03.12-01/01/95-017

FINAL

RELATIVE RISK RANKING SYSTEM DATA COLLECTION SAMPLING AND ANALYSIS PLAN MARINE CORPS BASE, CAMP LEJEUNE, NORTH CAROLINA

CONTRACT TASK ORDER 0314/0350

NOVEMBER 1, 1995

Baker

Baker Environmental, Inc.

FOSTER WHEELER

FOSTER WHEELER ENVIRESPONSE, INC.

WESTON

MANAGERS DESIGNERS/CONSULTANTS

✓

03.12-11/01/95-01733

FINAL

RELATIVE RISK RANKING SYSTEM DATA COLLECTION SAMPLING AND ANALYSIS PLAN MARINE CORPS BASE, CAMP LEJEUNE, NORTH CAROLINA

CONTRACT TASK ORDER 0314/0350

NOVEMBER 1, 1995

Prepared For:

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

Under the:

LANTDIV CLEAN Program
Contract N62470-89-D-4814

Prepared By:

BAKER ENVIRONMENTAL, INC.
Coraopolis, Pennsylvania

TABLE OF CONTENTS

1.0 INTRODUCTION

The Sampling and Analysis Plan (SAP) has been developed to provides an overview of the field program including sampling locations, rationale, procedures, and project management and schedule per the performance requirements identified in the RFP Appendix A (dated October 13, 1995) submitted by LANTDIV. Background information, existing health and safety procedures, sampling methodologies, and maps utilized for preparing this SAP were obtained from the following documents:

- Three Well Site Check Report, Building AS 3000, Marine Corps Air Station, New River (Groundwater Technology, 1993)
- Marine Corps Base, Camp Lejeune: SWMU Relative Risk Ranking Map/Data
- Final Site Inspection Project Plans and Health and Safety Plan, Sites A, 12, 68, 75, 76, 84, and 85, MCB, Camp Lejeune (Baker, 1994, CTO-0193)
- Final RI/FS Project Plans, Sites 36, 43, 44, 54, and 86, MCB, Camp Lejeune (Baker, 1994, CTO-0246)

The three sites to be investigated are identified on Figure 1.

2.0 FIELD PROCEDURES

The Baker field team will consist of two people, one field team leader and one sampling assistant. The field team leader will be responsible for coordinating all field efforts, logging of soils, directing the drilling crew, and providing health and safety oversight; and the assistant will support all sampling efforts. A field log book will be maintained by both personnel and will include all relative information on sampling, health and safety and air monitoring, and general site conditions.

2.1 Sampling Locations and Rationale

The following provides background information for each site, sample locations and their rationale, and analytical methods. Although sample locations have been identified in this SAP, the final sampling locations may be identified in the field based on site conditions. Note that trip blanks and equipment rinsates (from stainless steel spoon and peristaltic pump) will also be collected.

2.1.1 AS 3000 (BUILDING AS 3000)

Building AS 3000 is located in the central region of the MCAS, New River. The area immediately adjacent to Building AS 3000 is comprised of aircraft taxiways and grassy fields. According to past documents, one steel 550 gallon capacity UST was used to store diesel fuel. The tank was excavated and removed from the site on October 13, 1992. Groundwater and soil data from a site check study (1993) indicated non-detectable levels of petroleum constituents. Baker's field program will focus on the former tank pit area.

The proposed soil and groundwater sampling locations are identified on Figure 2. Three (3) borings will be advanced in the vicinity of the former tank pit. One surface sample will be collected from each boring. Upon collection, the boring will be further advanced to approximately five feet below

the water table (approximately 2 to 3 feet below ground surface) and a one inch PVC temporary well will be installed. Soil samples will be analyzed for total petroleum hydrocarbons (extractions 3550/5030 EPA Method 8015), and groundwater samples will be analyzed EPA Method 602, EPA Method 625, and lead (3030C extraction) as identified on Table 1. Note that trip blanks and equipment rinsates (from stainless steel spoon and peristaltic pump) will also be collected as shown on Table 1.

2.1.2 SITE A - MCAS OFFICER'S HOUSING

Site A is located on the west bank of the New River approximately 375 feet east of Longstaff Road at the intersection of Trotter Street. A suspected disposal area is believed to exist in an area extending from the New River to Base residential housing, located on Trotter Street. No information is available regarding the volume, type, or mode of waste disposed. Baker's investigation will focus on the suspected disposal area.

Project plans have been submitted for this site under CTO-0193. The original scope of work for this site included test pit excavations and groundwater sampling of two existing wells. For this investigation, soils will be collected via direct push sampling; the two existing wells will be sampled per the original scope of work.

Sampling locations for soil and groundwater are identified on Figure 3. Six (6) borings will be advanced near the approximate locations of proposed test pits identified in the project plans. A surface sample will be collected from each boring. All soil and groundwater samples will be analyzed for full TCL organics (i.e., volatile, semivolatiles, pesticides, and PCBs) and TAL metals as identified in Table 2.

2.1.3 SITE 84 - BUILDING 45 AREA

Site 84 is located approximately 200 yards south of Highway 24 on the main side of MCB, Camp Lejeune, one mile west of the main gate entrance. The study area is bordered by Building 45 (electrical substation) to the east and by Northeast Creek to the west. The area is wooded and vegetated with a pond located near the center of the site. Transformers reportedly containing PCBs were known to be used and possibly stored at the substation. Additional transformers potentially containing PCB transformer oil were discovered and removed from the pond. Accordingly, Baker's investigation will focus on the area within and near the pond, and along the bank of Northeast Creek.

Project plans have been submitted for this site under CTO-0193. The original scope of work for this site included soil, surface water, sediment, and groundwater sampling. For this investigation, the original scope of work will be executed with the exception that a temporary well will be installed instead of a permanent well.

Sampling locations for the soil, sediment, surface water, and groundwater are identified on Figure 4. Ten (10) borings will be advanced near the pond as identified in the project plans. Surface samples (0 to 6 inches and 6 to 12 inches) will be collected from each boring. Surface water and sediment samples will be collected from the pond (four stations) and along the bank of Northeast Creek (five stations). Furthermore, groundwater samples will be collected from the two existing wells and from the newly installed temporary well. All of the media will be analyzed for TCL PCBs as identified in Table 3.

3.0 SAMPLING PROCEDURES

Sampling procedures to be implemented for this field program as described below. Where applicable, Baker sampling procedures identified existing project plans will be referenced.

3.1 Soil

Surface samples will be collected using a stainless steel spoon from a six inch interval (at the discretion of the sampler) within the first two feet below ground surface. If the sample location is covered by concrete or asphalt, the surface sample will be collected from directly below the cover and/or base fill material (i.e., native soil). Subsurface samples will be taken at four feet (i.e., sampler driven from 2 to 4 feet) below ground surface or just above the water table, which ever is less. The subsurface soils will be collected using a direct push drill rig equipped with a macro-core Geoprobe sampling devise. Sample handling procedures and documentation will be followed in accordance to the Final Project Plans under CTO-0193 (Baker, 1994). Soil cuttings will be placed back into the borings upon completion and the surface will refinished with concrete or asphalt where appropriate. Spent acetate liners and any personal protective equipment (PPE) will be placed in plastic bags and discarded into a dumpster.

3.2 Groundwater

Temporary one-inch PVC wells will be installed using a direct push drill rig to approximately five feet below the water table. Groundwater samples from existing and the newly installed temporary wells will be sampled using a peristaltic pump. Dedicated tubing will be used for each well. Field parameter measurements will not be collected during sampling; the wells will be considered stabilized and ready for sampling after 3 to 5 well volumes have been purged. After sample collection each well will be pulled, backfilled with the soil cuttings, and the surface refinished with concrete or asphalt where appropriate. Sample handling procedures and documentation will be followed in accordance to the Final Project Plans under CTO-0193. Purge water generated during the sampling will be returned to the ground. Spent tubing and any PPE will be placed in plastic bags and discarded into a dumpster.

3.3 Surface Water

Surface water samples will be collected by dipping the laboratory sample jar directly into the water. The samples will be collected within the first six inches from the top. Sample handling procedures and documentation will be followed in accordance to the Final Project Plans under CTO-0246.

3.4 Sediment

Sediment samples will be collected by pushing a dedicated acetate liner into the sediment or by using a stainless steel spoon. Each sample will be collected within the first six inches. Sample handling procedures and documentation will be followed in accordance to the Final Project Plans under CTO-0246.

4.0 PATHWAY AND RECEPTOR DESCRIPTIONS

During the field activities, Baker will complete a field evaluation form for each SWMU/Site that is being sampled for this field activity. The form, included as Attachment A, provides a description necessary for the relative risk model pathway and receptor determinations of the relative risk model. The field personnel will fill out a form based on observations and professional judgement for each SWUM/Site at the time sampling activities occur at the SWMU/Site.

Pathway and Receptor Descriptions that will be determined include:

Chemical Hazard Factor (CHF)

Migration Pathway Factor (MPF)

Receptor Factor (RF)

The media that will be evaluated include:

Groundwater (GW) - Human Health (HH)

Soils - HH

Surface Water (SW) - HH

SW - Ecological Marine (EM)

Sediment (SED) - HH

SED - EM

SW - Ecological Fresh Water (EF)

SED - EF

The migration pathways to be evaluated will include:

Evident - Utilized pathway is clearly evident

Potential - Pathway seems to be present but is not certain

Confirmed - Pathway is not possible with existing site

The receptor factors that will be evaluated include:

Identified - Receptor is present on site more or less continuously

Potential - Receptor may be present or is indicated

Limited - Receptor is precluded from exposure to the site

The worksheets will be submitted with the report as an attachment.

5.0 IDENTIFICATION OF SUBCONTRACTORS

Weston-Gulf Coast, Inc. in Stockton, California (CTO-0350) and Lionville, Pennsylvania will perform the analyses. The laboratory contacts are Ms. Pat Young (CTO-0314) and Ms. Gail DeRuzzo (CTO-0350). The address, telephone number, and fax number are as follows:

Weston-Environmental Metrics
208 Welsh Pool Road
Lionville, PA 19341-1333
(610) 701-6100 (business)
(610) 701-6140 (fax)

Weston-Environmental Metrics
212 Frank West Circle, Suite A
Stockton, CA 95206-4044
(209) 983-1340 (business)
(209) 983-0304 (fax)

In addition, Microseeps of Pittsburgh, Pennsylvania will perform the direct push drilling.

6.0 ANALYTICAL REQUIREMENTS AND SAMPLE HANDLING

The samples will be analyzed by the procedures identified on Tables 1, 2, and 3. All of the methods are in accordance with USEPA protocols. Specific information on laboratory quality assurance procedures/quality control are identified in the Laboratory QA Plan, provided under a separate document for this project. Tables 4 and 5 provide information on laboratory holding times and bottle requirements for aqueous and soil samples, respectively.

Sample handling and documentation protocols will be implemented in accordance the procedures outlined in the Final Project Plans submitted by Baker for CTO-0193 and CTO-0246.

In order to identify and accurately track the various samples, all samples collected during this investigation will be designated with a unique number. The number will serve to identify the Base, site number, media, and sample number.

The sample designation format is as follows:

Base - Site Number - Media - Sample Number

- Base - CL (Camp Lejeune)
- Site Number
  - 0A (Site A)
  - 40 (UST 40 or AS 3000)
  - 84 (Site 84)
- Media
  - S (surface soil)
  - D (subsurface soil)
  - W (groundwater)
  - F (surface water)
  - E (sediment)
- Sample Number - (1, 2, 3, etc.)

Under this sample designation format, the sample number CL-0A-S-1 refers to

CL-0A-S-1	Camp Lejeune
CL-0A-S-1	Site A
CL-0A-S-1	Surface Sample
CL-0A-S-1	First Sample

Quality assurance and quality control samples will also designated with identification numbers. The letter "T" will be used for trip blanks (eg., CL-40-T-1) and the letter "R" will be used for equipment rinsates (e.g., CL-40-R-1).

Tables 1, 2, and 3 provide a summary of the sample numbers to be used for the investigations.

7.0 REPORT PREPARATION

A letter report will be submitted to LANTDIV which summarizes all of the data collected and will include the following sections:

- Reference to/or brief summaries of sampling depths and procedures
- Brief summary of QA procedures
- References to analytical methods and parameters
- Analytical results
- MPF and RF scoring results
- Appendix of field notes

The tables of results and MPF and RF scores shall be segregated by each of the individual Activities. Individual site maps will be prepared showing actual sampling locations at each site.

8.0 PROJECT SCHEDULE

Baker will the field program the week of October 23, 1995. The field program will be completed in two stages. Sites A and 84 will be started on October 24 (surface soil, surface water, sediment, and groundwater sampling of existing wells) and continue through October 27. The drilling and sampling programs for these sites, as well as for AS3000, will be completed the week of October 30 due to delays in getting utility clearance at these sites. Accordingly, the field work for the Camp Lejeune sites will be completed by November 6.

Assuming that the last sample is received by the laboratory on November 7, the data will need to be delivered to Baker by November 9 so that the report can be submitted to LANTDIV by November 14. Accordingly, a percentage of the samples will be analyzed within a 48-hour turnaround time. The remainder of the samples will be analyzed within a 7-day turnaround time (see Tables 1, 2, and 3 for turnaround times).

9.0 PROJECT MANAGEMENT

Mr. Richard Aschenbrenner will serve as the Baker Project Manager for this CTO. Mr. Richard Bonelli will serve as the Baker Point of Contact for this Activity. Mr. Mark DeJohn will serve as the Field Team Leader and Health and Safety Officer, and Ms. Linnea Johnson will serve as the Field Team Assistant. The report will be prepared by Mr. Bonelli.

TABLES

TABLE 1

SAMPLE QUANTITIES
UST 40 - AS3000
RELATIVE RISK RANKING SYSTEM DATA COLLECTION - CTO-0350
MCB, CAMP LEJEUNE, NORTH CAROLINA

Media	Sample ID	Analysis	Turnaround Time	Comments
Soil	CL-40-S-1	EPA 8015 (5030/3550 Extractions) - TPH	48 hours	None
	CL-40-S-2	EPA 8015 (5030/3550 Extractions) - TPH	48 hours	None
	CL-40-S-3	EPA 8015 (5030/3550 Extractions) - TPH	48 hours	None
Groundwater	CL-40-W-1	EPA 602 EPA 625 Lead (3030C Extraction)	48 hours	None
	CL-40-W-2	EPA 602 EPA 625 Lead (3030C Extraction)	48 hours	None
	CL-40-W-3	EPA 602 EPA 625 Lead (3030C Extraction)	48 hours	None
Trip Blanks	CL-40-T-1	EPA 602	48 hours	None
	CL-40-T-2	EPA 602	48 hours	None
	CL-40-T-3	EPA 602	48 hours	None
Equipment Rinsates	CL-40-R-1	EPA 602 EPA 625 Lead (3030C Extraction)	48 hours	R-1 will be collected from a stainless steel spoon.
	CL-40-R-2	EPA 602 EPA 625 Lead (3030C Extraction)	48 hours	R-2 will collected from the peristaltic pump.

TABLE 2

SAMPLE QUANTITIES
SITE A - MCAS OFFICER'S HOUSING
RELATIVE RISK RANKING SYSTEM DATA COLLECTION - CTO-0314
MCB, CAMP LEJEUNE, NORTH CAROLINA

Media	Sample ID	Analysis	Turnaround Time	Comments
Soil	CL-OA-S-1	TCL Organics TAL Metals	48 hours	None
	CL-OA-S-2	TCL Organics TAL Metals	48 hours	None
	CL-OA-S-3	TCL Organics TAL Metals	48 hours	None
	CL-OA-S-4	TCL Organics TAL Metals	48 hours	None
	CL-OA-S-5	TCL Organics TAL Metals	48 hours	None
	CL-OA-S-6	TCL Organics TAL Metals	48 hours	None
Groundwater	CL-OA-W-1	TCL Organics TAL Metals	7 days	None
	CL-OA-W-2	TCL Organics TAL Metals	7 days	None
Surface Water	CL-OA-F-1	TCL Organics TAL Metals	7 days	None
	CL-OA-F-2	TCL Organics TAL Metals	7 days	None
Sediment	CL-OA-E-1	TCL Organics TAL Metals	7 days	None
	CL-OA-E-2	TCL Organics TAL Metals	7 days	None

TABLE 2 (Continued)

SAMPLE QUANTITIES
SITE A - MCAS OFFICER'S HOUSING
RELATIVE RISK RANKING SYSTEM DATA COLLECTION - CTO-0314
MCB, CAMP LEJEUNE, NORTH CAROLINA

Media	Sample ID	Analysis	Turnaround Time	Comments
Trip Blanks	CL-OA-T-1	TCL Volatiles	7 days	None
	CL-OA-T-2	TCL Volatiles	7 days	None
	CL-OA-T-3	TCL Volatiles	7 days	None
	CL-OA-T-4	TCL Volatiles	7 days	None
Equipment Rinsates	CL-OA-R-1	TCL Organics TAL Metals	7 days	R-1 will be collected from a stainless steel spoon
	CL-OA-R-2	TCL Organics TAL Metals	7 days	R-1 will be collected from a peristaltic pump

TABLE 3

SAMPLE QUANTITIES
SITE 84 - BUILDING 45 AREA
RELATIVE RISK RANKING SYSTEM DATA COLLECTION - CTO-0314
MCB, CAMP LEJEUNE, NORTH CAROLINA

Media	Sample ID	Analysis	Turnaround Time	Comments
Soil	CL-84-S-1	TCL PCBs	7 days	None
	CL-84-S-2	TCL PCBs	7 days	None
	CL-84-S-3	TCL PCBs	7 days	None
	CL-84-S-4	TCL PCBs	7 days	None
	CL-84-S-5	TCL PCBs	7 days	None
	CL-84-S-6	TCL PCBs	7 days	None
	CL-84-S-7	TCL PCBs	7 days	None
	CL-84-S-8	TCL PCBs	7 days	None
	CL-84-S-9	TCL PCBs	7 days	None
	CL-84-S-A	TCL PCBs	7 days	None
	CL-84-S-C	TCL PCBs	7 days	None
	CL-84-S-D	TCL PCBs	7 days	None
	CL-84-S-E	TCL PCBs	7 days	None
	CL-84-S-F	TCL PCBs	7 days	None
	CL-84-S-G	TCL PCBs	7 days	None
	CL-84-S-H	TCL PCBs	7 days	None
	CL-84-S-I	TCL PCBs	7 days	None
	CL-84-S-J	TCL PCBs	7 days	None
	CL-84-S-K	TCL PCBs	7 days	None
	CL-84-S-L	TCL PCBs	7 days	None

TABLE 3 (Continued)

SAMPLE QUANTITIES
SITE 84 - BUILDING 45 AREA
RELATIVE RISK RANKING SYSTEM DATA COLLECTION - CTO-0314
MCB, CAMP LEJEUNE, NORTH CAROLINA

Media	Sample ID	Analysis	Turnaround Time	Comments
Groundwater	CL-84-W-1	TCL PCBs	48 hours	None
	CL-84-W-2	TCL PCBs	7 days	None
	CL-84-W-3	TCL PCBs	7 days	None
Sediment	CL-84-E-1	TCL PCBs	7 days	None
	CL-84-E-2	TCL PCBs	7 days	None
	CL-84-E-3	TCL PCBs	7 days	None
	CL-84-E-4	TCL PCBs	7 days	None
	CL-84-E-5	TCL PCBs	7 days	None
	CL-84-E-6	TCL PCBs	7 days	None
	CL-84-E-7	TCL PCBs	7 days	None
	CL-84-E-8	TCL PCBs	7 days	None
Surface Water	CL-84-F-1	TCL PCBs	7 days	None
	CL-84-F-2	TCL PCBs	7 days	None
	CL-84-F-3	TCL PCBs	7 days	None
	CL-84-F-4	TCL PCBs	7 days	None
	CL-84-F-5	TCL PCBs	7 days	None
	CL-84-F-6	TCL PCBs	7 days	None
	CL-84-F-7	TCL PCBs	7 days	None
	CL-84-F-8	TCL PCBs	7 days	None

TABLE 4

SUMMARY OF CONTAINERS, PRESERVATION, AND HOLDING TIMES FOR AQUEOUS SAMPLES
RELATIVE RISK RANKING SYSTEM DATA COLLECTION - CTO-0350
MCB, CAMP LEJEUNE, NORTH CAROLINA

Parameter	Container	Preservation	Holding Time
TCL Volatiles	Two 40-ml vials with teflon septum caps	Cool, 4°C HCl pH<2	14 days (7 days if unpreserved)
TCL Semivolatiles	1-liter amber glass bottle with teflon caps	Cool, 4°C	7 days to extraction; 40 days from extraction to analysis
TCL Pesticides/PCBs	1-liter amber glass bottle with teflon caps	Cool, 4°C	7 days to extraction; 40 days from extraction to analysis
TAL Metals	1-500 ml polyethylene bottle	HNO_3 pH<2	6 months; Mercury 28 days

Notes:

TCL - Target Contaminant List
TAL - Target Analyte List

TABLE 5

SUMMARY OF CONTAINERS, PRESERVATION, AND HOLDING TIMES FOR SOLID SAMPLES
RELATIVE RISK RANKING SYSTEM DATA COLLECTION - CTO-0350
MCB, CAMP LEJEUNE, NORTH CAROLINA

Parameter	Container	Preservation	Holding Time
TCL Volatiles	One 4-ounce wide-mouth glass jar	Cool, 4°C	10 days
TCL Semivolatiles	One 8-ounce wide-mouth glass jar	Cool, 4°C	7 days to extraction; 40 days from extraction to analysis
TCL Pesticides/PCBs	One 8-ounce wide-mouth glass jar	Cool, 4°C	7 days to extraction; 40 days from extraction to analysis
TAL Metals	One 8-ounce wide-mouth glass jar	Cool, 4°C	6 months; Mercury, 28 days

Notes:

TCL - Target Contaminant List
TAL - Target Analyte List

FIGURES

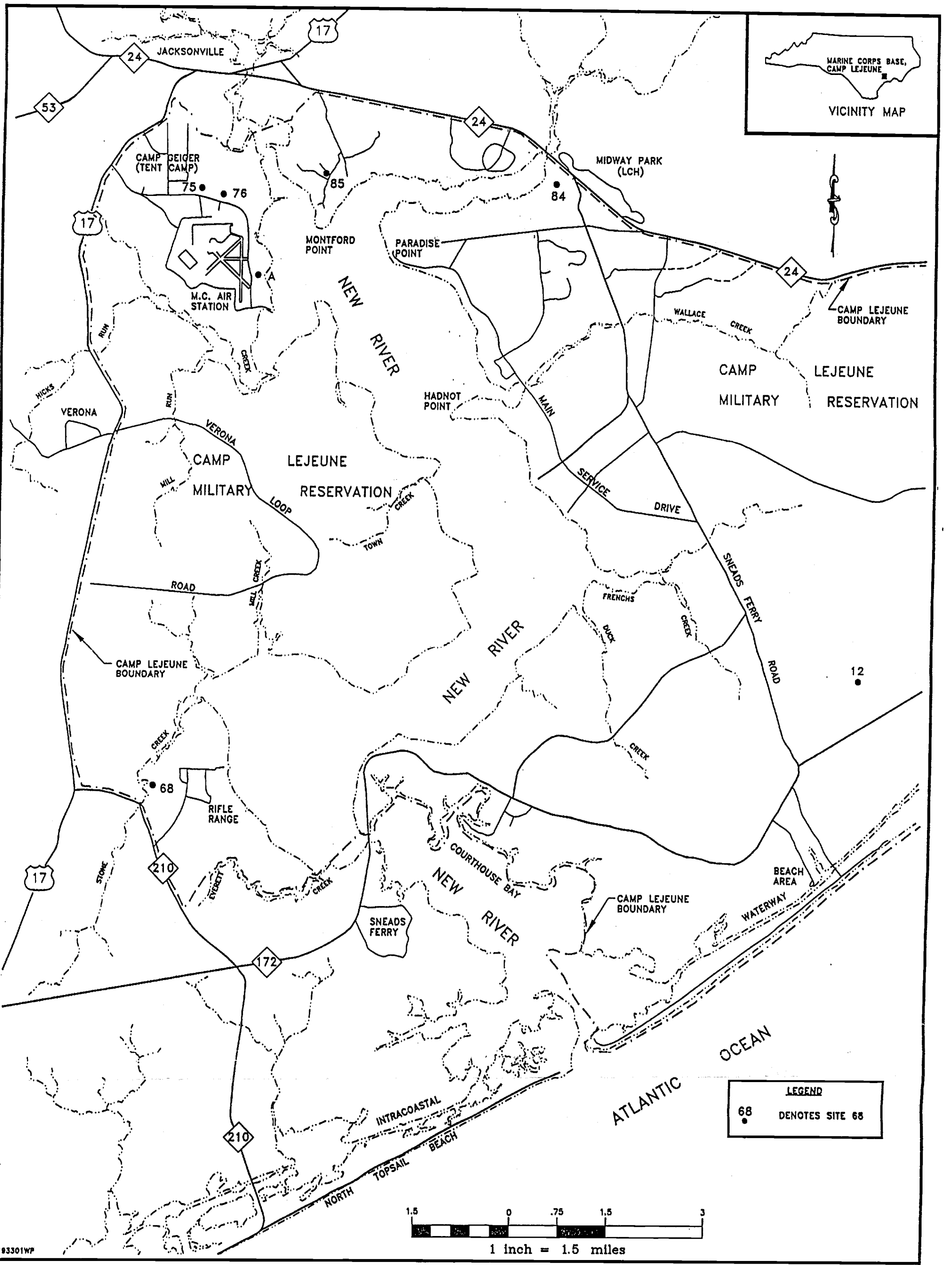
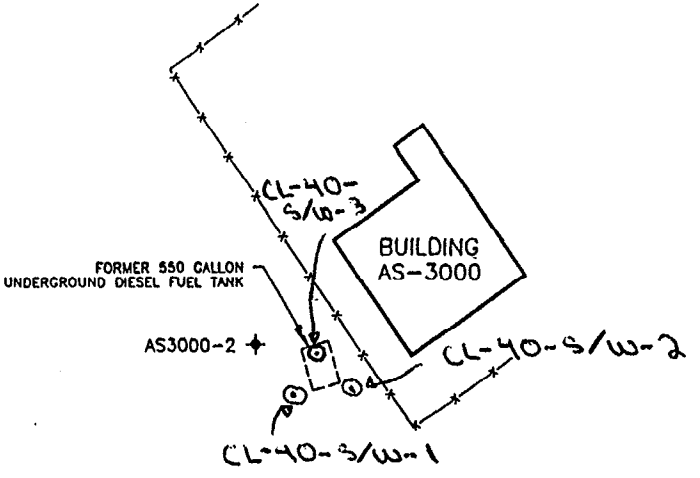


FIGURE 1
MARINE CORPS BASE, CAMP LEJEUNE
SITE LOCATION MAP

MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA

01733V01Z



SOURCE: BOBBITT SURVEYING, P.A. (3/29/93)

GROUNDWATER TECHNOLOGY
1244-B EXECUTIVE BI
CHESAPEAKE, VA. 233
(804) 436-7881

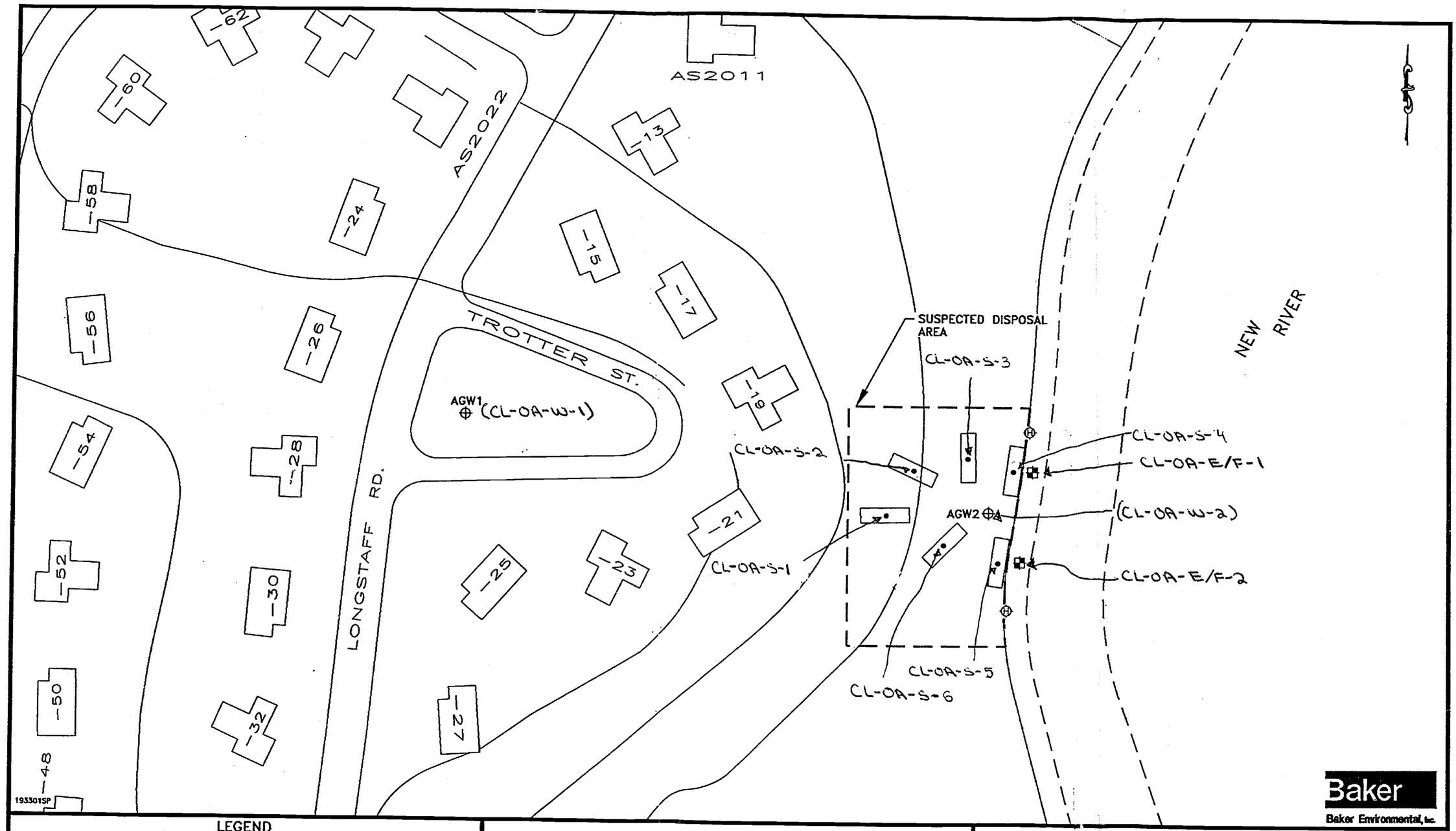
REV. NO.:	DRAWING DATE: 3/30/93	ACAD FILE: 3000-SIT

SITE MAP

CLIENT: LANTDIV NAVFACENGCOM			PM:
LOCATION: BUILDING AS-3000 MCAS, NEW RIVER, N.C.			PE/R
DESIGNED: BH	DETAILED: PJC	PROJECT NO.: 830011088.2001	FIGU

⊙ Proposed surface soil / groundwater sample

FIGURE 2



LEGEND

AGW1 ⊕ – EXISTING SHALLOW MONITORING WELL

• – PROPOSED SOIL SAMPLING LOCATION

⊞ – SURFACE WATER/SEDIMENT SAMPLING STATION

SOURCE: LANTDIV, FEB. 1992 REVISED: APRIL 21, 1994

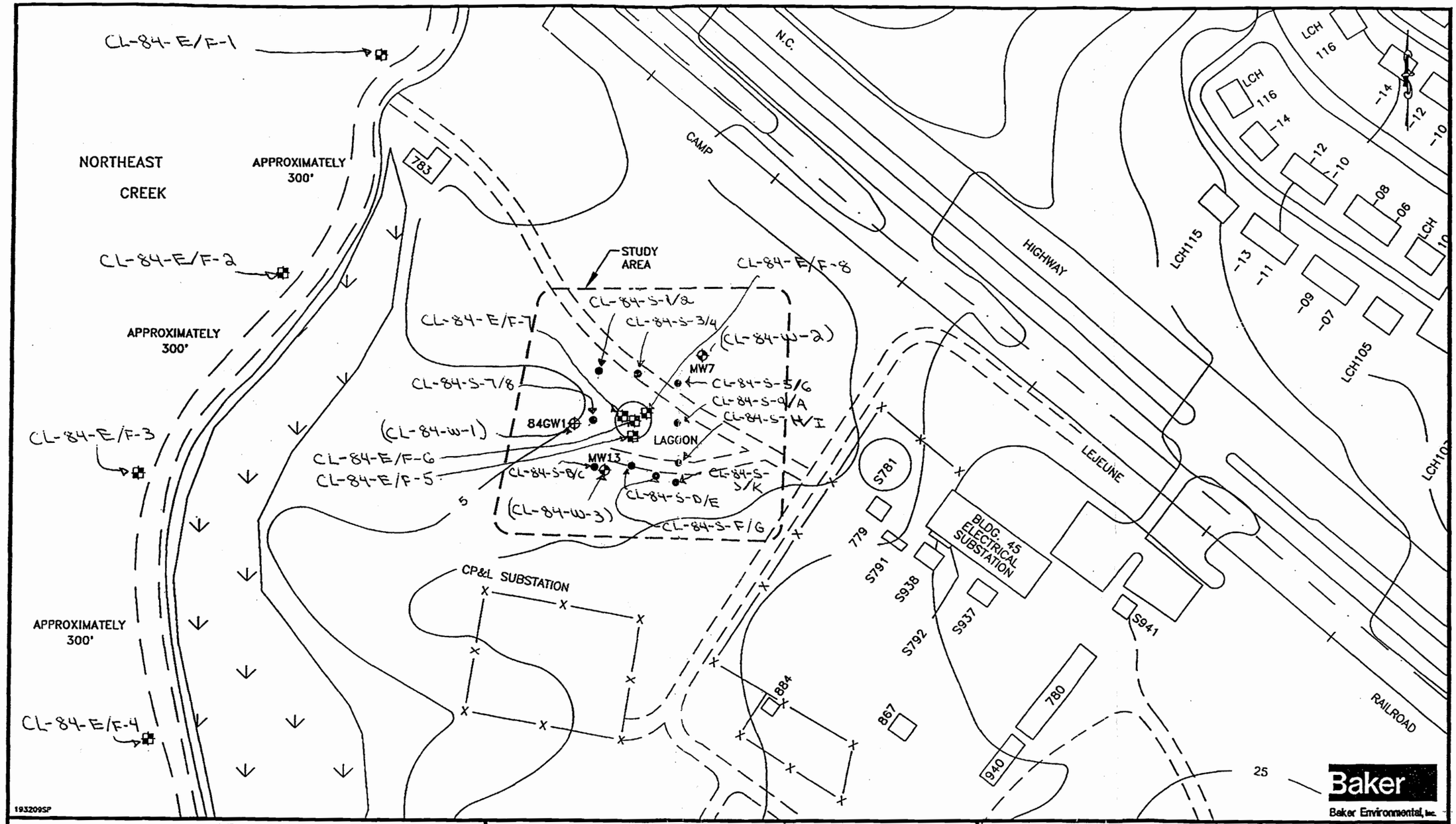
80 0 40 80 160

1 inch = 80 ft.

FIGURE 3
SOIL AND GROUNDWATER INVESTIGATION
SITE A
MCAS OFFICIER's HOUSING AREA

MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA

01733V02Z



LEGEND

MW7 – EXISTING SHALLOW MONITORING WELL

84GW1 – PROPOSED SHALLOW MONITORING WELL

– PROPOSED SURFACE WATER/SEDIMENT SAMPLING LOCATION

– PROPOSED HAND-AUGERED SOIL BORING

SOURCE: LANTDIV, FEB. 1992

120 0 60 120 240

1 inch = 120 ft.

FIGURE 4
SOIL, GROUNDWATER, SURFACE WATER, AND SEDIMENT INVESTIGATION
SITE 84
BUILDING 45 AREA

MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA

01733V032