	Model Error Resolution Document *Complete only applicable items.*	QA: QA Page 1 of 4

INITIATION

1. Originator:	2. Date:	3. ERD No.
Maryla Wasiolek	July 7, 2008	ANL-WIS-MD-000006 ERD 02

4. Document Identifier:	5. Document Title:
ANL-WIS-MD-000006 REV 02	Radionuclide Screening

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

This Error Resolution Document (ERD) is provided to update the *Radionuclide Screening* document in order to add clarity to the text and strengthen the transparency within the document as suggested in condition report (CR) 12171. The extent of condition is limited to *Radionuclide Screening* (ANL-WIS-MD-000006 Rev 02, ACN 01) as there is no change to any results or conclusions and therefore no impact to any downstream products, including the TSPA-LA or the SAR.

The downstream products evaluated consisted of the following:

- ANL-WIS-MD-000010 Rev 06
- ANL-WIS-MD-000020 Rev 01, Addendum 01
- ANL-WIS-MD-000027 Rev 00
- ANL-WIS-PA-000001 Rev 03
- MDL-EBS-PA-000004 Rev 03
- MDL-MGR-MD-000001 Rev 02
- MDL-NBS-HS-000010 Rev 03
- MDL-WIS-PA-000005 Rev 00 and Addendum 01

CR 12171—Potential Transparency Improvements to the Screening AMR

In CR 12171 it has been noted that the transparency of the *Radionuclide Screening* document would benefit from some increased clarity in Appendix A and Appendix C. Specifically, the units used in Equations A-1 to A-4 and the text were modified to clearly identify the contaminated media. In addition, a justification was added for the value of surface density of the soil, as used in the igneous scenario. Attachment 1 contains the text changes.

CONCURRENCE

	Printed Name	Signature	Date
7. Checker	DAB 17 Jul 08 James A. Jim Blink	James A. Blink	17 Jul 08
8. QCS/QA Reviewer	Robert Spencer	Robert Spencer	07/17/08

APPROVAL

9. Originator	Maryla Wasiolek	Maryla Wasiolek	7-17-08
10. Responsible Manager	Jerry McNeish / Paul R. Dixon	Jerry McNeish Paul R. Dixon	7-17-08 7-18-08

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ATTACHMENT 1—IMPROVEMENTS FOR TRANSPARENCY (CR 12171)

Table 4-1—Add the following new row to Table 4-1

Surface density of the soil used in calculation of atmospheric screening factors	1,100	kg/m^3	NCRP 1996 [DIRS 101882], Section 8.2.1

Appendix A:

In the Table of Contents (page vi) and on the Appendix A cover page, change the title of Appendix A to the following:

Screening Factors for Ground Water and Igneous Scenarios

Section A.1.2 (page A-18)—Replace equation (Eq. A-1) and the description with the following:

$$SF_{soil,ext,gw} \quad C_{soil[water]} \; D_{gw} \; U_{soil,ext,gw} \; DF_{soil,ext,gw} \qquad \text{(Eq. A-1)}$$

where

$SF_{soil, ext, gw}$ = groundwater screening factor for external exposure to radionuclides in soil (Sv/yr per Bq/m^3_{water})

$C_{soil [water]}$ = radionuclide concentration in soil per unit radionuclide concentration in water (Bq/kg_{soil} per Bq/m^3_{water}), calculated as explained in Equation A-4

D_{gw} = surface soil density for the groundwater scenario (kg_{soil}/m^3_{soil})

$U_{soil, ext, gw}$ = usage factor for soil exposure (number of hours of soil exposure per year) for the groundwater scenario (hr/yr)

$DF_{soil, ext, gw}$ = dose coefficient for exposure to soil contaminated to an infinite depth used for the groundwater scenario (Sv/hr per Bq/m^3_{soil}).

Section A.1.2 (page A-18)—Replace equation (Eq. A-2) and the description with the following:

$$SF_{soil,ext,ign} \quad C_{soil[air]} \; D_{ign} \; d_{ign} \; U_{soil,ext,ign} \; DF_{soil,ext,ign} \qquad \text{(Eq. A-2)}$$

where

$SF_{soil, ext, ign}$ = igneous screening factor for external exposure to radionuclides in soil (Sv/yr per Bq/m^3_{air})

$C_{soil [air]}$ = radionuclide concentration in soil per unit radionuclide concentration in air (Bq/kg_{soil} per Bq/m^3_{air})

D_{ign} = surface soil density for the igneous scenario (kg_{soil}/m^3_{soil})

d_{ign} = depth of contaminated soil layer for the igneous scenario (m)

$U_{soil, ext, ign}$ = usage factor for soil exposure (number of hours of soil exposure per year) for the igneous scenario (hr/yr)

$DF_{soil, ext, ign}$ = dose coefficient for exposure to contaminated soil surface used for the igneous scenario (Sv/hr per Bq/m^2_{soil}).

Section A.1.2 (page A-19)—In the 5th paragraph (Equation A-2 uses….) revise the following:

Change Sv/s per Bq/m^2 to Sv/s per Bq/m^2_{soil} (2nd sentence)

Change ($C_{soil} \times D$) to ($C_{soil\ [air]} \times D_{ign}$) (3rd sentence)

Change *d to* d_{ign} (3rd sentence)

Section A.1.2 (page A-19)—In the 6th paragraph (The average surface….) revise the following:

Begin the first sentence with:

"For the groundwater scenario, the average….

Add the following sentence to the end of the paragraph (reference will be updated in DIRS):

A value of 1,100 kg/m^3 is used for the igneous scenario, based on NCRP 1996 [DIRS 101882], Section 8.2.1.

Section A.1.2 (page A-20)—Replace the equation (Eq. A-3) and the description with the following:

$$SF_{soil,inh} \quad C_{soil,inh} U_{soil,inh} DF_{inh} \qquad \text{(Eq. A-3)}$$

where

$SF_{soil, inh}$ = screening factor for inhalation of resuspended soil particles (Sv/yr per Bq/m^3_{water} for the groundwater scenario, and Sv/yr per Bq/m^3_{air} for the igneous scenario)

$C_{soil, inh}$ = radionuclide concentration in soil (Bq/kg_{soil} per Bq/m^3_{water} for the groundwater scenario, and Bq/kg_{soil} per Bq/m^3_{air} for the igneous scenario)

$U_{soil, inh}$ = scenario dependent (groundwater or igneous) usage factor for soil exposure (mass of soil inhaled annually) (kg_{soil}/yr)

DF_{inh} = dose coefficient for inhalation (Sv/Bq).

Section A.1.2 (page A-21)—Replace the description below equation (Eq. A-4) with the following:

C_{soil} = radionuclide concentration in soil (Bq/kg_{soil} per Bq/m^3_{water} for $C_{soil\ [water]}$ and for $C_{soil, inh}$ in the groundwater scenario; and Bq/kg_{soil} per Bq/m^3_{air} for $C_{soil\ [air]}$ and for $C_{soil, inh}$ in the igneous scenario

$SF_{soil, ing}$ = screening factor for soil ingestion (Sv/yr per Bq/m^3_{water} for the groundwater scenario, and Sv/yr per Bq/m^3_{air} for the igneous scenario)

$U_{soil, ing}$ = usage factor for soil ingestion (mass of soil ingested anually) (kg_{soil}/yr)

DF_{ing} = dose coefficient for ingestion (Sv/Bq)

DC = surface soil depth correction factor (used only for the groundwater scenario) (m/m).

Appendix C

Add the following text to the end of the third paragraph of Appendix C (page C-1):

For some parameters, the dimensional units in these files are more concise than the units shown in the descriptions of Equations A-1 through A-4. The full descriptions in Appendix A are consistent with the numerical values and calculations in these files, as verified by CR 12171.