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NOTE TO: Docket File 40-8027

CORRECTED COPY OF AMENDMENT NO. 22

When distribution was made for the Kerr-McGee Nuclear Corporation, Amendment No. 22, dated May 18, 1983, an enclosure to the document was omitted. To correct this error, the document is being redistributed in its entirety (see enclosure).

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W. T. Crow, FCUF

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MAY 18 1983

FCUP:SDW
40-8027
SUB-1010, Amendment No. 22

Kerr-McGee Nuclear Corporation
ATTN: Mr. W. J. Shelley, Vice-President
Nuclear Licensing and Regulations
Kerr-McGee Center
Oklahoma City, Oklahoma 73125

Gentlemen:

In accordance with your application dated July 29, 1982 and supplements dated August 26 and 31, September 17, October 12 and 21, and December 6 and 21, 1982 and pursuant to Title 10 Code of Federal Regulations, Part 40, Source Material License No. SUB-1010 is hereby amended to authorize the injection of treated liquid raffinate in the Sequoyah waste disposal well subject to the following conditions:

1. Use of the No. 1 Sequoyah deep disposal well shall be limited to the injection of 5 million gallons of treated liquid raffinate. Following injection of this initial volume, Kerr-McGee shall submit to the NRC all monitoring results obtained from the injection program and all reports and conclusions regarding the nature of the disposal formation and any impacts resulting from the injection. This information shall be submitted in support of an application to dispose of additional volumes by deep well injection

2. The well-head injection pressure shall not exceed 250 psi

All other conditions of this license shall remain the same.

The above conditions were discussed with your Mr. Shelley and Mr. S. D. Wyngarden of my staff on April 28, 1983.

For your information, a copy of the safety evaluation report prepared in support of this amendment is enclosed.

FOR THE NUCLEAR REGULATORY COMMISSION

Original Signed by
Ralph G. Page

G. Page, Chief
Uranium Fuel Licensing Branch
~~Division of Fuel Cycle and~~
Material Safety, NMSS

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Enclosure: ~~Safety~~ Evaluation Report

MAY 1 8 1983

DOCKET NO: 40-8027

LICENSEE: Kerr-McGee Nuclear Corporation

FACILITY: Sequoyah UF_6 Production Plant

SUBJECT: REQUEST TO DISPOSE OF TREATED LIQUID RAFFINATE BY DEEP WELL INJECTION

I. Background

By letter dated July 29, 1982, the Kerr-McGee Nuclear Corporation (K-M) requested an amendment to its Source Material License No. SUB-1010 to permit disposal of treated liquid raffinate in the Sequoyah deep injection well. The Sequoyah facility produces approximately 5.6 million gallons of treated raffinate each year which has a neutral pH and contains mainly ammonium nitrate, heavy metals, and small concentrations of uranium and its decay products. K-M currently stores this solution in onsite lagoons and uses an estimated 2.5 million gallons per year as fertilizer on K-M owned land. Since the land application accounts for less than half of the volume generated annually and since annual rainfall exceeds evaporation from the ponds, K-M has been forced to construct additional ponds for raffinate storage. In this amendment request, K-M proposes the deep well injection of 5 million gallons each year for 5 years as an alternative disposal mechanism for the treated raffinate.

In May 1970, K-M submitted a similar request to amend SUB-1010 to permit the discharge of low level liquid waste in the same deep disposal well. The Atomic Energy Commission (AEC) staff denied the request in October 1970, but permitted K-M to reapply. Following several ensuing K-M applications requesting use of the well and subsequent denials by the AEC, K-M in April 1973 requested a hearing on the matter. In January 1974, the Atomic Safety and Licensing Board (ASLB) also denied authorization to use the well. Significant changes since 1974 in the raffinate composition, K-M's monitoring capabilities, and other conditions of the proposed injection well program distinguish the current amendment request from ones previously reviewed.

Prior to submitting the current amendment request in July 1982, K-M applied to the Oklahoma State Department of Health, Industrial

Waste Division, for a permit to operate the deep well. The State, which has an EPA approved underground injection control program with primary enforcement responsibility under the Safe Drinking Water Act, issued the permit on October 19, 1982. The NRC has conducted an independent environmental review to assure that all potential impacts associated with use of the well have been adequately considered. In order to obtain technical support for this review, the NRC awarded a contract to Dr. Don L. Warner, Consulting Geological Engineer. Dr. Warner assisted the AEC/NRC in its environmental reviews of the injection well in the early 1970's and was therefore uniquely qualified to assess the impacts associated with K-M's current request to use the same well. In his assessment, Dr. Warner analyzed engineering reports and other information available from previous reviews of the injection well in addition to K-M's current application material to the State of Oklahoma and the NRC.

II. Discussion

A. Radiological Safety

The quantities of radionuclides in the treated raffinate are well below the present maximum permissible concentrations (MPC's) for unrestricted release as specified in 10 CFR Part 20, Appendix B, Table 2. Assuming the soluble fraction of each nuclide is 100% (even though Ra-226 is only partially soluble in the raffinate), the average raffinate concentrations are 3.5% MPC for Ra-226, 0.1% MPC for natural uranium, and less than .01% MPC for Th-230.

B. Environmental Concerns

K-M proposes to inject treated raffinate between 1,619 and 3,122 feet below land surface into the Arbuckle Formation. Naturally occurring water within the Arbuckle typically contains around 142,000 mg/l total dissolved solids; 88,300 mg/l chloride; and 1,400 pCi/l Ra-226. This poor background quality of the natural formation water disqualifies the Arbuckle as an underground source of drinking water according to EPA regulations and makes it essentially useless for almost all purposes. Comparison of the chemical and radiological content of the treated raffinate and the natural formation water indicates that the proposed deep well injection would not significantly degrade the quality of the Arbuckle Reservoir or restrict its potential uses.

Overlying the Arbuckle in the vicinity of the Sequoyah facility is the Atoka Formation. The Atoka occurs at the land surface

to a depth of about 400 feet (1200 feet above the proposed injection zone). Engineering and geologic studies indicate that vertical migration of raffinate or Arbuckle formation water into the Atoka is an unlikely result of the injection program; however, if such migration did occur, the hydrologic impacts would be small. Well water samples taken near the bottom of the Atoka contain approximately 17,000 mg/l total dissolved solids and 10,000 mg/l chloride. In addition to this generally poor water quality, yields from the Atoka average only 0.5 GPM making it a useful aquifer in only a few isolated spots. The only local area capable of supporting a marginal water well is adjacent to the Carlisle School fault, approximately 5000 feet from the injection well.

Although the local groundwater quality is well understood, there is considerable uncertainty regarding the nature of the injection reservoir. More extensive testing of the Arbuckle is needed to clarify the existence and hydrologic nature of nearby faults, the migration patterns of wastewater and natural formation water, and other pertinent hydrogeologic characteristics. The properties of the Arbuckle are well-enough known to conclude that the formation can probably accept the first year injection of 5 million gallons of treated raffinate without significant environmental hazard. Approval of subsequent injections based upon analyses of the first year results will provide more certainty and better control of future injection impacts. Accordingly, it is recommended that use of the injection well be subject to the following condition:

> Use of the No. 1 Sequoyah deep disposal well shall be limited to the injection of 5 million gallons of treated liquid raffinate. Following injection of this initial volume, K-M shall submit to the NRC all monitoring results obtained from the injection program and all reports and conclusions regarding the nature of the disposal formation and any impacts resulting from the injection. This information shall be submitted in support of an application to dispose of additional volumes by deep well injection.

Additional discussion of the geologic and hydrologic impacts of the proposed injection is provided in "Environmental Assessment Related to Proposed Deep Well Injection of Liquid Raffinate at

the Kerr-McGee Sequoyah Facility, Oklahoma," prepared by Don L. Warner (copy enclosed). In this assessment, Dr. Warner determined that the well-head injection pressure of 300 psi allowed in the state permit is equal to the minimum hydraulic fracturing pressure for the receiving formation. Dr. Warner recommends the well-head injection pressure be limited to 250 psi to allow a factor for safety. Therefore, the following condition for use of the injection well is also recommended:

> The well-head injection pressure shall not exceed 250 psi.

C. Legal Issues

Although the ASLB denied authorization to use the deep well in 1974, changes in factual circumstances in K-M's current amendment request are adequate to allow the staff to reconsider the injection well program. These views and more complete discussions of the legal issues associated with this case are presented in the enclosed memo from the Office of the Executive Legal Director.

III. Conclusions and Recommendations

Based upon the information presented herein, I conclude that the proposed deep well injection of treated raffinate does not constitute an undue risk to public health or threat to environmental quality. I therefore recommend that License No. SUB-1010 be amended to permit use of the injection well subject to the aforementioned conditions.

Norman Stabeck

Stephen D. Wyngarden
Uranium Process Licensing Section
Uranium Fuel Licensing Branch
Division of Fuel Cycle and
Material Safety, NMSS

Approved by: D Hatfield for
W. T. Crow, Section Leader

Enclosures: As stated

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

OCT 27 1982

MEMORANDUM FOR: Ralph G. Page, Chief
Uranium Fuel Licensing Branch
Division of Fuel Cycle & Material Safety
Office of Nuclear Material Safety & Safeguards

FROM: Robert L. Fonner, Attorney
Regulations Division
Office of the Executive Legal Director

SUBJECT: KERR-MCGEE SEQUOYA INJECTION WELL

Your office staff has informally asked for advice on the position it should take, if any, on the use by Kerr-McGee Corporation of a raffinate waste injection well at its Gore, Oklahoma, uranium hexaflouride conversion plant (the Sequoyah plant) under a permit[1/] issued by the Oklahoma Department of Health - Industrial Waste Division. By letter of July 29, 1982 Kerr-McGee requested that its source material license, SUB-1010, be amended to permit the final disposal of treated raffinate in the Sequoyah waste disposal well conditioned on an approved state permit. The request was accompanied by a check of $3500 for a minor amendment. The Kerr-McGee application presents two legal issues:

1. What is the effect on the present application of a decision of the Atomic Safety and Licensing Board in 1974 denying a license amendment application for use of the same well for disposal of raffinate. See Kerr McGee Corporation (Amendment to Source Material License SUB-1010), 7 AEC 113 (1974).

2. What is the basis of NRC jurisdiction and what duties are imposed upon NRC in relation to State's issuance of a permit under the groundwater injection control program mandated by the Federal Safe Drinking Water Act. (42 U.S.C 300 et seq and implementing regulations of EPA in 40 CFR Parts 121, 122, 123, 124, and 146).

Effect of ASLB Opinion

The issue of use of the injection well was previously litigated (7 AEC 113) and resulted in a denial of the application on the ground that the applicant

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1/ The permit is for a class 1, "other industrial waste," well, not for a class 1 hazardous waste well, or a class IV hazardous and radioactive waste well. EPA has not published standards for class IV wells.

had failed to show (1) that its proposed procedures, equipment, and facilities were adequate to protect health and minimize danger to life or property, and (2) that issuance of the amendment would not be inimical to the health and safety of the public. Predominant among the factual determinations leading to the Board's conclusion were the applicant's failure to establish (1) the existence of the "South" fault which would close the boundary of the well reservoir, (2) the homogenous and isotopic nature of the disposal zones so that uniform radial flow rates could be calculated with some certainty, (3) that acceptable methods of flow calculation can be based upon data from a single well, and (4) that monitoring from a single well (the injection well itself) was adequate. The opinion dealt with a liquid acidic raffinate partially neutralized with ammonia and containing low level radionuclides.

According to the agency's rules the staff is obligated to follow an initial decision as final agency action 30 days after issuance in the absence of exceptions or certification of the record to the Commission. 10 CFR 2.760. Thus, the decision of January 18, 1974 is binding upon the staff to the extent the present application is a duplicate of the application denied.

Although the judicial doctrine of res judicata applies in a strict sense only in adjudicatory hearings, the same considerations of legal policy should apply when a matter is renewed administratively, and is not in adjudication. See Houston Lighting and Power Co. (South Texas Project. Units 1 and 2) LBP-79-27, 10 NRC 563 (1979). If the staff as party in a new adjudication chose to contest the application, res judicata would apply to all previously decided factual issues (and to those that could have been litigated) unless it could be shown that there were significant supervening developments with material bearing on previously litigated issues, or that there is present some unusual factor having special public interest implications. Alabama Power Company (Joseph M. Farley Nuclear Plant, Units 1 and 2) ALAB-182, 7 AEC 210, 216 (1974).

There does not seem to be any sound reason why the same rules should not apply in a subsequent non-adjudicatory administrative proceeding following an adjudicatory proceeding that determined identical factual issues between the same parties. Were it not so, an aggressive applicant disappointed in an adjudicatory proceeding could simply keep resubmitting his application until a fatigued staff simply gave in and issued the requested license or amendment.[2/]

There are in this case, however, both supervening developments with material bearing on previously litigated factual issues, and an unusual factor having

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2/ It does not appear to be in order to reopen the earlier hearing itself. The ASLB jurisdiction would have terminated upon its decision becoming final for the agency under the agency's rules. It would now have no jurisdiction with respect to the present application. Florida Power and Light Co., (St. Lucie Nuclear Power Plant, Unit No. 2) ALAB-579, 11 NRC 223 (1980).

public interest implications. The supervening developments bearing on litigated factual issues are (1) a change in composition of the raffinate, and (2) an additional monitoring well. The unusual factor having public interest implications is the development in recent years of the EPA underground injection control program pursuant to the Safe Drinking Water Act (42 U.S.C. 300f et seq.) administered as to this well by the State of Oklahoma under its primary enforcement role (see 42 U.S.C. 300h and 300h-1).

The change in composition of the raffinate began in 1973 as part of a small scale controlled experiment to determine if raffinate could be used as a fertilizer. For this purpose the raw raffinate was additionally treated with barium compounds to coprecipitate residual radium (most of the waste thorium and uranium being previously precipitated with ammonia). The resultant raffinate contains about 8% ammonium nitrate, about 3 pCi/l or less of radium-226 and trace amounts of heavy metals. Removal of the radium is a significant change in the radiological or hazardous waste characteristics of the raffinate. The current plan submitted to Oklahoma and to the NRC now also proposes a second dedicated monitoring well in addition to monitoring via injection well pressure drops. Thus two of the facts on which the Licensing Boards decision was based have changed.

The underground injection control program was enacted as part of the Safe Drinking Water Act (SDWA) by the Congress in December, 1974, almost a year after the conclusion of the adjudicatory hearing. § 2, Public Law 93-523, December 16, 1974, 88 Stat. 1660. The primary purpose of the SDWA is to establish minimum national standards for drinking water supplies for protection of the public health. Under the Act, EPA was charged with the duty of establishing Federal standards for all harmful contaminants, and to establish a joint Federal-State enforcement program. The definition of contaminants includes any radiological materials whether or not such materials originate from a source under the jurisdiction of the NRC. See 1974 U.S. Code Congressional and Administrative News, p. 6469.

The underground injection control program under the SDWA has as its purpose the prevention of injection into groundwater of waste that may endanger either present or potential drinking water sources. Here, also, EPA is to establish both standards and a joint Federal-State enforcement program. Under the latter, all States are to prohibit any underground injection not authorized by permit, and may not allow any injection that endangers drinking water sources. 42 U.S.C. 300h and 300h-1. If a state's program is either not approved by EPA or the State fails to enforce its program, the Administrator of EPA may take enforcement action.[3/] 42 U.S.C. 300h-1 and 300h-2.

3/ EPA's detailed regulations on this subject are found in 40 CFR Parts 121, 122, 123, 124, and 146. Part 146 establishes the technical standards for injection well permitting.

Oklahoma's underground injection control program has been approved and the State has primary enforcement responsibility under the SDWA.

Thus, for the injection of waste underground, including radioactive waste, there exists today a comprehensive Federal regulatory program administered by EPA that was not in existence at the time of the adjudicatory hearing. Kerr-McGee is securing a permit from the Oklahoma Department of Health issued under EPA approved regulations that conform to the national standards.

In my opinion, the changes in factual circumstances and the supervening national policy reflected in the SDWA are adequate to allow the licensing staff to consider again the application of Kerr-McGee for the use of the injection well under conditions that conform to the national policy. Positive staff action is not barred in this case by the initial decision of January 18, 1974.

The Basis of NRC Jurisdiction

The radioactive content of the treated raffinate is very low,[4/] more than an order of magnitude below NRC standards in 10 CFR Part 20, Appendix B, for release of licensed material and related isotopes in effluents on an exempt basis, and several times less than the primary drinking water standards for covered radioisotopes in 40 CFR Part 141.

Under NRC regulations in 10 CFR 20.106 and 20.301(c), the licensed material in the raffinate (i.e. trace amounts of natural uranium and thorium) may be disposed of without further licensing action. However, the NRC has a legal obligation under the National Environmental Policy Act (NEPA) to examine all environmental consequences resulting from licensed activities whether or not licensed material is directly involved. Calvert Cliffs Coordinating Comm. v. Atomic Energy Comm., 449 F.2d 1109, 1122 (1971); cert. denied 404 U.S. 942 (1972). Under Calvert Cliffs it also has a duty to mitigate those consequences by license condition wherever on balance it is possible to do so. Id. pp. 1128-1129.

Further, under the Calvert Cliffs doctrine, the NRC may not sidestep its NEPA obligation to mitigate environmental impacts by reliance upon a permit issued by another agency or a certificate that its regulations have been complied with. Id. p. 1123. There are two exceptions to this rule, one statutory, the other developed in NEPA cases. The statutory exception is found in § 511(c)(2) of the Clean Water Act (33 U.S.C. 1371(c)(2)) which prohibits NRC from reviewing or supplementing the conditions of a NPDES

4/ See Table 1.1 in Environmental Impact Appraisal for Proposed Amendments for Use of Raffinate, Docket No. 40-8027, March 1982.

permit. That is, NRC may not second guess the results of the EPA Water quality program as reflected in NPDES permits issued by it or permitting states, and may not impose additional mitigating conditions. Nonetheless, water quality impacts must still be weighed in any NRC NEPA cost-benefit analysis. See memorandum of Howard K. Shapar, ELD, to Harold R. Denton, Director, NRR, dated December 7, 1979, Deletion of Limiting Conditions of Operation as to Water Quality Requirements, etc.

The second exception is judically developed and states that if significant environmental impacts are adequately mitigated in a license or permit then no impact statement or negative declaration need be issued. See Cabinet Mountains Wilderness v. Peterson, C.A.D.C. slip opinion dated August 13, 1982. In that case the environmental impacts of significance were mitigated to a level of insignificance by conditions in the permit of the agency that was charged with the NEPA review. The court stated four criteria for applying this exception: (1) the agency must have taken a "hard look" at the problem, (2) the agency must have identified relevant areas of environmental concern, (3) the case must be convincing that the impacts are insignificant, and (4) if there was a significant impact, it must be convincingly established that mitigating conditions reduced it to a minimum. Although, in the cited case, the mitigating measures were imposed by the NEPA reviewing agency the logic of the criteria would support their application also to the mitigating conditions in the legally binding permits of other agencies, since the final result of application of the criteria is a determination that the impacts after mitigation are not "significant." Id. at p. 8.

Conclusion

Both the NRC and the Oklahoma Department of Health have jurisdiction to take licensing action with respect to the Kerr McGee injection well. In the circumstances of this case, the NRC's role is predominantly one of environmental review and mitigation, if necessary, while the State's role is one of issuing a permit for the use of the well under Federal law and regulations for control of drinking water pollution. In the performance of its role the NRC staff may, following the rule of the Cabinet Mountain case, include in its hard look at relevant areas of environmental concern[5/] the mitigating conditions of the State issued permit in determining if there are any significant areas of environmental concern requiring NRC action. If no significant unmitigated impacts are found, a license amendment without further conditions could be issued. If any significant environmental impact remains

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5/ In this case the relevant area of primary concern appears to be the possibly unconfined pollution of a deep salt water aquifer with an aqueous solution of ammonia nitrate.

unmitigated by the State permit, then the NRC license amendment could contain appropriate mitigating conditions to obviate the need for further formal environment review. If there remain impacts of significance that cannot be satisfactorily mitigated in either the State permit or NRC license amendment an appropriate NEPA statement will need to be prepared.

Robert L. Fonner

Robert L. Fonner
Attorney
Regulations Division
Office of the Executive
Legal Director

cc: GHCunningham, ELD
WCrow, ONMSS
WNixon, ONMSS
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Region IV