

N60200.AR.009149
NAS CECIL FIELD
5090.3a

SAMPLING AND ANALYSIS OUTLINE FOR BUILDING 624 NAS CECIL FIELD FL
11/1/1997
ABB ENVIRONMENTAL

SAMPLING AND ANALYSIS REPORT

BUILDING 624

BASE REALIGNMENT AND CLOSURE

ZONE A, YELLOW WATER WEAPONS COMPLEX
GROUP VII

NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

Unit Identification Code: N60200

Contract No.: N62467-89-D-0317/090

Prepared by:

ABB Environmental Services, Inc.
2590 Executive Center Circle, East
Tallahassee, Florida 32301

Prepared for:

Department of the Navy, Southern Division
Naval Facilities Engineering Command
2155 Eagle Drive
North Charleston, South Carolina 29419

David Porter, Code 18B9, BRAC Environmental Coordinator

November 1997

TABLE OF CONTENTS

Sampling and Analysis Report
Building 624
Base Realignment and Closure
Zone A, Yellow Water Weapons Complex, Group VII
NAS Cecil Field, Jacksonville, Florida

<u>Chapter</u>	<u>Title</u>	<u>Page No.</u>
1.0	INTRODUCTION	1
2.0	PHASE II INVESTIGATION	1
3.0	PRELIMINARY RISK EVALUATION (PRE)	1
3.1	PUBLIC HEALTH PRE	3
3.1.1	Groundwater	3
3.1.2	Subsurface Soil	3
3.2	ECOLOGICAL PRE	4
4.0	CONCLUSIONS AND RECOMMENDATIONS	4
	REFERENCES	5

APPENDIX

Appendix A: Soil Boring Logs and Table

LIST OF FIGURE

<u>Figure</u>	<u>Title</u>	<u>Page No.</u>
1	Building 624, Lift Station, Sample Location Plan	2

GLOSSARY

ABB-ES	ABB Environmental Services, Inc
BCT	Base Realignment and Closure cleanup team
ELCR	excess lifetime cancer risk
FDEP	Florida Department of Environmental Protection
HI	hazard index
HQ	hazard quotient
MCL	maximum contaminant level
$\mu\text{g}/\ell$	micrograms per liter
NAS	Naval Air Station
PRE	preliminary risk evaluation
RBC	risk-based concentration
SAO	Sampling and analysis outline
SCG	soil cleanup goals
TAL	target analyte list
TCL	target compound list
USEPA	U.S. Environmental Protection Agency
YWWX	Yellow Water Weapons Complex

1.0 INTRODUCTION

ABB Environmental Services, Inc. (ABB-ES), under contract to the Southern Division, Naval Facilities Engineering Command, has completed the Phase II Sampling and Analysis program for Building 624 at Naval Air Station (NAS) Cecil Field. This report summarizes the related field operations, results, conclusions, and recommendations of the Phase II investigation.

Building 624 is a former Weapons Handling Building located near the center of the Yellow Water Weapons Complex (YWWX). A review of facility drawings for Building 624 indicates the building may have formerly been used as a battery charging facility. A Sampling and Analysis Outline (SAO) for the assessment of subsurface soil and groundwater, near a leach pit at the southwest corner of the building, was prepared by ABB-ES and approved by the Base Realignment and Closure cleanup team (BCT) (ABB-ES, 1996). Other potential environmental concerns, related to special weapons that may have been stationed at YWWX, are being evaluated separately.

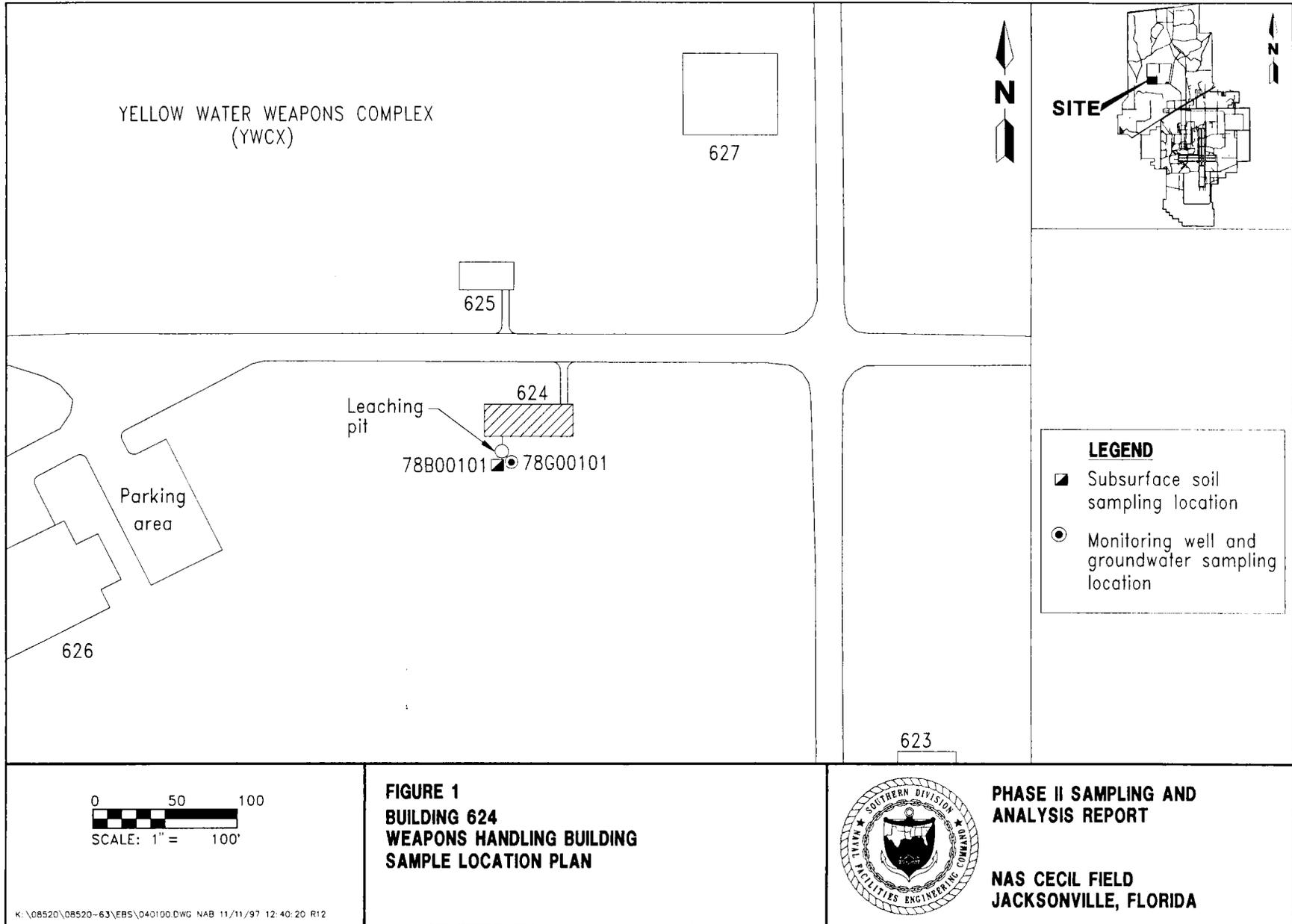
2.0 PHASE II INVESTIGATION

This Phase II investigation included the installation of one shallow groundwater monitoring well and collection and analysis of one groundwater sample. In addition, one subsurface soil sample was collected adjacent to the leaching pit from just above the groundwater table. Field activities were undertaken in general conformance with the Project Operations Plan (ABB-ES, 1994a).

The groundwater monitoring well was installed downgradient (south) of the leaching pit at Building 624. The well was installed to a depth of 14 feet below land surface. The soil and groundwater samples were analyzed for the full Contract Laboratory Program suite of target compound list (TCL) organics and target analyte list (TAL) inorganics. A general site plan indicating the location of the monitoring well and subsurface soil sample is presented on Figure 1. The soil boring log is included in Appendix A.

3.0 PRELIMINARY RISK EVALUATION (PRE)

A PRE was conducted to assess potential risks to human and ecological receptors posed by contaminants in groundwater. Primary exposure pathways were evaluated to determine which potentially contribute to human health and ecological risks. The evaluation was conducted in general conformance with methodology provided in the U.S. Environmental Protection Agency (USEPA) Region IV Memorandum *Amended Guidance on Preliminary Risk Evaluations (PREs) for the Purpose of Reaching a Finding of Suitability to Lease (FOSL)* (USEPA, 1994), USEPA Region IV Bulletin on Ecological Risk Assessment (USEPA, 1995), and minutes of meetings with the USEPA and the Florida Department of Environmental Protection (FDEP) concerning PREs (ABB-ES, 1995). Site background information and rationale for sample collection and analysis are detailed in the Environmental Baseline Survey Report (ABB-ES, 1994b) and the SAO (ABB-ES, 1996).



3.1 PUBLIC HEALTH PRE. All detected analytes were compared to readily available risk-based screening values to assess the likelihood of adverse human health effects associated with potential exposure to groundwater. Risk-based screening values were obtained from USEPA Region III RBCs (USEPA, 1996) and FDEP Groundwater Guidance Concentrations (FDEP, 1994). Most screening values published in the references listed above are based on toxicity constants and standard human exposure scenarios and correspond to fixed levels of risk. The designated level of risk for noncarcinogenic chemicals is based on a hazard quotient (HQ) of 1. The level of risk for carcinogenic chemicals is based on an excess lifetime cancer risk (ELCR) of 1×10^{-6} . Cancer and noncancer risks associated with industrial and residential land use are estimated by dividing the maximum detected analyte concentration by the corresponding USEPA Region III RBC value at the designated level of risk (ELCR of 1×10^{-6} or HQ of 1), respectively. For noncarcinogens, the HQ are summed to determine the cumulative noncancer risk or Hazard Index (HI).

3.1.1 Groundwater Eight inorganic analytes were detected in the groundwater sample collected in the study area. A comparison between concentrations of detected analytes in groundwater and RBCs for tap water and FDEP groundwater guidance concentrations is presented in Appendix A. Cumulative noncancer risk or HI of 1.7 and an ELCR of 8×10^{-5} were calculated for all detected analytes in the groundwater sample.

Thallium was detected at a concentration of 4.9 micrograms per liter ($\mu\text{g}/\ell$), exceeding the FDEP groundwater guidance concentration of 2 $\mu\text{g}/\ell$ and the RBC for tap water of 2.9 $\mu\text{g}/\ell$. The USEPA maximum contaminant level (MCL) for thallium in groundwater is 2 $\mu\text{g}/\ell$. The analytical result for thallium was less than the contract-required detection limit of 10 $\mu\text{g}/\ell$ and was, therefore, qualified as an estimated concentration. There is some uncertainty concerning the detections of thallium in groundwater above the State and Federal MCLs. Thallium has been observed, below the laboratory detection level, at similar concentrations (2 to 6 $\mu\text{g}/\ell$) at many sites throughout NAS Cecil Field, including upgradient groundwater samples at OUs 3 and 6. The detection of thallium may be from its presence as a naturally occurring element or from interelemental interference with iron or other cations during the analysis for thallium. Due to the widespread occurrence of thallium at similar concentrations and the potential for interelemental interference, it does not appear that thallium is site related.

Arsenic was detected at a concentration of 3.5 $\mu\text{g}/\ell$ and exceeds the RBC for tap water of 0.045 $\mu\text{g}/\ell$. However, the Florida Groundwater Guidance Concentration for arsenic is 50 $\mu\text{g}/\ell$. No other analytes were detected in excess of screening criteria.

3.1.2 Subsurface Soil Fifteen inorganic analytes and one volatile organic compound were detected in the subsurface soil sample collected adjacent to the leaching pit. A conservative comparison between concentrations of detected analytes in subsurface soil and soil cleanup goals (SCGs) and RBCs for surface soil (residential exposure scenario) is presented in Appendix A. The cumulative noncancer risk or HI calculated for all detected analytes in the subsurface soil sample is 0.1. No carcinogenic analytes were detected; therefore, an ELCR was not calculated. No analytes were detected at concentrations in excess of their respective SCGs or RBCs.

3.2 ECOLOGICAL PRE. Potential exposure pathways and ecological habitat associated with Building 624 were characterized by ABB-ES ecological risk assessors in June 1996. Building 624 is surrounded by mowed grass. No complete exposure pathways to groundwater or subsurface soil were identified within the study area. Therefore, no further ecological risk evaluation was conducted.

4.0 CONCLUSIONS AND RECOMMENDATIONS

One groundwater sample from the shallow surficial aquifer and one subsurface soil sample were collected at Building 624 and analyzed to determine the concentrations of TCL organic and TAL inorganic compounds. Concentrations of detected compounds were compared to human health and ecological screening criteria. A cumulative HI of 1.7 and an ELCR of 8×10^{-5} were calculated for all noncarcinogenic analytes detected in both matrices.

Thallium and arsenic, in groundwater, were the only analytes detected at concentrations in excess of their respective RBCs. The concentration of thallium was reported as an estimated value. However, due to the widespread occurrence of thallium (a naturally occurring element) at NAS Cecil Field, and the potential for interelemental interference during analysis, it does not appear that thallium is site related. Arsenic is naturally occurring at NAS Cecil Field and may not represent a release from the site. In addition, the detected concentration of arsenic is below the Florida groundwater guidance concentration. There is no potable water supply associated with Building 624; therefore, a groundwater-to-receptor pathway does not currently exist.

No complete exposure pathways to ecological receptors were identified for groundwater or subsurface soil in the study area. Therefore, no further ecological risk evaluation was conducted.

Based upon the information obtained for this assessment, the concentrations of analytes detected in subsurface soil and groundwater at Building 624 do not represent a hazard to human health or the environment. However, the BCT has concurred that all facilities within YWWX shall be designated as "encumbered" until the radiological survey for release has been completed. Therefore, the color classification for Building 624 should be changed from Gray to Light Green (encumbered).

REFERENCES

- ABB Environmental Services, Inc. (ABB-ES). 1994a. *Project Operations Plan for Cecil Field and Health and Safety Plan*. Prepared for Southern Division, Naval Facilities Engineering Command (SOUTHNAVFACENGCOM), North Charleston, South Carolina (December).
- ABB-ES. 1994b. *Base Realignment and Closure Environmental Baseline Survey Report, Naval Air Station, Cecil Field, Jacksonville, Florida*. Prepared for SOUTHNAVFACENGCOM, North Charleston, South Carolina (November).
- ABB-ES. 1995. Minutes of September 25, 1995, conference call to discuss preliminary risk evaluations.
- ABB-ES. 1996. *Sampling and Analysis Outline, Building 859LS, Base Realignment and Closure, Zone C, Developed Nonindustrial Area, Group V, Naval Air Station, Cecil Field, Jacksonville, Florida*. Prepared for SOUTHNAVFACENGCOM, North Charleston, South Carolina (July).
- Florida Department of Environmental Protection (FDEP). 1994. *Groundwater Guidance Concentrations*. Bureau of Drinking Water and Groundwater Resources, Tallahassee, Florida (June).
- U.S. Environmental Protection Agency (USEPA). 1994. *USEPA Region IV, Amended Guidance on Preliminary Risk Evaluations (PREs) for the Purpose of Reaching a Finding of Suitability to Lease (FOSL)*. Atlanta, Georgia, (December 20).
- USEPA. 1995. *Region IV Waste Management Division Preliminary Risk Evaluation, Ecological Risk Assessment, Supplemental Guidance to RAGS*. Region IV Bulletin No. 1 (November).
- USEPA. 1996. *Region III Risk-Based Screening Table, Region III, Technical Guidance Manual*. Risk Assessment. EPA/903/R-93-001 (May).

APPENDIX A

SOIL BORING LOGS AND TABLES

Project: NAS Cecil Field BRAC		Well ID: CEF-824-1S	Boring ID: CEF-824-1S
Client: SOUTHDIIVNAVFACENCOM		Contractor: Alliance Environmental, Inc.	Job No.: 08520-85
Northing/Easting: 389028.011/2158245.945		Date started: 10-22-98	Compltd: 10-22-98
Method: Auger	Casing dia.: 2 in.	Screened Int.: 2 - 12 ft.	Protection level: D
TOC elev.: Ft.	Type of OVM: PID	Total dpth: 13.0Ft.	Dpth to ∇: 3.5 Ft.
ABB Rep.: R. Holloway	Well development date: 10-22-98		Site: 78 - 824 TMR Bldg

Depth Ft.	Laboratory Sample ID.	Sample Recovery	Headspace (ppm)	Soil/Rock Description and comments	Lithologic symbol	Soil class.	Blows/6-in.	Well diag.
0				SILTY SAND (SM): 100%, quartz, light to dark gray, fine- to very fine- grained, sub-angular to sub-rounded.		SM	posthole	
3.7							posthole	
5								
10								
15								
20								
25								
30								

**BRAC Preliminary Risk Evaluation Table for Analytes Detected in Groundwater
Building 624, Naval Air Station Cecil Field**

Analyte	Sample 78G00101	Screening Values		Calculated Risk Values	
		FDEPGGC	RBC(T)	ELCR	HQ
Volatile Organic Compounds					
Acetone	7	700 st	3700 n		0.00
Toluene	6	1000 p	750 n		0.01
Semi-Volatile Organic Compounds					
4-Methylphenol	2	35 st	180 n		0.01
Inorganic Analytes					
Aluminum	82	s	37000 n		0.00
Arsenic	3.5	50 p	0.045 c	7.78E-05	
Barium	95.3	2000 p	2600 n		0.04
Cobalt	2.4		2200 n		0.00
Potassium	1820				
Thallium	4.9	2 p	2.9 n		1.69
Vanadium	4.1	49 st	260 n		0.02
Zinc	9.5	s	11000 n		0.00
Cyanide	3.5	200 p	730 n		0.00
Sum =				8E-05	1.7

Notes:

All Analytes are reported in ug/l

Sample Suffixes indicate the following:

F=filtered sample, DL= laboratory diluted sample, RE= laboratory re-extracted, D=field duplicate

FDEPGGC = FDEP Groundwater Guidance Concentration, June 1994

*= values that exceed FDEPGGC

p= primary standard (MCL)

st= systemic toxicant

t= organoleptic standard

s= secondary standard (related to taste, odor, color, or other non-aesthetic effects)

RBC(T)= Risk-based Concentration (Tap Water), USEPA Region III, May 1996

c=carcinogenic risk

n=non-carcinogenic risk

ELCR = calculated excess lifetime cancer risk, (ELCR = detected concentration/RBC(T) * 10E-06)

HQ = calculated Hazard Quotient for non-carcinogenic analytes (HQ=detected concentration/RBC(T))

