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LETTER AND U S NAVY RESPONSE TO U S EPA REGION III COMMENTS REGARDING DRAFT TECHNICAL MEMORANDUM CALCULATION OF BACKGROUND CONCENTRATIONS TECHNICAL MEMORANDUM CHEATHAM ANNEX FISC WILLIAMSBURG VA
06/30/2010
CH2M HILL

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CH2MHILL

June 30, 2010

358549.RP.FR

Mr. Robert Thomson, P.E., R.E.M.
Office of Federal Facility Remediation
United States Environmental Protection Agency (EPA), Region 3
1650 Arch Street
Philadelphia, PA 19103-2029

Subject: Response to USEPA Comments: Draft Technical Memorandum, *Calculation of Background Concentrations Technical Memorandum at Naval Weapons Station Yorktown and Cheatham Annex,* Naval Weapons Station Yorktown (WPNSTA), Yorktown, VA and Cheatham Annex (CAX), Williamsburg, VA

Dear Mr. Thomson:

This letter is in response to comments received on May 5, 2010 regarding the referenced draft document. Each comment is presented in *italics*, followed by the Navy's response. The order of the comments and responses, as provided by USEPA, has been modified slightly to allow for the most broad-reaching issues to be addressed first.

Comments and Responses:

- *Concentrations for the selected COCs in the two background areas: CAX and NWSY are significantly different. Therefore, separate background level concentrations should be computed for the two background areas.*

Response: Although USEPA's analysis indicates a statistical difference between the soils at Yorktown and CAX, it should be noted that these facilities are immediately adjacent to each other, are part of the same watershed and have undergone the same environmental genesis (i.e., hydrology, erosion, deposition). The bases consist of identical soil types as presented in the Soil Conservation Survey for York County. Some of the statistical differences may, in part, be a result of slightly different depths at which the samples were collected at each base. However, the Navy believes that in order to best support the decision making process, a wider range of data should be considered in the data set. The data set should not be determined solely on the statistical fit of the data. USEPA agreed to the approach presented in the work plan to combine the data sets based on the physical setting of the bases. The amount of data, particularly for the groundwater dataset at Cheatham Annex, is insufficient to separate the sets. Additional data collection would unnecessarily delay site decisions and is currently not funded. Therefore, the Navy believes that the sample data should be combined.

Further information on the soils, geology, and hydrology of the two bases may be found in the following publications:

Thomas, P. and Harper, D., *Soil Survey of Tidewater Cities Area, Virginia.* U.S. Department of Agriculture, Natural Resources Conservation Service. 2008.

Brockman, A., Nelms, D. and others. *Geohydrology of the Shallow Aquifer System, Naval Weapons Station Yorktown, Yorktown, Virginia.* U.S. Geological Survey Water-Resources Investigations Report 97-4188. 1997.

- *For most of the COCs evaluated in this report, significant differences were found in contaminant concentrations of surface and subsurface soils (for both CAX and NWSY), therefore, it is suggested to compute 95/95 UTLs separately for surface and subsurface soils.*

Response: Calculating separate UTLs for surface and subsurface soils is acceptable to the Navy. The background UTLs in the draft final document will be updated accordingly.

- *The concentrations of the selected metals found in the four soil associations of CAX area (for both surface and subsurface individually) are comparable. Therefore, four surface (and subsurface) soil associations can be considered to represent a single surface (and subsurface) population for CAX area. Background concentrations (95/95 UTLs) can be computed based upon the combined surface soil data set, and combined subsurface soil data set. A similar conclusion is derived for the four soil associations of NWSY area.*

  This is contrary to the CH2M Report which states that only soil associations 3 and 4 could be combined.

Response: The Navy agrees to combine all soil associations for the purpose of UTL calculation.

- *As mentioned before, it is not possible to compute a reliable decision statistic (e.g., 95/95UTL) based upon data sets consisting mostly of non-detect results (e.g., mercury and nitrobenzene in groundwater). EPA recommends that background concentrations calculated with a large number of non-detects be eliminated given the high uncertainty. Mercury maybe an exception as discussed above, based upon input from the project team.*

Response: It is agreed that UTL calculations will not be completed for constituents for which data sets consist of a large number of non-detects.

- *Overall, 95/95 UTL computations made by CH2M HILL appear to be correct except in cases when the majority of data are non-detects.*

Response: Comment noted. Please see the previous response of proposed use of data with a majority of non-detects.

- *Since some errors were identified in the calculations performed, it is suggested that CH2M HILL double check its calculations to assure that all statistics are correctly computed.*

Response: The Navy is aware that one soil sample (BGSB04-09) may have been grouped within the wrong soil type. Following final resolution of sample groups, the statistics will be recalculated, but the incorrect grouping based on soils types will not have an impact on the final statistics. If there were any additional errors which were identified which would impact the new calculations, the Navy would appreciate the USEPA's help in identifying these.

- *In some cases as identified in this report, it is noted that CH2M HILL included outliers in their computations resulting in inflating values of UTLs. These outlier concentrations may have come from areas that have potentially been impacted by site operations. Elevated observations (outliers) from these areas may represent releases. Therefore, outliers should not be included in the computation of 95/95UTLs.*

Response: The intended approach during development of UTLs was to complete calculations without using outliers. There were probably some discrepancies in the outliers identified based on the grouping of soil associations in the USEPA calculations compared to the original Navy calculations. Any outliers will be excluded during the recalculations.

- *Groundwater, surface, and subsurface soil background data were collected from CAX and NWSY sites. These sites consist of four soil association types. For some locations, duplicate samples were collected. In such cases, higher value was retained and used in the statistical analyses performed by CH2M HILL to establish background level concentrations. For comparison sake, the reviewers also used the higher duplicate value, even though the use of the average of duplicates is a preferred method and is commonly used in practice.*

  However, for background evaluation studies, the use of the lower value of the duplicate results perhaps will be more appropriate resulting in a conservative estimate (95/95UTL) of the background level concentration.

Response: The Navy does not agree that use of the lower value of a pair of background duplicate samples is appropriate. During the comparison of site data to screening levels (e.g., RSLs, MCLs and background UTLs), the higher of the two site values is required in the comparison which reflects a more conservative measure. However, selecting the lower (and more conservative) duplicate value in the background data set will result in comparison of a conservatively high site value with a conservatively low background value. This may lead to unnecessary concerns of a release or clean up values below levels actually representative of background. The Navy requests the inclusion of the maximum duplicate number into the background data set for the purpose of UTL calculation.

- *When reviewing the CH2M HILL report, some discrepancies were identified. For an example location BGSB04-09 (353) represents an outlier for manganese (also found in the CH2M HILL report) for soil association 3 and not from soil association 1 (incorrectly included in calculations for soil association type 1. It appears this outlier has been incorrectly included in the calculation of manganese UTL of 244.8 for soil association 1.*

Response: Background calculations will be reevaluated and checked following agreement on the grouping of the data sets. After data partitioning decisions are completed, it will be determined if this result remains an outlier and the data may be excluded from the UTL calculation, as appropriate.

- *"However, it is the recommendation of EPA that organic background concentrations be eliminated given the high uncertainty surrounding the calculations involving a large number of nondetects."*

Response: The Navy agrees that a high degree of variability may exist with organic background concentrations and UTLs for these compounds will not be included in the revised calculations.

If you have any questions or comments regarding the above response to comments, please feel free to contact me at 757-873-1442, x41634.

Sincerely,

CH2M HILL

Marlene Ivester
Project Manager

cc: Mr. Chris Murray/NAVFAC Mid-Atlantic
Mr. Tom Kowalski/NAVFAC Mid-Atlantic
Ms. Sue Haug/USEPA
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Mr. Bill Friedmann/CH2M HILL
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