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MCRD PARRIS ISLAND
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EMAIL OF TRANSMITTAL AND U S EPA REGION IV REVISIONS AND COMMENTS ON
WORKSHEET 11 FROM SAMPLING AND ANALYSIS PLAN FOR THIRD BATTALION POND
AT SITE 3 CAUSEWAY LANDFILL MCRD PARRIS ISLAND SC
6/10/2009
U S EPA REGION IV

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Subject: SEE ATTACHED REDLINE Re: FW: MCRD PI Tier I enviro Draft Minutes
Date: Wednesday, June 10, 2009 9:58:39 PM
Attachments: [Site 3 Pond DQOs 6 1 09 MS PC GZ - Lila Redline.doc](#)
Importance: High

Hi Folks,

Hope everyone gets this before the meeting. Sorry so late. Was out all last week. Thought this might help facilitate completing the DQO revisions from those drafted. By the way, The draft was very good. I saw nothing that I did not believe was agreed to, per se. That must be a first, besides some of Libby's minutes : -) However, you will see lots of red, just adding background/detail for clarification, refining how things are phrased and avoiding speaking to things about the whole draft tech memo and remedy when all we are supposed to be talking about is LUCs or No LUCs for fish consumption.

See attached. Talk to you soon.

Lila

SAP Worksheet #11 -- Project Quality Objectives/Systematic Planning Process Statements (UFP-QAPP Manual Section 2.6.1)

Problem Definition

For purposes of understanding the objectives of this study it is important to recognize the difference between the boundaries of Site 3 and the 3rd Battalion Pond (Pond). Site 3 contains the original landfill, the causeway constructed over the landfill and across a tidal marsh of the Broad River, and sediments which are adjacent to the causeway and which extend approximately 200 feet from the centerline of the causeway road northeast of the road. The causeway currently separates the 3rd Battalion Pond (northeast of the causeway) from a marshy area (southwest of the causeway). The 3rd Battalion Pond is that entire bi-lobed water body area northeast of the causeway. The Pond is connected to the tidal waters and marsh on the southwest side of the causeway via pipes and weirs. Fish are free to roam throughout the Pond and to enter and egress through the pipes, at times being exposed to potentially contaminated sediments along the causeway, and resulting, to an undetermined degree, in a transient population of fish.

The Site 3 post-construction HHRA presented in the Draft Technical Memorandum (TtNUS, July 2008) used the 2001 and 2003 sediment data collected in the pond north of the causeway to estimate post-construction risks to human health through theoretical partitioning of sediment contaminants to fish and subsequent human consumption of the fish by recreational and subsistence users. Site 3 post-construction COCs for fish consumption were determined to be Total DDT, Mercury, and Copper. Preliminary results of the partitioning revealed there is potentially an unacceptable risk from fish consumption. (SEE COMMENT - I WOULD DELETE THE REST OF THIS PARAGRAPH) The results of the HHRA indicated that risks (carcinogenic and non-carcinogenic) to all receptors were acceptable with the exception of non-carcinogenic risks associated with the child civilian subsistence user, which were due to mercury.

There is uncertainty associated with the estimation of fish tissue concentrations using sediment concentrations because of the complex mechanisms by which chemicals, especially mercury, enter the food chain. There is also uncertainty associated with fish tissue sampling as it relates to post construction conditions due to the transient nature of fish and the age of fish consumed. However, there are civilian subsistence fishers men and their families, including children, that reportedly consume fish caught from the 3rd Battalion Pond (Site 3) more than twice per week, regardless of where the fish have been or how old they are. In order to ensure subsistence fisher families are protected ~~reduce the uncertainty associated with the post construction risk assessment~~, a human health risk assessment that quantifies risk due to ~~exposure to metals and other Site 3 COCs from~~ consumption of fish exposed to Site 3 Post-Construction COCs and

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Comment [EPA1]: The tech memo still needs to revise the HHRA section. Therefore more generic language as I have proposed above would be appropriate and would not be inconsistent with the Tech memo once finalized.

PCBs (a concern prior to remedy implementation) will be conducted through the direct analysis of fish tissue. Due to the limitations placed on the fish sampling design as a result of these uncertainties, the team agreed results of this study will only be used to determine if Land Use Controls will be required to protect fishers, as opposed to making post-construction-specific remedy decisions.

11.1 **Identification of Study Goal**

Determine if human health risk from exposure to Total DDT (sum of 4,4'- and 2,4'- isomers of DDD, DDE, and DDT), total PCBs (sum of Aroclors), copper and mercury, in fish tissue is acceptable for recreational and subsistence fisherman who consume fish from the 3rd Battalion Pond. If human health risks are acceptable (HQs or HIs developed on a target organ-/effect-specific basis less than 1 and ILCRs less than 1×10^{-4}), then no action is required for consumption of fish from the 3rd Battalion Pond for this component of the selected remedy in the final ROD. (ICs, in the form of LUCs, to protect the integrity of the soil cover and rip-rap placement would still be required.)

If human health risk is determined to be unacceptable by fish tissue testing, then existing LUCs (fishing restrictions) developed to support the Interim Remedy will be updated as necessary to meet by all stakeholder requirements as a component of the final remedy for Site 3.

11.2 **Information Inputs**

In order to meet the study goals of the investigation, the physical and chemical data that will be collected at Site 3 are described below:

1. Previously collected data including original RI data (TtNUS, November 1999) and Technical Memorandum sediment data (TtNUS, July 2008) were used in order to identify target contaminants.
2. Subsistence Fisherman exposure assumptions: Exposure assumptions for the risk assessment were supported through application of U.S. EPA subsistence fisherman guidance (Guidance for Assessing Chemical Contaminant Data for Use in Fish Advisories, U.S. EPA, November 2000)
3. Field Parameters: 3rd Battalion Pond water quality indicators, including dissolved oxygen, pH, temperature, salinity, turbidity, and conductivity will be collected in order to document site conditions. Meteorological data will also be collected and recorded during the sampling event.

4. Fish tissue extracted from fillets will be analyzed for total DDT, total PCBs, copper and mercury. **The sampling methods are presented in Worksheet #18 and the analytical methods are presented in Worksheet #19.**
5. Reference data will be gathered from at least one other location at MCRD Parris Island that is near Site 3 and includes the same species of fish as are present in the 3rd Battalion Pond. The reference data will be used to determine if fish tissue concentrations are due to anthropogenic conditions at MCRD Parris Island, or are specific to Site 3.
6. Screening values – The screening values provided in “Guidance for Assessing Chemical Contaminant Data for Use in Fish Advisories” (U.S. EPA, EPA-823-B-00-007, November 2000) will be used for the selection of COPCs.

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Comment [EPA2]: Pending review and approval.

Target Analyte	Recreational Fisher		Subsistence Fisher	
	Non-carcinogens	Carcinogens	Non-carcinogens	Carcinogens
Total DDT	0.2 mg/kg	1.17E-2 mg/kg	2.45E-2 mg/kg	1.4E-3 mg/kg
Total PCBs	0.008 mg/kg	2.0E-3 mg/kg	9.83E-4 mg/kg	2.45E-4 mg/kg
Copper	TBD	---	TBD	---
Mercury	4.0E-2 mg/kg	---	4.9E-3 mg/kg	---

Comment [EPA3]: We need Tim's action item and feedback on this.

11.3 Study Boundaries

Site 3 is located along the causeway that was constructed across a tidal marsh of the Broad River and connects Horse Island and Parris Island. The causeway covers approximately 10 acres and is 4,000 feet long, 100 feet wide, and 10 feet high (above the water surface). The causeway currently separates the 3rd Battalion Pond (north~~east~~ of the causeway) from a marshy area (south~~west~~ of the causeway). The **vertical** study area boundary for this investigation includes the 3rd Battalion Pond ~~north of the causeway~~. The **horizontal** boundary for this investigation is limited to the depth of the pond, which is reportedly approximately 5 feet below the water surface. The investigation will extend to this depth as the intention is to **include collect~~ing~~** fish that typically forage along the pond bottom.

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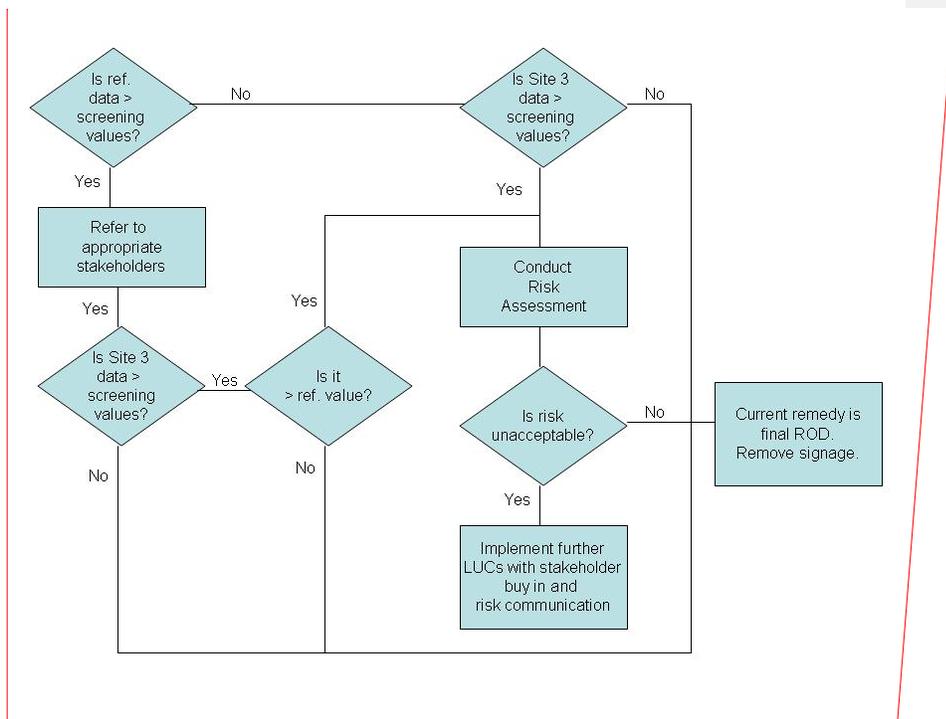
Comment [EPA4]: Are these two backwards?

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The reference sample location will be within MCRD Parris Island, but outside of the 3rd Battalion Pond where fish will potentially be unaffected by Site 3 contaminants.

11.4 Analytical Approach

The maximum concentration in any fish tissue sample will be used for comparison to screening values and the reference value in order to select COPCs and to make the decisions described below. For any COPC, the reference value is defined as twice the mean COPC concentration derived from the reference location data set. For decision making related to this investigation, it is important to ensure that concentrations in fish tissue from the reference location do not exceed the screening values. However, the decisions that will be made if the reference location data *does* exceed the screening values are also described below. The flow chart illustrates the site decisions.



Comment [EPAS]: Change language in last "yes" box to match above: "Update LUCs as necessary to meet stakeholder requirements."

Decision Rules:

The following decisions will be made assuming ~~if~~ *the reference location data is less than the screening values*:

1. If COPC maximum concentrations in fish tissue are ~~fish are~~ less than screening values, risk to human health receptors will not be further evaluated, and LUCs in the form of fish restrictions will not be required in the final remedy. ~~the component of the interim remedy that addresses sediment~~

~~will become the selected remedy described in the final ROD.~~ The current signage that limits subsistence fishing will be removed from ~~Site 3 the 3rd Battalion Pond.~~ No changes will be made to the engineered remedy for sediment in Site 3.

2. If COPC maximum concentrations in fish tissue are greater than screening and reference values, conduct risk assessment using average fish tissue concentrations as exposure point concentrations.

If risk to human receptors is unacceptable, the Project Team will evaluate the implementation of LUCs ~~and long term monitoring~~ as the final remedy with all stakeholders, including SCDHEC Bureau of Water. No changes will be made to the engineered remedy for sediment in ~~Site 3 the 3rd Battalion Pond.~~

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Note: US EPA and the Navy, through CERCLA authority, will require LUCs be applied to the site as the final remedy of the ROD if contaminant concentrations show unacceptable risk to human receptors. However, every attempt will be made to design the LUCs (including sign language) to meet with the satisfaction of all stakeholders while meeting the requirements of CERCLA.

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If risk to human receptors is acceptable, LUCs in the form of fish restrictions will not be required in the final remedy. The current signage that limits subsistence fishing will be removed from Site 3. No changes will be made to the engineered remedy for sediment in Site 3.

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3. If COPC maximum concentrations in fish tissue are greater than screening values, but less than the reference value, the Team will inform the appropriate stakeholders (such as the SCDHEC Bureau of Water), risk to human health receptors will not be further evaluated, and LUCs in the form of fish restrictions will not be required in the final remedy. The current signage that limits subsistence fishing will be removed from Site 3.. No changes will be made to the engineered remedy for sediment in Site 3. ~~The interim remedy for sediment will become the final remedy for the site.~~

If *the reference data is greater than the screening values*, then the appropriate stakeholders will be informed and the following decisions will be made:

4. If COPC maximum concentrations in fish tissue are greater than the screening values and the reference value, then refer to Decision Rule #2 above ~~will be made.~~

5. If COPC maximum concentrations in fish tissue are less than screening values, risk to human health receptors will not be further evaluated, and LUCs in the form of fish restrictions will not be required in the final remedy. The current signage that limits subsistence fishing will be removed from Site 3. No changes will be made to the engineered remedy for sediment in Site 3. the interim remedy for sediment will become the final remedy for the site.

6. If COPC concentrations in fish tissue are less than screening values, but greater than the detection limits, DHEC will conduct risk communication with subsistence fishers people that frequently fish at the 3rd Battalion pond. The focus of the risk communication will be related to the reported volume consumed by subsistence fishers man in the area, and mitigation of potential long-term health impacts.

Human Health Risk Assessment:

Maximum fish tissue concentrations will be screened against the screening values identified in Section 11.2 to identify COPCs that will be carried through the risk assessment calculations. Average fish tissue concentrations will be used as exposure point concentrations (EPCs) in the HHRA calculations.

The HHRA will consist of five components, including the selection of COPCs, exposure assessment, toxicity assessment, risk characterization, and uncertainty analysis. The methodology to be used for the Human Health Risk Assessment is presented in Appendix A.

Comment [EPA6]: Pending review and approval.

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11.5 Performance or Acceptance Criteria

Fish collected for analysis of fish tissue will be collected from areas within the 3rd Battalion Pond that are known to contain a population of fish. Because this is a biased sampling event affected by many factors including tidal influences, species availability, weather, etc., the use of quantitative statistics to estimate decision performance as specified in the DQO guidance (EPA, 2006) was not applied. Instead, the project team will use the results of the investigation to determine whether the amount and type of data collected is sufficient to support the attainment of project objectives. This will involve an evaluation of contaminant concentrations to ensure that contaminants are likely to have been detected if present, and that enough data have been

collected to support the site investigation. The project team will review the analytical results and ensure that all viewpoints are included in decision making.

Comment [EPA7]: Fuzzy on this. Was Tim there for this?

11.6 Plan Development for Obtaining Data

Fish for tissue analysis will be collected at four areas within the 3rd Battalion Pond, as shown on Figure 11.1. In addition, fish for tissue analysis will be collected from at least one reference location to reduce uncertainty associated with contaminants that may not be associated with Site 3 but that could bioaccumulate in fish collected for this investigation.

Data Collection Plan:

3rd Battalion Pond (4 locations):

An attempt will be made to collect 8 top predators, preferably Red Drum or Croaker, and 8 bottom feeders, preferably Mullet from the four locations around the pond. It is preferred that 2 Red Drum and 2 Mullet be collected from each of the four locations. Fish that are collected for tissue analysis will be of edible and legal size if possible (otherwise with Natural Resource Manager permission), although the potential for receptors to harvest other-than-legal size fish will be addressed in the risk assessment uncertainties analysis.

Fish samples will be collected using a combination of gill nets, trap nets, and trot lines (as necessary). Upon collection, fish will be separated by species and immediately placed on wet ice for processing. Live, non-target fish shall not be collected during this investigation and will be returned to the water.

The right filet from one fish will be used as a duplicate.

Fillet fish samples will be analyzed for Total DDT (sum of 4,4'- and 2,4'- isomers of DDD, DDE, and DDT), total PCBs (sum of Aroclors), copper, and mercury according to the analytical methods presented in Worksheet #19.

The same data collection protocol will be employed at the reference location.

3rd Battalion Pond
Parris Island, South Carolina

Site 3 UFP-SAP
Revision Number: 0
Revision Date: 7/1/2009