

August 11, 1976

40-2061

Kerr-McGee Chemical Corporation  
ATTN: Mr. Frank Lyons, Vice President  
Chemical Manufacturing Division  
Kerr-McGee Center  
Oklahoma City, Oklahoma 73125

Gentlemen:

On August 4, 1976, William H. Schultz, a radiation specialist from the Nuclear Regulatory Commission's Regional Office, visited your West Chicago, Illinois, plant to make independent measurements of radiation levels in areas surrounding the plant site.

This survey included the property (which you have identified as owned by Walter Hennessey) located between the plant site and the waste disposal area to the south. An earlier survey by NRC personnel had identified several locations on this property where radiation levels were above those permitted for unrestricted areas.

Our August 4 survey of this property showed that considerable debris had been removed and contaminated soil had been excavated and replaced with clean fill material. In our radiation survey of the property, we found that the radiation levels were well within the limits specified by the NRC for unrestricted areas.

Sincerely yours,

James G. Keppler  
Regional Director

bcc: Dudley Thompson, Acting Director, DFO  
PDR  
Local PDR

8507080427 850408  
PDR FOIA  
RAPKIN85-30 PDR

OFFICE	IE:III	IE:III	IE:III	IE:III		
SURNAME	Strama/ms	Lonergan	Fisher	Keppler	WHS	
DATE	8/11/76	8/11/76	8/11/76	8/11/76	8/11/76	

*Loezan*

UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION III  
799 ROOSEVELT ROAD  
GLEN ELLYN, ILLINOIS 60137

August 12, 1976

Gen W. Roy, Chief, Field Coordination and Enforcement Branch  
Office of Inspection and Enforcement, Headquarters

KERR-MCGEE CHEMICAL CORPORATION, WEST CHICAGO, ILLINOIS  
LICENSE NO. STA-583 (DOCKET NO. 40-2061)  
REQUEST FOR RADIATION SURVEYS OF BUILDINGS NO. 11, 12,  
20 AND 21 AT KERR-MCGEE THORIUM FACILITY  
(AITS NO. HO1317F3)

Attached is the draft response to L. C. Rouse, Chief, Fuel Processing  
and Fabrication Branch, as requested in the referenced AITS item  
resulting from independent surveys conducted by Region III personnel.

*William L. Fisher*

William L. Fisher, Acting Chief  
Fuel Facility and Materials  
Safety Branch

Attachment:  
Draft Response

cc w/attachment:  
R. F. Warnick, Regional Coordinator



DRAFT

L. C. Rouse, Chief, Fuel Processing and Fabrication Branch  
Division of Fuel Cycle and Material Safety

KERR-MCGEE CHEMICAL CORPORATION, WEST CHICAGO, ILLINOIS  
LICENSE NO. STA-583 (DOCKET NO. 40-2061)  
REQUEST FOR RADIATION SURVEYS OF BUILDINGS NO. 11, 12, 20  
AND 21 AT KERR-MCGEE THORIUM FACILITY

With regard to the subject request of May 20, 1976, independent surveys of the Kerr-McGee Chemical Corporation Thorium Facility buildings in West Chicago, Illinois, have been performed. Based upon the results of the independent surveys, Region III personnel have concluded and recommend that these buildings should not be released for unrestricted use until further decontamination is accomplished and the radioactive surface contamination levels meet the criteria and standard guidelines for decontamination,<sup>1/</sup> and that partial release should not be allowed until the entire facility is acceptable.

On April 14, 1976, the Kerr-McGee Chemical Corporation personnel of the West Chicago, Illinois Thorium Facility, forwarded to Region III their "Preliminary Survey" results (Exhibit 1) of radioactive surface contamination levels measured after decontamination in Buildings 11, 12, 20, and 21. Subsequent to this, the Oklahoma City office of the Kerr-McGee Chemical Corporation submitted to Headquarters (Exhibit 2) their request for the release of the four itemized buildings at their Thorium Facility in West Chicago for unrestricted use. The subject request was transmitted to the Region III Office of Inspection and Enforcement by memorandum (Exhibit 3) through Gen W. Roy and received on July 1, 1976.

1/ "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct, Source, or Special Nuclear Material," USAEC, December 1973.

The requested independent survey was initiated by Region III, Fuel Facility and Materials Safety Branch, Materials Radiological Protection Section personnel on July 9, 1976, and concluded on July 16, 1976. The average and maximum measurements obtained for total and removable surface contamination levels are tabulated in Table I. Detailed surveys were performed in all but building 20, a truck garage. A cursory survey of this building was performed and the results are discussed in a following paragraph. Measurements were made using a PAC-3G alpha survey instrument and an end window type GM beta-gamma survey instrument with a detector window thickness of less than 7 mg/cm<sup>2</sup> total absorber. Removable activity was obtained by wiping with dry filter paper over a surface area of 100 cm<sup>2</sup> and assessing the radioactive material on the wipes using appropriate instrumentation available at the ERDA, ANL facilities.

A cursory survey performed in building 20 indicated that there were no significant surface contamination levels of radiation within the building that would require further decontamination. However, upon exiting the rear (South) door of this building, ground radiation immediately increased to significantly measurable levels in the yard area behind the building. Ground radiation levels here were measured to be as high as 4 to 6 mrad/hr at some locations.

By comparison to data presented in Table I, the "Preliminary Survey" performed by Kerr-McGee personnel in the West Chicago facility is presented in Table II. The total alpha surface contamination data is graphically compared in Figure 1.

The total beta-gamma surface contamination levels in Table II were obtained using a detector with total absorber greater than 7 mg/cm<sup>2</sup>, possibly with a total absorber of up to 30 mg/cm<sup>2</sup>.

The data in table I which presents Kerr McGee's measurements should in all cases be equal to or less than the data presented in Table II. Table II contains the applicable values from the L. C. Rouse guidelines for decontamination of facilities & equipment prior to release for unrestricted use

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From data presented in Table II, the surface contamination level guidelines for decontamination of facilities and equipment prior to release for unrestricted use should be equal to or less than those presented in Table III.

Based upon the total and removable surface contamination levels of radioactivity as determined by Region III personnel and presented in Table I of this report, Region III personnel concluded by comparison to standard guideline levels (Table III) that the four buildings (Nos. 11, 12, 20 and 21) located at the Kerr-McGee Chemical Corporation Thorium Facility in West Chicago, Illinois should not be released for unrestricted use and further, that partial release of the plant facilities not be permitted until all decontamination to acceptable levels is accomplished and verified.

Kerr-McGee Chemical Corporation personnel have retained the services of a Consultant Health Physics contractor company to assist the licensee in formulating procedural techniques to accomplish and verify decontamination of the subject buildings to acceptable levels of radioactive surface contamination. The contractor will also assist the licensee with decontamination aspects of other buildings, equipment and the environment associated with the facility. NRC, Region III personnel have been assured that they will be presented with an opportunity to review these procedures (Exhibit 4) prior to further decontamination efforts and subsequent radiation surveying.

Gen W. Roy, Chief  
Field Coordination and  
Enforcement Branch

Attachments:

1. Tables I, II, and III
2. Figure 1
3. Exhibits 1 thru 4

TABLE I

Results of Independent Surface Radiation Survey Measurements Made by NRC Region III PersonnelinKerr-McGee Chemical Corp., Thorium Facility Buildings, West Chicago, Illinois

<u>Building Identification/Information</u>	<u>Surface Contamination Levels</u>			
	<u>Totals</u>		<u>Removable</u>	
	<u>Alpha</u> (dpm/100cm <sup>2</sup> )	<u>Beta-Gamma</u> (mrad/hr)	<u>Alpha</u> (dpm/100cm <sup>2</sup> )	<u>Beta-Gamma</u> (dpm/100cm <sup>2</sup> )
No. 11, (3 car garage): Average -	3,940	1.1	88.7	160
No. 11, (3 car garage): Maximum -	40,000	6.0	262	392
No. 12, (Warehouse) : Average -	3,907	0.81	262	454
No. 12, (Warehouse) : Maximum -	20,000	5.0	370	609
No. 21, Ground Floor (Solv. Ex. Plnt): Average -	3,255	0.84	157	272
No. 21, Ground Floor (Solv. Ex. Plnt): Maximum -	15,000	3.0	826	1,285
No. 21, 2nd Floor (Solv. Ex. Plnt) : Average -	5,000	0.30	1,161	2,243
No. 21, 2nd Floor (Solv. Ex. Plnt) : Maximum -	70,000	4.0	2,868	5,908
No. 21, 3rd Floor Balcony (Solv. Ex. Plnt): Average -	-	0.15	-	-
No. 21, 3rd Floor Balcony (Solv. Ex. Plnt): Maximum -	-	0.30	-	-
No. 20, (truck garage; not surveyed in detail)				



TABLE II

Preliminary Survey By Kerr-McGee of Surface Radioactivity Contamination Levels  
in Four, West Chicago, Thorium Facility Buildings

<u>Building Identification/Information</u>	<u>Surface Contamination Levels</u>		
	<u>Totals</u>	$\dot{\gamma}$ (mR/hr)	<u>Removable (dpm/100cm<sup>2</sup>)</u>
	$\alpha$ (dpm/100cm <sup>2</sup> )		$\alpha$ and $\dot{\gamma}$
No. 11, (3 car garage) : Average -	< 2,000	0.2	< 150
No. 11, (3 car garage) : Maximum -	3,750	0.4	300
No. 12, (warehouse) : Average -	< 3,500	< 0.10	< 200
No. 12, (warehouse) : Maximum -	8,000	0.15	300
No. 20, (truck garage) : Average -	< 2,000	< 0.10	< 250
No. 20, (truck garage) : Maximum -	5,500	0.12	375
No. 21, (Solv. Ex. Plnt): Average -	< 2,500	< 0.1	< 100
No. 21, (Solv. Ex. Plnt): Maximum -	4,000	0.14	-

TABLE III

Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use

<u>Isotope</u>	<u>Surface Contamination Levels</u>			
	<u>Totals</u>		<u>Removable</u>	
	<u>Alpha</u> (dpm/100cm <sup>2</sup> )	<u>Beta-Gamma</u> (mrad/hr at 1 cm)	<u>Alpha</u> (dpm/100cm <sup>2</sup> )	<u>Beta-Gamma</u> (dpm/100cm <sup>2</sup> )
U-nat, U-235, U-238, Th-Nat, Th-232 and associated decay products	Ave:	5,000	-	1,000
	Max:	25,000	-	-
Beta-Gamma Emitters	Ave:	-	0.2	-
	Max:	-	1.0	1,000

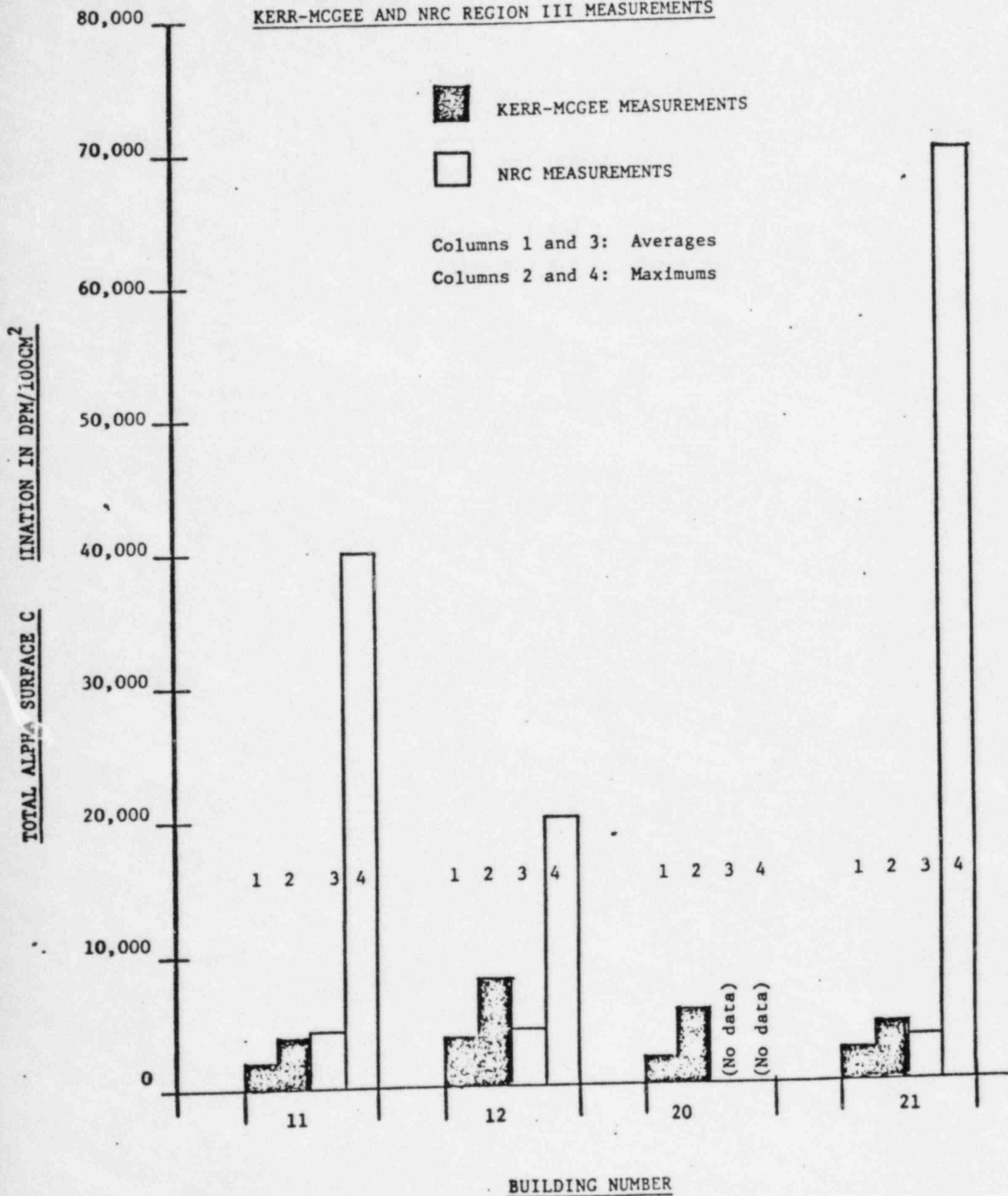


FIGURE 1

COMPARATIVE MEASUREMENTS OF ALPHA SURFACE CONTAMINATION LEVELS

KERR-MCGEE THORIUM FACILITY, WEST CHICAGO, ILLINOIS

KERR-MCGEE AND NRC REGION III MEASUREMENTS





**KERR-McGEE CHEMICAL CORP.**

258 ANN STREET • WEST CHICAGO, ILLINOIS 60185

April 14, 1976

Atomic Energy Commission  
Division of Compliance  
799 Roosevelt Rd.  
Glen Ellyn, Ill. 60137

Attn: Bill Schultz

Dear Bill

Enclosed are the results of a radiation survey of four buildings at the Kerr McGee facility in West Chicago. The same report is being forwarded from Oklahoma City to the NRC in Washington, attention Mr. Crow. A request is being made to release these four buildings from license. I don't know what your procedure is in action of this kind but we would appreciate anything you could do to expedite the inspection and subsequent release.

Yours Truly

Roy MacLean

Encl.

EXHIBIT I

LINDSAY RARE EARTHS

APR 15 1976

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PRELIMINARY SURVEY  
KERR MCGEE FACILITY, WEST CHICAGO, ILLINOIS

The following is a report of surveys made on four buildings of the Kerr McGee facility at 258 Ann Street, West Chicago, Illinois 60185. The plant has processed Monazite ores under AEC Source Material License STA-503 for many years but is now shut down. It is our desire to have four of the buildings released for unrestricted use. The buildings were stripped of equipment and cleaned. Radioactive equipment was removed to the radioactive waste disposal area which is located apart from the plant area.

The U. S. Atomic Energy Commission has issued guidelines ( April 22, 1970 ) for the decontamination of premises prior to release for unrestricted use. These guidelines were followed in cleaning up the buildings. They were checked with an Eberline PAC-4G for Alpha contamination and an Eberline Geiger Counter Model E-530 for Beta-Gamma contamination. The PAC-4G readings ( counts/min. ) were divided by the manufacturers suggested efficiency ( plus or minus 30% ) to obtain disintegration per minute readings. Work sheets are enclosed.

1. Building 11. ( 3 car garage )

Average  $\alpha$ : < 2000 dpm/100 cm  
High  $\alpha$ : 3750 dpm/100 cm

Average  $\gamma$ : 0.2 mR/hr.  
High  $\gamma$ : 0.4 mR/hr.

Removable Activity

Average  $\alpha + \gamma$ : < 150 dpm/100 cm  
high  $\alpha + \gamma$ : 300 dpm/100cm

2. Building 12 ( Warehouse )

Average  $\alpha$ : < 3500 dpm/100 cm  
High  $\alpha$ : 8000 dpm/100 cm

Average  $\gamma$ : < 0.10 mR/hr.  
High  $\gamma$ : 0.15 mR/hr.

Removable Activity

Average  $\alpha + \gamma$ : < 200 dpm/100 cm  
High  $\alpha + \gamma$ : 300 dpm/100 cm

More

3. Building 20 ( Garage )

Average  $\alpha$ : < 2000 dpm/100 cm  
High  $\alpha$ : 5500 dpm/100 cm

Average  $\gamma$ : < 0.10 mR/hr.  
High  $\gamma$ : 0.12 mR/hr.

Removable Activity

Average  $\alpha + \gamma$  : < 250 dpm/100 cm  
High  $\alpha + \gamma$  : 375 dpm/100 cm

4. Building 21 ( Solvent Extraction Plant )

Average  $\alpha$ : < 2500 dpm/100 cm  
High  $\alpha$ : 4000 dpm/100 cm

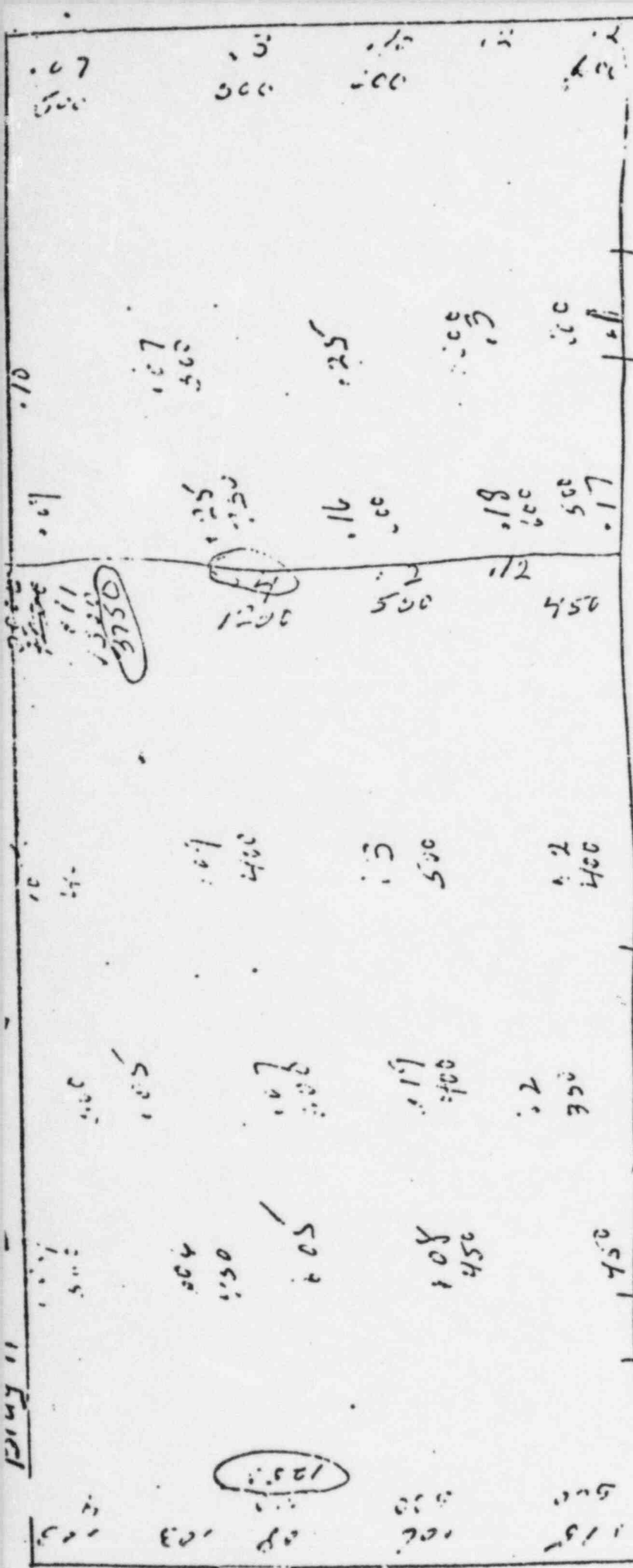
Average  $\gamma$ : < 0.1 mR/hr.  
High  $\gamma$ : 0.14 mR/hr.

Removable Activity

Average  $\alpha + \gamma$  : < 100 dpm/100 cm

Survey made in April 1976 by R.P. MacLean, Kerr McGee Chemical Corp.

11 Encl



ALFA BACK GROUND

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WALL

Court wall

SOUTH WALL

WEST WALL

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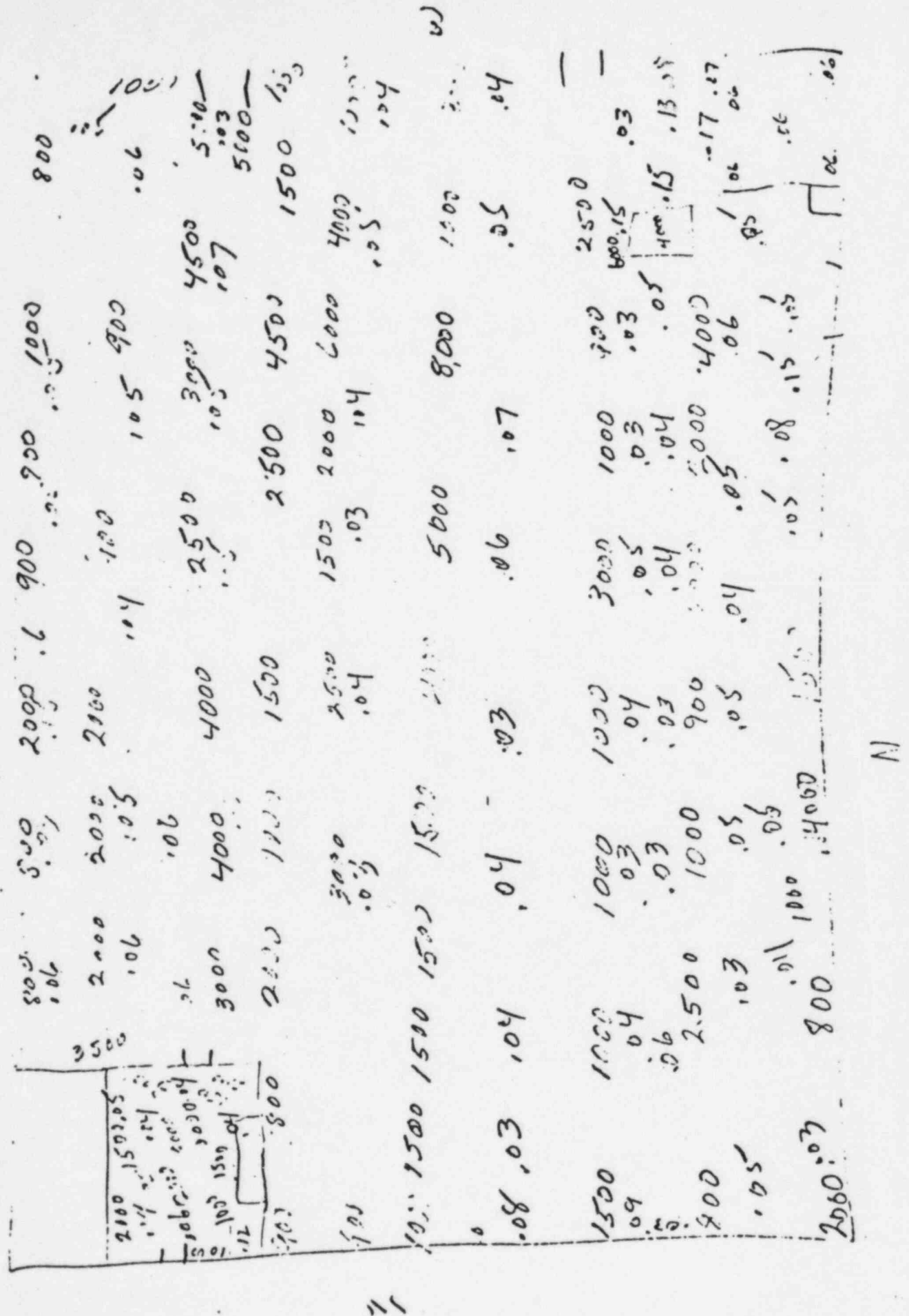
Alpha Readings x 250 = 25

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KERR-MCGEE

KERR-MCGEE COMPANY • OKLAHOMA CITY, OKLAHOMA 73105

April 20, 1976

Mr. William Crow  
Fuel Fabrication & Reprocessing Branch  
Directorate of Licensing  
Nuclear Regulatory Commission  
Washington, D.C. 20545

Dear Mr. Crow:

With further reference to our request in my letter of March 24, 1976, we wish to have four buildings on our property in West Chicago, Illinois released for unrestricted use. These buildings are described on our plot plan as buildings No. 11, 12, 20 and 21.

These buildings have been decontaminated and inspected by us. The survey of the residual contamination is attached. The buildings meet the Guidelines of the U.S.A.E.C. dated April 22, 1970. The survey results are very close to the proposed ANSI standards. It is our opinion that these latter standards would be quite impractical to reach.

A copy of the survey was transmitted to Mr. Wm. Schultz of your Glen Ellyn office. Please let us know if these buildings can now be inspected.

Sincerely yours,

*R. J. Vreeland*  
R. J. VREELAND  
Senior Project Engineer

RJV/so  
cc: R. P. MacLean  
M & H Corp.  
J. V. Connell

EXHIBIT 2

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UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

MAY 20 1976

Docket No. 40-2061

MEMORANDUM FOR: Gen W. Roy, Chief  
Field Coordination and Enforcement Branch  
Office of Inspection and Enforcement

FROM: W. T. Crow, Acting Chief  
Fuel Processing and Fabrication Branch  
Division of Fuel Cycle and Material Safety

SUBJECT: KERR-MCGEE CHEMICAL CORPORATION, WEST CHICAGO,  
ILLINOIS, LICENSE NO. STA-583 (DOCKET NO. 40-2061)  
REQUEST FOR RADIATION SURVEYS OF BUILDINGS  
NOS. 11, 12, 20 AND 21 AT KERR-MCGEE THORIUM  
FACILITY

You will find attached a request from Kerr-McGee Chemical Corporation for the release for unrestricted use of four buildings on their property in West Chicago, Illinois described on their plot plan (copy enclosed) as buildings numbers 11, 12, 20 and 21. Although the enclosed survey presumably indicates that the surface contamination levels are within allowable limits for unrestricted use in accordance with U.S. Atomic Energy Commission Guidelines dated April 22, 1970, the applicant reports that the values do not meet proposed ANSI standards. Accordingly, it is requested that your Region III Field Office conduct an independent survey to verify the reported results so that we may take appropriate action.

As noted in the Kerr-McGee April 20, 1976 letter, a copy of the survey was transmitted to W. H. Schultz of the Glen Ellyn office.

W. T. Crow  
Acting Chief  
Fuel Processing and  
Fabrication Branch  
Division of Fuel Cycle  
and Material Safety

Enclosure:  
As stated

EXHIBIT 3

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**KERR-McGEE CHEMICAL CORP.**

KERR-McGEE CENTER • OKLAHOMA CITY, OKLAHOMA 73125

March 24, 1976



Mr. William Crow  
Fuel Fabrication and Reprocessing Branch  
Directorate of Licensing  
Nuclear Regulatory Commission  
Washington, D. C. 20545

RE: License No. STA-583  
Docket No. (40-2061)

Dear Mr. Crow:

We wish to have removed from the license on our West Chicago, Illinois facility three buildings in the manufacturing area. These buildings are described on the plot plan in your records as Nos. 12, 20 and 21.

These buildings have been decontaminated and inspected by us in accordance with the "Guidelines for Decontamination of Facilities and Equipment" of the U.S. A.E.C. dated April 22, 1970.

Please let us know when you wish to inspect these buildings.

With further reference to the samples described in my letter of December 18, 1975, the analyses were completed this week and a final report will be sent to you as soon as it is prepared.

Very truly yours,

R. J. Vreeland  
Senior Project Engineer

RJV/ph

cc: Roy MacLean  
J. V. Connell  
M & H Corp.



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