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March 29, 2000
Contract No. NRC-02-97-009
Account No. 20.01402.771

U.S. Nuclear Regulatory Commission
ATTN: Mr. Timothy J. McCartin
Office of Nuclear Materials Safety and Safeguards
Division of Waste Management
Performance Assessment and HLW Integration Branch
Mail Stop 7F-06
Washington, DC 20555

Subject: Completion of CNWRA Report on Improvement to Approach for Modeling Dose (IM 01402.771.040)

Dear Mr. McCartin:

This letter transmits information documenting completion of the Intermediate Milestone "Improvement to Approach for Modeling Dose" (IM 01402.771.040). The planned focus of this milestone was to improve the Nuclear Regulatory Commission and Center for Nuclear Waste Regulatory Analyses performance assessment capabilities for calculating age-dependent doses. This capability is considered an important enhancement to the High Level Waste Division's capacity to support responses to public concerns about proposed dose limits in 10 CFR Part 63 and to support further investigations on the impact of receptor age assumptions on performance assessment calculations for a High Level Waste Repository proposed at Yucca Mountain, Nevada. To satisfy this Intermediate Milestone, CNWRA has worked closely with NRC staff to develop an approach for implementing age-dependent dose calculations in the TPA Version 4.0 code that is consistent with the needs of the High Level Waste program. In conjunction with TPA Version 4.0 code development work conducted under the TSPA KTI, the age-dependent dose calculation approach has been successfully coded into TPA Version 4.0 Beta code, which was delivered to NRC as an AI on February 17, 2000. The approach to age-dependent dose calculations developed for this IM contains the following enhancements:

- Expansion of total system performance assessment calculations to calculate doses to five additional age-dependent receptor groups including infant (<1 yr), toddler (1—7 yr), pre-teen (7—12 yr), teen (12—17), adult (>17 yr)
- Execution of pathway/dose calculations using the same biosphere models as in prior versions of the Total System Performance Assessment Code
- Capabilities to sample important input parameters for the age-dependent dose calculations during TPA code execution
- Flexibility to easily change age-dependent input parameters such as consumption rates, activity times, and breathing rates



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- Flexibility to update internal and external age-dependent dose coefficients when new information becomes available
- Application of age-dependent internal dose coefficients from the International Council on Radiological Protection, Publication 72.

Because the coding work has been planned and executed under a different task involving full documentation of the approach in a user manual to be delivered April 3, 2000, additional documentation related to this work was considered duplicative and unnecessary. As we discussed, completion of the conceptualization of the approach and implementation of the modifications to the TPA code provide sufficient objective evidence to demonstrate the work for IM 01402.771.040 has been completed.

If you have questions about the specific nature of the input provided by the CNWRA, please contact Mr. Pat LaPlante in our Washington office at (301) 881-0289.

Sincerely yours,



Gordon W. Wittmeyer, Ph.D.
Manager, Performance Assessment

GWW/bsc

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