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CNC CHARLESTON
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RESPONSE TO TANK ASSESSMENT REPORT FOR UNDERGROUND STORAGE TANK
(UST) AT BUILDING 656 DATED 20 OCTOBER 1997 CNC CHARLESTON SC
10/29/1997
ENVIRONMENTAL DETACHMENT CHARLESTON



DEPARTMENT OF THE NAVY
SUPERVISOR OF SHIPBUILDING, CONVERSION AND REPAIR, USN
PORTSMOUTH, VIRGINIA, DETACHMENT ENVIRONMENTAL CHARLESTON
1899 NORTH HOBSON AVENUE, BUILDING 30
NORTH CHARLESTON, SOUTH CAROLINA 29405-2106

Li 10.31.97
Lo 12.4.97

IN REPLY REFER TO:

Ser: 1054
October 29, 1997

South Carolina Department of Health
and Environmental Control
Bureau of Water, Groundwater
Assessment and Development Section
2600 Bull Street
Columbia South Carolina 29201-1708

RECEIVED
OCT 30 1997
Groundwater Assessment
and Development Section

Re: Response to Tank Assessment Report for UST at Building 656 (Site
Identification # 00942), dated October 20, 1997

Dear Mr. Bristol:

Your response to the Tank Assessment Report for UST 656 indicates additional investigative actions and contamination characterization is necessary at the site where the UST was formerly located. Chemicals of concern (COCs) requiring further investigation were "elevated levels of PAH (polynuclear aromatic hydrocarbons) ... in the groundwater sample obtained from the tank pit excavation". Your response also stated that additional assessment/corrective action for the UST site may be incorporated in RCRA Facility Investigation (RFI) work for Area of Concern (AOC) 655, inside which the removed UST was located.

AOC 655 is located in Zone H of the RFI. RFI work for Zone H is complete and the Final RFI Report for Zone H has been issued. The enclosed Section 9.13 of the Zone H RFI Report, dated June 24, 1997, presents conclusions for AOC 655. The RFI conclusions recommend that both surface soil and shallow groundwater at AOC 655 be included in the Corrective Measures Study (CMS) for the former Charleston Naval Base. However, PAH has not been identified as contributing to risk from shallow groundwater at AOC 655 and is not currently a Chemical of Concern for groundwater at AOC 655. SPORTENVDETCASN will notify Southern Division Naval Facilities Engineering Command personnel administering the RCRA Installation Restoration Program of the PAH contamination discovered in the groundwater samples taken during UST removal at Building 656.

Since UST 656 was located within a RCRA site at which groundwater has already been recommended for inclusion in the CMS, SPORTENVDETCASN believes that further action for UST 656 under the Tank Management Plan (dated October 18, 1996) should be deferred pending the outcome of the CMS.

South Carolina Department of Health
and Environmental Control

October 29, 1997

Page 2

Sincerely,


Earl R. Dearhart

Director, Supervisor of Shipbuilding, Conversion and Repair,
USN, Portsmouth, VA, Environmental Detachment Charleston SC

Encl: Ensafe/Allen & Hoshall, Final RCRA Facility Investigation Report for Zone H
NAVBASE Charleston, Section 9.13 dated June 24, 1997 - Conclusions for AOC
655

Ensafe/Allen & Hoshall, Final RCRA Facility Investigation Report for Zone H
NAVBASE Charleston, Table 6.2.8.16 Summary of Risk and Hazard-based
COCs for AOC 655

cc: Gabriel Magwood, SOUTHDIV
Tony Hunt, SOUTHDIV

9.13 AOC 655

AOC 655 is the site of a spill of approximately 300 gallons of No. 2 fuel oil. The spill occurred in 1985 when a fuel line within the boiler room of Building 656 ruptured. Approximately 150 gallons of the spilled fuel escaped through a seam in the concrete floor of the building to the underlying soil. Fuel oil was supplied to the boiler room from a nearby 5,800-gallon UST which is also within the subject AOC. Soil and groundwater sampling were conducted at AOC 655 to assess the presence or absence of residual contamination resulting from the previous oil spill and other possible releases which may have occurred in the vicinity.

As determined by soil sampling and subsequent risk assessment, four compounds or compound groups were responsible for risk present in surface soil at AOC 655. These compounds were Aroclor-1254, Aroclor-1260, dieldrin, and BEQs.

Aroclor-1260 was present at AOC 655 at RBSL-exceeding concentrations. The majority of the detections of Aroclor-1260 are centered in the area of the UST and the transformer vault adjacent to Building 656 where piping from the UST enters the building. The highest concentration of Aroclor-1260 was at the UST in both the upper and lower-interval samples collected from boring 656SB001. No other Aroclor-1260 was detected in the second-interval samples. Concentrations of Aroclor-1260 decrease at surface soil sample locations away from the UST.

Aroclor-1254 was detected at two soil borings at RBSL-exceeding concentrations (655SB005 and 655SB004). The 655SB005 detection of Aroclor-1254 is only slightly above the RBSL of 83 $\mu\text{g}/\text{kg}$. At soil boring 655SB004, immediately adjacent to the transformer vault, Aroclor-1254 was present in the upper and lower-interval at 110 $\mu\text{g}/\text{kg}$ and 180 $\mu\text{g}/\text{kg}$, respectively. This soil boring is surrounded by sample locations where no Aroclor-1254 was detected. No other second-interval samples contained Aroclor-1254.

Dieldrin was present in two soil samples at RBSL-exceeding concentrations (655SB00502 and 655SB00701). The dieldrin concentration in the second-interval sample at 655SB005 was only slightly above dieldrin's RBSL (44 $\mu\text{g}/\text{kg}$). The concentration of dieldrin in the upper-interval sample at 655SB007 was considerably higher (360 $\mu\text{g}/\text{kg}$). However, this detection was in the open-air alcove of Building 656 where it was likely used as an insecticide. No other soil sample collected at AOC 655 contained RBSL-exceeding concentrations of dieldrin.

BEQs were present in one soil sample (655SSGC9) collected from AOC 655 at concentrations which resulted in their identification as site COCs. The concentration of these compounds, when equated to BAP, exceeded the RBSL for BAP. The 655SSGC9 sample contained a BEQ concentration of 3,590 $\mu\text{g}/\text{kg}$. The sample location is at the edge of the current sampling pattern. BEQs were not detected in any second-interval sample collected at AOC 655.

At AOC 655, the total soil pathway risk for site residents and site workers was calculated as $3\text{E}-5$ and $6\text{E}-6$, respectively. The soil pathway hazard indices for all receptor groups were below 0.1. The primary contributors to surface soil risk were BEQs, Aroclor-1254, Aroclor-1260, and dieldrin. Table 9.13 summarizes human health risk assessment results.

Figure 9.28 illustrates the distribution of risk considering a residential scenario for AOC 655. Three areas (based on three sample locations) were identified that presented risk in the range between $1\text{E}-5$ and $1\text{E}-4$. The majority of the sampled area presented a risk of between $1\text{E}-6$ and $1\text{E}-5$.

Considering an industrial scenario at AOC 655 (Figure 9.29), only one sample location presented risk in the $1\text{E}-5$ to $1\text{E}-4$ range and only a small portion of the sampled area presented risk in the $1\text{E}-6$ to $1\text{E}-5$ range.

Due to lack of significant hazard in both the residential and industrial scenarios, no hazard maps for AOC 655 were prepared.

TPH contamination in excess of the screening level is present in the vicinity of the fuel oil UST and the piping leading from the UST into Building 656. The highest concentration of TPH detected at AOC 655 was 120 mg/kg. TPH concentrations drop to below the screening level in all directions away from the fuel oil UST. TPH was detected in three second-interval soil samples collected at AOC 655. One second-interval sample (655SB00402) contained TPH at a concentration which exceeded the screening level.

No ecological risk is anticipated for AOC 655 due to the lack of suitable habitat and lack of ecological receptors.

AOC 655 surface soil is recommended for inclusion in the CMS process on the basis of site resident and site worker risk as well as TPH concentrations.

The total shallow groundwater pathway risk for site residents and site workers was calculated as 1E-3 and 2E-4, respectively. The child resident hazard index was computed as 9, and the adult resident and site worker hazard indices were 4 and 1. The contributors to shallow groundwater risk and hazard were arsenic (NBCH655002 and NBCH655003) and chlordane (NBCH655002). Each was detected in at least one well during both quarterly sampling events. No arsenic or chlordane (sum of alpha and gamma isomers) was reported above their corresponding MCLs (0.05 and 0.002 $\mu\text{g/l}$). AOC 655 shallow groundwater is recommended for inclusion in the CMS process on the basis of projected resident and worker risk and hazard. However, if MCLs are strictly followed with respect to establishing groundwater remedial goals, no corrective measures would be required.

No fate and transport concerns were identified for AOC 655.

Table 6.2.8.16

Summary of Risk and Hazard-based COCs for AOC 655

NAVBASE - Charleston Zone H

Charleston, South Carolina

Medium	Exposure Pathway		Potential Future	Potential Future	Potential Future	Site Worker		Identification			
			Resident Adult Hazard Quotient	Resident Child Hazard Quotient	Resident Iwa ILCR	Hazard Quotient	ILCR	of COCs			
Surface Soil	Incidental Ingestion	Benzo(a)pyrene Equiv.	ND	ND	1.4E-05	ND	1.5E-06	2	4		
		Dieldrin	0.0015	0.014	1.4E-06	0.0005	1.5E-07	2			
		Aroclor-1254	0.0057	0.054	1.0E-06	0.002	1.1E-07	2			
		Aroclor-1260	ND	ND	4.7E-06	ND	5.2E-07	2			
Soil Ingestion Pathway Total			0.007	0.07	2E-05	0.003	2E-06				
	Dermal Contact	Benzo(a)pyrene Equiv.	ND	ND	4.5E-07	ND	1.9E-07	2			
		Dieldrin	0.0012	0.0041	6.2E-06	0.00089	2.5E-06	2	4		
		Aroclor-1254	0.0047	0.016	4.5E-07	0.0034	1.9E-07	2			
		Aroclor-1260	ND	ND	2.1E-06	ND	8.5E-07	2			
Soil Dermal Contact Pathway Total			0.006	0.02	9E-06	0.004	4E-06				
Shallow Groundwater	Ingestion	Arsenic	3.9	9	9.6E-04	1.4	2.2E-04	1	2	3	4
		Chlordane	0.05	0.1	2.0E-06	0.02	4.5E-07	2			
Shallow Groundwater Ingestion Pathway Total			4	9	1E-03	1	2E-04				
Sum of All Pathways			8	18	2E-03	3	5E-04				

Notes:

ND indicates not determined due to the lack of available risk information.

ILCR indicates incremental excess lifetime cancer risk

HI indicates hazard index

1- Chemical is a COC by virtue of projected child residence non-carcinogenic hazard.

2- Chemical is a COC by virtue of projected future resident lifetime ILCR.

3- Chemical is a COC by virtue of projected site worker non-carcinogenic hazard.

4- Chemical is a COC by virtue of projected site worker ILCR.