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LETTER TRANSMITTING COMMENTS ON WORK PLAN ADDENDUM TO SAMPLE ZONE J  
PROBABLE POINTS OF ENTRY TO ZONE J CNC CHARLESTON SC  
5/14/2001  
U S EPA REGION IV

## UNITED STATES ENVIRONMENTAL PROTECTION AGENCY



REGION 4

61 Forsyth Street, S.W.  
Atlanta, Georgia 30303-3104

May 14, 2001

4WD-OTS

MEMORANDUM

SUBJECT: Risk review comments for ecological aspects of Memorandum from EnSafe, Regarding the Scoping Package for Work Plan Addendum to Sample Zone J Probable Points of Entry for Charleston Naval Complex (CNC) and Zone J, Dated April 4, 2001

FROM: Sharon R. Thoms, Life Scientist  
Office of Technical Services  
Waste Management Division

TO: Dann Spariosu, Remedial Project Manager  
Base Realignment and Closure (BRAC) Team  
Federal Facilities Branch  
Waste Management Division

Per your request on April 24, I have reviewed the **Memorandum from EnSafe providing the Work Plan Addendum to Sample Zone J Probable Points of Entry to Zone J at Charleston Naval Complex (CNC), in Charleston, South Carolina, dated April 4, 2001**. My comments provided below are divided into comments to you the RPM and comments for the party preparing the report, which if you concur can be forwarded to the Navy. I will forward you my memo via Lotus Notes to facilitate verbatim conveyance.

GENERAL COMMENTS TO THE RPM

The purpose of the memorandum was to characterize storm-water mediated releases from Charleston Naval Complex (CNC) in an effort to identify potential migration of site-related constituents. The end result will be a refined list of chemicals of potential concern (COPCs) for Zone J. The refined list will consider the likelihood that a chemical identified as of penitential concern in sediment can be attributed to Naval operations at the CNC.

When presenting the comments to the Navy, please remember to distinguish the comments from the State and NOAA from EPA's comments. Please forward the responses to comments for OTS' files.

#### COMMENTS TO BE CONVEYED TO PARTY PREPARING THE REPORT

##### GENERAL COMMENTS:

1. The approach taken by the Navy is proactive in addressing potential migration of chemicals in surface soil and ground water to Zone J water bodies. The results of this study should be transferred to the future owners of the property to assist them in ongoing efforts to manage storm water at CNC.
2. The work plan acknowledges that there are potential diffuse area, i.e, non-point sources, associated with the CNC and attempts to measure contributions from these sources. The list of transport processes considered in the example for Basin 44 is comprehensive. Sources from the Navy are put in context with various other point and non-point sources to Zone J and the dynamics of particle transport.
3. Based on knowledge of the site it may prove difficult to distinguish contamination from the Navy from that from other sources. The procedures proposed to sort contaminants are a mixture of risk assessment and risk management. The approach to evaluate the pathways a pathway or potential migration analysis is valid; but please do not call it a risk assessment, because background criteria (risk management) are mixed with ESVs (risk assessment). Although it is an important part of this work, EPA wishes to see the document organized to separate risk assessment from the evaluation of contaminant origins. From the standpoint of exposure and potential risk to human health and the environment, the receptor being exposed cannot distinguish Navy contamination. The decision to consider only contamination associated with the unique characteristics of Naval operations is a risk management decision. Several comments on the proposed outline address this issue.

##### COMMENTS ON DOCUMENT BACKGROUND/GENERAL APPROACH:

1. The work plan would benefit by clarifying the terms "point" and "non-point" pollution as sources of contamination to Zone J. Point sources are inputs

recognized as coming from an identifiable outfall, often, a permitted discharge. Non-point sources are diffuse area sources. Non-point sources may originate from a series of smaller outfalls or small drainage channels. As an example of where clarification is needed, consider the sentence that spans Background Pages 3 and 4.

*Storm water has the potential to transport both site-related contaminants and non-point source pollutants to the Zone J water bodies.*

The sentence should clarify that storm water can transport non-point pollution from the CNC at the same time it transports non-point pollution from local land uses. The text should also clarify that the types of contaminants in storm water from the CNC may be similar to those associated with urban and civilian industrial land use. In practice, it may prove difficult to distinguish site-related contaminants from non-site-related contaminants. Non-site-related contamination can be characterized in terms of both point- and non-point sources. When making this clarification, keep in mind that the difference between point- and non-point source pollution involves the nature of pollutant origin rather than the nature of chemical pollutants.

2. Background, Pages 1 - 2. The section on the ecological screening values and their order of preference does not replicate the order that I had provided in my February 12, 2001 memo. As background to the comment, the screening criteria provided in the memorandum are repeated in the order given:
  1. Zone-specific background (inorganics and select PAHs),
  2. USEPA Region 4 SSVs
  3. PRGs for sediment, Oak Ridge National Laboratory
  4. ESVs from Savannah River Site

Region 4's screening approach is to consider background screening after, not before, screening for potential toxicity. Zone-specific background screening should be the fourth consideration.

***Charlie, what she deescribed is the standard EPA protocol.***

EPA considers comparisons with background values to be a risk management consideration rather than part of the risk assessment.

For chemicals lacking screening values, rather than using the ORNL PRGs, Region 4 has recommended use of the Region 5 EDQLs. The Region 5 EDQLs may be viewed at the following web site:

<http://www.epa.gov/reg5oopa/rcra/edql.htm>

***This is also true. We found out couple months ago that Reion 4 has switched to***

**Region 5 #s.**

4. Some of Navy's potential contribution to water quality or sediment impacts may be diffuse if contamination is spread out over a relatively large area. The work plan includes measurement of contaminants in sheet-flow runoff areas identified on Figures 4 through 10. Whereas there is no recognized outfall or ditch in these areas, how will samples be collected? The example Basin 44 did not address this issue.

**Hill's problems.**

5. It will be important to pick the reference sites appropriately. The mass of constituents coming off of a watershed will depend on the size of the watershed as well as antecedent conditions and rainfall pattern. Sediment delivery ratios decrease as a function of watershed size. It would be best if the reference watersheds were of similar size to the study watersheds at CNC and if site and reference outfalls were sampled for the same storms. The drainage basins at CNC differ in size. These complexities will need to be factored in when choosing appropriate reference sites and in interpreting the data. The work plan should expand the discussion of reference sites.

**This is going to be tricky.**

6. The analysis of the storm-water inputs will only address continuing or ongoing sources of contamination, but will not address past releases or spills. The discussion of the individual areas should include a discussion of any known or potential spills in past Naval operations. The example for Basin 44 did address this issue.
7. If there is ground water discharge to storm-water outfalls through a leak in the pipe or through illegal connections, there may be some contamination detected in flow between storms. Some of the work to identify possible illegal connections is mentioned in the work plan. More detail would be beneficial.
8. Also, potential non-point sources associated with Navy and non-Navy ship traffic and marina operation are not included in this approach. The work plan should either explain certain limitations of the study or try to enhance the study to include, for example, comparison of sediment samples from Navy and non-Navy docks/marinas.
9. If soils are being screened for the pathway analysis, indicate that risk of soils was evaluated in the risk assessments for the individual SWMUs and that this analysis is for potential future risk from migration of soils, assuming that soils can wash off the land and be transported to Zone J to become sediments. This might explain why soils are being screened against sediment ESVs. Please clarify rationale for the proposed approach.

### COMMENTS ON DATA COLLECTION AND ANALYSIS:

Both the collection and analysis of the data from this study are important aspects of the work plan, which require expansion of details.

1. In terms of collection of the data, the work plan should provide the number of samples to be collected and how these samples will be structured. For example, will all of the reference samples be pooled into one data set or will there be reference sample for different characteristics, such as industrial versus non-industrial watersheds? For each drainage basin shown in pink on Figures 4 through 10, will multiple outfalls within each area be pooled or will each outfall be analyzed separately? How many replicates will be taken at each outfall? How many storms will be sampled?

***I would assume that info she mentioned will be in the WP Addendum.***

2. What parameters will be compared between the sites and reference outfalls? Can the flow-weighted concentrations be compared directly, or is it more appropriate to compare the loading rates per hectare, which may better account for differences in sizes of the drainage basins?
3. Flow-weighted composite samples may be insufficient because studies have shown that most non-point pollution comes off in the first flush. Text states that it is possible to collect the first 30 minutes of a storm. ***(You should use this to justify buying samplers.)*** The Navy should make every effort to include the first 30 minutes after start of precipitation in their sampling. It is important to capture the entire storm, but especially the beginning of the runoff event.
4. There will be dissolved and suspended particles associated with the storm-water runoff. Will the samples taken be filtered or unfiltered? EPA recommends a minimum of total recoverable metals samples. Additional details of the sampling strategy should be provided.

### COMMENTS ON OUTLINE OR ORDERING OF APPROACH:

As a general comment, EPA policy recommends that the risk management be clearly differentiated from the risk assessment. The following comments are suggestions to the outline for how to separate risk assessment from risk management. Although important, the evaluation of contamination associated with the unique characteristics of Naval operations is a risk management consideration that is separate from an evaluation of how the contamination may affect the environment.

1. To separate risk assessment from risk management, I recommend that the sorting of Navy and non-Navy contamination occur within or, better yet, after

ecological risk assessment Step 3a, the refinement of chemicals of potential concern. I recommend that the current Steps 1 and 2 be preserved as the ecological risk assessment. The screening-level ERA should proceed on all of the Zone J samples. If new samples below the outfalls are collected, these samples should be added to the existing screening document. **(This answers our question last week.)** For convenience, they could be presented in a separate table for outfalls.

2. The Outline shown on Pages 7 and 8 appears to indicate that the process of evaluating risk at the CNC will start by sorting Navy contamination from non-Navy contamination and that apparently only the Navy contamination will be evaluated in the risk assessment. It is EPA's policy to evaluate the baseline risk attributable to all of the contamination present, natural plus anthropogenic. **Unfortunately, this IS EPA's (and DHEC's) position.**
3. The ecological risk assessment Steps 1 and 2 should involve screening of COPCs for their potential to cause unacceptable adverse effects to exposed biota, regardless of the chemical's association with Naval operations. In Steps 1 and 2 sediments should be screened with the ESVs in Region 4's guidance. The discussion of reference locations and other sources of contamination should occur after the screening-level toxicity evaluation, i.e., after Steps 1 and 2.
4. Waters collected in storm-water sampling should be screened in Step 2 against screening values for saltwater or freshwater depending on the receiving water body. The results of Steps 1 and 2 will be refined in Step 3.
5. The reference stations should not be screened against the ESVs.

*The following comments are recommendations for Step 3a.*

6. A comparison of site samples with non-anthropogenic background should be the first part of the refinement of COPCs in Step 3a. The refinement for naturally-occurring metals in sediments against background is different from distinguishing Navy and non-Navy sources. The discussions of background should be kept separate from the discussion of Navy-made sources and non-Navy-made sources.
7. The refinement in Step 3a should also consider ESVs other than Region 4 values, for example, when a chemical lacks a Region 4 ESV. (See hierarchy in General Approach Comment Number 2.) The surface water data from the outfall sampling (storms) should be screened against acute toxicity values in Step 3a, assuming that the concentrations will only be elevated during a storm runoff event. If filtered water samples are collected in addition to total recoverable, they are considered during Step 3a using the National Recommended Water Quality

Criteria for dissolved water samples  
(<http://www.epa.gov/ostwater/standards/wqcriteria.html>).

8. The same refinement tables as presented previously should be included in the Step 3a, i.e, tables of frequency of detects, frequency of detects above ESV, etc., as recommended by Tom Dillon. Any new data for sediments and surface water collected at outfalls might be included in its own table, for convenience.
9. The end of Step 3a may include an evaluation of other factors a risk manager may desire to consider such as discussion of points of entry and other material related to whether the contamination may have originated from Naval operations. The migration pathway checklist and evaluation are recommended to take place after the more traditional screening approach, to limit the chemicals of potential concern subject to analysis to a manageable number. This approach would in effect limit the point-of-entry assessment to only those contaminants that are of potential concern in sediment, as was agreed to by DHEC.

#### COMMENT ON STATISTICS:

1. *Section 1.0 Calculation of Background Iron Concentrations for Chas. Naval Complex, Page 1.* Region 4 of EPA recommends the use of the Wilcoxon Rank Sum test for evaluating whether site concentrations are generally higher than background or the slippage test for testing against background when a few samples from the site are elevated with respect to background. EPA is concerned that the distribution of contamination at the study site may not be the same as the distribution at the reference site, invalidating the UTL test assumptions. After the number of samples to be collected is established the consultant should contact EPA for specific recommendations on the statistics for comparing with reference sites. Please contact Ted Simon at EPA at (404) 562-8642.

#### SPECIFIC COMMENTS ON BASIN 44 EXAMPLE:

1. Figure 2.4.2 shows the catch basins and the samples for the SWMU/AOC investigations that are located near Basin 44. There are some samples such as 636SB003 that are located directly across a parking lot from the catch basins. It is possible that precipitation falling on the grassy area will generate sheet flow, the sheet flow will run onto the parking lot, and subsequently deliver contamination from the grassy area to the catch basin. Parking lots offer little opportunity for pollutant removal. Therefore, some of the samples near the 44/1-D and 44/1-B are candidates for the analysis of scenario 1b, waste in sheet flow collected into catch basins. I am recommending that the radius of 50 feet be relaxed to the extent that the distance between the sample and the catch basin is paved.
2. Catch-basin sampling might be the most direct and efficient way to address

question 1b. However, concentrations of constituents in catch basins are likely to be higher than ESVs. ESVs alone are probably not appropriate for evaluating sediments from catch basins. If enough catch basins can be found without CMCOPCs in the vicinity (and not across the parking lot from samples with high concentrations of CMCOPCs), it might be possible to compare "background" concentration levels with levels in potentially impacted catch basins.

3. *Comparison of ground water concentrations with background.* You may consider presenting this information in a table. Also include how many detections were within the range out of how many samples.
4. If the Navy was concerned with potential future ground water migration to the storm sewer lines, they would have to look at whether there was a ground water plume moving toward the depression. (This is assuming that the depression is associated with a leak allowing infiltration into the storm sewer line.) Drilling wells may be the most direct means of measuring a ground water depression, however, one might consider sampling water flowing into the catch basin during base flow. Water should not be flowing into the catch basin between storm events unless ground water leakage is occurring. If there was water entering the catch basin at base flow, i.e., between rain fall events, one might sample the water to see if it contained any COPCs above the benchmarks.
5. If a catch basin was experiencing both sheet flow and shallow ground-water inputs, one could distinguish these by sampling water entering a catch basin during and immediately after a storm to construct a graph of pollutant concentration over time after a storm event. Contaminants from sheet flow will show up as an early peak in the graph while contaminants in shallow ground water infiltration will show up as a delayed peak. This is a suggestion that may be performed, as necessary, to address a complex situation.

If you should have any questions please feel free to contact me at 2-8666.

cc: Lynn H. Wellman, Life Scientist/ETAG Coordinator  
Ted Simon, Human Health Risk Assessor, BRAC Team  
Elmer Akin, Chief Office of Technical Services