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MCRD PARRIS ISLAND  
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EMAIL OF TRANSMITTAL AND U S NAVY RESPONSES TO REGULATOR COMMENTS ON  
WORK PLAN ADDENDUM FOR SITE 27 EQUIPMENT PARADE DECK AREA MCRD PARRIS  
ISLAND SC  
7/28/2008  
TETRA TECH NUS

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**Subject:** Re: MCRD Parris Island Site 27 Work Plan Addendum - RTC  
**Date:** Monday, July 28, 2008 4:38:39 PM  
**Attachments:** [RTC - State Meredith MS.doc](#)  
[RTC - EPA comments MS.doc](#)  
[RTC - State Barker MS.doc](#)

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Thanks Mark !

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Subject  
MCRD Parris Island Site 27 Work Plan Addendum - RTC

We originally provided a couple figures and tables to highlight the second phase of the Site 27 work. Based at least partially on the unexpected DDT groundwater concentrations, the Team determined that a more substantial planning document would be necessary, and provided written comments to that effect. In response we provided the Site 27 Work Plan Addendum which was distributed last week. EPA and SCDHEC have asked for RTC to these earlier written comments to help support their review of the Addendum. Please see the attached RTC. thanks.

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(See attached file: RTC - State Meredith MS.doc)(See attached file: RTC - EPA comments MS.doc)(See attached file: RTC - State Barker MS.doc)

ENGINEERING COMMENTS  
Prepared by Meredith Amick  
Marine Corps Recruit Depot (MCRD)  
April 18, 2008

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**Specific Comments**

1. Proposed soil locations should be labeled on the map. Additionally the location of all SWMUs within the area should be included on all maps.

**Response: The proposed soil sample locations will be placed on a figure. A separate figure in the Addendum at a larger scale has been provided for the proposed soil samples.**

2. Please discuss the depth of the proposed soil samples and the relation to the depth of the groundwater contamination.

**Response: Two soil samples (surface and subsurface) will be collected from each proposed soil sample location. As per the Phase I sampling, surface soil samples will be collected from the 0- to 1-foot bgs interval beneath the surface cover (root zone or asphalt subbase). Subsurface soil samples will be collected from the interval showing signs of contamination (stains or oil, obvious odor, and/or elevated PID readings). If the subsurface soil does not exhibit signs of contamination, the subsurface soil sample will be collected from the interval just above the water table.**

3. Please discuss the constituents for which the groundwater and soil samples will be analyzed.

**Response: The constituents that the groundwater and soil samples will be analyzed for were identified in Sections 3.2.1 and 3.2.2 and on Table 8-2. Groundwater samples will be analyzed for VOCs, pesticides, TDS, TOC, and alkalinity (laboratory) and DO, temperature, salinity, specific conductivity, turbidity, pH, and ORP (field). Soil samples will be analyzed for VOCs, pesticides, TOC, and pH (laboratory).**

4. On Figure 3-1 Surface Soil, Subsurface Soil, and runoff to Surface Water should also be evaluated for exposure routes.

**Response: At this time, the only known contamination is in the groundwater. Consequently, only exposure to groundwater is shown on the CSM. If the proposed sampling shows contamination in surface and/or subsurface soil, the CSM will be revised to show additional exposure routes.**

5. Please provide soil data obtained from the Phase I RI WP.

**Response: The Phase 1 soil sample results are included in the Work Plan**

**Addendum. The results show that there are some elevated concentrations of PAHs in 2 surface soil samples (SS12 and SS13), but these are mostly likely attributable to the asphalt parking lot. Pesticides were detected in a number of the samples at concentrations lower than human health risk screening numbers, but higher than ecological risk screening numbers. The wide-spread detection of pesticides is most likely attributable to the historical wide-spread application of pesticides, especially near marshy areas. No additional soil samples are proposed for this area. The Phase 1 soil sample locations will be shown on the figures in the Addendum.**

J. Sommer Barker, Hydrogeologist

Table 3 Proposed Sampling – Site 27

1. The Phase I RI work plan indicates monitoring well MW-06 was sampled during the July 2002 field screening and monitoring well installation event. Free product was observed at this monitoring well. However, the Phase II RI work plan recommends sampling MW-06 for pesticides only. The Navy should continue monitoring for free product during the Phase II RI monitoring event.

**Response: The constituents that the groundwater and soil samples will be analyzed for were identified in Sections 3.2.1 and 3.2.2 and on Table 8-2. Groundwater samples will be analyzed for VOCs, pesticides, TDS, TOC, and alkalinity (laboratory) and DO, temperature, salinity, specific conductivity, turbidity, pH, and ORP (field). Soil samples will be analyzed for VOCs, pesticides, TOC, and pH (laboratory).**

Figure 2 - VOC Concentrations (µg/L) In Groundwater

2. The Legend states that the symbol 'H' is defined as "Reported Concentration Exceeds The Region 9 Tap Water PRG". Figure 2 shows chlorobenzene detections at monitoring well PI055MW12I are listed with an H next to its detection; however, chlorobenzene has a maximum contamination level (MCL) of 0.1 mg/L. It is unclear as to why these constituents are being screened against preliminary remediation goal (PRG) instead of their known MCLs. MCRD should clarify this and respond to this comment.

**Response: The Region 9 tap water PRG for chlorobenzene is 0.090 mg/L, which is lower than its MCL. The tap water PRGs are used for screening purposes to select potential chemicals of concern (COPCs), etc. in risk assessments. MCLs may be used to set site-specific PRGs once the risk assessments have been completed and chemicals of concern (COCs) have been identified.**

Table 3 Proposed Sampling – Site 27 Page 2 of 3

3. Monitoring well installation is suggested (ex. PAI-27MW51S) proposed in sampling plan table. However, monitoring well approval cannot be written based on the specifications proposed in this work plan. More information should be provided, either within this workplan, or in a separate monitoring well approval request. In addition to the information provided in this work plan, the following information is also required (R.61-71.H.1.a):
  - a) Proposed well locations on a scaled map or plot
  - b) Proposed well construction details
  - c) Well owner's name and mailing address
  - d) Property owner's name and mailing address (if different from the well owner)
  - e) Proposed parameters to be analyzed
  - f) Proposed drilling date

**Response: Additional information provided in the Addendum and in a Monitoring Well Approval Request will contain the requested items.**

## EPA

### GENERAL COMMENTS:

1. No text was provided with the submitted pages. **This amendment cannot be approved without the text discussed and agreed to.** Be sure to address the history that lead to Phase 2 data needs, describe the general purpose and rationale for the additional samples, etc. Be sure to include change page insertion instructions.

**Response: The Work Plan Addendum has been submitted detailing the information requested.**

2. In the text, also include additional facility history information for the buildings and concrete pads in question near the source areas.

**Response: The boundaries of the SWMUs will be placed on the Figures. Additional information on surrounding buildings and concrete pads is not available.**

3. No Phase 1 soil sample results were included with the provided change pages. Please include that data on a site map, and state whether soils have been delineated on and around the parking lot, or whether additional soil samples will be needed in these areas. If so, provide the proposed locations and sampling rationale. Be sure to include the proposed locations on the revised maps. Please recognize that additional comments may be submitted based on this new data and information.

**Response: The Phase 1 soil sample results are included in the Addendum. The results show that there are some elevated concentrations of PAHs in 2 surface soil samples (SS12 and SS13), but these are mostly likely attributable to the asphalt parking lot. Pesticides were detected in a number of the samples at concentrations lower than human health risk screening numbers, but higher than ecological risk screening numbers. The wide-spread detection of pesticides is most likely attributable to the historical wide-spread application of pesticides, especially near marshy areas. No additional soil samples are proposed for this area. The Phase 1 soil sample locations will be shown on the Figures.**

4. It appears to a degree some proposed well locations are placed at distances much removed from COC contour lines / plume edges. At this phase of the investigation locations should be selected foremost for the purpose of determining the nature and extent of contamination. Currently, the distances of some of the proposed wells to the inferred COC plume boundaries indicate there is a level of uncertainty in where the actual plume boundaries are located. If the Navy is fearful of incurring additional costs attempting to delineate the extent of contamination, EPA suggests an additional round of temporary well data be collected to more tightly constrain the plume boundaries. The new temporary well data would be used to target the permanent well placement and installation. See specific comments regarding proposed well placement and data gaps.

**Response: The locations of the proposed wells were selected to answer questions that the existing data present. Once the proposed sampling has been completed, existing data, along with the newly generated data, will be used to the extent possible to define the nature and extent of contamination and to calculate risks associated with exposure to contaminated media. See responses to specific comments regarding proposed well placement and data gaps.**

5. As discussed, an additional geotechnical investigation may or may not be necessary at some point in the CERCLA process in order to determine the existence, or lack thereof, of a confining layer. At this point, it will be acceptable to include the Public Works Geotechnical results in the RI Report, to make what conclusions you can about the area's geology/hydrogeology, and to propose additional geotechnical investigation if warranted. Such data can be gathered in support of the FS stage. However, if the Navy feels there is a cost benefit to doing such additional investigation while crews are in the field during Phase 2, then details of that investigation and its' intended purpose should be included in the revised Phase 2 WP and subject to review and comment/approval.

**Response: We would expect to include the Public Works Geotechnical results in the RI Report. However, since the Geotechnical Report has not become available to date, if it does not become available prior to demobilization, then the field crew may elect to DPT probe the clay unit beneath the deep wells (at approximately 35 feet) to confirm the unit is at least several feet thick. Any penetration will be abandoned when complete consistent with SCDHEC requirements.**

**In the Phase I sampling at Site 27, the intermediate temporary wells were screened just above an olive grey silty sandy clayey layer, which was noted at about 25 feet bgs. Temporary well 46D was drilled to a total depth of 35 feet. The olive grey silty sandy clayey layer was found to be about 1 foot thick at this location (between 24 and 25 ft bgs).**

6. If TDS and salinity data is gathered, it should be gathered at all levels of the investigation (S, I and D) and at a variety of locations.

**Response: Salinity measurements will be collected during groundwater purging. TDS analysis will be performed on all groundwater samples collected during Phase II of the RI investigation.**

7. The Conceptual Site Model needs to be further refined to include all potential pathways, receptors, etc. After the RI data has been gathered, the results should allow the Conceptual Model to be further refined, to explain how and where the contaminants were released, the nature, extent and magnitude of those contaminants, and which pathways are confirmed potential pathways.

**Response: At this time, the only known contamination is in the groundwater. Consequently, only exposure to groundwater is shown on the CSM. If the proposed**

**sampling shows contamination in surface and/or subsurface soil, the CSM will be revised to show additional exposure routes.**

8. Water level measurements are pertinent data points in this investigation due to vapor intrusion concerns. Since the site is reportedly tidally influenced to some degree, water level measurements should be taken at high tide, and as close to Spring High Tide as possible.

**Response: During the next round of groundwater sampling, two rounds of water level measurements will be made – one during high tide and one during low tide. The seasonal tidal charts will be evaluated to determine when in the tidal cycle the groundwater sampling is occurring (Seasonal High Tide, etc.). Weather conditions (raining, etc.) will also be noted when collecting the water level measurements.**

9. Since floating fuels were a concern at one point in this investigation, please provide the well construction data for wells in the areas of high VOC concentrations in surficial wells. Compare screen placement with low and high tide water level measurements.

**Response: Well construction sheets will be provided in the RI Report for the existing monitoring wells. Since the RI Report is not expected immediately, the well construction sheets will be placed on the FTP site soon. Screen placement will be compared to available water level measurements.**

10. Assuming well screens are properly placed to allow for floating fuel detections, during Phase 2 sampling, be sure to use an oil/water interface probe or similar equipment before the wells are disturbed, to determine if floating fuels, etc. may be present. If free-phase product is detected, a static water sample should be collected and analyzed.

**Response: Field procedures during the Phase 2 sampling will be conducted so that floating fuels are recognized, if present.**

11. For purposes of analysis of these samples taken in Phase 2, it is assumed the same scans and methodologies as required by the Phase I RIWP will be performed.

**Response: Since the first phase of sampling included VOCs, SVOCs, PAHs, Pesticides, and PCBs and only VOCs and pesticides have been identified as potential chemicals of concern, the proposed samples will be analyzed for VOCs and pesticides.**

**The constituents that the groundwater and soil samples will be analyzed for were identified in Sections 3.2.1 and 3.2.2 and on Table 8-2. Groundwater samples will be analyzed for VOCs, pesticides, TDS, TOC, and alkalinity (laboratory) and DO, temperature, salinity, specific conductivity, turbidity, pH, and ORP (field). Soil samples will be analyzed for VOCs, pesticides, TOC, and pH (laboratory).**

12. A schedule for this sampling round should be submitted in advance of field start, with sufficient time for EPA oversight to be planned (at least 2 weeks advance notice.)

**Response: The field mobilization is currently scheduled to start 4 August. Due to frequent Navy/EPA/SCDHEC conference calls, we expect that EPA will have more than two weeks advance notice.**

**SPECIFIC COMMENTS:**

13. Add additional soil samples and/or disperse proposed samples to include soil investigations in the area of the following locations: For pesticides - in addition to those proposed address TW46S and TW30S. For VOCs - in addition to those proposed address FDP12, FDP04, TW26S, FDP02, FDP17, FDP22, and FDP05. Please explain if all soil samples will be analyzed for both pesticides and VOCs, or if each sample will be a single analysis (the purpose of many could cross over, but maybe not all.)

**Response: The four extra samples noted in Table 3 will be placed in the areas requested above (see new figure in Addendum showing soil sample locations). The field crew will also be directed to collect soil samples at any location where visible signs of contamination are noted.**

14. Please include the new proposed soils samples on the map.

**Response: A new figure showing the proposed soil sample locations will be provided in the Addendum.**

15. Please provide additional detail regarding soil sample depths, intervals, etc. Describe soil sample depth in relation to water table levels.

**Response: Two soil samples (surface and subsurface) will be collected from each proposed soil sample location. As per the Phase I sampling, surface soil samples will be collected from the 0- to 1-foot bgs interval beneath the surface cover (root zone or asphalt subbase). Subsurface soil samples will be collected from the interval showing signs of contamination (stains or oil, obvious odor, and/or elevated PID readings). If the subsurface soil does not exhibit signs of contamination, the subsurface soil sample will be collected from the interval just above the water table.**

16. Please clarify the map legend with respect to health concern indicators (H).

**Response: As noted on the figures, contaminant concentrations that exceed the Region 9 tap water PRG for that contaminant are flagged with an "H", indicating an exceedence of a human health criteria.**

17. The locations of many of the shallow and intermediate permanent monitoring wells proposed for installation during the next phase of the remedial investigation (RI) are

situated some distance from the current interpretation of the volatile organic compound (VOC) and pesticide plume boundaries. For example, the proposed location of intermediate well PAI-27-MW61I is approximately 400 feet downgradient of the VOC and pesticide plume boundaries, and wells PAI-27-MW51S and PAI-27-MW52I are located approximately 200 feet upgradient from the VOC and pesticide plume boundary. Additionally, wells PAI-27-MW55S and PAI-27-MW56I are located 200 feet from the pesticide plume boundary and 500 feet from the VOC plume boundary. As such, uncertainty in the representativeness and overall quality of the well data comes into question when the well locations are some distance from the plume boundaries. Revise the MCRD Parris Island Site 27 Remedial Investigation Phase 2 Work Plan dated March 2008 (Phase 2 Work Plan) to provide additional justification and rationale for the distance of the proposed permanent monitoring well locations relative to the current interpretation of the VOC and pesticide plume boundaries.

**Response: The proposed location of intermediate well PAI-27-MW61I will be moved so that it is south of Building 864 (see revised figures in the Addendum).**

**Existing data near Building 405 shows that the upgradient groundwater has not been impacted. Proposed wells PAI-27-MW51S and PAI-27-MW52I are intended to confirm that groundwater upgradient of the existing data points has not been impacted. Monitoring well PAI-27MW64S was added north of building 405 to provide information on groundwater quality immediately upgradient of the plumes.**

**Although proposed wells PAI-27-MW55S and PAI-27-MW56I are somewhat removed from the VOC plume, the wells are intended to verify that groundwater to the west of the pesticide plume has not been impacted.**

18. The downgradient extent of pesticide concentrations in groundwater northwest of shallow monitoring well PI027MW21 is not addressed by the currently proposed network of monitoring wells. The Remedial Investigation Work Plan (RI Work Plan) prepared for Site 27 dated September 2007 (TtNUS, September 2007) indicates if the concentrations at the plume boundary are less than the action levels, then the horizontal extent of groundwater contamination will be considered to have been determined (Page 2-13). According to the figures presented in the Phase 2 Work Plan, a data gap exists in the horizontal extent of pesticide concentrations exceeding human health screening criteria in the shallow aquifer zone downgradient of PI027MW21. Revise the Phase 2 Work Plan to describe how the horizontal extent of pesticide contamination in the shallow aquifer zone at the leading edge of the plume will be determined since no new wells downgradient of PI027MW21 have been proposed.

**Response: The pesticide concentrations detected in monitoring well PI027MW21 are higher than the Region 9 tap water PRGs, but not as high as some of the other wells within the plume (PAI-27-TW-41S). The well will be resampled to confirm the concentrations of pesticides detected in the monitoring well. In addition, monitoring well PAI-27MW62S will be installed downgradient of PI027MW21.**

19. The proposed sampling at Site 27 (Equipment Parade Deck Satellite Accumulation Area) as presented in Table 3 of the Phase 2 Work Plan does not address the data gap that exists in the horizontal extent of pesticide concentrations exceeding human health screening criteria in shallow groundwater downgradient of permanent monitoring well PAI-27-MW-16. The downgradient extent of pesticide exceedances in shallow groundwater in this area is constrained horizontally by results from temporary well PAI-27-TW-39S. However, permanent monitoring well results will be needed to verify the horizontal extent of pesticide contamination in the shallow groundwater as determined by the temporary well data. Shallow monitoring well PAI-27-MW58S is proposed to constrain the plume boundary in this area. However, the proposed well location is greater than 300 feet downgradient of PAI-27-MW-16 and greater than 150 feet from the estimated pesticide plume boundary. As such, it is recommended that a shallow permanent groundwater monitoring well be installed to constrain the horizontal extent of pesticide contamination exceeding human health screening criteria downgradient of PAI-27-MW-16 in the vicinity of Building 852.

**Response: The pesticide concentrations detected in monitoring well PAI-27-MW-16 are slightly higher than the Region 9 tap water PRGs. The well will be resampled to confirm the concentrations of pesticides detected in the monitoring well. In addition, monitoring well PAI-27MW63S will be installed in the vicinity of temporary well PAI-27-TW-39S to define extent of contamination downgradient of PAI-27-MW16.**

20. Exceedances of the action levels for both VOCs and pesticides were measured in the deep aquifer zone in well PI055MW08D and pesticides only in well PI055MW13D. Currently, the vertical extent of VOC and pesticide contamination exceeding the action levels presented in the RI Work Plan (TtNUS, September 2007) has not been determined. Although sampling of the deep wells is proposed for the next phase of the investigation, the vertical extent of contamination will still not be delineated if the sample results exceed the action levels. As a result, MCRD should provide for additional investigation, as necessary, to determine the full vertical extent of contamination in the deep aquifer zone. Revise the Phase 2 Work Plan to address this issue.

**Response: The concentrations detected in monitoring wells PI055MW08D and PI055MW13D are slightly higher than the Region 9 tap water PRGs. The wells will be resampled to confirm the concentrations detected in the monitoring wells. If the concentrations are confirmed, additional future deeper monitoring wells may be required.**

21. The greater than 1000 micrograms per liter ( $\mu\text{g/L}$ ) chlorobenzene isoconcentration contour depicted in Figure 2, VOC Concentrations ( $\mu\text{g/L}$ ) in Groundwater Sites 27/55, is located approximately 25 feet from Building 405. Currently, the upgradient extent of the chlorobenzene contamination immediately north of Building 405 is not known. The utilization of wells PAI-27-MW51S and PAI-27-MW52I has been proposed to determine the upgradient extent of contamination. However, the proposed well locations are approximately 200 feet upgradient of the interpreted VOC plume boundary. In order to

more closely constrain the VOC plume near Building 405 and to preliminarily assess the vapor intrusion potential, it is recommended wells PAI-27-MW51S and PAI-27-MW52I be located on the northern rather than southern side of Building 405. Revise the Phase 2 Work Plan to address this issue.

**Response: A groundwater sample collected from monitoring well PAI-55-FD08 (north of Building 405) indicated that VOCs were not present in the groundwater in this area. The locations of proposed monitoring wells PAI-27-MW51S and PAI-27-MW52I were selected to confirm that groundwater further upgradient of Building 405 is free of contamination. Monitoring well PAI-27MW64S will be installed north of Building 405.**