



DEPARTMENT OF THE NAVY
NAVAL EDUCATION AND TRAINING CENTER
NEWPORT, RHODE ISLAND 02841-5000

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IN REPLY REFER TO

Department of Health & Human Services
Ms. Dontanette Cohill, Program Analyst/Coordinator
Division of Health Assessment and Consultation, ATSDR
Mailstop E-56
1600 Clifton Road, N.E.
Atlanta, Georgia 30333

Dear Ms. Cohill,

Medical review of the Agency for Toxic Substances and Disease Registry (ATSDR) document entitled "Public Health Assessment for Newport Naval Education and Training Center, Middletown, Newport County, Rhode Island" (Public Comment Release) has been completed with the assistance of the Navy Environmental Health Center (NAVENVIRHLTHCEN). Comments and recommendations are provided as enclosure (1).

The Naval Education and Training Center (NETC) concurs with the findings by the ATSDR that the center represents an indeterminate public health hazard. There is insufficient data to conclusively support any other determination.

If you require additional assistance, please contact Mr. Brad Wheeler, Installation Restoration Program Manager, at (401) 841-3735.

Sincerely,

W. H. RIGBY
CAPT, CEC, U. S. NAVY
Director for Public Works
By direction of the Commander

Encl:

(1) Medical Review of Public Health Assessment for Newport Naval Education and Training Center, Middletown, Rhode Island (Public Comment Release)

Copy to:

NORTHNAVFACENCOM Philadelphia, PA (Code 018, Attn: F. LaGreca)
w/ enclosures

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**MEDICAL REVIEW OF PUBLIC HEALTH ASSESSMENT FOR
NEWPORT NAVAL EDUCATION AND TRAINING CENTER
MIDDLETOWN, NEWPORT COUNTY, RHODE ISLAND
(PUBLIC COMMENT RELEASE)**

General Comments:

1. The document entitled "Public Health Assessment for Newport Naval Education/Training Center, Middletown, Newport County, Rhode Island" (Public Comment Release), prepared by the U.S. Department of Health and Human Services, Public Health Service, Agency for Toxic Substances and Disease Registry (ATSDR), and dated May 21, 1993, was provided to Navy Environmental Health Center (NAVENVIRHLTHCEN) for review on 27 May 1993. Our review comments and recommendations are provided below.
2. The information and methodology in the public health assessment (PHA) is generally consistent with the ATSDR *Public Health Assessment Guidance Manual*, March 1992 (PHA manual). However, one "comparison value" used, defined as a Reference Dose Concentration (RfDC), is not described in either the PHA manual or this report. The RfDC comparison values used in this report significantly affect the PHA outcome/conclusions. This is due to the RfDC values being more conservative than health protective values recommended by the Environmental Protection Agency (EPA), often by more than an order of magnitude. The assumptions and calculations used to derive the various RfDCs should be provided and contrasted to other health protective standards to show the degree of difference between them.
3. We concur with the ATSDR conclusion, stated in the "Summary" section (page 1), that the Naval Education Training Center, Newport, Rhode Island (NETC Newport) is of "indeterminate public health hazard." Data collected to date do not conclusively support any other determination.
4. We do not concur with the ATSDR conclusion, stated in the fourth paragraph of the "Summary" section, that "Completed pathways of past, present, and future exposure to contaminated surface soil have been identified at the Old Fire Fighting Training Area" (FFT area). Our opinion is that data collected to date do not support the conclusion of a completed surface soil pathway. We recommend that additional samples be collected and that you request ATSDR to reconsider the health assessment based on additional information from future sampling efforts. At a minimum, resampling should occur at SS-06. Care should be taken that samples do not include asphalt pieces. Consideration should also be given to the collection of additional samples within the child care facility playground area.

5. The technical point of contact for this review of the PHA is Ms. Andrea Lunsford, Head, Health Risk Assessment Department, Environmental Programs Directorate, NAVENVIRHLTHCEN, who may be contacted at (804) 444-7575 or DSN 564-7575, extension 402.

Review Comments and Recommendations:

1. Page 13, "Environmental Contamination and Other Hazards," Section A (Introduction)

Comments:

a. The list of acronyms and abbreviations provided includes "RfDC = Reference Dose Concentration." The next paragraph states that "The reference dose concentration (RfDC) is a medium-specific concentration that results in an exposure dose equivalent to EPA's reference dose (RfD)." How an RfDC corresponds to an RfD is not explained anywhere in the text. For a given chemical, they are not equal values.

b. The PHA manual (March 1992) does not include a definition for RfDCs, an explanation of their derivation, or a discussion of the uncertainty associated with their derivation. The EPA guidance manual entitled *Human Health Evaluation Manual, Part B: Development of Risk-based Preliminary Remediation Goals* (OSWER Directive 9285.7-01B; December 13, 1991) provides equations and recommended default assumptions to develop "preliminary remediation goals" (PRGs). Recently, New Jersey, Texas, and EPA Regions 4 and 10 have applied PRG equations to develop numeric cleanup standards. The RfDCs appear to utilize the same equations. However, our calculations indicate that ATSDR has used the basic PRG equations, but substituted infant body weight and "pica child" daily soil consumption parameters with results more than an order of magnitude higher than PRGs.

c. PRGs (and apparently, the RfDC values) are derived by using chronic RfD values, which are applicable to lifetime exposure durations (i.e., 30 year durations) and then applying alternative assumptions (such as child body weight and ingestion rates) to back-calculate the contaminant concentrations in soil, water, air, etc. which would represent a 10^{-6} risk. The uncertainty in this process is significant, especially if applying chronic RfD values to exposure scenarios with significantly shorter exposure durations. The alternative assumptions used to derive "child" and "pica child" RfDCs are related to body weight and ingestion rate parameters without adjustment for the period of exposure.

Recommendation: Explain the derivation of RfDC values, present the calculations and assumptions used in deriving the individual RfDCs in the PHA, and discuss the uncertainty

associated with them.

2. Page 13, "Environmental Contamination and Other Hazards," Section A (Introduction), paragraph 2

Comments:

a. The body weight assumption for a "child" is given as 10 kilogram (kg). This value is not consistent with either the PHA manual, Appendix D or the EPA guidance document *Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual; Part A* (December 1989), (RAGS manual). Both documents reference 16 kg for calculating intake values for children (ages 1-6 years). Both documents recommend 10 kg as the default body weight for infants. Use of an infant body weight to derive a soil ingestion risk for a child is not appropriate (i.e., infants are not found on playgrounds ingesting soil) and yields an unrealistically conservative risk estimate and soil reference concentration.

b. Soil ingestion rates of 200 milligram per day (mg/day) for a child and 100 mg/day for an adult are given. These values are in the RAGS manual; however, they are inconsistent with default values in the PHA manual. The PHA manual (Appendix D, page D-5) uses soil ingestion rates of 50-100 mg/day for a child (non-pica child) and 50 mg/day for an adult.

Recommendations:

a. Use a body weight value of 16 kg to calculate exposure doses for children.

b. Provide the rationale for using a soil ingestion rate value different from the default value in the PHA manual. Where ATSDR guidance is not followed, provide a reference.

3. Page 23, Section B (On-site Contamination), subsection entitled "McAllister Point Landfill (Surface Soil)"; page 24, Table 6 ("Maximum Contaminant Concentrations in On-site Surface Soil Samples, McAllister Point Landfill"); and page 18, Table 2 ("Maximum Contaminant Concentrations in On-site Subsurface Soil Samples, Fire Fighting Training Area")

Comments:

a. In the Section B discussion concerning McAllister Point Landfill, the collection of two off-site surface soil samples for Target Analyte List (TAL) metals analysis is mentioned. In the Section C discussion of McAllister Point Landfill the text states that off-site surface soil samples "did not exceed comparison values." As previously stated, the background soil results are not presented in either the text or tables.

b. The PHA manual indicates that if site-specific background values are not available, state, regional, or national background levels may be used for comparison purposes.

c. Such comparisons are useful so that the public may put sampling results in perspective with natural soil concentrations, particularly for the pica child. For example, Table 2 lists the manganese comparison value derived for the pica child as 200 parts per million (ppm). Table 5.1 ("Mean Concentrations... of Soils in the Coterminous United States") of the PHA manual lists the range of manganese concentrations in Eastern United States (U.S.) soils as <2 to 7000 ppm, with the arithmetic mean for manganese being given as 640 ppm. The arithmetic mean is therefore significantly above the concentrations detected on-site.

Recommendation: Discuss background soil concentration data and compare to on-site data.

4. Page 46, Section A (Completed Exposure Pathways) and page 19, Table 3 (Maximum Contaminant Concentrations in On-site Surface Soil Samples, Old Fire Fighting Training Area)

Comments: The first paragraph of Section A states "A completed exposure pathway (surface soil) was identified at the Old Fire Fighting Training Area." In the subsection entitled "Surface Soil Pathway" the text states that the contaminants of concern in the surface soil include metals (cadmium, copper, arsenic, lead, vanadium, antimony, manganese, and chromium), PAHs, and PCBs. We question the existence of a completed exposure pathway. The discussion below addresses the contaminants of concern in the FFT area:

a. Metals - As discussed below, specific metal concentrations of concern were measured at locations other than the child care facility. For all contaminants except antimony, the measured concentrations are less than the arithmetic mean concentration for Eastern United States (U.S.) soils. The concentration observed for antimony at the FFT area is well within the normal concentration range for antimony in Eastern U.S. soils.

(1) Cadmium - Cadmium was detected in only one of six surface soil samples (i.e., in sample SS-04). Cadmium was not detected at SS-02 (the sampling site in the playground area) or at the other four sampling sites. The comparison value listed on Table 3 is 0.4 ppm and the reference listed is "EMEG, pica child." The text acknowledges the concentration detected at this one site (0.94 ppm) is only of concern for pica children.

(2) Copper - Copper was observed in all surface soil

samples collected at the six sampling locations. Results range from 11.2 to 44.3 ppm. However, no comparison value is provided on Table 3. The text indicates that the highest concentration found is of concern for pica children. Concentrations of copper in Eastern U.S. soils range from <1 to 700 ppm. The arithmetic average is 22 ppm. The concentration measured at SS-02 is 11.2 ppm, a value significantly below the arithmetic average for Eastern U.S. soils.

(3) Arsenic - Arsenic concentrations ranged from 2 to 8.9 ppm. The concentration measured at SS-02 is "5.1 J", indicating an estimated value. The comparison value is "0.6 ppm" with the reference source for this value being shown as "RfDC pica child." Concentrations of arsenic in Eastern U.S. soils range from <0.1 to 73 ppm. The arithmetic average is 7.4 ppm, which is above the concentration measured at the SS-02 location.

(4) Lead - Lead concentrations ranged from 19 to 77.8 ppm. The concentration measured at SS-02 is 19 ppm. No comparison value is listed for lead. Concentrations of lead in Eastern U.S. soils range from <10 to 300 ppm, with an arithmetic average of 17 ppm. The text discusses the sensitivity of children to lead and the point is made that lead is ubiquitous and that therefore, "any additional exposure" to lead may be potentially harmful.

(5) Vanadium - Vanadium was observed in all six surface soil samples; results ranged from 9.8 to 36.3 ppm. No comparison value is provided on Table 3. Concentrations of vanadium in Eastern U.S. soils range from <7 to 300 ppm. The arithmetic average is 66 ppm, which is significantly above the concentration measured at SS-02.

(6) Antimony - Antimony was measured in only one of six surface soil samples, SS-06. Antimony was not detected at SS-02 (collected in the playground area) or at the other four sampling sites. Concentrations of vanadium in Eastern U. S. soils range from <1 to 8.8 ppm. The arithmetic average is 0.11 ppm. The comparison value listed on Table 3 is 0.8 ppm and the reference listed is "RfDC pica child." The text discusses the value measured at this one site (e.g., 5.6 ppm) to be only of concern for pica children.

(7) Manganese - Manganese was observed in all six surface soil samples. Results ranged from 174 to 750 ppm. The comparison value listed on Table 3 is 200 ppm and the reference listed is "RfDC pica child." The concentration measured at SS-02 is 174 ppm. Concentrations of manganese in Eastern U. S. soils range from <2 to 7000 ppm. The arithmetic average is 640 ppm.

(8) Chromium - Chromium was observed in all six surface soil samples. Results ranged from 6.8 to 18.8 ppm. The

comparison value listed on Table 3 is 10 ppm and the reference listed is "RfDC pica child." The concentration measured at SS-02 is 6.8 ppm. Concentrations of chromium in Eastern U.S. soils range from <1 to 1000 ppm. The arithmetic average concentration for Eastern U. S. soils is 52 ppm, significantly above the concentrations measured at all six sites.

b. PCBs - PCBs (an Aroclor-1254 congener) were only measured in one of six surface soil samples, SS-01. PCBs were not detected at SS-02 (collected in the playground area) or at the other four sampling sites. The comparison value listed on Table 3 is 0.01 ppm and the reference listed is "EMEG pica child." The text discusses the value measured at the one site (0.08 J ppm) as only of concern for pica children.

c. PAHs - Only one surface soil sample (SS-06) exhibits elevated levels of PAHs. The comparison value given applies only to benzo(a)pyrene. Results for benzo(a)pyrene ranged from 0.061 to 2.7 ppm. The comparison value listed on Table 3 is 0.12 ppm and the reference listed is "CREG [cancer risk evaluation guide]." The concentration measured at SS-02 is 0.13 ppm. Most of the data for PAHs collected at other sampling locations were qualified with a "U" or "J" qualifier.

Recommendations:

a. Consider the surface soil pathway at the FFT area incomplete until additional data (site characterization and background data) is collected and reassessment conducted.

b. Where "pica child" comparison values are used, provide alternate comparison values, based on standard EPA default exposure assumptions, i.e., adult and non-pica child exposure assumptions.

c. Rephrase the first paragraph of Section A to discuss the virtual absence of risk to normal children, where contaminants are found at levels that may pose potential health risk to high risk behavior children (pica children).

5. Page 53, "Public Health Implications," Section A (Toxicologic Evaluation), subsection entitled "Old Fire Fighting Training Area (Site 09)," paragraph 4 and page 73, "Conclusions"

Comment: This paragraph states that "The contaminant concentrations used to estimate exposures are predominantly from one surface soil sample (SS-06)...The sample was taken along the shoreline of the Old Fire Fighting Training Area and may be misleading as a representative sample of the exposure area (i.e., where children play)." This information is reiterated in Conclusion #3 (page 73). We concur that sample SS-06 is likely not a representative sample. However, we note several reasons

for this; i.e., not only is the sample from the shoreline, but also:

a. Sample SS-06 was the only surface soil sample which was noted to contain asphalt pieces. The presence of asphalt material in the sample is significant, since asphalt characteristically has high levels of PAHs. The only surface soil sample in which construction debris was noted (SS-06) is also the only surface soil sample exhibiting elevated levels of PAHs. The contamination measured at SS-06 is highly likely to be attributable to the presence of asphalt in the soil sample.

b. PAHs are tightly bound in asphalt-containing materials. Thus, PAH levels found in soil samples containing asphalt may be representative of the chemicals in the sample, but not representative of potential contamination in the soil or of contamination that will be transported.

c. Besides asphalt, the presence of PAHs in soil is often associated with contamination by petroleum products, which may be indicated by staining and odors. The Remedial Investigation (RI) report for NETC Newport (November, 1991; page 3-32) states "No visible signs of contamination (e.g., odors, staining) were observed in any of the surface soil samples collected from the Old Fire Fighting Training Area site."

d. The shoreline sample may have had a significant fraction of bay sediments; these are known to be polluted (from sources other than NETC Newport). The RI report states "The sediments in the Bay are contaminated with heavy metals, hydrocarbons and sewage sludge. A survey conducted by EPA (EPA 1975)...found 7048 milligram per liter (mg/l) manganese, 2351 mg/l zinc, 559 mg/l iron, 55 mg/l lead, 46 mg/l nickel, 44 mg/l copper, and less than 1 mg/l cadmium" (page 3-6). Although the levels of "hydrocarbon" contamination are not stated, it is clear that bay sediments have elevated contaminant levels. Thus, the sample taken from the shoreline is likely not representative of most of the site's surface soil.

e. At the FFT area, one discreet surface soil sample was collected from each of the following areas: child care center, playground, baseball field, large soil mound in the center of the sit, soil mound at the western end of the site, shoreline and pavilion/park area. The RI indicates that for PAHs, the concentrations found in the samples other than SS-06 are an order of magnitude lower than the "maximum concentrations" used to assess health risk. This is not addressed in this PHA document.

f. The RI report states that the child care recipients are "not normally exposed" to the shoreline. The children at the day care center are generally restricted to the building or to the fenced playground area adjacent to the building. This being the

case, the exposure pathway is not complete for children or adults who are not exposed to the shoreline.

Recommendations:

a. Discuss the presence of asphalt pieces in surface soil sample SS-06 and the potential impact asphalt may have on PAH results.

b. Discuss the other five PAH surface soil sample results, particularly the results for the sample collected at the child care facility. Evaluate representativeness of SS-06 for exposures at the child care facility. Discuss the concentrations observed in the samples taken at locations "where the children play."

c. Consider using representative surface soil samples (i.e., samples other than SS-06) for site characterization of exposure.

6. Page 63, "Public Health Implications," Section A (Toxicologic Evaluation), subsection entitled "Old Fire Fighting Training Area (Site 09), subsection entitled "Polycyclic Aromatic Hydrocarbons"

Comment: Paragraph one states that exposure of pica children to PAHs is of public health concern and could result in cancer-related health effects. The ATSDR comparison value used to determine this is EPA's cancer slope factor for benzo(a)pyrene. This value is not provided in the text and/or the tables.

Recommendation: Provide the comparison value that was used to determine that the level of PAHs is of public health concern for pica children.