

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of

KERR-MCGEE CHEMICAL CORPORATION

(West Chicago Rare Earths  
Facility)

}  
} Docket No. 40-2061-ML  
}

} ASLBP No. 83-495-01-ML  
}

TESTIMONY OF PAUL BENIOFF ON  
DISTRIBUTION COEFFICIENT ISSUE

Q.1. What is the purpose of your testimony?

A.1. The purpose of this testimony is to explain why the Kerr-McGee leachate test results are not pertinent to the staff analysis of concentrations of chemical species in the groundwater based on the use of distribution coefficients. In particular the 30 fold difference between the distribution coefficient assumed by the staff for lead and the leachate test results should be explained. In addition it should be explained how the staff results would be changed by use of the Kerr-McGee observational data.

Q.2. Why is there a 30 fold difference between the distribution coefficient assumed by the staff and the Kerr-McGee test results?

A.2. Insufficient information is given in the ASLB Memorandum and Order dated November 30, 1989 for me to understand what is being compared to obtain a difference of a factor of 30 for lead. However, the following observations may be relevant. The Kerr-McGee test results

show a composite maximum leachate concentration of 0.2046 mg/L for lead (Table 2-39 in Volume II of the Engineering Report). Use of the assumed distribution coefficient of 100 ml/g and an average concentration of 730 ppm (equals 730 ug/g) of lead in the Kerr-McGee wastes (Table E.1 of the SFES) gives an estimated concentration of 7.30 mg/L of lead in the leachate leaving the cell. This value is higher than Kerr-McGee's value by a factor of about 36. This difference shows that the staff's analysis is more conservative than that of Kerr-McGee in that it assumes a higher concentration of lead in the leachate leaving the cell than does the analysis of Kerr-McGee. The likely source of this difference is the choice of a conservative value for the distribution coefficient which is at the low end of the range of observed values.

- Q.3. Why are the Kerr-McGee leachate test results not pertinent to the staff analysis in the SFES of chemical concentrations in the groundwater?
- A.3. The leachate test results presented by Kerr-McGee are measurements done by use of the EP toxicity procedure. This procedure, which is described in the Code of Federal Regulations (40 CFR 261), is not equivalent to the in-situ leaching of wastes as would occur in the Proposed Action by means of any precipitation percolating through the cell cover. The procedure also does not correspond to the methods used to measure distribution coefficients. Furthermore, the leachate concentrations calculated using data in Table E.1 in the SFES are higher for most chemical species than the EP toxicity

results obtained by Kerr-McGee. This further confirms the conservative nature of the calculations presented in the SFES.

Q.4. How would staff results in the SFES be changed by use of Kerr-McGee's test results?

A.4. As noted in A.3, the EP toxicity results are not appropriate to use for modelling projected groundwater contamination for the Proposed Action. If they were used to represent concentrations in leachate leaving the waste cell, the maximum concentrations for most chemical parameters would be lower than the results presented in Table E.7 in the SFES. The single exception is arsenic, for which the peak concentrations would be about 16% higher than the values given in Table E.7. The higher value would be a small fraction, less than 3%, of the state and federal limits for groundwater protection (Tables 2.8 and 2.9 in the SFES).