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SCHOOL OF MINES AND METALLURGY
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Ro IV
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AP 1/12/73

December 22, 1972

40-8027

Mr. James C. Malaro
Chief, Materials Branch
Directorate of Licensing
U. S. Atomic Energy Commission
Washington, D. C. 20545

Dear Mr. Malaro:

It has been requested that I comment on the relative merits of subsurface injection and waste holding ponds as two possible methods of handling raffinate waste at the Kerr-McGee Corporation Sequoyah Facility. The raffinate wastes are currently being held in ponds. An injection well has been constructed, but has not been used to date.

It is obvious that the ponds are a temporary means of handling the raffinate wastewater, since precipitation at the Sequoyah Facility is about equal to evaporation and natural evaporation of the liquid can not, therefore, be expected to occur. This is recognized by Kerr-McGee Corporation, and, in their environmental report of June, 1972, it is stated that the ponds are for interim storage until such time as deep well disposal is approved or a solidification and/or disposal method can be developed. Information in the environmental report also shows that the storage ponds are leaking and that the shallow groundwater is being contaminated in the vicinity of the ponds. I would, therefore, recommend that an alternative to the ponds be developed at the earliest possible time and that the waste presently in the ponds be removed.

Kerr-McGee has supplied information concerning their injection well in reports dating back to 1969, all of which I have previously reviewed and commented upon. During a meeting on November 20, additional information was presented verbally and in the form of an outline and supplemental maps and overlays.

After considering all of the presently available information, it is my opinion that, in the absence of any more satisfactory practical alternative, Kerr-McGee Corporation could be allowed to use the well that they have constructed for injection of up to 50 million gallons of wastewater with no foreseeable significant hazard to the environment or public health.

Because the geology in the vicinity of the Kerr-McGee well is complex, I would recommend that, before the well is actually used for

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wastewater injection, the company should be required to drill a well about 2,000 feet north-northeast of the present well. This well would be for the purpose of proving the presence or absence of the fault that the company shows on their most recent structural geologic map. This well would need to be drilled only to the first marker bed that could be used to confirm the fault if it is present. If the fault is not present, the well should be continued to the same stratigraphic depth as the present well to be used as a monitor well and standby injection well.

A third well should be drilled about 500 feet from the present well between wells 1 and 2. This well should be drilled to the top of the Arbuckle Dolomite and cased to the top of the Simpson Formation. The Simpson should be left open, or if necessary, supported with a slotted or perforated liner to allow monitoring of fluid pressure and quality of water in the Simpson, This well would be used to detect any vertical leakage from the Arbuckle, since such leakage would increase the pressure or water level in the Simpson and, perhaps, contaminate the Simpson with radioactive wastewater.

If the fault to the north of the Kerr-McGee well is proven to exist during the drilling of well number 2, then a fourth well should be drilled about 2,000 feet southwest of the present well as a monitor and standby well. This well should be drilled to the same stratigraphic level as the present well and constructed in the same manner as the present well. If no fault exists north of the Kerr-McGee well, then the fourth well would not be necessary. In addition to these monitoring requirements, suggestions are made in my review of June, 1972, that should be considered, if the well is allowed to be used. If it is decided to allow Kerr-McGee to use the injection well, I will be happy to assist in implementing these recommendations.

I believe it might be important for Kerr-McGee to realize that no matter how they might gain permission to use the well, whether through a hearing or otherwise, the same or similar monitoring requirements would probably be imposed. In addition, there is a possibility that further drilling will yield information that would change the present geologic conclusions substantially, even to the extent the permission to use the well would eventually be denied.

Sincerely yours,

Don L. Warner, Professor
of Geological Engineering

DLW/lrb

cc: Mr. George DeBuchananne
U. S. Geological Survey

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December 22, 1972

Mr. George D. DeBuchananne
Chief, Office of Radiohydrology
Water Resources Division
U. S. Geological Survey
Washington, D. C. 20242

Dear George:

Enclosed is a copy of my letter to the Atomic Energy Commission concerning the Kerr-McGee injection well. I sent them an earlier letter immediately after the November 20 meeting, but it contained only the comments about the monitoring system, which was not enough for their purposes. The AEC has asked that I provide you with a copy of the present letter and that you then inform them of your opinion concerning my recommendations.

I hope that your European trip was enjoyable and best wishes for the Holiday Season.

Very truly yours,

Don L. Warner, Professor
of Geological Engineering

DLW/lrb

Enclosure

cc: Mr. James Malaro

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