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From: Commander, Western Division, Naval Facilities Engineering Command
To: Distribution

Subj: REVISED RESPONSES TO DTSC COMMENTS ON THE REMEDIAL INVESTIGATION/FEASIBILITY STUDY (RI/FS) PHASE 2A FOLLOW-ON FIELD SAMPLING PLAN, NAVAL AIR STATION (NAS) ALAMEDA, CA

Ref: (a) Department of Toxic Substances Control letter of 29 June 1994

Encl: (1) Revised Responses to DTSC Comments on Phase 2A Field Sampling Plan

1. Enclosure (1) revises responses to DTSC comments on the Phase 2A follow-on field sampling plan, as discussed during the July 15, 1994 technical review meeting. These revised responses address the additional comments provided in Ref (a). We are forwarding these revised responses to comments for review and concurrence. If no additional comments are received within 7 days from the date of this letter, these responses will be attached to the Phase 2A field sampling plan draft final. The field sampling plan will then be submitted for a 30 day review period before becoming final.

2. If you have any questions regarding the Navy response to comments, please contact Mr. George Kikugawa, Code 09ER3GK, (415) 244-2559; FAX (415) 244-2553.

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The following presents the Navy's revised responses to the Department of Toxic Substances Control (DTSC) comments, dated November 23, 1993 (and again on June 29, 1994), on the draft "Follow-On Field Sampling Plan, Remedial Investigation/Feasibility Study, Phase 2A" (draft Phase 2A FSP), dated October 11, 1993. The responses are incorporated in the text of the final follow-on field sampling plan. The agency's comments are presented verbatim in bold typeface. The Navy responses follow in normal typeface.

GENERAL COMMENTS

Comment No. 1: **Soil Sampling During Monitoring Well Installation. The FSP does not include soil sampling during the installation of monitoring wells. Soil sampling should be part of the installation of all monitoring wells.**

Response: Soil sampling and analyses are proposed for all monitoring wells in the draft Phase 2A FSP (see Table 10-1). Soil samples will be collected at depths of 0, 2.5 and 5 feet from all shallow wells for chemical analyses. Soil samples will also be obtained at 5-foot intervals from borings greater than 10 feet deep for lithologic interpretation.

Comment No. 2: **Regional groundwater flow directions are shown in Figure 2-3. However, hydrogeologic information currently available is not complete enough to make positive conclusions as to the actual groundwater gradients at the sites. The follow-on field sampling work must generate the information necessary to improve confidence in the regional groundwater gradient model. The model should consider groundwater head measurements as well as subsurface geology, preferential pathways, seasonal variations, and tidal influence.**

Response: The work proposed in the Phase 2A FSP is intended to generate sufficient information for establishing the regional and site-specific groundwater gradients. As noted in the Phase 2A FSP, groundwater levels will be monitored from all 26 existing wells and all proposed new wells (inclusive of shallow wells and the deep wells) from the Phase 2A sites, on a quarterly basis for one year. These groundwater level measurements will provide information to evaluate the groundwater gradients and seasonal variations of the groundwater gradients at each site.

The regional groundwater gradient will be developed using the groundwater level measurements to be obtained from groundwater monitoring programs proposed in this FSP, the Phases 2B and 3 FSP, and Phases 5 and 6 FSP. Groundwater level measurements will be collected from a total of approximately 210 existing and proposed groundwater monitoring wells from the sites in these three FSPs, on a quarterly basis for one year. The Navy believes that these groundwater level measurements will be sufficient to evaluate the regional groundwater gradient. In addition, the regional groundwater gradient model will consider subsurface geology, potential preferential pathways, seasonal variations, and tidal influence.

Comment No. 3: **Four Cone Penetrometer Test (CPT) points are planned for almost every site without regard for how large the site is. This means that at some of the larger sites CPT points will be between 600 and 800 feet apart (e.g., Site 3, the Abandoned Fuel Storage Area, and Site 10B, Missile Rework Operations). This spacing is too far apart to accurately detect any heterogeneity's in the Bay Mud layer, and to see if this layer is indeed acting as a complete aquitard. A more**

complete understanding of the Bay Mud layer, will in turn allow better placement of deeper wells to sample the second aquifer. CPT points should be placed no more than 300 feet apart.

Response:

The proposed cone penetrometer (CPT) locations are intended to provide a more complete understanding of the Bay Mud layer and lower aquifer. CPT locations are scoped to provide representative coverage at each site, and are located in a grid pattern, at the four corners of each site. A total of 27 CPT locations are proposed as part of the current Phase 2A FSP. A total of 128 CPT locations are proposed for the entire base. Eighteen of the 128 locations were added during the December 13, 1993 site walkover, resulting in a 200 to 400 foot spacing of the CPTs at most of the sites, including Site 10B. In order to maintain a 200 to 400 foot grid spacing of CPT locations at each site, two additional CPT locations will be added to Site 3, one to Site 4 and one to Site 16. The Navy believes that the eighteen CPT locations which were added as part of the site walkover, the additional lithologic data from NAS Alameda geotechnical borings, and the four new locations proposed to address this comment, will provide enough site-specific information to evaluate the Bay Mud layer. To evaluate the best locations for wells and borings at Site 3 and Site 13, the Navy proposes to use a Geoprobe screening investigation to collect soil and grab groundwater samples to be analyzed in a field laboratory to provide data within a one week period. This will allow the Navy and the regulators to make decisions about well locations within a two week period.

Comment No. 4:

The sampling of the storm drains is included at each site. Sampling should include air monitoring and water samples.

Response:

As discussed in Section 1.3 (page 1-3) of the draft Phase 2A FSP, sediment samples are proposed to be collected from storm sewers to assess the potential of the sewer to act as a conduit for migrating chemicals to the adjacent subsurface environment. The sediment sampling is designed to provide adequate data for evaluating chemicals in the sediment that would adversely impact the adjacent subsurface soil and groundwater.

If standing water is observed in the manholes or catch basins during sampling, a composite sample of the sediment and free-standing water will be collected for chemical analyses. The Navy believes that this sampling strategy will provide sufficient information to meet the sampling objectives. Therefore, no additional water sampling is proposed.

As described above, the purpose of the sampling is to evaluate whether chemicals in the sediment, if detected, would adversely impact the subsurface soil and groundwater. Therefore, air sampling is not proposed. In addition, health and safety air monitoring will be conducted as part of the health and safety program during sampling. The Navy believes that the results of the air monitoring can provide information to assess whether the releases of the chemicals from sediments into the ambient air are of any concern.

SPECIFIC COMMENTS

Comment No. 1:

Section 3.6.1, Soil Sampling: Only one boring (B03-04) will be located along the sanitary sewer line where floating product and contamination was observed. More investigation is needed along the sanitary sewer line. Three to four borings should be located along the length of the sewer line where fuel was observed. That length runs from NSP-S03-03 north to past OW-14.

Response: Based on discussions at the July 15, 1994 technical review meeting, an iterative approach to the Site 3 investigation is proposed. Initially, the area will be screened using a Geoprobe system. Screening samples will be collected from soil at two depths; one sample will be collected from the water table interface, and the other will be collected between the water table interface and the surface. The soil screening samples will be analyzed in a field laboratory for benzene, toluene, ethylbenzene and xylene (BTEX), TPH (purgeable and extractable), and metals (x-ray fluorescence). Approximately 20 percent of the soil samples will be collected as split samples and also sent to the analytical laboratory for confirmatory analyses. Also, grab groundwater samples will be collected and screened with field test kits for petroleum products (TPH, JP4, JP5). Approximately 20 percent of the grab groundwater samples will be submitted to the analytical laboratory for confirmatory analyses.

Results of the screening data will be used to locate permanent shallow monitoring wells and shallow borings. The number and location of wells and borings will be determined after consultation with the Navy, DTSC and RWQCB. Soil samples will be collected from these soil borings at 0, 2.5, and 5 feet bgs and analyzed for VOCs (the 0-foot sample will only be analyzed for VOCs if the borehole is covered by asphalt or concrete), SVOCs, EDB, TPH (purgeable and extractable), metals and general chemicals. Groundwater samples from permanent wells will be analyzed for VOCs, EDB, TPH (purgeable and extractable), metals and general chemical characteristics, including TDS.

Comment No. 2: **Section 3.6.1, Soil Sampling:** The sanitary sewer line that runs from NSP-S03-05 west should be investigated for potential soil contamination. The sewer line may be acting as a conduit for contamination. The 25,000 µg/L benzene soil gas concentration appears to follow the length of this sanitary sewer line.

Response: Please see response to Specific Comment No. 1.

Comment No. 3: **Section 3.6.1, Soil Sampling:** Analysis should include Semi-Volatile Organics Compounds (SVOCs) in soil.

Response: Soil samples from borings at Site 3 will be analyzed for SVOCs.

Comment No. 4: **Section 3.6.2, Cone Penetrometer Tests:** More CPT points are needed at Site 3. Four CPT points are not enough to provide a representative sample of the lithology and hydrogeologic characteristics of the Bay Mud layer, which exists below a depth of 15 feet at Site 3. Four CPT points are also not enough to adequately identify the second water bearing zone in the vicinity of Site 3. On Figure 3-1, CPT points S03-02 and S03-03 are at least 600 feet apart, and points S03-04 and S03-01 are at least 800 feet apart. Please refer to General Comment No. 3.

Response: Please see responses to General Comment No. 3 and Specific Comment No. 1.

Comment No. 5: **Section 3.6.3, Shallow Monitoring Wells:** The two additional monitoring wells currently proposed for Site 3 are not sufficient to adequately characterize groundwater contamination and the potential for floating product. A monitoring well is requested between the sewer line and the grass apron of site three. This location is requested because the trench for the sewer line may be dispersing the product, therefore, a monitoring well is needed between the source of contamination and the sewer line. A monitoring well is also requested within the

25,000 µg/L benzene soil gas isoline and near the railroad spur (approximately 200 feet west of M03-04).

Response: Two monitoring wells are proposed in the current Phase 2A FSP for Site 3; they are wells M-03-04 and M-03-05. The actual locations for these monitoring wells will be determined based on the results of field screening as discussed in the response to Specific Comment No. 1.

Comment No. 6: **Section 3.6.3, Shallow Monitoring Wells:** Please describe the condition of the Wahler, Kennedy and Canonie monitoring wells. Include whether they can be used for groundwater chemical analysis.

Response: Please refer to the third bullet in Section 3.6.3 of the FSP. As noted, the existing Kennedy and Wahler wells will be evaluated as to whether they can be used for groundwater monitoring. Based on the results of the field screening discussed in response to Specific Comment No. 1, the number and location of wells needed will be determined after consultation with the Navy, DTSC and RWQCB. Additionally, the Canonie wells, which were last sampled in 1990 (MW97-1, -2, and -3), are believed to be functional for groundwater monitoring, and are scheduled for sampling and analyses as part of the Phase 2A FSP.

Comment No. 7: **Section 3.6.3, Shallow Monitoring Wells:** Analyses should include SVOCs in groundwater.

Response: SVOC analyses will be included for existing and proposed wells at Site 3. The Phase 2A FSP will be changed accordingly.

Comment No. 8: **Section 4.6, Sampling Objectives, Locations, and Analyses:** The sampling strategy seems to not take into account the distribution of soil gas and the potential for contaminated soil due to leaking fuel feed lines. Identifying the location of fuel lines should be an objective of the geophysical survey. Soil borings should be located in area of greatest benzene gas contamination. Boring B7-13 should be moved west in order to be within the 50,000 µg/L benzene soil gas isoline. Boring 7C-14 should be located closer to soil gas sampling point P-2A, the location with the maximum concentration of benzene gas at 120,000 µg/L. An additional soil boring should be placed near soil gas sampling point O-5 in order to help define the extent of soil contamination.

Response: The geophysical survey will also include locating the fuel lines, in addition to locating the underground tanks. Boring B7C-13 will be moved 40 feet to the west. Boring B7C-14 will be moved to within the 100,000 µg/L isoconcentration contour. An additional soil boring will be installed in the vicinity of O-5 (B7C-15). Soil samples will be collected similarly to other soil borings and shallow wells at Site 7C.

Comment No. 9: **Section 4.6.1, Soil Sampling, first bullet:** How many borings are anticipated if the waste oil tanks are located? Is boring 7C-14 one of the borings for the investigation of the suspected waste oil tanks? When will these borings be drilled and how will the location for them be determined?

Response: If the waste oil tanks are located, a minimum of four borings will surround the tanks to the north, east, south and west, within 10 feet of the tanks. Should an existing boring, or previously proposed boring, already be located within 10 feet of the tanks,

then that boring will be used. Boring B7C-14 is not one of the borings for the investigation of the suspected waste oil tanks; boring B7C-14 is proposed at the location of the highest soil gas concentration.

Comment No. 10: Section 4.6.1, Soil Sampling, second bullet: Analysis should include SVOCs in soil.

Response: SVOCs were previously detected in vadose zone soils exceeding the preliminary comparison level of 10 mg/kg at two locations. Analyses for SVOCs will therefore be included for all of the vadose zone soils at Site 7C. The FSP will be changed accordingly.

Comment No. 11: Section 4.6.3, Shallow Monitoring Wells: An additional monitoring well is required west of B547-9 to help define the extent of contamination on the western edge of Site 7C. The direction of groundwater flow is not well enough understood to neglect this area of potential contamination.

Response: Three monitoring wells are presently proposed for Site 7C; they are M7C-06, M7C-07 and M7C-08. Due to the uncertainty in groundwater flow direction and in order to further define the extent of groundwater contamination in that area, an additional monitoring well (M7C-09) will be installed west of B547-9 in the vicinity of soil gas location P-0. The Phase 2A FSP will be changed accordingly.

Comment No. 12: Section 4.6.3, Shallow Monitoring Wells: Analysis should include SVOCs in groundwater.

Response: Low concentrations of SVOCs were previously detected in two of five groundwater samples, at concentrations of 78 µg/L and 102 µg/L, respectively. Groundwater will be analyzed for SVOCs semi-annually in order to monitor for SVOC occurrence in groundwater at the site. The Phase 2A FSP will be changed accordingly.

Comment No. 13: Section 4.6.4, Deep Monitoring Wells: Analysis should include SVOCs in deep monitoring wells.

Response: HydroPunch samples will be additionally analyzed for SVOCs and, depending on those results, the FSP will be changed to include SVOC sampling in the deep wells.

Comment No. 14: Figure 4.1, Proposed CPT and Sample Locations: Please include the soil gas plume map for site 7C (Figure 9-3, Soil Gas Survey, Data Summary Report Phases 1 and 2A, August 25, 1993) as a figure.

Response: The soil gas figure from the DSR will be included in the FSP as Figure 4-3.

Comment No. 15: Section 5.6, Sampling Objectives, Locations, and Analyses: The past investigations and the proposed follow-on investigation does not consider the location of industrial waste drains, industrial waste sewer lines, and the industrial waste treatment facility. Six floor drains directed methylene chloride and paint scraps to the industrial waste treatment facility. Currently all borings and proposed borings are outside the area of operation. Borings and monitoring wells should be located within building 410. The waste treatment facility includes several above ground tanks and a concrete sump. This facility must be fully investigated. Soil borings and monitoring wells are required in the area of the waste water treatment facility. The sampling objectives stated in the FSP are not

appropriate. The Navy should work closely with the State in developing a new sampling plan for Site 9.

Response: The issues noted above were addressed during a site walk visit attended by the DTSC, WESTDIV, NADEP and PRC on December 7, 1993. In summary, the site walk resulted in the identification of additional work including six additional CPT locations (CPT-S09-05 through CPT-S09-10) along the drain lines inside the building; six additional soil sample locations which will be collected during the advancement of the HydroPunches; six additional shallow HydroPunch samples; six additional deep HydroPunch samples; a contingency shallow monitoring well (pending HydroPunch analytical results); six shallow piezometers located along the drain lines at the CPT/HydroPunch locations; and a floor drain video inspection to check for cracks and or leakage points. In addition, the waste treatment facility will be investigated by IT Corporation according to field sampling plans prepared by ERM-West, Inc.

Comment No. 16: Section 5.6.3, Shallow Monitoring Wells: Analysis of shallow groundwater should include Total Petroleum Hydrocarbons (both purgeable and extractable). Site 9 is close to the old oil refinery site, Site 13.

Response: The shallow groundwater will be analyzed for total petroleum hydrocarbons - purgeable and extractable. The FSP will be changed accordingly.

Comment No. 17: Section 6.6.2, Cone Penetrometer Tests: More CPT points are needed at Site 10B. Four CPT points are not enough to get a representative sample of the lithology and hydrogeologic characteristics of the Bay Mud layer, which exists below a depth of 15 feet at Site 10B. Four CPT points are also not enough to adequately identify the second water bearing zone in the vicinity of Site 10B. On Figure 6-1, CPT points S10B-01 and S10B-03 are at least 600 feet apart, and points S10B-02 and S10B-04 are at least 600 feet apart. Please refer to General Comment No. 3.

Response: A total of six CPT locations are proposed for Site 10B as part of the current Phase 2A FSP. Two of the six locations were added as part of the December 7, 1993 site walkover which is discussed in Specific Comment No. 15. CPT location CPT-S10B-05 will bisect the 500 foot spacing between CPT-S10B-01 and CPT-S10B-03, and CPT-S10B-06 will bisect the 500 foot spacing between CPT-S10B-02 and CPT-S10B-04.

Comment No. 18: Section 7.6, Sampling Objectives, Locations, and Analyses: The locations of borings and monitoring wells should reflect the previous locations of oil tanks, storage yards and other operations of the old oil refinery. The present locations of borings and the locations of proposed borings do not seem to relate to the operations of the old oil refinery. The Sanborn Map identifies where various operations were located. The Sanborn Map should be referenced when the locations of borings and monitoring wells are selected. A figure of the old oil refinery should be included in Section 7.6.

Response: Soil borings and monitoring wells which were proposed for the current FSP were located based on existing soil and groundwater data. An overlay of previously existing structures indicates that the coverage addresses most of the previously existing structures, particularly the storage tanks. A figure showing the historical structures will be included in the FSP as Figure 7-3. In addition to the proposed Phase 2A FSP work, the Navy was involved with further site characterization at Site 13 in March,

1994. The site characterization and analysis penetrometer system (SCAPS) conducted borings and grab groundwater samples, as well as in-situ chemical analysis. These data are presently being reviewed to help evaluate well locations. These data will be presented at a technical review meeting in the near future.

The follow-on investigation at Site 13 will be conducted as discussed for Site 3 in response to Specific Comment No. 1. Monitoring wells and borings will be determined after consultation with the Navy, DTSC and RWQCB.

Comment No. 19: Section 7.6.1, Soil Sampling: The purpose of the follow-on Phase 2A field work is to provide final characterization of contamination at each site. The bullet item under Section 7.6.1 states, "To further evaluate..." If the Navy does not believe that the contamination at Site 13 cannot be fully characterized through the follow-on field work, this should be stated.

Response: Based on the additional work proposed for the Phase 2A FSP and in Specific Comment No. 18, the Navy believes that the extent and magnitude of soil and groundwater contamination will be characterized and adequate data will be collected to support cleanup decisions.

Comment No. 20: Section 7.6.3, Shallow Monitoring Wells: Two additional wells are requested. One near BOR-6 and the other east of building 169. The purpose of these wells are to characterize the outer extent of contamination at Site 13.

Response: Please see response to Specific Comment No. 18.

Comment No. 21: Section 9.6.3, Shallow Monitoring Wells: Two additional shallow monitoring wells are needed to the southwest and the northwest of shallow well MWD13-2. Detected in Well MW13-2 was 380 ppb of TRPH and 5000 ppb of oil and grease in the groundwater. Since the assumed groundwater flow direction is unclear at the site, we need to have wells on all sides of MWD13-2 to describe the extent of the TRPH and oil and grease plume in the groundwater at Site 19.

Response: There is presently one well scheduled for installation as part of the current Phase 2A FSP (M19-05). A shallow HydroPunch is proposed approximately 100 feet to the southwest of MWD13-2. CPT-S19-02 will also be moved approximately 100 feet to the northwest and a shallow HydroPunch groundwater sample will be obtained. Both shallow HydroPunch samples will be analyzed for TPH and oil and grease. Depending on the results of the groundwater sample, additional monitoring well(s) may be installed at these location(s).

Comment No. 22: Section 12.0, Table 12-2 and 12-2: Quantitation limits for some inorganics and benzene required by the CLP are not low enough to allow for comparison with Maximum Contaminant Levels in water and the RWQCB's Basin Plan. A separate letter is being sent to the Navy on this issue. Please refer to that upcoming letter and the comments on the RI/FS Work Plan Addendum for determining the proper laboratory method for sample analysis.

Response: The Navy received a letter from the DTSC dated December 20, 1994 regarding quantitation limits for analysis for some inorganics and benzene. The letter identifies quantitation limits lower than those specified in the quality assurance project plan for follow-on field work at NAS Alameda. The lower quantitation limits are proposed to

allow data to be compared to the State of California Maximum Contaminant Level (MCL) or secondary MCLs for drinking water, and the RWQCB's Basin Plan Water Quality objectives. The Navy met with DTSC and RWQCB on two occasions to discuss and agree on quantitation limits for field work at NAS Alameda. The Navy's contract laboratories were surveyed to evaluate the lowest possible quantitation limits for each laboratory. The Navy submitted a detailed letter to DTSC, dated January 26, 1994, explaining potential site specific matrix interference problems anticipated due to the salinity of the groundwater and due to the natural matrix interference introduced by soils. Additionally, the Navy agreed to provide laboratory back up documentation that will record all efforts to achieve DTSC proposed quantitation limits. Currently, the Navy is in the process of changing contract laboratories. The quantitation limits will be one of the data quality objectives that must be met by the contract laboratory.

The following table provides the results of the Navy's survey of contract laboratories; laboratories were asked to provide instrument detection limits.

Analyte	DTSC/RWQCB Quantitation Limit (mg/kg)	ETC/Mid-Pacific Instrument Detection Limit (mg/kg)	Anamatrix Instrument Detection Limit (mg/kg)	ATI Instrument Detection Limit (mg/kg)
Antimony	0.6*	1.0	2.76	0.2
Beryllium	0.4	possible**	0.06	0.4
Cadmium	0.5	possible**	0.2	0.4
Copper	0.49	possible**	0.49	0.4
Lead	0.05	0.2	0.26	0.2
Mercury	0.0036	0.013	0.0036	0.05
Nickel	1.48	possible**	1.48	1.0
Silver	0.26	possible**	0.26	1.0
Thallium	0.56	possible**	0.56	0.2

* Quantitation limit proposed by Navy is 2.76 mg/kg. Quantitation limit proposed by DTSC/RWQCB is 0.6 mg/kg.

** Quantitation limits proposed by DTSC/RWQCB are possible for laboratory to achieve.

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RESPONSE TO COMMENTS ON THE
DRAFT FOLLOW-ON FIELD SAMPLING PLAN
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
PHASE 2A

DATED 24 JUNE 1994

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