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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:

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NREAD
11 Apr 89

From: Supervisory Chemist, EC&MS, Soil, Water, and Environmental Branch, Natural Resources and Environmental Affairs Division. 5003/2083
To: Director, Natural Resources and Environmental Affairs Division
Via: Supervisory Ecologist, Soil, Water, Environmental Branch Natural Resources and Environmental Affairs Division *DS 4-11-89*

Subj: WATER MONITORING RELATED TO THE INSTALLATION RESTORATION (IR) PROGRAM

Encl: (1) Installation Restoration Program Background Information

1. As requested, I've prepared a summary of the Installation Restoration Program aboard Camp Lejeune including our monitoring. It is contained in the enclosure.

2. In 1985, it was recommended that the drinking water wells be sampled annually for VOCs to catch contamination before it is shown in significant levels in the treated drinking water. Natural Resources performed this in 1985 and 1986. I was lead to believe that it was in ESE's Scope of Work for 1987. Funding was requested for this monitoring in FY88 and FY89 but there was not sufficient funds. When I was in LANTDIV in the end of February, Paul Rakowski stated that he felt that DERA funds could be used to sample the Drinking Water wells in the proximity of the IR sites. I feel that this monitoring is very important for all wells. If we had not started monitoring all wells in 1985, we would not have found well 651 which the worst contaminated well.

3. Wells 603 and 642 were recommended to be sampled quarterly since they are the wells closest to possible contamination. They were last done in Aug 1988.

4. Finally, I feel that the quarterly SOC monitoring of the treated water in each system be continued after this year. I suspect that the State will make us sample once every three years at the very least.

Elizabeth A. Betz
ELIZABETH A. BETZ

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*What is this?
Why do we do it?
What does SDWA
Are we doing it?
Any applicable state!*

INSTALLATION RESTORATION PROGRAM

BACKGROUND INFORMATION

1. In the early 1980's the Navy instituted a program to find any possible "Love Canals" aboard it's facilities. The program was called the Navy Assesment and Control of Installation Pollutants (NACIP). The program had three phases:
 - a) Initial Assesment Study (IAS)
 - b) Confirmation Study
 - c) Remedial Measures
2. Camp Lejeune had a closed Chemical Landfill from the Naval Research Facility that had been located here. Therefore it was one of the first facilities to undergo the IAS which was completed in 1982 by Water and Air Research, Inc. of Gainesville, Florida
3. The IAS for Camp Lejeune discovered 75 abandoned disposal sites aboard the complex. It was decided that 22 of the 75 sites required further study, a confirmation study.
4. In 1984, the Confirmation Study was initiated on the 22 sites at Camp Lejeune by Environmental Science and Engineering, Inc. of Gainesville, Florida. It involved taking soil samples, digging shallow groundwater wells and sampling any existing wells (drinking water wells) in proximity to the sites.
5. On 30 Nov 84, Natural Resources received a call from LANTDIV that said that the initial results of Bldg 602, a drinking water well within a block of the Hadnot Point Fuel Farm, showed Benzene. Bldg 602 well was shut down.
6. On 4 Dec 84, the Hadnot Point Water Treatment Plant's raw and treated water was sampled as well as any drinking water wells within a mile of the Hadnot Point Fuel Farm or Bldg 602. The Bldg numbers sampled were:

601 603 608 634 642
7. On 6 Dec 84, the results were received. Trichloroethylene (TCE), Dichloroethylene (DCE) and Tetrachloroethylene (PCE) were found in the raw and treated water from the Hadnot Point Water Treatment plant and wells 601, 602 and 608. Wells 601 and 608 were shut down.
8. From 10-31 Dec 84, duplicate and quality control samples were run to confirm the presence of TCE, DCE and PCE in the wells. Wells 634 and 637, on the second sampling showed Methylene chloride. The wells were temporarily closed until it was determined that the methylene chloride was probably a laboratory contaminant. It was determined that all drinking water wells would be analyzed for volatile organic chemicals (VOCs) to start in January 1985. CLW

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9. 16 Jan 85. 37 wells serving the Hadnot Point and Holcomb Blvd water plants were sampled.

23 Jan 85. 21 wells serving the Onslow Beach, Courthouse Bay, Camp Johnosn and Tarawa Terrace water plants were sampled.

10. On 27 Jan 85, the Chief of Staff of MCB detected a gasoline odor in the water in his quarters, serviced by the Holcomb Blvd water plant.

A fuel line running through the Holcomb blvd reservoir had leaked. The Holcomb Blvd plant was shut down and water was supplied by the Hadnot Point plant. The reservoir was flushed and scrubbed with high pressure hoses. The State of North Carolina was notified.

On 29 Jan 85, The State sampled the finished water at Holcomb Blvd plant and the Chief of Staff's quarters

11. -29 Jan 85. 25 wells serving the Marine corps Air Station, New River and Rifle Range water plants were sampled.

12. The State's results were received on 31 Jan 85, they didn't show any fuel but instead showed levels of TCE. Samples of Hadnot Point Water and Holcomb Blvd water were taken and driven to the State lab.

13. On 1 Feb 85, the 31 Jan 85 samples showed that there was still a contaminated well operating in the Hadnot Point system. The results of the 16 Jan 85 sampling were phoned into Natural Resources and showed high levels of TCE in 651.

Well 651 is located on the back side of DRMO's disposal storage lot. It was not initially sampled as being in proximity to a NACIP site. It had the highest levels of TCE found. The concentration was in the 17,000 to 18,000 ppb range. Well 651 was shut down. Well 634 showed TCE also and was shut down.

14. On 4 Feb 85, Holcomb Blvd and Hadnot Point plants and distribution systems were flushed and Holcomb Blvd was put back on line.

15. On 7 Feb 85, received results of 23 Jan 85 sampling which showed two wells in the Tarawa Terrace System contaminated with PCE, DCE and TCE. One was a brand new well. These wells were shut down.

16. From 8 Feb 85 through 31 March 85, more samples and results were received. All drinking water wells were sampled and analyzed for VOCs, if levels were found the well was shut down. This shut down one well at the Rifle Range, one at Marine Corps Air Station, New River, two wells at Tarawa Terrace and eight wells in the Hadnot Point system.

17. The historical data of Tarawa Terrace area did not show any possible sources for the PCE contamination. However CLW the road from Tarawa Terrace, off Camp Lejeune, were three dry cleaners. The State was brought in. In April 1985 the North Carolina Division of Environmental Management (DEM) sampled the

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Tarawa Terrace wells. DEM recommended one well, TT-25, be regularly checked because it was probably the next well to get contaminated. The State initiated a study and determined that ABC Cleaners was the source of the PCE at Tarawa Terrace.

18. From April 1985 to 1987, the Base started monitoring the Hadnot Point and Tarawa Terrace treated water weekly for VOCs and TT-25 monthly.

19. January 1986, Natural Resources sampled all operating drinking water wells for VOCs.

20. The groundwater contamination that had been found in the Industrial Area, indirectly through NACIP, became a site in itself, now bringing the total to 23.

21. The Superfund Amendments Reauthorization Act (SARA) was enacted in 1986. Under SARA Congress established the Defense Environmental Restoration Account (DERA) to fund DOD cleanup sites. SARA also required that federal facilities' programs be consistent with EPA. This meant a revamping of NACIP. It now became the Installation Restoration Program which has three phases:

- a) Preliminary Assessment/Site Investigation (PA/SI)
- b) Remedial Investigation and Feasibility Study (RI/FS)
- c) Record of Decision and Remedial Action (RD/RA)

What was the IAS became the PA/SI. What was the Confirmation Study became the RI/FS. What was the Remedial Measures now was under part of the RI/FS and the balance was under RD/RA. What it meant to Camp Lejeune was that we now had 23 sites in RI/FS.

22. As the Supervisory Chemist understood it ESE was to sample all the drinking water wells on 1987.

23. Until 1987, the Safe Drinking Water Act and the applicable sections of the North Carolina Administrative Code did not address organic chemicals beyond trihalomethanes or the six listed pesticides. The Safe Drinking Water Act left the requirements for monitoring for the six listed pesticides to the states and North Carolina had not required Camp Lejeune to monitor for them. October 1987, the State initiated Synthetic Organic Chemicals (SOCs) monitoring requirements.

XXX The SOC regulations require that the sample be analyzed for the eight regulated SOC^Ss and thirty unregulated SOC^Ss listed in the attachment. Then the system will be sampled every three months for a year for the eight regulated SOC^Ss. If SOC are detected then monitoring will continue until otherwise directed by the State. If SOC^S are not detected then monitoring will be done for a year every three or five years, to be determined by the State.

24. During 1987, the Holcomb Blvd expanded system CLW test operating, which meant that the Tarawa Terrace and Camp Johnson wells and plants were not operated. The expansion was officially

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accepted and the Tarawa Terrace and Camp Johnson plants closed
1 April 1988.

25. To comply with SOC regulations, the Holcomb Blvd, Hadnot Point and Marine Corps Air Station, New River were sampled in December 1987 for both the regulated and unregulated SOCs. They were also sampled in March, May and September 1988 for the regulated SOCs. Nothing was detected above detection levels. In the December 1987 sample from Hadnot Point trichloroethylene was found at 0.2 ppb. The detection level for TCE is 0.5 ppb so what was seen was seen below actually measureable levels.

26. In August 1988, well 603 and 642 were sampled and analyzed for VOCs, since they are the ones closest to the contamination. Nothing was found.

27. In 1988, Camp Lejeune was ranked by the EPA and was added to the National Priority List. This makes Camp Lejeune qualify for DERA funds.

28. To put all the water systems at Camp Lejeune on the same schedule all six systems were sampled for both the regulated and unregulated SOCs in March 1989. Nothing was detected above or below detection levels. The systems will be done once a quarter for the rest of the year.

*calibration
2/28/88?*

bottom line ↗

will reg + unreg?

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REGULATED CONTAMINANTS

MCL

Benzene	0.005 mg/l
Carbon Tetrachloride	0.005 mg/l
1,2-Dichloroethane	0.005 mg/l
Trichloroethylene	0.005 mg/l
para-Dichlorobenzene	0.075 mg/l
1,1-Dichloroethylene	0.007 mg/l
1,1,1-Trichloroethane	0.20 mg/l
Vinyl Chloride	0.002 mg/l

UNREGULATED CONTAMINANTS

Bromobenzene
Bromodichloromethane
Bromoform
Bromomethane
Chlorobenzene
Chlorodibromomethane
Chloroethane
Chloroform
Chloromethane
o-Chlorotoluene
p-Chlorotoluene
Dibromomethane
m-Dichlorobenzene
o-Dichlorobenzene
trans-1,2-Dichloroethylene
cis-1,2-Dichloroethylene
Dichloromethane
1,1-Dichloroethane
1,1-Dichloropropene
1,2-Dichloropropane
1,3-Dichloropropane
1,3-Dichloropropene
2,2-Dichloropropane
Ethylbenzene
Styrene
1,1,2-Trichloroethane
1,1,1,2-Tetrachloroethane
1,1,2,2-Tetrachloroethane
Tetrachloroethylene
1,2,3-Trichloropropane
Toluene
p-Xylene
o-Xylene
m-Xylene
Ethylene dibromide (EDB)
1,2-Dibromo-3-Chloropropane (DBCP)

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