

03.12-11/07/97-01767

FINAL
REMEDIAL INVESTIGATION REPORT
SITE 73 - AMPHIBIOUS VEHICLE MAINTENANCE FACILITY

FIGURES

MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

CONTRACT TASK ORDER 0312

NOVEMBER 7, 1997

Prepared For:

DEPARTMENT OF THE NAVY
ATLANTIC DIVISION
NAVAL FACILITIES
ENGINEERING COMMAND
Norfolk, Virginia

Under:

LANTDIV CLEAN Program
Contract N62470-89-D-4814

Prepared by:

BAKER ENVIRONMENTAL, INC.
Coraopolis, Pennsylvania

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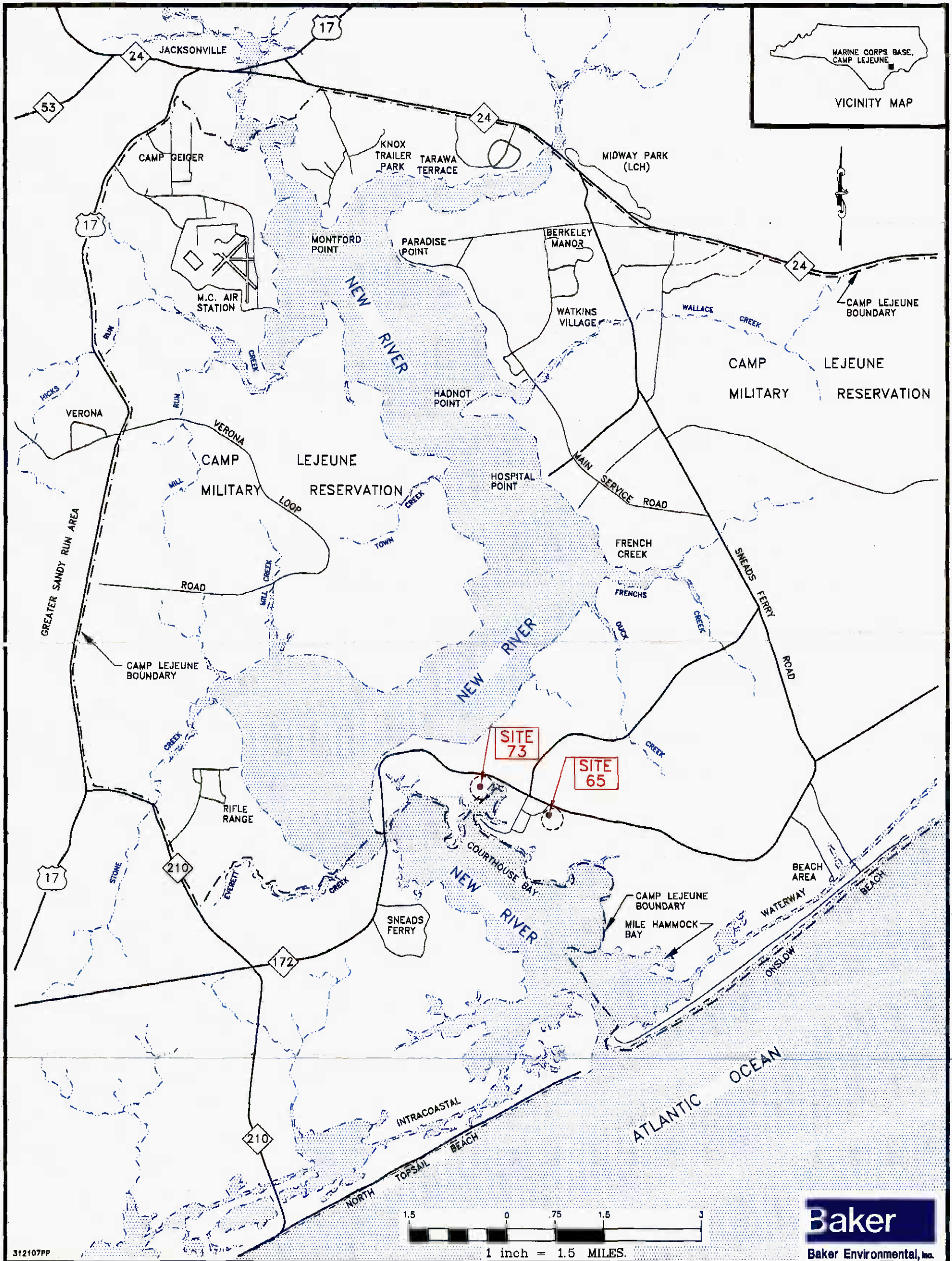
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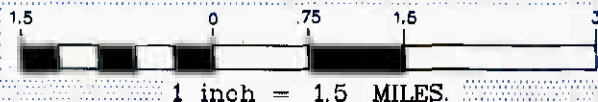
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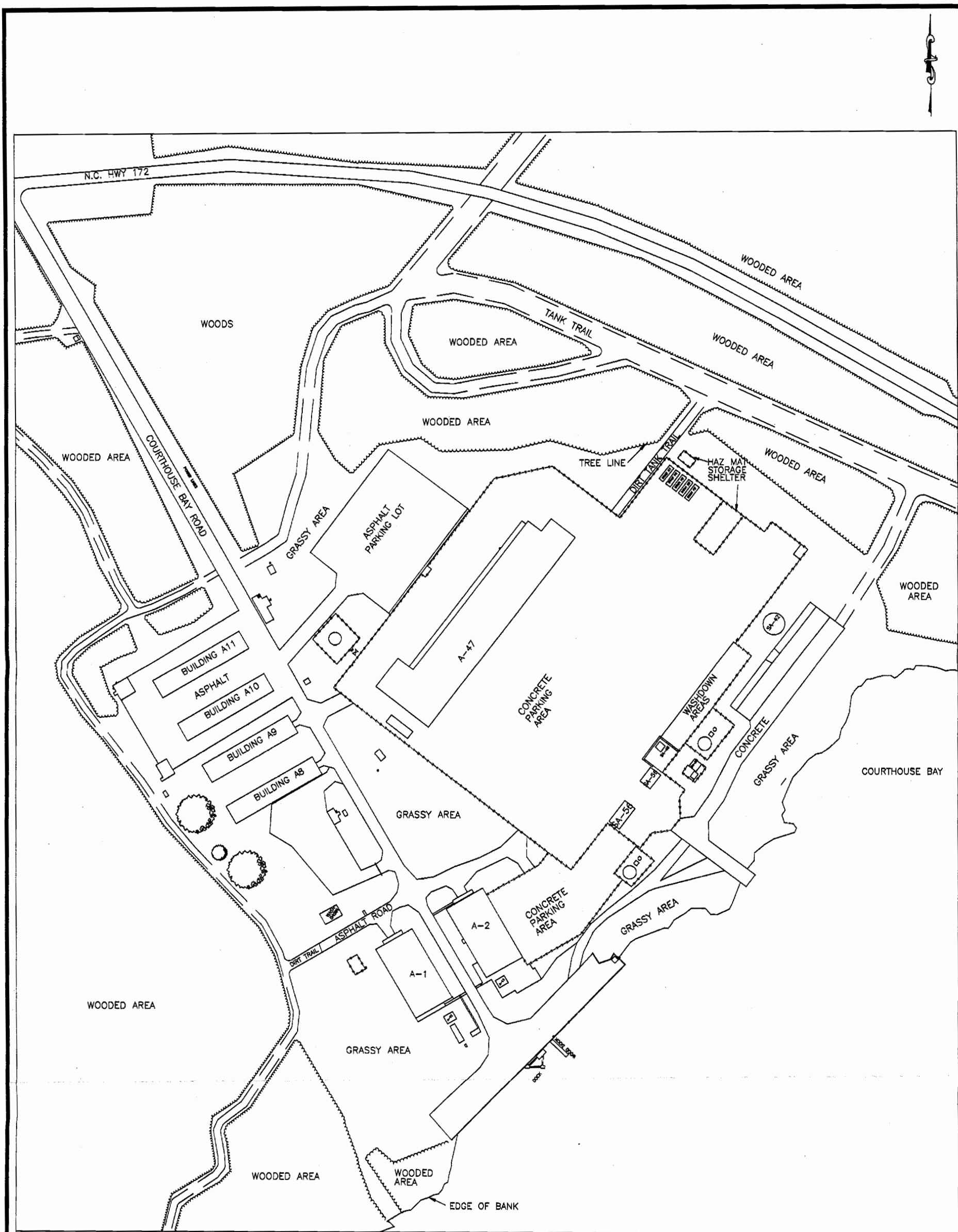


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Baker Environmental, Inc.

FIGURE 1-1
LOCATION MAP
SITE 65 - ENGINEER AREA DUMP AND
SITE 73 - AMPHIBIOUS VEHICLE MAINTENANCE FACILITY
REMEDIAL INVESTIGATION, CTO-0312

MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA

01767V01Y

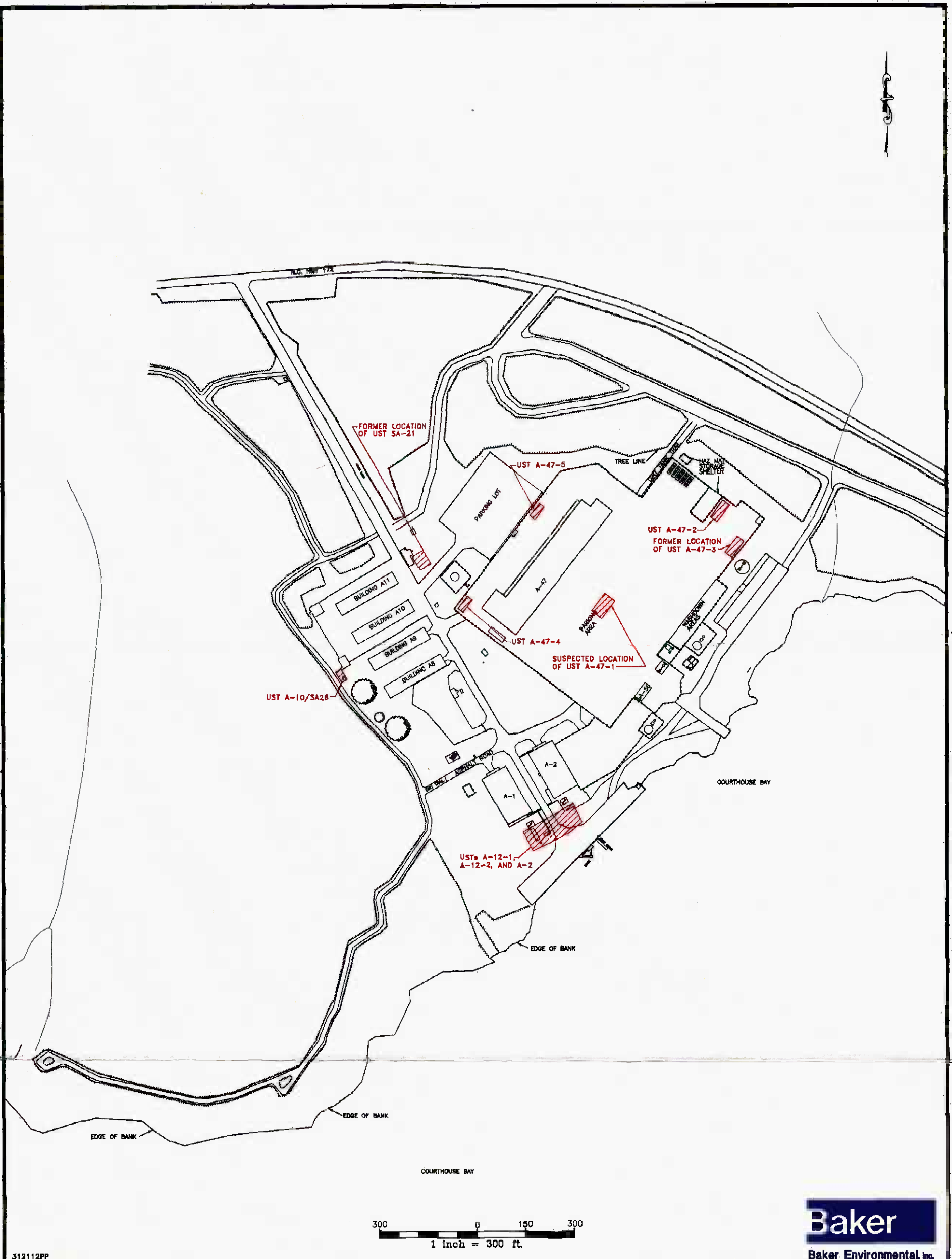


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Baker
Baker Environmental, Inc.

FIGURE 1-2
SITE MAP
SITE 73 - AMPHIBIOUS VEHICLE MAINTENANCE FACILITY
MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA

01767V02Z



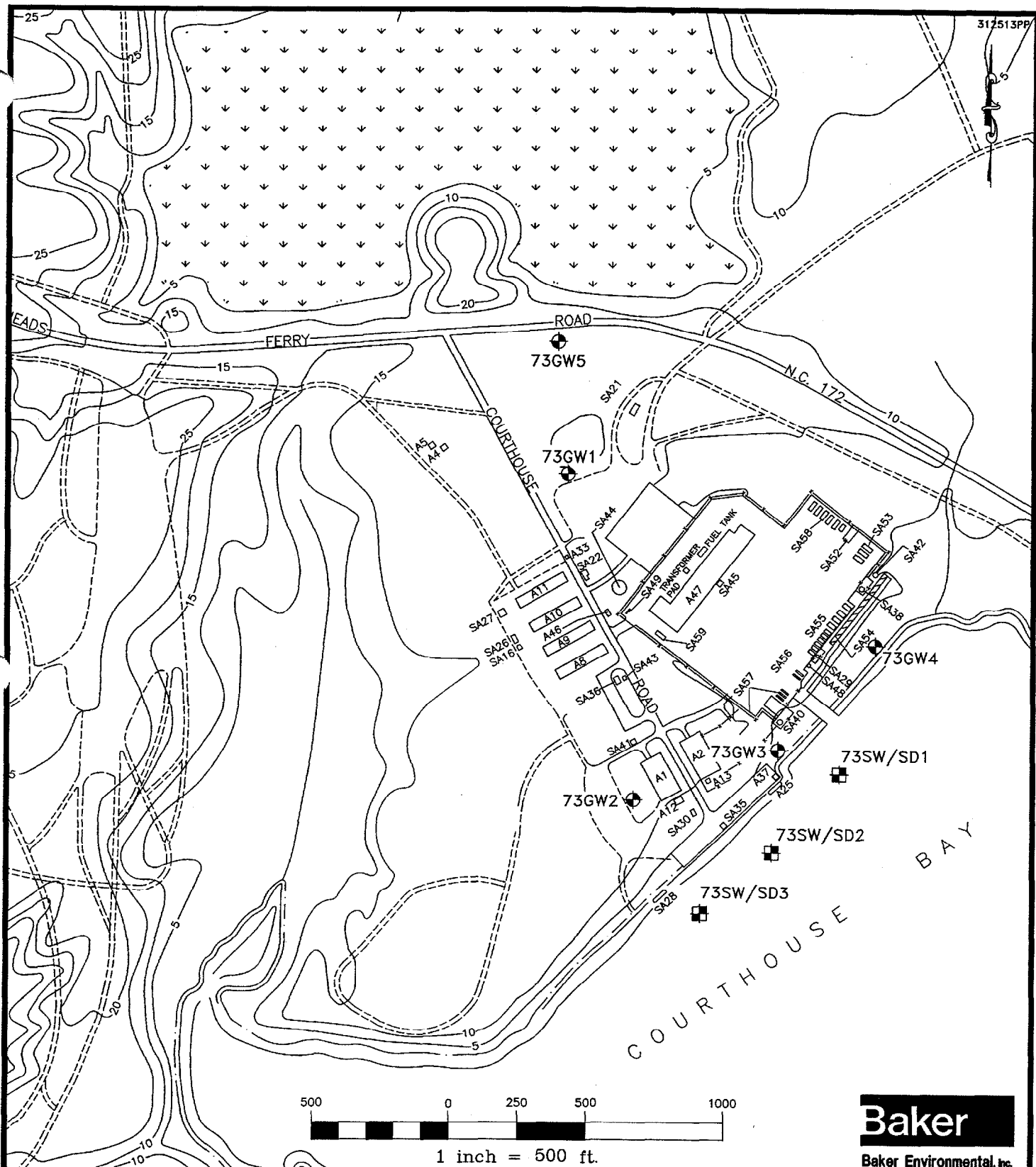
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 APPROXIMATE LOCATION OF UST

FIGURE 1-3
 UST LOCATION MAP
 SITE 73
 AMPHIBIOUS VEHICLE MAINTENANCE FACILITY
 REMEDIAL INVESTIGATION, CTO-0312
 MARINE CORPS BASE, CAMP LEJEUNE
 NORTH CAROLINA

01767V03Y



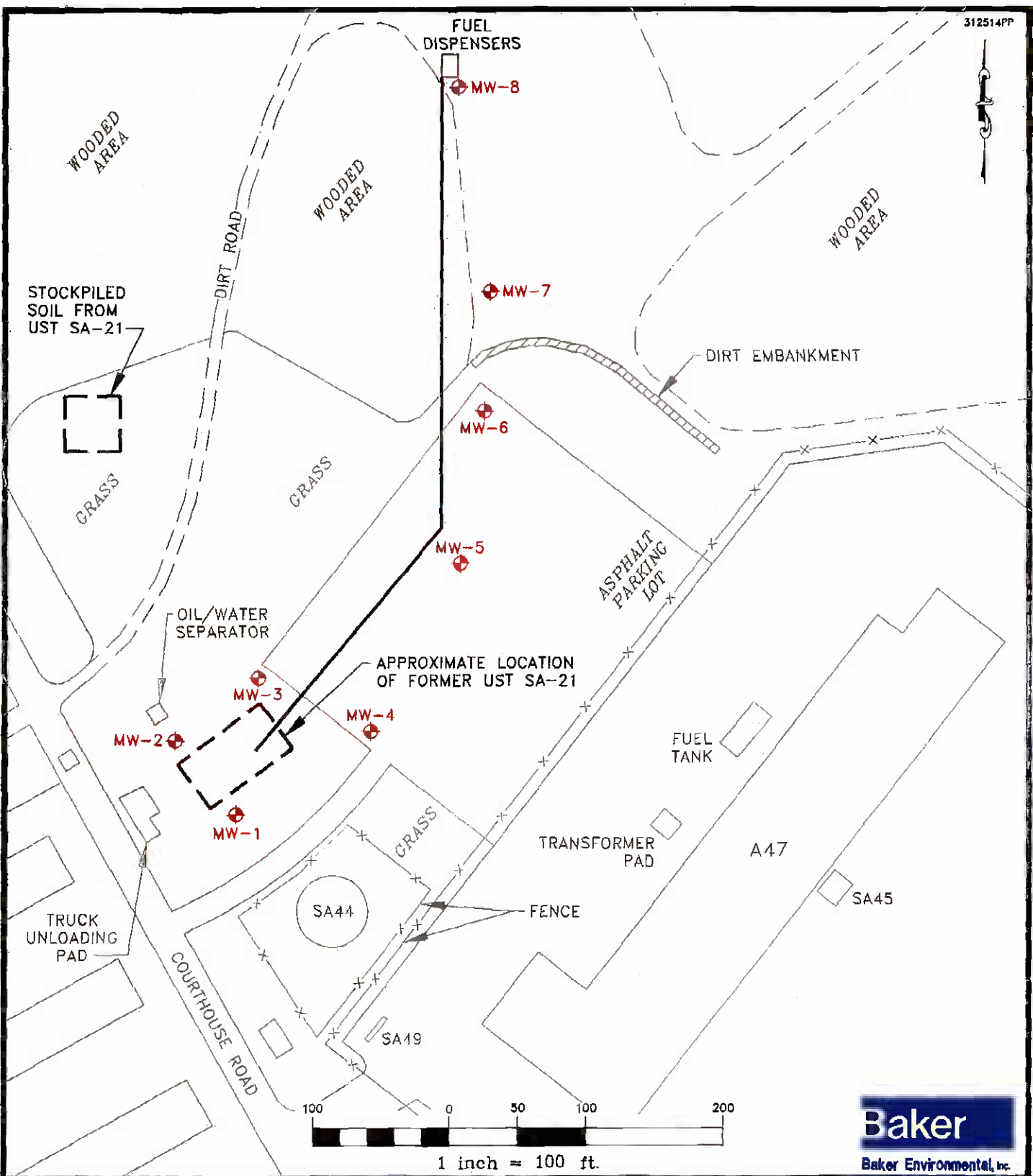
Baker
Baker Environmental, Inc.

LEGEND

- 73GW1 SHALLOW GROUNDWATER MONITORING WELL INSTALLED BY ESE (1984 AND 1986)
- 73SW/SD1 SURFACE WATER/SEDIMENT SAMPLE LOCATION BY ESE (1984)

FIGURE 1-4
CONFIRMATION STUDY SAMPLE LOCATION MAP
SITE 73
AMPHIBIOUS VEHICLE MAINTENANCE FACILITY
CTO - 0312
MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA

SOURCE: LANTDIV, OCT. 1991



LEGEND

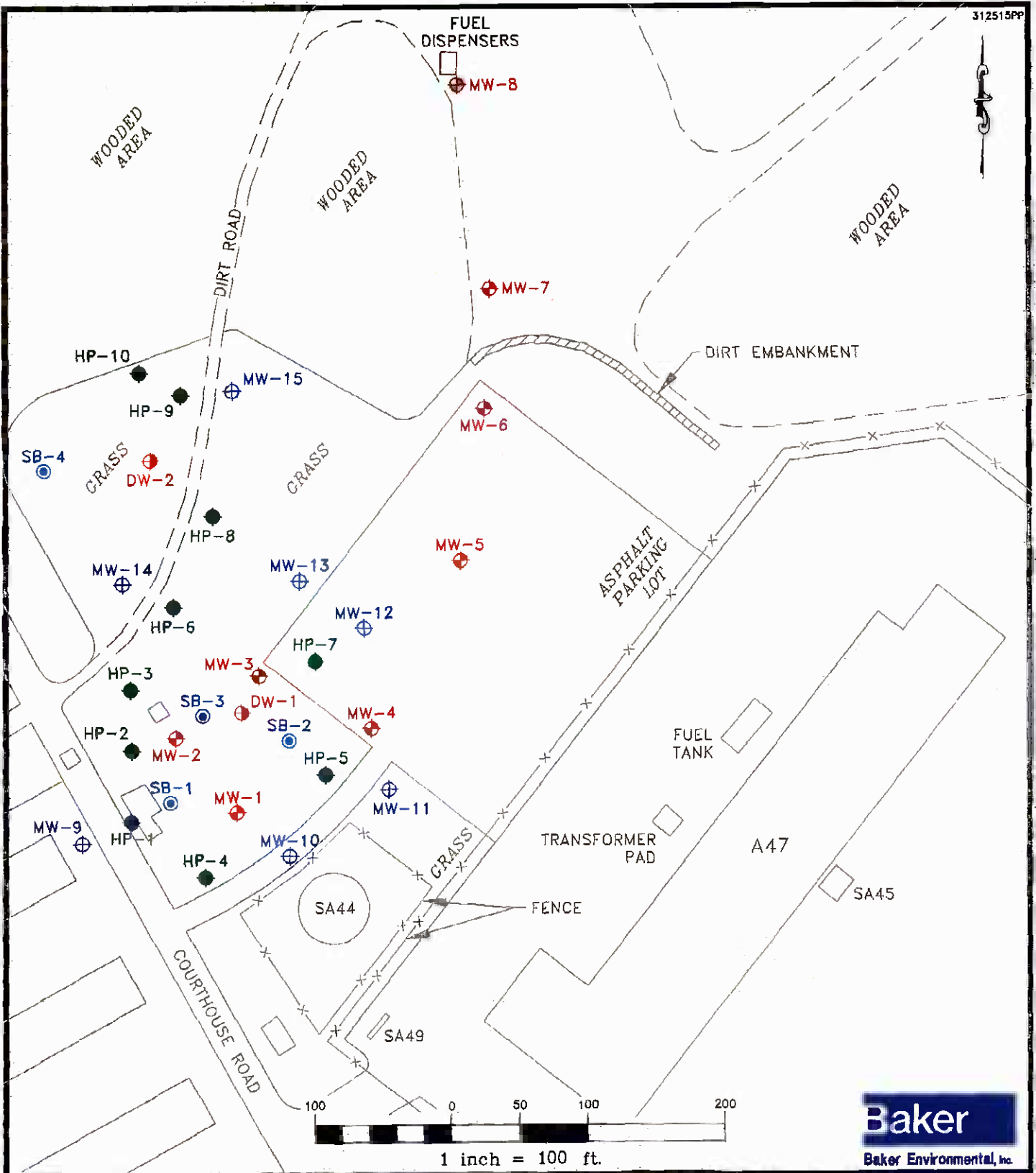
MW-1 EXISTING TYPE II GROUNDWATER MONITORING WELL INSTALLED BY ATEC ASSOC., AUGUST 1991

APPROXIMATE LOCATION OF UNDERGROUND FUEL DISTRIBUTION LINE

FIGURE 1-5
 UST SA-21 (ATEC, 1991) SAMPLE LOCATION MAP
 SITE 73
 AMPHIBIOUS VEHICLE MAINTENANCE FACILITY
 CTO - 0312
 MARINE CORPS BASE, CAMP LEJEUNE
 NORTH CAROLINA

SOURCE: FINAL SITE ASSESSMENT REPORT BUILDING A-47 BY BAKER ENVIRONMENTAL, INC., OCT. 12, 1992.

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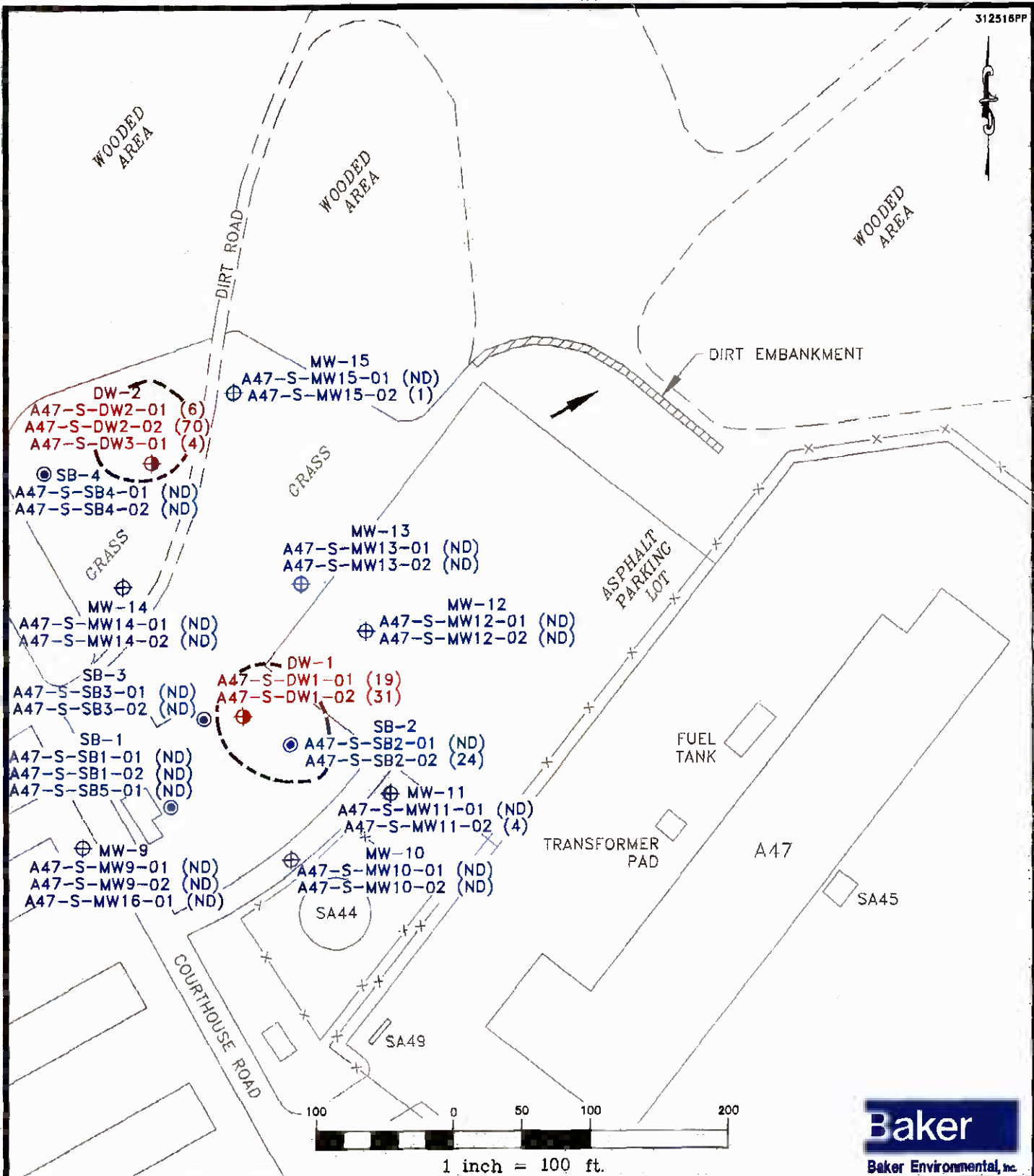


LEGEND

- ⊕ MW-1 EXISTING TYPE II GROUNDWATER MONITORING WELL INSTALLED BY ATEC ASSOC., AUGUST 1991
 - ⊕ MW-9 SHALLOW TYPE II GROUNDWATER MONITORING WELL INSTALLED BY BAKER ENVIRONMENTAL, INC., MAY 1992
 - ⊕ DW-1 DEEP TYPE III GROUNDWATER MONITORING WELL INSTALLED BY BAKER ENVIRONMENTAL, INC., MAY 1992
 - ⊙ SB-1 SOIL BORING INSTALLED BY BAKER ENVIRONMENTAL, INC., MAY 1992
 - HP-3 HYDROPUNCH PENETROMETER INSTALLED BY BAKER ENVIRONMENTAL, INC., MAY 1992
- SOURCE: LANTDIV, OCT. 1991

FIGURE 1-6
UST SA-21 (BAKER 1992) SAMPLE LOCATION MAP
SITE 73
AMPHIBIOUS VEHICLE MAINTENANCE FACILITY
CTO - 0312

MARINE CORPS BASE, CAMP LEJEUNE
 NORTH CAROLINA

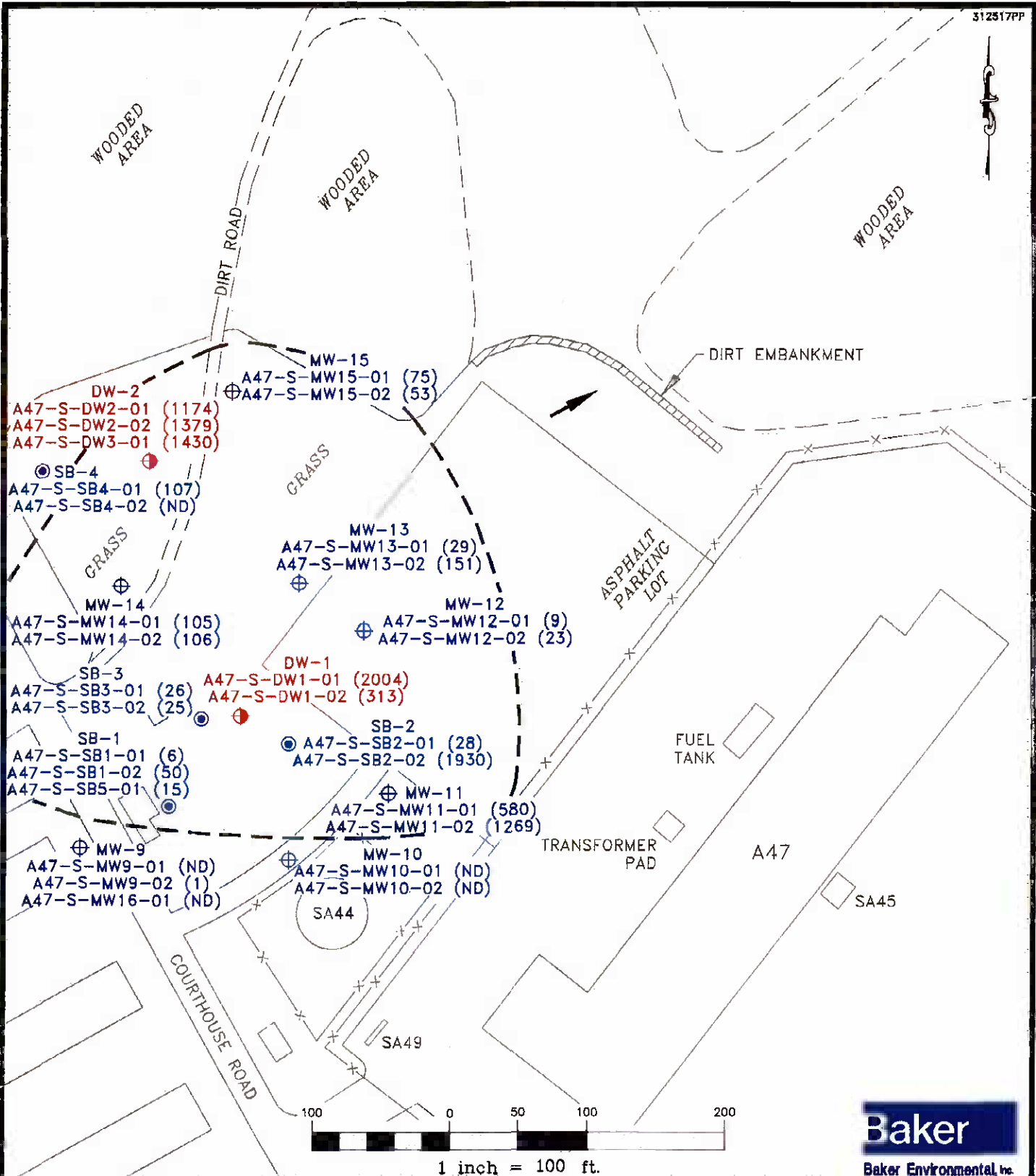


LEGEND

- MW-9 SOIL BORING FOR SHALLOW GROUNDWATER MONITORING WELL INSTALLED BY BAKER ENVIRONMENTAL, INC., MAY 1992
- DW-1 SOIL BORING FOR DEEP GROUNDWATER MONITORING WELL INSTALLED BY BAKER ENVIRONMENTAL, INC., MAY 1992
- SB-1 SOIL BORING INSTALLED BY BAKER ENVIRONMENTAL, INC., MAY 1992
- A47-S-MW9-01 (ND) SOIL SAMPLE NUMBER AND TPH CONCENTRATION IN mg/kg (ppm)
- ND NOT DETECTED AT METHOD DETECTION LIMITS
- ESTIMATED GROUNDWATER FLOW DIRECTION
- - - ESTIMATED EXTENT OF TPH CONTAMINATION (>10.0 mg/kg)
- SOURCE: LANTDIV, OCT. 1991

FIGURE 1-7
TPH (LOW-MED) CONCENTRATIONS
IN SOILS (BAKER, 1992)
SITE 73
AMPHIBIOUS VEHICLE MAINTENANCE FACILITY
CTO - 0312
MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA

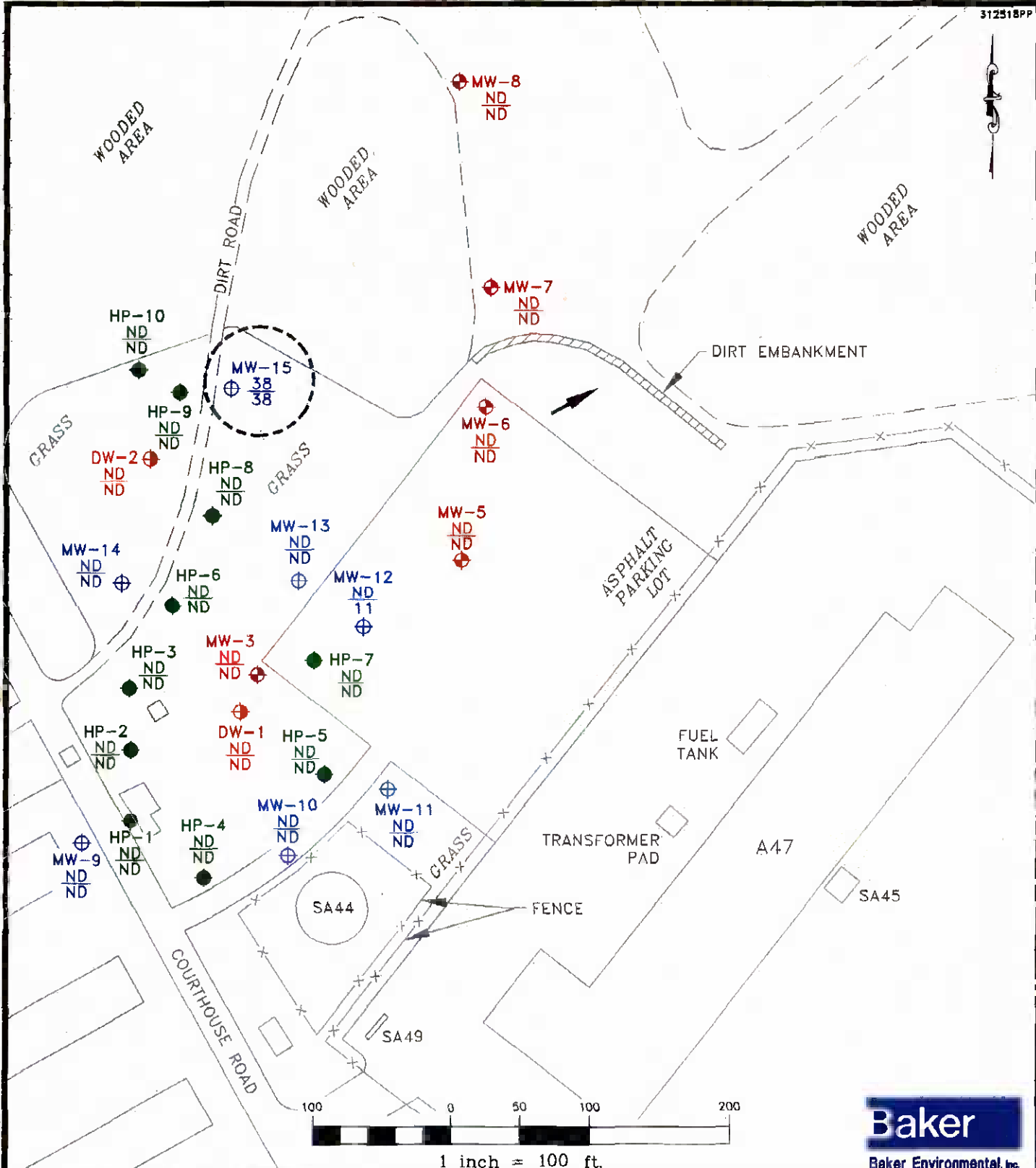




LEGEND

- MW-9 SOIL BORING FOR SHALLOW GROUNDWATER MONITORING WELL INSTALLED BY BAKER ENVIRONMENTAL, INC., MAY 1992
 - ⊕ SOIL BORING FOR DEEP GROUNDWATER MONITORING WELL INSTALLED BY BAKER ENVIRONMENTAL, INC., MAY 1992
 - ⊙ SOIL BORING INSTALLED BY BAKER ENVIRONMENTAL, INC., MAY 1992
 - A47-S-MW9-01 (ND) SOIL SAMPLE NUMBER AND TPH CONCENTRATION IN mg/kg (ppm)
 - ND NOT DETECTED AT METHOD DETECTION LIMITS
 - ➔ ESTIMATED GROUNDWATER FLOW DIRECTION
 - - - ESTIMATED EXTENT OF TPH CONTAMINATION (>10.0 mg/kg)
- SOURCE: LANTDIV, OCT. 1991

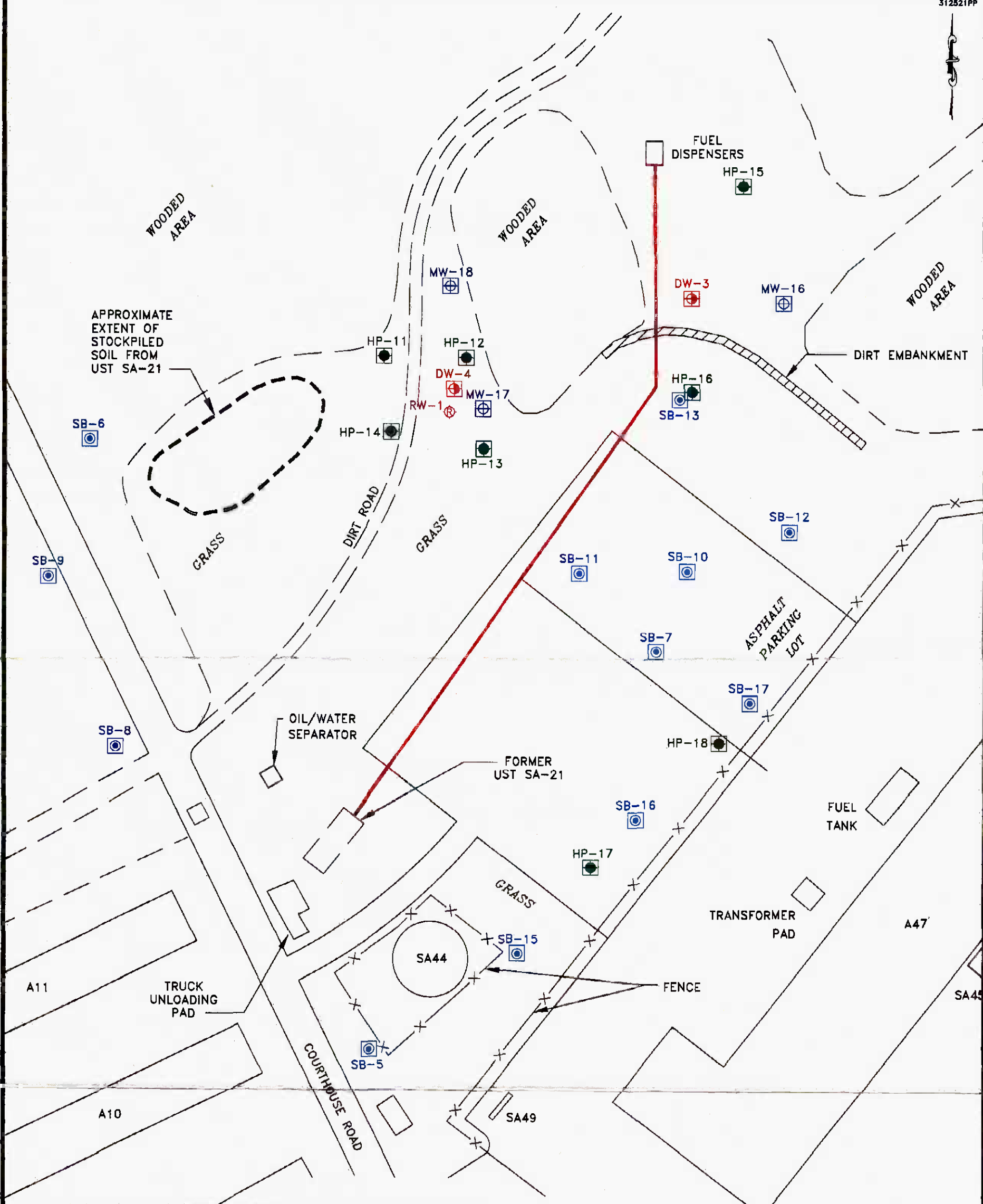
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TPH (MED-HIGH) CONCENTRATIONS IN SOILS
(BAKER, 1992) SITE 73
AMPHIBIOUS VEHICLE MAINTENANCE FACILITY
CTO - 0312
MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA








LEGEND

- MW-1 EXISTING TYPE II GROUNDWATER MONITORING WELL INSTALLED BY ATEC ASSOC., AUGUST 1991
 - MW-9 SHALLOW TYPE II GROUNDWATER MONITORING WELL INSTALLED BY BAKER ENVIRONMENTAL, INC., MAY 1992
 - DW-1 DEEP TYPE III GROUNDWATER MONITORING WELL INSTALLED BY BAKER ENVIRONMENTAL, INC., MAY 1992
 - HP-3 HYDROPUNCH PENETROMETER INSTALLED BY BAKER ENVIRONMENTAL, INC., MAY 1992
 - 38 BENZENE CONCENTRATION IN ug/l (ppb)
 - 38 TOTAL VOC CONCENTRATION IN ug/l (ppb)
 - ND NOT DETECTED AT METHOD DETECTION LIMITS
 - ESTIMATED GROUNDWATER FLOW DIRECTION
 - - - ESTIMATED EXTENT OF BENZENE CONTAMINATION (> 5.0 ug/l)
- SOURCE: LANTDIV, OCT. 1991

FIGURE 1-9
BENZENE AND TOTAL VOC
CONCENTRATIONS IN GROUNDWATER (BAKER, 1992)
SITE 73
AMPHIBIOUS VEHICLE MAINTENANCE FACILITY
CTO - 0312
MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA



LEGEND

-  MW-16 SHALLOW TYPE II GROUNDWATER MONITORING WELL INSTALLED BY BAKER ENVIRONMENTAL, INC., FEBRUARY 1993
-  DW-3 DEEP TYPE III GROUNDWATER MONITORING WELL INSTALLED BY BAKER ENVIRONMENTAL, INC., FEBRUARY 1993
-  HP-11 HYDROPUNCH INSTALLED BY BAKER ENVIRONMENTAL, INC., FEBRUARY 1993
-  RW-1 RECOVERY/PUMPING WELL INSTALLED BY BAKER ENVIRONMENTAL, INC., FEBRUARY 1993
-  SB-5 SOIL BORING INSTALLED BY BAKER ENVIRONMENTAL, INC., FEBRUARY 1993

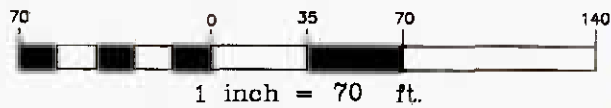
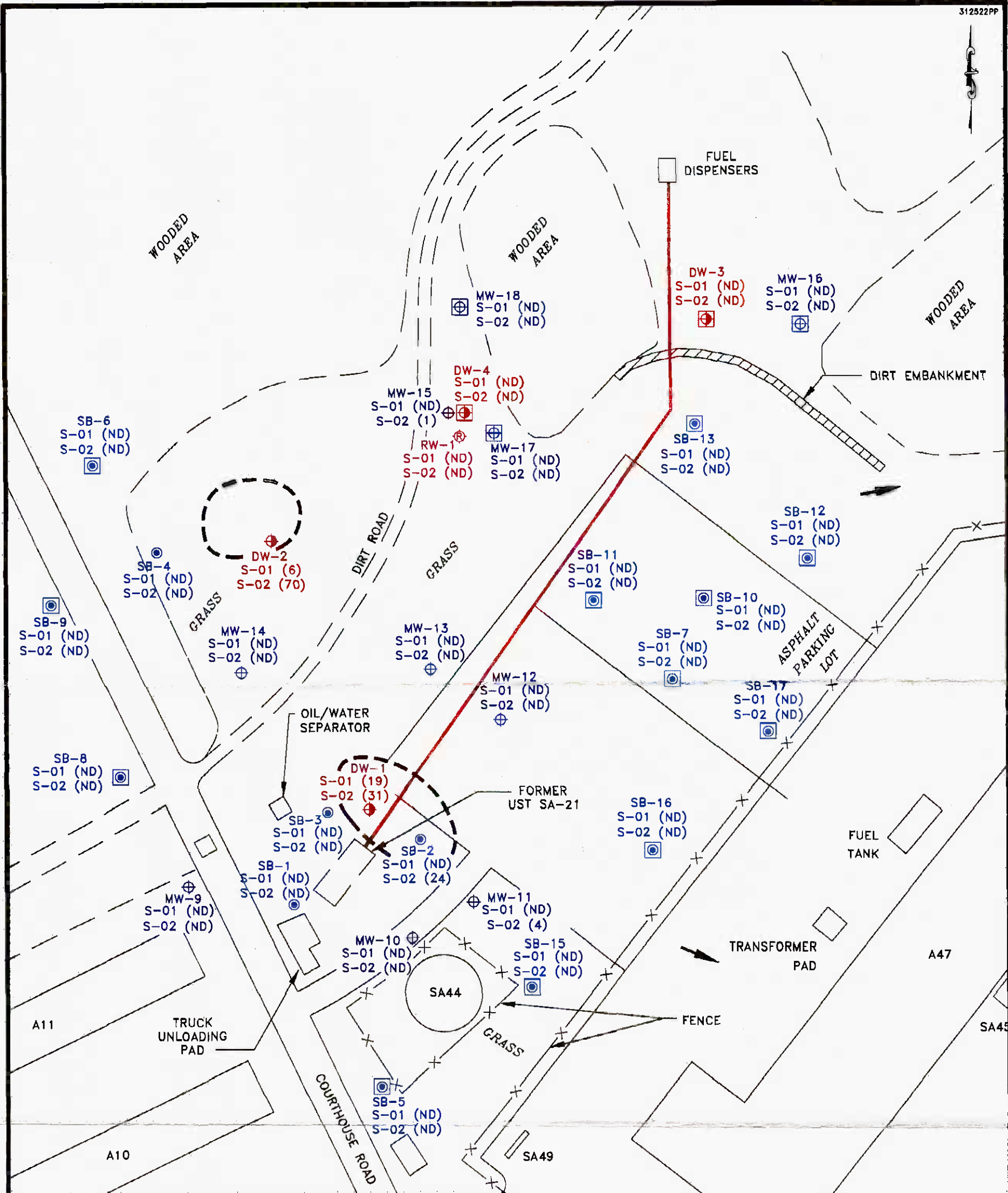


FIGURE 1-10
UST SA-21 (BAKER, 1993) SAMPLE LOCATION MAP
SITE 73
AMPHIBIOUS VEHICLE MAINTENANCE FACILITY
CTO - 0312
MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA



LEGEND

- MW-9 SHALLOW TYPE II GROUNDWATER MONITORING WELL INSTALLED BY BAKER ENVIRONMENTAL, INC., MAY 1992
- DW-1 DEEP TYPE III GROUNDWATER MONITORING WELL INSTALLED BY BAKER ENVIRONMENTAL, INC., MAY 1992
- SB-1 SOIL BORING INSTALLED BY BAKER ENVIRONMENTAL, INC., MAY 1992
- MW-16 SHALLOW TYPE II GROUNDWATER MONITORING WELL INSTALLED BY BAKER ENVIRONMENTAL, INC., FEBRUARY 1993
- DW-3 DEEP TYPE III GROUNDWATER MONITORING WELL INSTALLED BY BAKER ENVIRONMENTAL, INC., FEBRUARY 1993
- RW-1 RECOVERY/PUMPING WELL INSTALLED BY BAKER ENVIRONMENTAL, INC., FEBRUARY 1993
- SB-5 SOIL BORING INSTALLED BY BAKER ENVIRONMENTAL, INC., FEBRUARY 1993
- S-01 (ND) SOIL SAMPLE NUMBER AND TPH CONCENTRATION IN mg/kg (ppm)
- ND NOT DETECTED AT METHOD DETECTION LIMITS
- ESTIMATED GROUNDWATER FLOW DIRECTION
- ESTIMATED EXTENT OF TPH CONTAMINATION (>10.0 mg/kg)

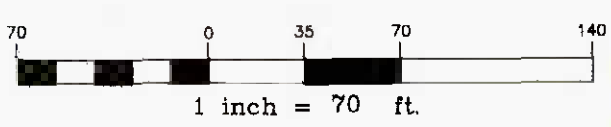
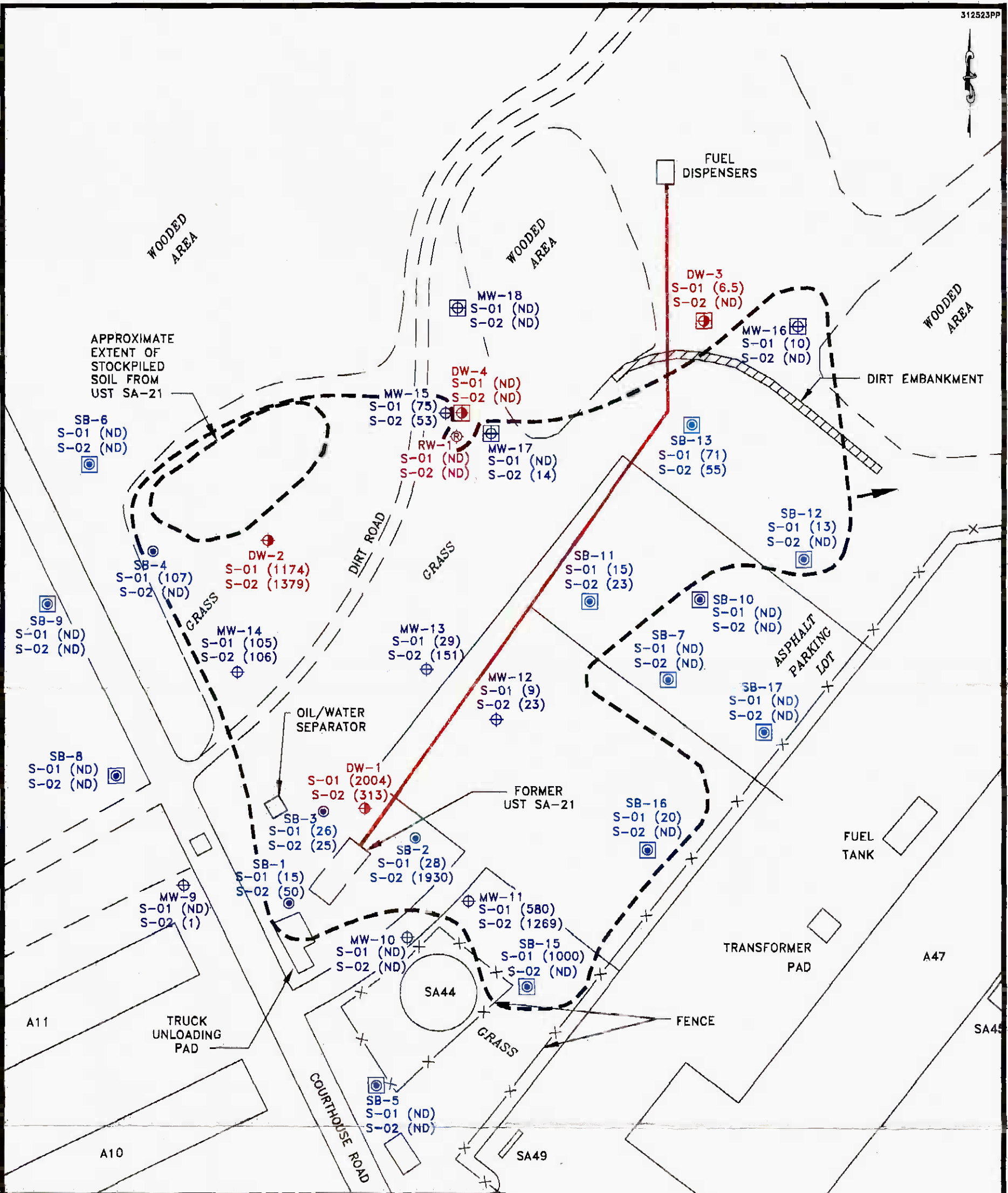


FIGURE 1-11
 TPH (LOW-MED) CONCENTRATIONS
 IN SOILS (BAKER, 1993)
 SITE 73 - AMPHIBIOUS VEHICLE MAINTENANCE FACILITY
 CTO - 0312
 MARINE CORP BASE, CAMP LEJEUNE
 NORTH CAROLINA

SOURCE: LANTDIY, OCT. 1991



LEGEND

- MW-9 SHALLOW TYPE II GROUNDWATER MONITORING WELL INSTALLED BY BAKER ENVIRONMENTAL, INC., MAY 1992
- DW-1 DEEP TYPE III GROUNDWATER MONITORING WELL INSTALLED BY BAKER ENVIRONMENTAL, INC., MAY 1992
- SB-1 SOIL BORING INSTALLED BY BAKER ENVIRONMENTAL, INC., MAY 1992
- MW-16 SHALLOW TYPE II GROUNDWATER MONITORING WELL INSTALLED BY BAKER ENVIRONMENTAL, INC., FEBRUARY 1993
- DW-3 DEEP TYPE III GROUNDWATER MONITORING WELL INSTALLED BY BAKER ENVIRONMENTAL, INC., FEBRUARY 1993
- RW-1 RECOVERY/PUMPING WELL INSTALLED BY BAKER ENVIRONMENTAL, INC., FEBRUARY 1993
- SB-5 SOIL BORING INSTALLED BY BAKER ENVIRONMENTAL, INC., FEBRUARY 1993
- S-01 (ND) SOIL SAMPLE NUMBER AND TPH CONCENTRATION IN mg/kg (ppm)
- ND NOT DETECTED AT METHOD DETECTION LIMITS
- ESTIMATED GROUNDWATER FLOW DIRECTION
- - - ESTIMATED EXTENT OF TPH CONTAMINATION (>10.0 mg/kg)

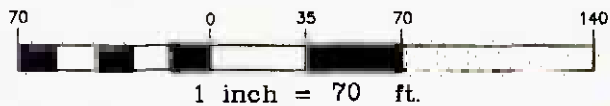
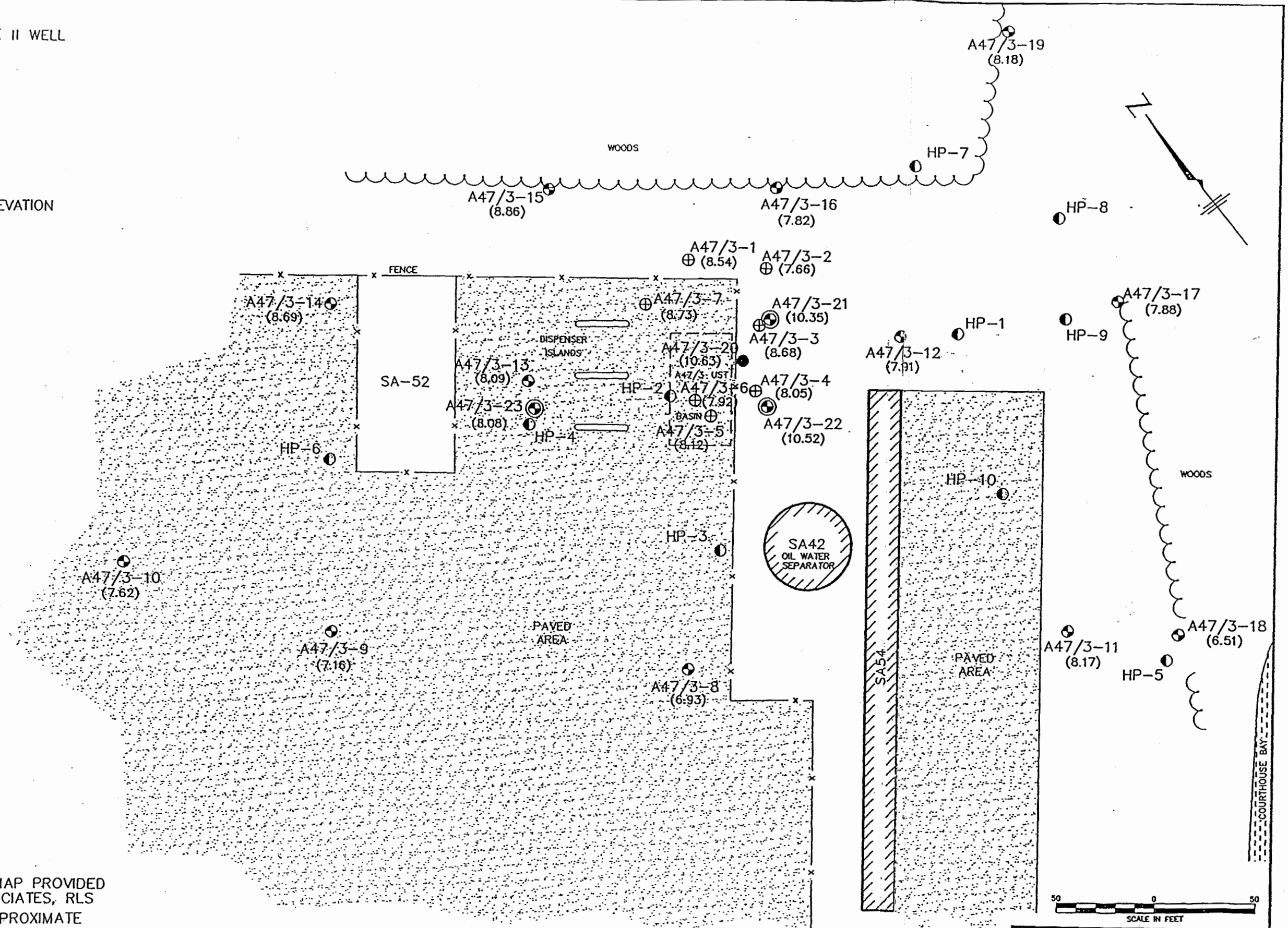


FIGURE 1-12
 TPH (MED-HIGH) CONCENTRATIONS
 IN SOILS (BAKER, 1993)
 SITE 73 - AMPHIBIOUS VEHICLE MAINTENANCE FACILITY
 CTO - 0312
 MARINE CORPS BASE, CAMP LEJEUNE
 NORTH CAROLINA

LEGEND

- ⊕ PRE-EXISTING TYPE II WELL
- ⊙ TYPE II WELL
- ⊗ TYPE III WELL
- PUMPING WELL
- HYDROPUNCH
- ▨ BUILDING
- (12.55) TOP OF CASING ELEVATION



- NOTES:
- ADAPTED FROM SURVEYED SITE MAP PROVIDED BY MICHAEL UNDERWOOD & ASSOCIATES, RLS
 - HYDROPUNCH LOCATIONS ARE APPROXIMATE

SOURCE: RICHARD CATLIN & ASSOCIATES, DECEMBER 1993



FIGURE 1-13
UST A47/3
(LAW-CATLIN, 1993)
SAMPLE LOCATION MAP
MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA

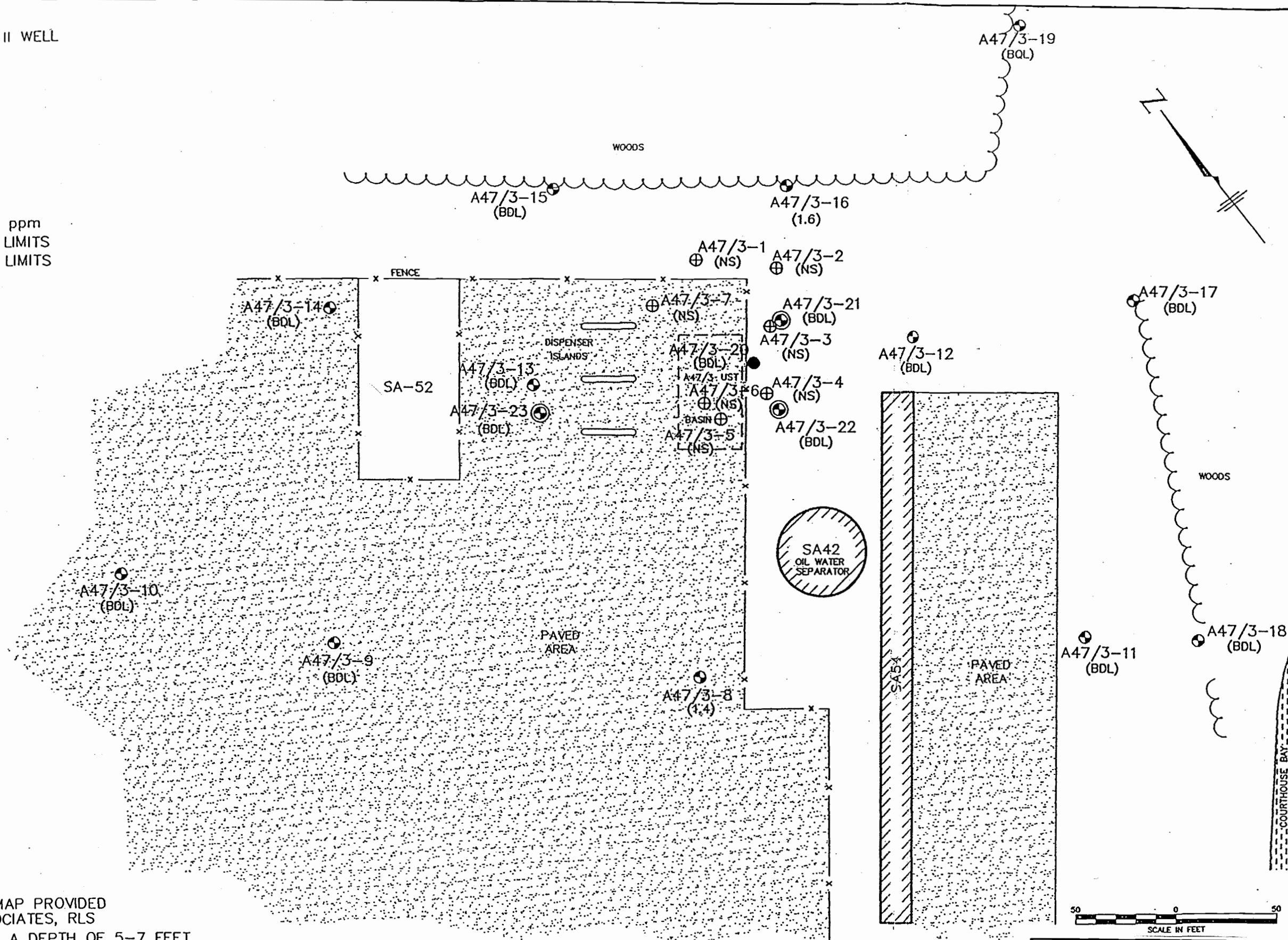
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LEGEND

- ⊕ PRE-EXISTING TYPE II WELL
- ⊙ TYPE II WELL
- ⊗ TYPE III WELL
- PUMPING WELL

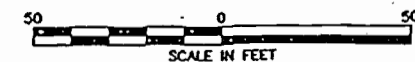
▣ BUILDING

- () TOTAL TPH CONCENTRATIONS IN ppm
- BDL BELOW DETECTABLE LIMITS
- BQL BELOW QUANTATION LIMITS
- NS NOT SAMPLED



NOTES:

1. ADAPTED FROM SURVEYED SITE MAP PROVIDED BY MICHAEL UNDERWOOD & ASSOCIATES, RLS
2. ALL SAMPLES WERE TAKEN FROM A DEPTH OF 5-7 FEET
3. ALL TPH CONCENTRATIONS WERE FOUND TO BE WITHIN STATE STANDARDS, THEREFORE WERE NOT CONTOURED.



SOURCE: RICHARD CATLIN & ASSOCIATES, DECEMBER 1993



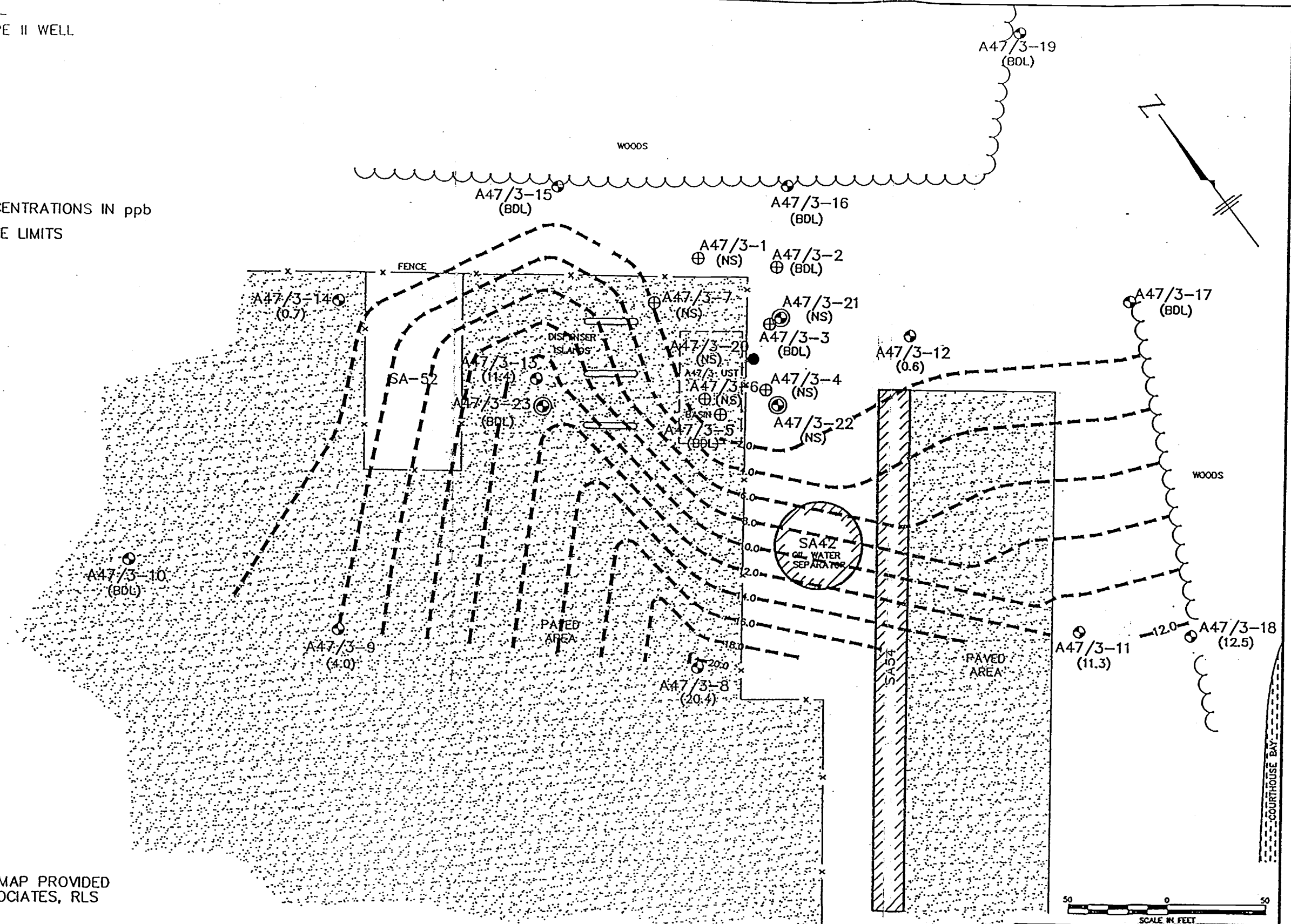
FIGURE 1-14
 TPH CONCENTRATIONS - SOIL
 (CATLIN ASSOCIATES 1993)
 SITE 73
 AMPHIBIOUS VEHICLE MAINTENANCE FACILITY
 CTO - 0312
 MARINE CORPS BASE, CAMP LEJEUNE
 NORTH CAROLINA

LEGEND

- ⊕ PRE-EXISTING TYPE II WELL
- ⊙ TYPE II WELL
- ⊗ TYPE III WELL
- PUMPING WELL



- () TOTAL BTEX CONCENTRATIONS IN ppb
- BDL BELOW DETECTABLE LIMITS
- NS NOT SAMPLED



NOTES:

1. ADAPTED FROM SURVEYED SITE MAP PROVIDED BY MICHAEL UNDERWOOD & ASSOCIATES, RLS
2. CONTOUR INTERVAL = 2 ppb

SOURCE: RICHARD CATLIN & ASSOCIATES, DECEMBER 1993



FIGURE 1-15
TOTAL BTEX CONCENTRATIONS - WATER
(CATLIN ASSOCIATES 1993)
SITE 73
AMPHIBIOUS VEHICLE MAINTENANCE FACILITY
CTO - 0312
MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA





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330 0 165 330
1 inch = 330 ft.



FIGURE 1-16
AERIAL PHOTOGRAPH, FEBRUARY 1, 1956
SITE 73 - AMPHIBIOUS VEHICLE MAINTENANCE FACILITY
REMEDIAL INVESTIGATION, CTO-0312
MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA

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FIGURE 1-17
AERIAL PHOTOGRAPH, OCTOBER 4, 1970
SITE 73 - AMPHIBIOUS VEHICLE MAINTENANCE FACILITY
REMEDIAL INVESTIGATION, CTO-0312
MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA

351 0 175.5 351
1 inch = 351 ft.



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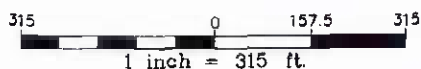
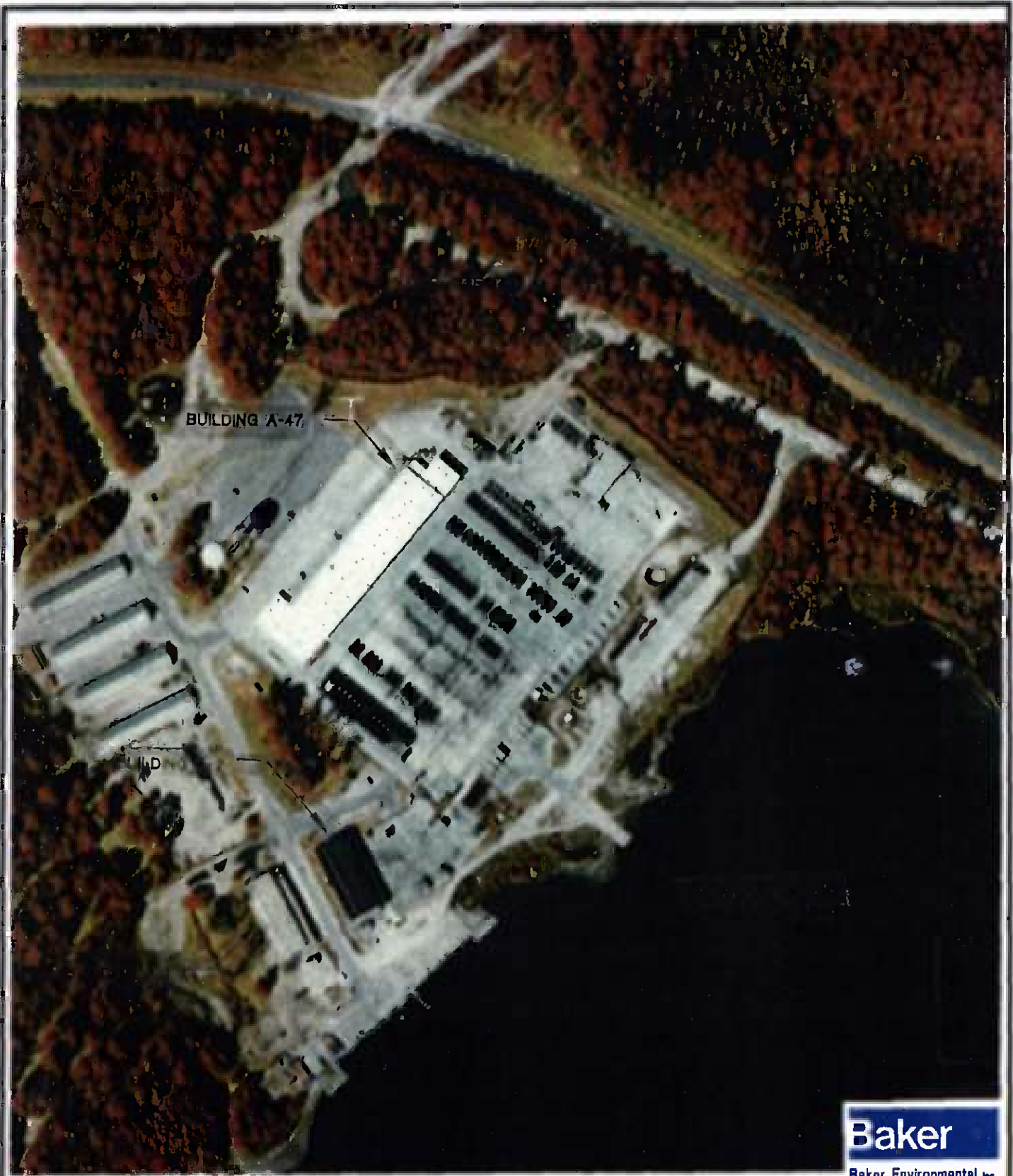


FIGURE 1-18
AERIAL PHOTOGRAPH, FEBRUARY 15, 1983
SITE 73 - AMPHIBIOUS VEHICLE MAINTENANCE FACILITY
REMEDIAL INVESTIGATION, CTO-0312
MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA



BUILDING A-47

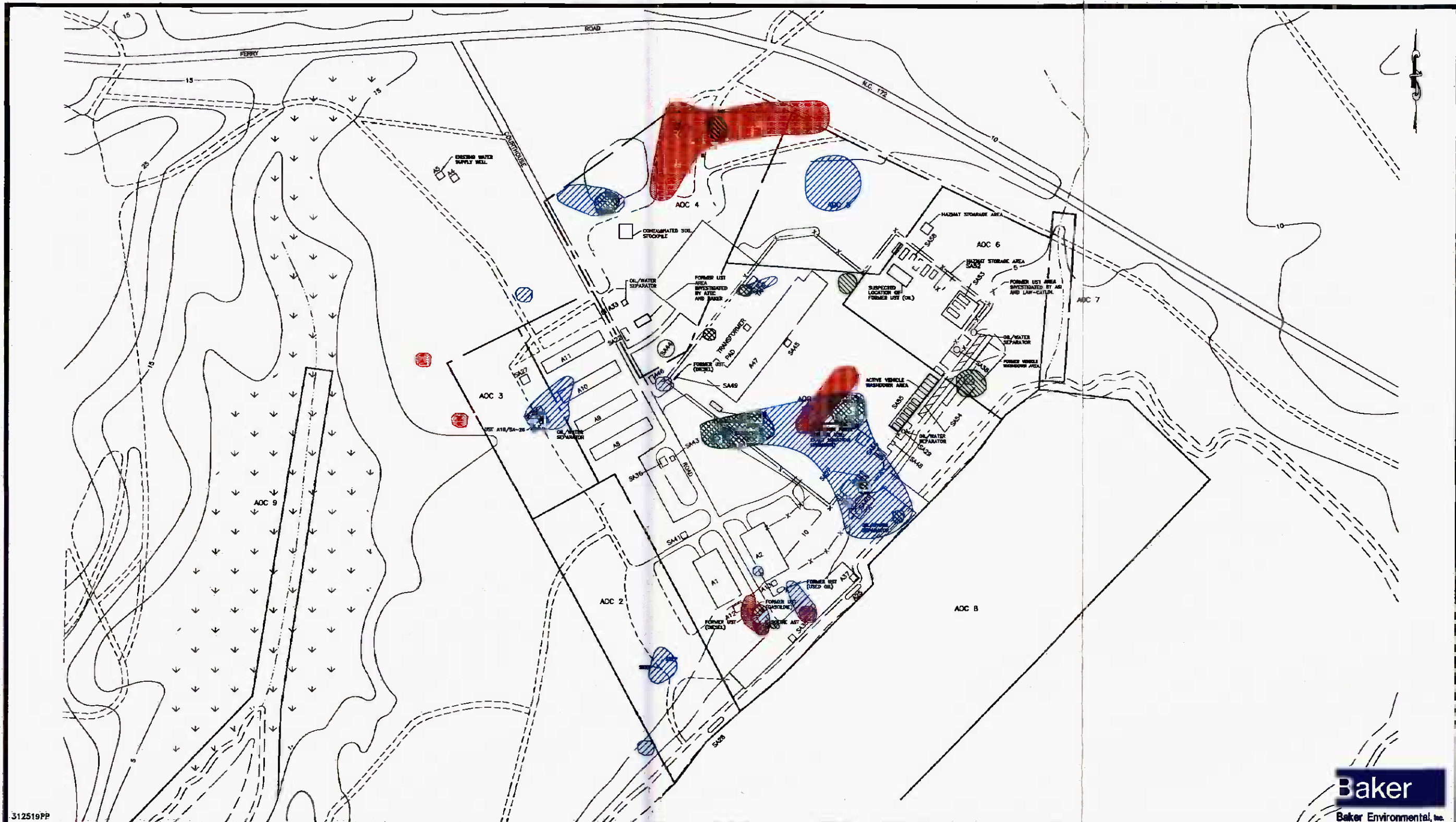
BUILD

Baker
Baker Environmental, Inc.

370 0 185 370
1 inch = 370 ft.






FIGURE 1-19
AERIAL PHOTOGRAPH, MARCH 6, 1993
SITE 73 - AMPHIBIOUS VEHICLE MAINTENANCE FACILITY
REMEDIAL INVESTIGATION, CTO-0312
MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA

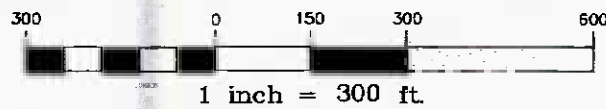


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Baker Environmental, Inc.

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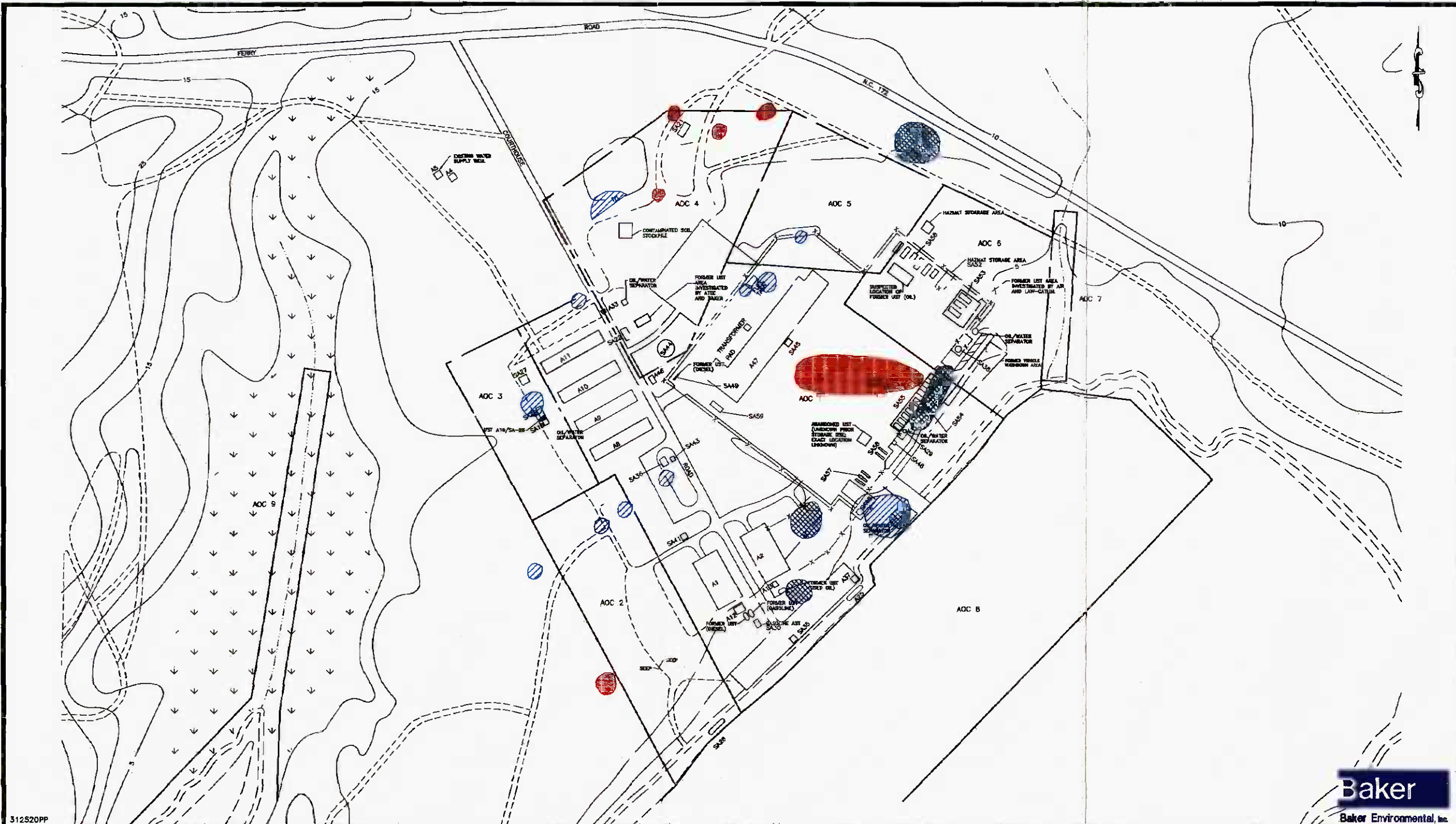
LEGEND

-  TOTAL SOLVENTS (TCE, TCA, PCE)
-  TOTAL BTEX
-  TOTAL VOLATILE HYDROCARBONS (TVHC)



SOURCE: LANTDIV, FEB. 1992




FIGURE 1-20
ESTIMATED LIMITS OF CONTAMINATION BASED
ON GROUNDWATER SAMPLE SCREENING RESULTS
SITE 73 - AMPHIBIOUS VEHICLE MAINTENANCE FACILITY
CTO - 0312
MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA



Baker
Baker Environmental, Inc.

312520PP

LEGEND

-  TOTAL SOLVENTS (TCE, TCA, PCE)
-  TOTAL BTEX
-  TOTAL VOLATILE HYDROCARBONS (TVHC)

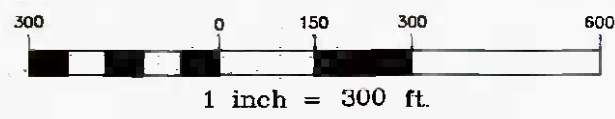


FIGURE 1-21
ESTIMATED LIMITS OF CONTAMINATION
BASED ON SOIL GAS RESULTS
SITE 73 - AMPHIBIOUS VEHICLE MAINTENANCE FACILITY
CTO - 0312
MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA

SOURCE: LANTDIV, FEB. 1992

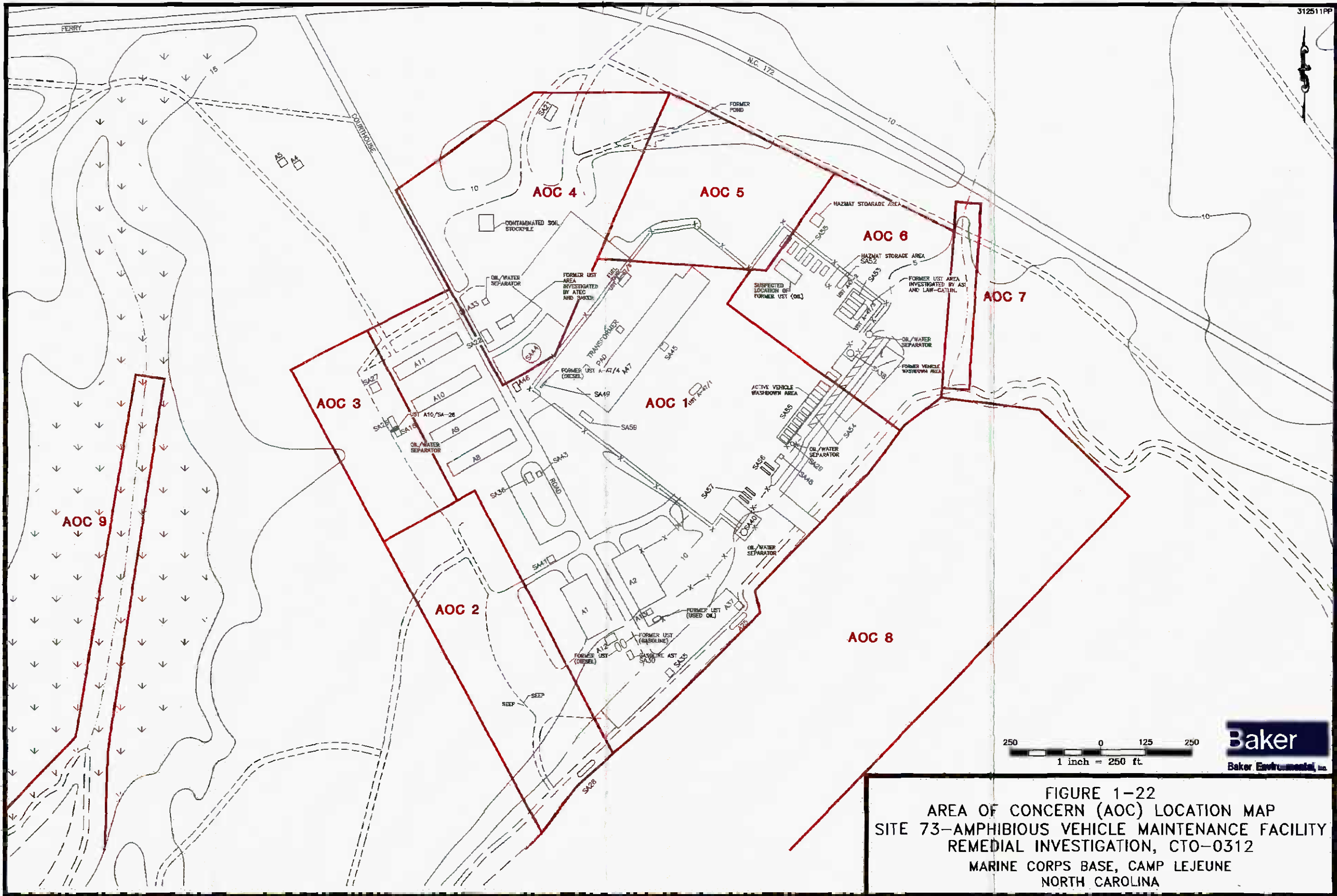
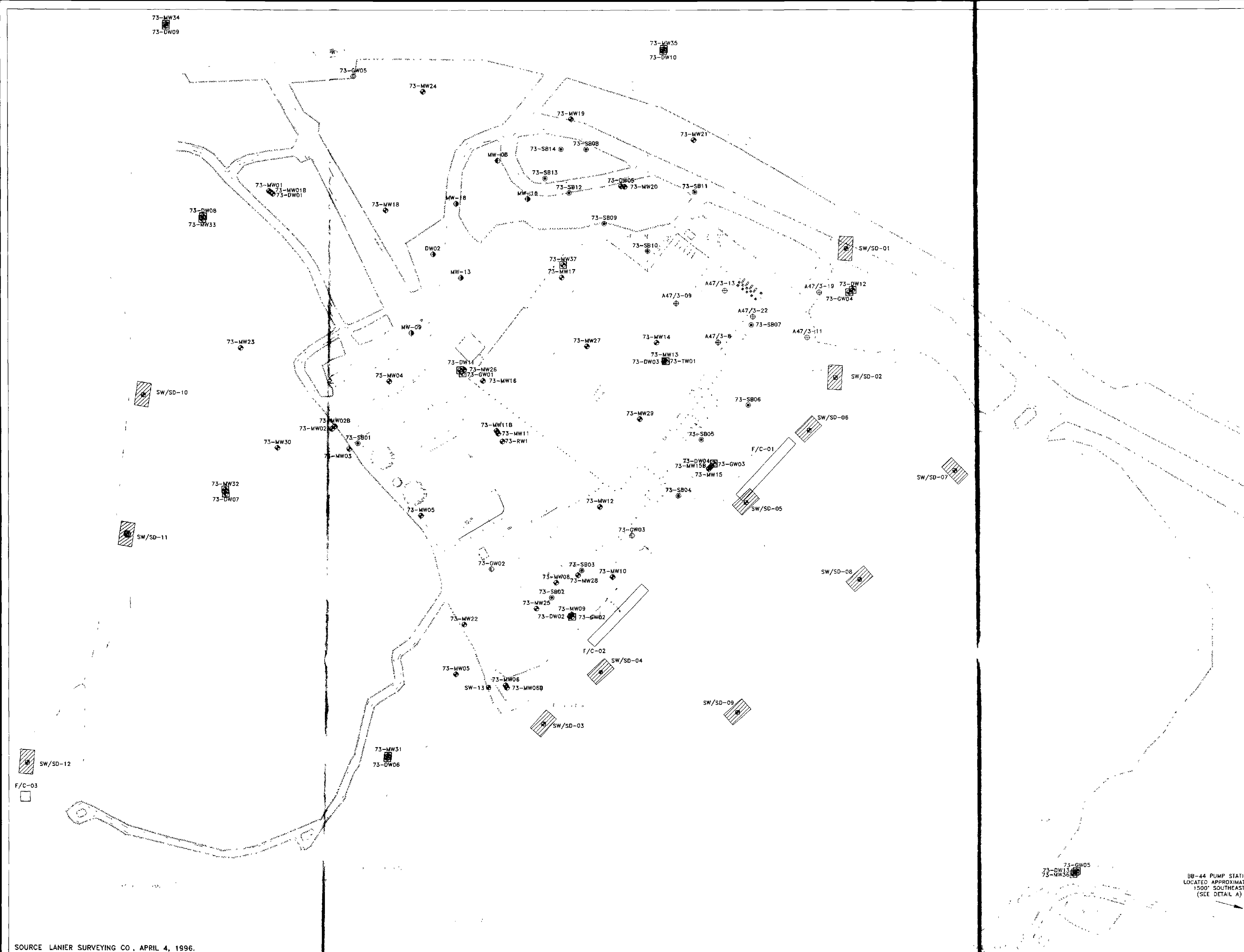
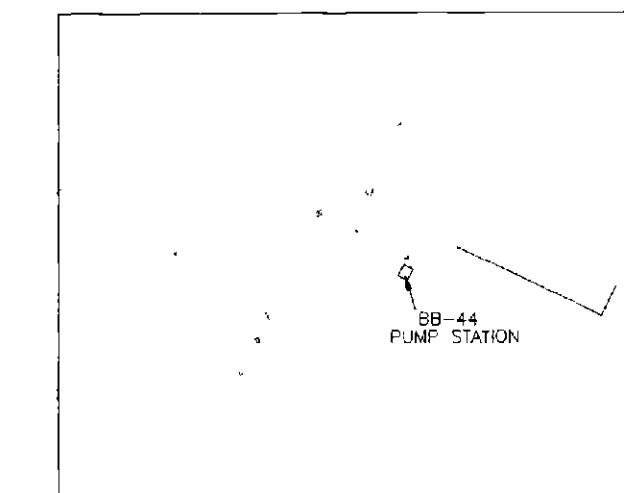


FIGURE 1-22
AREA OF CONCERN (AOC) LOCATION MAP
SITE 73-AMPHIBIOUS VEHICLE MAINTENANCE FACILITY
REMEDIAL INVESTIGATION, CTO-0312
MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA





- LEGEND**
- 73-SB01 SOIL BORINGS ADVANCED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE I (APRIL-MAY, 1995)
 - 73-MW01 MONITORING WELLS INSTALLED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE I (APRIL-MAY, 1995)
 - 73-MW31 MONITORING WELLS INSTALLED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE II (FEBRUARY-MARCH, 1996)
 - A47/3-B MONITORING WELLS INSTALLED DURING UST INVESTIGATION BY GSI AND LAW-CATLIN AND ASSOCIATES (1993)
 - MW-18 MONITORING WELLS INSTALLED BY BAKER DURING UST INVESTIGATION (1992 AND 1993)
 - MW-08 MONITORING WELLS INSTALLED DURING A UST INVESTIGATION BY ATEC AND ASSOCIATES (1991)
 - 73GW-02 MONITORING WELLS INSTALLED BY ESE DURING CONFIRMATORY SAMPLING (1990)
 - SW/SD-01 SURFACE WATER/SEDIMENT LOCATION SAMPLED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE I (APRIL-MAY, 1995)
 - F/C-01 FISH/CRAB LOCATION SAMPLED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE I (APRIL-MAY, 1995)

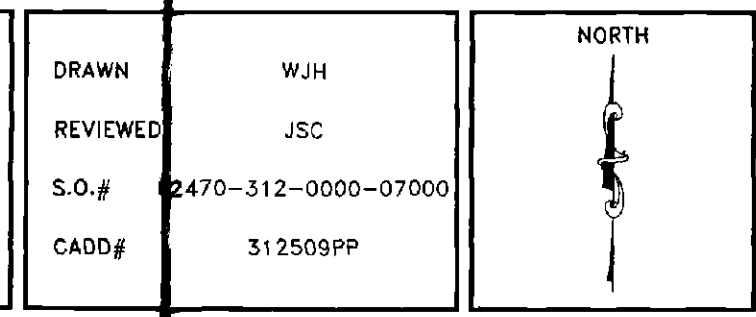


DETAIL A

BB-44 PUMP STATION
LOCATED APPROXIMATELY
1500' SOUTHEAST
(SEE DETAIL A)

SOURCE LANIER SURVEYING CO., APRIL 4, 1996.

| | |
|-----------|---------------------|
| REVISIONS | |
| DRAWN | WJH |
| REVIEWED | JSC |
| S.O.# | 2470-312-0000-07000 |
| CADD# | 312509PP |



SITE 73 - AMPHIBIOUS VEHICLE MAINTENANCE FACILITY
 REMEDIAL INVESTIGATION, CTO-0312
 MARINE CORPS BASE, CAMP LEJEUNE
 NORTH CAROLINA

BAKER ENVIRONMENTAL, Inc.
 Coraopolis, Pennsylvania



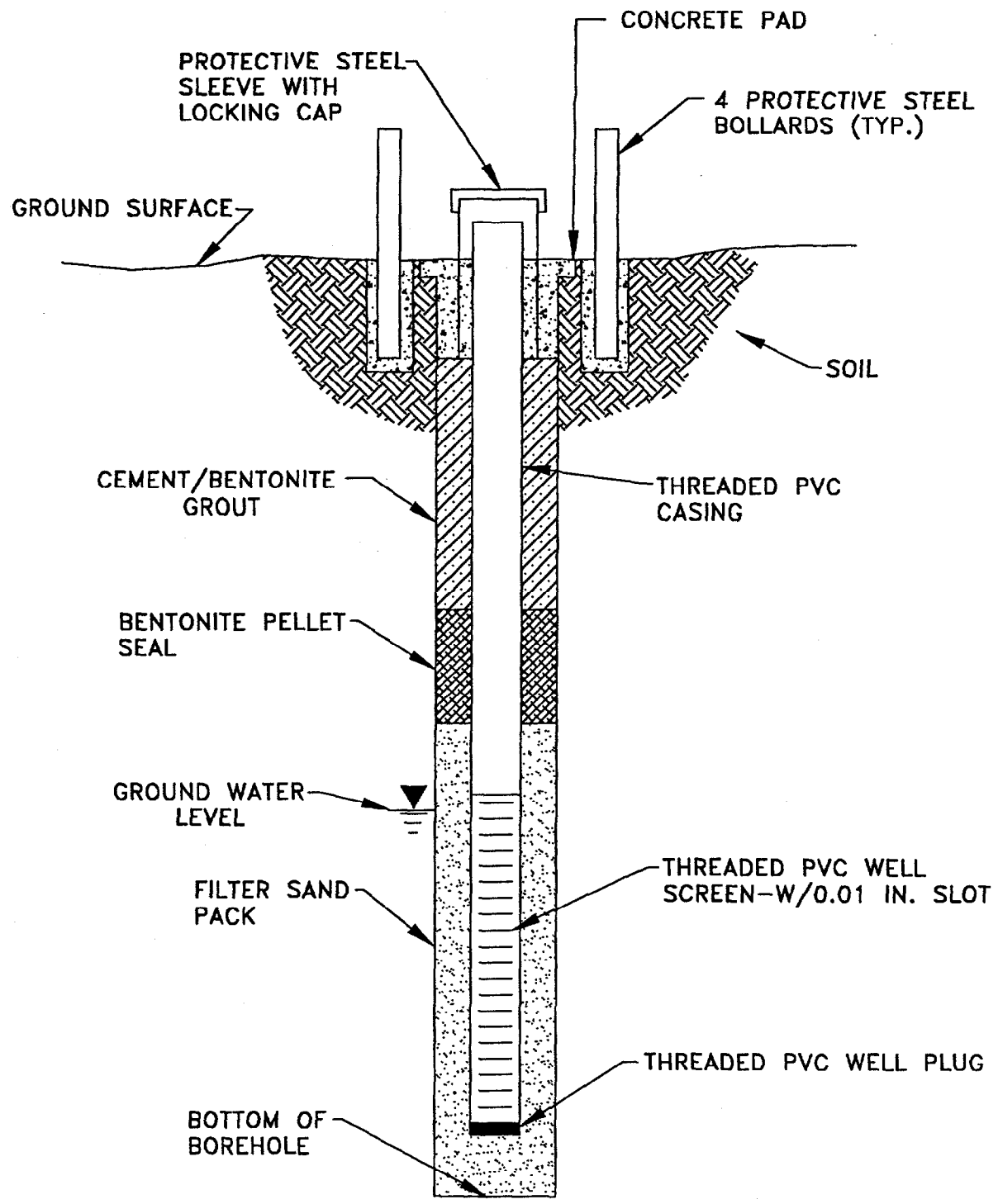
SAMPLE LOCATION MAP
 (RI PHASE I AND PHASE II)

SCALE 1" = 150'

DATE NOVEMBER 1996

FIGURE NO.
2-1

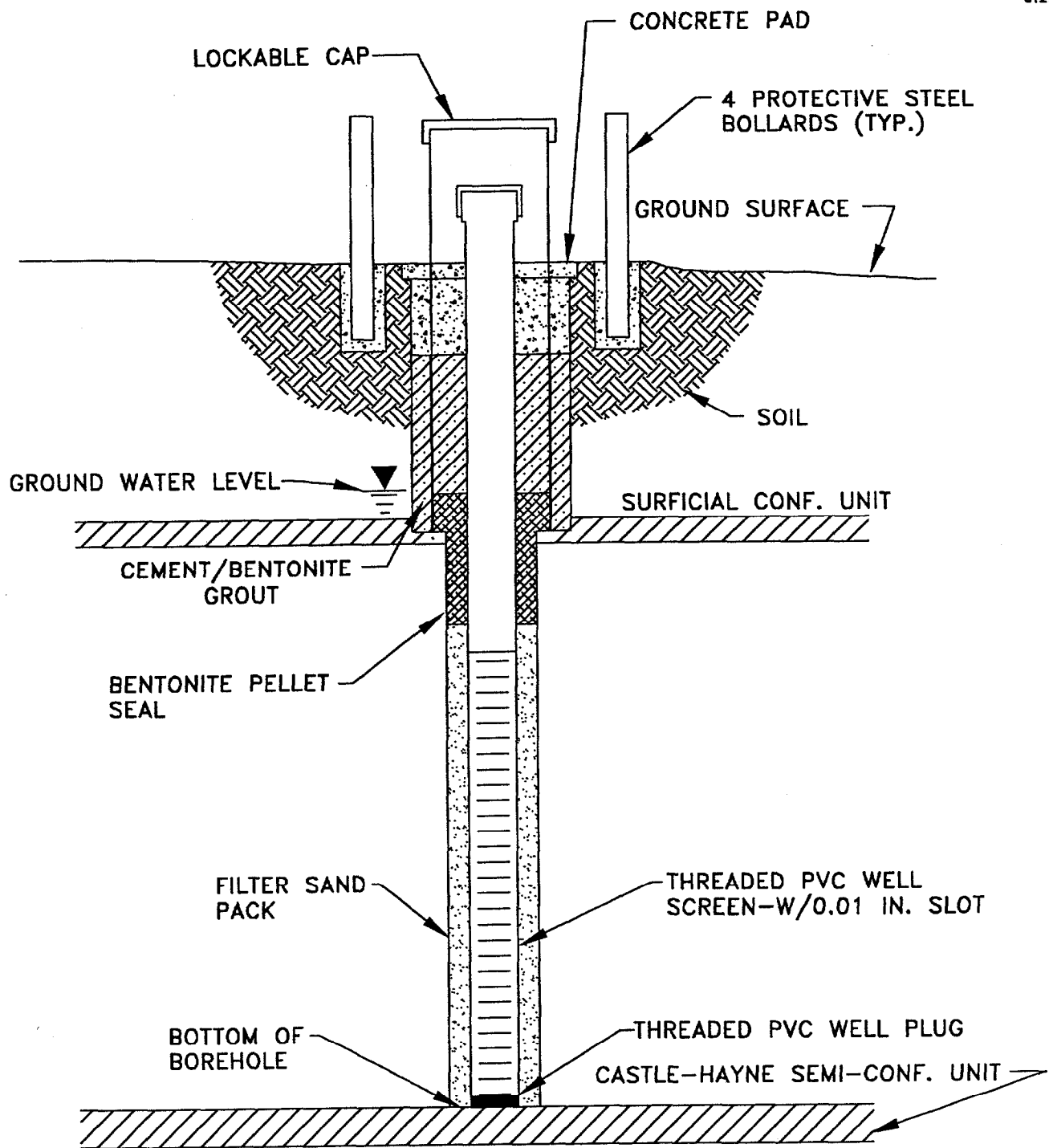
01767V04X



N.T.S.



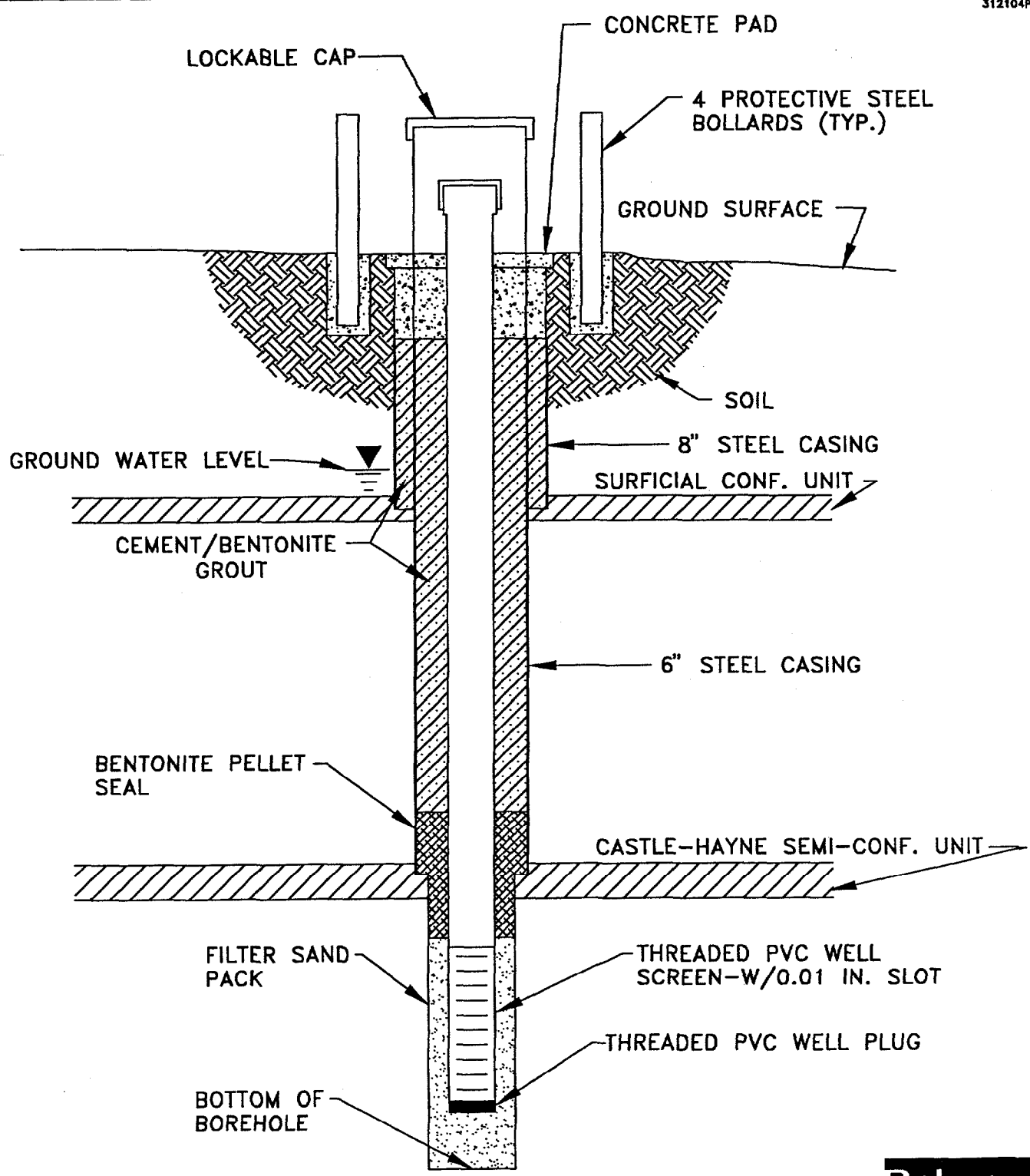
FIGURE 2-2
TYPICAL SHALLOW TYPE II
WELL CONSTRUCTION DIAGRAM
SITE 73-AMPHIBIOUS VEHICLE MAINTENANCE FACILITY
REMEDIAL INVESTIGATION, CTO-0312
MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA



N.T.S.

Baker
Baker Environmental, Inc.

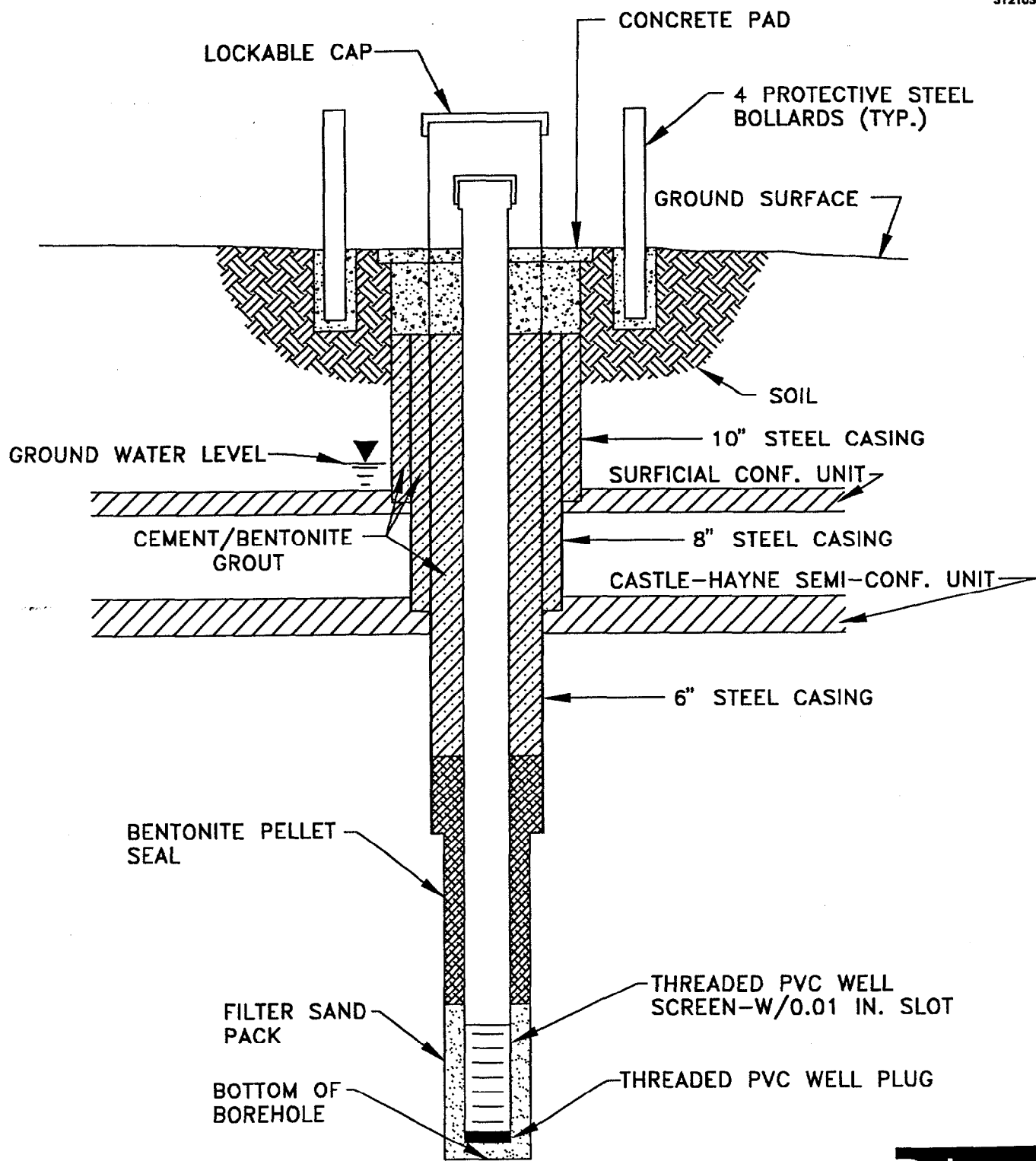
FIGURE 2-3
TYPICAL TYPE III WELL
CONSTRUCTION DIAGRAM (SHALLOW-INTERMEDIATE)
SITE 73-AMPHIBIOUS VEHICLE MAINTENANCE FACILITY
REMEDIAL INVESTIGATION, CTO-0312
MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA



N.T.S.

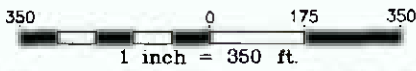
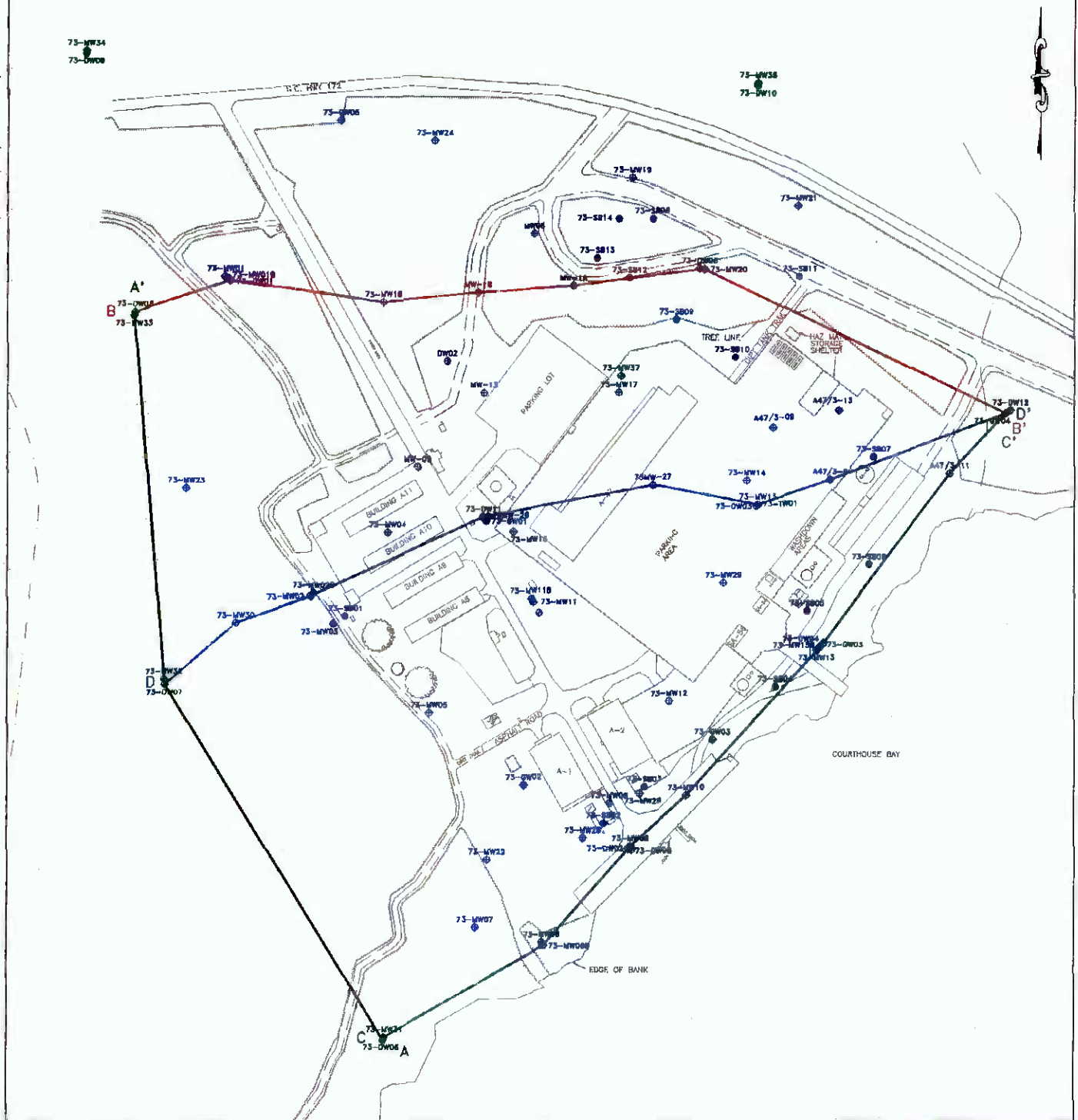


FIGURE 2-4
TYPICAL TYPE III WELL
CONSTRUCTION DIAGRAM (INTERMEDIATE)
SITE 73-AMPHIBIOUS VEHICLE MAINTENANCE FACILITY
REMEDIAL INVESTIGATION, CTO-0312
MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA



N.T.S.

FIGURE 2-5
 TYPICAL TYPE III WELL
 CONSTRUCTION DIAGRAM (DEEP)
 SITE 73-AMPHIBIOUS VEHICLE MAINTENANCE FACILITY
 REMEDIAL INVESTIGATION, CTO-0312
 MARINE CORPS BASE, CAMP LEJUNE
 NORTH CAROLINA



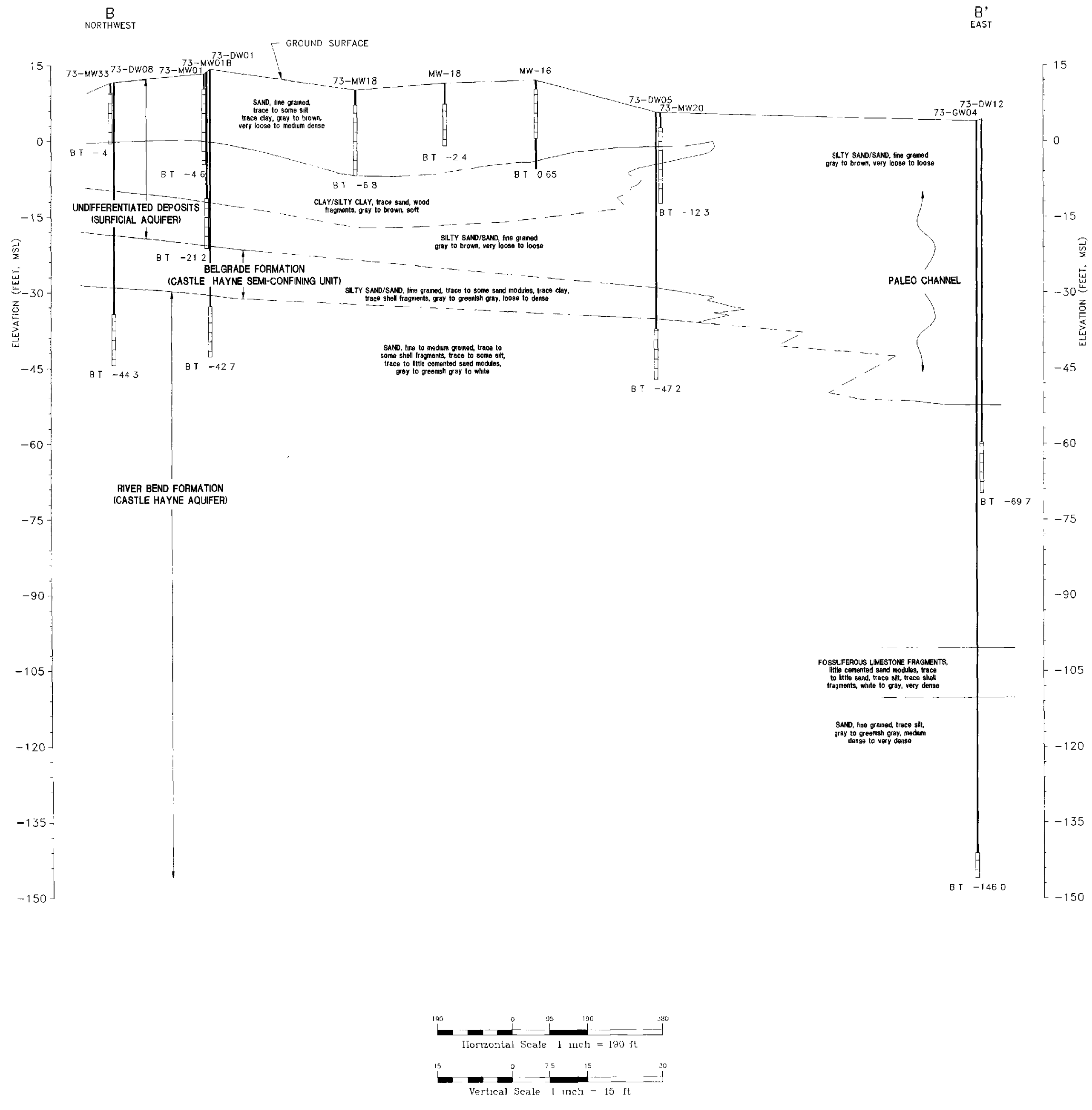
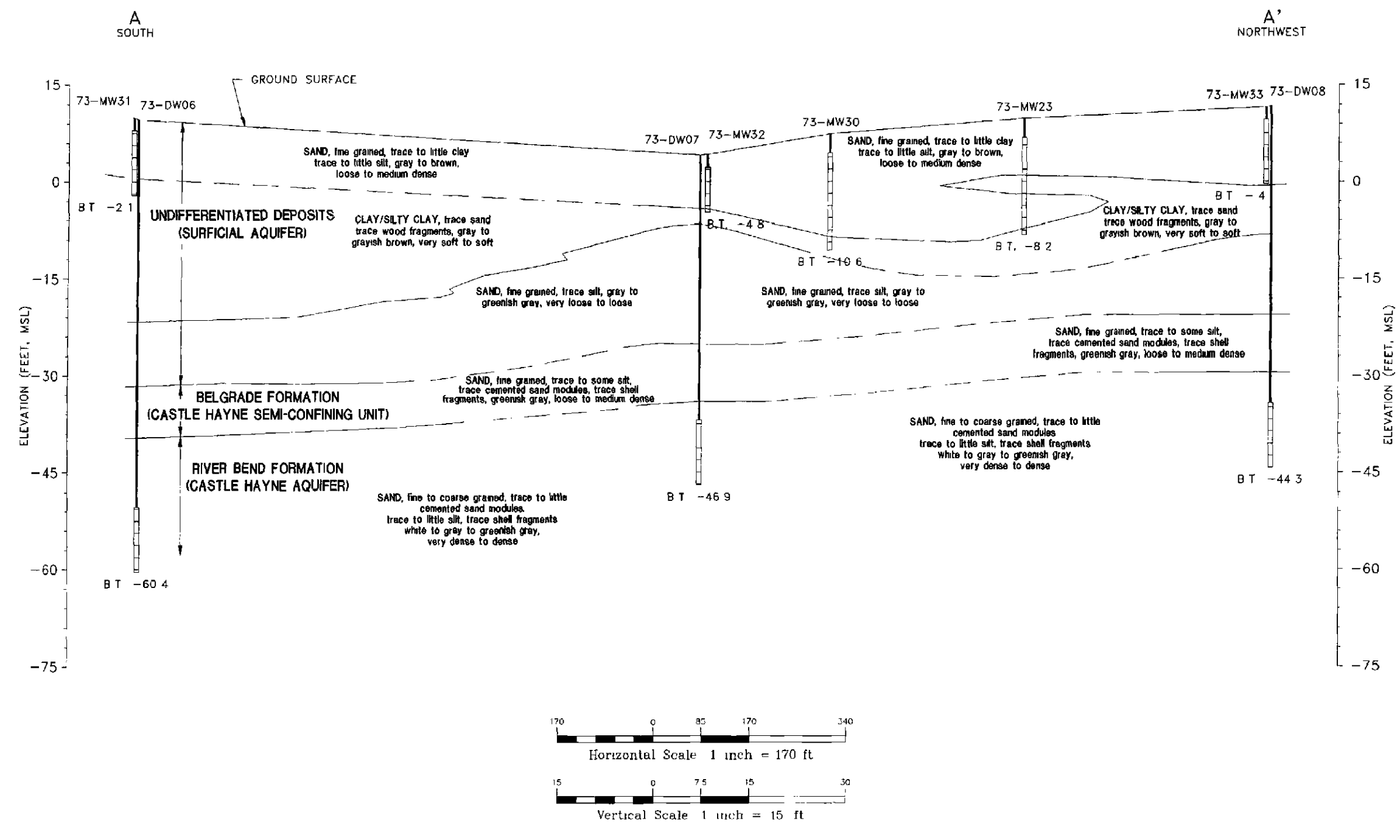
Baker
Baker Environmental, Inc.

LEGEND

- A—A' - CROSS-SECTION TRAVERSE LOCATION
- MW-1 - EXISTING TYPE II GROUNDWATER MONITORING WELL INSTALLED BY ATEC ASSOC., AUGUST 1991
- MW-9 - SHALLOW TYPE II GROUNDWATER MONITORING WELL INSTALLED BY BAKER ENVIRONMENTAL, INC., MAY 1992
- DW-1 - DEEP TYPE III GROUNDWATER MONITORING WELL INSTALLED BY BAKER ENVIRONMENTAL, INC., MAY 1992
- SB-1 - SOIL BORING INSTALLED BY BAKER ENVIRONMENTAL, INC., MAY 1992

FIGURE 3-3
CROSS-SECTION LOCATION
SITE 73
AMPHIBIOUS VEHICLE MAINTENANCE FACILITY
CTO - 0312
MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA

01767V07Y



| | | | | | | | |
|---|---|-----------|--|---|---|--------------------|------------------|
| LEGEND BT -60.4 WELL SCREEN INTERVAL BOREING TERMINATED, ELEVATION MSL ESTIMATED CONTACT PROJECTED CONTACT | DRAWN REL/WJH REVIEWED JEZ SO # 62470-312 CADD# 312101PP | NORTH | SITE 73 - AMPHIBIOUS VEHICLE MAINTENANCE FACILITY REMEDIAL INVESTIGATION, CTO - 0312 MARINE CORPS BASE, CAMP LEJEUNE NORTH CAROLINA | Baker Environmental, Inc. Coraopolis, Pennsylvania | HYDROGEOLOGIC CROSS SECTIONS A-A' AND B-B' | | FIGURE NO 3-4 |
| | | | | | SCALE AS SHOWN | DATE NOVEMBER 1996 | |

01767 VB4X

73-MW34
(8 65)

73-MW35
(6 28)

73-MW24
(7 78)

73-MW19
(8 88)

73-MW21
(8 77)

MW-08
(8 22)

MW-18
(6 74)

73-MW20
(5 29)

73-MW33
(8 82)

73-MW01
(10 09)

73-MW37
(5 28)

73-MW17
(4 63)

A47/3-13
(3 87)

A47/3-16
(3 87)

73-MW23
(7 78)

MW-09
(9 98)

73-MW27
(8 70)

73-MW14
(4 74)

A47/3-9
(2 28)

A47/3-11
(1 00)

73-MW02
(9 48)

73-MW03
(9 61)

73-MW11
(8 22)

73-MW29
(6 70)

73-MW15
(1 15)

73-MW32
(2 75)

73-MW05
(10 37)

73-MW12
(8 70)

73-MW28
(6 81)

73-MW10
(8 85)

73-MW25
(6 87)

73-MW09
(3 77)

73-MW07
(6 17)

73-MW06
(10 88)

73-MW31
(2 37)

73-MW36
(8 05)

LEGEND

- 73-MW01 MONITORING WELLS INSTALLED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE I (APRIL-MAY, 1995)
- 73-MW31 MONITORING WELLS INSTALLED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE II (FEBRUARY-MARCH, 1996)
- A47/3-8 MONITORING WELLS INSTALLED DURING UST INVESTIGATION BY GSI AND LAW-CATLIN AND ASSOCIATES (1993)
- MW-18 MONITORING WELLS INSTALLED BY BAKER DURING UST INVESTIGATION (1992 AND 1993)
- MW-08 MONITORING WELLS INSTALLED DURING A UST INVESTIGATION BY ATEC AND ASSOCIATES (1991)
- (8 61) GROUNDWATER ELEVATION
- 9 GROUNDWATER CONTOUR LINE
- ➔ DIRECTION OF GROUNDWATER FLOW
- A'-A' GRADIENT VECTOR

NOTE
GROUNDWATER LEVELS USED FOR THIS MAP
WERE COLLECTED ON MARCH 25, 1996

GRADIENT CALCULATIONS FOR THE SURFICIAL AQUIFER

- A-A' = $\frac{\Delta h}{\Delta L} = 016$ FT/FT
- B-B' = $\frac{\Delta h}{\Delta L} = 011$ FT/FT
- C-C' = $\frac{\Delta h}{\Delta L} = 017$ FT/FT
- D-D' = $\frac{\Delta h}{\Delta L} = 010$ FT/FT
- E-E' = $\frac{\Delta h}{\Delta L} = 008$ FT/FT
- F-F' = $\frac{\Delta h}{\Delta L} = 012$ FT/FT

SOURCE: LANIER SURVEYING CO., APRIL 4, 1996

REVISIONS

DRAWN WJH
 REVIEWED JSC
 S.O.# 62470-312-0000-07000
 CADD# 312512PP



SITE 73 - AMPHIBIOUS VEHICLE MAINTENANCE FACILITY
 REMEDIAL INVESTIGATION, CT0-0312
 MARINE CORPS BASE, CAMP LEJEUNE
 NORTH CAROLINA

BAKER ENVIRONMENTAL, Inc.
 Coraopolis, Pennsylvania



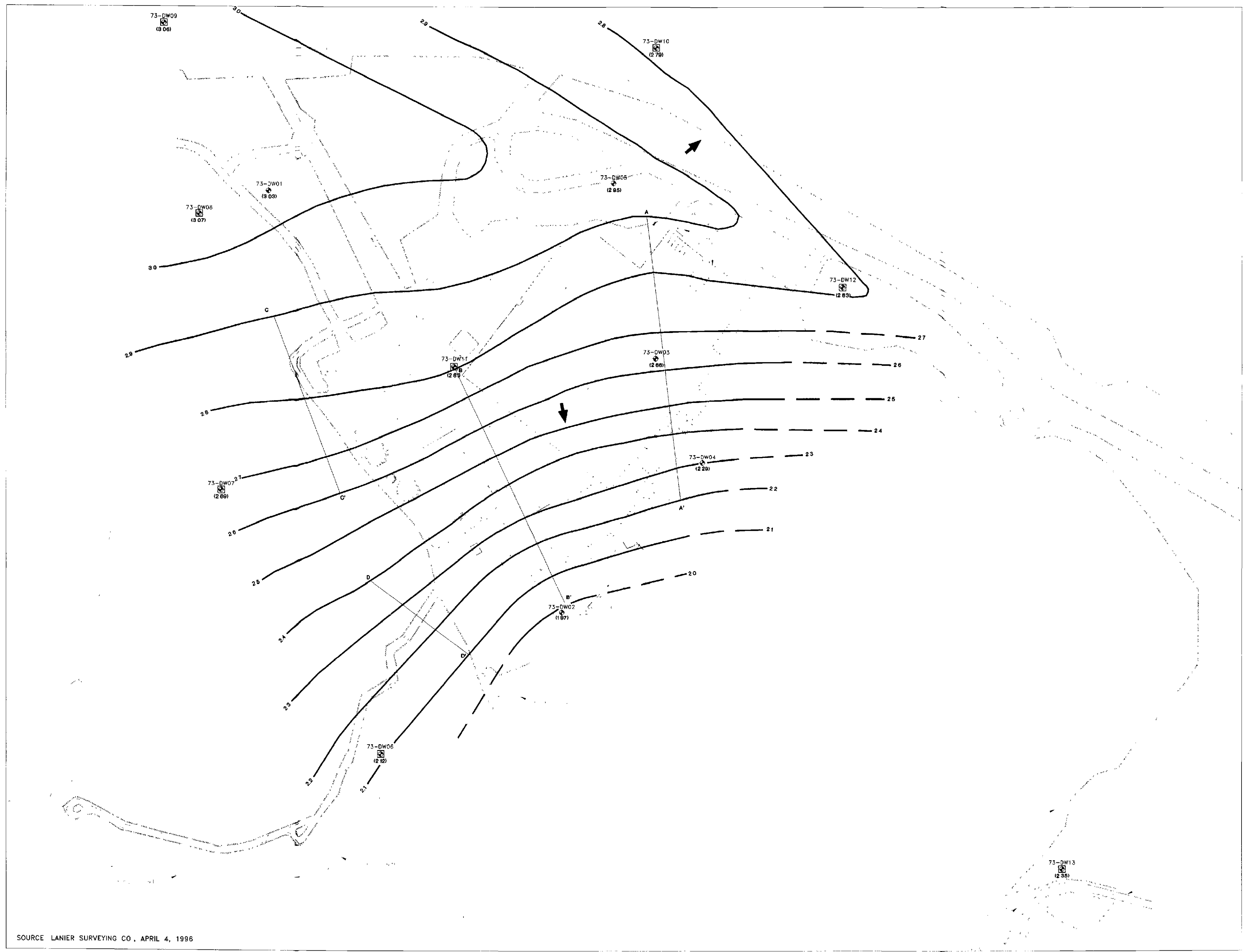
GROUNDWATER CONTOUR MAP DEPICTING
 FLOW IN THE SURFICIAL AQUIFER

SCALE 1" = 150'

DATE NOVEMBER 1996

FIGURE NO

3-6



- LEGEND
- 73-MW01 MONITORING WELLS INSTALLED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE I (APRIL-MAY, 1995)
 - 73-MW31 MONITORING WELLS INSTALLED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE II (FEBRUARY-MARCH, 1996)
 - (12 83) GROUNDWATER ELEVATION (MSL)
 - 28 GROUNDWATER CONTOUR LINE
 - ➔ DIRECTION OF GROUNDWATER FLOW
 - A'-A GRADIENT VECTOR

GRADIENT CALCULATIONS FOR THE UPPER PORTIONS OF THE CASTLE HAYNE AQUIFER

$$A-A' = \frac{\Delta h}{\Delta L} = \frac{0.7}{900} = 7.78 \times 10^{-4} \text{ FT/FT}$$

$$B-B' = \frac{\Delta h}{\Delta L} = \frac{0.8}{840} = 9.52 \times 10^{-4} \text{ FT/FT}$$

$$C-C' = \frac{\Delta h}{\Delta L} = \frac{0.3}{600} = 5.0 \times 10^{-4} \text{ FT/FT}$$

$$D-D' = \frac{\Delta h}{\Delta L} = \frac{0.3}{375} = 8.0 \times 10^{-4} \text{ FT/FT}$$

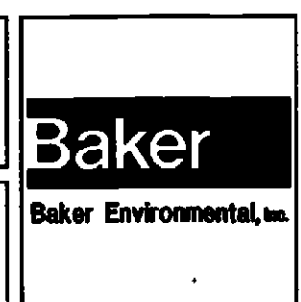
SOURCE LANIER SURVEYING CO., APRIL 4, 1996

| REVISIONS | |
|-----------|----------------------|
| DRAWN | WJH |
| REVIEWED | JSC |
| S O.# | 62470-312-0000-07000 |
| CAD# | 312507PP |

| | |
|-------|--|
| NORTH | |
| | |

SITE 73 - AMPHIBIOUS VEHICLE MAINTENANCE FACILITY
 REMEDIAL INVESTIGATION, CTO-0312
 MARINE CORPS BASE, CAMP LEJEUNE
 NORTH CAROLINA

BAKER ENVIRONMENTAL, Inc.
 Coraopolis, Pennsylvania



GROUNDWATER CONTOUR MAP DEPECTING FLOW
 IN THE UPPER-MOST PORTION OF THE
 CASTLE HAYNE AQUIFER

SCALE 1" = 150'

DATE NOVEMBER 1996

FIGURE NO
 3-7



- LEGEND**
- 73-MW51 (2 82) MONITORING WELLS INSTALLED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE II (FEBRUARY-MARCH, 1996)
 - (2 82) GROUNDWATER ELEVATION
 - 23 GROUNDWATER CONTOUR LINE
 - ➔ DIRECTION OF GROUNDWATER FLOW
 - A'-A GRADIENT VECTOR

NOTE
GROUNDWATER LEVELS USED FOR THIS MAP
WERE COLLECTED ON MARCH 25, 1996

GRADIENT CALCULATIONS FOR THE MIDDLE TO LOWER PORTION OF THE CASTLE HAYNE AQUIFER

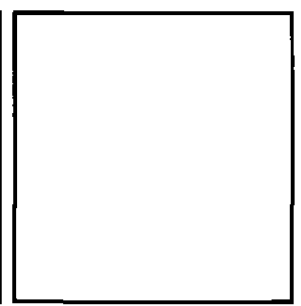
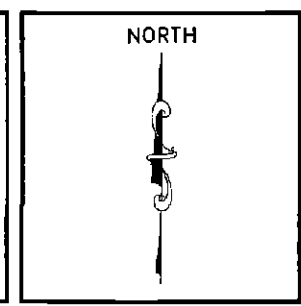
$$A-A' = \frac{\Delta h}{\Delta L} = \frac{0.8}{785} = 1.05 \times 10^{-3}$$

$$B-B' = \frac{\Delta h}{\Delta L} = \frac{0.6}{600} = 1.0 \times 10^{-3}$$

SOURCE: LANIER SURVEYING CO., APRIL 4, 1996

| REVISIONS | |
|-----------|----------------------|
| DRAWN | WJH |
| REVIEWED | JSC |
| S O # | 62470-312-0000-07000 |
| CADD# | 312508PP |

| | |
|----------|----------------------|
| DRAWN | WJH |
| REVIEWED | JSC |
| S O # | 62470-312-0000-07000 |
| CADD# | 312508PP |



SITE 73 - AMPHIBIOUS VEHICLE MAINTENANCE FACILITY
REMEDIAL INVESTIGATION, CTO-0312
MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA

BAKER ENVIRONMENTAL, Inc.
Coraopolis, Pennsylvania

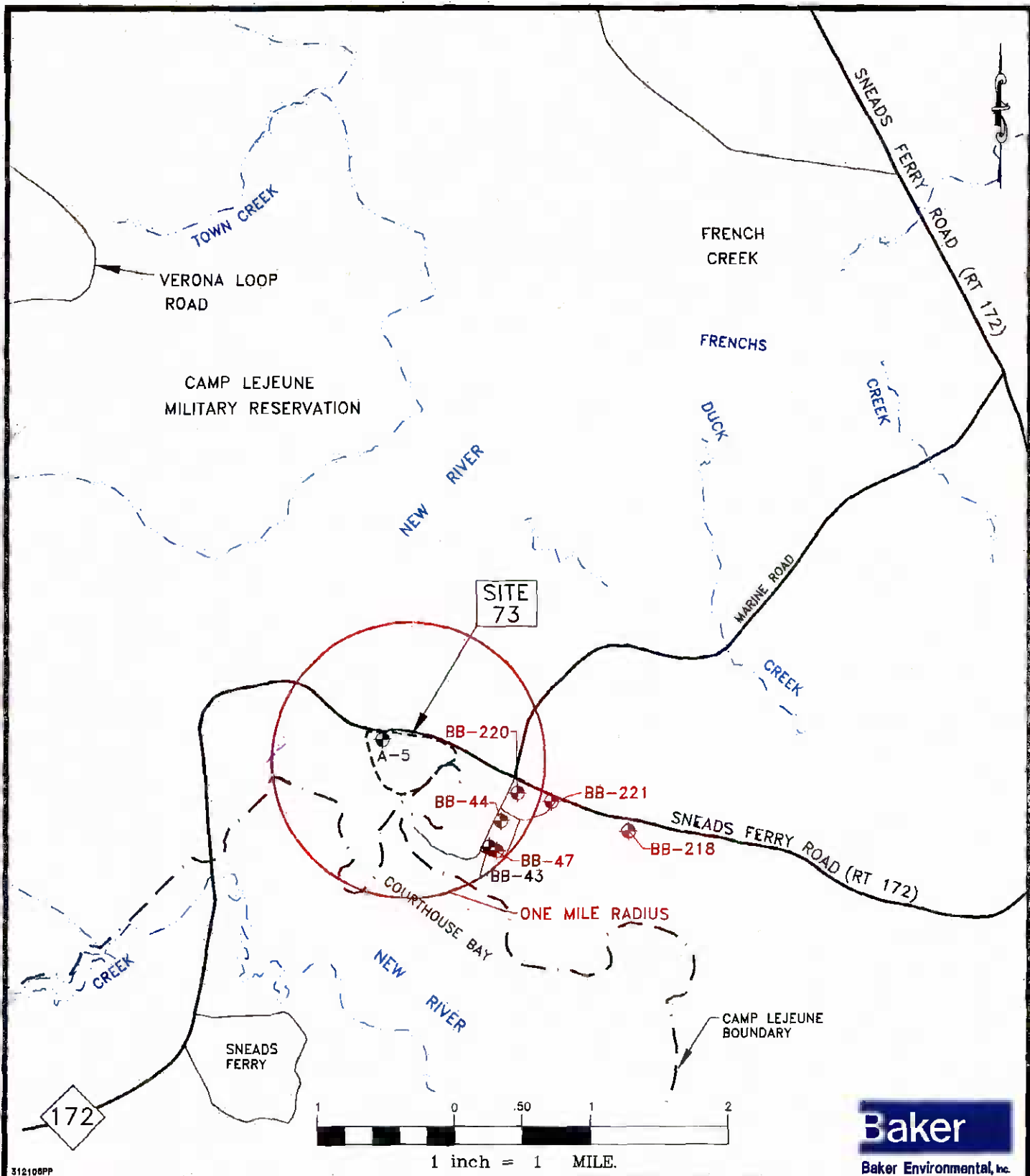


GROUNDWATER CONTOUR MAP DEPECTING FLOW
IN THE MID TO LOWER PORTION OF THE
CASTLE HAYNE AQUIFER

SCALE 1" = 150'

DATE NOVEMBER 1996

FIGURE NO.
3-8



Baker
Baker Environmental, Inc.

312108PP

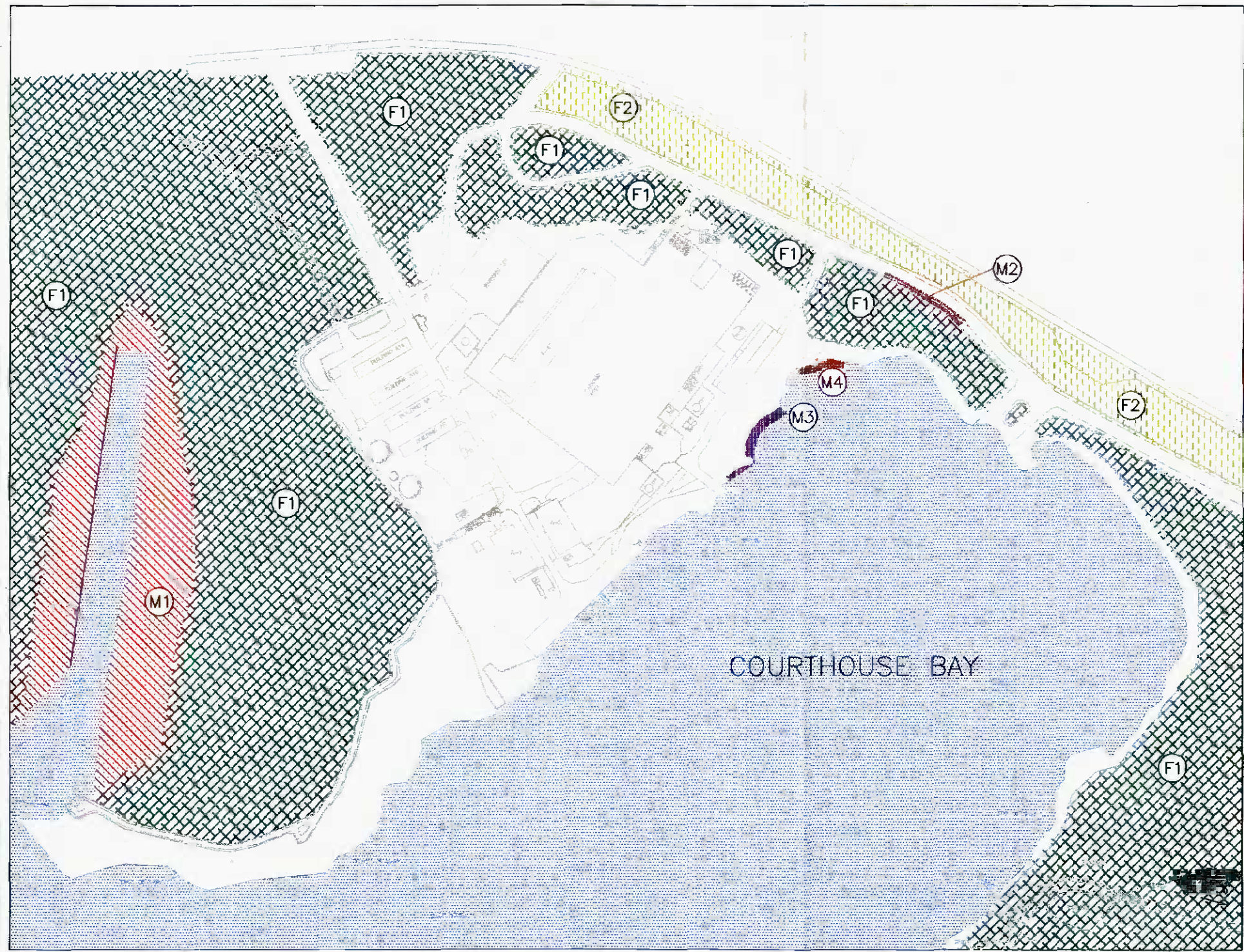
LEGEND

- - SITE
- - ACTIVE SUPPLY WELL
- - DEACTIVATED SUPPLY WELL (1991)

SOURCE: GEOPHEX, 1983.

FIGURE 3-9
SUPPLY WELL LOCATION MAP
SITE 73 - AMPHIBIOUS VEHICLE
MAINTENANCE FACILITY
REMEDIAL INVESTIGATION, CTO-0312
MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA

01717108V



LEGEND

- FORESTED AREA (LOBLOLLY PINE, SWEETGUM, WATER OAK, EASTERN RED CEDAR, SOUTHERN (WAX) MYRTLE, AND WILD GRAPE)
- FORESTED AREA (LOBLOLLY PINE, BLACK WILLOW, RED MAPLE, SOUTHERN WAX MYRTLE, WILD GRAPE, AND TRUMPET CREEPER)
- MARSH AREA (AMERICAN BEACHGRASS, CATTAIL, MARSH CORDGRASS, RUSH)
- MARSH AREA (SWITCH CANE, BLACK WILLOW, SWEETGUM, VIRGINIA CREEPER)
- MARSH AREA (BULRUSH, RUSH, AMERICAN BEACHGRASS, MARSH ELDER, SOUTHERN WAX MYRTLE)
- MARSH AREA (BULRUSH, RUSH, AMERICAN BEACHGRASS, SOUTHERN WAX MYRTLE)
- WATER



DETAIL A

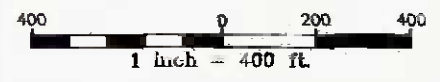
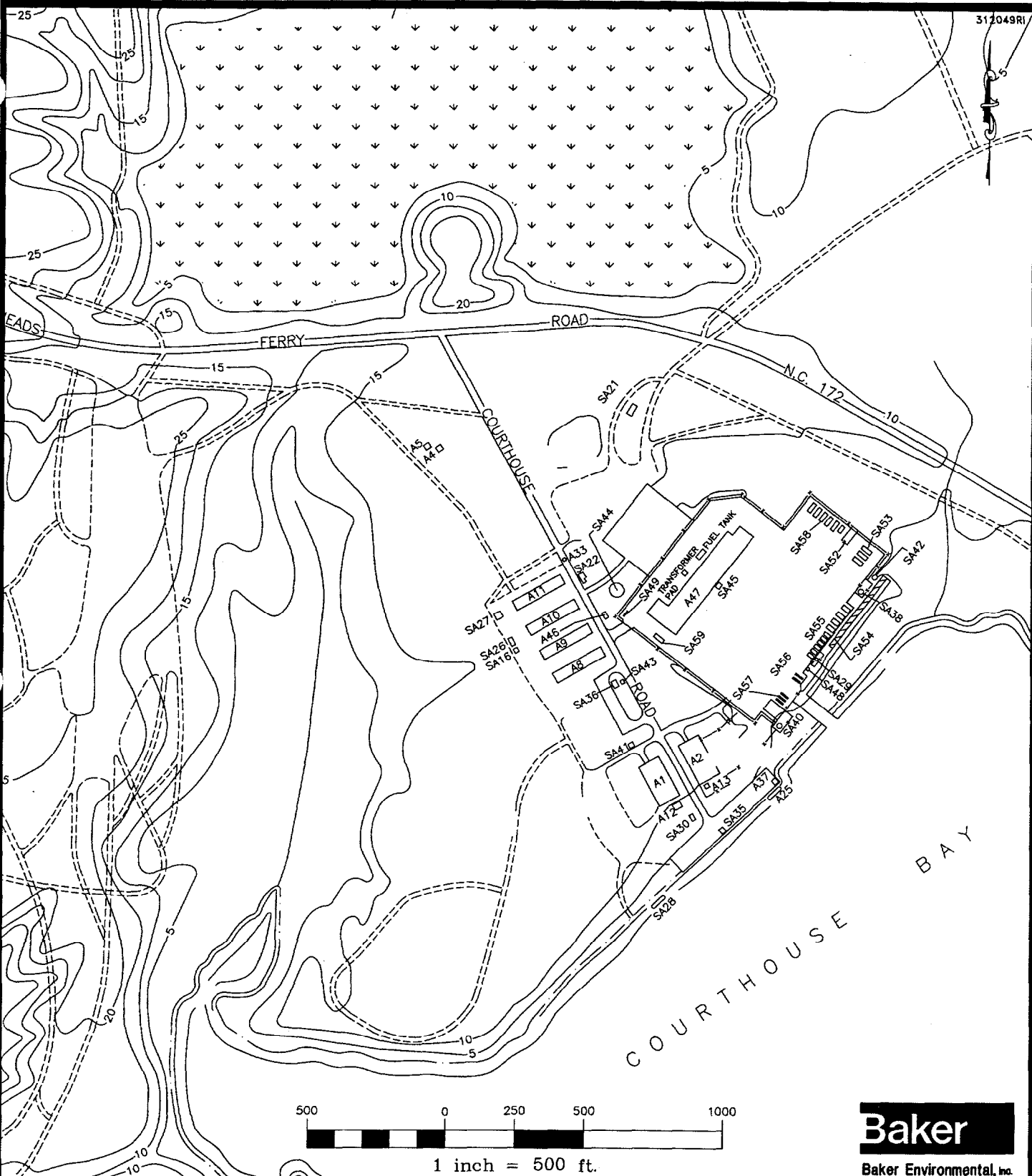


FIGURE 3-10
 BIOHABITAT MAP
 SITE 73-AMPHIBIOUS VEHICLE
 MAINTENANCE FACILITY
 REMEDIAL INVESTIGATION, CTO-0312
 MARINE CORPS BASE, CAMP LEJEUNE
 NORTH CAROLINA

01767V094

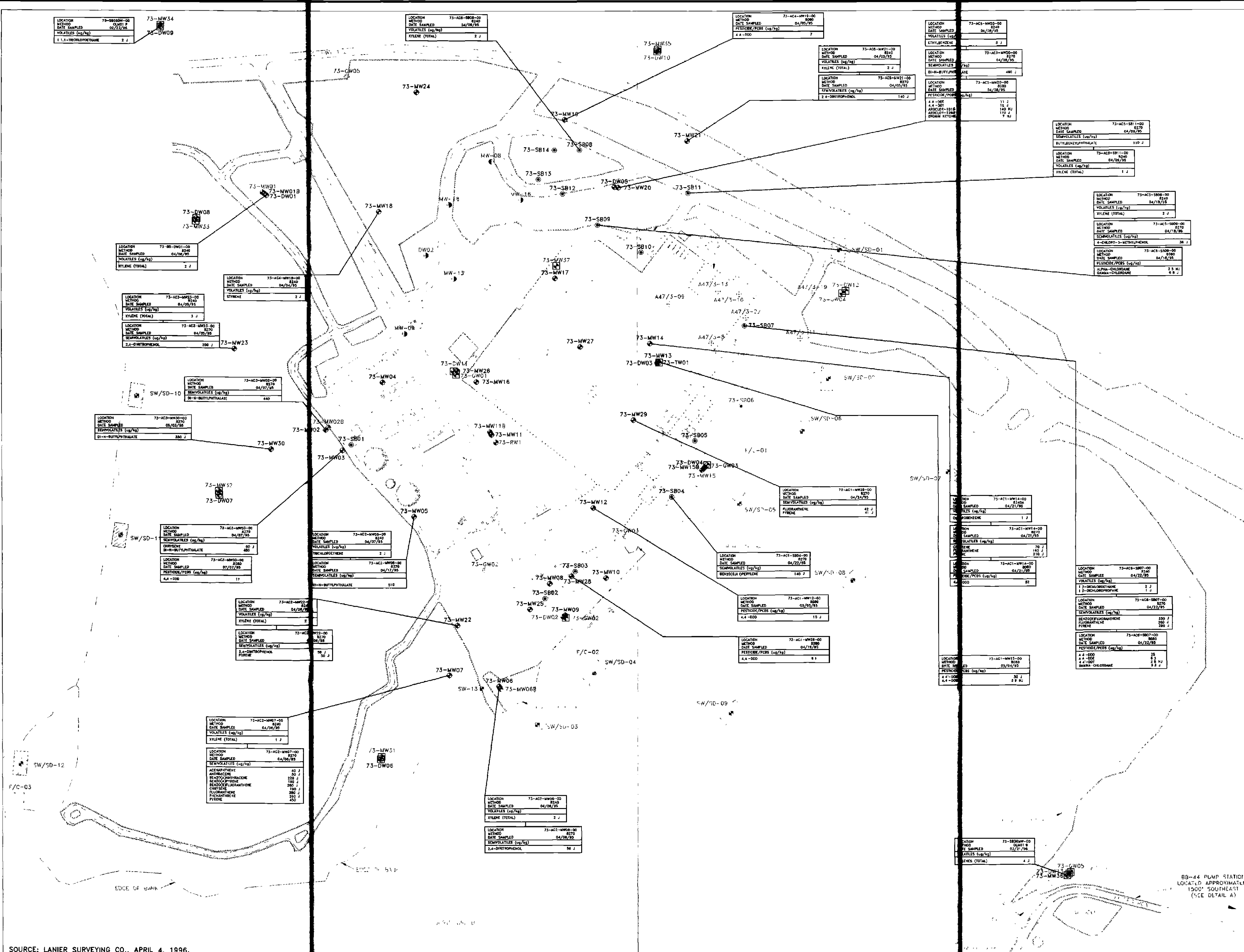


LEGEND

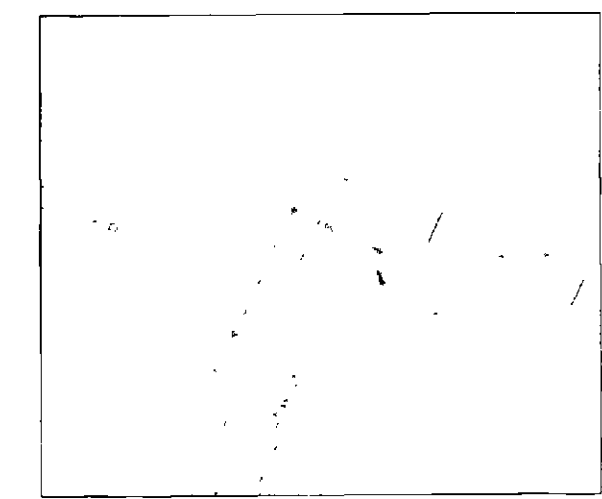
— 5 — SURFACE TOPOGRAPHY LINE

FIGURE 3-11
 SURFACE TOPOGRAPHY MAP
 SITE 73
 AMPHIBIOUS VEHICLE MAINTENANCE FACILITY
 CTO - 0312
 MARINE CORPS BASE, CAMP LEJEUNE
 NORTH CAROLINA

SOURCE: LANTDIV, OCT. 1991



- LEGEND**
- 73-SB01 SOIL BORINGS ADVANCED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE I (APRIL-MAY, 1995)
 - 73-MW01 MONITORING WELLS INSTALLED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE I (APRIL-MAY, 1995)
 - 73-MW51 MONITORING WELLS INSTALLED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE II (FEBRUARY-MARCH, 1996)
 - A47/3-8 MONITORING WELLS INSTALLED DURING UST INVESTIGATION BY OSI AND LAW-CATLIN AND ASSOCIATES (1993)
 - MW-18 MONITORING WELLS INSTALLED BY BAKER DURING UST INVESTIGATION (1992 AND 1993)
 - MW-08 MONITORING WELLS INSTALLED DURING A UST INVESTIGATION BY ATEC AND ASSOCIATES (1991)
 - 73GW-02 MONITORING WELLS INSTALLED BY ESE DURING CONFIRMATORY SAMPLING (1990)
 - SW/SD-01 SURFACE WATER/SEDIMENT LOCATION SAMPLED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE I (APRIL-MAY, 1995)
 - F/C-01 FISH/CRAW LOCATION SAMPLED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE I (APRIL-MAY, 1995)



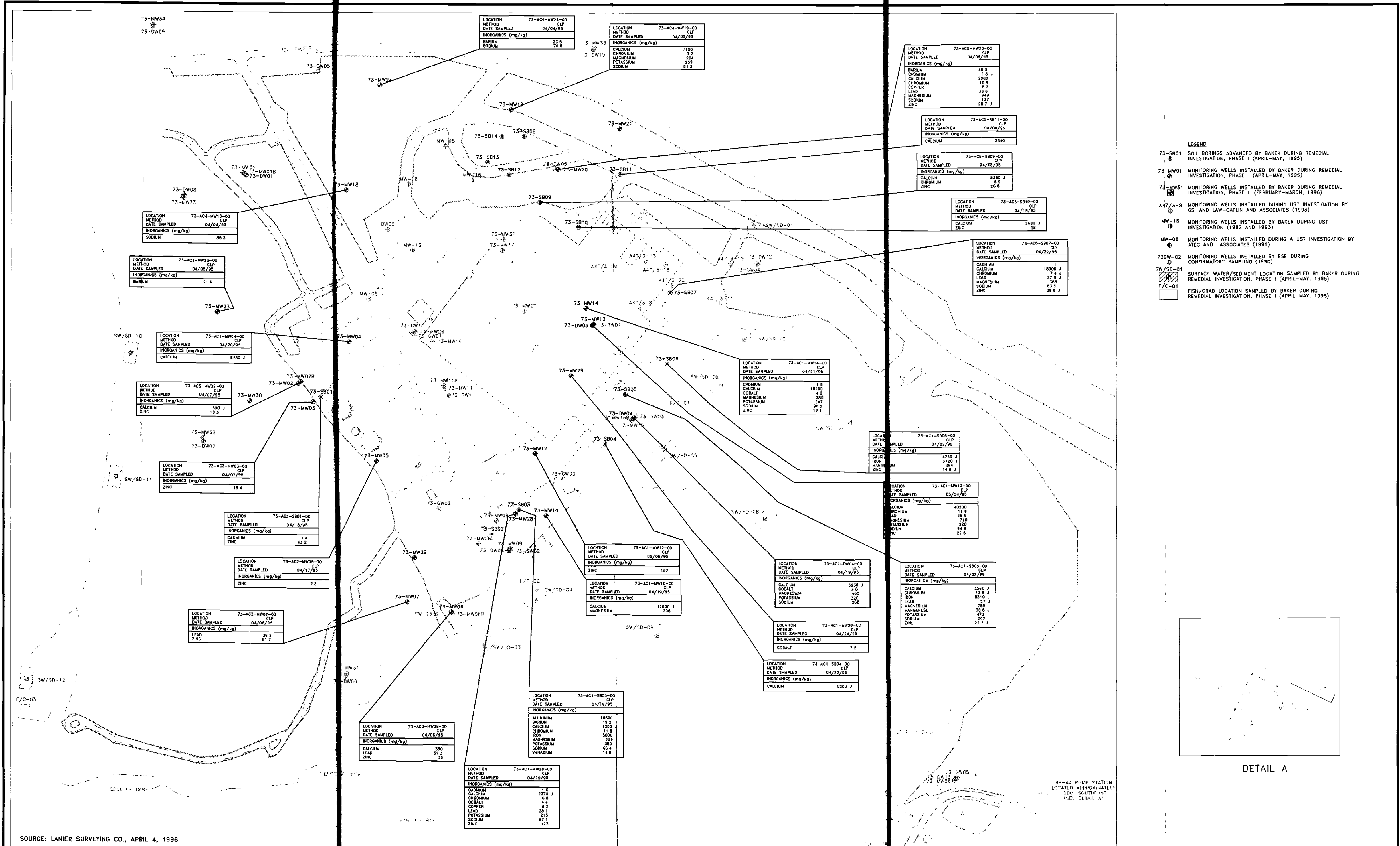
DETAIL A

89-44 PUMP STATION
LOCATED APPROXIMATELY
1500' SOUTHEAST
(SEE DETAIL A)

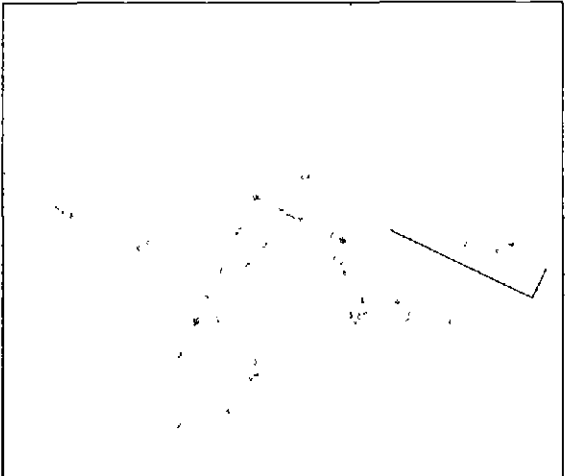
SOURCE: LANIER SURVEYING CO., APRIL 4, 1996.

| | | | | | | |
|---|--|-----------|---|---|---|--------------------------|
| REVISIONS DRAWN: WJH REVIEWED: JSC S.O.#: 52470-312-0000-07000 CADD#: 312580PP | | NORTH | SITE 73 - AMPHIBIOUS VEHICLE MAINTENANCE FACILITY REMEDIAL INVESTIGATION, CTO-0312 MARINE CORPS BASE, CAMP LEJEUNE NORTH CAROLINA | | DETECTED VOLATILES (METHODS 8240 AND CLP), SEMIVOLATILES (METHOD 8270), AND PESTICIDES/PCBS (METHOD 8080) IN SURFACE SOILS | FIGURE NO. 4-1 |
| BAKER ENVIRONMENTAL, Inc. Coraopolis, Pennsylvania | | | | SCALE: 1" = 150' DATE: NOVEMBER 1996 | | |

01767VB5X



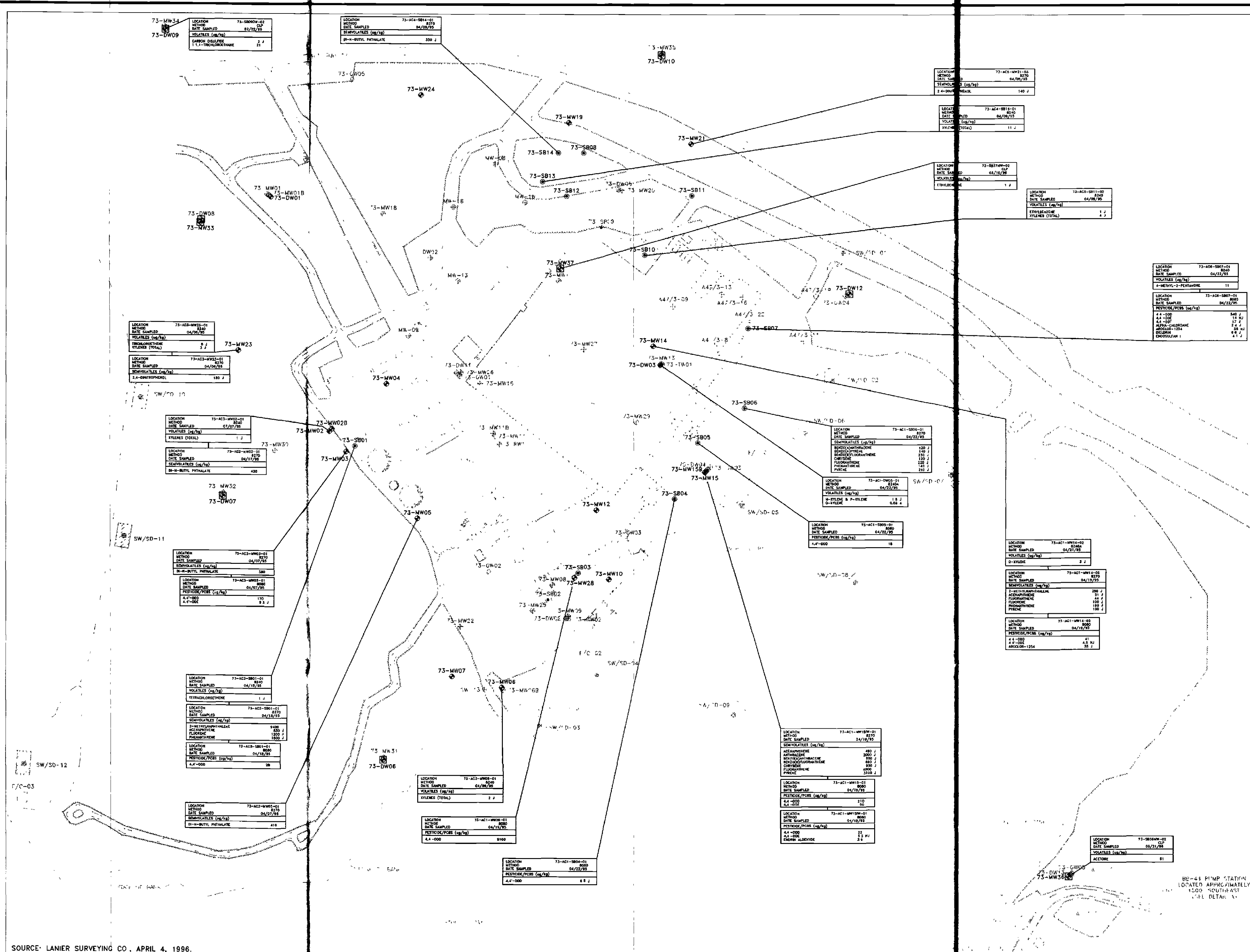
- LEGEND**
- 73-SB01 SOIL BORINGS ADVANCED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE I (APRIL-MAY, 1995)
 - 73-MW01 MONITORING WELLS INSTALLED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE I (APRIL-MAY, 1995)
 - 73-MW51 MONITORING WELLS INSTALLED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE I (FEBRUARY-MARCH, 1996)
 - A47/3-8 MONITORING WELLS INSTALLED DURING UST INVESTIGATION BY GSI AND LAW-CATLIN AND ASSOCIATES (1993)
 - MW-18 MONITORING WELLS INSTALLED BY BAKER DURING UST INVESTIGATION (1992 AND 1993)
 - MW-08 MONITORING WELLS INSTALLED DURING A UST INVESTIGATION BY ATEC AND ASSOCIATES (1991)
 - 73GW-02 MONITORING WELLS INSTALLED BY ESE DURING CONFIRMATORY SAMPLING (1990)
 - SW/SD-01 SURFACE WATER/SEDIMENT LOCATION SAMPLED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE I (APRIL-MAY, 1995)
 - F/C-01 FISH/CRAB LOCATION SAMPLED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE I (APRIL-MAY, 1995)



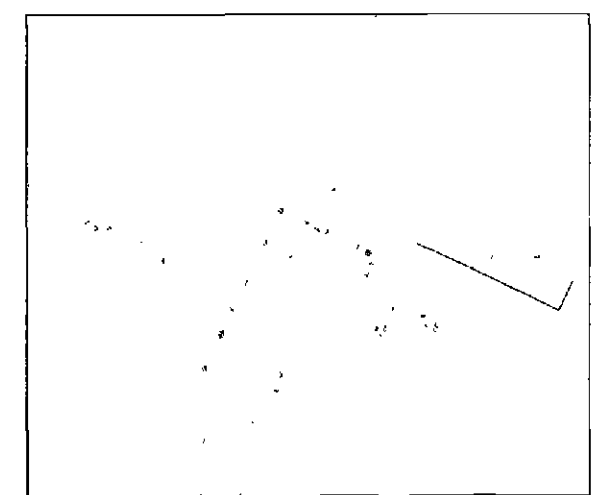
DETAIL A

SOURCE: LANIER SURVEYING CO., APRIL 4, 1996

| | | | | | | |
|------------------|--|--------------|--|------------------------|---|---------------------------------|
| <p>REVISIONS</p> | <p>DRAWN WJH REVIEWED JSC S.O.# 62470-312-00-07000 CADD# 312559P</p> | <p>NORTH</p> | <p>SITE 73 - AMPHIBIOUS VEHICLE MAINTENANCE FACILITY REMEDIAL INVESTIGATION, CTO-0312 MARINE CORPS BASE, CAMP LEJEUNE NORTH CAROLINA</p> <p>BAKER ENVIRONMENTAL, Inc. Coraopolis, Pennsylvania</p> | | <p>DETECTED INORGANICS EXCEEDING 2x BASE BACKGROUND IN SURFACE SOILS</p> | <p>FIGURE NO 4-2</p> |
| | | | | <p>SCALE 1" = 150'</p> | <p>DATE NOVEMBER 1996</p> | |



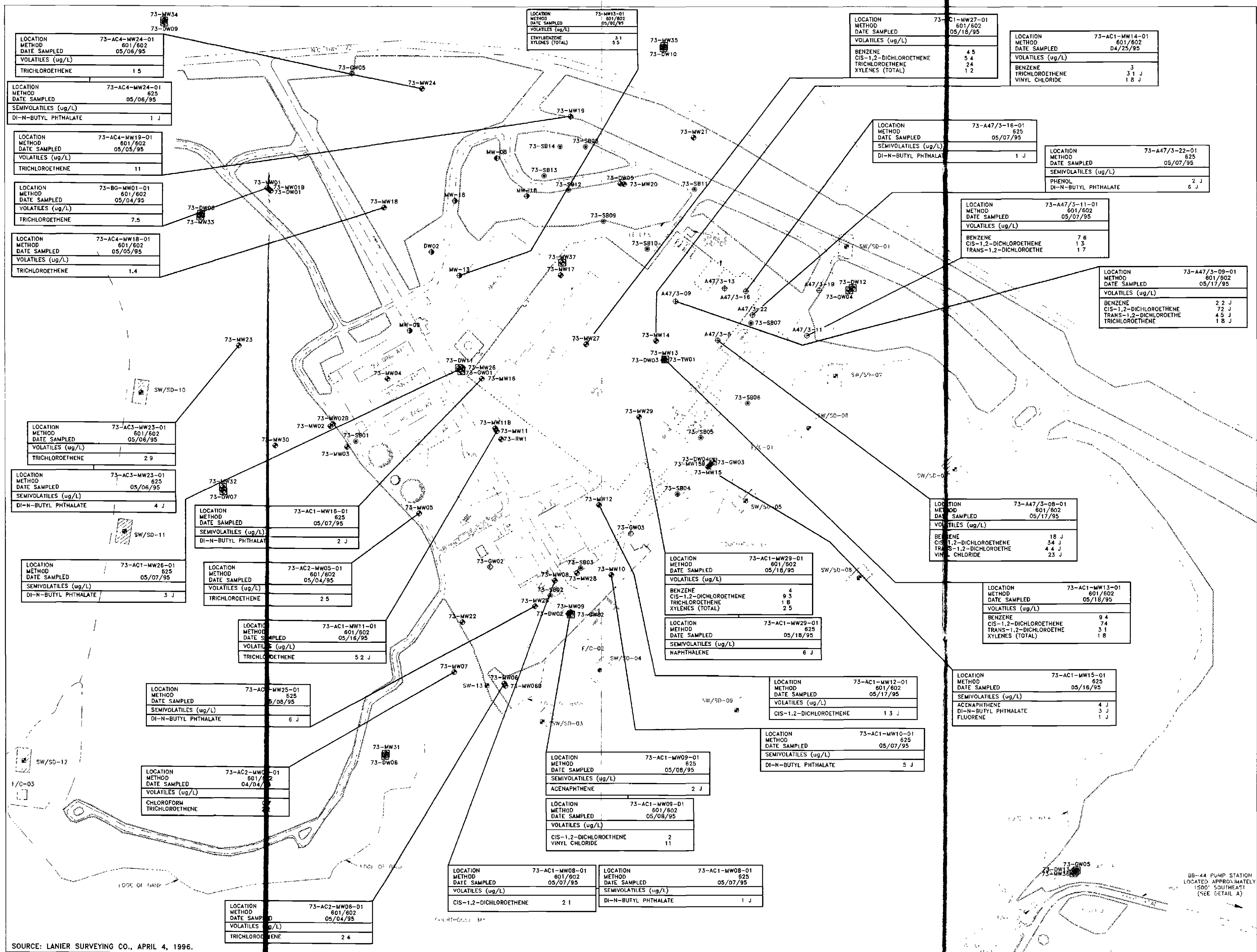
- LEGEND**
- 73-SB01 SOIL BORINGS ADVANCED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE I (APRIL-MAY, 1995)
 - 73-MW01 MONITORING WELLS INSTALLED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE I (APRIL-MAY, 1995)
 - 73-MW31 MONITORING WELLS INSTALLED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE II (FEBRUARY-MARCH, 1996)
 - A47/3-8 MONITORING WELLS INSTALLED DURING UST INVESTIGATION BY GSI AND LAW-CATLIN AND ASSOCIATES (1993)
 - MW-18 MONITORING WELLS INSTALLED BY BAKER DURING UST INVESTIGATION (1992 AND 1993)
 - MW-08 MONITORING WELLS INSTALLED DURING A UST INVESTIGATION BY ATEC AND ASSOCIATES (1991)
 - 73SW-02 MONITORING WELLS INSTALLED BY ESE DURING CONFIRMATORY SAMPLING (1990)
 - SW/SD-D1 SURFACE WATER/SEDIMENT LOCATION SAMPLED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE I (APRIL-MAY, 1995)
 - F/C-01 FISH/CRAB LOCATION SAMPLED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE I (APRIL-MAY, 1995)

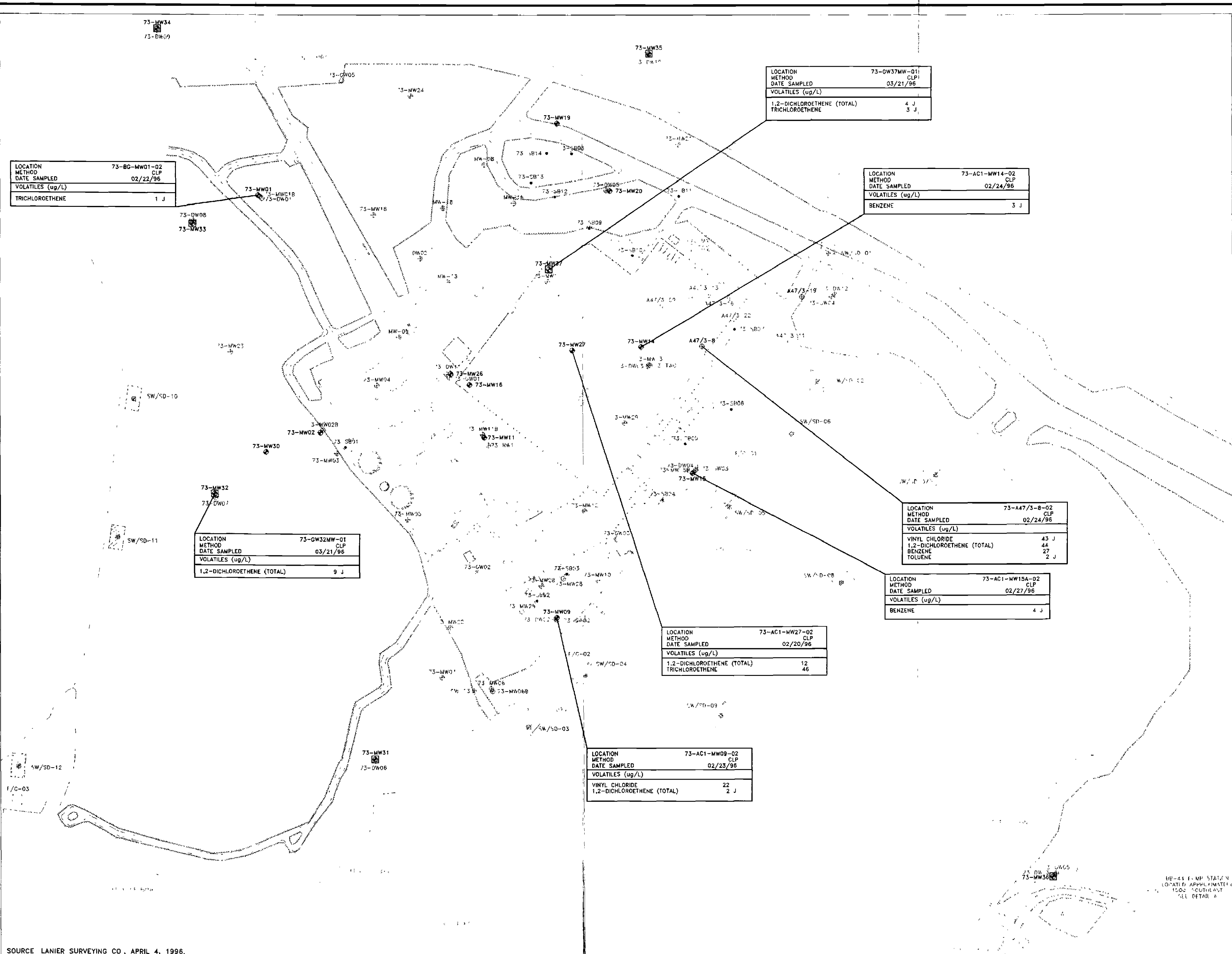


DETAIL A

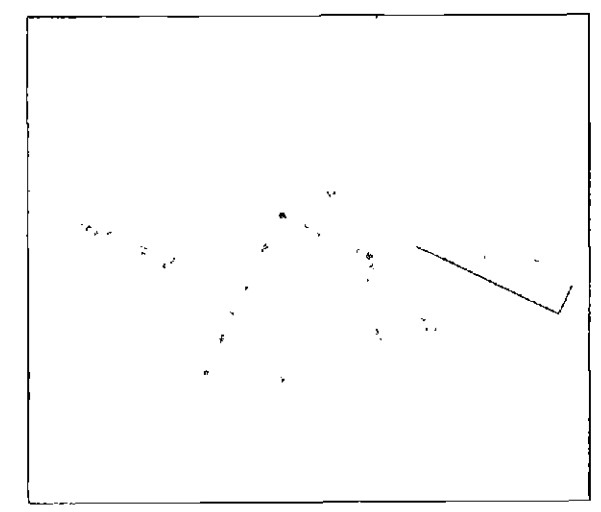
SOURCE: LANIER SURVEYING CO., APRIL 4, 1996.

| | | | | | |
|--|---------------------|---|---|---|---|
| <p>REVISIONS</p> <p>DRAWN: WJH</p> <p>REVIEWED: JSC</p> <p>S.O.#: 62470-312-0000-07000</p> <p>CADD#: 312547PP</p> | <p>NORTH</p> | <p>SITE 73 - AMPHIBIOUS VEHICLE MAINTENANCE FACILITY</p> <p>REMEDIAL INVESTIGATION, CTO-0312 MARINE CORPS BASE, CAMP LEJEUNE NORTH CAROLINA</p> <p>BAKER ENVIRONMENTAL, Inc. Coraopolis, Pennsylvania</p> | <p>Baker Baker Environmental, Inc.</p> | <p>DETECTED VOLATILES (METHOD 8240/8240A), SEMIVOLATILES (METHOD 8270), AND PESTICIDES/PCBs (METHOD 8080) IN SUBSURFACE SOILS</p> <p>SCALE: 1" = 150'</p> <p>DATE: NOVEMBER 1996</p> | <p>FIGURE NO</p> <p style="font-size: 2em;">4-3</p> |
|--|---------------------|---|---|---|---|





- LEGEND**
- 73-SB01 SOIL BORINGS ADVANCED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE I (APRIL-MAY, 1995)
 - 73-MW01 MONITORING WELLS INSTALLED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE I (APRIL-MAY, 1995)
 - 73-MW31 MONITORING WELLS INSTALLED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE II (FEBRUARY-MARCH, 1996)
 - A47/S-B MONITORING WELLS INSTALLED DURING UST INVESTIGATION BY GSI AND LAW-CATLIN AND ASSOCIATES (1993)
 - MW-18 MONITORING WELLS INSTALLED BY BAKER DURING UST INVESTIGATION (1992 AND 1993)
 - MW-08 MONITORING WELLS INSTALLED DURING A UST INVESTIGATION BY ATEC AND ASSOCIATES (1991)
 - 73GW-02 MONITORING WELLS INSTALLED BY ESE DURING CONFIRMATORY SAMPLING (1990)
 - SW/SD-01 SURFACE WATER/SEDIMENT LOCATION SAMPLED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE I (APRIL-MAY, 1995)
 - F/C-01 FISH/CRAB LOCATION SAMPLED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE I (APRIL-MAY, 1995)

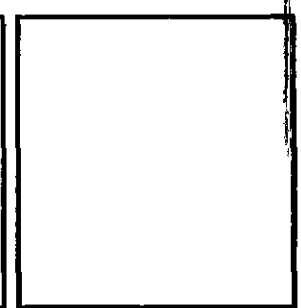
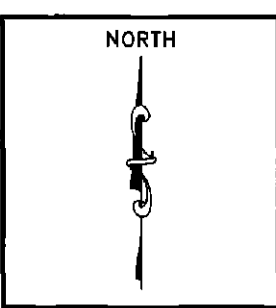


DETAIL A

SOURCE LANIER SURVEYING CO., APRIL 4, 1996.

| | |
|-----------|----------------------|
| REVISIONS | |
| DRAWN | WJH |
| REVIEWED | JSC |
| S.O.# | 62470-312-0000-07000 |
| CADD# | 312528PP |

| | |
|----------|----------------------|
| DRAWN | WJH |
| REVIEWED | JSC |
| S.O.# | 62470-312-0000-07000 |
| CADD# | 312528PP |



SITE 73 - AMPHIBIOUS VEHICLE MAINTENANCE FACILITY
 REMEDIAL INVESTIGATION, CTO-0312
 MARINE CORPS BASE, CAMP LEJEUNE
 NORTH CAROLINA

Baker Environmental, Inc.
 Coraopolis, Pennsylvania

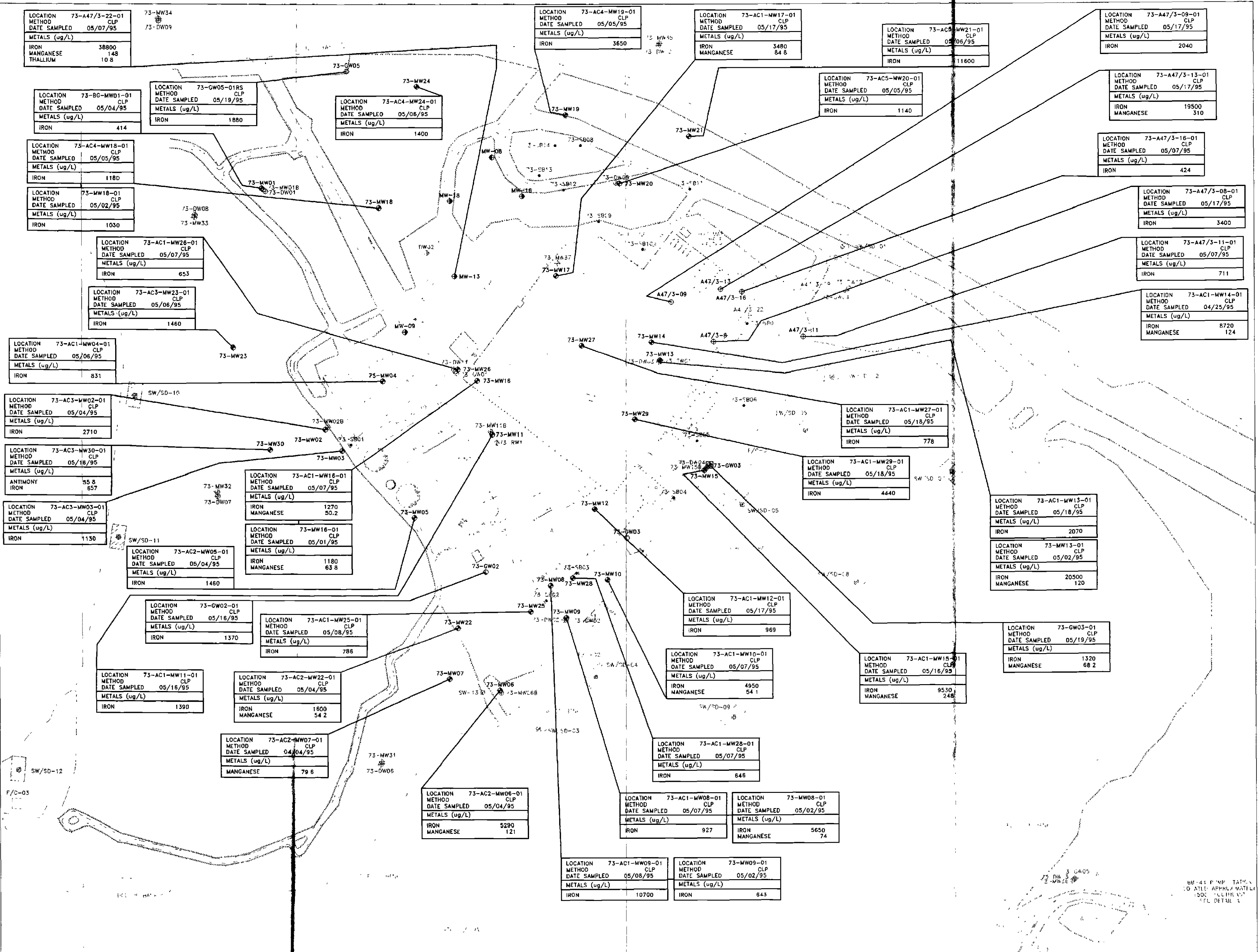


DETECTED VOLATILES IN THE UPPERMOST PORTION OF THE SURFICIAL AQUIFER VIA CLP METHOD (PHASE II)

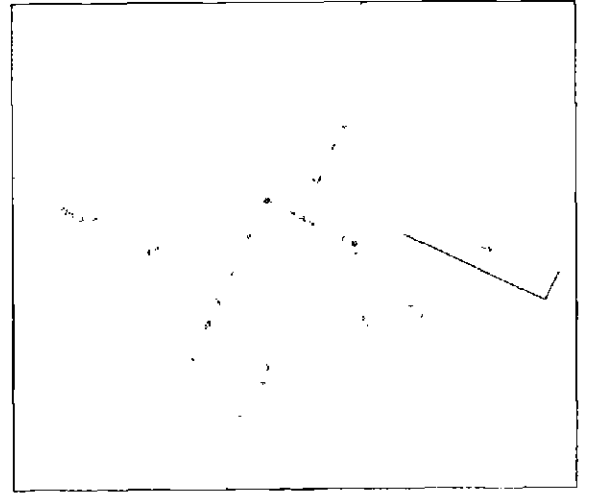
SCALE 1" = 150'

DATE NOVEMBER 1996

FIGURE NO.
 4-6



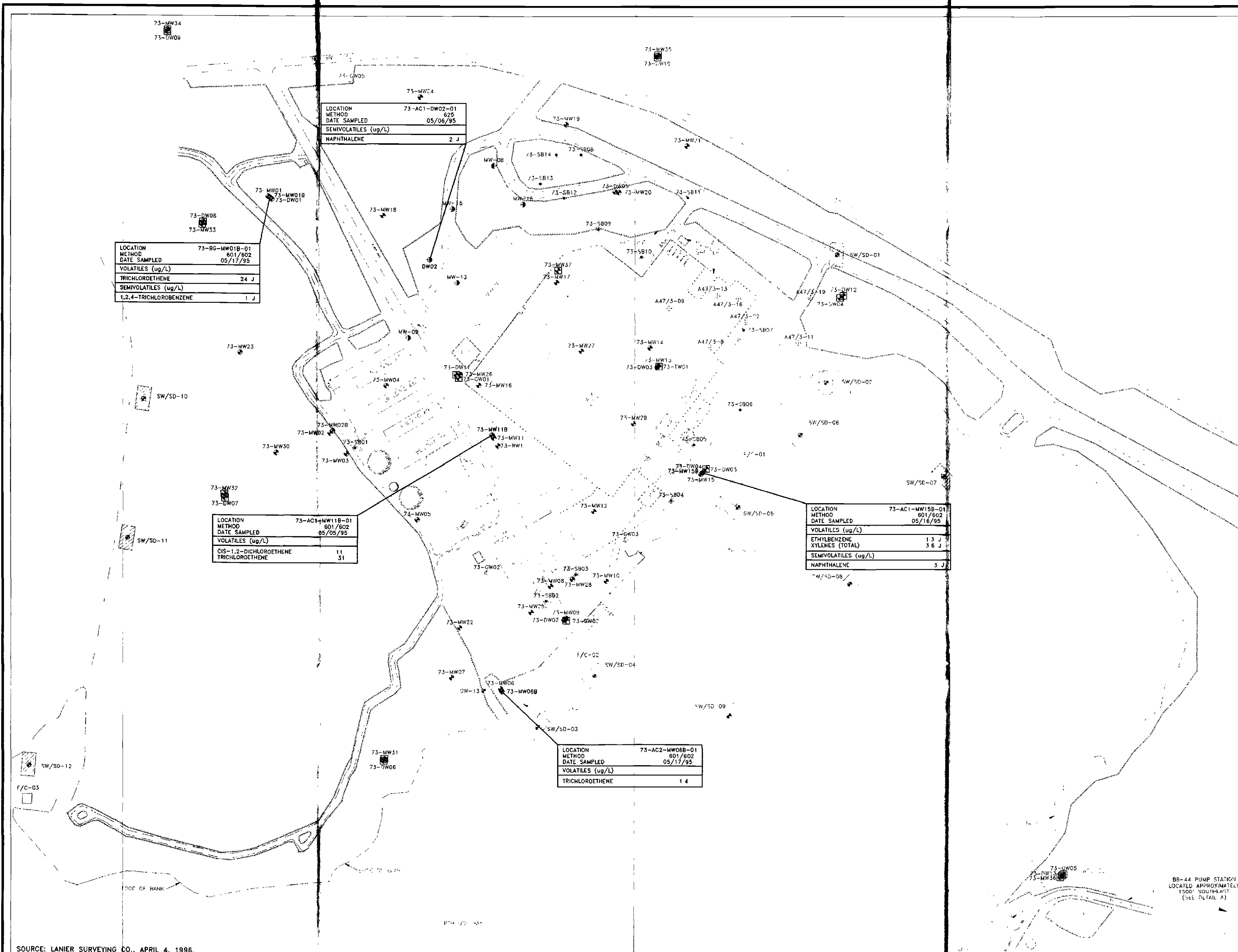
- LEGEND**
- 73-SB01 SOIL BORINGS ADVANCED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE I (APRIL-MAY, 1995)
 - 73-MW01 MONITORING WELLS INSTALLED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE I (APRIL-MAY, 1995)
 - 73-MW31 MONITORING WELLS INSTALLED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE II (FEBRUARY-MARCH, 1996)
 - A47/S-8 MONITORING WELLS INSTALLED DURING UST INVESTIGATION BY GSI AND LAW-CATLIN AND ASSOCIATES (1993)
 - MW-18 MONITORING WELLS INSTALLED BY BAKER DURING UST INVESTIGATION (1992 AND 1993)
 - MW-08 MONITORING WELLS INSTALLED DURING A UST INVESTIGATION BY ATEC AND ASSOCIATES (1991)
 - 73CW-02 MONITORING WELLS INSTALLED BY ESE DURING CONFIRMATORY SAMPLING (1990)
 - SW/SD-01 SURFACE WATER/SEDIMENT LOCATION SAMPLED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE I (APRIL-MAY, 1995)
 - F/C-01 FISH/CRAB LOCATION SAMPLED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE I (APRIL-MAY, 1995)



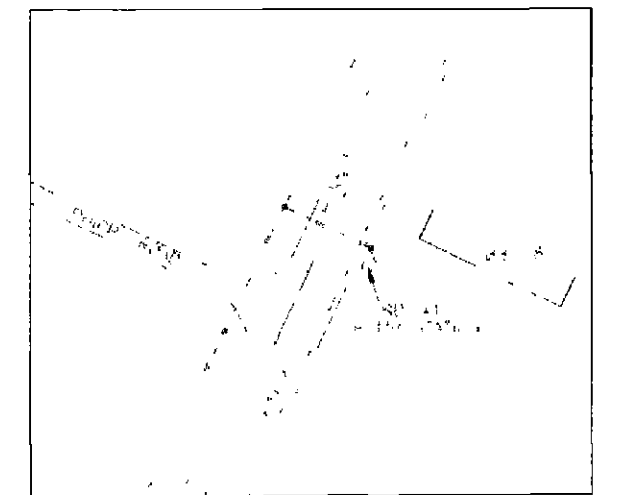
DETAIL A

SOURCE: LANIER SURVEYING CO., APRIL 4, 1996.

| | | | | | | |
|------------------|---|--------------|--|---|---|----------------------------------|
| <p>REVISIONS</p> | <p>DRAWN WJH REVIEWED JSC S.C.# 62470-312-0000-07000 CADD# 312558PP</p> | <p>NORTH</p> | <p>SITE 73 - AMPHIBIOUS VEHICLE MAINTENANCE FACILITY REMEDIAL INVESTIGATION, CTO-0312 MARINE CORPS BASE, CAMP LEJEUNE NORTH CAROLINA</p> <p>BAKER ENVIRONMENTAL, Inc. Coraopolis, Pennsylvania</p> | <p>Baker Baker Environmental, Inc.</p> | <p>DETECTED INORGANICS EXCEEDING NCWQS AND/OR FEDERAL MCLs IN THE UPPERMOST PORTION OF THE SURFICIAL AQUIFER (PHASE I)</p> | <p>FIGURE NO. 4-7</p> |
| | | | | <p>SCALE 1" = 150'</p> | <p>DATE NOVEMBER 1996</p> | |



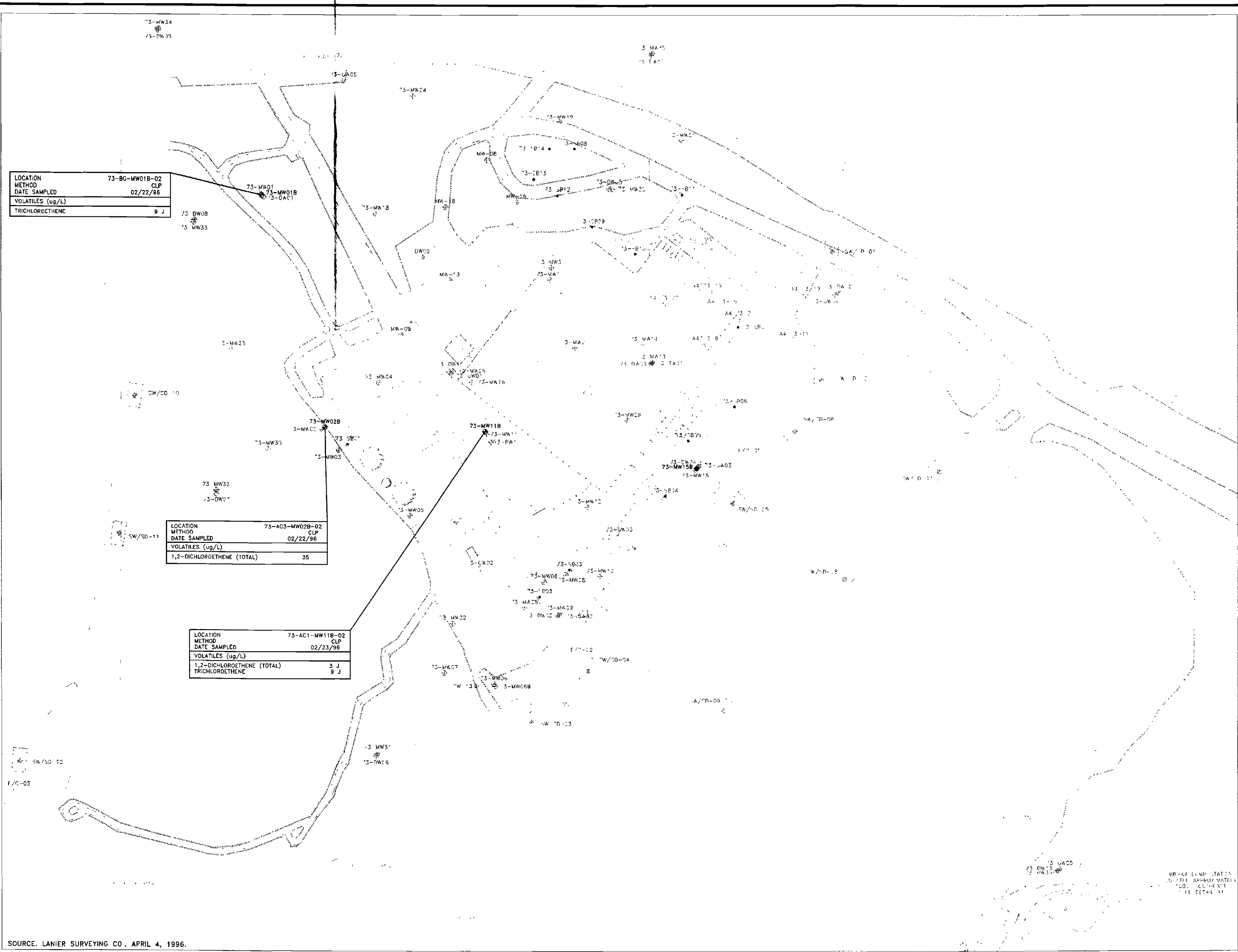
- LEGEND**
- 73-SB01 SOIL BORINGS ADVANCED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE I (APRIL-MAY, 1995)
 - 73-MW01 MONITORING WELLS INSTALLED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE I (APRIL-MAY, 1995)
 - 73-MW31 MONITORING WELLS INSTALLED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE II (FEBRUARY-MARCH, 1996)
 - A47/3-8 MONITORING WELLS INSTALLED DURING UST INVESTIGATION BY GSI AND LAW-CATLIN AND ASSOCIATES (1993)
 - MW-18 MONITORING WELLS INSTALLED BY BAKER DURING UST INVESTIGATION (1992 AND 1993)
 - MW-08 MONITORING WELLS INSTALLED DURING A UST INVESTIGATION BY ATEC AND ASSOCIATES (1991)
 - 730W-02 MONITORING WELLS INSTALLED BY ESE DURING CONFIRMATORY SAMPLING (1990)
 - SW/SD-01 SURFACE WATER/SEDIMENT LOCATION SAMPLED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE I (APRIL-MAY, 1995)
 - F/C-01 FISH/CRAB LOCATION SAMPLED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE I (APRIL-MAY, 1995)



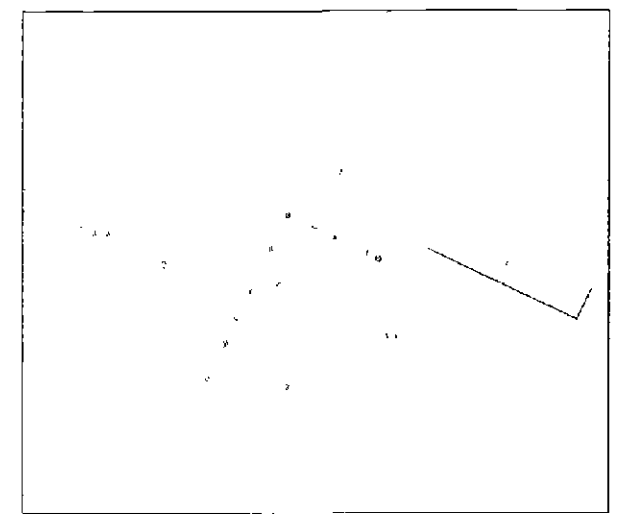
BB-44 PUMP STATION
LOCATED APPROXIMATELY
1500' SOUTH-EAST
(SEE DETAIL A)

SOURCE: LANIER SURVEYING CO., APRIL 4, 1996.

| | | | | | | |
|------------------|---|--------------|--|--|---|----------------------------------|
| <p>REVISIONS</p> | <p>DRAWN: WJH REVIEWED: JSC S.O.#: 62470-312-0000-07000 CADD#: 312533PP</p> | <p>NORTH</p> | <p>SITE 73 - AMPHIBIOUS VEHICLE MAINTENANCE FACILITY REMEDIAL INVESTIGATION, CTO-0312 MARINE CORPS BASE, CAMP LEJEUNE NORTH CAROLINA</p> <p>BAKER ENVIRONMENTAL, Inc. Coraopolis, Pennsylvania</p> | | <p>DETECTED VOLATILES (METHOD 601/602) AND SEMIVOLATILES (METHOD 625) IN THE LOWERMOST PORTION OF THE SURFICIAL AQUIFER (PHASE I)</p> | <p>FIGURE NO. 4-8</p> |
| | | | | | <p>SCALE 1" = 150'</p> | <p>DATE NOVEMBER 1996</p> |



- LEGEND**
- 73-SB01 SOIL BORINGS ADVANCED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE I (APRIL-MAY, 1995)
 - 73-MW01 MONITORING WELLS INSTALLED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE I (APRIL-MAY, 1995)
 - 73-MW31 MONITORING WELLS INSTALLED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE II (FEBRUARY-MARCH, 1996)
 - A47/S-8 MONITORING WELLS INSTALLED DURING UST INVESTIGATION BY GSI AND LAW-CATLIN AND ASSOCIATES (1993)
 - MW-18 MONITORING WELLS INSTALLED BY BAKER DURING UST INVESTIGATION (1992 AND 1993)
 - MW-08 MONITORING WELLS INSTALLED DURING A UST INVESTIGATION BY ATEC AND ASSOCIATES (1991)
 - 73CW-02 MONITORING WELLS INSTALLED BY ESE DURING CONFIRMATORY SAMPLING (1990)
 - SW/SD-01 SURFACE WATER/SEDIMENT LOCATION SAMPLED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE I (APRIL-MAY, 1995)
 - F/C-01 FISH/CRAB LOCATION SAMPLED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE I (APRIL-MAY, 1995)

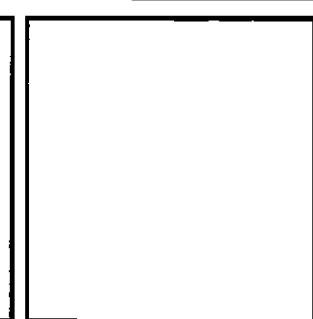
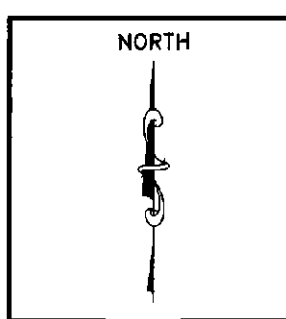


DETAIL A

SOURCE: LANIER SURVEYING CO., APRIL 4, 1996.

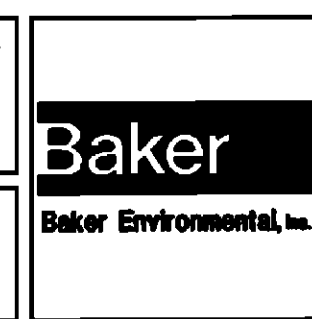
| REVISIONS | |
|-----------|----------------------|
| DRAWN | WJH |
| REVIEWED | JSC |
| S.O.# | 62470-312-0000-07000 |
| CADD# | 312538PP |

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| DRAWN | WJH |
| REVIEWED | JSC |
| S.O.# | 62470-312-0000-07000 |
| CADD# | 312538PP |



SITE 73 - AMPHIBIOUS VEHICLE MAINTENANCE FACILITY
 REMEDIAL INVESTIGATION, CTO-0312
 MARINE CORPS BASE, CAMP LEJEUNE
 NORTH CAROLINA

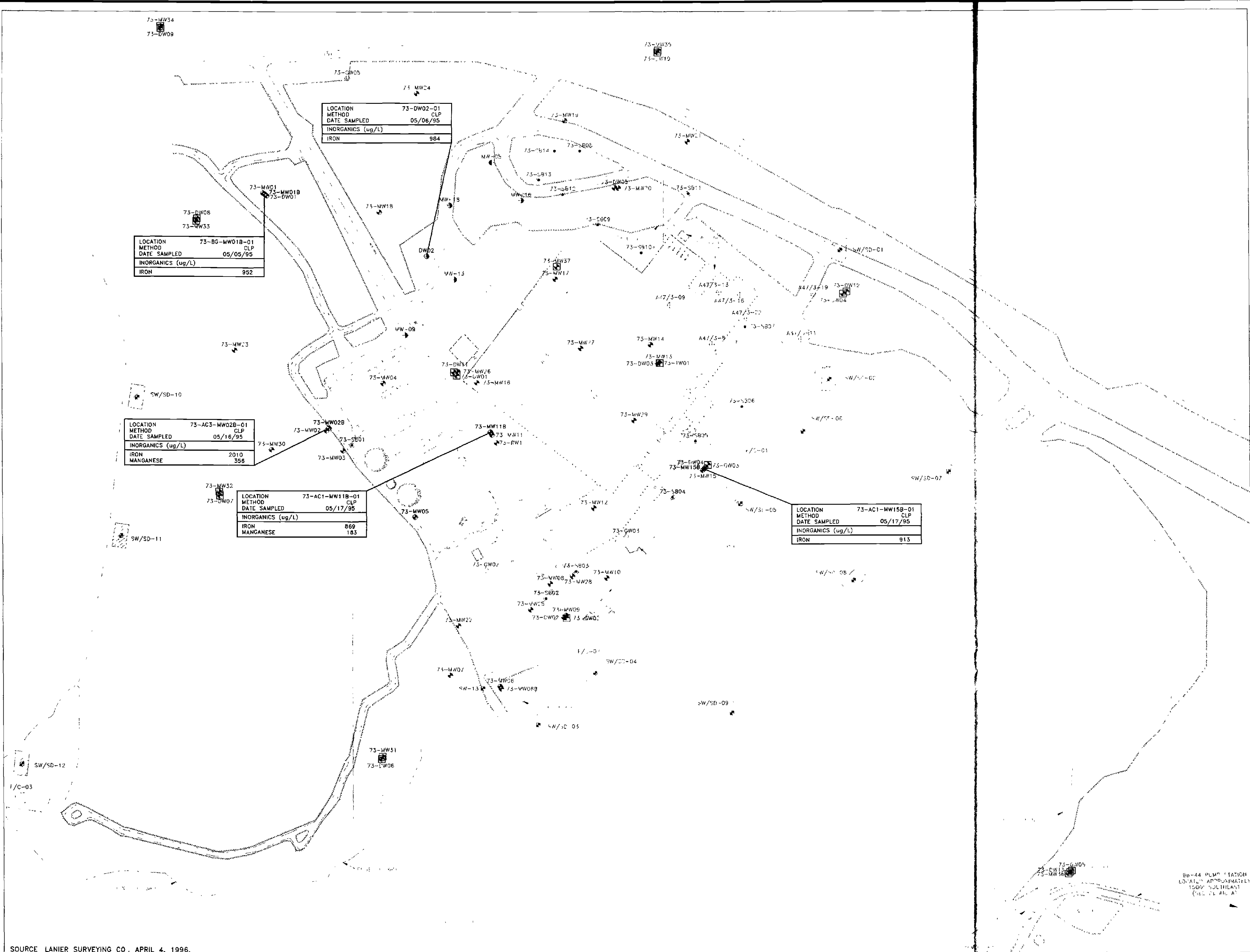
BAKER ENVIRONMENTAL, Inc.
 Coraopolis, Pennsylvania



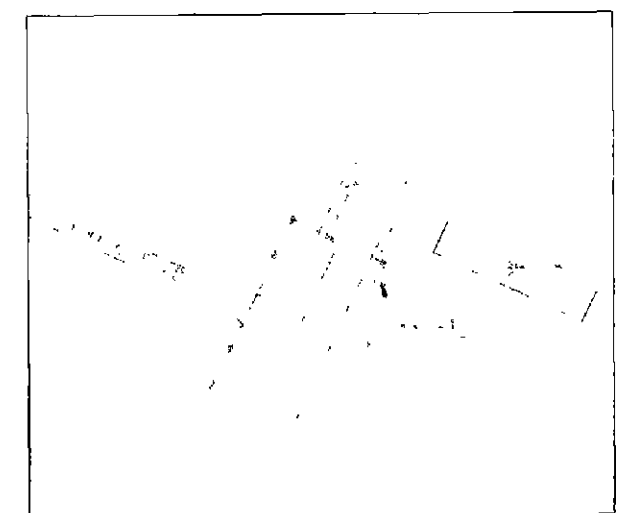
DETECTED VOLATILES IN THE LOWERMOST PORTION OF THE SURFICIAL AQUIFER VIA CLP METHOD (PHASE II)

 SCALE 1" = 150'
 DATE NOVEMBER 1996

FIGURE NO.
4-9



- LEGEND**
- 73-SB01 SOIL BORINGS ADVANCED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE I (APRIL-MAY, 1995)
 - 73-MW01 MONITORING WELLS INSTALLED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE I (APRIL-MAY, 1995)
 - 73-MW31 MONITORING WELLS INSTALLED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE II (FEBRUARY-MARCH, 1996)
 - A47/S-8 MONITORING WELLS INSTALLED DURING UST INVESTIGATION BY GSI AND LAW-CATLIN AND ASSOCIATES (1993)
 - MW-18 MONITORING WELLS INSTALLED BY BAKER DURING UST INVESTIGATION (1992 AND 1993)
 - MW-08 MONITORING WELLS INSTALLED DURING A UST INVESTIGATION BY ATEC AND ASSOCIATES (1991)
 - 730W-02 MONITORING WELLS INSTALLED BY ESE DURING CONFIRMATORY SAMPLING (1990)
 - SW/SD-01 SURFACE WATER/SEDIMENT LOCATION SAMPLED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE I (APRIL-MAY, 1995)
 - F/C-01 FISH/CRAB LOCATION SAMPLED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE I (APRIL-MAY, 1995)



DETAIL A

Bb-44 PLUM LOCATION
 LOCALITY APPROXIMATELY
 1500' SOUTHEAST
 (SEE 73-410-A)

SOURCE LANIER SURVEYING CO., APRIL 4, 1996.

| REVISIONS | |
|-----------|----------------------|
| DRAWN | WJH |
| REVIEWED | JSC |
| S.O.# | 62470-312-0000-07000 |
| CADD# | 312537PP |

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| NORTH | |
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| SITE 73 - AMPHIBIOUS VEHICLE MAINTENANCE FACILITY REMEDIAL INVESTIGATION, CTO-0312 MARINE CORPS BASE, CAMP LEJEUNE NORTH CAROLINA | |
| BAKER ENVIRONMENTAL, Inc. Coraopolis, Pennsylvania | |

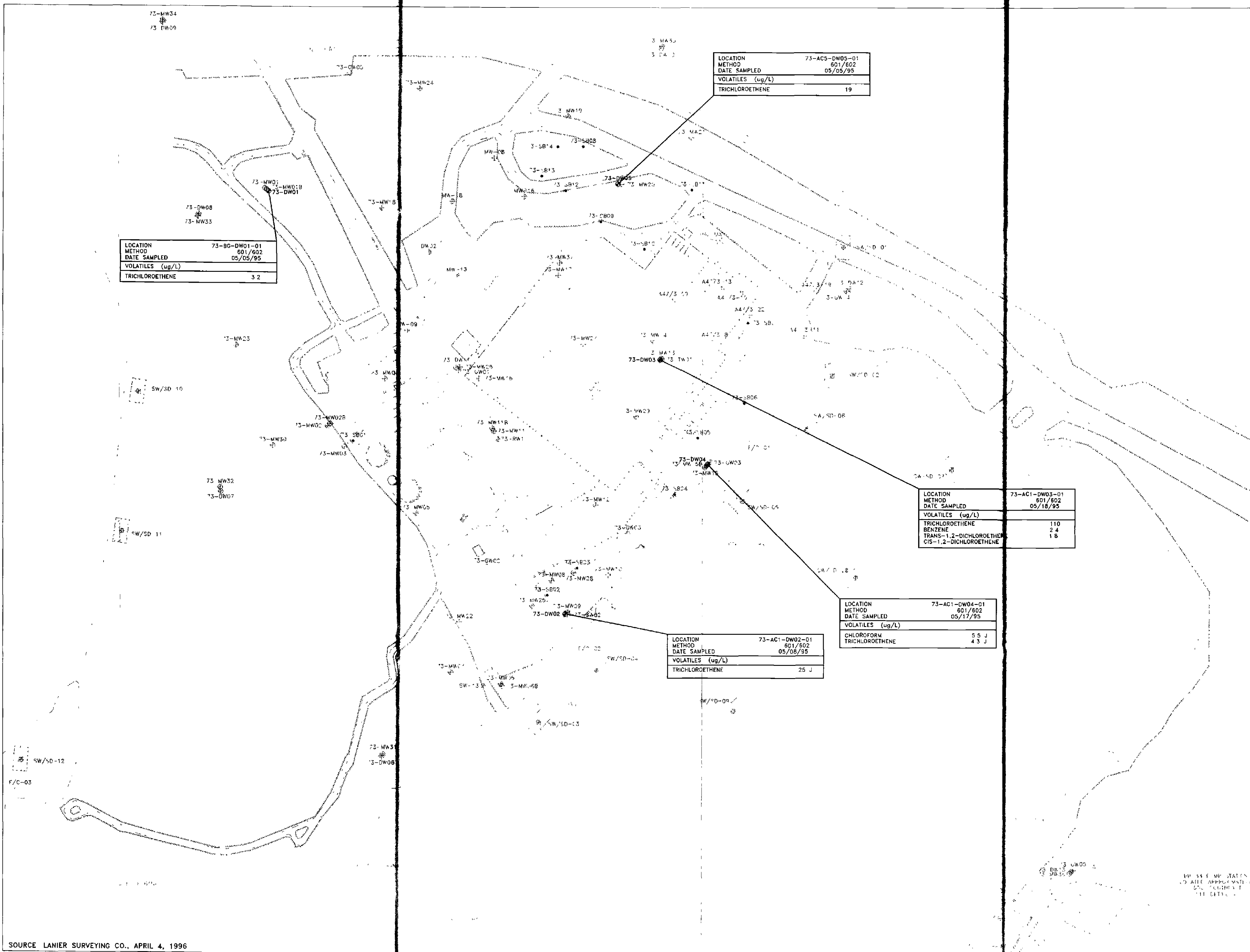
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|---|
| INORGANICS EXCEEDING NCWQS AND/OR FEDERAL MCLs IN LOWERMOST PORTION OF THE SURFICIAL AQUIFER (PHASE I) |
|---|

| | |
|-------|-----------|
| SCALE | 1" = 150' |
|-------|-----------|

| | |
|------|---------------|
| DATE | NOVEMBER 1996 |
|------|---------------|

| | |
|-----------|------|
| FIGURE NO | 4-10 |
|-----------|------|



| | |
|------------------|----------------|
| LOCATION | 73-AC5-DW05-01 |
| METHOD | 601/602 |
| DATE SAMPLED | 05/05/95 |
| VOLATILES (ug/L) | |
| TRICHLOROETHENE | 19 |

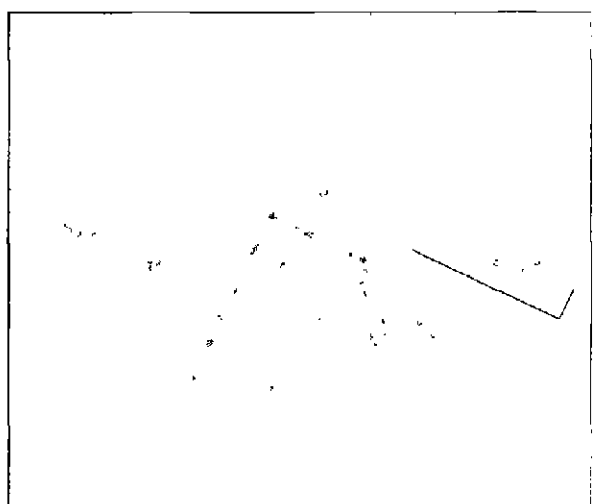
| | |
|------------------|---------------|
| LOCATION | 73-86-DW01-01 |
| METHOD | 601/602 |
| DATE SAMPLED | 05/05/95 |
| VOLATILES (ug/L) | |
| TRICHLOROETHENE | 3.2 |

| | |
|--------------------------|----------------|
| LOCATION | 73-AC1-DW03-01 |
| METHOD | 601/602 |
| DATE SAMPLED | 05/18/95 |
| VOLATILES (ug/L) | |
| TRICHLOROETHENE | 110 |
| BENZENE | 2.4 |
| TRANS-1,2-DICHLOROETHENE | 1.8 |

| | |
|------------------|----------------|
| LOCATION | 73-AC1-DW04-01 |
| METHOD | 601/602 |
| DATE SAMPLED | 05/17/95 |
| VOLATILES (ug/L) | |
| CHLOROFORM | 5.5 J |
| TRICHLOROETHENE | 4.3 J |

| | |
|------------------|----------------|
| LOCATION | 73-AC1-DW02-01 |
| METHOD | 601/602 |
| DATE SAMPLED | 05/08/95 |
| VOLATILES (ug/L) | |
| TRICHLOROETHENE | 25 J |

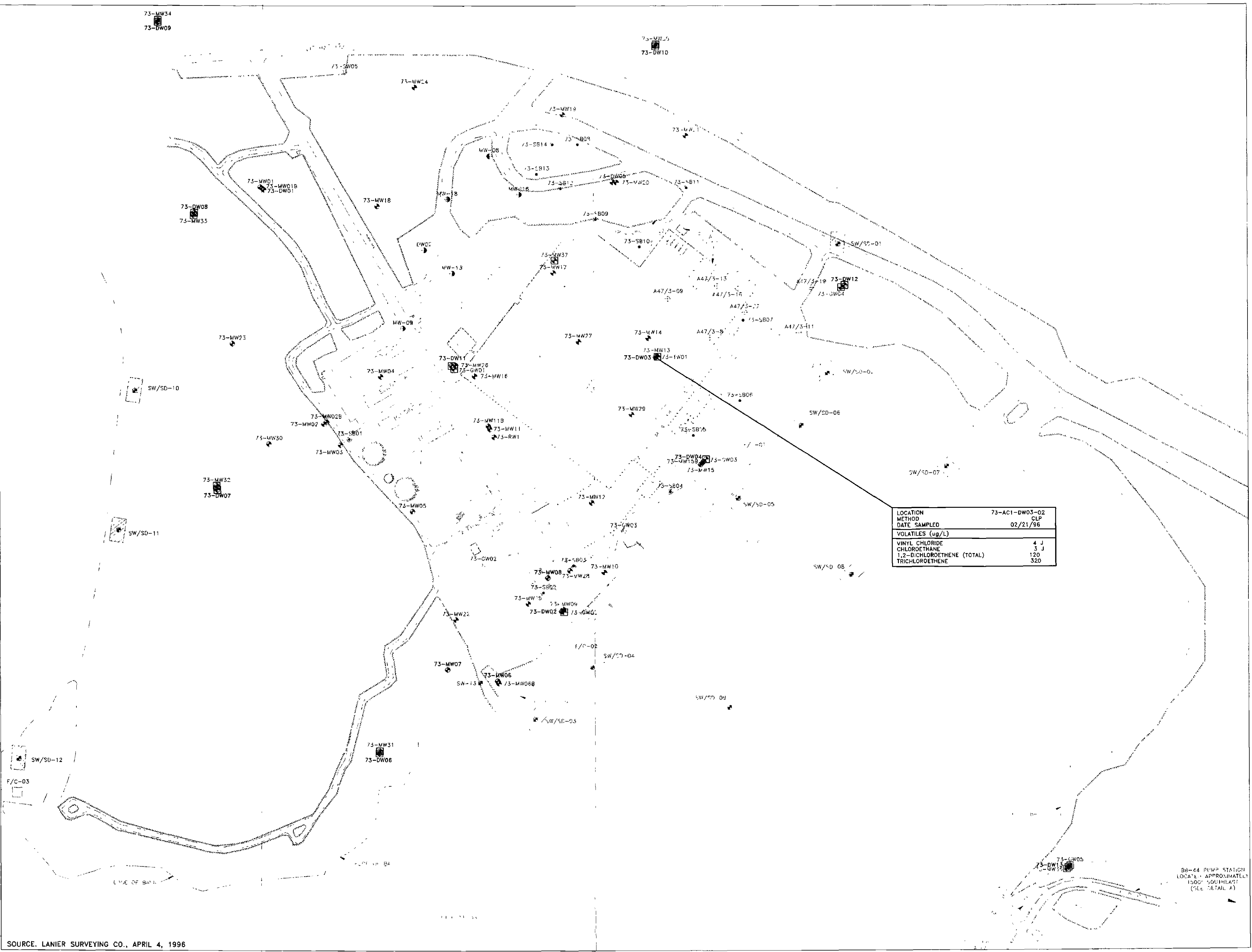
- LEGEND**
- 73-SB01 SOIL BORINGS ADVANCED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE I (APRIL-MAY, 1995)
 - 73-MW01 MONITORING WELLS INSTALLED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE I (APRIL-MAY, 1995)
 - 73-MW31 MONITORING WELLS INSTALLED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE II (FEBRUARY-MARCH, 1996)
 - A47/3-8 MONITORING WELLS INSTALLED DURING UST INVESTIGATION BY GSI AND LAW-CATLIN AND ASSOCIATES (1993)
 - MW-18 MONITORING WELLS INSTALLED BY BAKER DURING UST INVESTIGATION (1992 AND 1993)
 - MW-08 MONITORING WELLS INSTALLED DURING A UST INVESTIGATION BY ATEC AND ASSOCIATES (1991)
 - 73GW-02 MONITORING WELLS INSTALLED BY ESE DURING CONFIRMATORY SAMPLING (1990)
 - SW/SD-01 SURFACE WATER/SEDIMENT LOCATION SAMPLED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE I (APRIL-MAY, 1995)
 - F/C-01 FISH/CRAB LOCATION SAMPLED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE I (APRIL-MAY, 1995)



DETAIL A

SOURCE LANIER SURVEYING CO., APRIL 4, 1996

| | | | | | | |
|---|---|--------------|---|------------------------|---|----------------------------------|
| <p>REVISIONS</p> | <p>DRAWN WJH REVIEWED JSC S.O.# 62470-312-0000-07000 CADD# 312524PP</p> | <p>NORTH</p> | <p>SITE 73 - AMPHIBIOUS VEHICLE MAINTENANCE FACILITY REMEDIAL INVESTIGATION, CTO-0312 MARINE CORPS BASE, CAMP LEJEUNE NORTH CAROLINA</p> | | <p>DETECTED VOLATILES IN THE UPPERMOST PORTION OF CASTLE HAYNE VIA METHOD 601/602 (PHASE I)</p> | <p>FIGURE NO 4-11</p> |
| <p>BAKER ENVIRONMENTAL, Inc. Coraopolis, Pennsylvania</p> | | | | <p>SCALE 1" = 150'</p> | <p>DATE NOVEMBER 1996</p> | |



- LEGEND**
- 73-SB01 SOIL BORINGS ADVANCED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE I (APRIL-MAY, 1995)
 - 73-MW01 MONITORING WELLS INSTALLED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE I (APRIL-MAY, 1995)
 - 73-MW31 MONITORING WELLS INSTALLED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE II (FEBRUARY-MARCH, 1996)
 - A47/3-B MONITORING WELLS INSTALLED DURING UST INVESTIGATION BY GSI AND LAW-CATLIN AND ASSOCIATES (1993)
 - MW-18 MONITORING WELLS INSTALLED BY BAKER DURING UST INVESTIGATION (1992 AND 1993)
 - MW-08 MONITORING WELLS INSTALLED DURING A UST INVESTIGATION BY ATEC AND ASSOCIATES (1991)
 - 73GW-02 MONITORING WELLS INSTALLED BY ESE DURING CONFIRMATORY SAMPLING (1990)
 - SW/SD-01 SURFACE WATER/SEDIMENT LOCATION SAMPLED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE I (APRIL-MAY, 1995)
 - F/C-01 FISH/CRAB LOCATION SAMPLED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE I (APRIL-MAY, 1995)

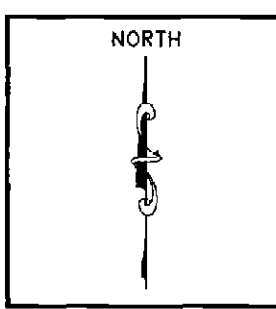


DETAIL A

SOURCE: LANIER SURVEYING CO., APRIL 4, 1996

| | |
|-----------|----------------------|
| REVISIONS | |
| DRAWN | WJH |
| REVIEWED | JSC |
| S.O.# | 62470-312-0000-07000 |
| CADD# | 312530PP |

| | |
|----------|----------------------|
| DRAWN | WJH |
| REVIEWED | JSC |
| S.O.# | 62470-312-0000-07000 |
| CADD# | 312530PP |



SITE 73 - AMPHIBIOUS VEHICLE MAINTENANCE FACILITY
 REMEDIAL INVESTIGATION, CTO-0312
 MARINE CORPS BASE, CAMP LEJEUNE
 NORTH CAROLINA

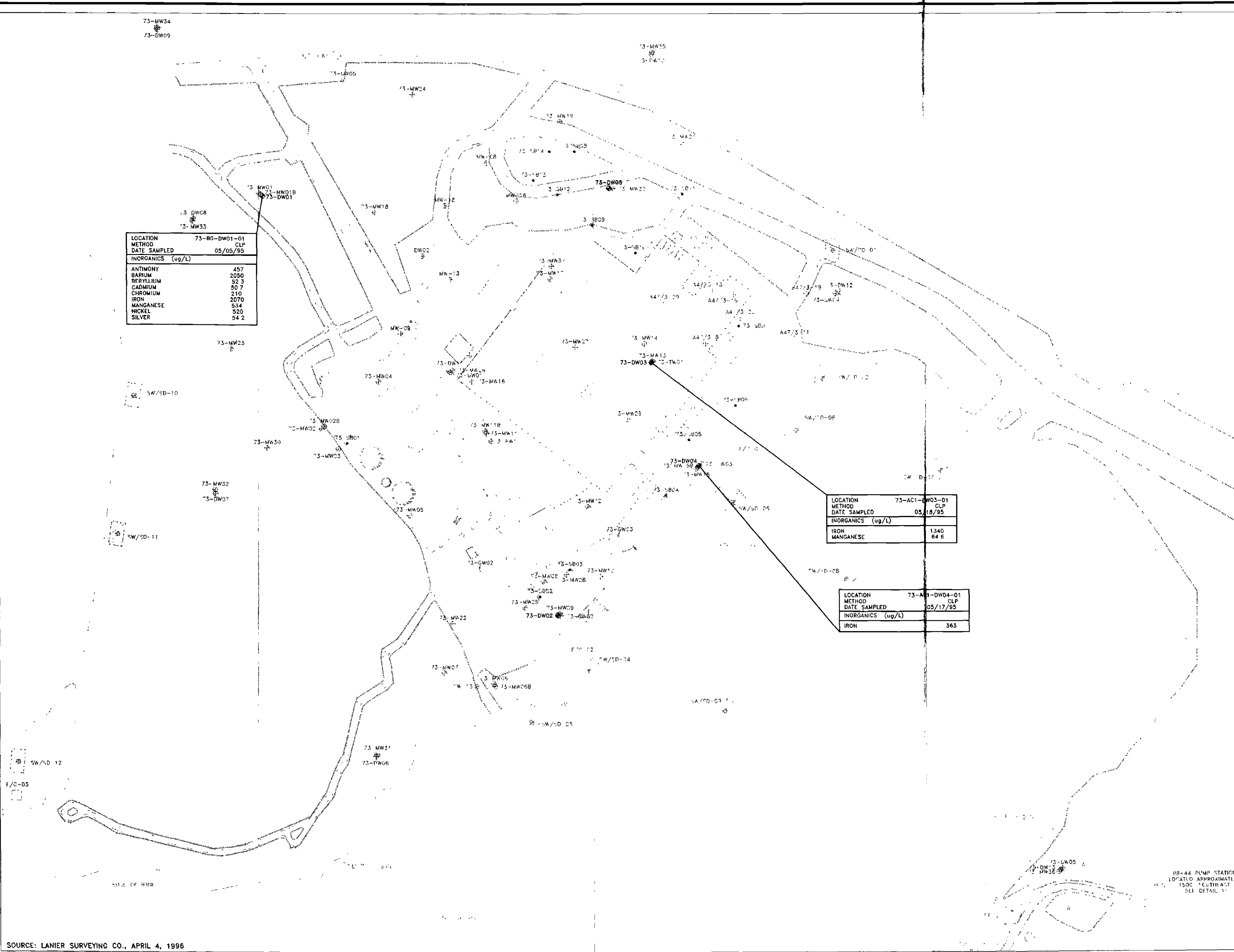
BAKER ENVIRONMENTAL, Inc.
 Coraopolis, Pennsylvania



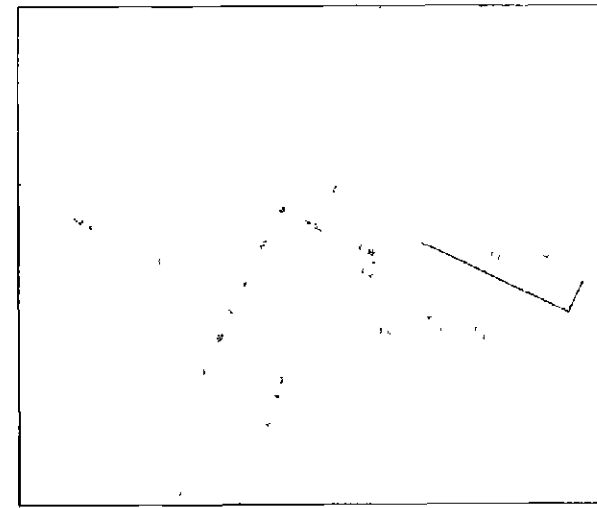
DETECTED VOLATILES IN UPPERMOST PORTION OF THE CASTLE HAYNE AQUIFER VIA CLP METHOD (PHASE II)

 SCALE 1" = 150'
 DATE NOVEMBER 1996

FIGURE NO.
4-12



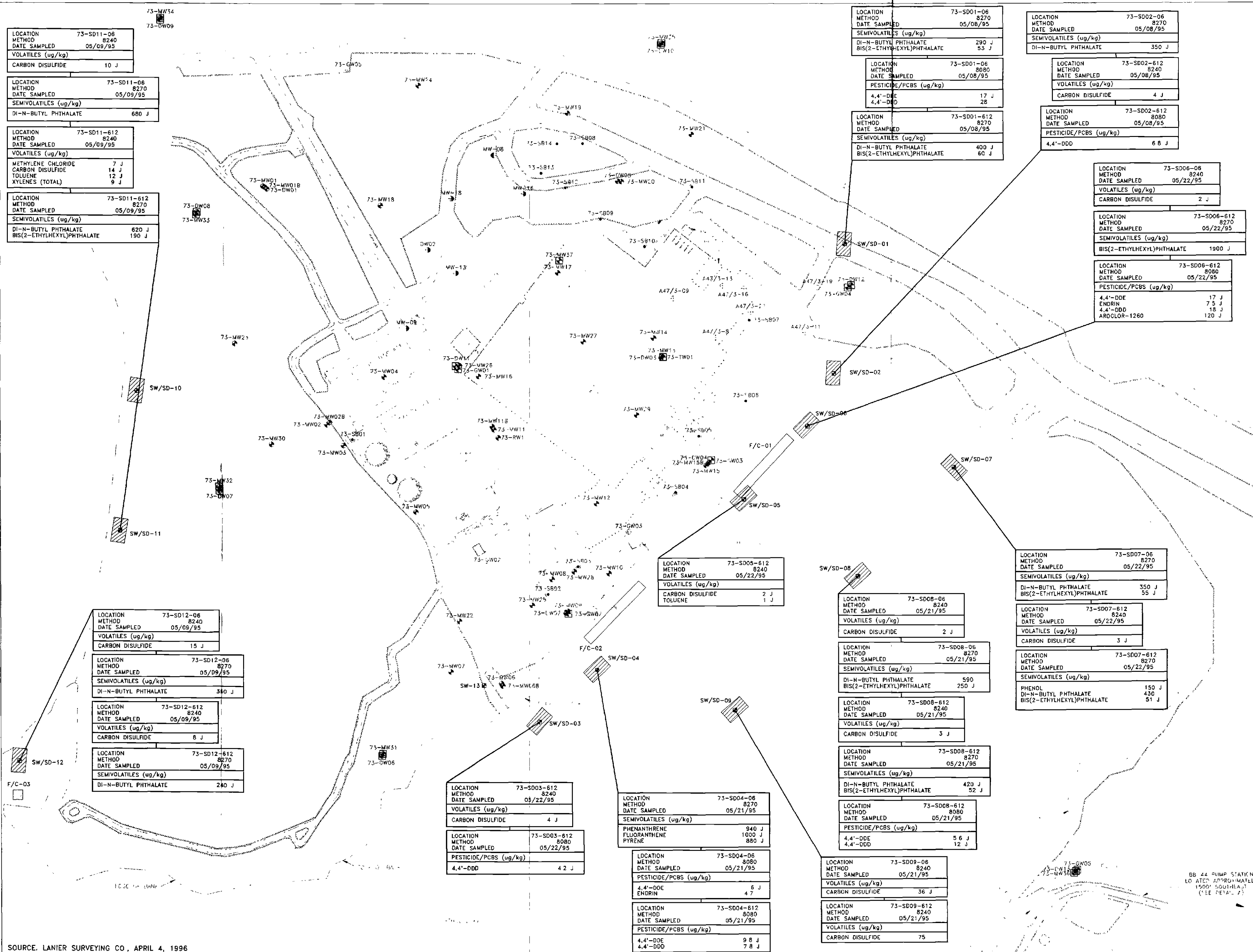
- LEGEND**
- 73-SB01 SOIL BORINGS ADVANCED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE I (APRIL-MAY, 1995)
 - 73-MW01 MONITORING WELLS INSTALLED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE I (APRIL-MAY, 1995)
 - 73-MW31 MONITORING WELLS INSTALLED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE II (FEBRUARY-MARCH, 1996)
 - A47/3-8 MONITORING WELLS INSTALLED DURING UST INVESTIGATION BY GSI AND LAW-CATLIN AND ASSOCIATES (1993)
 - MW-18 MONITORING WELLS INSTALLED BY BAKER DURING UST INVESTIGATION (1992 AND 1993)
 - MW-08 MONITORING WELLS INSTALLED DURING A UST INVESTIGATION BY ATEC AND ASSOCIATES (1991)
 - 73GW-02 MONITORING WELLS INSTALLED BY ESE DURING CONFIRMATORY SAMPLING (1990)
 - SW/SD-01 SURFACE WATER/SEDIMENT LOCATION SAMPLED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE I (APRIL-MAY, 1995)
 - F/C-01 FISH/CRAB LOCATION SAMPLED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE I (APRIL-MAY, 1995)



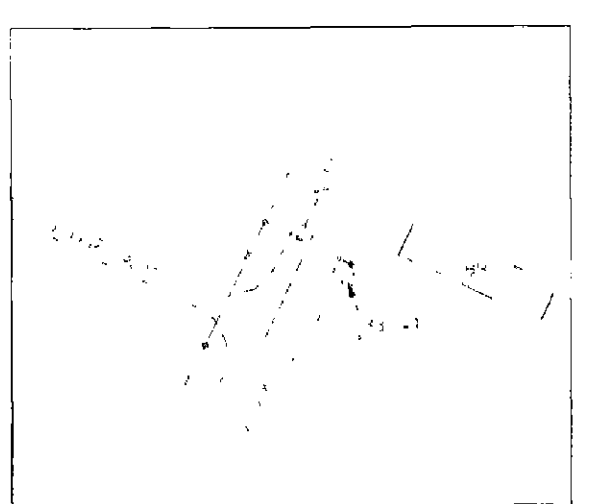
DETAIL A

SOURCE: LANIER SURVEYING CO., APRIL 4, 1996

| | | | | | | |
|------------------|--|--------------|--|----------------------------------|--|---|
| <p>REVISIONS</p> | <p>DRAWN WJH</p> <p>REVIEWED JSC</p> <p>S.O.# 62470-312-0000-07000</p> <p>CADD# 312527PP</p> | <p>NORTH</p> | <p>SITE 73 - AMPHIBIOUS VEHICLE MAINTENANCE FACILITY</p> <p>REMEDIAL INVESTIGATION, CTO-0312 MARINE CORPS BASE, CAMP LEJEUNE NORTH CAROLINA</p> | <p>Baker Environmental, Inc.</p> | <p>DETECTED INORGANICS EXCEEDING NCWQS AND/OR FEDERAL MCLs IN THE UPPERMOST PORTION OF THE CASTLE HAYNE AQUIFER (PHASE I)</p> | <p>FIGURE NO</p> <p style="font-size: 2em;">4-13</p> |
| | | | <p>BAKER ENVIRONMENTAL, Inc.</p> <p>Coraopolis, Pennsylvania.</p> | <p>SCALE 1" = 150'</p> | | <p>DATE NOVEMBER 1996</p> |



- LEGEND**
- 73-SB01 SOIL BORINGS ADVANCED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE I (APRIL-MAY, 1995)
 - 73-MW01 MONITORING WELLS INSTALLED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE I (APRIL-MAY, 1995)
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 - F/C-01 FISH/CRAB LOCATION SAMPLED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE I (APRIL-MAY, 1995)

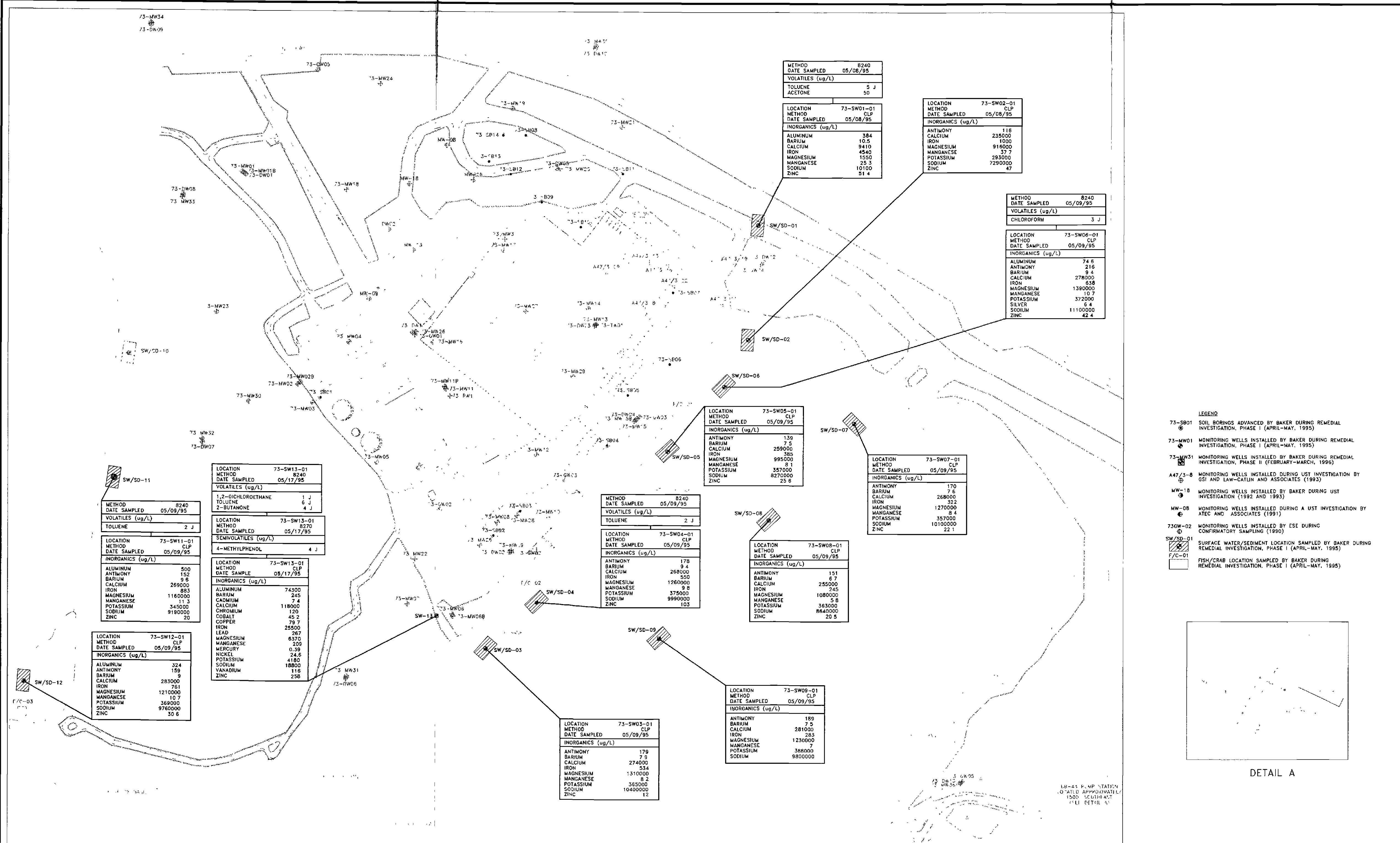


DETAIL A

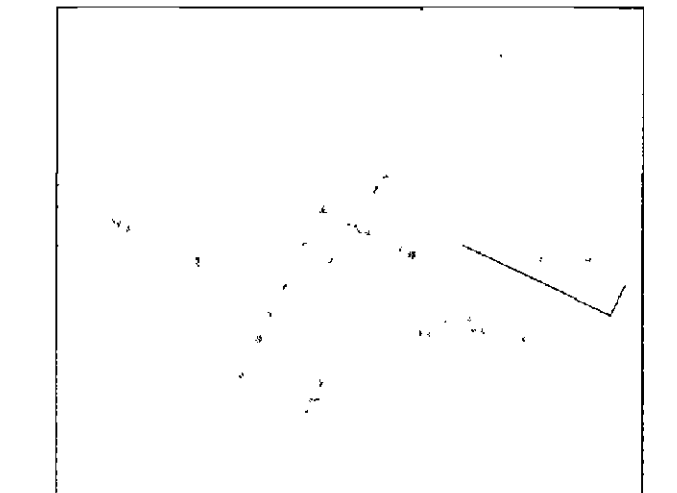
BB 44 PUMP STATION
 LOCATED APPROXIMATELY
 1500' SOUTHWEST
 (SEE DETAIL 2)

SOURCE: LANIER SURVEYING CO., APRIL 4, 1996

| | | | | | | |
|------------------|--|--------------|--|------------------------|---|-----------------------------------|
| <p>REVISIONS</p> | <p>DRAWN WJH REVIEWED JSC S.O.# 62470-312-0000-07000 CADD# 312565PP</p> | <p>NORTH</p> | <p>SITE 73 - AMPHIBIOUS VEHICLE MAINTENANCE FACILITY REMEDIAL INVESTIGATION, CTO-0312 MARINE CORPS BASE, CAMP LEJEUNE NORTH CAROLINA</p> | | <p>DETECTED VOLATILES (8240), SEMIVOLATILES (METHOD 8270), PESTICIDES/PCBS (METHOD 8080) IN SEDIMENT</p> | <p>FIGURE NO. 4-14</p> |
| | | | <p>BAKER ENVIRONMENTAL, Inc. Coraopolis, Pennsylvania</p> | <p>SCALE 1" = 150'</p> | | <p>DATE NOVEMBER 1996</p> |



- LEGEND**
- 73-SB01 SOIL BORINGS ADVANCED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE I (APRIL-MAY, 1995)
 - 73-MW01 MONITORING WELLS INSTALLED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE I (APRIL-MAY, 1995)
 - 73-MW31 MONITORING WELLS INSTALLED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE II (FEBRUARY-MARCH, 1996)
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 - F/C-01 FISH/CRAB LOCATION SAMPLED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE I (APRIL-MAY, 1995)



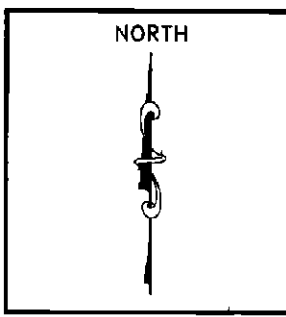
DETAIL A

44-45 PUMP STATION
 LOCATED APPROXIMATELY
 1500' SOUTH EAST
 OF DETAIL A

SOURCE: LANIER SURVEYING CO., APRIL 4, 1996

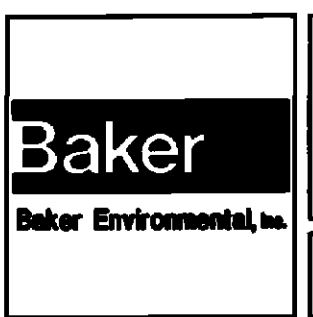
| REVISIONS | |
|-----------|--|
| | |
| | |

| | |
|----------|----------------------|
| DRAWN | WJH |
| REVIEWED | JSC |
| S.O.# | 62470-312-0000-07000 |
| CADD# | 312561PP |



SITE 73 - AMPHIBIOUS VEHICLE MAINTENANCE FACILITY
 REMEDIAL INVESTIGATION, CTO-0312
 MARINE CORPS BASE, CAMP LEJEUNE
 NORTH CAROLINA

BAKER ENVIRONMENTAL, Inc.
 Coraopolis, Pennsylvania



**ANALYTICAL RESULTS FOR
 SURFACE WATER**

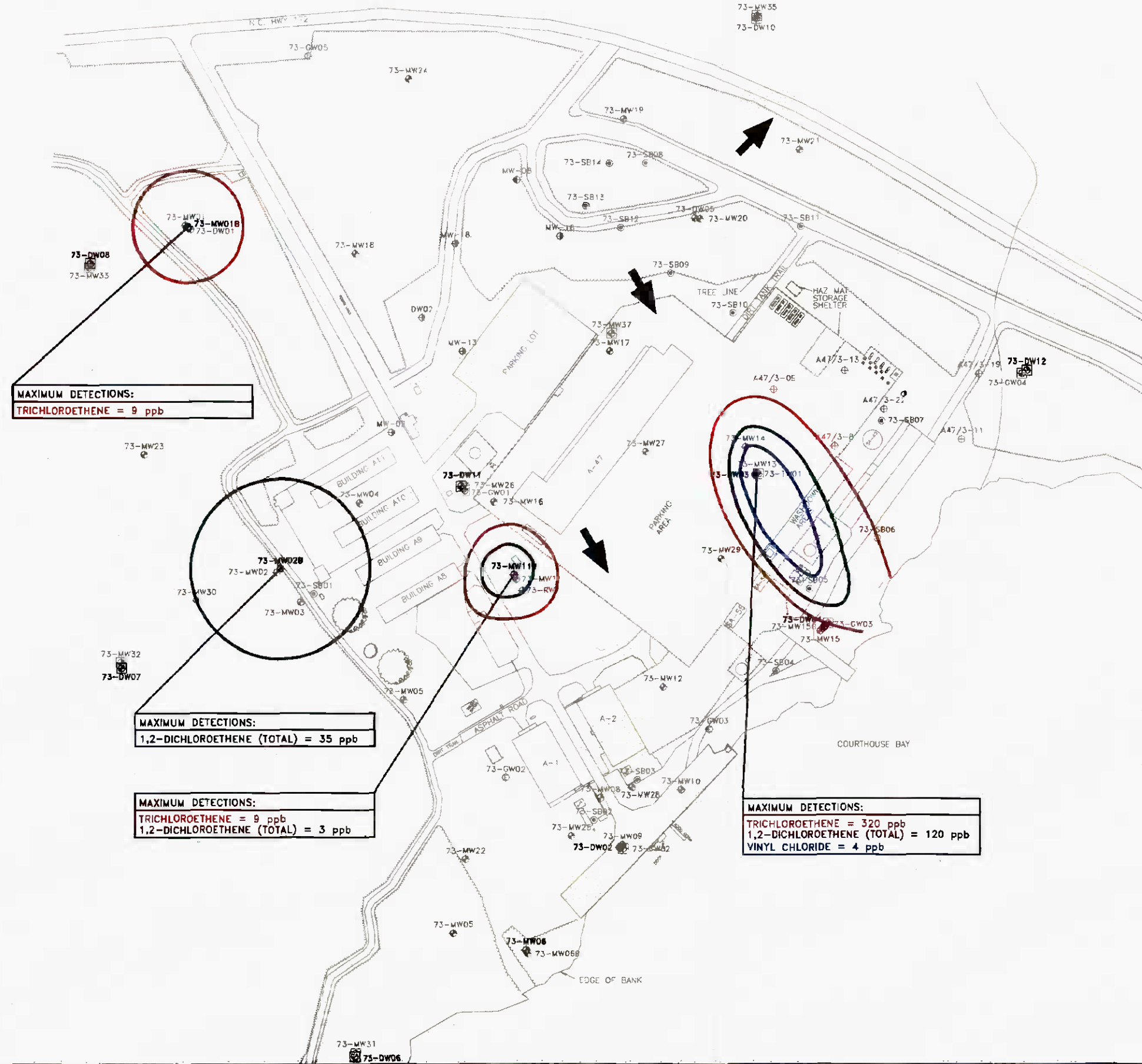
SCALE 1" = 150'

DATE NOVEMBER 1996

FIGURE NO.
4-16

73-MW34
73-DW09

73-MW35
73-DW10



LEGEND

- 73-SB01 SOIL BORINGS ADVANCED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE I (APRIL-MAY, 1995)
- 73-MW01 MONITORING WELLS INSTALLED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE I (APRIL-MAY, 1995)
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- 73GW-02 MONITORING WELLS INSTALLED BY ESE DURING CONFIRMATORY SAMPLING (1990)
- ➔ APPROXIMATE DIRECTION OF GROUNDWATER FLOW

NOTES:

- THE FOLLOWING ISOCONCENTRATION LINES DEFINE THE AREAS OF CONCERN:
- TRICHLOROETHENE = 1.0 PARTS PER BILLION (ppb)
- 1,2-DICHLOROETHENE (TOTAL) = 1.0 ppb
- VINYL CHLORIDE = 1.0 ppb
- PHASE II DATA FROM THE UPPER PORTION OF THE CASTLE HAYNE AQUIFER AND LOWER PORTION OF THE SURFICIAL AQUIFER, WAS USED TO DEVELOP THE ISOCONCENTRATION LINES.

SOURCE: LANIER SURVEYING CO., APRIL 4, 1996.

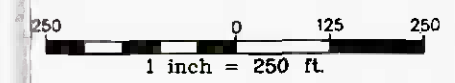
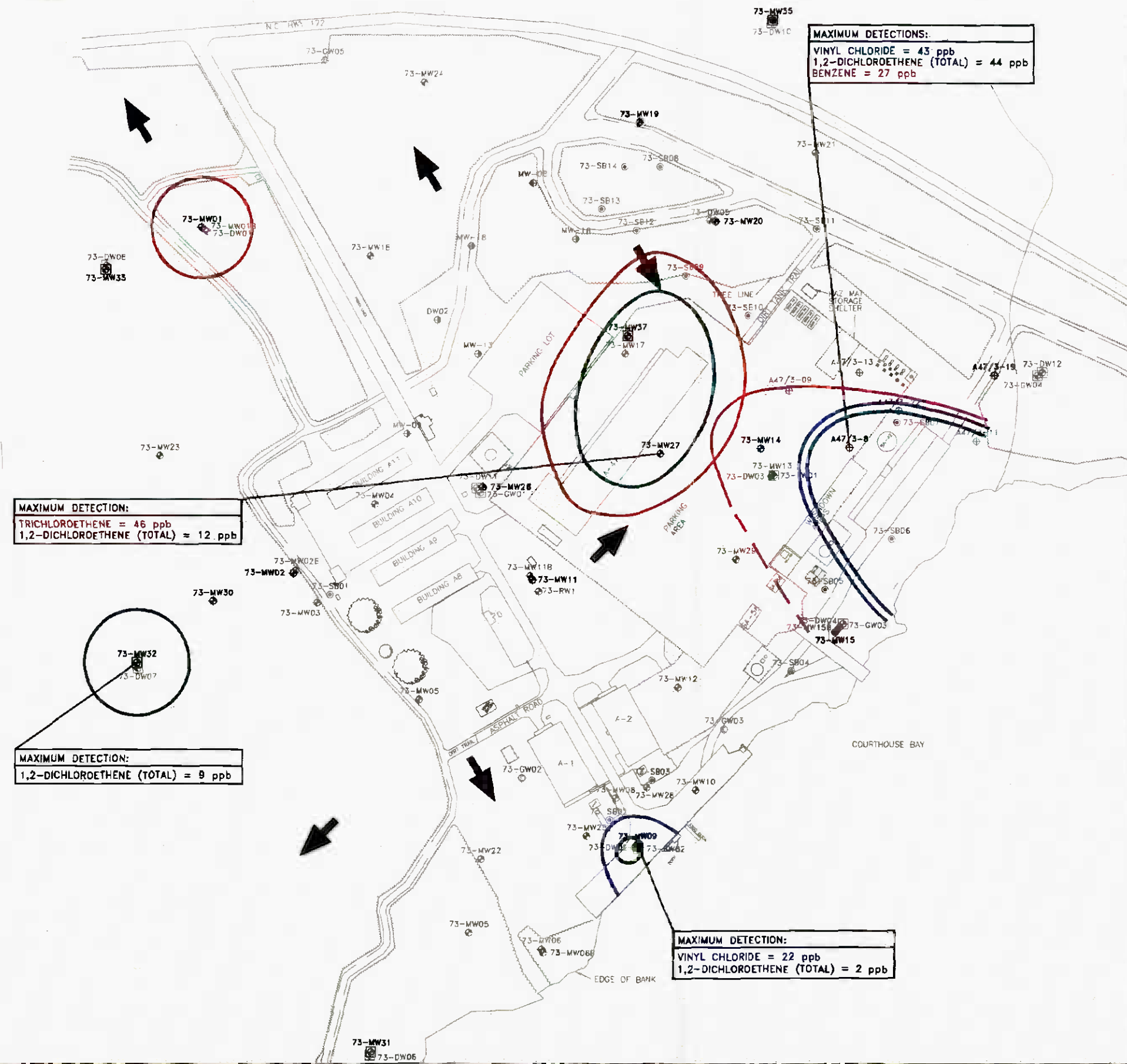


FIGURE 4-17
ISOCONCENTRATION MAP DEFINING
VOC DETECTIONS IN THE LOWER PORTION OF
THE SURFICIAL AQUIFER AND UPPER PORTION
OF THE CASTLE HAYNE AQUIFER
SITE 73 - AMPHIBIOUS VEHICLE MAINTENANCE FACILITY
REMEDIAL INVESTIGATION, CTO-0312
MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA

01767VB6Y



LEGEND

- 73-SB01 SOIL BORINGS ADVANCED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE I (APRIL-MAY, 1995)
- 73-MW01 MONITORING WELLS INSTALLED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE I (APRIL-MAY, 1995)
- 73-MW31 MONITORING WELLS INSTALLED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE II (FEBRUARY-MARCH, 1996)
- A47/3-8 MONITORING WELLS INSTALLED DURING UST INVESTIGATION BY GSI AND LAW-CATLIN AND ASSOCIATES (1993)
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- MW-08 MONITORING WELLS INSTALLED DURING A UST INVESTIGATION BY ATEC AND ASSOCIATES (1991)
- 73-MW-02 MONITORING WELLS INSTALLED BY ESE DURING CONFIRMATORY SAMPLING (1990)
- ➔ APPROXIMATE DIRECTION OF GROUNDWATER FLOW

NOTES:

- THE FOLLOWING ISOCONCENTRATION LINES DEFINE THE AREAS OF CONCERN:
- TRICHLOROETHENE = 1.0 PARTS PER BILLION (ppb)
- CIS-1,2-DICHLOROETHENE (TOTAL) = 1.0 ppb
- VINYL CHLORIDE = 1.0 ppb
- BENZENE = 1.0 ppb
- PHASE II DATA FROM THE UPPER PORTION OF THE SURFICAL AQUIFER WAS USED TO DEVELOP ISOCONCENTRATION LINES.

SOURCE: LANIER SURVEYING CO., APRIL 4, 1996.

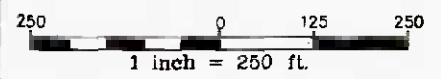
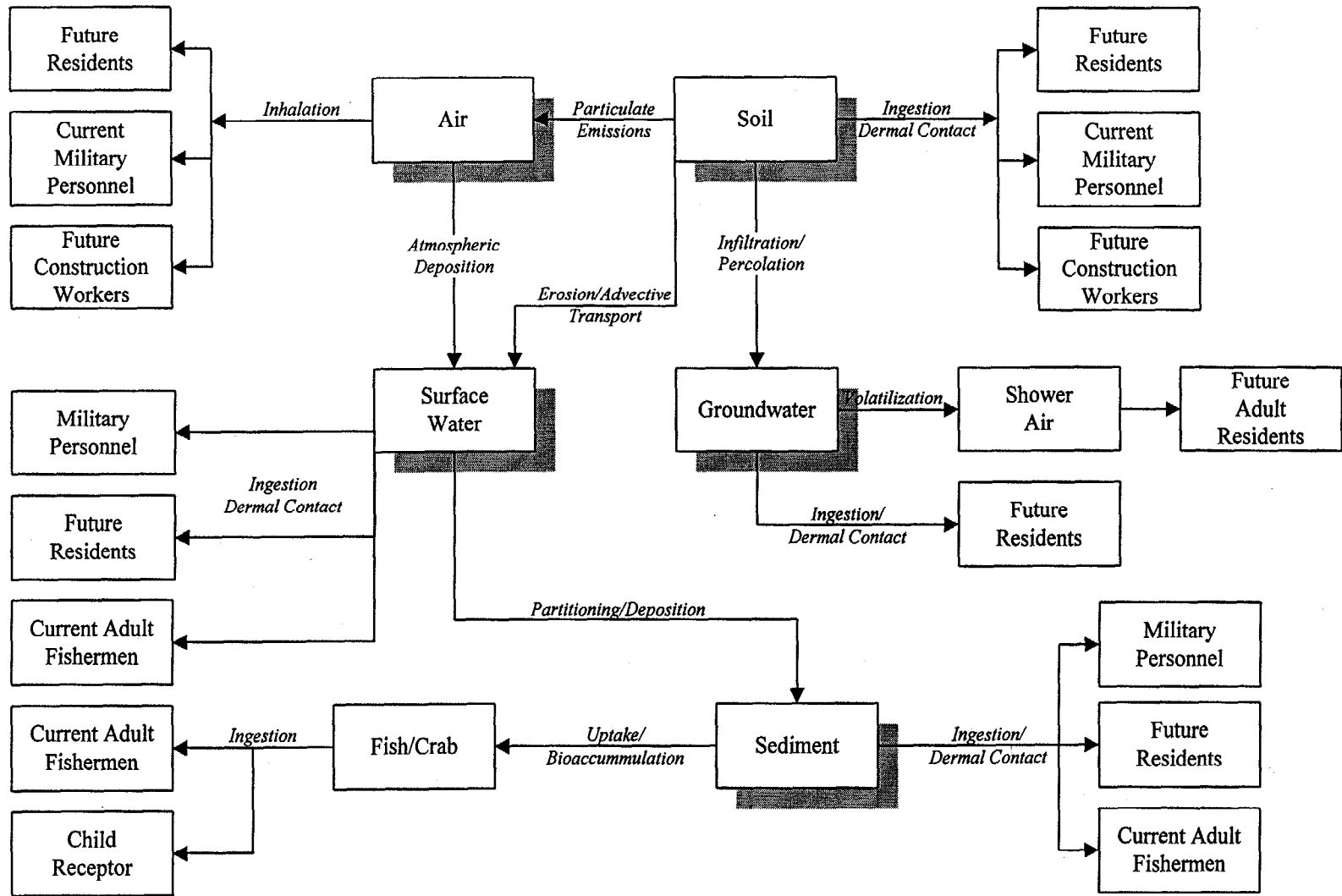


FIGURE 4-18
ISOCONCENTRATION MAP DEFINING
VOC DETECTIONS IN THE
UPPER PORTION OF THE SURFICAL AQUIFER
SITE 73 - AMPHIBIOUS VEHICLE MAINTENANCE FACILITY
FEASIBILITY STUDY, CTO-0312

MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA

FIGURE 6-1

CONCEPTUAL SITE MODEL
FOR CURRENT AND FUTURE HUMAN RECEPTORS
SITE 73 - AMPHIBIOUS VEHICLE MAINTENANCE FACILITY
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJEUNE, NORTH CAROLINA



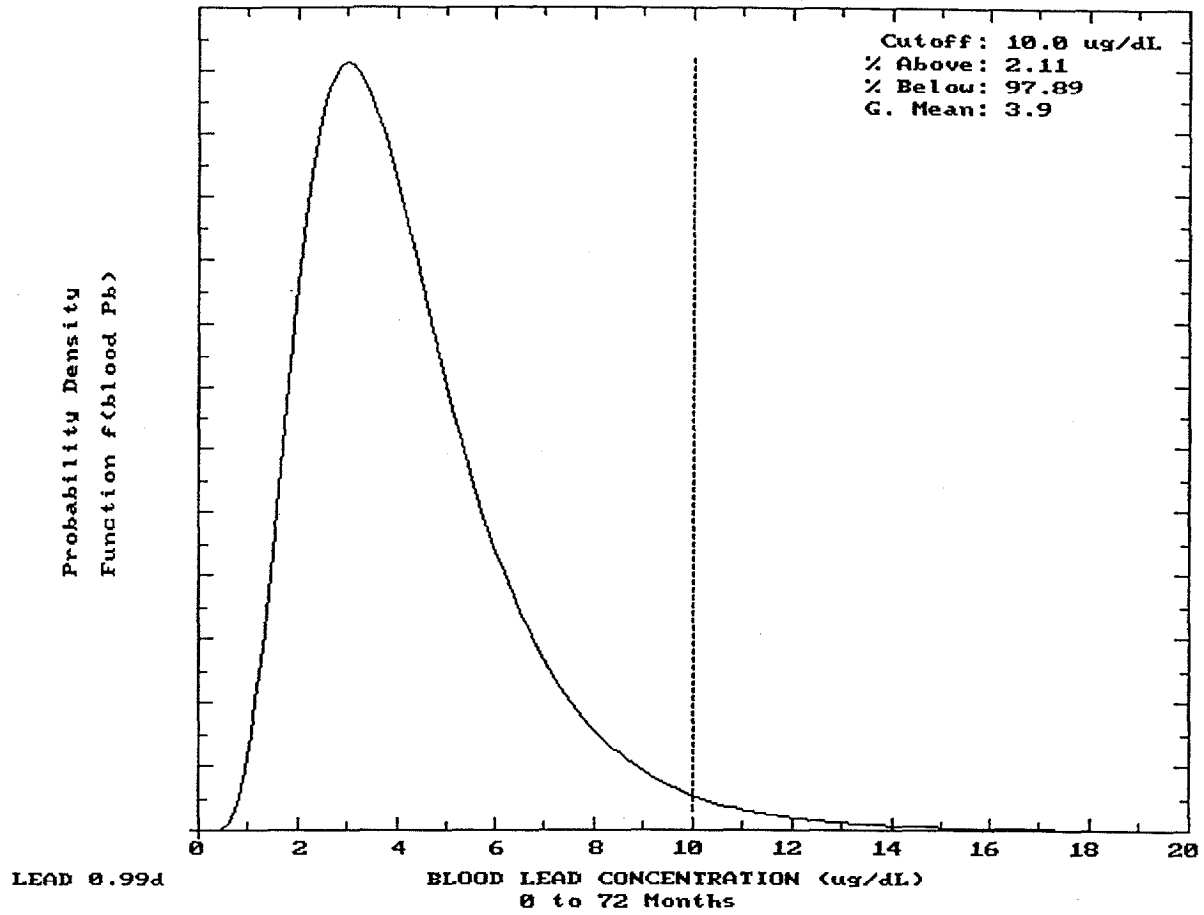
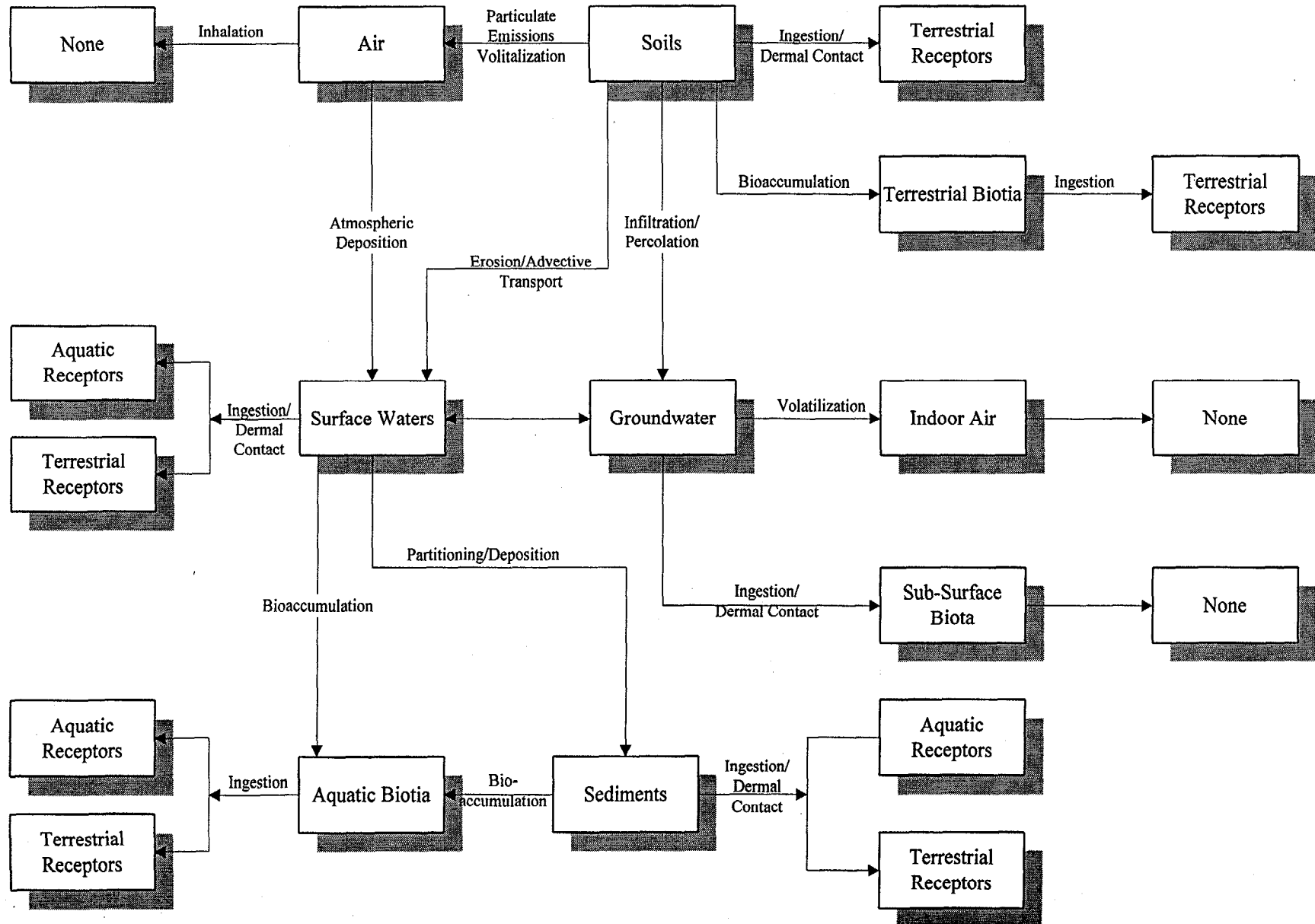
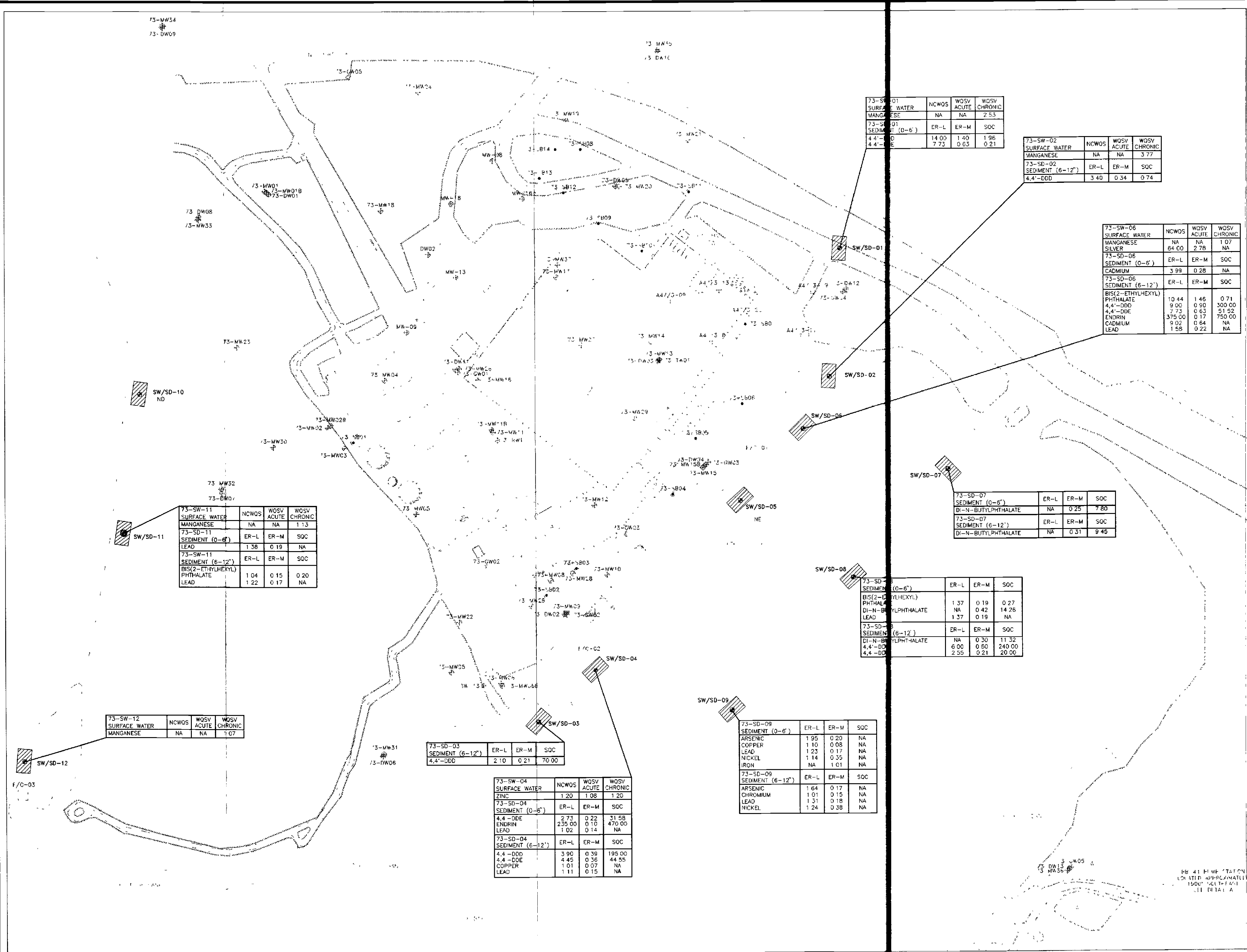


Figure 6-2
Probability Distribution of Blood Lead Levels - Site 73 Aquatic Biota Exposure
Site 73 - Amphibious Vehicle Maintenance Facility
Remedial Investigation, CTO-0312
MCB, Camp Lejeune, North Carolina

FIGURE 7-1

CONCEPTUAL EXPOSURE MODEL FOR ECOLOGICAL RECEPTORS
SITE 73 - AMPHIBIOUS VEHICLE MAINTENANCE FACILITY
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJEUNE, NORTH CAROLINA





| | | | | |
|----------|-----------------|-------|------------|--------------|
| 73-SW-01 | SURFACE WATER | NCWQS | WQSV ACUTE | WQSV CHRONIC |
| | MANGANESE | NA | NA | 2.53 |
| 73-SD-01 | SEDIMENT (0-6") | ER-L | ER-M | SQC |
| 4,4'-DDE | | 14.00 | 1.40 | 1.96 |
| 4,4'-DDD | | 7.73 | 0.65 | 0.21 |

| | | | | |
|----------|------------------|-------|------------|--------------|
| 73-SW-02 | SURFACE WATER | NCWQS | WQSV ACUTE | WQSV CHRONIC |
| | MANGANESE | NA | NA | 3.77 |
| 73-SD-02 | SEDIMENT (6-12") | ER-L | ER-M | SQC |
| 4,4'-DDD | | 3.40 | 0.34 | 0.74 |

| | | | | |
|----------|-----------------------------|--------|------------|--------------|
| 73-SW-06 | SURFACE WATER | NCWQS | WQSV ACUTE | WQSV CHRONIC |
| | MANGANESE | NA | NA | 1.07 |
| | SILVER | 64.00 | 2.78 | NA |
| 73-SD-06 | SEDIMENT (0-6") | ER-L | ER-M | SQC |
| | CADMIUM | 3.99 | 0.28 | NA |
| 73-SD-06 | SEDIMENT (6-12") | ER-L | ER-M | SQC |
| | BIS(2-ETHYLHEXYL) PHTHALATE | 10.44 | 1.46 | 0.71 |
| | 4,4'-DDD | 9.00 | 0.90 | 300.00 |
| | 4,4'-DDE | 7.73 | 0.63 | 91.52 |
| | ENDRIN | 375.00 | 0.17 | 750.00 |
| | CADMIUM | 9.02 | 0.64 | NA |
| | LEAD | 1.58 | 0.22 | NA |

| | | | | |
|----------|-----------------------------|-------|------------|--------------|
| 73-SW-11 | SURFACE WATER | NCWQS | WQSV ACUTE | WQSV CHRONIC |
| | MANGANESE | NA | NA | 1.13 |
| 73-SD-11 | SEDIMENT (0-6") | ER-L | ER-M | SQC |
| | LEAD | 1.38 | 0.19 | NA |
| 73-SW-11 | SEDIMENT (6-12") | ER-L | ER-M | SQC |
| | BIS(2-ETHYLHEXYL) PHTHALATE | 1.04 | 0.15 | 0.20 |
| | LEAD | 1.22 | 0.17 | NA |

| | | | | |
|----------|---------------------|------|------|------|
| 73-SD-07 | SEDIMENT (0-6") | ER-L | ER-M | SQC |
| | DI-N-BUTYLPHthalate | NA | 0.25 | 7.80 |
| 73-SD-07 | SEDIMENT (6-12") | ER-L | ER-M | SQC |
| | DI-N-BUTYLPHthalate | NA | 0.31 | 9.45 |

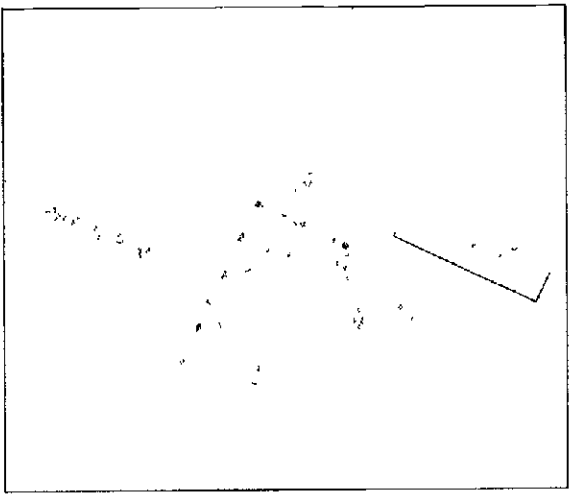
| | | | | |
|----------|-----------------------------|------|------|--------|
| 73-SD-08 | SEDIMENT (0-6") | ER-L | ER-M | SQC |
| | BIS(2-ETHYLHEXYL) PHTHALATE | 1.37 | 0.19 | 0.27 |
| | DI-N-BUTYLPHthalate | NA | 0.42 | 14.26 |
| | LEAD | 1.37 | 0.19 | NA |
| 73-SD-08 | SEDIMENT (6-12") | ER-L | ER-M | SQC |
| | DI-N-BUTYLPHthalate | NA | 0.30 | 11.32 |
| | 4,4'-DDE | 6.00 | 0.60 | 240.00 |
| | 4,4'-DDD | 2.55 | 0.21 | 20.00 |

| | | | | |
|----------|------------------|------|------|-------|
| 73-SD-03 | SEDIMENT (6-12") | ER-L | ER-M | SQC |
| | 4,4'-DDD | 2.10 | 0.21 | 70.00 |

| | | | | |
|----------|------------------|--------|------------|--------------|
| 73-SW-04 | SURFACE WATER | NCWQS | WQSV ACUTE | WQSV CHRONIC |
| | ZINC | 1.20 | 1.08 | 1.20 |
| 73-SD-04 | SEDIMENT (0-6") | ER-L | ER-M | SQC |
| | 4,4'-DDE | 2.73 | 0.22 | 31.58 |
| | ENDRIN | 235.00 | 0.10 | 470.00 |
| | LEAD | 1.02 | 0.14 | NA |
| 73-SD-04 | SEDIMENT (6-12") | ER-L | ER-M | SQC |
| | 4,4'-DDD | 3.90 | 0.39 | 195.00 |
| | 4,4'-DDE | 4.45 | 0.36 | 44.55 |
| | COPPER | 1.01 | 0.07 | NA |
| | LEAD | 1.11 | 0.15 | NA |

| | | | | |
|----------|------------------|------|------|-----|
| 73-SD-09 | SEDIMENT (0-6") | ER-L | ER-M | SQC |
| | ARSENIC | 1.95 | 0.20 | NA |
| | COPPER | 1.10 | 0.08 | NA |
| | LEAD | 1.23 | 0.17 | NA |
| | NICKEL | 1.14 | 0.35 | NA |
| | IRON | NA | 1.01 | NA |
| 73-SD-09 | SEDIMENT (6-12") | ER-L | ER-M | SQC |
| | ARSENIC | 1.64 | 0.17 | NA |
| | CHROMIUM | 1.01 | 0.15 | NA |
| | LEAD | 1.31 | 0.18 | NA |
| | NICKEL | 1.24 | 0.38 | NA |

- LEGEND**
- SW/SD-01 SURFACE WATER/SEDIMENT LOCATION SAMPLED BY BAKER DURING REMEDIAL INVESTIGATION, PHASE I (APRIL-MAY, 1995)
 - NA NOT AVAILABLE (SAMPLE COULD NOT BE ACCESSED)
 - NE NO EXCEEDANCES
 - ND NO DATA (SAMPLE COULD NOT BE ACCESSED)
 - NCWQS NORTH CAROLINA WATER QUALITY STANDARD
 - WQSV USEPA WATER QUALITY STANDARD
 - ER-L EFFECTS RANGE - LOW
 - ER-M EFFECTS RANGE - MEDIAN
 - SQC SEDIMENT QUALITY CRITERIA



DETAIL A

HW 41 BUNKER STATION
LOCATED APPROXIMATELY
1500' NORTH-EAST
OF DETAIL A

| | | | | | | |
|--------------------------|---|-----------|---|-------------------------------|--|------------------------------|
| REVISIONS | DRAWN WJH/REL REVIEWED JSC S.O.# 62470-312-0000-07000 CADD# 312571PP | NORTH | SITE 73 - AMPHIBIOUS VEHICLE MAINTENANCE FACILITY REMEDIAL INVESTIGATION, CTO-0312 MARINE CORPS BASE, CAMP LEJEUNE NORTH CAROLINA BAKER ENVIRONMENTAL, Inc. Coraopolis, Pennsylvania | Baker Environmental, Inc. | SURFACE WATER AND SEDIMENT QUOTIENT RATIO EXCEEDANCES SCALE 1" = 150' DATE NOVEMBER 1996 | FIGURE NO. 7-2 |
|--------------------------|---|-----------|---|-------------------------------|--|------------------------------|

01767V 10X