

MTG. HELD 1530 21 MARCH 1986

FEC CHR. J. E. ROUSE DANON SHARPE
BURE BOBA. J. WOODRUFF JR. J.

6280/4
FAC

SUBJECT: VOLATILE ORGANIC CHEMICALS (VOC) IN THE CAMP LEJEUNE WATER SUPPLY

INTRODUCTION: This staff study addresses the supply of adequate water to Tarawa Terrace, and the mid- and long-term responses to the subject.

1. PROBLEM:

- With the two wells closed at Tarawa Terrace, water supply to meet the summertime demand appears inadequate.

- The milestones for the VOC study under the NACIP.

2. ASSUMPTIONS:

- None.

3. FACTS BEARING ON THE PROBLEM:

- Annex A provides analytical data on the Tarawa Terrace (TT) water system. These data indicate no detectable VOC concentrations in the finished water without the TT new well in operation.

- Annex A also indicates that detectable levels of tetrachloroethylene (tetraCE) in the TT finished water would likely occur when the TT new well is operated and blended with other TT wells. The levels of the tetraCE in the finished water can only be estimated as between detectable levels 10 ppb and 20 ppb.

Interestingly, the only parameter of significance appears to be tetraCE in the new well.

- Annex B provides the alternative for providing water to the TT area and recommended construction of an 8" line from Brewster Blvd to TT.

- Completion of this auxiliary line is anticipated by 1 June

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- Annex C describes the issues which must be addressed to develop the mid- and long-term responses to the VOC problem. Milestones for the completion of the NACIP study are requested in order for the CG, MCB to properly plan future responses and make decisions on courses of action.

- Annex D provides the results of our search for VOC standards among states and other agencies.

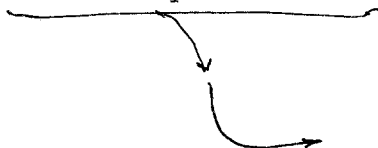
DISCUSSION:

- Annex A reinforces the recommendation to construct the 8" auxiliary raw water line to the TT system. Further, the data suggests interim use of the TT new well for contingency purposes would not pose any extreme health threat to the TT residents. Production for any duration should only be pursued following additional analyses of the "diluted" VOC concentrations in the finished water and review of these data by medical personnel.

- Construction of the 8" line offers future economic advantages in return of raw water from TT wells at a minimal cost.

- Funding for both the NACIP confirmation study and any remedial actions will use pollution abatement funds managed by NAVFACENGCOM.

- Defining maximum acceptable concentrations of VOCs in finished water which would be present during production from "positive" wells is extremely difficult due to lack of available data.



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5. CONCLUSIONS:

- The TT new well would be relatively safe to use for contingency purposes with caveats stated above.
- The construction of the 8" line offers much greater benefits than costs.
- The detailed NACIP study of the water system needs to be expedited.
- No clear regulatory limits for VOCs exist at present and will be slow in coming.

6. ACTION RECOMMENDED:

- a. Proceed with construction of 8" line to TT.

CS: Concur _____ Nonconcur _____

CG: Approved _____ Disapproved _____

- b. Forward message in Annex C.

CS: Concur _____ Nonconcur _____

CG: Approved _____ Disapproved _____

- c. Pursue definition of "acceptable" VOC levels in finished water through HQMC, NAVHOSP and NAVFACENGCOM.

CS: Concur _____ Nonconcur _____

CG: Approved _____ Disapproved _____

FINAL ESTIMATE 8" LINE (\$ 90,000)

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TARAWA TERRACE WATER SYSTEM
SUMMARY OF WATER QUALITY DATA (ppb)

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Date: 3/19/85

SAMPLE DATA

LOCATION	VOC Parameters	16 Jan* (L)	12 Feb (L)	19 Feb(N)	19 Feb(L)	11 Mar(N)**		
TT 26 Well	TCE	57	ND	ND	ND			
	4CE	1,580	ND	55	64			
	DCE	92	ND	ND	ND			
	B	ND	ND	ND	ND			
	VC	27	ND	ND	ND			
TT New Well						Pumped 2 Hours		
	TCE	ND	ND	53	ND	ND		
	4CE	132	37	26	ND	15		
	DCE	11	ND	ND	13	ND		
	B	ND	ND	ND	ND	-		
	VC	ND	ND	ND	ND	-		
							Pumped 24 Hours	
	TCE						ND	
	4CE						41	
	DCE						ND	
	B						-	
TT Finished Water							W/O New Well	
	TCE						ND	
	4CE						ND	
	DCE						ND	
	B						ND	
								Upstream of Reservoir at 24 Hours
	TCE						ND	
	4CE						21.3	
	DCE						ND	
	B						-	
							Downstream of Reservoir at 24 Hours	
TCE						ND		
4CE						Trace (6.6)		
DCE						ND		
B						-		

LEGEND: ND = Not Detectable at limit of 10 ppb
 TCE = Trichloroethylene
 4CE = Tetrachloroethylene
 DCE = Dichlorobenzene
 B = Benzene
 VC = Vinyl Chloride
 (L) = LANTDIV Laboratory
 (N) = State of NC Laboratory

*Wells having no detectable VOC's
also included: 25,30,31,32,52,54,67

**Dash (-) indicates parameters not reported telephonically-hard copy data to follow

HEADQUARTERS, MARINE CORPS BASE, CAMP LEJEUNE

ACTION BRIEF

Date: 1 MAR 1955

Staff Section: Assistant Chief of Staff, Facilities

Subj: ALTERNATIVES FOR PROVIDING WATER TO THE TARAWA TERRACE AREA

Problem: Because of the recent shutdown of two water wells in the Tarawa Terrace water system due to the presence of Volatile Organic Chemicals (VOC) in the raw water, sufficient well capacity is not expected to be available to satisfy water demand this summer. A shortage of 300,000 gpd (gallons per day) is expected this spring/summer if the present situation remains unchanged.

Background/Discussion: The following alternatives are listed as possible options for addressing the problem.

a. Alternative 1: New well, Tarawa Terrace. Estimated cost: \$80,000.

Advantages: Increase capacity by 100 gpm to 250 gpm (gallons per minute).

Disadvantages: Based on recent new wells and test wells in Tarawa Terrace, water in significant quantities is difficult to locate (e.g., well TT-25 is producing approximately 100 gpm although designed for 150 gpm. New well would be abandoned after completion of expansion of Holcomb Blvd plant in approximately two years. Wells in Montford Point area are high in iron content. Construction of a new well by spring is questionable but could possibly be completed.

b. Alternative 2: Transport water via tanker trucks from other Camp Lejeune plants. Assume hauling 300,000 gpd with 5,000 gallon tankers which would require 60 trips per day. Assuming a tanker can make 12 trips per day, a total of five tanker trucks would be required. Estimated cost: \$2,000 per day.

Advantages: Timely method of providing water.

Disadvantages: Logistics of loading/unloading/transporting; nonavailability of trucks.

c. Alternative 3: Tap to City of Jacksonville water line on Lejeune Blvd. Informal discussion with city officials indicates they probably could not provide 300,000 gpd at this time. No costs for taps or rates were quoted. A water line under Lejeune Blvd would have to be constructed. Estimated cost: Unknown.

Advantages: Timely response to problem, if available.

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Subj: ALTERNATIVES FOR PROVIDING WATER TO THE TARAWA TERRACE AREA

Disadvantages: Problems associated with connecting separate systems. Chance of requests for reciprocating favors from the City of Jacksonville would increase. VOCs in the city system could be higher than we are now facing.

d. Alternative 4: Change schedule of Holcomb Blvd plant contract to construct the water line to Tarawa Terrace immediately. The expansion of the Holcomb Blvd plant includes running a water line to TT and Camp Johnson. Contract has been awarded. Estimated cost: Unknown (additional cost to contractor).

Advantages: No unnecessary construction would be required.

Disadvantages: Serious doubts exist that contractor would complete line prior to high usage months. Line serving Tarawa Terrace is a 16" submerged line across Northeast Creek.

e. Alternative 5: Construct 8" water line from Brewster Blvd to Tarawa Terrace. Line could be tied to the railroad trestle to cross Northeast Creek. Estimated cost: \$75,000.

Advantages: Timely response to problem.

Disadvantages: Problems related to material procurement and construction could surface. The temporary line may require State approval. Pressures and elevations of the two systems have been investigated to determine feasibility.

f. Alternative 6: Modify Tarawa Terrace plant to include aeration or granular activated carbon (GAC) capable of removing VOCs. Estimated cost: \$300,000.

Advantages: Removal of VOCs would eliminate the problem.

Disadvantages: The modifications could not be made in the time frame required. The Tarawa Terrace plant will be discontinued upon completion of Holcomb Blvd plant expansion.

g. Alternative 7: Turn on contaminated wells that have been shut down if required to maintain adequate water levels. Estimated cost: None.

Advantages: Adequate quantity of water could be provided.

Disadvantages: Although no maximum contaminate levels have been set for VOCs and no regulations presently prevent using water containing VOCs, the potential health hazards must be weighed against the need and cost of providing water from other sources.

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Subj: ALTERNATIVES FOR PROVIDING WATER TO THE TARAWA TERRACE AREA

Recommended Action: Alternative 5, construct 8" line from Brewster Blvd to Tarawa Terrace. Preliminary engineering study indicates this would provide approximately 250 gpm (360,000 gpd).

Advantages:

- (1) Timely - target date for completion 1 June 1985.
- (2) Availability of water - can draw from Holcomb Blvd and Hadnot Point system.
- (3) Auxiliary line for future use during repair/maintenance of other system.
- (4) Minimum cost.
- (5) Potential future use to return raw water from Tarawa Terrace wells.

Very respectfully,



M. G. LILLEY
AC/S, Facilities

Decision on Recommended Action:

CS Concur _____ Nonconcur _____

CG Approved _____ Disapproved _____

Need more info as we discussed

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CG MCB CAMP LEJEUNE NC
LANTNAVFACENGCOM NORFOLK VA
INFO CMC WASHINGTON DC

UNCLAS //N11000//

LANTDIV FOR 114; CMC FOR LFL

SUBJ: NACIP STUDY ~~OF~~ CAMLEJ WATER SUPPLY SYSTEMS

A. CG MCB CAMLEJ NC 082305Z FEB 85

B. LANTDIV LTR 114:JGW:SSW 6280 DTD ¹⁰~~20~~ MAY 83

1. REF {A} DESCRIBED ONGOING ACTIONS TO ADDRESS THE PRESENCE OF VOLATILE ORGANIC CHEMICALS {VOC} IN ISOLATED WATER SUPPLY WELLS AT CAMLEJ. VOC'S HAVE BEEN DETECTED IN TEN WELLS WHICH HAVE BEEN CLOSED; NOTHING HAS BEEN DETECTED IN 67 WELLS.

2. SHORT-TERM ACTIONS BEING TAKEN ARE:

A. SEVERAL ALTERNATIVES FOR PROVIDING AMPLE WATER TO TARAWA TERRACE {TT} HAVE BEEN REVIEWED INCLUDING AN AUXILIARY LINE TO THE TT SYSTEM FROM THE HOLCOMB BLVD PLANT.

B. ANALYZING NEWLY CONSTRUCTED WELLS TO BOLSTER WATER PRODUCTION.

C. EXPEDITING INSTALLATION OF GAS CHROMATOGRAPH IN THE BASE


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ANNEX E

LAB TO PROVIDE LOCAL TESTING CAPABILITY.

D. EXPEDITING THE HOLCOMB BLVD PLANT EXPANSION PROJ {82-2243} WHICH WILL SUPPLY ALL WATER TO TT AND MONTFORD PT WHEN COMPLETE.

B. FOR MID/LONG-TERM ACTIONS, REQ THE SUBJ STUDY BE EXPEDITED AND THE FOLLOWING ISSUES BE ADDRESSED ^{AS DESCRIBED IN REF B.}

A. VERIFICATION OF EXISTENCE OF CONTAMINATION IN ALL WATER SUPPLY SYSTEMS. MOST WELLS IN THE EIGHT SYSTEMS HAVE BEEN SAMPLED ONCE. FOR THOSE SAMPLING LOCATIONS WHERE REPLICATE SAMPLES HAVE BEEN TAKEN, REPORTED VOC LEVELS HAVE VARIED GREATLY. THUS, THE VERIFICATION OF THE VOC'S IN ALL SYSTEMS APPEARS ~~UN~~WARRANTED. 

B. VERIFICATION OF THE LOCATION OF SOURCES OF VOC'S IN THE TEN WELLS WHICH HAVE BEEN CLOSED DUE TO DETECTABLE VOC'S: 601, 602, 603, 634, 637, 651, 652, 653, TT-20 AND TT NEW WELL.

C. CHARACTERIZATION OF VOC PROBLEMS IN THE HADNOT PT, HOLCOMB BLVD AND TT SYSTEMS TO FIND THE EXTENT AND RATE OF MIGRATION OF VOC'S, INCLUDING MIGRATION FROM POSITIVE WELLS TO CLEAN WELLS DURING INCREASED PUMPING.

D. REVIEW OF THE EXTENT OF USAGE ~~AND CONSTRUCTION PRACTICES~~ FOR TEST BORINGS AND THE LOCATION AND STATUS OF ABANDONED WELLS

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ABCARD CAMPLEJ TO DETERMINE THE POTENTIAL FOR INTER-AQUIFER EXCHANGE OF CONTAMINANTS VIA THESE ROUTES.

E. PREPARATION OF THE FEASIBILITY STEP AND COST ESTIMATES FOR INTERIM AND LONG-TERM ALTERNATIVES IN ACCORANCE^D WITH THE CONTINUING PHASES OF THE NACIP PROGRAM PER REF [B]9

F. RECOMMENDATIONS FOR INTERIM AND LONG-TERM MONITORING OF RAW WATER WELLS AND TREATMENT SYSTEMS.

4. REQ YR ASSISTANCE IN DEVELOPMENT OF MILESTONES FOR EACH OF THE ABOVE ISSUES BY 15 APR 85.

5. POC IS MR. BOB ALEXANDER, AV 484-3034/5.

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UNITED STATES MARINE CORPS
Natural Resources and Environmental Affairs Division
Marine Corps Base
Camp Lejeune, North Carolina 29542

IN REPLY REFER TO:

6280/1

NREAD

11 Mar 1985

From: Director, Natural Resources and Environmental Affairs
Division, Marine Corps Base, Camp Lejeune
To: Assistant Chief of Staff, Facilities, Marine Corps Base,
Camp Lejeune
Subj: STANDARDS FOR CERTAIN TYPES OF VOLATILE ORGANIC CHEMICALS
FOUND IN DRINKING WATER WELLS

1. The Chief of Staff recently requested the subject information. NREAD contacted Mr. Paul Hubbell, Code LFL, HQMC, regarding standards for the subject chemicals. Mr. Hubbell recommended that we not attempt to call individual States. He also advised that he would request the information from EPA and other sources he had available. Mr. Hubbell provided the following information on 8 March 1985:

a. Sources contacted:

- (1) American Water Works Association (AWWA);
- (2) All DOD services, except U. S. Air Force;
- (3) Criteria and Standards Division, EPA Office of Water;
- (4) Office of Drinking Water, EPA Office of Water; and
- (5) State Programs Division, EPA Office of Water.

b. Mr. Hubbell expressed surprise at the lack of information. He was, however, able to identify the following information:

(1) The Army has provided a letter from the Office of Emergency and Remedial Response, EPA to the Director of Policy, DOD. The letter establishes short term exposure limits of 200 ppb and long term limits of 5-50 ppb for Trichloroethylene. The letter limits these recommendations to incidents at two specific DOD installations. Mr. Hubbell is mailing MCB CLNC a copy.

(2) The Criteria and Standards Division, EPA Office of Water is providing "Non-Binding Health Advisories for Short Term Exposures" for several of these chemicals. Mr. Hubbell anticipates receipt of these on 11 March 1985 and will forward to MCBCLNC immediately.

(3) The AWWA has just started a data search but information will not be available for several months.

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ENCLOSURE (2)
ANNEX D

Subj: STANDARDS FOR CERTAIN TYPES OF VOLATILE ORGANIC CHEMICALS
FOUND IN DRINKING WATER WELLS

2. NREAD contacted Mr. Ken Orloff, Toxicologist, Region IV EPA, Atlanta, Georgia. Mr. Orloff advised that to his knowledge the only standards for the subject chemicals in Region IV was a limit of 3 ppb in Florida for Trichloroethylene.

3. It appears that the documents being forwarded by Mr. Hubbell constitute the best information available. NREAD concurs with Mr. Hubbell's recommendation relative to direct contacts with States addressed in paragraph 1.

J. I. WOOTEN

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Memorandum

11300
MAIN

DATE: 26 Apr 85
FROM: Base Maintenance Officer
TO: Assistant Chief of Staff, Facilities

SUBJ: WATER SHORTAGE IN TARAWA TERRACE AREA

1. Without water conservation measures or approval to turn on the VOC contaminated well this weekend, Base Maintenance anticipates water shortages and possible outages for the Tarawa Terrace area.
2. Presently, no guidance has been given regarding instructions for water plant operators when water reservoirs reach critical levels. This forces the operator to make operational decisions that should be previously made at a higher level.
3. Accordingly, without additional clarification/instructions regarding use of the previously mentioned well, I feel compelled to instruct our personnel to refrain from utilizing the well this weekend, even if this decision results in water outages.


H. L. LUTTRELL

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15 MARCH

WATER SAMPLE RESULTS (SAMPLES TAKEN 4 FEB)

<u>WELL</u>	<u>VOC</u>
602	74 PPB - 1,2 TDCI ; 1.5 ppb - PCE ; 38 ppb - TCE ; 8.4 PPB - BUTANE ; 2.2 PPB - PENTANE ; 3.1 3.1 PPB - METHYL PENTANE
608	1.6 PPB - BENZENE ; 9.0 - TCE
610	ND
645	ND
649	ND
654	ND
AS 191	ND
AS 203	ND

WATER PLANT

HOLCOMB (670)	FILTER # 1 - 2.8 PPB TCE " # 2 - 1.5 PPB TCE
HADNOT (20)	150 PPB - 1,2 TDCI ; 7.5 PPB - PCE ; 429 PPB - TCE ; 2.9 PPB - VC ;
AIR STATION (110)	ND
MONTFORD Pt	ND
TARAWA TERRACE	12 PPB - 1,2 TDCI 8 PPB - TCE 215 PPB - PCE

* RESULTS RECD FROM E. BETZ - 15 MARCH 1985

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