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NCBC GULFPORT
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LETTER REPORT ON SURFACE SOIL SAMPLING AND ANALYTICAL RESULTS FOR AREA
A NCBC GULFPORT MS
6/15/1995
ABB ENVIRONMENTAL



June 15, 1995

Mr. Dan Owens
Southern Division
Naval Facilities Engineering Command
2155 Eagle Drive
North Charleston, SC 29419-9010

SUBJECT: Letter Report, Surface Soil Sampling Field Program and Analytical Results for Area A, Former Herbicide Orange Storage Area, Naval Construction Battalion Center (NCBC) Gulfport, Mississippi

INTRODUCTION

ABB Environmental Services, Inc., (ABB-ES) under contract to Southern Division, Naval Facilities Engineering Command (SOUTHNAVFACENGCOM), conducted site investigation activities at Site A, Former Herbicide Orange (HO) Storage Area, at the Naval Construction Battalion Center (NCBC) in Gulfport, Mississippi. The field program consisted of sampling and characterizing surface soil at the site. The field program and preparation of this letter were completed under the Comprehensive Long-Term Environmental Action, Navy contract (Contract Number N62467-89-D-0317, Contract Task Order Number 092) between SOUTHNAVFACENGCOM and ABB-ES.

PURPOSE

The fence boundary on the southwest side of Site A encompasses approximately 240 feet of railroad tracks. NCBC Gulfport wants to move this fence boundary to exclude the railroad tracks. Approximately 850,000 gallons of HO were stored from 1965 to 1977 at Site A. 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD)-contaminated soil was incinerated and returned to selected areas within Site A. Surface soils along the southwest fence boundary were sampled to characterize possible dioxin contamination.

This letter report summarizes the findings and results based on information and data collected from Site A as a result of the surface soil sampling that was performed on December 18, 1994.

FIELD PROGRAM

Surface soil sampling included the collection of six samples, including one duplicate sample, at Site A. The samples were collected from the surface at depths of 0 to 6 inches. Figure 1 (Attachment 1) shows each sample location. Samples were analyzed for dioxins and furans (U.S. Environmental Protection Agency [USEPA] Method 8290).

ABB Environmental Services Inc.

Surface Soil Sampling All surface soil sampling was conducted using deconned equipment. Equipment was deconned according to the procedures outlined in the Addendum to the Versar Sampling and Analysis Plan (ABB-ES, 1994). Decontamination fluids were containerized in 55-gallon steel drums. Sampling equipment included stainless-steel hand augers, stainless-steel spoons, and glass bowls.

One sample was collected from each sample location by collecting surface soil from 0 to 6 inches. All six locations were sampled on December 18, 1994. All samples collected were properly preserved, placed in coolers, and packed with bagged ice immediately after collection.

All samples remained in the custody of the field operations leader until delivery to the courier service providing overnight shipment to the laboratory. All samples were shipped, complete with chain-of-custody (COC) forms, to the analytical laboratory within 24 hours for analyses. Upon arrival at the laboratory, the COC and preservation of the samples were checked with the contents of each cooler by laboratory personnel. After verification, the COC form was signed by laboratory personnel and the samples accepted for analyses.

ANALYTICAL PROGRAM

Sampling activities included the collection of six surface soil samples, including one duplicate sample. All samples were collected in accordance with procedures outlined in the addendum to the Versar Sampling and Analysis Plan (ABB-ES, 1994). Samples were submitted to Quanterra Environmental Services for chemical analyses. Samples were analyzed in accordance with USEPA SW-846 Method 8290 and Naval Energy and Environmental Support Activity (NEESA) Level D documentation (NEESA, 1988) for dioxins and furans.

Data Quality Assessment Review of the field notebook and COC forms did not indicate any non-conformance relative to sample handling. All required field quality control (QC) samples were collected in conformance with the requirements of the USEPA and ABB-ES Quality Assurance Plans and the June 1988 NEESA *Sampling and Chemical Analysis Quality Assurance Requirements for the Navy Installation Restoration Program* (NEESA, 1988) (Document 20.2-047B). These field QC samples included field duplicates, equipment rinsate blanks, and source water blanks.

The data review and validation of the ash were performed under subcontract to Heartland Environmental Services, St. Louis, Missouri. Review of analytical data indicated the laboratory generally met applicable analytical QC criteria for all chemical analyses.

The analytical results for environmental samples were evaluated and validated according to NEESA Level D QC criteria to determine data quality and useability.

Sample Identifier A standard system was implemented to identify the samples with their respective locations. For example, sample GPS00200 is the sample collected from sample location number 2. GP, representing NCBC Gulfport, and S, indicating a soil sample, are the base and matrix identifiers. The duplicate sample has a D on the end of the sample identifier. The quality assurance samples are similarly named except the matrix identifier is F or R for field blank and the equipment rinsate, respectively.

INVESTIGATIVE RESULTS

Analytical results for the six surface soil samples indicate concentrations of dioxins in all of the samples. Table 1 (Attachment 2) lists the analytes detected, concentrations detected for each sample, and the total toxicity equivalency (TE) concentration for each sample.

2,3,7,8-TCDD is considered to be the most potent carcinogen in the dioxin and furan families. Toxicologists believe that polychlorinated dibenzodioxins and polychlorinated dibenzofurans (PCDDs/PCDFs) with chlorine atoms at the 2, 3, 7, and 8 positions (2,3,7,8-substituted compounds) in their molecules can mimic the toxic properties of 2,3,7,8-TCDD. The USEPA-developed toxicity equivalency factors (TEFs) to quantify the carcinogenicity of these compounds relative to 2,3,7,8-TCDD. Concentrations of PCDDs/PCDFs in a sample are multiplied by TEFs to determine a 2,3,7,8-TCDD equivalent concentration.

Total TE concentrations ranged from 1.10 to 5.54 picograms per gram (pg/g), or parts per trillion with the highest concentrations detected in sample GPS001. The highest concentration of 2,3,7,8-TCDD was sample GPS005 at 2.9 pg/g. Samples GPS003 and GPS004 were the only ones not to detect concentrations of 2,3,7,8-TCDD.

SUMMARY

Six surface soil samples were collected to characterize dioxin contamination along the southwest fence boundary at Site A, former HO Storage Area, during December 1994. Mississippi Department of Environmental Protection has set an action level of 4.70 pg/g for 2,3,7,8-TCDD. Using the TEFs developed by the USEPA, sample GPS001 exceeds this action level. The total TE concentrations for the other samples ranged from 1.10 to 4.30 pg/g, which are all below the 4.7 pg/g action level.

Due to the short time frame for moving the fence line at the site, it is believed that no unacceptable health threats would result from any potential exposure to the dioxin contaminants. However, reasonable caution should be exercised to reduce skin contact and prevent dust generation during the work at the site.

Very truly yours,

ABB ENVIRONMENTAL SERVICES, INC.



Penny Baxter
Task Order Manager

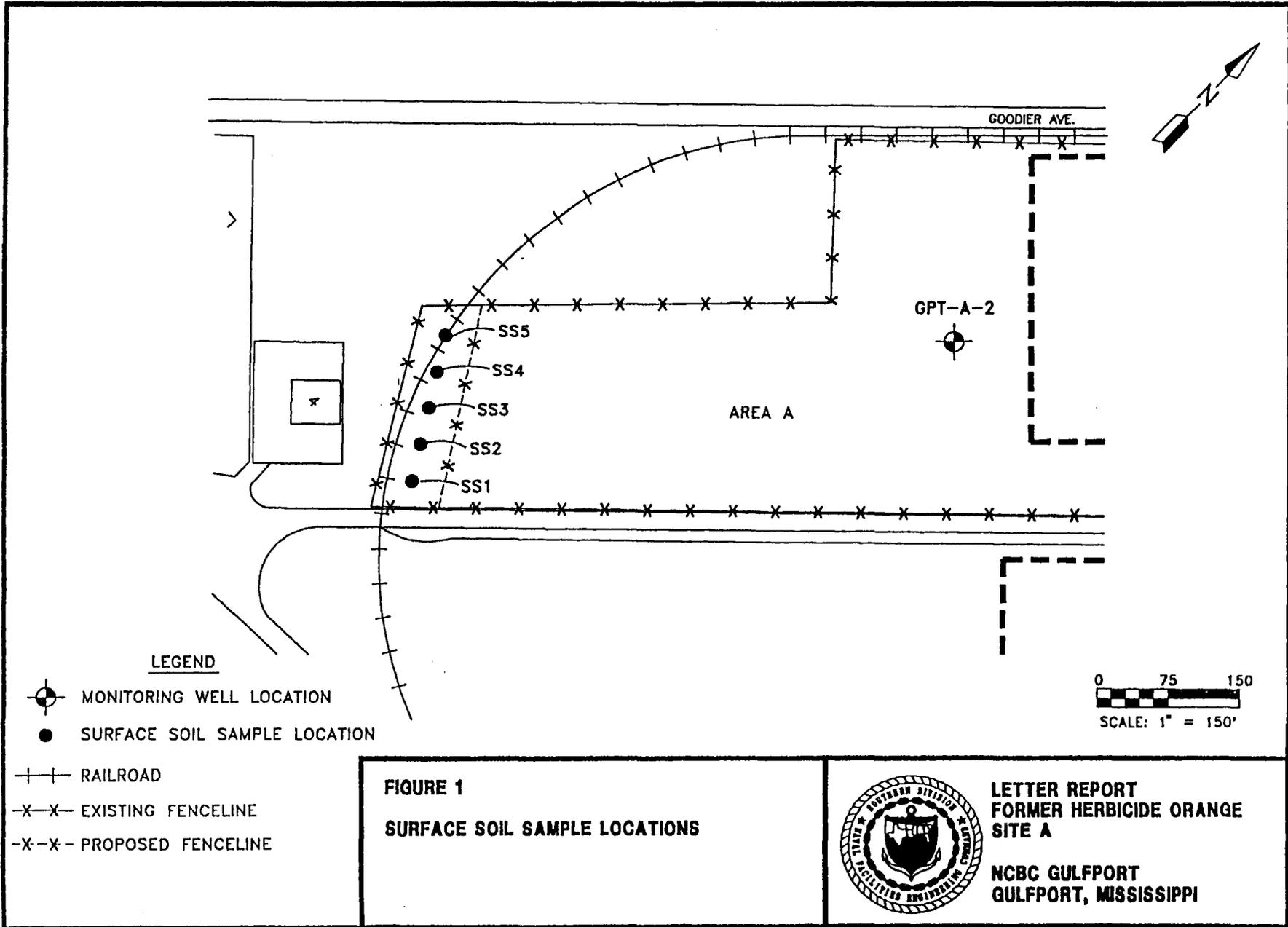
[8504.016]

Attachments:

- Attachment 1: Figure
- Attachment 2: Table
- Attachment 3: Glossary
- Attachment 4: References

ATTACHMENT 1

FIGURE



ATTACHMENT 2

TABLE

Table 1
Dioxins and Furans Detected in Surface Soil

Letter Report
Site A, Former Herbicide Orange Storage Area
Naval Construction Battalion Center
Gulfport, Mississippi

Analyte	TEF	GPS001	GPS002	GPS003	GPS003D	GPS004	GPS005
1,2,3,4,7,8-HxCDF	0.1	4.4	3.3	4.7	2.9	ND	ND
1,2,3,4,6,7,8-HpCDF	0.01	23	19	14	11	ND	7.4
OCDF	0.001	60	48	24	24	ND	14
2,3,7,8-TCDD	1	1.9	0.95	ND	0.92	ND	2.9
1,2,3,6,7,8-HxCDD	0.1	3.1	ND	ND	ND	ND	ND
1,2,3,4,6,7,8-HpCDD	0.01	110	86	80	61	9.9	49
OCDD	0.001	1,500	1,300	1,400	1,100	1,000	820
Total TE concentration		5.54	3.68	2.83	3.05	1.10	4.30

Notes: All concentrations are reported in picograms per gram or parts per trillion.

TEF = toxicity equivalency factor.
HxCDF = hexachlorodibenzofuran.
ND = not detected.
HpCDF = heptachlorodibenzofuran.
OCDF = octachlorodibenzofuran.
TCDD = tetrachlorodibenzo-p-dioxin.
HpCDD = heptachlorodibenzo-p-dioxin.
OCDD = octachlorodibenzo-p-dioxin.
TE = toxicity equivalency.

ATTACHMENT 3

GLOSSARY

GLOSSARY

2,3,7,8-TCDD	2,3,7,8-tetrachlorodibenzo-p-dioxin
ABB-ES	ABB Environmental Services, Inc.
COC	chain-of-custody or chain of custody
D	a sample identifier representing a duplicate sample
F	a sample identifier representing a field blank
GP	a sample identifier representing NCBC Gulfport
HO	Herbicide Orange
HpCDD	heptachlorodibenzo-p-dioxin
HpCDF	heptachlorodibenzofuran
HxCDF	hexachlorodibenzofuran
NCBC	Naval Construction Battalion Center
ND	not detected
NEESA	Naval Energy and Environmental Support Activity
OCDD	octachlorodibenzo-p-dioxin
OCDF	octachlorodibenzofuran
PCDD/PCDF pg/g	polychlorinated dibenzodioxin and polychlorinated dibenzofuran picograms per gram
QC	quality control
R	a sample identifier representing a equipment rinsate
S	a sample identifier representing a soil sample
SOUTHNAV- FACENCOM	Southern Division, Naval Facilities Engineering Command
TE	toxicity equivalency
TEF	toxicity equivalency factor
USEPA	U.S. Environmental Protection Agency

ATTACHMENT 4

REFERENCES

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ABB Environmental Services, Inc. (ABB-ES), 1994, Addendum to the Versar Sampling and Analysis Plan: prepared for Southern Division, Naval Facilities Engineering Command, Charleston, South Carolina, Contract No. N62467-89-D-0317.

Naval Energy and Environmental Support Activity (NEESA), 1988, Sampling and Chemical Analysis Quality Assurance Requirements for the Navy Installation Restoration Program: NEESA 20.2-047B, Port Hueneme, California.

U.S. Environmental Protection Agency (USEPA), 1986, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846.

USEPA, 1991, Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual Supplemental Guidance: Standard Default Exposure Factors (Interim Final); Office of Emergency and Remedial Response; USEPA; OSWER Directive 9285.6-03; March 25.

Post-it™ Fax Note	7671	Date	4/24	# of pages	5
To	Kate Kelly	From	M. Land		
Co./Dept.		Co.			
Phone #		Phone #			
Fax #		Fax #			

April 25, 1995

Mr. Dan Owens
 Southern Division
 Naval Facilities Engineering Command
 2155 Eagle Drive
 North Charleston, SC 29419-9010

SUBJECT: Letter Report, Surface Soil Sampling Field Program and Analytical Results for Area A, Former Herbicide Orange Storage Area, Naval Construction Battalion Center (NCBC) Gulfport, Mississippi

INTRODUCTION

ABB Environmental Services, Inc., under contract to Southern Division, Naval Facilities Engineering Command (SOUTHNAVFACENGCOM), conducted site investigation activities at Site A, Former Herbicide Orange (HO) Storage Area, at the Naval Construction Battalion Center (NCBC) in Gulfport, Mississippi. The field program consisted of sampling and characterizing surface soils at the site. The field program and preparation of this letter were completed under the Comprehensive Long-Term Environmental Action, Navy contract (Contract Number N62467-89-D-0317, Contract Task Order Number 092) between SOUTHNAVFACENGCOM and ABB-ES.

PURPOSE

The fence boundary on the southwest side of Site A encompasses approximately 240 feet of railroad tracks. NCBC Gulfport wants to move this fence boundary to exclude the railroad tracks. Approximately 850,000 gallons of HO were stored from 1965 to 1977 at Site A. 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD)-contaminated soil was incinerated and returned to selected areas within Site A. Surface soils along the southwest fence boundary were sampled to characterize possible dioxin contamination.

This letter report summarizes the findings and results based on information and data collected from Site A as a result of the surface soil sampling which was performed on December 18, 1994.

FIELD PROGRAM

Surface soil sampling included the collection of six samples, including one duplicate sample, at Site A. The samples were collected from the surface at depths of 0 to 6 inches. Figure 1 shows each sample location. Samples were analyzed for dioxins and furans (USEPA Method 8290).

Surface Soil Sampling

All surface soil sampling was conducted using deconned equipment. Equipment was deconned according to the procedures outlined in the Addendum to the Versar Sampling and Analysis Plan (ABB-ES, 1994). Decontamination fluids were containerized in 55 gallon steel drums. Sampling equipment included stainless steel hand augurs, stainless steel spoons and glass bowls.

One sample was collected from each sample location by collecting surface soil from 0 to 6 inches. All six locations were sampled on December 18, 1994. All samples collected were properly preserved, placed in coolers, and packed with bagged ice immediately after collection.

All samples remained in the custody of the field operations leader until delivery to the courier service providing overnight shipment to the laboratory. All samples were shipped, complete with chain-of-custody forms, to the analytical laboratory within 24 hours for analysis. Upon arrival at the laboratory, the chain-of-custody and preservation of the samples were checked with the contents of each cooler by laboratory personnel. After verification, the chain-of-custody form was signed by laboratory personnel and the samples accepted for analysis.

ANALYTICAL PROGRAM

Sampling activities included the collection of six surface soil samples, including one duplicate sample. All samples were collected in accordance with procedures outlined in the addendum to the Versar sampling and analysis plan (ABB-ES, 1994). Samples were submitted to Quanterra Environmental Services for chemical analyses. Samples were analyzed in accordance with USEPA SW-846 Method 8290 and NEESA Level D documentation (NEESA, 1988) for dioxins and furans.

Data Quality Assessment

Review of the field notebook and chain-of-custody forms did not indicate any non-conformance relative to sample handling. All required field quality control (QC) samples were collected in conformance with the requirements of the USEPA and ABB-ES Quality Assurance Plans and the June 1988 NEESA "Sampling and Chemical Analysis Quality Assurance Requirements for the Navy Installation Restoration Program" (NEESA, 1988) (Document 20.2-047B). These field QC samples included field duplicates, equipment rinseate blanks, and source water blanks.

The data review and validation of the ash were performed under subcontract to Heartland Environmental Services, St. Louis, Missouri. Review of analytical data indicated the laboratory generally met applicable analytical QC criteria for all chemical analyses.

The analytical results for environmental samples were evaluated and validated according to NEESA Level D QC criteria to determine data quality and useability.

Sample Identifier

A standard system was implemented to identify the samples with their respective locations. For example, sample GPS00200 is the sample collected from sample location number 2. GP, which represents ^{North} Gulfport, and S, which indicates ~~that it is a soil sample~~, are the base and matrix identifiers. The duplicate sample has a D on the end of the sample identifier. The quality assurance samples are similarly named except the matrix identifier is ~~F or R instead of S. F indicates that the sample is the field blank and R indicates that the sample is the equipment rinseate, respectively.~~

INVESTIGATIVE RESULTS

Analytical results for the six surface soil samples indicate concentrations of dioxins in all of the samples. Table 1 lists the analytes which were detected, concentrations detected for each sample, and the total toxicity equivalency (TE) concentration for each sample.

2,3,7,8-TCDD is considered to be the most potent carcinogen in the dioxin and furan families. Toxicologists believe that polychlorinated dibenzodioxins and polychlorinated dibenzofurans (PCDDs/PCDFs) with chlorine atoms at the 2, 3, 7, and 8 positions (2,3,7,8-substituted compounds) in their molecules can mimic the toxic properties of 2,3,7,8-TCDD. The USEPA developed toxicity equivalency factors (TEFs) to quantify the carcinogenicity of these compounds relative to 2,3,7,8-TCDD. Concentrations of PCDDs/PCDFs in a sample are multiplied by TEFs to determine a 2,3,7,8-TCDD equivalent concentration.

Total TE concentrations ranged from 1.10 to 5.54 pg/g, with the highest concentrations ~~being~~ detected in sample GPS001. ^{or parts per trillion} Sample GPS005 ~~detected~~ the highest concentration of 2,3,7,8-TCDD of 2.9 pg/g. Samples GPS003 and GPS004 were the only ones to not detect concentrations of 2,3,7,8-TCDD. ^(2,3,7,8-TCDD) The highest detected concentration ^{was at GPS005,}

SUMMARY

Six surface soil samples were collected to characterize dioxin contamination along the southwest fence boundary at Site A, former HO Storage Area, during December 1994. Mississippi Department of Environmental Protection has set an action level of 4.70 pg/g for 2,3,7,8-TCDD. Using the TEFs developed by the USEPA, sample GPS001 exceeds this action level. The total TE concentrations for the other samples ranged from 1.10 to 4.30 pg/g which are all below the 4.7 pg/g action level.

Due to the short time frame for moving the fence line at the site, it is believed that no unacceptable health threats would result from any potential exposure to the ~~and~~ dioxin contaminants. However, ^{reasonable} caution should be exercised to reduce skin contact and prevent dust generation during the ~~work~~ at the site.

Table 1
Dioxins and Furans Detected in Surface Soil

Letter Report
Site A, Former Herbicide Orange Storage Area
Naval Construction Battalion Center
Gulfport, Mississippi

Analyte	TEF	GPS001	GPS002	GPS003	GPS003D	GPS004	GPS005
1,2,3,4,7,8-HxCDF	0.1	4.4	3.3	4.7	2.9	ND	ND
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2,3,7,8-TCDD	1	1.9	0.95	ND	0.92	ND	2.9
1,2,3,6,7,8-HxCDD	0.1	3.1	ND	ND	ND	ND	ND
1,2,3,4,6,7,8-HpCDD	0.01	110	86	80	61	9.9	49
OCDD	0.001	1500	1300	1400	1100	1000	820
Total TE Concentration		5.54	3.68	2.83	3.05	1.10	4.30

Notes: All concentrations are reported in picograms per gram. *or parts per trillion.*
 TEF = Toxicity Equivalency Factor
 HxCDF = Hexachlorodibenzofuran
 HpCDF = Heptachlorodibenzofuran
 OCDF = Octachlorodibenzofuran
 TCDD = Tetrachlorodibenzo-p-dioxin.
 HpCDD = Heptachlorodibenzo-p-dioxin.
 OCDD = Octachlorodibenzo-p-dioxin.
 ND = not detected.
 TE = Toxicity Equivalency

Editing Service Request Form

Installation: <i>Cuepost</i>	
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Project Manager: <i>Penny Baxter</i>	Submitted by: <i>Karen Ballo (Knoxville)</i>
Date and Time Assigned: <i>6/2 *</i>	Date Due: <i>6/1 ?</i>
Charge Number: <i>08505-50-000</i>	Special Instructions: <i>received 6/1</i>
Hours Budgeted:	

Description of Services:	Copy Edit Instructions	Initials	Date
<input type="checkbox"/> See submitter before beginning work.	Captions are identical on figures, in the TOC, and on slip sheets. <i>NA</i>		
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Other Instructions	Tables are in the correct format.		
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	Figures are complete.		
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Copy Editing:	<i>Rita</i>	<i>6/2</i>	<i>6/2</i>	<i>RW</i>	<i>6/2</i>
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Proofreading (follow-up):	<i>NA</i>				
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DELIVERABLE REVIEW TRACKING AND DOCUMENT RECORD

Document Full Title and Faculty Name: Letter Report: Surface Soil Sampling Field Program and Analytical Results for Area A

Authors: Karen Boles and Bob Fisher

Task Order Manager: Penny Baxter

Project No.: 08505-50 (offsite)

Approved for Technical Review: _____

Date: May 30, 1995

Task Order Manager

Lead Senior Technical Review

Supplemental Technical Review

Name: Penny Baxter

Date: May 30, 1995

Meets Statement of Work

Approval: [Signature]

Date: 5/31/95

Overall Comments:

Additional Comments Attached:

Yes ___ No ___

Name: Marland Dulancy

Date: May 30, 1995

Meets ALL Technical Requirements

Approval: [Signature] Date: 5/30/95

Overall Comments:

Additional Comments Attached:

Yes ___ No ___

Name: Sandy Calhoun

Date: May 30, 1995

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Name: _____

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Yes ___ No ___

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Comments Attached:

Yes ___ No ___

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Date: _____

Comments Attached:

Yes ___ No ___

PROGRAM MANAGEMENT RELEASE

DOCUMENT APPROVED FOR RELEASE

Program Task Order Manager

Signature

Date

Comments Attached: Yes ___ No ___



May 26, 1995

Mr. Dan Owens
Southern Division
Naval Facilities Engineering Command
2155 Eagle Drive
North Charleston, SC 29419-9010

SUBJECT: Letter Report, Surface Soil Sampling Field Program and Analytical Results for Area A, Former Herbicide Orange Storage Area, Naval Construction Battalion Center (NCBC) Gulfport, Mississippi

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Total TE concentrations ranged from 1.10 to 5.54 picograms per gram (pg/g), or parts per trillion with the highest concentrations detected in sample GPS001. The highest concentration of 2,3,7,8-TCDD was sample GPS005 at 2.9 pg/g. Samples GPS003 and GPS004 were the only ones not to detect concentrations of 2,3,7,8-TCDD.

SUMMARY

Six surface soil samples were collected to characterize dioxin contamination along the southwest fence boundary at Site A, former HO Storage Area, during December 1994. Mississippi Department of Environmental Protection has set an action level of 4.70 pg/g for 2,3,7,8-TCDD. Using the TEFs developed by the USEPA, sample GPS001 exceeds this action level. The total TE concentrations for the other samples ranged from 1.10 to 4.30 pg/g, which are all below the 4.7 pg/g action level.

Due to the short time frame for moving the fence line at the site, it is believed that no unacceptable health threats would result from any potential exposure to the dioxin contaminants. However, reasonable caution should be exercised to reduce skin contact and prevent dust generation during the work at the site.

Very truly yours,

ABB ENVIRONMENTAL SERVICES, INC.

Penny Baxter
Task Order Manager

Attachments:

- Attachment 1: Figure
- Attachment 2: Table
- Attachment 3: Glossary
- Attachment 4: References

ATTACHMENT 1

FIGURE

ATTACHMENT 2

TABLE

Table 1
Dioxins and Furans Detected in Surface Soil

Letter Report
Site A, Former Herbicide Orange Storage Area
Naval Construction Battalion Center
Gulfport, Mississippi

Analyte	TEF	GPS001	GPS002	GPS003	GPS003D	GPS004	GPS005
1,2,3,4,7,8-HxCDF	0.1	4.4	3.3	4.7	2.9	ND	ND
1,2,3,4,6,7,8-HpCDF	0.01	23	19	14	11	ND	7.4
OCDF	0.001	60	48	24	24	ND	14
2,3,7,8-TCDD	1	1.9	0.95	ND	0.92	ND	2.9
1,2,3,6,7,8-HxCDD	0.1	3.1	ND	ND	ND	ND	ND
1,2,3,4,6,7,8-HpCDD	0.01	110	86	80	61	9.9	49
OCDD	0.001	1,500	1,300	1,400	1,100	1,000	820
Total TE concentration		5.54	3.68	2.83	3.05	1.10	4.30

Notes: All concentrations are reported in picograms per gram or parts per trillion.

TEF = toxicity equivalency factor.
HxCDF = hexachlorodibenzofuran.
ND = not detected.
HpCDF = heptachlorodibenzofuran.
OCDF = octachlorodibenzofuran.
TCDD = tetrachlorodibenzo-p-dioxin.
HpCDD = heptachlorodibenzo-p-dioxin.
OCDD = octachlorodibenzo-p-dioxin.
TE = toxicity equivalency.

ATTACHMENT 3

GLOSSARY

ATTACHMENT 4

REFERENCES

GLOSSARY

✓ 2,3,7,8-TCDD	2,3,7,8-tetrachlorodibenzo-p-dioxin
✓ ABB-ES	ABB Environmental Services, Inc.
✓ COC	chain-of-custody or chain of custody
✓ D	a sample identifier representing a duplicate sample
✓ F	a sample identifier representing a field blank
✓ GP	a sample identifier representing NCBC Gulfport
✓ HO	Herbicide Orange
✓ HpCDD	heptachlorodibenzo-p-dioxin
✓ HpCDF	heptachlorodibenzofuran
✓ HxCDF	hexachlorodibenzofuran
✓ NCBC	Naval Construction Battalion Center
✓ ND	not detected
✓ NEESA	Naval Energy and Environmental Support Activity
✓ OCDD	octachlorodibenzo-p-dioxin
✓ OCDF	octachlorodibenzofuran
✓ PCDD/PCDF	polychlorinated dibenzodioxin and polychlorinated dibenzofuran
✓ pg/g	picograms per gram
✓ QC	quality control
✓ R	a sample identifier representing a equipment rinsate
✓ S	a sample identifier representing a soil sample
✓ SOUTHNAV- FACENCOM	Southern Division, Naval Facilities Engineering Command
✓ TCDD	tetrachlorodibenzo-p-dioxin
✓ TE	toxicity equivalency
✓ TEF	toxicity equivalency factor
✓ USEPA	U.S. Environmental Protection Agency

REFERENCES

- ✓ ABB Environmental Services, Inc. (ABB-ES), 1994, Addendum to the Versar Sampling and Analysis Plan: prepared for Southern Division, Naval Facilities Engineering Command, Charleston, South Carolina, Contract No. N62467-89-D-0317.
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