

JUL 28 1982

DOCKET NO.: 40-8027  
APPLICANT: Kerr-McGee Nuclear Corporation  
FACILITY: Sequoyah Uranium Hexafluoride Production Plant  
SUBJECT: LIMITED EXEMPTION FOR MOLYBDENUM CONTENT OF TREATED RAFFINATE  
REVIEWER: W. A. Nixon

I. Background

On June 30, 1982 Amendment No. 17 was issued to Kerr-McGee (K-M) to permit the broad, but controlled, use of treated raffinate as fertilizer. Condition 3.b. of Amendment No. 17 limits the total quantity of various heavy metals which can be applied to cultivated land through the use of treated raffinate by relating the heavy metal content of treated raffinate to that of continuous-use irrigation water. Subsequent to the issuance of Amendment No. 17, K-M determined that the molybdenum (Mo) content of the treated raffinate now in storage would, if Condition 3.b. were applied, limit the annual fertilizer application rate to 150 pounds of nitrogen per acre. This application rate is only about 25 to 50% of that required for good forage production and is far below the annual limit of 700 pounds of nitrogen per acre specified in Condition 4. of Amendment No. 17. In a letter dated July 21, 1982, K-M applied for an exemption from Condition 3.b. so that a limited quantity (3 million gallons) of the current inventory of treated raffinate could be used at an annual nitrogen application rate exceeding 150 pounds per acre. Without approval to use the raffinate, storage capacity may be exceeded in the near future.

II. Discussion

The treated raffinate in storage at K-M contains 13-16 ppm Mo and about 25 grams per liter of nitrogen. The maximum annual application rate of Mo, if the current inventory were applied at 700 lbN/acre, is shown in the following table. Comparative figures for Mo from irrigation water are also given:

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<u>Source</u>	<u>Mo Content (1)</u> <u>mg/l</u>	<u>Mo Application (2)(3)</u> <u>g/acre/y</u>
Treated raffinate	13 to 16	165 to 204
Irrigation water		
continuous use	0.010	37
20 year use	0.050	185

1. Allowable Mo content of irrigation water from National Academy of Sciences, "Water Quality Criteria" 1972.
2. For raffinate, the Mo is based on application of 700 lbN/acre.
3. For irrigation water, the Mo is based on application of 3 acre feet of water per acre.

The maximum Mo application rate, if the exemption is granted, would be about 5 times that permitted by Condition 3.b. of Amendment No. 17 and would be equivalent to the application from 3 acre feet of irrigation water containing the maximum Mo content for 20 year use irrigation water. Actual fertilizer application rate in 1982, because the growing season is well advanced, will be limited to about 400 lbN/acre corresponding to about 100 gMo/acre, or less than 3 times that permitted by Condition 3.b. of Amendment No. 17.

The short-term increase in the application rate of Mo to the soil is not expected to have a significant impact. The impact can and will be indicated by analysis of forage grown on the fertilized areas. Condition 9. of Amendment No. 17 provides for the release of forage for animal feed only if the heavy metal content does not exceed the maximum tolerable dietary levels given in the National Academy of Sciences report "Mineral Tolerance of Domestic Animals, Washington, D.C., 1980." The Mo limit in this reference is 10 ppm. No forage samples grown with past test applications of treated raffinate have exceeded this limit. Analysis of the Mo content in soil is also required by Amendment No. 17 and this will further aid in detecting any adverse impact from use of the elevated Mo content raffinate.

K-M is pursuing methods to reduce the Mo content of the current inventory of treated raffinate and to improve the effectiveness for Mo removal of the raffinate treatment system. Some success has been attained in both approaches, but more work will have to be done before the problem can be solved.

K-M has agreed to use the treated raffinate exempted from the Mo requirements of Condition 3.b. of Amendment No. 17 only on land owned by K-M.

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III. Conclusion

The use of a limited quantity of treated raffinate with elevated Mo content as fertilizer on K-M owned land should have no serious short or long term impact. The actual impacts can be determined by analyses of soil and forage and these analyses are required under Amendment No. 17. I recommend that the amendment be approved.

*W. A. Nixon*

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Original Signed By:  
W. T. Crow

Approved: W. T. Crow, Section Leader

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