

6288/3b  
NREAD  
SEP 14 1988

From: Director, Natural Resources and Environmental Affairs Division  
To: Assistant Chief of Staff, Facilities  
Subj: INSTALLATION RESTORATION (IR) PROGRAM INTERIM ALTERNATIVE 3.1 WATER  
SUPPLY WELL ASSESSMENT

Ref: (a) NREAD ltr 5200 NREAD dtd 2 Aug 88

Encl: (1) JTC Data Report #88-357

1. In accordance with enclosure (1) of the reference, Water Supply Wells 642, 603 and Hadnot Point Water Treatment Plant (HP) were sampled 11 August 1988 and sent to JTC Environmental Consultants, Inc. for analysis for Volatile Organic Chemical (VOC) scan including methyl ethyl ketone, methyl iso-butyl ketone, and xylene. Enclosure (1) contains the analysis results. In summary, no VOCs were detected at a detection level of 10 ppb.

J. I. WOOLEN

Copy to:  
Nav Hosp (OPMS)  
BSafety

Blind copy to:  
Env Eng  
EMaintDiv (Util Br)  
→ SWEB (2)

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29 AUG 1988

COMPLETE

JTC DATA REPORT # 88-357  
LABORATORY ANALYSIS ON NAVAL SAMPLES  
CONTRACT #N62470-86-C-8754  
CASE # 401

PREPARED FOR:

DEPARTMENT OF THE NAVY  
ATLANTIC DIVISION  
NAVAL FACILITIES ENGINEERING COMMAND  
NORFOLK, VIRGINIA 23511-6287

PREPARED BY:

JTC ENVIRONMENTAL CONSULTANTS, INC.  
4 RESEARCH PLACE, SUITE L-10  
ROCKVILLE, MARYLAND 20850

CLW

August 23, 1988

0000006286

*Ann E. Rosecrance*

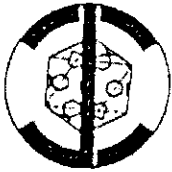
Ann E. Rosecrance  
Laboratory Director

Location: Camp Lejeune Date of Receipt: 8-12-88 Turnaround: routine

Date: 8-23-88 Case No. 401 to Naval Facilities Engineering Command, Norfolk, Virginia

JTC Data Report No. 88-357 Table 1

NAVY SAMPLE ID	JTC SAMPLE ID	ANALYSIS PARAMETER						
		Volatiles						
603	61-2185	See attached sheet						
642	61-2186							
HP 7HB 0130	61-2187							
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Environmental Consultants, Inc.

## PRIORITY POLLUTANT ANALYSIS DATA SHEET

## VOLATILE FRACTION

JTC SAMPLE # 61-2185 PROJECT NO. NF-61 Case # 401  
CLIENT SAMPLE # 603 DATE RECEIVED 8-12-88  
METHOD NO. 624 DETECTION LIMIT 10 ug/L

PARAMETER	RESULT	PARAMETER	RESULT
	ug/L		ug/L
acrolein	ND	1,2-dichloropropane	ND
acrylonitrile	ND	1,3-dichloropropylene	ND
benzene	ND	ethylbenzene	ND
carbon tetrachloride	ND	methylene chloride	ND
chlorobenzene	ND	methyl chloride	ND
1,2-dichloroethane	ND	methyl bromide	ND
1,1,1-trichloroethane	ND	bromoform	ND
1,1-dichloroethane	ND	dichlorobromomethane	ND
1,1,2-trichloroethane	ND	trichlorofluoromethane	ND
1,1,2,2-tetrachloroethane	ND	dichlorodifluoromethane	ND
chloroethane	ND	chlorodibromomethane	ND
2-chloroethylvinylether	ND	tetrachloroethylene	ND
chloroform	ND	toluene	ND
1,1-dichloroethylene	ND	trichloroethylene	ND
1,2-trans-dichloroethylene	ND	vinyl chloride	ND
		xylene	ND
		methyl ethyl ketone	ND
		methyl iso-butyl ketone	ND
		methyl n-butyl ketone	ND

ND = NOT DETECTED

\* = BELOW DETECTION LIMIT

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C Environmental Consultants, Inc.

## PRIORITY POLLUTANT ANALYSIS DATA SHEET

## VOLATILE FRACTION

JTC SAMPLE # 61-2186 PROJECT NO. NF-61 Case # 401  
CLIENT SAMPLE # 642 DATE RECEIVED 8-12-88  
METHOD NO. 624 DETECTION LIMIT 10 ug/L

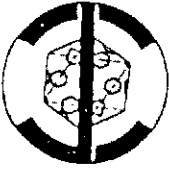
PARAMETER	RESULT	PARAMETER	RESULT
	ug/L		ug/L
acrolein	ND	1,2-dichloropropane	ND
acrylonitrile	ND	1,3-dichloropropylene	ND
benzene	ND	ethylbenzene	ND
carbon tetrachloride	ND	methylene chloride	ND
chlorobenzene	ND	methyl chloride	ND
1,2-dichloroethane	ND	methyl bromide	ND
1,1,1-trichloroethane	ND	bromoform	ND
1,1-dichloroethane	ND	dichlorobromomethane	ND
1,1,2-trichloroethane	ND	trichlorofluoromethane	ND
1,1,2,2-tetrachloroethane	ND	dichlorodifluoromethane	ND
chloroethane	ND	chlorodibromomethane	ND
2-chloroethylvinylether	ND	tetrachloroethylene	ND
chloroform	ND	toluene	ND
1,1-dichloroethylene	ND	trichloroethylene	ND
1,2-trans-dichloroethylene	ND	vinyl chloride	ND
		xylene	ND
		methyl ethyl ketone	ND
		methyl iso-butyl ketone	ND
		methyl n-butyl ketone	ND

ND = NOT DETECTED

\* = BELOW DETECTION LIMIT

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C Environmental Consultants, Inc.

## PRIORITY POLLUTANT ANALYSIS DATA SHEET

## VOLATILE FRACTION

JTC SAMPLE # 61-2187 PROJECT NO. NF-61 Case #401  
CLIENT SAMPLE # HP THB 0930 DATE RECEIVED 8-12-88  
METHOD NO. 624 DETECTION LIMIT 10 ug/L

PARAMETER	RESULT ug/L	PARAMETER	RESULT ug/L
acrolein	ND	1,2-dichloropropane	ND
acrylonitrile	ND	1,3-dichloropropylene	ND
benzene	ND	ethylbenzene	ND
carbon tetrachloride	ND	methylene chloride	ND
chlorobenzene	ND	methyl chloride	ND
1,2-dichloroethane	ND	methyl bromide	ND
1,1,1-trichloroethane	ND	bromoform	ND
1,1-dichloroethane	ND	dichlorobromomethane	ND
1,1,2-trichloroethane	ND	trichlorofluoromethane	ND
1,1,2,2-tetrachloroethane	ND	dichlorodifluoromethane	ND
chloroethane	ND	chlorodibromomethane	ND
2-chloroethylvinylether	ND	tetrachloroethylene	ND
chloroform	ND	toluene	ND
1,1-dichloroethylene	ND	trichloroethylene	ND
1,2-trans-dichloroethylene	ND	vinyl chloride	ND
		xylenes	ND
		methyl ethyl ketone	ND
		methyl iso-butyl ketone	ND
		methyl n-butyl ketone	ND

ND = NOT DETECTED

\* = BELOW DETECTION LIMIT

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UNITED STATES MARINE CORPS  
NATURAL RESOURCES AND ENVIRONMENTAL AFFAIRS DIVISION  
MARINE CORPS BASE  
CAMP LEJEUNE, NORTH CAROLINA 28542-5001

IN REPLY REFER TO:

5200  
NREAD  
2 Aug 88

From: Director, Natural Resources and Environmental Affairs  
Division  
To: Assistant Chief of Staff, Facilities  
Subj: INSTALLATION RESTORATION (IR) PROGRAM  
Ref: (a) AC/S, Facilities ltr 5200 NREAD dtd 1 Aug 88  
Encl: (1) Proposal for Implementation of Interim Alternatives  
for Hadnot Point Industrial Area, (IR) Program  
assigned to Natural Resources and Environmental  
Affairs Division

1. In accordance with the reference, the enclosure is provided.

*J. I. Wooten*  
J. I. WOOTEN

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IMPLEMENTATION OF INTERIM ALTERNATIVES  
FOR HADNOT POINT INDUSTRIAL AREA, INSTALLATION  
RESTORATION PROGRAM, ASSIGNED TO NATURAL RESOURCES AND  
ENVIRONMENTAL AFFAIRS DIVISION (NREAD)

1. Alternative 3.1 Water Supply Well Assessment.

Task Number 1. Sample wells 642 and 603 and Hadnot Point Water Treatment Plant (HPWTP) and ship samples to JTC Environmental Consultants, Inc. for analysis per contract No. N62470-86-C-8754. Deadline for shipment is 15 August 88 and every 90 days thereafter.

Task Number 2. Provide results of analysis to interested parties. Deadline is 15 September 1988 and every 90 days thereafter.

Cost of alternative 3.1 will be approximately \$700.00 per quarter for JTC Laboratory support. NREAD will absorb remaining costs.

2. Alternative 3.4 Continued Groundwater Monitoring.

Task Number 1. NREAD will request milestones for sampling, analysis and reporting of data from ESE via Atlantic Division, NAVFACENGCOM (Code 114). Deadline is 15 August 1988.

Task Number 2. NREAD will monitor ESE compliance with established milestones and advise AC/S, Facilities of any foreseen problems in meeting target dates.

NREAD will absorb labor requirements. It is assumed that Atlantic Division, NAVFACENGCOM, will provide funding for work performed by ESE.

3. Alternative 3.5 Cessation of Continuing Sources of Contamination.

Task Number 1. NREAD will perform a survey of all work areas in cooperations with cognizant HMDC (appointed per BO 6240.5A) and develop a list of sites with poor housekeeping and hazardous material handling deficiencies. Deadline is 1 October 1988. (See note 1)

Task Number 2. NREAD and HMDC will meet with cognizant organizational commanders and HMDO's (appointed per BO 6240.5A) and develop schedules for corrective action and deficiencies in HM handling equipment and storage facilities. Deadline is 1 November 1988.

Task Number 3. NREAD will oversee monitoring of corrective action by HMDC's and will advise AC/S, Facilities, of any

Moved to Bob Kavanoe



unresolved operational problems and facilities related issues. Will be performed continuously. (See note 1)

Task Number 4. NREAD will develop a map of known underground storage tanks (active and abandoned) within the HPIA and provide to AC/S, Facilities, for incorporation into Installation Restoration project planning. Deadline is 1 January 1989. (See note 1)

NOTE 1. It is recommended that a senior staff NCO be temporarily assigned to NREAD for a period of 12 months to assist with implementation of alternative 3.5.

BUDG 902 + 1602 TCE TANKS

1709 + 1710 - UNDERGROUND TANKS OF WASTE  
← BAGS OF SOIL (CONTAMINATE)

READ CHAPTER 4.

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~~0000006293~~

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UNITED STATES MARINE CORPS  
MARINE CORPS BASE  
CAMP LEJEUNE, NORTH CAROLINA 28542-5001

IN REPLY REFER TO:

5200  
NREAD.  
AUG 1 1988

From: Commanding General, Marine Corps Base, Camp Lejeune  
To: [REDACTED] (NREAD)  
Commanding Officer, U. S. Naval Hospital  
Assistant Chief of Staff, Manpower

Subj: INSTALLATION RESTORATION PROGRAM MARINE CORPS BASE, CAMP  
LEJEUNE, NORTH CAROLINA

Ref: (a) AC/S, Facilities/LANTDIV meeting of 26 July 88  
relative to Feasibility Study by Environmental Science  
and Engineering (ESE)

Encl: (1) Excerpt from Installation Restoration Contract Report  
by Environmental Service Engineering of May 88


1. During the reference, a report of the subject study was presented to the Camp Lejeune Complex personnel. Five interim alternatives to deal with immediate health risk in the Hadnot Point area of the base were provided by Environmental Science and Engineering (ESE). The AC/S, Facilities has scheduled a meeting at 0900, 2 August 88 and 0900, 5 August 88 at building 1 conference room to further address the Interim Alternatives prior to a 9 August 88 meeting with the Technical Review Committee.
2. Accordingly, it is requested the Natural Resources and Environmental Affairs Officer (NREAO), Assistant Chief of Staff, Facilities, take Interim Alternative 3.1, Water Supply Well Assessment, 3.4, Continued Groundwater Monitoring and 3.5, Cessation of Continuing Sources of Contamination for action. This assignment should include a written review of ongoing NREAD capabilities and ongoing activities, new Installations Restoration Program requirements, and additional NREAD resources required (i.e. funds, personnel, equipment).
3. Commanding Officer, Naval Hospital, Preventive Medicine Unit, in conjunction with AC/S, Manpower Safety Officer, is requested to take Interim Alternative 3.2, Ambient Air Monitoring (see enclosure (1)) for action. A written report for the 2 August 88 meeting mentioned in paragraph 1 above is desired. The report should address ongoing ambient air monitoring of harmful volatile compounds listed in paragraph 3.2 for two Hadnot Point sites depicted on page 2-6 of the enclosure; new Installation Restoration Program monitoring requirements and additional resources required (i.e. funds, personnel, equipment).

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Subj: INSTALLATION RESTORATION PROGRAM MARINE CORPS BASE, CAMP  
LEJEUNE, NORTH CAROLINA

4. AC/S, Manpower, Safety Officer is requested to take Installation Restoration Study Interim Alternative paragraph 3.3 of enclosure (1) Underground Work Space Monitoring for action. A written assessment of this requirement for the 2 August 88 meeting arranged by paragraph 1 above, including ongoing monitoring for organic vapors and gases and other problem addressed in paragraph 3.3 of the report, new installation Restoration Program requirements and additional resources required (i.e. funding, personnel, equipment, etc) is desired.

  
T. J. DALZELL  
By direction

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Feasibility Study for H.P. Industrial Area Ct  
Final

Services & Engineering ESE No 86-601-2000-2150  
May 88

C-LEJEUNE.1/HADNOT3.1  
05/04/88

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3.0 DESCRIPTION OF INTERIM ALTERNATIVES

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Five interim alternatives for HPIA were considered to ensure the protection of human health and the environment. The main objective of these options is to reduce immediate health risks. These alternatives differ from the long-term alternatives evaluated by not reducing the groundwater contamination. For this reason, the interim alternatives have not been compared and evaluated for the selection of one best option. All five alternatives prove to be reasonable options, and each should be considered individually.

3.1 WATER SUPPLY WELL ASSESSMENT

Interim Alternative 1 involves the sampling of drinking water wells in HPIA, as well as those nearby which have the potential for contamination. Several water supply wells have been tested previously and shut down; alternative wells have been selected for drinking water use. Interim Alternative 1 entails monitoring potentially contaminated water supply wells, in addition to the routine water treatment plant effluent monitoring which currently takes place. It is recommended that water supply wells are monitored semi-annually specifically for purgeable compounds, MEK, methyl iso-butyl ketone, and xylene. Recommended water supply wells (currently operating) to be resampled include Wells No. 642 and 603. If contamination is found in any of the water supply wells, an evaluation of the water treatment plant would be required to determine if contaminants would be reduced to acceptable levels.

3.2 AMBIENT AIR MONITORING

Interim Alternative 2 involves air monitoring of areas with the potential for high levels of harmful volatile compounds. These areas may include the interiors of buildings near "hot spots" of contaminated groundwater or high levels registered during soil gas analysis (see Appendix C). Compounds which may potentially be detected during air monitoring include

05/04/88

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benzene, toluene, and xylene in the fuel farm area; and TCE, T-1,2-dichloroethene, and vinyl chloride directly south of the fuel farm. These compounds can be detected using an HNU photoionizer, an organic vapor analyzer (OVA), or detector tubes. Ambient air monitoring serves the purpose of detecting harmful pollutants which personnel working in HPIA may be exposed to on a regular basis. Sampling should be conducted during varying climatic conditions (i.e., during a dry and rainy period). In the event of compounds being detected above the threshold limit value (TLV) acceptable to humans, immediate measures, such as forced ventilation, should be taken to reduce health risks until permanent remediation measures can be taken.

### 3.3 UNDERGROUND WORK SPACE MONITORING

Prior to conducting or installing new underground sewer pipes or electrical cables, underground cavities and work spaces should be monitored for the presence of organic vapors and oxygen content (Interim Alternative 3). Three instruments which should be used for monitoring underground work spaces are an explosimeter, an oxygen detector, and a photoionization detector (PID). The explosimeter will determine the level of organic vapors and gases present as a percentage of the lower explosive limit (LEL). The oxygen detector will determine the oxygen percentage (which must be between 19.5 and 23.5 for breathing without supplied air), and the PID will detect organic vapor concentrations. In the possible event of oxygen or organic vapor concentrations being unacceptable, appropriate mitigation measures should be taken.

### 3.4 CONTINUED GROUNDWATER MONITORING

Interim Alternative 4 consists of continued monitoring of groundwater from the 35 monitor wells, as well as the abandoned drinking water wells. The wells should be monitored for the chemical parameters listed in Section 3.1. Existing monitor wells should be sampled twice per year to more accurately assess the groundwater contaminant plume characteristics.

To date, 29 shallow (25 ft), 3 intermediate (75 ft), and 3 deep (150 ft) monitor wells exist at HPIA (excluding water supply wells). In addition, water supply Wells No. 602, 608, 630, 634, 637, and 652 should be resampled.

### 3.5 CESSATION OF CONTINUING SOURCES OF CONTAMINATION

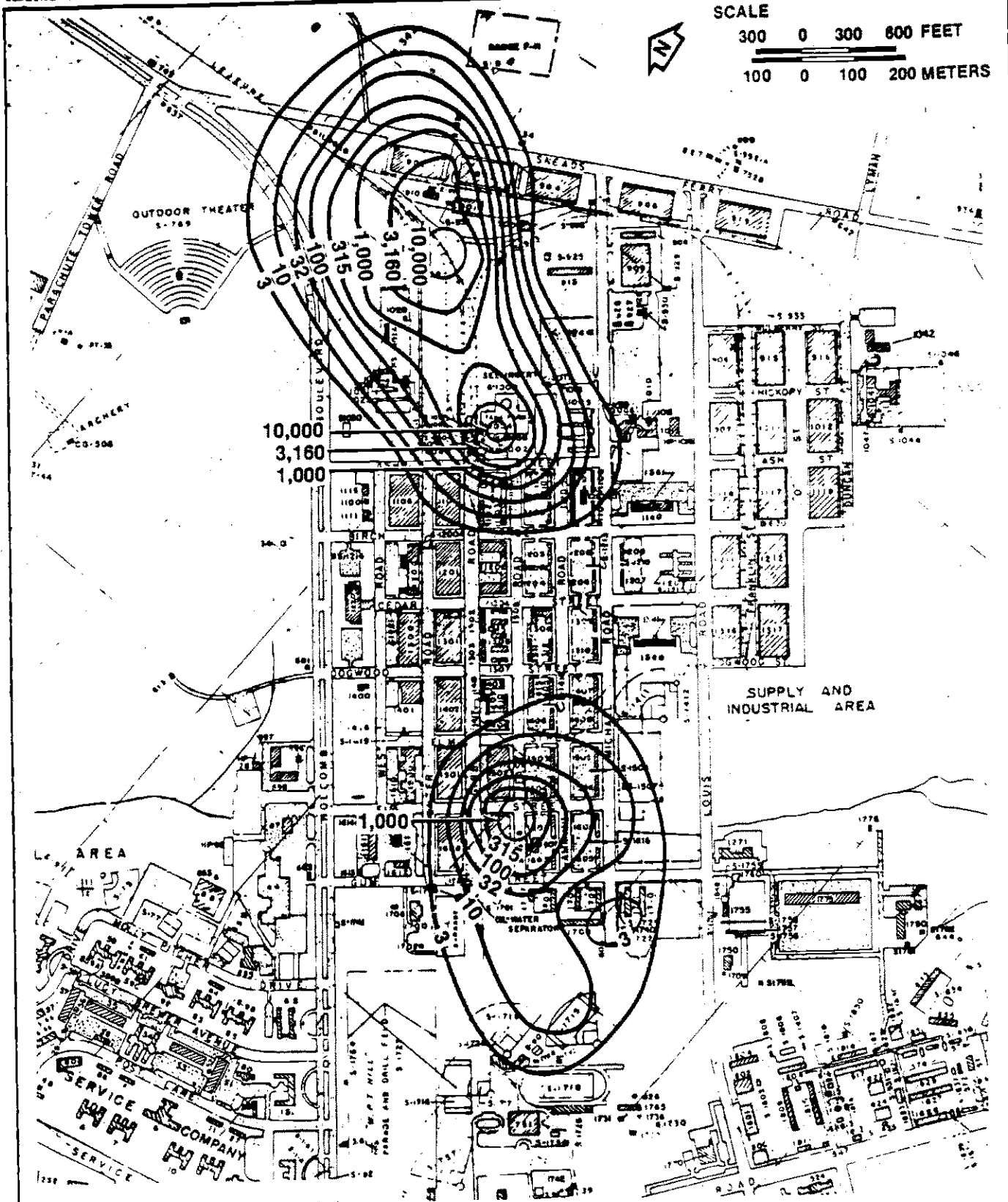
Interim Alternative 5 involves the evaluation and discontinuation of practices at HPIA which may result in contamination of the soil and groundwater in a particular area. Examples of practices or existing conditions which may be included in this category are outdated chemical disposal techniques, industrial operations potentially involving spillage of hazardous materials, and abandoned underground storage tanks containing fuel, oil, or hazardous chemicals (i.e., TCE). All practices involving the use of hazardous materials at HPIA should be evaluated for environmental contamination potential, and updated procedures should be instituted. In addition, locations of all underground storage tanks should be identified, and abandoned tanks should be leak tested or abandoned using approved methodologies. Any leaks identified during testing should result in removal of the stored material and cleanup of the contamination.

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SCALE

300 0 300 600 FEET  
100 0 100 200 METERS



NOTE: ALL VALUES ARE PARTS PER BILLION.

Figure 2-3  
TOTAL VOLATILE ORGANIC COMPOUND  
ISOPLETH MAP — HADNOT POINT  
INDUSTRIAL AREA  
CLW

SOURCE: ESE, 1988.



CONFIRMATION STUDY  
MARINE CORPS BASE  
CAMP LEJEUNE



DEPARTMENT OF THE NAVY  
NAVAL HOSPITAL  
CAMP LEJEUNE, NORTH CAROLINA 28542-5008



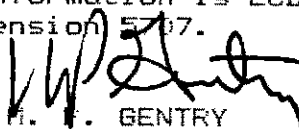
IN REPLY REFER TO

6000  
37  
3 Aug 88

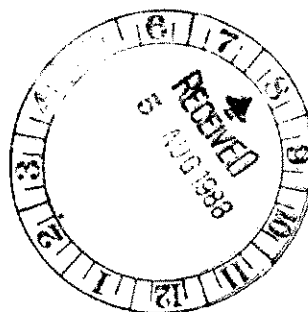
From: Commanding Officer  
To: Commanding General, Marine Corps Base, Camp Lejeune, NC  
28542-5008 (Attn: Assistant Chief of Staff, Facilities)  
Subj: INSTALLATION RESTORATION (IR) PROGRAM INTERIM ALTERNATIVE 3.2  
Ref: (a) CG Letter 5200 NREAD dtd 1 August 1988  
(b) Installation Restoration Contract Report of May 1988

1. In accordance with reference (a), the Industrial Hygiene Branch will undertake a study to determine the nature, scope and feasibility of supporting interim alternative 3.2 as described in reference (b).

2. This study has a target completion date of 19 August 1988. Point of contact for further information is LCDR R. J. Ellis, Head Industrial Hygiene Branch, extension 5797.

  
H. F. GENTRY  
By direction

Copy to:  
Base Safety Officer  
Head, NREAD



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UNITED STATES MARINE CORPS  
NATURAL RESOURCES AND ENVIRONMENTAL AFFAIRS DIVISION  
MARINE CORPS BASE  
CAMP LEJEUNE, NORTH CAROLINA 28542-5001

IN REPLY REFER TO:

ANALYSIS INFORMATION

11 Aug 88

Samples are from Marine Corps Base, Camp Lejeune

Covered under Navy Contract with Naval Facilities Engineering  
Command

Point of Contact at MCB Camp Lejeune: Elizabeth Betz or Tom Barbee  
at: (919) 451-5977/2471

Sample Number(s)

603  
642  
HP 20

Analyze for

VOCs  
Methyl Ethyl Ketone  
Methyl Iso-butyl Ketone  
Xylene

Elizabeth A. Betz

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**0000006301**

ADMIN. RECORD IS THE FIRST LINE OF DEFENSE AGAINST  
BETWEEN STATE AND FEDERAL AGENCY CONFLICT

VICTOR WEEKS - PRESENT @ MEETING, NEW GUY @ EPA

NEW RIVER AS ~~AP~~ PROBABLE WILL BE ADDED TO NPL.

ACT LINTON - STILL WANTING US TO FINE ABC

DOD GUIDANCE \* EPA

7 MONTHS FROM LAST TUESDAY

**CLW**

0000006302

Bittner

9 Aug 88

TECHNICAL REVIEW COMMITTEE

MEMBERS

REPRESENTING

Colonel T. J. Dalzell, USMC  
AC/S, Facilities  
Chairman of Technical  
Review Committee  
Phone: (919) 451-3034

Marine Corps Base, Camp Lejeune

Mr. Victor Weeks  
Region IV  
Atlanta, GA  
Phone: (919) 347-5059

U.S. Environmental Protection  
Agency

Mr. Stan Atwood  
Division of Health Services  
Raleigh, NC  
Phone: (919) 733-2081

NC Department of Human  
Resources

Mr. Preston Howard  
Division of Environmental  
Management  
Wilmington, NC  
Phone: (919) 256-4161

Department of Natural Resources  
and Community Development

Mr. Cameron Lanier  
Environmental Health Supervisor  
Onslow County Health Department  
Jacksonville, NC  
Phone: (919) 347-2154

Onslow County

Mr. Jerry Bittner  
City Manager  
Jacksonville, NC  
Phone: (919) 455-2600

City of Jacksonville

Mr. Tom Caulfield

Citizen Member

Mr. Ray Humphries

Citizen Member

Mr. H. D. Southerland

Citizen Member

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MEMBER

REPRESENTING

Mr. John Downing

Citizen Member

Mr. Gene Flannagan

Citizen Member

Colonel (Ret) Jack Mader

Citizen Member

Colonel (Ret) J. F. Jones

Citizen Member

Mr. Don Hudson

Citizen Member

EX-OFFICIO MEMBERS:

Mr. Bob Alexander  
Environmental Engineer

Marine Corps Base, Camp Lejeune

Lt Col Joseph Wellington  
Staff Judge Advocate's Office

Marine Corps Base, Camp Lejeune

Major Stuart Wagner  
Media, Joint Public Affairs  
Office

Marine Corps Base, Camp Lejeune

Mrs. Sue Jarman  
(Administrative Record)

Marine Corps Base, Camp Lejeune

Mrs. Cherryl Barnett  
Engineering Field Division  
Representative

Atlantic Division, Naval  
Facilities Engineering Command,  
Norfolk, VA

Mr. Bob Gregory  
(Installation Restoration  
Study)

Hunter-Environmental Science  
and Engineering, Inc.

**CLW**

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22 SITES + COURTHOUSE BAY

SEVERAL SITES HOPED TO MOVE TO CERLA/SARA - FUELS ONLY

6 SITES NO PROBLEMS SHOULD DROP OUT.

CHANGE ORDER IN LANTRDIV TO ESE TO INCLUDE ANOTHER ROUND  
OF SAMPLING WHICH ~~WILL~~ WILL SATISFY "CONTINUED GROUND-  
WATER MONITORING" - ACCORDING C. BARNETT @ 1130 ON 27 JUL 88  
THROUGH FY 89.

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SCOPE OF WORK IS EXPECTED AT BLDG 1.

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TOM Th13

DEPARTMENT OF THE NAVY

ATLANTIC DIVISION  
NAVAL FACILITIES ENGINEERING COMMAND  
NORFOLK, VIRGINIA 23511-6287

804-444-9523 TELEPHONE NO.

IN REPLY REFER TO:  
N62470-83-C-6106  
022421

26 JUL 1988

CERTIFIED MAIL-RETURN RECEIPT REQUESTED

\* Environmental Science and Engineering, Inc.  
P. O. Box ESE  
Gainesville, Florida 32602

Re: A&E Contract N62470-83-C-6106, Engineering Services for  
Confirmation Study to Determine Existence and Possible Migration of  
Specific Chemicals in Situ, Marine Corps Base, Camp Lejeune, North  
Carolina

Gentlemen:

It is our intention to modify the referenced contract to provide Remedial  
Investigation/Feasibility Study Efforts, Marine Corps Base, Camp Lejeune, North  
Carolina. Enclosure (1) defines the scope of work and is forwarded to assist you  
in the preparation of a fee proposal.

Enclosure (2) provides the format of fee submission. Your fee proposal should be  
submitted within 10 calendar days after receipt of this letter and must be  
accompanied by the following:

- a. Supporting information you developed in preparing your fee proposal;  
i.e., a breakdown of all direct costs (travel and reproduction).
- b. Your fee proposal must be accompanied by the Standard Form (SF) 1411  
provided as enclosure (3).

Enclosure (4), Certificate of Current Cost or Pricing Data, must be SIGNED, dated  
and submitted UPON COMPLETION of fee negotiations.

For further scope and schedule information, please contact the Project Manager,  
Ms. L. G. Rickman, of this Command, telephone 804-444-9615.

For further contract information, please contact the Contract Specialist  
Ms. Julie P. Hoagland of this Command, telephone 804-444-9523

Submit all requested information to this Command, Attention: Code 022421.

This letter is not a commitment by the Government, and any expense incurred prior  
to receipt of a contract modification is your responsibility.

*This is a corrected copy, the 1st letter  
has the wrong addressee annotated.*

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N62470-83-C-6106  
022421

Only a Contracting Officer is authorized to obligate the Government under this contract. Further, the Government is not obligated until the change order is executed by a Contracting Officer.

All information contained in this letter is for "Official Use Only" and must not be divulged to persons other than those having a definite "Need to Know" without prior approval in writing from this Command.

Sincerely,

A. L. WEST, P.E.  
A&E Contracts Branch  
Contracting Officer  
By direction of the Commander

Encl:

- (1) RFP Appendix A dtd 20 July 1988
- (2) A&E Fee Proposal Form
- (3) SF Form 1411, Contracting Pricing Proposal Cover Sheet (2 Copies)
- (4) Certificate of Current Cost or Pricing Data (2 copies)

Blind copy to:

MCB Camp Lejeune (w/encl (1) only)  
09A2135 (w/encl (1) only)  
02242 (w/encl (1) only)  
022421 (w/encl (1) only)  
022DF (w/o encls)  
02DF (w/o encls)

**CLW**

0000006309

RFP APPENDIX A

20 July 1988

1. A&E Contract No.: N62470-83-C-6106

Project Title/Location: Engineering Services For Confirmation Study to Determine Existence and Possible Migration of Specific Chemicals in Situ, Marine Corps Base, Camp Lejeune, North Carolina

Attachment:

- (a) Scope of Work for Remedial Investigation/Feasibility Study Efforts, Marine Corps Base, Camp Lejeune

2. LANTNAVFACENCOM Project Manager (PM)/Telephone:

Ms. L. G. (Lisa) Rickman, Code 09A2135/804-444-9614

- LANTNAVFACENCOM Engineer-in-Charge (EIC)/Telephone:

Ms. Cherryl Barnett, Code 114/804-445-1814

3. The following listed services are required:

Engineering Services  
Travel and Subsistence

4. Fees: (To be filled in at conclusion of negotiations on A&E contracts)

Engineering Services \_\_\_\_\_  
Travel and Subsistence \_\_\_\_\_

TOTAL CHANGE ORDER VALUE: \_\_\_\_\_

5. Proposed Milestones: See attachment (a)  
6. Scope Description: See attachment (a)  
7. Project Submittal Distribution: See attachment (a)

---

MAILING ADDRESSES: DIRECT DISTRIBUTION TO EACH ADDRESSEE BY A&E IS REQUIRED

LANTNAVFACENCOM

Commander  
Atlantic Division  
Naval Facilities Engineering Command  
Norfolk, Virginia 23511-6287

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SCOPE OF WORK  
REMEDIAL INVESTIGATION/FEASIBILITY STUDY EFFORTS  
MARINE CORPS BASE CAMP LEJEUNE

I. INTRODUCTION

Previous investigations of hazardous waste sites at the Marine Corps Base Camp Lejeune (MCB CLEJ) have been conducted under a Confirmation Study, phase two of the Installation Restoration (IR) program. As a result of the Superfund Amendments and Reauthorization Act of October 1986 (SARA), the Navy has changed its program to follow rules, regulations, guidelines, and criteria established by EPA for the Superfund program. SARA also mandates that DOD reports be reviewed by a Technical Review Committee (TRC) composed of representatives from EPA, state and local governments, and the local community.

This effort, although a continuation of the Confirmation Study, marks our conversion to the Remedial Investigation/Feasibility Study (RI/FS) format for MCB CLEJ. There are several objectives to this effort: first, to condense existing Confirmation Study data and recommendations for the 21 sites into a report suitable for TRC review. The remaining three objectives address the Hadnot Point Industrial Area (HPIA) specifically, and include generating data needed to conduct feasibility studies of the deep aquifer and shallow soils contamination, completing a public health evaluation of the site, and collecting additional data to facilitate design of the selected remedial action for the shallow aquifer.

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II. OBJECTIVES

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A. FOR THE 21 IR SITES

Condense the data presented in the Round One and Round Two Verification Step reports, issued in January 1985 and July 1987, respectively, into one report. This report, to be titled Remedial Investigation Interim Report, shall discuss the overall program history and then each site individually. The site-specific sections shall include a brief site description, site maps showing sample locations and groundwater contours, analytical data in tabular form (for only those compounds exceeding detection limits), a comparison of this data to relevant standards and criteria, and a concise series of recommendations. The recommendations should take one of three forms: no contaminants of concern were detected, so the site should be dropped from the program; some contaminants were detected at low levels, so a baseline risk assessment should be conducted to determine whether these levels present a threat to humans or the environment; or, extensive contamination was detected and, in

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In addition to a baseline risk assessment, the following data should be collected to conclude the RI and facilitate a FS of cleanup alternatives. These recommendations were summarized in ESE letter No. 86-601-0100 of September 29, 1987. Include a separate section on potable wells 651 and 653; a discussion on what was detected in the wells; the details of the exploratory soil gas effort to date; and recommendations for additional investigation, continued monitoring, or no further action. Include well construction data for all sites, boring logs, analytical data, water level measurements and laboratory QA/QC data in an appendix. The QA/QC data should be presented in the format prescribed for the Final Report, Section 3.7 of the Navy Quality Assurance Guide (provided previously).

Reporting requirements for the RI Interim Report are summarized in Section V.

#### B. FOR THE HPIA

- 1). SHALLOW AQUIFER. To facilitate design of the selected remedial alternative, request you perform the following response actions as outlined in your FS Report of June 1988. (Sampling and analysis requirements are summarized in Attachment A.)
  - a). Install 32 four-inch monitoring/recovery wells in the HPIA; locations are shown in the FS report. Wells should be installed in accordance with the specifications provided with the Confirmation Study Scope of Work. Sample these wells, the 35 existing monitoring wells, and water supply wells 601, 603, 642, 602, 608, 630, 634, 637, and 651, 652, and 653. Analyze all samples for volatile organics (including xylene, methyl ethyl ketone (MEK), and methyl isobutyl ketone (MIBK)) and lead. Survey in the 67 monitoring wells and nine potable wells; establish both horizontal and vertical control. Work, sample and safety plan requirements for this field effort are outlined in Section III; laboratory QA/QC requirements are outlined in Section IV. Sampling and analysis requirements are summarized in Attachment A. Compile this data into a RI Supplemental Report for the HPIA shallow aquifer; reporting requirements are outlined in Section V.
  - b). Perform slug tests on shallow aquifer wells. Assume about half the wells (30) will require testing; include in your estimate a unit price for additional tests. Perform step drawdown tests on shallow aquifer wells. Assume a one-week effort will be required (minimum of 12 tests).
  - c). Perform a Public Health Evaluation on the shallow aquifer in the HPIA. This shall evaluate the no-action alternative and each cleanup alternative evaluated in your June 1988 FS and shall conform to EPA's "Superfund Public Health Evaluation Manual (SPHEM)" (October 1986 or most recent version). Reporting requirements are outlined in Section V.

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## 2). DEEP AQUIFER

a). To complete the RI for the deep aquifer in the HPIA, construct additional monitor well clusters downgradient of the following source areas: Bldg. 1602, Bldg. 902, Bldg. 1202, and the Tank Farm Area, Site #22. These clusters shall consist of a shallow 25-foot well, an intermediate 75-foot well, and a deep 150-foot well. Wells shall be constructed of two-inch ID PVC; follow the same procedures used for installing the previous clusters in the HPIA. Sample these wells during the same timeframe as those wells listed in Section II.B.1).; analyze all samples for volatile organics (including xylene, MEK, and MIBK), acid extractables, base neutral extractables, and lead. Include unit costs for installing additional well clusters and performing additional sampling and analyses. Work, sample, and safety plan requirements are outlined in Section III; laboratory QA/QC requirements are outlined in Section IV. Sampling and analysis requirements are summarized in Attachment A.

b). Compile this data, the data generated under Section II.B.1)., that gathered for the characterization effort, and the information collected by USGS for their ongoing groundwater study and prepare a RI report for the HPIA deep aquifer. (Include in your estimate a trip to Raleigh to review USGS files). Reporting requirements are outlined in Section V.

c). Conduct a feasibility study, including a public health evaluation, for the deep aquifer in the HPIA. Follow EPA's SPHEM and "Guidelines for Conducting Remedial Investigations and Feasibility Studies under CERCLA" (March 1988 Draft or most recent version). (The latter document will be referred to as "RI/FS Guidelines" in subsequent sections of this document). Reporting requirements are outlined in Section V.

## 3). SURFACE SOILS

a). To complete the RI for the surface soils in the HPIA, collect samples from 10 borings to the water table in each of these three areas of concern: Bldg. 1602, Bldg. 902, Bldg. 1202. Collect composite samples every three feet using 3 1/2 inch ID, stainless steel split spoon (for initial costing purposes, assume 90 soil samples). Analyze 9 samples (10%) for priority pollutants; analyze the remainder (81) for volatile organics (including xylene, MEK, MIBK) and metals (using the EP toxicity test). Work, sample, and safety plan requirements are outlined in Section III; laboratory QA/QC requirements are described in Section IV. Sampling and analysis requirements are summarized in Attachment A. Prepare a RI report for the surface soils in the HPIA; reporting requirements are outlined in Section V.

b). Conduct a feasibility study, including a public health evaluation, for the contaminated surface soils in the HPIA. Follow EPA's SPHEM and "RI/FS Guidelines". Reporting

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requirements are outlined in Section V.

### III. PREPARATION OF WORK PLAN, SAMPLING PLAN AND HEALTH AND SAFETY PLAN

A work plan, sampling plan, and health and safety plan are required by RI/FS guidance documents. The plans document the procedures to be used, the resources needed and the rationale for the tasks to be undertaken. One set of plans will be required for the efforts in the HPIA.

#### A. WORK PLAN

The work plan documents the decisions and evaluations made during the scoping process. This plan should include the following sections: Introduction; Site Background and Physical Setting; Initial Evaluation; Work Plan Rationale; and RI/FS Tasks. A general description of each section is provided in "RI/FS Guidelines".

One copy of the draft work plan should be provided to the Engineer-In-Charge (EIC) and two to MCB CLEJ directly within 21 days after the change order is awarded. Two copies of the final work plan should be submitted to the EIC and two to MCB CLEJ.

#### B. SAMPLING PLAN

The sampling plan consists of a field sampling plan and a quality assurance project plan. The latter plan includes the laboratory QA/QC plan mandated by the Navy QA program and a description of field QA/QC procedures. Laboratory QA/QC requirements for this project are summarized in Section IV.

Include the following field decontamination procedures in the quality assurance project plan. Steam clean drilling equipment before transporting to site; steam clean again prior to drilling. After drilling each well, brush equipment to remove gross contamination, steam clean, wash with a phosphate-free soap, and steam clean again. All decon water, well development water, and purge water will be conveyed to the nearest sanitary sewer. Drill cuttings should be containerized in drums and tested for EP toxicity (metals). Assume 40 drums will be required; composite cuttings into 10 samples for analysis, with the exception of cuttings from the well sited in Lot 140. Analyze those cuttings separately for EP toxicity (metals and pesticides) and PCBs. Include unit costs for additional drums and for disposing of these drums as hazardous waste. Transportation of drums (must be palletized and labeled) to a secure area and disposal of cuttings (if non-hazardous) will be handled by CLEJ.

The field sampling plan provides guidance for all fieldwork by defining in detail the sampling and data-gathering methods to be used on the project. The plan should contain the

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following elements: site background; sampling objectives; sample locations and frequency; sample designation; sampling equipment and procedures; and sample handling and analysis. A schedule for sample collection and analysis should be included.

One copy of the draft sampling plan should be provided to the EIC and two copies to MCB CLEJ within 21 days after the change order is awarded. Two copies of the final sampling plan should be submitted to the EIC, two copies to MCB CLEJ, and one copy to Martin Marietta Energy Systems, Inc. to fulfill the QA/QC requirements (for the laboratory work plan).

#### C. HEALTH AND SAFETY PLAN

The Navy guidelines for site health and safety plans are included in Attachment B. Review your existing plan prepared for verification efforts at CLEJ and make any modifications necessary to address site-specific precautions and conform to Attachment B and "RI/FS Guidelines".

One copy of the revised safety plan should be provided to the EIC and two copies to MCB CLEJ.

#### IV. LABORATORY QUALITY ASSURANCE/QUALITY CONTROL (QA/QC) PROGRAM

Before field sampling begins, the contractor's laboratory must fulfill the requirements of the Navy's Quality Assurance Program (QAP). These requirements are outlined in the Quality Assurance Guide and include approval of a laboratory work plan, proficiency testing, submitting to a laboratory inspection, approval of a laboratory QA/QC plan, monthly progress reports, and final reports. At a minimum, this effort will require submission of a work plan (described in Section II.B.), a revised laboratory QA/QC plan, monthly progress reports, and final reports. Proficiency testing and reinspection will be required if the laboratory has not been inspected by Martin Marietta Energy Systems, Inc. within the past year.

Although the laboratory will correspond directly with Energy Systems on this program, the EIC should receive two copies of all correspondence. A final QA/QC report will be required at the completion of each investigative task in Section II (i.e. shallow aquifer, deep aquifer, etc). These reports are described in Section 3.7 of the Quality Assurance Guide and should be submitted to Energy Systems and included as appendices to the RI reports. Initiation of QAP requirements must be within 10 days of contract award.

#### V. REPORTING REQUIREMENTS

For each task described in Section II, submit three copies of the draft report to the EIC for review in accordance with the

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completion dates listed in Section VI. During the thirty-day government review period, present the findings to the MCB CLEJ steering committee at Camp Lejeune. Following receipt of government comments, submit twelve copies of the final report to the EIC. The original shall be unbound to facilitate reproduction. Text shall be single-spaced with double-spacing between paragraphs; copies shall be duplex-printed to reduce bulk. A summary of plans/reports required for this effort is presented in Attachment C.

Monthly progress reports are required for the duration of this effort; format is outlined in the original Confirmation Study Scope of Work.

Present the conclusions and recommendations from each task to a meeting of the TRC. The government may request you contract for meeting facilities close to the base; please cost this option separately (assume a room will be required for one day for twenty people).

Include a unit price for preparing and giving presentations to community groups.

#### VI. CONTRACT COMPLETION DATES

The tasks described above shall be completed in accordance with the following dates:

	DAY
Change Order Award	0
Initiate QA/QC Requirements	10
Initiate Preparation of RI Interim Report	10
Submit Draft Work and Sampling Plans	21
Receive Government Comments	35
Submit Final Work, Sampling, and Health and Safety Plans	50
Initiate Field Work in HPIA	60
Submit Draft RI Interim Report	70
Receive Government Comments	100
Submit Draft RI Supplemental Report for Shallow Aquifer	160
Submit Draft RI Report for Surface Soils	170
Submit Draft RI Report for Deep Aquifer	180
Submit Draft Public Health Evaluation (PHE) for Shallow Aquifer	190
Present Shallow Aquifer, Deep Aquifer, and Surface Soils RI Results, Including PHE for Shallow Aquifer to Steering Committee	200
Receive Government Comments on Draft RI Reports	210
Receive Government Comments on PHE	220
Submit Final RI Reports	240
Submit Final PHE for Shallow Aquifer	250
Submit Draft FS for Deep Aquifer, Surface Soils	280
Present RI, PHE Results to TRC	300

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Present FS Results to Steering Committee	300
Receive Government Comments on FS	320
Submit Final FS for Deep Aquifer, Surface Soils	350
Present FS Results to TRC	400

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SAMPLING AND ANALYSIS REQUIREMENTS FOR HADNOT POINT INDUSTRIAL AREA, MARINE CORPS BASE CAMP LEJEUNE

	# NEW WELLS	# GW SAMPLES	# SOIL SAMPLES	# TRIP BLANKS	# EQUIPMENT BLANKS	ANALYTICAL PARAMETERS
SHALLOW AQUIFER	32	78	-	8	4	Volatiles, Xylene, MEK, MIBK, Lead
DEEP AQUIFER	12	12	-	2	2	Volatiles, Xylene, MEK, MIBK, Acid extractables, Base-neutral extractables
SURFACE SOILS	-	-	81	-	-	Lead Volatiles, Xylene, MEK, MIBK, EP Tox Metals
DRILL CUTTINGS	-	-	9	-	-	Priority Pollutants, EP Tox Metals
	-	-	10	-	-	EP Tox Metals
	-	-	1	-	-	PCB's, EP Tox Metals and Pesticides

KEY

Volatiles: Priority Pollutant Volatile Organics  
 Ep Tox Metals: As, Ba, Cd, Cr, Pb, Hg, Se, Ag  
 EP Tox Pesticides: Endrin, Lindane, Methoxychlor, Toxaphene, 2,4-D, 2,4,5,-TP Silvex

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Attachment A

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Safety & Health Guidelines

for

NACIP Confirmation Studies

revised February 1986

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*ATTACHMENT (b)*  
E. F. I.

# SAFETY AND HEALTH GUIDELINES FOR NACIP CONFIRMATION STUDIES

February 1986

## I. INTRODUCTION

A confirmation study represents the first time a site suspected of containing hazardous wastes is extensively sampled. During this phase, safety and health precautions are paramount since the nature of the hazards present is not known.

These guidelines describe the steps involved in confirmation, the responsibilities and roles of participants, and specific safety and health requirements of those involved in on-site investigation.

### A. Confirmation Study Steps: Verification and Characterization

#### 1. Verification

The verification step involves sampling and analysis to confirm or deny the presence of suspected contaminants at sites being studied.

Sampling may be conducted in all media including ground water, soil, sediment, surface water, and air, as well as biological samples consisting of plant or animal tissue. In some cases, sampling of drums or other hazardous waste containment vessels may be necessary. Hazards encountered may be physical in nature or can result from exposure to toxic substances.

#### 2. Characterization

a. The sites for which contamination has been verified in the first step require further investigation to determine the levels and distribution of contamination, both vertical and horizontal. This step will result in a quantitative assessment of the extent of contamination, sources, and contaminant migration potential.

b. The hazards encountered during characterization are similar to those encountered during the verification step. However, the investigators will have more information on contaminants present which will allow for more specific safety and health planning.

### B. Participant Roles and Responsibilities

Advanced planning and preparation are crucial elements for ensuring protection of field workers during confirmation studies; this requires coordination of safety and health planning among all those involved in the on-site investigation. The Engineering Field Division (EFD), contractor, and activity all have an important role in assuring that on-site investigations are accomplished with the highest level of worker safety and health in mind.

#### 1. Engineering Field Division (EFD)

The EFD shall provide for adequate training of its personnel who administer, evaluate and monitor the hazardous waste site investigations to ensure contractor compliance with requirements presented in part II herein. The EFD shall review the contractors safety and health plan to ensure that the Navy guidelines contained herein are addressed. The EFD review of the contractors safety and health plan shall include the EFD Certified Industrial Hygienist or the servicing NAVMEDCOM or Navy Environmental Health Center (NEHC) Certified Industrial Hygienist (CIH), if one is not present at the EFD, and the EFD Safety Engineer/Manager prior to permitting the contractor to begin the on-site investigation.

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## 2. Activity

a. The activity shall provide to the contractor, all information available to the activity regarding known hazards associated with each site being studied. The activity Point of Contact (POC) shall assist the contractor in preparation of the contingency plan by providing information on emergency medical assistance available on the activity. The POC shall notify Navy medical facilities most capable of responding to an emergency on-site. The POC shall apprise activity security of the procedures that will be followed in the event of an emergency, and shall assure that emergency transportation has access to the work area.

b. All safety and health plans shall be made available for review by the activity safety and health manager and the servicing NAVMEDCOM Industrial Hygienist prior to the contractor beginning on-site investigation. A team review and preplanning meeting including the above safety and health professionals, other key activity personnel, and EFD personnel may be conducted at the request of the EFD Engineer-in-Charge if determined to be necessary.

## 3. Contractor

The prime contractor for the on-site investigation has primary responsibility of protecting the safety and health of all personnel on the work site and ensuring that contractor actions do not endanger surrounding personnel and/or property and that contamination encountered at the site does not contaminate other areas. All contractor personnel are responsible for strict adherence to applicable OSHA (29 CFR 1910, and 1926) state occupational safety and health regulations, and federal and state environmental regulations. The contractor shall designate and provide a safety and health contact on-site to ensure that all work is accomplished in compliance with pertinent standards and regulations promulgated by the groups above and to ensure conformance with safety and health plans submitted for review to the Navy prior to initiating the on-site investigation. The contractor safety and health contact is responsible for coordinating emergency assistance with all non-Navy organizations included in the contingency plan. The contractor will supply all equipment required for performance of his duties in a safe and healthful manner on-site.

## II. SPECIFIC CONTRACTOR REQUIREMENTS

The contractor is required to submit a written safety and health plan for the Confirmation Study to the Navy for approval prior to the conducting the on-site investigation. The safety and health plan shall include a description of the contractor's medical surveillance and training programs and site work control plans for each site investigated. The safety and health plan shall address all of the requirements of this section, and shall be performed in accordance with the Environmental Protection Agency publication "Standard Operating Safety Guides" dated 11 November 1984.

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A. Medical Program

To safeguard the health of field personnel, the contractor shall have a medical program in place. The program shall accomplish the following:

- (1) Identify the physician responsible for supervising all medical activities. As a minimum, he/she must be board eligible or certified by the American Board of Preventive Medicine in occupational medicine, or board certified in another clinical specialty with at least 2 years in the full-time practice of occupational medicine. If nurse practitioners, occupational health nurses or physicians assistants are to perform parts of the medical program, their credentials and plans for their professional supervision should be presented.
- (2) Require an occupational history to include all periods of employment, known hazards, and prior use of personal protective equipment. The standard Navy occupational medical history may be used (form OPNAV 5100/15 from OPNAVINST 5100.23B, Chapter 17) or a version of standard histories in current use (e.g., "Taking the Occupational History" Annals of Internal Medicine Vol. 99:641-651, 1983). If self-administered questionnaires are used, they must be reviewed by the responsible occupational medicine physicians or health professional under his/her supervision.
- (3) Obtain past medical history, to include quantitated smoking and alcohol use, medications, other drug use, medical and surgical conditions, and family history.
- (4) Obtain a medical review of systems.
- (5) Perform medical surveillance examination with emphasis on organ systems potentially effected by toxic substances identified in the work environment either by prior industrial hygiene sampling or by past documentation of hazardous substances.
- (6) Include in the examination, a medical certification involving physical requirements (sight, hearing, musculo-skeletal, cardiovascular, etc.) for safe job performance.
- (7) Include in the examination, a respirator medical certification conforming to ANSI Z88.6-1984 guidelines.
- (8) Perform laboratory testing to include complete blood count, white cell differential count, serum multiphasic screening (for renal and hepatic parameters), urinalysis, and specific testing relevant to encountered hazards that are required by CFR 1910 OSHA law, recommended by NIOSH criteria documents, and prescribed by the responsible occupational physician.
- (9) Identify frequency of periodic examinations
- (10) Explain emergency medical plans for injuries and acute toxic exposures. (See Section II C.5)
- (11) Describe maintenance, retention, and access to occupational medical records.

B. Education and Training Program

1. All employees involved in confirmation site investigations shall be trained in the area of safety and health. Training shall be provided to new employees and periodically to experienced employees. Training must cover specific areas covered by law such as respiratory training and handling of hazardous materials.

2. The contractor shall designate a safety and health contact to oversee all work performed at the confirmation sites. The safety and health contact shall have an educational background and experience level in engineering or the sciences and must have received adequate formal safety and health training specific to the hazards of the work. Certification, by examination, as a Certified Safety Professional (CSP) or as a Certified Industrial Hygienist (CIH), although not required, is an example of recognized special education, experience and proven professional ability. The qualifications of the designated safety and health contact and all training records must be provided to the EFD EIC.

3. The following types of safety and health training shall be completed by contractor personnel, as appropriate to their function during on-site investigation:

a. General Safety Procedures

- (1) Safety practices and procedures for hazardous waste site entry
- (2) First Aid and Cardiopulmonary Resuscitation (CPR)
- (3) Hazard Recognition and Evaluation
- (4) Work Zone Determination and Procedures
- (5) Decontamination Procedures
- (6) Preparation and use of Site Safety Plans

b. Safety Equipment Use and Maintenance

- (1) Field Monitoring Equipment
- (2) Emergency Equipment
- (3) Personal Protective Equipment
  - (a) Protective clothing--types, uses, limitations and levels of protection
  - (b) Respiratory equipment--masks, respirators, Self contained Breathing Apparatus (SCBA); 29 CFR 1910.134 and ANSI Z88.2-1980

c. Site Investigation Safety Decision Making

- (1) Planning Site Safety Procedures
- (2) Contingency Planning for Emergencies

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### C. Site Work Control Plan

A specific site work control plan must be prepared for work to be performed at each site being investigated during the confirmation study. Each site work control plan must address all the areas outlined in this section and must be kept current and technically correct.

#### 1. Site Entry Procedures - preplanning for on-site activity

- a. Routes of entry and exit
- b. Communication between workers on and off site

#### 2. Survey and Reconnaissance

a. Before beginning on-site work, the contractor shall collect and analyze data to identify potential safety and health hazards inherent to the required tasks, equipment, nature of operations and suspected contaminants. The contractor will determine and implement the necessary control measures for these hazards, including safety and health requirements for personnel working on-site. Potential hazards shall include mechanical, electrical, toxic, and other hazards that may cause serious injury, illness, or significant environmental or property damage.

b. The contractor will revise the necessary hazard control measures as field work generates additional data.

#### 3. Levels of Protection

a. Based upon information gathered during initial reconnaissance, the appropriate level of protection shall be prescribed ranging from Level A for the highest level of protection needed to Level D, the minimum protection that must be provided. Levels of protection are described in Part 5 of the USEPA Standard Operating Safety Guides, dated 11 November 1984.

b. Where information is incomplete on types, concentrations and potential for worker contact with chemicals, a level of protection shall be designated based on professional judgement of the contractor's safety and health contact.

#### 4. Work Zones and Site Control

To minimize the transfer of hazardous substances from the site, due to site activities, contamination control procedures shall be outlined in the site work control plan.

a. Work Zones—Delineation of zones where prescribed operations occur is required. Work area shall be designated with boundaries, size of zones, distance between zones and access points into each zone. Numbers of personnel and equipment in each zone shall be listed in the plan for each operation.

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- b. Site Control--The site shall be controlled to reduce potential for contaminant transport from the site by personnel or equipment.

The contractor shall present procedures in the plan to:

- (1) Exclude unnecessary personnel from the general area;
- (2) Minimize the amount of people and equipment on-site;
- (3) Manage work zones to control access of people and equipment; and
- (4) Implement proper decontamination procedures for equipment and protective clothing.

#### 5. Decontamination

Contamination of personnel and equipment may occur while working on-site. To prevent transfer of harmful materials into clean areas decontamination procedures shall be established before entering the site.

a. Initial Decontamination Plans--Establish wash and rinse procedures for all personnel and materials leaving the contaminated area.

b. Equipment Decontamination - A plan shall be developed for decontamination of all equipment to be removed from the site.

c. Waste Disposal - Plans shall be developed for proper packaging of contaminated clothing, equipment and rinse water generated during site investigation for disposal on-site or off-site at the discretion of the EIC.

d. Contamination Reduction Corridor (CRC)--A CRC shall be established to reduce access into and away from the contaminated area.

e. Medical Emergencies--A plan for decontamination shall also be prepared for medical emergency situations and should be addressed in the contingency plan section

#### 6. Contingency Planning

A plan shall be developed to address a course of action in the case of an emergency situation.

a. Key personnel--All key personnel and alternates responsible for site safety and health and on-site operations shall be identified.

b. Site emergency procedures shall be established, stated in the plan and conveyed to all personnel during site specific training.

Procedures shall include:

- (1) escape routes
- (2) signals for evacuating work parties

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(3) emergency communication

(4) fire, explosion and hazardous material release response

(5) first aid and evacuation of injured persons

c. Medical facilities and vehicles for emergency transportation shall be located and arrangements made for emergency medical care in the event of injury due to chemical exposure of personnel. This information shall be provided in the plan.

d. Training of personnel for non-routine site activities to address unlikely events that may occur on-site shall be established.

e. Procedures for operating during adverse weather conditions which may affect operations at the site shall be established in the plan.

#### 7. Recordkeeping

Records shall be maintained of all safety and health related matters that occur during the course of the study. This will include field analytical data collected using field instrumentation (i.e., HNU, OVA), employee health monitoring data, safety and health planning documentation and contingency plan communications and contacts. The records will be provided to the EIC upon completion of the contract.

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SUMMARY OF REQUIRED PLANS/REPORTS

	# COPIES (DRAFT)	# COPIES (FINAL)
A. FOR THE 21 SITES		
RI Interim Report	3	12
B. FOR HPIA		
Work Plan	3	4
Sampling Plan (includes field sampling plan & quality assurance project plan)	3	5
Health & Safety Plan	-	3
1). SHALLOW AQUIFER		
RI Supplemental Report	3	12
Public Health Evaluation (PHE)	3	12
2). DEEP AQUIFER		
RI Report	3	12
FS Report (includes PHE)	3	12
3). SHALLOW SOILS		
RI Report	3	12
FS Report (includes PHE)	3	12
C. Progress Reports (submitted monthly for duration of project)	-	2
D. LABORATORY QA/QC PROGRAM		
QA/QC Plan	-	3
Work Plan (part of Sampling Plan)	-	-
Progress Reports (submitted monthly for duration of lab work)	-	3
Final Reports (appendices to RI reports)	-	-

Attachment C

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