N60200.AR.002024
NAS CECIL FIELD, FL
5090.3a

CONFIRMATORY SAMPLING REPORT FOR BUILDING 80 OIL-WATER SEPARATOR 80-OW4 BASE REALIGNMENT AND CLOSURE UNDERGROUND STORAGE TANK AND ABOVEGROUND STORAGE TANK GREY SITES NAS CECIL FIELD FL

8/1/1999

HARDING LAWSON ASSOCIATES

CONFIRMATORY SAMPLING REPORT

BUILDING 80, OIL-WATER SEPARATOR 80-OW4

BASE REALIGNMENT AND CLOSURE

UNDERGROUND STORAGE TANK AND ABOVEGROUND STORAGE TANK GREY SITES

NAVAL AIR STATION CECIL FIELD JACKSONVILLE, FLORIDA

Unit Identification Code: N60200

Contract No.: N62467-89-D-0317/149

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August 1999

Revision 0.0

CERTIFICATION OF TECHNICAL
DATA CONFORMITY (MAY 1987)

The Contractor, Harding Lawson Associates, hereby certifies that, to the best of its knowledge and belief, the technical data delivered herewith under Contract No. N62467-89-D-0317/149 are complete and accurate and comply with all requirements of this contract.

DATE: August 22, 1999

NAME AND TITLE OF CERTIFYING OFFICIAL: Rao Angara
Task Order Manager

NAME AND TITLE OF CERTIFYING OFFICIAL: Eric A. Blomberg, P.G.
Project Technical Lead

(DFAR 252.227-7036)

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Naval Air Station Cecil Field
Jacksonville, Florida

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GLOSSARY

ABB-ES	ABB Environmental Services, Inc.
bls	below land surface
FAC	Florida Administrative Code
HLA	Harding Lawson Associates
OVA	organic vapor analyzer
ppm	parts per million
UST	underground storage tank

1.0 INTRODUCTION

Harding Lawson Associates (HLA), under contract to the Southern Division, Naval Facilities Engineering Command, has completed the confirmatory sampling for the oil-water separator, 80-OW4, at Naval Air Station Cecil Field in Jacksonville, Florida. This report summarizes the related field operations, results, conclusions, and recommendations of the confirmatory sampling.

Tank 80-OW4 is an oil-water separator located east of Building 80, which is an automotive maintenance and repair shop (Figure 1). A Contamination Assessment Plan for the assessment of soil and groundwater at Tank 80-OW4 was prepared by HLA (then ABB-ES) in November 1996 (ABB-ES, 1996).

2.0 FIELD INVESTIGATION

The confirmatory sampling for Tank 80-OW4 was initiated in November 1998. It included

- the advancement of eleven soil borings to the water table,
- the installation of one shallow groundwater monitoring well, and
- the collection and analysis of one groundwater sample and five subsurface soil samples.

Soil samples were collected from each boring at depth intervals of 1 foot below land surface (bls) and every 2 feet thereafter to the water table. These samples were screened for hydrocarbon vapors with an organic vapor analyzer (OVA). Five subsurface soil samples, CEF-80OW4-SB2 (5 ft bls), CEF-80OW4-SB5 (4.5 ft bls), CEF-80OW4-SB6 (4 ft bls), CEF-80OW4-SB8 (4 ft bls), and CEF-80OW4-SB10 (3 ft bls) were collected at the site and analyzed for used oil group parameters.

One monitoring well, CEF-80-13S, was installed downgradient of the separator to a depth of 15 feet bls. One groundwater sample was collected and analyzed for the Kerosene Analytical Group parameters. A general site plan indicating the location of the soil borings and the monitoring well is presented on Figure 2. The monitoring well construction is presented as Appendix A.

3.0 SCREENING AND ANALYTICAL RESULTS

Excessively contaminated soil (greater than 50 parts per million [ppm] on an OVA) was detected in five of the eleven soil borings. The highest OVA reading (2,250 ppm) was detected at 4 feet below land surface in soil boring SB8. The soil OVA data are summarized in Table 1 and presented on Figure 2.

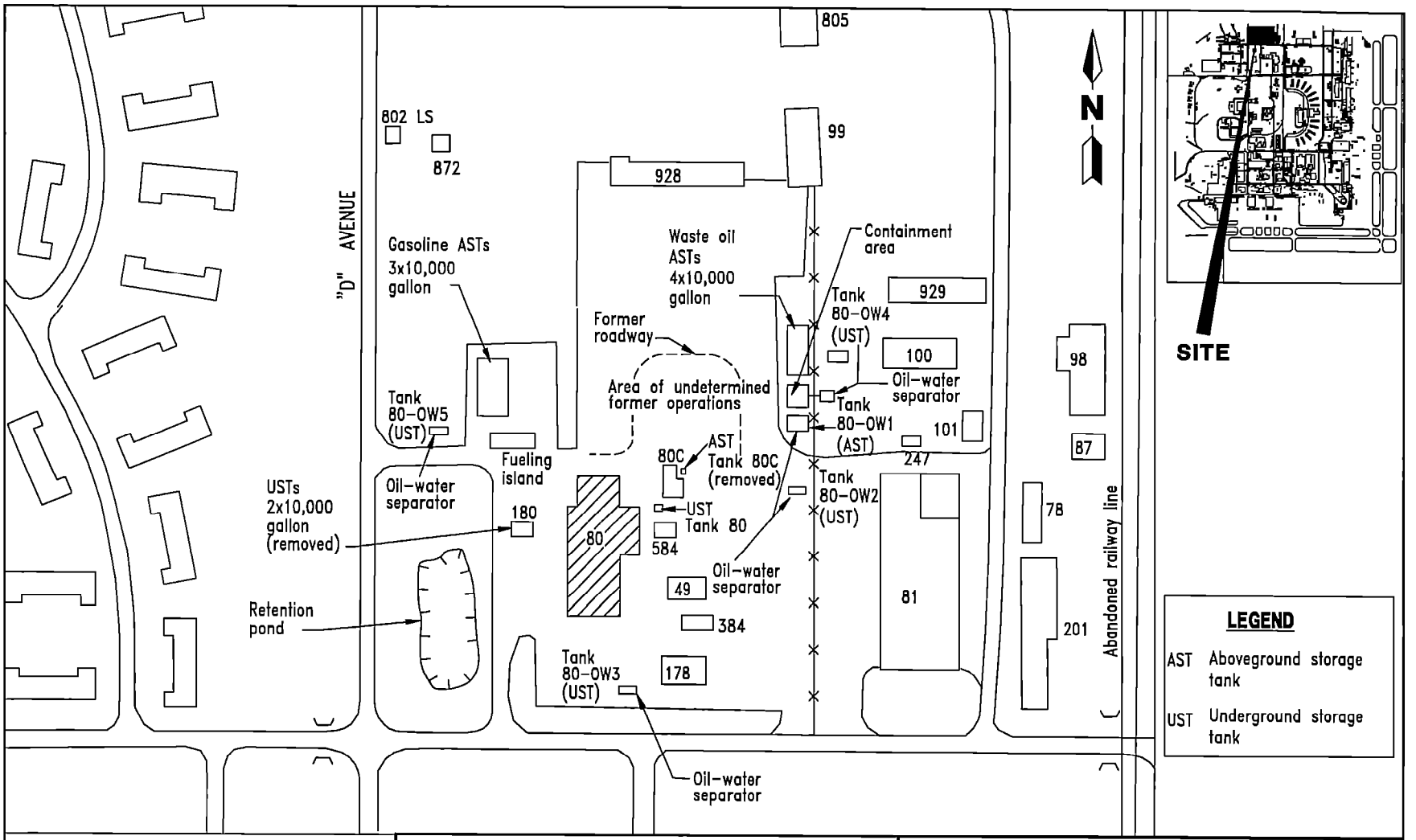

FIGURE 1
TANK 80-OW4
TRANSPORTATION AND FUEL MANAGEMENT COMPOUND

CONFIRMATORY SAMPLING REPORT
BUILDING 80, OIL-WATER SAPARATOR 80-OW4

NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

Figure 2 Tank 80-OW2, Soil Boring and Monitoring Well Locations

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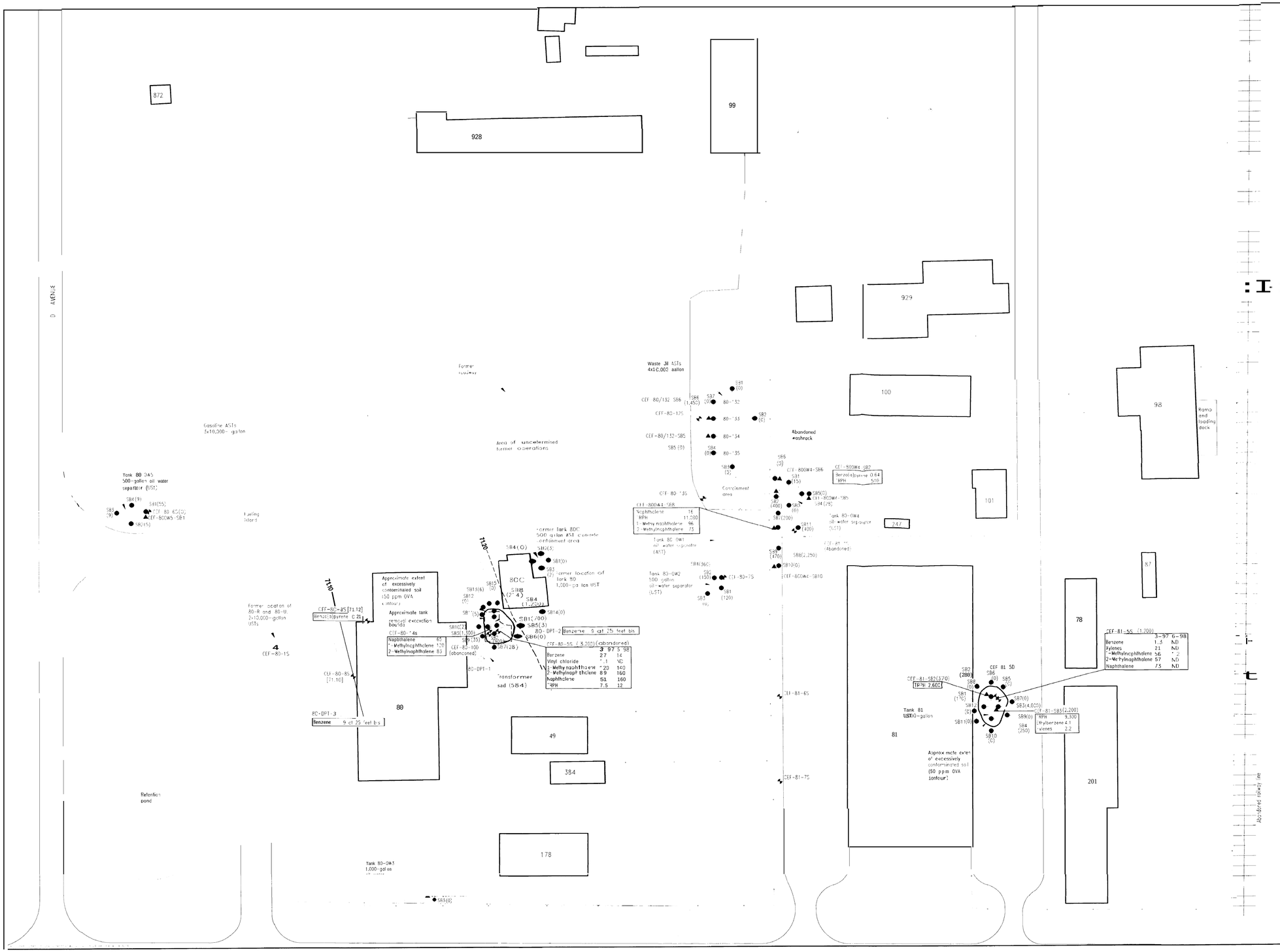
872
928
99
929
100
98
101
78
87
247
80
49
384
178
201
D AVENUE
Former hydrant
Gasoline ASTs 5x10,000- gallon
Area of undetermined former operations
Waste Jil ASTs 4x10,000 gallon
Abandoned washrack
Ramp and loading dock
Tank 80 OA5 500-gallon oil water separator (UST)
Parking lot
Former tank 80C 500 gallon AST concrete containment area
Former location of tank 80 1,000-gallon UST
Approximate extent of excessively contaminated soil (50 ppm OVA contour)
Approximate tank removal excavation boundary
Former location of 80-R and 80-U 2-10,000-gallon USTs
Transformer sad (584)
Tank 81 UST 10-gallon
Approximate extent of excessively contaminated soil (50 ppm OVA contour)
Retention pond
Tank 80-OW3 1,000-gallon
Abandoned railway line
Tank 80-OW4 oil water separator
Tank 80-OW1 oil water separator (AST)
Tank 80-OW2 500-gallon oil-water separator (UST)
Containment area
CEF-80-AS [71.12]
Benzo(a)pyrene 0.21
CEF-80-1S
CEF-80-85 [71.10]
80-DPT-3
Benzene 9 at 25 feet bls
CEF-80-'4s
Naphthalene 65
1-Methylnaphthalene 120
2-Methylnaphthalene 83
CEF-80/132-SB6 (1,450)
CEF-80-12S
CEF-80/132-SB5
SB5 (0)
CEF-80-'3S
CEF-80W4-SB8
Naphthalene 16
NPH 11,200
1-Methylnaphthalene 96
2-Methylnaphthalene 75
CEF-80W4-SB6
CEF-80W2-SB10
CEF-80-7S
CEF-81-6S
CEF-81-7S
CEF-81-SB2(370)
TPH 2,600
CEF-81-5S (1,200)
Benzene 1.5 ND
Xylenes 21 ND
1-Methylnaphthalene 56 ND
2-Methylnaphthalene 57 ND
Naphthalene 75 ND
CEF-81-SB3(2,200)
NPH 9,300
Ethylbenzene 4.1
Xylenes 2.2
CEF-80-DPT-1
Benzene 9 at 25 feet bls
Vinyl chloride 27 14
1-Methylnaphthalene 120 140
2-Methylnaphthalene 89 160
Naphthalene 51 160
NPH 7.5 12
CEF-80-5S (6,200) (abandoned)
CEF-82-100 (abandoned)
CEF-80-'4s (abandoned)
CEF-80-'32
CEF-80-'55
CEF-80-'34
CEF-80-'35
CEF-80-'36
CEF-80-'33
CEF-80-'37
CEF-80-'38
CEF-80-'39
CEF-80-'40
CEF-80-'41
CEF-80-'42
CEF-80-'43
CEF-80-'44
CEF-80-'45
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CEF-80-'63
CEF-80-'64
CEF-80-'65
CEF-80-'66
CEF-80-'67
CEF-80-'68
CEF-80-'69
CEF-80-'70
CEF-80-'71
CEF-80-'72
CEF-80-'73
CEF-80-'74
CEF-80-'75
CEF-80-'76

Table 1
Soil Screening Results

Confirmatory Sampling Report
Building 80, Tank 80-OW4
Naval Air Station Cecil Field
Jacksonville, Florida

Location	OVA Concentration (ppm)			
	Depth (feet bls)	Unfiltered	Filtered	Actual
SB1	1	0	--	0
	3	15	0	15
SB2	1	0	--	0
	3	110	0	110
	4	400	--	400
SB3	1	0	--	0
	3	0	--	0
SB4	1	0	--	0
	3	28	0	28
SB5	1	0	--	0
	3	0	--	0
	4.5	0	--	0
SB6	1	0	--	0
	3	0	--	0
	4	0	--	0
SB7	1	0	--	0
	3	15	0	15
	4	200	0	200
SB8	1	8	0	8
	3	260	25	235
	4	2,250	10	2,240
SB9	1	2	0	2
	3	470	5	465
SB10	1	1	0	1
	3	2	0	2
SB11	1	1	0	1
	3	4	0	4
	4	400	0	400

Notes: All soil samples were collected on February 5, 1997.
Soil samples were filtered with carbon to determine the methane concentration.

OVA = organic vapor analyzer.
ppm = parts per million.
bls = below land surface.
-- = filtered readings were not collected.

Benzo(a)pyrene, 1-methylnaphthalene, 2-methylnaphthalene, naphthalene, and TRPH were detected above cleanup target levels in the subsurface soil samples CEF-80OW4-SB2 and CEF-80OW4-SB8. Analytical results are summarized in Table 2 and presented in Appendix B.

No contaminants were detected above cleanup target levels in the groundwater sample collected from monitoring well CEF-80-13S. The complete analytical data set is summarized in Table 3 and presented in Appendix B.

4.0 CONCLUSIONS AND RECOMMENDATIONS

Data obtained during the confirmatory sampling at the Tank 80-OW4 site did not provide an adequate assessment of the horizontal and vertical extent of excessively contaminated soil.

No contaminants were detected above the regulatory standards specified in Chapter 62-770, FAC, in the groundwater sample collected from monitoring well CEF-80-7S.

It is recommended that additional action take place to address soil contamination at the oil-water separator 80-OW4 site.

Table 2
Summary of Subsurface Soil Analytical Detections

Confirmatory Sampling Report
Building 80, Tank 80-OW4
Naval Air Station Cecil Field
Jacksonville, Florida

Compound	CEF-80OW4-SB2 (5 feet bls; OVA = 400 ppm)	CEF-80OW4-SB5 (4.5 feet bls; OVA = 0 ppm)	CEF-80OW4-SB6 (4 feet bls; OVA = 0 ppm)	CEF-80OW4-SB8 (4 feet bls; OVA = 2,240 ppm)	CEF-80OW4-SB10 (3 feet bls; OVA = 2 ppm)	Soil Cleanup Target Levels[1]
Volatile Organic Aromatics (USEPA Method 8020) (mg/kg)						
Not detected		NC	NC	NC	NC	
Polynuclear Aromatic Hydrocarbons (USEPA Method 8310) (mg/kg)						
Pyrene	1.3	0.002	ND	ND	ND	2,200/570
Naphthalene	ND	ND	ND	**16**	ND	1,000/1
Phenanthrene	1.1	ND	ND	7.2	ND	1,900/120
Anthracene	ND	ND	ND	2.8	ND	19,000/2,000
Fluoranthene	1.8	ND	ND	ND	ND	2,800/550
Fluorene	ND	ND	ND	1.5	ND	2,100/87
Benzo(a)anthracene	0.74	ND	ND	0.21 J	ND	1.4/2.9
Chrysene	0.71	ND	ND	ND	ND	140/80
Benzo(b)fluoranthene	0.6	ND	ND	ND	ND	1.4/9.8
Benzo(k)fluoranthene	0.56	ND	ND	ND	ND	15/25
Benzo(a)pyrene	**0.64**	ND	ND	ND	ND	0.1/7.8
Indeno(1,2,3-cd)pyrene	0.39	ND	ND	ND	ND	1.5/28
Benzo(g,h,i)perylene	0.39	ND	ND	ND	ND	2,300/13,000
1-Methylnaphthalene	ND	ND	ND	**96**	ND	68/2.2
2-Methylnaphthalene	ND	ND	ND	**73**	ND	80/6.1
Total Recoverable Petroleum Hydrocarbons (TRPH) (FL-PRO) (mg/kg)						
TRPH	**510**	ND	ND	**11,000**	ND	350/340

See notes at end of table.

Table 2 (Continued)
Summary of Subsurface Soil Analytical Detections

Confirmatory Sampling Report
Building 80, Tank 80-OW4
Naval Air Station Cecil Field
Jacksonville, Florida

Compound	CEF-80OW4-SB2 (5 feet bls; OVA = 400 ppm)	CEF-80OW4-SB5 (4.5 feet bls; OVA = 0 ppm)	CEF-80OW4-SB6 (4 feet bls; OVA = 0 ppm)	CEF-80OW4-SB8 (4 feet bls; OVA = 2,240 ppm)	CEF-80OW4-SB10 (3 feet bls; OVA = 2 ppm)	Soil Cleanup Target Levels[1]
Inorganic Analytes (mg/kg)						
Arsenic	**0.8 J**	NC	NC	NC	NC	0.8/TCLP
Chromium	4.9	NC	NC	NC	NC	290/TCLP
Lead	7.3	NC	NC	NC	NC	500/TCLP
Mercury	0.026	NC	NC	NC	NC	3.7/TCLP
Silver	17 J	NC	NC	NC	NC	390/TCLP

[1] Chapter 62-770, Florida Administrative Code: Direct Exposure 1/Leachability, Table V.

Notes: Bold indicates concentration exceeds cleanup target level.

bls = below land surface.
OVA = organic vapor analyzer.
J = estimated.
NC = not collected.
ND = not detected.
USEPA = U.S. Environmental Protection Agency.
mg/kg = milligrams per kilogram.
FL-PRO = Florida-Petroleum Residual Organics.
TCLP = toxicity characteristic leaching procedure.

Table 3
Summary of Groundwater Analytical Detections

Confirmatory Sampling Report
Building 80, Tank 80-OW4
Naval Air Station Cecil Field
Jacksonville, Florida

Compound	Monitoring Well CEF-80-13S	Groundwater Cleanup Target Levels[1]
Volatile Organic Aromatics (USEPA Method 601/602) (μg/ℓ)		
No compounds detected.		
Polynuclear Aromatic Hydrocarbons (USEPA Method 610) (μg/ℓ)		
No compounds detected.		
Total Recoverable Petroleum Hydrocarbons (TRPH) (FL-PRO) (μg/ℓ)		
No compounds detected.		
Inorganic Analytes (mg/ℓ)		
Lead	0.006 J	15

[1] Chapter 62-770, Florida Administrative Code.

Notes: Groundwater sample was collected on May 19, 1999.

USEPA = U.S. Environmental Protection Agency.
μg/ℓ = micrograms per liter.
FL-PRO = Florida-Petroleum Residual Organic.

REFERENCES

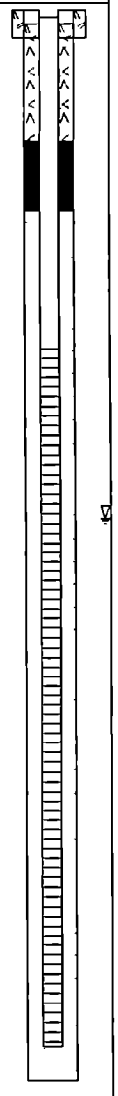
ABB Environmental Services, Inc. (ABB-ES). 1996. *Contamination Assessment Plan, Naval Air Station Cecil Field, Jacksonville, Florida.* Prepared for Southern Division, Naval Facilities Engineering Command (SOUTHNAVFACENGCOM), North Charleston, South Carolina (November).

APPENDIX A

MONITORING WELL CONSTRUCTION DETAIL

TITLE: NAS Cecil Field, Bldg. 80 Site Assessment Report	LOG of WELL: CEF-80-13S	BORING NO. CEF-80-13S
CLIENT: SOUTHDIVNAVFACENGCOM		PROJECT NO: 02523-12
CONTRACTOR: Groundwater Protection Services	DATE STARTED: 05-11-99	COMPLTD: 05-11-99
METHOD: HSA	CASE SIZE: 2in.	SCREEN INT.: 5-15 ft.	PROTECTION LEVEL: D
TOC ELEV.: FT.	MONITOR INST.: FID	TOT DPTH: 15.5FT.	DPTH TO ∇ 7.42 FT.
LOGGED BY: H.Hooper	WELL DEVELOPMENT DATE: 05-12-99	SITE: Building 80

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
				0	<> See Note		SM	posthole	
1									
2									
3									
4				0				posthole	
5					SILTY SAND: dark to light brown slightly silty fine sand.				
6				0				*	
								**	
7									
8				0					
9									
10				0					
11					SILTY SAND: dark to light brown slightly silty fine sand.				
12				0					
13									
14				0					
15									
16					<> Soil description taken from posthole and auger				
					* no split spoon samples taken				
17					** OVA readings taken at borehole				
18									
19									
20									



HARDING LAWSON ASSOCIATES

APPENDIX B

ANALYTICAL DATA

NAS Cecil Field - Subsurface Soil Analytical Results - O/W Separator 80-OW4

Sample Identifier	CEF-80OW4-SB10	CEF-80OW4-SB2	CEF-80OW4-SB5	CEF-80OW4-SB6
Sample Collect Date	4/1/99	1/20/99	3/31/99	3/31/99
Analyte				
Metals				
Arsenic	--	0.8 J mg/kg (0.6)	--	--
Cadmium	--	1. U mg/kg (1.)	--	--
Chromium	--	4.9 mg/kg (1.)	--	--
Lead	--	7.3 mg/kg (1.)	--	--
Mercury	--	0.02 mg/kg (0.01)	--	--
Selenium	--	2. U mg/kg (2.)	--	--
Silver	--	17. J mg/kg (2.)	--	--
PAHs				
1-Methylnaphthalene	39. U ug/kg (39.)	--	39. U ug/kg (39.)	38. U ug/kg (38.)
2-Chloronaphthalene	--	370. U ug/kg (370.)	--	--
2-Methylnaphthalene	39. U ug/kg (39.)	370. U ug/kg (370.)	39. U ug/kg (39.)	38. U ug/kg (38.)
3,3-Dichlorobenzidine	--	740. U ug/kg (740.)	--	--
Acenaphthene	19. U ug/kg (19.)	370. U ug/kg (370.)	19. U ug/kg (19.)	19. U ug/kg (19.)
Acenaphthylene	39. U ug/kg (39.)	370. U ug/kg (370.)	39. U ug/kg (39.)	38. U ug/kg (38.)
Anthracene	2. U ug/kg (2.)	370. U ug/kg (370.)	2. U ug/kg (2.)	2. U ug/kg (2.)
Benzo(a)anthracene	1.9 U ug/kg (1.9)	740. ug/kg (370.)	1.9 U ug/kg (1.9)	1.9 U ug/kg (1.9)
Benzo(a)pyrene	2. U ug/kg (2.)	640. ug/kg (370.)	2. U ug/kg (2.)	2. U ug/kg (2.)
Benzo(b)fluoranthene	3. U ug/kg (3.)	600. ug/kg (370.)	3. U ug/kg (3.)	3. U ug/kg (3.)
Benzo(g,h,i)perylene	3.9 U ug/kg (3.9)	390. ug/kg (370.)	3.9 U ug/kg (3.9)	3.8 U ug/kg (3.8)
Benzo(k)fluoranthene	2. U ug/kg (2.)	560. ug/kg (370.)	2. U ug/kg (2.)	2. U ug/kg (2.)
Carbazole	--	370. U ug/kg (370.)	--	--
Chrysene	1.9 U ug/kg (1.9)	710. ug/kg (370.)	1.9 U ug/kg (1.9)	1.9 U ug/kg (1.9)
Dibenzo(a,h)anthracene	3.9 U ug/kg (3.9)	370. U ug/kg (370.)	3.9 U ug/kg (3.9)	3.8 U ug/kg (3.8)
Dibenzofuran	--	370. U ug/kg (370.)	--	--
Fluoranthene	3.9 U ug/kg (3.9)	1800. ug/kg (370.)	3.9 U ug/kg (3.9)	3.8 U ug/kg (3.8)
Fluorene	3.9 U ug/kg (3.9)	370. U ug/kg (370.)	3.9 U ug/kg (3.9)	3.8 U ug/kg (3.8)
Indeno(1,2,3-cd)pyrene	1.9 U ug/kg (1.9)	390. ug/kg (370.)	1.9 U ug/kg (1.9)	1.9 U ug/kg (1.9)

Sample Identifier	CEF-80OW4-SB10	CEF-80OW4-SB2	CEF-80OW4-SB5	CEF-80OW4-SB6
Sample Collect Date	4/1/99	1/20/99	3/31/99	3/31/99
Analyte				
Isophorone	--	370. U ug/kg (370.)	--	--
Naphthalene	19. U ug/kg (19.)	370. U ug/kg (370.)	19. U ug/kg (19.)	19. U ug/kg (19.)
Phenanthrene	39. U ug/kg (39.)	1100. ug/kg (370.)	39. U ug/kg (39.)	38. U ug/kg (38.)
Pyrene	1.9 U ug/kg (1.9)	1300. ug/kg (370.)	2. J ug/kg (1.9)	1.9 U ug/kg (1.9)
Petroleum Hydrocarbons				
Total Petroleum Hydrocarbons (C8-C40)	7.7 U mg/kg (7.7)	510. mg/kg (7.4)	7.7 U mg/kg (7.7)	7.5 U mg/kg (7.5)
Volatiles				
1,1,1-Trichloroethane	--	560. U ug/kg (560.)	--	--
1,1,2,2-Tetrachloroethane	--	560. U ug/kg (560.)	--	--
1,1,2-Trichloroethane	--	560. U ug/kg (560.)	--	--
1,1-Dichloroethane	--	560. U ug/kg (560.)	--	--
1,1-Dichloroethene	--	560. U ug/kg (560.)	--	--
1,2-Dichlorobenzene	--	370. U ug/kg (370.)	--	--
1,2-Dichloroethane	--	560. U ug/kg (560.)	--	--
1,2-Dichloropropane	--	560. U ug/kg (560.)	--	--
1,3-Dichlorobenzene	--	370. U ug/kg (370.)	--	--
1,4-Dichlorobenzene	--	370. U ug/kg (370.)	--	--
2-Butanone	--	11000. U ug/kg (11000.)	--	--
2-Hexanone	--	11000. U ug/kg (11000.)	--	--
4-Methyl-2-pentanone	--	11000. U ug/kg (11000.)	--	--
Acetone	--	28000. U ug/kg (28000.)	--	--
Benzene	--	560. U ug/kg (560.)	--	--
Bromodichloromethane	--	560. U ug/kg (560.)	--	--
Bromoform	--	560. U ug/kg (560.)	--	--
Bromomethane	--	1100. U ug/kg (1100.)	--	--
Carbon disulfide	--	28000. U ug/kg (28000.)	--	--
Carbon tetrachloride	--	560. U ug/kg (560.)	--	--
Chlorobenzene	--	560. U ug/kg (560.)	--	--
Chloroethane	--	1100. U ug/kg (1100.)	--	--
Chloroform	--	560. U ug/kg (560.)	--	--

Sample Identifier	CEF-80OW4-SB10	CEF-80OW4-SB2	CEF-80OW4-SB5	CEF-80OW4-SB6
Sample Collect Date	4/1/99	1/20/99	3/31/99	3/31/99
Analyte				
Chloromethane	--	560. U ug/kg (560.)	--	--
cis 1,2-Dichloroethene	--	560. U ug/kg (560.)	--	--
cis 1,3-Dichloropropene	--	560. U ug/kg (560.)	--	--
Dibromochloromethane	--	560. U ug/kg (560.)	--	--
Ethylbenzene	--	560. U ug/kg (560.)	--	--
Methylene chloride	--	2800. U ug/kg (2800.)	--	--
o-Xylene	--	560. U ug/kg (560.)	--	--
Styrene	--	560. U ug/kg (560.)	--	--
Tetrachloroethene	--	1700. U ug/kg (1700.)	--	--
Toluene	--	560. U ug/kg (560.)	--	--
trans 1,2-Dichloroethene	--	560. U ug/kg (560.)	--	--
trans 1,3-Dichloropropene	--	560. U ug/kg (560.)	--	--
Trichloroethene	--	560. U ug/kg (560.)	--	--
Vinyl chloride	--	560. U ug/kg (560.)	--	--

Sample Identifier	CEF-80OW4-SB8
Sample Collect Date	4/1/99
Analyte	

PAHs

1-Methylnaphthalene	96000. ug/kg (8200.)
2-Methylnaphthalene	73000. ug/kg (8200.)
Acenaphthene	2100. U ug/kg (2100.)
Acenaphthylene	4100. U ug/kg (4100.)
Anthracene	2800. ug/kg (210.)
Benzo(a)anthracene	210. J ug/kg (210.)
Benzo(a)pyrene	210. U ug/kg (210.)
Benzo(b)fluoranthene	410. U ug/kg (410.)
Benzo(g,h,i)perylene	410. U ug/kg (410.)
Benzo(k)fluoranthene	210. U ug/kg (210.)
Chrysene	210. U ug/kg (210.)
Dibenzo(a,h)anthracene	410. U ug/kg (410.)
Fluoranthene	410. U ug/kg (410.)
Fluorene	1500. ug/kg (410.)
Indeno(1,2,3-cd)pyrene	210. U ug/kg (210.)
Naphthalene	16000. ug/kg (2100.)
Phenanthrene	7200. ug/kg (4100.)
Pyrene	210. U ug/kg (210.)

Petroleum Hydrocarbons

Total Petroleum Hydrocarbons (C8-C40)	11000. mg/kg (410.)

Footnotes: Values in parentheses are detection limits

NAS Cecil Field - Groundwater Analytical Results - O/W Separator 80-OW4

Sample Identifier	**CEF-80-13S**
Sample Collect Date	**5/19/99**
Analyte	

Metals

Arsenic	**0.01 U mg/l (0.01)**
Barium	**0.1 U mg/l (0.1)**
Cadmium	**0.001 U mg/l (0.001)**
Chromium	**0.01 U mg/l (0.01)**
Lead	**0.006 I mg/l (0.005)**
Mercury	**0.0002 U mg/l (0.0002)**
Selenium	**0.01 U mg/l (0.01)**
Silver	**0.01 U mg/l (0.01)**

PAHs

2-Chloronaphthalene	**10. U ug/l (10.)**
2-Methylnaphthalene	**10. U ug/l (10.)**
3,3-Dichlorobenzidine	**20. U ug/l (20.)**
Acenaphthene	**10. U ug/l (10.)**
Acenaphthylene	**10. U ug/l (10.)**
Anthracene	**10. U ug/l (10.)**
Benzo(a)anthracene	**10. U ug/l (10.)**
Benzo(a)pyrene	**10. U ug/l (10.)**
Benzo(b)fluoranthene	**10. U ug/l (10.)**
Benzo(g,h,i)perylene	**10. U ug/l (10.)**
Benzo(k)fluoranthene	**10. U ug/l (10.)**
Carbazole	**10. U ug/l (10.)**
Chrysene	**10. U ug/l (10.)**
Dibenzo(a,h)anthracene	**10. U ug/l (10.)**
Dibenzofuran	**10. U ug/l (10.)**
Fluoranthene	**10. U ug/l (10.)**
Fluorene	**10. U ug/l (10.)**
Indeno(1,2,3-cd)pyrene	**10. U ug/l (10.)**

Sample Identifier	CEF-80-13S
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Analyte	
Isophorone	10. U ug/l (10.)
Naphthalene	10. U ug/l (10.)
Phenanthrene	10. U ug/l (10.)
Pyrene	10. U ug/l (10.)
Petroleum Hydrocarbons	
Total Petroleum Hydrocarbons (C8-C40)	0.2 U mg/l (0.2)
Volatiles	
1,1,1-Trichloroethane	1. U ug/l (1.)
1,1,2,2-Tetrachloroethane	1. U ug/l (1.)
1,1,2-Trichloroethane	1. U ug/l (1.)
1,1-Dichloroethane	1. U ug/l (1.)
1,1-Dichloroethene	1. U ug/l (1.)
1,2-Dichlorobenzene	10. U ug/l (10.)
1,2-Dichloroethane	1. U ug/l (1.)
1,2-Dichloropropane	1. U ug/l (1.)
1,3-Dichlorobenzene	10. U ug/l (10.)
1,4-Dichlorobenzene	10. U ug/l (10.)
2-Butanone	20. U ug/l (20.)
2-Hexanone	20. U ug/l (20.)
4-Methyl-2-pentanone	20. U ug/l (20.)
Acetone	50. U ug/l (50.)
Benzene	1. U ug/l (1.)
Bromodichloromethane	1. U ug/l (1.)
Bromoform	1. U ug/l (1.)
Bromomethane	2. U ug/l (2.)
Carbon disulfide	50. U ug/l (50.)
Carbon tetrachloride	1. U ug/l (1.)
Chlorobenzene	1. U ug/l (1.)
Chloroethane	2. U ug/l (2.)
Chloroform	1. U ug/l (1.)

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Analyte	
Chloromethane	1. U ug/l (1.)
cis 1,2-Dichloroethene	1. U ug/l (1.)
Dibromochloromethane	1. U ug/l (1.)
Ethylbenzene	1. U ug/l (1.)
Methylene chloride	5. U ug/l (5.)
o-Xylene	1. U ug/l (1.)
Styrene	1. U ug/l (1.)
Tetrachloroethene	3. U ug/l (3.)
Toluene	1. U ug/l (1.)
trans 1,2-Dichloroethene	1. U ug/l (1.)
Trichloroethene	1. U ug/l (1.)
Vinyl chloride	1. U ug/l (1.)

Footnotes: Values in parentheses are detection limits