

03.13-05/01/86-00035

EVALUATION OF DATA FROM FIRST ROUND OF  
VERIFICATION SAMPLE COLLECTION AND ANALYSIS

CONFIRMATION STUDY TO DETERMINE POSSIBLE  
DISPERSION AND MIGRATION OF SPECIFIC CHEMICALS--  
U.S. NAVAL STATION ROOSEVELT ROADS, PUERTO RICO,  
AND U.S. NAVAL AMMUNITION FACILITY, VIEQUES

Contract No. N62470-85B-7972

Prepared for:

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Engineering Division, Norfolk, Virginia  
23511-6287

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May 1986

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1.0 INTRODUCTION

This report presents a tabulated evaluation of the data which were generated by the first round of Verification sample collection and analysis of the Confirmation Study of U.S. Naval Station (NAVSTA) Roosevelt Roads, Puerto Rico, and U.S. Naval Ammunition Facility (NAF) Vieques.

Fifteen sites of potential contamination were investigated during this round of the verification sampling and analysis program and are listed below:

<u>Site Number</u>	<u>Name</u>
1	Quebrada Disposal Site, Vieques
2	Mangrove Disposal Site, Vieques
3	IRFNA/MAF-4 Disposal Site, Vieques
5	Army Cremator Disposal Area
6	Langley Drive Disposal Site
7	Station Landfill
8	Drone Washdown
9	PCB Disposal, Dry Dock Area
10	Building 25 Storage Area
<del>12</del>	<del>Two Way Road Fuels Farm</del>
13	Tanks 210 to 217
14	Ensenada Honda Shoreline and Mangroves
15	Substation 2
16	Old Power Plant, Building 38
18	Pest Control Shop and Surrounding Area

During the onsite investigation of these 15 sites, 41 ground water monitor wells were installed and samples of ground water, surface water, sediment, and soil were collected for laboratory analysis. Table 1-1 presents site-specific information relative to the number of monitor wells installed, the type and number of samples collected for analysis, and the analytical constituents for each sample type.

Table 1-1. Summary Table of Step IA Verification, NAVSTA Roosevelt Roads and NAF Vieques Confirmation Study

Site Number	Installed Wells	Ground Water Samples	Surface Water Samples	Sediment Samples	Soil Samples	Analytical Constituents <sup>a</sup>
1	3	3	0	3	6	pH, oil and grease, VOA, xylene, MEK, MIBK, EDB, Cr (total and hexavalent), Pb
2	0	0	5	5	8	pH, Cr (total and hexavalent), Pb, VOA, xylene, MEK, MIBK
5	5	5	5	5	0	pH, Priority Pollutant scan, Cr hexavalent, xylene, MEK, MIBK, EDB
6	0	0	3	3	15	pH, Priority Pollutant scan, Cr hexavalent, xylene, MEK, MIBK, EDB
7	8	8	0	0	0	pH, Priority Pollutant scan, Cr hexavalent
	0	0	0	0	2	Oil and grease, VOA, xylene, MEK, MIBK, EDB
8	0	0	3	3	1	Oil and grease, Pb, VOA, xylene, MEK, MIBK, EDB
9	0	0	4	30	0	PCBs
10	8	8	0	0	0	pH, Priority Pollutant scan, Cr hexavalent, xylene, MEK, MIBK, EDB
12	6	6	1	1	20 <sup>b</sup>	pH, VOA, EDB, xylene, oil and grease, Pb
	--	--	--	--	2	EP Toxicity Test metals

Table 1-1. Summary Table of Step IA Verification, NAVSTA Roosevelt Roads and NAF Vieques Confirmation Study (Continued, Page 2 of 2)

Site Number	Installed Wells	Ground Water Samples	Surface Water Samples	Sediment Samples	Soil Samples	Analytical Constituents <sup>a</sup>
13	11	11	6	6	0	pH, VOA, Pb, oil and grease, EDB, xylene
14	0	0	12	12	0	pH, VOA, Pb, EDB, xylene, MEK, MIBK, oil and grease
15	0	0	0	0	16	PCBs
16	0	0	0	0	9	PCBs, oil and grease, VOA, Pb, EDB, xylene, MEK, MIBK
18	0	0	2	2	15	Pesticides

-- = not applicable.

<sup>a</sup> = Key to Constituent Abbreviations:

Cr = chromium.

Pb = lead.

VOA = volatile organic analysis.

PCBs = polychlorinated biphenyls.

EDB = ethylene dibromide.

MEK = methyl ethyl ketone.

MIBK = methyl isobutyl ketone.

Priority Pollutant Scan = U.S. Environmental Protection Agency (EPA) Priority Pollutant list of 129 pollutants, excluding asbestos, cyanide, and dioxin.

EP Toxicity Test Metals = Arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver by the extraction procedure (EP) toxicity test as described in 40 CFR Part 261.24, Appendix II.

<sup>b</sup> = no analyses. Only visual inspection for oil and measurement of thickness of oil layer, if found.

Source: ESE, 1986.

Section 2.0 presents the tabulated evaluation of the data, and a computer printout of the complete analytical data base is provided in a supplemental appendix under separate cover. Recommendations for additional monitoring in Round Two of the Verification Step of the Confirmation Study are described in Section 3.0.

## 2.0 DATA EVALUATION

As described in Section 1.0, this section presents the tabulated evaluation of the analytical data from the first round of Verification sample collection and analysis relative to available standards and criteria. Tables 2-1 through 2-13 present the concentration data for the samples collected from the 15 sites identified in Section 1.0, except for Site 3, IRFNA/MAF-4 Disposal Site, Vieques, and Site 9, PCB Disposal, Dry Dock Area. At Site 3, Well 3PW01 could not be sampled because significant modifications to the well were required, and the owner of the well could not be found during the onsite investigation to obtain approval for modifying the well to allow sample collection. No concentration data are presented for Site 9 because no contaminants were detected at this site; only concentration data for the analytical constituents that were detected are presented in Tables 2-1 through 2-13, and the complete data base is provided in the supplemental appendix under separate cover.

The criteria and standards presented in Tables 2-1 through 2-13 include acute toxicity data (Sax, 1979 and HEW, 1977), Acceptable Daily Intakes (ADIs) (EPA, 1986), draft EPA Health Advisories or "Suggested No Adverse Response Levels" (SNARLS) (EPA, 1985a), National Interim Primary Drinking Water Standards (NIPDWS) (EPA, 1985b), and EPA ambient water quality criteria (AWQC) (EPA, 1980). Certain constituents in Tables 2-1 through 2-13 have no established toxicological data and/or criteria or standards, and for this reason no information concerning these is provided. The acute toxicity data provided in the tabulated data evaluation include the lethal dose fifty (LD<sub>50</sub>) data for rats. The LD<sub>50</sub> is the calculated dose of a substance which is expected to cause the death of 50 percent of an entire defined experimental animal population. Results of studies on rats are the most frequently reported and therefore provide the most useful data for comparison purposes.

The criteria used to assess the extent of contamination for noncarcinogens in Tables 2-1 through 2-13 are the ADI values. EPA has

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Table 2-1. NAF Vieques Confirmation Study, Round One Sampling Results, Site 1, Quebrada Disposal Site

Constituent	Concentrations	Chemical Toxicity Parameters					MCL/ AWQC
		Acute Toxicity	ADI	Health Advisory SNARLS			
				1-day	10-day	Long-Term	
<b>SEDIMENT</b>							
<u>Sample Number:</u>	1SE1 1SE2 1SE3						
Oil & Grease (ug/g, dry)	63 86 120						
Chromium (Total) (ug/g, dry)	6.48 4.48 4.48						50 ug/L
<b>SOIL</b>							
<u>Sample Number:</u>	1S1A 1S2A 1S3A 1S4A 1S5A 1S6A						
Oil & Grease (ug/g, dry)	189 201 226 195 188 88						
Chromium (Total) (ug/g, dry)	26.3 18.5 26.8 24.8 25.0 25.2						50 ug/L
<b>GROUND WATER</b>							
<u>Sample Number:</u>	1GW1 1GW2 1GW3						
Chromium (Total) (ug/L)	286 303 309						50 ug/L

<sup>a</sup>Acute Toxicity = expressed as oral LD<sub>50</sub>(rat) mg/kg; or the dose of the substance orally ingested by rats which is expected to cause the death of 50 percent of the population.

<sup>b</sup>ADI = Acceptable Daily Intake—the amount of toxicant in ug/day for a 70 kg man or ug/kg/day which should not result in adverse effects after chronic exposure.

<sup>c</sup>Health Advisory (SNARLS) = Suggested No Adverse Response Levels expressed as mg of substance per liter of water.

<sup>d</sup>MCL/AWQC = Maximum Concentration Level of National Primary Drinking Water Standards/Ambient Water Quality Criteria associated with 10<sup>-6</sup> cancer risks.

Source: ESE, 1986.

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Table 2-2. NAF Vieques Confirmation Study, Round One Sampling Results, Site 2, Mangrove Disposal Site

Constituent	Concentrations	Chemical Toxicity Parameters			MCL/ AWQC
		Acute Toxicity	ADI	Health Advisory SNARLS 1-day 10-day Long-Term	
SURFACE WATER					
Sample Number:	2SW1 2SW2 2SW3 2SW4 2SW5				
Chromium (Total) (ug/L)	3.00 4.00 3.00 3.00 3.00				50 ug/L
SEDIMENT					
Sample Number:	2SE1 2SE2 2SE3 2SE4 2SE5				
Chromium (Total) (ug/g, dry)	12.6 32.9 88.4 5.28 16.2				50 ug/L
Lead (ug/g, dry)	— — 53.2 16.9 63.9				50 ug/L
SOIL					
Sample Number:	2S1N 2S2N 2S3N 2S4N 2S5N 2S6N				
Chromium (Total) (ug/g, dry)	9.00 3.73 46.4 20.4 33.6 36.9				50 ug/L
Lead (ug/g, dry)	232 — 10.2 345 — 6.42				50 ug/L
Sample Number:	2S7N 2S8N				
Chromium (Total) (ug/g, dry)	48.2 24.2				50 ug/L
Lead (ug/g, dry)	— —				50 ug/L

— = Not detected.

<sup>a</sup>Acute Toxicity = expressed as oral LD<sub>50</sub>(rat) mg/kg; or the dose of the substance orally ingested by rats which is expected to cause the death of 50 percent of the population.

<sup>b</sup>ADI = Acceptable Daily Intake—the amount of toxicant in ug/day for a 70 kg man or ug/kg/day which should not result in adverse effects after chronic exposure.

<sup>c</sup>Health Advisory (SNARLS) = Suggested No Adverse Response Levels expressed as mg of substance per liter of water.

<sup>d</sup>MCL/AWQC = Maximum Concentration Level of National Primary Drinking Water Standards/Ambient Water Quality Criteria associated with 10<sup>-6</sup> cancer risks.

Source: ESE, 1986.

Table 2-3. NAVSTA Roosevelt Roads Confirmation Study, Round One Sampling Results, Site 5, Army Cremator Disposal Area

Constituent	Concentrations					Chemical Toxicity Parameters			MCL/ AWQC
						Acute Toxicity	ADI	Health Advisory SNARLS	
						1-day	10-day	Long-Term	
<b>SURFACE WATER</b>									
Sample Number:	5SW1	5SW2	5SW3	5SW4	5SW5				
Bis(2-eth'hex')phthalate (ug/L)	1	1	2	—	1				
Di-n-octylphthalate (ug/L)	1	7	4	—	2				
Arsenic (ug/L)	102	105	97.0	96.0	104				50/0.0022 ug/L
Chromium (Total) (ug/L)	—	31.9	—	—	—				50 ug/L
Copper (ug/L)	2.0	—	—	—	—				1,000 ug/L
Nickel (ug/L)	—	—	—	—	33.6				13.4 ug/L
Thallium (ug/L)	83.3	86.7	89.1	116	111				13 ug/L
Zinc (ug/L)	15.0	16.1	4.31	19.9	5.01				5,000 ug/L
<b>SEDIMENT</b>									
Sample Number:	5SE1	5SE2	5SE3	5SE4	5SE5				
Bis(2-eth'hex')phthalate (mg/kg, dry)	0.1	—	—	—	—				
Di-n-octylphthalate (mg/kg, dry)	1	4	0.5	—	0.5				
BHC, D (ug/g, dry)	—	1.03	—	—	—	Oral LD <sub>50</sub> (rat) = 1,000 mg/kg			100 ug/L
Antimony (mg/kg, dry)	3.8	5.2	5.1	24	7.3	Oral LD <sub>50</sub> (rat) = 100 mg/kg			146 ug/L
Arsenic (ug/g, dry)	14.4	—	13.4	32.0	22.0				50/0.0022 ug/L
Beryllium (mg/kg, dry)	—	—	—	1.33	0.954				0.0037 ug/L
Chromium (Total) (ug/g, dry)	21.9	28.4	29.3	54.1	33.5				50 ug/L
Copper (ug/g, dry)	36.8	54.7	43.4	119	78.8				1,000 ug/L
Lead (ug/g, dry)	76.4	—	21.0	—	—				50 ug/L
Mercury (ug/g, dry)	0.109	—	—	—	—	0.1 mg/day for 70 kg man			2/0.144 ug/L
Nickel (ug/g, dry)	6.72	11.8	8.77	22.3	15.6				13.4 ug/L
Selenium (mg/kg, dry)	19.8	31.3	27.4	85.4	49.7				10 ug/L
Zinc (ug/g, dry)	25.9	42.8	32.8	72.8	50.8				5,000 ug/L

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Table 2-3. NAVSTA Roosevelt Roads Confirmation Study, Round One Sampling Results, Site 5, Army Cremator Disposal Area  
(Continued, Page 2 of 2)

Constituent	Concentrations					Chemical Toxicity Parameters			MCL/ AWQC
						Acute Toxicity	ADI	Health Advisory SNARLS	
						1-day	10-day	Long-Term	
GROUND WATER									
Sample Number:	5GW1	5GW2	5GW3	5GW4	5GW5				
Bis(2-eth'hex')phthalate (ug/L)	--	--	--	--	2				
Chloroform (ug/L)	0.54	--	--	--	--	Oral LD <sub>50</sub> (rat) = 800 mg/kg			0.19 ug/L
Pentachlorophenol (ug/L)	22	11	12	25	--	Oral LD <sub>50</sub> (rat) = 146 mg/kg			1.01 mg/L
1,1,2,2-Te'ch'ethane (ug/L)	1.1	--	--	--	--	Oral LD <sub>50</sub> (rat) = 200 mg/kg			0.17 ug/L
Arsenic (ug/L)	20.5	--	93.4	88.6	83.9				50/0.0022 ug/L
Beryllium (ug/L)	--	--	--	5.06	--				0.0037 ug/L
Chromium (Total) (ug/L)	3.25	6.05	18.1	26.9	28.4				50 ug/L
Copper (ug/L)	23.9	58.2	1,850	113	55.8				1,000 ug/L
Nickel (ug/L)	--	4.32	46.3	48.0	12.6				13.4 ug/L
Thallium (ug/L)	10.6	9.64	4,310	3,860	3,450				13 ug/L

-- = Not detected.

<sup>a</sup>Acute Toxicity = expressed as oral LD<sub>50</sub>(rat) mg/kg; or the dose of the substance orally ingested by rats which is expected to cause the death of 50 percent of the population.

<sup>b</sup>ADI = Acceptable Daily Intake—the amount of toxicant in mg/day for a 70 kg man or mg/kg/day which should not result in adverse effects after chronic exposure.

<sup>c</sup>Health Advisory (SNARLS) = Suggested No Adverse Response Levels expressed as mg of substance per liter of water.

<sup>d</sup>MCL/AWQC = Maximum Concentration Level of National Primary Drinking Water Standards/Ambient Water Quality Criteria associated with 10<sup>-6</sup> cancer risks.

Source: ESE, 1986.

Table 2-4. NAVSTA Roosevelt Roads Confirmation Study, Round One Sampling Results, Site 6, Langley Drive Disposal Site

Constituent	Concentrations			Chemical Toxicity Parameters			MCL/ AWQC	
				Acute Toxicity	ADI	Health Advisory SNARLS		
				1-day	10-day	Long-Term		
<b>SURFACE WATER</b>								
<u>Sample Number:</u>	R6SW1	R6SW2	R6SW3					
Bis(2-eth'hex')phthalate (ug/L)	1	1	—					
Di-n-octylphthalate (ug/L)	2	—	2					
Beryllium (ug/L)	23.6	50.6	24.7				0.0037 ug/L	
Cadmium (ug/L)	4.42	8.40	3.35				10 ug/L	
Chromium (+6)(ug/L)	—	34.4	36.7				50 ug/L	
Chromium (Total) (ug/L)	318	611	339				50 ug/L	
Copper (ug/L)	354	966	516				1,000 ug/L	
Lead (ug/L)	211	526	244				50 ug/L	
Mercury (ug/L)	0.856	0.997	0.997		0.1 mg/day for 70 kg man		2/0.144 ug/L	
Nickel (ug/L)	135	252	147				13.4 ug/L	
Selenium (ug/L)	278	—	549				10 ug/L	
Thallium (ug/L)	29.3	28.6	19.2				13 ug/L	
Zinc (ug/L)	558	1,310	818				5,000 ug/L	
<b>SEDIMENT</b>								
<u>Sample Number:</u>	R6SE1	R6SE2	R6SE3					
Bis(2-eth'hex')phthalate (mg/kg, dry)	0.09	—	—					
Di-n-octylphthalate (mg/kg, dry)	0.3	0.2	0.2					
Methyl Ethyl Ketone (ug/g, dry)	—	—	1.6	Oral LD <sub>50</sub> (rat) = 3400 mg/kg	3 mg/day for 70 kg man	NA	7.5 mg/L	0.750 mg/L
Antimony (mg/kg, dry)	5.9	6.9	7.4	Oral LD <sub>50</sub> (rat) = 150 mg/kg				146 ug/L
Arsenic (ug/g, dry)	7.76	15.1	16.4					50/0.0022 ug/L
Beryllium (mg/kg, dry)	—	0.360	0.392					0.0037 ug/L
Chromium (Total) (ug/g, dry)	6.71	11.7	18.0					50 ug/L
Copper (ug/g, dry)	9.10	20.4	26.4					1,000 ug/L

Table 2-4. NAVSTA Roosevelt Roads Confirmation Study, Round One Sampling Results, Site 6, Langley Drive Disposal Site  
(Continued, Page 2 of 5)

Constituent	Concentrations						Chemical Toxicity Parameters			MCL/ AWQC	
							Acute Toxicity	ADI	Health Advisory SNARLS		
							1-day	10-day	Long-Term		
SEDIMENT (Continued)											
Sample Number:	R6SE1	R6SE2	R6SE3								
Mercury (ug/g, dry)	—	—	0.084							0.1 mg/day for 70-kg man	2/0.144 ug/L
Nickel (ug/g, dry)	3.46	5.62	7.45								13.4 ug/L
Selenium (mg/kg, dry)	7.02	16.3	19.4								10 ug/L
Zinc (ug/g, dry)	14.1	23.3	29.8								5,000 ug/L
SOIL											
Sample Number:	R6S1A	R6S2A	R6S3A	R6S4A	R6S5A	R6S6A					
Benzo(a)anthracene (mg/kg, dry)	—	—	—	—	0.07	0.1					
Benzo(b)fluoranthene (mg/kg, dry)	—	—	—	—	0.06	0.2					
Benzo(k)fluoranthene (mg/kg, dry)	—	—	—	—	0.04	0.09					
Benzo(a)pyrene (mg/kg, dry)	—	—	—	—	0.04	0.2					
Benzo(g,h,i)perylene (mg/kg, dry)	—	—	—	—	—	0.08					
Bis(2-eth'hex')phthalate (mg/kg, dry)	—	—	0.05	—	0.06	0.2					
Chrysene (mg/kg, dry)	—	—	—	—	0.08	0.1					
Di-n-octylphthalate (mg/kg, dry)	—	0.1	—	—	0.10	—					
Fluoranthene (mg/kg, dry)	—	—	—	—	0.06	0.2				Oral LD <sub>50</sub> (rat) = 2,000 mg/kg	42 ug/L
Indeno(1,2,3-cd)pyrene (mg/kg, dry)	—	—	—	—	—	0.06					
Phenanthrene (mg/kg, dry)	—	—	—	—	—	0.03					
Pyrene (mg/kg, dry)	—	—	—	—	0.06	0.2					
Antimony (mg/kg, dry)	11	10	10	9.4	18	28				Oral LD <sub>50</sub> (rat) = 100 mg/kg	146 ug/L

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Table 2-4. NAVSTA Roosevelt Roads Confirmation Study, Round One Sampling Results, Site 6, Langley Drive Disposal Site  
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Constituent	Concentrations						Chemical Toxicity Parameters			MCL/ AWQC
							Acute Toxicity	ADI	Health Advisory SNARLS	
							1-day	10-day	Long-Term	
SOIL (Continued)										
Sample Number:	R6S1A	R6S2A	R6S3A	R6S4A	R6S5A	R6S6A				
Arsenic (ug/g, dry)	16.6	57.1	15.9	22.5	35.5	12.7				50/0.0022 ug/L
Beryllium (ug/g, dry)	—	1.01	0.276	0.623	1.11	0.289				0.0037 ug/L
Cadmium (ug/g, dry)	—	2.88	—	—	0.881	0.729				10 ug/L
Chromium (Total) (ug/g, dry)	16.9	23.7	17.9	17.5	34.9	13.8				50 ug/L
Copper (ug/g, dry)	22.6	50.3	20.6	26.2	380	51.0				1,000 ug/L
Lead (ug/g, dry)	—	—	—	—	222	—				50 ug/L
Mercury (ug/g, dry)	0.052	—	—	—	0.714	0.991	0.1 mg/day for 70 kg man			2/0.144 ug/L
Nickel (ug/g, dry)	6.32	12.5	6.35	6.59	14.5	5.07				13.4 ug/L
Selenium (mg/kg, dry)	13.9	55.8	16.1	21.0	49.3	13.5				10 ug/L
Zinc (ug/g, dry)	28.3	71.7	31.9	48.2	329	81.5				5,000 ug/L
Sample Number:	R6S7A	R6S8A	R6S9A	R6S10A	R6S11A	R6S12A				
Benzo(a)anthracene (mg/kg, dry)	—	—	—	—	—	—				
Benzo(b)fluoranthene (mg/kg, dry)	—	—	—	—	—	—				
Benzo(k)fluoranthene (mg/kg, dry)	—	—	—	—	—	—				
Benzo(a)pyrene (mg/kg, dry)	—	—	—	—	—	—				
Benzo(g,h,i)perylene (mg/kg, dry)	—	—	—	—	—	—				
Bis(2-eth'hex')phthalate (mg/kg, dry)	0.05	—	0.08	—	—	—				
Chrysene (mg/kg, dry)	—	—	—	—	—	—				
Di-n-octyl-phthalate (mg/kg, dry)	0.1	0.2	—	—	—	—				
Fluoranthene (mg/kg, dry)	0.02	—	—	—	—	—	Oral LD <sub>50</sub> (rat) = 2,000 mg/kg			42 ug/L
Indeno(1,2,3-cd)pyrene (mg/kg, dry)	—	—	—	—	—	—				
Phenanthrene (mg/kg, dry)	—	—	—	—	—	—				

Table 2-4. NAVSTA Roosevelt Roads Confirmation Study, Round One Sampling Results, Site 6, Langley Drive Disposal Site  
(Continued, Page 4 of 5)

Constituent	Concentrations						Chemical Toxicity Parameters			MCL/ AWQC	
							Acute Toxicity	ADI	Health Advisory SNARLS		
							1-day	10-day	Long-Term		
SOIL (Continued)											
Sample Number:	R6S7A	R6S8A	R6S9A	R6S10A	R6S11A	R6S12A					
Pyrene (mg/kg, dry)	0.02	—	—	—	—	—					
Antimony (mg/kg, dry)	27	51	15	17	9.5	9.1	Oral LD <sub>50</sub> (rat)= 100 mg/kg			146 ug/L	
Arsenic (ug/g, dry)	134	30.9	54.1	35.7	25.5	88.2					50/0.0022 ug/L
Beryllium (ug/g, dry)	3.31	2.18	1.17	2.52	1.59	6.14					0.0037 ug/L
Cadmium (ug/g, dry)	2.41	1.54	1.12	1.69	0.872	2.41					10 ug/L
Chromium (Total) (ug/g, dry)	39.0	36.0	78.2	39.2	50	58.4					
Copper (ug/g, dry)	823	163	107	383	211	527					1,000 ug/L
Lead (ug/g, dry)	76.5	92.8	180	3,040	568	197					50 ug/L
Mercury (ug/g, dry)	0.261	0.136	0.105	1.54	0.356	0.352	0.1 mg/day for 70 kg man			2/0.144 ug/L	
Nickel (ug/g, dry)	30.3	22.2	56.1	33.4	17.2	68.1					13.4 ug/L
Selenium (mg/kg, dry)	80.5	65.1	44.6	93.9	65.4	426					10 ug/L
Zinc (ug/g, dry)	439	520	339	758	475	949					5,000 ug/L
Sample Number:	R6S13A	R6S14A	R6S15A								
Benzo(a)anthracene (mg/kg, dry)	—	0.03	—								
Benzo(b)fluoranthene (mg/kg, dry)	—	0.04	—								
Benzo(k)fluoranthene (mg/kg, dry)	—	—	—								
Benzo(a)pyrene (mg/kg, dry)	—	—	—								
Benzo(g,h,i)perylene (mg/kg, dry)	—	—	—								
Bis(2-eth'hex')phthalate (mg/kg, dry)	—	0.3	4								
Chrysene (mg/kg, dry)	—	0.04	—								
Di-n-octyl-phthalate (mg/kg, dry)	—	0.1	—								
Fluoranthene (mg/kg, dry)	—	0.03	—				Oral LD <sub>50</sub> (rat)= 2,000 mg/kg			42 ug/L	

Table 2-4. NAVSTA Roosevelt Roads Confirmation Study, Round One Sampling Results, Site 6, Langley Drive Disposal Site  
(Continued, Page 5 of 5)

Constituent	Concentrations			Chemical Toxicity Parameters			MCL/ AWQC
				Acute Toxicity	ADI	Health Advisory SNARLS	
				1-day	10-day	Long-Term	
SOIL (Continued)							
Sample Number:	R6S13A	R6S14A	R6S15A				
Indeno(1,2,3-cd)pyrene (mg/kg, dry)	—	—	—				
Phenanthrene (mg/kg, dry)	—	—	—				
Pyrene (mg/kg, dry)	—	0.03	—				
Antimony (mg/kg, dry)	20	9.4	6.5	Oral LD <sub>50</sub> (rat) = 1,000 mg/kg			146 ug/L
Arsenic (ug/g, dry)	—	7.24	34.9				50/0.0022 ug/L
Beryllium (ug/g, dry)	14.9	1.61	1.39				0.0037 ug/L
Cadmium (ug/g, dry)	0.762	2.71	0.577				10 ug/L
Chromium (Total) (ug/g, dry)	75.2	35.2	18.6				
Copper (ug/g, dry)	383	332	101				1,000 ug/L
Lead (ug/g, dry)	58.0	466	169				50 ug/L
Mercury (ug/g, dry)	—	0.449	0.898		0.1 mg/day for 70 kg man		2/0.144 ug/L
Nickel (ug/g, dry)	165	32.3	23.3				13.4 ug/L
Selenium (mg/kg, dry)	—	68.5	60.0				10 ug/L
Zinc (ug/g, dry)	181	426	210				5,000 ug/L

— = Not detected.

<sup>a</sup>Acute Toxicity = expressed as oral LD<sub>50</sub>(rat) mg/kg; or the dose of the substance orally ingested by rats which is expected to cause the death of 50 percent of the population.

<sup>b</sup>ADI = Acceptable Daily Intake—the amount of toxicant in mg/day for a 70 kg man or ug/kg/day which should not result in adverse effects after chronic exposure.

<sup>c</sup>Health Advisory (SNARLS) = Suggested No Adverse Response Levels expressed as mg of substance per liter of water.

<sup>d</sup>MCL/AWQC = Maximum Concentration Level of National Primary Drinking Water Standards/Ambient Water Quality Criteria associated with 10<sup>-6</sup> cancer risks.

Source: ESE, 1986.

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Table 2-5. NAVSTA Roosevelt Roads Confirmation Study, Round One Sampling Results, Site 7, Station Landfill

Constituent	Concentrations	Chemical Toxicity Parameters			MCL/ AWQC
		Acute Toxicity	ADI	Health Advisory SNARLS 1-day 10-day Long-Term	
SOIL					
<u>Sample Number:</u>	R7S1N R7S2N R7S3N				
Oil & Grease (ug/g, dry)	198 80 127				
GROUND WATER					
<u>Sample Number:</u>	R7GW1 R7GW2 R7GW3 R7GW4 R7GW5 R7GW6				
Bis(2-eth'hex')phthalate (ug/L)	6 6 1 3 5 2				
Butyl benz'phthalate (ug/L)	17 -- 2 5 -- 3				
Di-n-butylphthalate (ug/L)	2 0.9 -- 0.7 -- --				
1,3-Dichlorobenzene (ug/L)	-- -- -- -- -- --				400 ug/L
1,2-Dichlorobenzene (ug/L)	-- -- -- -- -- --				400 ug/L
1,4-Dichlorobenzene (ug/L)	-- -- -- -- -- --				400 ug/L
Di-n-octylphthalate (ug/L)	1 -- -- -- -- --				
Arsenic (ug/L)	73.6 58.6 121 87.0 84.9 93.9				50/0.0022 ug/L
Beryllium (ug/L)	3.12 -- -- -- -- 11.3				0.0037 ug/L
Chromium (+6)(ug/L)	-- -- -- 46.0 -- --				50 ug/L
Chromium (Total) (ug/L)	15.9 6.89 30.8 8.72 15.9 2.3				
Copper (ug/L)	42.9 5.18 73.5 4.56 23.2 135				1,000 ug/L
Lead (ug/L)	-- -- -- -- 424 --				50 ug/L
Nickel (ug/L)	11.5 -- 14.3 10.2 10.0 13.5				13.4 ug/L
Selenium (ug/L)	-- -- -- -- -- 88.9				10 ug/L
Thallium (ug/L)	187 187 1,780 31.2 31.5 60.6				13 ug/L
Zinc (ug/L)	95.6 53.2 50.0 62.7 225 103				5,000 ug/L

Table 2-5. NAVSTA Roosevelt Roads Confirmation Study, Round One Sampling Results, Site 7, Station Landfill  
(Continued, Page 2 of 2)

Constituent	Concentrations		Chemical Toxicity Parameters			MCL/ AWQC
			Acute Toxicity	ADI	Health Advisory SNARLS	
			1-day	10-day	Long-Term	
GROUND WATER (Continued)						
Sample Number:	R7GW7	R7GW8				
Bis(2-eth'hex')phthalate (ug/L)	3	8				
Butyl benz'phthalate (ug/L)	1	0.7				
Di-n-butylphthalate (ug/L)	—	1				
1,3-Dichlorobenzene (ug/L)	—	0.7				400 ug/L
1,2-Dichlorobenzene (ug/L)	—	0.9				400 ug/L
1,4-Dichlorobenzene (ug/L)	—	9				400 ug/L
Di-n-octylphthalate (ug/L)	—	0.8				
Arsenic (ug/L)	46.1	120				50/0.0022 ug/L
Beryllium (ug/L)	4.16	6.65				0.0037 ug/L
Chromium (+6)(ug/L)	—	—				50 ug/L
Chromium (Total) (ug/L)	11.3	57.7				50 ug/L
Copper (ug/L)	33.0	42.8				1,000 ug/L
Lead (ug/L)	—	—				50 ug/L
Nickel (ug/L)	12.2	18.7				13.4 ug/L
Selenium (ug/L)	—	—				10 ug/L
Thallium (ug/L)	4.57	10.9				13 ug/L
Zinc (ug/L)	64.0	52.2				5,000 ug/L

— = Not detected.

<sup>a</sup>Acute Toxicity = expressed as oral LD<sub>50</sub>(rat) mg/kg; or the dose of the substance orally ingested by rats which is expected to cause the death of 50 percent of the population.

<sup>b</sup>ADI = Acceptable Daily Intake—the amount of toxicant in mg/day for a 70 kg man or mg/kg/day which should not result in adverse effects after chronic exposure.

<sup>c</sup>Health Advisory (SNARLS) = Suggested No Adverse Response Levels expressed as mg of substance per liter of water.

<sup>d</sup>MCL/AWQC = Maximum Concentration Level of National Primary Drinking Water Standards/Ambient Water Quality Criteria associated with 10<sup>-6</sup> cancer risks.

Table 2-6. NAVSTA Roosevelt Roads Confirmation Study, Round One Sampling Results, Site 8, Drone Washdown

Constituent	Concentrations	Chemical Toxicity Parameters					MCL/ AWQC
		Acute Toxicity	ADI	Health Advisory SNARLS			
				1-day	10-day	Long-Term	
<b>SURFACE WATER</b>							
Sample Number:	8SW1 8SW2 8SW3						
Oil & Grease (mg/L)	5 102 98						
<b>SEDIMENT</b>							
Sample Number:	8SE1 8SE2 8SE3						
Lead (ug/g, dry)	28.8 -- 43.4						50 ug/L
Oil & Grease (ug/g, dry)	4,740 787 1,670						
<b>SOIL</b>							
Sample Number:	8S1A						
Lead (ug/g, dry)	6.70						50 ug/L
Oil & Grease (ug/g, dry)	8.21						

-- = Not detected.

<sup>a</sup>Acute Toxicity = expressed as oral LD<sub>50</sub>(rat) mg/kg; or the dose of the substance orally ingested by rats which is expected to cause the death of 50 percent of the population.

<sup>b</sup>ADI = Acceptable Daily Intake—the amount of toxicant in mg/day for a 70 kg man or mg/kg/day which should not result in adverse effects after chronic exposure.

<sup>c</sup>Health Advisory (SNARLS) = Suggested No Adverse Response Levels expressed as mg of substance per liter of water.

<sup>d</sup>MCL/AWQC = Maximum Concentration Level of National Primary Drinking Water Standards/Ambient Water Quality Criteria associated with 10<sup>-6</sup> cancer risks.

Source: ESE, 1986.

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Table 2-7. NAVSTA Roosevelt Roads Confirmation Study, Round One Sampling, Site 10, Building 25 Storage Area

Constituent	Concentrations						Chemical Toxicity Parameters				
							Acute Toxicity	ADI	Health Advisory SNARLS		
							1-day	10-day	Long-Term		
GROUND WATER											
Sample Number:	10GW1	10GW2	10GW3	10GW4	10GW5	10GW6					
Bis(2-eth'hex')phthalate (ug/L)	4	--	--	--	--	--					
Butyl benz'phthalate (ug/L)	3	16	40	4	11	20					
Methyl Ethyl Ketone (ug/L)	--	--	--	9	--	--	Oral LD <sub>50</sub> (rat)= 3400 mg/kg	3 mg/day for 70 kg man	NA	7.5 mg/L	0.750 mg/L
Antimony (ug/L)	--	--	--	129	78.6	87.6	Oral LD <sub>50</sub> (rat)= 150 mg/kg				146 ug/L
Arsenic (ug/L)	119	--	--	--	105	--				50/0.0022 ug/L	
Beryllium (ug/L)	17.3	3.2	16.8	26.0	4.25	23.3				0.0037 ug/L	
Cadmium (ug/L)	29.6	--	5.78	5.39	--	12.3				10 ug/L	
Chromium (+6) (ug/L)	--	--	--	--	--	42.9				50 ug/L	
Chromium (Total) (ug/L)	72.7	5.90	71.8	138	36.2	113					
Copper (ug/L)	600	86.7	613	927	144	1,550				1,000 ug/L	
Lead (ug/L)	--	--	--	147	--	66.6				50 ug/L	
Mercury (ug/L)	0.309	--	0.527	0.309	--	0.309	0.1 mg/day for 70 kg man			2/0.144 ug/L	
Nickel (ug/L)	171	9.90	94.8	97.3	27.1	130				13.4 ug/L	
Selenium (ug/L)	324	93.1	208	512	30.1	324				10 ug/L	
Thallium (ug/L)	42.3	--	24.3	--	3.24	5.03				13 ug/L	
Zinc (ug/L)	733	68.8	584	533	132	857				5,000 ug/L	
Sample Number:	10GW7	10GW8									
Bis(2-eth'hex')phthalate (ug/L)	--	--									
Butyl benz'phthalate (ug/L)	16	15									
Methyl Ethyl Ketone (ug/L)	--	--									

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Table 2-7. NAVSTA Roosevelt Roads Confirmation Study, Round One Sampling Results, Site 10, Building 25 Storage Area  
(Continued, Page 2 of 2)

Constituent	Concentrations		Chemical Toxicity Parameters			MCL/ AWQC
			Acute Toxicity	ADI	Health Advisory SNARLS 1-day 10-day Long-Term	
GROUND WATER (Continued)						
Sample Number:	10GW7	10GW8				
Antimony (ug/L)	252	—	Oral LD <sub>50</sub> (rat)= 150 mg/kg			146 ug/L
Arsenic (ug/L)	—	—				50/0.0022 ug/L
Beryllium (ug/L)	27.1	13.0				0.0037 ug/L
Cadmium (ug/L)	3.05	5.57				10 ug/L
Chromium (+6) (ug/L)	—	—				50 ug/L
Chromium (Total) (ug/L)	179	112				
Copper (ug/L)	549	481				1,000 ug/L
Lead (ug/L)	—	69.1				50 ug/L
Mercury (ug/L)	—	0.222		0.1 mg/day for 70 kg man		2/0.144 ug/L
Nickel (ug/L)	99.2	73.8				13.4 ug/L
Selenium (ug/L)	411	216				10 ug/L
Thallium (ug/L)	3.24	112				13 ug/L
Zinc (ug/L)	489	672				5,000 ug/L

— = Not detected.

<sup>a</sup>Acute Toxicity = expressed as oral LD<sub>50</sub>(rat) mg/kg; or the dose of the substance orally ingested by rats which is expected to cause the death of 50 percent of the population.

<sup>b</sup>ADI = Acceptable Daily Intake—the amount of toxicant in mg/day for a 70 kg man or mg/kg/day which should not result in adverse effects after chronic exposure.

<sup>c</sup>Health Advisory (SNARLS) = Suggested No Adverse Response Levels expressed as mg of substance per liter of water.

<sup>d</sup>MCL/AWQC = Maximum Concentration Level of National Primary Drinking Water Standards/Ambient Water Quality Criteria associated with 10<sup>-6</sup> cancer risks.

Source: ESE, 1986.

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Table 2-8. NAVSTA Roosevelt Roads Confirmation Study, Round One Sampling Results, Site 12, Two Way Road Fuel Farm

Constituent	Concentrations	Chemical Toxicity Parameters				MCL/ AWQS						
		Acute Toxicity	ADI	Health Advisory SNARLS								
				1-day	10-day	Long-Term						
<b>SURFACE WATER</b>												
Sample Number:	12SW1											
Oil & Grease (mg/L)	0.4											
<b>SEDIMENT</b>												
Sample Number:	12SE1											
Oil & Grease (ug/g, dry)	3,340											
<b>SOIL</b>												
<b>GROUND WATER</b>												
Sample Number:	12GW1	12GW2	12GW3	12GW4	12GW5	12GW6						
Benzene (ug/L)	—	2,000	—	—	—	—	Oral LD <sub>50</sub> (rat) = 3,800 mg/kg	0.23 mg/L	0.07 mg/L	0.66 ug/L		
Toluene (ug/L)	—	400	—	—	—	—	Oral LD <sub>50</sub> (rat) = 5,000 mg/kg	20 mg/day for 70 kg man	21.5 mg/L	2.2 mg/L	0.34 mg/L	14.3 mg/L
Oil & Grease (mg/L)	0.4	1	0.7	3	0.4	42						

— = Not detected.

<sup>a</sup>Acute Toxicity = expressed as oral LD<sub>50</sub>(rat) mg/kg; or the dose of the substance orally ingested by rats which is expected to cause the death of 50 percent of the population.

<sup>b</sup>ADI = Acceptable Daily Intake—the amount of toxicant in mg/day for a 70 kg man or mg/kg/day which should not result in adverse effects after chronic exposure.

<sup>c</sup>Health Advisory (SNARLS) = Suggested No Adverse Response Levels expressed as mg of substance per liter of water.

<sup>d</sup>MCL/AWQS = Maximum Concentration Level of National Primary Drinking Water Standards/Ambient Water Quality Criteria associated with 10<sup>-6</sup> cancer risks.

Source: ESE, 1986.

Table 2-9. NAVSTA Roosevelt Roads Confirmation Study, Round One Sampling Results, Site 13, Tanks 210 to 217

Constituent	Concentrations	Chemical Toxicity Parameters				MCL/ AWQC	
		Acute Toxicity	ADI	Health Advisory SNARLS			
				1-day	10-day		Long-Term
<b>SURFACE WATER</b>							
Sample Number:	13SW5 13SW6						
Oil & Grease (mg/L)	0.6 0.4						
<b>SEDIMENT</b>							
Sample Number:	13SE1 13SE2 13SE3 13SE4 13SE5 13SE6						
Lead (ug/g, dry)	400 42.3 -- 7.79 -- --					50 ug/L	
Oil & Grease (ug/g, dry)	52,300 6,710 3,280 1,730 1,830 10,200						
<b>GROUND WATER</b>							
Sample Number:	13GW1 13GW2 13GW3 13GW4 13GW5 13GW6						
Benzene (ug/L)	-- 2,000 0.21 -- 350 --	Oral LD <sub>50</sub> (rat) = 3,800 mg/kg		0.23 mg/L	0.07 mg/L	0.66 ug/L	
Bromodichloromethane (ug/L)	-- -- 0.57 -- -- --					0.19 ug/L	
Chlorobenzene (ug/L)	-- -- -- -- 1.5 --					0.00072 ug/L	
Chloroform (ug/L)	1.0 -- 5.0 3.7 2.6 1.1	Oral LD <sub>50</sub> (rat) = 800 mg/kg				0.19 ug/L	
1,2-dichloroethane (ug/L)	-- 90 -- 170 -- --	Oral LD <sub>50</sub> (rat) = 770 mg/kg				0.94 ug/L	
Ethylbenzene (ug/L)	-- 130 -- 1.0 74 --	Oral LD <sub>50</sub> (rat) = 3,500 mg/kg	0.1 mg/kg/day			1.4 mg/L	
Toluene (ug/L)	-- 34,000 -- -- -- --	Oral LD <sub>50</sub> (rat) = 5,000 mg/kg	20 mg/day for 70 kg man	21.5 mg/L	2.2 mg/L	0.34 mg/L 14.3 mg/L	
Vinyl chloride (ug/L)	-- -- -- -- 1.9 --						
m-Xylene (ug/L)	-- 290 -- -- 220 --	Oral LD <sub>50</sub> (rat) = 5,000 mg/kg		12 mg/L	1.2 mg/L	0.62 ug/L	
o-and/or p-Xylene (ug/L)	-- 360 -- 0.57 180 --	Oral LD <sub>50</sub> (rat) = 5,000 mg/kg		12 mg/L	1.2 mg/L	0.62 ug/L	
Oil & Grease (mg/L)	0.7 5 0.6 3 2 0.5						
Sample Number:	13GW7 13GW8 13GW9 13GW10 13GW11						
Benzene (ug/L)	-- -- 16 -- --	Oral LD <sub>50</sub> (rat) = 3,800 mg/kg		0.23 mg/L	0.07 mg/L	0.66 ug/L	
Bromodichloromethane (ug/L)	-- -- -- -- --						
Chlorobenzene (ug/L)	-- -- -- -- --						
Chloroform (ug/L)	-- -- -- 0.42 --	Oral LD <sub>50</sub> (rat) = 800 mg/kg				0.19 ug/L	

Table 2-9. NAVSTA Roosevelt Roads Confirmation Study, Round One Sampling Results, Site 13, Tanks 210 to 217  
(Continued, Page 2 of 2)

Constituent	Concentrations	Chemical Toxicity Parameters				MCL/ AWQC	
		Acute Toxicity	ADI	Health Advisory SNARLS			
				1-day	10-day	Long-Term	
Sample Number:	13GW7 13GW8 13GW9 13GW10 13GW11						
1,2-dichloroethane (ug/L)	-- -- -- -- --	Oral LD <sub>50</sub> (rat) = 770 mg/kg					1.4 mg/L
Ethylbenzene (ug/L)	-- -- -- -- --	Oral LD <sub>50</sub> (rat) = 3,500 mg/kg	0.1 mg/kg/day			0.34 mg/L	14.3 mg/L
Toluene (ug/L)	-- -- -- -- --	Oral LD <sub>50</sub> (rat) = 5,000 mg/kg	20 mg/day for 70 kg man	21.5 mg/L	2.2 mg/L		
Vinyl chloride (ug/L)	-- -- -- -- --					0.62 mg/L	
M-Xylene (ug/L)	-- -- -- -- --	Oral LD <sub>50</sub> (rat) = 5,000 mg/kg		12 mg/L	1.2 mg/L	0.62 mg/L	
O-and/or P-Xylene (ug/L)	-- -- 4.9 -- --	Oral LD <sub>50</sub> (rat) = 5,000 mg/kg		12 mg/L	1.2 mg/L		
Oil & Grease (mg/L)	0.3 0.4 0.2 0.4 0.2						

-- = Not detected.

<sup>a</sup>Acute Toxicity = expressed as oral LD<sub>50</sub>(rat) mg/kg; or the dose of the substance orally ingested by rats which is expected to cause the death of 50 percent of the population.

<sup>b</sup>ADI = Acceptable Daily Intake--the amount of toxicant in mg/day for a 70 kg man or mg/kg/day which should not result in adverse effects after chronic exposure.

<sup>c</sup>Health Advisory (SNARLS) = Suggested No Adverse Response Levels expressed as mg of substance per liter of water.

<sup>d</sup>MCL/AWQC = Maximum Concentration Level of National Primary Drinking Water Standards/Ambient Water Quality Criteria associated with 10<sup>-6</sup> cancer risks.

Source: ESE, 1986.

Table 2-10. NAVSTA Roosevelt Roads Confirmation Study, Round One Sampling Results, Site 14, Ensenada Honda Shoreline and Mangroves

Constituent	Concentrations	Chemical Toxicity Parameters					MCL/ AWQC
		Acute Toxicity	ADI	Health Advisory SNARLS			
				1-Day	10-Day	Long-Term	
<b>SURFACE WATER</b>							
<u>Sample Number:</u>	14SW4 14SW5 15SW6 14SW7 14SW8 14SW9						
Oil & Grease (mg/L)	0.8 2 0.7 0.5 0.3 0.6						
<u>Sample Number:</u>	14SW10 14SW11						
Oil & Grease (mg/L)	0.5 0.5						
<b>SEDIMENT</b>							
<u>Sample Number:</u>	14SE1 14SE2 14SE3 14SE4 14SE5 14SE6						
Methyl Ethyl Ketone (ug/g, dry)	0.008 — — — — —	Oral LD <sub>50</sub> (rat) = 3,400 mg/kg	3 mg/day for 70 kg man	NA	7.5 mg/L	0.750 ug/L	
Oil & Grease (ug/g, dry)	112 119 250 219 656 147						
<u>Sample Number:</u>	14SE7 14SE8 14SE9 14SE10 14SE11 14SE12						
Methyl Ethyl Ketone (ug/g, dry)	— — — — — —	Oral LD <sub>50</sub> (rat) = 3,400 mg/kg	3 mg/day for 70 kg man	NA	7.5 mg/L	0.750 ug/L	
Oil & Grease (ug/g, dry)	806 225 2,080 1,670 1,118 993						

— = Not detected.

<sup>a</sup>Acute Toxicity = expressed as oral LD<sub>50</sub>(rat) mg/kg; or the dose of the substance orally ingested by rats which is expected to cause the death of 50 percent of the population.

<sup>b</sup>ADI = Acceptable Daily Intake—the amount of toxicant in mg/day for a 70 kg man or mg/kg/day which should not result in adverse effects after chronic exposure.

<sup>c</sup>Health Advisory (SNARLS) = Suggested No Adverse Response Levels expressed as mg of substance per liter of water.

<sup>d</sup>MCL/AWQC = Maximum Concentration Level of National Primary Drinking Water Standards/Ambient Water Quality Criteria associated with 10<sup>-6</sup> cancer risks.

Source: ESI, 1986.

Table 2-11. NAVSTA Roosevelt Roads Confirmation Study, Round One Sampling Results, Site 15, Substation 2

Constituent	Concentrations	Chemical Toxicity Parameters				MCL/ AWQC	
		Acute Toxicity	ADI	Health Advisory SNARLS			
				1-day	10-day		Long-Term
SOIL							
Sample Number:	15S1A 15S2A 15S3A 15S4A 15S5A 15S6A						
PCB 1260 (ug/g, dry)	32.1 308 91.3 9.41 2.38 186	Oral LD <sub>50</sub> (rat)= 1,315 mg/kg	0.125 mg/L	0.0125 mg/L		0.00079 ug/L	
Sample Number:	15S3A						
PCB 1260 (ug/g, dry)	8.18	Oral LD <sub>50</sub> (rat)= 1,315 mg/kg	0.125 mg/L	0.0125 mg/L		0.00079 ug/L	

<sup>a</sup>Acute Toxicity = expressed as oral LD<sub>50</sub>(rat) mg/kg; or the dose of the substance orally ingested by rats which is expected to cause the death of 50 percent of the population.

<sup>b</sup>ADI = Acceptable Daily Intake—the amount of toxicant in mg/day for a 70 kg man or mg/kg/day which should not result in adverse effects after chronic exposure.

<sup>c</sup>Health Advisory (SNARLS) = Suggested No Adverse Response Levels expressed as mg of substance per liter of water.

<sup>d</sup>MCL/AWQC = Maximum Concentration Level of National Primary Drinking Water Standards/Ambient Water Quality Criteria associated with 10<sup>-6</sup> cancer risks.

Source: ESE, 1986.

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Table 2-12. NAVSTA Roosevelt Roads Confirmation Study, Round One Sampling Results, Site 16, Old Power Plant, Building 38

Constituent	Concentrations						Chemical Toxicity Parameters				MCL/ AWQS	
							Acute Toxicity	ADI	Health Advisory SNARLS			
							1-day	10-day	Long-Term			
SOIL												
Sample Number:	16S1A	16S2A	16S3A	16S4A	16S5A	16S6A						
Lead (ug/g, dry)	3,910	420	15,700	834	151	12.7				50 ug/L		
Oil & Grease (ug/g, dry)	109	—	6,350	5,720	919	574						
Methyl Ethyl Ketone (ug/g, dry)	—	—	—	1	—	—	Oral LD <sub>50</sub> (rat) = 3,400 mg/kg	3 mg/day for 70 kg man	NA	7.5 mg/L	0.750 mg/L	
PCB 1016 (ug/g, dry)	—	—	—	—	—	—			0.125 mg/L	0.0125 mg/L		0.00079 ug/L
PCB 1260 (ug/g, dry)	—	404	92.9	55.9	3.39	8.85	Oral LD <sub>50</sub> (rat) = 1,315 mg/kg		0.125 mg/L	0.0125 mg/L		
Sample Number:	16S7A	16S8A	16S9A									
Lead (ug/g, dry)	69.8	215	—									50 ug/L
Oil & Grease (ug/g, dry)	1,310	840	221									
Methyl Ethyl Ketone (ug/g, dry)	—	—	1				Oral LD <sub>50</sub> (rat) = 3,400 mg/kg	3 mg/day for 70 kg man	NA	7.5 mg/L	0.750 mg/L	
PCB 1016 (ug/g, dry)	—	—	4.78						0.125 mg/L	0.0125 mg/L		0.00079 ug/L
PCB 1260 (ug/g, dry)	22.8	—	2.73				Oral LD <sub>50</sub> (rat) = 1,315 mg/kg		0.125 mg/L	0.0125 mg/L		

— = Not detected.

<sup>a</sup>Acute Toxicity = expressed as oral LD<sub>50</sub>(rat) mg/kg; or the dose of the substance orally ingested by rats which is expected to cause the death of 50 percent of the population.

<sup>b</sup>ADI = Acceptable Daily Intake—the amount of toxicant in mg/day for a 70 kg man or mg/kg/day which should not result in adverse effects after chronic exposure.

<sup>c</sup>Health Advisory (SNARLS) = Suggested No Adverse Response Levels expressed as mg of substance per liter of water.

<sup>d</sup>MCL/AWQC = Maximum Concentration Level of National Primary Drinking Water Standards/Ambient Water Quality Criteria associated with 10<sup>-6</sup> cancer risks.

Source: ESE, 1986.

Table 2-13. NAVSTA Roosevelt Roads Confirmation Study, Round One Sampling Results, Site 18, Pest Control Shop and Surrounding Area

Constituent	Concentrations	Chemical Toxicity Parameters			MCL/ AWQC
		Acute Toxicity	ADI	Health Advisory SNARLS 1-day 10-day Long-Term	
<b>SURFACE WATER</b>					
Sample Number:	18SW1 18SW2				
Chlordane (ug/L)	0.571 0.616				0.00046 ug/L
<b>SEDIMENT</b>					
Sample Number:	18SE1 18SE2				
Chlordane (ug/g, dry)	34.1 66.7			0.0625 mg/L 0.0625 mg/L 0.0075 mg/L	0.00046 ug/L
DDE, PP' (ug/g, dry)	1.37 2.63				
Endosulfan, A (ug/g, dry)	3.32 3.44	Oral LD <sub>50</sub> (rat) = 18 mg/kg			74 ug/L
Endosulfan, B (ug/g, dry)	4.38 7.65	Oral LD <sub>50</sub> (rat) = 18 mg/kg			74 ug/L
<b>SOIL</b>					
Sample Number:	18S1A 18S2A 18S3A 18S4A 18S5A 18S6C				
Aldrin (ug/g, dry)	— — — — — —				0.000074 ug/L
Chlordane (ug/g, dry)	— — — — — —			0.0625 mg/L 0.0625 mg/L 0.0075 mg/L	0.00046 ug/L
DDD, PP' (ug/g, dry)	— — 6.65 17.3 55.3 1.84				
DDE, PP' (ug/g, dry)	— — 2.23 — — 2.10				
DDT, PP' (ug/g, dry)	— — — — — —				0.000024 ug/L
Endosulfan sulfate (ug/g, dry)	— — — — — 2.54				
Endrin (ug/g, dry)	— — — — — —	Oral LD <sub>50</sub> (rat) = 7.5 mg/kg			1 ug/L
Heptachlor epoxide (ug/g, dry)	— — — — — —				
Sample Number:	18S7C 18S8C 18S9C 18S10C 18S11C 18S12C				
Aldrin (ug/g, dry)	— — — — 0.803 —				0.000074 ug/L
Chlordane (ug/g, dry)	— — — — 57.4 38.3			0.0625 mg/L 0.0625 mg/L 0.0075 mg/L	0.00046 ug/L
DDD, PP' (ug/g, dry)	— — 1.68 — 1.90 0.752				
DDE, PP' (ug/g, dry)	0.549 — 3.16 23.1 11.5 36.4				
DDT, PP' (ug/g, dry)	— — 6.92 88.1 130 208				0.000024 ug/L

Table 2-13. NAVSTA Roosevelt Roads Confirmation Study, Round One Sampling Results, Site 18, Pest Control Shop and Surrounding Areas (Continued, Page 2 of 2)

Constituent	Concentrations	Chemical Toxicity Parameters					MCL/ AWQC
		Acute Toxicity	ADI	Health Advisory SNARLS			
				1-day	10-day	Long-Term	
SOIL (Continued)							
Sample Number:	18S7C 18S8C 18S9C 18S10C 18S11C 18S12C						
Endosulfan sulfate (ug/g, dry)	2.16 -- -- -- -- --						
Endrin (ug/g, dry)	-- -- -- -- --	Oral LD <sub>50</sub> (rat) = 7.5 mg/kg					1 ug/L
Heptachlor epoxide (ug/g, dry)	-- -- -- -- --						
Sample Number:	18S13C 18S14C 18S15C						
Aldrin (ug/g, dry)	0.761 2.06 --						0.000074 ug/L
Chlordane (ug/g, dry)	142 181 --			0.0625 mg/L	0.0625 mg/L	0.0075 mg/L	0.00046 ug/L
DDD, PP' (ug/g, dry)	-- -- --						
DDE, PP' (ug/g, dry)	-- 7.93 0.750						
DDT, PP' (ug/g, dry)	-- 7.24 --						0.000024 ug/L
Endosulfan sulfate (ug/g, dry)	-- -- --						
Endrin (ug/g, dry)	-- 13.2 --	Oral LD <sub>50</sub> (rat) = 7.5 mg/kg					1 ug/L
Heptachlor epoxide (ug/g, dry)	-- 0.993 --						

-- = Not detected.

<sup>a</sup>Acute Toxicity = expressed as oral LD<sub>50</sub>(rat) mg/kg; or the dose of the substance orally ingested by rats which is expected to cause the death of 50 percent of the population.

<sup>b</sup>ADI = Acceptable Daily Intake—the amount of toxicant in mg/day for a 70 kg man or mg/kg/day which should not result in adverse effects after chronic exposure.

<sup>c</sup>Health Advisory (SNARLS) = Suggested No Adverse Response Levels expressed as mg of substance per liter of water.

<sup>d</sup>MCL/AWQC = Maximum Concentration Level of National Primary Drinking Water Standards/Ambient Water Quality Criteria associated with 10<sup>-6</sup> cancer risks.

Source: ESE, 1986.

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developed No Observed Adverse Effect Level (NOAEL) for many chemicals using animal studies in the majority of cases. Safety factors are then applied to the NOAEL data to account for the uncertainty in using available data from animal studies to calculate effects to humans. The result is an ADI value defined as the amount of toxicant which is not anticipated to result in adverse effects after chronic exposure.

For non-regulated contaminants in drinking water, the EPA Office of Drinking Water has developed Health Advisories or SNARLS. SNARLS are calculated to reflect the consumption and toxicological characteristics of a 10-kilogram (kg) child who consumes 1 liter (L) of water per day. Three exposure levels are considered: 1-day, 7- or 10-day, and long-term. For regulated contaminants in drinking water, the maximum contaminant levels (MCLs) of the NIPDWS were used in the data evaluation.

EPA AWQC are used to assess the extent of contamination for potentially carcinogenic compounds and are generally more conservative than other criteria which are based solely on acute toxic effects or a specific acute adverse response such as the Health Advisories. The use of AWQC in the assessment of ground water contamination provides a more conservative evaluation compared to the use of Health Advisory values because the AWQC are based on the assumption that exposure to the contaminant includes consumption of contaminated aquatic organisms not found in ground water.

The AWQC are presented as specific contaminant concentrations in water which, if exceeded, can be expected to cause a toxic effect in humans. The criteria for suspect or proven carcinogens are presented as concentrations in water associated with a range of estimated incremental cancer risks to humans. The range of concentrations corresponds to incremental cancer risks of  $10^{-7}$  to  $10^{-5}$  (one additional case of cancer in populations ranging from 10 million to 100,000, respectively). However, the concentration criteria associated with this range of

estimated incremental cancer risks was developed by EPA for information purposes only; methods do not exist to establish the presence of a threshold for carcinogenic effects. The data presented in Tables 2-1 through 2-13 correspond to the  $10^{-6}$  incremental cancer risks.

### 3.0 RECOMMENDATIONS FOR ROUND TWO

This section presents the recommendations for Round Two of the Verification Step of the Confirmation Study of NAVSTA Roosevelt Roads and NAF Vieques; these recommendations are based on the Round One data evaluation presented in Section 2.0.

#### 3.1 SITE 1, QUEBRADA DISPOSAL SITE

As shown in Table 2-1, only total chromium was detected in the ground water, and the total chromium concentration exceeded standards. The data for the sediment and soil samples collected from Site 1 do not indicate significant contamination. However, resampling of the three ground water Monitor Wells 1GW01 through 1GW03 for analysis of the Round One analytical constituents (see Table 1-1) is recommended.

#### 3.2 SITE 2, MANGROVE DISPOSAL SITE

Because significant contamination was not detected in any of the soil, surface water, or sediment samples collected from Site 2, additional monitoring at Site 2 is not recommended.

#### 3.3 SITE 5, ARMY CREMATOR DISPOSAL AREA

Although the concentration data for the sediment samples collected from Site 5 do not indicate significant contamination, significant concentrations of arsenic and metals and low levels of organic compounds were detected in the samples of surface water and ground water collected from Site 5. Therefore, resampling of the five Monitor Wells 5GW01 through 5GW05 and the five surface water and sediment sampling stations 5SW01/5SE01 through 5SW05/5SE05 for the Round One analytes is recommended. If contamination continues to be detected in the upgradient Monitor Well 5GW01, consideration should be given to investigating other potential sources of contamination which may exist upgradient of Site 5.

#### 3.4 SITE 6, LANGLEY DRIVE DISPOSAL SITE

Although the sediment data for Site 6 do not indicate significant sediment contamination, significant concentrations of several metals and

trace levels of two organic compounds were detected in the surface water samples collected from Site 6. Therefore, resampling of the three surface water sampling stations R6SW01/R6SE01 through R6SW03/R6SE03 for analysis of the Round One analytes is recommended. In addition, the collection and analysis of one background surface water and one background sediment sample for analysis of the Round One analytes are recommended. The background data will permit a more meaningful evaluation of not only the Site 6 surface water and sediment data, but also the Site 5 surface water and sediment data.

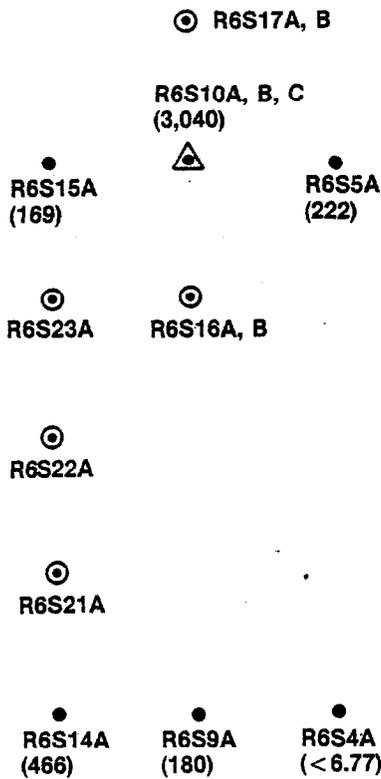
With the exception of the lead concentrations detected in the soil samples collected from Site 6, no other contaminant concentrations were detected at a significant level. Moderate concentrations of lead ranging from 169 to 568 micrograms per gram (ug/g)(dry) were detected in seven of the soil samples (R6S5A, R6S9A through R6S12A, R6S14A, and R6S15A), and one relatively high concentration of 3,040 ug/g (dry) was detected in sample R6S10A. Because the lead contamination appears to be concentrated in the areas near sample stations R6S10A and R6S11A, the collection of an additional 13 soil samples near these sample stations for lead analysis is recommended. The proposed soil sampling locations are shown in Figure 3-1.

### 3.5 SITE 7, STATION LANDFILL

As shown in Table 2-5, low levels of toxic organic compounds were detected in the ground water samples collected from Site 7, and the levels of arsenic and metals detected in some of the ground water samples exceeded applicable criteria and standards. Therefore, resampling of the eight ground water Monitor Wells R7GW01 through R7GW08 at Site 7 for analysis of the Round One analytes (see Table 1-1) in Round Two is recommended.

The concentration data for the soil samples collected from the drum ditch at Site 7 do not indicate the presence of significant contamination. Therefore, no additional monitoring specific to this area within Site 7 is proposed.

PROPOSED SOIL SAMPLING GRID NEAR STATION R6S10



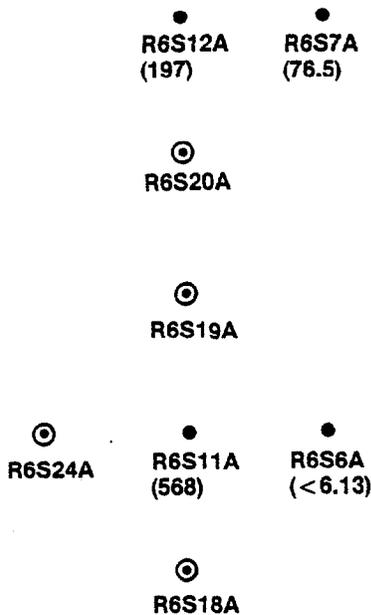
LEGEND:

R6S15A = ● EXISTING SAMPLE STATION WITH "A" DESIGNATING COMPOSITE SAMPLE FROM 0- TO 1-FOOT DEPTH INTERVAL, AND NUMBER IN PARENTHESES REPRESENTING LEAD CONCENTRATION IN ug/g, DRY. NO ADDITIONAL SAMPLING PROPOSED.

R6S10A, B, C = △ EXISTING SAMPLE STATION AS DESCRIBED ABOVE, EXCEPT THAT "B" AND "C" DESIGNATE PROPOSED ADDITIONAL COMPOSITE SAMPLING FROM 1- TO 2-FOOT AND 2- TO 3-FOOT DEPTH INTERVALS, RESPECTIVELY.

R6S16A, B = ⊙ NEW SAMPLE STATION WITH "A" AND "B" DESIGNATING PROPOSED COMPOSITE SAMPLING FROM 0- TO 1-FOOT AND 1- TO 2-FOOT DEPTH INTERVALS, RESPECTIVELY.

PROPOSED SOIL SAMPLING GRID NEAR STATION R6S11A



APPROXIMATE SCALE: 0.75 IN. = 25 FT.

Figure 3-1  
 PROPOSED SOIL SAMPLING FOR ROUND TWO  
 VERIFICATION—SITE 6, LANGLEY DRIVE  
 DISPOSAL SITE  
 SOURCE: ESE, 1986.



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### 3.6 SITE 8, DRONE WASHDOWN

Although significant levels of oil and grease were detected in the surface water and sediment samples collected from Site 8 (see Table 2-6), no other contaminants were detected in significant concentrations. It is likely that the detected oil and grease contamination is emanating from several aircraft and related equipment maintenance operations located in the general area surrounding and including Site 8. No additional monitoring is recommended at Site 8.

### 3.7 SITE 9, PCB DISPOSAL, DRY DOCK AREA

Because no PCB's were detected in any of the surface water or sediment samples collected from Site 9, no additional monitoring is recommended for this site.

### 3.8 SITE 10, BUILDING 25 STORAGE AREA

As shown in Table 2-7, low levels of toxic organic compounds were detected in the ground water samples collected from Site 10, and the levels of arsenic and some metals detected in the ground water samples exceeded applicable criteria and standards. This contamination also was detected in the upgradient ground water Monitor Well 10GW01. The resampling of the eight Monitor Wells 10GW01 through 10GW08 for the Round One analytes (see Table 1-1) is recommended.

### 3.9 ~~SITE 12, TWO WAY ROAD FUEL FARM~~

Although a significant level of oil and grease was detected in the sediment sample collected from Site 12 (see Table 2-8), the oil and grease concentration in the surface water sample does not indicate a significant degree of contamination and is inherent to the shipping activities conducted in the area. However, ~~the oil and grease concentration detected in the ground water sample collected from Monitor Well 12GW06 [42 milligrams per liter (mg/L)] indicates a significant degree of contamination. During the sampling of Monitor Well 12GW06, a layer of black oil was found floating above the ground water. In addition, significant concentrations of benzene and toluene were~~

detected in ground water sample 12GW02, indicating significant fuel-derived contamination. Consequently, resampling of the six Monitor Wells 12GW01 through 12GW06 and surface water/sediment sample station 12SW01/12SE01 for analysis of the Round One analytes (see Table 1-1) is recommended. In addition, 24 soil borings to a maximum depth of 20 feet on a 50-foot grid system centered around Monitor Well 12GW06 are recommended to define the extent of subsurface oil contamination in this area. The thickness of the oil layer should be measured in all soil borings and in Monitor Well 12GW06.

The results of the soil boring conducted at Site 12 to investigate potential oil contamination are presented in Figure 3-2. As shown, there are two distinct areas where oil contamination was found, and an additional 28 soil borings to a maximum depth of 20 feet are recommended to define the extent of the oil contamination. The layer of oil contamination should be measured in each soil boring.

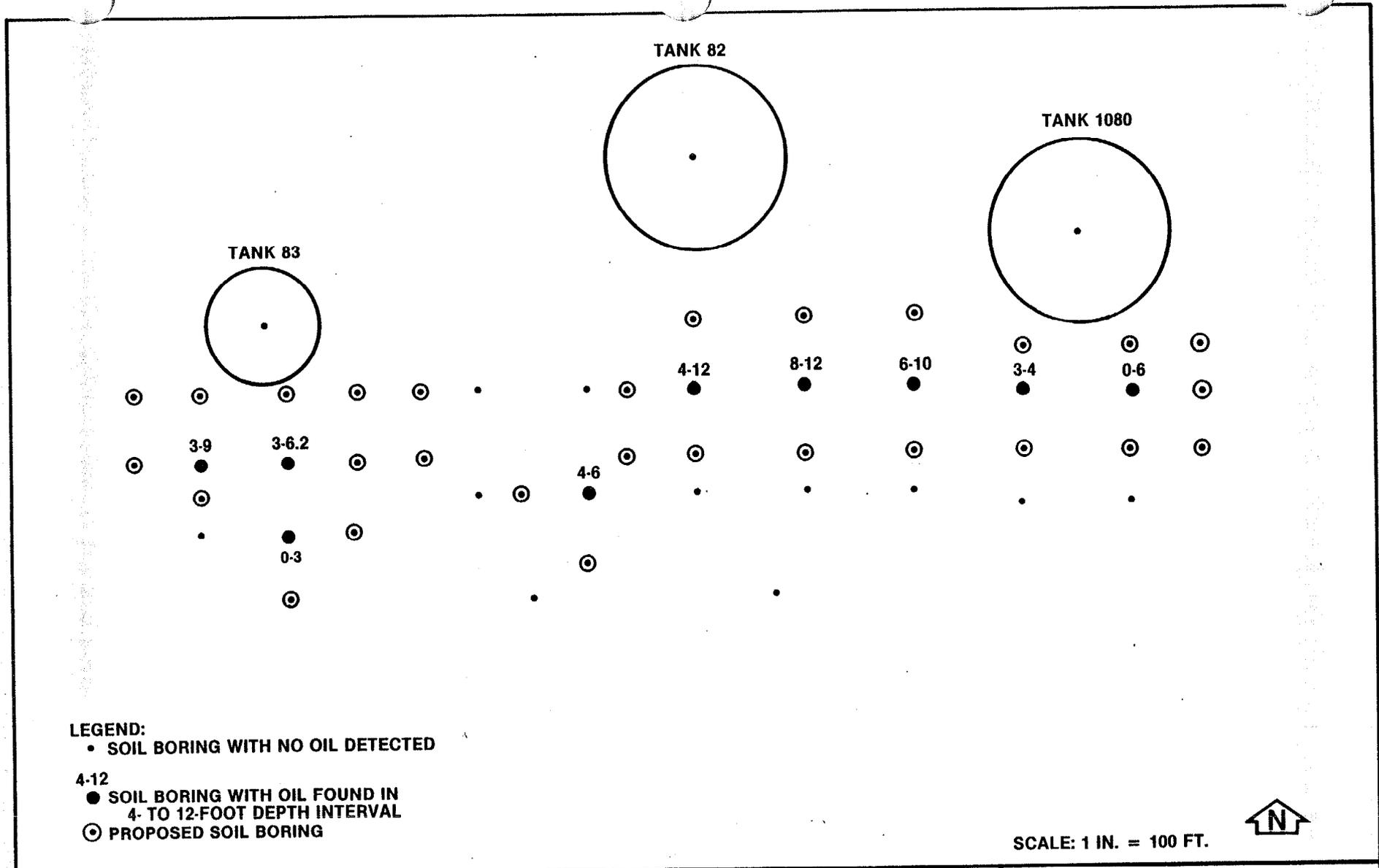
### 3.10 SITE 13, TANKS 210 TO 217

As shown in Table 2-9, substantial levels of oil and grease were detected in the sediment samples collected from Site 13, but only low levels of oil and grease were detected in two of the six surface water samples collected.

The data for the ground water samples collected from Site 13 show significant fuel-derived contamination for Monitor Wells 13GW02, 13GW04, 13GW05, and 13GW09. Therefore, resampling of 11 Monitor Wells 13GW01 through 13GW11 and surface water/sediment sample stations 13SW01/13SE01 through 13SW06/13SE06 for the Round One analytes (see Table 1-1) is recommended.

### 3.11 SITE 14, ENSENADA HONDA SHORELINE AND MANGROVES

As shown in Table 2-10, some significant levels of oil and grease were detected in the sediment samples collected from Site 14, but the oil and grease concentrations detected in the surface water samples did not indicate a substantial degree of contamination and are inherent to the shipping activities conducted in Ensenada Honda. Inspection of the



**Figure 3-2  
PROPOSED SOIL BORING LOCATIONS AT SITE  
12, TWO-WAY ROAD FUEL FARM**

SOURCE: ESE, 1986.



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mangroves indicated that the majority of damage incurred as a result of past oil spillage occurred in the mangroves along the southwestern shore of Ensenada Honda, and signs of recovery were apparent in this area. Therefore, no additional monitoring at Site 14 is recommended.

### 3.12 SITE 15, SUBSTATION 2

The PCB data for the soil samples collected at Site 15 (see Table 2-11) shows that PCB contamination exists. The PCB contamination is restricted to the area surrounding Substation 2, and no PCB contamination was detected in the soils in the storage yard across Valley Forge Road from Substation 2.

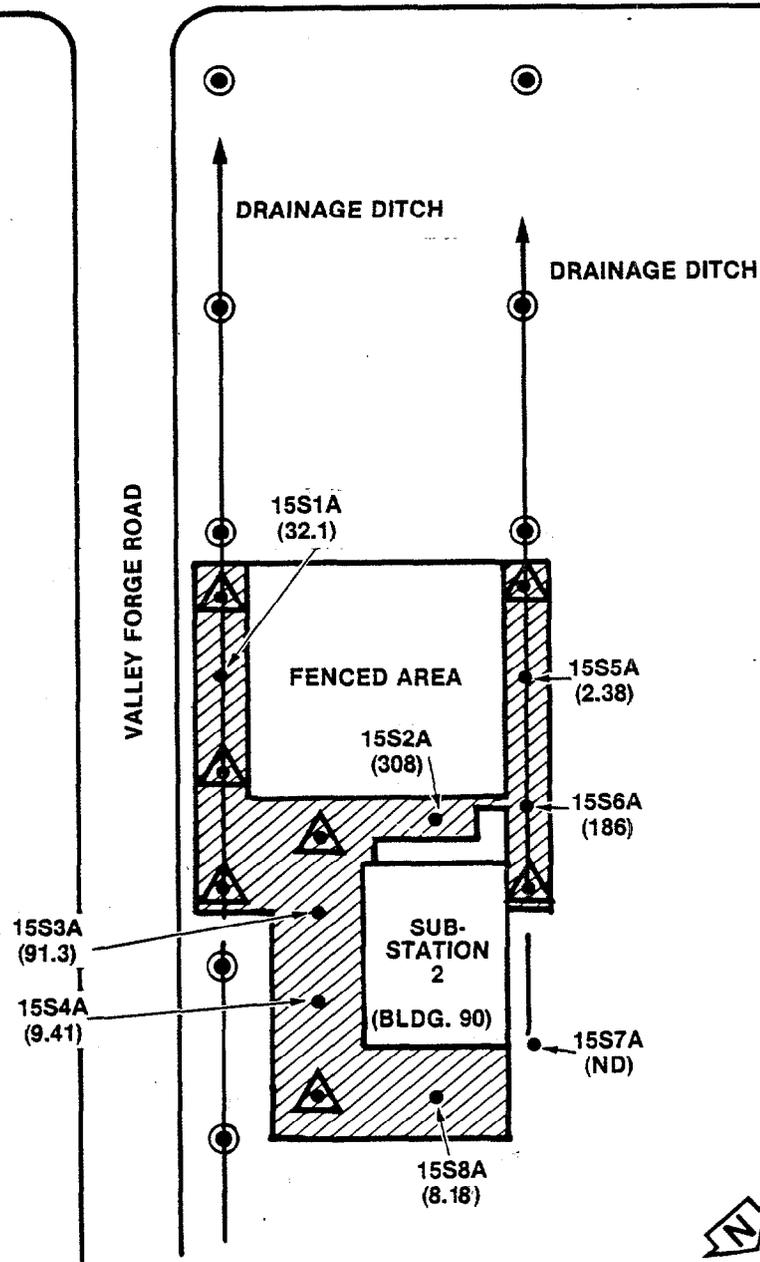
Excavation of soil to a depth of 1 foot in the area surrounding Substation 2 (see Figure 3-3) and disposal of the soil as PCB-contaminated material are recommended. In the area between Substation 2 (Building 90) and the adjacent fenced area where dark oil-stained soil exists, excavation of all stained soil is recommended rather than excavating only to a depth of 1 foot because it is likely that all soil which is visibly stained is PCB-contaminated. The volume of soil recommended for excavation is estimated to be approximately 164 cubic yards. Following excavation, confirmatory soil sampling should be conducted at sample stations 15S1A through 15S6A and 15S8A, and the seven other confirmatory soil sample stations shown in Figure 3-3 for PCB analysis. A PCB cleanup criterion of 1 ug/g, dry [1 part per million (ppm)] is recommended for the proposed soil excavation.

In addition to the 14 confirmatory soil samples, 8 additional soil samples should be collected for PCB analysis to define the extent of the PCB contamination. Figure 3-3 shows the proposed soil sampling locations.

### 3.13 SITE 16, OLD POWER PLANT, BUILDING 38

The concentration data for the soil samples collected from Site 16 presented in Table 2-12 show that PCB contamination exists adjacent to

FORRESTAL DRIVE



**LEGEND:**

- 15S1A = SOIL SAMPLE STATION 15S1A WITH PCB CONCENTRATION OF 32.1 ug/g, Dry. (ND) = NOT DETECTED.
- PROPOSED COMPOSITE SOIL SAMPLE FROM 0- TO 1-FOOT DEPTH INTERVAL
- ▲ PROPOSED CONFIRMATORY SOIL SAMPLE FROM 0- TO 1-FOOT DEPTH INTERVAL FOLLOWING EXCAVATION TO A DEPTH OF 1 FOOT.
- ▨ PROPOSED AREA FOR EXCAVATION TO A DEPTH OF 1 FOOT.

SCALE: 0.25 IN. = 10 FT.

**Figure 3-3**  
**PROPOSED SOIL SAMPLING AND EXCAVATION AT SITE 15, SUBSTATION 2**

SOURCE: ESE, 1986.



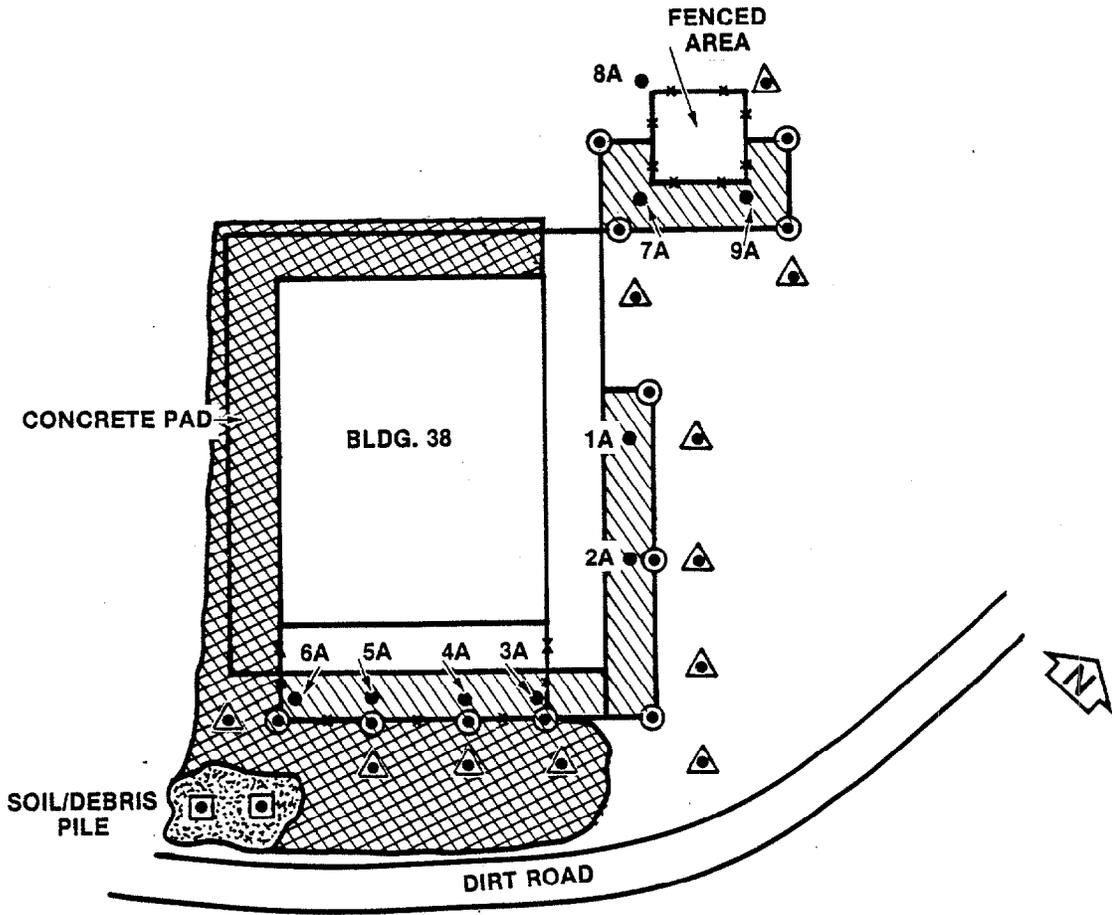
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Building 38 and the fenced area north of Building 38. In addition, high lead concentrations were detected in samples 16S1A, 16S3A, and 16S4A. Therefore, excavation to a depth of 1 foot in the areas shown in Figure 3-4 and disposal of the excavated soil as PCB-contaminated material are recommended. The volume of soil recommended for excavation and disposal is estimated to be approximately 300 cubic yards. Following excavation, collection of 11 confirmatory soil samples for PCB analysis is recommended (see Figure 3-4). A PCB cleanup criterion of 1 ppm, dry, is recommended for conducting the proposed soil excavation. In addition to the confirmatory soil sampling, 13 additional soil samples should be collected for PCB and lead analysis to define the extent of contamination. Figure 3-4 shows the proposed locations of the 13 additional soil sample stations. As shown, 2 of the 13 soil sample stations are located in the soil/debris pile that was formed by scraping the areas indicated in the figure. This scraping was performed between November 30, 1985, when the soil samples were collected from Site 16, and January 30, 1986.

#### 3.14 SITE 18, PEST CONTROL SHOP AND SURROUNDING AREA

As shown in Table 2-13, the chlordane concentrations in the surface water samples collected from Site 18 exceed the chlordane ambient water quality criterion. In addition, chlordane and several other pesticides were detected in the sediment and soil samples collected from Site 18. Because migration of the pesticide contamination in the soil to the nearby drainage canal has apparently occurred, collection of five additional surface water and five additional sediment samples from the drainage canal for pesticides analysis is recommended. Two surface water and two sediment samples should be collected from the existing sample stations (18SW1/18SE1 and 18SW2/18SE2), and three additional surface water and sediment sample stations should be spaced at 100-foot intervals downstream from 18SW2/18SE2.

In addition, the installation of a shallow ground water monitor well directly south of the former pest control shop is recommended. A sample



**LEGEND:**

-  RECENTLY SCRAPED AREA
-  PROPOSED AREA FOR EXCAVATION TO A DEPTH OF 1 FOOT
-  2A SOIL SAMPLE STATION 16S2A
-  PROPOSED CONFIRMATORY SOIL SAMPLE FROM 0- TO 1-FOOT DEPTH INTERVAL FOLLOWING EXCAVATION TO A DEPTH OF 1 FOOT
-  PROPOSED COMPOSITE SOIL SAMPLE FROM 0- TO 1-FOOT INTERVAL
-  PROPOSED COMPOSITE SOIL SAMPLE FROM TOP OF PILE TO GROUND SURFACE WITH ALIQUOTS COLLECTED AT 2-FOOT INTERVALS
-  FENCE

SOIL SAMPLE STATION	CONCENTRATION (ug/g, DRY)	
	PCB	LEAD
16S1A	—	3,910
16S2A	404	420
16S3A	92.9	15,700
16S4A	55.9	834
16S5A	3.39	151
16S6A	8.85	12.7
16S7A	22.8	69.8
16S8A	—	215
16S9A	7.51	—

SCALE: 1 IN. = 80 FT.

**Figure 3-4  
PROPOSED SOIL SAMPLING AND EXCAVATION  
AT SITE 16, OLD POWER PLANT, BUILDING 38**

SOURCE: ESE, 1986.



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of ground water should be collected for pesticides analysis to determine if pesticides contamination has migrated downward to the shallow ground water.

### 3.15 SUMMARY OF ROUND TWO RECOMMENDATIONS

A summary of the recommendations for Round Two Verification sampling and analysis is presented in Table 3-1. Site-specific information relative to the recommended number of monitor wells, type and number of samples proposed for collection, and analytical constituents for each sample type are presented in this table.

Table 3-1. Summary Table for Round Two Verification Sampling and Analysis, NAVSTA Roosevelt Roads and NAF Vieques Confirmation Study

Site Number	Proposed Additional Wells	Ground Water Samples	Surface Water Samples	Sediment Samples	Soil Samples	Analytical Constituents <sup>a</sup>
1	0	3	0	0	0	pH, oil and grease, VOA, xylene, MEK, MIBK, EDB, Cr (total and hexavalent), Pb
3	0	1	0	0	0	pH, Priority Pollutant scan
5	0	5	5	0	0	pH, Priority Pollutant scan, Cr hexavalent, xylene, MEK, MIBK, EDB
6	0	0	4	4	13	pH, Priority Pollutant scan, Cr hexavalent, xylene, MEK, MIBK, EDB
7	0	8	0	0	0	pH, Priority Pollutant scan, Cr hexavalent
10	0	8	0	0	0	pH, Priority Pollutant scan, Cr hexavalent, xylene, MEK, MIBK, EDB
12	0	6	1	1	52 <sup>b</sup>	pH, VOA, EDB, xylene, oil and grease, Pb
13	0	11	6	6	0	pH, VOA, Pb, oil and grease, EDB, xylene
15	0	0	0	0	22	PCBs
16	0	0	0	0	24	PCBs, lead
18	1	1	5	5	0	Pesticides

-- = not applicable.

<sup>a</sup> = Key to Constituent Abbreviations:

- Cr = chromium.
- Pb = lead.
- VOA = volatile organic analysis.
- PCBs = polychlorinated biphenyls.
- EDB = ethylene dibromide.
- MEK = methyl ethyl ketone.
- MIBK = methyl isobutyl ketone.

Priority Pollutant Scan = U.S. Environmental Protection Agency (EPA) Priority Pollutant list of 129 pollutants, excluding asbestos, cyanide, and dioxin.

<sup>b</sup> = no analyses. Only visual inspection for oil and measurement of thickness of oil layer, if found.

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