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BASE REALIGNMENT AND CLOSURE ENVIRONMENTAL SITE SCREENING FOR STUDY
AREA 8 NTC ORLANDO FL
4/1/1997
ABB ENVIRONMENTAL

124

**BASE REALIGNMENT AND CLOSURE
ENVIRONMENTAL SITE SCREENING REPORT**

**STUDY AREA 8
FORMER WASTEWATER TREATMENT PLANT LAGOONS**

**NAVAL TRAINING CENTER
ORLANDO, FLORIDA**

Unit Identification Code: N65928

Contract No.: N62467-89-D-0317/107

Prepared by:

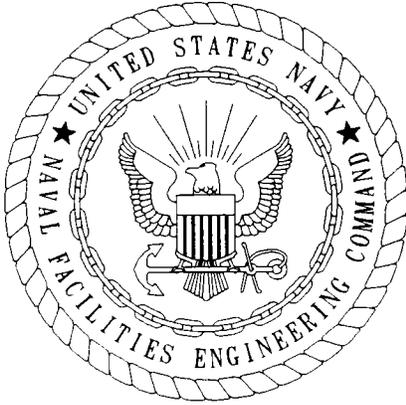
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Prepared for:

**Department of the Navy, Southern Division
Naval Facilities Engineering Command
2155 Eagle Drive
North Charleston, South Carolina 29418**

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April 1997



CERTIFICATION OF TECHNICAL
DATA CONFORMITY (MAY 1987)

The Contractor, ABB Environmental Services, Inc., hereby certifies that, to the best of its knowledge and belief, the technical data delivered herewith under Contract No. N62467-89-D-0317/107 are complete and accurate and comply with all requirements of this contract.

DATE: April 23, 1997

NAME AND TITLE OF CERTIFYING OFFICIAL: John Kaiser
Task Order Manager

NAME AND TITLE OF CERTIFYING OFFICIAL: Richard Allen
Project Technical Lead

(DFAR 252.227-7036)

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Naval Training Center
Orlando, Florida

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GLOSSARY

ABB-ES	ABB Environmental Services, Inc.
FDEP	Florida Department of Environmental Protection
FDEPG	Florida Department of Environmental Protection, Groundwater Guidance Concentrations
MCL	maximum contaminant level
$\mu\text{g}/\ell$	micrograms per liter
pCi/ ℓ	picocuries per liter
RBC	risk-based concentration
SA	site assessment
SVOC	semivolatile organic compound
TAL	target analyte list
UNF	unnumbered facility
USEPA	U.S. Environmental Protection Agency
VOC	volatile organic compound
WWTP	wastewater treatment plant

1.0 STUDY AREA 8, UNNUMBERED FACILITY (UNF)-15
(FORMER WASTEWATER TREATMENT PLANT LAGOONS)

1.1 STUDY AREA 8, BACKGROUND AND CONDITIONS. Study Area (SA) 8 originally consisted of the Greenskeeper Storage Area (Building 2134 and associated facilities) and former Wastewater Treatment Plant (WWTP) Lagoons (unnumbered facility [UNF-15]) (Figures 1-1 and 1-2). Site screening analytical results for the Greenskeeper Storage Area revealed exceedances for Federal and State guidance concentrations in soil and groundwater for arsenic. This facility, along with Study Area 9, the former Pesticide and Herbicide Storage Building, has been designated Operable Unit 3. The remaining portion of SA 8, the former WWTP lagoons, is the subject of this report.

Evaporation and percolation lagoons associated with a former WWTP were reportedly filled with approximately 18,000 cubic yards of WWTP-derived sludge, yard wastes, and miscellaneous debris. The filled areas have since been landscaped during the construction of the golf course.

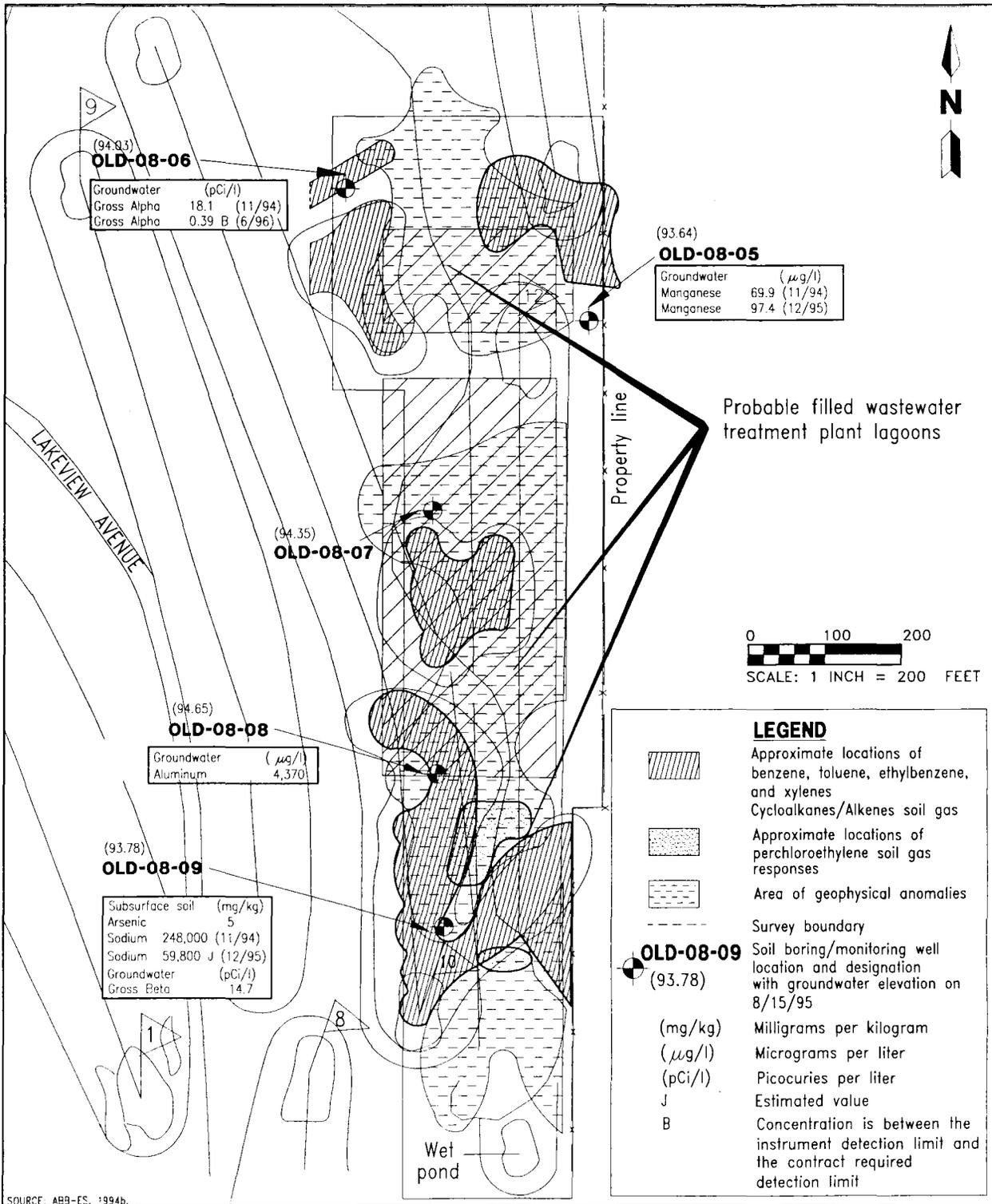
1.2 STUDY AREA 8, INVESTIGATION SUMMARY. A site screening program was performed to confirm the presence and location of former WWTP lagoons at SA 8 and to evaluate the potential for soil or groundwater contamination associated with the landfilled lagoons (Figure 1-1). An evaluation of aerial photographs revealed one lagoon to the north and one lagoon to the south of the former WWTP. Two additional small ponds were observed in the vicinity of the lagoons. However, it was not determined if they were associated with the WWTP operations. The target area selected for site screening activities encompassed the lagoons and ponds identified, extending 1,600 feet from north to south and 320 feet from east to west (Figure 1-2).

The site screening investigations are described below.

1.2.1 Geophysical Survey A geophysical survey was conducted to delineate the perimeter of the landfilled lagoons and ponds. Vertical magnetic gradient and terrain conductivity surveys were conducted with measurements taken on 20-foot centers. A confirmatory ground penetrating radar survey was also conducted.

1.2.2 Passive Soil Gas Survey A passive soil gas survey was completed to identify areas of elevated volatile organic compounds (VOCs) and semivolatile organic compounds (SVOCs) in the subsurface soil and groundwater.

Soil gas data are always semiquantitative, as multiple sources in soil and/or groundwater cannot be differentiated. Further, compound concentrations in each collector are compared on a relative basis, depending on whether or not the data are interpreted to be of high, moderate to high, moderate, etc., intensity. These qualitative soil gas values do not represent actual concentrations of the reported compounds. Efforts to relate soil gas response directly to groundwater or soil contaminant concentrations are generally not regarded as productive owing to the assumptions that are required for heterogeneity and source distribution. One hundred fifty soil gas collectors were installed on 50-foot centers, encompassing most of the original target area.



SOURCE: ABR-FS-1994b

FIGURE 1-2
SOIL BORING AND MONITORING WELL LOCATIONS,
PASSIVE SOIL GAS RESULTS, AND FORMER
WASTEWATER TREATMENT PLANT LAGOONS,
STUDY AREA 8



BASE REALIGNMENT AND
CLOSURE ENVIRONMENTAL SITE
SCREENING REPORT
NAVAL TRAINING CENTER
ORLANDO, FLORIDA

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1.2.3 Soil Boring Investigation and Monitoring Well Installation and Sampling

A subsurface sampling and analysis program was initiated to evaluate the potential presence of contaminants in the soil or groundwater. Established health and safety guidelines precluded situating soil borings or monitoring wells within the inferred perimeter of landfilled areas; therefore, three locations surrounding the northernmost landfilled area were selected for monitoring well installation (OLD-08-05, -06, and -07; Figure 1-2). A southwesterly hydraulic gradient was inferred from groundwater-level measurements taken from these wells, although the gradient is small and may be unpredictable on a seasonal basis. Two additional monitoring wells were subsequently installed along the west perimeter of the central and southern landfilled areas (OLD-08-08 and OLD-08-09). Appendix A presents the boring logs and monitoring well installation diagrams for these wells.

Five subsurface soil and five groundwater samples (one from each well location) were collected and submitted for full suite Contract Laboratory Program target compound list and target analyte list (TAL), and herbicide laboratory analyses. Sampling occurred in October and November 1994. Subsurface soil samples 08B005 through 08B009 correspond to monitoring well locations OLD-08-05 through OLD-08-09, respectively. Gross alpha, gross beta, and gamma radiation scans were performed for groundwater. All laboratory work was performed in accordance with U.S. Environmental Protection Agency (USEPA) Level IV data quality objectives.

Due to Florida Department of Environmental Protection (FDEP) concerns regarding manganese and sodium exceedances of Florida groundwater standards in monitoring wells OLD-08-05 and OLD-08-09, and a gross alpha exceedance in monitoring well OLD-08-06, wells OLD-08-05 and -09 were resampled for TAL metals, and OLD-08-06 was resampled for gross alpha. Groundwater samples were collected using a low-flow sampling procedure and were not filtered. The resampling occurred in December 1995 (TAL metals) and June 1996 (gross alpha).

1.3 STUDY AREA 8, RESULTS. The results of site screening investigations at Study Area 8 are discussed below. Appendix A presents the boring logs and monitoring well installation diagrams for monitoring wells installed during the investigation. Appendices B and C present the results of the geophysical and passive soil gas surveys. A summary of positive detections in soil and groundwater analytical results is presented in Appendix D as Tables D-1 and D-2. A complete set of soil and groundwater analytical results is presented in Appendix E.

1.3.1 Geophysical Survey The geophysical data have identified the likely extent of three landfilled lagoons and ponds. The northernmost pond identified in historical aerial photographs is coincident with a water hazard on the existing golf course.

1.3.2 Passive Soil Gas Survey Relative response value plots generated from soil gas analytical data, particularly for the cycloalkane and cycloalkene fractions, had a strong correlation with detected geophysical anomalies (Figure 2, Appendix B).

1.3.3 Subsurface Soil Arsenic, barium, calcium, copper, magnesium, manganese, silver, and zinc were detected above background screening concentrations in various subsurface soil samples at the former WWTP lagoons. Arsenic in boring

08B009 (detected at 5 milligrams per kilogram) exceeded both the residential and industrial risk-based concentrations (RBCs) for arsenic as a carcinogen. All other inorganics were detected at concentrations below the corresponding residential RBCs.

4,4'-DDD and -DDT were detected in soil from boring 08B009 (4 to 6 feet below land surface), and di-n-butylphthalate was detected in all subsurface soil samples collected from the WWTP lagoons. However, all organic concentrations detected in subsurface soil were less than the corresponding residential RBCs. Leachability-based soil cleanup goal values do not apply, as no organic compounds were present in groundwater above FDEP groundwater guidance concentrations (FDEPG).

1.3.4 Groundwater Aluminum, arsenic, barium, calcium, magnesium, manganese, potassium, sodium, and zinc were detected above background in various of the five monitoring wells installed at the WWTP lagoons. With the exception of aluminum, manganese, and sodium, all analytes were below FDEP groundwater guidance concentrations.

Aluminum was detected in well OLD-08-01 at a concentration of 4,370 micrograms per liter ($\mu\text{g}/\ell$), which was slightly higher than the background screening value of 4,067 $\mu\text{g}/\ell$. Manganese was detected in well OLD-08-05 at 69.9 $\mu\text{g}/\ell$, which exceeded the Florida secondary drinking water standard (odor, taste) of 50 $\mu\text{g}/\ell$. For the purpose of comparison, the tap water RBC for manganese is 840 $\mu\text{g}/\ell$ (noncarcinogenic effects). The manganese concentration measured in the resampling event (08G00502) was 97.4 $\mu\text{g}/\ell$.

Secondary standards have been established for Class G-I and G-II aquifers by the State of Florida, largely along Federal guidelines, to ensure that groundwater meets at least minimum criteria for taste, odor, and color, and does not pose a health risk.

Based on records reviews and interviews, site activities that may have contributed to the observed exceedances of secondary standards for aluminum in well OLD-08-08 and manganese in well OLD-08-05 include the former use of the site as a WWTP with at least two wastewater treatment lagoons. However, surface and subsurface soil concentrations of these analytes did not exceed screening concentrations (residential RBCs or soil cleanup goals).

The groundwater samples were moderately to very turbid (33 to 194 nephelometric turbidity units), suggesting that suspended solids may have contributed to the observed secondary standard exceedances. The aluminum exceedance in well OLD-08-08 (4,370 $\mu\text{g}/\ell$) was only slightly higher than the background screening value of 4,067 $\mu\text{g}/\ell$. The manganese exceedance in well OLD-08-05 (69.9 $\mu\text{g}/\ell$) exceeded the Florida secondary standard of 50 $\mu\text{g}/\ell$. As a consequence, the well was resampled on December 29, 1995, resulting in a manganese concentration of 97.4 $\mu\text{g}/\ell$.

Analytes exceeding Florida secondary standards should also be compared with RBCs for tapwater published by the USEPA, Region III. The tapwater guidance concentrations for these analytes are 37,000 and 840 $\mu\text{g}/\ell$, respectively.

Other groundwater parameters measured during sampling were within normal limits; pH varied from 5.8 to 6.78, temperature from 70.7 to 78.8 degrees Fahrenheit ($^{\circ}\text{F}$), and conductivity from 200 to 248 micromhos per centimeter. ABB Environmen-

tal Services, Inc., (ABB-ES) concludes that the aluminum and manganese exceeding secondary standards are most likely naturally occurring and do not pose a risk to human health or the environment.

Sodium was detected in well OLD-08-09 (248,000 $\mu\text{g}/\ell$) above the FDEPG primary standard of 160,000 $\mu\text{g}/\ell$. The sodium concentration measured in the resampling event (08G00902) was 59,800 $\mu\text{g}/\ell$.

Bis(2-ethylhexyl)phthalate was detected in well OLD-08-05, but at a concentration below the FDEPG primary standard and the tap water RBC.

Gross beta radiation was detected in monitoring well OLD-08-09 at 14.7 picocuries per liter (pCi/ ℓ), slightly exceeding the background screening value for gross beta (9.5 pCi/ ℓ). The measured gross beta radiological activity is significantly lower than the 50 pCi/ ℓ Federal and State guidance level. Gross beta activity in groundwater exceeding 50 pCi/ ℓ may prompt dose calculations so that comparison to the 4 millirem per year Federal and State maximum contaminant level (MCL) can be made. Dose calculations (whole body or organ) require that specific nuclides be established.

Gross alpha radiation was detected in groundwater from monitoring well OLD-08-06 (sample 08G00601) at 18.1 pCi/ ℓ , exceeding the FDEPG primary standard and Federal MCL of 15 pCi/ ℓ and the background screening value of 13 pCi/ ℓ . The gross alpha concentration measured in the resampling event (08G00602) was 0.39 pCi/ ℓ .

1.4 STUDY AREA 8, CONCLUSIONS AND RECOMMENDATIONS. During the site screening investigation at the WWTP lagoons, a contractor was observed trenching along the east fence line for the purpose of installing fiber-optic cable. Excavated materials included pieces of concrete, rebar, miscellaneous building debris, and at least one crushed and rusted 55-gallon drum. A passive soil gas survey also detected VOCs, particularly cycloalkane and cycloalkene fractions, which correlated with mapped subsurface geophysical anomalies. Monitoring wells were placed outside these zones to determine if groundwater quality had been impacted.

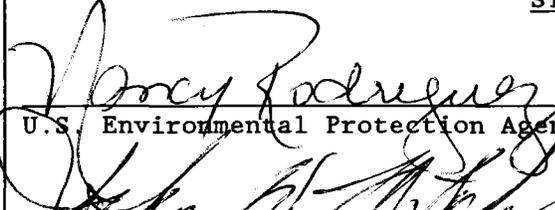
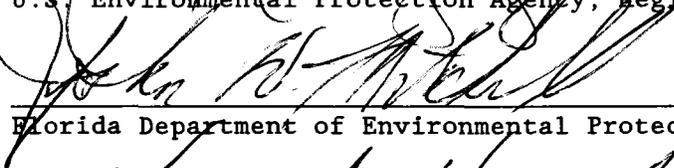
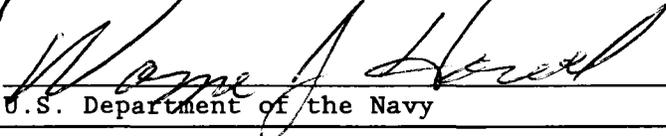
Because of the buried debris, it was not always possible to locate borings and monitoring wells directly on elevated soil gas response locations. However, other than the single phthalate detection, no organic compounds were detected in any of the five monitoring wells installed at the lagoons. The soil gas program likely detected traces of compounds present in concentrations too low to impact the site. Inorganic exceedances in groundwater samples from the WWTP lagoon area are randomly distributed, and there are no apparent sources for these constituents.

After resampling wells where Florida groundwater standards had been exceeded for manganese, sodium, and gross alpha, only manganese continues to be detected in one well above the Florida secondary drinking water standard. This appears to be an isolated occurrence and is not indicative of groundwater contamination at Study Area 8. However, future users of this property should be aware that the presence of manganese at the measured concentrations may render the groundwater from the surficial aquifer objectionable as a potable or irrigation water source.

Based upon the information available and the results of the site screening and analysis, ABB-ES recommends a Finding of Suitability to Transfer for Study Area

8, UNF-15. Because of the presence of disposed materials including demolition debris, the site should be reclassified from 7/Gray to 3/Light Green. Due to the presence of landfilled materials, future property owners should be given notice regarding past excavation and/or disposal activities.

The undersigned members of the Orlando Partnering Team concur with the findings of the preceding investigation.

<u>STUDY AREA 8</u>	
 _____ U.S. Environmental Protection Agency, Region IV	<u>5/22/97</u> _____ Date
 _____ Florida Department of Environmental Protection	<u>5/22/97</u> _____ Date
 _____ U.S. Department of the Navy	<u>5/22/97</u> _____ Date

APPENDIX A

BORING LOGS AND MONITORING WELL INSTALLATION DIAGRAMS

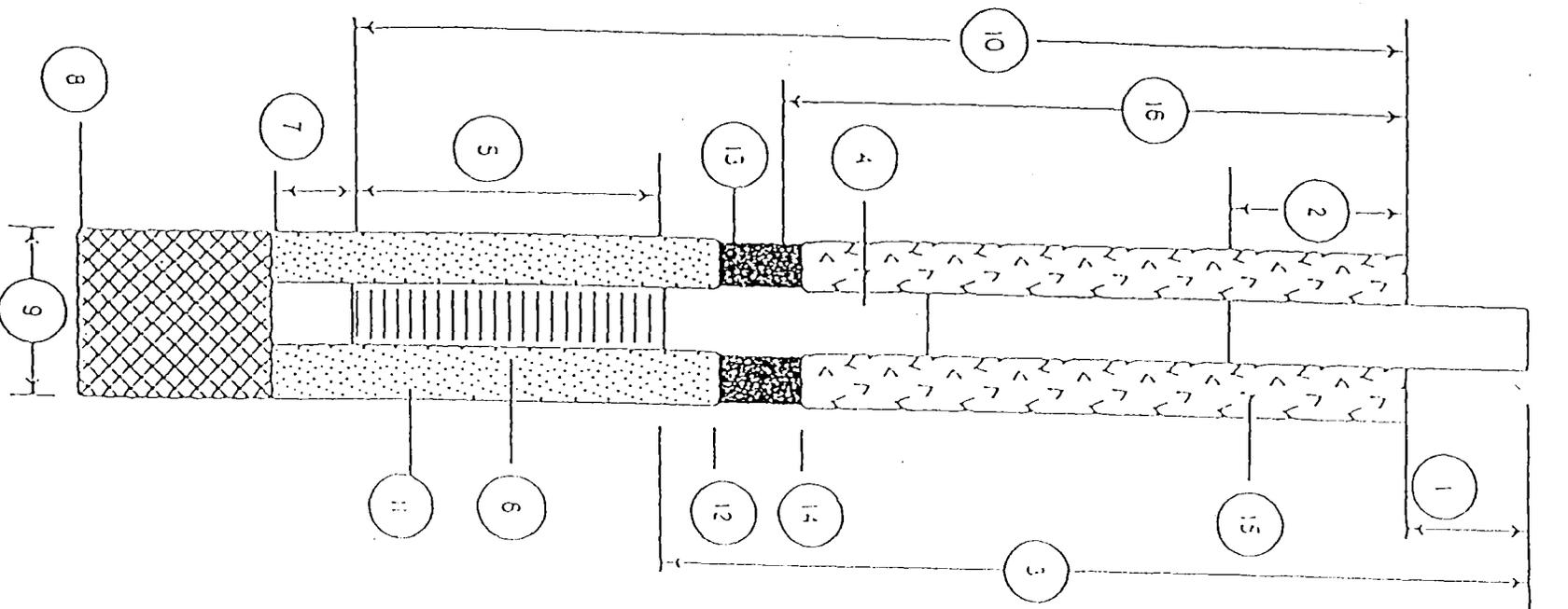
Project: BRAC NTC, Orlando, Group I, Site Screening		Well ID: OLD-08-05	Boring ID: OLD-08-05
Client: SOUTHNAVFACENGCOM	Contractor: Groundwater Protection, Inc.		Job No.: CTO-107
Northing/Easting: 1542578.87,554858.31		Date started: 10/18/94	Compltd: 10/18/94
Method: 8.25" Hollow stem auger	Casing dia.: 2 in.	Screened Int.: 3-13 ft. bls	Protection level: D
TOC elev.: 97.88 Ft.	Type of OVM: Porta FID	Total dpth: 13.5Ft.	Dpth to ∇: 8.0* Ft.
ABB Rep.: S. Grietens	Well development date: 11/07/94, 11/08/94		Site: Study Area 08

Depth Ft.	Laboratory Sample ID.	Sample Recovery	Headspace (ppm)	Soil/Rock Description and comments	Lithologic symbol	Soil class.	Blows/6-in.	Well diag.
0			0	QUARTZ SAND: Gray, fine/medium grained, good sorting, good to moderate rounding, with trace organics.		SP	posthole	
0			0			posthole		
0			0			2,2,5,10		
5	08B00501	80%	0			7,7,17,17		
0			0			8,8,7,7		
10			0	QUARTZ SAND: Black, silty, medium/fine grained, same as .5 to 10 feet.		2,4,9,17		
0			0	QUARTZ SAND: Brown/darkbrown, same as .5 to 10 feet.		8,11,12,12		
15								

WELL CONSTRUCTION DETAIL

WELL NUMBER: OLD-08-05

DATE OF INSTALLATION: 10/18/94



1. Height of Casing above ground: 0

2. Depth to first Coupling: 3'

Coupling Interval Depth: 10'

3. Total Length of Riser Pipe: 3'

4. Type of Riser Pipe: 2" ϕ Schedule 40 PVC

5. Length of Screen: 10'

6. Type of Screen: 2" ϕ Schedule 40 PVC .010 Slot Screen

7. Length of Sump: 4"

8. Total Depth of Boring: 13.5'

9. Diameter of Boring: 6.25"

10. Depth to Bottom of Screen: 13'

11. Type of Screen Filter: 20/30 Silica Sand

Quantity Used: 300 lb Size: ---

12. Depth to Top of Filter: 2'

13. Type of Seal: Bentonite

Quantity Used: 20 lb

14. Depth to Top of Seal: 1.5'

15. Type of Grout: Portland Cement

Grout Mixture:

Method of Placement: PLUMB

16. Tot. Depth of 6 in. Steel Casing: N/A

Project: BRAC NTC, Orlando, Group I, Site Screening		Well ID: OLD-08-08	Boring ID: OLD-08-08
Client: SOUTHNAVFACENGCOM	Contractor: Groundwater Protection, Inc.		Job No.: CTO-107
Northing/Easting: 1542751.88,554843.82		Date started: 10/18/94	Complt'd: 10/18/94
Method: 8.25" Hollow stem auger	Casing dia.: 2 in.	Screened Int.: 3-13 ft. bis	Protection level: D
TOC elev.: 97.93 Ft.	Type of OVM: Porta FID	Total dpth: 14.0Ft.	Dpth to ∇: 4.0/u Ft.
ABB Rep.: S. Grietens	Well development date: 11/08/94		Site: Study Area 08

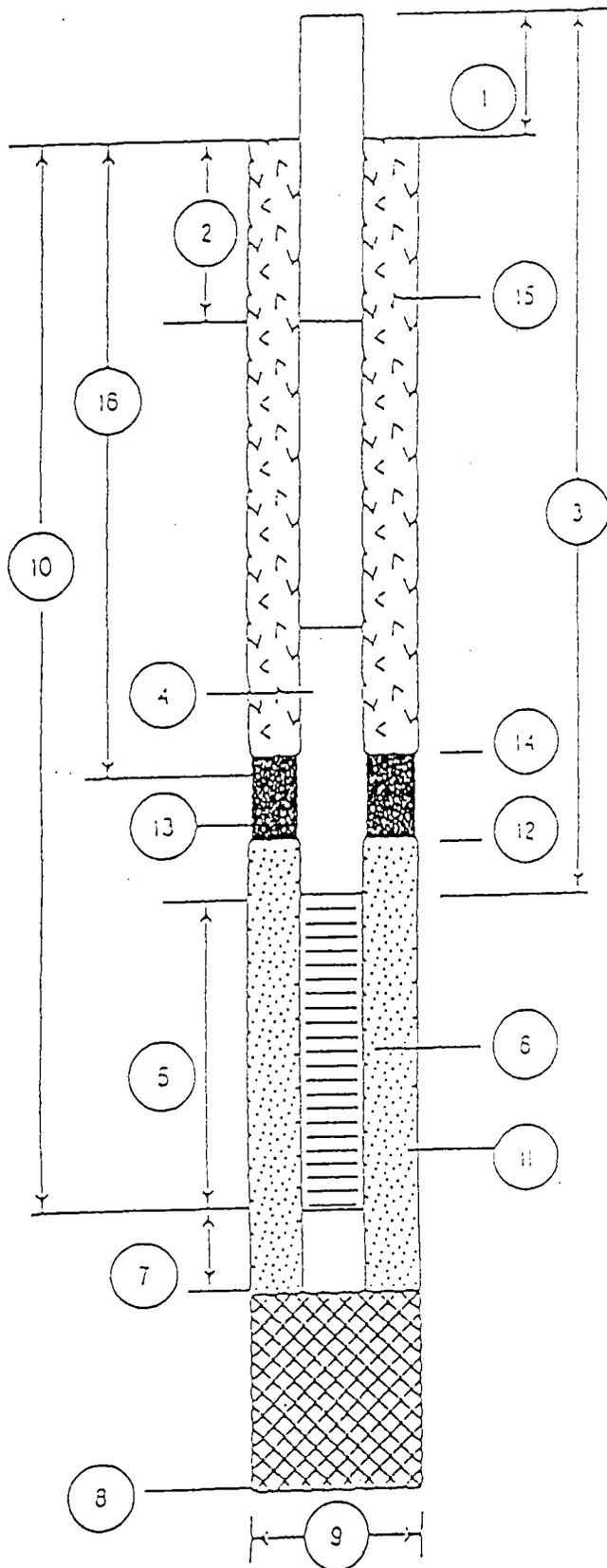
Depth Ft.	Laboratory Sample ID.	Sample Recovery	Headspace (ppm)	Soil/Rock Description and comments	Lithologic symbol	Soil class.	Blows/6-in.	Well diag.
0			0	QUARTZ SAND: Pea gravel, lime rock, (road base fill).		SP	posthole	
0			0	QUARTZ SAND: Gray, fine/medium grained, good sorting, moderate/good rounding.			posthole	
0	08B00801		0				2,3,8,7	
5		75%	0	QUARTZ SAND: Brown/brownish red, trace silts, same as 2 to 5 feet.			4,8,10,10	
			0				2,2,2,2	
		65%	0				2,4,5,7	
10			0				3,5,7,8	
		90%	0					
			0					
		85%	0					
15								

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 NAVAL FACILITIES ENGINEERING COMMAND
 CHARLESTON, SC.

WELL CONSTRUCTION DETAIL

WELL NUMBER: 0LO-08-06

DATE OF INSTALLATION: 10/18/94



1. Height of Casing above ground: 0
2. Depth to first Coupling: 3'
Coupling Interval Depths: 10'
3. Total Length of Riser Pipe: 3'
4. Type of Riser Pipe: 2" ϕ Schedule 40 PVC
5. Length of Screen: 10'
6. Type of Screens: 2" ϕ schedule 40 PVC .010 Slot Screen
7. Length of Sump: 6"
8. Total Depth of Boring: 14'
9. Diameter of Boring: 6.25"
10. Depth to Bottom of Screen: 13'
11. Type of Screen Filter: 20/30 Silica Sand
Quantity Used: 400 lb Size:
12. Depth to Top of Filter: 2'
13. Type of Seal: Bentonite
Quantity Used: 25 lb
14. Depth to Top of Seal: 1.5'
15. Type of Grout: Portland Cement
Grout Mixture:
Method of Placement: Poured
16. Tot. Depth of 8 in. Steel Casing: N/A

Project: BRAC NTC, Orlando, Group I, Site Screening		Well ID: OLD-08-07	Boring ID: OLD-08-07
Client: SOUTHNAVFACENGCOM		Contractor: Groundwater Protection, Inc.	Job No.: CT0-107
Northing/Easting: 1542318.86,554745.14		Date started: 10/18/94	Compltd: 10/19/94
Method: 8.25" Hollow stem auger	Casing dia.: 2 in.	Screened Int.: 3-13 ft. bls	Protection level: D
TOC elev.: 97.38 Ft.	Type of OVM: Porta FID	Total dpth: 14.0Ft.	Dpth to ♀: 5.0* Ft.
ABB Rep.: S. Grietens	Well development date: 11/07/94		Site: Study Area 08

Depth Ft.	Laboratory Sample ID.	Sample Recovery	Headspace (ppm)	Soil/Rock Description and comments	Lithologic symbol	Soil class.	Blows/6-in.	Well diag.
0			0	QUARTZ SAND: Black, silts, with some lime rock (fill).		SP	posthole	
0			0	QUARTZ SAND: Gray, fine/medium grained, trace silts, good sorting, good to moderate rounding.			posthole	
0			0	QUARTZ SAND: Light gray/white, same as 2 to 3 feet.				
0	08B00701		0				4,5,9,10	
5		75%	0	QUARTZ SAND: Dark brown/black, same as 2 to 3 feet, with trace organics.			4,8,9,12	
0			0				3,4,3,5	
0		90%	0				2,4,7,8	
10		85%	0				11,7,10,12	
0			0					
0		95%	0					
15								

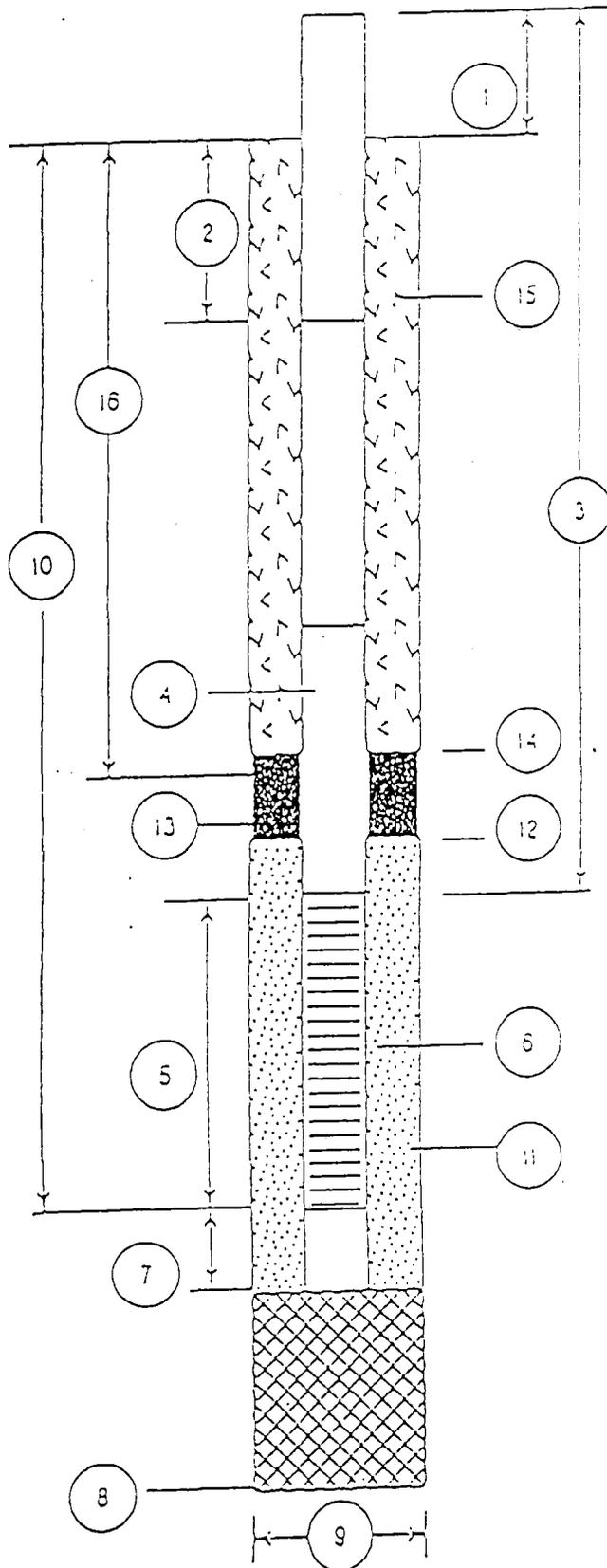
DEPARTMENT OF THE NAVY

SOUTHERN DIVISION
 NAVAL FACILITIES ENGINEERING COMMAND
 CHARLESTON, SC.

WELL CONSTRUCTION DETAIL

WELL NUMBER: OLD-08-07

DATE OF INSTALLATION: 10/19/94



1. Height of Casing above ground: 0
2. Depth to first Coupling: 3'
Coupling Interval Depths: 10'
3. Total Length of Riser Pipe: 3'
4. Type of Riser Pipe: 2" ϕ Schedule 40 PVC
5. Length of Screen: 10'
6. Type of Screen: 2" ϕ schedule 40 pvc .010 slot screen
7. Length of Sump: 6"
8. Total Depth of Boring: 14'
9. Diameter of Boring: 6.25"
10. Depth to Bottom of Screen: 13'
11. Type of Screen Filter: 20/30 Silica Sand
Quantity Used: 500 lb Size:
12. Depth to Top of Filter: 2'
13. Type of Seal: Bentonite
Quantity Used: 25 lb
14. Depth to Top of Seal: 1.5'
15. Type of Grout: Portland Cement
Grout Mixture:
Method of Placement: POURED
16. Tot. Depth of 6 in. Steel Casing: N/A

Project: BRAC NTC, Orlando, Group I, Site Screening		Well ID: OLD-08-08	Boring ID: OLD-08-08
Client: SOUTHNAVFACENGCOM		Contractor: Groundwater Protection, Inc.	Job No.: CTO-107
Northing/Easting: 1541882.48,554781.10		Date started: 10/19/94	Compltd: 10/19/94
Method: 6.25" Hollow stem auger	Casing dia.: 2 in.	Screened Int.: 3-13 ft. bls	Protection level: D
TOC elev.: 97.47 ft. Ft.	Type of OVM.: Porta FID	Total dpth: 14.0Ft.	Dpth to ∇: 5.0* Ft.
ABB Rep.: S. Grietens	Well development date: 11/08/94		Site: Study Area 08

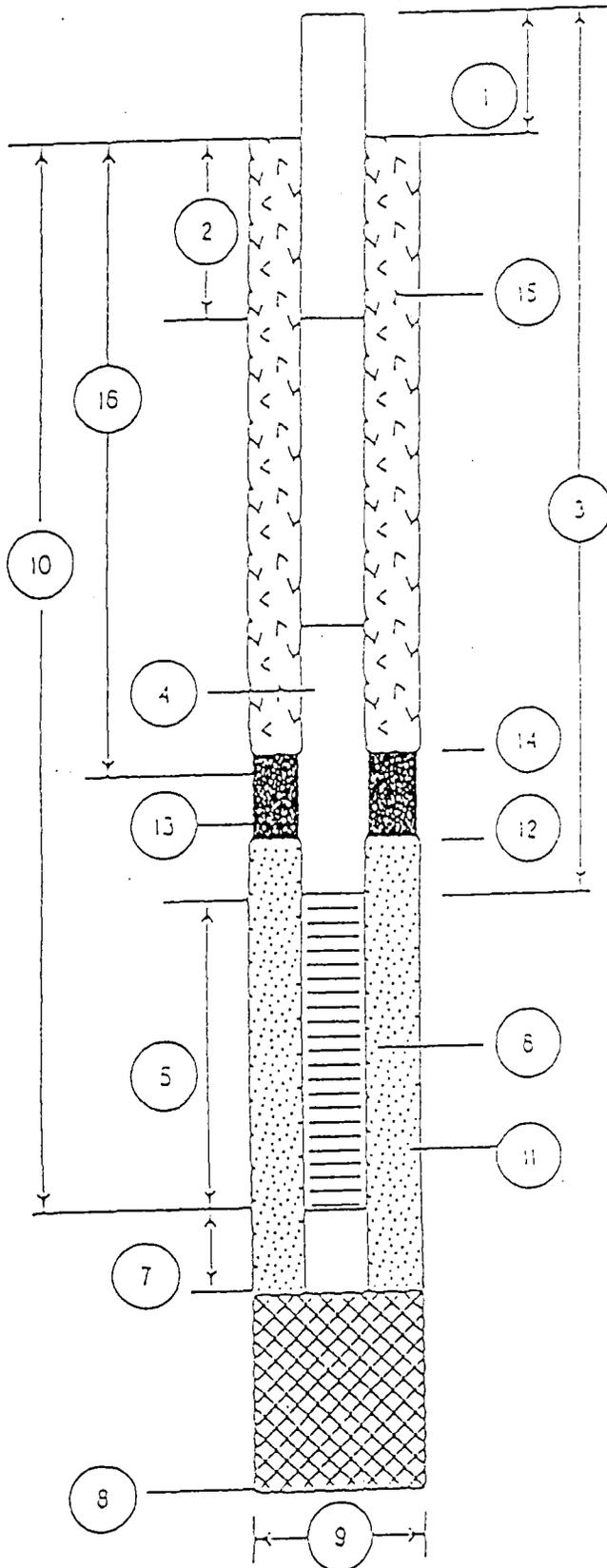
Depth Ft.	Laboratory Sample ID.	Sample Recovery	Headspace (ppm)	Soil/Rock Description and comments	Lithologic symbol	Soil class.	Blows/6-in.	Well diag.
0			0	QUARTZ SAND: Black, silty.		SP	posthole	
0			0	QUARTZ SAND: Gray, fine/medium grained, trace slts, good sorting, good to moderate rounding.			posthole	
0	08B00801	90%	0	QUARTZ SAND: Light gray/white, same as 2 to 3 feet.			3,8,9,10	
5		90%	0	QUARTZ SAND: Dark brown/black, same as 2 to 3 feet with trace organics.			3,5,8,9	
0		85%	0				8,7,8,8	
10		90%	0				5,9,8,9	
0		95%	0				8,9,14,14	
15								

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 NAVAL FACILITIES ENGINEERING COMMAND
 CHARLESTON, SC.

WELL CONSTRUCTION DETAIL

WELL NUMBER: 010-08-08

DATE OF INSTALLATION: 10/19/94



1. Height of Casing above ground: 0
2. Depth to first Coupling: 3'
Coupling Interval Depths: 10'
3. Total Length of Riser Pipe: 3'
4. Type of Riser Pipe: 2" ϕ Schedule 40 PVC
5. Length of Screen: 10'
6. Type of Screen: 2" ϕ schedule 40 PVC .010 Slot Screen
7. Length of Sump: 6"
8. Total Depth of Boring: 14'
9. Diameter of Boring: 6.25"
10. Depth to Bottom of Screen: 13'
11. Type of Screen Filter: 20/30 Silica Sand
Quantity Used: 400 lb Size:
12. Depth to Top of Filter: 2'
13. Type of Seal: Bentonite
Quantity Used: 25 lb
14. Depth to Top of Seal: 1.5'
15. Type of Grout: Portland Cement
Grout Mixture:
Method of Placement: POURED
16. Tot. Depth of 6 in. Steel Casing: N/A

Project: BRAC NTC, Orlando, Group I, Site Screening		Well ID: OLD-08-09	Boring ID: OLD-08-09
Client: SOUTHNAVFACENCOM	Contractor: Groundwater Protection, Inc.		Job No.: CTO-107
Northing/Easting: 1541759.79,554788.03		Date started: 10/19/94	Compltd: 10/19/94
Method: 8.25" Hollow stem auger	Casing dia.: 2 in.	Screened Int.: 3-13 ft. bls	Protection level: D
TOC elev.: 97.45 Ft.	Type of OVM: Porta FID	Total dpth: 14.0Ft.	Dpth to ∇ 5.0* Ft.
ABB Rep.: S. Grietens	Well development date: 11/08/94		Site: Study Area 08

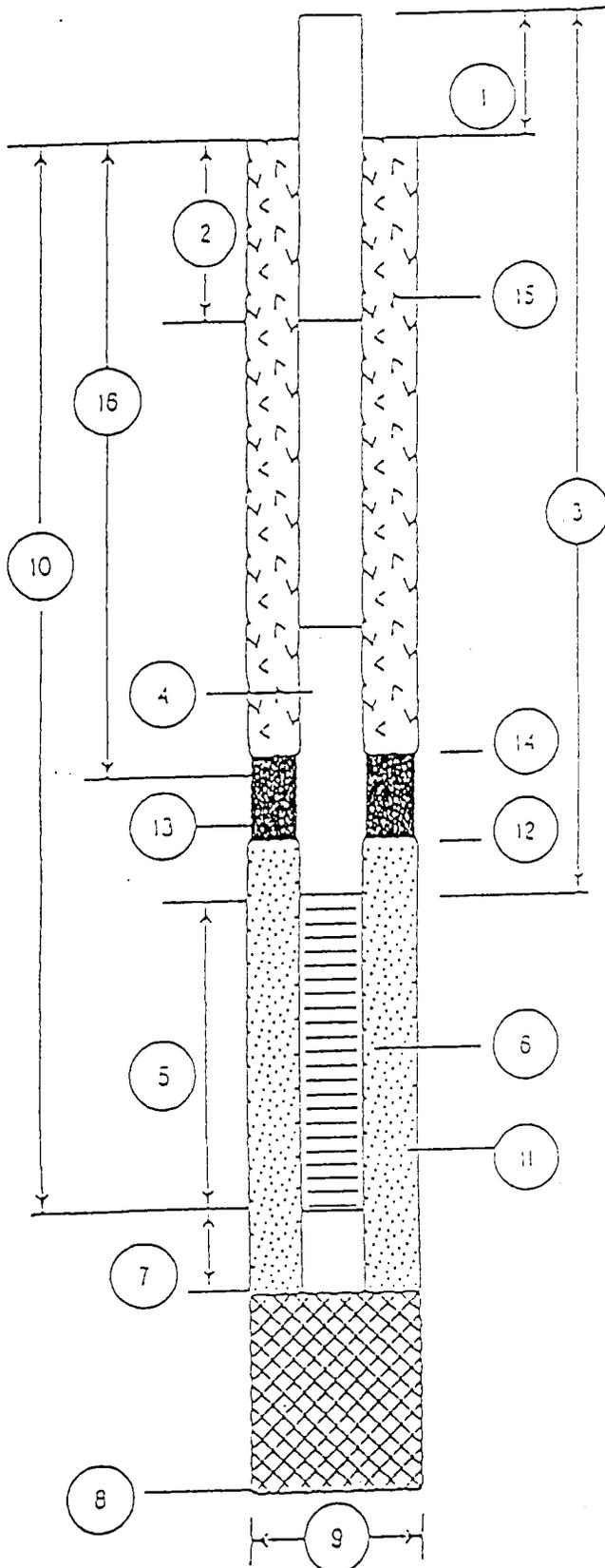
Depth Ft.	Laboratory Sample ID.	Sample Recovery	Headspace (ppm)	Soil/Rock Description and comments	Lithologic symbol	Soil class.	Blows/6-in.	Well diag.
0				QUARTZ SAND: Black, silty.		SP	pasthole	
0				QUARTZ SAND: Gray, fine/medium grained, trace silts, good sorting, good to moderate rounding.			pasthole	
0				QUARTZ SAND: Light gray/white, same as 2 to 3 feet.				
5	08B00901	90%	0				1,1,3	
7		70%	0	QUARTZ SAND: Dark brown/black, same as 2 to 3 feet with trace organics.			3,5,5,3	
10		100%	25				1,2,2,2	
12		80%	25				0/24"WOTs	
14		95%	0				1,1,1	

DEPARTMENT OF THE NAVY
 SOUTHERN DIVISION
 NAVAL FACILITIES ENGINEERING COMMAND
 CHARLESTON, SC.

WELL CONSTRUCTION DETAIL

WELL NUMBER: OLD-08-09

DATE OF INSTALLATION: 10/19/94



1. Height of Casing above ground: 0
2. Depth to first Coupling: 3'
Coupling Interval Depths: 10'
3. Total Length of Riser Pipe: 3'
4. Type of Riser Pipe: 2" ϕ Schedule 40 PVC
5. Length of Screen: 10'
6. Type of Screen: 2" ϕ schedule 40 pvc .010 slot screen
7. Length of Sump: 6"
8. Total Depth of Boring: 14'
9. Diameter of Boring: 6.25"
10. Depth to Bottom of Screen: 13'
11. Type of Screen Filter: 20/30 Silica Sand
Quantity Used: 400 lb Size: _____
12. Depth to Top of Filter: 2'
13. Type of Seal: Bentonite
Quantity Used: 25 lb
14. Depth to Top of Seal: 1.5'
15. Type of Grout: Portland Cement
Grout Mixture:
Method of Placement: RAILED
16. Tot. Depth of 6 in. Steel Casing: N/A

APPENDIX B
GEOPHYSICAL SURVEYS

TECHNICAL MEMORANDUM
GEOPHYSICAL SURVEYS
STUDY AREA 8 - FORMER WASTEWATER TREATMENT PLANT LAGOONS

NAVAL TRAINING CENTER
ORLANDO, FLORIDA

INTRODUCTION. The following is a summary of the significant findings of the geophysical surveys that took place at Study Area (SA) 8, Naval Training Center (NTC), Orlando (Figure 1). Field activities took place in SA 8 between July 28 and August 23, 1994. The geophysical surveys were conducted to determine the location of the former WWTP lagoons and evaluate potential subsurface debris disposal that may have taken place in them. The techniques used were magnetometry and terrain conductivity (TC) and ground penetrating radar (GPR).

GEOPHYSICAL TECHNIQUES. The magnetic method is a versatile geophysical technique used for evaluating shallow geologic structures and for locating buried manmade objects and buried debris by mapping local distortions in the earth's magnetic field produced by buried magnetic objects (steel and other magnetic materials). Vertical gradient measurements of the earth's magnetic field are often taken during environmental magnetic surveys, as they are more sensitive to the presence of near-surface metal objects than total field values alone. An EDA Instruments OmniPlus magnetometer with gradiometer capability was used during this survey.

TC surveys, also referred to as EMI (electromagnetic induction) surveys, have traditionally been used in mineral exploration for tracing conductive ore bodies (i.e., massive sulfides). More recently, conductivity surveys have been used in environmental studies for mapping buried debris and former structures, and for tracing conductive contaminant plumes in groundwater. TC instruments record two parameters: the quadrature phase and the in-phase components of an induced magnetic field. The quadrature-phase component is a measure of the ground conductivity value expressed in millimhos per meter. The in-phase component is significantly more sensitive to metallic objects and is useful for looking for buried tanks and drums and other manmade objects. The TC instrument used during this work was a Geonics EM-31DL with digital data logger.

The GPR technique uses high frequency radio waves to determine the presence of subsurface objects and structures. The radio wave energy is reflected from surfaces where there is a contrast in the electrical properties of subsurface materials, such as naturally occurring geologic horizons or manmade objects (e.g., buried utilities, tanks, drums). Typical applications for GPR include mapping buried utilities and delineating the boundaries of buried materials and abandoned landfills. The GPR system used during this investigation was a GSSI SIR System 3 with 500 MHz antenna.

A discussion of the results of this investigation follows.

RESULTS - STUDY AREA 8, FORMER WASTEWATER TREATMENT PLANT. A geophysical survey was completed in an area 340 feet wide (east to west) by 1,600 feet long (north to south). A geophysical survey grid was established with an arbitrary origin and oriented approximately true north and parallel to the Main Base east property line. Magnetometer and TC measurements were taken on 20-foot centers within the survey area, an area of approximately 11 acres. Figure 2 presents a map generated in the field showing the location of all magnetometer, TC, and GPR

traverses. More than 1,300 data points were acquired on a 20-foot by 20-foot measurement grid during the magnetometer/TC survey; 13,700 feet of GPR profiling was completed.

The results are presented as Figures 3 through 6. Figure 3 presents the vertical magnetic gradient contours, and Figures 4 and 5 present the quadrature (conductivity) and in-phase (equivalent to a metal detector) contours of the magnetic field induced by the transmitter of the TC instrument. Superimposed over the magnetic intensity on Figure 6 is the outline of the strongest geophysical anomalies.

ABB Environmental Services, Inc., concludes that the zones outlined on Figure 6 probably represent the former lagoons into which waste materials, probably demolition debris, have been disposed. During the field activities, a fiber-optic cable was being installed along the fence line at the eastern boundary of the survey area. The field party observed debris excavated by a backhoe, which included crushed drum fragments, cement blocks, Marston matting, steel cable, iron pipe, and tree stumps.

**FIGURES 1 THROUGH 6
AREA OF SURVEY, SURVEY TRAVERSE LOCATIONS, VERTICAL GRADIENT
CONTOURS, QUADRATURE CONTOURS, IN-PHASE CONTOURS,
AND AREA OF GEOPHYSICAL ANOMALIES**

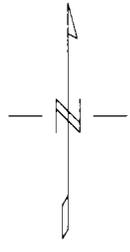
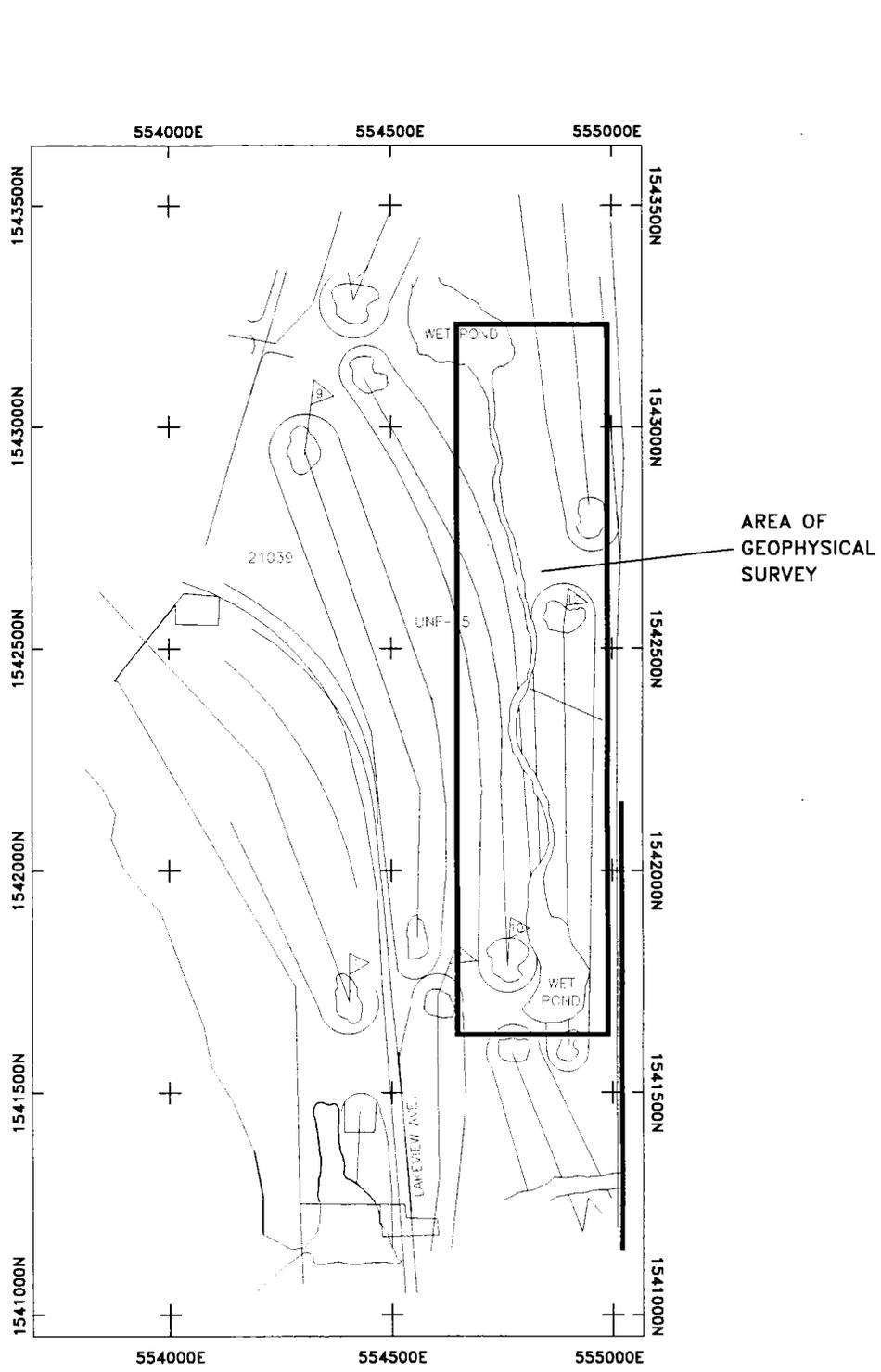
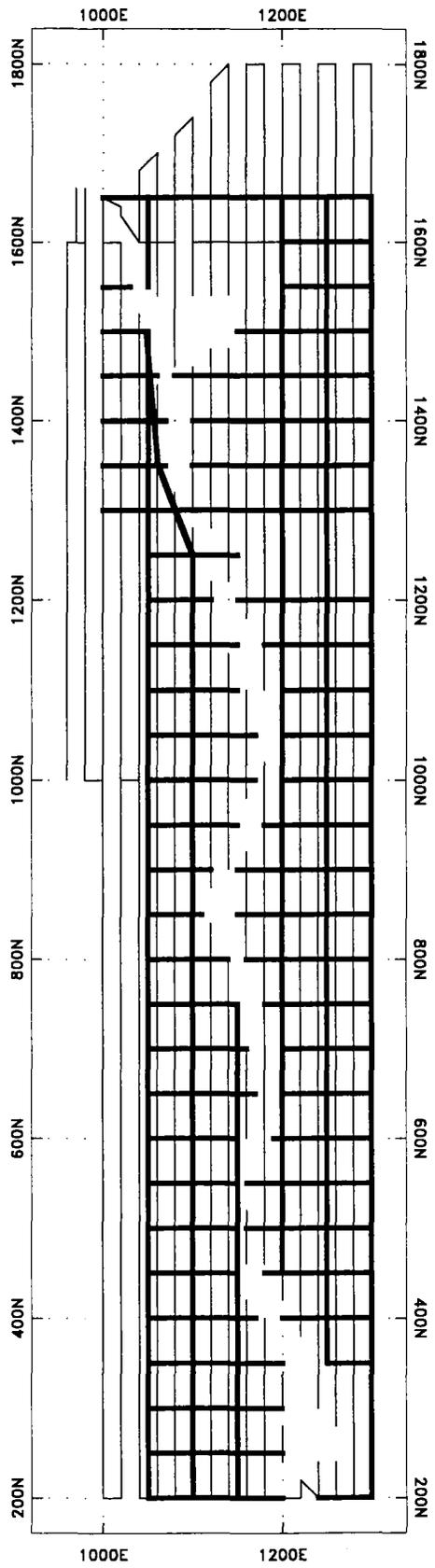


FIGURE 1



SOUTHERN DIVISION
STUDY AREA 8 FORMER WASTEWATER TREATMENT PLANT GEOPHYSICAL SURVEY
ABB ENVIRONMENTAL SERVICES, INC.

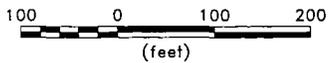


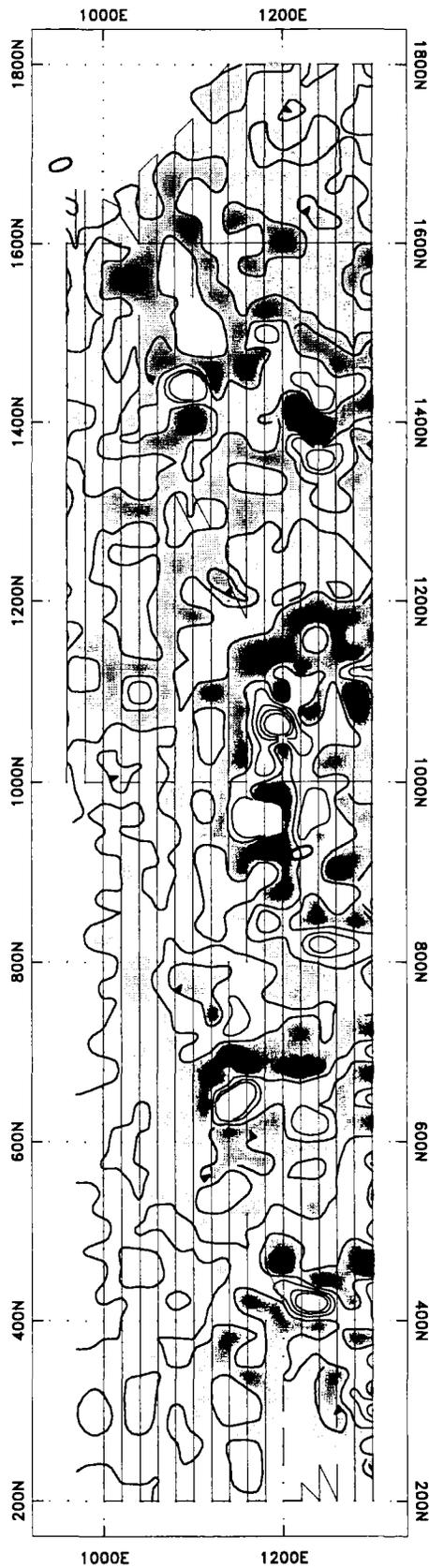
 GPR TRAVERSE
 MAGNETOMETER/TC TRAVERSE

FIGURE 2

SOUTHERN DIVISION
 GEOPHYSICAL SURVEY
 MAGNETOMETER, TC, AND GPR
 TRAVERSE LOCATIONS
 ABB ENVIRONMENTAL SERVICES, INC.

Scale 1:2400





CONTOUR INTERVAL: 20/100 GAMMAS/METER
 Scale 1:2400

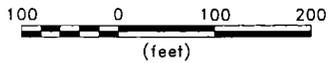
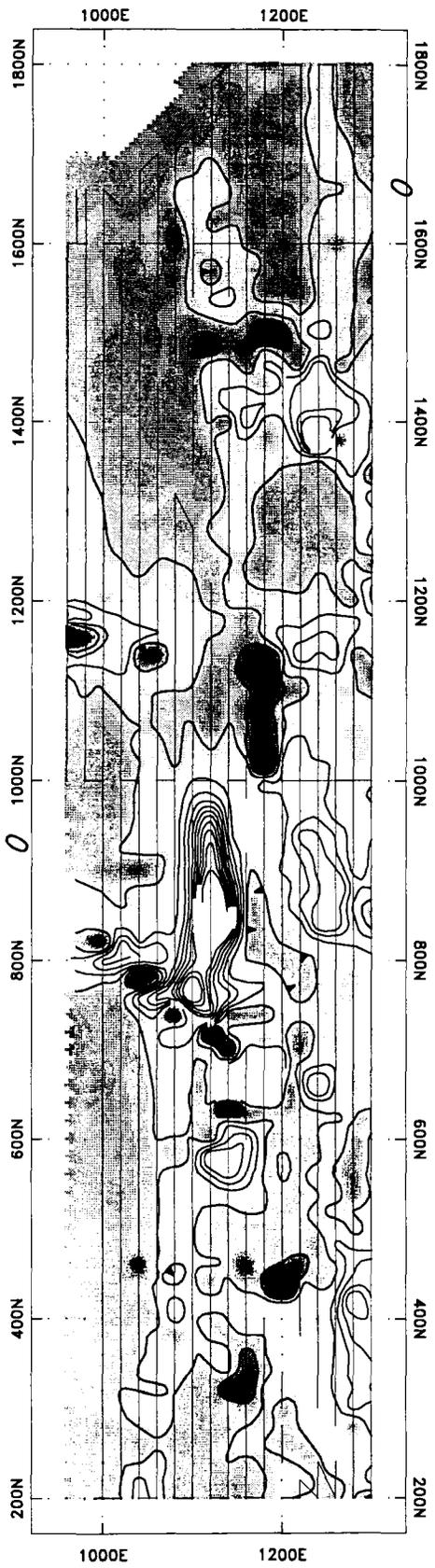


FIGURE 3

SOUTHERN DIVISION
VERTICAL GRADIENT CONTOURS STUDY AREA 8, FORMER WWTP
ABB ENVIRONMENTAL SERVICES, INC.



CONTOUR INTERVAL: 5 MMHOS/METER

Scale 1:2400

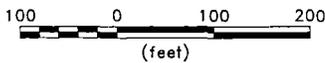
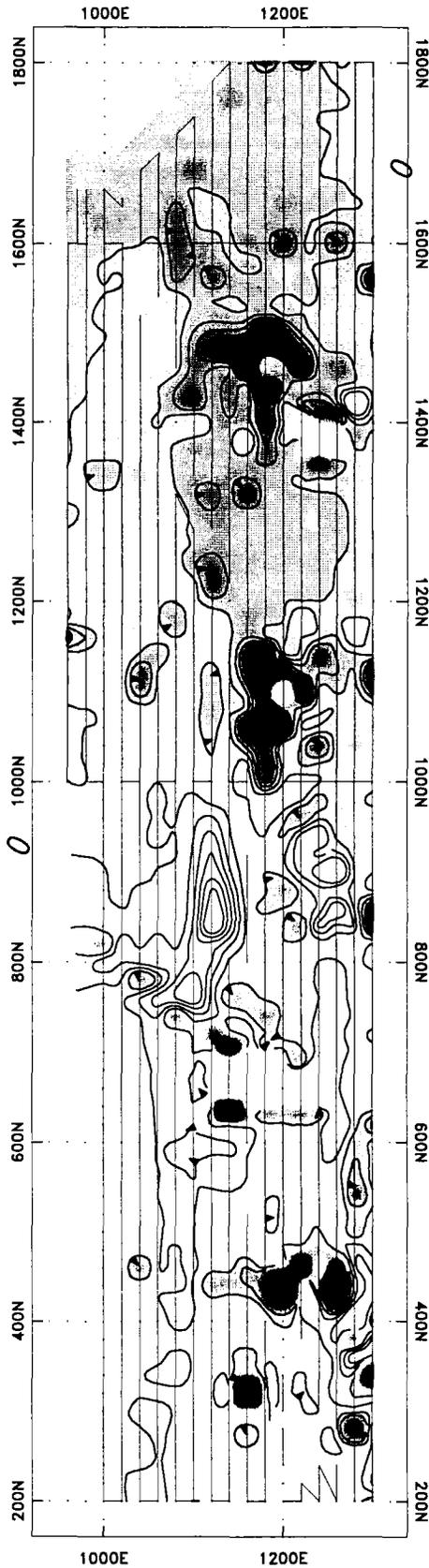


FIGURE 4

<p>SOUTHERN DIVISION</p> <p>QUADRATURE CONTOURS</p> <p>TERRAIN CONDUCTIVITY SURVEY</p> <p>STUDY AREA 8, FORMER WWTP</p> <p>ABB ENVIRONMENTAL SERVICES, INC.</p>



CONTOUR INTERVAL: 1 (UNITLESS)

Scale 1:2400

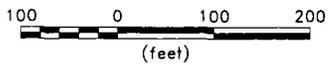


FIGURE 5

SOUTHERN DIVISION
INPHASE CONTOURS TERRAIN CONDUCTIVITY SURVEY STUDY AREA 8, FORMER WWTP
ABB ENVIRONMENTAL SERVICES, INC.

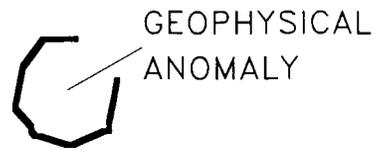
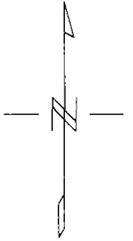
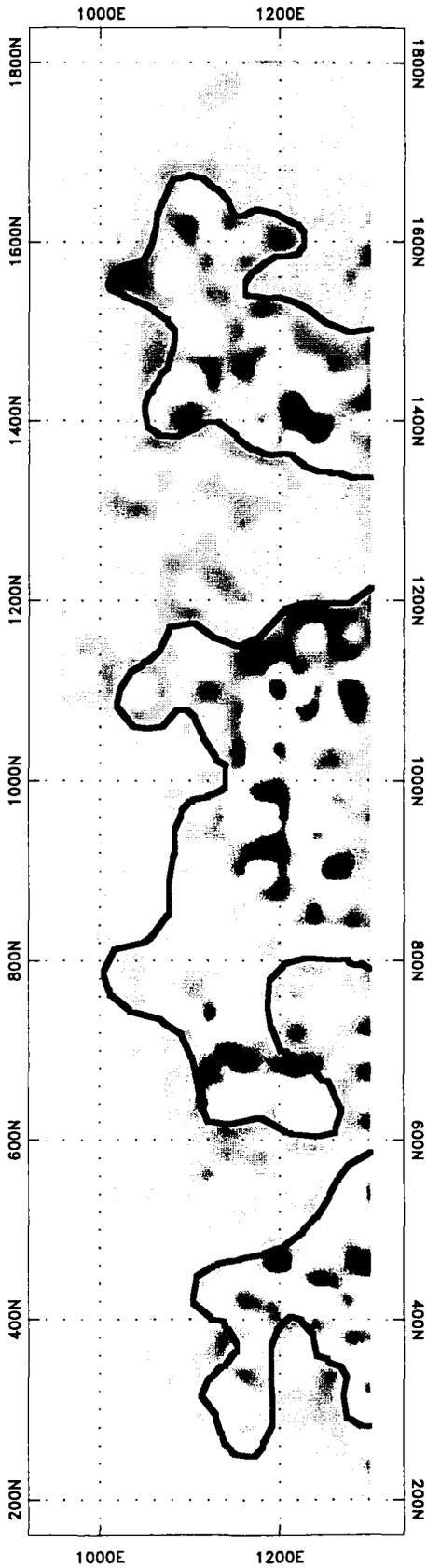


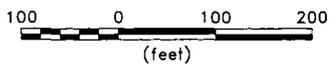
FIGURE 6

SOUTHERN DIVISION

AREAS OF GEOPHYSICAL ANOMALIES
STUDY AREA 8, FORMER WWTP

ABB ENVIRONMENTAL SERVICES, INC.

Scale 1:2400



APPENDIX C
SOIL GAS SURVEY FINDINGS

FINAL REPORT
ON THE FINDINGS OF
THE PETREX SOIL GAS SURVEYS
STUDY AREA 8
NAVAL TRAINING CENTER
ORLANDO, FLORIDA

1.0 EXECUTIVE SUMMARY. The information contained herein has been extracted from the Northeast Research Institute, LLC (NERI) report so that only information pertinent to Study Area 8 at Naval Training Center (NTC), Orlando, Florida is included. The complete report contains detailed information on quality assurance and quality control (QA/QC) procedures, thermal desorption-mass spectrometry, and data tables. In addition, only those figures (Plates 13 through 16) relevant to Study Area 8 are included. The complete document may be obtained from ABB Environmental Services, Inc. (ABB-ES), in Orlando, Florida.

In August and September 1994, ABB-ES subcontracted NERI to conduct a PETREX passive soil gas survey at NTC, Orlando. The purpose of this survey was to assist in site screening activities to assess the environmental impact from past site use at Study Area 8, which was occupied from the 1940s to 1976 by a wastewater treatment plant and associated lagoons. The area was screened for volatile and semivolatile organic compounds (VOCs and SVOCs) that may be present in the soil gas.

Benzene, toluene, ethylbenzene, and xylene(s) (BTEX), the cycloalkane/alkene petroleum hydrocarbons, and tetrachloroethene (PCE) were detected in soil gas at the study area. The distribution of the compound occurrences was mapped and potential source areas were identified. Low response levels were detected at Study Area 8; however, VOCs were detected at a significant number of sample locations at this site.

2.0 INTRODUCTION. In August and September 1994, ABB-ES subcontracted NERI under Subcontract No. SE4-09-027 to conduct a PETREX passive soil gas survey at NTC, Orlando. The purpose of this survey was to assist in site screening activities to assess the environmental impact from past site use at Study Area 8. This area was screened for VOCs and SVOCs that may be present in the soil gas.

Study Area 8, located on the northeast side of the NTC, Orlando golf course, was occupied from the 1940s to 1976 by a wastewater treatment plant and associated lagoons. In 1977, the plant was demolished and the lagoons were filled with yard waste, soil, sand, building debris, wastewater treatment plant sludge, and a steel mixing tank.

3.0 OBJECTIVES. The objectives of this soil gas survey were to

1. collect and report VOCs and SVOCs as constituents of the soil gas,
2. map the areal extent of the reported compounds in order to exhibit areas of potential subsurface contamination, and
3. attempt to determine the extent of potential source areas of the reported compounds in the subsurface.

4.0 OVERVIEW OF THE PETREX TECHNIQUE. Each PETREX soil gas sampler consists of two or three activated charcoal adsorption elements (collectors) housed in a resealable glass container in an inert atmosphere.

Soil gas sample collection is performed by unsealing the sampler and exposing the collector to the soil gas of the subsurface environment at the base of a shallow borehole. Sample collection proceeds via free vapor diffusion through the opening of the uncapped sampler container. Following a controlled period of time, the sampler is retrieved from the borehole, resealed, and submitted for analysis.

One collector from each soil gas sampler is analyzed by thermal desorption/mass spectrometry (TD-MS). Selected second collectors may be analyzed by TD chromatography/MS (TD-GC/MS) for compound confirmation. At least 10 percent of samplers used in any project are three-collector samplers. The third collector is used for setting instrument sensitivity prior to analysis.

Compounds are identified by comparison to standard reference spectra run on the same instrument. The mass spectral ion count of the appropriate indicator peak(s) for each compound or group of compounds is then plotted as relative response on a map and contoured using a variety of standard geostatistical analyses.

5.0 SCOPE OF WORK. A total of 150 PETREX soil gas samplers was utilized for this survey. At a majority of the sampler locations, a 2-inch-diameter by 12-inch-deep hole was excavated into the surface soil using a core shovel. After the sampler was lowered into the hole, the hole was backfilled with the soil plug taken from the shovel. Each sampler location was marked with a pin flag and ribbon flagging to help locate it during retrieval.

At the remaining sampler locations, located in asphalt, a 1-inch-diameter by 18-inch-deep hole was excavated through the asphalt into the underlying soil using an electric rotary hammer drill equipped with a carbide-tipped bit. A 2-foot length of 18-gauge galvanized steel wire was attached to the sampler, and the sampler was lowered into the borehole. A ball of aluminum foil was packed to within 1 inch of the surface, and the last inch was filled with quick-setting cement.

Field procedures for this survey also included decontamination of the borehole equipment between sampler locations to prevent cross contamination. The methods employed are listed below.

1. Equipment (core shovel head and drill bit) was washed thoroughly with laboratory detergent and potable water using a nylon brush to remove particulate matter.
2. Equipment was rinsed thoroughly with deionized/organic-free water.
3. Equipment was rinsed with a 10 percent solution of pesticide-grade isopropanol,
4. Equipment was rinsed again with deionized/organic-free water and air dried.

Retrieval of samplers placed in soil entailed removing the soil plug from the hole and lifting out the sampler, which was then cleaned, sealed, and labeled

with the sampler location number. Samplers placed beneath asphalt were retrieved by first chipping away the cement patch to expose the retrieval wire, then pulling gently on the wire to lift the sampler out of the borehole. The retrieval wire was removed from the sampler and the sampler was then cleaned, sealed, and labeled.

6.0 FIELD ACTIVITIES. Between August 15 and August 19, 1994, two NERI field geologists, assisted by ABB-ES personnel, conducted PETREX soil gas sampling onsite. One hundred fifty PETREX samplers were placed onsite, in approximate 50-foot square grids, as shown on Plate 13, Sample Locations Map.

Two sets of time calibration samplers were installed at three established sampling points in the study area. One set of these time calibration samplers was retrieved after 2 days and analyzed to check on the loading rate of VOCs onto the collectors. After reviewing the results from these time calibration samplers, it was determined to retrieve the second set of time calibration samplers after an additional 7 days of exposure in the field. Based on the results of these time calibration samplers, it was decided to retrieve all of the survey samplers after a further 7 days.

After an exposure period of approximately 14 to 16 days, the samplers were retrieved by a NERI field geologist between August 31 and September 2, 1994, and returned to NERI's Lakewood, Colorado, laboratory for analysis by TD-MS.

7.0 DISCUSSION. The soil gas response levels discussed below are described as elevated and moderate relative to the entire data set. The ion count values that have been reported represent qualitative soil gas values that were evaluated relative to the other sampler locations.

Ion count values are the unit of measure generated by the mass spectrometer to illustrate the relative intensities associated with each of the reported compounds. These response levels do not represent an actual concentration of the reported compounds, but are used to differentiate source areas from migration or dispersion pathways.

Study Area 8 was occupied from the 1940s to 1976 by a wastewater treatment plant and associated lagoons. In 1977, the plant was demolished and the lagoons were filled with yard waste, soil, sand, building debris, wastewater treatment plant sludge, and a steel mixing tank. All of these items may be potential sources of contamination. Plate 13 displays the locations of the 150 samplers placed at Study Area 8.

Samplers 136 and 139 adsorbed terpenes; therefore, petroleum hydrocarbons could not be reliably reported at these sample locations.

7.1 BTEX RELATIVE RESPONSE MAP. Low levels of BTEX response were detected throughout the site. The most significant of these detections, as determined by the number of spatially continuous responses, were identified in the southwestern and north-central portions of the survey area; however, the soil gas response levels detected are levels that may not represent detectable concentration levels in the subsurface.

7.2 CYCLOALKANES/ALKENES RELATIVE RESPONSE MAP. The distribution of the cycloalkanes/alkenes is shown on Plate 15. Potentially significant occurrences of the hydrocarbon compounds have been identified in the south-central, the west-central, and northeastern portions of the survey area. Due to the number of samples in each of these areas exhibiting elevated response, these areas may represent potential sources of petroleum disposal.

7.3 TETRACHLOROETHENE (PCE) RELATIVE RESPONSE MAP. Limited occurrences of PCE were detected throughout the site. The highest soil gas response values were detected at sample locations 196 and 209; however, the soil gas response levels detected at all locations are considered to be low and may not reflect detectable concentration levels in the subsurface. The distribution of PCE is shown on Plate 16.

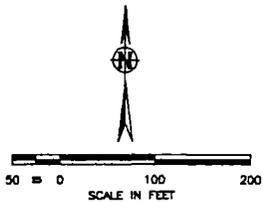
8.0 CONCLUSIONS

BTEX, the cycloalkane/alkene petroleum hydrocarbons, and PCE were detected in soil gas. The distributions of the compound occurrences were mapped and potential source areas were identified. Low response levels were also detected at Site Study Area 8; however, VOCs were detected at a significant number of sample locations at this site.

Because soil gas emanation rates are site and chemical specific, the environmental significance of the soil gas response values must be determined relative to compound concentrations in subsurface soil and/or groundwater. Changes in soil gas response in orders of magnitude may be used to plan future investigative studies and to aid in characterizing the behavior (migration, attenuation) of the chemicals in the subsurface. The PETREX method is extremely sensitive and often detects compounds in the low part per billion to part per trillion range; therefore, areas depicted as background by the PETREX method generally do not represent environmentally significant contaminant levels in the subsurface.

**PLATES 13, 14, 15, AND 16
SAMPLE LOCATIONS, BTEX RELATIVE RESPONSE (RR),
CYCLOALKANE/ALKENE RR, AND PCE RR**

1650N	96	95	94	93	92	91	90
1600N	97	98	99	100	101	102	103
1550N	110	109	108	107	106	105	104
1500N	111	112	113	114	115	116	117
1450N	124	123	122	121	120	119	118
1400N	125	126	127	128	129	130	131
1350N	138	137	136	135	134	133	132
1300N	139	140	141	142	143	144	145
1250N							
1200N			150	149	148	147	146
1150N			151	152	153	154	155
1100N			160	159	158	157	156
1050N			181	182	183	184	185
1000N			170	169	168	167	166
950N			171	172	173	174	175
900N			180	179	178	177	176
850N			181	182	183	184	185
800N			190	189	188	187	186
750N			191	192	193	194	195
700N			200	199	198	197	196
650N			201	202	203	204	205
600N			210	209	208	207	206
550N			211	212	213	214	215
500N			220	219	218	217	216
450N			221	222	223	224	225
400N			230	229	228	227	226
350N			231	232	233	234	235
300N							
	1000E	1050E	1100E	1150E	1200E	1250E	1300E
			239	238	237		236



LEGEND
Features: + PETREX Sample Location



605 Parfet Street
Suite 100
Lakewood, Colorado 80215
(303) 238-0090

Drawn By:
JCS
Checked By:
Project Manager:
CAS

Project #:
2158E
Date:
October 5, 1994
File Name:
2158-8_1.dwg

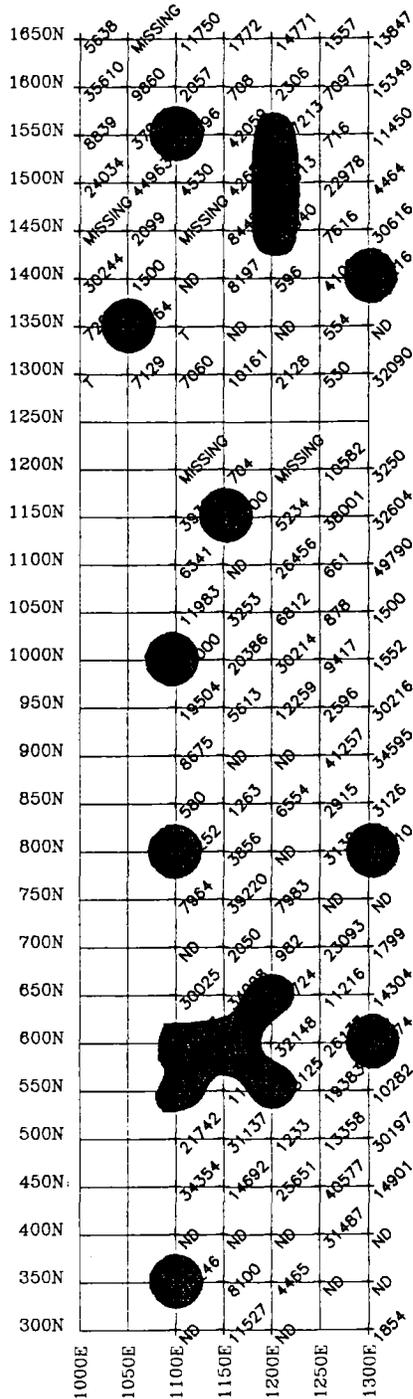
ABB Environmental Services, Inc.

Naval Training Center UNF-15, Study Area 8
Orlando, Florida



Sample Locations

Plate 13



LEGEND	
Relative Response Values: ■ ≥ 50,000	Features: + PETREX Sample Location T Samples affected by terpenes. See text for explanation.



605 Parfet Street
Suite 100
Lakewood, Colorado 80215
(303) 238-0090

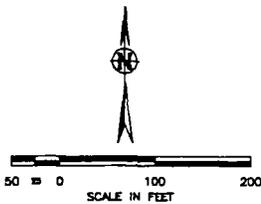
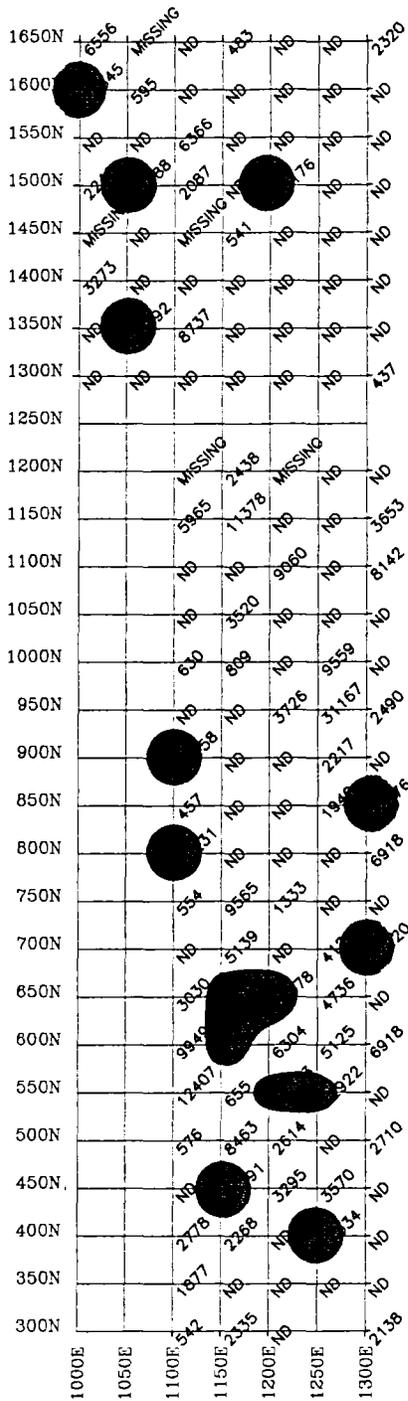
Drawn By:
JCS
Checked By:
Project Manager:
CAS

Project #:
2158E
Date:
October 5, 1994
File Name:
2158-8_2.dwg

ABB Environmental Services, Inc.
Naval Training Center UNF-15, Study Area 8
Orlando, Florida

Relative Response
Benzene, Toluene,
Ethylbenzene, Xylene(s)

Plate 14



LEGEND	
Relative Response Values: ■ ≥ 10,000	Features: + PETREX Sample Location



605 Parfet Street
Suite 100
Lakewood, Colorado 80215
(303) 238-0090

Drawn By:
JCS
Checked By:
Project Manager:
CAS

Project #:
2158E
Date:
October 5, 1994
File Name:
2158-8_4.dwg

ABB Environmental Services, Inc.

Naval Training Center UNF-15, Study Area 8
Orlando, Florida



Relative Response
Tetrachloroethene

Plate 16

APPENDIX D

SUMMARY OF POSITIVE DETECTIONS IN SOIL AND GROUNDWATER ANALYTICAL RESULTS

- D-1 Summary of Positive Detections in Subsurface Soil Analytical Results
- D-2 Summary of Positive Detections in Groundwater Analytical Results

APPENDIX D-1

**SUMMARY OF POSITIVE DETECTIONS IN SUBSURFACE SOIL
ANALYTICAL RESULTS**

Table D-1
Summary of Detections in Subsurface Soil Analytical Results, WWTP Lagoons, Study Area 8

Base Realignment and Closure, Environmental Site Screening Report
Study Area 8, Former Wastewater Treatment Plant Lagoons
Naval Training Center
Orlando, Florida

Identifier: Sampling Date: Feet bls:	Background Screening ¹	RBC ² for Residential Soil	RBC ² for Industrial Soil	08B00501 18-Oct-94	08B00601 18-Oct-94	08B00701 19-Oct-94	08B00701D 19-Oct-94	08B00801 19-Oct-94	08B00901 19-Oct-94
				6	4	4	4	4	4
Semivolatile Organic Compounds (µg/kg)									
Di-n-butylphthalate	ND	7,800,000 n	200,000,000 n	800	710	650	640	620	460
Pesticides/PCBs (µg/kg)									
4,4'-DDE	ND	1,900 c	17,000 c	--	--	--	--	--	4.7
4,4'-DDT	ND	1,900 c	17,000 c	--	--	--	--	--	3.8 J
Inorganic Analytes (mg/kg)									
Aluminum	2,119	78,000 n	1,000,000 n	75.2	714	155	156	13.1 B	1,720
Arsenic	1.1	0.43 c/23 n	3.8 c/610 n	--	0.48 B	0.54 J	--	--	5
Barium	3.6	5,500 n	140,000 n	7.1 B	1.4 J	0.88 J	0.96 J	0.43 J	13.9 J
Calcium	115	1,000,000	1,000,000	275 B	625 B	352 B	805 B	41.7 J	1,010 B
Chromium	3.7	390 n	10,000 n	0.88 B	1 B	0.96 B	0.91 B	0.66 B	1.2 B
Copper	--	3,100 n	82,000 n	1.1 B	--	1.3 B	--	--	3 B
Iron	264	23,000 n	610,000 n	71.5	49.5	31.5	28.6	96.3	182
Lead	3.9	400	400	0.65 J	1.1	0.56 J	0.67 B	0.22 B	--
Magnesium	32.8	460,468	480,468	--	20.3 J	8.8 J	11.5 J	--	145 B
Manganese	2.1	1800n	47,000 n	1.4 B	0.36 B	0.6 B	0.57 B	0.85 B	2.5 B
Silver	--	390 n	10,000 n	0.75 B	--	--	--	--	1.2 B
Sodium	--	1,000,000	1,000,000	--	--	--	--	--	155,000
Vanadium	3.4	550 n	14,000 n	--	--	--	0.91 B	--	--
Zinc	5.6	23,000 n	610,000 n	--	--	--	--	--	7.2
See notes at end of table.									

Table D-1 (Continued)
Summary of Detections in Subsurface Soil Analytical Results, WWTP Lagoons, Study Area 8

Base Realignment and Closure, Environmental Site Screening Report
Study Area 8, Former Wastewater Treatment Plant Lagoons
Naval Training Center
Orlando, Florida

¹ The background screening value is twice the average of detected concentrations for inorganic analytes.

² RBC Table, USEPA Region III, May 1996, R.L. Smith. RBC for chromium is based on chromium VI. RBC for lead is not available, value is Interim Guidance on Establishing Soil Lead Cleanup Levels at Superfund Sites (OSWER directive 9355.4-12). For essential nutrients (calcium, magnesium, potassium, and sodium), screening values were derived based on recommended daily allowances.

Notes: Bolded/shaded values (i.e., **0.43**) indicate exceedance of regulatory guidance and background.
All inorganic results are expressed in mg/kg soil dry weight; organics in $\mu\text{g}/\text{kg}$ soil dry weight.

WWTP = wastewater treatment plant.

bls = below land surface.

RBC = risk-based concentration.

$\mu\text{g}/\text{kg}$ = micrograms per kilogram.

ND = not determined.

n = noncarcinogenic pathway.

PCB = polychlorinated biphenyl.

DDE = dichlorodiphenyldichloroethene.

c = carcinogenic pathway.

DDT = dichlorodiphenyltrichloroethane.

-- = Analyte/compound was not detected at reporting limit.

mg/kg = milligrams per kilogram.

B = Reported concentration is between the instrument detection limit and contract required detection limit.

J = reported concentration is an estimated quantity.

USEPA = U.S. Environmental Protection Agency.

OSWER = Office of Solid Waste and Emergency Response.

APPENDIX D-2

**SUMMARY OF POSITIVE DETECTIONS IN GROUNDWATER
ANALYTICAL RESULTS**

Table D-2
Summary of Detections in Groundwater Analytical Results, WWTP Lagoons, Study Area 8

Base Realignment and Closure, Environmental Site Screening Report
Study Area 8, Former Wastewater Treatment Plant Lagoons
Naval Training Center
Orlando, Florida

Well ID: Identifier: Sampling Date:	Background Screening ¹	FDEPG	FEDMCL	RBC ² for Tap Water	OLD-08-05		OLD-08-06		OLD-08-07
					08G00501 11-Nov-94	08G00502 29-Dec-95	08G00601 11-Nov-94	08G00602 17-Jun-96	
Semivolatile Organic Compound (µg/kg)									
bis(2-Ethylhexyl)phthalate	ND	³ 6	6	4.8 c	3	NA	--	NA	--
Inorganic Analytes (µg/l)									
Aluminum	4,067	⁴200	ND	37,000 n	1,540	809	2,120	NA	510
Arsenic	5.0	³ 50	50	0.045 c/11 n	--	1.7	--	NA	45.2
Barium	31.4	³ 2,000	2,000	2,600 n	38.9 B	77.8	5.5 B	NA	14.8 B
Calcium	36,830	ND	ND	1,000,000	40,900	36,400	123,000	NA	50,700
Copper	5.4	⁴ 1,000	ND	1,500 n	--	24.5	--	NA	--
Chromium	7.8	³ 100	100	180 n	3.1 B	5.6 B	3.5 B	NA	--
Iron	1,227	⁴ 300	ND	11,000 n	837	924	120	NA	35.6 B
Lead	4.0	³ 15	15	15	2 B	--	2.4 B	NA	--
Magnesium	4,560	ND	ND	118,807	2,650 B	1780 B	3,730 B	NA	2,330 B
Manganese	17	⁴50	ND	840 n	69.9	97.4	23.8	NA	2.5 B
Nickel	--	³ 100	100	730 n	9.3 B	8 B	--	NA	--
Potassium	5,400	ND	ND	297,016	8,910	8160	3,720 B	NA	9,920
Silver	--	⁴ 100	ND	180 n	--	5.7 J	--	NA	--
Sodium	18,222	³160,000	ND	396,022	6,360	2920 J	13,400	NA	3,260 B
Vanadium	20.6	⁵ 49	ND	260 n	--	3.9 B	5.6 B	NA	8.6 B
Zinc	4.0	⁴ 5,000	ND	11,000 n	9.6 B	29.3	2.1 B	NA	--
Gross Alpha	13	³15	15	ND	2.2	NA	18.1	0.39 B	2.9
Gross Beta	9.5	--	--	ND	8.6	NA	--	NA	6.6
See notes at end of table.									

Table D-2 (Continued)
Summary of Detections in Groundwater Analytical Results, WWTP Lagoons, Study Area 8

Base Realignment and Closure, Environmental Site Screening Report
Study Area 8, Former Wastewater Treatment Plant Lagoons
Naval Training Center
Orlando, Florida

Well ID: Identifier: Sampling Date:	Background Screening ¹	FDEPG	FEDMCL	RBC ² for Tap Water	OLD-08-08	OLD-08-09	
					08G00801 11-Nov-94	08G00901 11-Nov-94	08G00902 29-Dec-95
Semivolatile Organic Compound (µg/kg)							
bis(2-Ethylhexyl)phthalate	ND	³ 6	6	4.8 c	--	--	NA
Inorganic Analytes (µg/l)							
Aluminum	4,067	⁴ 200	ND	37,000 n	4,370	2,330	976
Arsenic	5.0	³ 50	50	0.045 c/11 n	24.9	23.9	27.3
Barium	31.4	² 2,000	2,000	2,600 n	14.9 B	58.3 B	44.8 B
Calcium	36,830	ND	ND	1,000,000	44,900	40,800	39,000
Copper	5.4	⁴ 1,000	ND	1,500 n	--	--	--
Chromium	7.8	³ 100	100	180 n	7.7 B	--	--
Iron	1,227	⁴ 300	ND	11,000 n	317	406	185
Lead	4.0	³ 15	15	15	8.2	--	--
Magnesium	4,560	ND	ND	118,807	4,570 B	7,420	3670 B
Manganese	17	⁴ 50	ND	180 n	16.3	13.7 B	2.8 B
Nickel	--	³ 100	100	730 n	--	16 B	--
Potassium	5,400	ND	ND	297,016	12,600	14,900	8,640
Silver	--	⁴ 100	ND	840 n	--	--	--
Sodium	18,222	³ 160,000	ND	396,022	6,090	248,000	59,800 J
Vanadium	20.6	⁵ 49	ND	260 n	--	8.6 B	7.5 B
Zinc	4.0	⁴ 5,000	ND	11,000 n	1.9 B	47	30.2
Gross Alpha	13	³ 15	15	ND	12.5	--	NA
Gross Beta	9.5	--	--	ND	15	14.7	NA
See notes at end of table.							

Table D-2 (Continued)
Summary of Detections in Groundwater Analytical Results, WWTP Lagoons, Study Area 8

Base Realignment and Closure, Environmental Site Screening Report
Study Area 8, Former Wastewater Treatment Plant Lagoons
Naval Training Center
Orlando, Florida

¹ Groundwater background screening value is twice the average of detected concentrations for inorganic analytes.

² RBC Table, USEPA Region III, May 1996, R.L. Smith. RBC for chromium is based on chromium VI. RBC for lead is not available, value is treatment technology action limit for lead in drinking water distribution system identified in Drinking Water Standards and Health Advisories (USEPA, 1995). For essential nutrients (calcium, magnesium, potassium, and sodium) screening values were derived based on recommended daily allowances.

³ Primary Standard.

⁴ Secondary Standard.

⁵ Systemic Toxicant.

Notes: Bold/shaded numbers (i.e. **50**) indicate exceedance of groundwater guidance and background.
Analytical results expressed in $\mu\text{g}/\text{l}$, except for radiological parameters, which are expressed in picocuries per liter.

WWTP = wastewater treatment plant.

ID = identifier.

FDEPG = Florida Department of Environmental Protection, Groundwater Guidance Concentrations, June 1994.

FEDMCL= Federal Maximum Contaminant Levels, Primary Drinking Water Regulations and Health Advisories, February 1996.

RBC = risk-based concentration.

$\mu\text{g}/\text{kg}$ = micrograms per kilogram.

ND = not determined.

c = carcinogenic effects.

NA = not analyzed.

-- = analyte/compound was not detected at the reporting limit.

$\mu\text{g}/\text{l}$ = micrograms per liter.

n = noncarcinogenic effects.

B = Reported concentration is between the instrument detection limit and the contract required detection limit.

J = estimated value.

USEPA = U.S. Environmental Protection Agency.

APPENDIX E

SUMMARY OF ANALYTICAL RESULTS

- E-1 Summary of Subsurface Soil Analytical Results, Target Compound List Semivolatile Organic Compounds
- E-2 Summary of Soil Analytical Results, Target Compound List Semivolatile Organic Compounds
- E-3 Summary of Soil Analytical Results, Target Compound List Pesticides/PCBs
- E-4 Summary of Soil Analytical Results, Herbicides - SW 846 Method 8150
- E-5 Summary of Soil Analytical Results, Target Analyte List Metals
- E-6 Summary of Groundwater Analytical Results, Low Detection Limit Volatile Organic Compounds
- E-7 Summary of Groundwater Analytical Results, Target Analyte List Semivolatile Organics
- E-8 Summary of Groundwater Analytical Results, Target Compound List Pesticides/PCBs
- E-9 Summary of Groundwater Analytical Results, Herbicides - SW 846 Method 8150
- E-10 Summary of Groundwater Analytical Results, Target Analyte List Metals
- E-11 Summary of Groundwater Analytical Results, Radiological Parameters

APPENDIX E-1

**SUMMARY OF SUBSURFACE SOIL ANALYTICAL RESULTS,
TARGET COMPOUND LIST SEMIVOLATILE ORGANIC COMPOUNDS**

Table E-1
Summary of Soil Analytical Results
Target Compound List Volatile Organic Compounds

Base Realignment and Closure, Environmental Site Screening Report
Study Area 8, Former Wastewater Treatment Plant Lagoons
Naval Training Center
Orlando, Florida

Identifier: Sampling Date:	08S00100 30-Aug-94	08S00200 30-Aug-94	08S00300 30-Aug-94	08S00400 30-Aug-94	08S00500 30-Aug-94	08S00600 30-Aug-94	08S00700 30-Aug-94	08S00800 30-Aug-94
1,1,1-Trichloroethane	12 U	11 U	11 U	12 U	13 U	12 U	11 U	12 U
1,1,2,2-Tetrachloroethane	12 UJ	11 U	11 U	12 U	13 UJ	12 UJ	11 U	12 U
1,1,2-Trichloroethane	12 UJ	11 U	11 U	12 U	13 UJ	12 UJ	11 U	12 U
1,1-Dichloroethane	12 U	11 U	11 U	12 U	13 U	12 U	11 U	12 U
1,1-Dichloroethene	12 U	11 U	11 U	12 U	13 U	12 U	11 U	12 U
1,2-Dichloroethane	12 U	11 U	11 U	12 U	13 U	12 U	11 U	12 U
1,2-Dichloroethene (total)	12 U	11 U	11 U	12 U	13 U	12 U	11 U	12 U
1,2-Dichloropropane	12 U	11 U	11 U	12 U	13 U	12 U	11 U	12 U
2-Butanone	12 U	11 U	11 U	12 U	13 U	12 U	11 U	12 U
2-Hexanone	12 UJ	11 U	11 U	12 U	13 UJ	12 UJ	11 U	12 U
4-Methyl-2-pentanone	12 UJ	11 U	11 U	12 U	13 UJ	12 UJ	11 U	12 U
Acetone	12 U	11 U	11 U	12 U	13 U	12 U	11 U	12 U
Benzene	12 U	11 U	11 U	12 U	13 U	12 U	11 U	12 U
Bromodichloromethane	12 U	11 U	11 U	12 U	13 U	12 U	11 U	12 U
Bromoform	12 U	11 U	11 U	12 U	13 U	12 U	11 U	12 U
Bromomethane	12 U	11 U	11 U	12 U	13 U	12 U	11 U	12 U
Carbon disulfide	12 U	11 U	11 U	12 U	13 U	12 U	11 U	12 U
Carbon tetrachloride	12 U	11 U	11 U	12 U	13 U	12 U	11 U	12 U
Chlorobenzene	12 UJ	11 U	11 U	12 U	13 UJ	12 UJ	11 U	12 U
Chloroethane	12 U	11 U	11 U	12 U	13 U	12 U	11 U	12 U
Chloroform	12 U	11 U	11 U	12 U	13 U	12 U	11 U	12 U
Chloromethane	12 U	11 U	11 U	12 U	13 U	12 U	11 U	12 U
cis-1,3-Dichloropropene	12 U	11 U	11 U	12 U	13 U	12 U	11 U	12 U
Dibromochloromethane	12 UJ	11 U	11 U	12 U	13 UJ	12 UJ	11 U	12 U
Ethylbenzene	12 UJ	11 U	11 U	12 U	13 UJ	12 UJ	11 U	12 U
Methylene chloride	12 U	11 U	11 U	12 U	13 U	12 U	12 U	12 U
Styrene	12 UJ	11 U	11 U	12 U	13 UJ	12 UJ	11 U	12 U
Tetrachloroethene	12 UJ	11 U	11 U	12 U	13 UJ	12 UJ	11 U	12 U
Toluene	12 UJ	11 U	11 U	12 U	13 UJ	12 UJ	11 U	12 U
trans-1,3-Dichloropropene	12 UJ	11 U	11 U	12 U	13 UJ	12 UJ	11 U	12 U
Trichloroethene	12 U	11 U	11 U	12 U	13 U	12 U	11 U	12 U
Vinyl chloride	12 U	11 U	11 U	12 U	13 U	12 U	11 U	12 U
Xylene (total)	12 UJ	11 U	11 U	12 U	13 UJ	12 UJ	11 U	12 U

See notes at end of table.

Table E-1 (Continued)
Summary of Soil Analytical Results
Target Compound List Volatile Organic Compounds

Base Realignment and Closure, Environmental Site Screening Report
Study Area 8, Former Wastewater Treatment Plant Lagoons
Naval Training Center
Orlando, Florida

Identifier: Sampling Date:	08B00101 31-Aug-94	08B00201 31-Aug-94	08B00301 01-Sep-94	08B00401 01-Sep-94	08B00501 18-Oct-94	08B00601 18-Oct-94	08B00701 19-Oct-94	08B00701D 19-Oct-94	08B00801 19-Oct-94	08B00901 19-Oct-94
1,1,1-Trichloroethane	12 U	12 U	12 U							
1,1,2,2-Tetrachloroethane	12 U	12 U	12 U							
1,1,2-Trichloroethane	12 U	12 U	12 U							
1,1-Dichloroethane	12 U	12 U	12 U							
1,1-Dichloroethene	12 U	12 U	12 U							
1,2-Dichloroethane	12 U	12 U	12 U							
1,2-Dichloroethene (total)	12 U	12 U	12 U							
1,2-Dichloropropane	12 U	12 U	12 U							
2-Butanone	12 U	12 U	12 U							
2-Hexanone	12 U	12 U	12 U							
4-Methyl-2-pentanone	12 U	12 U	12 U							
Acetone	12 U	12 U	30	22	16 UJ	20 UJ	12 UJ	15 UJ	28 UJ	12 U
Benzene	12 U	12 U	12 U							
Bromodichloromethane	12 U	12 U	12 U							
Bromoform	12 U	12 U	12 U							
Bromomethane	12 U	12 U	12 U							
Carbon disulfide	12 U	12 U	12 U							
Carbon tetrachloride	12 U	12 U	12 U							
Chlorobenzene	12 U	12 U	12 U							
Chloroethane	12 U	12 U	12 U							
Chloroform	12 U	12 U	12 U							
Chloromethane	12 U	12 U	12 U							
cis-1,3-Dichloropropene	12 U	12 U	12 U							
Dibromochloromethane	12 U	12 U	12 U							
Ethylbenzene	12 U	12 U	12 U							
Methylene chloride	12 U	12 U	8 UJ							
Styrene	12 U	12 U	12 U							
Tetrachloroethene	12 U	12 U	12 U							
Toluene	12 U	12 U	12 U							
trans-1,3-Dichloropropene	12 U	12 U	12 U							
Trichloroethene	12 U	12 U	12 U							
Vinyl chloride	12 U	12 U	12 U							
Xylene (total)	12 U	12 U	12 U							

Notes: Analytical results expressed in micrograms per kilogram soil dry weight. (08S00600RE) where the same results were obtained as the original analyses.
U = Compound not detected at the contract-required quantitation limit.
J = Reported concentration is an estimated quantity.

APPENDIX E-2

**SUMMARY OF SOIL ANALYTICAL RESULTS, TARGET COMPOUND LIST
SEMIVOLATILE ORGANIC COMPOUNDS**

Table E-2
Summary of Soil Analytical Results
Target Compound List Semivolatile Organic Compounds

Base Realignment and Closure, Environmental Site Screening Report
Study Area 8, Former Wastewater Treatment Plant Lagoons
Naval Training Center
Orlando, Florida

Identifier:	08S00100	08S00200	08S00300	08S00400	08S00500	08S00600	08S00700	08S00800
Sampling Date:	30-Aug-94							
1,2,4-Trichlorobenzene	390 U	380 U	380 U	460 U	420 U	390 U	380 U	380 U
1,2-Dichlorobenzene	390 U	380 U	380 U	460 U	420 U	390 U	380 U	380 U
1,3-Dichlorobenzene	390 U	380 U	380 U	460 U	420 U	390 U	380 U	380 U
1,4-Dichlorobenzene	390 U	380 U	380 U	460 U	420 U	390 U	380 U	380 U
2,2'-oxybis(1-Chloropropane)	390 U	380 U	380 U	460 U	420 U	390 U	380 U	380 U
2,4,5-Trichlorophenol	970 U	950 U	950 U	1100 U	1000 U	980 U	960 U	960 U
2,4,6-Trichlorophenol	390 U	380 U	380 U	460 U	420 U	390 U	380 U	380 U
2,4-Dichlorophenol	390 U	380 U	380 U	460 U	420 U	390 U	380 U	380 U
2,4-Dimethylphenol	390 U	380 U	380 U	460 U	420 U	390 U	380 U	380 U
2,4-Dinitrophenol	970 U	950 U	950 U	1100 U	1000 U	980 U	960 U	960 U
2,4-Dinitrotoluene	390 U	380 U	380 U	460 U	420 U	390 U	380 U	380 U
2,6-Dinitrotoluene	390 U	380 U	380 U	460 U	420 U	390 U	380 U	380 U
2-Chloronaphthalene	390 U	380 U	380 U	460 U	420 U	390 U	380 U	380 U
2-Chlorophenol	390 U	380 U	380 U	460 U	420 U	390 U	380 U	380 U
2-Methylnaphthalene	390 U	380 U	380 U	460 U	420 U	390 U	380 U	380 U
2-Methylphenol	390 U	380 U	380 U	460 U	420 U	390 U	380 U	380 U
2-Nitroaniline	970 U	950 U	950 U	1100 U	1000 U	980 U	960 U	960 U
2-Nitrophenol	390 U	380 U	380 U	460 U	420 U	390 U	380 U	380 U
3,3'-Dichlorobenzidine	390 U	380 U	380 U	460 U	420 U	390 U	380 U	380 U
3-Nitroaniline	970 U	950 U	950 U	1100 U	1000 U	980 U	960 U	960 U
4,6-Dinitro-2-methylphenol	970 U	950 U	950 U	1100 U	1000 U	980 U	960 U	960 U
4-Bromophenyl-phenylether	390 U	380 U	380 U	460 U	420 U	390 U	380 U	380 U
4-Chloro-3-methylphenol	390 U	380 U	380 U	460 U	420 U	390 U	380 U	380 U
4-Chloroaniline	390 U	380 U	380 U	460 U	420 U	390 U	380 U	380 U
4-Chlorophenyl-phenylether	390 U	380 U	380 U	460 U	420 U	390 U	380 U	380 U
4-Methylphenol	390 U	380 U	380 U	460 U	420 U	390 U	380 U	380 U
4-Nitroaniline	970 U	950 U	950 U	1100 U	1000 U	980 U	960 U	960 U
4-Nitrophenol	970 U	950 U	950 U	1100 U	1000 U	980 U	960 U	960 U
Acenaphthene	390 U	380 U	380 U	460 U	420 U	390 U	380 U	380 U
Acenaphthylene	390 U	380 U	380 U	460 U	420 U	390 U	380 U	380 U
Anthracene	390 U	380 U	380 U	460 U	420 U	390 U	380 U	380 U
Benzo(a)anthracene	390 U	380 U	380 U	460 U	220 J	390 U	380 U	380 U
Benzo(a)pyrene	390 U	380 U	380 U	460 U	280 J	390 U	380 U	380 U
Benzo(b)fluoranthene	390 U	380 U	380 U	460 U	440	390 U	380 U	380 U

See notes at end of table.

Table E-2 (Continued)
Summary of Soil Analytical Results
Target Compound List Semivolatile Organic Compounds

Base Realignment and Closure, Environmental Site Screening Report
Study Area 8, Former Wastewater Treatment Plant Lagoons
Naval Training Center
Orlando, Florida

Identifier: Sampling Date:	08S00100 30-Aug-94	08S00200 30-Aug-94	08S00300 30-Aug-94	08S00400 30-Aug-94	08S00500 30-Aug-94	08S00600 30-Aug-94	08S00700 30-Aug-94	08S00800 30-Aug-94
Benzo(g,h,i)perylene	390 U	380 U	380 U	460 U	370 J	390 U	380 U	380 U
Benzo(k)fluoranthene	390 U	380 U	380 U	460 U	310 J	390 U	380 U	380 U
bis(2-Chloroethoxy)methane	390 U	380 U	380 U	460 U	420 U	390 U	380 U	380 U
bis(2-Chloroethyl)ether	390 U	380 U	380 U	460 U	420 U	390 U	380 U	380 U
bis(2-Ethylhexyl)phthalate	390 U	380 U	380 U	460 U	420 U	390 U	380 U	380 U
Butylbenzylphthalate	390 U	380 U	380 U	460 U	420 U	390 U	380 U	380 U
Carbazole	390 U	380 U	380 U	460 U	420 U	390 U	380 U	380 U
Chrysene	390 U	380 U	380 U	460 U	430	390 U	380 U	380 U
Di-n-butylphthalate	350 J	270 J	280 J	470	590	380 J	750	390
Di-n-octylphthalate	390 U	380 U	380 U	460 U	420 U	390 U	380 U	380 U
Dibenz(a,h)anthracene	390 U	380 U	380 U	460 U	420 U	390 U	380 U	380 U
Dibenzofuran	390 U	380 U	380 U	460 U	420 U	390 U	380 U	380 U
Diethylphthalate	390 U	380 U	380 U	460 U	420 U	390 U	380 U	380 U
Dimethylphthalate	390 U	380 U	380 U	460 U	420 U	390 U	380 U	380 U
Fluoranthene	390 U	380 U	380 U	460 U	670	390 U	380 U	380 U
Fluorene	390 U	380 U	380 U	460 U	420 U	390 U	380 U	380 U
Hexachlorobenzene	390 U	380 U	380 U	460 U	420 U	390 U	380 U	380 U
Hexachlorobutadiene	390 U	380 U	380 U	460 U	420 U	390 U	380 U	380 U
Hexachlorocyclopentadiene	390 U	380 U	380 U	460 U	420 U	390 U	380 U	380 U
Hexachloroethane	390 U	380 U	380 U	460 U	420 U	390 U	380 U	380 U
Indeno(1,2,3-cd)pyrene	390 U	380 U	380 U	460 U	280 J	390 U	380 U	380 U
Isophorone	390 U	380 U	380 U	460 U	420 U	390 U	380 U	380 U
N-Nitroso-di-n-propylamine	390 U	380 U	380 U	460 U	420 U	390 U	380 U	380 U
N-Nitrosodiphenylamine (1)	390 U	380 U	380 U	460 U	420 U	390 U	380 U	380 U
Naphthalene	390 U	380 U	380 U	460 U	420 U	390 U	380 U	380 U
Nitrobenzene	390 U	380 U	380 U	460 U	420 U	390 U	380 U	380 U
Pentachlorophenol	970 U	950 U	950 U	1100 U	1000 U	980 U	960 U	960 U
Phenanthrene	390 U	380 U	380 U	460 U	140 J	390 U	380 U	380 U
Phenol	390 U	380 U	380 U	460 U	420 U	390 U	380 U	380 U
Pyrene	390 U	380 U	380 U	460 U	510	390 U	380 U	380 U
See notes at end of table.								

Table E-2 (Continued)
Summary of Soil Analytical Results
Target Compound List Semivolatile Organic Compounds

Base Realignment and Closure, Environmental Site Screening Report
 Study Area 8, Former Wastewater Treatment Plant Lagoons
 Naval Training Center
 Orlando, Florida

Identifier: Sampling Date:	08B00101 31-Aug-94	08B00201 31-Aug-94	08B00301 01-Sep-94	08B00401 01-Sep-94	08B00501 18-Oct-94	08B00601 18-Oct-94	08B00701 19-Oct-94	08B00701D 19-Oct-94	08B00801 19-Oct-94	08B00901 19-Oct-94
Benzo(g,h,i)perylene	380 U	390 U	400 U	410 U	390 U	390 U	400 U	400 U	400 U	390 U
Benzo(k)fluoranthene	380 U	390 U	400 U	410 U	390 U	390 U	400 U	400 U	400 U	390 U
bis(2-Chloroethoxy)methane	380 U	390 U	400 U	410 U	390 U	390 U	400 U	400 U	400 U	390 U
bis(2-Chloroethyl)ether	380 U	390 U	400 U	410 U	390 U	390 U	400 U	400 U	400 U	390 U
bis(2-Ethylhexyl)phthalate	380 U	390 U	400 U	410 U	390 U	390 U	400 U	400 U	400 U	390 U
Butylbenzylphthalate	380 U	390 U	400 U	410 U	390 U	390 U	400 U	400 U	400 U	390 U
Carbazole	380 U	390 U	400 U	410 U	390 U	390 U	400 U	400 U	400 U	390 U
Chrysene	380 U	390 U	400 U	410 U	390 U	390 U	400 U	400 U	400 U	390 U
Di-n-butylphthalate	560	640	610	530	800	710	650	640	620	460
Di-n-octylphthalate	380 U	390 U	400 U	410 U	390 U	390 U	400 U	400 U	400 U	390 U
Dibenz(a,h)anthracene	380 U	390 U	400 U	410 U	390 U	390 U	400 U	400 U	400 U	390 U
Dibenzofuran	380 U	390 U	400 U	410 U	390 U	390 U	400 U	400 U	400 U	390 U
Diethylphthalate	380 U	390 U	400 U	410 U	390 U	390 U	400 U	400 U	400 U	390 U
Dimethylphthalate	380 U	390 U	400 U	410 U	390 U	390 U	400 U	400 U	400 U	390 U
Fluoranthene	380 U	390 U	400 U	410 U	390 U	390 U	400 U	400 U	400 U	390 U
Fluorene	380 U	390 U	400 U	410 U	390 U	390 U	400 U	400 U	400 U	390 U
Hexachlorobenzene	380 U	390 U	400 U	410 U	390 U	390 U	400 U	400 U	400 U	390 U
Hexachlorobutadiene	380 U	390 U	400 U	410 U	390 U	390 U	400 U	400 U	400 U	390 U
Hexachlorocyclopentadiene	380 UJ	390 UJ	400 UJ	410 UJ	390 U	390 U	400 U	400 U	400 U	390 U
Hexachloroethane	380 U	390 U	400 U	410 U	390 U	390 U	400 U	400 U	400 U	390 U
Indeno(1,2,3-cd)pyrene	380 U	390 U	400 U	410 U	390 U	390 U	400 U	400 U	400 U	390 U
Isophorone	380 U	390 U	400 U	410 U	390 U	390 U	400 U	400 U	400 U	390 U
N-Nitroso-di-n-propylamine	380 U	390 U	400 U	410 U	390 U	390 U	400 U	400 U	400 U	390 U
N-Nitrosodiphenylamine ¹	380 U	390 U	400 U	410 U	390 U	390 U	400 U	400 U	400 U	390 U
Naphthalene	380 U	390 U	400 U	410 U	390 U	390 U	400 U	400 U	400 U	390 U
Nitrobenzene	380 U	390 U	400 U	410 U	390 U	390 U	400 U	400 U	400 U	390 U
Pentachlorophenol	960 U	970 U	990 U	1000 U	980 U	980 U	990 U	1000 U	990 U	980 U
Phenanthrene	380 U	390 U	400 U	410 U	390 U	390 U	400 U	400 U	400 U	390 U
Phenol	380 U	390 U	400 U	410 U	390 U	390 U	400 U	400 U	400 U	390 U
Pyrene	380 U	390 U	400 U	410 U	390 U	390 U	400 U	400 U	400 U	390 U

¹ Cannot be separated from diphenylamine.

Notes: Analytical results expressed in micrograms per kilogram soil dry weight.

U = Compound not detected at the contract-required quantitation limit.

J = Reported concentration is an estimated quantity.

APPENDIX E-3

**SUMMARY OF SOIL ANALYTICAL RESULTS, TARGET COMPOUND LIST
PESTICIDES/PCBS**

Table E-3
Summary of Soil Analytical Results
Target Compound List Pesticides/PCBs

Base Realignment and Closure, Environmental Site Screening Report
Study Area 8, Former Wastewater Treatment Plant Lagoons
Naval Training Center
Orlando, Florida

Identifier: Sampling Date:	08S00100 30-Aug-94	08S00200 30-Aug-94	08S00300 30-Aug-94	08S00400 30-Aug-94	08S00500 30-Aug-94	08S00600 30-Aug-94	08S00700 30-Aug-94	08S00800 30-Aug-94
4,4'-DDD	19 U	15 U	7.5 U	18	84 U	460	81 J	19 U
4,4'-DDE	92	31	7.5 U	37	82 J	250 J	65 J	19 U
4,4'-DDT	130	28	7.5 U	7.9 J	84 U	75 U	37 U	19 U
Aldrin	9.8 U	7.8 U	3.9 U	2.1 U	43 U	39 U	19 U	9.8 U
alpha-BHC	9.8 U	7.8 U	3.9 U	2.1 U	43 U	39 U	19 U	9.8 U
alpha-Chlordane	21	21	3.9 U	11 J	270	35 J	100	63
Aroclor-1016	190 U	150 U	75 U	41 U	840 U	750 U	370 U	190 U
Aroclor-1221	390 U	310 U	150 U	83 U	1700 U	1500 U	760 U	390 U
Aroclor-1232	190 U	150 U	75 U	41 U	840 U	750 U	370 U	190 U
Aroclor-1242	190 U	150 U	75 U	41 U	840 U	750 U	370 U	190 U
Aroclor-1248	190 U	150 U	75 U	41 U	840 U	750 U	370 U	190 U
Aroclor-1254	190 U	150 U	75 U	41 U	840 U	750 U	370 U	190 U
Aroclor-1260	200	150 U	75 U	150	840 U	750 U	370 U	190 U
beta-BHC	9.8 U	7.8 U	3.9 U	2.1 U	43 U	39 U	19 U	9.8 U
delta-BHC	9.8 U	7.8 U	3.9 U	2.1 U	43 U	39 U	19 U	9.8 U
Dieldrin	20	15 U	35	7.9 J	84 U	75 U	37 U	19 U
Endosulfan I	9.8 U	7.8 U	3.9 U	2.1 U	43 U	39 U	19 U	9.8 U
Endosulfan II	19 U	15 U	7.5 U	4.1 U	84 U	75 U	37 U	19 U
Endosulfan sulfate	19 U	15 U	7.5 U	4.1 U	84 U	75 U	37 U	19 U
Endrin	19 U	15 U	7.5 U	4.1 U	84 U	75 U	37 U	19 U
Endrin aldehyde	19 U	15 U	7.5 U	4.1 U	84 U	75 U	37 U	19 U
Endrin ketone	19 U	15 U	7.5 U	4.1 U	84 U	75 U	37 U	19 U
gamma-BHC (Lindane)	9.8 U	7.8 U	3.9 U	2.1 U	43 U	39 U	19 U	9.8 U
gamma-Chlordane	18	16	3.9 U	11 J	300	40	120	68
Heptachlor	9.8 U	7.8 U	3.9 U	2.1 U	43 U	39 U	19 U	9.8 U
Heptachlor epoxide	9.8 U	7.8 U	3.9 U	2.1 U	43 U	39 U	19 U	9.8 U
Methoxychlor	98 U	78 U	39 U	21 U	430 U	390 U	190 U	98 U
Toxaphene	980 U	780 U	390 U	210 U	4300 U	3900 U	1900 U	980 U
See notes at end of table.								

Table E-3 (Continued)
Summary of Soil Analytical Results
Target Compound List Pesticides/PCBs

Base Realignment and Closure, Environmental Site Screening Report
Study Area 8, Former Wastewater Treatment Plant Lagoons
Naval Training Center
Orlando, Florida

Identifier: Sampling Date:	08B00101 31-Aug-94	08B00201 31-Aug-94	08B00301 01-Sep-94	08B00401 01-Sep-94	08B00501 18-Oct-94	08B00601 18-Oct-94	08B00701 19-Oct-94	08B00701D 19-Oct-94	08B00801 19-Oct-94	08B00901 19-Oct-94
4,4'-DDD	3.9 U	4 U	3.9 U	4 U	3.9 U	3.9 U	4 U	4 U	3.9 U	4 U
4,4'-DDE	3.9 U	4 U	3.9 U	4 U	3.9 U	3.9 U	4 U	4 U	3.9 U	4.7
4,4'-DDT	3.9 U	4 U	3.9 U	4 U	3.9 U	3.9 U	4 U	4 U	3.9 U	3.8 J
Aldrin	2 U	2.1 U	2 U	2.1 U	2 U	2 U	2 U	2 U	2 U	2 U
alpha-BHC	2 U	2.1 U	2 U	2.1 U	2 U	2 U	2 U	2 U	2 U	2 U
alpha-Chlordane	2 U	2.1 U	2 U	2.1 U	2 U	2 U	2 U	2 U	2 U	2 U
Aroclor-1016	39 U	40 U	39 U	40 U	39 U	39 U	40 U	40 U	39 U	40 U
Aroclor-1221	80 U	82 U	80 U	82 U	79 U	80 U	81 U	81 U	80 U	81 U
Aroclor-1232	39 U	40 U	39 U	40 U	39 U	39 U	40 U	40 U	39 U	40 U
Aroclor-1242	39 U	40 U	39 U	40 U	39 U	39 U	40 U	40 U	39 U	40 U
Aroclor-1248	39 U	40 U	39 U	40 U	39 U	39 U	40 U	40 U	39 U	40 U
Aroclor-1254	39 U	40 U	39 U	40 U	39 U	39 U	40 U	40 U	39 U	40 U
Aroclor-1260	39 U	40 U	39 U	40 U	39 U	39 U	40 U	40 U	39 U	40 U
beta-BHC	2 U	2.1 U	2 U	2.1 U	2 U	2 U	2 U	2 U	2 U	2 U
delta-BHC	2 U	2.1 U	2 U	2.1 U	2 U	2 U	2 U	2 U	2 U	2 U
Dieldrin	3.9 U	4 U	3.9 U	4 U	3.9 U	3.9 U	4 U	4 U	3.9 U	4 U
Endosulfan I	2 U	2.1 U	2 U	2.1 U	2 U	2 U	2 U	2 U	2 U	2 U
Endosulfan II	3.9 U	4 U	3.9 U	4 U	3.9 U	3.9 U	4 U	4 U	3.9 U	4 U
Endosulfan sulfate	3.9 U	4 U	3.9 U	4 U	3.9 U	3.9 U	4 U	4 U	3.9 U	4 U
Endrin	3.9 U	4 U	3.9 U	4 U	3.9 U	3.9 U	4 U	4 U	3.9 U	4 U
Endrin aldehyde	3.9 U	4 U	3.9 U	4 U	3.9 U	3.9 U	4 U	4 U	3.9 U	4 U
Endrin ketone	3.9 U	4 U	3.9 U	4 U	3.9 U	3.9 U	4 U	4 U	3.9 U	4 U
gamma-BHC (Lindane)	2 U	2.1 U	2 U	2.1 U	2 U	2 U	2 U	2 U	2 U	2 U
gamma-Chlordane	2 U	2.1 U	2 U	2.1 U	2 U	2 U	2 U	2 U	2 U	2 U
Heptachlor	2 U	2.1 U	2 U	2.1 U	2 U	2 U	2 U	2 U	2 U	2 U
Heptachlor epoxide	2 U	2.1 U	2 U	2.1 U	2 U	2 U	2 U	2 U	2 U	2 U
Methoxychlor	20 U	21 U	20 U	21 U	20 U	20 U	20 U	20 U	20 U	20 U
Toxaphene	200 U	210 U	200 U	210 U	200 U	200 U	200 U	200 U	200 U	200 U

See notes at end of table.

Table E-3 (Continued)
Summary of Soil Analytical Results
Target Compound List Pesticides/PCBs

Base Realignment and Closure, Environmental Site Screening Report
Study Area 8, Former Wastewater Treatment Plant Lagoons
Naval Training Center
Orlando, Florida

Notes: Analytical results expressed in micrograms per kilogram soil dry weight.

PCB = polychlorinated biphenyl.

DDD = dichlorodiphenyldichloroethane.

DDE = dichlorodiphenyldichloroethene.

DDT = dichlorodiphenyltrichloroethane.

U = Compound not detected at the contract-required quantitation limit.

BHC = benzene hexachloride.

J = Reported concentration is an estimated quantity.

N = Presumptive evidence of the presence of a compound.

APPENDIX E-4

**SUMMARY OF SOIL ANALYTICAL RESULTS, HERBICIDES - SW 846
METHOD 8150**

Table E-4
Summary of Soil Analytical Results
Herbicides - SW 846 Method 8150

Base Realignment and Closure, Environmental Site Screening Report
 Study Area 8, Former Wastewater Treatment Plant Lagoons
 Naval Training Center
 Orlando, Florida

Identifier:	08S00100	08S00200	08S00300	08S00400	08S00500	08S00600	08S00700	08S00800
Sampling Date:	30-Aug-94							
2,4,5-T	23 U	23 U	23 U	25 U	25 U	23 U	23 U	23 U
2,4-D	110 U	110 U	110 U	120 U	130 U	110 U	110 U	110 U
2,4-DB	110 U	110 U	110 U	120 U	130 U	110 U	110 U	110 U
2,4-DP (Dichloroprop)	110 U	110 U	110 U	120 U	130 U	110 U	110 U	110 U
Dalapon	230 U	230 U	230 U	250 U	250 U	230 U	230 U	230 U
Dicamba	23 U	23 U	23 U	25 U	25 U	23 U	23 U	23 U
Dinoseb	23 U	23 U	23 U	25 U	25 U	23 U	23 U	23 U
MCPA	14000 U	11000 U	11000 U	25000 U	25000 U	23000 U	11000 U	14000 U
MCPP	11000 U	11000 U	11000 U	12000 U	13000 U	11000 U	11000 U	11000 U
Silvex (2,4,5-TP)	23 U	23 U	23 U	25 U	25 U	23 U	23 U	23 U
See notes at end of table.								

Table E-4 (Continued)
Summary of Soil Analytical Results
Herbicides - SW 846 Method 8150

Base Realignment and Closure, Environmental Site Screening Report
Study Area 8, Former Wastewater Treatment Plant Lagoons
Naval Training Center
Orlando, Florida

Identifier:	08B00101	08B00201	08B00301	08B00401	08B00501	08B00601	08B00701	08B00701D	08B00801	08B00901
Sampling Date:	31-Aug-94	31-Aug-94	01-Sep-94	01-Sep-94	18-Oct-94	18-Oct-94	19-Oct-94	19-Oct-94	19-Oct-94	19-Oct-94
2,4,5-T	24 U	24 U	24 U	24 U	12 U					
2,4-D	120 U	120 U	120 U	120 U	59 U	60 U				
2,4-DB	120 U	120 U	120 U	120 U	59 U	60 U				
2,4-DP (Dichloroprop)	120 U	120 U	120 U	120 U	59 U	60 U				
Dalapon	240 U	240 U	240 U	240 U	120 U					
Dicamba	24 U	24 U	24 U	24 U	12 U					
Dinoseb	24 U	24 U	24 U	24 U	12 U					
MCPA	12000 U	12000 U	12000 U	12000 U	24000 U	12000 U	6000 U	6000 U	6000 U	6000 U
MCPP	12000 U	12000 U	12000 U	12000 U	5900 U	6000 U				
Silvex (2,4,5-TP)	24 U	24 U	24 U	24 U	12 U					

Notes: Analytical results expressed in micrograms per kilogram soil dry weight.
SW = solid waste (USEPA test methods for evaluating solid waste).
U = Compound not detected at the quantitation limit.

APPENDIX E-5

**SUMMARY OF SOIL ANALYTICAL RESULTS,
TARGET ANALYTE LIST METALS**

Table E-5
Summary of Soil Analytical Results
Target Analyte List Metals

Base Realignment and Closure, Environmental Site Screening Report
Study Area 8, Former Wastewater Treatment Plant Lagoons
Naval Training Center
Orlando, Florida

Identifier:	08S00100	08S00200	08S00300	08S00400	08S00500	08S00600	08S00700	08S00800
Sampling Date:	30-Aug-94							
Aluminum	152	153	145	1420	812	1750	2160	252
Antimony	4.5 U	4.4 U	4.4 U	4.7 U	5 U	4.6 U	4.5 U	4.5 U
Arsenic	1.5 U	4	9.1	4.9	7.2	45.2	577	12.2
Barium	57.2	3.5 B	1.6 B	9.9 B	11.2 B	26.3 B	33.8 B	2.7 B
Beryllium	0.05 UJ	0.21 J	0.25 J	0.05 UJ				
Cadmium	0.68 U	0.93 B	0.66 U	0.71 U	0.98 B	1.6	1.3	0.68 U
Calcium	6600	11500	1410	9490	4510	97900	47000	8420
Chromium	2 U	1.5 U	1.7 U	43.7	15.4	39.4	12.7	3.3 U
Cobalt	0.69 U	0.68 U	0.68 U	0.73 U	0.78 U	0.71 U	0.69 U	0.7 U
Copper	7.4	3.9 B	1.7 B	9.4	11.2	14.5	6.4	6.3
Iron	782 J	115 J	63.7 J	600 J	577 J	1210 J	776 J	1010 J
Lead	134	21	5.2	38.1	38.8	140	1250 UJ	30.3
Magnesium	96.1 B	110 B	21.3 B	118 B	124 B	1040 B	1410	95.4 B
Manganese	15.1	4.2	1.8 B	9.7	25.4	45.5	80.7	10.8
Mercury	0.03 B	0.03 B	0.01 U	0.19	0.23	0.67	0.08	0.06
Nickel	2.1 U	2.1 U	2.1 U	2.3 U	2.4 U	3.3 B	2.1 U	2.1 U
Potassium	86.9 U	68.6 U	78.8 U	73.6 U	78.4 U	179 B	213 B	69.9 U
Selenium	0.46 U	0.45 U	0.45 U	0.66 U	0.51 U	0.47 U	0.45 U	0.49 U
Silver	0.6 U	0.79 B	0.62 B	103	28.5	5.1	7.3	1.1 B
Sodium	31.8 B	3.6 U	3.5 U	3.8 U	4.1 U	24.3 B	29.5 B	13.2 B
Thallium	0.3 U	0.3 U	0.29 U	0.32 U	0.34 U	0.31 U	0.3 U	0.3 U
Vanadium	1.1 B	0.6 U	0.6 U	1.9 B	1.5 B	6.6 B	3.8 B	0.69 B
Zinc	301	24.9	2.8 U	37.7	63.1	75.1	64.2	70.2

See notes at end of table.

Table E-5 (Continued)
Summary of Soil Analytical Results
Target Analyte List Metals

Base Realignment and Closure, Environmental Site Screening Report
 Study Area 8, Former Wastewater Treatment Plant Lagoons
 Naval Training Center
 Orlando, Florida

Identifier:	08B00101	08B00201	08B00301	08B00401	08B00501	08B00601	08B00701	08B00701D	08B00801	08B00901
Sampling Date:	31-Aug-94	31-Aug-94	01-Sep-94	01-Sep-94	18-Oct-94	18-Oct-94	19-Oct-94	19-Oct-94	19-Oct-94	19-Oct-94
Aluminum	8.3 U	7.6 U	5.9 U	12.3 U	75.2	714	155	156	13.1 B	1720
Antimony	4.5 U	4.6 U	4.7 U	4.8 U	4.6 U	4.8 U	4.6 U	4.7 U	4.7 U	4.7 U
Arsenic	1.2 U	1.4 U	1.4 U	5.6	0.44 U	0.48 B	0.54 J	0.46 U	0.45 U	5
Barium	0.29 B	0.32 J	0.39 J	0.29 B	7.1 J	1.4 J	0.88 J	0.96 J	0.43 J	13.9 J
Beryllium	0.05 UJ	0.14 B	0.05 U							
Cadmium	0.68 U	0.7 U	0.7 U	0.72 U	0.69 U	0.73 U	0.7 U	0.71 U	0.7 U	0.71 U
Calcium	43.6 B	45.5 B	58.2 B	123 B	275 B	625 B	352 B	805 B	41.7 J	1010 B
Chromium	0.66 U	1 U	0.88 U	1.4 U	0.88 B	1 B	0.96 B	0.91 B	0.66 B	1.2 B
Cobalt	0.7 U	0.72 U	0.72 U	0.74 U	0.71 U	0.75 U	0.72 U	0.73 U	0.72 U	0.73 U
Copper	0.4 U	0.5 B	0.41 U	0.43 U	1.1 B	0.43 U	1.3 B	0.42 U	0.41 U	3 B
Iron	59.6 U	61.5	28.3 U	121	71.5	49.5	31.5	28.6	96.3	182
Lead	0.19 U	0.2 U	0.2 U	0.22 U	0.65 J	1.1	0.56 J	0.67 B	0.22 B	2 UJ
Magnesium	4.3 U	5.1 B	4.4 U	4.6 U	4.4 UJ	20.3 J	8.8 J	11.5 J	4.4 UJ	145 B
Manganese	0.39 B	0.45 B	0.15 B	0.89 B	1.4 B	0.36 B	0.6 B	0.57 B	0.85 B	2.5 B
Mercury	0.01 U	0.01 U	0.01 B	0.02 U	0.01 U	0.06 U	0.04 U	0.02 U	0.04 U	0.07 U
Nickel	2.1 U	2.2 U	2.2 U	2.3 U	2.2 U	2.3 U	2.2 U	2.2 U	2.2 U	2.2 U
Potassium	70 U	72 U	72.3 U	74.5 U	71.3 U	75.2 U	72.1 U	73.4 U	72.5 U	73.4 U
Selenium	0.49 U	0.47 U	0.47 U	0.49 U	0.47 U	0.49 UJ	0.47 UJ	0.48 U	0.47 U	0.48 UJ
Silver	0.6 U	0.62 U	0.62 U	0.64 U	0.75 B	0.65 U	0.62 U	0.63 U	0.62 U	1.2 B
Sodium	3.6 U	3.7 U	4.9 U	3.9 U	5.1 U	7.1 U	21.2 U	6.2 U	5.4 U	155000
Thallium	0.3 U	0.31 U	1 B	0.31 U	0.31 U	0.32 U	0.31 U	0.32 U	0.31 U	0.32 U
Vanadium	0.62 U	0.63 U	0.65 U	0.66 U	0.63 U	0.66 U	0.64 U	0.91 B	0.64 U	0.65 U
Zinc	1 U	20	1.2 U	1.8 U	0.88 U	0.46 U	0.42 U	0.33 U	0.34 U	7.2

Notes: Analytical results expressed in milligrams per kilogram soil dry weight.

U = Analyte not detected at the reporting limit.

B = Reported concentration is between the instrument detection limit and the contract-required detection limit.

J = Reported concentration is an estimated quantity.

APPENDIX E-6

**SUMMARY OF GROUNDWATER ANALYTICAL RESULTS,
LOW DETECTION LIMIT VOLATILE ORGANIC COMPOUNDS**

Table E-6
Summary of Groundwater Analytical Results
Low Detection Limit Volatile Organic Compounds

Base Realignment and Closure, Environmental Site Screening Report
 Study Area 8, Former Wastewater Treatment Plant Lagoons
 Naval Training Center
 Orlando, Florida

Identifier: Sampling Date:	08G00101 16-Sep-94	08G00201 16-Sep-94	08G00301 16-Sep-94	08G00401 16-Sep-94	08G00401D 16-Sep-94	08G00501 11-Nov-94	08G00601 11-Nov-94	08G00701 11-Nov-94	08G00801 11-Nov-94	08G00901 11-Nov-94
1,1,1-Trichloroethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2,2-Tetrachloroethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2-Trichloroethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dibromo-3-chloropropane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dibromomethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichlorobenzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloroethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloropropane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,3-Dichlorobenzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,4-Dichlorobenzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
2-Butanone	R	R	R	R	R	R	R	R	R	R
2-Hexanone	5 U	R	R	R	R	R	R	R	R	5 U
4-Methyl-2-pentanone	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Acetone	R	R	R	R	R	R	R	R	R	R
Benzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromochloromethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromodichloromethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromoform	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromomethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Carbon disulfide	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Carbon tetrachloride	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chlorobenzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloroethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloroform	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloromethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
cis-1,2-Dichloroethene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
cis-1,3-Dichloropropene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Dibromochloromethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Ethylbenzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Methylene chloride	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Styrene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U

See notes at end of table.

Table E-6 (Continued)
Summary of Groundwater Analytical Results
Low Detection Limit Volatile Organic Compounds

Base Realignment and Closure, Environmental Site Screening Report
Study Area 8, Former Wastewater Treatment Plant Lagoons
Naval Training Center
Orlando, Florida

Identifier: Sampling Date:	08G00101 16-Sep-94	08G00201 16-Sep-94	08G00301 16-Sep-94	08G00401 16-Sep-94	08G00401D 16-Sep-94	08G00501 11-Nov-94	08G00601 11-Nov-94	08G00701 11-Nov-94	08G00801 11-Nov-94	08G00901 11-Nov-94
Tetrachloroethene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Toluene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
trans-1,2-Dichloroethene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
trans-1,3-Dichloropropene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichloroethene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Vinyl chloride	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Xylene (total)	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U

Notes: Analytical results expressed in micrograms per liter.

U = Compound not detected at the quantitation limit.

J = Reported concentration is an estimated quantity.

R = Data rejected during data validation.

APPENDIX E-7

**SUMMARY OF GROUNDWATER ANALYTICAL RESULTS,
TARGET ANALYTE LIST SEMIVOLATILE ORGANIC COMPOUNDS**

Table E-7
Summary of Groundwater Analytical Results
Target Analyte List Semivolatile Organic Compounds

Base Realignment and Closure, Environmental Site Screening Report
Study Area 8, Former Wastewater Treatment Plant Lagoons
Naval Training Center
Orlando, Florida

Identifier: Sampling Date:	08G00101 16-Sep-94	08G00201 16-Sep-94	08G00301 16-Sep-94	08G00401 16-Sep-94	08G00401D 16-Sep-94	08G00501 11-Nov-94	08G00601 11-Nov-94	08G00701 11-Nov-94	08G00801 11-Nov-94	08G00901 11-Nov-94
1,2,4-Trichlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U				
1,2-Dichlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U				
1,3-Dichlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U				
1,4-Dichlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U				
2,2'-oxybis(1-Chloropropane)	10 U	10 U	10 U	10 U	10 U	10 U				
2,4,5-Trichlorophenol	25 U	25 U	25 U	25 U	25 U	25 U				
2,4,6-Trichlorophenol	10 U	10 U	10 U	10 U	10 U	10 U				
2,4-Dichlorophenol	10 U	10 U	10 U	10 U	10 U	10 U				
2,4-Dimethylphenol	10 U	10 U	10 U	10 U	10 U	10 U				
2,4-Dinitrophenol	25 U	25 U	25 U	25 U	25 U	25 U				
2,4-Dinitrotoluene	10 U	10 U	10 U	10 U	10 U	10 U				
2,6-Dinitrotoluene	10 U	10 U	10 U	10 U	10 U	10 U				
2-Chloronaphthalene	10 U	10 U	10 U	10 U	10 U	10 U				
2-Chlorophenol	10 U	10 U	10 U	10 U	10 U	10 U				
2-Methylnaphthalene	10 U	10 U	10 U	10 U	10 U	10 U				
2-Methylphenol	10 U	10 U	10 U	10 U	10 U	10 U				
2-Nitroaniline	25 U	25 U	25 U	25 U	25 U	25 U				
2-Nitrophenol	10 U	10 U	10 U	10 U	10 U	10 U				
3,3'-Dichlorobenzidine	10 U	10 U	10 U	10 U	10 U	10 U				
3-Nitroaniline	25 U	25 U	25 U	25 U	25 U	25 U				
4,6-Dinitro-2-methylphenol	25 U	25 U	25 U	25 U	25 U	25 U				
4-Bromophenyl-phenylether	10 U	10 U	10 U	10 U	10 U	10 U				
4-Chloro-3-methylphenol	10 U	10 U	10 U	10 U	10 U	10 U				
4-Chloroaniline	10 U	10 U	10 U	10 U	10 U	10 U				
4-Chlorophenyl-phenylether	10 U	10 U	10 U	10 U	10 U	10 U				
4-Methylphenol	10 U	10 U	10 U	10 U	10 U	10 U				
4-Nitroaniline	25 U	25 U	25 U	25 U	25 U	25 U				
4-Nitrophenol	25 U	25 U	25 U	25 U	25 U	25 U				
Acenaphthene	10 U	10 U	10 U	10 U	10 U	10 U				
Acenaphthylene	10 U	10 U	10 U	10 U	10 U	10 U				
Anthracene	10 U	10 U	10 U	10 U	10 U	10 U				
Benzo(a)anthracene	10 U	10 U	10 U	10 U	10 U	10 U				
Benzo(a)pyrene	0.1 UJ	0.1 U	0.1 U	0.1 UJ	0.1 UJ	0.1 U				
Benzo(k)fluoranthene	10 U	10 U	10 U	10 U	10 U	10 U				
bis(2-Chloroethoxy)methane	10 U	10 U	10 U	10 U	10 U	10 U				
See notes at end of table.										

Table E-7 (Continued)
Summary of Groundwater Analytical Results
Target Analyte List Semivolatile Organic Compounds

Base Realignment and Closure, Environmental Site Screening Report
 Study Area 8, Former Wastewater Treatment Plant Lagoons
 Naval Training Center
 Orlando, Florida

Identifier: Sampling Date:	08G00101 16-Sep-94	08G00201 16-Sep-94	08G00301 16-Sep-94	08G00401 16-Sep-94	08G00401D 16-Sep-94	08G00501 11-Nov-94	08G00601 11-Nov-94	08G00701 11-Nov-94	08G00801 11-Nov-94	08G00901 11-Nov-94
bis(2-Chloroethyl)ether	10 U	10 U	10 U	10 U	10 U	10 U				
bis(2-Ethylhexyl)phthalate	1 U	1 U	1 U	1 U	1 U	3	1 U	1 U	1 U	1 U
Butylbenzylphthalate	10 U	10 U	10 U	10 U	10 U	10 U				
Carbazole	10 U	10 U	10 U	10 U	10 U	10 U				
Chrysene	10 U	10 U	10 U	10 U	10 U	10 U				
Di-n-butylphthalate	10 U	10 U	10 U	10 U	10 U	10 U				
Di-n-octylphthalate	10 U	10 U	10 U	10 U	10 U	10 U				
Dibenz(a,h)anthracene	10 U	10 U	10 U	10 U	10 U	10 U				
Dibenzofuran	10 U	10 U	10 U	10 U	10 U	10 U				
Diethylphthalate	10 U	10 U	10 U	10 U	10 U	10 U				
Dimethylphthalate	10 U	10 U	10 U	10 U	10 U	10 U				
Fluoranthene	10 U	10 U	10 U	10 U	10 U	10 U				
Fluorene	10 U	10 U	10 U	10 U	10 U	10 U				
Hexachlorobenzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Hexachlorobutadiene	10 U	10 U	10 U	10 U	10 U	10 U				
Hexachlorocyclopentadiene	10 U	10 U	10 U	10 U	10 U	10 U				
Hexachloroethane	10 U	10 U	10 U	10 U	10 U	10 U				
Indeno(1,2,3-cd)pyrene	10 U	10 U	10 U	10 U	10 U	10 U				
Isophorone	10 U	10 U	10 U	10 U	10 U	10 U				
N-Nitroso-di-n-propylamine	10 U	10 U	10 U	10 U	10 U	10 U				
N-Nitrosodiphenylamine ¹	10 U	10 U	10 U	10 U	10 U	10 U				
Naphthalene	10 U	10 U	10 U	3 J	4 J	10 U				
Nitrobenzene	10 U	10 U	10 U	10 U	10 U	10 U				
Pentachlorophenol	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Phenanthrene	10 U	10 U	10 U	10 U	10 U	10 U				
Phenol	10 U	10 U	10 U	10 U	10 U	10 U				
Pyrene	10 U	10 U	10 U	10 U	10 U	10 U				

¹ Cannot be separated from diphenylamine.

Notes: Analytical results expressed in micrograms per liter.

Low detection limit analytical results indicated for Benzo(a)pyrene were obtained using High Pressure Liquid Chromatography, Method 8310(MOD). Except for samples 08G00501, 08G00601, and 08G00901, reported concentrations for this compound are from sample reanalyses (the same values were obtained from the original analyses).

Low detection limit analytical results indicated for bis(2-Ethylhexyl)phthalate, hexachlorobenzene, and pentachlorophenol were obtained using Selective Ion Monitoring chromatography.

U = Compound not detected at the contract-required quantitation limit.

J = Reported concentration is an estimated quantity.

APPENDIX E-8

**SUMMARY OF GROUNDWATER ANALYTICAL RESULTS,
TARGET COMPOUND LIST PESTICIDES/PCBs**

Table E-8
Summary of Groundwater Analytical Results
Target Compound List Pesticides/PCBs

Base Realignment and Closure, Environmental Site Screening Report
Study Area 8, Former Wastewater Treatment Plant Lagoons
Naval Training Center
Orlando, Florida

Identifier:	08G00101	08G00201	08G00301	08G00401	08G00401D	08G00501	08G00601	08G00701	08G00801	08G00901
Sampling Date:	16-Sep-94	16-Sep-94	16-Sep-94	16-Sep-94	16-Sep-94	11-Nov-94	11-Nov-94	11-Nov-94	11-Nov-94	11-Nov-94
4,4'-DDD	0.5 U	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 U
4,4'-DDE	0.5 U	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 U
4,4'-DDT	0.5 U	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 U
Aldrin	0.25 U	0.05 UJ	0.05 U	0.05 U	0.05 U	0.05 UJ	0.05 U	0.05 U	0.05 U	0.05 U
alpha-BHC	0.25 U	0.05 UJ	0.05 U	0.05 U	0.05 U	0.05 UJ	0.05 U	0.05 U	0.05 U	0.05 U
alpha-Chlordane	0.25 U	0.05 UJ	0.05 U	0.05 U	0.05 U	0.05 UJ	0.05 U	0.05 U	0.05 U	0.05 U
Aroclor-1016	2.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U
Aroclor-1221	2.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U
Aroclor-1232	2.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U
Aroclor-1242	2.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U
Aroclor-1248	2.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U
Aroclor-1254	2.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U
Aroclor-1260	2.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U
beta-BHC	0.25 U	0.05 UJ	0.05 U	0.05 U	0.05 U	0.05 UJ	0.05 U	0.05 U	0.05 U	0.05 U
delta-BHC	0.25 U	0.05 UJ	0.05 U	0.05 U	0.05 U	0.05 UJ	0.05 U	0.05 U	0.05 U	0.05 U
Dieldrin	0.5 U	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 U
Endosulfan I	0.25 U	0.05 UJ	0.05 U	0.05 U	0.05 U	0.05 UJ	0.05 U	0.05 U	0.05 U	0.05 U
Endosulfan II	0.5 U	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 U
Endosulfan sulfate	0.5 U	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 U
Endrin	0.5 U	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 U
Endrin aldehyde	0.5 U	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 U
Endrin ketone	0.5 U	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 U
gamma-BHC (Lindane)	0.25 U	0.05 UJ	0.05 U	0.05 U	0.05 U	0.05 UJ	0.05 U	0.05 U	0.05 U	0.05 U
gamma-Chlordane	0.25 U	0.05 UJ	0.05 U	0.05 U	0.05 U	0.05 UJ	0.05 U	0.05 U	0.05 U	0.05 U
Heptachlor	0.25 U	0.05 UJ	0.05 U	0.05 U	0.05 U	0.05 UJ	0.05 U	0.05 U	0.05 U	0.05 U
Heptachlor epoxide	0.25 U	0.05 UJ	0.05 U	0.05 U	0.05 U	0.05 UJ	0.05 U	0.05 U	0.05 U	0.05 U
Methoxychlor	2.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U
Toxaphene	25 U	5 UJ	5 U	5 U	5 U	5 UJ	5 U	5 U	5 U	5 U

See notes at end of table.

Table E-8
Summary of Groundwater Analytical Results
Target Compound List Pesticides/PCBs

Base Realignment and Closure, Environmental Site Screening Report
Study Area 8, Former Wastewater Treatment Plant Lagoons
Naval Training Center
Orlando, Florida

Notes: Analytical results expressed in micrograms per liter.

PCB = polychlorinated biphenyl.

DDD = dichlorodipenyldichloroethane.

DDE = dichlorodiphenyldichloroethene.

DDT = dichlorodiphenyltrichloroethane.

U = Compound not detected at the contract-required quantitation limit.

J = Reported concentration is an estimated quantity.

BHC = benzene hexachloride.

APPENDIX E-9

**SUMMARY OF GROUNDWATER ANALYTICAL RESULTS,
HERBICIDES - SW 846 METHOD 8150**

Table E-9
Summary of Groundwater Analytical Results
Herbicides - SW 846 Method 8150

Base Realignment and Closure, Environmental Site Screening Report
Study Area 8, Former Wastewater Treatment Plant Lagoons
Naval Training Center
Orlando, Florida

Identifier:	08G00101	08G00201	08G00301	08G00401	08G00401D	08G00501	08G00601	08G00701	08G00801	08G00901
Sampling Date:	16-Sep-94	16-Sep-94	16-Sep-94	16-Sep-94	16-Sep-94	11-Nov-94	11-Nov-94	11-Nov-94	11-Nov-94	11-Nov-94
2,4,5-T	0.5 U									
2,4-D	2.5 U									
2,4-DB	2.5 U									
2,4-DP (Dichloroprop)	2.5 U									
Dalapon	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Dicamba	0.5 U									
Dinoseb	0.5 U									
MCPA	250 U									
MCPP	250 U									
Silvex (2,4,5-TP)	0.5 U									

Notes: Analytical results expressed in micrograms per liter.

SW =

U = Compound not detected at the quantitation limit.

APPENDIX E-10

**SUMMARY OF GROUNDWATER ANALYTICAL RESULTS,
TARGET ANALYTE LIST METALS**

Table E-10
Summary of Groundwater Analytical Results
Target Analyte List Metals

Base Realignment and Closure, Environmental Site Screening Report
Study Area 8, Former Wastewater Treatment Plant Lagoons
Naval Training Center
Orlando, Florida

Identifier:	08G00101	08G00201	08G00301	08G00401	08G00401D	08G00501	08G00502
Sampling Date:	16-Sep-94	16-Sep-94	16-Sep-94	16-Sep-94	16-Sep-94	11-Nov-94	29-Dec-95
Aluminum	150 B	263	370	269	235	1540	809
Antimony	1.6 B	2.3 B	4.8 B	4.6 B	5.6	1.2 U	13.9 U
Arsenic	425	309	268	322	319	2.9 U	1.7 B
Barium	10.1 B	18.6 B	8.7 B	10 B	8.8 B	38.9 B	77.8 B
Beryllium	0.21 UJ	0.2 U	0.28 U				
Cadmium	2.9 U	2.1 U	2.2 U				
Calcium	72300	46700	44900	70200	64700	40900	36400
Chromium	3.8 B	7.2 B	6.9 B	6 B	5.1 B	3.1 B	5.6 B
Cobalt	3 U	3 U	3 U	3 U	3 U	2.6 U	2.7 U
Copper	1.7 U	1.7 U	1.7 U	1.8 B	1.7 U	9.1 U	24.5 B
Iron	114	391	64.2 B	611	539	837	924
Lead	0.83 U	2 B	1 U				
Magnesium	5830	5360	5020	6220	5750	2650 B	1780 B
Manganese	11.3 B	26.6	14.4 B	8.8 B	8.5 B	69.9	97.4
Mercury	0.06 U	0.24 U	0.44				
Nickel	15.9 B	28.9 B	9.2 U	9.2 U	14.3 B	9.3 B	8 B
Potassium	14300	13200	14600	20600	19300	8910	8160
Selenium	2 UJ	2 U	2.3 U				
Silver	2.6 U	2.2 U	5.7 J				
Sodium	14800	9080	8970	13300	12200	6360	2920 J
Thallium	1.3 U	1.3 UJ	2.4 U				
Vanadium	2.7 U	2.7 U	2.7 U	2.8 B	3.4 U	2.5 U	3.9 B
Zinc	5.8 U	3.4 U	83.9	13.5 U	10.7 U	9.6 B	29.3

See notes at end of table.

**Appendix E-10 (Continued)
Summary of Groundwater Analytical Results
Target Analyte List Metals**

Base Realignment and Closure, Environmental Site Screening Report
Study Area 8, Former Wastewater Treatment Plant Lagoons
Naval Training Center
Orlando, Florida

Identifier	08G00601	08G00701	08G00801	08G00901	08G00902
Sampling Date	11-Nov-94	11-Nov-94	11-Nov-94	11-Nov-94	29-Dec-95
Aluminum	2120	510	4370	2330	976
Antimony	1.5 U	1.2 U	3.2 UJ	5.1 UJ	13.9 U
Arsenic	2 U	45.2	24.9	23.9	27.3
Barium	5.5 B	14.8 B	14.9 B	58.3 B	44.8 B
Beryllium	0.2 U	0.2 U	0.2 U	0.2 U	0.28 U
Cadmium	2.1 U	2.1 U	2.1 U	2.1 U	2.2 U
Calcium	123000	50700	44900	40800	39000
Chromium	3.5 B	1.9 U	7.7 B	1.9 U	2.6 U
Cobalt	2.6 U	2.6 U	2.6 U	2.6 U	2.7 U
Copper	3.2 U	2.8 U	3.6 U	10.3 U	12.3 U
Iron	120	35.6 B	317	406	185
Lead	2.4 B	1.3 U	8.2	12.6 U	3.2 U
Magnesium	3730 B	2330 B	4570 B	7420	3670 B
Manganese	23.8	2.5 B	16.3	13.7 B	2.8 B
Mercury	0.02 U	0.02 U	0.11 U	0.02 U	0.08 U
Nickel	9.1 U	9.1 U	9.1 U	16 B	7.3 U
Potassium	3720 B	9920	12600	14900	8640
Selenium	2 U	2 U	2 U	2 UJ	2.3 U
Silver	2.2 U	2.2 U	2.2 U	2.2 U	2.3 UR
Sodium	13400	3260 B	6090	248000	59800 J
Thallium	1.3 UJ	1.3 U	1.3 UJ	1.3 UJ	2.4 UJ
Vanadium	5.6 B	8.6 B	2.5 U	8.6 B	7.5 B
Zinc	2.1 B	1.1 U	1.9 B	47	30.2

Notes: Analytical results expressed in micrograms per liter.

U = Analyte not detected at the reporting limit.

B = Reported concentration is between the instrument detection limit and the contract-required detection limit.

J = Reported concentration is an estimated quantity.

R = Analyte result rejected upon data validation.

APPENDIX E-11

**SUMMARY OF GROUNDWATER ANALYTICAL RESULTS,
RADIOLOGICAL PARAMETERS**

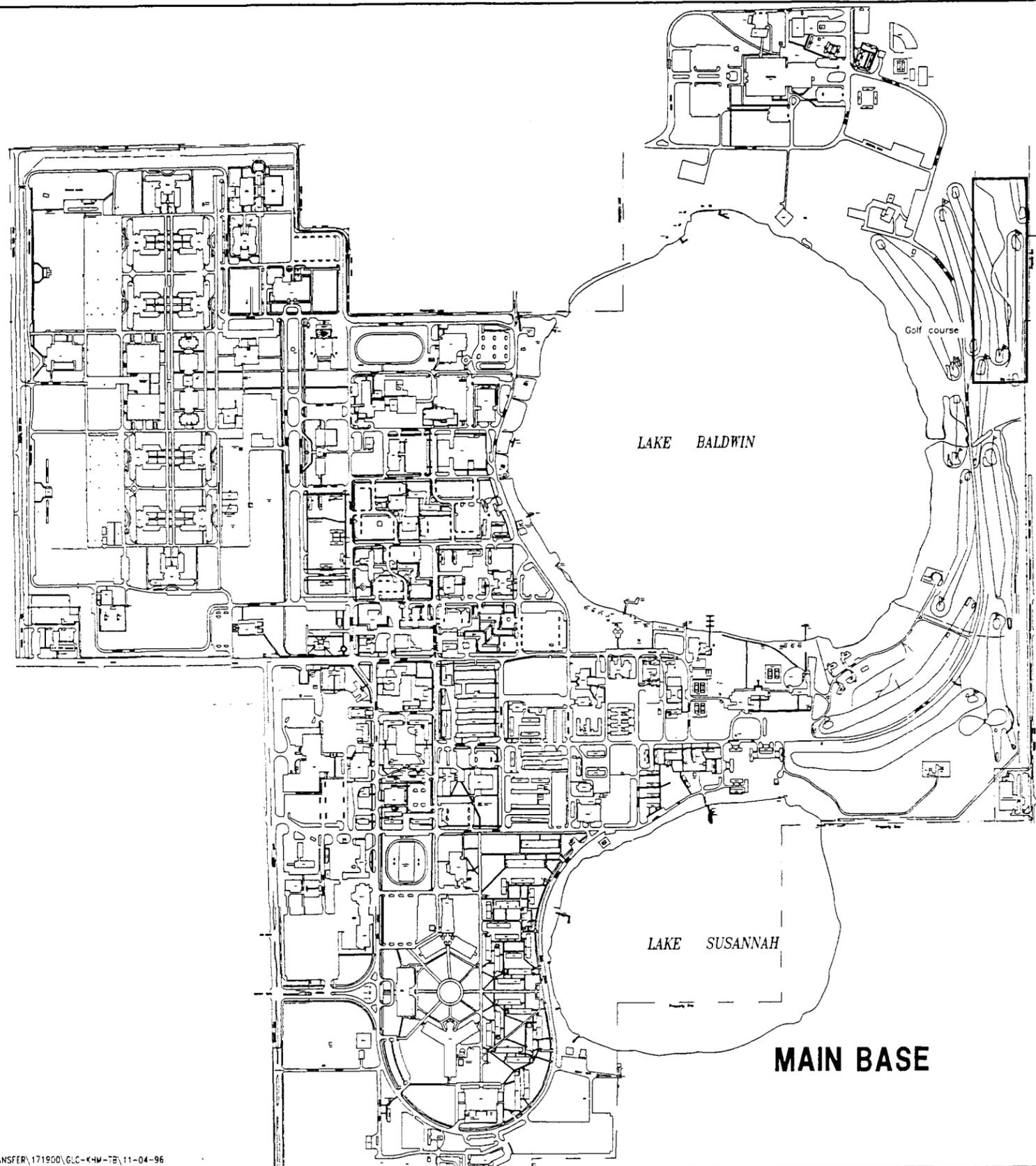
Table E-11
Summary of Groundwater Analytical Results
Radiological Parameters

Base Realignment and Closure, Environmental Site Screening Report
Study Area 8, Former Wastewater Treatment Plant Lagoons
Naval Training Center
Orlando, Florida

Identifier:	08G00501	08G00601	08G00602	08G00701	08G00801	08G00901
Sampling Date:	10-Nov-94	10-Nov-94	17-Jun-96	10-Nov-94	10-Nov-94	10-Nov-94
Gross Alpha	2.2	18.1	0.39	2.9	12.5	1 U
Gross Beta	8.6	3 U	NA	6.6	15	14.7
Actinium-228	26.2 U	40.8 U	NA	28 U	42.1 U	27.6 U
Bismuth-212	192 U	119 U	NA	208 U	85.9 U	247 U
Bismuth-214	18.3 U	29.8 U	NA	18 U	27.8 U	18.9 U
Cesium-137	4.8 U	9.7 U	NA	5.9 U	5.7 U	2.6 U
Lead-212	15.6 U	21.9 U	NA	15.6 U	19.3 U	16.4 U
Lead-214	18 U	30.5 U	NA	16.2 U	25 U	16.1 U
Potassium-40	89.4 U	249 U	NA	93.1 U	211 U	95 U
Thallium-208	8.2 U	13.6 U	NA	7.7 U	11.4 U	8.2 U
Thorium-228	542 U	1280 U	NA	590 U	1130 U	565 U
Thorium-234	325 U	754 U	NA	343 U	769 U	332 U
Uranium-235	34.7 U	43.2 U	NA	39.8 U	61.4 U	34.2 U

Notes: All results expressed in picocuries per liter.

U = Parameter was not detected.
NA = Not analyzed.



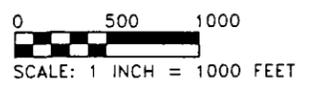
STUDY AREA 8

LAKE BALDWIN

Golf course

LAKE SUSANNAH

MAIN BASE



SOURCE: ABB-ES 1994b.

FIGURE 1-1
LOCATION OF STUDY AREA 8



**BASE REALIGNMENT AND
CLOSURE ENVIRONMENTAL SITE
SCREENING REPORT**

**NAVAL TRAINING CENTER
ORLANDO, FLORIDA**