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

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JUL 07 1980

MEMORANDUM FOR: Ross A. Scarano, Chief
Uranium Recovery Licensing Branch

THRU: Hubert J. Miller, Section Leader
New Facilities Section
Uranium Recovery Licensing Branch

FROM: Ronald S. Kaufmann
New Facilities Section
Uranium Recovery Licensing Branch

SUBJECT: AMENDMENT REQUEST FROM TETON EXPLORATION DRILLING INC., LEUENBERGER MINE

By letter dated June 17, 1980, Teton Exploration Drilling Inc., (TETON) requested amendment of Source-Byproduct Material License SUA-1373 to authorize effluent waste levels in the evaporation ponds to rise to 5214.6 feet (2.4 feet of freeboard). The original license allows the pond effluent waste elevations to be no greater than 5202 above mean sea level. In their letter requesting the amendment and submittals of February 22, 1980, April 9, 1980, May 15, 1980 and June 6, 1980, TETON provided embankment stability data, pond effluent quality data, calculation of freeboard, and an evaluation of the impact of an embankment failure.

Based on the embankment geometry (maximum embankment height of 17 feet and 4:1 sideslopes), the installation of an impoundment liner with a leak detection system and a review of soil boring data submitted to the NRC by TETON in a correspondence dated May 15, 1980, the embankment design is co sidered conservative with regard to stability requirements and acceptable to the WMUR staff.

Pond freeboard calculation, pond effluent quality and an embankment failure impact study were evaluated by WMUR staff. TETON's freeboard calculation of 2.4 feet is based on the PMF plus a six hour hundred year storm event. Regulatory Guide 3.11 requires freeboard be calculated with 1.4 PMF plus the hundred year storm event for tailings impoundments. However, the Regulatory Guide does state that "for small retention dams . . . where failure would neither jeopardize human life nor create damage to property or the environment beyond the sponsor's legal liabilities and financial capabilities, a less conservative flood design criteria may be used."

Though the wastes being placed in the TETON pond are similar to some tailings fluids and the TETON freeboard calculation is less conservative than using 1.4 PMF, the WMUR staff concurs with TETON's calculation of freeboard and considers that in the event of an embankment failure there will be no significant impact outside mine boundaries for the following reasons:

1. Current pond effluent quality for non-radiological parameters are better than drinking water.

2. Current uranium concentration in the pond is 7 ppm and radium-226 concentration is 6.6 pCi/l. Evaluations of embankment failure by TETON and WMUR staff indicate that in the event a precipitation event should cause the pond to reach capacity and the embankment fails or is overtopped, the calculated concentration of pond radium-226 just prior to the release of solution, due to dilution by rain water, would not exceed drinking water standards (5 pCi/l). Similarly, pond uranium concentration would be below 5ppm just prior to embankment failure. This 5 ppm is well below the value of ~40 ppm in Appendix B of 10 CFR 20 for concentrations of natural uranium in water released to unrestricted areas. This calculation does not consider that if the amendment is granted, TETON will use the added pond space for restoration and that the restoration process will further dilute uranium and radium concentrations. If the ponds are to be used for commercial mine operations, an evaluation will have to be made of radionuclide and chemical concentrations and subsequent impacts if solution were to be released.

3. Even if the pond concentration were at the current radium-226 and uranium values, the WMUR staff considers that an embankment failure under worst rainfall conditions would not result in contamination off the mine property. The evaporation pond is a small part of a larger drainage basin and the stream that would receive the effluent in the event of an embankment failure flows for a mile before leaving the mine property. The WMUR staff considers the quantity of water drained from the site during a major storm event substantial enough to dilute the pond radionuclide concentrations to better than drinking water quality if an embankment failure occured.

The proposed action is the amendment of Source-Byproduct Material License SUA-1373 to allow minimum pond freeboard of 2.4 feet.

Upon completion of the review of the licensee's application, the staff has concluded that issuance of Amendment No. 1 to Source-Byproduct Material License SUA-1373 as described above will not constitute undue risk to the health and safety of the public and will not result in any significant negative increment in the environmental impacts occurring with the current pond elevation limits.

Approval of the amendment is recommended with the following revision of Condition 32:

32. In the solar evaporation ponds, as shown on Figures III .5.3.01 a and b of the Environmental Report, there shall be no less than 2.4 feet of freeboard between the crest of the embankment and the surface of the operating pool.

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New Facilities Section
Uranium Recovery Licensing Branch
Division of Waste Management

Approved by:

Daniel M. Gillen

John J. Linehan, Section Leader