FEB 2 8 1990

Docket No. 70-925

Cimarron Corporation
ATTN: J. C. Stauter, Director
Nuclear Licensing and Regulation
P.O. Box 25861
Kerr-McGee Center
Oklahoma City, OK 73125

Dear Dr. Stauter:

We have reviewed the Site Investigation Report for the Cimarron facilities that you submitted on October 9, 1980. Our main concern is that the report does not contain an adequate model of groundwater movement on the site or an analysis of the uranium concentrations that might reach members of the public by groundwater pathways. Our detailed comments on this and other points are enclosed.

We look forward to meeting with you and your consultants on March 1, 1990, to discuss the issues raised in our enclosure.

Sincerely,

Original Signed by

Charles J. Haughney, Chief
Fuel Cycle Safety Branch
Division of Industrial and
Medical Nuclear Safety

Enclosure: NRC comments
on Cimarron
Site Investigation Report

cc: Dale McHard
Oklahoma State Department
of Health
James Berger
Oak Ridge Associated Universities

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ENCLOSURE

Groundwater Impact Analysis

The Grant report has provided an incomplete groundwater impact analysis. Only one point on the groundwater pathline was analyzed, however one could argue that the shallow aquifer anywhere onsite could be used as a source of drinking or irrigation water at some future time.

Section 4.3 of the Grant report states that the principal source of groundwater in the area of the Cimarron facility is the Garber/Wellington formation and that the Cimarron River and Cimarron River alluvium are too salty for use as drinking water. From the groundwater chemical analysis results given in table 3.4 and 4.2 of the Grant report it appears that the upper aquifer of the Garber Formation, identified as sandstone A in the Grant report, may have the best water quality of any of the other aquifers of the Garber formation.

If this is the case the peak concentration of uranium through time in a well tapping the shallow aquifer groundwater directly adjacent to and down gradient from the option 2 burial area should determined. Also if groundwater containing leachate from the option 2 burial area would flow through the shallow groundwater and into any site surface water, then the peak uranium concentration through time in that water should be determined. If it is unlikely that the shallow groundwater or surface water impacted from the option 2 burial will be used then a demonstration of that needs to be given.

Areas of Known Groundwater Contamination

The Grant report identifies numerous areas on-site where groundwater contamination currently exists. Specifically these areas are Former Waste Water Pond #1, Former Waste Water Pond #2, the Former Burial Area and the Uranium Plant Area.

Each of these areas was only briefly described in the Grant report. Because these areas may have to be subjected to a groundwater impact analysis before the site can be decommissioned they should be fully characterized.

The characterization of these areas should include determining if any residual soil contamination above the water table still exists. Next, the contaminant plume at each of these areas should be defined in terms of concentration and distribution of contamination. Statements made in the Grant report about a change in aquifer geochemistry down gradient from some of these areas should be validated. Finally, impacts for water use pathways should be considered including contaminated groundwater discharge to site surface water.

Site Conceptual Model

As part of a complete groundwater impact analysis at this site certain site characteristics will have to be better determined and these figured into a site conceptual model. The following comments are about specific points from the current site investigation report which need to be clarified before the site investigation report can be considered adequate.

Joints

The presence of joints in the Garber Formation is mentioned on page 5-9 of the Grant report. The presence of joints in saturated porous media can increase the migration rate of radionuclides through that media. Licensee should make a determination as to the effect of these joints (if any) on the hydraulic conductivity and contaminant transport rate in the Garber Formation, specifically sandstone A.

Perched Aquifers

Comments made by Cimarron Corporation on page B-7 of their October 9, 1989 submittal (response to State of Oklahoma and NRC questions on amendment request) state that perched water develops on the shale layers in the unsaturated zone after periods of heavy rain. The geologic cross-sections through the area of the option 2 burial ground, figures 5.1 and 5.2 in the Grant report, show the presence of mudstone (shale) lenses above the elevation of the groundwater table in sandstone A. The potential for mudstone lenses to produce perched aquifer conditions at the location of the proposed option 2 burial and the possibility that perched water may intrude the burial cell and increase contaminant transport away from the option 2 burial site is not addressed in the Grant report.

Groundwater Flow Direction

Figure 7.5 of the Grant report shows the pathline of the presumed groundwater flow away from the proposed option 2 burial cell. However, analysis of the shallow water table equipotential lines shown on figure 5.4 and also on figure 7.5 show that a groundwater divide can be drawn, see attached figure, through the area of the proposed option 2 disposal cell. This indicates that most if not all of the uranium that leaches out of the option 2 disposal cell would flow towards reservoir No. 3. Why wasn't this considered in the conceptual model of groundwater movement through the site.

Groundwater and Land Use

The groundwater and land use on and around the site should be described. This will help to determine potential receptors and how

they may be impacted if contamination leaves the site. For example, if crops are grown and cattle are grazed and watered on the Cimarron River flood plain adjacent to the site, this should be determined. This should also be done for the site itself. Also all groundwater users within a 2 mile radius of the site should be identified. Determine which aquifer they obtain their water from especially if it is the water table or Cimarron alluvium aquifer. This should be done not so much to see who might be impacted from contamination on the site, but rather to determine what potential future use might be made of the site and vicinity groundwater if the site is released for unrestricted use.

Erosion

The erosion history of the site needs to be characterized and the licensee needs to assess the potential for erosional processes to breach the disposal cell and provide risk to a member of the public.

Computer Simulations

For any computer simulations of site performance a print out of the input file, as well as the output file generated from it, should be provided so that an analysis can be made of all the input parameters and independent calculations made from them.

Volume Estimate and Justification For Burial

In light of the new information as to the revised uranium concentration and distribution in the contaminated soil that is around the uranium plant and other areas a new estimate for the volume of contaminated soil above option 1 limits should be provided.

PROPOSED AGENDA FOR MEETING BETWEEN
KERR-MCGEE TECHNICAL PEOPLE/CONSULTANTS AND NRC TECHNICAL PEOPLE
TO DISCUSS ISSUES RELATED TO THE SITE INVESTIGATION REPORT
OF THE CIMARRON CORPORATION FACILITY

1. Groundwater Impact Analysis

   Potential pathways

2. Areas of Known Groundwater Contamination

   Plans for characterization

3. Site Conceptual Model

   Joints

   Perched aquifers

   Groundwater flow direction

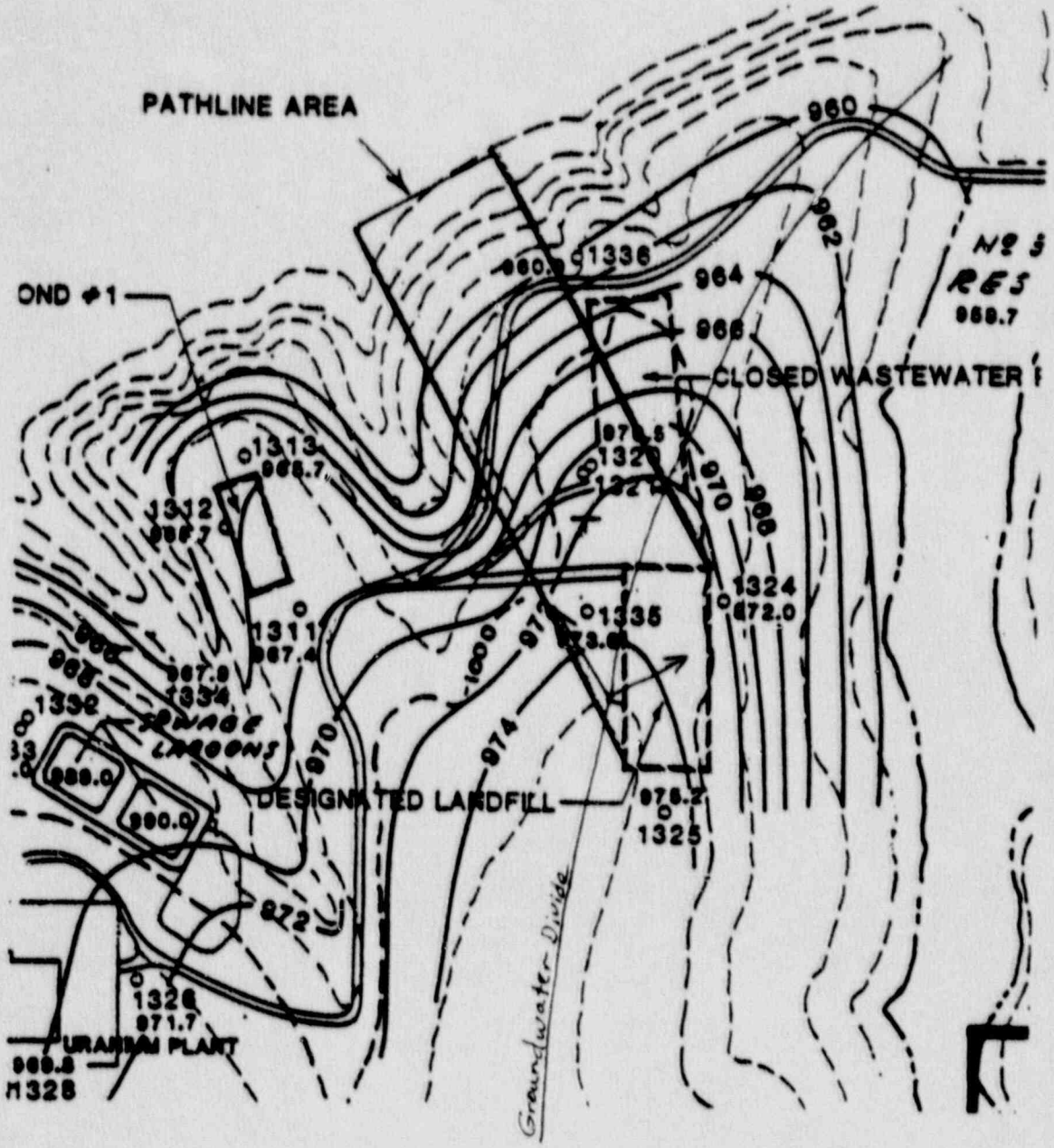
   Groundwater and land use

   Erosion

   Computer simulations

4. Volume Estimate for Option 2 Burial

   New estimate



JAMES L. GRANT & ASSOCIATES
geotechnical engineering • management • computer science
ENGLEWOOD, COLORADO

FIGURE 7.5

PATHLINE
FOR SATURATED ZONE SIMULATIONS