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REMEDATION MONITORING REPORT FOR ZONE H AREA OF CONCERN 659 (AOC 659)
ABOVE GROUND STORAGE TANK NS-14 (AST NS-14) CNC CHARLESTON SC
07/01/2004
CH2M HILL

CH2M-JONES, LLC.

CH2MHILL
Constructors, Inc.

Mr. Darryl F. Gates
CH2M-Jones
1330 Kilo Street
North Charleston, SC 29405

July 20, 2004

Mr. Michael A. Bishop
SCDHEC
2600 Bull Street
Columbia, SC 29201-1708

RECEIVED

JUL 23 2004

Water Monitoring Assessment &
Protection Division

Subject: Remediation Monitoring Report
AST NS 14 (Zone H, AOC 659)
Site ID. No. 01311
Charleston Naval Complex

Dear Mr. Bishop:

CH2M-Jones has completed an Aggressive Fluid Vapor Recovery (AFVR) event at the above-referenced site. The enclosed Remediation Action Report documents the results of the AFVR along with product recovery activities prior to and following the AFVR event. Product levels have been recorded within the impacted monitoring wells since September, 2002. Although the AFVR attributed to the overall reduction of free product at the site, measurable free product is still present within three of the four site monitoring wells.

The extent of free product along with dissolved phase petroleum constituents remain undefined. As a result, additional investigative actions are warranted. CH2M-Jones recommends that a Contamination Assessment Plan be developed to address future investigative actions for the site.

Sincerely,

CH2M HILL



Darryl F Gates
Environmental Scientist

**AST NS 14 (Zone H, AOC 659)
Charleston Naval Complex
North Charleston, South Carolina
SCDHEC Site ID #01311**

Prepared by:

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Charleston Naval Complex
1330 Kilo St.
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Prepared for:

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P.O. Box 190010
North Charleston, South Carolina 29419-9010**

July 2004

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Charleston Naval Complex
North Charleston, South Carolina

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1.0 Introduction

1.1 Background

In 1993, Naval Base (NAVBASE) Charleston was added to the list of bases scheduled for closure as part of the Defense Base Realignment and Closure Act, which regulates closure and transition of property to the community. The Charleston Naval Complex (CNC) was formed as a result of the dis-establishment of the Charleston Naval Shipyard and NAVBASE on April 1, 1996. Corrective Action (CA) activities for Site 659 are being conducted in accordance with the Underground Storage Tank (UST) Program of the South Carolina Department of Health and Environmental Control (SCDHEC).

1.2 General Site Description and Background

The CNC is located in the City of North Charleston, on the east and west bank of the Cooper River in Charleston County and Berkley County, South Carolina as shown in **Figure 1**. This installation consists of two major areas: an undeveloped dredge materials area on the east bank of the Cooper River on Daniel Island in Berkley County, and a developed area on the west bank of the Cooper River. The developed portion of the base is on the peninsula bounded on the west by the Ashley River and on the east by the Cooper River. This site is located within the developed portion of the base.

AOC 659 (Site ID #01311) consisted of a 30,000-gallon steel above ground storage tank (AST), which was formally designated as Building 14. The AST no longer exists and only the concrete support pad remains. The tank was enclosed by a five-foot high earthen berm and stored diesel fuel for small water craft from 1958 to 1990. Prior to 1958, the site was an undeveloped tidal marsh, **Figure 2**.

2.0 Previous Investigations

2.1 Soil investigation

On June 18, 1998, the Final RCRA Facility Investigation Report for Zone H, Site 659 was completed by EnSafe. During the investigation, eight soil samples were collected from depths of 0-1 foot and 3-5 feet below land surface (bls) from four soil borings. Total petroleum hydrocarbons (TPH), were detected above the Risk Based Screening Levels (RBSLs) within six of the eight soil samples. Please refer to EnSafe's Final RCRA Facility Investigation Report for soil boring locations and analytical results.

On November 20, 2001, eight soil samples were collected within four soil borings by CH2M-Jones. The soil samples were collected at depths of 0-1 and 3-5 feet bls and analyzed for VOCs and SVOCs. Results of the soil analysis indicated the presence of COCs above the RBSLs. Please refer to CH2M-Jones' December 31, 2001, Monitoring Report for soil boring locations and analytical results.

2.2 Groundwater Investigation

Monitoring wells 659GW001 and 659GW002 were installed November 14, 2001, at locations depicted on **Figure 2** and sampled for VOCs and SVOCs on November 20, 2001. Results of the groundwater analysis did not indicate the presence of COCs above the RBSLs.

On January 8, 2002, the South Carolina Department of Health and Environmental Control (SCDHEC) requested that the site be monitored semi annually for one year. During the June 28, 2002, monitoring event, monitoring well 659GW001 was not sampled due to the presence of free product, however, A groundwater sample was collected from monitoring well 659GW002 and analyzed for VOCs and SVOCs. Results of the analysis indicated that COCs were not present above the RBSLs.

On July 17 - 18, 2002, monitoring wells 659GW003 and 659GW004 were installed to delineate free product in the vicinity of monitoring well 659GW001. Once installed, each well was developed and allowed to stabilize for 30 days. On August 19, 2002, monitoring wells 659GW001, -002, -003 and -004 were gauged for the presence of free product. During the gauging event, free product was only detected in monitoring well 659GW001. On September 24, 2002, monitoring wells 659GW001, -002, -003 and -004 were again gauged for the presence of free product. Free product was detected within each well with the exception of monitoring well 659GW002.

3.0 Free Product Remedial Activities

3.1 Free Product Recovery (Bailing)

Free product was gauged and recovered using disposable bailer within monitoring wells 659GW001, -003 and -004. The recovery efforts were performed periodically from September 24, 2002, through May 30, 2003. Refer to **Table 1** for free product thickness, recovery dates and quantities. Approximately 11.30 gallons of free product were recovered from monitoring well 659GW001, 4.80 gallons from 659GW003, and 1.15 gallons from 659GW004 during bailing activities. Recovered product was containerized in a DOT-approved drum and stored within a locked compound at building 1824 on COC.

3.2 Aggressive Fluid Vapor Recovery (AFVR)

On June 17, 2003, CH2M-Jones completed an AFVR event performed on monitoring wells 659GW001, -003 and -004 at Site 659. EQ Industrial Services of Atlanta, GA, pumped approximately 301 gallons of oily water from the three monitoring wells using a vacuum truck. The oily water was consolidated with AFVR fluid extracted from SCDHEC Site Nos. 02099 and 01093 and containerized in a 3,000-gallon truck-mounted tank. The consolidated AFVR fluid from each site totaled approximately 760 gallons. The fluid was manifested as non-hazardous oily water and transported off site for proper disposal. A copy of the disposal manifest is provide in Appendix A.

3.3 Free Product Recovery (Absorbent Socks)

Following the AFVR, on July 28, 2003, monitoring wells 659GW001, -002, -003 and 004 were gauged for the presence of free product, which was detected and measured within monitoring wells 659GW001, -003 and -004. Oil-only absorbent socks with the capacity to absorb approximately 0.25 gallon of free product each were installed within wells 659GW001, -003 and -004 and replaced periodically. Approximately 1.0 gallon of free product was recovered from each monitoring well using the absorbent socks.

4.0 Conclusions and Recommendations

Free product remains in the vicinity of monitoring wells 659GW001, -003 and -004 at UST Site 659. Although the measurable thickness of free product within site wells has been reduced by ongoing recovery activities, the extent of the free product and dissolved phase contaminants have yet to be defined. CH2M-Jones recommends that a 6-inch free product recovery well be installed adjacent to monitoring well 659GW001 to accommodate higher capacity absorbent socks, which will expedite free product removal. Additionally, A Contamination Assessment Plan should be prepared and submitted to SCDHEC to specify procedures for defining the extent of free product and the dissolved phase plume.

Figures



Site 659

-  Fence
-  Railroads
-  Roads - Lines
-  Shoreline
-  Buildings
-  Surrounding Area

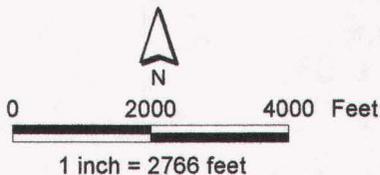


Figure 1
 Site Location Map
 Zone H, Site 659
 Charleston Naval Complex



659GW003

659GW001

659GW004

659GW002

-  Active
-  Roads - Lines

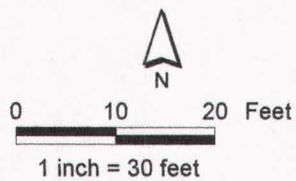


Figure 2
Site Map
Zone H, AOC 659
Charleston Naval Complex

Tables

Table 1
Free Product Measurement and Collection Quantities

Well No.	Date	Product	DTW	FP column (ft)	Comments
659GW001	09/24/2002	4.18	not obtained	not obtained	2.5 gallons bailed
	10/01/2002	3.25	4.31	1.06	2.0 gallons bailed
	10/09/2002	3.35	3.91	0.56	1.75 gallons bailed
	10/21/2002	3.37	4.26	0.89	1.20 gallons bailed
	10/29/2002	4.05	4.75	0.7	0.80 gallons bailed
	11/05/2002	3.77	4.72	0.95	1.20 gallons bailed
	11/14/2002	2.78	2.81	0.03	0.10 gallons bailed
	11/22/2002	not obtained	not obtained	-	0.45 gallons bailed
	12/09/2002	5.42	5.96	0.54	0.6 gallons bailed
	12/23/2002	not obtained	not obtained	not obtained	0.50 gallons bailed
	05/30/2003	not obtained	not obtained	not obtained	0.20 gallons bailed
	06/17/2003	not obtained	not obtained	not obtained	AFVR
	07/28/2003	4.15	4.4	0.25	No product removed
	10/03/2003	4.85	6.35	1.5	Installed absorbent sock
	12/12/2003	5.61	7.05	1.44	Replace absorbent sock
	01/12/2004	5.55	6.67	1.12	Replace absorbent sock
	02/12/2004	4.72	5.75	1.03	Replace absorbent sock
	05/28/2004	4.90	5.41	0.51	Replace absorbent sock
659GW002	09/24/2002	n/a	3.45	n/a	
	10/01/2002	n/a	1.81	n/a	
	10/09/2002	n/a	2.06	n/a	
	10/21/2002	n/a	2	n/a	
	10/29/2002	n/a	2.9	n/a	
	11/05/2002	n/a	3.48	n/a	
	11/14/2002	n/a	1.1	n/a	
	11/22/2002	n/a	not obtained		
	12/09/2002	n/a	not obtained		
	12/23/2002	n/a	not obtained		
	05/30/2003	n/a	not obtained		
	06/17/2003	n/a	not obtained		
	07/28/2003	n/a	not obtained		
	10/03/2003	n/a	not obtained		
	12/12/2003	n/a	5.33	n/a	
	01/12/2004	n/a	5.46	n/a	
02/12/2004	n/a	4.51	n/a		
05/28/2004	n/a	5.41	n/a		
U659GW003	09/24/2002	3.81	not obtained	not obtained	1.5 gal. Bailed
	10/01/2002	2.71	3.35	0.64	0.25 gallons bailed
	10/09/2002	3.42	3.75	0.33	0.25 gallons bailed
	10/21/2002	3.31	3.94	0.63	0.20 gallons bailed
	10/29/2002	4.06	4.8	0.74	0.40 gallons bailed
	11/05/2002	3.3	3.82	0.52	0.9 gallons bailed
	11/14/2002	not obtained	not obtained	not obtained	well under water due to weather
	11/22/2002	not obtained	not obtained	not obtained	0.25 gallons bailed
	12/09/2002	4.37	4.82	0.45	0.50 gallons bailed

Table 1 (cont.)
Free Product Measurement and Collection Quantities

	12/23/2002	not obtained	not obtained	not obtained	0.25 gallons bailed
	05/30/2003	not obtained	not obtained	not obtained	0.30 gallons bailed
	06/17/2003	not obtained	not obtained	not obtained	AFVR
	07/28/2003	4.51	4.61	0.1	No product removed
	10/03/2003	4.55	6.01	1.46	Installed absorbent sock
	12/12/2003	5.15	6.76	1.61	Replace absorbent sock
	01/12/2004	5.55	6.67	1.12	Replace absorbent sock
	02/12/2004	4.72	5.75	1.03	Replace absorbent sock
	05/28/2004	4.90	5.41	0.51	Replace absorbent sock
U659GW004	09/24/2002	sheen	3.92	not obtained	
	10/01/2002	sheen	3.12	not obtained	
	10/09/2002	sheen	4.01	not obtained	
	10/21/2002	sheen	3.21	not obtained	
	10/29/2002	4	4.5	0.5	0.10 gallons bailed
	11/05/2002	3.82	3.85	0.03	0.30 gallons bailed
	11/14/2002	sheen	2.72	not obtained	
	11/22/2002	not measured	not measured	not obtained	0.20 gallons bailed
	12/09/2002	4.02	4.05	0.03	0.20 gallons bailed
	12/23/2002	not obtained	not obtained	not obtained	0.10 gallons bailed
	05/30/2003	not obtained	not obtained	not obtained	0.25 gallons bailed
	06/17/2004	not obtained	not obtained	not obtained	AFVR
	07/28/2003	3.26	3.41	0.15	No product removed
	10/03/2003	4.49	5.46	0.97	Installed absorbent sock
	12/12/2003	5.25	6.55	1.30	Replace absorbent sock
	01/12/2004	5.33	7.11	1.78	Replace absorbent sock
	02/12/2004	4.67	5.11	0.44	Replace absorbent sock
	05/28/2004	4.82	5.38	0.56	Replace absorbent sock

n/a - Not Applicable

Appendix I
Waste Disposal Manifest

NON-HAZARDOUS WASTE MANIFEST

print or type (Form designed for use on elite (12 pitch) typewriter)

NON-HAZARDOUS WASTE MANIFEST		1. Generator's US EPA ID No. SC0170022560	Manifest Document No.	2. Page 1 of 1
3. Generator's Name and Mailing Address US NAVY- CHARLESTON NAVAL SHIPYARD 1849 AVE F N. CHARLESTON, SC 29405				
4. Generator's Phone () 843 921-5525				
5. Transporter 1 Company Name EQ Industrial Services	6. US EPA ID Number MI10 000 131 292	A. State Transporter's ID		
7. Transporter 2 Company Name	8. US EPA ID Number	B. Transporter 1 Phone 800 275 6629		
9. Designated Facility Name and Site Address EQ INDUSTRIAL SERVICES OF ATLANTA 5600 FULTON INDUSTRIAL, SW ATLANTA, GA 30336		C. State Transporter's ID		
		D. Transporter 2 Phone		
		E. State Facility's ID		
		F. Facility's Phone 404-494-3520		

11. WASTE DESCRIPTION	12. Containers		13. Total Quantity	14. Unit Wt./Vol.
	No.	Type		
a. <input type="checkbox"/> NON-REGULATED MATERIAL NON-HAZARDOUS (OILY WATER)	1	TT	760	G
b. <input type="checkbox"/>				
c. <input type="checkbox"/>				
d. <input type="checkbox"/>				

3. Additional Descriptions for Materials Listed Above 11a: Approval # ATL4624ALV-1 11b:	H. Handling Codes for Wastes Listed Above
-------------------------------------------------------------------------------------------------------------	-------------------------------------------

15. Special Handling Instructions and Additional Comments
IN CASE OF EMERGENCY CONTACT
EQIS 1-800-275-6629



6. GENERATOR'S CERTIFICATION: I hereby certify that the contents of this shipment are fully and accurately described and are in all respects in proper condition for transport. The materials described on this manifest are not subject to federal hazardous waste regulations.

Printed/Typed Name Jed Heames	Signature <i>[Signature]</i>	Date Month Day Year 6 17 03
7. Transporter 1 Acknowledgement of Receipt of Materials		
Printed/Typed Name Willie Riales	Signature <i>[Signature]</i>	Date Month Day Year 06 17 03
8. Transporter 2 Acknowledgement of Receipt of Materials		
Printed/Typed Name	Signature	Date Month Day Year

9. Discrepancy Indication Space

0. Facility Owner or Operator; Certification of receipt of the waste materials covered by this manifest, except as noted in item 19.

Printed/Typed Name	Signature	Date Month Day Year
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