



**PUBLIC SERVICE COMPANY OF NEW MEXICO**

ALVARADO SQUARE ALBUQUERQUE, NEW MEXICO 87158

April 16, 1990

Dr. Bruce Swanton  
New Mexico Environmental  
Improvement Division  
1190 St. Francis Drive  
Santa Fe, NM 87503



Dear Dr. Swanton:

Subject: Proposed Assessment Plan  
For Person Generating  
Station (NMT360010342)

Enclosed please find two (2) copies of our proposed assessment plan for the Person Generating Station ground water contamination investigation to be conducted pursuant to requirements contained in the NMEID Administrative Order issued January 11, 1990. This plan corresponds to Item 5 of the Person Station Technical Schedule submitted to the NMEID on February 20, 1990.

Please review this proposed assessment and call me should you have any questions regarding its content. Also, we will be quite willing to arrange a meeting at your office to discuss the technical merits of this proposal. I look forward to hearing from you.

Sincerely,

Ron D. Johnson  
Environmental Analyst

RDJ:krl

Enclosure: Proposed Assessment Plan  
for PNM Person Generating  
Station - Prepared by  
METRIC Corp., April 1990

**METRIC**  
Corporation



PROPOSED ASSESSMENT PLAN  
FOR  
PNM PERSON GENERATING STATION

PREPARED FOR  
PUBLIC SERVICE COMPANY OF NEW MEXICO

PREPARED BY  
METRIC CORPORATION

SUBMITTED TO  
NEW MEXICO ENVIRONMENTAL IMPROVEMENT DIVISION

APRIL 1990

*PSCP  
04A*

PROPOSED ASSESSMENT PLAN  
FOR  
PNM PERSON GENERATING STATION

PREPARED FOR  
PUBLIC SERVICE COMPANY OF NEW MEXICO

PREPARED BY  
METRIC CORPORATION

SUBMITTED TO  
NEW MEXICO ENVIRONMENTAL IMPROVEMENT DIVISION

APRIL 1990

Proposed Assessment Plan  
for  
PNM Person Generating Station

The items listed below correspond point for point to the sub-items contained within Item 5 of the Person Station Technical Schedule submitted to the NMEID on February 20, 1990. It is our intent to fully assess the rate and extent of hazardous constituent migration at and around the Person Station property.

Because an extensive amount of assessment work has already been completed, including the installation of ten monitoring wells, five aquifer test wells, and the performance of a soil gas survey, we feel it to be prudent to use that information in the guidance of work to be performed under this assessment.

For example, data derived from the 1985 soil gas survey and five years of water table contour mapping indicates that only three horizontal migration flow paths are likely. Therefore, we will propose using a repeated soil gas survey to refine the information and place pairs of monitoring wells along these three potential migration paths. We feel this to be a more logical approach for this situation than the mere standardized spacing of wells at radial distances from the source.

The soil gas survey performed in 1985 gave excellent correlation between soil gas concentrations and measured ground water concentrations. Ground water data collected from our late April 1990 compliance monitoring at the existing Person Station monitoring wells will likewise be used for correlation to soil gas analysis. The repeat soil gas survey will be conducted in early May 1990. Should this new information point to different

or additional pathways, monitoring well locations will be adjusted.

It should be kept in mind that the nature and timing of the schedule for this proposal is still dependent upon obtaining permissions from the adjacent landowner. Should PNM encounter difficulties or delays in acquiring those permissions, the proposal may require significant modification.

#### A. Aquifer Characterization

Characterization of the Uppermost Aquifer at Person Station will include the following tasks:

- 1) Two new piezometers will be installed into the second flow zone which is defined as the zone located between 20 and 40 feet below the water table. If an aquitard causing a vertical gradient is identified and found to extend between several wells or piezometers, stratigraphic cross sections showing vertical flow lines will be developed. Each cross section/flow net will include the location and name of each well, the stratigraphy of the subsurface, the groundwater elevations and the date of water elevation measurements.

- 2) Six new monitoring wells into the uppermost aquifer in addition to the two new piezometers discussed in item 1 above will be installed. If the data derived from these new wells and piezometers indicates the presence of mappable units in the uppermost aquifer, stratigraphic cross sections of the uppermost aquifer will be constructed. If an aquitard is identified below the water table, cross sections will be

constructed both down-dip and cross-dip with respect to the aquitard and with respect to the direction of groundwater flow.

3) If migration flow paths are identified in the uppermost aquifer for which hydraulic conductivities have not previously been determined, hydraulic conductivities for the newly identified flow paths will be determined.

4) Groundwater potentiometric contour maps will be constructed for the uppermost aquifer (0-20 feet  $\pm$  below the water table) and for the second flow zone (20-40 feet  $\pm$  below the water table).

5) A narrative description of the hydrologic conditions and potential contaminant pathways at the Person Station Site will be developed and presented in the Assessment Summary Report.

#### B. Assessment Monitoring System

The proposed assessment monitoring system will be developed and presented in the Assessment Summary Report.

#### C. Investigatory Approach

The first phase of the site investigation will include evaluating the existing information and conducting a soil gas survey to guide location of additional monitoring wells. An initial soil gas survey was conducted at Person Station in 1985 by Tracer Research Corporation. That soil gas survey indicated a good correlation between soil gas concentrations and groundwater concentrations.

#### D. New Monitoring Wells

Attached FIGURE 1 shows preliminary locations for six new monitoring wells to be completed in the uppermost aquifer. The six wells are positioned at 200 foot intervals along three potential contaminant flow paths. The monitoring well locations are tentatively selected to straddle the 5 ug/l 1,1,2,2-tetrachloroethylene (PCE) concentration line in the groundwater (uppermost aquifer) based on the 1985 soil gas survey (see FIGURE 1). The contaminant PCE was selected as the indicator parameter for plume delineation because it exists at higher relative concentrations and at greater distances from the source than the other contaminants.

The two northernmost potential flow paths shown on FIGURE 1 are indicated by the 1985 soil gas survey, while the southernmost potential flow path is suggested by the groundwater flow directions from the biannual potentiometric surface mapping.

The monitoring well locations will be finalized based on the results of the new soil gas survey.

The option of eliminating the soil gas survey and adding additional monitoring wells at closer intervals along the plume boundary was considered. It was determined, however, that the option including the soil gas survey and less wells was more cost effective while maintaining sufficient reliability.

Two new piezometers are proposed for installation into the second flow zone (20 to 40 feet below the water table). These piezometers will be located to create an equilateral triangle with existing monitoring well PSMW-8B (see FIGURE 1). The new piezometers in conjunction with PSMW-3B and PSMW-8B will be used to evaluate the groundwater flow direction in the second flow

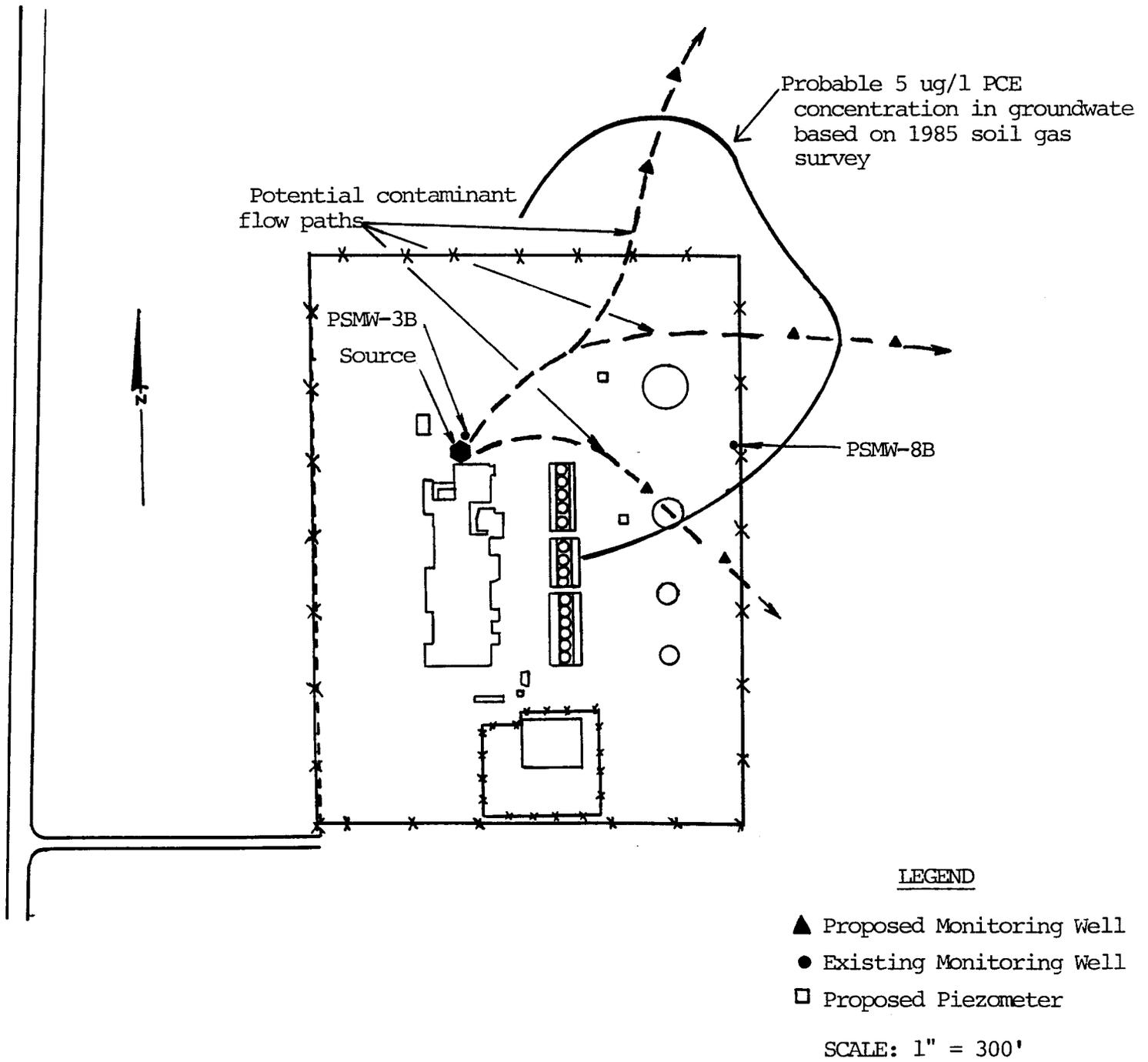


FIGURE 1  
Tentative New Monitoring Well and Piezometer  
Locations

zone. If the groundwater flow direction is confirmed to be from the source toward PSMW-8B, that will validate the use of PSMW-8B as the second flow zone monitoring well.

#### E. Future Strategy

If the uppermost aquifer monitoring wells proposed in Item D do not straddle the 5 ug/l PCE concentration line in the groundwater, additional monitoring wells will be drilled as necessary to determine the location of that line in a subsequent phase of the investigation.

If the two second flow zone piezometers indicate that the flow in the second zone is not toward PSMW-8B, an additional monitoring well will be installed in the second flow zone in the down gradient direction in a subsequent phase of the investigation.

#### F. Monitoring Well and Piezometer Construction Detail

The monitoring wells and piezometers to be installed in this investigation will be drilled by the rotary/wash method because the depths (greater than 120 feet) are too great for hollow stem augering. Attached FIGURE 2 shows the configuration of the monitoring wells while FIGURE 3 shows the configuration of the proposed piezometers.

The monitoring wells and piezometers will be developed by a combination of surging, bailing, and pumping with a positive displacement or submersible pump.

All drilling fluids and development water will be conveyed to the City of Albuquerque sewage treatment plant by licensed haulers if they meet the City effluent standards. If they do not meet the effluent standards, they will be treated as hazardous waste.

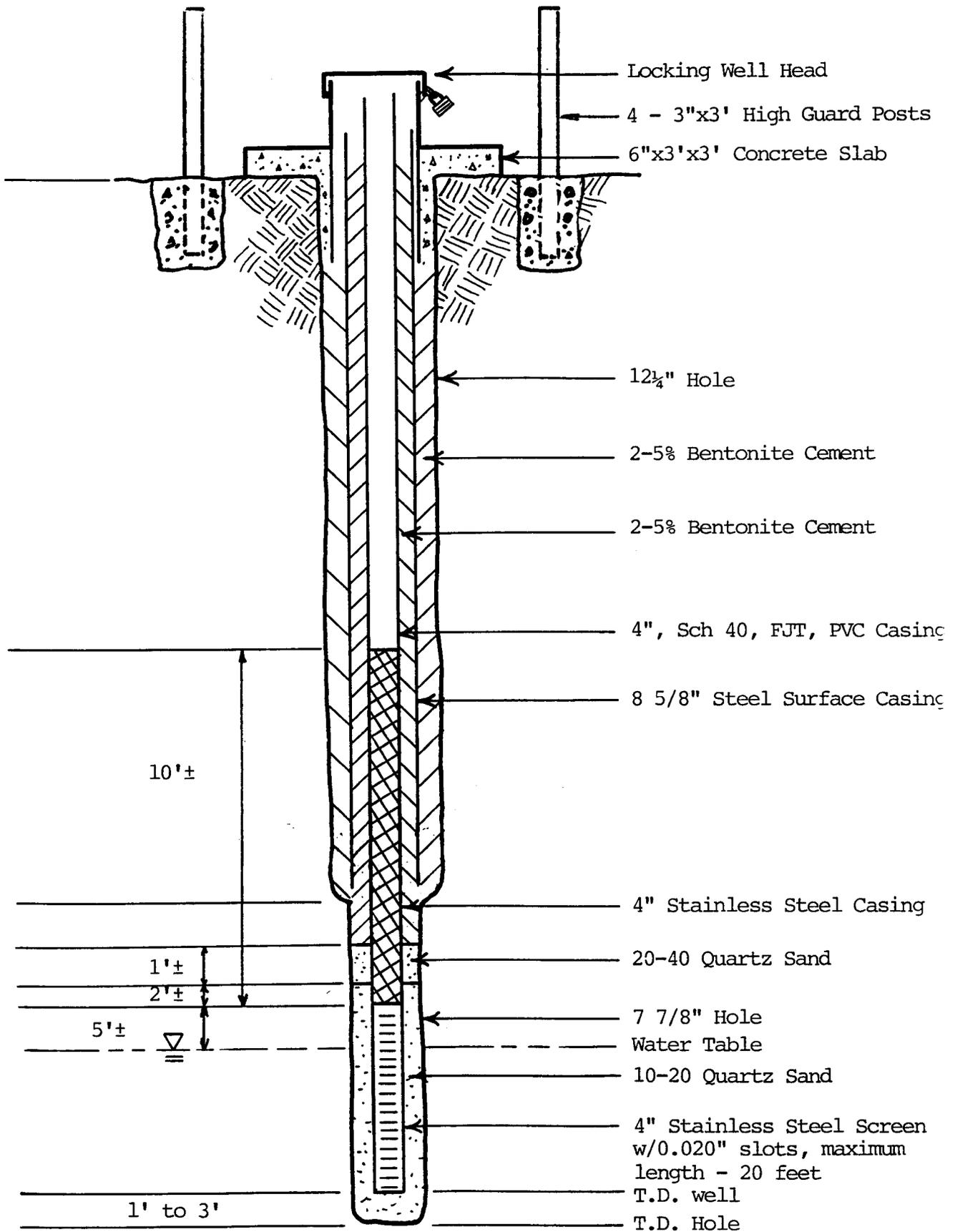


FIGURE 2  
Monitoring Well Construction Diagram

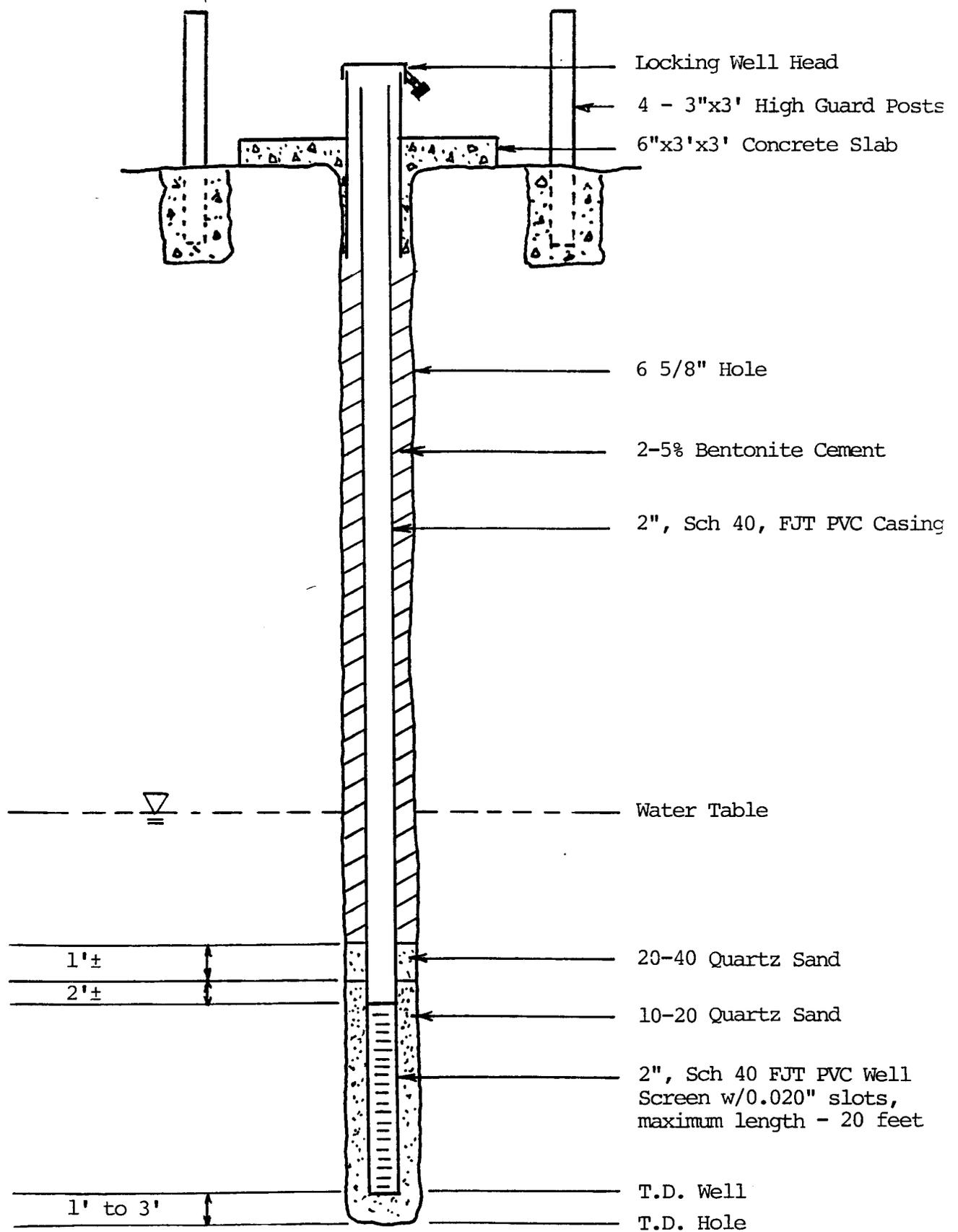


FIGURE 3

Piezometer Construction Diagram

Drill cuttings will be checked with a photoionization detector. If they are at or below background levels, they will be spread on the ground within the Person Station property. If the cuttings show elevated levels of volatile organics, they will be treated as hazardous waste.

#### G. Data Analysis

The water quality data obtained from the investigation will be used to generate water quality contour maps. The water level data will be used to generate potentiometric surface maps.

#### H. Appropriateness of Soil Gas Survey

Soil gas surveys will be used in addition to RCRA-type monitoring wells to define the limits of the contaminant plume in order to minimize the number of wells required. A previous soil gas survey conducted at Person Station in 1985 showed a good correlation between soil gas and groundwater concentrations for volatile organic compounds.

#### I. Sampling Parameters and Schedule

Each new monitoring well will be sampled three times initially. At the time of well installation, samples will be collected for rush analysis for TCA, PCE, and 1,1-DCE only. These analyses will be performed by Assaigai Laboratories in Albuquerque, New Mexico. The results from these analyses will be used to guide subsequent drilling operations.

Upon completion of all first phase monitoring wells, all new wells will be sampled at the same time. These samples will be analyzed for Appendix IX parameters by Analytical Technologies, Inc., in Tempe, Arizona. The analytical methods will be as

specified by Appendix IX with the exception of dioxin and furan species. As previously agreed to by NMEID, dioxin and furan species will be qualitatively screened for by the EPA method 625 rather than the EPA method 8280.

The third sampling event will be an exact repetition of the second sampling event conducted about one week later.

The results from the initial analytical screenings will be used to determine, in conference with NMEID, which parameters will be specifically analyzed for in subsequent quarterly sampling events.

Contaminant contour maps for each detected contaminant will be included in the quarterly monitoring reports which will be submitted within 90 days of the sampling event. Analytical data and water surface elevations will be submitted on pc-compatible computer disks in a format acceptable to both PNM and EID.

In addition to the quarterly monitoring reports, weekly verbal reports and written monthly status reports will be submitted to EID.

#### J. Compliance Monitoring Wells

A determination of which of the assessment monitoring wells will be included in the compliance monitoring program will be made and reported in the Assessment Summary Report. At least those wells ahead of the "leading edge of the plume" as determined by 5 ug/l PCE concentration, which is the indicator parameter, will be included.

#### K. Schedule of Implementation

Attached FIGURE 4 contains the schedule for completion of this plan. The well sampling events are scheduled to require sampling of all the monitoring wells at the same time to assure consistent quality control procedures and thus comparable results.

#### L. Sampling and Analysis Plan

The Sampling and Analysis Plan submitted to NMEID in February 1990 will be used on this project.

#### M. Rate of Constituent Migration

The rate of constituent migration will be assessed using several procedures. Initially, groundwater flow velocities will be determined from aquifer hydraulic conductivities and potentiometric surface gradients. Additionally, migration rates will be determined by comparing contaminant concentration contour maps and soil gas survey maps for different points in time. Finally, the use of pc-based solute transport models such as the EPRI model MYGRT will be investigated.

