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SITE ASSESSMENT WORK PLAN FOR MAIN BASE GOLF COURSE WITH TRANSMITTAL
LETTER NTC ORLANDO FL
6/1/1998
BROWN & ROOT ENVIRONMENTAL

SITE ASSESSMENT WORK PLAN

for

MAIN BASE GOLF COURSE

Naval Training Center
Orlando, Florida



Southern Division
Naval Facilities Engineering Command

Contract Number N62467-94-D-0888

Contract Task Order CTO-0024

JUNE 1998



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June 3, 1998

Project Number 7457

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Reference: CLEAN Contract No. N62467-94-D-0888
Contract Task Order No. 0024

Subject: Final Site Assessment Work Plan for Main Base Golf Course
Naval Training Center, Orlando, Florida

Dear Ms. Nwokike:

Enclosed is the final Work Plan for assessing arsenic contamination at the Main Base Golf Course. The final Work Plan incorporates comments received on the draft plan and a site map showing the grid of 147 one-acre sampling blocks.

If you have any questions or further comments on the Work Plan, please call me at (423) 220-4730.

Sincerely yours,

A handwritten signature in black ink that reads "Steven B. McCoy".

Steven B. McCoy, P.E.
Task Order Manager

SBM/smc

Enclosure

c: Ms. Nancy Rodriguez, USEPA Region IV
Mr. John Mitchell, FDEP
Mr. Wayne Hansel, SOUTHDIV (NTC-Orlando address - Lt. Gary Whipple)
Lt. Gary Whipple, NTC-Orlando
Mr. Bob Cohose, Bechtel
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Mr. Rick Allen, Harding Lawson Associates
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Mr. Mike Campbell, B&R Environmental

**SITE ASSESSMENT WORK PLAN
FOR
MAIN BASE GOLF COURSE

NAVAL TRAINING CENTER
ORLANDO, FLORIDA**

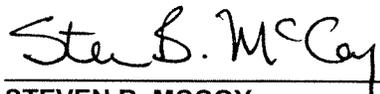
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**CONTRACT NUMBER N62467-94-D-0888
CONTRACT TASK ORDER 0024**

JUNE 1998

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P.G. CERTIFICATION

I hereby certify that this Site Assessment Work Plan for Main Base Golf Course was prepared under my direct supervision in accordance with acceptable standards of geological practice.

Michael J. Campbell, P.G. / Date
License No. PG-0001981

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ACRONYMS AND ABBREVIATIONS

ABB-ES	ABB Environmental Services, Inc.
BRAC	Base Realignment and Closure
FSA	field staging area
IDW	investigation-derived waste
IRA	Interim Removal Action
NTC	Naval Training Center
PARCC	precision, accuracy, representativeness, comparability, and completeness
POP	Project Operations Plan
PPE	personal protective equipment
QA	quality assurance
QC	quality control
RI/FS	Remedial Investigation and Feasibility Study
SA	Study Area
USEPA	U.S. Environmental Protection Agency

1.0 INTRODUCTION

This Work Plan has been developed by Brown & Root Environmental (B&R Environmental) to guide the investigation of the Main Base Golf Course at the Naval Training Center, Orlando. Surface soil samples at this site will be obtained and analyzed for arsenic, then a risk assessment prepared to evaluate the risk of the arsenic to human health under the intended reuse for the property. The Work Plan describes the data quality objectives, the technical approach for the field work, requirements for laboratory analysis, and the methods for evaluating the resulting data. Finally, a milestone schedule is provided to show the dates by which the project activities will be completed.

1.1 SITE BACKGROUND

The Naval Training Center (NTC), Orlando encompasses 2,072 acres in Orange County, Florida, and consists of four discrete facilities: Main Base, Area "C," Herndon Annex, and McCoy Annex. Additional details regarding the background of NTC, Orlando are provided in the Project Operations Plan (POP) (ABB-ES 1997).

The Main Base Golf Course (Facility 21039) is an 18-hole facility which encompasses approximately 90 acres and operated as a golf course from 1962 to May 1998. The original nine holes were constructed in 1962 and holes 10 through 18 were added in 1990. The course is located along the eastern shore of Lake Baldwin and extends to the northern boundary of NTC, Orlando. Nine ponds and water traps are located on the course. The golf course topography is generally level with rolling hills, swales, and typical course terrain. Stormwater exits the golf course at various runoff locations; however, Lake Baldwin, a designated wetland, receives most of the precipitation runoff from the course.

Reviews of aerial photographs reveal the course property to be undeveloped prior to the course construction and development. Structures presently on the golf course property include: the helicopter landing pad (No. 504), golf course clubhouse (No. 505), golf cart storage (No. 506) golf course public toilet (No. 145), golf course maintenance building (No. 2134), pump station (No. 2135), and grounds maintenance storage building (No. 21039-001). Additionally, four storm shelters, constructed of wooden frames on concrete slabs, are located in the vicinity of the 2nd, 5th, 9th, and 14th hole play area.

The former wastewater treatment plant lagoons (UNF-14) and the pesticide storage building (UNF-15) are areas of concern on the course. The treatment plant lagoons located near the 12th and 13th holes were reportedly filled with treatment plant sludge, yard waste, sand, asphalt, empty unmarked 1-gallon containers, building demolition debris, and a large stainless-steel mixing tank from the Air Force

Photographic Squadron. The 50,000-gallon per day wastewater treatment plant closed in 1976. A study at the former wastewater treatment plant has been completed (ABB-ES, April 1997). The results of that study indicated somewhat elevated concentrations of manganese and sodium in groundwater, although only manganese was present at concentrations exceeding the State of Florida's secondary drinking water standard. The site was approved for transfer by the NTC, Orlando Base Realignment and Closure (BRAC) Cleanup Team in April 1997 with the proviso that future property owners be advised of past excavation and disposal activities at the site.

An old pesticide mixing and storage area, designated Study Area (SA) 9, located west of the 4th fairway, was operated by the Air Force (1950's to 1960's) and Navy (1970's) and used to store and mix pesticides for base pest-control operations. Mixing containers were rinsed and rinsate poured into a drain inside the building that lead to a gravel sump. In 1981, the building was demolished and an estimated 300 gallons of residual pesticide, demolition debris, and pesticide containers were buried on site. Analyses of groundwater samples from monitoring wells installed around the pesticide building at SA 9 have detected pesticides, ethylbenzene, naphthalene, chlordane, and phenols from the surficial aquifer at a depth of 12 feet.

A more recent pesticide mixing and storage area, SA 8, is located near the 5th hole, approximately 800 feet to the north of SA 9. This area was active until the course closed in May 1998.

In September 1997, an Interim Removal Action (IRA) was taken at SA's 8 and 9 to remove 3,000 tons of excessively contaminated soil. In October 1997 the Remedial Investigation and Feasibility Study (RI/FS) was approved and field work started. Preliminary data from the RI indicates that some contaminated soil still exists in a drainage swale on the east side of SA 9 and throughout SA 8. On the eastern (golf course) side of SA 8, the arsenic concentrations are approximately 3.5 mg/kg which is higher than the Florida soil cleanup goal of 0.8 mg/kg for residential land use and the established base background screening concentration for arsenic of 1.0 mg/kg. The planned reuse for some of the golf course area is residential.

1.2 DATA REQUIREMENTS

Data are to be collected to determine if surface soils at the Main Base Golf Course are impacted with arsenic above the established background screening level. The purposes for collecting these data are to support a human health risk assessment and a possible evaluation of remedial alternatives if required. USEPA Level IV data quality is required for the sampling detailed in this Work Plan. Level IV data are characterized by rigorous quality assurance (QA) and quality control (QC) protocols and documentation, providing legally and technically defensible data.

2.0 TECHNICAL APPROACH

The technical approach to the field investigation is described below. The investigation is designed to support the data needs identified in Section 1.2.

2.1 SURFACE SOIL SAMPLING PROGRAM

One composite surface soil sample will be collected for laboratory analysis from each acre of the golf course for a total of approximately 150 samples. Figure 2-1 shows the sampling grid and the center point for each block. The center points of each sampling grid block, which are numbered SS02 through SS151, will be located and staked by a Florida-registered surveyor. (Note that blocks SS001, SS145, SS146, and SS147 have been deleted from the grid.) A compass and tape measure will be used to determine the locations where the other portions of the composite sample will be collected. The samples will be collected from a depth range of 0 to 1 ft and will be composited from five sample locations within each acre (Figure 2-2). At each of the five locations within the acre the sample will be homogenized in a stainless steel bowl. Approximately one fifth of the required sample will be transferred to a second stainless steel bowl and the remaining soil will be returned to the hole. Once all five of the portions are collected, the sample will be homogenized and transferred to the sample bottle. All sampling and decontamination will be performed in accordance with procedures specified in the POP for NTC, Orlando (ABB-ES 1997).

All sample numbers (Tetra Tech NUS SOP CT-04) will start with MGC (for Main Base Golf Course), followed by the sample type (e.g., SS, RB, FB), followed by the location number (e.g., 001), followed by the round number (00 for all samples collected). The sample number for the environmental sample collected at surface soil location 001 would be MGCSS00100. No dashes are to be used on the sample labels. Samples for field duplicates will be identified with a "blind" number. Each crew will be responsible for collecting one field duplicate for every 10 environmental samples. The sample number will include the crew number (e.g., NTCSSD1100 indicates the first duplicate collected by crew number one). Each crew must note the corresponding environmental sample in the field logbook. This will be the only way to tell which duplicate corresponds to which environmental sample. Rinsate and field blanks will be numbered consecutively (e.g., FB001 or RB006). Rinsate blanks will be collected from sampling tools (e.g., trowels or bowls). One field blank will be collected from each water source used for decontamination. One Matrix Spike/Matrix Spike Duplicate sample will be collected for each 20 environmental samples of similar matrix. "MS/MSD" will be added to the sample number on the labels and on the chain of custody. New sample numbers will not be created for these samples.

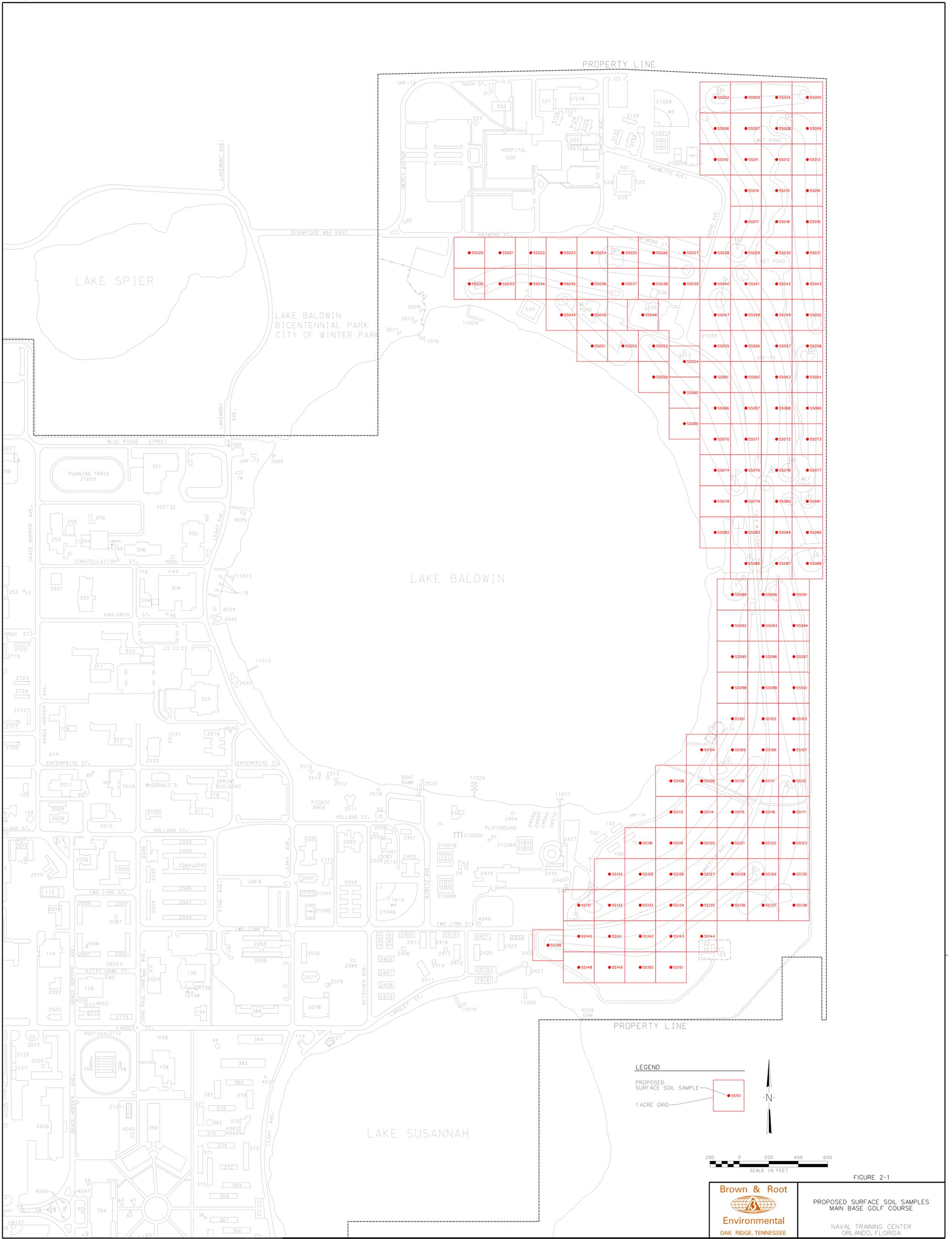


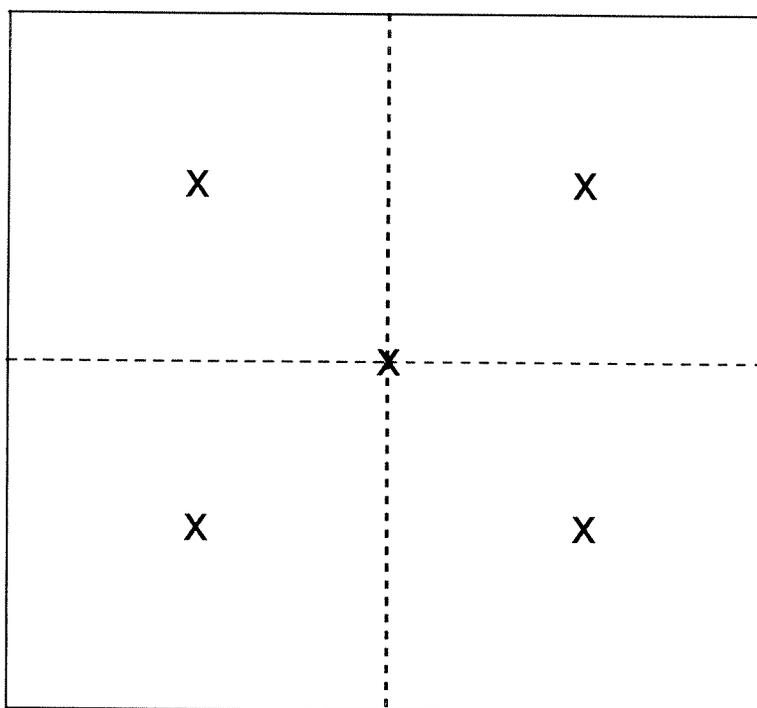
FIGURE 2-1

Brown & Root
 Environmental
 OAK RIDGE, TENNESSEE

PROPOSED SURFACE SOIL SAMPLES
 MAIN BASE GOLF COURSE

NAVAL TRAINING CENTER
 ORLANDO, FLORIDA

**FIGURE 2-2
SURFACE SOIL SAMPLING PATTERN**



Note: Area enclosed is approximately one acre.

The samples will be analyzed for arsenic only (Table 2-1). Analyses will be completed in accordance with USEPA Level IV DQOs.

2.2 INVESTIGATION-DERIVED WASTE MANAGEMENT

All investigation-derived waste (IDW) will be managed in an environmentally responsible manner consistent with the CERCLA program, RCRA requirements, and the base's standard procedures. Wastewater, personal protective equipment (PPE), and any other miscellaneous solid IDW generated during investigation activities will be containerized, centralized, and managed in accordance with the base's standard procedures.

IDW will be composited into 55-gallon steel 17C U.S. Department of Transportation (USDOT)-approved drums for characterization and classification. Filled waste containers will be securely closed, cleaned, and labeled. All labeling will include the date, the specific location (if applicable) from which the material came, waste type, and any field observations that may be appropriate. Labels will be completed with permanent markers and will be attached to the container when it is full or when sampling activities are complete. Disposable sampling supplies (e.g., gloves, etc.) will be stored in 55-gallon drum and properly disposed of.

IDW will temporarily be stored at the field staging area (FSA) pending the analytical results of the samples collected. Following receipt of the environmental and IDW sample results and comparison of these data to regulatory levels, disposal options and/or additional classification criteria will be determined with the Navy. Disposal of IDW will be performed in accordance with procedures specified in the POP (ABB-ES 1997).

**TABLE 2-1
ANALYTICAL PROGRAM SUMMARY
MAIN BASE GOLF COURSE
PAGE 1**

Site Assessment Work Plan
Main Base Golf Course
Naval Training Center
Orlando, Florida

Sample Identification	Freq	Quantity	Arsenic ^a
Surface Soil		150	150
QC Samples			
Duplicate	10%	15	15
Matrix Spike	5%	8	8
Other QC Samples			
Equipment Blanks	1 per day	4	4
Field Banks	1 per decon fluid type	2	2
Total Soil		179	179

^a SW-846 Method 6010B will be used for arsenic analysis.

3.0 DATA EVALUATION

3.1 DATA VALIDATION

The approach to providing reliable data that meet the DQOs will include QA/QC requirements for the analytical data generated during the field investigation. The QA/QC efforts for laboratory analyses will include collection and submittal of QC samples and the assessment and validation of data from the subcontract laboratories.

Data quality indicators include the precision, accuracy, representativeness, comparability, and completeness (PARCC) parameters. These parameters will be used within the data validation process to evaluate data quality. The achievable limits for these parameters vary with the DQO level of the data. The limits used for laboratory analytical data in this program will be those set by the CLP for Level IV DQOs and as specified in the USEPA methods for Level III DQOs.

3.2 DATA EVALUATION AND REPORTING

The purpose of this task is to assess usability of validated data results based upon data comparisons to non-site-related conditions. Results that meet the DQO requirements and are considered usable will be compared to background sampling results from a recent investigation (ABB-ES 1994). The following data evaluations and comparisons will be made:

- Evaluation of detection limits,
- Evaluation of qualified data,
- Comparison with background sampling results,
- Frequency of detection,
- Extent of contamination, and
- Comparison to ARARs.

A draft Site Assessment Report will be prepared which will include appropriate sections concerning site background, investigation activities, physical characteristics, nature and extent of contamination, and a risk evaluation.

After internal review the document will be prepared for submission to the NTC, Orlando BCT and the NTC Restoration Advisory Board for review. A final document will be prepared which includes the required changes based on comments received. The Florida Registered Professional Geologist responsible for report preparation will sign and seal the final report.

4.0 SCHEDULE

The schedule for the field effort, laboratory analysis, data validation, risk assessment, and report preparation is provided below.

TASK	START DATE	COMPLETION DATE
Survey Sample Locations	June 2, 1998	June 4, 1998
Collect Surface Soil Samples	June 3, 1998	June 5, 1998
Laboratory Analysis	June 4, 1998	June 11, 1998
Data Validation	June 9, 1998	June 16, 1998
Preliminary Risk Assessment Results	June 11, 1998	June 18, 1998
Draft Site Assessment Report	TBD*	TBD*
Final Site Assessment Report	TBD*	TBD*

*TBD: To be determined

5.0 REFERENCES

ABB-ES 1997. *Project Operations Plan for Site Investigations and Remedial Investigations. Naval Training Center, Orlando.* Unit Identification code N65928, Navy CLEAN District 1, Contract No. N62467-89-D-0317, August.

ABB-ES 1997. *Base Realignment and Closure Environmental Site Screening Report, Study Area 8, Former Wastewater Treatment Plant Lagoons, Naval Training Center, Orlando.* Unit Identification code N65928, Navy CLEAN District 1, Contract No. N62467-89-D-0317, April.

ABB-ES 1994. *Background Sampling Plan, Naval Training Center, Orlando, Florida (draft),* October.

SOUTHNAVFACENGCOM 1997. *Monitoring Well Design, Installation, Construction, and Development Guidelines.*