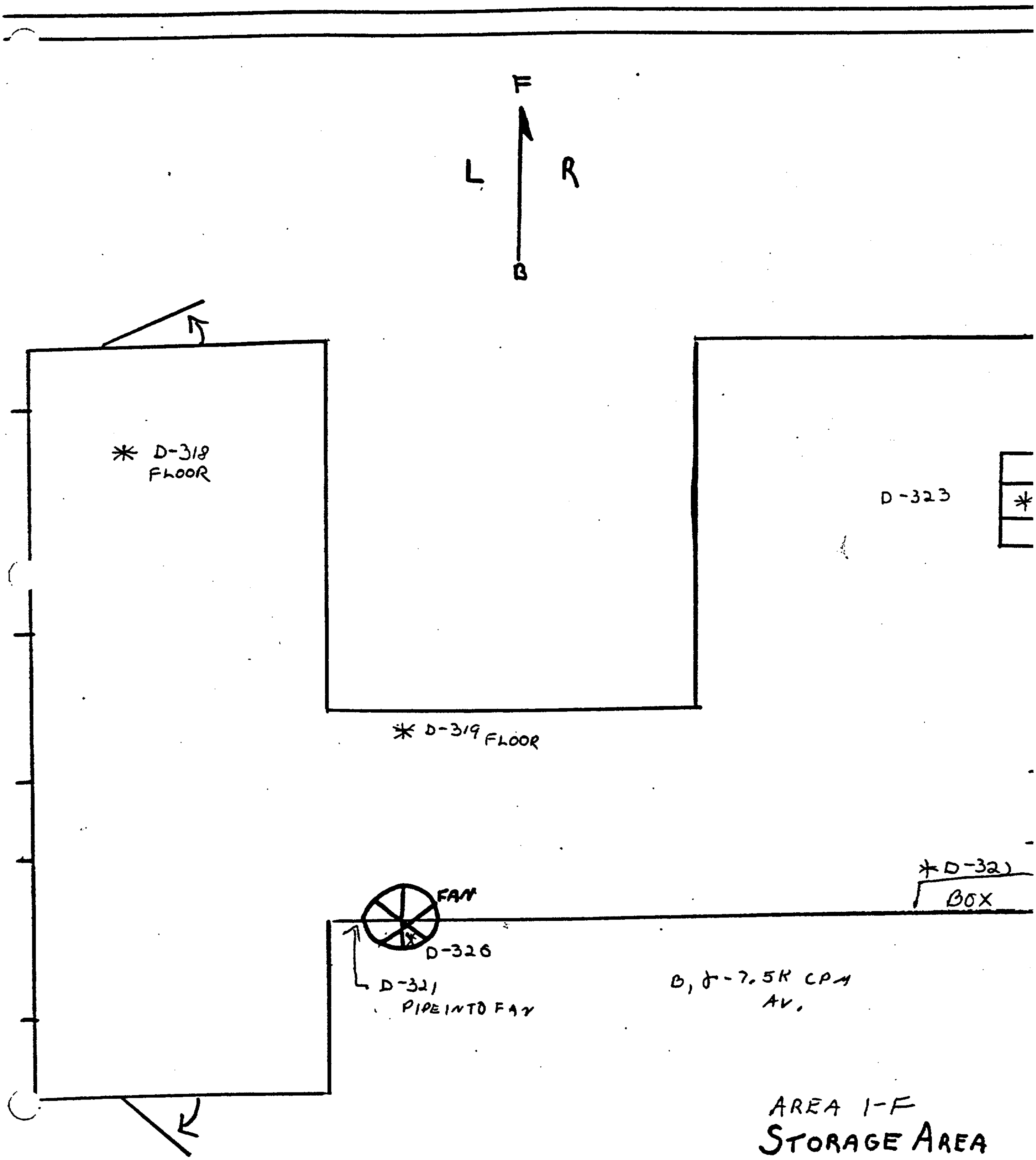
AREA 1-C

SAMPLE PREPARATION ROOM

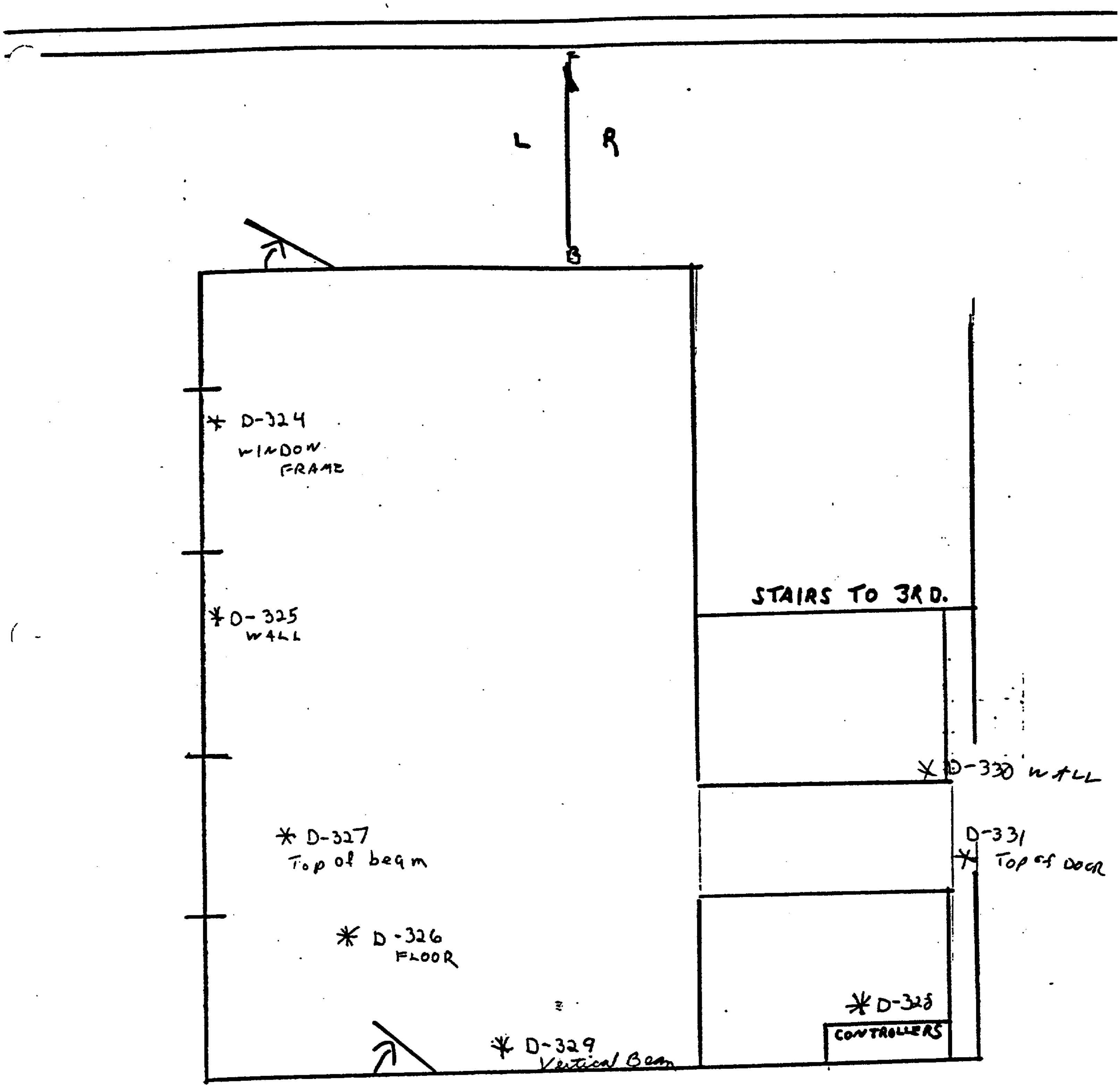
2ND. FLOOR, MAIN BLDG.



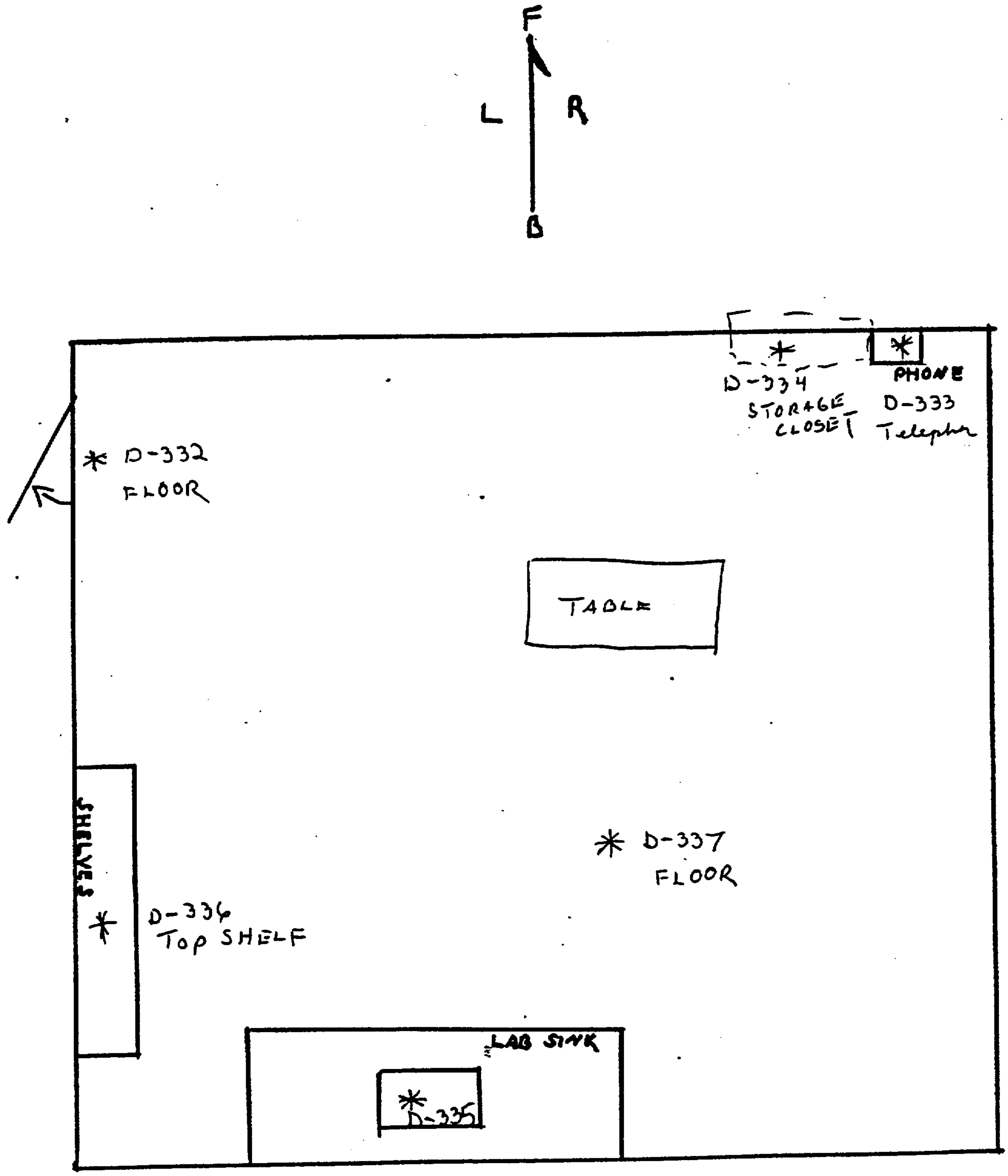
AREA I-D
HALL, LADIE'S & MEN'S ROOM,
EMPTY OFFICE
2ND. FLOOR MAIN BLDG.



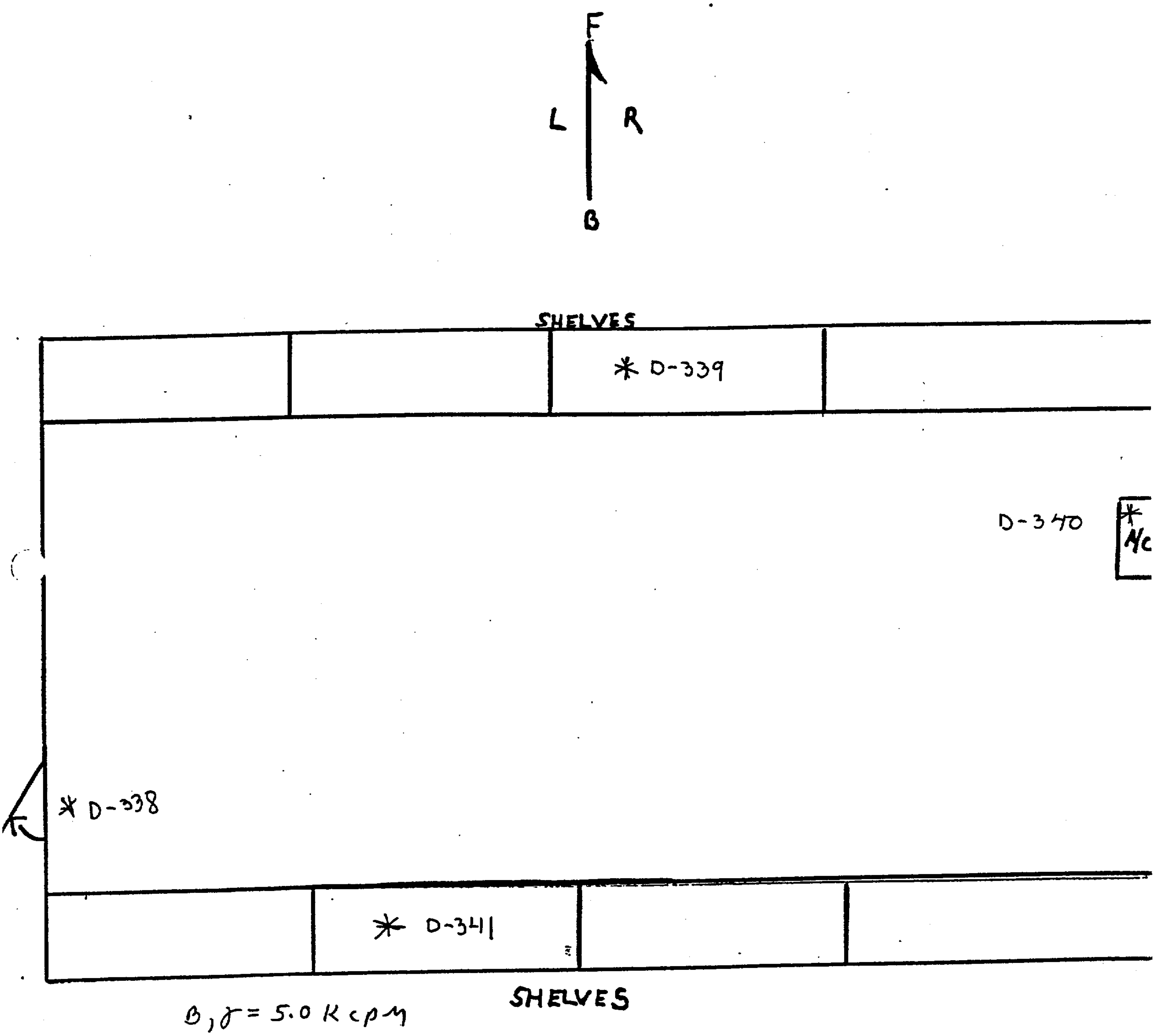
AREA 1-F
STORAGE AREA
2ND LEVEL, MAIN B



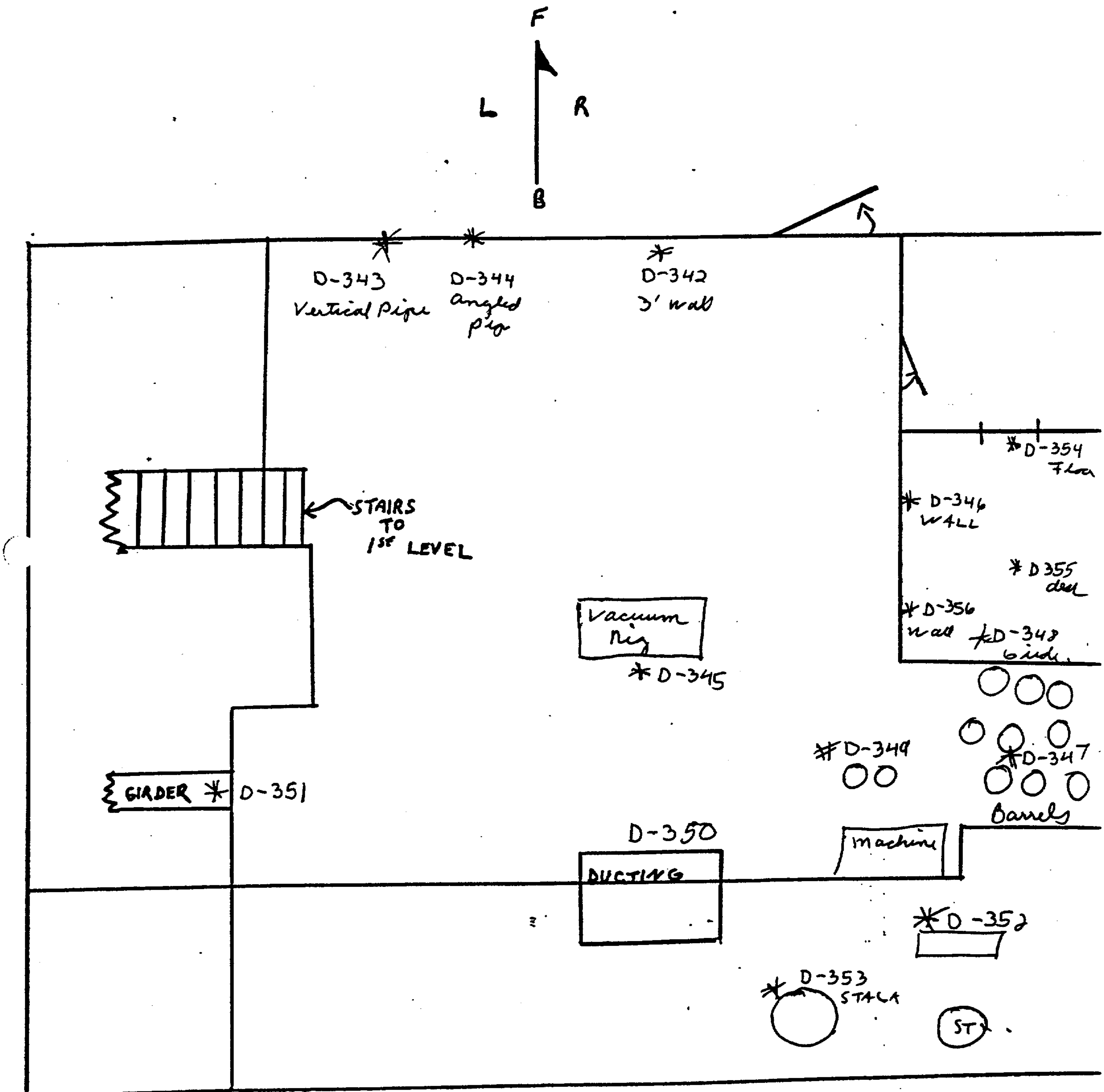
Area I-G
Press Room & Sulfonation Rc
2nd Floor, Main Bldg.



AREA I-H
TEST LAB #2
2ND LEVEL, MAIN B



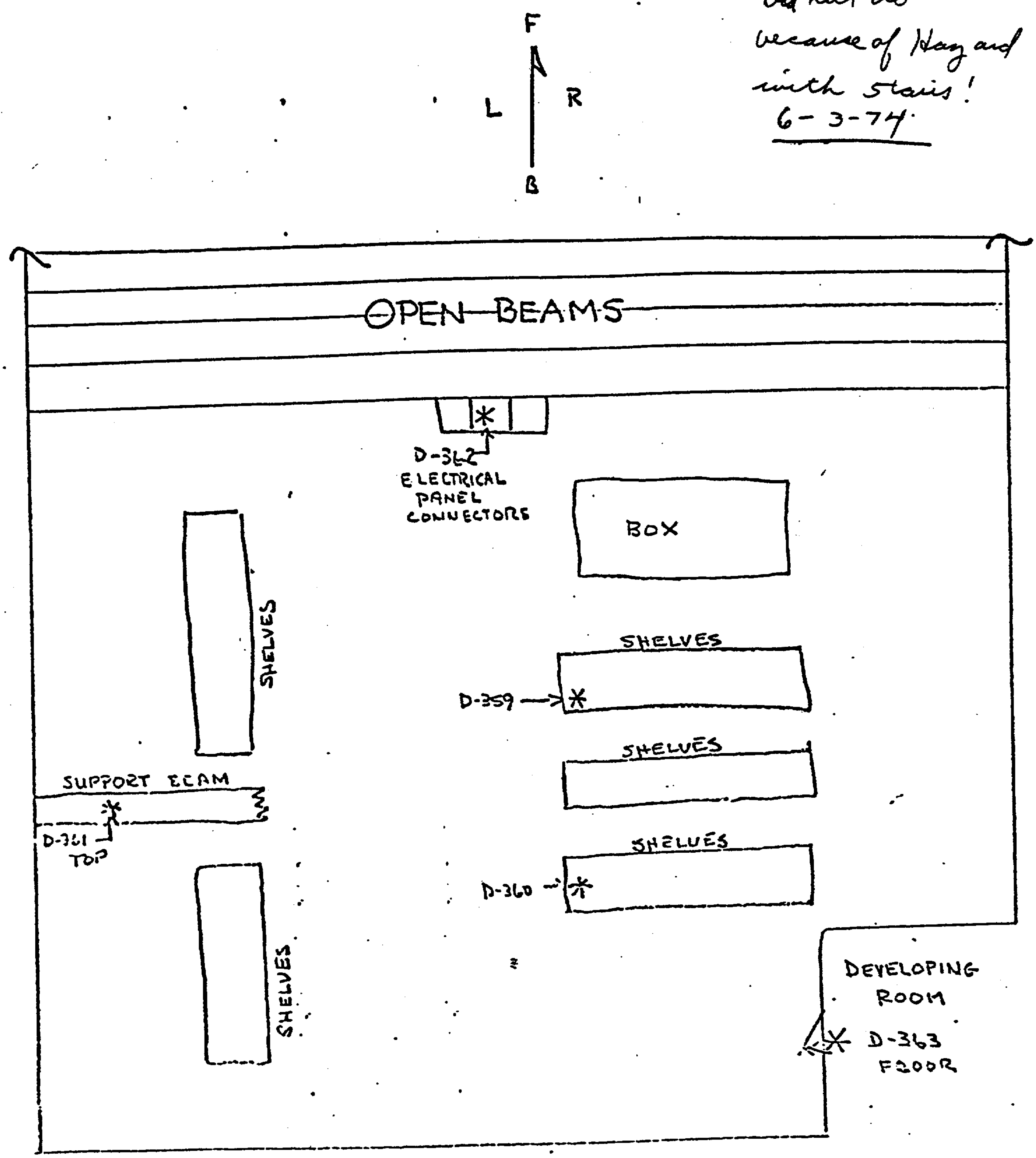
AREA 1-I
CONFERENCE ROOM #1
2ND. FLOOR, MAIN BLDG



AREA I-J
7-K BLENDING & STORAGE
2ND LEVEL, MAIN BLD

#10

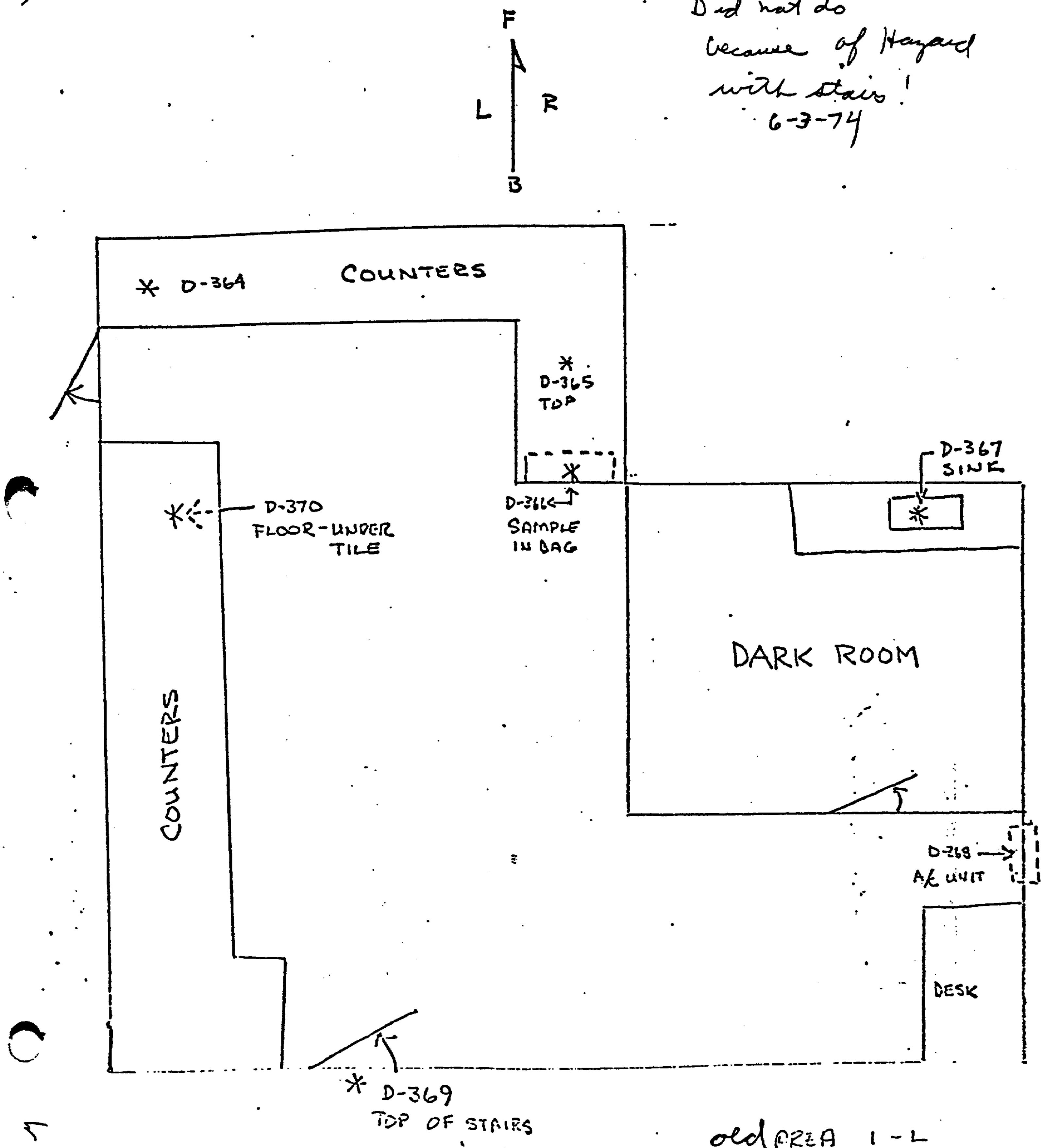
Did not do because of Hazard with stairs! 6-3-74



GENERAL AREA
7,0 - 12,5 K CFM

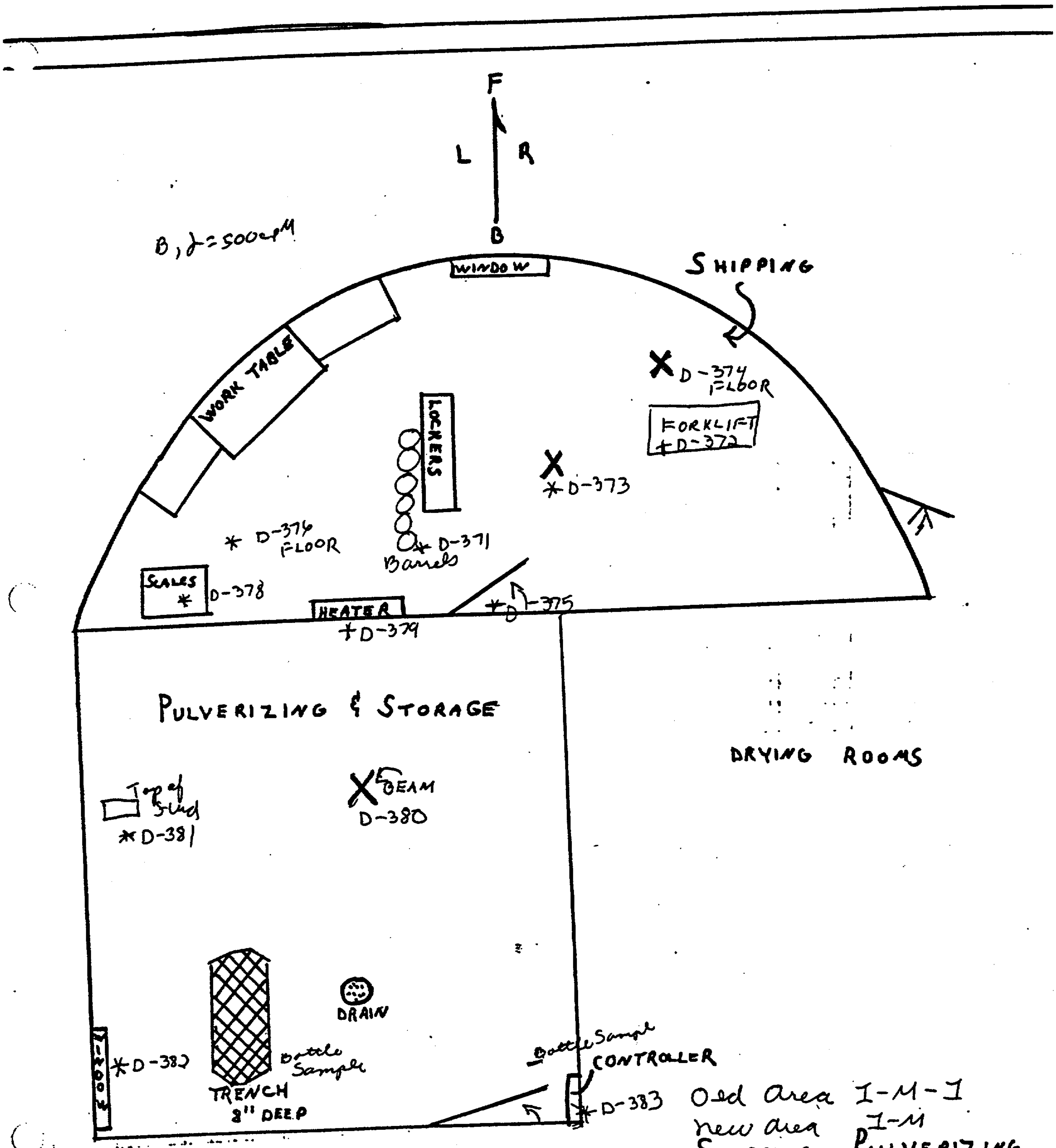
old AREA # 1-K

Did not do
because of Hazard
with stairs!
6-3-74

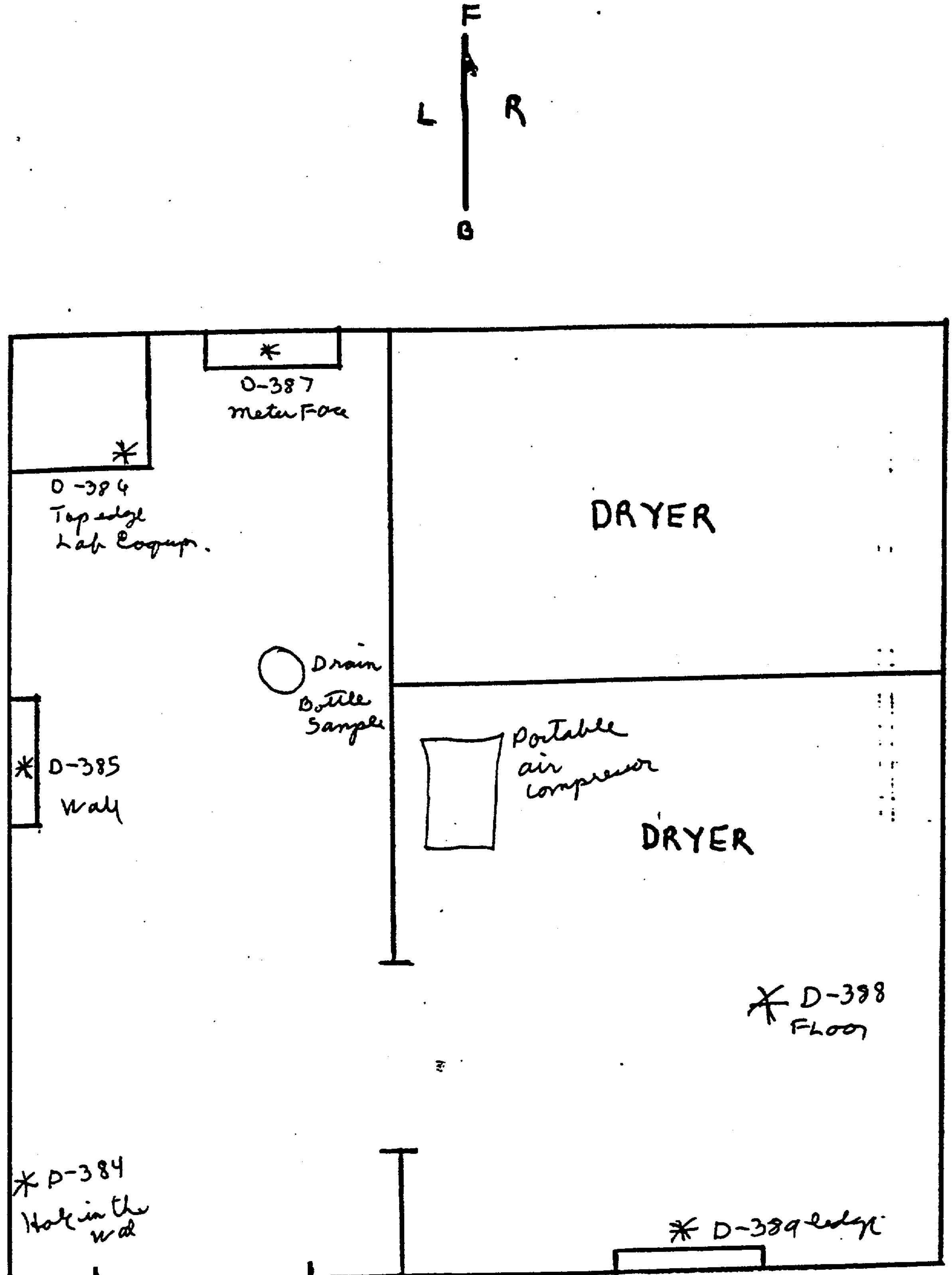


old AREA 1-L
DARK & DEVELOPING RM.

MM

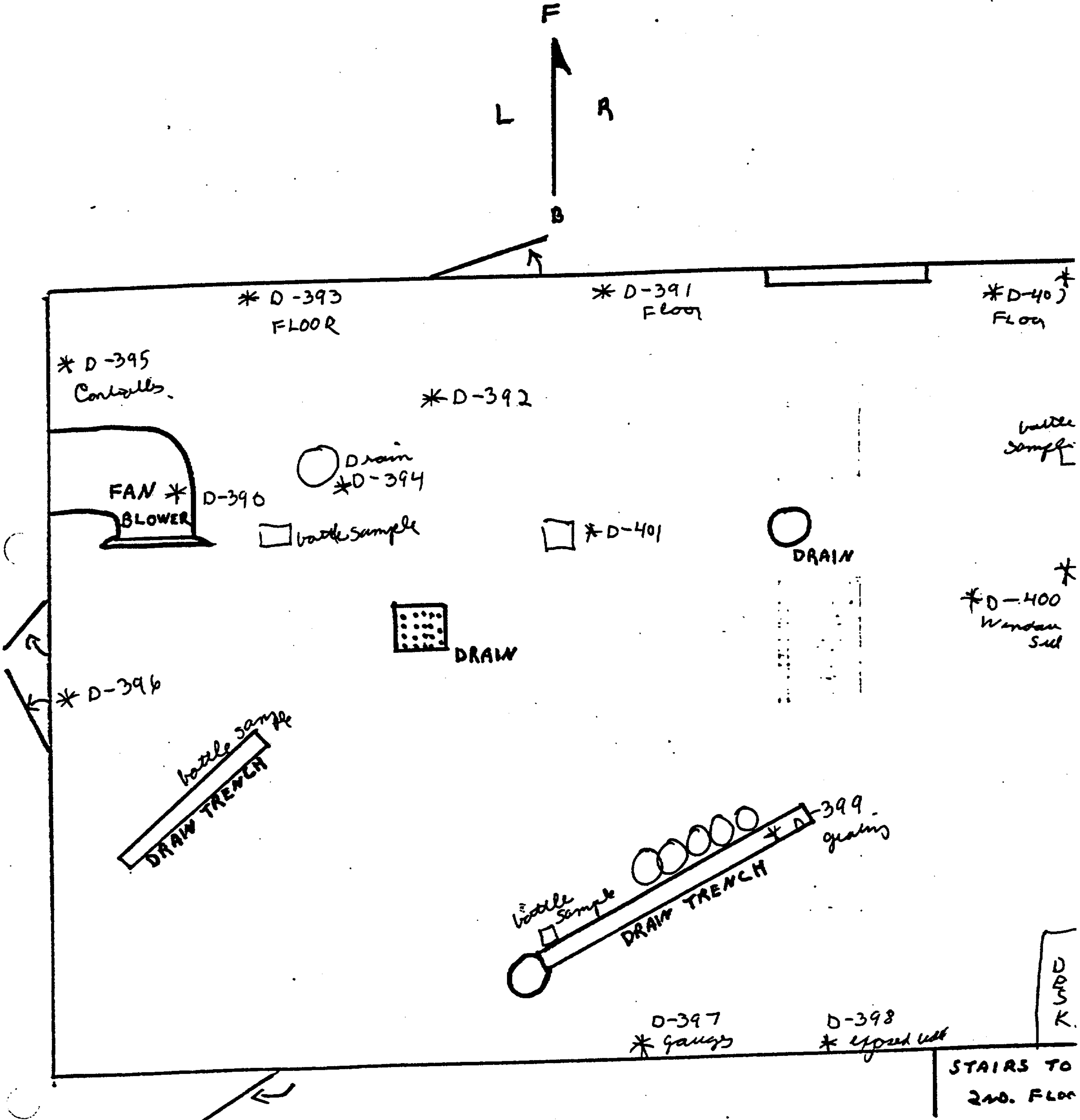


Old area I-M-I
new area I-M
SHIPPING, PULVERIZING
CERIUM OXIDE STORAGE
1ST FLOOR, MAIN BLDG.

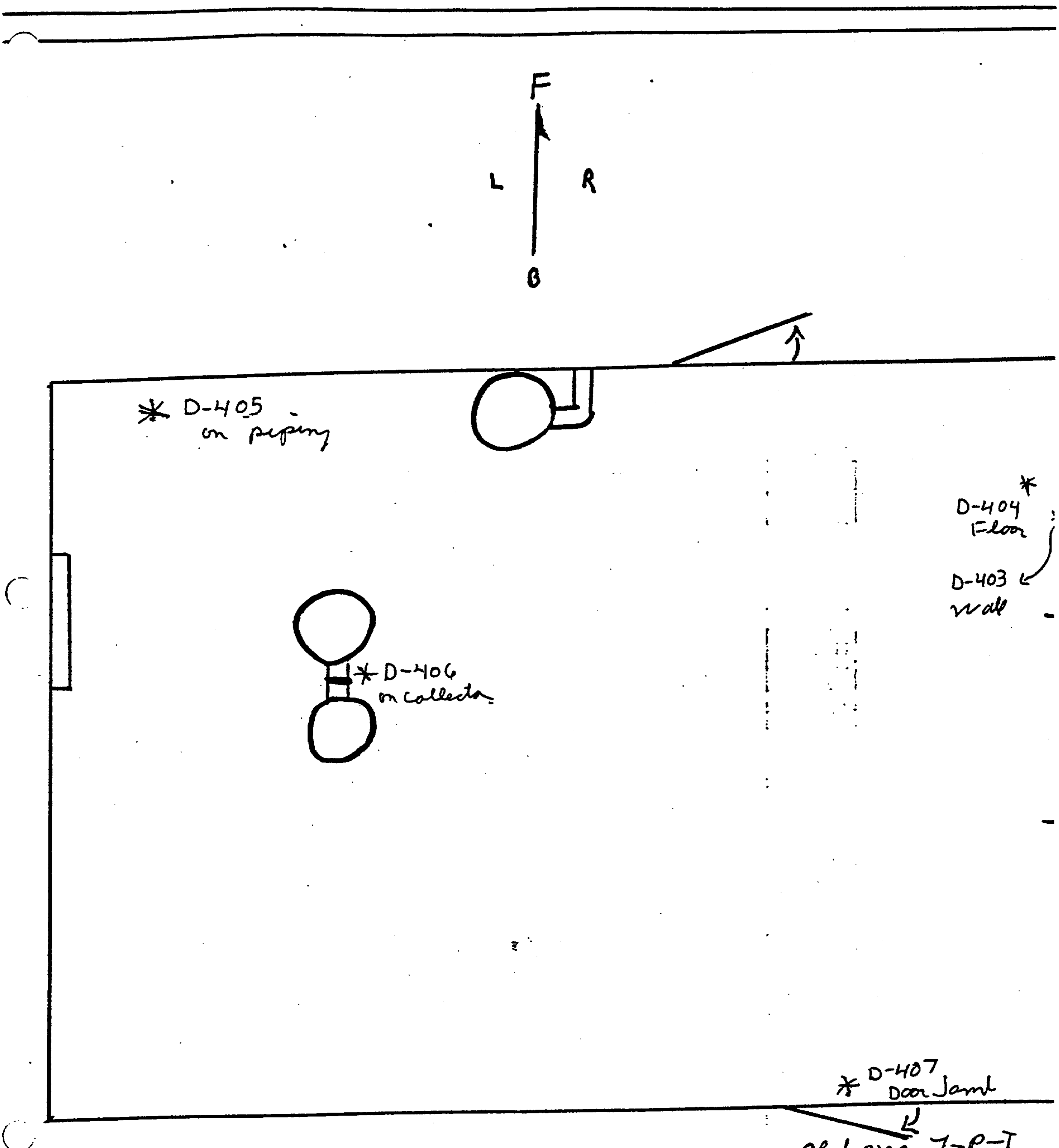


old area 1-N-1
new area 1-N
DRYING ROOMS

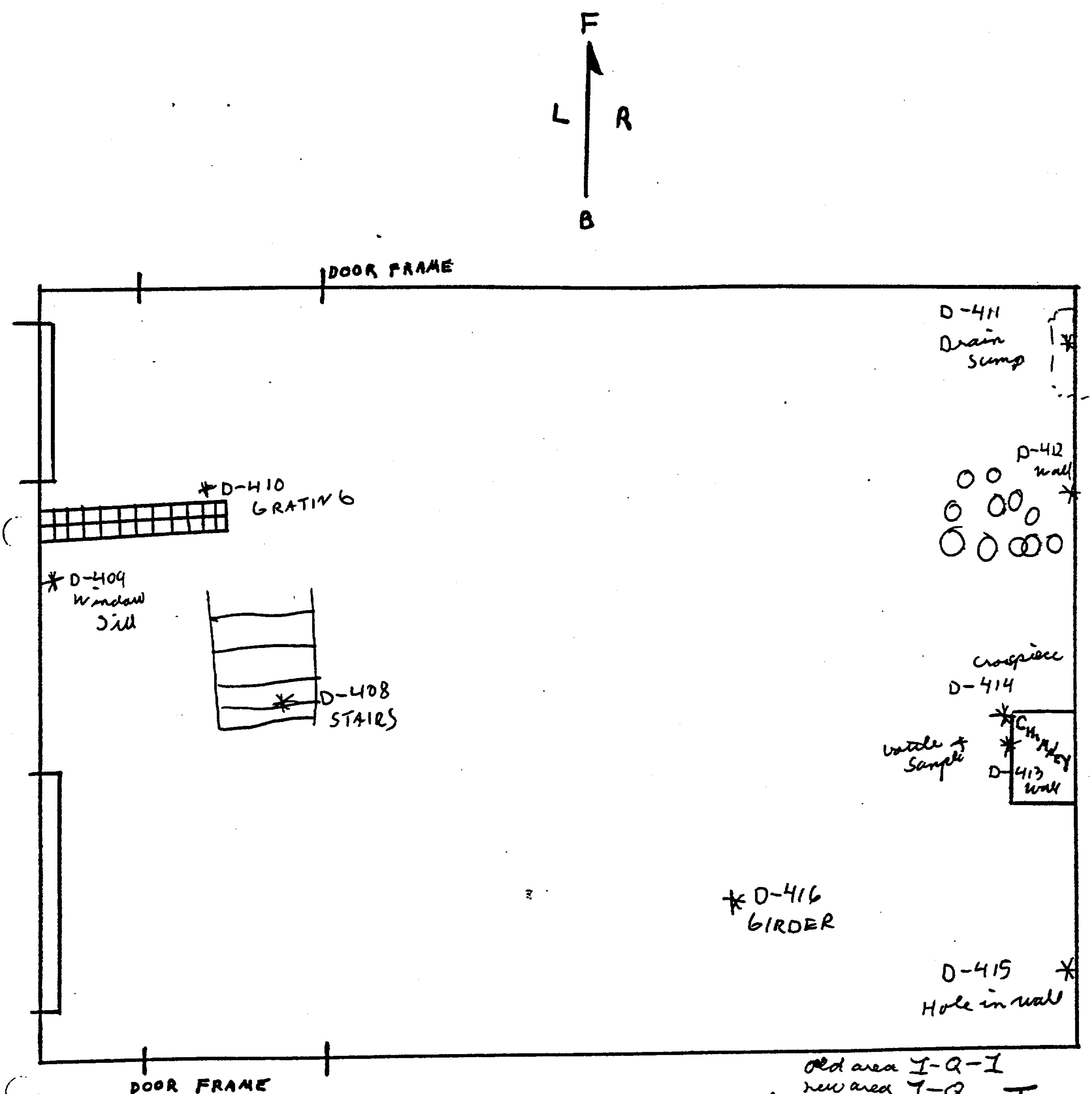
1ST FLOOR MAIN BLDG.



old area I-0-I
new area I-0
FURNACE & PRESS ROOM
1st Floor. Main Bldg.

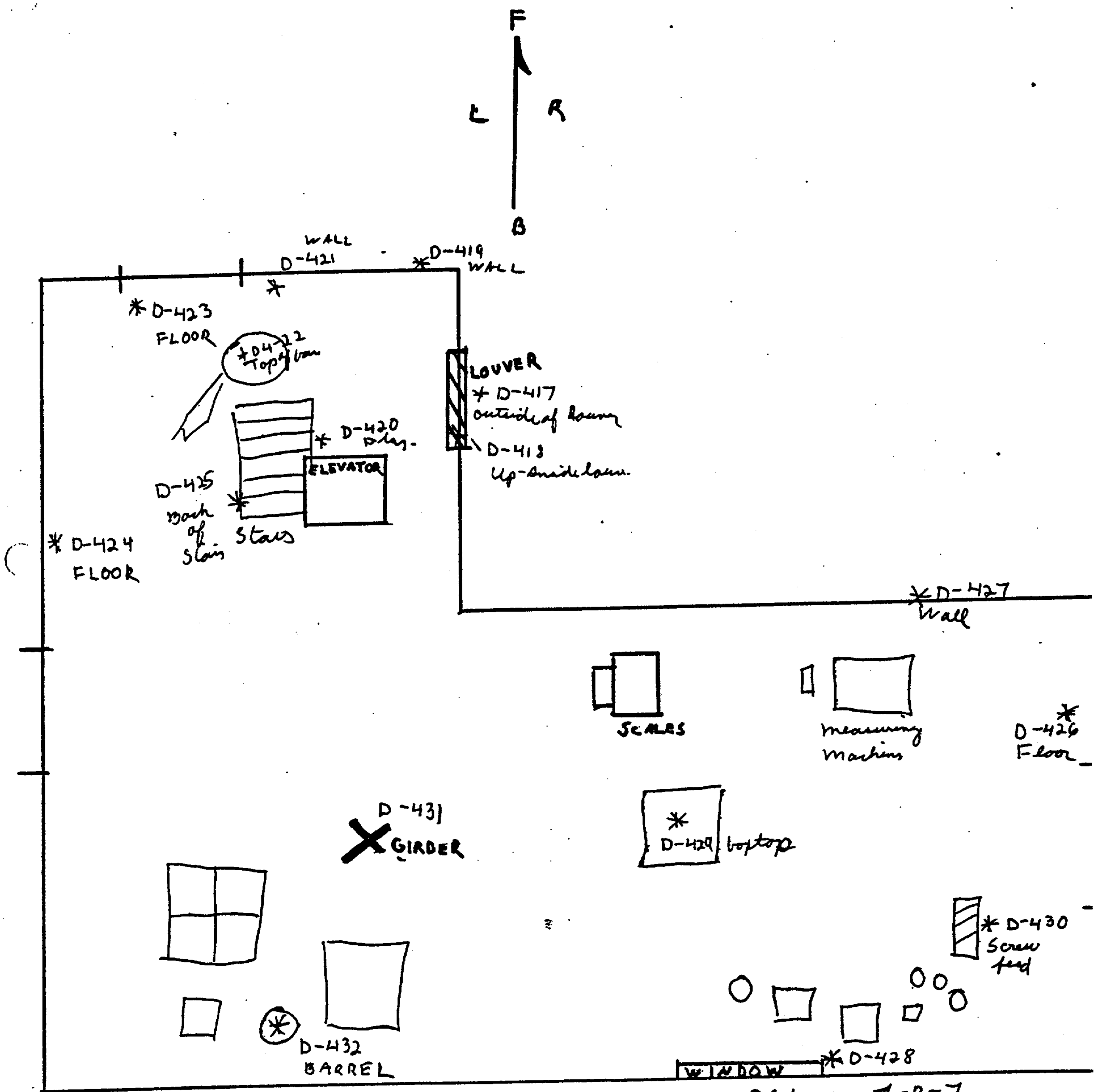


SHARPLES COLLECTOR RO
1ST FLOOR, MAIN BL



1 & 2 SULFONATION TANK ROOMS

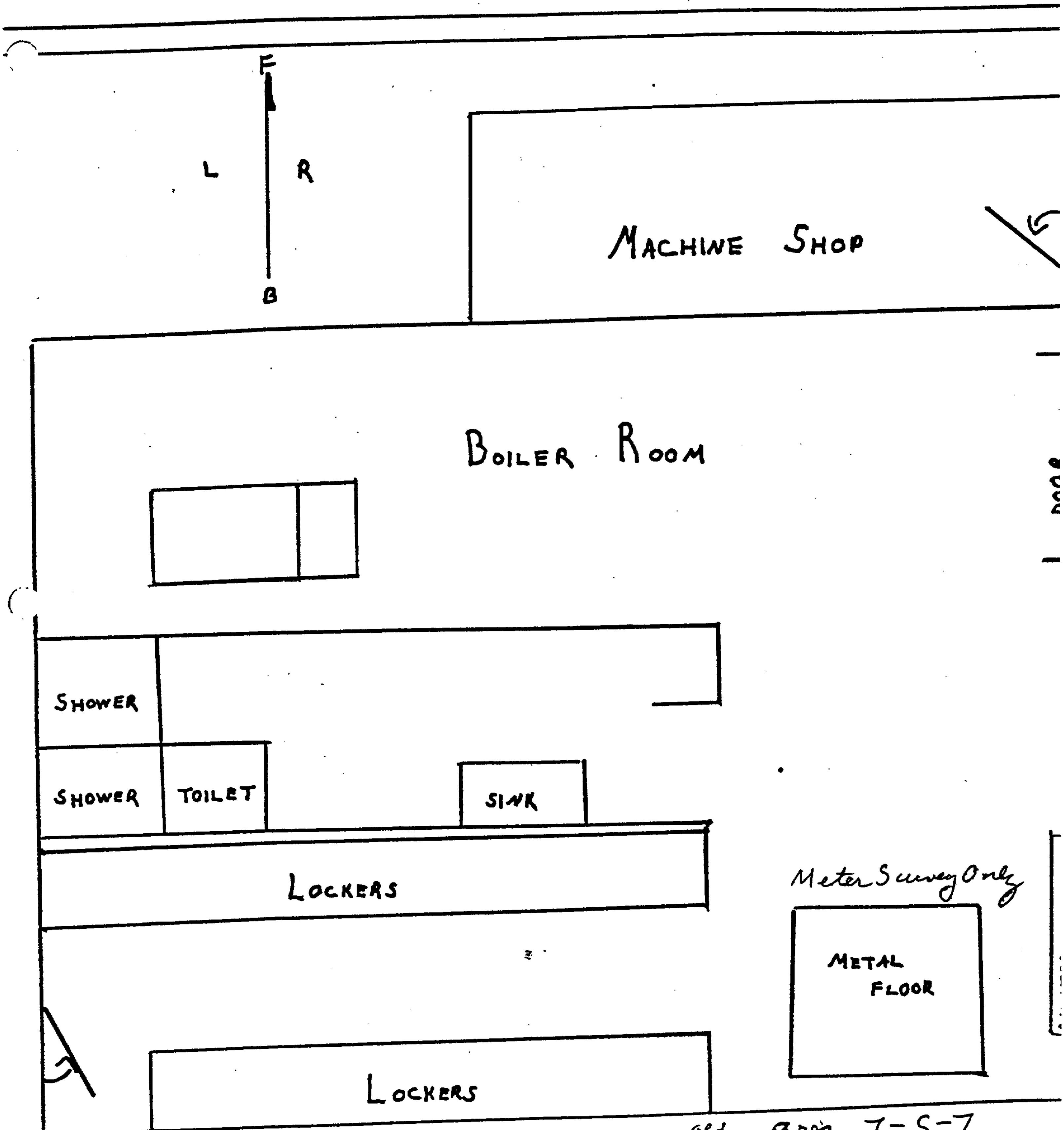
FIRST FLOOR, MAIN B



old area 1-R-1
new area 1-R

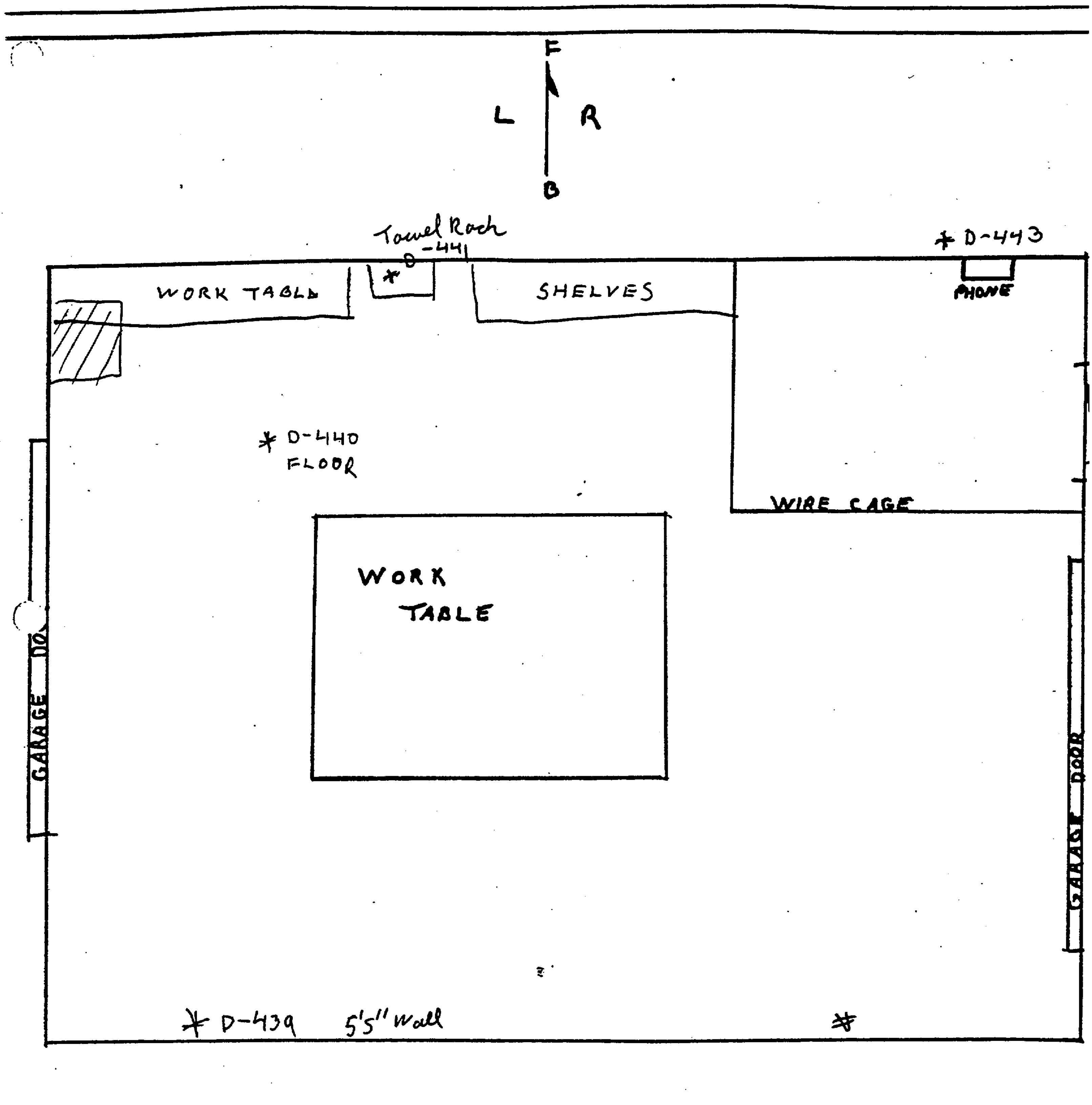
7-K BASTACITE ROOM

1ST LEVEL, MAIN BLDG.

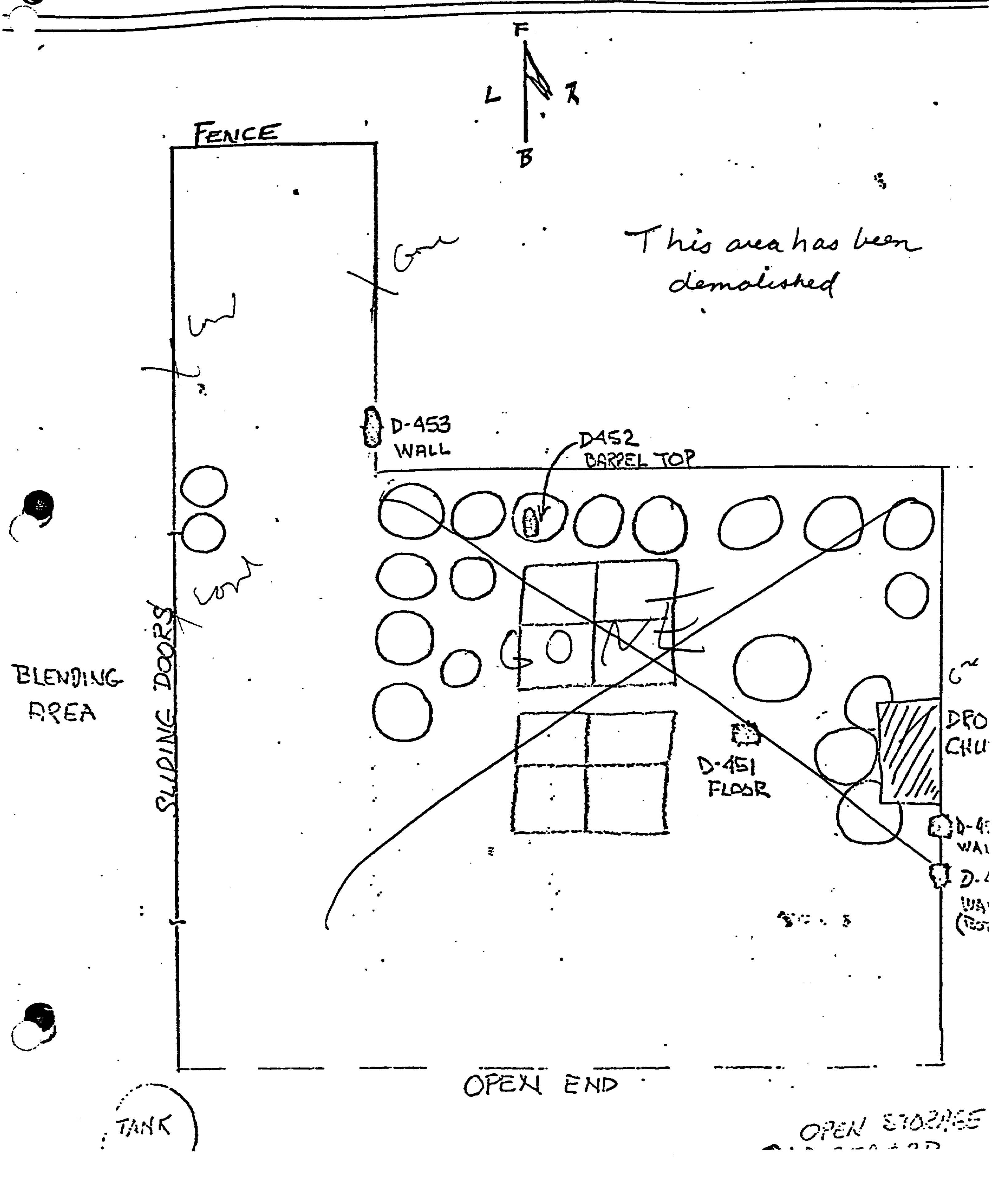


old area I-S-7
new area I-S[illegible]
LOCKER & BOILER ROOM

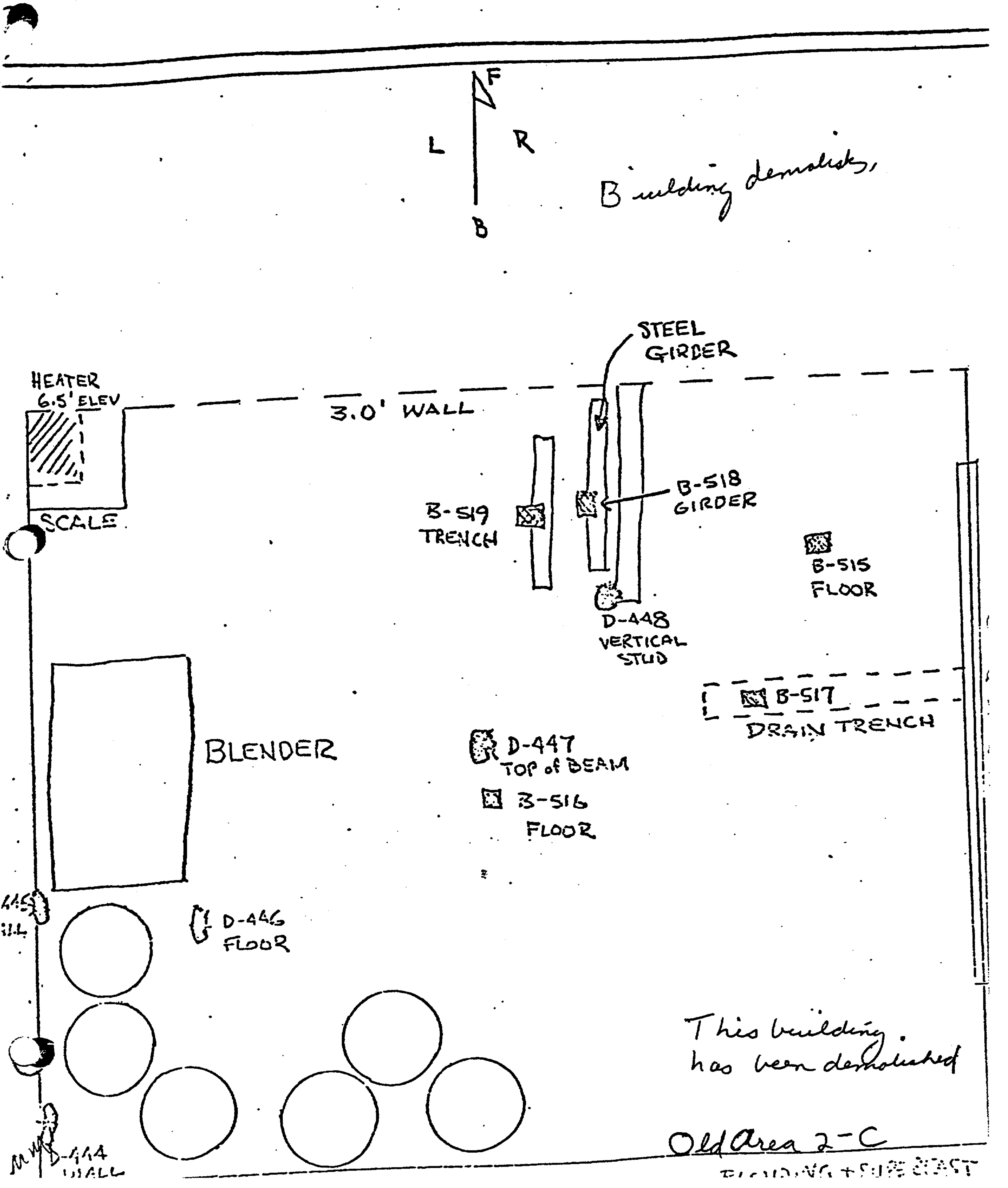
MACHINE SHOP
1ST. FLOOR, MAIN BLD

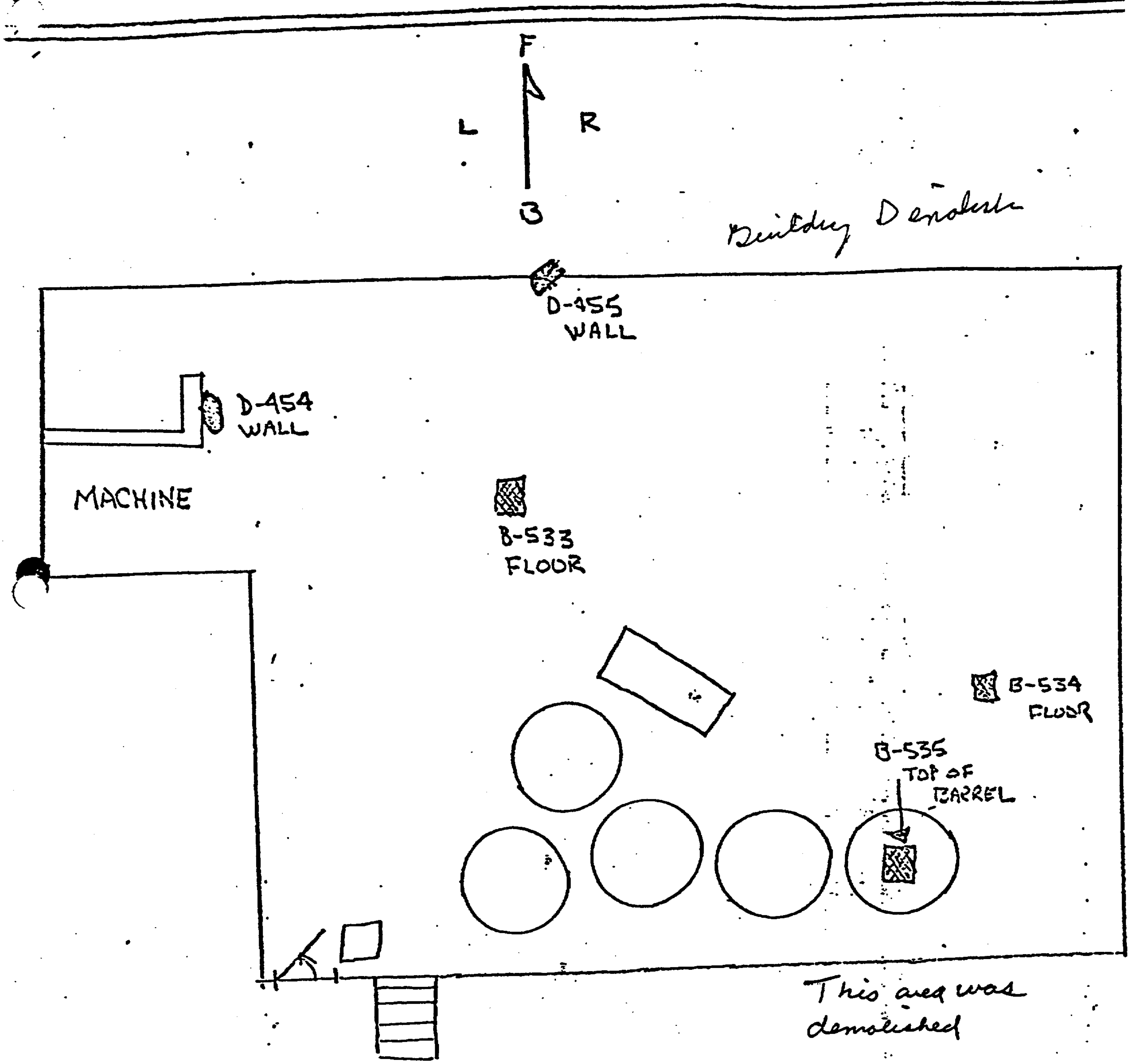


AREA 2-A
WORKSHOP BUILDING



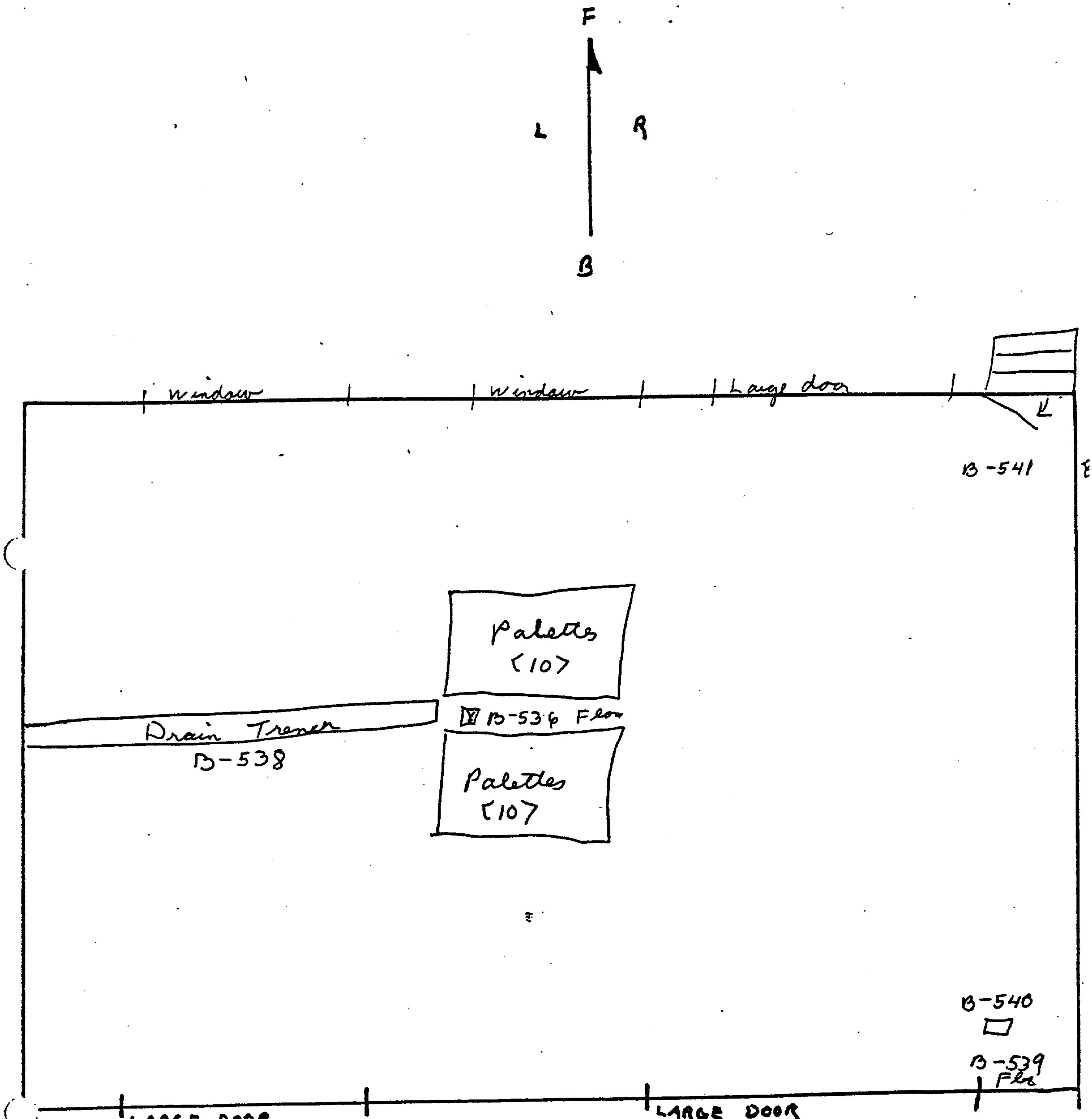
F
L
R
B
FENCE
This area has been demolished
D-453
WALL
D452
BARREL TOP
GONE
BLENDING
AREA
SLIDING DOORS
D-451
FLOOR
OPEN END
TANK
OPEN STORAGE


F
L
R
B
Building demolished,
STEEL GIRDER
HEATER 6.5' ELEV
3.0' WALL
SCALE
B-519 TRENCH
B-518 GIRDER
B-515 FLOOR
D-448 VERTICAL STUD
B-517
DRAIN TRENCH
BLENDER
D-447 TOP of BEAM
B-516 FLOOR
D-446 FLOOR
This building has been demolished
Old Area 2-C



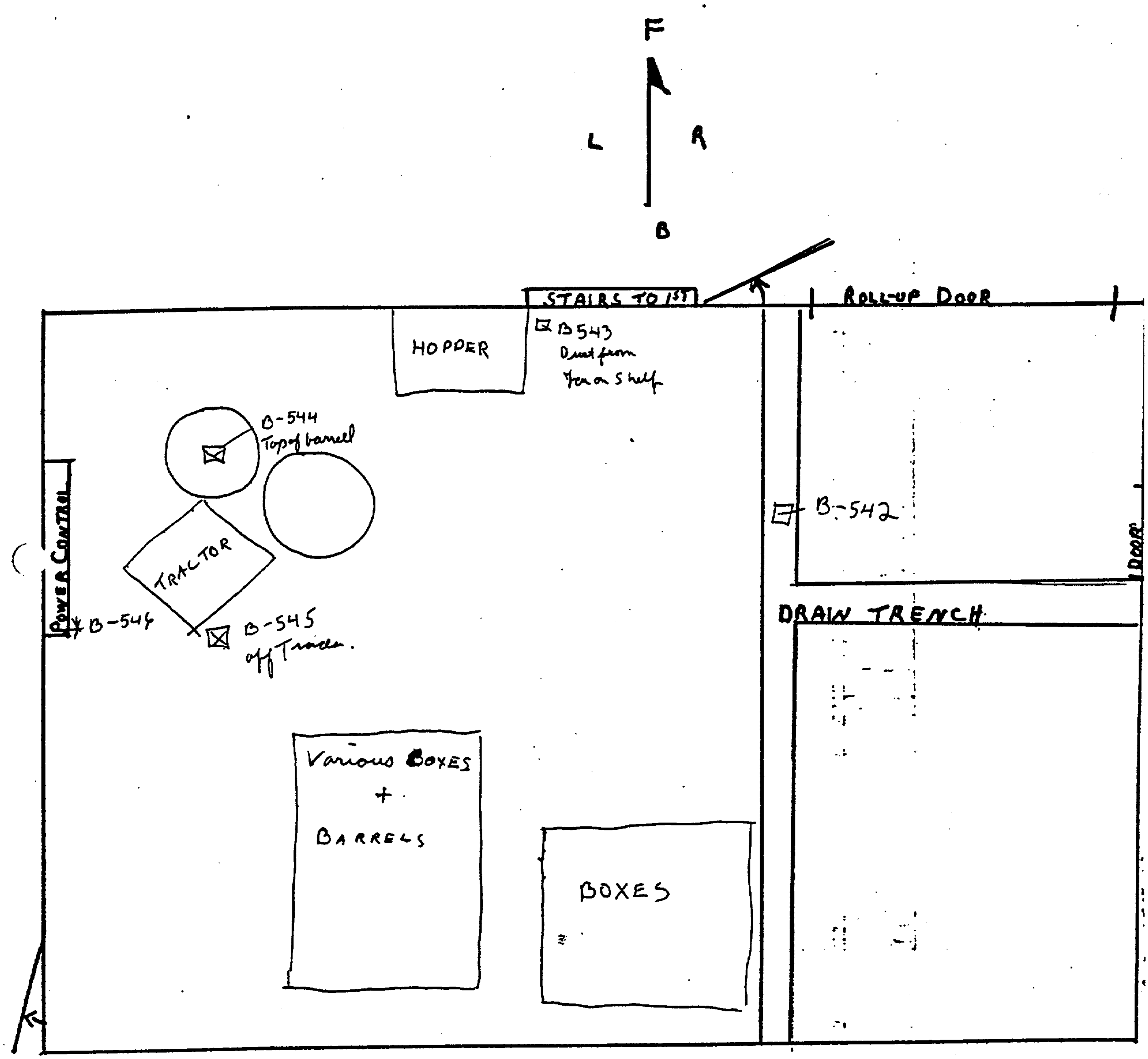
Old area #2-D

STORAGE AREA



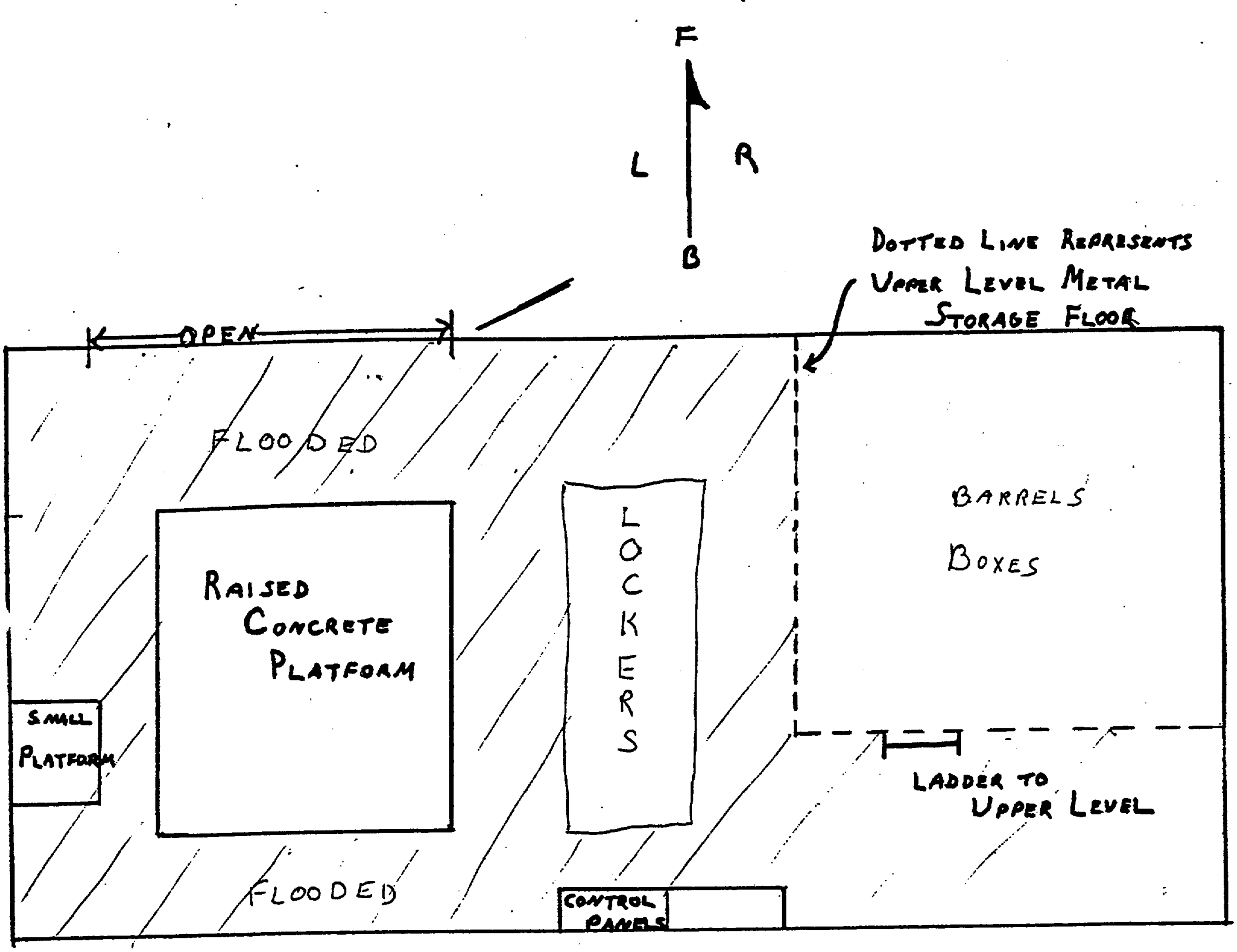
Area-2E
ELECTRONUCLEONICS
STORAGE

LEFT OF BALL MILL



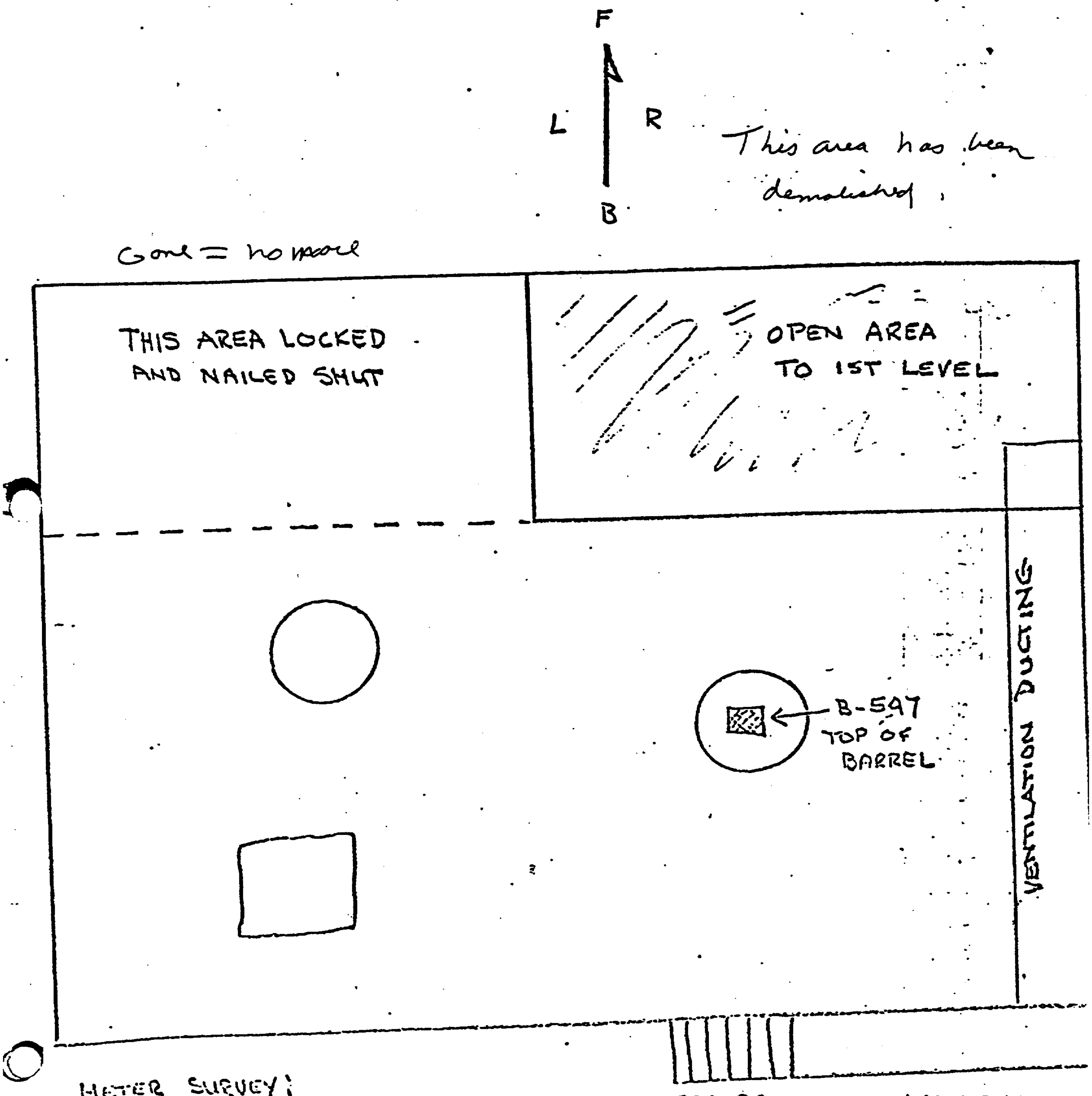
OLD AREA 2F
NEW AREA 2-C

BALL MILL
2ND LEVEL STOR



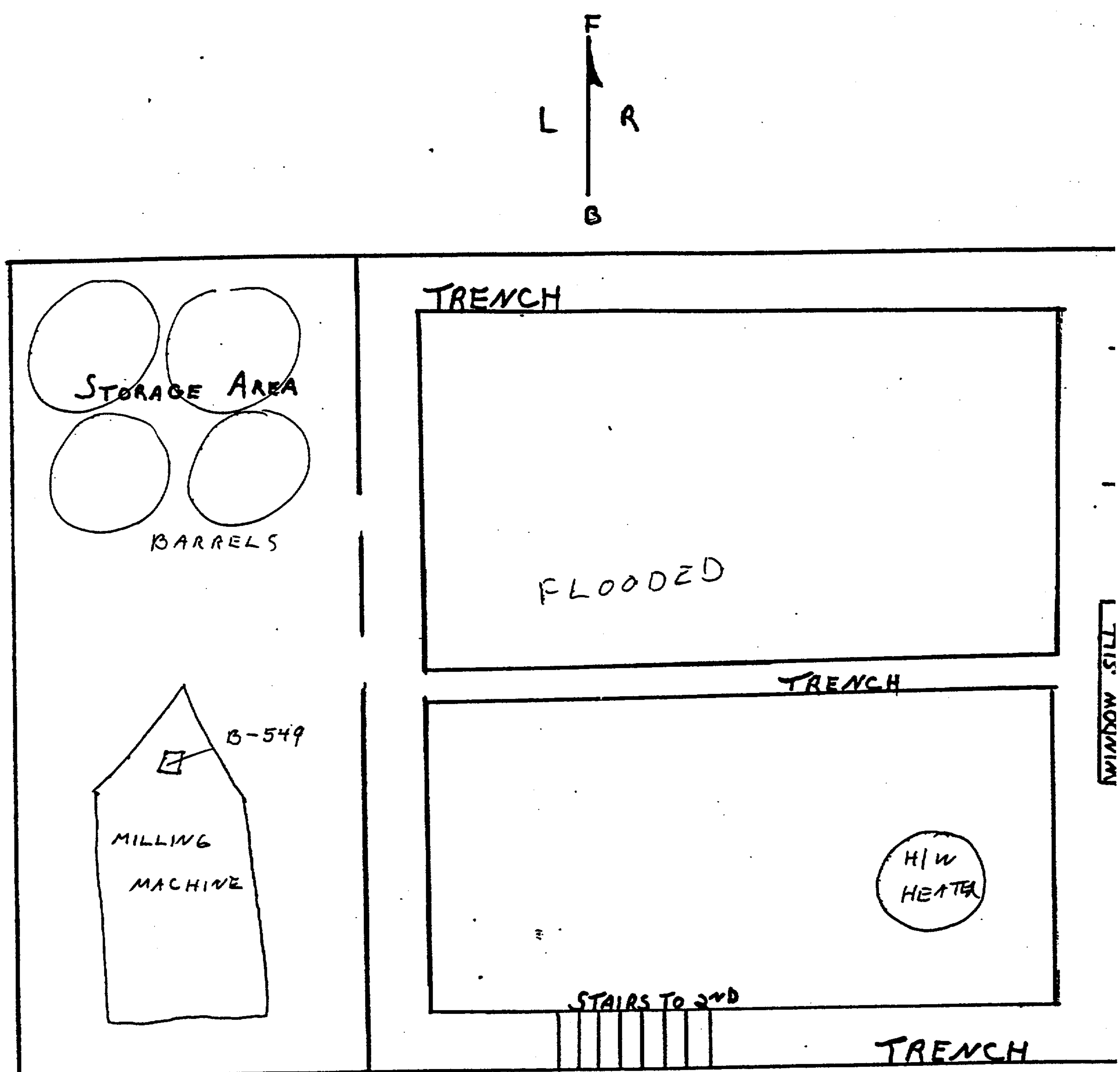
OLD AREA 2-G
NEW (LEVEL) 2-D
AREA

COMPRESSOR ROOM



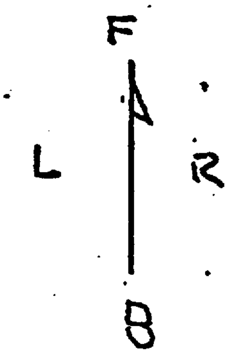
METER SURVEY:
10-15 K CPM β,γ
400 CPM α

#2
Ball Mill
2nd Floor

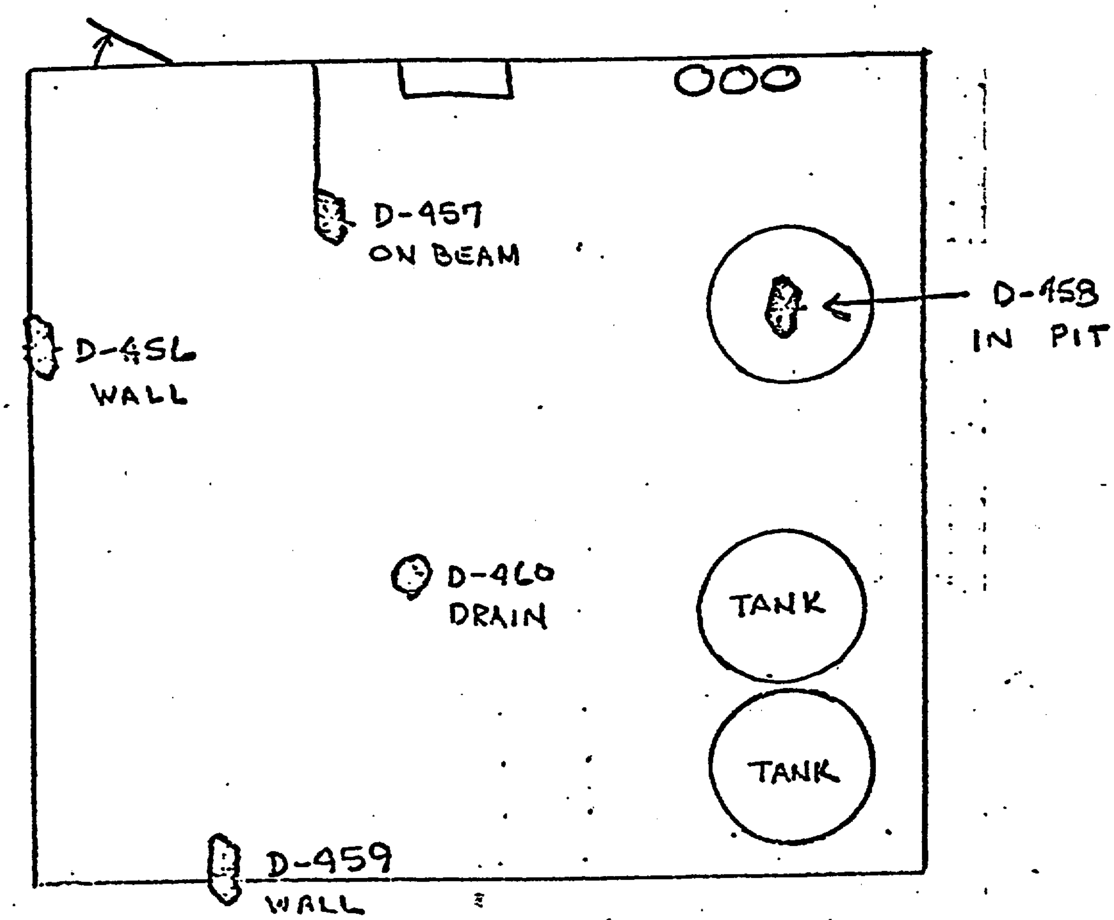


OLD AREA 2-I
NEW AREA 2-C

BALL MILL
LOWER OPERATIO.

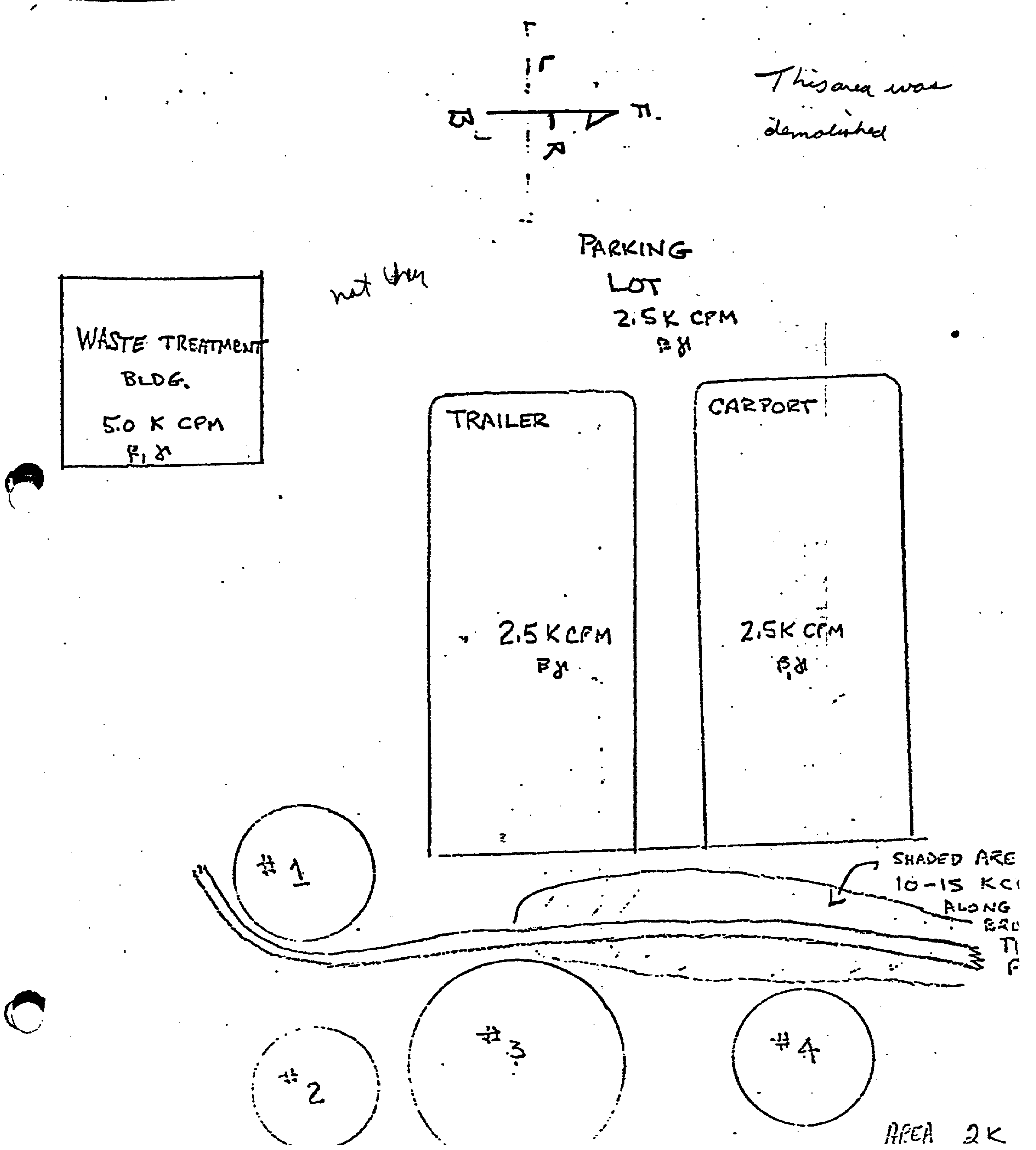


This area has been demolished



AREA-2J

WASTE TREATMENT PLANT
AREA 2-J



This area was demolished
PARKING
LOT
2.5K CPM
β γ
not this
WASTE TREATMENT
BLDG.
5.0 K CPM
β, γ
TRAILER
2.5 K CPM
β γ
CARPORT
2.5K CPM
β, γ
SHADED ARE
10-15 KC
ALONG
#1
#2
#3
#4
AREA 2K

4-74

BKGD = 0.4

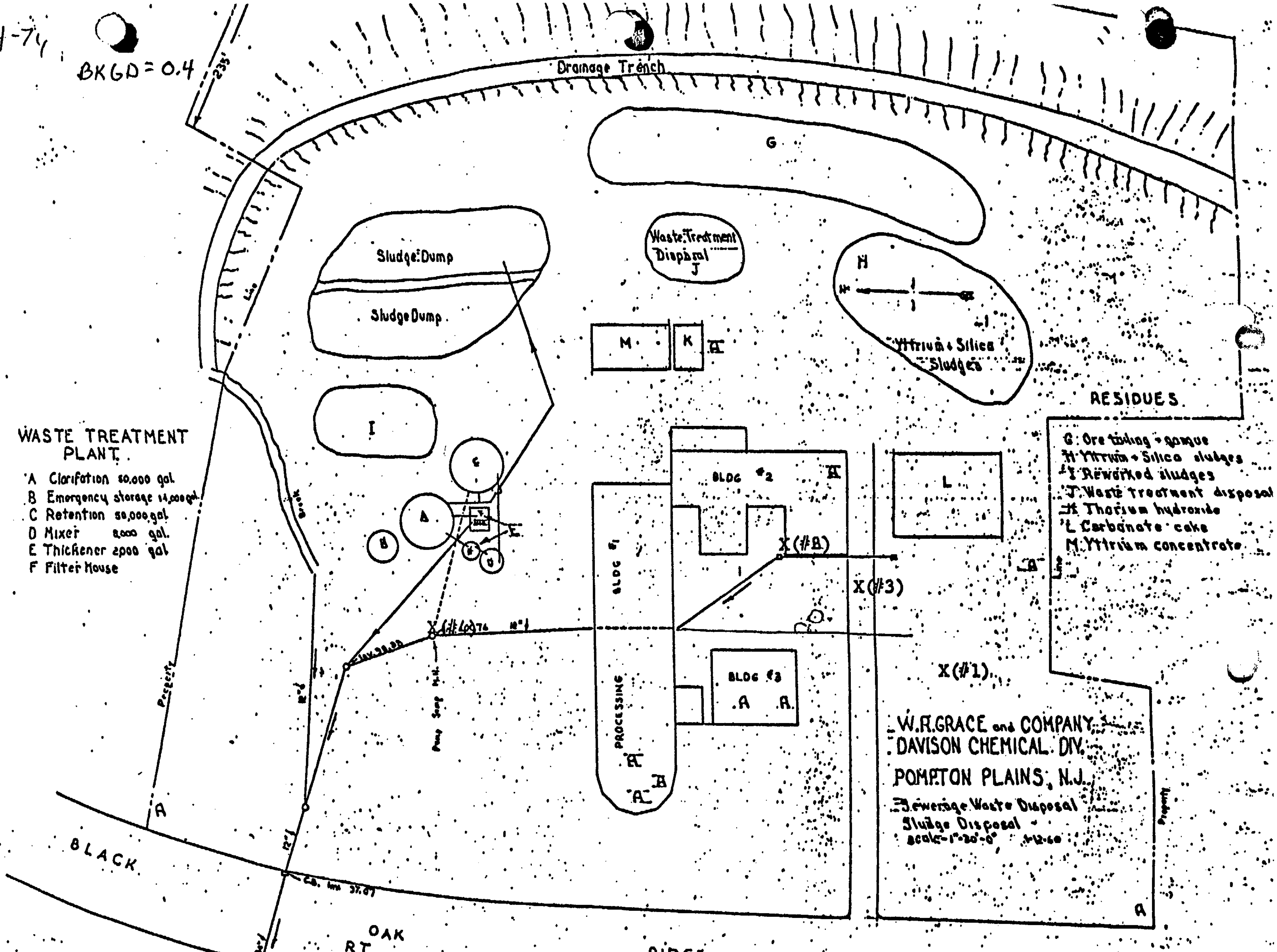


FIGURE 6

Site plan showing location of solid waste residues

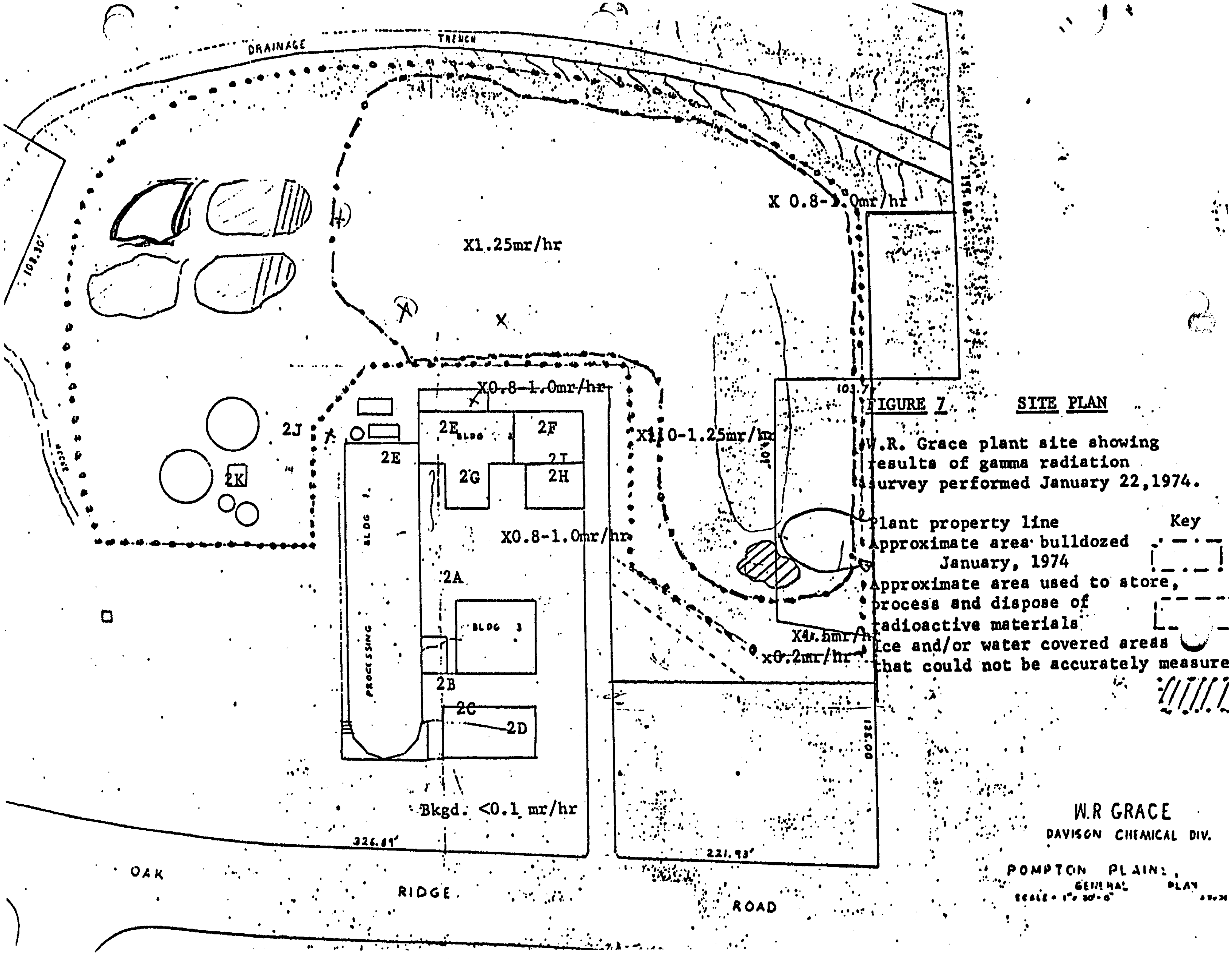


FIGURE 7. SITE PLAN

W.R. Grace plant site showing results of gamma radiation survey performed January 22,1974.

Key

Plant property line

Approximate area bulldozed January, 1974

Approximate area used to store, process and dispose of radioactive materials

Ice and/or water covered areas that could not be accurately measure

PART III

DECONTAMINATION

The various areas at the W. R. Grace Plant are described below in relation to what type of decontamination work was performed on them. The reference to the area, such as 1-A, is in keeping with the nomenclature found later in Part IV of this report. Mr. Stephen M. Sorensen of Applied Health Physics, Inc., supervised work at the site. Respiratory equipment was worn where necessary to insure proper health and safety protection of personnel. Air samples were periodically taken to determine air concentrations of natural thorium.

<u>W. R. Grace's Offices (1-A)</u> - These rooms were vacuumed cleaned of natural thorium with an X-100 absolute filter.

<u>Lab #1 (1-B)</u> - The following were removed from this room: muffle furnace, centrifuge, UF_6 cylinder and a stone. The lab was vacuumed, damp wiped with water, spray detergent and paper towels. The floor was damp mopped with detergent and water.

<u>Sample Preparation Room (1-C)</u> - This room was vacuumed, damp wiped and damp mopped.

<u>Hallway, Restrooms and Office (1-D)</u> - The water cooler in the hallway was removed. The area was then vacuumed, damp wiped and mopped.

<u>Grinding and Polishing Test Lab (1-E)</u> - This lab is still in use and was only vacuumed cleaned.

<u>Storage Level (1-F)</u> - Equipment was removed as part of the decontamination. The first layer of fiberboard flooring on the left side catwalk was removed. The walls, ceiling, and remaining floor were cleaned with a high pressure steam cleaner and detergent.

Press and Sulfonation Rooms (1-G) - The left front floor was removed as indicated on the diagram. Brickwork under the windows was removed. The area was completely steam cleaned and finished with a final high pressure washing.

Test Lab #2 (1-H) - A sink was removed after attempts to clean it failed. The room was damp washed, vacuumed, and wiped.

Conference Room #1 (1-I) - This room was vacuumed, damp wiped and mopped.

7-K Blending and Storage (1-J) - All equipment and furniture were removed from rooms on the right front side. Barrels and equipment were removed from the rest of the area. This area was cleaned with steam and high pressure water before a final wipedown.

Conference Room #2 (1-K) - This room was vacuumed, damp wiped and mopped.

Hallway (1-L) - This area was vacuumed and damp mopped. The stairs to the first level were steam cleaned.

Shipping, Pulverizing, Cerium Oxide Storage (1-M) - These rooms were vacuumed and the shipping room is still in use.

Drying Rooms (1-N) - A catch box from the upstairs labs was removed and buried, along with another box. These rooms were vacuumed cleaned and the hallway was washed.

Furnace and Press Room (1-O) - This room now contains electronucleonics equipment. Other equipment was removed as part of the decontamination. The drain trenches were dug out by hand and flushed with water. A fan blower and piping were removed and sent to South Pittsburg, Tennessee (a W. R. Grace facility). The shaded area on the diagram in Part IV shows where approximately 1/8 to 1/4 inch of concrete was removed with electric chisels. The walls and ceiling were steam cleaned. The floors were cleaned with high pressure water.

Sharples Collection Room (1-P) - Equipment was removed for cleaning, then replaced. The walls and floors were washed with high pressure water.

1&2 Sulfonation Tank Rooms (1-Q) - All equipment, the stairs, and two steel beam crosspieces were removed and buried. Concrete flooring in 7/8 of this area was removed to a level of 34 inches below the building footer. All drains going to the left outside of the area were enlarged with electric chisels. Brickwork on the left wall was removed to a height of 5.5 feet. Brickwork on the backwall was removed to a height of 10 feet. Brickwork on the chimney and backwall was removed up to the second level of the building. The front wall remains intact. The complete area was hydroblitzed after removal of debris. The floor was backfilled with clean soil for safety purposes. Demolition and cleaning in this room lasted approximately 3 weeks due to mashing of the sources of radioactivity.

7-K Bastacite Room (1-R) - All equipment was removed with the exception of the scale and screw feeds. Brickwork on the forward right wall was removed to a height of 3 feet with an electric chisel. Brickwork on the back left wall between the doors was removed to a height of 6 feet. The shaded areas on the diagram in Part IV show where 1/8 inch of concrete was removed with an electric chisel. The screw feed was completely dug out and hydroblitzed.

Locker and Boiler Rooms (1-S) - These rooms were washed with a hydroblitz and the boiler room was vacuum cleaned.

Workshop Building (2-A) - Shelves, a towel rack and cabinet were removed. This building was washed with a hydroblitz. Approximately 1/8 inch of concrete was removed as indicated in Part IV.

Ball-Mill (2-B) - All equipment was removed and anything was buried that was to be discarded by W. R. Grace. The drain trenches were dug and jack-

hammered to a depth of 2 feet. Shaded areas on the figure in Part IV indicate where concrete was chipped. The whole area was vacuumed and washed. Concrete on the wall below the rollup door on the front portion was removed with electric chisels.

Ball Mill (2-C) - All equipment and boxes were removed. The second level was completely taken out. Drain trenches were jackhammered to a depth of 2 feet and widened. All debris in this building was removed. The complete area was hydroblitzed.

Compressor Building (2-D) - Lockers, barrels, boxes, and equipment found in this area were removed. As indicated in Part IV, concrete in the shaded areas was removed a depth of 1/8 to 1/4 inch with electric chisels. The complete area was hydroblitzed.

Attic, Third level of Main Building - All debris, equipment, boxes, barrels, with the exception of metal shelving were removed. All areas were vacuumed clean and damp mopped.

Electronucleonic Storage - This area was jackhammered and hydroblitzed. Material found below the concrete floor was removed.

On-site Waste Disposal

W. R. Grace Company received permission to bury material disposed of in the decontamination onsite. The clearance granted by the State of New Jersey was for the burial to be in eight holes, each containing a maximum of no more than 997 pounds per hole. Figure I of Part III shows where the burial sites are located on the premises of W. R. Grace. All holes are 10 feet in diameter, 20 feet deep and spaced 6 feet apart. As part of burial, the holes are to be covered with 4 feet of topsoil. The tanks and waste treatment building on site were demolished and buried along with all debris and sludge resulting from the decontamination work.

Digging and filling of each hole proceeded as follows:

Hole #1 - dug and filled between April 22-26, 1974 by J. Baum, Inc. with 100 pounds of material.

Hole #2 - dug and filled between April 22-26, 1974 by V. Ottilio & Sons, Inc. with 75 pounds of material.

Hole #3 - dug and filled by V. Ottilio & Sons, Inc. between April 22-26, 1974 with 75 pounds of material.

Hole #4 - dug and filled on May 1, 1974 with 50 pounds of material by J. Baum, Inc.

Hole #5 - dug and filled by J. Baum, Inc. on May 21, 1974 with 500 pounds of material.

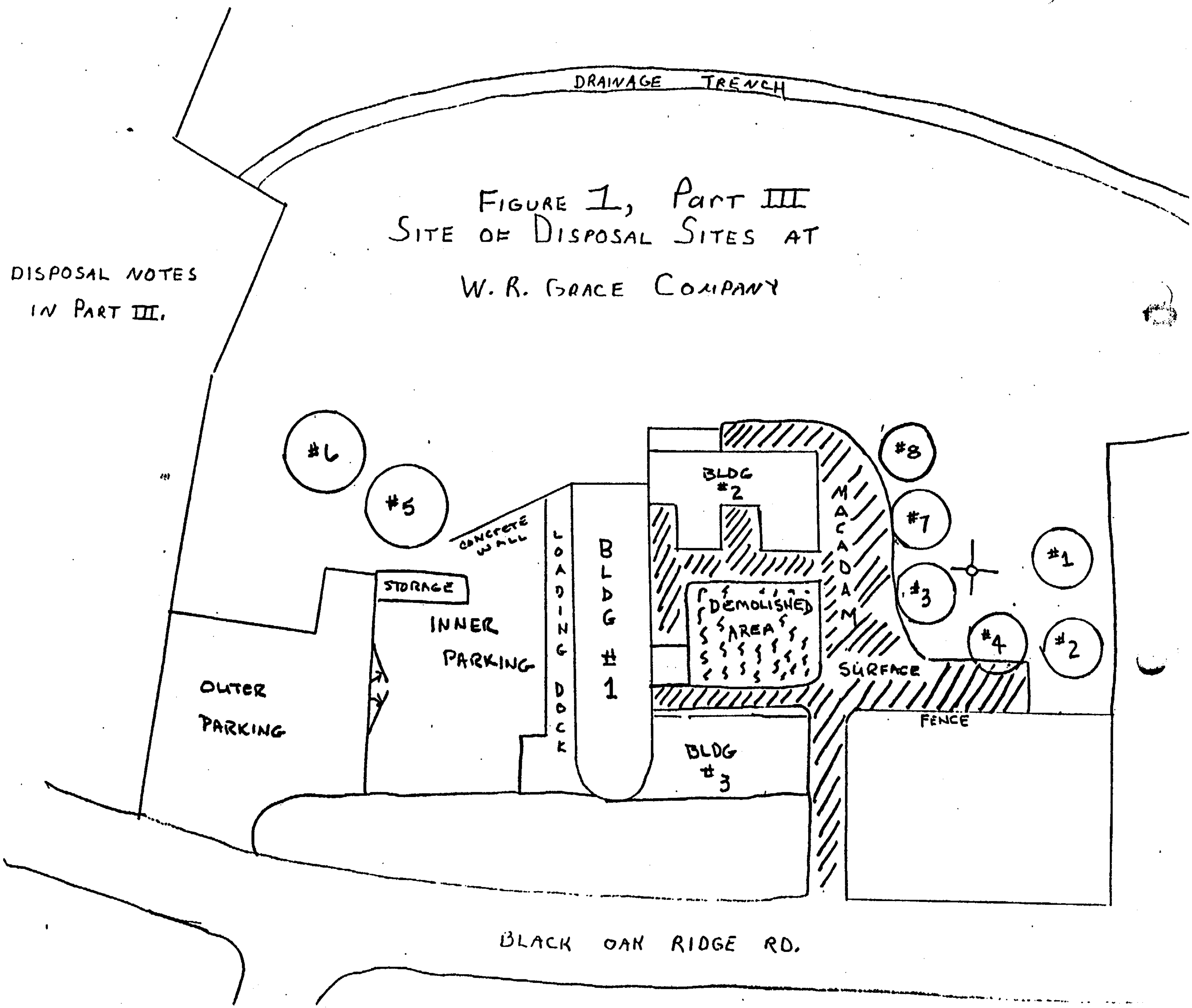
Hole #6 - dug and filled with 700 pounds of disposal material on May 22, 1974, by J. Baum, Inc.

Hole #7 - dug and filled June 1 through 10, 1974 by J. Baum, Inc. with 100 pounds of material.

Hole #8 - dug and filled June 10 through 28, 1974 by J. Baum, Inc. with 100 pounds of material.

FIGURE 1, PART III
SITE OF DISPOSAL SITES AT
W. R. GRACE COMPANY

WASTE DISPOSAL NOTES
LISTED IN PART III.



PART IV

Radiation Survey after Decontamination

On June 3 through 5 and on June 27, 1974 a final radiation survey was performed following decontamination of the W. R. Grace Company plant site at Wayne, New Jersey. The main building, three of the smaller areas, and part of the grounds were ready for inspection by Applied Health Physics, Inc. personnel. Decontamination was still in progress, due to unforeseen developments. This survey was completed on June 27, 1974 when all work was finished. Certain areas found to contain radioactive materials were resurveyed after further cleaning. These "hot" areas, noted both on Table 1 and certain parts of Figure 1 were cleaned and are now found to be within acceptable limits.

Some of the buildings surveyed prior to decontamination were torn down entirely; this is the result of heavy non-removable thorium-bearing material depositions and ground depositions. The demolished structures are: blending and superfast furnace, open storage, storage off blending area, waste treatment plant, and ball-mill 2nd floor operation. In addition, holding tanks and a trailer were removed. One area which could not be surveyed was the third level of the main building. Part of the stairs and landing were removed, which posed a safe access problem. A survey in this area was not critical since the survey prior to decontamination (Part II of this report) showed that radiation and contamination levels were within acceptable limits. The buildings and grounds were monitored with a beta-gamma GM survey meter (Victoreen Model 491; Probe Model 491). All readings were taken at a distance of 1 centimeter from the cleansed surfaces. Background levels were in the range of 0.05 to 0.1 mr/hr inside the buildings and 0.1 to 0.4 mr/hr

outdoors on site.

Smear samples were taken to evaluate removable alpha contamination. These were counted on-site and at the office of Applied Health Physics, Inc., Bethel Park, Pa. with a windowless gas-flow proportional counter (NMC, Model PC-3A). Analysis of these smears appears in Appendix B of Part IV.

The location of the smears and meter readings are located on each individual room diagram, which are collectively known as Figure 1. These results are then summarized in Table I.

Survey Results

On June 3-5, 1974, the beta-gamma radiation levels of the decontaminated surfaces were around the average level of 0.2 mr/hr set for building surfaces and equipment. The places reading 0.8 mr/hr or greater were noted in this report, and the information was relayed to the field supervisor for further decontamination work. The survey conducted on June 27, 1974 showed that the radiation levels in these areas, after cleaning, gave readings of 0.2 mr/hr or less. These corrected readings are in parentheses in Figure 1.

Of the smear samples, the highest found was 107 $\pm$ 7.4 dpm/100 cm^2 in the workshop area. This June 4, 1974 result is approximately a factor of ten below the accepted limits for removable alpha radioactivity as found in Appendix A. All of the smears are far below this limit of 1,000 dpm/100 cm^2 set for removable alpha activity.

The results of the property survey taken on June 24, 1974 are contained in Figure II. It should be realized that a covering of soil is still needed on some parts of the site in order for this work to be considered finished. A survey is therefore needed when this work is done.

Conclusion

From the results of the decontamination survey, the property is ready for unlimited occupancy, with the exception of some work that is incomplete outdoors. After this work is done, a survey undertaken by Applied Health Physics, Inc., personnel should verify that this property meets all the requirements set forth by the State of New Jersey and the United States Atomic Energy Commission for release of decontaminated facilities.

ADDENDUM

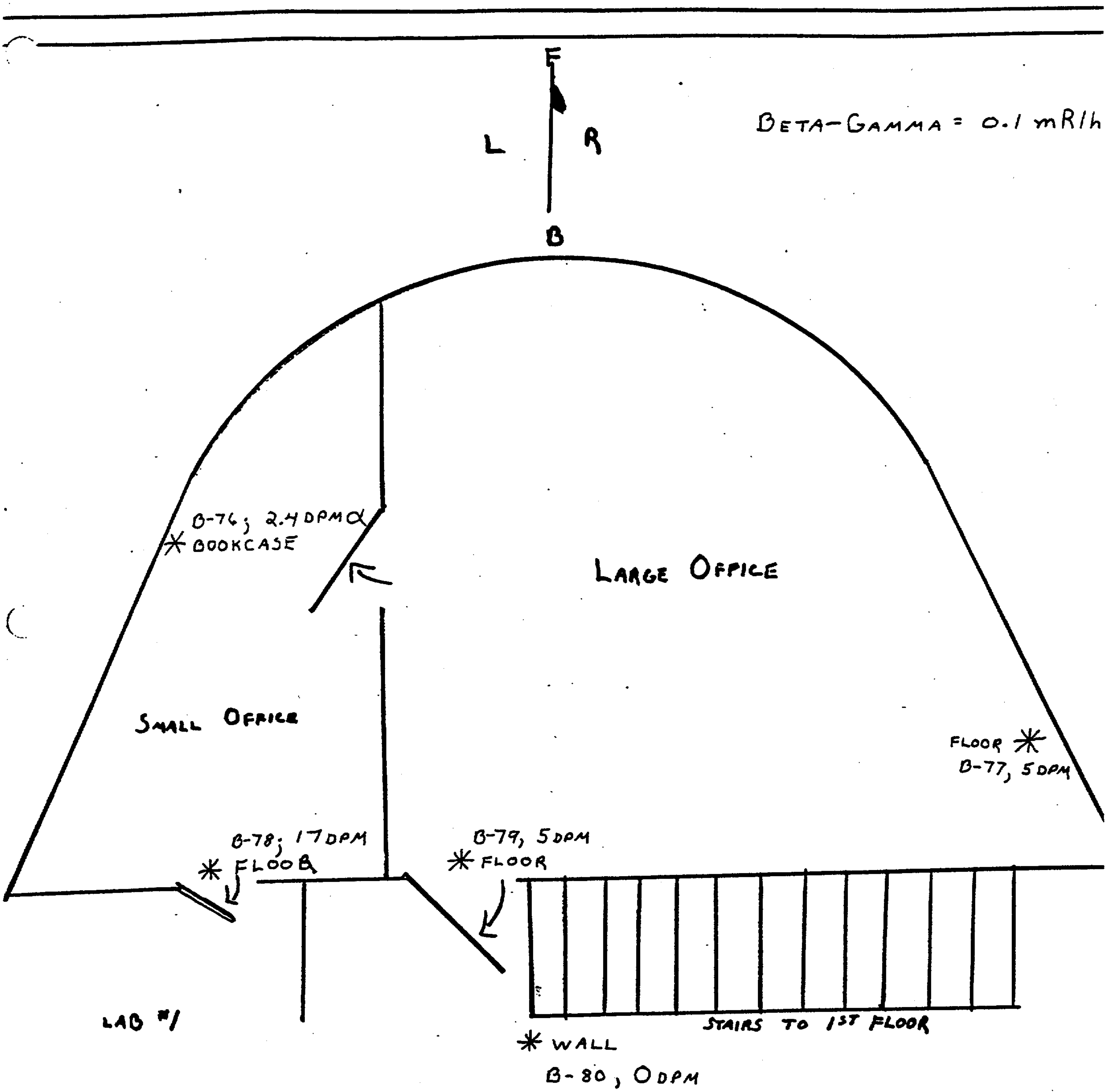
On July 18, 1974, the grounds were surveyed after all soil was put in place over the burial sites and smoothed. Figure III shows the results of this survey. The W. R. Grace Co. property now is within the radioactivity contamination limits set forth by the United States Atomic Energy Commission and the State of New Jersey.

FIGURE 1

Key to Following Diagrams:

*= Location of smear sample e.g.;
B-78 is the sample number
17 DPM is the removable alpha
DPM/100 CM^2.

Meter reading of the room is in the upper right corner, except for "hot" spots as indicated.

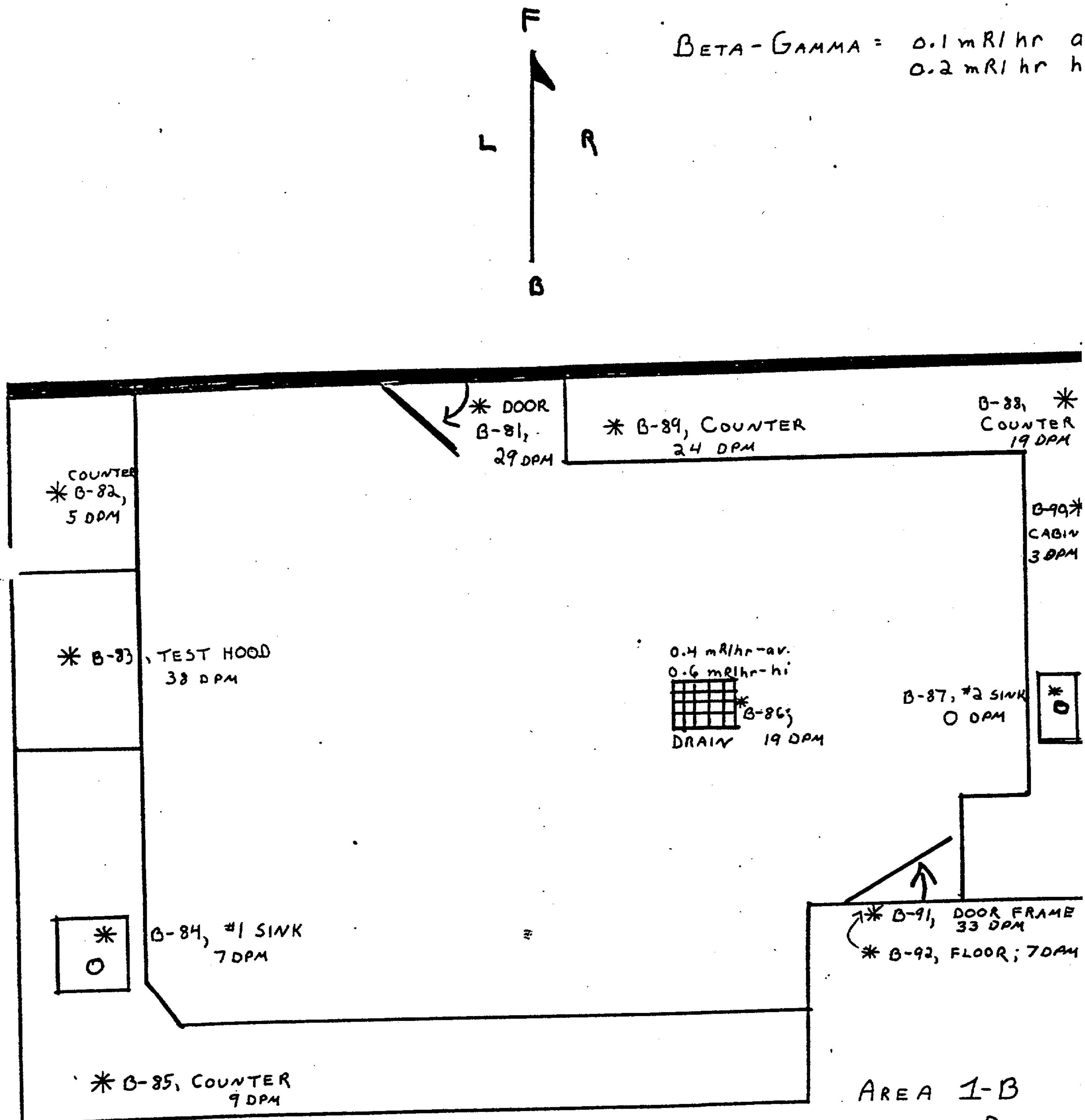


AREA 1-A

AFTER DECON.

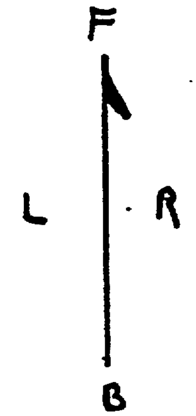
OFFICES
2ND. FLOOR, MAIN

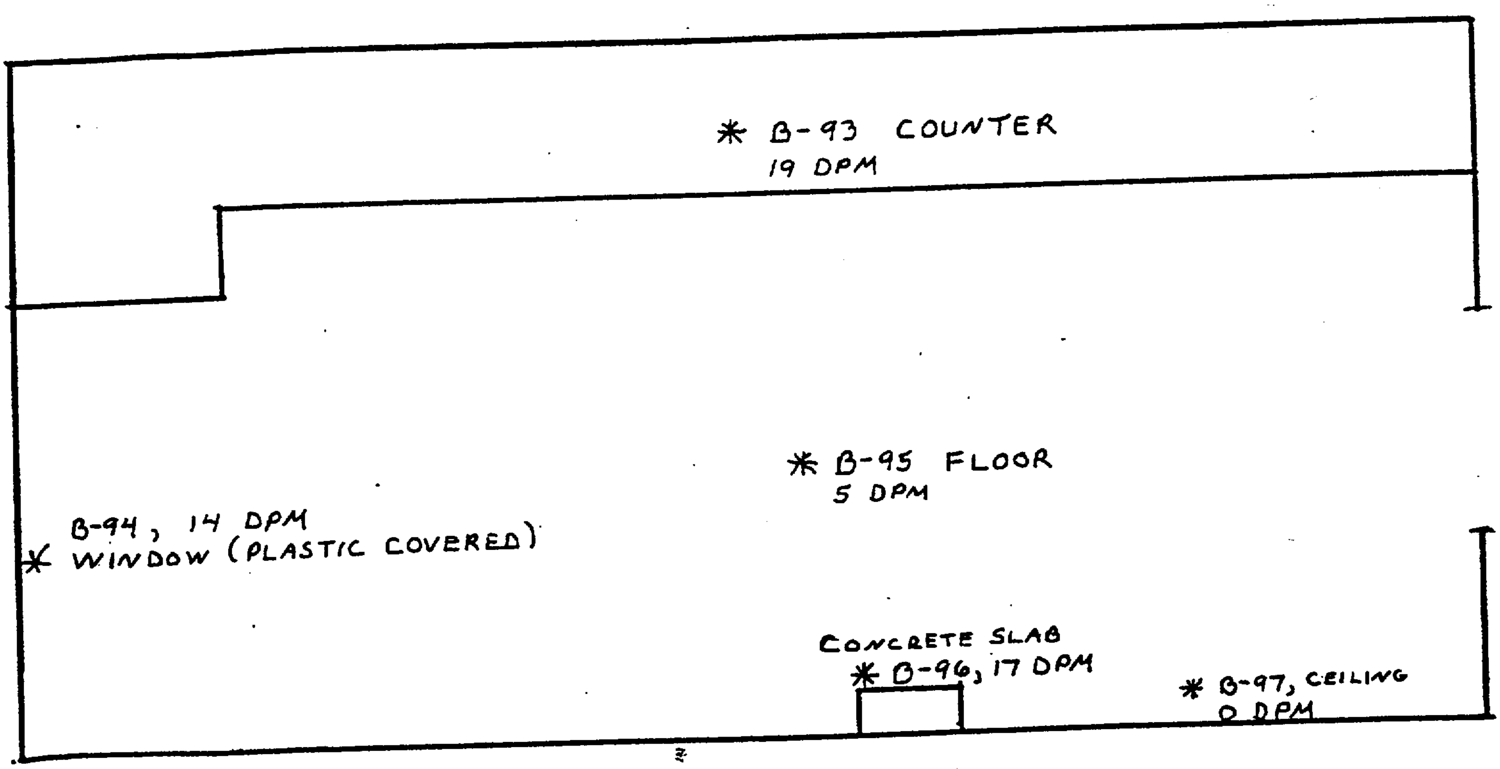
Beta-Gamma = 0.1 mR/hr a
0.2 mR/hr h



Area 1-B
After Decon
Lab No. 1
2nd. Floor, Main Bl

BETA-GAMMA = 0.1 mR/hr

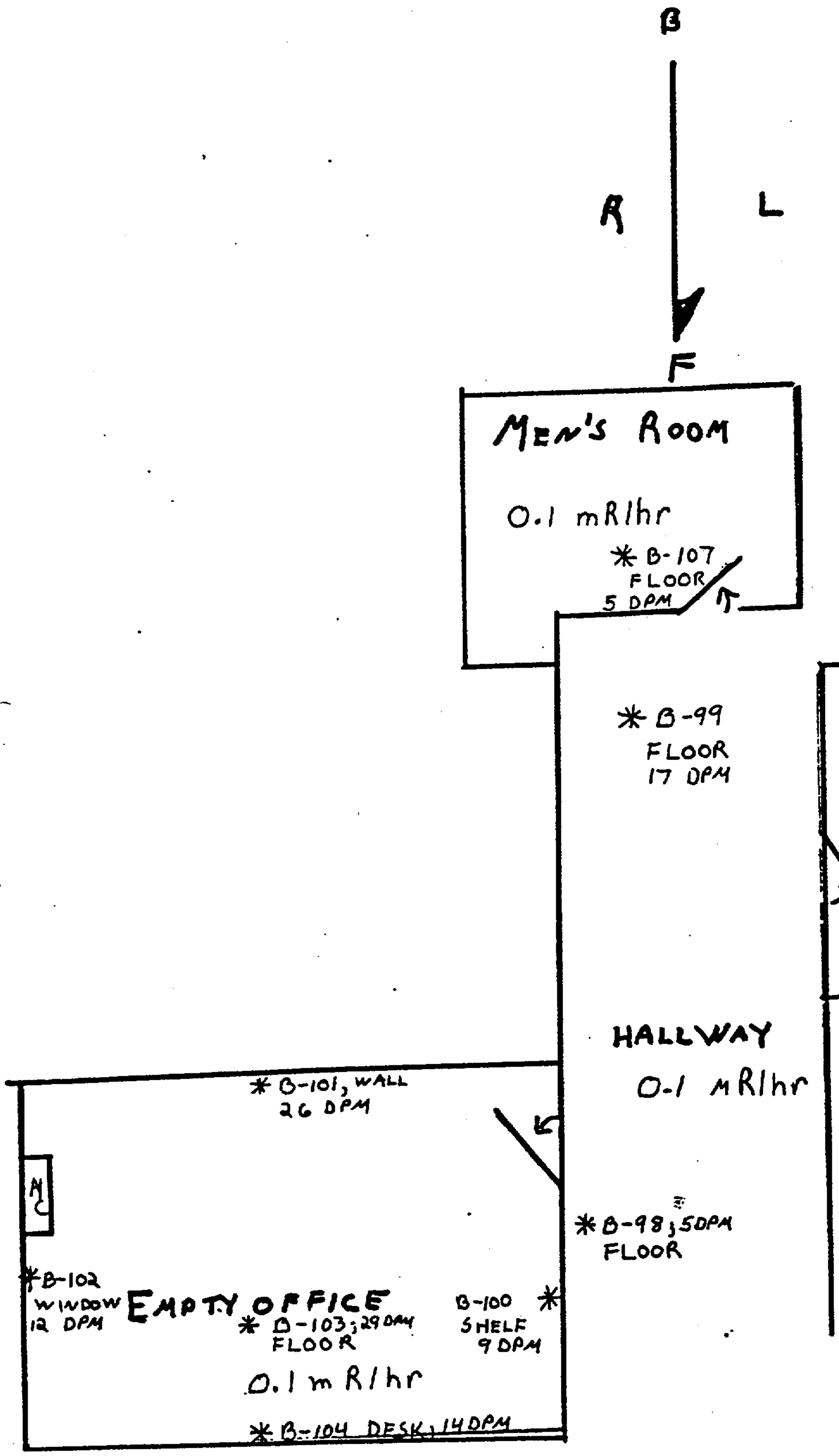




AREA 1-C
AFTER DECON.

SAMPLE PREPARATION ROOM
2ND. FLOOR, MAIN BLDG.

BETA-GAMMA 0.1 mRI

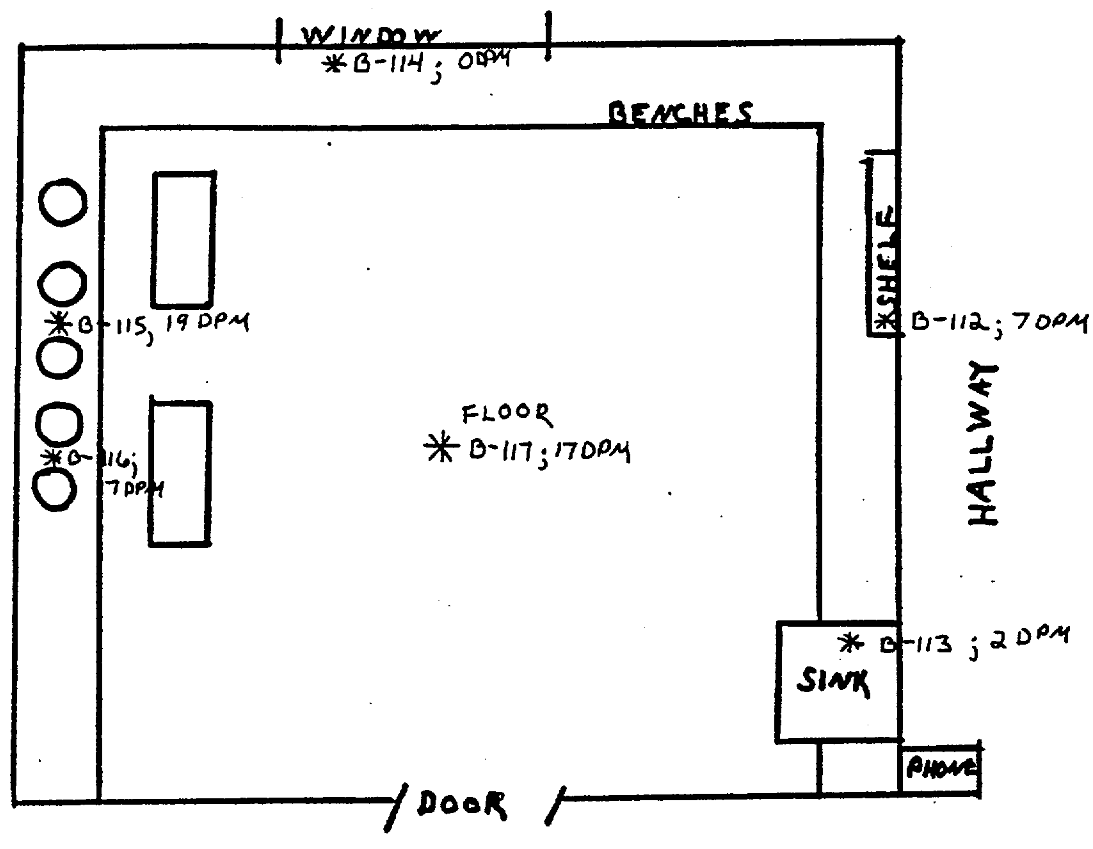


AREA 1-D
AFTER DECON.

HALL, LADIE'S & MEN'S ROOM,
EMPTY OFFICE

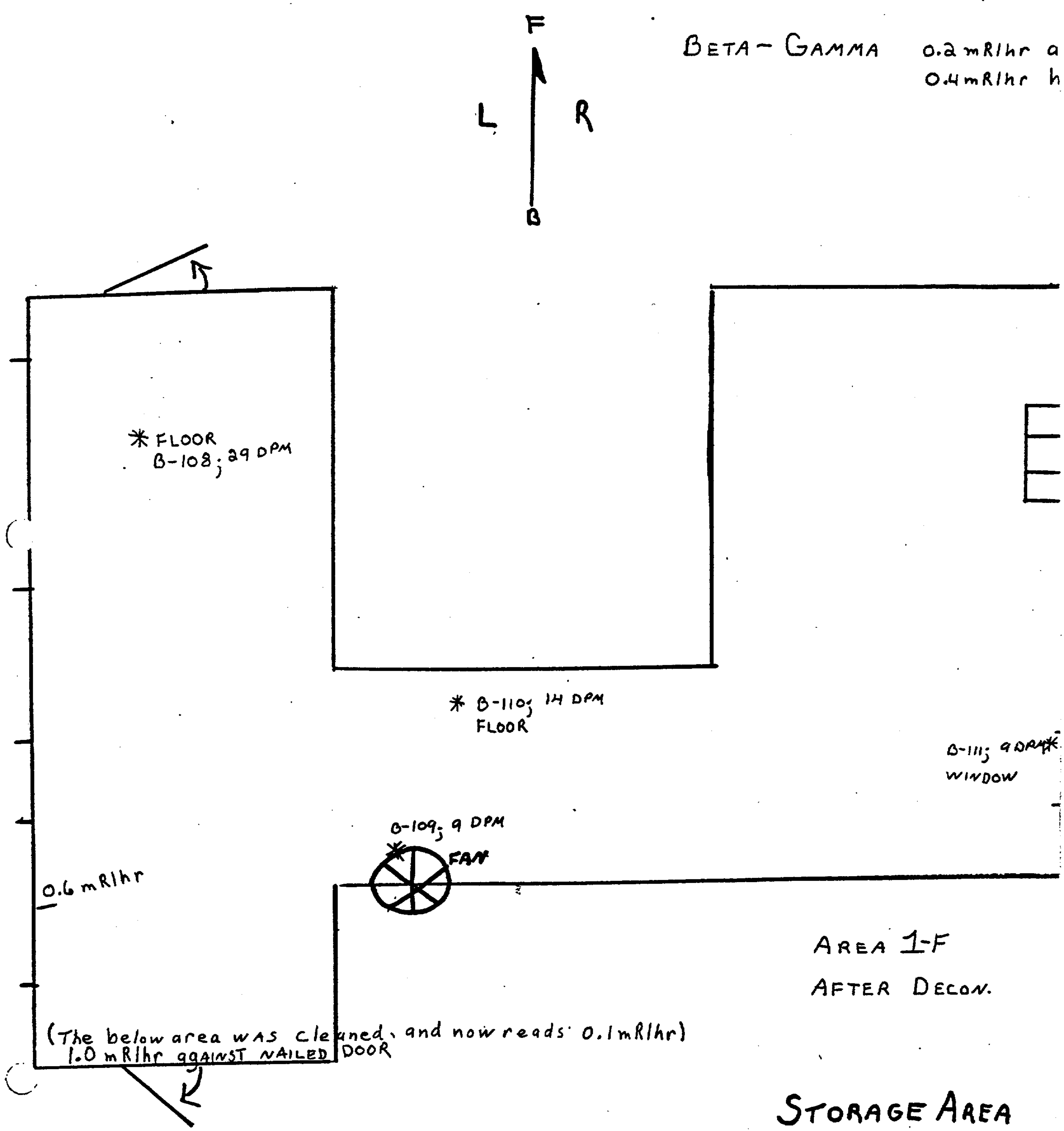
2ND. FLOOR MAIN BLDG.

BETA-GAMMA 0.05 mR/hr
0.4 mR/hr

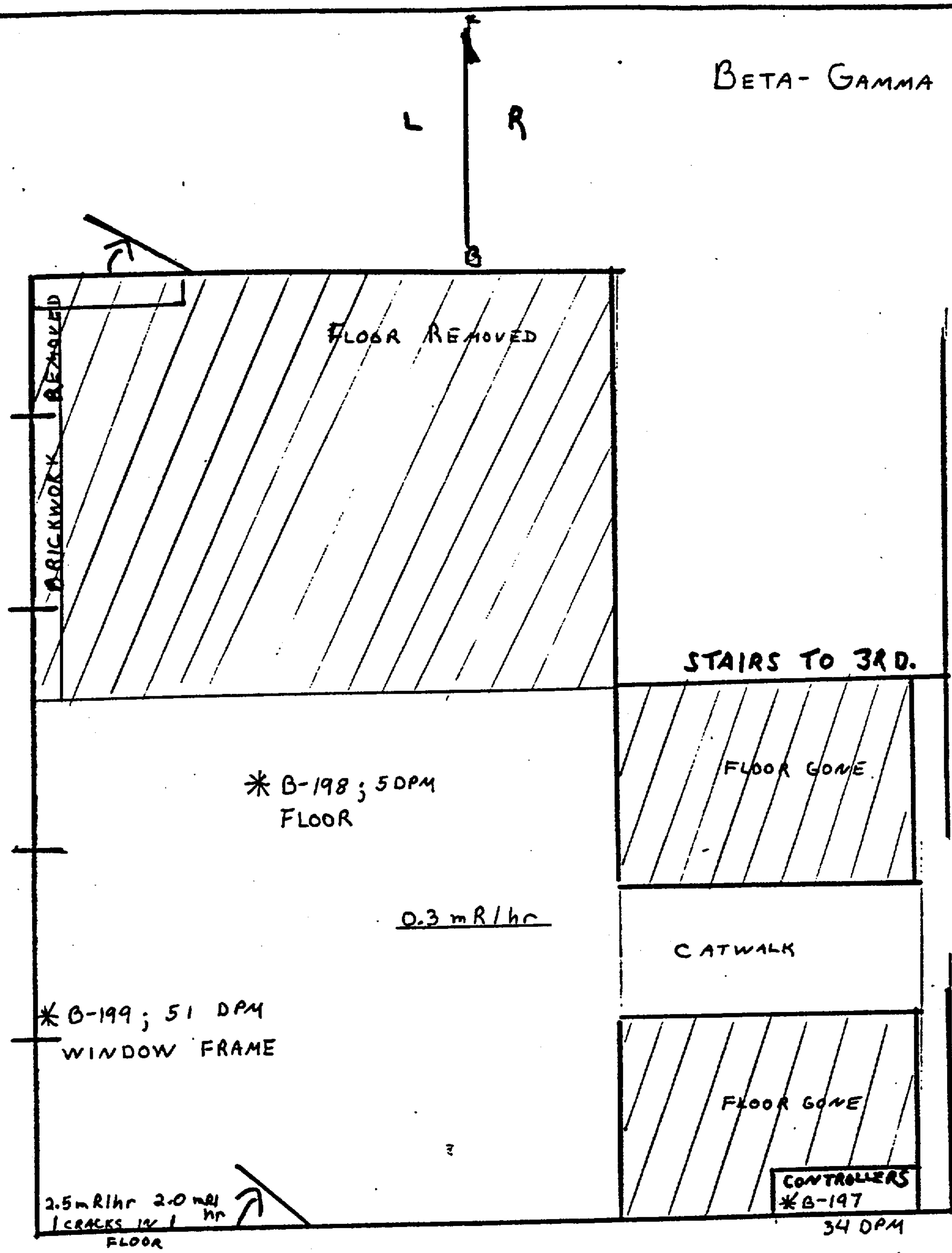


AREA 1-E
AFTER DECON.

GRINDING & POLISHING TEST LAB
2ND FLOOR MAIN BLDG.


F
L
R
B
BETA - GAMMA 0.2 mR/hr a
0.4 mR/hr h
* FLOOR
B-108; 29 DPM
* B-110; 14 DPM
FLOOR
B-111; 9 DPM *
WINDOW
B-109; 9 DPM
FAN
0.6 mR/hr
AREA 1-F
AFTER DECON.
(The below area was cleaned, and now reads 0.1 mR/hr)
1.0 mR/hr against NAILED DOOR
STORAGE AREA
2ND LEVEL, MAIN Bl

BETA-GAMMA 0.3 mR/hr

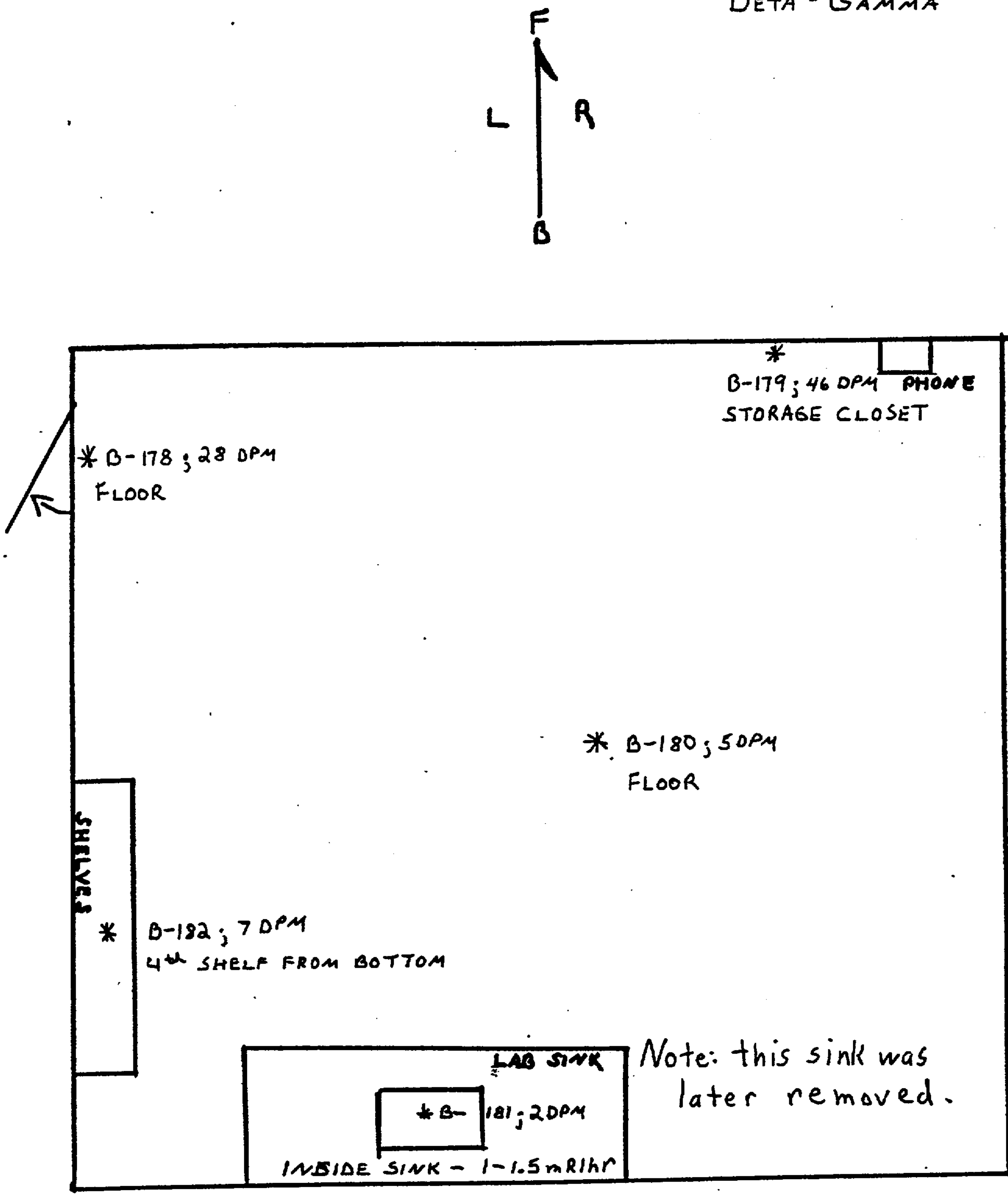


AREA 1-G.
AFTER DECON.

PRESS ROOM & SULFONATION RO

2nd FLOOR, MAIN BLDG.

BETA - GAMMA 0.15 mR/hr
0.2 mR/hr

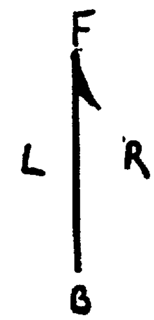


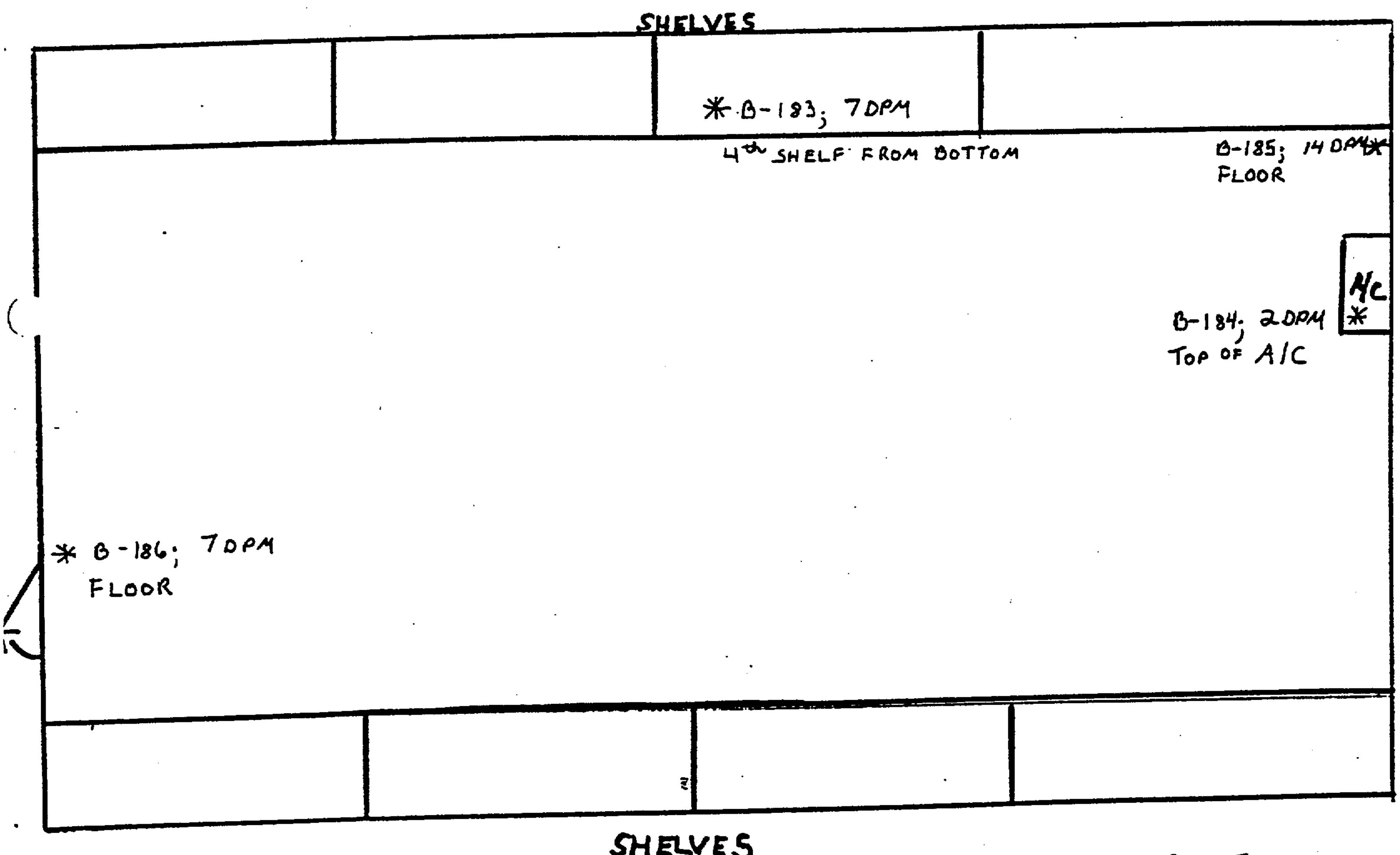
AREA 1-H
AFTER DECON.
TEST LAB #2

2ND LEVEL, MAIN B[illegible]

BETA-GAMMA 0.15 mR/hr

0.2 mR/hr





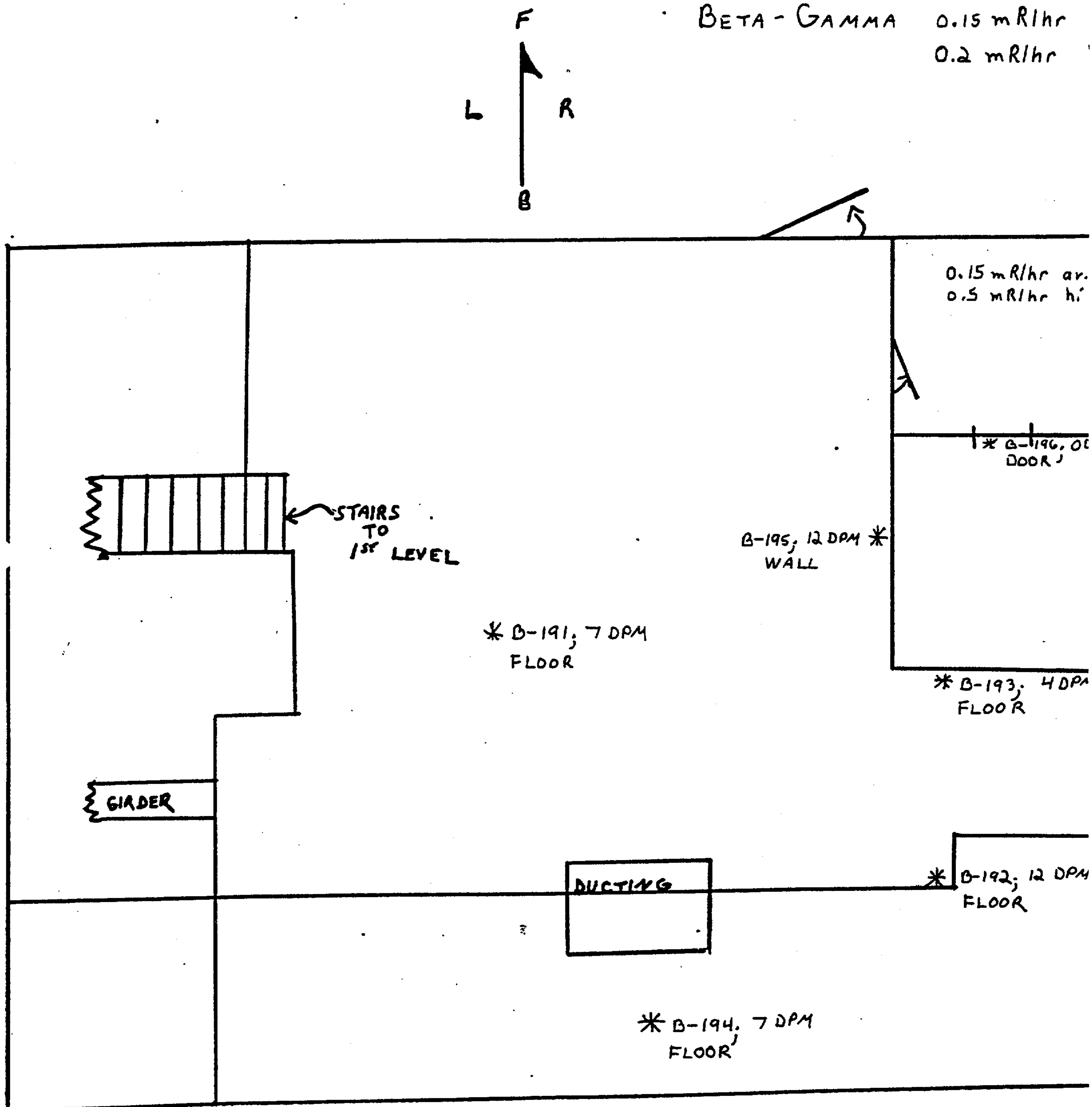
AREA 1-I

AFTER DECON.

CONFERENCE ROOM #1

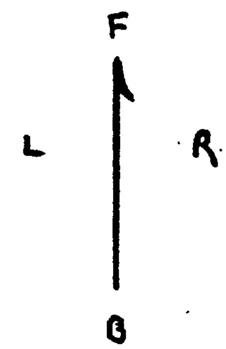
2ND. FLOOR, MAIN BLDG.

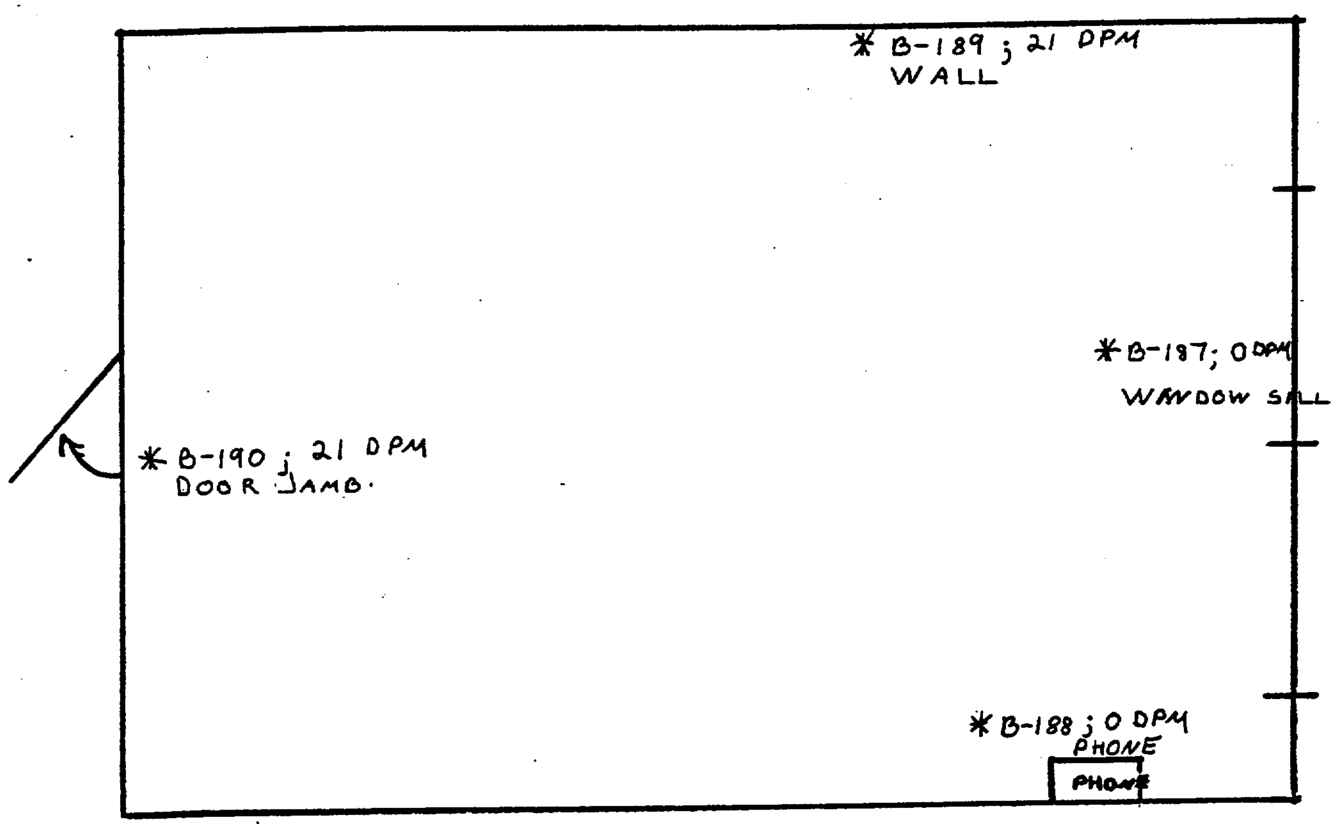
BETA-GAMMA 0.15 mR/hr
0.2 mR/hr



AREA 1J, AFTER DECON.
7-K BLENDING & STORAG
2ND LEVEL, MAIN BL

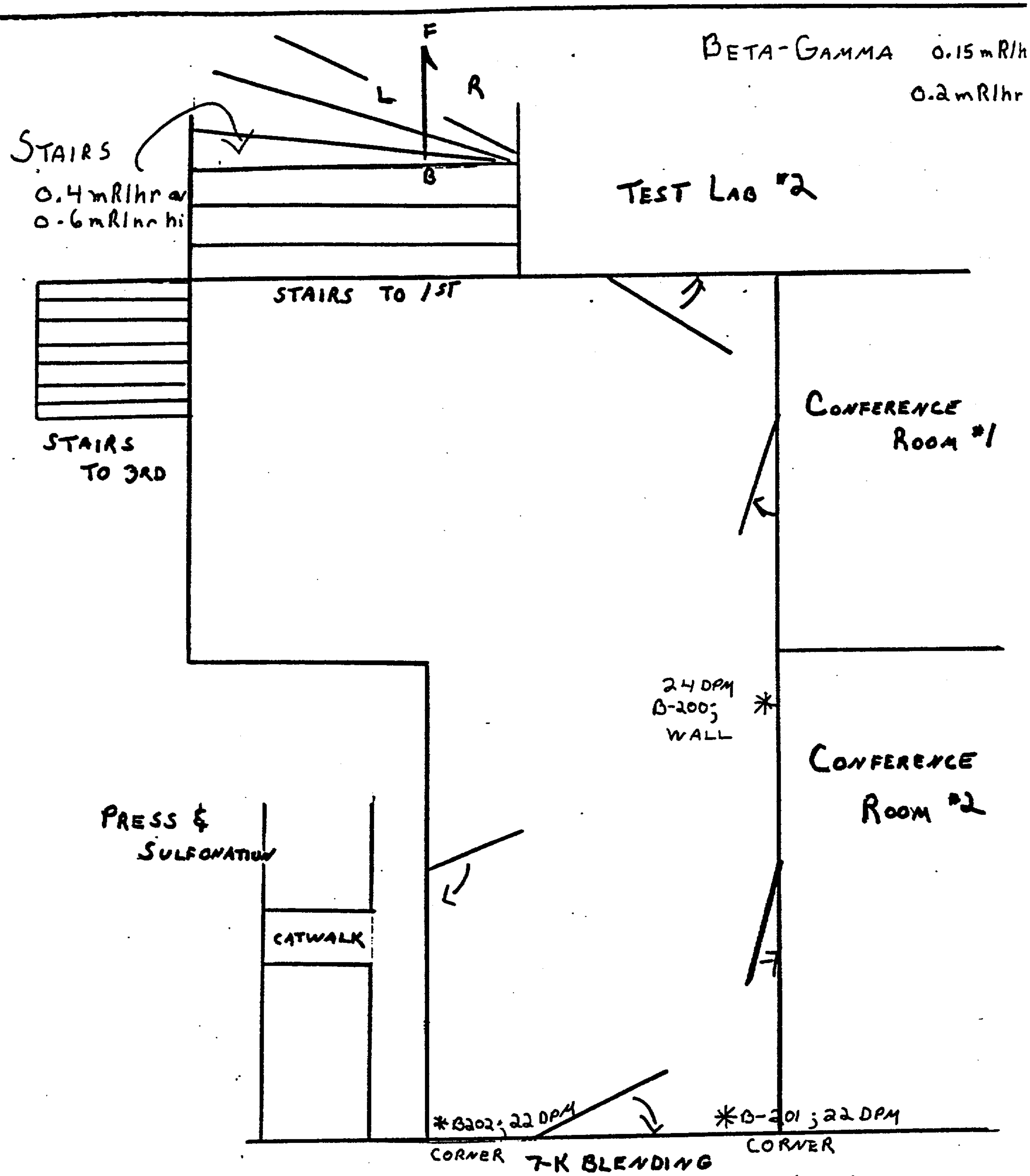
BETA-GAMMA 0.15 mR/hr
0.25 mR/hr



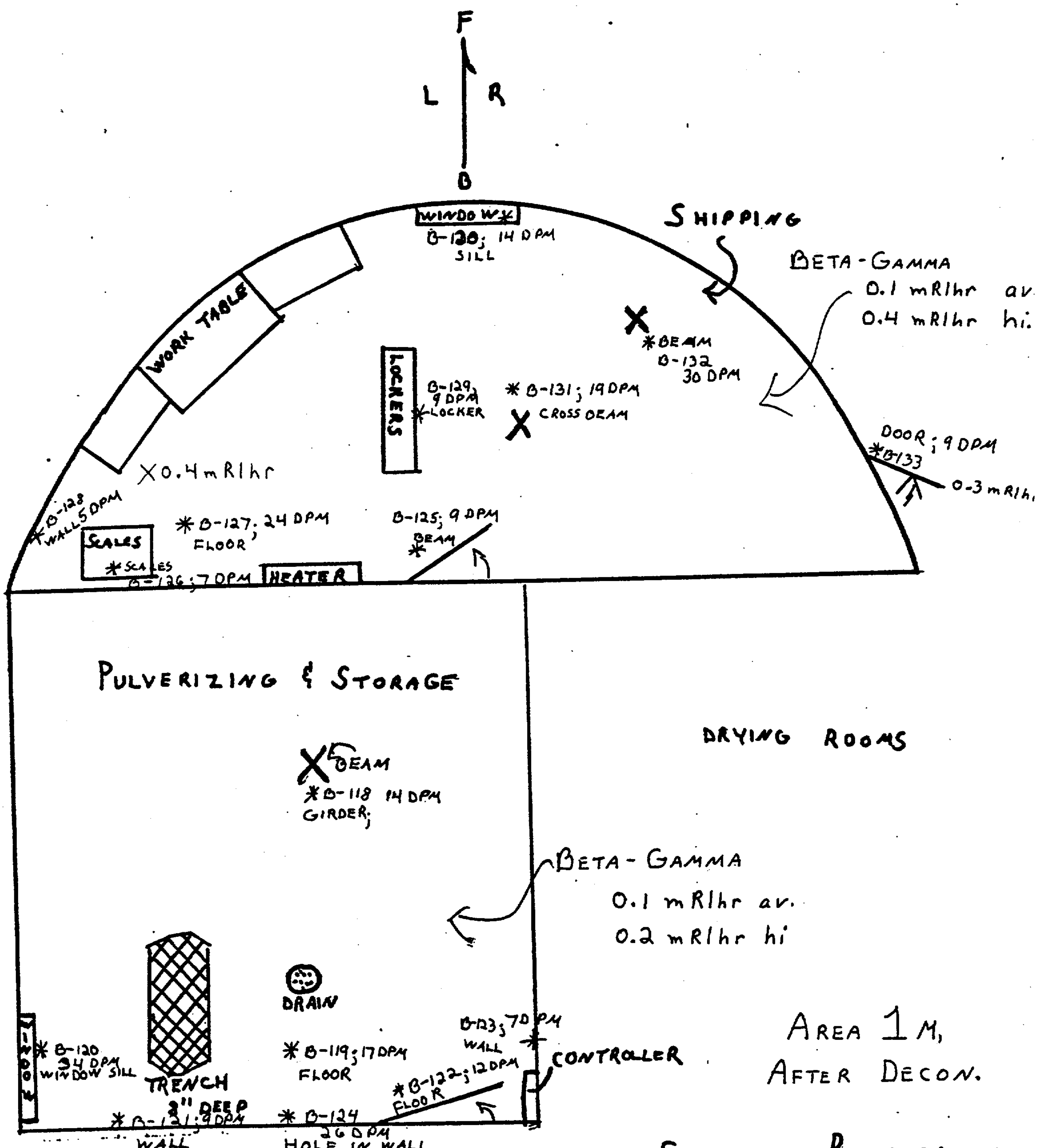


AREA 1K
AFTER DECON.

CONFERENCE ROOM #2
2ND FLOOR, MAIN BLDG

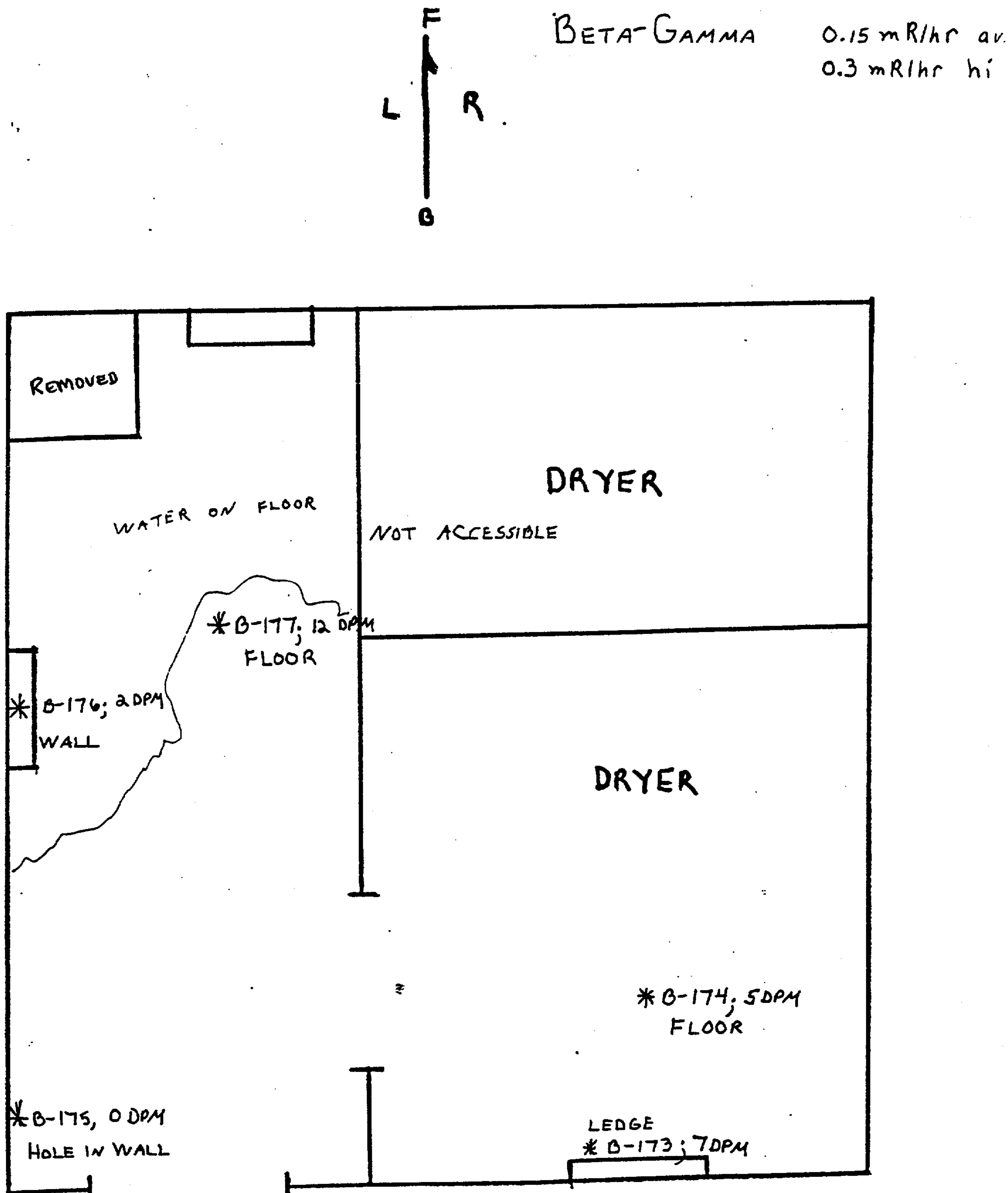


AREA 1-L
AFTER DECON.
SECOND FLOOR HALLWAY
MAIN BLDG.



AREA 1M,
AFTER DECON.

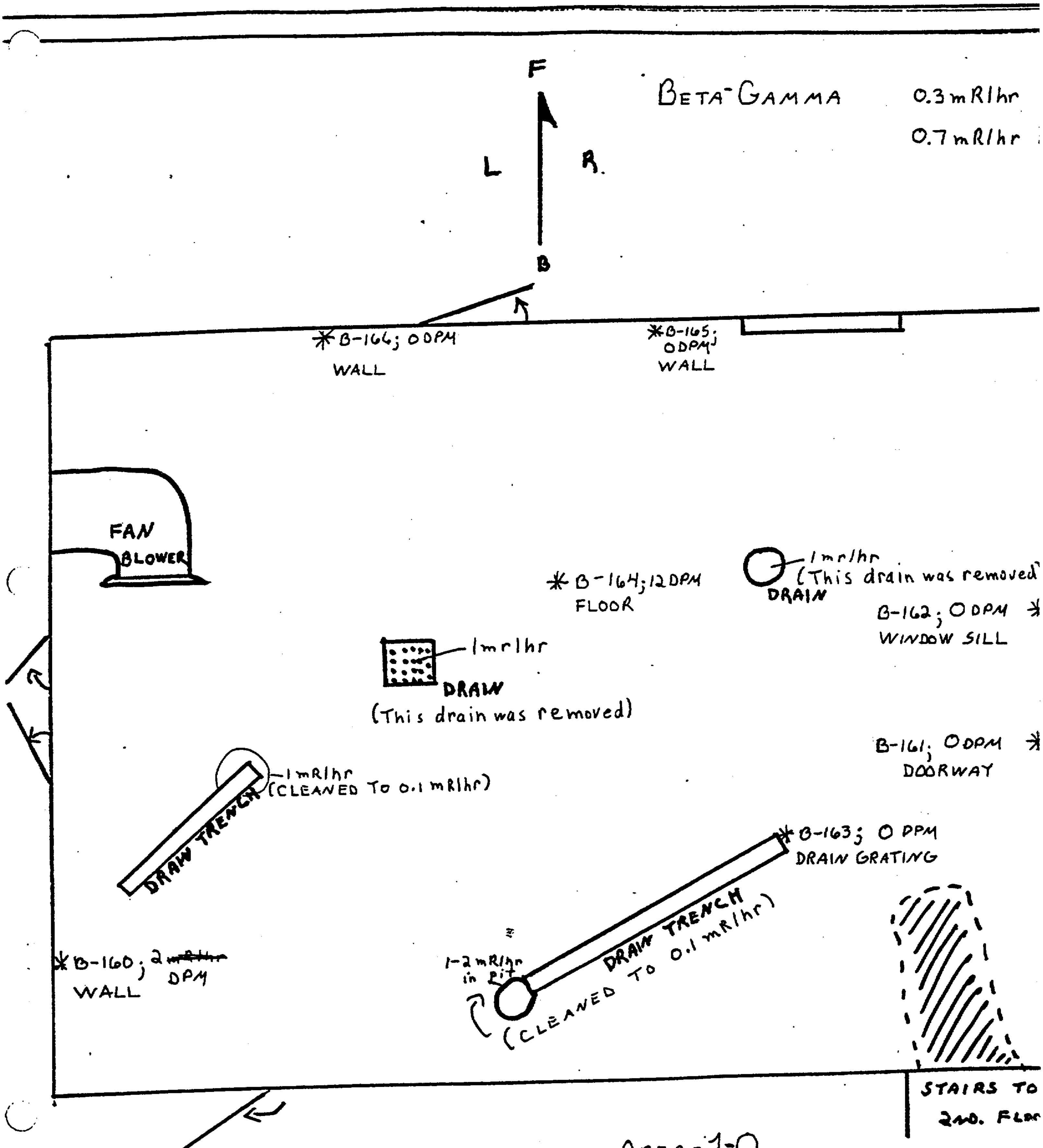
SHIPPING, PULVERIZING
CERIUM OXIDE STORAGE
1ST FLOOR, MAIN BLDG.



AREA I N, AFTER DECON

DRYING ROOMS

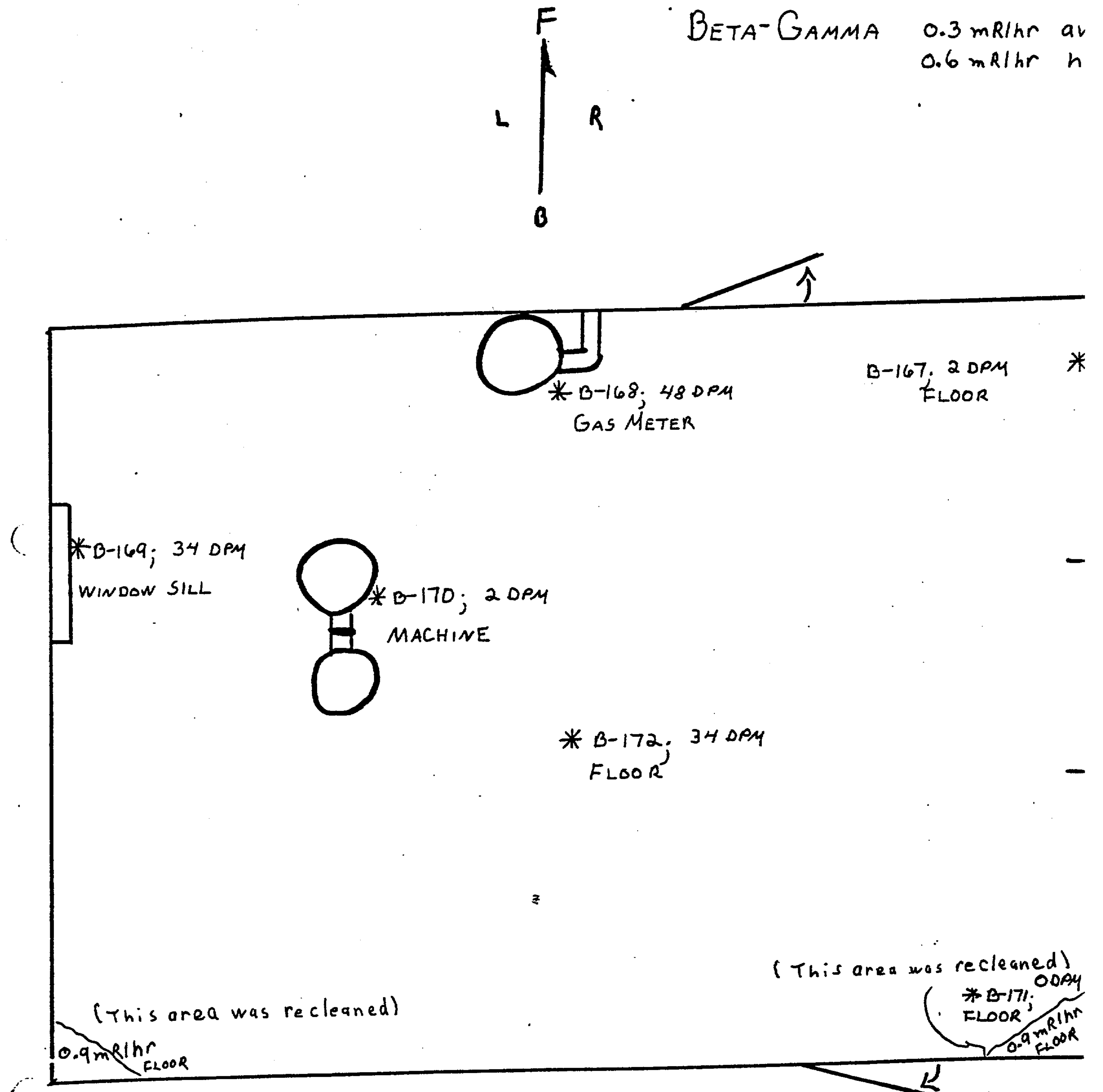
1ST. FLOOR MAIN BLDG.



AREA-1-0

AFTER DECON.

FURNACE & PRESS ROOM
1ST. FLOOR. MAIN BLDG



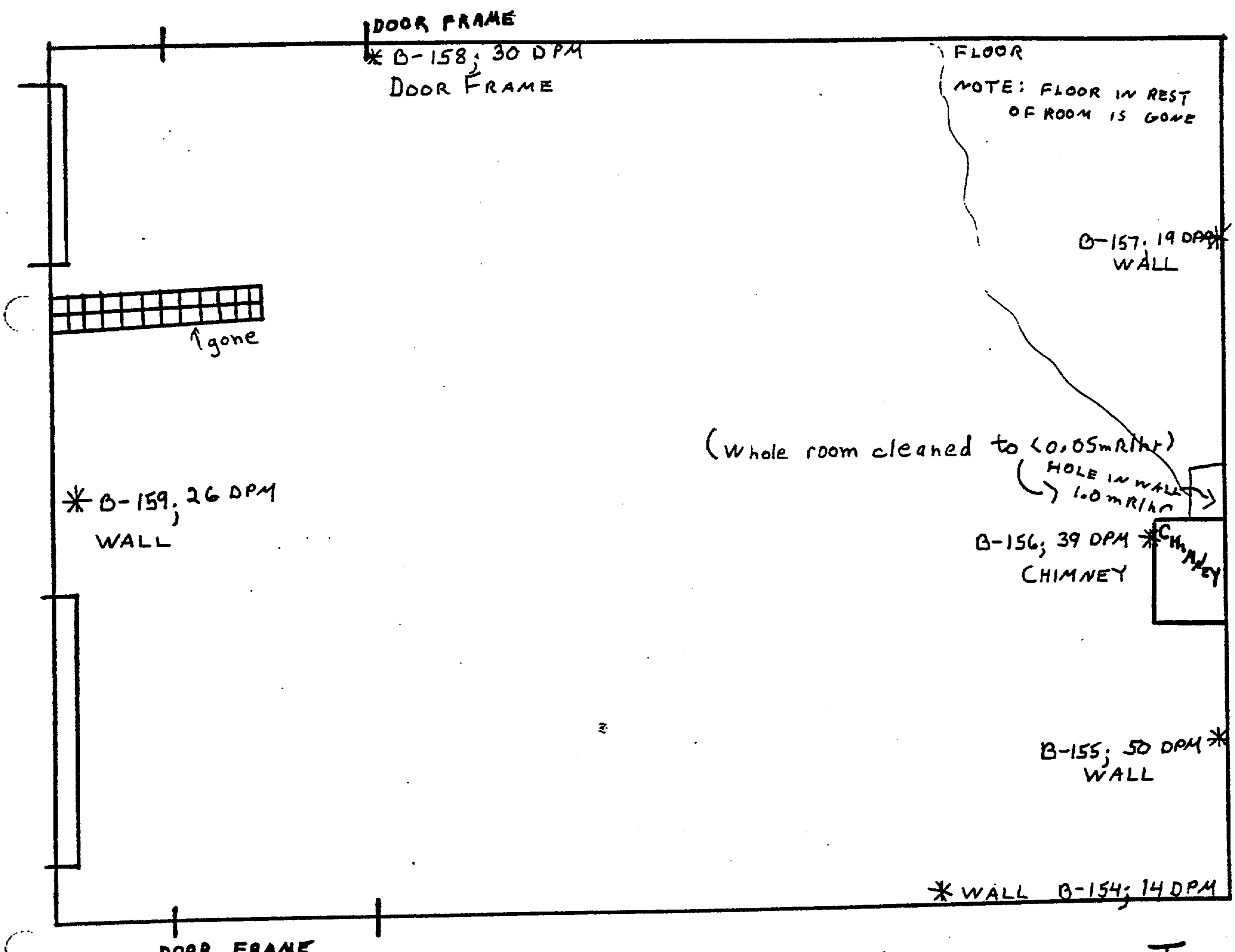
AREA 1-P, AFTER DECON
SHARPLES COLLECTOR RO
1ST FLOOR, MAIN BL

F

L R

B

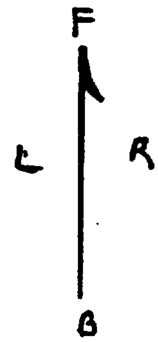
BETA-GAMMA 0.25mR/hr av
0.7mR/hr h



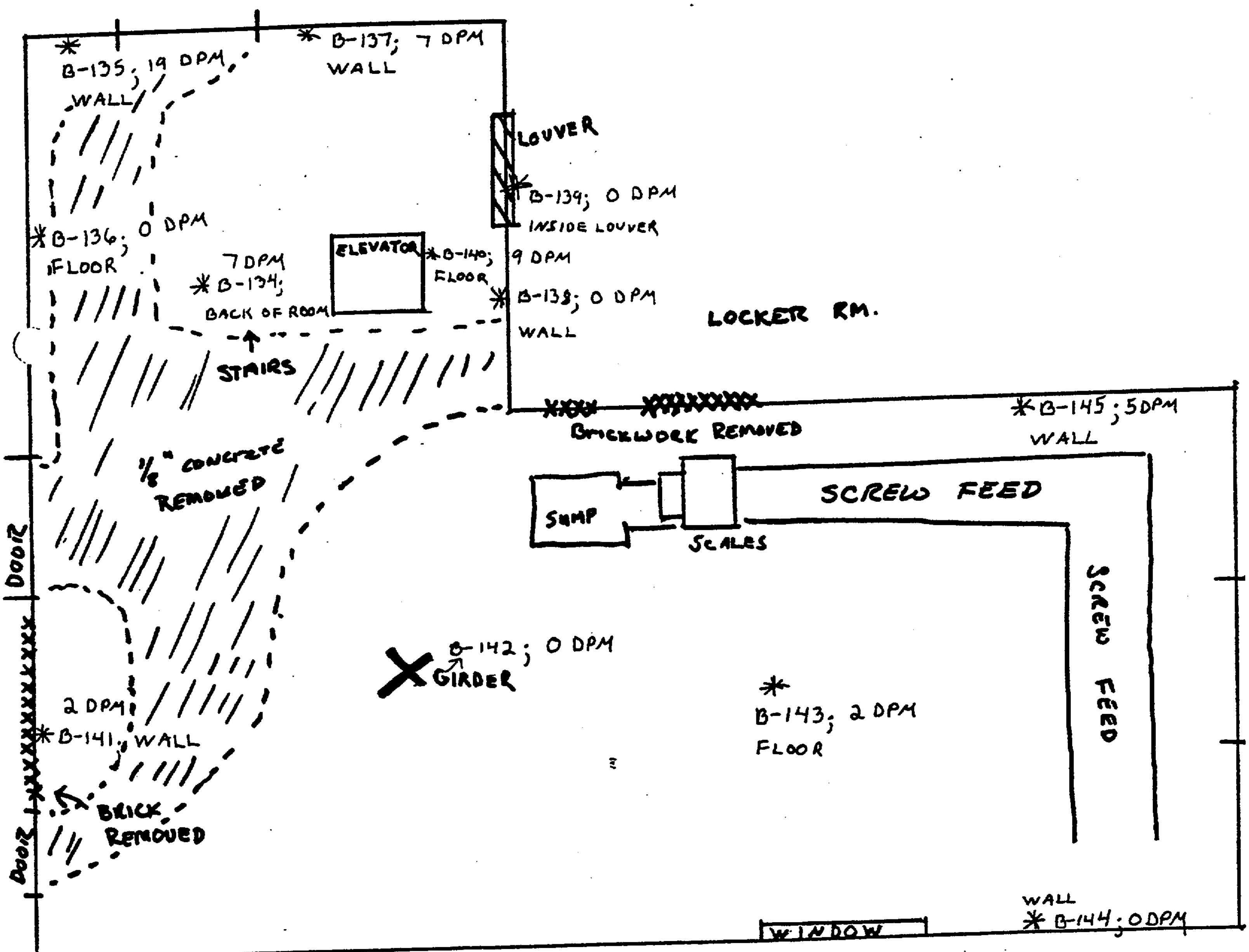
AREA 1Q,
AFTER DECON.

1 & 2 SULFONATION TANK ROOM

FIRST FLOOR, MAIN B

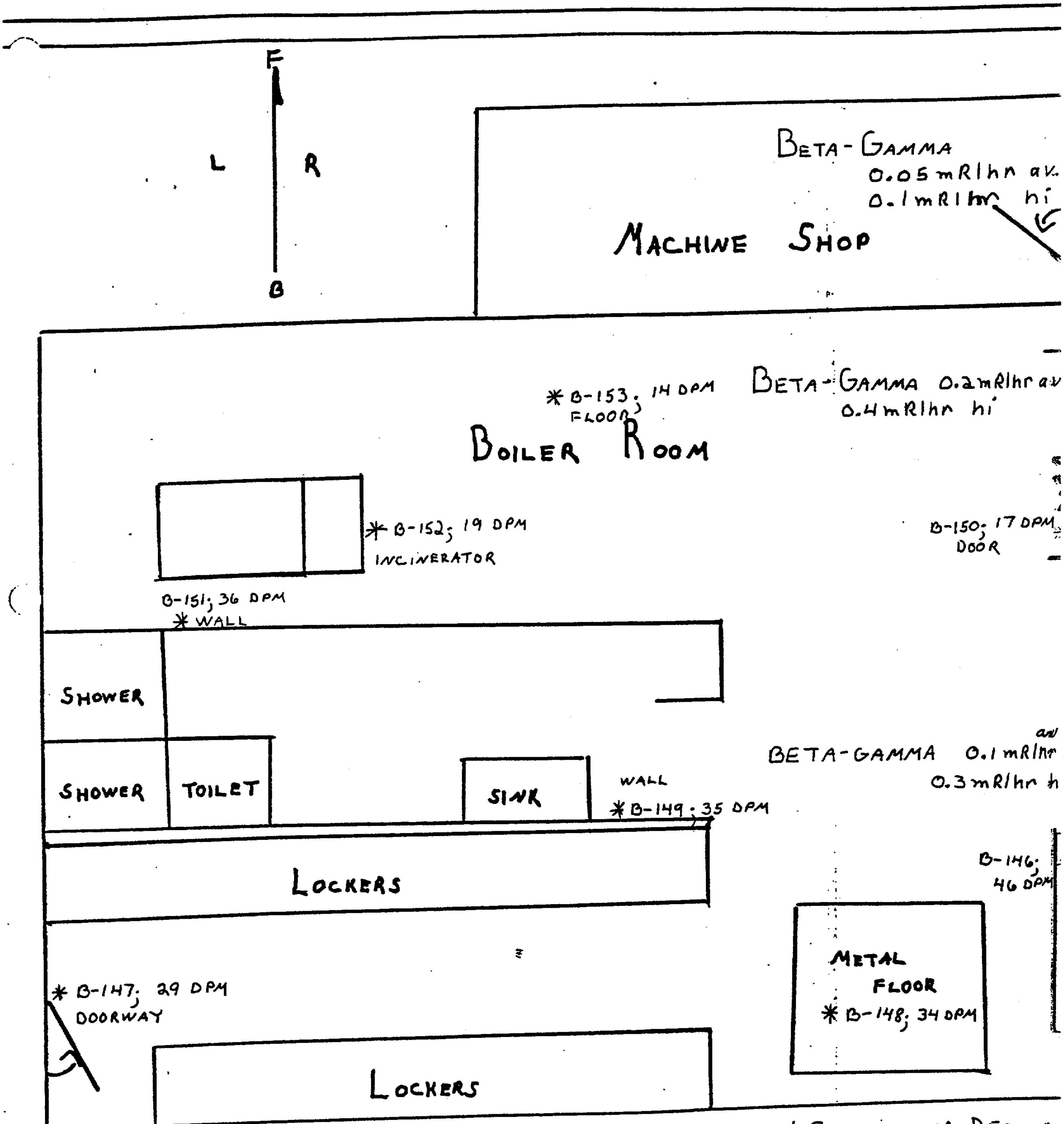


BETA-GAMMA 0.2 mR/hr av.
0.7 mR/hr hi



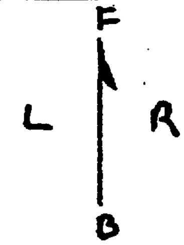
AREA 1-R, AFTER DECON.
7-K BASTACITE ROOM

1ST LEVEL, MAIN BLDG.

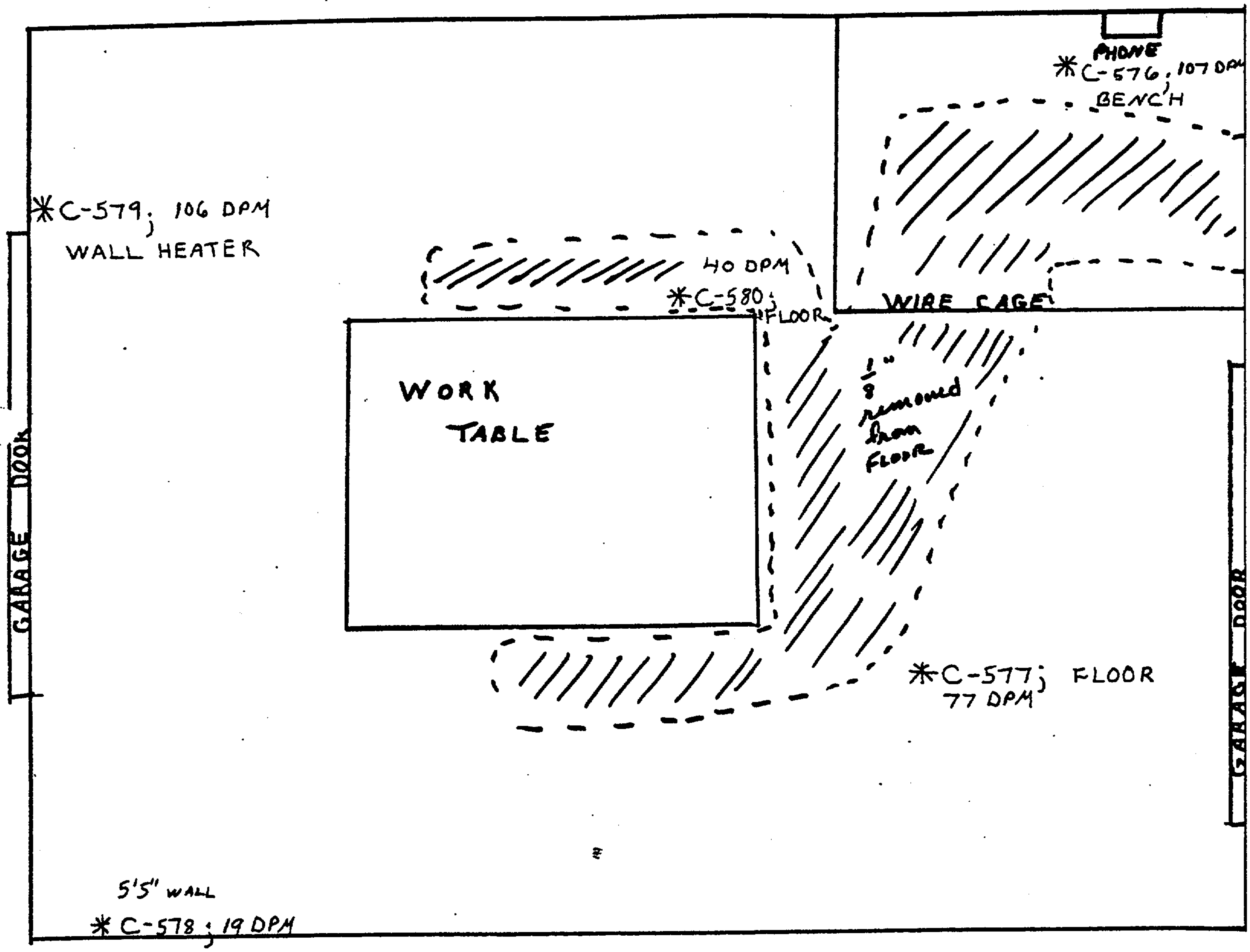


AREA 1-S, AFTER DECON.
LOCKER & BOILER ROOM

MACHINE SHOP
1ST. FLOOR, MAIN BLG



Beta - Gamma 0.3 mR/hr av.
0.7 mR/hr av.



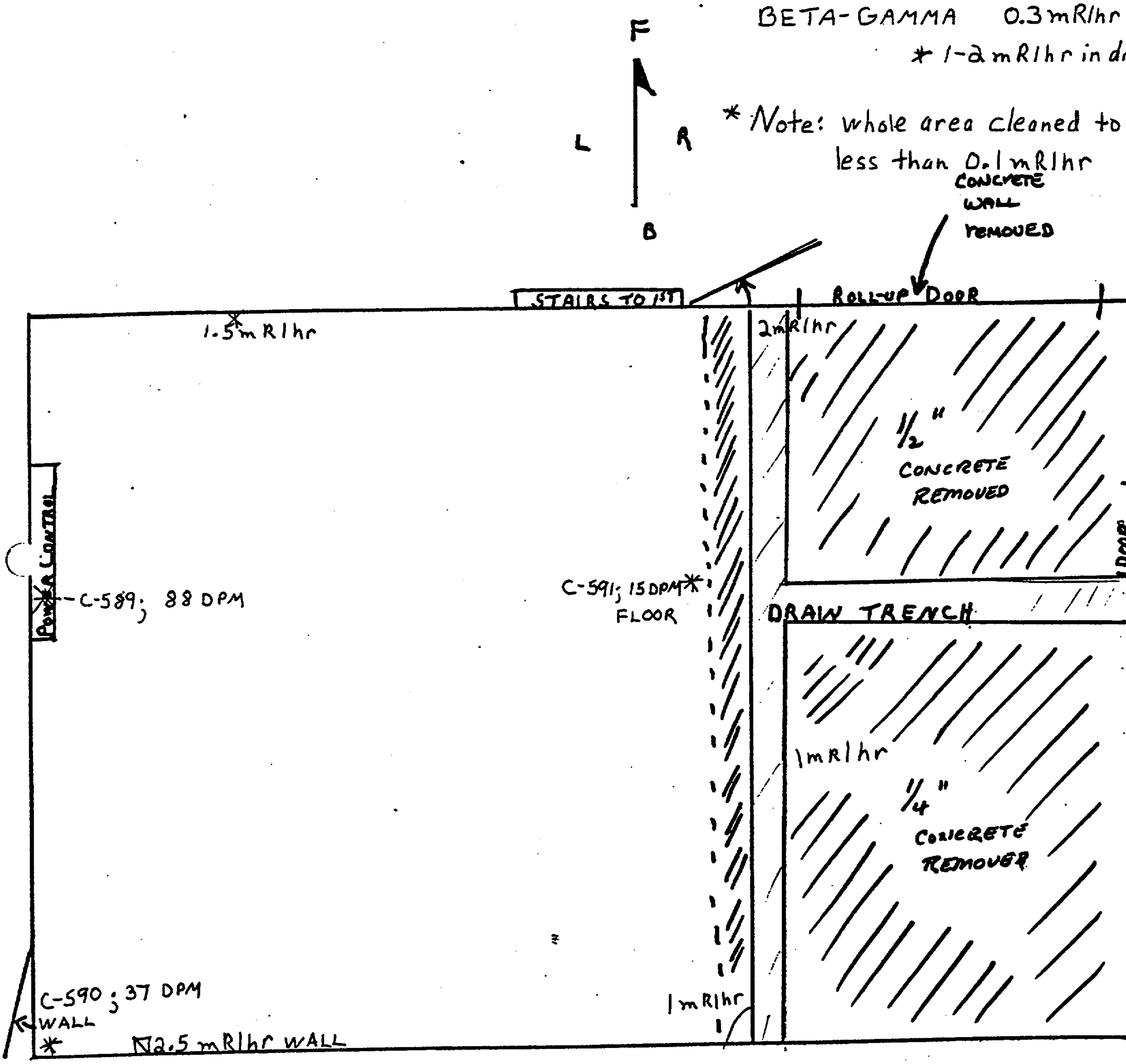
Area 2-A

After Decon.

Workshop Building

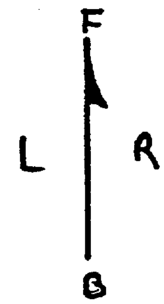
BETA-GAMMA 0.3 mR/hr
* 1-2 mR/hr in dra

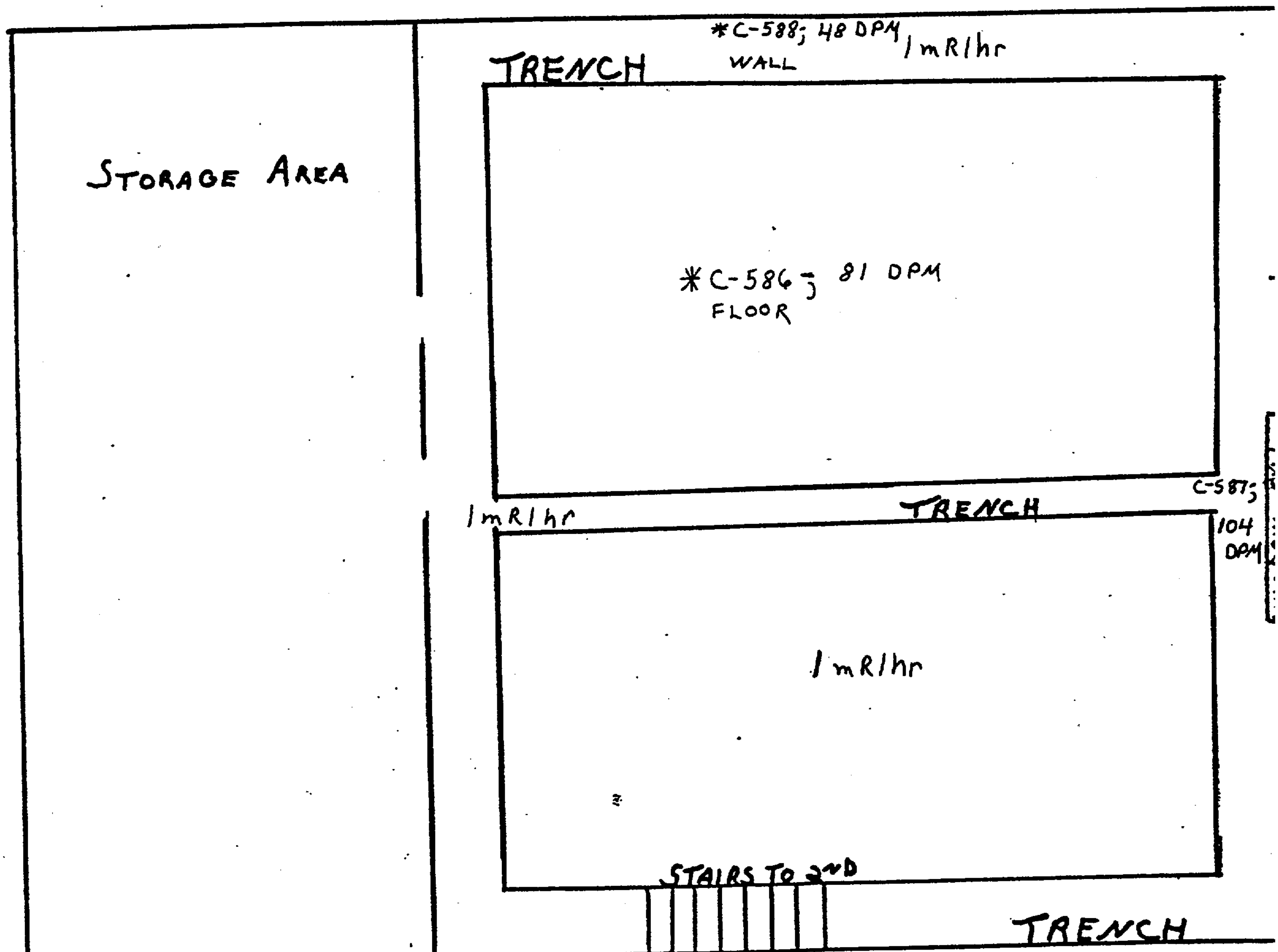
* Note: whole area cleaned to less than 0.1 mR/hr



AREA 2-B;
AFTER DECON.
BLDG # 2
BALL MILL
2ND LEVEL STOR

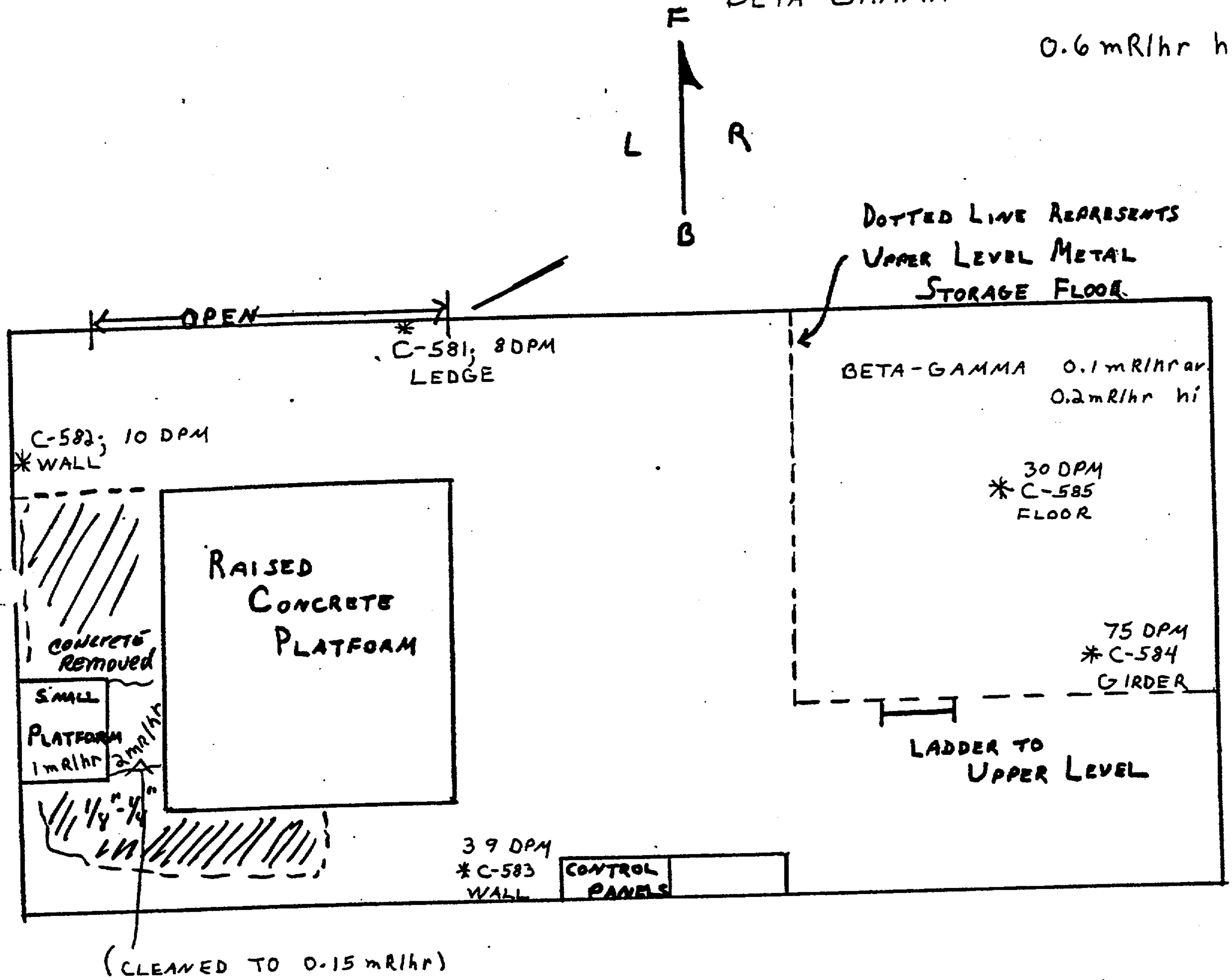
BETA-GAMMA 0.5mR/hr av-
1mR/hr in trer
& concrete
(cleaned to 0.15 mR/hr)





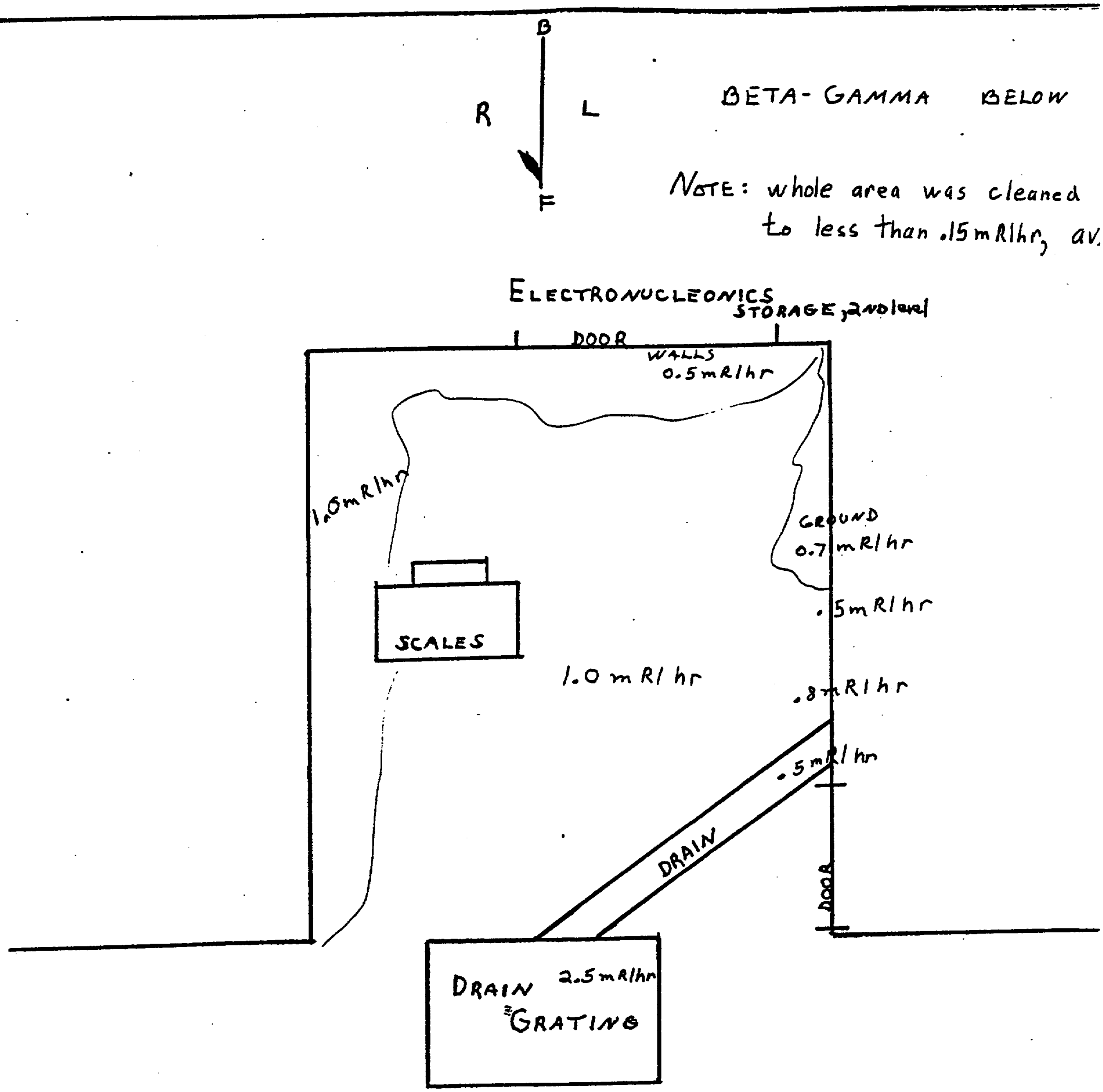
AREA 2-C
AFTER DECON.
BALL MILL
LOWER OPERATI

BETA-GAMMA 0.2 mR/hr a
0.6 mR/hr h



AREA 2-D
AFTER DECON.

COMPRESSOR ROOM



AREA 2-E

AFTER PRELIMINARY DECON.

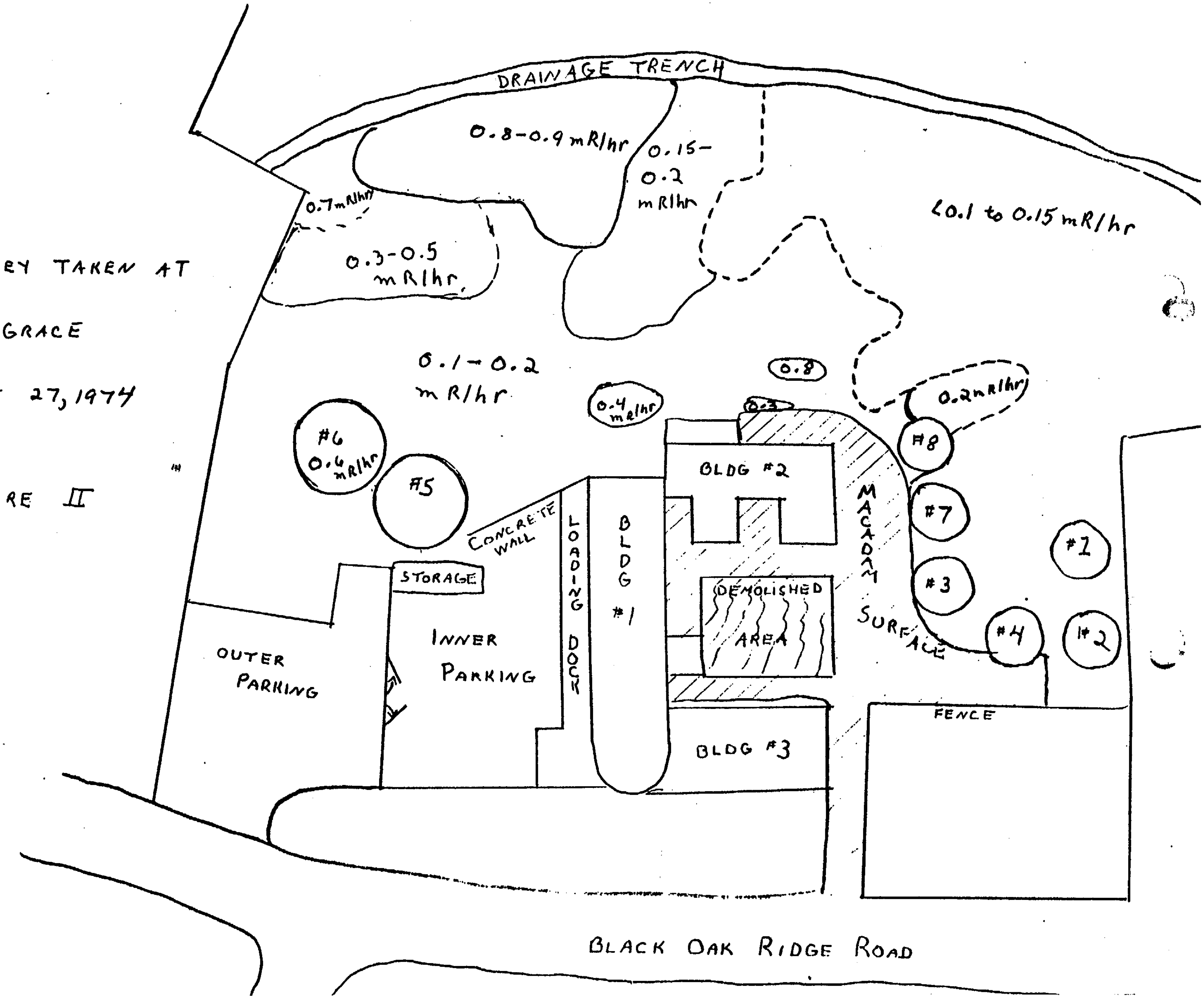
OUTSIDE, 3 BUILDINGS

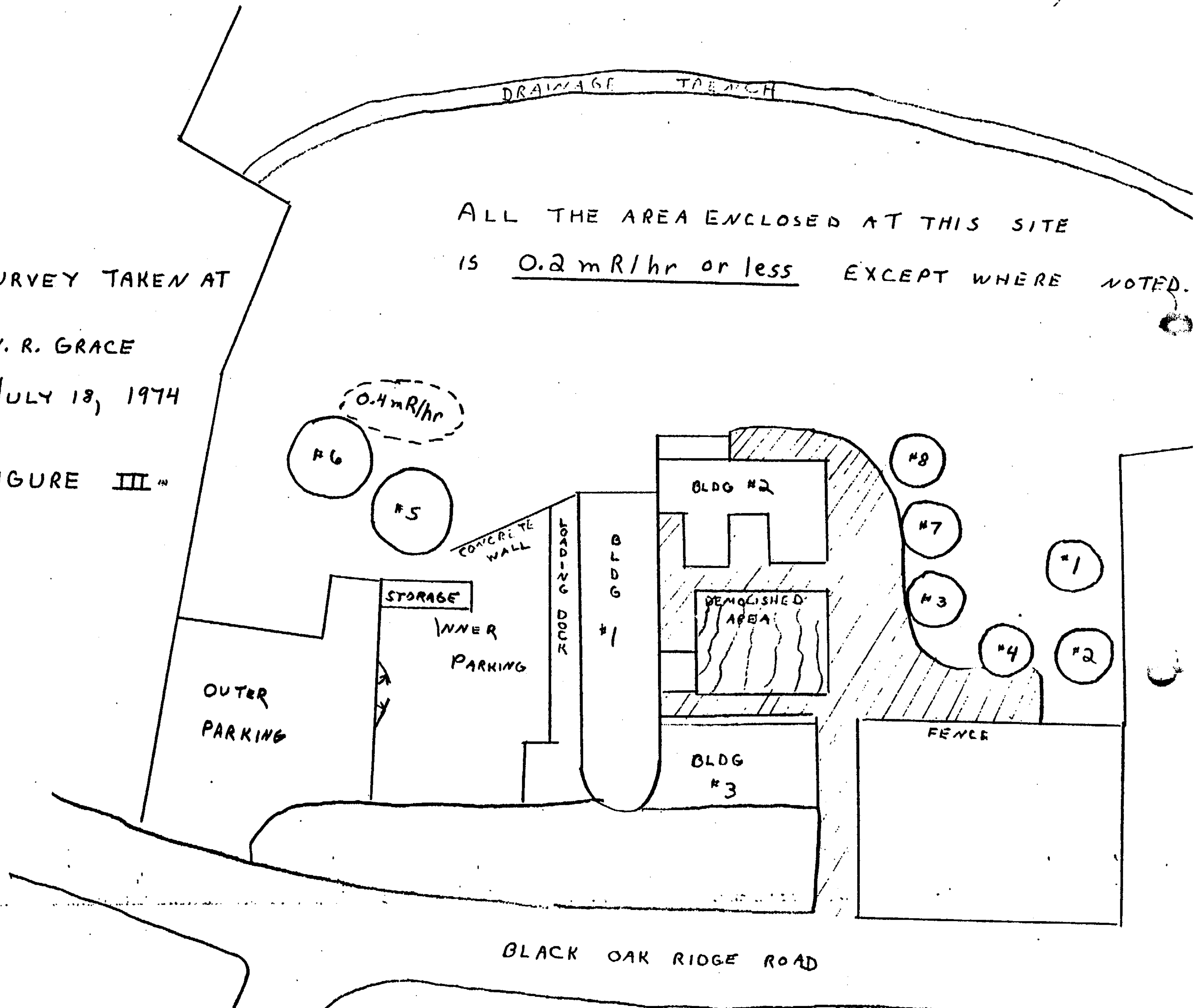
SURVEY TAKEN AT

W.R. GRACE

JUNE 27, 1974

FIGURE II



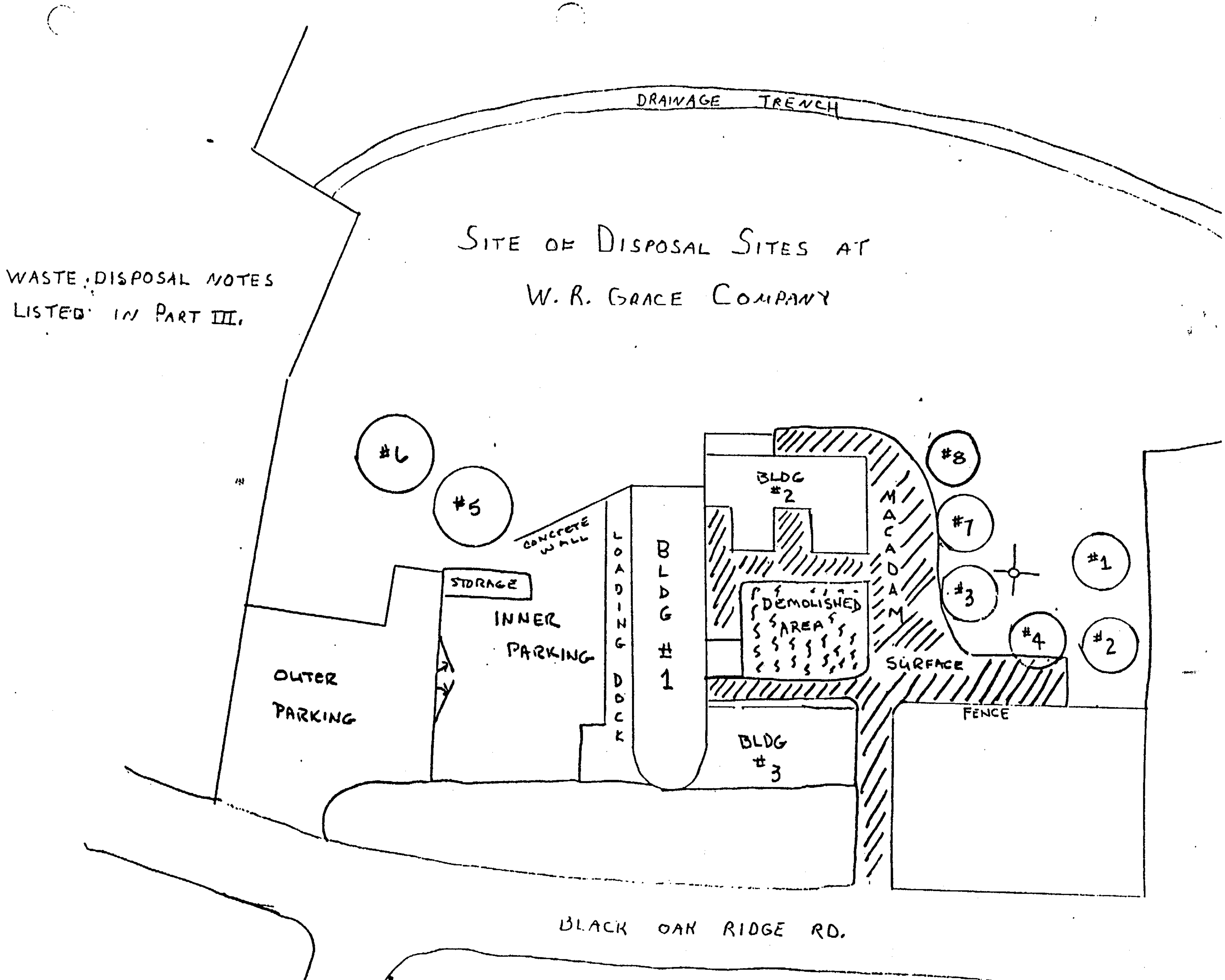


SURVEY TAKEN AT

W. R. GRACE

JULY 18, 1974

FIGURE III



SITE OF DISPOSAL SITES AT
W. R. GRACE COMPANY
WASTE DISPOSAL NOTES
LISTED IN PART III.
DRAINAGE TRENCH
#6
#5
#8
#7
#1
#3
#4
#2
BLDG #2
BLDG #1
BLDG #3
MACADAM SURFACE
DEMOLISHED AREA
CONCRETE WALL
LOADING DOCK
STORAGE
INNER PARKING
OUTER PARKING
FENCE
BLACK OAK RIDGE RD.

APPENDIX A

Radioactivity Limits

for

Unrestricted Release

of

Equipment

RADIOACTIVITY LIMITS FOR UNRESTRICTED RELEASE

of

FACILITIES and EQUIPMENT

1. The maximum amount of fixed alpha radioactivity in disintegrations per minute per 100 square centimeters on buildings or equipment should not exceed 25,000 dpm.

2. The average amount of fixed alpha radioactivity in disintegrations per minute per 100 square centimeters on buildings or equipment should not exceed 5,000 dpm.

3. The maximum amount of removable (capable of being removed by wiping the surface with a filter paper or soft absorbent paper) alpha radioactivity in disintegrations per minute per 100 square centimeters on buildings or equipment should not exceed 1,000 dpm.

4. (a) The maximum level at one centimeter from the most highly contaminated surface of a building or piece of equipment measured with an open-window beta-gamma survey meter through a tissue equivalent absorber of not more than seven milligrams per square centimeter should not exceed 1.0 millirad per hour.

   (b) The average radiation level at one centimeter from the contaminated surface of the building or equipment measured in the same manner should not exceed 0.2 millirad per hour.

5. The contamination limits for abandonment of facilities involving U-233 or plutonium should not exceed 1/10 of the limits in items 1, 2 and 3 above.

NOTES: A. A reasonable effort should be made to minimize the contamination present.

B. Surfaces of premises, equipment or scrap likely to be contaminated, and of such size, construction, or location as to make the surface inaccessible for purposes of measurement, shall be presumed to be contaminated in excess of the levels specified above.

C. Premises, equipment or scrap having contaminated surfaces which have been covered by painting, metal plating or other covering material should be presumed to be contaminated in excess of the levels specified above, unless it can be established that the contamination was below the above levels prior to applying the covering.

APPENDIX B

Analyses of Removable Contamination

APPLIED HEALTH PHYSICS, Inc.

Health Physics Laboratory Report: Analyses of Removable Contamination

Client: W. R. GRACE COMPANY W.O. # ______ Date: ______

Description of survey: ______

Surveyed by: M.McClosky/R. Slayton Date: 6/3/74 Suspected Activity: Natural Thorium

Counted with: ☐ GM detector ☐ Scintillation detector ☒ Gas Proportional detector

Counter Mfg: NMC Model PC-3A s/n 620(W.R. Grace)

Background of detector before counting: α 8.8cpm β ______

Background of detector after counting: α 7.4 β ______

Efficiency of detector: α 42% β ______ Counted by: RJS 6/4/74

SER. NO.	SAMPLE IDENTIFICATION Time	Location	Alpha Ctg. Time	Alpha c/m Gross	Alpha c/m Net	Alpha d/m	Alpha d/m/100cm²	Beta-Gamma Ctg. Time	Beta-Gamma c/m Gross	Beta-Gamma c/m Net	Beta-Gamma d/m	Beta-Gamma d/m/cm²
B-76		W.R.Grace - Main Office Book Case	2 Min.	18	1	2.4	± 1.6					
77		Floor	"	21	2	5	± 1.8					
78		"	"	29	7	17	± 3					
79		"	"	19	2	5	± 1.8					
80		Wall	"	15	0	0	± 0.9					
81		Large Lab - Door	"	40	12	29	± 3.9					
82		" - Counter	"	20	2	5	± 1.8					
83		" - Test Hood	"	48	16	38	± 4.5					
84		" - #1 Sink	"	23	3	7	± 2.1					
85		" Corner Counter	"	24	4	9	± 2.3					
86		" Drain	"	33	8	19	± 3.2					
87		" #2 Sink	"	14	0	0	± 0.9					
88		" Counter	"	33	8	19	± 3.2					
89		" "	"	36	10	24	± 3.6					
90		" Cabinet	"	17	1	3	± 1.5					
91		" Ledge	"	43	14	33	± 4.2					
92		" Floor	"	23	3	7	± 2.1					
93		Sample Preparation Room - Counter	"	32	8	19	± 3.2					
94		Sample Preparation Room - Window - Plastic covered	"	27	6	14	± 2.8					
95		Sample Preparation Room - Floor	"	21	2	5	± 1.8					

APPLIED HEALTH PHYSICS, Inc.

Health Physics Laboratory Report: Analyses of Removable Contamination

Client: W.R. GRACE COMPANY W.O. #______ Date______ Page # 2 of

Description of survey: ______

Surveyed by: M.McClosky/R. Slayton Date: 6/3/74 Suspected Activity: Natural Thorium

Counted with: ☐ GM detector ☐ Scintillation detector ☒ Gas Proportional detector

Counter Mfg: NMC Model PC-3A s/n 620(W.R. Grace)

Background of detector before counting: α 8.8cpm β ______

Background of detector after counting: α 7.4 β ______

Efficiency of detector: α 42% β ______ Counted by: RJS 6-4-74

SER. NO.	SAMPLE IDENTIFICATION		Alpha					Beta-Gamma				
	Time	Location	Ctg. Time	c/2m Gross	c/m Net	d/m	d/m/100cm²	Ctg. Time	c/m Gross	c/m Net	d/m	d/m cm²
96		Sample Preparation Room - Concrete Slab	2 Min.	30	7	17	± 3					
97		Sample Preparation Room - Ceiling	"	10	0	0	±0.9					
98		Small Hallway - Floor	"	20	2	5	±1.8					
99		Small Hallway - Floor	"	29	7	17	± 3					
100		Empty Office - Shelf	"	24	4	9	±2.3					
1		" - Wall	"	38	11	26	±3.7					
102		" - Window	"	26	5	12	±2.6					
103		" - Floor	"	40	12	29	±3.9					
104		" - Desk	"	28	6	14	±2.3					
105		Ladies' Room-Window Frame	"	32	8	19	±3.2					
106		" - Door	"	39	12	29	±3.9					
107		Men's Room - Floor	"	20	2	5	±1.8					
108		Storage Area, 2nd Level - Floor	"	40	12	29	±3.9					
109		Storage Area, 2nd Level - Fan	"	23	4	9	±2.3					
110		Storage Area, 2nd Level - Floor	"	28	6	14	±2.3					
111		Storage Area, 2nd Level - Window	"	24	4	9	±2.3					
112		Grinding-Polishing Test Lab - Shelf	"	21	3	7	±2.1					
113		Grinding-Polishing Test Lab - Sink	"	18	1	2	±1.3					
114		Grinding-Polishing Test Lab - Bench	"	15	0	0	±0.9					
115		Grinding-Polishing Test Lab - Bet. 2nd & 3rd Vat	"	32	8	19	±3.2					
6		Grinding-Polishing Test Lab - 4th & 5th Vat	"	21	3	7	±2.1					
117		Grinding-Polishing Test Lab - Floor	"	29	7	17	±3					
118		Shipping, Pulverizing Cerium Oxide Storage-Girder	"	27	6	14	±2.3					

AHP: HP102

APPLIED HEALTH PHYSICS, Inc.

Health Physics Laboratory Report: Analyses of Removable Contamination

Client: W.R. GRACE W.O. # ______ Date: ______ Page # 3 of

Description of survey: ______

Surveyed by: M. McClosky/R. Slayton Date: 6-3-74 Suspected Activity: Natural Thorium

Counted with: ☐ GM detector ☐ Scintillation detector ☒ Gas Proportional detector

Counter Mfg: NMC Model PC-3A s/n 620 (W.R. Grace)

Background of detector before counting: α 8.8cpm β ______

Background of detector after counting: α 7.4 β ______

Efficiency of detector: α 42% β ______ Counted by: RJS 6-4-74

SER. NO.	Time	Location	Alpha Ctg. Time	Alpha c/2m Gross	Alpha c/m Net	Alpha d/m	Alpha d/m/100cm²	Beta-Gamma Ctg. Time	Beta-Gamma c/m Gross	Beta-Gamma c/m Net	Beta-Gamma d/m	Beta-Gamma d/m cm²
119		Shipping, Pulverizing Cerium Oxide Storage-Floor	2 min	29	7	17	± 3					
120		Shipping, Pulverizing Window Cerium Oxide Storage-Sill	"	47	15	34	± 4.2					
121		Shipping, Pulverizing Cerium Oxide Storage-Wall	"	23	4	9	± 2.3					

APPLIED HEALTH PHYSICS, I.

Health Physics Laboratory Report: Analyses of Removable Contamination

Client: W.R. GRACE W.O. # ______ Date: ______ Page # 4 of

Description of survey: ______

Surveyed by: M. McClosky/R. Slayton Date: 6-3-74 Suspected Activity: Natural Thorium

Counted with: ☐ GM detector ☐ Scintillation detector ☒ Gas. Proportional detector

Counter Mfg: NMC Model PC-3A s/n 620 (W.R. Grace)

Background of detector before counting: α 10 β ______

Background of detector after counting: α 9 β ______

Efficiency of detector: α 42% β ______ Counted by: RS,MM 6-5-74

SER. NO.	SAMPLE IDENTIFICATION Time	Location	Alpha Ctg. Time	c/2m Gross	c/m Net	d/m	d/m/100cm²	Beta-Gamma Ctg. Time	c/m Gross	c/m Net	d/m	d/m cm²
B-122		Shipping, Pulverizing Cerium Oxide Storage-Floor	2 min	28	5	12	±2.6					
B-123		Shipping, Pulverizing Cerium Oxide Storage-Wall	"	24	3	7	±2.1					
124		Shipping, Pulverizing Cerium Oxide Storage- Hole in Wall	"	39	11	26	±3.7					
125		Shipping, Pulverizing Cerium Oxide Storage-Beam	"	26	4	9	±2.3					
1		Shipping, Pulverizing Cerium Oxide Storage-Scales	"	23	3	7	±2.1					
127		Shipping, Pulverizing Cerium Oxide Storage-Floor	"	37	10	24	±3.6					
128		Shipping, Pulverizing Cerium Oxide Storage-Wall	"	22	2	5	±1.9					
129		Shipping, Pulverizing Cerium Oxide Storage-Locker	"	25	4	9	±2.3					
130		Shipping, Pulverizing Cerium Oxide Storage- Window Sill	"	30	6	14	±2.8					
131		Shipping, Pulverizing Cerium Oxide Storage-Cross Beam	"	33	8	19	±3.2					
132		Shipping, Pulverizing Cerium Oxide Storage-Beam	"	44	13	30	±3.9					
133		Shipping, Pulverizing Cerium Oxide Storage-Door	"	26	4	9	±2.3					
134		First Level 7-K Bastasite Room-Back of Room	"	24	3	7	±2.1					
135		First Level 7-K Bastasite Room-Wall	"	34	8	19	±3.2					
136		First Level 7-K Bastasite Room-Floor	"	15	0	0	±0.97					
137		First Level 7-K Bastasite Room-Wall	"	24	3	7	±2.1					
138		First Level 7-K Bastasite Room-Wall	"	13	0	0	±0.97					
139		First Level 7-K Bastasite Room-Inside Louver	"	16	0	0	±0.97					
140		First Level 7-K Bastasite Room-Floor	"	25	4	9	+2.3					
141		First Level 7-K Bastasite Room-Wall	"	19	1	2	±1.4					
142		First Level 7-K Bastasite Room-Girder	"	14	0	0	±0.97					
143		First Level 7-K Bastasite Room-Floor	"	20	1	2	±1.4					

APPLIED HEALTH PHYSICS, Inc.

Health Physics Laboratory Report: Analyses of Removable Contamination

Client: W.R. GRACE W.O. # Date: Page # 5 of 8

Description of survey:

Surveyed by: M. McClosky/R. Slayton Date: 6-3-74 Suspected Activity: Natural Thorium

Counted with: ☐ GM detector ☐ Scintillation detector ☒ Gas Proportional detector

Counter Mfg: NMC Model PC-3A s/n 620 (W.R. Grace)

Background of detector before counting: α 10 β

Background of detector after counting: α 9 β

Efficiency of detector: α 42% β Counted by: RS, MM 6-5-74

SER. NO.	SAMPLE IDENTIFICATION		Alpha					Beta-Gamma				
	Time	Location	Ctg. Time	c/2m Gross	c/m Net	d/m	d/m/100cm^2	Ctg. Time	c/m Gross	c/m Net	d/m	d/m/cm^2
44		First Level 7-K Bastasite Room-Wall	2 min	18	0	0	±0.97					

AHP: HP102

APPLIED HEALTH PHYSICS, Inc.

Health Physics Laboratory Report: Analyses of Removable Contamination

Client: W.R. GRACE W.O. # ______ Date: ______ Page # 6 of 8

Description of survey: ______

Surveyed by: M.McClosky/R. Slayton Date: 6-3-74 Suspected Activity: Natural Thorium

Counted with: ☐ GM detector ☐ Scintillation detector ☒ Gas Proportional detector

Counter Mfg: NMC Model PC-3A s/n 620 (W.R. Grace)

Background of detector before counting: α 4.0 β ______

Background of detector after counting: α 10 β ______

Efficiency of detector: α 42% β ______ Counted by: MM 6-5-74

ER. NO.	Time	Location	Alpha Ctg. Time	Alpha c/2m Gross	Alpha c/m Net	Alpha d/m	Alpha d/m/100cm²	Beta-Gamma Ctg. Time	Beta-Gamma c/m Gross	Beta-Gamma c/m Net	Beta-Gamma d/m	Beta-Gamma d/m/cm²
-145	10:00 A.M.	First Level 7-K Bastasite Room-Wall	2 min	17	2	5	±1.8					
.46		Locker & Boiler Room-Radiator		55	21	46	±4.9					
.47		Locker & Boiler Room-Doorway		37	12	29	±3.9					
.48		Locker & Boiler Room-Metal Floor		43	15	34	±4.2					
.49		Locker & Boiler Room-Wall		46	16	35	±4.3					
[illegible]		Locker & Boiler Room-Door		27	7	17	±3.0					
.51		Locker & Boiler Room-Wall		48	17	36	±4.3					
.52		Locker & Boiler Room-Incinerator		29	8	19	±3.2					
.53		Locker & Boiler Room-Floor		26	6	14	±2.8					
.54		1 & 2 Sulfonation Tank Room-Wall		25	6	14	±2.8					
.55		1 & 2 Sulfonation Tank Room-Wall		60	23	50	±5.1					
.56		1 & 2 Sulfonation Tank Room-Chimney		49	18	39	±4.5					
.57		1 & 2 Sulfonation Tank Room-Wall		29	8	19	±3.2					
.58		1 & 2 Sulfonation Tank Room-Door Frame		39	13	30	±3.9					
.59		1 & 2 Sulfonation Tank Room-Wall		36	11	26	±3.7					
.60		Furnace & Press Room-Wall		15	1	2	±1.3					
.61		Furnace & Press Room-Doorway		7	0	0	±0.8					
.62		Furnace & Press Room-Window Sill		13	0	0	±0.8					
.63		Furnace & Press Room-Drain Grating		13	0	0	±0.8					
.64		Furnace & Press Room-Floor		24	5	12	±2.6					
.65		Furnace & Press Room-Wall		10	0	0	±0.8					
.66		Furnace & Press Room-Wall		12	0	0	±0.8					
.67		Sharples Collector Room-Floor		15	1	2	±1.3					

APPLIED HEALTH PHYSICS, Inc.

Health Physics Laboratory Report: Analyses of Removable Contamination

Client: W.R. GRACE W.O # ________ Date: ________ Page # 7 of

Description of survey: ____________

Surveyed by: M.McClosky/R. Slayton Date: 6-3-74 Suspected Activity: Natural Thorium

Counted with: ☐ GM detector ☐ Scintillation detector ☒ Gas Proportional detector

Counter Mfg: NMC Model PC-3A s/n 620 (W.R. Grace)

Background of detector before counting: α 7.0 β ________
Background of detector after counting: α 4.0 β ________
Efficiency of detector: α 42% β ________ Counted by: MM 6-5-74

SER. NO.	Time	Location	Alpha Ctg. Time	Alpha c/2m Gross	Alpha c/m Net	Alpha d/m	Alpha d/m/100cm²	Beta-Gamma Ctg. Time	Beta-Gamma c/m Gross	Beta-Gamma c/m Net	Beta-Gamma d/m	Beta-Gamma d/m/cm²
)-168	9:00 A.M.	Sharples Collector Room-Gas Meter	2 min	52	20	48	±4.9					
169		Sharples Collector Room-Window Sill		26	14	34	±4.2					
170		Sharples Collector Room-Machine		13	1	2	±1.2					
171		Sharples Collector Room-Floor		12	0	0	±0.7					
172		Sharples Collector Room-Floor		26	14	34	±4.2					
1(		Drying Rooms-Ledge		17	3	7	±2.0					
174		" " Floor		15	2	5	±1.7					
175		" " Hole in wall		10	0	0	±0.7					
176		" " Wall		14	1	2	±1.2					
177		" " Floor		21	5	12	±2.6					
178		Test Lab #2 Floor		37	12	28	±3.8					
179		" " " Storage Closet		31	19	46	±4.8					
180		" " " Floor		15	2	5	±1.7					
181		" " " Lab Sink		14	1	2	±1.2					
182		" " " Shelf		19	3	7	±2.0					
183		Conference Room #1-Bookshelf		19	3	7	±2.0					
184		Conference Room #1-Top of A/C		14	1	2	±1.2					
185		Conference Room #1-Floor		23	6	14	±2.7					
186		Conference Room #1-Floor		17	3	7	±2.0					
187		Conference Room #2-Window Sill		11	0	0	±0.7					
1		Conference Room #2-Phone		12	0	0	±0.7					
189		Conference Room #2-Wall		30	9	21	±3.3					
190		Conference Room #2-Door Jamb		30	9	21	±3.3					

APPLIED HEALTH PHYSICS, INC.

Health Physics Laboratory Report: Analyses of Removable Contamination

Client: W.R. GRACE W.O. # ________ Date: ________ Page # 8 of 8

Description of survey: ________

Surveyed by: M.McClosky/R. Slayton Date: ________ Suspected Activity: Natural Thorium

Counted with: ☐ GM detector ☐ Scintillation detector ☒ Gas Proportional detector

Counter Mfg: NMC Model PC-3A s/n 620(W.R. Grace)

Background of detector before counting: α 8.8cpm β ________

Background of detector after counting: α 7.4cpm β ________

Efficiency of detector: α 42% β ________ Counted by: RJS 6-4-74

SER. NO.	SAMPLE IDENTIFICATION: Time	SAMPLE IDENTIFICATION: Location	Alpha: Ctg. Time	Alpha: c/2m Gross	Alpha: c/m Net	Alpha: d/m	Alpha: d/m/100mc^2	Beta-Gamma: Ctg. Time	Beta-Gamma: c/m Gross	Beta-Gamma: c/m Net	Beta-Gamma: d/m	Beta-Gamma: d/m/cm^2
B-191	3:30 P.M.	2nd Level Z-K Blending & Storage- Floor	2 min	25	3	7	±2.0					
192		2nd Level Z-K Blending & Storage- Floor		28	5	12	±1.3					
193		2nd Level Z-K Blending & Storage- Floor		31	6	4	±1.7					
194		2nd Level Z-K Blending & Storage- Floor		22	3	7	±2.1					
195		2nd Level Z-K Blending & Storage- Wall		27	5	12	±2.6					
[illegible]		2nd Level Z-K Blending & Storage- Door		16	0	0	±0.9					
197		Press & Sulfonation Room- Controller		55	14	34	±4.2					
198		Press & Sulfonation Room- Floor		21	2	5	±1.8					
199		Press & Sulfonation Room- Window Frame		60	21	51	±5.1					
200		Main Bldg. Rear 2nd Floor Hallway- Wall		29	10	24	±3.5					
201		Main Bldg. Rear 2nd Floor Hallway- Corner		35	9	22	±3.4					
202		Main Bldg. Rear 2nd Floor Hallway- Corner		34	9	22	±3.4					

APPLIED HEALTH PHYSICS, Inc.

Health Physics Laboratory Report: Analyses of Removable Contamination

Client: W.R. GRACE W.O.# ______ Date: 6-4-74 Page # 1 of 1

Description of survey: ______

Surveyed by: M.McCelosky/R. Slayton Date: 6/3/74 Suspected Activity: Natural Thorium

Counted with: ☐ GM detector ☐ Scintillation detector ☒ Gas Proportional detector

Counter Mfg: NMC Model PC-3A s/n 620 (W.R. Grace)

Background of detector before counting: α 8.2 cpm β ______
Background of detector after counting: α 8.8 β ______
Efficiency of detector: α 42% β ______ Counted by: RJS 6-4-74

ER. NO.	SAMPLE IDENTIFICATION		Alpha					Beta-Gamma				
	Time	Location	Ctg. Time	c/2m Gross	c/m Net	d/m	d/m/100cm²	Ctg. Time	c/m Gross	c/m Net	d/m	d/m/cm²
576	11:20 P.M.	Outside Work Shop-Bench	2 min	107	45	107	±7.4					
577		" " " Floor		77	30	77	±6.3					
578		" " " 5' 5" Wall		33	8	19	±3.2					
579		" " " Wall Heater		106	45	106	±7.3					
580		" " " Floor		51	17	40	±4.6					
5[illegible]		Compressor Room- Ledge		24	4	8	±2.2					
582		" " Wall		25	4	10	±2.4					
583		" " Wall		50	17	39	±4.5					
584		" " Girder		80	32	75	±6.2					
585		" " Storage Floor		42	13	30	±3.9					
586		Ball Mill Lower Operation-Floor		85	34	81	±6.4					
587		Ball Mill Lower Operation-Window Sill		104	44	104	±7.3					
588		Ball Mill Lower Operation-Wall		57	20	48	±4.9					
589		Ball Mill 2nd Level Storage-Power Supply		91	37	88	±6.7					
590		Ball Mill 2nd Level Storage-Wall		48	16	37	±4.4					
591		Ball Mill 2nd Level Storage-Floor		30	7	15	±2.9					

TABLE I

RESULTS OF DECONTAMINATION RADIATION FINAL SURVEY

Location	Reference	Beta-Gamma Meter Survey mR/hr		Alpha Removable Contamination DPM/100 cm^2	
		average	high	average	high
W. R. Grace Office, 2nd level, Main Bldg.	1-A	0.1	0.1	6±1.8	17±3
Lab #1, 2nd level, Main Bldg.	1-B	0.1	0.2	16±2.7	38±4.5
Floor Drain, 2nd level, Main Bldg.	1-B	0.4	0.6	---	19±3.2
Sample Preparation Room, 2nd level, Main Bldg.	1-C	0.1	0.1	11±2.3	19±3.2
Small Hallway, 2nd level, Main Bldg.	1-D	0.1	0.1	7±2.4	17±3
Men's Room, 2nd level, Main Bldg.	1-D	0.1	0.1	---	5±1.8
Ladies' Room, 2nd level, Main Bldg.	1-D	0.1	0.1	24±3.6	29±3.9
Empty Office, 2nd level, Main Bldg.	1-D	0.1	0.1	18±3	29±3.9
Grinding & Polishing Test Lab, 2nd level, Main Bldg.	1-E	0.05	0.4	9±2.1	19±3.2
Storage level, 2nd level, Main Bldg.	1-F	0.2	0.4	15±2.7	29±3.9
against nailed door		---	1.0	---	---
Press Room & Sulfonation Room, 2nd level, Main Bldg.	1-G	0.3	2.0 (back corner)	30±3.7	51±5.1
Test Lab #2, 2nd level, Main Bldg.	1-H	0.15	0.2	18±2.7	46±4.8

Continued on next page

TABLE I

RESULTS OF DECONTAMINATION RADIATION FINAL SURVEY

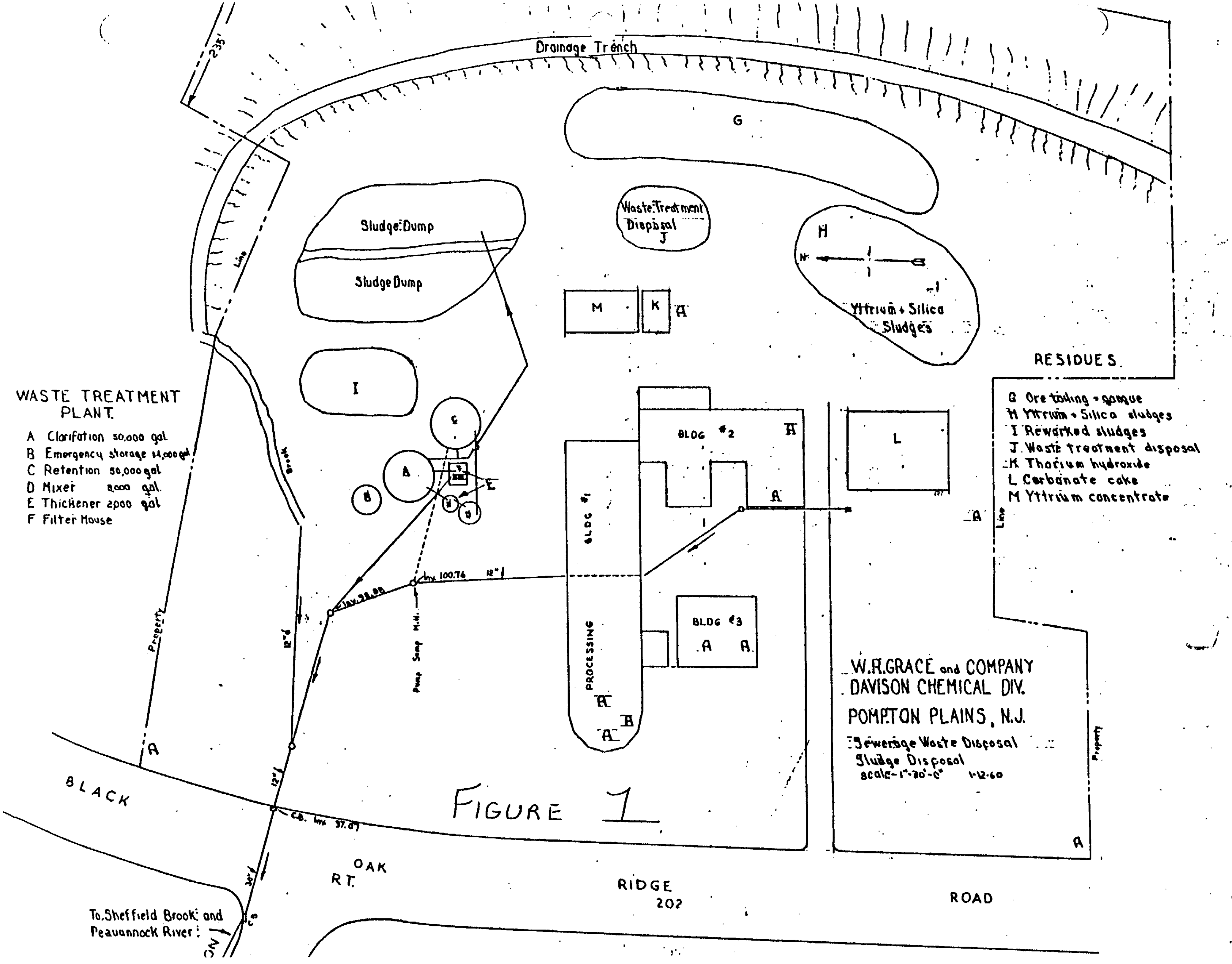
Location	Reference	Beta-Gamma Meter Survey mR/hr		Alpha Removable Contamination DPM/100 cm^2	
		average	high	average	high
Conference Room #1, 2nd level, Main Bldg.	1-I	0.15	0.2	8 ± 2.0	14 ± 2.7
7-K Blending & Storage, 2nd level, Main Bldg.	1-J	0.15	0.2	7 ± 1.8	12 ± 2.6
Conference Room #2, 2nd level, Main Bldg.	1-K	0.15	0.25	11 ± 2.0	21 ± 3.3
Hallway, 2nd level, Main Bldg.	1-L	0.15	0.2	23 ± 3.4	24 ± 3.5
stairs to 1st level		0.4	0.6	---	---
Shipping, Pulverizing, Cerium Oxide Storage, 1st level, Main Bldg.	1-M	0.1	0.4	15 ± 2.8	34 ± 4.2
Drying Rooms, 1st level, Main Bldg.	1-N	0.15	0.3	5.2 ± 1.6	12 ± 2.6
Furnace & Press Room, 1st level, Main Bldg.	1-O	0.3	0.7	2 ± 1.3	12 ± 2.6
four drains		---	1.0	---	---
Sharples Collector Room, 1st level, Main Bldg.	1-P	0.3	0.6	20 ± 2.8	48 ± 4.9
two corners		---	0.9	---	---
1 & 2 Sulfonation Tank Rooms, 1st level, Main Bldg.	1-Q	0.25	0.7	30 ± 3.9	50 ± 5.8
brick wall		---	1.0	---	---
7-K Bastacite Room, 1st level, Main Bldg.	1-R	0.2	0.7	4 ± 1.6	19 ± 3.2

Continued on next page

TABLE I

RESULTS OF DECONTAMINATION RADIATION FINAL SURVEY

Location	Reference	Beta-Gamma Meter Survey mR/hr		Alpha Removable Contamination DPM/100 cm^2	
		average	high	average	high
Locker Room, 1st level, Main Bldg.	1-S	0.1	0.3	36 ± 4.3	46 ± 4.9
Boiler Room, 1st level, Main Bldg.	1-S	0.2	0.4	22 ± 3.3	36 ± 4.3
Machine Shop, 1st level, Main Bldg.	1-S	0.05	0.1	---	---
Workshop Bldg.	2-A	0.3	0.7	70 ± 5.8	107 ± 7.4
Ball Mill, 2nd level, Storage	2-B	0.3	(1.0-2.0) (drains)	47 ± 4.7	88 ± 6.7
Ball Mill, Lower Operation	2-C	0.5	1.0 (trench & concrete)	77 ± 6.2	104 ± 7.3
Compressor Bldg., 1st and 2nd levels	2-D	0.2	0.6	32 ± 3.8	75 ± 6.2
small concrete slab		---	2.0	---	---
Outside of Electronucleonic Storage	2-E	1.0	---	---	---



Drainage Trench
235'
G
Sludge Dump
Sludge Dump
Waste Treatment Disposal J
H
Yttrium + Silica Sludges
M
K
A
I
RESIDUES
G Ore tailing + gangue
H Yttrium + Silica sludges
I Reworked sludges
J Waste treatment disposal
K Thorium hydroxide
L Carbonate cake
M Yttrium concentrate
WASTE TREATMENT PLANT
A Clarifation 50,000 gal
B Emergency storage 14,000 gal
C Retention 50,000 gal
D Mixer 2,000 gal.
E Thickener 2000 gal
F Filter House
BLDG #2
L
BLDG #1
PROCESSING
BLDG #3
Brook
Property Line
12" ϕ
Inv. 100.76
Inv. 98.88
Pump Sump M.H.
W.R.GRACE and COMPANY
DAVISON CHEMICAL DIV.
POMPTON PLAINS, N.J.
Sewerage Waste Disposal
Sludge Disposal
scale - 1" = 30'-0" 1-12-60
BLACK OAK RIDGE ROAD
RT. 202
C.B. Inv. 97.87
30" ϕ
To Sheffield Brook and Pequannock River

FIGURE 1

40 86

GRACE W. R. GRACE & CO., DAVISON CHEMICAL DIVISION
CHARLES & BALTIMORE STREETS, BALTIMORE, MD. 21203 ■ 301: 727-3900

July 26, 1974

RECEIVED
AUG 1 1974

Mr. Bernard Singer,
Chief, Materials Licensing
United States Atomic Energy Commission
Washington, D. C. 20545

Ref: License STA-422

Dear Mr. Singer:

W. R. Grace & Co. presently holds an AEC Storage License, STA-422, for property located at 868 Black Oak Ridge Road, Wayne Township, New Jersey. We have recently completed decontamination of these facilities, using the services of Applied Health Physics, Inc., Bethel Park, Pennsylvania. Their report of the decontamination is attached. We have supplied a copy of this report to Mr. McClintock at King of Prussia and have scheduled a compliance inspection for Thursday, August 1, 1974.

This is our request for release of these facilities for unrestricted use and termination of our storage license. I trust that the Applied Health Physics report meets the requirements of your Guidelines dated April 22, 1970.

Assuming a satisfactory compliance inspection, I would like to ask you to give priority to the Release if possible. We have a buyer for the property and are most anxious to arrange a closing date with him.

Very truly yours,

B. L. Mobley

B. L. Mobley
Supervisor
Environmental Control

BLM:nbs

Attachment: AHP Report

No action taken - per Douglas Collins 8/1/74

105

UNITED STATES GOVERNMENT

Docket 40-86

2-Way Memo

Subject: RO, Region I, Close out Survey W.R. Grace + Co. Davison Chemical Division Pompton Plains, N.J.

DATE OF MESSAGE: Aug 6, 1974

DATE OF REPLY:

INSTRUCTIONS

Use routing symbols whenever possible.

SENDER:
Forward original and one copy. Conserve space.

RECEIVER:
Reply below the message, keep one copy, return one copy.

To: B. Singer
D. Collins

USE BRIEF, INFORMAL LANGUAGE

I received a call from Gene Epstein, Inspector RO, I concerning their close-out survey of the above facility. He says the plate is in poor shape and can't be released without further decontamination. It does not meet our criteria for release for unrestricted use. Epstein quoted the following examples:

1. A drain 4 ft underground read 1 mr/hr at the surface 2 inches above ground using a survey meter with 7 mg/cm² window.
2. Smear samples taken at 57 different locations averaged 18,000 dpm/cm² alpha with hot spots of 74,000 dpm/cm² of alpha.

From: Buchanan

OPTIONAL FORM 27
OCTOBER 1962
GSA FPMR (41 CFR) 101-11.6

106 5027-102 1. TO BE RETAINED BY ADDRESSEE

UNITED STATES GOVERNMENT

2-Way Memo

Subject: W. R. Grace

DATE OF MESSAGE 08/6/74

DATE OF REPLY

INSTRUCTIONS

Use routing symbols whenever possible.
SENDER:
Forward original and one copy.
Conserve space.
RECEIVER:
Reply below the message, keep one copy, return one copy.

To: B. Singer
D. Collins

FOLD — USE BRIEF, INFORMAL LANGUAGE — FOLD

3. Removable alpha contamination averages 800 dpm/cm^2
4. Soil and water samples have been taken and sent to ARCO for analysis — should have results in 2 weeks.

The inspector recommended further decontamination and suggested the licensee tear out certain areas for disposal. His report will be available in about 2 weeks.

I told him we would do nothing until we could be assured that facility was clean enough for release.

From: Buchanan

5027 – 102

1. TO BE RETAINED BY ADDRESSEE

OPTIONAL FORM 27
OCTOBER 1962
GSA FPMR (41 CFR) 101 – 11.6

40-86

REGULATORY OPERATIONS

GRACE W.R.GRACE & CO., [illegible] CHEMICAL DIVISION
CHARLES & BALTIMORE STREETS, BALTIMORE, MD. 21203 301: 727-3900

September 16, 1974

Mr. Bernard Singer, Chief
Materials Licensing
United States Atomic Energy Commission
Washington, D. C. 20545

Ref. License STA-422

Dear Mr. Singer:

On July 26, 1974, I sent you what turned out to be a "Draft" report from Applied Health Physics, Inc., on the decontamination work done at our Pompton Plains (Wayne Township), New Jersey, facilities. Today I received a final report from them and am forwarding it to you.

Mr. Epstein, of the Compliance Section at King of Prussia, inspected the premises on August 1-2 and found several small areas that needed further cleaning. These were corrected, and he is scheduled to return for another inspection on September 20.

As in my letter of July 26, we are requesting release of these facilities for unrestricted use and termination of our storage license.

I would again like to ask you to give priority to the release if possible. Our prospective buyer is anxious to move in. Thank you.

Very truly yours,

B. L. Mobley

B. L. Mobley
Supervisor
Environmental Control

BLM:nbs

Attachment: AHP Report

1890

107

DATE Sept. 18, 1974

DOCKET NO. 40-86

AEC PUBLIC DOCUMENT ROOM AND OTHERS

We will furnish the following document(s) when additional copies are made available:

Health Physics Report for W.R. Grace & Company

Appendix A

Radiation Readings

Area	DPM/100 cm² alpha	Beta-gamma
Bld 1 area 1-D	12,500	0.1-.2 mr/hr
	11,000	
	5000	
	8240	
	11000	
Bld 1 Lab Area 1-B.	35000	0.1 to .35 mr/hr
	50000	
	12500	
Catwalk Bld 1	25000	
	30000	0.8 mr/hr average.
	40000	
	25000	
	25000	
	20000	
	30000	
	20000	
	15000	
Suffonation Room Bld 1 floor	10000	
	15000	0.2-.5 mr/hr.
	18000	
	20000	

.03

Bld. 1 Wall of Sulfonation Room.	3000	
	35000	0.2 -.5 mr/hr.
	55000	
	50 000	
	5000	
	22500	
END Storage Room BLD 1.	5000	
	12500	
	5000	0.1-.2 mr/hr.
	10 000	
	5000	
	2500	
	2000	
3rd floor Lab. Bdg. 1	9000	0.1-.2 mr/hr.
	6000	
	5000	
3rd floor Library. Bld 1	2000	0.1 mr/hr
Kettle Area Bld 1	500	
	2500	0.08-~~0.2~~ mr/hr.
	16000	

Garnet ~~Ar~~ Storage Area 7500
Bld. 1 9000
12500
10 000 0.1 - 1.5 - 2.0 mr/hr.
12500
200000
300000
85000
30000

~~Ball Mill Bdg.~~
Ball Mill Bldg. 6000
10000 .1 - 1.0 mr/hr.
12500
2500
17500

Grinding Bld. 4500 .3 - 1.4 mr/hr.
500
3000

~~OLD Compressor Bld. 10000~~ ~~mr/hr~~

OLD ~~Maintenance~~ Compresor Bld.	12,500	.3 – 1.0 mr/h.
	25000	
	30000	
OLD Maintenance Bld.	10 000	
	7500	.3 – 0.8 mr/hr.
	5000	
	250	
	1000	
	15000	
	15000	

Appendix B

Removable Contamination

Area	dpm α / 100 cm²	dpm β-γ / 100 cm²
Office Area	7.5	26
1-D Bld-1	12.5	51
	25.0	42
	40.0	53
	22.5	2.6
Laboratory	17.5	13
1-B Bld-1	20.0	84
	25.0	126
	47.5	20
	20.0	113
	35.0	69
Catwalk	65.0	126
Bld -1	62.5	73
	50.4	130
	107.5	180
Filter Press Pad	147.5	340
Bld 1	10.0	13

Sulfonation Room	45	71
Floor Bld - 1	35	402
	77.5	100
	40	20
	37.5	20
Sulfonation Room		
Wall Bld - 1	165	131
	0	0
	20	55
END Storage Room	24	91
Bld - 1	24	0
	45	0
3rd Floor Lab.	42	53
Bld - 1.	12	124
	25	208
Library 3rd floor Bld - 1	42	37
Garret Storage Area		
Bld - 1 -	92	58
	360	595
Ball Mill Bldg.	30	0
	20	62

OLD Compressor Bldg. –	242	648
	145	320
~~OLD Maintenance Bld~~		
OLD Maintenance Bld–	107	262
	115	337
	197	390
Parking lot	7	0
~~Plat~~ Loading Platform	15	47
Grinding Ball Mill	~~1~~5	0
area	47	197.

U.S. ATOMIC ENERGY COMMISSION
IDAHO OPERATIONS OFFICE
ANALYTICAL CHEMISTRY BRANCH
SAMPLE RECORD SHEET

ROUTINE ___ SPECIAL ✓ SERIAL NO. [illegible]

SAMPLE FROM: RO:I
COLLECTED BY: Eugene Epstein
DATE SUBMITTED: 8/5/74

SAMPLES RECEIVED: 8/12/74
ANALYSIS COMPLETED: 9/9/74

ANALYZED BY: [illegible]

SAMPLE NO.	DATE	HOUR	SAMPLE DESCRIPTION	ANAL. FOR	INST. USED	QUANT. USED	TIME CNTD.	COUNT TIME	TOTAL COUNT	GROSS COUNT	BKGD. C/M	NET COUNT C/M		RESULTS
2416	8/1		Soil, Burial Ground	nat U		1.2	[illegible]	[illegible]	[illegible]	[illegible]	0.4	1.6		[illegible]
			No. 1	nat Th		0.5	[illegible]	[illegible]	[illegible]	[illegible]	18.8	[illegible]		[illegible]
						(1.3)								
2417			Soil, Burial Ground	nat U		1.1				3.4	0.4	3.0		[illegible]
			No. 2	nat Th		0.5				78.8	18.8	60.0		[illegible]
						(1.3)								
2418			Soil, Burial Ground	Nat U		1.1				3.2	0.7	[illegible]		[illegible]
			No. 3	nat Th		0.5				26.8	18.8	[illegible]		[illegible]
						(1.3)								
[illegible]			Soil, Burial Ground	Nat U		1.3				3.0	0.4	2.6		[illegible]
			No. 4	nat Th		0.5				84.0	18.8	[illegible]		[illegible]
						(1.3)								
2420			Soil, Burial Ground	Nat U		1.1				[illegible]	0.4	[illegible]		[illegible]
			No. 5	nat Th		0.5				[illegible]	18.8	[illegible]		[illegible]
						(1.3)								

[illegible]