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LETTER OF TRANSMITTAL FOR ENGINEERING EVALUATION AND INTERIM REMOVAL
REMEDIAL WORK PLAN/INTERIM MEASURE WORK PLAN REVISION 1 FOR SITE 45 AND
U S NAVY RESPONSES TO REGULATOR COMMENTS ON DRAFT WORK PLAN MCRD
PARRIS ISLAND SC
12/23/1997
BECHTEL

Bechtel

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DEC 23 1997

Commanding Officer
Department of the Navy
Naval Facilities Engineering Command
Attention: Mr. Art Sanford
2155 Eagle Drive, P.O. Box 190010
North Charleston, SC 29419-9010

SUBJECT: Bechtel Job No. 22567
Department of the Navy Contract No. N62467-93-D-0936
DO 0048 SUBMITTAL OF REVISION 1 OF THE ENGINEERING EVALUATION AND INTERIM REMOVAL
REMEDIAL WORK PLAN/INTERIM MEASURE WORK PLAN, SITE 45/SWMU 45,
MARINE CORPS RECRUIT DEPOT (MCRD), PARRIS ISLAND, SOUTH CAROLINA
Site/Subject Codes: 145/5320

Dear Mr. Sanford:

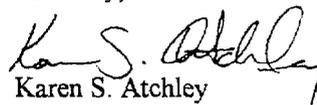
Enclosed is a copy of the above-mentioned revised document for Navy approval and signature. The Safety and Health addendum and Quality Control Plans will be submitted under a separate cover letter. An Environmental Protection Plan (EPP) will not be written for this delivery order (DO) since the EPP written for DO 0011, also at MCRD Parris Island, is still relevant.

A copy of the comments and responses to comments from SCDHEC and EPA have been included. The public comment period ended December 12, 1997 and resulted in no verbal or written comments.

Please note that the construction drawings are not being submitted at this time. These will also be distributed under a separate cover letter for inclusion in this document.

Please call me at (423) 220-2167 if you have any questions.

Sincerely,


Karen S. Atchley
Project Manager

KSA:dcm:LR1476
Enclosure: As stated

cc: Kenneth Lapierre, EPA
Don Hargrove, SCDHEC
Susan Peterson, SCDHEC

Tim Harrington, MCRD
Dean Bradley, MCRD
Mark Speranza, Brown & Root



Bechtel Environmental, Inc.

Responses to Allison Humphris of EPA Comments dated October 20, 1997. These comments were on Revision 0 of the EE/WP.

Comment 1.

Initiation of the RI/RFI for Site 45 should not be postponed until completion of this removal action. The removal action was initiated to address the imminent threat presented by high solvent concentrations in the groundwater. To delay implementation of the full investigation and final remedy selection would be inconsistent with this goal. Previous record searches and field studies have yielded sufficient information to identify significant remaining data gaps and design an adequate study plan to address those gaps. The plan could also be designed to consider and utilize information obtained during implementation of this removal action. In short, the RI/RFI should be conducted concurrently with the removal action such that information sufficient to select a final remedy for the site is available upon completion of this removal action.

Response: Comment noted. All information gathered in the interim removal will be provided to the CLEAN contractor for use in the RI/RFI.

Comment 2. Page 1, Section 1.0, Paragraph 3:

According to Figure 1.5, vinyl chloride was also detected above MCLs in one well (170 ppb in 6MW-S). Thus, vinyl chloride should be added to the list of groundwater contaminants in this paragraph and throughout the document.

Response: Text changed to add Vinyl Chloride.

Comment 3. Page 2, Figure 1.1:

A scale should be provided in this, and all subsequent, figures where appropriate.

Response: Comment noted, a scale has been added to figures where appropriate.

Comment 4. Pages 3-7, Section 1.1.2 and Figures 1.3 and 1.4:

The nature and scope of the proposed removal action is the direct result of site-specific hydrogeologic conditions. As such, this document must include a more thorough, accurate description of these site conditions. The depth, thickness and continuity of low-permeability layers (particularly the 14 foot clay layer) which control the distribution of groundwater contamination must be adequately and consistently described.

The following inconsistencies should be also addressed. According to Section 1.1.2, occasional 6-inch thick silty clay layers were encountered in these sands, yet Figure 1.3 shows silty clay areas up to 3 feet thick and peat layers up to 10 feet thick. Also, the lithology of MW-6 is depicted quite differently in Figures 1.3 and 1.4.

Response: Figures 3 and 4 have been revised based on a review of the boring logs from the well installations. The text in section 1.1.2 has been revised to reflect how the hydrogeologic data was obtained. Data from the site investigations is included in the work plan.

Comment 5. Page 8, Section 1.3.2:

The decision to limit this removal action to the top 14' of the aquifer must be better supported with site-specific data. What is the distribution of groundwater contamination relative to all observed low permeability layers? To known or suspected source areas? The technical memorandum entitled: *Groundwater Results, 18 June to 30 June 1996* provides a good summary of these conditions. Recommend that this memo be included as an attachment to the EECA, and that Section 1.3.2 be revised and expanded to ensure consistency with the contents of this technical memorandum.

Response: The tech memo is included in the workplan and the text and figures have been reviewed and revised as necessary.

Comment 6. Page 10, Figure 1.6:

According to the legend notes, "Values posted are maximum total VOCs from monitoring well cluster". This was not the case for well cluster MW-8. Please recheck all values and revise the figure for accuracy.

Response: All values have been checked and revised as necessary.

The ground-water concentrations and vertical distribution of PCE and related suggest that an area of pure PCE (DNAPL) may exist in the area between well clusters MW-8 and MW-7 (..following the general rule of thumb that DNAPLs may be present where groundwater contaminant concentrations exceed 1% of the aqueous solubility of the contaminant. The aqueous solubility of PCE is 150 mg/l.). The potential for existence of a DNAPL source area, though not detected, should be considered as investigation and remediation of this site proceeds.

Response: Following the general rule of thumb stated above, we also expected to find pure DNAPL. However, pure PCE was not encountered during either site investigation.

Comment 7. Page 11, Section 1.4.3:

The objectives of the proposed removal action should be modified as follows:

A. "Minimize further migration of groundwater containing VOCs...": As stated in Section 1.6.3 of this document, pump and treat "will provide hydraulic control of the site and prevent further migration of the solvent plume." This function should be listed as an objective of the proposed removal action.

B. "Reduce concentrations...": This objective should specify which concentrations are targeted for reduction. For example, is the goal to reduce groundwater contaminant concentrations in all areas of the plume which exceed MCLs? This does not appear to be the case, since groundwater contamination in excess of MCLs extends beyond the vertical extent of the proposed 3-well extraction system.

C. Specify the relation of this action to the final remedial action for the site. As specified in Section 300.415(f) of the NCP, if the removal action does not adequately address the threat posed, this action must be consistent with, and allow for an orderly transition to, any subsequent remedial response activities.

Response: Comments noted. Text is modified.

Comment 8. Page 12, Table 1-1 and Page 25, Section 4.2.3:

According to this table, Natural Attenuation (NA) is a "readily implementable" technology, which "could be used for final remedial action." This statement is unsupported. A decision to implement NA as a final remedial action at this site must be supported by adequate data collection and analysis. Tables 1A and 1B of the guidance document "Draft Region 4 Approach to Natural Attenuation of Chlorinated Solvents" (5/13/97) (copy attached) provide a complete listing of the chemical and geochemical parameters which

may be needed to develop an adequate conceptual site model to support this remedial alternative. Section 4.2.3 appears to provide a rough list of parameters to be sampled in support of natural attenuation. If the intent is to begin collecting parameters in support of NA during this removal action, this goal should be more clearly stated in the text, and the number, location and frequency of samples to be collected, and analytical methods and parameters should be clearly defined.

Response: Comment noted. Additional groundwater analysis will be performed as suggested by the guidance document. The additional analysis are included in the work plan. These samples will be collected from all the monitoring wells on a quarterly basis.

Comment 9. Page 25, Section 4.2.3:

The text proposes collecting quarterly ground-water samples from the existing monitoring wells. A subset of these wells should be monitored on a more frequent basis during the removal action. The deep and shallow wells within the “source area” and along the principal ground-water flow direction away from the source area (including paired wells MW-7, MW-8, MW-6, and MW-5) need to be monitored on at least a monthly basis, to obtain sufficient data during the removal action to help define the scope of the final remedial action for this contamination. Quarterly sampling of wells in the key areas of contamination may not be adequate to define the appropriate scope of the final remedial action, particularly since contaminant concentrations will likely be changing rather dramatically over some, or all, of this area of contamination. This sampling could focus on the specific chlorinated solvents of concern, to establish how the concentrations of those contaminants change over time.

Response: Comment noted. Monthly samples will be collected from the recovery wells. The remaining wells will be sampled quarterly. Since the spill occurred in 1994, quarterly sampling will provide the necessary information about changing conditions.

Comment 10. Attachment 2:

A. The modeling presented is basically a screening tool, with limited documentation of modeling input and only partial utilization of standard modeling procedures. For example, the model was not calibrated under ambient conditions before running the two pumping scenarios, and the recharge within the model domain is not well defined. This short-cut modeling approach is acceptable for the analysis of the proposed interim action presented herein, but would not be acceptable for modeling a final remedial action.

Response: Agree, the model was used for a screening tool to determine the possible effect of the recovery wells could have on the surficial aquifer. The RI/RFI and FS/CMS will focus on the remaining data and modeling requirements. Also the proposed treatment system is designed to accommodate changes in pumping rates that might be required because of actual pumping rates.

B. The source(s) of values presented under the heading “**Aquifer Properties**” should be completely documented.

Response: The text was revised to provide sources for all information

Response to Susan Peterson of SCDHEC Comments dated October 20, 1997.

Comment 1. Section 1.4.3, Interim Removal action objectives, page 11

Explain the omission of “minimize further migration of groundwater containing VOCs around the dry cleaning facility” (as seen in the June 1997 IM WP) as an Interim Removal Action Objective

Response: The proposed pump and treat system will provide containment of the contaminated groundwater. This objective will be added to the list.

Comment 2. Section 1.7.1, Pump and Treat, page 17

Revise the document to include figures that depict the treatment system (to include Attachment 5.)

Response: Design drawings will be included with the revised work plan.

Comment 3. Section 3.3.4, Personal Protective Equipment, page 23

Note whether the PPE will be disposed in a South Carolina licensed landfill

Response: They will be disposed of in a South Carolina Licensed landfill. Text Revised.

Response to Donald C. Hargrove of SCDHEC Comments dated October 13, 1997

Comment 1. Figures 1.3 and 1.4: These figures do not indicate the confining or semi-confining clay layer described in Sections 1. 1. 2 and 1. 3.2. Please revise. the figures to indicate that an aquitard is present at a depth of approximately 14 feet below ground surface (bgs).

Response: Figures 1.3 and 1.4 have been revised based on the drilling log data collected during well installation.

Comment 2) Section 2.4, Permits: This section does not mention existing air emission permits or the possible need for obtaining an additional permit to cover the estimated air emissions of 200 pounds per month as stated in Section 1.7.2, Off-Gas Discharge section. Does this discharge require an additional permit? Please revise the text to justify whether or not existing permits are adequate.

Response: The DHEC Bureau of Air Quality has been formally contacted and has issued a determination that an air permit will not be required for this site. The request and the determination letter are included in the work plan for reference.

Comment 3) Section 4.2.3, Groundwater Monitoring: It should be noted within this section that some of the monitoring wells at SWMU 45 have been damaged due to vehicular traffic. MCRD should include in this work plan a discussion on which of these wells have been damaged, which wells should be abandoned, and the type of well to replace the abandoned wells.

With respect to the type of wells that will replace the damaged wells, the issue of flush-mount versus above ground stick-ups arises. Flush-mounted wells are only warranted where normal vehicular traffic would be impeded by an above-ground stickup. Parking lots, the Parade Deck, roads or alleys, and certain training areas are locations where flush-mount installations may be appropriate. The use of flush-mounted wells is not recommended elsewhere due to problems associated with cover-seal integrity, the possibility of being covered by other onbase activities, and low visibility which makes them difficult to locate by field personnel and State and Federal regulatory personnel. Additionally, the installation of flush-mount wells in any area that is not paved is not recommended. The possibility of sand and debris compromising the seal also is increased in these areas. Additionally, the possibility of pesticides, herbicides and/or fertilizers entering these wells due to direct application is increased if flush-mounted wells are installed in vegetated areas or areas where these chemicals are transported and/or handled.

Since flush-mounted monitoring wells currently exist at SWMU 45 as well as other areas of the base, this section should be revised to include the protocol for inspecting the concrete pad (cracking and/or a lack of stability), opening the water-tight cover, performing a seal inspection and evaluation, and inspecting and documenting whether the flush-mount casing interior is wet or dry. If the interior has standing water, procedures for removing any standing water should be specified in the work plan and the standing

water should be treated as Investigation Derived Waste (IDW). Additionally, the water-tight seal on the cover must be repaired or replaced if no longer viable.

A field inspection and evaluation form should be drafted and added to Volume 11 of the Master Work Plan as well as this work plan. This form should be included with all field sampling efforts.

Maintenance of the flush-mount seals is vital to the quality and acceptability of the data generated from monitoring wells installed as flush wells.

The integrity of these monitoring wells should be of utmost importance in the design, construction, and maintenance of said wells. If a monitoring well is damaged by vehicular traffic or vandalism, or contaminated due to unlocked caps, breached well seals, or vandalism, steps must immediately be taken to either repair or abandon and replace the monitoring well in question. This action might include re-mobilization of field personnel as well.

Response: The Bechtel Project procedure 6004 contains a form "Navy RAC Groundwater Sampling Record" that is used to document the collection of samples from monitoring wells. This form has been revised to include checking the flush mount well attributes listed above and is included in the work plan. Each time a well is sampled its integrity will be checked for the following:

- *Is the concrete pad cracked or unstable?*
 - *Is the water-tight cover damaged?*
 - *Is water in the interior of the casing?*
 - *Is the bentonite seal cracked or damaged?*
- and repairs will be made as necessary.*

Comment 4) Attachment 4, Drawing 145-DOOO-002: The recovery well profile indicates that all three extraction wells will be installed in vaults with the casings terminating approximately 1 foot below ground surface. This design is not acceptable due to the following reasons:

- a) The proposed screened interval is 4 to 14 feet bgs. Using 2 feet of this interval for the vault allows only 2 feet above the screen for extra filter pack, the bentonite seal, and grout (concrete has been excluded).
- b) The bottoms of the vaults are constructed of gravel. This porous media will allow infiltration of groundwater up into the vault and possibly enter the well during a rise in the water table due to seasonal highs and excessively wet conditions.
- c) The recovery well profile shows the bentonite seal installed directly above the screen with no extra filter pack as a buffer. This oversight could allow for intrusion of bentonite into the screen which could clog the screen and/or the filter pack surrounding the screen.
- d) The wells proposed vary from the standard installation of monitoring wells as set forth in R.61-71 of the South Carolina Well Standards and Regulations, and Section 6 of the USEPA Environmental Investigations Standard Operating Procedures and Quality Assurance Manual (EPA-SOPQAM) (May 1996). There is no written justification for this variation. The exact variations that should be explained and justified include:
 - i) The proposed wells are designed as below grade installations enclosed in vaults.
 - ii) The proposed wells do not allow for any filter pack to be installed above the screen.

- iii) The proposed wells do not allow for the installation of a 2 foot bentonite seal.
- iv) The proposed wells do not allow for at least 2.5 feet of grout above the bentonite seal.
- v) The proposed wells do not allow for the installation of concrete to be installed to a depth of 2 feet in the borehole with a pad at the surface extending 6 inches below ground surface.

These extraction wells should be installed with casings that terminate above ground. This will allow 4 feet between the ground surface and the top of the screen for extra filter pack to act as a buffer, the bentonite seal, and concrete to the surface along with the pad. Even by making this change to an above ground design, the proposed screened intervals of 4-14 feet do not allow a sufficient length of borehole above the filter pack to install the bentonite seal, grout, and concrete pad. A variation of the monitoring well construction must be made to allow for this shallow screened interval. Listed below are the specifications that would be acceptable for construction of these wells with such a shallow screen:

- a) The filter pack should extend one (1) foot above the screen.
- b) The bentonite seal should extend one (1) foot above the filter pack.
- c) The remainder of the borehole (2 feet) should be filled with concrete as an integral part of the concrete pad that extends six (6) inches below ground surface.

The bentonite seal must still be hydrated properly before placement of the concrete. The only exclusion here is the grout. This variation should still protect the filter pack and screen from intrusion of bentonite, concrete, or surface contamination.

This above ground design can be protected by using a well housing and protective guard posts painted with high visibility paint.

Please revise the figure to show extraction wells completed above ground.

Response: The extraction wells will be installed with above ground installations and will meet all the requirements of R.61-71 of the South Carolina Well Standards and Regulations, and Section 6 of the USEPA Environmental Investigations Standard Operating Procedures and Quality Assurance Manual (EPA-SOPQAM) (May 1996).

Comment 5) The actual design of the low profile air stripper should be included in a figure. Please revise.

Response: Construction drawings are included in the revised work plan.

Comment 6) A figure should be added that shows the proposed locations for the extraction wells, the air stripper, all electrical service details, as well as plumbing from the wells to the stripper and from the stripper to the sewer system. Please revise.

Response: Construction drawings are included in the revised work plan.