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MCRD PARRIS ISLAND
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EMAIL REGARDING U S EPA REGION IV COMMENTS ON U S NAVY RESPONSE TO COMMENTS ON SAMPLING AND ANALYSIS PLAN FOR MUNITIONS RESPONSE PROGRAM SITES WITH ATTACHMENTS MCRD PARRIS ISLAND SC
1/5/2010
U S EPA REGION IV

From:	Llamas.Lila@epamail.epa.gov
To:	Sladic, Mark
Cc:	Meredith Amick; Charles CIV NAVFAC SE Cook; heber pittman; Annie Gerry; Zimmerman, Greg; Blanken, Michelle; mac mcrae; Churchill, Peggy; Basinski, Ralph; tim harrington (email)(timothy.j.harrington@usmc.mil); llamas.lila@epa.gov
Subject:	RE: MCRD Parris Island MRP SI SAP RTC and path forward
Date:	Tuesday, January 05, 2010 1:27:40 PM
Attachments:	Munitions Penetration Depths-19122009.pdf
Importance:	High

Hi Mark and others,

I hope everyone had a great holiday!

Mark, I looked over what you sent. Does the USACE information address MEC found in all media? Specifically, does it include MEC found in sediments, as opposed to just upland soils? If so, do just those found in sediments also meet the "majority in the top two feet" finding? It is not clear in the information you sent, and it is not clear who to contact with this question, so I pose it back to you. Please advise.

And secondly, did the Active Range investigation hold true to these findings? Was the overwhelming majority of rounds detected in the top two feet of sediment? Please advise.

Also, I was out for quite a long time on leave, and then was just today successful in getting with David Buxbaum on the RTC. I still need to get with my supervisor, then I will be able to give you EPA's feedback on the RTCs. I hope that will be today or tomorrow.

While EPA understands your need to make progress, you must also understand that implementation of the SAP without approval will mean you are proceeding at risk.

Thanks,
Lila

From: "Sladic, Mark" <Mark.Sladic@tetratech.com>

To: Meredith Amick <AmickMS@dhec.sc.gov>, Joe Bowers <BOWERSJB@dhec.sc.gov>, Stacey French
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Cc: "Blanken, Michelle" <Michelle.Blanken@tetratech.com>, "Basinski, Ralph" <Ralph.Basinski@tetratech.com>

Date: 01/05/2010 11:40 AM

Subject: RE: MCRD Parris Island MRP SI SAP RTC and path forward

Hi Meredith. Our MRP staff has prepared the following responses to SCDHEC's comments. In order to make Navy's completion date for the final SI, we are mobilizing some activities (vegetation clearing, detector aided survey) this week. The actual sampling will be a couple weeks off yet and we will still be able to make adjustments in the scope of sampling if necessary before then:

Response to General Comment #2

Please explain for all sites how the areas on which MEC investigation will be done were chosen. Additionally please explain why the areas not undergoing MEC investigation were not chosen. The Department needs this information in order to concur with the investigation strategy.

Response: The initial screening as to which units would be investigated was based on whether the units was eligible for the MRP. Only closed ranges were eligible. Active ranges are not eligible and are not within the scope of this SI. This screening was accomplished during the HRR / PA phase. The next step was to determine which units had potential MEC. Investigations are being conducted at all of the units where MEC may be present. This includes all units other than the Rifle Range, where explosives were not used and MEC is not a potential concern. Within areas where MEC investigations are being conducted, resources are not available to investigate 100% of the area. In addition, under the DoD MRP, intrusive investigations of MEC cannot be conducted. Therefore, potential MEC in the subsurface, which is identified as anomalies during the geophysics investigation, cannot be investigated during the SI phase. The purpose of a SI is to determine presence / absence rather than nature and extent. Therefore, the locations within a unit where the MEC investigations are to place were deliberately biased toward locations which are most likely to contain MEC. Areas with lesser probability of MEC were not chosen for the MEC investigation. The Navy acknowledges that information gaps are likely to exist when the SI is completed. The results of the SI will be used to identify information gaps and develop the scope of any follow-on investigations during the RI phase.

Response to General Comment #8

Based on the table provided, it still appears that at some UXO sites (possibly UXO 4, 6, and 8), the detection depth of the instrument may not be great enough to detect potential MEC. At these sites, Land Use Controls will be required, and the site may need to be closed as a landfill.

Response: The maximum MEC penetration depths are beyond the detection capabilities of the instrumentation. However, according to studies conducted by the US ACE the actual depth of penetration is actually much lower. Most items are found within the top two feet of the surface. This is well within the detection depth of the geophysical

instrumentation. Below is the discussion, which is contained within the US ACE guidance titled "Military Munitions Response Actions". Attachment 1 contains the relevant information from the guidance document. The Navy acknowledges that that control measures may be necessary at locations where the instrument detection capabilities are not great enough to detect potential MEC. This will be determined based on the results of the SI and further investigations, if conducted.

e. Penetration Depth Considerations. The maximum possible depth of MEC is an important consideration in the selection of an appropriate detection system. If MEC is intentionally buried, factors affecting burial depth may include type of soil, mechanical vs. hand-excavation, depth of water table, etc. If the munitions was fired or dropped, then the depth of penetration can be estimated by considering soil type, munitions type and weight, and impact velocity. There are many cases where MEC can penetrate deeper than geophysical systems can currently reliably detect. At such locations, it is possible that undetected MEC remains deeper than it can be detected. The topic of ordnance penetration is still under discussion in the MMRP community. For up-to-date information on this topic contact the MM CX. Figure 8-12 shows the depth of recovery for thousands of MEC items. The curve indicates that while the maximum depth of penetration of MEC will resemble the depth predicted in the penetration analysis, the actual depth of penetration for most items is much lower. In fact, Figure 8-12 shows that most items were located less than two feet deep.

MEC SAP WSs 10.2.1.2, 10.3.1.2, 10.4.1.2, 10.5.1.2,, 10.6.1.2 have been modified to include this additional information. These sections of the WSs will include a discussion of MEC penetration depths. For example WS 10.3.1.2 now reads as follows.2.1:

10.3.1.2 Potential or Known Sources of MEC: The sources of potential MEC at the Field Artillery West Main Range are the area surrounding the range fan, the target area/impact areas (assumed to be areas of higher elevation), and the firing points. Penetration depths for the types of munitions used are estimated to be between 5 and 10 feet bgs, depending on the soil type and angle of penetration. The US ACE has conducted studies regarding the depth of recovery for thousands of ordnance items. The data (Figure 8-12 of EM 1100-1-400d http://www.itrcweb.org/Documents/USACEMilitaryMunitionsResponseActionsJune2007.pdf) shows that while the maximum depth of penetration will resemble the penetrating depth predicted by the penetration analysis, the actual depth of penetration for most items is much lower. In fact, most items were located less than two feet deep. Expended shrapnel rounds have little ability to penetrate the ground surface and are typically found on the surface. The impact area within the range fan would have received the most ammunition that failed to detonate (duds). Complete rounds could exist at the firing points because unused projectiles may have been buried there.
Similar changes have been made to the other WS sections referenced above.

Response to General Comment #14

Soil and Sediment sampling depth should be reconsidered and explained for each individual site. This explanation should be based on both risk (i.e. deep burrowing species in Beaufort known to burrow to a depth of at least 3ft) and delineation (i.e. at least 6 inches below where anomalies are detected).

Response: The primary objective the SI is to determine presence or absence of contamination. Therefore, the depths at which samples will be collected will be based primarily based on the depths at which MC may be present. This is based on a combination of available information regarding historical activities and the results of the MEC investigation for all sites other than the Rifle Range. Also, as noted above in the above response most munitions items are expected to be found in the upper two feet of soil.

Response to Specific Comment #2

pH data should be obtained as it can effect leachability of metals. This may help in a weight of evidence argument, since background data will not be used in the SI.

Response: Soils samples will be collected for pH analysis at each of the sites.

Region 4 policy is to use the screening values from the RSL Summary Table for comparison. Therefore, to remain consistent, these values should be used instead of the Region 5 Soil Screening Levels.

Response: Screening values from both the RSL Summary Table and Region 5 ecological screening values were used along with other criteria. The lowest criteria is presented in WS #15 as the PAL. Appendix B-2 lists the screening values that were considered.

No changes have been made in response to this comment

Annie's review is as follows:

The Department wants to make it clear that groundwater samples will be required for the sites before consideration will be given for no further monitoring.

Response: Groundwater monitoring will be conducted, as necessary, in the RI phase.

-----Original Message-----
From: Meredith Amick [mailto:AmickMS@dhec.sc.gov]
Sent: Friday, December 18, 2009 11:39 AM
To: Joe Bowers; Stacey French; Annie Gerry; David M. Scaturo; Priscilla Wendt (E-mail); Lila Llamas; Pat Franklin; Charles CIV NAVFAC SE Cook; TomDillon (E-mail); mac mcrae; Zimmerman, Greg; Sladic, Mark; Churchill, Peggy; heber pittman; tim harrington (email)(timothy.j.harrington@usmc.mil)
Cc: Blanken, Michelle; Basinski, Ralph
Subject: Re: MCRD Parris Island MRP SI SAP RTC and path forward

Hi team,

These are the Department concerns on the responses that will affect the field work. Additional concerns will be addressed when the revised SAP is officially reviewed.

Response to General Comment #2

Please explain for all sites how the areas on which MEC investigation will be done were chosen. Additionally please explain why the areas not undergoing MEC investigation were not chosen. The Department needs this information in order to concur with the investigation strategy.

Response to General Comment #8

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Response to General Comment #14

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Response to Specific Comment #2

pH data should be obtained as it can effect leachability of metals. This may help in a weight of evidence argument, since background data will not be used in the SI.

Region 4 policy is to use the screening values from the RSL Summary Table for comparison. Therefore, to remain consistent, these values should be used instead of the Region 5 Soil Screening Levels.

Annie's review is as follows:

The Department wants to make it clear that groundwater samples will be required for the sites before consideration will be given for no further monitoring.

Let us know if you have questions.
Meredith

>>> "Sladic, Mark" <Mark.Sladic@tetratech.com> 12/4/2009 2:18 PM >>>
Good afternoon everyone:

Please see attached RTC for EPA and SCDHEC review comments on the MC and MEC SAPs. The most significant item that might require some additional discussion is the resolution of the geophysics study. We intend to use modern, up to date equipment for the geophysics surveys. However, the maximum effective depth that this equipment can register does have limitations, that unfortunately do not always match up optimally with potential munitions penetration depths. This is not an issue exclusive to MCRD, the equipment specified, or the application. We may need to be careful about how we interpret a geophysics study that provides less information than we hope for, but there are not a lot of viable options (either technical or cost) to improve the performance. We believe that any other remaining issues will be relatively minor.

Based on our experience at other sites, we believe the information collected will support an appropriately complete SI analysis and

documentation.

In order to support the mandatory 30 September 2010 submittal date for the final SI Report, it is necessary to expedite field mobilization. We propose to field mobilize in January. A specific date will be determined after Team concurrence, based on staff schedules.

Please review the attached RTC and let us know if you identify any obstacles to a January mobilization, cognizant that data collection issues are critical, but that data interpretation issues can still be resolved (if any) during or after field mobilization. The two attached spreadsheets support responses to DHEC comments. Thanks.

Mark Sladic, P.E.| Project Manager
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(See attached file: Munitions Penetration Depths-19122009.pdf)

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15 June 2007

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MILITARY MUNITIONS RESPONSE ACTIONS

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Table 8-3: Simplified Expression for Estimating MEC Detection Depths Using Geophysical Techniques

Estimated Detection Depth (meters) = 11*diameter (mm)/1000
Assumptions: Item length is at least two times its diameter Item is not constructed of thin-walled metal Item is in a "worst-case" orientation with respect to the sensor (e.g. for EMI instruments, the item's long axis is co-planar with the system's coils) **Definitions:** Depth = actual depth to top of buried MEC, in meters. Diameter = diameter of minor axis of MEC, in millimeters. Length = length of major axis of MEC.

d. Actual detection capabilities encountered at the site will be different than those estimated by the formula above; any item not buried in a worst-case orientation should be detected at depths greater than those estimated by this formula. Also, items having lengths that are less than twice their diameter, or items manufactured with thin-walled metals, will only be reliably detected at depths that are shallower than those estimated by this formula. Conversely, items that are very long compared to their diameter, such as most rockets, or thick-walled items, such as some projectiles, will be reliably detected at depths that are greater than those estimated by this formula.

e. Penetration Depth Considerations. The maximum possible depth of MEC is an important consideration in the selection of an appropriate detection system. If MEC is intentionally buried, factors affecting burial depth may include type of soil, mechanical vs. hand-excavation, depth of water table, etc. If the munition was fired or dropped, then the depth of penetration can be estimated by considering soil type, munition type and weight, and impact velocity. There are many cases where MEC can penetrate deeper than geophysical systems can currently reliably detect. At such locations, it is possible that undetected MEC remains deeper than it can be detected. The topic of ordnance penetration is still under discussion in the MMRP community. For up-to-date information on this topic contact the MM CX. Figure 8-12 shows the depth of recovery for thousands of MEC items. The curve indicates that while the maximum depth of penetration of MEC will resemble the depth predicted in the penetration

analysis, the actual depth of penetration for most items is much lower. In fact, Figure 8-12 shows that most items were located less than two feet deep.

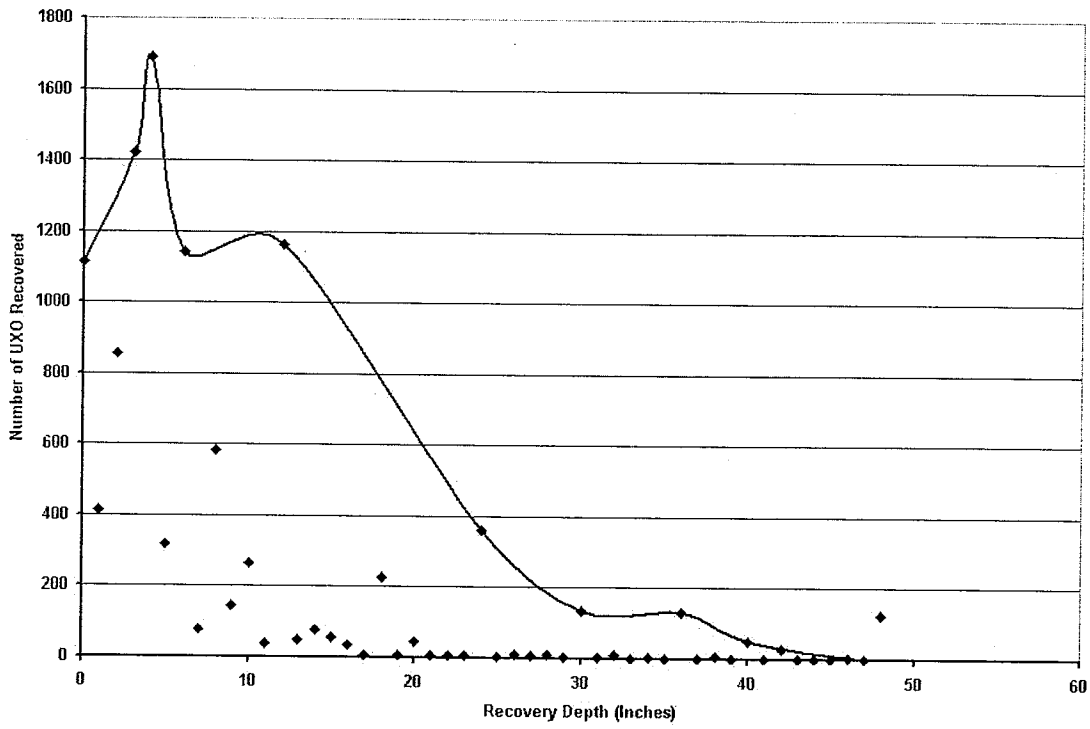

Figure 8-12: Actual Depth of Recovery of Fired UXO

Reference: UXO Recovery Database, NDCEE, 2003. Unexploded Ordnance (UXO) Task 307.

8-10. Digital Data Format and Storage and Coordinate Reporting.

There are two types of data typically generated during MEC investigations: geophysical mapping data and geographic information systems (GIS) data. Though geophysical data can be considered as geographic information, it is often not practical to treat all geophysical mapping data as GIS data. Specifically, the databases used to store and interpret geophysical measurements are designed to work with specialized geophysical processing and interpretation software and often are not easily reformatted to meet GIS storage and reporting standards, and rarely does the need arise to do so. However, geophysical maps and anomaly databases produced as the result of geophysical data interpretations are often key components to the project GIS, and these will often be produced according to the guidelines defined for the project GIS.

For project specific requirements, refer to the DID and/or PWS/SOW.