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OUTFALLS 4 AND 5 HERBICIDE ORANGE INVESTIGATION NCBC GULFPORT MS
3/3/2006
TETRA TECH



Rev. 1
03/03/06

Outfalls 4 and 5 Herbicide Orange Investigation

Naval Construction Battalion Center
Gulfport, Mississippi

Contract Task Order 0327
March 2006


Naval Facilities Engineering Command
Southern Division
Naval Facilities Engineering Command
2155 Eagle Drive
North Charleston, South Carolina 29406



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TtNUS/TLH-06-013/9409-4.1

March 3, 2006

Project Number 9409

Commander, Southern Division
Naval Facilities Engineering Command
Attn: Art Conrad
2155 Eagle Drive
North Charleston, South Carolina 29406

Reference: Clean Contract No. N6267-94-D0888
Contract Task Order No. 0327

Subject: **Final Outfalls 4 and 5 Herbicide Orange Investigation**

Dear Mr. Conrad:

Introduction

This letter report summarizes the collection and analysis of dioxin samples related to the drainage system Outfalls 4 & 5 adjacent to the Naval Construction Battalion Center Gulfport, Mississippi. These outfalls are part of the drainage system that was potentially hydrologically connected to Site 8. The primary objective was to characterize the levels and distribution of the remaining HO-related dioxins to determine if the soil and sediment meets current MDEQ residential (unrestricted) standards. The results of this sampling will be used to determine if additional sampling or remedial activities are necessary. Samples were collected and analyzed in accordance with TtNUS and MDEQ SOPs.

This series of samples represents nearly three years of study and investigation into potential alternative routes of sediment migration from Site 8 on NCBC Gulfport. Samples were collected from ditches as well as dredged piles of sediment adjacent to suspected pathways. In all a total of 15 dioxin samples were analyzed for dioxin and furans using the high resolution analysis (USEPA Method 8290).

The information sources used for this investigation included historical aerial photographs, oral histories obtained from long-term residents, and field observations. The Outfall 4/5 study is part of the larger Community Sampling effort completed in the neighborhoods adjacent to NCBC and includes a topographically low area not identified with an outfall number.

NORTH OF BASE/28th STREET

This area is the closest to Site 8 studied for this investigation. A depression on this property extends from 28th Street to the northwest. The concern, as confirmed by interviews with local residents and aerial photography, is that dioxin contaminated sediments from the base may have been transported across 28th Street during large precipitation events and deposited in the depression. Nine grab samples CS001, CS002, CS003, CS004, CS005, and CS017 shown on (Figure 1); and CS006, CS007, CS008, and CS009 shown on (Figure 2), were collected from the sediments in the area immediately north of 28th Street, between 53rd and 43rd Avenue. This depression was considered a likely area for deposition of sediments following storm events.

OUTFALLS 4 AND 5 DREDGED SOIL PILES

Local community members have had concerns that extensive storm water runoff from the north side of NCBC Gulfport may have carried impacted sediments across 28th Street and into residential neighborhoods. While the ditches themselves were sampled extensively in 1996 and 1997, some were concerned that the spoils from ditch clean-out activities may contain dioxins – especially in light of the consistent low dioxin results from the bottom of the ditches in the area. These spoils, or dredge materials were often removed and disposed of offsite. However, in areas that were undeveloped or heavily wooded, the dredged sediments were often placed in linear piles running adjacent to the primary ditch. It is in these piles that a series of composite samples were collected to determine if they contain dioxin related to the Herbicide Orange stored on NCBC.

Locations associated with Outfall 4&5 were determined by observing off base hydrological drainage patterns and local historical knowledge regarding surface flows toward Turkey Creek. While the connection with Outfall 4 was confirmed with historical maps and aerial photographs, no such connection could be made with Outfall 5. Therefore, any connection with Outfall 5 would have to be determined with sample results.

Outfall 4 & 5 sampling was completed in August 2005. Five composite samples (CSOF401, CSOF402, CSOF501, CSOF502, and CSOF503) were collected from a series of piles in wooded areas as shown on Figure 3. These piles ranged from less than 2 feet to over 5 feet high. The piles are heavily covered in pine straw and leaves and are not readily visible from the nearby roads. Each sample represents a composite of three samples taken approximately 15 feet apart over the 0 to 24 inch interval.

RESULTS

The investigation of soil and sediment north of the base near Outfalls 4 and 5 did confirm the presence of dioxins and furans. However, the levels reported and the types of congeners present do not represent an observed release from Site 8. None of the TCDD sample results exceed MDEQ screening levels for residential property. While some of the total dioxin results (TEQ) do exceed the 4.26 ppt screening number, exceedances are due to congeners associated with other industrial sources common in industrialized areas. It should be noted that the limitations of this study include the potential that dioxin concentrations were higher in the past, but are not still present because of the maintenance of the ditches.

The samples from the low areas near Outfall 4, as characterized by samples CS001 through CS017 do not exhibit a dioxin profile that would indicate a connection to Site 8. The reported 35.54 ppt from CS006 was almost entirely due to non-Herbicide Orange related furans – most likely associated with electrical transformers. Further, MDEQ has reviewed these results and approved a transfer of ownership while maintaining residential zoning.

Mr. Art Conrad
NAVFAC
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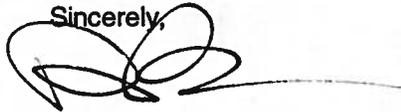
Similarly, the TCDD results for the Outfall 4 and 5 dredge piles were all well below the screening level. The contribution of non-Herbicide Orange related dioxin and furan congeners caused three of the sample results to exceed MDEQ screening criteria – the source(s) of which is likely electrical transformers and the byproducts of combustion. Interestingly, the pile sample with the sample result, CS0F501, did not contain any TCDD at all.

Table 1
Dioxin/Furan Results
Outfall 4/5 Study
Gulfport, Mississippi

SAMPLE ID	TEQ
CS001	2.02
CS002	0.21
CS003	9.87
CS004	0.80
CS005	2.08
CS006	35.54
CS007	1.98
CS008	1.77
CS009	0.39
CS017	0.33
CSOF401	5.538
CSOF402	4.340
CSOF501	9.646
CSOF502	3.652
CSOF503	0.249

If you have any comments or concerns, please do not hesitate to call me at (850)385-9899, or send me an email at fisherr@ttnus.com.

Sincerely,



Robert Fisher, PG
Task Order Manager
Date: March 03, 2006

Enclosures

c: Gordon Crane, NCBC Gulfport
Bob Merrill, MDEQ
Debbie Humbert, Pittsburgh
Mark Perry/File

SOIL SAMPLES 6 THROUGH 9

SAMPLES IN THE S 1/2 OF THE SW 1/4 OF
SECTION 32, TOWNSHIP 07 SOUTH, RANGE 11 WEST,
CITY OF GULFPORT, HARRISON COUNTY, MISSISSIPPI
SURVEY FOR TETRA TECH NUS, INC., NOVEMBER 2002

THIS SURVEY AND PLAT WERE PREPARED ONLY FOR CLIENT AS NAMED HEREON AND NO THIRD OR OTHER PARTY CERTIFICATION IS EXPRESSED OR IMPLIED. ALL BEARINGS/DISTANCES ARE SHOWN AS MEASURED UNLESS NOTED OTHERWISE. THIS SURVEY PERFORMED WITHOUT THE BENEFIT OF A TITLE REPORT. THIS PLAT IS CERTIFIED ONLY TO THAT DATA SHOWN HEREON AND MAY NOT BE COMPLETE OR ALL-INCLUSIVE FOR ANY PURPOSES OR USES OTHER THAN THOSE AS ORIGINALLY CONTRACTED FOR BY CLIENT. VERIFICATION OF ACTUAL FIELD CONDITIONS IS REQUIRED BEFORE DETAILED PLANNING OR CONSTRUCTION IS COMMENCED.

IP = IRON PIPE S = SET
IR = IRON ROD F = FOUND
PK = PK NAIL D = DEED BEARING/
RR = RAIL ROAD SPIKE DISTANCE
CS = COTTON SPINDLE ohe = OVERHEAD
CM = CONCRETE MONUMENT ELECTRIC LINES

SAMPLE LOCATION DATA SHOWN DEVELOPED FROM INFORMATION PROVIDED BY TETRA TECH, N.U.S. PROPERTY TAX MAP INFORMATION OBTAINED FROM HARRISON COUNTY TAX MAPS, DATED AUGUST 2002. AERIAL PHOTOGRAPHY SHOWN OBTAINED FROM HARRISON COUNTY, CIRCA 1996. COORDINATES SUPPLIED WERE DERIVED FROM A COMBINATION OF FIELD MEASUREMENTS, AERIAL MAP AND HARRISON COUNTY BASE MAP CORRELATION. THIS SURVEY IS REFERENCED IN FEET TO STATE PLANE COORDINATES SUPPLIED BY HARRISON COUNTY ENGINEERING DEPARTMENT, DATUM NAD-1983.

THE INTENT OF THIS SURVEY IS TO SHOW SAMPLE LOCATIONS AS INSTALLED OR COLLECTED BY TETRA TECH, NUS. A COPY OF THIS PLAT IS VALID ONLY IF IT IS COMPLETE AND INTACT, HAS AN ORIGINAL SIGNATURE AND DATE, AND HAS THE ORIGINAL EMBOSSED OR COLORED (NOT BLACK) STAMPED SURVEYOR'S SEAL.

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FIGURE 2

TETRA TECH, NUS	
SECTION 32, TOWNSHIP 07 SOUTH, RANGE 11 WEST	
SOIL SAMPLES 6 THROUGH 9	
LAND SURVEYING INCORPORATED 203 - 48th STREET GULFPORT, MS 39507	SCALE: 1" = 150'
	PLOT DATE: <input type="checkbox"/>
	DRAWN BY: RDP
	CHECKED BY: RDP
	DWG NAME: <input type="checkbox"/>
REVISED:	

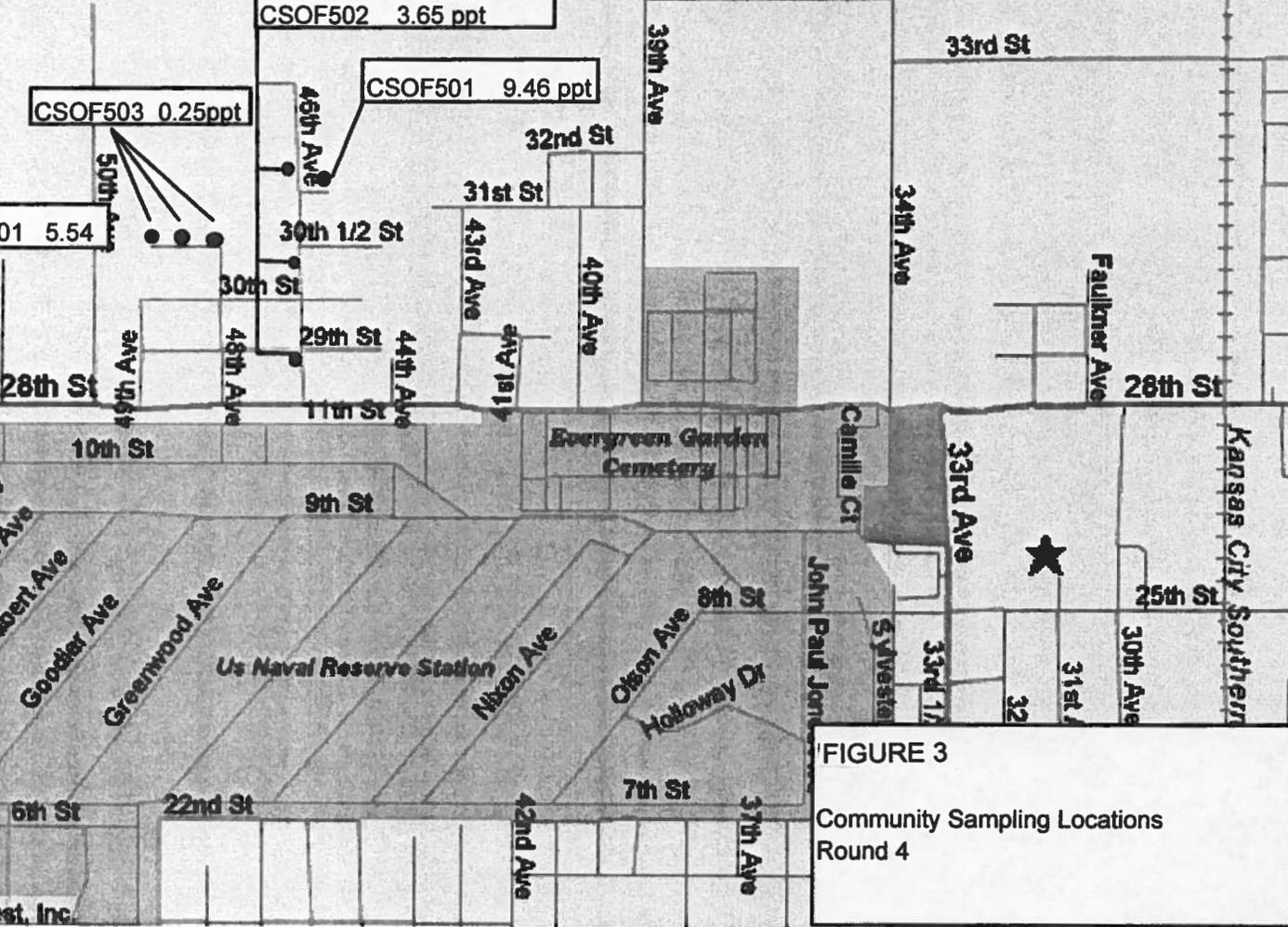


FIGURE 3
Community Sampling Locations
Round 4