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LETTER DISCUSSING PROPOSED TEST HOLES TO BE DRILLED DURING 3 TO 15 APRIL
1995 MILLINGTON SUPPACT TN
3/22/1995
U S DEPARTMENT OF THE INTERIOR



United States Department of the Interior

U.S. GEOLOGICAL SURVEY

Water Resources Division
810 Broadway, Suite 500
Nashville, Tennessee 37203

March 22, 1995

Mr. Greg Parker
Memphis and Shelby County Health Department
Pollution Control Section
Water Quality Room 438-L
814 Jefferson Avenue
Memphis, Tennessee 38105

Dear Mr. Parker:

In April 1994, five stratigraphic test holes were drilled by the U.S. Army Corps of Engineers, Memphis District (Corps), for the U.S. Geological Survey (USGS), as part of cooperative Navy/USGS environmental investigations being conducted at the NAS Memphis. The test holes were drilled to obtain subsurface information for development of a conceptual model of the hydrogeology at the base and to plan for environmental investigations at RCRA Solid Waste Management Units (SWMUs) located within the North Complex. With planning now underway for investigations at SWMUs within the NAS Memphis South Complex, a second round of stratigraphic test holes are being planned by the USGS to obtain subsurface information at up to three sites within the South Complex and at one additional location within the North Complex. The purpose of this letter and attachments is to make application for and receive a permit from the Memphis and Shelby County Health Department for the drilling program, which is described briefly below.

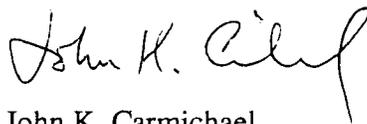
The proposed test holes will be drilled by the Corps during the period April 3-15, 1995. The holes will be drilled using standard hydraulic-rotary methods to depths of about 200 feet below land surface (terminating a few feet into the Cook Mountain Formation) to obtain information about the hydrogeology of the loess/alluvium, fluvial deposits, Cockfield Formation, and Cook Mountain Formation. Upon completion of the boreholes, geophysical logs will be run in each hole, then the holes will be abandoned with cement grout from the Cook Mountain to land surface. Locations for the test-hole stations have been selected in areas close enough to the SWMUs so that relevant, site-specific hydrogeologic information may be obtained, yet far enough away from the sites that subsurface contamination is not anticipated. The locations of the test holes (Stations 6 through 9) and the corresponding SWMUs (numbers 2, 9, 14, 59, and 65) are shown in figure 1.

Depending on several factors, a decision may be made to substitute the test hole at Station 9 with a cluster of three water-level observation wells, one each in the loess/alluvium, fluvial deposits, and the Cockfield Formation, at a central location on-base (figure 1). The decision to replace the test hole with the observation wells will be made by the USGS while drilling is being conducted.

If this option is selected, the Corps will install the fluvial and Cockfield wells, and the USGS will use its auger rig to install the third observation in the loess/alluvium (~15 to 20 feet deep) at the cluster location in May. A generalized drawing of the proposed well constructions is shown in figure 2.

The attached permit application has been prepared so that it covers plans to drill either the four test holes or the three test holes and the three observation wells. A permit is therefore requested that will cover whichever drilling plan is selected. Once the drilling work is completed, the USGS will notify your office as to which plan was conducted, and will submit the driller's logs and (or) well construction details, as appropriate. If you have any questions concerning the proposed drilling program or the permit application package, please give me a call at (615) 736-5424, ext. 3137.

Sincerely,

A handwritten signature in black ink that reads "John K. Carmichael". The signature is written in a cursive style with a large, sweeping flourish at the end.

John K. Carmichael
Hydrologist

attachments

MEMPHIS AND SHELBY COUNTY HEALTH DEPARTMENT

POLLUTION CONTROL SECTION

WATER QUALITY ROOM 438-L

814 JEFFERSON AVENUE

MEMPHIS, TN 38105

901-576-7741

WELL APPLICATION FORM

SECTIONS I, II, III, AND IX MUST BE COMPLETELY FILLED OUT BY THE WELL OWNER. SECTIONS IV THRU VIII MUST BE COMPLETELY FILLED OUT BY THE WELL DRILLER. APPLICANT AND DRILLER MUST SIGN APPLICATION.

I. WELL OWNER

NAME OR NAME OF ESTABLISHMENT: U.S. Navy, Naval Air Station-Memphis
 CONTACT NAME: Tonya Barker TITLE: Environmental Director
 MAILING ADDRESS: NAS Memphis, 7800 3RD Avenue, Public Works Dept
 CITY: Millington STATE: TN ZIP: 38054
 PHONE: BUSINESS (901) 873-5462 HOME _____

II. WELL LOCATION

ADDRESS: NAS Memphis, various locations (see attached figure)
 WELL IS APPROX. _____ MILES N S E W OF _____ RD. OR ST.
 WELL IDENTIFICATION # _____ LAND SIZE IN ACRES _____

III. TYPE WELL TO BE DRILLED

_____ WATER PRODUCTION
 _____ DEWATERING
 _____ RECOVERY
 SOIL BORING (up to 4 stratigraphic test holes)
 _____ OTHER
 SPECIFY _____

Observation MONITORING
 _____ a. Groundwater-quality
 _____ b. Methane gas
 c. Water level (3 wells)
 _____ d. Leachate
 _____ e. Gas movement
 _____ f. Chemical movement
 _____ g. Other: _____

IV. WELL DRILLER

DRILLING COMPANY: Test holes: U.S. Army Corps of Engineers, Memphis
Observation wells: U.S. Geological Survey, Dist.
 TENNESSEE WELL DRILLER LICENSE #: N/A
USACE: John Monroe (901) 544-3381
 REPRESENTATIVE: USGS: Bill Parks or Jack Carmichael (als) 734-5424, ext. 3137 PHONE: (901) 766-2977
 MAILING ADDRESS: U.S. Army Corps of Engineers Geotechnical Engineering
Clifford Davis Federal Bldg, 167 N. Mid. Survey Branch
 CITY: Memphis STATE: TN ZIP: 38103

V. TYPE OF WORK

NEW WELLS (up to 3 water-level observation wells)
 _____ REWORK
 _____ FILL AND ABANDON
 _____ REPLACEMENT
 _____ REPAIR
 _____ OTHER
 SPECIFY _____

{ up to 4 test holes drilled to about 200 feet for stratigraphic information then filled with cement grout and abandoned.

VI. WELL CONSTRUCTION INFORMATION ** See Figure 2*

- 1. EXPECTED DEPTH OF WELL: _____ FT. CONSTRUCTION WATER SOURCE: _____
- 2. WELL CASING: TYPE MATERIAL _____ DIAMETER _____ WALL THICKNESS _____
- 3. TYPE OF WATER PUMPING EQUIP.: SUBMERSIBLE _____ JET _____ TURBINE _____

VII. MONITORING WELL INFORMATION

- 1. NUMBER OF WELLS NEEDED: up to 3 PROPOSED DEPTH OF WELL(S): 15-20' / 70-80' / 120-140'
- 2. SUBSTANCES TO BE MONITORED FOR: Water levels
- 3. SAMPLING METHOD TO BE USED: DAILER N/A PLMP N/A
- 4. HOW OFTEN IS WELL TO BE SAMPLED?: continuous water-level recorders

VIII. ~~WATER WELL USAGE~~ N/A

- _____ RESIDENTIAL _____ COMMERCIAL _____ INDUSTRIAL _____ FARM
- _____ HEAT PUMP _____ SPRINKLER SYSTEM _____ IRRIGATION
- _____ RETAIN LAKE LEVEL _____ OTHER (SPECIFY) _____

IX. ADDITIONAL INFORMATION REQUIRED

- 1. HOW MANY EXISTING WELLS ARE ON PROPERTY?
194 ACTIVE 4 INACTIVE OR ABANDONED _____ NONE
- 2. THE FOLLOWING MUST ACCOMPANY APPLICATION WHEN SUBMITTED:
 - A. PLOT PLAN SHOWING ALL NEEDED INFORMATION AS STATED IN REGULATIONS.
 - B. \$25.00 PROCESSING FEE (DOES NOT APPLY TO FILLING AN ABANDONED WELL)
 - C. ALL WELL APPLICATIONS REQUIRE AN ADDITIONAL \$100.00 INSPECTION FEE (WITH THE EXCEPTION OF WATER PRODUCTION WELL APPLICATIONS).
 - D. A SKETCH OF ANY PROPOSED MONITORING WELL MUST BE ENCLOSED.

THE APPLICANT AND WELL DRILLER HEREBY AGREE TO COMPLY WITH ALL RULES AND REGULATIONS ADOPTED BY THE M.S.C.H.D. TO REGULATE WATER-QUALITY CONTROL WITHIN SHELBY COUNTY. FURTHERMORE, THE DUTIES WHICH ARE LISTED IN THE REGULATIONS HAVE BEEN READ BY THE APPLICANT AND BY THE WELL DRILLER, AND ARE FULLY UNDERSTOOD AND AGREED UPON.

SIGNATURE OF WELL OWNER L.W. Elkins, LCDR, CEC, USN, PWO DATE 3-27-95
 Professional Geologist # TN0029
 SIGNATURE OF WELL DRILLER William S. Parker DATE 3-27-95

REMARKS: THE HEALTH DEPARTMENT RESERVES THE RIGHT TO SUPPLEMENT THE GENERAL REQUIREMENTS BY AN ADDENDUM AS MAY BE REQUIRED. IF THE APPLICATION IS APPROVED BY THE HEALTH DEPARTMENT, A CONSTRUCTION PERMIT WILL BE ISSUED IN WRITING TO THE WELL DRILLER WITH A COPY BEING SENT TO THE APPLICANT. NO CONSTRUCTION IS TO BEGIN UNTIL SAID PERMIT HAS BEEN RECEIVED, AND SHALL BE KEPT AT THE CONSTRUCTION SITE UNTIL THE WELL HAS BEEN COMPLETED.

FOR DEPARTMENT USE ONLY

DATE APPLICATION RECEIVED _____ LOG NUMBER _____

PERMIT REJECTED _____ GRANTED _____ CONDITIONS _____

APPROVAL/DENIAL DATE _____ PERMIT NUMBER _____

DEPARTMENT SIGNATURE _____

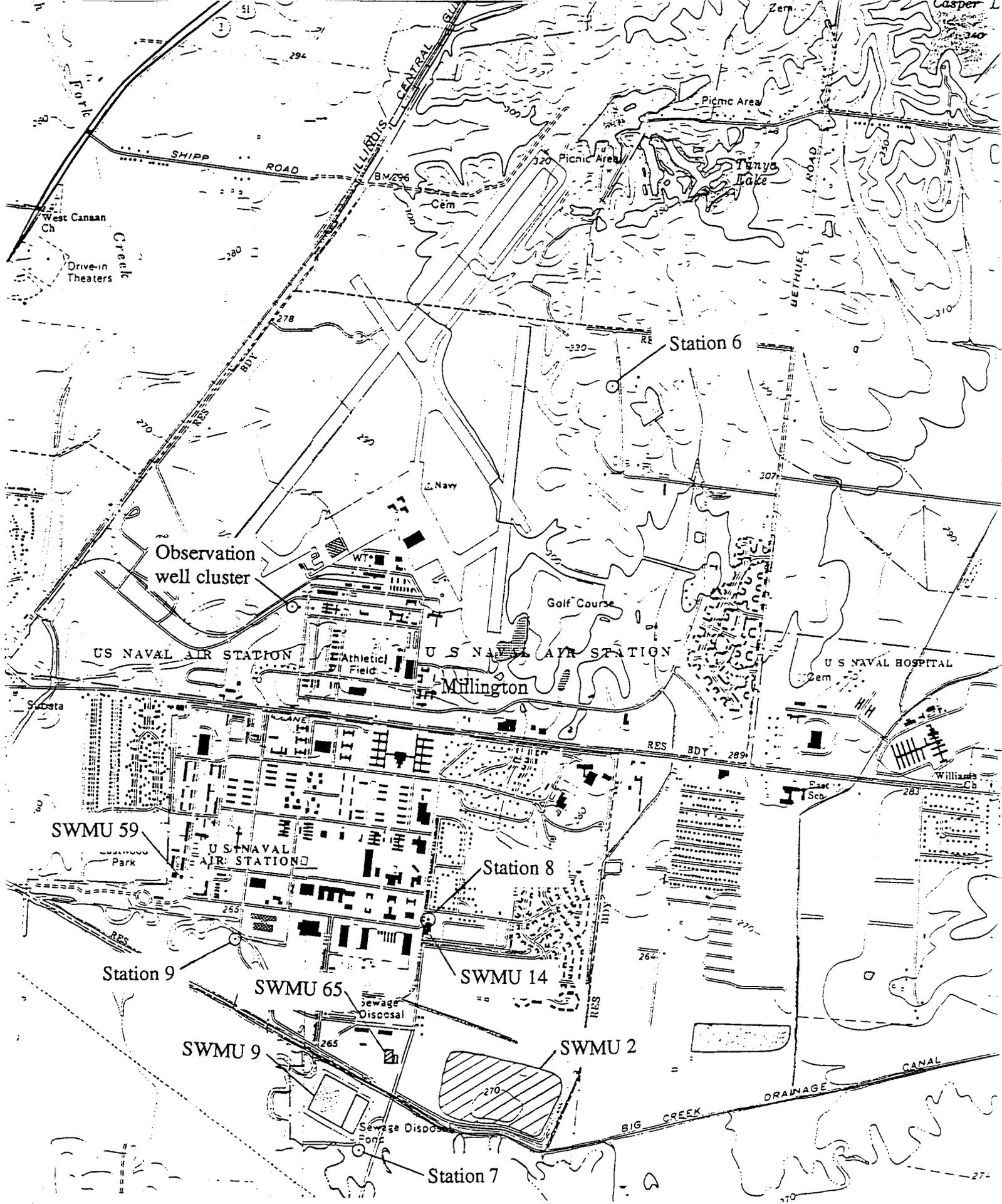


Figure 1.--Locations of the Naval Air Station Memphis, stratigraphic test-hole stations 6 through 9 and associated SWMUs, and water-level observation well cluster.

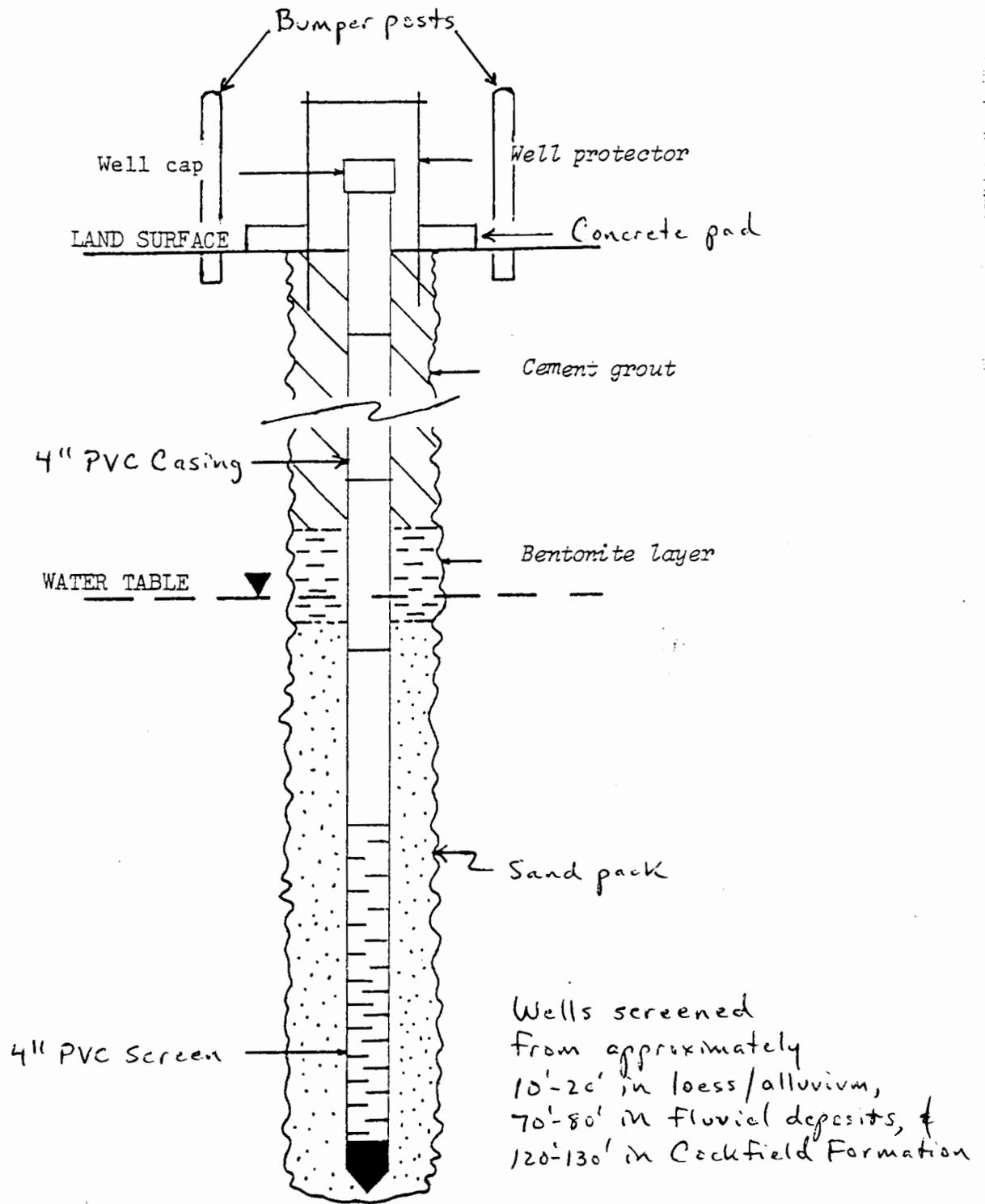


Figure 2.-- Schematic diagram showing the construction of the wells (not to scale)