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# TOW WAY FUEL FACILITY MULTI STAGE PRODUCT RECOVERY TEST REPORT
ROOSEVELT ROADS NAVAL ACTIVITY PUERTO RICO
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TERRA VAC

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# REPORT
# TOW WAY FUEL FACILITY
# MULTI-STAGE PRODUCT RECOVERY TEST
# US NAVAL STATION
# ROOSEVELT ROADS, PUERTO RICO
# PROJECT NO. 11-0234

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Prepared for:

Officer in Charge
Contracting Office
U.S. Naval Station
Roosevelt Roads, Puerto Rico

# REPORT
## MULTI-PHASE PRODUCT RECOVERY TEST
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## 1.0 INTRODUCTION

Terra Vac was contracted by the U.S. Navy to conduct single, dual, and three-phase testing of free product recovery systems at the U.S. Naval Station Tow Away Fuel Facility, Roosevelt Roads, Puerto Rico under Contract Number N62470-92-D-6257. Single phase recovery is free product only pumping; dual phase recovery is vacuum enhanced free product only pumping; three-phase recovery is vacuum enhanced groundwater and free product recovery.

The purpose of the tests was to determine the best available technology to enhance free product recovery without causing the product to spread further. Concerns have been expressed by the United States Environmental Protection Agency (EPA) that upward spreading of product might occur by wicking-up the product under vacuum extraction methods or smearing the product to lower depths by lowering the water table during simultaneous product and groundwater pumping.

The scope of work included soil testing, measurement of water and product levels, product recovery rates, installation and testing of recovery systems and evaluation of radius of influence and capture zone. This report summarizes the various tests and evaluates the effectiveness of three different product recovery techniques.

## 1.1 SITE BACKGROUND

The location of the tests was the fuel storage area known as Tow Way Fuel Facility located on the eastern end of the Naval Station adjacent to the fueling dock. The Tow Way Fuel Facility consists of 9 underground storage tanks which contained diesel and jet fuel (JP-5). Previous reports by others indicated there is a minimum of 1 million gallons of petroleum product released to the ground between 1957 to 1986 resulting in the contamination of soil and groundwater. These reports estimate between 100,000 to 243,000 gallons of free floating product, and that the volume of contaminated soil was approximately 2 million cubic feet. The test area is depicted in Figure 1 and is divided into two discrete testing areas called Area 1 and Area 2. The dividing line between Areas 1 and 2 is Palau Street which is sometimes referred to as the "paved road".

Previous site work by Terra Vac included the installation and operations of a single phase, free product recovery system in exiting identified as "UGW" wells. Monthly

reports were submitted to the Navy summarizing the site activities and the progress of the product recovery operations. In 1994 a vacuum assisted recovery process was also tested. In July, 1995, the EPA issued a letter to the Navy evaluating the recovery operations and assessing the technical aspects of the recovery system in relation to the objective for full scale site cleanup.

## 1.2 RECOVERY TESTING OBJECTIVE

Recovery tests were implemented in three stages with each stage consisting of a different recovery system designed to enhance the performance of the product recovery. Stage 1 was the baseline test for single-phase recovery (i.e. free product only) utilizing product-only pumps. Stage 2 was a modification of Stage 1 with the addition of vacuum to the wells which produced a two-phase (i.e free product and vapors) recovery system. Stage 3 was a significant modification, wherein the product recovery pumps were removed and vacuum entrainment systems were installed in the test wells, resulting in a three-phase recovery process (i.e free product, vapor and groundwater).

## 2.0 WELL INSTALLATION

Six product recovery wells (PW) and 4 monitor wells (MW) were installed between September 12, 1995 and September 26, 1995. These wells were in addition to the existing UGW wells mentioned above. Each new well was approximately 24 feet deep as measured below grade with the exception of MW-1 which was completed to a depth of 16 feet below grade due to auger refusal at that depth. Also, MW-1 was used during the tests both for monitoring and product recovery as substantial product was observed in this well.

One of the reasons for installing new wells was to identify the impact of free product pumping in nearby wells over the last 3 years. If the free product only pumping systems were effective, the surrounding area would contain no free product in these new wells. Also, measurement of the product/water interface could be assessed under various operating conditions as requested by EPA.

The new product recovery wells were constructed with 4 inch diameter PVC well screen having a slot size of 0.20 inch. The screened interval was from 4 feet below grade (BG) to 24 feet BG. The riser section was from 4 feet BG to 2 feet above grade. Well locations are shown Figure 1. The monitoring wells were similarly constructed except that 2 inch PVC screen and riser were used. Well logs and construction details are provided in Appendix A.

Both recovery and monitor wells were completed with silica sand pack in the annular space between the well screen and the borehole. The sand pack extended to 1 foot above the top of the screen. A bentonite seal of approximately 0.5 feet was placed atop the sand packing, and then each well was grouted to surface with portland cement.

Concrete pads and steel well vaults with posts constructed of 3 inch steel and filled with concrete were installed in the pads to protect the wells.

## 2.1 SOIL SAMPLING AND ANALYSIS

Soil sampling was performed during well installation to characterize the subsurface soils and evaluate the soil contamination. Drilling operations were supervised by a registered professional geologist. The geologist inspected and visually classified the sediments according to the Unified Soil Classification system. Continuous soil samples were obtained using a 1-3/8 inch I.D. split-barrel sampler. The number of blows per foot (N-value) required to drive the split spoon was recorded for each sample. The N-value is generally representative of the relative density of soils.

Once the split-spoon soil samplers were opened a representative soil sample was collected at random intervals. The soil samples were prepared in the field by the geologist. Four ounce laboratory grade glass jars were filled with soil so there was no head space in the jar. Each jar was then sealed with a lid containing a Teflon liner and the jar was labeled with the well location, time and date. Soil samples were stored on ice while awaiting pick-up by the laboratory. Following each sampling event, the split-spoons were thoroughly washed with a soap solution and rinsed with fresh water.

The soils down to 5 feet BG consist of brown fill material with gravel, silts, and sands. From 5 feet BG to 10 feet BG the soils are generally gray to dark gray weathered volcanic material which grades to clay and silty sand. From 10 feet BG to 16 feet BG there is brown to reddish brown weathered volcanic rock which is fractured and broken. The fractures contain a mixture of sand, silt, and clay. Below 16 feet to total depth there is a poorly weathered volcanic rock. The rock is hard and contains many fractures. More specific lithology for each well is provided in Appendix A.

N-values of the soils in Area 1 typically ranged from 5 to 25 to a depth of approximately 15 feet BG. Below 15 feet, the N-values were generally greater than 100. In Area 2, similar N-values were obtained for the shallow soils, though the values increased more rapidly than in Area 1, with values greater than 100 at just 10 feet BG. The lower N-values correlate with a higher degree of weathering.

Soil analyses for TPH by EPA method 418.1 were completed on each of the soil samples along with quality control samples. Results of the soil sampling and a copy of the laboratory analytical reports are provided in Appendix B.

## 2.2 SUBSURFACE HYDROCARBON DISTRIBUTION

Based on soil characteristics and analytical results from soil sampling a number of conclusions can be made concerning the presence of free product and the character of the subsurface soils.

The soil characteristics and N-values indicated that the lithology varies with depth. Many zones were identified where a high density of fractures exist. In many cases these fracture zones were the same zones where high concentrations of hydrocarbons were detected. Such zones of high fracture density typically exhibit a higher porosity and in some cases higher permeability where the fractures are contiguous. Surrounded by lower permeable material, these fracture zones act as conduits for fluid flow as a result of preferential migration of water and hydrocarbons through the fractures.

Discreet zones of fractures within the soil profile varied between Area 1 and Area 2. The continuity of these zones is not fully apparent by the boring logs alone. Specific examples of both the fractures zones and high concentrations of hydrocarbons for each area are provided below.

### 2.2.1 AREA 1

Discreet zones within the soil profile exhibited high concentrations of hydrocarbons. These zones were found at depths from 11 to 13 feet BGL in both PW-1 and PW-2. Samples recovered during drilling operations indicated zones of high density fractures at approximately the same stratigraphic level. Given the close proximity of these wells (7 feet between them) one may suspect that the fracture zones are connected.

This product zone is also within the range of the natural fluctuations in the water table and represents a natural "smear zone" of liquid hydrocarbons floating above the water table.

### 2.2.2 AREA 2

Wells PW-4, PW-5, and PW-6 contain fracture zones and associated high concentrations of hydrocarbons at 8 to 10 feet BG and at 20 to 21 feet BG. Given the spacial proximity of the wells, ranging from 9 to 35 feet from one to the another, it is likely that the fracture zones are interconnected. However, the zone of high concentrations at 20 to 21 feet is well below the water table or prior pumping levels observed at the site.

### 2.2.3 Hydrogeologic conditions:

Groundwater levels in the test areas are generally about 8 to 12 ft. BG in Area 1 and 11 to 18 ft. BG in Area 2. Product thickness at the beginning of the tests in September 1995 ranged from 0.3 to 9.1 ft. Fluctuations in the piezometric levels in Area 1 have been 5 to 11 ft. in Area 1 (UGW-5 and UGW-22 respectively) and 3 feet in Area 2 at UGW-1. Groundwater flow direction at the site is to the southwest based on previous studies (O'Brien and Gere report, 1990).

## 2.3 RECOVERY SYSTEM PREPARATION

On September 14, 1995 the existing recovery system was turned off in preparation of construction of the Stage 1 test. New construction began on September 23,1995. Six pneumatic product only recovery systems were installed in the PW recovery wells. The new recovery wells were labeled PW-1 to PW-6. The new monitoring wells were labeled MW-1 to MW-4. The wells which already existed on site were identified previously as UGW wells. The locations of the PW and MW wells were chosen based on the data suggesting these areas had substantial free floating product and the highest product producing capacity and the fact that the locations provided adequate space to place the monitoring wells in appropriate positions around the existing pumping wells for testing and comparison purposes. The pump discharges for new recovery systems were connected to the exiting product holding tanks.

## 2.4 STAGE 1 TESTING SYSTEM

The Stage 1 system consisted of product only recovery using pneumatic pumps under atmospheric conditions. Each of the 6 product recovery wells were tested individually. In addition, well MW-1 was used for product recovery. Water and product levels were recorded at each well for 24 hours before the pumping began and also during pumping. The piezometric level was calculated from this data using a product density of 0.8 g/cc. Several monitoring wells were measured for piezometric water surface during each well test to evaluate the directional zone of influence. PW-2 and PW-6 are discussed below as examples of the testing operations.

The product recovery rates are defined as the rate at which product is extracted during pumping operations. The product recovery rates were recorded for each well and ranged 0.0 to 4.10 gallons per day. Tables 1 to 15 present the complete data set recorded during the Stage 1 test.

### 2.4.1 PW-2, Stage 1 Test

Testing of PW-2 began by recording water and product levels before operating the pneumatic product pumps for baseline data. The depth to piezometric water surface was 11.03 feet below top of casing (TOC) and the product thickness was 1.15 ft. at the start of the test. The water and product levels were also measured during and after pump operations. Total testing time of PW-2 was 74.27 hours. The piezometric surface was calculated along with water and product levels. This data is presented in Table 3 and graphically in Figure 4.

While pumping from PW-2 with a drawdown of 2.35 feet, a hydraulic influence was observed at MW-2, UGW-5, PW-1 and UGW-22. MW-2 had a baseline piezometric level of 10.55 feet TOC that lowered to 11.06 feet TOC while the product thickness decreased by 0.20 feet. UGW-22 piezometric surface started at 9.32 TOC and dropped to

9.78 feet TOC and the product thickness changed by 0.0 feet. PW-1 piezometric surface went from 8.28 feet TOC to 8.45 feet TOC and the product thickness decreased by 0.17 feet. The baseline piezometric level in UGW-5 was measured at 10.74 feet TOC and lowered to 11.31 feet TOC in response to pumping at PW-2 and the product thickness decreased by 0.04 feet. These data are presented in Table 4 and Figure 5.

The product thickness in PW-2 initially was 1.15 feet but after 44.2 hours of test run time the product thickness had decreased to 0.01 feet. Thus, PW-2 product recovery rate recorded near the end of the test was nominal. Product recovery data is presented in Table 15.

### 2.4.2 PW-6, Stage 1 Test

The total test time for PW-6 was 72 hours with static level measurements taken for about an hour before operations commenced. The piezometric water surface at PW-6 began at a high level of 14.22 feet TOC, then reached a low level of 17.08 feet TOC before finally stabilizing at 15.35 feet TOC. The water and product levels along with the calculated piezometric levels are presented in Table 11 and Figure 11. The product recovery rate for PW-6 was 3.6 gpd. The recovery data is presented in Table 15.

Initially, the product thickness in PW-6 was 3.97 feet. After 8.42 hours of operation the product thickness had decreased to 0.10 feet. An influence on the surrounding wells was observed, as the piezometric surface in PW-3 decreased from 14.04 feet TOC to 14.39 feet TOC during the operation period. The piezometric level in MW-3 went from a baseline of 13.92 feet TOC to 14.21 feet TOC. The piezometric surface in well UGW-1 also lowered from 13.30 feet TOC to 13.54 feet TOC. Similarly, the product thickness decreased in nearby wells PW-3, MW-3 and UGW-1 to 0.20, 0.12, and 0.05 feet, respectively. The data is presented in Table 12 and on Figure 13.

## 2.5 EVALUATION OF STAGE ONE TEST

Product level measurements recorded during Stage 1 suggests that recharge of the product, either through matrix porosity (i.e primary porosity) or by flow through fractures (i.e secondary porosity) occurs at low rates if not further enhanced. For example, during the inactive pumping period, well PW-2 was allowed to recharge to equilibrium, 0.15 feet increase in product thickness over 19 hours was measured. This pales in comparison to the 1.15 feet of product that was originally measured in the well before the test. Similarly, quite slow recharges of product were observed in other monitoring wells during the tests of Stage 1. The data to support these conclusions is presented in Tables 4 and 6.

### 2.5.1 RECOVERY RATE

"Recovery rate" as used herein is defined as the product extraction rate during pumping operations as opposed to the rate at which product recovers or recharges in a specific well after pumping is stopped, this latter rate is termed "recharge rate". The product recovery rates were calculated at various times by recording the time it takes to pump the product, at the wellhead, into a calibrated container. Table 15 presents the recovery data.

The product recovery rates were recorded at seven wells as part of Stage 1. Although Stage 1 testing employed "product only" pumps, when low product recharge rates and small product thicknesses exist, water enters the system, especially when the pumps are set at levels to maximize product recovery rates as done here. The total fluid recovery rate was 136 gpd and the product recovery rate was 15 gpd.

If only the Stage 1 process was operated, potentially 5500 gallons of product per year would be recovered assuming a constant rate of recharge of the product. However, it is typical to observe reductions in recovery rates over time. Therefore, the annual product recovery production would be expected to be somewhat lower.

### 2.5.2 CAPTURE ZONE

The tables in this section present hydraulic capture zones as indicated by the differential drawdown of the piezometric level of nearby wells in response to pumping. The average capture zone surrounding the pumping well is not radially symmetric, as shown in the table below. The drawdown data below is in feet below grade.

**PW1 Stage 1 Test**

| Well No. | Starting Piezometric Depth in feet | Ending Piezometric Depth in feet | Piezometric Drawdown in feet | Product thickness decrease in feet | Distance from PW-1 in feet |
|---|---|---|---|---|---|
| PW-1 | 8.61 | 9.22 | 0.61 | 0.03 | |
| PW-2 | 11.62 | 13.89 | 2.27 | 0.25 | 7.0 |
| MW-2 | 11.75 | 12.74 | 0.99 | 0.17 | 5.8 |
| UGW-22 | 9.82 | 10.57 | 0.75 | 0.00 | 10.0 |
| UGW-5 | 12.06 | 12.55 | 0.49 | ++0.50 | 5.0 |

++indicates an increase in the product thickness in (ft.)

**PW-2 Stage 1 Test**

| Well No. | Starting Piezometric Depth in feet | Ending Piezometric Depth in feet | Piezometric Drawdown in feet | Product Thickness Decrease in feet | Distance from PW-2 in feet |
|---|---|---|---|---|---|
| PW-2 | 11.03 | 13.38 | 2.35 | 1.14 | |
| UGW-22 | 9.32 | 9.78 | 0.46 | 0.00 | 20.75 |
| UGW-5 | 10.74 | 11.31 | 0.57 | 0.04 | 14.5 |
| MW-2 | 10.55 | 11.06 | 0.51 | 0.20 | 5.8 |
| PW-1 | 8.28 | 8.45 | 0.17 | 0.17 | 7.0 |

**PW-3 Stage 1 Test**

| Well No. | Starting Piezometric Depth in feet | Ending Piezometric Depth in feet | Piezometric Drawdown in feet | Product Thickness Decrease in feet | Distance from PW-3 in feet |
|---|---|---|---|---|---|
| PW-3 | 14.04 | 16.86 | 2.82 | 0.44 | |
| PW-6 | 14.22 | 15.35 | 1.13 | 3.97 | 9 |
| MW-3 | 13.92 | 14.45 | 0.53 | ++0.65 | 3 |
| PW-5 | 13.83 | 17.53 | 3.7 | 2.49 | 13 |
| MW-4 | 12.98 | 13.26 | 0.28 | ++0.26 | 15 |
| UGW-1 | 13.30 | 13.71 | 0.41 | 0.45 | 8 |

++indicates an increase in the product thickness in (ft.)

**PW-4 Stage 1 Test**

| Well No. | Starting Piezometric Depth in feet | Ending Piezometric Depth in feet | Piezometric Drawdown in feet | Product Thickness Decrease in feet | Distance from PW-4 in feet |
|---|---|---|---|---|---|
| PW-4 | 12.31 | 14.33 | 2.02 | 0.46 | |
| PW-6 | 14.22 | 15.35 | 1.13 | na | 35 |
| PW-3 | 14.04 | 16.86 | 2.82 | 0.44 | 30 |
| MW-3 | 13.92 | 14.45 | 0.53 | ++.65 | 27 |
| MW-4 | 12.98 | 13.26 | 0.28 | ++0.36 | 19 |
| UGW-1 | 13.30 | 13.71 | 0.41 | 0.45 | 24 |

++indicates an increase in the product thickness in (ft.)

**PW-5 Stage 1 Test**

| Well No. | Starting Piezometric Depth in feet | Ending Piezometric Depth in feet | Piezometric drawdown in feet | Product Thickness Decrease in feet | Distance from PW-5 in feet |
|---|---|---|---|---|---|
| PW-5 | 14.67 | 17.35 | 2.68 | 1.79 | |
| PW-3 | 14.21 | 14.22 | 0.01 | ++0.16 | 13 |
| MW-3 | 13.92 | 14.10 | 0.18 | 1.10 | 11 |
| MW-4 | 12.98 | 13.01 | 0.03 | 0.40 | 5 |
| PW-6 | 14.33 | 17.08 | 2.75 | na | 9 |

++indicates an increase in the product thickness in (ft.)

**PW-6 Stage 1 Test**

| Well No. | Starting Piezometric Depth in feet | Ending Piezometric Depth in feet | Piezometric Drawdown in feet | Product Thickness Decrease in feet | Distance from PW-6 in feet |
|---|---|---|---|---|---|
| PW-6 | 14.22 | 15.35 | 1.13 | 3.97 | |
| PW-3 | 14.04 | 14.39 | 0.35 | ++0.28 | 9 |
| MW-3 | 13.92 | 14.21 | 0.29 | ++0.53 | 11 |
| PW-5 | 13.83 | 17.50 | 3.67 | 2.47 | 9 |
| MW-4 | 12.98 | 13.03 | 0.05 | ++0.12 | 17 |
| UGW-1 | 13.30 | 13.54 | 0.24 | 0.05 | 14 |

++ indicates an increase in the product thickness in (ft.)

**MW-1 Stage 1 Test**

| Well No. | Starting Piezometric Depth in feet | Ending Piezometric Depth in feet | Piezometric drawdown in feet | Product Thickness Decrease in ft | Distance from MW-1 in feet |
|---|---|---|---|---|---|
| MW-1 | 11.38 | 12.49 | 1.11 | 3.37 | |
| PW-2 | 11.68 | 11.55 | ++0.13 | ++0.08 | 10.25 |
| MW-2 | 11.06 | 10.94 | ++0.12 | ++0.04 | 24 |
| PW-1 | 8.46 | 8.57 | 0.11 | ++0.01 | 21 |
| UGW-22 | 9.70 | 9.71 | 0.01 | 0.00 | 20.5 |

++indicates an increase in the product thickness in (ft.) or rise in piezometric surface.

## 2.6 STAGE 1 CONCLUSION

Although the Stage 1 system recovered free product, the recovery rates dropped off quickly and product recharge rates were slow. In an effort to maximize product recovery rates with this system 10 times as much water was recovered as product, thus, this Stage 1 system effectively operated as a "total fluids" (product & water) recovery system. Accordingly, operation in a product only recovery rate would yield a much smaller amount of product with capture zone of only a couple feet.

Based on a product recovery rate of 15 gpd observed in Stage 1 the projected yearly maximum product recovery with the Stage 1 total fluids system would be 5500 gallons considering a constant recharge rate. Based on the estimated spill volume of 243,000 gallons, it would take 44 years or more to recover the total volume of spilled product, that is, assuming all of the product would migrate into the capture zones.

The capture zones at each test well are clearly indicated by the difference in the piezometric levels at the monitoring points. The shape of the capture zone is not radially symmetric around the respective test wells, but rather it is eccentric. This is consistent with the patterns observed in highly fractured rock. In fact, while pumping in MW-1, the piezometric level in wells MW-2 and PW-2 actually rose indicating that the capture effect toward these wells is unrelated to the pumping of product. In addition, the typical relationship between drawdown and distance from pumping wells (i.e. more drawdown at nearer wells) was inversed. For example, pumping PW-3 yielded 0.53 feet of drawdown in the nearby well MW-3 only 3 feet away, while 13 feet away in PW-5 a drawdown of 3.7 feet was observed. The average capture zone of Stage 1 was 8 feet. Based on these results it would take about 270 wells spaced at about 15 feet to recover the free product at the site.

## SECTION 3.0 STAGE TWO SYSTEM

The Stage 2 system used product recovery with product only pumps as in Stage 1 with the simultaneous addition of vacuum extraction (soil vapor extraction). The Stage 2 process was designed to exert a negative relative pressure within the well to enhance the flow of fluids into the recovery wells.

Vacuum extraction is a well-known process and one of the most widely utilized technologies to recover volatile hydrocarbons from soils. The application of vacuum to the recovery wells for this test had the further purpose of creating less than atmospheric pressure in the soils while applying the same product pumping system as used in Stage 1.

### 3.1 SYSTEM CONSTRUCTION

The construction of this phase required the wellheads to be connected to a vacuum source with a water/product interface probe sealed into each wellhead. Sealing the interface probes into the wellhead permitted water and product level measurements with a constant vacuum applied at the wellhead without interrupting the test.

### 3.2 OPERATIONS OF STAGE TWO

Each of the 6 new product recovery wells and well MW-1 were tested individually for water and product levels, wellhead vacuum, and air flow. Water and product levels were recorded at each well before the pump operations began and during pumping. The piezometric level was calculated from this data using a product density of 0.8 g/cc. The

The air flow from the wells ranged from 0 to 40 scfm. Several surrounding wells were monitored for changes in the piezometric level during each well test to record the capture zone influence. PW-1 and PW-5 are used below as examples of the testing operations. The product recovery rates were recorded for each well and ranged from 0 to 54 gpd. The complete data set for product recovery is presented in Table 35.

### 3.2.1 PW-1

Stage Two testing began on October 10, 1995, starting at PW-1. PW-1 had 0.10 feet of product before applying the vacuum. When 3 inches Hg vacuum was applied to the wellhead, the product thickness doubled for 0.3 hours, then decreased to 0.01 feet indicating that some of the hydrocarbons were volatilized or otherwise recovered. After 15.8 hours of applied vacuum the product disappeared altogether. The air flow from PW-1 was recorded as 12 scfm at 3 inches Hg. The liquid level in the well rose approximately 0.5 to 1.0 foot over the duration of the testing due to the applied vacuum. PW-1 was tested for 97.7 hours.

The vacuum ROI is calculated by the equation as follows (Reference: Paul Johnson, Shell Oil Company):

$$(Pr^2 - Pw^2)/(Pw^2 - Pa^2) = Ln(r/Rw)/Ln(Rw/Ri)$$

RI= ROI (ft)
Rw= Radius of well and sand pack (ft.)
r= Distance from well to monitoring point (ft.)
Pa= Atmosphere pressure (1.0 atm)
Pr= Absolute pressure at monitoring point (atm.)
Pw= Absolute pressure at vacuum well (atm.)

$$RI = Rw * \exp(-x)$$
$$\text{where } x = \ln(r/Rw) * ((Pw^2 - Pa^2) / (Pr^2 - Pw^2))$$

Vacuum measurements where recorded at 3 monitoring points in order to determine the vacuum radius of influence (ROI).

| TEST WELL: PW-1 | MONITOR WELL: PW-2 |
|---|---|
| r=Distance from monitor well | 7 feet |
| Rw= Radius of well & sand pack | 0.50 FEET |
| Pa= Atmosphere pressure | 1.0 atm |
| Pr= Absolute pressure at PW-2 | .9986 atm |
| Pw= Absolute pressure at PW-1 | .8517 atm |
| RI= Radius of Influence | 7.50 feet |

| TEST WELL: PW-1 | MONITOR WELL: MW-2 |
|---|---|
| r=Distance from monitor well | 5.8 FEET |
| Rw= Radius of well & sand pack | .50 FEET |
| Pa= Atmosphere pressure | 1.0 ATM |
| Pr= Absolute pressure at MW-2 | .9988 ATM |
| Pw= Absolute pressure at PW-1 | .8490 ATM |
| RI= Radius of Influence | 6.20 FEET |

| TEST WELL: PW-1 | MONITOR WELL: UGW-22 |
|---|---|
| r=Distance from monitor well | 10 FEET |
| Rw= Radius of well & sand pack | .5 FEET |
| Pa= Atmosphere pressure | 1.0 ATM |
| Pr=Absolute pressure at UGW-22 | .9983 ATM |
| Pw= Absolute pressure at PW-1 | .8517 ATM |
| RI= Radius of Influence | 11.00 FEET |

Figure 18 presents the vacuum ROI for PW-1 in graphical form.

The water and product level were recorded and the piezometric level was calculated for the surrounding wells to determine the impact of vacuum and product pumping on the

water table. The piezometric surface at UGW-5 began at 12.79 feet TOC and lowered to 12.95 feet TOC. The piezometric water surface at MW-2 started at 11.80 feet TOC and ended at 13.97 feet TOC. At PW-2, the baseline piezometric level was at 12.34 feet TOC and was also lowered to 13.41 feet TOC. The data is presented in Table 17 and Figure 17.

### 3.2.2 PW-5 Stage 2 Test

A vacuum of 3 inches Hg at the wellhead resulted in 16.8 scfm air flow. During the baseline period of the test, the product thickness was 0.01 feet. The product thickness at PW-5 increased to 0.20 feet after 0.71 hours of operations, then decreased to 0.01 feet approximately 2.4 hours later, indicating some volatilization of the product and additional recovery. The piezometric level at PW-5 began at 18.95 TOC feet and changed to 19.38 TOC by the end of the test, a lowering of 0.43 feet. Figure 31 and Table 27 represent the data recorded during this test.

The product recovery rate increased from approximately 2.6 gpd to 7.9 gpd with the vacuum applied at 3 inches Hg. With the applied vacuum at 4 inches Hg, the product recovery rate decreased slightly to 7.2 gpd which may be due an increased volatilization rate at higher vacuums. Product recovery rates are presented in Table 35. Figure 32 presents the recovery rates for PW-5.

The vacuum ROI was found to be 1.25 inches water at MW-3, the only monitoring point where an influence was recorded. The vacuum ROI is calculated as above in Section 3.2.1 and the results follow:

| TEST WELL: PW-5 | MONITOR WELL: MW-3 |
|---|---|
| r=Distance from monitor well | 11 FEET |
| Rw=Radius of well & sand pack | .5 FEET |
| Pa= Atmosphere pressure | 1.0 ATM |
| Pr= Absolute pressure at MW-3 | .9959 ATM |
| Pw= Absolute pressure at PW-5 | .7989 ATM |
| RI= Radius of Influence | 12.60 FEET |

Figure 30 represents the vacuum ROI for well PW-5 in graphical form.

The water and product levels were recorded and the piezometric level was calculated for the surrounding wells to determine the impact of vacuum and product pumping on the

water table. The piezometric water surface at UGW-1 began at 13.88 feet TOC and ended at 14.27 feet TOC, dropping 0.39 feet. The piezometric water surface at MW-3 started at 14.59 feet TOC and lowered 0.29 feet to 14.88 feet TOC. At PW-3, the piezometric water surface dropped 0.11 feet, beginning at 18.16 feet TOC and ending at 18.27 feet TOC. The data is presented in Table 17 and Figure 33.

## 3.3 EVALUATION OF STAGE TWO TEST

### 3.3.1 PRODUCT RECOVERY RATES

The product recovery rates were recorded at seven wells with 3 to 4 inches Hg applied vacuum at the wellheads. The total liquid recovery rate was 267 gpd and the product recovery rate was 79 gpd as recorded at the wellheads. If the system, as tested, was allowed to operate at these rates for 1 year and assuming product would freely migrate towards the capture zones, potentially 28,700 gallons of product would be recovered. This represents a 420% increase in product recovery over the "product only" system while reducing the recovered water to product ratio by 75%. Table 35 presents the recovery rates for individual wells.

### 3.3.2 CAPTURE ZONE

The following tables represent possible capture zones as shown by the difference of the piezometric levels while testing the 7 recovery wells. The shape of the capture zone is not radially symmetric around the respective test wells, but rather as eccentric as the patterns of highly fractured rock. The data below is presented in feet below grade.

**PW-1 Stage 2 Test**

| Well No. | Starting Piezometric Depth in feet | Ending Piezometric Depth in feet | Piezometric Drawdown in feet | Product Thickness Decrease in feet | Distance from PW-1 in feet |
|---|---|---|---|---|---|
| PW-1 | 10.99 | 10.16 | ++0.83 | 0.0 | |
| MW-2 | 11.80 | 13.97 | 2.17 | ++0.49 | 5.8 |
| PW-2 | 12.34 | 13.41 | 1.07 | ++0.43 | 7.0 |
| UGW-22 | 10.70 | 11.82 | 1.12 | 0.01 | 10.0 |
| UGW-5 | 12.79 | 12.95 | 0.16 | 0.05 | 5.0 |

++indicates an increase in the product thickness in (ft.) or rise in the piezometric level (ft.)

**PW-4 Stage 2 Test**

| Well No. | Starting Piezometric Depth in feet | Ending Piezometric Depth in feet | Piezometric Drawdown in feet | Product Thickness Decrease in feet | Distance from PW-4 in feet |
|---|---|---|---|---|---|
| PW-4 | 14.28 | 12.89 | ++1.39 | ++1.14 | |
| PW-6 | 16.47 | 16.37 | ++0.10 | ++0.06 | 35 |
| PW-5 | 19.44 | 19.31 | ++0.13 | ++0.07 | 31 |
| PW-3 | 18.26 | 18.28 | 0.02 | 0.0 | 30 |
| MW-4 | 13.66 | 13.59 | ++0.07 | 0.17 | 19 |
| MW-3 | 14.97 | 14.72 | ++0.25 | 0.20 | 27 |
| UGW-1 | 14.19 | 13.90 | ++0.29 | NA | 24 |

++indicates an increase in the product thickness in (ft.) or rise in the piezometric level.

**PW-5 Stage 2 Test**

| Well No. | Starting Piezometric Depth in feet | Ending Piezometric Depth in feet | Piezometric Drawdown in feet | Product Thickness Decrease in feet | Distance from PW-5 in feet |
|---|---|---|---|---|---|
| PW-5 | 18.95 | 19.38 | 0.43 | ++0.01 | |
| PW-6 | 16.35 | 16.54 | 0.19 | ++0.07 | 9 |
| PW-3 | 18.16 | 18.27 | 0.11 | 0.0 | 13 |
| MW-3 | 14.59 | 14.88 | 0.29 | ++0.05 | 11 |
| UGW-1 | 13.88 | 14.27 | 0.39 | 0.31 | 8 |
| MW-4 | 13.55 | 13.63 | 0.08 | ++0.02 | 5 |

++indicates an increase in the product thickness in (ft.) or rise in the piezometric level.

| TEST WELL: PW-2 | MONITOR WELL: PW-1 |
|---|---|
| r=Distance from monitor well | 7 FEET |
| Rw= Radius of well & sand pack | .5 FEET |
| Pa= Atmosphere pressure | 1.0 ATM |
| Pr= Absolute pressure at PW-1 | .9977 ATM |
| Pw= Absolute pressure at PW-2 | .8517 ATM |
| RI= Radius of Influence | 7.70 FEET |

| TEST WELL: PW-2 | MONITOR WELL: MW-1 |
|---|---|
| r=Distance from monitor well | 10.25 FEET |
| Rw= Radius of well & sand pack | .5 FEET |
| Pa= Atmosphere pressure | 1.0 ATM |
| Pr= Absolute pressure at MW-1 | .9977 ATM |
| Pw= Absolute pressure at PW-2 | .8490 ATM |
| RI= Radius of Influence | 11.40 FEET |

| TEST WELL: PW-2 | MONITOR WELL: UGW-22 |
|---|---|
| r=Distance from monitor well | 20.75 FEET |
| Rw= Radius of well & sand pack | .50 FEET |
| Pa= Atmosphere pressure | 1.0 ATM |
| Pr=Absolute pressure at UGW-22 | .9986 ATM |
| Pw= Absolute pressure at PW-2 | .8490 ATM |
| RI= Radius of Influence | 23.10 FEET |

entrainment process is used to recover groundwater, product and vapors simultaneously. Free product recovery is optimized by adjusting the depth of the entrainment hoses so they recover as much of the product and vapor and as little of the groundwater as possible.

## 4.2 SYSTEM CONSTRUCTION

The construction of the Stage 3 test consisted of the removal of the pneumatic recovery system and the installation of the vacuum entrainment, product recovery system along with the product interface probes at each wellhead in seven wells.

## 4.3 STAGE 3 OPERATIONS

Each of the product recovery wells were tested individually for water levels, product levels, wellhead vacuum, and air flow. Water and product levels were recorded at each well before the entrainment operations began and during entrainment elevation. The wellhead vacuum used during this phase ranged from 1.0 inches Hg to 3.5 inches Hg. Air flow was observed up to 17.5 scfm. Several surrounding wells were monitored during each well test to evaluate the change in piezometric level. MW-1 and PW-5 are discussed in the Section 4.3.1 and 4.3.2 as examples of the testing operations. The product recovery rates where recorded for each well and ranged 0 to 45 gpd per well. The complete data set for product recovery is presented in Table 59.

### 4.3.1 MW-1

The product thickness in MW-1 was approximately 1.17 feet before startup and was reduced to 0.05 feet within the first hour of operations. The product thickness increased 0.63 feet after 6.75 hours of stopping operations. The vacuum at the wellhead was 3.5 inches Hg. The air flow was not recorded, because MW-1 was a small diameter well and could not be fitted for airflow measurement during entrainment. The piezometric water surface in MW-1 began at 12.99 feet TOC, then was lowered to 14.53 feet TOC within one hour after the vacuum at the well head was stopped, which implies that the vacuum had significant capacity to lift fluid from the wells. The water and product level was not recorded during entrainment operations because measurement probe would not pass by the entrainment tube in the 2 inch well casing. The test was conducted for 7.75 hours. The data is presented in Table 54 and Figure 51.

The product recovery rate was recorded over an 1 hour period at the separator at 45 gpd. The water produced during recovery rate test was 44.60 gpd. The product recovery rate for MW-1 is presented in Table 55.

The water and product levels were monitored in several nearby wells to calculate the piezometric level. This data is represented in Table 56 and Figure 52. The greatest effect was observed at PW-2, where the piezometric surface rose 0.20 feet. Other wells

radially symmetric around the respective test wells, but rather is eccentric, typical of the patterns associated with highly fractured rock.

**PW-1 Stage 3 Test**

| Well No. | Starting Piezometric Depth in feet | Ending Piezometric Depth in feet | Piezometric Drawdown in feet | Product Thickness Decrease in feet | Distance from PW-1 in feet |
|---|---|---|---|---|---|
| PW-1 | 10.83 | 15.10 | 4.27 | 0.0 | |
| MW-1 | 13.97 | 13.83 | ++0.14 | ++0.08 | 17 |
| UGW-22 | 10.89 | 10.91 | ++0.02 | 0.01 | 10 |
| MW-2 | 12.92 | 12.87 | ++0.05 | 0.06 | 5.8 |
| PW-2 | 15.2 | 15.18 | ++0.02 | NA | 7 |

++indicates an increase in the product thickness in (ft.) or rise in piezometric surface.

**PW-2 Stage 3 test**

| Well No. | Starting Piezometric Depth in feet | Ending Piezometric Depth in feet | Piezometric Drawdown in feet | Product Thickness Decrease in feet | Distance from PW-2 in feet |
|---|---|---|---|---|---|
| PW-2 | 16.98 | 15.20 | ++1.78 | 0.14 | |
| PW-1 | 10.83 | 10.83 | 0 | 0.0 | 7 |
| MW-2 | 11.38 | 12.18 | 0.8 | ++0.29 | 5.8 |
| MW-1 | 14.15 | 13.55 | ++0.6 | ++0.04 | 10.25 |
| UGW-22 | 10.78 | 10.87 | 0.09 | 0.01 | 20.75 |

++indicates an increase in the product thickness in (ft.) or rise in piezometric surface.

**PW-3 Stage 3 Test**

| Well No. | Starting Piezometric Depth in feet | Ending Piezometric Depth in feet | Piezometric Drawdown in feet | Product Thickness Decrease in feet | Distance from PW-3 in feet |
|---|---|---|---|---|---|
| PW-3 | 15.67 | 15.60 | ++0.07 | 0.27 | |
| PW-6 | 13.68 | 13.7 | 0.02 | ++0.04 | 9 |
| PW-5 | 15.44 | 15.44 | 0 | ++0.08 | 13 |
| MW-4 | 13.24 | 13.24 | 0 | ++0.02 | 15 |
| UGW-1 | 12.67 | 12.72 | 0.05 | 0.0 | 8 |
| MW-3 | 13.02 | 13.06 | 0.04 | 0.12 | 3 |

++indicates an increase in the product thickness in (ft.) or rise in piezometric surface.

**PW-4 Stage 3 Test**

| Well No. | Starting Piezometric Depth in ft | Ending Piezometric Depth in ft | Piezometric Drawdown in feet | Product Thickness Decrease in feet | Distance from PW-4 in feet |
|---|---|---|---|---|---|
| PW-4 | 13.91 | 14.46 | 0.55 | 0.50 | |
| PW-5 | 16.67 | 16.52 | ++0.15 | ++0.01 | 24 ft |
| PW-6 | 16.69 | 16.55 | ++0.14 | ++0.08 | 35 ft |
| PW-3 | 15.7 | 15.76 | 0.06 | ++0.02 | 30 ft |
| MW-4 | 13.33 | 13.31 | ++0.02 | 0.03 | 19 ft |
| UGW-1 | 13.6 | 13.56 | ++0.04 | ++0.01 | 24 ft |

++indicates an increase in the product thickness in (ft.) or rise in piezometric surface.

**PW-5 Stage 3 Test**

| Well No. | Starting Piezometric Depth in feet | Ending Piezometric Depth in feet | Piezometric Drawdown in feet | Product thickness Decrease in feet | Distance from PW-5 in feet |
|---|---|---|---|---|---|
| PW-5 | 15.89 | 16.67 | 0.78 | 0.49 | |
| PW-6 | 17.42 | 16.7 | ++0.72 | 0.01 | 9 |
| PW-3 | 15.67 | 15.75 | 0.08 | ++0.04 | 13 |
| MW-3 | 14.18 | 14.23 | 0.05 | ++0.06 | 11 |
| UGW-1 | 13.55 | 13.6 | 0.05 | ++0.02 | 5.5 |
| MW-4 | 13.46 | 13.33 | ++0.13 | 0.01 | 5 |

++indicates an increase in the product thickness in (ft.) or rise in piezometric surface.

**PW-6 Stage 3 Test**

| Well No. | Starting Piezometric Depth in feet | Ending Piezometric Depth in feet | Piezometric Drawdown in feet | Product Thickness Decrease in feet | Distance from PW-6 in feet |
|---|---|---|---|---|---|
| PW-6 | 16.77 | 17.58 | 0.81 | 0.46 | |
| PW-5 | 16.45 | 16.89 | 0.44 | +0.09 | 9 |
| PW-3 | 15.81 | 15.82 | 0.01 | 0.25 | 9 |
| MW-4 | 13.4 | 13.48 | 0.08 | 0.68 | 17 |
| UGW-1 | 13.61 | 14.93 | 1.32 | 0.02 | 14 |
| MW-3 | 14.37 | 15.9 | 1.53 | 0.12 | 11 |

++ indicates an increase in the product thickness in (ft.) or rise in piezometric surface.

**MW-1 Stage 3 Test**

| Well No. | Starting Piezometric Depth in feet | Ending Piezometric Depth in feet | Piezometric Drawdown in feet | Product Thickness Decrease in feet | Distance from MW-1 in feet |
|---|---|---|---|---|---|
| MW-1 | 12.99 | 13.53 | 0.54 | 0.54 | |
| MW-2 | 11.84 | 11.83 | ++0.01 | 0.0 | 24 |
| PW-1 | 10.88 | 10.83 | ++0.05 | 0.0 | 21 |
| UGW-22 | 10.8 | 10.79 | ++0.01 | 0.0 | 20.5 |
| PW-2 | 16.98 | 16.78 | ++0.2 | ++0.32 | 10.25 |

++indicates an increase in the product thickness in (ft.) or rise in piezometric surface.

The data show a lowering of the piezometric level at the monitoring wells of tests PW-2, PW-3, PW-5 and PW-6 as a result of the simultaneous recovery of water, product and vapors from the vacuum entrainment operations of Stage 3. Interesting discrepancies occurred while operating wells PW-1, PW-6 and MW-1 wherein the majority of the piezometric levels rose during the operation. This phenomena might be explained by the relatively greater distance between the test wells and the monitoring points in these three cases such that these small changes in piezometric levels simply represent the natural fluctuations in the water tables.

## 4.5 STAGE 3 CONCLUSIONS

The Stage 3 recovery system provides the most productive free product recovery at this site. The yearly expected product recovery rate is 49,100 gallons of product with the tested system, assuming the constant migration of the product into the capture zones. Based on the estimated spill volume of 243,000 gallons, it would take 5 years or more to recover the total volume.

## 5.0 FINAL CONCLUSIONS AND RECOMMENDATIONS

Figure 53 and Table 57 depict comparisons of the three test stages. Product recovery rate in Stage 3 using 3-phase vacuum entrainment was 800% greater than Stage 1 and 70% greater than Stage 2. Stage 2 product recovery rate was 420% greater than Stage 1. Formal delineation of capture zones are inconclusive due to the heterogenieties and natural fluctutations in the water table. By comparing the free product production ratio's, in the table below, the Stage 3 process of Three Phase Entrainment Extraction is more efficient in capturing and more effective in recovering the product with less water than either of the other systems tested.

**FREE PRODUCT PRODUCTION RATIO**

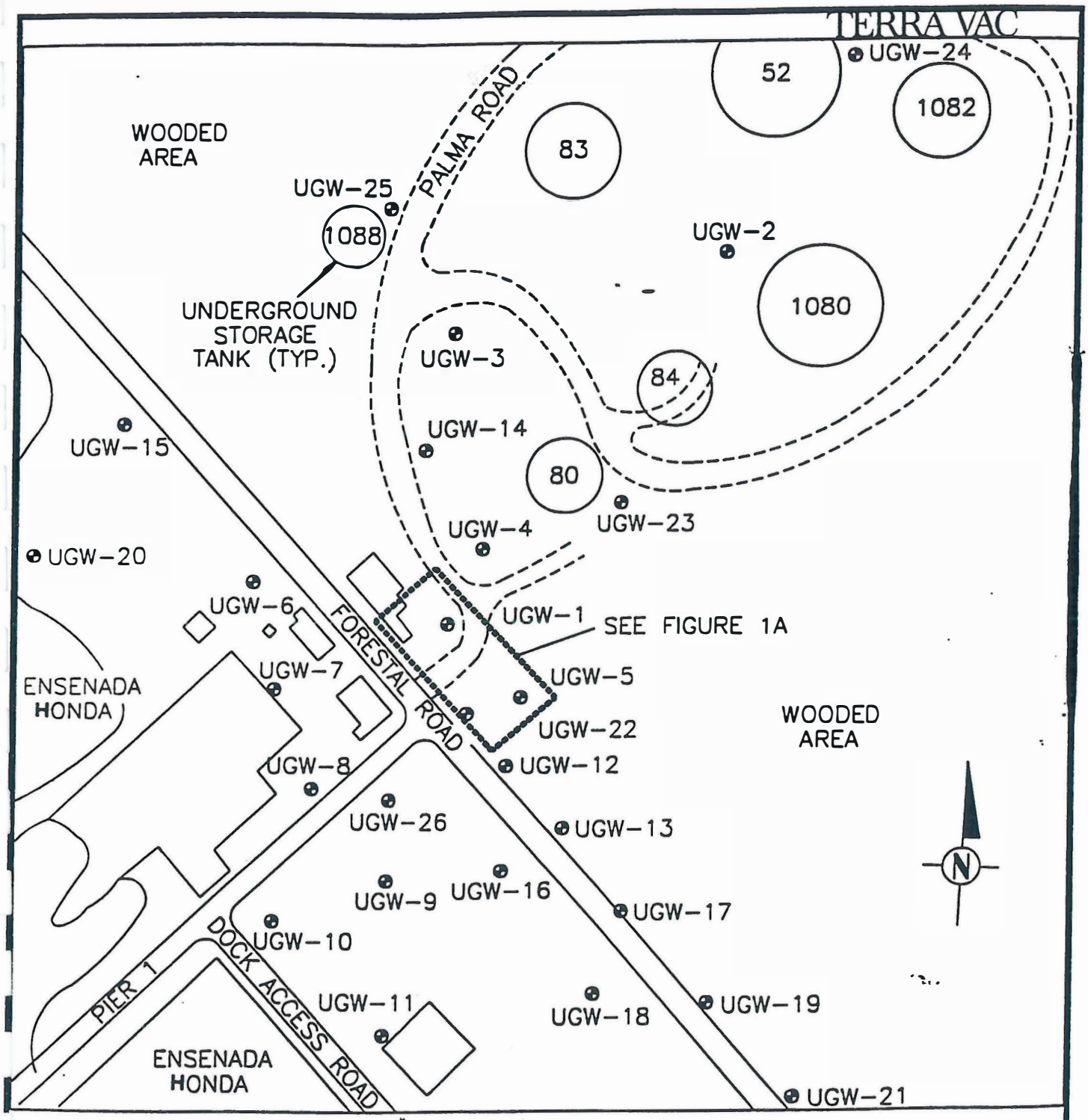
| STAGE | GALLONS PER DAY FREE PRODUCT PRODUCTION | GALLONS PER DAY WATER PRODUCTION | PRODUCT PRODUCTION RATIO |
|---|---|---|---|
| STAGE 1 | 15 | 121 | 11 % |
| STAGE 2 | 79 | 188 | 30 % |
| STAGE 3 | 135 | 265 | 34 % |

The Stage 3 vacuum system also effectively removes contaminated groundwater simultaneously with free product and vapors from the soil. As the vacuum system extracts hydrocarbon vapors from above the water table, air is drawn into the soil to replace the vapors. With the air comes oxygen which further stimulates the natural biodegradation of hydrocarbons that is occurring on the site. In addition, the effect of the vacuum radius of influence during Stage 3 was effective to volatilize and recover many residual hydrocarbons that remain behind in the fractures when product only recovery systems are used.

Thus, Terra Vac's vacuum enhanced product recovery system, TPEE, demonstrated here, not only increase product recovery rates by 800%, it effects a complete cleanup of soil and groundwater.

The product recovery rate of the wells tested in Stage 3 was an average of 19 gpd per well. If vacuum entrainment extraction was used in the 7 test wells along with the 9 other wells where the product thickness was greater than 0.10 feet, potentially 307 gpd (16 wells at 19 gpd average) would be recovered. If the operations maintained this recovery rate for 1 year, then about 112,100 gallons of liquid product could be recovered.

Therefore, vacuum entrainment is recommended on an expanded scale to include all wells on site that have greater than 0.01 feet of free product. Further consideration should be given to installing additional wells at the proper spacing throughout the free product area so that effective cleanup of the product could be accomplished. Based on results of this test and previous work it is likely that complete cleanup of the free product could be accomplished within 12 to 18 months using the Three Phase Entrainment Extraction system.




APPROXIMATE SCALE

150' 0' 150'

NOTE: ALL LOCATIONS ARE APPROXIMATE

LEGEND:

MONITORING WELLS INSTALLED BY BB&L (1993)

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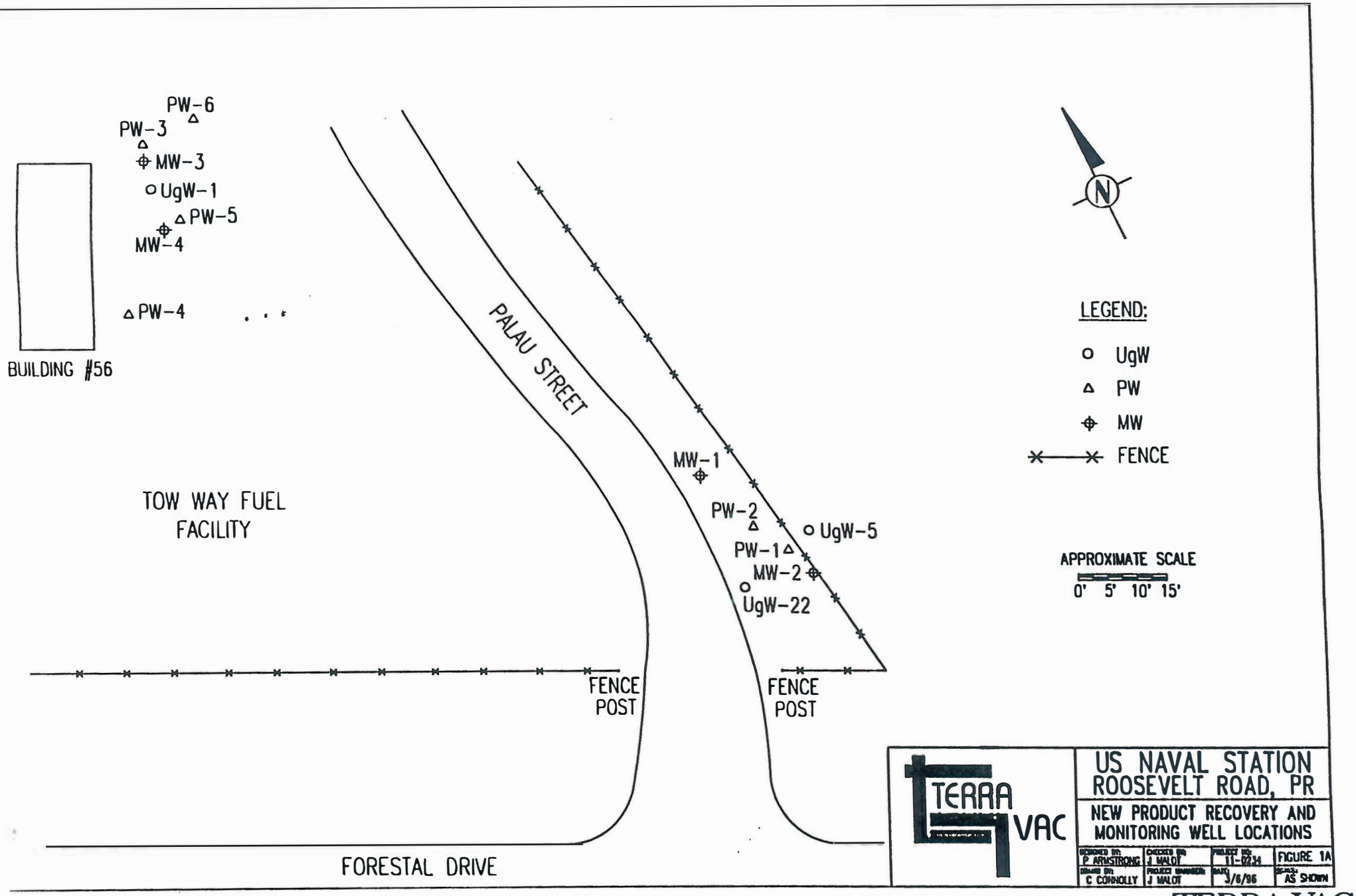
US NAVAL STATION
ROOSEVELT ROAD, PR

SITE MAP
TOW WAY FUEL FACILITY

| | | | |
|---|---|---|---|
| DESIGNED BY: P ARMSTRONG | CHECKED BY: J MALOT | DWG. NO: 11-0234 | FIGURE 1 |
| DRAWN BY: C CONNOLLY | PROJECT MANAGER: J MALOT | DATE: 3/6/96 | SCALE: AS SHOWN |

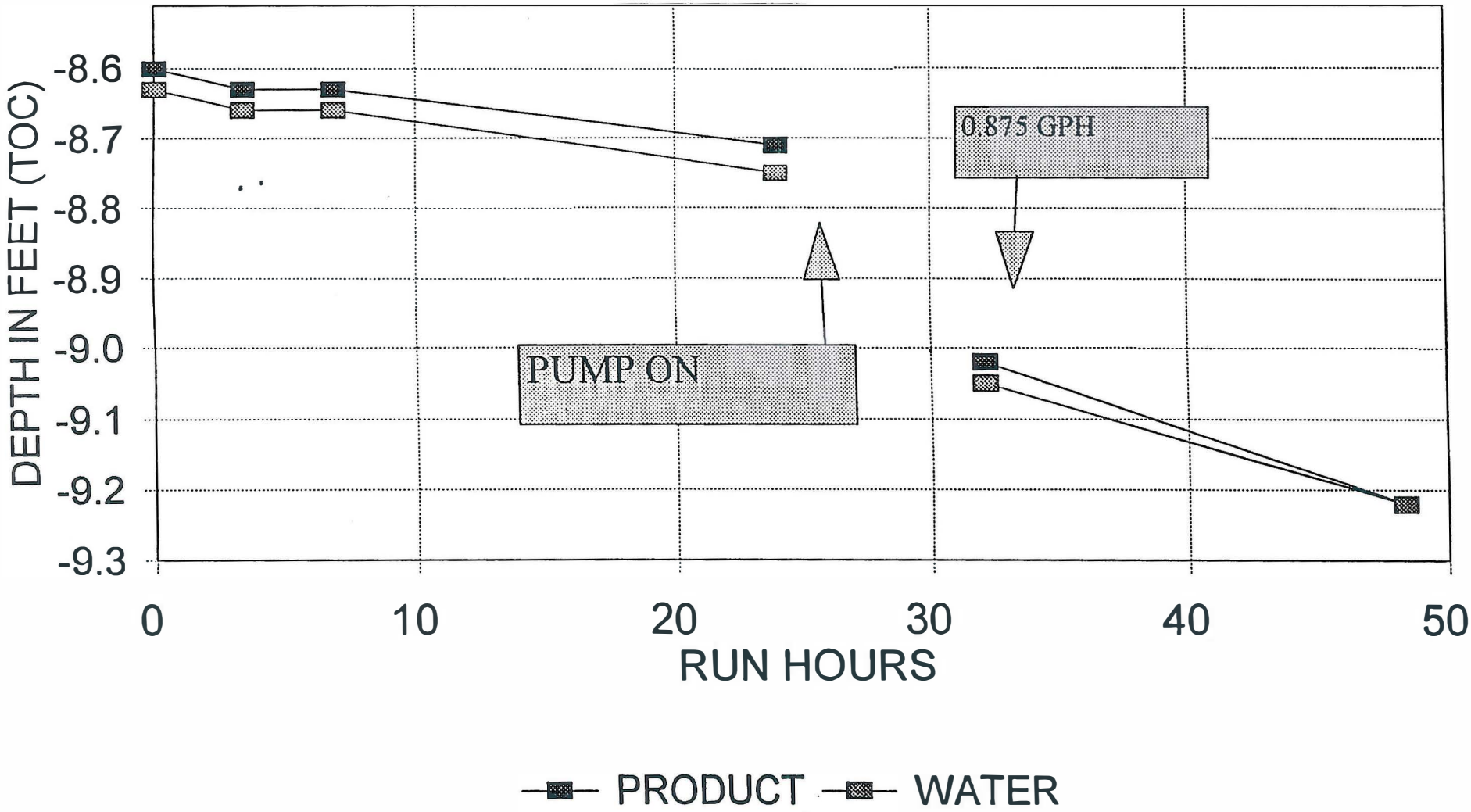

PW-6
PW-3
MW-3
UgW-1
PW-5
MW-4
PW-4
BUILDING #56
TOW WAY FUEL FACILITY
PALAU STREET
MW-1
PW-2
UgW-5
PW-1
MW-2
UgW-22
FENCE POST
FENCE POST
FORESTAL DRIVE
N
LEGEND:
UgW
PW
MW
FENCE
APPROXIMATE SCALE
0' 5' 10' 15'
TERRA VAC
US NAVAL STATION ROOSEVELT ROAD, PR
NEW PRODUCT RECOVERY AND MONITORING WELL LOCATIONS
DESIGNED BY: P ARMSTRONG
CHECKED BY: J MALOT
PROJECT NO: 11-0234
FIGURE 1A
DRAWN BY: C CONNOLLY
PROJECT MANAGER: J MALOT
DATE: 3/6/96
SCALE: AS SHOWN

TERRA VAC

## NAVY TOW WAY FUEL FACILITY

# PW-1 PHASE ONE TEST

**FIGURE 2**



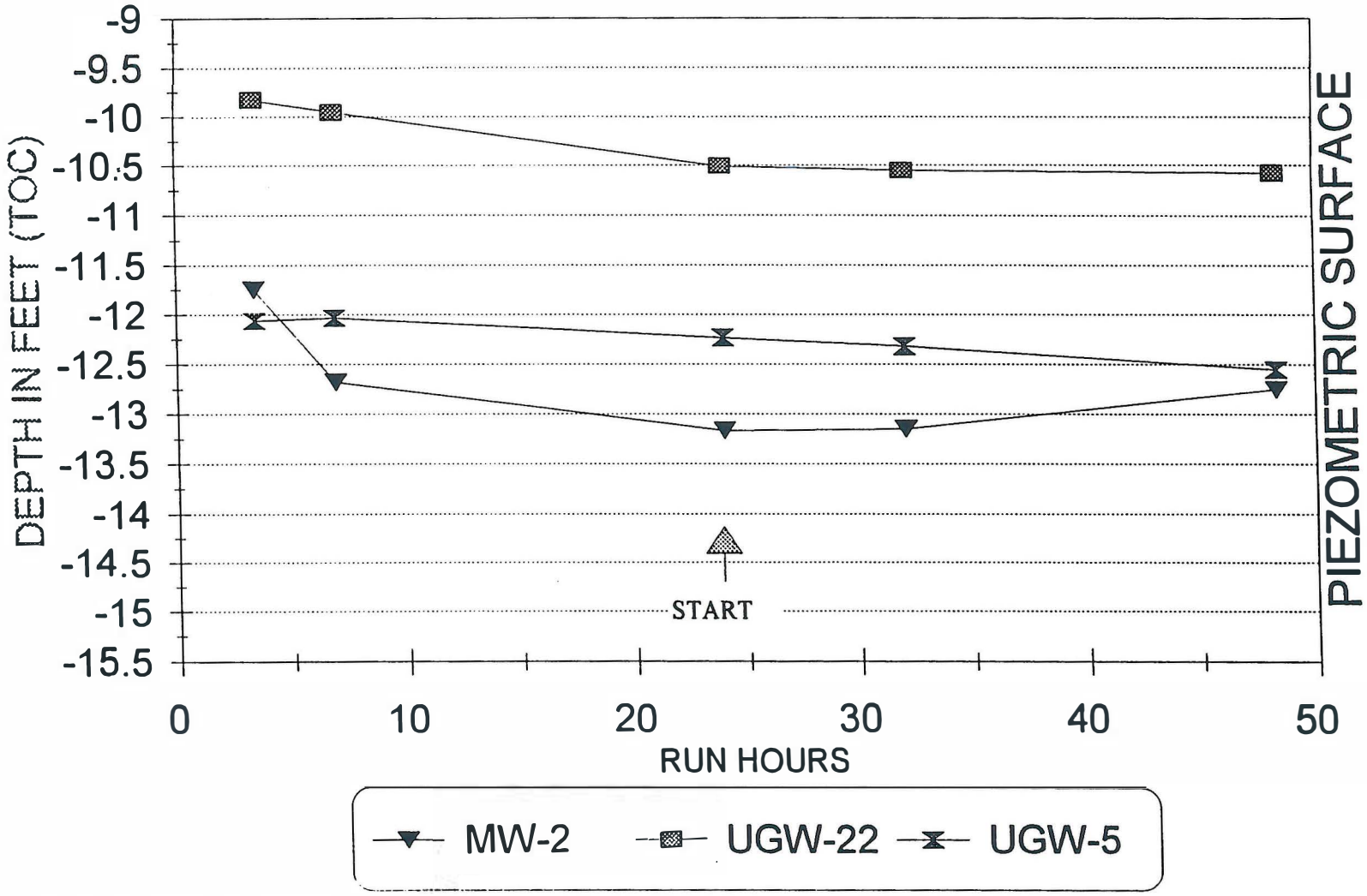

TERRA VAC

11234P1 WB1

# NAVY TOW WAY FUEL FACILITY

## PW-1 STAGE ONE CAPTURE ZONE

FIGURE 3



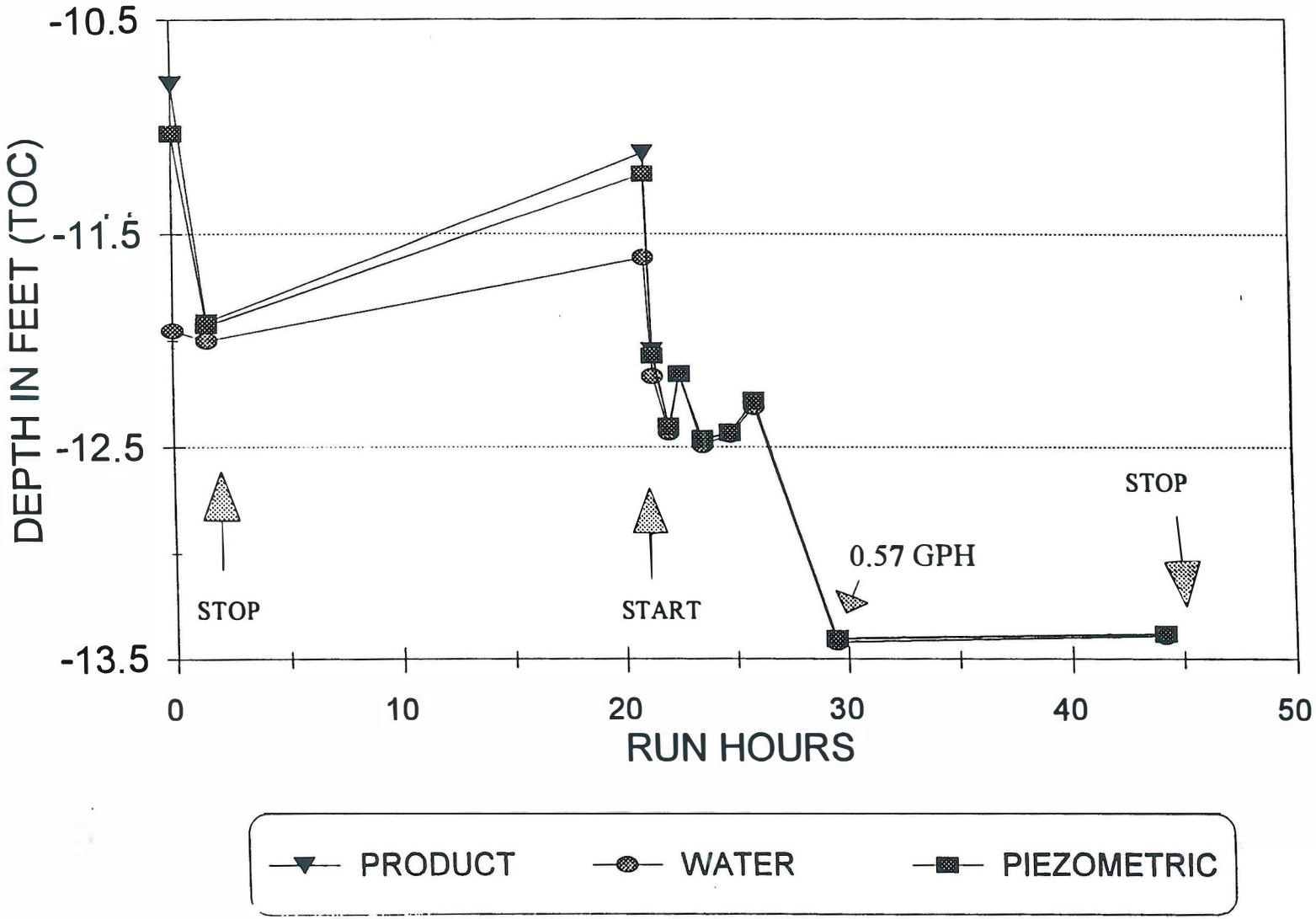

TERRA VAC

1234P1.WB1

# NAVY TOW WAY FUEL FACILITY

## PW-2 STAGE ONE TEST

FIGURE 4



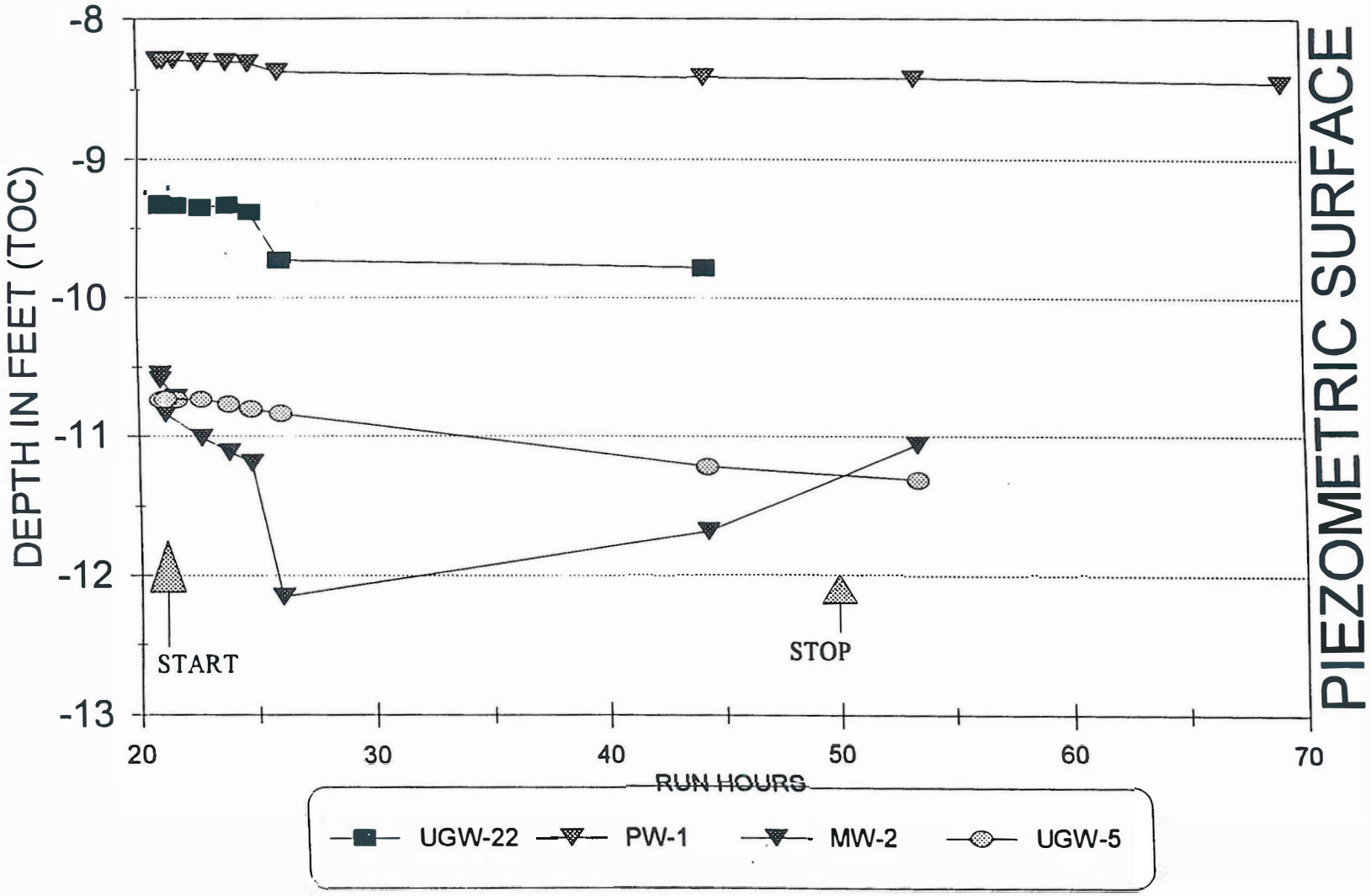

TERRA VAC

1234P1.WB1

# NAVY TOW WAY FUEL FACILITY

## PW-2 STAGE ONE CAPTURE ZONE

FIGURE 5



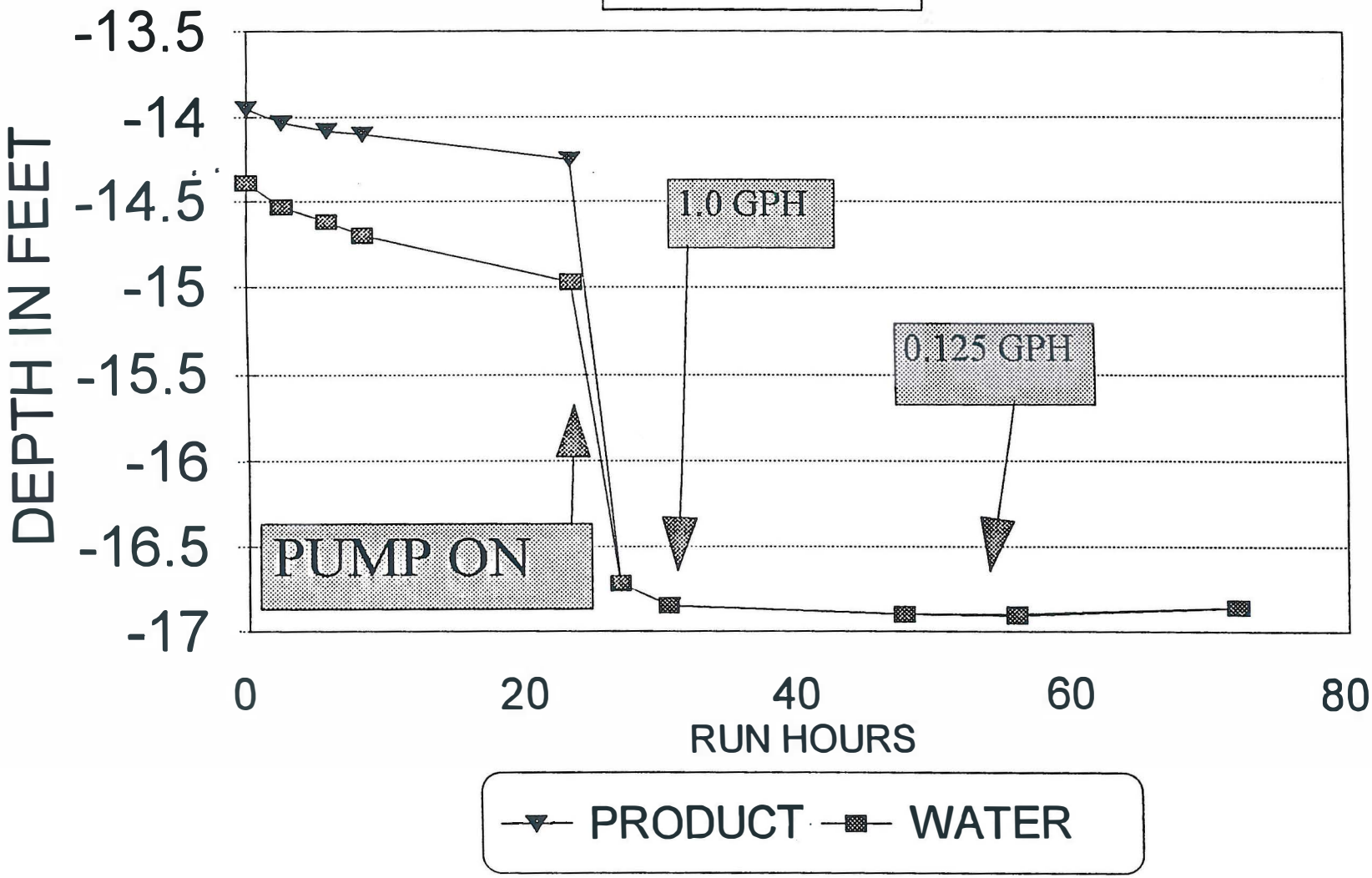

TERRA VAC

1234P1 WB1

## Roosevelt Roads Naval Station

# PW-3 STAGE ONE TEST

FIGURE 6



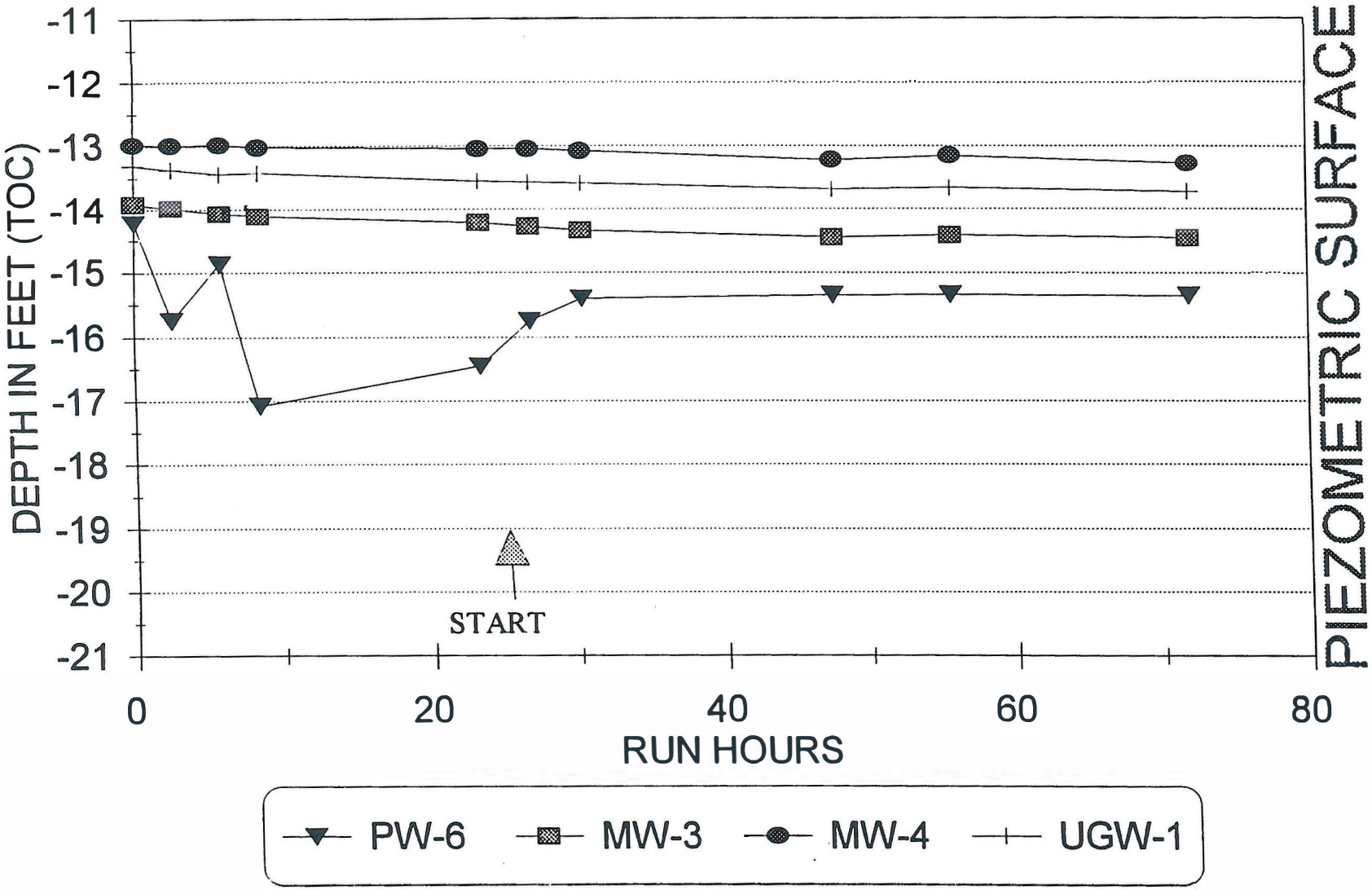

TERRA VAC

11234P1 WB1

# NAVY TOW WAY FUEL FACILITY

## PW-3 STAGE ONE CAPTURE ZONE

FIGURE 7



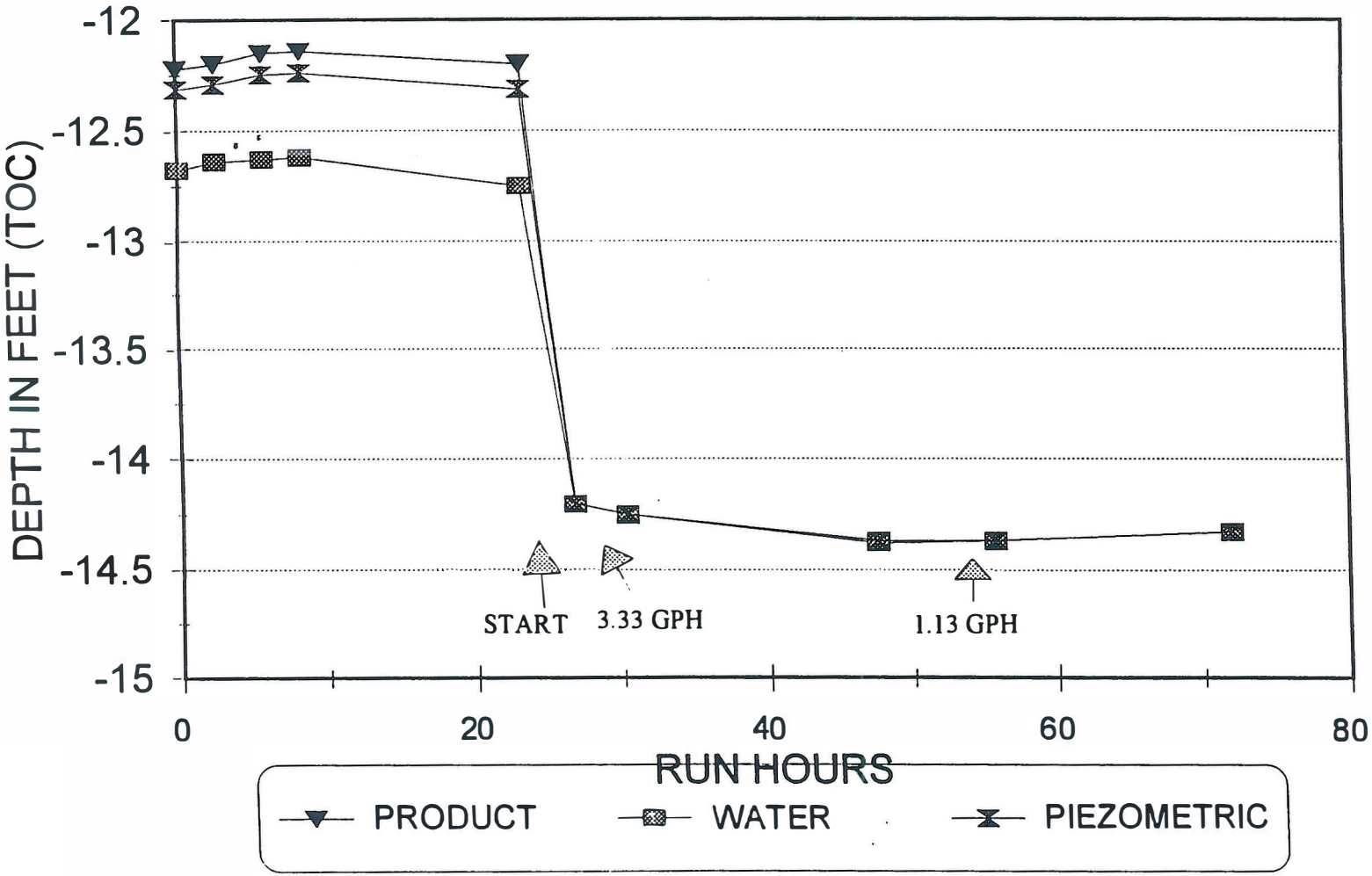

TERRA VAC

1234P1.WB1

# NAVY TOW WAY FUEL FACILITY

## PW-4 STAGE ONE TEST

FIGURE 8



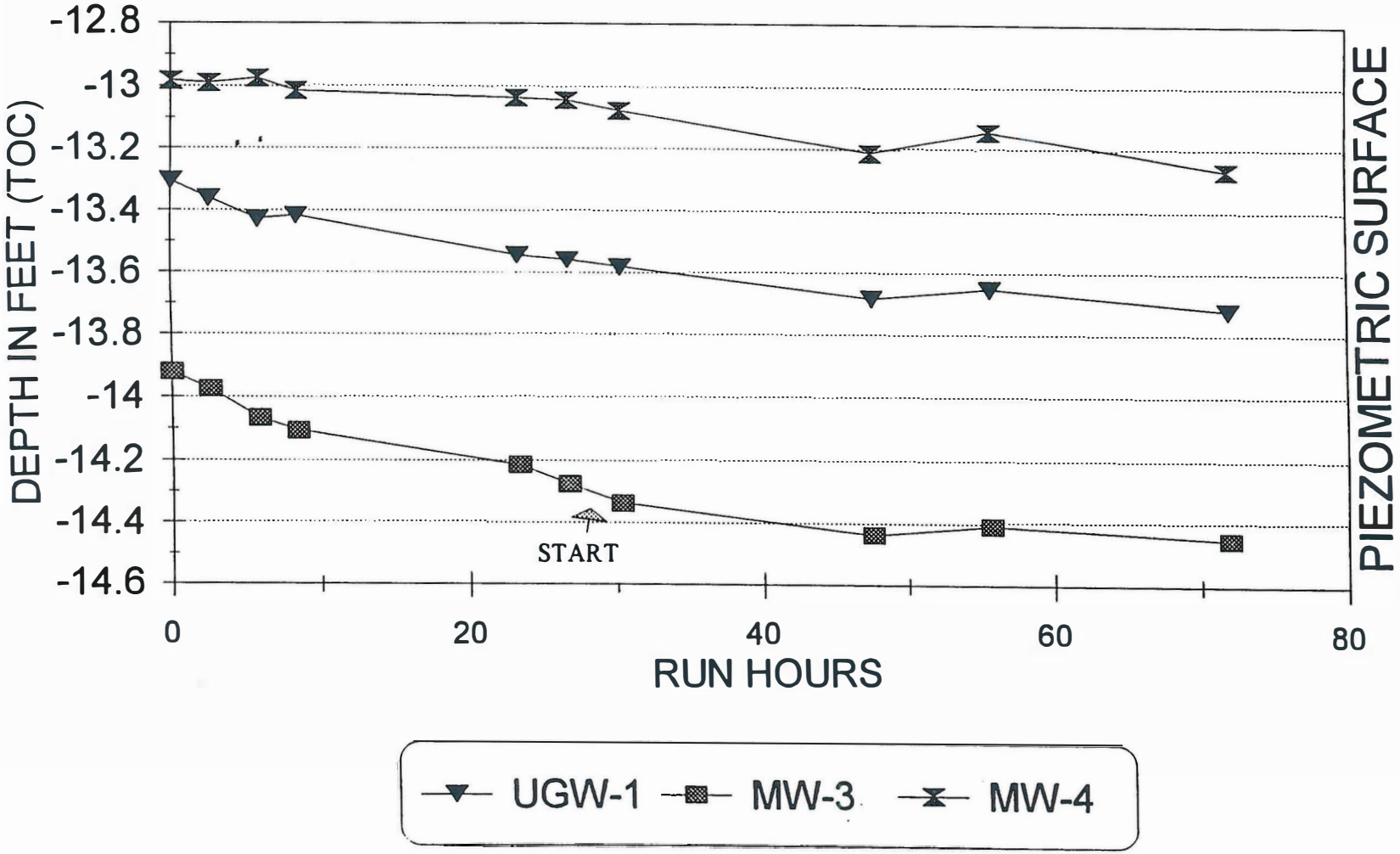

TERRA VAC

1234P1 WB1

# NAVY TOW WAY FUEL FACILITY

## PW-4 STAGE ONE CAPTURE ZONE

FIGURE 9



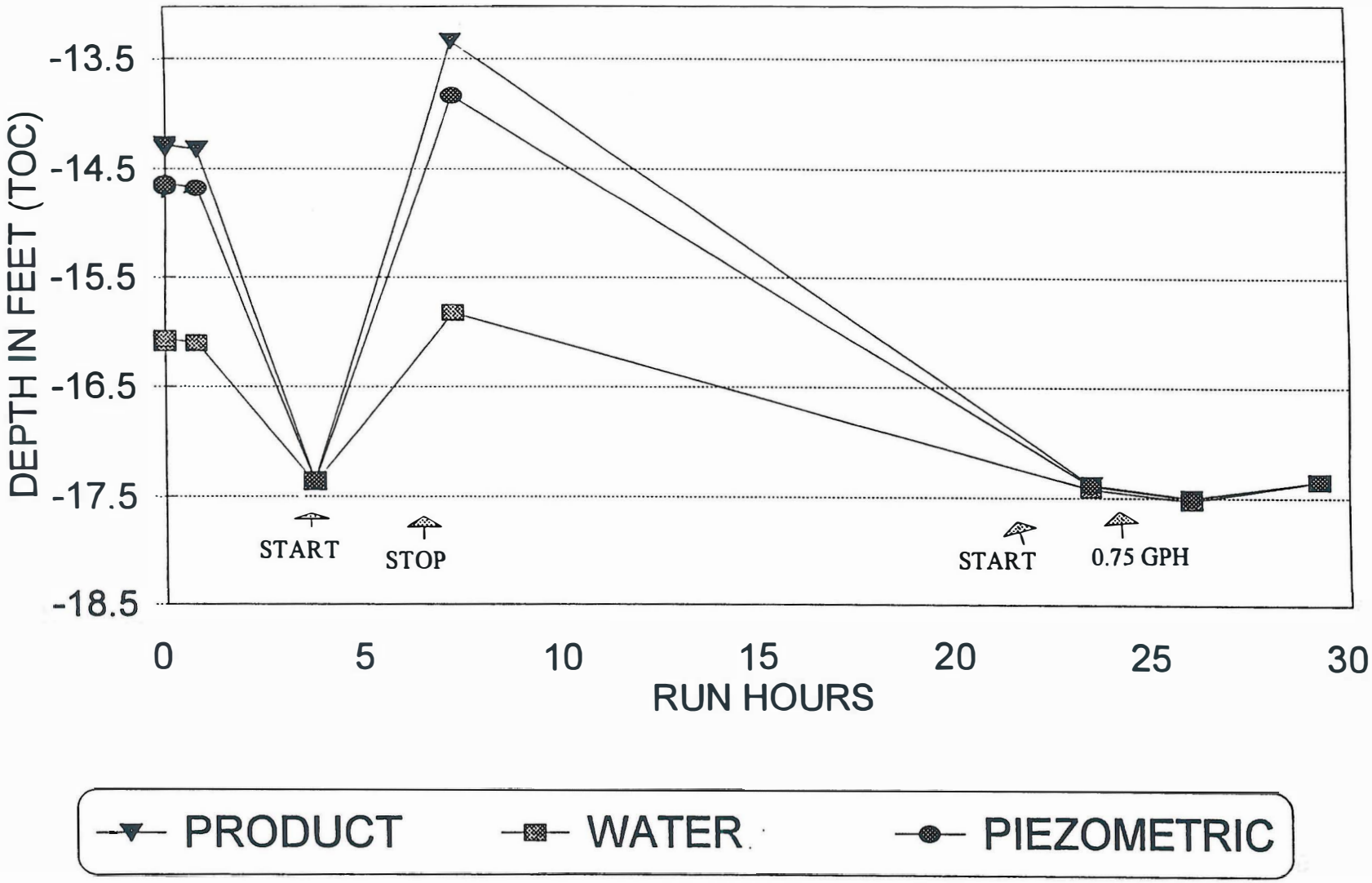

TERRA VAC

1234P1.WB1

# NAVY TOW WAY FUEL FACILITY

## PW-5 STAGE ONE TEST

FIGURE 10



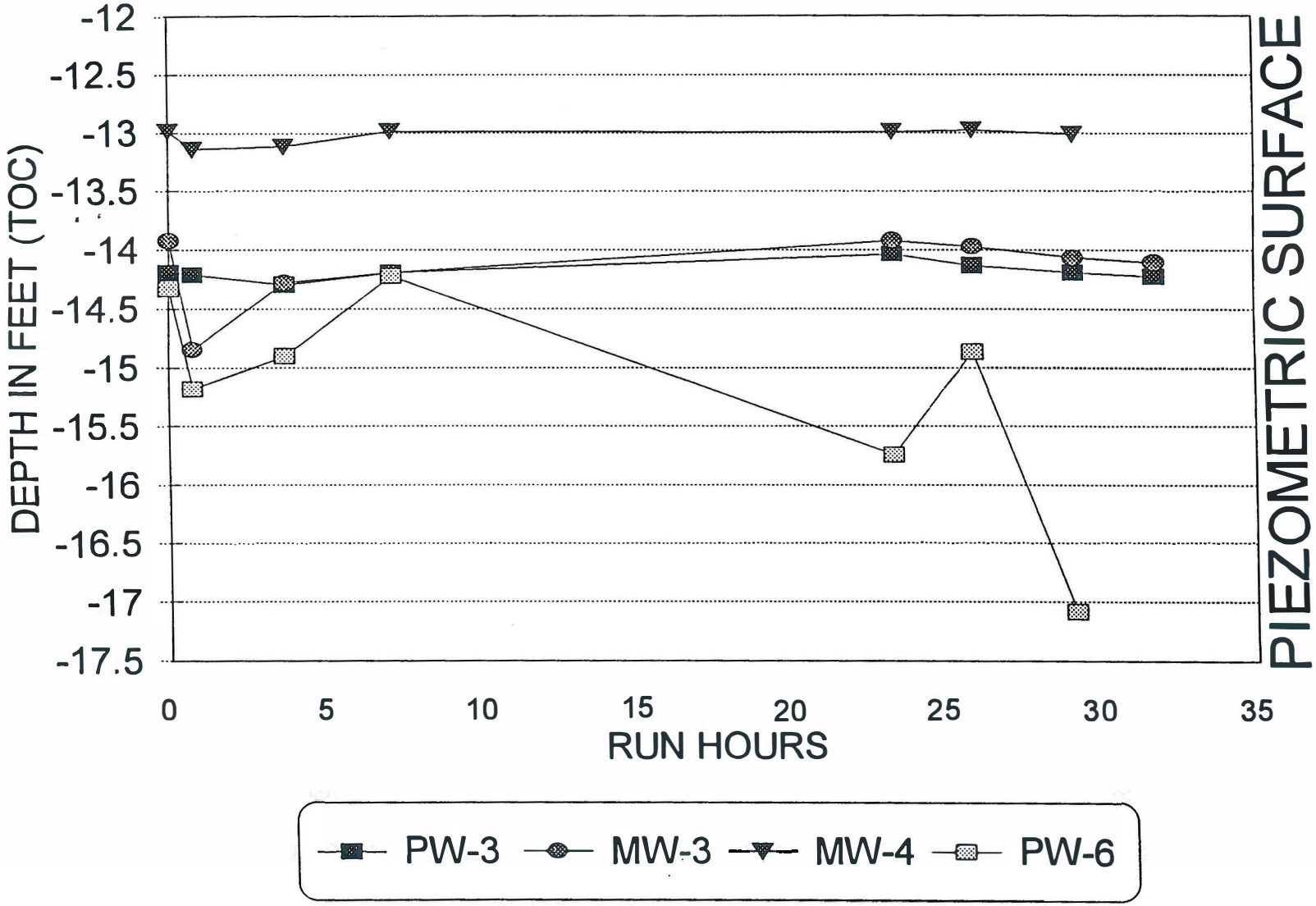

TERRA VAC

11234P1.WB1

# NAVY TOW WAY FUEL FACILITY

## PW-5 STAGE ONE CAPTURE ZONE

FIGURE 11

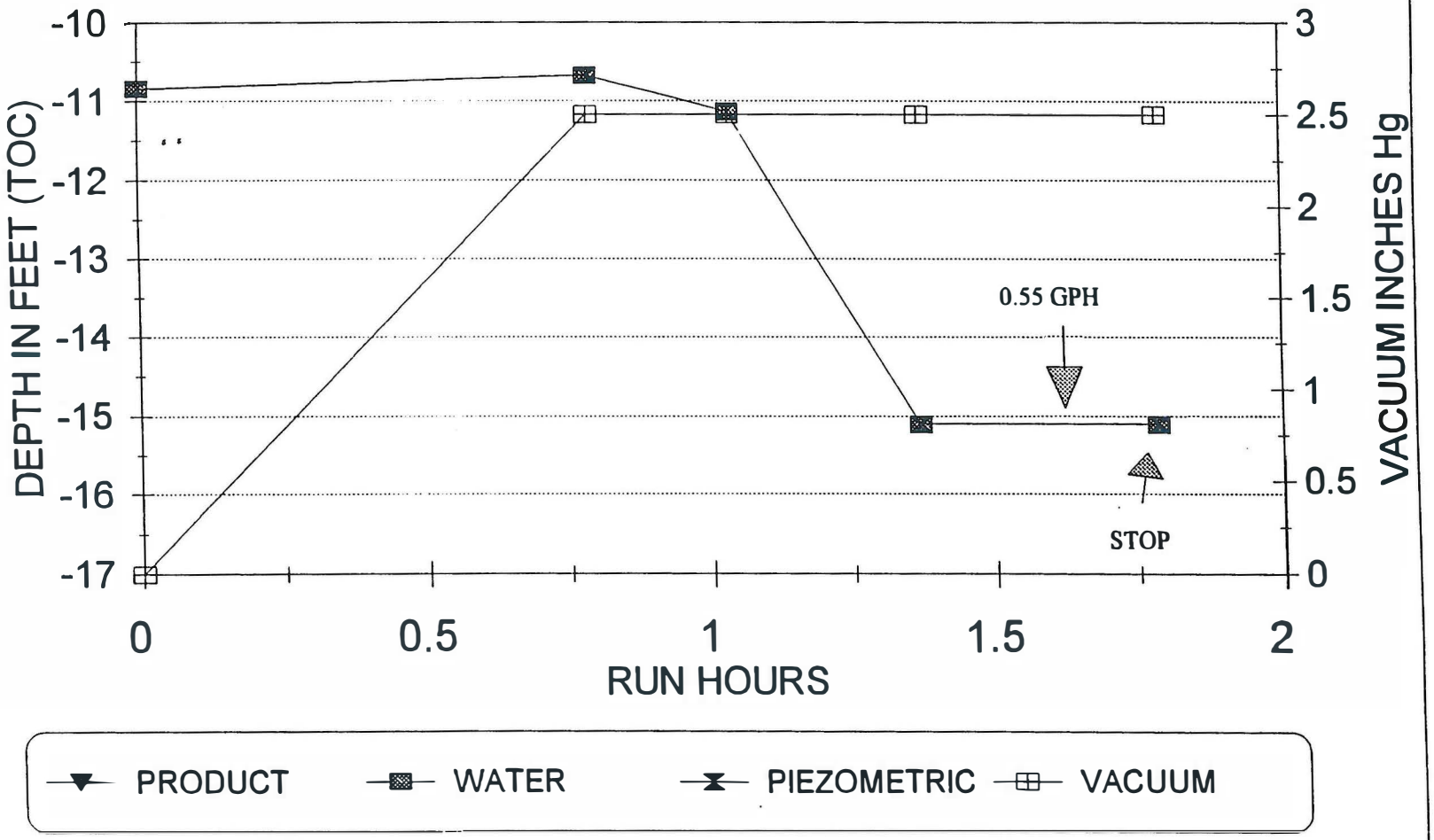



TERRA VAC

# TOW WAY FUEL FACILITY

## PW-1 STAGE THREE TEST

FIGURE 39

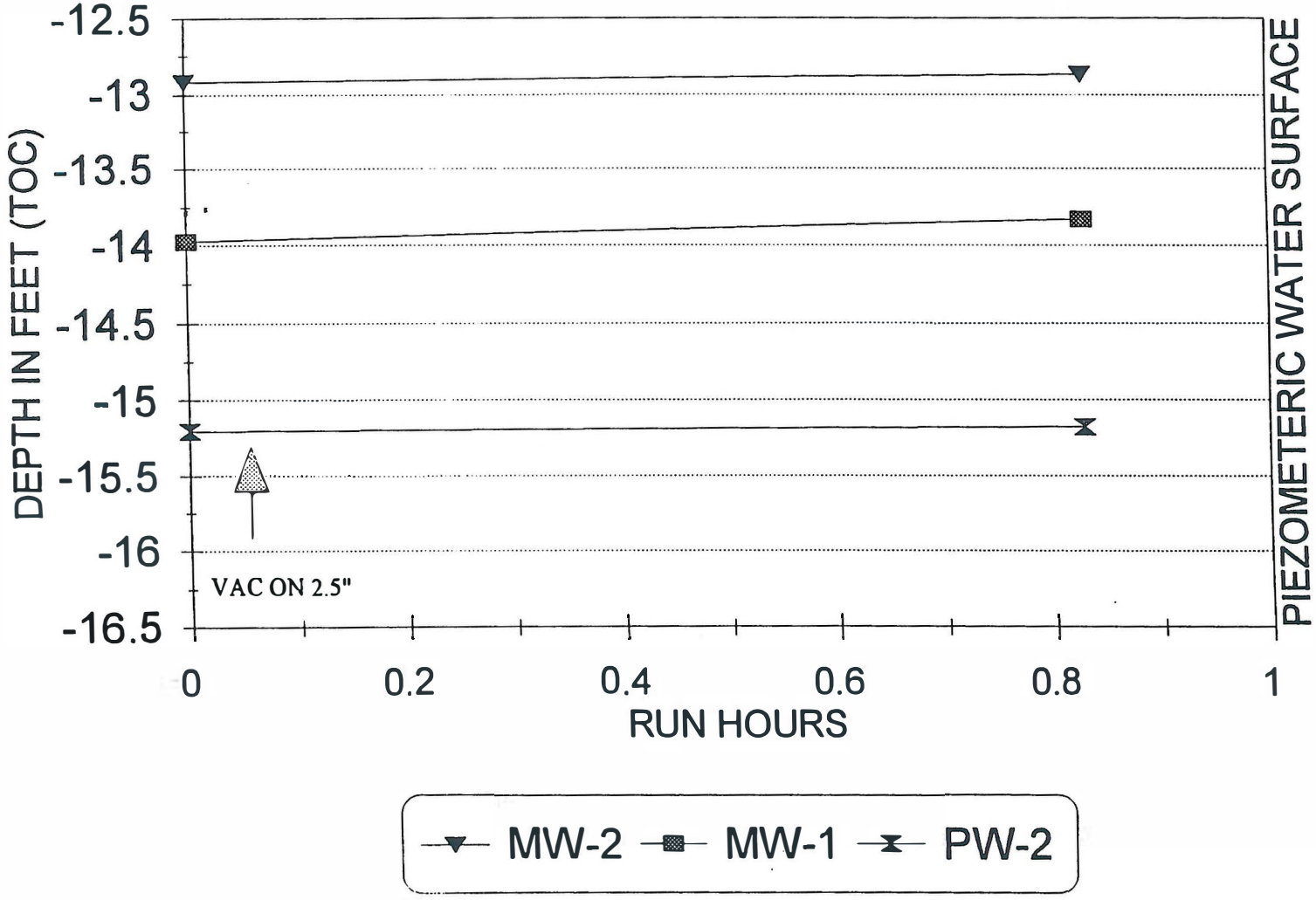



TERRA VAC

# NAVY TOW WAY FUEL FACILITY

## PW-1 STAGE THREE CAPTURE ZONE

FIGURE 40

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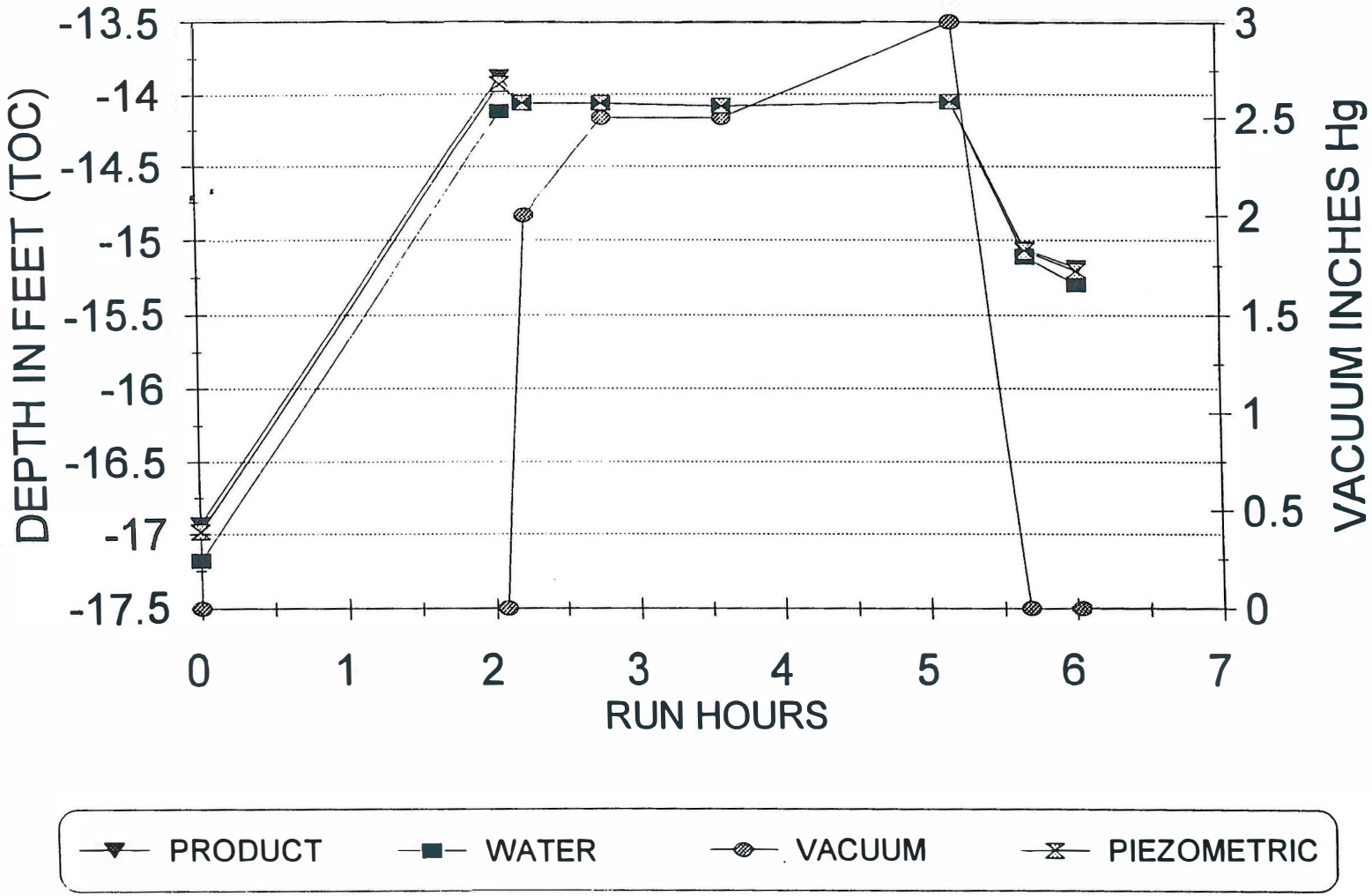
# NAVY TOW WAY FUEL FACILITY

## PW-2 STAGE THREE TEST

FIGURE 41

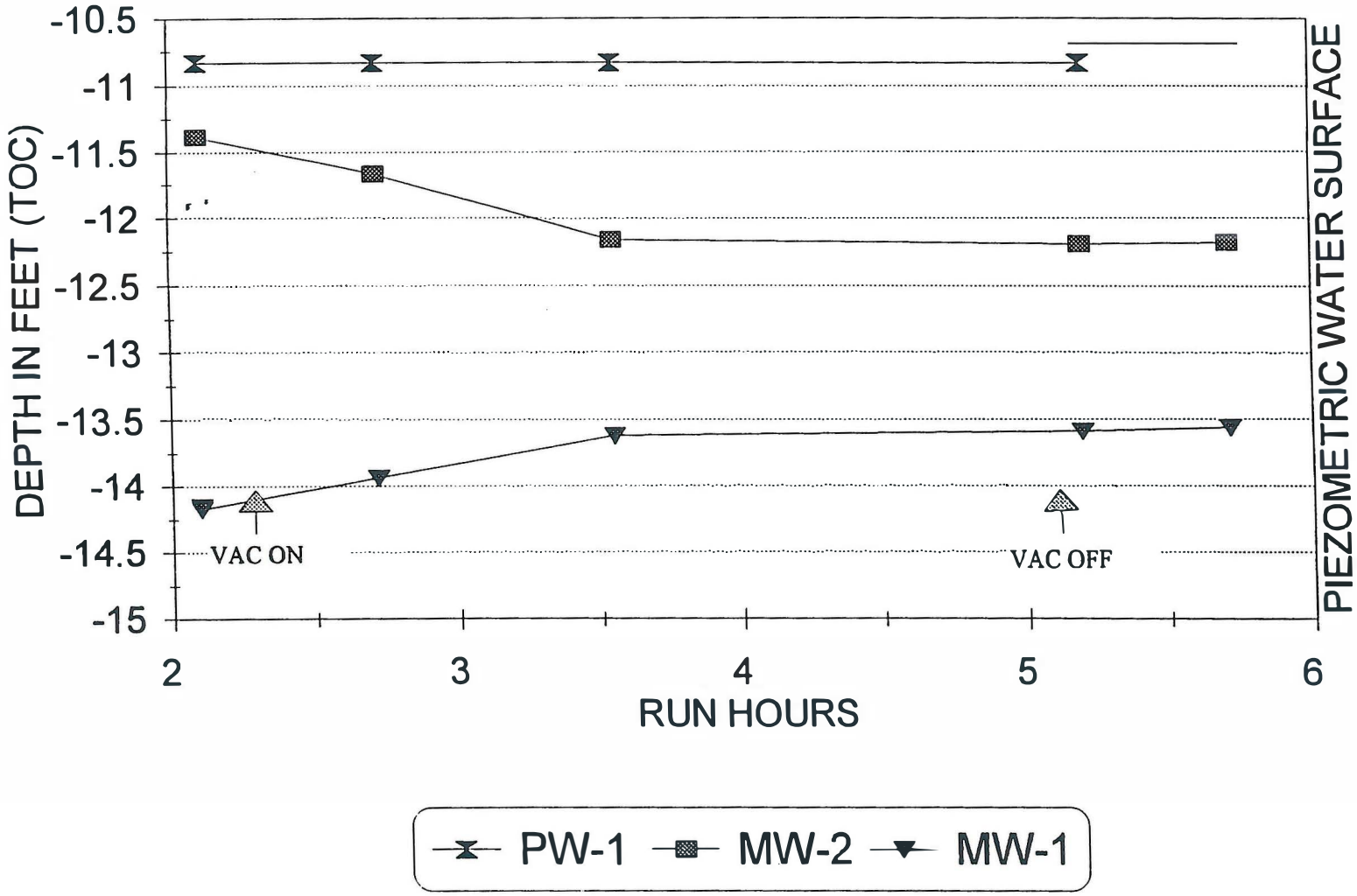



TERRA VAC

# NAVY TOW WAY FUEL FACILITY

## PW-2 STAGE THREE CAPTURE ZONE

FIGURE 42

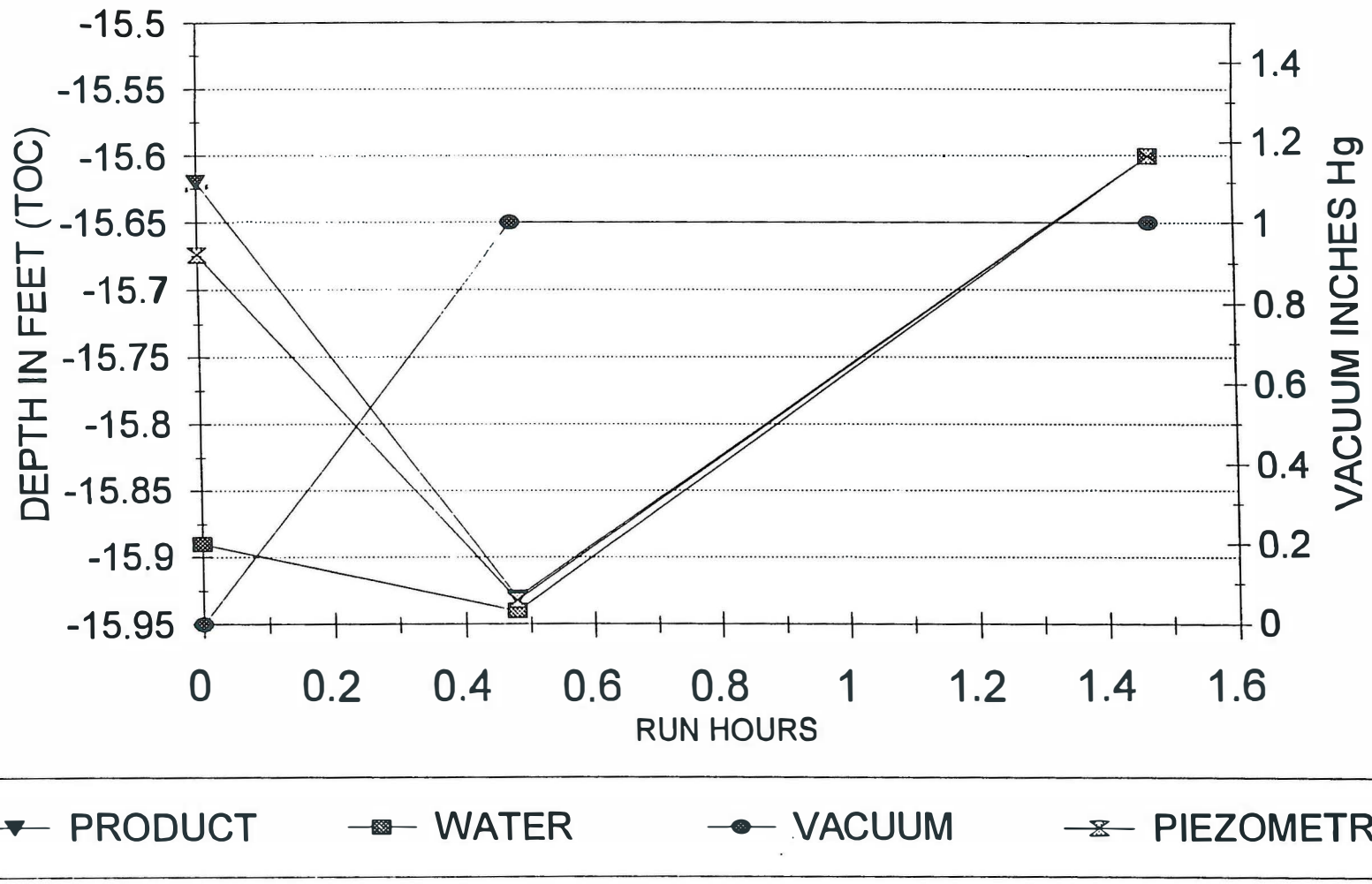



TERRA VAC

# NAVY TOW WAY FUEL FACILITY

## PW-3 STAGE THREE TEST

FIGURE 43

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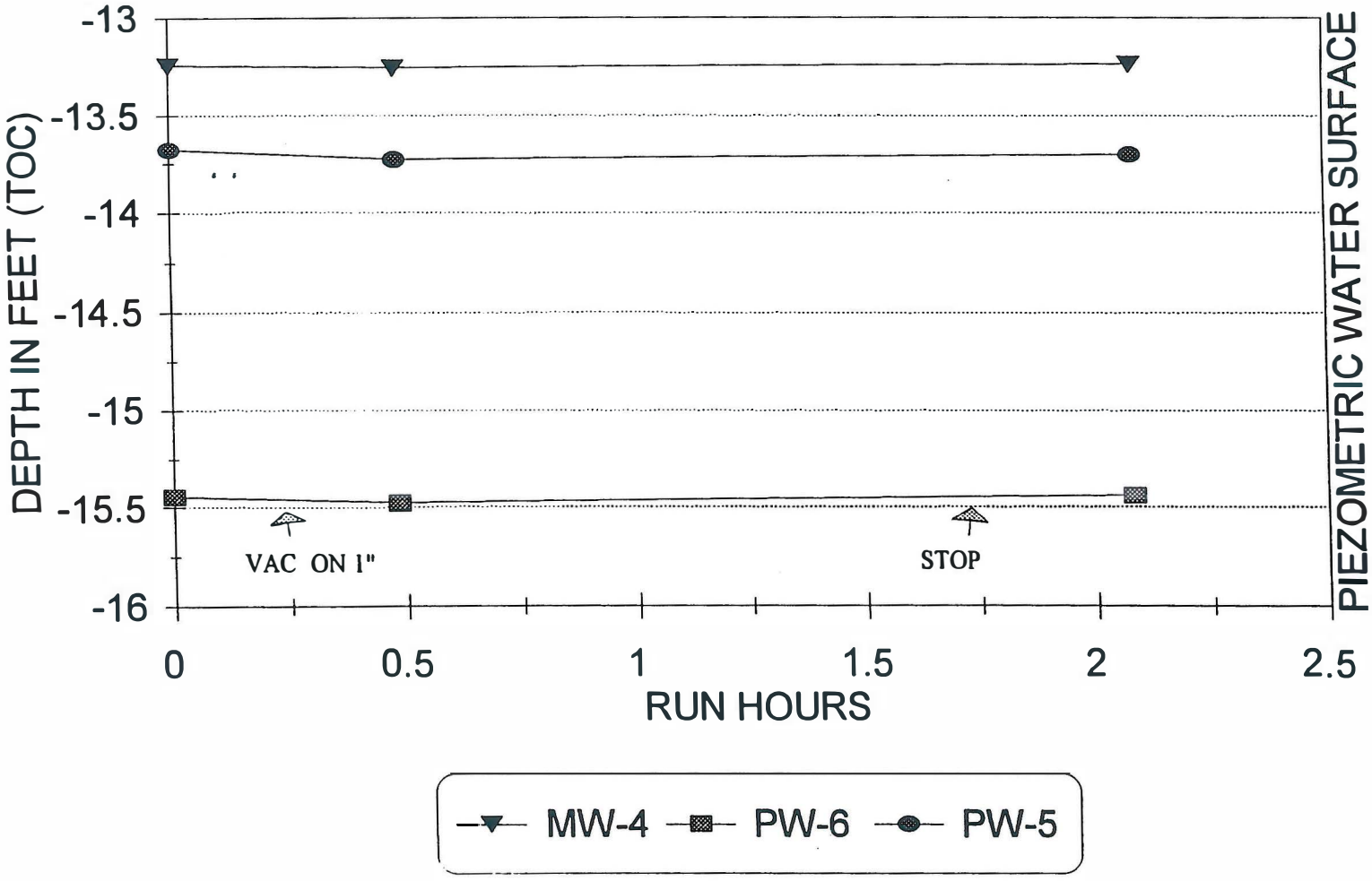
# NAVY TOW WAY FUEL FACILITY

## PW-3 STAGE THREE CAPTURE ZONE

FIGURE 44

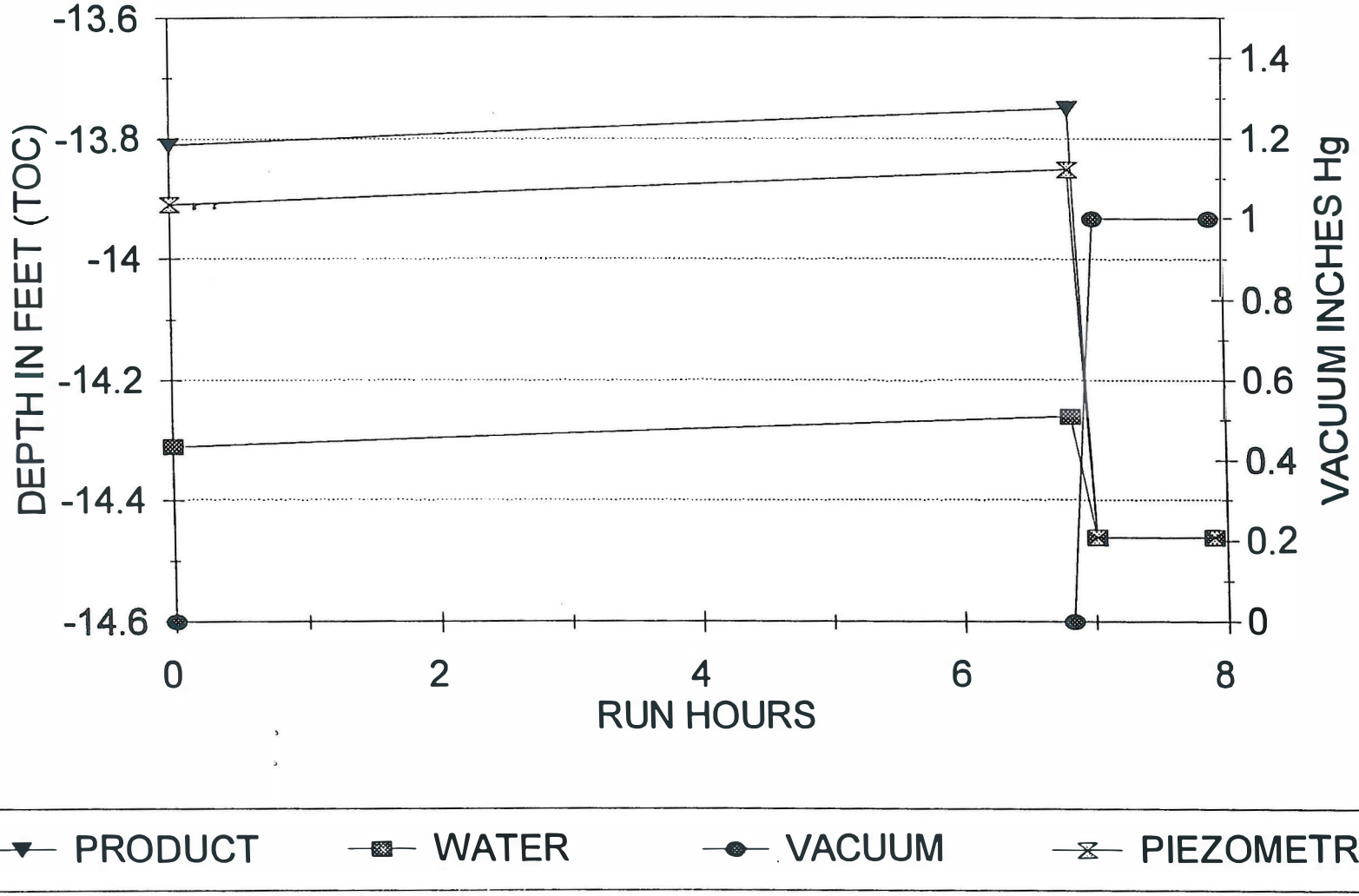



TERRA VAC

# NAVY TOW WAY FUEL FACILITY

## PW-4 STAGE THREE TEST

FIGURE 45

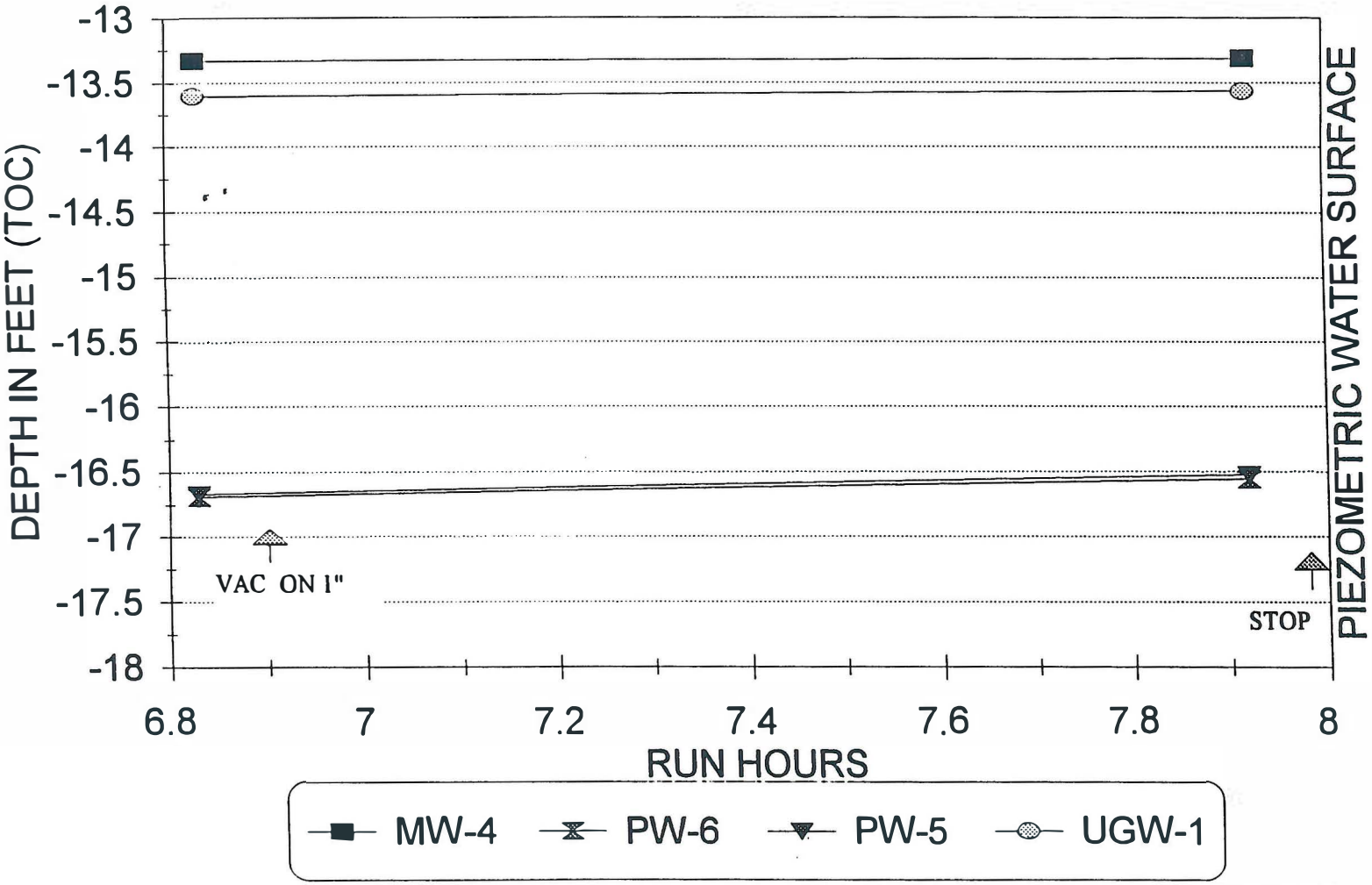



TERRA VAC

# NAVY TOW WAY FUEL FACILITY

## PW-4 STAGE THREE CAPTURE ZONE

FIGURE 46

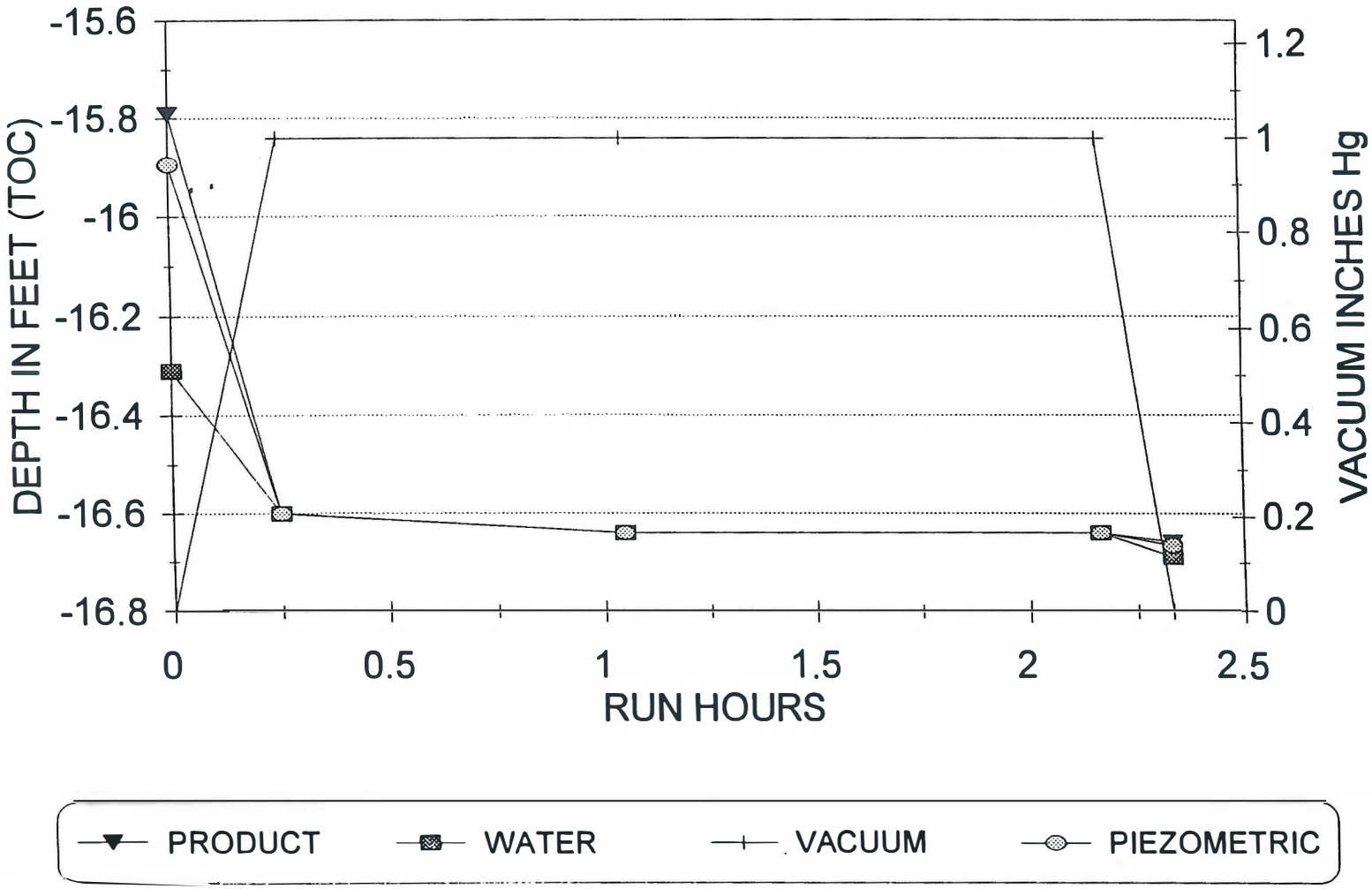



TERRA VAC

# NAVY TOW WAY FUEL FACILITY

## PW-5 STAGE THREE TEST

FIGURE 47

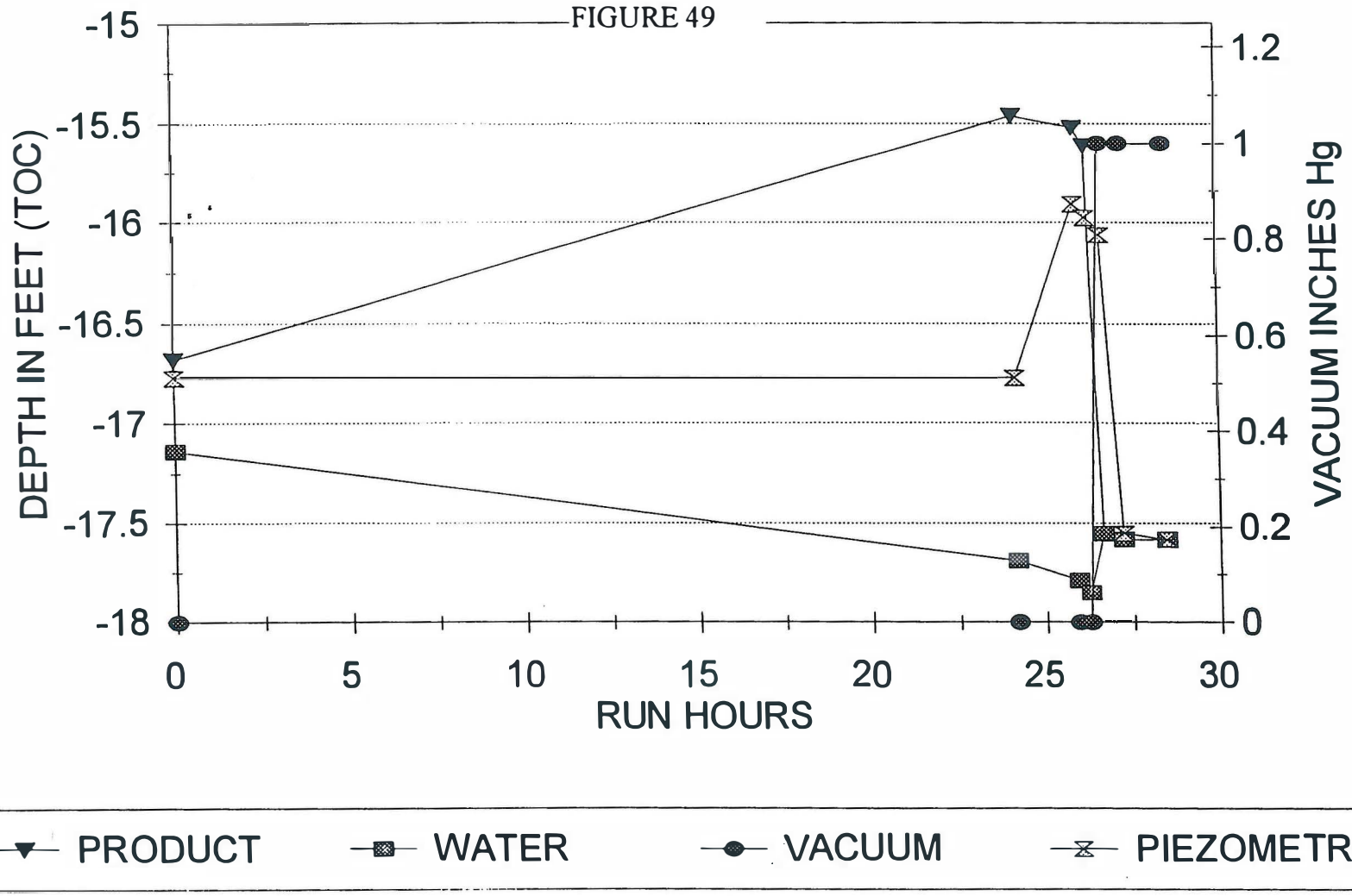



TERRA VAC

# NAVY TOW WAY FUEL FACILITY

## PW-6 STAGE THREE TEST

FIGURE 49

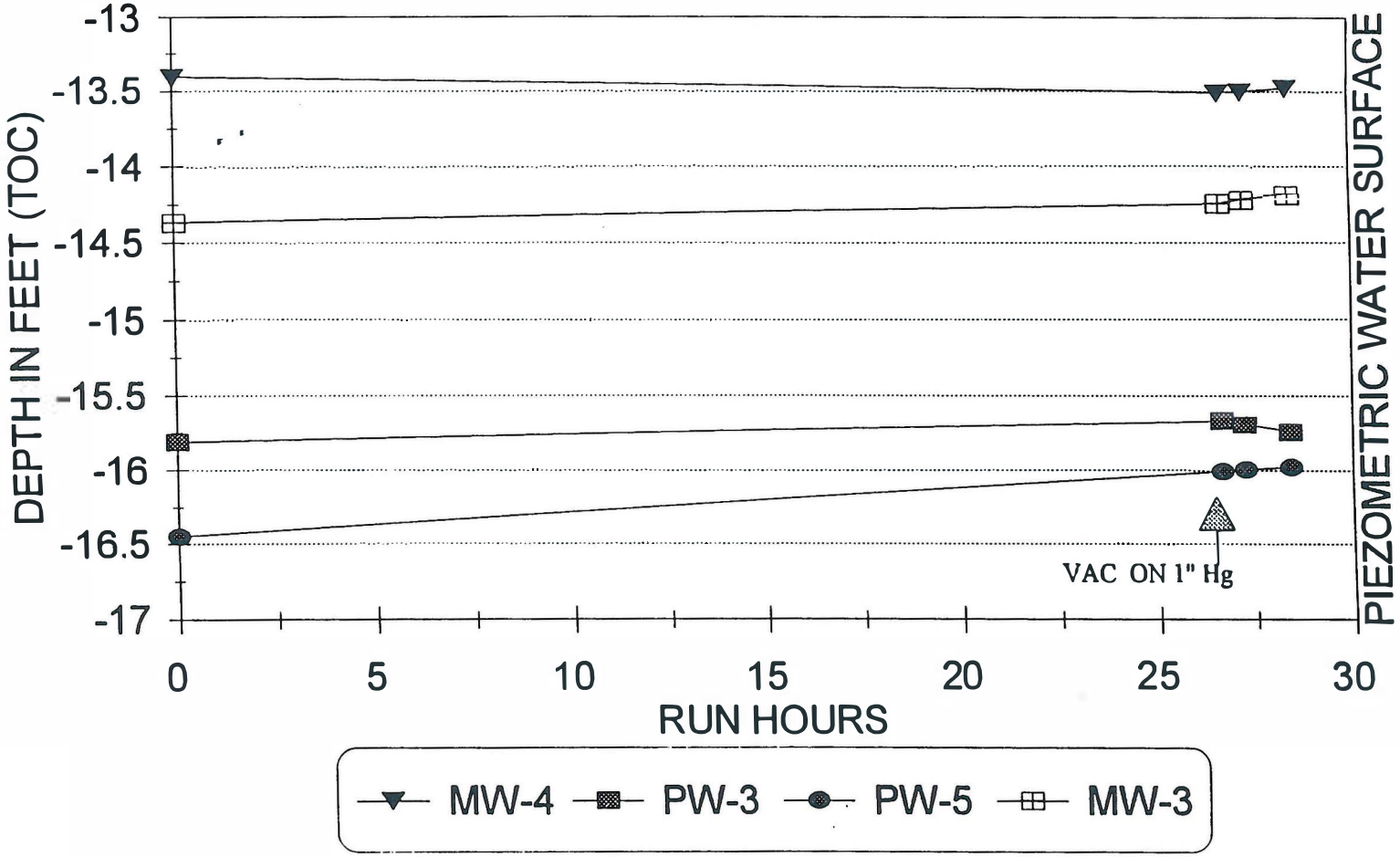



TERRA VAC

# NAVY TOW WAY FUEL FACILITY

## PW-6 STAGE THREE CAPTURE ZONE

FIGURE 50

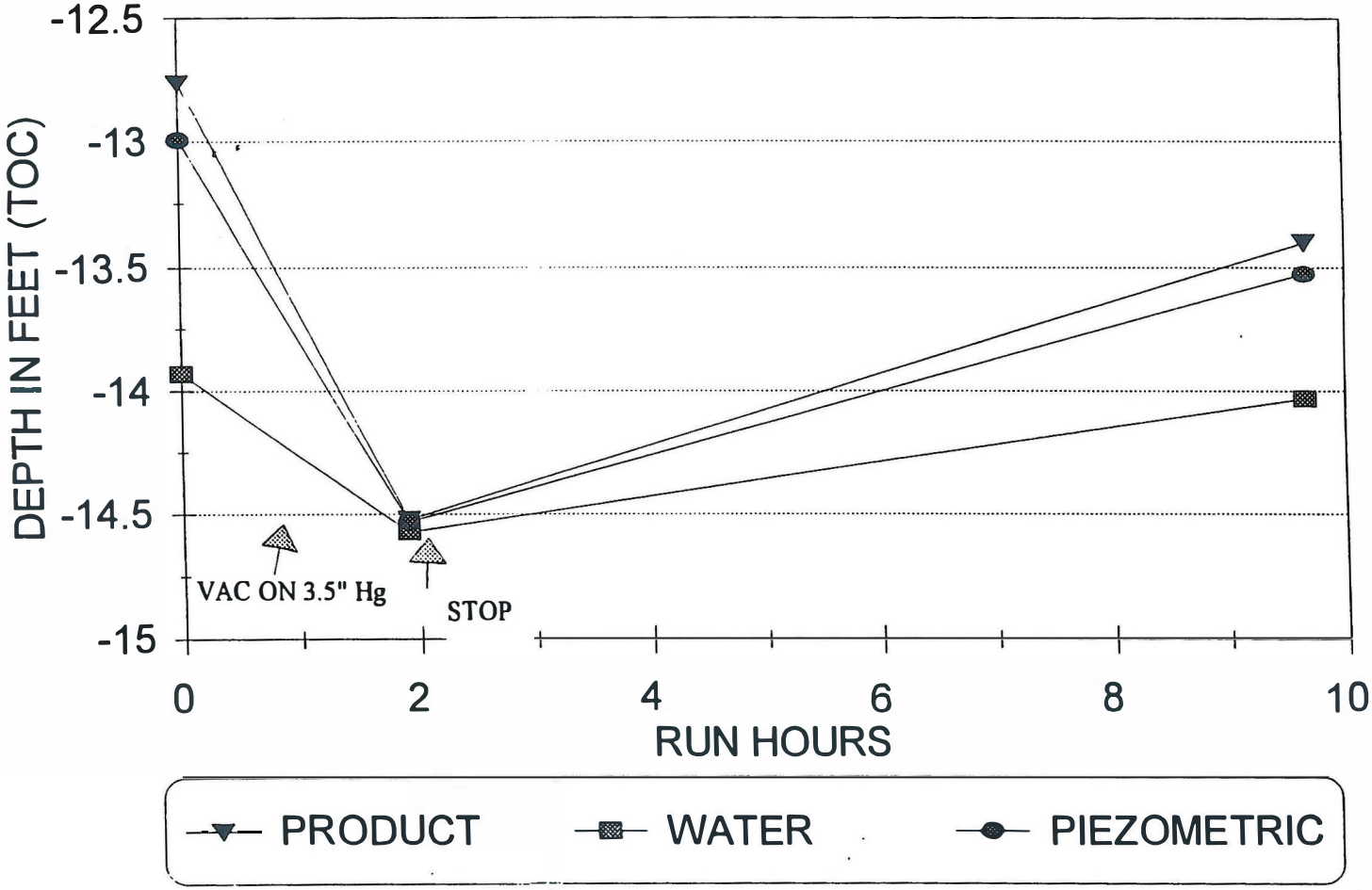



TERRA VAC

# NAVY TOW WAY FUEL FACILITY

## MW-1 STAGE THREE TEST

FIGURE 51

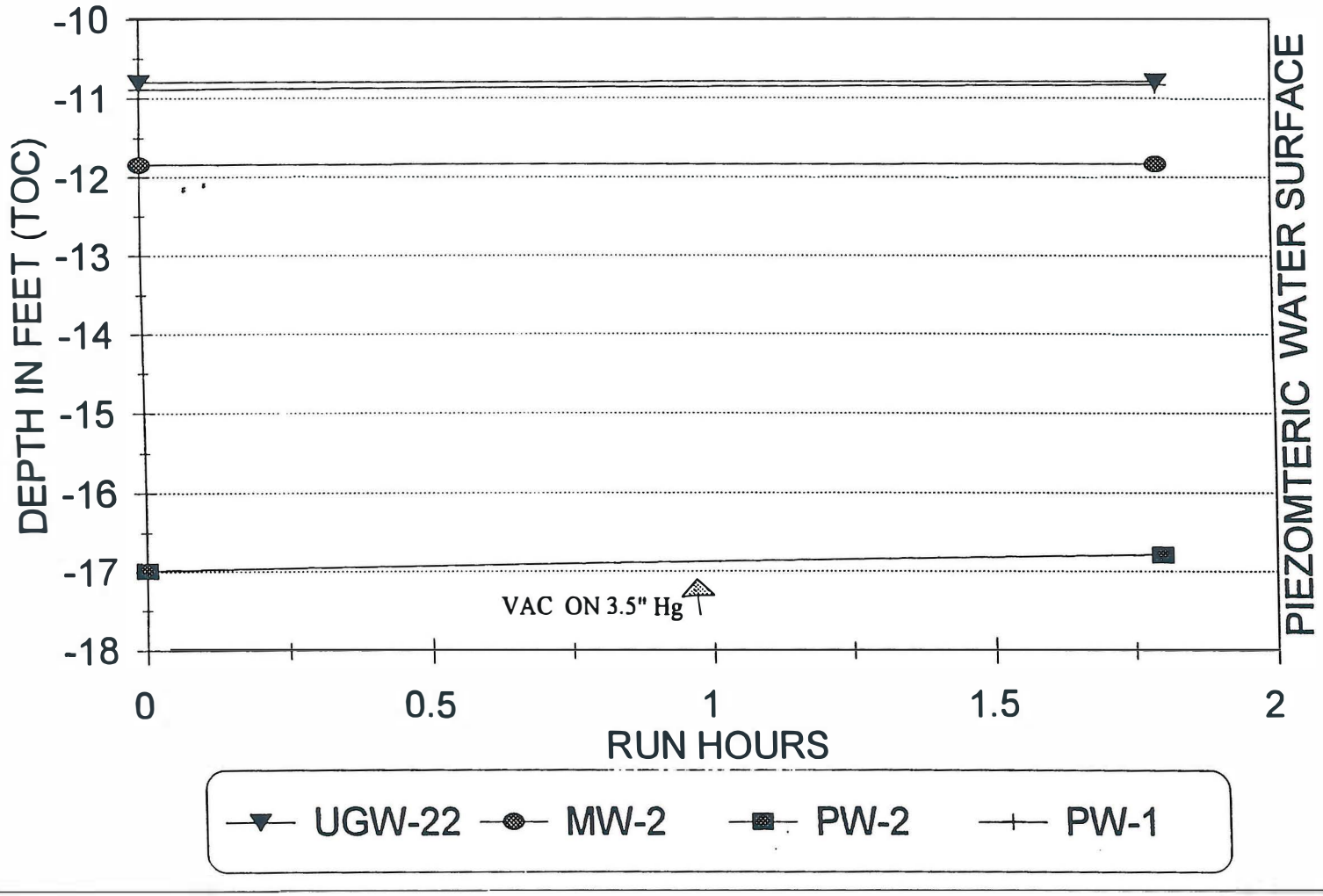



TERRA VAC

# NAVY TOW WAY FUEL FACILITY

## MW-1 STAGE THREE CAPTURE ZONE

FIGURE 52

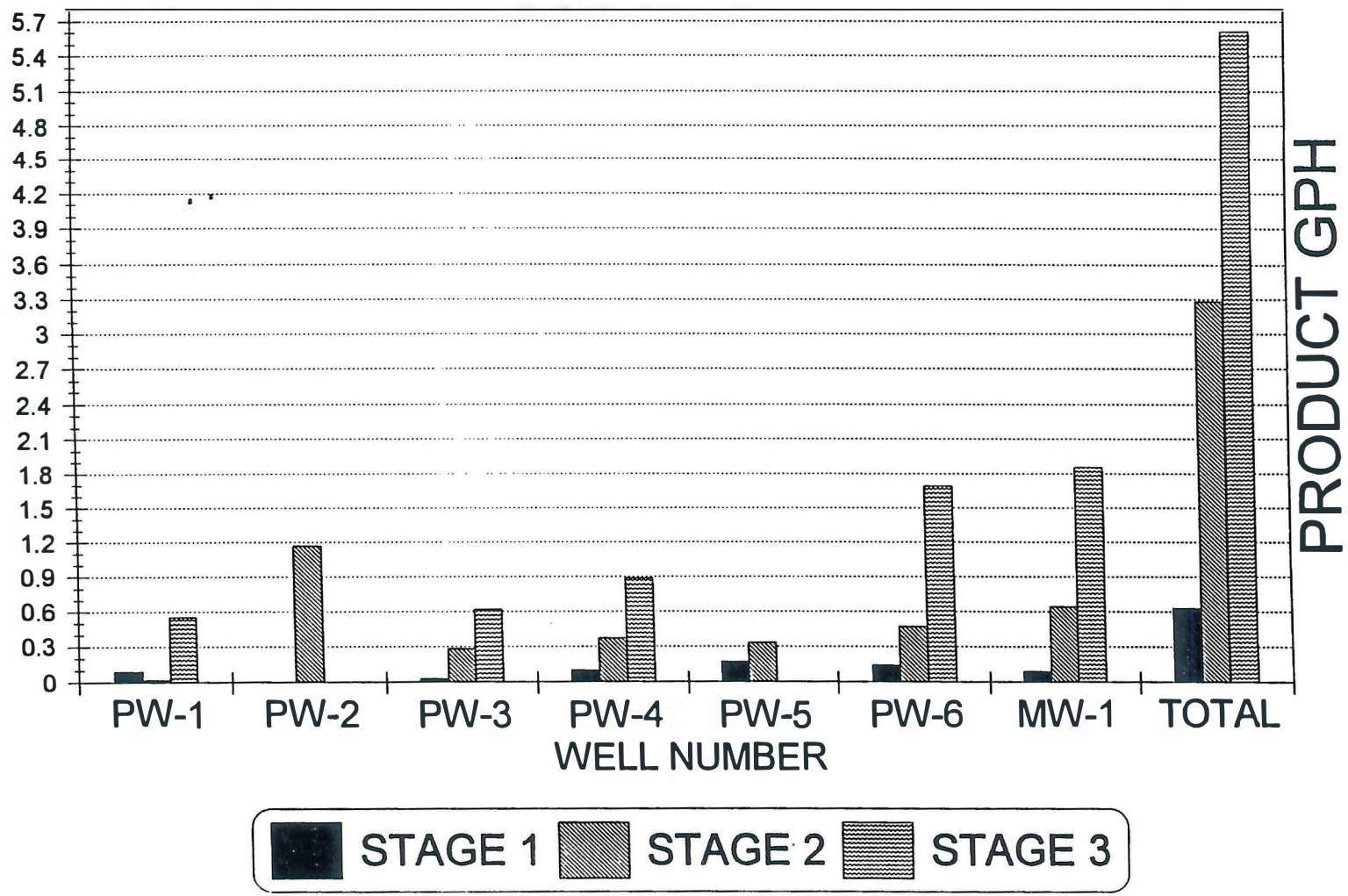



TERRA VAC

# NAVY TOW WAY FUEL FACILITY

## PRODUCT RECOVERY RATES

FIGURE 53

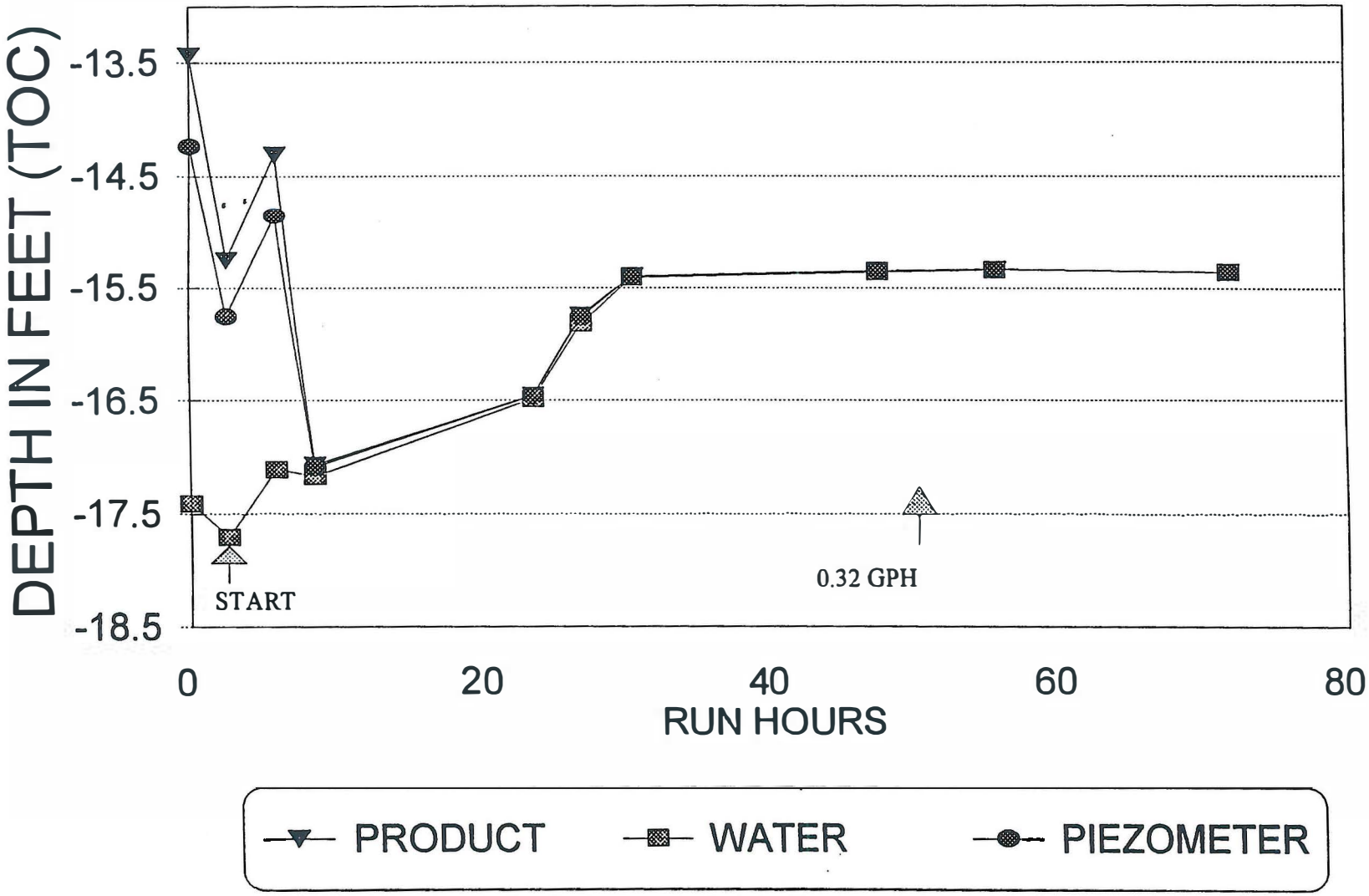



TERRA VAC

# NAVY TOW WAY FUEL FACILITY

## PW-6 STAGE ONE TEST

FIGURE 12



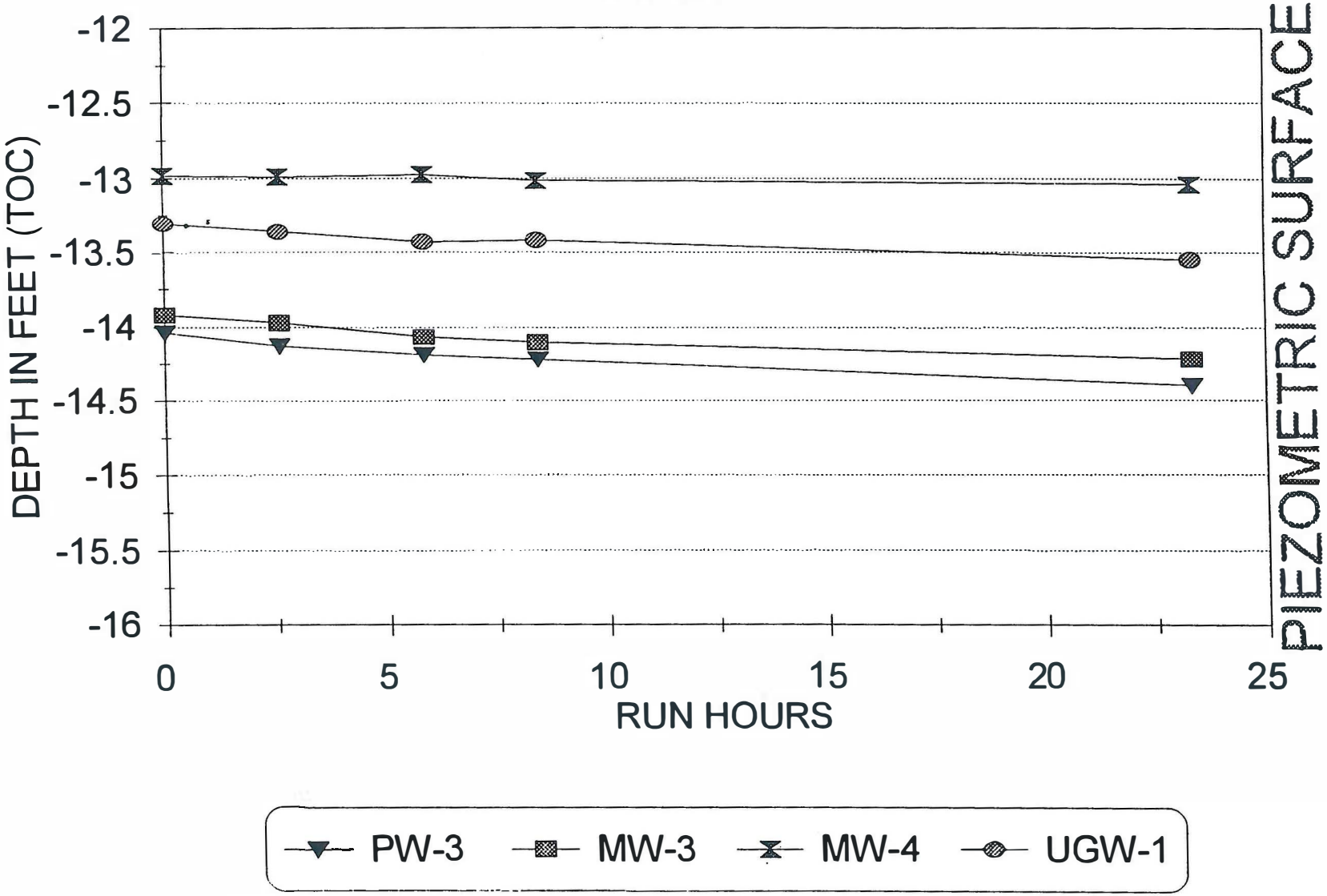

TERRA VAC

11234P1.WB1

# NAVY TOW WAY FUEL FACILITY

## PW-6 STAGE ONE CAPTURE ZONE

FIGURE 13



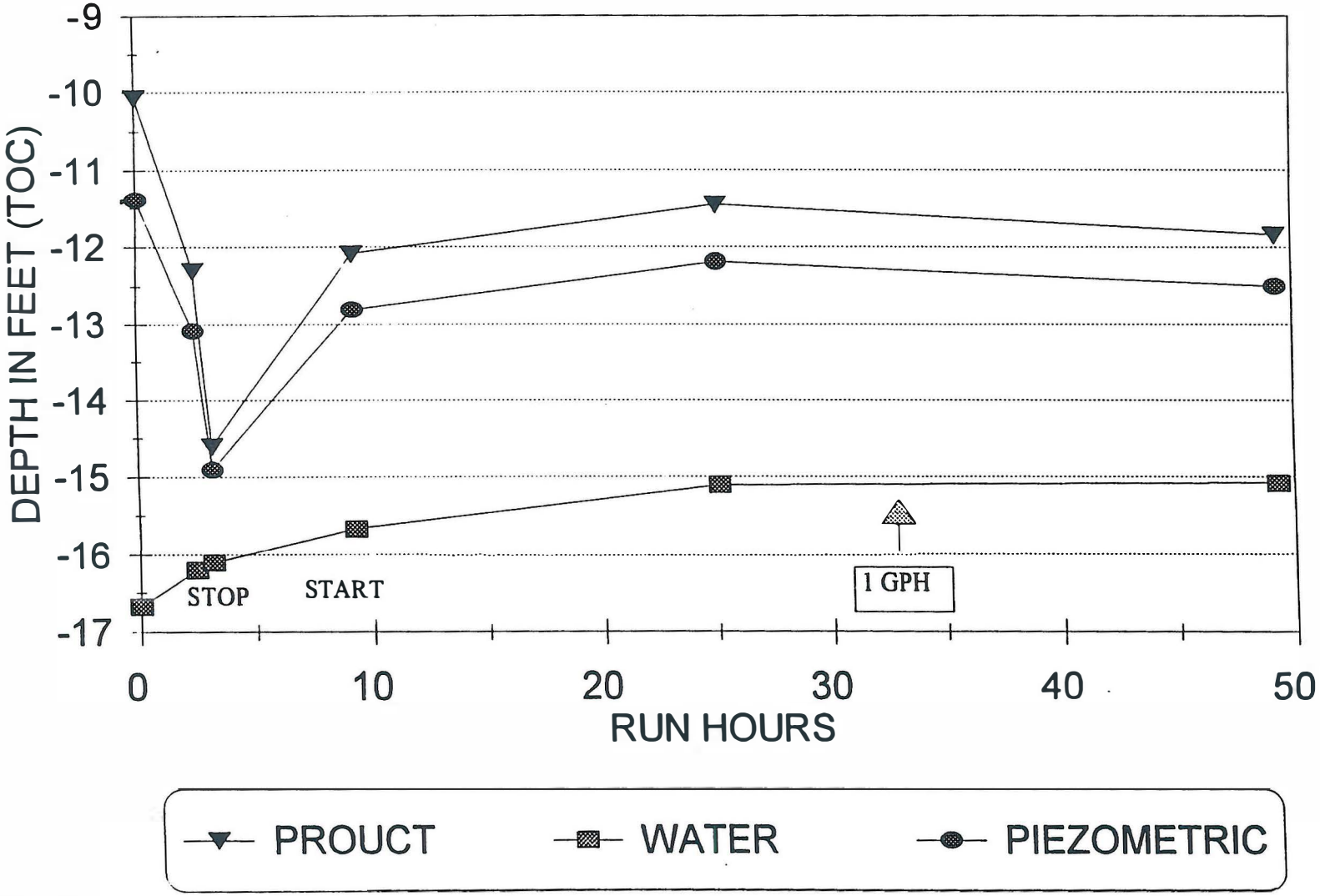

TERRA VAC

1234P1.WB1

# NAVY TOW WAY FUEL FACILITY

## MW-1 STAGE ONE TEST

FIGURE 14



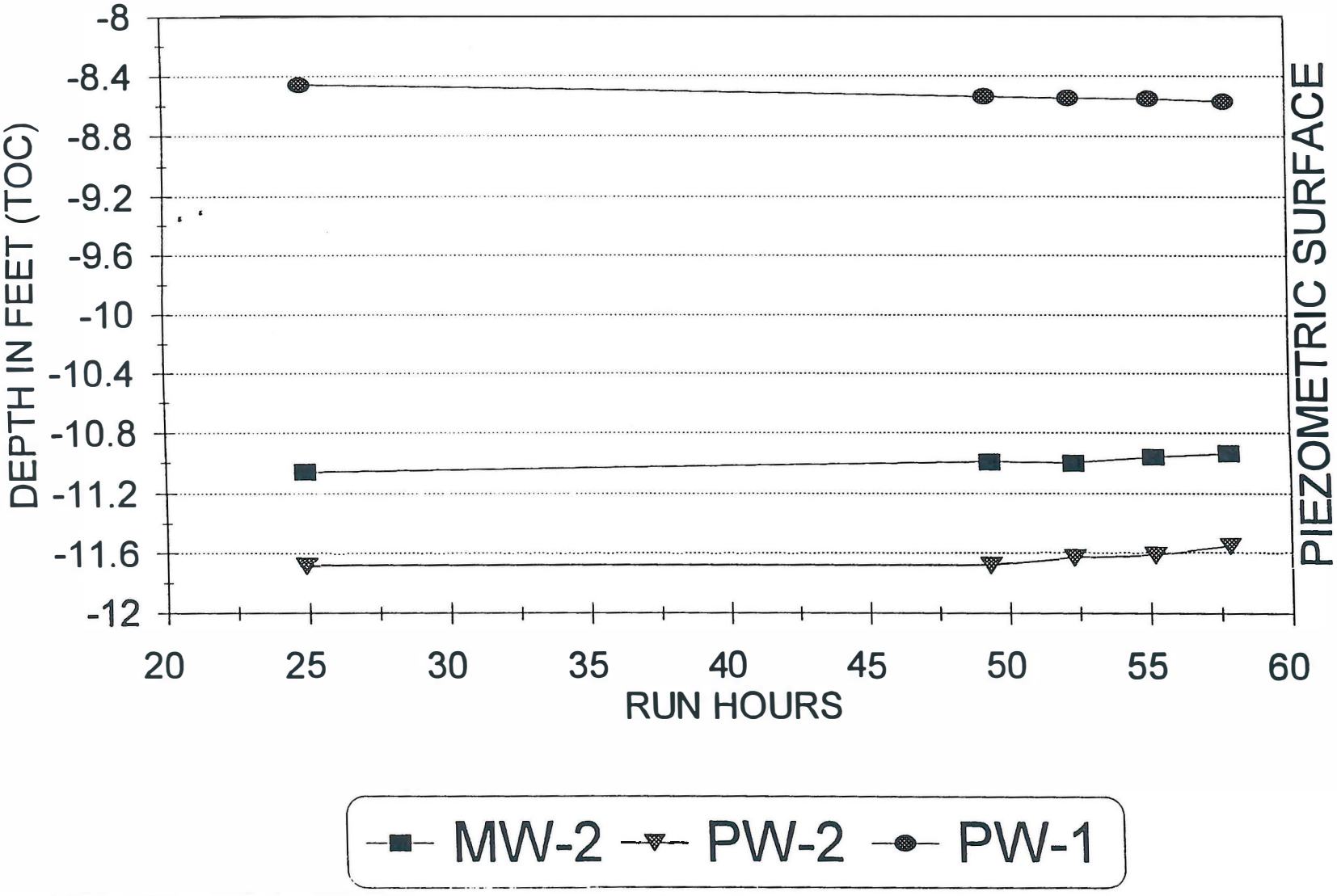

TERRA VAC

1234P1.WB1

# NAVY TOW WAY FUEL FACILITY

## MW-1 STAGE ONE CAPTURE ZONE

FIGURE 15



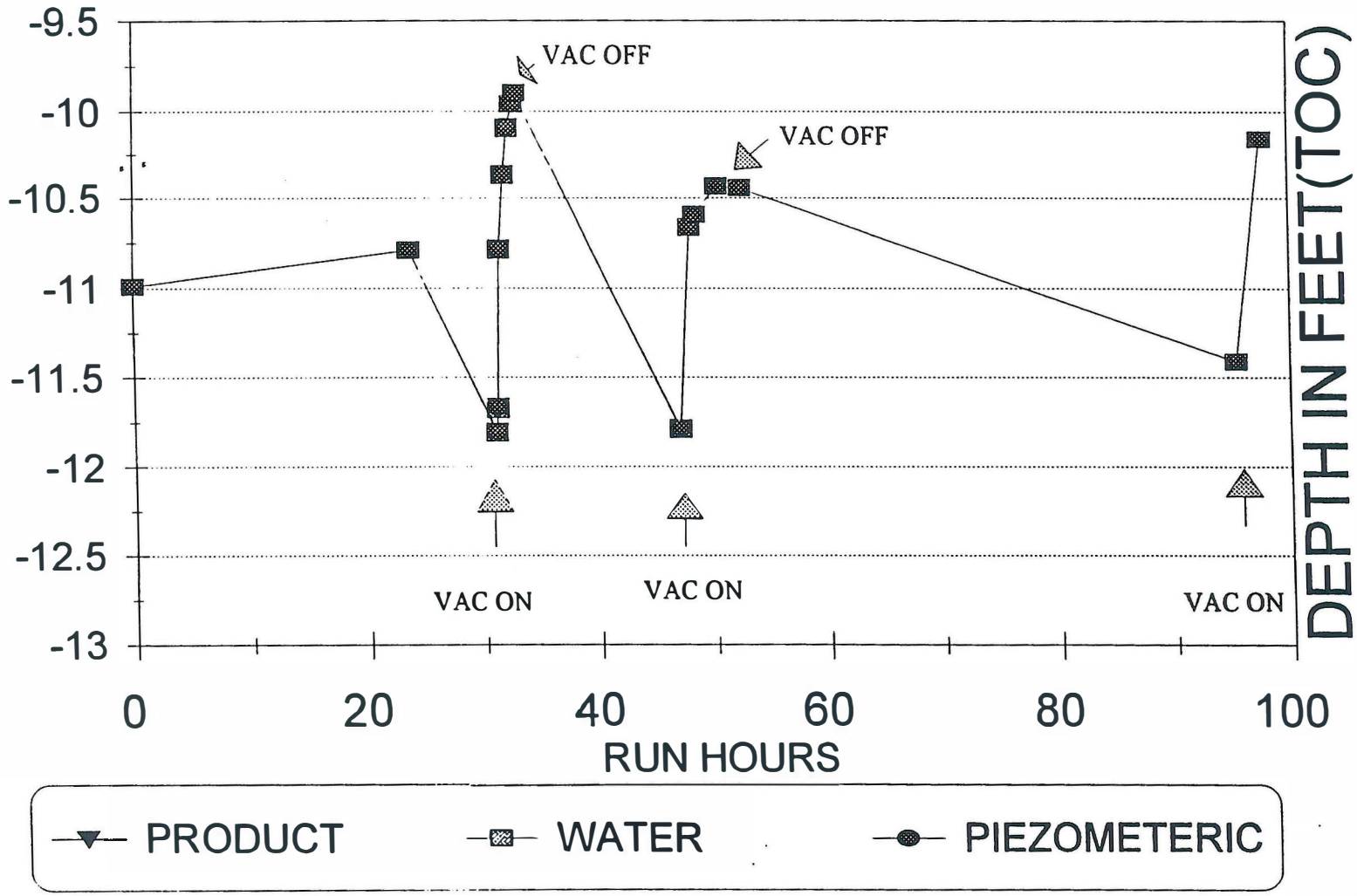

TERRA VAC

11234P1.WB1

# NAVY TOW WAY FUEL FACILITY

## PW-1 STAGE TWO TEST

FIGURE 16



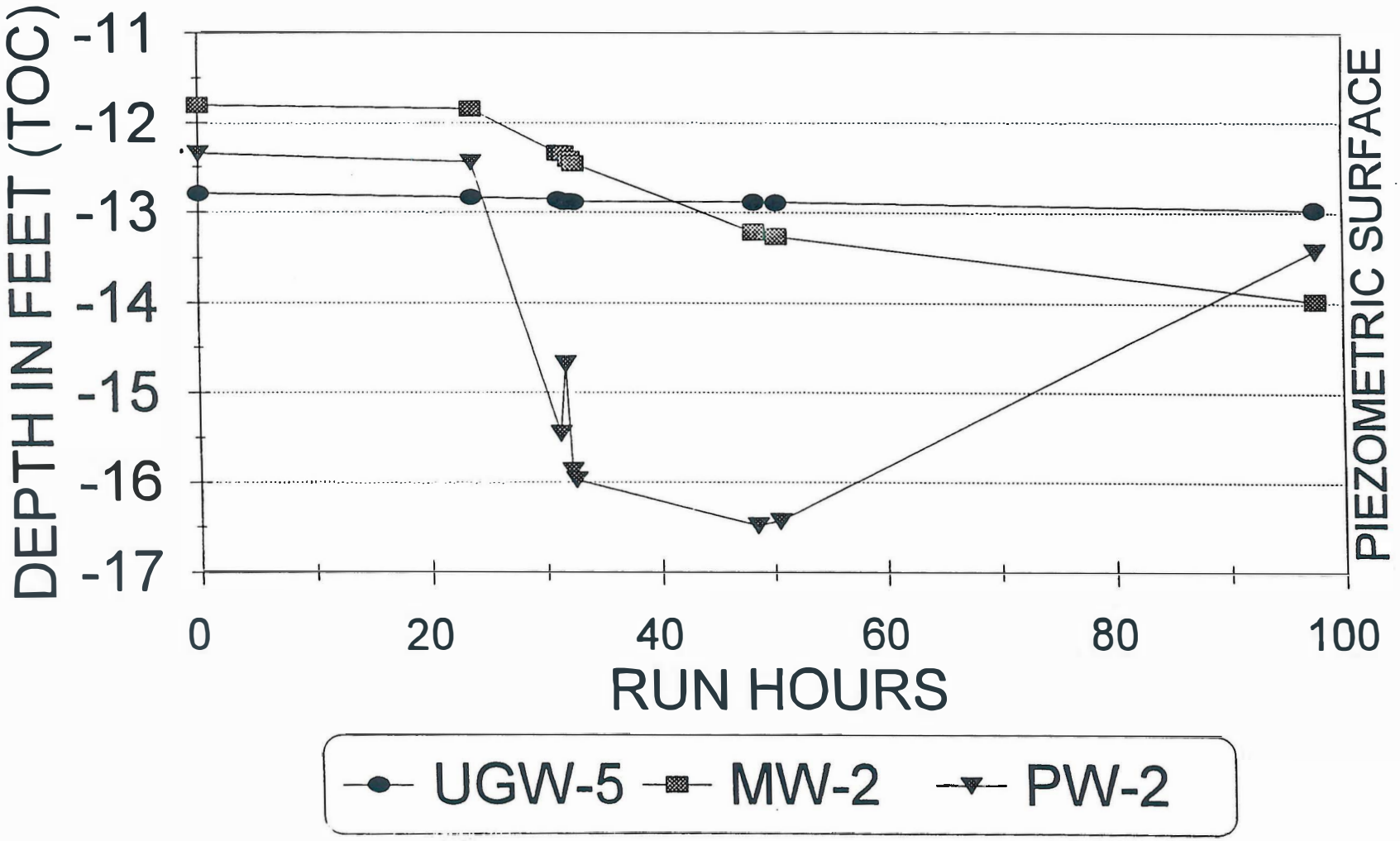

TERRA VAC

1234P2.WB1

# NAVY TOW WAY FUEL FACILITY

## PW-1 STAGE TWO CAPTURE ZONE

FIGURE 17



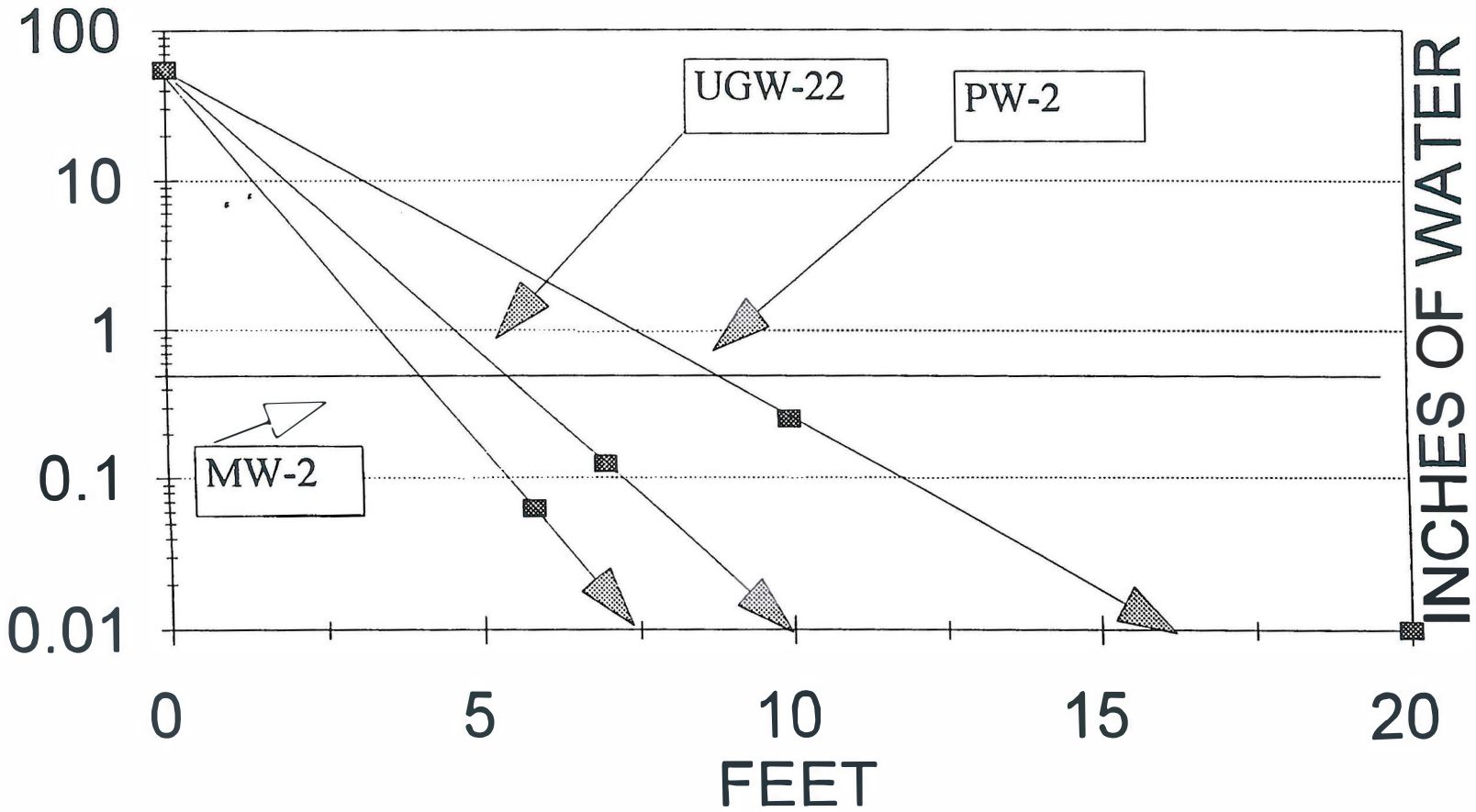

TERRA VAC

234P2.WB1

# NAVY TOW WAY FUEL FACILITY

## PW-1 STAGE TWO VACUUM ROI

FIGURE 18



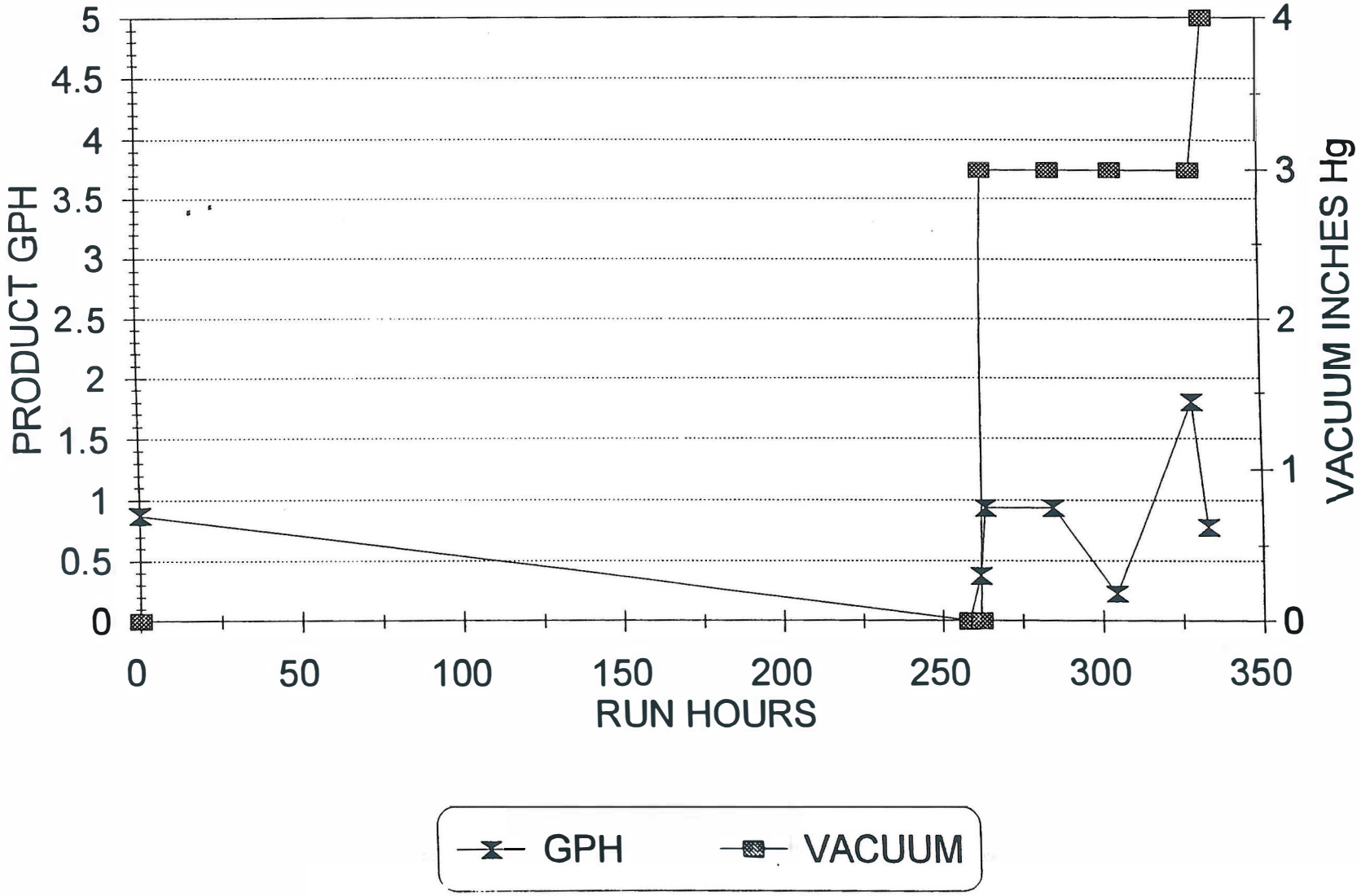

TERRA VAC

11234P2.WB1

# NAVY TOW WAY FUEL FACILITY

## PW-1 STAGE TWO RECOVERY RATE

FIGURE 19



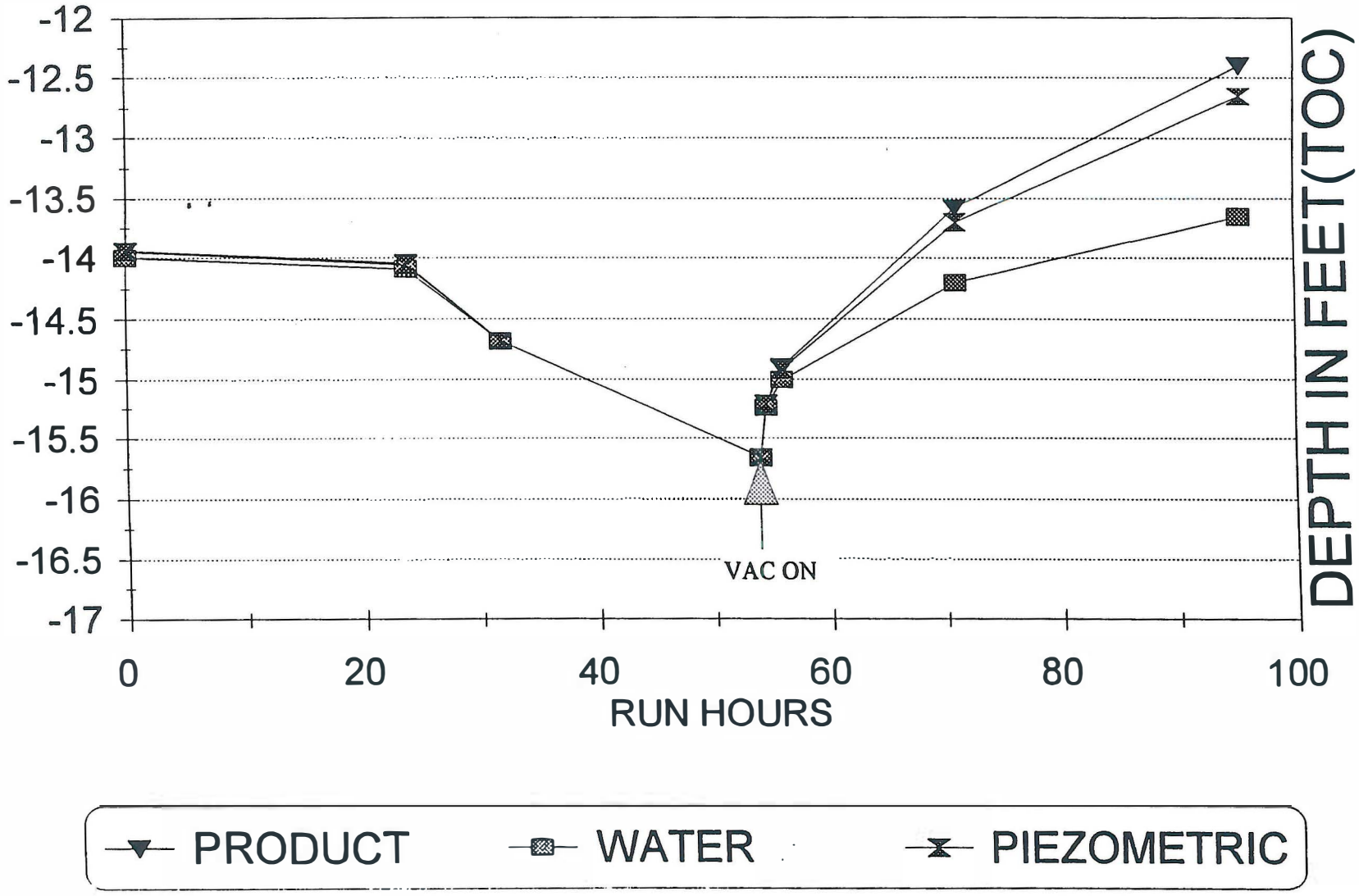

TERRA VAC

I1234P2 WB1

# NAVY TOW WAY FUEL FACILITY

## PW-2 STAGE TWO TEST

FIGURE 20



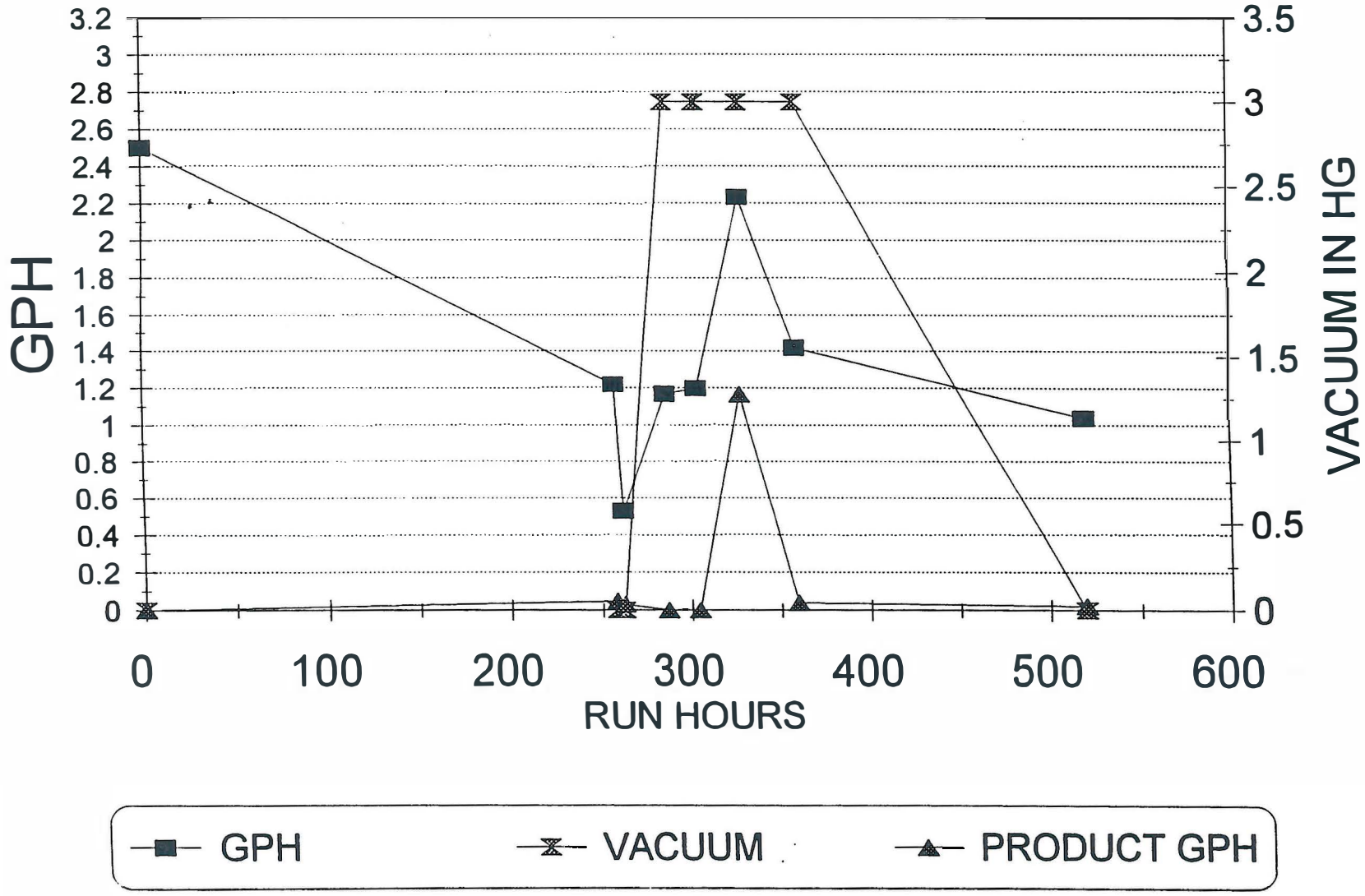

TERRA VAC

1234P2.WB1

# NAVY TOW WAY FUEL FACILITY

## PW-2 STAGE TWO RECOVERY RATE

FIGURE 21



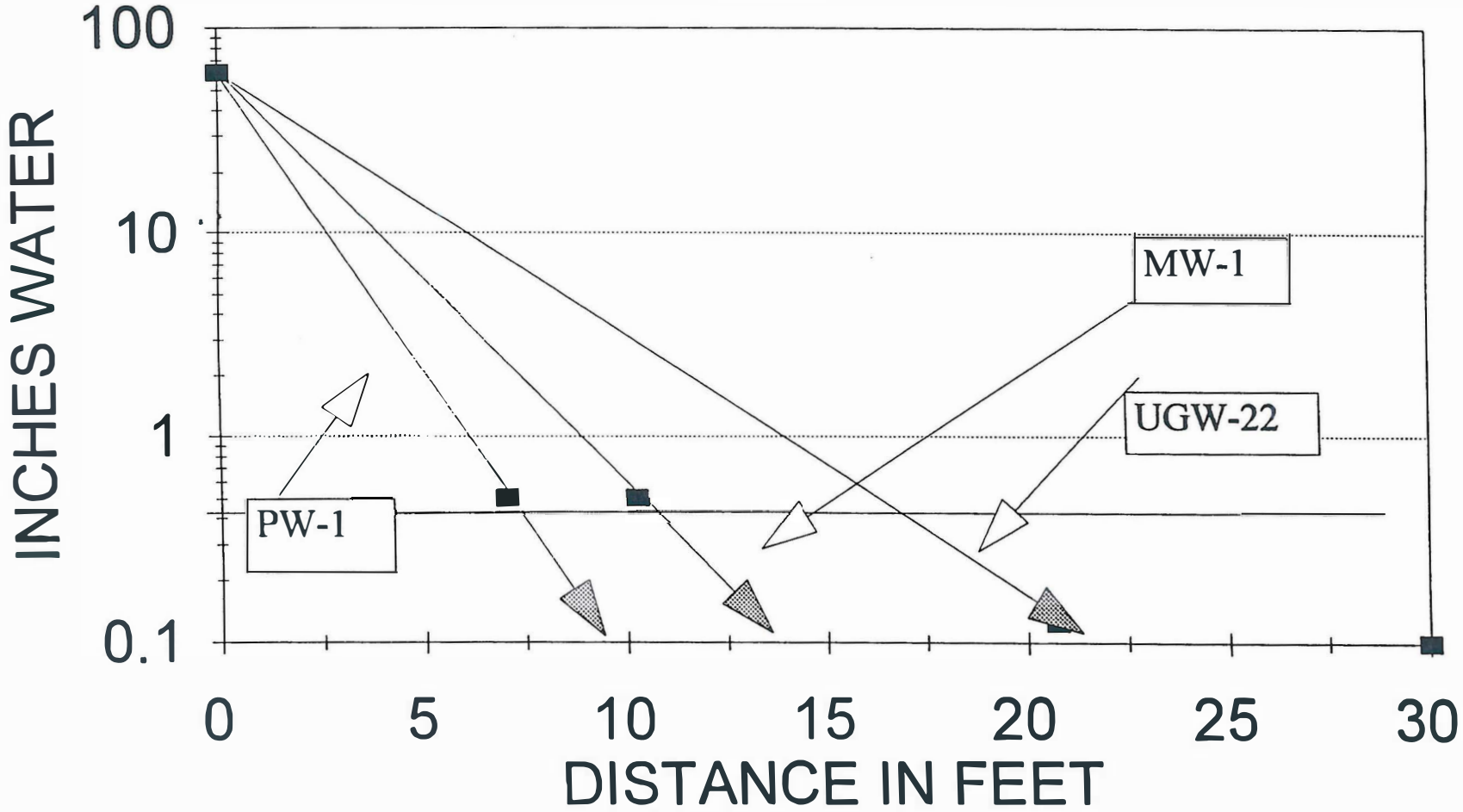

TERRA VAC

I1234P2.WB1

# NAVY TOW WAY FUEL FACILITY

## PW-2 STAGE TWO VACUUM ROI

FIGURE 22



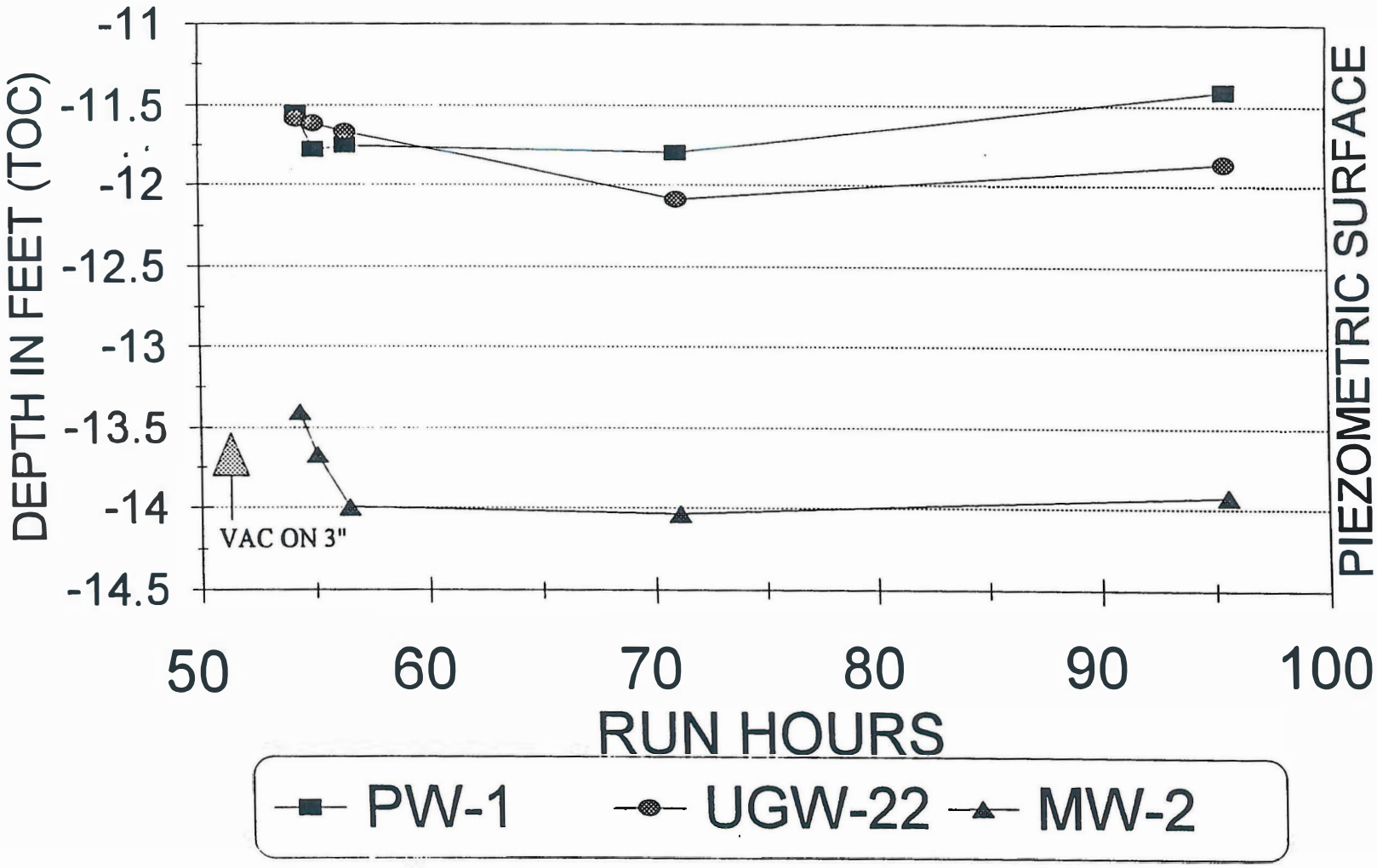

TERRA VAC

11234P2 WB1

# NAVY TOW WAY FUEL FACILITY

## PW-2 STAGE TWO CAPTURE ZONE

FIGURE 23



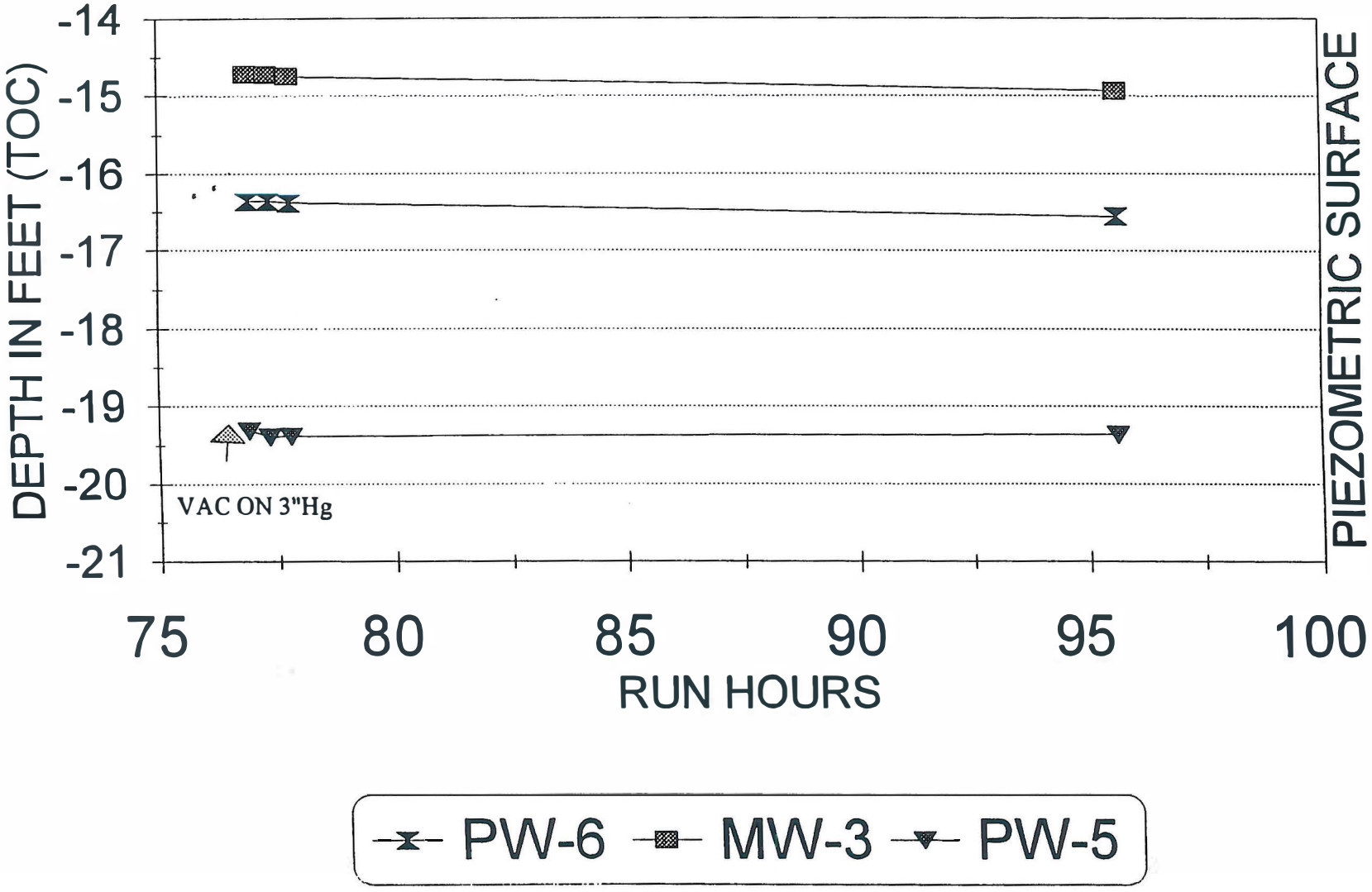

TERRA VAC

1234P2.WB1

# TOW WAY FUEL FACILITY

## PW-3 STAGE TWO CAPTURE ZONE

FIGURE 24



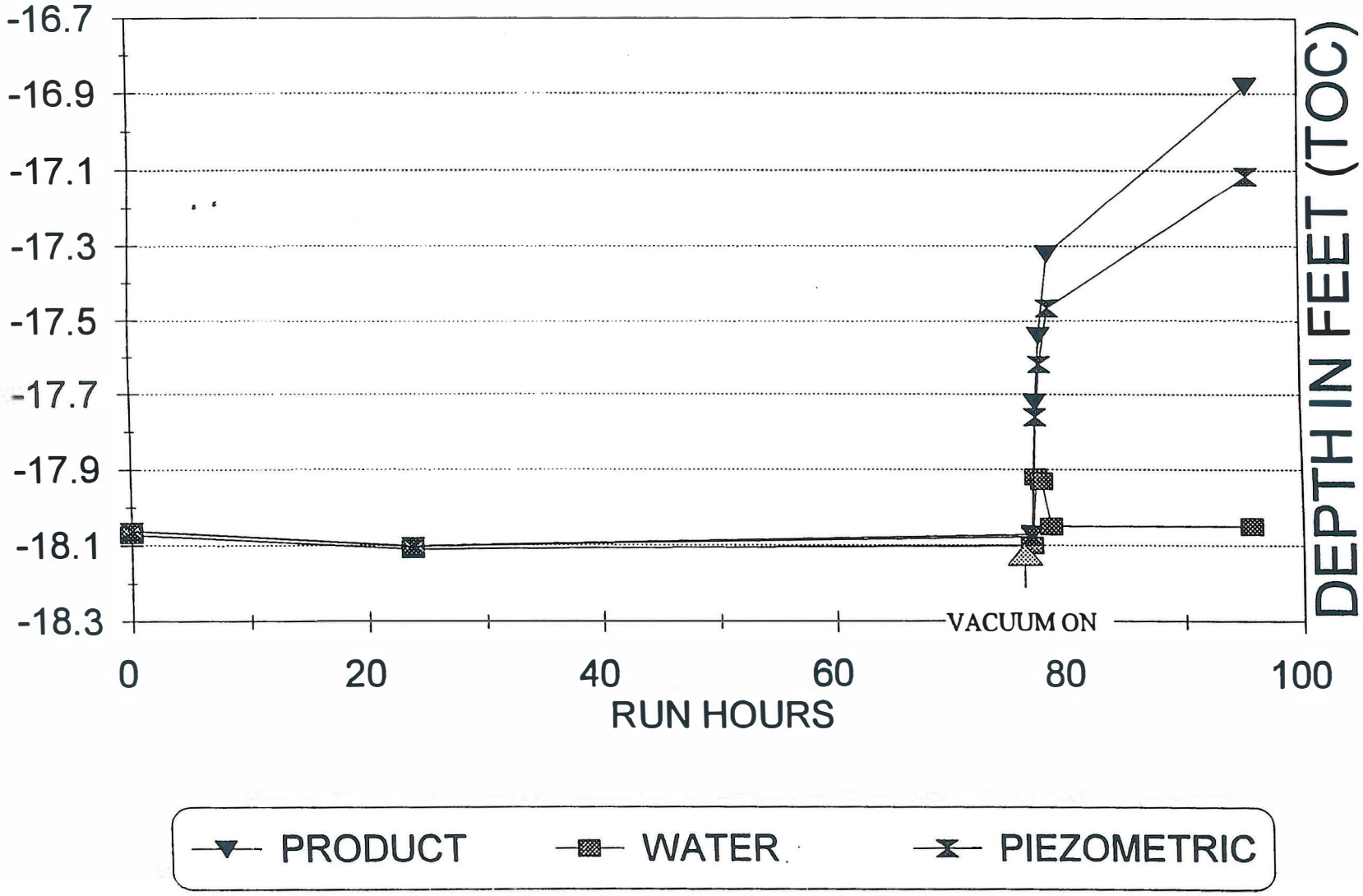

TERRA VAC

1234P2 WB1

# NAVY TOW WAY FUEL FACILITY

## PW-3 STAGE TWO TEST

FIGURE 25



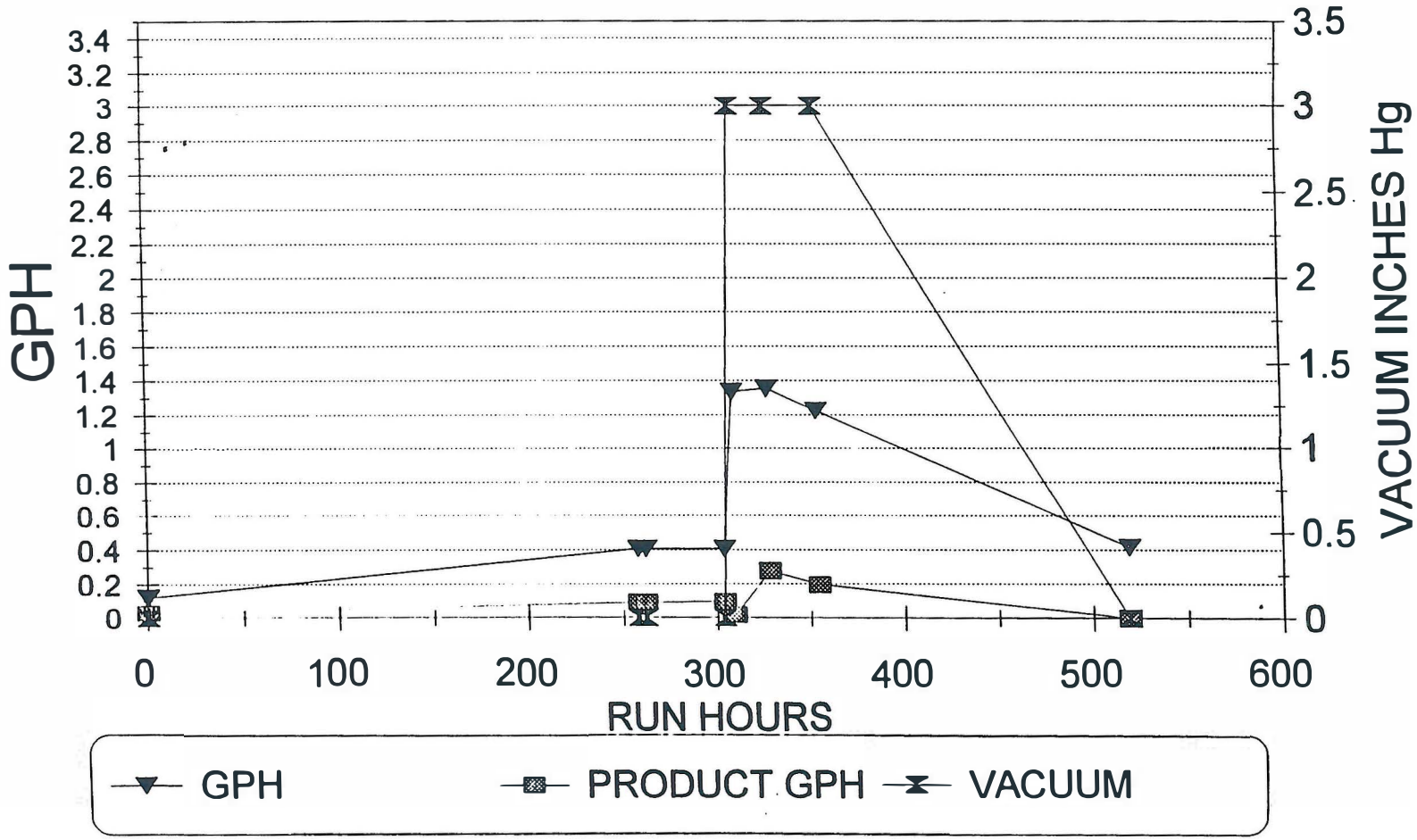

TERRA VAC

1234P2.WB1

# NAVY TOW WAY FUEL FACILITY

## PW-3 STAGE TWO RECOVERY RATE

FIGURE 26

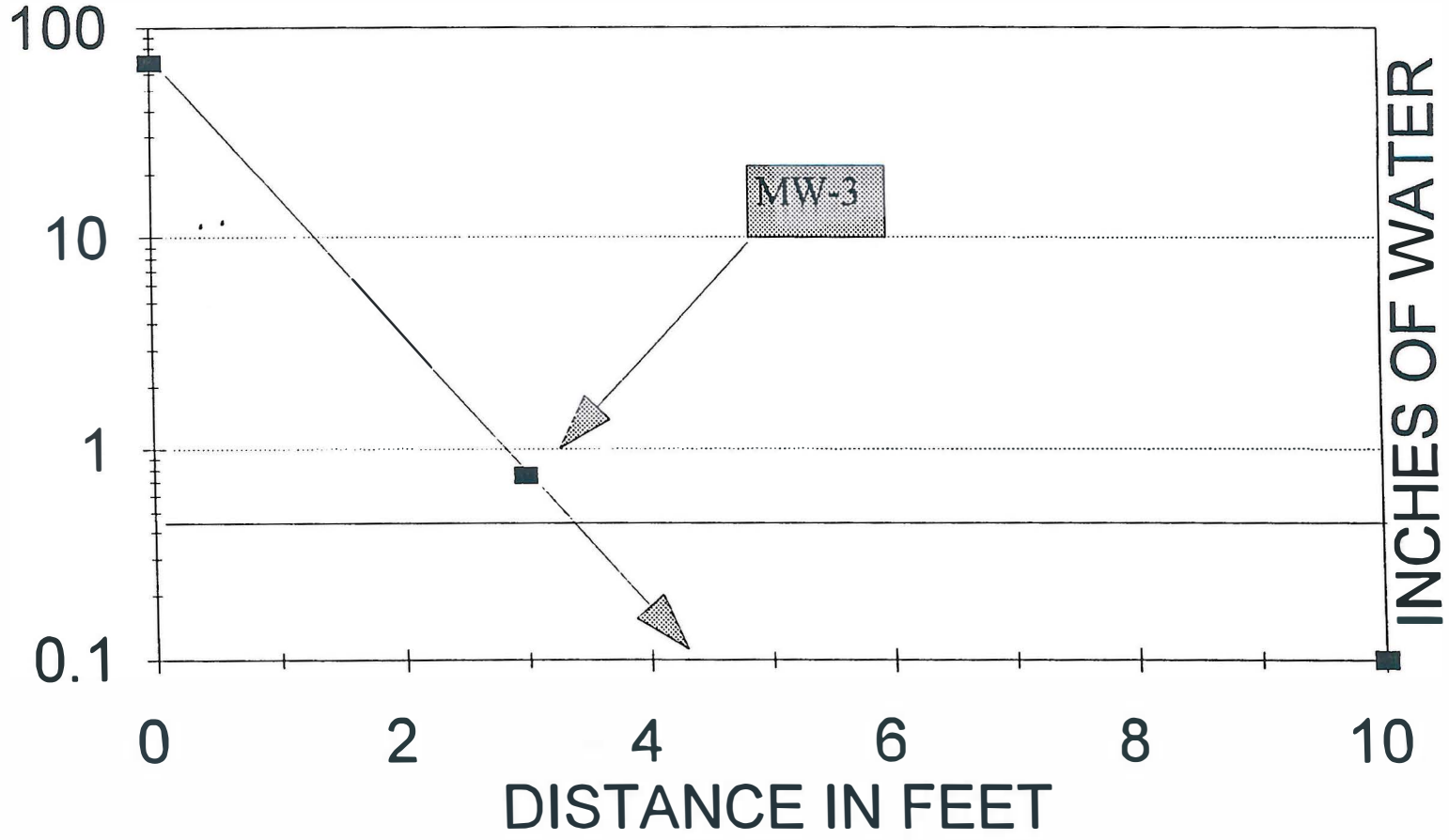



TERRA VAC

# NAVY TOW WAY FUEL FACILITY

## PW-3 STAGE TWO VACUUM ROI

FIGURE 27

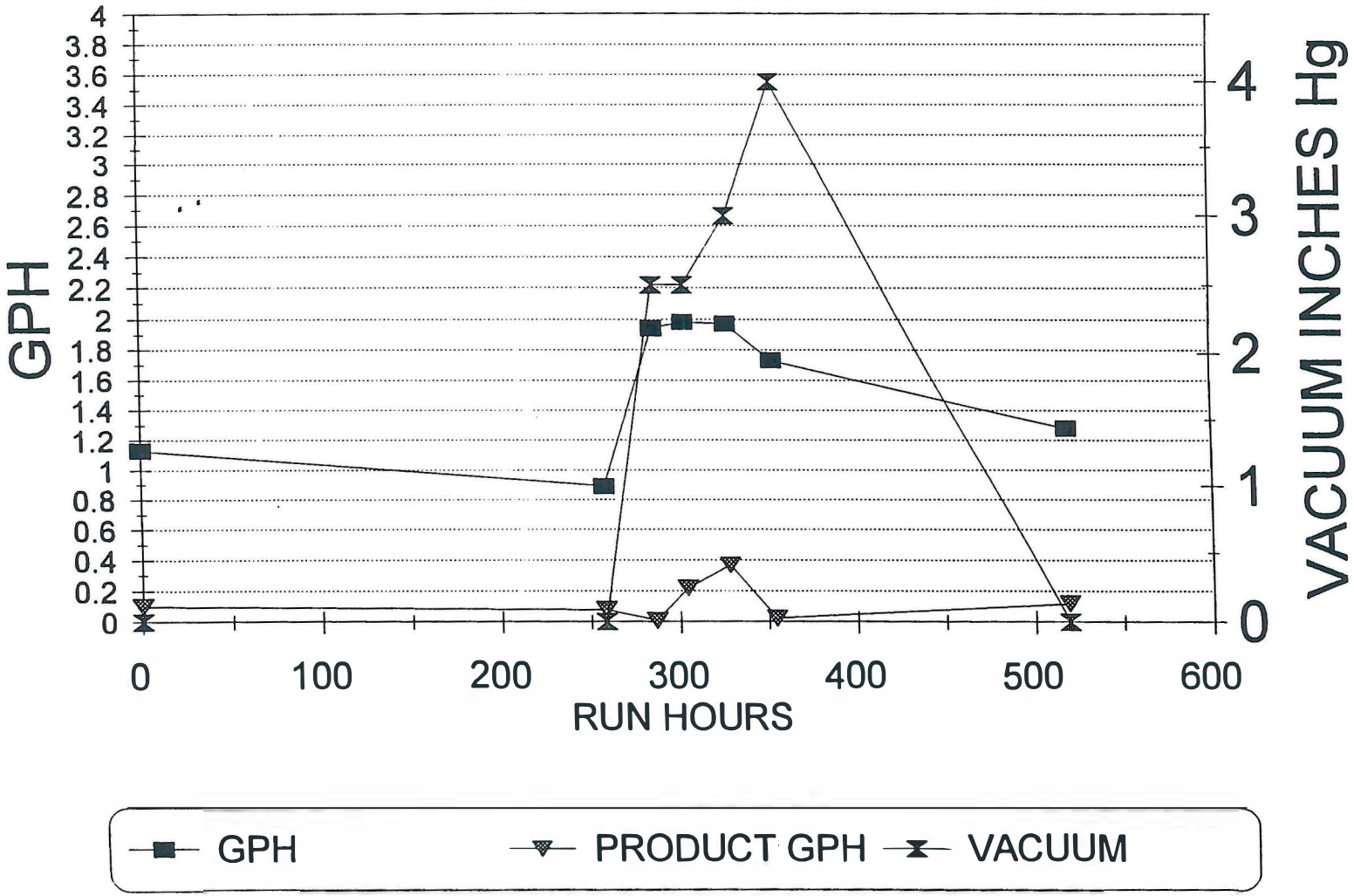



TERRA VAC

# TOW WAY FUEL FACILITY

## PW-4 STAGE TWO RECOVERY RATE

FIGURE 28

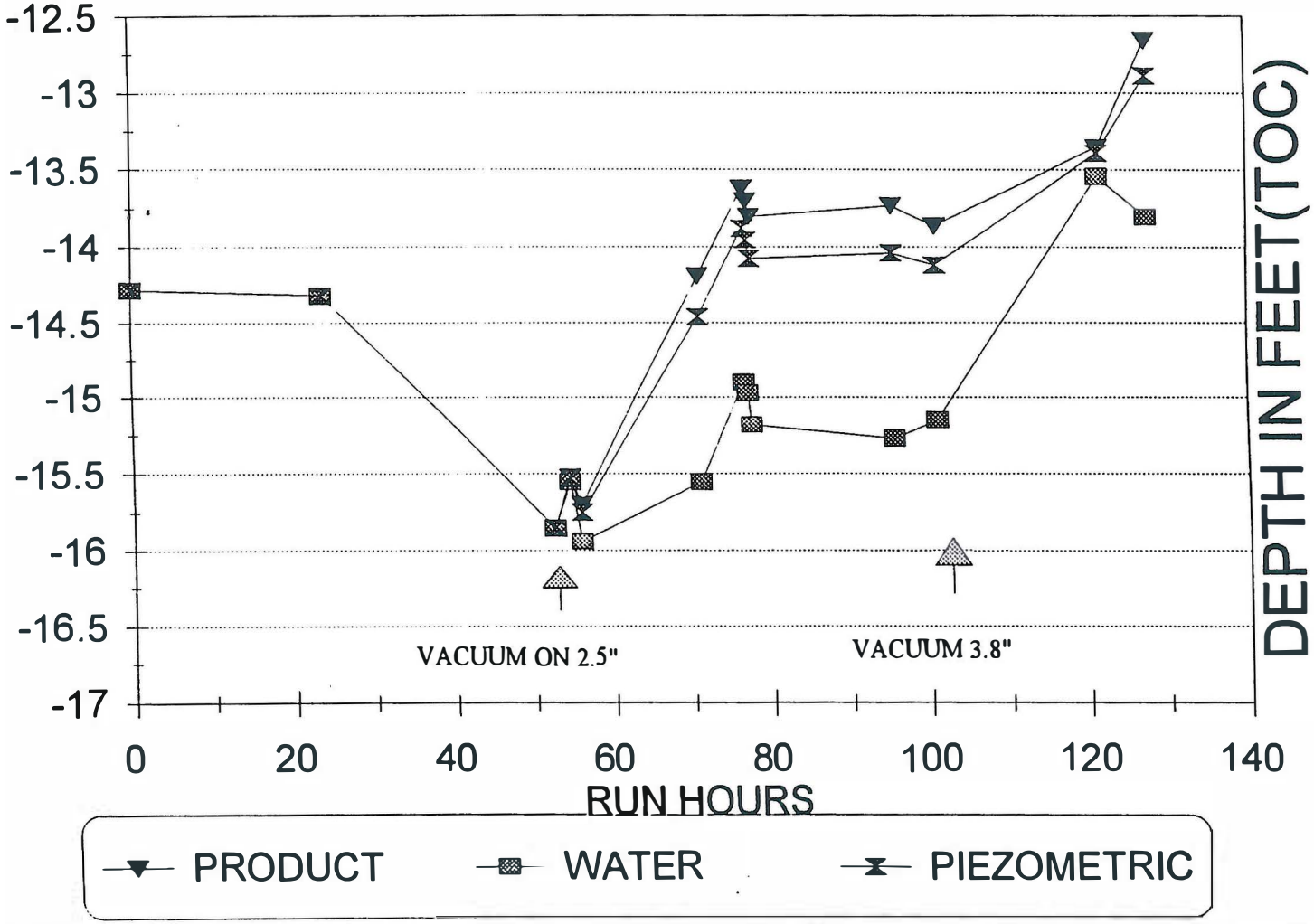



TERRA VAC

# NAVY TOW WAY FUEL FACILITY

## PW-4 STAGE TWO TEST

FIGURE 29

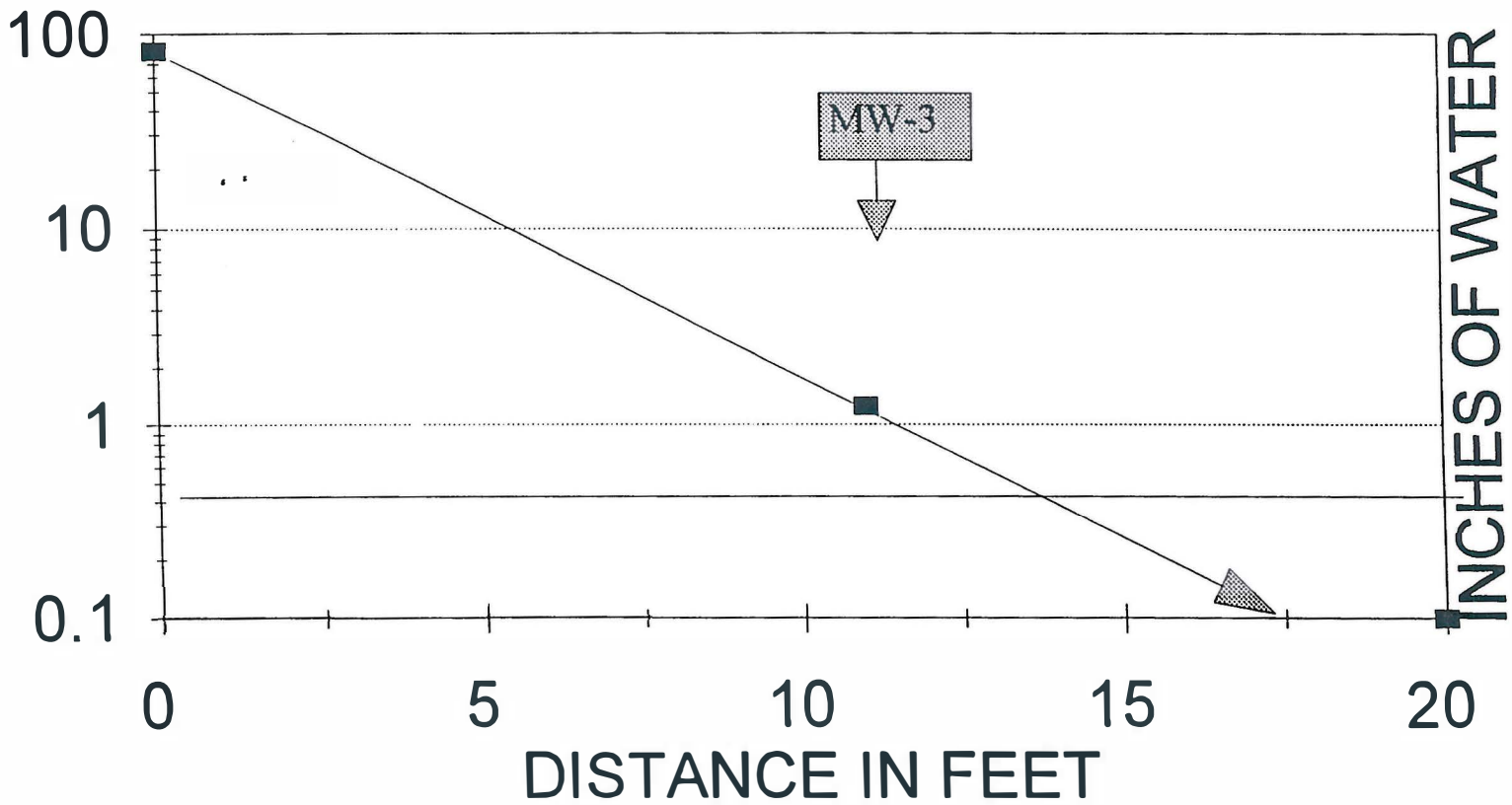



TERRA VAC

# NAVY TOW WAY FUEL FACILITY

## PW-5 STAGE TWO VACUUM ROI

FIGURE 30

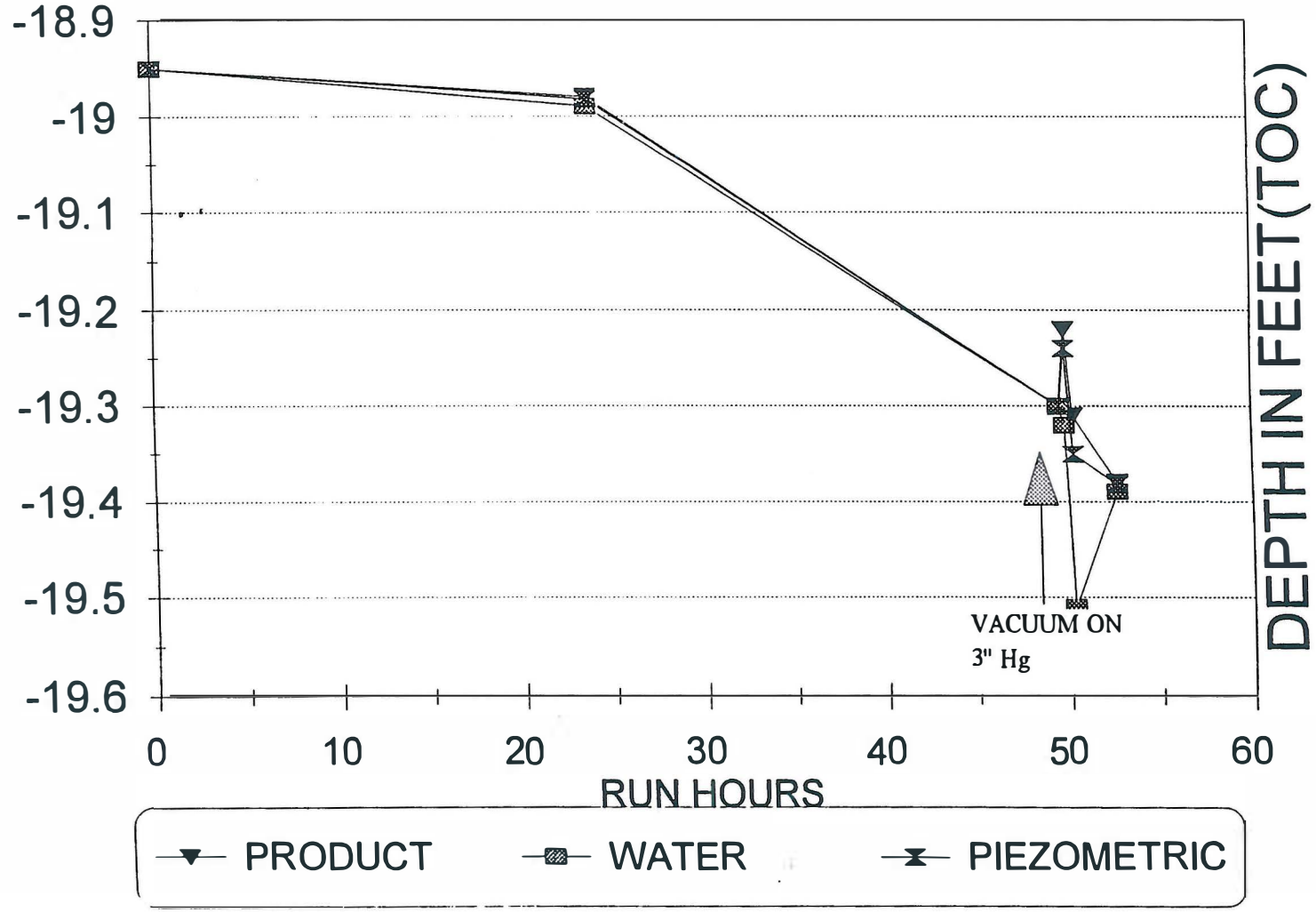



TERRA VAC

# NAVY TOW WAY FUEL FACILITY

## PW-5 STAGE TWO TEST

FIGURE 31

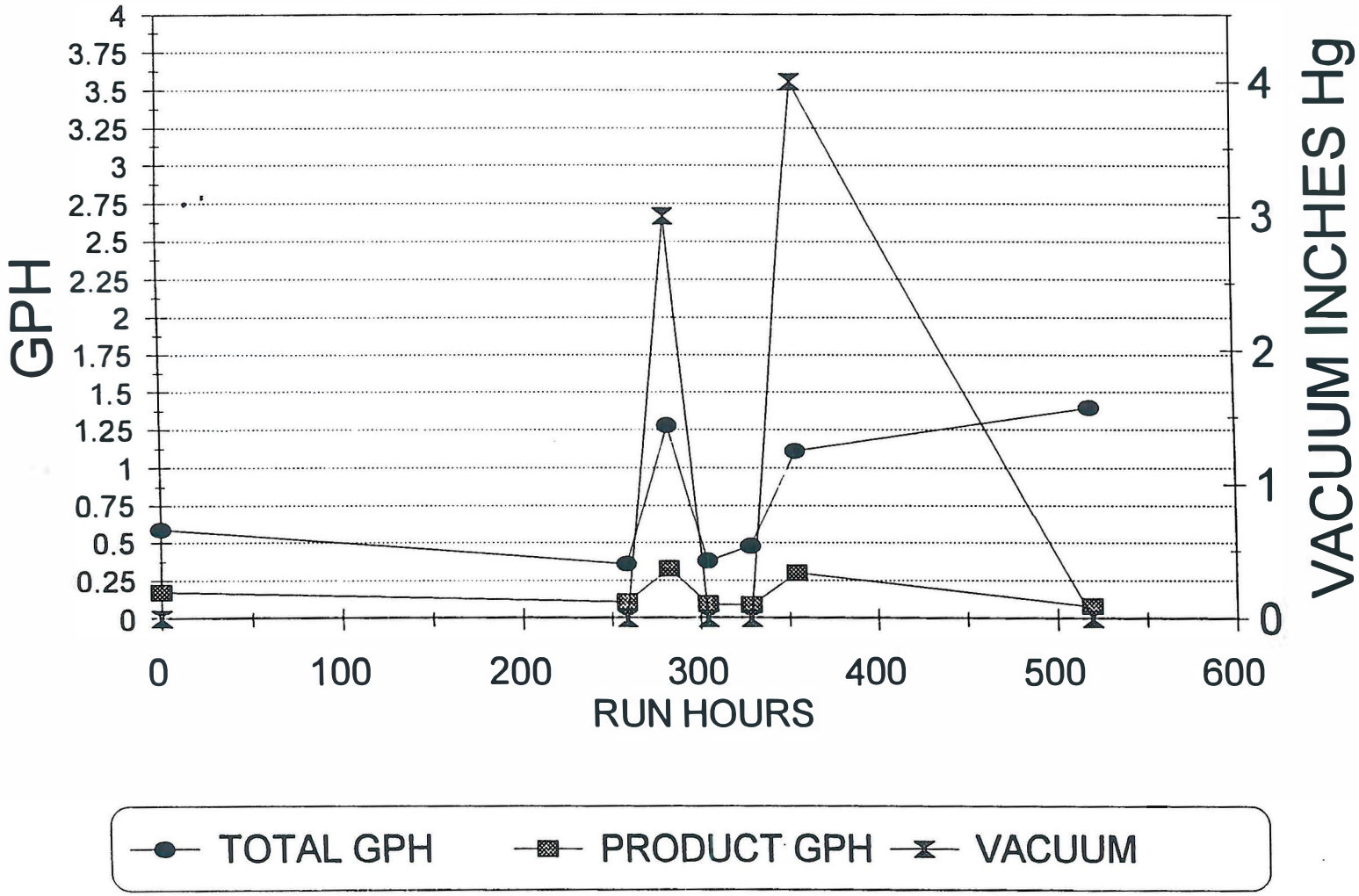



TERRA VAC

# NAVY TOW WAY FUEL FACILITY

## PW-5 STAGE TWO RECOVERY RATES

FIGURE 32

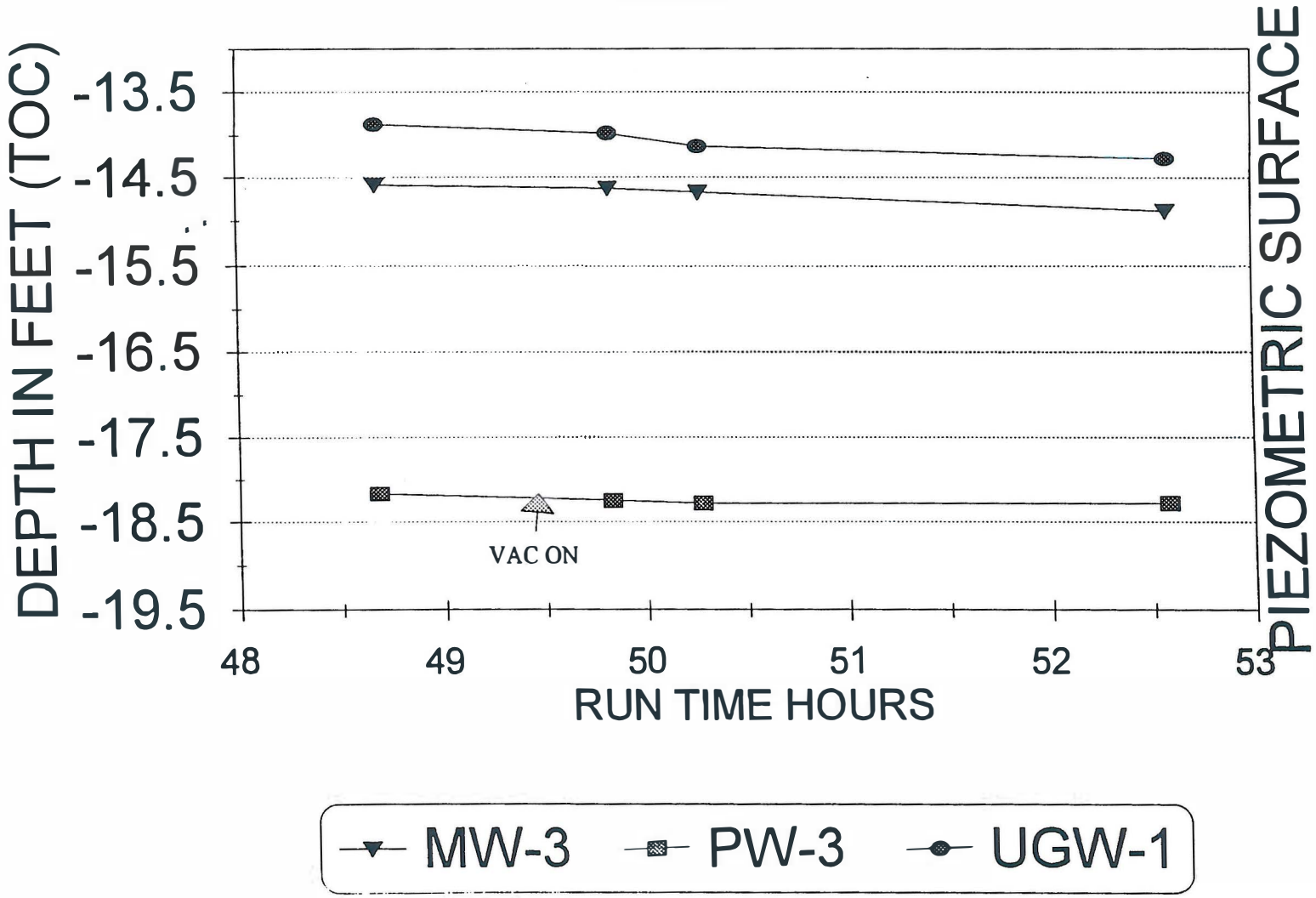



TERRA VAC

# NAVY TOW WAY FUEL FACILITY

## PW-5 STAGE TWO CAPTURE ZONE

FIGURE 33

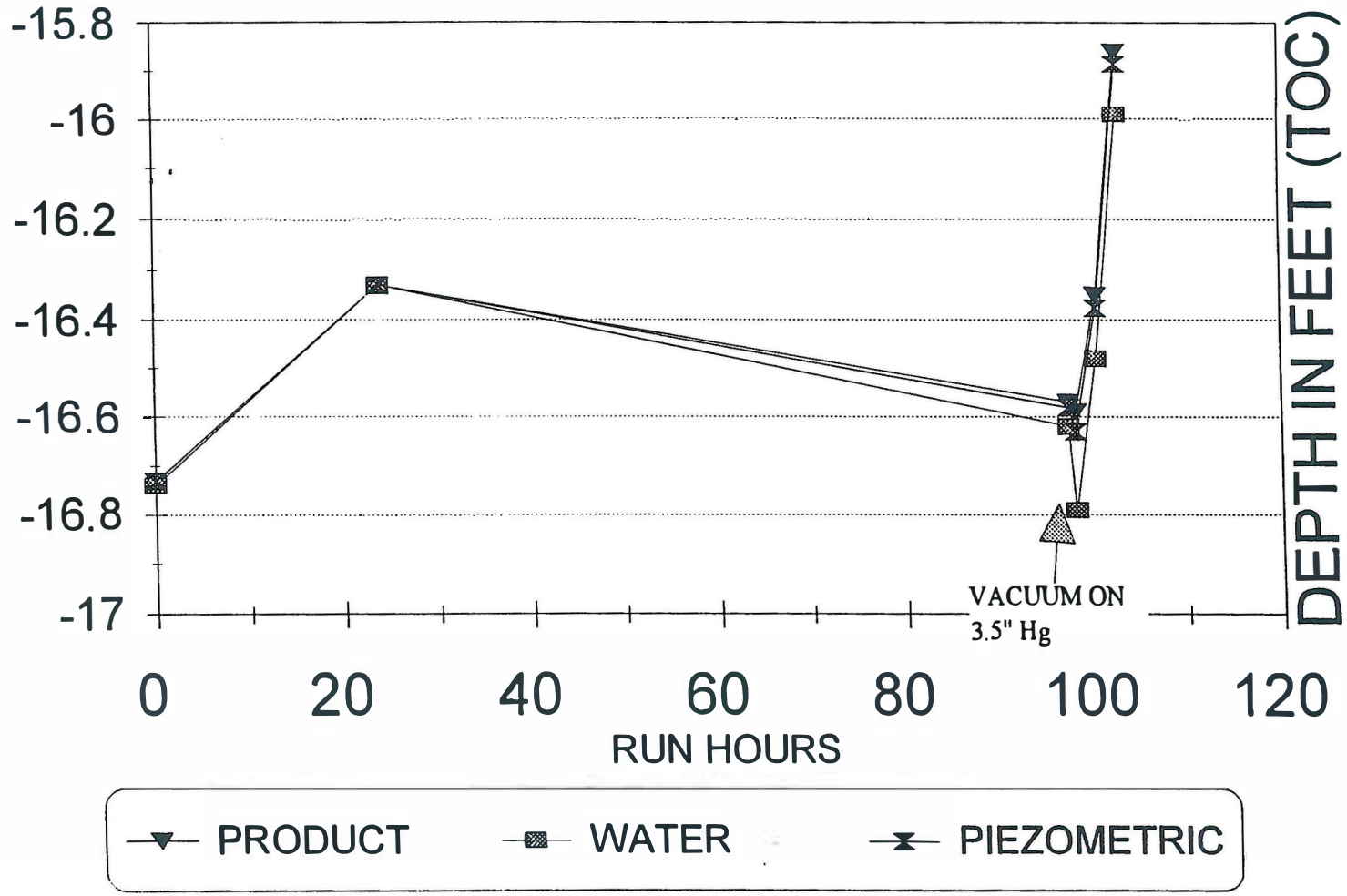



TERRA VAC

# NAVY TOW WAY FUEL FACILITY

## PW-6 STAGE TWO TEST

FIGURE 34

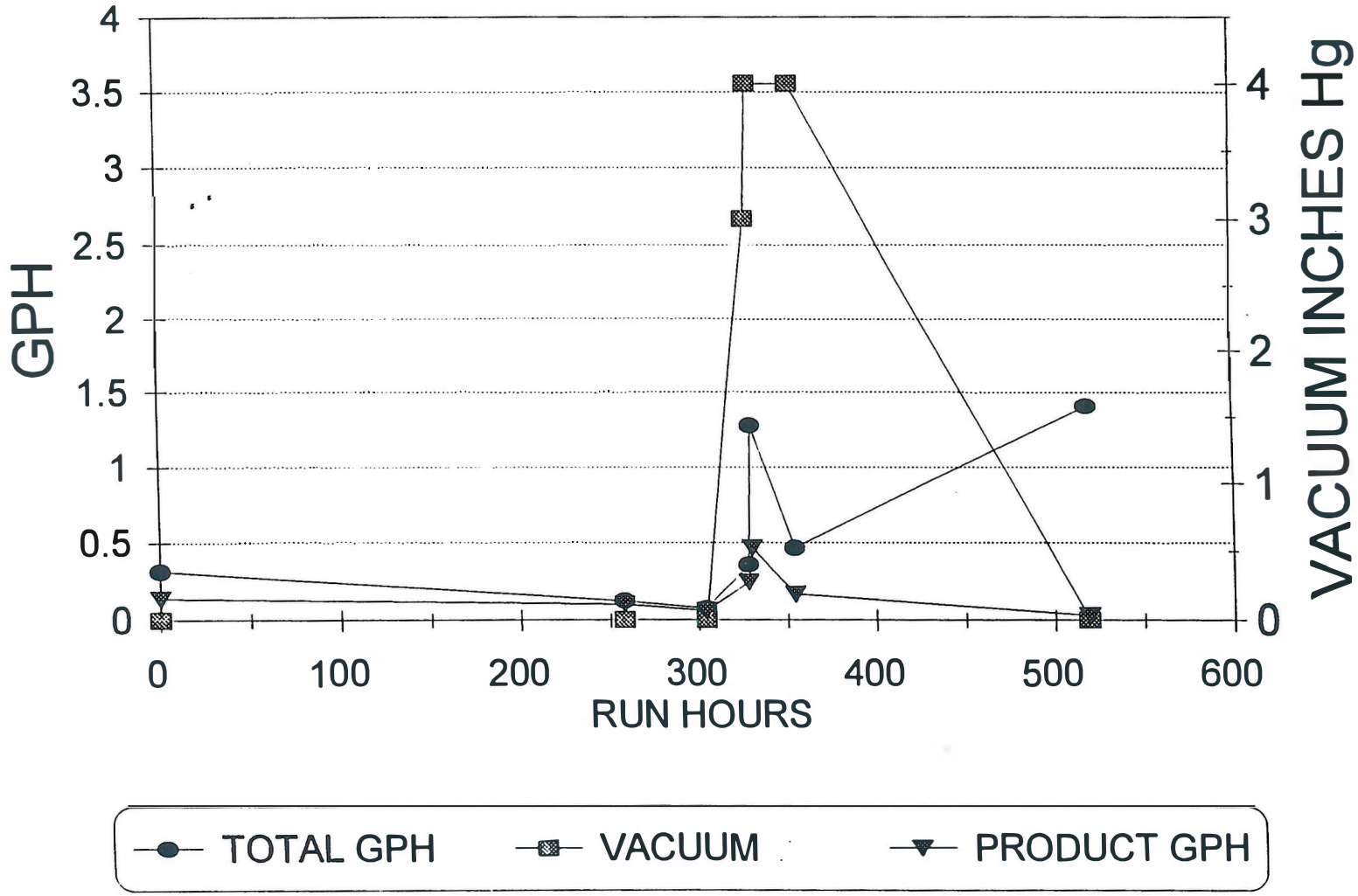



TERRA VAC

# NAVY TOW WAY FUEL FACILITY

## PW-6 STAGE TWO RECOVERY RATES

FIGURE 35

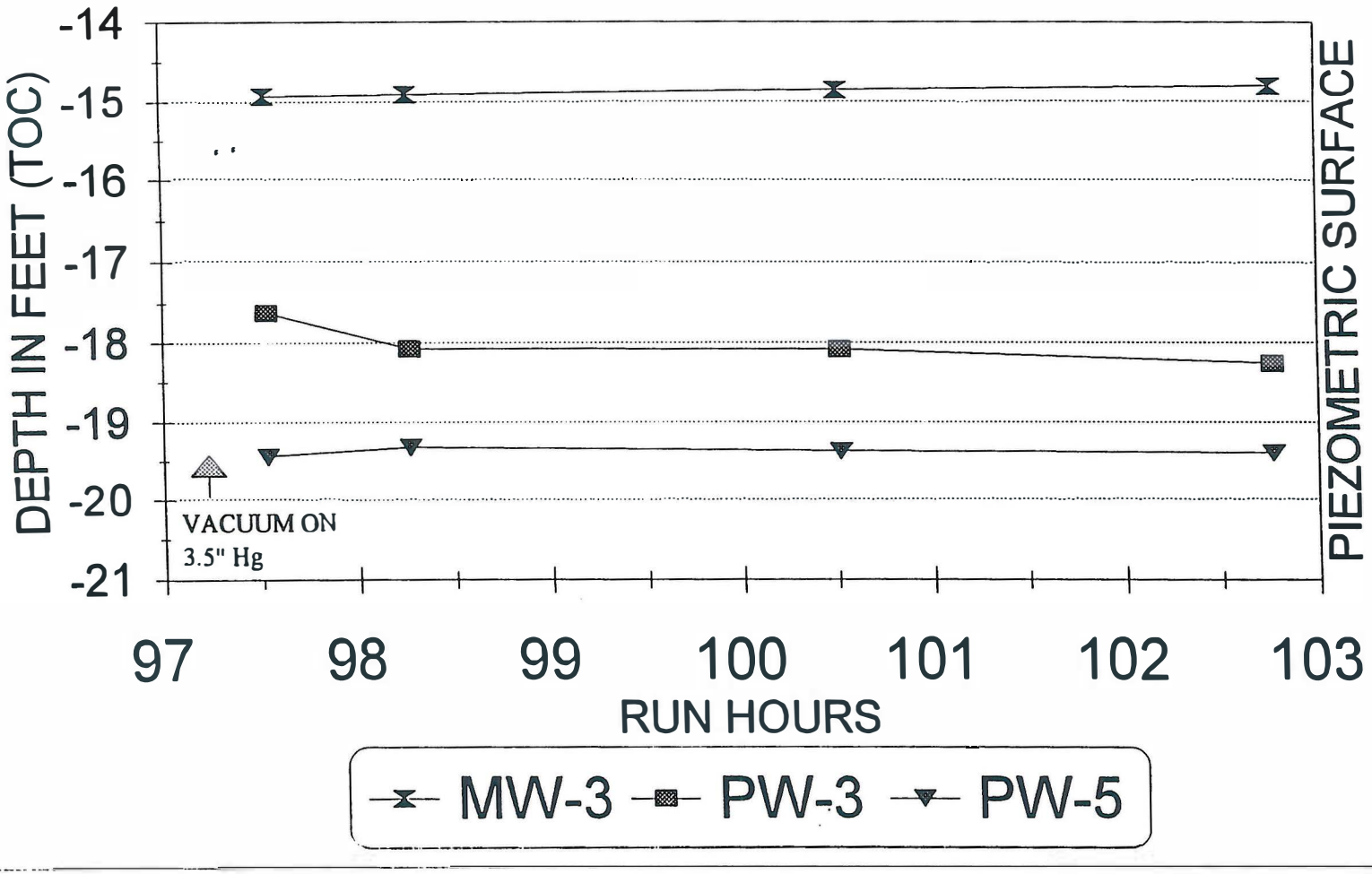



TERRA VAC

# NAVY TOW WAY FUEL FACILITY

## PW-6 STAGE TWO CAPTURE ZONE

FIGURE 36

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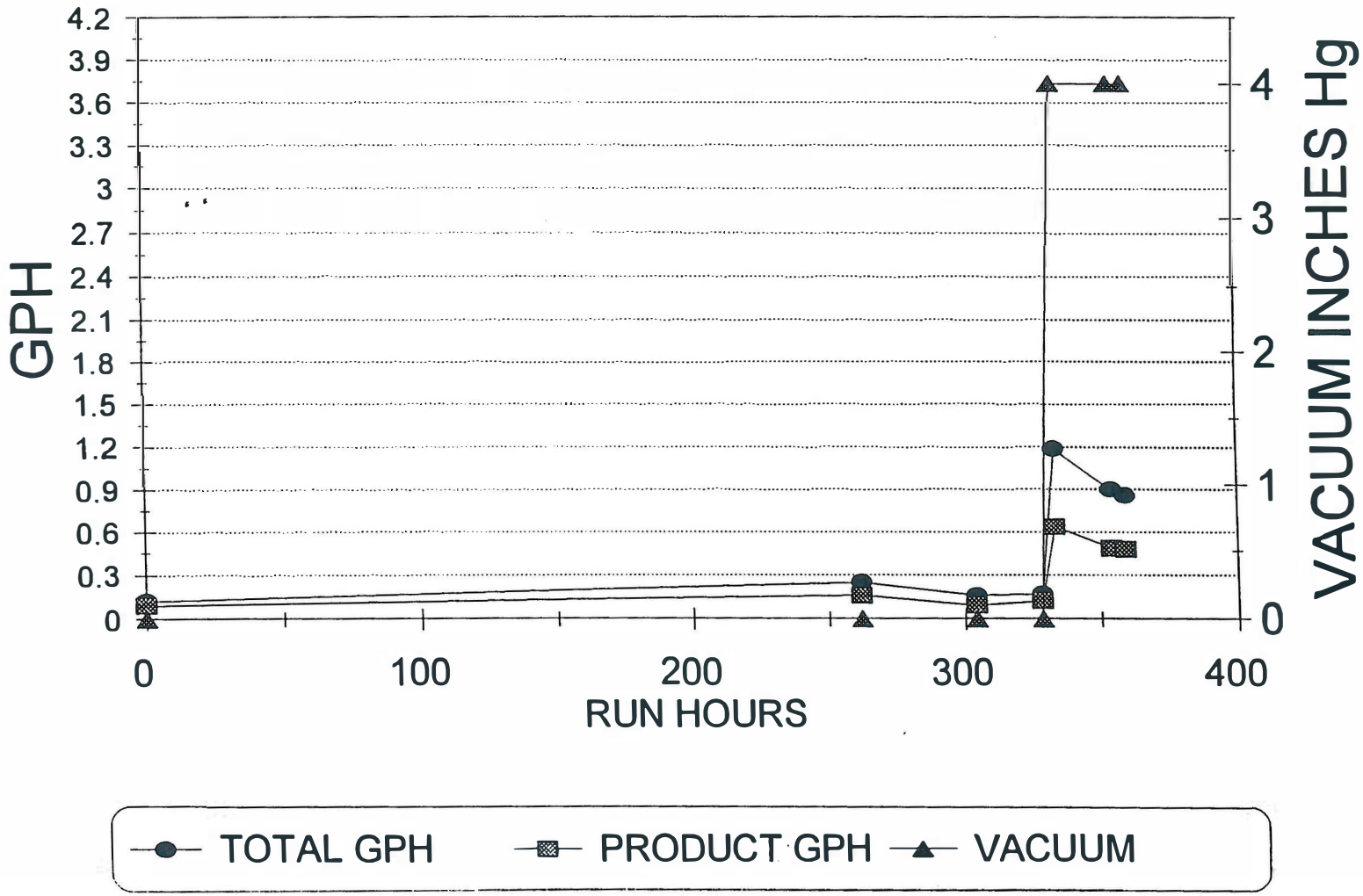
# NAVY TOW WAY FUEL FACILITY

## MW-1 STAGE TWO RECOVERY RATES

FIGURE 37

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# TABLE 49
# US NAVY
# TOW WAY FUEL FACILITY
# ROOSEVELT ROADS, PUERTO RICO
# PW-5 PRODUCT RECOVERY RATES
## TV PROJECT # 110234
## STAGE 3

| DATE | TIME | RUN HOURS | SEP TANK PRODUCT LEVEL ft | SEP TANK WATER LEVEL ft | PRODUCT THICKNESS f | PRODUCT GALLONS | PRODUCT GPH | PRODUCT GPD | WATER GPD |
|---|---|---|---|---|---|---|---|---|---|
| 18-Oct-95 | 13:10 | 0 | 5.37 | 5.45 | 0.08 | 7.44 | 0 | | |
| 18-Oct-95 | 15:13 | 2.05 | 5.36 | 5.44 | 0.08 | 7.44 | 0 | 0 | 10.9 |

TERRA VAC

# TABLE 50
# US NAVY
# TOW WAY FUEL FACILITY
# ROOSEVELT ROADS, PUERTO RICO
# PW-5 CAPTURE ZONE DATA
## TV PROJECT # 110234
## STAGE 3

| WELL NUMBER | DATE | TIME | RUN HOURS | PRODUCT LEVEL ft | WATER LEVEL ft | PRODUCT THICKNESS ft | PIEZOMETRIC SURFACE ft |
|---|---|---|---|---|---|---|---|
| PW-6 | 18-Oct-95 | 13:02 | 0.03 | -17.41 | -17.44 | 0.03 | -17.42 |
| PW-3 | 18-Oct-95 | 13:02 | 0.03 | -15.66 | -15.71 | 0.05 | -15.67 |
| MW-3 | 18-Oct-95 | 13:02 | 0.03 | -13.97 | -15.03 | 1.06 | -14.18 |
| UGW-1 | 18-Oct-95 | 13:02 | 0.03 | -13.38 | -14.23 | 0.85 | -13.55 |
| MW-4 | 18-Oct-95 | 13:02 | 0.03 | -13.41 | -13.67 | 0.26 | -13.46 |
| PW-5 | 18-Oct-95 | 13:10 | 0.17 | START | | | |
| PW-6 | 18-Oct-95 | 14:01 | 1.01 | -17.02 | -17.45 | 0.43 | -17.11 |
| PW-3 | 18-Oct-95 | 14:01 | 1.01 | -15.73 | -15.81 | 0.08 | -15.75 |
| MW-4 | 18-Oct-95 | 14:01 | 1.01 | -13.37 | -13.59 | 0.22 | -13.41 |
| UGW-1 | 18-Oct-95 | 14:01 | 1.01 | -13.40 | -14.22 | 0.82 | -13.56 |
| MW-3 | 18-Oct-95 | 14:01 | 1.01 | -14.00 | -15.06 | 1.06 | -14.21 |
| PW-6 | 18-Oct-95 | 15:08 | 2.13 | -16.70 | -16.72 | 0.02 | -16.70 |
| PW-3 | 18-Oct-95 | 15:08 | 2.13 | -15.73 | -15.82 | 0.09 | -15.75 |
| MW-3 | 18-Oct-95 | 15:08 | 2.13 | -14.01 | -15.13 | 1.12 | -14.23 |
| UGW-1 | 18-Oct-95 | 15:08 | 2.13 | -13.43 | -14.3 | 0.87 | -13.60 |
| MW-4 | 18-Oct-95 | 15:08 | 2.13 | -13.28 | -13.53 | 0.25 | -13.33 |
| PW-5 | 18-Oct-95 | 15:13 | 2.33 | STOP | | | |

NOTE: WATER & PRODUCT LEVEL MEASUREMENTS ARE FROM TOP OF CASING (TOC)

TERRA VAC

# TABLE 51
# US NAVY
# TOW WAY FUEL FACILITY
# ROOSEVELT ROADS, PUERTO RICO
# PW-6 ENTRAINMENT TEST
## TV PROJECT # 110234
## STAGE 3

| DATE | TIME | RUN HOURS | PRODUCT LEVEL ft | WATER LEVEL ft | PRODUCT THICKNESS ft | PIEZOMETRIC SURFACE ft | WELLHEAD VACUUM | DELTA-P | SCFM AIR FLOW |
|---|---|---|---|---|---|---|---|---|---|
| 17-Oct-95 | 08:20 | 0.00 | -16.68 | -17.14 | 0.46 | -16.77 | 0.00 | | |
| 18-Oct-95 | 08:31 | 24.18 | -15.46 | -17.69 | 2.23 | -15.91 | 0.00 | | |
| 18-Oct-95 | 10:16 | 25.93 | -15.52 | -17.79 | 2.27 | -15.97 | 0.00 | | |
| 18-Oct-95 | 10:37 | 26.28 | -15.61 | -17.85 | 2.24 | -16.06 | 0.00 | | |
| 18-Oct-95 | 10:40 | 26.33 | START | | | | 1.00 | 0.125 | 17.5 |
| 18-Oct-95 | 11:00 | 26.67 | -17.55 | -17.55 | 0.00 | -17.55 | 1.00 | 0.125 | 17.5 |
| 18-Oct-95 | 11:35 | 27.25 | -17.58 | -17.58 | 0.00 | -17.58 | 1.00 | 0.125 | 17.5 |
| 18-Oct-95 | 12:48 | 28.47 | -17.58 | -17.58 | 0.00 | -17.58 | 1.00 | 0.125 | 17.5 |

NOTE: WATER & PRODUCT LEVEL MEASUREMENTS ARE FROM TOP OF CASING (TOC)

TERRA VAC

# TABLE 52
# US NAVY
# TOW WAY FUEL FACILITY
# ROOSEVELT ROADS, PUERTO RICO
# PW-6 PRODUCT RECOVERY RATES
## TV PROJECT # 110234
## STAGE 3

| DATE | TIME | RUN HOURS | SEP TANK PRODUCT LEVEL ft | SEP TANK WATER LEVEL ft | PRODUCT THICKNESS ft | PRODUCT GALLONS | PRODUCT GPH | PRODUC GPD | WATER GPD |
|---|---|---|---|---|---|---|---|---|---|
| 18-Oct-95 | 10:40 | | 5.41 | 5.45 | 0.04 | 3.72 | | | |
| | 12:52 | 2.2 | 5.37 | 5.45 | 0.08 | 7.44 | 1.69 | 40.6 | 0 |

TERRA VAC

# TABLE 53
# US NAVY
# TOW WAY FUEL FACILITY
# ROOSEVELT ROADS, PUERTO RICO
# PW-6 CAPTURE ZONE DATA
## TV PROJECT # 110234
## STAGE 3

| WELL NUMBER | DATE | TIME | RUN HOURS | PRODUCT LEVEL ft | WATER LEVEL ft | PRODUCT THICKNESS ft | PIEZOMETRIC SURFACE ft |
|---|---|---|---|---|---|---|---|
| PW-5 | 17-Oct-95 | 08:20 | 0 | -16.35 | -16.83 | 0.48 | -16.45 |
| PW-3 | 17-Oct-95 | 08:20 | 0 | -15.75 | -16.05 | 0.30 | -15.81 |
| MW-4 | 17-Oct-95 | 08:20 | 0 | -13.21 | -14.17 | 0.96 | -13.40 |
| UGW-1 | 17-Oct-95 | 08:20 | 0 | -13.43 | -14.31 | 0.88 | -13.61 |
| MW-3 | 17-Oct-95 | 08:20 | 0 | -14.13 | -15.32 | 1.19 | -14.37 |
| PW-6 | 18-Oct-95 | 10:40 | 26.33 | START | | | |
| PW-5 | 18-Oct-95 | 11:01 | 26.68 | -15.89 | -16.45 | 0.56 | -16.00 |
| PW-3 | 18-Oct-95 | 11:01 | 26.68 | -15.66 | -15.69 | 0.03 | -15.67 |
| MW-4 | 18-Oct-95 | 11:01 | 26.68 | -13.45 | -13.73 | 0.28 | -13.51 |
| UGW-1 | 18-Oct-95 | 11:01 | 26.68 | -13.41 | -14.28 | 0.87 | -13.58 |
| MW-3 | 18-Oct-95 | 11:01 | 26.68 | -14.01 | -15.16 | 1.15 | -14.24 |
| PW-5 | 18-Oct-95 | 11:36 | 27.27 | -15.88 | -16.44 | 0.56 | -15.99 |
| PW-3 | 18-Oct-95 | 11:36 | 27.27 | -15.68 | -15.73 | 0.05 | -15.69 |
| MW-4 | 18-Oct-95 | 11:36 | 27.27 | -13.44 | -13.73 | 0.29 | -13.50 |
| UGW-1 | 18-Oct-95 | 11:36 | 27.27 | -13.4 | -14.27 | 0.87 | -13.57 |
| MW-3 | 18-Oct-95 | 11:36 | 27.27 | -13.99 | -15.12 | 1.13 | -14.22 |
| MW-4 | 18-Oct-95 | 12:45 | 28.42 | -13.42 | -13.70 | 0.28 | -13.48 |
| UGW-1 | 18-Oct-95 | 12:45 | 28.42 | -13.38 | -14.24 | 0.86 | -13.55 |
| MW-3 | 18-Oct-95 | 12:45 | 28.42 | -13.97 | -15.04 | 1.07 | -14.18 |
| PW-3 | 18-Oct-95 | 12:45 | 28.42 | -15.73 | -15.78 | 0.05 | -15.74 |
| PW-5 | 18-Oct-95 | 12:45 | 28.42 | -15.86 | -16.43 | 0.57 | -15.97 |

NOTE: WATER & PRODUCT LEVEL MEASUREMENTS ARE FROM TOP OF CASING (TOC)

TERRA VAC

# TABLE 54
# US NAVY
# TOW WAY FUEL FACILITY
# ROOSEVELT ROADS, PUERTO RICO
# MW-1 ENTRAINMENT TEST

## TV PROJECT # 110234
## STAGE 3

| DATE | TIME | RUN HOURS | PRODUCT LEVEL ft | WATER LEVEL ft | PRODUCT THICKNESS ft | PIEZOMETRI SURFACE ft | WELL HEAD VACUUM | TOTAL DELTA-P | TOTAL VAC | SCFM AIR FLOW |
|---|---|---|---|---|---|---|---|---|---|---|
| 17-Oct-95 | 08:20 | 0.00 | -12.76 | -13.93 | 1.17 | -12.99 | 0 | | | 0.0 |
| 17-Oct-95 | 09:15 | 0.92 | START | | | | 3.5 | NA | 4 | |
| 17-Oct-95 | 10:15 | 1.92 | -14.52 | -14.57 | 0.05 | -14.53 | 0 | | | |
| 17-Oct-95 | 10:15 | 1.92 | STOP | | | | | | | |
| 17-Oct-95 | 18:00 | 9.67 | -13.4 | -14.03 | 0.63 | -13.53 | 0 | | | |

NOTE: WATER & PRODUCT LEVEL MEASUREMENTS ARE FROM TOP OF CASING (TOC)

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# TABLE 55
# US NAVY
# TOW WAY FUEL FACILITY
# ROOSEVELT ROADS, PUERTO RICO
# MW-1 PRODUCT RECOVERY RATE
## TV PROJECT # 110234
## STAGE 3

| DATE | TIME | RUN HOURS | SEP TANK PRODUCT LEVEL ft | SEP TANK WATER LEVEL ft | PRODUCT THICKNESS ft | PRODUCT GALLONS | PRODUCT GPH | PRODUCT GPD | WATER GPD |
|---|---|---|---|---|---|---|---|---|---|
| 18-Oct-95 | 09:15 | | 5.89 | 5.95 | 0.06 | 5.58 | | | |
| | 10:15 | 1 | 5.85 | 5.93 | 0.08 | 7.44 | 1.86 | 44.6 | 44.6 |

# TABLE 57
# US NAVY
# TOW WAY FUEL FACILITY
# ROOSEVELT ROADS, PUERTO RICO
# ALL WELLS PRODUCT RECOVERY RATES

**TV PROJECT # 110234**
**ALL STAGES**

| WELL NUMBER | STAGE ONE PRODUCT GPD | STAGE TWO PRODUCT GP | STAGE THREE PRODUCT GP |
|---|---|---|---|
| PW-1 | 2.2 | 0.5 | 13.2 |
| PW-2 | 0.0 | 28.1 | 0.0 |
| PW-3 | 0.7 | 6.7 | 14.9 |
| PW-4 | 2.4 | 8.9 | 21.4 |
| PW-5 | 4.1 | 7.9 | 0.0 |
| PW-6 | 3.4 | 11.3 | 40.6 |
| MW-1 | 2.2 | 15.4 | 44.6 |
| TOTAL | 15.1 | 78.7 | 134.6 |

GPD = GALLONS PER DAY

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# TABLE 58

## US NAVY
## TOW WAY FUEL FACILITY
## ROOSEVELT ROADS, PUERTO RICO
## WATER AND PRODUCT LEVEL DATA
### TV PROJECT # 110234

| WELL NUMBER | DATE 1995 | TIME | PRODUCT LEVEL ft | WATER LEVEL ft | PRODUCT THICKNESS ft | PIEZOMETRI SURFACE ft |
|---|---|---|---|---|---|---|
| UGW-1 | 21-Oct | 09:45 | -13.35 | -13.68 | 0.33 | -13.42 |
| UGW-2 | 20-Oct | 14:50 | -55.64 | -56.50 | 0.86 | -55.81 |
| UGW-3 | 20-Oct | 15:51 | -21.56 | -21.97 | 0.41 | -21.64 |
| UGW-4 | 20-Oct | 15:57 | -14.95 | -24.20 | 9.25 | -16.80 |
| UGW-5 | 21-Oct | 10:10 | -12.30 | -12.39 | 0.09 | -12.32 |
| UGW-6 | 22-Oct | 08:57 | -10.17 | -10.17 | 0.00 | -10.17 |
| UGW-7 | 22-Oct | 08:58 | -7.82 | -7.82 | 0.00 | -7.82 |
| UGW-8 | 22-Oct | 08:59 | -7.32 | -7.32 | 0.00 | -7.32 |
| UGW-9 | 22-Oct | 09:07 | -7.73 | -7.73 | 0.00 | -7.73 |
| UGW-10 | 22-Oct | 09:00 | -9.11 | -9.11 | 0.00 | -9.11 |
| UGW-11 | 22-Oct | 09:02 | -8.70 | -8.70 | 0.00 | -8.70 |
| UGW-12 | 20-Oct | 16:45 | -9.80 | -19.95 | 10.15 | -11.83 |
| UGW-13 | 20-Oct | 16:30 | -11.45 | -19.76 | 8.31 | -13.11 |
| UGW-14 | 22-Oct | 08:51 | -15.93 | -15.93 | 0.00 | -15.93 |
| UGW-15 | 22-Oct | 08:53 | -11.67 | -11.67 | 0.00 | -11.67 |
| UGW-16 | 22-Oct | 09:03 | -12.68 | -12.68 | 0.00 | -12.68 |
| UGW-17 | 20-Oct | 16:21 | -11.22 | -15.93 | 4.71 | -12.16 |
| UGW-18 | 22-Oct | 09:04 | -13.12 | -13.12 | 0.00 | -13.12 |
| UGW-19 | 20-Oct | 16:16 | -11.77 | -14.45 | 2.68 | -12.31 |
| UGW-20 | 22-Oct | 08:55 | -11.46 | -11.46 | 0.00 | -11.46 |
| UGW-21 | 21-Oct | 15:00 | -13.56 | -13.56 | 0.00 | -13.56 |
| UGW-22 | 21-Oct | 10:10 | -11.35 | -11.37 | 0.02 | -11.35 |
| UGW-23 | 22-Oct | 08:50 | -64.11 | -64.11 | 0.00 | -64.11 |
| UGW-24 | 22-Oct | 08:45 | -75.30 | -75.31 | 0.01 | -75.30 |
| UGW-25 | 20-Oct | 15:05 | -50.27 | -51.95 | 1.68 | -50.61 |
| UGW-26 | 22-Oct | 09:05 | -8.35 | -8.35 | 0.00 | -8.35 |

NOTE: WATER & PRODUCT LEVEL MEASUREMENTS ARE FROM TOP OF CASING (T

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# TABLE 59

## STAGE 3
## US NAVY
## TOW WAY FUEL FACILITY
## ROOSEVELT ROADS, PUERTO RICO
## PRODUCT RECOVERY RATES

**TV PROJECT # 110234**

| WELL NUMBER | DATE | PRODUCT GPH | PRODUCT GPD | WATER GPD |
|---|---|---|---|---|
| PW-1 | 18-Oct-95 | 0.55 | 13.2 | 110.4 |
| PW-2 | 18-Oct-95 | 0.00 | 0.0 | 56.1 |
| PW-3 | 18-Oct-95 | 0.62 | 14.9 | 0 |
| PW-4 | 18-Oct-95 | 0.89 | 21.4 | 42.5 |
| PW-5 | 18-Oct-95 | 0.00 | 0.0 | 10.9 |
| PW-6 | 18-Oct-95 | 1.69 | 40.6 | 0 |
| MW-1 | 18-Oct-95 | 1.86 | 44.6 | 44.6 |
| TOTAL | 18-Oct-95 | 5.61 | 134.6 | 264.5 |

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# TABLE 48
# US NAVY
# TOW WAY FUEL FACILITY
# ROOSEVELT ROADS, PUERTO RICO
# PW-5 ENTRAINMENT TEST
## TV PROJECT # 110234
## STAGE 3

| DATE | TIME | RUN HOURS | PRODUCT LEVEL ft | WATER LEVEL ft | PRODUCT THICKNESS f | PIEZOMETRI SURFACE ft | WELLHEAD VACUUM | DELTA-P | SCFM AIR FLOW |
|---|---|---|---|---|---|---|---|---|---|
| 18-Oct-95 | 13:00 | 0.00 | -15.79 | -16.31 | 0.52 | -15.89 | 0.00 | 0.00 | 0.0 |
| 18-Oct-95 | 13:10 | 0.17 | ON | | | | 1.00 | 0.125 | 17.5 |
| 18-Oct-95 | 13:15 | 0.25 | -16.6 | -16.60 | 0.00 | -16.60 | 1.00 | 0.125 | 17.5 |
| 18-Oct-95 | 14:03 | 1.05 | -16.64 | -16.64 | 0.00 | -16.64 | 1.00 | 0.125 | 17.5 |
| 18-Oct-95 | 15:10 | 2.17 | -16.64 | -16.64 | 0.00 | -16.64 | 1.00 | 0.125 | 17.5 |
| 18-Oct-95 | 15:13 | 2.22 | OFF | | | | 0.00 | 0.00 | 0.0 |
| 18-Oct-95 | 15:20 | 2.33 | -16.66 | -16.69 | 0.03 | -16.67 | 0.00 | 0.00 | 0.0 |

NOTE: WATER & PRODUCT LEVEL MEASUREMENTS ARE FROM TOP OF CASING (TOC)

TERRA VAC

# TABLE 47
# US NAVY
# TOW WAY FUEL FACILITY
# ROOSEVELT ROADS, PUERTO RICO
# PW-4 CAPTURE ZONE DATA
## TV PROJECT # 110234
## STAGE 3

| WELL NUMBER | DATE 18-Oct-95 | TIME | RUN HOURS | PRODUCT LEVEL ft | WATER LEVEL ft | PRODUCT THICKNESS ft | PIEZOMETRIC SURFACE ft |
|---|---|---|---|---|---|---|---|
| PW-5 | 18-Oct-95 | 15:20 | 6.83 | -16.66 | -16.69 | 0.03 | -16.67 |
| PW-6 | 18-Oct-95 | 15:20 | 6.83 | -16.59 | -17.08 | 0.49 | -16.69 |
| PW-3 | 18-Oct-95 | 15:20 | 6.83 | -15.69 | -15.75 | 0.06 | -15.70 |
| MW-4 | 18-Oct-95 | 15:20 | 6.83 | -13.28 | -13.52 | 0.24 | -13.33 |
| UGW-1 | 18-Oct-95 | 15:20 | 6.83 | -13.43 | -14.29 | 0.86 | -13.60 |
| PW-4 | 18-Oct-95 | 15:28 | 6.97 | START | | | |
| PW-3 | 18-Oct-95 | 16:25 | 7.92 | -15.74 | -15.82 | 0.08 | -15.76 |
| PW-6 | 18-Oct-95 | 16:25 | 7.92 | -16.44 | -17.01 | 0.57 | -16.55 |
| PW-5 | 18-Oct-95 | 16:25 | 7.92 | -16.51 | -16.55 | 0.04 | -16.52 |
| MW-4 | 18-Oct-95 | 16:25 | 7.92 | -13.27 | -13.48 | 0.21 | -13.31 |
| UGW-1 | 18-Oct-95 | 16:25 | 7.92 | -13.39 | -14.26 | 0.87 | -13.56 |
| MW-3 | 18-Oct-95 | 16:25 | 7.92 | -13.98 | -15.08 | 1.10 | -14.20 |
| PW-4 | 18-Oct-95 | 16:31 | 8.02 | STOP | | | |

NOTE: WATER & PRODUCT LEVEL MEASUREMENTS ARE FROM TOP OF CASING (TOC)

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# TABLE 38
## STAGE 3
## US NAVY
## TOW WAY FUEL FACILITY
## ROOSEVELT ROADS, PUERTO RICO
## PW-1 PRODUCT RECOVERY RATES
### TV PROJECT # 110234

| DATE | TIME | RUN TIME | SEP TANK PRODUCT LEVEL ft | SEP TANK WATER LEVEL ft | PRODUCT THICKNESS ft | PRODUCT GALLONS | PRODUCT GPH | PRODUCT GPD | WATER GPD |
|---|---|---|---|---|---|---|---|---|---|
| 17-Oct-95 | 14:25 | 0.12 | 5.77 | 5.85 | 0.08 | 7.44 | 0 | 0 | 0 |
| 17-Oct-95 | 15:15 | 0.95 | 5.71 | 5.79 | 0.08 | 7.44 | 0 | 0 | 140.48 |
| 17-Oct-95 | 16:07 | 1.82 | 5.61 | 5.70 | 0.09 | 8.37 | 0.55 | 13.20 | 110.37 |

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# TABLE 39
# US NAVY
# TOW WAY FUEL FACILITY
# ROOSEVELT ROADS, PUERTO RICO
# PW-2 ENTRAINMENT TEST
## TV PROJECT # 110234
## STAGE 3

| DATE | TIME | RUN HOURS | PRODUCT LEVEL ft | WATER LEVEL ft | PRODUCT THICKNESS ft | PIEZOMETRI SURFACE ft | WELL HEAD VACUUM | TOTAL DELTA-P | TOTAL VAC | SCFM AIR FLOW |
|---|---|---|---|---|---|---|---|---|---|---|
| 17-Oct-95 | 08:20 | 0.00 | -16.93 | -17.18 | 0.25 | -16.98 | 0.00 | | | |
| 17-Oct-95 | 10:25 | 2.08 | -13.88 | -14.12 | 0.24 | -13.93 | 0.00 | | | |
| 17-Oct-95 | 10:32 | 2.20 | START | | | 0.00 | 2.00 | 0.10 | 5.00 | 15.36 |
| 17-Oct-95 | 10:34 | 2.23 | -14.06 | -14.06 | 0.00 | -14.06 | 2.00 | 0.10 | 5.00 | 15.36 |
| 17-Oct-95 | 11:07 | 2.78 | -14.06 | -14.06 | 0.00 | -14.06 | 2.50 | 0.10 | 5.00 | 15.22 |
| 17-Oct-95 | 11:57 | 3.62 | -14.08 | -14.08 | 0.00 | -14.08 | 2.50 | 0.10 | 5.00 | 15.22 |
| 17-Oct-95 | 13:31 | 5.18 | -14.05 | -14.05 | 0.00 | -14.05 | 3.00 | 0.13 | 5.00 | 16.86 |
| 17-Oct-95 | 13:43 | 5.38 | STOP | | | | | | | |
| 17-Oct-95 | 14:01 | 5.68 | -15.06 | -15.11 | 0.05 | -15.07 | 0.00 | | | |
| 17-Oct-95 | 14:22 | 6.03 | -15.18 | -15.29 | 0.11 | -15.20 | 0.00 | | | |

NOTE: WATER & PRODUCT LEVEL MEASUREMENTS ARE FROM TOP OF CASING (TOC)

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# TABLE 40
# US NAVY
# TOW WAY FUEL FACILITY
# ROOSEVELT ROADS, PUERTO RICO
# PW-2 PRODUCT RECOVERY RATE
## TV PROJECT # 110234
## STAGE 3

| DATE | TIME | RUN HOURS | SEP TANK PRODUCT LEVEL ft | SEP TANK WATER LEVEL ft | PRODUCT THICKNESS ft | PRODUCT GALLONS | PRODUCT GPH | PRODUC GPD | WATER GPD |
|---|---|---|---|---|---|---|---|---|---|
| 17-Oct-95 | 10:32 | 0 | 5.85 | 5.93 | 0.08 | 7.44 | | | |
| 17-Oct-95 | 13:43 | 3.18 | 5.77 | 5.85 | 0.08 | 7.44 | 0 | 0 | 56.1 |

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# TABLE 41
# US NAVY
# TOW WAY FUEL FACILITY
# ROOSEVELT ROADS, PUERTO RICO
# PW-2 CAPTURE ZONE DATA
## TV PROJECT # 110234
## STAGE 3

| WELL NUMBER | DATE | TIME | RUN HOURS | PRODUCT LEVEL ft | WATER LEVEL ft | PRODUCT THICKNESS ft | PIEZOMETRIC SURFACE ft |
|---|---|---|---|---|---|---|---|
| PW-1 | 17-Oct-95 | 10:26 | 2.10 | -10.83 | -10.83 | 0.00 | -10.83 |
| MW-2 | 17-Oct-95 | 10:26 | 2.10 | -11.74 | -12.19 | 0.45 | -11.38 |
| MW-1 | 17-Oct-95 | 10:26 | 2.10 | -14.45 | -14.83 | 0.38 | -14.15 |
| MW-1 | 17-Oct-95 | 11:03 | 2.72 | -14.49 | -14.89 | 0.40 | -14.17 |
| UGW-22 | 17-Oct-95 | 11:03 | 2.72 | -10.78 | -10.78 | 0.00 | -10.78 |
| MW-2 | 17-Oct-95 | 11:03 | 2.72 | -11.91 | -12.51 | 0.60 | -11.43 |
| PW-1 | 17-Oct-95 | 11:03 | 2.72 | -10.83 | -10.83 | 0.00 | -10.83 |
| MW-2 | 17-Oct-95 | 11:53 | 3.55 | -12.26 | -13.00 | 0.74 | -11.67 |
| UGW-22 | 17-Oct-95 | 11:53 | 3.55 | -10.81 | -10.81 | 0.00 | -10.81 |
| MW-1 | 17-Oct-95 | 11:53 | 3.55 | -14.23 | -14.60 | 0.37 | -13.93 |
| PW-1 | 17-Oct-95 | 11:53 | 3.55 | -10.83 | -10.83 | 0.00 | -10.83 |
| PW-1 | 17-Oct-95 | 13:32 | 5.20 | -10.83 | -10.83 | 0.00 | -10.83 |
| MW-2 | 17-Oct-95 | 13:32 | 5.20 | -12.77 | -13.53 | 0.76 | -12.16 |
| UGW-22 | 17-Oct-95 | 13:32 | 5.20 | -10.88 | -10.89 | 0.01 | -10.87 |
| MW-1 | 17-Oct-95 | 13:32 | 5.20 | -13.96 | -14.39 | 0.43 | -13.62 |
| UGW-5 | 17-Oct-95 | 13:32 | 5.20 | -12.91 | -12.94 | 0.03 | -12.89 |
| MW-2 | 17-Oct-95 | 13:42 | 5.37 | -12.82 | -13.59 | 0.77 | -12.20 |
| MW-2 | 17-Oct-95 | 14:03 | 5.72 | -12.80 | -13.56 | 0.76 | -12.19 |
| MW-1 | 17-Oct-95 | 14:03 | 5.72 | -13.92 | -14.34 | 0.42 | -13.58 |
| MW-1 | 17-Oct-95 | 14:18 | 5.97 | -13.89 | -14.31 | 0.42 | -13.55 |
| UGW-5 | 17-Oct-95 | 14:18 | 5.97 | -10.89 | -10.91 | 0.02 | -10.87 |
| MW-2 | 17-Oct-95 | 14:18 | 5.97 | -12.77 | -13.51 | 0.74 | -12.18 |
| PW-1 | 17-Oct-95 | 14:18 | 5.97 | -10.83 | -10.83 | 0.00 | -10.83 |

NOTE: WATER & PRODUCT LEVEL MEASUREMENTS ARE FROM TOP OF CASING (TOC)

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# TABLE 43
# US NAVY
# TOW WAY FUEL FACILITY
# ROOSEVELT ROADS, PUERTO RICO
# PW-3 PRODUCT RECOVERY RATES
## TV PROJECT # 110234
## STAGE 3

| DATE | TIME | RUN HOURS | SEP TANK PRODUCT LEVEL ft | SEP TANK WATER LEVEL ft | PRODUCT THICKNESS ft | PRODUCT GALLONS | PRODUCT GPH | PRODUC GPD | WATER GPD |
|---|---|---|---|---|---|---|---|---|---|
| 18-Oct-95 | 09:00 | 0 | 5.42 | 5.45 | 0.03 | 2.79 | 0 | 0 | |
| 18-Oct-95 | 10:30 | 1.5 | 5.41 | 5.45 | 0.04 | 3.72 | 0.62 | 14.9 | 0 |

# TABLE 44
## US NAVY
## TOW WAY FUEL FACILITY
## ROOSEVELT ROADS, PUERTO RICO
## PW-3 CAPTURE ZONE DATA
### TV PROJECT # 110234
### STAGE 3

| WELL NUMBER | DATE | TIME | RUN HOURS | PRODUCT LEVEL ft | WATER LEVEL ft | PRODUCT THICKNESS ft | PIEZOMETRIC SURFACE ft |
|---|---|---|---|---|---|---|---|
| PW-4 | 19-Oct-95 | 08:31 | 0 | -13.81 | -14.31 | 0.50 | -13.41 |
| PW-6 | 19-Oct-95 | 08:31 | 0 | -15.46 | -17.69 | 2.23 | -13.68 |
| PW-5 | 19-Oct-95 | 08:31 | 0 | -15.81 | -16.27 | 0.46 | -15.44 |
| MW-4 | 19-Oct-95 | 08:31 | 0 | -13.45 | -13.71 | 0.26 | -13.24 |
| UGW-1 | 19-Oct-95 | 08:31 | 0 | -13.37 | -14.25 | 0.88 | -12.67 |
| MW-3 | 19-Oct-95 | 08:31 | 0 | -14.08 | -15.40 | 1.32 | -13.02 |
| PW-3 | 19-Oct-95 | 08:45 | 0.23 | START | | | |
| PW-6 | 19-Oct-95 | 09:00 | 0.48 | -15.52 | -17.76 | 2.24 | -13.73 |
| PW-5 | 19-Oct-95 | 09:00 | 0.48 | -15.90 | -16.43 | 0.53 | -15.48 |
| MW-3 | 19-Oct-95 | 09:00 | 0.48 | -14.05 | -15.32 | 1.27 | -13.03 |
| UGW-1 | 19-Oct-95 | 09:00 | 0.48 | -13.39 | -14.27 | 0.88 | -12.69 |
| MW-4 | 19-Oct-95 | 09:00 | 0.48 | -13.46 | -13.72 | 0.26 | -13.25 |
| PW-3 | 19-Oct-95 | 09:10 | 0.65 | STOP | | | |
| PW-3 | 19-Oct-95 | 09:30 | 0.65 | START | | | |
| PW-3 | 19-Oct-95 | 10:30 | 1.65 | STOP | | | |
| PW-6 | 19-Oct-95 | 10:36 | 2.08 | -15.52 | -17.79 | 2.27 | -13.70 |
| PW-5 | 19-Oct-95 | 10:36 | 2.08 | -15.87 | -16.41 | 0.54 | -15.44 |
| MW-3 | 19-Oct-95 | 10:36 | 2.08 | -14.02 | -15.22 | 1.20 | -13.06 |
| UGW-1 | 19-Oct-95 | 10:36 | 2.08 | -13.42 | -14.30 | 0.88 | -12.72 |
| MW-4 | 19-Oct-95 | 10:36 | 2.08 | -13.46 | -13.74 | 0.28 | -13.24 |

NOTE: WATER & PRODUCT LEVEL MEASUREMENTS ARE FROM TOP OF CASING (TOC)

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# TABLE 45
# US NAVY
# TOW WAY FUEL FACILITY
# ROOSEVELT ROADS, PUERTO RICO
# PW-4 ENTRAINMENT TEST
## TV PROJECT # 110234
## STAGE 3

| DATE | TIME | RUN HOURS | PRODUCT LEVEL ft | WATER LEVEL ft | PRODUCT THICKNESS ft | PIEZOMETRI SURFACE ft | WELLHEAD VACUUM | DELTA-P | SCFM AIR FLOW |
|---|---|---|---|---|---|---|---|---|---|
| 18-Oct-95 | 08:30 | 0.00 | -13.81 | -14.31 | 0.50 | -13.91 | 0.00 | 0.00 | 0.00 |
| 18-Oct-95 | 15:20 | 6.83 | -13.75 | -14.26 | 0.51 | -13.85 | 0.00 | 0.00 | 0.00 |
| 18-Oct-95 | 15:28 | 6.97 | START | | | | 1.00 | 0.13 | 17.48 |
| 18-Oct-95 | 15:31 | 7.02 | -14.46 | -14.46 | 0.00 | -14.46 | 1.00 | 0.13 | 17.48 |
| 18-Oct-95 | 16:24 | 7.90 | -14.46 | -14.46 | 0.00 | -14.46 | 1.00 | 0.13 | 17.48 |
| 18-Oct-95 | 16:31 | 8.02 | STOP | | | | | | |

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# TABLE 46
# US NAVY
# TOW WAY FUEL FACILITY
# ROOSEVELT ROADS, PUERTO RICO
# PW-4 PRODUCT RECOVERY RATES
## TV PROJECT # 110234
## STAGE 3

| DATE | TIME | RUN HOURS | SEP TANK PRODUCT LEVEL ft | SEP TANK WATER LEVEL ft | PRODUCT THICKNESS ft | PRODUCT GALLONS | PRODUC GPH | PRODUCT GPD | WATER GPD |
|---|---|---|---|---|---|---|---|---|---|
| 18-Oct-95 | 15:28 | 0 | 5.36 | 5.44 | 0.08 | 7.44 | | | |
| 18-Oct-95 | 16:31 | 1.05 | 5.33 | 5.42 | 0.09 | 8.37 | 0.89 | 21.4 | 42.5 |

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# TABLE 23
# US NAVY
# TOW WAY FUEL FACILITY
# ROOSEVELT ROADS, PUERTO RICO
# PW-3 TEST
## TV PROJECT # 110234
## STAGE 2

| DATE | TIME | RUN HOURS | PRODUCT LEVEL ft | WATER LEVEL ft | PRODUCT THICKNESS ft | PIEZOMETRI SURFACE ft | WELLHEAD VACUUM | DELTA-P | SCFM AIR FLOW |
|---|---|---|---|---|---|---|---|---|---|
| 10-Oct-95 | 09:15 | 0.0 | -18.06 | -18.07 | 0.01 | -18.06 | 0 | | |
| 11-Oct-95 | 08:58 | 23.7 | -18.10 | -18.11 | 0.01 | -18.10 | 0 | | |
| 13-Oct-95 | 14:07 | 76.9 | -18.07 | -18.10 | 0.03 | -18.08 | 0 | | 0.0 |
| | 14:15 | 77.0 | START | VAC | | | 3 | 0.0625 | 11.9 |
| | 14:35 | 77.3 | -17.72 | -17.92 | 0.20 | -17.76 | 3 | 0.0625 | 11.9 |
| | 15:02 | 77.8 | -17.54 | -17.93 | 0.39 | -17.62 | 3 | 0.0625 | 11.9 |
| | 15:50 | 78.6 | -17.32 | -18.05 | 0.73 | -17.47 | 3 | 0.0625 | 11.9 |
| 14-Oct-95 | 08:53 | 95.6 | -16.88 | -18.05 | 1.17 | -17.11 | 3.1 | 0.0625 | 11.9 |
| | 10:30 | 97.3 | STOP | VAC | | | | | |

NOTE: WATER AND PRODUCT LEVEL MEASUREMENT ARE FROM TOP OF CASING (TOC)

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# TABLE 24
# US NAVY
# TOW WAY FUEL FACILITY
# ROOSEVELT ROADS, PUERTO RICO
# PW-3 VACUUM ROI TEST
## TV PROJECT # 110234
## STAGE 2

| WELL NUMBER | DATE | TIME | INCHES WATE | DISTANCE |
|---|---|---|---|---|
| PW-3 | 16-Oct-95 | 11:30 | 68.00 | 0.00 |
| MW-3 | 16-Oct-95 | 11:30 | 0.75 | 3.00 |
| | 16-Oct-95 | 11:30 | 0.1 | 10 |
| PW-5 | 16-Oct-95 | 11:30 | 0.00 | 13.00 |
| PW-6 | 16-Oct-95 | 11:30 | 0.00 | 9.00 |
| UGW-1 | 16-Oct-95 | 11:30 | 0.00 | 8.00 |
| MW-4 | 16-Oct-95 | 11:30 | 0.00 | 15.00 |

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# TABLE 25
# US NAVY
# TOW WAY FUEL FACILITY
# ROOSEVELT ROADS, PUERTO RICO
# PW-4 CAPTURE ZONE TEST

**TV PROJECT # 110234**
**STAGE 2**

| WELL NUMBER | DATE | TIME | RUN HOURS | PRODUCT LEVEL ft | WATER LEVEL ft | PRODUCT THICKNESS ft | PIEZOMETRI SURFACE ft |
|---|---|---|---|---|---|---|---|
| PW-4 | 12-Oct-95 | 15:29 | 54.2 | START | VAC | | |
| PW-6 | 12-Oct-95 | 15:52 | 54.63 | -16.45 | -16.55 | 0.10 | -16.47 |
| PW-5 | 12-Oct-95 | 15:52 | 54.63 | -19.43 | -19.47 | 0.04 | -19.44 |
| PW-3 | 12-Oct-95 | 15:52 | 54.63 | -18.26 | -18.27 | 0.01 | -18.26 |
| MW-4 | 12-Oct-95 | 15:52 | 54.63 | -13.42 | -14.60 | 1.18 | -13.66 |
| MW-3 | 12-Oct-95 | 15:52 | 54.63 | -14.67 | -16.15 | 1.48 | -14.97 |
| UGW-1 | 12-Oct-95 | 15:52 | 54.63 | -12.61 | -20.52 | 7.91 | -14.19 |
| PW-3 | 12-Oct-95 | 17:19 | 56.08 | -18.28 | -18.29 | 0.01 | -18.28 |
| PW-6 | 12-Oct-95 | 17:19 | 56.08 | -16.41 | -16.51 | 0.10 | -16.43 |
| PW-5 | 12-Oct-95 | 17:19 | 56.08 | -19.26 | -19.26 | 0.00 | -19.26 |
| MW-4 | 12-Oct-95 | 17:19 | 56.08 | -13.54 | -14.73 | 1.19 | -13.78 |
| MW-3 | 12-Oct-95 | 17:19 | 56.08 | -14.87 | -16.36 | 1.49 | -15.17 |
| UGW-1 | 12-Oct-95 | 17:19 | 56.08 | -18.76 | -18.86 | 0.10 | -18.78 |
| PW-3 | 13-Oct-95 | 08:27 | 71.21 | -18.28 | -18.29 | 0.01 | -18.28 |
| PW-6 | 13-Oct-95 | 08:27 | 71.21 | -16.27 | -16.51 | 0.24 | -16.32 |
| PW-5 | 13-Oct-95 | 08:27 | 71.21 | -19.44 | -19.44 | 0.00 | -19.44 |
| MW-4 | 13-Oct-95 | 08:27 | 71.21 | -13.42 | -14.46 | 1.04 | -13.63 |
| MW-3 | 13-Oct-95 | 08:27 | 71.21 | -14.53 | -15.87 | 1.34 | -14.80 |
| UGW-1 | 13-Oct-95 | 08:27 | 71.21 | -13.93 | -14.83 | 0.90 | -14.11 |
| PW-6 | 13-Oct-95 | 14:08 | 76.90 | -16.34 | -16.50 | 0.16 | -16.37 |
| PW-5 | 13-Oct-95 | 14:08 | 76.90 | -19.29 | -19.40 | 0.11 | -19.31 |
| PW-4 | 13-Oct-95 | 14:08 | 76.90 | -13.62 | -14.90 | 1.28 | -13.88 |
| MW-4 | 13-Oct-95 | 14:08 | 76.90 | -13.39 | -14.40 | 1.01 | -13.59 |
| MW-3 | 13-Oct-95 | 14:08 | 76.90 | -14.46 | -15.74 | 1.28 | -14.72 |
| UGW-1 | 13-Oct-95 | 14:08 | 76.90 | -13.72 | -14.62 | 0.90 | -13.90 |

NOTE: WATER AND PRODUCT LEVEL MEASUREMENT ARE FROM TOP OF CASING (TOC)

TERRA VAC

# TABLE 26
# US NAVY
# TOW WAY FUEL FACILITY
# ROOSEVELT ROADS, PUERTO RICO
# PW-4 TEST
## TV PROJECT # 110234
## STAGE 2

| DATE | TIME | RUN HOURS | PRODUCT LEVEL ft | WATER LEVEL ft | PRODUCT THICKNESS ft | PIEZOMETRI SURFACE ft | WELLHEAD VACUUM | TOTAL DELTA-P | TOTAL VAC | SCFM AIR FLOW |
|---|---|---|---|---|---|---|---|---|---|---|
| 10-Oct-95 | 09:15 | 0.0 | -14.28 | -14.28 | 0.00 | -14.28 | 0.00 | | | |
| 11-Oct-95 | 08:58 | 23.7 | -14.32 | -14.32 | 0.00 | -14.32 | 0.00 | | | |
| 12-Oct-95 | 13:50 | 52.6 | -15.85 | -15.85 | 0.00 | -15.85 | 0.00 | | | 0.0 |
| 12-Oct-95 | 15:29 | 54.2 | START | VAC | | | 2.50 | | | 0.0 |
| 12-Oct-95 | 15:50 | 54.6 | -15.52 | -15.55 | 0.03 | -15.53 | 2.50 | | | 0.0 |
| 12-Oct-95 | 17:17 | 56.0 | -15.70 | -15.94 | 0.24 | -15.75 | 2.50 | | | 0.0 |
| 13-Oct-95 | 08:24 | 71.2 | -14.19 | -15.55 | 1.36 | -14.46 | 2.50 | 0.0625 | | 12.0 |
| 13-Oct-95 | 14:08 | 76.9 | -13.62 | -14.90 | 1.28 | -13.88 | 2.50 | 0.0625 | | 12.0 |
| 13-Oct-95 | 14:33 | 77.3 | -13.70 | -14.97 | 1.27 | -13.95 | 2.80 | 0.0625 | | 12.0 |
| 13-Oct-95 | 15:00 | 77.8 | -13.80 | -15.18 | 1.38 | -14.08 | 2.80 | 0.0625 | | 12.0 |
| 14-Oct-95 | 08:55 | 95.7 | -13.73 | -15.27 | 1.54 | -14.04 | 3.00 | 0.0625 | | 11.9 |
| 14-Oct-95 | 14:00 | 100.7 | | | | | 3.70 | 0.75 | 4.00 | 40.8 |
| 14-Oct-95 | 14:20 | 101.1 | -13.86 | -15.15 | 1.29 | -14.12 | 3.80 | 0.75 | 4.00 | 40.7 |
| 15-Oct-95 | 10:45 | 121.5 | -13.35 | -13.54 | 0.19 | -13.39 | 3.8 | 0.50 | 4.00 | 33.2 |
| 15-Oct-95 | 16:50 | 127.6 | -12.66 | -13.8 | 1.14 | -12.89 | 3.8 | 0.50 | 4.00 | 33.2 |

NOTE: WATER AND PRODUCT LEVEL MEASUREMENT ARE FROM TOP OF CASING (TOC)

TERRA VAC

# TABLE 27
# US NAVY
# TOW WAY FUEL FACILITY
# ROOSEVELT ROADS, PUERTO RICO
# PW-5 TEST
## TV PROJECT # 110234
## STAGE 2

SCFM

| DATE | TIME | RUN HOURS | PRODUCT LEVEL ft | WATER LEVEL ft | PRODUCT THICKNESS ft | PIEZOMETRI SURFACE ft | WELLHEAD VACUUM | TOTAL DELTA-P | AIR FLOW |
|---|---|---|---|---|---|---|---|---|---|
| 10-Oct-95 | 09:15 | 0.00 | -18.95 | -18.95 | 0.00 | -18.95 | 0.00 | 0.00 | 0.00 |
| 11-Oct-95 | 08:58 | 23.72 | -18.98 | -18.99 | 0.01 | -18.98 | 0.00 | 0.00 | 0.00 |
| 12-Oct-95 | 10:47 | 49.53 | -19.30 | -19.30 | 0.00 | -19.30 | 0.00 | 0.00 | 0.00 |
| 12-Oct-95 | 10:49 | 49.57 | START | VAC | | | 3.00 | 0.13 | 16.86 |
| 12-Oct-95 | 11:04 | 49.82 | -19.22 | -19.32 | 0.10 | -19.24 | 3.00 | 0.125 | 16.86 |
| 12-Oct-95 | 11:32 | 50.28 | -19.31 | -19.51 | 0.20 | -19.35 | 3.00 | 0.125 | 16.86 |
| 12-Oct-95 | 13:53 | 52.63 | -19.38 | -19.39 | 0.01 | -19.38 | 3.00 | 0.125 | 16.86 |
| 12-Oct-95 | 15:38 | 54.38 | STOP | VAC | | | | | |

NOTE: WATER AND PRODUCT LEVEL MEASUREMENT ARE FROM TOP OF CASING (TOC)

TERRA VAC

# TABLE 28
# US NAVY
# TOW WAY FUEL FACILITY
# ROOSEVELT ROADS, PUERTO RICO
# PW-5 CAPTURE ZONE TEST
## TV PROJECT # 110234
## STAGE 2

| WELL NUMBER | DATE | TIME | RUN HOURS | PRODUCT LEVEL ft | WATER LEVEL ft | PRODUCT THICKNESS ft | PIEZOMETRI SURFACE ft |
|---|---|---|---|---|---|---|---|
| PW-6 | 12-Oct-95 | 09:56 | 48.7 | -16.35 | -16.35 | 0.00 | -16.35 |
| PW-3 | 12-Oct-95 | 09:56 | 48.7 | -18.16 | -18.17 | 0.01 | -18.16 |
| MW-3 | 12-Oct-95 | 09:56 | 48.7 | -14.31 | -15.73 | 1.42 | -14.59 |
| PW-5 | 12-Oct-95 | 09:56 | 48.7 | -19.26 | -19.27 | 0.01 | -19.26 |
| UGW-1 | 12-Oct-95 | 09:56 | 48.7 | -12.16 | -20.74 | 8.58 | -13.88 |
| PW-4 | 12-Oct-95 | 09:56 | 48.7 | -15.79 | -15.79 | 0.00 | -15.79 |
| MW-4 | 12-Oct-95 | 09:56 | 48.7 | -13.32 | -14.48 | 1.16 | -13.55 |
| PW-5 | 12-Oct-95 | 10:49 | 49.6 | START | VAC | | |
| PW-6 | 12-Oct-95 | 11:05 | 49.8 | -16.59 | -16.65 | 0.06 | -16.60 |
| PW-3 | 12-Oct-95 | 11:05 | 49.8 | -18.24 | -18.24 | 0.00 | -18.24 |
| PW-4 | 12-Oct-95 | 11:05 | 49.8 | -15.87 | -15.87 | 0.00 | -15.87 |
| MW-3 | 12-Oct-95 | 11:05 | 49.8 | -14.34 | -15.78 | 1.44 | -14.63 |
| UGW-1 | 12-Oct-95 | 11:05 | 49.8 | -12.28 | -20.75 | 8.47 | -13.97 |
| MW-4 | 12-Oct-95 | 11:05 | 49.8 | -13.34 | -14.51 | 1.17 | -13.57 |
| PW-6 | 12-Oct-95 | 11:32 | 50.3 | -16.70 | -16.71 | 0.01 | -16.70 |
| PW-3 | 12-Oct-95 | 11:32 | 50.3 | -18.27 | -18.28 | 0.01 | -18.27 |
| PW-4 | 12-Oct-95 | 11:32 | 50.3 | -15.85 | -15.85 | 0.00 | -15.85 |
| MW-4 | 12-Oct-95 | 11:32 | 50.3 | -13.35 | -14.53 | 1.18 | -13.59 |
| MW-3 | 12-Oct-95 | 11:32 | 50.3 | -14.38 | -15.84 | 1.46 | -14.67 |
| UGW-1 | 12-Oct-95 | 11:32 | 50.3 | -12.48 | -20.75 | 8.27 | -14.13 |
| PW-6 | 12-Oct-95 | 13:50 | 52.6 | -16.53 | -16.60 | 0.07 | -16.54 |
| PW-3 | 12-Oct-95 | 13:50 | 52.6 | -18.27 | -18.28 | 0.01 | -18.27 |
| PW-4 | 12-Oct-95 | 13:50 | 52.6 | -15.85 | -15.85 | 0.00 | -15.85 |
| MW-4 | 12-Oct-95 | 13:50 | 52.6 | -13.39 | -14.57 | 1.18 | -13.63 |
| MW-3 | 12-Oct-95 | 13:50 | 52.6 | -14.59 | -16.06 | 1.47 | -14.88 |
| UGW-1 | 12-Oct-95 | 13:50 | 52.6 | -12.70 | -20.57 | 7.87 | -14.27 |
| PW-5 | 12-Oct-95 | 15:38 | 54.38 | STOP | VAC | | |

NOTE: WATER AND PRODUCT LEVEL MEASUREMENT ARE FROM TOP OF CASING (TOC

# TABLE 29
## US NAVY
## TOW WAY FUEL FACILITY
## ROOSEVELT ROADS, PUERTO RICO
## PW-5 VACUUM ROI TEST
### TV PROJECT # 110234
### STAGE 2

| WELL NUMBER | DATE | TIME | INCHES WATER | DISTANCE IN FEET |
|---|---|---|---|---|
| PW-5 | 16-Oct-95 | 13:46 | 81.6 | 0 |
| MW-3 | 16-Oct-95 | 13:46 | 1.25 | 11 |
| blank | | | 0.1 | 20 |
| MW-4 | 16-Oct-95 | 13:46 | 0 | |
| UGW-1 | 16-Oct-95 | 13:46 | 0 | 5.5 |
| PW-3 | 16-Oct-95 | 13:46 | 0 | 13 |
| PW-6 | 16-Oct-95 | 13:46 | 0 | 9 |
| PW-4 | 16-Oct-95 | 13:46 | 0 | 24.5 |

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# TABLE 30
# US NAVY
# TOW WAY FUEL FACILITY
# ROOSEVELT ROADS, PUERTO RICO
# PW-6 TEST
## TV PROJECT # 110234
## STAGE 2

| DATE | TIME | RUN HOURS | PRODUCT LEVEL ft | WATER LEVEL ft | PRODUCT THICKNESS ft | PIEZOMETRI SURFACE ft | WELLHEAD VACUUM | TOTAL DELTA-P | TOTAL VACUUM | SCFM AIR FLOW |
|---|---|---|---|---|---|---|---|---|---|---|
| 10-Oct-95 | 09:15 | 0.00 | -16.73 | -16.74 | 0.01 | -16.73 | 0.00 | | | |
| 11-Oct-95 | 08:58 | 23.72 | -16.33 | -16.33 | 0.00 | -16.33 | 0.00 | | | |
| 14-Oct-95 | 10:31 | 97.27 | START | VAC | | | 3.50 | 0.625 | 4.00 | 37.4 |
| 14-Oct-95 | 10:46 | 97.52 | -16.57 | -16.62 | 0.05 | -16.58 | 4.00 | 0.625 | 4.00 | 37.0 |
| 14-Oct-95 | 11:00 | 97.75 | PUMP MOVED TO PRODUCT | | | | | | | |
| 14-Oct-95 | 11:30 | 98.25 | -16.59 | -16.79 | 0.20 | -16.63 | 4.00 | | | |
| 14-Oct-95 | 13:45 | 100.50 | -16.35 | -16.48 | 0.13 | -16.38 | 4.00 | 0.75 | 4.00 | 40.5 |
| 14-Oct-95 | 16:00 | 102.75 | -15.86 | -15.99 | 0.13 | -15.89 | 4.00 | | 4.00 | |

NOTE: WATER AND PRODUCT LEVEL MEASUREMENT ARE FROM TOP OF CASING (TOC)

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# TABLE 31
# US NAVY
# TOW WAY FUEL FACILITY
# ROOSEVELT ROADS, PUERTO RICO
# PW-6 VACUUM ROI TEST
## TV PROJECT # 110234
## STAGE 2

| WELL NUMBER | DATE | TIME | INCHES WATER | DISTANCE IN FEET |
|---|---|---|---|---|
| PW-6 | 16-Oct-95 | 11:00 | 61.20 | 0.00 |
| PW-5 | 16-Oct-95 | 11:00 | 0.00 | 9.00 |
| PW-3 | 16-Oct-95 | 11:00 | 0.00 | 9.00 |
| MW-3 | 16-Oct-95 | 11:00 | 0.00 | 11.00 |
| UGW-1 | 16-Oct-95 | 11:00 | 0.00 | 14.00 |
| MW-4 | 16-Oct-95 | 11:00 | 0.00 | 17.00 |
| PW-4 | 16-Oct-95 | 11:00 | N/A | 33.00 |

# TABLE 32
## US NAVY
## TOW WAY FUEL FACILITY
## ROOSEVELT ROADS, PUERTO RICO
## PW-6 CAPTURE ZONE TEST
### TV PROJECT # 110234
### STAGE 2

| WELL NUMBER | DATE | TIME | RUN HOURS | PRODUCT LEVEL ft | WATER LEVEL ft | PRODUCT THICKNESS ft | PIEZOMETRIC SURFACE ft |
|---|---|---|---|---|---|---|---|
| PW-6 | 14-Oct-95 | 10:31 | 97.27 | START | VAC | | |
| PW-5 | 14-Oct-95 | 10:47 | 97.53 | -19.43 | -19.44 | 0.01 | -19.43 |
| PW-3 | 14-Oct-95 | 10:47 | 97.53 | -17.48 | -18.17 | 0.69 | -17.62 |
| PW-4 | 14-Oct-95 | 10:47 | 97.53 | -13.96 | -15.26 | 1.30 | -14.22 |
| MW-4 | 14-Oct-95 | 10:47 | 97.53 | -13.40 | -14.48 | 1.08 | -13.62 |
| MW-3 | 14-Oct-95 | 10:47 | 97.53 | -14.63 | -16.10 | 1.47 | -14.92 |
| UGW-1 | 14-Oct-95 | 10:47 | 97.53 | -13.88 | -14.77 | 0.89 | -14.06 |
| PW-3 | 14-Oct-95 | 11:31 | 98.27 | -18.07 | -18.08 | 0.01 | -18.07 |
| PW-5 | 14-Oct-95 | 11:31 | 98.27 | -19.32 | -19.32 | 0.00 | -19.32 |
| PW-4 | 14-Oct-95 | 11:31 | 98.27 | -13.97 | -15.37 | 1.40 | -14.25 |
| MW-4 | 14-Oct-95 | 11:31 | 98.27 | -13.39 | -14.45 | 1.06 | -13.60 |
| MW-3 | 14-Oct-95 | 11:31 | 98.27 | -14.62 | -16.06 | 1.44 | -14.91 |
| UGW-1 | 14-Oct-95 | 11:31 | 98.27 | -13.86 | -14.75 | 0.89 | -14.04 |
| PW-5 | 14-Oct-95 | 13:46 | 100.52 | -19.37 | -19.37 | 0.00 | -19.37 |
| PW-3 | 14-Oct-95 | 13:46 | 100.52 | -18.08 | -18.08 | 0.00 | -18.08 |
| PW-4 | 14-Oct-95 | 13:46 | 100.52 | -14.04 | -15.32 | 1.28 | -14.30 |
| MW-4 | 14-Oct-95 | 13:46 | 100.52 | -13.34 | -14.35 | 1.01 | -13.54 |
| MW-3 | 14-Oct-95 | 13:46 | 100.52 | -14.57 | -15.95 | 1.38 | -14.85 |
| UGW-1 | 14-Oct-95 | 13:46 | 100.52 | -13.80 | -14.68 | 0.88 | -13.98 |
| PW-3 | 14-Oct-95 | 16:01 | 102.77 | -18.26 | -18.26 | 0.00 | -18.26 |
| PW-5 | 14-Oct-95 | 16:01 | 102.77 | -19.39 | -19.39 | 0.00 | -19.39 |
| PW-4 | 14-Oct-95 | 16:01 | 102.77 | -13.26 | -13.78 | 0.52 | -13.36 |
| MW-4 | 14-Oct-95 | 16:01 | 102.77 | -13.33 | -14.33 | 1.00 | -13.53 |
| MW-3 | 14-Oct-95 | 16:01 | 102.77 | -14.53 | -15.88 | 1.35 | -14.80 |
| UGW-1 | 14-Oct-95 | 16:01 | 102.77 | -13.78 | -14.66 | 0.88 | -13.96 |

NOTE: WATER AND PRODUCT LEVEL MEASUREMENT ARE FROM TOP OF CASING (TOC)

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# TABLE 33
# US NAVY
# TOW WAY FUEL FACILITY
# ROOSEVELT ROADS, PUERTO RICO
# MW-1 VACUUM ROI TEST
## TV PROJECT # 110234
## STAGE 2

| WELL NUMBER | DATE | TIME | WELLHEAD INCHES WATER | DISTANCE IN FEET |
|---|---|---|---|---|
| MW-1 | 16-Oct-95 | 08:40 | 68.000 | 0.00 |
| PW-2 | 16-Oct-95 | 08:40 | 0.125 | 10.25 |
| UGW-5 | 16-Oct-95 | 08:40 | 3.750 | 23.00 |
| | 16-Oct-95 | 08:40 | 0.010 | 70.00 |
| UGW-22 | 16-Oct-95 | 08:40 | 0.000 | 20.50 |
| PW-1 | 16-Oct-95 | 08:40 | 0.000 | 21.00 |
| MW-2 | 16-Oct-95 | 08:40 | 0.000 | 24.00 |

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# TABLE 34
# US NAVY
# TOW WAY FUEL FACILITY
# ROOSEVELT ROADS, PUERTO RICO
# MW-1 CAPTURE ZONE TEST

**TV PROJECT # 110234**
**STAGE 2**

| WELL NUMBER | DATE | TIME | PRODUC LEVEL ft | WATER LEVEL ft | PRODUCT THICKNESS ft | PIEZOMETRIC SURFACE ft | VACUUM |
|---|---|---|---|---|---|---|---|
| MW-1 | 16-Oct-95 | 08:00 | START | VAC | | | 5 |
| PW-2 | 16-Oct-95 | 08:15 | -12.07 | -12.11 | -0.04 | -12.14 | 4.2 |
| PW-1 | 16-Oct-95 | 08:15 | -6 | -6 | 0 | -6.00 | |
| UGW-22 | 16-Oct-95 | 08:15 | NA | NA | | | 0.125 |
| MW-2 | 16-Oct-95 | 08:15 | NA | NA | | | 0.03125 |
| UGW-5 | 16-Oct-95 | 08:15 | NA | NA | | | 0 |

NOTE: WATER AND PRODUCT LEVEL MEASUREMENT ARE FROM TOP OF CASING (T

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# TABLE 35
## US NAVY
## TOW WAY FUEL FACILITY
## ROOSEVELT ROADS, PUERTO RICO
## RECOVERY RATES TEST
### TV PROJECT # 110234
### STAGE 2

| WELL NUMBER | DATE | TIME | RUN HOURS | TOTAL RATE GPD | PRODUCT RATE GPD | WELLHEAD INCH Hg VACUUM |
|---|---|---|---|---|---|---|
| PW-1 | 30-Sep-95 | 17:40 | 0 | 21.0 | 2.3 | 0 |
| PW-1 | 11-Oct-95 | 12:00 | 258 | 0.0 | 0.0 | 0 |
| PW-1 | 11-Oct-95 | 15:55 | 262 | 9.0 | 0.0 | 0 |
| PW-1 | 11-Oct-95 | 16:25 | 263 | START | | 3 |
| PW-1 | 11-Oct-95 | 17:33 | 264 | 22.5 | 0.0 | 3 |
| PW-1 | 12-Oct-95 | 14:50 | 285 | 22.5 | | 3 |
| PW-1 | 13-Oct-95 | 10:05 | 304 | 5.5 | | 3 |
| PW-1 | 14-Oct-95 | 10:20 | 329 | 43.2 | 0.4 | 3 |
| PW-1 | 26-Sep-95 | 14:45 | 333 | 18.7 | 0.0 | 4 |
| PW-1 | 22-Oct-95 | 09:10 | 519 | 19.7 | 0.0 | 0 |
| PW-2 | 30-Sep-95 | 17:40 | 0 | 60.0 | 0.0 | 0 |
| PW-2 | 11-Oct-95 | 12:00 | 258 | 29.3 | 1.2 | 0 |
| PW-2 | 11-Oct-95 | 15:55 | 262 | 12.7 | 0.7 | 0 |
| PW-2 | 12-Oct-95 | 16:25 | 287 | 28.1 | 0.0 | 3 |
| PW-2 | 13-Oct-95 | 10:05 | 304 | 28.8 | 0.0 | 3 |
| PW-2 | 14-Oct-95 | 10:20 | 329 | 53.5 | 28.1 | 3 |
| PW-2 | 15-Oct-95 | 17:15 | 360 | 34.1 | 1.0 | 3 |
| PW-2 | 22-Oct-95 | 09:10 | 519 | 25.0 | 0.6 | 0 |
| PW-3 | 30-Sep-95 | 17:40 | 0 | 3.0 | 0.7 | 0 |
| PW-3 | 11-Oct-95 | 12:00 | 258 | 9.8 | 2.3 | 0 |
| PW-3 | 11-Oct-95 | 15:55 | 262 | 9.8 | 2.3 | 0 |
| PW-3 | 13-Oct-95 | 10:00 | 304 | 9.8 | 2.4 | 0 |
| PW-3 | 13-Oct-95 | 15:30 | 310 | 32.2 | 0.5 | 3 |
| PW-3 | 14-Oct-95 | 10:08 | 328 | 32.6 | 6.7 | 3 |
| PW-3 | 15-Oct-95 | 12:00 | 354 | 29.5 | 4.8 | 3 |
| PW-3 | 22-Oct-95 | 09:10 | 519 | 10.1 | 0.0 | 0 |
| PW-4 | 30-Sep-95 | 17:40 | 0 | 27.1 | 2.4 | 0 |
| PW-4 | 11-Oct-95 | 12:00 | 258 | 21.4 | 1.9 | 0 |
| PW-4 | 12-Oct-95 | 16:29 | 287 | 46.6 | 0.2 | 2.5 |
| PW-4 | 13-Oct-95 | 10:00 | 304 | 47.5 | 5.3 | 2.5 |
| PW-4 | 14-Oct-95 | 10:08 | 328 | 47.3 | 8.9 | 3 |
| PW-4 | 15-Oct-95 | 12:00 | 354 | 41.5 | 0.6 | 4 |
| PW-4 | 22-Oct-95 | 09:10 | 519 | 30.7 | 2.9 | 0 |
| PW-5 | 30-Sep-95 | 17:40 | 0 | 14.2 | 4.1 | 0 |
| PW-5 | 11-Oct-95 | 12:00 | 258 | 8.6 | 2.6 | 0 |
| PW-5 | 12-Oct-95 | 12:15 | 283 | 30.7 | 7.9 | 3 |
| PW-5 | 13-Oct-95 | 10:00 | 304 | 9.1 | 2.3 | 0 |
| PW-5 | 14-Oct-95 | 10:08 | 328 | 11.5 | 2.1 | 0 |
| PW-5 | 15-Oct-95 | 12:00 | 354 | 26.6 | 7.2 | 4 |
| PW-5 | 22-Oct-95 | 09:10 | 519 | 33.6 | 1.9 | 0 |
| PW-6 | 30-Sep-95 | 17:40 | 0 | 7.7 | 3.4 | 0 |
| PW-6 | 11-Oct-95 | 12:00 | 258 | 3.0 | 2.4 | 0 |
| PW-6 | 13-Oct-95 | 10:00 | 304 | 1.9 | 1.5 | 0 |
| PW-6 | 14-Oct-95 | 10:08 | 328 | 8.6 | 6.0 | 3 |
| PW-6 | 14-Oct-95 | 12:16 | 331 | 30.7 | 11.3 | 4 |
| PW-6 | 15-Oct-95 | 12:00 | 354 | 11.3 | 4.1 | 4 |
| PW-6 | 22-Oct-95 | 09:10 | 519 | 33.8 | 0.7 | 0 |
| MW-1 | 30-Sep-95 | 17:40 | 0 | 3.0 | 2.3 | 0 |
| MW-1 | 11-Oct-95 | 15:55 | 262 | 6.0 | 3.8 | 0 |
| MW-1 | 13-Oct-95 | 10:05 | 304 | 3.8 | 2.3 | 0 |
| MW-1 | 14-Oct-95 | 10:08 | 328 | 4.1 | 3.0 | 0 |
| MW-1 | 14-Oct-95 | 15:05 | 333 | 28.6 | 15.4 | 4 |
| MW-1 | 15-Oct-95 | 12:00 | 354 | 21.6 | 11.8 | 4 |
| MW-1 | 15-Oct-95 | 17:15 | 360 | 20.6 | 11.5 | 4 |

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# TABLE 36
# US NAVY
# TOW WAY FUEL FACILITY
# ROOSEVELT ROADS, PUERTO RICO
# PW-1 CAPTURE ZONE DATA

**TV PROJECT # 110234**
**STAGE 3**

| WELL NUMBER | DATE | TIME | RUN HOURS | PRODUC LEVEL ft | WATER LEVEL ft | PRODUCT THICKNESS ft | PIEZOMETRI SURFACE ft |
|---|---|---|---|---|---|---|---|
| MW-1 | 17-Oct-95 | 14:18 | 0.00 | -13.89 | -14.31 | 0.42 | -13.97 |
| UGW-22 | 17-Oct-95 | 14:18 | 0.00 | -10.89 | -10.91 | 0.02 | -10.89 |
| MW-2 | 17-Oct-95 | 14:18 | 0.00 | -12.77 | -13.51 | 0.74 | -12.92 |
| PW-2 | 17-Oct-95 | 14:18 | 0.00 | -15.18 | -15.29 | 0.11 | -15.20 |
| PW-1 | 17-Oct-95 | 14:25 | 0.12 | START | | | |
| PW-2 | 17-Oct-95 | 15:08 | 0.83 | -15.14 | -15.32 | 0.18 | -15.18 |
| UGW-22 | 17-Oct-95 | 15:08 | 0.83 | -10.91 | -10.92 | 0.01 | -10.91 |
| MW-1 | 17-Oct-95 | 15:08 | 0.83 | -13.73 | -14.23 | 0.50 | -13.83 |
| MW-2 | 17-Oct-95 | 15:08 | 0.83 | -12.73 | -13.41 | 0.68 | -12.87 |
| UGW-5 | 17-Oct-95 | 15:08 | 0.83 | -12.91 | -12.93 | 0.02 | -12.91 |
| PW-1 | 17-Oct-95 | 15:15 | 0.95 | STOP | | | |

NOTE: WATER & PRODUCT LEVEL MEASUREMENTS ARE FROM TOP OF CASING (TOC)

TERRA VAC

# STAGE 3
# US NAVY
# TOW WAY FUEL FACILITY
# ROOSEVELT ROADS, PUERTO RICO
# PW-1 ENTRAINMENT TEST
## TV PROJECT # 110234
## TABLE 37

| TIME | RUN HOURS | PRODUCT LEVEL ft | WATER LEVEL ft | PRODUCT THICKNESS ft | PIEZOMETRI SURFACE ft | WELLHEAD VACUUM | DELTA-P | SCFM AIR FLOW |
|---|---|---|---|---|---|---|---|---|
| 14:18 | 0.00 | -10.83 | -10.83 | 0.00 | -10.83 | 0.00 | | 0.00 |
| 14:25 | 0.12 | START | | | | 2.00 | | 0.00 |
| 15:05 | 0.78 | -10.67 | -10.67 | 0.00 | -10.67 | 2.50 | | 0.00 |
| 15:15 | 0.95 | STOP | | | | 0.00 | | 0.00 |
| 15:20 | 1.03 | START | INSERT TUBE 4' BELOW WATER | | | | | |
| 15:20 | 1.03 | -11.13 | -11.13 | 0.00 | -11.13 | 2.50 | | 0.00 |
| 15:40 | 1.37 | -15.1 | -15.1 | 0.00 | -15.10 | 2.50 | | 0.00 |
| 16:05 | 1.78 | -15.1 | -15.1 | 0.00 | -15.10 | 2.50 | | 0.00 |
| 16:06 | 1.80 | STOP | | | | | | |

ER & PRODUCT LEVEL MEASUREMENTS ARE FROM TOP OF CASING (TOC)

TERRA VAC

**TABLE 1**
**US NAVY**
**TOW WAY FUEL FACILITY**
**ROOSEVELT ROADS, PUERTO RICO**
**PW-1 PRODUCT ONLY PUMP TEST**
**TV PROJECT # 110234**
**STAGE 1**

| DATE | TIME | RUN HOURS | PRODUCT LEVEL ft | WATER LEVEL ft | PRODUCT THICKNESS ft | PIEZOMETRI SURFACE ft |
|---|---|---|---|---|---|---|
| 29-Sep-95 | 08:40 | 0.00 | -8.60 | -8.63 | 0.03 | -8.61 |
| 29-Sep-95 | 12:05 | 3.42 | -8.63 | -8.66 | 0.03 | -8.64 |
| 29-Sep-95 | 15:35 | 6.92 | -8.63 | -8.66 | 0.03 | -8.64 |
| 30-Sep-95 | 08:40 | 24.00 | -8.71 | -8.75 | 0.04 | -8.72 |
| 30-Sep-95 | 08:45 | 24.08 | START | | | |
| 30-Sep-95 | 16:45 | 32.08 | -9.02 | -9.05 | 0.03 | -9.03 |
| 01-Oct-95 | 09:00 | 48.33 | -9.22 | -9.22 | 0.00 | -9.22 |

NOTE: WATER & PRODUCT LEVELS ARE RECORDED FROM TOP OF CASING

TERRA VAC

**TABLE 2**
**US NAVY**
**TOW WAY FUEL FACILITY**
**ROOSEVELT ROADS, PUERTO RICO**
**PW-1 CAPTURE ZONE TEST**
**TV PROJECT # 110234**
**STAGE 1**

| WELL NUMBER | DATE | TIME | RUN HOURS | PRODUCT LEVEL ft | WATER LEVEL ft | PRODUCT THICKNESS ft |
|---|---|---|---|---|---|---|
| | 29-Sep-95 | 08:40 | 0.00 | | | |
| PW-2 | 29-Sep-95 | 12:05 | 3.42 | -11.52 | -12.02 | 0.5 |
| MW-2 | 29-Sep-95 | 12:05 | 3.42 | -11.60 | -12.34 | 0.74 |
| UGW-22 | 29-Sep-95 | 12:05 | 3.42 | -9.82 | -9.82 | 0.00 |
| UGW-5 | 29-Sep-95 | 12:05 | 3.42 | -12.06 | -12.06 | 0.00 |
| PW-2 | 29-Sep-95 | 15:35 | 6.92 | -14.96 | -14.98 | 0.02 |
| MW-2 | 29-Sep-95 | 15:36 | 6.93 | -12.53 | -13.26 | 0.73 |
| UGW-22 | 29-Sep-95 | 15:36 | 6.93 | -9.95 | -9.95 | 0.00 |
| UGW-5 | 29-Sep-95 | 15:36 | 6.93 | -12.02 | -12.08 | 0.06 |
| MW-2 | 30-Sep-95 | 08:40 | 24.00 | -12.98 | -13.89 | 0.91 |
| PW-2 | 30-Sep-95 | 08:40 | 24.00 | -15.20 | -15.23 | 0.03 |
| UGW-22 | 30-Sep-95 | 08:40 | 24.00 | -10.50 | -10.50 | 0.00 |
| UGW-5 | 30-Sep-95 | 08:40 | 24.00 | -12.23 | -12.27 | 0.04 |
| PW-1 | 30-Sep-95 | 08:45 | 24.08 | START | | |
| UGW-22 | 30-Sep-95 | 16:45 | 32.08 | -10.55 | -10.55 | 0.00 |
| MW-2 | 30-Sep-95 | 16:45 | 32.08 | -12.97 | -13.85 | 0.88 |
| PW-2 | 30-Sep-95 | 16:45 | 32.08 | -14.89 | -14.91 | 0.02 |
| UGW-5 | 30-Sep-95 | 16:45 | 32.08 | -12.31 | -12.36 | 0.05 |
| UGW-22 | 01-Oct-95 | 09:00 | 48.33 | -10.57 | -10.57 | 0.00 |
| MW-2 | 01-Oct-95 | 09:00 | 48.33 | -12.63 | -13.20 | 0.57 |
| PW-2 | 01-Oct-95 | 09:00 | 48.33 | -13.84 | -14.09 | 0.25 |
| MW-1 | 01-Oct-95 | 09:00 | 48.33 | -12.69 | -12.95 | 0.26 |
| UGW-5 | 01-Oct-95 | 09:00 | 48.33 | -12.45 | -12.95 | 0.50 |

NOTE: WATER & PRODUCT LEVELS ARE RECORDED FROM TOP OF CASING

TERRA VAC

**TABLE 3**
**US NAVY**
**TOW WAY FUEL FACILITY**
**ROOSEVELT ROADS, PUERTO RICO**
**PW-2 PRODUCT ONLY PUMP TEST**
**TV PROJECT # 110234**
**STAGE 1**

| DATE | TIME | RUN HOURS | PRODUCT LEVEL ft | WATER LEVEL ft | PRODUCT THICKNESS ft | PIEZOMETRI SURFACE ft |
|---|---|---|---|---|---|---|
| 24-Sep-95 | 11:23 | 0 | -10.80 | -11.95 | 1.15 | -11.03 |
| | 12:53 | 1.50 | -11.91 | -12.00 | 0.09 | -11.93 |
| 25-Sep-95 | 08:27 | 21.07 | -11.12 | -11.61 | 0.49 | -11.22 |
| START | 08:47 | 21.40 | -12.05 | -12.17 | 0.12 | -12.07 |
| | 09:30 | 22.12 | -12.40 | -12.43 | 0.03 | -12.41 |
| | 10:00 | 22.62 | -12.16 | -12.16 | 0.00 | -12.16 |
| | 11:00 | 23.62 | -12.46 | -12.49 | 0.03 | -12.47 |
| | 12:15 | 24.87 | -12.43 | -12.44 | 0.01 | -12.43 |
| | 13:20 | 25.95 | -12.28 | -12.31 | 0.03 | -12.29 |
| | 16:52 | 29.48 | -13.40 | -13.42 | 0.02 | -13.40 |
| 26-Sep | 07:35 | 44.20 | -13.38 | -13.39 | 0.01 | -13.38 |
| | 10:50 | 47.45 | STOP | | | |

NOTE: WATER & PRODUCT LEVELS ARE RECORDED FROM TOP OF CASING

(1) NOTE: PW-2 was pumped then allowed to recharge over night

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# TABLE 4
## US NAVY
## TOW WAY FUEL FACILITY
## ROOSEVELT ROADS, PUERTO RICO
## PW-2 CAPTURE ZONE TEST
### TV PROJECT # 110234
### STAGE 1

| WELL NUMBER | DATE | RUN HOURS | PRODUCT LEVEL ft | WATER LEVEL ft | PRODUCT THICKNESS ft | PIEZOMETRI SURFACE ft |
|---|---|---|---|---|---|---|
| UGW-22 | 25-Sep-95 | 20.95 | -9.32 | -9.32 | 0.00 | -9.32 |
| UGW-5 | 25-Sep-95 | 20.95 | -10.72 | -10.81 | 0.09 | -10.74 |
| MW-2 | 25-Sep-95 | 20.95 | -10.45 | -10.94 | 0.49 | -10.55 |
| PW-1 | 25-Sep-95 | 20.95 | -8.25 | -8.42 | 0.17 | -8.28 |
| PW-2 | 25-Sep-95 | 20.95 | -11.12 | -11.61 | 0.49 | -11.22 |
| MW-1 | 25-Sep-95 | 20.95 | -9.75 | -16.60 | 6.85 | -11.12 |
| PW-2 | 25-Sep-95 | 21.40 | start | | | |
| PW-1 | 25-Sep-95 | 21.62 | -8.25 | -8.43 | 0.18 | -8.29 |
| MW-2 | 25-Sep-95 | 21.62 | -10.50 | -10.96 | 0.46 | -10.59 |
| UGW-5 | 25-Sep-95 | 21.62 | -10.72 | -10.81 | 0.09 | -10.74 |
| UGW-22 | 25-Sep-95 | 21.62 | -9.33 | -9.33 | 0.00 | -9.33 |
| MW-1 | 25-Sep-95 | 21.62 | -9.75 | -16.60 | 6.85 | -11.12 |
| PW-1 | 25-Sep-95 | 22.13 | -8.25 | -8.41 | 0.16 | -8.28 |
| MW-2 | 25-Sep-95 | 22.13 | -10.62 | -11.09 | 0.47 | -10.71 |
| UGW-5 | 25-Sep-95 | 21.13 | -10.72 | -10.79 | 0.07 | -10.73 |
| UGW-22 | 25-Sep-95 | 21.13 | -9.33 | -9.33 | 0.00 | -9.33 |
| MW-1 | 25-Sep-95 | 21.13 | -9.75 | -16.60 | 6.85 | -11.12 |
| PW-1 | 25-Sep-95 | 22.67 | -8.25 | -8.44 | 0.19 | -8.29 |
| MW-2 | 25-Sep-95 | 22.67 | -10.74 | -11.21 | 0.47 | -10.83 |
| UGW-5 | 25-Sep-95 | 22.67 | -10.72 | -10.79 | 0.07 | -10.73 |
| UGW-22 | 25-Sep-95 | 22.67 | -9.33 | -9.33 | 0.00 | -9.33 |
| MW-1 | 25-Sep-95 | 22.67 | -9.75 | -10.79 | 1.04 | -9.96 |
| PW-1 | 25-Sep-95 | 23.82 | -8.27 | -8.41 | 0.14 | -8.30 |
| MW-2 | 25-Sep-95 | 23.82 | -10.91 | -11.40 | 0.49 | -11.01 |
| UGW-5 | 25-Sep-95 | 23.82 | -10.75 | -10.82 | 0.07 | -10.76 |
| UGW-22 | 25-Sep-95 | 23.82 | -9.35 | -9.35 | 0.00 | -9.35 |
| MW-1 | 25-Sep-95 | 23.82 | -9.75 | -16.65 | 6.90 | -11.13 |
| PW-1 | 25-Sep-95 | 24.77 | -8.27 | -8.43 | 0.16 | -8.30 |
| MW-2 | 25-Sep-95 | 24.77 | -11.01 | -11.53 | 0.52 | -11.11 |
| UGW-5 | 25-Sep-95 | 24.77 | -10.79 | -10.85 | 0.06 | -10.80 |
| UGW-22 | 25-Sep-95 | 24.77 | -9.33 | -9.33 | 0.00 | -9.33 |
| MW-1 | 25-Sep-95 | 24.77 | -9.77 | -16.63 | 6.86 | -11.14 |
| PW-1 | 25-Sep-95 | 26.03 | -8.27 | -8.46 | 0.19 | -8.31 |
| MW-2 | 25-Sep-95 | 26.03 | -11.09 | -11.59 | 0.50 | -11.19 |
| UGW-5 | 25-Sep-95 | 26.03 | -10.82 | -10.90 | 0.08 | -10.84 |
| UGW-22 | 25-Sep-95 | 26.03 | -9.38 | -9.38 | 0.00 | -9.38 |
| PW-1 | 26-Sep-95 | 44.28 | -8.37 | -8.38 | 0.01 | -8.37 |
| MW-2 | 26-Sep-95 | 44.28 | -12.01 | -12.73 | 0.72 | -12.15 |
| UGW-22 | 26-Sep-95 | 44.28 | -9.73 | -9.73 | 0.00 | -9.73 |
| UGW-5 | 26-Sep-95 | 44.28 | -11.20 | -11.28 | 0.08 | -11.22 |
| MW-1 | 26-Sep-95 | 44.28 | -10.06 | -16.67 | 6.61 | -11.38 |
| PW-2 | 26-Sep-95 | 47.45 | stop | | | |
| MW-1 | 26-Sep-95 | 48.78 | -13.47 | -15.80 | 2.33 | -13.94 |
| MW-1 | 26-Sep-95 | 49.78 | -12.92 | -15.75 | 2.83 | -13.49 |
| PW-2 | 26-Sep-95 | 49.78 | -12.58 | -12.68 | 0.10 | -12.60 |
| PW-1 | 26-Sep-95 | 49.78 | -8.41 | -8.42 | 0.01 | -8.41 |
| PW-1 | 26-Sep-95 | 53.40 | -8.41 | -8.44 | 0.03 | -8.42 |
| UGW-22 | 26-Sep-95 | 53.40 | -9.78 | -9.78 | 0.00 | -9.78 |
| MW-2 | 26-Sep-95 | 53.40 | -11.60 | -11.98 | 0.38 | -11.68 |
| PW-2 | 26-Sep-95 | 53.40 | -12.17 | -12.30 | 0.13 | -12.20 |
| MW-1 | 26-Sep-95 | 53.40 | -12.08 | -15.67 | 3.59 | -12.80 |
| UGW-5 | 26-Sep-95 | 53.40 | -11.30 | -11.35 | 0.05 | -11.31 |
| PW-2 | 27-Sep-95 | 69.20 | -11.63 | -11.88 | 0.25 | -11.68 |
| MW-2 | 27-Sep-95 | 69.20 | -11.00 | -11.29 | 0.29 | -11.06 |
| PW-1 | 27-Sep-95 | 69.20 | -8.45 | -8.45 | 0.00 | -8.45 |

NOTE: WATER & PRODUCT LEVELS ARE RECORDED FROM TOP OF CASING

TERRA VAC

**TABLE 5**
**US NAVY**
**TOW WAY FUEL FACILITY**
**ROOSEVELT ROADS, PUERTO RICO**
**PW-3 PRODUCT ONLY PUMP TEST**
**TV PROJECT # 110234**
**STAGE 1**

| DATE | TIME | RUN HOURS | PRODUCT LEVEL ft | WATER LEVEL ft | PRODUCT THICKNESS ft | PIEZOMETRI SURFACE ft |
|---|---|---|---|---|---|---|
| 28-Sep-95 | 09:10 | 0.00 | -13.95 | -14.39 | 0.44 | -14.04 |
| 28-Sep-95 | 11:45 | 2.58 | -14.03 | -14.53 | 0.50 | -14.13 |
| 28-Sep-95 | 15:00 | 5.83 | -14.08 | -14.62 | 0.54 | -14.19 |
| 28-Sep-95 | 17:35 | 8.42 | -14.10 | -14.70 | 0.60 | -14.22 |
| 29-Sep-95 | 08:30 | 23.33 | -14.25 | -14.97 | 0.72 | -14.39 |
| 29-Sep-95 | 11:55 | 26.75 | START | | | |
| 29-Sep-95 | 11:55 | 26.75 | -16.72 | -16.72 | 0.00 | -16.72 |
| 29-Sep-95 | 15:30 | 30.33 | -16.85 | -16.85 | 0.00 | -16.85 |
| 30-Sep-95 | 08:45 | 47.58 | -16.90 | -16.90 | 0.00 | -16.90 |
| 30-Sep-95 | 16:55 | 55.75 | -16.90 | -16.91 | 0.01 | -16.90 |
| 01-Oct-95 | 09:10 | 72.00 | -16.86 | -16.86 | 0.00 | -16.86 |

NOTE: WATER & PRODUCT LEVELS ARE RECORDED FROM TOP OF CASING

TERRA VAC

# TABLE 6
## US NAVY
## TOW WAY FUEL FACILITY
## ROOSEVELT ROADS, PUERTO RICO
## PW-3 CAPTURE ZONE TEST
### TV PROJECT # 110234
### STAGE 1

| WELL NUMBER | DATE | TIME | RUN HOURS | PRODUCT LEVEL ft | WATER LEVEL ft | PRODUCT THICKNESS ft | PIEZOMETRIC SURFACE ft |
|---|---|---|---|---|---|---|---|
| PW-6 | 28-Sep-95 | 09:10 | 0 | -13.43 | -17.40 | 3.97 | -14.22 |
| MW-3 | 28-Sep-95 | 09:10 | 0 | -13.76 | -14.55 | 0.79 | -13.92 |
| PW-5 | 28-Sep-95 | 09:10 | 0 | -13.33 | -15.82 | 2.49 | -13.83 |
| MW-4 | 28-Sep-95 | 09:10 | 0 | -12.90 | -13.30 | 0.40 | -12.98 |
| PW-4 | 28-Sep-95 | 09:10 | 0 | -12.22 | -12.68 | 0.46 | -12.31 |
| UGW-1 | 28-Sep-95 | 09:10 | 0 | -11.48 | -20.60 | 9.12 | -13.30 |
| PW-6 | 28-Sep-95 | 11:45 | 2.58 | -15.25 | -17.70 | 2.45 | -15.74 |
| MW-3 | 28-Sep-95 | 11:45 | 2.58 | -13.79 | -14.70 | 0.91 | -13.97 |
| PW-5 | 28-Sep-95 | 11:45 | 2.58 | -17.38 | -17.42 | 0.04 | -17.39 |
| MW-4 | 28-Sep-95 | 11:45 | 2.58 | -12.90 | -13.34 | 0.44 | -12.99 |
| PW-4 | 28-Sep-95 | 11:45 | 2.58 | -12.20 | -12.64 | 0.44 | -12.29 |
| UGW-1 | 28-Sep-95 | 11:45 | 2.58 | -11.53 | -20.68 | 9.15 | -13.36 |
| MW-4 | 28-Sep-95 | 15:00 | 5.83 | -12.88 | -13.35 | 0.47 | -12.97 |
| PW-4 | 28-Sep-95 | 15:00 | 5.83 | -12.15 | -12.63 | 0.48 | -12.25 |
| MW-3 | 28-Sep-95 | 15:00 | 5.83 | -13.85 | -14.93 | 1.08 | -14.07 |
| PW-5 | 28-Sep-95 | 15:00 | 5.83 | -17.50 | -17.53 | 0.03 | -17.51 |
| PW-6 | 28-Sep-95 | 15:00 | 5.83 | -14.30 | -17.10 | 2.80 | -14.86 |
| UGW-1 | 28-Sep-95 | 15:00 | 5.83 | -11.60 | -20.74 | 9.14 | -13.43 |
| PW-6 | 28-Sep-95 | 17:35 | 8.42 | -17.06 | -17.16 | 0.10 | -17.08 |
| PW-5 | 28-Sep-95 | 17:35 | 8.42 | -17.35 | -17.35 | 0.00 | -17.35 |
| MW-3 | 28-Sep-95 | 17:35 | 8.42 | -13.88 | -15.00 | 1.12 | -14.10 |
| MW-4 | 28-Sep-95 | 17:35 | 8.42 | -12.92 | -13.38 | 0.46 | -13.01 |
| PW-4 | 28-Sep-95 | 17:35 | 8.42 | -12.14 | -12.62 | 0.48 | -12.24 |
| UGW-1 | 28-Sep-95 | 17:35 | 8.42 | -11.62 | -20.60 | 8.98 | -13.42 |
| PW-6 | 29-Sep-95 | 08:30 | 23.33 | -16.45 | -16.48 | 0.03 | -16.46 |
| PW-5 | 29-Sep-95 | 08:30 | 23.33 | -17.50 | -17.52 | 0.02 | -17.50 |
| MW-3 | 29-Sep-95 | 08:30 | 23.33 | -13.95 | -15.27 | 1.32 | -14.21 |
| MW-4 | 29-Sep-95 | 08:30 | 23.33 | -12.93 | -13.45 | 0.52 | -13.03 |
| PW-4 | 29-Sep-95 | 08:30 | 23.33 | -12.20 | -12.75 | 0.55 | -12.31 |
| UGW-1 | 29-Sep-95 | 08:30 | 23.33 | -11.73 | -20.80 | 9.07 | -13.54 |
| PW-6 | 29-Sep-95 | 11:55 | 26.75 | -15.73 | -15.81 | 0.08 | -15.75 |
| MW-3 | 29-Sep-95 | 11:55 | 26.75 | -14.00 | -15.37 | 1.37 | -14.27 |
| PW-5 | 29-Sep-95 | 11:55 | 26.75 | -17.50 | -17.51 | 0.01 | -17.50 |
| MW-4 | 29-Sep-95 | 11:55 | 26.75 | -12.93 | -13.49 | 0.56 | -13.04 |
| PW-4 | 29-Sep-95 | 11:55 | 26.75 | -14.20 | -14.20 | 0.00 | -14.20 |
| UGW-1 | 29-Sep-95 | 11:55 | 26.75 | -11.75 | -20.80 | 9.05 | -13.56 |
| PW-6 | 29-Sep-95 | 15:30 | 30.33 | -15.39 | -15.40 | 0.01 | -15.39 |
| MW-3 | 29-Sep-95 | 15:30 | 30.33 | -14.05 | -15.48 | 1.43 | -14.34 |
| PW-5 | 29-Sep-95 | 15:30 | 30.33 | -17.55 | -17.55 | 0.00 | -17.55 |
| MW-4 | 29-Sep-95 | 15:30 | 30.33 | -12.96 | -13.54 | 0.58 | -13.08 |
| PW-4 | 29-Sep-95 | 15:30 | 30.33 | -14.25 | -14.25 | 0.00 | -14.25 |
| UGW-1 | 29-Sep-95 | 15:30 | 30.33 | -11.77 | -20.83 | 9.06 | -13.58 |
| PW-6 | 30-Sep-95 | 08:45 | 47.58 | -15.34 | -15.35 | 0.01 | -15.34 |
| PW-5 | 30-Sep-95 | 08:45 | 47.58 | -17.56 | -17.57 | 0.01 | -17.56 |
| MW-3 | 30-Sep-95 | 08:45 | 47.58 | -14.15 | -15.58 | 1.43 | -14.44 |
| MW-4 | 30-Sep-95 | 08:45 | 47.58 | -13.07 | -13.77 | 0.70 | -13.21 |
| PW-4 | 30-Sep-95 | 08:45 | 47.58 | -14.37 | -14.38 | 0.01 | -14.37 |
| UGW-1 | 30-Sep-95 | 08:45 | 47.58 | -11.90 | -20.80 | 8.90 | -13.68 |
| PW-4 | 30-Sep-95 | 16:55 | 55.75 | -14.37 | -14.37 | 0.00 | -14.37 |
| MW-4 | 30-Sep-95 | 16:55 | 55.75 | -13.01 | -13.66 | 0.65 | -13.14 |
| MW-3 | 30-Sep-95 | 16:55 | 55.75 | -14.12 | -15.55 | 1.43 | -14.41 |
| PW-6 | 30-Sep-95 | 16:55 | 55.75 | -15.33 | -15.33 | 0.00 | -15.33 |
| PW-5 | 30-Sep-95 | 16:55 | 55.75 | -17.60 | -17.61 | 0.01 | -17.60 |
| UGW-1 | 30-Sep-95 | 16:55 | 55.75 | -11.87 | -20.76 | 8.89 | -13.65 |
| PW-6 | 01-Oct-95 | 09:10 | 72.00 | -15.35 | -15.35 | 0.00 | -15.35 |
| PW-5 | 01-Oct-95 | 09:10 | 72.00 | -17.53 | -17.53 | 0.00 | -17.53 |
| MW-3 | 01-Oct-95 | 09:10 | 72.00 | -14.16 | -15.60 | 1.44 | -14.45 |
| MW-4 | 01-Oct-95 | 09:10 | 72.00 | -13.11 | -13.87 | 0.76 | -13.26 |
| PW-4 | 01-Oct-95 | 09:10 | 72.00 | -14.33 | -14.33 | 0.00 | -14.33 |
| UGW-1 | 01-Oct-95 | 09:10 | 72.00 | -11.98 | -20.65 | 8.67 | -13.71 |

NOTE: WATER & PRODUCT LEVELS ARE RECORDED FROM TOP OF CASING

TERRA VAC

# TABLE 7
# US NAVY
# TOW WAY FUEL FACILITY
# ROOSEVELT ROADS, PUERTO RICO
# PW-4 PRODUCT ONLY PUMP TEST
## TV PROJECT # 110234
## STAGE 1

| DATE | TIME | RUN HOURS | PRODUCT LEVEL ft | WATER LEVEL ft | PRODUCT THICKNESS ft | PIEZOMETRI SURFACE ft |
|---|---|---|---|---|---|---|
| 28-Sep-95 | 09:10 | 0 | -12.22 | -12.68 | 0.46 | -12.31 |
| 28-Sep-95 | 11:45 | 2.58 | -12.20 | -12.64 | 0.44 | -12.29 |
| 28-Sep-95 | 15:00 | 5.83 | -12.15 | -12.63 | 0.48 | -12.25 |
| 28-Sep-95 | 17:35 | 8.42 | -12.14 | -12.62 | 0.48 | -12.24 |
| 29-Sep-95 | 08:30 | 23.33 | -12.20 | -12.75 | 0.55 | -12.31 |
| 29-Sep-95 | 11:55 | 26.75 | -14.20 | -14.20 | 0.00 | -14.20 |
| 29-Sep-95 | 15:30 | 30.33 | -14.25 | -14.25 | 0.00 | -14.25 |
| 30-Sep-95 | 08:45 | 47.58 | -14.37 | -14.38 | 0.01 | -14.37 |
| 30-Sep-95 | 16:55 | 55.75 | -14.37 | -14.37 | 0.00 | -14.37 |
| 01-Oct-95 | 09:10 | 72.00 | -14.33 | -14.33 | 0.00 | -14.33 |

NOTE: WATER & PRODUCT LEVELS ARE RECORDED FROM TOP OF CASING

TERRA VAC

# TABLE 8
## US NAVY
## TOW WAY FUEL FACILITY
## ROOSEVELT ROADS, PUERTO RICO
## PW-4 CAPTURE ZONE TEST
### TV PROJECT # 110234
### STAGE 1

| WELL NUMBER | DATE | TIME | RUN TIME | PRODUCT LEVEL ft | WATER LEVEL ft | PRODUCT THICKNESS ft | PIEZOMETRI SURFACE ft |
|---|---|---|---|---|---|---|---|
| PW-6 | 28-Sep-95 | 09:10 | 0 | -13.43 | -17.40 | 3.97 | -14.22 |
| PW-3 | 28-Sep-95 | 09:10 | 0 | -13.95 | -14.39 | 0.44 | -14.04 |
| MW-3 | 28-Sep-95 | 09:10 | 0 | -13.76 | -14.55 | 0.79 | -13.92 |
| PW-5 | 28-Sep-95 | 09:10 | 0 | -13.33 | -15.82 | 2.49 | -13.83 |
| MW-4 | 28-Sep-95 | 09:10 | 0 | -12.90 | -13.30 | 0.40 | -12.98 |
| UGW-1 | 28-Sep-95 | 09:10 | 0 | -11.48 | -20.60 | 9.12 | -13.30 |
| PW-6 | 28-Sep-95 | 11:45 | 2.58 | -15.25 | -17.70 | 2.45 | -15.74 |
| PW-3 | 28-Sep-95 | 11:45 | 2.58 | -14.03 | -14.53 | 0.50 | -14.13 |
| MW-3 | 28-Sep-95 | 11:45 | 2.58 | -13.79 | -14.70 | 0.91 | -13.97 |
| PW-5 | 28-Sep-95 | 11:45 | 2.58 | -17.38 | -17.42 | 0.04 | -17.39 |
| MW-4 | 28-Sep-95 | 11:45 | 2.58 | -12.90 | -13.34 | 0.44 | -12.99 |
| UGW-1 | 28-Sep-95 | 11:45 | 2.58 | -11.53 | -20.68 | 9.15 | -13.36 |
| MW-4 | 28-Sep-95 | 15:00 | 5.83 | -12.88 | -13.35 | 0.47 | -12.97 |
| MW-3 | 28-Sep-95 | 15:00 | 5.83 | -13.85 | -14.93 | 1.08 | -14.07 |
| PW-3 | 28-Sep-95 | 15:00 | 5.83 | -14.08 | -14.62 | 0.54 | -14.19 |
| PW-5 | 28-Sep-95 | 15:00 | 5.83 | -17.50 | -17.53 | 0.03 | -17.51 |
| PW-6 | 28-Sep-95 | 15:00 | 5.83 | -14.30 | -17.10 | 2.80 | -14.86 |
| UGW-1 | 28-Sep-95 | 15:00 | 5.83 | -11.60 | -20.74 | 9.14 | -13.43 |
| PW-6 | 28-Sep-95 | 17:35 | 8.42 | -17.06 | -17.16 | 0.10 | -17.08 |
| PW-5 | 28-Sep-95 | 17:35 | 8.42 | -17.35 | -17.35 | 0.00 | -17.35 |
| MW-3 | 28-Sep-95 | 17:35 | 8.42 | -13.88 | -15.00 | 1.12 | -14.10 |
| PW-3 | 28-Sep-95 | 17:35 | 8.42 | -14.10 | -14.70 | 0.60 | -14.22 |
| MW-4 | 28-Sep-95 | 17:35 | 8.42 | -12.92 | -13.38 | 0.46 | -13.01 |
| UGW-1 | 28-Sep-95 | 17:35 | 8.42 | -11.62 | -20.60 | 8.98 | -13.42 |
| PW-6 | 29-Sep-95 | 08:30 | 23.33 | -16.45 | -16.48 | 0.03 | -16.46 |
| PW-5 | 29-Sep-95 | 08:30 | 23.33 | -17.50 | -17.52 | 0.02 | -17.50 |
| PW-3 | 29-Sep-95 | 08:30 | 23.33 | -14.25 | -14.97 | 0.72 | -14.39 |
| MW-3 | 29-Sep-95 | 08:30 | 23.33 | -13.95 | -15.27 | 1.32 | -14.21 |
| MW-4 | 29-Sep-95 | 08:30 | 23.33 | -12.93 | -13.45 | 0.52 | -13.03 |
| UGW-1 | 29-Sep-95 | 08:30 | 23.33 | -11.73 | -20.80 | 9.07 | -13.54 |
| PW-6 | 29-Sep-95 | 11:55 | 26.75 | -15.73 | -15.81 | 0.08 | -15.75 |
| PW-3 | 29-Sep-95 | 11:55 | 26.75 | -16.72 | -16.72 | 0.00 | -16.72 |
| MW-3 | 29-Sep-95 | 11:55 | 26.75 | -14.00 | -15.37 | 1.37 | -14.27 |
| PW-5 | 29-Sep-95 | 11:55 | 26.75 | -17.50 | -17.51 | 0.01 | -17.50 |
| MW-4 | 29-Sep-95 | 11:55 | 26.75 | -12.93 | -13.49 | 0.56 | -13.04 |
| UGW-1 | 29-Sep-95 | 11:55 | 26.75 | -11.75 | -20.80 | 9.05 | -13.56 |
| PW-6 | 29-Sep-95 | 15:30 | 30.33 | -15.39 | -15.40 | 0.01 | -15.39 |
| PW-3 | 29-Sep-95 | 15:30 | 30.33 | -16.85 | -16.85 | 0.00 | -16.85 |
| MW-3 | 29-Sep-95 | 15:30 | 30.33 | -14.05 | -15.48 | 1.43 | -14.34 |
| PW-5 | 29-Sep-95 | 15:30 | 30.33 | -17.55 | -17.55 | 0.00 | -17.55 |
| MW-4 | 29-Sep-95 | 15:30 | 30.33 | -12.96 | -13.54 | 0.58 | -13.08 |
| UGW-1 | 29-Sep-95 | 15:30 | 30.33 | -11.77 | -20.83 | 9.06 | -13.58 |
| PW-3 | 30-Sep-95 | 08:45 | 47.58 | -16.90 | -16.90 | 0.00 | -16.90 |
| PW-6 | 30-Sep-95 | 08:45 | 47.58 | -15.34 | -15.35 | 0.01 | -15.34 |
| PW-5 | 30-Sep-95 | 08:45 | 47.58 | -17.56 | -17.57 | 0.01 | -17.56 |
| MW-3 | 30-Sep-95 | 08:45 | 47.58 | -14.15 | -15.58 | 1.43 | -14.44 |
| MW-4 | 30-Sep-95 | 08:45 | 47.58 | -13.07 | -13.77 | 0.70 | -13.21 |
| UGW-1 | 30-Sep-95 | 08:45 | 47.58 | -11.90 | -20.80 | 8.90 | -13.68 |
| MW-4 | 30-Sep-95 | 16:55 | 55.75 | -13.01 | -13.66 | 0.65 | -13.14 |
| MW-3 | 30-Sep-95 | 16:55 | 55.75 | -14.12 | -15.55 | 1.43 | -14.41 |
| PW-3 | 30-Sep-95 | 16:55 | 55.75 | -16.90 | -16.91 | 0.01 | -16.90 |
| PW-6 | 30-Sep-95 | 16:55 | 55.75 | -15.33 | -15.33 | 0.00 | -15.33 |
| PW-5 | 30-Sep-95 | 16:55 | 55.75 | -17.60 | -17.61 | 0.01 | -17.60 |
| UGW-1 | 30-Sep-95 | 16:55 | 55.75 | -11.87 | -20.76 | 8.89 | -13.65 |
| PW-3 | 01-Oct-95 | 09:10 | 72.00 | -16.86 | -16.86 | 0.00 | -16.86 |
| PW-6 | 01-Oct-95 | 09:10 | 72.00 | -15.35 | -15.35 | 0.00 | -15.35 |
| PW-5 | 01-Oct-95 | 09:10 | 72.00 | -17.53 | -17.53 | 0.00 | -17.53 |
| MW-3 | 01-Oct-95 | 09:10 | 72.00 | -14.16 | -15.60 | 1.44 | -14.45 |
| MW-4 | 01-Oct-95 | 09:10 | 72.00 | -13.11 | -13.87 | 0.76 | -13.26 |
| UGW-1 | 01-Oct-95 | 09:10 | 72.00 | -11.98 | -20.65 | 8.67 | -13.71 |

NOTE: WATER & PRODUCT LEVELS ARE RECORDED FROM TOP OF CASING

TERRA VAC

**TABLE 9**
**US NAVY**
**TOW WAY FUEL FACILITY**
**ROOSEVELT ROADS, PUERTO RICO**
**PW-5 PRODUCT ONLY PUMP TEST**
**TV PROJECT # 110234**
**STAGE 1**

| | TIME | RUN HOURS | PRODUCT LEVEL ft | WATER LEVEL ft | PRODUCT THICKNESS ft | PIEZOMETRI SURFACE ft |
|---|---|---|---|---|---|---|
| 27-Sep-95 | 09:45 | 0.00 | -14.31 | -16.1 | 1.79 | -14.67 |
| 27-Sep-95 | 10:33 | 0.80 | -14.28 | -16.06 | 1.78 | -14.64 |
| 27-Sep-95 | 13:27 | 3.70 | -14.32 | -16.1 | 1.78 | -14.68 |
| 27-Sep-95 | 15:35 | 5.83 | START | | | 0.00 |
| 27-Sep-95 | 16:55 | 7.17 | -17.35 | -17.37 | 0.02 | -17.35 |
| 27-Sep-95 | | | | | | |
| 28-Sep-95 | 09:00 | 23.25 | COMPRESSOR FAILED OVER NIGHT | | | |
| 28-Sep-95 | 09:10 | 23.42 | -13.33 | -15.82 | 2.49 | -13.83 |
| 28-Sep-95 | 09:30 | 23.75 | START COMPRESSOR | | | |
| 28-Sep-95 | 09:35 | 23.83 | PW-5 | START | | |
| 28-Sep-95 | 11:45 | 26.00 | -17.38 | -17.42 | 0.04 | -17.39 |
| 28-Sep-95 | 15:00 | 29.25 | -17.5 | -17.53 | 0.03 | -17.51 |
| 28-Sep-95 | 17:35 | 31.83 | -17.35 | -17.35 | 0.00 | -17.35 |

NOTE: WATER & PRODUCT LEVELS ARE RECORDED FROM TOP OF CASING

TERRA VAC

**TABLE 10**
**US NAVY**
**TOW WAY FUEL FACILITY**
**ROOSEVELT ROADS, PUERTO RICO**
**PW-5 CAPTURE ZONE TEST**
**TV PROJECT # 110234**
**STAGE 1**

| WELL NUMBER | DATE | TIME | RUN HOURS | PRODUCT LEVEL ft | WATER LEVEL ft | PRODUCT THICKNESS ft | PIEZOMETRIC SURFACE ft |
|---|---|---|---|---|---|---|---|
| PW-3 | 27-Sep-95 | 09:45 | 0.00 | -14.10 | -14.54 | 0.44 | -14.19 |
| MW-3 | 27-Sep-95 | 09:45 | 0.00 | -13.48 | -15.70 | 2.22 | -13.92 |
| MW-4 | 27-Sep-95 | 09:45 | 0.00 | -12.81 | -13.67 | 0.86 | -12.98 |
| PW-4 | 27-Sep-95 | 09:45 | 0.00 | -12.13 | -13.10 | 0.97 | -12.32 |
| PW-6 | 27-Sep-95 | 09:45 | 0.00 | -13.13 | -19.12 | 5.99 | -14.33 |
| PW-3 | 27-Sep-95 | 10:32 | 0.78 | -14.13 | -14.54 | 0.41 | -14.21 |
| MW-3 | 27-Sep-95 | 10:32 | 0.78 | -14.63 | -15.68 | 1.05 | -14.84 |
| PW-4 | 27-Sep-95 | 10:32 | 0.78 | -12.77 | -13.90 | 1.13 | -13.00 |
| PW-4 | 27-Sep-95 | 11:00 | 1.25 | -13.90 | -14.42 | 0.52 | -14.00 |
| PW-6 | 27-Sep-95 | 11:46 | 2.02 | RATE CHECK =2.5 GPH | | | |
| PW-6 | 27-Sep-95 | 13:27 | 3.70 | -14.62 | -17.40 | 2.78 | -15.18 |
| PW-3 | 27-Sep-95 | 13:27 | 3.70 | -14.20 | -14.67 | 0.47 | -14.29 |
| MW-3 | 27-Sep-95 | 13:27 | 3.70 | -14.13 | -14.87 | 0.74 | -14.28 |
| MW-4 | 27-Sep-95 | 13:27 | 3.70 | -13.07 | -13.41 | 0.34 | -13.14 |
| PW-4 | 27-Sep-95 | 13:27 | 3.70 | -12.65 | -12.97 | 0.32 | -12.71 |
| PW-5 | 27-Sep-95 | 15:35 | 5.83 | START | | | |
| PW-6 | 27-Sep-95 | 16:55 | 7.17 | -14.35 | -17.10 | 2.75 | -14.90 |
| PW-3 | 27-Sep-95 | 16:55 | 7.17 | -14.05 | -14.78 | 0.73 | -14.20 |
| MW-3 | 27-Sep-95 | 16:55 | 7.17 | -14.05 | -14.78 | 0.73 | -14.20 |
| MW-4 | 27-Sep-95 | 16:55 | 7.17 | -13.05 | -13.37 | 0.32 | -13.11 |
| UGW-1 | 27-Sep-95 | 16:55 | 7.17 | -11.62 | -20.70 | 9.08 | -13.44 |
| PW-4 | 27-Sep-95 | 16:55 | 7.17 | -12.37 | -12.67 | 0.30 | -12.43 |
| PW-6 | 28-Sep-95 | 09:10 | 23.42 | -13.43 | -17.40 | 3.97 | -14.22 |
| PW-3 | 28-Sep-95 | 09:10 | 23.42 | -13.95 | -14.39 | 0.44 | -14.04 |
| MW-3 | 28-Sep-95 | 09:10 | 23.42 | -13.76 | -14.55 | 0.79 | -13.92 |
| MW-4 | 28-Sep-95 | 09:10 | 23.42 | -12.90 | -13.30 | 0.40 | -12.98 |
| PW=4 | 28-Sep-95 | 09:10 | 23.42 | -12.22 | -12.68 | 0.46 | -12.31 |
| UGW-1 | 28-Sep-95 | 09:10 | 23.42 | -11.48 | -20.60 | 9.12 | -13.30 |
| | 28-Sep-95 | 09:30 | 23.75 | START COMPRESSOR | | | |
| PW-5 | 28-Sep-95 | 09:35 | 23.83 | START | | | |
| PW-6 | 28-Sep-95 | 10:30 | 24.75 | START | | | |
| PW-3 | 28-Sep-95 | 11:45 | 26.00 | -14.03 | -14.53 | 0.50 | -14.13 |
| MW-3 | 28-Sep-95 | 11:45 | 26.00 | -13.79 | -14.70 | 0.91 | -13.97 |
| MW-4 | 28-Sep-95 | 11:45 | 26.00 | -12.90 | -13.34 | 0.44 | -12.99 |
| PW-4 | 28-Sep-95 | 11:45 | 26.00 | -12.20 | -12.64 | 0.44 | -12.29 |
| UGW-1 | 28-Sep-95 | 11:45 | 26.00 | -11.53 | -20.68 | 9.15 | -13.36 |
| PW-6 | 28-Sep-95 | 11:45 | 26.00 | -15.25 | -17.70 | 2.45 | -15.74 |
| MW-4 | 28-Sep-95 | 15:00 | 29.25 | -12.88 | -13.35 | 0.47 | -12.97 |
| PW-4 | 28-Sep-95 | 15:00 | 29.25 | -12.15 | -12.63 | 0.48 | -12.25 |
| MW-3 | 28-Sep-95 | 15:00 | 29.25 | -13.85 | -14.93 | 1.08 | -14.07 |
| PW-3 | 28-Sep-95 | 15:00 | 29.25 | -14.08 | -14.62 | 0.54 | -14.19 |
| PW-5 | 28-Sep-95 | 15:00 | 29.25 | -17.50 | -17.53 | 0.03 | -17.51 |
| PW-6 | 28-Sep-95 | 15:00 | 29.25 | -14.30 | -17.10 | 2.80 | -14.86 |
| UGW-1 | 28-Sep-95 | 15:00 | 29.25 | -11.60 | -20.74 | 9.14 | -13.43 |
| PW-6 | 28-Sep-95 | 17:35 | 31.83 | -17.06 | -17.16 | 0.10 | -17.08 |
| MW-3 | 28-Sep-95 | 17:35 | 31.83 | -13.88 | -15.00 | 1.12 | -14.10 |
| PW-3 | 28-Sep-95 | 17:35 | 31.83 | -14.10 | -14.70 | 0.60 | -14.22 |
| PW-5 | 28-Sep-95 | 17:35 | 31.83 | -17.35 | -17.35 | 0.00 | -17.35 |
| MW-4 | 28-Sep-95 | 17:35 | 31.83 | -12.92 | -13.38 | 0.46 | -13.01 |
| PW-4 | 28-Sep-95 | 17:35 | 31.83 | -12.14 | -12.62 | 0.48 | -12.24 |
| UGW-1 | 28-Sep-95 | 17:35 | 31.83 | -11.62 | -20.60 | 8.98 | -13.42 |

NOTE: LEAVE SYSTEM ON OVER NIGHT
NOTE: WATER & PRODUCT LEVELS ARE RECORDED FROM TOP OF CASING

TERRA VAC

# TABLE 11
# US NAVY
# TOW WAY FUEL FACILITY
# ROOSEVELT ROADS, PUERTO RICO
# PW-6 PRODUCT ONLY PUMP TEST
## TV PROJECT # 110234
## STAGE 1

| DATE | TIME | RUN HOURS | PRODUCT LEVEL ft | WATER LEVEL ft | PRODUCT THICKNESS ft | PIEZOMETRI SURFACE ft |
|---|---|---|---|---|---|---|
| 28-Sep-95 | 09:10 | 0.00 | -13.43 | -17.40 | 3.97 | -14.22 |
| 28-Sep-95 | 10:00 | 0.83 | START | | | |
| 28-Sep-95 | 11:45 | 2.58 | -15.25 | -17.70 | 2.45 | -15.74 |
| 28-Sep-95 | 15:00 | 5.83 | -14.30 | -17.10 | 2.80 | -14.86 |
| 28-Sep-95 | 17:35 | 8.42 | -17.06 | -17.16 | 0.10 | -17.08 |
| 29-Sep-95 | 08:30 | 23.33 | -16.45 | -16.48 | 0.03 | -16.46 |
| 29-Sep-95 | 11:55 | 26.75 | -15.73 | -15.81 | 0.08 | -15.75 |
| 29-Sep-95 | 15:30 | 30.33 | -15.39 | -15.40 | 0.01 | -15.39 |
| 30-Sep-95 | 08:45 | 47.58 | -15.34 | -15.35 | 0.01 | -15.34 |
| 30-Sep-95 | 16:55 | 55.75 | -15.33 | -15.33 | 0.00 | -15.33 |
| 01-Oct-95 | 09:10 | 72.00 | -15.35 | -15.35 | 0.00 | -15.35 |

NOTE: WATER & PRODUCT LEVELS ARE RECORDED FROM TOP OF CASING

TERRA VAC

**TABLE 12**
**US NAVY**
**TOW WAY FUEL FACILITY**
**ROOSEVELT ROADS, PUERTO RICO**
**PW-6 CAPTURE ZONE TEST**
**TV PROJECT # 110234**
**STAGE 1**

| WELL NUMBER | DATE | TIME | RUN HOURS | PRODUCT LEVEL ft | WATER LEVEL ft | PRODUCT THICKNESS ft | PIEZOMETRIC SURFACE ft |
|---|---|---|---|---|---|---|---|
| PW-3 | 28-Sep-95 | 09:10 | 0.00 | -13.95 | -14.39 | 0.44 | -14.04 |
| MW-3 | 28-Sep-95 | 09:10 | 0.00 | -13.76 | -14.55 | 0.79 | -13.92 |
| PW-5 | 28-Sep-95 | 09:10 | 0.00 | -13.33 | -15.82 | 2.49 | -13.83 |
| MW-4 | 28-Sep-95 | 09:10 | 0.00 | -12.90 | -13.30 | 0.40 | -12.98 |
| PW-4 | 28-Sep-95 | 09:10 | 0.00 | -12.22 | -12.68 | 0.46 | -12.31 |
| UGW-1 | 28-Sep-95 | 09:10 | 0.00 | -11.48 | -20.60 | 9.12 | -13.30 |
| PW-3 | 28-Sep-95 | 11:45 | 2.58 | -14.03 | -14.53 | 0.50 | -14.13 |
| MW-3 | 28-Sep-95 | 11:45 | 2.58 | -13.79 | -14.70 | 0.91 | -13.97 |
| PW-5 | 28-Sep-95 | 11:45 | 2.58 | -17.38 | -17.42 | 0.04 | -17.39 |
| MW-4 | 28-Sep-95 | 11:45 | 2.58 | -12.90 | -13.34 | 0.44 | -12.99 |
| PW-4 | 28-Sep-95 | 11:45 | 2.58 | -12.20 | -12.64 | 0.44 | -12.29 |
| UGW-1 | 28-Sep-95 | 11:45 | 2.58 | -11.53 | -20.68 | 9.15 | -13.36 |
| MW-4 | 28-Sep-95 | 15:00 | 5.83 | -12.88 | -13.35 | 0.47 | -12.97 |
| PW-4 | 28-Sep-95 | 15:00 | 5.83 | -12.15 | -12.63 | 0.48 | -12.25 |
| MW-3 | 28-Sep-95 | 15:00 | 5.83 | -13.85 | -14.93 | 1.08 | -14.07 |
| PW-3 | 28-Sep-95 | 15:00 | 5.83 | -14.08 | -14.62 | 0.54 | -14.19 |
| PW-5 | 28-Sep-95 | 15:00 | 5.83 | -17.50 | -17.53 | 0.03 | -17.51 |
| UGW-1 | 28-Sep-95 | 15:00 | 5.83 | -11.60 | -20.74 | 9.14 | -13.43 |
| PW-5 | 28-Sep-95 | 17:35 | 8.42 | -17.35 | -17.35 | 0.00 | -17.35 |
| MW-3 | 28-Sep-95 | 17:35 | 8.42 | -13.88 | -15.00 | 1.12 | -14.10 |
| PW-3 | 28-Sep-95 | 17:35 | 8.42 | -14.10 | -14.70 | 0.60 | -14.22 |
| MW-4 | 28-Sep-95 | 17:35 | 8.42 | -12.92 | -13.38 | 0.46 | -13.01 |
| PW-4 | 28-Sep-95 | 17:35 | 8.42 | -12.14 | -12.62 | 0.48 | -12.24 |
| UGW-1 | 28-Sep-95 | 17:35 | 8.42 | -11.62 | -20.60 | 8.98 | -13.42 |
| PW-5 | 29-Sep-95 | 08:30 | 23.33 | -17.50 | -17.52 | 0.02 | -17.50 |
| PW-3 | 29-Sep-95 | 08:30 | 23.33 | -14.25 | -14.97 | 0.72 | -14.39 |
| MW-3 | 29-Sep-95 | 08:30 | 23.33 | -13.95 | -15.27 | 1.32 | -14.21 |
| MW-4 | 29-Sep-95 | 08:30 | 23.33 | -12.93 | -13.45 | 0.52 | -13.03 |
| PW-4 | 29-Sep-95 | 08:30 | 23.33 | -12.20 | -12.75 | 0.55 | -12.31 |
| UGW-1 | 29-Sep-95 | 08:30 | 23.33 | -11.73 | -20.80 | 9.07 | -13.54 |

NOTE: WATER & PRODUCT LEVELS ARE RECORDED FROM TOP OF CASING

TERRA VAC

**TABLE 13**
**US NAVY**
**TOW WAY FUEL FACILITY**
**ROOSEVELT ROADS, PUERTO RICO**
**MW-1 PRODUCT ONLY PUMP TEST**
**TV PROJECT # 110234**
**STAGE 1**

| 26-Sep-95 | TIME | RUN HOURS | PRODUCT LEVEL ft | WATER LEVEL ft | PRODUCT THICKNESS ft | PIEZOMETRIC SURFACE ft |
|---|---|---|---|---|---|---|
| 26-Sep-95 | 07:40 | 0 | -10.06 | -16.67 | 6.61 | -11.38 |
| 26-Sep-95 | 09:00 | 1.33 | START | | | |
| 26-Sep-95 | 10:05 | 2.42 | -12.3 | -16.2 | 3.9 | -13.08 |
| 26-Sep-95 | 10:50 | 3.17 | -14.6 | -16.1 | 1.5 | -14.90 |
| 26-Sep-95 | 10:51 | 3.18 | STOP | | | |
| 26-Sep-95 | 16:55 | 9.25 | -12.08 | -15.67 | 3.59 | -12.80 |
| 26-Sep-95 | 17:00 | 9.33 | START | | 0 | |
| 27-Sep-95 | 08:45 | 25.08 | -11.45 | -15.1 | 3.65 | -12.18 |
| 27-Sep-95 | 08:50 | 25.17 | STOP | | | |
| 27-Sep-95 | 09:40 | 26.00 | START | | | |
| 28-Sep-95 | 09:00 | 49.33 | -11.84 | -15.08 | 3.24 | -12.49 |
| 28-Sep-95 | 09:36 | 49.93 | START | | | |
| 28-Sep-95 | 11:00 | 51.33 | TOTAL RATE | 2 GPH | | |
| | | | PRODUCT RATE | '0.5 GPH | | |

NOTE: WATER & PRODUCT LEVELS ARE RECORDED FROM TOP OF CASING

TERRA VAC

**TABLE 14**
**US NAVY**
**TOW WAY FUEL FACILITY**
**ROOSEVELT ROADS, PUERTO RICO**
**MW-1 CAPTURE ZONETEST**
**TV PROJECT # 110234**
**STAGE 1**

| WELL NUMBER | DATE | RUN HOURS | PRODUCT LEVEL ft | WATER LEVEL ft | PRODUCT THICKNESS ft | PIEZOMETRIC SURFACE ft |
|---|---|---|---|---|---|---|
| PW-2 | 27-Sep-95 | 24.91 | -11.63 | -11.88 | 0.25 | -11.68 |
| MW-2 | 27-Sep-95 | 24.91 | -11.00 | -11.29 | 0.29 | -11.06 |
| PW-1 | 27-Sep-95 | 24.91 | -8.45 | -8.48 | 0.03 | -8.46 |
| PW-2 | 28-Sep-95 | 49.33 | -11.56 | -11.91 | 0.35 | -11.63 |
| PW-1 | 28-Sep-95 | 49.33 | -8.53 | -8.55 | 0.02 | -8.53 |
| MW-2 | 28-Sep-95 | 49.33 | -10.92 | -11.27 | 0.35 | -10.99 |
| UGW-22 | 28-Sep-95 | 49.33 | -9.70 | -9.70 | 0.00 | -9.70 |
| UGW-5 | 28-Sep-95 | 49.33 | -11.89 | -11.94 | 0.05 | -11.90 |
| | 28-Sep-95 | 49.83 | | | | |
| UGW-22 | 28-Sep-95 | 52.33 | -9.71 | -9.71 | 0.00 | -9.71 |
| MW-2 | 28-Sep-95 | 52.33 | -10.93 | -11.27 | 0.34 | -11.00 |
| PW-1 | 28-Sep-95 | 52.33 | -8.54 | -8.58 | 0.04 | -8.55 |
| PW-2 | 28-Sep-95 | 52.33 | -11.54 | -11.90 | 0.36 | -11.61 |
| UGW-5 | 28-Sep-95 | 52.33 | -11.88 | -11.91 | 0.03 | -11.89 |
| PW-2 | 28-Sep-95 | 55.16 | -11.50 | -11.85 | 0.35 | -11.57 |
| PW-1 | 28-Sep-95 | 55.16 | -8.54 | -8.60 | 0.06 | -8.55 |
| UGW-22 | 28-Sep-95 | 55.16 | -9.71 | -9.71 | 0.00 | -9.71 |
| MW-2 | 28-Sep-95 | 55.16 | -10.89 | -11.23 | 0.34 | -10.96 |
| UGW-5 | 28-Sep-95 | 55.16 | -11.88 | -11.91 | 0.03 | -11.89 |
| UGW-22 | 28-Sep-95 | 57.83 | -9.71 | -9.71 | 0.00 | -9.71 |
| MW-2 | 28-Sep-95 | 57.83 | -10.87 | -11.20 | 0.33 | -10.94 |
| PW-1 | 28-Sep-95 | 57.83 | -8.56 | -8.60 | 0.04 | -8.57 |
| PW-2 | 28-Sep-95 | 57.83 | -11.48 | -11.85 | 0.37 | -11.55 |
| UGW-5 | 28-Sep-95 | 57.83 | -11.93 | -11.97 | 0.04 | -11.94 |

NOTE: WATER & PRODUCT LEVELS ARE RECORDED FROM TOP OF CASING

TERRA VAC

**TABLE 15**
**U S NAVY**
**TOW WAY FUEL FACILITY**
**ROOSEVELT ROADS, PUERTO RICO**
**PRODUCT RECOVERY RATES**
**TV PROJECT # 110234**
**STAGE 1**

| DATE | TIME | WELL NUMBER | TOTAL RATE GPD | PRODUCT RATE GPD | NUMBER OF WELLS |
|---|---|---|---|---|---|
| 30-Sep-95 | 16:30 | TANK | 72.0 | 15.0 | 6 |
| 30-Sep-95 | 16:40 | PW-1 | 21.0 | 2.2 | |
| 30-Sep-95 | 16:40 | MW-1 | 3.0 | 2.2 | |
| 30-Sep-95 | 16:40 | PW-2 | 60.0 | 0.0 | |
| 30-Sep-95 | 16:40 | PW-3 | 3.0 | 0.7 | |
| 30-Sep-95 | 16:40 | PW-4 | 27.1 | 2.4 | |
| 30-Sep-95 | 16:40 | PW-5 | 14.2 | 4.1 | |
| 30-Sep-95 | 16:40 | PW-6 | 7.7 | 3.4 | |
| 30-Sep-95 | 16:40 | TOTAL | 208.0 | 30.1 | 7 |
| 01-Oct-95 | 09:30 | TANK | 168.0 | 13.1 | 7 |
| 10-Oct-95 | 09:27 | TANK | AVERAGE | 17.0 | 7 |

RATES RECORDED AT WELLHEAD

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# TABLE 16
## US NAVY
## TOW WAY FUEL FACILITY
## ROOSEVELT ROADS, PUERTO RICO
## PW-1 VACUUM ROI TEST
### TV PROJECT # 110234
### STAGE 2

| WELL NUMBER | DATE | TIME | VACUUM IN WATER | DISTANCE FEET |
|---|---|---|---|---|
| UGW-5 | 16-Oct-95 | 10:10 | 0.00 | 5.00 |
| PW-1 | | 10:10 | 54.4 | 0 |
| MW-2 | | 10:10 | 0.06 | 5.83 |
| PW-2 | | 10:10 | 0.13 | 7.00 |
| UGW-22 | | 10:10 | 0.25 | 10.00 |
| blank | | | 0.01 | 20 |
| blank | | | 0.15 | 30 |
| MW-1 | | 10:10 | 0.00 | 21.00 |
| | PW-1 WELLHEAD VACUUM 4" H | | | 54.4 |

# TABLE 17
## US NAVY
## TOW WAY FUEL FACILITY
## ROOSEVELT ROADS, PUERTO RICO
## PW-1 CAPTURE ZONE TEST
### TV PROJECT # 110234
### STAGE 2

| WELL NUMBER | DATE | TIME | RUN HOURS | PRODUCT LEVEL ft | WATER LEVEL ft | PRODUCT THICKNESS ft | PIEZOMETRI SURFACE ft |
|---|---|---|---|---|---|---|---|
| MW-2 | 10-Oct-95 | 09:15 | 0.0 | -11.66 | -12.35 | 0.69 | -11.80 |
| PW-2 | 10-Oct-95 | 09:15 | 0.0 | -12.33 | -12.39 | 0.06 | -12.34 |
| UGW-22 | 10-Oct-95 | 09:15 | 0.0 | -10.7 | -10.72 | 0.02 | -10.70 |
| UGW-5 | 10-Oct-95 | 09:15 | 0.0 | -12.78 | -12.85 | 0.07 | -12.79 |
| MW-2 | 11-Oct-95 | 08:58 | 23.7 | -11.71 | -12.38 | 0.67 | -11.84 |
| PW-2 | 11-Oct-95 | 08:58 | 23.7 | -12.44 | -12.49 | 0.05 | -12.45 |
| UGW-22 | 11-Oct-95 | 08:58 | 23.7 | -10.77 | -10.78 | 0.01 | -10.77 |
| UGW-5 | 11-Oct-95 | 08:58 | 23.7 | -12.82 | -12.90 | 0.08 | -12.84 |
| PW-1 | 11-Oct-95 | 16:25 | 31.2 | START | VAC | | |
| MW-2 | 11-Oct-95 | 16:35 | 31.3 | -12.15 | -13.10 | 0.95 | -12.34 |
| UGW-22 | 11-Oct-95 | 16:35 | 31.3 | -10.8 | -10.81 | 0.01 | -10.80 |
| PW-2 | 11-Oct-95 | 16:35 | 31.3 | -15.45 | -15.45 | 0.00 | -15.45 |
| UGW-5 | 11-Oct-95 | 16:35 | 31.3 | -12.86 | -12.87 | 0.01 | -12.86 |
| MW-2 | 11-Oct-95 | 17:01 | 31.8 | -12.16 | -13.10 | 0.94 | -12.35 |
| UGW-22 | 11-Oct-95 | 17:01 | 31.8 | -10.82 | -10.83 | 0.01 | -10.82 |
| PW-2 | 11-Oct-95 | 17:01 | 31.8 | -14.68 | -14.68 | 0.00 | -14.68 |
| UGW-5 | 11-Oct-95 | 17:01 | 31.8 | -12.88 | -12.91 | 0.03 | -12.89 |
| MW-2 | 11-Oct-95 | 17:35 | 32.3 | -12.22 | -13.18 | 0.96 | -12.41 |
| PW-2 | 11-Oct-95 | 17:35 | 32.3 | -15.86 | -15.87 | 0.01 | -15.86 |
| UGW-22 | 11-Oct-95 | 17:35 | 32.3 | -10.85 | -10.85 | 0.00 | -10.85 |
| UGW-5 | 11-Oct-95 | 17:35 | 32.3 | -12.88 | -12.89 | 0.01 | -12.88 |
| UGW-5 | 11-Oct-95 | 17:55 | 32.7 | -12.88 | -12.9 | 0.02 | -12.88 |
| UGW-22 | 11-Oct-95 | 17:55 | 32.7 | -10.86 | -10.87 | 0.01 | -10.86 |
| MW-2 | 11-Oct-95 | 17:55 | 32.7 | -12.28 | -13.19 | 0.91 | -12.46 |
| PW-2 | 11-Oct-95 | 17:55 | 32.7 | -15.96 | -16.01 | 0.05 | -15.97 |
| PW-1 | 12-Oct-95 | 08:00 | 46.8 | SYSTEM OFF | | | |
| | 12-Oct-95 | 08:20 | 47.1 | START | | | |
| MW-2 | 12-Oct-95 | 09:45 | 48.5 | -12.99 | -14.1 | 1.11 | -13.21 |
| PW-2 | 12-Oct-95 | 09:45 | 48.5 | -16.48 | -16.49 | 0.01 | -16.48 |
| UGW-22 | 12-Oct-95 | 09:45 | 48.5 | -11.41 | -11.42 | 0.01 | -11.41 |
| UGW-5 | 12-Oct-95 | 09:45 | 48.5 | -12.87 | -12.94 | 0.07 | -12.88 |
| PW-2 | 12-Oct-95 | 11:44 | 50.5 | -16.43 | -16.44 | 0.01 | -16.43 |
| UGW-22 | 12-Oct-95 | 11:44 | 50.5 | -11.47 | -11.49 | 0.02 | -11.47 |
| UGW-5 | 12-Oct-95 | 11:44 | 50.5 | -12.88 | -12.94 | 0.06 | -12.89 |
| MW-2 | 12-Oct-95 | 11:44 | 50.5 | -13.03 | -14.18 | 1.15 | -13.26 |
| PW-1 | 12-Oct-95 | 14:57 | 53.7 | STOP | | | |
| PW-1 | 14-Oct-95 | 10:25 | 97.2 | START | | | |
| UGW-22 | 14-Oct-95 | 10:55 | 97.7 | -11.82 | -11.83 | 0.01 | -11.82 |
| MW-2 | 14-Oct-95 | 10:55 | 97.7 | -13.73 | -14.91 | 1.18 | -13.97 |
| PW-2 | 14-Oct-95 | 10:55 | 97.7 | -13.31 | -13.8 | 0.49 | -13.41 |
| UGW-5 | 14-Oct-95 | 10:55 | 97.7 | -12.95 | -12.97 | 0.02 | -12.95 |

NOTE: WATER AND PRODUCT LEVEL MEASUREMENT ARE FROM TOP OF CASING (TOC)

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# TABLE 18
# US NAVY
# TOW WAY FUEL FACILITY
# ROOSEVELT ROADS, PUERTO RICO
# PW- 1 TEST
## TV PROJECT # 110234
## STAGE 2

SCFM

| DATE | TIME | RUN HOURS | PRODUCT LEVEL ft | WATER LEVEL ft | PRODUCT THICKNESS ft | PIEZOMETRI SURFACE ft | WELLHEAD VACUUM | TOTAL DELTA-P | TOTAL VACUUM | AIR FLOW |
|---|---|---|---|---|---|---|---|---|---|---|
| 10-Oct-95 | 09:15 | 0.0 | -10.99 | -10.99 | 0.00 | -10.99 | PUMP ON | 0 | 0 | 0 |
| 1-Oct-95 | 08:58 | 23.7 | -10.79 | -10.79 | 0.00 | -10.79 | | | | |
| 1-Oct-95 | 16:21 | 31.1 | -11.80 | -11.81 | 0.01 | -11.80 | | | | 0.00 |
| 11-Oct-95 | 16:25 | 31.2 | START | VACUUM | | | | | | 0.00 |
| 1-Oct-95 | 16:27 | 31.2 | -11.66 | -11.68 | 0.02 | -11.66 | 3.00 | 0.0625 | 3.00 | 11.92 |
| 1-Oct-95 | 16:45 | 31.5 | -10.78 | -10.79 | 0.01 | -10.78 | 3.00 | 0.0625 | 3.00 | 11.92 |
| 11-Oct-95 | 17:09 | 31.9 | -10.36 | -10.37 | 0.01 | -10.36 | 3.00 | 0.0625 | 3.00 | 11.92 |
| 11-Oct-95 | 17:35 | 32.3 | -10.09 | -10.10 | 0.01 | -10.09 | 3.00 | 0.0625 | 3.00 | 11.92 |
| 1-Oct-95 | 18:00 | 32.8 | -9.96 | -9.96 | 0.00 | -9.96 | 3.00 | 0.0625 | 3.00 | 11.92 |
| 11-Oct-95 | 18:15 | 33.0 | -9.90 | -9.90 | 0.00 | -9.90 | 3.00 | 0.0625 | 3.00 | 11.92 |
| 12-Oct-95 | 08:00 | 46.8 | system shut down over night | | | | | | | |
| 2-Oct-95 | 08:15 | 47.0 | -11.78 | -11.79 | 0.01 | -11.78 | | | | |
| 12-Oct-95 | 08:20 | 47.1 | START | | | | | | | |
| 12-Oct-95 | 09:20 | 48.1 | -10.66 | -10.66 | 0.00 | -10.66 | 3.00 | 0.0625 | 3.00 | 11.92 |
| 2-Oct-95 | 09:46 | 48.5 | -10.59 | -10.59 | 0.00 | -10.59 | 3.00 | 0.0625 | 3.00 | 11.92 |
| 2-Oct-95 | 11:42 | 50.5 | -10.43 | -10.43 | 0.00 | -10.43 | 3.00 | 0.0625 | 3.00 | 11.92 |
| 12-Oct-95 | 13:47 | 52.5 | -10.44 | -10.44 | 0.00 | -10.44 | 3.00 | 0.0625 | 3.00 | 11.92 |
| 12-Oct-95 | 14:57 | 53.7 | STOP | | | | | | | |
| 4-Oct-95 | 08:40 | 95.4 | -11.41 | -11.41 | 0.00 | -11.41 | | | | |
| 14-Oct-95 | 10:25 | 97.2 | START | | | | 4.10 | 0.625 | 4.00 | 36.93 |
| 14-Oct-95 | 10:57 | 97.7 | -10.16 | -10.16 | 0.00 | -10.16 | | | | |

OTE: WATER AND PRODUCT LEVEL MEASUREMENT ARE FROM TOP OF CASING (TOC)

# TABLE 19
## US NAVY
## TOW WAY FUEL FACILITY
## ROOSEVELT ROADS, PUERTO RICO
## PW-2 CAPTURE ZONE TEST
### TV PROJECT # 110234
### STAGE 2

| WELL NUMBER | DATE | TIME | RUN HOURS | PRODUCT LEVEL ft | WATER LEVEL ft | PRODUCT THICKNESS f | PIEZOMETRI SURFACE ft |
|---|---|---|---|---|---|---|---|
| PW-2 | 12-Oct-95 | 14:57 | 53.7 | START | VAC | | |
| PW-1 | 12-Oct-95 | 15:13 | 54.3 | -11.55 | -11.55 | 0.00 | -11.55 |
| UGW-22 | 12-Oct-95 | 15:13 | 54.3 | -11.58 | -11.60 | 0.02 | -11.58 |
| MW-2 | 12-Oct-95 | 15:13 | 54.3 | -13.16 | -14.37 | 1.21 | -13.40 |
| MW-1 | 12-Oct-95 | 15:13 | 54.3 | -14.53 | -14.54 | 0.01 | -14.53 |
| UGW-5 | 12-Oct-95 | 15:13 | 54.3 | -12.91 | -12.95 | 0.04 | -12.92 |
| PW-1 | 12-Oct-95 | 15:43 | 54.3 | -11.78 | -11.79 | 0.01 | -11.78 |
| UGW-22 | 12-Oct-95 | 15:45 | 55.1 | -11.61 | -11.63 | 0.02 | -11.61 |
| MW-2 | 12-Oct-95 | 15:45 | 55.1 | -13.42 | -14.67 | 1.25 | -13.67 |
| UGW-5 | 12-Oct-95 | 15:45 | 55.1 | -12.89 | -12.95 | 0.06 | -12.90 |
| PW-1 | 12-Oct-95 | 17:11 | 56.5 | -11.75 | -11.76 | 0.01 | -11.75 |
| UGW-22 | 12-Oct-95 | 17:11 | 56.5 | -11.66 | -11.69 | 0.03 | -11.67 |
| MW-2 | 12-Oct-95 | 17:11 | 56.5 | -13.76 | -14.92 | 1.16 | -13.99 |
| UGW-5 | 12-Oct-95 | 17:11 | 56.5 | -12.91 | -12.95 | 0.04 | -12.92 |
| PW-1 | 13-Oct-95 | 08:15 | 71.1 | -11.80 | -11.80 | 0.00 | -11.80 |
| MW-2 | 13-Oct-95 | 08:15 | 71.1 | -13.81 | -14.92 | 1.11 | -14.03 |
| UGW-22 | 13-Oct-95 | 08:15 | 71.1 | -12.08 | -12.11 | 0.03 | -12.09 |
| UGW-5 | 13-Oct-95 | 08:15 | 71.1 | -12.98 | -13.07 | 0.09 | -13.00 |
| PW-1 | 14-Oct-95 | 08:40 | 95.6 | -11.41 | -11.41 | 0.00 | -11.41 |
| MW-2 | 14-Oct-95 | 08:40 | 95.6 | -13.69 | -14.86 | 1.17 | -13.92 |
| UGW-22 | 14-Oct-95 | 08:40 | 95.6 | -11.86 | -11.87 | 0.01 | -11.86 |
| UGW-5 | 14-Oct-95 | 08:40 | 95.6 | -12.99 | -13.06 | 0.07 | -13.00 |

NOTE: WATER AND PRODUCT LEVEL MEASUREMENT ARE FROM TOP OF CASING (TOC)

# TABLE 20
## US NAVY
## TOW WAY FUEL FACILITY
## ROOSEVELT ROADS, PUERTO RICO
## PW-2 VACUUM ROI TEST
### TV PROJECT # 110234
### STAGE 2

| WELL NUMBER | DATE | TIME | VACUUM INCHES WATER | DISTANCE FEET |
|---|---|---|---|---|
| PW-2 | 16-Oct-95 | 09:20 | 61.20 | 0.00 |
| PW-1 | 16-Oct-95 | 09:20 | 0.5 | 7 |
| MW-1 | 16-Oct-95 | 09:20 | 0.50 | 10.25 |
| UGW-22 | 16-Oct-95 | 09:20 | 0.125 | 20.75 |
| blank | | | 0.1 | 30 |
| MW-2 | 16-Oct-95 | 09:20 | 0 | 5.83 |
| UGW-5 | 16-Oct-95 | 09:20 | 0.00 | 14.52 |

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# TABLE 21
# US NAVY
# TOW WAY FUEL FACILITY
# ROOSEVELT ROADS, PUERTO RICO
# PW-2 TEST
## TV PROJECT # 110234
## STAGE 2

| DATE | TIME | | PRODUCT LEVEL ft | WATER LEVEL ft | PRODUCT THICKNESS ft | PIEZOMETRI SURFACE ft | WELL HEAD VACUUM | TOTAL DELTA-P | TOTAL VAC | SCFM AIR FLOW |
|---|---|---|---|---|---|---|---|---|---|---|
| 10-Oct-95 | 09:15 | 0.0 | -13.93 | -13.99 | 0.06 | -13.94 | | | | |
| 11-Oct-95 | 08:58 | 23.7 | -14.04 | -14.09 | 0.05 | -14.05 | | | | |
| 11-Oct-95 | 17:01 | 31.8 | -14.68 | -14.68 | 0.00 | -14.68 | | | | |
| 12-Oct-95 | 14:57 | 53.7 | START | | | | | | | 0.0 |
| 12-Oct-95 | 15:12 | 54.0 | -15.66 | -15.66 | 0.00 | -15.66 | 3 | 0.0625 | 3 | 11.9 |
| 12-Oct-95 | 15:42 | 54.5 | -15.21 | -15.24 | 0.03 | -15.22 | | | | 0.0 |
| 12-Oct-95 | 17:09 | 55.9 | -14.9 | -15.01 | 0.11 | -14.92 | 2.5 | 0.0625 | 3 | 12.0 |
| 13-Oct-95 | 08:16 | 71.0 | -13.58 | -14.2 | 0.62 | -13.70 | 2.5 | 0.0625 | 3 | 12.0 |
| 14-Oct-95 | 08:41 | 95.4 | -12.4 | -13.65 | 1.25 | -12.65 | 3.5 | 0.0625 | 3 | 11.8 |
| | 09:44 | PUMP MOVED UP TO PRODUCT LEVEL | | | | | | | | |

NOTE: WATER AND PRODUCT LEVEL MEASUREMENT ARE FROM TOP OF CASING (TOC)

# TABLE 22
## US NAVY
## TOW WAY FUEL FACILITY
## ROOSEVELT ROADS, PUERTO RICO
## PW-3 CAPTURE ZONE TEST
### TV PROJECT # 110234
### STAGE 2

| WELL NUMBER | DATE | TIME | RUN HOURS | PRODUCT LEVEL ft | WATER LEVEL ft | PRODUCT THICKNESS f | PIEZOMETRIC SURFACE ft |
|---|---|---|---|---|---|---|---|
| PW-6 | 13-Oct-95 | 14:07 | 76.9 | -16.34 | -16.50 | 0.16 | -16.37 |
| PW-5 | 13-Oct-95 | 14:07 | 76.9 | -19.29 | -19.40 | 0.11 | -19.31 |
| PW-4 | 13-Oct-95 | 14:07 | 76.9 | -13.62 | -14.90 | 1.28 | -13.88 |
| MW-4 | 13-Oct-95 | 14:07 | 76.9 | -13.39 | -14.40 | 1.01 | -13.59 |
| MW-3 | 13-Oct-95 | 14:07 | 76.9 | -14.46 | -15.74 | 1.28 | -14.72 |
| UGW-1 | 13-Oct-95 | 14:07 | 76.9 | -13.72 | -14.62 | 0.90 | -13.90 |
| PW-3 | 13-Oct-95 | 14:15 | 77.0 | START | VAC | | |
| PW-6 | 13-Oct-95 | 14:33 | 77.3 | -16.34 | -16.47 | 0.13 | -16.37 |
| PW-5 | 13-Oct-95 | 14:33 | 77.3 | -19.39 | -19.40 | 0.01 | -19.39 |
| PW-4 | 13-Oct-95 | 14:33 | 77.3 | -13.70 | -14.95 | 1.25 | -13.95 |
| MW-4 | 13-Oct-95 | 14:33 | 77.3 | -13.80 | -14.39 | 0.59 | -13.92 |
| MW-3 | 13-Oct-95 | 14:33 | 77.3 | -14.46 | -15.78 | 1.32 | -14.72 |
| UGW-1 | 13-Oct-95 | 14:33 | 77.3 | -13.74 | -14.62 | 0.88 | -13.92 |
| PW-6 | 13-Oct-95 | 15:00 | 77.8 | -16.38 | -16.45 | 0.07 | -16.39 |
| PW-5 | 13-Oct-95 | 15:00 | 77.8 | -19.38 | -19.39 | 0.01 | -19.38 |
| PW-4 | 13-Oct-95 | 15:00 | 77.8 | -13.80 | -15.18 | 1.38 | -14.08 |
| MW-4 | 13-Oct-95 | 15:00 | 77.8 | -13.39 | -14.40 | 1.01 | -13.59 |
| MW-3 | 13-Oct-95 | 15:00 | 77.8 | -14.48 | -15.83 | 1.35 | -14.75 |
| UGW-1 | 13-Oct-95 | 15:00 | 77.8 | -13.76 | -14.64 | 0.88 | -13.94 |
| PW-6 | 14-Oct-95 | 08:52 | 95.7 | -16.50 | -16.78 | 0.28 | -16.56 |
| PW-5 | 14-Oct-95 | 08:52 | 95.7 | -19.36 | -19.37 | 0.01 | -19.36 |
| MW-4 | 14-Oct-95 | 08:52 | 95.7 | -13.41 | -14.49 | 1.08 | -13.63 |
| PW-4 | 14-Oct-95 | 08:52 | 95.7 | -13.73 | -15.27 | 1.54 | -14.04 |
| MW-3 | 14-Oct-95 | 08:52 | 95.7 | -14.64 | -16.11 | 1.47 | -14.93 |
| UGW-1 | 14-Oct-95 | 08:52 | 95.7 | -13.89 | -14.77 | 0.88 | -14.07 |
| PW-3 | 14-Oct-95 | 10:30 | 97.3 | STOP | VAC | | |

NOTE: WATER AND PRODUCT LEVEL MEASUREMENT ARE FROM TOP OF CASING (TOC

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BORING/WELL NUMBER: MW-1 DATE DRILLED: 9/19/95

Project: ROOSEVELT ROADS US NAVY STATION Project Number: 11-0234

Drilling Contractor: GEOTECH Log by: F. McKay
Drilling Method: HSA ( 6.25" ID)

DIAMETER: 2" LENGTH: 12.5' MATERIAL: PVC SCH 40 SLOT SIZE: 020"
DIAMETER: 2" LENGTH: 3.5' MATERIAL: PVC SCH 40
MATERIAL: SAND FILTER SIZE: 6-20 Reference Elev.: Total depth: 16.0'

| ELL. TION | DEPTH (ft.) | LITHOLOGY | (USCS) | GEOLOGIC DESCRIPTION (Color, Texture, Structure, etc.) | SOIL ANALYSES (PPM) |
|---|---|---|---|---|---|
| | 0 | | FILL | FILL : Brown, Silty - Clay with Sand and Gravel, Numerous Gravel, Gravel up to > 3 cm, SW=.50, No Hydro Carbon (H.C.) Odor | |
| | | | FILL | FILL : Same As Above Slight H.C. Odor | |
| | 5 | | (CL-ML) | CLAYEY/SILT : Lt. Brown - Gray - Green, Clayey -Silt, Also Some Sand and Large Gravel, Plastic, (CL - ML), Strong H.C. Odor, SW = .50 | 7,290 |
| | | | (CL-ML) | CLAYEY/SILT : Same As Above, Less Plastic | 5,995 |
| | | | | | 3,284 |
| | | | | | 3,473 |
| | 10 | | | WEATHERED ROCK : Gray - Green to Brown, Silty - Sand & Gravel, Hard, Dry, Broken - Fractured Rock, Zones of High Fractures and Product @ 11', SW = <.50 | 981 |
| | | | | | 366 |
| | | | | | 303 |
| | | | | WEATHERED ROCK : Reddish - Brown, Silty Clay Few Clasts, Compact - Hard, Plastic when wet, SW = .50 | 96 |
| | | | | | 3,103 |
| | 15 | | | WEATHERED ROCK : Same as Above Contact @ 15.25' : Dk. Brown to Gray - Green, Decomposed Rock, Silts - Sands, Few Clays, Saturated with Product | 27,233 |
| | | | | | 5,965 |
| | | | | WEATHERED ROCK : Lt. Brown - Reddish, Very Compact, Breaks down into Silts and Clays, few Sands Sizes, SW = .50 | |
| | 20 | | | | |
| | 25 | | | | |

marks: screen 16.0'-4.0' (bls)
riser 4.0'-surface
sump 16.0'-15.5'(bls)
sand 16.0'-3.5' (bls)
bentonite 3.5'-3.0' (bls)
grout 3.0'- surface

TERRA VAC

| | | | |
|---|---|---|---|
| BORING/WELL NUMBER: | MW-2 | DATE DRILLED: | 9/12/95 |
| Project: | ROOSEVELT ROADS US NAVY STATION | Project Number: | 11-0234 |
| Drilling Contractor: | GEOTECH | Log by: | F. McRay |
| Drilling Method: | HSA ( 6.25" ID) | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| DIAMETER: | 2" | LENGTH: | 20.0' | MATERIAL: | PVC SCH 40 | SLOT SIZE: | 020" |
| NG DIAMETER: | 2" | LENGTH: | 5.0' | MATERIAL: | PVC SCH 40 | | |
| ER MATERIAL: | SAND | FILTER SIZE: | 6-20 | Reference Elev.: | | Total depth: | 25.0' |

| ELL TION | DEPTH (ft.) | LITHOLOGY | (USCS) | GEOLOGIC DESCRIPTION (Color, Texture, Structure, etc.) | | SOIL ANALYSES (PPM) |
|---|---|---|---|---|---|---|
| | 0 | | | FILL | : Brown, Silty - Clay with Sand and Gravel, Fill, Numerous Gravel, Gravel up to > 3 cm, SW=.50 | |
| | | | | FILL | : Brown, Some Gray - Green, Silty - Sandy - Clay With Gravel, Fill, Large Gravel > 2cm, SW = .50 | |
| | 5 | | (CL-ML) | CLAYEY/SILT | : Lt. Brown, Silty - Clay Some Sand, (CL-ML), Plastic, Hydro Carbon (H.C.) Odor, SW = .50 | |
| | | | (CL-ML) | CLAYEY/SILT | : Same As Above | |
| | 10 | | (CL) | CLAY | : Lt. Brown, Silty - Clay, Very Plastic, (CL), Strong H.C. Odor, SW = .75 | |
| | | | | WEATHERED ROCK | : Reddish - Brown, Silt - Clay - Sand & Gravel, Gravel 2mm-2cm, Decomposed Rock, Fractured, Slight H.C. Oder, Dry, SW = <.50 | |
| | 15 | | | WEATHERED ROCK | : Same as Above, H.C. Odor SW = .50 | |
| | | | | WEATHERED ROCK | : Reddish - Brown, Silt - Clay - Sand & Gravel, Gravel 2mm-2cm, Decomposed Rock, Slight H.C. Odor, Dry, SW = <.50 | |
| | 20 | | | WEATHERED ROCK | : Reddish - Brown, Silt - Clay - Sand & Gravel, Gravel 2mm-2cm, Decomposed Rock, Slight H.C. Odor, Dry, SW = <.50 | |
| | | | | WEATHERED ROCK | : Same as Above, H.C. Odor SW = .50 | |
| | 25 | | | | | |

marks: screen 25.0'-5.0' (bls)
riser 5.0'-surface
sump 25.0'-24.5'(bls)
sand 25.0'-4.0' (bls)
bentonite 4.0'-3.5' (bls)
grout 3.5'- surface

TERRA VAC

| | | | |
|---|---|---|---|
| BORING/WELL NUMBER: | PW-3 | DATE DRILLED: | 9/22/95 |
| Project: | ROOSEVELT ROADS US NAVY STATION | Project Number: | 11-0234 |
| Drilling Contractor: | GEOTECH | Log by: | F. McKay |
| Drilling Method: | HSA ( 6.25" ID) | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| EEN DIAMETER: | 4" | LENGTH: | 20.0' | MATERIAL: | PVC SCH 40 | SLOT SIZE: | 020" |
| NG DIAMETER: | 4" | LENGTH: | 4.0' | MATERIAL: | PVC SCH 40 | | |
| LTER MATERIAL: | SAND | FILTER SIZE: | 6-20 | Reference Elev.: | | Total depth: | 24.0' |

| WELL PLETION | DEPTH (ft.) | LITHOLOGY | (USCS) | GEOLOGIC DESCRIPTION (Color, Texture, Structure, etc.) | SOIL ANALYSES (PPM) |
|---|---|---|---|---|---|
| | 0 | | FILL | FILL : Brown, Silty - Clay with Sand and Gravel, Numerous Gravel, Gravel up to > 3 cm, SW=.50, Clay - Fill is Plastic, No H.C. Odor | |
| | | | | WEATHERED ROCK : Dk.Gray - Green, Fractured Rock, Gravels - Sands, Few Silts and Clays, SW = .50, Slight H.C. odor Hydro-Carbon (H.C.) Odor, SW = .50 | |
| | 5 | | | WEATHERED ROCK : Dk.Gray - Green, Fractured Rock, Gravels - Sands, Few Silts and Clays, SW = .50, Slight H.C. odor Hydro-Carbon (H.C.) Odor, SW = .50 | 339 |
| | | | | | 5,943 |
| | | | | WEATHERED ROCK : Gray - Green grading down to Reddish - Brown, Fractured Rock on top grading down to compact Silts - Clays, H.C. Odor, SW = .50 | 10.3 |
| | | | | | 615 |
| | 10 | | | WEATHERED ROCK : Same as Above H.C. Odor | 635 |
| | | | | WEATHERED ROCK : Dk.Gray - Green, Fractured Rock, Gravels - Sands, Few Silts and Clays, SW = .50, Slight H.C. odor Hydro-Carbon (H.C.) Odor, SW = .50 | |
| | | | | | 540 |
| | 15 | | | WEATHERED ROCK : Dk.Gray - Green, Fractured Rock, Gravels - Sands, Few Silts and Clays, SW = .50, Slight H.C. odor Hydro-Carbon (H.C.) Odor, SW = .50 | 514 |
| | | | | | 5,004 |
| | | | | WEATHERED ROCK : Dark Gray - Dk. Green, some Iron Staining, Fractured Rock, Breaks down into Silts and Clays, SW = .50, Strong H.C. Odor | |
| | 20 | | | WEATHERED ROCK : Same as Above, (observed from cuttings) | |
| | 25 | | | | |

emarks: screen 24.0'-4.0' (bls)
riser 4.0'-surface
sump 24.0'-23.5'(bls)
sand 24.0'-3.5' (bls)
bentonite 3.5'-3.0' (bls)
grout 3.0'- surface

TERRA VAC

| | | | |
|---|---|---|---|
| BORING/WELL NUMBER: | MW-3 | DATE DRILLED: | 9/25/95 |
| Project: | ROOSEVELT ROADS US NAVY STATION | Project Number: | 11-0234 |
| Drilling Contractor: | GEOTECH | Log by: | F. McKay |
| Drilling Method: | HSA ( 6.25" ID) | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| N DIAMETER: | 2" | LENGTH: | 20.0' | MATERIAL: | PVC SCH 40 | SLOT SIZE: | 020" |
| ING DIAMETER: | 2" | LENGTH: | 4.0' | MATERIAL: | PVC SCH 40 | | |
| ER MATERIAL: | SAND | FILTER SIZE: | 6-20 | Reference Elev.: | | Total depth: | 24.0' |

| WELL COMPLETION | DEPTH (ft.) | LITHOLOGY | (USCS) | GEOLOGIC DESCRIPTION (Color, Texture, Structure, etc.) | SOIL ANALYSES (PPM) |
|---|---|---|---|---|---|
| | 0 | | | FILL : Brown, Silty - Clay with Sand and Gravel, Numerous Gravel, Gravel up to > 3 cm, SW=.50, Clay - Fill is Plastic, No H.C. Odor | |
| | | | | FILL : Same as Above | |
| | | | | WEATHERED ROCK : Dk.Gray - Green, Fractured Rock, Gravels - Sands, Few Silts and Clays, SW = .50, Slight H.C. odor Hydro-Carbon (H.C.) Odor, SW = .50 | |
| | 5 | | | WEATHERED ROCK : Dk.Gray - Green, Fractured Rock, Gravels - Sands, Few Silts and Clays, SW = .50, Slight H.C. odor Hydro-Carbon (H.C.) Odor, SW = .50 | |
| | | | | WEATHERED ROCK : Gray - Green grading down to Reddish - Brown, Fractured Rock on top grading down to compact Silts - Clays, H.C. Odor, SW = .50 | |
| | 10 | | | WEATHERED ROCK : Same as Above H.C. Odor | |
| | | | | WEATHERED ROCK : Dk.Gray - Green, Fractured Rock, Gravels - Sands, Few Silts and Clays, SW = .50, Slight H.C. odor Hydro-Carbon (H.C.) Odor, SW = .50 | |
| | 15 | | | WEATHERED ROCK : Dk.Gray - Green, Fractured Rock, Gravels - Sands, Few Silts and Clays, SW = .50, Slight H.C. odor Hydro-Carbon (H.C.) Odor, SW = .50 | |
| | | | | WEATHERED ROCK : Dark Gray - Dk. Green, some Iron Staining, Fractured Rock, Breaks down into Silts and Clays, SW = .50, Strong H.C. Odor | |
| | 20 | | | WEATHERED ROCK : Same as Above, (observed from cuttings) | |
| | 25 | | | | |

Remarks: screen 24.0'-4.5' (bls)
riser 4.5'-surface
sump 24.0'-23.5'(bls)
sand 24.0'-4.0' (bls)
bentonite 4.0'-3.5' (bls)
grout 3.5'- surface

TERRA VAC

| | | | |
|---|---|---|---|
| BORING/WELL NUMBER: | MW-4 | DATE DRILLED: | 9/22/95 |
| Project: | ROOSEVELT ROADS US NAVY STATION | Project Number: | 11-0234 |
| Drilling Contractor: | GEOTECH | Log by: | F. McKay |
| Drilling Method: | HSA ( 6.25" ID) | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| EN DIAMETER: | 2" | LENGTH: | 20.0' | MATERIAL: | PVC SCH 40 | SLOT SIZE: | 020" |
| NG DIAMETER: | 2" | LENGTH: | 4.0' | MATERIAL: | PVC SCH 40 | | |
| LTER MATERIAL: | SAND | FILTER SIZE: | 6-20 | Reference Elev.: | | Total depth: | 24.0' |

| WELL PLETION | DEPTH (ft.) | LITHOLOGY | (USCS) | GEOLOGIC DESCRIPTION (Color, Texture, Structure, etc.) | SOIL ANALYSES (PPM) |
|---|---|---|---|---|---|
| | 0 | | | FILL : Brown, Silty - Clay with Sand and Gravel, Numerous Gravel, Gravel up to > 3 cm, SW=.50, Clay - Fill is Plastic, No H.C. Odor (Observed from Cuttings) | |
| | | | (ML-SM) | SILTY/SAND : Dk.Gray - Green, Silty - Sand, Some caly, Slight H.C. odor, SW = .50 | |
| | 5 | | | WEATHERED ROCK : Brown - Reddish, Fractured Rock, Breaks down to Sands Silts and Clays, SW = .50, Slight H.C. odor | |
| | | | | WEATHERED ROCK : Gray - Green, Decomposed Rock, Breaks down to Silts and Clays, H.C. Odor, SW = .50 | |
| | 10 | | | WEATHERED ROCK : Same as Above: | |
| | | | | WEATHERED ROCK : Dk.Gray - Green, Fractured Rock, Gravels - Sands, Few Silts and Clays, SW = .50, Slight H.C. odor | |
| | 15 | | | WEATHERED ROCK : Dk.Gray - Green, Fractured Rock, Gravels - Sands, Few Silts and Clays, SW = .50, Slight H.C. odor | |
| | | | | WEATHERED ROCK : Dark Gray - Dk. Green, Fractured Rock Breaks down into Silts and Clays, SW = .50, Strong H.C. Odor | |
| | 20 | | | WEATHERED ROCK : Same as Above, | |
| | 25 | | | | |

emarks: screen 24.0'-4.5' (bls)
riser 4.5'-surface
sump 24.0'-23.5'(bls)
sand 24.0'-4.0' (bls)
bentonite 4.0'-3.5' (bls)
grout 3.5'- surface

TERRA VAC

| | | | |
|---|---|---|---|
| BORING/WELL NUMBER: | PW-1 | DATE DRILLED: | 9/26/95 |
| Project: | ROOSEVELT ROADS US NAVY STATION | Project Number: | 11-0234 |
| Drilling Contractor: | GEOTECH | Log by: | F. McKay |
| Drilling Method: | HSA ( 6.25" ID) | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| SN DIAMETER: | 4" | LENGTH: | 20.0' | MATERIAL: | PVC SCH 40 | SLOT SIZE: | 020" |
| ING DIAMETER: | 4" | LENGTH: | 4.0' | MATERIAL: | PVC SCH 40 | | |
| TER MATERIAL: | SAND | FILTER SIZE: | 6-20 | Reference Elev.: | | Total depth: | 24.0' |

| WELL LETION | DEPTH (ft.) | LITHOLOGY | (USCS) | GEOLOGIC DESCRIPTION (Color, Texture, Structure, etc.) | SOIL ANALYSES (PPM) |
|---|---|---|---|---|---|
| | 0 | | | FILL : Brown, Silty - Clay with Sand and Gravel, Numerous Gravel, Gravel up to > 3 cm, SW=.50 | |
| | | | | FILL : Same As Above | |
| | 5 | | (CL-ML) | CLAYEY/SILT : Lt. Brown - Gray - Green, Clayey -Silt, Also Some Sand and Large (LG.) Gravel, Plastic, (CL - ML), Hydro-Carbon (H.C.) Odor, SW = .50 | |
| | | | (CL-ML) | CLAYEY/SILT : Same As Above, Less Plastic | 1,469<br>1,457<br>2,904 |
| | 10 | | | WEATHERED ROCK : Brown - Reddish, Clayey - Silty - Sand & Gravel, Some Layering, Compact - Hard, Dry, (CL-SW), Strong H.C. Odor, Fractured Zone, SW = <.50 | 2,361<br>6,506<br>3,030 |
| | | | | WEATHERED ROCK : Reddish - Brown grading down to Dark Gray - Green, Clayey - Silt, Compact - Hard, Breaks into Silts & Clay, Fracture Zone at approximately 13', SW = <.50 | 3,205<br>802 |
| | 15 | | | WEATHERED ROCK : Brown - Reddish, Clayey - Silt, Compact - Hard - Dry, Breaks into Silts & Clay, Layering, H.C. Odor, SW = .50 | 1,173<br>438<br>222 |
| | | | | WEATHERED ROCK : Dark Gray - Green grading down to Reddish -Brown, Clayey - Silt, some Layering, Some Fracture Zones, Light H.C. Odor, S.W. = <.50 | |
| | 20 | | | WEATHERED ROCK : Same as Above, (observed from cuttings) | |
| | 25 | | | | |

marks: screen 24.0'-4.0' (bls)
riser 4.0'-surface
sump 24.0'-23.5'(bls)
sand 24.0'-3.5' (bls)
bentonite 3.5'-3.0' (bls)
grout 3.0'- surface

TERRA VAC

| | | | |
|---|---|---|---|
| BORING/WELL NUMBER: | PW-2 | DATE DRILLED: | 9/20/95 |
| Project: | ROOSEVELT ROADS US NAVY STATION | Project Number: | 11-0234 |
| Drilling Contractor: | GEOTECH | Log by: | F. McKay |
| Drilling Method: | HSA ( 6.25" ID) | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| EN DIAMETER: | 4" | LENGTH: | 20.0' | MATERIAL: | PVC SCH 40 | SLOT SIZE: | 020" |
| SING DIAMETER: | 4" | LENGTH: | 4.0' | MATERIAL: | PVC SCH 40 | | |
| TER MATERIAL: | SAND | FILTER SIZE: | 6-20 | Reference Elev.: | | Total depth: | 24.0' |

| WELL LETION | DEPTH (ft.) | LITHOLOGY | (USCS) | GEOLOGIC DESCRIPTION (Color, Texture, Structure, etc.) | SOIL ANALYSES (PPM) |
|---|---|---|---|---|---|
| | 0 | | | FILL : Brown, Silty - Clay with Sand and Gravel, Numerous Gravel, Gravel up to > 3 cm, SW=.50, Clay - Fill is Plastic, No H.C. Odor | |
| | | | | FILL : Same As Above Slight H.C. Odor | |
| | 5 | | | WEATHERED ROCK : Dk.Gray - Green, Fractured Rock, Gravels - Sands, Few Silts and Clays, SW = .50, Slight H.C. odor | |
| | | | | Hydro-Carbon (H.C.) Odor, SW = .50 | 1,441 |
| | | | | | 2,041 |
| | | | | WEATHERED ROCK : Gray - Green grading down to Reddish - Brown, Fractured Rock on top grading down to compact Silts - Clays, Strong H.C. Odor, SW = .50 | 1,167 |
| | | | | | 837 |
| | 10 | | | WEATHERED ROCK : Brown - Reddish, Clayey - Silty - Sand & Gravel, Some Layering, Compact - Hard, Dry, Breaks into Silts & Clays, Strong H.C. Odor, Fractured Rock Zone, SW = .50 | 4,282 |
| | | | | | 1,375 |
| | | | | | 48,158 |
| | | | | WEATHERED ROCK : Reddish - Brown grading down to Dark Gray - Green, Clayey - Silt, Compact - Hard, Breaks into Silts & Clay, Fracture Zone @ approximatly 12.5', SW = <.50, Product | 29,971 |
| | | | | | 7,413 |
| | 15 | | | WEATHERED ROCK : Gray - Green, Fractured Rock, Gravel & Sand Sizes, Breaks into Silts & Clay, H.C. Odor, SW = .50 | |
| | | | | | 7,388 |
| | | | | | 605 |
| | | | | WEATHERED ROCK : Dark Gray - Green grading down to Reddish -Brown, Clayey - Silt, some Layering, light H.C. Odor, SW = <.50 | 606 |
| | 20 | | | WEATHERED ROCK : Same as Above, (observed from cuttings) | |
| | 25 | | | | |

Remarks: screen 24.0'-4.0' (bls)
riser 4.0'-surface
sump 24.0'-23.5'(bls)
sand 24.0'-3.5' (bls)
bentonite 3.5'-3.0' (bls)
grout 3.0'- surface

TERRA VAC

| | | | |
|---|---|---|---|
| BORING/WELL NUMBER: | PW-3 | DATE DRILLED: | 9/22/95 |
| Project: | ROOSEVELT ROADS US NAVY STATION | Project Number: | 11-0234 |
| Drilling Contractor: | GEOTECH | Log by: | F. McKay |
| Drilling Method: | HSA ( 6.25" ID) | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| EN DIAMETER: | 4" | LENGTH: | 20.0' | MATERIAL: | PVC SCH 40 | SLOT SIZE: | 020" |
| NG DIAMETER: | 4" | LENGTH: | 4.0' | MATERIAL: | PVC SCH 40 | | |
| ER MATERIAL: | SAND | FILTER SIZE: | 6-20 | Reference Elev.: | | Total depth: | 24.0' |

| WELL MPLETION | DEPTH (ft.) | LITHOLOGY | (USCS) | GEOLOGIC DESCRIPTION (Color, Texture, Structure, etc.) | SOIL ANALYSES (PPM) |
|---|---|---|---|---|---|
| | 0 | | FILL | FILL : Brown, Silty - Clay with Sand and Gravel, Numerous Gravel, Gravel up to > 3 cm, SW=.50, Clay - Fill is Plastic, No H.C. odor | |
| | | | | WEATHERED ROCK : Dk.Gray - Green, Fractured Rock, Gravels - Sands, Few Silts and Clays, SW = .50, Slight H.C. odor Hydro-Carbon (H.C.) Odor, SW = .50 | |
| | 5 | | | WEATHERED ROCK : Dk.Gray - Green, Fractured Rock, Gravels - Sands, Few Silts and Clays, SW = .50, Slight H.C. odor Hydro-Carbon (H.C.) Odor, SW = .50 | 339 |
| | | | | | 5,943 |
| | | | | WEATHERED ROCK : Gray - Green grading down to Reddish - Brown, Fractured Rock on top grading down to compact Silts - Clays, H.C. Odor, SW = .50 | 10.3 |
| | | | | | 615 |
| | 10 | | | WEATHERED ROCK : Same as Above H.C. Odor | 635 |
| | | | | WEATHERED ROCK : Dk.Gray - Green, Fractured Rock, Gravels - Sands, Few Silts and Clays, SW = .50, Slight H.C. odor Hydro-Carbon (H.C.) Odor, SW = .50 | |
| | | | | | 540 |
| | 15 | | | WEATHERED ROCK : Dk.Gray - Green, Fractured Rock, Gravels - Sands, Few Silts and Clays, SW = .50, Slight H.C. odor Hydro-Carbon (H.C.) Odor, SW = .50 | 514 |
| | | | | | 5,804 |
| | | | | WEATHERED ROCK : Dark Gray - Dk. Green, some Iron Staining, Fractured Rock, Breaks down into Silts and Clays, SW = .50, Strong H.C. Odor | |
| | 20 | | | WEATHERED ROCK : Same as Above, (observed from cuttings) | |
| | 25 | | | | |

...rks: screen 24.0'-4.0' (bls)
riser 4.0'-surface
sump 24.0'-23.5'(bls)
sand 24.0'-3.5' (bls)
bentonite 3.5'-3.0' (bls)
grout 3.0'- surface

TERRA VAC

| | | | |
|---|---|---|---|
| BORING/WELL NUMBER: | FW-4 | DATE DRILLED: | 9/25/95 |
| Project: | ROOSEVELT ROADS US NAVY STATION | Project Number: | 11-0234 |
| Drilling Contractor: | GEOTECH | Log by: | F. McKay |
| Drilling Method: | HSA ( 6.25" ID) | | |

| | | | | | |
|---|---|---|---|---|---|
| EN DIAMETER: | 4" | LENGTH: | 20.0' | MATERIAL: PVC SCH 40 | SLOT SIZE: 020" |
| NG DIAMETER: | 4" | LENGTH: | 4.0' | MATERIAL: PVC SCH 40 | |
| LTER MATERIAL: | SAND | FILTER SIZE: | 6-20 | Reference Elev.: | Total depth: 24.0' |

| WELL COMPLETION | DEPTH (ft.) | LITHOLOGY | (USCS) | GEOLOGIC DESCRIPTION (Color, Texture, Structure, etc.) | SOIL ANALYSES (PPM) |
|---|---|---|---|---|---|
| | 0 | | | FILL : Brown, Silty - Clay with Sand and Gravel, Numerous Gravel, Gravel up to > 3 cm, SW=.50, Clay - Fill is Plastic, No H.C. Odor | |
| | | | | FILL : Same as Above | |
| | | | (CL-ML) | SILTY/CLAY : Dk.Gray - Green, Silty - Clay with some Sand, Very Plastic, SW = .50 Hydro-Carbon (H.C.) Odor, SW = .50 | |
| | 5 | | (CL-ML) | SILTY/CLAY : Same as Above | |
| | | | | | 361 |
| | | | | WEATHERED ROCK : Gray - Green, Silty - Clay with Sand, Hard, Compact, Breaks down easy to Silts & Clays, SW = .50 | 2,467 |
| | 10 | | | WEATHERED ROCK : Brown - Reddish, Compact, Fractured Rock, Breaks Down into Silts and Clays, SW = .50 | 1,156 |
| | | | | | 737 |
| | | | | WEATHERED ROCK : Brown - Reddish, Grades into Gray - Green, Fractured Rock, Breaks down into Silts and Clays, SW = .50 | |
| | | | | | 1,472 |
| | 15 | | | WEATHERED ROCK : Dk.Gray - Green, Fractured Rock, Gravels - Sands, Few Silts and Clays, SW = .50, Slight H.C. odor Hydro-Carbon (H.C.) Odor, SW = .50 | 620 |
| | | | | WEATHERED ROCK : Brown - Reddish, Fractured Rock, Breaks down into Silts and Clays, Plastic when wet, SW = .50 | 285 |
| | 20 | | | WEATHERED ROCK : Gray - Green, Grades into Reddish - Brown, Fractured Rock, Breaks down into Silts and Clays, Fracture zone/ Product @ approximately 21.0' | 645 |
| | | | | | 7,970 |
| | | | | | 587 |
| | | | | WEATHERED ROCK : Same as Above | |
| | 25 | | | | |

Remarks: screen 24.0'-4.0' (bls)
riser 4.0'-surface
sump 24.0'-23.5'(bls)
sand 24.0'-3.5' (bls)
bentonite 3.5'-3.0' (bls)
grout 3.0'- surface

TERRA VAC

| | | | |
|---|---|---|---|
| BORING/WELL NUMBER: | PW-5 | DATE DRILLED: | 9/23/95 |
| Project: | ROOSEVELT ROADS US NAVY STATION | Project Number: | 11-0234 |
| Drilling Contractor: | GEOTECH | Log by: | F. McKay |
| Drilling Method: | HSA ( 6.25" ID) | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| EEN DIAMETER: | 4" | LENGTH: | 20.0' | MATERIAL: | PVC SCH 40 | SLOT SIZE: | 020" |
| ING DIAMETER: | 4" | LENGTH: | 4.0' | MATERIAL: | PVC SCH 40 | | |
| LTER MATERIAL: | SAND | FILTER SIZE: | 6-20 | Reference Elev.: | | Total depth: | 24.0' |

| WELL MPLETION | DEPTH (ft.) | LITHOLOGY | (USCS) | GEOLOGIC DESCRIPTION (Color, Texture, Structure, etc.) | SOIL ANALYSES (PPM) |
|---|---|---|---|---|---|
| | 0 | | | FILL : Brown, Silty - Clay with Sand and Gravel, Numerous Gravel, Gravel up to > 3 cm, SW=.50, Clay - Fill is Plastic, No H.C. Odor | |
| | | | | FILL : Same as Above | |
| | | | (ML-SW) | SILTY/SAND : Gray - Green, Silty - Sand, Some Clay, SW = .50, Slight H.C. odor | 2,508 |
| | 5 | | | WEATHERED ROCK : Brown - Reddish, Fractured Rock, Breaks down into Silts and Clays, SW = .50, Slight H.C. odor | 1,161 |
| | | | | | 335 |
| | | | | WEATHERED ROCK : Gray - Green, Breaks down into Silts & Clays, Fractured Rock on top grading down to compact Silts - Clays, H.C. Odor, SW = .50 | 610 |
| | | | | | 456 |
| | 10 | | | WEATHERED ROCK : Dark Gray - Dark Green, Hard, Decomposed Rock, Breaks down into Silts & Clays, Zones of High Fractures and High H.C Odor, SW = .50 | 1,196 |
| | | | | | 825 |
| | | | | | 2,015 |
| | | | | WEATHERED ROCK : Dk.Gray - Green, Fractured Rock, Gravels - Sands, Few Silts and Clays, SW = .50, Slight H.C. odor Hydro-Carbon (H.C.) Odor, SW = .50 | |
| | | | | | 1,093 |
| | 15 | | | WEATHERED ROCK : Gray - Green, Fractured Rock, Gravels - Sands, Few Silts and Clays, SW = .50, Slight H.C. odor Hydro-Carbon (H.C.) Odor, SW = .50 | |
| | | | | WEATHERED ROCK : Dark Gray - Dk. Green, some Iron Staining, Fractured Rock, Breaks down into Silts and Clays, SW = .50, Strong H.C. Odor | |
| | 20 | | | WEATHERED ROCK : Same as Above, (observed from cuttings) | |
| | 25 | | | | |

marks: screen 24.0'-4.0' (bls)
riser 4.0'-surface
sump 24.0'-23.5'(bls)
sand 24.0'-3.5' (bls)
bentonite 3.5'-3.0' (bls)
grout 3.0'- surface

TERRA VAC

| | | | |
|---|---|---|---|
| BORING/WELL NUMBER: | PW-6 | DATE DRILLED: | 9/26/95 |
| Project: | ROOSEVELT ROADS US NAVY STATION | Project Number: | 11-0234 |
| Drilling Contractor: | GEOTECH | Log by: | F. McKay |
| Drilling Method: | HSA ( 6.25" ID) | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| EN DIAMETER: | 4" | LENGTH: | 20.0' | MATERIAL: | PVC SCH 40 | SLOT SIZE: | 020" |
| NG DIAMETER: | 4" | LENGTH: | 4.0' | MATERIAL: | PVC SCH 40 | | |
| ..ER MATERIAL: | SAND | FILTER SIZE: | 6-20 | Reference Elev.: | | Total depth: | 24.0' |

| WELL IPLETION | DEPTH (ft.) | LITHOLOGY | (USCS) | GEOLOGIC DESCRIPTION (Color, Texture, Structure, etc.) | | SOIL ANALYSES (PPM) |
|---|---|---|---|---|---|---|
| | 0 | | | FILL | : Brown, Silty - Clay with Sand and Gravel, Numerous Gravel, Gravel up to > 3 cm, SW=.50, Clay - Fill is Plastic, No H.C. Odor | |
| | | | | FILL | : Same as Above | |
| | | | (ML-SM) | SILTY/SAND | : Gray - Green, Silty - Sand, Some Clay, Slight H.C. Odor, SW = .50 | |
| | 5 | | (ML-SM) | SILTY/SAND | : Same as Above | |
| | | | | WEATHERED ROCK | : Gray - Green, Fractured Rock, Gravels - Sands, Breaks down to Silts and Clays, SW = .50, Slight H.C. Odor, SW = .50 | 1,161 |
| | | | | | | 1,027 |
| | 10 | | | WEATHERED ROCK | : Dk.Gray - Green, Fractured Rock, Gravels - Sands, Breaks down to Silts and Clays, Strong H.C. Odor, Zones of Soft Clay, SW = .50 | 404 |
| | | | | WEATHERED ROCK | : Dk.Gray - Green, Fractured Rock, Gravels - Sands, Few Silts and Clays, SW = .50, Strong H.C. odor, SW = .50 | 1,669 |
| | 15 | | | WEATHERED ROCK | : Dk.Gray - Green, Fractured Rock, Gravels - Sands, Breaks down to Silts and Clays, Hydro-Carbon (H.C.) Odor, SW = .50 | 613 |
| | | | | WEATHERED ROCK | : Dark Gray - Dk. Green, some Iron Staining, Fractured Rock, Breaks down into Silts and Clays, SW = .50, Strong H.C. Odor | 694 |
| | | | | | | 3,267 |
| | 20 | | | WEATHERED ROCK | : Dk.Gray - Green, Fractured Rock, Gravels - Sands, Breaks down to Silts and Clays, Strong H.C. odor, Product @ approximately 21.0', SW = .50 | 6,915 |
| | 25 | | | | | |

omarks: screen 24.0'-4.0' (bls)
riser 4.0'-surface
sump 24.0'-23.5'(bls)
sand 24.0'-3.5' (bls)
bentonite 3.5'-3.0' (bls)
grout 3.0'- surface

# ANALYTICAL TEST REPORT

FOR

# ROOSEVELT ROADS

ON

# SEPTEMBER 1995

PREPARED FOR

# TERRA VAC, INC.

# PROJECT #110234-2-5821

eqlab
ENVIRONMENTAL QUALITY LABORATORIES, INC.

ENVIRONMENTAL QUALITY LABORATORIES, INC. P.O. BOX 11458, SANTURCE, P.R. 00910-1458, TELS. 725-5333, 725-3708 • FAX: 724-3110

# T A B L E  O F  C O N T E N T S


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| 2 | Analytical Testing Schedule | 2-1 |
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# L I S T  O F  T A B L E S


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| 2.1 | Analytical Testing Schedule | 2-1 |

# SECTION I

# INTRODUCTION

On September 1995 Environmental Quality Laboratories, Incorporated (EQ Lab) received various soil samples in our facilities in Santurce. Terra Vac personnel, Fred McKay brought us the samples of Roosevelt Roads yard and shop areas, Project No 11-0234.

The objective of the project was to analyzed the samples for Total Petroleum Hydrocarbons (TPH 418.1).

The following sections provides an overview of the Analytical Activities and Chain of Custody.

# SECTION II

# ANALYTICAL TESTING SCHEDULE

| PARAMETERS | NUMBER OF SAMPLES | TYPE OF SAMPLE |
|---|---|---|
| TPH 418.1 | Various | Grab |

# SECTION III

# ANALYTICAL TEST RESULTS

TERRAVAC, INC.
P.O. BOX 1591
SAN JUAN, P.R. 00903

Attn: MR. FRED McKAY
Invoice Number:

Order #: 95-09-340
Date: 10/25/95 08:11
Work ID: Soil - Grab
Date Received: 09/19/95
Date Completed: 09/27/95
Client Code: 666_01

DS #: 95-12464 Facility: Roosevelt Roads
Samples collected by Client.
Eq Lab Samples # 149014 to 149024
Limit = Detection Limit

SAMPLE IDENTIFICATION

| Sample Number | Sample Description |
|---|---|
| 01 | PW-3 (7') |
| 02 | PW-3 (8') |
| 03 | PW-3 (9') |
| 04 | PW-3 (10') |
| 05 | PW-3 (11') |
| 06 | PW-3 (12') |
| 07 | PW-3 (13') |
| 08 | PW-3 (14') |
| 09 | PW-3 (15') |
| 10 | PW-3 (16') |
| 11 | PW-3 (17') |

Certified By
Ismael Martínez

ISMAEL MARTINEZ JIMENEZ
Licenciado
Estado Libre Asociado de Puerto Rico
LICENCIA NUM. 1486

A 381559

TEST RESULTS BY SAMPLE

**Sample: 01A PW-3 (7')** **Collected: 09/13/95** **Category: 149014**
**Job: 01-23 Soil - Grab**

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | 1,469 | 5.0 | mg/kg | 09/25/95 | RP |

**Sample: 02A PW-3 (8')** **Collected: 09/13/95** **Category: 149015**
**Job: 01-23 Soil - Grab**

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | 1,457 | 5.0 | mg/kg | 09/25/95 | RP |

**Sample: 03A PW-3 (9')** **Collected: 09/13/95** **Category: 149016**
**Job: 01-23 Soil - Grab**

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | 2,984 | 5.0 | mg/kg | 09/25/95 | RP |

**Sample: 04A PW-3 (10')** **Collected: 09/13/95** **Category: 149017**
**Job: 01-23 Soil - Grab**

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | 2,361 | 5.0 | mg/kg | 09/25/95 | RP |

**Sample: 05A PW-3 (11')** **Collected: 09/13/95** **Category: 149018**
**Job: 01-23 Soil - Grab**

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | 6,506 | 5.0 | mg/kg | 09/25/95 | RP |

**Sample: 06A PW-3 (12')** **Collected: 09/13/95** **Category: 149019**
**Job: 01-23 Soil - Grab**

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | 3,030 | 5.0 | mg/kg | 09/25/95 | RP |

**Sample: 07A PW-3 (13')** **Collected: 09/13/95** **Category: 149020**
**Job: 01-23 Soil - Grab**

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | 3,205 | 5.0 | mg/kg | 09/25/95 | RP |

**Sample: 08A PW-3 (14')** **Collected: 09/13/95** **Category: 149021**
**Job: 01-23 Soil - Grab**

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | 882 | 5.0 | mg/kg | 09/25/95 | RP |

TEST RESULTS BY SAMPLE

**Sample: 09A PW-3 (15')** **Collected: 09/13/95** **Category: 149022**
**Job: 01-23 Soil - Grab**

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | 1,173 | 5.0 | mg/kg | 09/25/95 | RP |

**Sample: 10A PW-3 (16')** **Collected: 09/13/95** **Category: 149023**
**Job: 01-23 Soil - Grab**

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | 438 | 5.0 | mg/kg | 09/25/95 | RP |

**Sample: 11A PW-3 (17')** **Collected: 09/13/95** **Category: 149024**
**Job: 01-23 Soil - Grab**

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | 222 | 5.0 | mg/kg | 09/25/95 | RP |

TERRAVAC, INC.
P.O. BOX 1591
SAN JUAN, P.R. 00903

Attn: MR. FRED McKAY
Invoice Number:

Order #: 95-09-342
Date: 10/25/95 08:11
Work ID: D.I. Water - Grab
Date Received: 09/19/95
Date Completed: 09/27/95
Client Code: 666_01

DS #: 95-12464 Facility: Roosevelt Roads
Samples collected by Client.
Eq Lab Samples # 149025 to 149027
Limit = Detection Limit

SAMPLE IDENTIFICATION

| Sample Number | Sample Description |
|---|---|
| 01 | Trip Blank |
| 02 | Field Blank |
| 03 | Equipment Blank |

Certified By
Ismael Martínez

A 381607

TEST RESULTS BY SAMPLE

**Sample: 01A Trip Blank** **Collected: 09/13/95** **Category: 149025**
**Job: 01-23A D.I. Water - Grab**

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | <0.5 | 0.5 | mg/L | 09/25/95 | RP |

**Sample: 02A Field Blank** **Collected: 09/13/95** **Category: 149026**
**Job: 01-23A D.I. Water - Grab**

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | <0.5 | 0.5 | mg/L | 09/25/95 | RP |

**Sample: 03A Equipment Blank** **Collected: 09/13/95** **Category: 149027**
**Job: 01-23A D.I. Water - Grab**

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | <0.5 | 0.5 | mg/L | 09/25/95 | RP |

TERRAVAC, INC.
P.O. BOX 1591
SAN JUAN, P.R. 00903

Attn: MR. FRED McKAY
Invoice Number:

Order #: 95-09-442
Date: 10/25/95 14:30
Work ID: Soil - Grab
Date Received: 09/22/95
Date Completed: 10/05/95
Client Code: 666_01

DS #: 95-12455
Samples collected by Client.
Eq Lab Samples # 149213 to 149223
Limit = Detection Limit

SAMPLE IDENTIFICATION

| Sample Number | Sample Description |
|---|---|
| 01 | MW - 1 - 6' |
| 02 | MW - 1 - 7' |
| 03 | MW - 1 - 8' |
| 04 | MW - 1 - 9' |
| 05 | MW - 1 - 10' |
| 06 | MW - 1 - 11' |
| 07 | MW - 1 - 12' |
| 08 | MW - 1 - 13' |
| 09 | MW - 1 - 14' |
| 10 | MW - 1 - 15' |
| 11 | MW - 1 - 16' |

Certified By:
Ismael Martínez

Estado Libre Asociado de Puerto Rico
LICENCIA NUM. 1486

A 381195

## TEST RESULTS BY SAMPLE

**Sample: 01A MW - 1 - 6'** **Collected: 09/19/95** **Category: 149213**
**Job: 01-23 Soil - Grab**

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | 7,290 | 5.0 | mg/kg | 09/28/95 | PR |

**Sample: 02A MW - 1 - 7'** **Collected: 09/19/95** **Category: 149214**
**Job: 01-23 Soil - Grab**

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | 5,995 | 5.0 | mg/kg | 09/28/95 | RP |

**Sample: 03A MW - 1 - 8'** **Collected: 09/19/95** **Category: 149215**
**Job: 01-23 Soil - Grab**

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | 3,284 | 5.0 | mg/kg | 09/28/95 | RP |

**Sample: 04A MW - 1 - 9'** **Collected: 09/19/95** **Category: 149216**
**Job: 01-23 Soil - Grab**

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | 3,473 | 5.0 | mg/kg | 09/28/95 | RP |

**Sample: 05A MW - 1 - 10'** **Collected: 09/19/95** **Category: 149217**
**Job: 01-23 Soil - Grab**

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | 981 | 5.0 | mg/kg | 09/28/95 | RP |

**Sample: 06A MW - 1 - 11'** **Collected: 09/19/95** **Category: 149218**
**Job: 01-23 Soil - Grab**

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | 366 | 5.0 | mg/kg | 09/28/95 | RP |

**Sample: 07A MW - 1 - 12'** **Collected: 09/19/95** **Category: 149219**
**Job: 01-23 Soil - Grab**

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | 303 | 5.0 | mg/kg | 09/28/95 | RP |

**Sample: 08A MW - 1 - 13'** **Collected: 09/19/95** **Category: 149220**
**Job: 01-23 Soil - Grab**

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | 96 | 5.0 | mg/kg | 09/28/95 | RP |

TEST RESULTS BY SAMPLE

Sample: 09A MW - 1 - 14' Collected: 09/19/95 Category: 149221
Job: 01-23 Soil - Grab

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | 3,103 | 5.0 | mg/kg | 09/28/95 | RP |

Sample: 10A MW - 1 - 15' Collected: 09/19/95 Category: 149222
Job: 01-23 Soil - Grab

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | 27,233 | 5.0 | mg/kg | 09/28/95 | RP |

Sample: 11A MW - 1 - 16' Collected: 09/19/95 Category: 149223
Job: 01-23 Soil - Grab

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | 5,965 | 5.0 | mg/kg | 09/28/95 | RP |

TERRAVAC, INC.
P.O. BOX 1591
SAN JUAN, P.R. 00903

Attn: MR. FRED McKAY
Invoice Number:

Order #: 95-09-445
Date: 10/25/95 08:12
Work ID: D.I. Water - Grab
Date Received: 09/22/95
Date Completed: 10/05/95
Client Code: 666_01

DS #: 95-12455
Samples collected by Client.
Eq Lab Samples # 149224 & 149225
Limit = Detection Limit

SAMPLE IDENTIFICATION

| Sample Number | Sample Description |
|---|---|
| 01 | Field Blank |
| 02 | Equipment Blank |

Certified By
Ismael Martínez

A 381646

TEST RESULTS BY SAMPLE

**Sample: 01A Field Blank** **Collected: 09/19/95** **Category: 149224**
**Job: 01-23A D.I. Water - Grab**

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | <0.5 | 0.5 | mg/L | 09/28/95 | RP |

**Sample: 02A Equipment Blank** **Collected: 09/19/95** **Category: 149225**
**Job: 01-23A D.I. Water - Grab**

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | <0.5 | 0.5 | mg/L | 09/28/95 | RP |

TERRAVAC, INC.
P.O. BOX 1591
SAN JUAN, P.R. 00903

Attn: MR. FRED McKAY
Invoice Number:

Order #: 95-09-446
Date: 10/25/95 08:12
Work ID: Soil - Grab
Date Received: 09/22/95
Date Completed: 10/05/95
Client Code: 666_01

DS #: 95-12456
Samples collected by Client.
Eq Lab Samples # 149226 to 149237
Limit = Detection Limit

SAMPLE IDENTIFICATION

| Sample Number | Sample Description |
|---|---|
| 01 | PW - 2 - 6' |
| 02 | PW - 2 - 7' |
| 03 | PW - 2 - 8' |
| 04 | PW - 2 - 9' |
| 05 | PW - 2 - 10' |
| 06 | PW - 2 - 11' |
| 07 | PW - 2 - 12' |
| 08 | PW - 2 - 13' |
| 09 | PW - 2 - 14' |
| 10 | PW - 2 - 16' |
| 11 | PW - 2 - 17' |
| 12 | PW - 2 - 18' |

Certified By
Ismael Martinez

ISMAEL MARTINEZ JIMENEZ
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Estado Libre Asociado de Puerto Rico
LICENCIA NUM. 1486

A 381617

## TEST RESULTS BY SAMPLE

**Sample: 01A PW - 2 - 6'** Collected: 09/20/95 Category: 149226
Job: 01-23 Soil - Grab

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | 1,441 | 5.0 | mg/kg | 09/28/95 | RP |

**Sample: 02A PW - 2 - 7'** Collected: 09/20/95 Category: 149227
Job: 01-23 Soil - Grab

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | 2,041 | 5.0 | mg/kg | 09/28/95 | RP |

**Sample: 03A PW - 2 - 8'** Collected: 09/20/95 Category: 149228
Job: 01-23 Soil - Grab

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | 1,167 | 5.0 | mg/kg | 09/28/95 | RP |

**Sample: 04A PW - 2 - 9'** Collected: 09/20/95 Category: 149229
Job: 01-23 Soil - Grab

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | 837 | 5.0 | mg/kg | 09/28/95 | RP |

**Sample: 05A PW - 2 - 10'** Collected: 09/20/95 Category: 149230
Job: 01-23 Soil - Grab

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | 4,282 | 5.0 | mg/kg | 09/28/95 | RP |

**Sample: 06A PW - 2 - 11'** Collected: 09/20/95 Category: 149231
Job: 01-23 Soil - Grab

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | 1,375 | 5.0 | mg/kg | 09/28/95 | RP |

**Sample: 07A PW - 2 - 12'** Collected: 09/20/95 Category: 149232
Job: 01-23 Soil - Grab

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | 48,158 | 5.0 | mg/kg | 09/28/95 | RP |

**Sample: 08A PW - 2 - 13'** Collected: 09/20/95 Category: 146233
Job: 01-23 Soil - Grab

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | 29,971 | 5.0 | mg/kg | 09/28/95 | RP |

## TEST RESULTS BY SAMPLE

**Sample: 09A PW - 2 - 14'** **Collected: 09/20/95** **Category: 149234**
**Job: 01-23 Soil - Grab**

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | 7,413 | 5.0 | mg/kg | 09/28/95 | RP |

**Sample: 10A PW - 2 - 16'** **Collected: 09/20/95** **Category: 149235**
**Job: 01-23 Soil - Grab**

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | 7,388 | 5.0 | mg/kg | 09/28/95 | RP |

**Sample: 11A PW - 2 - 17'** **Collected: 09/20/95** **Category: 149236**
**Job: 01-23 Soil - Grab**

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | 605 | 5.0 | mg/kg | 09/28/95 | RP |

**Sample: 12A PW - 2 - 18'** **Collected: 09/20/95** **Category: 149237**
**Job: 01-23 Soil - Grab**

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | 606 | 5.0 | mg/kg | 09/28/95 | RP |

TERRAVAC, INC.
P.O. BOX 1591
SAN JUAN, P.R. 00903

Attn: MR. FRED McKAY
Invoice Number:

Order #: 95-09-450
Date: 10/25/95 08:12
Work ID: D.I. Water - Grab
Date Received: 09/22/95
Date Completed: 10/05/95
Client Code: 666_01

DS #: 95-12456
Samples collected by Client.
Eq Lab Sample # 149238 to 149240
Limit = Detection Limit

SAMPLE IDENTIFICATION

| Sample Number | Sample Description |
|---|---|
| 01 | Trip Blank |
| 02 | Field Blank |
| 03 | Equipment Blank |

Certified By
Ismael Martínez

A 381636

TEST RESULTS BY SAMPLE

**Sample: 01A Trip Blank** **Collected: 09/20/95** **Category: 149238**
**Job: 01-23A D.I. Water - Grab**

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | <0.5 | 0.5 | mg/L | 09/28/95 | RP |

**Sample: 02A Field Blank** **Collected: 09/20/95** **Category: 149239**
**Job: 01-23A D.I. Water - Grab**

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | <0.5 | 0.5 | mg/L | 09/28/95 | RP |

**Sample: 03A Equipment Blank** **Collected: 09/20/95** **Category: 149240**
**Job: 01-23A D.I. Water - Grab**

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | <0.5 | 0.5 | mg/L | 09/28/95 | RP |

TERRAVAC, INC.
P.O. BOX 1591
SAN JUAN, P.R. 00903

Attn: MR. FRED McKAY
Invoice Number:

Order #: 95-09-582
Date: 10/25/95 08:14
Work ID: Soil - Grab
Date Received: 09/22/95
Date Completed: 10/24/95
Client Code: 666_01

DS # 95-12457
Samples collected by Client.
Eq Lab Samples # from 149241 to 149248
Limit = Detection Limit

SAMPLE IDENTIFICATION

| Sample Number | Sample Description |
|---|---|
| 01 | PW-3B - 6' |
| 02 | PW-3B - 7' |
| 03 | PW-3B - 8' |
| 04 | PW-3B - 10' |
| 05 | PW-3B - 10' |
| 06 | PW-3B - 14' |
| 07 | PW-3B - 15' |
| 08 | PW-3B - 18' |

Certified By
Ismael Martínez

ISMAEL MARTINEZ JIMENEZ
Químico Licenciado
Estado Libre Asociado de Puerto Rico
LICENCIA NUM. 1486

A 381569

TEST RESULTS BY SAMPLE

Sample: 01A PW-3B - 6' Collected: 09/22/95 Category: 149241
Job: 01-23 Soil - Grab

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | 339 | 5.0 | mg/kg | 10/23/95 | RP |

Sample: 02A PW-3B - 7' Collected: 09/22/95 Category: 149242
Job: 01-23 Soil - Grab

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | 5,943 | 5.0 | mg/kg | 10/23/95 | RP |

Sample: 03A PW-3B - 8' Collected: 09/22/95 Category: 149243
Job: 01-23 Soil - Grab

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | 18.3 | 5.0 | mg/kg | 10/23/95 | RP |

Sample: 04A PW-3B - 10' Collected: 09/22/95 Category: 149244
Job: 01-23 Soil - Grab

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | 615 | 5.0 | mg/kg | 10/23/95 | RP |

Sample: 05A PW-3B - 10' Collected: 09/22/95 Category: 149245
Job: 01-23 Soil - Grab

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | 635 | 5.0 | mg/kg | 10/23/95 | RP |

Sample: 06A PW-3B - 14' Collected: 09/22/95 Category: 149246
Job: 01-23 Soil - Grab

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | 540 | 5.0 | mg/kg | 10/23/95 | RP |

Sample: 07A PW-3B - 15' Collected: 09/22/95 Category: 149247
Job: 01-23 Soil - Grab

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | 514 | 5.0 | mg/kg | 10/23/95 | RP |

Sample: 08A PW-3B - 18' Collected: 09/22/95 Category: 149248
Job: 01-23 Soil - Grab

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | 5,804 | 5.0 | mg/kg | 10/23/95 | RP |

TERRAVAC, INC.
P.O. BOX 1591
SAN JUAN, P.R. 00903

Attn: MR. FRED McKAY
Invoice Number:

Order #: 95-09-584
Date: 10/25/95 08:14
Work ID: Deionized Water - Grab
Date Received: 09/22/95
Date Completed: 10/24/95
Client Code: 666_01

DS # 95-12457 Limit = Detection Limit
Samples collected by Client
Eq Lab Samples # 149249 - Field Blank
# 149250 - Equipment Blank

SAMPLE IDENTIFICATION

| Sample Number | Sample Description | Sample Number | Sample Description |
|---|---|---|---|
| 01 | Field Blank | 02 | Equipment Blank |

Certified By
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Estado Libre Asociado de Puerto Rico
LICENCIA NUM. 1486

A 381604

TEST RESULTS BY SAMPLE

**Sample: 01A Field Blank** **Collected: 09/22/95** **Category: 149249**
**Job: 01-23A D.I. Water - Grab**

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | 1.41 | 0.5 | mg/L | 10/23/95 | RP |

**Sample: 02A Equipment Blank** **Collected: 09/22/95** **Category: 149250**
**Job: 01-23A D.I. Water - Grab**

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | 1.41 | 0.5 | mg/L | 10/23/95 | RP |

TERRAVAC, INC.
P.O. BOX 1591
SAN JUAN, P.R. 00903

Attn: MR. FRED McKAY
Invoice Number:

Order #: 95-09-537
Date: 10/25/95 08:12
Work ID: Soil - Grab
Date Received: 09/27/95
Date Completed: 10/09/95
Client Code: 666_01

DS # 95-12461 Facility: Roosevelt Roads, US Navy Station
Samples collected by Client.
Eq Lab Samples # from 149632 to 149640
Limit = Detection Limit

SAMPLE IDENTIFICATION

| Sample Number | Sample Description |
|---|---|
| 01 | PW 5-4' |
| 02 | PW 5-5' |
| 03 | PW 5-7' |
| 04 | PW 5-8' |
| 05 | PW 5-9' |
| 06 | PW 5-10' |
| 07 | PW 5-11' |
| 08 | PW 5-12' |
| 09 | PW 5-14' |

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LICENCIA NUM. 1486

A 381626

TEST RESULTS BY SAMPLE

**Sample: 01A PW 5-4'** **Collected: 09/23/95** **Category: 149632**
**Job: 01-23 Soil - Grab**

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | 2,508 | 5.0 | mg/kg | 10/04/95 | RP |

**Sample: 02A PW 5-5'** **Collected: 09/23/95** **Category: 149633**
**Job: 01-23 Soil - Grab**

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | 1,161 | 5.0 | mg/kg | 10/04/95 | RP |

**Sample: 03A PW 5-7'** **Collected: 09/23/95** **Category: 149634**
**Job: 01-23 Soil - Grab**

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | 335 | 5.0 | mg/kg | 10/04/95 | RP |

**Sample: 04A PW 5-8'** **Collected: 09/23/95** **Category: 149635**
**Job: 01-23 Soil - Grab**

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | 610 | 5.0 | mg/kg | 10/04/95 | RP |

**Sample: 05A PW 5-9'** **Collected: 09/23/95** **Category: 149636**
**Job: 01-23 Soil - Grab**

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | 456 | 5.0 | mg/kg | 10/04/95 | RP |

**Sample: 06A PW 5-10'** **Collected: 09/23/95** **Category: 149637**
**Job: 01-23 Soil - Grab**

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | 1,196 | 5.0 | mg/kg | 10/04/95 | RP |

**Sample: 07A PW 5-11'** **Collected: 09/23/95** **Category: 149638**
**Job: 01-23 Soil - Grab**

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | 825 | 5.0 | mg/kg | 10/04/95 | RP |

**Sample: 08A PW 5-12'** **Collected: 09/23/95** **Category: 149639**
**Job: 01-23 Soil - Grab**

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | 2,015 | 5.0 | mg/kg | 10/04/95 | RP |

TEST RESULTS BY SAMPLE

Sample: 09A PW 5-14' Collected: 09/23/95 Category: 149640
Job: 01-23 Soil - Grab

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | 1,093 | 5.0 | mg/kg | 10/04/95 | RP |

TERRAVAC, INC.
P.O. BOX 1591
SAN JUAN, P.R. 00903

Attn: MR. FRED McKAY
Invoice Number:

Order #: 95-09-538
Date: 10/25/95 08:13
Work ID: Deionized Water - Grab
Date Received: 09/27/95
Date Completed: 10/09/95
Client Code: 666_01

DS # 95-12461 Facility: Roosevelt Roads, US Navy Station
Samples collected by Client.
Eq Lab Samples #149641- Field Blank / #149642- Equipment Blank
Limit = Detection Limit

SAMPLE IDENTIFICATION

| Sample Number | Sample Description |
|---|---|
| 01 | Field Blank |
| 02 | Equipment Blank |

Certified By
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Estado Libre Asociado de Puerto Rico
LICENCIA NUM. 1486

A 381616

TEST RESULTS BY SAMPLE

**Sample: 01A Field Blank** **Collected: 09/23/95** **Category: 149641**
**Job: 01-23A D.I. Water - Grab**

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | <0.5 | 0.5 | mg/L | 10/04/95 | RP |

**Sample: 02A Equipment Blank** **Collected: 09/23/95** **Category: 149642**
**Job: 01-23A D.I. Water - Grab**

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | <0.5 | 0.5 | mg/L | 10/04/95 | RP |

TERRAVAC, INC.
P.O. BOX 1591
SAN JUAN, P.R. 00903

Attn: MR. FRED McKAY
Invoice Number:

Order #: 95-09-539
Date: 10/25/95 08:13
Work ID: Soil - Grab
Date Received: 09/27/95
Date Completed: 10/09/95
Client Code: 666_01

DS # 95-12459 Facility: Roosevelt Roads, US Navy Station
Samples collected by Client.
Eq Lab Samples # from 149643 to 149652
Limit = Detection Limit

SAMPLE IDENTIFICATION

| Sample Number | Sample Description |
|---|---|
| 01 | PW 4-6' |
| 02 | PW 4-8' |
| 03 | PW 4-10' |
| 04 | PW 4-12' |
| 05 | PW 4-14' |
| 06 | PW 4-16' |
| 07 | PW 4-18' |
| 08 | PW 4-20' |
| 09 | PW 4-21' |
| 10 | PW 4-22' |

Certified By
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LICENCIA NUM. 1486

A 381606

TEST RESULTS BY SAMPLE

Sample: 01A PW 4-6' Collected: 09/25/95 Category: 149643
Job: 01-23 Soil - Grab

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | 361 | 5.0 | mg/kg | 10/04/95 | RP |

Sample: 02A PW 4-8' Collected: 09/25/95 Category: 149644
Job: 01-23 Soil - Grab

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | 2,467 | 5.0 | mg/kg | 10/04/95 | RP |

Sample: 03A PW 4-10' Collected: 09/25/95 Category: 149645
Job: 01-23 Soil - Grab

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | 1,156 | 5.0 | mg/kg | 10/04/95 | RP |

Sample: 04A PW 4-12' Collected: 09/25/95 Category: 149646
Job: 01-23 Soil - Grab

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | 737 | 5.0 | mg/kg | 10/04/95 | RP |

Sample: 05A PW 4-14' Collected: 09/25/95 Category: 149647
Job: 01-23 Soil - Grab

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | 1,472 | 5.0 | mg/kg | 10/04/95 | RP |

Sample: 06A PW 4-16' Collected: 09/25/95 Category: 149648
Job: 01-23 Soil - Grab

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | 620 | 5.0 | mg/kg | 10/04/95 | RP |

Sample: 07A PW 4-18' Collected: 09/25/95 Category: 149649
Job: 01-23 Soil - Grab

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | 285 | 5.0 | mg/kg | 10/04/95 | RP |

Sample: 08A PW 4-20' Collected: 09/25/95 Category: 149650
Job: 01-23 Soil - Grab

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | 645 | 5.0 | mg/kg | 10/04/95 | RP |

TEST RESULTS BY SAMPLE

Sample: 09A PW 4-21' Collected: 09/25/95 Category: 149651
Job: 01-23 Soil - Grab

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | 7,970 | 5.0 | mg/kg | 10/04/95 | RP |

Sample: 10A PW 4-22' Collected: 09/25/95 Category: 149652
Job: 01-23 Soil - Grab

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | 687 | 5.0 | mg/kg | 10/04/95 | RP |

TERRAVAC, INC.
P.O. BOX 1591
SAN JUAN, P.R. 00903

Attn: MR. FRED McKAY
Invoice Number:

Order #: 95-09-540
Date: 10/25/95 08:13
Work ID: Deionized Water - Grab
Date Received: 09/27/95
Date Completed: 10/09/95
Client Code: 666_01

DS # 95-12459 Facility: Roosevelt Roads, US Navy Station
Samples collected by Client.
Eq Lab Samples #149653 -Field Blank / #149654 -Equipment Blank
Limit = Detection Limit

SAMPLE IDENTIFICATION

| Sample Number | Sample Description | Sample Number | Sample Description |
|---|---|---|---|
| 01 | Field Blank | 02 | Equipment Blank |

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LICENCIA NUM. 1486
A 381627

TEST RESULTS BY SAMPLE

**Sample: 01A Field Blank** **Collected: 09/25/95** **Category: 149653**
**Job: 01-23A D.I. Water - Grab**

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | <0.5 | 0.5 | mg/L | 10/04/95 | RP |

**Sample: 02A Equipment Blank** **Collected: 09/25/95** **Category: 149654**
**Job: 01-23A D.I. Water - Grab**

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | <0.5 | 0.5 | mg/L | 10/04/95 | RP |

TERRAVAC, INC.
P.O. BOX 1591
SAN JUAN, P.R. 00903

Attn: MR. FRED McKAY
Invoice Number:

Order #: 95-09-541
Date: 10/25/95 08:14
Work ID: Soil - Grab
Date Received: 09/27/95
Date Completed: 10/09/95
Client Code: 666_01

DS # 95-12460 Facility: Roosevelt Roads, US Navy Station
Samples collected by Client.
Eq Lab Samples # from 149655 to 149662
Limit = Detection Limit

SAMPLE IDENTIFICATION

| Sample Number | Sample Description |
|---|---|
| 01 | PW 6-7' |
| 02 | PW 6-9' |
| 03 | PW 6-11' |
| 04 | PW 6-13' |
| 05 | PW 6-15' |
| 06 | PW 6-17' |
| 07 | PW 6-19' |
| 08 | PW 6-20' |

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LICENCIA NUM. 1486

A 381637

TEST RESULTS BY SAMPLE

Sample: 01A PW 6-7' Collected: 09/26/95 Category: 149655
Job: 01-23 Soil - Grab

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | 1,161 | 5.0 | mg/kg | 10/04/95 | RP |

Sample: 02A PW 6-9' Collected: 09/26/95 Category: 140656
Job: 01-23 Soil - Grab

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | 1,027 | 5.0 | mg/kg | 10/04/95 | RP |

Sample: 03A PW 6-11' Collected: 09/26/95 Category: 149657
Job: 01-23 Soil - Grab

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | 404 | 5.0 | mg/kg | 10/04/95 | RP |

Sample: 04A PW 6-13' Collected: 09/26/95 Category: 149658
Job: 01-23 Soil - Grab

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | 1,669 | 5.0 | mg/kg | 10/04/95 | RP |

Sample: 05A PW 6-15' Collected: 09/26/95 Category: 149659
Job: 01-23 Soil - Grab

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | 613 | 5.0 | mg/kg | 10/04/95 | RP |

Sample: 06A PW 6-17' Collected: 09/26/95 Category: 149660
Job: 01-23 Soil - Grab

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | 694 | 5.0 | mg/kg | 10/04/95 | RP |

Sample: 07A PW 6-19' Collected: 09/26/95 Category: 149661
Job: 01-23 Soil - Grab

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | 3,267 | 5.0 | mg/kg | 10/04/95 | RP |

Sample: 08A PW 6-20' Collected: 09/26/95 Category: 149662
Job: 01-23 Soil - Grab

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | 6,915 | 5.0 | mg/kg | 10/04/95 | RP |

TERRAVAC, INC.
P.O. BOX 1591
SAN JUAN, P.R. 00903

Attn: MR. FRED McKAY
Invoice Number:

Order #: 95-09-542
Date: 10/25/95 08:14
Work ID: Deionized Water - Grab
Date Received: 09/27/95
Date Completed: 10/09/95
Client Code: 666_01

DS # 95-12460 Facility: Roosevelt Roads, US Navy Station
Samples collected by Client.
Eq Lab Samples # from 149663 to 149665
Limit = Detection Limit

SAMPLE IDENTIFICATION

| Sample Number | Sample Description |
|---|---|
| 01 | Trip Bla k |
| 02 | Field Bla k |
| 03 | Equipment Blank |

Certified By
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LICENCIA NUM. 1483
A 381647

TEST RESULTS BY SAMPLE

**Sample: 01A Trip Blank** **Collected: 09/26/95** **Category: 149663**
**Job: 01-23A D.I. Water - Grab**

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | <0.5 | 0.5 | mg/L | 10/04/95 | RP |

**Sample: 02A Field Blank** **Collected: 09/26/95** **Category: 149664**
**Job: 01-23A D.I. Water - Grab**

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | <0.5 | 0.5 | mg/L | 10/04/95 | RP |

**Sample: 03A Equipment Blank** **Collected: 09/26/95** **Category: 149665**
**Job: 01-23A D.I. Water - Grab**

| Test Description | Result | Limit | Units | Analyzed | By |
|---|---|---|---|---|---|
| TPH 418.1 | <0.5 | 0.5 | mg/L | 10/04/95 | RP |

# SECTION IV

# CHAIN OF CUSTODY

eqlab

# SAMPLE DELIVERY SLIP

ENVIRONMENTAL QUALITY LABORATORIES, INC.

Delivery Slip 95 12484

EQL W.O. No. 666-01-23 P.W. 1

Client Terra Vac
Roosevelt Roads

**SAMPLE DESCRIPTION**

Sampling Point PW-5 7' - 18'

Client Tag

- ☐ WATER
- ☐ Surface/stream
- ☐ Underground
- ☐ Sea
- ☐ Drinking PWSID No.
- ☐ Process

- ☐ WASTE WATER
- ☐ Domestic
- ☐ Industrial
- ☐ Raw
- ☐ In-plant
- ☐ Treated

OTHER
- ☐ Liquid
- ☐ Solid
- ☐ Sludge
- ☐ Suspension
- ☐ Emulsion
- ☐ Oil
- ☐ Soil
- ☐ Air
- ☐ Other

TYPE
- ☒ Grab
- ☐ Multiple Grab
- ☐ Composite Hrs.

11 Sample

**CONTAINER**
- ☐ Sterile
- ☒ Glass
- ☐ Plastic
- ☐ Charcoal Tube
- ☐ Vial
- ☐ Other
- ☐

**PRESERVATION**
- ☐ Ice 4°C
- ☐ Chemical
- ☐ $H_2SO_4$
- ☐ $HNO_3$
- ☐ NAOH
- ☐ EDTA
- ☐ $Na_2S_2O_3$
- ☒ None

**CHLORINATED**
- ☒ No ☐ Yes

**TOXIC OR HAZARDOUS**
- ☒ No ☐ Yes ☐ Unknown

If yes, identify material and special handling

**TEST PARAMETERS**

If previously defined. P.O. # 110234-2-5821 W.O. # 666-01-23 Contr. #

If not, test for

**CHAIN OF CUSTODY**

| | Signature | Date | Time |
|---|---|---|---|
| Collected in field by | [illegible] | 9-13-95 | 1057 - 1400 |
| Fixed in field by | [illegible] | 9-13-95 | 1057 - 1400 |
| Released to EQL by | | 9/15/95 | 11:35 |
| Received by EQL | | | |
| Received by Lab. | | | |

SAMPLE FOUND TO BE TOXIC OR HAZARDOUS. ☐ YES ☐ NO

| | | | |
|---|---|---|---|
| Returned to Client | | | |
| Received by Client | | | |

**COMMENTS** Samples
1) 7' 2) 8' 3) 9' 4) 10' 5) 11' 6) 12'
7) 13' 8) 14' 9) 15' 10) 16 11) 17'
Total of 11 samples #1-11 (7'-17')
Trip - Field Equip

**EQL SAMPLE(S) NO(S).** 149014 to 149027

**NOTES** Por ordenes del cliente se cambio el Nombre de punto de muestreo. 9/22-95

FACTURADO

POR _____ FECHA 10/3/95

1. Sign legibly. If not legible, print name above signature.
2. Laboratory tests will yield values for the sample received in the laboratory. Correct procedures in sampling, fixing, preservation, and handling of sample are of utmost importance if the test values are to be representative of the source sample.
3. Remaining proportions of toxic or hazardous samples will be returned to client for the proper and final disposal.

eqlab

# SAMPLE DELIVERY SLIP

ENVIRONMENTAL QUALITY LABORATORIES, INC.

Delivery Slip 95 12455

EQL W.O. No. 666-01-23

Client Terra Che 11-0234

Roosevelt Roads

## SAMPLE DESCRIPTION

Sampling Point PW-2 = MW-1 Client Tag

- ☐ WATER
- ☐ Surface/stream
- ☐ Underground
- ☐ Sea
- ☐ Drinking PWSID No.
- ☐ Process

- ☐ WASTE WATER
- ☐ Domestic
- ☐ Industrial
- ☐ Raw
- ☐ In-plant
- ☐ Treated

OTHER
- ☐ Liquid
- ☐ Solid
- ☐ Sludge
- ☐ Suspension
- ☐ Emulsion
- ☐ Oil
- ☒ Soil
- ☐ Air
- ☐ Other

TYPE
- ☒ Grab
- ☐ Multiple Grab
- ☐ Composite Hrs.

CONTAINER
- ☐ Sterile
- ☒ Glass
- ☐ Plastic
- ☐ Charcoal Tube
- ☐ Vial
- ☐ Other

PRESERVATION
- ☐ Ice
- ☐ Chemical
- ☐ $H_2SO_4$
- ☐ $HNO_3$
- ☐ NAOH
- ☐ EDTA
- ☐ $Na_2S_2O_3$
- ☒ None

CHLORINATED
- ☒ No
- ☐ Yes

TOXIC OR HAZARDOUS
- ☒ No
- ☐ Yes
- ☐ Unknown

If yes, identify material and special handling

## TEST PARAMETERS

If previously defined P.O. # 110734-2-5821 W.O. # 666-01-23 Contr. #

If not, test for

(Hold) Hold All PW-2 = MW-1 Sample

Do Not Analyze

## CHAIN OF CUSTODY

| | Signature | Date | Time |
|---|---|---|---|
| Collected in field by | [illegible] | 9-19-95 | MOC |
| Fixed in field by | [illegible] | 9-19-95 | MOC |
| Released to EQL by | [illegible] | 9. 22. 95 | 1:30 p |
| Received by EQL | [illegible] | 9. 22. 95 | 1:25 p |
| Received by Lab. | Gustavo Gorilla | 9-22-95 | 3:30 pm |

SAMPLE FOUND TO BE TOXIC OR HAZARDOUS. ☐ YES ☐ NO

| | | | |
|---|---|---|---|
| Returned to Client | | | |
| Received by Client | | | |

## COMMENTS

Hold Samples 149213 to 149[illegible]

EQL SAMPLE(S) NO(S). Single Jars 12A-21 11 Sing

NOTES 12A6, 12B7, 13 8, 14 9, 15 10, 16 11, 17 12, 18 13, 19 14, 20 15, 21 16, Field Blank, Equip B

Total (13)

1. Sign legibly. If not legible, print name above signature.
2. Laboratory tests will yield values for the sample received in the laboratory. Correct procedures in sampling, fixing, preservation, and handling of sample are of utmost importance if the test values are to be representative of the source sample.
3. Remaining proportions of toxic or hazardous samples will be returned to client for the proper and final disposal.

eqlab

# SAMPLE DELIVERY SLIP

ENVIRONMENTAL QUALITY LABORATORIES, INC.

Delivery Slip 95 12156

EQL W.O. No. 666-01-23

Client Terra VCC H-0234
Roosevelt Ranch

## SAMPLE DESCRIPTION

Sampling Point PW-2 Client Tag

☐ WATER
☐ Surface/stream
☐ Underground
☐ Sea
☐ Drinking PWSID No.
☐ Process

☐ WASTE WATER
☐ Domestic
☐ Industrial
☐ Raw
☐ In-plant
☐ Treated

OTHER
☐ Liquid
☐ Solid
☐ Sludge
☐ Suspension
☐ Emulsion
☐ Oil
☒ Soil
☐ Air
☐ Other

☐ TYPE
☒ Grab
☐ Multiple Grab
☐ Composite Hrs.

CONTAINER
☐ Sterile
☒ Glass
☐ Plastic
☐ Charcoal Tube
☐ Vial
☐ Other

PRESERVATION
☐ Ice
☐ Chemical
☐ $H_2SO_4$
☐ $HNO_3$
☐ NAOH
☐ EDTA
☐ $Na_2S_2O_3$
☒ None

CHLORINATED
☒ No ☐ Yes

TOXIC OR HAZARDOUS
☐ No ☐ Yes ☐ Unknown

If yes, identify material and special handling

## TEST PARAMETERS

If previously defined. P.O. # 110234-2-5521 W.O. # 666-01-23 Contr. #

If not, test for

TPH 418.1

## CHAIN OF CUSTODY

| | Signature | Date | Time |
|---|---|---|---|
| Collected in field by | [signature] | 9-20-95 | 1600 |
| Fixed in field by | [signature] | 9-20-95 | 1600 |
| Released to EQL by | [signature] | 9:22.95 | 1:30 p |
| Received by EQL | [signature] | 9 22.95 | 1:25 p |
| Received by Lab. | Huntown Gorilla | 9-22-95 | 3:30 pm |

SAMPLE FOUND TO BE TOXIC OR HAZARDOUS. ☐ YES ☐ NO

| | | | |
|---|---|---|---|
| Returned to Client | | | |
| Received by Client | | | |

## COMMENTS

TPH 418.1 149226 to 149224

Sample Terra #23-34 = 12

#22 (1), 24 (7), 25 (8), 26 (9), 27 (10), 28 (11), 29 (12), 30 (13), 31 (14), 32 (15), 33 (17), 34 (18)

EQL SAMPLE(S) NO(S).

Equip Blank + Field Blank

## NOTES

14 Total

1. Sign legibly. If not legible, print name above signature.
2. Laboratory tests will yield values for the sample received in the laboratory. Correct procedures in sampling, fixing, preservation, and handling of sample are of utmost importance if the test values are to be representative of the source sample.
3. Remaining proportions of toxic or hazardous samples will be returned to client for the proper and final disposal.

eqlab

# SAMPLE DELIVERY SLIP

ENVIRONMENTAL QUALITY LABORATORIES, INC.

Delivery Slip 95 12457
EQL W.O. No. 666-01-23

Client Terra Vac 11-0234
Cosewicht Russia

## SAMPLE DESCRIPTION

Sampling Point PW-3B Client Tag

- ☐ WATER
- ☐ Surface/stream
- ☐ Underground
- ☐ Sea
- ☐ Drinking PWSID No.
- ☐ Process

- ☐ WASTE WATER
- ☐ Domestic
- ☐ Industrial
- ☐ Raw
- ☐ In-plant
- ☐ Treated

OTHER
- ☐ Liquid
- ☐ Solid
- ☐ Sludge
- ☐ Suspension
- ☐ Emulsion
- ☐ Oil
- ☒ Soil
- ☐ Air
- ☐ Other

TYPE
- ☒ Grab
- ☐ Multiple Grab
- ☐ Composite Hrs.

TOXIC OR HAZARDOUS
☒ No ☐ Yes ☐ Unknown
If yes, identify material and special handling

CONTAINER
- ☐ Sterile
- ☒ Glass
- ☐ Plastic
- ☐ Charcoal Tube
- ☐ Vial
- ☐ Other

PRESERVATION
- ☐ Ice
- ☐ Chemical
- ☐ $H_2SO_4$
- ☐ $HNO_3$
- ☐ NAOH
- ☐ EDTA
- ☐ $Na_2S_2O_3$
- ☒ None

CHLORINATED
☒ No ☐ Yes

## TEST PARAMETERS

If previously defined. P.O. # 110234-2-550 P.O. # 666-01-23 Contr. #
If not, test for
TPH 418.1

## CHAIN OF CUSTODY

| | Signature | Date | Time |
|---|---|---|---|
| Collected in field by | [illegible] | 9-22-95 | 1100 |
| Fixed in field by | [illegible] | 9-22-95 | 1100 |
| Released to EQL by | [illegible] | 9.22.95 | 1:30pm |
| Received by EQL | [illegible] | 9.22.95 | 1:25pm |
| Received by Lab. | Hunter Bonilla | 9-22-95 | 3:30pm |

SAMPLE FOUND TO BE TOXIC OR HAZARDOUS. ☐ YES ☐ NO

| | | | |
|---|---|---|---|
| Returned to Client | | | |
| Received by Client | | | |

## COMMENTS

TPH 418.1 : (8) Soil Samples
#35 (6'), 36 (7'), 38 (9'), 39 (10'), 40 (14'), 41 (15'), 42 (18')
Field Blank, Equipment Blank
Trip Blank
Total (11) Samples

EQL SAMPLE(S) NO(S).

## NOTES

1. Sign legibly. If not legible, print name above signature.
2. Laboratory tests will yield values for the sample received in the laboratory. Correct procedures in sampling, fixing, preservation, and handling of sample are of utmost importance if the test values are to be representative of the source sample.
3. Remaining proportions of toxic or hazardous samples will be returned to client for the proper and final disposal.

149241 to 149250

eqlab

# SAMPLE DELIVERY SLIP

ENVIRONMENTAL QUALITY LABORATORIES, INC.

Delivery Slip 95 12461

EQL W.O. No. 666-01-23

Client Terra Vac 11-0734

Rossmoyne Road, US Navy Site

## SAMPL DESCRIPTION

Sampling Point PW-5

Client Tag 11-0734

- ☐ WATER
- ☐ Surface/stream
- ☐ Underground
- ☐ Sea
- ☐ Drinking PWSID No.
- ☐ Process

- ☐ WASTE WATER
- ☐ Domestic
- ☐ Industrial
- ☐ Raw
- ☐ In-plant
- ☐ Treated

OTHER
- ☐ Liquid
- ☐ Solid
- ☐ Sludge
- ☐ Suspension
- ☐ Emulsion
- ☐ Oil
- ☒ Soil
- ☐ Air
- ☐ Other

TYPE
- ☒ Grab
- ☐ Multiple Grab
- ☐ Composite Hrs.

CONTAINER
- ☐ Sterile
- ☒ Glass
- ☐ Plastic
- ☐ Charcoal Tube
- ☐ Vial
- ☐ Other

PRESERVATION
- ☐ Ice
- ☐ Chemical
- ☐ $H_2SO_4$
- ☐ $HNO_3$
- ☐ NAOH
- ☐ EDTA
- ☐ $Na_2S_2O_3$
- ☒ None

CHLORINATED
- ☒ No ☐ Yes

TOXIC OR HAZARDOUS
- ☒ No ☐ Yes ☐ Unknown

If yes, identify material and special handling

## TEST PARAMETERS

If previously defined. P.O. # 11-0734-2-7721 W.O. # 666-01-23 Contr. #

If not, test for 418.1

## CHAIN OF CUSTODY

| | Signature | Date | Time |
|---|---|---|---|
| Collected in field by | [illegible] | 9-15-95 | 12:00 |
| Fixed in field by | [illegible] | 9-22-95 | 7:00 |
| Released to EQL by | [illegible] | 9-22-95 | 1:00 pm |
| Received by EQL | [illegible] | 9-22-95 | 2:30 pm |
| Received by Lab. | Victer Wilendly | 9-22-95 | 4:30 pm. |

SAMPLE FOUND TO BE TOXIC OR HAZARDOUS. ☐ YES ☐ NO

| | | | |
|---|---|---|---|
| Returned to Client | | | |
| Received by Client | | | |

## COMMENTS

PW-5 41 11.5' 44 1' 45 7' 46 8'
47 9' 48 10' 49 12' 50 17' 51 14'
Cont. (1. Soil Sample + Triplicate + Field Blank)

EQL SAMPLE(S) NO(S). 149632 to 149642 Total Jars (11)

## NOTES

1. Sign legibly. If not legible, print name above signature.
2. Laboratory tests will yield values for the sample received in the laboratory. Correct procedures in sampling, fixing, preservation, and handling of sample are of utmost importance if the test values are to be representative of the source sample.
3. Remaining proportions of toxic or hazardous samples will be returned to client for the proper and final disposal.

eqlab

# SAMPLE DELIVERY SLIP

ENVIRONMENTAL QUALITY LABORATORIES, INC.

Delivery Slip 95 12459

EQL W.O. No. 666-01-23

Client Terra Vac 11-0234

Roosevelt Roads US Navy Sta

## SAMPLE DESCRIPTION

Sampling Point PW-4

Client Tag

| WATER | WASTE WATER | OTHER | TYPE |
|---|---|---|---|
| ☐ Surface/stream | ☐ Domestic | ☐ Liquid | ☒ Grab |
| ☐ Underground | ☐ Industrial | ☐ Solid | ☐ Multiple Grab |
| ☐ Sea | ☐ Raw | ☐ Sludge | ☐ Composite Hrs. |
| ☐ Drinking PWSID No. | ☐ In-plant | ☐ Suspension | |
| ☐ Process | ☐ Treated | ☐ Emulsion | |
| | | ☐ Oil | |
| | | ☒ Soil | |
| | | ☐ Air | |
| | | ☐ Other | |

**CONTAINER**
☐ Sterile
☒ Glass
☐ Plastic
☐ Charcoal Tube
☐ Vial
☐ Other
☐

**PRESERVATION**
☐ Ice
☐ Chemical
☐ $H_2SO_4$
☐ $HNO_3$
☐ NAOH
☐ EDTA
☐ $Na_2S_2O_3$
☒ None

**CHLORINATED**
☒ No ☐ Yes

**TOXIC OR HAZARDOUS**
☒ No ☐ Yes ☐ Unknown

If yes, identify material and special handling

## TEST PARAMETERS

If previously defined. P.O. # 11-0234-7-5821 W.O. # 666-01-23 Contr. #

If not, test for TPH 418.1

## CHAIN OF CUSTODY

| | Signature | Date | Time |
|---|---|---|---|
| Collected in field by | [illegible] | 9/25/95 | 1300 |
| Fixed in field by | [illegible] | [illegible] | [illegible] |
| Released to EQL by | [illegible] | 9-27-95 | 1:00 pm |
| Received by EQL | [illegible] | 9-27-95 | 1:00 pm |
| Received by Lab. | Victor M. Lendy | 9-27-95 | 4:30 pm. |

SAMPLE FOUND TO BE TOXIC OR HAZARDOUS. ☐ YES ☐ NO

| | | | |
|---|---|---|---|
| Returned to Client | | | |
| Received by Client | | | |

## COMMENTS

Analyze for 418.1

Soil Samples #53 6", #54 8", #56 12", #55 12", 59 12", 60 12", 62 12", 64 20", 65 [illegible], 66 [illegible], Total of 10 Soil Samples + Field Blank and Equipment Blank Total of 12 Samples

EQL SAMPLE(S) NO(S). 149643 to 149654

## NOTES

1. Sign legibly. If not legible, print name above signature.
2. Laboratory tests will yield values for the sample received in the laboratory. Correct procedures in sampling, fixing, preservation, and handling of sample are of utmost importance if the test values are to be representative of the source sample.
3. Remaining proportions of toxic or hazardous samples will be returned to client for the proper and final disposal.

eqlab

# SAMPLE DELIVERY SLIP

ENVIRONMENTAL QUALITY LABORATORIES, INC.

Delivery Slip 95 12460

EQL W.O. No. 666-01-23

Client Terra Vac 11-0234

Roosevelt Roads U.S. Navy Station

## SAMPLE DESCRIPTION

Sampling Point PW-6

Client Tag

- ☐ WATER
- ☐ Surface/stream
- ☐ Underground
- ☐ Sea
- ☐ Drinking PWSID No.
- ☐ Process

- ☐ WASTE WATER
- ☐ Domestic
- ☐ Industrial
- ☐ Raw
- ☐ In-plant
- ☐ Treated

OTHER
- ☐ Liquid
- ☐ Solid
- ☐ Sludge
- ☐ Suspension
- ☐ Emulsion
- ☐ Oil
- ☒ Soil
- ☐ Air
- ☐ Other

TYPE
- ☒ Grab
- ☐ Multiple Grab
- ☐ Composite Hrs.

CONTAINER
- ☐ Sterile
- ☒ Glass
- ☐ Plastic
- ☐ Charcoal Tube
- ☐ Vial
- ☐ Other
- ☐

PRESERVATION
- ☐ Ice
- ☐ Chemical
- ☐ $H_2SO_4$
- ☐ $HNO_3$
- ☐ NAOH
- ☐ EDTA
- ☐ $Na_2S_2O_3$
- ☒ None

CHLORINATED
- ☒ No
- ☐ Yes

TOXIC OR HAZARDOUS
- ☒ No
- ☐ Yes
- ☐ Unknown

If yes, identify material and special handling

## TEST PARAMETERS

If previously defined. P.O. # 110234.2-5821 W.O. # 666-01-23 Contr. #

If not, test for 418.1

## CHAIN OF CUSTODY

| | Signature | Date | Time |
|---|---|---|---|
| Collected in field by | [illegible] | 9-26-95 | 10:40 |
| Fixed in field by | [illegible] | 9-26-95 | 10:40 |
| Released to EQL by | [illegible] | 9-27-95 | 1:00 |
| Received by EQL | [illegible] | 9-27-95 | 1:00 |
| Received by Lab. | Victor Molina | 9-27-95 | 4:30 pm. |

SAMPLE FOUND TO BE TOXIC OR HAZARDOUS. ☐ YES ☐ NO

| | | | |
|---|---|---|---|
| Returned to Client | | | |
| Received by Client | | | |

## COMMENTS

Analysis for 418.1

Sample Stations: # 66 (7.5'), 67 (9'), 68 (11'), 69 (13'), 70 (15'), 71 (17'), 72 (19'), 73 (20').

Total 12 soil samples. Trip-Equip-Field Blank

EQL SAMPLE(S) NO(S). 149655 to 149665 KFC (11 Samples)

## NOTES

1. Sign legibly. If not legible, print name above signature.
2. Laboratory tests will yield values for the sample received in the laboratory. Correct procedures in sampling, fixing, preservation, and handling of sample are of utmost importance if the test values are to be representative of the source sample.
3. Remaining proportions of toxic or hazardous samples will be returned to client for the proper and final disposal.