HEADQUARTERS, MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

Date 6-18-90

From: AC/S, Environmental Management

To: Danny DDS

Subj: Stephanie — Sent copy of NOTE 20 June 90

I have sent the attached to AC/S Fac for review/comments & possible funding. I am also looking at the EMD funding situation.

TKS

Julian

Betz — File

CLW

0000005705

Prepared/Compiled by
Stephany Del Re

6286/3
BEMD

Topic

- United States Geological Survey's continued efforts (Phase III) at MCB, Camp Lejeune, NC.
  Phase III - Flow model will be used to evaluate alternative ground-water use and management practices that will reduce chances for further contamination and help assure that future water -supply needs are met.

Purpose of Discussing Topic

- A plentiful and good and quality water supply is vital for Camp Lejeune to carry out its mission and to maintain the operational readiness of the Fleet Marine Forces.

- It would be very difficult to impound large supplies of freshwater on the surface of the land in the area, Camp Lejeune relies on large amounts of ground water for water supply.

Background

I. This is a three-phase study:

   a. The first phase is the examination of available data

   b. The second phase is the collection of additional data and construction of new observation wells and

   c. The third phase is modeling.

   d. Phase I and II are completed. Phase III needs funding for this effort to continue.

II. An increase in the amount of waste generated by Base operations has accompanied the growth of the Base. As a result,

   a. Significant amounts of wastes containing hazardous compounds have been disposed of or spilled on the Base.

   b. Most disposal and spill sites are directly underlain by sand and lack natural or synthetic barriers to prevent the wastes from moving downward into the ground-water system.

   c. Some wastes have infiltrated to the water table and have contaminated some ground-water in the shallow and supply aquifers.

   d. Many of the waste disposal and spill sites are near water supply wells.

CLW

III. Salt intrusion

a. Ground-water withdrawals from wells that are near the tidal reaches of the New River and its tributaries may cause salty water in these drainageways to move into and through the shallow aquifers toward the pumping wells.

b. It is also possible that salty water could be drawn upward from deeper parts of the aquifer system by wells pumping large amounts of ground-water from the deep sand aquifers or the lower parts of the sand and limestone aquifer.

IV. Future water supply needs of Onslow County

(Attachments 1,2 and 3)

Attachment I

Specifically, we see the following uses for a 3-dimensional flow model:

Water Supply

* Provide a general picture for the Base of where most productive areas for ground-water supplies are likely to be found.

* Evaluate well interference in well fields.

* Locate new well sites or well fields likely to produce large supplies.

* Evaluate pumping schedules and pumping rates for existing wells.

* Evaluate how ground-water withdrawals by others (i.e., Jacksonville, Onslow County) affect the Base supply and how the Base affects the supply of others.

* Well construction and design.

Water Contamination

* Provide a general picture of areas susceptible or not susceptible to ground-water contamination.

* Locate disposal sites to minimize impacts on water supply and environment.

* Contaminant tracing by evaluating particle flow paths and particle time-of-travel.

* Remedial action by evaluating various pump-and-treat schemes.

* Help locate monitoring wells and design monitoring schedules for areas of potential contamination.

Input To Other Studies

* Model sensitivity analysis can indicate need for more data collection in critical areas.

* Model can help evaluate need for more detailed models of smaller areas. These models may be further 3-Dimensional flow models or, where contamination or salt-water intrusion are found to be problems, solute-transport or variable-density flow models.

* Model can provide boundary conditions and initial calibrated starting values for model parameters for more detailed models.

assessment of the hydrogeologic framework that was developed during Phase 1.

WORK TASK VI Continue preparation of GIS dataset and coordination with Camp Lejeune GIS system.

WORK TASK VII Prepare a report that describes the refined hydrogeologic framework. The proposed title of the phase 2b report is "Hydrogeologic framework beneath Camp Lejeune Marine Corps Base, North Carolina."

Attachment 2

WORK PLAN FOR PHASE 3
Year 4 (April 1, 1989 - March 30, 1990)

WORK TASK I Construct a finite-difference ground-water flow model of the hydrogeologic system in and around Camp Lejeune based on the data and interpretations that resulted from investigations during Phases 1 and 2.

a. Design grid for modeled area and determine boundary conditions.

b. Discretize appropriate maps of aquifer and confining-bed characteristics (such as structure tops, thicknesses, hydraulic conductivity, potentiometric surfaces, etc.).

c. Develop a steady-state digital model for unstressed (pre-pumping) conditions and a transient model simulating the stressed conditions through present time.

d. Evaluate different ground-water pumpage and development schemes to determine which alternatives will reduce the chances for contamination of the water-supply aquifer (optimization analysis).

The ground-water flow model will be a management aid that can be used (1) to guide site selection for new wells through prediction of water-level drawdowns that will occur in response to planned pumping rates at potential well sites, and (2) to evaluate water-level drawdowns at existing production wells through prediction of drawdowns that would occur in response to alternative pumping schedules. The potential benefits to be gained from model studies are less well interference, lower pumping costs, and reduced chance for contamination of the water supply.

WORK TASK II Prepare report on the results of Phase 3 investigations with appropriate illustrations and data tables. The proposed title of the Phase 3 report is "Ground-water supply and potential for contamination--Camp Lejeune Marine Corps Base, North Carolina."

CLW

ATTACHMENT 3

PROPOSAL TO COMPLETE PHASE III OF CAMP LEJEUNE STUDY

The USGS proposes to complete the Phase III of the Camp Lejeune ground-water management study by March 30, 1992. The final products will be a ground-water flow model and a Water-Resources Investigations Report. The breakdown in costs and proposed time frame are as follows:

Year 1. April 1, 1990 to March 30, 1991

Work Tasks:

1. Prepare all remaining maps needed for model, and digitize maps.
2. Create data files for model.
3. Calibrate model and perform sensitivity analysis.
4. Begin computer simulations for various pumping senarios.
5. Generate annotated outline for Phase III report.

Funding: $125,000

Year 2. April 1, 1991 to March 30, 1992.

Work Tasks:

1. Complete computer simulations for various pumping senarios.
2. Write Water-Resources Investigations Report for Phase III.

Funding: $125,000

UNITED STATES MARINE CORPS
Environmental Management Department
Marine Corps Base
Camp Lejeune, North Carolina 28542-5001

6284
BEMD

From: Assistant Chief of Staff, Environmental Management Department
To: Assistant Chief of Staff, Facilities

Subj: USGS - GROUNDWATER MANAGEMENT STUDY

Encl: (1) USGS Groundwater Management Study: Proposal to complete Phase III

1. Phase I & II of the subject Groundwater Management Study have been completed. Phase III is awaiting the funding indicated in attachment 3 - a total of ~~$250,000~~ $125,000. The proposed Phase III modeling will contribute to long-term water resources planning and the protection of existing potable water supplies, which is obviously a critical element to carrying out the Marine Corps mission.

2. It is recommended that the Phase III portion ~~of~~ (2) of the USGS Groundwater Management Study be included in the ~~FY-91~~ Facilities Budget. (Considered by HQMC Forces for FY-90 - Funding ~~of~~)

3. Point Of Contact is Stephany Del Re, extension ~~5090~~ 5068.

J. I. WOOTEN

CLW

000000571 1