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QA: N/A

**JUL 30 2002**

**OVERNIGHT MAIL**

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**TRANSMITTAL OF REPORT ADDRESSING KEY TECHNICAL ISSUE (KTI)  
AGREEMENT ITEM IGNEOUS ACTIVITY (IA) 2.03**

**References:**

1. *Characterize Framework for Igneous Activity at Yucca Mountain, Nevada*, ANL-MGR-GS-000001, Revision 00, ICN 01.
2. *Igneous Consequence Modeling for the TSPA-SR*, ANL-WIS-MD-000017, Revision 00, ICN 01.
3. *Total System Performance Assessment for the Site Recommendation*, TDR-WIS-PA-000001, Revision 00, ICN 01.
4. Ltr, Brocoum to Reamer, dtd 2/2/01.

This letter transmits a report entitled *Range of Tephra Volumes*, which satisfies the subject KTI agreement. The agreement statement is as follows:

IA 2.03 – “Document how tephra volumes from analog volcanos represent the likely range of tephra volumes from Yucca Mountain Region (YMR) volcanos.

DOE agreed and will document the basis for determining the range of tephra volumes that is likely from possible future volcanoes in the YMR in the Eruptive Processes AMR (ANL-MGR-GS-000002). This will be available to the NRC in FY 2002.”

For the Total System Performance Assessment - Site Recommendation (TSPA-SR), the U.S. Department of Energy (DOE) used information, described in the enclosure to this letter, as the basis to calculate tephra volumes. The enclosure is based on information on page 34 of Reference 1, and the use of the information in the ASHPLUME code, as described in Section 6.1.2.1.1 of Reference 2. Both of these references were transmitted to the U.S. Nuclear Regulatory Commission (NRC) by the referenced letter (Reference 4). The information

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in Reference 1 provides a conservative basis to represent the range of tephra volumes likely from possible future volcanoes in the Yucca Mountain Region. First, the information in Reference 1 is the total erupted volume for volcanoes in the Yucca Mountain Region. Since the volume of tephra cannot exceed the total erupted volume, use of the total volume provides a conservative upper bound on tephra volumes from basaltic volcanoes in the Yucca Mountain Region.

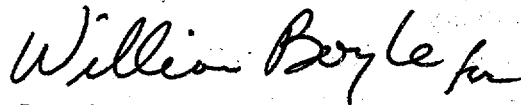
Second, the upper end of the range described in Reference 2 was based on information from basaltic volcanoes throughout the world. Many of these volcanoes are significantly larger than volcanoes in the Yucca Mountain Region. Hence, inclusion of volume data from basaltic volcanoes throughout the world is conservative. Finally, the sampling scheme in the ASHPLUME code considered the range of volumes as a log uniform distribution, which means that any value in the range had an equally likely chance of being sampled.

Section 5.2.9.5 of the TSPA-SR report (Reference 3) describes the results of a study of dose sensitivity to uncertainties in the volume of material erupted. The study used the 5<sup>th</sup> and 95<sup>th</sup> percentile values for the volumes, which correspond to values of 0.0026 km<sup>3</sup> and 0.336 km<sup>3</sup>, respectively. The results described in the TSPA-SR report indicate that the mean annual eruptive dose rate is insensitive to the range of values selected in the analysis for erupted volume.

While the agreement for IA 2.03 indicated that this information would be provided in an Analysis and Model Report, the information has been included in the enclosed report as discussed at the April 15-16, 2002, NRC/DOE Technical Exchange and Management Meeting on KTIs.

The DOE believes the information in the enclosure, Reference 1, Reference 2, and the sensitivity analysis referenced above, provides a basis for completion of IA 2.03.

This letter makes no new regulatory commitments. If you have any questions about this letter and its enclosure, please contact Timothy C. Gunter at (702) 794-1343 or Eric T. Smistad at (702) 794-5073.



Joseph D. Ziegler  
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OL&RC:TCG-1325

Enclosure:  
*Range of Tephra Volumes*

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