



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

January 3, 1996

Mr. Dave Song
Department of the Navy
Western Division
Naval Facilities Engineering Command
900 Commodore Drive
San Bruno, CA 94066-2402

Subject: EPA Field and Laboratory Audit Reports for Hunters Point Annex

Dear Mr. Song:

Enclosed please find the results of the field and laboratory audits conducted by EPA as part of our oversight of the ecological field investigation. Overall, the audit results indicate that the Navy's contractors are doing an exceptional job of ensuring quality assurance during sample collection and laboratory analysis. The majority of the issues identified in the audit reports were discussed with the Navy's contractors during the audits and subsequently resolved. However, the Navy should follow up with the contractors to ensure that all of the issues identified have been addressed and procedures modified as appropriate.

If you have any questions regarding these reports, please contact me at (415) 744-2387.

Sincerely,

A handwritten signature in cursive script that reads "Sheryl Lauth".

Sheryl Lauth
Remedial Project Manager

cc: Mr. Jim Sickles, PRC
Mr. Cyrus Shabahari, DTSC



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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December 27, 1995

MEMORANDUM

SUBJECT: Inspection of Pore Water Extraction Method performed at Anametrix Inc. Laboratory, San Jose, CA
Eugenia McNaughton

FROM: Eugenia McNaughton, Ph.D., Biologist
Quality Assurance Management Section (P-3-2)

THROUGH: Vance S. Fong, P.E., Chief *Base Eng for VF*
Quality Assurance Management Section (P-3-2)

TO: Sheryl Lauth, Environmental Protection Specialist
Hazardous Waste Management, Navy Section (H-9-2)

Summary

Anametrix, under contract with PRC Environmental Management Inc. (PRC), is processing and making the chemical determination of pore water that is to be sent to Aquatec Laboratories for toxicity testing. U.S. EPA Region 9 Laboratory is analyzing split sediment pore water samples using the same methods.

General Comment

An on-site inspection of the method by which pore water is extracted from sediments collected offshore at Hunter's Point Annex was made at the Anametrix Inc. Laboratory, San Jose, CA, on December 1, 1995. All aspects of sample processing, including handling, storage, preparation and analysis, were observed. Overall, the pore water extraction procedure was well thought out, clearly documented in the Standard Operating Procedure (SOP) and carried out in a well-organized and effective manner. The extraction procedure is consistent with the procedure followed by the staff at the Region 9 Laboratory.

Background

It is necessary to analyze the interstitial, or pore, water in order to evaluate the actual toxicity of contaminants found in a sediment. The methods that have been developed for extracting the pore water do not provide sufficient detail to ensure that laboratories working on a split sample follow the same protocol.

During the planning phase of the Hunter's Point Annex split

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sampling study, modifications to published methods were agreed upon by both laboratories. As the protocol was actually performed, it was found that there was need for further modification. The process was discussed and observed to resolve any remaining procedural questions. The Anametrix draft Standard Operating Procedure (SOP) 7.109 for Pore (Interstitial) Water Extraction from Marine Sediments was followed as written. There were several issues, however, that required clarification.

Specific Issues

1. Salinity and pH are measured when the pore water has been extracted. There was some discussion about measuring pore water ammonia, but there is no mention of ammonia analysis in the SOP. The procedure for measuring ammonia should be referred to in the SOP, even if it is only occasionally part of routine pore water analysis.
2. In discussing the logistics of transporting the pore water sample, it was mentioned that the sample may not always be completely frozen when it is sent. It was agreed that it cannot be assumed that even completely frozen samples will arrive at the bioassay laboratory in that state, though they must be no warmer than 4°C. It was agreed that the laboratory would request that the bioassay laboratory note the physical condition of the sample at the time of its receipt.
3. There was a question as to how to describe a pore water quality control sample in the data package. The Navy contractor should make that decision and confirm it with the laboratory.
4. The material of which the tools and equipment that come into contact with the sediment are made is not specified in the SOP. All tools that come into contact with the sediment and the pore water should be made of non-reactive material. The laboratory's inorganics section manager should inquire about this matter of the supplier or manufacturer and confirm that all such equipment coming into contact with the sample is inert.

SOP

1. [SOP Section 3.0: Interferences] This section comments on the difficulty of maintaining the integrity of the sediment sample, but does not offer procedures by which disturbance of the original chemical conditions may be minimized. Providing advice regarding the use of non-reactive containers, equipment, tools and protective wear and a

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reminder to work gently with the sediment or pore water during transfer procedures would be appropriate for this section.

2. [Section 7.0: Procedure and Data Reduction, Stage Two] The statement that the bottles opposite one another in the rotor should be balanced should be changed to read must be balanced.

Laboratory Coordination

1. The SOP requires that the sediment be centrifuged at ambient collection temperature. The inorganics section manager asked whether that procedure might be changed to allow the sediment to be centrifuged at storage temperature (4°C), which would reduce the overall sample preparation time significantly. Upon consultation with Amy Wagner at the Region 9 Laboratory, it was agreed that the rest of the samples could be run at 4°C after the split sediment samples have been processed as per the protocol. This information was forwarded verbally during the week of December 4th to you, with the understanding that you would forward it to the appropriate parties.
2. The SOP requires that the Stage One centrifugation be run at 3200 x g for 30 minutes. The inorganics section manager stated that there is little difference in sample phase separation at 15 or 30 minutes. A sample was run, stopped at 15 minutes, removed from the centrifuge for visual inspection and returned for the remainder of the prescribed time. Upon a second inspection after 30 minutes, it was agreed that there was little difference. Again, after consultation with Amy Wagner, it was agreed that, after the split sediment samples was processed as per the SOP, the rest of the samples could be run for 15 minutes at 3200 x g during stage one preparation. That information was forwarded to you at the same time as item 1.

If you have any questions, please call me at (415)744-1636.

Dave Song

**SEDIMENT FIELD EVALUATION
AND SPLIT SAMPLING REPORT
PHASE 1B ECOLOGICAL RISK ASSESSMENT
HUNTERS POINT ANNEX**

Field Audit

On 16 November 1995, Ms. Lisa Saban (WESTON) and Ms. Euginia McNaughton (EPA) conducted a field audit of the Navy's contractor (PRC) Phase 1B Ecological Risk Assessment Sediment sampling program. They arrived at Hunters Point at 09:30 and boarded the boat at 11:30 to observe the sediment sampling techniques. The Navy's sediment sampling team consisted of Mr. Jim Baker (PRC), Mr. Timo Alison (PRC), Mr. Scott Adamson (Kinetic Laboratories), and Mr. Jay Wilkin (Kinetic Laboratories). The boat was owned and operated by Kinetic Laboratories.

Mr. Adamson discussed boat safety and Mr. Alison discussed site health and safety issues with Ms. Saban and Ms. McNaughton before boarding the boat. Both the boat safety manual and the site health and safety plan were on board the boat. Mr. Alison informed Ms. Saban that sites X1 and Y2 may contain the radionuclide radium 226 because these sites are adjacent to a landfill where radium 226 was detected. To collect samples from sites X1 and Y2, PRC planned to have a radionuclide safety officer on board the vessel.

During the audit, PRC personnel collected samples from two stations. The first station sampled was TUST03, along transect U off of Parcel E. The second station was TUSM04. The station positioning was performed using a differential global positioning system (DGPS) instrument. This instrument is automatically corrected against a base station at Hunter's Point every 5 seconds for station position accuracy. The DGPS was calibrated by comparing satellite position against known surveyed locations. The instrument automatically corrects every 5 seconds. There appeared to be no problems with station positioning. Each station position was held within a variance of 4-5 meters. Each grab and station position is recorded in the field logbook.

The sampling crew were well prepared and organized for the sampling effort. Sampling techniques were very good. There were a few items that Ms. Saban and Ms. McNaughton pointed out to improve the sampling techniques. The samplers were told to record the depth of sediment removed from the van Veen should they not use the pre-recorded 12-cm. depth. The samplers were informed that this measurement should be performed using a stainless steel ruler so the ruler can be deconed. On several occasions the van Veen was tilted to facilitate siphoning off the overlying water. Although the samplers did not disturb the fine sediment fraction, they were reminded to siphon off the overlying water without tipping the van Veen too far so that fine sediments were not disturbed and removed. The samplers only used one scrub brush for deconing both between stations and between composites. The samplers were told to use one scrub brush to decon between stations and a separate scrub brush to scrub between composites (dedicated equipment) to reduce the potential for cross-contamination.

The sample storage and shipping appeared adequate. The samplers were very thorough and quickly filled the pre-labeled jars and placed the samples on ice. The samplers rinsed the jars off with surface water to clean the excess sediment from the jar surface. The samplers were reminded to check lids to ensure they were secure before rinsing with surface water to eliminate the chance that surface water may get into a sample. The samplers were very careful to leave no headspace in the jars with the exception of one amphipod bioassay sample. The samplers were reminded of the importance of leaving no head space in the jars.

Recordkeeping appeared adequate with the exception of the sample labels. The sample labels were pre-printed with the sample location but not with the type of analysis. Instead of the type of analysis, the sample label read "see COC." The samplers were told this was not acceptable. The samplers responded that it appeared redundant to have the type of analysis written on both the COC (chain of custody) form and the sample container labels. The samplers were reminded that the lab should have both the COC and a pre-labeled sample label to cross-reference. The samplers agreed to record the sample analyses on the labels. The samplers did have a triple-check in place to ensure sample locations and types of analyses were cross-referenced.

Overall, the samplers appeared to do a very good job and were commended on the very organized setup that they had developed for this sampling effort. They were extremely cooperative and were interested in all of the auditor's suggestions to improve the quality of their operation. A copy of the field audit checklist is included in Appendix A.

Split Sampling Effort

Between 20 November and 7 December 1995, WESTON personnel Ms. Laura Samrad, Ms. Gretchen Coffman, and Mr. Scott Emerson-Price collected split samples from the sediment collected by PRC Environmental for the Phase 1B Ecological Risk Assessment. The Navy's sediment sampling team consisted of Mr. Timo Alison (PRC), Mr. Richard Self (PRC), Mr. Cooper Hines (PRC), Mr. Scott Adamson (Kinetic Laboratories), and Mr. Sean Kinney (Kinetic Laboratories). At the end of each sampling day, all split samples were delivered by WESTON personnel to the EPA laboratory in Richmond, CA.

20 November 1995

On 20 November 1995, WESTON personnel, Ms. Samrad and Ms. Coffman, collected split samples from Station 0009TV1 at 08:30, Station 0009TP1 at 11:30, and Station 0009TO3 at 14:00. The grain size of the collected sediment ranged from silty clay to clayey silt, with minor sand. The color was brown with black mottles. No problems were encountered in the sampling effort. The sediment will be analyzed for VOAs, BNAs, pesticides/PCBs, metals, TOC, grain size, and used to conduct an amphipod bioassay. Sediment was also collected for pore water

extraction that will be analyzed for VOAs, BNAs, metals, ammonia, sulfides, and to conduct the Microtox and echinoderm development bioassays.

During this first day of sampling, the labels on the 2-liter poly containers (pore water), were accidentally pre-printed with BNAs twice instead of VOAs on one container, and BNAs on another container. These labels were not corrected until the second day of sampling; however, the lab was informed of the error by Ms. Saban on 20 November 1995. No problems arose as a result of the mis-label.

21 November 1995

On 21 November 1995, WESTON personnel, Ms. Samrad and Mr. Emerson-Price, collected split samples from Station 0009TB1 at 08:30. The grain size of the collected sediment ranged from silty clay to clayey silt, with minor sand. The color was brown with black mottles. No problems were encountered in the sampling effort.

The sediment will be analyzed for VOAs, BNAs, pesticides/PCBs, metals, TOC, grain size, and used to conduct an amphipod bioassay. The sediment collected for pore water extraction will be analyzed for VOAs, BNAs, metals, ammonia, sulfides, and to conduct the Microtox and echinoderm development bioassays.

27 November 1995

On 27 November 1995, WESTON personnel, Ms. Samrad and Ms. Coffman, collected split samples from Station 0009TD3 at 08:45 and Station 0009TI1 at 10:45. The grain size of the sediment retrieved in samples 0009TD3 and 0009TI1 ranged from silty clay to clayey silt, with minor sand. The color was brown with black mottles. The sediment will be analyzed for VOAs, BNAs, pesticides/PCBs, metals, TOC, grain size, and used to conduct an amphipod bioassay. The pore water will be analyzed for VOAs, BNAs, metals, ammonia, sulfides, and to conduct the Microtox and echinoderm development bioassays.

PRC's sample collection was problematic at Station 0009TF1. PRC and Kinnetics Laboratory staff tried unsuccessfully to obtain sediment at this station and in close vicinity to the station. The samplers concluded that tidal currents have created an erosive channel at the proposed sampling location. The few samples retrieved contained only gravel and rock. Samplers tried to retrieve samples for approximately an hour and a half (13:00 to 14:30), with no success. The samplers decided to try again (possibly further from shore) at a later date following discussions with PRC senior staff.

28 November 1995

On 28 November 1995, WESTON personnel, Ms. Samrad and Mr. Emerson-Price, collected split samples from Station 0009TT1 at 09:00. This split location was changed from Station 0009TS1 identified in the split sampling plan (Phase 1B Ecological Risk Assessment Split Sample Analysis and Quality Assurance Project Plan, WESTON, 1995) because PRC was not performing an amphipod bioassay at 0009TS1. This change was made under the EPA RPMs (Ms. Sheryl Lauth) direction (Pers. comm. Ms. Saban and Ms. Lauth, 22 November 1995). Another split sample was collected from Station 0009TQ3 at 11:15. At both stations, the grain size of the collected sediment ranged from silty clay to clayey silt, with minor sand. The color was brown with black mottles.

At Station 0009TT1, the sediment will be analyzed for VOAs, BNAs, pesticides/PCBs, metals, TOC, grain size, and to conduct an amphipod bioassay. The sediment collected for pore water extraction will be analyzed for VOAs, BNAs, metals, ammonia, sulfides, and used to conduct the Microtox and echinoderm development bioassays. At Station 0009TQ3, the sediment will be analyzed for VOAs, BNAs, pesticides/PCBs, metals, and TOC. The sediment collected for pore water extraction at Station 0009TQ3 will be used for the Microtox bioassay.

4 December 1995

On 4 December 1995, WESTON personnel, Ms. Samrad and Ms. Coffman, collected split samples from Station 0009TY2 at 09:00, Station 0009TX1 at 10:30, and Station 0009TF1 at 13:30. PRC had a radionuclide specialist (Mr. Dave Preston) on board screening the samples for possible radionuclides. WESTON personnel were instructed by EPA not to collect the splits if any radionuclides were present. No radionuclides were present in any of the samples; therefore, split samples were collected. The grain size of the collected sediment ranged from silty clay to clayey silt, with minor sand. The color was brown with black mottles.

Station 0009TF1 (the station samplers had problems sampling on 27 November) was moved approximately 60 meters from the shoreline. The original sampling location was closer to the shore. At this new location, sediment retrieval was very good. The grain size of the collected sediment ranged from silty clay to clayey silt, with minor sand. The color was brown with black mottles.

These sediment samples will be analyzed for VOAs, BNAs, pesticides/PCBs, metals, TOC, grain size, and used to conduct an amphipod bioassay. The sediment collected for pore water extraction will be analyzed for VOAs, BNAs, metals, ammonia, sulfides, and used to conduct the Microtox and echinoderm development bioassay.

7 December 1995

On 7 December 1995, Ms. Samrad collected a split sample from Station 0009TM3 at 08:25. No problems were encountered in the sampling effort. The grain size of the collected sediment ranged from silty clay to clayey silt. It was brown in color with black mottles. This sediment sample will be analyzed for VOAs, BNAs, pesticide/PCBs, metals, and TOC. The sediment collected for pore water extraction will be used to conduct a Microtox bioassay. An MS/MSD will be conducted on this sediment sample.

APPENDIX A

FIELD AUDIT NOTES

FIELD AUDIT REPORT: SURFACE SEDIMENT SAMPLING Page 1 of 1

Site/Facility Name: Hunter Point Location: RUSTOC 3 - 954651008
 Date: 11/1/95 (Thursday) Work Period: 11:30 AM To: 12:30 AM PM
 Weather: Clear Scattered Broken Overcast Sea State: calm Wind: calm - foggy
 Chief Scientist: Jim Baker (PRC) Vessel Operator: Scott Adamson (Kinetic Laboratories)
 Onsite Personnel/Company: PRC & field leader L3 Overall Boat safety Oceanographers
Tim Alison (PRC) Houston office
Jim Baker (PRC) LISA Subram (Western)
Jay Wilkin (Kinetic Lab.) Engineer McNaughton (EPA)
L3 Vessel Operation -> Deck Safety

Station Positioning

What equipment (i.e. land-based surveyor, standard theodolite EDM device or DGPS) was used for locating stations? DGPS - shoreline
 Was equipment calibrated? yes no Compares satellite against known surveyed in location
 Was equipment used correctly? yes no corrects every 5 sec
 Who determined station position? Scott Adamson on transect correct distance, angle
 Were vertical positioning data recorded for each station? yes no Set range & bearing prepared in from survey
 If so how was vertical positioning established? navigational chart - nothing 120m from shore
 Did the sampling stations appear to be accurately located? yes no accuracy 1-3 meters (GPS) this site
 How were the positioning data recorded? which operator call out when scan beam hits bottom, Scott records
 Were station locations marked for future sampling? yes no if so how were they marked? Using GPS readings GPS readings on log
 Was relocating of any station required due to presence of debris prohibiting sample collection? yes no + log book time in log book
 If so at which stations and how were repositioning data recorded?
 When collecting multiple grabs, was station repositioning conducted correctly? yes no
 If not, what was the estimated variance in positioning between grabs? 4-5 meter variation (combined 1-3m GPS accuracy & boat movement)
 Did overall station positioning procedures appear to follow procedures outlined in the sampling and analysis plan? yes no
 If not, how did they deviate?
 Comments: they usually collect 6 grabs per station. Scott locates the station and keeps location position - records each grab location
Pre-printed labels.

Sampling Techniques

Were samples collected using a modified 0.1-m² van Veen grab sampler? yes no If not, what type of sampler was used?
 Was the ship stabilized prior to sample collection? yes no If yes, how so? Scott held at position using GPS
 Observations of sample acceptance criteria: Wire angle horizontal - no angle towards
 Water leakage no
 Surface disturbance no, siphoned overlying water - no disturbance of sediment
 Average penetration depth 12cm
 Observations of sample physical characteristics: Grain size fine sand small shell debris, algae, amphipod tubes
 Color brown-black-greenish grey
 Presence of debris very small shell debris, small clams
 Presence of oily sheens no
 Odor no // temperature of sediment taken 15°C
 Were top 10 cm collected for chemical analyses? yes no 12cm brown layer (oxidized) 1cm also streaking (mottled)
 If not, were minimum penetration depths for medium/course sand (4 to 5 cm) or fine sand (6 to 7 cm) achieved? yes no
 Were samples for chemical analyses single grabs or composites If composites, what was the average number of grabs? 6 grabs
 Were sediments homogenized prior to transfer to sample analysis containers? yes no dropped gel from van veen into buckets prior to chemical analysis
 If so, were samples for VOC and sulfide analyses collected prior to homogenization? yes no rose H₂O + bioacet
 Was sampling equipment decontaminated between stations? yes no If so, what decontamination procedures were used? Seawater rinse Alcohol scrub
Distilled water double rinse 0.1N Nitrate Acid rinse Deionized water rinse Methanol rinse rinsed + scrubbed van veen?
 Were field duplicates collected? yes no If so, which stations? between each composite

FIELD AUDIT REPORT: SURFACE SEDIMENT SAMPLING (Continued)

Sampling Techniques (Continued)

Were health and safety procedures observed? yes no

What stations were sampled during the audit? TV9T03

Did overall sampling techniques appear to follow techniques outlined in the sampling and analysis plan? yes no

If not, how did they deviate? _____

Comments: Moved exhaust to side of boat to get rid of fumes out of cabin

Sample Storage and Shipping

Were samples placed in appropriate container types? _____

Grain Size Glass Other _____

Vetals Arsenic Pesticides PCBs "B" "OC" Glass with PTFE-faced lid Other _____

VOAs Glass with PTFE-faced septum lid Other _____

Sulfides Polyethylene Other Glass

Were chemistry samples placed on ice in coolers prior to transport to analytical laboratory? yes no

Were grain size samples placed in a cool location prior to transport to analytical laboratory? yes no

Did sample storage and shipping procedures appear to follow procedures outlined in the sampling and analysis plan? yes no

If not, how did they deviate? _____

Comments: Amplified in 2 AL HDPE - left a week's space in sample pod for samples containers have "see coc" on analysis line. custodian sent each cooler - hand delivered to courier -> lab - same day. there is a refrigerator at the base but not used so far - make a plan to get them out to lab each day.

Record Keeping

Was cruise log prepared correctly? yes no very shallow H2O if grab in balance - toss out 1:25 PM Sampling initiated

Survey name Date Coordinates Wind angle Physical characteristics of sample

Station number Deployment Time Penetration depth

Were samples labeled correctly? yes no Need survey code, sampler initials, and analysis request

Survey code Sampling date Sampler initials

Sample number Requested analysis Says "see coc"

Were sample numbers assigned correctly? yes no

Were chain-of-custody forms prepared correctly? yes no

Did record keeping procedures appear to follow procedures outlined in the sampling and analysis plan? yes no

If not, how did they deviate? _____

Comment: Consecutive sample #'s. keep copy of coc - write sample location on it. fax to PRC in San Fran. Amametrica - San Jose -> Extract Pore H2O -> freeze -> Aquatictech Aquatictech - Pore H2O processing. Have preprinted sample location, sample ID, both in tabular form and in logbook - do not check this way (+ third check of coc form w/ sample ID/location on it).

FIELD AUDIT REPORT: SURFACE SEDIMENT SAMPLING (Continued)

Sampling Techniques (Continued)

Were health and safety procedures observed? yes no

What stations were sampled during the audit? TBMO+

Did overall sampling techniques appear to follow techniques outlined in the sampling and analysis plan? yes no

If not, how did they deviate?

Comments: Overall they did a good job. Careful with filling
knives - close to top of hole then keep knives horizontal
we detected some issues, don't take off sample jars

Sample Storage and Shipping

Were samples placed in appropriate container types?

Gran Size Glass Other _____

Metals Ammonia Pesticides PCBs TB TOC Glass with PTFE-faced Other _____

VOAs Glass with PTFE-faced section Other _____

Sulfides Polyethylene Other Glass

Were chemistry samples placed on ice in coolers prior to transport to analytical laboratory? yes no

Were gran size samples placed in a cool location prior to transport to analytical laboratory? yes no

Did sample storage and shipping procedures appear to follow procedures outlined in the sampling and analysis plan? yes no

If not, how did they deviate?

Comments: _____

Record Keeping

Was cruise log prepared correctly? yes no

Survey name

Date

Coordinates

Wire angle

Physical characteristics of sample

Station number

Deployment #

Time

Penetration depth

horizontal
12cm

Were samples labeled correctly? yes no

Survey code

Sampling date

Sampler initials

Sample number

Requested analysis

"see LOC" - need to sample here

Were sample numbers assigned correctly? yes no

Were chain-of-custody forms prepared correctly? yes no

Did record keeping procedures appear to follow procedures outlined in the sampling and analysis plan? yes no

If not, how did they deviate?

Comment: write sample numbers on side of jar as well as LOC

