DEPARTMENT OF THE NAVY
NAVY ENVIRONMENTAL HEALTH CENTER
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From: Commanding Officer, Navy Environmental Health Center
To: Commanding Officer, Southwest Division, Naval Facilities Engineering Command (Michael Pound), 1220 Pacific Hwy, Bldg. 130, San Diego, CA 92132-5190

Subj: MEDICAL REVIEW OF TECHNICAL MEMORANDUM, REVISED RISK ASSESSMENT PROCEDURES, MARINE CORPS AIR STATION, EL TORO, CA

Ref: (a) Bechtel National facsimile of 22 Mar 99

Encl: (1) Subject Medical Review
(2) Medical/Health Comments Survey

1. Per reference (a), we have completed a review of the subject document and forward our comments to you as enclosure (1).

2. Please complete and return enclosure (2) as your comments are needed to continually improve our services to you.

3. We are available to discuss the enclosed information with you and, if you desire, with you and your contractor. If you require additional assistance, please call Mr. K. Gene Astley at (757) 462-5541 or Mr. David McConaughy at (757) 462-5557. The DSN prefix is 253. The e-mail address is: astleyk@nehc.med.navy.mil and mcconaughyd@nehc.med.navy.mil.

P. B. GILLOOLY
By direction

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MEDICAL REVIEW OF TECHNICAL MEMORANDUM, REVISED RISK ASSESSMENT PROCEDURES, MARINE CORPS AIR STATION EL TORO

Ref: (a) Risk Assessment Guidance for Superfund: Volume I, Human Health Evaluation Manual, Supplemental Guidance Dermal Risk Assessment Interim Guidance, U. S. EPA/OERR/NCEA-W-0364, 7 May 98 (External Review Draft)
(b) Exposure Factors Handbook: Volume I, General Factors, EPA/600/P-95/002Fa, August 1997
(c) Phone call between Daniel Stralka, USEPA Region IX and Ms. Kurtz of 25 March 99

General Comments:

1. Excerpts from the document entitled "Technical Memorandum, Revised Risk Assessment Procedures, MCAS El Toro" was provided to the Navy Environmental Health Center (NAVENVIRHLTHCEN) for review on 22 March 1999. The memorandum was prepared for Southwest Division, Naval Facilities Engineering Command, by Bechtel National. Specifically, we were asked to review the proposed exposure parameters for site specific appropriateness, and provide input for the Navy's response to California's Department of Toxic Substances Control (DTSC) comments on adherence factors.

2. Data for the dermal absorption of chemicals from a soil matrix is very limited. Site-specific factors, such as soil pH, type, composition, organic carbon content, particle size, moisture content, exposure time, and loading rates, can affect the fate and transport properties of the specific chemical (e.g., soil desorption rate). This, in turn, affects (and can be affected by) the degree and form of the chemical available for contact with the skin. This term is called the adherence factor (AF) measured in units of milligrams per square centimeter (mg/cm^2).

3. Chemical specific factors, such as mass, charge, lipid solubility, and molecular weight of the chemical, also greatly impact the potential for dermal absorption and contribute to the large uncertainty in attempting to quantify the human health risk numbers associated with this exposure route. Thus, we believe that it is inappropriate to quantify risk from the dermal route by using standard default values instead of values derived from both standardized experimental protocols, modeling studies, and site-specific information.

4. Differences in the soil-to-skin AF associated with different body parts (e.g., hands, face, forearms, lower legs) for various activities confounds the hazard assessment issue, as does the distribution, metabolism, and excretion of the chemical (and/or metabolite(s)) from the body (e.g., physicochemical parameters). Chemical release from soil may be the limiting factor for dermal absorption in some cases.

5. Based on limited experimental data, the CA EPA recommended using a default AF of 1.0 mg/cm^2 for a broad range of chemicals (guidance document, CA EPA 1994). Variations in the amount absorbed as a result of changes in exposure time, soil loading, soil characteristics, etc. are not considered. U. S. EPA Region IX preliminary remediation goal (PRG) tables currently are being used for risk assessment purposes at MCAS El Toro. For consistency of approach and to take advantage of more recent data interpretations, we recommend using U. S. EPA Region IX guidance AF values at El Toro. These AF values agree with the proposed values presented in reference (a). Per reference (c), reference (a) is anticipated to be in final form this spring (1999).

6. Table 1 of the Technical Memorandum lists the proposed exposure parameter values to be used in the equations for quantitatively estimating human health risks. The values are appropriately conservative for estimating the reasonable maximum exposure, however they are not representative of an average (central tendency) exposure estimate. We recommend modifying the table to account for both reasonable maximum exposure and central tendency exposure. Specific comments are provided below.

Specific Comments:

1. Page 8, Table 1, "Values Assigned to Dose Equation Parameters, Soil Ingestion":

Comments:

a. The soil ingestion intake rate listed for resident child and resident adult are 200 mg/day and 100 mg/day respectively. These values are appropriate for estimating the reasonable maximum exposure (RME), but are not representative of central tendency (CT). Reference (a) recommends 100 mg/day for resident child CT and 50 mg/day for resident adult CT.

b. The Fraction of Ingested Soil for the child resident, adult resident and office worker is listed as 1.0. This value assumes that concentrations in indoor dust and in outdoor soil are equal. For those instances the fraction ingestion (FI) conservatively (health protectiveness) could be equal to 1.0. The FI is appropriate as an RME for the resident child and resident adult. An office worker's exposure time to the site is 8 hours a day, or about one half of the waking hours. Therefore, a FI of 0.5 may be appropriate.

2. Page 8, Table 1, "Values Assigned to Dose Equation Parameters, Soil Dermal Contact":

Comments:

a. Reference (b) recommends adherence factors from 0.2 mg/cm^2 for both adults and children to age-specific adherence factors of 0.08 and 0.3 mg/cm^2 for adults and children,

respectively. Regions I, III, IV, VI, IX, and X have adopted these adherence factors as interim policy. We support the default adherence factors of 0.3 for children and 0.08 mg/cm^2 until further guidance is published.

b. Adherence increases with moisture content, decreases with particle size, but is relatively unaffected by clay or organic content. The dry climate at El Toro and the relatively high silica content (large particle size) of the surface soil in this region will tend to reduce the adherence of soil to skin.

c. The exposed skin area is listed as 2900, 5700, and 5700 cm^2 for resident child, resident adult, and office worker respectively. Reference (a) recommends that the 50th percentile body surface area (SA) values be used to estimate dermal contact rates. Body SA values are correlated to body weight. Therefore, we recommend that CT and RME default values for children be age and weight specific. For the adult SA, reference (a) recommends using 5000 cm^2 and 5800 cm^2 for the respective central tendency and reasonable maximum exposure. These values assume an individual is wearing a short sleeve shirt, shorts, and shoes which means that up to 25% of the skin area may be exposed to soil. An office worker wearing long pants, long sleeve shirt, and shoes would result in 10 to 15 % exposed skin area. Assuming a whole body CT of 20,000 cm^2 and a RME of 23,000 cm^2, the respective default values for an office worker assuming 15% exposed skin would be 3000 cm^2 and 3450 cm^2. The range of defaults for children can be derived by multiplying the 50th and 95th percentiles by 0.25 for the ages of interest. This information is located in Tables 6-6, 6-7, and 6-8 of reference (a).

3. Page 8, Table 1, "Values Assigned to Dose Equation Parameters, General Parameters":

Comments:

a. The resident adult exposure duration is listed as 24 years. Recent studies indicate that the average adult resides at one residence for 9 years. We suggest reviewing local consensus reports to determine average time at one residence. Use 9 years as a CT default for exposure duration if local consensus values are not available.

b. The default body weight used for resident child is 15 kg. As stated above, we recommend using age adjusted body weights in human health risk calculations. Body weights for children by age group are located in Chapter 7 of reference (a).

FROM: _____
(YOUR NAME/COMMAND)
TO: NAVENVIRHLTHCEN, ENVIRONMENTAL PROGRAMS
FAX: COM: (757) 444-7261/DSN: 863-7261

MEDICAL/HEALTH COMMENTS - YOUR VIEW

Please help us improve our review process by indicating the extent to which you agree or disagree with the comments we provided your activity.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. "Value added" to IR/BRAC process?	1	2	3	4	5
2. Received in a timely manner?	1	2	3	4	5
3. High level of technical expertise?	1	2	3	4	5
4. Very useful to the RPM?	1	2	3	4	5
5. Contractor incorporated comments?	1	2	3	4	5
6. Easily readable/useful format?	1	2	3	4	5
7. Overall review was of high quality?	1	2	3	4	5
8. NAVENVIRHLTHCEN was easily accessible?	1	2	3	4	5
9. NAVENVIRHLTHCEN input during scoping or workplan development would be "value added"?	1	2	3	4	5
10. Added involvement in IR/BRAC document needed?	1	2	3	4	5

Please return by fax using the box provided at the top of this page. If you have any other comments, please list them below or telephone Mr. David McConaughy, Industrial Hygienist at (757) 462-5557, DSN 253, at any time to discuss your viewpoint. As our customer, your comments and suggestions of how we can improve our services to you are important!