ENVIRONMENTAL
CONTROL
ASSOCIATES, INC.

April 1, 1997

Ms. Juliet Shin
Alameda County Health Agency
1131 Harbor Bay Parkway
Alameda, CA 94502

RE: **Work Plan to Investigate Product Near Monitoring Well MW-2**
Gateway Center, 2900 Main Street, Alameda

Dear Ms. Shin:

On behalf of Alameda Gateway Limited and Mr. John Beery, Environmental Control Associates, Inc. (ECA) is submitting this work plan to investigate reported hydrocarbon product in the vicinity of monitoring well MW-2 at the referenced site (Figure 1), as requested by Alameda County Health Agency (ACHA). The work plan addresses comments in ACHA's March 22, 1996 letter by proposing subsurface environmental investigation to determine the extent of hydrocarbons near well MW-2.

Introduction and Background

On April 11, 1990 four underground storage tanks (UST's) were removed from the site. A 1,100-gallon fuel oil UST was removed from the north side of Building 137. A 600-gallon diesel UST was removed from between Buildings 133 and 72. A 600-gallon diesel and 7,000-gallon gasoline UST were removed from the west side of Building 85 (Figure 2). On August 13, 1992, three monitoring wells were installed north of each UST excavation (Figure 2). Previous investigations have shown that wells MW-1 and MW-3 are not influenced by tidal changes while MW-2 is influenced by tides from the nearby Alameda Estuary. Groundwater sampling results indicated that petroleum hydrocarbons have been detected in the three monitoring wells. In a January 29, 1996 report, total petroleum hydrocarbons as diesel (TPHd) were detected at 20,000 parts per billion (ppb), total petroleum hydrocarbons as gasoline (TPHg) at 23,000 ppb, and total oil & grease (TOG) at 30,000 ppb in well MW-2. In a March 22, 1996 letter, the ACHA requested further investigation to delineate the extent of hydrocarbons detected in well MW-2.

Work Plan Approach

The work plan proposes to complete the project in two phases. In the first phase of work, ECA proposes to obtain groundwater quality data by installing hydroprobes (small diameter temporary wells) to the north and east (downgradient) of monitoring well MW-2 to determine if hydrocarbons are migrating to the surface waters of Alameda Estuary. After completion of this work, ECA will submit

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preliminary results to ACHA and propose a suitable well location, if necessary, after discussions with ACHA. If well installation is necessary, the second phase of work will consist of installing a new monitoring well at the agreed upon selected location. After installation and development of the well, ECA will conduct water quality monitoring in the new well and three existing wells and submit a report of findings.

Field Investigation Work Plan - Phase I
Four hydroprobes will be installed at locations shown on Figure 3 as described in Attachment A.

Field Sampling Methodology
ECA will collect groundwater samples for laboratory analyses by pneumatically driving small diameter (1-inch) probes into soils and groundwater. No additional characterization of geologic or hydrogeologic conditions are proposed at this time. Samples will be labeled with the project name, date and time sample was collected, and designated sample location. Chain-of-custody documentation will be completed to document sample integrity during shipment to the analytical laboratory. After collection, all samples will be placed in an iced cooler for transport to the laboratory. All probe holes will be grouted using Portland cement.

Field Investigation Work Plan - Phase II
If recommended after Phase I, ECA will install one groundwater quality monitoring well at a downgradient location. Based on available information the direction of the hydrocarbon groundwater contamination plume is to the north towards Alameda Estuary, about 175 feet from well MW-2. It is likely that a proposed well will be placed east or north of MW-2 to monitor groundwater conditions downgradient of well MW-2.

Drilling and Sampling Methodology
Before constructing the well an exploratory boring will be drilled and soil sampled for litholgic description using Geoprobe equipment (Attachment A). After collecting soil samples the boring will be converted to a monitoring well using a hollow stem auger drilling rig. No soil samples are anticipated to be submitted for laboratory analyses.

A general well design for the proposed well is illustrated on Figure 4. It is likely a limited access drilling rig will be required to gain access to the proposed well location. The proposed well will be constructed using 1-inch diameter well casing and screen and extend to a total depth of about 10 - 15 feet bg. The well screen to be used will be 0.01-inch factory-slotted casing from 3 feet bg to the total well depth. The annular space adjacent to the well screen will be backfilled with an appropriately graded sand pack, and sealed with bentonite pellets and cement grout to the surface. The well will be secured with a locking cap, and housed in a vault box. After well completion, the horizontal coordinates and top of casing elevations will be surveyed, referenced to mean sea level, for future water level measurements.

All soil cuttings and groundwater purged from the wells will be stored on-site until analyses are completed, and disposed of appropriately. As required, well construction permits and grouting activities will be coordinated with Alameda Flood Control and Water Conservation District - Zone 7. Boring logs describing soil lithology and and monitoring well construction will be prepared and presented in the field investigation report.

Monitoring Well Completion

Based on past field work at the site, ECA expects to encounter shallow groundwater at 5 - 7 feet below ground surface. Based on the fine-sized materials encountered in past borings, ECA's well design calls for 0.010-inch slotted, 1-inch diameter, schedule 40 PVC well screen. Figure 4 presents a general schematic of the proposed well design. The well will be situated in a vault box and fitted with a secure locking device. Well development and water quality sampling and analyses will be performed after construction.

Groundwater Sampling and Laboratory Analyses

After construction, the wells will be developed, sampled (following standard protocol described in Attachment C), and analyzed for TPHg, TPHd, O & G, and PNA's. Attachment B describes the proposed analytical laboratory methods.

TPHmo

Field Investigation Report

At the conclusion of Phase I, ECA will complete and submit a letter report to ACHA containing the results of hydroprobe sampling and presenting recommendations. After well installation, if necessary, groundwater quality sampling and laboratory analyses, ECA will present a field investigation report to ACHA detailing field activities and presenting results.

ECA will coordinate all field activities with ACHA, as required. If you have questions or desire additional information, please contact John Beery or ECA.

Very truly yours,

Environmental Control Associates, Inc.

REGISTERED GEOLOGIST
PETER J. CASTRO
No. 5522
STATE OF CALIFORNIA
8-31-97

Timothy B. Tyler
Project Manager

Peter J. Castro, RG #5522
Project Geologist

cc: John Beery - Alameda Gateway Limited

Attachments:

Figure 1 - Site Location Map
Figure 2 - Location of Monitoring Wells at Site
Figure 3 - Proposed Location of Hydroprobes
Figure 4 - Typical Monitoring Well Design

Attachment A - Geoprobe and Hydroprobe Sampling Techniques
Attachment B - Analytical Laboratory Procedures
Attachment C - Groundwater Sampling Procedures

6 foot long screens

ATTACHMENT A
GEOPROBE AND HYDROPROBE SAMPLING TECHNIQUES

Groundwater Quality (Hydroprobe) Sampling Procedure
Groundwater quality sampling is performed using a 6-foot section of decontaminated 3/4-inch I.D. slotted galvanized steel probe pipe (hydroprobe) with an end cap point. The hydroprobe is pneumatically driven into the borehole and 5-foot sections of unperforated probe pipe are coupled together and also driven into the ground until the hydroprobe extends into the aquifer (about 11 - 15 feet below ground surface). Groundwater samples will be collected by lowering small diameter decontaminated stainless steel bailers into the probes and withdrawing the sample. The samples are transferred into two 40-milliliter glass vials and a 1-liter amber glass bottle. All samples are labeled with the project name, date and time of sample collection, and designated sample location. Chain-of-custody documentation is also completed. Samples will be delivered to Excelchem Environmental Laboratories of Roseville for analyses. After sampling, all probe holes are grouted using Portland cement.

Soil Sampling Procedure
A 2-foot long, 1-inch diameter, Geoprobe soil core sampler will be used to obtain soil samples. The core samplers will be fitted with an acetate liner. The sampler will be connected to 1-inch diameter Geoprobe rods and pneumatically driven to the sampling depths. A small diameter rod is then lowered through the hollow probes to trigger the release mechanism of the core sampler bottom point shaft. The probe and sampler are then driven 2 additional feet to obtain the soil sample. The rods and soil sample will be removed from the borehole using a winch and derrick system. The core sampler is then opened and the sample described and logged.

Decontamination Procedures
All geoprobe equipment was cleaned on-site between borings with a tri-sodium phosphate and drinking water solution and then rinsed with de-ionized water.

ATTACHMENT B

ANALYTICAL LABORATORY PROCEDURES

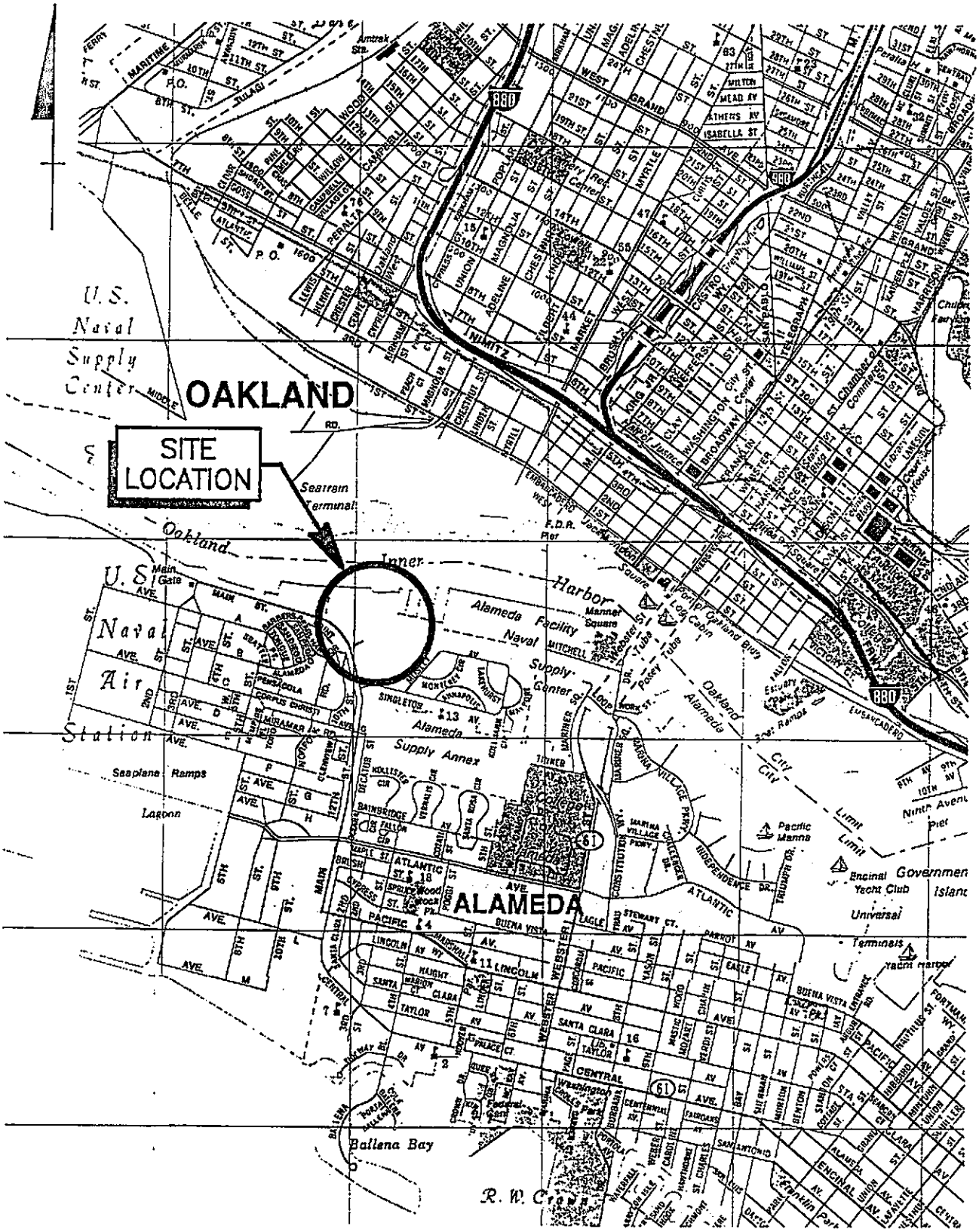
Groundwater samples will be analyzed in the laboratory for the presence of purgable petroleum hydrocarbons calculated as diesel (TPHd), total purgable hydrocarbons calculated as gasoline (TPHg), benzene, toluene, ethyl benzene, and xylenes (BTEX compounds), total oil and grease (TOG), and polynuclear Aromatics (PNA's). Analysis for TPHd and TPHg will be performed according to modified EPA method 8015, and BTEX compounds using EPA method 8020. TOG will be analyzed using standard methods SM 5520C. PNA's will analyzed using EPA method 625. All laboratory analyses will be performed by Excelchem Environmental Laboratories of Roseville, California DHS certification #1760.

ATTACHMENT C

GROUNDWATER SAMPLING PROCEDURES

Initially, the depth to groundwater will be measured and documented in each well. Product thickness measurements will be checked using hydrocarbon sensitive paste and steel tape. The wells will then be purged of 4 casing volumes while physical parameters (temperature, pH, and electrical conductivity) are monitored for stabilization. After recovery of the water levels, groundwater samples will be collected with teflon bailers and placed into appropriate EPA-approved containers. The samples will be labeled, logged onto chain-of-custody documents, and transported on ice to the laboratory. Sampling equipment will be thoroughly cleaned between wells. Purge water will be stored on site in DOT approved 55-gallon drums pending off-site transport and disposal at a licensed facility.

Source: Smith Environmental Technologies Corporation, 1996



APPROXIMATE SCALE

1/2 0 1/2 MILE

SITE LOCATION MAP
GATEWAY CENTRAL
ALAMEDA, CALIFORNIA

Figure 1 - Site Location Map

ECA
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Source: Smith Environmental Technologies Corporation, 1996

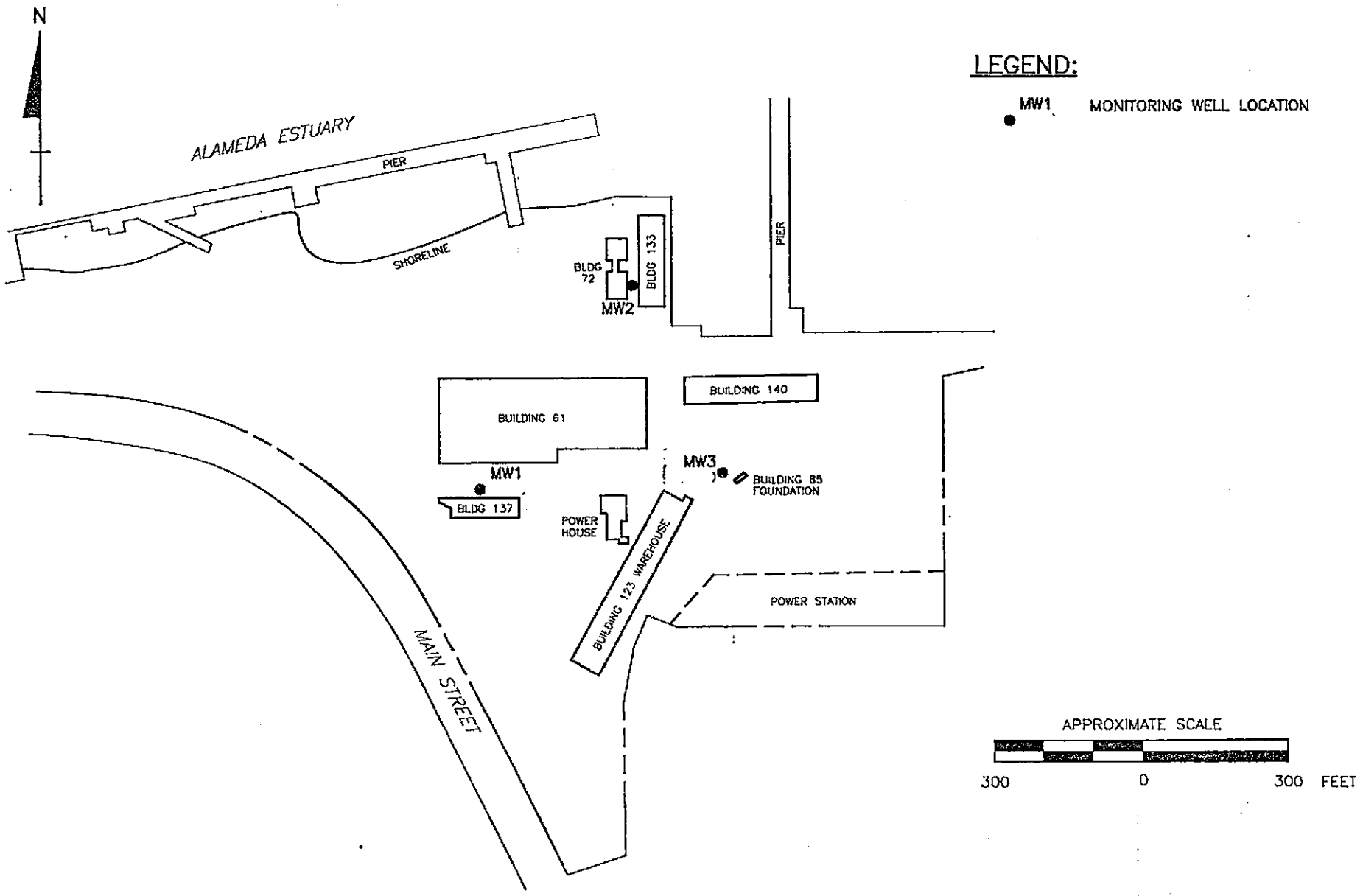

Figure 2 - Location of Monitoring Wells at Site

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Source: Smith Environmental Technologies Corporation, 1996

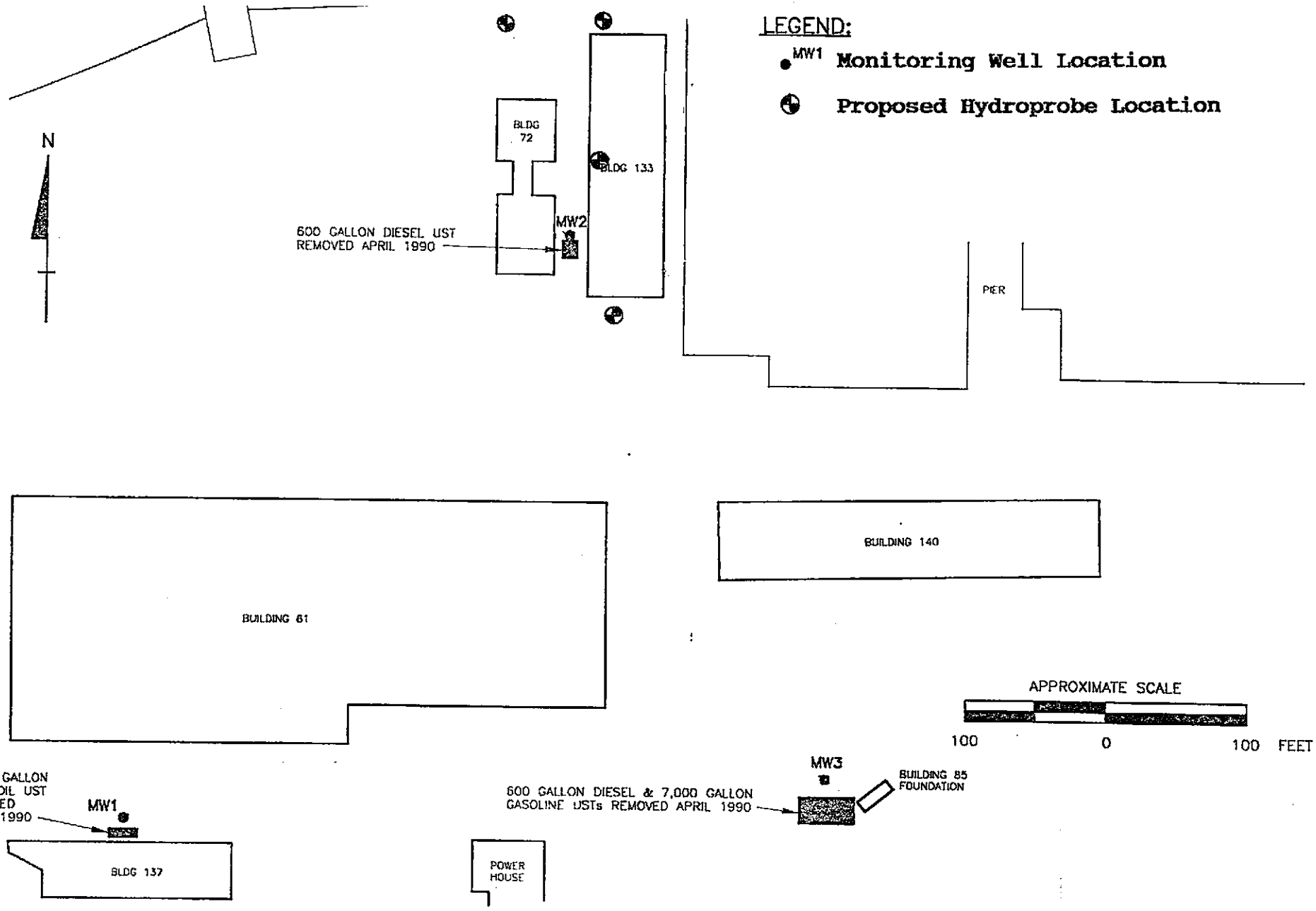

Figure 3 - Proposed Location of Hydroprobes

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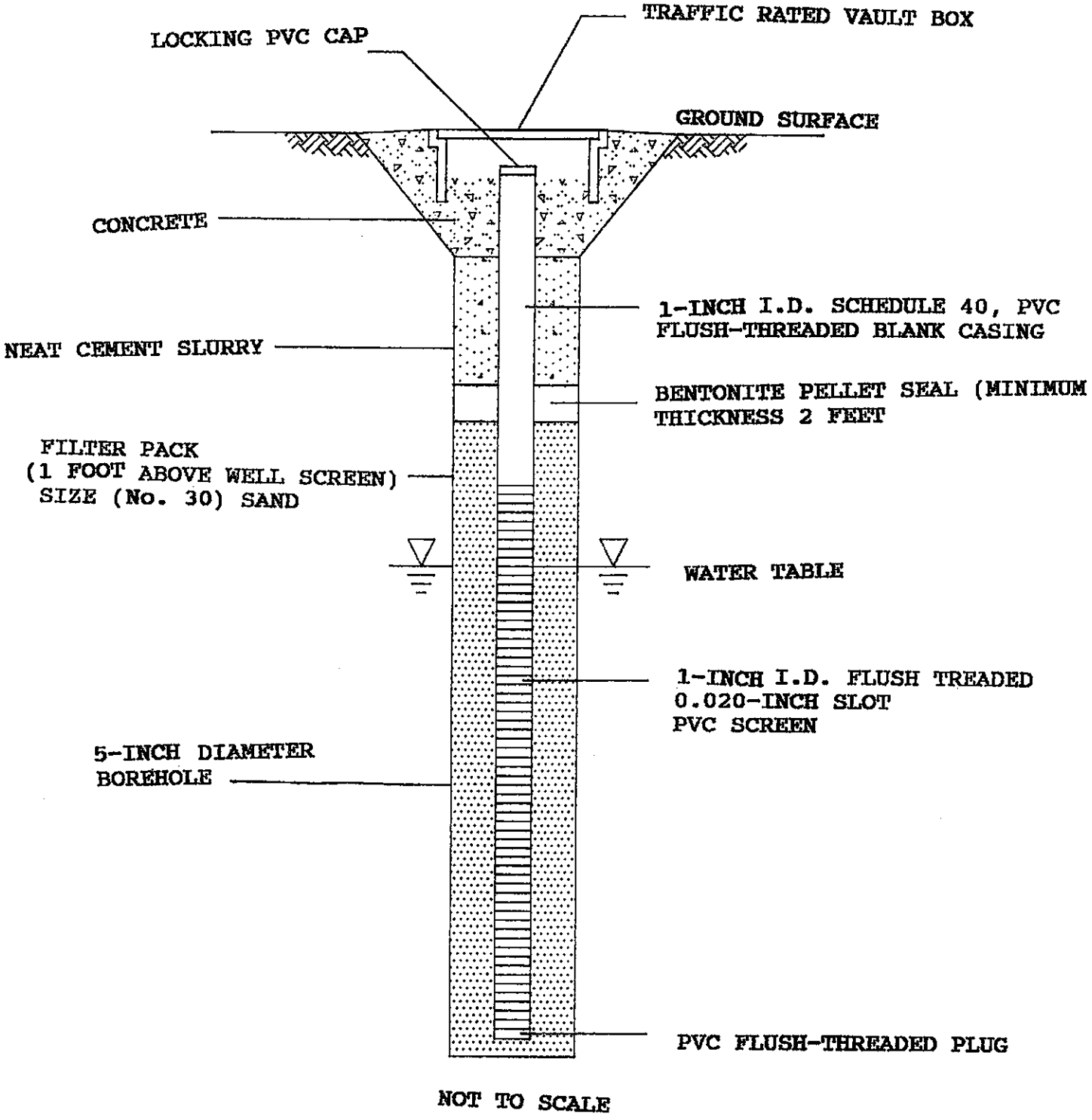

Figure 4 - Typical Monitoring Well Design

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