	Model **Error Resolution Document** *Complete only applicable items.*	QA: QA Page 1 of 3

INITIATION

1. Originator:	2. Date:	3. ERD No.
Bruce Robinson/Ming Zhu	3/24/2008	MDL-NBS-HS-000020 ERD 01

4. Document Identifier:	5. Document Title:
MDL-NBS-HS-000020 REV02 AD 02	Particle Tracking Model and Abstraction of Transport Processes

6. Description of and Justification for Change (Identify applicable CRs and TBVs):

I Background Information Summary

This ERD is prepared to resolve TBVs associated with *Particle Tracking Model and Abstraction of Transport Processes*, MDL-NBS-HS-000020 REV02 AD01 and Rev 02 AD 02. Changes required to address these TBVs are being made to AD02, but also apply to AD01, where the table being edited was actually produced.

TBV-8404: *Particle Tracking Model and Abstraction of Transport Processes*, MDL-NBS-HS-000020 REV02 AD01 and Rev 02 AD 02 referenced a draft of *Waste Form and In-Drift Colloids-Associated Radionuclide Concentrations: Abstraction and Summary*, MDL-EBS-PA-000004 REV 03 (SNL 2007 [DIRS 177423]). The original plan is that the TBV will be resolved when the referenced document is qualified and values cited addressed.

TBV-8413: *Particle Tracking Model and Abstraction of Transport Processes*, MDL-NBS-HS-000020 REV02 AD01 and Rev 02 AD 02 referenced DTN: MO0701PAGROUND.000 [DIRS 179310], a DTN accompanying the source document cited in TBV-8404 above. The original plan is that the TBV will be resolved when the source document and these data are qualified and values cited addressed.

The resolution of the TBVs and updates to the parent report described in this ERD do not have any impact on the conclusions of the subject document, or to any existing downstream technical products such as the TSPA-LA or the SAR.

(see attached)

CONCURRENCE

	Printed Name	Signature	Date
7. Checker	Kenneth Rehfeldt	Kenneth Rehfeldt	03/24/2008
8. QCS/QA Reviewer	Charles Beach	Charles R. Beach	3-24-08

APPROVAL

9. Originator	Bruce Robinson Ming Zhu		03/24/2008 3/24/08
10. Responsible Manager	Paul Dixon		3-24-08

(Continued from Block 6)

II Inputs and/or Software

Direct inputs to this error resolution analysis include the following DTNs: MO0701PAGROUND.000 [DIRS 179310] and LA0701PANS02BR.003. These DTNs are from the parent report and are all qualified as shown in the TDMS.

No software controlled under IM-PRO-003, *Software Management*, is used in this analysis.

III Analysis and Results

III.1 Analysis of TBV-8404

The issue is in Table 6-21 of the parent report, MDL-NBS-HS-000020 REV02 AD01 and Rev 02 AD 02. The table in question has two parts to the information. The first is the CDF of colloid concentrations, and the second is a threshold value for the ionic strength, which for the Waste Form and In-Drift Colloids model is used to lower the colloid concentrations to account for colloid flocculation at high ionic strength. In the implementation of the TSPA model for unsaturated-zone colloid transport, the threshold is not used; rather, it is assumed that the ionic strength is always lower than the threshold, and the higher colloid concentrations in the CDF are used. However, the threshold value is present in the table, and MDL-NBS-HS-000020 Rev 02 included a description of the potential use of this threshold concept. Now that the source document SNL 2007 [DIRS 177423] for Table 6-21 in Addendum 01 has been updated, it is apparent during the closure of this TBV that the threshold value has changed to a correlation that depends on pH, so it is no longer 0.05 M, but a value that is a function of pH. Additionally, the section and table numbers in SNL 2007 [DIRS 177423] are different from what is cited in Table 6-21 of the parent report.

The difference in the approach to the threshold, as well as the incorrect section and table numbers cited, creates a documentation issue with respect to transparency. Because the threshold value is not even used in the UZ transport abstraction model for TSPA, the following changes are required: 1) the table needs to be updated to remove the threshold value from the table; 2) a note needs to be added in the comment field that no threshold value is used in the UZ transport model; and 3) the section and table numbers referenced in SNL 2007 [DIRS 177423] need to be corrected. The following is the revised version of this table after making these corrections.

Table 6-21. Colloid Concentration Distribution

Colloid Concentration (mg/L)	Cumulative Probability	Comment
0.001 to 0.1	0.50	Used to determine colloid concentration, which in turn is used in the estimation of reversible colloid K_c. Note that in Table 6-13 of SNL 2007 [DIRS 177423], this distribution is defined for fluids below a threshold value of ionic strength. In the UZ transport abstraction model for TSPA, it is assumed that the unsaturated zone fluids are always below the threshold value, such that this distribution is used for all realizations. Therefore, the threshold value is not used in the UZ transport abstraction model.
0.1 to 1.0	0.75	
1.0 to 10	0.90	
10 to 50	0.98	
50 to 200	1	
Type of Uncertainty		The cumulative distribution data listed in this table will be used to generate random colloid concentrations at TSPA-LA runtime to address the influence of colloid concentration uncertainty of radionuclide transport.
Input Description		This parameter is used along with sorption coefficient onto colloids to determine the partitioning coefficient of radionuclides onto colloids.

Source: SNL 2007 [DIRS 177423], Section 6.3.11, Table 6-13; DTN: MO0701PAGROUND.000 [DIRS 179310].

Output DTN: LA0701PANS02BR.003, Revision 003 (20080319).

TSPA-LA = Total System Performance Assessment for the License Application.

There is no impact of this TBV resolution to the conclusions of the subject document, or to any existing downstream technical products because the corrected information is consistent with the implementation of the UZ transport abstraction model in TSPA and the information removed from Table 6-21 of Addendum 01 of MDL-NBS-HS-000020 REV02 is not used by any of the downstream products.

III.2 Analysis of TBV-8413

Similar to the discussion with respect to TBV-8404 above, DTN: MO0701PAGROUND.000 [DIRS 179310] contains the CDF information in the revised Table 6-21 presented earlier. It also mentions the use of a threshold value for ionic strength, but because this threshold is not used in the UZ transport abstraction model, the note in the comment field in revised Table 6-21 suffices to resolve this TBV as well.

IV Impact Evaluation

The resolution of TBV-8404 and TBV-8413 resulted in an update to Table 6-21 of MDL-NBS-HS-000020 REV02 AD01 and Rev 02 AD 02. The resolution of these TBVs did not impact the conclusions of the subject document. In addition, there is no impact of the TBV resolutions on any existing downstream technical products because the corrected information is consistent with the implementation of the UZ transport model in the TSPA-LA and the information removed from Table 6-21 of Addendum 01 is not used by any of the downstream products.