CSTF AQUATIC SUBCOMMITTEE MEETING NOTES
MARCH 7, 2002
CORPS OF ENGINEERS OFFICE

The March meeting of the CSTF Aquatic Subcommittee was held on March 7, 2002 from 10-12 at the Corps of Engineers office in Los Angeles. A list of the meeting attendees is attached. The topic of discussion was the Long-Term Monitoring Plan (LTMP) for the aquatic capping site. As such, no other topics were discussed. The following is a summary of the meeting.

Steve Cappellino reviewed a draft outline for the LTMP that was sent around for comment approximately 2 weeks before the meeting (see attached). Steve mentioned that while Heal the Bay was not present at the meeting, Mitzy Taggart had provided some comments prior to the meeting. Mitzy had two main concerns. First, she wanted to make sure that the Work Plan contained sufficient rationale on why the proposed sampling methods will answer the objective questions for the program. For example, how will collecting sediment concentrations at specific sample depths tell us if the chemicals are migrating through the cap? Her other concern was that the wording of the monitoring duration should be presented clearer such that while a decision may be made after 3 years, and our current estimates are that monitoring may continue for up to 10 years, this specific portion of the NEIBP should be left alone for a longer period of time so that it could continue to be monitored, if someone wanted to do so. Steve suggested that they address Mitzy's concerns by structuring the objectives similar to EPA's Data Quality Objectives process to ensure that sufficient data is collected to answer the questions at hand and that the text related to monitoring duration be revised to clearly state that the site will not receive additional material for many years so that additional monitoring could occur. All agreed that the proposed changes would be sufficient and the group then moved on to specific comments from the meeting attendees.

All in attendance agreed that the objectives presented in the draft outline were accurate, but that the Work Plan needed to clearly define what is considered success or failure. The group then went through each of the three main categories for monitoring: cap integrity, chemical containment, and biological recolonization. Everyone agreed that biological recolonization was a secondary objective, evaluated more from a local natural resource perspective than as a measure of success/failure.

Cap Integrity

Steve Bay asked about using sub-bottom profiling to map the surface of the cap, in addition to bathymetry. After a brief discussion, all agreed that Anchor would look into its feasibility/accuracy potential at the site (see note addendum at end for follow-uo information). Jack Gregg agreed that some other measure of surface integrity was needed to augment the proposed surveys. Jack then asked what the accuracy of the current surveys was. Ying Poon mentioned that the accuracy was 0.1 meter vertically, and 3x3 meters horizontally (after the data is reduced to a workable format).

Chemical Containment

Steve Bay asked why we were not planning to look at pore water chemistry. Steve Cappellino responded that the thought process was that if chemicals are migrating through the cap via the pore water, as they enter oxidized zones in the cap material, some of the chemicals should re-partition back to the sediment creating a signature that could be detected analytically. Since it is easier to collect a sediment sample from a discreet sample layer than to collect pore water, this approach was proposed. In addition, we do not have any pore water samples from the baseline monitoring so we would not know what the starting concentrations might be for future monitoring. After a brief discussion the group decided to leave out the pore water monitoring for now and revisit it after the initial rounds of testing to see if it would be beneficial.

Steve Bay stated that he did not feel that using surface grabs to collect surface chemistry was the best way to go. He suggested instead using shorter diver cores through the cap surface only. After discussing the benefit of shorter vs. longer core samples, the group decided on the following plan:

Collect shallow diver cores (~5 feet long) through the cap into the top of the LARE material. These cores will then be sub-sampled at the following intervals: just above the mixed cap/LARE layer, midway through the cap layer, and at the cap surface. Alternating layers will be archived to fill in additional data, if needed. For example, if the cap is 3 feet thick and the particular site had a 6 inch mixed layer between the cap/LARE material, the goal would be to collect a four foot core and section at the following intervals: 0-0.5 feet (surface), 1.0-1.5 feet (mid-core), and 2.0-2.5 feet (just above mixed layer). Final interval depth would depend on the minimum requirements for analysis, but would not exceed 6 inches. A review of the data should occur to look for indicator chemicals to use so that the sample interval can be reduced.

Biological Recolonization

Steve Bay suggested possibly collecting mounded material from burrows on the surface of the cap for chemical analysis, if present during the diver surveys. The thought being that this might show if the organisms are burrowing into the LARE material.

David Moore suggested that the entire program be written as a phased approach where preliminary samples are collected as part of standard monitoring, but that secondary (confirmatory) steps be taken (as with Steve's above example) if indications show potential migration, etc. All agreed that this would be a good approach to take.

Steve Bay mentioned that current research shows that it is better to randomly locate the benthos sample stations rather than clustering them as previously done. A 10-meter grid was suggested so that 5-10 stations are located in the pit and 5-10 stations are located around the edges of the pit (both within the larger NEIBP depression and on the surrounding edges). The requested changes will be made in the work plan.

With that the meeting was concluded at 12 pm. A detailed work plan will now be developed and sent around for review before the next aquatic meeting scheduled for March 25th from 10-12 at the POLA.

Meeting Note Addendum: Sub-Bottom Profiling

The issue of using sub-bottom profiling to assist in monitoring cap integrity was researched by Anchor staff following the meeting where is was discovered that the technology would not work at the current time due to methane gas bubble interferences. The best explanation can be summarized in the following description provided by Tony Petrillo of Blue Water Engineering in Seattle, WA.

> "Sub-bottom profiling over sediment rich in organic materials may be of limited usefulness. This is because sediments rich in organic materials, while decomposing, often produce biogenic gas. This gas can sometimes be observed bubbling to the surface. The problem is that, while sub-bottom energy can usually travel from water through the water sediment interface to a sediment matrix, trapped gas within the sediment only reflects sub-bottom energy. This results in a sub-bottom record completely being opaque to sonar energy. This is because, while water and sediment sound velocity are similar in velocity (nominally 4800 ft/sec and 6000 ft, respectively) sound velocity in biogenic gas is roughly the same as that in air or 1100 ft/second. This results in an acoustic impedience mismatch and inability of sound waves to penetrate the gas trapped in the sediment."

Additional information related to this subject is also available from the Corps and can be provided upon request by contacting Steve Cappellino at 949-833-7150.

Attachment A
NEIBP Long-term Monitoring – PROPOSED Sampling OUTLINE

Objectives:

- Intensive monitoring for the first three years should provide substantial evidence for predicting long-term cap effectiveness by monitoring cap integrity, chemical containment, and biological re-colonization.
- Monitoring should be able to detect "fatal flaws" in design or site condition factors that are likely to be evident within a few years after cap placement.

Timing and Duration:

Monitoring will occur sometime between July and September. Monitoring will be conducted for up to 10 years, and would include more intensive monitoring for the first three years (summer of 2002, 2003 and 2004) and abbreviated monitoring in years 5 and 10.

Monitoring Overview:

To meet the above objectives, the first three years of the long-term monitoring program for the NEIBP will focus on evaluating three main categories of monitoring: overall cap integrity, effectiveness of chemical containment, and biological re-colonization of the cap surface. Based on the results of the first three years of monitoring, an abbreviated sample program will be developed for the remaining monitoring period.

1) **Cap Integrity** – The objective for this category is to evaluate the overall integrity of the cap to monitor for significant erosional, depositional and/or mixing events.

    a) **Bathymetry** – Bathymetric surveys will take place at the NEIBP disposal site. Each bathymetric survey event will encompass the entire NEIBP and will extend to a distance of 200 m beyond the top lip of the NEIBP disposal cell. The purpose of the bathymetric surveys will be to evaluate possible overall consolidation or deposition.
    b) **Sediment Coring** – Sediment cores will be collected using a vibracore or equivalent device to a depth that penetrates the cap layer and extends into the LARE material. The purpose of these core samples will be to monitor cap thickness and evaluate possible changes in l mixing between the cap and the LARE material. Note that samples for chemical analysis will be collected from these same cores (see below).

2) **Chemical Containment** – The objective for this category is to monitor the effectiveness of the cap at containing chemicals present in the LARE dredge material.

a) **Surface Grab Samples** – Surface sediment grab samples will be collected at stations within and surrounding the NEIBP disposal site to monitor for surface re-contamination of the clean cap surface. Samples will be analyzed for standard physical parameters and LARE COCs.

b) **Sediment Coring –** Sediment core samples will be collected through the cap material and sufficiently into the LARE material to effectively sample the cap/LARE interface. Samples locations will include stations sampled for the post-cap construction monitoring. Sample composite intervals will be a maximum of 20 cm (less if analytical procedures permit) and will focus on areas with visible horizons. Samples will be analyzed for standard physical parameters and LARE COCs.

3) **Biological Re-Colonization** – The objective for this category is to evaluate the potential long-term biological impact of the CAD facility by monitoring biological recruitment of the cap surface.

a) **Benthic Sampling** – Benthic samples will be obtained by screening surface sediment samples collected using a Van Veen grab sampler. Benthic community data will provide information on both the abundance (number of individual organisms) and richness (numbers of species or taxa). By comparison to nearby natural reference stations, this information will be used to track re-colonization of the cap. It will also provide evidence of potential bioturbators (particularly juvenile burrowers and larval stages observable in surface sediments).

b) **Video Surveying -** Underwater video photography will be taken of the cap surface to evaluate for the presence of ghost shrimp burrows or other evidence of bioturbation. These diver surveys will also provide general information on the status of the cap.

c) **Surface Grab Sample Observations** – Surface sediment grab samples collected for chemical analysis will also be evaluated for the presence of bioturbators and macrofauna present on the surface of the cap. These observations will focus on the presence and activity of ghost shrimp (*Neotrypea californiensis*, formerly *Callianassa californiensis*), but will include all evidence of any deep bioturbators or macro biota.