

2000-11

F01A-00-101 Resp. 1 Record B/1-133

## URANIUM MATERIALS - INVENTORY

[DEPLETED OR

RECEIVED

MATERIAL	SOURCE	EST. 14-U	DATE ORDERED	DATE RECEIVED
Uranyl nitrate	- 10 lb., reagent - Shattuck Chem.	4.7	9-19-58	10-14-58
Uranyl chloride	- 10 lb., C.P. - "	7.0	9-19-58	10-14-58
Uranyl acetate	- 2 lb., reagent - "	1.1	9-19-58	10-14-58
Uranyl sulfate	- 2 lb., C.P. - "	1.1	9-19-58	10-14-58
UO <sub>2</sub> contained in ThO <sub>2</sub> Res. shipped to Pompton. @ memo 5 Aug/60				
UO <sub>2</sub> - reactor grade - cer. prod. depl. - Enwin.		15	Aug/60	Aug/60
UO <sub>2</sub> SAMPLES - CONTR. AT-143				
(1) <del>8</del> 250g. UO <sub>2</sub>				
(2) 183g. UO <sub>2</sub>				
Return AT-143 UO <sub>2</sub> nonmaterial (2.9. residue of above 20# Enwin UO <sub>2</sub> )				
UO <sub>2</sub> - reactor grade - cer. prod. depl. - Enwin		15	May/60	5 June/61

ITEM #

11



NATURAL.]

## TRANSFERRED

(5)

MATERIAL	DESTINATION	EST. 16-U	DATE SHIPPED	TOTAL 16-U	AEC LICENSE NO.
				4.7	C-4132
				11.7	
				12.8	
				13.9	
EXPL. THO <sub>2</sub> Res.	Dev. Chem. Div. Prompton Pl., N.J.	6.64	8 Aug/60	7.26	"
—	—	—	—	22.26 <del>21.26</del>	"
} AT-143 SAMPLES	} G.E. ANP	1	13 Oct/60	21.26 <del>20.26</del>	"
			4 Nov/60		
VO <sub>2</sub> (3.3 hg.)	GE. ANP	7.26	15 June/61	14.00	
				29.0	"

UNITED STATES  
ATOMIC ENERGY COMMISSION

**SPECIAL NUCLEAR MATERIAL LICENSE**

Pursuant to the Atomic Energy Act of 1954 and Title 10, Code of Federal Regulations, Chapter 1, Part 70, "Special Nuclear Material Regulations," a license is hereby issued authorizing the licensee to receive and possess the special nuclear material designated below; to use such special nuclear material for the purpose(s) and at the place(s) designated below; and to 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 70.32(a) of said regulations, and is subject to all applicable rules, regulations, and orders of the Atomic Energy Commission now or hereafter in effect and to any conditions specified below.

<p><b>Licensee</b></p> <p>1. Name <b>W. R. Grace &amp; Co.</b></p> <p>2. Address <b>Research Division Washington Research Center Charlottesville, Maryland</b></p>		<p>3. License No. <b>ENR-417</b></p> <p>4. Expiration Date <b>October 31, 1961</b></p> <p>5. Docket No. <b>70-456</b></p>
<p>6. Special Nuclear Material <b>Plutonium contained in the U-235 Isotope</b></p>	<p>7. Maximum quantity of special nuclear material which licensee may possess at any one time under this license <b>250 grams contained U-235.</b></p>	
<p>8. Authorized use <b>For use in accordance with the procedures as described in the licensee's application dated October 4, 1960.</b></p>		
<p>9. Quantity of special nuclear material allocated to licensee pursuant to Section 70.31(b) of said part <b>None</b></p>		

**CONDITIONS**

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

**#ITEM#** 2

For the U. S. ATOMIC ENERGY COMMISSION

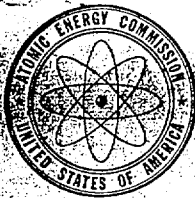
067 1 8 1960

Date of issuance

☆ U. S. GOVERNMENT

**J. C. Delaney**  
**Division of Licensing and Regulation**

B12



UNITED STATES  
ATOMIC ENERGY COMMISSION

IN REPLY REFER TO:

LAR:JED  
70-436

OCT 18 1960

W. R. Grace & Co.  
Research Division  
Washington Research Center  
Clarksville, Maryland

Attention: Mr. W. P. Gage  
Vice President

Gentlemen:

Enclosed is Special Nuclear Material License SM-417.

Very truly yours,

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

Enclosures:

1. SM-417
2. Part 20
3. Part 20, effect. Jan., 1961

Distribution:

- L.D. Mackay, FIN-CRCC, w/encl. 1  
D. George, EDM, w/encl. 1  
S.R. Gustavson, LAR, w/encl. 1  
H. Steele, LAR, w/encl. 1  
✓ Encl., w/encl. 1 & cy 10/4/60 appl.

ITEM #

3

NYOO COMPLIANCE DIVISION

OCT 20 1960

RECEIVED

C 159

B13





W. R. GRACE & CO. BOOKED NO.

70-456  
For Div of Compliance

Research Division

WASHINGTON RESEARCH CENTER CLARKSVILLE, MARYLAND  
September 21, 1961

United States Atomic Energy Commission  
Washington 25, D. C.

Attention: Division of Licensing and Regulation

Gentlemen:

W. R. Grace & Co. hereby makes application to the United States Atomic Energy Commission for renewal of its Special Nuclear Material License SNM-417. The information required by Section 70.22, Part 70, Chapter 1, Title 10, Code of Federal Regulations is contained herein or is incorporated by reference to our original application dated October 4, 1960. The information is presented in the same numerical order.

1. See application dated October 4, 1960.

2. W. R. Grace & Co., through its Research Division, is continuing research in the preparation of compositions of urania and other materials having specific properties and characteristics. Negotiations are under way seeking Atomic Energy Commission support for a portion of this work.

Conversations have been held with Aerojet-General Nucleonics which indicate potential usefulness of Grace technology involving special nuclear materials in their hydrazine synthesis program (Air Force contract). Confirmatory experiments will require handling of special nuclear materials. Research Division's support of W. R. Grace's Nuclear Reactor Materials plant at Irwin, Tennessee may require work with special nuclear materials. All work will be carried out at the Washington Research Center.

3. It is requested that the license be renewed for a period of one year.

4. The total amount and specifications of the special nuclear material which will be required for the various projects is not known at the present time. However, we will not have in our possession at the Washington Research Center more than 250 grams of contained U-235 at any one time.

5. The dates on which we may require special nuclear material are presently unknown.

ITEM # 4

B/H

(D)

**W. R. GRACE & CO.**

Research & Development Division

WASHINGTON RESEARCH CENTER

CONTINUATION

U. S. Atomic Energy Commission

- 2 -

September 21, 1961

6. See application dated October 4, 1960.

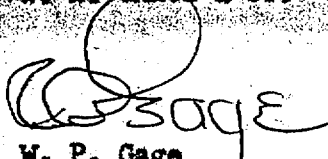
7. See application dated October 4, 1960.

8. See application dated October 4, 1960.

If additional information is required we will be happy to supply it.

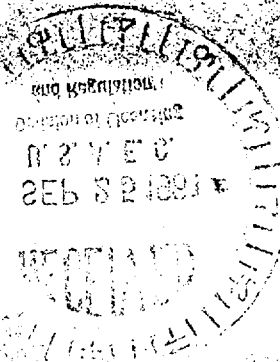
Very truly yours,

W. R. GRACE & CO.



W. P. Gage  
President  
Research Division

WSP:ps





**W. R. GRACE & CO.**

**Research and Development Division**

WASHINGTON RESEARCH CENTER • CLARKSVILLE, MARYLAND

October 6, 1961

United States Atomic Energy  
New York Operations Office  
376 Hudson Street  
New York 14, New York

Reference: CO-NY: EE

Attention: Mr. Eugene Epstein  
Compliance Division

Subject: Inspection on 9/29/61 of Washington Research Center Facilities  
W. R. Grace & Co., Clarksville, Md.  
Re: Lic. SMB-334  
SNB-417

Dear Mr. Epstein:

The following items are enclosed in this letter to supply you with the additional information you still desired on completing the above inspection:

(1) Inventory of nuclear materials stored at Hilltop laboratory, Curtis Bay.

(2) Monitoring record of storage room area taken immediately following your visit. It is apparent that there has been very slight, but definite, contamination of the enclosed floor area and door handle. No contamination of adjacent areas was detected. This storage room has been improved by decontaminating the areas of very slight activity and by painting the floor. Upon completing this, the room was again monitored as indicated by the enclosed record. We shall include this storage room in our regular monitoring schedule and maintain its condition as indicated by the second monitoring record.

Exhibit "A"

ITEM #

5

B/S

(5)



**W. R. GRACE & CO.**

Research & Development Division

WASHINGTON RESEARCH CENTER

CONTINUATION

Mr. Epstein

- 2 -

October 6, 1961

Several samples, greater than 3.3 lbs. U or 9.9 lbs. Th, were labeled "Radioactive Materials" with isotope, amount and date description. These preferably should have been labeled "Caution Radioactive Materials". This has now been done.

I believe the above actions should bring our activities in laboratories 225 and 215 and the storage area well within full compliance with AEC regulations and also within our own high safety standards. May I express our appreciation of your interest and suggestions in the course of the inspection that should help us maintain our work in compliance with the desired safety standards and regulations.

Yours truly,



F. T. Fitch  
Supervisor

Inorganic Chemical Research

FTF:jz

cc: D. L. Fuller  
W. T. Barrett  
D. J. Moyer  
Files

# W. R. GRACE & CO.

## Research Division

WASHINGTON RESEARCH CENTER • CLARKSVILLE, MARYLAND

### INTER-OFFICE MEMO

TO: Dr. F. T. Fitch (2)  
FROM: R. L. Koffler  
DATE: September 29, 1961  
SUBJECT: Inventory of Nuclear Materials at Hilltop

Inventory of nuclear materials at Hilltop that you requested is as follows:

Material	Total Weight		Wt. of U-238 Lbs.	Wt. of Th-232 Lbs.
	Lbs.	Oz.		
Uranyl Nitrate		295	0.31	
Uranium Oxide $U_3O_8$	1		0.84	
Uranyl Acetate		5	0.006	
Thorium Hydroxide	60			46.3
Thorium Oxide Pellets		620		1.2
Thorium Oxide	8			7.0
Total Pounds U-238			1.16	
Total Pounds Th-232				54.5

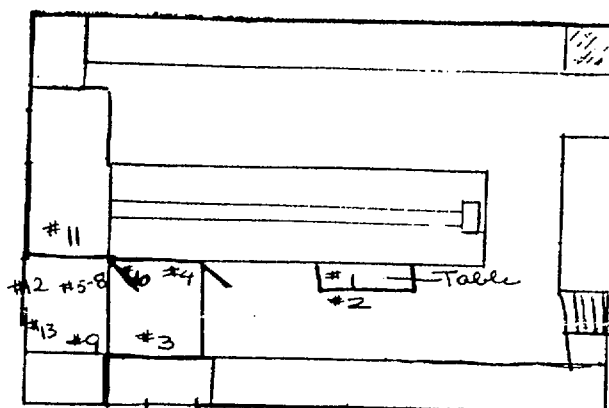
*R. L. Koffler*  
R. L. Koffler

FLK:ech

cc: C. D. Helm  
Chron. File  
WRC File

# MONITORING SAMPLES - Project 6170

Sheet # 13  
 Date: 10-2-61  
 Time: 11 AM  
 Room # Storage area  
 Sampler: Weaver Moyer



- Correct diagram for room,
- indicate pertinent equipt, etc.,
- locate in-lab. samples by number on diagram.

1. Note special conditions or operations influencing monitoring:
2. Record below any high analysis, any unsafe condition indicated, any resulting corrective action taken:

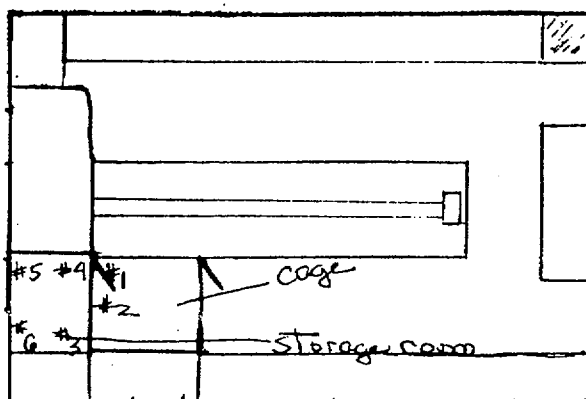
SAMPLES			ANALYSIS			Comments and/or Location
Sample No.	type	air volume	date	BeO	cpm.	
1	Smear	1 ft <sup>2</sup>	10-2-61		0.4	table in front of cage
2	Smear	1 ft <sup>2</sup>	10-2-61		0.5	floor around table
3	Smear	1 ft <sup>2</sup>	10-2-61		3.8	cage floor
4	Smear	1 ft <sup>2</sup>	10-2-61		0.8	floor cabinet top in cage
5	Air	320 ft <sup>3</sup>	10-4-61		1.9	Storage area near sample
6	Smear	1 ft <sup>2</sup>	10-2-61		1.8	Storage area floor
7	Smear	1 ft <sup>2</sup>	10-2-61		1.1	second shelf in room
8	Smear	1 ft <sup>2</sup>	10-2-61		2.4	floor under shelves
9	Smear	1 ft <sup>2</sup>	10-2-61		3.6	floor by wall
10	Smear	1 ft <sup>2</sup>	10-2-61		0.7	door knob area nearby
11	Smear	1 ft <sup>2</sup>	10-2-61		0.7	floor of room next door
12	Smear	1 ft <sup>2</sup>	10-2-61		0.1	pipe in Storage room
13	Air	330 ft <sup>3</sup>	10-4-61		0.7	on chair in room

9.4 ft<sup>3</sup>/min  
 10:53-11:03  
 30 ft<sup>3</sup>/min

33 ft<sup>3</sup>/min  
 11:10-11:20 AM



# MONITORING SAMPLES - Project 6170



Sheet # 14

Date: 10-5-61

Time: 10 AM

Room # Storage room

Sampler: T. W. Dean

(Repeat)

- Correct diagram for room,
- indicate pertinent equip., etc.,
- locate in-lab. samples by number on diagram.

1. Note special conditions or operations influencing monitoring:
2. Record below any high analysis, any unsafe condition indicated, any resulting corrective action taken:

Sample No	SAMPLES		ANALYSIS			Comments and/or Location
	type	air volume	date	BeO	cpm.	
1	Smear	1 ft <sup>2</sup>	10-5-61		0.0	door knob + arise around it
2	Smear	1 ft <sup>2</sup>	10-5-61		0.6	on floor in front of room
3	Smear	1 ft <sup>2</sup>	10-5-61		0.3	floor over inside room
4	Smear	1 ft <sup>2</sup>	10-5-61		0.4	"
5	Smear	1 ft <sup>2</sup>	10-5-61		0.6	"
6	Smear	1 ft <sup>2</sup>	10-5-61		0.8	"

## MONITORING LIMITS USED (Smear)

(WORK AREAS) (CONTROLLED AREAS)

40 cpm/ft<sup>2</sup> - 20 cpm/ft<sup>2</sup>

20 cpm/ft<sup>2</sup> - decontamination required, if surface

(In practice - clean up when any decontamination appears)

- above estimates based on: ORNL-332, "Applied Health Radiation Survey Instruments" pp 118-122

Air Samples  $5.5 \text{ cpm/m}^3 \pm 3 \times 10^{-4} \text{ mpc}$  - WORK AREA LIMIT  
(based on lower limits for Th.)

UNITED STATES  
ATOMIC ENERGY COMMISSION

**SPECIAL NUCLEAR MATERIAL LICENSE**

Pursuant to the Atomic Energy Act of 1954 and Title 10, Code of Federal Regulations, Chapter 1, Part 70, "Special Nuclear Material Regulations," a license is hereby issued authorizing the licensee to receive and possess the special nuclear material designated below; to use such special nuclear material for the purpose(s) and at the place(s) designated below; and to 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 70.32(a) of said regulations, and is subject to all applicable rules, regulations, and orders of the Atomic Energy Commission now or hereafter in effect and to any conditions specified below.

<p align="center"><b>Licensee</b></p> <p>1. Name: <b>W. R. Grace &amp; Co.</b></p> <p>2. Address: <b>Research Division Washington Research Center Clarksville, Maryland Attention: Mr. W. P. Gage, President Research Division</b></p>		<p>3. License No. <b>SNM-417, as amended</b></p> <p>4. Expiration Date <b>October 31, 1962</b></p> <p>5. Docket No. <b>70-156</b></p>
<p>6. Special Nuclear Material <b>Material included in the 2-033 isotope</b></p>	<p>7. Maximum quantity of special nuclear material which licensee may possess at any one time under this license <b>250 grams contained 2-033.</b></p>	

8. Authorized use  
**For use in accordance with the procedures as described in the licensee's application dated September 21, 1961.**

9. Quantity of special nuclear material allocated to licensee pursuant to Section 70.31(b) of said part  
**None**

**CONDITIONS**

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

**DISTRIBUTION:**

Formal	D. George, NMM	Thornburg, CO
Boc. Rm.	S. Gustavson, LR	
Suppl.	H. Steele, LR	
Compl. w/cy dtd 9/21/61	Nussbaumer, LR	LR
S/Health	Etter(2)	Nussbaumer:rl
H. J. McAlduff, OROO		9/27/61

OCT 10 1961

**RECEIVED**

For the U. S. ATOMIC ENERGY COMMISSION

Date of issuance **ITEM # 10**

*Shipley c-151*  
 ☆ U. S. GOVERNMENT PRINTING OFFICE : 1958 - O-471648 **Donald A. Nussbaumer**  
**Division of Licensing and Regulation**

*B/b*

Robert Lowenstein, Director  
Division of Licensing & Regulation, HQ.

NOV 28 1961

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

TRANSMITTAL OF LICENSE COMPLIANCE INSPECTION REPORT -  
10 CFR 30, 40, 70

CO:I:EE

Transmitted herewith is the following inspection report  
involving noncompliance:

W. R. GRACE AND COMPANY  
Washington Research Center  
Clarksville, Maryland

License Nos.: 19-4003-1 w/amends. 1, 2, and 3  
SNM-417  
SMB-334

The following items of noncompliance were noted during  
the course of the inspection:

License SMB-334

20.201(b) "Surveys"

- in that the licensee did not perform any survey or  
evaluate hazards relative to the storage of Natural  
Uranium and Thorium in a storage room. (See item 13  
of the report details.)

20.203 "Caution signs, symbols, and signals"

(f)(2) "Containers" - in that a container in which  
5,600 grams of Natural Uranium was stored did not  
have a label reading "Caution - Radioactive Materials".  
(See item 17 of the report details.)

License 19-4003-1

20.201(b) "Surveys"

- in that the licensee did not make any evaluation  
as to the amount of tritium in a laboratory and in  
the environs during processing and storage of 10 g  
of tritium. (See item 13 of the report details.)

License SNM-417

No items of noncompliance were noted for license  
SNM-417

COMPLIANCE  
EPSTEIN:mg

KLEVIN

KIRKMAN

ITEM # 7

B/7

10



The items of noncompliance were discussed with Dr. F. T. Fitch and Dr. D. Fuller, Director of Laboratories, a member of management. Fuller indicated his willingness to comply with the regulations.

It was pointed out that the items of noncompliance for license SNB-334 had occurred at our initial inspection of license C-4132 conducted on January 22, 1959. Fitch stated that the initial citation for 10 CFR 20.201(b) was failure to perform surveys and evaluate the need for personnel monitoring in areas of use. He stated that they had done this, but failed to survey or evaluate hazards in the storage area. With regard to 10 CFR 20.203 (f)(2) Fitch stated he thought that when he used a label reading Radioactive Materials (with prescribed symbol) that he was complying with the regulation. Fitch stated both items of noncompliance would be immediately remedied. Letters from the licensee dated October 6, 1961 and October 23, 1961 (exhibits "A" and "B"), were received at NYOO. The licensee stated that proper labels have been applied to containers.

With regard to the item of noncompliance for license 19-4003-1, 10 CFR 20.201(b), the licensee indicated in his letter of October 23, 1961 that a tritium monitoring system has been ordered, and that a material balance will be made to determine any loss of tritium to the environs.

We wish to point out, as noted in the report details, the licensee has approximately 10 cc of tritiated water in a glass flask in an exhaust hood. The only seal was a rubber stopper into which was inserted a glass tube, with a glass stopcock sealed by grease. The use of glass stopcocks sealed with stopcock grease has been commented upon in reports as an inadequate method to contain tritium. A specific reference, "Tritium Protection" by Robert F. Barker, Isotopes Extension, Division of Civilian Applications, USAEC, printed in "Isotopes" of January 1956 states, "Metal valves are most often used because tritium readily diffuses through stopcock grease." We believe that in the letter to the licensee a comment should be made concerning the licensee's method of handling tritium.

No hazard exists, and no follow-up inspection will be made.

We recommend that the licensee be sent a letter advising of the items of noncompliance, and taking note of the corrective action already taken by the licensee.

Enclosures:

1 cc Rpt

cc: Div of Cmp, HQ.

w/orig of Rpt

## COMPLIANCE INSPECTION REPORT

1. Name and address of licensee

W. R. GRACE AND COMPANY  
Washington Research Center  
Clarksville, Maryland

2. Date of inspection

September 29, 1961

3. Type of inspection

Initial and Reinspection

4. To CFR Part(s) applicable

5. License number(s), issue and expiration dates, scope and conditions (including amendments)

20 - 30 - 40 - 70

License NumberDocket NumberDateExp. Date

19-4003-1 (Reinspection)

6/14/60

6/30/62

amend. 1 (amended in its entirety)

amend. 2

5/4/61

6/30/62

amend. 3

8/14/61

6/30/62

SMB-334 Reinspection 40-2810

7/3/61

6/30/64

SMB-417, as amended 70-756

9/29/61

10/31/62

Initial

6. Inspection findings (and items of noncompliance)

The Washington Research Center of the W. R. Grace and Company performs research and analysis mainly in inorganic chemistry. License SMB-417 was used for a three week period in 1960 to prepare ceramic fuel plates. License SMB-334 was used in processing experiments by wet chemistry, to evaluate fuel processes. License 19-4003-1 is in current use for work involving tagging compounds with tritium and C-14. Dr. J. D. Moyer was with the National Bureau of Standards Isotopes Division for several years. Direct radiation and environmental surveys are performed on areas of use. Personnel monitoring devices are not used. Records are maintained of the receipt of materials, use, surveys, bioassays for uranium, and transfer. The only items of noncompliance observed or noted during the course of the inspection are set out below:

License SMB-334

## 20.201 "Surveys"

(b)- in that the licensee did not perform any survey or evaluate hazards relative to the storage of Natural Uranium and Thorium in a storage room. (See item 13 of the report details.)

## 20.203 "Caution signs, symbols, and signals"

## (f)(2) "Containers"

- in that a container in which 5,600 grams of natural uranium was stored (CONT'D)

7. Date of last previous inspection

-1 1/22/59

8. Is "Company Confidential" information contained in this report? Yes ☐ No ☒

(Specify page(s) and paragraph(s))

SMB-334 - 1/22/59

## DISTRIBUTION:

1 cy - CO-HQ.

1 cy - BL&amp;R

2 cys - CO-NY

Eugene Epstein (Inspector)

Approved by:

Robert W. Kirkman, Director  
Region I, Division of ComplianceNovember 21, 1961  
(Date report prepared)

If additional space is required for any numbered item above, the continuation may be extended to the reverse of this form using foot to head format, leaving sufficient margin at top for binding, identifying each item by number and noting "Continued" on the face of form under appropriate item.

ITEM 6 CONT'D

did not have a label reading, "Caution-Radioactive Materials". (See item 17 of the report details.)

License 19-4003-1

20.201 "Surveys"

(b)- in that the licensee did not make any evaluation as to the amount of tritium in a laboratory and in the environs during processing and storage of 10 c of tritium. (See item 13 of the report details.)

License SNM-417

No items of noncompliance were noted for License SNM-417

PART 30, 40, 70 INSPECTION

W. R. GRACE AND COMPANY  
Washington Research Center  
Clarksville, Maryland

Date of Inspection: September 29, 1961 (Announced)

Persons Accompanying Inspector:

Mr. H. Chaney, Maryland State Department of Health

Persons Contacted:

Dr. F. T. Fitch, Head of Analytical & Research Departments  
Dr. D. Fuller, Director of Laboratories  
Dr. J. D. Moyer, Research Chemist  
Miss T. Weaver, Technician

DETAILS

9. Background Information

An initial inspection under License -1 was performed on January 22, 1959 by Mr. W. E. Kriegsman of this office, and the following items of non-compliance were noted.

License -1

License Condition 12

-in that materials were not used by authorized persons, or under the direct supervision of authorized users.

cc 207 "Material signs, labels and signals"

10. Organization and Administration

The Washington Research Center of W. R. Grace and Company performs research and analysis mainly in inorganic chemistry. Further development of processes is done by the Process Development Group at W. R. Grace, Curtis Bay, Maryland. At the Washington Research Center, special nuclear material was used for a three week period in 1960. Source material had been used to study methods used in fuel production. Special nuclear material and source material were used under the direction of Dr. F. T. Fitch, Supervisor of Research. Fitch has a Ph.D. in chemistry and has taken courses in nuclear physics. Byproduct material is used by Dr. D. J. Moyer for tagging and tracer studies in the Analytical and Physical Research Departments. Moyer, a Ph.D. in organic chemistry, was employed in the isotopes division, NBS, for nine years. There is no isotope committee. Moyer stated he has full authority as RSO to allow the use of isotopes under safe conditions.

11. Facilities and Uses of Materials

A. Special Nuclear Material License SNM-417

Special Nuclear Material, Uranium Oxide, 93% enriched in U-235, was used from November 1, 1960 to December 15, 1960. Grace had a contract from General Electric to prepare ceramic fuel plates for subsequent testing by General Electric. 245 grams of UO<sub>2</sub> as U-235, were received on November 1, 1960. 8 grams of U-235 was sent to Ledoux & Company for analysis. The balance of material, 237 grams as U-235 were sent to General Electric on December 15, 1960.

All work was performed in Laboratory 225 inside a chemical type exhaust hood, using small amounts. Wet processes were used. Fitch stated that this method was used to avoid any dust, or loss of material.

B. Source Material License SMB-334

Depleted or natural uranium oxide and thorium oxide, is used in experimental research to evaluate fuel processing. Amounts used did not exceed 50 grams at any one experiment. Thorium nitrate is on hand as a standard analytical reagent. Amounts of source material on hand are as follows:

1. In Curtis Bay, Maryland, Hilltop Laboratory

uranium nitrate	-	295 grams containing 0.31 pounds U-238
uranium oxide	-	1 pound containing .84 pounds U-238
uranyl acetate	-	5 grams containing .006 pounds U-238
thorium hydroxide	-	60 pounds containing 46.3 pounds Th-232
thorium oxide pellets	-	620 grams containing 1.2 pounds Th-232
thorium oxide	-	8 pounds containing 7.0 pounds Th-232

2. At Clarksville

Source material had been used under expired AEC Contract AF-143-AP(11-1)-171, sub AF-143. Twenty-nine pounds of depleted or natural uranium oxide, and 83.1 pounds of thorium was on hand. Storage was as follows:

In Laboratory 225:

U-238 - 5,600 grams depleted UO<sub>2</sub>  
0.4 Kg. Thorium nitrate  
200 grams hydrated thorium oxide

In Laboratory 215:

A maximum of 3 pounds natural uranium oxide in 260 small jars which are analytical samples.

In a storage room in the basement:

3,200 grams Th-232  
9.5 pounds thorium nitrate  
2,191 grams thorium wastes  
17 jars each containing 300 grams Th-232  
10 pounds uranyl nitrate

C. Byproduct Material License No. 19-4003-1

Byproduct material is used by Moyer as required by License Condition 12 for tagging experiments. All work is performed by Moyer in Rooms 201 and 126. Both rooms are standard chemical laboratories having stainless steel tables and chemical type exhaust hoods. The exhaust hoods have an air flow of 1,200 cfm.

Moyer only uses C-14, and tritium. Carbon 14 is used to prepare tagged compounds of Succinic acid, Ethylene, and Cyanide. 10 c of tritiated water was in a hood in a flask. 10 c of tritiated products were in vials in the hood. The only seal on the flask consisted of a glass tube inserted into a rubber cork. The glass tube was sealed by a glass stopcock with a grease seal. Moyer stated he uses Wilzbach techniques to tag organic compounds with tritium. Experiments with C-14 and with tritium are for the Polymer Division of the W. R. Grace Company Clifton, N. J. Moyer has prepared a total of 1 mc of C-14 tagged compounds and approximately 10 c of tritium tagged compounds. He has himself taken 1 mc C-14 compounds to W. R. Grace, Clifton, N.J. in accordance with License Condition 15. A total of 7.3 mc of C-14 and 10 c of tritiated compounds in various organic compound were on hand in Room 201. Tritiated compounds have not been transferred to W. R. Grace, Clifton, N. J. as yet. Moyer stated he has just started work with tritium. Moyer stated that products produced are not distributed to the public in accordance with License Condition 13. Moyer has one assistant, a technician, Miss T. Weaver, who assists Moyer in health physics duties. Weaver does not use materials. Use of byproduct material is in accordance with License Condition 14 which requires use as described in items 6, 7, and 8 of the license, as represented in his application, dated May 20, 1960, and a letter dated January 14, 1960.

12. Instrumentation and Calibration

License SNM-417, SMB-334, and 19-4003-1

Moyer had on hand the following operable instrumentation:

- (a) PG-3A Nuclear Measurements Corporation windowless proportional counter.
- (b) Tracerlab Model 3U-14 survey meter 0-25 mr/hr
- (c) Victoreen Cutie-Pie-0-2500 mr/hr.

The above instruments are calibrated monthly by Moyer using generally licensed standards. Moyer stated he did not have any instrumentation to monitor tritium.

13. Surveys

License SNM-417, SMB-334, and 19-4003-1

Moyer stated that direct radiation surveys were made during all uses



of special nuclear and source material. Air samples were taken with a Staplex Air Sampler and samples counted. Smears were also taken of areas of use. Records were maintained of these surveys and results indicated in percent of maximum permissible concentration with the concentration as stated in Appendix B, Table I and Table II indicated for thorium and uranium. MPC were never exceeded for operations. Moyer stated, however, that no direct radiation, air samples, or smear surveys were ever taken or made of the basement storage area. The inspector observed a lunch table immediately adjacent to the storage room, and two workmen eating their lunch. Moyer stated only the storage room was a restricted area. Under License -1 Moyer stated that he did not evaluate tritium concentrations in the hood or in Room 201, either during storage or during tritium experiments when he prepared approximately 10 c of tritiated compounds. Moyer stated that he realized some tritium may escape to the atmosphere through the exhaust hood, but he did not evaluate the concentrations released to the atmosphere.

A direct radiation survey was made by the inspector using a #5680 NMC thin window survey meter calibrated August 4, 1961, and a #1627 Juno survey meter calibrated September 8, 1961. The following radiation levels were noted.

Inside the basement storage room:

All windows of Juno opened	-	5 mr/hr
Beta window closed	-	2.5 mr/hr

Immediately outside the storage room: 0.07 mr/hr

In Room 225:

Inside an exhaust hood where a bag of thorium waste was stored - 0.2 mr/hr

In Room 201:

Inside the exhaust hood - 0.05 mr/hr

The licensee, in a letter dated October 6, 1961 to NYOO stated that monitoring of the storage area was performed immediately after the inspection. In a further letter to NYOO dated October 23, 1961 the licensee submitted data sheets showing the results of smears and air samples taken before and after decontamination. The letter of October 6, 1961 stated that slight contamination and alpha activity had been detected as a result of the air surveys, and that they had cleared and decontaminated the storage room areas. Maximum permissible concentrations were not exceeded. See exhibits "A" and "B" for licensee's letters of October 6, 1961 and October 6, 1961.

#### 14. Storage and Security of Material

Licenses SNM-417, SMB-334, and 19-4003-1

All material not in use is stored in a locked storeroom. Material in use was stored within hoods, and in attended or locked laboratories. The building has a security system, and unauthorized persons are not permitted within the building without escort.

15. Procurement Procedures and Control

Licensee SNM-417

Records were maintained of the receipt of 245 grams of special nuclear material from Davison Chemical, Erwin, Tennessee and the subsequent transfer of materials to the contractor, General Electric. Accountability reports were sent to AEC Headquarters showing use and transfer.

Licensee SMB-334

All source material was received from Davison Chemical, Erwin, Tennessee.

License 19-4003-1

All materials have been received from Oak Ridge. The licensee is authorized to possess a Co-60 source. Moyer stated that they have not received this source but intend to procure a Co-60 calibration source in the near future.

All materials are delivered directly to either Fitch or Moyer. They are the only persons permitted to open packages.

16. Waste Disposal

Licenses SNM-417, SMB-334 and 19-4003-1

All waste materials under SNM-417 were collected and shipped to the contractor, General Electric. All analytical samples under SMB-334 have been retained, and there are some 260 bottles containing from 1 to 10 grams of source material in Laboratory 225. All other wasted source material is in the storage room. Moyer stated he did not know if any tritium was lost to the atmosphere because he had not evaluated his yield of tritiated compounds.

17. Posting and Labeling

License 19-4003-1

Vials containing a total of 7 mc of C-14 in storage in a hood in Room 126 had labels reading "Caution Radioactive Material" (with symbol). The hood in which the C-14 was stored was similarly labeled. Room 201, in which 20 c of tritium was stored was posted with a sign reading, "Danger-Radioactive Material" (with symbol). Three vials in the exhaust hood containing approximately 10 curies of tritiated compounds had labels reading, "Caution-Radioactive Materials" (with symbol). Approximately 10 c of tritiated water in a flask in the hood was not labeled, but Moyer stated this was transient storage, and the Melzback apparatus is in almost constant use, and someone is in attendance.

License SMB-334

A container in Room 225 in which 5,600 grams of U-238 natural uranium oxide had a label reading, "Radioactive Materials" (with symbol) but did not include the word "Caution". The label also indicated the kind, quantity, and date of assay. A total of 5,600 grams U-238 (natural) and 600 grams Th-232 (natural) were in the room.

The basement storage room was posted with a sign reading, "Caution-Radioactive Materials (with symbol). A container with 10 pounds of U-238 as uranyl chloride had a label reading, "Caution Radioactive Material (with symbol).

Form AEC-3 was posted on the main bulletin board so that all employees on their way to restricted areas could observe the notice.

18. Personnel Monitoring

License SNM-417, SMB-334, and 19-4003-1

No personnel monitoring devices have been used for any of the personnel. Moyer stated they were working with small amounts of alpha emitters and with curie quantities of tritium, and did not think that film badges would be effective. Urine analysis was performed for all those working with special nuclear material, for uranium in urine. Records were maintained showing that the maximum uranium content per liter of urine was .003 mg, which consisted of U-238 enriched by 93% with U-235, for a total content of  $6 \times 10^{-6}$  uc. No bioassays have been performed for Moyer for tritium.

19. Records

License SNM-417, SMB-334, and 19-4003-1

Records are maintained of receipt of materials, use, surveys, and bioassays for uranium. Transfer records are also maintained.

GRACE

RESEARCH DIVISION

Washington Research Center, Clarksville, Maryland  
September 11, 1962

United States Atomic Energy Commission  
Washington 25, D. C.

Attention: Division of Licensing and Regulation

Gentlemen:

W. R. Grace & Co. hereby makes application to the United States Atomic Energy Commission for renewal of its Special Nuclear Material License SNM-417, as amended. The information required by Section 70.21 and Section 70.22, Part 70, Chapter 1, Title 10, Code of Federal Regulations is contained herein or is incorporated by reference to our original application dated October 4, 1960. The information is presented in the same numerical order.

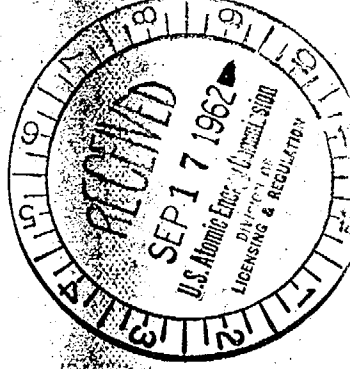
1. See application dated October 4, 1960.

2. W. R. Grace & Co., through its Research Division, is continuing research in the preparation of compositions of uranium and other materials having specific properties and characteristics. A portion of this work is being performed under contract AT(30-1)-2800, additional work is being carried out under a subcontract with Aerojet-General Nuclear Co. (016569) as a part of their prime contract with the Air Force. The Research Division is also carrying out work in support of W. R. Grace's Nuclear Reactor Materials plant at Irwin, Tennessee. While most of this work will be done using source or depleted material, it may be necessary to prepare samples containing special nuclear materials. All work will be carried out at the Washington Research Center.

3. It is requested that the license be renewed for a period of one year.

4. The total amount and specifications of the special nuclear material which will be required for the various projects is not known at the present time. However, we will not have in our possession at the Washington Research Center more than 250 grams of contained U-235 at any one time.

5. The dates on which we may require special nuclear material are presently unknown.



ITEM #

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9028

**W. R. GRACE & CO.**  
Research & Development Division  
WASHINGTON RESEARCH CENTER  
CONTINUATION

U. S. Atomic Energy Commission - 2 -

September 11, 1962

6. See application dated October 4, 1960.
7. See application dated October 4, 1960.
8. See application dated October 4, 1960.

If additional information is required, we will be happy to supply it.

Very truly yours,

W. R. GRACE & CO.



W. P. Gage  
President  
Research Division

WEE:pa



1-1001-1  
40-2514  
78-444

W. E. Jones and Company  
Washington Research Center  
Clocksville, Maryland

Attention: Mr. F. E. Mitchell, Manager  
Analysis and Research  
Research Department

**Summary:**

This refers to the inspection conducted on September 20, 1951, of your activities conducted under the Experimental Material License No. 19-4001-1, Source Material License No. 23-174, and Special Source Material License No. 207-417. There were no items of noncompliance noted for License No. 207-417.

With regard to License No. 19-4001-1 and 23-174, it appears that certain of your activities were not conducted in full accordance with the requirements of the AEC's "Standards for Production of Atomic Radiation," Part 20, Title 10, Code of Federal Regulations, as cited.

**LICENSE NO. 19-4001-1**

1. Surveys were not made to determine the concentrations of Tritium in each tank and in air discharged to unrestricted areas, as required by Section 20.20(a), "Surveys."

**LICENSE NO. 23-174**

2. Radiation surveys had not been conducted in the tritium and thorium storage areas, as required by Section 20.20(a), "Surveys."

ITEM #

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1. The enclosure in which 1.5 kilograms of various samples was placed in June 1941 was not labeled as required by Circular 28, Series 22, "Samples, signs, labels and stamps."

We have received copies of your letter dated January 2, 1942 and January 21, 1942 to the Compliance Division Office in New York City. It appears that the samples described in these letters were intended to correct the deficiencies mentioned above. You are requested to take the necessary steps to assure that all licensed manufacturers be conducted in compliance with trademark regulations. These matters will be reviewed during the next inspection of your plant. You should you have any questions, please do not hesitate to contact.

There were no other items of trademark law noted as a result of this visit. We appreciate the cooperation given the New York Division.

Very truly yours,

Walter L. Price  
Assistant Director  
Division of Enforcement  
U. S. Department of Commerce

Enclosure  
15 CPA 22

cc: Compliance Division, NY  
Compliance Division, I  
Public Document Room

STANDARD CONCURRENCE COPY IN BYPRODUCT FILE

12:15  
COMPLIANCE DIV.  
12:15  
COMPLIANCE DIV.

1-17-42

UNITED STATES  
ATOMIC ENERGY COMMISSION

**SPECIAL NUCLEAR MATERIAL LICENSE**

Pursuant to the Atomic Energy Act of 1954 and Title 10, Code of Federal Regulations, Chapter 1, Part 70, "Special Nuclear Material Regulations," a license is hereby issued authorizing the licensee to receive and possess the special nuclear material designated below; to use such special nuclear material for the purpose(s) and at the place(s) designated below; and to 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 70.32(a) of said regulations, and is subject to all applicable rules, regulations, and orders of the Atomic Energy Commission now or hereafter in effect and to any conditions specified below.

Licensee 1. Name <b>W. R. Grace &amp; Company</b> 2. Address <b>Research Division Washington Research Center Clarksville, Maryland</b>		3. License No. <b>SNM-417, as amended</b> 4. Expiration Date <b>October 31, 1963</b> 5. Docket No. <b>70-456</b>
6. Special Nuclear Material <b>Uranium enriched in the U-235 isotope</b>	7. Maximum quantity of special nuclear material which licensee may possess at any one time under this license <b>250 grams contained U-235</b>	

8. Authorized use  
**For use in accordance with the procedures and conditions described in the licensee's application dated September 11, 1962.**

9. Quantity of special nuclear material allocated to licensee pursuant to Section 70.31(b) of said part

**CONDITIONS**

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

**ITEM #** 10

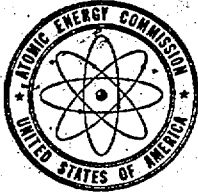
For the U. S. ATOMIC ENERGY COMMISSION

**SEP 19 1962**

Date of issuance

**Donald A. Nussbaumer**  
**Division of Licensing & Regulation**

B/10



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

70-456

L&R:JED

SEP 19 1962

W. R. Grace & Company  
Research Division  
Washington Research Center  
Clarksville, Maryland

Attention: Mr. W. P. Gage, President  
Research Division

Gentlemen:

Enclosed is Special Nuclear Material License SNM-417, as amended to  
expire October 31, 1963.

Very truly yours,

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

Enclosure:

License SNM-417, as amended

DISTRIBUTION:

Formal & Suppl. Dockets  
Document Room

✓ Div. of Compliance, Field, w/cy  
of ltr. dtd 9-11-62, and  
Hq. 1 cy w/o incoming

H. J. McAlduff, GRCO  
D. George, NMM  
H. Steele, L&R  
State Health (license only)  
D. A. Nussbaumer, L&R  
Br. & Div. Reading files

NYOO COMPLIANCE DIVISION

SEP 24 1962

RECEIVED

ITEM #

11

B/K

5. The dates on which we may require special nuclear material are presently unknown.

4. The total amount and specifications of the special nuclear material which will be required for the various projects is not known at the present time. However, we will not have in our possession at the Washington Research Center more than 250 Grams of contained U-235 at any one time.

3. It is requested that the license be renewed for a period of one year.

2. W. R. Grace & Co., through its Research Division is continuing research in the preparation of compositions of urania and other materials having specific properties and characteristics. A portion of this work is being performed under AEC Contract AT(30-1)-2884. The Research Division is also carrying out work in support of W. R. Grace's subsidiary, Nuclear Fuel Services, Inc. While most of this work will be done using source or depleted material, it may be necessary to prepare samples containing special nuclear materials. All work will be carried out at the Washington Research Center.

1. See application dated October 4, 1960.

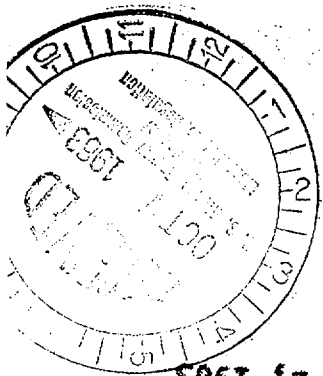
W. R. Grace & Co. hereby makes application to the United States Atomic Energy Commission for renewal of its Special Nuclear Material License SNM-417, as amended. The information required by Section 70.21 and Section 70.22, Part 70, Chapter 1, Title 10, Code of Federal Regulations is contained herein or is incorporated by reference to our original application dated October 4, 1960. The information is presented in the same numerical order.

Gentlemen:

Attention: Division of Licensing and Regulation

United States Atomic Energy Commission  
Washington 25, D.C.

October 2, 1963



W. R. GRACE & CO.  
WASHINGTON RESEARCH CENTER  
CLARKSVILLE, MARYLAND

For Div of Compliance

70-456

ITEM # 12



COPY

Form AEC-401  
(1-59)UNITED STATES  
ATOMIC ENERGY COMMISSION

## SPECIAL NUCLEAR MATERIAL LICENSE

Pursuant to the Atomic Energy Act of 1954 and Title 10, Code of Federal Regulations, Chapter 1, Part 70, "Special Nuclear Material Regulations," a license is hereby issued authorizing the licensee to receive and possess the special nuclear material designated below; to use such special nuclear material for the purpose(s) and at the place(s) designated below; and to 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 70.32(a) of said regulations, and is subject to all applicable rules, regulations, and orders of the Atomic Energy Commission now or hereafter in effect and to any conditions specified below.

Licensee		3. License No.
1. Name	W. R. Grace and Company	SNM-417, as renewed
2. Address	Research Division Washington Research Center Clarksville, Maryland	4. Expiration Date October 31, 1964
5. Docket No.	70-456	
6. Special Nuclear Material Uranium enriched in the U-235 isotope	7. Maximum quantity of special nuclear material which licensee may possess at any one time under this license  250 grams contained U-235	
8. Authorized use  For use in accordance with the procedures and conditions described in the licensee's application dated October 2, 1963.		
9. Quantity of special nuclear material allocated to licensee pursuant to Section 70.31(b) of said part  -----		

## CONDITIONS

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

For the U. S. ATOMIC ENERGY COMMISSION

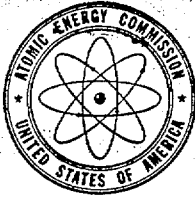
Date of issuance OCT 14 1963

U. S. GOVERNMENT PRINTING OFFICE: 1958-O-571645 Donald A. Nussbaumer  
Division of Licensing and Regulation

ITEM #

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12



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

IN REPLY REFER TO:

DLR:KEL  
70-436

OCT 14 1963

W. E. Grace and Company  
Research Division  
Washington Research Center  
Clarksville, Maryland

Attention: Mr. T. G. Gibian  
President  
Research Division

Gentlemen:

Enclosed is Special Nuclear Material License No. SNM-417,  
as renewed.

Very truly yours,

Ronald A. Buschman, Chief  
Source & Special Nuclear Materials  
Branch  
Division of Licensing & Regulation

Enclosure:  
SNM-417, as renewed

Distribution:

Formal	H. J. McAluff, OROO
Doc. Rm.	D. George, NMM
Suppl.	N. Doulos, LR
Br. & Div. rfs	D. Buschman, LR
Compliance	St. Health (lic. only)

ITEM #

14

Compliance 416  
B/14



W. R. GRACE & CO.  
RESEARCH DIVISION



Washington Research Center, Clarkeville, Maryland 21029

June 12, 1964

Source and Special Nuclear Materials Branch  
Division of Licensing and Regulation  
United States Atomic Energy Commission  
Washington 25, D.C.

Attention: Mr. Robert L. Layfield

Gentlemen:

License No. SNM-417

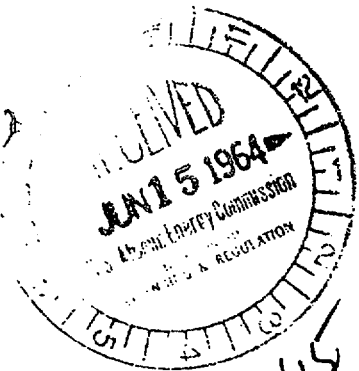
We understand there has been some misunderstanding as to the intent of Grace in our letter of May 28, 1964, requesting amendment of this License. We intended that we would not hold more than 1,000 grams of enriched uranium on the Washington Research Center premise, counting the total material which might be received at any time under this License or under any other license arrangement permitting us to have experimental quantities of  $UO_2$ . This was our intent in presenting the request for license amendment, and we are perfectly willing to be bound by this limitation.

I hope this will assist you in obtaining approval for the license amendment which was requested.

Very truly yours,

*W. K. O'Loughlin*  
W. K. O'Loughlin  
Security Officer

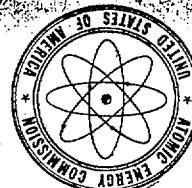
WKO/c



ITEM #

15

B/15



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

JUN 26 1964

MAIL  
IN REPLY REFER TO:

70-456

SMM-417, Amendment No. 1

DISTRIBUTION:

Doc. Room  
Compliance

Suppl.

Br. & Div. RFS

H. J. McAlduff, OROO

D. George, NMM

N. Douglas, MI

D. Nussbaumer, MI

State Health

W. R. Grace and Company  
Research Division  
Washington Research Center  
Charlottesville, Maryland

Attention: Mr. W. E. O'Loughlin  
Director, Contract Operations

Gentlemen:

As requested in your letter dated May 28, 1964, items 7 and 8 of Special Nuclear Material License No. SMM-417, dated October 14, 1963, are hereby amended and items 11 and 12 are hereby added to read as follows:

"7. 1000 Grams.

"8. For use in accordance with the procedures described in the licensee's application dated October 2, 1965, and supplements dated May 28 and June 16, 1964.

"11. Shipments of special nuclear material shall be made pursuant to Section 11.21 or 11.22, Title 10, Code of Federal Regulations, Part 11.

"12. The licensee is hereby exempted from the requirements of Section 10.24, 10 CFR 10, insofar as this section applies to the material held under this license."

All other conditions of this license shall remain the same.

FOR THE ATOMIC ENERGY COMMISSION

127 MA 25 01  
01 JUL

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

ITEM #

16

R-I

3506170000

8/16

# Inventory Record Report for 20-13014-02

License Number: 20-13014-02    Docket Number: 30-20826    Part: 30    Job/Box: 2862 / 04    Accession Number:

Licensee: W R GRACE AND COMPANY

Address: HARMONY STREET

City: ADAMS

State: MA

Zip Code: 01220

## Site Information

Description of Site of Operation: W R GRACE AND COMPANY, HARMONY STREET, ADAMS, MA

Primary State of Operation: MA    NRC Region: I

Facility: SEALED SRCS FOR INSTRUMENTS

## License Information (Termination/Expiration)

Original License Missing from File? No    License Originally Issued on 2/8/84

License Expired? No    Expiration Date:

License Terminated? Yes    Termination Date: 12/18/92

Termination Amendment Issued? Yes    NRC Letter Indicating Termination? Yes    Licensee Requested Termination? Yes

Civil Defense License? No    Import Only License? No    Export Only License? No    No Authorization to Possess OR For Distribution Only? No

## License Application Information

Application with Info on Intended Use? Yes    Waste Generation or Disposal? Yes    Other Important Information? Yes

Supporting Information on Application:

KR-85 AND ST-90 SEALED SOURCES TO BE USED IN BETA GAUGES FOR THE MEASUREMENT OF LATEX IMPREGNATION IN PAPER WEBS

IF DISPOSAL IS NECESSARY SEALED SOURCES WILL BE RETURNED TO THE ACCURAY CORP.

## License Transfer Information (Superseded/Agreement State)

Transferred to General License? No    Transferred to Agreement State? No    Agreement State Code:

Covered or Superseded? No    Superseding License Number:

Additional Notes on License Transfer:

## License Closeout Information

Telephone Contact Regarding Closeout? No    NRC Verification Letter? No    NRC Closeout Inspection? No    Noted Problems on Inspection Report? No

Closeout Survey Performed? No    By NRC/AEC or Gov't Contractor? No    By Licensee? No    By Licensee Contractor? No

## Licensed Materials Disposition Information

Certificate of Disposition or Status? No

Licensee Letter on Disposition? Yes    Contents: 11/18/92: BETA GAUGE WITH SOURCES DISP. OF BY ABB OF COLUMBUS, OHIO

Other Document with Disposition Info? Yes    Description: SHIPPING DOCUMENTS; ACKNOWLEDGMENT LETTER FOR RECEIPT OF MATL

No Possession Indicated? No    Disposal by Decay Indicated? No    Disposal by Incineration Indicated? No

Mat'l Transferred or Sold? Yes    To: ABB PROCESS AUTOMATION INC.

License Number: 34-00255-03

Sent Offsite for Disposal? No    To:

Other Means:

## Disposal Information

Was 10 CFR 20 Disposal Mentioned? No    Other Onsite Disposal (Burial, Sewer, Dumping) Mentioned? No

## Comments/Other Information

Other Licenses Contained in the File:

General Comments:

Inventory Record Comments:

Reviewer: BWK

Listed On Form 35? Yes

Record Entered: 7/29/97

Record Last Updated: 7/29/97

ITEM # 17

## — BEGINNING REPORT FOR EXPERT SYSTEM DETAIL EVALUATION —

Reviewer's initials: BWK

Date of evaluation: 07/29/97

Initial materials-based Sealed Score estimate: 1.3  
Zero final sealed source score. Sources were accounted for, or were unimportant

## Materials AUTHORIZATIONS – Materials With HALF-LIFE ABOVE 3 MONTHS

Std/Loose	Spec Form	SLD Accted?	Activity/amt.	Matl.Score	Material
SEALED	-- NA --	COMPLETE	0.500	CI 0.0	Kr-85 (Krypton)
SEALED	-- NA --	COMPLETE	0.070	CI 1.3	Sr-90 (Strontium)

<sup>2</sup> Entry of matls with half-life > 3 months is required. Entry of short-lived materials is elective

— End of the Materials Possession Report —

—The evaluator's memo for materials possession: *The license did not give activity of Kr-85 and Sr-90 sealed sources so information was used on the application as follows: 500 millicurie Kr-85 source and 70 millicurie Sr-90 source.*

## SEALED SOURCES SCORING REPORT

Because there were SEALED SOURCES authorized, the report will include available information leading to the calculation of the FINAL OVERALL SEALED SCORE. The SEALED SOURCE routine begins with the individual SEALED SOURCE HAZARD SCORES that are given in the materials authorization table. The disposition of each source or source grouping and examines the disposition of each source (or source grouping) entered. Scores for those WITH INCOMPLETE ACCOUNTING are summed to arrive at the final SEALED SOURCE summary score.

ONLY SOURCES OR SOURCE GROUPINGS  
NOT ACCOUNTED FOR AT LICENSE TERMINATION  
CONTRIBUTE TO THE FINAL SEALED SOURCE SCORE

- — FOR THIS LICENSE, AN INITIAL SEALED SOURCE SCORE OF 1.3
- — indicates that source(s) of some hazard were authorized under this license.

----- FINAL OVERALL SEALED SOURCE SCORE OF ZERO -----  
----- indicates accounting for SOURCES WAS COMPLETE -----

\* \* \* \* \*

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— BASIC CONCLUSIONS ABOUT LICENSE and MATERIALS SCORING —

1. The evaluator's memo for materials possession: *The license did not give activity of Kr-85 and Sr-90 sealed sources so information was used on the application as follows: 500 millicurie Kr-85 source and 70 millicurie Sr-90 source.*
- 

End of system conclusions for site: *W.R. GRACE AND COMPANY*

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EVALUATOR'S COMMENTS

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GENERAL COMMENTS ABOUT THIS LICENSE

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- *According to licensee's disposition letter dated 11/18/92 a beta gauge with Sr-90 and Kr-85*
- *sealed sources was transferred to ABB Process Automation, Inc.*

Form AEC-313  
(5-58)

ATOMIC ENERGY COMMISSION

APPLICATION FOR BYPRODUCT MATERIAL LICENSE

Form approved.  
Budget Bureau No. 38-R027.4.

INSTRUCTIONS.—Complete Items 1 through 16 if this is an initial application. If application is for renewal of a license, complete only Items 1 through 7 and indicate new information or changes in the program as requested in Items 8 through 15. Use supplemental sheets where necessary. Item 16 must be completed on all applications. Mail three copies to: U.S. Atomic Energy Commission, Washington, D.C., 20545. Attention: Isotopes Branch, Division of Licensing and Regulation. Upon approval of this application, the applicant will receive an AEC Byproduct Material License. An AEC Byproduct Material License is issued in accordance with the general requirements contained in Title 10, Code of Federal Regulations, Part 30 and the Licensee is subject to Title 10, Code of Federal Regulations, Part 20.

1. (a) NAME AND STREET ADDRESS OF APPLICANT. (Institution, firm, hospital, person, etc.)	(b) STREET ADDRESS(ES) AT WHICH BYPRODUCT MATERIAL WILL BE USED. (If different from 1 (a).)
Dewey and Almy Chemical Division W.R. Grace & Co. 62 Whittemore Avenue Cambridge, Massachusetts 02140	Same
2. DEPARTMENT TO USE BYPRODUCT MATERIAL	3. PREVIOUS LICENSE NUMBER(S). (If this is an application for renewal of a license, please indicate and give number.)
Analytical Laboratory	20-01823-02
4. INDIVIDUAL USER(S). (Name and title of individual(s) who will use or directly supervise use of byproduct material. Give training and experience in Items 8 and 9.)	5. RADIATION PROTECTION OFFICER (Name of person designated as radiation protection officer if other than individual user. Attach resume of his training and experience as in Items 8 and 9.)
Charles A. Salinis	Charles A. Salinis

6. (a) BYPRODUCT MATERIAL. (Elements and mass number of each.)	(b) CHEMICAL AND/OR PHYSICAL FORM AND MAXIMUM NUMBER OF MILLICURIES OF EACH CHEMICAL AND/OR PHYSICAL FORM THAT YOU WILL POSSESS AT ANY ONE TIME. (If sealed source(s), also state name of manufacturer, model number, number of sources and maximum activity per source.)
Ni - 63 Tritium	Hewlett Packard Electron Capture Detector Model No. 2-2837 containing U.S. Radium Lab 508-1 foil. Hewlett-Packard High Temperature Electron Capture Detector Model No. 2-6195 containing Lab 784 foil. A maximum of four cells, two containing 200 millicuries of tritium and two containing 2 millicuries of Ni 63 to be possessed at any one time.

7. DESCRIBE PURPOSE FOR WHICH BYPRODUCT MATERIAL WILL BE USED. (If byproduct material is for "human use," supplement A (Form AEC-313a) must be completed in lieu of this item. If byproduct material is in the form of a sealed source, include the make and model number of the storage container and/or device in which the source will be stored and/or used.)

F & M Model 810 Gas Chromatograph

ITEM # 18 19116

B/118



Marvin M. Mann, Assistant Director  
Division of Inspection, Washington

MAR 4 1958

Robert W. Kirkman, Director  
Inspection Division, NYOO

TRANSMITTAL OF LICENSE COMPLIANCE INSPECTION REPORT - 10 CFR 30

SYMBOL: INS:WEK

Transmitted herewith is the following inspection report  
involving "non-compliance":

Dewey & Almy Chemical Company  
Division of W.R. Grace & Company  
Central Research Division  
62 Whittamore Avenue  
Cambridge 62, Massachusetts

License No. 20-1823-1, 2

The following item of non-compliance was brought to the attention  
of Dr. Stivers and he voluntarily agreed to correct it:

30.41(a) "Records" - in that no records have been maintained  
of transfers of radioactive wastes made under the provisions  
of 20.301(1). (See Paragraph 17 of report details)

We do not feel that a follow-up inspection is required as a  
result of this item of non-compliance.

We recommend that a letter be sent to the licensee confirming  
the understanding that records of transfers of radioactive  
wastes would be maintained.

Enclosure:  
Insp. rpt. (2)

ITEM #

19

12/19

6

I-F  
242

UNITED STATES ATOMIC ENERGY COMMISSION

COMPLIANCE INSPECTION REPORT

1. Name and address of licensee or permit holder <b>Dewey &amp; Almy Chemical Company</b> <b>Division of W. R. Grace &amp; Company</b> <b>Central Research Division</b> <b>62 Whittemore Avenue</b> <b>Cambridge 40, Massachusetts</b>		2. Date of inspection <b>February 12, 1958</b>
		3. Type of inspection <b>Initial</b>
		4. 10 CFR part(s) applicable <b>20 - 30</b>

5. License (or permit) number(s) and expiration date(s)  
**20-1823-1**      **1/18/57**      **1/31/62**

~~6. Scope of license(s) and permit~~  
**20-1823-1**      **6/20/57**      **1/31/62**      **Amendment #1**

Scope and Conditions  
~~Scope: Co60, one sealed source of 450 curies for use in the study of irradiation effects.~~  
~~Conditions: #11-Byproduct material to be used by or under the supervision of Mr. D.A. Trageser #12-Licenses shall comply with 10 CFR 20 of July 16, 1955 or effective regulations. #13-Sealed source shall not be opened. #14-Licenses shall report any exposures in excess of 3 rem within a 24 hour period.~~  
**Scope: None**  
**Conditions: #11-Amended to replace the name of Mr. D.A. Trageser by the name of W.R. Page.**

~~7. Special conditions and limitations of license(s) and permit~~  
**20-1823-2**      **4/12/57**      **4/30/59**

**Scope: G14 in any form, 10 millicuries; H3 in any form, 1 curie; S35 in any form, 20 millicuries; P32 in any form, 2 millicuries; Tl31 in any form, 1 milliecurie, for laboratory studies of organic chemicals.**

**(and items of non-compliance)**  
**Inspection finding: Research Division of Dewey and Almy Company holds two active byproduct material licenses. License #1 for 450 curies of Co60 as a sealed source is used by the Process Development Department under Mr. W.R. Page. License #2 for milliecurie amounts of G14, H3, S35, P32, and Tl31 for laboratory studies of organic chemicals is used by the Spectrographic Department under Dr. Stivers. Mr. Page serves as the R.S.O and 4 other individuals are involved in the use of byproduct materials. The facilities for the use of byproduct material are adequate for the scope of the license. Sufficient written radiological detection instruments were available to the licensee. Satisfactory written radiological instructions have been prepared for the use of the Co60 sealed source. Personnel working with the tracer amounts under license #2 have been verbally instructed regarding radiological safety procedures. A bi-weekly film badge service is in effect and a review of the records indicated that exposures have been less than 50 mr/2 wks for both operations. Surveys have been properly conducted. Personnel procedures are adequate to ensure that the licensed limits**  
**10. Give date of last previous inspection: None**  
**11. Is "Company Confidential" information contained in this report? No**  
**(Specify page(s) and paragraph(s))**

**DISTRIBUTION:**  
**William E. Kriegerman** (Inspector)  
**Robert F. Kirkman, Director** (Operations office)  
**New York**  
**March 4, 1958** (Date report prepared)  
**2 cys. - Division of Inspection, Washington**  
**2 cys. - Inspection Division NYOO**

If additional space is required for any numbered item above, the continuation may be extended to the reverse of this form using foot to head format, leaving sufficient margin at top for binding, identifying each item by number and noting "Continued" on the face of form under appropriate item.

ITEM 5 CONT'D

<u>License</u>	<u>Date</u>	<u>Exp. Date</u>	<u>Scope and Conditions</u>
20-1823-2 (cont'd)			Conditions: #11-Byproduct material to be used by or under the supervision of Mr. D. A. Trageser or Mr. W. R. Page. #12-Licensee shall comply with 10 CFR 20 of 1/29/57. #13-Total amount of H <sup>3</sup> procured under this license shall not exceed one curie.
20-1823-2 Amendment #1	6/30/57	4/30/59	Scope: None  Conditions: #11 is amended to delete the name of Mr. D. A. Trageser.
20-1823-2 Amendment #2	9/19/57	4/30/59	Scope: None  Conditions: #11 is amended to read: By-product material to be used by or under the supervision of Mr. W. R. Page or Mr. E. C. Stivers.

ITEM 6 CONT'D

are not exceeded. Radioactive wastes produced under license -2 have been transferred to MIT for disposal. Posting and labeling requirements were met. Records have been maintained of purchases, film badge results and survey results.

The only item of non-compliance noted during the inspection is as follows:

10 CFR 30.41 (a) "Records" - in that no records have been maintained of transfers of radioactive wastes to MIT by Dr. Stivers under the provisions of 20.301 (1) (Paragraph 17 of report details).

## PART 30 INSPECTION

Dewey & Almy Chemical Company  
Division of W.R. Grace & Company  
Central Research Division  
62 Whittemore Avenue  
Cambridge 40, Massachusetts

Date of Inspection: February 12, 1958

### Person Accompanying Inspector:

A representative of the Commonwealth of Massachusetts, Bureau of Industrial Hygiene was invited to accompany the inspector but was unable to attend.

### Persons Contacted and Titles:

Mr. W.R. Page, Manager, Process Development Department  
Dr. E.C. Stivers, Manager, Spectrographic Department

## 9. Organization and Administration

The Dewey & Almy Company is a Division of the W.R. Grace Company. Within the Central Research Division, two byproduct material licenses are currently in effect. License -1 for 450 curies of Co<sup>60</sup> as a sealed source is used by the Process Development Department, under Mr. W.R. Page. License -2 for millicurie amounts of C<sup>14</sup>, H<sup>3</sup>, S<sup>35</sup>, P<sup>32</sup>, and I<sup>131</sup> for laboratory studies of organic chemicals is used under the supervision of Dr. Stivers of the Spectrographic Department. Mr. W.R. Page serves as the R.S.O. and no significant changes have occurred in his experience or training since the submission of his application for a byproduct material license. In addition to Mr. Page and Dr. Stivers, one technician is involved in the use of Co<sup>60</sup> sealed source and 3 technicians are using byproduct material in Dr. Stivers laboratory.

## 10. Facilities and Uses of Byproduct Material

### A. License -1

The 450 curie Co<sup>60</sup> sealed source is used in a Brookhaven lead-shielded irradiator on the ground floor of building 8. The area in which it is used is fenced off from the remainder of the general storage area in building 8 by an 8' high cyclone fence. Access to the fenced-in area is controlled by Mr. Page and his technician. The irradiator consists of a 3' diameter lead container with a dummy lead plug and an additional lead plug as a material container. The lead plugs are removed using a 6' rod. The operator remains behind a chain barrier while removing the plug. A laboratory monitor with an automatic alarm is installed in the room. Whenever a radiation level in excess of 50 mr exists in the immediate area, an alarm bell attached to the laboratory monitor rings warning the individuals of the presence of high radiation levels. Records are maintained of the use of the source and showed that the plug is never removed for more than 15 seconds at a time, in order to insert materials for irradiation.

### B. License -2

To the date of the inspection only C<sup>14</sup> and H<sup>3</sup> have been purchased or used by Dr. Stivers' group. Three hoods in the Central Laboratory are used for the preparation of various labeled compounds containing C<sup>14</sup> or H<sup>3</sup>. As of December 17, 1957 total inventory of C<sup>14</sup> was approximately 3.5 millicuries and the total purchase of H<sup>3</sup> was slightly more than 4 millicuries. Dr. Stivers stated that individuals working with byproduct materials wear rubber gloves and laboratory coats.

## 11. Instrumentation

### A. License -1

Mr. Page and his technicians have available for use with the Co<sup>60</sup> sealed source the following operable instruments:

Atomic Instrument Model 414 survey meter  
1 Jordan Electronics Rams-II monitoring system with an alarm buzzer

B. License -2

Dr. E.C. Stivers has available the following operable radiation detection instrument:

1 Nuclear Electronics Corporation Model RMA-3 monitor using an end-window beta gamma detector.

12. Radiological Safety Precautions and Procedures

A. License -1

Written radiological safety instructions have been prepared for the use of the  $\text{Co}^{60}$  sealed source. Surveys have been conducted in the vicinity of the source and on the roof of building 8. A review of the records indicated that removal of the lead plug covering the source produced a radiation level of 2500 mr/hr on the roof immediately above the source housing. The record of use of the source indicated that the lead plug has not been removed for longer than 15 seconds in any one hour during operational use. On this basis an individual on the roof would not receive in excess of 10 mr in any one hour.

B. License -2

Personnel working under Dr. Stivers have been verbally instructed concerning radiological safety precautions and procedures. Surveys for surface contamination are conducted upon the completion of each experiment according to Dr. Stivers. No records are maintained of these surveys. Dr. Stivers stated that it was essential to their operation that no radioactive materials are released outside of the hood because the laboratory is used for the manufacture and testing of bottle cap liners and similar items which may be incorporated in products used for the packaging of food stuffs.

13. Procurement Procedures and Control

Mr. Page maintains copies of the license and ensures that the limits are not exceeded. Dr. Stivers requisitions the byproduct material for use in his laboratory and these are reviewed by Mr. Page prior to ordering the materials.

14. Waste Disposal

A. License -1

No radioactive materials are produced under this license.

B. License -2

Radioactive wastes produced by Dr. Stivers laboratory consisting of small amounts of  $\text{C}^{14}$  and  $\text{H}^3$  are packaged and turned over to MIT for disposal. Dr. Stivers estimated that a maximum of 25 microcuries of  $\text{C}^{14}$  has been released to this date. In addition he estimated that a maximum of 250 microcuries of  $\text{H}^3$  as methanol has been released to the sewerage system during the past month.

15. Posting

A. License -1

The fenced enclosing the radiation section of building 8 has been posted to indicate the presence of radioactive materials and the radiation levels present. The Brookhaven irradiator is properly labeled to indicate the presence of radioactive materials. The roof of building 8 above the source container has been chained off and posted with radiation warning signs in order to prevent unauthorized entry. (In this regard see paragraph 10)

B. License -2

The hoods in which radioactive materials are stored have been properly labeled to indicate the presence of radioactive materials.

16. Personnel Monitoring

A bi-weekly film badge service provided by Nucleonic Corporation of America is employed by the licensee. A review of the records indicated that exposures have been less than 50 mr/week for both the operations under license -1 and -2.

17. Records

Records of purchase, film badge results, and survey results have been properly maintained as indicated in the preceeding paragraphs. No records have been maintained by Dr. Stivers under license -2 regarding the amount of material transferred to MIT for disposal. The licensee holds no AEC contracts.

Dr. Stivers stated that he intended to maintain records of waste disposal and both users indicated a willingness to comply with all applicable regulations.



Office Memorandum • UNITED STATES GOVERNMENT WEL

TO : Director,  
Division of Licensing and Regulation

DATE: MAR 14 1958

FROM : Assistant Director for Compliance  
Division of Inspection

SUBJECT: **DEWEY AND ALMY CHEMICAL COMPANY, DIVISION OF W.H. GRACE AND COMPANY**  
**LICENSE NO. 20-1823-1 w/amend #1 AND 20-1823-2**

SYMBOL: INS: CUP

Information gathered during inspection of the subject licensee shows noncompliance with AEC regulations (or license provisions) as set out in the enclosures.

It is suggested that a letter be addressed to the licensee to inform him of the noncompliance items and request that appropriate action be taken to correct or overcome these deficiencies. When corrective action has been completed on this matter, please furnish **NYOO Inspection Division** with copies of pertinent correspondence (to and from the licensee) and these items will be reviewed during **the next regular** inspection.

A summary of this case will be included in the **March** report to the Office of the General Manager.

A copy of this memorandum and the enclosure have been furnished the Office of the General Counsel.

Enclosure:

Cpy rpt dtd 3/4/58

Trans memo to R.W. Kirkman, NYOO  
to M.M. Mann dtd 3-4-58

cc: W.D. English, OCC, w/encl  
R.W. Kirkman, NYOO, w/o encl ✓

1) W.D. English  
2) R.W. Kirkman  
3) L.S. ..

RECEIVED

INS  
LDL:mk

INS  
MGMANN

RECEIVED

MAR 11 1958

NYOO INSPECTION DIVISION

NEW YORK OFFICE OF THE GENERAL MANAGER

ITEM # 20

2/20

1717 H Street, N.W.

DLE:KOP

APR 28 1958

Dovey and Almy Chemical Company  
Division of V. R. Grace and Company  
Central Research Division  
62 Whittemore Avenue  
Cambridge 40, Massachusetts

Attn: Mr. W. R. Page

Gentlemen:

This refers to the inspection report conducted on February 12, 1958, of your activities licensed under AEC Byproduct Material License Nos. 20-1823-1 with Amendment No. 1 and 20-1823-2 with Amendment Nos. 1 and 2.

It appears that certain of your activities were not conducted in full compliance with the requirements of the AEC's "Standards for Protection Against Radiation" contained in Part 20, Title 10, Code of Federal Regulations, and the AEC's "Licensing of Byproduct Material" contained in Part 30, Title 10, Code of Federal Regulations, in that:

1. Contamination survey results for Dr. E. C. Silvers laboratory were not maintained as required by Section 20.401(e), Records of surveys, radiation monitoring and disposal.
2. Records of transfers of radioactive wastes have not been maintained as required by Section 20.41, Records.

It is requested that you notify this office within 30 days of the action which has been or will be taken by you to correct this deficiency and specify the date such correction and full compliance has been or will be achieved.

Very truly yours,

cc: Inspection Division, Wash.  
Inspection Division, NIOO  
Public Document Room

James H. Mason, Chief  
Isotopes Branch  
Division of Licensing and Regulation

Enclosures, Part 20  
1. 10 CFR Part 20  
2. 10 CFR Part 30

DLR DLR DLR  
RCP:aghs LAB:gers JHM:son  
4-25-58

ITEM #

21

RECEIVED

APR 29 1958  
B/21

1000

# DEWEY AND ALMY CHEMICAL COMPANY

DIVISION OF W. R. GRACE & CO.

CAMBRIDGE 40, MASSACHUSETTS

May 12, 1958

Mr. James R. Mason, Chief  
Isotopes Branch  
Division of Licensing and Regulation  
U.S. Atomic Energy Commission  
1717 H Street, N.W.  
Washington 25, D.C.

Reference: DLR:RGP

Dear Mr. Mason:

We wish to notify you by this letter that we have complied with the requests made in your letter of April 28, 1958 regarding the handling of radioactive materials at our Cambridge location.

Under Section 20.401(C) a notebook has been established in which records of surveys, radiation monitoring and disposal are being kept. This records book will be under the direct supervision of Dr. E. C. Stivers.

Provisions have also been made under Section 30.41 to record in this same notebook the receipt, transfer, export and disposal of these radioactive materials.

The records required and described in Sections 30.41 and 20.401(C) have been kept on previous tests where we have used radioactive tracers at various locations around the company. At the suggestion of your representative, we have consolidated these records in the notebook which will be kept under Dr. E. C. Stivers' supervision.

Very truly yours,

W. R. Page  
W. R. Page

RECEIVED

WRP:MLM

ITEM # 22

B/22

Received  
Kriegsmar-

1717 N Street, NW

DLR:REP

Dow and Almy Chemical Company  
Division of W. R. Grace & Company  
Central Research Division  
62 Whittemore Avenue  
Cambridge 40, Massachusetts

Attention: Mr. W. R. Page

Thank you for your letter of May 22, 1958. It appears that you have adequately corrected these deficiencies in your hydrofluoric material program which we brought to your attention in our letter of April 28, 1958.

Your cooperation is appreciated.

Very truly yours,

James R. Mason, Chief  
Isotope Branch  
Division of Licensing & Regulation

RECEIVED

cc: Inspection Division, Wash. } v/cpy ltr  
Inspection Division, NYOO }  
Public Document Room  
JUN 8 1958

NYOO INSPECTION DIVISION

NEW YORK 53' W. Y.  
NEW YORK OPERATIONS  
U. S. Atomic Energy Commission

DLR DLR DLR  
RGPage:hgs LERogers JRM:m

ITEM # 23

6-2-58

NYOO  
COMPLIANCE INSPECTION REPORT

20-30, 40, 70

Epstein

I GENERAL INFORMATION

Dewey & Almy Chemical Co.  
Division of W.R. Grace & Co.  
Central Research Div.  
Persons Accompanying Inspector: 62 WHITMORE AV.  
Cambridge 40, Mass.

License No's.:  
20-1823-1, 2.  
Type Inspection:  
Reinspect  
Announced  
Date: 12/1/61

None

Mass. Dept of Labor ntfd  
but did not appear.

A. Name of Licensee:

B. Persons Contacted

Title

Radiation Duties

Charles A LERMOND -

Spectroscopist.

R.S.O.

Experience and Radiation Training of Above Individuals

M.S. in Chemistry Boden and M.I.T.  
Also Nuclear Physics - at MIT

C. Organization, Administration, Affiliations, Overall Program:

2000 employees engaged in production of  
vinyl acetate and other organic materials

Radiation Safety Committee - Formal Meetings?  
Scope of Authority:

Frequency: Minutes Kept?

Name

Position

none

Radiation Safety Officer, Training and Qualifications

lermond above

Scope of Authority:

full

AEC-3 posted  
OIC.

6/24  
(8)

ITEM # 24

Other People Using Isotopes

<u>Name</u>	<u>Title</u>	<u>Radiation duties, training and experience</u>
-------------	--------------	--

None

No materials used

Procurement

all in storage.

Person responsible for ordering: Lermond

Person responsible for seeing limit is not exceeded: 0

Procurement procedure:

Supplier(s) None

Is shipment opened before user receives it?

Preassayed? Sterilized?

D. Facilities

<u>Item</u>	<u>Description (size, etc.)</u>
Lab	Storage area fenced off in rear of Bldg 11 the warehouse here the 450 C Co <sup>60</sup> sealed source in
Counting Room	in a Brookhaven <del>factor</del> irradiator is completely
Fume Hood	CRATED and enclosed with a wood fence.
Dry Box	
Tables, Benches	
Remote Handling Equipment	

E. Restricted Area Established?

Description

~~about~~ storage area in Bldg 11 where irradiator is stored

F. Handling Procedures or Operation

Co - 1

Last use of the irradiator was between the irradiation of vinyl acetate during a period of 5/27/61 - 6/2/61. After this use the irradiator was packaged. Lermond stated management is looking to sell or dispose of the irradiator and the source.



G. Instrumentation

model 414 Atomic INSTR. 0-3000 mμ/hr.  
 Jordon ELECTRONICS - 1000 mμ/hr.  
 RAMS II

Calibration Procedures

on all scales  
 using irradiated  
 at 6 mo intervals  
 by LERMOND

H. Material Use

Qty. on Hand:

<u>Isotope &amp; Form</u>	<u>Use</u>	<u>Qty./Exp.</u>	<u>Rate of Use</u>	<u>Max.</u>	<u>Usual</u>	<u>Current</u>
1.						
2.						
3.						
4.						
5.						

I. General

Lie-2.

LERMOND stated materials on hand under Lie-2  
 have not been used for 3 yrs. The only material  
 on hand is in a locked cabinet in Bldg 22 &  
 storage room. Material consists  
 of 3 mc tritiated ARW  
 and 32 mc " "  
 totally in storage

## II PERMISSIBLE DOSES, LEVELS, & CONCENTRATIONS

Sat

Unsat\*

N. A.

### A. Exposure of Individuals in Restricted Areas

1. Exposure of adults to radiation (20.101a)
2. Exposure of adults to airborne radioactive material (20.101b)
3. Overexposure of adults (20.105)
4. Exposure of minors to radiation (20.101c)
5. Exposure of minors to radioactive material (20.101c)
6. Overexposure of minors (20.105)

### B. Unrestricted Areas

1. Exposure to radiation (20.102a)
2. Exposure in terms of area levels (20.102b)
3. Exposure to radioactive materials (effluents) (20.103)

## III PRECAUTIONARY PROCEDURES

### A. Personnel Monitoring (20.202a)

1. Film badges: Supplier N.C.A. Freq. bi weekly 0 exposures on all reports 1958 to date
2. Wrist badges: Supplier \_\_\_\_\_ Freq. \_\_\_\_\_
3. Dosimeters: Type \_\_\_\_\_ Freq. \_\_\_\_\_

### B. Surveys (20.201)

1. Restricted areas
2. Unrestricted areas
3. Airborne contamination surveys

### C. Caution Signs, Labels & Signals

1. Posting radiation areas (20.203b)
2. Posting high radiation areas (20.203c)
3. Posting airborne radiation areas (20.203d)
4. Posting rooms or areas (20.203e)
5. Labeling containers (20.203f) all Containers labeled in accordance f(4)
6. Alarm signals & interlocks in high radiation areas (20.203c) in storage

D. Instruction of Personnel (20.206)

Sat	Unsat*	N. A.
W - (O)		

E. Storage in Unrestricted Areas (20.207)

--	--	--

#### IV WASTE DISPOSAL

A. Disposal by transfer (20.301 1) qty/time \_\_\_\_\_

--	--	--

B. Disposal into sanitary sewer (20.303)  
qty/time \_\_\_\_\_

none		
------	--	--

C. Disposal by burial (20.304) qty/time \_\_\_\_\_

all material retained		
-----------------------	--	--

D. Disposal as an effluent (20.301 3)  
qty/time \_\_\_\_\_

--	--	--

E. Other \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

#### V RECORDS, REPORTS, & NOTIFICATION

##### A. Records

1. Personnel monitoring (20.401)

✓		
---	--	--

2. Surveys (20.401)

✓		
---	--	--

3. Leak tests (Condition \_\_\_ of License # not required by any license condition)

--	--	--

4. Receipts (30.41, 70.51)

✓		
---	--	--

5. Transfers (30.41, 70.51)

		✓
--	--	---

6. Exports (30.41)

		✓
--	--	---

7. Inventory (70.51)

		✓
--	--	---

8. Waste disposal (20.401c)

✓		
---	--	--

B. Reports of Loss or Theft (20.402)

		✓
--	--	---

##### C. Notification of Incidents

1. Class A (20.403a)

		✓
--	--	---

2. Class B (20.403b)

		✓
--	--	---

3. Class C (20.403c)

		✓
--	--	---

V COMPLIANCE WITH SPECIAL PROVISIONS OF LICENSE  
(Conditions \_\_\_\_\_)

Sat

Unsat\*

N. A.

\*VI DESCRIPTION OF ALL UNSATISFACTORY ITEMS:

*none*

*Lic - 1*

- Condition 11 - *Co<sup>60</sup> 450 C irradiator was used by Leonard OK*
- 3 - *sealed sources were never opened.*
- 14 *no incident occurred where any person received in excess of 3 rads in any 24 hour period.*
- 12 - *license complied with 10 CFR 20.*

*Lic - 2*

Condition 12 - *materials are in storage under Leonard's supervision*

- 13 - *license T<sup>3</sup> <sup>accumulated</sup> on ~~hand~~ ~~hand~~ did not exceed 2 C.*
- 11 - *that an storage is in accordance with 10 CFR 20*

VII SURVEY DATA & GENERAL COMMENTS





Name of Licensee: Dewey Alamy Co  
License No(s): 20-1823-1-2  
Date of Inspection: Dec 1, 1961

D R A F T

Initials, Date and Time

Dictated to Steno: Dec 5, 1961 Clear report 591  
Received from Steno: Dec 5 1961 PBK 591 Clear  
Received by Sr. Reviewer: Dec 5 1961 PBK Clear report  
Returned to Inspector: \_\_\_\_\_  
Passed to Steno for Final: \_\_\_\_\_

F I N A L

Received from Steno: \_\_\_\_\_  
Received by Sr. Reviewer: \_\_\_\_\_  
Received by Director: 12/6/61  
Received by Sect'y. for transmittal to Wash.: 12/6/61 BH  
Transmitted to Wash.: 12/6/61

ITEM # 25

B/25

UNITED STATES ATOMIC ENERGY COMMISSION  
DIVISION OF COMPLIANCE

INSPECTION FINDINGS AND LICENSEE ACKNOWLEDGMENT

DEC 6 1961

*Reinspection*

<p>1. LICENSEE <i>Devco &amp; Alloy Chemical Division</i> <i>W. R. GRACE and Company</i> <i>Research Division</i> <i>22 HARTFORD AVENUE</i> <i>CAMBRIDGE 40 MASS.</i></p>	<p>2. REGIONAL OFFICE</p> <p>REGION I, DIVISION OF COMPLIANCE U. S. ATOMIC ENERGY COMMISSION 376 HUDSON STREET NEW YORK 14, NEW YORK</p>
<p>3. LICENSE NUMBER(S) <i>20-1823-1-2</i></p>	

4. INSPECTION FINDINGS

Date of Inspection *DEC 1, 1961*

- ☒ 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)
- ☐ C. Rooms or areas were not properly posted to indicate the presence of a HIGH RADIATION AREA. 10 CFR 20.203(c)(1)
- ☐ 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)
- ☐ K. Records of surveys or disposals were not properly maintained. 10 CFR 20.401(b)
- ☐ L. Records of receipt, transfer, disposal, export or inventory of licensed material were not properly maintained. 10 CFR 30.41, 40.61 or 70.51
- ☐ M. Records of leak tests were not maintained as prescribed in your license.

*Reginald G. Butler*  
AEC Representative

5. LICENSEE'S ACKNOWLEDGMENT

The AEC representative has explained and I understand the items of noncompliance listed above, if any. The items of noncompliance will be corrected within the next 30 days.

Date

Licensee Representative

COPIES: ☐ LICENSEE; ☒ COMPLIANCE AREA; ☐ DIV. OF LIC. & REG.; ☐ DIV. OF COMPLIANCE (2)

12-1211200 (40-1077-1)

JUN 7 - 1962

W. L. Davis & Company  
Heavy and Alloy Chemical Division  
22 Matthews Avenue  
Cambridge 40, Massachusetts

Dear Sirs:

We are enclosing enclosed No. 1 to License No. 20-11120-1 in response to your application dated November 27, 1961.

It had come to our attention that some sealed sources supplied by the Brookhaven National Laboratory, such as the sources covered by your Hypocenter Material License No. 20-11120-1, have exhibited anomalous contamination as a result of activity being induced in the source source assembly at the time of installation of certified cobalt in the Brookhaven reactor, or at the time of early removal and handling to various other laboratories. The total source is usually within the limits of activity and in fact the problem associated the use of such sources of the type covered by your license. However, you indicated in your application of December 25, 1961 that you would further investigate source at your source. Since you have not reported differently with contamination resulting from your present source, we shall assume that your source has yielded negative results. However, this may not be the case with other Brookhaven National Laboratory sources which are in process of replacement for the source previously held by you. Therefore, Condition 11 of the enclosed standard license prohibits replacement of your present source.

Should you desire to replace your present source, it will be necessary that you request a license amendment for this purpose. If the replacement source is to be of the 226, 232, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.

ITEM # 20



**E. R. Chase & Company**

**- 1 -**

and other appropriate surfaces in the immediate vicinity of the irradiator. If samples containing radioactive material are to be irradiated, your procedure should provide for surveying (by taking water samples, if necessary) of these samples to determine that the radioactivity is adequately contained prior to their introduction into the irradiator where contamination may be transferred to the source. Your procedures must be prepared as a written instruction to be followed by all individuals using or having responsibility for the use of the source. Two copies of such instructions must be supplied to this office with a request for license amendment to permit replacement of your present source with any NRE tubular type source, unless data is submitted showing that the source is not contaminated in excess of that allowed by condition 15 of the original license.

**Very truly yours,**

**Jack M. Ball  
Isotopes Branch  
Division of Licensing & Regulation**

**Enclosures:  
Attachment No. 4  
Form ABC-313  
10 CFR 20 & 20**

**cc: Compliance, Region 1**

**DIV OF COMPLIANCE  
REC-1, USAEC, N.Y.  
RECEIVED**

**LR:R**

**J M Ballink  
6/6/62**

**JUN 13 11 48 AM '62**

UNITED STATES GOVERNMENT

# Memorandum

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

FROM : James E. Hyder, Radiation Specialist  
Region I, Division of Compliance

SUBJECT: W. R. GRACE & COMPANY  
DEWEY & ALMY CHEMICAL DIVISION  
CAMBRIDGE, MASSACHUSETTS  
LICENSE NO. 20-1823-2

*J E H*

Thru telephone conversation <sup>on</sup> January 3, 1966 with Philip Bourne, an authorized user under this license, it was learned that the only material on hand is one tritium foil in a gas chromatography unit.

Mr. Bourne explained that no other byproduct materials had been used or obtained since he became associated with the program in late 1964. No additional use of byproduct material is planned for the near future.

*Given in view of above material on hand & in use, please change due date to 1/67*  
*BPM*



5010-108

ITEM # 21

Buy U.S. Savings Bonds Regularly on the Payroll Savings Plan

*B/27*

U. S. ATOMIC ENERGY COMMISSION  
BYPRODUCT MATERIAL LICENSE  
Supplementary Sheet

Page 1 of 1 Pages

License Number 20-01823-02

Amendment No. 11

30-04609

W. E. Grace and Company  
Dewey & Almy Chemical Division  
62 Whittamore Avenue  
Cambridge, Massachusetts 02140

In accordance with application dated February 22, 1973, License Number 20-01823-02  
is amended as follows:

The expiration date in Item 4 is changed to March 31, 1978.

RECEIVED  
U.S. ATOMIC ENERGY COMMISSION

MAR 23 1973

For the U. S. Atomic Energy Commission

Original Signed By

Robert E. Brinkman

Materials Branch

Date 3 1973

ITEM #

28

Directorate of Licensing  
Washington, D. C. 20545

82/28



U. S. ATOMIC ENERGY COMMISSION  
BYPRODUCT MATERIAL LICENSE

Supplementary Sheet

Page 1 of 2 Pages

License Number 20-01823-02

Amendment No. 10

W. R. Grace and Company  
Dewey and Almy Chemical Division  
62 Whittemore Avenue  
Cambridge, Massachusetts 02140

In accordance with application dated December 14, 1970, License Number 20-01823-02 is amended as follows:

**To add:**

- |  |                                       |  |
|--|---------------------------------------|--|
| 6. Byproduct material<br>(element and mass number) | 7. Chemical and/or physical form      | 8. Maximum amount of radioactivity which<br>licensee may possess at any one time |
| <b>B. Nickel 63</b>                                | <b>B. Foils in detector<br/>cells</b> | <b>B. Not to exceed 2<br/>millicuries for<br/>each cell</b>                      |

**9. Authorized use**

- 3. To be used with Hewlett-Packard gas chromatography unit for sample analysis.**

**Condition 12. is amended to read:**

- 12. Byproduct material shall be used by, or under the supervision of, Frank D. Brako, or Charles A. Salinis.**

**Condition 15. is added:**

- 15.A. Each chromatograph detector containing Nickel 63 shall be tested for leakage and/or contamination at intervals not to exceed six months. In the absence of a certificate from a transferor indicating that a test has been made within six months prior to the transfer, the detector shall not be put into use until tested.**

## 15. continued

- B. The test shall be capable of detecting the presence of 0.005 microcurie of radioactive material on the test sample. The test sample shall be taken from the surfaces of the device in which the foil is mounted or stored on which one might expect contamination to accumulate. Records of leak test results shall be kept in units of microcuries and maintained for inspection by the Commission.
- C. If the test reveals the presence of 0.005 microcurie or more of removable contamination, the licensee shall immediately withdraw the foil from use and shall cause it to be decontaminated and repaired or to be disposed of in accordance with Commission regulations. A report shall be filed within five days of the test with the Director, Division of Materials Licensing, U. S. Atomic Energy Commission, Washington, D. C., 20545, describing the equipment involved, the test results, and the corrective action taken. A copy of each report shall also be sent to the Director, Region I, Division of Compliance, USAEC, 970 Broad Street, Newark, New Jersey, 07102.
- D. Tests for leakage and/or contamination shall be performed by the licensee or by other persons specifically authorized by the Commission or an Agreement State to perform such services.

For the U. S. Atomic Energy Commission

Detected Signed By  
Robert C. Brinkmanby Materials Branch  
Division of Materials Licensing  
Washington, D. C. 20545Date DEC 31 1970

U. S. ATOMIC ENERGY COMMISSION  
BYPRODUCT MATERIAL LICENSE

License No. 20-01823-02  
Page 1 of 2 Pages  
Amendment No. 09

Pursuant to the Atomic Energy Act of 1954 and Title 10, Code of Federal Regulations, Chapter 1, Parts 30, 32, 33, 34, and 35, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, own, possess, transfer and import byproduct material listed below; and to use such byproduct material for the purpose(s) and at the place(s) designated below. 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 and to any conditions specified below.

<p>Licensee</p> <p>1. <b>W. R. Grace and Company</b> <b>Dewey and Almy Chemical Division</b></p> <p>2. <b>62 Whittemore Avenue</b> <b>Cambridge, Massachusetts 02140</b></p>	<p>In accordance with application dated <b>January 16, 1968</b></p> <p>3. License number <b>20-01823-02</b> is amended in its entirety to read as follows:</p> <p>4. Expiration date <b>March 31, 1973</b></p> <p>5. Reference No. <span style="float: right;">✓</span></p>
--	---

<p>6. Byproduct material (element and mass number)</p> <p><b>A. Hydrogen 3</b></p>	<p>7. Chemical and/or physical form</p> <p><b>A. Foils for detector cells</b></p>	<p>8. Maximum amount of radioactivity which licensee may possess at any one time</p> <p><b>A. Not to exceed 200 millicuries for each cell</b></p>
--	---	---

**9. Authorized use**

**A. To be used with F & N gas chromatography units for sample analysis.**

**CONDITIONS**

- 10. Byproduct material may only be used at the licensee's address stated in Item 2 above.**
- 11. The licensee shall comply with the provisions of Title 10, Part 20, Code of Federal Regulations, Chapter 1, "Standards for Protection Against Radiation."**
- 12. Byproduct material shall be used by, or under the supervision of, Frank D. Brako.**

U. S. ATOMIC ENERGY COMMISSION  
BYPRODUCT MATERIAL LICENSE

Page 2 of 2 Pages

Supplementary Sheet

License Number 20-01823-02

Amendment No. 09

CONDITIONS

(Continued)

13. Detector cells containing Hydrogen 3 foil shall only be used in conjunction with a properly operating temperature control mechanism which prevents foil temperatures from exceeding 225 degrees Centigrade.
14. Except as specifically provided otherwise by this license, the licensee shall possess and use byproduct material described in Items 6, 7, and 8 of this license in accordance with statements, representations, and procedures contained in application dated January 16, 1968.

RECEIVED  
 DIVISION OF COMMERCE  
 JAN 23 1968  
 REC'D T. J. G. 38  
 Y. M. C. 23  
 82 MAR 11 7 03 PM '68

For the U. S. Atomic Energy Commission

Original Signed By  
Robert E. Brinkman

by Isotopes Branch

Division of Materials Licensing  
Washington, D. C. 20545

Date

JAN 23 1968

UNITED STATES ATOMIC ENERGY COMMISSION  
**APPLICATION FOR BYPRODUCT MATERIAL LICENSE**

**INSTRUCTIONS.**—Complete Items 1 through 16 if this is an initial application or an application for renewal of a license. Information contained in previous applications filed with the Commission with respect to Items 8 through 15 may be incorporated by reference provided references are clear and specific. Use supplemental sheets where necessary. Item 16 must be completed on all applications. Mail two copies to: U.S. Atomic Energy Commission, Washington, D.C., 20545, Attention: Isotopes Branch, Division of Materials Licensing. Upon approval of this application, the applicant will receive an AEC Byproduct Material License. An AEC Byproduct Material License is issued in accordance with the general requirements contained in Title 10, Code of Federal Regulations, Part 30, and the licensee is subject to Title 10, Code of Federal Regulations, Part 20.

<b>1. (a) NAME AND STREET ADDRESS OF APPLICANT.</b> (Institution, firm, hospital, person, etc. Include ZIP Code.)  <b>Dewey and Almy Chemical Division W. R. Grace &amp; Company 62 Whittemore Avenue Cambridge, Massachusetts 02140</b>		<b>(b) STREET ADDRESS(ES) AT WHICH BYPRODUCT MATERIAL WILL BE USED.</b> (If different from 1 (a). Include ZIP Code.)  <b>same</b>
<b>2. DEPARTMENT TO USE BYPRODUCT MATERIAL</b>  <b>Analytical Laboratory</b>		<b>3. PREVIOUS LICENSE NUMBER(S).</b> (If this is an application for renewal of a license, please indicate and give number.)  <b>20-1823-2 066</b>
<b>4. INDIVIDUAL USER(S).</b> (Name and title of individual(s) who will use or directly supervise use of byproduct material. Give training and experience in Items 8 and 9.)  <b>Frank D. Brako</b>		<b>5. RADIATION PROTECTION OFFICER</b> (Name of person designated as radiation protection officer if other than individual user. Attach resume of his training and experience as in Items 8 and 9.)  <b>Frank D. Brako</b>
<b>6. (a) BYPRODUCT MATERIAL.</b> (Elements and mass number of each.)  <b>Tritium (Hydrogen-3)</b>	<b>(b) CHEMICAL AND/OR PHYSICAL FORM AND MAXIMUM NUMBER OF MILLICURIES OF EACH CHEMICAL AND/OR PHYSICAL FORM THAT YOU WILL POSSESS AT ANY ONE TIME.</b> (If sealed source(s), also state name of manufacturer, model number, number of sources and maximum activity per source.)  <b>F&amp;M Electron Capture Detector Model No. 2-2837 Containing V. S. Radium Lab. 508-1 Foil.  A maximum of two cells, each containing 200 millicuries of tritium to be possessed at any one time.</b>	
<b>7. DESCRIBE PURPOSE FOR WHICH BYPRODUCT MATERIAL WILL BE USED.</b> (If byproduct material is for "human use," supplement A (Form AEC-313a) must be completed in lieu of this item. If byproduct material is in the form of a sealed source, include the make and model number of the storage container and/or device in which the source will be stored and/or used.)  <b>F&amp;M Model 810 Gas Chromatograph</b>		

99729

Form AEC-313

8-64

10 CFR 30

Attachment No. 1

13. FACILITIES AND EQUIPMENT:

Effluent gas will be piped into a fume hood at temperatures above 150°C.

14. RADIATION PROTECTION PROGRAM:

Follow Manufacturer's Recommendations.

15. WASTE DISPOSAL:

Return to supplier F&M Scientific  
Avondale, Pa.



867  
83729

W. R. Grace and Company  
Dewey and Almy Chemical Division  
ATTN: Mr. J. V. Pisano  
62 Whittemore Avenue  
Cambridge, Massachusetts 02140

NOV 8 1971

Gentlemen:

On February 5, 1971, we sent Invoice L-3149-71 to you requesting payment of the annual fee for AEC License 29-01823-02. The annual fee is prescribed by Section 170.31 of 10 CFR 170 of the Commission's regulations, copy enclosed. On June 21, 1971, we sent a second billing. A further letter of clarification was sent to you on August 17, 1971. At this time, we have not received the payment.

Section 170.41 of Part 170 provides that:

"In any case where the Commission finds that a licensee has failed to pay the applicable annual fee required in this part, the Commission may suspend or revoke the license or may issue such order with respect to licensed activities as the Commission determines to be appropriate or necessary in order to carry out the provisions of this part, Parts 30, 40, 50, and 70 of this chapter and of the Act."

You are hereby notified that if we have not received the required fee payment of \$40 by November 22, 1971, it will be necessary to take appropriate action in accordance with Section 170.41, cited above.

Sincerely,

Lyall Johnson, Director  
Division of State and  
Licensee Relations

Enclosure:  
10 CFR 170 as amended

GRESS  
11/8/71

SLR

SLR

Miller:dlp

Johnson

11/ /71

11/ /71



FEB 10 1978

✓ Docket No. 030-04609

W. R. Grace and Company  
Dewey and Almy Chemical Division  
ATTN: Dr. Arthur S. Wexler  
55 Hayden Avenue  
Lexington, Massachusetts 02173

Gentlemen:

Subject: Inspection 78-01

This refers to the inspection conducted by Ms. M. Campbell of this office on January 25, 1978, of activities authorized by NRC License No. 20-1823-02 and to the discussions of our findings held by Ms. Campbell with yourself and Mr. F. Brako of your staff at the conclusion of the inspection, and to a previous telephone discussion between Ms. Campbell and Mr. F. Brako on January 19, 1978.

The inspection was an examination of activities conducted under your license as they relate to radiation safety and to compliance with the Commission's rules and regulations and the conditions of your license. The inspection consisted of selective examinations of procedures and representative records, interviews with personnel, measurements made by the inspector, and observations by the inspector.

Based on the results of this inspection, it appears that certain of your activities were not conducted in full compliance with NRC requirements, as set forth in the Notice of Violation, enclosed herewith as Appendix A. These items of noncompliance have been categorized into the levels as described in our correspondence to you dated December 31, 1974. This notice is sent to you pursuant to the provisions of Section 2.201 of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations. Section 2.201 requires you to submit to this office, within twenty (20) days of your receipt of this notice, a written statement or explanation in reply including: (1) corrective steps which have been taken by you and the results achieved; (2) corrective steps which will be taken to avoid further items of noncompliance; and (3) the date when full compliance will be achieved.

ITEM # 29

b/p 29 (15)

OFFICE ▶	FFMS	FFMS				
SURNAME ▶	<i>McClintock</i> Campbell/cc	<i>McClintock</i> McClintock				
DATE ▶	2/10/78	2/10/78				

FEB 10 1970

In accordance with Section 2.790 of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, a copy of this letter and your reply will be placed in the Public Document Room.

Should you have any questions concerning this inspection, we will be pleased to discuss them with you.

Sincerely,

Robert O. McClintock, Chief  
Materials Radiological Protection  
Section

Enclosure: Appendix A, Notice of Violation

bcc w/encl:

IE Mail & Files (For Appropriate Distribution)

Central Files

Public Document Room (PDR)

Nuclear Safety Information Center (NSIC)

REG:I Reading Room

Commonwealth of Massachusetts

OFFICE ▶						
SURNAME ▶						
DATE ▶						

APPENDIX A

NOTICE OF VIOLATION

Based on the results of an NRC inspection conducted on January 25, 1978, it appears that certain of your activities were not conducted in full compliance with NRC regulations and the conditions of your license as indicated below:

- A. Condition 10 of your license limits the location of use of licensed material to your facility at 62 Whittemore Avenue, Cambridge, Massachusetts.

Contrary to this requirement, on the date of the inspection, January 25, 1978, your licensed material had been moved to, and was being used at, your facility at 55 Hayden Avenue, Lexington, Massachusetts.

This is an infraction.

- B. 10 CFR 20.207(a) requires that licensed materials, stored in an unrestricted area, be secured against unauthorized removal from the place of storage. 10 CFR 20.207(b) requires that materials not in storage must be under constant surveillance and immediate control of the licensee. As defined in 10 CFR 20.3(17), an unrestricted area is any area access to which is not controlled by the licensee for purposes of protection of individuals from exposure to radiation and radioactive materials.

Contrary to this requirement, on the date of the inspection, January 25, 1978, licensed materials were stored in your unlocked chemical storeroom, which is an unrestricted area, and the material was neither under constant surveillance nor under your immediate control.

This is an infraction.

OFFICE ►						
SURNAME ►						
DATE ►						

030 04609

Page 1 of     INSPECTION REPORT NO. 78-01Attached☐ Appendix A☒ Appendix B☐ Appendix C☐ Memo

WR Grace and Company  
Dewey and Almy Chemical Division  
55 Hayden Avenue Lexington, Mass 02173

Licensee contact: Mrs. Frank Brako Telephone no. 617-861-6600License no. 20-01823-02 Last amendment and date: 11 3/8/73Category: K, and Priority: 7, as of last amendment.Inspection date(s): January 25 1978 Type of inspection: unannounced routine

## SUMMARY OF FINDINGS AND ACTION

☐ No noncompliance, clear 591 issued☐ Noncompliance, 591 issued☒ Noncompliance, Appendix A☐ Regional action Hq action☐ Action on previous noncompliance, Appendix B☐ Supplemental info, Appendix C

## RECOMMENDATIONS

See basis in Appendix C or attached memo.

☐ Change Category to:                     ☐ Change Priority to:                     ☐ Next inspection date: Jan 1983 (phone)

## PERSONS CONTACTED

\*Mr F. Brako, User

\*Dr A. Wexler Manager

Inspector: W. A. CampbellApproved: RD Mullen

2/1/78

2/2/78

Plan approved: \_\_\_\_\_ Date: \_\_\_\_\_

Licensee: \_\_\_\_\_

License no: \_\_\_\_\_

Inspection Items	Scheduled for inspection	Post-inspection status	Module no.	766 Time Info
Management meeting - Entrance and Exit Interviews [REQUIRED]			307038	20 m
Initial Management Meeting				
Program requirements, MC 28 <u>50</u> [REQUIRED]			77710 B	20 m
Licensee Event Followup			927008	
Followup on Inspector-identified problems			927018	
Followup on Noncompliance and Deviations			927028	
IE Bulletin/Immediate Action Letter Followup			927038	
Followup on Headquarters Requests			927048	
Followup on Regional Requests			927058	
Independent Inspection Effort [REQUIRED]				20 m
Inspector Dispatched to Site			937008	
Followup on Significant Event Occurring During Inspection			937018	

## AREAS INSPECTED AND FINDINGS

77710B - Industrial-Academic

Licensee: \_\_\_\_\_ License no: \_\_\_\_\_ Amendment no: \_\_\_\_\_

INSPECTION ITEMS	CRITERIA	FINDING
1. <u>Organization</u> Management organization. Radiation protection organization.	Lic Cond _____	<u>n/a</u>

NOTES &amp; REMARKS:

2. <u>Licensee internal audits</u> Scope and frequency. Management controls.	Lic Cond _____	<u>n/a</u>
--	----------------	------------

NOTES &amp; REMARKS:

3. <u>Training and instructions to employees</u> Training program, scope and frequency, retraining. Required tests administered; scores satisfactory. Instructions to workers.	Lic C Lic Cond _____ 19.12	<u>C</u>
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NOTES &amp; REMARKS:

4. <u>Radiation protection procedures</u> Operating & emergency procedures implemented. Security.	Lic Cond _____ 20.207	<u>n/c</u>
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NOTES &amp; REMARKS:

material stored on shelf in open storage area for chemicals

## AREAS INSPECTED AND FINDINGS

Licensee: \_\_\_\_\_ License no: \_\_\_\_\_ Amendment no: \_\_\_\_\_

INSPECTION ITEM	CRITERIA	FINDING
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5. Materials, facilities and instrumentsC

Authorized uses and quantities.

Lic Cond \_\_\_\_\_

Restricted areas, posting requirements.

20.203

Survey instruments & dosimeters; operable,  
properly calibrated.

Lic Cond \_\_\_\_\_

## NOTES &amp; REMARKS:

no <sup>63</sup>Ni ever used or purchased  
<sup>3</sup>H now on hand  
15 yrs old from F&M Scientific (← now HP)

6. Receipt and transfer of materialsC

Procedures implemented, adequate.

20.205, 71.51

Transfer of byproduct material.

30.41

Labeling and packaging.

71.5, 49CFR 170-189

Records of receipt, transfer, storage,  
survey, and monitoring

30.51

## NOTES &amp; REMARKS:

7. Personnel protection - externaln/aPersonnel monitoring control; minimize  
exposures, control of accumulated dose.

20.101, 20.102, 20.202

Surveys conducted, adequate.

20.201

Records of monitoring, surveys, disposals.

20.401, Lic Cond \_\_\_\_\_

Levels in unrestricted areas.

20.1, 20.105

## NOTES &amp; REMARKS:

8. Personnel protection - internaln/a

Airborne concentrations in restricted areas.

20.103

Exposure of minors.

20.104

Posting of airborne radioactivity areas.

20.203

Survey, monitoring requirements; records.

20.201, 20.401

Leak tests of sealed sources.Lic Cond 15

## NOTES &amp; REMARKS:

no <sup>63</sup>Ni



## AREAS INSPECTED AND FINDINGS

Licensee: \_\_\_\_\_ License no: \_\_\_\_\_ Amendment no: \_\_\_\_\_

INSPECTION ITEM	CRITERIA	FINDING
9. <u>Effluent control, waste disposal</u>		<u>n/a</u>
Release of effluents.	20.106	
Waste disposal.	20.301, 20.303, 20.304, 20.305	
Procedures, records.	20.401, Lic Cond _____	

NOTES &amp; REMARKS:

10. <u>Shipping, shipping incidents</u>		<u>n/a</u>
Procedures for pickup, receipt, monitoring of packages.	20.205(b) & (c)	
Transportation of licensed material.	71.5	
Incidents, reports, corrective actions.	49CFR 170-189	

NOTES &amp; REMARKS:

11. <u>Notifications and reports</u>		<u>n/a</u>
To individuals.	19.13	
Overexposures, excessive levels & concentrations, incidents.	20.403, 20.405	
Personnel exposures and monitoring, termination reports.	20.407, 20.408	
Theft or loss of licensed material.	20.402	

NOTES &amp; REMARKS:

12. <u>Posting of notices</u>		<u>c</u>
Part 20, license & documents, procedures, notice of violations.	19.11(a)	
NRC-3.	19.11(c)	

NOTES &amp; REMARKS:

## AREAS INSPECTED AND FINDINGS

Licensee: \_\_\_\_\_ License no: \_\_\_\_\_ Amendment no: \_\_\_\_\_

INSPECTION ITEM	CRITERIA	FINDING
13. <u>Environmental monitoring program</u>	Lic Cond _____	<u>n/a</u>

Implementation of program, scope and frequency as required.  
Records maintained, reviewed by management.

NOTES &amp; REMARKS:

14. <u>Emergency preparedness</u>	Lic Cond _____	<u>n/a</u>
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Procedures available for incidents and accidents.  
Training for personnel; coordination with supporting groups and agencies.

NOTES &amp; REMARKS:

15. <u>Other license conditions</u>	Lic 10	<u>n/c</u>
-------------------------------------	--------	------------

moved from Cambridge  
address 5 years ago

NOTES &amp; REMARKS:

16. <u>Confirmatory measurements</u>		_____
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Licensee's surveys verified on sampling basis. 20.105, 20.201

NOTES &amp; REMARKS:

17. <u>Independent inspection effort</u>		_____
--	--	-------

NOTES &amp; REMARKS:

## APPENDIX A - DOCUMENTATION OF NONCOMPLIANCE

Licensee: \_\_\_\_\_

License no: \_\_\_\_\_

Reference

Basis for noncompliance

Report item 1moved to Lexington without  
authorization

10 CFR \_\_\_\_\_

Lic Cond 10

Type n/c \_\_\_\_\_

Report item 2stored in <sup>open</sup> chemical storeroom on shelf10 CFR 20.207

Lic Cond \_\_\_\_\_

Type n/c \_\_\_\_\_

Report item \_\_\_\_\_

10 CFR \_\_\_\_\_

Lic Cond \_\_\_\_\_

Type n/c \_\_\_\_\_

Report item \_\_\_\_\_

10 CFR \_\_\_\_\_

Lic Cond \_\_\_\_\_

Type n/c \_\_\_\_\_

Report item \_\_\_\_\_

10 CFR \_\_\_\_\_

Lic Cond \_\_\_\_\_

Type n/c \_\_\_\_\_

## APPENDIX C - SUPPLEMENTARY INFO \_\_\_\_\_

Licensee: \_\_\_\_\_

License no: \_\_\_\_\_

☐ Uncorrected/repeated noncompliance☐ Unresolved items☐ Unusual occurrence, conditions, etc☐ Inspector's comments☐ Basis for change of Category or Priority

This gas chromatograph has not been used for many years. It should probably be disposed of.

UNITED STATES ATOMIC ENERGY COMMISSION  
**APPLICATION FOR BYPRODUCT MATERIAL LICENSE**

**INSTRUCTIONS.**—Complete Items 1 through 16 if this is an initial application or an application for renewal of a license. Information contained in previous applications filed with the Commission with respect to Items 8 through 15 may be incorporated by reference provided references are clear and specific. Use supplemental sheets where necessary. Item 16 must be completed on all applications. Mail two copies to: U.S. Atomic Energy Commission, Washington, D.C., 20545, Attention: Isotopes Branch, Division of Materials Licensing. Upon approval of this application, the applicant will receive an AEC Byproduct Material License. An AEC Byproduct Material License is issued in accordance with the general requirements contained in Title 10, Code of Federal Regulations, Part 30, and the Licensee is subject to Title 10, Code of Federal Regulations, Part 20.

<b>1. (a) NAME AND STREET ADDRESS OF APPLICANT.</b> (Institution, firm, hospital, person, etc. Include ZIP Code.)  W. R. Grace & Co Dewey & Almy Chemical Division		<b>(b) STREET ADDRESS(ES) AT WHICH BYPRODUCT MATERIAL WILL BE USED.</b> (If different from 1 (a). Include ZIP Code.)  62 Whittemore Avenue Cambridge, Mass. 02140	
<b>2. DEPARTMENT TO USE BYPRODUCT MATERIAL</b>  Analytical Laboratory		<b>3. PREVIOUS LICENSE NUMBER(S).</b> (If this is an application for renewal of a license, please indicate and give number.)  20-01823-02	
<b>4. INDIVIDUAL USER(S).</b> (Name and title of individual(s) who will use or directly supervise use of byproduct material. Give training and experience in Items 8 and 9.)  Charles A. Salinis and Frank D. Brako		<b>5. RADIATION PROTECTION OFFICER</b> (Name of person designated as radiation protection officer if other than individual user. Attach resume of his training and experience as in Items 8 and 9.)  Charles A. Salinis	
<b>6. (a) BYPRODUCT MATERIAL.</b> (Elements and mass number of each.)  Tritium (Hydrogen-3)		<b>(b) CHEMICAL AND/OR PHYSICAL FORM AND MAXIMUM NUMBER OF MILLCURIES OF EACH CHEMICAL AND/OR PHYSICAL FORM THAT YOU WILL POSSESS AT ANY ONE TIME.</b> (If sealed source(s), also state name of manufacturer, model number, number of sources and maximum activity per source.)  F&M Electron Capture Detector Model 2-2837 - Containing U.S. Radium Lab 508-1 foil type.  A maximum of two cells, each containing 200 millicuries of tritium to be possessed at any one time.	
<b>7. DESCRIBE PURPOSE FOR WHICH BYPRODUCT MATERIAL WILL BE USED.</b> (If byproduct material is for "human use," supplement A (Form AEC-313a) must be completed in lieu of this item. If byproduct material is in the form of a sealed source, include the make and model number of the storage container and/or device in which the source will be stored and/or used.)  F&M Model 810 Gas Chromatograph			

# TRAINING AND EXPERIENCE OF EACH INDIVIDUAL NAMED IN ITEM 4 (Use supplemental sheets if necessary)

8. TYPE OF TRAINING	WHERE TRAINED	DURATION OF TRAINING	ON THE JOB (Circle answer)	FORMAL COURSE (Circle answer)
a. Principles and practices of radiation protection	General Electric Company	3-1/2 yrs	Yes No	Yes No
b. Radioactivity measurement standardization and monitoring techniques and instruments			Yes No	Yes No
c. Mathematics and calculations basic to the use and measurement of radioactivity	College Physics & Mathematics through Calculus		Yes No	Yes No
d. Biological effects of radiation			Yes No	Yes No

## 9. EXPERIENCE WITH RADIATION. (Actual use of radioisotopes or equivalent experience.)

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
Tritium	29-33 foils	General Electric Co.	3-1/2 yrs. -	
Hydrogen-3)	200-300 millicuries each	Syracuse, N.Y.	Also: D&A Chemical Div. 3 yrs.	
These cells were used in Barber Coleman Models M-10 & 5000 and Aerograph Gas Chromatographs				

## 10. RADIATION DETECTION INSTRUMENTS. (Use supplemental sheets if necessary.)

TYPE OF INSTRUMENTS (Include make and model number of each)	NUMBER AVAILABLE	RADIATION DETECTED	SENSITIVITY RANGE (mr/hr)	WINDOW THICKNESS (mg/cm <sup>2</sup> )	USE (Monitoring, surveying, measuring)
None required					

## 11. METHOD, FREQUENCY, AND STANDARDS USED IN CALIBRATING INSTRUMENTS LISTED ABOVE.

None required with this instrument

## 12. FILM BADGES, DOSIMETERS, AND BIO-ASSAY PROCEDURES USED. (For film badges, specify method of calibrating and processing, or name of supplier.)

None required with this instrument

## INFORMATION TO BE SUBMITTED ON ADDITIONAL SHEETS IN DUPLICATE

13. FACILITIES AND EQUIPMENT. Describe laboratory facilities and remote handling equipment, storage containers, shielding, fume hoods, etc. Explanatory sketch of facility is attached. (Circle answer) Yes No
14. RADIATION PROTECTION PROGRAM. Describe the radiation protection program including control measures. If application covers sealed sources, submit leak testing procedures where applicable, name, training, and experience of person to perform leak tests, and arrangements for performing initial radiation survey, servicing, maintenance and repair of the source.
15. WASTE DISPOSAL. If a commercial waste disposal service is employed, specify name of company. Otherwise, submit detailed description of methods which will be used for disposing of radioactive wastes and estimates of the type and amount of activity involved.

## CERTIFICATE (This item must be completed by applicant)

16. 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 30, AND THAT ALL INFORMATION CONTAINED HEREIN, INCLUDING ANY SUPPLEMENTS ATTACHED HERETO, IS TRUE AND CORRECT TO THE BEST OF OUR KNOWLEDGE AND BELIEF.
<p>Dewey &amp; Almy Chemical Division</p> <p>W. R. Grace &amp; Co.</p> <p>Applicant named in item 1</p> <p>Date <u>February 22, 1973</u></p> <p>By: <u>Charles A. Salinis</u> <i>Charles A. Salinis</i></p> <p><u>Senior Chemist</u></p> <p>Title of certifying official</p>

**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.



9. Type of Use: Analysis of micro organisms metabolic products at G.E. Gas Chromatographic Analysis of Volatiles and derivatives at Dewey & Almy Chemical Division.
13. Facilities & Equipment: Effluent gas is piped into a fume hood at all times.
14. Radiation Protection Program: Follow manufacturers recommendations
15. Waste Disposal: Return to Supplier - Hewlett Packard,  
32 Hartwell Avenue  
Lexington, Mass.

F&M Scientific of Avondale, Pa. has been taken over by Hewlett Packard.

*Charles A. Salinis*

AEC-314  
(1-68)

UNITED STATES ATOMIC ENERGY COMMISSION

CERTIFICATE-DISPOSITION OF RADIOISOTOPES

LICENSEE (Institution, Firm, Hospital, Person, etc.)

W R GRACE & COMPANY  
DEWEY & ALMY CHEMICAL DIVISION  
62 WHITTEMORE AVENUE  
CAMBRIDGE MASSACHUSETTS 02140

PROGRAM CODE:

03100

LICENSE NUMBER:

20-01823-02

EXPIRATION DATE:

03/31/73

ADDRESS (if same as above write same)

SAME

DEPARTMENT(S)

SAME

INDIVIDUAL RADIOISOTOPE USER(S)

Charles A. Salinis Frank D. Brako

CERTIFICATION

The licensee and any individual executing this certification on behalf of the licensee certify that  
(check appropriate item(s) below):

☐ NO BYPRODUCT MATERIALS HAVE BEEN PROCURED AND/OR POSSESSED BY LICENSEE.

OR

ALL BYPRODUCT MATERIALS PROCURED AND/OR POSSESSED BY LICENSEE UNDER BYPRODUCT  
MATERIAL LICENSE NO. \_\_\_\_\_ HAVE BEEN:

☐ (1) TRANSFERRED TO (state name or institution, firm, hospital, person, etc.)

WHICH HAS BYPRODUCT MATERIAL LICENSE NO. \_\_\_\_\_

☐ (2) DISPOSED OF BY DECAY.

☐ (3) DISPOSED OF IN COMPLIANCE WITH THE  
PROVISIONS OF 10 CFR 20.

☐ (4) LICENSED UNDER LICENSE NO. \_\_\_\_\_ ISSUED BY  
AN AGREEMENT STATE PURSUANT TO SECTION 274 OF THE ATOMIC ENERGY ACT OF 1954,  
AS AMENDED.

REMARKS: (if additional space is needed use reverse side)

TRANSFER TO CHARLES SALINIS AS 34863  
NEW LICENSEE

SIGNATURE OF CERTIFYING OFFICIAL

Frank Brako

DATE

2/21/73

MECRAY, KAIN, CAMISHION, PIERUCCI, P.A.  
A PROFESSIONAL ASSOCIATION

0730

PAUL ME CRAY, JR., M. D.  
EUGENE H. KAIN, M. D.  
RUDOLPH C. CAMISHION, M. D.  
LOUIS PIERUCCI, JR., M. D.

Suite 303 Cooper River Parkway West  
North Park Drive  
Pennsauken, N. J. 08109  
609-663-3501

February 21, 1973

Mr. Richard Cunningham  
Director of Licensing  
of the Atomic Energy Commission  
Washington, DC

Dear Mr. Cunningham:

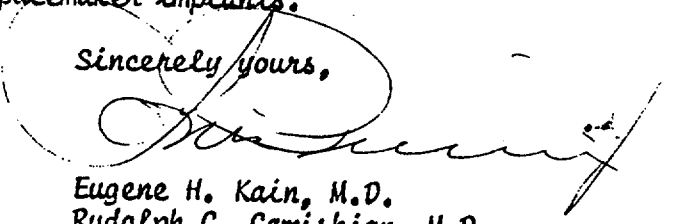
We would like to obtain an application so that we may apply for a license to implant the Biotronik Betacel 400 Nuclear Powered Demand Pacemaker. The power source is Prometheum 147 manufactured for Biotronik by the McDonald-Douglas Corporation.

These units would be inserted at The Cooper Hospital in Camden, New Jersey. The Cooper Hospital has the necessary personnel for pre- and postoperative care of this type of patient in addition to the proper x-ray equipment.

We estimate that we will be implanting approximately 35 units per year. We have had experience with the implantation of permanent pacemaking units since 1962.

We would be pleased to follow any protocol set up by the Atomic Energy Commission for these pacemaker implants.

Sincerely yours,

  
Eugene H. Kain, M.D.  
Rudolph C. Camishion, M.D.  
Louis Pierucci, Jr., M.D.

LPjr:dlm

GRACE

Dewey and Almy Chemical Division

W.R. Grace & Co.  
55 Hayden Avenue  
Lexington, Mass. 02173

(617) 861-6600

February 17, 1978

United States  
Nuclear Regulatory Commission  
Region 1  
631 Park Avenue  
King of Prussia, Pennsylvania 19406

Attention: Mr. Robert O. McClintock  
Materials Radiological Protection Service

Dear Sir:

Your correspondence of February 10, 1978 to us in reference to Inspection 78-01 (Docket No. 030-04609) has been received and the infractions noted. Corrective steps are as follows:

1. The licensed material has been stored under lock and key in a restricted area accessible only to Frank Brako and Arthur S. Wexler since the date of the recent inspection.
2. We are actively seeking a qualified disposal service to dispose of the licensed material which no longer is needed in our operations.
3. Please advise the appropriate corrective if any for infraction A.

Very truly yours,

*Frank D. Brako*

Frank D. Brako  
Research Associate

FDB:njb

ITEM # 30

B/30

Docket No. 030-04609

MAR 9 1978

W. R. Grace and Company  
Dewey and Almy Chemical Division  
ATTN: Dr. Arthur S. Wexler  
55 Hayden Avenue  
Lexington, Massachusetts 02173

Gentlemen:

Subject: Inspection 78-01

This refers to your letter dated February 17, 1978, in response to our letter dated February 10, 1978.

Thank you for informing us of the corrective and preventive actions documented in your letter. These actions will be examined during a subsequent inspection of your licensed program.

As discussed during your March 2, 1978 telephone conversation with Mr. F. Costello of this office, it is our understanding that you are correcting infraction A by submitting a letter to the USNRC's Radioisotope Licensing Branch, Washington, D.C. 20555, requesting that your facility at 55 Hayden Avenue, Lexington, Massachusetts, be authorized as a place of use for your licensed material. You are further advised that, if you dispose of this material and wish to terminate your license, you should submit a letter to the same office describing the disposal of all of your licensed materials, and request that your license be terminated.

Your cooperation with us is appreciated.

Sincerely,

Robert O. McClintock, Chief  
Materials Radiological Protection  
Section

ITEM # 31

(2)

OFFICE ▶	FFMS	FFMS				
SURNAME ▶	<i>Campbell</i> Campbell/jl	<i>McClintock</i> McClintock				<i>B/31</i>
DATE ▶	3/8/78	3/8/78				

MAR 9 1978

bcc:

IE Mail &amp; Files (For Appropriate Distribution)

Central Files

Public Document Room (PDR)

Nuclear Safety Information Center (NSIC)

REG:I Reading Room

Commonwealth of Massachusetts

OFFICE ▶						
SURNAME ▶						
DATE ▶						



GRACE

Dewey and Almy Chemical Division

W.R. Grace & Co.  
55 Hayden Avenue  
Lexington, Mass. 02173

DOCKET NO. 030-04609

(617) 861-6600

August 29, 1978

U. S. Nuclear Regulatory Commission  
Radioisotope Licensing Branch  
Washington, D. C. 20555

Gentlemen:

This is to inform you that our licensed material consisting of an electron capture detector with tritium foil (max. 200 millicuries) Model No. 2-2837, Serial No. 1165, from F&M Scientific-Hewlett Packard, has been disposed of by:

Interex Corporation  
3 Strathmore Road  
Natick, Mass. 01760

Please terminate our license No. 20-1823-02.

Sincerely,

*H J Maria*  
H. J. Maria, Ph.D.  
Senior Chemist

HJM:njb

cc: R. O. McClintock, Chief  
Materials Radiological Protection Section  
U. S. Nuclear Regulatory Commission, Region 1  
631 Park Avenue  
King of Prussia, Pa. 19406

Frank R. Archibald, P. E.  
Industrial Radiation Control Supervisor  
Mass. Dept. of Labor and Industries  
Division of Occupational Hygiene  
39 Boylston Street  
Boston, Mass. 02116

Harold Bavley, P.E., Director  
Mass. Dept. of Labor and Industries  
Div. of Occupational Hygiene  
39 Boylston Street  
Boston, Mass. 02116

ITEM #

32

96502

2/32

## MATERIALS DATA REPORT—INDUSTRIAL, MEDICAL, SOURCE, SPECIAL NUCLEAR

## A. TYPE OF ACTION AND IDENTIFICATION CODES

NEW LICENSE	AMENDMENT TO RENEW LICENSE	AMENDMENT TO TERMINATE	VOID	DOCKET NUMBER	MAIL CONTROL NUMBER	CHANGE NAME/ADDRESS ("X" box)
1 XX NEW LICENSE AND NEW LICENSEE			2	030-20826	15874	
	OTHER AMENDMENT	CLERICAL CHANGE NO AMENDMENT				

## B. INDICATIVE INFORMATION

INDIVIDUAL LICENSEES	NAME (Last, First, Middle)	NAME (Last, First, Middle)
	NAME (Last, First, Middle)	NAME (Last, First, Middle)
	NAME (Last, First, Middle)	NAME (Last, First, Middle)
ORGANIZATION	ORGANIZATION NAME (Alphabetic Sequence) W.R. Grace & Company	
LICENSEES	DEPARTMENT OR BUREAU	
ADDRESS	BUILDING, STREET 5 Harmony Street	CITY Adams
	STATE MA	ZIP CODE 01220
6	TYPE OF APPLICANT 333	U.S. GOVERNMENT AGENCY INDIVIDUAL LICENSEE ORGANIZATIONAL LICENSEE
	DATE REQUEST RECEIVED 09/16/83	INSTITUTION CODE 13014
	PENDING PROG. CODE 03217	ACTUAL PROG. CODE 03120
SECONDARY PROGRAM CODES (As required)		
#1	#2 02	#3
#4	#5	
LICENSE NUMBER 20-13014-01	DATE LICENSE ISSUED OR ACTION COMPLETED FEB 08 1984	EXPIRATION DATE 1/31/89

## C. STATISTICAL INFORMATION

MEDICAL CATEGORY:	FOR HUMAN USE ONLY	FOR HUMAN AND NONHUMAN USE	<input checked="" type="checkbox"/> FOR NONHUMAN USE ONLY		
POSSESSION OF THE MATERIAL IS AUTHORIZED IN ONE OF THE FOLLOWING AREAS:					
AND/OR IN THE STATE(S), TERRITORY(IES), COUNTRY CHECKED (At right)	<input checked="" type="checkbox"/> SAME AS "STATE" IN ADDRESS	ALL STATES		ALL NON-AGREEMENT STATES	
	AL - ALABAMA	GA - GEORGIA	MD - MARYLAND	NJ - NEW JERSEY	SC - SOUTH CAROLINA
	AK - ALASKA	HI - HAWAII	MA - MASSACHUSETTS	NM - NEW MEXICO	SD - SOUTH DAKOTA
	AZ - ARIZONA	ID - IDAHO	MI - MICHIGAN	NY - NEW YORK	TN - TENNESSEE
	AR - ARKANSAS	IL - ILLINOIS	MN - MINNESOTA	NC - NORTH CAROLINA	TX - TEXAS
	CA - CALIFORNIA	IN - INDIANA	MS - MISSISSIPPI	ND - NORTH DAKOTA	UT - UTAH
	CO - COLORADO	IA - IOWA	MO - MISSOURI	OH - OHIO	VT - VERMONT
	CT - CONNECTICUT	KS - KANSAS	MT - MONTANA	OK - OKLAHOMA	VA - VIRGINIA
	DE - DELAWARE	KY - KENTUCKY	NB - NEBRASKA	OR - OREGON	WA - WASHINGTON
	DC - WASHINGTON, DC	LA - LOUISIANA	NV - NEVADA	PA - PENNSYLVANIA	WV - WEST VIRGINIA
	FL - FLORIDA	ME - MAINE	NH - NEW HAMPSHIRE	RI - RHODE ISLAND	WI - WISCONSIN

## D. POSSESSION LIMITS OF SOURCE AND SPECIAL NUCLEAR MATERIALS AND TRITIUM

SOURCE MATERIAL CEILING		G - GRAMS		SNM CEILING		G - GRAMS		IF FOR POWER REACTOR	
		Kg - KILOGRAMS				Kg - KILOGRAMS		("X" here)	
*MATERIAL	AMOUNT	UNIT	CONFIG.	ENRICH.	*MATERIAL	AMOUNT	UNIT	CONFIG.	ENRICH.
U5 = U235		G	S				G	S	
		Kg	UNS				Kg	UNS	
U3 = U233		G	S				G	S	
		Kg	UNS				Kg	UNS	
PU = Plutonium		G	S				G	S	
		Kg	UNS				Kg	UNS	
UR = Uranium		G	S				G	S	
		Kg	UNS				Kg	UNS	
TH = Thorium		G	S				G	S	
		Kg	UNS				Kg	UNS	
		G	S				G	S	
		Kg	UNS				Kg	UNS	
		G	S				G	S	
		Kg	UNS				Kg	UNS	
H3-Tritium		CURIES			RIS CODES				
		MILLCURIES							
		MICROCURI							

\*Use two-digit codes.

S-SEALED.

UNS-UNSEALED.

30-20826

<b>NRC Form 313 I</b> (12-81) 10 CFR 30		<b>U.S. NUCLEAR REGULATORY COMMISSION</b>		<b>1. APPLICATION FOR:</b> (Check and/or complete as appropriate)	
<b>APPLICATION FOR BYPRODUCT MATERIAL LICENSE</b> <b>INDUSTRIAL</b>				<input checked="" type="checkbox"/> <b>a. NEW LICENSE</b>	
<i>See attached instructions for details.</i>				<input type="checkbox"/> <b>b. AMENDMENT TO:</b> LICENSE NUMBER	
<i>Completed applications are filed in duplicate with the Division of Fuel Cycle and Material Safety, Office of Nuclear Material Safety, and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555 or applications may be filed in person at the Commission's office at 1717 H Street, NW, Washington, D. C. or 7915 Eastern Avenue, Silver Spring, Maryland.</i>				<input type="checkbox"/> <b>c. RENEWAL OF:</b> LICENSE NUMBER	L & L 13014
<b>2. APPLICANT'S NAME</b> (Institution, firm, person, etc.)  W. R. Grace & Company		<b>3. NAME AND TITLE OF PERSON TO BE CONTACTED</b> <b>REGARDING THIS APPLICATION</b> Henry A. Johnson <b>03217</b>			
TELEPHONE NUMBER: AREA CODE -- NUMBER EXTENSION 413-743-0546		TELEPHONE NUMBER: AREA CODE -- NUMBER EXTENSION 413-743-0546 Ext. 29			
<b>4. APPLICANT'S MAILING ADDRESS</b> (Include Zip Code) (Address to which NRC correspondence, notices, bulletins, etc., should be sent.)  Harmony Street Adams, Ma. 01220		<b>5. STREET ADDRESS WHERE LICENSED MATERIAL WILL BE USED</b> (Include Zip Code)  Harmony Street Adams, Ma. 01220			
(IF MORE SPACE IS NEEDED FOR ANY ITEM, USE ADDITIONAL PROPERLY KEYED PAGES.)					
<b>6. INDIVIDUAL(S) WHO WILL USE OR DIRECTLY SUPERVISE THE USE OF LICENSED MATERIAL</b> (See Items 16 and 17 for required training and experience of each individual named below)					
FULL NAME		TITLE			
a.	Henry A. Johnson	Date	9/23/83		
b.		Log.	Sept 10 1983		
c.		By	Brown		
<b>7. RADIATION PROTECTION OFFICER</b>  Henry A. Johnson		Orig To	Attach a resume of person's training and experience as required in Items 16 and 17 and describe his responsibilities under Item 15.		
Action Compl		9/26/83	Applicant... 2629 Check No... 1110-32 Amount/Fee... \$110-32 Date Check Recd... 9/23/83 Received By... Brown		
<b>8. LICENSED MATERIAL</b>					
L I N E  NO.	ELEMENT AND MASS NUMBER  A	CHEMICAL AND/OR PHYSICAL FORM  B	NAME OF MANUFACTURER AND MODEL NUMBER (If Sealed Source)  C	MAXIMUM NUMBER OF MILLCURIES AND/OR SEALED SOURCES AND MAXIMUM ACTI- VITY PER SOURCE WHICH WILL BE POSSESSED AT ANY ONE TIME  D	
(1)	Krypton 85	Sealed Source	AccuRay 0-2 Serial 773389531	500 millicuries	
(2)	Strontium 90	Sealed Source	AccuRay 0-2 Serial 773389532	70 millicuries	
(3)			Models 5-15 or 5-18		
(4)					
<b>DESCRIBE USE OF LICENSED MATERIAL</b> E					
(1)	To be used in AccuRay beta gauge for the				
(2)	measurement of latex impregnation in paper webs.				
(3)	ITEM # 34 (2)				
(4)					

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LINE NO.	CONTAINER AND/OR DEVICE IN WHICH EACH SEALED SOURCE WILL BE STORED OR USED. A.	NAME OF MANUFACTURER B.	MODEL NUMBER C.
(1)	Source Housing	AccuRay Corp.	0 - 2
(2)	Source Housing	AccuRay Corp.	0 - 2
(3)			
(4)			

## 10. RADIATION DETECTION INSTRUMENTS

LINE NO.	TYPE OF INSTRUMENT A	MANUFACTURER'S NAME B	MODEL NUMBER C	NUMBER AVAILABLE D	RADIATION DETECTED (alpha, beta, gamma, neutron) E	SENSITIVITY RANGE (milliroentgens/hour or counts/minute) F
(1)	All radiological services are to be performed					
(2)	by AccuRay Corp.					
(3)						
(4)						

## 11. CALIBRATION OF INSTRUMENTS LISTED IN ITEM 10

☒ a. CALIBRATED BY SERVICE COMPANY

NAME, ADDRESS, AND FREQUENCY Semi-annually

AccuRay Corp.

650 Ackerman Rd., Columbus, Ohio 43202

☐ b. CALIBRATED BY APPLICANT

Attach a separate sheet describing method, frequency and standards used for calibrating instruments.

## 12. PERSONNEL MONITORING DEVICES

TYPE (Check and/or complete as appropriate.) A	SUPPLIER (Service Company) B	EXCHANGE FREQUENCY C
<input type="checkbox"/> (1) FILM BADGE N/A	N/A	<input type="checkbox"/> MONTHLY N/A
<input type="checkbox"/> (2) THERMOLUMINESCENCE DOSIMETER (TLD)		<input type="checkbox"/> QUARTERLY
<input type="checkbox"/> (3) OTHER (Specify): _____ _____		<input type="checkbox"/> OTHER (Specify): _____ _____

## 13. FACILITIES AND EQUIPMENT (Check where appropriate and attach annotated sketch(es) and description(s).)

- ☐ a. LABORATORY FACILITIES, PLANT FACILITIES, FUME HOODS (Include filtration, if any), ETC.
- ☐ b. STORAGE FACILITIES, CONTAINERS, SPECIAL SHIELDING (fixed and/or temporary), ETC.
- ☐ c. REMOTE HANDLING TOOLS OR EQUIPMENT, ETC.
- ☐ d. RESPIRATORY PROTECTIVE EQUIPMENT, ETC.

N/A

## 14. WASTE DISPOSAL

## a. NAME OF COMMERCIAL WASTE DISPOSAL SERVICE EMPLOYED

N/A

b. IF COMMERCIAL WASTE DISPOSAL SERVICE IS NOT EMPLOYED, SUBMIT A DETAILED DESCRIPTION OF METHODS WHICH WILL BE USED FOR DISPOSING OF RADIOACTIVE WASTES AND ESTIMATES OF THE TYPE AND AMOUNT OF ACTIVITY INVOLVED. IF THE APPLICATION IS FOR SEALED SOURCES AND DEVICES AND THEY WILL BE RETURNED TO THE MANUFACTURER, SO STATE.

Sealed sources will be returned to the AccuRay Corp.

### INFORMATION REQUIRED FOR ITEMS 15, 16 AND 17

Describe in detail the information required for Items 15, 16 and 17. Begin each item on a separate page and key to the application as follows:

15. **RADIATION PROTECTION PROGRAM.** Describe the radiation protection program as appropriate for the material to be used including the duties and responsibilities of the Radiation Protection Officer, control measures, bioassay procedures (if needed), day-to-day general safety instruction to be followed, etc. If the application is for sealed source's also submit leak testing procedures, or if leak testing will be performed using a leak test kit, specify manufacturer and model number of the leak test kit.
16. **FORMAL TRAINING IN RADIATION SAFETY.** Attach a resume for each individual named in Items 6 and 7. Describe individual's formal training in the following areas where applicable. Include the name of person or institution providing the training, duration of training, when training was received, etc.
  - a. Principles and practices of radiation protection.
  - b. Radioactivity measurement standardization and monitoring techniques and instruments.
  - c. Mathematics and calculations basic to the use and measurement of radioactivity.
  - d. Biological effects of radiation.
17. **EXPERIENCE.** Attach a resume for each individual named in Items 6 and 7. Describe individual's work experience with radiation, including where experience was obtained. Work experience or on-the-job training should be commensurate with the proposed use. Include list of radioisotopes and maximum activity of each used.

### 18. CERTIFICATE

(This item must be completed by applicant)

*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 30, and that all information contained herein, including any supplements attached hereto, is true and correct to the best of our knowledge and belief.*

**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.

a. LICENSE FEE REQUIRED  
(See Section 170.31, 10 CFR 170)

b. CERTIFYING OFFICIAL (Signature)

c. NAME (Type or print)

Henry A. Johnson

(1) LICENSE FEE CATEGORY:

170.31 I

d. TITLE

Technical Superintendent

(2) LICENSE FEE ENCLOSED: \$

e. DATE



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION I  
631 PARK AVENUE  
KING OF PRUSSIA, PENNSYLVANIA 19406

October 14, 1983

License No. -----  
Docket No. 030-20826  
Control No. 15874

W. R. Grace and Company  
ATTN: Henry A. Johnson  
Technical Superintendent  
Harmony Street  
Adams, MA 01220

Gentlemen:

Your application dated September 7, 1983 for a byproduct material license  
has been assigned to Mike Varela for review.

Enclosed for your information is a copy of our guide describing the minimum information needed in applications for licenses to use byproduct material in the form of sealed sources in nonportable gauging devices. Additional information is needed in support of your application. We have checked the item(s) on the reverse side of this form which reference section(s) in the guide for which you should submit additional information.

We are using this form letter to enable us to process your application in a timely manner. Your cooperation in promptly submitting the requested information will also help us to decrease the process time for your application.

In providing the requested information, please reply in duplicate and reference your assigned mail control number.

If you have any questions, please contact the Licensing Assistant at telephone number (215) 337-5336.

Sincerely,

Original Signed By  
John E. Glenn, Ph.D., Chief  
John E. Glenn, Ph.D., Chief  
Nuclear Materials Section B  
Division of Engineering and  
Technical Programs

"OFFICIAL RECORD COPY"

Enclosure:

A Guide for Preparation of Applications for  
Licenses to Use Sealed Sources Containing  
Byproduct Material in Nonportable Gauging  
Devices (1980)

RI:DETP  
Glenn/slj  
10/14/83

ITEM # 36

1/25

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PROVIDE INFORMATION ONLY FOR THE CHECKED ITEMS

- ☐ Your application is being returned for signature
- ☐ Location of use - Item 4
- ☐ Name(s) of individual user(s) - Item 6
- ☐ Name of the Radiation Protection Officer - Item 7
- ☒ Duties and responsibilities of the Radiation Protection Officer - Item 7
- ☐ Name of the manufacturer and model number of each sealed source - Item 8
- ☐ Name of the manufacturer and model number of each source holder - Item 8
- ☐ Radiation detection instruments - Items 10 and 11 - (complete only if requesting a specific authorization listed below)
- ☐ Personnel monitoring equipment - Item 12 (complete only if requesting a specific authorization listed below)
- ☒ Description of facilities and equipment - Item 13
- ☐ Describe disposal of sealed source(s) when use is discontinued - Item 14
- ☐ Name of company who will provide servicing operations - Item 15(a)
- ☒ Means of controlling access to the devices - Item 15(b)
- ☒ Describe "lock-out procedures" - Item 15(c)
- ☒ Leak testing of sealed sources - Item 15(d)
- ☒ Training and experience of each individual who will use or supervise the use of the devices - Items 16 and 17
- ☐ Other

---

SPECIFIC AUTHORIZATIONS

- ☐ 1. Servicing operation - Section VII, Item 1 (a) through (g)
- ☐ 2. Leak testing of sealed sources - Section VII, Item 2 (a) through (e)
- ☐ 3. Radiation survey instruments - Section VII, Item 3 (a) through (e)

DEC 13 1983

Docket No. 030-20826  
Control No. 15874

W. R. Grace & Company  
ATTN: Mr. Henry A. Johnson  
Technical Superintendent  
Harmony Street  
Adams, MA 01220

SUBJECT: APPLICATION FOR MATERIAL LICENSE DATED SEPTEMBER 7, 1983,  
AND OUR REQUEST FOR INFORMATION DATED OCTOBER 14, 1983

Gentlemen:

This concerns the subject application for material license and our letter in which we notified you that the application was deficient and that certain additional information was required.

You are hereby notified that unless within thirty (30) days from the date of this notice we receive the additional information requested, we will consider that you have abandoned your application. This action is without prejudice to the resubmission of an application.

Sincerely,

Original Signed By  
Jenny M. Johansen

John E. Glenn, Ph.D., Chief  
Nuclear Materials Section B  
Division of Engineering and  
Technical Programs

Enclosure: Letter dated October 14, 1983

RI:DETP  
Johansen/cop  
12/8/83

RI:DETP  
Glenn

ITEM # 37

B/26

OFFICIAL RECORD COPY

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12/09/83



GRACE

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~~P2~~ P2

Polyfibron Division

Industrial Chemicals Group  
W.R. Grace & Co.  
Harmony Street  
Adams, Mass. 01220

(413) 743-0546

January 12, 1984

United States Nuclear Regulatory Commission  
Region 1  
631 Park Avenue  
King of Prussia, PA. 19406

Attn: Dr. John E. Glenn

Dear Sir:

In reference to: Docket No. 030-20826  
Control No. 15874

The duties of the Radiation Protection Officer - Item 7 are to determine that:

- (a) All byproduct materials, sealed sources, and devices in use and/or in the possession of the applicant are limited to those listed in the license and are being used for the purposes specified in the license.
- (b) Only those individuals authorized by the license use or supervise use of the devices.
- (c) Periodic leak tests of the sealed sources are conducted as required by the license.
- (d) The established "lock-out" procedures are followed during maintenance or repairs to prevent individuals from entering the radiation beams.

The "gap" in our particular measuring devices is only 1/2 inch so there is little danger of people unknowingly entering the beam. We will turn the equipment off when any maintenance work is done.

Item 13. The equipment is used to monitor a paper web prior to and after impregnation. (See Figure 1 and Figure 2 for sketches of the equipment.)

ITEM # 38

B/37  
15874  
JAN 17 1984

Item 15(b). Repairs and maintenance to the sources will only be performed by representatives of the supplier, the AccuRay Corporation.

Radiation warning signals have been installed by the supplier on the equipment as illustrated by "W" on Figures 1 and 2.

Item 15(c). The device shutter will be "tagged-off" when any repairs are made. The individuals responsible to see this is done will be the radiation protection officer and/or the production supervisor of the equipment at the time the repair is being made.

Item 15(d). The supplier will perform leak tests and this will be done semi-annually.

For routine use of these sealed sources the training is provided by the supplier.

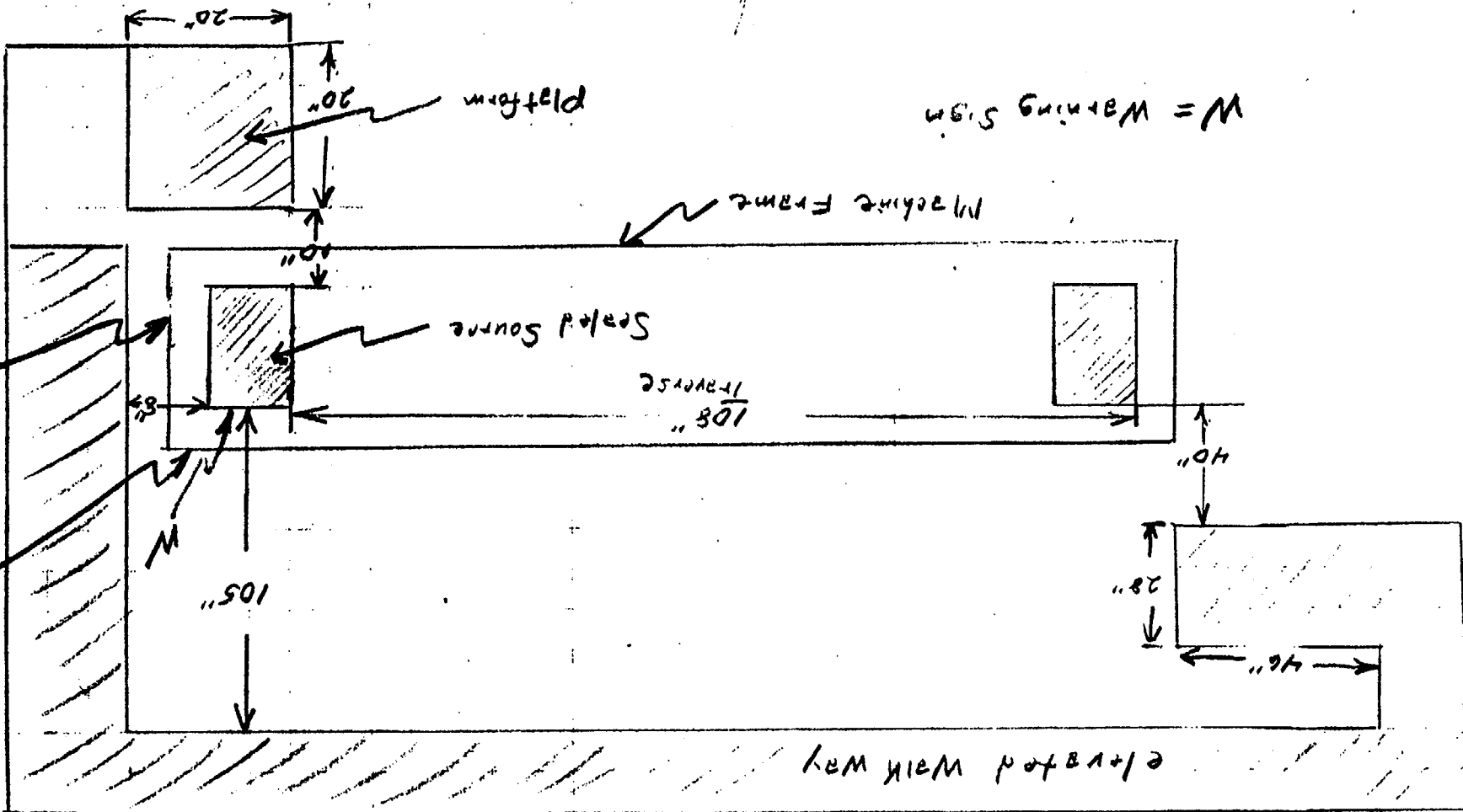
Sincerely,

W. R. GRACE & CO.



Henry A. Johnson  
Certifying Official

HAI:sml  
Attachments (2)



North (entrance) end of impregnation machine  
where the source is 60" above the elevated walkway  
and platform level which are 5 feet above ground level.

Figure 1

1/10/84 H.A.J.

W = Warning Sign

South (exit) end of impregnation machine.

Where the walkways are at ground level and

the source is 21" above ground level.

Figure 2

1/12/84

H.A.J.

FEB 0 8 1984

License No. 20-13014-02  
Docket No. 030-20826  
Control No. 15874

W. R. Grace & Company  
ATTN: Henry A. Johnson  
Technical Superintendent  
Harmony Street  
Adams, MA 01220

Gentlemen:

Enclosed is License No. 20-13014-02. You should review this license for correctness and to assure that procedures required by the conditions are implemented.

Presently, the NRC is modifying the way licenses for certain gauges are written. Your amendment includes this new way of listing devices that have been approved by the NRC. The approved models and the required leak test frequency are listed on the manufacturer's distribution license. You may obtain this information from the manufacturer. All previously licensed and requested gauges are covered by this authorization.

We wish you success with your licensed program.

Sincerely,

Original Signed By  
John E. Glenn, Ph.D.

John E. Glenn, Ph.D., Chief  
Nuclear Materials Section B  
Division of Engineering and  
Technical Programs

Enclosures:

1. License No. 20-13014-01
2. Form NRC-313(I)
3. Form NRC-3

RI:DETP  
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2/7/84

RI:DETP  
Glenn  
2/7/84

OFFICIAL RECORD COPY

20-13014-02/LTR - 0001.0.0  
01/31/84

ITEM # 39

B/38

## MATERIALS LICENSE

Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974 (Public Law 93-438), and Title 10, Code of Federal Regulations, Chapter I, Parts 30, 31, 32, 33, 34, 35, 40 and 70, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess, and transfer byproduct, source, and special nuclear material designated below; to use such material for the purpose(s) and at the place(s) designated below; to deliver or transfer such material to persons authorized to receive it in accordance with the regulations of the applicable Part(s). This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, as amended, and is subject to all applicable rules, regulations and orders of the Nuclear Regulatory Commission now or hereafter in effect and to any conditions specified below.

## Licensee

1. W. R. Grace &amp; Company

2. Harmony Street  
Adams, Massachusetts 01220

3. License number 20-13014-02

4. Expiration date January 31, 1989

5. Docket or  
Reference No. 030-208266. Byproduct, source, and/or  
special nuclear material7. Chemical and/or physical  
form8. Maximum amount that licensee  
may possess at any one time  
under this licenseA. Krypton 85  
B. Strontium 90A. Sealed sources  
B. Sealed sourcesA. See Subitem 9.A.  
B. See Subitem 9.B.

## 9. Authorized use

A. and B. For possession and use in Accu-Ray Corporation devices which have been evaluated and approved for licensing purposes and authorized for distribution under a license issued by the Nuclear Regulatory Commission or an Agreement State.

## CONDITIONS

10. Licensed material shall be used only at the licensee's facilities at Harmony Street, Adams, Massachusetts.
11. The licensee shall comply with the provisions of Title 10, Chapter 1, Code of Federal Regulations, Part 19, "Notices, Instructions, and Reports to Workers; Inspections" and Part 20, "Standards for Protection Against Radiation."
12. Licensed material shall be used by, or under the supervision of, Henry A. Johnson.
13. A. (1) Each sealed source containing licensed material, other than Hydrogen 3, with a half-life greater than thirty days and in any form other than gas shall be tested for leakage and/or contamination at intervals not to exceed six months, except those sealed sources as specified by the manufacturer and specifically authorized by the Commission or an Agreement State may be leak tested at intervals not to exceed three years. In the absence of a certificate from a transferor indicating that a test has been made within six months prior to the transfer, a sealed source received from another person shall not be put into use until tested.

ITEM # 40

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③

**MATERIALS LICENSE  
SUPPLEMENTARY SHEET**

License number

20-13014-02

Docket or Reference number

030-20826

(13.A.continued)

**CONDITIONS**

(2) The periodic leak test required by this condition does not apply to sealed sources that are stored and not being used. The sources excepted from this test shall be tested for leakage prior to any use or transfer to another person unless they have been leak tested within six months prior to the date of use or transfer.

- B. The test shall be capable of detecting the presence of 0.005 microcurie of radioactive material on the test sample. The test sample shall be taken from the sealed source or from the surfaces of the device in which the sealed source is permanently mounted or stored on which one might expect contamination to accumulate. Records of leak test results shall be kept in units of microcuries and maintained for inspection by the Commission.
- C. If the test reveals the presence of 0.005 microcurie or more of removable contamination, the licensee shall immediately withdraw the sealed source from use and shall cause it to be decontaminated and repaired or to be disposed of in accordance with Commission regulations. A report shall be filed within 5 days of the test with the U. S. Nuclear Regulatory Commission, Region I, 631 Park Avenue, King of Prussia, Pennsylvania 19406, describing the equipment involved, the test results, and the corrective action taken.
- D. Tests for leakage and/or contamination shall be performed by the device manufacturer or by other persons specifically authorized by the Commission or an Agreement State to perform such services.

- 14. Sealed sources containing licensed material shall not be opened or removed from their respective source holders by the licensee.
- 15. Installation, relocation, removal from service, maintenance, repair, and initial radiation survey of devices containing licensed material and installation, replacement, and disposal of sealed sources containing licensed material used in devices shall be performed only by the device manufacturer or by other persons specifically authorized by the Commission or an Agreement State to perform such services.
- 16. The licensee shall conduct a physical inventory every six (6) months to account for all sealed sources received and possessed under the license. The records of the inventories shall be maintained for two (2) years from the date of the inventory for inspection by the Commission, and shall include the quantities and kinds of licensed material, location of sealed sources and the date of the inventory.

MATERIALS LICENSE  
SUPPLEMENTARY SHEET

License number

20-13014-02

Docket or Reference number

030-20826

(continued)

## CONDITIONS

17. Except as specifically provided otherwise by this license, the licensee shall possess and use licensed material described in Items 6, 7, and 8 of this license in accordance with statements, representations, and procedures contained in application dated September 7, 1983, and letter dated January 12, 1984. The Nuclear Regulatory Commission's regulations shall govern the licensee's statements in applications or letters, unless the statements are more restrictive than the regulations.

Date

FEB 08 1984

For the U.S. Nuclear Regulatory Commission

Original Signed By

John E. Glenn, Ph.D.

By

Nuclear Materials and Safeguards Branch  
Region I  
King of Prussia, Pennsylvania 19406



GRACE

Polyfibron Division

Industrial Chemicals Group  
W.R. Grace & Co.  
Harmony Street  
Adams, Mass. 01220

(413) 743-0546

December 21, 1988

U. S. Nuclear Regulatory Commission  
Region I  
Nuclear Materials Safety Section B  
475 Allendale Road  
King of Prussia, PA 19406

Gentlemen:

Enclosed please find two copies of our License No. 20-13014-02,  
Docket No. 030-20826, Control No. 15874.

We have also included two copies of the supplementary letter  
dated January 12, 1984 which listed the additional information  
requested by Dr. John E. Glenn during the processing of our original  
request for the above license.

We now are requesting that the license be renewed. The only change  
required is the expiration date listed as Item 4.

Please find a check made out to U.S.N.R.C. for the sum of \$120.00 as  
required by Title 10, Chapter 1 Code of Federal Regulations -  
Energy, paragraph 170.3P.

Sincerely,

W R GRACE & COMPANY

*Henry A. Johnson*

Henry A. Johnson  
Certifying Official

HAI/lg

Enclosures

Log	Yes: 9
Remitter	
Check No.	A 5302
Amount	\$ 120
Fee Category	3P
Type of Fee	REN
Date Check Rec'd.	1/9/89
Date Completed	1/9/89
By:	<i>[Signature]</i>

ITEM # 41

OFFICIAL RECORD COPY, ML10

110042

DEC 23 1988

B/40



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION I  
475 ALLENDALE ROAD  
KING OF PRUSSIA, PENNSYLVANIA 19406

**12 JAN 1989**

W. R. Grace & Co.  
Polyfibron Division  
ATTN: Henry A. Johnson  
Certifying Official  
Harmony Street  
Adams, MA 01220

DOCKET NO. 030-20826  
LICENSE NO. 20-13014-02  
CONTROL NO. 110042

SUBJECT: LICENSE RENEWAL APPLICATION

Gentlemen:

This is to acknowledge receipt of your application for renewal of material(s) license identified above. Your application is deemed timely filed, and accordingly, the license will not expire until final action has been taken by this office.

Any correspondence regarding the renewal application should reference the control number specified and your license number.

Sincerely,

Original Signed By:  
Doris J. Foster

Doris J. Foster, Chief  
Licensing Assistant Section  
Division of Radiation Safety  
and Safeguards

OFFICIAL RECORD COPY **ML10**

ITEM # 42

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## MATERIALS LICENSE

Amendment No. 01

Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974 (Public Law 93-438), and Title 10, Code of Federal Regulations, Chapter I, Parts 30, 31, 32, 33, 34, 35, 40 and 70, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess, and transfer byproduct, source, and special nuclear material designated below; to use such material for the purpose(s) and at the place(s) designated below; to deliver or transfer such material to persons authorized to receive it in accordance with the regulations of the applicable Part(s). This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, as amended, and is subject to all applicable rules, regulations and orders of the Nuclear Regulatory Commission now or hereafter in effect and to any conditions specified below.

## Licensee

1. W. R. Grace &amp; Company

2. Harmony Street  
Adams, Massachusetts 01220In accordance with application dated  
December 21, 1988,3. License number 20-13014-02 is amended in  
its entirety to read as follows:

4. Expiration date March 31, 1994

5. Docket or  
Reference No. 030-208266. Byproduct, source, and/or  
special nuclear material7. Chemical and/or physical  
form8. Maximum amount that licensee  
may possess at any one time  
under this licenseA. Krypton 85  
B. Strontium 90A. Sealed sources  
B. Sealed sourcesA. See Sugitem 9.A.  
B. See Subitem 9.B.

## 9. Authorized use

A. and B. For use in Kay Ray, Accuray, Ohmart, LFE, Berthold Systems, Inc., Data Measurement Corp., Flow Measurement Systems, Ronan Engineering or Texas Nuclear devices which have been evaluated and approved for licensing purposes and authorized for distribution under a license issued by the Nuclear Regulatory Commission or an Agreement State.

## CONDITIONS

10. Licensed material shall be used only at Harmony Street, Adams, Massachusetts.

11. A. Licensed material shall be used by, or under the supervision of, Henry A. Johnson.

B. The Radiation Safety Officer for this license is Henry A. Johnson.

12. Sealed sources or detector cells containing licensed material shall not be opened or sources removed from source holders or detector cells by the licensee.

13. A. Sealed sources shall be tested for leakage and/or contamination at intervals not to exceed 6 months or at such other intervals as are specified by the certificate of registration, not exceeding 3 years.

B. In the absence of a certificate from a transferor indicating that a test has been made within six months prior to the transfer, a sealed source or detector cell received from another person shall not be put into use until tested.

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REG1 LIC30  
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ITEM #

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MATERIALS LICENSE  
SUPPLEMENTARY SHEET

License number

20-13014-02

Docket or Reference number

030-20826

Amendment No. 01

(13. continued)

## CONDITIONS

- C. Sealed sources and detector cells need not be leak tested if:
- (i) The sealed source contains only tritium; or
  - (ii) The source contains only krypton-85; or
  - (iii) The sealed source or detector cell contains not more than 100 microcuries of other beta and/or gamma emitting material, or not more than 10 microcuries of alpha emitting material; or
  - (iv) The sealed source or detector cell is in storage and not being used. However, when the source or detector cell is removed from storage for use or transfer to another person, and has not been tested within the required leak test interval, it shall be tested before use or transfer. No sealed source or detector cell shall be stored for a period of more than 10 years without being tested for leakage and/or contamination.
- D. The test shall be capable of detecting the presence of 0.005 microcurie of radioactive material on the test sample. If the test reveals the presence of 0.005 microcurie or more of removable contamination, the source or detector cell shall be removed from service and decontaminated, repaired, or disposed of in accordance with Commission regulations. A report shall be filed within 5 days of the date the leak test result is known with the U.S. Nuclear Regulatory Commission, Region I, ATTN: Chief, Nuclear Materials Safety Branch, 475 Allendale Road, King of Prussia, Pennsylvania 19406. The report shall specify the source involved, the test results, and corrective action taken. Records of leak test results shall be kept in units of microcuries and shall be maintained for inspection by the Commission. Records may be disposed of following Commission inspection.
- E. The licensee is authorized to collect leak test samples for analysis by manufacturer or tests for leakage and/or contamination shall be performed by persons specifically licensed by the Commission or an Agreement State to perform such services.
14. Each gauge shall be tested for the proper operation of the on-off mechanism and indicator, if any, at no longer than six-month intervals or at such longer intervals as specified by the manufacturer, not to exceed 3 years, and at the same interval as the leak test specified in Condition 13.A.
15. Installation, initial radiation surveys, relocation, removal from service, or any similar activity shall be performed only by persons specifically licensed by the Commission or an Agreement State to perform such services. The licensee may initially mount the device in accordance with written instructions provided by the manufacturer; however, the device may not be used until surveyed by a person specifically licensed by the Commission or an Agreement State to install gauges. The licensee may repair the electronic equipment not associated with the source or its shielding.

MATERIALS LICENSE  
SUPPLEMENTARY SHEET

License number

20-13014-02

Docket or Reference number

030-20826

Amendment No. 01

(Continued)

## CONDITIONS

16. Prior to initial use and after installation, relocation, dismantling, alignment, or any other activity involving the source or removal of the shielding, the licensee shall assure that a radiological survey is performed to determine radiation levels around, above and below the gauge with the shutter open. This survey shall be performed only by persons specifically licensed by the Commission or an Agreement State to install gauges. A record of the results of this survey shall be maintained.
17. The licensee shall conduct a physical inventory every 6 months to account for all sources and/or devices received and possessed under the license. Records of inventories shall be maintained for 2 years from the date of each inventory.
18. Except as specifically provided otherwise in this license, the licensee shall conduct its program in accordance with the statements, representations, and procedures contained in the documents including any enclosures, listed below. The Nuclear Regulatory Commission's regulations shall govern unless the statements, representations and procedures in the licensee's application and correspondence are more restrictive than the regulations.
  - A. Application dated September 7, 1983
  - B. Letter dated January 12, 1984
  - C. Application dated December 21, 1988

Date MAR 14 1989

For the U.S. Nuclear Regulatory Commission

Original signed By:

By John E. Glenn, Ph.D.

Nuclear Materials Safety Branch

Region I

King of Prussia, Pennsylvania 19406

MAR 14 1989

License No. 20-13014-02  
Docket No. 030-20826  
Control No. 110042

W. R. Grace & Company  
ATTN: Henry A. Johnson  
Harmony Street  
Adams, Massachusetts 01220

Gentlemen:

Please find enclosed the renewal of your NRC Material License.

Please review the enclosed document carefully and be sure that you understand all conditions. If there are any errors or questions, please notify the Region I Material Licensing Section, (215) 337-5239, so that we can provide appropriate corrections and answers.

Please be advised that you must conduct your program involving licensed radioactive materials in accordance with the conditions of your NRC license, representations made in your license application, and NRC regulations. In particular, please note the items in the enclosed, "Requirements for Materials Licensees."

Since serious consequences to employees and the public can result from failure to comply with NRC requirements, the NRC expects licensees to pay meticulous attention to detail and to achieve the high standard of compliance which the NRC expects of its licensees.

You will be periodically inspected by NRC. A fee may be charged for inspections in accordance with 10 CFR Part 170. Failure to conduct your program safely and in accordance with NRC regulations, license conditions, and representations made in your license application and supplemental correspondence with NRC will result in prompt and vigorous enforcement action against you. This could include issuance of a notice of violation, or in case of serious violations, an imposition of a civil penalty or an order suspending, modifying or revoking your license as specified in the General Policy and Procedures for NRC Enforcement Actions, 10 CFR Part 2, Appendix C.

ITEM # 44

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ML 20-13014-02/LTR - 0001.0.0  
02/07/89

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W. R. Grace & Company

-2-

We wish you success in operating a safe and effective licensed program.

Sincerely,

**Original signed By:**  
**John E. Glenn, Ph.D.**

John E. Glenn, Ph.D., Chief  
Nuclear Materials Safety Section A  
Division of Radiation Safety  
and Safeguards

Enclosures:

1. Amendment No. 01
2. Requirements for Materials Licensees
3. NRC Forms 3 and 313
4. 10 CFR Parts 2, 19, 20, and 170
5. Regulatory Guide 10.7

DRSS:RI  
Darden/kl

*Steven Hill Rarden*  
2/28/89

DRSS:RI  
Glenn

*John E. Glenn*  
2/28/89  
3/7/89

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ML 20-13014-02/LTR - 0002.0.0  
02/07/89

JUL 28 1992

Docket No. 030-20826

License No. 20-13014-02

W.R. Grace and Company  
ATTN: Alex Nagy, Plant Manager  
Harmony Street  
Adams, Massachusetts 01220

Dear Mr. Nagy:

Subject: Routine Inspection 030-20826/92-001

On July 14, 1992, Betsy Ullrich and Tara Weidner of this office conducted a routine safety inspection at the above address of activities authorized by the above listed NRC license. The inspection was an examination of your licensed activities as they relate to radiation safety and to compliance with the Commission's regulations and the license conditions. The inspection consisted of observations by the inspector, interviews with personnel, and a selective examination of representative records. The findings of the inspection were discussed with you and Julie Hoffman at the conclusion of the inspection. This also refers to the telephone conversations on July 14, 1992 between Betsy Ullrich of this office and Julie Hoffman and on July 22, 1992, between Betsy Ullrich and you. As was discussed during the telephone conversations, the "NRC Form 591 Safety Inspection" report given to you at the time of the inspection is not valid, and you should dispose of it.

Based on the results of this inspection, it appears that your activities were not conducted in full compliance with NRC requirements. A Notice of Violation is enclosed as Appendix A and categorizes each violation by severity level in accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions," 10 CFR Part 2, Appendix C (Enforcement Policy). You are required to respond to this letter and in preparing your response, you should follow the instructions in Appendix A. Since you have submitted an amendment to name a new Radiation Safety Officer, you do not need to describe the corrective action for this violation. However, you should describe how you will prevent such a violation in the future.

The violation described in the attached Notice of Violation involving unauthorized change in the Radiation Safety Officer is classified as a Severity Level IV violation. As indicated in Supplement IV of the NRC Enforcement Policy, significant violations of this type are

DOC GRACE

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RETURN ORIGINAL TO  
REGION I

Pg 1

July 27, 1992

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20-13014-02 PDR

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ITEM #

B/44

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normally classified as Severity Level III. However, after careful consideration of the factors involved in this specific instance, it is felt this incident posed a minimal health and safety problem. We have exercised our judgment under the NRC Enforcement Policy and have classified this violation as Severity Level IV. Similar violations of this type in the future may result in additional enforcement action.

Please use the enclosed self-addressed green envelope when you respond to this letter to assist us in the timely processing of your response. In accordance with Section 2.790 of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, a copy of this letter and your reply will be placed in the Public Document Room. The responses directed by this letter and the accompanying Notice are not subject to the clearance procedures of the Office of Management and Budget as required by the Paperwork Reduction Act of 1980, PL 96-511.

Your cooperation with us is appreciated.

Sincerely,

**Original Signed By:**  
**Francis M. Costello**



Francis M. Costello, Chief  
Industrial Applications Section  
Division of Radiation Safety  
and Safeguards

Enclosure: Appendix A, Notice of Violation

cc:  
Public Document Room (PDR)  
Nuclear Safety Information Center (NSIC)  
Commonwealth of Massachusetts

W.R. Grace and Company

3

bcc:

Region I Docket Room (w/concurrences)

D. Holody, RI

*FME*  
RI:DRSS  
Ullrich/lp

7/7/92

RI:DRSS  
Weidner *[Signature]*

7/7/92

*FME*  
RI:DRSS  
Costello

7/7/92

APPENDIX A

NOTICE OF VIOLATION

As a result of the inspection conducted on July 14, 1992, and in accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions," 10 CFR Part 2, Appendix C (Enforcement Policy) (1992), the following violation was identified:

Condition 11.B of license No. 20-13014-02 states that the Radiation Safety Officer for this license is Henry A. Johnson.

Contrary to the above, Henry A. Johnson has not been employed by W. R. Grace and Company since January 1990, and no individual has been approved by the NRC as Radiation Safety Officer.

This is a Severity Level IV violation (Supplement IV).

Pursuant to the provisions of 10 CFR 2.201, W. R. Grace and Company is hereby required to submit to this office within thirty days of the date of the letter which transmitted this Notice, a written statement or explanation in reply, including: (1) the corrective steps which have been taken and the results achieved; (2) corrective steps which will be taken to avoid further violations; and (3) the date when full compliance will be achieved. Where good cause is shown, consideration will be given to extending this response time.

DOC GRACE

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Pg 1

July 27, 1992

RETURN ORIGINAL TO  
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20-13014-02

PDR

## INDUSTRIAL/ACADEMIC INSPECTION FIELD NOTES\*

Region IInspection Report No. 92-001License No. 20-13014-02

Licensee (name and address)

Docket No. 030-20826W. R. Grace & Company  
Harmony Street  
Adams Massachusetts 01220Licensee Contact Julie Hoffman

Telephone No. \_\_\_\_\_

Last Amendment No. 01Date of Amendment 3/14/89

Priority:

5KProgram Code(s): 08120Date of Last Inspection 3/24/85Date of This Inspection 7/14/92

Type of Inspection:

☐ Announced  
☒ Routine  
☐ Initial☒ Unannounced  
☐ Special  
☒ ReinspectionNext Inspection Date July ☒ Normal ☐ Reduced ☐ Extended

Summary of Findings and Action:

- ☒
- No violations, Clear 591 or letter issued
- 
- ☐
- Violations, 591 or letter issued
- 
- ☐
- Action on Previous Violations

Inspector: W. R. GRACE / WEIDNER  
(Signature)

Date \_\_\_\_\_

Approved: J. Crutch  
(Signature)Date 7/28/92

\* All areas indicated in field notes are not required to be addressed during each inspection.

e. Any previous violations not corrected  
Explain.

( ) Y (X) N

3. SCOPE OF PROGRAM

- a. License has multiple authorized locations of use ( ) Y (X) N  
b. If so, list location(s) inspected ( ) N/A

- c. List those individuals contacted during inspection

*Alex Nagy, Plant Manager*

*Julie Hoffman, Tech Supervisor*

\*Indicates presence at exit meeting

- d. Briefly describe scope, including types of use involving byproduct material, frequency of use, staff size, etc.

*1 500 mCi Ki-85 gauge S/N K-4329-Y*

*1 70 mCi Sr-90 gauge S/N S-752-T*

*on either end of the "impregnation line"*  
*Gauges not used, however, are maintained*  
*in place if needed.*

4. INTERNAL AUDITS OR INSPECTIONS

- a. Audits are required by license condition ( ) Y (X) N  
b. Audits or inspections are conducted (X) Y ( ) N

(1) Audits conducted by *AccuRay*

(2) Frequency *6 months*

- c. Records maintained.

(X) Y ( ) N

Remarks.

*AccuRay performs 6-month survey,*  
*inventory, weights*

*Also, Com of Mass inspected 11/4/91, &*

Remarks.

7. RADIOLOGICAL PROTECTION PROCEDURES

- a. Radioactive materials used in accordance with current procedures [L/C] (X) Y ( ) N
- b. Individuals understanding of current procedures is adequate [L/C]
- (1) in general rules for safe use of RAM (X) Y ( ) N
- (2) in emergency procedures (X) Y ( ) N

Remarks.

8. MATERIALS

- a. Isotope, chemical form, quantity and use as authorized [L/C] (X) Y ( ) N

Remarks.

## b. Leak tests and Inventory

- (1) Leak tests of sealed sources performed as required [L/C] (X) Y ( ) N
- (2) Inventory of RAM performed as required [L/C] (X) Y ( ) N
- (3) Records maintained (X) Y ( ) N

Remarks.

7/6/92

1/7/92

7/24/91

Prior records have been filed  
and "archived."

Remarks.

12. PERSONNEL RADIATION PROTECTION - INTERNAL

☒ N/A

- a. Potential for exposure of individuals to airborne RAM exists ☐ Y ☐ N
- b. Monitoring for airborne radioactivity conducted [20.201(b) to meet 20.103] ☐ Y ☐ N
- c. Records maintained [20.401 and L/C] ☐ Y ☐ N
- d. Briefly describe licensee's monitoring system for airborne radioactivity [L/C]

- e. Bioassay program implemented as described in correspondence with NRC ☐ Y ☐ N

Remarks.

13. RADIOACTIVE EFFLUENT AND WASTE DISPOSAL

- a. RAM in effluents to unrestricted areas
- b. Release in accordance with regulatory limits [20.106(a)]

☐ Y ☒ N

☐ Y ☐ N *NY*

Remarks.

- c. Describe waste disposal method(s) - solid and liquid:

*They plan to return the gauges to the vendor when (if) they are disposed.*

16. ENVIRONMENTAL MONITORING PROGRAM

- a. Licensee has implemented an environmental monitoring program [L/C]  
b. Records maintained

( ) Y ( ) N  
( ) Y ( ) N

NA

Remarks.

- c. Briefly describe the licensee's environmental monitoring program:

17. TRANSPORTATION (10 CFR 71.5(a) and 49 CFR 171-189)

- a. Licensee makes shipments of RAM  
b. Shipments are:  
    ( ) delivered to common carriers  
    ( ) transported in licensee's own private vehicle  
    ( ) both  
    ( ) no shipments since last inspection

( ) Y ( ) N

Remarks.

Complete only if shipments made since last inspection:

c. Shipments

- (1) Authorized packages used [173.415,416]  
(2) Package type used \_\_\_\_\_  
(3) For DOT-7A packages, performance test record on file [173.415(a)]

( ) Y ( ) N ( ) N/A

( ) Y ( ) N ( ) N/A



19. INDEPENDENT MEASUREMENTS

- a. Survey instrument used Ludlum
- b. NRC Serial No. 019415
- c. Last date of calibration 5-29-92
- d. Inspector's measurements were compared to licensee's ☐ Y ☒ N
- e. Describe the type and results of measurements:

Si-90 gauge 3mK/h contact < 0.1 mK/h at 3 ft  
K-85 gauge 1mK/h contact < 0.1 mK/h at 3 ft

20. BULLETINS AND INFORMATION NOTICES

- a. Bulletins, Information Notices, etc., received by the licensee ☒ Y ☐ N
- b. Licensee took appropriate action in response to Bulletins, INs, etc. ☒ Y ☐ N

Remarks.

*None required*

*NOTE: licensee has never received a bill for an annual fee.*

23. PERFORMANCE EVALUATION FACTORS

Licensee  
(name &  
location)

WPA Group Co  
Adams MA

Inspector

ULLICH/WECDNER

Inspection Date

7/14/92

- a. Lack of senior management involvement with the radiation safety program and/or Radiation Safety Officer (RSO) oversight
- b. RSO too busy with other assignments
- c. Insufficient staffing
- d. Radiation Safety Committee fails to meet or functions inadequately
- e. Inadequate consulting services or inadequate audits

( ) Y ( ☒ ) N

( ) Y ( ☒ ) N

( ) Y ( ☒ ) N

( ) Y ( ) N ( ☒ ) N/A

( ) Y ( ☒ ) N ( ) N/A

Remarks (consider above assessment and/or other pertinent PEFs):

Regional follow-up on above PEFs citations:

Certified By: Brenda Platche SAFETY INSPECTION

1. LICENSEE

W. R. Grace and Company  
Harmony Street  
Adams, MA 01220

2. REGIONAL OFFICE

U. S. NRC, Region I  
631 Park Avenue  
King of Prussia, PA 19406

3. DOCKET NUMBER(S)

030-20826

4. LICENSE NUMBER(S)

20-13014-02

5. DATE OF INSPECTION

March 26, 1985

Licensee:

The inspection was an examination of the activities conducted under your license as they relate to radiation safety and to compliance with the Nuclear Regulatory Commission's (NRC) rules and regulations and the conditions of your license. The inspection consisted of selective examinations of procedures and representative records, interviews, with personnel, and observations by the inspector. The findings as a result of this inspection are as follows:

- ☐ 1. Within the scope of this inspection, no violations were observed.
- ☐ 2. The inspector also verified the steps you have taken to correct the violations identified during the last inspection. We have no further questions on those actions at this time.
- ☒ 3. During this inspection certain of your activities, as checked below, were in violation of NRC requirements.  
THIS IS A NOTICE OF VIOLATION which is required to be posted in accordance with 10 CFR 19.11.
- ☐ A. \_\_\_\_\_ was not properly posted to indicate the presence of a \_\_\_\_\_ 10 CFR 20.203(b), (c), (d), (e) or 34.42.
- ☐ B. Containers located in \_\_\_\_\_ were not properly labeled to indicate the presence of radioactive material. 10 CFR 20.203(f)(1), or (f)(2).
- ☒ C. Inventory of sealed sources of sealed sources were not performed at the proper frequency License Condition Number 16
- ☐ D. Records of \_\_\_\_\_ were not properly maintained. 10 CFR \_\_\_\_\_ or License Condition Number \_\_\_\_\_
- ☒ E. Documents were not properly posted or otherwise made available: 10 CFR 19.11.
- ☐ F. Reports or notifications of \_\_\_\_\_ were not made in accordance with 10 CFR \_\_\_\_\_ or License Condition Number \_\_\_\_\_
- ☐ H. \_\_\_\_\_
- ☐ I. \_\_\_\_\_
- ☐ J. \_\_\_\_\_
- ☐ K. 8505200641 850326  
REG1 LIC30  
20-13014-02 PDR

I hereby state that within 30 days the actions described by me to the inspector will be taken to correct the violations identified in the items checked above. This statement of corrective actions is made in accordance with the requirements of 10 CFR 2.201. No further response will be submitted unless required by the NRC.

Henry A. Johnson  
SIGNATURE - LICENSEE

3/26/85  
DATE

C. J. Cheng  
SIGNATURE - NRC INSPECTOR

3/26/85  
DATE

RETURN ORIGINAL TO

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LICENSE NO: 20-13014-02

DOCKET NO. (s) 30-20826

PAGE \_\_\_\_\_ OF \_\_\_\_\_

ATTACHED

- ☒ Appendix A
- ☐ Appendix B
- ☐ Appendix C
- ☐ Memo

INSPECTION REPORT NO. 85/01

W. R. Star & Co  
Harmony St  
Adams, MA, 01220

*Technical Superintendent*

LICENSEE CONTACT: Henry A. Johnson

Telephone No: 413-743-0546 x29

LICENSE NO: \_\_\_\_\_

CATEGORY K

PRIORITY: VII

CATEGORY \_\_\_\_\_

PRIORITY: \_\_\_\_\_

CATEGORY \_\_\_\_\_

PRIORITY: \_\_\_\_\_

INSPECTION DATE (s): 3/26/85

TYPE OF INSPECTION:

- ☐ SPECIAL
- ☒ ROUTINE
- ☒ DAYSHIFT
- ☐ OTHER
- ☐ ANNOUNCED
- ☒ UNANNOUNCED

SUMMARY OF FINDINGS AND ACTION

- ☐ NO NONCOMPLIANCE, CLEAR 591 ISSUED
- ☐ NO NONCOMPLIANCE, LETTER
- ☐ NONCOMPLIANCE, APPENDIX A

- ☐ ACTION ON PREVIOUS NONCOMPLIANCE, APPENDIX B
- ☒ NONCOMPLIANCE, 591 ISSUED
- ☐ SUPPLEMENTAL INFO, APPENDIX C

RECOMMENDATIONS  
SEE BASIS IN APPENDIX C

- ☐ CHANGE CATEGORY TO: \_\_\_\_\_
- ☐ NEXT INSPECTION DATE: 0000

- ☐ CHANGE PRIORITY TO: \_\_\_\_\_

PERSONS CONTACTED

Mr. Henry A. Johnson, Tech Supv. / RSO

INSPECTOR: Oberg

5/8/85

APPROVED: John E. Allen

5/8/85

INSPECTION PLAN AND REPORT NUMBER \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_

Plan Approved: \_\_\_\_\_

Date: \_\_\_\_\_

Licensee: \_\_\_\_\_

*W. R. Grace & Co.*

License No. 20-13014-02

Inspection Items	Scheduled for Inspection	Post Inspection Status	Module No.
Management Meeting - Entrance and Exit Interviews (Required)	✓	✓	30703B
Program Requirements, MC 2850 (Required)	✓	✓	77710B
Followup on Noncompliance and Deviations			92702B
Independent Inspection Effort (Required)	✓	✓	92706B
Transportation			86740B

Licensee: W.R. Grace & Co AREAS INSPECTED AND FINDINGS  
License No: 20-13014-02 Amendment No: Reg. Lic 2/6/84  
30-20825 1< VII

INSPECTION ITEMS	CRITERIA	FINDING
1. <u>Organization</u> Management organization? Radiation Protection Organization? Scope of Operation? <u>2 BF gauges</u> NOTES & REMARKS: <u>Appeared to be adequate</u>	Lic Cond <u>17</u> <u>Mr. Henry A. Johnson, Superintendent</u> <u>and RSO</u>	<input checked="" type="checkbox"/>
2. <u>Licensee Internal Audits</u> Scope and frequency? Management controls? NOTES & REMARKS: <u>Duties of RPO / Htr. of 1/12/84</u>	Lic Cond <u>17</u>	<input checked="" type="checkbox"/>
3. <u>Training and Instructions to Employees</u> Training program, scope and frequency, retraining? Required tests administered; scores satisfactory? Instructions to workers? NOTES & REMARKS: <u>Appeared to be adequate for program</u>	Lic Cond <u>17</u> Routine use of <u>Lock-out procedures. Training</u> <u>Provided by</u> <u>Accu-Ray Corp.</u> <u>It's a supplier</u> 19.12 <u>OK</u>	<input checked="" type="checkbox"/>
4. <u>Radiation Protection Procedures</u> Operating & emergency procedures implemented? Security? NOTES & REMARKS: <u>Inadequate for program.</u>	Lic Cond <u>17</u> <u>Duties of RPO / Accu-Ray</u> <u>20.207 OK</u>	<input checked="" type="checkbox"/>
5. <u>Materials, Facilities and Instruments</u> Authorized uses and quantities? Restricted areas, posting requirements? Survey instruments & dosimeters, operable, properly calibrated? NOTES & REMARKS:	Lic Cond <u>15</u> <u>as specified - meas. of</u> <u>labeled as required. Paper web</u> <u>Installation, removal, relocation</u> <u>regions etc. by supplier or others</u> <u>authorized</u> 20.203	<input checked="" type="checkbox"/>

## AREAS INSPECTED AND FINDINGS

Licensee: \_\_\_\_\_ License No: \_\_\_\_\_ Amendment No: \_\_\_\_\_

INSPECTION ITEM	CRITERIA	FINDING
<b>6. Receipt and Transfer of Materials</b>		
Procedures implemented, adequate?	20.205, 71.51	Receipts installed by mfg
Transfer of byproduct material?	NA 30.41	
Control of source material,	40.51, 40.64, 70.42, 70.51, 70.53, 70.54	
Labeling and packaging?	71.5, 49CFR 170-189	
Records of receipt, transfer, storage, survey and monitoring?	30.51, Lic. Cond. No. 16	Physical inventory
Procedures for pickup, receipt, monitoring of packages?	20.205(b)&(c)	
NOTES & REMARKS: 6 No. Physical inventory of sealed sources / LC #16, not performed 02-773389531 K-4329X Kx-85 570 mCi } LT. to J. John 9/13/85 02-773389532 S-752T Sr-90 70 mCi } pursuant to supply LICE		
<b>7. Personnel Protection - External</b>		
Personnel monitoring control; minimize exposures, control of accumulated dose?	20.101, 201.102, 20.202	
Surveys conducted, adequate?	20.201	
Records of monitoring, surveys, disposals?	20.401, Lic Cond 15	
Levels in unrestricted areas?	20.1, 20.105	
NOTES & REMARKS: Appeared to be adequate		
<b>8. Personnel Protection - Internal</b>		
Airborne concentrations in restricted areas?	20.103	
Exposure of minors?	20.104	
Posting of airborne radioactivity areas?	20.203	
Survey, monitoring bioassay requirements; records?	20.201, 20.401	
Leak tests of sealed sources?	Lic Cond 13	
NOTES & REMARKS: Leak testing by supplier was in accordance w/ requirements		

617-835-1000  
 Old Sr 90  
 manual, Supp  
 Reset LFE Recs  
 Reset Di. Control  
 55-Grand St  
 Ellington MA

Installation  
 &  
 Sunny Oymog

## AREAS INSPECTED AND FINDINGS

Licensee: \_\_\_\_\_ License No: \_\_\_\_\_ Amendment No: \_\_\_\_\_

INSPECTION ITEM	CRITERIA	FINDING
9. <u>Effluent Control, Waste Disposal</u>		<input checked="" type="checkbox"/>
Release of effluents?	20.106	<i>NA</i>
Waste disposal, proper packaging for shipment?	20.301, 20.303, 20.304, 20.305	
Procedures, records?	20.401, Lic Cond	
NOTES & REMARKS: <i>To be returned to supplier when no longer needed.</i>		
10. <u>Transportation</u>		<input checked="" type="checkbox"/>
Management controls, audits?		<i>NA</i>
Selection of packaging?	49 CFR 173.393-5; 10 CFR 71	
Preparation of packages for shipment? Filling	49 CFR 172.173	
and loading, closing, liquids?	49 CFR 172.300	
Markings & labelling?	49 CFR 172.402, 403	
Monitoring?	49 CFR 173.393	
Shipping papers, loading and placarding of vehicles?	49 CFR 172.200	
Reports of Incidents?	49 CFR 171.15, 171.16	
Training program?		
Examination of packages?		
NOTES & REMARKS: <i>No shipping/transporting of matl.</i>		
11. <u>Notifications and Reports</u>		<input checked="" type="checkbox"/>
To individuals?	19.13	<i>NA</i>
Overexposures, excessive levels and concentrations, incidents?	20.403, 20.405	
Personnel exposures and monitoring, termination reports?	20.407, 20.408	
Theft or loss of licensed materials?	20.402	
NOTES & REMARKS: <i>No theft or loss of lic. matl.</i>		



## AREAS INSPECTED AND FINDINGS

Licensee: \_\_\_\_\_ License No: \_\_\_\_\_ Amendment No: \_\_\_\_\_

## INSPECTION ITEM

## CRITERIA

## FINDING

12. Posting of NoticesPart 20, license & documents, procedures,  
notice of violations?

19.11(a)

NRC-37

19.11(c)

NOTES &amp; REMARKS:

*Required documents not posted.*

13. Environmental Monitoring ProgramLic Cond 17Implementation of program, scope and frequency  
as required?

Records maintained, reviewed by management?

NOTES &amp; REMARKS:

14. Emergency PreparednessLic Cond 17

Procedures available for incidents and accidents?

Training for personnel; coordination with supporting  
groups and agencies?

NOTES &amp; REMARKS:

*Operating & lack of procedures &  
training provided by supplier.*

15. Other License Conditions

*Reviewed*

NOTES &amp; REMARKS:

INSPECTION REPORT NUMBER \_\_\_\_\_

Page \_\_\_\_ of \_\_\_\_

777108 - Industrial - Academic

AREAS INSPECTED AND FINDINGS

Licensee: \_\_\_\_\_ License No: \_\_\_\_\_ Amendment No: \_\_\_\_\_

INSPECTION ITEM	CRITERIA	FINDING
-----------------	----------	---------

16. Confirmatory Measurements

Licensee's surveys verified on sampling basis? 201.105, 20.201

NOTES & REMARKS:

Direct reading surveys showed rad.  
levels not significantly different from background  
(0.02-0.05 mR/hr) in work areas on  
catwalks

NRC Instrument:

902

Calibration due date:

4/23/85

17. Independent Inspection Effort

Toured facilities  
& reviewed program w/ RPO

NOTES & REMARKS:

INSPECTION REPORT NUMBER \_\_\_\_\_

Page \_\_\_\_\_ of \_\_\_\_\_

APPENDIX A - DOCUMENTATION OF NONCOMPLIANCE

Licensee: W. Brann

License No: 20-13014-02

Reference	Basis for noncompliance
Report item <u>6</u> 10 CFR _____ Lic Cond <u>16</u> Type n/c <u>IV (VI)</u>	<i>B.M. Physical Exam not performed.</i>
Report item <u>12</u> 10 CFR <u>19.11</u> Lic Cond _____ Type n/c <u>V (VI)</u>	<i>Required documents not posted</i>
Report item _____ 10 CFR _____ Lic Cond _____ Type n/c _____	
Report item _____ 10 CFR _____ Lic Cond _____ Type n/c _____	
Report item _____ 10 CFR _____ Lic Cond _____ Type n/c _____	
Report item _____ 10 CFR _____ Lic Cond _____ Type n/c _____	

**Licensee:** \_\_\_\_\_

**License No:**

### Status

Report No: \_\_\_\_\_ Type n/c: \_\_\_\_\_ Describe: \_\_\_\_\_

Report No: \_\_\_\_\_ Type n/c: \_\_\_\_\_ Describe: \_\_\_\_\_

Report No: \_\_\_\_\_ Type n/c: \_\_\_\_\_ Describe: \_\_\_\_\_

Report No: \_\_\_\_\_ Type n/c: \_\_\_\_\_ Describe: \_\_\_\_\_

Report No: \_\_\_\_\_ Type n/c: \_\_\_\_\_ Describe \_\_\_\_\_

Report No: \_\_\_\_\_ Type n/c: \_\_\_\_\_ Describe \_\_\_\_\_

Action taken:	OPEN
	CLOSED

INSPECTION REPORT NUMBER \_\_\_\_\_

Page \_\_\_\_\_ of \_\_\_\_\_

APPENDIX C - SUPPLEMENTARY INFORMATION

Licensee: \_\_\_\_\_ License No: \_\_\_\_\_

- 
- ☐ Uncorrected/repeated noncompliance
  - ☐ Unusual occurrence, conditions, etc
  - ☐ Basis for change of Category or Priority

- ☐ Unresolved items
- ☐ Inspector's comments

NOV 25 1992

Docket No. 030-20826

License No. 20-13014-02

W.R. Grace & Co.  
ATTN: Alexander W. Nagy  
Assistant Plant Manager  
Harmony Street  
Adams, Massachusetts 01220

Dear Mr. Nagy:

Subject: Routine Inspection No. 030-20826/92-001

This refers to your letter dated August 13, 1992, in response to our letter dated July 23, 1992.

Thank you for informing us of the corrective and preventive actions documented in your letter. These actions will be examined during a future inspection of your licensed program.

A copy of your letter dated July 22, 1992, has been forwarded for review of the new Radiation Safety Officer. An amendment to your license will be issued when the review is complete.

Your cooperation with us is appreciated.

Sincerely,

Original Signed By:

John D. Kinneman, Chief  
Research, Development  
and Decommissioning  
Division of Radiation Safety  
and Safeguards

cc:  
Public Document Room (PDR)  
Nuclear Safety Information Center (NSIC)  
Commonwealth of Massachusetts

GRACE

OFFICIAL RECORD COPY

Pg 1

October 6, 1992

9212080322 921125  
PDR ADOCK 03020826  
C PDR

070112

ITEM #

46

RETURN ORIGINAL TO  
REGION I

IE:07

B/45

12

W.R. Grace & Co.

2

bcc:

Region I Docket Room (w/concurrences)

RI:DRSS  
Ullrich/tlp

10/1/92

RI:DRSS  
Weidner

10/6/92

RI:DRSS  
Kinneman

10/6/92

GRACE

OFFICIAL RECORD COPY

Pg 2

October 6, 1992

GRACE

Polyfibron Division

W.R. Grace & Co.-Conn.  
Harmony Street  
Adams, MA 01220

(413) 743-0546  
Fax: (413) 743-7941

August 13, 1992

Mr. Francis Costello, Chief  
Industrial Applications Section  
Nuclear Regulatory Commission  
475 Allendale Road  
King of Prussia, PA. 19406-1415

RE: Notice of Violation  
License No. 20-13014-02  
Inspection 030-20826/92-001

Dear Mr. Costello:

Pursuant to my letter to Ms. Betsy Ullrach dated July 22 (attached), I would like to add the following:

1. NRC will be notified of any change in Radiation Safety Officer at least 30 days prior through the enclosed Notification Form.
2. Mr. Stephen Jones, our current Radiation Safety Officer, has had significant radiation experience prior to his employ at W. R. Grace. Between 1974-1978, he worked at the following nuclear sites:

Hanford, WA.  
Filzpatrick, Oswego, N.Y.  
Millstone, CT.  
Calvert Cliffs, MD.  
David-Besse, OH.  
Trojan, OR.  
Benton Harbor, MI.

All sites required an 8-hour Radiation Safety course. In addition, he has taken a 32-hour radiation course while employed by General Electric.

W. R. Grace - Adams believes it is now in full compliance as the violation detailed in the NOV has been corrected.

Sincerely,

W. R. GRACE & CO.

*Alexander W. Nagy*  
Alexander W. Nagy  
Assistant Plant Manager

9212080330 921125  
PDR ADOCK 03020826  
C PDR

ITEM # 47

AWN:sml  
Enclosures

2/46

2



DATE:

PREVIOUS RSO:

NAME:		PREVIOUS RSO:			
TYPE OF TRAINING	WHERE TRAINED	DURATION OF TRAINING	ON THE JOB		FORMAL COURSE
Principles and practices of radiation protection			Yes	No	Yes No
Radioactivity measurement standardization and monitoring techniques and instruments			Yes	No	Yes No
Mathematics and calculations basic to the use and measurement of radioactivity			Yes	No	Yes No
Biological effects of radiation			Yes	No	Yes No

### EXPERIENCE WITH RADIATION

[illegible]

DEC 18 1992

License No. 20-13014-02  
Docket No. 030-20826  
Control No. 116891

W. R. Grace & Company  
ATTN: Alexander W. Nagy  
Assistant Plant Manager  
Harmony Street  
Adams, Massachusetts 01220

Dear Mr. Nagy:

Please find enclosed Amendment No. 02 terminating License No. 20-13014-02 as requested by your letter dated November 18, 1992.

Your cooperation with us is appreciated.

Sincerely,

Original Signed By:  
Duncan White

Duncan A. White  
Nuclear Materials Safety Branch  
Division of Radiation Safety  
and Safeguards

Enclosure:  
Amendment No. 02

DRSS:RI  
White/cmm

12/18/92

OFFICIAL RECORD COPY - G:\WPS\MLTR\L2013014.02 - 12/14/92

ML 10

ITEM # 48

B/47

GRACE

Polyfibron Division

W.R. Grace & Co.-Conn.  
Harmony Street  
Adams, MA 01220

(413) 743-0546  
Fax: (413) 743-7941

December 4, 1992

MS 16  
Q-4

Mr. Francis Costello, Chief  
Industrial Applications Section  
Nuclear Regulatory Commission  
475 Allendale Road  
King of Prussia, PA. 19406-1415

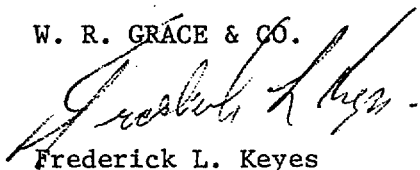
Re: License #20-13014-02

Dear Mr. Costello:

Enclosed are copies of the shipping documents regarding removal of the radioactive elements from our Beta gauge. If you have any further questions, please feel free to call me at your earliest convenience.

Sincerely,.

W. R. GRACE & CO.

  
Frederick L. Keyes  
Purchasing Agent

FLK:sml  
Enclosures

cc: Director of Nuclear Material Safety & Safeguards  
U. S. Nuclear Regulatory Commission  
Washington, D. C. 20555

Division of Occupational Hygiene  
39 Bolyston Street  
Boston, Ma. 02116

ITEM # 49

B/48

OFFICIAL RECORD COPY ML 10

116891  
DEC 07 1992



November 30, 1992

W.R. Grace & Co.  
Att: J. Johnson  
Harmony St.  
Adams, MA 01220

Dear Sir:

Please be advised that the following sources were received at ABB Process Automation Inc., Columbus, Ohio and are now in our possession under USNRC Byproduct Material License 34-00255-03.

Date Received	Source Serial No.	Isotope	Quantity	Source Model	Device Model
11-23-92	S-752-T	SR-90	70 mCi	S-18	O-2
11-23-92	K-4329-X	KR-85	500 mCi	S-11	O-2

To comply with the requirement for notification of transfer in the Code of Federal Regulations Title 10, Part 31.5, we recommend you forward a copy of this letter to:

Director of Nuclear Material Safety & Safeguards  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Very truly yours,

Doris Kramer  
Administrator  
Radiological Operations

NOTE: If these sources were registered with the state of Massachusetts we suggest you also notify them of this transfer at:

Division of Occupational Hygiene  
39 Boylston Street  
Boston, MA 02116

cc: K. Schultz, ABB, Columbus

ABB Process Automation Inc.

ITEM #

50

4 1992

B/49

W.R. Grace &amp; Co.-Conn.

DIVISION: POLYFIBRON

PLANT LOCATION

- HARMONY STREET
- ADAMS, MA 01220

GRACE

PD 00715

DATE: NOV. 18, 1992

REFER TO OUR PURCHASE ORDER:

TO: ABB PROCESS AUTOMATION INC.

- 650 ACKERMAN ROAD
- COLUMBUS, OH X 43202

ATTN: RADIOLOGICAL OPERATIONS

- ☐ RETURN OF MATERIAL FOR CREDIT (SEE BELOW) \*
- ☐ FOR REPAIR, ALTERATION, INSPECTION, ETC., AS ORDERED
- ☐ TO BE INCORPORATED INTO A PRODUCT BEING MADE FOR US
- ☐ OTHER:

\* REASON(S) FOR RETURN

QUANTITY	UNIT OF MEASURE	DESCRIPTION	VALUATION
1	DR	RADIOACTIVE MATERIAL, NOS. UN2982 SEALED SOURCE, 0.07:0.5 CURIES ISOTOPE SR-90; KR-85 RADIOACTIVE II YELLOW TRANSPORT INDEX 0.2 PACKAGE TYPE A  RETURNING SURPLUS SOURCES TO SUPPLIER	

THIS SHIPMENT REQUESTED BY:		CREDIT	DEBIT	ACCOUNT:	LTR	DIV	DEPT	P	PR	SUB	PROJECT
FLK											
LOCATION OF MATERIAL						X	7	030		30	009
DATE SHIPMENT DESIRED											
11/18/92											
ROUTING		PPD.	COLL.	AUTHORIZED							
YELLOW FRT		XX		<i>L. Giroux</i>							
DATE SHIPPED		SHIPPED VIA		B/L OR U.P.S. NO.				OR SIGNATURE			

FORM 81-5L

ITEM # 51

B/SO

<b>TELEPHONE CONVERSATION RECORD</b>		<b>Date:</b> 11-23-92	<b>Time:</b> 2:00 pm
<b>Mail Control No.:</b> 116891		<b>License :</b> 20-13014-02	<b>Docket No.:</b> 030-20826
<b>Person Called:</b> Stephen Jones		<b>Organization:</b> WR Grace - Polyfibron Division	<b>Telephone Number:ex:</b> 223 (413) 743-0546
<b>Person Calling:</b> Duncan White			
<b>Subject:</b> Additional Information for License Termination			
<b>Summary:</b> Requested that the licensee provide documentation from ABB that licensed material was properly transferred.			
<b>Action Required/Taken:</b> MS 15			
<b>Signature:</b> <i>Duncan White</i>		<b>Date:</b> 11-23-92	

ITEM # 52

OFFICIAL RECORD COPY

ML 10

116891

B/S1

GRACE

Polyfibron Division

W.R. Grace & Co.-Conn.  
Harmony Street  
Adams, MA 01220

(413) 743-0546  
Fax: (413) 743-7941

November 18, 1992

030-20826

Mr. Francis Costello, Chief  
Industrial Applications Section  
Nuclear Regulatory Commission  
475 Allendale Road  
King of Prussia, PA. 19406-1415

Re: License No. 20-13014-02

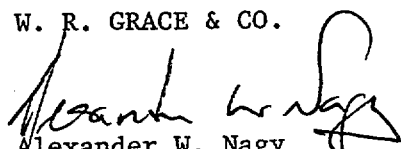
Dear Mr. Costello:

This letter is formal notification that we are no longer in possession of a radiation source. The Beta measurement gauge which required licensing and contained both Krypton and Strontium 90 has been removed and disposed of by ABB of Columbus, Ohio.

We, thus, no longer need the above license and request it be cancelled.

Sincerely,

W. R. GRACE & CO.

  
Alexander W. Nagy  
Assistant Plant Manager

AWN:sml

ITEM # 53

OFFICIAL RECORD COPY ML 10

116891

NOV 20 1992

A/S2

DATE 9/25/92

TELEPHONE OR VERBAL CONVERSATION RECORD

TIME 7:30 ☒ A.M.  
☐ P.M.

☐ INCOMING CALL

☒ OUTGOING CALL

☐ VISIT

PERSON CALLING

D. White

OFFICE/ADDRESS

RI

PHONE NUMBER

EXTENSION

PERSON CALLED

S. Jones

OFFICE/ADDRESS

WR Grace

PHONE NUMBER

EXTENSION

413-743-0546 ext. 223

CONVERSATION

SUBJECT

Def. Phone Call.

SUMMARY

Requested that licensee provide credentials for RSO designee (ie Experience and training with gauges).

REFERRED TO:

ACTION REQUESTED

MS 15

ITEM # 54

☐ ADVISE ME OF ACTION TAKEN.

INITIALS

DATE

ACTION TAKEN

INITIALS

DATE

OFFICIAL RECORD COPY ML 10

116 891



GRACE

Polyfibron Division

W.R. Grace & Co.-Conn.  
Harmony Street  
Adams, MA 01220

(413) 743-0546  
Fax: (413) 743-7941

July 22, 1992

030-20826  
20-1304-02

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

Log	Aug 7 '92
Remitter	
Check No.	8061
Amount	\$ 380
Fee Category	3P
Type of Fee	PMO
Date Check Rec'd	8/31/92
Date Completed	8/31/92
By:	<i>[Signature]</i>

ITEM #

55

OFFICIAL RECORD COPY ML 10

116891  
JUL 27 1992

FAX REC'D 7/22/92

B154

AUG 25 1992

-2-

W. R. Grace & Co.  
Attn: Alexander W. Nagy  
Assistant Plant Manager  
Polyfibron Division  
Industrial Chemicals Group  
Harmony Street  
P.O. Box 269  
Adams, MA 01220-0269

Gentlemen:

This refers to your letter dated July 22, 1992, for an amendment to Materials License 20-13014-02.

Your request is subject to an amendment fee of \$380 as specified in fee Category 3P of \$170.31, 10 CFR 170, which went into effect August 9, 1991. A copy of the July 10, 1991, Federal Register notice regarding the revisions to the Commission's license and annual fee regulations (10 CFR 170 and 10 CFR 171) is enclosed.

Payment of the \$380 fee should be made to the U.S. Nuclear Regulatory Commission and mailed to the following address:

U.S. Nuclear Regulatory Commission  
ATTN: Sandra Kimberley  
License Fee and Debt Collection Branch, OC/DAF  
Mail Stop MNBB 4503  
Washington, D.C. 20555

Your application will be processed by the Region I Licensing staff located at 475 Allendale Road, King of Prussia, Pennsylvania 19406. The fee, however, is required prior to issuance of the amendment. When submitting the fee, please refer to CONTROL NUMBER 116891.

If we do not receive a reply from you within 30 calendar days from the date of this letter, we shall assume that you do not wish to pursue your application and will void this action.

Sincerely,

Signed by  
Sandra Kimberley

Sandra Kimberley  
License Fee and Debt Collection Branch  
Division of Accounting and Finance  
Office of the Controller

Enclosure:  
July 10, 1991, Federal Register notice

cc: Region I

DISTRIBUTION  
Pending Fee File  
OC/DAF R/F  
LFDCEB R/F (2)

OFFICE: OC/LFDCEB  
NAME: SKimberley  
DATE: 8/24/92

OC/LFDCEB  
SKimberley  
8/24/92

OC/LFDCEB  
MMessier  
8/25/92

IAO 01/B:WRGRACE.mer

ITEM # 56

B/S3

GRACE

Polyfibron Division

W.R. Grace & Co.-Conn.  
Harmony Street  
Adams, MA 01220

(413) 743-0546  
Fax: (413) 743-7941

August 28, 1992

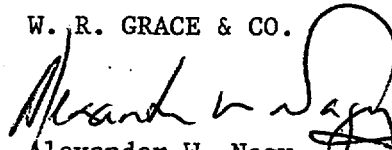
U. S. NuClear Regulatory Commission  
Attn: Sandra Kimberley  
License Fee and Debt Collection Branch, OC/DAF  
Mail Stop MNBB 4503  
Washington, D. C. 20555

Dear Ms. Kimberley:

Enclosed is check for \$380.00 as specified in the attached letter.

Sincerely,

W. R. GRACE & CO.

  
Alexander W. Nagy  
Assistant Plant Manager

AWN:sml  
Enclosures

RECEIVED  
U.S. NUCLEAR  
COMMISSION  
92 AUG 31 AM 10:08

ITEM # 57

B/S6

MATERIALS LICENSE  
SUPPLEMENTARY SHEET

License number

20-13014-02

Docket or Reference number

030-20826

Amendment No. 02

W. R. Grace & Company  
Harmony Street  
Adams, Massachusetts 01220

In accordance with letter dated December 4, 1992, License Number 20-13014-02 is hereby terminated.



9303010342 921218  
PDR ADOCK 03020826  
C PDR

ITEM # 58

Date

DEC 18 1992

For the U.S. Nuclear Regulatory Commission

Original Signed By:

By

Duncan White

Nuclear Materials Safety Branch

Region I

King of Prussia, Pennsylvania 19406

OFFICIAL RECORD COPY ML 10

EXPERT SYSTEM LICENSE EVALUATION  
EVALUATION REPORT FOR LICENSE 20-13014-01

Licensee: W.R. GRACE AND COMPANY  
Site of operation: HARMONY STREET, ADAMS, MA

INFORMATION ON EXACT AMOUNTS OF MATL WAS NOT NEEDED TO EVALUATE

---

THIS LICENSE WAS ELIMINATED FROM CONSIDERATION

The reason for elimination was: Sealed sources-adequate suppor

---

EXPERT SYSTEM EVALUATION WAS BASED ON THE  
INVENTORY RECORD IN JOB 0907, BOX 02

Docket 30-04736

Licensee: W.R. GRACE AND COMPANY  
Address: ADAMS MASSACHUSETTS  
State of operation: MA  
Site used: HARMONY STREET, ADAMS, MA  
Disposition information present: LICENSEE LETTER STATING DISPOSITION  
Contents of letter: SOURCE RETURNED TO LFE CORPORATION  
Matl. Transfrd to: LFE CORPORATION  
License to which transferred: UNK  
There is an NRC verification letter in this license file  
This license was listed as expired on 07/31/83  
Remarks:

Zip: 01220

JOB NUMBER: 0907      BOX NUMBER: 02

---

Date of last evaluation/revision: 08/25/92

Reviewer: SSC

ITEM # 59

B/58

## A. TYPE OF ACTION AND IDENTIFICATION CODES

1 <input type="checkbox"/> NEW LICENSE	<input checked="" type="checkbox"/> AMENDMENT TO RENEW LICENSE	<input type="checkbox"/> AMENDMENT TO TERMINATE	<input type="checkbox"/> VOID	DOCKET NUMBER <b>030-04736</b>	MAIL CONTROL NUMBER <b>90600</b>	CHANGE NAME/ ADDRESS <input type="checkbox"/>
<input type="checkbox"/> NEW LICENSE AND NEW LICENSEE	<input checked="" type="checkbox"/> OTHER AMENDMENT	<input type="checkbox"/> CLERICAL CHANGE NO AMENDMENT	<b>3</b>			

## B. INDICATIVE INFORMATION:

INDIVIDUALS	NAME (LAST, FIRST, MIDDLE)	NAME (LAST, FIRST, MIDDLE)			
	NAME (LAST, FIRST, MIDDLE)	NAME (LAST, FIRST, MIDDLE)			
	NAME (LAST, FIRST, MIDDLE)	NAME (LAST, FIRST, MIDDLE)			
ORGANIZATIONAL LICENSEE	ORGANIZATION NAME (ALPHABETIC SEQUENCE) <b>Grace &amp; Company, W. R.</b>				
	DEPARTMENT OR BUREAU <b>Polyfibrion Division</b>				
ADDRESS	BUILDING, STREET <b>Harmony Street</b>	CITY <b>Adams</b>	STATE <b>MA</b>	ZIP CODE <b>01220</b>	
6	TYPE OF APPLICANT <input type="checkbox"/> U.S. GOVERNMENT AGENCY <input type="checkbox"/> INDIVIDUAL LICENSEE <input checked="" type="checkbox"/> ORGANIZATIONAL LICENSEE	DATE REQUEST RECEIVED <b>10/05/77</b>	INSTITUTION CODE <b>13014</b>	PENDING PROG. CODE	ACTUAL PROG. CODE <b>03/20</b>
	SECONDARY PROGRAM CODES AS REQUIRED: #1 #2 #3 #4 #5				
7	LICENSE NUMBER <b>20-13014-01</b>	DATE LICENSE ISSUED <b>JUL 10 1978</b>	EXPIRATION DATE <b>7/21/83</b>		

## C. STATISTICAL INFORMATION:

## MEDICAL CATEGORY:

☐ FOR HUMAN USE ONLY☐ FOR HUMAN AND NONHUMAN USE☒ FOR NONHUMAN USE ONLY

## POSSESSION OF THE MATERIAL IS AUTHORIZED IN ONE OF THE FOLLOWING AREAS:

☒ SAME AS "STATE" IN ADDRESS☐ ALL STATES☐ ALL NON-AGREEMENT STATES

## AND/OR IN THE STATE(S), TERRITORY(S), COUNTRY CHECKED BELOW:

ALABAMA -AL	GEORGIA -GA	MARYLAND -MD	NEW JERSEY -NJ	SOUTH CAROLINA-SC	WYOMING -WY
ALASKA -AK	HAWAII -HI	MASSACHUSETTS-MA	NEW MEXICO -NM	SOUTH DAKOTA -SD	
ARIZONA -AZ	IDAHO -ID	MICHIGAN -MI	NEW YORK -NY	TENNESSEE -TN	AMERICAN SAMOA-AS
ARKANSAS -AR	ILLINOIS -IL	MINNESOTA -MN	NORTH CAROLINA-NC	TEXAS -TX	CANAL ZONE -CZ
CALIFORNIA -CA	INDIANA -IN	MISSISSIPPI -MS	NORTH DAKOTA -ND	UTAH -UT	GUAM -GU
COLORADO -CO	IOWA -IA	MISSOURI -MO	OHIO -OH	VERMONT -VT	PUERTO RICO -PR
CONNECTICUT -CT	KANSAS -KS	MONTANA -MT	OKLAHOMA -OK	VIRGINIA -VA	VIRGIN ISLANDS -VI
DELAWARE -DE	KENTUCKY -KY	NEBRASKA -NB	OREGON -OR	WASHINGTON -WA	
WASHINGTON, DC-DC	LOUISIANA -LA	NEVADA -NV	PENNSYLVANIA -PA	WEST VIRGINIA -WV	CANADA -CN
FLORIDA -FL	MAINE -ME	NEW HAMPSHIRE-NH	RHODE ISLAND -RI	WISCONSIN -WI	

## D. POSSESSION LIMITS OF SOURCE AND SPECIAL NUCLEAR MATERIALS AND TRITIUM

SOURCE MATERIAL CEILING

SNM CEILING

☐ GRAMS☐ KILOGRAMS☐ GRAMS☐ KILOGRAMS☐ "X" HERE IF FOR POWER REACTOR

	AMOUNT	UNIT	CONFIG.	ENRICH.	MAT.	AMOUNT	UNIT	CONFIG.	ENRICH.
U5		<input type="checkbox"/> G <input type="checkbox"/> kg	<input type="checkbox"/> S <input type="checkbox"/> UNS				<input type="checkbox"/> G <input type="checkbox"/> kg	<input type="checkbox"/> S <input type="checkbox"/> UNS	
U3		<input type="checkbox"/> G <input type="checkbox"/> kg	<input type="checkbox"/> S <input type="checkbox"/> UNS				<input type="checkbox"/> G <input type="checkbox"/> kg	<input type="checkbox"/> S <input type="checkbox"/> UNS	
PU		<input type="checkbox"/> G <input type="checkbox"/> kg	<input type="checkbox"/> S <input type="checkbox"/> UNS				<input type="checkbox"/> G <input type="checkbox"/> kg	<input type="checkbox"/> S <input type="checkbox"/> UNS	
UR		<input type="checkbox"/> G <input type="checkbox"/> kg	<input type="checkbox"/> S <input type="checkbox"/> UNS				<input type="checkbox"/> G <input type="checkbox"/> kg	<input type="checkbox"/> S <input type="checkbox"/> UNS	
TH		<input type="checkbox"/> G <input type="checkbox"/> kg	<input type="checkbox"/> S <input type="checkbox"/> UNS				<input type="checkbox"/> G <input type="checkbox"/> kg	<input type="checkbox"/> S <input type="checkbox"/> UNS	
		<input type="checkbox"/> G <input type="checkbox"/> kg	<input type="checkbox"/> S <input type="checkbox"/> UNS				<input type="checkbox"/> G <input type="checkbox"/> kg	<input type="checkbox"/> S <input type="checkbox"/> UNS	
		<input type="checkbox"/> G <input type="checkbox"/> kg	<input type="checkbox"/> S <input type="checkbox"/> UNS				<input type="checkbox"/> G <input type="checkbox"/> kg	<input type="checkbox"/> S <input type="checkbox"/> UNS	
H3		<input type="checkbox"/> CURIES <input type="checkbox"/> MICROCURIES <input type="checkbox"/> MILLICURIES			RIS CODES	ITEM # <b>60</b>			

U5=U235, U3=U233, PU=PLUTONIUM, UR=URANIUM, TH=THORIUM, H3=TRITIUM, G=GRAMS,  
kg=KILOGRAMS, S=SEALED, UNS=UNSEALED

U.S. NUCLEAR REGULATORY COMMISSION  
MATERIAL DATA INPUT INDUSTRIAL5 - INDUSTRIAL BYPRODUCT  
REFERENCE COPY

## A. TYPE OF ACTION AND IDENTIFICATION CODES

1 <input type="checkbox"/> NEW LICENSE	<input checked="" type="checkbox"/> AMENDMENT TO RENEW LICENSE	<input type="checkbox"/> AMENDMENT TO TERMINATE	<input type="checkbox"/> VOID	DOCKET NUMBER <b>030-04736</b>	MAIL CONTROL NUMBER <b>90600</b>	CHANGE NAME/ ADDRESS <input type="checkbox"/>
<input type="checkbox"/> NEW LICENSE AND NEW LICENSEE	<input checked="" type="checkbox"/> OTHER AMENDMENT	<input type="checkbox"/> CLERICAL CHANGE NO AMENDMENT	<b>4</b>			

## B. INDICATIVE INFORMATION:

INDIVIDUAL LICENSEE	NAME (LAST, FIRST, MIDDLE) <b>In accordance with application dated September 30, 1977, License Number 20-13014-01 is amended in its entirety to read as follows:</b>		NAME (LAST, FIRST, MIDDLE)		
	NAME (LAST, FIRST, MIDDLE)		NAME (LAST, FIRST, MIDDLE)		
	NAME (LAST, FIRST, MIDDLE)		NAME (LAST, FIRST, MIDDLE)		
	NAME (LAST, FIRST, MIDDLE)		NAME (LAST, FIRST, MIDDLE)		
ORGANIZATION NAME (ALPHABETIC SEQUENCE) <b>3 Grace &amp; Company, W. R.</b>	DEPARTMENT OR BUREAU <b>4 Polyfibron Division</b>				
	BUILDING, STREET <b>5 Harmony Street</b>		CITY <b>Adams</b>	STATE <b>MA</b>	ZIP CODE <b>01220</b>
TYPE OF APPLICANT <b>6</b>	<input type="checkbox"/> U.S. GOVERNMENT AGENCY <input type="checkbox"/> INDIVIDUAL LICENSEE <input checked="" type="checkbox"/> ORGANIZATIONAL LICENSEE	DATE REQUEST RECEIVED <b>10/05/77</b>	INSTITUTION CODE <b>13014</b>	PENDING PROG. CODE	ACTUAL PROG. CODE <b>03120</b>
	SECONDARY PROGRAM CODES AS REQUIRED: #1 #2 #3 #4 #5				
7	LICENSE NUMBER <b>20-13014-01</b>	DATE LICENSE ISSUED OR ACTION COMPLETED	EXPIRATION DATE <b>7/31/83</b>		

BYPRODUCT

CHEMICAL OR PHYSICAL FORM

POSSESSION LIMIT

A. Strontium 90

A. Sealed Sources (Tracerlab Model S-1A)

A. Not to exceed  
10.3 millicuries  
per source

A. For use in Tracerlab Model BG-1A beta gauge for measurement of coated textiles

1A  
5  
7 H. A. Johnson19  
17 A(1)(3), B. C. D. LFE Corporation

45 LFE Corporation

16 applications dated September 30, 1977 and June 21, 1978

MAIL TO:

DATE MAILED

REVIEWER

DATE COMPLETED

## MATERIALS DATA INPUT INDUSTRIAL

1- FILE COPY

## A. TYPE OF ACTION -

<input type="checkbox"/> NEW LICENSE	<input checked="" type="checkbox"/> AMENDMENT TO RENEW LICENSE	<input type="checkbox"/> AMENDMENT TO TERMINATE	<input type="checkbox"/> VOID	<input checked="" type="checkbox"/> CHANGE LICENSEE NAME/ADDRESS
<input type="checkbox"/> NEW LICENSE AND NEW LICENSEE	<input type="checkbox"/> OTHER AMENDMENT	<input type="checkbox"/> CLERICAL CHANGE NO AMENDMENT		

## B. INDICATIVE INFORMATION:

DOCKET NUMBER 030-04736	MAIL CONTROL NO. 42954	DATE REQUEST REC'D 11/29/73	INSTITUTION CODE 13014	PENDING PROG. CODE	ACTUAL PROG. CODE 03120
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## SECONDARY PROGRAM CODES AS REQUIRED:

#1	#2	#3	#4	#5
----	----	----	----	----

INDIVIDUAL LICENSEES	NAME (LAST, FIRST, MIDDLE)	NAME (LAST, FIRST, MIDDLE)
	NAME (LAST, FIRST, MIDDLE)	NAME (LAST, FIRST, MIDDLE)
	NAME (LAST, FIRST, MIDDLE)	NAME (LAST, FIRST, MIDDLE)

ORGANIZATION LICENSEES	ORGANIZATION NAME (ALPHABETIC SEQUENCE) Grace & Co., W. R.	TYPE OF ORGANIZATION	
	DEPARTMENT OR BUREAU Polyfibron Division	<input type="checkbox"/> U. S. GOVERNMENT AGENCY	<input type="checkbox"/> EDUCATIONAL INSTITUTION
		<input type="checkbox"/> MEDICAL INSTITUTION	<input checked="" type="checkbox"/> INDUSTRY <input type="checkbox"/> OTHER

ADDRESS	BUILDING, STREET Harmony Street	CITY Adams	STATE MA	ZIP CODE 01220
---------	------------------------------------	---------------	-------------	-------------------

## C. STATISTICAL INFORMATION:

LICENSE NUMBER 20-13014-01	DATE LICENSE ISSUED OR ACTION COMPLETED 11 30 73	EXPIRATION DATE 11/30/78
-------------------------------	---	-----------------------------

## USAGE OF MEDICAL BYPRODUCT:

<input type="checkbox"/> FOR HUMAN USE ONLY	<input type="checkbox"/> FOR HUMAN AND NONHUMAN USE	<input checked="" type="checkbox"/> FOR NONHUMAN USE ONLY
---	---	---

## POSSESSION OF THE MATERIAL IS AUTHORIZED IN ONE OF THE FOLLOWING AREAS:

<input checked="" type="checkbox"/> SAME AS 'STATE' IN ADDRESS	<input type="checkbox"/> ALL STATES	<input type="checkbox"/> ALL AGREEMENT STATES	<input type="checkbox"/> ALL NON-AGREEMENT STATES
--	-------------------------------------	---	---

## AND/OR IN THE STATE(S), TERRITORY(S), COUNTRY CHECKED BELOW:

ALABAMA -AL	GEORGIA -GA	MARYLAND -MD	NEW JERSEY -NJ	SOUTH CAROLINA -SC	WYOMING -WY
ALASKA -AK	HAWAII -HI	MASSACHUSETTS -MA	NEW MEXICO -NM	SOUTH DAKOTA -SD	
ARIZONA -AZ	IDAHO -ID	MICHIGAN -MI	NEW YORK -NY	TENNESSEE -TN	AMERICAN SAMOA -AS
ARKANSAS -AR	ILLINOIS -IL	MINNESOTA -MN	NORTH CAROLINA -NC	TEXAS -TX	CANAL ZONE -CZ
CALIFORNIA -CA	INDIANA -IN	MISSISSIPPI -MS	NORTH DAKOTA -ND	UTAH -UT	GUAM -GU
COLORADO -CO	IOWA -IA	MISSOURI -MO	OHIO -OH	VERMONT -VT	PUERTO RICO -PR
CONNECTICUT -CT	KANSAS -KS	MONTANA -MT	OKLAHOMA -OK	VIRGINIA -VA	VIRGIN ISLANDS -VI
DELAWARE -DE	KENTUCKY -KY	NEBRASKA -NE	OREGON -OR	WASHINGTON -WA	
WASHINGTON DC -DC	LOUISIANA -LA	NEVADA -NV	PENNSYLVANIA -PA	WEST VIRGINIA -WV	CANADA -CN
FLORIDA -FL	MAINE -ME	NEW HAMPSHIRE -NH	RHODE ISLAND -RI	WISCONSIN -WI	

## D. POSSESSION LIMITS OF SOURCE AND SPECIAL NUCLEAR MATERIALS AND TRITIUM

TYPE OF MATERIAL	AMOUNT AUTHORIZED	UNIT OF MEASUREMENT		SEALED/UNSEALED CONFIGURATION	MAXIMUM ENRICHMENT
U235		<input type="checkbox"/> GRAMS	<input type="checkbox"/> KILOGRAMS	<input type="checkbox"/> SEALED <input type="checkbox"/> UNSEALED	
U233		<input type="checkbox"/> GRAMS	<input type="checkbox"/> KILOGRAMS	<input type="checkbox"/> SEALED <input type="checkbox"/> UNSEALED	'X' HERE IF FOR POWER REACTOR  <input type="checkbox"/>  RIS CODE
PU		<input type="checkbox"/> GRAMS	<input type="checkbox"/> KILOGRAMS	<input type="checkbox"/> SEALED <input type="checkbox"/> UNSEALED	
URANIUM		<input type="checkbox"/> GRAMS	<input type="checkbox"/> KILOGRAMS	<input type="checkbox"/> SEALED <input type="checkbox"/> UNSEALED	
THORIUM		<input type="checkbox"/> GRAMS	<input type="checkbox"/> KILOGRAMS	<input type="checkbox"/> SEALED <input type="checkbox"/> UNSEALED	
TRITIUM		<input type="checkbox"/> MICRO-CURIES	<input type="checkbox"/> MILLI-CURIES <input type="checkbox"/> CURIES		

## E. FEE CATEGORIES:

EX	1A	1B	1C	2A	2B	3A	3B	3C	3D	3E
4A	5A				32					



## MATERIALS DATA INPUT

4 INDUSTRIAL BYPRODUCT  
REFERENCE COPY

DOCKET NUMBER <b>030-04736</b>		MAIL CONTROL NO. <b>42954</b>	DATE REQUEST REC'D <b>11/29/73</b>	PROGRAM CODE (PRIMARY) <b>03120</b>	
SECONDARY PROGRAM CODES:					
#1	#2	#3	#4	#5	
INDIVIDUAL LICENSEES	NAME		NAME		
	NAME		NAME		
	NAME		NAME		
ORGANIZATION LICENSEES	ORGANIZATION NAME <b>Grace &amp; Co., W. R.</b>				
	DEPARTMENT OR BUREAU <b>Polyfibron Division</b>				
	TYPE OF ORGANIZATION <input type="checkbox"/> U. S. GOVERNMENT AGENCY <input type="checkbox"/> EDUCATIONAL INSTITUTION <input type="checkbox"/> MEDICAL INSTITUTION <input checked="" type="checkbox"/> INDUSTRY <input type="checkbox"/> OTHER				
ADDRESS BUILDING, STREET <b>Harmony Street</b>			CITY <b>Adams</b>	STATE <b>MA</b>	ZIP CODE <b>01220</b>
BYPRODUCT		CHEMICAL OR PHYSICAL FORM			POSSESSION LIMIT
[Change H <sup>2</sup> ] A Strontium 90		activity A sealed source (Tromble S-1A)			November 30, 1978 A 10.3 millicuries
A To be used in LFE (Tromble) BG-1A beta gauge for measurement of coated textiles					

- (12)  
(1)  
(7) H.A. Johnson  
(19)  
(11) out to include R3 Region I the supplier  
(11) the supplier  
(16) app November 27, 1973

MAIL TO:

Johnson

DATE MAILED

REVIEWER

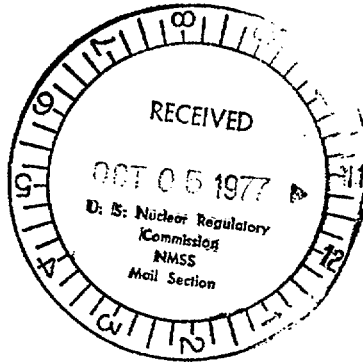
DATE COMPLETED

12/1/73 1/30/73

LICENSE CONTROL FORM

18. APPLICANT <b>Dewey and Almy Chemical Division W.R. Grace and Company</b>			01. PROG. CODE <b>614</b>		03. LICENSE NO. <b>20-13014-1</b>		06. AMDT. <b>NEW</b>		09. TASK NO. <b>05906</b>		12. CONTROL NO. <b>05906</b>				
21. STREET OR BUILDING <b>Harmony Street</b>			63. ASG TO <b>REB</b>		42. PURPOSE OF TASK IN FIELD 09* <b>New License</b>										
24. CITY OR POST OFFICE <b>Adams</b>		27. STATE <b>MASS</b>		30. ZIP <b>01220</b>		33. DATE REC'D YEAR MO. DAY <b>68 10 11</b>		36. DATE ISSUED YEAR MO. DAY <b>68 11 01</b>		39. EXPIRATION DATE YEAR MO. DAY <b>73 10 30</b>					
57. FORM OF THE COMMUNICATION FROM APPLICANT ( ) LETTER ( ) APPLICATION DATED:										YEAR <b>68</b>		MO. <b>10</b>		DAY <b>9</b>	
BYPRODUCT			CHEMICAL OR PHYSICAL FORM						POSS. LIMIT						
Strontium 90			A sealed source (Tracerlab S-1A)						A 15 millicuries						
To be used in Tracerlab Model BG-1A beta gauge for materials measurement															
<p>Item 5 Reference No <u>20-3656-1</u></p> <p>(1a) <u>David R. Beckerman</u></p> <p>(1b) <u>Tracerlab</u></p> <p>(1c) <u>Tracerlab</u></p> <p>(1d) <u>gyp Oct. 9, 1968</u></p> <p>a reissue license previously issued to Dewey &amp; Almy, Inc. Expired &amp; closed out in error. RCB</p> <p>see also Premord Corporation 20-03656-02</p>															
MAIL TO: <u>Beckerman</u>				DATE MAILED: <b>NOV 1 1968</b>				REVIEWER: <u>RCB</u>		DATE COMPLETED: <u>11/1/68</u>					

GRACE



**Polyfibron Division**

Industrial Chemicals Group  
W.R. Grace & Co.  
Harmony Street  
Adams, Mass. 01220

(413) 743-0546

September 30, 1977

U. S. Atomic Energy Commission  
Materials Branch  
Directorate of Licensing  
Washington, D. C. 20545

Dear Sirs:

Please find two copies of our application for the renewal of License No. 20-13014-01 Amendment No. 01 for a byproduct material. Thank you for your prompt attention to this request.

Very truly yours,

W. R. GRACE & CO.

*Henry A. Johnson*  
Henry A. Johnson  
Technical Supt.

HAI:sml  
Enclosures

COPIES SENT TO CEE OF  
INSPECTION AND ENFORCEMENT

ITEM # 61

90600 B/60  
~~90229~~ VOID  
②

Form AEC-313  
(2-73)  
10 CFR 30

UNITED STATES ATOMIC ENERGY COMMISSION  
**APPLICATION FOR BYPRODUCT MATERIAL LICENSE**

Form approved  
Budget Bureau No. 38-80027

**INSTRUCTIONS.**—Complete Items 1 through 16 if this is an initial application or an application for renewal of a license. Information contained in previous applications filed with the Commission with respect to Items 8 through 15 may be incorporated by reference provided references are clear and specific. Use supplemental sheets where necessary. Item 16 must be completed on all applications. Mail two copies to: U.S. Atomic Energy Commission, Washington, D.C., 20545, Attention: Materials Branch, Directorate of Licensing. Upon approval of this application, the applicant will receive an AEC Byproduct Material License. An AEC Byproduct Material License is issued in accordance with the general requirements contained in Title 10, Code of Federal Regulations, Part 30, and the Licensee is subject to Title 10, Code of Federal Regulations, Part 20, and the license fee provisions of Title 10, Code of Federal Regulations, Part 170. The license fee category should be stated in Item 16 and the appropriate fee enclosed. (See Note in Instruction Sheet).

<b>1. (a) NAME AND STREET ADDRESS OF APPLICANT.</b> (Institution, firm, hospital person, etc. include ZIP Code and telephone number.)  W. R. Grace & Company Harmony Street Adams, Massachusetts 01220		<b>(b) STREET ADDRESS(ES) AT WHICH BYPRODUCT MATERIAL WILL BE USED.</b> (If different from 1(a). include ZIP Code.)	
<b>2. DEPARTMENT TO USE BYPRODUCT MATERIAL</b>  Textile coating department		<b>3. PREVIOUS LICENSE NUMBER(S).</b> (If this is an application for renewal of a license, please indicate and give number.)  Renewal of License No. 20-13014-01 Amendment No. 01	
<b>4. INDIVIDUAL USER(S).</b> (Name and title of individual(s) who will use or directly supervise use of byproduct material. Give training and experience in Items 8 and 9.)  H. A. Johnson		<b>5. RADIATION PROTECTION OFFICER.</b> (Name of person designated as radiation protection officer if other than individual user. Attach resume of his training and experience as in Items 8 and 9.)  H. A. Johnson	
<b>6. (a) BYPRODUCT MATERIAL.</b> (Elements and mass number of each.)  A. Strontium 90		<b>(b) CHEMICAL AND/OR PHYSICAL FORM AND MAXIMUM NUMBER OF MILLICURIES OF EACH CHEMICAL AND/OR PHYSICAL FORM THAT YOU WILL POSSESS AT ANY ONE TIME.</b> (If sealed source(s), also state name of manufacturer, model number, number of sources and maximum activity per source.)  A. Sealed Source (Tracer lab S-1A)  A. 10.3 millicuries	

**7. DESCRIBE PURPOSE FOR WHICH BYPRODUCT MATERIAL WILL BE USED.** (If byproduct material is for "human use," supplement A (Form AEC-313a) must be completed in lieu of this item. If byproduct material is in the form of a sealed source, include the make and model number of the storage container and/or device in which the source will be stored and/or used.)

To be used in LFE (Tracer lab) BG-1A beta gauge  
for measurement of coated textiles.

90600

90229

**TRAINING AND EXPERIENCE OF EACH INDIVIDUAL NAMED IN ITEM 4** (Use supplemental sheets if necessary)

8. TYPE OF TRAINING	WHERE TRAINED	DURATION OF TRAINING	ON THE JOB (Circle answer)	FORMAL COURSE (Circle answer)
a. Principles and practices of radiation protection .....	All radiological services are to be performed by L.F.E.		Yes No	Yes No
b. Radioactivity measurement standardization and monitoring techniques and instruments .....			Yes No	Yes No
c. Mathematics and calculations basic to the use and measurement of radioactivity ..			Yes No	Yes No
d. Biological effects of radiation .....			Yes No	Yes No

**9. EXPERIENCE WITH RADIATION.** (Actual use of radioisotopes or equivalent experience.)

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
		All radiological services are to be performed by L.F.E.		

**10. RADIATION DETECTION INSTRUMENTS.** (Use supplemental sheets if necessary.)

TYPE OF INSTRUMENTS (Include make and model number of each)	NUMBER AVAILABLE	RADIATION DETECTED	SENSITIVITY RANGE (mr/hr)	WINDOW THICKNESS (mg/cm <sup>2</sup> )	USE (Monitoring, surveying, measuring)
Provided by L.F.E.					

**11. METHOD, FREQUENCY, AND STANDARDS USED IN CALIBRATING INSTRUMENTS LISTED ABOVE.**

Calibrated by L.F.E.

**12. FILM BADGES, DOSIMETERS, AND BIO-ASSAY PROCEDURES USED.** (For film badges, specify method of calibrating and processing, or name of supplier.)

Not required.

**INFORMATION TO BE SUBMITTED ON ADDITIONAL SHEETS IN DUPLICATE**

13. FACILITIES AND EQUIPMENT. Describe laboratory facilities and remote handling equipment, storage containers, shielding, fume hoods, etc. Explanatory sketch of facility is attached. (Circle answer) Yes No Not required.

14. RADIATION PROTECTION PROGRAM. Describe the radiation protection program including control measures. If application covers sealed sources, submit leak testing procedures where applicable, name, training, and experience of person to perform leak tests, and arrangements for performing initial radiation survey, servicing, maintenance and repair of the source.

Provided by L.F.E.

15. WASTE DISPOSAL. If a commercial waste disposal service is employed, specify name of company. Otherwise, submit detailed description of methods which will be used for disposing of radioactive wastes and estimates of the type and amount of activity involved.

Provided by L.F.E.

**CERTIFICATE (This item must be completed by applicant)**

16. 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 30; AND THAT ALL INFORMATION CONTAINED HEREIN, INCLUDING ANY SUPPLEMENTS ATTACHED HERETO, IS TRUE AND CORRECT TO THE BEST OF OUR KNOWLEDGE AND BELIEF.

License Fee Category \$ \_\_\_\_\_

Fee Enclosed \$ \_\_\_\_\_

Date September 30, 1977

SS 7 MC E 100 AL W. R. Grace & Co.

Applicant named in item 1

By: Henry A. Johnson, P.E.

Henry A. Johnson, P.E.

Technical Superintendent

Title of certifying official

UNITED STATES ATOMIC ENERGY COMMISSION  
**APPLICATION FOR BYPRODUCT MATERIAL LICENSE**

**INSTRUCTIONS.**—Complete Items 1 through 16 if this is an initial application or an application for renewal of a license. Information contained in previous applications filed with the Commission with respect to Items 8 through 15 may be incorporated by reference provided references are clear and specific. Use supplemental sheets where necessary. Item 16 must be completed on all applications. Mail two copies to: U.S. Atomic Energy Commission, Washington, D.C., 20545, Attention: Isotopes Branch, Division of Materials Licensing. Upon approval of this application, the applicant will receive an AEC Byproduct Material License. An AEC Byproduct Material License is issued in accordance with the general requirements contained in Title 10, Code of Federal Regulations, Part 30, and the Licensee is subject to Title 10, Code of Federal Regulations, Part 20.

<b>1. (a) NAME AND STREET ADDRESS OF APPLICANT.</b> (Institution, firm, hospital, person, etc. Include ZIP Code.)  W. R. Grace & Co. Polyfibron Division Harmony Street Adams, Mass. 01220		<b>(b) STREET ADDRESS(ES) AT WHICH BYPRODUCT MATERIAL WILL BE USED.</b> (If different from 1 (a). Include ZIP Code.)
<b>2. DEPARTMENT TO USE BYPRODUCT MATERIAL</b>  Textile Coating, Department 14		<b>3. PREVIOUS LICENSE NUMBER(S).</b> (If this is an application for renewal of a license, please indicate and give number.)  20-13014-01
<b>4. INDIVIDUAL USER(S).</b> (Name and title of individual(s) who will use or directly supervise use of byproduct material. Give training and experience in Items 8 and 9.)  H. A. Johnson		<b>5. RADIATION PROTECTION OFFICER</b> (Name of person designated as radiation protection officer if other than individual user. Attach resume of his training and experience as in Items 8 and 9.)  See Paragraph 14
<b>6. (a) BYPRODUCT MATERIAL.</b> (Elements and mass number of each.)  Strontium 90	<b>(b) CHEMICAL AND/OR PHYSICAL FORM AND MAXIMUM NUMBER OF MILLICURIES OF EACH CHEMICAL AND/OR PHYSICAL FORM THAT YOU WILL POSSESS AT ANY ONE TIME.</b> (If sealed source(s), also state name of manufacturer, model number, number of sources and maximum activity per source.)  Strontium 90 One sealed source 10.3 millicuries  Serial No. 335 Source Model S2A.2 LFE Corporation (Tracer Lab Inc.)	

**7. DESCRIBE PURPOSE FOR WHICH BYPRODUCT MATERIAL WILL BE USED.** (If byproduct material is for "human use," supplement A (Form AEC-313a) must be completed in lieu of this item. If byproduct material is in the form of a sealed source, include the make and model number of the storage container and/or device in which the source will be stored and/or used.)

To be used in a LFE Corp. Gauge Model BG-1A  
Serial #601 source housing for the Beta Gauge  
measurement of coated textiles

**COPIES**  
SENT TO COMPLIANCE

42954

# TRAINING AND EXPERIENCE OF EACH INDIVIDUAL NAMED IN ITEM 4 (Use supplemental sheets if necessary)

8. TYPE OF TRAINING	WHERE TRAINED	DURATION OF TRAINING	ON THE JOB (Circle answer)	FORMAL COURSE (Circle answer)
a. Principles and practices of radiation protection			Yes No	Yes No
b. Radioactivity measurement standardization and monitoring techniques and instruments			Yes No	Yes No
c. Mathematics and calculations basic to the use and measurement of radioactivity			Yes No	Yes No
d. Biological effects of radiation			Yes No	Yes No

## 9. EXPERIENCE WITH RADIATION. (Actual use of radioisotopes or equivalent experience.)

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE

## 10. RADIATION DETECTION INSTRUMENTS. (Use supplemental sheets if necessary.)

TYPE OF INSTRUMENTS (Include make and model number of each)	NUMBER AVAILABLE	RADIATION DETECTED	SENSITIVITY RANGE (mr/hr)	WINDOW THICKNESS (mg/cm <sup>2</sup> )	USE (Monitoring, surveying, measuring)

## 11. METHOD, FREQUENCY, AND STANDARDS USED IN CALIBRATING INSTRUMENTS LISTED ABOVE.

## 12. FILM BADGES, DOSIMETERS, AND BIO-ASSAY PROCEDURES USED. (For film badges, specify method of calibrating and processing, or name of supplier.)

## INFORMATION TO BE SUBMITTED ON ADDITIONAL SHEETS IN DUPLICATE

13. FACILITIES AND EQUIPMENT. Describe laboratory facilities and remote handling equipment, storage containers, shielding, fume hoods, etc. Explanatory sketch of facility is attached. (Circle answer) Yes No

14. RADIATION PROTECTION PROGRAM. Describe the radiation protection program including control measures. If application covers sealed sources, submit leak testing procedures where applicable, name, training, and experience of person to perform leak tests, and arrangements for performing initial radiation survey, servicing, maintenance and repair of the source. LFE Field Engineer will perform 6 month radiation checks on the equipment as well as servicing and maintenances.

15. WASTE DISPOSAL. If a commercial waste disposal service is employed, specify name of company. Otherwise, submit detailed description of methods which will be used for disposing of radioactive wastes and estimates of the type and amount of activity involved. If necessary, LFE Corp. will dispose of the source.

## NOTE: CERTIFICATE (This item must be completed by applicant)

16. 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 30, AND THAT ALL INFORMATION CONTAINED HEREIN, INCLUDING ANY SUPPLEMENTS ATTACHED HERETO, IS TRUE AND CORRECT TO THE BEST OF OUR KNOWLEDGE AND BELIEF.

Date November 27, 1973

RECEIVED

Polyfibron Division of  
W. R. Grace & Co.

Applicant named in item 1

By:

Henry A. Johnson

Henry A. Johnson

Technical Superintendent

Title of certifying official

**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.

## APPLICATION FOR BYPRODUCT MATERIAL LICENSE

INSTRUCTIONS.—Complete Items 1 through 16 if this is an initial application. If application is for renewal of a license, complete only Items 1 through 7 and indicate new information or changes in the program as requested in Items 8 through 15. Use supplemental sheets where necessary. Item 16 must be completed on all applications. Mail three copies to: U. S. Atomic Energy Commission, Washington 25, D. C. Attention: Isotopes Branch, Division of Licensing and Regulation. Upon approval of this application, the applicant will receive an AEC Byproduct Material License. An AEC Byproduct Material License is issued in accordance with the general requirements contained in Title 10, Code of Federal Regulations, Part 30 and the Licensee is subject to Title 10, Code of Federal Regulations, Part 20.

1. (a) NAME AND STREET ADDRESS OF APPLICANT. (Institution, firm, hospital, person, etc.)

Dewey and Almy Chemical Division  
W. R. Grace & Co.  
Harmony Street  
Adams, Massachusetts

(b) STREET ADDRESS(ES) AT WHICH BYPRODUCT MATERIAL WILL BE USED. (If different from 1 (a).)

2. DEPARTMENT TO USE BYPRODUCT MATERIAL

Fabric Coater

3. PREVIOUS LICENSE NUMBER(S). (If this is an application for renewal of a license, please indicate and give number.)

License No. 20-3656-1 Renewal

4. INDIVIDUAL USER(S). (Name and title of individual(s) who will use or directly supervise use of byproduct material. Give training and experience in Items 8 and 9.)

David R. Beckerman, Plant Manager

5. RADIATION PROTECTION OFFICER (Name of person designated as radiation protection officer if other than individual user. Attach resume of his training and experience as in Items 8 and 9.)

6. (a) BYPRODUCT MATERIAL. (Elements and mass number of each.)

Strontium-90

(b) CHEMICAL AND/OR PHYSICAL FORM AND MAXIMUM NUMBER OF MILLICURIES OF EACH CHEMICAL AND/OR PHYSICAL FORM THAT YOU WILL POSSESS AT ANY ONE TIME. (If sealed source(s), also state name of manufacturer, model number, number of sources and maximum activity per source.)

Sealed Source Model S-1A

15 Millicuries

7. DESCRIBE PURPOSE FOR WHICH BYPRODUCT MATERIAL WILL BE USED. (If byproduct material is for "human use," supplement A (Form AEC-313a) must be completed in lieu of this item. If byproduct material is in the form of a sealed source, include the make and model number of the storage container and/or device in which the source will be stored and/or used.)

For use in one Tracerlab Model BG-1A Absorption Type Beta Gauge.

05906



## TRAINING AND EXPERIENCE OF EACH INDIVIDUAL NAMED IN ITEM 4 (Use supplemental sheets if necessary)

8. TYPE OF TRAINING	WHERE TRAINED	DURATION OF TRAINING	ON THE JOB (Circle answer)	FORMAL COURSE (Circle answer)
a. Principles and practices of radiation protection	Instructed by Tracerlab.		( Yes ) No	Yes ( No )
b. Radioactivity measurement standardization and monitoring techniques and instruments			Yes ( No )	Yes ( No )
c. Mathematics and calculations basic to the use and measurement of radioactivity			Yes ( No )	Yes ( No )
d. Biological effects of radiation			Yes ( No )	Yes ( No )

## 9. EXPERIENCE WITH RADIATION. (Actual use of radioisotopes or equivalent experience.)

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DETECTION METHOD	TYPE OF USE
Strontium-90		Instructed by Tracerlab		Beta Ray Gauge

## 10. RADIATION DETECTION INSTRUMENTS. (Use supplemental sheets if necessary.)

TYPE OF INSTRUMENTS (Include make and model number of each)	NUMBER AVAILABLE	RADIATION DETECTED	SENSITIVITY RANGE (mr/hr)	WINDOW THICKNESS (mg/cm <sup>2</sup> )	USE (Monitoring, surveying, measuring)

## 11. METHOD, FREQUENCY, AND STANDARDS USED IN CALIBRATING INSTRUMENTS LISTED ABOVE.

## 12. FILM BADGES, DOSIMETERS, AND BIO-ASSAY PROCEDURES USED. (For film badges, specify method of calibrating and processing, or name of supplier.)

## INFORMATION TO BE SUBMITTED ON ADDITIONAL SHEETS

13. FACILITIES AND EQUIPMENT. Describe laboratory facilities and remote handling equipment, storage containers, shielding, fume hoods, etc. Explanatory sketch of facility is attached. (Circle answer) Yes No

14. RADIATION PROTECTION PROGRAM. Describe the radiation protection program including control measures. If application covers sealed sources, submit leak testing procedures where applicable, name, training, and experience of person to perform leak tests, and arrangements for performing initial radiation survey, servicing, maintenance and repair of the source. All leak tests and maintenance performed by Tracerlab

15. WASTE DISPOSAL. If a commercial waste disposal service is employed, specify name of company. Otherwise, submit detailed description of methods which will be used for disposing of radioactive wastes and estimates of the type and amount of activity involved. If necessary, Tracerlab will dispose of the source.

## CERTIFICATE (This item must be completed by applicant)

16. 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 30, AND THAT ALL INFORMATION CONTAINED HEREIN, INCLUDING ANY SUPPLEMENTS ATTACHED HERETO, IS TRUE AND CORRECT TO THE BEST OF OUR KNOWLEDGE AND BELIEF.

Dewey and Almy Chemical Div.

W. R. Grace &amp; Co.

Applicant named in item 1

Date October 9, 1968

By:

David R. Beckerman

Plant Manager

Title of certifying official

**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.

NOV 8 1977

FCRL: PG  
(90600)

W. R. Grace and Company  
Textile Coating Department  
ATTN: H. A. Johnson  
Harmony Street  
Adams, MA 01220

Gentlemen:

This refers to your application dated September 30, 1977, for renewal of License No. 20-13014-01. Although this license does not expire until November 30, 1978, we are happy to consider your request.

Your application provides no information concerning leak testing of the sealed source in the LFE device. If you use a leak test kit, please provide the name of the manufacturer and model number of this kit, and state that leak tests will be conducted at intervals not to exceed six months. If some other individual or company provides leak test services, we will need a complete description of the leak test services to be provided including the names of the individuals who will collect the leak test samples and those who will analyze the results. In addition, we will need information concerning the instrument used to analyze the results, and a sample calculation showing how instrument results are converted to microcuries.

Items 8 and 9 of your application provide no information concerning experience and training in the use of the device authorized by your license. For each individual who will use the device we need information showing their qualifications to use the device; (training by LFE at time of installation, on-the-job training, etc.).

Although Items 10, 13, 14, and 15 appear to indicate that all services of the device authorized by your license are to be provided by LFE we are not certain if this includes all of the services specified in Condition 15 of your license, including removal of the device for return to your supplier. If this is your intent, please specify this. If not, and any of the services specified in Condition 15 of your license, including removal of the device for return to your supplier, will be performed by the W. R. Grace Company we need to know the name of the individuals who will perform each specific service, a description of each specific service to be performed, and a description of the experience and training of the individuals in providing service on the device. If any services are performed involving removals, relocations,

ITEM # 62

B/b1

(2)

and installations, we need a description of the radiation surveys to be performed.

In addition to the above, we need to know your procedures for assuring that the device is in the shielded position to assure that individuals do not enter the radiation beam when repairs or maintenance are performed on or around the equipment on which the device is mounted. If the device shutters are locked or bolted in the closed position, please describe how this is accomplished and identify the individual responsible for enforcing this procedure.

Our review of your application will continue upon receipt of the above information. Please reply in duplicate, and reference Mail Control No. 90600.

Sincerely,

Paul R. Guinn  
Radioisotopes Licensing Branch  
Division of Fuel Cycle and  
Material Safety

CRESS:Willste  
MC#256261  
11/7/77

RLB  
PGuinn:wh  
11/8/77

MAR 8 1978

W. R. Grace and Company  
ATTN: Mr. H. A. Johnson  
Harmony Street  
Adams, MA 01220

Gentlemen:

This refers to your request for renewal of License No. 20-13014-01 and our request for additional information dated Nov. 8, 1977, a copy of which is enclosed. A check of our files indicates that we have not received a response from you to date. If we do not receive a reply within 30 days, it may be necessary to deny your application and terminate your license. Such action would require that you divest yourself of all licensed material.

Sincerely,

Paul R. Guinn  
Radioisotopes Licensing Branch  
Division of Fuel Cycle and  
Material Safety

Enclosure:  
As stated

ITEM #

63

B/62

4/12/78

Henry A. Johnson called + read  
a reply to my letter dated November

8, 1977. Wrote to sent him

Week

Paul Green

6/6/78

Called Johnson.

Said he would send a reply  
immediately

Jack Thompson

7/9/78

ITEM # 64

D

GRACE

19

2408

Polyfibron Division

Industrial Chemicals Group  
W.R. Grace & Co.  
Harmony Street  
Adams, Mass. 01220

(413) 743-0546

June 21, 1978

United States Nuclear Regulatory Commission  
Washington, D. C. 20555

Reference: Mail Control No. 90600

Dear Sirs:

Please find two amended copies of our application for the renewal of License No. 20-13014-01 Amendment No. 01 for a byproduct material. Corrections have been made on our application as suggested by Mr. Paul R. Guinn of the Radioisotopes Licensing Branch Division of Fuel Cycle and Material Safety.

Very truly yours,

W. R. GRACE & CO.

*Henry A. Johnson*  
Henry A. Johnson  
Technical Supt.

HAI:sml  
Enclosures

COPIES SENT TO OFF. OF  
INSPECTION AND ENFORCEMENT

ITEM # 65

B/64

(7)

UNITED STATES ATOMIC ENERGY COMMISSION  
**APPLICATION FOR BYPRODUCT MATERIAL LICENSE**

Form approved  
Budget Bureau No. 36-20027

INSTRUCTIONS.—Complete Items 1 through 16 if this is an initial application or an application for renewal of a license. Information contained in previous applications filed with the Commission with respect to Items 8 through 15 may be incorporated by reference provided references are clear and specific. Use supplemental sheets where necessary. Item 16 must be completed on all applications. Mail two copies to: U.S. Atomic Energy Commission, Washington, D.C., 20545, Attention: Materials Branch, Directorate of Licensing. Upon approval of this application, the applicant will receive an AEC Byproduct Material License. An AEC Byproduct Material License is issued in accordance with the general requirements contained in Title 10, Code of Federal Regulations, Part 30, and the Licensee is subject to Title 10, Code of Federal Regulations, Part 20, and the license fee provisions of Title 10, Code of Federal Regulations, Part 170. The license fee category should be stated in Item 16 and the appropriate fee enclosed. (See Note in Instruction Sheet).

1. (a) NAME AND STREET ADDRESS OF APPLICANT. (Institution, firm, hospital person, etc. Include ZIP Code and telephone number.)

**W. R. Grace & Company  
Harmony Street  
Adams, Massachusetts 01220**

(b) STREET ADDRESS(ES) AT WHICH BYPRODUCT MATERIAL WILL BE USED. (If different from 1(a). Include ZIP Code.)

2. DEPARTMENT TO USE BYPRODUCT MATERIAL

**Textile coating department**

3. PREVIOUS LICENSE NUMBER(S). (If this is an application for renewal of a license, please indicate and give number.)

**Renewal of License No. 20-13014-01  
Amendment No. 01**

4. INDIVIDUAL USER(S). (Name and title of individual(s) who will use or directly supervise use of byproduct material. Give training and experience in Items 8 and 9.)

**H. A. Johnson**

5. RADIATION PROTECTION OFFICER. (Name of person designated as radiation protection officer if other than individual user. Attach resume of his training and experience as in Items 8 and 9.)

**H. A. Johnson**

6. (a) BYPRODUCT MATERIAL. (Elements and mass number of each.)

**A. Strontium 90**

(b) CHEMICAL AND/OR PHYSICAL FORM AND MAXIMUM NUMBER OF MILLICURIES OF EACH CHEMICAL AND/OR PHYSICAL FORM THAT YOU WILL POSSESS AT ANY ONE TIME. (If sealed source(s), also state name of manufacturer, model number, number of sources and maximum activity per source.)

**A. Sealed Source  
(Tracer lab S-1A)**

**A. 10.3 millicuries**

7. DESCRIBE PURPOSE FOR WHICH BYPRODUCT MATERIAL WILL BE USED. (If byproduct material is for "human use," supplement A (Form AEC-313a) must be completed in lieu of this item. If byproduct material is in the form of a sealed source, include the make and model number of the storage container and/or device in which the source will be stored and/or used.)

**To be used in LFE (Tracer lab) BG-1A beta gauge  
for measurement of coated textiles.**

(Continued on reverse side)

# TRAINING AND EXPERIENCE OF EACH INDIVIDUAL NAMED IN ITEM 4

Page Two

## 8. TYPE OF TRAINING

	WHERE TRAINED	DURATION OF TRAINING	ON THE JOB (Circle answer)	FORMAL COURSE (Circle answer)
a. Principles and practices of radiation protection	All radiological services are to be performed by L.F.E. (See item 14)	Training by LFE at time of installation	Yes <input checked="" type="radio"/> No <input type="radio"/>	Yes <input checked="" type="radio"/> No <input type="radio"/> 2408
b. Radioactivity measurement standardization and monitoring techniques and instruments			Yes <input type="radio"/> No <input type="radio"/>	Yes <input type="radio"/> No <input type="radio"/>
c. Mathematics and calculations basic to the use and measurement of radioactivity			Yes <input type="radio"/> No <input type="radio"/>	Yes <input type="radio"/> No <input type="radio"/>
d. Biological effects of radiation			Yes <input type="radio"/> No <input type="radio"/>	Yes <input type="radio"/> No <input type="radio"/>

## 9. EXPERIENCE WITH RADIATION. (Actual use of radioisotopes or equivalent experience.)

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
		All radiological services are to be performed by L.F.E.		

## 10. RADIATION DETECTION INSTRUMENTS. (Use supplemental sheets if necessary.)

TYPE OF INSTRUMENTS (Include make and model number of each)	NUMBER AVAILABLE	RADIATION DETECTED	SENSITIVITY RANGE (mr/hr)	WINDOW THICKNESS (mg/cm <sup>2</sup> )	USE (Monitoring, surveying, measuring)
Provided by L.F.E.					

## 11. METHOD, FREQUENCY, AND STANDARDS USED IN CALIBRATING INSTRUMENTS LISTED ABOVE.

Calibrated by L.F.E.

## 12. FILM BADGES, DOSIMETERS, AND BIO-ASSAY PROCEDURES USED. (For film badges, specify method of calibrating and processing, or name of supplier.)

Not required.

## INFORMATION TO BE SUBMITTED ON ADDITIONAL SHEETS IN DUPLICATE

13. FACILITIES AND EQUIPMENT. Describe laboratory facilities and remote handling equipment, storage containers, shielding, fume hoods, etc. Explanatory sketch of facility is attached. (Circle answer) Yes ☒ No ☐ See attached.

14. RADIATION PROTECTION PROGRAM. Describe the radiation protection program including control measures. If application covers sealed sources, permit leak testing procedures where applicable, name, training, and experience of person to perform leak tests, and arrangements for performing initial radiation survey, servicing, maintenance and repair of the source. See attached

15. WASTE DISPOSAL. If a commercial waste disposal service is employed, specify name of company. Otherwise, submit detailed description of methods which will be used for disposing of radioactive wastes and estimates of the type and amount of activity involved. See attached.

## CERTIFICATE (This item must be completed by applicant)

16. 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 30, AND THAT ALL INFORMATION CONTAINED HEREIN, INCLUDING ANY SUPPLEMENTS ATTACHED HERETO, IS TRUE AND CORRECT TO THE BEST OF OUR KNOWLEDGE AND BELIEF.

License Fee Category \$ \_\_\_\_\_

Fee Enclosed \$ \_\_\_\_\_

Date June 21, 1978

W. R. Grace & Co.

Applicant named in Item 1

By: Henry A. Johnson, P.E.

Henry A. Johnson, P.E.

Technical Superintendent

Title of certifying official

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.



2408

Item 13. Facilities and Equipment - Not required.

Item 14. Radiation Protection Program -

To be provided by L.F.E. Leak tests will be performed at 6 month intervals by L.F.E. When repairs or maintenance are performed on or around the equipment on which the device is mounted the lock switch will be placed in the OFF position. The person responsible for enforcing this procedure is Mr. A. J. Cirone.

Item 15. Waste Disposal - All services will be performed by L.F.E., including removal of the device for return to the supplier.

U. S. NUCLEAR REGULATORY COMMISSION  
MATERIALS LICENSE

Amendment No. 02

Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974 (Public Law 93-438), and Title 10, Code of Federal Regulations, Chapter 1, Parts 30, 31, 32, 33, 34, 35, 36, 40 and 70, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess, and transfer byproduct, source, and special nuclear material designated below; to use such material for the purpose(s) and at the place(s) designated below; to deliver or transfer such material to persons authorized to receive it in accordance with the regulations of the applicable Part(s); and to import such byproduct and source material. This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, as amended, and is subject to all applicable rules, regulations and orders of the Nuclear Regulatory Commission now or hereafter in effect and to any conditions specified below.

Licensee		In accordance with application dated September 30, 1977,
1. W. R. Grace and Company Polyfibron Division		3. License number 20-13014-01 is amended in its entirety to read as follows:
2. Harmony Street Adams, Massachusetts 01220		4. Expiration date July 31, 1983
		5. Docket or Reference No.
6. Byproduct, source, and/or special nuclear material	7. Chemical and/or physical form	8. Maximum amount that licensee may possess at any one time under this license
A. Strontium 90	A. Sealed sources (Tracerlab A. Model S-1A)	Not to exceed 10.3 millicuries per source

## 9. Authorized use:

A. For use in Tracerlab Model PG-1A beta gauge for measurement of coated textiles.

## CONDITIONS

10. Licensed material shall be used only at the licensee's address stated in Item 2 above.

11. The licensee shall comply with the provisions of Title 10, Chapter 1, Code of Federal Regulations, Part 19, "Notices, Instructions and Reports to Workers; Inspections" and Part 20, "Standards for Protection Against Radiation."

12. Licensed material shall be used by, or under the supervision of, H. A. Johnson.

13. Sealed sources containing licensed material shall not be opened or removed from their respective source holders by the licensee.

ITEM #

66

B/KS

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MATERIALS LICENSE

Supplementary Sheet

License Number 20-13014-01

Docket or

Reference No. \_\_\_\_\_

Amendment No. 02

CONDITIONS

(continued)

14. A. (1) Each sealed source containing licensed material, other than Hydrogen-3, with a half-life greater than thirty days and in any form other than gas shall be tested for leakage and/or contamination at intervals not to exceed six months. In the absence of a certificate from a transferor indicating that a test has been made within six months prior to the transfer, a sealed source received from another person shall not be put into use until tested.

(2) The periodic leak test required by this condition does not apply to sealed sources that are stored and not being used. The sources excepted from this test shall be tested for leakage prior to any use or transfer to another person unless they have been leak tested within six months prior to the date of use or transfer.

B. The test shall be capable of detecting the presence of 0.005 microcurie of radioactive material on the test sample. The test sample shall be taken from the sealed source or from the surfaces of the device in which the sealed source is permanently mounted or stored on which one might expect contamination to accumulate. Records of leak test results shall be kept in units of microcuries and maintained for inspection by the Commission.

C. If the test reveals the presence of 0.005 microcurie or more of removable contamination, the licensee shall immediately withdraw the sealed source from use and shall cause it to be decontaminated and repaired or to be disposed of in accordance with Commission regulations. A report shall be filed within 5 days of the test with Region I, U. S. Nuclear Regulatory Commission, Office of Inspection and Enforcement, 631 Park Avenue, King of Prussia, Pennsylvania 19406, describing the equipment involved, the test results, and the corrective action taken.

D. Tests for leakage and/or contamination shall be performed by LFE Corporation or by other persons specifically authorized by the Commission or an Agreement State to perform such services.

15. Installation, relocation, maintenance, repair, and initial radiation survey of devices containing licensed material and installation, replacement, and disposal of sealed sources containing licensed material used in devices shall be performed only by LFE Corporation or by other persons specifically authorized by the Commission or an Agreement State to perform such services.

16. Except as specifically provided otherwise by this license, the licensee shall possess and use licensed material described in Items 6, 7, and 8 of this license in accordance with statements, representations, and procedures contained in applications dated September 30, 1977 and June 21, 1978.

JUL 10 1978

Date \_\_\_\_\_

For the U. S. Nuclear Regulatory Commission

Original Signed By

PAUL R. GUIEN

by Radioisotopes Licensing Branch

Division of Materials and Fuel Cycle

Facility Licensing  
Washington, D. C. 20555

**U. S. ATOMIC ENERGY COMMISSION  
BYPRODUCT MATERIAL LICENSE**

License No. 20-13014-01  
Page 1 of 3 Pages

Amendment No. 01

Pursuant to the Atomic Energy Act of 1954 and Title 10, Code of Federal Regulations, Chapter 1, Parts 30, 32, 33, 34, and 35, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, own, possess, transfer and import byproduct material listed below; and to use such byproduct material for the purpose(s) and at the place(s) designated below. This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, as amended, and is subject to all applicable rules, regulations, and orders of the Atomic Energy Commission now or hereafter in effect and to any conditions specified below.

**Licensee**

1. **W. R. Grace and Company  
Polyfibron Division**
2. **Harmony Street  
Adams, Massachusetts 01220**

In accordance with application dated  
November 27, 1973,

3. License number 20-13014-01 is amended  
in its entirety to read as follows:

4. Expiration date  
November 30, 1978

5. Reference No.

6. Byproduct material  
(element and mass number)

A. Strontium 90

7. Chemical and/or physical  
form

A. Sealed source  
(Tracerlab S-1A)

8. Maximum amount of radioac-  
tivity which licensee may  
possess at any one time

A. 10.3 millicuries

**9. Authorized use**

A. To be used in LFK (Tracerlab) BG-1A beta gauge for measurement of coated  
textiles.

**CONDITIONS**

10. Byproduct material shall be used only at the licensee's address stated in  
Item 2 above.
11. The licensee shall comply with the provisions of Title 10, Chapter 1, Code of  
Federal Regulations, Part 19, "Notices, Instructions and Reports to Workers;  
Inspections" and Part 20, "Standards for Protection Against Radiation."
12. Byproduct material shall be used by, or under the supervision of, H. A. Johnson.
13. Sealed sources containing byproduct material shall not be opened or removed  
from their respective source holders by the licensee.

U. S. ATOMIC ENERGY COMMISSION  
BYPRODUCT MATERIAL LICENSE  
Supplementary Sheet

Page 2 of 3 Pages

License Number 20-13014-01

Amendment No. 01

(continued)

CONDITIONS

14. A(1) Each sealed source containing byproduct material, other than Hydrogen 3, with a half-life greater than thirty days and in any form other than gas shall be tested for leakage and/or contamination at intervals not to exceed six months. In the absence of a certificate from a transferor indicating that a test has been made within six months prior to the transfer, the sealed source shall not be put into use until tested.
- (2) The periodic leak test required by this condition does not apply to sealed sources that are stored and not being used. The sources excepted from this test shall be tested for leakage prior to any use or transfer to another person unless they have been leak tested within six months prior to the date of use or transfer.
- B. The test shall be capable of detecting the presence of 0.005 microcurie of radioactive material on the test sample. The test sample shall be taken from the sealed source or from the surfaces of the device in which the sealed source is permanently mounted or stored on which one might expect contamination to accumulate. Records of leak test results shall be kept in units of microcuries and maintained for inspection by the Commission.
- C. If the test reveals the presence of 0.005 microcurie or more of removable contamination, the licensee shall immediately withdraw the sealed source from use and shall cause it to be decontaminated and repaired or to be disposed of in accordance with Commission regulations. A report shall be filed within 5 days of the test with the USAEC, Region I, Directorate of Regulatory Operations, 631 Park Avenue, King of Prussia, Pennsylvania 19406, describing the equipment involved, the test results, and the corrective action taken.
- D. Tests for leakage and/or contamination shall be performed by the supplier or by other persons specifically authorized by the Commission or an Agreement State to perform such services.

U. S. ATOMIC ENERGY COMMISSION  
BYPRODUCT MATERIAL LICENSE

Page 3 of 3 Pages

Supplementary Sheet

License Number 20-13014-01

Amendment No. 01

(continued)

CONDITIONS

15. Installation, relocation, maintenance, repair, and initial radiation survey of devices containing byproduct material and installation, replacement, and disposal of sealed sources containing byproduct material used in devices shall be performed only by the supplier or by other persons specifically authorized by the Commission or an Agreement State to perform such services.
16. Except as specifically provided otherwise by this license, the licensee shall possess and use byproduct material described in Items 6, 7, and 8 of this license in accordance with statements, representations, and procedures contained in application dated November 27, 1973.

For the U. S. Atomic Energy Commission

Original Signed By

Robert E. Brinkman

by Materials Branch

Directorate of Licensing  
Washington, D. C. 20545

Date NOV 30 1973

*REB*  
*Rel/cash*

*9*

*1*

U. S. ATOMIC ENERGY COMMISSION  
BYPRODUCT MATERIAL LICENSE

Page 1 of 3 Pages

Pursuant to the Atomic Energy Act of 1954 and Title 10, Code of Federal Regulations, Chapter 1, Parts 30, 32, 33, 34, and 35, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, own, possess, transfer and import byproduct material listed below; and to use such byproduct material for the purpose(s) and at the place(s) designated below. 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 and to any conditions specified below.

Licensee 1. Dewey and Almy Chemical Division W. R. Grace and Company 2. <del>Harmony Street</del> Adams, Massachusetts 01220			3. License number 20-13014-01 4. Expiration date November 30, 1973 5. Reference No. 20-03656-01
6. Byproduct material (element and mass number) A. Strontium 90	7. Chemical and/or physical form A. Sealed Source (Tracerlab S-1A)	8. Maximum amount of radioac- tivity which licensee may possess at any one time A. 15 millicuries	
9. Authorized use A. To be used in Tracerlab Model BG-1A beta gauge for materials measurement.			

CONDITIONS

10. Byproduct material may only be used at the licensee's address stated in Item 2 above.
11. The licensee shall comply with the provisions of Title 10, Part 20, Code of Federal Regulations, Chapter 1, "Standards for Protection Against Radiation."
12. Byproduct material shall be used by, or under the supervision of, David R. Beckerman.
13. Sealed sources containing byproduct material shall not be opened or removed from their respective source holders by the licensee.

U. S. ATOMIC ENERGY COMMISSION  
BYPRODUCT MATERIAL LICENSE  
Supplementary Sheet

Page 2 of 3 Pages

License Number 20-13014-01

(Continued)

CONDITIONS

14. A. Each sealed source containing byproduct material, other than Hydrogen 3, with a half-life greater than thirty days and in any form other than gas shall be tested for leakage and/or contamination at intervals not to exceed six months. In the absence of a certificate from a transferor indicating that a test has been made within six months prior to the transfer, the sealed source shall not be put into use until tested.
- B. The test shall be capable of detecting the presence of 0.005 microcurie of radioactive material on the test sample. The test sample shall be taken from the sealed source or from the surfaces of the device in which the sealed source is permanently mounted or stored on which one might expect contamination to accumulate. Records of leak test results shall be kept in units of microcuries and maintained for inspection by the Commission.
- C. If the test reveals the presence of 0.005 microcurie or more of removable contamination, the licensee shall immediately withdraw the sealed source from use and shall cause it to be decontaminated and repaired or to be disposed of in accordance with Commission regulations. A report shall be filed within 5 days of the test with the Director, Division of Materials Licensing, U. S. Atomic Energy Commission, Washington, D. C., 20545, describing the equipment involved, the test results, and the corrective action taken. A copy of such report shall also be sent to the Director, Region I, Division of Compliance, USAEC, 970 Broad Street, Newark, New Jersey, 07102.
- D. Tests for leakage and/or contamination shall be performed by Tracerlab or by other persons specifically authorized by the Commission or an Agreement State to perform such services.



U. S. ATOMIC ENERGY COMMISSION  
BYPRODUCT MATERIAL LICENSE

Page 3 of 3 Pages

Supplementary Sheet

License Number 20-13014-01

(Continued)

CONDITIONS

15. Installation, relocation, maintenance, repair, and initial radiation survey of devices containing byproduct material and installation, replacement, and disposal of sealed sources containing byproduct material used in devices shall be performed only by Tracerlab or by other persons specifically authorized by the Commission or an Agreement State to perform such services.
16. Except as specifically provided otherwise by this license, the licensee shall possess and use byproduct material described in Items 6, 7, and 8 of this license in accordance with statements, representations, and procedures contained in application dated October 9, 1968.

For the U. S. Atomic Energy Commission

Original Signed by  
Robert E. Brinkman

Date NOV 1 1968

by Isotopes Branch  
Division of Materials Licensing  
Washington, D. C. 20545

REB

REB/cjk

status 4

LICENSE STATUS CHANGE CONTROL

Docket No. 030-04736

License No. 20-13014-A

Expiration Date: 7/31/83

Name: W.R. Grace

Address: Poly fibron Division  
Harmony Street  
Adams, Massachusetts

Licensee Contact: Henry A Johnson  
(Name and Title)

Date of Contact: 9/12/83

Technical Superintendent

Telephone No. 413-743-0546

Basis for retirement or termination material returned to supplier  
LFE Corp for disposal confirmed in LTR 9/12/83

Verification:

- a) Form 314 or Equivalent
- b) L/N LFE has received material and is authorized for it.
- c) Close-out survey by licensee required.
- d) Close-out survey by NRC required.

<u>Yes</u>	No
<u>Yes</u>	<u>No</u>
Yes	<u>No</u>
Yes	<u>No</u>

Action to be taken:

- a) Retire/terminate license (circle one)
- b) Change to status "4" on computer
- c) Remove from Docket Room after 12/83 date
- d) L/N \_\_\_\_\_ replaces/supersedes this one

<u>Yes</u>	No
<u>Yes</u>	No
<u>Yes</u>	No
Yes	<u>No</u>

cc:  
Expired License File  
New License File (L/N)

Reviewer J. Johnson Date 9/22/83

Section Chief E. J. Glen Date 9/22/83

Entered ADP \_\_\_\_\_ Date \_\_\_\_\_

Status "4" verified \_\_\_\_\_ Date \_\_\_\_\_

ITEM # 67

B166

## ORNL SITES - SUMMARY

License No.: SNM-00929 ORNL Score: 17  
Docket No.: 070-00980  
Licensee: W.R. Grace and Company Review Status: Complete  
Site Address(es): HMS Laboratory P.O. Box 188  
868 Black Oak Ridge Road Pompton Plains, New Jersey  
Wayne, New Jersey  
Site Contact: none  
Telephone No.: none  
SDMP Site: no  
Related License(s): R-00132, R-00196  
NRC Reviewer: Andrew J. Schwartz  
Review Abstract: The HMS Laboratory is part of the DOE's Pompton Plains, New Jersey site. Further action by the ORNL Identified Sites Program is not necessary.  
Recommendations: None.

Summary: License No. SNM-00929 was issued on October 12, 1965 authorizing possession and use of up to 250 grams of contained U-235 in gas centrifuge technology for isotope separation. A radioactive materials disposition document from the licensee dated September 19, 1968 states that all radioactive will be or has been transferred to the Oak Ridge Gaseous Diffusion facility prior to license expiration. The license expired on October 31, 1968.

The HMS Laboratory is part of the Department of Energy (DOE) site at Pompton Plains, New Jersey. Since DOE has responsibility to remediate this site as described in U.S. DOE Project Plan (Revision 3), Formerly Utilized Sites Remedial Action Program, April 1992, no further action by the ORNL Identified Sites Program is necessary.

Reviewed by:  Date 2/2/95

Approved by:  Date 2-6-95

February 2, 1995

ITEM # 68

5

EXPERT SYSTEM LICENSE EVALUATION  
REPORT FOR LICENSE SNM-00929

NAME OF LICENSEE: W.R. GRACE & COMPANY (HMS LABORATORY)

LISTED SITE: HMS LABORATORY, WAYNE, NEW JERSEY

--- TYPE OF ACTIVITY OR FACILITY: SNM - OTHER MANUFACTURE OR TESTING

DESCRIPTION OF FIRST SITE AT WHICH SNM-00929 WAS USED  
W.R. GRACE & COMPANY  
HMS LABORATORY  
WAYNE, NEW JERSEY

Description of LICENSEE ACTIVITY UNDER THIS LICENSE

THE LICENSEE WAS USING U-235 AS A GAS CENTRIFUGE FEED AND AS MASS  
SPECTROMETER STANDARDS.

The final score for SITE CONTAMINATION is: 17

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

--Information on type and form of materials--

--Authorized Material--

--Form Authorized--

U-235-BELOW 500 GMS

Loose or Any

AMOUNT OR ACTIVITY OF THOSE MATERIALS CONTRIBUTING TO INITIAL SCORE:

---Material--      -SLD/LOOSE--      POSS. LIMIT      Unit      -Score-

U-235-BELOW 500 GMS	LOOSE	355.00	GM	17.7
------------------------	-------	--------	----	------

INITIAL SITE SCORE, based on LOOSE material possession limits: : 18

FINAL DECISION FOR LOOSE MATERIALS:  
POTENTIAL SITE CONTAMINATION:  
PRIORITY SITE FOR REVIEW

The final SCORE for SITE CONTAMINATION is: 17

SEQUENCE OF RECORDED REASONING

1. There was one identifiable site with this license.
2. FIRST SITE: Possible building contamination, but fairly low likelihood or low level only. Score not changed.
3. FIRST SITE: Description of activity was inadequate to determine whether outdoor contamination at the site was a likelihood. No change in score

4. FIRST SITE: There was no evidence or reason to suspect the occurrence of NONROUTINE or EPISODIC releases to the environment or outdoors at this site. Score not changed.
5. FIRST SITE: There was PROBABLE use of glove boxes, hoods, or protective clothing
6. FIRST SITE: Possible inappropriate disposal or abandonment of contaminated material from glove boxes, hoods, or equipment.  
Score = score \* 1.1
7. FIRST SITE: There was possible or limited generation of contaminated material from machinery used in the operation.  
Score = score \* 1.2.
8. FIRST SITE: Possible inappropriate disposal or abandonment of contaminated material from machinery (cloths, parts, etc).  
Score = score \* 1.1
9. FIRST SITE: There was limited generation of solid waste in the operation. Score = score \* 1.2
10. FIRST SITE: Contaminated solid waste was probably appropriately disposed. Score = score \* 1.0
11. FIRST SITE: There was no available information indicating onsite disposal of material or waste at the site. Score not changed
12. FIRST SITE: There is evidence in the file indicating that turnover of the materials under this license was not frequent. This 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
13. FIRST SITE: There was adequate documentation of the disposition of materials. Score = score \* 0.7
14. FIRST SITE: Because the score for this site is below 20 at this point, a closeout survey would not necessarily have been warranted.
15. 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
16. 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

---

THE LICENSEE WAS USING U-235 AS A GAS CENTRIFUGE FEED AND AS MASS SPECTROMETER STANDARDS.

---

Reviewer's comments concerning potential TURNOVER OF MATERIALS  
THE AMOUNT OF MATERIAL USED IN THE OPERATION WAS ON THE ORDER OF GRAMS. THIS MATERIAL WAS COLLECTED AND REUSED, WHICH INDICATED THAT THE TURN OVER RATE WAS SLOW. THE CERTIFICATE OF DISPOSITION INDICATED THAT ALL MATERIALS WERE RETURNED TO THE OAK RIDGE GASEOUS DIFFUSION PLANT IN OAK RIDGE, TENNESSEE.

---

Reviewer's comments concerning potential GENERATION OF WASTE  
THE CENTRIFUGE WAS MORE THAN LIKELY OPERATED UNDER A VACUUM. HOWEVER, THERE WAS NO INDICATION THAT THE CENTRIFUGE WAS DECONTAMINATED AFTER PRODUCTION CEASED. THE U-235 MATERIAL WAS USED IN SMALL QUANTITIES ONLY. THIS MATERIAL WAS COLLECTED AND REUSED.

---

- GENERAL COMMENTS ENTERED BY THE REVIEWER CONCERNING THE EVALUATION -  
-- THE LICENSEE WAS AUTHORIZED 340 GRAMS OF U-235 FOR USE IN CENTRIFUGE  
-- RESEARCH AND DEVELOPMENT AND FOR USE AS MASS SPECTROMETRY STANDARDS.  
-- THE MATERIALS WERE TRANSFERRED TO THE OAK RIDGE GASEOUS DIFFUSION  
-- PLANT IN OAK RIDGE, TENNESSEE PRIOR TO THE EXPIRATION OF THE LICENSE.  
--

---

END OF COMMENTS FOR LICENSE EVALUATION

---

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

Docket Number: 70-00980                      REGION RESPONSIBLE: I  
LICENSEE NAME: W.R. GRACE & COMPANY (HMS LABORATORY)  
STREET ADDRESS: P.O. BOX 106    City: POMPTON PLAINS    Zip: 07444  
FIPS state code (principal operation): NJ  
Site used: HMS LABORATORY, WAYNE, NEW JERSEY  
Disposition information present: CERTIFICATE  
Matl. Transfrd to: OAK RIDGE GASEOUS DIFFUSION PLANT  
License to which transferred: UNKNOWN  
This license was listed as expired on 10/31/68

APPLICATION INFORMATION

There WAS a licensee application contained in the file  
The application contained some information on material use.

GENERAL INVENTORY RECORD COMMENTS:  
U-235 USED AS A CENTRIFUGE FEED AND AS STANDARDS.

JOB NUMBER: 1710    BOX NUMBER: 17

---

COMMENTS ON INVENTORY ENTRY FOR SNM-00929

---

ACCORDING TO THE CERTIFICATE OF DISPOSITION, THE MATERIAL WAS RETURNED TO  
THE OAK RIDGE GASEOUS DIFFUSION PLANT FOR DISPOSAL.

---

Date of last evaluation or revision: 06/22/94

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) <input checked="" type="checkbox"/> (a) New license <input type="checkbox"/> (b) Amendment to License No. _____ <input type="checkbox"/> (c) Renewal of License No. _____ <input type="checkbox"/> (d) Previous License No. _____		2. NAME OF APPLICANT HMS Laboratory, W. R. Grace & Company	
		3. PRINCIPAL BUSINESS ADDRESS HMS Laboratory, W. R. Grace & Company P. O. Box 188, Pompton Plains, N.J.	
4. STATE THE ADDRESS(ES) AT WHICH SOURCE MATERIAL WILL BE POSSESSED OR USED HMS Laboratory, W. R. Grace & Company 868 Black Oak Ridge Road, Wayne, New Jersey			
5. BUSINESS OR OCCUPATION Chemical Research		6. (a) IF APPLICANT IS AN INDIVIDUAL, STATE CITIZENSHIP	(b) AGE
7. DESCRIBE PURPOSE FOR WHICH SOURCE MATERIAL WILL BE USED Research and development in gas centrifuge technology for isotope separation. No production is involved.			
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 Hexafluoride	Gas and Solid 66 w/o U	77 lbs. U
URANIUM DEPLETED IN THE U-235 ISOTOPE	Uranium Hexafluoride	Gas and Solid 66 w/o U	200 lbs. U
THORIUM			
(e) MAXIMUM TOTAL QUANTITY OF SOURCE MATERIAL YOU WILL HAVE ON HAND AT ANY TIME (in pounds) Natural and depleted uranium source material containing not more than a total of 250 grams of U-235			
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 Supplemental Sheet, Item 9			
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). The laboratory will be under the supervision of Richard M. Mandle, former manager of the W. R. Grace rare earth-thorium processing plant. He has had 17 years experience in handling radioactive source materials.			
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 Supplemental Sheet, Item 11a			
(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 Supplemental Sheet, Item 11b			

ITEM # 69 3045

5



Item 9: The uranium hexafluoride will be fed in gram quantities to laboratory gas centrifuges to study the isotopic separative efficiency of these machines. The uranium source material will be handled in a vacuum system either as a gas or as a condensed solid, which minimizes health physics hazards. The laboratory area, restricted to authorized personnel, is properly ventilated with ample safety equipment.

Item 11a: Radiation Detection and Related Instruments

Sampling: Staplex Hi-Volume Air Sampler, Model w/TFA #41 filter.

Detection: Anton Electronics Corporation Survey Meter, Model #5, sensitivity range 0-50 mr/hr or 0-30,000 cpm; detects beta and gamma.

Nuclear Corporation of America DR-15 Gas Flow Windowless Proportional Counter; 0- 100,000 dpm detects alpha, beta and gamma.

Radiation Instrument Development Laboratory  
Model 49-54 Scaler.

Analysis: Applied Physics Corporation, MAT Mass Spectrometer for isotopic analysis.

Item 11b: Methods, Frequency and Standards Used in Calibrating Instruments Listed in 11a:

Methods: The Anton Survey Meter has a built-in standard source and is checked against a standard thorium oxide sample (gamma only).

The Nuclear Corporation Proportional Counter is calibrated by inserting National Bureau of Standards  $U_3O_8$  source No. 909-7 (21.8 dps) into the chamber and counting at the proper voltage.

Frequency: The instruments are calibrated against these primary standards at least semi-annually and with secondary standards at each use.

Item 12b: In the event of an accidental release (see attached sheet "Emergency Procedures in the Event of Hexafluoride Release") escaped uranium hexafluoride will be immediately flushed with water to hydrolyze the uranium and minimize airborne activity. The wash water will be diverted into an approved radiological waste treatment plant where the source material will be removed. Safety equipment is available to protect personnel during an emergency of this type.

Item 12b: Continued

EMERGENCY PROCEDURES IN THE EVENT OF HEXAFLUORIDE RELEASE

The design of the facilities and operating procedures are such that the spread of contamination would be minimized in the event of an accident involving radioactive material. If an incident should occur in which source material is released, the following emergency procedures are to be followed:

1. Make a quick estimate of the situation and warn other occupants of the room. If any of the material is airborne hold your breath and retreat immediately to a safe distance.
2. If you have time stop all equipment at master control and do what you can to avoid the spread of contaminating material and set emergency air switch.
3. Remove contaminated clothing and put on a clean laboratory coat kept nearby for such emergency. Thoroughly wash exposed parts of your body.
4. Immediately notify Project Supervisor, and if fire is involved, the Fire Department. Call the Medical Office if medical attention is needed.
5. Evacuate and close off the room, but, unless it is unsafe, remain in the immediate area until you can be checked for contamination.
6. Notify personnel in adjacent areas of the condition. Evacuate these areas if there is any doubt of the spread of contamination.
7. If fire is involved, the Project Supervisor will direct the Fire Department in an effort to avoid spread of contamination.
8. The Project Supervisor will plan and direct decontamination consistent with safety and the nature of the accident. Waste disposal will be done in an acceptable manner.
9. The Project Manager will perform a survey of the entire area and those areas where contamination may have been carried. Operation will be resumed only after safety is assured, the operation reviewed, and corrective measures taken.
10. The Project Manager will make necessary reports to the assigned AEC Operations Office according to the regulations issued for this purpose.
11. Immediate bioassay and medical examination will be given to personnel involved in the accident.

Item 12c: Detailed Description of Radiation Survey Program and Procedures

Frequency

All work and storage areas are surveyed at least monthly for alpha contamination in air and on surfaces of benches, floors, desks, etc.

Sampling

Air samples are taken by drawing a measured volume of air through filter paper impregnated with an antistatic agent.

Smear samples are collected by wiping impregnated filter paper over 1 ft.<sup>2</sup> areas.

Counting

Both air and smear samples are counted in the NuCorp Windowless Proportional Counter at the voltage setting which measures only alpha activity.

Quantitation

Counting data are interpreted on the basis of the best available information on filtering efficiency of the paper, and absorption of alpha particles by the paper and dust. Activities are calculated to microcuries per cubic centimeter of air, and dpm/ft.<sup>2</sup> for smears.

Maximum Permissible Limits

Our maximum permissible limits are set at less than one-half the limits required or recommended in the following publications:

1. CFR, Title 10, Part 20, "Standards for Protection Against Radiation".
2. U.S.A.E.C. Dept. ORNL-332 "Applied Health Radiation Survey Instrumentation" pp. 118-122.

Corrective action is required, and follow-up surveys made when contamination exceeds 50% of the MPL's set forth in these articles.

Effluent Wastes

We have a developed method for measuring contamination in solutions by evaporation of measured volume and counting alpha activity on planchets. However, no liquid waste is expected to issue from the laboratory.

Supplemental Sheet No. 4  
Form AEC-2

HMS Laboratory  
W. R. Grace & Company  
Wayne, New Jersey

Item 13: No wastes will be released from the laboratory. Uranium hexafluoride will be reused after each experiment.

UNITED STATES GOVERNMENT

# Memorandum

TO : Files  
THRU: Donald A. Nussbaumer, Chief  
Source & Special Nuclear Materials Br., DML

DATE: SEP 23 1965

FROM : Leland C. Rouse  
Source & Special Nuclear Materials Branch  
Division of Materials Licensing

SUBJECT: LICENSE APPLICATION FROM W. R. GRACE COMPANY FOR GAS CENTRIFUGE RESEARCH  
ACTIVITIES (DOCKET NO. 70-980)

W. R. Grace and Company submitted an application dated September 10, 1965, for an AEC license to authorize research work on a laboratory scale gas centrifuge test bed at its HMS Laboratory in Wayne, New Jersey. The applicant states that the research activities are to be performed in association with Electro-Nucleonics, Inc., of Caldwell, New Jersey, under AEC Contract No. AT(49-2)-2459.

The description of the gas centrifuge equipment and processes on pages 8 and 9 of the application is identical to the description provided by the General Electric Company for its gas centrifuge test equipment in its application dated June 1, 1965. (General Electric was authorized to perform gas centrifuge research activities through an amendment to License No. SNM-158, Docket No. 70-179, issued July 14, 1965.) The applicant has also summarized his proposed activities on page 3 of his application by paraphrasing statements made in the more detailed description presented on pages 8 and 9.

The applicant has requested a Source and Special Nuclear Material License for possession and use of uranium as  $UF_6$  such that the quantities possessed at any time shall not contain in excess of 250 grams of U-235. The material will be natural or depleted uranium except for samples taken from the product stream of the centrifuge, which may be slightly enriched. After analysis the samples are returned to the system and remixed to the natural state. Since the product and waste gas streams (plus samples) are remixed to the natural state at the end of the cycle, there is no buildup of enriched material and no criticality control considerations.

The application is satisfactory from the radiation safety viewpoint. The principal consideration is the possible exposure of employees to concentrations of airborne radioactivity. The fact that the entire gas centrifuge system is under vacuum and contains only gram quantities at any time tends to minimize this potential problem. The ventilation system for the laboratory is said to provide an air change every 5 minutes. The applicant also states that personnel have been trained in the handling of  $UF_6$  from the standpoint of both chemical and radiation contamination control. The application includes a copy of the laboratory "Emergency Procedures in the Event of Hexafluoride Release", which appear to provide adequate instruction to employees. The applicant possesses appropriate air sampling and counting equipment and states that regular monthly airborne and smear surveys will be conducted.



ITEM #

70

Buy U.S. Savings Bonds Regularly on the Payroll Savings Plan

B/b9  
(2)

SEP 23 1965

No liquid radioactive waste will result during routine operations. In the event of an accidental release, water used to hydrolyze the  $UF_6$  will be diverted to the liquid waste system of the adjacent W. R. Grace thorium processing plant.

Assuming approval is received to license the proposed activities, it appears appropriate to issue a combined Source and Special Nuclear Material License to the applicant.

MEMORANDUM FOR CHAIRMAN SEABORG  
 COMMISSIONER PALFREY  
 COMMISSIONER RAMEY  
 COMMISSIONER TAPE

SUBJECT: LICENSE APPLICATION FROM W. R. GRACE AND COMPANY FOR GAS  
 CENTRIFUGE RESEARCH ACTIVITIES

W. R. Grace and Company submitted an application dated September 10, 1965, for an AEC license to authorize research work involving source and special nuclear material on a laboratory scale gas centrifuge test bed at its laboratory in Wayne, New Jersey. The applicant states that the research activities are to be performed in association with Electro-Nucleonics, Inc., of Caldwell, New Jersey, under AEC Contract No. AT(49-2)-2459.

Grace's identification of its centrifuge process is essentially the same as that furnished us by the General Electric Company for its gas centrifuge test equipment. General Electric was authorized to perform gas centrifuge research activities by a license amendment issued July 14, 1965.

The Grace application is satisfactory from the radiation safety viewpoint; there are no criticality control considerations.

Subject to Commission approval, I intend to authorize the Division of Materials Licensing to issue the requested license. I would like to discuss this matter with the Commission at an early information meeting.

ITEM # 71

Harold L. Price  
 Director of Regulation

cc: General Manager  
 General Counsel  
 W. B. McCool, Secretary (2)

bcc: H. L. Price, REG  
 H. K. Shapar, OGC  
 F. P. Baranowski, PROD  
 E. B. Tremmel, DIP

Ind. Part. ~~Class~~ Security: ~~ACM/KP~~

OFFICE ▶	DML <i>LR</i>	DML <i>DN</i>	DML <i>LJohnson</i>	OGC <i>HL</i>	DML <i>HL</i>	REG
SURNAME ▶	LRouse:esc	DNussebaumer	LJohnson	<i>HL</i>	Jandbride	HLPrice
DATE ▶	9-27-65	9/27/65	9/27/65	9/27/65	9/27/65	

TO : Charles F. Knesel, Chief  
Classification Branch  
Division of Classification  
FROM : D. A. Nussbaumer, Chief, Source & Special  
Nuclear Materials Branch  
Division of Materials Licensing  
SUBJECT:

DATE: SEP 29 1965

CLASSIFICATION REVIEW OF SUBMITTAL W. R. GRACE & COMPANY \*  
DOCKET NO. 70-980 & 40-7399

We propose to place a copy of the attached document(s),  
dated September 10, 1965 in the AEC Public Document  
Room in accordance with established procedures.

Please review the above and, if no Restricted Data  
or Defense Information are contained therein, indicate  
this determination in the space provided below. One  
copy of this memorandum and enclosure thereto may be  
retained for your files.

In the event this material does contain Restricted  
Data or Defense Information, please provide us with  
memorandum indicating the specific references which  
include same.

Enclosure: Ltr. (Appl.) 9-10-65 from W. R. Grace & Company  
to Dr. McBride for a source and special nuclear  
material license.....which includes: 41

AEC-2 dtd. 9-9-65 for source material license..... 41

\*\*\*\*\*

The above listed material has been reviewed and it has  
been determined that it does not contain any Restricted  
Data or other classified information.

1. Ltr (Appl.), dtd 9/10/65 from W. R. Grace & Co. to Dr. McBride,  
for Source and Special Nuclear Materials License -  
Unclassified

2. Form AEC-2, dtd 9/9/65 for Source Matl. License - Unclassified.

*L. E. C. H. M. J.*  
Division of Classification

*7/30/65*  
Date  
187684

ITEM # 72

*B/74*



UNITED STATES GOVERNMENT

# Memorandum

TO : Files

DATE: October 1, 1965

FROM : Lyall Johnson, Assistant Director  
Division of Materials Licensing

*Q*

SUBJECT: LICENSE APPLICATION FROM W. R. GRACE AND COMPANY FOR GAS CENTRIFUGE  
RESEARCH ACTIVITIES

On September 30, 1965, I telephoned Vincent D'Amico, Division of Industrial Participation, who confirmed my understanding that he is the AEC contract administrator for AEC Contract No. AT(49-2)-2459 with W. R. Grace and Company (and Electro-Nucleonics, Inc.).

I informed D'Amico of our receipt of a SNM license application in connection with Grace's gas centrifuge activity at the Grace laboratory at Pompton Plains, New Jersey. I stated that a memorandum to the Commission was being prepared for the signature of the Director of Regulation and that OGC had suggested that in addition to a mention of the health and safety aspects the memorandum should include a finding regarding the security aspects.

In response to my inquiry D'Amico stated that Grace is complying with the security clause in the contract whereby Grace agrees to conform to all security regulations and requirements of the Commission, including security clearance of personnel.

D'Amico agreed that a statement to this effect, attributed to him as the AEC contract administrator, could be included in the Director of Regulation's memorandum to the Commission.



Buy U.S. Savings Bonds Regularly on the Payroll Savings Plan

*B/72*  
ITEM # 73

OCT 5 1965

70-980

MEMORANDUM FOR CHAIRMAN SEABORG  
COMMISSIONER PALFREY  
COMMISSIONER RAMEY  
COMMISSIONER TAPE

SUBJECT: LICENSE APPLICATION FROM W. R. GRACE AND COMPANY FOR  
GAS CENTRIFUGE RESEARCH ACTIVITIES

W. R. Grace and Company submitted an application dated September 10, 1965, for an AEC license to authorize research work involving source and special nuclear material on a laboratory scale gas centrifuge test bed at its laboratory in Wayne, New Jersey. The applicant states that the research activities are to be performed in association with Electro-Nucleonics, Inc., of Caldwell, New Jersey, under AEC Contract No. AT(49-2)-2459.

Grace's identification of its centrifuge process is essentially the same as that furnished us by the General Electric Company for its gas centrifuge test equipment. General Electric was authorized to perform gas centrifuge research activities by a license amendment issued July 14, 1965.

The Grace application is satisfactory from the radiation safety viewpoint; there are no criticality control considerations.

Grace's gas centrifuge activity is being carried out pursuant to a contract with the Commission under which Grace agrees to conform to all AEC security regulations and requirements. The AEC contract administrator has advised that Grace is complying with these contract security provisions. I conclude, therefore, that issuance of the license would not be inimical to the common defense and security.

B/73

ITEM # 74 (2)

OCT 5 1965

Subject to Commission approval, I intend to authorize the Division of Materials Licensing to issue the requested license. I would like to discuss this matter with the Commission at an early information meeting.

(Signed) HLP  
Harold L. Price  
Director of Regulation

cc: General Manager  
General Counsel  
W. B. McCool, Secretary (2)

bcc: H. L. Price, REG  
H. K. Shapar, OGC  
F. P. Baranowski, PROD  
E. B. Tremmel, DIP

OFFICE ▶	DML	DML	REG	OGC		
SURNAME ▶	L. JOHNSON:fk	J. McBride	H. Price	(See attached yellow)		
DATE ▶	10/4/65	10/4/65	10/5/65			

~~OFFICIAL USE ONLY~~

*L. E. Johnson*

UNITED STATES GOVERNMENT

# Memorandum

TO : File  
Original signed  
W. B. McCool  
FROM : W. B. McCool, Secretary

DATE: October 11, 1965

SUBJECT: LICENSE APPLICATION FROM W. R. GRACE COMPANY (DIRECTOR OF  
REGULATION'S OCTOBER 5 MEMORANDUM)

SECY:ICB

*Doc 100 H 70-980*

1. At Regulatory Information Meeting 167 on October 8, 1965, the Commission approved the license application from W. R. Grace Company for gas centrifuge research activities.

2. It is our understanding the Director of Regulation is taking the required action.

*(New Jersey)  
location*

cc:  
Chairman  
Director of Regulation  
Deputy Director of Regulation  
Asst. Dir. of Reg. for Admin.  
Asst. Dir. of Reg. for Nuclear Safety  
General Counsel  
Director, Materials Licensing  
Director, Congressional Relations  
Director, Industrial Participation

General Manager  
Deputy General Manager  
Asst. General Manager  
Exec. Asst. to Gen. Mgr.

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1965 OCT 12 PM 4 44  
J. S. ATOM. ENERGY COMM.  
REGULATORY  
MAIL SECTION

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ITEM #

*8174*  
*75*

October 12, 1965

*Central File*

NOTE FOR JOHN McBRIDE

With reference to our memo to the Commission dated October 5, 1965, the Commission approved on October 8 our issuing the license to W. R. Grace and Company.

Please take the necessary action.

Hal

ITEM #

76

B/75

J. A. McBride, Director  
Division of Materials Licensing

Harold L. Price  
Director of Regulation

**LICENSE - W. R. GRACE AND COMPANY**

70-980

With reference to our memo to the Commission dated October 5, 1965,  
the Commission approved on October 8 our issuing the license to  
W. R. Grace and Company.

I would appreciate your taking appropriate action.

REG

REG

CL Henderson: W. R. Grace

B176  
ITEM # 77

DML:LP  
70-980

OCT 12 1965

F. R. Grace and Company  
HMS Laboratory  
Box 188  
Tompton Plains, New Jersey

Attention: R. M. Mandle, Project Manager  
HMS Laboratory

Gentlemen:

Enclosed is Special Nuclear Material License No. SNM-929.

Please note that this license includes authorization to possess  
and use the source material required for your program.

Very truly yours,

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

Enclosure:  
SNM-929

DISTRIBUTION:

~~Suppl.~~ w/encl.  
Doc. Room w/encl.  
State Health (lic. only)  
Compliance, Region I w/encl.  
H. J. McAlduff, OROO w/encl.  
D. George, NMM w/encl.  
N. Doulos, ML w/encl.  
Br. RF w/encl.  
Div. RF w/encl.

ITEM # 178

*ISSUANCE  
OK by  
H. J. McAlduff  
in compliance  
with the  
requirements of  
the Atomic Energy  
Act of 1946*

OFFICE ▶	DML <i>L.R.</i>	DML <i>D</i>				
SURNAME ▶	LRouse:ss	DNussbaumer				
DATE ▶	9-23-65	10/12/65				<i>B/177</i>

UNITED STATES  
ATOMIC ENERGY COMMISSION

SPECIAL NUCLEAR MATERIAL LICENSE

Pursuant to the Atomic Energy Act of 1954 and Title 10, Code of Federal Regulations, Chapter 1, Part 70, "Special Nuclear Material Regulations," a license is hereby issued authorizing the licensee to receive and possess the special nuclear material designated below; to use such special nuclear material for the purpose(s) and at the place(s) designated below; and to 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 70.32(a) of said regulations, and is subject to all applicable rules, regulations, and orders of the Atomic Energy Commission now or hereafter in effect and to any conditions specified below.

<p>Licensee</p> <p>1. Name W. R. Grace and Company</p> <p>2. Address HMS Laboratory Box 188 Pompton Plains, New Jersey</p>		<p>3. License No. SNM-929</p> <p>4. Expiration Date October 31, 1968</p> <p>5. Docket No. 70-980</p>
<p>6. Special Nuclear Material</p> <p>Uranium enriched in the U-235 isotope.</p>	<p>7. Maximum quantity of special nuclear material which licensee may possess at any one time under this license</p> <p>250 grams of contained U-235</p>	
<p>8. Authorized use</p> <p>For use in accordance with the procedures described in the licensee's application dated September 10, 1965.</p>		
<p>9. Quantity of special nuclear material allocated to licensee pursuant to Section 70.31(b) of said part</p> <p>.....</p>		

CONDITIONS

10. Unless otherwise specified, the authorized place of use is the licensee's address stated in Item 2 above. Authorized place of use: The licensee's HMS Laboratory  
Wayne New Jersey
11. Pursuant to Title 10, Code of Federal Regulations, Part 40, the licensee is authorized to possess 77 pounds of natural uranium and 200 pounds of depleted uranium for use in accordance with the procedures described in the licensee's application dated September 10, 1965.

*LR (9-23-65) 10/12/65*

For the U. S. ATOMIC ENERGY COMMISSION

Date of issuance OCT 12 1965

★ U. S. GOVERNMENT PRINTING OFFICE: 1962 O - 632574 Donald A. Nussbaumer  
Division of Materials Licensing

COPY



UNITED STATES GOVERNMENT

# Memorandum

TO : J. A. McBride, Director  
Division of Materials Licensing

FROM : Harold L. Price  
Director of Regulation *[Signature]*

SUBJECT: LICENSE - W. R. GRACE AND COMPANY

DATE: OCT 13 1965

With reference to our memo to the Commission dated October 5, 1965, the Commission approved on October 8 our issuing the license to W. R. Grace and Company.

I would appreciate your taking appropriate action.

*DANUSBAUMER notified 10/12/65*

*LIC issued  
10/12/65*



ITEM # B/78  
79

Buy U.S. Savings Bonds Regularly on the Payroll Savings Plan

File COPY



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

December 16, 1965

Please reply to:  
W. R. Grace & Co.  
HMS Laboratory  
P. O. Box 106  
Pompton Plains  
New Jersey 07444

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

Dear Mr. Nussbaumer:

License #SNM-929

We would appreciate being allocated the following uranium hexafluoride containing  $U^{235}/U^{238}$  by weight:

1500 grams	$UF_6$	containing 1.0% $U^{235}/U^{238}$
1500 grams	"	" 1.5% " "
1500 grams	"	" 2.0% " "
1500 grams	"	" 2.5% " "

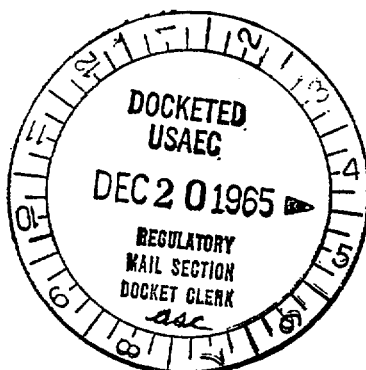
to be used as "standards" in our mass spectrometer for isotope ratio measurements in connection with our gas centrifuge technology research and development program.

Very truly yours,

*Richard M. Mandel*

Richard M. Mandel  
Project Manager

MCB:l



COPY PROVIDED  
CONFERENCE

ITEM # 80

RECEIVED  
REGULATORY  
MAIL SECTION

DEC 20 PM 5 49

RECEIVED  
B/79

RECEIVED

DML:ND  
70-980  
SNM-929

DEC 30 1965

W. R. Grace & Company  
HMS Laboratory  
P. O. Box 106  
Pompton Plains, New Jersey 07444

Attention: Mr. Richard M. Mandle  
Project Manager

Gentlemen:

As requested in your letter dated December 16, 1965, you are hereby allocated under License SNM-929, 105 grams of contained U-235 of various enrichments contained in 6,000 grams of uranium hexafluoride. Arrangements for procurement of the material should be made through the AEC Materials Leasing Officer, Oak Ridge, Tennessee.

Very truly yours,

Robert L. Layfield  
Source & Special Nuclear Materials Branch  
Division of Materials Licensing

DISTRIBUTION:

Suppl.  
Doc. Room  
Compliance, Region I  
H. J. McAlduff, OROO  
J. Verme, NMM  
N. Doulos, ML  
Br. & Div. RFs

ITEM # 81 <sup>B/86</sup>

OFFICE	<input checked="" type="checkbox"/> DML	<input type="checkbox"/> NMM	<input checked="" type="checkbox"/> DML			
SURNAME	NDoulos:sr	JVerme	RLayfield			
DATE	12/31/65	DEC 29 1965				

Form AEC-437  
(12-61)  
(Previous editions obsolete)

U.S. ATOMIC ENERGY COMMISSION

## SPECIAL NUCLEAR MATERIAL DRAFT

1. SUPPLYING FIELD OFFICE <b>Oak Ridge Operations Office Oak Ridge, Tennessee</b>		3. DELIVER TO: (SS STATION AND SYMBOL) <b>W. R. Grace and Company HMS Laboratory P. O. Box 106 Pompton Plains, New Jersey SNM-929</b>		4. DRAFT NUMBER <b>07/SNM-929/453(1)</b>	
2. MATERIAL (Check) <input checked="" type="checkbox"/> U-235 <input type="checkbox"/> Pu <input type="checkbox"/> U-233		5. REQUESTED DELIVERY DATE <b>Prior to March 31, 1966</b>		6. SHIPPED a. Kg    b. Wt% U-235    c. Form AEC-101 or AEC-388 No.    d. Date	
7. PROJECT NUMBER					
6. ORDERED a. Kg    b. Wt% U-235		8. PROJECT TITLE, MATERIAL FORM, ETC.			
0.015 1% 0.0225 1.5% 0.030 2% 0.0375 2.5%		As UF <sub>6</sub> As UF <sub>6</sub> As UF <sub>6</sub> As UF <sub>6</sub>			
9. (Ordering Field Office) By: _____ Date: _____		10. (Supplying Headquarters Program Division) By: _____ Date: _____		11. (Ordering Headquarters Program Division) By: <b>Robert L. Layfield</b> Date: <b>DEC 30 1965</b>	
				12. DIVISION OF NUCLEAR MATERIALS MANAGEMENT <b>I HEREBY CERTIFY THAT THE ABOVE QUANTITY WILL NOT EXCEED MATERIAL APPROVED FOR THIS DIVISION FOR FY 1966.</b> <b>for Mary T. Terry</b> <b>Douglas E. George, Dir. Div. of Nuclear Materials Mgmt.</b> Date: <b>DEC 23 1965</b>	

ITEM #

22

B/81

USAC, GERMANTOWN, MARYLAND  
DONALD A. NUSSBAUMER, CHIEF  
SOURCE & SPECIAL NUCLEAR MATERIALS BRANCH  
DIVISION OF MATERIALS LICENSING

H. J. McALPHEE, JR.  
PRODUCTION DIVISION  
USAC, OAK RIDGE OPERATIONS OFFICE  
OAK RIDGE, TENNESSEE

RETELCON JANUARY 3, 1966, FINANCIAL LIMITATION FOR MICHIGAN TECHNOLOGICAL  
UNIVERSITY LICENSE SNM-256 HEREBY INCREASED TO \$10,000. INITIAL FINANCIAL  
LIMITATION OF \$2,000 HEREBY ESTABLISHED FOR W. R. GRACE & COMPANY LICENSE

NO. SNM-929. REFERENCE: DML:ND

bcc: F. L. Hiser, OC  
L. Johnson, DML

JAN 7 1966

70-988

70-277

DATE	1/2/66	1/2/66	1/2/66	1/2/66	1/2/66
OFFICE	DML	DML	DML	DML	DML
NDoulos:ST	NDoulos:ST	NDoulos:ST	NDoulos:ST	NDoulos:ST	NDoulos:ST
Rm 423	Rm 423	Rm 423	Rm 423	Rm 423	Rm 423
x7445	x7445	x7445	x7445	x7445	x7445

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

ITEM #

83

6/82

UNITED STATES ATOMIC ENERGY COMMISSION  
DIVISION OF COMPLIANCE

INSPECTION FINDINGS AND LICENSEE ACKNOWLEDGMENT

JUL 14 1966

<b>1. LICENSEE</b> W. R. GRACE & COMPANY HMS Laboratory P. O. Box 106 Pompton Plains, New Jersey 07444	<b>2. REGIONAL OFFICE</b> U. S. Atomic Energy Commission Region I, Division of Compliance 376 Hudson Street New York, New York 10014
<b>3. LICENSE NUMBER(S)</b> SNM929 70-780	<b>4. DATE OF INSPECTION</b> July 13, 1966 (Initial)
<b>5. INSPECTION FINDINGS</b> <p><input checked="" type="checkbox"/> A. No item of noncompliance was found.</p> <p><input type="checkbox"/> B. Rooms or areas were not properly posted to indicate the presence of a RADIATION AREA. 10 CFR 20.203(b) or 34.42</p> <p><input type="checkbox"/> 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</p> <p><input type="checkbox"/> D. Rooms or areas were not properly posted to indicate the presence of an AIRBORNE RADIOACTIVITY AREA. 10 CFR 20.203(d)</p> <p><input type="checkbox"/> E. Rooms or areas were not properly posted to indicate the presence of RADIOACTIVE MATERIAL. 10 CFR 20.203(e)</p> <p><input type="checkbox"/> F. Containers were not properly labeled to indicate the presence of RADIOACTIVE MATERIAL. 10 CFR 20.203(f) (1) or (f) (2)</p> <p><input type="checkbox"/> 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)</p> <p><input type="checkbox"/> 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)</p> <p><input type="checkbox"/> I. Form AEC-3 was not properly posted. 10 CFR 20.206(c)</p> <p><input type="checkbox"/> J. Records of the radiation exposure of individuals were not properly maintained. 10 CFR 20.401(a) or 34.33(b)</p> <p><input type="checkbox"/> K. Records of surveys or disposals were not properly maintained. 10 CFR 20.401(b) or 34.43(d)</p> <p><input type="checkbox"/> 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</p> <p><input type="checkbox"/> M. Records of leak tests were not maintained as prescribed in your license, or 10 CFR 34.25(c)</p> <p><input type="checkbox"/> N. Records of inventories were not maintained. 10 CFR 34.26</p> <p><input type="checkbox"/> O. Utilization logs were not maintained. 10 CFR 34.27</p>	
<p style="text-align: right;"><b>Alfred W. Grella</b> (AEC Compliance Inspector)</p>	
<b>6. LICENSEE'S ACKNOWLEDGMENT</b> <p>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.</p> <p style="text-align: right;">B/82</p>	
<p>(Date) _____ (Licensee Representative — Title or Position) _____</p>	

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

ITEM # 84

UNITED STATES GOVERNMENT

# Memorandum

TO : Leo Dubinski, Assistant Director for Materials  
Division of Compliance, HQ

DATE: JUL 22 1966

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

SUBJECT: INSPECTION: W. R. GRACE AND COMPANY  
POMPTON PLAINS, NEW JERSEY  
LICENSE NUMBER: SNM-929

CO:I:AWG

Reference is made to your memo of June 1, 1966, subject as above, and previous discussions on this matter. Subject license was inspected by A. W. Grella of this office on July 13, 1966, with a clear Form AEC-591 issued at the conclusion of the inspection. Listed below are his observations concerning the security practices in effect by the licensee.

The provisions for physical security appeared to be excellent. The gas centrifuge test area located on grade level was accessible only through a locked door. Inside this door an entrance log had to be signed, and a list of personnel authorized access to the area was noted to be posted. This list was noted to contain approximately 15 - 20 names of W. R. Grace and Electro-Nucleonics personnel, plus about 5 - 6 AEC HQs personnel.

After passing through the first locked door and signing the entrance log, access to the shop areas itself was through another door which caused a loud bell to alarm, requiring manual shut off from a switch inside the room proper. It was noted that this bell would cause any persons working in the room to become aware of another person having entered the room.

Access to the area by the inspector was permitted under the escort of R. M. Mandle, Project Manager. Prior to actually being escorted to the area, the inspector was required to furnish identification (AEC Security badge and DML credentials were accepted). It was noted that Mr. Mandle had furnished his Security Officer, Miss M. Bodle, with a letter to him from Mr. D'Amico of the Assistant General Manager's office, HQ, authorizing access of the inspector for the purposes of inspecting the AEC license. The inspector was also required to sign a separate log of classified visitors which is maintained by the Security Officer in the upstairs administrative area.

Initial entrance to the upstairs administrative area itself was also through a locked door immediately adjacent to the desk of Mrs. Bodle, who functions as a combination receptionist-Security Officer-Purchasing Agent. Another log for all visitors to the HMS lab is also maintained in the upstairs area and the inspector was also required to sign this log. Mandle stated to the



PD  
7-25-66

Buy U.S. Savings Bonds Regularly on the Payroll Savings Plan

ITEM #

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inspector that security clearance is not required for access to the upstairs area since it is not a classified area. However, all visitors are controlled.

The laboratory area proper is noted to be protected with two automatic alarm systems connected to the Newark District Telegraph Company during off hours. One system was noted to provide alarm protection on opening of the first door or upon breaking of any windows, with the second being a microwave type system intended to detect and cause alarm upon detection of any movement within the room during off hours.

The gas centrifuge test bed equipment itself was covered with an opaque tarpaulin during the inspection, although a view of one end of the equipment was permitted, which at least furnished the inspector with a good general idea of what was involved as far as the health and safety aspects of the handling of  $UF_6$  materials in the process.



EXTRACT FROM NUCLEONICS WEEK, Vol. 7, No. 46, dated  
November 17, 1966

ELECTRO-NUCLEONICS IS AIMING AT THE FUEL MARKET VIA  
CENTRIFUGE enrichment of uranium, John J. Newgard, president,  
told shareholders at the annual meeting, Tuesday. Fore-  
seeing a total nuclear fuels market in the billions of  
dollars in the latter 1970's and early 1980's, Newgard pre-  
dicted that a workable mechanism will evolve, providing a  
modus operandi for accommodating industry interest in getting  
into gas-centrifuge enrichment and the government's interest  
in anti-proliferation safeguards. With zero income but some  
funding from W. R. Grace, the company raised, in August, an  
unannounced amount in private funding through Alex Brown &  
Sons, Baltimore.

ITEM # 86

~~① Newgard~~

② File ✓

SNM Supply Power

W. R. Grace & Co

Prompt Planning

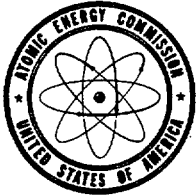
N.Y.

70-980

④

11/14/66

12/85



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

REF:DML:ND  
70-980

AUG 26 1968

W. R. Grace & Company  
HMS Laboratory  
P. O. Box 106  
Pompton Plains, New Jersey 07444

SUBJECT: NOTICE OF LICENSE EXPIRATION

Gentlemen: Attention: Mr. Richard M. Mandle

Notice is given that Special Nuclear Material License Number SNM- 929 expires on October 31, 1968.

If you desire to continue your program using special nuclear material(s), an application for renewal of the license should be filed with this office pursuant to Title 10, Code of Federal Regulations, Part 70, Section 70.33. The application should be in letter form and seven copies submitted.

It is to your advantage to file such an application at least thirty (30) days before the expiration date of your existing license. Your program will then be covered by your existing license until action is taken on your application for license renewal. (Section 70.33(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 special nuclear material without a valid license.

If you do not wish to renew your license, please complete the enclosed form "Certification of Status of Special Nuclear Material Activities Under United States Atomic Energy Commission Special Nuclear Material License Number- 929 ", 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.

Very truly yours,

*Donald A. Nussbaumer*

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

*Supple*

Enclosure:

"Certification . . ."

*[Signature]*  
Dictator

*[Signature]*  
Approved

ITEM # 87

B/86

W. R. GRACE & CO.

7 HANOVER SQUARE, NEW YORK, N.Y. 10005

September 19, 1968

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

Regulatory Suppl File Cy.

Ref: DML:ND  
70-980

Gentlemen:

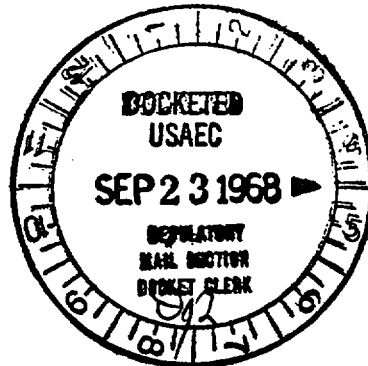
We enclose four completed copies of "Certification of Status of Special Nuclear Material Activities Under United States Atomic Energy Commission Special Nuclear Material License Number 929."

Very truly yours,



Richard M. Mandle

RM/lp

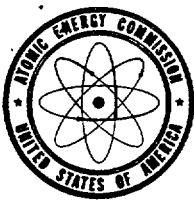


ITEM # 88

ACKNOWLEDGED

4351

6/87



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

Regulatory Suppl File Cy.

CERTIFICATION OF STATUS OF SPECIAL NUCLEAR MATERIAL ACTIVITIES  
UNITED STATES ATOMIC ENERGY COMMISSION

LICENSE NUMBER SNM- 929

LICENSEE: W. R. Grace & Co.  
HMS Laboratory  
ADDRESS: P. O. Box 106  
Pompton Plains, New Jersey 07444

The licensee and any individual executing this certification on behalf of the licensee certify that (check appropriate item(s) below):

- ☐ No special nuclear materials have been procured and/or possessed by licensee.
- ☒ All special nuclear materials procured and/or possessed by licensee under Special Nuclear Material License No. SNM- 929 have:
- ☒ (1) been or will be prior to expiration of the above license transferred to Oak Ridge Gaseous Diffusion Plant  
(Institution, firm, hospital, person, etc.)

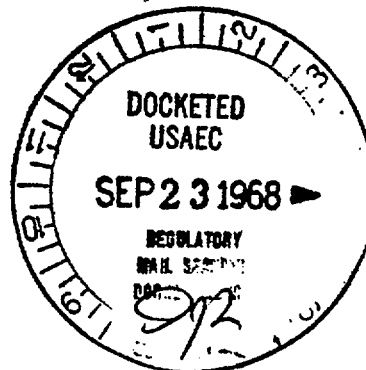
which has Special Nuclear Material License No. SNM-

- ☒ (2) been or will be disposed of in compliance with 10 CFR 20 prior to expiration of this license.

*Richard M. Mandle*  
Certifying Official

Date: 9/19/68

Please return 4 copies to:  
U. S. Atomic Energy Commission  
Division of Materials Licensing  
Washington, D. C. 20545



ITEM # 89

40-84

SOURCE MATERIAL LICENSE

Davison Chemical Company  
Division of W. R. Grace and Company  
Baltimore 3, Maryland

License No. R-196

Dated: JAN 24 1957

Attention: Mr. David P. Barrett  
General Manager, Rare Earths

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 unlimited quantities of Thorium-containing material during the term of this license, from producers and distributors licensed by the Atomic Energy Commission and through importation, for processing at your Compton Plains, New Jersey, and Curtis Bay, Maryland, plants.

You are further licensed to transfer and deliver possession of and title to Thorium-containing 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. 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 February 1, 1958.

cc: Document Room  
Docket Officer

FOR THE ATOMIC ENERGY COMMISSION

Mann, INS, w/cy ltr 12/31/56 fm Davison Chemical Co.

ITEM #

B/89  
90

CAL

CAL

CAL

Lyall Johnson  
Chief, Licensing Branch  
Division of Civilian Application

RFBorlik:mb

CTEdwards

LJohnson

Enclosure:

1. 10 CFR 20<sup>1</sup>/ /57 1/ /57 1/ /57

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

FEB 27 1957


Rare Earths, Inc.  
Paterson R.D. # 1  
New Jersey

Gentlemen:

Enclosed is a copy of the AEC regulation, entitled "Standards For Protection Against Radiation", which establishes standards to be followed in handling radioactive materials which are subject to the licensing authority of the AEC. Source material such as you handle under your AEC license is included in this category of radioactive materials.

The effective date of this regulation is February 28, 1957 at which time your AEC source material license will become subject to its provisions.

Very truly yours,

  
Lyall Johnson  
Chief, Licensing Branch  
Division of Civilian Application

Enclosure:  
10 CFR 20

12/90  
ITEM # \_\_\_\_\_

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 sélectionnés)

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

Address  
(Street,  
City,  
Zone,  
State)

DAVISON CHEMICAL CO.

Box 483

Pompton Plains, New Jersey

(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)

Anglo-Oriental (Malaya) Limited

16 Barrech Road (P.O. Box 180)

Kuala Lumpur, Selangor

Federation of Malaya

3. Country of exportation (Pays d'exportation)

Malaya

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

Monasite Sand

Quantity (Quantité) (a)	Commodity description (See Special Instructions for Item 4) Description des produits (Consultez les Instructions spéciales 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)
17.9 long tons	Monasite Sand	9930.380	CIF-NEW YORK \$ 4686.00

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'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)

DAVISON CHEMICAL 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)

Richard L. Stone, G. S. Mgr.

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)

May 21, 1957

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.

MAY 22 1957

Date (Date)

Designated Commerce Official (Fonctionnaire compétent du Ministère du Commerce)

QUADRUPLICATE COPY

Comm-DC 36956

Best  
copy



PURCHASE

ORDER



DAVISON CHEMICAL COMPANY

DIVISION OF



P. O. BOX 4000

NEW YORK, N. Y.

RECEIVED JAN 12 1959

REQ. NO. 1000

DATE 1-28-59

*Payroll through Community*

DAVISON CHEMICAL COMPANY, Inc.

200 E. 42nd St.

NEW YORK 17, N.Y.

DAVISON CHEMICAL COMPANY

DIVISION OF D. A. GRAHAM & SONS

NEW YORK, N. Y.

ORDER NO.

1000

DATE

1-28-59

REQ. NO.

1000

100-10110

R. L. BROWN

ACCOUNT NO.

100-10110

0731.07

PURCHASE



ORDER

No.

070

DAVISON CHEMICAL COMPANY

*Product*

DAVISON CHEMICAL COMPANY  
P.O. BOX 100  
NEW YORK, N.Y.

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# DAVISON CHEMICAL COMPANY

INVOICE COPY  
1-3638

CALTIMORE, MD.

AT 100 P. O. BOX 14, PLAINFIELD, N.J.

CONTRACT

ORIGINATOR

TELEPHONE

VEHICLE CARRIER

STATE

COUNTY

CAR INITIAL

CAR NO.

FREIGHT

SALESMAN

DATE

DATE SHIPPED

DELIVERY NO.

SHIPPED FROM

P. O. B.

TERMS

CONTAINER

SIZE

DESCRIPTION

OUR PLANT

Net Cash

QUANTITY

PRICE

2200 lbs

6.50/lb

14.30

INVOICE

NUMBER

3638

Net total

Thorium Oxide, 99% min.

2200 lbs 6.50/lb 14.30

DAVISON CHEMICAL COMPANY

THORIUM OXIDE

99% MIN.

U.S. A.

Q. D-7000

135.00

50/UP

SHIPMENT - COMPLETED ORDER

Shipment scheduled 7/8/57

Ship 27/80% - 1/40% metal drums

show "Bond on Refuse" on B/L

radioactive labels on drums

CC Export License 3-3839-B

Canadian Import License 150B Order No. 90/1/57

TOTAL WEIGHT (LBS.)

2265 lbs GTO-B

INVOICE NUMBER

3638

MAKE ALL CHECKS PAYABLE TO DAVISON CHEMICAL COMPANY DIVISION OF W. R. GRACE & CO.  
CLAIMS FOR LOSS OR DAMAGE MUST BE MADE IMMEDIATELY ON ARRIVAL OF GOODS

to Shipments

Shipment to Davidson Chem. / J. W. Tenn

9/5/57 - 1242 # ThO<sub>2</sub>

10/1/57 - 1933 # ThO<sub>2</sub>

11/15/57 - 2541 # ThO<sub>2</sub>

12/12/57 - 1800 # ThO<sub>2</sub>

Inventory  
in hand at present - 9400 #

Residue in barrels from  
5/1800 #

WATER CHEMICAL FORM

DATE: 10/10/66  
TO: Mr. J. L. ...  
FROM: Mr. J. L. ...

DATE	DESCRIPTION	QUANTITY	UNIT
10/10/66	Water	100	gals
10/11/66	Water	100	gals
10/12/66	Water	100	gals
10/13/66	Water	100	gals
10/14/66	Water	100	gals
10/15/66	Water	100	gals
10/16/66	Water	100	gals
10/17/66	Water	100	gals
10/18/66	Water	100	gals
10/19/66	Water	100	gals
10/20/66	Water	100	gals
10/21/66	Water	100	gals
10/22/66	Water	100	gals
10/23/66	Water	100	gals
10/24/66	Water	100	gals
10/25/66	Water	100	gals
10/26/66	Water	100	gals
10/27/66	Water	100	gals
10/28/66	Water	100	gals
10/29/66	Water	100	gals
10/30/66	Water	100	gals
10/31/66	Water	100	gals

UNLESS OTHERWISE SPECIFIED, ALL QUANTITIES ARE IN GALLONS. CLAIMS FOR LOSS OF DAMAGE MUST BE MADE IMMEDIATELY ON ARRIVAL OF GOODS.

10/10/66 100 gals  
10/11/66 100 gals  
10/12/66 100 gals  
10/13/66 100 gals  
10/14/66 100 gals  
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10/16/66 100 gals  
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10/31/66 100 gals



[illegible]



10

**ON PHOTO**

Q 4  
22

**ADD ADDITIONAL**

The above members and Executive  
Order members are not eligible for  
Influence, Pushing Letters, Carrots and  
Corruption money.

THE

**DATE**

# DAVIDSON CHEMICAL COMPANY

Division of L. R. Grace & Co.

# THE GREAT ESCAPE

THE

100-443887-100

THE



Publications

**THE**

THE

## References

**PLATE 1**

Business must show edge number and also be entitled as required by statute. It is at least of

10

(Approximately 20 tons) Export to Canada @ U.S. ex/dock value  
f.o.b. Houston Plains. New Jersey

THESE ARE THE ONLY TWO COPIES OF THE REPORT.

THE UNIVERSITY OF CHICAGO PRESS

Please furnish original bill of lading via airmail bearing our 15 dollar

CONTINUING TO OWE THIS DUTY TO MR. A. P. B.

**TRANSPORTATION RECORD**

COPY

COPY

EXHIBIT B

January 6, 1959

R. M. Mandle

FILES

Survey of Plant for St. John X-Ray Lab

Monasite Storage area	2-10 mr/hr
Ball Mill area	1 mr/hr
Monasite 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	2 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

ITEM # 92

12/9/1

(2)

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) <sub>4</sub> under Whittney Press	8



11/19/59  
P.M.

PBK  
JRR JRR

TELEPHONE CALL FROM JOHN RUSSO, NEW JERSEY STATE DEPT. OF HEALTH

John Russo, New Jersey State Department of Health, called and asked for you but I took the call. He stated that on June 11, 1959 several members of his department were taking routine water samples in the Wayne-Pompton Plains area in New Jersey about 1/4 mile away from the Passaic Valley water shed. They noticed a milky white dispersion in the river, took some samples of it and had it analyzed. The alpha contamination was 3370 micro-microcuries per liter and the beta contamination was 1495 micro-microcuries per liter. Subsequent water samples taken at the same point (I believe he said <sup>at a point</sup> ~~where a brook and the Pompton River enter into the Passaic River~~) on November 5 revealed  $6 \times 10^{-5}$  microcuries per cc contamination. He also stated that other samples were taken on November 18 but had not been analyzed as yet. Approximately 1/4 mile away upstream is situated Rare Earths, Inc., affiliate of the Davison Chemical Company which is a Division of W. R. Grace & Son. <sup>(business enclosed)</sup> A tour of this plant by Russo and his associates revealed that this company is processing monazite sand. He noted that they had approximately 9000 lbs. thorium oxide stored in their backyard and that when it rained, this material was being washed down into the river and probably resulting in the milky white slurry that was observed. He also stated that during a tour of the plant he noted that a milling operation was being performed and that thorium containing compounds were being heated under very high temperatures resulting in thoron gas.

ITEM # 93

B/92

(2)

He felt that we should take a look into this operation and I agreed.

He added that this company had been taken to court last year,  
convicted and fined for general pollution of the area and the  
river surrounding the plant.

*Bob K. knows about this.*

## COMPLIANCE INSPECTION REPORT

1. Name and address of licensee <b>Rare Earths, Inc. Division of W. R. Grace &amp; Co. Pompton Plains, New Jersey</b>	2. Date of inspection <b>November 25, 1959</b>
	3. Type of inspection <b>Initial</b>
	4. 10 CFR Part(s) applicable <b>20 - 40</b>
5. License number(s), issue and expiration dates, scope and conditions (including amendments) <b>R-196      3/27/59      3/31/60</b>	

**Scope:** Licensed to receive possession of and title to thorium-containing material from producers and distributors licensed by the AEC and through importation, for processing at your Pompton Plains, New Jersey and Curtis Bay, Maryland, plants.

**Conditions:** Required to maintain records of inventories, receipts and transfers of refined source material.

**C-3623      12/13/56      1/1/58**

**Scope:** Fifty (50) lbs. of refined source material (uranium-magnesium fluoride slag) during the term of this license for use in experimental work relating to the recovery of uranium from magnesium fluoride scrap.

**Conditions:** Compliance with Part 20.

**R-132      8/25/56      4/1/57**

(Continued)

6. Inspection findings (and items of noncompliance)  
**Rare Earths, Inc., a branch plant of Davison Chemical Co., a division of W. R. Grace & Co., is engaged in the manufacture of rare earth oxides from monazite sands containing 3 to 3.5% ThO<sub>2</sub> under license R-196. The licensee's facilities include an 8800 sq. ft. production area containing a ball mill, numerous filter presses and tanks, a waste treatment plant, and indoor and outdoor storage areas containing monazite sands (bags), drummed products and waste sludges. R. Handle, plant manager and RSO, is responsible for procurement of materials. Personnel protection clothing are worn by plant employees who have been briefed on radiological health and safety. No air dust or stack surveys have been made to date. Inadequate direct radiation surveys have been made in both the restricted and unrestricted areas. Personnel monitoring is accomplished through the issuance of weekly and 13-week film badges supplied by St. John X-Ray Co. No overexposures were found. Waste sludges and drums were stored in the unrestricted areas adjacent to the plant. Approximately 750 tons of sludge wastes were stored on the plant grounds. Inventory records showed a total of 16,645 lbs. of monazite sand or approximately 5000 lbs. of ThO<sub>2</sub> on hand. ThO<sub>2</sub> in barrels totalled approximately 5180 lbs. Waste disposal is accomplished by release of plant effluents to a storm sewer. Thorium contaminated monazite bags, wipes and wood have been incinerated on the plant grounds. Records of procurement, receipt, transfer, film badge, physical exams are maintained. Under license C-3623 a drum of 50 lbs. uranium magnesium scrap was procured. No work has ever been done on the material which is stored in the licensee's warehouse. Under license R-132 no work has been performed either at Pompton Plains or in the licensee's plant at Curtis Bay. All work under (Continued)**

- |   |  |
|---|--|
| 7. Date of last previous inspection<br><b>None.</b> | 8. Is "Company Confidential" information contained in this report? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/><br>(Specify page(s) and paragraph(s))<br><b>Process description and layout - p. 2, 3, 4 (Item 11)</b> |
|---|--|

**DISTRIBUTION:**  
4 cys. Div of Insp, Rg  
2 cys. Insp Div, NRCO

**Paul E. Klevin**

(Inspector)

Approved by:

**Robert W. Kirkman, Director**  
**New York**

(Operations office)

**January 25, 1960**

(Date report prepared)

If additional space is required for any numbered item above, the continuation may be extended to the reverse of this form using foot to head format, leaving sufficient margin at top for binding, identifying each item by number and noting "Continued" on the face of form under appropriate item.

ITEM # 94

3

ITEM 5 CONT'D

R-132      8/15/56      4/1/57

Scope: Licensed to receive possession of and title to:

- a) Unlimited quantities of raw source material (solely monazite sand) during the term of this license, from producers and distributors licensed by the AEC and through importation, for processing at your Pompton Plains, New Jersey Plant and your Curtis Bay, Maryland Plant, and
- b) One-hundred lbs. of thorium bomb reduction residues for experimental processing at your Curtis Bay, Maryland Plant.

Conditions: Required to maintain records of inventories, receipts and transfers of refined source material.

ITEM 6 CONT'D

license R-132 is being performed under license R-196.

The only items of noncompliance found during the course of the inspection of the aforementioned licenses are:

License R-196

X 20.102(b)(1)(2) - "Permissible levels of radiation in unrestricted areas"  
- in that levels of radiation exist at the outside storage and dump areas of such a magnitude that if an individual were continuously present in these areas, it could result in his receiving a dose in excess of 2 mrem in any one hour or could result in his receiving a dose in excess of 100 mrem in any seven consecutive days. (See item 14B and 15 of report details.)

X 20.201(b) "Surveys"  
- in that the radiation surveys conducted by the licensee have not fully evaluated the direct radiation hazard both in and out plant.  
  
- in that no in or out plant air samples or stack air samples have been taken to date in order to evaluate the thoron and thorium concentrations originating from production operations and from storage of sludge materials.  
  
- in that no water effluent sample surveys have been made by the licensee to determine status of compliance with Section 20.103.

(See items 14, 15 and 17 of report details.)

20.207 "Storage of licensed material"

- in that the licensee stores in the unrestricted area adjacent to his production area approximately 750 tons of thorium bearing sludges which are not secured against removal. (See item 15 and 16 of report details.)

20.203(b) "Caution signs, labels and signals" - "Radiation areas"

- in that radiation areas within and outside of the plant existed which required posting in accordance with this section (i.e., measurements taken at the locations at which approximately 30 drums each of Th(OH) and ThO<sub>2</sub> showed radiation readings from 7.5 to 12 mr/hr at 1', respectively, from these drums.) (i.e., at piles of sludge containing silica (mesothorium) and gray phosphate cake radiation levels found were 11 and 15 mr/hr at 1' from the piles, respectively.) (See items 14B and 18 of report details.)

20.203(e)(2) "Additional Requirements"

- in that the area outside the plant where approximately 30 drums of ThOH (approximately 500 lbs. per drum) were stored was not posted with any radiation caution sign or symbol.

- in that piles of sludge stored outplant which include waste treatment sludge, yttrium and reworked silica sludge, were not posted with any radiation caution, radioactive material sign or symbol.

(See items 16 and 18 of report details.)

20.203(f)(2)(4) "Containers"

- in that drums of ThO<sub>2</sub> and ThOH, each containing 500 lbs. of material, were not labeled with any caution sign, symbol, kind, or amount of material.

- in that 120 lb. bags of monazite sand containing from 3 to 3.5% of ThO<sub>2</sub> were not labeled with any caution, radioactive material sign and symbol and kind, and amount of material.

(See item 18 of report details.)

20.305 "Treatment or disposal by incineration"

- in that the licensee has periodically incinerated on his unrestricted plant ground bags, wipes and wood contaminated with thorium. (See item 19 of report details.)

20.301 "General requirement"

- in that the licensee has disposed of both soluble and insoluble effluent to a storm sewer without obtaining Commission approval as per Section 20.302. (See item 17 of report details.)

X 20.401(c) "Records of surveys, radiation monitoring and disposal"

- in that the records of surveys made by the licensee are incomplete in that no notation as to the instruments used or distances from source of radiation were available or were levels at sludge piles available, and specifically, the survey of March 27, 1959 did not record any measurements in units (mr/hr). (See item 14B and Exhibit B and C of report details.)

There were no items of noncompliance noted under licenses C-3623 or R-132.

PART 40 INSPECTION

Rare Earths, Inc.  
Division of W. R. Grace & Co.  
Pompton Plains, New Jersey

Date of Inspection: November 25, 1959

Persons Accompanying Inspector:

Mr. John Russo, New Jersey State Department of Health

Persons Contacted:

Richard Mandle, Plant Manager  
Richard Stone, Sales Manager  
D. Hubbard, Manager, Industrial Relations, Erwin Plant, Davison Chemical Company

DETAILS

Licenses #R-196 (Items 9 thru 20)

9. Introduction

On November 19, 1959, John Russo, New Jersey State Department of Health, telephoned this office to inform us that on June 11, 1959, several members of his department were taking routine water samples in the Wayne-Pompton Plains area in New Jersey, when they noticed a milky dispersion in the Pequonnock River. Samples taken and analyzed of this dispersion revealed alpha contamination of 3370 uuc/l and beta contamination of 1495 uuc/l. Russo stated that approximately 1/4 mile upstream from the sampling point is located Rare Earths, Inc., Division of W. R. Grace & Co. He stated that he and his associates toured the plant and found that the plant was processing monazite sand. He noted that there was approximately 9000 lbs. of ThO<sub>2</sub> stored in their backyard and when it rained this material was being washed down the river. He added that Rare Earths, Inc. had been taken to court last year, convicted and fined for general pollution of the area and the river surrounding the plant.

10. Organization and Procedures

Rare Earths, Inc., a branch plant of Davison Chemical Co., a division of W. R. Grace & Co., is engaged in the manufacture of rare earths oxide (Re<sub>2</sub>O<sub>3</sub>) from monazite sands containing from 3 to 3.5% thorium oxide.

Richard Mandle is the plant manager, while Richard Stone is the sales manager. Mandle reported that he is the radiological safety officer (RSO). Mandle stated he has had no formal training in radiation protection. He said he attended several lectures at Brookhaven in 1949 relative to rare earth processing and obtained information on radiation protection and monitoring. He noted that he attended a lecture on radiochemistry given by John Harley, HASL, NIDC.

D. Hubbard, Manager, Industrial Relations, Erwin Plant of Davison Chemical Co., a division of W. R. Grace Co., stated that he had come up to the Rare Earths plant for the first time on November 24, 1959, at the request of Mandle so that he (Hubbard) could be present during the inspection. Hubbard has a BA degree in physics and law degree from Vanderbilt. He was employed as a health physicist for the Union Carbide & Carbon Co., in Oak Ridge, for approximately 12 years and for the AEC as a member of the OROC Inspection Division for approximately two years.

ITEM # \_\_\_\_\_

76/8

12

Mandle stated the plant was on a 24-hour day operation, and that the twenty-five employees were composed of seven production workers and ten office employees on an 8 to 4 shift, two production workers on a 4 to 12 shift, two workers on a 12 to 8 shift, and three maintenance men. No minors are employed.

#### 11. Facilities and Uses

A two story brick building containing a production area (approximately 3000 square feet), three quality control labs (1200 square feet), and offices are located in Pompton Plains, New Jersey. The plant facilities are located on Black Oak Ridge Road (Rt. 202), a main thoroughfare. The production area consists of monazite ore storage, ball mill, filter press, rare oxide, chloride, and thorium refining areas. A layout of the plant is included in the licensee's file. Facilities for change lockers, laundry, and lunch room are available for the production personnel. Mandle wished to have the layout and process description treated as "business confidential". A waste treatment facility and several waste storage tanks, Th(OH) drum storage and several areas where process and waste sludges were stored in open piles are located outside the plant. Mandle supplied a brief description of the operations involved in the processing of  $\text{Re}_2\text{O}_3$  from monazite sand. The process description which includes the location and type equipment used follows:

12. Procurement Procedures and Control

R. Mandle is responsible for ordering monazite sand containing 3 to 3.5% thorium from producers and distributors licensed by the AEC. Mandle reported, to date, Lindsay Chemical Co., West Chicago, Illinois, and Baumhoff-Marshall, Inc., Boise, Idaho, have been his suppliers. Records of purchase orders from both companies are included in the licensee's file.

13. Instrumentation

At the time of inspection an inoperable Beckmann MX-5 beta-gamma survey meter was found to be on hand. Mandle stated that on several occasions a Victoreen alpha survey meter had been borrowed from Ledoux Co. Subsequent to the inspection, R. Stone contacted this office (December 28, 1959) and stated that the instrument has been repaired and that his company intends to procure additional instrumentation.

14. Radiological Procedures and Control

A. Instructions and Personnel Protection

According to Mandle, production workers have been orally briefed on radiological health safety by F. Nonemaker and himself. A copy of the lecture given to production workers by F. Nonemaker dated April 17, 1958 is included in the licensee's file. The lecture was attended by all workers who were required to sign the sheet of attendance. All production workers, according to Mandle, are equipped with orlon uniforms, respirators, gloves, and rubber overshoes.

B. Surveys

No air surveys for both thoron and thorium have been made to date by the licensee either in-plant or out-plant. No stack air surveys have been made to date. At the time of the inspection, little or no production operations involving the handling of monazite sands or packaging of



of  $\text{ThO}_2$  and  $\text{ThOH}$  were in process. Three samples taken at the  $\text{ReO}_2$  waste press area, mesothorium area, and monasite storage area showed thorium concentrations of 2, 60, and 20 alpha d/m/ $\text{M}^3$ , respectively. Smear samples taken at various locations inside the plant showed levels of 120 to 540 alpha d/m/100  $\text{cm}^2$ . A 1-1/8" Whatman filter paper pressed on waste silica press cake in the mesothorium area showed a concentration of 190 alpha d/m/1-1/8" filter paper sample. A copy of the air and smear results analyzed by HASL is included as Exhibit A in the report details.

Handle reported that two direct radiation surveys have been made to date. Records of surveys conducted on January 6 and March 7, 1959 are included as Exhibits B and C, respectively. Neither survey record includes the instrument used nor the distances from the sources of radiation. Only the January 6, 1959 survey expressed the results in mr/hr. The surveys did not include the radiation levels in the unrestricted outside storage dumps, where piles of yttrium sludge, silica waste (mesothorium containing material), waste treatment sludge and phosphate sludge were stored. The surveys did not include evaluation of  $\text{Th}(\text{OH})$  drum storage area, where a measurement of 7.5 mr/hr was found at one foot from the drums using a GM survey meter. Other measurements taken by the inspector using a Juno alpha-beta-gamma survey meter #5666, and a Nuclear Measurements Corp. beta-gamma survey meter #5571, which were calibrated on November 4, 1959 are as follows.

LOCATION	JUNE	GM
a. Inside Plant		
1. Waste silica press - contact with floor	800 alpha d/m/100 $\text{cm}^2$ - 8 mr/hr gamma	
2. Passageway to office next to press	50,000 alpha d/m/100 $\text{cm}^2$ - 5 mr/hr gamma 15 mr/hr beta	
3. Hand wheel between tank #2 and tank #6	6000 alpha d/m/100 $\text{cm}^2$ - 12 mr/hr gamma	
4. Storage area		7 mr/hr at 1' from monasite storage bags - 1.5 mr/hr bkgd of storage area (waist high meas.)
5. $\text{Th}(\text{OH})$ drum storage near tank #12		7.5 mr/hr at 1' from drums

LOCATION	JUNE	GM
b. Out Plant		
1. Gray Pile (Phosphate cake)		11 m/hr at 1' from pile
2. Silicon and Mesothorium Piles		15 m/hr at 1' from pile
3. Yttrium Pile		1.5 m/hr at 1' from pile
4. Waste Treatment Sludge		1-2 m/hr at 1' from sludge
5. Background bet. Th(OH) drum storage and Yttrium sludge pile		1.3 m/hr
6. Th(OH) drum storage area (approximately 30 drums)		12 m/hr at 1' from drums
7. Primary mixing tank outside waste treatment plant		1.5 m/hr at contact with tank
8. Waste treatment plant (biogr)		0.3 - 0.5 m/hr

#### C. Medical

Handle stated the preoperational physicals and yearly physicals which include chest X-rays, blood, and check of physical well-being are provided for all plant employees. No urine analysis program is in effect.

#### D. Personnel Monitoring

Weekly film badges supplied by St. John X-Ray Laboratory, Calton, New Jersey, are provided employees. The badges also contain a film for a 13-week cumulative exposure. The weekly film badge results for 1958 and 1959 average 100 mR gamma or less while the beta exposures range up to 285 mR. The 13-week cumulative exposures averaged approximately 1200 mR. No dosimeters or ring badges are employed.

#### 15. Storage and Security of Material

Initially, Handle declared his entire plant and surrounding ground as his restricted area. However, after a tour of the plant and grounds, he noted that a 4' wooden fence surrounding his grounds did not completely enclose his plant grounds. He then said that his restricted area would be limited to his production plant and waste disposal which was located approximately 75' from the plant. The waste disposal plant was under lock and key. It was pointed out to Handle that even if the 4' fence covered the entire rear portion of their plant grounds, no control or gated area was available to keep the public from entering the plant grounds, from the parking area, or from the unfenced opposite side of the plant, which is located on a main thoroughfare. Handle agreed this was a correct statement. Stored on the unrestricted plant grounds were piles of thorium bearing sludges, 1-600, yttrium sludge, silicon sludge (mesothorium), phosphate sludge, and waste treatment sludge. Also stored outside the plant in the unrestricted area were over 30 drums of Th(OH). These drums contained an average of 500 lbs. of material. A radiation measurement made with a Juno showed 12 m/hr at 1' from the Th(OH) drums.

16. Inventory

On hand as of November 15, 1959 was 16,645.4 lbs. of monazite or approximately 5000 lbs. of  $\text{ThO}_2$ .  $\text{ThO}_2$  residues in barrels totalled 5180 lbs. Thorium content of sludges stored on plant property are as follows:

- a) Ore tailings Tungus (mesothorium) - 230 tons residue containing 8,200 lbs. of  $\text{ThO}_2$  - located in Area G.
- b) Yttrium sludges - 200 tons residue containing 3000 lbs. of  $\text{ThO}_2$  - located in Area H.
- c) Repurposed sludges - 137 tons residue containing 2750 lbs. of  $\text{ThO}_2$  - located in Area I.
- d) Waste treatment cake - 105 tons residue containing 1300 lbs. of  $\text{ThO}_2$  - located in Area J.
- e) In process silica sludge - 30 tons residue containing 2700 lbs. of  $\text{ThO}_2$  - located in Area H.
- f) In process thorium carbonate - 31 tons residue containing 3100 lbs. of  $\text{ThO}_2$  - located in Area L.
- g) In process thorium Hydroxide - 15 tons residue containing 10,500 lbs. of  $\text{ThO}_2$  - located in Area K.
- h) Refined yttrium concentrate - 20 tons residue containing 2700 lbs. of  $\text{ThO}_2$  - located in Area M.

A copy of the facility layout which includes the locations of the production and waste treatment plants, sludge storage, and drainage trench constructed by the licensee is included as Exhibit D.

17. Waste Disposal

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 35,000 gallons of water per day. All of the washes are discharged into a common 1000 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 functioning of the pumps.

The retention tank has a capacity of 50,000 gallons, which provides 24 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 diluting 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 8000 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 is 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 2000 gallon Hardinge thickener at pH 5.8 - 6.2.

Mandle stated that no liquid effluent samples were checked by his company to determine the thorium concentration of the liquid effluent discharged to the storm sewer. He said the State had made some checks and that he was going to make arrangements with the State to analyse some water samples for him. No approval to dump liquid effluents into a storm sewer by the AEC was reported to be given his company.

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 24 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 3500 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.

Mandle stated, and it was noted during the inspection, that a drainage ditch was under construction to collect run-off water from the hill surrounding the upper end of the licensee's grounds. Another drainage ditch is being constructed between the piles of sludge and the production and waste treatment plant. This, according to Mandle, would prevent run-off to the street.

Mandle said that on several occasions due to the fluctuation in pH, there were slug discharges to the storm sewer. This discharge consisted of both soluble and insoluble wastes (milky white dispersion noted in item 9 of report details).

A telephone conversation with John Russo, New Jersey State Dept. of Health, on January 18, 1960, revealed the following information with regard to release of soluble and insoluble effluent to the streams by the licensee. Russo said on January 17, 1957, a sample taken from the creek near the plant showed a thorium concentration of  $6 \times 10^{-5}$  ug/ml. On February 14, 1958, two samples of a milky white dispersion showed a concentration of suspended material amounting to 4700 ug/ml, and 419 umc/ml. On June 24, 1959, a sample containing soluble effluent revealed no activity in excess of instrument background while another sample (milky white dispersion) showed a concentration of 3880 umc/ml. On January 21, 1959, another dispersion sample showed a concentration of 3300 umc/ml. On November 10, 1959, an undissolved sample collected in the stream showed a concentration of 11,400 umc/ml. On November 21,

1959, another sample revealed a concentration of 5900 uuc/ml. Russo stated that since December 14, 1959, several samples run by his office showed concentrations less than instrument background. Russo stated that "Handle has taken to watch the pH control, and therefore has had a better control of effluent release to the storm sewer".

#### 18. Posting and Labeling

After being queried as to the relative cleanliness of the radiation signs, Hubbard noted that he had posted various areas inside and outside the plant with required caution signs and symbols just prior to the inspection. There were several areas in the plant and outplant in which radiation areas existed which were not posted. The areas in which over 30 odd drums of ThOH and about 30 drums of ThO<sub>2</sub> were stored were not posted with a sign denoting a radiation area. Each of the aforementioned drums contained over 500 lbs. of material. According to Handle, radiation measurements made with a calibrated GM or Juno showed levels from 7.5 mr/hr to 12 mr/hr at 1' from the drums. The area in which over 30 drums of ThOH were stored outside the plant was not posted either with a caution, radiation material sign or the radiation area sign. The drums themselves were not labeled with a caution, radioactive material sign, amount, or type of material. Several hundred 120 lb. bags of monazite sand containing from 3 to 3.5% ThO<sub>2</sub>, which were stored in the monazite storage area, were not labeled with any radioactivity sign or amount, or type of material. The storage area was properly posted with both a caution sign and symbol.

The piles of sludge such as the silica (mesothorium) and gray phosphate cake at which radiation measurements at 1' from the pile showed 11 and 15 mr/hr, respectively, were not posted with a radiation area or a caution, radioactive material sign. These piles contained approximately 200 tons of materials (4 tons ThO<sub>2</sub>). Other piles of sludge stored outplant which include waste treatment yttrium and reworked silica sludge were not posted with any caution, radioactive material sign or symbol. Hubbard stated that he had run out of signs and noted that he was aware that these areas required proper posting. The entrances to the production and waste treatment plants were noted to be properly posted.

#### 19. Incineration

Handle stated that he periodically incinerated paper bags in which the monazite sand is shipped and wipes and wood contaminated with thorium. He added that he has not evaluated the hazard involved in the burning of these contaminated materials by taking air samples, soil samples, etc. during and after burning of the waste, respectively.

#### 20. Records

Records of procurement, receipt, transfer, film badge, physical exams, were found to be in order. No records were maintained on waste disposal. Direct radiation survey records did not include the type of instrument used and did not, in the March 27, 1959 survey (Exhibit C), record the measurements in mr/hr. The survey records shown in Exhibit B and C did not completely evaluate the hazard due to storage of piles of radioactive sludge outside the plant, at which levels in excess of 10 mr/hr existed.

21. Other Part 40 Licenses

A. License C-3623

Under License C-3623, a 50 lb. drum of uranium-magnesium scrap was procured by R. Mandle for use in experimental work relating to the recovery of uranium from magnesium fluoride scrap. No work was ever performed according to Mandle. The 50 lbs. of material which was reportedly posted, was stored in the company storage warehouse. Records of receipt were available.

B. License R-132

According to Mandle, no work is in progress under license R-132, Davison's Pompton Plains or Curtiss Bay plants. All work at Pompton Plains is being performed under license R-196. No work under R-132 or R-196, according to Mandle, is being performed at the Curtiss Bay, Maryland, plant of Davison Chemical Co. Under R-132, Mandle stated that 100 lbs. of thorium bomb reduction residues had been transferred by him to the Davison Chemical Co. plant at Erwin, Tennessee.

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

Exhibit A

SAMPLE REQ. NO. \_\_\_\_\_  
DATE SENT \_\_\_\_\_  
DATE RECEIVED 12-2-57  
DATE REPORTED 12-2-57

TYPE OF SAMPLE  
SMOKE - AIR

METHOD OF DETERMINATION

Alpha Count (Geant)

PLANT  
R.E. N.Y.

MAILING ADDRESS

ROUTE RESULTS TO

ANALYZE FOR

INSTRUMENT Thorium

SAMPLE NO.	DATE	HOUR	SAMPLE DESCRIPTION		SAMPLING (M)		SAMPLE TAKEN	TOTAL COUNT	COUNT PER MIN.	RESULTS
			RATE	TIME	TOTAL					
1-205	11/25	3:30 PM	Rate Count, count press	27.5	1935.0	27.5	11	15	0.54	2
			No operations in progress							
1-207	11/25	3:30 PM	Rate Count, count press	27.5	18	27.5	124	15	8.04	6.0
			No operations in progress							
1-206	11/25	3:30 PM	Storage Area, Thorium, Thorium	32.5	29.942.5	32.5	86	15	5.13	20
			No operations in progress							
1-290	11/25	3:30 PM	4" area off handling	16 IN	964	964		5	192.17	540
			Rate count covering (small)							
1-201	11/25	3:30 PM	Storage Area, Thorium, Thorium	8 IN	215	215		5	42.37	120
			guarding will be storage							
1-202	11/25	3:30 PM	Storage Area, Thorium, Thorium	16 IN	568	568		5	112.97	320
			Storage Area, Thorium, Thorium							
1-203	11/25	3:30 PM	Rate Count, count press	347	347	347		5	68.77	190
			Rate Count, count press							
1-204	11/25	3:30 PM	Rate Count, count press	941	941	941		16	58.18	160
			Rate Count, count press							

ANALYZED BY

5.6.1 H.O.P.

SURVEYOR TO OBTAIN LAST COPY-RETURN ALL OTHERS TO HEALTH AND SAFETY DIVISION

COPI

COPI

EXHIBIT B

January 6, 1959

R. M. Mandle

FILES

Survey of Plant for St. John X-Ray Lab

Monasite Storage area	2-10	mr/hr
Ball Mill area	1	mr/hr
Monasite transfer drums	3	mr/hr
Centrifuge and Press #3	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	0.5-1	mr/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 - Calif 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 ABC 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.

WCB:1

R.M.M.



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
Munizite Storage	6
Th(OH) <sub>3</sub> under Whitney Press	8

DAVISON CHEMICAL COMPANY  
DIVISION OF I. R. GRACE & CO.  
BALTIMORE 3, MARYLAND

CHEMICALS DIVISION  
RARE EARTHS

January 12, 1960

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

Mr. Paul B. Kleven  
Inspection Division  
United States Atomic Energy Commission  
376 Hudson Street  
New York 14, New York

Dear Mr. Kleven:

We enclose the following information requested as a result of your recent inspection of these facilities:

1. Process description.
2. Waste treatment plant operating description.
3. Plot plan indicating location of residues and waste treatment plant.
4. Thorium content of sludges stored on property.

The process description has been copied from a detailed engineering report of the company. We have indicated the number of associated tanks, presses and processing equipment in parenthesis. These coincide with the numbers of equipment itemized on the company process flow diagram given to you during your visit. In view of the nature of this description and flow diagram we have stamped it "Company Confidential" and ask that it be so treated by the Commission.

We estimate that during the past ten years approximately 750 tons of residues have been transferred to the area indicated on the enclosed plot plan.

If further information on any of the above is required, we will be pleased to cooperate.

Sincerely,

*Richard M. Mandle*  
Richard M. Mandle  
Technical Director

RMM:MCB

ITEM # 96

P R O G R E S S T H R O U G H C H E M I S T R Y

January 12, 1960

DAVISON CHEMICAL COMPANY  
DIV. OF W. R. GRACE & CO.  
BOX 488  
POMPTON PLAINS, NEW JERSEY

THORIUM CONTENT OF SLUDGES STORED ON PROPERTY

	<u>Tons Residue</u>	<u>Contained ThO<sub>2</sub> Pounds</u>	<u>Area</u>
Ore tailings (gangue	230	8,200	G
Yttrium sludges	200	3,000	H
Reworked sludges	137	2,750	I
Waste treatment cake	105	1,300	J
In process silica sludge	30	2,700	H
In process thorium carbonate	31	3,100	L
In process thorium hydroxide	15	10,500	K
Refined yttrium concentrate	20	2,700	M

January 12, 1960

### WASTE TREATMENT PLANT

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 35,000 gallons of water per day. All of the washes are discharged into a common 1000 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 24 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 diluting 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 8000 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 2000 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 24 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 3500 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. Wet chemical analyses of samples of effluent meeting the turbidity standards of the Department of Health indicate

thorium levels below our limit of detection. 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.

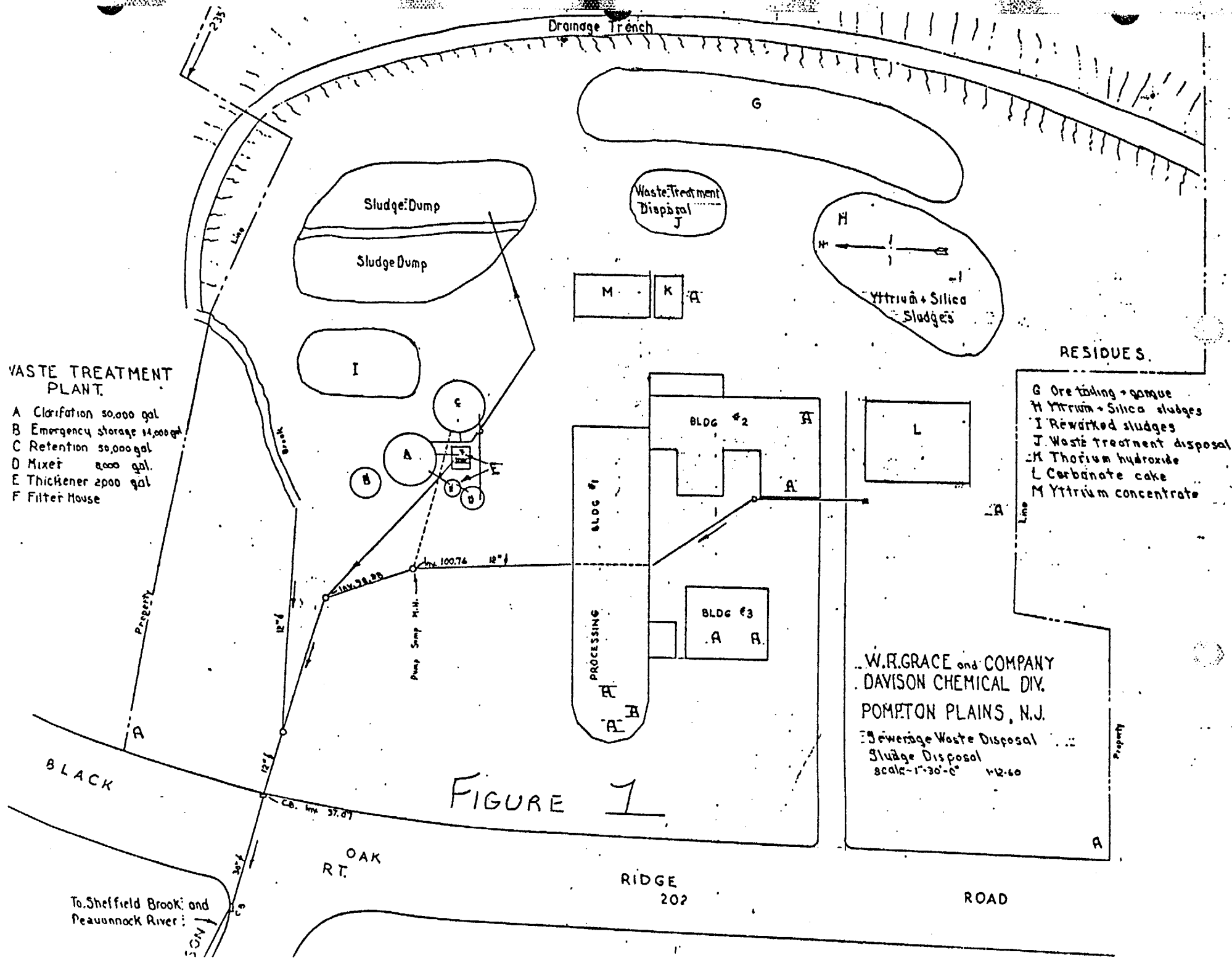
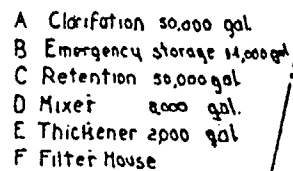


FIGURE 1

W.R.GRACE and COMPANY  
DAVISON CHEMICAL DIV.  
POMPTON PLAINS, N.J.

Minor Waste Disposal  
Sludge Disposal  
scale-1'-30'-0" 12-60

RESIDUES.

- G Ore tailing + gangue
- H Yttrium + Silica sludges
- I Rewashed sludges
- J Waste treatment disposal
- K Thorium hydroxide
- L Carbonate cake
- M Yttrium concentrate

µc/ml, which is approximately 20% the MPC of  $1 \times 10^{-6}$  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 RIBL 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



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., Arden, New York as fertilizer. Garino samples and counts all liquid before transfer. The records of these assays show no activity over background.

Solids

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. Garino stated that four pits were dug and filled in 1963 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(o)(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 pounds of 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 operation 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  $1.9 \times 10^{-12}$  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

HEALTH PHYSICS MANUAL

DAVISON CHEMICAL CO.

POMPTON PLAINS

NEW JERSEY

JANUARY 1, 1960

PREPARED BY

PETER J. GARINO

B/96

NYOO COMPLIANCE DIVISION

AUG 25 1960

ITEM # 97

RECEIVED

(69)

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## 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 <sup>232</sup> and thorium <sup>288</sup> 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.

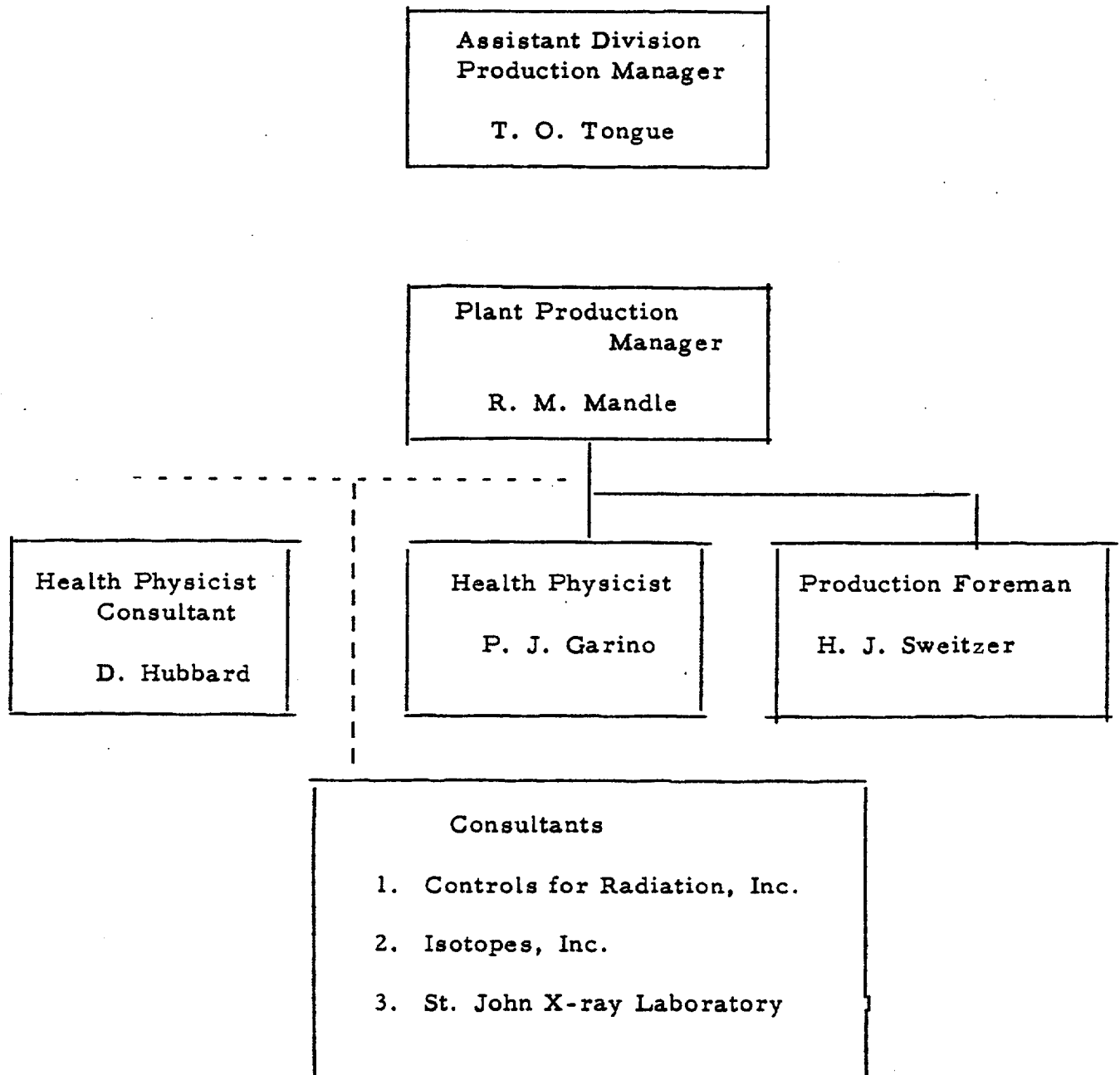
Fifty to seventy-five years of experience in refining thorium from monazite has produced no noticeable evidence of radiation injury or chemical toxicity. Industrial exposure averaged  $10^{-10}$  uc/cc during this period.

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  $2 \times 10^{-12}$  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  $3 \times 10^{-11}$  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 TER

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 permissible 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 permissible concentration(MPC)	In restricted areas this is limited to $5 \times 10^{-11}$ microcuries per milliliter of air. This is equivalent to 110 alpha disintegrations per minute per cubic meter of air.
Roentgen	The quantity of X or gamma-radiation such that the associated corpuscular emission per 0.001293 gram of air (lcc 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.



# MAXIMUM PERMISSIBLE LEVELS AND CONCENTRATIONS

## PERMISSIBLE WEEKLY DOSE

Conditions of exposure		Dose in critical organs (mrem)			
Parts of body	Radiation	Skin, at basal layer of epidermis	Blood forming organs	Gonads	Lens of eye
Whole body - - - - -	Any radiation with half-value-layer greater than 1 mm of soft tissue.	1600	1300	1300	1300
Whole body - - - - -	Any radiation with half-value layer less than 1 mm of soft tissue.	1,500	300	300	300
Hands and forearms or feet and ankles or head and neck.	Any radiation - - - - -	21,500	- - - - -	- - - - -	- - - - -

<sup>1</sup> For exposures of the whole body to X or gamma rays up to 3 mev, this condition may be assumed to be met if the "air dose" does not exceed 300 mr, provided the dose to the gonads does not exceed 300 mrem. "Air dose" means that the dose is measured by an appropriate instrument in air in the region of highest dosage rate to be occupied by an individual, without the presence of the human body or other absorbing and scattering material.

<sup>2</sup> Exposure of these limited portions of the body under these conditions does not alter the total weekly dose of 300 mrem permitted to the bloodforming organs in the main portion of the body, to the gonads, or to the lens of the eye.

# MAXIMUM PERMISSIBLE LEVELS AND CONCENTRATIONS (cont.)

## PERMISSIBLE CONCENTRATIONS IN AIR AND WATER ABOVE NATURAL BACKGROUND

Material	Table I <sup>4</sup>		Table II <sup>4</sup>	
	Column 1 <sup>1</sup>	Column 2 <sup>2</sup>	Column 1 <sup>1</sup>	Column 2 <sup>2</sup>
	Air (2)	Water (3)	Air (2)	Water (3)
Tel27 - - - - -	3x10 <sup>-7</sup>	8x10 <sup>-2</sup>	1x10 <sup>-8</sup>	3x10 <sup>-3</sup>
el29 - - - - -	1.2x10 <sup>-7</sup>	3.3x10 <sup>-2</sup>	4x10 <sup>-9</sup>	1.1x10 <sup>-3</sup>
Th234 - - - - -	2x10 <sup>-6</sup>	10	6x10 <sup>-8</sup>	3x10 <sup>-1</sup>
Th-natural (soluble) - - - - -	5x10 <sup>-11</sup>	1.5x10 <sup>-6</sup>	1.7x10 <sup>-12</sup>	5x10 <sup>-8</sup>
Th-natural (unsoluble) - - - - -	5x10 <sup>-11</sup>	- - - -	1.7x10 <sup>-12</sup>	- - - -
Tm170 - - - - -	1.5x10 <sup>-7</sup>	8x10 <sup>-1</sup>	5x10 <sup>-9</sup>	2.5x10 <sup>-3</sup>
U-natural (soluble) <sup>3</sup> - - - - -	5x10 <sup>-11</sup>	2x10 <sup>-4</sup>	1.7x10 <sup>-12</sup>	7x10 <sup>-6</sup>
U-natural (unsoluble) <sup>3</sup> - - - - -	5x10 <sup>-11</sup>	- - - -	1.7x10 <sup>-12</sup>	- - - -
U233 (soluble) - - - - -	4x10 <sup>-10</sup>	4.5x10 <sup>-4</sup>	1x10 <sup>-11</sup>	1.5x10 <sup>-5</sup>
U233 (unsoluble) - - - - -	5x10 <sup>-11</sup>	- - - -	1.6x10 <sup>-12</sup>	- - - -
V48 - - - - -	3x10 <sup>-6</sup>	1.5	1x10 <sup>-7</sup>	5x10 <sup>-2</sup>
Xe133 - - - - -	1.3x10 <sup>-5</sup>	1.3x10 <sup>-2</sup>	4x10 <sup>-7</sup>	4x10 <sup>-4</sup>
Xe135 - - - - -	5x10 <sup>-6</sup>	4x10 <sup>-3</sup>	1.7x10 <sup>-7</sup>	1.4x10 <sup>-4</sup>
Y91 - - - - -	1.2x10 <sup>-7</sup>	6x10 <sup>-1</sup>	4x10 <sup>-9</sup>	2x10 <sup>-2</sup>
Zn65 - - - - -	6x10 <sup>-6</sup>	2x10 <sup>-1</sup>	2x10 <sup>-7</sup>	6x10 <sup>-3</sup>
Unidentified beta or gamma emitters of any undetermined mixtures of beta or gamma emitters - - - -	- - - -	- - - -	1x10 <sup>-9</sup>	1x10 <sup>-7</sup>
Unidentified alpha emitters or any undetermined mixtures of alpha emitters - - - - -	- - - -	- - - -	5x10 <sup>-12</sup>	1x10 <sup>-7</sup>

<sup>1</sup>Air concentrations are given in microcuries per milliliter of air.

<sup>2</sup>Water concentrations are given in microcuries per milliliter of water. These figures also apply to foodstuffs in microcuries per gram (wet-weight).

<sup>3</sup>For enriched uranium the same radioactivities per unit volume as those for natural uranium are applicable. It should be noted that the contribution of U-234 to the gross activity of enriched uranium is 20-40 times that of the U-235.

<sup>4</sup>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 permissible 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 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      $5 \times 10^{-11}$  uc/ml

Uranium      $5 \times 10^{-11}$  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 permissible concentration. The effluent is then graded according to the following standards:

#### PLANT EFFLUENT STANDARDS

<u>Grade of Effluent</u>	<u>Sample Position and % Hardinge Overflow</u>		<u>M. P. C. Weir</u>	<u>Disposition</u>
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)

<u>Grade of Effluent</u>	<u>Sample Position and % Hardinge Overflow</u>	<u>M. P. C. Weir</u>	<u>Disposition</u>
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.

## 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 week and a report of the readings by name and badge number is 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.



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 \_\_\_\_\_

[illegible]

SURVEY OF RADIOLOGICAL AIR-BORNE CONTAMINATION

Location	Date	Time	Type of Survey	Results

(24)

Date \_\_\_\_\_

\_\_\_\_\_

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 DEPART NT  
RARE EARTH DIVISION

# DUST RESPIRATOR INSPECTION REPORT

DATE OF INSPECTION \_\_\_\_\_

[illegible]

By Health Physios Department

RECORD OF DISCHARGE OF PROCESS EFFLUENTS TO THE  
POMPTON RIVER

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



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

Operator \_\_\_\_\_

Shift \_\_\_\_\_

Job Description \_\_\_\_\_

d/m/m<sup>3</sup>  
CONCENTRATION  
(L) (H) (AVG)

TIME	OPERATION OR OPERATING AREA	(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			
:10				
:20				
:30				
:40				
:50				
1:00				
:10				
:20				
:30				
:40				
:50				
2:00				
:10				
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: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 <sup>3</sup>	AVGE CONC X TOTAL TIME

(TxC) \_\_\_\_\_  
(T)

d/m/M<sup>3</sup> \_\_\_\_\_ times max.  
per. conc.

CONTACTS FOR EMERGENCY USE

OPERATIONS SUPERVISOR

R. M. Mandle

Home Phone TE 5-3189

OPERATIONS ASSISTANT

H. J. Sweitzer

Home Phone TE 5-5119

HEALTH PHYSICS

P. J. Garino

Home Phone OX 4-0877

MEDICAL OFFICER

Dr. S. T. Bernson

Office Phone TE 5-2400

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

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## 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.

$$18 \times 60 = 1080 \div 30 = 1110 = \text{count time in minutes.}$$

$$235 \div 1110 = .21 \text{ c/m bkgd.}$$

When it is impossible to count the background overnight, it 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.

$$4 \div 15 = .27 \text{ c/m background.}$$

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.

$$3.28 + 3.50 + 2.98 = 9.76$$

$$9.76 \div 3 = 3.25$$

$$640 \div 3.25 = 197, \text{ the average counts/minute}$$

- 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.

$$608 + 626 + 599 = 1833$$

$$1833 \div 9 = 204, \text{ the average count/min.}$$



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

Count = total count

Time = time in minutes.

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

The counter background was .12 c/m.

$$32 \div 7.38 = 4.35$$

$$4.35 - .12 = 4.23 \text{ c/m}$$

- 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<sup>3</sup>. Air dust samples are usually reported in this way. This formula is used:

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

\*.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 ( $\text{HNO}_3$ ) 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 ( $\text{HNO}_3$ ) 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.

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

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.

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

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.

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

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

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

## BETA COUNTING

### TABLE OF CONTENTS:

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## 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.

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

#### 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.

$$\begin{aligned}\text{Average c/m} &= 5300 \div 5282 \div 5199 = 15781 \div \\ &9 = 1753.4 - 7.3 = 1746.1 \text{ c/m.}\end{aligned}$$

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.  $488 \times 60 = 29280$  d/m. The average c/m of the standard was 1746.1.  $\text{Geo.} = 1746.1 \div 29280 = 6.0\%$  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.

$$5200 + 5169 + 5310 = 15,679$$

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

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 ( $\text{HNO}_3$ ) 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.

## BETA COUNTING

### 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.

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

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%.

$$d/m/sample = 60.5 \div .071 = 852 \text{ d/m/sample.}$$

## BETA COUNTING

### 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.

$$\text{Bkgd.} = 37 \div 5 = 7.4 \text{ c/m.}$$

$$c/m = 768 \div 30 = 25.6 - 7.4 (\text{bkgd.}) = 18.2 \text{ c/m.}$$

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%.

$$d/m = 18.2 \div .063 = 289 \text{ d/m.}$$

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.

$$d/m/ml = 289 \div 3 = 96.3 \text{ d/m/ml.}$$

## 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°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.

$$c/m = 562 \div 15 = 37.5 - 8.5 \text{ c/m (bkgd.)} = 29.0 \text{ c/m}$$

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

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

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

The geometry of the counter was 6.4%.

$$d/m = 29.0 \div .064 = 453.1 \text{ d/m}$$

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.

$$d/m/\text{sample} = d/m \times 2 = d/m/\text{sample.}$$

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

$$d/m/\text{sample} = 453.1 \times 2 = 706.2 \text{ d/m/sample.}$$

## 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.

$$c/m = 27198 \div 15 = 1813.2 - 8.1 = 1805.1 \text{ c/m}$$

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

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

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

The geometry of the counter was 6.2%.

$$d/m = 1805.1 \div .062 = 29115 \text{ d/m.}$$

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.

$$d/m/\text{gram} = d/m \times \text{factor} = d/m/\text{gram.}$$

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.

$$0.7678\text{g.} - 0.3561\text{g.} = 0.4117\text{g. (weight of sample)}$$

$$1 \div 0.4117\text{g.} = 2.43 \text{ (factor)}$$

$$d/m/\text{gram} = 29115 \times 2.43 = 70749 \text{ d/m/gram.}$$

Steep

Drainage Trench

G

H

M

Ytterbium Silica  
Sludges

RESIDUES

3. Crystalline residue

4. Ytterbium - silica residue

5. Ytterbium - silica residue

6. Water - insoluble residue

WASTE TREATMENT  
PLANT

B. Emergency Storage

I

Storage

Storage

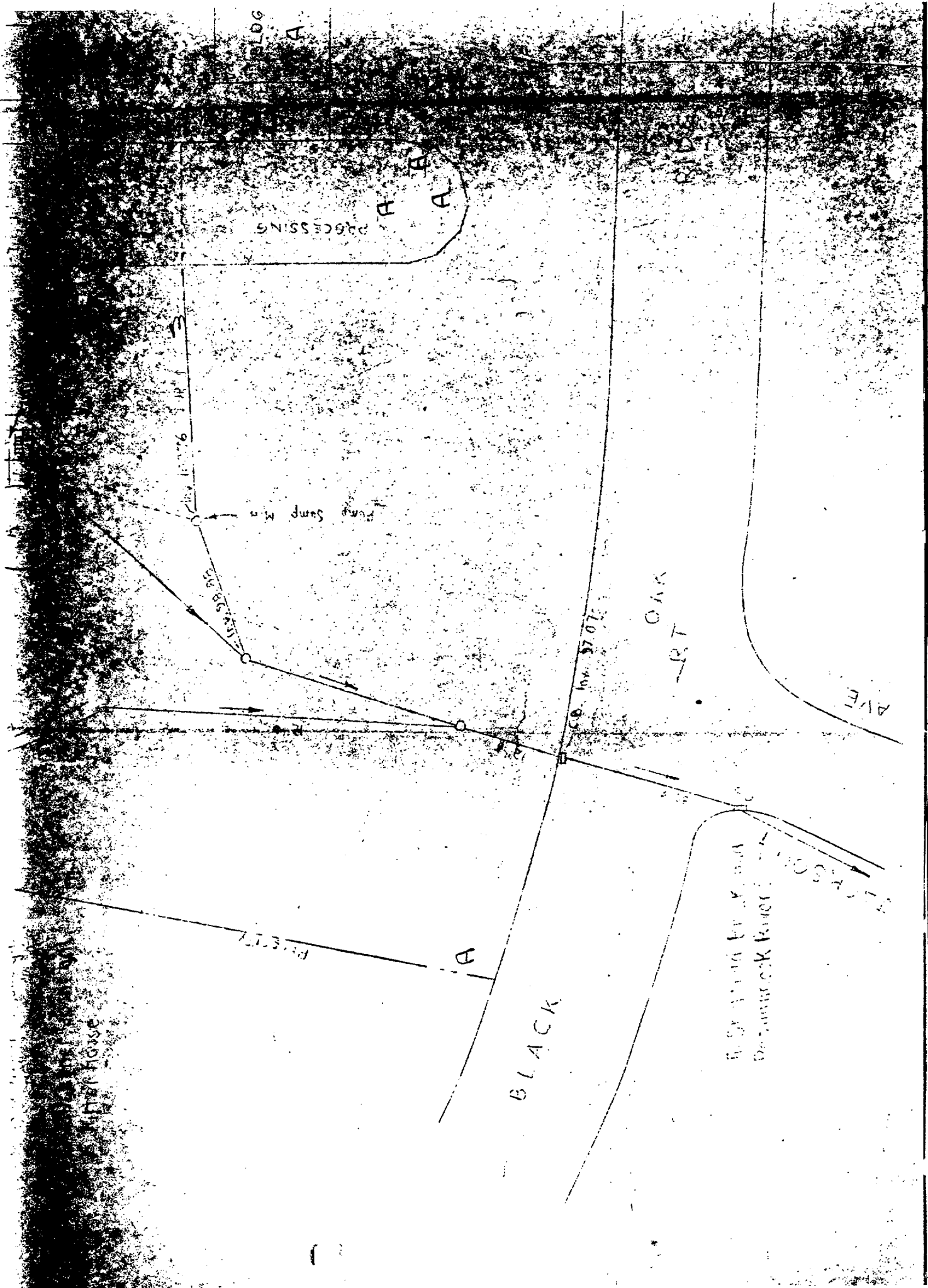
Line

235

M

Storage

Storage



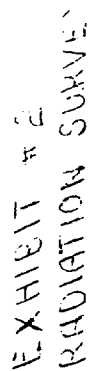
WATER  
TREATMENT  
PLANT  
Aeration of Air and Plant  
Effluent Sampling Stations  
A-Air Sampling Station  
E-Effluent Sampling Station

W. R. GRACE and COMPANY  
DAVISON CHEMICAL DIV.  
POMERON PLAINS, NJ

Sewerage Waste Disposal  
Sludge Drying Pond  
Sediment Pond

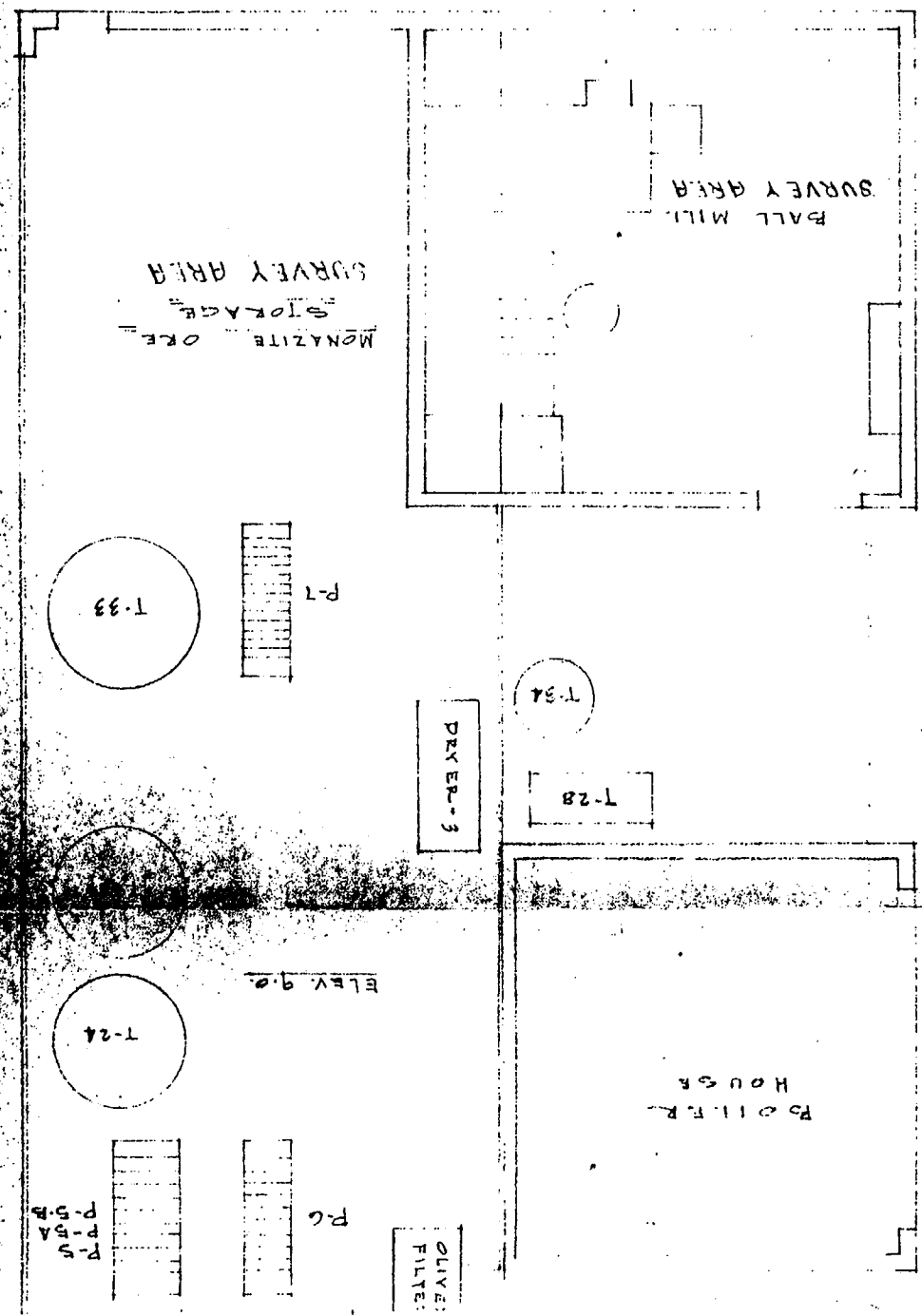
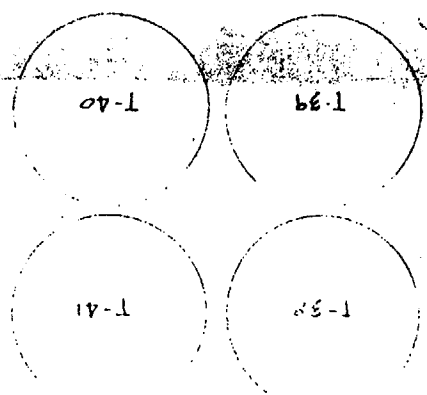
ROAD

100 ft. x 100 ft.  
typical building  
containing process  
equipment

EXHIBIT # 2  
RADIATION SURVEY



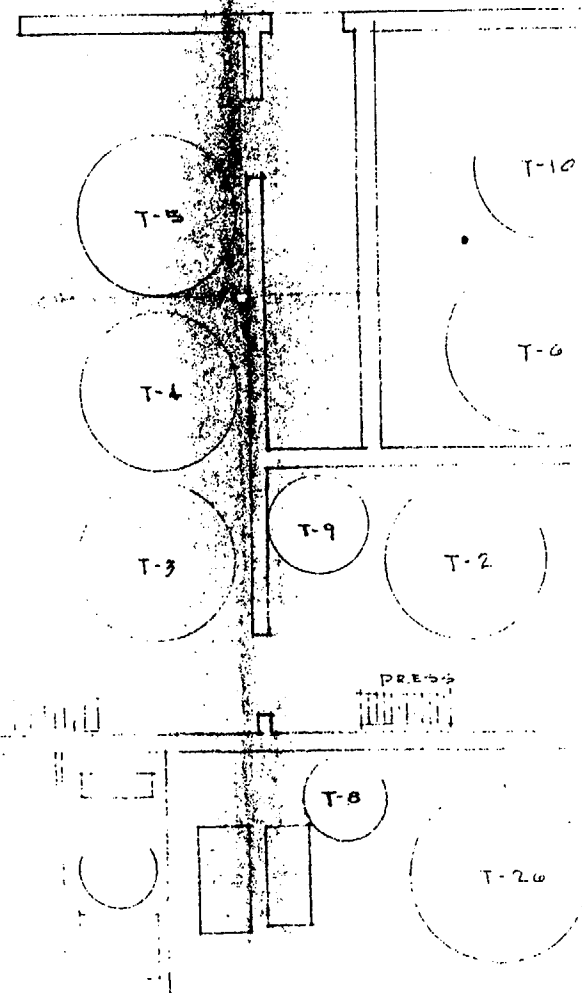
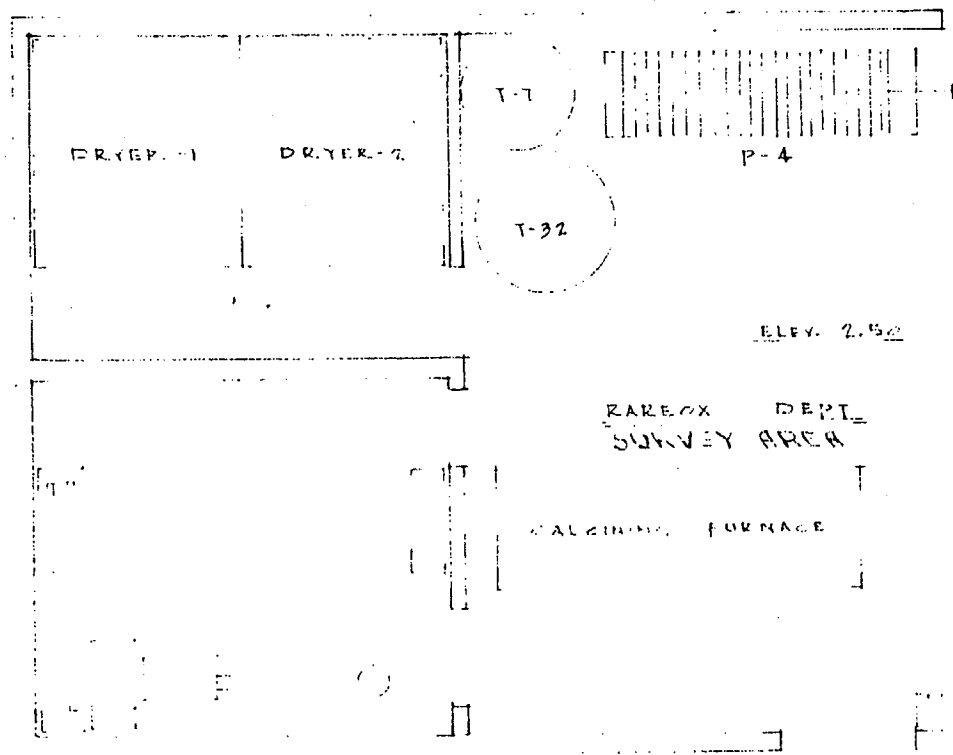
# EXHIBIT #2 RADIATION SURVEY AREAS



Scale 1/8" = 1'-0"  
Division of  
Equip  
GR-00

ELEV. 0.0

ELEV. 2.50

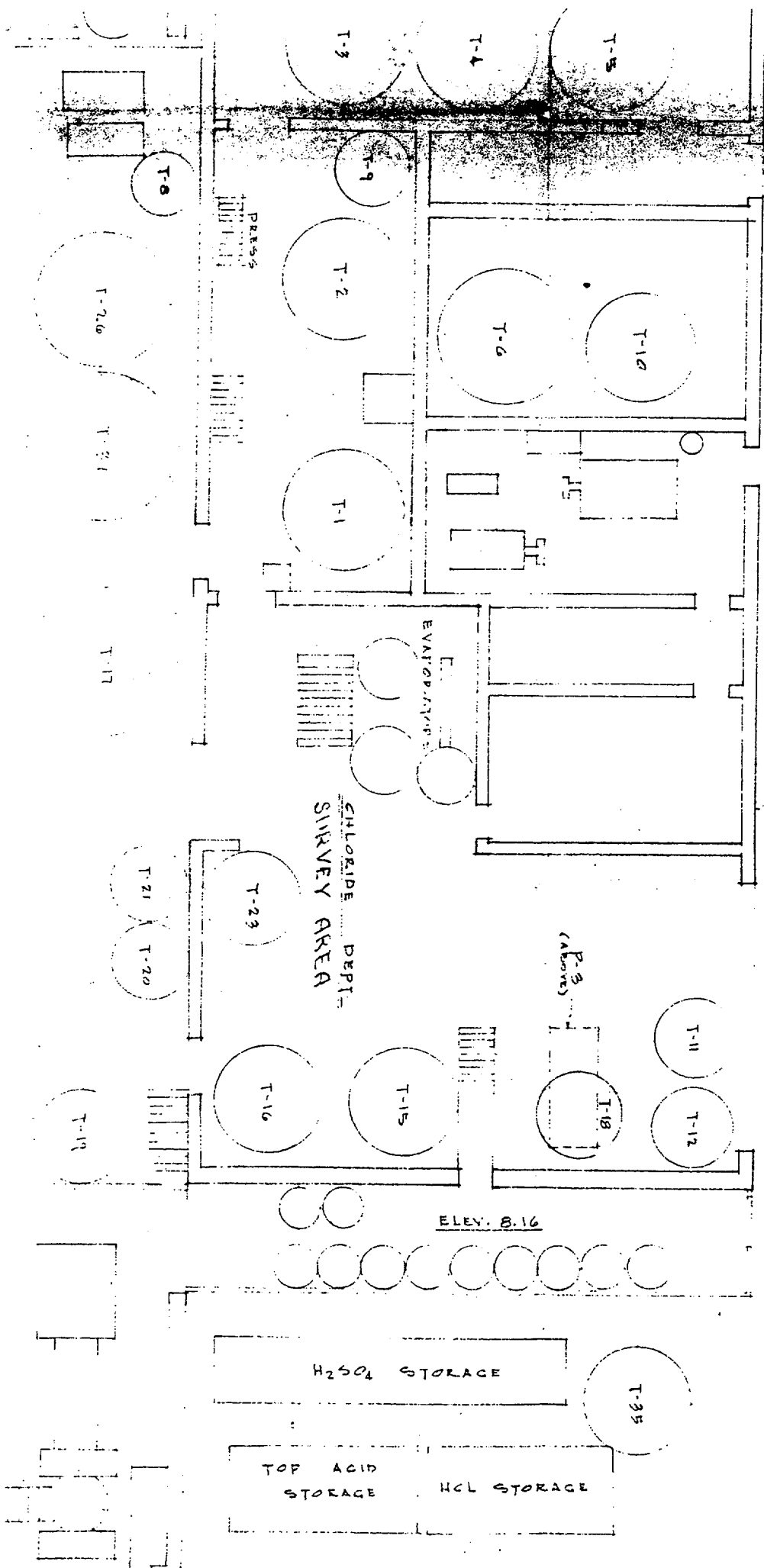


ELEV. 0.00

LINE OF LOADING PLATFORM

ELEV. 2.50

MAST  
TRAILER  
Pg. 1 of 2



WASTE  
TREATMENT  
POND

P-3  
(AERATOR)

DEPT-  
AREA

T-11

T-12

T-18

T-15

T-16

T-19

T-20

ELEV. 8.16

H<sub>2</sub>SO<sub>4</sub> STORAGE

T-35

TOP ACID  
STORAGE

HCL STORAGE

SPENT ACID

T-36



EXHIBIT  
LOCATI  
SAMPLIN  
A-Hir S-

2700-A

DIVISION OF INSPECTION  
Memo Route Slip

Action Information Current Review  
Comment Note & Return Per Our Telcon File

Dubinski - OROO	
Hageman - COO	
Haycock - AL00	
Kirkman - NY00	X
Attention B. L. Harless	✓
Smith - SAN	
Sullivan - SR00	
Walker - IOO	
Zangar - H00	

REMARKS: RE: CASES PENDING ENFORCEMENT ACTION - PART 40

Reference is made to the listing on reverse of your quarterly report, June 30, 1960.

Davison Chemical Company  
Division of W. R. Grace and Company  
License No. R-196:

A review of this file indicates that enforcement action has not been completed. Copies of letters to the licensee from L&R dated March 14 and June 6, 1960, have been furnished your office.

NY00 INSPECTION DIVISION

JUL 22 1960

RECEIVED

FROM: MMMann PAMorris LDLow CCPalmiter MDBlaha X DATE: 7/21/60

MAR 14 1963

40-66

Devleco Chemical Company  
Division of W. L. Cross & Company  
181 N. Charles Street  
Baltimore 3, Maryland

Attention: Mr. David P. Barrett, Sales Manager

Gentlemen:

This refers to the inspection conducted on November 23, 1959 of your activities at Pumpkin Plains, New Jersey, authorized under ADC Source Material License Nos. E-196 and C-3623.

There were no items of noncompliance noted for License No. C-3623. With regard to License E-196, it appears that certain of your activities were not conducted in full compliance with the requirements of the ADC's "Standards for Protection Against Radiation," Part 20, Title 10, Code of Federal Regulations, in that:

1. Surveys to determine the concentrations of airborne radioactivity were not made as required by Section 20.201(b), "Surveys."
2. Surveys to determine the concentration of radioactivity in the plant liquid effluent were not made as required by Section 20.201(h), "Surveys."
3. Surveys to determine the external radiation levels in and around the plant were not complete as required by Section 20.201(h), "Surveys." Although surveys had been made, they did not include all areas where source material is stored and used.
4. Records of external radiation survey results were not maintained in the units required by Section 20.401(a), "Records of surveys, radiation monitoring, and disposal."
5. Source material waste was disposed by incineration without prior approval by the Commission. This is in violation of Section 20.305, "Treatment or disposal by incineration."

REGISTERED MAIL  
RETURN RECEIPT REQUESTED

ITEM # 98

38

3/19/63

(7)

Jim Klein  
W. L. Cross  
ad



6. Source material waste was disposed by release to a steam vent. This is in violation of Section 20.201, "Waste disposal."
7. Areas in which source material was stored and used were not posted as required by Section 20.203(a)(2), "Caution signs, labels and signals."
8. Areas in which source material was stored and used were not posted as required by Section 20.203(b), "Caution signs, labels and signals."
9. Radiation levels in and around the storage and dump areas were such that an individual could receive an exposure in excess of 2 mrem in any one hour or an exposure in excess of 100 mrem in any seven consecutive days. This is in violation of Section 20.101(b)(1)(2), "Permissible levels of radiation in unrestricted areas."
10. Source material in the storage area was not secured against unauthorized removal as required by Section 20.207, "Storage of licensed material."

Pursuant to the provisions of Section 2.20(a), "Section of Violations," of the AEC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, you are requested to notify this office, within thirty days of your receipt of this notice, of the steps taken or to be instituted to achieve correction of the alleged violations, and the date when such correction has been or will be achieved.

In addition, you are requested to submit the following information in order to facilitate the review of your removal applications:

1. A detailed description of your organization, including authority and responsibility of each level of management and/or supervision in regard to development, approval, and adherence to operating procedures.
2. The qualifications and experience of the personnel in your organization assigned the responsibility for developing, conducting, and administering the radiation safety program for the mill.

3. A description of the area in which the mill is located including distances to inhabited areas, locations of rivers and source of water supply for the mill. A topographical map with the above identifications is preferred.
4. The ultimate control or disposition of mill tailings, i.e., discharge into a pond, river, etc.. A statement as to whether or not the tailings will reach a water supply; and if so, where the tailings enter such supplies in relation to points of public utilization of the water, and expected dilution factors.
5. A flow diagram of the mill production operation and a diagram of plant layout indicating areas and points in the process where dust is generated.
6. A description of dust collection and ventilation equipment that are utilized during mill operations, including the type capacity and locations of such equipment, e.g., air transfer points, crushing, grinding, etc..
7. A description of the method for restricting both the mill and the tailings pond from unauthorized entry.
8. A description of mill discharge stacks including the height of the stacks and types of gas to be discharged, and method for controlling release of radioactive material.
9. A description of the equipment used to remove solid radioactive material and soluble radium if tailings are discharged directly into a ground or surface water supply.
10. A description of the survey program which is followed to determine concentrations of airborne radioactivity within the mill, including the units, model number and capacity of sampling devices, and the step-by-step procedures for sample analysis. This description should also include:
  - (a) The number of sampling locations in each area.
  - (b) A reference description of the sampling location to operating personnel.

- (c) A reference description of the sampling location to the process operation.
  - (d) The number of air samples taken in each area per month.
  - (e) The number of air samples taken in each location per month.
11. A description of the method for determining exposure of employees to external radiation. For film badge studies, indicate number and category of personnel involved in the program.
  12. A description of the liquid effluent survey program, including the number, location and frequency of check samples and a stop-by-stop procedure for analysis of the radioactive material.
  13. A copy of the written operating instructions dealing with radiological safety which are supplied to employees. These instructions should include provisions for personnel hygiene including washing prior to eating or leaving the plant.
  14. If respirators are utilized, a description of your program for their use and control including the type, method for fitting, procedures for cleaning, reuse and class of use, and management enforcement of the program.

Very truly yours,

CC: Division of Inspection, Wash.  
Division of Inspection, NTDO  
Public Document Room

Ignell Johnson, Chief  
Licensing Branch  
Division of Licensing  
and Regulation

Enclosures:  
10 CTR Part 20  
10 CTR Part 2

APD 10 111

DIA:RSB

DIA:RSB

DIA:LB

JJL:am:shs

LXRogers

LJohnson

3-7-60

JAN 26 1960

Harold M. Mann, Assistant Director  
Division of Inspection, Headquarters

Robert V. Kirkman, Director  
Inspection Division, R100

**TRANSMITTAL OF LICENSE COMPLIANCE INSPECTION REPORT - LO CTR 40**

**SYMBOL: INS:PMK**

Transmitted herewith is the following inspection report  
involving noncompliance:

**BAKE KARTES, INC.**  
Division of W. R. Grace & Co.  
Pompton Plains, New Jersey

License Nos. B-196,  
B-192 - Clear Rpt.  
C-3623 Clear Rpt.

The following items of noncompliance were found during  
the inspection of License B-196:

20.102(b)(1)(2) - "Permissible levels of radiation in  
unrestricted areas" - In that levels of radiation exist  
at the outside storage and dump areas of such a magnitude  
that if an individual were continuously present in these  
areas, it could result in his receiving a dose in excess  
of 2 mrem in any one hour or could result in his receiving  
a dose in excess of 100 mrem in any seven consecutive  
days. (See item 14B and 15 of report details.)

**20.201(b) "Surveys"**

- in that the radiation surveys conducted by the licensee  
have not fully evaluated the direct radiation hazard both  
in and out plant.

- in that no in or out plant air samples or stack air  
samples have been taken to date in order to evaluate the thoron  
and thorium concentrations originating from production  
operations and from storage of sludge materials.

- in that no water effluent sample surveys have been made  
by the licensee to determine status of compliance with  
Section 20.102.

Inspection (See items 14, 15, and 17 of report details.)

Klevin:pm Kirkman  
1/25/60

(continued)

ITEM # 99

77

2/9/60  
(3)

JAN 26 1960

20.207 "Storage of licensed material"

- in that the licensee stores in the unrestricted area adjacent to his production area approximately 790 tons of thorium bearing sludges which are not secured against removal. (See item 15 and 16 of report details.)

20.207(b) "Caution signs, labels and signals" - "Radiation areas"

- in that radiation areas within and outside of the plant existed which required posting in accordance with this section (i.e., measurements taken at the locations at which approximately 30 drums each of  $\text{Th}(\text{OH})$  and  $\text{ThO}_2$  showed radiation readings from 7.5 to 12 mr/hr at 1', respectively, from these drums). (i.e., at piles of sludge containing silicon (mesothorium) and gray phosphate cake, radiation levels found were 11 and 15 mr/hr at 1' from the piles, respectively.) (See items 14B and 18 of report details.)

(a)(2) "Additional Requirements"

- in that the area outside the plant where approximately 30 drums of  $\text{ThOH}$  (approximately 500 lbs. per drum) were stored was not posted with any radiation caution sign or symbol.
- in that piles of sludge stored outplant which include waste treatment sludge, yttrium and reversed silicon sludge, were not posted with any radiation caution, radioactive material sign or symbol. (See items 16 and 18 of report details.)

20.305

"Treatment or disposal by incineration"

- in that the licensee has periodically incinerated on his unrestricted plant ground bags, wipes and wood contaminated with thorium. (See item 19 of report details.)

20.301

"General Requirement"

- in that the licensee has disposed of both soluble and insoluble effluent to a storm sewer without obtaining Commission approval as per Section 20.302. (See item 17 of report details.)

20.401(a) "Records of surveys, radiation monitoring and disposal"

- in that the records of surveys made by the licensee are incomplete in that no notation as to the instruments used or distances from sources of radiation were available or were levels at sludge piles available, and specifically, the survey of March 27, 1959 did not record any measurements in units (mr/hr). (See item 14B and Exhibits B and C of report details.)

Barbara H. Mann

- 3 -

There were no items of noncompliance noted under Licenses C-3623 or B-132.

The aforementioned items of noncompliance were discussed with Richard Mueller, Plant Manager, Richard Stone, Sales Manager, and D. Richard, Manager, Industrial Relations, Evelyn Plant, Daviess Chemical Co. All of the aforementioned individuals stated their willingness to comply with the Federal Regulations. Mueller, in a telephone conversation to this office on January 14, 1960, said that the services of health physicists of the Evelyn, Tennessee plant have been made available to him and that he has already started to conduct an air sampling program. He also informed us that he has routinely submitted both liquid waste effluent and product samples to the New Jersey Department of Health for analysis in order to cope with the general problem of contamination.

We wish to note that liquid waste samples to the storm sewer which have been analyzed since December 14, 1960, have been found to be the same as instrument background. This is quite a reduction in waste concentrations released to the outside environment. Mueller said more rigid control of pH fluctuation is probably the reason for this.

We feel that a hazard exists and a follow-up inspection is required.

We recommend that a letter be sent to the licensee (R. Mueller) regarding that the aforementioned items of noncompliance be corrected.

Enclosure:  
Thomp. Rpt. (4 cpy)

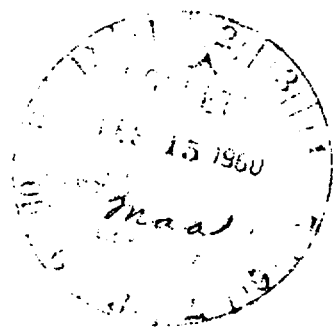
DAVISON CHEMICAL COMPANY

DIVISION OF W. R. GRACE & CO.  
BALTIMORE 3, MARYLAND

February 11, 1960

40-86

Mr. J. C. Delaney  
Chief, Materials Section  
Division of Licensing and Regulation  
United States Atomic Energy Commission  
Washington 25, D. C.



Dear Mr. Delaney:

Subject: Source Material License No. R-196

Currently, we are authorized under the subject license to receive and process thorium-containing materials at our Pompton Plains, New Jersey, and Curtis Bay, Maryland, plants. The license expires March 31, 1960.

We would like to renew the license to cover our Pompton Plains, New Jersey, plant. There is no activity in thorium processing at Curtis Bay, so there is no need to include that location in the permit.

If you require that we fill out specific forms, please send me or let me know where I can obtain the necessary copies. Thank you for your co-operation.

Cordially yours,

*Thomas O. Tongue*

Thomas O. Tongue

TOT:ccs

B/99

ITEM # 120

7512



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

IN REPLY REFER TO:

40-86  
LAW:MD

FEB 13 1960

Devason Chemical Company  
Division of W. R. Grace & Company  
Baltimore 3, Maryland

Attention: Mr. Thomas O. Thomas  
Gentlemen:

This will acknowledge receipt of your application dated  
February 11, 1960, for renewal (Pursuant to Section 40.26,  
10 CFR 40) of your License No. R-196.

Very truly yours,

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

DISTRIBUTION:  
Formal & Suppl. Dockets  
Document Room  
Dir. of INS, w/cy of  
appl. dtd 2-11-60

RECEIVED

FEB 13 1960

MAILED 11  
DIVISION

2/13/60

ITEM # 101



UNITED STATES GOVERNMENT

*Memorandum*

TO : Files

DATE: April 8, 1960

*Re: S*  
FROM : R. G. Page, Radiation Safety Branch  
Division of Licensing and RegulationSUBJECT: COLLECT PHONE CALL TO MR. D. C. HUBBARD  
DAVISON CHEMICAL COMPANY  
ERWIN, TENNESSEE

SYMBOL: DLR:RGP

The call was made to confirm Hubbard's proposed April 13 visit with representatives of DLR regarding the notice of alleged violation dated March 14, 1960. Hubbard explained that he would be accompanied by Dick Mandle, Plant Manager of the Pompton Plains, New Jersey plant and Tommy Tongue from Davison's home office in Baltimore. The appointment was made for 2 P.M., on the 13th.

cc: L. R. Rogers  
L. Johnson*B/101*  
ITEM # 102

DAVISON CHEMICAL COMPANY

DIVISION OF W. R. GRACE & CO.  
BALTIMORE 3, MARYLAND

April 11, 1960

DOCKET NO. 40-86

Mr. Lyall Johnson, Chief  
Licensing Branch  
Division of Licensing and Regulation  
U. S. Atomic Energy Commission  
Washington 25, D. C.

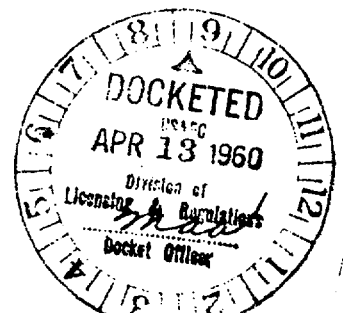
Reference: 40-86

Dear Mr. Johnson:

The following information is furnished in reply to your letter based upon inspection of our Pompton Plains, New Jersey, facility on November 23, 1959, by the New York Operations Office. We are indicating corrective action taken to comply with Part 20, Title 10, Code of Federal Regulations and are outlining additional corrective measures which will be completed as soon as possible in order to insure complete and continued compliance.

1. Bi-weekly surveys to determine the concentrations of airborne radioactivity are being made throughout the facility.
2. Surveys to determine the concentration of radioactivity in the plant liquid effluent were started in December, 1959. Daily aliquots are being taken and combined into representative weekly sample for radiometric analysis. Analysis of the levels of radioactivity involved indicate only 10% of the M.P.C. for natural thorium as stated in Appendix B, Table II, Part 20, and outlined in Section 20.103.
3. Surveys to determine the external radiation levels in and around the plant have been set up on a monthly basis and now include all areas where source material is stored and used.
4. Records of external radiation surveys are now maintained in the units required by Section 20.401(c).
5. No source material waste will be disposed of by incineration without prior approval by the Commission.
6. Permission will be requested by separate letter for approval to release source material waste to a storm sewer in accordance with Section 20.302.

ITEM # 103



7. Areas in which source material are stored and used have been properly posted since the inspection on November 23, 1959, in accordance with Section 20.203(e)(2).
8. Areas in which source material are stored and used have been properly posted since the inspection on November 23, 1959, in accordance with Section 20.203(b).
9. A restricted area will be established by erection of a fence which will include the facility and all storage and dump areas, and access to the restricted area will be controlled. Estimates for the fence have been requested from several contractors and are currently being reviewed.
10. The restricted area mentioned in paragraph 9 above will include storage areas for licensed source material to prevent unauthorized removal from the plant of storage.

In order to insure continued compliance with Part 20, Title 10, Mr. Peter Garino, a graduate chemist, has been made responsible for health and safety at the Pompton Plains plant.

Mr. Don Hubbard, who is presently responsible for health and safety at Davison's Erwin, Tennessee, plant, 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 40, Massachusetts, has been retained to carry out certain tests and to assist generally with implementing the radiation protection program.

The information requested in your letter covering mill operations is being prepared and will be submitted in a separate reply. Confirming the telephone conversation between Mr. John J. Lane of the AEC and our Mr. Richard L. Stone on March 31, 1960, the information will cover a brief description of the process, flow sheet and outline of the carry-through of uranium, thorium and radium.

Very truly yours,

DAVISON CHEMICAL COMPANY  
Division of W.R. Grace & Co.

*T. O. Tongue*

T. O. Tongue  
Acting Production Manager

TOT:flc

UNITED STATES GOVERNMENT

## Memorandum

TO : Files

DATE: MAY 24 1960

FROM : C. G. Welty

SUBJECT: MEETING BETWEEN REPRESENTATIVES OF DLR  
AND DAVISON CHEMICAL COMPANY,  
DIVISION OF W. R. GRACE & COMPANY, BALTIMORE, MARYLAND

DATE OF MEETING: April 13, 1960

PLACE OF MEETING: AEC HEADQUARTERS, GERMANTOWN

PURPOSE OF MEETING: To discuss the compliance status of the  
Company's operations in its Pompton Plains,  
New Jersey plant.

The meeting was held at the request of  
Mr. D. C. Hubbard, Davison Chemical Co.,  
Erwin, Tennessee. (See memo of  
April 8, 1960, R. G. Page to the Files)

## PERSONS ATTENDING:

<u>NAME</u>	<u>ORGANIZATION</u>
Mr. D. C. Hubbard	Davison Chemical Co., Erwin, Tennessee
Mr. Dick Mandle	Plant Manager Rare Earths, Inc. Davison Chemical Co., Pompton Plains, New Jersey
Mr. Tommy Tongue	Davison Chemical Co. Baltimore 3, Maryland.
Mr. L. R. Rogers	AEC, DLR
Mr. J. J. Lane	AEC, DLR
Mr. R. E. Cunningham	AEC, DLR
Mr. C. G. Welty	AEC, DLR

## POINTS DISCUSSED:

1. Davison representatives pointed out their April 11, 1960 reply to our Part 2 letter of March 14, 1960. This letter replied only to the points of citation and did not provide the additional information which was requested to support their license renewal application.

ITEM #

104

8/103

(2)

41

MAY 24 1960

To Files

- 2 -

The letter stated that corrective action would be taken on all points of alleged violation. This was reconfirmed by Davison representatives during the course of the meeting.

Mr. Mandle indicated that the additional information requested in our letter of March 14, 1960, would be compiled and submitted in support of their license renewal application. No target date was specified.

2. Although the licensee was cited for discharging to a storm sewer, the Davison personnel indicated that present control over effluent treatment is adequate to hold average thorium levels below the MPC level for thorium discharged to sanitary sewerage systems.

The licensee indicated that it will apply for an exception under Section 20.302 to allow them to discharge to a storm sewer and that supporting information will accompany the application.

3. In the course of the discussion, it was established that the licensees' most difficult problem is that of controlling thorium air concentrations in the mill work areas. No solution for this problem was set forth by the licensee during the meeting.
4. A second problem with serious implications is that of ultimately disposing of thorium-bearing ores from which the rare earths have been extracted. Mr. Rogers discussed the AEC regulations as they apply to the disposal and storage of such materials.

The meeting was adjourned with no resulting decisions as to how the thorium air contamination and ore disposal problems should be handled.

40-24

JUN 8 1960 NMF

Barison Chemical Company  
Division of W. R. Grace & Company  
Baltimore 2, Maryland

Attention: Mr. David P. Barrett, Sales Manager

Dear Sirs:

This is in reference to your letter of April 11, 1960, in which you inform us that you have corrected, or will correct, these deficiencies in your course material program which we brought to your attention in our letter of March 14, 1960.

It is noted that in Item 6 of your letter, you state that you will make application by separate letter for approval to release courses material to unrestricted areas in cases of the limits specified in Appendix B, Table II, of 10 CFR 20. We have no record of having received such application. Further, our review of your license renewal application of February 11, 1960, is pending receipt of further information concerning your mill operations as requested in our letter of March 14, 1960.

Very truly yours,

Spill Johnson, Chief  
Licensing Branch  
Division of Licensing  
and Regulation

cc: Inspection Division, Edgtra.)  
Inspection Division, NRCO } w/cpy ltr 4-11-60  
Public Document Room )

DLR:ESB      DLR:IB      DLR:LB  
CCW:hgs:LMR      JRMason      LJohnson

6-1-60

ITEM # 105

42

DAVISON CHEMICAL COMPANY

DIVISION OF W. R. GRACE & CO.  
BALTIMORE 3, MARYLAND

June 20, 1960

Mr. Lyall Johnson, Chief  
Licensing Branch  
Division of Licensing and Regulation  
U. S. Atomic Energy Commission  
Washington 25, D. C.

Reference: 40-86

Dear Mr. Johnson:

We wish to acknowledge your letter of June 6 requesting the status of our application for approval to release source material to unrestricted areas and information concerning plant operations.

Subsequent to our letter of April 11, 1960, we met with Messrs. Rogers, Page and others to review our problem. It was then decided advisable for us to systematically sample the plant effluent and surface run-off to determine the effectiveness of our water treatment plant. It was also suggested that we "core drill" the plant area to appraise the significance of leaching from our tailings pile.

Following the meeting referred to above, we placed orders for equipment to measure the low level of activity involved. This equipment was received on June 16. We are now in a position to gather data at a stepped-up rate. During the year weekly composite samples of effluent, taken at the point of exit from our property, have been analysed by Controls for Radiation, Inc., Cambridge, Massachusetts. The results of these analyses are shown in Exhibit A. All samples except for the week of March 27 - April 2, 1960, are well below the maximum permissible concentration. We feel that these data indicate our water treatment plant is sufficiently effective to permit us to operate within the scope of Appendix "B", Table II, of 10 CFR 20.

For the past several months our health physicist has gathered activity data around the property and taken a limited

ITEM # 106

3/105  
②  
JUN 21 1960

# DAVISON CHEMICAL COMPANY

DIVISION OF W. R. GRACE & CO.

BALTIMORE 3, MARYLAND

Mr. Lyall Johnson

U. S. AEC

June 20, 1960

number of dust samples. The latter samples were evaluated by Controls for Radiation and for the most part indicate a low level of contamination.

A manual is being prepared that covers sampling procedures, methods of evaluation, time spent by employees at each job location, and other pertinent information. During July we plan to submit a formal report which will include a copy of our manual and additional information requested in the second section of your letter of March 14, 1960. We hope at that time the Commission will be in a position to act favorably on our application for license renewal.

Very truly yours,

DAVISON CHEMICAL COMPANY  
Division of W.R. Grace & Co.

*T. O. Tongue*  
T. O. Tongue

TOT:flc  
Attachment

bcc: Messrs. R.D. Goodall-Page Edmunds  
D.P. Barrett  
F.C. Dehler  
R.M. Mandle - Pompton  
Don Hubbard - Erwin  
with attachments



# EXHIBIT A

Results of weekly composite effluent water samples taken at the point of exit from our property, without additional dilution, analysed radiochemically for Thorium by Controls for Radiation, Inc.

<u>Sample</u>	<u>dpm/L</u>	<u>M.P.C.</u>
1/1/60 - 1/31/60	2.6 $\pm$ 1.1	2.4
2/1/60 - 2/14/60	7.9 $\pm$ 1.4	7.2
2/15/60 - 2/20/60	10.0 $\pm$ 5	9.2
2/22/60 - 2/27/60	3.6 $\pm$ 1.3	3.3
2/28/60 - 3/5/60	2.6 $\pm$ 1.1	2.4
3/6/60 - 3/12/60	4.3 $\pm$ 1.4	3.9
3/13/60 - 3/19/60	90 $\pm$ 14	81.0
3/20/60 - 3/26/60	66 $\pm$ 11	60.0
3/27/60 - 4/2/60	2240 $\pm$ 110	218.0
4/3/60 - 4/9/60	30 $\pm$ 5.4	27.6
4/10/60 - 4/16/60	91.2 $\pm$ 6.7	83.0
4/17/60 - 4/23/60	67.2 $\pm$ 6.0	61.0
4/24/60 - 4/30/60	26.6 $\pm$ 4.8	25.2
5/1/60 - 5/7/60	79.8 $\pm$ 7.9	72.6

TOT:flc  
6/20/60

# DAVISON CHEMICAL COMPANY

DIVISION OF W. & GRACE & CO.  
BALTIMORE 3, MARYLAND

July 13, 1960

Mr. Lyall Johnson, Chief  
Licensing Branch  
Division of Licensing and Regulation  
U. S. Atomic Energy Commission  
Washington 25, D. C.

Reference: 40-50

Dear Mr. Johnson:

Attached are two booklets dealing with our operation at Pompton Plains, New Jersey.

- a. The first booklet gives pertinent information concerning the plant, its operation and the surrounding area. Specifically, it is a reply to the questions posed in the second half of your letter of March 14, 1960.
- b. The second booklet is a Health Physics Manual prepared by Mr. Peter J. Marino, Health Physicist at the Pompton plant. Included in the report are such items as sampling points, schedule and methods of sampling, detail descriptions of the methods used to measure radioactivity, exposure time and other items required to assure conformance with accepted procedures.

Based on the accompanying information and our letter of June 20, we would like to officially request the Commission for approval to discharge the plant effluent into the storm sewer on Black Horse Ridge Road as provided in Part 20, Title 10, Section 20.301, "Waste Disposal."

It is our understanding that the reports submitted herewith, together with previous letters, will permit the Commission to revise our application for license renewal.

Very truly yours,

DAVISON CHEMICAL COMPANY  
Division of W. & Grace & Co.

TOT:rls  
Attachments

T. C. Tongue

ITEM # \_\_\_\_\_



DAVISON CHEMICAL COMPANY

DIVISION OF W. R. GRACE & CO.  
BALTIMORE 3, MARYLAND

July 13, 1960

Mr. Lyell Johnson, Chief  
Licensing Branch  
Division of Licensing and Regulation  
U. S. Atomic Energy Commission  
Washington 25, D. C.

Reference: 10-86

Dear Mr. Johnson:

Attached are two booklets dealing with our operation at Pompton Plains, New Jersey.

1. The first booklet gives pertinent information concerning the plant, its operation and the surrounding area. Specifically, it is a reply to the questions posed in the second half of your letter of March 14, 1960.
2. The second booklet is a Health Physics Manual prepared by Mr. Peter J. Marino, Health Physicist at the Pompton plant. Included in the report are such items as sampling points, schedule and methods of sampling, detail descriptions of the methods used to measure radioactivity, exposure time and other items required to assure conformance with accepted procedures.

Based on the accompanying information and our letter of June 20, we would like to officially request the Commission for approval to discharge the plant effluent into the storm sewer on Black Oak Ridge Road as provided in Part 20, Title 10, Section 20.201, "Waste Disposal."

It is our understanding that the reports submitted herewith, together with previous letters, will permit the Commission to review our application for license renewal.

Very truly yours,

DAVISON CHEMICAL COMPANY  
Division of W. R. Grace & Co.

TOT:lc  
Attachments

T. O. Tongue

DIVISION OF INSPECTION  
Memo Route Slip

Action Information Correspondence Review  
Comment Note & Return Per Our Telcon File

Dubinski - OROO	
Hageman - COO	
Haycock - AL00	
Kirkman - NY00 Attention B. L. Harless	X
Smith - SAN	
Sullivan - SROO	
Walker - IOO	
Zangar - HOO	

REMARKS: RE: CASES PENDING ENFORCEMENT ACTION - PART 40

Reference is made to the listing on reverse of your quarterly report, June 30, 1960.

✓ Davison Chemical Company  
Division of W. R. Grace and Company  
License No. R-196:

A review of this file indicates that enforcement action has not been completed. Copies of letters to the licensee from L&R dated March 14 and June 6, 1960, have been furnished your office. ✓

NYOO INSPECTION DIVISION

JUL 22 1960

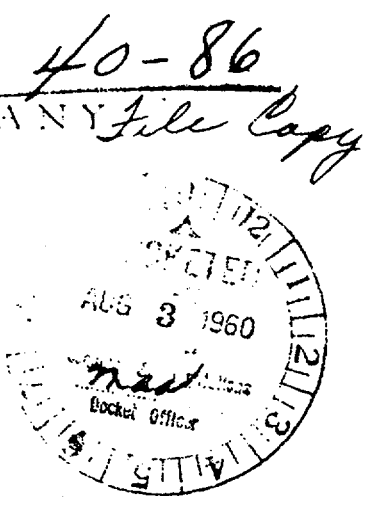
RECEIVED

ITEM # 108

pa 8/107

44 FROM: MMMann PAMorris LDLow CCPalmiter MDBlaha X DATE: 7/21/60

DAVISON CHEMICAL COMPANY  
DIVISION OF W. R. GRACE & CO.  
BALTIMORE 3, MARYLAND



July 29, 1960

Mr. Lyall Johnson, Chief  
Licensing Branch  
Division of Licensing and Regulation  
U. S. Atomic Energy Commission  
Washington 25, D. C.

Reference: 40-86

Dear Mr. Johnson:

Attached are two booklets dealing with our operation at Pompton Plains, New Jersey.

- a. The first booklet gives pertinent information concerning the plant, its operation and the surrounding area. Specifically, it is a reply to the questions posed in the second half of your letter of March 14, 1960.
- b. The second booklet is a Health Physics Manual prepared by Mr. Peter J. Garino, Health Physicist at the Pompton plant. Included in the report are such items as sampling points, schedule and methods of sampling, detail descriptions of the methods used to measure radioactivity, exposure time and other items required to assure conformance with accepted procedures.

Based on the accompanying information and our letter of June 20, we would like to officially request the Commission for 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."

It is our understanding that the reports submitted herewith, together with previous letters, will permit the Commission to review our application for license renewal.

Very truly yours,

DAVISON CHEMICAL COMPANY  
Division of W. R. Grace & Co.

*T. O. Tongue*  
T. O. Tongue

TOT:flc  
Attachments

B/108

ITEM # 109

9

HEALTH PHYSICS MANUAL

DAVISON CHEMICAL CO.

POMPTON PLAINS

NEW JERSEY

JANUARY 1, 1960

PREPARED BY

PETER J. GARINO

NYOO COMPLIANCE DIVISION

AUG 25 1960

**RECEIVED**

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## 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 <sup>232</sup> and thorium <sup>288</sup> 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.

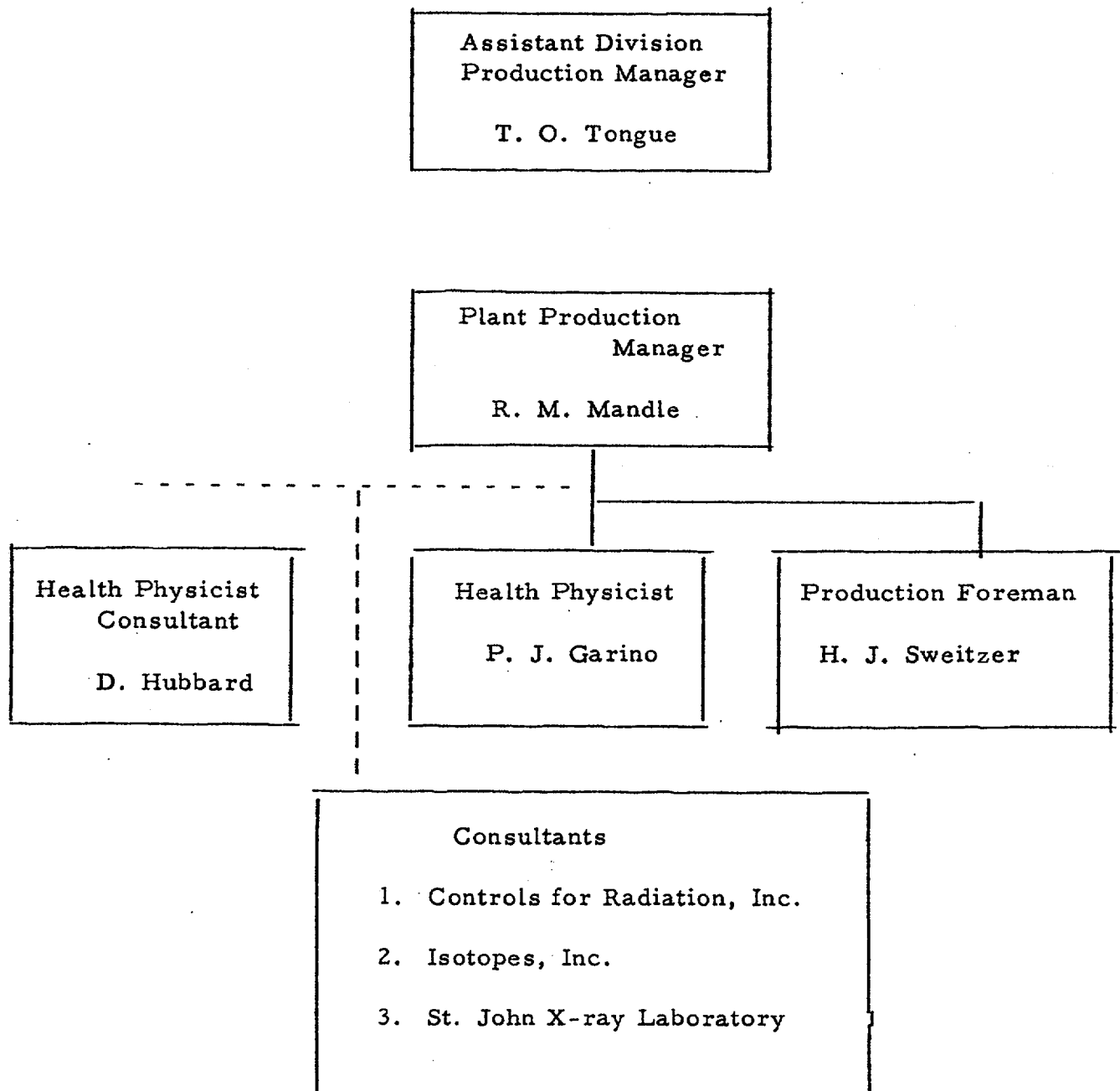
Fifty to seventy-five years of experience in refining thoria from monazite has produced no noticeable evidence of radiation injury or chemical toxicity. Industrial exposure averaged  $10^{-10}$  uc/cc during this period.

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  $2 \times 10^{-12}$  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  $3 \times 10^{-11}$  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 $5 \times 10^{-11}$ microcuries per milliliter of air. This is equivalent to 110 alpha disintegrations per minute per cubic meter of air.
Roentgen	The quantity of X or gamma-radiation such that the associated corpuscular emission 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.

MAXIMUM PERMISSIBLE LEVELS AND CONCENTRATIONS

PERMISSIBLE WEEKLY DOSE

Conditions of exposure		Dose in critical organs (mrem)			
Parts of body	Radiation	Skin, at basal layer of epidermis	Blood forming organs	Gonads	Lens of eye
Whole body - - - - -	Any radiation with half-value-layer greater than 1 mm of soft tissue.	1600	1300	1300	1300
Whole body - - - - -	Any radiation with half-value layer less than 1 mm of soft tissue.	1,500	300	300	300
Hands and forearms or feet and ankles or head and neck.	Any radiation - - - - -	21,500	- - - - -	- - - - -	- - - - -

<sup>1</sup> For exposures of the whole body to X or gamma rays up to 3 mev, this condition may be assumed to be met if the "air dose" does not exceed 300 mr, provided the dose to the gonads does not exceed 300 mrem. "Air dose" means that the dose is measured by an appropriate instrument in air in the region of highest dosage rate to be occupied by an individual, without the presence of the human body or other absorbing and scattering material.

<sup>2</sup> Exposure of these limited portions of the body under these conditions does not alter the total weekly dose of 300 mrem permitted to the bloodforming organs in the main portion of the body, to the gonads, or to the lens of the eye.

MAXIMUM PERMISSIBLE LEVELS AND CONCENTRATIONS (cont.)

PERMISSIBLE CONCENTRATIONS IN AIR AND WATER ABOVE NATURAL BACKGROUND

Material	Table I <sup>4</sup>		Table II <sup>4</sup>	
	Column 1 <sup>1</sup>	Column 2 <sup>2</sup>	Column 1 <sup>1</sup>	Column 2 <sup>2</sup>
	Air (2)	Water (3)	Air (2)	Water (3)
Tel27 - - - - -	3x10 <sup>-7</sup>	8x10 <sup>-2</sup>	1x10 <sup>-8</sup>	3x10 <sup>-3</sup>
Tel29 - - - - -	1.2x10 <sup>-7</sup>	3.3x10 <sup>-2</sup>	4x10 <sup>-9</sup>	1.1x10 <sup>-3</sup>
Th234 - - - - -	2x10 <sup>-6</sup>	10	6x10 <sup>-8</sup>	3x10 <sup>-1</sup>
Th-natural (soluble) - - - - -	5x10 <sup>-11</sup>	1.5x10 <sup>-6</sup>	1.7x10 <sup>-12</sup>	5x10 <sup>-8</sup>
Th-natural (unsoluble) - - - - -	5x10 <sup>-11</sup>	- - - -	1.7x10 <sup>-12</sup>	- - - -
Tm170 - - - - -	1.5x10 <sup>-7</sup>	8x10 <sup>-1</sup>	5x10 <sup>-9</sup>	2.5x10 <sup>-3</sup>
U-natural (soluble) <sup>3</sup> - - - - -	5x10 <sup>-11</sup>	2x10 <sup>-4</sup>	1.7x10 <sup>-12</sup>	7x10 <sup>-6</sup>
U-natural (unsoluble) <sup>3</sup> - - - - -	5x10 <sup>-11</sup>	- - - -	1.7x10 <sup>-12</sup>	- - - -
U233 (soluble) - - - - -	4x10 <sup>-10</sup>	4.5x10 <sup>-4</sup>	1x10 <sup>-11</sup>	1.5x10 <sup>-5</sup>
U233 (unsoluble) - - - - -	5x10 <sup>-11</sup>	- - - -	1.6x10 <sup>-12</sup>	- - - -
V48 - - - - -	3x10 <sup>-6</sup>	1.5	1x10 <sup>-7</sup>	5x10 <sup>-2</sup>
Xe133 - - - - -	1.3x10 <sup>-5</sup>	1.3x10 <sup>-2</sup>	4x10 <sup>-7</sup>	4x10 <sup>-4</sup>
Xe135 - - - - -	5x10 <sup>-6</sup>	4x10 <sup>-3</sup>	1.7x10 <sup>-7</sup>	1.4x10 <sup>-4</sup>
Y91 - - - - -	1.2x10 <sup>-7</sup>	6x10 <sup>-1</sup>	4x10 <sup>-9</sup>	2x10 <sup>-2</sup>
Zn65 - - - - -	6x10 <sup>-6</sup>	2x10 <sup>-1</sup>	2x10 <sup>-7</sup>	6x10 <sup>-3</sup>
Unidentified beta or gamma emitters of any undetermined mixtures of beta or gamma emitters - - - -	- - - -	- - - -	1x10 <sup>-9</sup>	1x10 <sup>-7</sup>
Unidentified alpha emitters or any undetermined mixtures of alpha emitters - - - - -	- - - -	- - - -	5x10 <sup>-12</sup>	1x10 <sup>-7</sup>

<sup>1</sup>Air concentrations are given in microcuries per milliliter of air.

<sup>2</sup>Water concentrations are given in microcuries per milliliter of water. These figures also apply to foodstuffs in microcuries per gram (wet-weight).

<sup>3</sup>For enriched uranium the same radioactivities per unit volume as those for natural uranium are applicable. It should be noted that the contribution of U-234 to the gross activity of enriched uranium is 20-40 times that of the U-235.

<sup>4</sup>Table I applies to restricted areas, Table II to unrestricted areas.

JAN 13 1961

Lyall E. Johnson, Assistant Director  
for Facilities & Materials Licensing  
Division of Licensing and Regulation

Donald E. Warner, Acting Assistant <sup>ORIGINAL SIGNED BY</sup> Director for Materials  
Division of Compliance D. E. WARNER  
COMPLETION OF ENFORCEMENT ACTION - DAVISON CHEMICAL  
COMPANY, DIVISION OF W. R. GRACE COMPANY, LICENSE  
NO. R-196

CO:MOB

Reference is made to memo from this Division, dated  
November 9, 1960, requesting information as to whether  
enforcement action has been completed on inspection of  
subject licensees. This inspection report was forwarded  
to your Division by NY on January 26, 1960.

The information that enforcement action has been  
completed is needed by NY before follow-up inspection  
of this licensee can be scheduled.

Your cooperation will be appreciated.

cc: R. V. Kirtman, NY

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1/13/61

ITEM #

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B/109

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PART 40 INSPECTION

W. R. GRACE & COMPANY  
Davison Chemical Division  
Pompton Plains, New Jersey

Date of Inspection: June 29, 1961 (Announced)

Persons Accompanying Inspector:

Mr. John Russo, New Jersey State Department of Health

Persons Contacted:

Richard Mandle, Plant Manager  
Richard Stone, Sales Manager  
Peter J. Garino, Health Physicist

DETAILS

9. Background Information

On November 23, 1959, an inspection of the activities conducted under License R-196 was made at the facilities of Rare Earths, Inc., Pompton Plains, New Jersey. The report was transmitted to M. M. Mann, Assistant Director, Division of Inspection, HQ. on January 26, 1960. The licensee was found to be in noncompliance with the following sections: 20.102(b)(1)(2), "Permissible levels of radiation in unrestricted areas"; 20.201(b), "Surveys"; 20.207, "Storage of licensed material"; 20.203(b), "Caution signs, labels and signals - Radiation areas"; 20.203(e)(2), "Additional requirements"; 20.305, "Treatment or disposal by incineration"; 20.301, "General Requirement"; and 20.401(c), "Records of surveys, radiation monitoring and disposal". It was found that a hazard existed, and a follow-up inspection was recommended.

On March 14, 1960, DL&R (Lyall Johnson) in a letter to D. P. Barrett, Sales Manager, Davison Chemical Company, Division of W. R. Grace & Company, 101 N. Charles Street, Baltimore 1, Maryland, informed the licensee of the above-mentioned items of noncompliance. In addition, the DL&R letter requested additional information from the licensee in order to continue their review of the licensee's renewal application.

On April 11, 1960, T. O. Tongue, Acting Production Manager, Davison Chemical Company, Division of W. R. Grace & Company, informed DL&R (Johnson) of the corrective action taken in order to comply with 10 CFR 20, and also outlined additional corrective measures which will be completed as soon as possible in order to assure complete compliance.

On June 6, 1960, DL&R (Johnson) answered the April 11 letter and also noted that in item 6 of the 4/11 letter, the licensee stated that he would make application by separate letter for approval to release source material waste to a storm sewer in accordance with Section 20.302. The letter also stated that DL&R has no record of having received such application, and that their review of the licensee's renewal application of 2/11/60 was pending receipt of further information concerning mill operations as requested in DL&R's letter of March 14, 1960.

On June 20, 1960, the licensee (T.O. Tongue) acknowledged the DL&R letter of June 6 requesting the status of application for approval to release source material to unrestricted areas and information concerning plant operations. Tongue stated that Davison people met with Rogers, Page and others to review this problem and took DL&R's suggestions that they "core drill" the plant area to appraise the significance of leaching from their tailings pile. The letter also stated that following the meeting with DL&R people, they placed orders for equipment to measure low-level activity involved, and that for the past several months, their health physicist has taken a limited number of dust samples. The samples were analyzed by Controls for Radiation, and for the most part indicated a low level of contamination.

In a memo dated January 13, 1961 from D. E. Warner, Acting Assistant Director for Materials, Division of Compliance, to Lyall Johnson, Assistant Director for Facilities and Materials Licensing, DL&R, Warner made reference to a memo from Compliance Headquarters dated November 9, 1960, requesting information as to whether enforcement action had been completed on the inspection of Davison Chemical Company, Division of W. R. Grace & Company, License R-196. The memo also noted that information that enforcement action had been completed was needed by NY before a follow-up inspection of this licensee could be scheduled.

On May 15, 1961, D. E. Warner, in a memo to Lester Rogers, Assistant Director for Nuclear Materials Safety, referred to the memo of May 5, 1960 and said that NY would continue to defer re-scheduling of this licensee pending receipt of information that enforcement action had been completed or that none was contemplated.

On May 29, 1961, in a memo route slip from D. E. Warner to R. W. Kirkman, Warner informed this office that enforcement action had been completed by letter dated 6/6/60.

#### 10. Action Taken on Items of Noncompliance

As noted prior, in a letter dated March 14, 1960, DL&R informed the licensee (Barrett, Sales Manager) of the items of noncompliance found during the course of the inspection conducted by New York on November 25, 1959. The citations, action taken by the licensee as per their letter dated 4/11/60 and current status as per inspection of June 29 are noted below:



A. Citation (DL&R's)

"Surveys to determine the concentrations of airborne radioactivity were not made as required by Section 20.201(b), 'Surveys'."

Reported Action Taken (Licensee's letter dated 4/11/60)

"Biweekly surveys to determine the concentrations of airborne radioactivity are being made throughout the facility."

Current Status

The licensee was found to conduct biweekly air samples using a Staplex air sampler. Radiation surveys are made on a monthly basis.

The licensee has conducted air samples in all the areas and has also conducted a job analysis of each operation for all the operators working in the plant. Results of the radioactive exposure to airborne thorium aerosols indicate that none of the employees is exposed to the daily rate of concentrations exceeding the levels specified in Part 20 for a 40 hour work week. A copy of a typical job analysis sheet is included as Exhibit "A".

Two air samples were taken by the inspectors at the feederhopper and ball mill areas. Samples were taken using a Hudson pump having a flow rate of approximately 30 to 35 linear feet per minute, respectively, for periods of 1/2 hour each. The collection time of the samples was 30 minutes for the air sample taken at the feederhopper and 35 minutes at the ball mill area. The samples, collected on Whatman 41 filter paper, were analyzed by HASL. Results indicated that the general air concentrations at the feederhopper were 10-10 uc/ml, and the ball mill area was  $1.89 \times 10^{-11}$  uc/ml.

Records of air sample results maintained by the licensee were reviewed. These records were noted to be recorded in uc/ml.

B. Citation (DL&R's)

"Surveys to determine the concentration of radioactivity in the plant liquid effluent were not made as required by Section 20.201(b), 'Surveys'."

Reported Action Taken (Licensee's letter of 4/11/60)

"Surveys to determine the concentration of radioactivity in the plant liquid effluent were started in December, 1959. Daily aliquots are being taken and combined into representative weekly sample for radiometric analysis. Analysis of the levels of radioactivity involved indicate only 10% of the M.P.C. for natural thorium as stated in Appendix B, Table II, Part 20, and outlined in Section 20.103."

#### Current Status

Daily samples are taken from the river and stream to measure effluent concentrations to the river. Daily samples are counted on a gas flow proportional counter which has been purchased by the licensee. The licensee is using a limit of thorium concentration of  $10^{-7}$  uc/ml. A review of the records maintained by the licensee showed that the effluent concentration to the river was recorded in some decimal fraction times  $10^{-7}$  uc/ml. The maximum amount discharged to the river was  $0.2 \times 10^{-7}$  uc/ml.

Two water samples were taken by the inspectors. The first was taken at the weir in the pump house, and the second was taken approximately 500' from the plant at Sheffield Brook. The samples, analyzed by HASL, were found to be  $10^{-9}$  and  $2.91 \times 10^{-8}$  uc/ml, respectively.

In a letter dated July 6, 1961, received after the inspection, the licensee requested permission to continue the operations of the present system of controls and records until they could tie into a sanitary sewer system. They noted in their letter that since 1948, they were tied up to a sewer system by Sheffield Farms. This letter is included as Exhibit "B".

#### C. Citation

"Surveys to determine the external radiation levels in and around the plant were not complete as required by Section 20.201(b), 'Surveys'. Although surveys had been made, they did not include all areas where source material is stored and used."

#### Reported Action Taken

"Surveys to determine the external radiation levels in and around the plant have been set up on a monthly basis and now include all areas where source material is stored and used."

#### Current Status

Monthly radiation surveys have been made by the licensee of all areas of storage and use, and records are maintained. The records indicated that in unrestricted areas, the maximum direct radiation measurement around the newly installed chain-link fence surrounding the plant confines was 0.25 mr/hr, with an average radiation level of .15 mr/hr. In the restricted areas, thorium vault, a maximum of 10 mr/hr was recorded, with an average of 3 to 4 mr/hr.

The following independent measurements were made by the inspectors using a Juno and a GM-2 survey meter, calibrated June 5, 1961:

- (1) Ball mill area - general radiation level, 2 mr/hr;
  - at contact with the drum containing yttrium sludge, 7.5 mr/hr;
  - at one foot from the drum, 4 mr/hr;
  - at contact with the drum containing ground monazite, 10 mr/hr;
  - at one foot from this drum, 5 mr/hr

- (2) Monazite storage area - general radiation level, 5 mr/hr at 3' from the floor;  
at one foot from a bag containing monazite, 12 mr/hr
- (3) Locker room area - .04 mr/hr at 3' above floor;  
at contact with the floor, 7000 alpha dpm/100 cm<sup>2</sup>
- (4) Thorium vault - 10 mr/hr maximum; 3 - 4 mr/hr average

D. Citation

"Records of external radiation survey results were not maintained in the units required by Section 20.401(c), 'Records of surveys, radiation monitoring, and disposal'."

Reported Action Taken

"Records of external radiation surveys are now maintained in the units required by Section 20.401(c)."

Current Status

The records of monthly radiation surveys maintained by the licensee were reviewed. The records were recorded in the units required by 10 CFR 20.

E. Citation

"Source material waste was disposed by incineration without prior approval by the Commission. This is in violation of Section 20.305, 'Treatment or disposal by incineration'."

Reported Action Taken

"The source material waste will be disposed of by incineration without prior approval by the Commission."

Current Status

Garino, Hendle and Stone stated that no material has been disposed of by incineration since the last inspection. At present, Stone stated that they are presently storing empty monazite bags, and that this pile is growing daily. He stated that he intends to write to the Commission for approval to incinerate these bags, but that he would not incinerate unless he had prior approval. In a letter received by this office dated July 3, 1961 from Peter J. Garino, Health Physicist, to DL&R (Lyall Johnson), the licensee requested approval to incinerate. This letter is included as Exhibit "C".

F. Citation

"Source material waste was disposed by release to a storm sewer. This is in violation of Section 20.301, 'Waste disposal'."

Reported Action Taken

"Permission will be requested by separate letter for approval to release source material waste to a storm sewer in accordance with Section 20.302."

Current Status

As a precautionary measure to prevent any material run-off to enter the storm sewers, an additional culvert was built around the entire facility. As noted prior in the report, the records of effluent release show no release to their sewer system in excess of the limits specified in Part 20.

G. Citation

"Areas in which source material was stored and used were not posted as required by Section 20.203(e)(2), 'Caution signs, labels and signals'."

Reported Action Taken

"Areas in which source material are stored and used have been properly posted since the inspection on November 23, 1959, in accordance with Section 20.203(e)(2)'."

Current Status

An inspection of the facilities show that areas in which source material has been stored and used have been properly posted with a radiation caution sign and symbol. In addition, it was found that a form AEC-3 was posted at the entrance to the restricted areas.

H. Citation

"Areas in which source material was stored and used were not posted as required by Section 20.203(b), 'Caution signs, labels and signals'."

Reported Action Taken

"Areas in which source material are stored and used have been properly posted since the inspection on November 23, 1959, in accordance with Section 20.203(b)."

Current Status

An inspection of the ball mill area, thorium storage area, vault, and piles of sludge at which radiation levels in excess of 5 mr/hr at one foot existed revealed the areas to be posted with a proper radiation area sign and symbol.

I. Citation

"Radiation levels in and around the storage and dump areas were such that an individual could receive an exposure in excess of 2 mrem in any one hour or an exposure in excess of 100 mrem in any seven consecutive days. This is in violation of Section 20.102(b)(1)(2). 'Permissible levels of radiation in unrestricted areas'."

Reported Action Taken

"A restricted area will be established by erection of a fence which will include the facility and all storage and dump areas, and access to the restricted area will be controlled. Estimates for the fence have been requested from several contractors and are currently being reviewed."

Current Status

Stone stated that a fence was erected at a cost of \$6000. The fence is locked when not attended. He further added that when personnel are at the plant site, the two fence gates are closed, but not locked. An inspection of the restricted areas showed that an approximately 8' high fence has been erected around the plant confines and grounds. The entire area within the fence area is designated by Mandle and Stone as the plant's restricted area.

J. Citation

"Source material in the storage area was not secured against unauthorized removal as required by Section 20.207, 'Storage of licensed material'."

Reported Action Taken

"The restricted area mentioned in paragraph 9 above" (paragraph I above) "will include storage areas for licensed source material to prevent unauthorized removal from the plant of storage."

Current Status

See paragraph I above.

# Part 2.6 OPERATOR

Operation or Operating Area	Time per oper	oper per shift	Time per shift (min)	No. of slps.	CONCENTRATION g/m <sup>3</sup> LOW HIGH AVE.	AVGE CONC X TOTAL TIME
1. Ball Mill AREA			170	3	3 124 65	10710
2. Furnace Room			170	3	3 5 4	610
3. Furnace BANK CX			60	3	3 9 6	360
4. Tank at B-5 Area			60	3	4 1 6	360
5. Control Room		45	510	2	2 12 7	280
					TXC 5	12590

(IXC) 12360 - 24.3% c/m<sup>3</sup>  
 (I) 510  
 11.208 MAX.  
 PART. CONC.

**Lester R. Rogers, Assistant Director  
for Nuclear Materials Safety  
Division of Licensing and Regulation**

**Donald E. Warner, Acting Assistant  
Director for Materials  
Division of Compliance**

Original signed by  
E. G. Outten

MAY 15 1961

**COMPLETION OF ENFORCEMENT ACTION,  
W. R. GRACE; LICENSE NO. R-196**

CO:ULB

Reference is made to the report of inspection of  
subject licensee, which was forwarded to your  
Division by our memo dated May 5, 1960.

New York will continue to defer scheduling reinspec-  
tion of this licensee pending receipt of information  
that enforcement action has been completed or that  
none is contemplated.

Your cooperation is appreciated.

cc: R. W. Kirkman, NY ✓

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Brady:em

Warner

5-12-61

ITEM #

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B/110



MEMO ROUTE SLIP		See me about this	For
Form ABC-89 (Rev. May 14, 1948)		Note and return	Postmark
TO (Name and unit)	INITIALS	REMARKS	
Compliance Division R. W. Kirkman	DATE		
TO (Name and unit)	INITIALS	REMARKS	
	DATE		
TO (Name and unit)	INITIALS	REMARKS	
	DATE		
FROM (Name and unit) Donald E. Warner Acting Assistant Director for Materials, CO Headquarters	REMARKS	Reference is made to your Quarterly Report, dated 3-31-61, listing W. R. Grace (Davison Chemical Company), Baltimore, Md., License R-196, as pending for a follow-up inspection. Enforcement Branch has telephonically informed this Division that they consider enforcement action completed by letter dated 6-6-60. Please remove from your pending list.	
PHONE NO.	DATE		
	5-29-61		

USE OTHER SIDE FOR ADDITIONAL REMARKS

U. S. GOVERNMENT PRINTING OFFICE : 1957 O-420067

ITEM # 174

B/111

DAVISON CHEMICAL COMPANY

DIVISION OF W. R. GRACE & CO.  
BALTIMORE 3, MARYLAND

June 20, 1960

Mr. Lyall Johnson, Chief  
Licensing Branch  
Division of Licensing and Regulation  
U. S. Atomic Energy Commission  
Washington 25, D. C.

Reference: 40-86

Dear Mr. Johnson:

We wish to acknowledge your letter of June 6 requesting the status of our application for approval to release source material to unrestricted areas and information concerning plant operations.

Subsequent to our letter of April 11, 1960, we met with Messrs. Rogers, Page and others to review our problem. It was then decided advisable for us to systematically sample the plant effluent and surface run-off to determine the effectiveness of our water treatment plant. It was also suggested that we "core drill" the plant area to appraise the significance of leaching from our tailings pile.

Following the meeting referred to above, we placed orders for equipment to measure the low level of activity involved. This equipment was received on June 16. We are now in a position to gather data at a stepped-up rate. During the year weekly composite samples of effluent, taken at the point of exit from our property, have been analyzed by Controls for Radiation, Inc., Cambridge, Massachusetts. The results of these analyses are shown in Exhibit A. All samples except for the week of March 27 - April 2, 1960, are well below the maximum permissible concentration. We feel that these data indicate our water treatment plant is sufficiently effective to permit us to operate within the scope of Appendix "B", Table II, of 10 CFR 20.

For the past several months our health physicist has gathered activity data around the property and taken a limited

ITEM # 113

JUN 21 1960

43

DAVISON CHEMICAL COMPANY

DIVISION OF W. R. GRACE & CO.

BALTIMORE 3 MARYLAND

Mr. Lyall Johnson

U. S. AEC

June 20, 1960

number of dust samples. The latter samples were evaluated by Controls for Radiation and for the most part indicate a low level of contamination.

A manual is being prepared that covers sampling procedures, methods of evaluation, time spent by employees at each job location, and other pertinent information. During July we plan to submit a formal report which will include a copy of our manual and additional information requested in the second section of your letter of March 14, 1960. We hope at that time the Commission will be in a position to act favorably on our application for license renewal.

Very truly yours,

DAVISON CHEMICAL COMPANY  
Division of W.R. Grace & Co.

*T. O. Tongue*  
T. O. Tongue

TOT:flc  
Attachment

bcc: Messrs. R.D. Goodall-Page Edmunds  
D.P. Barrett  
F.C. Dehler  
R.M. Mandle - Pompton  
Don Hubbard - Erwin  
with attachments

# EXHIBIT A

Results of weekly composite effluent water samples taken at the point of exit from our property, without additional dilution, analysed radiochemically for Thorium by Controls for Radiation, Inc.

<u>Sample</u>	<u>dpm/L</u>	<u>M.P.C.</u>
1/1/60 - 1/31/60	2.6 $\pm$ 1.1	2.4
2/1/60 - 2/14/60	7.9 $\pm$ 1.4	7.2
2/15/60 - 2/20/60	10.0 $\pm$ 5	9.2
2/22/60 - 2/27/60	3.6 $\pm$ 1.3	3.3
2/28/60 - 3/5/60	2.6 $\pm$ 1.1	2.4
3/6/60 - 3/12/60	4.3 $\pm$ 1.4	3.9
3/13/60 - 3/19/60	90 $\pm$ 14	81.0
3/20/60 - 3/26/60	66 $\pm$ 11	60.0
3/27/60 - 4/2/60	2240 $\pm$ 110	218.0
4/3/60 - 4/9/60	30 $\pm$ 5.4	27.6
4/10/60 - 4/16/60	91.2 $\pm$ 6.7	83.0
4/17/60 - 4/23/60	67.2 $\pm$ 6.0	61.0
4/24/60 - 4/30/60	26.6 $\pm$ 4.8	25.2
5/1/60 - 5/7/60	79.8 $\pm$ 7.9	72.6

TOT:flc  
6/20/60

## COMPLIANCE INSPECTION REPORT

1. Name and address of licensee  <b>W. R. GRACE &amp; COMPANY Davison Chemical Division Pompton Plains, New Jersey</b>	2. Date of inspection  <b>June 29, 1961</b>
	3. Type of inspection <b>Follow-up</b>
	4. 10 CFR Part(s) applicable  <b>20 - 40</b>

5. License number(s), issue and expiration dates, scope and conditions (including amendments)

<u>License No.</u>	<u>Docket No.</u>	<u>Date</u>	<u>Exp. Date</u>
R-196	40-86	3/27/59	3/31/60

**SCOPE:** Thorium-containing material from producers and distributors licensed by the AEC and through importation for processing at Pompton Plains, New Jersey and Curtis Bay, Maryland plants.

**CONDITIONS:** Maintenance of records of inventories, receipts and transfers of refined source material. Compliance with Part 20. Non-exceptional.

6. Inspection findings (and items of noncompliance)

This follow-up inspection was conducted to determine if the licensee had corrected all the items of noncompliance noted during the initial inspection of November 25, 1959. The inspection revealed that W. R. Grace & Company, Davison Chemical Division, Pompton Plains, New Jersey, had corrected the previous items of noncompliance and was in compliance with the Federal Regulations. No additional items of noncompliance were noted during the course of this follow-up inspection.

7. Date of last previous inspection  <b>November 25, 1959</b>	8. Is "Company Confidential" information contained in this report? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> (Specify page(s) and paragraph(s))
---	--

## DISTRIBUTION:

1 cy - DLAR  
3 cys - CO-HQ  
2 cys - CO-NY

**Paul B. Klevin**

(Inspector)

Approved by:

**Robert W. Kirkman, Director  
New York Compliance Area**

(Operations office)

**August 17, 1961**

(Date report prepared)

If additional space is required for any numbered item above, the continuation may be extended to the reverse of this form using foot to head format, leaving sufficient margin at top for binding, identifying each item by number and noting "Continued" on the face of form under appropriate item.

## PART 40 INSPECTION

W. R. GRACE & COMPANY  
Davison Chemical Division  
Pompton Plains, New Jersey

Date of Inspection: June 29, 1961 (Announced)

### Persons Accompanying Inspector:

Mr. John Russo, New Jersey State Department of Health

### Persons Contacted:

Richard Mandle, Plant Manager  
Richard Stone, Sales Manager  
Peter J. Garino, Health Physicist

## DETAILS

### 9. Background Information

On November 25, 1959, an inspection of the activities conducted under License R-196 was made at the facilities of Rare Earths, Inc., Pompton Plains, New Jersey. The report was transmitted to M. M. Mann, Assistant Director, Division of Inspection, HQ. on January 26, 1960. The licensee was found to be in noncompliance with the following sections: 20.102(b)(1)(2), "Permissible levels of radiation in unrestricted areas"; 20.201(b), "Surveys"; 20.207, "Storage of licensed material"; 20.203(b), "Caution signs, labels and signals - Radiation areas"; 20.203(e)(2), "Additional requirements"; 20.305, "Treatment or disposal by incineration"; 20.301, "General Requirement"; and 20.401(c), "Records of surveys, radiation monitoring and disposal". It was found that a hazard existed, and a follow-up inspection was recommended.

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On June 20, 1960, the licensee (T.O. Tongue) acknowledged the DL&R letter of June 6 requesting the status of application for approval to release source material to unrestricted areas and information concerning plant operations. Tongue stated that Davison people met with Rogers, Page and others to review this problem and took DL&R's suggestions that they "core drill" the plant area to appraise the significance of leaching from their tailings pile. The letter also stated that following the meeting with DL&R people, they placed orders for equipment to measure low-level activity involved, and that for the past several months, their health physicist has taken a limited number of dust samples. The samples were analyzed by Controls for Radiation, and for the most part indicated a low level of contamination.

In a memo dated January 13, 1961 from D. E. Warner, Acting Assistant Director for Materials, Division of Compliance, to Lyall Johnson, Assistant Director for Facilities and Materials Licensing, DL&R, Warner made reference to a memo from Compliance Headquarters dated November 9, 1960, requesting information as to whether enforcement action had been completed on the inspection of Davison Chemical Company, Division of W. R. Grace & Company, License R-196. The memo also noted that information that enforcement action had been completed was needed by NY before a follow-up inspection of this licensee could be scheduled.

On May 15, 1961, D. E. Warner, in a memo to Lester Rogers, Assistant Director for Nuclear Materials Safety, referred to the memo of May 5, 1960 and said that NY would continue to defer re-scheduling of this licensee pending receipt of information that enforcement action had been completed or that none was contemplated.

On May 29, 1961, in a memo route slip from D. E. Warner to R. W. Kirkman, Warner informed this office that enforcement action had been completed by letter dated 6/6/60.

10. Action Taken on Items of Noncompliance

As noted prior, in a letter dated March 14, 1960, DL&R informed the licensee (Barrett, Sales Manager) of the items of noncompliance found during the course of the inspection conducted by New York on November 25, 1959. The citations, action taken by the licensee as per their letter dated 4/11/60 and current status as per inspection of June 29 are noted below:

A. Citation (DL&R's)

"Surveys to determine the concentrations of airborne radioactivity were not made as required by Section 20.201(b), 'Surveys'."

Reported Action Taken (Licensee's letter dated 4/11/60)

"Biweekly surveys to determine the concentrations of airborne radioactivity are being made throughout the facility."

Current Status

The licensee was found to conduct biweekly air samples using a Staplex air sampler. Radiation surveys are made on a monthly basis.

The licensee has conducted air samples in all the areas and has also conducted a job analysis of each operation for all the operators working in the plant. Results of the radioactive exposure to airborne thorium aerosols indicate that none of the employees is exposed to the daily rate of concentrations exceeding the levels specified in Part 20 for a 40 hour work week. A copy of a typical job analysis sheet is included as Exhibit "A".

Two air samples were taken by the inspectors at the feeder-hopper and ball mill areas. Samples were taken using a Hudson pump having a flow rate of approximately 30 to 35 linear feet per minute, respectively, for periods of 1/2 hour each. The collection time of the samples was 30 minutes for the air sample taken at the feederhopper and 35 minutes at the ball mill area. The samples, collected on Whatman 41 filter paper, were analyzed by HASL. Results indicated that the general air concentrations at the feederhopper were  $10^{-10}$  uc/ml, and the ball mill area was  $1.39 \times 10^{-11}$  uc/ml.

Records of air sample results maintained by the licensee were reviewed. These records were noted to be recorded in uc/ml.

B. Citation (DL&R's)

"Surveys to determine the concentration of radioactivity in the plant liquid effluent were not made as required by Section 20.201(b), 'Surveys'."

Reported Action Taken (Licensee's letter of 4/11/60)

"Surveys to determine the concentration of radioactivity in the plant liquid effluent were started in December, 1959. Daily aliquots are being taken and combined into representative weekly sample for radiometric analysis. Analysis of the levels of radioactivity involved indicate only 10% of the M.P.C. for natural thorium as stated in Appendix B, Table II, Part 20, and outlined in Section 20.103."



#### Current Status

Daily samples are taken from the river and stream to measure effluent concentrations to the river. Daily samples are counted on a gas flow proportional counter which has been purchased by the licensee. The licensee is using a limit of thorium concentration of  $10^{-7}$  uc/ml. A review of the records maintained by the licensee showed that the effluent concentration to the river was recorded in some decimal fraction times  $10^{-7}$  uc/ml. The maximum amount discharged to the river was  $0.2 \times 10^{-7}$  uc/ml.

Two water samples were taken by the inspectors. The first was taken at the weir in the pump house, and the second was taken approximately 500' from the plant at Sheffield Brook. The samples, analyzed by HASL, were found to be  $10^{-9}$  and  $2.91 \times 10^{-8}$  uc/ml, respectively.

In a letter dated July 6, 1961, received after the inspection, the licensee requested permission to continue the operations of the present system of controls and records until they could tie into a sanitary sewer system. They noted in their letter that since 1948, they were tied up to a sewer system by Sheffield Farms. This letter is included as Exhibit "B".

#### C. Citation

"Surveys to determine the external radiation levels in and around the plant were not complete as required by Section 20.201(b), 'Surveys'. Although surveys had been made, they did not include all areas where source material is stored and used."

#### Reported Action Taken

"Surveys to determine the external radiation levels in and around the plant have been set up on a monthly basis and now include all areas where source material is stored and used."

#### Current Status

Monthly radiation surveys have been made by the licensee of all areas of storage and use, and records are maintained. The records indicated that in unrestricted areas, the maximum direct radiation measurement around the newly installed chain-link fence surrounding the plant confines was 0.25 mr/hr, with an average radiation level of .15 mr/hr. In the restricted areas, thorium vault, a maximum of 10 mr/hr was recorded, with an average of 3 to 4 mr/hr.

The following independent measurements were made by the inspectors using a Juno and a GM-2 survey meter, calibrated June 5, 1961:

- (1) Ball mill area - general radiation level, 2 mr/hr;
  - at contact with the drum containing yttrium sludge, 7.5 mr/hr;
  - at one foot from the drum, 4 mr/hr;
  - at contact with the drum containing ground monazite, 10 mr/hr;
  - at one foot from this drum, 5 mr/hr

- (2) Monazite storage area - general radiation level, 5 mr/hr at 3' from the floor;  
at one foot from a bag containing monazite, 12 mr/hr
- (3) Locker room area - .04 mr/hr at 3' above floor;  
at contact with the floor, 7000 alpha dpm/100 cm<sup>2</sup>
- (4) Thorium vault - 10 mr/hr maximum; 3 - 4 mr/hr average

D. Citation

"Records of external radiation survey results were not maintained in the units required by Section 20.401(c), 'Records of surveys, radiation monitoring, and disposal'."

Reported Action Taken

"Records of external radiation surveys are now maintained in the units required by Section 20.401(c)."

Current Status

The records of monthly radiation surveys maintained by the licensee were reviewed. The records were recorded in the units required by 10 CFR 20.

E. Citation

"Source material waste was disposed by incineration without prior approval by the Commission. This is in violation of Section 20.305, 'Treatment or disposal by incineration'."

Reported Action Taken

"No source material waste will be disposed of by incineration without prior approval by the Commission."

Current Status

Garino, Mandle and Stone stated that no material has been disposed of by incineration since the last inspection. At present, Stone stated that they are presently storing empty monazite bags, and that this pile is growing daily. He stated that he intends to write to the Commission for approval to incinerate these bags, but that he would not incinerate unless he had prior approval. In a letter received by this office dated July 3, 1961 from Peter J. Garino, Health Physicist, to DL&R (Iyall Johnson), the licensee requested approval to incinerate. This letter is included as Exhibit "C".

F. Citation

"Source material waste was disposed by release to a storm sewer. This is in violation of Section 20.301, 'Waste disposal'."

Reported Action Taken

"Permission will be requested by separate letter for approval to release source material waste to a storm sewer in accordance with Section 20.302."

Current Status

As a precautionary measure to prevent any material run-off to enter the storm sewers, an additional culvert was built around the entire facility. As noted prior in the report, the records of effluent release show no release to their sewer system in excess of the limits specified in Part 20.

G. Citation

"Areas in which source material was stored and used were not posted as required by Section 20.203(e)(2), 'Caution signs, labels and signals'."

Reported Action Taken

"Areas in which source material are stored and used have been properly posted since the inspection on November 23, 1959, in accordance with Section 20.203(e)(2)'."

Current Status

An inspection of the facilities show that areas in which source material has been stored and used have been properly posted with a radiation caution sign and symbol. In addition, it was found that a form AEC-3 was posted at the entrance to the restricted areas.

H. Citation

"Areas in which source material was stored and used were not posted as required by Section 20.203(b), 'Caution signs, labels and signals'."

Reported Action Taken

"Areas in which source material are stored and used have been properly posted since the inspection on November 23, 1959, in accordance with Section 20.203(b)."

Current Status

An inspection of the ball mill area, thorium storage area, vault, and piles of sludge at which radiation levels in excess of 5 mr/hr at one foot existed revealed the areas to be posted with a proper radiation area sign and symbol.

I. Citation

"Radiation levels in and around the storage and dump areas were such that an individual could receive an exposure in excess of 2 mrem in any one hour or an exposure in excess of 100 mrem in any seven consecutive days. This is in violation of Section 20.102(b)(1)(2), 'Permissible levels of radiation in unrestricted areas'."

Reported Action Taken

"A restricted area will be established by erection of a fence which will include the facility and all storage and dump areas, and access to the restricted area will be controlled. Estimates for the fence have been requested from several contractors and are currently being reviewed."

Current Status

Stone stated that a fence was erected at a cost of \$6000. The fence is locked when not attended. He further added that when personnel are at the plant site, the two fence gates are closed, but not locked. An inspection of the restricted areas showed that an approximately 8' high fence has been erected around the plant confines and grounds. The entire area within the fence area is designated by Mandle and Stone as the plant's restricted area.

J. Citation

"Source material in the storage area was not secured against unauthorized removal as required by Section 20.207, 'Storage of licensed material'."

Reported Action Taken

"The restricted area mentioned in paragraph 9 above" (paragraph I above) "will include storage areas for licensed source material to prevent unauthorized removal from the plant of storage."

Current Status

See paragraph I above.

bcc: Mr. Paul B. Klevin  
U.S. Atomic Energy Commission  
New York, New York

DAVISON CHEMICAL COMPANY  
DIVISION OF W. R. GRACE & CO.  
BALTIMORE 3, MARYLAND

*Klevin*

July 3, 1961

*sd*

United States Atomic Energy Commission  
Washington 25, D.C.

Attention: Mr. Lyall Johnson  
Chief, Licensing Division

Gentlemen:

We are processors of source material (monazite sand) operating under License R-196 of the Atomic Energy Commission. We have an accumulation of burlap bags which contained monazite sand and which have been emptied as thoroughly as possible; also filter cloths used in process equipment and similar combustible materials.

Permission is requested to burn not more than 100 pounds of such materials under favorable meteorological conditions (no high winds, etc.).

At intervals during the burning of this material, radiation readings will be taken and air samples will also be collected in accordance with Title 10, Part 20.106 (A) and 20.302 of Regulation 10 CFR 20. These will be taken downwind of the incinerator and will include readings inside and outside the restricted area. Ash will be collected and stored in 55 gallon steel drums marked in accordance with applicable regulations. Records will also be maintained as required by regulations and all disposal will be under my supervision.

If you require additional information, please let me know.

Very truly yours,

*Peter J. Garino*

Peter J. Garino  
Health Physicist

PJG:MCB

ITEM # 115

RECEIVED  
JUL 11 1961  
B/114

*Fvln C*

AREA MONITORING SURVEY DATA SHEET

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

DATE June 2, 1961

BUILDING OR AREA Plant Survey

NATURE OF SUSPECTED ACTIVITY Debris - Gamma

MONITORED BY Barth G. Weiss

INSTRUMENT USED Geiger - Anton #5

LOCATION	Distance From Source	Radiation Level <i>in 1 min./hr.</i>	REMARKS
Shipping Room	3 ft.	0.20	<i>all readings in room - hi.</i>
Receiving Room	"	0.25	<i>all readings at waist level</i>
Calcining Furnace	"	0.25	
Unit #1	"	1.50	
Sulphur Kettle	"	1.5	
Thorium Refining	"	2.5	<i>Inactive area.</i>
Units 16+17	"	0.50	
Centrifuge	"	1.50	
Thorium Press	"	2.50	
Uranium Storage	"	3.00	
Dall Mill	"	2.0	
T. 2P+41	"	0.50	
Thorium Hydrochloride Storage	"	2.50	
Sulfur Sulfide Area	"	2.50	
Thorium Vault Inside	"	10.0	
Outside	"	2.5	
Process Storage	"	0.2	

# AREA MONITORING SURVEY DATA SHEET

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

DATE June 1, 1961

BUILDING OR AREA Savory Along Fence

NATURE OF SUSPECTED ACTIVITY Date - Jan

MONITORED BY C. Harris

INSTRUMENT USED Jager - Anton Malle 5

[illegible]



# SURVEY OF RADIOLOGICAL AIR-BORNE CONTAMINATION

OUT DOOR SAMPLES

30 MIN. COUNT IN SEALER

Location	Date	Time	Type of Survey	Results		mc/ml	MPC
THORIUM HYDRATE STORAGE	5/9/61	9:30 AM	AIR BORN ALPHA	6	M <sup>3</sup>		
		2:00 PM		4			
				5	.67	$3.2 \times 10^{-13}$	19%
NORTH WEST CORNER OF FENCE LINE	5/9/61	10:00 AM	DITTO	0	M <sup>3</sup>		
		2:30 PM		2	.13	$.59 \times 10^{-13}$	3.5%
				1			
MIDWAY ALONG SOUTH END OF FENCE	NOTHING	OVER BACKGROUND					
SOUTH WEST CORNER OF PROPERTY	5/9/61	10:40 AM	DITTO	1	M <sup>3</sup>		
		3:15 PM		5	.4	$1.8 \times 10^{-13}$	10.6%
				3			

Date

5/11/61

Peter J. Gano

# SURVEY OF RADIOLOGICAL AIR-BORNE CONTAMINATION

Location	Date	Time	Type of Survey	Results <i>per ml</i> MPC			
SHIPPING Room	5/8/61	8:30 AM 2:00 PM.	ALPHA AIR BOAT 100 cu ft. of AIR FILTERED IN 10 MIN.	16 24 20	M <sup>3</sup> 8	3.7 x 10 <sup>-12</sup>	7.4%
PULVERIZING Room	5/8/61	8:50 AM 2:20 PM	DITTO	15 6 10	M <sup>3</sup> 4	1.8 x 10 <sup>-12</sup>	3.6%
CALCINING FURNACE	5/8/61	9:05 AM 2:40 PM.	DITTO	12 8 10	M <sup>3</sup> 4	1.8 x 10 <sup>-12</sup>	3.3%
Thorium REFINING	5/8/61	9:25 AM 3:00 PM	DITTO	19 25 22	M <sup>3</sup> 9	4.1 x 10 <sup>-12</sup>	8.2%
Thorium CRYSTALLIZER	5/8/61	9:55 AM 3:20 PM.	DITTO	81 62 72	M <sup>3</sup> 29	1.3 x 10 <sup>-12</sup>	2.6%
PROCESS STORAGE	5/8/61	10:10 AM 3:40 PM.	DITTO	38 31 30	M <sup>3</sup> 12	5.4 x 10 <sup>-12</sup>	10.8%

Date

5/10/61

*Peter J. Ganso*

# SURVEY OF RADIOLOGICAL AIR-BORNE CONTAMINATION

Location	Date	Time	Type of Survey	Results $\mu\text{c/ml}$ MPC			
5/8/61 BALL MILL	5/8/61	10:30 AM	AIR BORN	77	M <sup>3</sup>		
		4:00 P.M.	ALPHA	238	64	$2.9 \times 10^{-11}$	58%
				157			
MONAZITE STORAGE	5/8/61	10:50 AM	DITTO	49	M <sup>3</sup>		
		4:20 P.M.		61	23	$1.0 \times 10^{-11}$	20%
				55			
LUNCH ROOM 'TRAILER'	5/8/61	11:10 AM	DITTO	8	M <sup>3</sup>		
		4:40 P.M.		6	2.6	$1.01 \times 10^{-12}$	2.2%
				7			
KETTLE AREA	5/8/61	11:30 AM.	DITTO	23	M <sup>3</sup>		
		4:55 PM		8	6	$2.7 \times 10^{-12}$	5.4%
				15			
CONTROL LAB.	5/8/61	11:50 AM	DITTO	11	M <sup>3</sup>		
	5/9/61	9:00 AM.		15			
				13	5	$2.3 \times 10^{-12}$	4.6%

Date

5/10/61

*Robt J. Harris*

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

BUILDING OR AREA SURVEY ALONG FENCE

MONITORED BY P. Harris

INSTRUMENT USED Geiger- Anton #5

[illegible]

# AREA MONITORING SURVEY DATA SHEET

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

DATE Jan. 18, 1961

BUILDING OR AREA Swampy Along Fence

NATURE OF SUSPECTED ACTIVITY Better Gamma

MONITORED BY P. James

INSTRUMENT USED Geiger - Anton #5

[illegible]

cc: New York Operations Office  
U. S. Atomic Energy Commission  
Attn: Mr. Paul Klevin

DAVISON CHEMICAL COMPANY

DIVISION OF W. R. GRACE & CO.  
BALTIMORE 3 • MARYLAND

*Klevin*  
*Lorenz*

July 6, 1961

DAVISON CHEMICAL COMPANY  
DIV. OF W. R. GRACE & CO.  
BOX 488  
POMPTON PLAINS, NEW JERSEY

Mr. Lyall Johnson, Chief  
Licensing Branch  
Division of Licensing and Regulation  
U. S. Atomic Energy Commission  
Washington 25, D.C.

Dear Mr. Johnson:

Reference: 40-86

This letter supplements our letters to you dated June 20, 1960 and July 13, 1960, regarding plant operations and disposal of plant effluents.

When we started operations at this location in 1948, we tied into the sewage system established in 1921 by Sheffield Farms. Subsequently, we set up and are operating our own industrial waste treatment plant on a continual basis. All plant effluents are treated prior to release into the existing system and our records indicate we are complying with applicable regulations.

We have also started construction of a secondary culvert to insure that any surface run-off which might overflow the primary culvert, due to cloudbursts or similar extraordinary conditions, would automatically be caught and passed into our waste treatment plant.

Wayne Township has set up and is operating a sewage disposal plant which discharges into the Pompton River approximately 100 yards upstream of the point where our treated plant effluents enter the river.

The town system is expanding and we expect within the next two years that we shall be able to put our plant effluents directly into the town plant by means of a sanitary sewer system.

The results of "core drilling" the plant area, referred to in paragraph 2 of our letter of June 20, 1960, were negative. No significant radioactivity was detected and a record of the core drill locations and radioactivity readings was noted in our files.

We therefore request permission to continue operations with the present

ITEM # 116

- continued -

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- 2 -

Mr. Lyall Johnson, Chief  
Licensing Branch  
U. S. Atomic Energy Commission

system of controls and records until we can tie into the sanitary sewer  
system referred to above.

Very truly yours,

P. J. Garino  
Health Physicist

PGJ:MCB

RECEIVED

JUN 3 1961

U.S. GOVERNMENT PRINTING OFFICE

UNITED STATES  
ATOMIC ENERGY COMMISSION  
NEW YORK OPERATIONS OFFICE  
376 HUDSON STREET  
NEW YORK 14, NEW YORK

REFER TO:  
CO-NY:PEK

July 19, 1961

TELEPHONE No. 1  
YUKON 9-1000  
Ext. 282

TO: Rare Earths, Incorporated  
Division of W. R. Grace and Co.  
Pompton Plains, New Jersey  
ATTN: Richard Mandle, Plant Manager

On June 29, 1961 an inspection was conducted of your  
activities authorized under AEC License(x) Number(x) R-196

No item of noncompliance was noted as a result of this inspection.

Paul B. Klevin  
AEC Representative  
Paul B. Klevin

Received:

Licensee Representative

July 19, 1961

(date)

Mailed to licensee on 7/19/61.

DISTRIBUTION:

Original - Licensee  
Copy - Division of Licensing & Regulation  
Copy - Operations Office  
Copy - Division of Compliance  
Copy - Office of origin for assist  
inspections or as needed

Signatures to appear on all copies.

ITEM # 117



UNITED STATES  
ATOMIC ENERGY COMMISSION  
NEW YORK OPERATIONS OFFICE  
376 HUDSON STREET  
NEW YORK 14, NEW YORK

REFER TO:

CO-NY:AMB

July 26, 1961

TELEPHONE NO.:  
YUKON 9-1000  
Ext. 286

W. R. Grace & Company  
Division of Davison Chemical Company  
Baltimore 3, Maryland

ATTN: David Barrett

LICENSING REQUIREMENTS FOR PERSONS POSSESSING URANIUM OR  
THORIUM SOURCE MATERIAL

Gentlemen:

Records of the Atomic Energy Commission indicate that, under a license which has expired, you were authorized to receive and transfer uranium and/or thorium source material. Under former regulations, a license to possess source material was not required.

Under revised regulation 10 CFR 40, "Licensing of Source Material," effective February 13, 1961, a copy of which is attached, any person who possesses source material must now be specifically licensed unless the material is possessed pursuant to a general license or an exemption established in the regulations.

Accordingly, if you possess uranium or thorium source material that is not exempted from the licensing requirement (see Section 40.13 of the regulation for details), or if you possess such material and you are not generally licensed (see Section 40.22), you are required to obtain a license in order to retain possession of the material.

If you do not possess any uranium or thorium source material, or if any such material now in your possession is exempted from the licensing requirement or is generally licensed, please complete and sign the enclosed form of certification and return it to this office. In this event, you may disregard the following paragraph.

ITEM # 118

B/117

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- 2 -

If a specific license is required, your application should be submitted to the Division of Licensing and Regulation, U. S. Atomic Energy Commission, Washington 25, D. C., in letter form in quadruplicate indicating the quantity of material you possess, describing the activities you wish to perform using the material, and your procedures for assuring that your possession and use of the material will not endanger the health and safety of the public, in full compliance with the requirements of 40.32. We request that you notify this office by letter in the event that you do file such an application.

Very truly yours,

A handwritten signature in dark ink, appearing to read "Robert W. Kirkman". The signature is fluid and cursive, with the first letters of the first and last names being capitalized and prominent.

Robert W. Kirkman, Director  
New York Compliance Area

Enclosure:  
10 CFR 40  
Certification of Status of  
Source Material

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

REMARKS

A clear inspection report form was not given to the licensee at the time of the follow-up inspection inasmuch as air and

REMARKS

liquid effluent samples had to be analyzed by HASL, NYOO. The results of these samples revealed no levels in excess of those

REMARKS

specified in 10 CFR 20.

*[Signature]*  
July 19, 1961

## COMPLIANCE INSPECTION REPORT

1. Name and address of licensee  <b>W. R. GRACE &amp; COMPANY Devcon Chemical Division Pompton Plains, New Jersey</b>	2. Date of inspection  <b>June 29, 1961</b>
	3. Type of inspection <b>Follow-up</b>
	4. 10 CFR Part(s) applicable  <b>20 - 40</b>

5. License number(s), issue and expiration dates, scope and conditions (including amendments)

License No.	Packet No.	Iss. Date	Exp. Date
-------------	------------	-----------	-----------

<b>B-196</b>	<b>40-06</b>	<b>1/27/59</b>	<b>1/31/60</b>
--------------	--------------	----------------	----------------

**SCOPE:** Thorium-containing material from producers and distributors licensed by the AEC and through inspection for processing at Pompton Plains, New Jersey and Curtis Bay, Maryland plants.

**CONDITIONS:** Maintenance of records of inventories, receipts and transfers of refined source material. Compliance with Part 20. Non-exceptional.

6. Inspection findings (and items of noncompliance)

This follow-up inspection was conducted to determine if the licensee had corrected all the items of noncompliance noted during the initial inspection of November 25, 1959. The inspection revealed that W. R. Grace & Company, Devcon Chemical Division, Pompton Plains, New Jersey, had corrected the previous items of noncompliance and was in compliance with the Federal Regulations. No additional items of noncompliance were noted during the course of this follow-up inspection.

7. Date of last previous inspection  <b>November 25, 1959</b>	8. Is "Company Confidential" information contained in this report? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> (Specify page(s) and paragraph(s)).
---	---

## DISTRIBUTION:

1 cy - ELAR  
2 cys - CO-ND  
2 cys - CO-NT

**Paul B. Klevin**

(Inspector)

Approved by:

**Robert W. Kirkman, Director  
New York Compliance Area**

(Operations office)

**August 17, 1961**

(Date report prepared)

If additional space is required for any numbered item above, the continuation may be extended to the reverse of this form using foot to head format, leaving sufficient margin at top for binding, identifying each item by number and noting "Continued" on the face of form under appropriate item.

16-72314-2 U. S. GOVERNMENT PRINTING OFFICE

RECOMMENDATIONS SHOULD BE SET FORTH IN A SEPARATE COVERING MEMORANDUM

PART 40 INSPECTION

W. R. GRACE & COMPANY  
Davison Chemical Division  
Pompton Plains, New Jersey

Date of Inspection: June 29, 1961 (Announced)

Persons Accompanying Inspector:

Mr. John Russo, New Jersey State Department of Health

Persons Contacted:

Richard Mandle, Plant Manager  
Richard Stone, Sales Manager  
Peter J. Garino, Health Physicist

DETAILS

9. Background Information

On November 25, 1959, an inspection of the activities conducted under License R-196 was made at the facilities of Rare Earths, Inc., Pompton Plains, New Jersey. The report was transmitted to M. M. Mann, Assistant Director, Division of Inspection, HQ. on January 26, 1960. The licensee was found to be in noncompliance with the following sections: 20.102(b)(1)(2), "Permissible levels of radiation in unrestricted areas"; 20.201(b), "Surveys"; 20.207, "Storage of licensed material"; 20.203(b), "Caution signs, labels and signals - Radiation areas"; 20.203(e)(2), "Additional requirements"; 20.305, "Treatment or disposal by incineration"; 20.301, "General Requirement"; and 20.401(c), "Records of surveys, radiation monitoring and disposal". It was found that a hazard existed, and a follow-up inspection was recommended.

On March 14, 1960, DL&R (Lyall Johnson) in a letter to D. P. Barrett, Sales Manager, Davison Chemical Company, Division of W. R. Grace & Company, 101 N. Charles Street, Baltimore 1, Maryland, informed the licensee of the above-mentioned items of noncompliance. In addition, the DL&R letter requested additional information from the licensee in order to continue their review of the licensee's renewal application.

On April 11, 1960, T. O. Tongue, Acting Production Manager, Davison Chemical Company, Division of W. R. Grace & Company, informed DL&R (Johnson) of the corrective action taken in order to comply with 10 CFR 20, and also outlined additional corrective measures which will be completed as soon as possible in order to assure complete compliance.

On June 6, 1960, DL&R (Johnson) answered the April 11 letter and also noted that in item 6 of the 4/11 letter, the licensee stated that he would make application by separate letter for approval to release source material waste to a storm sewer in accordance with Section 20.302. The letter also stated that DL&R has no record of having received such application, and that their review of the licensee's renewal application of 2/11/60 was pending receipt of further information concerning mill operations as requested in DL&R's letter of March 14, 1960.

On June 20, 1960, the licensee (T.O. Tongue) acknowledged the DL&R letter of June 6 requesting the status of application for approval to release source material to unrestricted areas and information concerning plant operations. Tongue stated that Davison people met with Rogers, Page and others to review this problem and took DL&R's suggestions that they "core drill" the plant area to appraise the significance of leaching from their tailings pile. The letter also stated that following the meeting with DL&R people, they placed orders for equipment to measure low-level activity involved, and that for the past several months, their health physicist has taken a limited number of dust samples. The samples were analyzed by Controls for Radiation, and for the most part indicated a low level of contamination.

In a memo dated January 13, 1961 from D. E. Warner, Acting Assistant Director for Materials, Division of Compliance, to Lyall Johnson, Assistant Director for Facilities and Materials Licensing, DL&R, Warner made reference to a memo from Compliance Headquarters dated November 9, 1960, requesting information as to whether enforcement action had been completed on the inspection of Davison Chemical Company, Division of W. R. Grace & Company, License R-196. The memo also noted that information that enforcement action had been completed was needed by NY before a follow-up inspection of this licensee could be scheduled.

On May 15, 1961, D. E. Warner, in a memo to Lester Rogers, Assistant Director for Nuclear Materials Safety, referred to the memo of May 5, 1960 and said that NY would continue to defer re-scheduling of this licensee pending receipt of information that enforcement action had been completed or that none was contemplated.

On May 29, 1961, in a memo route slip from D. E. Warner to R. W. Kirkman, Warner informed this office that enforcement action had been completed by letter dated 6/6/60.

#### 10. Action Taken on Items of Noncompliance

As noted prior, in a letter dated March 14, 1960, DL&R informed the licensee (Barrett, Sales Manager) of the items of noncompliance found during the course of the inspection conducted by New York on November 25, 1959. The citations, action taken by the licensee as per their letter dated 4/11/60 and current status as per inspection of June 29 are noted below:

A. Citation (DL&R's)

"Surveys to determine the concentrations of airborne radioactivity were not made as required by Section 20.201(b), 'Surveys'."

Reported Action Taken (Licensee's letter dated 4/11/60)

"Biweekly surveys to determine the concentrations of airborne radioactivity are being made throughout the facility."

Current Status

The licensee was found to conduct biweekly air samples using a Staplex air sampler. Radiation surveys are made on a monthly basis.

The licensee has conducted air samples in all the areas and has also conducted a job analysis of each operation for all the operators working in the plant. Results of the radioactive exposure to airborne thorium aerosols indicate that none of the employees is exposed to the daily rate of concentrations exceeding the levels specified in Part 20 for a 40 hour work week. A copy of a typical job analysis sheet is included as Exhibit "A".

Two air samples were taken by the inspectors at the feeder-hopper and ball mill areas. Samples were taken using a Hudson pump having a flow rate of approximately 30 to 35 linear feet per minute, respectively, for periods of 1/2 hour each. The collection time of the samples was 30 minutes for the air sample taken at the feederhopper and 35 minutes at the ball mill area. The samples, collected on Whatman 41 filter paper, were analyzed by HASL. Results indicated that the general air concentrations at the feederhopper were  $10^{-10}$  uc/ml, and the ball mill area was  $1.89 \times 10^{-11}$  uc/ml.

Records of air sample results maintained by the licensee were reviewed. These records were noted to be recorded in uc/ml.

B. Citation (DL&R's)

"Surveys to determine the concentration of radioactivity in the plant liquid effluent were not made as required by Section 20.201(b), 'Surveys'."

Reported Action Taken (Licensee's letter of 4/11/60)

"Surveys to determine the concentration of radioactivity in the plant liquid effluent were started in December, 1959. Daily aliquots are being taken and combined into representative weekly sample for radiometric analysis. Analysis of the levels of radioactivity involved indicate only 10% of the M.P.C. for natural thorium as stated in Appendix B, Table II, Part 20, and outlined in Section 20.103."

#### Current Status

Daily samples are taken from the river and stream to measure effluent concentrations to the river. Daily samples are counted on a gas flow proportional counter which has been purchased by the licensee. The licensee is using a limit of thorium concentration of  $10^{-7}$  uc/ml. A review of the records maintained by the licensee showed that the effluent concentration to the river was recorded in some decimal fraction times  $10^{-7}$  uc/ml. The maximum amount discharged to the river was  $0.2 \times 10^{-7}$  uc/ml.

Two water samples were taken by the inspectors. The first was taken at the weir in the pump house, and the second was taken approximately 500' from the plant at Sheffield Brook. The samples, analyzed by HASL, were found to be  $10^{-9}$  and  $2.91 \times 10^{-8}$  uc/ml, respectively.

In a letter dated July 6, 1961, received after the inspection, the licensee requested permission to continue the operations of the present system of controls and records until they could tie into a sanitary sewer system. They noted in their letter that since 1948, they were tied up to a sewer system by Sheffield Farms. This letter is included as Exhibit "B".

#### C. Citation

"Surveys to determine the external radiation levels in and around the plant were not complete as required by Section 20.201(b), 'Surveys'. Although surveys had been made, they did not include all areas where source material is stored and used."

#### Reported Action Taken

"Surveys to determine the external radiation levels in and around the plant have been set up on a monthly basis and now include all areas where source material is stored and used."

#### Current Status

Monthly radiation surveys have been made by the licensee of all areas of storage and use, and records are maintained. The records indicated that in unrestricted areas, the maximum direct radiation measurement around the newly installed chain-link fence surrounding the plant confines was 0.25 mr/hr, with an average radiation level of .15 mr/hr. In the restricted areas, thorium vault, a maximum of 10 mr/hr was recorded, with an average of 3 to 4 mr/hr.

The following independent measurements were made by the inspectors using a Juno and a GM-2 survey meter, calibrated June 5, 1961:

- (1) Ball mill area - general radiation level, 2 mr/hr;
  - at contact with the drum containing yttrium sludge, 7.5 mr/hr;
  - at one foot from the drum, 4 mr/hr;
  - at contact with the drum containing ground monazite, 10 mr/hr;
  - at one foot from this drum, 5 mr/hr



- (2) Monazite storage area - general radiation level, 5 mr/hr at 3' from the floor;  
at one foot from a bag containing monazite, 12 mr/hr
- (3) Locker room area - .04 mr/hr at 3' above floor;  
at contact with the floor, 7000 alpha dpa/100 cm<sup>2</sup>
- (4) Thorium vault - 10 mr/hr maximum; 3 - 4 mr/hr average

D. Citation

"Records of external radiation survey results were not maintained in the units required by Section 20.401(c), 'Records of surveys, radiation monitoring, and disposal'."

Reported Action Taken

"Records of external radiation surveys are now maintained in the units required by Section 20.401(c)."

Current Status

The records of monthly radiation surveys maintained by the licensee were reviewed. The records were recorded in the units required by 10 CFR 20.

E. Citation

"Source material waste was disposed by incineration without prior approval by the Commission. This is in violation of Section 20.305, 'Treatment or disposal by incineration'."

Reported Action Taken

"No source material waste will be disposed of by incineration without prior approval by the Commission."

Current Status

Garino, Mandle and Stone stated that no material has been disposed of by incineration since the last inspection. At present, Stone stated that they are presently storing empty monazite bags, and that this pile is growing daily. He stated that he intends to write to the Commission for approval to incinerate these bags, but that he would not incinerate unless he had prior approval. In a letter received by this office dated July 3, 1961 from Peter J. Garino, Health Physicist, to DL&R (Lyall Johnson), the licensee requested approval to incinerate. This letter is included as Exhibit "C".

F. Citation

"Source material waste was disposed by release to a storm sewer. This is in violation of Section 20.301, 'Waste disposal'."

Reported Action Taken

"Permission will be requested by separate letter for approval to release source material waste to a storm sewer in accordance with Section 20.302."

Current Status

As a precautionary measure to prevent any material run-off to enter the storm sewers, an additional culvert was built around the entire facility. As noted prior in the report, the records of effluent release show no release to their sewer system in excess of the limits specified in Part 20.

G. Citation

"Areas in which source material was stored and used were not posted as required by Section 20.203(e)(2), 'Caution signs, labels and signals'."

Reported Action Taken

"Areas in which source material are stored and used have been properly posted since the inspection on November 23, 1959, in accordance with Section 20.203(e)(2)'."

Current Status

An inspection of the facilities show that areas in which source material has been stored and used have been properly posted with a radiation caution sign and symbol. In addition, it was found that a form AEC-3 was posted at the entrance to the restricted areas.

H. Citation

"Areas in which source material was stored and used were not posted as required by Section 20.203(b), 'Caution signs, labels and signals'."

Reported Action Taken

"Areas in which source material are stored and used have been properly posted since the inspection on November 23, 1959, in accordance with Section 20.203(b)."

Current Status

An inspection of the ball mill area, thorium storage area, vault, and piles of sludge at which radiation levels in excess of 5 mr/hr at one foot existed revealed the areas to be posted with a proper radiation area sign and symbol.

I. Citation

"Radiation levels in and around the storage and dump areas were such that an individual could receive an exposure in excess of 2 mrem in any one hour or an exposure in excess of 100 mrem in any seven consecutive days. This is in violation of Section 20.102(b)(1)(2), 'Permissible levels of radiation in unrestricted areas'."

Reported Action Taken

"A restricted area will be established by erection of a fence which will include the facility and all storage and dump areas, and access to the restricted area will be controlled. Estimates for the fence have been requested from several contractors and are currently being reviewed."

Current Status

Stone stated that a fence was erected at a cost of \$6000. The fence is locked when not attended. He further added that when personnel are at the plant site, the two fence gates are closed, but not locked. An inspection of the restricted areas showed that an approximately 8' high fence has been erected around the plant confines and grounds. The entire area within the fence area is designated by Mandle and Stone as the plant's restricted area.

J. Citation

"Source material in the storage area was not secured against unauthorized removal as required by Section 20.207, 'Storage of licensed material'."

Reported Action Taken

"The restricted area mentioned in paragraph 9 above" (paragraph I above) "will include storage areas for licensed source material to prevent unauthorized removal from the plant of storage."

Current Status

See paragraph I above.

Operation or operating area	time per oper	oper per shift	time per shift (min)	No. of slps.	CONCENTRATION d/m /M <sup>3</sup>			AVGE CONC X TOTAL TIME
					Low	High	Avg.	
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 6	12390

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

Exh. A

706. 110 d/m m<sup>3</sup>

L. Dublinski, Asst. Dir. for Materials  
Division of Compliance

R. E. Cunningham, Chief, Enforcement Branch  
Division of Licensing and Regulation

JUL 28 1961

RARE EARTHS, INCORPORATED  
DIVISION OF W. E. GRACE AND COMPANY  
POMPTON PLAINS, NEW JERSEY

LICENSE NO. R-196

DLM:REC

40-84

He received a copy of a clear notice issued to the subject licensee on July 19, 1961. This issuance was based on an inspection conducted June 29, 1961.

In view of conditions previously noted during the inspection of this licensee and the pending application, it is requested that a full report of this inspection be forwarded to us.

OFFICE	LR:EB				
SURNAME	RE Cunningham: hgs				
DATE	7-27-61				
		ITEM #			

UNITED STATES  
ATOMIC ENERGY COMMISSION

IN REPLY REFER TO:  
CS:LC:ND

WASHINGTON 25, D. C.  
SOURCE MATERIAL LICENSE

License No. R-132

Effective April 1, 1955.

Rare Earths, Inc.  
Box 488  
Pompton Plains, New Jersey

Att: 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, and in view of the information contained in your application for license you are hereby authorized:

To receive possession of and title to unlimited quantities of raw source material (solely monazite sand) during the term of this license, from producers and distributors licensed by the Atomic Energy Commission and through importation, for processing only.

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

In transactions which are exports from the United States, each such transaction shall have prior authorization, regardless of quantity, which may be applied for on form AEC-7, in duplicate.

As a condition of issuance of this license, you are required to report your inventories, processing and receipts and deliveries of raw and refined source material on form AEC-4, periodically, in accordance with the instructions on the form.

This license shall expire at 12:01 a.m., E.S.T., on April 1, 1956.

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.

FOR THE ATOMIC ENERGY COMMISSION

Signed

and

By W. J. Johnston

Chief, Licensing Controls Branch

This license is subject to the right of recapture or control reserved by Section 103 of the Atomic Energy Act of 1954, and to all of the other provisions of said Act, now or hereafter in effect and to all valid rules and regulations of the U. S. Atomic Energy Commission.

ITEM # 120

B/1119

~~CONFIDENTIAL~~

June 27, 1955

C  
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P  
Y

RARE EARTHS, INC. PROCESS FOR BREAKING MONAZITE SANDS INTO

RARE EARTH AND THORIUM COMPONENTS

Monazite sands are essentially an orthophosphate of rare earths and thorium. The sands vary in composition according to 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.

Through the ages these pegmatites have weathered and the monazite sands and other heavy minerals have concentrated in stream beds or beach sands. The monazite sands are rarely present in excess of a few percent and are recovered by dredging or tabling or as a by product of other heavy mineral separations. The concentrates are presently further enriched in electromagnetic and electrostatic separators to yield 90-98% monazite. Non-monazite minerals present in the concentrates after concentration may include silica, rutile, ilmenite, quartz, zircon and magnetite.

A chemical separation process is used to break the monazite and produce rare earth fractions relatively free of thorium, and a thorium fraction relatively free of rare earths.

FIRST OPERATION - Digestion of the Monazite (Sulfonation Reactor)

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 monazite sand with sulphuric 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 4 to 6 hours.

SECOND OPERATION - Crystallization (Tank 1, Centrifuge & Press 5)

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 recycled acid and wash streams from subsequent process steps. The wash streams contain sufficient water to dilute the free acid in the sulfonation to approximately 50% total acidity, and also provide water hydration for rare earth sulfates from sulfonation.

The hydrated rare earth sulfates form as a dense crystalline salt in a slurry of approximately 50% phosphoric sulphuric acid liquor. The thorium sulfate produced in the sulfonation is more soluble in this acid than the rare earth sulfates which permits a crude separation of thorium and rare earths.

The hydrated rare earth sulfates from the crystallization are pumped to a classifier to remove the finely ground non-monazite gangue and acids from the rare earth sulfates. The overflow from the classifier is filtered through a precoat drum filter to separate the gangue from the thorium-rich acid liquors. A portion of this filtered acid is removed for thorium separation and the remainder is recycled to the crystallizer tanks.

ITEM #

B/12-0  
C



Process for breaking monazite sands into rare earth and thorium components (cont'd)

THIRD OPERATION - Rare Earth Removal from Acid Stream (Tank 24, Press 5A, Tank 15)

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 an 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 its acid liquor, 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 washed rare earth sulfate crystals in operation 6.

FOURTH OPERATION - Thorium Separation from Acid Stream (Tank 25, Press 5B, Tank 16 Filter 3)

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 on a drum filter and the spent acid is sent to an acid dilution boot for the Superphosphate Plant. The thorium fluoride is then treated with caustic soda to convert the thorium fluoride to hydroxide. Sodium fluoride and free caustic are removed by water washing in the Shriver thickener. The washed product is then dried and packed as thorium hydroxide product.

FIFTH OPERATION - Removal of Acid from Crude Rare Earth Crystals (Centrifuge, Tank 17)

The hydrated rare earth sulfate crystals from the underflow of the classifier (operation 2) are filtered on a pan filter and countercurrently washed with the rare earth process wash liquors before these liquors are sent to the crystallizing tank. This operation serves to remove the bulk of the phosphoric acid and sulphuric acid from the rare earth crystals so that they may be dissolved in water in operation 6 with a minimum acid contamination since acid interferes with the thorium separation.

SIXTH OPERATION - Removal of Thorium from Rare Earths (Tank 19, Press 1, Tank 6)

The thickened rare earth hydroxide from operation 3 is mixed with the washed rare earth crystals from operation 5 and filtrate from operation 8. The rare earth values go into solution as neutral rare earth sulfates, and gangue and thorium remain insoluble 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 crystallizing tank (operation 8).

SEVENTH OPERATION - Recovery of Thorium and Rare Earths from Gangue (Press 1, Tank 8 Press 6, Tank 21)

The thorium phosphate cake in operation 6 is combined with the gangue from the precoat drum filter in operation 2 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 crystal filter to the sulfonator crystallization tanks.

EIGHTH OPERATION - Formation of Rare Earth Double Sulfate. (Tank 6, Tank 3, Press 2, Tank 10, Press 7)

In the double sulfate precipitation tank, neutral rare earth sulfate liquors from operation 6 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 pH8, which causes the soluble yttrium earths to precipitate. The yttrium earths are filter pressed and stored, the filtrate from the operation goes to the plant waste.

\* The double salt may be treated with the following for the preparation of rare earth products:

- a) Hydrofluoric acid to give rare earth fluoride.
- b) Caustic soda to form rare earth hydroxide.
- c) Soda ash to form polishing powders.

Rare earth chloride, cerium products and didymium earths are produced from rare earth hydroxide. Heavy rare earths are recovered from yttrium residues.

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DAVISON CHEMICAL COMPANY  
DIV. OF W. R. GRACE & CO.  
BOX 488  
POMPTON PLAINS, NEW JERSEY



POMPTON PLAINS, NEW JERSEY

FLUORINE DIOXIDE PROCESS FOR SEPARATING URANIUM FROM THORIUM

UNITED STATES PATENT OFFICE

Fluorine dioxide is a powerful oxidizing agent and is used in the process for separating uranium from thorium. The process involves the reaction of fluorine dioxide with a mixture of thorium and uranium compounds to form a complex. The complex is then separated into two fractions, one containing thorium and the other containing uranium. The thorium fraction is further processed to separate thorium from the complex, and the uranium fraction is further processed to separate uranium from the complex.

The process is carried out in a series of steps. First, a mixture of thorium and uranium compounds is prepared. This mixture is then reacted with fluorine dioxide to form a complex. The complex is then separated into two fractions, one containing thorium and the other containing uranium. The thorium fraction is further processed to separate thorium from the complex, and the uranium fraction is further processed to separate uranium from the complex.

The process is carried out in a series of steps. First, a mixture of thorium and uranium compounds is prepared. This mixture is then reacted with fluorine dioxide to form a complex. The complex is then separated into two fractions, one containing thorium and the other containing uranium. The thorium fraction is further processed to separate thorium from the complex, and the uranium fraction is further processed to separate uranium from the complex.

FIRST OPERATION - SEPARATION OF URANIUM FROM THORIUM

The first operation of the process involves digestion of the sample with concentrated sulfuric acid. The rate of the reaction is increased by the addition of a small amount of hydrogen peroxide. The reaction is carried out in a series of steps. First, a mixture of thorium and uranium compounds is prepared. This mixture is then reacted with fluorine dioxide to form a complex. The complex is then separated into two fractions, one containing thorium and the other containing uranium. The thorium fraction is further processed to separate thorium from the complex, and the uranium fraction is further processed to separate uranium from the complex.

SECOND OPERATION - SEPARATION OF THORIUM FROM URANIUM

The second operation involves the separation of the thorium from the uranium. This is done by the addition of a small amount of hydrogen peroxide to the mixture. The reaction is carried out in a series of steps. First, a mixture of thorium and uranium compounds is prepared. This mixture is then reacted with fluorine dioxide to form a complex. The complex is then separated into two fractions, one containing thorium and the other containing uranium. The thorium fraction is further processed to separate thorium from the complex, and the uranium fraction is further processed to separate uranium from the complex.

The process is carried out in a series of steps. First, a mixture of thorium and uranium compounds is prepared. This mixture is then reacted with fluorine dioxide to form a complex. The complex is then separated into two fractions, one containing thorium and the other containing uranium. The thorium fraction is further processed to separate thorium from the complex, and the uranium fraction is further processed to separate uranium from the complex.



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DANSON CHEMICAL COMPANY  
DIV OF W. R. GRACE & CO.  
BOX 7488  
MONTICELLO PLAINS, NEW JERSEY

JAN 17 1956

FORM  
(2-47) AEC-4UNITED STATES OF AMERICA  
ATOMIC ENERGY COMMISSIONFORM APPROVED.  
BUDGET BUREAU NO. 38-R0044MONTHLY REPORT OF PROCESSORS OF URANIUM  
AND THORIUM SOURCE MATERIALSPURSUANT TO CODE OF FEDERAL REGULATIONS,  
TITLE 10—ATOMIC ENERGY, PART 40—  
CONTROL OF SOURCE MATERIALTo: U. S. Atomic Energy Commission,  
P. O. Box 30, Ansonia Station,  
New York 23, N. Y.

## 1. PROCESSOR'S NAME

Rare Earths, Inc.

## ADDRESS

P.O. Box 488, Pompton Plains, NJ

## AEC LICENSE NO.

R-132

## 2. REPORT FOR MONTH OF

December, 1955

INSTRUCTIONS.—File two (2) copies of this report with the U. S. Atomic Energy Commission, P. O. Box 30, Ansonia Station, New York 23, N. Y., not later than 15 days after the end of each month in which you transferred, delivered, or held possession of or title to any source material. Inventory means all source material in your possession or to which you have title, regardless of location.

3. Summary of receipts, deliveries, and inventories of source material during the month. (The entries for "Receipts" and "Deliveries" below should be the totals of transfers of each grade of source material. List in block 5 on the reverse side each receipt form and delivery to others included in these totals.)

(i) Raw source material (excluding residues and tailings).

Figures are reported in Short Tons (Specify unit of measure).

DESCRIPTION OF RAW SOURCE MATERIAL AND URANIUM AND THORIUM CONTENT (a)	INVENTORY BEGINNING OF MONTH (b)	RECEIPTS FROM OWN PRODUCTION AND PURCHASES (c)	TOTAL (b) and (c) (d)	DELIVERIES TO:		INVENTORY END OF MONTH (e)
				Process (f)	Others (g)	
Monazite	90.25	19.0	109.25	30		79.3

(ii) Residues and tailings.

Figures are reported in Lbs. ThO<sub>2</sub> (Specify unit of measure).

DESCRIPTION OF RAW SOURCE MATERIAL AND URANIUM AND THORIUM CONTENT (a)	INVENTORY BEGINNING OF MONTH (b)	RECEIPTS PROCESS (c)	FROM OTHERS (d)	TOTAL (b) and (c) and (d) (e)	DELIVERIES TO:		INVENTORY END OF MONTH (h)
					Process (f)	Others (g)	
Thorium Sludge	27,674	2,665		30,339	3,007		27,322

(iii) Refined source material.

Figures are reported in Lbs. ThO<sub>2</sub> (Specify unit of measure).

DESCRIPTION OF REFINED SOURCE MATERIAL AND URANIUM AND THORIUM CONTENT (a)	INVENTORY BEGINNING OF MONTH (b)	RECEIPTS PROCESS (c)	FROM OTHERS (d)	TOTAL (b) and (c) and (d) (e)	DELIVERIES TO:		INVENTORY END OF MONTH (h)
					Further Processing (f)	Others (g)	
Refining Process	9,269	3,007		12,276	5,850	517	5,909
Finished Stock	671	5,850		6,521	6,000	1	520

(iv) Source material in process.

Estimated uranium and thorium content in inventory.

At beginning of month 9,700At end of month 5,600

ITEM #

122 B/121

16-53572-3

By Richard M. Mankle  
(Signature of authorized official)

*J.P.*

12/16/55

(Signature of authorized official)

(Title)

(Date)

5. Statement of each receipt and delivery of source material during the month.

Report each receipt or delivery of source material during the month, grouping together all transfers of one grade under the heading "Receipts" or "Deliveries." Do not include here the details of "Deliveries to process" or "Receipts from process." The totals of receipts from and deliveries to others of any one grade (column (f)) must agree with the total for that grade shown in block 3.

[illegible]

(If necessary, attach additional sheets, using the same grouping of columns (a) through (g))

APR 5 1956

FORM APPROVED.  
BUDGET BUREAU NO. 38-R004.4.MONTHLY REPORT OF PROCESSORS OF URANIUM  
AND THORIUM SOURCE MATERIALSPURSUANT TO CODE OF FEDERAL REGULATIONS,  
TITLE 10—ATOMIC ENERGY, PART 40—  
CONTROL OF SOURCE MATERIALTo: U. S. Atomic Energy Commission,  
P. O. Box 30, Ansonia Station,  
New York 23, N. Y.

## 1. PROCESSOR'S NAME

Rare Earths, Inc.

## ADDRESS

P.O. Box 488, Pompton Plains, N. J.

## AEC LICENSE NO.

R - 132

## 2. REPORT FOR MONTH OF

March, 1956

INSTRUCTIONS.—File two (2) copies of this report with the U. S. Atomic Energy Commission, P. O. Box 30, Ansonia Station, New York 23, N. Y., not later than 15 days after the end of each month in which you transferred, delivered, or held possession of or title to any source material. *Inventory* means all source material in your possession or to which you have title, regardless of location.

3. Summary of receipts, deliveries, and inventories of source material during the month. (The entries for "Receipts" and "Deliveries" below should be the totals of transfers of each grade of source material. List in block 5 on the reverse side each receipt form and delivery to others included in these totals.)

(i) Raw source material (excluding residues and tailings).

Figures are reported in Short Tons (Specify unit of measure).

DESCRIPTION OF RAW SOURCE MATERIAL AND URANIUM AND THORIUM CONTENT (a)	INVENTORY BEGINNING OF MONTH (b)	RECEIPTS FROM OWN PRODUCTION AND PURCHASES (c)	TOTAL (b) and (c) (d)	DELIVERIES TO:		INVENTORY END OF MONTH (g)
				Process (e)	Others (f)	
Monazite	53.5	32.9	86.4	20		66.4

(ii) Residues and tailings.

Figures are reported in Lbs. ThO<sub>2</sub> (Specify unit of measure).

DESCRIPTION OF RAW SOURCE MATERIAL AND URANIUM AND THORIUM CONTENT (a)	INVENTORY BEGINNING OF MONTH (b)	RECEIPTS PROCESS (c)	FROM OTHERS (d)	TOTAL (b) and (c) and (d) (e)	DELIVERIES TO:		INVENTORY END OF MONTH (h)
					Process (f)	Others (g)	
Thorium Sludge	27,799	1,695	-	29,494	2,250		27,244

(iii) Refined source material.

Figures are reported in Lbs. ThO<sub>2</sub> (Specify unit of measure).

DESCRIPTION OF REFINED SOURCE MATERIAL AND URANIUM AND THORIUM CONTENT (a)	INVENTORY BEGINNING OF MONTH (b)	RECEIPTS PROCESS (c)	FROM OTHERS (d)	TOTAL (b) and (c) and (d) (e)	DELIVERIES TO:		INVENTORY END OF MONTH (h)
					Further Processing (f)	Others (g)	
Refining Process	5,118	2,250		7,368	4,092		2,934
Finished Stock	9,117	4,092		13,209		1,000	12,209

(iv) Source material in process.

Estimated uranium and thorium content in inventory.

At beginning of month 4,717At end of month 7,748

ITEM #

123 B/122



4/4/56  
(Date)

5. Statement of each receipt and delivery of source material during the month.

[illegible]

U. S. GOVERNMENT PRINTING OFFICE 16-56372-1

MONTHLY REPORT OF PROCESSORS OF URANIUM  
AND THORIUM SOURCE MATERIALSPURSUANT TO CODE OF FEDERAL REGULATIONS,  
TITLE 10—ATOMIC ENERGY, PART 40—  
CONTROL OF SOURCE MATERIALTo: U. S. Atomic Energy Commission,  
P. O. Box 30, Ansonia Station,  
New York 23, N. Y.

## 1. PROCESSOR'S NAME

RARE EARTHS, INC.

## ADDRESS

P.O. BOX 488, Pompton Plains, N. J.

## AEC LICENSE NO.

R - 132

## 2. REPORT FOR MONTH OF

April, 1956

INSTRUCTIONS.—File two (2) copies of this report with the U. S. Atomic Energy Commission, P. O. Box 30, Ansonia Station, New York 23, N. Y., not later than 15 days after the end of each month in which you transferred, delivered, or held possession of or title to any source material. *Inventory* means all source material in your possession or to which you have title, regardless of location.

3. Summary of receipts, deliveries, and inventories of source material during the month. (The entries for "Receipts" and "Deliveries" below should be the totals of transfers of each grade of source material. List in block 5 on the reverse side each receipt form and delivery to others included in these totals.)

(i) Raw source material (excluding residues and tailings).

Figures are reported in Short Tons (Specify unit of measure).

DESCRIPTION OF RAW SOURCE MATERIAL AND URANIUM AND THORIUM CONTENT (a)	INVENTORY BEGINNING OF MONTH (b)	RECEIPTS FROM OWN PRODUCTION AND PURCHASES (c)	TOTAL (b) and (c) (d)	DELIVERIES TO:		INVENTORY END OF MONTH (g)
				Process (e)	Others (f)	
Monazite	66.4	63.13	129.53	30		99.53

(ii) Residues and tailings.

Figures are reported in Lbs. ThO<sub>2</sub> (Specify unit of measure).

DESCRIPTION OF RAW SOURCE MATERIAL AND URANIUM AND THORIUM CONTENT (a)	INVENTORY BEGINNING OF MONTH (b)	RECEIPTS PROCESS (c)	FROM OTHERS (d)	TOTAL (b) and (c) and (d) (e)	DELIVERIES TO:		INVENTORY END OF MONTH (h)
					Process (f)	Others (g)	
Thorium Sludge	27,244	2,828		30,072	1,858		28,214

(iii) Refined source material.

Figures are reported in Lbs. ThO<sub>2</sub> (Specify unit of measure).

DESCRIPTION OF REFINED SOURCE MATERIAL AND URANIUM AND THORIUM CONTENT (a)	INVENTORY BEGINNING OF MONTH (b)	RECEIPTS PROCESS (c)	FROM OTHERS (d)	TOTAL (b) and (c) and (d) (e)	DELIVERIES TO:		INVENTORY END OF MONTH (h)
					Further Processing (f)	Others (g)	
Refining Process	2,934	1,858		4,792	1,737		3,055
Finished Stock	12,209	1,737		13,946		4,000	9,946

(iv) Source material in process.

Estimated uranium and thorium content in inventory.

At beginning of month 7,748 At end of month 9,143

ITEM #

5/15/56  
(Date)

5. Statement of each receipt and delivery of source material during the month.

Report each receipt or delivery of source material during the month, grouping together all transfers of one grade under the heading "Receipts" or "Deliveries." Do not include here the details of "Deliveries to process" or "Receipts from process." The totals of receipts from and deliveries to others of any one grade (column (f)) must agree with the total for that grade shown in block 3.

A circular stamp from the U.S. Atomic Energy Commission. The outer ring contains the text "U.S. ATOMIC ENERGY COMMISSION" at the top and "DIVISION OF CIVILIAN APPLICATIONS" at the bottom. The center of the stamp features the date "MAY 16 1956" and the word "RECEIVED" in large, bold, capital letters. The stamp is oriented upside down relative to the document's text.

U. S. GOVERNMENT PRINTING OFFICE 16-58372-1

CAL:CTE

CAL:ND

SOURCE MATERIAL LICENSE

License No. R-132

Effective: April 1, 1956

Rare Earths, Inc.  
Box 488  
Pompton Plains, New Jersey

Attention: Mr. Richard L. Stone  
Baltimore 3, Maryland  
Gentlemen:

Attn: Mr. Richard L. Stone  
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 authorized:

To receive possession of and title to unlimited quantities of raw source material (solely monazite sand) during the term of this license, from producers and distributors licensed by the Atomic Energy Commission and through importation, for processing only.

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

In transactions which are exports from the United States, each such transaction shall have prior authorization, regardless of quantity, which may be applied for on form AEC-7, in triplicate.

As a condition of issuance of this license, you are required to report your inventories, processing and receipts and deliveries of raw and refined source material on Form AEC-4, periodically, in accordance with the instructions on the form.

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 is subject to the right of recapture or control reserved by Section 108 of the Atomic Energy Act of 1954, and to all of the other provisions of said Act, now or hereafter in effect and to all valid rules and regulations of the U. S. Atomic Energy Commission.

This license shall expire April 1, 1957.

FOR THE ATOMIC ENERGY COMMISSION  
SIGNED

and

Lyall Johnson

Chief, Licensing Branch

Division of Civilian Application

ITEM #

CAL

CAL

CAL

OFFICE  
SURNAME

SURNAME

Doulos/mad

C.T. Edwards

L. Johnson

3-5-56

316

8/124

MONTHLY REPORT OF PROCESSORS OF URANIUM  
AND THORIUM SOURCE MATERIALSPURSUANT TO CODE OF FEDERAL REGULATIONS,  
TITLE 10—ATOMIC ENERGY, PART 40—  
CONTROL OF SOURCE MATERIALTo: U. S. Atomic Energy Commission,  
P. O. Box 30, Ansonia Station,  
New York 23, N. Y.

## 1. PROCESSOR'S NAME

RARE EARTHS, INC.

## ADDRESS

P.O. Box 488, Pompton Plains, NJ

## AEC LICENSE NO.

R-132

## 2. REPORT FOR MONTH OF

May - 1956

INSTRUCTIONS.—File two (2) copies of this report with the U. S. Atomic Energy Commission, P. O. Box 30, Ansonia Station, New York 23, N. Y., not later than 15 days after the end of each month in which you transferred, delivered, or held possession of or title to any source material. Inventory means all source material in your possession or to which you have title, regardless of location.

3. Summary of receipts, deliveries, and inventories of source material during the month. (The entries for "Receipts" and "Deliveries" below should be the totals of transfers of each grade of source material. List in block 5 on the reverse side each receipt form and delivery to others included in these totals.)

(i) Raw source material (excluding residues and tailings).

Figures are reported in Short Tons (Specify unit of measure).

DESCRIPTION OF RAW SOURCE MATERIAL AND URANIUM AND THORIUM CONTENT (a)	INVENTORY BEGINNING OF MONTH (b)	RECEIPTS FROM OWN PRODUCTION AND PURCHASES (c)	TOTAL (b) and (c) (d)	DELIVERIES TO:		INVENTORY END OF MONTH (g)
				Process (e)	Others (f)	
Monazite	99.53	--	99.53	21.25		78.28

(ii) Residues and tailings.

Figures are reported in Lbs. ThO<sub>2</sub> (Specify unit of measure).

DESCRIPTION OF RAW SOURCE MATERIAL AND URANIUM AND THORIUM CONTENT (a)	INVENTORY BEGINNING OF MONTH (b)	RECEIPTS PROCESS (c)	FROM OTHERS (d)	TOTAL (b) and (c) and (d) (e)	DELIVERIES TO:		INVENTORY END OF MONTH (h)
					Process (f)	Others (g)	
Thorium Sludge	28,214	2,234		30,448	1,341		29,107

(iii) Refined source material.

Figures are reported in Lbs. ThO<sub>2</sub> (Specify unit of measure).

DESCRIPTION OF REFINED SOURCE MATERIAL AND URANIUM AND THORIUM CONTENT (a)	INVENTORY BEGINNING OF MONTH (b)	RECEIPTS PROCESS (c)	FROM OTHERS (d)	TOTAL (b) and (c) and (d) (e)	DELIVERIES TO:		INVENTORY END OF MONTH (h)
					Further Processing (f)	Others (g)	
Refining Process	3,055	1,341		4,396			4,396
Finished Stock	9,946	--		9,946		4,082	5,864

(iv) Source material in process.

Estimated uranium and thorium content in inventory.

At beginning of month 9,143At end of month 5,758ITEM # 126

6/1/56  
(Date)

5. Statement of each receipt and delivery of source material during the month.

Report each receipt or delivery of source material during the month, grouping together all transfers of one grade under the heading "Receipts" or "Deliveries." Do not include here the details of "Deliveries to process" or "Receipts from process." The totals of receipts from and deliveries to others of any one grade (column (f)) must agree with the total for that grade shown in block 3.

[illegible]

(If necessary, attach additional sheets, using the same grouping of columns (a) through (g))

MONTHLY REPORT OF PROCESSORS OF URANIUM  
AND THORIUM SOURCE MATERIALSPURSUANT TO CODE OF FEDERAL REGULATIONS,  
TITLE 10—ATOMIC ENERGY, PART 40—  
CONTROL OF SOURCE MATERIALTo: U. S. Atomic Energy Commission,  
P. O. Box 30, Ansonia Station,  
New York 23, N. Y.

## 1. PROCESSOR'S NAME

Rare Earths, Inc.

## ADDRESS

P.O. Box 488, Pompton Plains, NJ

## AEC LICENSE NO.

R-132

## 2. REPORT FOR MONTH OF

June, 1956

INSTRUCTIONS.—File two (2) copies of this report with the U. S. Atomic Energy Commission, P. O. Box 30, Ansonia Station, New York 23, N. Y., not later than 15 days after the end of each month in which you transferred, delivered, or held possession of or title to any source material. Inventory means all source material in your possession or to which you have title, regardless of location.

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(i) Raw source material (excluding residues and tailings).

Figures are reported in Short Tons (Specify unit of measure).

DESCRIPTION OF RAW SOURCE MATERIAL AND URANIUM AND THORIUM CONTENT (a)	INVENTORY BEGINNING OF MONTH (b)	RECEIPTS FROM OWN PRODUCTION AND PURCHASES (c)	TOTAL (b) and (c) (d)	DELIVERIES TO:		INVENTORY END OF MONTH (g)
				Process (e)	Others (f)	
Monazite	78.28	29.6	107.88	25.		82.88

(ii) Residues and tailings.

Figures are reported in Lbs. ThO<sub>2</sub> (Specify unit of measure).

DESCRIPTION OF RAW SOURCE MATERIAL AND URANIUM AND THORIUM CONTENT (a)	INVENTORY BEGINNING OF MONTH (b)	RECEIPTS PROCESS (c)	FROM OTHERS (d)	TOTAL (b) and (c) and (d) (e)	DELIVERIES TO:		INVENTORY END OF MONTH (h)
					Process (f)	Others (g)	
Thorium Sludge	29,107	2,091		31,198	1,535		29,663

(iii) Refined source material.

Figures are reported in Lbs. ThO<sub>2</sub> (Specify unit of measure).

DESCRIPTION OF REFINED SOURCE MATERIAL AND URANIUM AND THORIUM CONTENT (a)	INVENTORY BEGINNING OF MONTH (b)	RECEIPTS PROCESS (c)	FROM OTHERS (d)	TOTAL (b) and (c) and (d) (e)	DELIVERIES TO:		INVENTORY END OF MONTH (h)
					Further Processing (f)	Others (g)	
Refining Process	4,396	1,535		5,931	2,077		3,854
Finished Stock	5,864	2,077				23	7,918

(iv) Source material in process.

Estimated uranium and thorium content in inventory.

At beginning of month 5,758At end of month 6,301ITEM # 137

By Richard M. Brandle  
(Signature of authorized official) / RMB

Vice President  
(Title)

7/23/56  
(Date)

5. Statement of each receipt and delivery of source material during the month.

Report each receipt or delivery of source material during the month, grouping together all transfers of one grade under the heading "Receipts" or "Deliveries." Do not include here the details of "Deliveries to process" or "Receipts from process." The totals of receipts from and deliveries to others of any one grade (column (f)) must agree with the total for that grade shown in block 3.

[illegible]

(If necessary, attach additional sheets, using the same grouping of columns (a) through (g)).



MONTHLY REPORT OF PROCESSORS OF URANIUM  
AND THORIUM SOURCE MATERIALSPURSUANT TO CODE OF FEDERAL REGULATIONS,  
TITLE 10—ATOMIC ENERGY, PART 40—  
CONTROL OF SOURCE MATERIALTo: U. S. Atomic Energy Commission,  
P. O. Box 30, Ansonia Station,  
New York 23, N. Y.

## 1. PROCESSOR'S NAME

Rare Earths, Inc.

## ADDRESS

P.O.Box 488, Pompton Plains, N.J.

## AEC LICENSE NO.

R - 132

## 2. REPORT FOR MONTH OF

July, 1956

INSTRUCTIONS.—File two (2) copies of this report with the U. S. Atomic Energy Commission, P. O. Box 30, Ansonia Station, New York 23, N. Y., not later than 15 days after the end of each month in which you transferred, delivered, or held possession of or title to any source material. Inventory means all source material in your possession or to which you have title, regardless of location.

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(i) Raw source material (excluding residues and tailings).

Figures are reported in Short Tons (Specify unit of measure).

DESCRIPTION OF RAW SOURCE MATERIAL AND URANIUM AND THORIUM CONTENT (a)	INVENTORY BEGINNING OF MONTH (b)	RECEIPTS FROM OWN PRODUCTION AND PURCHASES (c)	TOTAL (b) and (c) (d)	DELIVERIES TO:		INVENTORY END OF MONTH (g)
				Process (e)	Others (f)	
Monazite	82.88		82.88	10.5		72.38

(ii) Residues and tailings.

Figures are reported in Lbs. ThO<sub>2</sub> (Specify unit of measure).

DESCRIPTION OF RAW SOURCE MATERIAL AND URANIUM AND THORIUM CONTENT (a)	INVENTORY BEGINNING OF MONTH (b)	RECEIPTS PROCESS (c)	FROM OTHERS (d)	TOTAL (b) and (c) and (d) (e)	DELIVERIES TO:		INVENTORY END OF MONTH (h)
					Process (f)	Others (g)	
Thorium Sludge	29,663	1,032		30,695	947		29,748

(iii) Refined source material.

Figures are reported in Lbs. ThO<sub>2</sub> (Specify unit of measure).

DESCRIPTION OF REFINED SOURCE MATERIAL AND URANIUM AND THORIUM CONTENT (a)	INVENTORY BEGINNING OF MONTH (b)	RECEIPTS PROCESS (c)	FROM OTHERS (d)	TOTAL (b) and (c) and (d) (e)	DELIVERIES TO:		INVENTORY END OF MONTH (h)
					Further Processing (f)	Others (g)	
Refining Process	3,854	947		4,801			4,801
Finished Stock	7,918					3	7,915

(iv) Source material in process.

Estimated uranium and thorium content in inventory.

At beginning of month 6,301At end of month 4,737

ITEM #

128

8/14/56  
(Date)

5. Statement of each receipt and delivery of source material during the month.

[illegible]

U. S. GOVERNMENT PRINTING OFFICE 16-58872-1

7/1/5

# DAVISON CHEMICAL COMPANY

DIVISION OF W. R. GRACE & CO.  
BALTIMORE 3 • MARYLAND

June 29, 1956

Mr. Lyall C. Johnson  
Chief Licensing Bureau  
Civilian Applications  
U. S. Atomic Energy Commission  
1901 Constitution Avenue  
Washington, D. C.

Gentlemen:

*about 3% Th  
per BS  
7/9/56  
HJ*

We have been advised that the Atomic Energy Commission has on hand at the Fernald, Ohio site large quantities of thorium bomb reduction residues. We also understand that these residues are to be disposed of, or moved.

Our company is interested in obtaining these residues from the Commission for processing. In order to evaluate, we request a 100 pound sample to be shipped to us at our plant,

Rare Earths, Inc.  
c/o Davison Chemical Co.  
Curtis Bay, Baltimore, Md.

Attention: Mr. R. M. Mandle.

Any questions concerning this should be directed to Mr. David P. Barrett, Davison Chemical Company, Baltimore 3, Maryland.

Very truly yours

*Richard M. Mandle*

Richard M. Mandle

RMM/bb

COPY: Mr. Nelson C. Sievering  
Feed Materials Branch  
Division of Production  
U. S. Atomic Energy Commission

ITEM # 129

2/128  
655

CAL:CTE

February 27, 1956

Post Paid

Section 15 (a) of the United States Criminal Code, 18 U. S. C. Sec. 15 (a), prohibits a criminal using any means, including the mails, to obtain information from any department or agency of the United States as to any matter within its jurisdiction.

JUL 25 1956

Davison Chemical Company  
Division of W. R. Grace & Co.  
Baltimore 3, Maryland

Attn: Mr. Richard M. Mandle

Gentlemen:

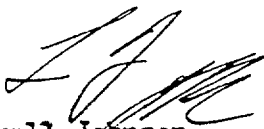
This refers to your letter dated June 29, 1956 in which you expressed an interest in receiving 100 pounds of thorium bomb reduction residues.

We are enclosing for your information AEC source material regulations (10 CFR 40) and copies of Form AEC-2 which should be executed in triplicate, under oath or affirmation, and submitted to this office as your application for license to receive source material.

You may wish to include by reference the information contained in your letter of June 29.

Your request for license will be considered promptly upon receipt of a properly executed application.

Very truly yours,

  
Lyall Johnson  
Chief, Licensing Branch  
Division of Civilian Application

Enclosures:

1. 10 CFR 40
2. Form AEC-2 (4)

Bcc B. Schwartz, Prod

ITEM #

130

Source

8/129

16 OFFICE

CAL

CAL

SURNAME

Edwards:mbb

Johnson

DATE

7/14/56

7/14/56

DAVISON CHEMICAL COMPANY  
DIVISION OF W. R. GRACE & CO.  
BALTIMORE 3, MARYLAND

August 2, 1956

Mr. Lyall Johnson  
Chief Licensing Branch  
U. S. Atomic Energy Commission  
1901 Constitution Ave.  
Washington 25, D. C.

Attention: Mr. Charles Edwards

Dear Mr. Edwards:

We refer to our recent telephone conversation and your letter of July 25 concerning a license which would permit Rare Earths to obtain samples of various commission-owned thorium residues.

We now request that our License #R-132 be amended to permit Rare Earths to receive title to thorium in the form of metal scrap, sludges and residues, in addition to the monazite ore purchases now authorized. We believe this change will facilitate the present and future requests covered in our letter of June 29.

We appreciate your assistance in this matter.

Very truly yours,

*Richard M. Mandle*  
Richard M. Mandle  
Vice-President, Rare Earths, Inc.

RMM:hks

State of Maryland, City of Baltimore  
Subscribed and sworn to before me this  
2nd day of August, 1956.

*Helen K. Shepherd*  
Notary Public

August 2, 1956

ITEM # 131

CAL:RFB

SOURCE MATERIAL LICENSE  
License No. R-132  
Revision No. 1  
Dated: August 15, 1956

Rare Earths, Inc.  
c/o Davison Chemical Company  
Division of W. R. Grace & Co.  
Baltimore 3, Maryland

Attention: Mr. Richard M. Mandle  
Vice President

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:

- a. Unlimited quantities of raw source material (solely monazite sand) during the term of this license, from producers and distributors licensed by the Atomic Energy Commission and through importation, for processing at your Pompton Plains, New Jersey Plant and your Curtis Bay, Maryland Plant, and
- b. One-hundred pounds of thorium bomb reduction residues for experimental processing at your Curtis Bay, Maryland Plant.

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 issuance of this license, you are required to maintain records of your inventories, receipts and transfers of raw and refined source material.

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 April 1, 1957.

Enclosure:  
Part 20

FOR THE ATOMIC ENERGY COMMISSION

OFFICE ▶	CAL	CAL	CAL	SIGNED	ITEM # 132
SURNAME ▶	Borlik	CEdwards	LJohnson	Dispatched	
DATE ▶	8/15/56	8/17/56	Chief, Licensing Branch		

Division of Civilian Application

FB

AUG 20 1956

Rare Earths, Inc.  
c/o Davison Chemical Company  
Division of W. R. Grace & Co.  
Baltimore 3, Maryland

Attention: Mr. Richard M. Mandle  
Vice-President

Gentlemen:

AEC Source Material License No. R-132, Revision No. 1 is enclosed.

Please note that the provision of your license which required the submission of reports to the AEC of inventories, processing and receipts and deliveries of raw and refined source material has been deleted. In lieu thereof your revised license requires that Rare Earths, Inc. maintain records of its inventories, receipts and transfers of raw and refined source material.

This letter constitutes your authorization to procure from the Commission, prior to the April 1, 1957 expiration date of your license, one hundred pounds of thorium bomb reduction Residues. For details regarding procurement of this material, you should communicate with Oak Ridge Operations Office, U. S. Atomic Energy Commission, P. O. Box E, Oak Ridge, Tennessee, Attn: Dr. E. M. Roth.

CC:Roth, OROO, w/lic.  
NF Sievering, PROD, w/lic.  
MM Mann, INS, Lic. R-132, 4-1-56 appl. 2-27-56 ltr. from Mandle, 6-29-56  
AEC ltr. 7-25-56, ltr. from Mandle, 8-2-56, Lic. R-132-Rev. #1,  
AEC ltr. of authorization, 8-15-56

DF Musser, NMM, w/lic.  
JC Ryan, FIN(2) w/lic.  
H Steele, CA, w/lic.

Very truly yours,  
Lyall Johnson  
Chief, Licensing Branch  
Division of Civilian Application

SIGNED

and

Dispatched

Enclosure:  
License No. R-132, Rev. No. 1

Document Room Copy Dispatched  
by Document Transmittal No. 2-20

CAL	CAL	CAL		
Borlik/mjm	CEdwards	LJohnson	ITEM #	132
8/15/56	8/17/56	8/17/56		

# DAVISON CHEMICAL COMPANY

DIVISION OF W. R. GRACE & CO.  
BALTIMORE 3, MARYLAND

October 15, 1956

Mr. Eber Price, Director  
Civilian Applications Division  
U.S. Atomic Energy Commission  
Washington, D. C.

Dear Mr. Price:

As we discussed by phone the Davison Chemical Company, Division of W. R. Grace & Co., is carrying out certain economic studies in connection with the design and construction of a solvent extraction plant to produce nuclear grade thorium oxide from crude thorium concentrates. In considering a potential plant location, one of the major factors consists of establishing with the various states involved exceptable specifications on the discharge of plant effluents into public streams. Since there has been little or not previous experience on the level of thorium that is permissible in streams, we would like to have the opinion of the Atomic Energy Commission on this matter. I understand from my discussion with you that we might expect an opinion prior to the time that we would actually file a request for a facilities license. Would you please advise me as to the steps that we would need to take in order to get established a specific specification on the concentration of thorium that is permissible for discharge into a stream. If this concentration could be expressed in terms of parts per million after dilution with the water in a river, it would then permit us to complete our evaluation of a number of plant sites with wide variances between maximum and minimum river flow.

I would be happy to come to Washington some time at your convenience and discuss our plans with you in more detail. Thank you for any assistance you may be able to give us in this matter.

Yours truly,

*T. C. Runion*

T. C. Runion  
Reactor Materials

TCR:bld

cc: Mr. A.H. Paesler  
Water Control Commission  
State of Virginia  
415 West Franklin Street  
Richmond, Virginia

ITEM #

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