



KERR-McGEE CORPORATION

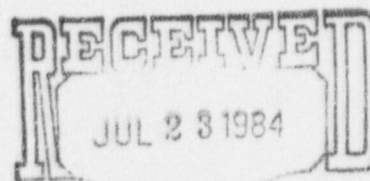
KERR-McGEE CENTER • OKLAHOMA CITY, OKLAHOMA 73125

ENVIRONMENT AND HEALTH MANAGEMENT DIVISION

July 20, 1984

EXPRESS MAIL

RETURN RECEIPT REQUESTED



RADIATION PROTECTION BUREAU

Mr. Kent Breese
Uranium Licensing Section
Radiation Protection Bureau
Environmental Improvement Division
State of New Mexico
P.O. Box 968
Santa Fe, New Mexico 87504-0968

Dear Mr. Breese:

On November 24, 1980, Radioactive Material License SUA-616 was amended to authorize operation of an ion exchange plant located at Quivira Mining Company's Church Rock I Mine. Construction of the ion exchange plant as described in the license amendment application was postponed because of the lack of economic or environmental justification.

A recent increase in the uranium content of the mine discharge water above the 2 mg/l NPDES limitation has prompted a search for a method of reducing uranium in the NPDES outfall to permit compliance as quickly and economically as possible. The results of mine water sampling (see Attachment 1) show that approximately 39 percent of the uranium in the total flow of mine water is coming from a single haulage drift with only 2 percent of the total flow.

Quivira Mining Company plans to process this small stream (40-50 gpm) through an underground ion exchange system to recover the uranium and lower the total mine water uranium content by about 0.7 ppm U.

This letter with attachments provides the information required for modification of the November 24, 1980 amendment so that we may proceed with plans to reduce the uranium content of the NPDES outfall. Included in the attachments is information answering the questions presented by you in a telephone conversation with Jim Marler on July 13, 1984. If you need additional information, please call Mr. Marler at (405) 270-2637. Your expeditious review of this information is appreciated.

Sincerely,

J.C. Stauter, Director
Nuclear Licensing & Regulation

9803250473 840720
PDR ADOCK 04008905
C PDR

MODIFICATIONS TO AMENDMENT OF SUA-616
FOR IX PLANT AT CHURCH ROCK MINE
July 20, 1984

- I. The planned operation differs from the previously authorized operations in the following manner:

<u>Item</u>	<u>Authorized</u>	<u>Planned</u>
Location	CRI Surface	CRI Underground
IX Tanks	16	2
Input and Discharge	4000 gpm treated	50 gpm untreated (100 gpm design)
U Concentrations:		
In	2.0 mg/l	50 mg/l
Out	0.1 mg/l	<5 mg/l
Extraction Efficiency	95%	>90%
Maximum Resin Load	3 lbs/CF	4.5 lbs/CF
Elutions at Mine Site	7 per month	none
Uranium Recovered	33,400 lbs/yr	9,000 lbs/yr
Auxilliary Equipment	Solution makeup Eluate recycle Eluate storage Acid mix tanks	none
Transportation	Brine eluate concentrate Acid trailer	Loaded resin Special transfer tanks and trailer

- II. A description of the planned ion exchange system is as follows:

Based on the sampling results shown in Attachments 1a and 1b, the 7000 haulage drift on the 1-5 level was found to be the primary source of uranium in the outfall. Two ion exchange tanks will be located underground at the 1-5 station about 200 feet from the mine shaft (See Attachment 2). The 40 to 50 gpm water flow from the 7000 haulage drift will be piped to two IX tanks which will operate in series. The IX tanks will be 4' diameter x 8' high (See Drawing ATN-53-M-01), and will contain about 50 cubic feet of DOW 21K anion exchange resin or equivalent in each tank. The resin is expected to load uranium to about 4.5 pounds per cubic foot. Typically, one column (a transfer batch) will collect

approximately 225 pounds of uranium in about one week at the present flow rate and grade. The uranium-bearing resin will be transferred out of the column to a resin transfer tank (See Drawing ATN-53-M-02) that will be hoisted to the surface and hauled to the Ambrosia Lake Mill IX plant for elution. The discharge water from the IX tanks will be returned to the mine water drainage system at the 1-5 station. After removal of the uranium from the resin (elution) at the mill IX plant, the regenerated resin will be returned to the mine for re-use.

- III. Each transfer of loaded (uranium-bearing) resin to the mill IX plant will be made in specially-designed and fabricated transfer tanks (Drawing ATN-53-M-01). Transportation of the IX resin will be in accordance with the regulations and support recommendations of the Kerr-McGee Corporate Staff Health Physicist as outlined in the attached memorandum (G.J. Sinke to B.J. Buntz, June 28, 1984).

The specially-designed transfer tank will be secured to a fifth wheel trailer which is pulled by a pickuptruck. Specifications for purchase of the trailer are included as Attachment 4. A sketch of the transfer tank and trailer arrangement is included as Attachment 5.

The transportation route to and from the Ambrosia Lake mill will be via Interstate 40 as shown on the route map included in the November 24, 1980 license amendment.

An emergency response procedure for a potential transportation accident is included in the submittals for the November 24, 1980 license amendment. Updated notification lists for the procedure are attached.

CHURCH ROCK UNDERGROUND WATER
GRADES AND VOLUMES

Uranium Study - 1984

Sample Location	U mg/l			Approximate GPM
	05-02-84	05-16-84	05-22-84	
1) 0700 HD	---	1.6	---	
2) 9000 HD	---	0.16	---	
3) 0300 HD	---	0.32	---	
4) 8000 HD	---	0.16	---	
5) 7000 HD	54.2 48.5	---	47.2	≈ 46 gpm
6) 7100 HD	---	0.63		
7) 7200 HD	---	3.5	4.8	≈ 50 gpm
8) 7300 HD (includes 7400, 7500 and 7600)	---	4.3	4.5	≈ 320 gpm
9) 1100-1500 HD	---	---	1.1	
10) Composite 1-5 Level	4.6	---	4.8	≈ 1,350 gpm
11) Composite 1-4 Level	0.82	---	1.1	≈ 1,500 gpm
12) 1200 HD (1-4 Level)	---	---	3.2	≈ 10 gpm
13) 1000 HD (Between 6000 and CRIE)(1-4 Level)	---	---	1.0	
14) 1000 HD (Between 0100 and 2300)(1-4 Level)	---	---	1.2	
15) CRIE Station (1-4 Level)	---	---	0.43	
16) Pump Discharge	---	2.1	2.1	≈ 2,800 to 2,870 gpm
17) Final Discharge	---	2.3	2.1	≈ 2,450 to 2,500 gpm

U in total flow = 2800 gpm x 2.1 mg/l x 0.012 = 71 lbs/day

U in 7000 HD = 46 gpm x 50 mg/l x 0.012 = 28 lbs/day

$$(28 \div 71) \times 100 = 39.4\%$$

Reduction of U in total flow at 90% recovery of 7000 HD

$$(28 \text{ lbs/day} \times 0.9) \div (2800 \text{ gpm} \times 0.012) = 0.75 \text{ ppm} \quad \checkmark$$

Attachment 1b

Sketch of Haulage
Drifts at the
Church Rock Mine
Level 1-5

