

UNITED STATES  
ATOMIC ENERGY COMMISSION  
DIVISION OF COMPLIANCE, REGION IV  
10395 WEST COLFAX, ROOM 200  
DENVER, COLORADO 80215

April 10, 1970

File

THRU: Glen D. Brown, Senior Radiation Specialist, CO:IV

KERR-McGEE CORPORATION, OKLAHOMA CITY, OKLAHOMA - LICENSE  
NO. SUB-986 (Docket 40-8006) - HEALTH AND SAFETY EVALUATION  
INSPECTION CONDUCTED MARCH 25, 1970


The licensee uses uranium in the form of  $U_3O_8$  as a mix with sand aggregates to construct subsurface ore zones typical to natural uranium deposits encountered during ore prospecting. These are used for the calibration and standardization of instruments. No items of noncompliance were noted during the inspection and the potential for encountering items of health and safety significance is appraised as negligible.

Licensee personnel are not likely to receive whole body exposure in excess of 50% of 10 CFR 20.101(a) limits, no bioassay program is required, airborne concentrations are not encountered, and contamination surveys are not required.

It is recommended that the next inspection of this license be conducted during March, 1973.

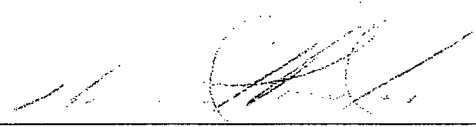
Herman J. Paas, Jr.  
Radiation Specialist

INSPECTION FINDINGS AND LICENSEE ACKNOWLEDGMENT

<b>1. LICENSEE</b> <b>Kerr-McGee Corporation</b> <b>Kerr-McGee Building</b> <b>Oklahoma City, Oklahoma 73102</b>	<b>2. REGIONAL OFFICE</b> <b>U. S. ATOMIC ENERGY COMMISSION</b> <b>REGION IV, DIVISION OF COMPLIANCE</b> <b>10395 W. COLFAX, ROOM 200</b> <b>DENVER, COLORADO 80215</b>
<b>3. LICENSE NUMBER(S)</b> <b>SUB-986 (Docket No. 40-8006)</b>	<b>4. DATE OF INSPECTION</b> 

**5. INSPECTION FINDINGS**

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



(AEC Compliance Inspector)

**6. LICENSEE'S ACKNOWLEDGMENT**

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

\_\_\_\_\_  
(Date)

\_\_\_\_\_  
(Licensee Representative — Title or Position)

ORIGINAL: LICENSEE. COPIES:  CO REGION  CO HEADQUARTERS  CO ENFORCEMENT

INSPECTION REPORT

1. Name and address of licensee

Kerr-McGee Corporation  
Kerr-McGee Building  
Oklahoma City, Oklahoma 73102

2. Date of inspection

March 25, 1970

3. Type of inspection

Initial

4. License number(s), docket number(s), number and date of last amendment for each license. Category and Priority of each license

License No. SUB-986 (Docket No. 40-8006)  
Issued: May 20, 1969

Category E  
Priority III

5. Date of previous inspection - None

6. Is "Company Confidential", or proprietary, or classified information contained in report?

(Specify paragraphs)

Yes \_\_\_\_\_ No     No    

7. Scope of inspection

Reviewed records, interviewed those responsible for the administration and radiation safety aspects of the program, toured the facility and discussed inspection findings with management.

8. Herman J. Paas, Jr. *HP*

Inspector

4/10/70  
Date of Report

Glen D. Brown *GDB*

Reviewer

4/13/70  
Date of Review

Licensee Kerr-McGee Corp., Oklahoma City, Oklahoma - SUB-986

Summary

The licensee uses uranium in the form of U<sub>3</sub>O<sub>8</sub> as a mix in a sand aggregate which is permanently placed in subsurface test pits which are then used for purposes of calibrating and designing instrumentation. Examination of records and inspection of facility revealed no items of noncompliance. Program appeared capably administered and is of a nature such that negligible hazard is encountered.

Noncompliance and Safety Items

None

Unusual Occurrences

None

Status of Previously Reported Noncompliance or Safety Items

This was initial inspection.

Management Interview

The results of the inspection were discussed with Mr. J. P. Hewlett, Administrative Manager, Kerr-McGee Corporation. No items of noncompliance were noted or observed and a clear Form AEC-591 was issued to Mr. Hewlett.

Licensee Kerr-McGee Corp., Oklahoma City, Oklahoma - SUB-986

## DETAILS

### A. Participants

J. P. Hewlett, Administrative Manager  
Howard C. Eberline, Technical Director

### B. Scope of License Program

The licensee has used 260 pounds of uranium in the form of  $U_3O_8$  as a mixture in sand aggregates and has buried this to resemble a 6' deep ore zone in a subsurface arrangement which has 3' of sand between the top of the ore zone and the surface of the earth. Five test pits are in use. The test holes in this aggregate are used for calibration and testing of instrumentation.

### C. Organization

Mr. E. A. McGee, Chairman of the Board of Directors, Kerr-McGee Corp.  
Howard C. Eberline, Technical Director  
J. P. Hewlett, Administrative Manager

### D. Administrative Control

Mr. Hewlett stated that he has complete administrative control over all aspects of this license. He stated he reports to Mr. Eberline who, in turn, reports to Mr. McGee, Chairman of the Board of Directors, Kerr-McGee, Corp. (See par. C)

### E. Use of Material

The licensee simulates uranium ore deposits by mixing uranium as  $U_3O_8$  in sand aggregates and then uses this mixture as a simulated ore zone in a subsurface pit assembly. Five such pits, containing approximately 260 pounds of uranium have been constructed and three additional pits are planned. The installation is located at the licensee's research facility at 3301 N. W. 150th St., Oklahoma City. Exhibit A, attached to this report, shows a cross-section of one of the pits and includes a tabulation of the ore zone composition for each of the five pits in use.

F. Facilities

The test area covers about 1200 sq. ft. at an open field location on the licensee's property at 3301 N. W. 150th St., Oklahoma City, Oklahoma. This facility includes one small building which is used for the storage of materials and eight pits of the structure shown in Exhibit A; five of these pits are now in use and three are intended for future applications but do not contain any uranium at the time of the inspection.

G. Equipment

The licensee uses a portable Geiger-type radiation survey instrument for external radiation evaluation and uses laboratory assay techniques related to their Kerr-McGee mill operations in Grants, New Mexico, for purposes of assaying ore composition. Hewlett stated that 10 CFR 20 and 40 are basic guidelines. It should be noted that the end usage of source material is nearly identical to prospecting in ore deposits that have a composition ranging from 0.09 to 0.51 % U3O8.

H. Radiological Safety Procedures

I. Personnel Monitoring and Exposure to External Radiation

Monthly badge exchange program furnished by Landauer. Vendor's original reports show maximum quarterly exposure received by any Kerr-McGee employee was 30 mr. Employee receiving this exposure was engaged in other activities involving penetrating radiation. Potential for exposure in excess of 25% of 10 CFR 20.101(a) limits is negligible.

J. Exposure of Employees to Concentrations of Radioactive Materials

Not applicable as entire structure is located three feet below ground level and covered with three feet of sand. Original mixing of aggregate was accomplished in an enclosed "pre-mix type cement truck". No airborne problem was encountered.

Licensee Kerr-McGee Corp., Oklahoma City, Oklahoma - SUB-986

K. Effluents to Unrestricted Areas

None

L. Disposals

None made

M. Miscellaneous Surveys, Evaluations, and Records

Records include those of receipt, use, aggregate assay, location placement, personnel monitoring, and storage quantities. Radiation doses were evaluated one time when the original five pits were completed and all levels were recorded as less than 1 mr/hr.

N. Special License Conditions

Use is in accord with procedures described in application dated May 8, 1969, and the authorized place of use is as defined in License Condition No. 9.

O. Posting and Labeling

The storage building, the storage drum containing about one-half barrel of U<sub>3</sub>O<sub>8</sub>, and the five test pits that are now being used are labeled and posted in accord with applicable 10 CFR 20.203 requirements.

Licensee Kerr-McGee Corp., Oklahoma City, Oklahoma - SUB-986

P. Independent Measurements

Using the Frieseke-Hoepfner portable survey instrument, a dose of 3 mr/hr was measured in contact with the storage barrel located in the storage building. The dose measured at all test pits and at the nearest approach to the building from the unrestricted area was less than 0.5 mr/hr in all cases.

Q. Operations Observed

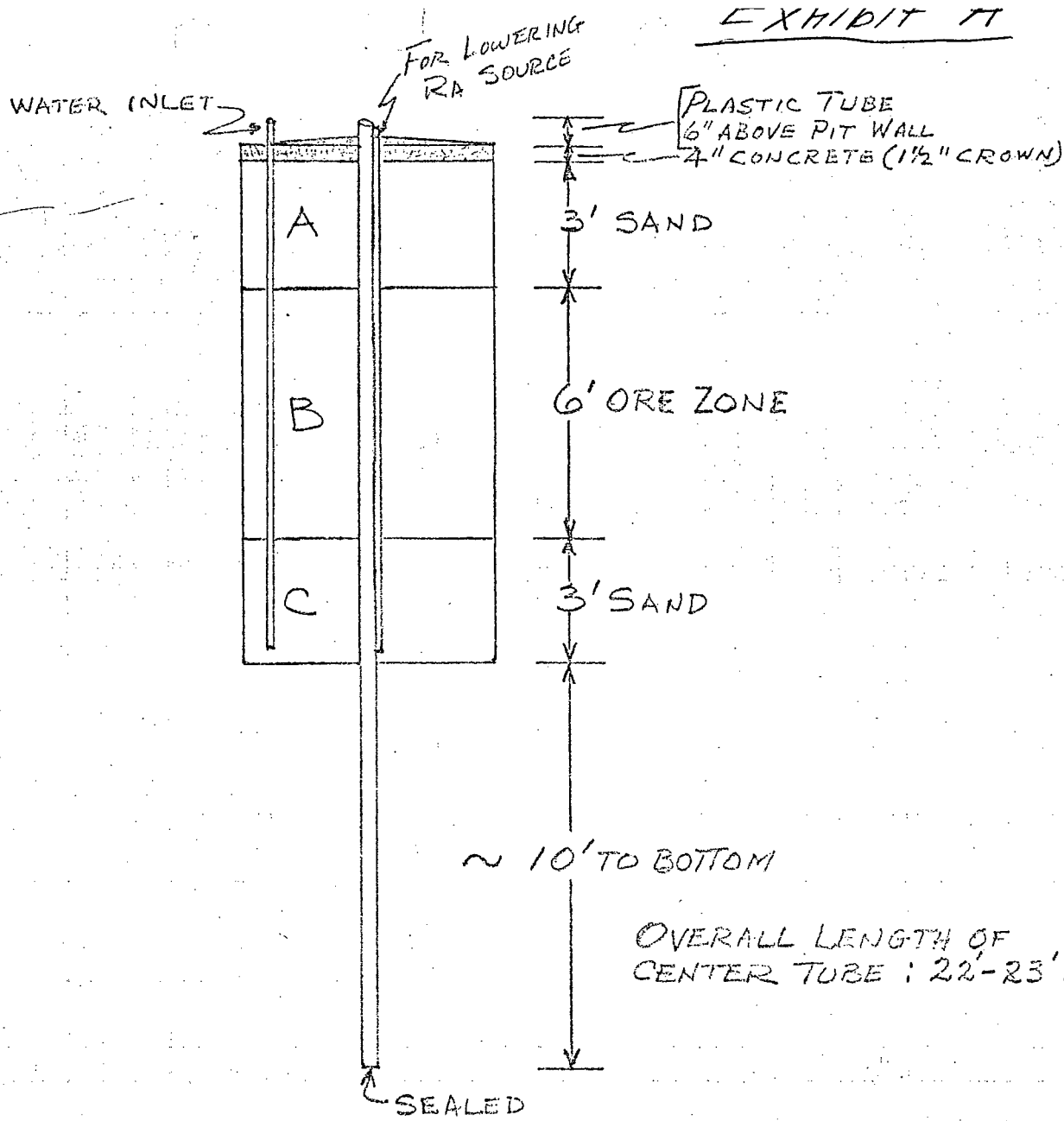
None

R. Incidents, Overexposures, Theft or Loss, Equipment Malfunction

Mr. Hewlett stated that the licensee had not experienced any incidents of the type itemized. The discussion and review of records and procedures apparently verified this statement.

S. Other Information or Continuation from Previous Paragraphs





ORE ZONE COMPOSITION

		Approx. $U_3O_8$	# of U
35	Pit No. 1: Grants "B" (Lot 10138)	0.24	53.8
115	Pit No. 2: Grants "C" (Lot 10135 - 0.437%) and "D" (Lot 10311 - 0.587%). Mix 1:1	0.51	94.
42	Pit No. 3: Sand + Yellowcake	0.20	45.
46	Pit No. 4: Casper, Series 20 & 24, + Sand	?	39.6
32	Pit No. 5: Bottom 6", Grants "B"	0.24	27.5
	Center 5', Grants "A"	0.09	
	Top 6", Casper Series 42	0.42 (?)	240.3 #
290			240.3 # of U as $U_3O_8$

3/25/70  
HP

YELLOW CAKE INVENTORY

AEC License SUB-986

Received from Nuclear Division (5-28-69):

Gross Weight, lbs.	830
Tare Weight, lbs.	53.0
Net Wet Weight, lbs.	777
Moisture, %	2.0
U <sub>3</sub> O <sub>8</sub> , %	89.0
Net Dry Weight, lbs.	761.5
U <sub>3</sub> O <sub>8</sub> , lbs.	677.7

REMOVAL RECORD

[All weights in grams (1b x 453.592); assume 2% moisture]

<u>Date</u>	<u>Amount</u>	<u>Disposition</u>	<u>Remaining</u>
5-28-69	(Net amount received)		352,441
8-22-69	17,464	Test Pit No. 3	334,977
8-26-69	2,950	Test Pit No. 3	332,027

REC'D ✓

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KERR-McGEE CORPORATION

DEPARTMENT OF PHYSICAL SCIENCE AND MEASUREMENT

