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LETTER FINDING THE DRAFT FINAL ZONE J RESOURCE CONSERVATION AND RECOVERY ACT FACILITY INVESTIGATION WORK PLAN DATED 22 NOVEMBER 1995 INADEQUATE CNC CHARLESTON SC
7/16/1996
SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL

South Carolina
DHEC
Department of Health and Environmental Control
2600 Bull Street, Columbia, SC 29201-1708

CERTIFIED MAIL
Return Receipt Requested

To Todd
Fran Tony
Received 7/18/96

July 16, 1996

Commander Phil Dalby
Officer in Charge, Caretaker Site Office
Naval Facilities Engineering Command
Building NH-45
Charleston Naval Base
Charleston, SC 29408-2020

Re: Draft Final Zone J RCRA Facility Investigation
(RFI) Work Plan, Dated November 22, 1995
Charleston Naval Base
SC0 170 022 560

Dear Commander Dalby:

The South Carolina Department of Health and Environmental Control (Department) and the Environmental Protection Agency (EPA) have reviewed the above referenced Zone J RFI Work Plan in accordance with applicable State and Federal Regulations, and the Charleston Naval Shipyard's Hazardous Waste Permit, effective June 5, 1990. Based on this review the Charleston Naval Shipyard has not adequately fulfilled the requirements of Permit Condition IV.C.4.

The Charleston Naval Base has submitted the Zone J RFI Work Plan for the second time and there is still a significant improvement to make. Meetings held with the purpose of clarifying the scope of work required for the Zone J RFI Work Plan have produced minimal results. Previous comments sent by EPA have not been addressed or have been only partially addressed. The Department is concerned about this situation and asks NAVBASE to fully comply with the minimum RFI Work Plan requirements set in the approved RCRA Permit when revising the Zone J RFI Work Plan.

To avoid further delay on the investigative work at the Base, the Department will expect to receive a significantly revised and improved Zone J RFI Work Plan. Failure to do so may be grounds for the issuance of an order with possible assessment of a penalty.

Attached are comments provided by the U.S. Environmental Protection Agency and the South Carolina Department of Natural Resources. Within thirty (45) days of receipt of this letter, please make the specified changes and resubmit the Zone J RFI Work Plan for a new review by the Department and U.S. EPA.

Should you have any questions regarding this issue, please contact me at (803) 896-4179 or Paul Bergstrand at (803) 896-4016.

Sincerely,

Johnny Tapia P., Environmental Engineer Associate
Hazardous Waste Permitting Section
Bureau of Solid & Hazardous Waste Management

Attachments

cc: Paul Bergstrand, Hydrogeology
Rick Richter, Trident EQC
Tony Hunt, SOUTHNAVFACENGNCOM
Doyle Brittain, EPA Region IV

ENVIRONMENTAL PROTECTION AGENCY COMMENTS ON THE
RESOURCE CONSERVATION AND RECOVERY ACT FACILITY INVESTIGATION
WORK PLAN FOR ZONE J

1. The additional information on dredging activities in the Cooper River, added to Section 4.2.6, Pages 4-45 to 4-46 in the Draft Zone J RFI Work Plan, is appreciated. However, rather than just mentioning the types of contaminants found in analysis of the 1991 and 1992 pre-dredging sediment samples, it would be more helpful to include the actual chemical concentrations.

2. The response to the comment concerning the possible need for evaluating a larger portion of Clouter Island for ecological risk is good. It is recommended that the information contained in the response to comments be included in the Work Plan in Section 4.2.8, Pages 4-57 to 4-60. (This section was called Section 3.2.8 in the June 9, 1995, Draft Final Zone J RFI Work Plan.)

3. Page 1-8, Section 1.2: If contaminants from upland AOCs/SWMUs have migrated into the Zone J water bodies and have settled in the sediments, the contaminated sediments might be considered as a secondary contaminant source, particularly with respect to ecological concerns.

4. Page 3-11, Section 3.3: Although the potential for natural recovery of contaminated areas is relevant to risk, it is more of a risk management, rather than a risk assessment, topic in relation to possible remedial action or mitigation. A discussion of natural recovery might be more appropriate in a Corrective Measures Study rather than in the risk characterization portion of the ecological risk assessment.

5. Page 4-46, Section 4.2.6: The original purpose of mapping sediment grain size distribution was to aid in selection of sediment sampling locations, particularly in depositional areas. Section 4.2.6 states that such mapping might be inconclusive, in view of the dredging operations conducted periodically in the area. The general information given on Page 4-49, Section 4.2.6, concerning the relationship between surface water hydrology, shoreline structures such as piers, and deposition of fine-grained sediment is probably sufficient information on general sediment particle size distribution for now. However, sediment grain size must be determined for sediment samples collected for chemical/biological analyses, to facilitate evaluation of the data and the potential for ecological effects.

6. Page 4-44, Section 4.2.6: Although the primary ecological risk from NAVBASE to the Cooper River might be the "discharge of storm water and past discharges of industrial wastewater," the migration of NAVBASE ground water contaminants must also be considered.

7. Page 4-52, Section 4.2.7: The priority pollutant analytical data for Shipyard Creek dredged materials were not available for inclusion in the Final Zone J RFI Work Plan. When the data become available, they should be evaluated with respect to their relevance to the Zone J RFI.

8. A lot of environmental investigatory work has been done in the water bodies around Naval Base Charleston. EPA has previously recommended that the results of these investigations be reviewed and analyzed to focus where Naval Base Charleston should collect samples, and to avoid needless duplication of effort. This requires coordination with other agencies. The results of this coordination and data review are not apparent in the subject Draft Zone J RFI Work Plan. Three contacts to begin with are:

Ms. Carolyn Thompson
RCRA Compliance Specialist
US Environmental Protection Agency, Region IV
Phone (404) 347-3555, X6386

Dr. Jeff Hyland, Manager
EMAP for Carolinian Province (NOAA)
Phone (803) 762-5415

Dr. Fred Holland, Director
Marine Resources Research Institute
Contaminated Creek Portion of Charleston Harbor Projects
Phone (803) 762-5107

Information from these and other contacts should be incorporated into the Zone J RFI Work Plan.

In the Work Plan, other sources are discussed but the results are not used. In particular, three studies are mentioned: 1) A Physical and Ecological Characterization of the Charleston Harbor Estuarine System, 1990; 2) a 1992 soil study by the US Army Corps of Engineers; and 3) a state-sponsored study "recently conducted" to assess bioeffects and water quality standards.

Attached is a copy of a letter from Dr. A.F. Holland, with the South Carolina Department of Natural Resources, containing some EMAP sampling data that have not undergone full quality assurance reviews. These data are from a sediment sample taken in Shipyard Creek. Note that the arsenic, chromium, copper, nickel, fluoranthene and pyrene are all above EPA Region IV screening levels. These data should be sufficient for a preliminary problem formulation. This problem formulation should be presented in the Zone J Work Plan.

The Tidal Creek Project mentioned in Dr. Holland's letter is discussed in a March 1996, Interim Report entitled The Tidal Creek Project. Information contained in this report should be considered in the Zone J RFI Work Plan.

9. On Page 2-5, it says:

> Because numerous potential contaminant sources other than NAVBASE exist, direct analysis of tissue samples is not considered the most appropriate means of evaluating biota impacts. Tissue concentrations will be estimated based on surface water and sediment concentrations, chemical characteristics, and reasonable migration patterns of representative species.

On Page 4-50, it says:

> Due to the transient nature of most of the selected tissue species (from an earlier study) (except oysters) and the fact that NAVBASE is not necessarily the specific contributor of contaminants in the area, tissue information will not be included in this overview.

The Work Plan seeks to make the argument that discovering levels of contaminants in biota is unimportant because there are several possible contributors of contaminants, i.e., Hess, W.R. Grace, MacAlloy. This argument is flawed. EPA reiterates the earlier point about coordination with other agencies and full use of existing data.

It should be possible to design a study, working in concert with the other contaminant generators nearby, that will delineate the contaminants in biota and probably link their presence to specific waste streams. This effort should not be ignored.

Seafood consumption will likely be the centerpiece of the Zone J human health risk assessment. Fin fish, crabs, and oysters should all be sampled to determine the effect of mobile versus sessile lifestyles. Human consumption of all three types of animals occurs. In addition, the diets of these organisms should be considered.

10. Many of the comments which EPA made on the June 9, 1995, Draft Zone J RFI Work Plan remain inadequately addressed. EPA chooses not to repeat those same comments here but simply refers Naval Base Charleston to the previous comments for re-consideration. Considering the meetings which have been held to discuss this document, a previous verbal agreement reached, and the provision of written comments, EPA considers this to be a significant concern. As examples, EPA will note only

three comments regarding these previously made but inadequately addressed comments:

a. At the April 28, 1995, scoping meeting, EPA pointed out that the proposal to focus the Zone J RFI Work Plan on ecological risk assessment was not satisfactory, and that the Zone J RFI Work Plan must comply with all RFI requirements as contained in the HSWA portion of the RCRA Permit. Yet, EPA's comment was ignored. EPA made this comment again as Comment 1 in response to the June 9, 1995, Draft Zone J RFI Work Plan. In a September 22, 1995, meeting to discuss the SCDHEC and EPA comments, this comment was made again. Yet, this comment has essentially been ignored in the November 22, 1995, Draft RFI Work Plan. While the ecological risk assessment is an important part of any RFI, the RFI is more than an ecological risk assessment. EPA's comment number 1 on the Draft Zone J RFI Work Plan remains to be adequately addressed. EPA will not to approve a Zone J RFI Work Plan which focuses primarily on ecological risk assessment and does not adequately address all RFI requirements contained in the HSWA portion of the RCRA Permit.

b. Comment 4 on the June 9, 1995, Draft Zone J RFI Work Plan concerned fate and transport of contaminants. Yet, there is no evidence that fate and transport has been considered in the Zone J RFI Work Plan. This must be addressed.

c. Comment 11 on the June 9, 1995, Draft Zone J RFI Work Plan concerned the use of CERCLA terminology. The Response to Comments submitted with the Draft #2 Zone J RFI Work Plan stated that CERCLA terminology had been changed to RCRA terminology. Yet, no change was made in the use of CERCLA terminology between the June 9, 1995, and the November 22, 1995, Draft Zone J RFI Work Plans. (See Section 2.2.)

11. Page 1-5, Section 1.2 states that:

> The Zone J RFI will also ensure that each zone-specific area of concern/solid waste management unit (AOC/SWMU) investigation includes a complete and formal ecological risk assessment (ERA) following the strategies presented in Section 3, Volume III of the Comprehensive RFI Work Plan.

This raises two questions:

a. How will this be done?

b. What is the relevance of this to Zone J?

12. Page 1-8, Section 1.3 deals with the human health risk assessment in Zone J. In entirety, it states:

> 1.3 Human Health Assessment
>
> Risks to human health will be assessed as outlined in Section 2 of the BRA. Each zone will be responsible for addressing all issues regarding human health.

For a document that is approximately three inches thick and deals mostly with ecological risk assessment, two sentences for human health risk asessment is totally inadequate.

13. Page 2-1, Section 2.1, third sentence and throughout the work plan. The concept is presented that in the absence of visibly affected receptors, no samples will be taken. EPA has been very clear from the beginning that no area will be identified as "clean" without Data Quality Objective Level 3 or 4 data. Simply showing the absence of visibly affected receptors is not adequate.

14. Page 2-3, Section 2.1 commits to the analysis of RFI data without presenting a work plan as to how this analysis will be performed. Also, the statement is made that strategies to discuss fate and transport are discussed in detail in the individual zone-specific work plans. Regardless of the truth of that statement for other zones, the issue at hand is the fate and transport in Zone J which has not been addressed.

15. Pages 5-1 - 5-2, Sections 5.0, 5.2, and 5.4. In substance, the statement is made that

> --- the Comprehensive RFI Work Plan will be followed except when decision is made to deviate and if Naval Base Charleston considers the deviation to be significant agency approval will be obtained.

EPA has said from the beginning that all procedures must be written down and agreed upon by EPA before they are used. Any deviations from an approved work plan, or any data collected with an unapproved work plan, will be at the risk of Naval Base Charleston.

South Carolina Department of

Natural Resources

Marine Resources

31 July 1995

Carolyn Thompson
RCRA Compliance Section
U.S. Environmental Protection Agency
345 Courtland Street
Atlanta, GA 30365

Dear Ms. Thompson:

Here is the data on Shipyard Creek that you requested. The Tidal Creek Project (TCP) divided the creek into three three hundred meter sections. A sediment sample was randomly collected in the first (upper) and the third (lower) sections and analyzed for metals, pesticides, and microtox EC50s. The principle input of contaminants occurs at the lower end of the creek due to dischcharges from the Macalloy Plant. The microtox EC50s are 0.3956 for the upper sample, 6.3288 for the lower sample, and 0.3147 for the sample taken where Macalloy discharges. Microtox values below 1.0 are considered to represent high toxicity.

Eighteen macrobenthic cores were randomly collected the entire length of the creek yielding a total of fourteen taxa including eleven in the first, eight in the second, and six in the third section. The kinds and relative abundances of the macrobenthos are similar to other creeks. However, longitudinal species richness patterns are the reverse of what is typically observed in most creeks where the lower sections typically have more species. The total numbers per square meter are 2266, 2740, and 5080, respectively. There is no reduction in biodiversity overall but the species which are found are the more pollution tolerant species such as *Capitella capitata*, *Streblospio benedicti*, and *Heteromastus filiformis*.

EMAP sampled Shipyard in 1994 as well. Their site is close to the lower TCP site however it is probably a bit farther out of the creek and in a shipping channel. The microtox EC50 they obtain is 0.298 and 0.143 after corrected for water. EMAP ran several toxicity tests with sediment from this site including the ten day sediment amphipod bioassays with *Ampelisca verrilli* and *Ampelisca abdita*. The amphipod bioassay showed significant toxicity with *A. verrilli* and no significant toxicity with *A. abdita*. EMAP is also developing other biological indicators such as bivalve growth tests which have indicated significant toxicity for sediments from Shipyard Creek.

Sincerely,

A. F. Holland

Shipyard Creek

	TCP-UPPER SECTION	TCP-LOWER SECTION	EMAP SITE
METALS (ppm)			
Aluminum	13750	10700	32461
Chromium	397	419	1911
Copper	64.6	21.9	26.8
Lead	107	54.6	23.4
Manganese	99.5	85.7	192
Cadmium	0.523	0	0.298
Iron	12990	9703	21450
Arsnic	12	17	10.4
Zinc	338	197	87.2
Argon			0.09
Nickel			18.1
Mercury			0.086
Tin			1.46
PESTICIDES (ppb)			
Beta BHC	0	14.9	
Endosulfan I/Alpha chlordane	<10	0	
DDD	0	0	
Lindane (gamma BHC)	<10	<10	
Heptachlor	0	0	
Malathion	0	0	
Heptacnlor epoxide	0	0	
DDE	<10	<10	
Dieldrin	0	0	0.12
DDT	0	0	0.04
Delta BHC	0	0	
Endrin	0	0	0
Gamma chlordane	<10	0	
Alpha BHC	0	0	
Aldrin	0	0	
TOTAL PCBs (ppb)			21
PAHs (ppb)			
Napthalene			174.8
Acenapthylene			52.9
Acenapthene			36.2
Fluorene			39.9
Phenanthrene			268.2
Anthracene			109.7
Fluoranthrene			546.2
Pyrene			696.4
Benzo(a)anthracene			224
Chrysene			263.2
Benzo(a)pyrene			220.1
Dibenzo(a,h)anthracene			27.9
2-Metylnapthalene			37.2
Total PAHs			8195.7

South Carolina Department of
Natural Resources

James A. Timmerman, Jr., Ph.D.
Director

June 20, 1996

Mr. Doyle Brittain
U.S. Environmental Protection Agency
Building NH-50
Commander, Naval Base Charleston
North Charleston, S.C. 29408-5100

RE: Draft Final Zone J RFI Work Plan;
Naval Base Charleston (Nov. 22, 1995)

Dear Doyle:

Personnel of the Marine Resources Division, S.C. Department of Natural Resources (SCDNR) have reviewed the above referenced RFI Work Plan and offer the following comments. These comments are based on this review as well as several discussions in meetings and by telephone with various representatives of the U.S. Navy, Southern Division, and the CLEAN contractor, EnSafe. Comments relating to specific portions of the plan will follow several general items.

On a minor point, clarification is probably warranted regarding the change in the name of this agency which has occurred during the closure process at Naval Base Charleston (NAVBASE). As a part of the restructuring of state government in South Carolina, effective July 1, 1994, the S.C. Wildlife and Marine Resources Department (SCWMRD) was renamed the S.C. Department of Natural Resources (SCDNR).

As is the case with all site assessments at both RCRA and CERCLA facilities, our sister agency, the S.C. Department of Health and Environmental Control (SCDHEC) has the responsibility for providing input on human health risk assessment. We will support their position on issues related to this aspect of remediation at NAVBASE. This is also applicable to the Health and Safety Plan portion (Section 7) of the Work Plan. Our review is concentrated on ecological risk assessment and potential impacts on resources for which the SCDNR has responsibility as a Natural Resource Trustee agency. However, some of our recommendations regarding an assessment of contaminant levels in commercially and recreationally harvested species should also be useful is developing a model for human health risk.

Regarding coordination with the various agencies and the inclusion of data from past and ongoing research efforts, there has been a concerted effort in recent months on the part of Naval Base

Charleston personnel and contractors to ensure that this issue is adequately addressed. It is our opinion that it has been, provided the Final Zone J RFI Work Plan reflects these efforts. Data from relevant EMAP stations and the SCDNR Tidal Creek Project (TCP) have been requested and received for inclusion. Data from the Long and Scott study (NMFS) continue to be unavailable except in limited draft from and this information has been provided for inclusion in the Final Zone J RFI Work Plan.

There is one additional index which is not addressed in the Draft Final Zone J RFI Work Plan which we feel may be warranted to both enable comparisons with data collected through other efforts and to provide additional insight into potential impacts from levels of metals detected in sediment samples. The acid volatile sulfide/simultaneously extractible metals (AVS/SEM) ratio is often used as a measure of bioavailability of metals in estuarine environments. While there are several factors which can affect this index, it can be utilized to provide valuable information to assist in evaluating the potential impacts on biota from elevated levels of metals in sediments. Ideally, these measurement should be made on undisturbed sediments that have not been exposed to air. However, the measurements could be made on sediment composite samples to look at relative AVS/SEM ratios among sites. We recognize that these ratios will not necessarily equate to actual AVS/SEM ratios in undisturbed sediments, but this index has proven useful in other studies. We must clarify, however, that the use of AVS/SEM ratio should not be a rationale for determining what is "clean" and what is not. The fact that sequestering of metals by AVS is not permanent and that changes in various parameters can modify this effect as well as the fact that not all metals are subject to sequestering render this an insufficient justification for identifying locations as "clean". Any subsequent natural or anthropogenic disturbance of these sediments would have the potential to totally alter the bioavailability of these metals.

Regarding the ecological and human health risk assessment process, there is concern on the part of the SCDNR regarding the appropriate species for use in evaluating potential impacts. Obviously, species which are both common to the area and which are harvested commercially and/or recreationally would be the best candidates. Therefore, we would like to suggest three species which we feel would be of particular interest to have included in the risk assessment process. White shrimp (Penaeus setiferus) are heavily harvested by recreational shrimpers in the Cooper River as well as other areas along the coast during late summer and fall. These animals, once they move into an estuarine area are believed to remain there for extended periods prior to moving offshore as adults. Harvesting by individuals of this species is typically intense and extremely localized. Another species which is harvested recreationally as well as commercially in this area is the blue crab (Callinectes sapidus). This crustacean is quite common and has been demonstrated to bioaccumulate contaminants. A finfish which is both heavily recreationally harvested as well as being a major component of estuarine finfish communities is the red drum, or spottail bass (Sciaenops ocellatus). This species also has been well documented as having a much more localized home range, especially in the early life stage, than others which are similarly harvested.

We agree that there does seem to be some confusion regarding exactly how data generated based

on RFI Work Plans from other zones and that to be generated from Zone J will actually be integrated into a meaningful dataset from which appropriate conclusions can be drawn regarding either potential impacts or further data needs. However, it is our understanding from our discussions with personnel of NAVBASE and EnSafe that such integration of data is the intent and the confusion is simply an artifact of the necessary division of the site into manageable units (i.e., zones), schedules imposed for sampling in these zones, and occasional perturbations in funding.

Specific comments:

Page 4-44, first paragraph - In the description of the waters of the Cooper River, the actual SCDHEC classification of Class SB should be included with the verbage on what it means.

Page 4-44, third paragraph - We agree that the "primary ecological risk from NAVBASE to the Cooper River is the discharge of stormwater and past discharges of industrial wastewater." However, discharge of groundwater is also a contributing factor and must be included in this discussion.

Page 4-45, third paragraph - Figure 1-2 showing these outfalls should be referenced here.

Page 4-46, first paragraph - Levels of the detected contaminants from the analysis of pre-dredging sediment samples in 1991 should be included in some manner. A map of sampling locations and a table of results for those contaminants which were detected would be helpful. Also, in order to determine the meaningfulness of this data, detection limits for all parameters are needed.

Page 4-46, third paragraph - The statement that ". . . mapping of sediment grain size and organotin content may be inconclusive" is unclear. Inconclusive as to what? We agree that, not only dredging, but also redistribution of sediments due to natural processes has certainly resulted in constituents not always being in the location where they were originally deposited. However, this should not be used as an excuse for not ascertaining to what extent this is, indeed, the case and the levels of contamination may be present. While the information summarized on page 4-49 is probably sufficient for use to assist in refining appropriate locations for sampling, grain size as well as total organic carbon (TOC) from samples to be taken as a part of this effort is necessary to enable proper interpretation of the data and the potential for ecological effects.

Page 4-50, third paragraph - At least a brief summary of the tissue information from this study, especially for oysters, should be included.

Page 4-50, fourth paragraph - There is a problem with the wording of the last sentence in this paragraph which needs to be corrected.

Page 4-51, first paragraph - Relevant data received from SCDNR from the Tidal Creek Project Report and EMAP personnel should be inserted to replace the verbage regarding these studies.

Page 4-51, Sampling Plan - It is the opinion of the SCDNR that the number and distribution of stations in the Cooper River should be adequate for further characterization of the nature and extent of contamination in this system from NAVBASE activities.

Page 4-52, Section 4.2.7 ESA VII - Shipyard Creek and Associated Wetlands - The data from the analysis of USACOE sampling in Shipyard Creek should be available and should be included.

Page 4-54, Previous Investigations - Levels for the contaminants identified in the USACOE study should be included. Relevant information from the SCDNR tidal creek study and EMAP stations should be included as well to the extent that it is available.

Page 4056, Sampling Plan - The sampling plan for Shipyard Creek is acceptable to the SCDNR.

Page 4-60, Sampling Plan and Response to Comment 25 - We are in agreement with the comment regarding the need for more extensive sampling on Clouter Island. It may be appropriate to simply include the verbage in the response to this comment in this section to address this issue.

We appreciate the opportunity to provide input into this process. We hope that these comments are of assistance in developing the Final Zone J RFI Work Plan. We would like to be apprised of the intended schedule for the completion of this document and the implementation of the sampling. Please do not hesitate to contact me (803-762-5068) if you have questions or if you wish to discuss any items further. In order to facilitate the use of these comments in the revision, I have taken the liberty of copying Todd Haverkost and Tony Hunt with them.

Sincerely,

Jane D Settle

Jane D. Settle
Project Manager
Environmental Evaluations Program

cc: Ed Duncan, SCDNR
Dr. Bob Van Dolah, SCDNR
Beth Partlow, SC Governor's Office
Diane Duncan, USFWS
Denise Klimas, NOAA
Todd Haverkost, EnSafe
Tony Hunt, US Navy, Southern Division