



**TETRA TECH NUS, INC.**

55 Jonspin Road • Wilmington, MA 01887-1020  
Tel 978.658.7899 • Fax 978.658.7870 • www.tetrattech.com

N62661 AR 001460  
NAVSTA NEWPORT RI  
5090 3a

C-NAVY-08-01-1506W

August 24, 2001

Project Number N7538

Ms. Kimberlee Keckler  
U.S. Environmental Protection Agency  
Federal Facilities Superfund Section  
1 Congress Street, Suite 1100  
Boston, Massachusetts 02114-2023

Reference: CLEAN Contract No. N62472-90-D-1298  
Contract Task Order 0282

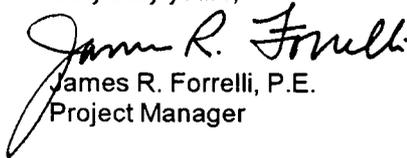
Subject: Response to EPA's Comments on the Human Health Risk Evaluation  
Groundwater Exposure Parameter Tables  
Old Fire Fighting Training Area, Naval Station Newport, Newport, Rhode Island  
Received in EPA letter to James Shafer of the U.S. Navy August 17, 2001

Dear Ms. Keckler:

The Navy has reviewed the comments provided by EPA on the human health risk evaluation groundwater exposure parameter tables for the Old Fire Fighting Training Area site. The responses to EPA's comments are provided in the attachment to this letter (two copies). EPA's comments are presented verbatim in italic type followed by the Navy's response in standard type. The risk evaluation is being prepared in accordance with the responses.

Please contact Jim Shafer of the Navy or me if you have any questions about this transmittal or would like to discuss this matter further.

Very truly yours,

  
James R. Forrelli, P.E.  
Project Manager

JRF:rp

Enclosure

- c: J. Shafer, NORTHDIV (w/enc. - 3)
- M. Griffin, NAV STA Newport (w/enc. - 2)
- P. Kulpa, RIDEM (w/enc. - 4)
- D. Egan, TAG (w/enc.)
- J. Stump, Gannet Fleming (w/enc. - 2)
- J. Trepanowski/G. Glenn, TtNUS (w/enc.)
- C. Race, TtNUS (w/enc.)
- File N7538-8.0 (w/enc.)/File N7538-3.2 (w/o enc. - 2)

**ATTACHMENT**  
**Responses to Comments from the**  
**U.S. Environmental Protection Agency**  
**Human Health Risk Evaluation Groundwater Exposure Parameters**  
**Old Fire Fighting Training Area**  
**Comments dated August 17, 2001**

No. Comment/Response

1. Table 4-1 *Comment: The reference for the RME and CTE exposure durations for the child resident should be EPA, 1994. Please correct this reference.*

Response: This has been corrected.

2. Table 4-2 *Comment: Please provide the calculations for deriving the age-adjusted skin surface area/body weight ratio (SA-ADJ) value for children between 1 and 6 years old. From the 2000 EPA interim Dermal Guidance, the skin surface area for child exposure is 6,600 cm<sup>2</sup> for both reasonable maximum exposure (RME) and central tendency exposure (CTE). Please use this value to derive the SA-ADJ value in the equation for dermal absorbed dose.*

Response: A table containing the derivation of SA-ADJ values will be provided with the groundwater risk evaluation report. All surface area values were obtained from Table C.1 of the 2000 EPA Dermal Guidance and body weights were obtained from the 1997 EPA Exposure Factors Handbook.

3. Table 4-2 *Comment: The reference for the RME and CTE exposure durations and exposure frequency should be EPA, 1994. Please correct this reference.*

Response: This has been corrected.

4. Table 4-2 *Comment: Table 4-2 presents 0.33 hr/day or 20 minutes as the RME exposure time for a child bathing and 0.17 hr/day or 10 minutes as the CTE exposure time for a child bathing. These exposure times do not correspond with those presented in the cited reference.*

*Chapter 15 of the Exposure Factors Handbook (EPA, 1997) recommends 20 minutes (0.33 hr/day) as the 50<sup>th</sup> percentile value for time spent bathing and 45 minutes (0.75 hr/day) as the 90<sup>th</sup> percentile value for time spent bathing. Typically, the 90<sup>th</sup> percentile value is used for RME exposure and the 50<sup>th</sup> percentile value is used for CTE exposure. These recommended values are supported by the 2000 EPA interim Dermal Guidance, as well. Please verify that the correct exposure times are used in the dermal evaluation for this receptor.*

Response: The RME and CTE exposure durations for a child bathing have been modified as requested based on Chapter 15 Tables 15-26 and 15-30.

**Response to EPA Comments**  
**Groundwater Risk Evaluation Input Parameters**

5. Table 4-3 *Comment: The reference for the RME and CTE exposure durations for the adult resident should be EPA, 1994. Please correct this reference.*

Response: The reference has been corrected.

6. Table 4-4 *Comment: Table 4-4 presents 15 minutes/day as the RME exposure time for an adult showering and 10 minutes/day as the CTE exposure time for an adult showering. These exposure times do not correspond with those presented in the cited reference.*

*Chapter 15 of the Exposure Factors Handbook (EPA, 1997) recommends 15 minutes/day as the 50<sup>th</sup> percentile value for time spent showering and 35 minutes/day as the 90<sup>th</sup> percentile value for time spent showering. Typically, the 90<sup>th</sup> percentile value is used for RME exposure and the 50<sup>th</sup> percentile value is used for CTE exposure. These recommended values are supported by the 2000 EPA interim Dermal Guidance, as well. Please verify that the correct exposure times are used in the dermal evaluation for this receptor.*

Response: The RME and CTE exposure durations for an adult showering have been modified using the 15 minutes per day as the 50<sup>th</sup> percentile value and 30 minutes per day as the 91<sup>st</sup> percentile value. These values were obtained from Table 15-21 and Table 15-23 of the 1997 Exposure Factors Handbook. The value of 35 minutes per day suggested by the reviewer was a 95<sup>th</sup> percentile value, not a 90<sup>th</sup> percentile.

7. Table 4-4 *Comment: Table 4-4 presents a total body surface area of 18,150 cm<sup>2</sup> for the adult resident with a cited reference of "EPA, 1998". This reference is not provided in the table.*

*The Exposure Factors Handbook (EPA, 1997) recommends a total body surface area of 20,000 cm<sup>2</sup> for an adult. The 2000 EPA Interim Dermal Guidance recommends a total surface body area of 18,000 cm<sup>2</sup> for an adult. Please verify that the correct total body surface area and cited reference are used in this evaluation.*

Response: The value of 18,150 cm<sup>2</sup> has been verified to be correct. This value was obtained following the procedure cited in the 2000 EPA Dermal Guidance, and appears different than the value presented in the 2000 EPA Dermal Guidance (18,000 cm<sup>2</sup>) only because of rounding. These data represent the average of the male and female 50<sup>th</sup> percentile surface areas from Tables 6.2 and 6.3 in the 1997 Exposure Factors Handbook.

8. Table 4-4 *Comment: Please provide an additional table of dermal permeability constants for all the chemicals of potential concern (COPCs) that are evaluated quantitatively for the dermal exposure pathway. It is important to ensure that the calculated dermal absorbed doses are correct.*

Response: The dermal permeability constants presented in the 2000 EPA Dermal Guidance will be used and will be provided with the groundwater risk evaluation report.

**Response to EPA Comments**  
**Groundwater Risk Evaluation Input Parameters**

9. Table 4-5 *Comment: According to EPA Region I's Risk Update number 3 (dated August 1995), the systemic dose from inhalation of volatile organic compounds (VOCs) during household use (including showering) can be evaluated qualitatively by doubling the VOC risks from groundwater ingestion. Thus, it is unnecessary to quantitatively evaluate risk for VOC inhalation from showering in Table 4-5.*

Response: While not required by EPA Region I Guidance, the modeling approach for estimating exposure to VOCs from inhalation while showering is more accurate than merely assuming that all risks are to be doubled based on tap water ingestion. This showering model has been applied at numerous Navy sites and has generally been accepted by EPA. The approximation method's drawbacks are that risks will be either underestimated or overestimated because oral and inhalation toxicity factors are generally different and Henry's Law constants are different for each substance.

10. Table 4-5 *Comment: The reference for the RME and CTE exposure durations and exposure frequency should be EPA, 1994. Please correct this reference.*

Response: This has been corrected.

11. Table 4-5 *Comment: Table 4-5 presents 15 minutes/day as the RME exposure time for an adult showering and 10 minutes/day as the CTE exposure time for an adult showering. These exposure times do not correspond with those presented in the cited reference.*

*Chapter 15 of the Exposure Factors Handbook (EPA, 1997) recommends 15 minutes/day as the 50<sup>th</sup> percentile value for time spent showering and 35 minutes/day as the 90<sup>th</sup> percentile value for time spent showering. Typically, the 90<sup>th</sup> percentile value is used for RME exposure and the 50<sup>th</sup> percentile value is used for CTE exposure. These recommended values are supported by the 2000 EPA interim Dermal Guidance, as well. Please verify that the correct exposure times are used in the dermal evaluation for this receptor.*

Response: The RME and CTE exposure durations for an adult showering have been modified using the 15 minutes per day as the 50<sup>th</sup> percentile value and 30 minutes per day as the 91<sup>st</sup> percentile value. These values were obtained from Table 15-21 and Table 15-23 of the 1997 Exposure Factors Handbook. The value of 35 minutes per day suggested by the reviewer was a 95<sup>th</sup> percentile value, not a 90<sup>th</sup> percentile.