

**U.S. Environmental Protection Agency
Science Advisory Board**

Draft Minutes of Public Meeting October 5, 2005

Committee: SAB Katrina Soil and Sediment Sampling Plan Workgroup. (See attached Roster)

Date and Time: October 5, 2005 from 11:30 a.m. – 2:30 p.m. Eastern Time

Location: By telephone only

Purpose: The purpose of this meeting was to allow the EPA Science Advisory Board (SAB) workgroup to discuss the Agency's *Quality Assurance Project Plan, Katrina Response, Environmental Soil and Sediment Sampling, Gulf Coast of Mississippi, September, 2005*. This document was prepared by EPA's Region 4 Office. It is posted at the SAB's website, www.epa.gov/sab and will be found in the FACA file for this meeting.

Materials Available: The following materials were distributed before the meeting:

1. Agenda
2. Workgroup roster and biosketches
3. Quality Assurance Project Plan, Katrina Response, Environmental Soil and Sediment Sampling, Gulf Coast of Mississippi, September 2005.
4. Collected individual comments from Drs. Ivan Fernandez, Michael McFarland, Douglas Splitstone, and Louis Thibodeaux available on October 4.
5. Additional collected individual comments from Drs. Samuel Luoma, Deborah Swackhamer, and Jeffrey Griffiths available on October 5.

Attendees: Because this was a conference call there are no sign-in sheets

The following individuals from the Workgroup were present for all or part of the call:

Deborah Swackhamer, Chair
Ivan Fernandez
Jeffrey Griffiths
Michael McFarland
Douglas Splitstone
Louis Thibodeaux

The following individuals from the SAB Staff Office were present for all of the call:

Anthony Maciorowski, Associate Director for Science
Thomas Armitage, DFO
Kathleen White, DFO

The following individuals from EPA were present for all or part of the call:

From the EPA Region 4 Science and Ecosystems Support Division, Athens, GA

1. Fred Sloan
2. Antonio Quinones
3. Don Hunter
4. Danny France
5. Charles Hooper
6. Charles Appleby
7. Bill Cosgrove

From EPA Region 4 in Atlanta

1. Donna Webster
2. Franklin Hill
3. Scott Sudweeks
4. David Langston
5. Randall Chaffins

From the EPA Office of Research and Development

1. Tom Holdsworth
2. Fran Kremer
3. Robert Puls
4. John Wilson
5. Bob Olexey

From EPA Headquarters

1. Dale Harowski

The following individual from the State of Mississippi was present:

1. Bob Merrill

The following individuals representing industry were present:

1. Corky Kratt, Chevron
2. John Leech, Chevron
3. Donald Scharr, First Chemical Corp.
4. Stephen Weishar, URS Diamond

The following individual from the press was present:

1. Tony Van Witsen, Jim Lehrer News Hour

1. Summary

The meeting was conducted according to the attached agenda.

The SAB workgroup reviewed the U.S. EPA Region 4 *Quality Assurance Project Plan, Katrina Response, Environmental Soil and Sediment Sampling, Gulf Coast of Mississippi, September, 2005*. U.S. EPA Region 4 is conducting soil and sediment sampling activities to document potential hazardous material and constituent releases caused by Hurricane Katrina. The workgroup was asked to respond to the following charge questions: 1) Are the project objectives clearly stated in the quality assurance project plan? and 2) Will the sampling design meet the stated project objectives? The workgroup commended EPA Region 4 for the rapid development of the QAPP. In response to the first charge question, workgroup members found that the project objectives in the QAPP should be more clearly stated. Workgroup members expressed the opinion that the primary objective of the study should be to obtain a snapshot of potential hazardous material releases. Statements in the QAPP indicating that the data could be used to support a human health risk assessment are not warranted. In response to the second charge question, workgroup members found that the sampling design in the QAPP will meet the study objective of providing a snapshot of potential hazardous material releases. However, there is a need to establish benchmarks or triggers against which to make decisions. SAB workgroup members provided specific suggestions about sample collection. Specific suggestions focused on avoiding crossing soil horizons, not diluting soil samples, and providing documentation with digital imagery. Workgroup members also found that EPA should clarify the rationale in the QAPP for selecting sampling sites. It appears that the sites were selected with care and consultation, and the justifications for each site selection should be documented.

The following is a chronological summary of the meeting.

Thomas Armitage, the Designated Federal Officer, welcomed those present. After calling the roll, he stated that this was a public teleconference being held under the requirements of the Federal Advisory Committee Act. Although it was not possible, in this emergency, to give the usual fifteen days notice of the teleconference in the Federal Register, a notice was published on September 13, 2005 announcing that a series of such meetings would be held and that more information was available on the SAB's website.

Armitage stated that materials relating to this activity were posted on the SAB's website (www.epa.gov/sab). These include the workgroup roster, biosketches, the charge and document provided by EPA, the agenda, and the preliminary individual responses prepared by work group members in advance of this conference call. Other materials will be posted there as they become available, including the minutes of this call. The minutes will be used to document the findings and recommendations of the workgroup.

Armitage noted that on the call the workgroup would be asked to discuss the EPA Region 4 soil and sediment sampling plan in light of the charge questions and provide consultative advice that is as unambiguous as possible. He also noted that the Agency is undertaking soil and sediment sampling under difficult circumstances, and the public is highly interested in receiving credible scientific information in the most expeditious manner possible.

After reviewing the agenda, Armitage then turned the call over to the Chair, Dr. Deborah Swackhamer.

2. Discussion of Sampling Plan and Charge Questions

Deborah Swackhamer thanked Region 4 for developing the plan so swiftly and seeking SAB advice, and stated that she hoped the SAB review could be helpful. Swackhamer stated that there were two charge questions provided to the workgroup: 1) Are the project objectives clearly stated in the quality assurance project plan? and 2) Will the sampling design meet the stated project objectives? She thanked the workgroup members for their participation and comments and asked them to discuss responses to the charge questions.

Charge Question #1: Project objectives – are they clearly stated?

Swackhamer noted that there appeared to be consensus among the written workgroup comments that the project objectives stated in the quality assurance project plan (QAPP) were confusing. This was because different objectives were stated in various parts of the document. Swackhamer asked Michael McFarland to provide his comments on the first charge question.

Michael McFarland expressed appreciation for the rapid development of the plan. He noted that within the QAPP there seemed to be a progressive development of the questions to be addressed by study. At the beginning of the QAPP, it appeared that EPA was focused on developing a “snapshot” of potential hazardous material releases at sampling sites (which he felt the proposed data collection activities would support), but later in the QAPP there were more detailed public health, risk-related questions discussed. Therefore, he found that it was difficult to understand the overall purpose of the quality assurance plan. He stated that the lack of clarity made it somewhat difficult to address the second charge question (i.e., Will the sampling design meet the stated objectives?).

Douglas Splitstone supported what McFarland said, he noted that the study objectives seemed to evolve and broaden throughout the QAPP document. Splitstone also stated that it was not clear what should be concluded if EPA does not find any releases of potentially hazardous materials. He noted that if EPA finds contaminants, it appears that the Agency will conduct follow-up activities. There are some very narrow conclusions that can be drawn, but he expressed concern about the public health discussion in Section 4 and conclusions that could be drawn from negative findings.

Jeffrey Griffiths recommended that EPA should simply state in the QAPP that the study would provide a snapshot. He noted that this is an important snapshot, but he stated that the study, as described, would not support a risk assessment. He noted that the study would, however, be valuable in designing a more comprehensive data collection plan that could support a subsequent risk assessment. Ivan Fernandez agreed with the statements of other workgroup members.

Deborah Swackhamer summarized the workgroup discussion of charge question #1. She stated that that, although the objectives are stated in different ways in parts of the QAPP, the primary objective should be to provide a snapshot of measured levels of potentially hazardous materials and constituents at sampled sites (as stated in Sections 2.1.1 and 2.1.2). Statement in the QAPP indicating that that the data could be used to support a human health risk assessment are not warranted. She noted that the use of judgmental rather than probabilistic sampling limits the applicability of the data. She polled the workgroup members and they agreed with these statements.

Charge Question #2: Sampling design – will it provide the data needed to meet the stated objectives?

Deborah Swackhamer asked the workgroup for comments in response to the second charge question.

Douglas Splitstone commented that the EPA Region 4 QAPP contrasted with the sediment sampling plan for Louisiana (previously reviewed by the SAB) because Region 4 has been able to identify very specific areas of interest to be sampled. Splitstone stated that the judgmental sampling design in the QAPP would allow EPA to look at those areas, and might even support some probabilistic statements of a very limited nature.

Michael McFarland concurred, and noted that the results of this sampling will allow EPA to estimate variability, and to later design a data collection activity that would support a human health risk assessment.

Ivan Fernandez stated that his concerns were more focused on specific sampling techniques and that he would address those later. Jeffrey Griffiths stated that the other workgroup members had encapsulated his comments in their remarks.

Deborah Swackhamer summarized workgroup comments. She stated that workgroup members had commented that the sampling design was appropriate to meet the objective that was recommended by the workgroup (i.e, providing the snapshot of conditions as discussed above).

Deborah Swackhamer called on Ivan Fernandez to comment on specific concerns about sampling techniques. Fernandez stated that, given the proposed sample compositing scheme, and the limited population size, the nature of the substrate samples would not be very well defined. He questioned what would be known about the three-inch increment

to be sampled as part of the soil system (e.g., is it overburden, organic material, etc.). He noted that the description of what will be sampled, and the supporting documentation that goes with it (e.g., soil survey information), may not be adequate, and is definitely not well described in the QAPP document.

Swackhamer referred to Louis Thibodeaux's written comments, which suggested taking a scraping in the top half-inch to be sure of getting "Katrina-related" materials. Fernandez responded that, if the goal is to obtain surface distribution data this would be a good approach. However, if the goal is to understand what is in the upper soil, then it may not be the best approach. Swackhamer referred to Samuel Luoma's written suggestion of ground-truthing the samples, taking two samples and sorting one for particle size. Fernandez stated that this might be a more sensitive way of detecting change. However, he noted that because there may be a high concentration contaminants in the clay component, this approach may not represent soil burden. He stated that the objectives of the study should be kept in mind.

Michael McFarland stated that understanding the distribution of chemicals may be critical if the EPA really wants to identify areas of contamination where the further action is to be taken. He noted that if the top half-inch scrapings will give a good idea of distribution, it might be good to encourage use of this approach.

Jeffrey Griffiths stated that he is not an expert in soil sampling but he understood that some chemicals fall through the soil column and locate in the layer between the deposited sediments and the soil. He stated that it would be good to document, with a digital camera, how far down the samples were taken.

Ivan Fernandez noted that digital imagery and good documentation would be very valuable. He stated that if the upper centimeter were sampled, it would be good to have a record of the overall depth of the sediment. The soil beneath could be sampled and subsequently tested depending upon the results obtained from the upper layer. Fernandez stated that layering is important, even within that three-inch top layer. One sampling approach is to look at the surface increment, with due attention to thickness, and then sample and archive (or sample and analyze) from below, being careful to respect (not mix) the boundaries of the layers.

Deborah Swackhamer expressed support for the idea of sampling the subsurface and providing documentation with digital imagery. She noted that sampling requires professional judgments and stated that, while it is always very good to have a fixed depth, if that doesn't make sense – and it doesn't seem to in this case – that is not what should be done.

Fred Sloan, EPA Region 4 Project Leader asked for an opportunity to respond to workgroup comments. He stated that the approach discussed by the workgroup would provide good information, but indicated that he believed it was beyond the scope of this study. He stated that the workgroup had discussed some non-standard sampling procedures. He also stated that believed archiving the subsurface was beyond the scope

of the study. He noted that these are things EPA might want to consider in a more comprehensive sampling plan rather than this snapshot.

Deborah Swackhamer responded that the workgroup was concerned that the Agency obtain samples representing what Hurricane Katrina has caused, and not lose the information by mixing that material with other soils.

Sloane stated the standard soil sampling procedure is use an increment of 0 to 6 inches. He indicated that EPA had cut this in half because of the brief time that the Hurricane Katrina waters were over the soil. He noted that in the past the Agency for Toxic Substances Disease Registry (ATSDR) has recommended sampling at three-inch increments when there is concern about contaminants at the surface. Sloan also thanked the workgroup for their comments on the objectives of the QAPP and indicated that other internal EPA reviewers had commented that the study objectives should be clarified.

Other Sampling Issues

Deborah Swackhamer stated that in her written comments, she had raised some questions about quality assurance issues, including duplication. She questioned whether the duplicate and split sample inclusion rate of 5% was adequate. She also noted that at the Naval Construction Battalion Center – Gulfport (NCBC) site, samples were only being analyzed for dioxins and that the quality assurance measures would not be representative at this site. She questioned whether separate quality assurance samples are needed.

Jeffrey Griffiths spoke of Table I in the QAPP, which provides the rationale for sampling the locations. He noted that frequently the rationale provided in the table is the potential for contaminants to have moved with the storm surge. He noted that this seemed to be very generic and stated that it would be helpful if the table indicated why those particular sites were selected.

Robert Merrill of the Mississippi Department of Environmental Quality commented that he had no problems with the NCBC sampling plan.

Fred Sloan responded to the comments on quality assurance issues. He noted that EPA is using one spiked duplicate out of twenty, which is in the Standard operating procedure. Swackhamer responded that this is only a problem because there are so few samples being taken overall. Sloan responded that because EPA is using one lab, they were only going to use one matrix spike duplicate sample and one population variability duplicate sample per site. Generally, EPA tries to do duplicates at the rate of one in ten, but if the lab is only doing a handful of samples, like four or five, they also try to do a duplicate. He stated that he would like to take a duplicate and split sample per site or complex of sites (See section 5.2.3). Swackhamer stated that this addressed her concerns. After confirming that the written comments will be part of the record, Swackhamer stated that there was no need to go into greater detail.

Deborah Swackhamer asked if the Work Group members had any other issues to discuss on the call. Michael McFarland responded that he has no real qualms with EPA going ahead with the sampling plan as written. But he has the same concern as Douglas Splitstone – what conclusions can be drawn if no contamination is found? He stated that it is not clear that you can conclude from this snapshot, that there is no risk. He stated that the snapshot would provide a basis for a second, more comprehensive sampling plan that would provide a basis for human health or ecological risk decision.

Fred Sloan addressed the question of “what do we do if we don’t find anything?” by noting all of the facilities to be sampled are permitted and under corrective action plans. He stated that the findings of the study would feed back into those programs. He stated that EPA staff in the Region 4 Office would have to decide whether to conduct a second round of sampling, or ask the facilities to provide more data.

Franklin Hill of EPA’s Region 4 Office agreed that the study would provide a snap shot. He stated that if EPA does not find anything, the Agency would turn the facilities back to the operators and the programs that regulate them.

Douglas Splitstone expressed concern is that the study results could be given a much broader “spin” than is warranted. He stated that it appear that that no inferences would be made about the communities beyond the facilities unless positive evidence of contamination is found. Sloan responded that EPA did not intend to draw inferences beyond the facilities. He noted, however, that EPA has tried to place sampling points between the facilities and communities and between facilities and ditches that lead to open waters. Michael McFarland asked whether there were specific concentrations that would trigger a second assessment, or whether concentrations below certain limits would trigger return of the facilities to the operators and the programs that regulate them. Fred Sloan responded that EPA has not yet clarified this.

Bob Merrill of Mississippi commented on regulatory triggers. He stated that EPA uses a dioxin toxicity equivalence (TEQ) level of 1 ppb as a regulatory trigger, but Mississippi has a more stringent standard. He stated that this raises the question of whose standard is to be applied. Fred Sloan stated that the data from the study would be available to the Mississippi Department of Environmental Quality and others.

Deborah Swackhamer noted that Merrill provided a good example of two benchmarks for dioxin. She asked Sloan whether there were benchmarks that will be used for the other contaminants? Sloan responded that one of the sites had been 80% remediated before Hurricane Katrina flooded the entire area. He stated that there is some concern that contaminants may have moved off of the remaining 20% of the site and contaminated the portion that had already been cleaned up. Sloan stated that there are some generic benchmarks available. Scott Sudweeks of EPA Region 4 stated that the Agency is considering which benchmarks to use for evaluating the samples. He noted that there are no local “non-Katrina” contaminated soils to use for benchmark comparisons, and stated that use of national average background concentrations is being considered. Swackhamer noted that Samuel Luoma’s written comments suggest using a reference site approach;

she stated that getting down deeper in the soil at the same site might also help. However, she noted that using a national average as a benchmark has difficulties because of differences in background levels of metals in the soils. Ivan Fernandez suggested using caution when going deeper in the soil to establish benchmarks, and noted that he favored using a reference location. He stated that this would support at least qualitative conclusions.

Scott Sudweeks spoke of the difficulty of finding reference locations in a timely manner. He stated that a tiered approach might be applied, for example, using ten times the national average urban level as the first tier. A regional reference location might be used in the second tier. Fred Sloan spoke of the pre-Katrina background and control data that are available on these sites. He stated that some data exist because the facilities were regulated and had to provide the data at an earlier time. Swackhamer stated that the use of pre-hurricane data was an excellent idea.

Douglas Splitstone stated that he favored the use of pre-hurricane facility-specific data for comparisons. However, he urged caution in using national average data for benchmarks because it is hard to “tease out” what part of the difference is due to Hurricane Katrina.

Michael McFarland stated that he also supported the use of facility-specific pre-Katrina data. He spoke of the data quality objectives process and the need to articulate decision rules, for example – if the concentration is above or below some benchmark, what is the action? Fred Sloan responded that this study was intended to provide just a preliminary snapshot. He stated that he could not identify the specific actions that would be taken as a result of the study, although he could give a long laundry list of actions that might be taken. McFarland stated that if the concentrations were above facility-specific background, he assumed the Agency would infer that there had been a release, consult with the State of Mississippi, and decide on what the next actions will be. Sloan indicated that this was basically correct.

Douglas Splitstone returned to the issue of what decision would be made if the concentrations do not exceed a benchmark. Sloan said that in these cases EPA would transition the regulated facilities back to the normal monitoring they receive.

Swackhamer stated that these decisions should be made on a facility-by-facility basis. Fred Sloan reminded the work group that one of the sites in the study is the biggest single industrial complex in the state of Mississippi. He noted that it might be hard to tease out which facility caused a release in a complex of this size.

Swackhamer asked the Workgroup for any further comments. There were none so she asked for public comments.

3. Public Comments

Donald Sharr of First Chemical offered comments. He stated that, in listening to the discussion on the teleconference, he thought he heard a predisposition to believe that there had been releases from the facilities. He noted that most of the sites in the study had already been evaluated through facility self-assessments and mass balance assessments. He expressed his opinion that, if the sampling program does not find levels above benchmarks, there may not have been releases. He also stated that if the sampling study finds anything, in a storm of this size the materials may have come from elsewhere entirely, and not from the local facilities. He expressed concern about how the data would be made available to the public and how it would be used for decision-making. In addition to making the points above, he stated that he had forwarded to Fred Sloan some corrections in the description of First Chemical to be included in the plan

Corky Kratt of Chevron also provided comments. He said that his concern is the use of the data. He noted that “what the results are compared to” is important. He also expressed concern about how the data will be shared with the public and whether the context will be correct. He noted that without the context, it is hard for people to understand what levels of chemicals were there before Katrina and what has changed. He indicated that all three industries in the complex had worked hard to build constructive relationships with the community. He stated that if the data were collected and made publicly available they could be easily misunderstood. He also stated that he had difficult time understanding why certain sampling locations were selected. A noted that a number of the sampling locations are in places where there was no possibility of storm surge due to a protective dike. He stated, however, that Fred Sloan had listened to Chevron’s concerns, and that most of the sampling locations are fine. He further noted that some of the sampling locations are in shared areas, and a few are in areas that might be more attributable chiefly to one facility.

4. Wrap up and Next Steps

There were no further public comments, so Deborah Swackhamer summarized the discussion and described next steps.

Dr. Swackhamer stated that based on the teleconference discussion and written comments the work group found that:

1. The objectives in the QAPP need clarification.
2. The sampling design would meet the study objective recommended by the work group (providing a “snapshot” of sampled sites). However, there is a need to establish benchmarks or triggers against which to make decisions.
3. The work group had provided some specific suggestions about sample collection, especially avoiding crossing soil horizons and not diluting soil samples,

4. EPA should clarify the rationale for why the sampling sites were chosen. It appeared that the sites were selected with care and consultation, and this should be documented.

Michael McFarland stated that Corky Kratt and Donald Sharr had raised the issue of risk communication. He noted that this was not in the work group's charge, but he asked whether EPA Region 4 had a systematic approach to addressing risk communication. Deborah Swackhamer asked Fred Sloan whether there was a plan for the proactive dissemination of the data and putting it in context. Sloan responded that the data will be reviewed by the chemist, and that he will look at (not review) the data and provide it to the EPA Atlanta Federal Center. Franklin Hill stated that EPA Region 4 is now working on a communications strategy for releasing the data to the public. He expected that the Region would coordinate with EPA Headquarters and post the data on the designated website. Swackhamer encouraged Region 4 to continue to work on this.

No other workgroup members had any further comments.

Deborah Swackhamer thanked Fred Sloan for his help and Sloan thanked the SAB for providing input. Sloan stated that EPA will consider the SAB input and apply what they can. He noted that the sampling has in fact started.

Swackhamer asked if anyone else at EPA had additional comments. There were no comments so she summarized next steps. The minutes will be written up, sent to her for certification. Once certified, the minutes will be posted at the SAB website along with the written comments of the workgroup members. The Workgroup would appreciate hearing back from Region 4 about the utility of the advice. After thanking the participants for their efforts, Dr. Swackhamer adjourned the meeting at 1:05 p.m. Eastern Time.

Respectfully Submitted:

Certified as True:

/Signed/

/Signed/

Dr. Thomas Armitage
Designated Federal Officer

Dr. Deborah Swackhamer, Chair
Katrina Soil and Sediment Plan
Workgroup

Attachments

1. Agenda for the meeting
2. Workgroup roster
3. Comments prepared by individual workgroup members in advance of the meeting

Attachment 1: Meeting Agenda

SCIENCE ADVISORY BOARD
Katrina Soil and Sediment Sampling Plan Workgroup
Public Teleconference
October 5, 11:30 a.m. – 2:30 p.m. (Eastern Time)

Agenda

1. Convene Meeting, Roll Call of Meeting Participants
Dr. Thomas Armitage
Designated Federal Officer
EPA SAB Staff Office
2. Discussion of Sampling Plan and Charge Questions
Dr. Deborah Swackhamer,
Chair and Workgroup
 - A. Discussion by Charge Question
 - B. Other Comments
3. Public Comment (brief comments only)
4. Summary and Identification of Most Important Points for the Agency's Consideration
Dr. Deborah Swackhamer,
Chair and Workgroup
 - A. Summary by Dr. Swackhamer
 - B. Discussion of Summary by Workgroup
5. Agency Feedback
Agency Staff
6. Wrap-up and Next Steps
Dr. Deborah Swackhamer,
Chair

Attachment 2: Work group roster

U.S. Environmental Protection Agency Science Advisory Board Katrina Soil and Sediment Sampling Plan Workgroup Roster

CHAIR Dr. Deborah Swackhamer, Professor, Division of Environmental Health Sciences, School of Public Health, University of Minnesota, Minneapolis, MN

MEMBERS

Dr. Ivan J. Fernandez, Professor, Department of Plant, Soil and Environmental Sciences, University of Maine, Orono, ME

Dr. Jeffrey Griffiths, Associate Professor, Family Medicine and Community Health, School of Medicine, Tufts University, Boston, MA

Dr. Samuel N. Luoma, Senior Research Hydrologist, US Geological Survey, Menlo Park, CA

Dr. Michael J. McFarland, Associate Professor, Department of Civil and Environmental Engineering, Utah State University, River Heights, UT

Mr. Douglas Splitstone, Principal, Splitstone and Associates, Murrysville, PA

Dr. Louis J. Thibodeaux, Jesse Coates Professor, Gordon A. & Mary Cain Department of Chemical Engineering, College of Engineering, Louisiana State University, Baton Rouge, LA

SCIENCE ADVISORY BOARD STAFF

Dr. Thomas Armitage, Designated Federal Officer, U.S. Environmental Protection Agency, Washington, D.C.

**Attachment 3: Comments prepared by individual workgroup
members in advance of the meeting**

**U.S. Environmental Protection Agency
Science Advisory Board
SAB Workgroup on Katrina Soil and Sediment Sampling Plan
Collected Individual Comments on U.S. EPA Region 4 “Quality Assurance Project
Plan, Katrina Response, Environmental Soil and Sediment Sampling, Gulf Coast of
Mississippi, September, 2005”**

As of October 4, 2005 (12:00 p.m.)

Ivan J. Fernandez

Review Comments on: Quality Assurance Project Plan, Katrina Response Environmental
Soil and Sediment Sampling, Gulf Coast of Mississippi

By: Ivan J. Fernandez, University of Maine, SAB EPEC

Date: October 2, 2005

I find this QAPP to be sufficiently precise so as to document the intent of the project, and the manner in which the project will be carried out on the ground. I am not directly familiar with many of the other documents referenced in this QAPP containing details of analytical protocols and procedures, and therefore assume completeness in that regard.

I have made only a couple of broad comments below regarding my review of the document. Then I have pasted the text of the QAPP below that and have made additional comments in Word edit mode for your consideration.

General Comments

(1) The first Charge question has to do with the clarity of project objectives. By the time one has reviewed the document, it is clear what is intended. However, it is not until 2.1.1 on page 9 that we read a clear statement of purpose that I recommend be italicized at a minimum: *It must be strongly emphasized that this investigation is not intended to provide a comprehensive assessment of potential releases beyond the operational perimeters of these facilities. Rather, it is intended to provide a first look at these areas post-Katrina.*

I would almost prefer to see this moved up in the document and expanded to discuss further what this study is not. This is not a comprehensive assessment of concentrations in the areas noted since a statistically based sampling design is not used nor is baseline data established to determine sample population needs. This is not a loading study to determine the amount of new sediment, or changes in total soil burdens

(or sediment, but the concept is less relevant there). In this context this is not a criticism, but simply that this is a rapid and qualitative assessment of soil and sediment concentrations in potentially impacted areas, limited in scope by time and the critical nature of the circumstance.

(2) Soil and sediment sampling is operationally defined in a manner consistent with a modal soil concept. That is, a standard A horizon with no change due to the flooding. Sediments are more vaguely described as a grab sample up to 6 in.

For sediments, is there more than can be said for the sampling criteria as to depth? It would seem to standardize the results to say a depth of some standard amount, say 3 in, unless conditions warranted a different increment and talk about what might be encountered. If there is a gravelly bed over fine sediments, or the opposite for some flooding phenomenon, is all just sampled the same? Is there any insight on particle size for these samples to go along with the interpretation of the chemistry data?

For soils, the idea here is to get a quick look at surface material concentrations. However, if there are major differences in the morphology of the native soils among sites, then this could be confounded by what is being sampled. If flooding eroded surface Ap horizons in some areas and not in others, or flooding deposited an overburden in some areas than not in others, then a 0-3" depth from the physical surface could be sampling many different materials, and composite samples would complicate the issue further. I have no idea about the nature of the soils in the wetland at Gulfport, but if soil sampling is going to take place, are there surface O horizon layers involved? For these reasons I recommend some additional language regarding the sampling procedure to be followed, and that a digital photo record of the sampled sites be included. I also recommend that evidence of sediment overburden or erosion be noted as to depth. For the purpose of this initial survey of these sites, a surface 0-3" likely remains the best course of action without the time for reconnaissance evaluations. However, the document should discuss the issues and emphasize the operationally defined nature of the sampling planned. And despite the likelihood of all of the soil sites being disturbed lands, some language should address the use, or the lack of applicability, for NRCS soil survey information for these sites. If these surveys identify major soil types in areas that have not been drastically altered by past human activity, then these could be used to guide some of the soil sampling.

DFO Note: Dr. Fernandez provided the following comments as inserts to the text in the document.

Section 1.0

“Phosphates complex will also be analyzed using gamma spectroscopy in addition to the parameters listed above.”

Comment: As written, this seems to mix the instrument for analysis (gamma spectroscopy) with parameters measured by referring the parameters above. I think this should say what is being measured along with the instrument if desired.

Section 1.2

Risk Management Plan (RMP) Facilities. “There was a minor chlorine leads on piping...”

Comment: It might be technical language I am not familiar with, but is this talking about “leaks”?

“FeCL”

Comment: If this is chloride, it’s a lower case “l”.

Section 2.1.1

“It must be strongly emphasized that this investigation is not intended to provide a comprehensive assessment of potential releases beyond the operational perimeters of these facilities. Rather, it is intended to provide a first look at these areas post-Katrina.”

Comment: Might want to italicize as this is critical information for the context of this study.

Section 2.1.2

“The ??? will help define the objectives of the field investigation.”

Comment: something missing?

Section 2.1.3

“The primary inputs needed to support the decision are surface soil and sediment samples.”

Comment: Wouldn’t the primary inputs be results from the analysis of surface soil and sediment samples, not just the physical samples?

“Samples from the Chevron Refinery – Pascagoula, First Chemical, and MS Phosphates complex will also be analyzed using gamma spectroscopy in addition to the parameters listed above.”

Comment: state for what?

Section 2.1.4 – Temporal Boundaries

“All efforts will be made to obtain quick turnaround on the analytical results to expedite decision making.”

Comment: Shouldn’t “decision-making” be hyphenated throughout?

Section 2.1.7

“Samples will be collected on an authoritative basis, from areas deemed most likely to be impacted.”

Comment: Meaning?

“Two grab samples will be collected from ditches draining the facility to St. Louis Bay.”

Comment: To be analyzed separately or composited?

Section 3.3

“The surface soil samples will, where appropriate, be collected as 5-point composites (“X” pattern, with aliquots in center and on corners) using stainless steel hand augers.”

Comment: Other protocols referred to likely include this information, but it might be good to indicate here that operators are wearing a specific type of glove, and whether they use new gloves for each sample.

“All grass, roots and other vegetative material, as well as small rocks or stones, will be removed from the sample matrix during sample mixing, prior to containerization.”

Comment: Is there any guidance for operators on where they sample, or rather when they deviate from 100 ft? Presumably a major obstruction like a wall would be good reason. But what about a messy sample due to roots or rocks or signs of disturbance? This speaks to how rigidly systemic vs modal the samples end up being.

“Sediment samples will be collected at the selected locations using stainless steel scoops, stainless steel spoons and/or stainless steel hand augers. The depth to be sampled should not exceed 6” but may be less.”

Comment: Based on what criteria? I might be better to state an initial target interval for the sediment but then the guidance for modifications thereof.

Section 3.4

“Samples from the Chevron Refinery – Pascagoula, First Chemical, and MS Phosphates complex will also be analyzed for Radium 226 and radionuclides using gamma spectroscopy ...”

Comment: Finally! This information should be included above as well.

Section 3.6

“A duplicate sample is a co-located sample, usually collected less than six inches from the primary sample at a location and is collected to show variability of the matrix sampled.”

Comment: Are there any other standards or QA samples involved in the project? I am thinking if there is a field standard used, such that it is a known sample matrix that is put in the same bags, carried to the field in coolers and simply “takes the ride” to determine if there are changes in concentrations that might occur from the handling process?

Section 3.7

“The locations of all samples will be logged using a GPS capable of one meter accuracy, as specified in **Section 2.1.7**. If a sample location is in an area where a GPS signal cannot be received, sampling stations will be located using a tape and compass from a known point.”

Comment: I would recommend a digital photo of each sampling location is collected that could aid in later interpretations, or the use of the data from this study for future monitoring of changes over time.

Section 3.9

“It should be noted that time constraints do not allow for the normal QA/QC checks for the pre-cleaned sample containers as specified in the EISOPQAM.”

Comment: Without knowing this document and its protocols, this could be addressed by putting lab standards into a clean bottle and taking to the field for handling as a ‘field blank’?

Section 4.2

“Analyses for metals, VOCs, semivolatiles, pesticides and PCBs will be performed by CLP laboratories.”

Comment: Is there anywhere in this document where the list of metals is actually spelled out? That could be useful, depending on the users of this document.

Section 5.2.2

“Following collection of the initial sample that is to be duplicated, the sample will be re-collected with clean equipment.”

Comment: Since soil samples, I believe, will be composited, it is not clear to me at what level the duplication is taking place. This is presumably a duplicate of a single specific sample (not a composite of 5), and therefore the duplicate is located nearby. However, the data from the primary sample will only be from a composited sample. This may be my confusion, or just the use of standard language that needs some modification or clarification for the specific design employed here. Same issue for Splits in 5.2.3.

Michael McFarland

Quality Assurance Project Plan Katrina Response Environmental Soil and Sediment Sampling Gulf coast of Mississippi – McFarland Comments

In general, the quality assurance project plan (QAPP) provides a clear and concise description of the data collection activities designed to document the potential hazardous material and constituent releases from Risk Management Plan, Tier 2 and Toxic Release Inventory (TRI) facilities in the Hancock, Harrison and Jackson Counties of Mississippi. Based on facility history and operation, the soil and sediment sampling program will focus on a specific suite of hazardous chemicals. Results from the soil and sediment sampling activities should provide a valuable “snapshot” of the extent of contamination associated with chemical releases from the various facilities. The quality control measures appear sound and should result in ensuring the integrity of laboratory results.

Response to the SAB Charge:

Project Objectives – are they clearly stated?

The answer to this question is clearly no. There are obvious inconsistencies between some of the statements found within the data quality objectives (DQO) process description as well as statements found in other parts of the document. For example, under Section 2.1.2 (DQO), it states that the decision is to “determine what areas of the Mississippi Gulf Coast, in immediate proximity of the hazardous waste facilities, may be the site of potential releases of hazardous materials to surrounding soils and/or sediments”. The data collection efforts will clearly support the resolution of this decision. However, in Section 2.1.5 (DQO), it is stated that the data will be utilized by the Technical Services Section to “make a preliminary assessment ... of whether exposure to contaminated soil and sediment may pose an actionable human health risk”. The data collection activity, as presently designed, will not support this decision. Similarly, in Section 4.0 (SAMPLING DESIGN AND RATIONALE), the QAPP states that “the collection of these samples will help determine if an acceptable risk to human health exist in the affected areas”. The collected data will not support a decision of whether there is acceptable risk to human health because the data collection program was not designed to specifically address that issue.

In summary, the project objectives need to be more explicit. In the current document, the reader is left to infer what the QAPP project objectives are meant to be. In some cases, it appears that the objective is simply to provide an estimate of the extent of contamination present at certain physical locations (e.g., snapshot) while, in others, the objective seems to be to determine if, as a result of chemical releases, soils and/or sediments pose an unacceptable risk to public health.

Sampling design – will it provide the data needed to meet the stated objectives?

The data collection activity will establish a “snapshot” of the extent of contamination associated with potential releases of hazardous materials and constituents from specific Risk Management Plan, Tier 2 and Toxic Release Inventory (TRI) facilities. This objective, which is described in Section 2.1.2 (Identify the decision) of the QAPP, is supported by the described field sampling activities. However, the data collection activity will not support a decision of whether or not exposure to contaminated soil and sediment poses an actionable human health risk.

In my opinion, the overarching limitation of the QAPP to address the issue of human health risk stems from failure of the document to fully complete the DQO process. The problem starts in Section 2.1.5. (i.e., Decision Rule). The decision rule is normally structured as an “if - then” statement. For example, the decision rule could state simply that if the field sampling data results in chemical concentrations above some actionable threshold, then the decision-makers will conclude that there is an unacceptable human health risk associated with the soil and/or sediment.

The problems associated with Section 2.1.5 then extend to Section 2.1.6 (i.e., Error Limits). In Section 2.1.6, there appears to be some confusion as to what is meant by decision error and how it can be controlled. The QAPP is correct in that imprecision and systematic bias (what is termed variability in the document) in sample collection and analysis can lead to decision error. The DQO process recognizes this fact and allows the decision-maker to establish the tolerable error limits associated with decisions based on the results from field sampling.

The error limits are basically the level of uncertainty that the decision-maker can tolerate in his/her decisions. In other words, does the decision maker want his/her decisions to be supported with 95% confidence, 99% confidence, 99.9% confidence etc. Once the decision-maker establishes the tolerable error limits (level of uncertainty) necessary to support decisions, that information can be used in conjunction with parameter variability to determine the minimum number of samples that must be collected. For example, if the decision-maker desires to have decisions supported with 99.9% confidence (i.e., the decision-maker wants to limit the probability of maker the wrong decision to no more than 0.001%), the number of field samples that must be collected will be significantly greater than if the decisions only need to be supported with 90% confidence (error limit of 0.10%), everything else being equal.

Since the QAPP does not specify the contaminant action levels, tolerable error limits or an estimate of parameter variability, the sampling design cannot be optimized (Section 2.1.7) in terms of collecting the correct amount of data to support decisions with a known level of confidence. Moreover, it appears that the specified number of soil/sediment samples to be collected in the current sampling program was established arbitrarily or, at least, was not based on a systematic process that explicitly recognized the decision-maker’s specified data quality requirements.

Despite the QAPP’s failure to account for the decision-maker’s data quality requirements, the sampling plan does account for professional judgment in terms of where to collect samples, and, therefore, supports development of a “snap shot” or estimate of the extent

of potential contamination. This information can be used, amongst other things, to establish the contaminants of concern as well as the variability in their concentration which, in turn, may be employed to develop a more focused field sampling activity specifically designed to address questions of public health risk.

Minor Recommendations

The following bullets summarize minor recommendations.

- Section 5.4 – The QAPP duly recognizes the importance of completing a follow-up data assessment to determine whether the data generated is of the correct type, quality and amount to be used for its intended purpose. This data assessment process should be systematic and, therefore, it is recommended that the QAPP incorporate the following document by reference - Guidance for Data Quality Assessment: Practical Methods for Data Analysis (QA/G-9): EPA/600/R-96/084.
- It would be of value to insert a list of acronyms in the front of the QAPP.

Douglas Splitstone

Quality Assurance Project Plan,
Katrina Response Environmental Soil and Sediment Sampling,
Gulf Coast of Mississippi
Splitstone Comments

Summary Comments

I found the subject quality assurance project plan (QAPP) to be a detailed description of where samples are to be collected, sample handling and field collection procedures to be employed, and sample assays to be performed. The description of precisely what is to be accomplished by this effort is fuzzy and apparently multifaceted. The sampling design chosen is understandably one of expediency. However, the decisions supported by an “authoritative” or “judgmental” sampling program are quite limited in scope. This fact is not reflected in the QAPP.

It is obvious that should one or more of the designated analytes be detected at a “high” level, then further investigation will be initiated. There is no mention of what will happen if none of the target analytes are detected, let alone the risks of this outcome being false. The sampling design may permit the assessment of such a risk for some of the varied objectives listed in Table 1 (Rationale) but certainly not all. One such objective is “Evaluate potential for hazardous constituents to have drained from the site via ditch.” However, the sampling would not permit such an assessment for “Evaluate potential for hazardous constituents to have moved North with the storm surge.”

Clearly Stated Project Objectives

The objectives of the project appear to be stated differently in various sections of the QAPP. The objectives also appear to broaden in scope as one progresses through the document. In addition to the various “rationale” listed in Table 1, the following are some examples:

1.0 INTRODUCTION

“The analytical results will be evaluated to determine if these constituents are present in soils and sediments adjacent to the facilities, indicating a possible release to the environment, which may in turn lead to a more thorough assessment.”

2.0 SAMPLING/DATA QUALITY OBJECTIVES

2.1 Data Quality Objectives

2.1.1 Problem Statement

“The problem is identifying these potential releases to surrounding soils and sediments. It must be strongly emphasized that this investigation is not intended to provide a comprehensive assessment of potential releases beyond the operational perimeters of these facilities. Rather, it is intended to provide a first look at these areas post-Katrina.”

2.1.2 Identify the Decision

“The decision needed is to determine what areas of the Mississippi Gulf Coast, in immediate proximity to the hazardous waste facilities, may be the site of a potential release of hazardous materials to surrounding soils and/or sediments.”

2.1.5 Decision Rule

“The Technical Services Section . . . , will review the data and make a preliminary assessment whether soil or sediments may have been adversely impacted and whether exposure to contaminated soil or sediment may pose an actionable human health risk.”

2.1.7 Optimize Sampling Design

“Port Bienville Industrial Park (Polychemie, Inc.),

Grab sediment samples will be collected at the three indicated locations **to determine** if a potential release occurred as the storm surge receded. Two composite surface soil samples will be collected at the indicated locations **to determine** if contaminants may have moved further inland from the facility on the rising flood waters.”

“Ershigs Fiberglass,

Four composite surface soil samples will be collected as shown, **to determine** if

contaminants may have been deposited between the facility and nearby housing.”

4.0 SAMPLING DESIGN AND RATIONALE

“The collection of these samples will help determine if an unacceptable risk to human health exist in the affected areas.”

4.1 Sampling Design

“These sampling stations were selected to provide preliminary information on potential releases to nearby housing and sediments.”

Adequacy of the Sampling Design

The sampling design is clearly described in Section 2.0 of the QAPP.

2.0 SAMPLING/DATA QUALITY OBJECTIVES

2.1 Data Quality Objectives

2.1.7 Optimize Sampling Design

“Samples will be collected on an authoritative basis, from areas deemed most likely to be impacted. Specifically, soils will be sampled adjacent to facility perimeters and sediment samples from drainage pathways. If samples cannot be safely collected, the sampling team will note the location and report it to the field project leader. Proposed sampling locations are presented in **Table 1.**”

The limitations of the design of choice are not recognized. These limitations are clearly stated in several of the USEPA guidance documents regarding data quality. The following is from *Guidance for Data Quality Assessment, Practical Methods for Data Analysis, EPA QA/G-9, QA97 Version*. Either the sampling design needs to be revised to meet the stated objectives or the objectives revised to be consonant with what the chosen sampling design can deliver.

1.3 DESIGNS FOR SAMPLING ENVIRONMENTAL MEDIA

Sampling designs provide the basis for how a set of samples may be analyzed. Different sampling designs require different analysis techniques and different assessment procedures. There are two primary types of sampling designs: authoritative (judgment) sampling and probability sampling. This section describes some of the most common sampling designs.

1.3.1 Authoritative Sampling

With authoritative (judgment) sampling, an expert having knowledge of the site (or process) designates where and when samples are to be taken. This type of sampling should only be considered when the objectives of the investigation are not of a statistical nature, for example, when the objective of a study is to identify specific locations of leaks, or when the study is focused solely on the sampling locations themselves. **Generally, conclusions drawn from authoritative samples apply only to the individual samples and aggregation may result in severe bias and lead to highly erroneous conclusions. Judgmental sampling also precludes the use of the sample for any purpose other than the original one.** Thus if the data may be used in further studies (e.g., for an estimate of variability in a later study), a probabilistic design should be used.

When the study objectives involve estimation or decision making, some form of probability sampling is required. As described below, this does not preclude use of the expert's knowledge of the site or process in designing a probability-based sampling plan; however, valid statistical inferences require that the plan incorporate some form of randomization in choosing the sampling locations or sampling times. For example, to determine maximum SO₂ emission from a boiler, the sampling plan would reasonably focus, or put most of the weight on, periods of maximum or near-maximum boiler operation. Similarly, if a residential lot is being evaluated for contamination, then the sampling plan can take into consideration prior knowledge of contaminated areas, by weighting such areas more heavily in the sample selection and data analysis. Probability samples are samples in which every member of the target population (i.e., every potential sampling unit) has a known probability of being included in the sample.

Louis Thibodeaux

COMMENTS SAB Reviewer of EPA Region 4 Hurricane Katrina
Soil and Sediment sampling Plan.
Louis J Thibodeaux, LSU Baton Rouge, LA
3 October 2005

The storm surge. A hurricane surge is windstorm generated floodwaters originating from an ocean or lake moving onto the beach and points further inland. In the case of Katrina the high water mark appeared to be 24-30 feet above MSL in Long Beach, MS. It is characterized as a mass of water moving onshore at approximately the "over the bottom" speed of the eye. The water rise rate is of the order of meters in minutes. Wind waves are superimposed onto this rising tide. In combination the incoming water is moving very rapid and is very turbulent containing considerable suspended particles (i.e., TSS) derived from the bed sediment of the nearest upstream water body. Typically these

include the near shore marine(MS Sound), the bay (Bay St. Louis), the bayou or river. On the rising flood the flow is usually more erosive than on the falling flood. During the slackwater time -period the flow is very mild and particles settle from the water column. The outflowing water is hindered by the counterflowing wind and the slow recession of the water level in the ocean, bay, etc.

Surge chemodynamics. The problem is identifying potential hazard chemical release to the surrounding soils and sediments (para. 2.1.1, p. 9) from impacted facilities containing these substances. To this end the above description of a general storm surge serves as a backdrop for developing a strategy for locating sampling sites. The following surge related chemodynamic dispersion events occur: 1. the incoming torrent will likely damage equipment, washout material from surface impoundments, erode exposed contaminated surface soils, entrain spilled liquids and solids, etc. 2. and move suspended and floating material inland with a vector heading in the direction of the flow velocity, 3. solubilize a fraction of the mobilized material and translocating a solid-bound fraction plus any free-phase material with density greater than water, 4. deposit relatively clean particles (sands then silts and clays) during the slackwater time-period upon the dislodged and translocated hazardous material, 5. and the out-going flow will move relatively rapid in the ditches and stormwater conveyences and erode much deposited material.

Comments and concerns about the plan.

Are the objectives twofold? Is the plan to collect soil and sediment samples (1) near impacted facilities to determine if flooding from the storm surge released hazardous constituents and materials, and (2) to determine the dispersion/delivery of this material to residential settings(para. 2.1.1, p. 9).

It appears that the goal of the project is to obtain analytical results and to evaluate the data in order to decide whether releases from any potential sites have occurred(para. 2.1.2, p. 9).

With limited resources and time a focus on locating release sites rather than human exposure sites may be more achievable primarily due to the higher concentration levels likely encountered at the release sites.

Having each team approach each site with a generic protocol for sampling is an excellent tactic(para. 2.1.7, p.11).

It appears that many of the located sample sites around some facilities are consistent with the chemodynamics of the surge

process. They appear to be located in positions likely to intercept the contaminated sediment "plumes" produced by flood flows moving over expected source areas. Sample sites shown on Figs. 7,8 and 11 appear to be good examples.

The rationale for the 5-point composite for surface soils(para. 3.3, p. 12) is unclear. Corner samples one hundred feet from center outline a very large area. Locating sample spots using a generic protocol traversing projected sediment plume locations that originate from likely within-facility source areas may increase the probability of finding hazardous materials on surface soils.

A surface soil sample obtained upon removing all grass, roots, etc. taken from an interval 0" to 3" interval below ground surface (para. 3.3, p. 12) may be more representative of material layed down prior to Katrina. A protocol obtaining a scraping sample within the top 1 cm. layer of a 1 square meter area of surface soil may be more representative of katrina derived material.

In the case of sediment in layers deposited on soils, ditches, wastewater conveyances, etc., it may be appropriate to locate the fresh deposit sediment/pre-existing "soil" interface and sample the layers 0" to 3" upward. The First Chemical Corp.-Pascagoula primary products are aniline, nitrotoluene and nitrobenzene which are liquids with densities in the range of 1.1 to 1.2 gr/cm³. Being sinkers they likely will migrate to this interface. Also, contaminated solids eroded from the impacted facility arrive first and likely settle from the water column first while later arriving cleaner particles settle on top. They will likely be near this interface as well. The sediment column length sampled should not exceed 6" but may be less as noted in paragraph 3.3, page 12.

**U.S. Environmental Protection Agency
Science Advisory Board
SAB Workgroup on Katrina Soil and Sediment Sampling Plan
Additional Collected Individual Comments on U.S. EPA Region 4 “Quality
Assurance Project Plan, Katrina Response, Environmental Soil and Sediment
Sampling, Gulf Coast of Mississippi, September, 2005”**

As of October 5, 2005 (8:30 a.m.)

Samuel Luoma

I cannot add too much to the comments you sent along, other than to concur with the conclusions about fuzzy objectives and the importance of making the sampling approach compatible with objectives. There are two additional details that might be helpful to the team.

1. As Ivan noted, soil and sediment texture (particle size) will be a very important confounding factor in determining if contaminants were mobilized or if soils or sediments are contaminated. In practical terms it is the fine-grained material that is of the greatest concern for human health (dust, under fingernails, ingestion, mobility etc.) and the most likely to cause difficulties (be mobilized) when the sediments are moved. False negatives are a strong possibility if the particle size is not removed; especially where so much physical energy was involved. Minimizing the particle size bias involves more than just removing pebbles; sands, silts and clays will give very different results when exposed to same input of contaminants. I would recommend isolating fine-grained materials from a subsample from each site OR analyzing all samples for Al, Ti and Organic C...all markers of clays or surface area for inorganics and natural controls or organic chemicals. That would aid interpretataions with regard to regulatory critieria (i.e. assure low values are not just diluted with sand) and provide a basis for understanding if samples are beyond the regional baseline of contamination.

2. False negatives, or at least questionable conclusions from the point of view of public trust, are also possible if the only basis for decision making is compliance with regulatory standards. Even though the present effort is just a "snapshot", the data will be useful and credible if there is some objective basis for comparing concentrations in these facilities to the regional baseline created by the storm. This does not require an exceptional effort. I believe five sites outside the influence of industrial contamination should be sampled; just as the industrial sites are sampled. Comparisons could be normalized for Al or Organic C (as above) and give a quick snapshot of the degree of any contamination issues. Any study like this needs "controls" for perspective; even though it is often the last thing some institutions want to fund.

Samuel N. Luoma
Fulbright Distinguished Scholar, 2004
Scientific Associate
The Natural History Museum London

**U.S. Environmental Protection Agency
Science Advisory Board
SAB Workgroup on Katrina Soil and Sediment Sampling Plan
Additional Collected Individual Comments on U.S. EPA Region 4 “Quality
Assurance Project Plan, Katrina Response, Environmental Soil and Sediment
Sampling, Gulf Coast of Mississippi, September, 2005”**

As of October 5, 2005 (10:30 a.m.)

Deborah Swackhamer

Charge Question 1: I think the original objectives stated in the introduction and then explained more fully in Section 2.1.1 and 2.1.2 are clear and appropriate, to “determine what areas of the Mississippi Gulf Coast, in immediate proximity to the hazardous waste facilities, may be the site of a potential release of hazardous materials to surrounding soils and/or sediments.” However, later on in the document, in section 2.1.5 and 4.0, different objectives are stated, which are not appropriate to the sample design. Specifically, the objective to determine “whether exposure to contaminated soil or sediment may pose an actionable human health risk” and if there is “unacceptable risk to human health” is not supported by this design. This is a screening study, not a risk assessment study. The implication is that the decision to be made is a yes/no decision, is the site have potential releases and needs to be studied further, or not?

Charge Question 2: In general, the sampling design will provide the necessary data to meet the objective stated in 2.1.1 and 2.1.2. The design and subsequently generated data would not support a health risk assessment, however.

Specific Comments and Questions related to the Charge Question 2:

There are lots of acronyms used without a full spelling out of what they mean. For example, NCBC (not defined until much later after its first appearance in document); EISOPQAM, ASBLOQAM, IDW.

Is there any information on what such sampling results would look like pre-Katrina? In other words, what is the background contamination from these sites in the immediate vicinity?

Timeline – hopefully sampling has not yet begun, and this review will have an opportunity to assist in and improve this effort.

Section 2.1.6 states that it is “important to specify the acceptable decision error rates.” What are they?

Sections 3.1. and 3.3 – it would be preferable to have field staff who are experienced at conducting soil and sediment sampling, as there is some degree of professional judgment involved in this design.

Sampling depth – why 3” of soil, 6” of sediment? What is the rationale?

It is understandable that there is not the time to check the pre-cleaned containers for contamination. However, it would be useful to know the past performance of this QA check.

In section 5.2, the matrix spikes, duplicate sample collections, and split sampling will all occur at 5% frequency. For the 33 samples in this plan, that amounts to 1 matrix spike, one duplicate, and one split. Will this be sufficient? Or will you do 2 (round up the number of samples)? This should be clarified. It should also be specified that they will be analyzed for all the same analytes as the regular samples. Given that the NCBC site is being sampled for dioxins but not other analytes, these QA measures will not be representative of this site –since duplicates, splits and matrix spikes for this site alone would be expensive to analyze, and perhaps not necessary for a screening study, I suggest that they be collected and held without immediate analysis as a backup (the sampling is likely far less expensive than the analysis). In any event, the QASP should discuss these issues.

**U.S. Environmental Protection Agency
Science Advisory Board
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Additional Collected Individual Comments on U.S. EPA Region 4 “Quality
Assurance Project Plan, Katrina Response, Environmental Soil and Sediment
Sampling, Gulf Coast of Mississippi, September, 2005”**

As of October 5, 2005 (11:00 a.m.)

Jeffrey Griffiths

Comments: Jeffrey K. Griffiths, Tufts University October 5 2005

Charge Question 1: Are project objectives clearly stated?

1. The concept that this is a preliminary snapshot should be reinforced at the beginning of the document, as it is in section 2.1.1. In my view, this snapshot is both necessary first step, while insufficient, to provide a thorough assessment of human health risks as stated in later sections. It should be emphasized that the sampling sites are ones that in professional judgment are likely to be ones that are contaminated, should contamination have occurred. The rationale for these sites, on pages 11-12, and in Table 1 (page 13), is not well documented however reasonable the ‘professional judgment’ may be as to site selection. The language about health risk assessments and so forth should be harmonized with this snapshot approach.

Charge Question 2: Sampling Design

I presuppose that this design is a preliminary snapshot testing sites that are highly likely to have been contaminated should contamination have occurred, based on drainage patterns, proximity to holding tanks, etc. (see prior comment about site selection rationale).

2. The sampling may mix new deposits with old sediments/soils, and so the sampling plan has to document the overlying deposits, provide a visual record, and the samples should be characterized as to depth and composition (new and old). On page 10 the depth of the soil samples is listed as 3”, and in other locations the sediment samples depth is listed as up to 6 inches. I am unclear how the sampling team will sample new sediments lying atop soil.

3. In the initial text, the fact that some sites will be tested for unknown contaminants with gamma spectroscopy should be fixed, so that the radionuclide contaminants to be explored with gamma spec are delineated (just as dioxins, VOCs, heavy metals, etc are delineated in the preceding text).