

N61165.AR.005310  
CNC CHARLESTON  
5090.3a

ENVIRONMENTAL ASSESSMENT REPORT DATED 10 SEPTEMBER 1998 FOR ZONE G  
AREAS 12 THRU 14 WITH SOUTH CAROLINA DEPARTMENT OF HEALTH AND  
ENVIRONMENTAL CONTROL REVIEW LETTER CNC CHARLESTON SC  
11/16/1998  
SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL



2600 Bull Street  
Columbia, SC 29201-1708

COMMISSIONER:  
Douglas E. Bryant

BOARD:  
John H. Burriss  
Chairman

William M. Hull, Jr., MD  
Vice Chairman

Roger Leaks, Jr.  
Secretary

Mark B. Kent

Cyndi C. Mosteller

Brian K. Smith

Rodney L. Grandy

Department of the Navy  
Southern Division NFEC  
P.O. Box 190010  
North Charleston, SC 29419-9010  
Attention: Mr. Gabriel Magwood

Re: Environmental Assessment Report dated 10 September 1998  
Zone G/Area 12,13,14, (Site Identification # 01186)  
Fuel Distribution System  
Charleston Naval Complex/Charleston Naval Base  
Charleston, SC  
Charleston County

Dear Mr. Magwood:

The author has completed technical review of the referenced document. As submitted, the report provides a narrative describing environmental assessment activities and analytical results of soil and groundwater sampling conducted to determine if releases have occurred as a result of operation of the referenced piping system. The results presented indicate reportable concentrations of VOC (volatile organic compounds) and PAH (polynuclear aromatic hydrocarbon) compounds were detected in groundwater and soil grab samples obtained at the referenced site. The concentration reported for total naphthalene for soil samples exceed levels proposed in the SCAP (Soil Corrective Action Plan, amended July 1997).

With consideration to the above comments, the results presented by the assessment report appear to indicate that additional endeavors for remedial actions and/or contaminant characterizations are warranted at the referenced site. In this regard, the author concurs with conclusions and recommendations as presented and the proposed additional assessment and remedial action is approved for implementation. An appropriate and reasonable monitoring program sufficient to demonstrate the efficacy of the remedial action should be developed and submitted to my attention by 2 January 1999.

Charleston Naval Complex/Charleston Naval Base  
16 November 1998  
page 2

Should you have any questions please contact me at (803) 734-5328.

Sincerely,

  
Paul L. Bristol, Hydrogeologist  
Groundwater Quality Section  
Bureau of Water

cc: Trident District EQC



ENSAFE INC.

ENVIRONMENTAL AND MANAGEMENT CONSULTANTS

Li 10.12.99  
Co 11.19.99

201 North Palafox Street, Suite 200 • Pensacola, FL 32501 • Telephone 850-434-2230 • Facsimile 850-434-2288 • www.ensafe.com

Soil = Cont. GW Monit.

RECEIVED

OCT 4 1999

Water Monitoring, Assessment &  
Protection Division

October 1, 1999

Mr. Paul Bristol  
South Carolina Department of Health and Environmental Control  
Groundwater Quality Section  
Bureau of Water  
2600 Bull Street  
Columbia, SC 29201

**RE: Fuel Distribution System, Areas 12, 13, and 14, Charleston Naval Complex,  
South Carolina (SCDHEC No. 01186)**

Dear Mr. Bristol:

EnSafe is please to submit, on behalf of the U.S. Navy, Southern Division Naval Facilities Engineering Command, two copies of the letter report for SCDHEC petroleum site number 01186. This submittal incorporates the results of follow-on investigative activities performed in accordance with recommendations in the CAR and to address any SCDHEC comments concerning these areas.

Should you have any questions or concerns regarding this submittal, please contact me.

Sincerely,

ENSAFE INC.

Craig R. Smith

Attachment

cc: T. Haverkost, EnSafe - Charleston  
0144 File

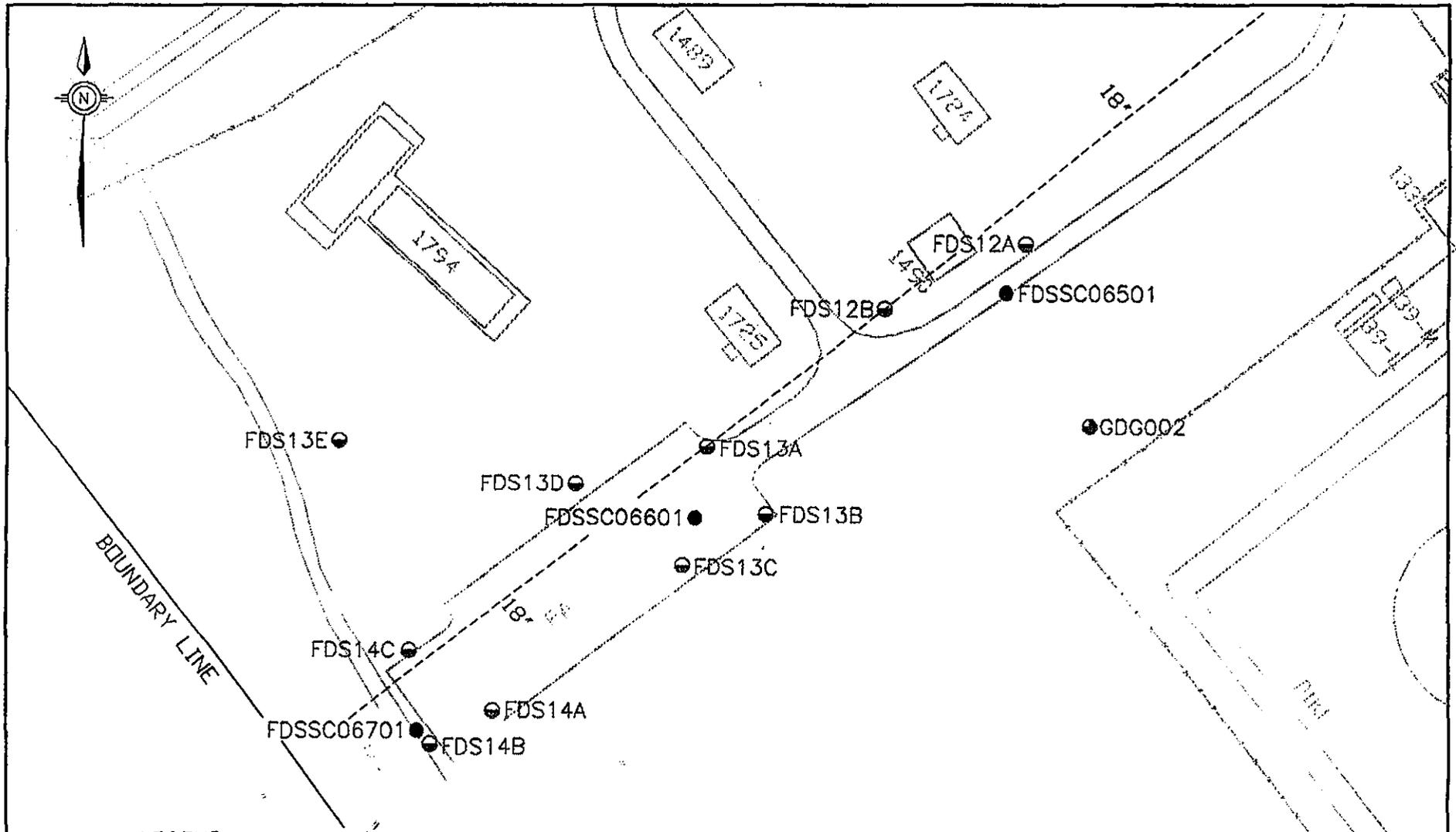
**Areas 12, 13, and 14  
(SCDHEC No. 01186)**

**Background**

The combined Areas 12, 13, and 14 of the Fuel Distribution System (FDS) are associated with Phase I soil samples FDSSC06501 through FDSSC06701. These samples exhibited total petroleum hydrocarbons-gasoline range organics ranging from 67 micrograms per kilogram ( $\mu\text{g}/\text{kg}$ ) at FDSSC06601 to 147  $\mu\text{g}/\text{kg}$  at FDSSC06501. The Phase I soil results prompted subsequent Phase II soil and groundwater sampling at the combined areas. Phase II soil sampling revealed total naphthalenes of 6,500  $\mu\text{g}/\text{kg}$  and 4,700  $\mu\text{g}/\text{kg}$  at FDSSC06601 and FDSSC06701, respectively, which exceeded the risk-based screening level (RBSL) of 210  $\mu\text{g}/\text{kg}$ . To determine if groundwater has been adversely affected by petroleum constituents, 10 shallow groundwater monitoring wells were installed and sampled in the combined areas during Phase II. Data from nearby shallow grid well GDG002 were also incorporated into the investigation. During the first sampling event 50.3 micrograms per liter ( $\mu\text{g}/\text{L}$ ) of arsenic was detected at FDS14A, which slightly exceeded the RBSL of 50  $\mu\text{g}/\text{L}$ . Arsenic was detected at 21.8  $\mu\text{g}/\text{L}$  at FDS14A during the second sampling, which was below the RBSL. Arsenic was detected at 210  $\mu\text{g}/\text{L}$  at FDS13A during the second sampling event. No groundwater RBSLs for organics were exceeded at the combined areas (*Contamination Assessment Report* [CAR], EnSafe 1998). Figure 1 depicts the Areas 12, 13, and 14 sample locations.

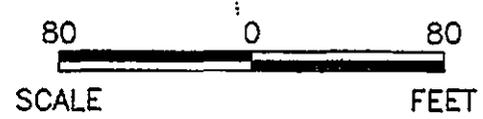
**Follow-on Activities**

The CAR recommended and South Carolina Department of Health and Environmental Control (SCDHEC) concurred that intrinsic remediation was appropriate to address the total naphthalenes detected in soil at Areas 12, 13, and 14. The CAR also recommended that monitoring well FDS13A be resampled for arsenic. This sampling was completed in March 1999.



**LEGEND**

- - Soil Boring
- ⊙ - Shallow Monitoring Well
- ⊗ - Grid Based Shallow Monitoring Well
- - - - - Fence
- - - - - Diesel Line



FUEL DISTRIBUTION SYSTEM  
LETTER REPORT  
CHARLESTON NAVAL COMPLEX  
CHARLESTON, S.C.

FIGURE 1  
AREAS 12, 13, AND 14  
SAMPLE LOCATIONS

**Results**

Post-CAR sampling at FDS13A detected 18.3  $\mu\text{g/L}$  of arsenic in groundwater, well below the RBSL of 50  $\mu\text{g/L}$ , as shown in Table 1. Attachment A contains the analytical data from the resampling of FDS13A. The CAR contains analytical data from previous sampling.

Table 1  
 Analytes Detected in Shallow Groundwater  
 Post-CAR Sampling, Area 13  
 Fuel Distribution System

Parameters	Location	Sample Results	RBSL ( $\mu\text{g/L}$ )	Exceeds RBSL
<b>Inorganics (<math>\mu\text{g/L}</math>)</b>				
Arsenic (As)	FDS13A	18.3	50	No

*Notes:*

$\mu\text{g/L}$  = Micrograms per liter

RBSLs from the *South Carolina Risk-Based Corrective Action for Petroleum Releases* (SCDHEC, January 5, 1998).

**Conclusions and Recommendations**

As reported in the CAR, concentrations of total naphthalenes in soil at FDSSC06601 (6,500  $\mu\text{g/kg}$ ) and FDSSC06701 (4,700  $\mu\text{g/kg}$ ) exceed the RBSL of 210  $\mu\text{g/kg}$ . Because these samples were collected below the water table at a depth of 8.5 to 10.5 feet, they are effectively samples of the aquifer matrix and therefore Site Specific Target Levels would not be applicable. These concentrations are also below the 84,000  $\mu\text{g/kg}$  soil-to-groundwater soil screening level (SSL [DAF=20]) from the (*Soil Screening Guidance: Technical Background Document* [USEPA 1996]), suggesting migration to groundwater is unlikely.

To support the CAR's recommendation of intrinsic remediation for the total naphthalenes detected in soil, limited monitoring of groundwater is recommended. Groundwater at well FDS14B downgradient of FDSSC06701 and wells FDS13B and FDS13C downgradient of FDSSC06601 should be sampled and analyzed for RBSL SVOCs two more times at three-month intervals to demonstrate that soil contaminants are not adversely impacting groundwater.

The results of the resampling of monitoring well FDS13A for arsenic in shallow groundwater revealed a detection of 18.3  $\mu\text{g/L}$ , below the RBSL of 50  $\mu\text{g/L}$ . This concentration is comparable to the Zone G background concentration of 17.8  $\mu\text{g/L}$ . It is also comparable to the 27  $\mu\text{g/L}$  of arsenic detected in the initial sampling event. These concentrations suggest that the 210  $\mu\text{g/L}$  detected during the second sampling event was an anomalously high concentration. In accordance with the recommendation presented in the CAR and as agreed to by SCDHEC in the November 18, 1998 letter, no further action is recommended for groundwater at the combined Areas 12, 13 and 14. In addition, groundwater is not currently used at Charleston Naval Complex (CNC) as a source of potable or process water; a basewide potable water system provides drinking and process water to buildings at CNC. This system is to remain in operation under the current base reuse plan. This shallow aquifer contains significant concentrations of naturally occurring chlorides and elevated total dissolved solids, which make this water-bearing unit a questionable potable water source.

**Attachment A**  
**Analytical Data**

CHARLESTON CTO-0144 FUEL DISTRIBUTION  
POST-CAR GROUNDWATER SAMPLING  
AREAS 12, 13, AND 14

ARSENIC		SAMPLE ID ----->	FDS-G-W13A-03				
		ORIGINAL ID ----->	FDSGW13A03				
		LAB SAMPLE ID ---->	37648.04				
		ID FROM REPORT -->	FDSGW13A03				
		SAMPLE DATE ----->	03/05/99				
		DATE EXTRACTED -->	03/09/99				
		DATE ANALYZED ---->	03/10/99				
		MATRIX ----->	Water				
		UNITS ----->	UG/L				
CAS #	Parameter	37648	VAL				
7440-38-2	Arsenic (As)	18.3					

#01186

AREAS 12, 13 + 14

**Attachment A**  
**Analytical Data**

DATALCP3  
06/14/99

CHARLESTON CTO-0144 FUEL DISTRIBUTION  
POST-CAR GROUNDWATER SAMPLING  
AREAS 12, 13, AND 14

Page: 1  
Time: 16:02

ARSENIC		SAMPLE ID ----->	FDS-G-W13A-03					
		ORIGINAL ID ----->	FDSGW13A03					
		LAB SAMPLE ID ---->	37648.04					
		ID FROM REPORT -->	FDSGW13A03					
		SAMPLE DATE ----->	03/05/99					
		DATE EXTRACTED -->	03/09/99					
		DATE ANALYZED ---->	03/10/99					
		MATRIX ----->	Water					
		UNITS ----->	UG/L					
CAS #	Parameter		37648	VAL				
7440-38-2	Arsenic (As)		18.3					

\*\*\* Validation Complete \*\*\*