

# Memorandum

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Subject: Long Beach Naval Complex RI/FS Workplan and SAP

Date:

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NSY LONG BEACH  
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## INTRODUCTION

Per your request of May 6, 1993 I have reviewed the five documents provided regarding the Long Beach Naval Station and Shipyard: Draft Remedial Investigation / Feasibility ( RI/FS ) Workplan ( both for the Station and the Shipyard ), the RI/FS Draft Sampling and Analysis Plan ( SAP, also for both the Station and the Shipyard ), and the Site 6B Draft Preliminary Assessment Report ( PAR ), all dated April 30, 1993. These reports were produced for the Navy by CH2M Hill and Jacobs Engineering, and are not signed by a geologist or civil engineer registered by the State of California.

For the RI/FS Workplans, I have not reviewed Appendices concerning other disciplines: Appendix A ( ARARs ), B ( Screening Risk Assessment Methodology ), nor C ( Leaching Pathway ). For the SAPs, I have not reviewed Appendices A ( QAPP ), nor B ( Site Safety and Health Plan ). Further, I have not commented on portions of documents dealing with harbor and ocean sediment sampling; though I noticed no obvious problems, my expertise does not include such investigations, so I defer.

The pairs of documents, the RI/FSs and SAPs are nearly identical except for the site-specific sections. In the comments that follow the section numbers are cited for either the RI/FS or the SAP and the comments apply to both RI/FSs or both SAPs. Where a comment applies to only of the documents it is explicitly noted.

## CONCLUSIONS

These documents are well-prepared and represent adequate workplans and SAPs for a Phase I investigation, with the exception of the comments below. The PAR provides adequate basis for designing an initial investigation as recommended in the PAR.



All future documents ( including the finalized versions of those reviewed here ) containing descriptions of geology, geophysics, ground water chemistry or flow, or engineered features, plans for investigating such, or interpretations of physical conditions must be signed by a geologist or engineer registered by the State of California.

## SPECIFIC COMMENTS and RECOMMENDATIONS

### RI/FS Workplan

#### Section 3.4.1 Background Soils

There is no discussion of the relative concentrations of metals, minerals or organics in any samples other than the two chosen as background for screening level purposes. As I related in the meetings, I have reviewed the data for all the samples, plotted graphs for soils and for ground water to identify outliers, and in many cases the concentrations in the two " background " samples are amongst the highest. Sample B-11 is high in Calcium ( Ca ) and perhaps so in mercury ( Hg ). Sample B-22 is high in aluminum ( Al ), barium ( Ba ), chromium ( Cr ), copper ( Cu ), iron ( Fe ), lead ( Pb ), nickel ( Ni ), and vanadium ( V ).

In contrast, samples B-4, -7, -13A, -14, -15, -16, -44, and -45 all are relatively low in metals, minerals, and organics, yet provide a good range of values upon which to base statistical interpretations of background and use for comparison to screening levels for health-based criteria.

I recommend that the final version of the RI/FS workplan utilize data from the samples that comprise a distinct grouping representing apparently unimpacted soils. All tables displaying the background data, comparisons of the data to screening levels, data re-interpretations and text re-writing should be accomplished before determining the need for further sampling for background. I believe adequate samples representing reasonably expected concentrations in background have already been acquired, but defer final judgement until the existing data have been analyzed and the Navy has developed rationale for further sampling, if such is necessary.

## Sampling and Analysis Plan

### General comment:

The discussions of ground penetrating radar ( GPR ), cone penetrometer testing ( CPT ), and Hydropunch surveys are very open-ended. No mention is made of using any areal survey tools in grid patterns to locate subsurface features such as trenches or pits, or to resolve fill patterns or stratigraphy. Many pages are devoted to determining health risk from exposures to contaminated soil and ground water, the key to making decisions regarding clean-up locations, methods, and levels. Yet the basic data to define the actual, physical description of the subsurface will never be generated in a detail commensurate the effort involved with risk assessment. GPR is mentioned as a tool to locate underground utilities at proposed boring locations; CPT may be used where well points may be installed; and hydropunch may be used as the vehicle for installing well points. At the technical committee meetings there was discussion that GPR would be tested to see if it was useful for this site. The testing may have been conducted. If so, the technical committee should have access to the printouts and grid locations, so that we may make informed decisions regarding the use of GPR.

I recommend maximum use be made of survey techniques such as GPR, CPT and Hydropunch to define the subsurface in three dimensions, the sooner the better. Phase 2 can also benefit by a focused use of survey techniques to define contaminant plumes in three dimensions.

### Section 4.5.2 Background Surface Soil Sampling Approach ( Shipyard ), and Section 4.5.2.2 Background Surface Soil Samples ( Station )

There is no discussion of the review process for the data from the proposed presumed background locations. As for the RI/Fs Workplan comment above, the existing data needs to be reviewed prior to deciding whether more samples for background are needed. Further, should additional locations be deemed necessary, the data must be reviewed prior calculating a range of background values. The criteria for excluding ( perhaps more importantly, including ) various samples as background should be a topic for agreement by the technical committee before the results of calculations are published as drafts.

I recommend that this section be changed to reflect full consideration of existing data prior to designing further sampling; that rationale be provided for additional sampling, and that the technical committee be involved in setting criteria for excluding and including data used for background.

### Section 6.3 Well Installation and Completion

Though the SAP recognizes the need to use a cement in the grout that provides good service in brackish conditions, the cement type is not specified.

I recommend that the SAP explicitly list the cement type so that the technical committee can judge the appropriateness of the type and the geologist responsible for executing the SAP orders the proper type, the drillers are told explicitly and the load is checked for the specified cement type.

#### Section 6.3.2 Well Development

The SAP states that well development will not proceed beyond removal of 10 well volumes. The SAP does not say how that volume was selected, nor what the implications are of a well not meeting the development criteria. The SAP does state performance criteria for completion of development, but the volume restriction supercedes other criteria. Usually, when a well cannot meet standard performance criteria ( e.g., steady pH, EC, turbidity ) the implication is poor well design, construction, or both.

I recommend that the restriction on well volumes be deleted, or the rationale for the restriction be explicit and reviewed by the technical committee.

#### Section 6.3.3 Aquifer Testing

The SAP states that the expected length of time for pumping during an aquifer test is four hours. Often, an aquifer test lasting less than 24 hours does not provide data regarding recharge or barrier conditions. The information desired from the aquifer tests is implied parenthetically ( transmissivity, hydraulic conductivity, and specific yield ). If recharge and barrier conditions are not needed for this investigation, then perhaps four hours is adequate, but the rationale for the selection of four hours ( rather than two or eight hours ) is not provided. Slug tests are discussed as possible alternatives to pumping tests in wells where water production is inadequate for pumping tests. Experience has shown that slug tests, if performed in wells of similar construction and using the same technique at each well, can provide good relative data regarding the distribution of hydraulic properties. Slug tests performed in wells that also have pumping tests will provide some degree of calibration. Indeed, the number of pumping test(s) may be reduced based on initial pumping test and slug test data, with an emphasis on a few good pumping tests lasting longer than four hours and using slug tests as correlative tools. Such a technique may save disposing of large quantities of pumped water and save time overall.

I recommend that the technical rationale for selection of aquifer pumping tests lasting four hours be provided. Also, the SAP should explicitly state what information normally acquired during full pumping tests is not necessary to acquire at this site. The accuracy of such tests should be discussed in light of the needed degree of accuracy for risk assessment. Consideration should be given to perform a few full-length pumping tests with slug tests as correlative tools.

Mention is made of using transducers and data loggers, but no mention is made of the frequency of " picking " water levels.

I recommend that the SAP state the data pick frequency, with the normal method of acquiring early data at very short frequency, falling off at a geometric rate.

#### Section 6.5 Water Level Measurements

There is a typographical error stating that ground water levels will be measured to the nearest 0.01 inch, rather than 0.01 feet.

#### Section 6.6.1 Groundwater, Item 4

The unit designation of 1 per mil for salinity measurement may be confusing to the lay reader.

I recommend that the unit designation be 1 part per thousand ( ppt ) or 1 gram per liter ( g/l ), as appropriate.

The criterion of purging by pumping three times to dryness in slowly producing wells is not supported by rationale ( the norm is once ), and appears to be in conflict minimizing fluid production ( restricting the volumes removed during development and abbreviated pumping tests ).

I recommend that the SAP provide explicit rationale for purging three times to dryness, rather than once.

#### Well Point Groundwater Sampling

Following the initial paragraph are guidelines for sampling. Are these guidelines applicable to all ground water sampling and not just wellpoint ground water sampling ? They seem to apply to all ground water sampling.

I recommend that the guidelines, if applicable to all ground water sampling, be separated by section that explicitly states that they apply to all ground water sampling.

Section 6.6.5 Subsurface Soil, 2<sup>nd</sup> paragraph

Reference to the " blocking plug " is ambiguous. Does this imply that a plug or blank center bit will be used rather than a center bit with fishtail teeth ?

I recommend that " blocking plug " be changed to read " center bit " or " center fishtail bit ".

Section 6.7.2 Groundwater and Soil Sampling Equipment

The decontamination procedure, the third bulleted item parenthetical remark ( when semivolatile and nonvolatile organic contamination may be present ) implies knowledge of the conditions at the site. The sites where rinsing with subgrade methanol may not be necessary are as known now as they will be when the samplers are there. Why not specify which sites the rinse is or is not required ?

I recommend that the SAP state explicitly which sites are suspected of having semivolatile or nonvolatile organics contamination for the purpose of sample equipment decontamination and therefore at which sites a methanol rinse is required. The samplers should be instructed at which locations a methanol rinse is required and which locations they must merely be prepared to perform the methanol rinse if situations warrant.

Section 6.9.2 Packaging and Shipping

There is no discussion of the method to verify that coolers reached and maintained a maximum temperature of 4°C.

I recommend that the SAP include the method to verify that ambient temperatures in the shipping coolers was lowered to a maintained 4°C.

There is no discussion of the criteria or procedures for resampling should samples be lost, tampered with, or broken due to mis-handling or freezing.

I recommend that the SAP include criteria for when the loss of a sample would cause a need for resampling (i.e., are there any samples by themselves that are critical to the Phase 1 investigation ? ).

Section 6.12.4 Trip Blanks

The sentence, " Samples collected...TCL volatiles. " contains the awkward phrase, " separately together ".

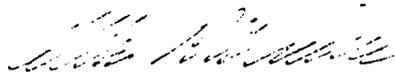
I recommend that the sentence be re-written.

Section 6.12.6 Harbor Sediment Reference Samples, ( Naval Station SAP only )

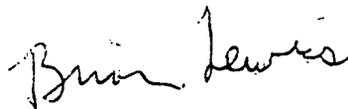
The first sentence is ambiguous. The phrase, " surface deep " is awkward.

I recommend that the sentence be re-written.

If you have any questions or comments, please call me at (916) 255-2104 or Calnet at 8-494-2104.



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