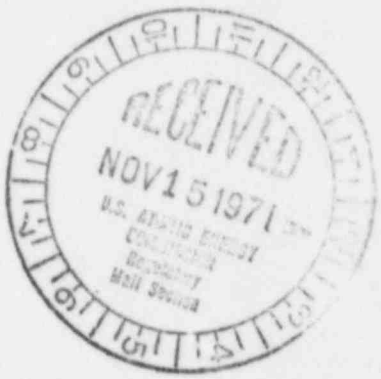
DOCKET NO. 70-1193
40-8027

KERR-McGEE

KERR-McGEE BUILDING • OKLAHOMA CITY, OKLAHOMA 73102

Regulatory File Cy.

November 13, 1971



Mr. L. M. Muntzing
Director of Regulations
United States Atomic Energy Commission
Washington, D. C. 20545

Dear Mr. Muntzing:

Please refer to our submission dated October 15, 1971, of the "Show Cause" statement required by Revised Appendix D of 10CFR50 for our licenses SUB-1010 and SNM-1174.

Upon more complete and substantive review by corporate personnel and additional examination of the events which preceeded the issuance of the revised amendment, we conclude that our submission referred to above is inadequate for your purposes. We desire to submit additional material and, after review, have concluded that complete replacement would be most appropriate. Consequently, we are sending 50 copies each of a "Show Cause" statement for the subject licenses, revised completely in format and content to meet what we now believe to be your requirements more adequately. Five copies of each accompany this letter; the balance have been mailed separately.

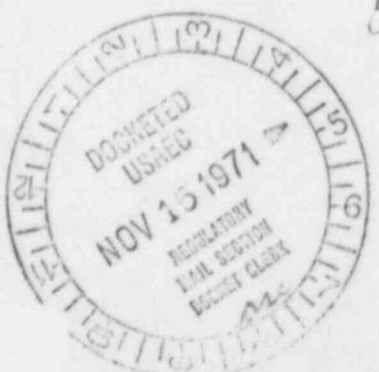
We appreciate your willingness to consider using such a resubmission. We would be happy to discuss all or part of these revisions at your convenience.

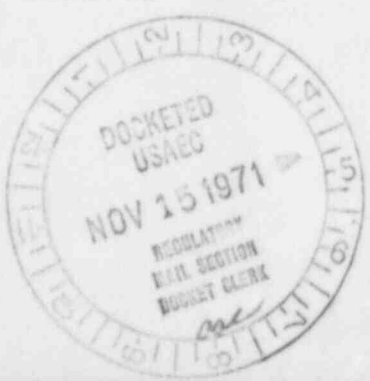
Sincerely,

W. J. Shelley

W. J. Shelley
Director, Regulation and Control

WJS:srj
Enclosures





4321

8512200194 711113
PDR ADOCK 04008027
C PDR

FROM: Kerr-McGee Corporation
Oklahoma City, Okla.
(W. J. Shelley)

DATE OF DOCUMENT: 11-12-71
DATE RECEIVED: 11-15-71
NO.: 4991

LTR. x MEMO: REPORT: OTHER:

TO: L. Muntzing

ORIG.: 1 CC: OTHER:

ACTION NECESSARY ☐ NO ACTION NECESSARY ☐
CONCURRENCE ☐ COMMENT ☐
DATE ANSWERED: BY:

CLASSIF: U POST OFFICE REG. NO:

FILE CODE: DOCKETS: 70-1193 & 40-8027

DESCRIPTION: (Must Be Unclassified)
Ltr. trans. the following which completely revised their 10-15-71 submission of the "show cause" statements.....:

ENCLOSURES:
(50 copies each)
"Show Cause" statement for the Cimarron Pu Production Plant, notarized 11-12-71...

"Show Cause" statement for the Sequoyah UF_6 Production Plant, notarized 11-12-71..

REMARKS:

REFERRED TO	DATE	RECEIVED BY	DATE
D. Nussbaumer: w/2 cys. --	11-16	FOR ACTION (70-1193)	
C. Buchanan: w/2 cys. --	11-16	FOR ACTION (40-8027)	
Distribution:			
2-reg. file cys.		1-R. Cunningham, DML	
2-AEC PDR		1-L. Rogers, REP	
2-CO (Hdqtrs)		1-J. DiNunno (A-170)	
1-C. Henderson		1-R. Faulkner (E-1120)	
1-J. [illegible], BR		1-C. Miles, (C-479)	
1-Shaper, OGC (P-506B)		1-NSIC	
4-C. Edwards, DML		1-DTIE	

DO NOT REMOVE

ACKNOWLEDGED

U.S. ATOMIC ENERGY COMMISSION MAIL CONTROL FORM FORM AEC-326S (6-60)

☆ U.S. GOVERNMENT PRINTING OFFICE: 1970—406-979

DOCKET NO. 40-[illegible]27

Regulatory File Cy.

RECEIVED
NOV 15 1971
U.S. ATOMIC ENERGY COMMISSION
Regulatory Mail Section

KERR-McGEE CORPORATION

SEQUOYAH URANIUM HEXAFLUORIDE PRODUCTION PLANT

LICENSE SUB-1010

Section E, Appendix D. Statement

REVISED

I. Introduction

Pursuant to Section E of Appendix D, 10CFR Part 50, as revised effective September 9, 1971, Kerr-McGee Corporation respectfully submits the following written statement of reasons, with supporting factual data, why, with reference to the established criteria, operation of Kerr-McGee's Sequoyah Uranium Hexafluoride Production Plant, License SUB-1010, should be permitted to continue pending completion of NEPA environmental review under Section B of the revised Appendix D.

A. Physical Description

The Sequoyah Facility is located at the western edge of Sequoyah County in eastern Oklahoma on a 2100-acre site at the junction of the Illinois and Arkansas Rivers. The Facility occupies an area of approximately 75 acres near the center of the site. The nearest populated area is the town of Gore, Oklahoma, located on U.S. Highway 64 approximately two miles northwest from the Sequoyah site. The town of Vian is located four miles to the east along Highway 64.

B. Site Selection

The site was selected at the conclusion of a study of available sites in eastern Oklahoma after consideration of transportation, water supply, availability of land, absence of other industrial enterprise, convenience to the Nuclear Division office in Oklahoma City, quantity and skill of available labor

supply, and recognition of the current and chronic depressed state of the eastern Oklahoma economic activity.

C. Plant Scope

Kerr-McGee determined to build the Sequoyah Uranium Hexafluoride Production Plant in order to broaden its interests in the enlarging nuclear industry. Several projections of the demand for electrical power and the probable impact of commercial power reactors indicated conversion requirements exceeding the then available commercial conversion capability by 1972. Alternate processes were examined and the process developed by the USAEC during the period of National Defense production was selected. The selected process offered the advantages of flexibility for economical production rates and adaptability to a wide range of feed materials which would probably become available with the growth of mining and milling activity.

Bechtel Corporation of San Francisco, California, provided architectural and engineering services for the design and construction in accordance with criteria supplied by Kerr-McGee. These criteria included provision for meeting the most stringent criteria for environmental pollution at that time.

D. Process Description

The Sequoyah Facility receives impure uranium concentrates from concentration mills located in the western United States or Canada in 55-gallon drums by truck. The drums are weighed, emptied into a sampling system, vacuum cleaned and reused. The concentrate is passed through a sampling system which removes a small portion as a representative sample for analysis. The concentrate is stored in hoppers briefly, then digested in a hot nitric acid solution. Recycle materials are added, the solution adjusted for acid and uranium content, and the uranium values extracted in countercurrent solvent extraction system using tribuyt[illegible]sphate as a specific extractant in solution of diluent he[illegible]e uranium-rich organic solution

DOCKETED USAEC NOV 15 1971 REGULATORY

is scrubbed by a small stream of water and the uranium is reextracted into a large portion of water and then concentrated in a two-stage heating process. The impurities extracted by the solvent extraction system constitute the primary liquid waste from the process.

Upon the completion of concentration, the uranium-rich water solution is dehydrated and denitrated in a stirred reactor to uranium trioxide, UO_3, which is conveyed to a milling system and stored temporarily. It is then fed into a two-stage fluid bed operating at approximately 1100°F where it is reduced to uranium dioxide, UO_2, by a countercurrent flow of dissociated ammonia. Upon completion of the reaction, the UO_2 is stored in a hopper temporarily and fed to a two-stage reactor system in which it is converted to UF_4 by a countercurrent stream of anhydrous hydrofluoric acid gas. The UF_4 is then conveyed to a series of fluorination towers which burn the UF_4 in the presence of elemental fluorine to the gaseous compound UF_6. The gaseous product of this reaction is cooled and filtered twice by sintered metal particulate filters and then condensed to a solid at 50°F in a refrigerated heat exchanger known as a "cold trap." Gases not condensed in the first cold trap then pass through a cleanup reactor to scavenge any excess fluorine by passing it through a falling stream of UF_4. This gas, containing noncondensable gases, HF and a trace of fluorine, is then passed into a secondary "cold trap" at a temperature of -50°F for the removal of UF_6. Noncondensables must be further treated for the removal of fluorine, HF and traces of UF_6. These noncondensable gases are exhausted to a three-fluid burner which combines them with air and hydrogen gas exhausted from the fluorine manufacturing process and burns the fluorine and hydrogen to HF and water. This hot gas stream is cooled and passed through a sieve-plate scrubber where the HF gas is absorbed in water.

The solidified UF_6 collected in the cold trap is melted by heating with steam and drained to a shipping cylinder. The cylinder is vented to the cold trap, disconnected from the drain manifold and moved to a storage yard for sampling,

solidification and storage. After analytical tests are completed the cylinder can then be shipped to a diffusion site as feed material for the enrichment process. Such cylinders contain 10 tons of UF_6 and are approved by the Department of Transportation for natural UF_6 shipments.

E. Waste Treatment

The process produces waste streams which are treated to prevent uncontrolled release to the environment and are collected into three primary and several secondary streams prior to discharge.

1. Raffinate

The waste stream from the extraction system, known as raffinate, is primarily composed of ammonium nitrate, nitric acid, metallic salts, small quantities of uranium and the radioactive daughter products of normal uranium decay. This stream is combined with spent sodium hydroxide from the solvent treatment system and the miscellaneous digest scrubber and any excess recovered weak acids from the absorber as a convenience for treatment. Treatment provides for neutralization by lime slurry and impoundment in earthen-walled retention basins for permanent storage. It would be desirable to develop an appropriate method of safe harmless disposition of a solid. Currently, however, no practicable process for solidification has been developed. Several alternatives have been considered by the Kerr-McGee technical staff and engineering studies are proceeding with the objection of selecting the most desirable alternative for further development and installation.

After neutralization contained uranium and daughter products, thorium 230 and 234 and radium 226 for the most part, coprecipitate with most of the other heavy metal impurities as hydroxides. This precipitate is allowed to settle first in a settling basin and then in a clarification lagoon. No sludge or supernatant liquid is released from the storage impoundments.

Two storage ponds have been constructed with a combined capacity of about 25 million gallons providing for three feet of freeboard height above the maximum liquid level to protect against accidental release by overflow. Basin No. 2 with approximately 15 million gallon capacity has just been put into use This basin provides storage capacity for approximately two years at planned production rates.

2. Fluoride Discard

The second liquid waste stream is generated by the hydrofluoric acid scrubber. The scrubber is connected to all emergency vent headers located on process vessel and storage tanks so that gases evolved through the overpressurization of vessels and tanks are absorbed, thus avoiding uncontrolled release to the atmosphere. This fluoride waste stream is combined with waste sodium carbonate solutions originating in the fluorine cell rework area, spilled acid from the HF vaporizer room sump and laboratory wastes. Treatment of this fluoride-containing stream provides for its neutralization by lime slurry with resultant precipitation of the fluoride as calcium fluoride. This alkaline sludge is first settled in a retention basin to permit flocculation and sedimentation. The overflow is treated with sulphuric acid, to adjust the pH and precipitate excess calcium hydroxide, and permitted to clarify by retention in a second basin. The clarified treated waste overflows and is combined with clean waste water and the sewage lagoon overflow and is discharged to the Illinois River through a natural water course. A concrete stilling basin at the point of combination allows for mixing of the flow and controlled release through slotted weirs so that the rate of discharge may be measured. Samples of the discharge are taken periodically at this point.

Sanitary and domestic wastes are treated in a stabilization lagoon which is approved by the State Department of Health. Overflow from this lagoon is combined with other liquid effluents.

3. Gaseous

During the dehydration and denitration of concentrated aqueous uranium solution to the intermediate product uranium trioxide, UO_3, gases are released containing nitric acid, water vapor, oxides of nitrogen and entrained solids. These gases are first scrubbed with water for the removal of entrained solids and condensation of nitric acid vapor and water and piped to an absorption tower for the absorption and concentration of nitrous oxides. The absorption tower is designed to remove approximately 99% of the incoming nitrous oxide. The gas stream is discharged from the absorber into the boiler stack and released at the top of the stack approximately 150 feet above ground level. Nitric acid produced from the absorption tower is recycled to the process for reuse.

Reduction of uranium trioxide to uranium dioxide, UO_2, produces a waste gas of nitrogen, hydrogen and water vapor. This gas stream is filtered on sintered metal particulate filters for the removal of any solid entrainment and piped to a waste gas burner where the excess hydrogen is converted to water vapor. The gas from the burner is piped to the boiler stack and released approximately 150 feet above the ground.

A waste gas stream is discharged from the hydrofluorination reactors containing hydrofluoric acid vapor and water vapor. This gas is cooled in a condenser producing a weak hydrofluoric acid solution which is returned to the vendor and noncondensables are then piped to the hydrofluoric scrubber described above for control of hydrofluoric acid evolution.

Noncondensable gases from the hydrofluoric acid scrubber are conducted to the top of the boiler stack and released to the atmosphere at this point. Initial diffusion and dispersion calculations concluded that the HF concentration discharged at this point would be reduced to one part per billion at the maximum fallout point at ground level based upon probable climatological conditions.

4. Miscellaneous

Considerable ambient air is moved through solid uranium streams as displaced gas when hoppers are emptied and filled and to pneumatically convey uranium dusts to a collection point to avoid their uncontrolled release. Uranium dusts are removed from such air streams by cyclone separators and filters of closely woven fabric felt. Such filters are provided on all exhaust gas streams in order to eliminate release of uranium dust to the environment.

In the design, construction and operation of the waste treatment systems full compliance with applicable State and Federal regulations, specifically "Water Quality Standards of the State of Oklahoma 1968 and Title 10 Code of Federal Regulation Part 20, restricts release of radioactive materials to the lowest practicable level.

Retention basins constructed for raffinate storage and fluoride stream settline and clarification are built to AEC standards, "Licensing Guide - Information and Criteria Pertinent to the Evaluation of Fmbankment Retention Systems." These storage pits are monitored by seepage wells located at their periphery. Results of this monitoring program are reported under environmental surveillance programs later in this document.

II. Discussion of Factors

The following is a summary statement indexed to the subdivision of Subsection E.2. of Appendix D and arranged by pertinent subject matter as outlined in "The Guide to the Preparation of Environmental Reports" issued in February, 1971, of the reasons why the operating license SUB-1010 should not be suspended pending completion of the NEPA environmental review after a balance of all the pertinent factors.

A. The Environment of the Sequoyah Facility Will Not Suffer Any Significant Adverse Impact with Continued Operation During the Review Period.

Operation of the Sequoyah Facility commenced in

February, 1970. Production operations have since continued without interruption. During this period Kerr-McGee has monitored the impact of the operations on the environment, and from these data we can measure no adverse effect on the environment. Based upon the expected operation rate (approximately one-half capacity, as in '71) we project no adverse effect on the environment for the NEPA review period (through July, 1972).

1. Land Use

Prior to the erection of the site, the immediate plant area was used for the cultivation of wheat and some pasture. During construction, grading changed the contour to provide for the plant and adjacent auxiliary facilities. Upon completion of the installation, the disturbed area was regraded into a graceful contour and reseeded in order to prevent unsightly soil erosion. Vegetation quickly became established and no erosion has occurred. The balance of the land is being retained in its original condition and agricultural operations have continued under lease arrangements with the neighboring farmers.

No further construction work is planned and no further disturbance of the ground surface will occur.

Architecturally, the lean, uncluttered appearance and orderly arrangement of the Sequoyah Facility enhances the aesthetic value of the site.

2. Water Use

Water for plant use is diverted from surface water as permitted by Oklahoma Water Resources Board Permit No. P-67-765 and stored in the Tenkiller Ferry Reservoir seven miles north on the Illinois River under Corps of Engineers Water Storage Contract No. DACW50-70-C-0083. It is piped from the dam of the reservoir (2.5×10^6 g/da, 3.9CFS) through a 16-inch main to the plant's treatment system. After use in the process and for sanitary and potable water, liquid discard streams flow through a natural water course to the Illinois River (ave. flow 1460 cps) approximately 1000 yards above its junction with the Arkansas River (ave. flow 1950 cps).

Heat is dissipated from the process by means of a cooling water system including a cooling tower. Approximately 5% of the water withdrawn from the reservoir is returned as water vapor to the atmoshpere from the operation of the cooling tower. The temperature of the discard stream is approximately 5°F higher than intake temperature. This discard stream is calculated to raise average temperature in the Illinois by .1°F.

No changes in the amounts or processing of water are planned for the NEPA review period.

3. Chemical Discharge

As described above, chemical wastes are retained or processed to remove chemical impurities prior to discharging to the Illinois River. As a result of this treatment, no significant flow of chemical discharge occurs in the water returned to the Illinois River.

This effluent system is measured three times each day by removing a sample which is analyzed for fluoride and nitrate ion and composited into weekly samples and subsequently into monthly samples. Daily samples are analyzed by the Sequoyah Laboratory staff to provide assurance to plant supervision that control measures are operating adequately.

The results of these analyses are shown on Table I for radioactivity and Table II for fluoride and nitrate including data determined in a preoperational program conducted in 1969 by R. Y. Nelson of Oklahoma University. As can be seen by Table I radioactive discharge is well within the alpha, beta and radium limits of 10CFR20. On Table II, which shows the analysis of the monthly samples for fluoride and nitrate as nitrogen, it can be seen that fluoride control resulting from the fluoride precipitation and clarification system described above shows only two months above U.S. Public Health Service drinking water standards. Nitrate concentrations are erratic however. Source of the nitrate contamination has been traced to originating as leaching by rainwater of nitrate solutions accidently spilled during early startup operations and not completely removed in decontamination efforts. As described above, all

nitrate wastes have been stored in a neutralized condition in retention ponds since the startup of the plant.

DISCHARGE DATA

Effluent:	2,300,000 gal/day	
	3.9 cfs	
	19,159,000 lbs	
Nitrate:	Current Daily Analysis	
	N as NO_3 - 2 ppm	
	NO_3 - 8.4 ppm	
	160.9 lbs/day	
Fluoride:	Current Daily Analysis	
	F^- - .7 ppm	
	13.4 lbs/day	
Illinois River:	1462 cfs	
	NO_3 - 2.4 ppm[1]	2,290 lbs/day
	F^- - .1 ppm[2]	95 lbs/day
Arkansas River:	19,500 cfs	
	NO_3 - 4.8 ppm[1]	64,000 lbs/day
	F^- - .3 ppm[2]	4,680 lbs/day

[1]Oklahoma Water Quality Standards-1968

[2]Table II

From these data it is concluded that no adverse effect on the environment has occurred and that operations during the review period will have no adverse effect.

4. Gaseous Effluents

As described above, all gaseous effluents are treated for the removal of uranium contamination and noxius gases.

Effluents are measured as a part of the environmental surveillance system by stack samplers and air samplers located at the fence line in the immediate plant area and 1000 feet in four directions from the plant. In addition, soil and vegetation samples are collected at the location of the air samplers. No airborne samples at the fence line and remote air

samplers in excess of MPC (10CFR20) levels of radioactive contamination for unrestricted areas have been measured during the operation of the plant. Planned production rates will not generate any significant losses during the NEPA review period.

5. Solid Wastes

Small amounts of contaminated burnable wastes are collected in the plant and burned regularly in an enclosed burner whose exhaust discharges through the boiler stack. Burnable solid wastes uncontaminated with uranium are burned in a gas-fired open-pit burner approved by the Oklahoma Air Pollution Commission.

Nonburnable solid waste, such as contaminated metals and insulation containing nonremovable surface contamination in excess of MPC limits, are buried on the site in accordance with AEC regulations in a regulated area at the northwest corner. Approximately 88 kilograms of normal uranium have been buried during operation of the plant.

6. Environmental Surveillance

The environmental surveillance program was instituted at the Sequoyah site prior to startup of the plant for the purposes of establishing a baseline content of potential contaminants. The sampling described above is an integral part of the environmental surveillance program.

In addition, certain additional precautions are taken to measure the possible release of environmental pollutants. Two water wells, one currently in use, located on the site outside the immediate plant area are sampled and measured routinely.

A normal fault to the east of the plant area traverses the site in a northeast to southwest direction. Geological studies including the drilling of 20 test cores into the subsurface geology demonstrated that this fault was a normal occurrence existing in this area as a result of movement of the earth's crust approximately 250 million years ago. Extensive geological examinations of the cores removed demonstrated the solidity and subsurface geology of the immediate plant area.

While it is improbable that communication can exist between surface waters in the plant area and aquifers lying on the eastern side of the fault zone, a well was drilled in the immediate fault zone and established as a sampling point to insure that such movement would not go undetected.

Two small surface water ponds lie within the site north and south of the plant area. Since chemical contamination in gaseous effluents, if released by the plant, would be returned to the surface as fallout which would eventually progress into surface waters, these two surface ponds were added to the sampling program in order to detect uncontrolled release of gaseous effluents in addition to the air sampling stations.

With the establishment of these additional points, a coordinated environmental surveillance program of liquid, gaseous and surface contamination was commenced. In addition to normal effluent sampling of the plant discharge streams, the monitor wells described above and the Arkansas and Illinois Rivers are sampled weekly and an analysis made of possible contaminants on a monthly composite of such weekly samples. The results of the environmental surveillance programs, including plant outfall, gaseous air samplers and surface water sampling, during the period of 1971 operation are tabulated on the attached Tables I through X. Except for the nitrate ion found in two months in the discharge, release to the environment is controlled.

10CFR20 and Oklahoma Department of Health limits used for control are:

Radioactive	Air	α - 200×10^{-14}	μCi/ml (Natural U)
	Water	α - 200×10^{-7}	μCi/ml (Natural U)
	Water	β - 100×10^{-7}	μCi/ml (Thorium)
		Ra_{226} - $.3 \times 10^{-7}$	μCi/ml
Chemical		F^- - 1.5 ppm	(USPHS)
		NO_3 as N - 10.0 ppm	(USPHS)

TABLE I

GROSS ALPHA AND BETA AND RADIUM 226 ANALYSIS OF SEQUOYAH FACILITY
COMBINATION STREAM AND THE ILLINOIS AND ARKANSAS RIVERS
$\mu Ci/ml \times 10^{-7}$

	Combination Stream			Illinois River						Arkansas River					
	At Plant			Upstream			Downstream			Upstream			Downstream		
	α	β	226 Ra	α	β	226 Ra	α	β	226 Ra	α	β	226 Ra	α	β	226 Ra
Operational															
1971(a)															
January	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
February	1.6	.8	.01	<.01	.01	<.01	.04	.09	<.01	.02	.06	<.01	.03	.05	<.01
March	6.8	4.0	<.01	.01	.09	<.01	.20	.14	<.01	.02	.14	<.01	.29	.37	<.01
April	31.8	13.0	.26	.02	<.01	.04	1.10	.50	.01	.03	.10	<.01	.04	.06	<.01
May	26.4	47.4	.02	.01	.09	.01	.90	2.00	.05	.01	.03	.07	.01	.07	.04
June	NS	NS	NS	<.01	.09	<.01	.04	.12	<.01	.03	.12	<.01	<.01	.16	<.01
July	4.2	3.3	.03	.03	.03	.01	<.01	.14	<.01	<.01	.04	.02	<.01	<.01	.02
August	11.7	6.0	.06	.06	.03	.02	.06	.03	<.01	.01	.06	<.01	.02	.05	.02
September	3.6	3.0	.02	.08	.05	<.01	1.80	1.70	.02	<.01	.10	.02	<.01	.17	.01
Preoperational															
1969(b)															
July	No Effluent			.03	.08			NS		.03	.06		.04	.03	
August	"			.03	.07			NS		.04	.05		.02	.04	
September	"			.02	.03			NS		.02	.05		.02	.01	
October	"			.02	.03			NS		.02	.01		.02	.02	
November	"			<.01	<.01			NS		<.01	.04		<.01	.01	
December*	"			<.01	<.01			NS		NS	NS		NS	NS	

(a) CEP Results
(b) R. Y. Nelson's Preoperational Survey Results
NS - Not Sampled
* - Sequoyah Lab Results

TABLE II

FLUORIDE AND NITRATE ANALYSIS OF SEQUOYAH FACILITY
COMBINATION STREAM AND THE ILLINOIS AND ARKANSAS RIVERS
CONCENTRATION IN PPM F^- & NO_3 AS N

	Combination Stream At Plant		Illinois River Upstream		Illinois River Downstream		Arkansas River Upstream		Arkansas River Downstream	
	F	N	F	N	F	N	F	N	F	N
Operational										
1971[a]										
January	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
February	1.0	1.8	.5	1.8	.4	1.8	2.0	1.3	1.3	.5
March	2.6	<.1	<.1	<.1	.2	<.1	.4	.1	.2	<.1
April	2.6	22.0	.1	.2	.1	.2	.4	.4	.3	.4
May	.8	8.1	<.1	2.6	.3	1.2	.6	.6	.3	1.8
June	NS	NS	<.1	1.1	.2	.8	.4	1.1	.4	.8
July	.4	.9	<.1	.5	.2	.5	.2	.3	.2	.2
August	.7	13.7	.1	.3	.2	.2	.4	.3	.3	.2
September	.6	3.1	.1	.5	.2	.7	.2	.9	.2	.7
Preoperational										
1969[b]										
July	Not Operating		.2	.5	NS	NS	.4	.2	.1	.3
August	"		.2	.4	NS	NS	.5	.1	.2	.3
September	"		.2	.3	NS	NS	.5	.1	.4	.3
October	"		.3	.3	NS	NS	.4	.4	.3	.3
November	"		.1	.3	NS	NS	.4	.5	.1	.3
December*	.3		<.1		<.1		.3		.1	

(a) CEP Results
(b) R. Y. Nelson's Preoperational Results
NS - Not Sampled
* - Sequoyah Lab Results

TABLE III

GROSS ALPHA, GROSS BETA AND RADIUM-226 ANALYSIS
SEQUOYAH FACILITY MONITOR WELLS
$\mu Ci/ml \times 10^{-6}$

	Well 1			Well 2			Well 3			Well 4*			Well 5			Well 6		
	α	β	Ra	α	β	Ra	α	β	Ra	α	β	Ra	α	β	Ra	α	β	Ra
Operational																		
1971[a]																		
January	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
February	.10	.07	.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	.01	<.01	.02	.06	<.01	.03	.02	<.01
March	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
April	.01	.02	<.01	<.01	.02	<.01	.19	.19	<.01	<.01	.04	<.01	<.01	.02	<.01	.03	.03	<.01
May	.04	.12	.03	.03	.08	<.01	.02	.06	<.01	.03	.06	<.01	.08	.18	<.01	.04	.07	<.01
June	.08	.11	<.01	.25	.11	<.01	.06	.08	<.01	NS	NS	NS	.03	.07	<.01	.02	.04	<.01
July	.07	.10	.04	.05	.07	<.01	.04	.12	<.01	NS	NS	NS	.02	.10	.06	<.01	.02	<.01
August	.09	.05	.03	.10	.03	<.01	NS	NS	NS	NS	NS	NS	.03	.08	<.01	.01	.02	<.01
September	.14	.08	.01	.05	.04	<.01	.03	.15	<.01	NS	NS	NS	.02	.05	.02	<.01	<.01	<.01

Preoperational
Wells were not drilled prior to facility operation.

[a] CEP Results
* - Well #4 Abandoned in June
NS - Not Sampled

TABLE IV

FLUORIDE AND NITRATE ANALYSIS
SEQUOYAH FACILITY MONITOR WELLS
CONCENTRATION IN PPM F^- & NO_3 AS N

	Well 1		Well 2		Well 3		Well 4*		Well 5		Well 6	
	F	N	F	N	F	N	F	N	F	N	F	N
Operational												
1971[a]												
January	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
February	1.8	11.0	.4	4.3	2.0	3.3	6.0	5.5	6.3	5.5	.7	5.5
March	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
April	.5	32.0	.2	1.6	1.5	6.5	.6	3.1	1.0	4.4	.7	3.5
May	1.3	30.0	1.0	44.0	.9	5.5	.8	6.3	.9	3.9	.7	3.5
June	1.0	43.1	.6	14.7	1.1	2.3	NS	NS	1.1	1.8	.5	1.5
July	1.4	3.9	.9	23.3	1.2	.5	NS	NS	.8	19.5	.3	.3
August	1.0	2.2	.8	3.2	NS	NS	NS	NS	.9	44.3	.4	.2
September	1.2	4.1	.9	2.5	.6	4.3	NS	NS	1.0	3.1	.4	1.6

Preoperational
Wells were not drilled prior to facility operation.

[a] CEP Results
* - Well #4 Abandoned in June
NS - Not Sampled

TABLE V

GROSS ALPHA, GROSS BETA AND RADIUM-226 ANALYSIS
SEQUOYAH FACILITY FAULT AND DOMESTIC WELLS
$\mu Ci/ml \times 10^{-6}$

	Fault Well			Carlisle School Well			Residence Well 1			Residence Well 2		
	α	β	Ra	α	β	Ra	α	β	Ra	α	β	Ra
Operational												
1971[a]												
January	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
February	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01			
March	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
April	.01	.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01			
May	.01	.02	<.01	<.01	<.01	<.01	<.01	<.01	<.01	NS	NS	NS
June	<.01	.03	<.01	<.01	<.01	<.01	<.01	<.01	<.01			
July	.02	.03	<.01	<.01	<.01	<.01	<.01	<.01	<.01	NS	NS	NS
August	.02	.02	<.01	<.01	<.01	<.01	<.01	<.01	<.01			
September	.01	.02	<.01	<.01	<.01	<.01	<.01	<.01	<.01	NS	NS	NS
Preoperational												
1969[b]												
July				<.01	<.01		<.01	.01		<.01	.01	
August				<.01	<.01		<.01	.01		<.01	.01	
September				<.01	<.01		<.01	.01		<.01	.01	
October				<.01	.01		NS	NS		<.01	.01	
November				<.01	<.01		NS	NS		<.01	.01	
December*	<.01	.04	<.01	<.01	.04		<.01	.03		<.01	.06	

(a) CEP Results - Residence well 2 abandoned prior to facility operation.
(b) R. Y. Nelson Preoperational Survey Results
NS - Not Sampled
* - Sequoyah Lab Results

TABLE VI

FLUORIDE AND NITRATE ANALYSIS
SEQUOYAH FACILITY FAULT AND DOMESTIC WELLS
CONCENTRATION IN PPM F^- & NO_3 AS N

	Fault Well		Carlisle School Well		Residence Well 1		Residence Well 2	
	F	N	F	N	F	N	F	N
Operational								
1971[a]								
January	NS	NS	NS	NS	NS	NS	NS	NS
February	1.8	6.6	1.0	4.4	1.8	5.5		
March	NS	NS	NS	NS	NS	NS	NS	NS
April	2.6	2.6	.1	6.2	.2	3.5		
May	2.9	2.7	<.1	3.2	.3	25.5	NS	NS
June	3.0	1.5	.2	1.6	.4	.8		
July	2.4	.1	.2	.5	.2	<.1	NS	NS
August	2.7	.6	.2	.4	.3	.4		
September	2.7	.1	.2	.4	.3	.3	NS	NS
Preoperational								
1969[b]								
July			.3	.3	.2	.3	.1	.6
August			.4	.4	.2	.1	.2	NS
September			.3	.5	.2	NS	.3	.4
October			.3	.4	NS	NS	.3	.6
November			.2	.3	NS	NS	.2	.4
December*	.7	2.3	.1	NS	<.1	NS	<.1	NS

(a) CEP Results
(b) R. Y. Nelson Preoperational Survey Results
NS - Not Sampled
* - Sequoyah Lab Results

TABLE VII

GROSS ALPHA ACTIVITY AND FLUORIDE RESULTS
SEQUOYAH FACILITY ENVIRONMENTAL AIR
ALPHA RESULTS - $\mu Ci/ml \times 10^{-14}$
FLUORIDE RESULTS - CONCENTRATION IN PPM F^-

	East[1]		North[2]		South[2]		West[3]	
	α	F	α	F	α	F	α	F
Operational								
1971[(a)]								
April	5.4	<.001						
May	1.9	.001	<.3		3.0	.003		
June	5.8	<.001	10.6	<.001	3.4	<.001		
July	2.4	.002	7.0	<.001	3.6	<.001		
August	3.0	.001	7.2	.002	1.4	.002		
September	<.3	<.001	4.6	.001	2.6	.005		
Preoperational								
1969[(b)]								
June thru November Average	<100.0	NS	<100.0	NS	<100.0	NS	<100	NS

[1]East station installed in April, 1970
[2]North and South stations installed in May, 1970
[3]West station is under construction

(a) CEP Results
(b) R. Y. Nelson's Preoperational Survey Results
NS - Not Sampled

TABLE VIII

RADIOACTIVITY AND CHEMICAL ANALYSIS
SEQUOYAH FACILITY PONDS[1]
ALPHA, BETA AND Ra-226 RESULTS - $\mu Ci/ml \times 10^{-6}$
FLUORIDE AND NITRATE RESULTS - CONCENTRATION IN PPM F^- & NO_3 AS N

	Pond 1 (1/4 Mile South of Facility)					Pond 2 (1/4 Mile East of Facility)				
	α	β	Ra	N	F	α	β	Ra	N	F
Operational										
1971[(a)]										
January	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
February	.02	.02	<.01	5.5	5.4	<.01	.02	<.01	11.0	1.5
March	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
April	.01	.04	<.01	1.7	.3	.01	.02	<.01	.5	.2
May	<.01	.02	<.01	1.4	<.1	<.01	.01	<.01	1.4	.1
June	.01	.01	<.01	1.3	.4	<.01	.01	<.01	.2	.3
July	.01	.01	<.01	<.1	1.2	.01	.01	<.01	.5	.1
August	.07	.04	<.01	.2	2.7	.01	.01	<.01	.3	.2
September	.02	.02	<.01	.3	1.7	<.01	.01	<.01	.6	.1
Preoperational										
1969[(b)]										
July	<.01	.01	NS	.4	.1	<.01	<.01	NS	.2	<.1
August	<.01	<.01	NS	.5	<.1	<.01	<.01	NS	.3	<.1
September	<.01	.01	NS	.4	<.1	<.01	<.01	NS	.3	<.1
October	<.01	.01	NS	.3	.1	<.01	.01	NS	.3	<.1
November	<.01	<.01	NS	.2	<.1	<.01	<.01	NS	.2	<.1
December*	<.01	<.01	NS	NS	.1	<.01	.04	NS	NS	<.1

[1]Ponds were constructed for water supplies when land was farmed and are fed by runoff and/or small springs.

(a)CEP Results
(b)R. Y. Nelson's Preoperational Survey Results

NS - Not Sampled
* - Sequoyah Lab Results

TABLE IX

GROSS ALPHA RESULTS
SEQUOYAH FACILITY RESTRICTED AREA FENCE LINE AIR SAMPLES
$\mu Ci/ml \times 10^{-12}$ ASSUMING ALL ALPHA ACTIVITY DUE TO NATURAL URANIUM

	South Fence Gross Alpha	North Fence Gross Alpha
Operational		
1971[a]		
January	.78	.76
February	1.02	.84
March	1.30	1.06
April	2.00	1.20
May	.68	.76
June	.74	1.04
July	.78	.86
August	.80	.64
September	.22	.42
Preoperational		
1969[b]		
June thru October Average		<1.00

[a] Sequoyah Facility Health Physics Monthly Average Results
[b] R. Y. Nelson's Preoperational Survey Results

TABLE X

FLUORIDE AND URANIUM RESULTS
SEQUOYAH FACILITY ENVIRONMENTAL SOIL AND VEGETATION SAMPLES
FLUORIDE RESULTS - mg/g
URANIUM RESULTS - μg/g

	South		West		North		East	
	F	U	F	U	F	U	F	U
SOIL								
Operational								
1971[a]								
June	1.0	.3	4.1	.7	5.8	.8	2.7	3.7
September	3.4	3.0	<.1	8.0	3.9	15.0	2.0	3.0
Preoperational								
1969[b]								
June	NS	13.2	NS	29.7	NS	25.2	NS	22.5
October	NS	29.1	NS	22.2	NS	18.6	NS	17.1
VEGETATION								
Operational								
1971[a]								
September	3.0	32.0	2.0	75.0	4.0	13.0	1.0	11.0
Preoperational								
1969[b]								
June	NS	38.1	NS	34.5	NS	25.2	NS	13.2
October	NS	31.5	NS	18.9	NS	20.4	NS	22.8

(a) CEP Results
(b) R. Y. Nelson's Preoperational Survey Results
NS - Not Sampled

7. Transportation

Materials are moved to the plant normally in truckload quantities by common carriers or in vendor trucks. Such trucks travel over the interstate highway system to the turnoff on Interstate Highway 40, approximately one-half mile east of the Arkansas River Bridge. Here the route moves onto State Highway 10 for approximately one-half mile and then to the plant area over an asphalted concrete road installed as access to the plant. All radioactive materials are transported in accordance with D.O.T. regulations.

Plant personnel normally live in residential areas some distance from the site. A small percentage live in the area of Vian, Oklahoma, approximately six miles to the east. Others live at distances primarily in rural areas ranging up to Muskogee and Stillwell. All employees travel to the plant location from their homes in privately-owned automobiles or trucks.

This amount of movement of materials and personnel to and from the plant since the commencement of operations in February of 1970 has not resulted in unexpected wear or unnecessarily hazardous conditions on these public-supported highways. Continued operation of the plant during the NEPA review period will not measurably increase the deterioration of the highway system.

8. Schools

No adverse impact of this installation on public schools has been experienced since the majority of employees were local residents. Additional tax income of approximately $90,000 is received by Sequoyah County annually.

9. Accidents

In an industrial processing plant such as the Sequoyah Facility, the possibility of internal accident or climatic conditions disrupting the closed processing system is present.

Sequoyah County is subject to steady winds and has a small probability of 1.66×10^{-3} of being hit by a

tornado in any given year. The small probability decreases geometrically as the area of interest decreases. As a consequence, an advanced weather warning service has been arranged through local meteorological consultants. This weather warning service provides that at 50% probability of damaging winds at the site a warning is given four hours prior to its arrival and at 90% probability, one hour prior. Such warnings are made by the consultants after examining available weather information collected through public and private networks and are based upon mathematical models and historical data of the system. In the event of a four-hour warning being received by the plant management, production operations are ceased and all personnel moved indoors. At the one-hour warning, all but essential services are terminated, storage tanks closed off, and a close watch is posted. During 1971 five severe weather warnings have been received but no damaging storm has approached the plant.

Internal accidents caused by equipment malfunctions, design inadequacies or human error are a possibility in a newly-installed chemical plant. On three occasions during early startup operations such accidents resulted in the release of some hydrofluoric acid, UF_6, and nitric acid solution of uranium to the restricted area in the plant. Since this time, considerable effort at correcting the design problems, securing equipment reliability, and training personnel in correct operating procedures has resulted in no accidental releases to the environment of contamination during the nine months of 1971.

Based upon experience gained during the initial period of operation, the probability of release of environmental pollution during the NEPA review period is essentially nonexistent.

B. Continued Operations During the Review Period Foreclose Subsequent Adoption of Alternatives to Design or Operation that Could Result from the NEPA Environmental Review.

Construction of the Sequoyah Facility is essentially

complete. Operations have been stable since the first of 1971 and no serious releases of gaseous or liquid contaminants have been experienced. Kerr-McGee's technical staff is currently considering in depth alternate disposal methods of the raffinate and fluoride waste. Additional air purification equipment to improve further the operation of certain conveying equipment is on order and will be installed upon receipt.

No change is contemplated which would prevent the installation of improved protective devices or purification equipment as a result of NEPA review. Kerr-McGee management endorses and supports the current activity of searching for improved methods of effluent disposal and would welcome a practicable solution to this problem.

C. The Effect of Delay in Facility Operations Upon Public Interest

Delaying scheduled 1972 operations of the Sequoyah Facility would have a wide impact upon many local and national public groups in addition to placing undue burden upon a vital Kerr-McGee operation.

1. The nuclear industry has been seriously delayed in meeting proposed installation schedules of commercial power facilities because of delayed equipment, interrupted construction schedules and increasing regulatory requirements. Such delays have caused serious consequences to the planned income from this important new industry resulting in postponement of commitments and, in some cases, withdrawal and termination of some activities.

The conversion work scheduled for the Sequoyah Facility during this period would probably be placed with subsidized foreign operations.

In view of the effort during design and construction and nonforeclosure of required improvements, we believe that postponement of production effort during the early part of 1972 would be permanently damaging to an important

contributor to the vitality of the nuclear fuel cycle and the entire nuclear industry.

2. It is planned that 100 people will be employed at the Sequoyah Facility during the first half of 1972. Postponement of operations during NEPA review would mean that a majority of these people would face immediate layoff in a currently depressed economic situation. Such a layoff would reduce the income of a chronically depressed economic area by approximately $500,000 in direct wages and the subsequent cascading multiplication of such direct wages in generating the needs for additional services. In order to find equivalent employment, laid off personnel would have to move from the area thus causing further migration of skilled personnel from Oklahoma.

3. Even temporary termination of the operation of such facilities results in accelerated maintenance and equipment replacement costs. A shutdown of 20 days to perform needed maintenance work early in September of 1971 required the expenditure of approximately $190,000 in unrecoverable and unplanned costs. Deterioration occurring during a shutdown as long as six months is estimated to cost $350,000 in similar expense.

4. In addition to the dispersal of trained and experienced operating staff, additional time prior to reestablishment of productive operation would be experienced while new staff were recruited and trained. During the initial plant startup, such recruitment and training required the expenditure of approximately $3,000 per man. Inexperienced people operating a complex processing system such as the Sequoyah Facility prior to gaining some experience suffer from an unusual number of personal injuries and accidental releases of chemicals and process fluids. As stated previously, all accidental releases from the Sequoyah process occurred early in the startup period and have significantly decreased as personnel became more experienced in the operation of complex processing equipment. Such a penalty to the environment would probably exceed that avoided by terminating operations during NEPA review.

5. Termination of operations of the Sequoyah Facility would remove the market for materials and supplies and equipment parts of approximately $600,000 for the six-month period. Such a penalty would accrue to a wide population of small business in eastern Oklahoma. Only hydrofluoric acid is shipped to the area from outside of the plains states. Transportation facilities would lose approximately $100,000 worth of business in the hauling of feed material to the plant and product to the diffusion site.

6. Kerr-McGee Corporation would be penalized to the extent of approximately $1,700,000 in revenue. Such a penalty to a corporation with a commitment to the industry, concern for Oklahoma economic activity, willingness to risk a multimillion dollar investment in a new industry which included recognition of and expenditures for protection of the environment and who responded to each new regulatory requirement willingly and cooperatively seems to be unnecessarily inequitable in today's society.

III. Conclusion

In summary, suspension of operation of the Sequoyah Facility would be a net loss to the human environment. In view of the fact that operation of the plant has no adverse effect on the environment, the penalties accruing to the nuclear industry, the Sequoyah employees, Sequoyah and Muskogee Counties and Kerr-McGee Corporation by suspension of operations during the NEPA review period would be grossly inequitable.

State of Oklahoma)
)
County of Oklahoma)

I, Parker S. Dunn, being first duly sworn, depose and say that the foregoing statement is true as I verily believe.

Parker S. Dunn.

Parker S. Dunn
Group Vice President

Subscribed and sworn to before me this 12 day of November, 1971.

Notary Public for Oklahoma

My Commission Expires November 9, 1975

FROM: Kerr-McGee Corp.
Oklahoma City, Okla.
(W. J. Shelley)

DATE OF DOCUMENT: 11-8-71
DATE RECEIVED: 11-11/15-71
NO.: 4949

LTR: X MEMO: REPORT: OTHER:

TO: L. Muntzing

ORIG.: 1 CC: OTHER:

ACTION NECESSARY ☐ NO ACTION NECESSARY ☐
CONCURRENCE ☐ COMMENT ☐
DATE ANSWERED: BY:

CLASSIF: U POST OFFICE REG. NO:

FILE CODE: DOCKET: 40-8027

DESCRIPTION: (Must Be Unclassified)
Ltr. trans. the following as req. by our 9-25-71 letter:

ENCLOSURES:
(10 cys. rec'd 11-11-71;
100 addtl. cys. rec'd 11-15)

"Applicant's Environmental Report," dated 11-71, for the UF_6 Sequoyah Facility.....

REMARKS:

REFERRED TO	DATE	RECEIVED BY	DATE
Buchanan:	11-15		
w/2 cys. -- FOR ACTION (1 cy. to Buchanan on 11/12/71)			
Distribution:			
1-reg. file cy.		1-R. Cunningham, DML	
1-AEC PDR			
1-CO (region)		1-L. Rogers, EKP	
1-C. Henderson, DR		1-L. DiNunno (A-170)	
1-J. Felton, DR		1-Totter (E-201)	
1-Shapar, OGC (P-506B)		1-R. Faulkner (P-1120	
4-C. Edwards, DML		1-C. Miles (C-479)	
1-NSIC		1-DTIE	
DO NOT REMOVE	ACKNOWLEDGED		asc

U.S. ATOMIC ENERGY COMMISSION
MAIL CONTROL FORM FORM AEC-326S (8-60)

☆ U.S. GOVERNMENT PRINTING OFFICE: 1970-406-979

DOCKET NO. 40-8027

KERR-McGEE CORPORATION
KERR-McGEE BUILDING • OKLAHOMA CITY, OKLAHOMA 73102

November 8, 1971

RECEIVED
NOV 11 1971
U.S. ATOMIC ENERGY COMMISSION
REGULATORY
MAIL SECTION

Mr. L. M. Muntzing
Director of Regulations
United States Atomic Energy Commission
Washington, D. C. 20545

Dear Mr. Muntzing:

As requested by Mr. Price's letter of September 25, an Environmental Report (10 copies) required by Revised Appendix D to 10CFR50, effective September 9, for our License SUB-1010, Docket No. 40-8027 is enclosed. The balance (190) required are being shipped today.

In preparing the enclosed document, we have followed the outline of subjects presented in your "Guide to the Preparation of Environmental Reports" published in February, 1971.

We would be pleased to discuss the contents of this report at your convenience.

Very truly yours,

W. J. Shelley

W. J. Shelley
Director, Regulation and Control

WJS:srj
Enclosures

DOCKETED
USAEC
NOV 15 1971
REGULATORY
MAIL SECTION
DOCKET CLERK

1p

~~8507310324~~ MS49