BURLINGTON
RESOURCES

SAN JUAN DIVISION

September 19, 1997

Certified P 358 636 572

Bill Olson
New Mexico Oil Conservation Division
2040 S. Pacheco
Santa Fe, NM 87505

RE: Soil and Groundwater Investigation Work Plan
Hampton 4M - Unit Letter N, Section 13, Township 30N, Range 11W

Dear Mr. Olson

Burlington Resources (Burlington) is submitting this Soil and Ground Water Investigation Work Plan for the Hampton 4M well site. This work plan presents information on monitoring well construction, soil and ground water sampling and analysis, and the tasks to determine the upgradient extent and source of ground water contamination. As required by the NMOCD letter dated August 27, 1997, this work plan only addresses soil and ground water contamination upgradient of PNM's former dehydrator pit.

Monitoring Well Construction

Monitoring wells will typically be constructed of 4 inch diameter, Schedule 40 polyvinyl chloride (PVC) pipe which will extend to approximately 2 feet above the ground surface. The screened interval of the well will be constructed of machine slotted Schedule 40 PVC that will extend 5 feet above and 10 feet below the water table (subject to site conditions). The sand pack will consist of 10-20 silica sand which will extend to approximately 2 feet above the screened section. A bentonite seal will be installed immediately above the sand pack, and will consist of approximately 2 feet of 1/4-inch bentonite holeplug. The remaining annular space will be filled with a neat cement slurry consisting of 5% bentonite. The well be finished with a locking, above-ground well protector padlock, and a 2 feet by 2 feet by 4 inch thick concrete pad. A typical well completion diagram is provided in Figure 1.

Surface and top of casing elevations will be surveyed to the nearest 0.01 foot, as necessary, to determine ground water flow direction.

Soil and Ground Water Sampling

Ground water samples will be collected following well purging procedures (removal of a minimum of 3 well volumes, or until dry). Ground water samples will be collected using containers supplied by the laboratory with the proper preservatives. Zero headspace techniques will be used for those samples requiring analysis for volatile constituents. Collected samples will be stored on ice and delivered under chain-of custody procedures to the analytical laboratory for analyses.

Ground water samples may be analyzed for the following constituents using the referenced methods.

Total Dissolved Solids	Standard Field Methods
Benzene, Toluene, Ethylbenzene, Total Xylenes (BTEX)	EPA Method 602 or 8020
Cations/Anions	Various EPA or Standard Methods
Heavy Metals	EPA Method 6010 or 7000 Series

3535 East 30th St., 87402-8801, P.O. Box 4289, Farmington, New Mexico 87499-4289, Telephone 505-326-9700, Fax 505-326-9833

If a non-aqueous phase liquid is detected in any of the monitoring wells, additional samples will be collected for analysis of Polynuclear Aromatic Hydrocarbons (PAHs) using EPA Method 8100.

Additional samples may be analyzed for Dissolved Oxygen, Carbon Dioxide, pH, Conductance, Temperature, Nitrogen, and Phosphorus. Direct reading field instruments or field test kits may be used to obtain this information, as needed.

Soil samples will be collected using EPA, Standard, or NMOCD established methods. All samples will be collected using containers supplied by the laboratory. Samples collected for laboratory analyses will be stored on ice and delivered under chain of custody procedures to the analytical laboratory.

Soil samples may be analyzed for the following constituents using the referenced methods.

Total Petroleum Hydrocarbons	EPA Method 8015A Mod (C_5 to C_{28})
Benzene, Toluene, Ethylbenzene, Total Xylenes (BTEX)	EPA Method 602 or 8020A or Field Headspace Analysis (PID)

Additional samples may be analyzed for pH, Conductance, Temperature, Nitrogen, Phosphorous, and Microbial Counts. Field instruments, test kits as well as laboratory procedures may be used to obtain this information.

Task 1: Up Gradient Monitoring Well Installation

Previous investigative work has estimated the ground water flows under the site from southeast to northwest. This work has also given some insight as to the eastern and western extent of ground water contamination. The upgradient and downgradient extent of contamination has not been defined.

Upgradient borehole drilling indicates that ground water contamination exists on the southern-most edge of the location (Figure 2: Hampton 4M Site Diagram). To determine the upgradient extent of the ground water contamination, Burlington will install a monitoring well off site and upgradient of the well pad. Figure 2 shows the approximate location of the proposed monitoring well.

In the event that the ground water aquifer in question is not encountered in the proposed monitoring well, Burlington will install another well adjacent to the first well. If no ground water is encountered in either upgradient well, Burlington will conclude that ground water is isolated under the well location and no permanent wells will be installed

Any upgradient ground water that is encountered will be sampled and analyzed to determine, at a minimum, BTEX concentrations. If upgradient ground water samples contain significant levels of BTEX compounds, then Burlington may conclude that an off-site source is responsible, and will seek further guidance from the NMOCD. If, however, upgradient ground water samples contain minimal to no levels of BTEX compounds, then Burlington will conclude the source is on the well pad and will initiate Task 2.

Monitoring wells will also be installed to the north and northwest of the well pad to determine the downgradient extent of the ground water contamination. Burlington will be working in conjunction with PNM for work downgradient of PNM's former dehydrator pit. Conversations with Denver Bearden of PNM indicates that up to three downgradient wells may be needed to delineate the ground water contamination (Figure 2).

Task 2: On Site Source Investigation

Previous investigative work at the site has established that a dissolved phase BTEX component exists in the ground water under portions of the well pad. Figure 2 displays the monitoring wells and temporary wells with the BTEX concentrations found in each. As seen in Figure 2, the highest concentrations of BTEX exists in the southeast quarter of the well pad indicating the source may be located there.

Sandstone bedrock in the southeast quarter of the well pad presents a unique investigative challenge. Investigation using conventional methods, such as a boring rig, would be expensive and may not locate the source (needle in the haystack theorem). A soil vapor analysis is not feasible due the difficulty in penetrating the sandstone. Therefore, if presented with Task 2, Burlington proposes to aggressively investigate the southeast quarter of the location by using equipment capable of removing sandstone. Layers of rock will be systematically ripped and removed allowing the exposed surface to be screened using a Photo Ionization Detector (PID). The process of removal and screening will continue until the source area is located using the PID. Once located, further efforts will focus on source remediation.

Source remdiation will incorporate procedures and methods as defined in Burlington's Unlined Surface Impoundment Closure Plan and Addendums. All of which have been approved by the NMOCD.

Work Schedule

Burlington is currently working with the BLM to obtain archaeological clearance to perform the off-site well installation. Burlington will complete the site investigation as outlined in this work plan within 45 days of the receipt of archaeological clearance. If conditions arise that would prevent Burlington from meeting this schedule, Burlington may seek an extension.

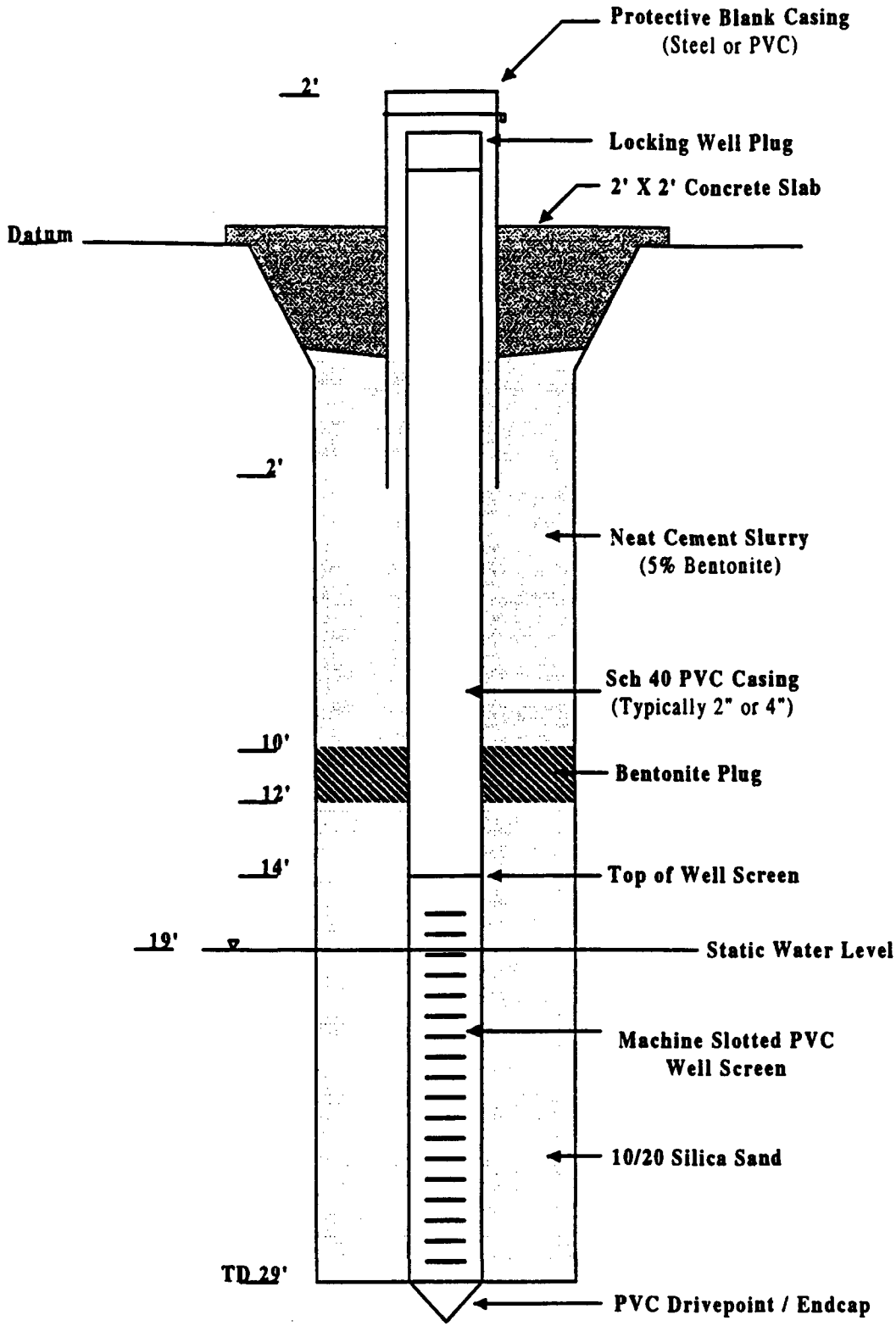
The unique characteristics of the Hampton 4M location pose challenges of site characterization and remediation. All parties working together will be the most efficient means to address the contamination at the Hampton 4M site. If further clarification is needed regarding this matter, please contact me at (505) 326-9537.

Sincerely,

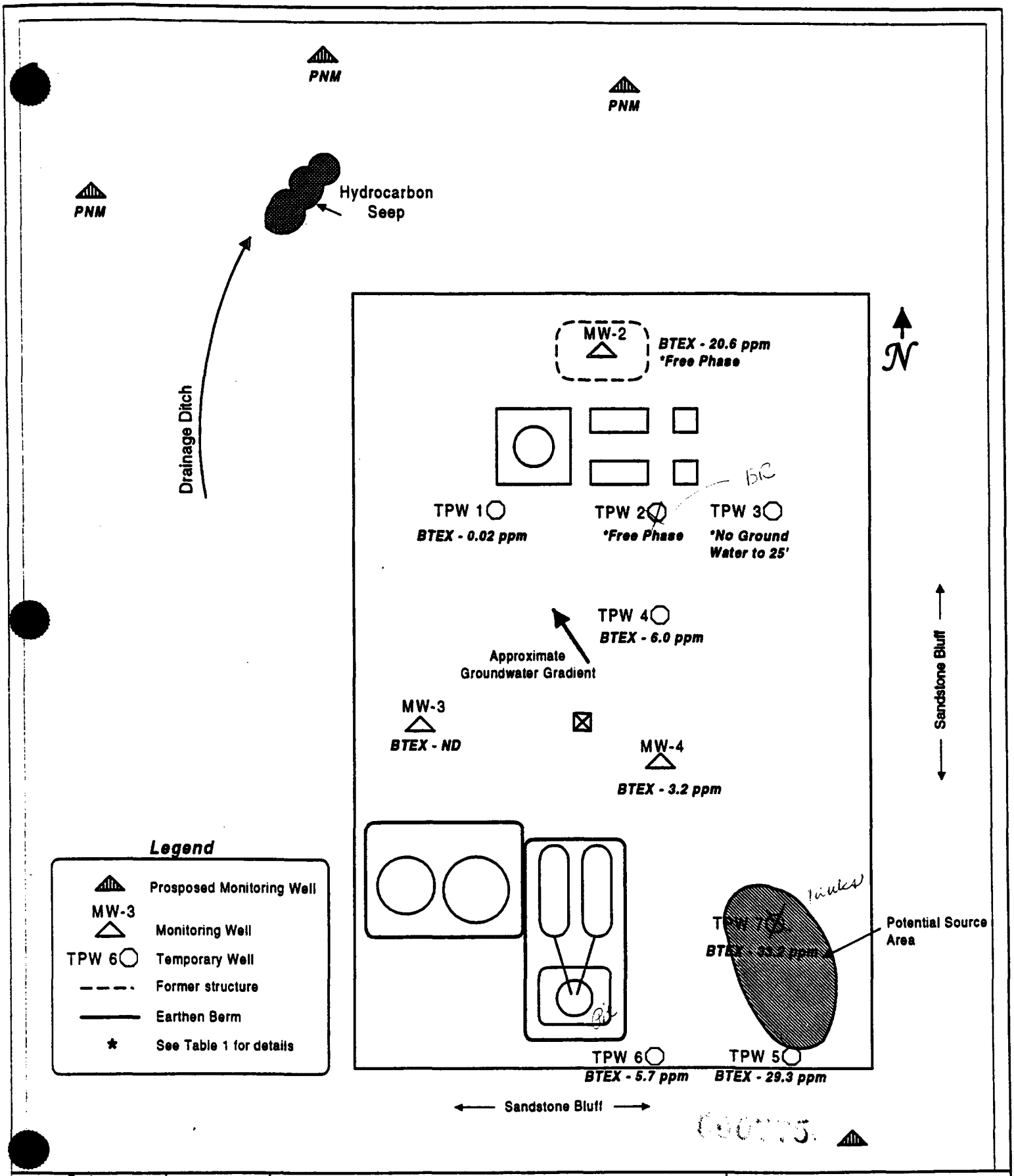
Craig A. Bock
Environmental Representative

Enclosures: Figure 1: Typical Monitoring Well Installation Diagram
Figure 2: Hampton 4M Site Diagram

cc: Denny Foust - NMOCD Aztec
Johnny Ellis - BR
Ken Raybon - BR
Keith Baker - BR
Denver Bearden - PNM Farmington
Maureen Gannon - PNM Albuquerque



Date:	9/18/97	Figure 1: Typical Well Diagram	BURLINGTON RESOURCES San Juan Division
Originated By:	CAB		



Date	9/18/97	**Figure 2: SITE DIAGRAM** Hampton 4M	**BURLINGTON RESOURCES** San Juan Division
Originated By:	CAB		
USGS 7.5 Minute Series	USGS Quadrangle Name	Aztec, NM	

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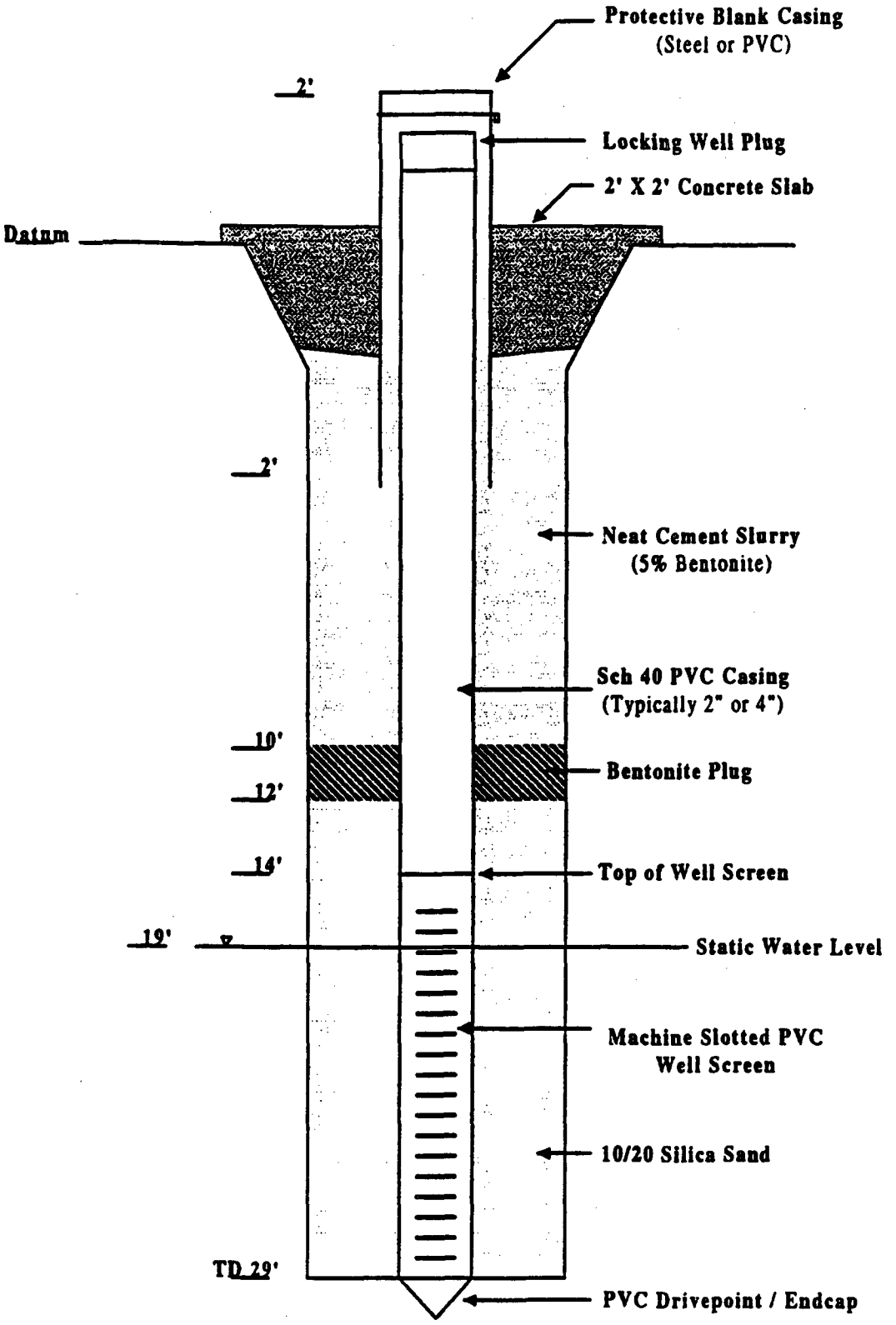

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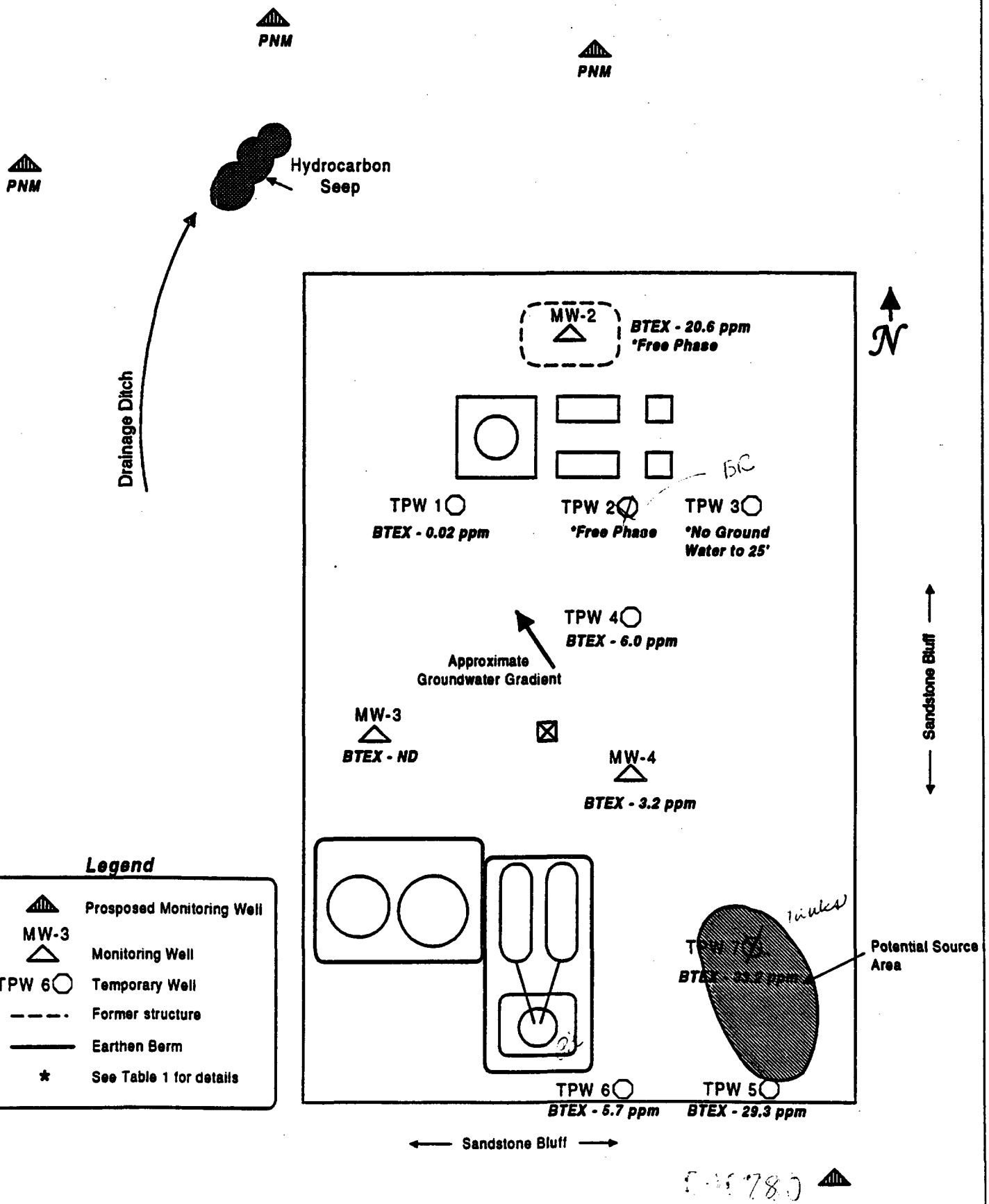

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