

Summary of the Resolution of the Key Technical Issue on Thermal Effects on Flow

<u>Subissue #</u>	<u>Subissue Title</u>	<u>Status</u>	<u>NRC/DOE Agreements</u>
1	Features, events, and processes related to thermal effects on flow	Closed-Pending	<p>1) Provide the FEPs AMRs relating to TEF. The DOE will provide the following updated FEPs AMRs related to thermal effects on flow to the NRC: <i>Disruptive Events FEPs</i> (ANL-NBS-MD-000005) Rev 00 ICN 01; <i>Features, Events, and Processes: System Level</i> (ANL-WIS-MD-000019) Rev 00; <i>Features, Events, and Processes in UZ Flow and Transport</i> (ANL-NBS-MD-000001) Rev 01; <i>Features, Events, and Processes in SZ Flow and Transport</i> (ANL-NBS-MD-000002) Rev 01; <i>Features, Events, and Processes in Thermal Hydrology and Coupled Processes</i> (ANL-NBS-MD-000004) Rev 00 ICN 01; <i>Miscellaneous Waste Form FEPs</i> (ANL-WIS-MD-000009) Rev 00 ICN 01; and <i>Engineered Barrier System Features, Events, and Processes</i> (ANL-WIS-PA-000002) Rev 01. Expected availability: January 2001.</p> <p>2) Provide the FEPs database. The DOE will provide the FEPs data base to the NRC during March 2001.</p>

2	Thermal effects on temperature, humidity, saturation, and flux	Closed-Pending	<p>1) Consider measuring losses of mass and energy through the bulkhead of the drift-scale test (DST) and provide the technical basis for any decision or method decided upon (include the intended use of the results of the DST such as verifying assumptions in FEP exclusion arguments or providing support for TSPA models. The DOE should analyze uncertainty in the fate of thermally mobilized water in the DST and evaluate the effect this uncertainty has on conclusions drawn from the DST results. The DOE's position is that measuring mass and energy losses through the bulkhead of the DST is not necessary for the intended use of the DST results. The DST results are intended for validation of models of thermally-driven coupled processes in the rock, and measurements are not directly incorporated into TSPA models. Results of the last two years of data support the validation of DST coupled-process models and the current treatment of mass and energy loss through the bulkhead. The DOE will provide the NRC a white paper on the technical basis for the DOE's understanding of heat and mass losses through the bulkhead and their effects on the results by April 2001. This white paper will include the DOE's technical basis for its decision regarding measurements of heat and mass losses through the DST bulkhead. This white paper will address uncertainty in the fate of thermally mobilized water in the DST and also the effect this uncertainty has on conclusions drawn from the DST results. The NRC will provide comments on this white paper. The DOE will provide analyses of the effects of this uncertainty on the uses of the DST in response to NRC comments.</p> <p>2) Provide the location and access to the Multi-Scale Thermohydrologic Model input and output files. The output files are in the Technical Data Management System. The DTNs are LL000509112312.003, LL000509012312.002, and LL000509212312.004. The input files are located in the Project records system. The document identification number is MOL.20000706.0396. The DOE will provide the requested information to the NRC in January 2001.</p>
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2	Thermal effects on temperature, humidity, saturation, and flux - cont.	<p>3) Provide the following references: Multi-Scale Thermohydrologic Model AMR, ICN 01; Abstraction of Near Field Environment Drift Thermodynamic and Percolation Flux AMR, ICN 01; Engineered Barrier System Degradation Flow and Transport PMR, Rev. 01; and Near Field Environment PMR, ICN 03. DOE will provide to the NRC the following documents:</p> <ul style="list-style-type: none"> • <i>Multi-Scale Thermohydrologic Model</i> AMR (ANL-EBS-MD-00049) Rev 00 ICN 01 (January 2001) • <i>Abstraction of Near-Field Environment Drift Thermodynamic and Percolation Flux</i> AMR (ANL-EBS-HS-000003) Rev 00 ICN 01 (January 2001) • <i>Engineered Barrier System Degradation, Flow and Transport</i> PMR (TDR-EBS-MD-000006) Rev 01 (September 2001) • <i>Near-Field Environment</i> PMR (TDR-NBS-MD-000001) Rev 00 ICN 03 (January 2001) <p>4) Provide the Multi-Scale Thermohydrologic Model AMR, Rev. 01. The DOE will provide the <i>Multi-Scale Thermohydrologic Model</i> AMR (ANL-EBS-MD-00049) Rev 01 to the NRC. Expected availability is FY 02.</p> <p>5) Represent the cold-trap effect in the appropriate models or provide the technical basis for exclusion of it in the various scale models (mountain, drift, etc.) considering effects on TEF and other abstraction/models (chemistry). See page 11 of the Open Item (OI) 2 presentation. The DOE will represent the "cold-trap" effect in the <i>Multi-Scale Thermohydrologic Model</i> AMR (ANL-EBS-MD-00049) Rev 01, expected to be available in FY 02. This report will provide technical support for inclusion or exclusion of the cold-trap effect in the various scale models. The analysis will consider thermal effects on flow and the in-drift geochemical environment abstraction.</p> <p>6) Provide the detailed test plan for Phase III of the ventilation test, and consider NRC comments, if any. The DOE will provide a detailed test plan for the Phase III ventilation test in March 2001. The NRC comments will be provided no later than two weeks after receipt of the test plan, and will be considered by the DOE prior to test initiation.</p>
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2	Thermal effects on temperature, humidity, saturation, and flux - cont.	<p>7) Provide the Ventilation Model AMR, Rev. 01 and the Pre-Test Predictions for Ventilation Test Calculation, Rev. 00. The DOE will provide the <i>Ventilation Model</i> AMR (ANL-EBS-MD-000030) Rev 01 to the NRC in March 2001. Note that ventilation test data will not be incorporated in the AMR until FY02. The DOE will provide the Pre-test Predictions for Ventilation Tests (CAL-EBS-MD-000013) Rev 00 to the NRC in February 2001. Test results will be provided in an update to the <i>Ventilation Model</i> AMR (ANL-EBS-MD-000030) in FY 02.</p> <p>8) Provide the Mountain Scale Coupled Processes AMR, or an other appropriate AMR, documenting the results of the outlined items on page 20 of the OI 7 presentation (considering the NRC suggestion to compare model results to the O.M. Phillips analytical solution documented in <i>Water Resources Research</i>, 1996). The DOE will provide the updated <i>Mountain-Scale Coupled Processes Model</i> AMR (MDL-NBS-HS-000007) Rev 01 to the NRC in FY 02, documenting the results of the outlined items on page 20 of DOE's Open Item 7 presentation at this meeting. The DOE will consider the NRC suggestion of comparing the numerical model results to the O.M. Phillips analytical solution documented in <i>WRR</i> (1996).</p> <p>9) Provide the Multi-Scale Thermohydrologic Model AMR, ICN 03. The DOE will provide the <i>Multi-Scale Thermohydrologic Model</i> AMR (ANL-EBS-MD-000049) Rev 00 ICN 03 to the NRC. Expected availability July 2001.</p> <p>10) Represent the full variability/uncertainty in the results of the TEF simulations in the abstraction of thermodynamic variables to other models, or provide technical basis that a reduced representation is appropriate (considering risk significance). The DOE will discuss this issue during the TSPA technical exchange tentatively scheduled for April 2001.</p> <p>11) Provide the Calibrated Properties AMR, incorporating uncertainty from all significant sources. The DOE will provide an updated <i>Calibrated Properties Model</i> AMR (MDL-NBS-HS-000003) Rev 01 that incorporates uncertainty from significant sources to the NRC in FY 02.</p>
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2	Thermal effects on temperature, humidity, saturation, and flux - cont.		<p>12) Provide the Unsaturated Zone Flow and Transport PMR, Rev. 00, ICN 02, documenting the resolution of issues on page 5 of the OI 8 presentation. The DOE will provide the <i>Unsaturated Zone Flow and Transport PMR</i> (TDR-NBS-HS-000002) Rev 00 ICN 02 to the NRC in February 2001. It should be noted, however, that not all of the items listed on page 5 of the DOE's Open Item 8 presentation at this meeting are included in that revision. The DOE will include all the items listed on page 5 of the DOE's Open Item 8 presentation in Revision 02 of the <i>Unsaturated Zone Flow and Transport PMR</i>, scheduled to be available in FY 02.</p> <p>13) Provide the Conceptual and Numerical Models for Unsaturated Zone Flow and Transport AMR, Rev. 01 and the Analysis of Hydrologic Properties Data AMR, Rev. 01. The DOE will provide updates to the <i>Conceptual and Numerical Models for UZ Flow and Transport</i> (MDL-NBS-HS-000005) Rev 01 and the <i>Analysis of Hydrologic Properties Data</i> (ANL-NBS-HS-000002) Rev 01 AMRs to the NRC. Scheduled availability is FY 02.</p>
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