LETTER OF TRANSMITTAL AND U S EPA REGION IV COMMENTS ON REMEDIAL INVESTIGATION ADDENDUM FOR SITE 45 FORMER MORALE, WELFARE AND RECREATION DRY CLEANING FACILITY MCRD PARRIS ISLAND SC

2/3/2006

U S EPA REGION IV

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
Atlanta Federal Center
61 Forsyth Street, SW
Atlanta, Georgia 30303-8960

February 3rd, 2006

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

4WD-FFB

Brigadier General Richard T. Tryon
Commanding General
Marine Corps Recruit Depot
P.O. Box 5028
Parris Island, SC 29905-9001

SUBJ: EPA Review of Remedial Investigation Addendum For Site 45 Former MWR Dry Cleanining Facility, Marine Corps Recruit Depot, Parris Island, South Carolina

Dear General Tryon:

The U.S. Environmental Protection Agency (EPA) has completed its review of the above referenced document. EPA's comments are attached. Please feel free to contact me with any questions you may have with regard to these comments. I may be reached at 404-562-9969.

Sincerely,

Lila Llamas, Senior RPM
Federal Facilities Branch
Waste Management Division

cc: Tim Harrington, MCRD
Art Sanford, NAVFAC
Jerry Stamps, SCDHEC
Don Hargrove, SCDHEC

EPA's comments are attached.

U. S. ENVIRONMENTAL PROTECTION AGENCY
TECHNICAL REVIEW OF THE
MARINE CORPS RECRUIT DEPOT (MCRD), PARRIS ISLAND
REMEDIAL INVESTIGATION ADDENDUM
SITE/SWMU 45 – FORMER MWR DRY CLEANING FACILITY
REVISION 0, OCTOBER 2005

MCRD PARRIS ISLAND,
SOUTH CAROLINA

GENERAL COMMENTS:

1. In order to avoid repetition, please note that comments for this document also apply to the Executive Summary. If text in the Executive Summary is found to be similar to that upon which we have commented in the body of the document or its Appendices, then any changes proposed in response to comments should be applied to the Executive Summary as well.

2. The Marine Corps Recruit Depot (MCRD), Parris Island Remedial Investigation Addendum for Site/Solid Waste Management Unit (SWMU) 45 Former Morale, Welfare and Recreation (MWR) Dry Cleaning Facility (SWMU 45 RI Addendum) falls short of providing complete horizontal delineation of the extent of dissolved groundwater contamination. However, as reported, it is agreed that any further characterization activity may be accomplished as part of future phases of regulatory activity at this site. Therefore, it will be necessary to reach agreement on what needs to be done to complete the horizontal delineation of the dissolved contaminant groundwater plume in both the SU and SL groundwater zones at Site 45.

   As indicated by the most recent groundwater sampling results, additional characterization to delineate the horizontal extent of the Surficial Upper (SU) and Surficial Lower (SL) groundwater zones is necessary. Data gaps in the monitoring well network were identified in the area north of PAI-45-MW08-SU, west of PAI-45-TW-158-SL and PAI-45-MW19-SL and south of PAI-45-MW20. Additionally, the horizontal extent of trichloroethene (TCE) and total 1, 2-dichloroethene (DCE) contamination in excess of applicable maximum contaminant levels (MCLs) in the SL groundwater downgradient of well PAI-45-MW05-SL near Building 200 is unknown. This particular data point may be helpful in performing site-specific assessment of Vapor Intrusion for Building 200.

3. The SWMU 45 RI Addendum states that dense nonaqueous phase liquids (DNAPLs) field screening tests found no free product within the site areas investigated. Although no DNAPL was confirmed during the addendum investigation, DNAPL has been reported for the area nearest the location of the former perchloroethylene (PCE) above ground storage tanks. According to the EPA guidance (2002, 2004) the presence of free phase

liquids, particularly DNAPL, would preclude the use of the Johnson and Ettinger vapor intrusion models. Therefore, of greater concern is whether or not DNAPL is present at the secondary source area, which is much closer to existing buildings. Information reported to EPA previously regarding the potential secondary source was that it was unknown at this time as to whether there is DNAPL or not at this other location. The presence of DNAPL at the second location may influence decisions made with respect to site-specific evaluation of buildings, dependent upon other site-specific factors.

4. Due to the uncertainties associated with the vapor intrusion model inputs and output, and the concerns and issues presented above and in Specific Comments provided in the following pages, it is agreed that the hypothetical residence over hot spots modeling results may only provide a benchmark for future comparisons of constituents of potential concern (COPCs) concentrations as they are observed over time.

5. All references to, and use of numbers related to, OSHA needs to be deleted from this document. OSHA levels are not ARARs at CERCLA sites. Risk based numbers should be negotiated and used.

6. There needs to be a discussion of site-specific concerns in Section 6. EPA would like more specific information about Buildings 200 and 293 to be included, as well as a description of any other facilities which exist down gradient of the plume. The information may or may not allow them to be eliminated as concerns, or may allow us to reach consensus on the appropriate path forward for assessing Vapor Intrusion. (See Section 6 comments.)

7. Additional characterization information regarding the vertical profile of wells in closest proximity to Building 200, if not also 293, might be helpful. For example, the depth at which ground water (gw) concentrations in wells PAI-45-MW05-SU/SL begin to exceed the VI trigger levels is not known. Obviously it is somewhere below the non-detect depth, but above the detected depth. Also, since groundwater is so shallow, there may be gw table/contaminant flux issues which could impact the potential for VI concerns. If future groundwater monitoring data indicate that concentrations are increasing in well PAI-45-05-SU and/or PAI-45-MW05-SL, soil gas monitoring and/or indoor air quality monitoring and use of a more robust vapor intrusion model may be required to determine the human health risks due to vapor intrusion at Building 200.

8. More detailed concerns related to Buildings 200 and 293 cannot be clarified until the additional information requested above is provided.

SPECIFIC COMMENTS:

9. **<u>Section 1.2.2, Site 45 Background History</u> :** The first sentence in the last paragraph of this section states "Groundwater flow at site 45 is primarily to the south-southeast in the general direction of the marsh, consistent with the 2001 field event." The text should clarify that the surficial, (upper and lower) groundwater flow at Site 45 is primarily to the

south-southeast whereas the deep groundwater flow at Site 45 is generally to the southwest, as depicted in Figure 3-7. Revise the SWMU 45 RI Addendum to address this issue.

10. **Figure 1-2:** If other facilities exist down gradient, please expand this Figure to include those.

11. **Section 3.2.1, Membrane Interface Probe:** The acronym "ECD" reported in the fifth bulleted item on Page 3-2 was not defined in the text. It is also not identified in the Acronym List on Page vi. Revise the Acronym List accordingly.

12. **Section 3.2.9, Data Collection for Vapor Intrusion Model:** As reported in Section 3.2.9, Building 293 has a crawl space and Building 200 is essentially slab-on-grade construction. The second bulleted item in this section states that "Slab-on-grade construction was assumed for vapor intrusion modeling input". However, the last sentence in this section states "Modeling exercises (described in Section 6) took these factors into account to determine what potential vapor intrusion risks may be present in these two facilities". Since only the slab-on-grade construction was modeled, the last sentence in this section should state that only one facility, Building 200 was modeled for vapor intrusion risks, or that the modeling would only apply to slab-on-grade construction. Revise the SWMU 45 RI Addendum to address this issue.

    The fourth bulleted item in Section 3.2.9, states that copies of drawings for Buildings 200 and 293 were obtained to assist with modeling assumptions. Revise the SWMU 45 RI Addendum to provide more detail in the text regarding what site specific building data was utilized for the vapor intrusion modeling. Explain which parameters were known, versus which were estimated or defaulted to, and explain if these are conservative estimates/defaults or not.

    The last sentence states these factors were taken into account when modeling the potential for vapor intrusion in these two facilities. However, EPA understands that only a residential scenario was modeled. The J&E model is built on the premise that different construction characteristics and site factors result in different potential risks for intrusion, therefore, EPA would need more information to accept that the modeling determined what potential vapor intrusion risks exists at the two facilities.

    Also see Section 6 comments.

13. **Section 3.4:** On page 2-3, the text states "Water-table fluctuations are a function of recharge, evaporation, and transpiration and have been observed to be as great as 6.5 feet at some locations (Glowacz, et al., 1980). Please ad to this section a more detailed discussion regarding flux, as specifically as you can, to those areas near buildings. Describe its potential impact on vapor intrusion, include proximity of contaminants to the surface, capillary fringe, etc.

14. **Table 3-2:** It would be useful to add to this chart the information for all wells referenced/utilized in this Addendum, for ease of reference.

15. **Table 3-4:** Please verify that the Federal MCL for total 1,2-DCE is -9999 as reported in the table. Provide the applicable MCL if available or indicate otherwise and correct the table as necessary.

16. **Table 3-5:** The value -9999 reported as the Federal MCL for many of the volatile organics listed in the table is incorrect. Revise the SWMU 45 RI Addendum to provide the applicable MCL if available or indicate otherwise and correct the table as necessary.

17. **Section 4.2.1, 2005 PCE Groundwater Plumes – Surficial Upper and Surficial Lower:** The second paragraph in Section 4.2.1, reports a data gap to the north of the center of the PCE plume near SU monitoring well PAI-45-MW08. The text should be revised to also report in this section that the SU groundwater PCE plume is also loosely constrained to the south of PAI-45-MW20-SU as depicted in Figure 4-3. To a lesser extent, the SL groundwater PCE plume west of PAI-TW-158 is also loosely constrained, as depicted in Figure 4-4. Revise the SWMU 45 RI Addendum to address this discrepancy.

    The last sentence in the second paragraph states "It is anticipated that the plume could easily be bounded to the north (if necessary) during future phases of regulatory activity at this site." The text should be modified to include the potential data gaps in the SU and SL groundwater PCE plumes as identified above. Revise the SWMU 45 RI Addendum to address this discrepancy.

18. **Section 4.2.3, 2005 cis-1,2-DCE Groundwater Plumes– Surficial Upper and Surficial Lower** As well as the reported data gap to the north of PAI-45-MW08-SU, the text in the second paragraph in this section should also report that the SU groundwater cis-1,2-DCE plume south of PAI-45-MW20-SU is also loosely constrained as depicted in Figure 4-7. Revise the SWMU 45 RI Addendum to address this issue.

19. **Section 4.2.4, 2005 Total 1,2-DCE Groundwater Plumes– Surficial Upper and Surficial Lower:** As outlined in Section 4.2.4, possible data gaps exist in the SU groundwater zone to the north of PAI-45-MW08-SU. It should also be noted in the text of the second paragraph in this section that SU groundwater total 1,2-DCE plume south of PAI-45-MW20-SU is also loosely constrained as depicted in Figure 4-9. Additionally, as indicated in Figure 4-10, potential data gaps also exist to the east, west and south of the SL groundwater DCE plume, which was not reported in this section. The SWMU 45 RI Addendum should be revised as appropriate to address this issue.

20. **Figures 4-3 thru 4-12:** Could these be mapped using the MCL as the lowest end point instead of zero, with a different color being below the MCL down to zero?

21. **Figure 4-13:** Additional cross-sections could be useful during future stages of the

CERCLA process.

22. **Section 6.0 Vapor Intrusion Human Health Risk Assessment**

In response to this comment, EPA would recommend a Team level discussion and resolution, rather than repeated RTC/Comment processes. EPA would also like to discuss timing of resolution of this matter with respect to the CERCLA process.

There needs to be a discussion of site-specific concerns in Section 6. EPA would like more specific information about Buildings 200 and 293 to be included, as well as a description of any other facilities which exist down gradient of the plume. The information may or may not allow them to be eliminated as concerns, or may allow us to reach consensus on the appropriate path forward for assessing Vapor Intrusion. Vertical contamination distribution and flux/capillary zone information nearest to facilities would be useful (see Section 3.4 comments). Plume migration calculations regarding arrival at facilities needs to be based on VI Guidance trigger levels in addition to "residential RBCs", or site/building-specific RBCs. Please identify if parameters set are known or estimated / defaulted, and if estimated / defaulted, describe conservatism or not.

Several alternative approaches exist for considering future potential for exposure.

23. **Section 6.1, Potential Risks Associated with the Migration of Chemicals from Groundwater Through Building Foundations Into Indoor Air:**

Remove all references to OSHA being applicable. Recalculate numbers, time frames, etc. where OSHA limits were used. It should be noted that OSHA standards are not Applicable or Relevant and Appropriate Requirements (ARARs) under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and should not be used to determine whether the exposure pathway presents a risk to human health. (See omitted footnote in VI Guidance.)

Clarify in the first sentence of the second paragraph on Page 6-2 that the specific Johnson and Ettinger (J&E) model used was the Groundwater Screening Level Model.

Building 200 is reported as the Temporary Housing and is similar to a non-residential hotel as shown in Appendix L, Photographs No. 5 through 9. Although there may be workers at Building 200, there may also be persons present that are non workers. However, an evaluation of the potential exposures to the non-workers under the non-residential setting/scenario was not presented. The EPA draft guidance (US EPA, 2002) recommends that for the non-residential situation appropriate adjustments to the non-residential exposure durations should be considered. Also, the EPA guidance recommends that building specific air volumes and air exchange rates should be utilized, and any other relevant factors should be considered. Additional text is needed in this section to discuss why an evaluation of the non-worker, non-residential setting was not

performed.

Although not reported in this section, additional discussion is needed in the text regarding the types of persons who work and are temporarily housed at Building 200. In particular, indicate if the elderly, pregnant or nursing women, infants or children are temporarily housed at Building 200. Additionally, the typical duration (number of days) of habitation should also be reported. Any preferential vapor pathways such as utility features should also be discussed in this section.

Revise the SWMU 45 RI Addendum to address these issues.

NOTE: SOME OF THE REMAINING COMMENTS FOR SECTION 6 ARE SOMEWHAT OUT OF CONTEXT, GIVEN THIS IS NOT AN APPROACH EPA WOULD SUPPORT FOR SITE SPECIFIC RISK ASSESSMENT. (See comments above.)

24. **Section 6.1.1, Potential Risks to Hypothetical Residents:** The second sentence on Page 6-3 incorrectly references Appendix M as the location for the printouts for the J&E vapor intrusion model. The correct reference is Appendix O. Revise the SWMU 45 RI Addendum to correct this discrepancy.

25. **Section 6.1.2, Potential Exposures to Occupation Workers:**

Modify Table 6-2 to appropriately assess worker and non-worker scenarios at Buildings 200 and 293, based on risk based limits, duration of exposure, etc., eliminating OSHA limits, etc. Then update the text in this section. See comments on Section 6. Please add an Appendix to capture your calculations, factors considered, etc., as necessary.

The second paragraph in Section 6.1.2 states "The only potential indoor exposures to current occupational workers are at Building 200..." The case has not yet been made for this. Please make the case or withdraw the statement. This paragraph also states, "no COPCs were detected in the monitoring wells located upgradient of Building 200." Although this statement is true with respect to the COPC concentrations in the SU groundwater zone, it is not true for the SL groundwater zone. As shown in Figure 4-2, concentrations of TCE and total 1,2-DCE, (12 ug/l and 91 ug/l, respectively), measured in upgradient well PAI-45-MW05-SL are in excess of applicable MCLs. Therefore, the second sentence should be reworded accordingly. Revise the SWMU 45 RI Addendum to address this issue.

26. **Section 6.2, Conclusions:**

The second bulleted item in this section states "...tends to over estimate indoor air concentrations. Commercial Buildings generally tend to have proportionately larger ventilation systems on a per square foot basis compared to a private residence, and any such increased ventilation rate (if proven to exist) would reduce (dilute) intruding vapor concentrations to a greater degree than in a private residence." However, commercial

buildings could have other factors which make them more vulnerable (greater negative pressure systems, open sumps in basements, larger utility preferential pathways, etc.). Either be more inclusive in your analysis or withdraw this statement. Also, as discussed in Specific Comment No. 22, above, Building 200 Temporary Housing is similar in appearance to a hotel as shown in the photographs located in Appendix L. Additionally, Photographs No. 6 and 7, Appendix L, show a single heating-cooling air unit located below the front window of each room, similar to some hotels. It is currently unclear if this is actually the heating and cooling unit, and if it is the only source of ventilation for the room. If so, this may affect the air exchange rates and building mixing height model parameters. As stated in the EPA 2002 guidance, building related parameters with moderate to high uncertainty and model sensitivity include building air-exchange rate and building mixing height. The SWMU 45 RI Addendum should be revised as appropriate to address this issue.

The first bulleted item on Page 6-4 states that "the plume has not reached Building 200 (Temporary Housing) or 293 (Attorney Offices) in detectable concentrations for the COPCs." The Figures 3 thru 12 in Section 4 appear to contradict this statement. Please resolve the potential discrepancy between detected levels and modeled levels. As discussed in Specific Comment No. 11, above, this statement is true for contaminant concentrations detected in the SU groundwater zone. However, detections of TCE and DCE in SL groundwater monitoring well PAI-45-MW05-SL were in excess of applicable MCLs. The text in this section of the SWMU 45 RI Addendum should be revised to address this issue.

Next to last bullet. Please make a statement about the current levels under building 293. Also make a statement regarding the likelihood of lower levels, yet above the VI Guidance trigger levels, reaching the building. More may need to be said about building 293 after additional information is provided as requested here and above.

The last bulleted item on Page 6-4 reports that screening levels and semi-site specific attenuation factors provided by the EPA guidance (2002) were not used to evaluate the vapor intrusion pathway at Site 45. Revise the SWMU 45 RI Addendum to discuss how the screening levels and site specific attenuation factors that were utilized in the model were determined.

27. **Table 6-1:** Explain the proposed use of calculated RBCs. Explain what site-specific factors went into calculating these RBCs.

28. Table 6-2: Please delete this table.

29. **Section 7.0, Conclusions and Recommendations**

For the fifth bulleted item in this section, Specific Comment No. 26 above also applies.

Sixth bullet. The plume may have reached Building 200. See above. Modeled air was

compared to OSHA numbers inappropriately. See above. The fourth sentence in the sixth bulleted item in Section 7.0 states "Uncertainties in modeling output with regard to predicted concentrations (biased high or low) could be checked by collecting air samples for these COPCs; however based on estimated surficial groundwater velocities calculated in Section 3.4.2 and very conservative assumptions, the need for this would not appear to be evident for at least 4 to 5 years." Upon what concentration was this based. Reassess timeframes once risk-based numbers have been used for comparison. Also as commented previously, this may hold true for the SU groundwater zone, but TCE and total 1,2-DCE were detected in PAI-45-MW05-SL at 12 ug/l and 91 ug/l, respectively and are in excess of applicable MCLs. This well is located approximately 30 feet upgradient of Building 200. Flux issues and shallow groundwater come into play. Additionally, as reported in Table 6-1, the site-specific risk based concentration (RBC) as determined by the vapor intrusion modeling for TCE is 12 ug/l (based on a cancer risk of 1E -6 or HI of 1). There currently is no well downgradient of PAI-45-MW05-SL whose data could be used to constrain the plume. Therefore, it is currently uncertain if concentrations of TCE and total 1,2-DCE in the SL groundwater zone in excess of MCLs terminate before reaching Building 200. The SWMU 45 RI Addendum should be revised as appropriate to address this issue.

Seventh bullet – See comment number 26 regarding same language.

Eighth bullet – Make a statement as to whether this is conclusive of there being no DNAPL present or not.

Ninth bullet – More delineation may be needed during the FS stage. More characterization and analysis may be needed for VI, but could be done during the FS stage and/or later.