Regulatory File Cy.

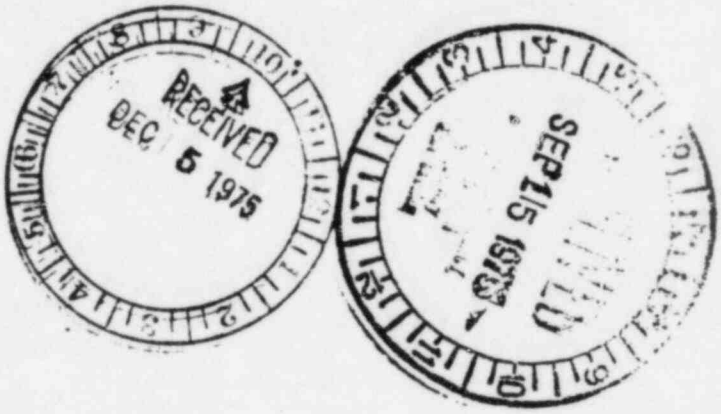
40-802,

Environmental File

KERR-McGEE NUCLEAR CORPORATION

KERR-McGEE CENTER • OKLAHOMA CITY, OKLAHOMA 73125

September 11, 1975



Richard B. Chitwood, Chief
Fuel Cycle Environmental
Projects Branch
Division of Materials and
Fuel Cycle Facility Licensing
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Chitwood:

Please refer to your letter of July 14, requesting that certain additional information be supplied to the environmental data submitted on June 27, 1975.

This data is enclosed as an attachment to this letter. Please let us know if you need additional or more detailed data.

Very truly yours,

W. J. Shelley, Director
Regulation and Control

WJS:ml

Attachment

1869

76

KERR-McGEE NUCLEAR CORPORATION

LICENSE #SUB-1010, DOCKET #40-3027

ADDITIONAL ENVIRONMENTAL INFORMATION
REQUESTED JULY 14, 1975

1. A comparison of the discharge rates and concentrations of each major radiological and non-radiological contaminant in the plant air and water effluents before and after the proposed expansion.

   Answer: See attached Tables I and III.

2. Calculations of the estimated maximum and annual average air concentrations of these radiological and non-radiological contaminants at the most restrictive site boundary and at the offsite location where the maximum concentration occurs.

   Answer: See attached Tables I and II.

3. Estimation of the annual radiological doses to an individual at the most restrictive site boundary and at the offsite location where the maximum concentration occurs.

   Answer: See attached Table II.

4. Estimation of water concentration values of radiological and non-radiological contaminants at or near the point of discharge and at a location where complete mixing has occurred.

   Answer: Table V illustrates the concentrations attributable to Kerr-McGee's Sequoyah Facility Liquid Effluents. As can be seen from Table IV when actual analyses are made of the upstream versus downstream samples, little or no additional contaminants can be attributed to the plant's combination stream.

5. Comparison of the concentrations of non-radiological contaminants with applicable federal or state standards.

   Answer: See attached Tables I and III.

6. A description of all proposed new air and water pollution control devices. Provide information on the efficiency of each system and methods that will be used to determine that systems are operating properly.

Answer: No additional air and water pollution control devices are included in the expansion program. Installed capacities of all units are of sufficient size to accommodate the anticipated load of the expanded capacity.

A new ion exchange unit is being installed currently on the discharge from the sanitary lagoon to remove the uranium carried into this stream from laundry and sanitary fixtures. It is anticipated that this unit will remove approximately 1/3 of the current quantity of uranium being discharged through the combination stream. The system will be controlled by daily measurements of the lagoon effluent prior to and after treatment and the unit regenerated upon evidences of ion resin loading.

7. Specify the quantity and composition of raffinate waste that will be discharged from the plant at the expanded level. In addition, analyze the effect of the additional raffinate waste on the overall raffinate disposal problem.

Answer: The quantity of raffinate waste discharged from the plant at the expanded level will be approximately twice as much as at current capacity level. The effect of this additional raffinate waste will be to increase the quantity available for discharge through the commercial disposal system proposed in the information submitted for consideration on August 14, 1975. It is not anticipated that any change of composition will be measurable beyond that expected with varying sources of feed materials as described previously.

8. Specify the authorities that have been contacted concerning your expansion activities and briefly describe the status of necessary licenses and permits that will be required.

Answer: The authorities contacted concerning expansion activities are as follows:

(1). Corps of Engineers

Storage of water in Tenkiller Reservoir. The current contract for water storage is sufficient for the use at the expanded capacity.

(2). Oklahoma Water Resources Board

Allocation of Surface Water Permit. Original application provides adequate volume for the expanded capacity of the plant.

Waste Discharge Permit. A new waste discharge permit application has been filed with the Board, and approval is expected well before required date of July 1977.

(3). Environmental Protection Association

Waste Discharge Permit Application, #OK-076-OY12-000111. Modification for additional discharge was applied for on June 30, 1975, and by letter dated August 26, 1975, Region VI, Dallas, Texas, notified Kerr-McGee that the expansion will not constitute a new source as defined by Section 306, Public Law 92-500.

(4). Oklahoma Air Pollution Control Board.

No additional authorities have been contacted regarding the proposed expansion, and no known additional permits will be required.

TABLE I

AIR-BORNE EFFLUENT SUMMARY
Level of Production
Present Level = 5000 Short Tons U/Yr., Expanded Level = 10,000 Short Tons U/Yr.

	Metric Tons per Month Level of Production		Grams per second Level of Production		Highest Concentration, $\mu g/m^3$ Distance: 1/2 mile SW Level of Production		Ambient Air Qty. Stds.
ITEM	Present	Expanded[1]	Present	Expanded	Present	Expanded	$\mu g/m^3$
NOx	6.05[3]	12.09	2.303	4.606	1.15	2.30	100[4]
SO_2	1.51[2]	4.10	0.574	1.558	0.287	0.779	60[5]
Fluoride	0.101[2]	0.174	0.0384	0.0661	0.0726	0.1244	.5[6]
Fluoride (Ground)	0.030[2]	0.032	0.004	0.004			
Hexane	9.7	14.0	3.69	5.33	*	*	15.88g/sec[7]

(1) Information Source: Table II - page 24 June 1975 Environmental Information on Expansion.
(2) Information Source: Table XI(Revised) - page 12 Jan. 1973 App. Environmental Report Supplemental #2.
(3) Information Source: Historic Records - 1974
(4) EPA National Primary and Secondary Ambient Air Quality Standard.
(5) EPA National Secondary Ambient Air Quality Standard
(6) State of Washington Ambient Air Fluoride Standard
(7) Oklahoma State Health Department, Air Quality Services, Environmental Service - Guidelines for Interpretation and Enforcement of Regulation No. 15 (15.33)

TABLE I

EXAMPLE CALCULATION

NO_x

Historical Data - $\underline{6.045}$ $\frac{\text{MT } NO_2}{\text{Month}}$ (Present Level)

Plant Expansion Rate Double NO_x Level

Thus: $6.045 \times 2 = \underline{12.09}$ $\frac{\text{MT } NO_2}{\text{Month}}$

Conversion Factor

$$\frac{\text{Metric Ton /Month}}{\text{Seconds/Month}} = \frac{1{,}000{,}000 \text{ gms}}{2{,}626{,}560 \text{ sec.}} = .3807261$$

$$\frac{\text{MT } NO_2}{\text{Month}} \times .3807261 = \begin{matrix} 6.045 \times .381 = 2.303 \text{ g/sec.} \\ 12.09 \times .381 = 4.606 \text{ g/sec.} \end{matrix}$$

Present

$$X = 2.303 \frac{.991 \text{ } \mu g/m^3 \text{ (A)}}{1.98 \text{ g/sec.}}$$

Expanded

$$X = 4.606 \frac{.991 \text{ } \mu g/m^3 \text{ (B)}}{1.98 \text{ g/sec.}}$$

(A) Ratio Data from Dames & Moore Report, Applicants Env. Rept., June 1972

(B) Table I

TABLE II

RADIOLOGICAL AIRBORNE

EFFLUENT SUMMARY

-RELEASE*-

SOURCE	RELEASE RATE
Ground Soluble	2.4×10^{-11} ci/sec.
Ground Insoluble	4.1×10^{-10} ci/sec.
Stack Soluble	2.2×10^{-11} ci/sec.
Stack Insoluble	5.8×10^{-12} ci/sec.

--DOSAGE--

	Max. Conc. Pt.(1) Millirem/Yr.	Offsite(2) Millirem/Yr.	1 Mile SW(3) Millirem/Yr.
Lung	6.37	5.36	1.970
Bone	.0671	.06	.021
Kidney	.275	.234	0.087

*Since the effectiveness of the filter system stays at a constant, no appreciable increase in airborne radiological contaminants is noted in the expansion.

(1) Maximum concentration point is 1/2 mi. S.W. of Plant (Dames & Moore Study, Applicant's Environmental Report Supp. #2, December 1972).

(2) Offsite - State Highway 10 (750 ft. E. of Plant). (KM letter, App. B, dated April 9, 1973 to L. C. Rouse, AEC).

(3) Continued Occupancy at I-40 (Dames & Moore Study, Applicant's Environmental Report Supp. #2, December 1972).

TABLE III

LIQUID EFFLUENT SUMMARY

Level of Production
Present Level = 5000 Short Tons U/yr. Expanded Level = 10,000 Short Tons U/yr.

ITEM	UNITS	AVG. ($\bar{X}$) RANGE (R)	PRESENT[1]	EXPANDED	ILL ppm[4]	ROBERT S. KERR[5]	LIMITS	UTL[3] ILL	UTL[3] ARK
Temp	F	R	49°-78°	49°-78°	*	43.8-80.5	+5.0 entire stream		
pH		R	7.1-8.1	(2)	7.1-8.4	7.6-8.2	6.5 to 8.5	6.5-8.5	6.5-8.5
TDS	mg/l	$\bar{X}$ R	121 104-152	(2)	220-731	197-434	127 Ill. 665 ARK.	144	860
D-O_2	mg/l	R	6.4-11.2	(2)		7.6-11.6	>6		
$CACO_3$	mg/l	R	55-80	(2)	92-410	88-102			
Cl	mg/l	$\bar{X}$ R	7.5 1.05-20	(2)	1.2-300	48-150	12.1 Ill. 1487 Ark.	17.2	1876
SO_4	mg/l	$\bar{X}$ R	15.83 11-21	14.9	3.2-33.0	29-56	12.5 Ill. 139 Ark.	15.9	172
NH_3	mg/l	R	0.2-0.7						
NO_3	mg/l	$\bar{X}$ R	0.8-2.0	1.31	* 0.0-7.8	* 1.7-17	10.16		
F	mg/l	$\bar{X}$ R	0.6-0.8	1.83	*	*	1.7		
U	µci/ml	$\bar{X}$ R	43.9×10^{-8}	87.9×10^{-8}		*	3×10^{-5}		

* Information not available.

1) Actual measurements, reported monthly to OWRB
2) No increase is present due to nature of plant operations. Contaminants levels due to raw water concentrations.
3) State of Oklahoma Standards, Okla. Water Quality Standards, 1973.
4) Appraisal of the water and related land resources of Oklahoma, Region Nine, OWRB Report 1971
5) Water Resources Data for Okla., USGS, 1974.

TABLE IV

1974 ILLINOIS RIVER ENVIRONMENTAL SAMPLES

(N,F - mg/l; U - μCi/ml x 10^{-6}; α,β,Ra - pCi/l)

Upstream	Analysis	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
	Nitrate	0.2	0.2	0.5	0.8	0.6	0.2	0.5	0.3	0.2	0.2	0.1	0.6
	Fluoride	<0.5	<0.5	<0.5	<0.5	0.4	0.8	0.5	0.9	0.7	0.2	0.2	0.9
	Gross α	<8.	<8.	<8.	<8.	<8.	<8.	<7.	<8.		<14.		
	Gross β	<22.	<25.	<20.	<25.	<26.	<19.	<15.	<16.		<38.		
	Uranium	3.2	2.7	.7	.7	.7	.5	.5	.5	1.1	.5	3.1	.9
	226-Ra			<0.07			0.30						
Downstream	Nitrate	0.6	<0.2	0.4	0.7	0.4	0.2	0.5	0.3	0.1	0.4	0.1	0.6
	Fluoride	<0.5	<0.5	<0.5	0.7	0.8	0.2	0.3	0.3	0.6	0.3	0.2	0.3
	Gross α	<8.	<8.	<8.	<8.	15.	<8.	9.	20.		<14.		
	Gross β	<22.	<25.	<20.	<25.	<26.	<19.	<15.	<16.		<38.		
	Uranium	5.2	5.4	.9	.8	.6	.5	.7	.7	.5	.5	3.2	.5
	226-Ra			<0.07			0.14						

TABLE V

LIQUID EFFLUENT DISPERSION
(Chemical - mg/l, U - uCi/ml)

	Combination Stream	Complete Mixing[1]
Uranium	87.9×10^{-8}	$.338 \times 10^{-8}$
SO_4	14.9	.057
NO_3	1.31	.005
Fluoride	1.83	.007

(1) Complete Mixing - is that portion of the contaminants attributable to the combination stream. As clearly indicated in Table III, this is a fraction of the contaminants in the river.

Dilution Factor:

35 yr. Avg Discharge Rate of Illinois River (Water Resources Data for Oklahoma, U.S. Geological Survey, 1973) = 1506 cfs x 60 sec. = 90,360 cfm = 675,892.8 gpm.

$$\frac{\text{Seq. Disch. Rate (gpm)}}{\text{Ill. River Disch. Rate (gpm)}} = \frac{2600 \text{ gpm}}{675{,}892.8 \text{ gpm}} = .0038467$$