

March 3, 2002

Joseph D. Ziegler, Acting Director
Office of Licensing Application and Strategy
U.S. Department of Energy
Office of Repository Development
P.O. Box 364629 M/S 523
North Las Vegas, NV 89036-8629

SUBJECT: COMPLETION OF TOTAL SYSTEM PERFORMANCE ASSESSMENT AND
INTEGRATION (TSPA) KEY TECHNICAL ISSUE AGREEMENT 3.15

Dear Mr. Ziegler:

In your letter dated September 25, 2002, the U.S. Department of Energy (DOE) enclosed a memorandum from R.W. Andrews (Bechtel SAIC Company, LLC) dated September 19, 2002, that designated the EQ3/6 data0.ymp file (DTN: MO0009THERMODYN.001) as the reference database for geochemical modeling activities. The memo states that the reference database, including subsequent revisions, will form a basis for geochemical modeling inputs and that if the reference database is not used, then justification for the decision will be documented in the technical product. In addition, DOE provided a copy of the Scientific Processes Guidelines Manual (MIS-WIS-MD-000001 Revision 01), a document that was prepared by DOE to assist its staff and contractors in the production of consistent technical products that comply in content, format, and process with DOE implementing procedures. The U.S. Nuclear Regulatory Commission staff has reviewed this information, with respect to TSPA 3.15, and the results of the staff's review are enclosed.

TSPA agreement 3.15 stemmed from an NRC staff concern that DOE use of different EQ3/6 databases could lead to inconsistency in the results of DOE models and abstractions. Previous staff reviews of DOE analysis model reports and process model reports indicated that DOE geochemical modeling activities did not use a consistent database of thermodynamic and kinetic parameters.

J. Ziegler

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Staff finds the DOE response acceptable to complete agreement TSPA1.3.15. DOE has provided a reference EQ3/6 database for the Yucca Mountain Project and a procedure by which DOE investigators will document all deviations from the reference database and justification for those deviations used by different geochemical modeling activities. If there are any questions regarding this letter, please contact William Dam at 301-415-6710 or by e-mail at wld@nrc.gov.

Sincerely,
/RA/

Janet R. Schlueter, Chief
High-Level Waste Branch
Division of Waste Management
Office of Nuclear Material Safety
and Safeguards

Attachment: NRC Review of DOE Letter Pertaining to TSPA1 3.15.

cc: See attached distribution list

J. Ziegler

-2-

Staff finds the DOE response acceptable to complete agreement TSPA.3.15. The DOE has provided a reference EQ3/6 database for the Yucca Mountain Project and a procedure by which DOE investigators will document all deviations from the reference database and justification for those deviations used by different geochemical modeling activities. If there are any questions regarding this letter, please contact William Dam at 301-415-6710 or by e-mail at wld@nrc.gov.

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cc: See attached distribution list

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Letter to J. Ziegler from Janet R. Schlueter dated: March 3, 2003

cc:

A. Kalt, Churchill County, NV	M. Corradini, NWTRB
R. Massey, Churchill/Lander County, NV	J. Treichel, Nuclear Waste Task Force
I. Navis, Clark County, NV	K. Tilges, Shundahai Network
E. von Tiesenhausen, Clark County, NV	M. Chu, DOE/Washington, D.C.
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J. Pegues, City of Las Vegas, NV	B. Helmer, Timbisha Shoshone Tribe
M. Murphy, Nye County, NV	R. Arnold, Pahrump Paiute Tribe

cc: (Continued)

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R. Craig, USGS

W. Booth, Engineering Svcs, LTD

E. Opelski, NQS

L. Lehman, T-REG, Inc.

S. Echols, ESG

A. Bacock, Big Pine Paiute Tribe of the
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H. Blackeye, Jr., Duckwater Shoshone Tribe

M. Smurr, BNFL, Inc.

T. Kingham, GAO

D. Feehan, GAO

E. Hiruo, Platts Nuclear Publications

C. Anderson, Las Vegas Paiute Tribe

R. Boland, Timbisha Shoshone Tribe

J. Birchim, Yomba Shoshone Tribe

J. Leeds, Las Vegas Indian Center

R. Bahe, Benton Paiute Indian Tribe

C. Bradley, Kaibab Band of Southern Paiutes

R. Joseph, Lone Pine Paiute-Shoshone Tribe

L. Tom, Paiute Indian Tribes of Utah

E. Smith, Chemehuevi Indian Tribe

J. Charles, Ely Shoshone Tribe

D. Crawford, Inter-Tribal Council of NV

R. Quintero, Inter-Tribal Council of NV
(Chairman, Walker River Paiute Tribe)

D. Eddy, Jr., Colorado River Indian Tribes

H. Jackson, Public Citizen

J. Wells, Western Shoshone National Council

R. Henning, BSC

I. Zabarte, Western Shoshone National Council

**NRC Review of DOE Documents Pertaining to Total System
Performance Assessment and Integration Key Technical Issue Agreement 3.15**

The U.S. Nuclear Regulatory Commission (NRC) goal of issue resolution during this interim precicensing period is to assure that the U.S. Department of Energy (DOE) has assembled enough information on a given issue for NRC to accept a license application for review. Resolution by the NRC staff during precicensing does not prevent anyone from raising any issue for NRC consideration during the licensing proceedings. Just as important, resolution by the NRC staff during precicensing does not prejudge what the NRC staff evaluation of that issue will be after its licensing review. Issues are resolved by the NRC staff during precicensing when the staff has no further questions or comments about how DOE is addressing an issue. Pertinent new information could raise new questions or comments on a previously resolved issue.

This enclosure addresses agreement Total System Performance Assessment and Integration (TSPAI).3.15 which was reached between NRC and DOE during a technical exchange and management meeting.¹

Wording of the Agreement:

Define a reference EQ3/6 database for the Yucca Mountain Project. DOE will provide documentation of all deviations from the reference database and justification for those deviations used by different geochemical modeling activities (ENG4.1.2). DOE will define a reference EQ3/6 database for the Yucca Mountain Project. DOE will provide documentation of all the deviations from the reference database and justification for those deviations used by different geochemical modeling activities. The database will be available in FY 2003.

NRC Review

Background: EQ3/6 is a set of computer codes and associated databases for use in modeling the complex geochemical processes that occur when aqueous solutions (e.g., groundwaters, saline waters, effluent streams) react with soil, rock, or solid waste materials. Development of the software and associated databases was supported by the DOE for use in its modeling of geochemical processes pertinent to the geologic disposal of high-level nuclear waste. Applications of the code in the Yucca Mountain Project include modeling of the chemistry of seepage water, water contacting the drip shield and waste package, and water inside a failed waste package (in-package chemistry). Previous staff reviews of DOE analysis model reports and process model reports indicated that DOE geochemical modeling activities did not use a consistent database of thermodynamic and kinetic parameters. Because modeling results are highly dependent on input parameters, there was staff concern that the DOE use of different EQ3/6 databases would lead to inconsistency in the results of DOE models and abstractions.

Summary of the Information Provided by DOE: The DOE provided a memorandum from R.W. Andrews (Bechtel SAIC Company, LLC) dated September 19, 2002, that designated the

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Reamer, C.W. "U.S. Nuclear Regulatory Commission/U.S. Department of Energy Technical Exchange and Management Meeting on Total System Performance Assessment and Integration (August 6–10, 2001)." Letter (August 23) to S. Brocoum, DOE.

EQ3/6 data0.ymp file (DTN: MO0009THERMODYN.001) as the reference database for geochemical modeling activities. The memo states that the reference database, including

subsequent revisions, will form a basis for geochemical modeling inputs and that if the reference database is not used, then justification for the decision will be documented in the technical product. In addition, the DOE provided a copy of the Scientific Processes Guidelines Manual (MIS-WIS-MD-000001 Revision 01), a document that was prepared by the DOE to assist its staff and contractors in the production of consistent technical products that comply in content, format, and process with DOE implementing procedures. The manual is designed to provide clarification of the scientific procedures, guides, and standards, and to identify forms and checklists to be used by the originators and checkers of scientific documents during the processing of those documents. The memo from R.W. Andrews stated that the Scientific Processes Guidelines Manual is in the process of revision to, in part, include a description for the designation of reference databases to help facilitate the consistent use of data where appropriate throughout the Yucca Mountain Project.

Staff Comments:

Staff finds the DOE response to agreement TSPA1.3.15 acceptable. The DOE has provided a reference EQ3/6 database for the Yucca Mountain Project and a procedure by which DOE investigators will document all deviations from the reference database and justification for those deviations used by different geochemical modeling activities.

Additional Information Needed:

None.

Status of Agreement:

Agreement TSPA1.3.15 is complete.