

Distribution:
FCUF r/f
✓ Docket No. 40-8027
LTyson

APR 18 1980

NOTE TO: R. G. Page
FROM: W. T. Crow
SUBJECT: KERR-McGEE FERTILIZER PROGRAM

Original Signed By:

The problems involved in granting permission for commercial distribution of treated raffinate fertilizer have been discussed with Kerr-McGee, and they are aware that such use may not be permitted. Use of the material on Kerr-McGee-owned land serves a useful purpose in that a substantial portion of the raffinate (about 50% if we approve the latest request) can be disposed of in this manner and, on an interim basis, limits the storage ponds capacity needs.

For your information, attached is information on the radioactivity content of commercial fertilizers versus the Kerr-McGee-treated raffinate.

8512170190 800418
PDR ADOCK 04008027
C PDR

OFFICE	FCUP	FCUP			
SURNAME	W. Nixon:sh	WTCrow			
DATE	4/17/80	4/18/80			

Question 7:

If any commercial fertilizer materials are to be applied to any of the test areas in 1980, estimate the amount of radioactivity to be added from these sources per unit acre, and identify the isotopic composition of the addition. Provide details of the estimates.

Response:

Although the exact amount of commercial additives (Lime, P_2O_5 and K_2O) required on treatment acreage during 1980 will be determined by soil tests, result of 1979 additions to treatment areas (160 and 270-acre) are provided below. Quantities of commercial additives needed were determined by soil testing conducted prior to 1979 raffinate treatments:

1979 Commercial Additive	Quantity Applied Acre	x	Analyses			=	Amount Added/acre		
			pCi/g		µg/g		µCi		g
			Ra-226	Th-230	U		Ra-226	Th-230	U
Lime	2.86 Tons		.05	.032	.2		.129	.08	.52
P_2O_5	174 lbs.		15.5	34.2	227		1.22	2.7	17.9
K_2O	133 lbs.		.15	.11	.42		.009	.006	.02
Total Amount/Commercial Additives/Acre							1.358	2.786	18.44

At an average of 600 lbs. N/acre application rate of treated raffinate, (average analysis 1979: 29.2 g N/l; .65 pCi Ra-226/l; .028 pCi Th-230/l; and .044 mg U/l), each acre received .006 µCi Ra-226; .0002 µCi Th-230; and .4 g U as a result of raffinate applications.

Based upon these analyses, additions to treatment area soils from combined commercial additives during 1979 contributed 226 times more Ra-226, 45 times more U, and 13,930 times more Th-230 than additions from treated raffinate. Compared to commercial additives used at recommended application rates, radionuclide addition from treated raffinate is insignificant.

FROM Kerr-McGee Nuclear Corp.		DATE OF DOCUMENT 4/7/80	DATE RECEIVED 4/30	NO 16031
TO W. Nixon		LTR <input checked="" type="checkbox"/>	MEMO <input type="checkbox"/>	REPORT <input type="checkbox"/>
CLASSIF un		ORIG 1	CC <input type="checkbox"/>	OTHER <input type="checkbox"/>
POST OFFICE un		ACTION NECESSARY <input type="checkbox"/>		CONCURRENCE <input type="checkbox"/>
REG. NO.		NO ACTION NECESSARY <input type="checkbox"/>		COMMENT <input type="checkbox"/>
DESCRIPTION (Must Be Unclassified) copy of corrected page 1.		FILE CODE 40-8027	DATE ANSWERED BY	
ENCLOSURES		REFERRED TO Reg File cy	DATE 4/22	RECEIVED BY DLC
		FCUF (4)		
		I&E (2)		
		PDR		
		LPDR		
REMARKS				
			16031	HEX

U. S. NUCLEAR REGULATORY COMMISSION

MAIL CONTROL FORM

FORM NRC-326
(1-75)

40-8027

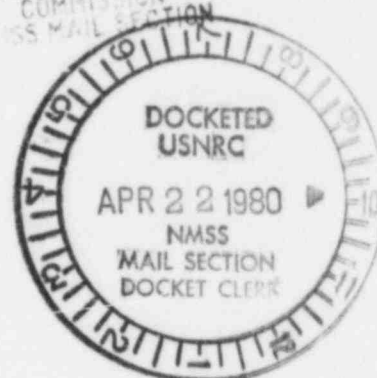
**KERR-McGEE**

KERR-McGEE CENTER • OKLAHOMA CITY, OKLAHOMA 73125

REGULATORY OPERATIONS
FILE COPY
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April 7, 1980

APR 14 AM 9 05

U.S. NUCLEAR REG.
COMMISSION
MAIL SECTION

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. William A. Nixon
 Uranium Process Licensing Section
 Uranium Fuel Licensing Branch
 Division of Fuel Cycle & Material Safety
 U. S. Nuclear Regulatory Commission
 Washington, D. C. 20555

RE: Correction to Letter, April 3, 1980, Docket 40-8027

Dear Mr. Nixon:

Please refer to the letter to you dated April 3, 1980 transmitting additional information on the 1980 treated raffinate fertilizer program to be conducted at the Sequoyah Facility.

Page 1 has been corrected to indicate October, 1981 instead of October, 1980 as the date the next treated raffinate pond is expected to reach capacity. The correct date was given on the attached table in our original response.

If you require additional information, please contact me.

Very truly yours,

W. J. Shelley, Director
 Regulation and Control

WJS/hmw

Enclosure

FEE EXEMPT

8005130020 3PP

16031

Question 1:

Provide a material balance-and-flow diagram for the raffinate treatment system, starting with raffinate from the uranium purification circuit.

Response:

The projected raffinate inventory and operation of the raffinate treatment system are as follow:

	<u>1000's Gallons</u>
1) Raffinate Annual Production rate:	7,200
2) Existing Inventory Pond 2:	17,587 (untreated)
3) Existing Inventory Pond 3E:	12,072 (treated)
4) Treatment Capacity:	1,500 gal./mo.

<u>Pond Capacities</u>	<u>1000's Gallons</u>
P ₁ (Clarifier A)	7,860
P ₂	18,300
P ₃ E	14,430
P ₃ W	14,430
P ₄ (under construction)	<u>14,430</u>
Total	69,690

With expected utilization for fertilizer during 1980 and projecting additions of rainfall vs. evaporation, Pond 3E will be at capacity by the end of March, 1980. The next treated raffinate pond (capacity: 14,430,000 gallons) is expected to reach capacity by end of October, 1981 (Refer to attached table).

FROM Kerr-McGee Nuclear Cor		DATE OF DOCUMENT 4/7/80		DATE RECEIVED 4/4/80		NO 16030	
TO W.Nixon		LTR X		MEMO		SPORT	
		ORIG 1		CC		OTHER	
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REG NO		FILE CODE 40-8027		COMMENT <input type="checkbox"/>		DATE ANSWERED	
DESCRIPTION (Must Be Unclassified)		REFERRED TO		DATE		RECEIVED BY	
corrected copy of page 4-2 of license amendment dated May 10, 1979.		Reg File cy		4/22			
		FCUF (4)					
		I&E (2)					
		PDR					
		LPDR					
ENCLOSURES							
REMARKS							
						16030 DLC	

U. S. NUCLEAR REGULATORY COMMISSION

MAIL CONTROL FORM

FORM NRC-326
(1-75)

40-8027
2C



KERR-McGEE NUCLEAR CORPORATION
KERR-McGEE CENTER • OKLAHOMA CITY, OKLAHOMA 73125

REGULATORY OPERATIONS
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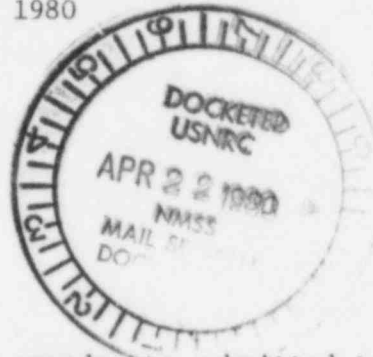
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CERTIFIED MAIL - RETURN RECEIPT REQUESTED

U.S. NUCLEAR REG.
COMMISSION
MISS MAIL SECTION

April 7, 1980

William A. Nixon
Uranium Fuel Licensing Branch
Mail Stop 396 SS
US Nuclear Regulatory Commission
Washington D. C. 20555



Dear Mr. Nixon:

During a recent review of the license amendments submitted to you on May 10, 1979, an error was discovered on page 4-2. The sentence beginning on the third line of paragraph 4.2 should read "Daily grab samples are analyzed for temperature, pH, uranium, nitrate and fluoride for purposes of control".

We have taken the liberty of correcting this page and have attached eight (8) copies to replace those currently in your file.

We regret this apparent typographical error and wish to assure you that this procedure has been in effect during the entire period.

Sincerely,

W. J. Shelley
W. J. Shelley, Director
Regulation and Control

WJS/pls

Attachments

FEE EXEMPT
info only

~~8445134429~~

3pp

16030

Environmental Surveillance

The combined liquid effluent stream consisting of the fluoride treatment effluent, the sanitary water treatment system discharge, the overflow from the recirculating cooling water system, and the bypassed plant intake water is sampled continuously at the point where it leaves the immediate plant-area south of the port access road. Daily grab samples are analyzed for temperature, pH, uranium, nitrate and fluoride for purposes of control. Monthly continuous samples and monthly composites are analyzed for uranium, gross alpha, gross beta, thorium 230, nitrate and fluoride. The samples are also analyzed quarterly for radium 226. In addition, the four individual streams are sampled and analyzed every two weeks to pin-point the major source of contamination.

The Illinois and Arkansas River are sampled monthly and quarterly respectively, upstream and downstream of the plant outfall and are analyzed for uranium, gross alpha, gross beta, nitrate and fluoride. Radium 226 is analyzed quarterly. A fault well and an onsite farm pond are sampled semi-annually. The Carlisle School pond is currently sampled monthly until a new rural water system pipeline is installed at which time the sample frequency will be semi-annual. The fault well, farm pond and school pond are analyzed in the same manner as the river water samples.

Seepage monitor wells are located near the raffinate and fluoride treatment and storage ponds. These are shown in figures IV (a), IV (b) and described on page 4-9.

Air samples are taken along the restricted area fence line (east, west, north, south) and counted daily for radioactive particulate matter. One week continuous air samples are taken each month for fluoride analysis. Similarly, air samples are taken weekly at 750 feet east of the plant, 1/2 mile SW of the plant, at the Carlisle School, at Hwy. 64 North and I-40 South of the plant. The 750 feet east location and 1/2 mile SW location are composited quarterly and analyzed for gross alpha, U, Th-230 and Ra-226.

Soil samples and vegetation samples are collected and analyzed each April and October. These are collected at 1000 feet and 6000 feet distances from the plant in the cardinal compass directions. They are analyzed for uranium and fluoride.

License No. <u>SUB-1010</u>	Docket No. <u>40-8027</u>
Amend No. _____	Date <u>4-1-80</u> Section _____
Replaces _____	Dated <u>5-10-79</u>

Page

4-2

Docket No. 40-8027

30 Davis
4/17/80

W. T. Taylor
"LICENSE AMENDMENTS"

894

William O. Miller, License Fee Management Branch, ADM

MATERIALS LICENSE AMENDMENT CLASSIFICATION

Applicant: Perr - McGee
License No: _____ Fee Category: 2C
Application Dated: 4/7/80 Received: 4/14/80
Applicant's Classification: _____

The above application for amendment has been reviewed by NMS in accordance with §170.31 of Part 170, and is classified as follows:

1. Safety and Environmental Amendments to Licenses in Fee Categories 1A through 1H, 2A, 2B, 2C, and 4A
 - (a) _____ Major safety and environmental
 - (b) _____ Minor safety and environmental
 - (c) _____ Safety and environmental (Categories 1D through 1G only)
 - (d) _____ Administrative
2. Justification for reclassification: _____

3. The application was filed (a) _____ pursuant to written NRC request and the amendment is being issued for the convenience of the Commission, or (b) ☒ Other (State reason): _____

Signature W. T. Taylor
Division of Fuel Cycle & Material
Safety

Date 4/16/80

16030

FROM Kerr-McGee		DATE OF DOCUMENT 4/3/80		DATE REC'D 4/7/80		NO 15945	
		LTR X		MEMO		REPORT	
		OTHER					
TO Director		ORIG. 1		CC 7		OTHER	
		ACTION NECESSARY <input type="checkbox"/>		CONCURRENCE <input type="checkbox"/>		DATE ANSWERED	
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CLASSIF un		POST OFFICE		FILE CODE 40-8027			
REG NO.							
DESCRIPTION: (Must Be Unclassified)		REFERRED TO		DATE		RECEIVED BY	
additional info on the 1980 fertilizer program to be con- ducted at the Sequoyah facility		Reg File cy		4/11			
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U. S. NUCLEAR REGULATORY COMMISSION

MAIL CONTROL FORM

FORM NRC-326
(1-75)

40-8027

**KERR-McGEE**

KERR-McGEE CENTER • OKLAHOMA CITY, OKLAHOMA 73125

April 3, 1980

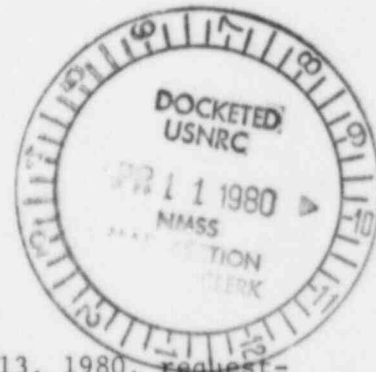
REGULATORY OPERATIONS
FILE COPY

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. William A. Nixon
 Uranium Process Licensing Section
 Uranium Fuel Licensing Branch
 Division of Fuel Cycle & Material Safety
 U. S. Nuclear Regulatory Commission
 Washington, D. C. 20555

RE: Docket 40-8027

Dear Mr. Nixon:



Please refer to your letter dated March 13, 1980, requesting additional information on the 1980 fertilizer program to be conducted at the Kerr-McGee Nuclear Sequoyah Facility.

Attached are responses for your timely consideration and if you require additional information, please contact me.

Very truly yours,

W. J. Shelley
 W. J. Shelley, Director
 Regulation and Control

WJS/hmw

Enclosures

15945

8405120076

7pp

FEE EXEMPT

Question 1:

Provide a material balance-and-flow diagram for the raffinate treatment system, starting with raffinate from the uranium purification circuit.

Response:

The projected raffinate inventory and operation of the raffinate treatment system are as follow:

	<u>1000's Gallons</u>
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2) Existing Inventory Pond 2:	17,587 (untreated)
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<u>Pond Capacities</u>	<u>1000's Gallons</u>
P ₁ (Clarifier A)	7,860
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Total	69,690

With expected utilization for fertilizer during 1980 and projecting additions of rainfall vs. evaporation, Pond 3E will be at capacity by the end of March, 1980. The next treated raffinate pond (capacity: 14,430,000 gallons) is expected is expected to reach capacity by end of October, 1980 (Refer to attached Table).

PROJECTED RAFFINATE INVENTORY

REV. # 7		UNTREATED				TREATED				
03/17/80		CLAR-A & POND#2				PONDS#3E, 3W, 4, 5, & 6				

DATE	RAIN	EVAP	INTO	OUT	TOTAL	RAIN	EVAP	INTO	OUT	TOTAL
*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
					17587					12072
MAR 31	979	320	600	1500	17346	382	207	1500	0	13746
APR 30	1107	612	600	1500	16941	432	417	1500	0	15261
MAY 31	1367	590	600	1500	16819	1067	638	1500	590	16600
JUN 30	1235	693	600	1500	16460	963	774	1500	648	17641
JUL 31	920	813	600	1500	15667	718	930	1500	600	18329
AUG 31	859	759	600	1500	14867	670	881	1500	624	18994
SEP 30	1135	530	600	1500	14572	885	623	1500	0	20756
OCT 31	892	404	600	1500	14160	696	492	1500	0	22460
NOV 30	810	256	600	1500	13814	632	322	1500	0	24270
DEC 31	547	325	600	1500	13136	427	421	1500	0	25776
JAN 31	458	155	600	1500	12539	357	205	1500	0	27427
FEB 28	608	212	600	0	13535	475	289	0	0	27612
MAR 31	979	320	600	0	14794	764	438	0	0	27939
APR 30	1107	612	600	0	15839	860	840	0	0	27962
MAY 31	1367	590	600	0	17267	1067	810	0	590	27629
JUN 30	1235	693	600	0	18409	963	947	0	648	26997
JUL 31	920	821	600	0	19108	718	1101	0	600	26014
AUG 31	859	786	600	0	19781	670	1012	0	624	25048
SEP 30	1135	551	600	1500	19455	885	606	1500	0	26738
OCT 31	892	424	600	1500	19023	696	545	1500	0	28368
NOV 30	810	265	600	1500	18669	632	354	1500	0	30166
DEC 31	547	331	600	1500	17985	640	581	1500	0	31725
JAN 31	458	155	600	1500	17388	535	283	1500	0	33478
FEB 28	608	212	600	1500	16884	712	398	1500	0	35292
MAR 31	979	320	600	1500	16643	1146	614	1500	0	37324
APR 30	1107	612	600	1500	16238	1295	1220	1500	0	38919
MAY 31	1367	590	600	1500	16116	1600	1177	1500	590	40252
JUN 30	1235	693	600	1500	15758	1445	1403	1500	648	41145
JUL 31	920	813	600	1500	14965	1077	1662	1500	600	41460
AUG 31	859	759	600	1500	14164	1005	1557	1500	624	41784

NOTES

ALL QUANTITIES ARE IN THOUSANDS OF GALLONS

RAINFALL BASED ON 30 YEAR AVERAGE

EVAP. RATES ARE 70%(N0AA)23 YR. AVE. CLASS A PAN RATES

POND CAPACITIES

CLAR-A=7860

POND#2=18300

PONDS#3E, 3W, 4, 5, & 6=14430 EA.

GALLONS PER INCH OF RAIN

CLAR-A=124.7

POND#2=130.9

PONDS#3E, 3W, 4, 5, & 6=99.7 EA

Question 2:

Will buffer zones be established along the borders of Kerr-McGee-owned property?

Response:

As stated in our request for amendment dated January 29, 1980, buffer zones will be maintained within 100 feet of existing stream channels. As timber clearing will be required over much of the expansion area, timber strips may be left along the borders of Kerr-McGee-owned property in these areas. However, beyond the identification of property boundaries for sprayer application, no special provision for a buffer zone is considered necessary.

Question 3:

Compare the annual production of treated raffinate to that expected to be used for fertilizer in 1980, assuming that the total requested acreage is treated.

Response:

The following assumptions were used to provide an estimate of maximum 1980 raffinate fertilizer use:

- 1) Annual raffinate production: 7.2×10^6 gallons
- 2) Average concentration: 30 g N/l = 250 lbs. N/1000 gallons
- 3) Fertilizer rate: 600 lbs. N/acre
- 4) Treated acreage: $160 + 270 + 885 = 1315$ acres
- 5) 1980 fertilizer use: 2400 gallons/acre (600 lbs. N/acre rate) x 1315 acres =
 3.15×10^6 gallons

This rate of use requires (1) immediate USNRC approval of the amendment request in order that timber clearing can commence in the expansion area, (2) commencement of fertilizer treatment in May, 1980, and (3) good growing season conditions.

Question 4:

Describe in detail the location, number and schedule for soil, water and vegetation tests to be performed on the 160, 270 and 885-acre sites during 1980. If the sampling program for 1980 for the 160 and 270-acre areas differ from the 1979 program, identify the differences and state reasons for the changes.

Response:

The attached figure has been revised to indicate sampling locations used for collection of water, soil and vegetation during 1979 on the 160 and 270-acre areas. Following clearing in the expansion area, specific locations for soil nitrate sampling will be established in conjunction with OSU Agronomy personnel. Adequate sampling will be conducted in this area to establish soil N loading rates.

During 1980, the same locations on the 160 and 270-acre areas will be used for collection of water (both surface and groundwater) and soil samples. The sampling frequency and reporting schedule is outlined in the amendment request. Surface runoff water from these areas will be sampled prior to release and is subject to discharge limitations as specified by EPA-NPDES permits.

As outlined, the 1980 monitoring program on the 160 and 270-acre areas differs from the 1979 program in the following areas: (1) No vegetation sampling will be conducted, (2) For groundwater, with the exception of Ra-226 and nitrate, analyses of other parameters has been discontinued, (3) Residual nitrates ($\text{NO}_3\text{-N}$) will be the only parameter monitored in soil samples, and (4) Sample frequency of groundwater monitor wells will be changed to once per year instead of monthly.

As demonstrated through small plot testing (1973-76) and large scale use of raffinate fertilizer (1977-79), it has been shown that impact of raffinate fertilizer use is similar to use of commercial ammonium-nitrate fertilizer. As such, the same fertilizer management practices apply to use of both fertilizer products. Proper N fertilizer management practices include: (1) establishment of soil residual $\text{NO}_3\text{-N}$ levels, (2) plant residue management, and (3) timing of N fertilizer applications to insure uptake by

plants. The 1980 monitoring program has been modified based upon results of extensive collection and analyses of seven years of information related to raffinate fertilizer use.

Results of previous monitoring have identified the areas of environmental concern related to raffinate fertilizer use and these areas are addressed in the proposed 1980 monitoring program.

Question 5:

Show, on a chart similar to Figure 1 of the application, the locations of any businesses, schools, or occupied residences, on or within 400 feet of the boundaries of the parcels of land comprising the 885 new test acres. On the same chart, locate any water wells within the same distance from the boundaries.

Response:

Refer to Figure 1 (attached).

Question 6:

Describe any special provisions to be taken to prevent fertilizer components from entering the several ponds located on, or within 400 feet of the proposed new test acreage.

Response:

Based upon results of previous monitoring programs, (refer to 1978 Completion Report, SUB1010 Amendment #9 Table 12, page 27), no special provisions are required to prevent fertilizer components from entering ponds located on or within 400 feet of the proposed new treatment acreage. Fertilizer management practices (identified in Response 4) will be implemented and are the only provisions necessary to control possible impact to the hydrologic system of the treatment acreage.

Question 7:

If any commercial fertilizer materials are to be applied to any of the test areas in 1980, estimate the amount of radioactivity to be added from these sources per unit acre, and identify the isotopic composition of the addition. Provide details of the estimates.

Response:

Although the exact amount of commercial additives (Lime, P_2O_5 and K_2O) required on treatment acreage during 1980 will be determined by soil tests, result of 1979 additions to treatment areas (160 and 270-acre) are provided below. Quantities of commercial additives needed were determined by soil testing conducted prior to 1979 raffinate treatments:

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			Ra-226	Th-230			Ra-226	Th-230	
Lime	2.86 Tons		.05	.032	.2	.129	.08	.52	
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K ₂ O	133 lbs.		.15	.11	.42	.009	.006	.02	
Total Amount/Commercial Additives/Acre							1.358	2.786	18.44

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Based upon these analyses, additions to treatment area soils from combined commercial additives during 1979 contributed 226 times more Ra-226, 45 times more U, and 13,930 times more Th-230 than additions from treated raffinate. Compared to commercial additives used at recommended application rates, radionuclide addition from treated raffinate is insignificant.

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NUMBER OF PAGES: 1

ACCESSION NUMBER(S):

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