

FORMAT VOLCANICS/2

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MEMORANDUM FOR: John J. Linehan, Acting Chief
Operations Branch
Division of High-Level Waste Management

FROM: Ronald L. Ballard, Chief
Technical Review Branch
Division of High-Level Waste Management

SUBJECT: ERRATUM FOR MEMORANDUM - VOLCANISM AT NNWSI

The memorandum title " Volcanism at NNWSI " transmitted on July 7, 1987, contained an error in the second page of the attachment. Please substitute the attached page two for the page two contained in the referenced memorandum.

ORIGINAL SIGNED BY

Ronald L. Ballard, Chief
Technical Review Branch
Division of High-Level Waste Management

Attachment:
As stated

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WM Project: WM-11
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As stated in Link et. al., this calculation produces the "expected release" due to volcanism by assuming that volcanism could occur in 3.4×10^7 years (the reciprocal of 2.9×10^{-8}), determining the resulting release, and assigning the prorated share of release to a 10,000 year time frame. This is a way of reporting "risk" but is not the correct way to plot releases against the EPA standard.

As the EPA standard is a plot of release values verses probability the EA would have been more correct if it had reported Link's "expected release if volcanism occurred between 100 and 10,000 years after emplacement" as reported in table 8-6 of Link et. al., rather than Table 8-4. The values presented in table 8-6 are approximately 4 orders of magnitude higher than the values presented in table 8-4 and the EA. The value as presented in the EA of .038 curies per 1000 MTHM is an EPA ratio of approximately .00025, much below the EPA standard, while a summation of the values from table 8-6 would give an EPA ratio of approximately .9, very close to the low probability limit of the EPA standard.

Additional concerns as to the method of reporting relate to the fact that Link et. al., assumed a repository that was smaller in both size and total radionuclide inventory than has been assumed in the FEA, and assumed an effective dike width of zero. As the calculational methodology of Link et. al., is sensitive to these parameters, a straight line extrapolation of values would increase the probability of intersection of the repository by volcanism, because both a larger " target " and volcanic source would be available. In addition, while the EPA ratio may not increase the total release to the the accessible environment would increase. In addition, the values presented in tables 8-4 and 8-6 of Link et. al., assume random intersection of the repository by dikes. As shown in Link et. al., non-random intersections could increase the release by several orders of magnitude.

Significance of Concerns

It is the opinion of the NRC Geologic staff that neither the available information on volcanism, nor the analyses performed to date are sufficient to make a licensing determination with respect to the significance of volcanism to meeting the performance objectives of 10 CFR 60. To make this determination would require more reliable geologic data and a much more sophisticated analysis than presented by DOE in the EA. With the present data base, uncertainties in probability calculations can range 3 to 4 orders of magnitude. Link et. al., for example, quotes probabilities ranging from 10^{-7} to 10^{-10} . Even calculations which utilize more accurate ages for the past volcanic activity in the area of NNWSI will probably not significantly reduce this probability range. If site characterization activities show that the centers of volcanism in the area of the site are structurally controlled, and the relationship of these structures to the site could be established, this information, together with more reliable age dates, would allow for an informed decision on the significance of the phenomena of volcanism to the performance objectives. The staff recommends that the DOE consider the concerns identified above in the plans for testing and analysis during site characterization.

JUL 09 1987

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 Operations Branch
 Division of High-Level Waste Management

FROM: Ronald L. Ballard, Chief
 Technical Review Branch
 Division of High-Level Waste Management

SUBJECT: ERRATUM FOR MEMORANDUM - VOLCANISM AT NNWSI

DATE:

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CONCURRENCES

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