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25 SEP 1986

From: Commander, Atlantic Division, Naval Facilities Engineering Command  
To: Commanding General, Marine Corps Base, Camp Lejeune

Subj: COMMENTS ON U.S. GEOLOGICAL SURVEY (USGS) PROPOSAL TO STUDY THE WATER  
AQUIFER

Ref: (a) MARCORB Camp Lejeune ltr 6280/4 FAC of 5 Sep 85 (subj: Requesting  
Comments on USGS proposal)

1. The USGS proposal is for an ambitious aquifer study program which will be part of North Carolina's and the USGS's effort in studying the groundwater. Marine Corps concerns are groundwater contamination and an adequate potable water supply for the future.

While both the USGS and the Marine Corps concerns are for the groundwater, the extent and depth of the studies needed to satisfy each need are different. The USGS proposal would have the Marine Corps fund a study suited for the USGS goals, but considerably beyond the needs of the Marine Corps.

2. Based on the project proposal, there appears to be some overlap between the USGS study and the NACIP Confirmation Study being conducted by Environmental Science and Engineering, Inc. The chemical tests described under Phase II will be performed by ESE on composite samples from all existing wells in October 1986. Should any parameters exceed analytical detection limits or Maximum Contaminant Levels, as applicable, individual wells will be sampled for that contaminant. USGS Phase III goal of determining alternative groundwater use and management practices to reduce the chances for contamination is also being addressed by the NACIP program. At the conclusion of the Confirmation Study, ESE will have evaluated the potential for both horizontal and vertical contaminant migration from each site under study. If the potential exists for contaminant migration into your water supply aquifer, they will look at remedial alternatives, which may include changes in your groundwater use and management practices. As you are aware, ESE will commence this extensive investigation for the Hadnot Point water supply aquifer this fall.

3. Adequacy of the water supply is determined by pump tests to determine aquifer capacity and analyses of groundwater samples to determine quality. Three or four tests, properly performed, should provide adequate aquifer data to estimate the water supply potential. These could be done at the existing water wells at a considerably lower cost than the USGS proposal.

Cost/well (estimate)

Remove Marine Corps pump, inspect the pump and make minor adjustments/repairs and replace after test 350.00

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Subj: COMMENTS ON U.S. GEOLOGICAL SURVEY (USGS) PROPOSAL TO STUDY THE WATER  
AQUIFER

Install test pump and perform test	6,000.00
Drill 1-1/4 inch Observation Well at \$18.50/feet	<u>3,650.00</u>
Total	\$10,000.00/well
5 well tests	= 50,000.00
Contingencies at 10 percent	= 5,000.00
Escalated to 1987 at 10 percent	= <u>5,000.00</u>
Total	= \$60,000.00

Well test analyses can be done in-house by LANTNAVFACENGCOM using the modified Theis Method.

4. Salt water intrusion can be determined by periodically sampling the chloride levels at various depths of some of the existing wells near and away from the ocean. The intrusion rate can be estimated by dividing the difference of the distances of two wells from the coastline by the time required for the chloride concentration of the furthest well to reach the chloride concentration that existed in the closest well when the sampling began.

✓ 5. While a groundwater model such as proposed may be useful for the large area USGS groundwater type of study, other more economical methods are available to determine groundwater draw down levels induced by Marine Corps pumping over a period of time.

6. A simple network program based upon the Theis equation that can be run on a desktop PC Computer with user instructions could be developed by this office. This should be adequate for Marine Corps needs. New well locations can be evaluated and drilled where the computer model indicates drawdowns would be smallest. Well pumping routines simulated on the computer showing those wells that produce the minimum drawdowns and can be selected for well pump operation.

*J. R. Bailey*  
J. R. BAILEY  
By direction

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