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NCBC GULFPORT
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LETTER REPORT REGARDING TECHNICAL ASSISTANCE FOR DIRECT PUSH TECHNOLOGY DRILLING ACTIVITIES AT SITES 1 AND 5 NCBC GULFPORT MS
4/7/1997
ABB ENVIRONMENTAL

ABB

473

April 7, 1997

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

Dear Mr. Conrad:

SUBJECT: Field Report, Technical Assistance for Direct-Push Technology (DPT) Drilling Activities at Sites 1 and 5 at the Naval Construction Battalion Center (NCBC) Gulfport, Mississippi; Contract No. N62467-89-D-0317/096

INTRODUCTION

ABB Environmental Services, Inc. (ABB-ES), was contracted by Southern Division, Naval Facilities Engineering Command to provide technical assistance to the remedial action contractor, Morrison Knudson (MK), during field activities at NCBC Gulfport, Mississippi. The field activities included the advancement of soil borings in the landfill areas of Sites 1 and 5 for the purpose of determining if dioxin is present in either landfill and to determine the best locations to perform removal of the potential dioxin sources. The soil sampling is part of a phased approach that may eventually result in excavation of the potential sources of dioxin at Sites 1 and 5.

BACKGROUND

Site 1, Training Area. The site is a training area on top of an inactive landfill. Unknown quantities of chemical wastes containerized in 55-gallon drums were disposed of by trench-and-fill operations between 1942 and 1948. The site was subsequently backfilled with soil and is now characterized by planted trees, grass areas, and buildings associated with the training mission of the base.

Site 5, Heavy Equipment Training Area. The site consists of an area located between Fourth Street and Colby Avenue. An estimated 6,000 cubic yards of solid waste, unknown quantity of liquid waste (not containerized), 50 to 100 drums of liquid dichlorodiphenyl trichloroethane (DDT), and boxes of powdered DDT were disposed of by trench-and-fill method from 1972 to 1976. The site was eventually covered with 4 to 6 feet of fill.

Decision-making criteria for the placement of the soil borings was based on the results of a geophysical investigation performed by MK (1995). The primary targets for the location of the soil borings were the large metallic anomalies encountered during the geophysical investigation.

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FIELD ACTIVITIES

On December 3, 1996, ABB-ES personnel attended the DPT investigation preconstruction meeting with personnel from MK, Bhate Environmental (Bhate), and the Navy.

Sixty soil borings were advanced by Bhate, 27 borings at Site 5 and 33 borings at Site 1, utilizing Bhate's Geoprobe™ 4220 drill rig. Two soil samples were collected from most of the soil borings. The first sample was collected at or directly above the groundwater level, and the second sample was collected about 5 feet below the groundwater level. ABB-ES personnel were onsite for the first 41 borings advanced by Bhate. A copy of the logbook pages kept during this activity is in Attachment A. By December 13, all work on Site 5 had been completed and ABB-ES demobilized. Bhate completed work at Site 1 after December 13.

Site 1. Between December 4 to December 13, 1996, Bhate utilized their Geoprobe™ unit to drill 14 boreholes at Site 1 from the anomalous areas of the landfill. The average depth of the boreholes at Site 1 was approximately 12 feet below land surface (bls). Groundwater was encountered at an average depth of approximately 6 feet bls in the boreholes at Site 1. Table 1, Attachment B, shows the depth and other data from the 14 borings.

Refusal was encountered at shallow depth (approximately 3 feet bls) at locations A4-1 and A4-2 at Site 1. The refusal, according to Bhate, appeared to be caused by contact with metal buried in the ground.

ABB-ES personnel left NCBC Gulfport on December 13, 1996, prior to the completion of the investigative probing at Site 1. Thirty-three borings were advanced at Site 1 by Bhate from December 4 to 16, 1996.

Site 5. Between December 4 to 13, 1996, Bhate utilized their Geoprobe™ unit to drill 27 boreholes at Site 5 from the anomalous areas of the landfill. The average depth of the boreholes at Site 5 was approximately 15 feet bls. Groundwater was encountered at an average depth of approximately 9 feet bls in the boreholes at Site 5. Table 2, Attachment B, shows the depth and other data from the 27 borings.

At borehole location A5-1 in the Site 5 landfill, an oily substance was observed in the soil sample collected from the interval at 8 to 10 feet bls. One location (A9-1) exhibited high concentrations of volatile organic vapors with the air-monitoring instrument, a HeathTech Detecto-Pak III (flame-ionization detector). The same borehole was checked with the backup instrument, an HNu, Inc. photoionization detector (HNu) DL-101. The HNu did not detect any volatile vapors at the opening of the borehole. Both instruments were calibrated daily with 100 parts per million isobutylene.

The decontamination of the DPT drilling and sampling equipment was performed as referenced in Appendix C, pages 22-23 of the workplan for Sites 1,4, and 5 by MK, September 1996. The only modification to the decontamination procedure was the change in the requirement to rinse the downhole equipment with nitric acid. Bhate indicated that they had permission to eliminate the nitric acid rinse from the decontamination procedure.

The quality assurance and quality control sampling performed by Bhate was performed as referenced in the workplan (MK, 1996).

The soil and water samples were managed under chain-of-custody protocol until delivery to the analytical laboratory, Southwest Laboratories in Broken Arrow, Oklahoma, where the samples would be analyzed. Table 3, in Attachment B, show the parameters for the samples analyzed.

CONCLUSIONS

The field effort performed by MK and their subcontractor, Bhate, at Sites 1 and 5 was performed in accordance with the workplan (MK, 1996).

ABB-ES appreciates the opportunity to provide our technical assistance on this project. If you have any questions or comments or require any additional information, please do not hesitate to contact us.

Sincerely,

ABB ENVIRONMENTAL SERVICES, INC.

for Steve Scavone Geologist	for Robert Fisher, P.G. Lead Hydrogeologist	Penny Baxter, P.G. Task Order Manager

pc: Gordon Crane, NCBC Gulfport

Attachments

[8575-093]

ATTACHMENT A

COPY OF FIELD NOTES

(31)

TUESDAY DECEMBER 3 1996

0730 ABB MEETING
BOB FISHER
STEVE SLAVONE

0800 MOB TO BLD 166 FOR PRE-CON MEETING WITH ROICC, M/K, FIRE/SAFETY, AND SUBC. BHATEES

1000 MEETING ENDS DISCUSSED
- CONTRACT REQUIREMENTS
- ROLES + RESPONSIBILITIES
- FIRE/SAFETY ISSUES
- DRILLING PERMITS
- SCHEDULE COORDINATION

1200 Lunch

1300 Return from lunch

R. R. [illegible]
12/3/96

(32)

December 4, 1996

0700 ABB Mob to Base

0730 ABB-CREW
Bob Fisher
Steve Scavone.

0800 At Site 5. Prep work commnc
Decon area constructed at
SW corner of site

0845 Groundwater from GPT-5-1
@ ≈ 6.9' btc. Grade is about
1'-2' above toc. Therefore
GW 8'-9' below ground surface.

0930 MK workplan calls for
3 samples per boring if
GW ▽ is below 5'. They
are requesting field change
for only 2. Field decision
will be made by Han Maung.

1030 Decon 2 hand augers in prep.
for samples for Gulfport
City.

1030 @ Gordon Crane's office
coordinating Geoprobe
drilling activities.

(33)

December 4, 1996 Site 5

1200 - Lunch

1300 - Arrive @ Site 5, MK
and BHATE Environmental
operating geoprobe unit.

1310 - BHATE collects sample from
8'-10' @ A5-1 ▽ @ ≅ 10'
P.I.D. Reading ≅ 10.3 ppm — SAS
Air Monitoring instrument:
HNU - DL-101 — SAS
Soil samples are collected
in 6" brass sleeves, (4 sleeves
per 2' sampler). ends are
covered with teflon tape
and capped. Samples are
placed in a chilled cooler.

1330 - Sample collected from 15'-17'
PID - background. Tip of
spoon appears oily dark brown
fine sand, some silt. — SAS
A5-1, total depth ≅ 17' bgs.

1350 - Mobilize Geoprobe to location
A5-2 and begin probing.

1405 - Sample collected from 6'-8' @
A5-2. PID @ 11.7 ppm. — SAS

December 4, 1996 Site 5

1415 - Billy Byrd on site to observe field activities. HNU background ≅ 0.2 ppm. Bhate changes nitrile gloves between samples.

1425 - Sample collected from 13.5' - 15' @ A5-2. HNU - background. Total depth of boring ≅ 15' bgs. Dark brown fine to very fine silty sand saturated. ▽ @ ≅ 8.5' bgs. Art Conrad on site. — SAS

1430 - Mobilize Geoprobe and tools to decon area to decon probing and sampling equipment. — SAS

Decon Process: — SAS

1) Scrub with Liquinox & DI water
2) Rinse with DI water. — SAS
3) Rinse with Isopropanol 99% — SAS
4) Rinse with DI water. — SAS
5) Air dry. — SAS

1450 - Penny Baxter, Bob Fisher, Gordon Crane, on site to observe.

1510 - All above off site. — SAS

Bhate continues cleanup — SAS and decon activities. Decon Geoprobe unit in decon pit.

December 4, 1996 Site 5

1635 - Scavone and Rex Hansen off site. Bhate continues securing site and cleanup.

1640 - Arrive @ Gordon Crane's office. Office closed. — SAS

1645 - Steve Scavone departs NCBC Gulfport en route to hotel.

1700 - Scavone arrives @ hotel.

DECEMBER 5, 1996 Site 5

0725 - DEPART FROM HOLIDAY INN EXPRESS EN ROUTE TO NCBC GULFPORT (SITE 5). —— SAS

0740 - ARRIVE ON SITE @ A5-3. BHATE PREPARING TO ADVANCE SAMPLING equipment. REX HANSEN ON SITE.

0750 - HAN MANNG ON SITE. MATT THOMAS (BHATE) begins advancing probe rods. —— SAS

0800 - SAMPLE COLLECTED FROM 6' to 8' @ A5-3. HNU @ 2.9 ppm LITHO. BROWN TO DARK BROWN FINE SILTY SAND. BACKGROUND 0.2 ppm.

0820 - SAMPLE COLLECTED FROM 13.5' to 15' @ A5-3. HNU @ 0.6 ppm

▽ @ 8.5' A5-3 TOTAL DEPTH ≅ 15' bgs.

WEATHER CONDITIONS: RAIN —— SAS. OVERCAST. FORECAST: RAIN CLEARING after NOON

0840 - TAILGATE HEALTH & SAFETY BRIEFING

Attendees: DON BARLETT (BHATE)

SAS —— MATT THOMAS (BHATE)

SAS —— REX HANSEN (WK)

SAS —— STEVE SCAVONE (ABB-ES)

Comments: PPE, Standard chemicals of concern, pinch hazards, dehydration.

DECEMBER 5, 1996 Site 5

0850 - DECISION made to discontinue probing until RAIN CLEARS. —— SAS PID MAY not operate optimally in RAINY conditions. —— SAS BHATE FIELD CREW MOBILIZES NEED equipment to decon pad to perform decon WHILE RAIN continues.

0940 - DECON complete, BHATE MOBILIZES GEOPROBE TO NEXT sampling location HAN MANNG on site. —— SAS

0945 - BHATE SITUATES GEOPROBE on A5-4, Set up EXCLUSION ZONE. HNU WRAPPED IN PLASTIC SHEETING TO AVOID EXCESSIVE WATER ON UNIT FROM CONTINUING LIGHT RAIN. BACKGROUND ≅ 0.2 ppm —— SAS

0955 - S. SCAVONE OFF SITE TO GORDON CLARKE'S OFFICE. —— SAS

1020 - S. SCAVONE ON SITE @ A5-4. —— SAS SAMPLE COLLECTED FROM 6' to 8' @ A5-4. HNU @ 13.6 ppm.

1035 - SAMPLE COLLECTED FROM 13' - 15' bgs. @ A5-4. HNU @ 0.3 ppm LITHO. — DARK BROWN SATURATED FINE SILTY SAND. —— SAS

DECEMBER 5, 1996 Site 5

1035 - A5-4 total depth ≅ 15' bgs
▽ @ ≅ 8.0' bgs. — SAS

1045 - BHATE MOBILIZES GEOPROBE TO LOCATION A5-5. Set up exclusion zone. — SAS

1100 - SAMPLE COLLECTED FROM 5.5' to 7.5' @ A5-5. HNU @ 2.2 ppm LITHOLOGY: GRAY WET FINE SAND SOME SILT. Slight yellow coloring.

1105 - HAN MANNS OFF SITE. — SAS

1120 - SAMPLE COLLECTED FROM 13' to 14.5' @ A5-5. HNU @ 0.9 ppm. ▽ @ 7.5' A5-5 TOTAL DEPTH ≅ 14.5' bgs.

1135 - BHATE BEGINS LOADING EQUIPMENT TO PERFORM DECON OF RODS AND SAMPLING EQUIPMENT. — SAS

1140 - BHATE DECONS EQUIPMENT. — SAS

1152 - S. SCAVONE OFF SITE FOR LUNCH. — SAS

1300 - RETURN FROM LUNCH TO GORDON CRANES OFFICE. — SAS

1335 - ARRIVE @ Site 5 Decon AREA and discuss work to be performed for the remainder of the day. — SAS

1340 - BHATE MOBILIZES GEOPROBE TO A3-1.

DECEMBER 5 1996 Site 5

1340 - SET UP EXCLUSION ZONE AND PREPARE TO ADVANCE BORING A3-1. — SAS
~~SAMPLE COLLECTED FROM 5.5' to 7.5'~~ SAS
~~@ A3-1, HNU @ ___ ppm.~~ SAS

1355 - HIT REFUSAL ON FIRST ATTEMPT TO BORE A3-1. @ 5' bgs hit something that appears metallic. — SAS
MOVE GEOPROBE ≅ 5' NNW of original A3-1 location. — SAS

1410 - SAMPLE COLLECTED FROM 5.5 to 7.5' @ A3-1, HNU @ 1.1 ppm. — SAS
LITHO - DARK GRAY MOIST FINE SAND SOME SILT. — SAS

1425 - SAMPLE COLLECTED FROM 12.5' to 14' @ A3-1, HNU @ 1.4 ppm — SAS
LITHO - Orange brown Saturated fine sand, some silt. gunpowder-like odor.
▽ @ ≅ 8.0' bgs in A3-1. — SAS
TOTAL DEPTH @ A3-1 ≅ 14' bgs.

1435 - BHATE MOBILIZES GEOPROBE TO LOCATION A3-2. Set up exclusion zone — SAS

1450 - SAMPLE COLLECTED FROM 6' to 8' @ A3-2. HNU @ 16 ppm — SAS
LITHO - LIGHT GRAY TO WHITE FINE TO VERY FINE SAND. — SAS

DECEMBER 5, 1996 Site 5

1510 – SAMPLE COLLECTED FROM 13' to 15' @ A3-2, HNU @ 0.4 ppm — SAS
LITHO – BROWN SATURATED FINE SAND SOME SILT. ▽ @ ≅ 8.5', TOTAL DEPTH @ A3-2 ≅ 15' — SAS

1520 – BHATE DECONS equipment to drill one more borehole (A3-3) — SAS

1550 – BHATE MOBILIZES GEOPROBE ONTO LOCATION A3-3. Set up exclusion zone

1600 – SAMPLE COLLECTED FROM 6' to 8' @ A3-3. HNU @ 4.2 ppm — SAS
LITHO – WHITE FINE TO VERY FINE SAND.

1615 – SAMPLE COLLECTED FROM 11' to 13' @ A3-3. HNU @ 0.6 ppm — SAS
▽ 8.5' LITHOLOGY – DARK ORANGE/BROWN FINE TO VERY FINE SATURATED SAND, SOME SILT. Total Depth of A3-3 ≅ 13' bgs.

1625 – BHATE MOBILIZES RIG and equipment to decon pad and begins decon activities. — SAS

1705 – SCARONE and HANCEN depart from site while BHATE continues site cleanup and security. — SAS

DECEMBER 6, 1996 Site 5

0755 – SCARONE ARRIVE ON SITE @ location A2-1. BHATE already probing location and preparing to collect 1st sample. — SAS

0800 – Sample collected from 6' to 8' @ A2-1. HNU @ 4.5 ppm
LITHOLOGY: WHITE/GRAY FINE SAND.

0825 – SAMPLE COLLECTED FROM 13' to 15' @ A2-1. HNU @ 14 ppm. — SAS
▽ @ ≅ 9.5' bgs. LITHOLOGY: DARK ORANGE BROWN fine saturated silty sand. Total Depth ≅ 15' bgs.

0835 – BHATE MOBILIZES RIG TO LOCATION A2-2 and set up exclusion ZONE — SAS

0850 – SAMPLE COLLECTED FROM 7.5' to 9' @ A2-2. HNU @ 4.4 ppm
LITHOLOGY: DARK BROWN FINE SILTY SAND.

0910 – SAMPLE COLLECTED FROM 14.5' to 16.5' @ A2-2. HNU @ 0.3 ppm
LITHOLOGY: DARK ORANGE/BROWN FINE SATURATED SILTY SAND. — SAS
▽ @ ≅ 10' bgs. TOTAL DEPTH ≅ 16.5'

0920 – BHATE MOBILIZES RIG and Equipment to Decon pad to perform decon on used rods and sample equipment

December 6, 1996. Site 5

1000 - REX HANSEN OFF SITE TO PICK UP EQUIPMENT @ HOLIDAY INN FOR BHATE GEOPROBE. — SRS

1010 - BHATE MOBILIZES RIG TO LOCATION A2-3. Set up exclusion zone.

1025 - SAMPLE COLLECTED FROM 7' to 9' @ A2-3. HNU @ 1.3 ppm LITHOLOGY: LIGHT BROWN FINE SATURATED SAND SOME SILT — SRS

1045 - SAMPLE COLLECTED FROM 14' to 16' @ A2-3. HNU @ 0.2 ppm LITHOLOGY: ORANGE BROWN FINE SATURATED SAND, SOME SILT. — SRS
▽ @ ≅ 9' bgs, Total Depth ≅ 16'.

1100 - BHATE MOBILIZES RIG TO LOCATION A1-1. Set up exclusion ZONE.

1115 - SAMPLE COLLECTED FROM 6.5' to 8.5' @ A1-1. HNU @ 2.5 ppm LITHOLOGY: WHITE/GRAY FINE SAND

1150 - SAMPLE COLLECTED FROM 13' to 15' @ A1-1. HNU @ 0.8 ppm. LITHOLOGY: DARK ORANGE/BROWN FINE TO VERY FINE SILTY SAND.
▽ @ ≅ 9' bgs, Total depth ≅ 15' bgs.

December 6, 1996 Site 5

1210 - BHATE MOBILIZES RIG AND EQUIPMENT TO DECON PAD TO PERFORM DECON. SCAVONE AND HANSEN off site to do lunch. — SAR

1300 - ARRIVE @ GORDON CRANE'S office contact ABB-ES KNOXVILLE office.

1345 - CHECK on status of utility clearance @ Site 1. No pavement markings yet to indicate utility clearance

1350 - ARRIVE @ Site 5, Speak with BHATE PERSONNEL. BHATE indicates to REX HANSEN that BHATE only has contract to drill 300 lineal feet. Project may require ≅ 600 - 700 lineal feet of boring. — SRS

1420 - REX off site to make phone calls regarding contract — SRS

1430 - BHATE MOBILIZES RIG TO LOCATION A1-2, Set up exclusion ZONE.

1450 - SAMPLE COLLECTED FROM 6' to 8' @ A1-2. HNU @ 7.5 ppm. LITHOLOGY: DARK BROWN SATURATED FINE SILTY SAND, WOOD DEBRIS. WEATHER CONDITIONS: 65°-70° PARTLY CLOUDY. — SRS

December 6, 1996 Site 5

1505 - SAMPLE COLLECTED FROM 12.5' to 14.5' @ A1-2. ~~HNU~~ MINI RAE @ 0.0 ppm
LITHOLOGY: DARK BROWN FINE SATURATED SILTY SAND. — SAS
∇ @ ≅ 8.5' bgs Total Depth ≅ 14.5'

1515 - BHATE MOBILIZES RIG TO LOCATION A1-3. Set up exclusion zone.

1525 - SAMPLE COLLECTED FROM 6' to 8' @ A1-3. MINI RAE @ 18.7 ppm
Lithology: TAN/Reddish TAN fine SATURATED SAND, TRACE SILT.

1540 - SAMPLE COLLECTED FROM 13'-15' @ A1-3. MINI RAE @ 0.0 ppm
Lithology - DARK BROWN fine saturated silty SAND. — SAS
∇ @ ≅ 8.5' bgs. Total depth ≅ 15'

1555 - BHATE MOBILIZES RIG TO DECON PAD TO DECON RIG AND EQUIPMENT

1625 - REX HANSEN ON SITE. — SAS.
BHATE CONTINUES DECON, CLEANUP and Site Security — SAS

1705 - SCAVONE AND HANSEN off site

DECEMBER 7, 1996 Site 1

0750 - S. SCAVONE ON SITE @ ABB TRAILER (DECON PAD LOCATION for Site 1). BHATE and MORRISON KNUDSON ON SITE.
TAILGATE HEALTH & SAFETY
ATTENDEES: MATT THOMAS (BHATE)
SAS — DON BARRETT (BHATE)
SAS — REX HANSEN (MK)
SAS — STEVE SCAVONE (ABB-ES)
COMMENTS: STANDARD CHEMICALS OF CONCERN
STANDARD PPE, Subsurface utility hazard

0810 - H & S Meeting complete. REX is going to Site 5 to grout boreholes.

0820 - BHATE MOBILIZES RIG TO Site 1 (A4-1)
SET UP EXCLUSION ZONE. — SAS
~~SAS SAMPLE COLLECTED FROM — to — SAS~~
~~SAS @ A4-1. MINI RAE @ — ppm SAS~~
~~SAS Lithology — SAS~~

0845 - Depth to water in nearby monitoring well @ ≅ 5.5'. — SAS
Refusal encountered @ ≅ 2.5' bgs @ location A4-1. — SAS

0855 - MOVED RIG ≅ 5 feet South and hit Refusal @ ≅ 3.0 feet bgs. — SAS
— SAS

December 7, 1996 Site 1

0905 – Third Attempt @ A4-1, hit refusal @ ≅ 3.5' bgs. location between first two attempts. Move Rig 10' South of original A4-1 location. — SAS

0915 – REFUSAL on 4th Attempt @ 3' bgs.

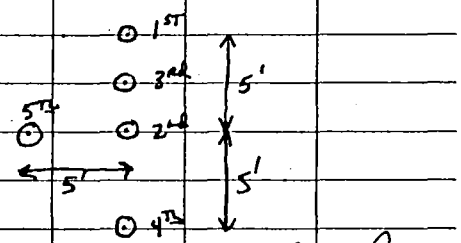
0920 – Move Rig to 5th location 5' SOUTH And 5' WEST of ORIGINAL location. MINI RAE READ 98 ppm in borehole surface at original location. — SAS

*

0930 – SAMPLE COLLECTED from 3' to 5' @ A4-1 (5th Attempt). Mini Rae @ 40.5 ppm. Lithology – DARK GRAY FINE SATURATED SAND, TRACE Silt. — SAS.

0945 – SAMPLE COLLECTED FROM 9' to 11' @ A4-1. MINI RAE @ 8.4 ppm. Lithology – DARK BROWN SATURATED FINE SILTY SAND. ▽ @ ≅ 5' bgs. Total Depth (A4-1) ≅ 11' bgs.

A4-1 locations



December 7, 1996 Site 1

0955 – BHATE MOBILIZES RIG TO LOCATION A4-2. Set up exclusion zone

1005 – Refusal on 1st Attempt @ 1.2' bgs. Move Rig 5' WSW of original location — SAS

1025 – 2nd Attempt Refusal @ 1.0' bgs. located 3rd location @ ≅ 8' WEST and 5' South of original location. Move Rig to 3rd Attempt location

1035 – Air monitoring instrument battery going dead. Backup instrument having the same problem. Stop probing activities to check on the availability of another air monitoring instrument. (PID or FID) BHATE CONTACTS THEIR office to inform them of current status. BHATE manager indicates to them that they can operate rig as long as they wear respirators. Decision made to discontinue work for today, get operational instrument and start probing again tomorrow 12/8/96. — SAS

1145 – BHATE BEGINS MOBILIZING Rig and tools

DECEMBER 7, 1996 Site 1

1145 - to decon pad to perform decon and secure equipment. — SRS

1215 - SCAVONE and HANSEN OFF SITE.

DECEMBER 8, 1996 Site 1

0800 - SCAVONE ON SITE @ A4-2

0900 - SAMPLE COLLECTED from 3'-5' @ A4-2. Mini RAE @ 0.0 ppm Brown/Gray Fine Sand — SRS

0805 - SAMPLES COLLECTED from 10.5'-12.5' @ A4-2. Mini RAE @ 18.9 ppm Lithol. Dark Brown Saturated fine silty sand. ▽ @ ~~6.5'~~ 7.0' bgs. Total depth of A4-2 ≅ 12.5'

0820 - BHATE MOBILIZES RIG TO LOCATION A4-3. Set up exclusion zone

0835 - SAMPLE COLLECTED from 3' to 5' @ A4-3. Mini RAE @ 0.0 ppm Lithology - Light gray fine sand.

0850 - SAMPLE COLLECTED from ~~10.5 - 12.5~~ 13'-15' @ A4-3. Mini RAE @ 1.4 ppm Lithology: Dark Brown Saturated fine silty sandy. ▽ @ ≅ 8.5' bgs. Total depth A4-3 ≅ 15' bgs. — SRS

0920 - BHATE MOBILIZES RIG and supplies to decon pad to perform decon.

1015 - BHATE MOBILIZES RIG TO LOCATION A4-4. Set up exclusion zone. — SRS

1020 - BHATE BEGINS PROBING @ LOCATION A4-4 (Site 1). — SRS

December 8, 1996 Site 1

1030 - Sample collected from 3' to 5' @ A4-4. HNU @ 0.0 ppm. Lithology: Gray fine sand trace silt.

1045 - Sample collected from 13' to 15' @ A4-4. Mini RAE @ 0.3 ppm. Lithology: Dark brown saturated silty sand. ▽ @ ≅ 8.0' bgs, T.D. ≅ 15'

1105 - Bhate mobilizes rig to location B1-1 (site 1). Set up exclusion zone.

1120 - Sample collected from 3'-5' @ B1-1. HNU @ 2.8 ppm. Lithology: Dark brown fine silty sand — SAS.

1140 - Sample collected from 10'-12' @ B1-1. HNU @ 0.4 ppm. Lithology: Whitish tan fine to very fine saturated sand. Trace silt. ▽ @ ≅ 7.5' bgs. T.D @ 12' bgs.

1155 - Bhate mobilizes rig and supplies to decon pad to perform decon. Scavone and Hansen off site for lunch. — SAS

1310 - Scavone and Hansen return to site 1 decon area. — SAS.

1330 - Bhate returns to decon area — SAS

December 8, 1996 Site 1

1340 - Bhate mobilizes rig to location B1-2. Set up exclusion zone — SAS.

1400 - Sample collected from 5.5'-7.5' @ B1-2 HNU @ 0.5 ppm. Lithology: Dark brown saturated silty sand. — SAS

1402 - Entire sample from 5.5'-7.5' is saturated, therefore rig moved ≅ 1 foot east of original location to take shallow sample from 3' to 5' bgs — SAS

Clay layer noted from ≅ 6'-7' bgs in soil samples — SAS.

1410 - Decision made to not collect shallow sample from B1-2

1415 - Move rig to location B1-3. Set up exclusion zone — SAS

1425 - Collect sample from 3' to 5' @ B1-3. HNU @ 7.6 ppm. Lithology: Dark brown fine wet silty sand, some clay. — SAS

1445 - Sample collected from 10'-12' @ B1-3. HNU @ 0.2 ppm — SAS

Lithology: Tan to brown saturated fine silty sand. ▽ @ 4.5' T.D. @ 12' bgs.

DECEMBER 8, 1996 SITE 1

1455 – BHATE MOBILIZES RIG TO LOCATION A5-1 (SITE 1). Set up exclusion zone.

1505 – SAMPLE COLLECTED FROM 2.5'-4' @ A5-1. HNU @ 7.8 ppm
Lithology: WHITE FINE to V. FINE SAND.

1525 – SAMPLE COLLECTED FROM 9.5' to 11.5' @ A5-1. HNU @ 0.5 ppm
Lithology: DARK BROWN SATURATED FINE Silty SAND, SOME FINE GRAVEL
* APPEARANCE of oil soaked soil.
▽ @ ≅ 7.0' TOTAL Depth ≅ 11.5' bgs.

1545 – BHATE MOBILIZES RIG TO DECON AREA to perform decon. — SAS
SCAVONE and HANSEN off site en route to bus station to pick up AIR Monitoring device sent to BHATE. — SAS

1600 – Depart from Bus Station en route to hotel. — SAS

December 9, 1996 Site 5

0825 – SCAVONE ARRIVES on site @ Site 5. Rex HANSEN and BHATE on site already probing.

0825 – COLLECTED SAMPLE FROM 6'-8' @ A10-1. HNU @ 9.9 ppm
Litho: gray & white silty sand

0825 – COLLECTED Sample FROM 13' to 15' @ A10-1. HNU @ 0.4 ppm
Litho: DK BROWN Saturated Silty Sand, OILY APPEARANCE
▽ @ 8.5' TOTAL Depth ≅ 15'

0835 – Hit Refusal @ ≅ 5' bgs at location A10-2 (Site 5). Move Rig ≅ 5' ~~EAST~~ WEST of original location. — SAS

0855 – Sample collected from 6' to 8' @ A10-2. HNU @ 17 ppm
Lithology: GRAY FINE to Medium Saturated Silty Sand — SAS

0910 – SAMPLE COLLECTED FROM 13'-15' @ A10-2. HNU @ 3 ppm
Litho: DARK BROWN Saturated fine silty SAND.
▽ @ ≅ 8.5', TOTAL Depth @ 15'

0920 – BHATE MOBILIZES Rig and equip. TO DECON PAD @ Site 5 to perform decon. — SAS

December 9, 1996 Site 5

0935- Gordon Crane on site to observe activities — CAS

0955- Gordon Crane off site. Bhate mobilizes rig to location A6-6. Set up exclusion zone — SAS

1005- Sample collected from 6'-8' @ A6-6. HNU @ 11 ppm. Lithology: Gray fine sand trace silt.

1020- Sample collected from 13'-15' @ A6-6. HNU @ 0.8 ppm. Lithology: Dark Brown saturated silty fine sand. ▽ @ 9' bgs. Total Depth = 15' bgs — SAS

1030- Bhate mobilizes rig to location A6-5. Set up exclusion zone.

1040- Sample collected from 5.5'-7.5' @ A6-5. HNU @ 17 ppm. Litho: Lt. Gray fine sand — SAS

1100- Sample collected from 12.5'-14.5' @ A6-5. HNU @ 7.4 ppm. Litho - Dark Brown fine saturated silty sand. ▽ @ 7.5'. TD @ 14.5'

1115- Bhate mobilizes rig and equipment to Site 5 decon pad to perform decon. Scavone and Hansen off site for lunch

December 9, 1996 Site 5

1305- Rex Hansen and Steve Scavone return to decon pad @ Site 5 to continue probing operations. — SAS

1320- Bhate mobilizes rig to location A6-4. Set up exclusion zone.

1335- Accelerator cable broke on Geoprobe. Assist Matt Thomas in removal of cable. Rex and Don off site to grout boreholes at Site 1 — SAS

1350- Matt Thomas and Steve Scavone off site to get supplies to repair Geoprobe unit — SAS

1500- Matt Thomas and Steve Scavone return to site and repair Geoprobe unit. — SAS

1620- Geoprobe repaired. Bhate begins site cleanup and security, decon geoprobe unit. — SAS

Samples being packed and prepared to be shipped: Analytical: VOC 8240, Metals 6010/7471A, SVOC 8270, Dioxin/Furans 8290, Pesticides 8080, Herbicides 8150. Southwest Laboratories Broken Arrow, OK.

December 9, 1996 Site 5

1700 – Rex Hansen and Steve Scavone off site en route to Hotel. Bhate continues to decon and cleanup site. — SAS

December 10, 1996 Site 5

0800 – Scavone arrives on site @ Site 5 location A6-4 — SAS
Rex Hansen and Bhate continue to perform geoprobe borings.

0800 – Sample collected from 5.5 – 7.5' @ A6-4. HNU @ 1.3 ppm
Litho: Brown fine sand — SAS

0805 – Sample collected from 12.5' – 14.5' @ A6-4. HNU @ 0.3 ppm
Lithology: Dark Brown fine — SAS
saturated silty sand — SAS
▽ @ ≅ 7.5' bgs. T. Depth ≅ 14.5'

0820 – Bhate mobilizes rig to location A6-3. Set up exclusion zone.

0835 – Sample collected from 5.5' – 7.5' @ A6-3. HNU @ 0.7 ppm
Litho: Gray fine wet sand trace silt

0850 – Sample collected from 12.5' – 14.5' @ A6-3. HNU @ 0.3 ppm
Litho: Dark Brown saturated fine silty sand. ▽ @ ≅ 7.5' bgs
Total Depth ≅ 14.5' bgs — SAS

0900 – Bhate mobilizes rig and supplies to decon pad to perform decon. Scavone off site — SAS

December 10, 1996 Site 5

0905 – Scavone arrives @ Gordon Crane's office. Rex Hansen @ Gordon's office for conference call (left site @ ≅ 0830) — CAS.

0950 – Rex Hansen and Steve Scavone depart from Gordon Crane's office en route to site 5.

0955 – Arrive @ location A6-2

0955 – Sample collected from 5.5' to 7.5' @ A6-2. HNU @ 2.1 ppm Lithology: WHITE FINE SAND. — SAS

1005 – Sample collected from 13' to 15' @ A6-2. HNU @ 0.4 ppm Litho: DARK BROWN SATURATED FINE SILTY SAND. ▽ @ ≅ 8' bgs. Total Depth ≅ 15' bgs — SAS

Rex Hansen off site to pick up package for Bhate @ Hotel.

1015 – Bhate mobilizes rig to location A6-1. Set up exclusion zone.

1025 – Sample collected from 5.5' to 7.5' @ A6-1. HNU @ 0.7 ppm Litho: GRAY SATURATED FINE SAND.

1035 – Rex Hansen returns to site with Bhate's package — SAS

December 10, 1996 Site 5

1045 – Sample collected from 12.5' to 14.5' @ A6-1. HNU @ 0.3 ppm Litho: DARK BROWN FINE SATURATED SILTY SAND. ▽ @ ≅ 8.0' bgs Total Depth ≅ 14.5' bgs — SAS

1055 – Bhate mobilizes rig and supplies to decon pad to decon 7 new drill rods from Geoprobe. — SAS

* Heavy sheen present on the surface of the water in the stream adjacent to and south of site 5. — SAS

1110 – Bhate mobilizes rig to location A9-5. Set up exclusion zone. Billy Byrd (ROICC) on site to observe.

1117 – Billy Byrd off site. — SAS

1125 – Sample collected from 5.5' to 7.5' @ A9-5. HNU @ 1.1 ppm Litho: GRAY/WHITE FINE SAND

1145 – Sample collected from 13' to 15' @ A9-5. HNU @ 0.4 ppm Litho: BROWN/TAN FINE SATURATED SILTY SAND. ▽ @ 9' bgs. Total Depth ≅ 15'.

1155 – Bhate mobilizes rig & equipment to decon pad. Scavone and Hansen off site for lunch.

December 10, 1996 Site 5

1425 - Scavone and Hansen arrive @ Site 5 decon pad. Waiting of BHATE crew. — SAS.

1500 - Still waiting on BHATE crew, checked at Gordon Crane's office. — SAS

1508 - Billy Byrd on site to observe.

1515 - BHATE returns to site with gas for Geoprobe. Fuel up Geoprobe unit and prepare to continue probing. — SAS.

1521 - Billy Byrd off site after talking with Rex. — SAS

1535 - Sample collected from 5.5' - 7.5' @ A9-4. HNU @ 1.9 ppm Lithology: Gray/White Fine Sand. — SAS

1550 - Sample collected from 13' - 15' — SAS @ A9-4. HNU @ 0.4 ppm Litho: Dark Brown Saturated Fine to very fine silty sand / sandy silt. — SAS ▽ @ ≅ 9' bgs, Total Depth ≅ 15' bgs.

1600 - BHATE mobilizes rig and equip. to Site 5 decon pad to decon.

1610 - Scavone and Hansen off site — SAS

December 11, 1996 Site 5

0820 - Scavone arrives on site. Hansen and BHATE crew continuing probe work @ location A9-3

0820 - Sample collected from 6.5' - 8.5' bgs @ A9-3. HNU @ 1.4 ppm Litho: Dark Brown Fine Silty Sand. PID not functioning properly. Switch to backup Heath Detecto Pak 3 (FID). (Heath-Tech).

0840 - Billy Byrd on site — SAS

0900 - Billy Byrd off site — SAS

0903 - Sample collected from 14' to 16' @ A9-3. FID @ 2.0 ppm Litho: Dark Brown Fine saturated silty sand. ▽ @ ≅ 9.4' bgs. Total Depth @ ≅ 16' bgs — SAS.

0905 - Rex Hansen off site — SAS

0915 - BHATE mobilizes rig to location A9-2. Set up exclusion zone. FID calibrated w/ 100 ppm methane gas. Background ≅ 2 ppm. — SAS

0930 - Sample collected from 6' - 8' bgs @ A9-2. FID @ >100 ppm Litho: Reddish Gray Fine Sand Trace silt. — SAS

December 11, 1996 Site 5

0955 - Sample collected from 14'-16' — SAS
@ A9-2. FID @ 3.0 ppm
Litho: Dark Brown Saturated fine Silty
Sand. ▽ @ 8.5' bgs, Total Depth ≅ 16'.

1005 - Scavone off site to get
Teflon tape for BHATE — SAS

1100 - Scavone returns to site. — SAS

* BHATE has upgraded to level
C personal protective equipment
(ppe). Due to high FID readings
from location A9-1. (Readings
>10,000 ppm at top of borehole
Sustained for ≅ 15 minutes. — SAS
Sample collected @ 6'-8' bgs.
@ A9-1 FID @ 3200 ppm.
Litho: Tan/Lt. Brown fine moist
* mottled dark brown staining.
BHATE upgraded @ ≅ 1040 to
Level C PPE. — SAS
BHATE indicated that upon completion
of borehole A9-1, borehole would
be grouted to eliminate any
inhalation hazard associated
with the open borehole and
the vapors coming from borehole.

December 11, 1996 Site 5

1115 — FID >10,000 at top of bore
hole @ A9-1 with geoprobe
rods in hole @ 14' bgs — SAS

1120 — Sample collected from 14'-16'
* @ A9-1. FID @ 4400 ppm.
Litho: Dark Brown/Reddish brown
fine Saturated silty sand — SAS
▽ @ ≅ 8.5', Total Depth ≅ 16'

1125 — FID >10,000 at top of borehole
@ A9-1 after removal of probe
rods. Ambient Air in exclusion
zone @ ≅ background 1.0 ppm.

1135 — BHATE mixes up grout to
abandon location A9-1. — SAS
HNU (PID) @ 0.2 @ top of
borehole. FID > 10000 at top
of borehole. Spike on FID is
likely to be methane — SAS
Both instruments appear to be
operating properly. — SAS

1145 — BHATE abandoning boreholes at
Site 5. — SAS

1155 — BHATE performing decon and preparing
to move to Site 1. Scavone off site
for lunch. — SAS

December 11, 1996 Site 5

1440 - Scavone arrives @ Site 5 decon pad. Bhate continues decon. Rex Hansen on site to assist Bhate with QA/QC sampling.

1500 - Scavone off site to pick up sample shipping supplies.

1515 - Scavone returns to site. — SAS

1530 - Bhate indicates that it is too late to collect QA/QC samples and be able to ship the samples on time. Bhate will pack samples collected from probing and ship the samples off tonight. — SAS

1600 - Scavone off site en route to hotel. — SAS

December 12, 1996 Site 5

0710 - Scavone arrives on site at Site 5 decon area. Rex Hansen and Bhate on site. Tailgate QA/QC and decon meeting. Discussed priority of decon, detection levels of analyses, changing of ppe from field to decon pad. Don and doff of gloves between decon stations. — SAS

0740 - Bhate begins sampling. Field blank is first sample collected. Bhate using ultra-pure deionized water from: Environmental Sampling Supply — SAS
9601 San Leandro Street — SAS
Oakland, California 94603 — SAS
(510) 562-4988 — SAS
ATTN: William Levey — SAS

Sample containers: — SAS
8 - 1 liter amber bottles — SAS
3 - 40 ml clear glass VOA vials
1 - .1 liter white plastic bottle

0800 - Rinsate blank on brass liners. Bhate rinses brass liner with distilled water and then rinse with ultra pure deionized water

December 12, 1996 Site 5

0805 - BHATE BEGIN SAMPLE COLLECTION of RINSATE blank (BRASS liner) Pour ultra-pure deionized water through brass liner and into sample containers: — SAS

8 - 1 liter Amber glass bottles
3 - 40 ml clear glass VOA vials.
1 - 1 liter Plastic bottle. — SAS

DEIONIZED WATER: BW0005-1035
20L LDPE Cubitainer with ultra pure BLANK WATER — SAS.

0820 - Complete RINSATE blank on brass Liner and pack samples in cooler with ice. Begin preparation to decon geoprobe soil sampler prior to collection of RINSATE blank. — SAS

0835 - BHATE begins decon on soil sampler in preparation of collection of RINSATE blank.

1) Scrub with liquinox — SAS
2) Rinse with distilled water
3) Rinse with Isopropanol 99%.
4) Rinse with distilled water.
5) Allow to air dry — SAS

December 12 1996 Site 5

0900 - BHATE Rinses deconed soil sampler with ultra pure deionized water

0903 - BHATE BEGINS SAMPLE COLLECTION OF RINSATE BLANK FROM SOIL SAMPLER. Method: Pour ultra-pure deionized water through soil sampler and into sample containers. — SAS

8 - 1 liter Amber glass bottles. — SAS
3 - 40 ml clear glass VOA vials. — SAS
1 - 1 liter Plastic bottle. — SAS

0915 - COMPLETE RINSATE BLANK ON deconed soil SAMPLER. BEGIN Site CLEANUP and preparation to move operation to Site 1 — SAS

0930 - SCHONS DEPARTS FROM SITE en route GORDON CRANE'S OFFICE — SAS

0935 - CALL KUCKUCK office to speak with Bob FISHER regarding TURKEY CREEK SAMPLING AT BRIDGE on 8th AVENUE in GREENPORT. PICK UP KEYS TO ABB FIELD TRAILER TO GET SUPPLIES FOR SAMPLING. — SAS

0950 - ARRIVE @ ABB trailer. Pick up supplies. Kill several WASPS in trailer. — SAS

1040 - DEPART FROM ABB trailer en route to Site 5

December 12, 1996 Site 1

1045 – Arrive @ Site 5 Decon pad where BHATE is loading equipment to mobilize to Site 1. —— SAS

1050 – Travel to Gordon Crane's office to talk with Rex Hanson. —— SAS

1100 – Travel to Site 1 Decon pad to meet BHATE personnel. BHATE continuing to mobilize rig and equipment to Site 1 to continue geoprobe work. —— SAS

1125 – BHATE arrives @ Site 1 decon pad with supplies. —— SAS

1140 – Scavone and Hansen off site for lunch. —— SAS

1300 – Scavone and Hansen arrive @ Site 1 Decon area. BHATE preparing to mobilize rig to location A5-2.

1310 – Travel to location A5-2 and wait on BHATE. —— SAS

1345 – BHATE mobilizes rig to location A5-2 @ Site 1. Set up exclusion zone.

1405 – Sample collected from 5'-7' @ A5-2. FID @ 3.0 ppm
Litho: Dark Brown saturated fine Silty Sand —— SAS

December 12, 1996 Site 1

1410 – Location A5-2 complete —— SAS
Total Depth = 7' bgs, ▽ @ ≅ 4' bgs.
FID Background ≅ 0.0 ppm

1430 – BHATE mobilizes rig to location A1-5 (Site 1). Set up exclusion zone. BHATE indicated that they have a problem with having to Donn and Doff their Tyveks between the field and the decon pad. Scavone, after witnessing a QA/QC shortcoming at Site 5, suggested that BHATE should remove their field tyvek prior to entering decon pad. and put on decon tyvek when entering decon pad —— SAS

1450 – Sample collected from 2'-4' bgs @ A1-5. FID @ 22 ppm
Litho: Brown, fine, Silty Sand —— SAS
Orange tan fine Silty Sand 2'-3.5'

1505 – Sample collected from 9.0'-11.0' @ A1-5. FID @ 70 ppm
Litho: Dark Brown Saturated fine Silty Sand. ▽ @ ≅ 4.0' bgs
Total Depth @ ≅ 11.0' —— SAS
Ron Henderson (BHATE) on site. —— SAS

December 12, 1996 Site 1

1530 – Sample collected from 2'-4' @ A1-1. F.I.D. @ 2.0 ppm Litho: Dark brown saturated fine silty sand ——— SAS.

1550 – Sample collected from 9'-11' @ A1-1. FID @ 1.0 ppm. Litho: Brown/Gray fine saturated silty sand. ▽ @ ≅ 4.0' bgs. Total Depth @ ≅ 11' bgs.

1600 – BHate mobilizes rig and equipment to Site 1 decon pad to perform decon. Ron Henderson, Rex Hanson and Steve Scavone discuss issues of performance and BHate personnel behavior. ——— SAS.

1605 – BHate begins decon. ——— SAS.

1645 – Scavone and Hanson off site ——— SAS.

December 13, 1996

0730 – Travel to 8th Avenue sediment sampling location. ——— SAS

0745 – Arrive @ 8th Avenue sediment sampling location. Water in creek is flowing from west to east. Access to sampling location will not be a problem. While on site, heard gunshots fired. Possibly a shooting range nearby. ——— SAS

0815 – Arrive @ Gordon Clark's office to discuss 8th Avenue sample location. Gordon not in office yet. Phone Scavone to have temporarily down. ——— SAS

0845 – Call Bob Fisher to discuss 8th Avenue sample location. ——— SAS

0915 – Contact Triangle Lab to remind them that they would be receiving samples on Saturday. Deb Hage indicated that there would be someone at the lab to log in the samples.

0925 – Arrive @ Site 1 to observe probe activities. Rex Hanson, Ron Henderson, Matt Thorne on site

December 13, 1996 Site 1

0945 - BHATE HAS COMPLETED 3 BORINGS (A1-2, A1-3, AND A1-4), TDs @ 11', 12', AND 12' RESPECTIVELY. FID <30 ppm FOR ALL 6 SAMPLES COLLECTED. — SAS

0947 - BHATE MOBILIZES RIG AND SUPPLIES TO DECON PAD (Site 1) TO PERFORM DECON. — SAS

1000 - ARRIVE @ GORDON CRANE'S AND DISCUSS 8TH AVENUE SAMPLE LOCATION.

1015 - ARRIVE @ ABB FIELD TRAILER TO GATHER SAMPLING SUPPLIES — SAS

1045 - ARRIVE @ GORDON CRANE'S office CONTACT CITY OF GULFPORT TO INFORM ALEX CHRISTY THAT WE WOULD BE SAMPLING THE 8TH AVENUE LOCATION TODAY. — SAS

1100 - TRAVEL TO SITE 1 TO OBSERVE BHATE AND MK CREW. BHATE COMPLETING DECON AND PREPARING TO CONTINUE PROBING. — SAS

1120 - SCAVONE OFF SITE EN ROUTE TO FEDEX TO PICK UP COOLER. — SAS

1200 - ARRIVE @ FEDEX, PICK UP COOLER FROM TRIANGLE LABS. — SAS

December 13, 1996 Site 1

1215 - SCAVONE ARRIVES @ 8TH AVENUE SAMPLING location. Collect sediment sample from creek ≅10 feet west of bridge. Sample collected from ≅ 1'-1.5' into sediment, placed in 2-4oz amber glass jars and placed in chilled cooler.

1235 - SCAVONE DEPARTS from sampling site en route TO HOTEL TO CHECK OUT. — SAS

1315 - CHECK out of HOTEL and travel to NCBC GULFPORT TO unload and decon equipment

1400 - UNLOADED EQUIPMENT and DECON, LOCK UP ABB FIELD TRAILER and travel to GORDON CRANE'S Office — SAS

1405 - MAKE COPIES OF C-o-c and drop off key at GORDON'S office — SAS

1435 - DEPART FROM NCBC GULFPORT en ROUTE TO FEDEX TO SHIP 5 oz SAMPLES TO TRIANGLE LABS in DURHAM, NORTH CAROLINA

(74) December 13, 1996

1500 - Arrive @ Hotel to pack cooler with ice for shipment to Triangle Labs.
~~Made copy~~ SAS

1530 - Arrive @ FedEx and ship sample cooler to Triangle Labs. SAS.

1545 - Depart from FedEx en route to Airport. SAS.

1615 - Arrive @ Airport and turn in rental car @ Hertz. SAS.

1715-2230 - Air travel. SAS

2315 - Arrive @ Home SAS

ATTACHMENT B

TABLES

Table 1
Site 1 Sampling[1]

Field Report, Technical Assistance for
Direct-Push Technology Drilling Activities at Sites 1 and 5
Naval Construction Battalion Center
Gulfport, Mississippi

Sample Location	Sample Depth	Head Space[2] (ppm)	Depth to Groundwater	Total Drilled Footage
December 7, 1996				
A4-1	3 to 5	40.5	5	11
December 8, 1996				
	9 to 11	8.4		
A4-2	3 to 5	0.0	7.0	12.5
	10.5 to 12.5	18.9		
A4-3	3 to 5	0.0	8.5	15
	13 to 15	1.4		
A4-4	3 to 5	0.0	8.0	15
	13 to 15	0.3		
B1-1	3 to 5	2.8	7.5	12
	10 to 12	0.4		
B1-2	5.5 to 7.5	0.5	5.5	7.5
	---	---		
B1-3	3 to 5	7.6	4.5	12
	10 to 12	0.2		
A5-1	2.5 to 4	7.8	7.0	11.5
	9.5 to 11.5	0.5		
December 12, 1996				
A5-2	5 to 7	3.0	4.0	7.0
	---	---		
A1-5	2 to 4	22	4.0	11.0
	9 to 11	70		
A1-1	2 to 4	2.0	4.0	11.0
	9 to 11	1.0		
December 13, 1996				
A1-2	---	---	---	11.0
	9 to 11	---		
A1-3	---	---	---	12.0
	10 to 12			
A1-4	---	---	---	12.0
	10 to 12			

[1] All measurements are in feet unless otherwise specified.
[2] Head space measurements were collected with photoionization and flame ionization detectors at tip of soil sample collected from interval.

Notes: ppm = parts per million.
--- = no data.

Table 2
Site 5 Sampling[1]

Field Report, Technical Assistance for
Direct-Push Technology Drilling Activities at Sites 1 and 5
Naval Construction Battalion Center
Gulfport, Mississippi

Sample Location	Sample Depth	Head Space[2] (ppm)	Depth to Groundwater	Total Drilled Footage
December 4, 1996				
A5-1	8 to 10	10.3	10	17
	15 to 17	0.2		
A5-2	6 to 8	11.7	8.5	15
	13.5 to 15	0.2		
December 5, 1996				
A5-3	6 to 8	2.9	8.5	15
	13.5 to 15	0.6		
A5-4	6 to 8	13.6	8	15
	13 to 15	0.3		
A5-5	5.5 to 7.5	2.2	7.5	14.5
	13 to 14.5	0.9		
A3-1	5.5 to 7.5	1.1	8.0	14
	12.5 to 14	1.4		(5 feet at refusal)
A3-2	6 to 8	16	8.5	15
	13 to 15	0.4		
A3-3	6 to 8	4.2	8.5	13
	11 to 13	0.6		
December 6, 1996				
A2-1	6 to 8	4.5	9.5	15
	13 to 15	14		
A2-2	7.5 to 9	4.4	10	16.5
	14.5 to 16.5	0.2		
A2-3	7 to 9	1.3	9	16
	14 to 16	0.2		
A1-1	6.5 to 8.5	2.5	9	15
	13 to 15	0.8		
A1-2	6 to 8	7.5	8.5	14.5
	12.5 to 14.5	0.0		
A1-3	6 to 8	18.7	8.5	15
	13 to 15	0.0		
December 9, 1996				
A10-1	6 to 8	9.9	8.5	15
	13 to 15	0.4		
A10-2	6 to 8	17.0	8.5	15
	13 to 15	3.0		(over 5 feet at refusal)

See notes at end of table.

Table 2 (Continued)
Site 5 Sampling[1]

Field Report, Technical Assistance for
Direct-Push Technology Drilling Activities at Sites 1 and 5
Naval Construction Battalion Center
Gulfport, Mississippi

Sample Location	Sample Depth	Head Space[2] (ppm)	Depth to Groundwater	Total Drilled Footage
A6-6	6 to 8	11.0	8	15
	13 to 15	0.8		
A6-5	5.5 to 7.5	17.0	7.5	14.5
	12.5 to 14.5	7.4		
December 10, 1996				
A6-4	5.5 to 7.5	1.3	7.5	14.5
	12.5 to 14.5	0.3		
A6-3	5.5 to 7.5	0.7	7.5	14.5
	12.5 to 14.5	0.3		
A6-2	5.5 to 7.5	2.1	8	15
	13 to 15	0.4		
A6-1	5.5 to 7.5	0.7	8	14.5
	12.5 to 14.5	0.3		
A9-5	5.5 to 7.5	1.1	9	15
	13 to 15	0.4		
A9-4	5.5 to 7.5	1.9	9	15
	13 to 15	0.4		
December 11, 1996				
A9-3	6.5 to 8.5	1.4	9.4	16
	14 to 16	2.0		
A9-2	6 to 8	>100	8.5	16
	14 to 16	3.0		
A9-1	6 to 8	3,200 (FID) 0.2 (HNu)	8.5	16
	14 to 16	4,400 (FID) 0.2 (HNu)		

[1] All measurements are in feet unless otherwise specified.
[2] Head space measurements were collected with photoionization and flame ionization detectors at tip of soil sample collected from interval.

Notes: > greater than.
ppm = parts per million.

Table 3
Analytical Parameters

Field Report, Technical Assistance for
Direct-Push Technology Drilling Activities at Sites 1 and 5
Naval Construction Battalion Center
Gulfport, Mississippi

Soil Analyses	Method	Water Analyses	Method
Volatile organics	8240	Volatile organics	8240
Semivolatile organics	8270	Semivolatile organics	8270
Pesticides	8080	Pesticides	8080
Herbicides	8150	Herbicides	8150
Dioxins and furans	8290	Dioxins and furans	8290
RCRA metals	6010/7471A	RCRA metals	6010A/7470A

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

Note: RCRA = Resource Conservation and Recovery Act.

ATTACHMENT C

GLOSSARY

GLOSSARY

ABB-ES	ABB Environmental Services, Inc.
Bhate	Bhate Environmental
bls	below land surface
DDT	dichlorodiphenyl trichloroethane
DPT	direct-push technology
HNu	HNu, Inc., manufacturer of photoionization detector
MK	Morrison Knudson
NCBC	Naval Construction Battalion Center
RCRA	Resource Conservation and Recovery Act

ATTACHMENT D

REFERENCES

REFERENCES

Morrison Knudson (MK), 1995, Geophysical Investigation of Sites 1, 4, and 5 at the Naval Construction Battalion Center, Gulfport, Mississippi: prepared by Geosphere Midwest Inc.

MK, 1996, Work Plan, CBC Gulfport, Sites 1, 4 and 5, Appendix C, pp. 22-23, Contract N62467-93-D-1106, Delivery Order No. 0002, Statement of Work No. 009, Revision 0, September.