

**GRAINGER LABORATORIES, INC.
LETTER OF AUGUST 10, 1982**

ALSO ATTACHED ARE

**MEMORANDUM FOR THE RECORDS WRITTEN BY SUPERVISORY CHEMIST
DATED MAY 25, 1982 AND JULY 30, 1982**

**MEMORANDUM WRITTEN BY SUPVY CHEMIST TO SUPVY ECOLOGIST
DATED AUGUST 19, 1982**

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GRAINGER LABORATORIES

INCORPORATED

ANALYTICAL AND CONSULTING CHEMISTS

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ANALYTICAL LABORATORY

Environment Analysis
Construction Materials
Identification of Unknowns
Agriculture
Fuels
Textiles
Chemicals
Hazardous Waste

August 10, 1982
82-4471

Commanding General
Marine Corps Base
Camp Lejeune, N.C. 28542

Attention: AC/S Facilities

Subject: Analyses of samples 206 and 207 from site coded "TT" and samples 208 and 209 from site coded "HP". Samples received July 29, 1982.

Discussion:

Previously all samples from site TT and HP presented difficulties in performing the monthly Trihalomethane analyses. Interferences which were thought to be chlorinated hydrocarbons hindered the quantitation of certain Trihalomethanes. These appeared to be at high levels and hence more important from a health standpoint than the total Trihalomethane content. For these reasons we called the situation to the attention of Camp Lejeune personnel.

Results:

The identity of the contaminant in the well field represented by samples 206 and 207 was suspected to be Tetrachloroethylene. This was confirmed by two analytical techniques and the results were 76 $\mu\text{g}/\text{l}$ and 82 $\mu\text{g}/\text{l}$ for samples 206 and 207 respectively. Sample 86 from May 27, 1982 was reanalyzed as a part of our study. Sample 86 was from site TT and contained 80 $\mu\text{g}/\text{l}$ tetrachloroethylene.

Samples 208 and 209 were also analyzed by the same analytical techniques. The magnitude of the contamination was not as great as previously observed from this same sampling point. Upon reanalyzing sample 120 from site HP May 27, 1982, Trichloroethylene was identified and quantitated at 1400 $\mu\text{g}/\text{l}$. A lesser amount of Tetrachloroethylene was confirmed at 15 $\mu\text{g}/\text{l}$. Samples 208 and 209 contained 19 $\mu\text{g}/\text{l}$ and 21 $\mu\text{g}/\text{l}$ Trichloroethylene respectively; Tetrachloroethylene was not detected.

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Prior to this report, the samples from July 28, 1982 from site HP were analyzed. Traces of both solvents were found in this set. Though not quantitated, the level of Trichloroethylene seems to be in the range of that which was found in samples 208 and 209. The sample which showed the most contamination relative to the others was 205. Also sample 168 from site TT on July 28, 1982 was analyzed and shown to contain 104 µg/l Tetrachloroethylene.

Conclusion:

Tetrachloroethylene was identified as the contaminant in the well field coded "TT". Its concentration seems relatively stable over the period in which it has been examined. It was confirmed that the well field coded "HP" has shown contamination by Trichloroethylene and Tetrachloroethylene. These levels have been variable over the period studied and are now at significantly lower levels than when first encountered. The following table summarizes the findings:

<u>Sample</u>	<u>Date Taken</u>	<u>Site Code</u>	<u>Tri chloroethylene</u>	<u>Tetra- chloroethylene</u>
206	7-27-82	TT	-	76
207	7-27-82	TT	-	82
86	5-27-82	TT	-	80
168	7-28-82	TT	-	104
208	7-27-82	HP	19	<1
209	7-27-82	HP	21	<1
120	5-27-82	HP	1400	15
205	7-28-82	HP	No Data	1.0

Bruce A. Babson

Bruce A. Babson
Chemist

BAB/ab
Customer #92400

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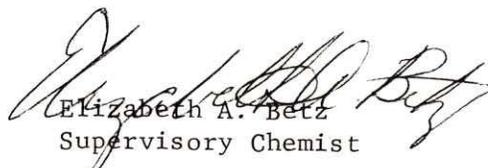
Date: 25 May 1982

Memorandum for the Record

From: Ms. Betz, Quality Control Lab., Environmental Section, NREAB, BMaintDiv

Subj: Phone Conversation with Mike Hargett on 6 May 1982

1. On 6 May 1982, Mike Hargett, of Grainger Labs called to say that during the analysis of April's 1982 samples they had some interferences. He said that peaks for Perclene and Trichloroethylene (TCE), which are synthetic organic cleaning solvents were found in samples #001-005 (Tarawa Terrace Water System) and #037-041 (Hadnot Point Water System). He also stated that the TCE peak for the Hadnot Point samples overlapped the Bromodichloromethane peak. He asked if a less than value would be acceptable since that is all that could be read. I stated that that would be fine. He also stated that no mention would be made of the extra peaks except for the less than value on the report.
2. Right after I talked with Mike Hargett, I notified Danny Sharpe, Supervisory Ecologist, of Grainger's findings. The findings were then sent up the chain of command to Billy Elston, Deputy Base Maintenance Officer, and over to the Utilities Director, Fred Cone.
3. Later on 6 May 1982, I called Mike Hargett back to discuss cost of analysis. Analysis would cost \$75 for both parameters per sample.
4. On 14 May 1982, while briefing Col Millice and LtCol Fritzgerald on April's trihalomethane analysis, it appeared to me that they had not been informed about the findings. I didn't inform them.


Elizabeth A. Betz
Supervisory Chemist

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Date: 30 July 1982

Memorandum for the Record

From: Ms. Betz, Quality Control Lab., Environmental Section, NREAB, BMaintDiv

Subj: Raw and Treated Sampling at Tarawa Terrace and Hadnot Point Water Treatment Plants

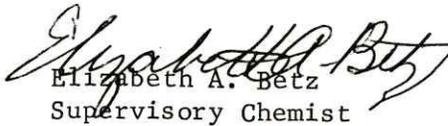
1. On 28 July 1982, Gaines Huneycutt and Elizabeth Betz collected a raw and a treated water sample at the Water Treatment Plants for Hadnot Point and Tarawa Terrace. The reason for the sampling was that during the analysis of the Base's THM samples by Grainger Labs, Grainger had come across some interfering peaks caused by the presence of trichloroethylene and perchloroethylene (synthetic organic cleaning solvents) in the samples from Tarawa Terrace and Hadnot Point.

2. Below is listed the sample numbers and locations of the samples.

Sample #	Location	Time
206 A&B	TT WTP, Bldg STT-38, Raw	1000
207 A&B	TT WTP, Bldg STT-39A, Treated	1005
208 A&B	HP WTP, Bldg 20 (Man-hole) Raw	1055
209 A&B	HP WTP, Bldg 20, Treated	1100

3. The sample containers had arrived in an ice chest from Grainger. Mike Hargett had instructed that the samples had to be sent back to Grainger by bus and on ice since the solvents were highly volatile. A DD1348/1 was prepared by Mr. Richardson of Base Maintenance Property Office. At approximately 1130, the samples were carried to Freight Traffic, who had arranged to take them to the bus station for the 1400 bus to Raleigh. Mike Hargett was called and notified to have someone pick up the samples at approximately 1730 at the Raleigh bus station.

4. During a phone conversation with Mike Hargett on 30 July 1982, it was learned that the samples had been received.


Elizabeth A. Betz
Supervisory Chemist

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Date: 19 August 1982

Memorandum

From: Ms. Betz, Quality Control Lab., Environmental Section, NREAB, BMaintDiv

To: Mr. Sharpe, Supervisory Ecologist, Environmental Section, NREAB, BMaintDiv

Subj: Grainger Laboratories Letter of 10 August 1982

Encl: (1) Subject Letter
(2) SNARL for Trichloroethylene
(3) SNARL for Tetrachloroethylene
(4) Suggested Action Guidance-Tetrachloroethylene

1. On 6 May 1982, Mike Hargett, of Grainger Labs, called and informed me that on 3 May 1982, while they were analyzing the first set of Trihalomethane samples received from us, interferences possibly from chlorinated hydrocarbons hindered analysis of samples from two systems, Tarawa Terrace and Hadnot Point.

2. It was determined that raw and treated samples from the treatment plants for the two systems would be taken for analysis of the interfering chlorinated hydrocarbons. On 28 July 1982, a raw water sample, #206, and a treated water sample, #207, were taken at the Tarawa Terrace water treatment plant. A raw water sample, #208, and a treated water sample, #209, were taken at the Hadnot Point water treatment plant, on 28 July 1982. The Trihalomethane samples for July were also taken on 28 July 1982, for these two systems. In Grainger's letter, of 10 August 1982, they erroneously report the samples as taken on 27 July 1982, they were collected and shipped on 28 July 1982.

3. Analysis of the above samples and some Grainger had preserved showed that in the Tarawa Terrace water treatment plant and system, the interfering chlorinated hydrocarbon is tetrachloroethylene, or otherwise known as perchloroethylene. Tetrachloroethylene is used as a dry cleaning and degreasing solvent, and heat-transfer medium. Analysis of the Hadnot Point water treatment plant and system samples showed Trichloroethylene and low levels of tetrachloroethylene. Trichloroethylene is used primarily as a metal degreaser. It is also used as a dry-cleaning solvent and a type of pesticide, fumigant.

4. Neither tri- or tetrachloroethylene are regulated contaminants under the Safe Drinking Water Act. However, EPA has a "SNARLS" program which provides some guidance on unregulated contaminants. A snarl is a suggested no adverse response level and is not a legally enforceable standard. Snarl values are usually provided for 1-day, 10-day, and longer-term exposure periods.

5. Tetrachloroethylene, in high doses, has been reported to produce liver and kidney damage and central nervous system disturbances in humans. EPA's snarls for tetrachloroethylene are 2300 ug/l for 1-day, 175 ug/l for 10-days, and 20 ug/l for longer-term where drinking water is the only source of exposure. On 9 April 1980, EPA came out with a Suggested Action Guidance on Tetrachloroethylene. This guidance was a result of possible tetrachloroethylene contamination of drinking water

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where coated A/C pipe was used. Their recommendations were (1) immediate corrective action (within 24 hours) if the Tetrachloroethylene level exceeds 2.3 mg/l (same as 1-day snarl) (2) corrective action within 10 days if the tetrachloroethylene level exceeds 0.13 mg/l (same as 10 day snarl) (3) for extended periods the tetrachloroethylene level should not be greater than 0.04 mg/l.

6. Trichloroethylene, like tetrachloroethylene and other halogenated hydrocarbons (ie Trihalomethanes), at high levels, has been reported to produce liver and kidney damage and central nervous system disturbances in humans. EPA's snarls for trichloroethylene were determined to be 2 mg/l for 1-day, 0.2 mg/l for 10-day, and 75 ug/l for a chronic snarl. There is no Suggested Action Guidance on trichloroethylene.

7. Below is a table of the results received from Grainger labs.

Sample #	Sample Date	WTP	Sample Site	chloroethylene, ug/l	
				Tri-	Tetra-
86	5-28-82	TT	Distribution Point,	-	80
168			Bldg TT-2453		
168	7-28-82	TT	Distribution Point,	-	104
			Bldg TT-2453		
206	7-28-82	TT	Raw Water @ Plant	-	76
208	7-28-82	TT	Treated Water @	-	82
			Plant		
120	5-27-82	HP	Distribution Point,	1400	15
			Bldg NH-1		
205	7-28-82	HP	Distribution Point,	No Data	100
			Bldg FC-530		
208	7-28-82	HP	Raw Water @ Plant	19	<1
209	7-28-82	HP	Treated Water @	21	<1
			Plant		

What Grainger means by no data for trichloroethylene analysis for sample #205 is that Trihalomethane samples 201-205, from Hadnot Point, were analyzed qualitatively for trichloroethylene, but exact quantities were not determined. According to a phone conversation on 19 August 1982, with Bruce Babson of Grainger Labs and myself, samples 201-205 were in the range of 208 and 209 for Trichloroethylene, and of samples 201-205, 205 had the most contamination.

8. The level of tetrachloroethylene for the Tarawa Terrace system samples averaged 0.09 mg/l, which exceeded the recommended level of 0.04 mg/l. The levels do not vary significantly between the raw and treated samples. The raw and treated samples were taken at the plant where the water had already traveled some distance in pipes. Therefore, with no significant difference between raw and treated samples and the high average of 0.09 mg/l, I would believe the tetrachloroethylene contamination is possibly do to the use of coated A/C pipe in the raw water lines at Tarawa Terrace.. Tetrachloroethylene, in the Hadnot Point system samples is at trace levels and well under recommended levels.

9. The level of trichloroethylene, at Hadnot Point, is presently averaging 20 ug/l, which is below all three recommended snarls; 1-day, 10-day, and chronic. No explanation is offered for the 1400 ug/l level on 27 May 1982, or why it is now averaging only 20 ug/l.

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Elizabeth A. Betz
Supervisory Chemist