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ALAMEDA POINT
SSIC NO. 5090.3

December 1990 86-018-1810

PHASE 2A ANALYTICAL RESULTS FOR SITE 13, OIL REFINERY SITE REMEDIAL INVESTIGATION/FEASIBILITY STUDY NAVAL AIR STATION ALAMEDA ALAMEDA, CALIFORNIA

VOLUME 1

ENCLOSURE 8

Prepared for: Western Division Naval Facilities Engineering Command
San Bruno, California

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December 4, 1990

86-018-1810

Ms. Bella Dizon (Code 1813BD)
Western Division Naval Facilities
Engineering Command
PO Box 727
San Bruno, CA 94066-0727

Phase 2A Analytical Results for Site 13, Oil Refinery Site
Remedial Investigation/Feasibility Study
Naval Air Station Alameda
Alameda, California

Dear Ms. Dizon:

This report presents the Phase 2A analytical results for Site 13, Oil Refinery Site, that were obtained as part of the Remedial Investigation/ Feasibility Study at Naval Air Station Alameda. Pertinent information provided with this report include a site plan showing the boring and well locations, summary tables of the analytical results, a table showing the comparison of action levels for various chemical groups, and certified analytical reports.

The summary tables (Tables 1A, 1B, and 2) are prepared as part of the Data Management Plan to provide an efficient method of screening large amounts of analytical data that highlight site-specific areas of potential concern. Chemical concentrations exceeding various established action levels (referenced from Table 3) are highlighted on these tables. Certified analytical reports are provided in Appendix A and include the raw laboratory data and detection limits for each chemical group analyzed.

If you have any questions regarding these results, please call me at (415) 573-8012.

Very truly yours,

Timothy G. Bodkin, R.G.
Senior Project Scientist

TGB/gd

Enclosures

cc: J. Babcock, Canonie Environmental Services Corp.
R. Duffield, Canonie Environmental Services Corp.

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ALAMEDA POINT
SSIC NO. 5090.3

REVISED
PHASE 1 AND 2A ANALYTICAL RESULTS FOR SITE 13, OIL REFINERY SITE REMEDIAL INVESTIGATION/FEASIBILITY STUDY

DATED 01 JUNE 1992

IS ENTERED IN THE DATABASE AND FILED AT ADMINISTRATIVE RECORD NO. **N00236.000832** AND **N00236.000833**

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TABLE 1A

SUMMARY TABLE OF ANALYTICAL RESULTS: SOIL
SITE 13, OIL REFINERY
NAS ALAMEDA
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

	Boring Number/Sample Depth (feet)							
Chemical Group/Analyte	MWOR-1 2.5 - 3.0	MWOR-1 7.0 - 7.5	MWOR-1 11.5 - 12.0	MWOR-1 14.5 - 15.0	MWOR-2 2.5 - 3.0	MWOR-2 7.0 - 7.5	MWOR-2 10.0 - 10.5	MWOR-3 2.5 - 3.0
Volatile Organics								
1,2-Dichloroethene (total)								
2-Butanone (MEK)								
Acetone		16.		13.		16.	16.	
Benzene								
Bromodichloromethane								
Carbon Disulfide								
Carbon Tetrachloride								
Ethylbenzene								
Methylene Chloride		14.	14.	11.	6.	23.	22.	
Tetrachloroethene								
Toluene	450.	13.	10.	12.		8.		46.
Xylene (total)								

Notes:

1. Analytical results are presented in micrograms/kilogram (ug/kg).

2. Blank spaces indicate that the analyte was not detected.

TABLE 1A

SUMMARY TABLE OF ANALYTICAL RESULTS: SOIL
SITE 13, OIL REFINERY
NAS ALAMEDA
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

	Boring Number/Sample Depth (feet)							
Chemical Group/Analyte	MWOR-3 7.0 - 7.5	MWOR-3 10.0 - 10.5	MWOR-3 11.5 - 12.0	MWOR-4 2.5 - 3.0	MWOR-4 6.5 - 7.0	MWOR-4 10.0 - 10.5	MWOR-4 14.0 - 14.5	MWOR-5 7.0 - 7.5
Volatile Organics								
1,2-Dichloroethene (total)								
2-Butanone (MEK)								
Acetone	28.	24.	42.	22.	48.	30.	21.	18.
Benzene								
Bromodichloromethane								
Carbon Disulfide								
Carbon Tetrachloride								
Ethylbenzene								
Methylene Chloride	14.	15.	13.	7.	34.	11.	18.	10.
Tetrachloroethene								
Toluene	32.	8.	12.	43.				11.
Xylene (total)								

Notes:

1. Analytical results are presented in micrograms/kilogram (ug/kg).

2. Blank spaces indicate that the analyte was not detected.

TABLE 1A

SUMMARY TABLE OF ANALYTICAL RESULTS: SOIL
SITE 13, OIL REFINERY
NAS ALAMEDA
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

	Boring Number/Sample Depth (feet)							
Chemical Group/Analyte	MWOR-5 10.0 - 10.5	MWOR-5 12.5 - 13.0	MWOR-5 14.5 - 15.0	BOR-6 5.5 - 6.0	BOR-6 8.0 - 8.5	BOR-6 11.0 - 11.5	BOR-6 14.0 - 14.5	BOR-7 2.5 - 3.0
Volatile Organics								
1,2-Dichloroethene (total)								
2-Butanone (MEK)								
Acetone	21.		27.				29.	
Benzene								
Bromodichloromethane								
Carbon Disulfide								
Carbon Tetrachloride								
Ethylbenzene								
Methylene Chloride	10.	13.	13.	21.	19.	22.	11.	31.
Tetrachloroethene								
Toluene				8.	18.	54.	13.	260.
Xylene (total)								

Notes:

1. Analytical results are presented in micrograms/kilogram (ug/kg).

2. Blank spaces indicate that the analyte was not detected.

TABLE 1A

SUMMARY TABLE OF ANALYTICAL RESULTS: SOIL
SITE 13, OIL REFINERY
NAS ALAMEDA
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

	Boring Number/Sample Depth (feet)							
Chemical Group/Analyte	BOR-7 4.0 - 4.5	BOR-7 8.5 - 9.0	BOR-7 13.5 - 14.0	BOR-8 4.0 - 4.5	BOR-8 7.0 - 7.5	BOR-8 11.0 - 11.5	BOR-8 14.0 - 14.5	BOR-9 2.0 - 2.5
Volatile Organics								
1,2-Dichloroethene (total)								
2-Butanone (MEK)								
Acetone				23.	14.	21.	32.	
Benzene								
Bromodichloromethane								
Carbon Disulfide								
Carbon Tetrachloride								
Ethylbenzene								
Methylene Chloride	12.	14.	14.	15.	15.	11.	8.	14.
Tetrachloroethene								
Toluene	9.	14.	36.	25.			7.	
Xylene (total)								

Notes:

1. Analytical results are presented in micrograms/kilogram (ug/kg).

2. Blank spaces indicate that the analyte was not detected.

TABLE 1A

SUMMARY TABLE OF ANALYTICAL RESULTS: SOIL
SITE 13, OIL REFINERY
NAS ALAMEDA
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

	Boring Number/Sample Depth (feet)							
Chemical Group/Analyte	BOR-9 6.5 - 7.0	BOR-9 11.0 - 11.5	BOR-9 14.0 - 14.5	BOR-10 3.5 - 4.0	BOR-10 7.0 - 7.5	BOR-10 11.0 - 11.5	BOR-10 14.0 - 14.5	BOR-11 2.5 - 3.0
Volatile Organics								
1,2-Dichloroethene (total)								
2-Butanone (MEK)						20.		
Acetone				18.	38.	71.	18.	18.
Benzene	1000.	960.						
Bromodichloromethane								
Carbon Disulfide						14.		
Carbon Tetrachloride								
Ethylbenzene		1800.						
Methylene Chloride	2800.	2000.	3300.	10.	11.	19.	10.	10.
Tetrachloroethene								
Toluene					16.	110.		38.
Xylene (total)		4100.						

Notes:

1. Analytical results are presented in micrograms/kilogram (ug/kg).

2. Blank spaces indicate that the analyte was not detected.

TABLE 1A

SUMMARY TABLE OF ANALYTICAL RESULTS: SOIL
SITE 13, OIL REFINERY
NAS ALAMEDA
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

	Boring Number/Sample Depth (feet)							
Chemical Group/Analyte	BOR-11 6.5 - 7.0	BOR-11 14.0 - 14.5	BOR-11 11.0 - 11.5	BOR-12 3.5 - 4.0	BOR-12 8.5 - 9.0	BOR-12 11.0 - 11.5	BOR-12 14.0 - 14.5	BOR-13 2.0 - 2.5
Volatile Organics								
1,2-Dichloroethene (total)								
2-Butanone (MEK)						21.		
Acetone			43.	17.	37.	110.	38.	
Benzene								
Bromodichloromethane								
Carbon Disulfide						13.		
Carbon Tetrachloride								
Ethylbenzene								
Methylene Chloride	31.	17.	49.	10.	45.	160.	63.	15.
Tetrachloroethene								
Toluene		10.	100.	16.	13.	230.	9.	21.
Xylene (total)								

Notes:

1. Analytical results are presented in micrograms/kilogram (ug/kg).

2. Blank spaces indicate that the analyte was not detected.

TABLE 1A

SUMMARY TABLE OF ANALYTICAL RESULTS: SOIL
SITE 13, OIL REFINERY
NAS ALAMEDA
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

	Boring Number/Sample Depth (feet)							
Chemical Group/Analyte	BOR-13 6.5 - 7.0	BOR-13 11.0 - 11.5	BOR-13 14.0 - 14.5	BOR-14 6.0 - 6.5	BOR-14 8.0 - 8.5	BOR-14 13.0 - 13.5	BOR-15 2.0 - 2.5	BOR-15 6.5 - 7.0
Volatile Organics								
1,2-Dichloroethene (total)								
2-Butanone (MEK)								
Acetone	17.	25.						26.
Benzene								
Bromodichloromethane								
Carbon Disulfide								
Carbon Tetrachloride								
Ethylbenzene								
Methylene Chloride	17.	27.	29.	18.	13.	14.		40.
Tetrachloroethene								
Toluene	26.	37.	29.				1600.	13.
Xylene (total)								

Notes:

1. Analytical results are presented in micrograms/kilogram (ug/kg).

2. Blank spaces indicate that the analyte was not detected.

TABLE 1A

SUMMARY TABLE OF ANALYTICAL RESULTS: SOIL
SITE 13, OIL REFINERY
NAS ALAMEDA
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

	Boring Number/Sample Depth (feet)							
Chemical Group/Analyte	BOR-15 11.0 - 11.5	BOR-15 14.0 - 14.5	BOR-16 2.0 - 2.5	BOR-16 11.0 - 11.5	BOR-16 14.0 - 14.5	BOR-16 6.5 - 7.0	BOR-17 2.5 - 3.0	BOR-17 7.0 - 7.5
Volatile Organics								
1,2-Dichloroethene (total)								
2-Butanone (MEK)								7.
Acetone	39.	28.				18.	15.	50.
Benzene								
Bromodichloromethane							2.	
Carbon Disulfide								
Carbon Tetrachloride								
Ethylbenzene	10.							
Methylene Chloride	31.	26.	12.	11.	14.	16.	11.	20.
Tetrachloroethene								
Toluene	14.		57.	27.	12.	15.	300.	15.
Xylene (total)	27.							

Notes:

1. Analytical results are presented in micrograms/kilogram (ug/kg).

2. Blank spaces indicate that the analyte was not detected.

TABLE 1A

SUMMARY TABLE OF ANALYTICAL RESULTS: SOIL
SITE 13, OIL REFINERY
NAS ALAMEDA
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

	Boring Number/Sample Depth (feet)							
Chemical Group/Analyte	BOR-17 10.0 - 10.5	BOR-17 11.5 - 12.0	BOR-18 3.5 - 4.0	BOR-18 7.0 - 7.5	BOR-18 11.0 - 11.5	BOR-18 14.0 - 14.5	BOR-19 2.5 - 3.0	BOR-19 7.0 - 7.5
Volatile Organics								
1,2-Dichloroethene (total)								
2-Butanone (MEK)								
Acetone		70.	25.			12.	29.	79.
Benzene		10.						
Bromodichloromethane								
Carbon Disulfide								
Carbon Tetrachloride								
Ethylbenzene	1400.	5.						
Methylene Chloride		15.	16.	16.	11.	15.	12.	25.
Tetrachloroethene								
Toluene		13.	62.	36.	26.	38.		40.
Xylene (total)								

Notes:

1. Analytical results are presented in micrograms/kilogram (ug/kg).

2. Blank spaces indicate that the analyte was not detected.

TABLE 1A

SUMMARY TABLE OF ANALYTICAL RESULTS: SOIL
SITE 13, OIL REFINERY
NAS ALAMEDA
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

	Boring Number/Sample Depth (feet)							
Chemical Group/Analyte	BOR-19 11.0 - 11.5	BOR-19 14.0 - 14.5	BOR-20 3.0 - 3.5	BOR-20 6.0 - 6.5	BOR-20 10.0 - 10.5	BOR-20 11.5 - 12.0	BOR-21 2.5 - 3.0	BOR-21 7.0 - 7.5
Volatile Organics								
1,2-Dichloroethene (total)								
2-Butanone (MEK)			2.					
Acetone		45.	13.	12.	15.	13.	53.	35.
Benzene								
Bromodichloromethane								
Carbon Disulfide						2.		
Carbon Tetrachloride								
Ethylbenzene	1500.							
Methylene Chloride		8.	8.	19.	20.	15.		12.
Tetrachloroethene					2.			
Toluene		6.	15.	4.	2.	2.	18.	
Xylene (total)								

Notes:

1. Analytical results are presented in micrograms/kilogram (ug/kg).

2. Blank spaces indicate that the analyte was not detected.

TABLE 1A

SUMMARY TABLE OF ANALYTICAL RESULTS: SOIL
SITE 13, OIL REFINERY
NAS ALAMEDA
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

	Boring Number/Sample Depth (feet)							
Chemical Group/Analyte	BOR-21 11.5 - 12.0	BOR-21 14.0 - 14.5	BOR-22 2.5 - 3.0	BOR-22 7.5 - 8.0	BOR-22 11.0 - 11.5	BOR-22 14.0 - 14.5	BOR-23 3.0 - 3.5	BOR-23 8.5 - 9.0
Volatile Organics								
1,2-Dichloroethene (total)								
2-Butanone (MEK)								
Acetone		19.					11.	45.
Benzene								
Bromodichloromethane								
Carbon Disulfide								
Carbon Tetrachloride								
Ethylbenzene								
Methylene Chloride		18.	19.	14.	28.	15.	7.	7.
Tetrachloroethene								
Toluene			17.	21.	140.	6.	41.	12.
Xylene (total)								

Notes:

1. Analytical results are presented in micrograms/kilogram (ug/kg).

2. Blank spaces indicate that the analyte was not detected.

TABLE 1A

SUMMARY TABLE OF ANALYTICAL RESULTS: SOIL
SITE 13, OIL REFINERY
NAS ALAMEDA
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

	Boring Number/Sample Depth (feet)							
Chemical Group/Analyte	BOR-23 11.0 - 11.5	BOR-23 14.5 - 15.0	BOR-24 2.5 - 3.0	BOR-24 7.0 - 7.5	BOR-24 11.0 - 11.5	BOR-24 14.0 - 14.5	BOR-25 2.5 - 3.0	BOR-25 6.5 - 7.0
Volatile Organics								
1,2-Dichloroethene (total)								
2-Butanone (MEK)	26.							
Acetone	85.	17.		33.	36.		63.	38.
Benzene								
Bromodichloromethane								
Carbon Disulfide	11.							
Carbon Tetrachloride								
Ethylbenzene								
Methylene Chloride	22.	12.	14.	6.	7.	17.	14.	8.
Tetrachloroethene								
Toluene	130.	10.					34.	17.
Xylene (total)								

Notes:

1. Analytical results are presented in micrograms/kilogram (ug/kg).

2. Blank spaces indicate that the analyte was not detected.

TABLE 1A

SUMMARY TABLE OF ANALYTICAL RESULTS: SOIL
SITE 13, OIL REFINERY
NAS ALAMEDA
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

	Boring Number/Sample Depth (feet)							
Chemical Group/Analyte	BOR-25 11.0 - 11.5	BOR-25 14.0 - 14.5	BOR-26 10.0 - 10.5	BOR-26 13.0 - 13.5	BOR-27 2.5 - 3.0	BOR-27 7.0 - 7.5	BOR-27 10.0 - 10.5	BOR-27 12.5 - 13.0
Volatile Organics								
1,2-Dichloroethene (total)								
2-Butanone (MEK)								
Acetone	15.	24.	27.	19.	18.	21.	32.	140.
Benzene								
Bromodichloromethane								
Carbon Disulfide								
Carbon Tetrachloride								
Ethylbenzene								
Methylene Chloride	9.	14.			10.	13.	15.	32.
Tetrachloroethene								
Toluene	20.	11.		9.	95.	8.		74.
Xylene (total)								

Notes:

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2. Blank spaces indicate that the analyte was not detected.

TABLE 1A

SUMMARY TABLE OF ANALYTICAL RESULTS: SOIL
SITE 13, OIL REFINERY
NAS ALAMEDA
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

	Boring Number/Sample Depth (feet)							
	MWOR-2	MWOR-5	BOR-7	BOR-7	BOR-7	BOR-8	BOR-9	BOR-10
Chemical Group/Analyte	12.0 - 12.5	7.0 - 7.5	0.5 - 1.0	2.5 - 3.0	4.0 - 4.5	11.0 - 11.5	14.0 - 14.5	0.5 - 1.0
Semivolatile Organics								
2-Methylnaphthalene							13000.	
Benzo(a)pyrene	520.							
Benzo(b)fluoranthene						1100.		
Benzo(g,h,i)perylene						1400.		
Benzo(k)fluoranthene	510.							
Butylbenzylphthalate								
Chrysene						480.		
Di-n-Butylphthalate								340.
Diethylphthalate				570.				
Fluoranthene	520.	630.				800.		
Indeno(1,2,3-cd)pyrene						690.		
Naphthalene							5300.	
Phenanthrene							1800.	
Pyrene	810.	670.				1900.		
bis(2-Ethylhexyl)phthalate			870.		1100.			

Notes:

1. Analytical results are presented in micrograms/kilogram (ug/kg).

2. Blank spaces indicate that the analyte was not detected.

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TABLE 1A

SUMMARY TABLE OF ANALYTICAL RESULTS: SOIL
SITE 13, OIL REFINERY
NAS ALAMEDA
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

	Boring Number/Sample Depth (feet)							
Chemical Group/Analyte	BOR-10 3.5 - 4.0	BOR-10 11.0 - 11.5	BOR-10 14.0 - 14.5	BOR-11 11.0 - 11.5	BOR-13 0.5 - 1.0	BOR-13 11.0 - 11.5	BOR-13 14.0 - 14.5	BOR-17 10.0 - 10.5
Semivolatile Organics								
2-Methylnaphthalene								8300.
Benzo(a)pyrene								
Benzo(b)fluoranthene								
Benzo(g,h,i)perylene								
Benzo(k)fluoranthene								
Butylbenzylphthalate								
Chrysene								
Di-n-Butylphthalate	350.	610.	400.		12000.	1000.	600.	
Diethylphthalate								
Fluoranthene								
Indeno(1,2,3-cd)pyrene								
Naphthalene								4100.
Phenanthrene								
Pyrene				690.				
bis(2-Ethylhexyl)phthalate								

Notes:

1. Analytical results are presented in micrograms/kilogram (ug/kg).

2. Blank spaces indicate that the analyte was not detected.

TABLE 1A

SUMMARY TABLE OF ANALYTICAL RESULTS: SOIL
SITE 13, OIL REFINERY
NAS ALAMEDA
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

	Boring Number/Sample Depth (feet)							
Chemical Group/Analyte	BOR-17R 10.5 - 11.0	BOR-18 0.5 - 1.0	BOR-18 3.5 - 4.0	BOR-18 7.0 - 7.5	BOR-19 11.0 - 11.5	BOR-21 0.5 - 1.0	BOR-22 0.5 - 1.0	BOR-22 2.5 - 3.0
Semivolatile Organics								
2-Methylnaphthalene	3100.				17000.			
Benzo(a)pyrene								
Benzo(b)fluoranthene								
Benzo(g,h,i)perylene								
Benzo(k)fluoranthene								
Butylbenzylphthalate		4600.					4400.	
Chrysene								
Di-n-Butylphthalate		970.	2000.	450.			940.	980.
Diethylphthalate								
Fluoranthene						440.		
Indeno(1,2,3-cd)pyrene								
Naphthalene	800.				5400.			
Phenanthrene								
Pyrene						380.		
bis(2-Ethylhexyl)phthalate								

Notes:

1. Analytical results are presented in micrograms/kilogram (ug/kg).

2. Blank spaces indicate that the analyte was not detected.

TABLE 1A

SUMMARY TABLE OF ANALYTICAL RESULTS: SOIL
SITE 13, OIL REFINERY
NAS ALAMEDA
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

	Boring Number/Sample Depth (feet)			
	BOR-22	BOR-22	BOR-23	BOR-26
Chemical Group/Analyte	7.5 - 8.0	14.0 - 14.5	11.0 - 11.5	13.0 - 13.5
Semivolatile Organics				
2-Methylnaphthalene				
Benzo(a)pyrene				
Benzo(b)fluoranthene				
Benzo(g,h,i)perylene				
Benzo(k)fluoranthene				
Butylbenzylphthalate				
Chrysene				
Di-n-Butylphthalate	1000.	890.		510.
Diethylphthalate				
Fluoranthene				
Indeno(1,2,3-cd)pyrene				
Naphthalene				
Phenanthrene				
Pyrene			650.	
bis(2-Ethylhexyl)phthalate				

Notes:

1. Analytical results are presented in micrograms/kilogram (ug/kg).

2. Blank spaces indicate that the analyte was not detected.

TABLE 1A

SUMMARY TABLE OF ANALYTICAL RESULTS: SOIL
SITE 13, OIL REFINERY
NAS ALAMEDA
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

	Boring Number/Sample Depth (feet)							
Chemical Group/Analyte	MWOR-1 7.5 - 8.0	MWOR-2 12.5 - 13.0	MWOR-2 13.0 - 13.5	BOR-8 10.5 - 11.0	BOR-8 12.5 - 13.0	BOR-9 0.5 - 1.0	BOR-16 0.5 - 1.0	BOR-16 2.5 - 3.0
Pesticides								
4,4'-DDD				9.	5.			
4,4'-DDE	17.			35.	31.		31.	4.
4,4'-DDT	14.	7.	3.	12.	11.	2.	160.	
Toxaphene								
beta-BHC				4.				
Heptachlor epoxide							5.	
gamma-BHC								

Notes:

1. Analytical results are presented in micrograms/kilogram (ug/kg).

2. Blank spaces indicate that the analyte was not detected.

TABLE 1A

SUMMARY TABLE OF ANALYTICAL RESULTS: SOIL
SITE 13, OIL REFINERY
NAS ALAMEDA
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

	Boring Number/Sample Depth (feet)						
	BOR-17	BOR-18	BOR-19	BOR-22	BOR-26	BOR-26	BOR-26
Chemical Group/Analyte	4.0 - 4.5	14.5 - 15.0	8.0 - 8.5	3.5 - 4.0	6.0 - 6.5	10.5 - 11.0	13.5 - 14.0
Pesticides							
4,4'-DDD							14.
4,4'-DDE							1.
4,4'-DDT	7.			3.			12.
Toxaphene					1400.	2500.	400.
beta-BHC		2.					
Heptachlor epoxide							
gamma-BHC			3.				

Notes:

1. Analytical results are presented in micrograms/kilogram (ug/kg).

2. Blank spaces indicate that the analyte was not detected.

TABLE 1A

SUMMARY TABLE OF ANALYTICAL RESULTS: SOIL
SITE 13, OIL REFINERY
NAS ALAMEDA
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

	Boring Number/Sample Depth (feet)							
Chemical Group/Analyte	MWOR-1 1.0 - 1.5	MWOR-1 3.0 - 3.5	MWOR-1 7.5 - 8.0	MWOR-1 12.0 - 12.5	MWOR-1 15.0 - 15.5	MWOR-2 2.0 - 2.5	MWOR-2 4.0 - 4.5	MWOR-2 8.0 - 8.5
Metals								
Aluminum	3610.0	4160.0	4770.0	12000.0	7500.0	8070.0	3080.0	3760.0
Antimony						3.5		
Arsenic							2.6	
Barium	35.0		30.0	140.0	57.0	47.7	17.6	19.3
Cadmium								
Calcium	2600.0	2100.0	1500.0	1900.0	1700.0	3550.0	1550.0	1840.0
Chromium	22.0	22.0	29.0	63.0	37.0	3.6	27.2	25.2
Cobalt						5.8	3.6	3.9
Copper	9.2	11.0	6.7	17.0	8.6	59.6	12.2	8.5
Iron	6230.0	6920.0	8560.0	15400.0	10800.0	26600.0	6160.0	6940.0
Lead								
Magnesium	1900.0	2100.0	1800.0	3900.0	3000.0	3310.0	1860.0	2110.0
Manganese	93.0	88.0	120.0	93.0	100.0	702.0	69.5	80.1
Nickel	21.0	22.0	23.0	55.0	36.0	2.6	20.9	21.6
Potassium	540.0	620.0		620.0	710.0	270.0	410.0	510.0
Selenium								
Sodium				800.0		270.0	102.0	121.0
Thallium								
Titanium	330.0	360.0	300.0	440.0	430.0	632.0	276.0	328.0
Vanadium	16.0	17.0	22.0	29.0	22.0	27.6	13.1	14.4
Zinc	18.0	19.0	14.0	37.0	26.0	95.8	22.5	22.2

Notes:
1. Analytical results are presented in milligrams/kilogram (mg/kg).
2. Blank spaces indicate that the analyte was not detected.

TABLE 1A

SUMMARY TABLE OF ANALYTICAL RESULTS: SOIL
SITE 13, OIL REFINERY
NAS ALAMEDA
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

	Boring Number/Sample Depth (feet)							
Chemical Group/Analyte	MWOR-2 11.0 - 11.5	MWOR-2 12.5 - 13.0	MWOR-2 13.0 - 13.5	MWOR-3 2.0 - 2.5	MWOR-3 4.0 - 4.5	MWOR-3 8.0 - 8.5	MWOR-3 10.5 - 11.0	MWOR-3 11.0 - 11.5
Metals								
Aluminum	94.1	7570.0	8020.0	3580.0	3560.0	5670.0	12300.0	11600.0
Antimony								
Arsenic	6.1	4.3					5.3	5.7
Barium	47.6	61.5	71.8	18.9	22.1	42.0	68.2	60.0
Cadmium								
Calcium	2370.0	2100.0	2060.0	2190.0	1730.0	1880.0	2200.0	2110.0
Chromium	45.8	41.7	39.3	27.7	23.0	31.8	54.1	55.3
Cobalt	9.9	6.4	7.0	4.0	4.8	3.6	7.7	7.0
Copper	92.0	11.9	15.4	8.1	10.5	8.5	16.2	13.4
Iron	18800.0	14100.0	13600.0	6910.0	6840.0	7560.0	17800.0	19200.0
Lead	8.6						6.2	
Magnesium	5790.0	3390.0	3540.0	2010.0	2200.0	2140.0	3810.0	3800.0
Manganese	274.0	146.0	134.0	79.9	78.2	107.0	153.0	166.0
Nickel	54.2	45.6	44.3	21.6	24.0	22.6	58.3	61.0
Potassium	1800.0	1100.0	1300.0	480.0	620.0	410.0	890.0	800.0
Selenium								
Sodium	2550.0	1370.0	1350.0	129.0	178.0	766.0	1160.0	1090.0
Thallium								
Titanium	291.0	437.0	453.0	339.0	278.0	403.0	580.0	554.0
Vanadium	30.2	24.0	22.7	15.3	13.8	15.7	31.8	33.3
Zinc	91.7	35.7	34.9	22.7	30.2	24.4	52.8	35.7

Notes:
1. Analytical results are presented in milligrams/kilogram (mg/kg).
2. Blank spaces indicate that the analyte was not detected.

CanonieEnvironmental

TABLE 1A

SUMMARY TABLE OF ANALYTICAL RESULTS: SOIL
SITE 13, OIL REFINERY
NAS ALAMEDA
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

	Boring Number/Sample Depth (feet)							
Chemical Group/Analyte	MWOR-3 13.0 - 13.5	MWOR-4 1.5 - 2.0	MWOR-4 3.0 - 3.5	MWOR-4 7.0 - 7.5	MWOR-4 10.5 - 11.0	MWOR-4 14.5 - 15.0	MWOR-5 1.0 - 1.5	MWOR-5 8.5 - 9.0
Metals								
Aluminum	7790.0	4130.0	8790.0	17000.0	6620.0	7870.0	21900.0	14800.0
Antimony				2.7		3.9	4.6	4.9
Arsenic	3.1	4.5	3.0	3.3		5.6		8.2
Barium	58.6	84.7	61.4	128.0	58.7	63.7	20.6	142.0
Cadmium								
Calcium	1880.0	1500.0	1230.0	3150.0	1560.0	2490.0	14800.0	1110.0
Chromium	37.5	23.2	23.3	75.0	33.7	44.3	7.3	48.4
Cobalt	7.6	3.5	3.6	2.7	6.2	6.8	13.3	13.2
Copper	10.6	13.0	16.0	13.0	10.1	15.1	113.0	44.1
Iron	14800.0	7440.0	7080.0	13200.0	10800.0	13200.0	25900.0	27500.0
Lead	7.6	8.1	10.0	15.2	7.9	6.5		22.1
Magnesium	3660.0	1490.0	1390.0	2940.0	2730.0	3440.0	9730.0	6680.0
Manganese	210.0	227.0	195.0	105.0	130.0	178.0	414.0	759.0
Nickel	55.6	16.0	17.7	46.5	39.4	45.7	4.7	55.4
Potassium	680.0	680.0	640.0	550.0	520.0	860.0	590.0	2500.0
Selenium								
Sodium	755.0	152.0	144.0	346.0	219.0	213.0	1830.0	1340.0
Thallium								
Titanium	376.0	264.0	260.0	139.0	220.0	542.0	581.0	292.0
Vanadium	23.7	15.7	15.8	1780.0	19.4	25.1	82.0	37.6
Zinc	32.1	25.9	23.8	31.9	29.8	36.2	56.6	78.0

Notes:
1. Analytical results are presented in milligrams/kilogram (mg/kg).
2. Blank spaces indicate that the analyte was not detected.

CanonieEnvironmental

TABLE 1A

SUMMARY TABLE OF ANALYTICAL RESULTS: SOIL
SITE 13, OIL REFINERY
NAS ALAMEDA
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

	Boring Number/Sample Depth (feet)							
Chemical Group/Analyte	MWOR-5 10.5 - 11.0	MWOR-5 13.0 - 13.5	MWOR-5 15.0 - 15.5	BOR-6 0.5 - 1.0	BOR-6 6.0 - 6.5	BOR-6 8.5 - 9.0	BOR-6 11.5 - 12.0	BOR-6 14.5 - 15.0
Metals								
Aluminum	9820.0	8740.0	5660.0	3460.0	3960.0	9840.0	11100.0	10200.0
Antimony								
Arsenic	7.2	3.9	4.5					
Barium	86.5	71.0	48.8	27.0	31.0	67.0	42.0	45.0
Cadmium								
Calcium	1200.0	1480.0	1640.0	4600.0	870.0	1400.0	1700.0	2200.0
Chromium	34.8	62.1	34.9	22.0	22.0	41.0	40.0	42.0
Cobalt	7.7	4.4	5.5			6.1	7.4	7.1
Copper	23.2	24.7	9.0	22.0	48.0	34.0	17.0	12.0
Iron	18000.0	13900.0	10600.0	5920.0	7570.0	14400.0	18200.0	14300.0
Lead	22.8	8.7	9.1			6.1		
Magnesium	4460.0	3520.0	2720.0	1800.0	1200.0	2400.0	4100.0	3500.0
Manganese	342.0	123.0	125.0	75.0	130.0	130.0	220.0	160.0
Nickel	38.1	45.9	33.1	23.0	16.0	38.0	61.0	50.0
Potassium	1900.0	1200.0	950.0		620.0	850.0	780.0	780.0
Selenium								
Sodium	1010.0	287.0	249.0			910.0		
Thallium								
Titanium	363.0	343.0	386.0	290.0	280.0	290.0	480.0	430.0
Vanadium	28.2	24.2	20.2	15.0	18.0	32.0	33.0	25.0
Zinc	49.3	41.1	33.2	21.0	47.0	30.0	35.0	30.0

Notes:
1. Analytical results are presented in milligrams/kilogram (mg/kg).
2. Blank spaces indicate that the analyte was not detected.

TABLE 1A

SUMMARY TABLE OF ANALYTICAL RESULTS: SOIL
SITE 13, OIL REFINERY
NAS ALAMEDA
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

	Boring Number/Sample Depth (feet)							
Chemical Group/Analyte	BOR-7 0.5 - 1.0	BOR-7 2.0 - 2.5	BOR-7 3.5 - 4.0	BOR-7 9.0 - 9.5	BOR-7 14.5 - 15.0	BOR-8 1.0 - 1.5	BOR-8 3.5 - 4.0	BOR-8 6.5 - 7.0
Metals								
Aluminum	5040.0	4060.0	4310.0	18800.0	12400.0	3150.0	3700.0	4130.0
Antimony								
Arsenic								
Barium	35.0	24.0	57.0	110.0	76.0			
Cadmium								
Calcium	3000.0	1900.0	1200.0	2100.0	2100.0	2400.0	2100.0	1800.0
Chromium	28.0	22.0	23.0	72.0	40.0	20.0	26.0	23.0
Cobalt				7.2				
Copper	13.0	12.0	7.4	26.0	20.0	15.0	9.1	6.7
Iron	7900.0	6780.0	7760.0	22100.0	14000.0	5810.0	6330.0	7190.0
Lead				9.6	6.5			
Magnesium	2000.0	2400.0	1500.0	3600.0	3000.0	1800.0	1800.0	2300.0
Manganese	93.0	85.0	76.0	190.0	150.0	69.0	79.0	88.0
Nickel	23.0	24.0	16.0	61.0	45.0	20.0	19.0	24.0
Potassium	640.0	640.0	790.0	2300.0	1100.0			720.0
Selenium								
Sodium				990.0				
Thallium								
Titanium	470.0	320.0	290.0	653.0	590.0	300.0	410.0	360.0
Vanadium	20.0	15.0	18.0	46.0	27.0	14.0	17.0	17.0
Zinc	18.0	19.0	16.0	42.0	38.0	18.0	16.0	17.0

Notes:
1. Analytical results are presented in milligrams/kilogram (mg/kg).
2. Blank spaces indicate that the analyte was not detected.

TABLE 1A

SUMMARY TABLE OF ANALYTICAL RESULTS: SOIL
SITE 13, OIL REFINERY
NAS ALAMEDA
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

	Boring Number/Sample Depth (feet)							
Chemical Group/Analyte	BOR-8 10.5 - 11.0	BOR-8 12.5 - 13.0	BOR-9 0.5 - 1.0	BOR-9 2.5 - 3.0	BOR-9 7.0 - 7.5	BOR-9 11.5 - 12.0	BOR-9 14.5 - 15.0	BOR-10 0.5 - 1.0
Metals								
Aluminum	9560.0	10100.0	2820.0	5850.0	7430.0	12500.0	9490.0	4400.0
Antimony								
Arsenic								3.8
Barium	58.0	130.0		28.0	41.0	81.0	67.0	84.9
Cadmium								
Calcium	3500.0	1800.0	3300.0	4100.0	1900.0	2400.0	2700.0	2980.0
Chromium	39.0	70.0	20.0	30.0	34.0	40.0	39.0	38.6
Cobalt	8.7	6.2				6.8	6.8	4.0
Copper	45.0	14.0	16.0	8.3		10.0	8.5	6.4
Iron	14700.0	16100.0	5450.0	8580.0	10000.0	16000.0	12500.0	7000.0
Lead								
Magnesium	3900.0	4400.0	1600.0	2700.0	2300.0	4000.0	3400.0	1920.0
Manganese	170.0	130.0	64.0	94.0	100.0	180.0	150.0	87.9
Nickel	52.0	54.0	18.0	27.0	25.0	52.0	40.0	19.0
Potassium	1600.0	1700.0		870.0	670.0	1000.0	1000.0	500.0
Selenium						12.0		
Sodium	1200.0	1400.0						174.0
Thallium								
Titanium	480.0	570.0	250.0	480.0	450.0	533.0	641.0	
Vanadium	30.0	33.0	13.0	21.0	26.0	32.0	30.0	19.2
Zinc	53.0	36.0	18.0	19.0	15.0	27.0	24.0	19.8

Notes:
1. Analytical results are presented in milligrams/kilogram (mg/kg).
2. Blank spaces indicate that the analyte was not detected.

TABLE 1A

SUMMARY TABLE OF ANALYTICAL RESULTS: SOIL
SITE 13, OIL REFINERY
NAS ALAMEDA
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

	Boring Number/Sample Depth (feet)							
Chemical Group/Analyte	BOR-10 4.0 - 4.5	BOR-10 8.0 - 8.5	BOR-10 11.5 - 12.0	BOR-10 14.5 - 15.0	BOR-11 0.5 - 1.0	BOR-11 3.5 - 4.0	BOR-11 7.0 - 7.5	BOR-11 11.5 - 12.0
Metals								
Aluminum	4280.0	4290.0	5530.0	7530.0	8960.0	45.8	3380.0	5690.0
Antimony					6.0	4.3	4.2	6.0
Arsenic			4.9	4.8				5.0
Barium	21.2	48.7	51.3	67.5	103.0	23.6	20.4	61.5
Cadmium								
Calcium	2230.0	5140.0	5900.0	1760.0	8020.0	3610.0	1630.0	26500.0
Chromium	32.1	27.1	35.7	40.3	29.1	34.4	24.5	27.9
Cobalt	4.2	4.5	7.4	7.4	7.8	4.0	3.9	9.5
Copper	7.3	22.8	11.5	12.8	42.5	4.7	6.8	18.9
Iron	7050.0	7040.0	10600.0	12700.0	13700.0	7260.0	5770.0	9810.0
Lead			58.5		64.2			59.2
Magnesium	2160.0	2040.0	3640.0	3100.0	5600.0	2090.0	1890.0	2660.0
Manganese	90.6	94.3	158.0	169.0	548.0	89.8	70.2	202.0
Nickel	21.7	22.1	36.0	41.8	46.0	23.6	22.2	38.9
Potassium	620.0	540.0	1100.0	1100.0	830.0	590.0	580.0	960.0
Selenium								
Sodium	264.0	423.0	1620.0	1360.0	493.0	191.0	270.0	1350.0
Thallium								
Titanium	400.0	287.0	418.0	442.0	257.0	444.0	296.0	286.0
Vanadium	17.6	17.0	22.4	23.7	27.6	18.5	14.2	21.0
Zinc	22.2	34.4	92.5	36.4	64.7	23.9	22.4	79.8

Notes:
1. Analytical results are presented in milligrams/kilogram (mg/kg).
2. Blank spaces indicate that the analyte was not detected.

TABLE 1A

SUMMARY TABLE OF ANALYTICAL RESULTS: SOIL
SITE 13, OIL REFINERY
NAS ALAMEDA
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

	Boring Number/Sample Depth (feet)							
Chemical Group/Analyte	BOR-11 14.5 - 15.0	BOR-12 0.5 - 1.0	BOR-12 4.0 - 4.5	BOR-12 10.0 - 10.5	BOR-12 11.5 - 12.0	BOR-12 14.5 - 15.0	BOR-13 0.5 - 1.0	BOR-13 2.5 - 3.0
Metals								
Aluminum	9190.0	4190.0	4190.0	11400.0	8710.0	7440.0	4470.0	5030.0
Antimony	6.0	4.8	4.5	7.4	6.0	4.6		
Arsenic	3.1		2.6		6.1			
Barium	78.7	82.5	39.4	77.0	46.8	56.4	31.0	53.0
Cadmium								
Calcium	1820.0	9970.0	3610.0	2870.0	5840.0	1560.0	4400.0	3200.0
Chromium	41.7	28.4	30.9	53.9	40.7	37.4	29.0	31.0
Cobalt	5.3	4.1	3.8	7.6	10.9	3.7		
Copper	10.7	39.1	11.6	36.0	30.1	20.6	9.5	5.6
Iron	13900.0	7290.0	6840.0	15200.0	14500.0	10800.0	8020.0	7600.0
Lead		6.7		9.1	31.0		8.8	
Magnesium	3390.0	26.6	2250.0	4850.0	3940.0	2620.0	1800.0	2100.0
Manganese	130.0	159.0	81.3	158.0	184.0	86.0	96.0	91.0
Nickel	49.6	25.9	24.7	43.6	51.4	37.1	26.0	23.0
Potassium	1300.0	910.0	690.0	1600.0	1400.0	980.0	620.0	670.0
Selenium								
Sodium	1240.0	392.0	494.0	2060.0	1320.0	519.0		
Thallium								
Titanium	452.0	268.0	383.0	557.0	377.0	430.0	470.0	490.0
Vanadium	23.8	15.7	16.6	32.4	27.7	21.7	22.0	20.0
Zinc	42.0	41.9	25.5	53.0	73.8	36.7	20.0	16.0

Notes:
1. Analytical results are presented in milligrams/kilogram (mg/kg).
2. Blank spaces indicate that the analyte was not detected.

TABLE 1A

SUMMARY TABLE OF ANALYTICAL RESULTS: SOIL
SITE 13, OIL REFINERY
NAS ALAMEDA
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

	Boring Number/Sample Depth (feet)							
Chemical Group/Analyte	BOR-13 7.0 - 7.5	BOR-13 11.5 - 12.0	BOR-13 14.5 - 15.0	BOR-14 0.0 - 0.5	BOR-14 4.0 - 4.5	BOR-14 8.5 - 9.0	BOR-14 14.0 - 14.5	BOR-15 0.5 - 1.0
Metals								
Aluminum	11400.0	12300.0	12400.0	4710.0	5210.0	8900.0	13100.0	18200.0
Antimony								8.2
Arsenic								2.5
Barium	42.0	78.0	84.0	34.0	28.0	52.0	110.0	23.0
Cadmium								
Calcium	2900.0	2200.0	2000.0	2900.0	2200.0	2000.0	2600.0	9100.0
Chromium	53.0	44.0	40.0	28.0	28.0	40.0	50.0	22.8
Cobalt	7.5						7.2	15.2
Copper	10.0	9.3	11.0	36.0	23.0	22.0	17.0	160.0
Iron	16500.0	16200.0	15000.0	7770.0	8420.0	12500.0	19400.0	28500.0
Lead								14.1
Magnesium	4400.0	3300.0	3300.0	2200.0	2600.0	2800.0	4000.0	12000.0
Manganese	160.0	120.0	140.0	92.0	90.0	140.0	250.0	456.0
Nickel	46.0	45.0	48.0	24.0	26.0	35.0	62.0	20.1
Potassium	1400.0	1500.0	1500.0	730.0	930.0	740.0	1000.0	780.0
Selenium								
Sodium	1900.0	920.0	710.0				900.0	560.0
Thallium								
Titanium	610.0	554.0	590.0	440.0	460.0	520.0	550.0	544.0
Vanadium	34.0	31.0	31.0	19.0	19.0	30.0	35.0	76.8
Zinc	33.0	29.0	30.0	27.0	24.0	30.0	36.0	66.8

Notes:
1. Analytical results are presented in milligrams/kilogram (mg/kg).
2. Blank spaces indicate that the analyte was not detected.

TABLE 1A

SUMMARY TABLE OF ANALYTICAL RESULTS: SOIL
SITE 13, OIL REFINERY
NAS ALAMEDA
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

	Boring Number/Sample Depth (feet)							
Chemical Group/Analyte	BOR-15 2.5 - 3.0	BOR-15 7.0 - 7.5	BOR-15 11.5 - 12.0	BOR-15 14.5 - 15.0	BOR-16 0.5 - 1.0	BOR-16 2.5 - 3.0	BOR-16 7.0 - 7.5	BOR-16 11.5 - 12.0
Metals								
Aluminum	4840.0	5890.0	11700.0	10900.0	16200.0	7040.0	12600.0	14400.0
Antimony	5.5	5.8	4.4	6.7				
Arsenic		3.5	5.3					
Barium	30.6	48.6	61.6	72.4	290.0	68.0	99.0	98.0
Cadmium					3.5			
Calcium	2390.0	2730.0	1840.0	1670.0	5600.0	1900.0	2100.0	2900.0
Chromium	31.1	36.7	49.8	59.8	47.0	30.0	44.0	51.0
Cobalt	4.7	6.0	8.8	4.5	10.0		6.8	9.0
Copper	7.0	10.8	11.9	11.8	74.0	8.1	11.0	12.0
Iron	8480.0	10300.0	15400.0	13400.0	20300.0	9060.0	15500.0	17900.0
Lead		8.3			260.0	5.7		
Magnesium	2660.0	3300.0	3880.0	3040.0	5100.0	1600.0	4000.0	5000.0
Manganese	113.0	127.0	147.0	140.0	450.0	210.0	210.0	250.0
Nickel	30.2	37.5	69.1	51.3	50.0	28.0	47.0	60.0
Potassium	740.0	1200.0	1100.0	850.0	2700.0	800.0	800.0	1300.0
Selenium					12.0			14.0
Sodium	176.0	488.0	2060.0	1840.0				
Thallium								
Titanium	351.0	431.0	524.0	293.0	567.0	390.0	490.0	644.0
Vanadium	17.9	20.6	29.8	24.7	48.0	22.0	33.0	36.0
Zinc	32.8	33.6	37.4	32.2	1280.0	25.0	30.0	35.0

Notes:
1. Analytical results are presented in milligrams/kilogram (mg/kg).
2. Blank spaces indicate that the analyte was not detected.

TABLE 1A

SUMMARY TABLE OF ANALYTICAL RESULTS: SOIL
SITE 13, OIL REFINERY
NAS ALAMEDA
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

	Boring Number/Sample Depth (feet)							
Chemical Group/Analyte	BOR-16 14.5 - 15.0	BOR-17 2.0 - 2.5	BOR-17 4.0 - 4.5	BOR-17 8.0 - 8.5	BOR-17 10.5 - 11.0	BOR-17 11.0 - 11.5	BOR-17 14.5 - 15.0	BOR-18 0.5 - 1.0
Metals								
Aluminum	12500.0	2990.0	4710.0	9930.0	7970.0	11400.0	8990.0	9550.0
Antimony				4.4	4.3	3.8	4.6	
Arsenic						5.0	3.2	20.0
Barium	84.0	76.2	44.9	77.3	79.9	93.0	84.9	76.0
Cadmium								
Calcium	3300.0	2300.0	2220.0	1630.0	2020.0	2400.0	2080.0	3600.0
Chromium	53.0	23.0	28.2	36.5	44.3	56.2	47.8	34.0
Cobalt	7.9	3.8	6.1	6.3	6.8	7.6	8.9	7.8
Copper	10.0	15.2	12.9	15.3	19.6	22.0	13.0	65.0
Iron	16800.0	6060.0	8820.0	14900.0	13900.0	17800.0	15400.0	19400.0
Lead			18.6	7.1		7.4	8.1	50.0
Magnesium	4500.0	1740.0	2190.0	3890.0	3190.0	3980.0	4080.0	6500.0
Manganese	240.0	72.1	96.2	109.0	196.0	155.0	254.0	280.0
Nickel	55.0	20.8	27.5	44.1	48.6	59.4	58.1	43.0
Potassium	1300.0	430.0	770.0	820.0	623.0	790.0	990.0	1000.0
Selenium								12.0
Sodium		137.0	135.0	334.0	370.0	377.0	361.0	
Thallium								
Titanium	627.0	245.0	343.0	528.0	435.0	610.0	42.6	360.0
Vanadium	33.0	12.5	18.5	27.6	25.3	31.5	26.2	32.0
Zinc	32.0	27.5	25.5	39.2	39.2	59.2	37.4	91.0

Notes:
1. Analytical results are presented in milligrams/kilogram (mg/kg).
2. Blank spaces indicate that the analyte was not detected.

TABLE 1A

SUMMARY TABLE OF ANALYTICAL RESULTS: SOIL
SITE 13, OIL REFINERY
NAS ALAMEDA
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

	Boring Number/Sample Depth (feet)							
Chemical Group/Analyte	BOR-18 4.0 - 4.5	BOR-18 7.5 - 8.0	BOR-18 11.5 - 12.0	BOR-18 14.5 - 15.0	BOR-19 0.5 - 1.0	BOR-19 3.5 - 4.0	BOR-19 8.0 - 8.5	BOR-19 11.5 - 12.0
Metals								
Aluminum	5950.0	12400.0	10700.0	14200.0	4140.0	4390.0	10800.0	11200.0
Antimony					5.8	5.7	4.8	7.5
Arsenic					2.6		3.5	
Barium	68.0	66.0	81.0	94.0	46.4	26.8	109.0	85.9
Cadmium								
Calcium	2000.0	1900.0	2300.0	3100.0	22300.0	1990.0	1960.0	2260.0
Chromium	23.0	50.0	39.0	54.0	34.0	29.9	41.4	45.9
Cobalt			7.1	9.1	3.5	4.2	9.4	8.1
Copper	7.1	9.1	8.4	14.0	10.7	7.0	12.1	23.5
Iron	7820.0	13600.0	12900.0	18600.0	6980.0	7390.0	14600.0	16600.0
Lead							6.7	
Magnesium	1500.0	3400.0	3500.0	4900.0	2040.0	2460.0	4140.0	3940.0
Manganese	180.0	120.0	320.0	230.0	101.0	80.2	192.0	200.0
Nickel	14.0	39.0	48.0	63.0	27.1	26.8	56.6	58.6
Potassium		690.0	1100.0	1500.0	670.0	830.0	770.0	916.0
Selenium				15.0				
Sodium					467.0	238.0	431.0	612.0
Thallium								
Titanium	380.0	513.0	516.0	655.0	382.0	389.0	485.0	393.0
Vanadium	17.0	30.0	25.0	33.0	17.9	16.9	30.7	27.9
Zinc	17.0	23.0	25.0	35.0	30.2	20.9	38.7	54.6

Notes:
1. Analytical results are presented in milligrams/kilogram (mg/kg).
2. Blank spaces indicate that the analyte was not detected.

TABLE 1A

SUMMARY TABLE OF ANALYTICAL RESULTS: SOIL
SITE 13, OIL REFINERY
NAS ALAMEDA
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

	Boring Number/Sample Depth (feet)							
Chemical Group/Analyte	BOR-19 14.5 - 15.0	BOR-20 2.5 - 3.0	BOR-20 5.0 - 5.5	BOR-20 5.5 - 6.0	BOR-20 7.0 - 7.5	BOR-20 10.5 - 11.0	BOR-20 14.5 - 15.0	BOR-21 0.5 - 1.0
Metals								
Aluminum	6290.0	4130.0	4300.0	3480.0	4570.0	3190.0	4170.0	47.9
Antimony	4.5	2.6	3.0	2.8	4.8	3.1	3.7	
Arsenic	3.8						4.8	
Barium	62.8	23.9	31.9	26.9	22.1	15.2	17.9	26.2
Cadmium								
Calcium	1960.0	5370.0	3300.0	2100.0	2120.0	1330.0	3570.0	3090.0
Chromium	40.1	38.3	29.7	25.8	30.3	24.1	23.5	52.2
Cobalt	7.1	3.1	4.1	3.2	3.9	4.0	4.6	3.7
Copper	9.8	16.0	15.7	11.6	5.5	5.5	12.4	25.7
Iron	11600.0	7440.0	7790.0	6760.0	7580.0	6580.0	8270.0	7920.0
Lead		7.6					8.6	8.8
Magnesium	3010.0	1610.0	2230.0	1940.0	2150.0	1980.0	2230.0	2270.0
Manganese	245.0	90.7	97.6	77.0	84.4	78.5	94.0	108.0
Nickel	45.1	20.0	23.2	22.3	23.7	25.5	23.9	28.6
Potassium	800.0	570.0	700.0	547.0	760.0	580.0	970.0	660.0
Selenium								
Sodium	380.0	212.0	317.0	359.0	531.0	461.0	715.0	237.0
Thallium								2.7
Titanium	311.0	462.0	416.0	322.0	429.0	244.0	229.0	431.0
Vanadium	21.0	18.6	17.3	14.8	17.1	14.1	15.5	19.3
Zinc	34.3	25.3	30.4	24.2	22.1	21.5	29.2	33.2

Notes:
1. Analytical results are presented in milligrams/kilogram (mg/kg).
2. Blank spaces indicate that the analyte was not detected.

TABLE 1A

SUMMARY TABLE OF ANALYTICAL RESULTS: SOIL
SITE 13, OIL REFINERY
NAS ALAMEDA
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

	Boring Number/Sample Depth (feet)							
Chemical Group/Analyte	BOR-21 3.0 - 3.5	BOR-21 7.5 - 8.0	BOR-21 12.0 - 12.5	BOR-21 15.0 - 15.5	BOR-22 0.5 - 1.0	BOR-22 3.5 - 4.0	BOR-22 8.0 - 8.5	BOR-22 11.5 - 12.0
Metals								
Aluminum	3400.0	4790.0	6350.0	7830.0	12300.0	5720.0	5810.0	28800.0
Antimony				4.6				
Arsenic	2.7		2.9	3.3				
Barium	22.2	28.0	53.6	38.1	200.0	31.0	29.0	81.0
Cadmium								
Calcium	4140.0	2350.0	1620.0	2230.0	9000.0	3600.0	3100.0	7100.0
Chromium	23.0	32.7	55.7	40.7	28.0	31.0	30.0	89.0
Cobalt	3.1	2.9	4.1	3.3	6.4			15.0
Copper	9.3	8.9	13.4	12.2	110.0	5.4	13.0	36.0
Iron	6030.0	7500.0	13300.0	13000.0	14400.0	8070.0	8190.0	37000.0
Lead	6.8	8.8	6.2	8.3	7.4		22.0	19.0
Magnesium	2100.0	2250.0	2980.0	3200.0	3900.0	2400.0	2400.0	10000.0
Manganese	89.0	91.2	146.0	132.0	230.0	93.0	94.0	500.0
Nickel	23.5	24.3	39.4	39.7	25.0	23.0	23.0	91.0
Potassium	550.0	730.0	910.0	1000.0	2400.0	850.0	910.0	3700.0
Selenium								26.0
Sodium	184.0	202.0	500.0	460.0				3300.0
Thallium		3.1						
Titanium	284.0	441.0	350.0	504.0	879.0	627.0	580.0	964.0
Vanadium	13.3	17.7	23.2	24.0	32.0	22.0	22.0	70.0
Zinc	18.7	26.5	28.5	32.0	72.0	17.0	21.0	94.0

Notes:
1. Analytical results are presented in milligrams/kilogram (mg/kg).
2. Blank spaces indicate that the analyte was not detected.

TABLE 1A

SUMMARY TABLE OF ANALYTICAL RESULTS: SOIL -
SITE 13, OIL REFINERY
NAS ALAMEDA
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

	Boring Number/Sample Depth (feet)							
	BOR-22	BOR-23	BOR-23	BOR-23	BOR-23	BOR-23	BOR-24	BOR-24
Chemical Group/Analyte	14.5 - 15.0	1.0 - 1.5	3.5 - 4.0	9.0 - 9.5	11.5 - 12.0	15.0 - 15.5	1.0 - 1.5	3.0 - 3.5
Metals								
Aluminum	10400.0	3080.0	5320.0	6440.0	12400.0	7550.0	4910.0	3780.0
Antimony		2.4		2.5	5.8	2.6		
Arsenic			3.1	5.6	4.9		4.9	3.3
Barium	83.0	24.1	77.7	48.1	63.1	68.0	43.7	64.7
Cadmium								
Calcium	2400.0	1720.0	28800.0	2740.0	3820.0	2190.0	2440.0	1560.0
Chromium	47.0	23.4	35.5	38.5	59.2	46.3	25.9	24.5
Cobalt	6.8	3.1	5.1	7.5	11.0	7.0	4.7	3.6
Copper	9.5	8.6	18.6	14.2	29.7	11.3	23.2	13.3
Iron	14400.0	6010.0	9630.0	12500.0	22400.0	14100.0	8930.0	7020.0
Lead			15.3		18.6		36.3	
Magnesium	3700.0	1560.0	2880.0	4050.0	6130.0	3700.0	2740.0	1290.0
Manganese	230.0	95.8	213.0	180.0	310.0	210.0	140.0	150.0
Nickel	48.0	21.3	32.0	40.4	64.6	47.9	26.2	17.5
Potassium	1600.0	390.0	830.0	1100.0	2000.0	1100.0	760.0	710.0
Selenium								
Sodium	1200.0	130.0	477.0	647.0	1670.0	768.0	176.0	143.0
Thallium								
Titanium	534.0	256.0	298.0	328.0	420.0	440.0	209.0	250.0
Vanadium	28.0	14.8	21.2	22.1	36.1	24.3	16.6	16.2
Zinc	28.0	24.1	38.6	45.2	70.2	38.0	40.6	26.5

Notes:
1. Analytical results are presented in milligrams/kilogram (mg/kg).
2. Blank spaces indicate that the analyte was not detected.

TABLE 1A

SUMMARY TABLE OF ANALYTICAL RESULTS: SOIL
SITE 13, OIL REFINERY
NAS ALAMEDA
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

	Boring Number/Sample Depth (feet)							
Chemical Group/Analyte	BOR-24 7.5 - 8.0	BOR-24 11.5 - 12.0	BOR-24 14.5 - 15.0	BOR-25 0.5 - 1.0	BOR-25 3.5 - 4.0	BOR-25 7.0 - 7.5	BOR-25 11.5 - 12.0	BOR-25 14.5 - 15.0
Metals								
Aluminum	12300.0	8100.0	8820.0	3470.0	3470.0	4200.0	4700.0	7860.0
Antimony	4.4	4.0				2.5		
Arsenic	7.1	8.1	3.9			3.3		3.6
Barium	114.0	87.6	77.9	10.6	39.3	24.8	37.0	65.2
Cadmium								
Calcium	2290.0	1720.0	2580.0	2010.0	1720.0	9270.0	1900.0	1940.0
Chromium	45.1	41.6	44.3	29.3	29.1	33.1	31.3	39.9
Cobalt	9.5	6.5	6.9	2.8	3.2	3.8	4.2	5.8
Copper	15.2	15.3	14.1	8.5	65.4	7.1	13.5	13.3
Iron	19400.0	14100.0	14300.0	6550.0	6340.0	7560.0	8700.0	13800.0
Lead	12.4	7.5	9.8			2180.0	8.9	
Magnesium	4620.0	3550.0	3870.0	1900.0	1710.0	2180.0	2480.0	3760.0
Manganese	227.0	184.0	169.0	96.6	102.0	89.8	102.0	109.0
Nickel	60.5	50.4	50.7	22.5	22.6	22.8	28.0	45.6
Potassium	800.0	590.0	942.0	460.0	480.0	590.0	870.0	1400.0
Selenium								
Sodium	429.0	331.0	275.0	305.0	456.0	426.0	618.0	1350.0
Thallium								
Titanium	556.0	325.0	479.0	295.0	273.0	451.0	386.0	446.0
Vanadium	34.0	24.6	25.4	16.0	15.3	18.8	17.7	23.8
Zinc	37.7	32.4	36.4	20.7	46.6	24.6	28.2	37.2

Notes:
1. Analytical results are presented in milligrams/kilogram (mg/kg).
2. Blank spaces indicate that the analyte was not detected.

TABLE 1A

SUMMARY TABLE OF ANALYTICAL RESULTS: SOIL
SITE 13, OIL REFINERY
NAS ALAMEDA
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

	Boring Number/Sample Depth (feet)							
Chemical Group/Analyte	BOR-26 1.0 - 1.5	BOR-26 2.5 - 3.0	BOR-26 6.0 - 6.5	BOR-26 10.5 - 11.0	BOR-26 13.5 - 14.0	BOR-27 1.0 - 1.5	BOR-27 3.0 - 3.5	BOR-27 7.5 - 8.0
Metals								
Aluminum	4210.0	4720.0	4150.0	4310.0	9520.0	3810.0	3770.0	4230.0
Antimony								
Arsenic						3.7		
Barium	32.0	49.0			66.0	46.7	31.9	27.8
Cadmium		4.1						
Calcium	1900.0	2900.0	1900.0	1500.0	2000.0	2600.0		2410.0
Chromium	27.0	46.0	24.0	24.0	39.0	27.9	32.6	34.6
Cobalt						4.0	3.2	3.9
Copper		17.0	8.3	6.9	22.0	25.5	8.8	9.0
Iron	6890.0	15700.0	7300.0	7140.0	16600.0	6960.0	6750.0	7490.0
Lead		120.0						
Magnesium	2100.0	2300.0	2000.0	2000.0	4200.0	2100.0	1950.0	2000.0
Manganese	88.0	220.0	120.0	82.0	130.0	92.8	90.1	95.9
Nickel	22.0	29.0	24.0	22.0	48.0	22.5	21.0	23.9
Potassium	630.0	790.0	630.0	630.0	1600.0	640.0	470.0	630.0
Selenium								
Sodium					1200.0	340.0	314.0	361.0
Thallium							2.9	
Titanium	360.0	300.0	340.0	280.0	470.0	381.0	377.0	380.0
Vanadium	16.0	17.0	17.0	16.0	27.0	15.9	15.7	20.0
Zinc	17.0	59.0	19.0	18.0	39.0	30.2	23.1	25.2

Notes:
1. Analytical results are presented in milligrams/kilogram (mg/kg).
2. Blank spaces indicate that the analyte was not detected.

TABLE 1A

SUMMARY TABLE OF ANALYTICAL RESULTS: SOIL
SITE 13, OIL REFINERY
NAS ALAMEDA
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

Chemical Group/Analyte	Boring Number/Sample Depth (feet) BOR-27 10.5 - 11.0	BOR-27 13.0 - 13.5
Metals		
Aluminum	4090.0	14000.0
Antimony		5.0
Arsenic		9.5
Barium	25.4	61.4
Cadmium		1.0
Calcium	1920.0	5240.0
Chromium	29.3	64.3
Cobalt	3.7	12.4
Copper	10.9	85.5
Iron	7250.0	25000.0
Lead		14.7
Magnesium	2260.0	7620.0
Manganese	88.3	327.0
Nickel	24.0	76.0
Potassium	750.0	2400.0
Selenium		
Sodium	555.0	2420.0
Thallium		
Titanium	350.0	366.0
Vanadium	15.5	37.9
Zinc	22.9	101.0

Notes:
1. Analytical results are presented in milligrams/kilogram (mg/kg).
2. Blank spaces indicate that the analyte was not detected.

TABLE 1B

SUMMARY TABLE OF ANALYTICAL RESULTS: SOIL
SITE 13, OIL REFINERY
NAS ALAMEDA
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
OTHER ANALYSES

Boring Location/Depth	Total Petroleum Hydrocarbons (mg/kg)	pH	TOC (mg/kg)	Ash (%)	Nitrate as N (mg/kg)
MWOR-1 2.5'-3.0'	11.5				
MWOR-1 3.0'-3.5'		8.9			
MWOR-1 4.0'-4.5'			316	99.0	
MWOR-2 4.0'-4.5'		9.2			
MWOR-2 5.0'-5.5'			416	99.2	0.21
MWOR-2 12.0'-12.5'	6.4				
MWOR-3 4.0'-4.5'		8.9			
MWOR-3 5.0'-5.5'		9.6	364	98.7	
MWOR-3 7.0'-7.5'	2.4				
MWOR-3 10.0'-10.5'	15.8				
MWOR-4 2.5'-3.0'	149.0				
MWOR-4 3.0'-3.5'		7.7			
MWOR-4 4.0'-4.5'			727	99	1.26
MWOR-5 1.5'-2.0'			1820	98.3	0.21
MWOR-5 7.0'-7.5'	5.5				
MWOR-5 8.5'-9.0'		9.2			
BOR-6 2.0'-2.5'			364	99.1	1.12
BOR-6 11.5'-12.0'		7.4			
BOR-7 2.0'-2.5'	168.0	9.5			
BOR-7 6.0'-6.5'			505	98.9	0.36
BOR-8 2.5'-3.0'			263	99.3	
BOR-8 3.0'-3.5'			631	99.3	
BOR-8 3.5'-4.0'		9.9			
BOR-8 11.0'-11.5'	57.9				
BOR-9 2.0'-2.5'	26.8				
BOR-9 2.5'-3.0'		8.7			
BOR-9 4.0'-4.5'			16800	94.4	
BOR-9 6.5'-7.0'	4360.0				
BOR-9 11.0'-11.5'	2500.0				
BOR-9 14.0'-14.5'	2370.0				
BOR-10 1.0'-1.5'			316	99.3	
BOR-10 4.0'-4.5'		9.9			
BOR-10 11.0'-11.5'	17.2				

TABLE 1B

SUMMARY TABLE OF ANALYTICAL RESULTS: SOIL
SITE 13, OIL REFINERY
NAS ALAMEDA
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
OTHER ANALYSES

Boring Location/Depth	Total Petroleum Hydrocarbons (mg/kg)	pH	TOC (mg/kg)	Ash (%)	Nitrate as N (mg/kg)
BOR-11 2.5'-3.0'	3.5				
BOR-11 3.5'-4.0'		9.1			
BOR-11 4.0'-4.5'			416	99.3	0.18
BOR-11 11.0'-11.5'	22.4				
BOR-12 3.5'-4.0'	7.5				
BOR-12 4.0'-4.5'		10.0			
BOR-12 8.0'-8.5'			416	99.3	0.14
BOR-12 11.0'-11.5'	24.2				
BOR-13 1.0'-1.5'				95.9	
BOR-13 2.0'-2.5'	3.2				
BOR-13 2.5'-3.0'		8.8			
BOR-13 6.5'-7.0'	91.8				
BOR-14 0.0'-0.5'		9.0			
BOR-14 1.0'-1.5'					
BOR-14 4.0'-4.5'		9.0			
BOR-14 4.5'-5.0'					
BOR-14 8.5'-9.0'		7.5			
BOR-14 9.0'-9.5'					
BOR-14 14.0'-14.5'		7.5			
BOR-14 14.5'-15.0'					
BOR-15 2.0'-2.5'	4690.0				
BOR-15 2.5'-3.0'		8.7			
BOR-15 4.0'-4.5'			1140	98.8	3.42
BOR-15 6.5'-7.0'	9.6				
BOR-15 11.0'-11.5'	253.0				
BOR-15 14.0'-14.5'	3.6				
BOR-16 2.0'-2.5'	56.2				
BOR-16 2.5'-3.0'		6.2			
BOR-16 3.5'-4.0'			4150	98.2	
BOR-17 2.5'-3.0'	1480.0				
BOR-17 4.0'-4.5'		8.2			
BOR-17 5.0'-5.5'			3530	98.9	
BOR-17 7.0'-7.5'	227.0				

TABLE 1B

SUMMARY TABLE OF ANALYTICAL RESULTS: SOIL
SITE 13, OIL REFINERY
NAS ALAMEDA
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
OTHER ANALYSES

Boring Location/Depth	Total Petroleum Hydrocarbons (mg/kg)	pH	TOC (mg/kg)	Ash (%)	Nitrate as N (mg/kg)
BOR-17 10.0'-10.5'	194.0				
BOR-17 10.5'-11.0'	1430.0				
BOR-17 11.5'-12.0'	257.0				
BOR-18 2.5'-3.0'			601	98.5	0.12
BOR-18 3.5'-4.0'	3.2				
BOR-18 4.0'-4.5'		7.0			
BOR-19 2.5'-3.0'	175.0				
BOR-19 3.5'-4.0'		9.3			
BOR-19 4.0'-4.5'			416	99.3	0.38
BOR-19 11.0'-11.5'	3660.0				
BOR-20 4.5'-5.0'			156	99.2	0.37
BOR-20 5.0'-5.5'		9.4			
BOR-20 5.5'-6.0'		9.6			
BOR-21 2.5'-3.0'	2.6				
BOR-21 3.0'-3.5'		9.8			
BOR-21 4.0'-4.5'			364	99.2	1.32
BOR-21 7.0'-7.5'	8.6				
BOR-21 11.5'-12.0'	46.8				
BOR-22 3.5'-4.0'		9.6			
BOR-22 4.0'-4.5'			273	98.4	0.98
BOR-22 7.5'-8.0'	9.0				
BOR-22 11.0'-11.5'	16.1				
BOR-23 3.0'-3.5'	3.2				
BOR-23 3.5'-4.0'		9.3			
BOR-23 4.0'-4.5'			819	98.7	0.23
BOR-23 11.0'-11.5'	24.6				
BOR-24 3.0'-3.5'		8.6			
BOR-24 4.0'-4.5'			416	98.8	1.79
BOR-25 3.5'-4.0'		9.4			
BOR-25 4.0'-4.5'			109	99.3	0.15
BOR-25 11.0'-11.5'	2.9				
BOR-26 1.5'-2.0'	7.3				
BOR-26 2.5'-3.0'		6.4			

TABLE 1B

SUMMARY TABLE OF ANALYTICAL RESULTS: SOIL
SITE 13, OIL REFINERY
NAS ALAMEDA
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
OTHER ANALYSES

Boring Location/Depth	Total Petroleum Hydrocarbons (mg/kg)	pH	TOC (mg/kg)	Ash (%)	Nitrate as N (mg/kg)
BOR-26 4.0'-4.5'			271	99.3	
BOR-26 13.0'-13.5'	13.9				
BOR-27 2.5'-3.0'	251.0				
BOR-27 3.0'-3.5'		9.2			
BOR-27 4.0'-4.5'			218	99.4	0.18
BOR-27 7.0'-7.5'	11.4				
BOR-27 10.0'-10.5'	2.1				
BOR-27 12.5'-13.0'	22.2				

Notes:

1. Analytical results are presented in units as shown.

2. Sample depths are presented in feet.

TABLE 1B

SUMMARY TABLE OF ANALYTICAL RESULTS: SOIL
SITE 13, OIL REFINERY
NAS ALAMEDA
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
OTHER ANALYSES

Boring Location/Depth	Total Phosphorus (mg/kg)	Total Kjeldahl Nitrogen (mg/kg)	Chloride (mg/kg)	Sulfate (mg/kg)
MWOR-1 2.5'-3.0'				
MWOR-1 3.0'-3.5'				
MWOR-1 4.0'-4.5'	340	129.0	8.5	13.8
MWOR-2 4.0'-4.5'				
MWOR-2 5.0'-5.5'	372	95.0	3.9	10.9
MWOR-2 12.0'-12.5'				
MWOR-3 4.0'-4.5'				
MWOR-3 5.0'-5.5'	480	174.0	51.2	30.8
MWOR-3 7.0'-7.5'				
MWOR-3 10.0'-10.5'				
MWOR-4 2.5'-3.0'				
MWOR-4 3.0'-3.5'				
MWOR-4 4.0'-4.5'	785	168.0	6.0	6.5
MWOR-5 1.5'-2.0'	538	202.0	41.0	1040.0
MWOR-5 7.0'-7.5'				
MWOR-5 8.5'-9.0'				
BOR-6 2.0'-2.5'	301	78.4	5.6	
BOR-6 11.5'-12.0'				
BOR-7 2.0'-2.5'				
BOR-7 6.0'-6.5'	467	218.0	15.6	35.9
BOR-8 2.5'-3.0'	455	151.0	5.2	
BOR-8 3.0'-3.5'	143	151.0	6.2	
BOR-8 3.5'-4.0'				
BOR-8 11.0'-11.5'				
BOR-9 2.0'-2.5'				
BOR-9 2.5'-3.0'				
BOR-9 4.0'-4.5'	2000	1270.0	20.9	123.0
BOR-9 6.5'-7.0'				
BOR-9 11.0'-11.5'				
BOR-9 14.0'-14.5'				
BOR-10 1.0'-1.5'	180	72.8	6.5	8.2
BOR-10 4.0'-4.5'				
BOR-10 11.0'-11.5'				

TABLE 1B

SUMMARY TABLE OF ANALYTICAL RESULTS: SOIL
SITE 13, OIL REFINERY
NAS ALAMEDA
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
OTHER ANALYSES

Boring Location/Depth	Total Phosphorus (mg/kg)	Total Kjeldahl Nitrogen (mg/kg)	Chloride (mg/kg)	Sulfate (mg/kg)
BOR-11 2.5'-3.0'				
BOR-11 3.5'-4.0'				
BOR-11 4.0'-4.5'	232	146.0	5.5	10.9
BOR-11 11.0'-11.5'				
BOR-12 3.5'-4.0'				
BOR-12 4.0'-4.5'				
BOR-12 8.0'-8.5'	472	162.0	69.9	48.4
BOR-12 11.0'-11.5'				
BOR-13 1.0'-1.5'				
BOR-13 2.0'-2.5'				
BOR-13 2.5'-3.0'				
BOR-13 6.5'-7.0'				
BOR-14 0.0'-0.5'				
BOR-14 1.0'-1.5'		350.0		1.5
BOR-14 4.0'-4.5'				
BOR-14 4.5'-5.0'		250.0		4.3
BOR-14 8.5'-9.0'				
BOR-14 9.0'-9.5'		160.0	4.4	6.6
BOR-14 14.0'-14.5'				
BOR-14 14.5'-15.0'		120.0	8.1	6.7
BOR-15 2.0'-2.5'				
BOR-15 2.5'-3.0'				
BOR-15 4.0'-4.5'	736	174.0	185.0	28.2
BOR-15 6.5'-7.0'				
BOR-15 11.0'-11.5'				
BOR-15 14.0'-14.5'				
BOR-16 2.0'-2.5'				
BOR-16 2.5'-3.0'				
BOR-16 3.5'-4.0'	1300	465.0	17.5	45.2
BOR-17 2.5'-3.0'				
BOR-17 4.0'-4.5'				
BOR-17 5.0'-5.5'	340	297.0	3.8	55.1
BOR-17 7.0'-7.5'				

TABLE 1B

SUMMARY TABLE OF ANALYTICAL RESULTS: SOIL
SITE 13, OIL REFINERY
NAS ALAMEDA
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
OTHER ANALYSES

Boring Location/Depth	Total Phosphorus (mg/kg)	Total Kjeldahl Nitrogen (mg/kg)	Chloride (mg/kg)	Sulfate (mg/kg)
BOR-17 10.0'-10.5'				
BOR-17 10.5'-11.0'				
BOR-17 11.5'-12.0'				
BOR-18 2.5'-3.0'	1030	202.0	11.3	5.0
BOR-18 3.5'-4.0'				
BOR-18 4.0'-4.5'				
BOR-19 2.5'-3.0'				
BOR-19 3.5'-4.0'				
BOR-19 4.0'-4.5'	571	90.0	16.4	54.9
BOR-19 11.0'-11.5'				
BOR-20 4.5'-5.0'	232	146.0	4.6	15.7
BOR-20 5.0'-5.5'				
BOR-20 5.5'-6.0'				
BOR-21 2.5'-3.0'				
BOR-21 3.0'-3.5'				
BOR-21 4.0'-4.5'	232	101.0	6.6	30.2
BOR-21 7.0'-7.5'				
BOR-21 11.5'-12.0'				
BOR-22 3.5'-4.0'				
BOR-22 4.0'-4.5'	489	84.0	16.6	17.1
BOR-22 7.5'-8.0'				
BOR-22 11.0'-11.5'				
BOR-23 3.0'-3.5'				
BOR-23 3.5'-4.0'				
BOR-23 4.0'-4.5'	436	207.0	14.4	31.9
BOR-23 11.0'-11.5'				
BOR-24 3.0'-3.5'				
BOR-24 4.0'-4.5'	679	207.0	5.8	13.9
BOR-25 3.5'-4.0'				
BOR-25 4.0'-4.5'	241	78.0	5.8	6.4
BOR-25 11.0'-11.5'				
BOR-26 1.5'-2.0'				
BOR-26 2.5'-3.0'				

TABLE 1B

SUMMARY TABLE OF ANALYTICAL RESULTS: SOIL
SITE 13, OIL REFINERY
NAS ALAMEDA
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
OTHER ANALYSES

Boring Location/Depth	Total Phosphorus (mg/kg)	Total Kjeldahl Nitrogen (mg/kg)	Chloride (mg/kg)	Sulfate (mg/kg)
BOR-26 4.0'-4.5'	462	72.8	4.5	4.4
BOR-26 13.0'-13.5'				
BOR-27 2.5'-3.0'				
BOR-27 3.0'-3.5'				
BOR-27 4.0'-4.5'	555	95.0	5.7	10.5
BOR-27 7.0'-7.5'				
BOR-27 10.0'-10.5'				
BOR-27 12.5'-13.0'				

Notes:

1. Analytical results are presented in units as shown.

2. Sample depths are presented in feet.

TABLE 2

SUMMARY TABLE OF ANALYTICAL RESULTS: WATER
SITE 13, OIL REFINERY
NAS ALAMEDA
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

Chemical Group/Analyte	Units	Well Number MWOR-1	MWOR-2	MWOR-3	MWOR-4	MWOR-5
Volatile Organics						
Benzene	ug/l					
Ethyl Benzene	ug/l					
Methylene Chloride	ug/l	10.		17.	5.	
Xylene (total)	ug/l					
Semivolatile Organics						
Naphthalene	ug/l					
2-Methylnaphthalene	ug/l					
bis(2-ethylhexyl)phthalate	ug/l					
Pesticides						
4,4'-DDT	ug/l	0.08				
Total Petroleum Hydrocarbons	mg/l		0.08			
Metals						
Aluminum	mg/l	46	184	386	244	223
Arsenic	mg/l		0.077			
Barium	mg/l	0.37	0.88	1.9	1.7	1.3
Beryllium	mg/l		0.0054	0.0084	0.0055	0.0056
Calcium	mg/l	359	83	113	61	23
Chromium	mg/l	0.13	0.6	1.1	0.72	0.65
Cobalt	mg/l		0.14	0.25	0.17	0.13
Copper	mg/l	0.042	0.26	0.32	0.19	0.25
Iron	mg/l	59	266	465	300	296
Lead	mg/l		0.18	0.054		0.055
Magnesium	mg/l	98	94	128	80	81
Manganese	mg/l	12	3.4	11	4.8	5.4
Nickel	mg/l	0.19	0.71	1.7	0.92	0.8
Potassium	mg/l	14	34	43	16	35
Selenium	mg/l		0.097	0.18	0.12	0.12
Sodium	mg/l	390	353	172	47	97
Titanium	mg/l	1.4	4.7	7.3	5.6	5.4
Vanadium	mg/l	0.11	0.55	0.76	0.55	0.51
Zinc	mg/l	0.12	0.68	0.86	0.56	0.63

TABLE 2

SUMMARY TABLE OF ANALYTICAL RESULTS: WATER
SITE 13, OIL REFINERY
NAS ALAMEDA
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

Chemical Group/Analyte	Units	Well Number				
		MWOR-1	MWOR-2	MWOR-3	MWOR-4	MWOR-5
Total Organic Carbon	mg/l	21.3	23.2	15.1	7.5	10.0
General Minerals						
Total Dissolved Solids	mg/l	3160.	1380.	880.	620.	780.
Specific Conductance	umhos/c	4020	2320	1410	470	540
pH	–	6.8	7.8	7.4	6.7	7.2

Notes:

1. Shaded concentrations denote concentrations in excess of the Maximum Contaminant Level or the Applied Action Level.

TABLE 2

SUMMARY TABLE OF ANALYTICAL RESULTS: WATER
SITE 13, OIL REFINERY
NAS ALAMEDA
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

Chemical Group/Analyte	Units	Well Number MW-1 (HLA)
Volatile Organics		
Benzene	ug/l	400.
Ethyl Benzene	ug/l	34.
Methylene Chloride	ug/l	
Xylene (total)	ug/l	32.
Semivolatile Organics		
Naphthalene	ug/l	23.
2-Methylnaphthalene	ug/l	16.
bis(2-ethylhexyl)phthalate	ug/l	11.
Pesticides		
4,4'-DDT	ug/l	0.025
Total Petroleum Hydrocarbons	mg/l	21
Metals		
Aluminum	mg/l	50
Arsenic	mg/l	
Barium	mg/l	0.66
Beryllium	mg/l	
Calcium	mg/l	82
Chromium	mg/l	0.15
Cobalt	mg/l	
Copper	mg/l	0.051
Iron	mg/l	92
Lead	mg/l	
Magnesium	mg/l	81
Manganese	mg/l	2.7
Nickel	mg/l	0.19
Potassium	mg/l	25
Selenium	mg/l	
Sodium	mg/l	506
Titanium	mg/l	1.3
Vanadium	mg/l	0.13
Zinc	mg/l	0.18

TABLE 2

SUMMARY TABLE OF ANALYTICAL RESULTS: WATER
SITE 13, OIL REFINERY
NAS ALAMEDA
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

Chemical Group/Analyte	Units	Well Number MW-1 (HLA)
Total Organic Carbon	mg/l	67.6
General Minerals		
Total Dissolved Solids	mg/l	1820.
Specific Conductance	umhos/c	2580
pH	–	7.0

Notes:

1. Shaded concentrations denote concentrations in excess of the Maximum Contaminant Level or the Applied Action Level.

TABLE 3

COMPARISON OF ACTION LEVELS FOR VARIOUS CHEMICAL GROUPS
NAS ALAMEDA
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

Chemical Group/Analyte	MCL (mg/l)	STLC (mg/l)	TTLC (mg/kg)	AAL Biological Receptor	AAL Water (ug/l)	AAL Air (ug/m3)	AAL Soil (mg/kg)
Volatile Organics							
1,1,1-Trichloroethane	0.2			Human	300	300	
1,1,2,2-Tetrachloroethane	0.001						
1,1,2-Trichloroethane	0.032						
1,1-Dichloroethylene	0.006						
1,2-Dichloroethane	0.0005						
1,3-Dichloropropene	0.0005						
1,4-Dichlorobenzene	0.005						
2-Butanone				Human	2,000	300	
Benzene	0.001			Human	0.2	0.07	
Benzene				Freshwater	1		
Benzene				Saltwater	1		
Carbon Tetrachloride	0.0005						
Chloroform				Human	6	0.6	
Dibromochloropropane	0.0002						
Ethylbenzene	0.68			Human	2,000	100	
Ethylene Dibromide	0.00002						
Monochlorobenzene	0.03						
n-Hexane				Human	100	200	
Tetrachloroethylene	0.005						
Toluene				Human	2,000	200	
Toluene				Freshwater	90		
Toluene				Saltwater	20		
Trichloroethylene	0.005	204.	2,040	Human	7	7	
Vinyl Chloride	0.0005			Human	0.5	0.1	
Xylene				Freshwater	40		

TABLE 3

COMPARISON OF ACTION LEVELS FOR VARIOUS CHEMICAL GROUPS
NAS ALAMEDA
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

Chemical Group/Analyte	MCL (mg/l)	STLC (mg/l)	TTLC (mg/kg)	AAL Biological Receptor	AAL Water (ug/l)	AAL Air (ug/m3)	AAL Soil (mg/kg)
Volatile Organics							
Xylene				Saltwater	70		
Xylene (all isomers)	1.75			Human	2,000	400	30,000
Semivolatile Organics							
Acenaphthene				Human	20	2	
Acenaphthylene				Human	20	2	
Anthracene				Human	20	2	100
Atrazine	0.003						
Bentazon	0.018						
Benzo(a)pyrene				Human	0.09	0.009	
Fluoranthene				Human	20	2	
Fluorene				Human	20	2	
Naphthalene				Human	20	2	
Naphthalene				Freshwater	600		
Naphthalene				Saltwater	700		
Pentachlorophenol		1.7	17	Human	2	0.2	
Pentachlorophenol				Freshwater	5		
Pentachlorophenol				Saltwater	10		
Phenanthrene				Human	20	2	100
Pyrene				Human	20	2	
Pesticides/PCBs							
2,4,5-TP Silvex	0.01	1.	10				
2,4-D	0.1	10.	100	Human	40	4	
Aldicarb				Human	20	2	

TABLE 3

COMPARISON OF ACTION LEVELS FOR VARIOUS CHEMICAL GROUPS
NAS ALAMEDA
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

Chemical Group/Analyte	MCL (mg/l)	STLC (mg/l)	TTLC (mg/kg)	AAL Biological Receptor	AAL Water (ug/L)	AAL Air (ug/m3)	AAL Soil (mg/kg)
Pesticides/PCBs							
Aldrin		0.14	1.4				
Chlordan		0.25	2.5				
DDD,DDE,DDT		0.1	1.0				
Diazinon				Human	30	3	
Dicofol				Human	1	0.1	
Dieldrin		0.8	8				
Dioxin (2,3,7,8-TCCD)		0.001	0.01				
Endrin	0.0002	0.02	0.2				
Heptachlor		0.47	4.7	Human	0.1	0.01	
Heptachlor Epoxide				Human	0.02	0.002	
Kepone		2.1	21				
Lead Compounds, Organic			13				
Lindane	0.004	0.4	4	Human	0.2	0.02	
Malathion				Human	800	80	
Methoxychlor	0.1	10.	100				
Mirex		2.1	21				
Molinate	0.02						
Paraquat				Human	200	4	
Parathion, Ethyl				Human	40	0.2	
Polychlorinated Biphenyls (PCBs)		5.	50				
Simazine	0.01						
Thiobencarb	0.07						
Toxaphene	0.005	0.5	5				

TABLE 3

COMPARISON OF ACTION LEVELS FOR VARIOUS CHEMICAL GROUPS
NAS ALAMEDA
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

Chemical Group/Analyte	MCL (mg/l)	STLC (mg/l)	TTLC (mg/kg)	AAL Biological Receptor	AAL Water (ug/l)	AAL Air (ug/m3)	AAL Soil (mg/kg)
Inorganics							
Aluminum	1.0						
Antimony		15.	500				
Arsenic	0.05	5.0	500	Freshwater	70		
Arsenic				Saltwater	20		
Asbestos			1.0				
Barium	1.0	100.	10,000	Human	350	5	
Beryllium		0.75	75				
Cadmium	0.01	1.0	100	Freshwater	0.2		
Cadmium				Saltwater	5		
Chromium	0.05			Freshwater	50		
Chromium				Saltwater	2		
Chromium III		560.	2,500	Human	50,000	50	
Chromium VI		5.	500				
Cobalt		80.	8,000				
Copper		25.	2,500	Human	4,000	200	
Copper				Freshwater	4		
Copper				Saltwater	6		
Cyanide				Human	1,000	50	
Fluoride (temperature dependent)	1.4 to 2.4						
Fluoride Salts		180.	18,000				
Lead	0.05	5.0	1,000	Freshwater	10		
Lead				Saltwater	4		
Mercury (inorganic)	0.002	0.2	20	Human	70	0.07	
Molybdenum		350.	3,500				
Nickel		20.	2,000	Human	400	0.1	

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TABLE 3

COMPARISON OF ACTION LEVELS FOR VARIOUS CHEMICAL GROUPS
NAS ALAMEDA
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

Chemical Group/Analyte	MCL (mg/l)	STLC (mg/l)	TTLC (mg/kg)	AAL Biological Receptor	AAL Water (ug/L)	AAL Air (ug/m3)	AAL Soil (mg/kg)
Inorganics							
Nickel				Freshwater	1		
Nickel				Saltwater	8		
Nitrate	45.0			Saltwater	10		
Selenium	0.01	1.0	100				
Silver	0.05	5.	500	Human	200	2	
Silver				Freshwater	1		
Silver				Saltwater	6		
Thallium		7.0	700				
Vanadium		24.	2,400				
Zinc		250.	5,000	Human	8,000	800	
Zinc				Freshwater	30		
Zinc				Saltwater	10		
Consumer Acceptance Limits							
Color	15 units						
Copper	1.0						
Corrosivity	Relatively Low						
Odor - Threshold	3 units						
Foaming Agents (MBAs)	0.5						
Iron	0.3						
Manganese	0.05						
Thiobencarb	0.001						
Turbidity	5 units						
Zinc	5.0						

TABLE 3

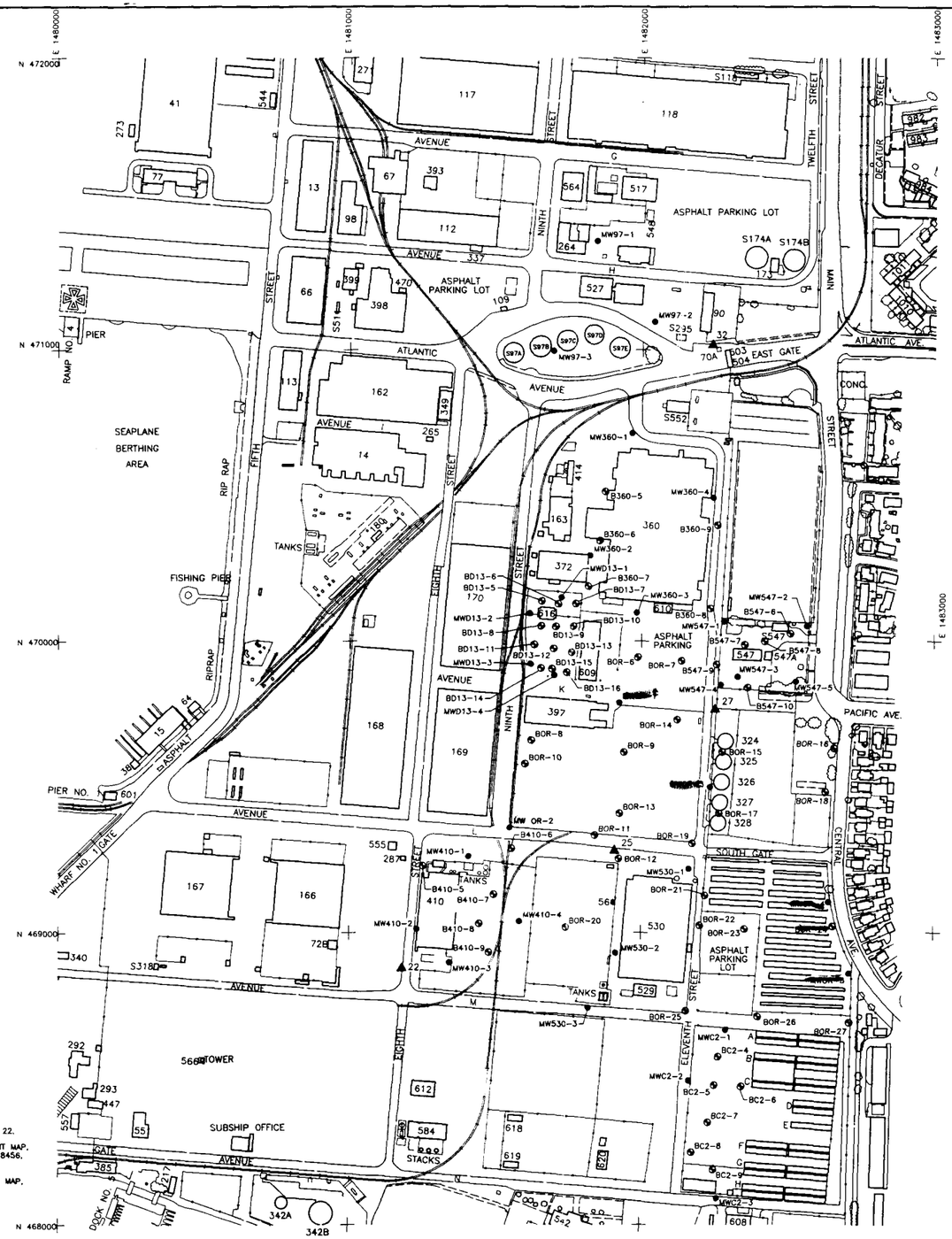
COMPARISON OF ACTION LEVELS FOR VARIOUS CHEMICAL GROUPS
NAS ALAMEDA
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

Chemical Group/Analyte	MCL (mg/l)	STLC (mg/l)	TTLC (mg/kg)	AAL Biological Receptor	AAL Water (ug/L)	AAL Air (ug/m3)	AAL Soil (mg/kg)
Mineralization							
Total Dissolved Solids	500						
or							
Specific Conductance	900 umhos						
Chloride	250						
Sulfate	250						

Notes:

1. MCLs are Maximum Contaminant Levels.
2. AALs are Applied Action Levels.
3. STLCs are Soluble Threshold Limit Concentrations.
4. TTLCs are Total Threshold Limit Concentrations.
5. MCLs, STLCs, and TTLCs were referenced in Barclay's California Code of Regulations, Title 22, Social Security, Division 4 , Environmental Health, updated June 22, 1990.
6. AALs were referenced from the California Department of Health Services AAL List 90-1, dated June 29, 1990, which supersedes all previous AAL lists.
7. MCLs for the constituents listed under Consumer Acceptance Limits and Mineralization apply to Secondary Drinking Water Standards.
8. State of California recommended MCLs are listed for Mineralization under the Secondary Drinking Water Standards.
9. Freshwater and saltwater biological receptors for the listed AALs apply to aquatic life.

DRAWING NUMBER 86-018-E87



LEGEND:

- B360-5 SOIL BORING LOCATION
- MW97-2 MONITORING WELL LOCATION
- ▲22 SURVEY MONUMENT

SCALE
200 0 200 400 FEET

REFERENCES:

1. NAVAL AIR STATION ALAMEDA GENERAL DEVELOPMENT MAP, SHEETS 18 & 22.
2. NAVAL AIR STATION ALAMEDA, ALAMEDA, CALIFORNIA GENERAL DEVELOPMENT MAP, STATION MAP WITH SURVEY MONUMENTS ADDED, NAVFAC DRAWING NO. 638456, REVISION 8, DATED SEPTEMBER 15, 1986.
3. NAVAL AIR STATION, ALAMEDA, CALIFORNIA, STATION BENCHMARK LOCATION MAP, PWC DRAWING NO. 25144, DATED JANUARY 1985

PHASE 2A
MONITORING WELL AND SOIL BORING LOCATIONS
NAVAL AIR STATION ALAMEDA, CALIFORNIA

PREPARED FOR

WESTERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
SAN BRUNO, CALIFORNIA

No.	DATE	ISSUE / REVISION	DWN. BY	CK'D BY	AP'D BY
2	11-9-90	ISSUED FOR PHASE 2A SURVEY DATA REPORT	VZC	TGB	RJG
1	10-17-90	ISSUED FOR ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT PERMIT NO. 90385	VZC	TGB	RJG

CanonieEnvironmental

DATE: 10-9-90	FIGURE 1	DRAWING NUMBER 86-018-E87	2
SCALE: AS SHOWN			

N00236.000798
ALAMEDA POINT
SSIC NO. 5090.3

APPENDIX A – CERTIFIED ANALYTICAL RESULTS

PHASE 2A ANALYTICAL RESULTS FOR SITE 13, OIL REFINERY SITE REMEDIAL INVESTIGATION/FEASIBILITY STUDY

DATED 01 DECEMBER 1990

N00236.000798
ALAMEDA POINT
SSIC NO. 5090.3

APPENDIX A – CERTIFIED ANALYTICAL RESULTS

THIS RECORD CONTAINS ANALYTICAL DATA AND IS NOT REQUIRED TO BE PHYSICALLY LOCATED WITH THE ADMINISTRATIVE RECORD DOCUMENT.

THIS DATA WILL NOT BE IMAGED.

TO VIEW THE DATA, CONTACT:

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SSIC NO. 5090.3

PHASE 2A ANALYTICAL RESULTS FOR SITE 13, OIL REFINERY SITE REMEDIAL INVESTIGATION/FEASIBILITY STUDY

DATED 01 DECEMBER 1990

THIS RECORD CONTAINS MULTIPLE VOLUMES WHICH HAVE BEEN ENTERED SEPARATELY

VOLUME II OF II IS ENTERED IN THE DATABASE AND FILED AT ADMINISTRATIVE RECORD NO. **N00236.000799**