

3516

PA.20-1

PA.20

MEMORANDUM

TO: FILE

DATE 6/11/87

FROM: D. Levine

SUBJECT: Elimination Recommendation

SITE NAME: Pennsylvania Salt Manufacturing Co. ALTERNATE NAME: Penn Salt
CITY: Philadelphia (Windmoor) STATE: PA PA.20

OWNER(S)

Past: Current:
Owner contacted [] yes [x] no; if yes, date contacted

TYPE OF OPERATION

- [x] Research & Development [x] Facility Type
[] Production scale testing [x] Manufacturing
[] Pilot Scale [] University
[x] Bench Scale Process [] Research Organization
[] Theoretical Studies [] Government Sponsored Facility
[] Sample & Analysis [] Other
[x] Production ?
[] Disposal/Storage

TYPE OF CONTRACT

- [] Prime [] Other information (i.e., cost + fixed fee, unit price, time & material, etc)
[] Subcontractor
[] Purchase Order

all correspondence is directly between Penn Salt and AEC/MED

Contract/Purchase Order #

CONTRACTING PERIOD:

OWNERSHIP:

Table with 7 columns: AEC/MED OWNED, AEC/MED LEASED, GOVT OWNED, GOVT LEASED, CONTRACTOR OWNED, CONTRACTOR LEASED. Rows include LANDS, BUILDINGS, EQUIPMENT, ORE OR RAW MATL, FINAL PRODUCT, WASTE & RESIDUE.

AEC/MED INVOLVEMENT AT SITE

Control

- AEC/MED managed operations
- AEC/MED responsible for accountability
- AEC/MED overviewed operations
- Contractor had total control
- unknown

- Health Physics Protection
 - Little or None
 - AEC/MED responsibility
 - Contractor responsibility

AEC evaluated materials for potential radiation hazard, and found none (letter, Blatz to Termini, 6/8/53).

MATERIALS HANDLED:

Type (on basis of records reviewed)

- No Radioactive
 - Natural Radioactive from Feed Materials Production
 - Ore
 - Refined Source Material
 - Residue
 - Natural Radioactive Material from Non-Nuclear Activities
 - Man-Made
 - Other _____
- Comment _____

Quantities (on the basis of records reviewed)

- None
 - Small Amounts
 - Production Quantities
- Comment handled samples; licensed to handle 2000 lbs. for use in processing studies; no records found to date which indicate actual production

OTHER PERTINENT FACTS:

Facility was Licensed

- During AEC/MED-Related Operations
 - For Similar Activities
 - For Other Activities

Comment license number C-3448 dated 1/20/56, to handle 2000 lbs. of fluoride scrap containing one to five percent uranium

Commercial Production Involving Radioactive Material during AEC/MED Operations

Facility was Decontaminated and Released

Availability of Close Out Records

- None
- Some
- Sufficient

Radioactive Status:

	YES	MAYBE	PROBABLY	NOT
Contaminated Potential for Exposure (accessible)	---	---	NOT X	---
	---	---	X	---

QUANTITY OF RECORDS AVAILABLE:

- Very Little Some Sufficient

PROBABILITY OF FINDING ADDITIONAL RECORDS:

- Low Possible High

RECOMMENDATIONS:

- Eliminate
 Consider for Remedial Action
 Collect More Data

Comment _____

REFERENCES: (see attached list and references)

SUMMARY

Penn Salt experimented with samples of fluoride-containing by-products from AEC operations to determine if they were viable materials for HF production. Penn Salt was licensed to handle 2000 pounds of fluoride scrap for use in processing studies. Based on the facts that the objective of the work at Penn Salt was to produce HF, and that they were licensed to handle the scrap containing Uranium, it is recommended that this site be eliminated.

Penn Salt

6/5/87

DATE	FILE#	FROM	TO	SUBJECT	SITES	BOX #
✓ 01/12/53	3.1NYDD	BROWN, S.	BELMORE, F.	NYDD'S MAGNESIUM FLUORIDE PROGRAM; <i>Disposition of fluoride-containing material</i>	NYDD, NBL, HARSHAW CHEMICAL, BLOCKSON CHEMICAL, PENNSALT	5/92
✓ 02/24/53	PA.20	BELMORE, F.	GALL, J.	FLUORIDE-CONTAINING BY-PRODUCTS FROM AEC OPERATIONS	PENNSALT, CANONSBURG, VITRO	5/92
✓ 02/26/53	PA.20	GALL, J.	BELMORE, F.	HF PRODUCTION FROM SAMPLE MATERIAL	PENNSALT	5/92
✓ 03/13/53	PA.20	GALL, J.	BELMORE, F.	RECEIPT OF SAMPLES OF CALCIUM FLUORIDE AND MAGNESIUM FLUORIDE CAKE	PENNSALT, CANONSBURG, VITRO	5/92
✓ 04/10/53	PA.20	KIRK, R.	GALL, J.	AEC FLUORIDE-CONTAINING BY-PRODUCTS	PENNSALT, NBL, CANONSBURG, VITRO, FERNALD	5/92
✓ 04/13/53	PA.20	GALL, J.	KIRK, R.	ANSWERS TO QUESTIONS PERTAINING TO AEC-OWNED <u>FLUORIDE-CONTAINING BY-PRODUCTS</u>	PENNSALT	5/92
✓ 05/11/53	PA.20	KIRK, R.	GALL, J.	<u>FLUORIDE-CONTAINING BY-PRODUCTS</u> FROM AEC OPERATIONS	PENNSALT	5/92
✓ 06/08/53	PA.20	BLATZ, H.	TERMINI, J.	<u>SAMPLE RECEIVED FROM THE PENNSALVANIA SALT MANUFACTURING CO. OF WYNDMOOR, PA</u>	PENNSALT, CANONSBURG, VITRO, NBL	5/92
<i>not found</i> 05/19/53	PA.5	TERMINI, J.	BROWN, S.	FACTORS AFFECTING DISPOSAL OF <u>SCRAP PLANT CAF₂-MGF₂ RESIDUE</u>	VITRO, CANONSBURG, BLOCKSON, HARSHAW, PENNSALT, MULTIPLE	41/41
<i>not found</i> 05/25/53	PA.5	BROWN, S.	SPARKS, B.	<u>CAF₂-MGF₂ RESIDUE</u> STORED AT THE CANONSBURG SITE	VITRO, CANONSBURG, PENNSALT, HARSHAW,	41/1
✓ 04/07/43	PA.20	RUSSELL, G.	FILE	CONFERENCE AT PENN SALT COMPANY ON <u>HF RECOVERY</u> APRIL 5, 1943	PENN SALT	145/2
✓ 01/21/56	PA.20	JOHNSON, L.	PENFIELD, W.L.	<u>SOURCE MATERIAL LICENSE C-3448 FOR PENNSYLVANIA SALT</u>	PENNSALT	593-3-5
✓ 11/26/48	OH.4	KENT, E.	TALUSIG, W.	AQUEDUS <u>POTASSIUM CARBONATE</u> REQUIREMENTS	HASYAW, duPONT, INNIS SPERDEN, NIAGARA ALKALI, ALLIDE CHEMICAL AND DYE, GE, PENNSALT	FOIA
✓ 09/09/49	3.1SLAD	MORGAN, J.	KOENIG, J.	DISTILLATION DATA FOR <u>AHF</u>	KINETIC CHEMICAL CORP (SUBSIDIARY OF duPONT), PENN SALT, HARSHAW	105/17
<i>not found</i> 03/24/52	3.1NSA	GEIGER, L.	KELLEY, W.	DISPOSAL OF SCRAP <u>ZIRCONIUM</u>	PENN SALT, DETREX, ALLEGHENY-LUDLUM	67/108

✓07/06/44 NY.5 RUSSELL, G.

NICHOLS, COL.

S₂F₁₀

PRODUCTION OF S₂F₁₀ (REQUEST OF PENNSALT TO DEVELOP AND MANUFACTURE S₂F₁₀ FOR USE AS A CHEMICAL WARFARE AGENT, MIT ARRANGEMENT WITH HOOKER FOR 1000 LBS OF SF₆)

PENNSALT, HOOKER, MIT

39/14

not found
1 / 3.4

REPORT

CONTRACTS LIST

MULTIPLE, HOOKER, PENNSALT, 1603
STAUFFER, ALLIED,
VIRGINIA-CAROLINA, REED COLLEGE,
STATE COLLEGE OF WASHINGTON,
UNIVERSITY OF OREGON, UNIVERSITY OF
WASHINGTON, WYOMING, IDAHO, OREGON

not found
03/16/65 3.4

NEWS RELEASE

NEWS RELEASE -PROCUREMENT CONTRACT AWARDS BY AEC AND PRIME COST
TYPE CONTRACTORS FOR DECEMBER 1964

MULTIPLE, UNIVERSITY OF DENVER, ACF UNKN
INDUSTRIES, AEROJET-GENERAL CORP,
SUPERIOR TUBE, PHILLIPS PETROLEUM,
UNITED AIRCRAFT CORP, PRATT &
WHITNEY, PENNSALT, NUCLEAR FUEL
SERVICES, DOW CHEMICAL, STAUFFER

UNITED STATES ARMY IN WORLD WAR II

Special Studies

MANHATTAN:
THE ARMY AND THE ATOMIC BOMB

by
Vincent C. Jones



PROJECT

*CENTER OF MILITARY HISTORY
UNITED STATES ARMY
WASHINGTON, D.C., 1985*

tion plants. Because of the huge requirements of just the gaseous diffusion plant, as well as the problems of shipment, the designers decided to build a fluorine gas production plant right at the diffusion plant site. The District's materials group also played a significant role in letting contracts and overseeing the activities of a number of private research institutions (Johns Hopkins, MIT, Purdue) and chemical firms (American Cyanamid, Du Pont, General Chemical, Harshaw Chemical, Hooker Electrochemical, Kinetic Chemicals, Penn Salt) in the development and supply of the numerous fluorinated hydrocarbon chemical compounds—in the form of coolants, sealants, and lubricants—needed to operate the plants safely and efficiently with the highly corrosive feed material.¹⁶

Feed Materials Production

The initial phase of the feed materials production network was conversion of the uranium-bearing crude ore into pure concentrates of black oxide and soda salt by various industrial firms under contract to the District. In each case the refining treatment was quite similar and involved subjecting the crude ore to the successive processes of pulverization into a sandlike material, acid immersion, precipitation to eliminate impurities, and roasting (drying).

Eldorado Mining at its Port Hope refinery processed all Canadian ore

¹⁶MDH, Bk. 7, Vol. 1, App. K, DASA; List, sub: Contracts To Be Taken Over by MD, Incl to Ltr. H. T. Wensel (Tech Aide, OSRD) to Marshall, 20 Mar 43, Admin Files, Gen Corresp, 161, MDR; List, sub: MD Contracts With Various Univs, Incl to Memo, Marsden to Groves, 2 Nov 43, MDR.

and some Congo ore into black oxide, whereas the Vitro Manufacturing Company at its Cannonsburg (Pennsylvania) refinery processed only Congo ore into soda salt. Designed only for treating the higher-grade Congo and Canadian ores, neither the Eldorado nor Vitro plants could properly process the carnotite concentrates from the Colorado Plateau region. Aware that the Linde Air Products Company had produced for the OSRD a satisfactory grade of black oxide from carnotite concentrates, the District's Materials Section at the end of 1942 made arrangements with Linde to refine new stocks of concentrates at its plant in Tona-wanda, New York, as well as to produce other feed materials for the project. With assistance of the Tona-wanda area engineer, Linde expanded its black oxide production facilities, but, by late 1943, was phasing out domestic ores and using its facilities to refine higher-yielding African ores.¹⁷

Figures compiled by the Madison Square Area Engineers Office, beginning in September 1943, show that the amount of uranium from all sources available for refinement in the United States and Canada, and the quantity of black oxide and soda salt extracted from this ore, grew dramatically from 1943 to 1945. Thus, at the end of September 1943, the Manhattan District had available 2,920 tons of uranium ore and produced 1,660 tons of black oxide and soda salt. A year later, the quantities rose

¹⁷MDH, Bk. 7, Vol. 1, pp. 1.20, 7.1-7.8, Apps. C-1A and F7, DASA. Details of early development of black oxide production by Linde in 1942-43 may be followed in Rpts, Mat Sec (later Mad Sq Area Engrs Office), Oct 42-Aug 43, 30 Oct, 30 Nov, and 31 Dec 43, 29 Jan 44, OROO.

to 5,640 tons of black oxide produced. And in 1945, the District produced 6,600 tons of black oxide.

The final product is produced in a version of the process through a number of treatments, including chemical feeds to the electrolytic plant. The black oxide (uranium oxide) is an important component of the development of the uranium salt (uranium third, and uranium salt into a compound of uranium and liquid electromagnetism stage of uranium metal for the process.

Because of the considerable quantities of feed materials for each treatment, the Manhattan District had available 2,920 tons of uranium ore and produced 1,660 tons of black oxide and soda salt. A year later, the quantities rose

¹⁸Rpts, M 31 Oct 44, 29

¹⁹Ibid., Sec pp. 8.1-10.10

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

AEC LICENSE FILE
OK
DRAWER 573-3-5

IN REPLY, REFER TO:
CALAD

SOURCE MATERIAL LICENSE

License No. C-3448

Dated: January 30, 1956

Pennsylvania Salt Manufacturing Co.
Three Penn Center Plaza
Philadelphia 3, Pennsylvania

Attention: Mr. Walker Penfield

Gentlemen:

Pursuant to the Atomic Energy Act of 1954 and Section 10.21 of the Code of Federal Regulations, Title 10 - Atomic Energy, Chapter 1, Part 10 - Control of Source Material, you are hereby licensed to receive possession of and/or title to 2,000 pounds of fluoride scrap, containing about one to five per cent uranium, for use in processing studies.

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 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.

This license shall expire on February 1, 1957.

FOR THE ATOMIC ENERGY COMMISSION

Lyall Johnson
Chief, Licensing Branch
Division of Civilian Application

- CC: GROC, Attn: H. N. Roth
- (THEU) Div. of PROD, Wash
- W. F. Sievering, PROD
- W. E. Campbell, FIN
- R. L. Southwick, IS
- C. A. Nelson, INS
- C. G. Manly, CA

CAL CAL CAL

Delaney/mad C.F. Edwards L. Johnson

1-20-56

MATERIALS
C-3448

JAN 30 1956

F-6944

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

ACC LICENSE FILE
~~OR DRAWER~~
DRAWER 593-3-5

IN REPLY REFER TO:

JAN 21 1956

Pennsylvania Salt Manufacturing Co.
Three Penn Center Plaza
Philadelphia 2, Pennsylvania

Attention: Mr. Walker Penfield

Gentlemen:

Reference is made to your letter of December 23, 1955, which transmits your application for a license for one ton of magnesium fluoride scrap containing up to about five per cent uranium and to Form AEC-3, dated January 13, 1956, which you submitted regarding a three hundred pound sample of the fluoride scrap. Reference is also made to your telephone conversation of January 19, 1956, with Mr. Dalancy of this office during which you indicated that a license for a total of one ton of scrap was required and that the three hundred pound sample was expected to be a part of the total one ton licensed quantity.

Enclosed is AEC Source Material License No. C-3448 authorizing your receipt of 3,000 pounds of fluoride scrap containing about one to five per cent uranium for use in processing studies.

By this letter you are authorized to procure the licensed material from the Commission. You should communicate with Dr. H. H. Roth, Director, Research and Development Division, Oak Ridge Operations Office, U. S. Atomic Energy Commission, P. O. Box B, Oak Ridge, Tennessee, regarding procurement.

Very truly yours,

- CC: GRCO, Attn: H. H. Roth, w/encl #1
- (THRU) Div. of PROD, Wash., w/encl #1
- H. F. Sievering, PROD
- W. E. Campbell, FIN, w/encl #1
- R. L. Southwick, IS, w/encl #1
- G. A. Nelson, INS, w/encl #1
- C. G. Manly, CA, w/encl #1

- Enclosures:
- 1. License No. C-3448
- 2. Press release of 1-17-56

CAL CAL CAL

Dalancy/and C.T. Edwards L. Johnson

1-20-56

MATERIALS 4
C-3448

1644
JAN 30 1956

Office Memorandum • UNITED STATES GOVERNMENT

TO : J. P. Termini, Process Development Branch
Production Division, NYOO

DATE: June 8, 1953

FROM : Hanson Blatz, ^{HB} Chief, Radiation Branch
Health and Safety Division

SUBJECT: SAMPLE RECEIVED FROM THE PENNSYLVANIA SALT MANUFACTURING CO. OF
WYNDMOOR, PENNSYLVANIA.

SYMBOL: HSR:EVB:md

The Health and Safety Division has completed their study of the four samples which were received from the Pennsylvania Salt Manufacturing Co. of Wyndmoor, Pennsylvania. Their analysis is as follows:

1. Calcium fluoride - magnesium fluoride wet cake. This is the Vitro by-product wet cake. The uranium content is 0.04%. The UX_1 and UX_2 content is much more than the amount attributable to radioactive decay of uranium. On May 12, the excess was approximately 45 times the amount of UX_1 and UX_2 to be expected on the basis of the uranium content above.

The beta surface dose on that date was 1.4 mreps per hour as measured with a GM type survey instrument with the shield open. The minimum value that the beta surface dose rate will be is 0.03 - 0.04 mreps/hr above background. This dose rate will be due to the UX_1 and UX_2 in equilibrium with the uranium.

2. Magnesium fluoride cake from AEC New Brunswick Laboratories. The uranium content is 0.1%. The UX_1 and UX_2 is 3 times more than is accounted for by equilibrium with natural uranium. On June 3, the beta surface dose rate was 0.12 - 0.14 mreps/hr.
3. Fluorspar from Pennsalt at Mexico, Kentucky. The uranium content is less than 2 parts per million.
4. Fluorspar from Ozark - Mahoning, Rosiclare, Illinois. The uranium content is less than 2 parts per million.

Recommendations.

There is no potential radiation hazard in handling the magnesium fluoride and calcium fluoride - magnesium fluoride cake when the uranium content is 0.3% or less and provided the beta activity is less than 0.2 mreps per hour above background as measured with a GM type survey instrument with the shield open. The New Brunswick cake contains 0.1% uranium and reads less than 0.2 mreps per hour.

OFFICIAL USE ONLY

J. P. Termini

- 2 -

June 8, 1953

It can, therefore, be released. The Vitro cake; on the other hand, contains 0.04% uranium but reads about 0.7 mreps per hour (on June 3). The excess UX_1 and UX_2 is responsible for this reading. On or about July 23, the surface dose rate will be 0.2 mreps/hr or less. At that time, it can be released without reservations.

Since the fluorspar samples show trace amounts of uranium they may be handled in any way whatsoever since there is no radiation hazard. There is, however, a chemical toxicity which is due to the calcium and magnesium fluoride. The maximum permissible concentration in air for these materials is 1 - 3 mg of magnesium fluoride or calcium fluoride/cubic meter of air. Thus, the chemical toxicity, rather than the radioactivity, constitutes the limiting factor in the handling of these substances.

CC: Arthur Newmann - Cleveland Area Office

OFFICIAL USE ONLY

37ME

ORDELS
5/92

OFFICIAL USE ONLY

PA 210 File 221.1

Office Memorandum • UNITED STATES GOVERNMENT

TO : J. P. Termini, Process Development Branch
Production Division, NYOO

DATE: June 8, 1953

FROM : Hanson Blatz, ^{HB} Chief, Radiation Branch
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SYMBOL: HSR:EVB:md

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OFFICIAL USE ONLY

OFFICIAL USE ONLY

92 J. P. Termini

- 2 -

June 8, 1953

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CC: Arthur Newmann - Cleveland Area Office

OFFICIAL USE ONLY

NOTE

Box 5
#92

221.4

PA. 20

MAY 11 1953

PP:JPT:js

Pennsylvania Salt Manufacturing Company
Whitemarsh Research Laboratories
Chestnut Hill, Pennsylvania

Attention: Dr. J. F. Gall, Director of Inorganic Research

Subject: FLUORIDE-CONTAINING BY-PRODUCTS FROM AEC OPERATIONS

Gentlemen:

We would like to briefly summarize the items you have discussed with Mr. J. P. Termini of our office during recent telephone conversations.

CaF₂-MgF₂ and MgF₂

1. In your letter of April 22nd, you indicated that Pennsalt would be interested in handling dry material of a higher uranium content for HF and possibly uranium recovery. You were informed that the dry material currently being produced is not a mixture of calcium and magnesium fluorides but contains approximately equal weights of magnesium fluoride and calcium and magnesium oxides. The oxides make this material unsuitable for HF production. The change to the MgF₂ material would probably not be made for at least one to two years.

We must consider further Pennsalt's proposal to extract residual uranium from the resulting kiln residues before making a decision.

2. A small amount of calcium oxide may be added to the kiln residue resulting from processing the currently available CaF₂ - MgF₂ wet cake, but magnesium or sodium oxide would be preferred for kiln residues resulting from the potential MgF₂ cake.
3. In evaluating the CaF₂ - MgF₂ wet cake as a raw material for HF production, it is suggested that you also consider the case where the resulting kiln residues would not have

to be returned. We are determining whether the return of this residue will be necessary.

4. We have received the samples that you have sent for examination by our Health and Safety Division. We will inform you of the results.

Aqueous HF

In your letter of April 13, you requested our assurance that Pennsalt would not be required to take back more than a total of 300 tons per month of AHF equivalent. Because of security restrictions and because of the difficulty in predicting future production, we can not give you the assurance that you are seeking. In addition, each operating contractor at our production sites independently negotiate for both the supply and the return of hydrofluoric acid and therefore, it would not be possible to say that any one supplier, such as Pennsalt, would be called upon to handle all of the aqueous HF by-product from our operations. If our aqueous HF production warrants it, we would again discuss this matter with you.

Very truly yours,

R. L. Kirk, Director
Production Division

CC: S. H. Brown ✓
B. Sparks, Att: A. Neumann, Cleveland Area
Production R.F.
Mail & Records

Bx 5, #92

PA. 20

PENNSYLVANIA SALT MANUFACTURING COMPANY

C O P Y

April 13, 1963

Manager of Operations
U. S. Atomic Energy Commission
P. O. Box 30, Ansonia Station
New York 23, New York

Attention: R. L. Kirk, Director, Production Division

Dear Mr. Kirk:

Thank you for your letter of April 10 giving detailed replies to the questions in my letter of April 2 concerning CaF_2 - MgF_2 and MgF_2 materials and aqueous 70% HF. We comment as follows: (numbers correspond to your paragraphs).

1. Analysis - Samples have been forwarded to our Analytical Section for analysis.
2. Health Hazard - Samples of material on hand, and commercial fluorspar, will be forwarded to you as soon as the latter is received from your plant.
3. no comment.
4. No comment.
5. No comment.
6. No comment.
7. No comment.
8. Experimental Carload Quantities - We feel that the alternative procedure suggested in this paragraph would be the more acceptable to us; namely that the uranium-containing sulfates, after extraction of HF by us, would be returned to you. This eliminates the by-product material, and should facilitate recovery of uranium values by your facility.
9. Aqueous 70% HF - The figures given in your letter, for the amount of aqueous 70% HF we can handle, are not to be regarded as a commitment by Pennsalt. They were used by me for order of magnitude discussion. We would still like to have assurance from AEC that Pennsalt would not be likely to be called upon to take back more than a total of 300 tons per month AHF equivalent of queous 70% HF.

Very truly yours,

U-1183

J. F. Gall, Director
Inorganic Research Department
R. & D. Divison

JFG:AM:-js

PA. 20

APRIL 10 1953

PP: JPT:smo

Pennsylvania Salt Manufacturing Co.
Whitemarsh Research Laboratory
Chestnut Hill, Pennsylvania

Attention: Dr. John F. Gall, Director of Inorganic Research
and Development

Gentlemen:

We were pleased to talk with you on April 2 regarding your interest in evaluating for purchase AEC fluoride-containing by-products, specifically the CaF_2 - MgF_2 and MgF_2 wet cake materials and aqueous 70% HF.

During our discussion with you, several items were noted for further study. We would like to summarize the action that is being taken and the information already received.

CaF_2 - MgF_2 and MgF_2

1. Analysis

In addition to the fluoride salts, these materials are believed to contain 1 to 2% silicates, 0.1-0.5% chlorides, and less than 0.05% uranium. You said that your laboratory would analyze the samples that we have sent to you which we indicated are typical.

2. Health Hazard

Handling of this material, under normal and adequate ventilation, would not constitute a radioactive hazard. Our Health and Safety Division will undertake a comparative examination of samples of the materials sent to you and commercial fluorspar. The results of this examination will be made available to you.

3. Drying of Material

A rotary drier is presently being used at Vitro Manufacturing Plant in Canonsburg, Pa. It is estimated that this equipment could dry approximately 15-20 tons per day of $\text{CaF}_2\text{-MgF}_2$ wet cake; we are determining whether the dryer can be spared to further process these materials.

4. Shipment

Our Traffic Department has informed us that the shipment of these materials on a Government bill of lading would be desirable if the Government can successfully negotiate with the railroads for a lower classification and lower freight rates. The possibility of such an arrangement is good considering the shipping quantities now anticipated.

The freight rates for shipping these materials under a "fluorspar" classification are as follows:

<u>From</u>	<u>To</u>	<u>Rate</u>
Canonsburg, Pa.	Calvert City, Ky.	\$0.47/100 lbs. (?)
Fernald, Ohio	Calvert City, Ky.	\$0.68/100 lbs.

5. Nature of Material

The change from $\text{CaF}_2\text{-MgF}_2$ cake to MgF_2 cake would probably not be made for at least 1 to 2 years.

6. Disposal of Resulting Sulfates

The waste disposal problem of resulting sulfates would be dependent upon local health department regulations.

7. Tests Conducted by the New Brunswick AEC Laboratory

Sooping tests were undertaken at our New Brunswick Laboratory to determine the suitability of these materials for HF production. The results of these tests are presented in the enclosed table.

8. Experimental Carload Quantities

We are taking the necessary steps to determine whether carload quantities of these materials can be sent to you for conducting larger scale tests. You have indicated to us that, if necessary, the uranium-containing sulfates, resulting from using these materials in HF production, could be returned to us.

Aqueous 70% HF

You indicated some interest in purchasing by-product aqueous 70% HF from our operations. You were particularly interested in determining whether your existing facilities would be adequate to handle the quantity of this material resulting from future AEC operation. You mentioned that you could handle, on a contained AHF basis, 100 tons per month as aqueous 70% HF and 300 tons per month for reprocessing to AHF.

We were pleased to hear that you had this degree of capacity for 70% HF. We shall want to discuss the HF production picture with you from time to time, evaluating your AHF selling price and 70% HF credit price.

Please contact us if additional information is needed.

Very truly yours,

R. L. Kirk, Director
Production Division

Enclosure:
Aforementioned Table on NBL Data

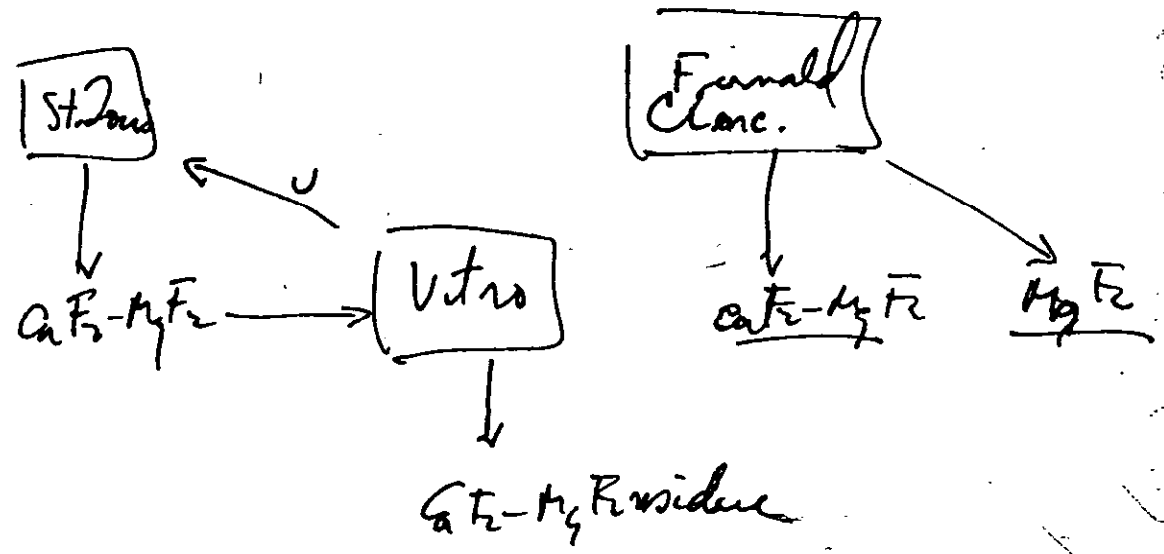
cc: S. H. Brown ✓
R. L. Kirk
F. M. Belmore
B. Sparks Att: A. Neuman

NBL Data: Treatment of MgF_2 and Fluorspar With 96% H_2SO_4

<u>Material</u> (1)	<u>Molar Ratio</u> ($\text{H}_2\text{SO}_4/\text{MgF}_2$)	<u>Temp.</u> ($^{\circ}\text{C}$) (2)	<u>Reaction Time</u> (hours)	<u>Agitation</u>	<u>% Reaction</u>
"as is"	4.1	fuming	5.5	none	40%
"as is"	4.1	fuming	2	none	37%
-8 μ	4.6	fuming	0.5	none	91%
-8 μ	4.6	fuming	0.5	yes	80%
+8-16 μ	4.6	fuming	0.5	none	83%
+8-16 μ	4.6	fuming	0.5	yes	82%
+16-32 μ	4.6	fuming	0.5	none	80%
+16-32 μ	4.6	fuming	0.5	yes	81%
-325 mesh	11.5	fuming	0.5	yes	74%
-325 mesh	11.5	fuming	0.5	yes	74%
Fluorspar	9.1	fuming	0.5	yes	70%
Fluorspar	9.1	fuming	0.5	yes	72%

- (1) Used 5-15g material for each experiment
 "as is" = MgF_2 = 50% + 200 mesh; 17% - 200 + 325 mesh; 29% - 325 mesh
 Fluorspar = commercial grade CaF_2 passed through 325 mesh
- (2) Fuming temperature estimated to be 275°C - 300°C

$.05\%$ $100,000 \times \frac{.01}{100} = 50\% \text{U}$ $30\% \text{U}$



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 ...
 ...

PA. 20

Boys
#92

2214

APRIL 10 1953

PP:JPT:ms

Pennsylvania Salt Manufacturing Co.
Whitemarsh Research Laboratory
Chestnut Hill, Pennsylvania

Attention: Dr. John F. Call, Director of Inorganic Research
and Development

Gentlemen:

We were pleased to talk with you on April 2 regarding your interest in evaluating for purchase ABC fluoride-containing by-products, specifically the $\text{CaF}_2\text{-MgF}_2$ and MgF_2 wet cake materials and aqueous 70% HF.

During our discussion with you, several items were noted for further study. We would like to summarize the action that is being taken and the information already received.

$\text{CaF}_2\text{-MgF}_2$ and MgF_2

1. Analysis

In addition to the fluoride salts, these materials are believed to contain 1 to 2% silicates, 0.1-0.5% chlorides, and less than 0.05% uranium. You said that your laboratory would analyze the samples that we have sent to you which we indicated are typical.

2. Health Hazard

Handling of this material, under normal and adequate ventilation, would not constitute a radioactive hazard. Our Health and Safety Division will undertake a comparative examination of samples of the materials sent to you and commercial fluorspar. The results of this examination will be made available to you.

3. Drying of Material

A rotary drier is presently being used at Vitro Manufacturing Plant in Canonsburg, Pa. It is estimated that this equipment could dry approximately 15-20 tons per day of $\text{CaF}_2\text{-MgF}_2$ wet cake; we are determining whether the dryer can be spared to further process these materials.

4. Shipment

Our Traffic Department has informed us that the shipment of these materials on a Government bill of lading would be desirable if the Government can successfully negotiate with the railroads for a lower classification and lower freight rates. The possibility of such an arrangement is good considering the shipping quantities now anticipated.

The freight rates for shipping these materials under a "fluorspar" classification are as follows:

<u>From</u>	<u>To</u>	<u>Rate</u>
Canonsburg, Pa.	Calvert City, Ky.	\$0.47/100 lbs. (?)
Fernald, Ohio	Calvert City, Ky.	\$0.68/100 lbs.

5. Nature of Material

The change from $\text{CaF}_2\text{-MgF}_2$ cake to MgF_2 cake would probably not be made for at least 1 to 2 years.

6. Disposal of Resulting Sulfates

The waste disposal problem of resulting sulfates would be dependent upon local health department regulations.

7. Tests Conducted by the New Brunswick ASC Laboratory

Scoping tests were undertaken at our New Brunswick Laboratory to determine the suitability of these materials for HF production. The results of these tests are presented in the enclosed table.

8. Experimental Carload Quantities

We are taking the necessary steps to determine whether carload quantities of these materials can be sent to you for conducting larger scale tests. You have indicated to us that, if necessary, the uranium-containing sulfates, resulting from using these materials in HF production, could be returned to us.

NBL Data: Treatment of MgF_2 and Fluorspar With 96% H_2SO_4

<u>Material (1)</u>	<u>Molar Ratio</u> <u>(H_2SO_4/MgF_2)</u>	<u>Temp.</u> <u>(°C) (2)</u>	<u>Reaction Time</u> <u>(hours)</u>	<u>Agitation</u>	<u>% Reaction</u>
"as is"	4.1	fuming	5.5	none	40%
"as is"	4.1	fuming	2	none	37%
-8 μ	4.6	fuming	0.5	none	91%
-8 μ	4.6	fuming	0.5	yes	80%
+8-16 μ	4.6	fuming	0.5	none	83%
+8-16 μ	4.6	fuming	0.5	yes	82%
+16-32 μ	4.6	fuming	0.5	none	80%
+16-32 μ	4.6	fuming	0.5	yes	81%
-325 mesh	11.5	fuming	0.5	yes	76%
-325 mesh	11.5	fuming	0.5	yes	76%
Fluorspar	9.1	fuming	0.5	yes	70%
Fluorspar	9.1	fuming	0.5	yes	72%

- (1) Used 5-15g material for each experiment
 "as is" = MgF_2 = 50% ; 200 mesh: 17% - 200 + 325 mesh: 29% - 325 mesh
 Fluorspar = commercial grade CaF_2 passed through 325 mesh
- (2) Fuming temperature estimated to be 275°C - 300°C

10/17/52
 10/17/52

Pennsylvania Salt Manufacturing Co.
Manufacturing Chemists
Research and Development Division
Wyndmoor, Pennsylvania



WHITEMARSH RESEARCH LABORATORIES

ADDRESS REPLY TO:
 BOX 4388
 CHESTNUT HILL P. O.
 PHILA. 18, PA.

March 13, 1953

Penn Salt - NAC

Mr. F. M. Belmore, Director
 Production Division
 U. S. Atomic Energy Commission
 P.O. Box 30 Ansonia Station
 New York 23, New York

Dear Mr. Belmore:

This will advise you that we have now received the samples of $\text{CaF}_2 - \text{MgF}_2$ cake and of MgF_2 cake which you referred to in your letter of February 24th.

The sample sent from Vitro Manufacturing Co. in Cannonsburg, Pennsylvania, bears a radio-activity hazard label, and we will appreciate your advice as to the cautions necessary in working with this sample material.

We will be pleased to examine the applicability of these samples to the manufacture of HF after we receive your advice on handling.

We look forward, also, to your comments on the questions contained in my letter to you of February 26th.

Very truly yours,

J. F. Gall

J. F. Gall, Director
 Inorganic Research Department
 R. & D. Division

JFG:AM

Box 5, #92

PENNSYLVANIA SALT MANUFACTURING CO.

PA. 20

C O P Y

February 26, 1953

Mr. F. M. Belmore, Director
Production Division
U.S. Atomic Energy Commission
P. O. Box 30 Ansonia Station
New York 25, New York

Dear Mr. Belmore :

Thank you for your letter of February 24, confirming information previously received by telephone from Mr. J. P. Termini concerning fluoride-containing by-products.

We will be pleased to receive sample material which you are sending and we will make preliminary tests to determine its usefulness as a raw material for HF production.

You mentioned that production rates will be available after necessary security procedures are followed. In this connection, please indicate the type of individual security clearances necessary for discussion of this matter.

In considering this product, some immediate questions, which you may be able to answer, are as follows:

1. Is a complete analysis available, for example, what is the nature of the material designated in your letter as "others"?
2. Does handling this material involve any hazard, through radio-activity or other cause?
3. Do you anticipate any difficulty in drying the product? Are facilities available for drying at the production site; or are near-by custom drying facilities available?
4. What will be the location of production of this material currently and in future? May this product be shipped on Government bill of lading? Have freight rates been established?
5. How soon may the change-over be made from $\text{CaF}_2\text{-MgF}_2$ cake to MgF_2 cake?
6. Has this product been used anywhere for the production of HF?
7. Have you or others considered the disposition of magnesium sulfate or mixed calcium magnesium sulfates from processing this product to produce HF? Have you considered problems of ground, water and stream pollution from waste magnesium sulfate?

U-643

C O P Y

COPY

U. S. Atomic Energy Commission

Sheet No. 2

8. Could an experimental carload of one or both products be supplied to our plant location at Calvert City, Kentucky?

I assure you again that we are interested in the possibility of using this material, and we will appreciate your answers to the above questions.

Very truly yours,

J. F. Gall, Director
Inorganic Research Department
R. & D. Division

JFG:AM:-js

COPY

29

PA. #20

FEBRUARY 24 1953

PP:JPT:js

Pennsylvania Salt Manufacturing Company
Whitemarsh Research Laboratory
Chestnut Hill, Pennsylvania

Attention: Dr. John F. Gall

Subject: FLUORIDE-CONTAINING BY-PRODUCTS FROM AEC OPERATIONS

Gentlemen:

In your conversation with Mr. J. P. Termini of this office, you indicated that Pennsylvania Salt Manufacturing Company would be interested in receiving samples of fluoride-containing by-products from AEC operations to determine if you could use them as a raw material for HF production.

An established price for this material has not, as yet, been determined. Several HF producers will be contacted and will have an opportunity to examine this material and to submit bids in accordance with usual Government practices.

The material currently being produced is a $\text{CaF}_2 - \text{MgF}_2$ wet cake with approximately 10 - 15% moisture; material from future production will probably be a wet cake with the same composition or with essentially all MgF_2 . The approximate average analyses, on a dry basis, for these materials are

<u>$\text{CaF}_2 - \text{MgF}_2$ Cake</u>	<u>MgF_2 Cake</u>
24% CaF_2	98-99% MgF_2
74% MgF_2	1 - 2% others
2% others	

Approximately 3800 tons (dry basis) of wet cake is currently available with an equivalent AEF content of approximately 2000 tons. It is expected that this material will continue to be available in production quantities. Production rates, however, are security information and any discussion on these figures would have to be undertaken

29
Pennsylvania Salt Manufacturing Company -2-

according to security regulations. If you remain interested after your preliminary experimental studies, we shall undertake the necessary security procedures in order that we may discuss the present and future production plans for these materials.

We are sending you several pounds of current production material from Vitro Manufacturing Co., Canonsburg, Pennsylvania, and a dried sample of the MgF_2 cake from our laboratory at New Brunswick, New Jersey.

We shall be pleased to hear the results of your evaluation of these materials as a feed source for your HF manufacture.

Very truly yours,

F. M. Belmore, Director
Production Division

CC: S. H. Brown ✓
C. J. Rodden, Attention: G. J. Petretic, NBL
B. Sparks, Attention: A. Newmann, Cleveland Area
Mail & Records
Production RP

Box 5
92

PA. 20

221.4

FEBRUARY 24 1953

PP:JPF:js

Pennsylvania Salt Manufacturing Company
Whitemarsh Research Laboratory
Chestnut Hill, Pennsylvania

Attention: Dr. John F. Gall

Subject: FLUORIDE-CONTAINING BY-PRODUCTS FROM AEC OPERATIONS

Gentlemen:

In your conversation with Mr. J. P. Termini of this office, you indicated that Pennsylvania Salt Manufacturing Company would be interested in receiving samples of fluoride-containing by-products from AEC operations to determine if you could use them as a raw material for HF production.

An established price for this material has not, as yet, been determined. Several HF producers will be contacted and will have an opportunity to examine this material and to submit bids in accordance with usual Government practices.

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<u>$\text{CaF}_2 - \text{MgF}_2$ Cake</u>	<u>MgF_2 Cake</u>
24% CaF_2	98-99% MgF_2
74% MgF_2	1 - 2% others
2% others	

Approximately 3800 tons (dry basis) of wet cake is currently available with an equivalent AHF content of approximately 2000 tons. It is expected that this material will continue to be available in production quantities. Production rates, however, are security information and any discussion on these figures would have to be undertaken

according to security regulations. If you remain interested after your preliminary experimental studies, we shall undertake the necessary security procedures in order that we may discuss the present and future production plans for these materials.

We are sending you several pounds of current production material from Vitro Manufacturing Co., Canonsburg, Pennsylvania, and a dried sample of the HgF_2 cake from our laboratory at New Brunswick, New Jersey.

We shall be pleased to hear the results of your evaluation of these materials as a feed source for your HF manufacture.

Very truly yours,

F. M. Bolmore, Director
Production Division

CC: S. H. Brown ✓
C. J. Rodden, Attention: G. J. Petretic, NEL
B. Sparks, Attention: A. Newmann, Cleveland Area
Mail & Records
Production RF

~~SECRET~~

This document consists of 4 pages. Copy 3 of 4 copies. Series A.

DEV-3a
D-167 (Mad Sq. Area)

14 September 1944

WFM:ncm

Subject: Vouchers passed by General Accounting Office.

To: The Area Engineer, Madison Square Area, New York, N. Y.

1. There are inclosed lists in triplicate setting forth vouchers passed by the General Accounting Office at this station for the period 30 June - 31 July 1944 for the following contractors:

- | | |
|--------------------------------|-------------------------|
| U. S. Trucking Corp. | Contract W-7401 eng-27 |
| Harshaw Chemical Co. | Contract W-7405 eng-2 |
| African Metals Corp. | Contract W-7405 eng-24 |
| African Metals Corp. | Contract W-7405 eng-30 |
| Vitro Mfg. Co. | Contract W-7405 eng-54 |
| Pennsylvania Salt Mfg. Co. | Contract W-7405 eng-30 |
| Vitro Mfg. Co. | Contract W-7405 eng-251 |
| Dr. Samuel T. Arnold | Contract W-7405 eng-263 |
| Westinghouse Elect. & Mfg. Co. | Contract W-7407 eng-2 |

2. Credit for the vouchers listed may be considered as having been allowed in the accounts of the disbursing officer(s) involved, in the absence of new evidence to the contrary.

3. One (1) copy of this list should be distributed by your office to the contractor concerned through the Contracting Officer and/or Certifying Officer as you may determine.

For the District Engineers:

U. S. ENGINEER OFFICE
MANHATTAN DISTRICT
DISPATCHED

SEP 21 1944

W. R. McCauley, Jr.,
Captain, Corps of Engineers,
Assistant.

Special Rereview
Final Determination
Unclassified

By: 4984
Date:

P. F. Brown Incl.:
Lists, in trip.

Distribution:

- Copies 1 & 2 - Addressee
- " 3 & 4 - Classified Files

~~SECRET~~

11586

CLASSIFICATION CANCELLED OR
CHANGED TO Unclassified

BY AUTHORITY OF DOC 9/2/71

BY S. J. [unclear] DATE 7/26/85

~~CONFIDENTIAL~~

Miss History
Box 145
Room 2 PA 20

7-11-43
0-58-0

357-07
15

7/10/5-27
7/10/1-14

Memorandum to the Materials File:

April 1943

Subject: Conference at Penn. Salt Company on
HF Recovery, April 5, 1943.

Through: Lt. Col. Crenshaw, Major Ruhoff, Captain Hadlock,
Lt. Burman.

Present: Penn. Salt Co. - Mr. Prince, Mr. Penfield, Mr. Gaydos,
Mr. Fehr
Mallinckrodt - Mr. Drennan, Dr. Lacher
Linde - Dr. Rehm, Mr. Abrams
Corps of Eng. - Major Ruhoff, Major Russell, Dr. Winters

1. Attached find letter to Mallinckrodt and Linde discussing results of the conference, and DuPont drawing E-51183-W with DuPont letters to Penn. Salt, dated April 1, 1943 and April 2, 1943. The inclosures cover the important items discussed at the conference.

2. Penn. Salt definitely stated that they would not accept the return of acid of less than 66% concentration. They also made it definite they prefer not to ship 66% HF in the same car they deliver the anhydrous acid to the plant. They will supply tank cars for the shipments to the plants and from the plants back to their producing point.

3. Dr. Winters believes there are two 11,000-gallon steel storage tanks available at St. Louis for use as 66% acid storage tanks (Equip. Pc. 703). He will check this point and let us know. The materials of construction for various concentrations of HF were discussed with Mr. Gaydos. He suggested the following materials in the order of decreasing effectiveness:

- a. For 66%-100% HF, Silver, monel-K, copper, steel and bronze (93-7)
- b. For less than 65% HF, neoprene coatings, Karbate and Havg.

4. There is some question as to the advisability of using neoprene lining in equipment piece 704 in contact with 66-80% HF. The undersigned will contact DuPont later this week for an opinion on this point.

5. Penn. Salt has built a DPC plant for making cryolite. The plant may or may not be run, depending on the need for the product. HF is a by-product of this operation, but the plant could be run to make HF if it is necessary to have an additional source of supply.

Inclosures (2)

~~CONFIDENTIAL~~

[Signature]
G. W. RUSSELL,
Major, Corps of Engineers,
Assistant.

~~CONFIDENTIAL~~

O-213-b

APR 1, 1943

Mallinckrodt Chemical Works,
3000 North 2nd Street,
St. Louis, Missouri.

Attention: r. J. R. Lacher

Gentlemen:

It is our understanding that you established for ~~Penn-Salt~~
Company the following conditions on which the design of the HF re-
covery system will be based, in a conference in Philadelphia, Penn-
sylvania, on Monday, April 5, 1943.

<u>Condition</u>	<u>Mallinckrodt</u>
Maximum Flow of Gases to Primary Condenser	1515 HF/hr. 40% water/hr. 24 cu.ft. inert per 40% water 100 GPM
Minimum Flow of Gases to Primary Condenser	0
Ratio HF:water	fairly constant, but expect smaller quantities of HF
Cooling Water	
a. Type	City Water
b. Summer Temperature	85° F.
c. Winter Temperature	50° F.
Refrigeration	None available
Entering Gas Temperature Maximum	175° C.
Current Characteristics	3-phase 60-cycle 208 Volt

~~CONFIDENTIAL~~

<u>Condition</u>	<u>Mallinckrodt</u>
Maximum Back Pressure Permissible at Entrance to Primary Condenser	4" Water
Pressure Characteristics Available at Vent from Secondary Condenser to Scrubbers	1/2" Pressure to 0
Foul Factor	Fine Dust
Scrubber System Available	Dual scrubbers in parallel for purge line and condenser recovery system followed by common header scrubber, spray-type operated with lime. No suction fan available.

Referring to du Pont diagrammatic flow sheet E-51183-W, it is our understanding that you agreed to the following changes:

1. Equipment Piece 700 (trombone condenser) will be jacketed or placed in cooling water box rather than sprayed.
2. An after cooler will be placed in condensate line between trombone condenser and condensate receiver, Equip. Pc. 704.
3. A drop-off line will be placed in the incoming gas line prior to the vertical liquid trap to remove any pre-condensed liquid. The line will lead to a small tank which in turn will deliver to condensate receiver, Equip. P. 704.
4. Scale on Equip. Pc. 703 (66% SO_2 storage tank) will be eliminated.
5. Equalizing vent will be placed between anhydrous HF receiver and line delivering to secondary condenser.
6. Both Mallinckrodt and Linde will install a by-pass line so that gases may be delivered direct to scrubbers. This line will be a separate line from the purge line.

CONFIDENTIAL

[Handwritten signature]

Dr. J. R. Lasher - M.O.W.

5/2/63

Dr. J. R. Lasher - M.O.W.

It is our understanding that the Penn Salt Company will supply the design and specifications of the major pieces of equipment to Mallinckrodt and Linde. Mallinckrodt and Linde will lay out this equipment for their locations, have the equipment fabricated, and install it.

It was also agreed Mallinckrodt and Linde would contact Penn Salt with carbon copies to this office, concerning an agreement on standard methods of analysis for anhydrous and 66% HF.

For the District Engineer:

Very truly yours,

JOHN E. BUNOFF,
Major, Corps of Engineers,
Assistant.

cc: Mr. Gaydos, Penn Salt

~~CONFIDENTIAL~~