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December 9, 1985

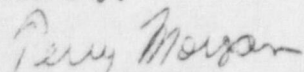
Mr. Chuck Johnson
UNC Mining and Milling
P.O. Drawer QQ
Gallup, NM 87301

Dear Mr. Johnson:

The Radiation Protection Bureau sent your latest revised PMF estimate for the Church Rock site to our consultant, Dr. Steve Abt, for review, and his comments are attached. Apparent errors in either procedure or calculations have resulted in an underestimation of the PMF volume, according to Dr. Abt. He suggests and this Bureau requests that UNC review the calculations made in determining the peak runoff values.

We would be glad to schedule a meeting at your convenience to discuss the PMF determination for the Church Rock site. Please feel-free to call me at 827-2850 if you have any questions.

Sincerely,



Terry L. Morgan
Acting Program Manager
Uranium Licensing Section

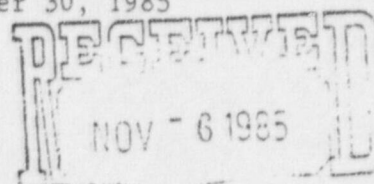
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PDR ADOCK 04008907
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Steven R. Abt, Ph.D., P.E.
2401 Creekwood Dr.
Fort Collins, CO 80525

October 30, 1985



RADIATION PROTECTION BUREAU

Mr. Terry Morgan
State of New Mexico
Radiation Protection Bureau
Environmental Improvement Division
P.O. Box 968
Santa Fe, New Mexico 87504-0968

RE: Review of PMF Determination for UNC Pipeline Canyon Watershed,
August 15, 1985 Submittal

Dear Mr. Morgan,

In accordance with your request, I have reviewed the PMF determination for the UNC-Pipeline Canyon Watershed submitted to you by UNC in August 1985. The review was conducted using the letter and submittals from UNC, Design of Small Dams (1977) and Hydrometeorological Report No. 49 (1984). Please note that the review will concentrate on major discrepancies in procedure or interpretation. Minor differences will not be addressed.

The PMF determination submitted by UNC utilizes the HMR 49 procedure for adjusting the PMP and the SCS Triangular Hydrograph Method presented in Design of Small Dams for determining the resulting PMF. Their assumptions that:

- a) The 1-hr PMP is 9.5 inches,
- b) The channel length from the top of the watershed to the entrance of the impoundment area is 5.68 miles,
- c) The watershed area is 19.18 square miles,

are consistent with the Nelson and Abt review of June 15, 1985. Using the 1-hr, 1-mi² PMP rainfall depth of 9.5 inches, UNC applied a rainfall adjustment reducing the PMP by 5 percent per 1000 feet of elevation above 5000 ft. Since the watershed and mill are at an approximate elevation of 7000 ft from MSL, a 10 percent reduction of the PMP results in an adjusted PMP depth of approximately 8.6 inches. The rainfall was then distributed in 1/4 hr increments where 74 percent, 89 percent, 95 percent and 100 percent of the PMP falls in 1/4 hr, 1/2 hr, 3/4 hr and 1 hr periods, respectively. The incremental rainfall values were then adjusted from 1-hr, 1-mi² depths to lesser values to reflect the 19.18 mi² tributary basin. The reviewer concurs with the procedures UNC followed although there are slight variances in the resulting 1/4 hr rainfall depths.

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The PMP 1/4 hr rainfall depths were input into the SCS Triangular Hydrograph Method for determination of the PMF entering the impoundment area. UNC adjusted the cumulation runoff and incremental runoff values as well as estimated the time of concentration and time to peak of each incremental hydrograph. The reviewer concurs with the procedures. However, the reviewer does not agree with the Δ peak values generated by UNC in their table presented on page II-5. The table presents the time increments in 1/4 hr segments, the excess rainfall for each segment and the peak runoff for each segment. The resulting peak runoff values for each segment range from 20-40 percent below the values calculated by the reviewer. Furthermore, the precipitation values (P) used on page II-3 to compute the cumulative runoff from


$$Q = \frac{(P - 0.25)^2}{P + 0.85}$$

are 5-10 percent below the values determined in this review .

Therefore, in the opinion of this reviewer, the low incremental rainfall values used to determine the runoff in conjunction with the incorrectly computed peak runoff values for each 1/4 hr hydrograph result in an incorrect PMF composite hydrograph. The resulting PMF peak discharge and volume of flow are considerably underestimated. It is recommended that UNC review their PMF computations.

The reviewer would be pleased to meet with you and UNC to discuss and "compare notes" to resolve an acceptable PMF estimate. Call me at 303-491-6707 or 303-493-8568 if specifics are desired pertaining to this review.

Very Truly Yours,



Steven R. Abt, Ph.D., P.E.

cc: J. D. Nelson