CONFIRMATION STUDY
NAVAL AIR STATION, ALAMEDA

WORK PLAN
VERIFICATION STEP
August 27, 1984

INTRODUCTION

The Verification Step Work Plan described here is intended to determine whether or not contamination of soil, sediment, or water at 5 pre-selected sites is present at levels high enough to pose a possible environmental or human health hazard. The work is also intended to provide the field data necessary to make a reasonable determination of whether or not additional detailed field studies are warranted to accurately define the nature and extent of site contamination. Such additional studies are beyond the scope of work described here, and would fall in the Characterization Step of the overall Confirmation Study.

The emphasis in this Work Plan is only on providing an answer to the question "Is there actually significant contamination at this site?" It is recognized that no absolute answer to this question can ever be given, based on a limited amount of field work. This Work Plan is designed to maximize the probability of observing contamination, in order to increase the reliability of the "answer", for a reasonable level of field and laboratory effort.

This Work Plan concentrates on the proposed field and laboratory program. The proposed Safety Plan is described in a separate document. The other aspects of the Verification Step, such as field data review and reports, are adequately described in the current (April 27, 1984) version of Contract Appendix "A", the contract Scope of Work, which is included for reference here.

PROPOSED FIELD AND LABORATORY PROGRAM

Five sites have been identified for study during the Verification Step. They are known as the:

1943-1956 Disposal Area
Seaplane Lagoon
Buildings 301 and 389
CAN-2 Area
Area 97.

A program of field work and laboratory testing has been developed for each site, based on our review of the Initial Assessment Study (IAS) and other documents provided to date by the Navy, our observations during 4 base visits, and our discussions with Joe Shandling, Bob Baker, Dan Lent, Stan Ristrem, Larry Scharr, Ben Fugate, and others at NAS, Alameda, Henry Shanks, Helen Ling, and Carl Schwab of WESTNAVFACENGCOM, and John Accardi of NEESA. It is our understanding that our discussions with John Accardi have covered his own discussions with the authors of the IAS through at least mid-May, 1984.

The current Scope of Work for the overall Confirmation Study calls for the investigation of conditions at the West Beach Landfill and at Building 360, in addition to studies at the 5 sites named above. However, field and laboratory information is already available on the presence of contaminants in soil and ground water at the West Beach Landfill and Building 360, and it appears that additional studies may be required in order to answer the concerns of state agencies over conditions in the landfill. These studies are likely to involve a scope out of proportion to the level of effort justified during the Verification Step. Therefore, we recommend that field work at the West Beach Landfill and at Building 360 be postponed until the Characterization Step of this contract, when the associated changes in overall project scope and cost can be readily handled during regularly scheduled negotiations. However, existing information on these sites will be reviewed during the Verification Step, so that appropriate recommendations can be made for Characterization Step work.

Field operations during the Verification Step will be carried out or directly supervised by qualified geologists, geotechnical engineers, or environmental engineers from the regular professional staffs of Wahler Associates or its subcontractor, Kennedy/Jenks Engineers. Laboratory analyses are expected to be carried out by Kennedy/Jenks' laboratory or by EAL Corporation, both of which are state-certified facilities. If samples are sent to other laboratories for analysis, state-certified laboratories will be used. The proposed field and laboratory activities associated with each site are discussed in the following paragraphs.

1943-1956 Disposal Area

This Work Plan calls for installing 5 permanent ground water monitoring wells, located roughly as shown on Figure 2. It is anticipated that these wells will be installed to a depth of between 15 and 40 feet, depending on the stratigraphy at each well location. The wells will be cased with 2-inch diameter PVC casing and slotted screens. The wells will be sand and/or gravel packed to the extent possible, and provided with shallow surface seals and locking well caps. The wells will be located far enough inland to minimize tidal influence, based on existing data on the extent of tidal influence derived from work in the West Beach Landfill.

At least one soil sample will be obtained from above the water table in each well, and ground water will be sampled once in each well. The samples will be analyzed for the 17 heavy metals covered by the California Assessment Manual (the "CAM metals"). Samples will be analyzed for metals by inductively-coupled plasma emission spectroscopy (ICP) scan, for organic priority pollutants by gas chromatography/mass spectrometry (GC/MS), for gross alpha and beta radioactivity, and for pH and electrical conductivity. For this study, analysis of organic compounds by GC/MS is preferred to Total Organic Carbon (TOC) and Total Organic Halogens (TOX) methods because of its superior detection limits and compound identification capabilities. TOC and TOX have limited acceptance by California state regulatory agencies. In addition to chemical samples, water levels will be obtained in each well. The wells will be surveyed for location and elevation.

The proposed well locations have been selected in order to provide a cost-effective indication of the possibility of environmental impact due to the migration of pollutants away from their areas of original disposal. Consideration was taken of the fact that most of the site almost certainly consists of natural materials. Therefore, actual wastes are unlikely to be encountered in any reasonably-scoped Verification Step field program, and ground water monitoring is judged to be the most effective means of initially assessing environmental impact.

Seaplane Lagoon

This Work Plan calls for the collection of 10 surface/near-surface sediment samples, 8 inside the lagoon and 2 outside the lagoon. The samples will be collected with a Ponar grab sampler unless the lagoon bottom is soft and records indicate a significant rate of sedimentation in the last 20 years. Recent interviews with activity personnel suggest that sedimentation rates in the lagoon may not be as great as has been previously reported. If the bottom is soft, if records indicate that significant sedimentation has taken place in the last 20 years, and if the water depth is less than about 15 feet, then an attempt will be made to recover disturbed core samples from the uppermost 3 feet of the sediments at two locations in the lagoon. If coring is successful, then the core samples would replace Ponar dredge samples on a one-for-one basis. At least one sample will be taken from the bottom near each identified outfall into the lagoon. The remaining in-lagoon samples will be distributed throughout the lagoon in order to increase the likelihood of observing contamination from other unidentified outfalls or other sources. If sampling conditions permit, more than 10 sampling locations may be utilized, with some samples representing composites of several locations. However, in order to control the possible degradation of analytical sensitivity which may be associated with composite samples, no more than 2 locations will be represented in a single sample. The two samples collected outside the lagoon will provide a local background reference for contaminants, especially heavy metals, which may be expected to occur at significant levels even in sediments not affected by discharges into the lagoon. Figure 1 shows the general areas where Seaplane Lagoon sampling is planned.

All 10 sediment samples will be analyzed for the CAM metals by ICP scan, and for PCB's by GC. These appear to be the possible contaminants which are likely to be of greatest interest in the Seaplane Lagoon. An attempt will be made to identify any non-PCB peaks which appear on the chromatograms produced from these samples.

Sampling in the Seaplane Lagoon will require the use of a power boat, both in the lagoon, and outside, in the harbor area. Consideration of base security concerns, and overall project cost indicate that it would be best to use a Navy boat and crew to support this sampling, rather than a private or commercial vessel. Based on our discussions with Mr. Shandling of NAS, Alameda, we understand that a suitable boat and operating personnel will be provided by the Navy.

Buildings 301 and 389

This Work Plan calls for the collection of 10 shallow soil samples in the storage areas adjacent to Buildings 301 and 389. The samples will be collected from the uppermost 12 inches of soil, using a hand-auger, pushed or driven tube sampler, or similar, appropriate sampling tool. Exact sampling locations and depths will be determined in the field, based on visual inspection and/or information developed from site personnel. In general, samples will be taken from the uppermost 6 inches of fine-grained soils, or from a horizon which shows evidence of possible contamination when visually inspected in the field. Upper soil layers may be ignored if they are coarse-grained, or if they appear to have been imported after storage of electrical equipment stopped. Recent discussions with Public Works Center personnel indicate that sampling should be concentrated near the north and west sides of Building 389. An effort will be made to sample those areas which are most likely to be contaminated with PCB's, either from storage of electrical equipment, or from use of PCB's as weed killers. All 10 soil samples will be analyzed for PCB's by GC. An attempt will be made to identify any non-PCB peaks which appear on the chromatograms produced from these samples.

The proposed sampling scheme represents an increase in spatial coverage, at the expense of depth profiling, when compared to the scheme outlined in the IAS. This is justified because lateral spreading of concentrated PCB spills on unsaturated ground may be quite limited and a smaller number of sampling locations would therefore involve a much greater risk of missing a significant contaminant "hot spot". At the same time, it appears that depth profiling, if warranted, could be reasonably postponed until the Characterization Step.

CAN-2 Area

This Work Plan calls for the collection of 10 shallow soil samples at a variety of locations within the CAN-2 storage area. The samples will be collected from the uppermost 12 inches of soil. Soil samples will be taken using a hand auger, pushed or driven tube sampler, or similar, appropriate sampling tool. Exact sampling locations and depths will be determined in the field, based on visual inspection for evidence of earlier spills, on records of the areas where various materials were previously stored, and on the location of the earlier PCB spill and cleanup. In general, samples will be taken from the uppermost 6 inches of fine-grained soils, or from a horizon which shows evidence of possible contamination when visually inspected in the field. Upper soil layers may be ignored if they are coarse-grained, or if they appear to have been imported after storage in a given area stopped.

In addition to the shallow soil samples, one monitoring well will be installed in the area, to assess the condition of the shallow ground water and to recover deeper soil samples for possible chemical analysis. It is anticipated that this well will be installed to a depth of between 15 and 40 feet, depending on the actual stratigraphy of the well site. The well will be cased with 2-inch diameter PVC casing and slotted screens. The well will be sand and/or gravel-packed to the extent possible, and provided with a shallow surface seal and locking well cap.

All soil samples and the water sample will be analyzed for the CAM metals by ICP scan, for PCB's and common chlorinated pesticides by GC, for total hydrocarbons by GC, and for pH. The IAS called for PCB, pesticide, and metal analyses on samples from the CAN-2 area. The total hydrocarbon analyses have been added as a cost-effective means of estimating possible contamination with other organics, such as solvents, fuels, etc. pH has been added as a cost-effective means of assessing possible metal mobility in the soil column.

Area 97

During earlier investigations around Area 97, Kennedy Engineers (now Kennedy/Jenks Engineers) installed 18 shallow semi-permanent monitoring wells. During recent site visits, 10 of these wells have been located. Six more of the original wells seem to have been obliterated, although they should be recoverable by surveying techniques. The condition of the remaining 2 wells is not presently known. The 10 wells which have been located in the field appear to be reasonably intact, based on visual inspection. This Work Plan calls for the cleaning, re-development, and purging of the 10 currently located Kennedy Engineers' ground water monitoring wells, located roughly as shown on Figure 3. The wells will then be sampled and the samples analyzed for lead and total hydrocarbons, using atomic absorption (AA) and GC respectively. Water levels will be obtained in each well.

In addition, an attempt will be made to locate the remaining 8 original wells by means of surveying. If any of these wells can be recovered, they will be included in the rehabilitation and resampling program with the 10 currently located wells. If sufficient additional original wells cannot be recovered to give an adequate areal distribution of sampling points, especially in the quadrent northwest of Area 97, then up to 3 new monitoring wells will be installed and sampled. The installation of new wells will be contingent on the findings of sampling from the original wells. No new wells would need to be installed at this time, if the existing wells show a

pattern of contamination which indicates that Characterization Step work is necessary. If new wells are installed, they would be constructed in a manner consistent with the original wells.

Wells in Area 97 which can be located will be incorporated into the overall Confirmation Study monitoring plan, for possible use during later steps. At the conclusion of the program, a recommendation will be made as to whether the wells should be upgraded and/or maintained for long-term monitoring, or whether they should be destroyed. In the unlikely event that currently unlocated wells cannot be located by an initial retracing of their recorded survey positions, then an intensive search would be beyond the current scope of the Verification Step. However, we recommend that additional steps be taken to locate these wells so that they can either be adequately protected and incorporated in the sampling plan, or destroyed. This work could be added to the Verification Step, or negotiated into the following Characterization Step.

The proposed well locations will give a high probability of encountering the residual gasoline plume, if it still exists, while minimizing the overall amount of drilling in the highly developed part of the base, where the possibility of hitting unidentified or "lost" buried utilities is high. If new wells are installed, consideration will be given to the most likely plume directions, in light of available ground water gradient data, and to the principal that the Verification Step should focus on problem confirmation, not detailed definition.

SAMPLING, SAMPLE PRESERVATION, AND CHEMICAL TESTING

Table 1 presents a summary of the testing proposed for the Verification Step. Where applicable, sampling methods and tools will conform to EPA, California, or other recognized guidelines. Ground water samples will be collected with either stainless steel or Teflon/glass bailers. Sediment samples will be obtained with a Ponar grab sampler, which is rated by EPA as

a good general purpose sediment sampler. All sampling and drilling tools will be cleaned before each use with cleaning agents appropriate to the materials being sampled and the conditions of use.

All samples will be packaged and preserved in accordance with applicable EPA or other appropriate agency guidelines. This includes routine field chilling of all samples immediately after packaging, the use of Teflon/silicone rubber septa vials for volatile organics samples, and the use of acid preservatives for metals samples of water. All other applicable sample storage and preservation guidelines will be applied. Both Wahler Associates and Kennedy/Jenks Engineers have thorough practical experience with the requirements of chemical sample handling.

Wherever applicable, chemical testing will be performed in accordance with EPA or other appropriate agency standards. In cases where strict standard methods are not available, generally recognized standard laboratory practices will be utilized.

GENERAL CONSIDERATIONS

Before field sampling can begin, the Navy must provide any needed security clearances, gate passes, authorizations to take photographs, and other similar documentation and/or authorizations to Wahler Associates and its subcontractors, including drillers, surveyors, etc. Before drilling begins for the 1943-1956 Disposal Site, the Area 97 site or the CAN-2 site, it will be necessary for the specific drilling locations to be checked by the Navy and any concerned public or private utilities in order to determine if there is any danger of damaging buried utilities during drilling. We understand that such information can be provided in response to written requests to the Navy. Wahler Associates cannot accept any liability resulting from damage to buried utilities or other structures not identified during this pre-drilling review.

This Work Plan assumes that suitable maps will be provided by the Navy for purposes of project planning, analysis, and both written and oral presentations. If such maps cannot be provided, then additional work will need to be authorized in order to allow suitable maps to be prepared. As discussed earlier, this Work Plan also assumes that the Navy will provide a suitable boat and crew to support the Seaplane Lagoon sampling.

As discussed and agreed during contract negotiations, this Work Plan assumes that the Navy will retain responsibility for proper disposal of waste materials (e.g. drill cuttings and contaminated personal protective gear) generated during the course of the Confirmation Study. Also as discussed and agreed during contract negotiations, the fee negotiated and incorporated into the contract was only intended to cover the nominal scope and level of effort of Verification Step work which was subject to negotiation at that time. Increases in Verification Step scope or level of effort over those used for contract negotiation, and scope and fees for later steps of the study, are subject to negotiation, if those steps are authorized by the Navy.

TABLE 1

PROPOSED VERIFICATION STEP TESTING
CONFIRMATION STUDY, NAS, ALAMEDA, August 27, 1984

Test Description (Analysis Method)	1943-1956 Disposal Area	Seaplane Lagoon	Buildings 301 & 389	CAN-2 Area	Area 97	Total Number of Tests
17 metal scan (ICP)						
in water	5			1		6
in soil	5	10		10		25
PCB's in soil (GC)		10	10			20
PCB's and pesticides (EPA Method 608, GC)						
in soil				10		10
in water				1		1
Petroleum hydrocarbons (GC)						
in water				1	15	16
in soil				10		10
Organic Priority Pollutants (EPA Methods 624 & 625, GC/MS)						
in water	5					5
in soil	5					5
Gross alpha and gross beta						
in water	5					5
in soil	5					5
Lead in water (AA)					15	15
pH and/or electrical conductivity						
of water	5			1		6
of soil/soil extract	5			10		15

METHODS KEY: ICP = Inductively-coupled plasma emission spectroscopy
GC = Gas Chromatography
GC/MS = Gas Chromatography with Mass Spectrometer
AA = Atomic Absorption

N00236.000161
ALAMEDA POINT
SSIC NO. 5090.3

FIGURES 1 THROUGH 3

CONFIRMATION STUDY
WORK PLAN
VERIFICATION STEP

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APPENDIX A – SCOPE OF WORK

CONFIRMATION STUDY
WORK PLAN
VERIFICATION STEP

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