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NCBC GULFPORT  
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MONTHLY ASSESSMENT REPORT FOR FREE PHASE PRODUCT BETWEEN 5  
NOVEMBER 1993 AND 6 DECEMBER 1993 WITH TRANSMITTAL NCBC GULFPORT MS  
12/8/1993  
ABB



8 December 1993

Commanding Officer  
Southern Division  
Naval Facilities Engineering Command  
2155 Eagle Drive  
North Charleston, SC 29418

Attention: Mr. David Criswell

Subject: NCBC Site 6 Free Phase Product Assessment  
Contract Task Order 096  
Progress Report - November 1993

Dear Mr. Criswell:

This progress report covers the period from 5 November 1993 through 6 December 1993. The status of major task activities conducted during this CTO, as well as projected activities, is summarized in Attachment 1.

If you have any questions, please call me at (615) 531-1922.

Sincerely,

ABB ENVIRONMENTAL SERVICES, INC.

Penny M. Baxter  
Senior Project Manager

attach

pc: file

[8505.004]

ABB Environmental Services Inc.

ATTACHMENT 1

MONTHLY PROGRESS REPORT  
NOVEMBER 1993  
NCBC GULFPORT SITE 6  
CTO 96

#### A. WORK ACCOMPLISHED DURING REPORTING PERIOD

On 9 November 1993 Gordon Crane requested that ABB-ES take a water sample of the IDW for possible disposal of the generated groundwater into the POTW. A telephone conversation was held with Mr. Al Gombos at the Harrison County Wastewater and Solid Waste Department on 10 November 1993. Mr. Gombos stated that analytical requirements for acceptance of water to discharge to the sanitary sewer would be given only after the permit application was received. Mr. Gombos mailed a permit application to ABB-ES on 19 November. A copy of his cover letter is included in this report as Attachment 2. A copy of this letter has been forwarded to G. Crane/NCBC. During a telephone conversation, Buddy Broadway/Public Works Director/Gulfport requested that the discharge flow rate be limited to 2000 gallons per day. It is doubtful if the water would be acceptable to the POTW.

The first shift for the field activity began on 14 November. Bob Fisher and Penny Baxter mobilized to the Base and marked the grid system for the Hydropunch II™ sampling. Discovery of a second associated plume during the investigation caused additional drive points to be used. Forty-one drive points, instead of the 30 originally scoped, were needed to properly delineate the plumes. This technique proved to be very effective in delineating the plumes in a short period of time. The USGS and a representative from MSDEQ, Mr. Philip Weathersby, visited the site during this shift. Following the conclusion of this field shift on 20 November, a technical bulletin was written summarizing the field activities and recommending proposed well locations. A copy of the TB S6-01 is included in this report as Attachment 3. The bulletin was reviewed by G. Crane/NCBC and B. Oakley/USGS. Upon making corrections to the document and re-issuing the TB, a copy was sent to Mr. Philip Weathersby on 3 December for review. We are expecting his comments by 7 December. The field personnel mobilized for the second field shift, well installation and sampling, on 6 December.

A letter was written to the Base on 6 December to outline the suggested sampling strategy for the proposed and existing wells. The letter was reviewed by USGS, and Bill Oakley/USGS gave the go-ahead on the evening of 6 December. The letter was faxed to Philip Weathersby on the morning of 7 December for review and comment. A copy of this letter is included in this report as Attachment 4.

#### B. FUTURE PROJECT ACTIVITIES

While in Gulfport, Gordon asked me if we could assist in producing a fact sheet for this activity. I contacted our community relations expert, and she expects to get a draft copy to me on 7 December. After I review this fact sheet, I will fax both you and Gordon a copy. We do have some budget for such an activity that was originally scoped to occur later in this CTO.

Drilling and installation of the monitoring wells started on 6 December. The drillers will be onsite on 7 December, and this field effort is expected to take 5 to 7 days to complete. One 5-in recovery well, two deep wells, and three shallow water table wells will be installed. Although these wells are being installed as observation points, the soil and groundwater will be sampled for selected parameters. Attachment 4 is a letter to Gordon Crane indicating what and where we are suggesting that samples be taken.

After completion of the second field shift, a technical bulletin will be written to advise the Base, USGS, and MSDEQ of activities performed. The date of delivery for this TB is 30 December 1993.

The tentative date for the pump test is 10 January 1994. This effort will take 5 to 7 days in the field, and the technical bulletin associated with this third shift will be delivered 31 January.

The dates quoted above are approximately 3 weeks behind the original baseline due to a slip in the schedule caused by a meeting with MSDEQ being delayed in October.

#### C. FINANCIAL STATUS SUMMARY AND PROJECTION

This CTO has undergone some variances in cost for the field effort. Outlined below are some of the changes/variations that have occurred:

- The original estimate for the Hydropunch II™ work was given by a local contractor in MS. This company had gone out of business between the time the POA was done and subcontracting took place. The estimate for Hydropunch II™ that we were able to obtain was approximately \$3000 more for the 30 samples.
- The installation of the additional 11 drive points needed to delineate the second plume along with driving the two deep drive points to obtain the DNAPL samples requested by the MSDEQ will add approximately \$5600 to the Hydropunch II™ drilling invoice. Bottom line of the Hydropunch II™ effort invoice will be approximately \$18,000 unburdened.
- The increased amount of IDW (discussed under Technical Status below) has resulted in the rental of an onsite tank to hold the liquid waste. The increased cost associated with the rental of the tank is approximately \$2500.
- The lowest bid for drilling services was approximately \$2000 more than the estimate in the POA.
- The addition of a complete suite of analyses will need to be run on the groundwater IDW collected in the holding tank. The approximate cost will be \$2500 for this added sample.

#### D. TECHNICAL STATUS SUMMARY AND PROJECTION

The team had proposed installation of a 6-in recovery well during the second field shift currently in progress. The State of MS requires a permit for the installation of 6-in wells or larger, and the permit process is 4 to 6 weeks long. Mr. Weathersby/MSDEQ volunteered to talk with the permitting department to see if a variance was possible. Upon learning that no variances would be allowed, the decision was made to drop the size to a 5-in well. No technical repercussions are expected from this size change as far as the immediate needs are concerned. In the long term for the actual remediation system, a 6-in well may be needed.

The question of IDW disposal for waste from the pump test has not yet been finalized. The hydraulic conductivity values estimated from slug tests performed on the wells during the first field shift were higher than originally estimated from the geologic descriptions. This may mean that the wells will produce more development, purge, and pumping water than originally calculated. Plans are being made for the temporary installation onsite of a 6000 gallon tank to hold this water.

ATTACHMENT 2

LETTER FROM AL GOMBOS  
HARRISON COUNTY WASTEWATER AND SOLID WASTE  
MANAGEMENT DISTRICT

**HARRISON COUNTY  
WASTEWATER AND SOLID WASTE  
MANAGEMENT DISTRICT**

14108 AIRPORT ROAD  
P.O. BOX 2409  
GULFPORT, MISSISSIPPI 39505  
Telephone (601) 868-8752  
Fax (601) 868-8751

November 19, 1993

Ms. Valerie A. Rule  
ABB Environmental Services, Inc.  
1400 Centerpoint Boulevard, Suite 158  
Knoxville, TN 37932-1968

Dear Ms. Rule:

In response to your request for information, I have attached the District's Industrial/Commercial Sewage Disposal Permit Application Form. Upon our receipt of this completed form we will review this information and respond to you accordingly.

In addition to the completed application, please furnish any and all information pertaining to the Gulfport Navy Base's plan for the proper disposition of the wastewater and by-products resulting from the ground water remediation activities caused by petroleum contamination. By copy of this letter, I am requesting any and all information available from the Mississippi Department of Environmental Quality.

If you have any questions please contact me at my office.

Very truly yours,



Al Gombos  
O&M Contract Administrator

AGG:wp

cc: Walter Huff, D.E.Q.  
OMI  
Mr. Buddy Broadway, Gulfport Public Works

ATTACHMENT 3

TECHNICAL BULLETIN TB S6-01  
COMPLETION OF HYDROPUNCH II SAMPLING TO DELINEATE FREE-PHASE  
PRODUCT PLUME



## TECHNICAL BULLETIN

TB S6-01

Rev. 1

Date 12/03/93

Page 1 of 5

FREE-PHASE PRODUCT ASSESSMENT  
SITE 6 FORMER FIRE-FIGHTING TRAINING AREA  
NCEC, GULFPORT, MISSISSIPPI

### SUBJECT

Completion of Hydropunch II<sup>®</sup> Sampling to delineate free-phase product plume

### SUMMARY

Approximately 3 feet of floating free-phase product was discovered in monitoring well GPT-6-1 on 31 October 1991. This discovery initiated the Free-Phase Product Assessment. The free-phase product in well GPT-6-1 is apparently a result of the former south fire-fighting training pit which is located approximately 30 feet east of monitoring well GPT-6-1.

Forty-one Hydropunch II<sup>®</sup> drive points were used to assess the horizontal and vertical extent of the free-phase product. During the field effort, a second plume was discovered. This plume is assumed to be the result of the former north fire-fighting training pit. The two plumes have coalesced and have migrated to the west of the former pits. The south free phase plume has a maximum observed thickness of 2.5 feet, and the north plume has a maximum observed thickness of 1.0 foot.

Two borings, M-18D and M-15D, were extended to collect groundwater samples from the basal part of the sand at the top of the clay layer between 25 and 29 feet below land surface (bls). Sample collections consisted of one free-phase product sample, two groundwater samples at the confining clay layer, and a soil sample at 8 feet bls and a soil sample at 15 feet bls. The two soil samples are being analyzed for grain size, total organic carbon, and cation exchange capacity. A groundwater sample was collected from M-18D between 21 and 25 feet bls and from K-15D between 25 and 29 feet bls.

The formation above the clay layer is a dark brown, fine to medium sand with little silt.

Rising head slug tests were performed on existing monitoring wells GPT-6-2 and GPT-6-3. Analyses of these tests indicate hydraulic conductivity values range between  $1.1-1.3 \times 10^{-3}$  centimeters/second (cm/sec).

### ATTACHMENTS

- Attachment 1: Chronology of Events at Site 6
- Attachment 2: Plume Map at Site 6
- Attachment 3: Diagram of Hydropunch II<sup>®</sup>
- Attachment 4: Slug test results
- Attachment 5: Proposed Location of Pilot-Scale Pumping Test Well

The data and interpretation contained in this technical bulletin are derived from preliminary field data and are subject to revision as additional data become available.

## DISCUSSION

The following discussion presents the methods and results of the field activities conducted from 14 November to 20 November 1993. These field activities included Hydropunch II® drilling, free-phase product measurement, sampling of groundwater for potential dense non-aqueous phase liquids (DNAPLs), soil sampling, and slug testing of monitoring wells. A chronology of the events at Site 6 is provided in Attachment 1.

### Hydropunch II® Drilling/Plume Delineation

The primary objective of this field effort was to assess the horizontal and vertical extent of the free-phase product plume at Site 6, former fire-fighting training area. Observations of the free-product were made by installing sacrificial drive points and monitoring points intersecting the groundwater table. From these well screens, visual observations of the product were made by withdrawing the fluids with clear bailers. The results of these observations were recorded in the field book and on a gridded site map (Attachment 2).

Prior to installation of the Hydropunch II® monitoring points, the location was post-holed to 3.0 feet bls. Post holing was performed at all locations because of the presence of buried utilities on the site. The Hydropunch II® tool (Attachment 3, left side) was then attached to the B-50 drill rig via standard AW drill rods and pushed or hammered 2 to 3 feet below the groundwater table. When the tool was withdrawn, the drive point remained in the soil with the well screen attached. This configuration (hydrocarbon mode) of the Hydropunch II® allowed direct sampling and measurement of the floating product. When the points are no longer needed, they will be grouted in place.

The delineation of the free-phase product at the site started with installation of well points near monitoring well GPT-6-1; the well is contaminated with nearly 3 feet of floating free-phase product. The investigation proceeded to the west, south, and east until groundwater that was free of floating product was observed. The map of the site (Attachment 2) shows observations from the monitoring points and the locations of buildings and the former pits. As shown, points Q-16 and Q-14 delineate the south pit free-product to the east. Points O-11, L-11, and I-12 delineate to the south, and F-14, I-16, and J-17 delineate floating free-product to the west. The vertical extent of the floating free-phase product is defined by the points with floating product in them. The thickness of the southern plume's light non-aqueous phase liquid (LNAPL) ranges from 2.5 feet in L-14 to a trace in I-14, M-12, M-16, and O-16. The product in L-14 was described as a dark brown, oily, and viscous fluid with a strong diesel fuel odor.

The product in I-14, M-12, M-16, and O-16 was described as a light brown, oily, and viscous fluid with a hydrocarbon odor.

While delineating the northern edge of the floating free-product in the area of the south pit, a second plume was discovered. This second plume is apparently the result of the second fire-fighting training pit, which is to the north, merging with the floating free-product from the fire-fighting training pit on the south side of the site. This north plume was first discovered when point M-19 was installed. This well point had 1 foot of free-product floating in it. The product was described as a dark brown, oily, and viscous fluid with a strong odor of diesel fuel. M-19 is located in the north pit area, 30 feet south of Building 383. From M-19, delineation and characterization points were installed to the northwest and northeast. The horizontal extent of the floating free-product on the north side of the plume is delineated by points I-20, J-23, M-25, O-25, P-24, S-21, Q-19, and O-17. The vertical extent (thickness) of the floating free-product ranges from 1.0 foot in monitoring point M-19 to less than 0.02 foot in monitoring points J-21, L-23, Q-21, and O-19.

Monitoring well GPT-6-3 did not have any free-product, but flame ionization detector (FID) readings of the well were as high as 500 parts per million (ppm), and a strong diesel odor was present when opened. Monitoring well GPT-6-2 did not have free product, and well head readings with the FID indicated no detectable organic vapors above background.

#### Groundwater and Soil Sampling

Free-phase product samples were collected for free-phase effluent (fingerprint) analysis, Dioxin 8290 analyses, library search of volatiles, and non-hydrocarbon solvents. The samples were sent to CH2M Hill for these analyses.

Two deep borings were completed to the underlying clay layer. The Hydropunch I<sup>®</sup> tool was set in the groundwater sampling mode (Attachment 3, right side), which allows discrete sampling at a selected interval. The location of the borings were M-18D and K-15D. The soils encountered were a orange-brown, silty clay to 4 feet, overlying a fine to medium grained, brown sand with vary little of silt, a typical observation for this site. An underlying clay layer was encountered at depths of 25 to 29 feet bls. The boring at M-18 was completed to 21 feet bls, and the Hydropunch<sup>®</sup> was pushed to 25 feet bls. At that point, the tool was pulled back to allow groundwater to flow in. After 0.5 hour, the tool was removed with 1.2 L of groundwater. The boring at K-15 was completed to 25 feet bls, and the tool was pushed to 29 feet bls. The groundwater samples from M-18 and K-15 will be analyzed by CH2M Hill Laboratories for volatile organics using EPA Method 8260.

Two soil samples were collected from the deep boring M-18D. These samples were sent to GATS, Inc. in Oak Ridge, Tennessee, for grain size analysis (sieve and hydrometer), total organic carbon (TOC), and cation exchange capacity (CEC) analyses. The grain size results will be used to design the screen slot size and the filter pack of the recovery well that will be installed in December.

Results of the sieve and hydrometer tests on the two soil samples were similar. The results are as follows:

- 2% fine gravel,
- 2% coarse sand,
- 21% medium sand,
- 60% fine sand,
- 10% coarse silt, and
- 5% fine silt and clay.

The screening and sampling within deep borings at M-18D and K-15D indicate that groundwater contamination extends to the clay layer at both locations. The clay layer is situated at approximately 25 feet bls, and the results of the DNAPL samples may have implications on the extraction well system and on how the effluent will be handled and disposed.

#### Slug Testing

Rising head slug tests were performed on existing wells GPT-6-2 and GPT-6-3 (GPT-6-1 was not tested due to the presence of free-product). The results of these tests (Attachment 4) is a hydraulic conductivity on the order of  $10^{-3}$  cm/sec. Attachment 4 contains two slug test sheets per well. The first sheet has data gathered for the durations of the test; the second sheet per well represents the portion of the slug test used to interpret the hydraulic conductivity. Conductivities of this magnitude are indicative of fine to medium sands with silts, as were observed in borings M-18D and K-15D and confirmed by grain size analyses.

The proposed location of a pilot-scale pumping test well is shown on Attachment 5 along with proposed shallow and deep monitoring/observation wells. Prior to the execution of the pump test, slug tests will be performed in selected wells.

#### Comparison of Hydropunch® Monitoring Points and Monitoring Wells

The results from Hydropunch® monitoring points are comparable to permanent monitoring wells as shown in experimentation between point L-14 and monitoring well GPT-6-1. Observations between the point and the monitoring well resulted in 2.5 feet thickness of free-phase product in both. Bail-

down tests in L-14 and GPT-6-1 resulted in a recovery of product that was similar both with respect to time and thickness. These results lend confidence to the delineation of the product thickness at the two locations. A final round of measurements will be made in the monitoring points prior to abandonment in December.

#### IMPLICATIONS OF RESULTS

The most important implication of this field effort is the discovery of a north plume resulting from the north fire-fighting training pit. The north plume extends below Building 383. Also, the water surface at several locations in the nearby ditches had a sheen that appeared to be coming from the sides of the ditch. The sheen may be the result of dissolved-phase and free-phase product migrating to the ditches in the groundwater. However, organic-related sheens are commonly a result of algal growth in this area.

The two deep borings indicate that groundwater contamination apparently extends down to the underlying clay layer, as FID readings of drilling cuttings were as high as 1,000 ppm above background.

The soils encountered were fine to medium sand with varying amounts of silt. Rising head slug tests resulted in hydraulic conductivities in the  $10^{-3}$  cm/sec range, typical for fine to medium sand.

Finally, the Hydropunch<sup>®</sup> push-probe technology proved to be effective at this site for a number of reasons. The shallow groundwater table, the ease of pushing the tool into unconsolidated sediments, and the real-time results from Hydropunch<sup>®</sup> points compared to installing monitoring wells saved time and money and resulted in a lower volume of investigation derived waste. The results from the Hydropunch<sup>®</sup> points are comparable to permanent monitoring wells as shown in experimentation between point L-14 and monitoring well GPT-6-1. Observations from the point and the monitoring well both resulted in 2.5 feet of production. Bail down tests in L-14 and GPT-6-1 resulted in recovery of product that was similar with respect to time and thickness.

ATTACHMENT 1

Chronology of Events at Site 6

14 November 1993, Sunday

- Arrive at NCBC Gulfport, Mississippi.
- Superimpose grid on Site 6.

15 November 1993, Monday

- Installed three well points: J-14, K-14, and I-14.
- Heavy rain stops drilling.

16 November 1993, Tuesday

- Installed 17 well points: K-15, L-13, I-12, M-12, M-14, Q-14, O-16, O-13, M-16, O-11, I-15, I-18, J-19, M-18, O-17, Q-16, and L-14.
- Made observations and measured floating product thicknesses in 20-inch completed points.

17 November 1993, Wednesday

- Installed 14 well points: M-19, L-21, J-21, I-20, L-23, I-23, M-25, K-25, M-26, L-11, F-14, O-19, Q-19, and J-23.
- Made observations and measured floating product thicknesses in 34-inch completed points.

18 November 1993, Thursday

- Installed four well points: Q-21, O-21, P-24, and O-25.
- Made observations and measured floating product thicknesses in 38-inch completed points.
- Drilled deep borings M-18D and K-15D to collect soil samples and DNAPL groundwater samples for organic analysis.
- Collected free-phase product from M-19.

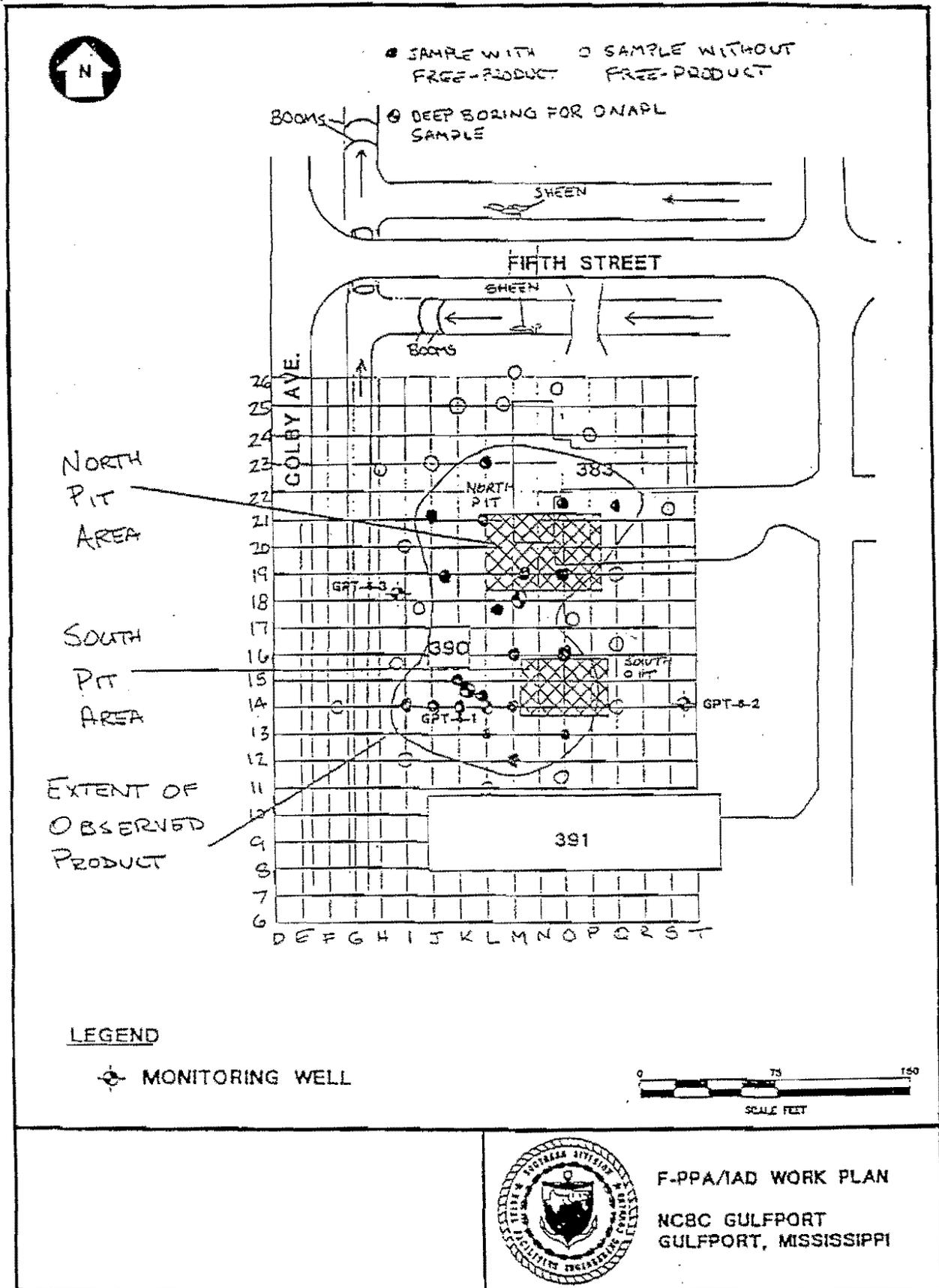
19 November 1993, Friday

- Observe water levels in all points designated as delineation points.
- Perform aquifer slug tests on monitoring well GPT-6-2.

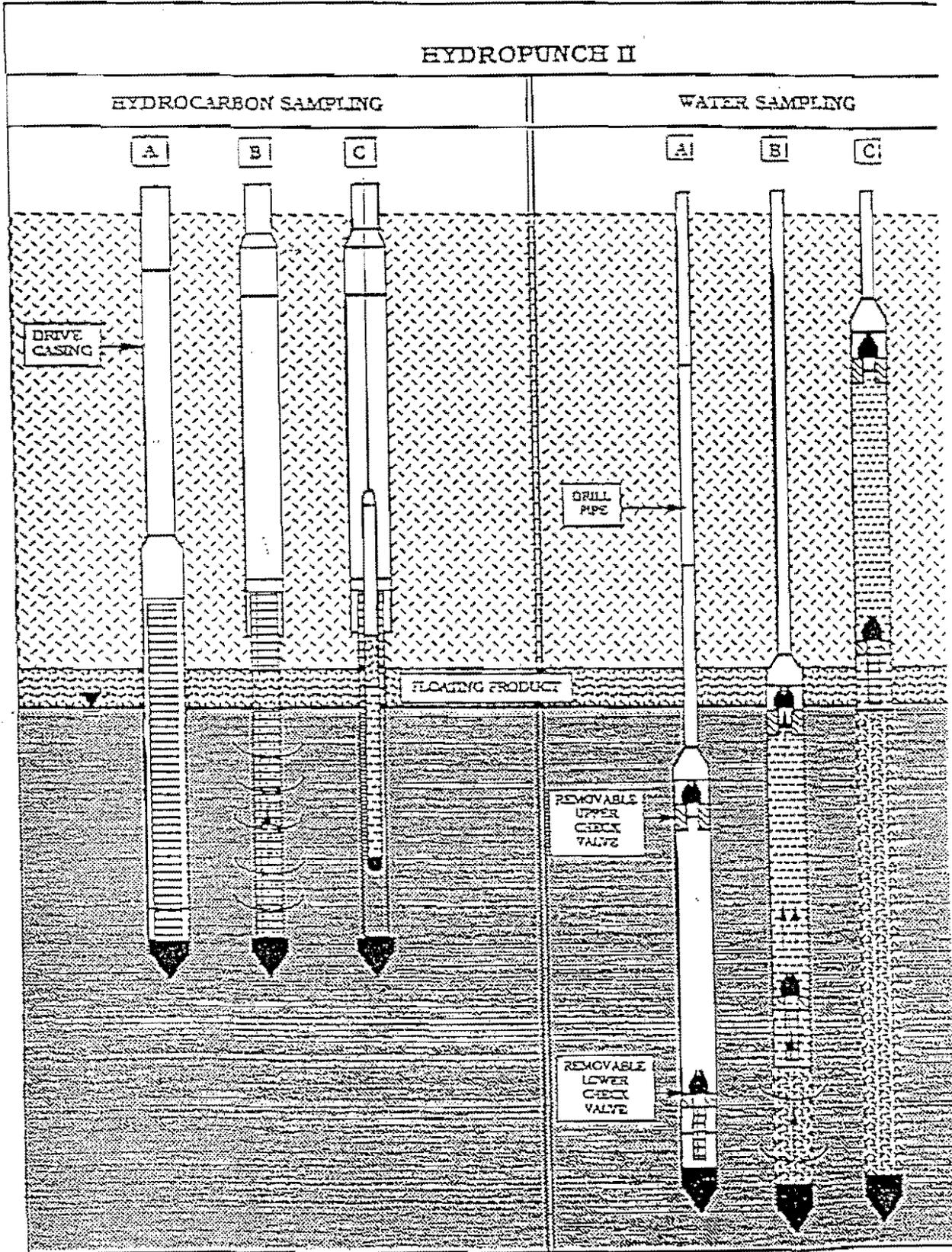
20 November 1993, Saturday

- Perform aquifer slug tests on GPT-6-3.
- Ship equipment back to ABB Navy Department, Tallahassee, Florida.

# ATTACHMENT 2: PLUME MAP



ATTACHMENT 3: DIAGRAM OF HYDROPUNCH II



LEGEND: HYDROCARBON SAMPLING

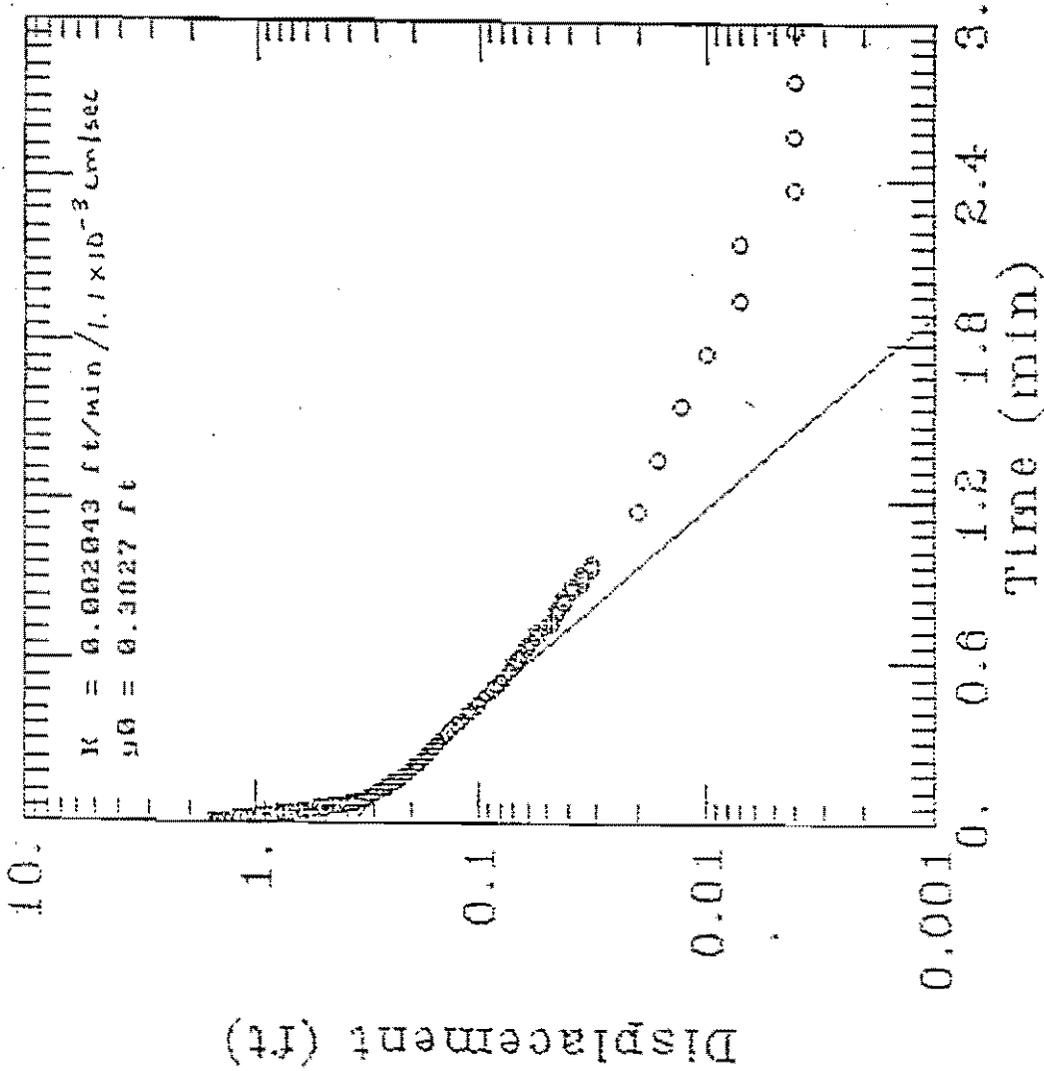
- [A] Hydropunch II closed while being driven into position.
- [B] Tool opened and 5 foot screen released into position for collection of hydrocarbon or water sample at the very top of the aquifer.
- [C] Hydrocarbon sample being collected using bailer lowered through drive casing.

LEGEND: WATER SAMPLING

- [A] Hydropunch II closed while being driven into position.
- [B] Cone separates and tool open to collect sample.
- [C] Check valves closed as sample is removed within body.

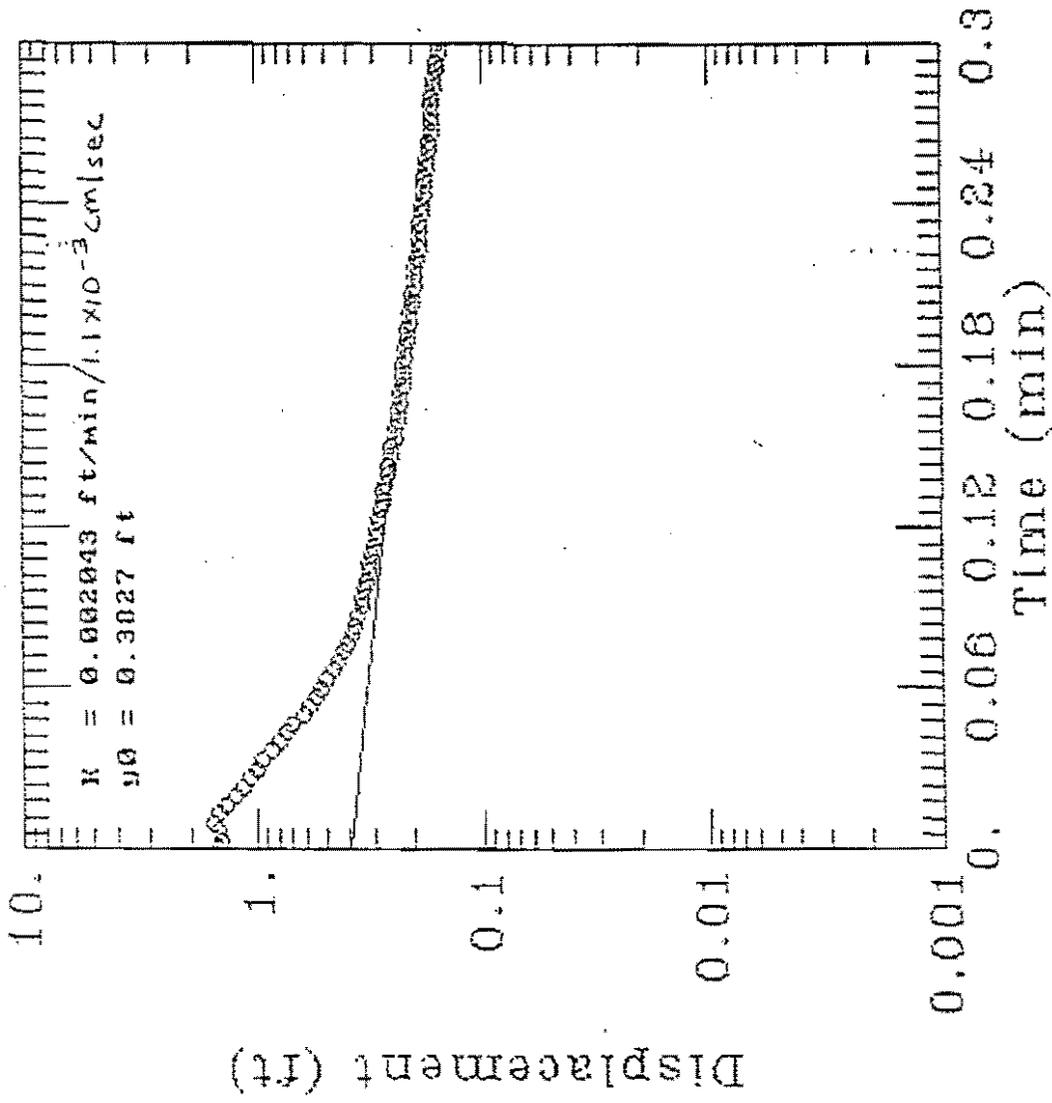
# ATTACHMENT 4A: Slug Test Results

## GPT-6-2 RISING HEAD SLUG TEST

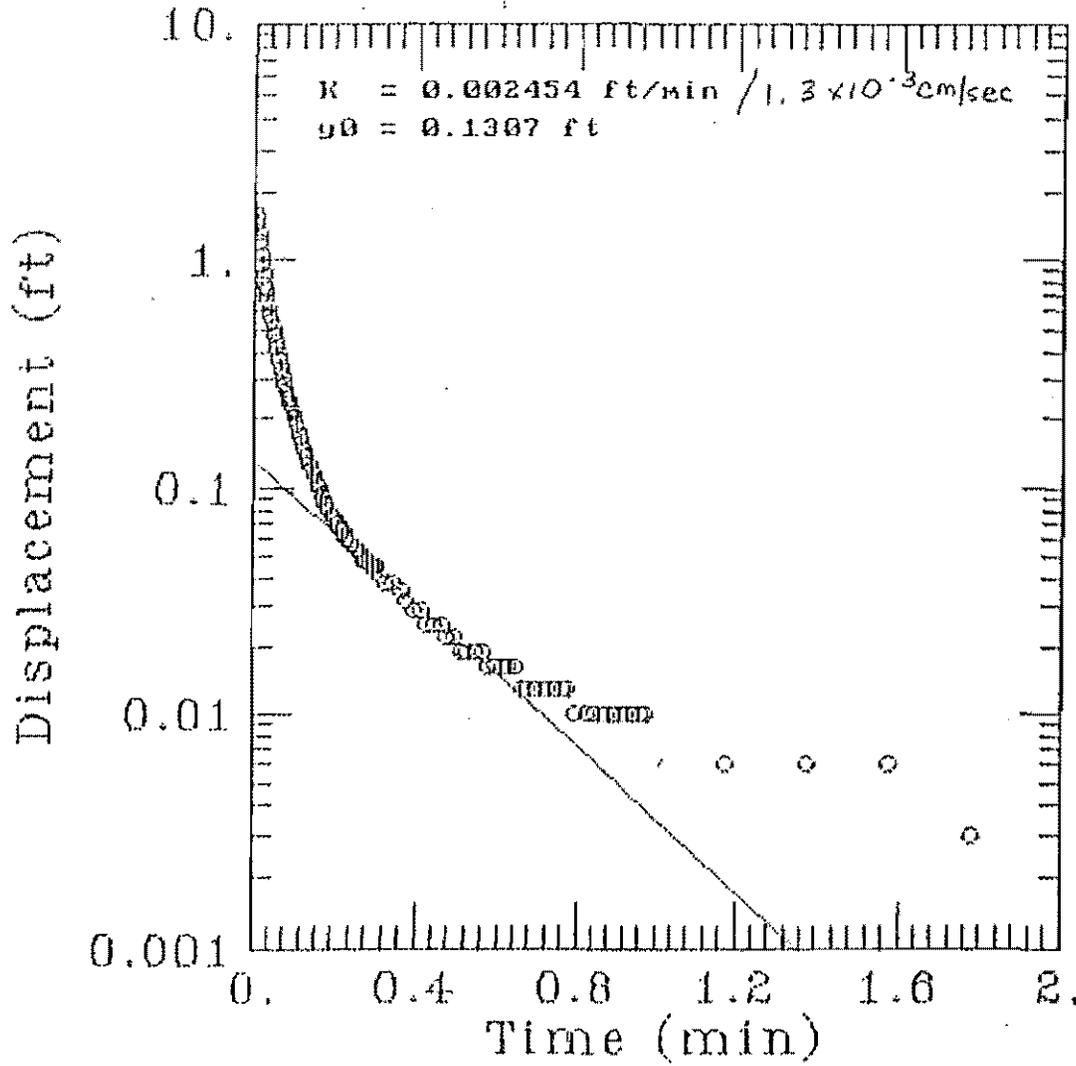


# Attachment 4B: Slug Test Results

## GPT-6-2 RISING HEAD SLUG TEST

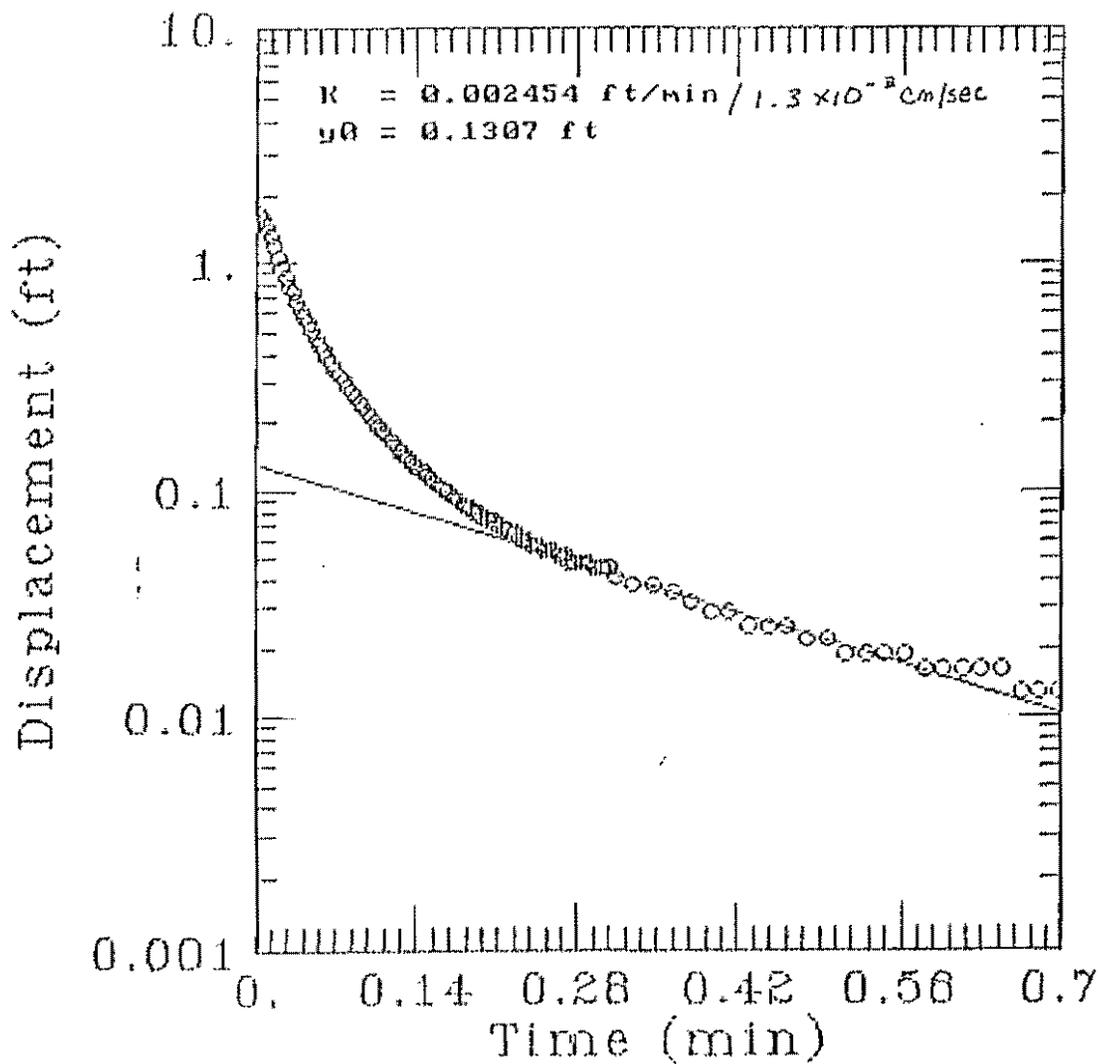


# GPT-6-3 RISING HEAD SLUG TEST



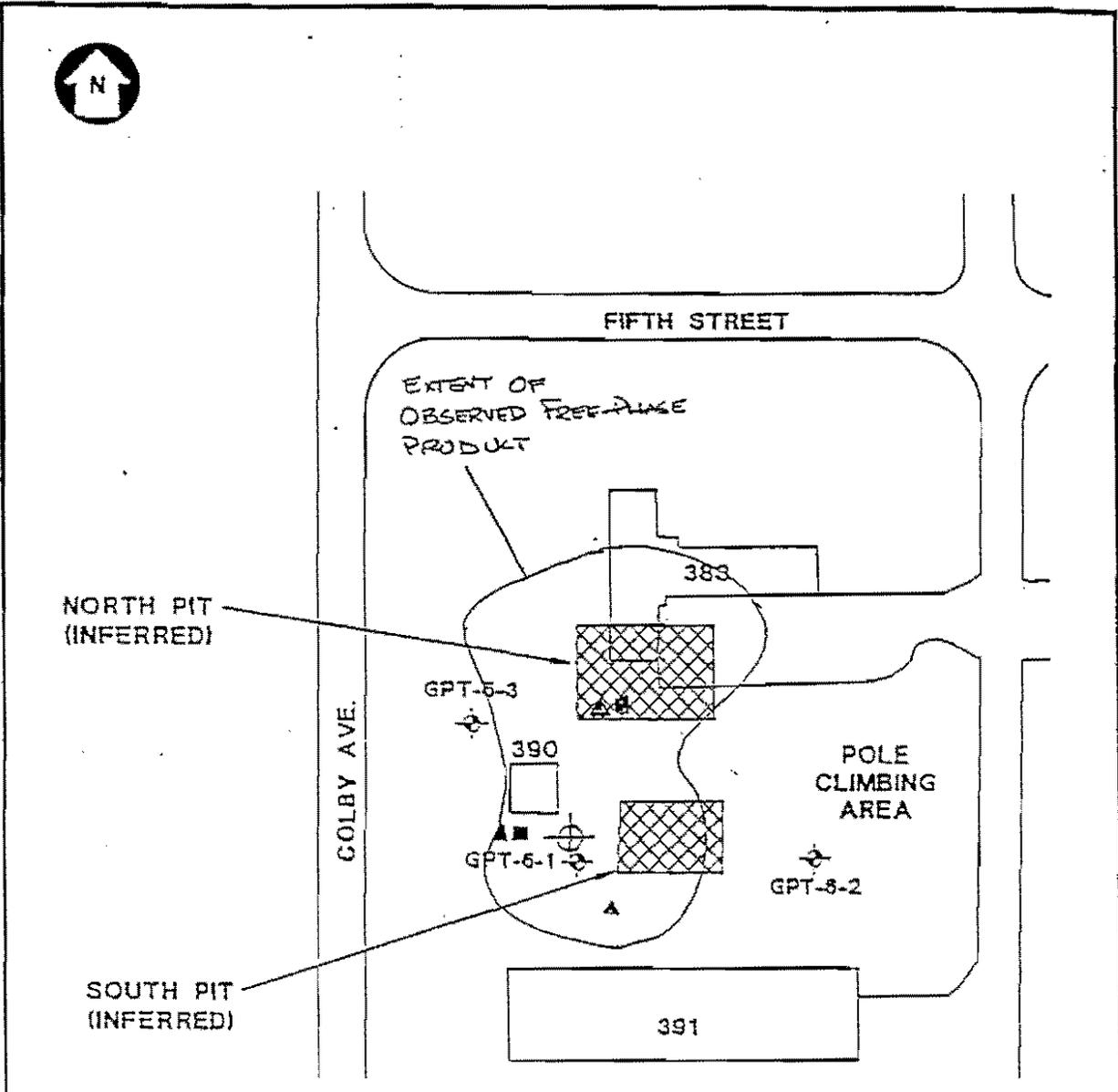
Attachment 4c: Slug Test Results

# GPT-6-3 RISING HEAD SLUG TEST



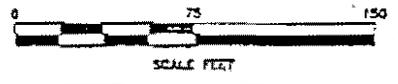
Attachment 4D: Slug Test Results

# ATTACHMENT 5: PROPOSED MONITORING WELL AND RECOVERY WELL LOCATIONS



### LEGEND

- ⊕ MONITORING WELL
- ▲ PROPOSED SHALLOW MONITORING WELL
- PROPOSED DEEP MONITORING WELL
- ⊕ PROPOSED RECOVERY WELL



F-PPA/IAD WORK PLAN  
NCBC GULFPORT  
GULFPORT, MISSISSIPPI

ATTACHMENT 4

LETTER TO GORDON CRANE  
ON SAMPLING STRATEGY FOR THE FPPA SITE 6



3 December 1993

Mr. Gordon Crane  
NCBC Gulfport  
5200 CBC 2nd Street  
Building 322  
Gulfport, MS 39501-5001

Subject: Sampling strategy specifics for FPPA Site 6

Dear Gordon:

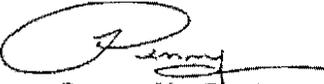
Contained in this letter are sampling strategy specifics to clarify our interim action design field sampling. The original sampling of wells, although scoped, had not been well defined for the Site 6 well sampling. Enclosed is a table and map explaining what we propose to sample for and where. Listed below are some of the reasons that outline the logic used in selecting this sampling strategy.

- Soil samples from the unsaturated zone near one of the sources (north pit) and soil in the saturated zone will be collected for analysis of a full TCL suite and will be considered as representative on soil conditions in and near the aquifer.
- Soil samples from a boring associated with the south pit will be analyzed for VOC, SVOC, and TPH at the 8-10 ft interval.
- Deep soil samples (20-22 ft) from borings associated with both the south and north pits will be collected for analyses of VOC and SVOC.
- The shallow well associated with the north pit (GPT-6-6) and the shallow well associated with the south pit (GPT-6-7) will both be sampled for the full TCL suite. These samples will be either in or downgradient from a potential source.
- Groundwater from the other proposed and existing wells will be sampled for indicator parameters which will include VOC, SVOC, and TPH. Well number GPT-6-8 will be for observation purposes only along with a few selected Hydropunch drive points.

We will need to send these to Phillip Weathersby at the MSDEQ to get his input. I am sending a copy of this letter to the USGS for their review. Can I proceed with this?

Please call me at (615) 531-1922 if you have any questions or concerns.

Sincerely,  
ABB Environmental Services, Inc.



Penny M. Baxter  
Senior Project Manager

pc: J. Harsh/USGS  
✓ D. Criswell/SoDiv  
P. Weathersby/MSDEQ  
file

{8505.003}

ABB Environmental Services Inc.

GULFPORT SITE 6  
FORMER FIRE-FIGHTING TRAINING PITS

SAMPLING PROGRAM  
SUBSURFACE SOILS

Sample Type	B-6-4 3-5 ft	B-6-4 8-10 ft	B-6-4 20-22 ft	B-6-5 8-10 ft	B-6-5 20-22 ft
TCL-CLP VOAs	X	X	X	X	X
TCL-CLP SVOAs	X	X	X	X	X
TCL-CLP PEST/PCBs	X	X			
TAL-CLP INORGANICS W/CYANIDE	X	X			
TPH (METHOD 418.1)	X	X		X	
TOC (METHOD 415.1)					X
HERBICIDES (METHOD 8150)	X	X			
DIOXANS/FURANS (METHOD 8290)	X	X			
TRIP BLANK	XP			XP	
POTABLE WATER FIELD BLANK	XF				
DISTILLED WATER FIELD BLANK	XF				
EQUIPMENT RINSATE FIELD BLANK	XF			XL	
DUPLICATE	XF				
MATRIX SPIKE	XF				
MATRIX SPIKE DUPLICATE	XF				

XF = FULL SUITE OF ANALYSIS

XP = ONLY VOAs

XL = ONLY VOAs, SVOAs, TPH, TOC

GULFPORT SITE 6  
FORMER FIRE-FIGHTING TRAINING PITS

SAMPLING PROGRAM  
GROUNDWATER

Sample Type	GPT-6-1	GPT-6-2	GPT-6-3	GPT-6-4	GPT-6-5	GPT-6-6	GPT-6-7	GPT-6-8	GPT-RW
TCL-CLP VOAs		X	X	X	X	X	X		
TCL-CLP SVOAs		X	X	X	X	X	X		
TCL-CLP PEST/PCBs						X	X		
TAL-CLP INORGANICS W/CYANIDE						X	X		
TPH (METHOD 418.1)		X	X			X	X		
TOC (METHOD 415.1)						X	X		
HERBICIDES (METHOD 8150)						X	X		
DIOXANS/FURANS (METHOD 8290)						X	X		
TRIP BLANK		XP		XP		XP			
EQUIPMENT RINSATE FIELD BLANK		XO		XD		XF			
DUPLICATE						XF			
MATRIX SPIKE						XF			
MATRIX SPIKE DUPLICATE						XF			

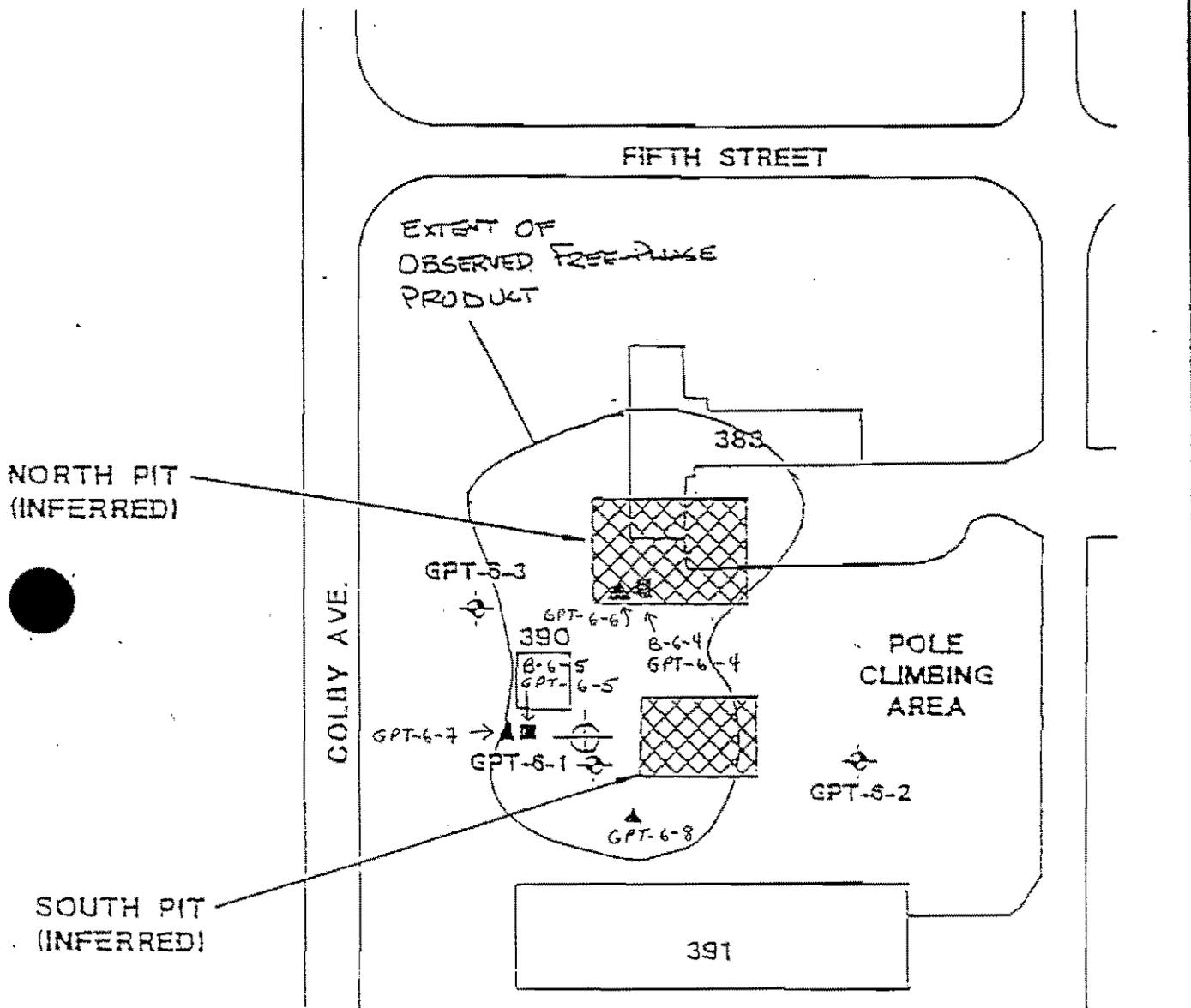
XF = FULL SUITE OF ANALYSIS

XP = ONLY VOAs

XO = ONLY VOAs, SVOAs, TPH

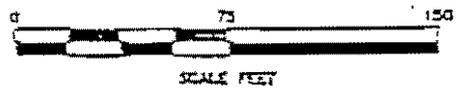
XD = ONLY VOAs, SVOAs

ATTACHMENT 5: PROPOSED MONITORING WELL AND RECOVERY WELL LOCATIONS



LEGEND

-  MONITORING WELL
-  PROPOSED SHALLOW MONITORING WELL
-  PROPOSED DEEP MONITORING WELL
-  PROPOSED RECOVERY WELL



F-PPA/IAD WORK PLAN  
 NORS CONSULT