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3315 Almaden Expressway, Suite 34
San Jose, CA 95118
Phone: (408) 264-7723
Fax: (408) 264-2435

ADDITIONAL SUBSURFACE ENVIRONMENTAL INVESTIGATION AND PUMPING TEST

9/30/92

at

Former Bay Street Texaco Station
1127 Lincoln Avenue
Alameda, California

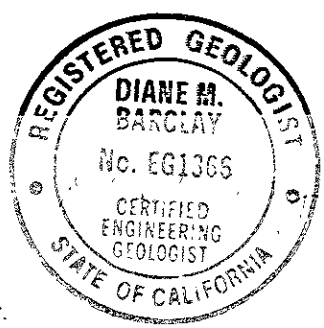
61006.04

Report prepared for:

Texaco Environmental Services
108 Cutting Boulevard
Richmond, California 94804
by
RESNA Industries Inc.

Philip J. Mayberry
Project Geologist

Diane Barclay
Certified Engineering Geologist
No. 1366



September 30, 1992

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Applied GeoSystems, Inc.
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3315 Almaden Expressway, Suite 34
San Jose, CA 95118
Phone: (408) 264-7723
Fax: (408) 264-2435

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INTRODUCTION

Texaco Environmental Services (TES) contracted with RESNA Industries Inc. (RESNA) to perform an Additional Subsurface Environmental Investigation and pumping test at the former Bay Street Texaco Station located at 1127 Lincoln Avenue in Alameda, California and prepare this report. In addition, additional research regarding site usage and nearby utilities was performed. The purpose of this investigation was to evaluate further the vertical and lateral extent of gasoline hydrocarbons in the soil and first-encountered groundwater related to known product lines and underground gasoline-storage tanks that existed formerly at the site. The purpose of the pumping test was to evaluate sustainable pumping rates and capture radii for the design of an interim groundwater remediation system.

Work performed for this investigation included: drilling five soil borings (B-12 through B-16 for groundwater monitoring wells MW-4 through MW-8); collecting soil samples from the borings; constructing three 4-inch diameter groundwater monitoring wells in borings (MW-4, MW-5, and MW-8) and two 2-inch diameter groundwater monitoring wells in borings (MW-6 and MW-7); developing the new wells and sampling the groundwater from new and existing monitoring wells; submitting soil and groundwater samples for laboratory analysis; research; and preparing this report including a summary of previous work performed at the

site, summaries of field procedures used during this investigation, the findings and interpretation of data, and conclusions.

SITE DESCRIPTION

The former Bay Street Texaco Station located at 1127 Lincoln Avenue in Alameda, California, is now an operating auto repair shop utilizing the building and facilities of the former service station, located in a commercial and residential area. The site location is shown on Plate 1, Site Vicinity Map. A plant nursery borders the site on the west, homes border the site to the north, and commercial and residential properties border the site across Lincoln Avenue and Bay Street to the south and east. The site is on a relatively flat asphalt-covered lot at an elevation of approximately 17 feet above mean sea level. Two 4,000-gallon gasoline-storage tanks were formerly located in the middle of the site, two 1,000-gallon gasoline-storage tanks were formerly located on the eastern side of the site, and one 550-gallon waste-oil-storage tank was formerly located in the western portion of the site as shown on Plate 2, Generalized Site Plan. An open storm drain trench extends across the site from the repair shop along the northern boundary of the site as shown on Plate 2.

REGIONAL AND LOCAL GEOLOGY AND HYDROGEOLOGY

Geology

The site is on the central portion of Alameda Island, at the eastern margin of San Francisco Bay within the East Bay Plain, in the south-central portion of the Oakland Alluvial Plain (Hickenbottom, 1988). The East Bay Plain lies within the Coast Range geomorphic province and is characterized by broad alluvial fan margins sloping westward into San Francisco Bay.

Helley, et al. (1979) mapped the surface deposits of most of Alameda Island as Pleistocene-age Merrit Sand, with a maximum thickness of 65 feet. The Merrit Sand is a loose, well-sorted fine- to medium-grained sand with silt and lenses of sandy clay. The Merrit Sand is chiefly derived as a wind- and water-deposited beach and nearshore deposit, and is underlain by older Pleistocene alluvium consisting of layers of poorly consolidated to

unconsolidated clay, silt, sand, and gravel of thickness up to 1,100 feet (Atwater, 1977; Hickenbottom, 1988).

Hydrogeology

Alameda County uses ground water as part of its domestic water supply. The remainder of the water supply is derived from surface reservoirs and from imported water that is transported in from the Mokelumne Aqueduct, the State Water Project, and the Hetch Hetchy Aqueduct (Hickenbottom, 1988).

Ground-water quality in the water-bearing units of the Oakland Alluvial Plain is generally good (meets recommended primary and secondary standards for drinking water). The most productive water wells in the Oakland Alluvial Plain are those completed within the older alluvium units. These units contain appreciable quantities of ground water, and are therefore considered to be the principal ground-water reservoir in the East Bay Plain area. The Merrit Sand is not considered a primary source of ground-water supply because of its limited areal distribution and thickness.

The site is located approximately 1/2-mile south of the Inner Harbor of the tidal channel between Alameda Island and the city of Oakland.

SITE BACKGROUND AND PREVIOUS WORK

Prior to the present investigation, RESNA (formerly Applied GeoSystems) and others performed investigations related to the removal of the onsite tanks and evaluation of the extent of hydrocarbons at the site. A summary of previous work performed at the site is included in Appendix A. Results of these investigations are shown in Tables 1 through 3 of this report.

ADDITIONAL ENVIRONMENTAL AND UTILITIES RESEARCH

In July 1992, RESNA researched the files of the Alameda Fire and Building Departments for additional information on environmental site usage and utility locations in the site

vicinity. Also, information regarding the thickness of the water-bearing zone at the site was sought from the Alaneda County Flood Control and Water Conservation District (ACFCWD) and the City of Alameda Public Works Department. No additional information was available.

FIELD WORK

The field work performed as part of this additional subsurface environmental investigation and pumping test is described below. A summary of the field procedures employed by RESNA is included in Appendix B. Work for this investigation was performed in accordance with the Site Safety and Health Plan (RESNA, June, 1992).

Drilling

A Drilling permit was acquired from ACFCWD's Zone 7 Water Agency prior to drilling at the site. Additionally, three Excavation in the Right-of-Way permits were acquired from the City of Alameda Central Permit Office to install wells MW-6, MW-7, and MW-8 on city property. However, trees prevented drill rig access and the location of well MW-8, which was originally planned to be drilled in Bay Street, was drilled approximately eight feet west of the original location in a driveway of a property owned by Mr. Leo Pagano. Written permission was obtained from Mr. Pagano to drill MW-8 in the driveway of his property. Copies of the permits are included in Appendix C. On June 17 through 19, 1992, five soil borings (B-12 through B-16) for groundwater monitoring wells MW-4 through MW-8 were drilled, and groundwater monitoring wells (MW-4 through MW-8) were constructed in the borings. The locations of wells are shown on Plate 2.

Soil borings for groundwater monitoring wells MW-4 through MW-8 were located to evaluate further the lateral extent of gasoline hydrocarbons in the soil and first-encountered groundwater in areas not investigated during previous subsurface investigations. These wells were also constructed to evaluate further the magnitude and direction of the groundwater gradient and possible migration of gasoline hydrocarbons from offsite.

Drill Cuttings

Drill cuttings from the soil borings were placed on and covered with plastic at the site. On June 26, 1992, A RESNA geologist collected a composite soil sample of the drill cuttings. Based on results of laboratory testing of this composite soil sample (see Laboratory Analyses, below), the soils were removed and transported on August 10, 1992, by Caballero Trucking of San Jose, California, a licensed waste hauler, to Browning-Ferris Industries (BFI) Vasco Road Sanitary Landfill (a Class III sanitary landfill) in Livermore, California. The results of the composite soil sample chemical analyses are summarized in Table 1. Chain of Custody Records and laboratory analysis reports are included in Appendix E.

Soil Sampling and Description

On June 17 through 19, 1992, a total of 20 soil samples were collected from the soil borings and described using the Unified Soil Classification System (Plate 3) as indicated on the Logs of Borings, Plates 4 through 8. Soil samples from the borings were collected at intervals of 5 feet or less from the surface to total depths of the borings. Sampling procedures are described in Appendix B.

The earth materials encountered at the site during this assessment consisted of minor silty gravel backfill, and fine- to medium-grained silty sand backfill and native soil (See Geologic Cross Sections A-A', B-B', C-C', and D-D' on Plates 9 and 10. Ground-water was first encountered in the borings at a depths of approximately 10 to 12 feet below the ground surface. The groundwater rose in the borings immediately after it was reached by the drill string, suggesting confined or at least semiconfined conditions; however, no other evidence that these conditions existed was observed in the borings or interpreted to be part of the soil stratigraphy.

Monitoring Well Construction and Development

Groundwater monitoring wells MW-4 through MW-8 were constructed in borings (B-12 through B-16) drilled for the wells. These wells were completed with 4-inch-diameter (MW-4, MW-5, and MW-8) and 2-inch-diameter (MW-6 and MW-7), Schedule 40, polyvinyl

chloride (PVC) casing. The well casings were set in the wells to total depths of approximately 20 feet below ground surface. The screened casings for the monitoring wells consist of 2-inch-diameter (MW-6 and MW-7) and 4-inch-diameter (MW-4, MW-5, and MW-8), 0.020 inch machine-slotted PVC set from the total well depths to depths of approximately 5 to 7 feet below ground surface. The filter pack for the wells consisted of Monterey No. 2 X 12-size sand. Blank PVC casings were set from the top of the screened casings to within a few inches below the ground surface.

Groundwater monitoring wells MW-4 through MW-8 were developed on June 22, 1992, as described in the field protocol in Appendix B. Well development data sheets showing volume of water removed and turbidity measurements from each well are also included in Appendix B.

Surveying and Groundwater Sampling

Well casing top elevations were surveyed to a U. S. Coast and Geodetic Survey Elevation Datum by Ron Archer Civil Engineer, Inc., on June 22, 1992. The survey results are included in Appendix D, Wellhead Survey. Depths to water (DTW) were measured in groundwater monitoring wells MW-1 through MW-8 and water samples were collected and visually inspected for floating product on June 25, 1992. Well casing top elevations, measured DTWs, and groundwater elevations are presented in Table 2. Initial water samples collected from groundwater monitoring wells MW-1 through MW-8 showed no visual evidence of hydrocarbon product.

Groundwater monitoring wells MW-1 through MW-8 were purged and the groundwater in the wells sampled on June 25, 1992. Appendix B contains a description of subjective analysis and groundwater sampling procedures. Stabilization graphs and well purge data sheets for wells MW-1 through MW-8, showing volume of water removed, temperature, pH, conductivity, and turbidity are also included in Appendix B.

Pumping and Recovery Test

A step-drawdown test was performed on July 21, 1992, to evaluate the optimum pumping rate at which to perform the constant discharge test. Well MW-5 was initially pumped at 1 gallon per minute (gpm) for 27 minutes with a drawdown of 1.38 feet; the pumping rate was then increased to 1.4 gpm for 45 minutes with a total drawdown of 6. 09 feet. The pumping rate was increased to 2 gpm, and within three minutes the water level decreased to below the pump intake, which at 19 feet deep was 1 foot above the bottom of the well (20 feet). The results of the step-drawdown test indicated that the well could sustain a pumping rate of about 1.2 gpm.

Immediately prior to beginning the constant discharge test on July 28, 1992, RESNA personnel measured depth to water (DTW) levels in the pumping well (MW-5) and in the observation wells (MW-2, MW-3, MW-4, MW-6, and MW-8) for the purposes of evaluating the hydraulic gradient and groundwater flow direction during the day of the pumping test. Floating product was not observed in these wells. Well MW-7 was not accessible due to a parked car, so water levels were not measured in this well. Initial water level measurements were obtained for the wells before the start of pumping with an electric DTW probe. DTW measurements are reported in Table 2. The appropriate field procedures are described in Appendix B.

The 24-hour pumping and recovery test was conducted on MW-5 on July 28 and 29, 1992. The test was designed as a 24-hour constant discharge pumping test followed by a 5-hour recovery test. The well was pumped using a submersible pump and the pumping rate was adjusted by valving. The discharge rate was determined using a calibrated one-gallon bucket and a stopwatch. Water levels and discharge rates were measured using an electric sounder at periodic intervals during both the pumping and recovery portions of the test. In addition, pressure transducers attached to a Hermit data logger were placed in wells MW-1, MW-2, MW-3, MW-4, and MW-5 from which water level change data were recorded every five minutes or less. Manual measurements were also recorded in these wells in addition to MW-6 and MW-8. After pumping for 24 hours, the pump was turned off and recovery data were obtained for 5 hours. The pumping rate was relatively constant at 1.2 gpm (231 ft^3/d).

The discharge water was transported by Laidlaw Environmental Services of Martinez, California, to Gibson Oil Company in Redwood City, California, for disposal.

GROUNDWATER GRADIENT

The evaluated magnitude of the groundwater gradient and direction of groundwater flow at the site was approximately 0.01 (1.0 feet vertical drop over 100 feet horizontal distance) toward the north-northeast, based on the June 25, 1992, DTW measurements for groundwater monitoring wells MW-1 through MW-8. The groundwater gradient evaluated from the June 25, 1992, DTW measurements is presented graphically on Plate 11.

LABORATORY ANALYSES

Selected soil samples collected from the borings drilled for groundwater monitoring wells MW-4 through MW-8 were analyzed in accordance with Alameda County Health Care Services (ACHCS) requirements for the gasoline constituents benzene, toluene, ethylbenzene, and total xylenes (BTEX) and total petroleum hydrocarbons as gasoline (TPHg) using modified Environmental Protection Agency (EPA) Methods 5030/8015/8020. The composite samples of the drill cuttings stockpile were also analyzed for BTEX, TPHg, and organic lead using modified EPA Methods 5030/8015/8020 and the LUFT Manual method. Soil analysis was performed by Mobile Chem Laboratories (State of California Hazardous Waste Testing Laboratory Certification Number 1223) in Martinez, California.

Soil samples collected from exploratory borings B-12 through B-16 were selected for laboratory analysis based on:

- location above first-encountered groundwater;
- areas where the presence of petroleum hydrocarbons were suspected; and
- maximum of 5-foot intervals and/or change in stratigraphic units, as recommended by State Department of Health Services (DHS) guidelines.

Groundwater samples obtained from groundwater monitoring wells MW-1 through MW-8 were analyzed in accordance with ACHCS requirements for BTEX and TPHg by modified EPA Methods 5030/8015/602.

The results of soil and groundwater sample chemical analyses are summarized in Tables 1 and 3. Chain of Custody Records and laboratory analysis reports are included in Appendix E.

In addition, one representative soil sample collected from within the water-bearing zone in each of the borings drilled for wells MW-4 through MW-8 was submitted to Johnson Filtration Systems Inc. laboratory in St. Paul, Minnesota on June 29, 1992, for particle size distribution analysis to aid in future groundwater monitoring/extraction well design. The results of analysis and design recommendations are included in Appendix F.

PUMPING AND RECOVERY TEST RESULTS AND DATA ANALYSES

Data obtained from the pumping and recovery test was used for evaluation of a sustainable pumping rate for well MW-5 and for estimating the transmissivity and storativity of the water-bearing zone. The transmissivity information was used to estimate the zone of capture for an extraction well at the site. It should be noted that due to generally accepted technical and regulatory reasons, the pumping and observation wells used during this test were partially penetrating wells (they were not screened throughout the complete vertical extent of the water-bearing zone). This sometimes causes vertical components in flow that differ from the laminar flow typically assumed in fully penetrating wells. These components generally lead to increased drawdown, and therefore low estimated transmissivity values. Partial penetration can be compensated for during aquifer test analysis if the thickness of the water-bearing zone is known; however, this factor is not yet known for the site, so attempts to estimate it might lead to faulty conclusions. It is safe to say that the values obtained from the following analyses are probably minimum values, and that the values can be revised once the thickness of the water-bearing zone is known.

The pumping test showed that well MW-5 was capable of sustaining a pumping rate of 1.2 gpm. Drawdown and recovery data from six of the seven nearby groundwater observation

wells were used to analyze the pumping test. The datalogger water level measurements from MW-4 showed unusual behavior in that they fluctuated up and down several times during the test. This pattern was not observed in the manual measurements from this well. It is unclear whether this could have been due to mechanical reasons such as transducer connections or equipment calibration. Consequently, the datalogger water level data from MW-4 was not analyzed due to its unreliability. The datalogger and manual measurements are presented on pages G1 through G28 of Appendix G. Manual measurements are denoted by an "M" after the well number.

Water elevations recorded before and at the end of the pumping and recovery tests are tabulated on Table 4. Water elevations observed prior to the start of pumping are contoured on Plate G1 in Appendix G. Water elevations observed at the end of pumping are contoured on Plate G2. The extraction well appears to be capturing a zone of water about 90 feet wide (the entire area for which data are available). Water elevations from the end of the recovery portion of the test (recovery ranged from 56 to 75 per cent in the observation wells, and was 96 per cent in the pumping well) are contoured on Plate G3. The groundwater levels had returned to a configuration very similar to that shown prior to the commencement of pumping, with the hydraulic gradient and flow direction almost identical.

The drawdown and recovery data were analyzed using the method of the Jacob (1950) approximation for the Theis (1935) equation to estimate the transmissivity and storativity of the water-bearing zone. Because the nature of the water-bearing zone was questionable as to whether it was leaky confined or unconfined, the data were also analyzed using the Graphical Well Analysis Package (GWAP) software to analyze data using the methods of Hantush (1956) for leaky aquifers and Neuman (1975) for unconfined aquifers. The Neuman analysis was conducted for both elastic and delayed response because it was not known if the pumping test was long enough in duration to assess the existence of delayed response. Details of the pumping test analyses are presented in Appendix G. The transmissivity and storativity (or specific yield) values are shown in Tables 5 and 6.

Based on the data acquired during this pumping test, the average minimum transmissivity (T) for this water-bearing zone was estimated as approximately 1,124 gallons per day per

foot (gpd/ft), or 150.3 ft^2/d. The hydraulic conductivity could not be estimated because the thickness of the water-bearing zone was not known. The storativity of this water-bearing zone was found to range from 0.0009 to 0.0028, with an average storativity of 0.0018.

The steady-state capture radius for well MW-5 (or a similar well installed at the site) was estimated using the maximum pumping rate of 1.2 gpm, the average transmissivity value evaluated by the above methods, and the evaluated hydraulic gradient (Bear, 1979). The average width of the effective area of capture upgradient of MW-5 was estimated to be 154 feet upgradient of MW-5, and the distance to the downgradient stagnation point (r) was found to be 24 feet, as shown on Plate G4. This is considered to be a relatively small zone of capture. These calculations are presented in Appendix G.

DISCUSSION AND CONCLUSIONS

Soil

The results of this and previous investigations indicate gasoline hydrocarbons have impacted shallow soils at the site at depths to 10 feet in the vicinity of boring B-10/VW-5 and the former product dispensers/pipelines to levels of TPHg up to 9,200 parts per million (ppm) in the previously drilled boring B-5, as shown on Plate 12, TPHg in Soil at Depths to 6 Feet, and Plate 13, TPHg in Soil at Depths Between 6 and 10 feet. The extent of the gasoline hydrocarbons has been delineated laterally to 100 ppm (and found to be within the predicted effective radius of vapor extraction) except east, northeast, and southwest of the site. The site has not been delineated vertically.

The results of this and previous investigations suggest that the former product lines and eastern gasoline-storage tanks probably have been the source of the gasoline hydrocarbons detected in the shallow soils. There are relatively low concentrations of TPHg (13 to 48 ppm) in soil samples collected from borings B-3, B-7, and B-13 in the northern portion of the site.

Groundwater

The interpreted distributions of TPHg and benzene in the groundwater are shown on Plate 14, TPHg Concentrations in Groundwater, and Plate 15, Benzene Concentrations in Groundwater. BTEX compounds in groundwater samples from wells MW-1 and MW-6 (benzene and toluene), MW-2, MW-3, and MW-8 (benzene), and MW-5 BTEX exceeded the California State Department of Health Services (DHS) minimum contaminant levels (MCL) or action levels (DWAL) for drinking water (DHS, 1990). The lateral extent of benzene has been delineated in groundwater to 1.0 ppb in the southwestern portion of the site, and southeast of the site. The extent of benzene in groundwater has not been evaluated offsite in the downgradient (north), upgradient (south), and crossgradient (northeastern and northwestern) directions, and has not been delineated vertically. The possible effects of utility and storm drain trenches on gasoline hydrocarbon migration have not been addressed due to lack of information.

Pumping and Recovery Test

Groundwater extraction followed by groundwater treatment prior to discharge to the city's storm drain system is a viable and cost-effective interim remediation alternative for this site. The predicted zone of capture of 24 feet downgradient and 154 feet wide upgradient of MW-5 is probably a minimum. This capture zone will most likely provide an adequate zone of capture for the gasoline hydrocarbon-affected groundwater onsite; however, it is considered too small to capture offsite regions affected by gasoline hydrocarbons.

The results of the pumping test indicate that it will probably not be possible to lower the groundwater surface significantly due to the relatively low capability of the wells at the site to sustain the pumping rate required to produce this effect. This, however, will need to be reevaluated when the thickness of the water-bearing zone beneath the site is known, so that effects of partial penetration on the pumping test analysis can be corrected for, if necessary.

Potential Sources

The primary source of gasoline hydrocarbons in the soil and groundwater reported at the site appears to be in the vicinity B-10/VW-5, and is most likely in the area of the product dispenser, pipelines, and/or the eastern gasoline-storage tanks removed in September 1989. This is evidenced by the distribution of TPHg and benzene in the soil and groundwater; the disparity between TPHg and benzene concentrations detected in wells MW-2 and MW-6; and the absence of TPHg and benzene in wells MW-4 and MW-7. Based on the TPHg and benzene concentrations detected in MW-6, the possibility of a contributing source upgradient still exists; however, these concentrations are more likely the result of slight dispersion of site gasoline hydrocarbons upgradient.

LIMITATIONS

This report was prepared in accordance with generally accepted standards of environmental geological practice in California at the time this investigation was performed. This investigation was conducted solely for the purpose of evaluating environmental conditions of the soil and groundwater with respect to gasoline hydrocarbons at and near the site, related to the known previous underground gasoline-storage tanks at the site. No soil engineering or geotechnical references are implied or should be inferred. Evaluation of the geologic conditions at the site for the purpose of this investigation is made from a limited number of observation points. Subsurface conditions may vary away from the data points available. Additional work, including further subsurface investigation, can reduce the inherent uncertainties associated with this type of assessment. This report has been prepared solely for Texaco Environmental Services, and any reliance on this report by third parties shall be at such party's sole risk.

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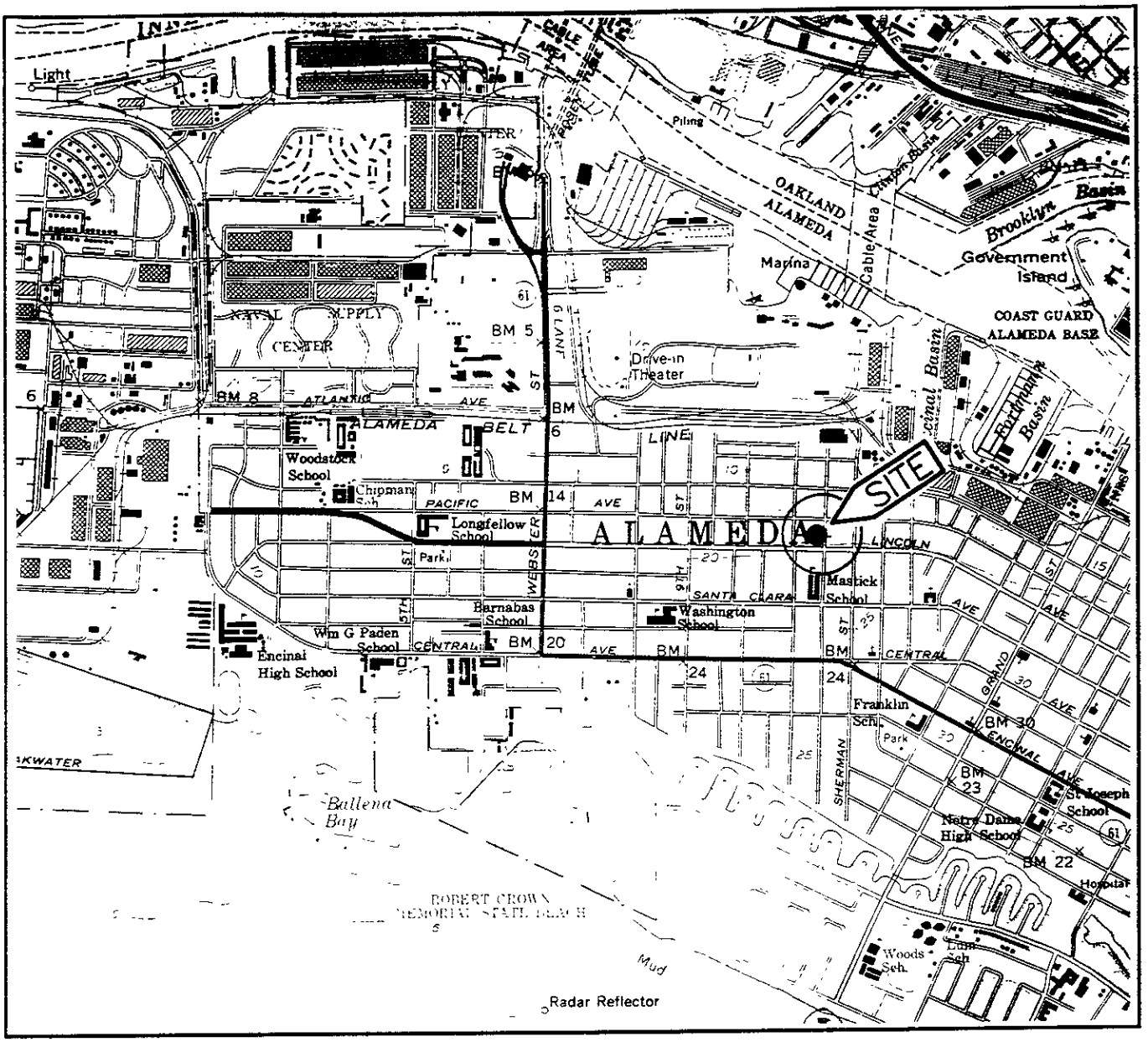

Base: U.S. Geological Survey
7.5–Minute Quadrangle
Oakland West, California.
Photorevised 1980

LEGEND

= Site Location

N

Approximate Scale

2000 1000 0 2000 4000

feet

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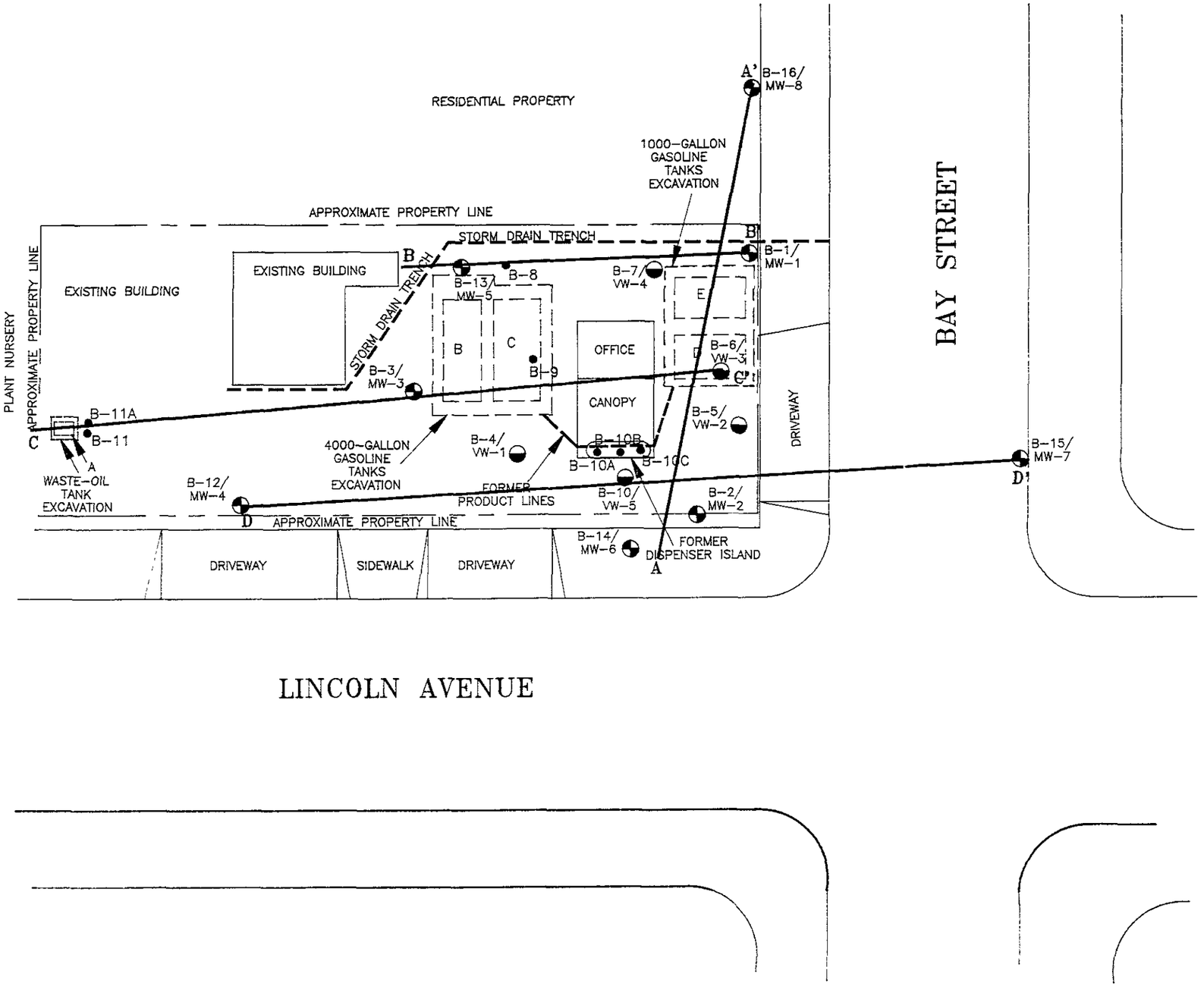
SITE VICINITY MAP
Former Bay Street Texaco Station
1127 Lincoln Avenue
Alameda, California

PLATE 1



EXPLANATION

B-11A● = Soil boring (RESNA, March and April 1991)

B-10/ VW-5 ◒ = Vapor monitoring/extraction well (RESNA, March 1991)

B-16/ MW-8 ◓ = Groundwater monitoring well (RESNA, March 1991 and June 1992)

D ——— D' = Geologic cross-sections

N

Approximate Scale

20 10 0 20 40

feet

Source: Surveyed by Ron Archer, Civil Engineer, inc March 1991. Located June 22, 1992

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GENERALIZED SITE PLAN
Former Bay Street Texaco Station
1127 Lincoln Avenue
Alameda, California

PLATE
2

UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISION		LTR	DESCRIPTION	MAJOR DIVISION		LTR	DESCRIPTION
COARSE-GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	GW	Well-graded gravels or gravel-sand mixtures, little or no fines.	FINE-GRAINED SOILS	SILTS AND CLAYS LL<50	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands, or clayey silts with slight plasticity.
		GP	Poorly-graded gravels or gravel-sand mixtures, little or no fines.			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
		GM	Silty gravels, grave-sand-silt mixtures.			OL	Organic silts and organic silt-clays of low plasticity.
		GC	Clayey gravel, gravel-sand -clay mixtures.		SILTS AND CLAYS LL>50	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
	SAND AND SANDY SOILS	SW	Well-graded sand or gravelly sands, little or no fines.			CH	Inorganic clays of high plasticity, fat clays.
		SP	Poorly-graded sands or gravelly sands, little or no fines.			OH	Organic clays of medium to high plasticity, organic silts.
		SM	Silty sands, sand-silt mixtures	HIGHLY ORGANIC SOILS		PT	Peat and other highly organic soils.
		SC	Clayey sands, sand-clay mixtures.				


Depth through which sampler is driven


Relatively undisturbed sample


No sample recovered


Static water level observed in well/boring


Initial water level observed in boring

S-10 Sample number


Sand pack


Bentonite

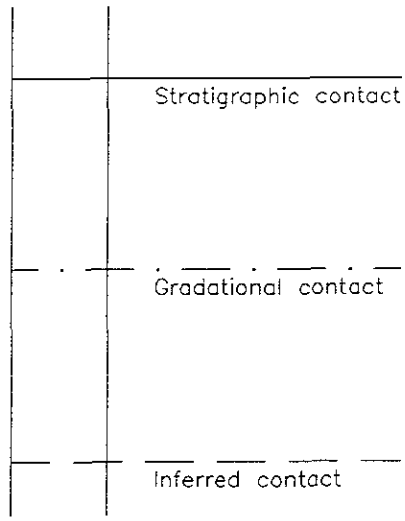

Neat cement


Caved native soil


Blank PVC


Machine-slotted PVC

P.I.D Photoionization detector



BLOWS REPRESENT THE NUMBER OF BLOWS OF A 140-POUND HAMMER FALLING 30 INCHES TO DRIVE THE SAMPLER THROUGH EACH 6 INCHES OF AN 18-INCH PENETRATION

GRADATIONAL AND INFERRED CONTACT LINES SEPARATING UNITS ON THE LOGS REPRESENT APPROXIMATE BOUNDARIES ONLY. ACTUAL BOUNDARIES MAY BE GRADATIONAL AND VARY IN DEPTH. SOIL CONDITIONS AT THE DRILL LOCATION AT THE TIME OF DRILLING ONLY.

RESNA
Moving to Resolve Issues

UNIFIED SOIL CLASSIFICATION SYSTEM PLATE AND SYMBOL KEY

Former Bay Street Texaco Station
1127 Lincoln Avenue
Alameda, California

3

PROJECT 61006.04

Depth of boring: 20 feet Diameter of boring: 10 inches Date drilled: 06/18/92

Well depth: 20 feet Material type: Sch 40 PVC Casing diameter: 4 inches

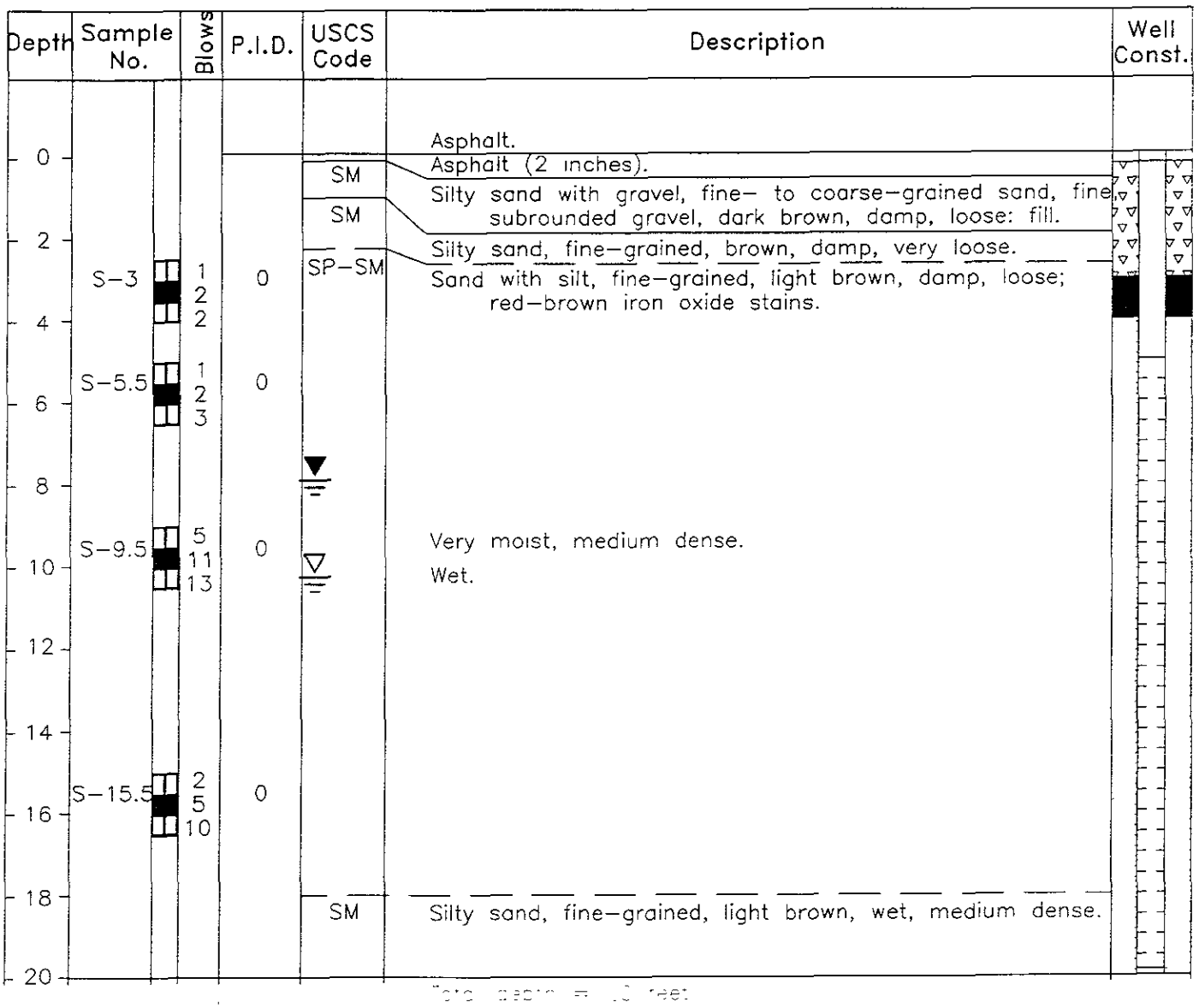
Screen interval: 5 to 20 feet Slot size: 0.020-inch

Drilling Company: HEW Drilling Driller: Jasper and Mike

Method Used: Hollow-Stem Auger Field Geologist: Kathy Thomas

Signature of Registered Professional: Diane M. Barclay

Registration No.: CEG 1366 State: CA



Total depth = 20 feet

RESNA
Working in Resource Protection

LOG OF BORING B-12/MW-4

Former Bay Street Texaco Station
1127 Lincoln Avenue
Alameda, California

PLATE 4

PROJECT: 61006.04

Depth of boring: 20 feet Diameter of boring: 10 inches Date drilled: 06/17/92

Well depth: 20 feet Material type: Sch 40 PVC Casing diameter: 4 inches

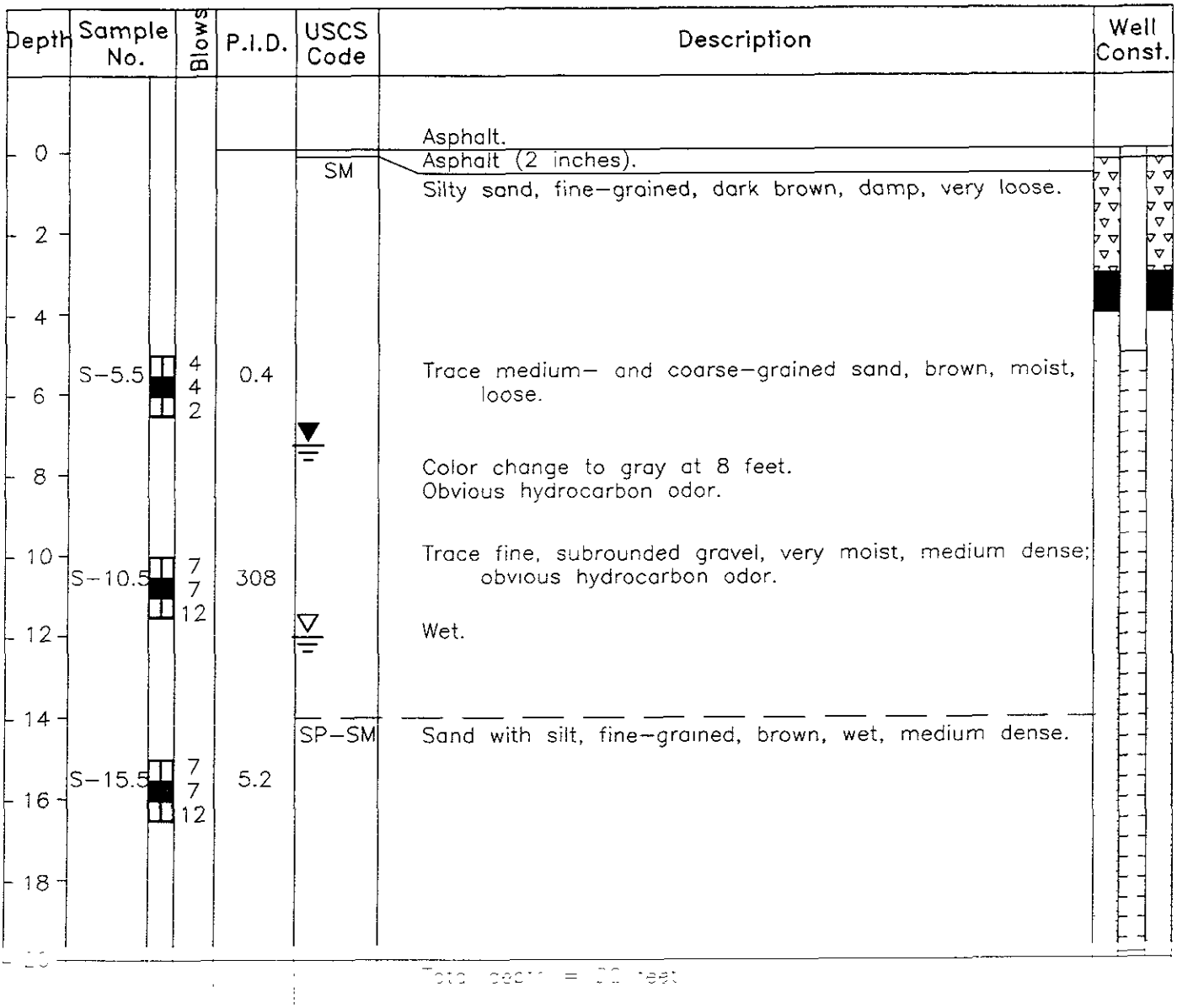
Screen interval: 5 to 20 feet Slot size: 0.020-inch

Drilling Company: HEW Drilling Driller: Jasper and Mike

Method Used: Hollow-Stem Auger Field Geologist: Kathy Thomas

Signature of Registered Professional: Diane M. Barclay

Registration No.: CEG 1366 State: CA



RESNA
Working to Restore Nature

LOG OF BORING B-13/MW-5

Former Bay Street Texaco Station
1127 Lincoln Avenue
Alameda, California

PLATE 5

PROJECT: 61006.04

Depth of boring: 20-1/2 feet Diameter of boring: 8 inches Date drilled: 06/19/92

Well depth: 20 feet Material type: Sch 40 PVC Casing diameter: 2 inches

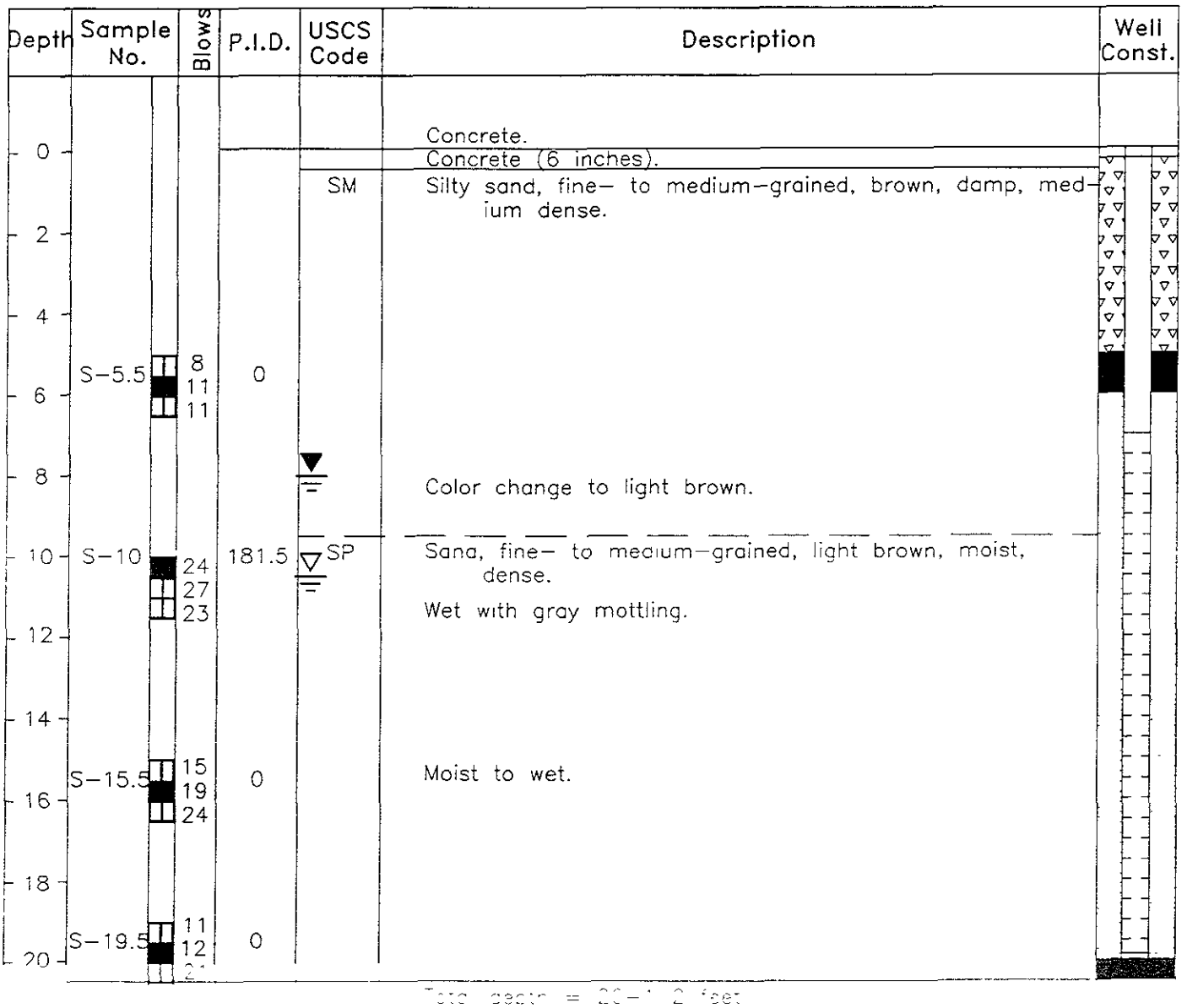
Screen interval: 7 to 20 feet Slot size: 0.020-inch

Drilling Company: HEW Drilling Driller: Phillip and Reggie

Method Used: Hollow-Stem Auger Field Geologist: Philip Mayberry

Signature of Registered Professional: Diane M Barclay

Registration No.: CEG 1366 State: CA



Total depth = 20-1/2 feet

RESNA

LOG OF BORING B-14/MW-6

PLATE

Former Bay Street Texaco Station
1127 Lincoln Avenue
Alameda, California

6

PROJECT: 61006.04

Depth of boring: 21 feet Diameter of boring: 8 inches Date drilled: 06/19/92

Well depth: 20 feet Material type: Sch 40 PVC Casing diameter: 2 inches

Screen interval: 7 to 20 feet Slot size: 0.020-inch

Drilling Company: HEW Drilling Driller: Phillip and Reggie

Method Used: Hollow-Stem Auger Field Geologist: Philip Mayberry

Signature of Registered Professional: Diane M Barclay

Registration No.: CEG 1366 State: CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
0					Asphalt.	
					Asphalt (6 inches).	
				SM	Silty sand, fine- to medium-grained, dark brown, damp, medium dense.	
4				SP	Sand, fine- to medium-grained, light brown with red mottling, damp, medium dense.	
6	S-6	9 12 17	0			
8					▼	
10	S-9.5	31 35 45	0		▽ Color change to brown, damp, very dense. Wet at 10-1/2 feet.	
12						
14						
16	S-15.5	12 35 50	0			
18						
20	S-20	40 50 50	0			

RESNA

LOG OF BORING B-15/MW-7 PLATE

Former Bay Street Texaco Station
27 Lincoln Avenue
Alameda, California

7

PROJECT: 61006.04

Depth of boring: 20 feet Diameter of boring: 10 inches Date drilled: 06/17/92

Well depth: 20 feet Material type: Sch 40 PVC Casing diameter: 4 inches

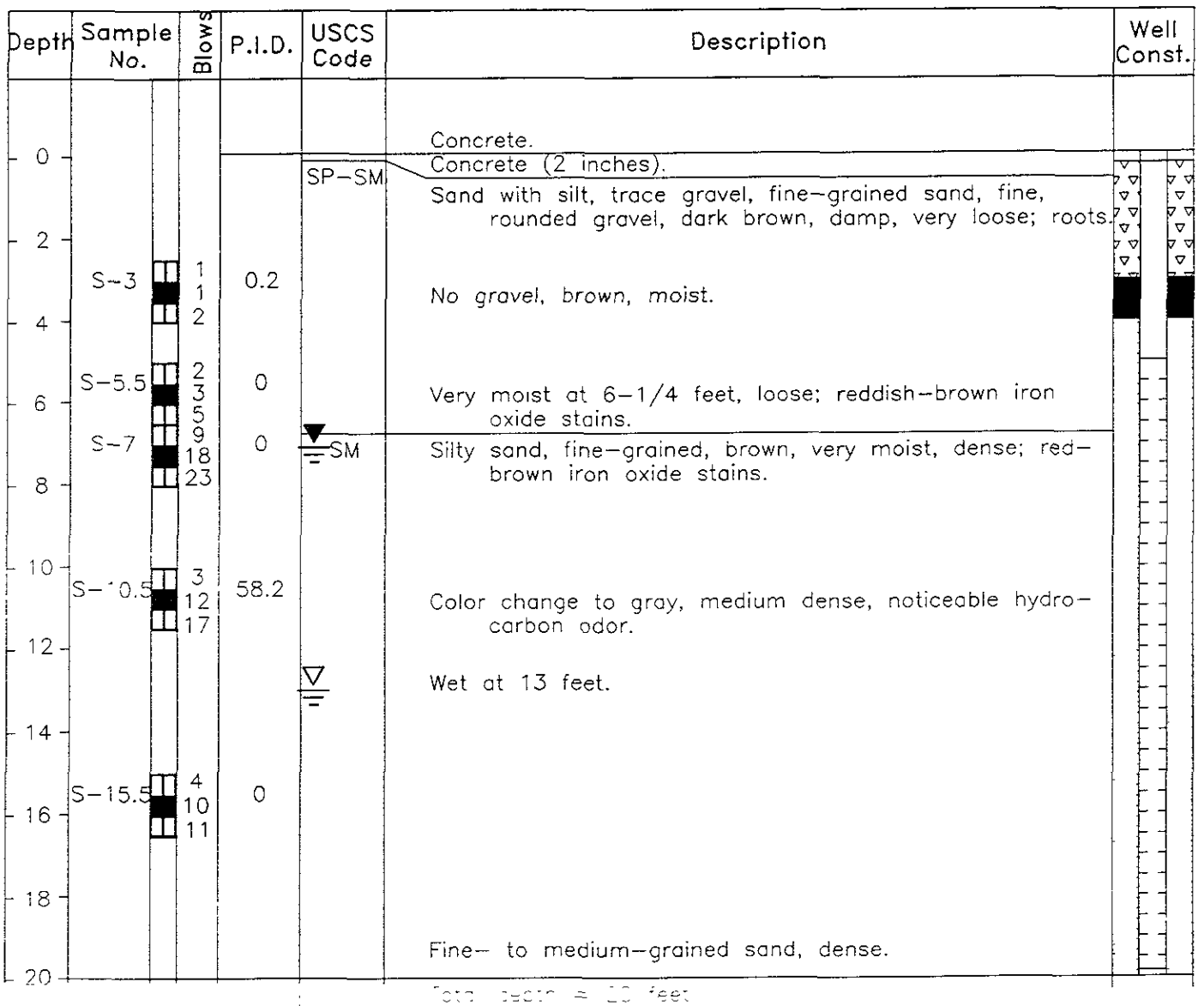
Screen interval: 5 to 20 feet Slot size: 0.020-inch

Drilling Company: HEW Drilling Driller: Jasper and Mike

Method Used: Hollow-Stem Auger Field Geologist: Kathy Thomas

Signature of Registered Professional: Diane M. Barclay

Registration No.: CEG 1366 State: CA



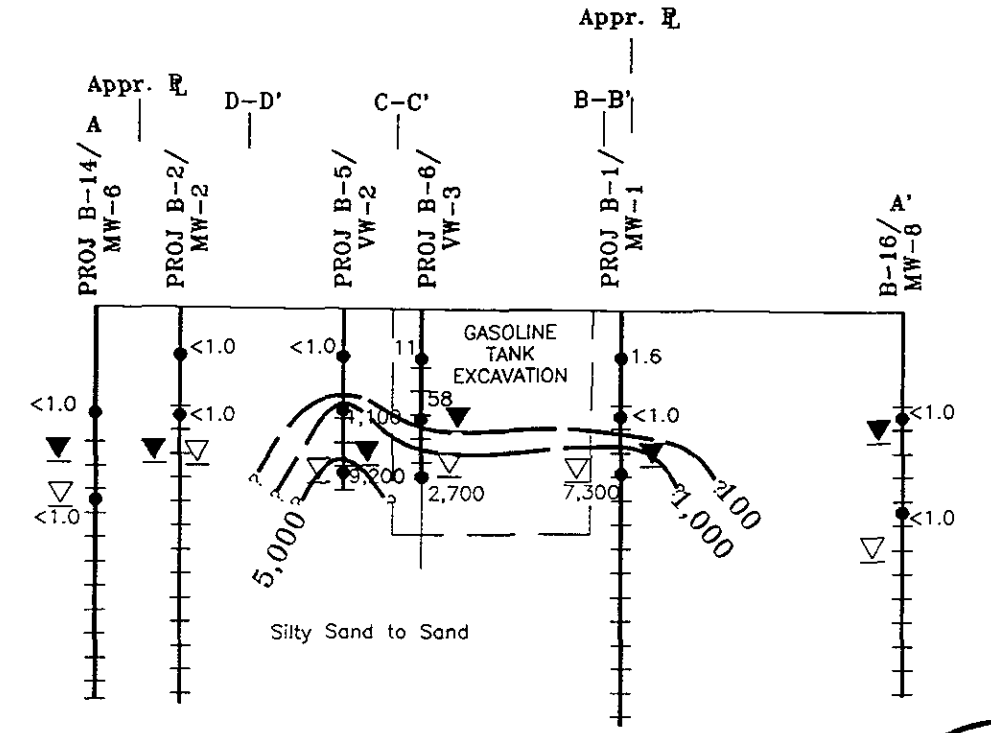
RESNA

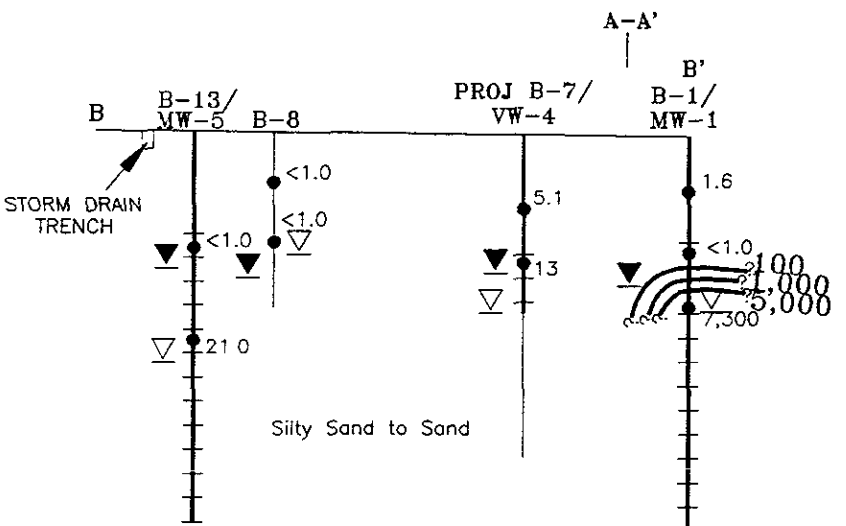
LOG OF BORING B-16/MW-8

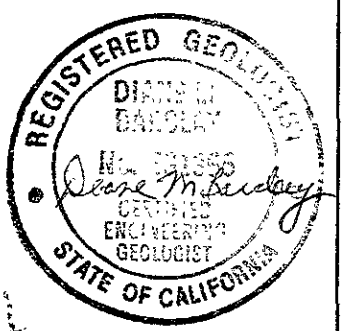
Former Bay Street Texaco Station
127 Lincoln Avenue
Alameda, California

PLATE 8

PROJECT: 61006.04







EXPLANATION

−5,000 = Line of equal concentration of TPHg in soil in parts per million

9,200 = Laboratory analyzed soil sample showing concentration of TPHg in parts per million

= Well casing

= Well screen

= Boring

= Initial water level in boring

= Static water level in well (8-25-93)

Approximate Horizontal Scale

20 10 0 20 40

feet

Approximate Vertical Scale

10 05 0 10

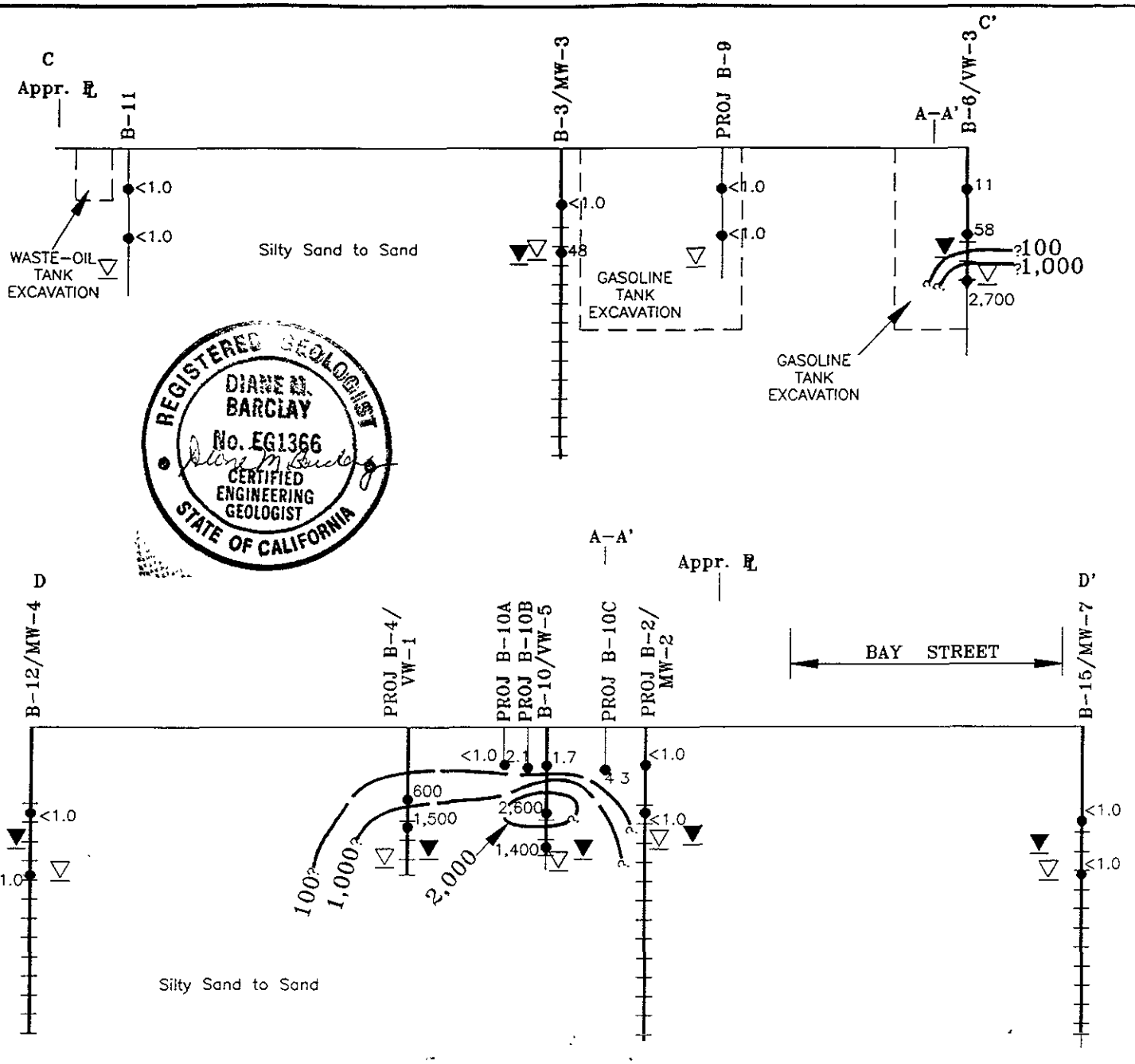
feet

RESNA
Working to Restore Nature

PROJECT 61006.04

GEOLOGIC CROSS-SECTIONS A-A' & B-B'
Former Bay Street Texaco Station
1127 Lincoln Avenue
Alameda, California

PLATE 9



EXPLANATION

−2,000 = Line of equal concentration of TPHg in soil in parts per million

2,600 = Laboratory analyzed soil sample showing concentration of TPHg in parts per million

= Well casing

= Well screen

= Boring

= Initial water level in boring

= Static water level on 6-25-92

Approximate Horizontal Scale

20 10 0 20 40

feet

Approximate Vertical Scale

10 5 0 5 10

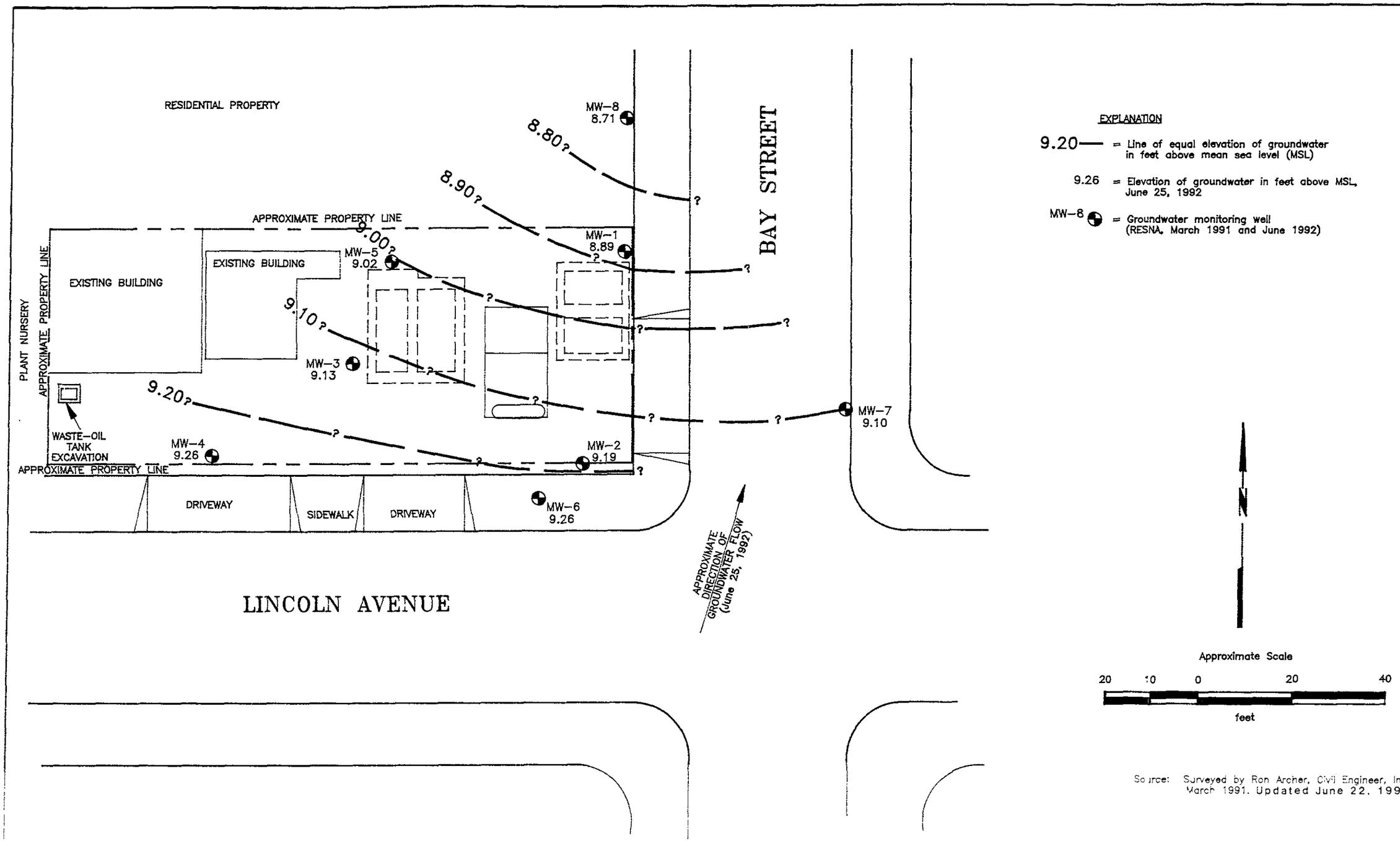
feet

RESNA
Working to Restore Nature

PROJECT 61006.04

GEOLOGIC CROSS-SECTIONS C-C' & D-D'
Former Bay Street Texaco Station
1127 Lincoln Avenue
Alameda, California

PLATE 10



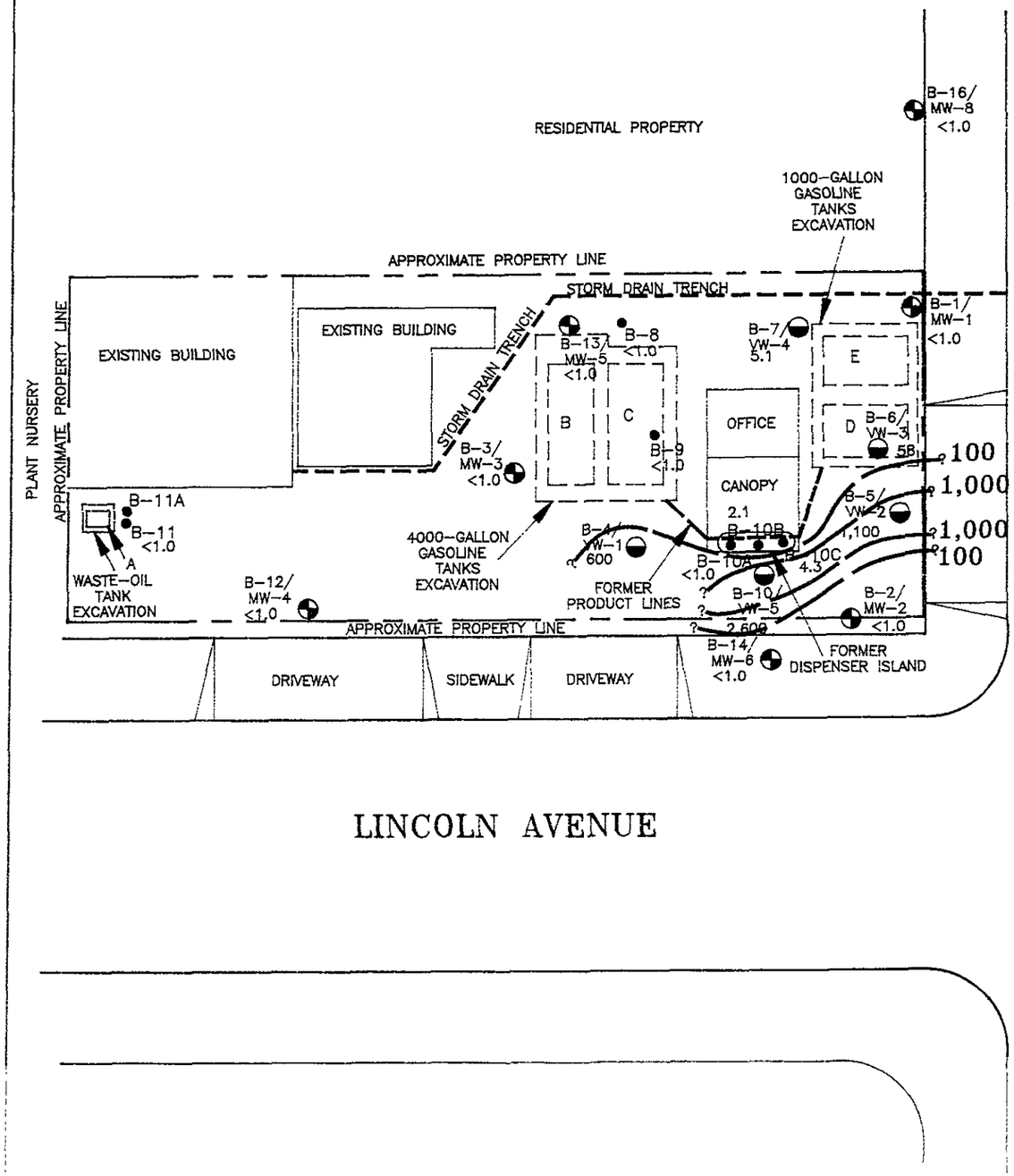
Source: Surveyed by Ron Archer, Civil Engineer, Inc. March 1991. Updated June 22, 1992.

RESNA
Working to Restore Nature

PROJECT 61006.04

GROUNDWATER GRADIENT MAP
Former Bay Street Texaco Station
1127 Lincoln Avenue
Alameda, California

PLATE
11



EXPLANATION

B-11A● = Soil boring (RESNA, March and April 1991)

B-10/ VW-5 ◒ = Vapor monitoring/extraction well (RESNA, March 1991)

B-16/ MW-8 ◓ = Groundwater monitoring well (RESNA, March 1991 and June 1992)

—1,000 = Line of equal concentration of TPHg in soil at depth to 6 feet

2,600 = Concentration of TPHg in soil at depth to 6 feet in parts per million

N

Approximate Scale

20 10 0 20 40

feet

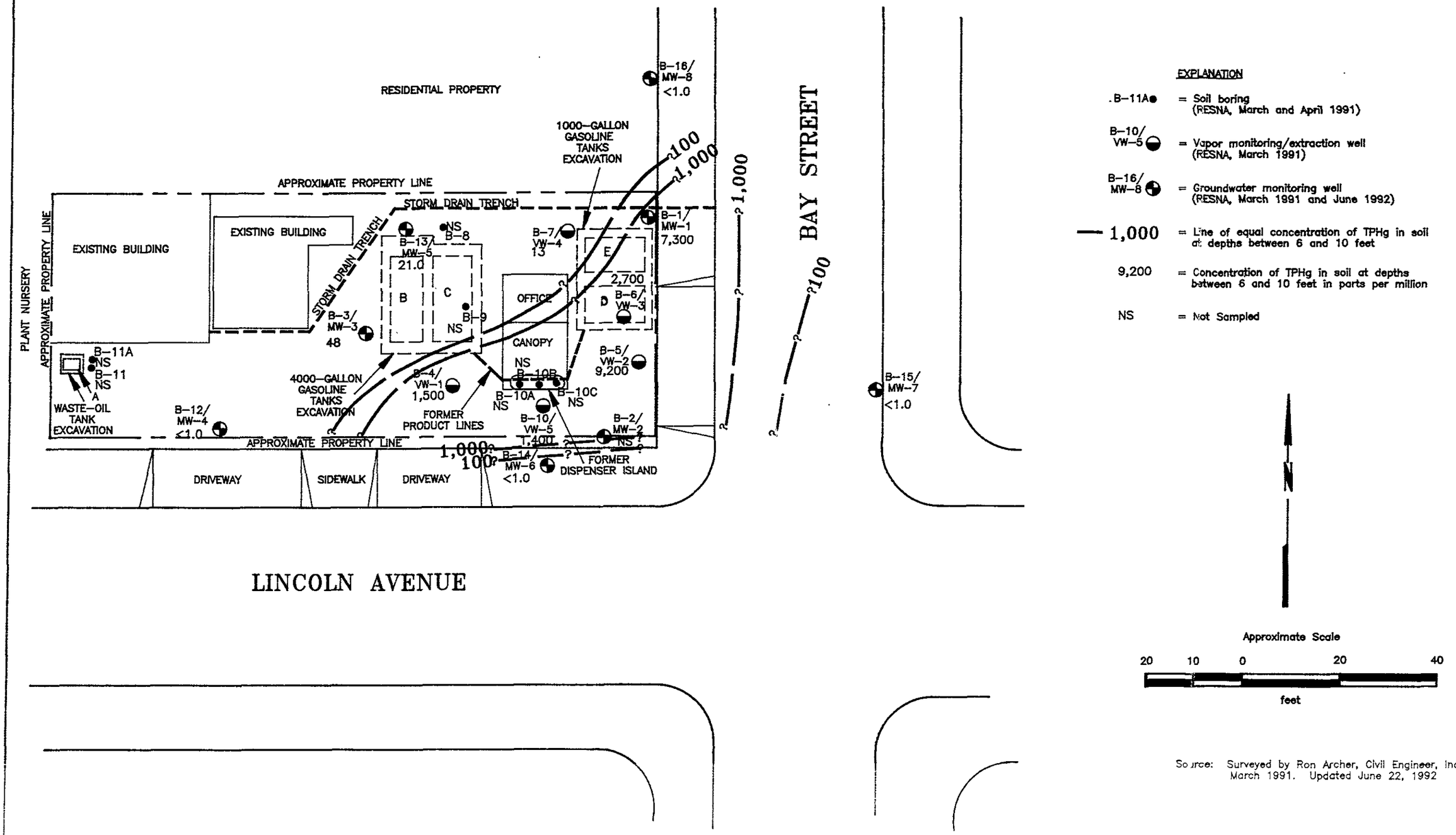
Source: Surveyed by Ron Archer, Civil Engineer, Inc March 1991 Updated June 22, 1992

RESNA
Working to Restore Nature

PROJECT 61006.04

TPHg IN SOIL AT DEPTHS TO 6 FEET
Former Bay Street Texaco Station
1127 Lincoln Avenue
Alameda, California

PLATE
12



EXPLANATION

- B–11A● = Soil boring (RESNA, March and April 1991)
- B–10/ VW–5 ◒ = Vapor monitoring/extraction well (RESNA, March 1991)
- B–16/ MW–8 ◒ = Groundwater monitoring well (RESNA, March 1991 and June 1992)
- 1,000 = Line of equal concentration of TPHg in soil at depths between 6 and 10 feet
- 9,200 = Concentration of TPHg in soil at depths between 6 and 10 feet in parts per million
- NS = Not Sampled

Approximate Scale

20 10 0 20 40

feet

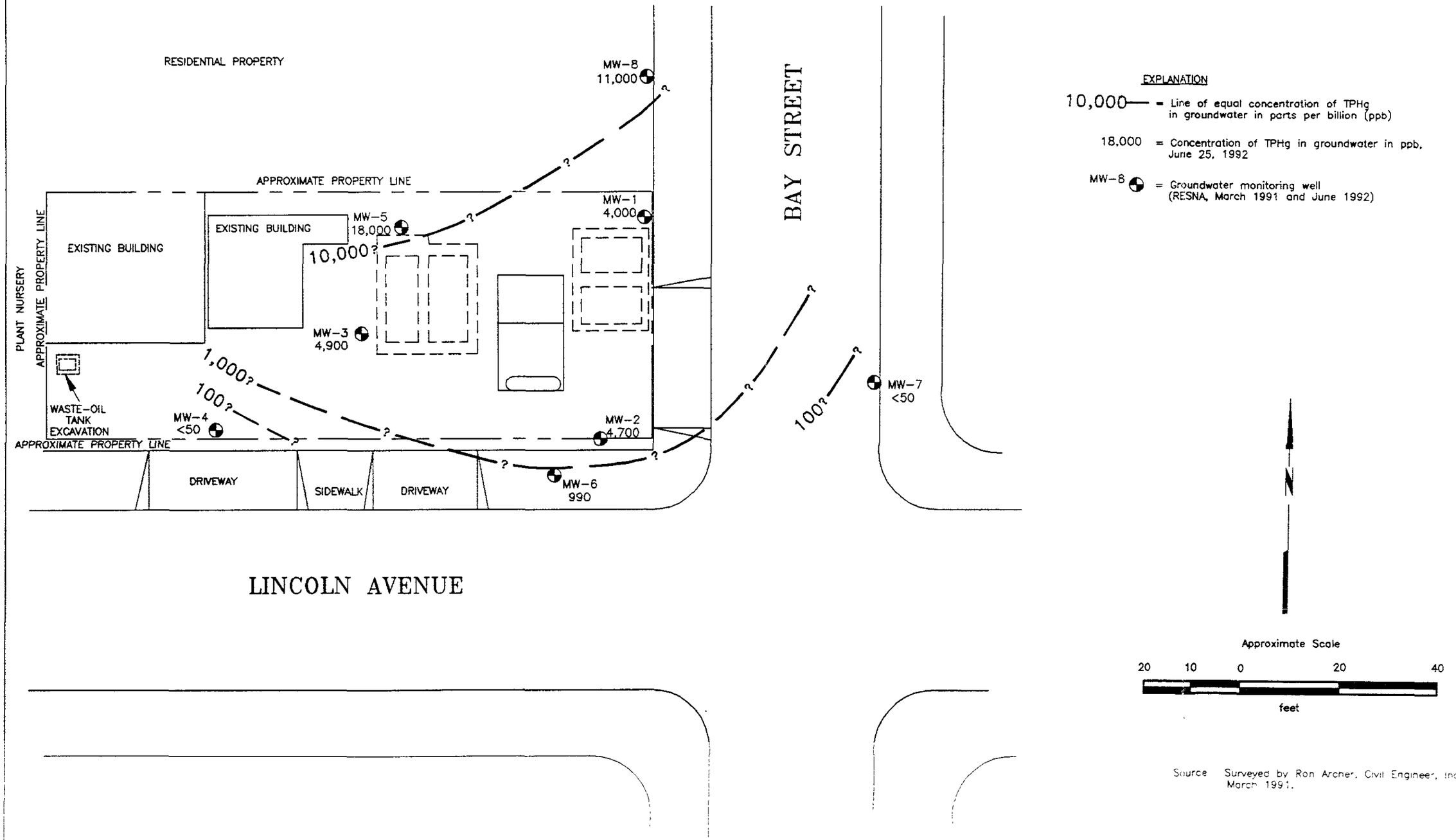
Source: Surveyed by Ron Archer, Civil Engineer, Inc. March 1991. Updated June 22, 1992

RESNA
Working to Restore Nature

PROJECT 61006.04

TPHg IN SOIL AT DEPTHS BETWEEN 6 AND 10 FEET
Former Bay Street Texaco Station
1127 Lincoln Avenue
Alameda, California

PLATE
13



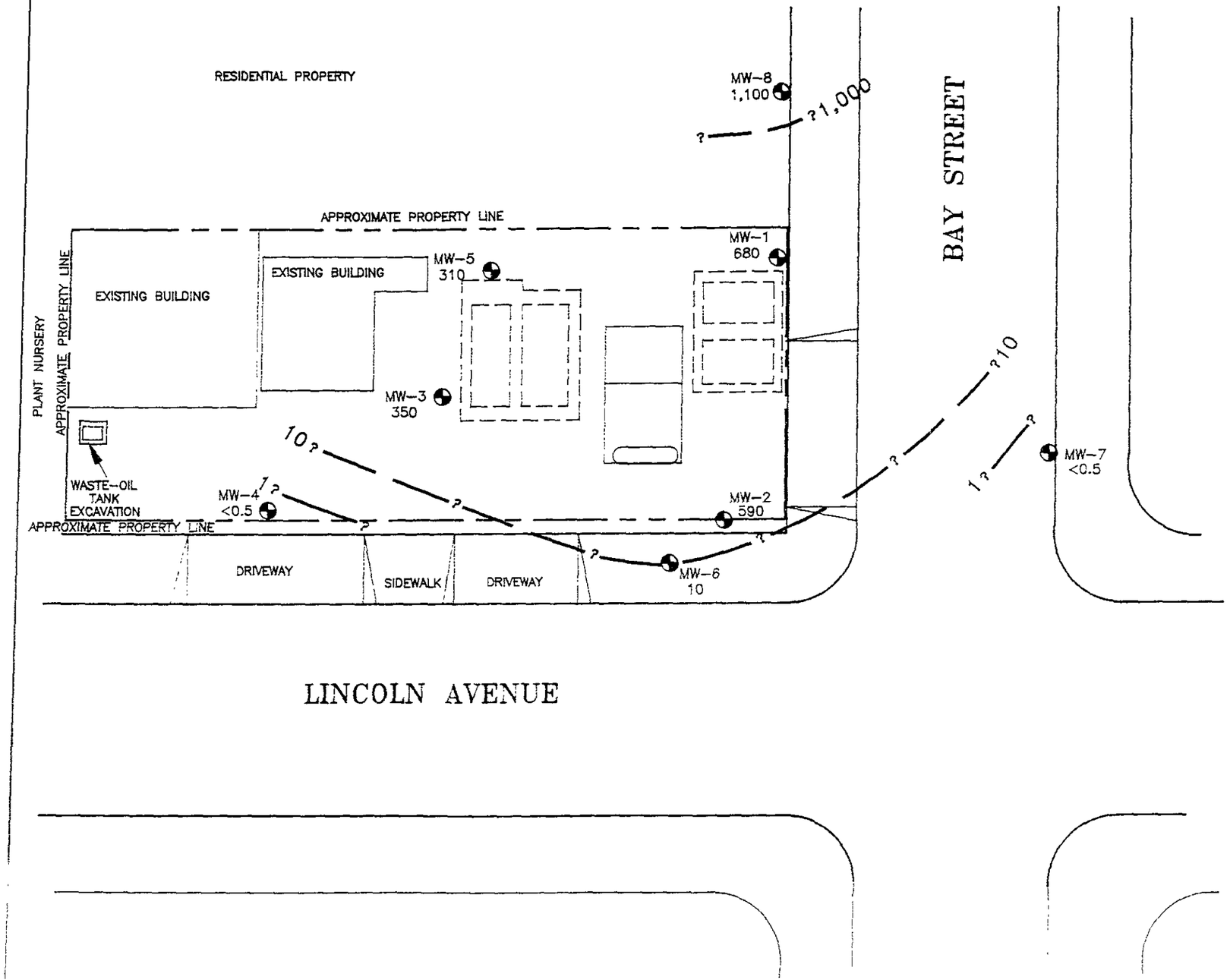
Source Surveyed by Ron Archer, Civil Engineer, Inc March 1991.

RESNA
Working to Restore Nature

PROJECT 61006.04

TPHg CONCENTRATIONS IN GROUNDWATER
Former Bay Street Texaco Station
1127 Lincoln Avenue
Alameda, California

PLATE
14



EXPLANATION

1,000 —— = Line of equal concentration of benzene in groundwater in parts per billion (ppb)

1,100 = Concentration of benzene in groundwater in ppb, June 25, 1992

MW-8 = Groundwater monitoring well (RESNA, March 1991 and June 1992)

N

Approximate Scale

20 10 0 20 40

feet

Source: Surveyed by Ron Archer, Civil Engineer, Inc March 1991. Updated June 22, 1992.

RESNA
Working to Restore Nature

PROJECT 61006.04

BENZENE CONCENTRATIONS IN GROUNDWATER
Former Bay Street Texaco Station
1127 Lincoln Avenue
Alameda, California

PLATE 15

TABLE 1
CUMULATIVE RESULTS OF LABORATORY ANALYSES OF SOIL SAMPLES FROM BORINGS
Former Bay Street Texaco Station
Alameda, California
(Page 1 of 2)

Sample Number	TPHg	B	T	E	X	TPHd	TOG	VOCs & Semi-VOCs
S-2½-B1	1.6	0.006	0.052	0.009	0.083	NA	NA	NA
S-5½-B1	<1.0	<0.005	<0.005	<0.005	0.007	NA	NA	NA
S-8½-B1	7,300	17	350	130	630	<10	NA	NA
S-2½-B2	<1.0	<0.005	0.007	<0.005	0.023	NA	NA	NA
S-5½-B2	<1.0	<0.005	<0.005	<0.005	0.014	<10	NA	NA
S-3½-B3	<1.0	<0.005	<0.005	<0.005	0.006	NA	NA	NA
S-6½-B3	48	<0.005	<0.005	0.089	0.65	<10	NA	NA
S-4½-B4	600	<0.005	0.23	6.0	32	NA	NA	NA
S-6½-B4	1,500	0.087	10	26	130	<10	NA	NA
S-2½-B5	<1.0	0.006	0.019	0.018	0.11	NA	NA	NA
S-5½-B5	1,100	<0.005	5.1	8.1	47	<10	NA	NA
S-8½-B5	9,200	93	540	160	770	NA	NA	NA
S-2½-B6	11	0.013	0.31	0.14	0.99	NA	NA	NA
S-5½-B6	58	<0.005	1.4	0.84	4.9	<10	NA	NA
S-8½-B6	2,700	60	290	53	260	NA	NA	NA
S-3½-B7	5.1	<0.005	0.072	0.026	0.15	NA	NA	NA
S-7-B7	13	0.24	0.61	0.44	1.3	<10	NA	NA
S-2½-B8	<1.0	<0.005	0.006	<0.005	0.015	NA	NA	NA
S-5½-B8	<1.0	<0.005	<0.005	<0.005	0.010	<10	NA	NA
S-2½-B9	<1.0	<0.005	<0.005	<0.005	0.007	NA	NA	NA
S-5½-B9	<1.0	<0.005	<0.005	<0.005	0.009	<10	NA	NA
S-2½-B10	1.7	<0.005	0.017	0.027	0.14	NA	NA	NA
S-5½-B10	2,600	<0.005	12	31	160	NA	NA	NA
S-8½-B10	1,400	2.6	32	21	110	<10	NA	NA
S-2½-B10A	<1.0	<0.005	<0.005	<0.005	<0.005	NA	NA	NA
S-3-B10B	2.1	<0.005	0.007	<0.005	0.079	NA	NA	NA
S-3-B10C	4.3	<0.005	0.023	0.14	0.55	NA	NA	NA

See notes on Page 2 of 2

TABLE 1
CUMULATIVE RESULTS OF LABORATORY ANALYSES OF SOIL SAMPLES FROM BORINGS
Former Bay Street Texaco Station
Alameda, California
(Page 2 of 2)

Sample Number	TPHg	B	T	E	X	TPHd	TOG	VOCs & Semi-VOCs
S-2½-B11	<1.0	<0.005	<0.005	<0.005	0.008	NA	NA	NA
S-5½-B11	<1.0	<0.005	<0.005	<0.005	0.007	<10	NA	NA
S-3½-B11A	NA	NA	NA	NA	NA	NA	<50	0.9*
S-6-B11A	NA	NA	NA	NA	NA	NA	<50	1.0*
S-5½-B12	<1.0	<0.005	<0.005	<0.005	<0.005	NA	NA	NA
S-9½-B12	<1.0	<0.005	<0.005	<0.005	<0.005	NA	NA	NA
S-5½-B13	<1.0	<0.005	<0.005	<0.005	<0.005	NA	NA	NA
S-10½-B13	21.0	0.21	0.54	1.6	7.6	NA	NA	NA
S-5½-MW6 /B14	<1.0	<0.005	<0.005	<0.005	<0.005	NA	NA	NA
S-10-MW6	<1.0	<0.005	<0.005	<0.005	<0.005	NA	NA	NA
S-6-MW7 /B15	<1.0	<0.005	<0.005	<0.005	<0.005	NA	NA	NA
S-9½-MW7	<1.0	<0.005	<0.005	<0.005	<0.005	NA	NA	NA
S-5½-B16	<1.0	<0.005	<0.005	<0.005	<0.005	NA	NA	NA
S-10½-B16	<1.0	0.051	<0.005	0.007	0.013	NA	NA	NA
S-Pile-A-D	<1.0	<0.005	<0.005	<0.005	0.010	NA	NA	NA

Sample depth measured in feet.
Results in parts per million (ppm).
NA : Not analyzed.
< : Below indicated laboratory detection limit.
TPHg : Total petroleum hydrocarbons as gasoline (analyzed by EPA Method 5030/8015).
TPHd : Total petroleum hydrocarbons as diesel (analyzed by EPA Method 3550/8015).
B : benzene, T : toluene, E : ethylbenzene, X : total xylene isomers.
BTEX : Measured by EPA Method 5030/8020.
TOG : Total oil and grease (analyzed by Standard Method 5520 E/F).
VOCs : Volatile organic compounds (analyzed by EPA Method 8010).
Semi-VOCs : Semi-volatile organic compounds (analyzed by EPA Method 8270)
(* = ND with the exception of indicated concentration of Di-N-butyl phthalate)

Sample Identification S-6-B11A
- B11A — Boring number
- 6 — Sample depth
- S — Soil sample

MW-7 Well number used for boring identification

TABLE 2
CUMULATIVE RESULTS OF GROUNDWATER MONITORING DATA
Former Bay Street Texaco Station
Alameda, California
(Page 1 of 2)

Well Date	Elevation of Wellhead	Depth to-Water	Elevation of Groundwater	Floating Product/ Sheen
MW-1				
03/22/91	16.49	7.23	9.26	NONE
04/04/91		6.68	9.81	NONE
08/13/91		8.59	7.90	NONE
11/14/91		9.38	7.11	NONE
02/19/92		6.34	10.15	NONE
06/25/92		7.60	8.89	NONE
07/21/92		8.06	8.43	NONE
MW-2				
03/22/91	17.14	7.60	9.54	NONE
04/04/91		7.07	10.07	NONE
08/13/91		8.85	8.29	NONE
11/14/91		9.60	7.54	NONE
02/19/92		6.96	10.18	NONE
06/25/92		7.95	9.19	NONE
07/21/92		8.37	8.77	NONE
MW-3				
03/22/91	16.91	7.43	9.48	NONE
04/04/91		6.80	10.11	NONE
08/13/91		8.88	8.03	NONE
11/14/91		9.68	7.23	NONE
02/19/92		6.69	10.22	NONE
06/25/92		7.78	9.13	NONE
07/21/92		8.31	8.60	NONE
MW-4				
06/25/92	17.18	7.92	9.26	NONE
07/21/92		8.49	8.69	NONE
MW-5				
06/25/92	16.37	7.35	9.02	NONE
07/21/92		7.89	8.48	NONE
MW-6				
06/25/92	17.12	7.86	9.26	NONE
07/21/92		8.30	8.82	NONE
MW-7				
06/25/92	16.71	7.61	9.10	NONE
07/21/92		INACCESSIBLE		

See notes on page 2 of 2

TABLE 2
CUMULATIVE RESULTS OF GROUNDWATER MONITORING DATA
Former Bay Street Texaco Station
Alameda, California
(Page 2 of 2)

Well Date	Elevation of Wellhead	Depth to-Water	Elevation of Groundwater	Floating Product/ Sheen
MW-8				
06/25/92	15.91	7.20	8.71	NONE
07/21/92		7.68	8.23	NONE
VW-1				
03/22/91	16.83	DRY	DRY	NONE
04/04/91		6.89	9.92	NONE
08/13/91		DRY	DRY	NONE
11/14/91		DRY	DRY	NONE
02/19/92		DRY	DRY	NONE
06/25/92		7.36	9.47	NONE
VW-2				
03/22/91	17.00	7.59	9.41	NONE
04/04/91		7.04	9.96	NONE
08/13/91		DRY	DRY	NONE
11/14/91		DRY	DRY	NONE
02/19/92		6.94	10.06	NONE
06/25/92		8.10	8.90	NONE
VW-3				
03/22/91	16.94	7.71	9.23	NONE
04/04/91		6.92	10.02	NONE
08/13/91		8.45	8.49	NONE
11/14/91		DRY	DRY	NONE
02/19/92		7.40	9.54	NONE
06/25/92		7.16	9.78	NONE
VW-4				
03/22/91	16.81	7.66	9.15	SHEEN
04/04/91		INACCESSIBLE		
08/13/91		8.40	8.41	NONE
11/14/91		DRY	DRY	NONE
02/19/92		5.76	11.05	NONE
06/25/92		7.23	9.58	NONE
VW-5				
03/22/91	17.20	7.67	9.53	SHEEN
04/04/91		INACCESSIBLE		
08/13/91		DRY	DRY	NONE
11/14/91		DRY	DRY	NONE
2/19/92		7.04	10.16	NONE
06/25/92		8.09	9.11	NONE

Elevations above mean sea level
Depth to water measured in feet below top of casing

TABLE 3
CUMULATIVE RESULTS OF LABORATORY ANALYSES
OF GROUNDWATER SAMPLES
Former Bay Street Texaco Station
Alameda, California
(Page 1 of 2)

Well Number / Date	TPHg	B	T	E	X	TPHd*	VOCs & Semi-VOCs	DO	EG
MW-1									
03/22/91	4,500	1,300	670	180	770	1,100	ND	NA	NA
08/13/91	850	260	51	13	48	NA	NA	NA	NA
11/14/91	<30	<0.30	<0.30	<0.30	<0.30	NA	NA	NA	NA
02/19/92	440	14	14	2.1	9.9	NA	NA	4.0	<10
06/25/92	4,000	680	110	73	140	NA	NA	NA	NA
MW-2									
03/22/91	1,100	100	20	63	220	140	ND	NA	NA
08/13/91	1,100	270	4.7	16	49	NA	NA	NA	NA
11/14/91	870	56	8.9	21	46	NA	NA	NA	NA
02/19/92	2,100	57	5.6	9.1	75	NA	NA	3.2	NA
06/25/92	4,700	590	24	290	160	NA	NA	NA	NA
MW-3									
03/22/91	2,500	390	27	240	780	770	ND	NA	NA
08/13/91	1,300	180	3.8	79	200	NA	NA	NA	NA
11/14/91	870	89	9	30	82	NA	NA	NA	NA
02/19/92	990	<0.5	<0.5	2.0	72	NA	NA	3.4	NA
06/25/92	4,900	350	11	330	570	NA	NA	NA	NA
MW-4									
06/25/92	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	NA	NA
MW-5									
06/25/92	18,000	310	1,200	750	2,400	NA	NA	NA	NA
MW-6									
06/25/92	990	10	240	55	310	NA	NA	NA	NA
MW-7									
06/25/92	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	NA	NA
MW-8									
06/25/92	11,000	1,100	29	150	190	NA	NA	NA	NA
Oct. 1990									
MCLs	—	1.0	—	680	1,750	—	—	—	—
DWALs	—	—	100	—	—	—	—	—	—

See notes on page 2 of 2

TABLE 3
CUMULATIVE RESULTS OF LABORATORY ANALYSES
OF GROUNDWATER SAMPLES
Former Bay Street Texaco Station
Alameda, California
(Page 2 of 2)

Results in parts per billion (ppb)

TPHg	:	Total petroleum hydrocarbons as gasoline (analyzed by EPA Method 5030).
TPHd	:	Total petroleum hydrocarbons as diesel (analyzed by EPA Method 3510).
BTEX	:	Measured by EPA Method 602/(624).
B : benzene, T : toluene, E : ethylbenzene, X : total xylene isomers.		
—	:	Not Applicable
MCLs	:	Adopted Maximum Contaminant Levels in Drinking Water, DHS (October 1990)
DWALs	:	Recommended Drinking Water Action Levels, DHS (October 1990)
ND	:	Below laboratory detection limit.
NA	:	Not Analyzed
*	:	Anametrix states: "The concentrations reported as diesel for samples W-9-MW1, W-9-MW2, and W-9-MW3 are primarily due to the presence of a lighter petroleum product, possibly gasoline."
VOCs	:	Volatile organic compounds (analyzed by EPA Method 624/8240).
Semi-VOCs	:	Semi-volatile organic compounds (analyzed by EPA Method 8270).
DO	:	Dissolved oxygen in parts per million (ppm).
EG	:	Ethylene glycol in ppm.

TABLE 4
GROUNDWATER ELEVATIONS PRIOR TO THE PUMPING TEST,
AT THE END OF THE PUMPING TEST,
AND AT THE END OF THE RECOVERY TEST
Former Bay Street Texaco Station
1127 Lincoln Avenue
Alameda, California
July 28-29, 1992

Time (Date)	Groundwater Elevations (in feet)						
	Well MW-1	Well MW-2	Well MW-3	Well MW-4	Well MW-5	Well MW-6	Well MW-8
11:00am (7/28/92)	8.29	8.65	8.47	8.57	8.34	8.70	8.10
11:20am (7/29/92)	7.68	8.22	7.54	8.05	1.69	8.29	7.53
5:00pm (7/29/92)	8.10	8.47	8.24	8.36	8.09	8.52	7.90

TABLE 5
PUMPING TEST RESULTS
TRANSMISSIVITY (gpd/ft)
Former Bay Street Texaco Station
1127 Lincoln Avenue
Alameda, California

Well	Jacob	Recovery	Hantush	Neuman Elastic Response	Neuman* Delayed Response
MW-1	1,044	930	1,092	973	600
MW-1M	1,054	1,180	1,019	888	1,043
MW-2	1,566	1,375	1,440	1,313	1,254
MW-2M	1,138	1,550	1,313	1,283	1,344
MW-3	883	736	755	643	658
MW-3M	936	825	973	828	828
MW-4M	982	1,425	1,283	1,225	1,144
MW-6M	1,334	2,136	1,375	1,283	1,440
MW-8M	1,079	1,312	1,197	1,019	888

Jacob : Calculated using Jacob (1950) approximation for Theis (1935).
Recovery : Calculated using recovery equation, test data as for Jacob method.
Hantush : Calculated using Graphical Well Analysis Package (GWAP) Version 2.38 (1991) after Hantush (1956).
Neuman : Calculated using GWAP Version 2.38 (1991) after Neuman (1975).

TABLE 6
PUMPING TEST RESULTS
STORATIVITY OR SPECIFIC YIELD
Former Bay Street Texaco Station
1127 Lincoln Avenue
Alameda, California

Well	Jacob	Hantush	Neuman Elastic Response	Neuman* Delayed Response
MW-1	0.0010	0.0012	0.0012	0.0015
MW-1M	0.0012	0.0013	0.0013	0.0014
MW-2	0.0017	0.0020	0.0020	0.0023
MW-2M	0.0026	0.0020	0.0020	0.0021
MW-3	0.0015	0.0020	0.0020	0.0023
MW-3M	0.0011	0.0021	0.0011	0.0024
MW-4M	0.0028	0.0017	0.0023	0.0023
MW-6M	0.0025	0.0024	0.0024	0.0025
MW-8M	0.0010	0.0009	0.0010	0.0019

* : Specific yield.
Jacob : Calculated using Jacob (1950) approximation for Theis (1935).
Hantush : Calculated using Graphical Well Analysis Package (GWAP) Version 2.38 (1991) after Hantush (1956).
Neuman : Calculated using GWAP Version 2.38 (1991) after Neuman (1975).

APPENDIX A

SITE BACKGROUND AND PREVIOUS WORK

SITE BACKGROUND AND PREVIOUS WORK

According to Mr. Leo Pagano, present property owner, the site was built in the early 1930's by Mr. Henry Michaels. Mr. Michaels obtained an oil storage permit from the Alameda Fire Department (AFD) on June 26, 1933 (Alameda Fire Department records) to store 2,200 gallons of gasoline in four underground storage tanks (USTs). Mr. Pagano further reported that he leased the station from Mr. Michaels in 1946, acquired the master lease with Texaco, Inc. from Mr. Michaels in 1957, and subsequently purchased the property and station from Mr. Michaels in 1965 (McLaren/Hart, 1991). According to Mr. Pagano, Texaco, Inc. sold him the facilities of the station in 1980 and he continued to sell gasoline until he retired in January 1985, and leased the property to Mr. Nolan Eugene Lewis. Mr. Lewis reportedly did not sell gasoline after acquiring the lease.

Others have performed environmental work at the site under contract to the property owner, Mr. Leo Pagano, prior to RESNA's performance of this investigation under contract to Texaco Environmental Services. According to the work plan (McLaren/Hart, 1991), the removal of four gasoline underground storage tanks and one waste-oil underground storage tank was performed by Zaccor, and soil samples were collected by Environmental Bio-Systems. Environmental Bio-Systems collected twelve soil samples from the bottom and side-walls of the former gasoline-storage tank excavations at depths from 7.5 to 12.0 feet, and one soil sample from the bottom of the former waste-oil-storage tank excavation at a depth of 7.5 feet. No ground water was encountered in the excavations to the total depth of approximately 13 feet below the ground surface.

Soil samples collected from the former gasoline-storage tank excavations were analyzed for TPHg using the California State Department of Health Services (DHS) Leaking Underground Fuel Tank Manual (LUFT Manual) method, and for the gasoline constituents BTEX using EPA Method 8020. In addition, the sample obtained from beneath the former waste-oil-storage tank was analyzed for total petroleum hydrocarbons as diesel (TPHd) and total oil and grease (TOG) using methods unspecified in the McLaren/Hart work plan, volatile-organic compounds (VOCs) using EPA Method 8240, semi-VOCs using EPA Method 8270, and for cadmium, chromium, lead, and zinc by atomic adsorption spectroscopy (McLaren/Hart, 1991).

Laboratory analysis of the soil samples collected from the former gasoline-storage tank excavation reported concentrations of TPHg from 3.7 to 6,200 parts per million (ppm). Analysis of the soil sample collected from the bottom of the former waste-oil-storage tank excavation reported nondetectable levels of TPHg, BTEX, TPHd, TOG, VOCs (with the exception of 0.61 ppm acetone), and semi-VOCs. Concentrations of the metals cadmium,

chromium, lead, and zinc detected in this sample were at the low ends of common ranges for these elements in soil. The results of these previous laboratory analysis of soil samples are included in Table A1. It is not clear from the information currently available to us whether further excavation was performed in the areas of the former tank excavations, and whether any investigation was performed regarding the product pipelines.

In March 1991, RESNA performed an Initial Subsurface Investigation (RESNA, May 7, 1991) which included the installation of three groundwater monitoring wells (MW-1, MW-2, and MW-3), five vapor wells (VW-1 through VW-5), and an additional seven subsurface borings. The locations of these subsurface borings, groundwater monitoring wells, vapor extraction wells, and pertinent site features are shown on the Generalized Site Plan (Plate 2 of the present report). Included in this work was research for sensitive receptors, water wells, and potential offsite sources. The research was conducted by accessing records of the U. S. Environmental Protection Agency, California State agency databases, ACFCWD records, and Alameda Fire Department records. Only two cathodic protection wells were found to exist within a one-quarter mile radius of the site. At least 15 sites within a on-quarter mile radius of the site were found to have had underground storage tanks that contained gasoline, diesel, heating oil, or distillate. Inspection of aerial photographs dated 1953 and 1959 revealed the possible presence of a service station at the northeast corner of 9th Street and Lincoln Avenue. Diesel, oil and grease, and volatile and semi-volatile organic compounds were not found to have impacted the shallow soil at the site. Gasoline hydrocarbons were found to have impacted shallow soil at the site in the vicinity of the former gasoline storage tanks and former product pumps. The lateral extent of gasoline hydrocarbons was evaluated to < 1.0 ppm in the western and extreme southeastern portions of the site. The former gasoline storage tanks and possibly the former product lines were thought to be sources for the hydrocarbons. The presence of relatively high concentrations of gasoline hydrocarbons in borings B-1 and B-5 along the eastern boundary, and B-4 and B-10 upgradient of the tanks and product lines, suggested possible offsite sources of the gasoline hydrocarbons in the soil at the site. The shallow groundwater at the site was impacted by gasoline hydrocarbons, the concentrations of which were increasing to the north.

RESNA (May 12, 1992) conducted a one-day vapor extraction test at the site to evaluate the feasibility of vapor extraction as a remediation alternative, and to select the most appropriate off-gas alternative. Vapor extraction was found to be a practical and cost-effective interim soil remediation alternative, even though the high groundwater table inhibited the efficiency of the extraction. It was expected that use of all existing vapor extraction wells would be necessary to extract gasoline from the soil.

RESNA began quarterly groundwater monitoring at the request of TES in August 1991. The groundwater gradient was found to be relatively consistent in both magnitude in direction (0.001 to 0.01 to the northeast to north-northwest), and concentrations during the third quarter of 1991 were found to have decreased as water levels decreased (RESNA, September 24, 1991; January 9, 1992, March 26, 1992, and August 20, 1992).

TABLE A1
PREVIOUS LABORATORY ANALYSES OF SOIL SAMPLES
(Source: McLaren/Hart, 1991)
Former Bay Street Texaco Station
Alameda, California
(Page 1 of 2)

Sample Location	Sample ID	Sample Depth	TPHg	TPHd	B	T	E	X	TOG	ACETONE
TANK A (Center)	HA-1	7.5	ND	ND	ND	ND	ND	ND	ND	0.61
TANK B (North End)	BH-4	10.5	81	NA	0.7	1.0	1.5	5.5	NA	NA
TANK B (South End)	BH-5	10.5	6.8	NA	0.3	0.5	0.3	0.8	NA	NA
TANK B (West End)	BH-10	10.0	670	NA	2.9	8.3	22	110	NA	NA
TANK B and C (South End)	BH-13	11.0	5,000	NA	21	200	150	380	NA	NA
TANK C (North End)	BH-2	11.0	5,100	NA	84	180	150	500	NA	NA
TANK C (North End)	BH-11	12.0	3.7	NA	ND	0.1	0.1	0.5	NA	NA
TANK C (South End)	BH-3	11.0	480	NA	2.0	23	11	43	NA	NA
TANK C (East End)	BH-12	11.0	4,600	NA	42	220	160	350	NA	NA
TANK D (West End)	BH-8	8.5	750	NA	15	56	21	120	NA	NA
TANK D (East End)	BH-9	8.5	6,200	NA	240	740	180	1,000	NA	NA
TANK E (West End)	BH-6	8.0	6,100	NA	93	430	140	610	NA	NA
TANK E (East End)	BH-7	8.0	300	NA	6.6	22	8.5	48	NA	NA

See Notes of Page 2 of 2

TABLE A1
PREVIOUS LABORATORY ANALYSES OF SOIL SAMPLES
(Source: McLaren/Hart, 1991)
Former Bay Street Texaco Station
Alameda, California
(Page 2 of 2)

Sample *Location*	Sample *ID*	Sample *Depth*	Cadmium	Chromium	Lead	Zinc
Tank A (Center)	HA-1	7.5	ND	11	5	22
TTLC[1]			100	2,500	1,000	5,000
Selected Average for soils[2]			0.06	100	10	50

Sample depth in feet.
Results in parts per million.
HA : Hand auger sample.
BH : Backhoe sample.
ND : *Not detected above laboratory reporting limit.*
NA : Not analyzed for this compound.
[1] : Total Threshold Limit Concentration, California Code of Regulations, Title 22.
[2] : Lindsay, W.L., 1979, Chemical Equilibria in Soils, John Wiley & Sons.

APPENDIX B

FIELD PROTOCOL
WELL DEVELOPMENT DATA SHEETS
WELL PURGE DATA SHEETS
STABILIZATION GRAPHS

FIELD PROTOCOL

The following presents RESNA's protocol utilized during this site investigation involving petroleum hydrocarbon-impacted soil and/or groundwater.

Sampling of Stockpiled Soil

One composite soil sample is collected for each 50 cubic yards of stockpiled soil, and for each individual stockpile composed of less than 50 cubic yards. Composite soil samples are obtained by first evaluating relatively high, average, and low areas of hydrocarbon concentration by digging approximately one to two feet into the stockpile and placing the intake probe of a field calibrated OVM against the surface of the soil; and then collecting one sample from the "high" reading area, and three samples from the "average" areas. Samples are collected by removing the top one to two feet of soil, then driving laboratory-cleaned brass sleeves into the soil. The samples are sealed in the sleeves using aluminum foil, plastic caps, and aluminized duct tape; labeled; and promptly placed in iced storage for transport to the laboratory, where compositing will be performed.

Soil Borings

Prior to the drilling of borings and construction of monitoring wells, permits are acquired from the appropriate regulatory agency. In addition to the above-mentioned permits, encroachment permits from the City or State are acquired if drilling of borings offsite in the City or State streets is necessary. Copies of the permits are included in the appendix of the project report. Prior to drilling, Underground Services Alert is notified of our intent to drill, and known underground utility lines and structures are approximately marked.

The borings are drilled by a truck-mounted drill rig equipped with 8- or 10-inch-diameter, hollow-stem augers. The augers are steam-cleaned prior to drilling each boring to minimize the possibility of cross-contamination. After drilling the borings, monitoring wells are constructed in the borings, or neat-cement grout with bentonite is used to backfill the borings to the ground surface.

Borings for groundwater monitoring wells are drilled to a depth of no more than 20 feet below the depth at which a saturated zone is first encountered, or a short distance into a stratum beneath the saturated zone which is of sufficient moisture and consistency to be judged as a perching layer by the field geologist, whichever is shallower. Drilling into a deeper aquifer below the shallowest aquifer can begin only after a conductor casing is properly installed and allowed to set, to seal the shallow aquifer.

Drill Cuttings

Drill cuttings subjectively evaluated as having hydrocarbon contamination at levels greater than 100 ppm are separated from those subjectively evaluated as having hydrocarbon contamination levels less than 100 ppm. Evaluation is based either on subjective evidence of soil discoloration, or on measurements made using a field calibrated OVM. Readings are taken by placing a soil sample into a ziplock-type plastic bag and allowing volatilization to occur. The intake probe of the OVM is then inserted into the headspace created in the plastic bag immediately after opening it. The drill cuttings from the borings are placed in labeled 55-gallon drums approved by the Department of Transportation; or on plastic at the site, and covered with plastic. The cuttings remain the responsibility of the client.

Soil Sampling in Borings

Soil samples are collected at no greater than 5-foot intervals from the ground surface to the total depth of the borings. The soil samples are collected by advancing the boring to a point immediately above the sampling depth, and then driving a California-modified, split-spoon sampler containing brass sleeves through the hollow center of the auger into the soil. The sampler and brass sleeves are laboratory-cleaned, steam-cleaned, or washed thoroughly with Alconox® and water, prior to each use. The sampler is driven with a standard 140-pound hammer repeatedly dropped 30 inches. The number of blows to drive the sampler each successive six inches are counted and recorded to evaluate the relative consistency of the soil.

The samples selected for laboratory analysis are removed from the sampler and quickly sealed in their brass sleeves with aluminum soil, plastic caps, and aluminized duct tape. The samples are then be labeled, promptly placed in iced storage, and delivered to a laboratory certified by the State of California to perform the analyses requested.

One of the samples in brass sleeves not selected for laboratory analysis at each sampling interval is tested in the field using an OVM that is field calibrated at the beginning of each day it is used. This testing is performed by inserting the intake probe of the OVM into the headspace created in the plastic bag containing the soil sample as described in the Drill Cuttings section above. The OVM readings are presented in Logs of Borings included in the project report.

Logging of Borings

A geologist is present to log the soil cuttings and samples using the Unified Soil Classification System. Samples not selected for chemical analysis, and the soil in the sampler shoe, are extruded in the field for inspection. Logs include texture, color, moisture, plasticity, consistency, blow counts, and any other characteristics noted. Logs also include subjective evidence for the presence of hydrocarbons, such as soil staining, noticeable or obvious product odor, and OVM readings.

Monitoring Well Construction

Monitoring wells are constructed in selected borings using clean 2- or 4-inch-diameter, thread-jointed, Schedule 40 PVC casing. No chemical cements, glues, or solvents are used in well construction. Each casing bottom is sealed with a threaded end-plug, and each casing top with a locking plug. The screened portions of the wells are constructed of machine-slotted PVC casing with 0.020-inch-wide (typical) slots for initial site wells. Slot size for subsequent wells may be based on sieve analysis and/or well development data. The screened sections in groundwater monitoring wells are placed to allow monitoring during seasonal fluctuations of groundwater levels.

The annular space of each well is backfilled with No. 2 by 12 sand, or similar sorted sand, to approximately two feet above the top of the screened casing for initial site wells. The sand pack grain size for subsequent wells may be based on sieve analysis and/or well development data. A 1- to 2-foot-thick bentonite plug is placed above the sand as a seal against cement entering the filter pack. The remaining annulus is then backfilled with a slurry of water, neat cement, and bentonite to approximately one foot below the ground surface.

An aluminum utility box with a PVC apron is placed over each wellhead and set in concrete placed flush with the surrounding ground surface. Each wellhead cover has a seal to protect the monitoring well against surface-water infiltration and requires a special wrench to open. The design discourages vandalism and reduces the possibility of accidental disturbance of the well.

Groundwater Monitoring Well Development

The monitoring wells are developed by bailing or over-pumping and surge-block techniques. The wells are either bailed or pumped, allowed to recharge, and bailed or pumped again until the water removed from the wells is determined to be clear. Turbidity measurements (in NTUs) are recorded during well development and are used in evaluating well development. The development method used, initial turbidity measurement, volume of water removed, final turbidity measurement, and other pertinent field data and observations are included in reports. The wells are allowed to equilibrate for at least 48 hours after development prior to sampling. Water generated by well development will be stored in 17E Department of Transportation (DOT) 55-gallon drums on site and will remain the responsibility of the client.

Groundwater Sampling

The static water level in each well is measured to the nearest 0.01-foot using a Solinst® electric water-level sounder or oil/water interface probe (if the wells contain floating product) cleaned with Alconox® and water before use in each well. The liquid in the onsite wells is examined for visual evidence of hydrocarbons by gently lowering approximately half the length of a Teflon® bailer (cleaned with Alconox® and water) past the air/water interface. The sample is then retrieved and inspected for floating product, sheen, emulsion, color, and clarity. The thickness of floating product detected is recorded to the nearest 1/8-inch.

Wells which do not contain floating product are purged using a submersible pump. The pump, cables, and hoses are cleaned with Alconox® and water prior to use in each well. The wells are purged until withdrawal is of sufficient duration to result in stabilized pH, temperature, and electrical conductivity of the water, as measured using portable meters calibrated to a standard buffer and conductivity standard. If the well becomes dewatered, the water level is allowed to recover to at least 80 percent of the initial water level. Prior to the collection of each ground water sample, the Teflon® bailer is cleaned with Alconox® and rinsed with tap water and deionized water, and the latex gloves worn by the sampler changed. Hydrochloric acid is added to the sample vials as a preservative (when applicable). A sample method blank is collected by pouring distilled water into the bailer and then into sample vials. A sample of the formation water is then collected from the surface of the water in each of the wells using the Teflon® bailer. The water samples are then gently poured into laboratory-cleaned, 40-milliliter (ml) glass vials, 500 ml plastic bottles or 1-liter glass bottles (as required for specific laboratory analysis) and sealed with Teflon®-lined caps, and inspected for air bubbles to check for headspace, which would allow volatilization to occur. The samples are then labeled and promptly placed in iced storage. A field log of

well evacuation procedures and parameter monitoring is maintained. Water generated by the purging of wells is stored in 17E DOT 55-gallon drums onsite and remains the responsibility of the client.

Sample Labeling and Handling

Sample containers are labeled in the field with the job number, sample location and depth, and date, and promptly placed in iced storage for transport to the laboratory. A Chain of Custody Record is initiated by the field geologist and updated throughout handling of the samples, and accompanies the samples to a laboratory certified by the State of California for the analyses requested. Samples are transported to the laboratory promptly to help ensure that recommended sample holding times are not exceeded. Samples are properly disposed of after their useful life has expired.

Aquifer Testing

Pumping Test

The initial water levels in wells to be used during the test are measured prior to commencement of pumping. The flow rate of the pump is adjusted to the desired pumping rate, and water levels allowed to recover to initial levels. Pumping then begins, and the starting time of pumping is recorded. Drawdowns in observation wells are recorded at intervals throughout pumping using pressure transducers, with backup manual measurements. Evacuated water is stored in a storage tank at the site and remains the responsibility of the client. After the pump is shut off, recovery measurements are taken in the wells until recovery is approximately 80 percent of the initial water level. Barometric pressure and tidal information are collected for the time interval of the pumping test to allow screening of possible effects of atmospheric pressure and tidal fluctuations on the ground water levels.

WELL DEVELOPMENT DATA SHEET

Project Name: Texaco Alameda Job No. 61006.04

Date: June 22, 1992 Page 1 of 1

Well No. MW-5 Time Started 9:50

TIME (hr)	GALLONS (cum.)	TEMP. (F)	pH	CONDUCT. (micromho)	TURBIDITY (NTU)
9:50	Start developing MW-5				
9:50	0				>200
10:15	35				>200
10:40	75				>200
11:10	110				>200
11:10	Stop developing MW-5				

Notes:

Well Diameter (inches) : 4
Depth to Bottom (feet) : 19.18
Depth to Water - initial (feet) : 7.30
Gallons per Well Casing Volume : 7.76
Gallons Purged : 110
Well Casing Volume Purged : 14.18

WELL DEVELOPMENT DATA SHEET

Project Name: Texaco Alameda Job No. 61006.04

Date: June 22, 1992 Page 1 of 1

Well No. MW-6 Time Started 1:30

TIME (hr)	GALLONS (cum.)	TEMP. (F)	pH	CONDUCT. (micromho)	TURBIDITY (NTU)
1:55	Start developing MW-6				
1:55	0				>200
2:15	12				>200
2:40	25				>200
3:00	35				>200
3:00	Stop developing MW-6				

Notes:

Well Diameter (inches) : 2
Depth to Bottom (feet) : 17.97
Depth to Water - initial (feet) : 7.60
Gallons per Well Casing Volume : 1.69
Gallons Purged : 35
Well Casing Volume Purged : 20.71

WELL DEVELOPMENT DATA SHEET

Project Name: Texaco Alameda Job No. 61006.04

Date: June 22, 1992 Page 1 of 1

Well No. MW-7 Time Started 8:10

TIME (hr)	GALLONS (cum.)	TEMP. (F)	pH	CONDUCT. (micromho)	TURBIDITY (NTU)
8:10	Start developing MW-7				
8:10	0				>200
8:45	10				>200
9:05	22				>200
9:30	35				>200
9:30	Stop developing MW-7				

Notes:

Well Diameter (inches) : 2
Depth to Bottom (feet) : 18.91
Depth to Water - initial (feet) : 7.56
Gallons per Well Casing Volume : 1.85
Gallons Purged : 35
Well Casing Volume Purged : 18.92

WELL DEVELOPMENT DATA SHEET

Project Name: Texaco Alameda Job No. 61006.04

Date: June 22, 1992 Page 1 of 1

Well No. MW-8 Time Started _____

TIME (hr)	GALLONS (cum.)	TEMP. (F)	pH	CONDUCT. (micromho)	TURBIDITY (NTU)
3:35	Start developing MW-8				
3:35	0				>200
4:00	30				>200
4:30	70				>200
5:05	110				>200
5:05	Stop developing MW-8				

Notes:

Well Diameter (inches) : 4
Depth to Bottom (feet) : 18.78
Depth to Water - initial (feet) : 7.14
Gallons per Well Casing Volume : 7.60
Gallons Purged : 110
Well Casing Volume Purged : 14.47

WELL PURGE DATA SHEET

Project Name: Texaco--Alameda Job No. 61006.04

Date: June 25, 1992 Page 1 of 1

Well No. MW-1 Time Started 1358

TIME (hr)	GALLONS (cum.)	TEMP. (F)	pH	CONDUCT. (micromho)	TURBIDITY (NTU)
1358	Start purging MW-1				
1358	0	73.5	7.04	1.03	>200
1402	5	70.5	6.44	1.04	5.2
1405	10	69.3	6.39	.97	3.7
1409	15	68.8	6.37	.96	2.8
1413	20	68.9	6.39	.93	2.4
1417	25	69.5	6.37	.86	2.6
1421	30	69.2	6.39	.83	2.7
1425	35	69.4	6.39	.82	2.6
1425	Stop purging MW-1				

Notes:

Well Diameter (inches) : 4
Depth to Bottom (feet) : 19.13
Depth to Water - initial (feet) : 7.60
Depth to Water - final (feet) : 8.23
% recovery : 95
Time Sampled : 1500
Gallons per Well Casing Volume : 7.53
Gallons Purged : 35
Well Casing Volume Purged : 4.65
Approximate Pumping Rate (gpm) : 1.30

WELL PURGE DATA SHEET

Project Name: Texaco--Alameda Job No. 61006.04

Date: June 25, 1992 Page 1 of 1

Well No. MW-2 Time Started 1533

TIME (hr)	GALLONS (cum.)	TEMP. (F)	pH	CONDUCT. (micromho)	TURBIDITY (NTU)
1533	Start purging MW-2				
1533	0	75.4	5.68	1.26	15.8
1537	5	73.2	6.23	1.19	1.8
1541	10	73.8	6.71	1.19	2.2
1545	15	73.1	6.82	1.16	2.7
1549	20	72.4	6.87	1.04	2.3
1554	25	71.0	6.90	.99	2.5
1558	30	71.5	6.91	.96	2.1
1603	35	70.0	6.90	.87	2.3
1603	Stop purging MW-2				

Notes:

Well Diameter (inches) : 4
Depth to Bottom (feet) : 19.17
Depth to Water - initial (feet) : 7.95
Depth to Water - final (feet) : 8.48
% recovery : 95
Time Sampled : 1700
Gallons per Well Casing Volume : 7.33
Gallons Purged : 35
Well Casing Volume Purged : 4.77
Approximate Pumping Rate (gpm) : 1.17

WELL PURGE DATA SHEET

Project Name: Texaco--Alameda Job No. 61006.04

Date: June 25, 1992 Page 1 of 1

Well No. MW-3 Time Started 1612

TIME (hr)	GALLONS (cum.)	TEMP. (F)	pH	CONDUCT. (micromho)	TURBIDITY (NTU)
1612	Start purging MW-3				
1612	0	76.0	7.27	.87	>200
1616	5	72.4	6.92	1.09	9.8
1619	10	72.5	6.93	1.06	5.5
1624	15	72.5	6.94	1.09	3.2
1628	20	72.6	7.03	.93	2.6
1632	25	72.5	7.03	.90	3.0
1635	30	72.0	7.02	.86	3.8
1639	35	72.3	7.04	.83	2.7
1639	Stop purging MW-3				

Notes:

Well Diameter (inches) : 4
Depth to Bottom (feet) : 19.44
Depth to Water - initial (feet) : 7.78
Depth to Water - final (feet) : 8.06
% recovery : 98
Time Sampled : 1725
Gallons per Well Casing Volume : 7.61
Gallons Purged : 35
Well Casing Volume Purged : 4.60
Approximate Pumping Rate (gpm) : 1.30

WELL PURGE DATA SHEET

Project Name: Texaco--Alameda Job No. 61006.04

Date: June 25, 1992 Page 1 of 1

Well No. MW-4 Time Started 1057

TIME (hr)	GALLONS (cum.)	TEMP. (F)	pH	CONDUCT. (micromho)	TURBIDITY (NTU)
1057	Start purging MW-4				
1057	0	76.4	7.98	.27	>200
1101	5	73.9	7.66	.61	42.9
1105	10	71.9	7.61	.60	56.9
1109	15	71.4	7.60	.68	67.2
1113	20	71.9	7.62	.66	124.7
1116	25	72.1	7.61	.61	35.4
1121	30	71.7	7.56	.57	23.6
1124	35	71.8	7.46	.57	13.9
1124	Stop purging MW-4				

Notes:

Well Diameter (inches) : 4
Depth to Bottom (feet) : 20.02
Depth to Water - initial (feet) : 7.92
Depth to Water - final (feet) : 8.11
% recovery : 98
Time Sampled : 1205
Gallons per Well Casing Volume : 7.90
Gallons Purged : 35
Well Casing Volume Purged : 4.43
Approximate Pumping Rate (gpm) : 1.30

WELL PURGE DATA SHEET

Project Name: Texaco--Alameda Job No. 61006.04

Date: June 25, 1992 Page 1 of 1

Well No. MW-5 Time Started 1310

TIME (hr)	GALLONS (cum.)	TEMP. (F)	pH	CONDUCT. (micromho)	TURBIDITY (NTU)
1310	Start purging MW-5				
1310	0	74.8	5.64	1.09	>200
1315	5	73.7	6.43	1.07	56.2
1320	10	72.7	6.67	1.04	56.5
1325	15	72.2	6.85	1.11	77.5
1330	20	70.8	6.87	1.14	54.3
1334	25	70.8	6.89	1.17	32.5
1338	30	70.4	6.92	1.17	23.0
1343	35	70.8	6.94	1.19	23.8
1343	Stop purging MW-5				

Notes:

Well Diameter (inches) : 4
Depth to Bottom (feet) : 19.68
Depth to Water - initial (feet) : 7.35
Depth to Water - final (feet) : 7.57
% recovery : 98
Time Sampled : 1440
Gallons per Well Casing Volume : 8.05
Gallons Purged : 35
Well Casing Volume Purged : 4.35
Approximate Pumping Rate (gpm) : 1.06

WELL PURGE DATA SHEET

Project Name: Texaco--Alameda Job No. 61006.04

Date: June 25, 1992 Page 1 of 1

Well No. MW-6 Time Started 1035

TIME (hr)	GALLONS (cum.)	TEMP. (F)	pH	CONDUCT. (micromho)	TURBIDITY (NTU)
1035	Start purging MW-6				
1035	0	70.7	7.62	.86	>200
1037	2	71.9	7.22	.81	>200
1038	4	71.8	7.11	.88	>200
1039	6	70.9	7.06	.89	>200
1041	8	70.1	7.08	.85	>200
1043	10	69.8	7.15	.76	>200
1043	Stop purging MW-6				

Notes:

Well Diameter (inches)	: 2
Depth to Bottom (feet)	: 19.71
Depth to Water - initial (feet)	: 7.86
Depth to Water - final (feet)	: 8.03
% recovery	: 99
Time Sampled	: 1145
Gallons per Well Casing Volume	: 1.93
Gallons Purged	: 10
Well Casing Volume Purged	: 5.18
Approximate Pumping Rate (gpm)	: 1.25

WELL PURGE DATA SHEET

Project Name: Texaco--Alameda Job No. 61006.04

Date: June 25, 1992 Page 1 of 1

Well No. MW-7 Time Started 0827

TIME (hr)	GALLONS (cum.)	TEMP. (F)	pH	CONDUCT. (micromho)	TURBIDITY (NTU)
0827	Start purging MW-7				
0827	0	67.6	5.41	.68	>200
0829	2	68.7	5.79	.60	>200
0830	4	68.4	5.94	.68	>200
0831	6	68.0	6.10	.67	>200
0832	8	67.5	6.33	.62	>200
0833	10	66.9	6.48	.58	>200
0835	12	66.4	6.69	.54	>200
0835	Stop purging MW-7				

Notes:

Well Diameter (inches) : 2
Depth to Bottom (feet) : 19.82
Depth to Water - initial (feet) : 7.61
Depth to Water - final (feet) : 7.81
% recovery : 98
Time Sampled : 0925
Gallons per Well Casing Volume : 1.99
Gallons Purged : 12
Well Casing Volume Purged : 6.03
Approximate Pumping Rate (gpm) : 1.5

WELL PURGE DATA SHEET

Project Name: Texaco--Alameda Job No. 61006.04

Date: June 25, 1992 Page 1 of 1

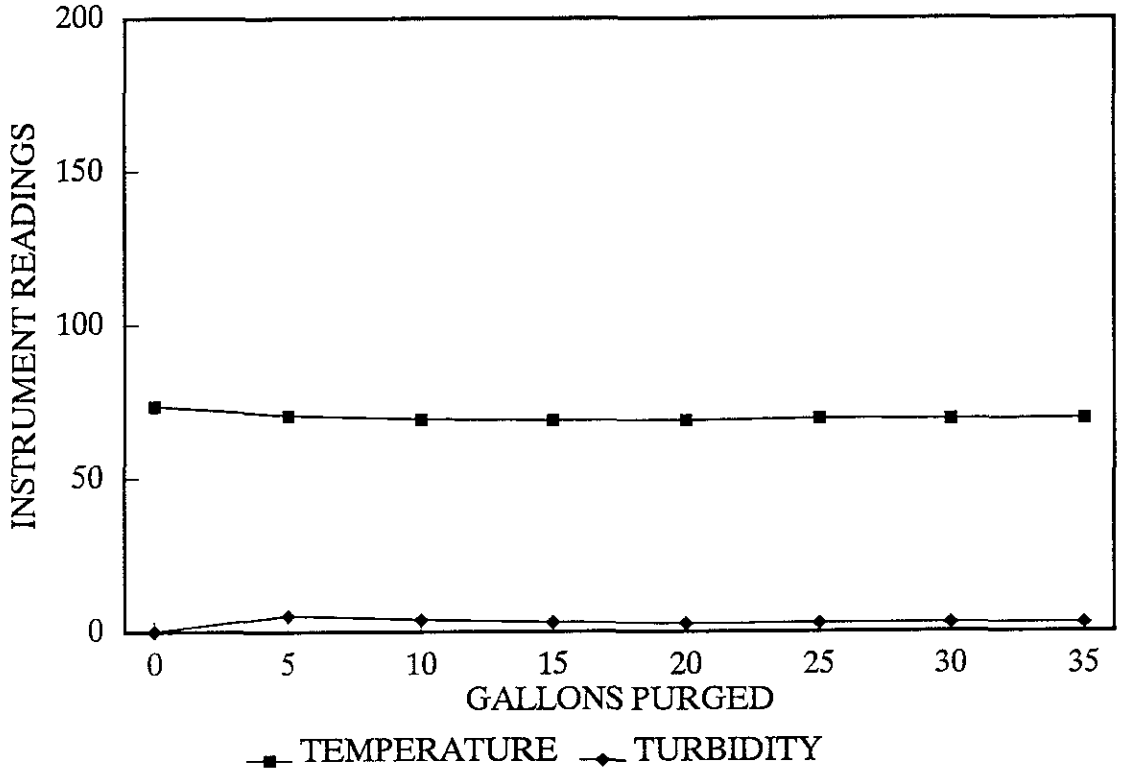
Well No. MW-8 Time Started 0838

TIME (hr)	GALLONS (cum.)	TEMP. (F)	pH	CONDUCT. (micromho)	TURBIDITY (NTU)
0838	Start purging MW-8				
0838	0	64.9	6.51	.96	>200
0842	5	64.5	6.61	1.00	12.6
0846	10	65.1	6.66	.99	45.1
0850	15	65.0	6.73	1.00	85.0
0854	20	64.9	6.48	.98	95.2
0857	25	65.3	6.51	.99	107.2
0900	30	64.9	6.54	.98	115.0
0904	35	64.9	6.51	.98	96.9
0904	Stop purging MW-8				

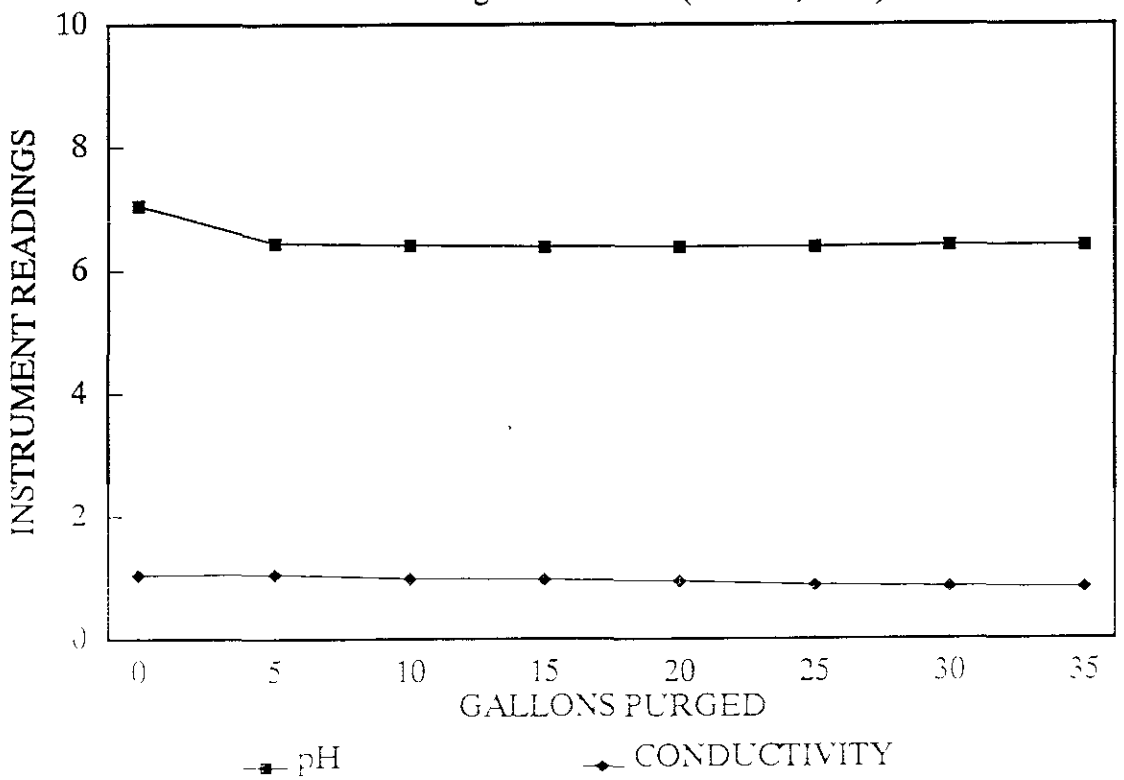
Notes:

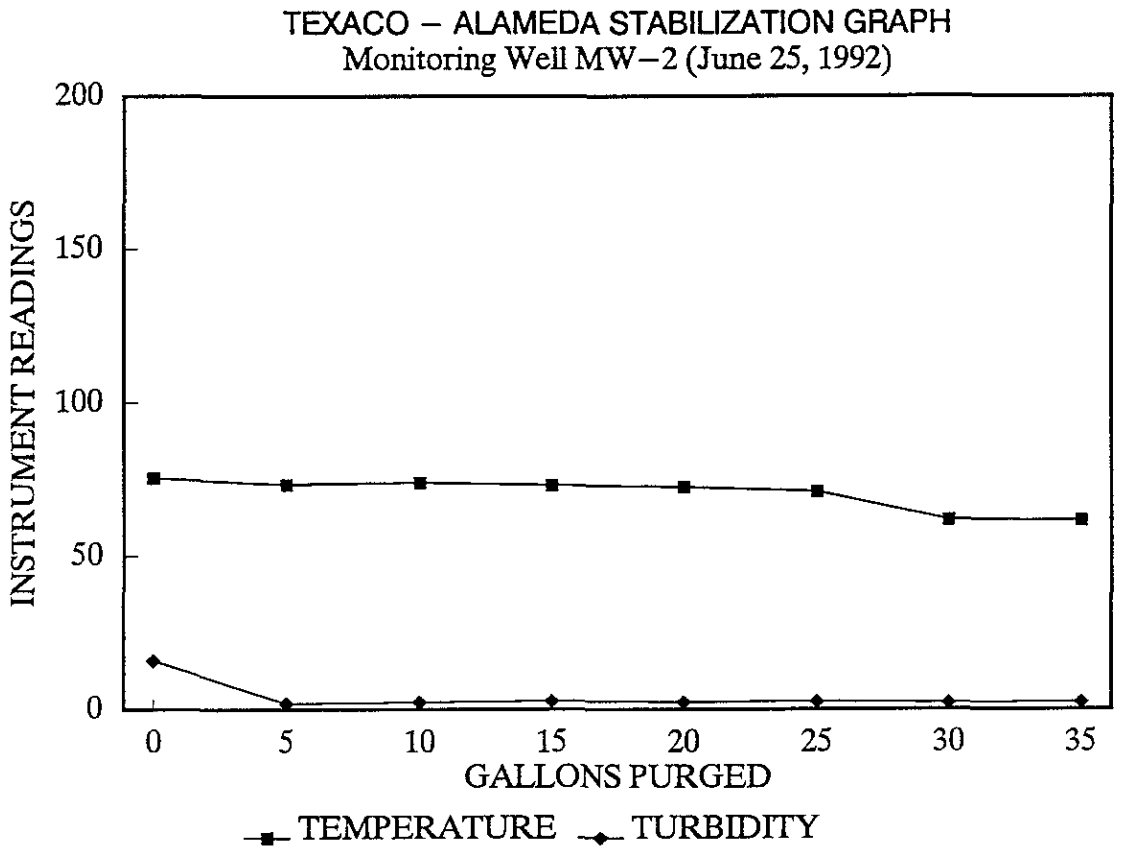
Well Diameter (inches) : 4
Depth to Bottom (feet) : 19.55
Depth to Water - initial (feet) : 7.20
Depth to Water - final (feet) : 7.31
% recovery : 99
Time Sampled : 1010
Gallons per Well Casing Volume : 8.06
Gallons Purged : 35
Well Casing Volume Purged : 4.34
Approximate Pumping Rate (gpm) : 1.35

TEXACO – ALAMEDA STABILIZATION GRAPH
Monitoring Well MW–1 (June 25, 1992)



TEXACO – ALAMEDA STABILIZATION GRAPH
Monitoring Well MW–1 (June 25, 1992)




TEXACO – ALAMEDA STABILIZATION GRAPH
Monitoring Well MW–2 (June 25, 1992)
INSTRUMENT READINGS
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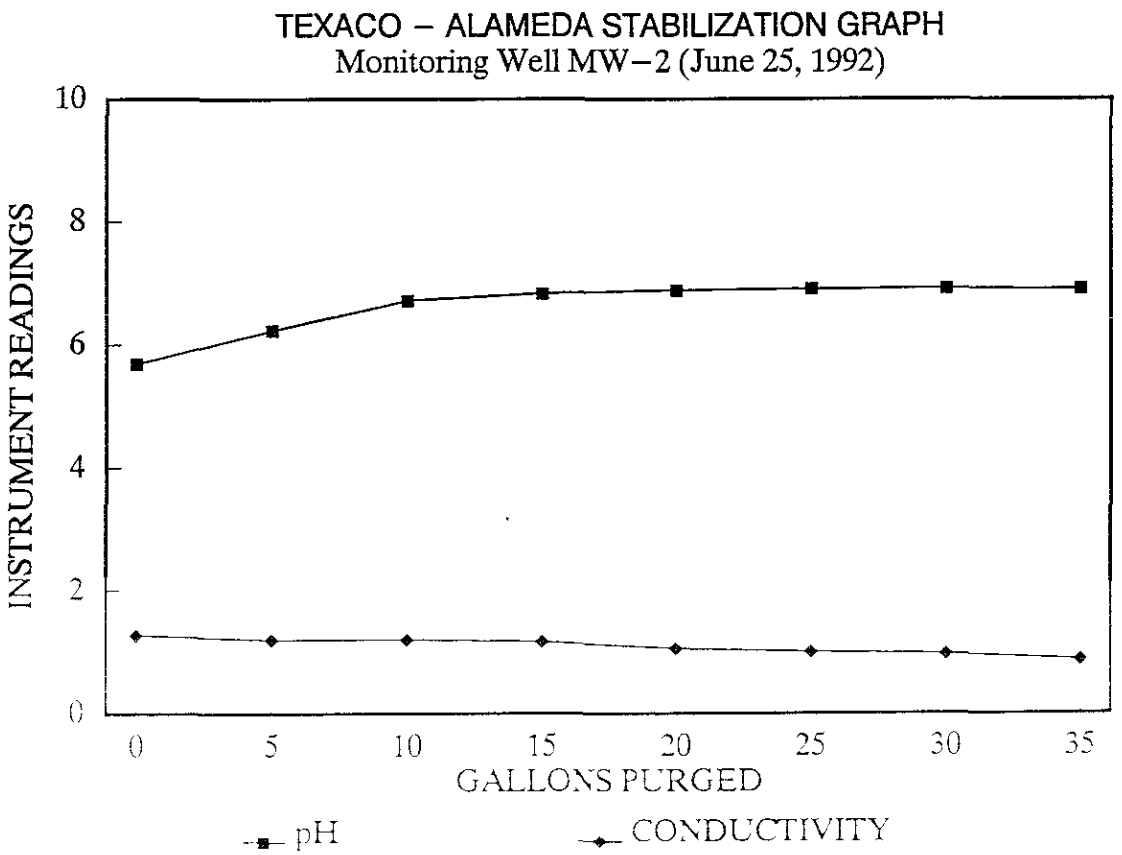
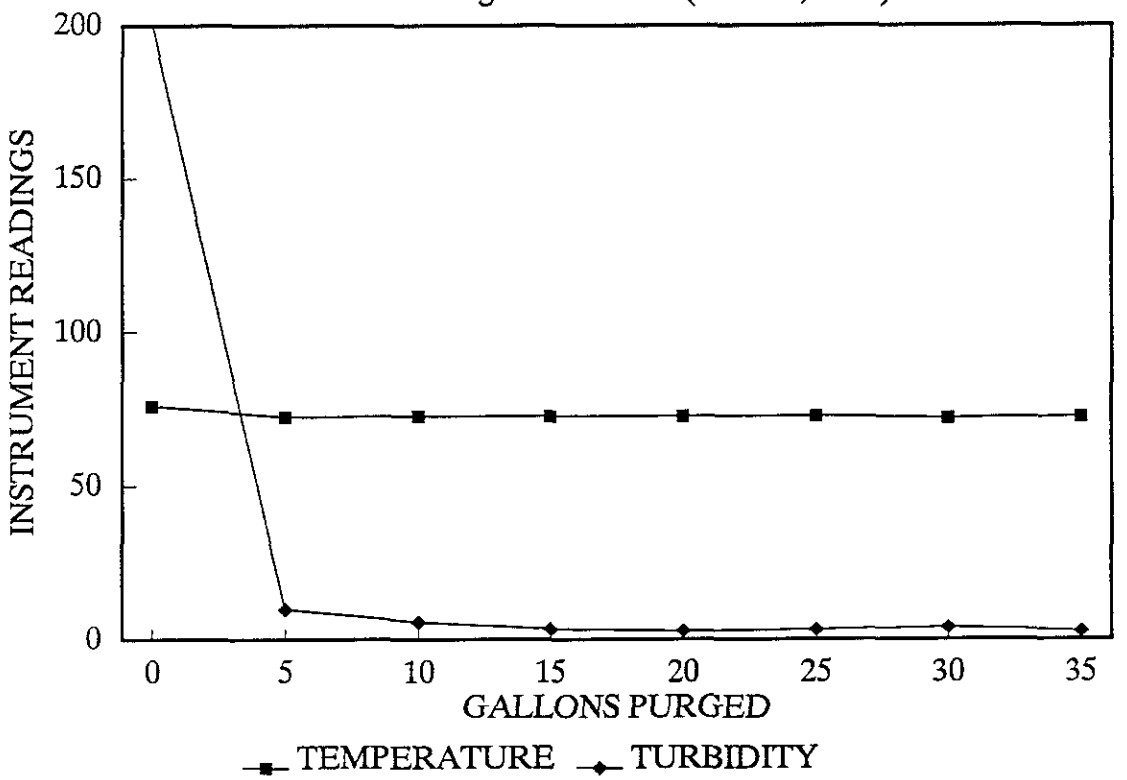
100
50
0
0
5
10
15
20
25
30
35
GALLONS PURGED
TEMPERATURE
TURBIDITY


TEXACO – ALAMEDA STABILIZATION GRAPH
Monitoring Well MW–2 (June 25, 1992)
INSTRUMENT READINGS
10
8
6
4
2
0
0
5
10
15
20
25
30
35
GALLONS PURGED
pH
CONDUCTIVITY

TEXACO – ALAMEDA STABILIZATION GRAPH
Monitoring Well MW–3 (June 25, 1992)



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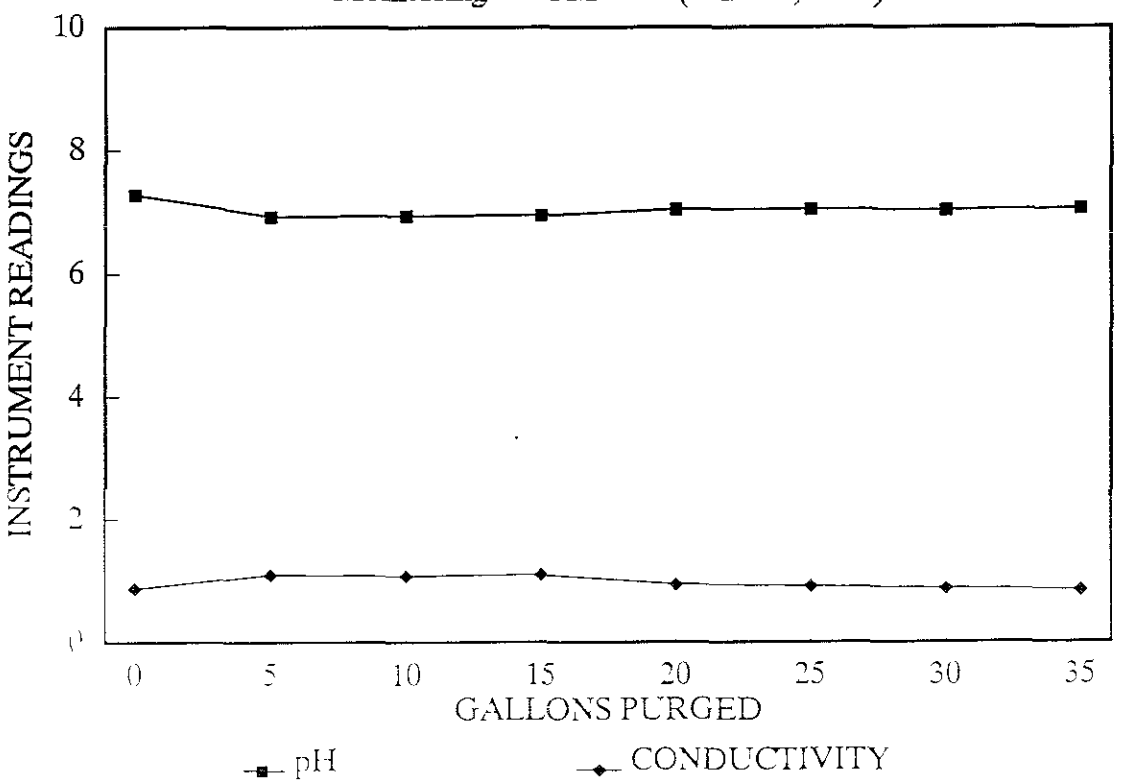
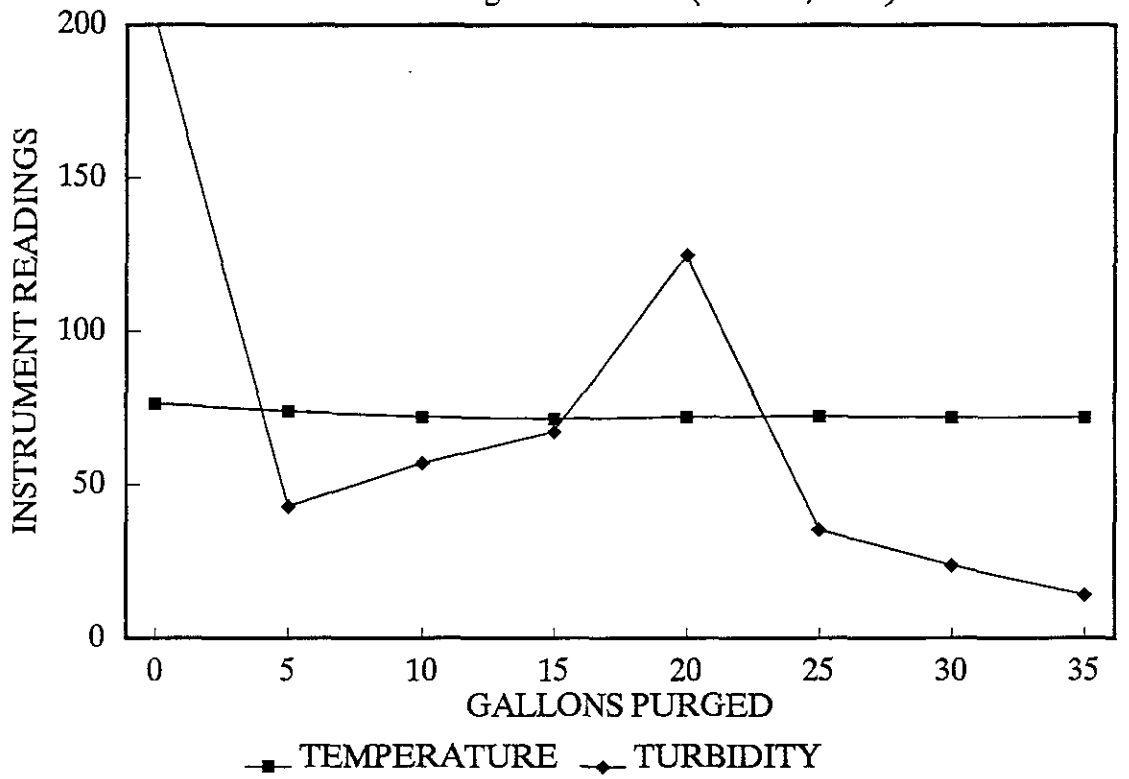
Monitoring Well MW–3 (June 25, 1992)



TEXACO – ALAMEDA STABILIZATION GRAPH
Monitoring Well MW–4 (June 25, 1992)



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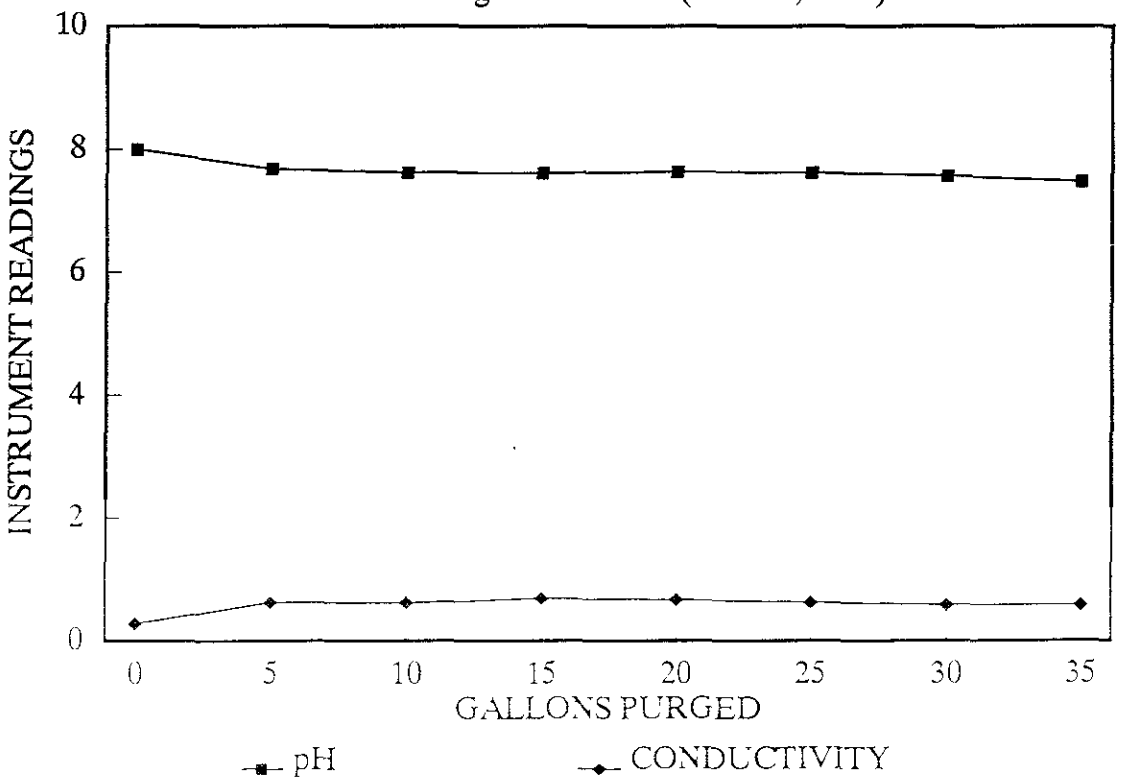
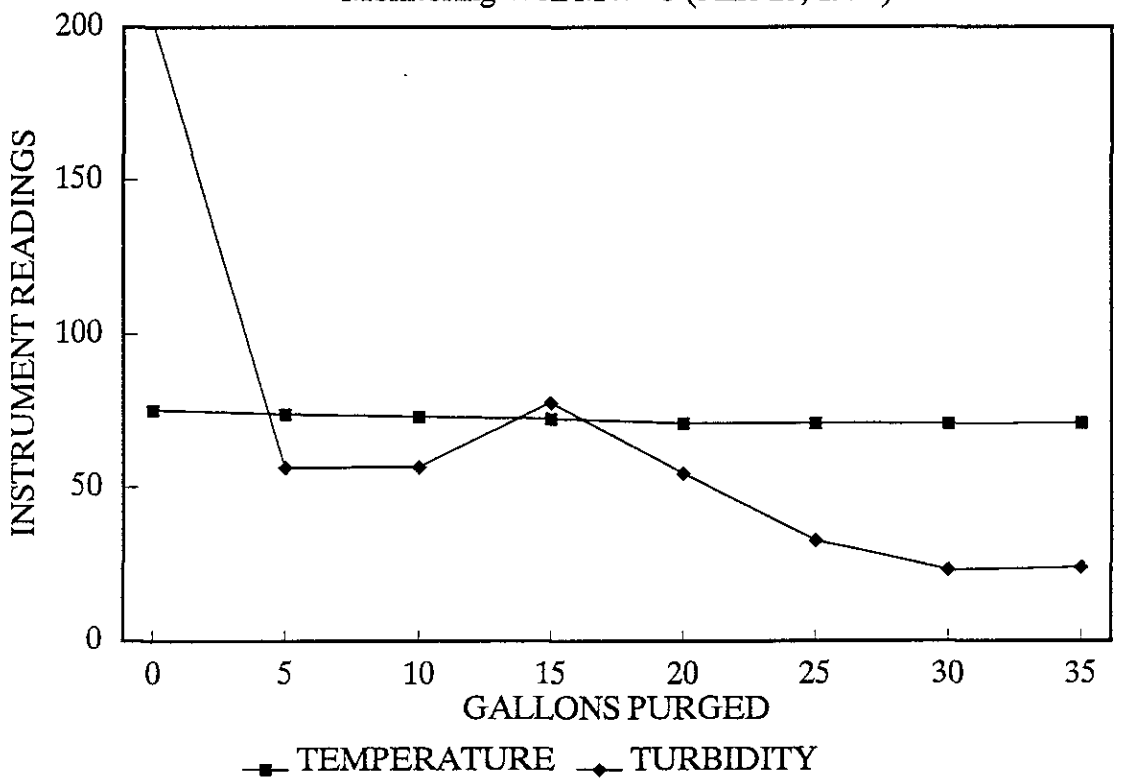
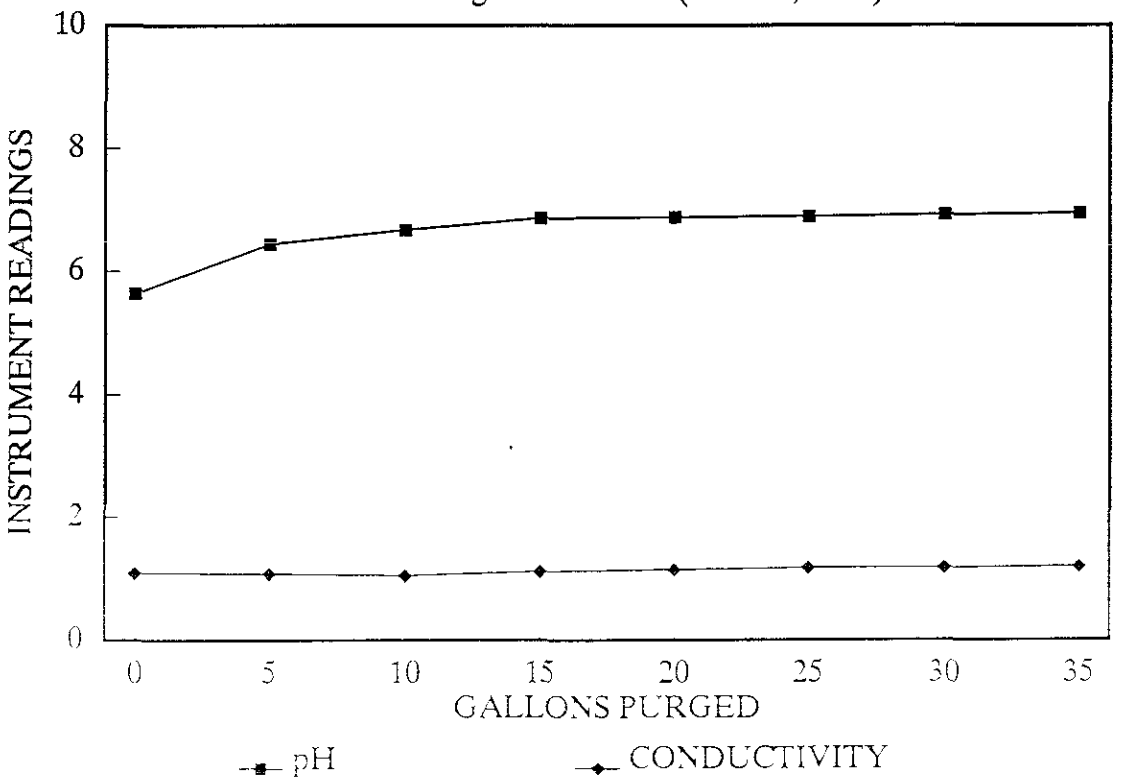
Monitoring Well MW–4 (June 25, 1992)



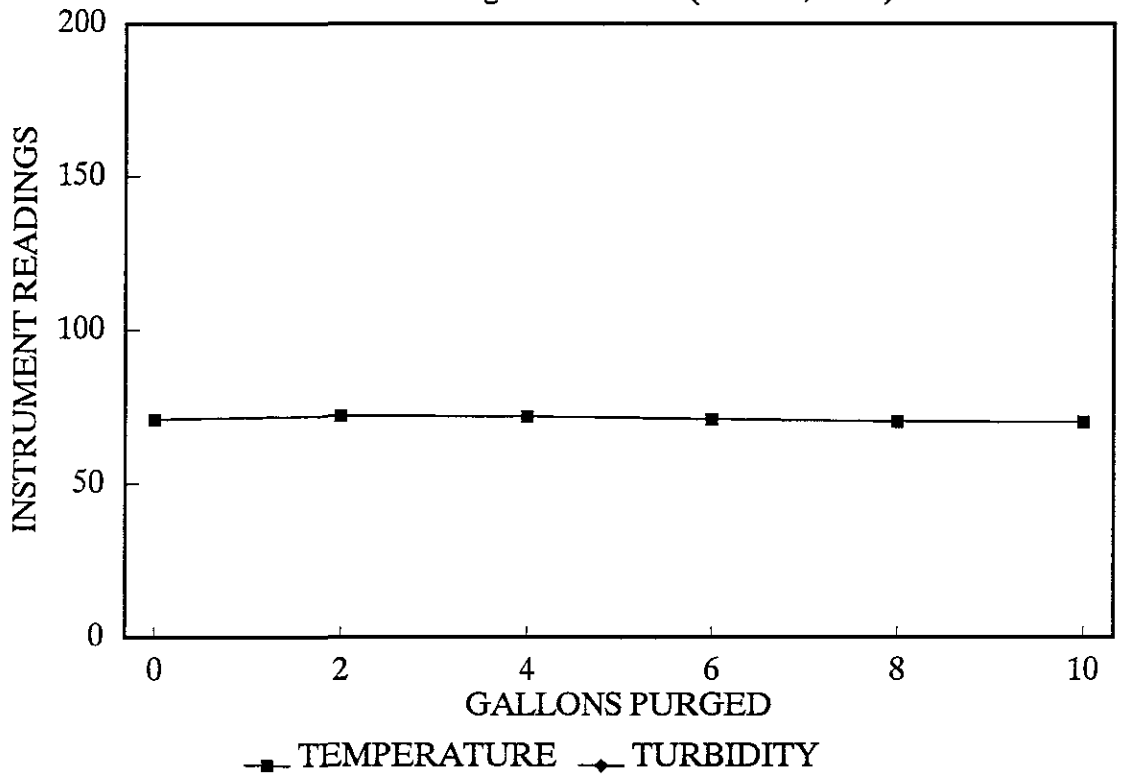
TEXACO – ALAMEDA STABILIZATION GRAPH
Monitoring Well MW–5 (June 25, 1992)



TEXACO – ALAMEDA STABILIZATION GRAPH
Monitoring Well MW–5 (June 25, 1992)



TEXACO – ALAMEDA STABILIZATION GRAPH
Monitoring Well MW–6 (June 25, 1992)



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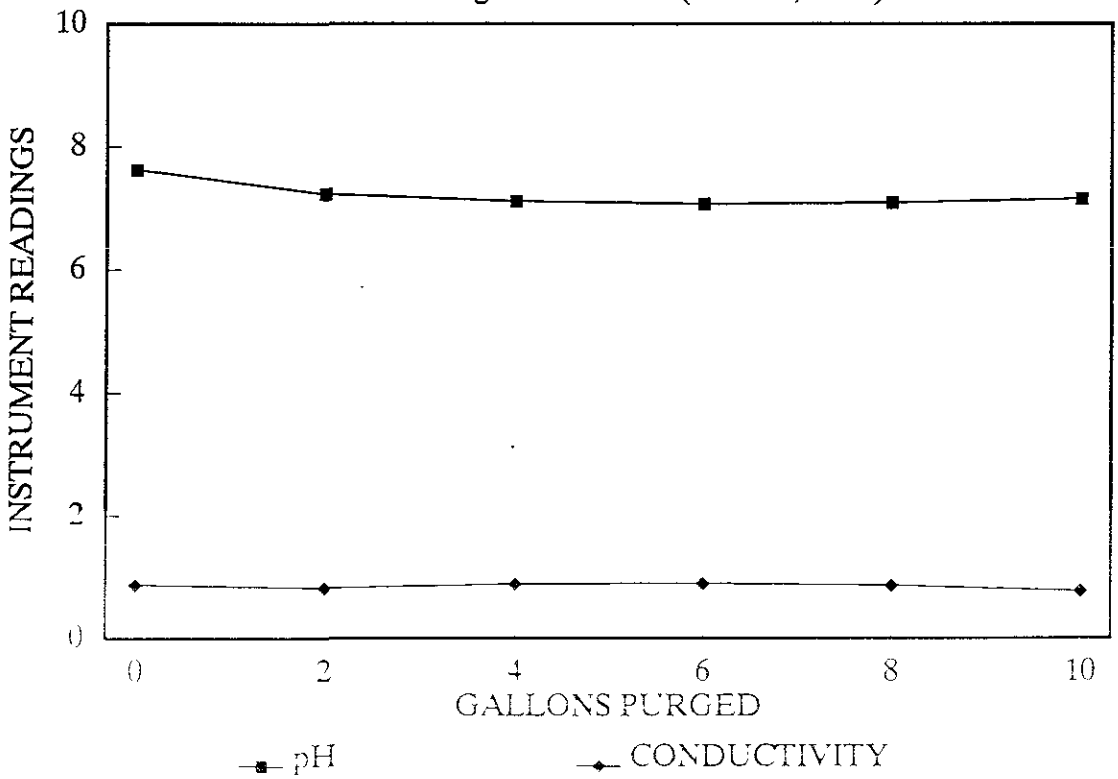
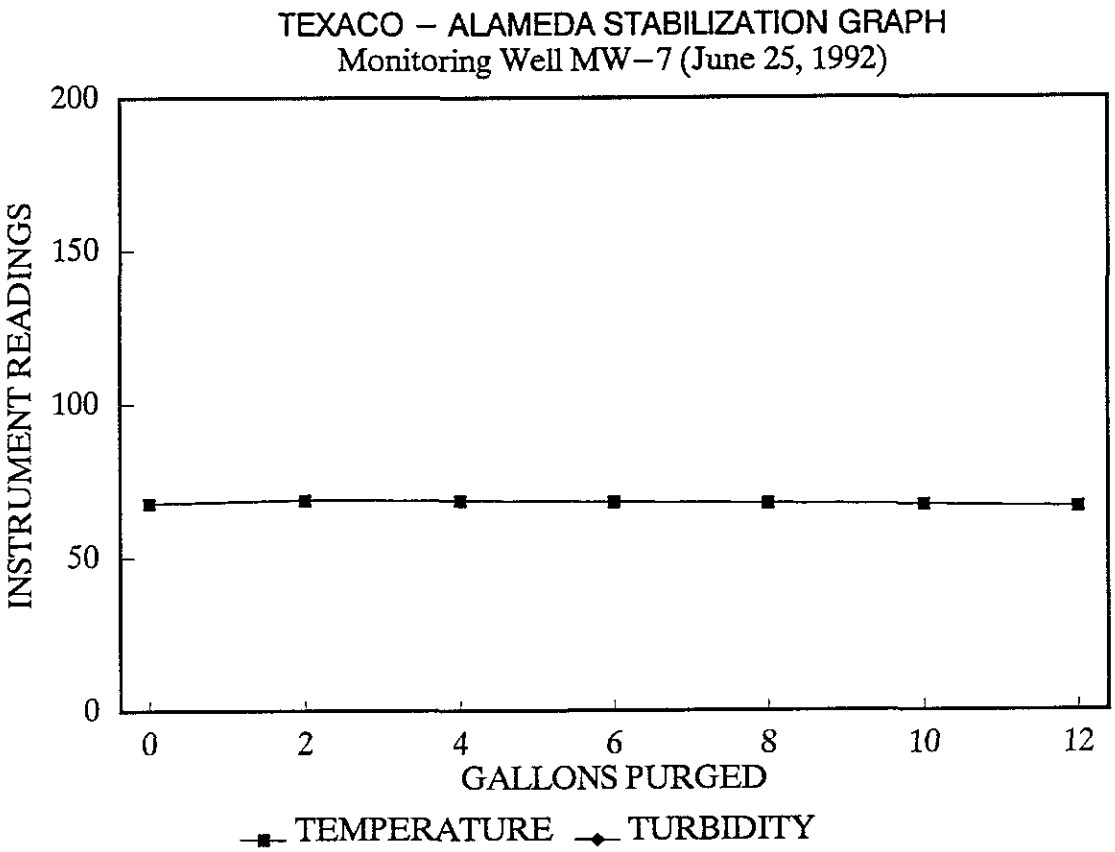
Monitoring Well MW–6 (June 25, 1992)




TEXACO – ALAMEDA STABILIZATION GRAPH
Monitoring Well MW–7 (June 25, 1992)
INSTRUMENT READINGS
200
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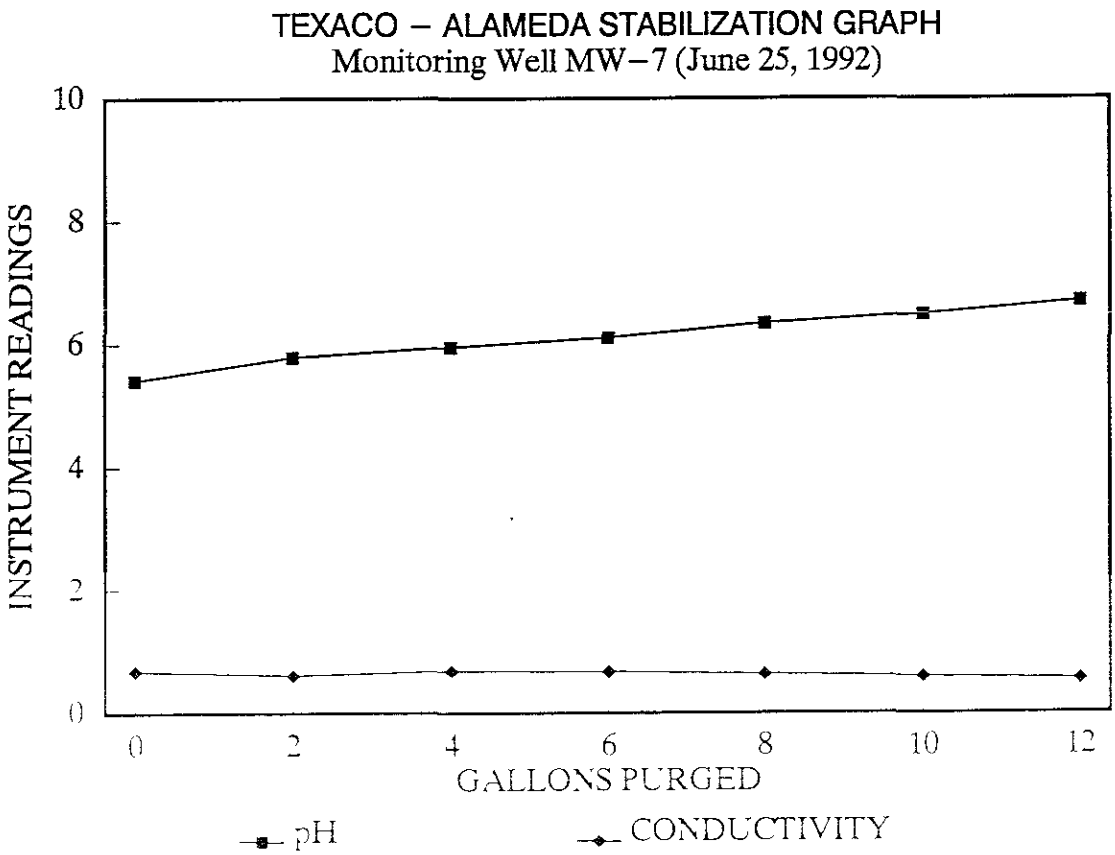
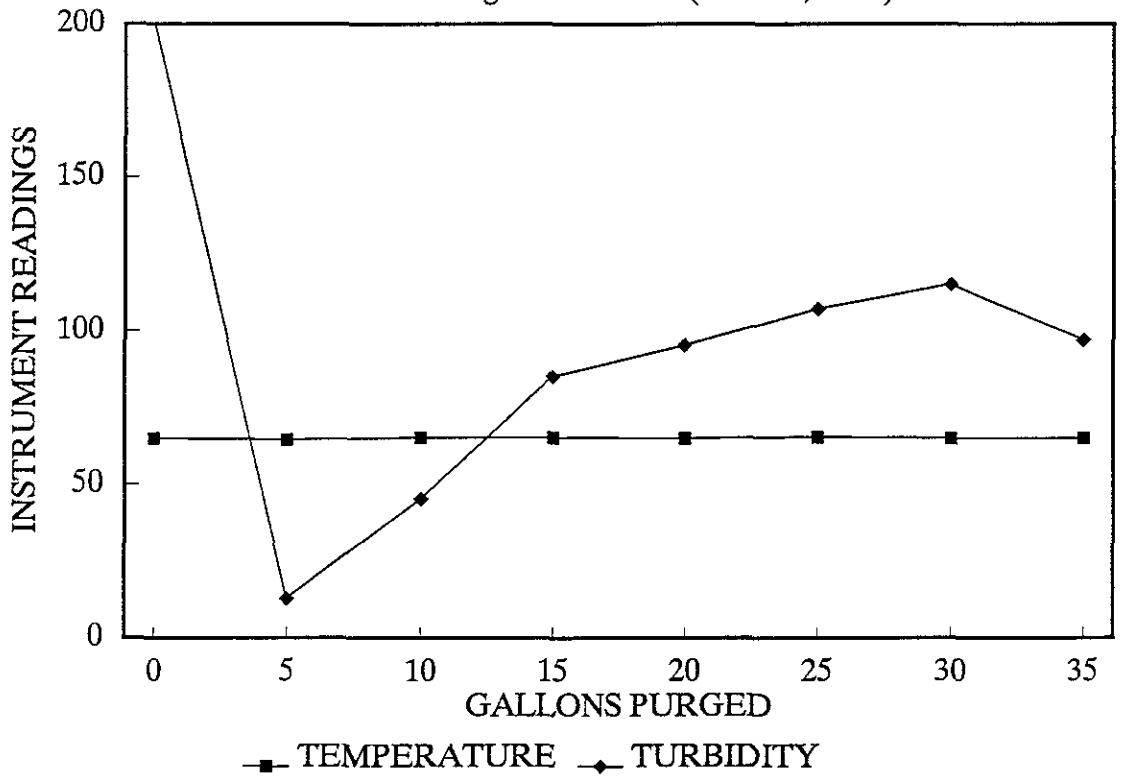
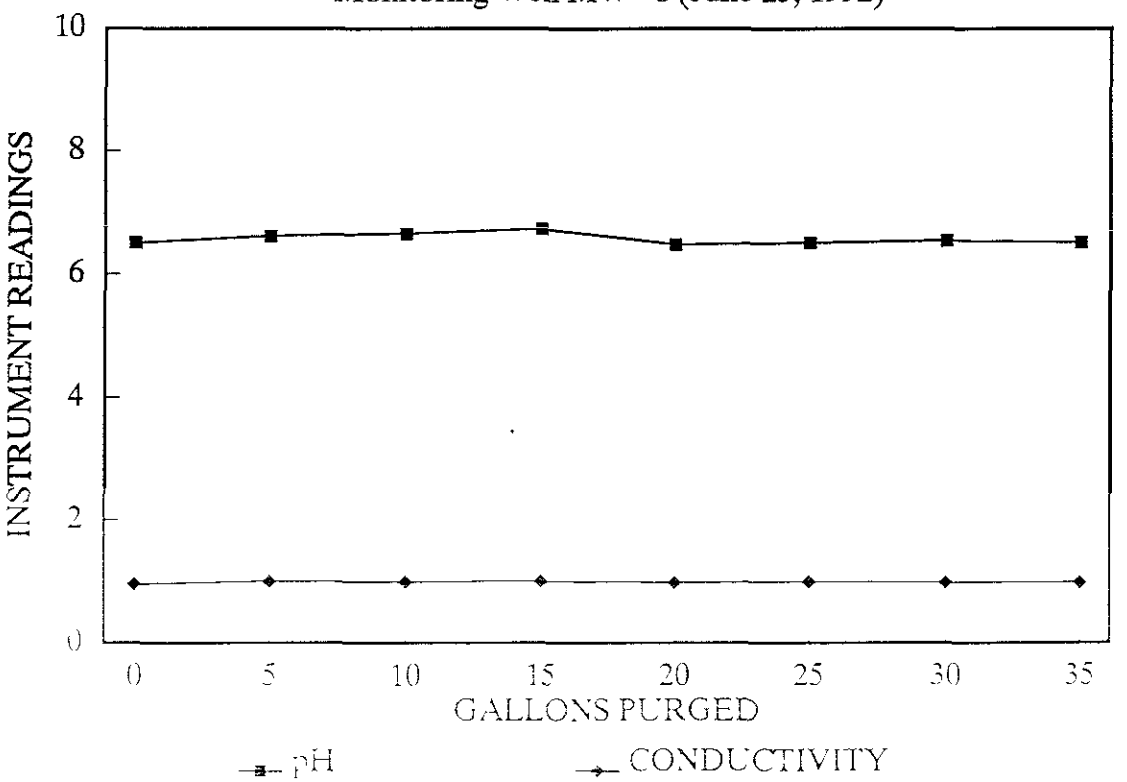
100
50
0
0
2
4
6
8
10
12
GALLONS PURGED
TEMPERATURE
TURBIDITY


TEXACO – ALAMEDA STABILIZATION GRAPH
Monitoring Well MW–7 (June 25, 1992)
INSTRUMENT READINGS
10
8
6
4
2
0
0
2
4
6
8
10
12
GALLONS PURGED
pH
CONDUCTIVITY

TEXACO – ALAMEDA STABILIZATION GRAPH
Monitoring Well MW–8 (June 25, 1992)



TEXACO – ALAMEDA STABILIZATION GRAPH
Monitoring Well MW–8 (June 25, 1992)



APPENDIX C

DRILLING PERMIT
PERMITS TO EXCAVATE IN CITY OF ALAMEDA RIGHT-OF-WAY

ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
5997 PARKSIDE DRIVE • PLEASANTON, CALIFORNIA 94588 • (510) 484-2600

2 June 1992

Resna
3315 Almaden Expressway, Ste. 34
San Jose, CA 95118

Gentlemen:

Enclosed is drilling permit 92276 for a monitoring well construction project at 1127 Lincoln Avenue in Alameda for Texaco Environmental Services.

Please note that permit condition A-2 requires that a well construction report be submitted after completion of the work. The report should include drilling and completion logs, location sketch, and permit number.

If you have any questions, please contact Wyman Hong or me at 484-2600.

Very truly yours,

Craig A. Mayfield

Craig A. Mayfield
Water Resources Engineer

WH:mm
Enc.

CITY OF ALAMEDA
CENTRAL PERMIT OFFICE **415-522-4100**
2263 SANTA CLARA AVE., ROOM 204
ALAMEDA, CA 94501

APPLICATION FOR PERMIT TO EXCAVATE IN THE RIGHT-OF-WAY OF THE CITY OF ALAMEDA

_____ SERVICE NUMBER DATE 5-27 19 92

Application is hereby made for a permit to excavate on the east side of Bay Ave. (St.) approximately 30 feet north of Lincoln Avenue

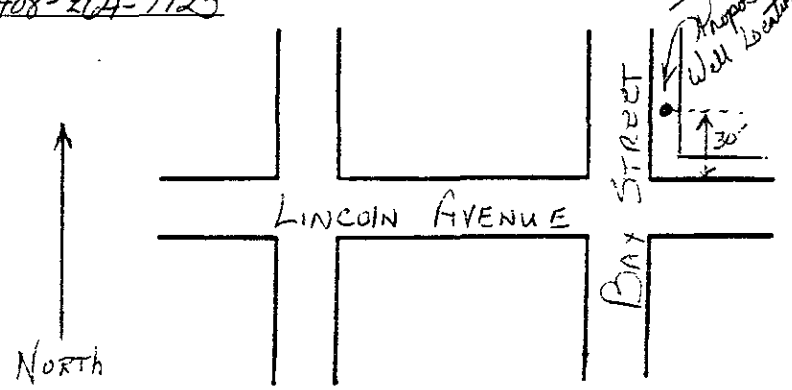
House No. 1127 Lincoln Avenue Owner Texaco Environmental Services

For the purpose of installation of a groundwater monitoring well

Name of Applicant RESNA / Philip Mayberry Address 3315 Almaden Expressway #34, San Jose, CA 95118

Phone 408-264-7723

☐ VERBAL APPROVAL
Date _____
By _____
Reasons: _____



See Attached Plate A

Diagram of Proposed Work

FOR OFFICE USE ONLY

This permit to be Inspected by ☑ ENGINEERING DIVISION ☐ MAINTENANCE DIVISION

☐ ALL STRIPING, PAINTED GRAPHICS AND PAVEMENT MARKERS DAMAGED OR DESTROYED BY STREET EXCAVATION WORK ARE TO BE RESTORED BY THE PERMITEE.

☑ ALL CONSTRUCTION WITHIN THE PUBLIC RIGHT OF WAY MUST HAVE BARRICADES WITH FLASHERS FOR NIGHT TIME PROTECTION.

☑ ALL WORK INVOLVED IS TO BE DONE IN ACCORDANCE WITH STANDARD CITY OF ALAMEDA SPECIFICATIONS AND CITY OF ALAMEDA PRACTICES ALL TO THE SATISFACTION OF THE CITY ENGINEER. INSPECTION CHARGES SHALL BE PAID TO THE CITY MONTHLY. ACCEPTANCE OF THIS PERMIT CONSTITUTES ACCEPTANCE OF THE CONDITIONS INCLUDED.

☐ CONCRETE PERMIT REQUIRED

☐ NO OPEN TRENCH CUTTING

☐ STATE PERMIT REQUIRED

☐ SPECIAL CONDITIONS _____

RECEIVED DATE _____ SIGNED _____ PERMIT # 12-116

APPROVAL DATE 6/3/92 SIGNED _____

ISSUED DATE _____ SIGNED _____

WHITE APPLICANT'S COPY YELLOW CENTRAL PERMIT OFFICE COPY PINK INSPECTION COPY

CITY OF ALAMEDA
CENTRAL PERMIT OFFICE

415-522-4100

2263 SANTA CLARA AVE., ROOM 204
ALAMEDA, CA 94501

APPLICATION FOR PERMIT TO EXCAVATE IN THE RIGHT-OF-WAY OF THE CITY OF ALAMEDA

_____ SERVICE NUMBER DATE 5-27 19 92

Application is hereby made for a permit to excavate on the west side of Bay Ave. (St.) approximately 90 feet north of Lincoln Avenue

House No. 1127 Lincoln Ave Owner Texaco Environmental Services

For the purpose of installation of a groundwater monitoring well

Name of Applicant RESNA / Philip Mayberry Address 3315 Almaden Expressway, San Jose, CA 95118

Phone 408-264-7723

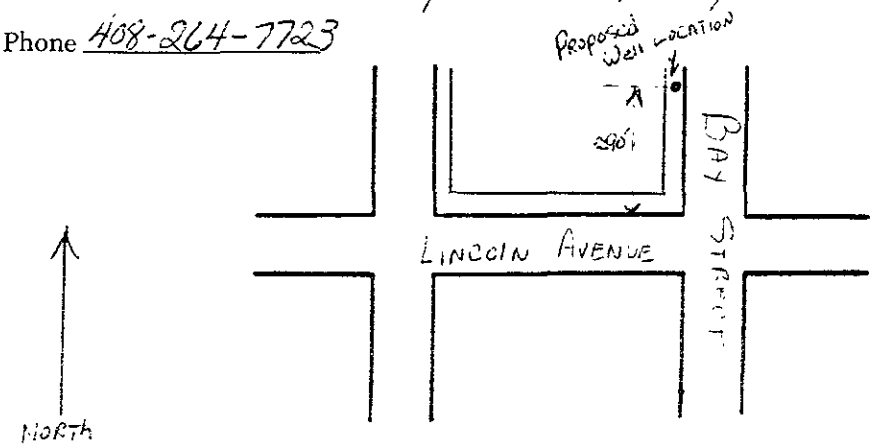


Diagram of Proposed Work

☐ VERBAL APPROVAL
Date
By
Reasons:

RECEIVED

See Attached Plate A

FOR OFFICE USE ONLY

This permit to be Inspected by ☑ ENGINEERING DIVISION ☐ MAINTENANCE DIVISION

☐ ALL STRIPING, PAINTED GRAPHICS AND PAVEMENT MARKERS DAMAGED OR DESTROYED BY STREET EXCAVATION WORK ARE TO BE RESTORED BY THE PERMITEE.

☑ ALL CONSTRUCTION WITHIN THE PUBLIC RIGHT OF WAY MUST HAVE BARRICADES WITH FLASHERS FOR NIGHT TIME PROTECTION.

☑ ALL WORK INVOLVED IS TO BE DONE IN ACCORDANCE WITH STANDARD CITY OF ALAMEDA SPECIFICATIONS AND CITY OF ALAMEDA PRACTICES ALL TO THE SATISFACTION OF THE CITY ENGINEER. INSPECTION CHARGES SHALL BE PAID TO THE CITY MONTHLY. ACCEPTANCE OF THIS PERMIT CONSTITUTES ACCEPTANCE OF THE CONDITIONS INCLUDED.

☐ CONCRETE PERMIT REQUIRED

NO OPEN TRENCH CUTTING

☐ STATE PERMIT REQUIRED

SPECIAL CONDITIONS

PERMIT # 92-11

APPROVED 6/2/92 SIGNED

ISSUED SIGNED

WHITE APPLICANT'S COPY YELLOW CENTRAL PERMIT OFFICE COPY PINK INSPECTION COPY

CITY OF ALAMEDA
CENTRAL PERMIT OFFICE **415-522-4100**
2263 SANTA CLARA AVE., ROOM 204
ALAMEDA, CA 94501

APPLICATION FOR PERMIT TO EXCAVATE IN THE RIGHT-OF-WAY OF THE CITY OF ALAMEDA

_____ SERVICE NUMBER DATE 5-27 19 92

Application is hereby made for a permit to excavate on the north side of Lincoln (Ave.) St. approximately 35 feet west of Bay Street

House No. 1127 Lincoln Ave Owner Texaco Environmental Services

For the purpose of installation of a groundwater monitoring well

Name of Applicant RESNA / Phil Mayberry Address 3315 Almaden Expressway #34 San Jose, CA 95118

Phone 408-264-7723

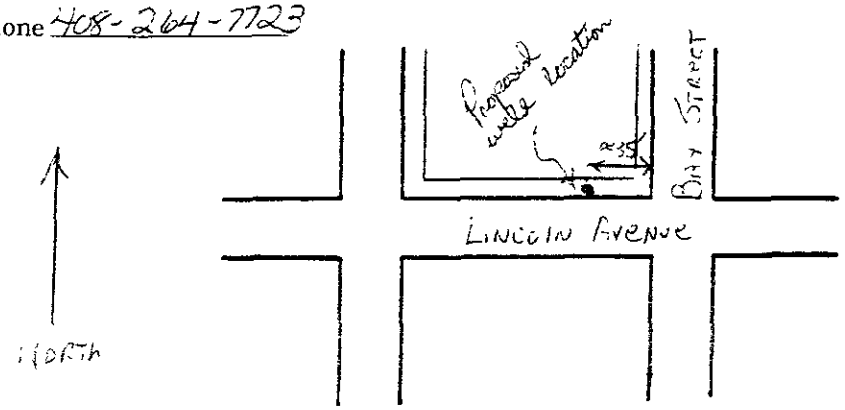


Diagram of Proposed Work

☐ VERBAL APPROVAL
Date
By
Reasons:

RECEIVED

See Attached Plate A

FOR OFFICE USE ONLY

This permit to be Inspected by ☑ ENGINEERING DIVISION ☐ MAINTENANCE DIVISION

☐ ALL STRIPING, PAINTED GRAPHICS AND PAVEMENT MARKERS DAMAGED OR DESTROYED BY STREET EXCAVATION WORK ARE TO BE RESTORED BY THE PERMITEE.

☑ ALL CONSTRUCTION WITHIN THE PUBLIC RIGHT OF WAY MUST HAVE BARRICADES WITH FLASHERS FOR NIGHT TIME PROTECTION.

☑ ALL WORK INVOLVED IS TO BE DONE IN ACCORDANCE WITH STANDARD CITY OF ALAMEDA SPECIFICATIONS AND CITY OF ALAMEDA PRACTICES ALL TO THE SATISFACTION OF THE CITY ENGINEER. INSPECTION CHARGES SHALL BE PAID TO THE CITY MONTHLY. ACCEPTANCE OF THIS PERMIT CONSTITUTES ACCEPTANCE OF THE CONDITIONS INCLUDED.

CITY ENGINEER 5-27-92 DATE

CONCRETE PERMIT REQUIRED

NO OPEN TRENCH CUTTING

☐ STATE PERMIT REQUIRED

SPECIAL CONDITIONS

PERMIT #

ISSUED DATE 6/2/92 SIGNED

WHITE APPLICANT'S COPY YELLOW CENTRAL PERMIT OFFICE COPY PINK INSPECTION COPY

ZONE 7 WATER AGENCY

5997 PARKSIDE DRIVE PLEASANTON, CALIFORNIA 94588 VOICE (510) 484-2600
FAX (510) 462-3914

DRILLING PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

LOCATION OF PROJECT 1127 LINCOLN AVENUE
ALAMEDA, CALIFORNIA

CLIENT
Name TEXACO ENVIRONMENTAL SERVICES
Address 168 CUTTING Blvd. Phone 510-236-3611
City RICHMOND Zip 94804

APPLICANT
Name RESNA
ATTN: PHILO MAYBERRY
Address 3315 ALMADEN EXPRESSWAY #34 Phone 408-264-7723
City SAN JOSE Zip 95118

TYPE OF PROJECT

Well Construction		Geotechnical Investigation	
Cathodic Protection	___	General	___
Water Supply	___	Contamination	___
Monitoring	X	Well Destruction	___

PROPOSED WATER SUPPLY WELL USE
Domestic ___ Industrial ___ Other ___
Municipal ___ Irrigation ___

DRILLING METHOD:
Mud Rotary ___ Air Rotary ___ Auger X
Cable ___ Other ___

DRILLER'S LICENSE NO. 604987

WELL PROJECTS

Drill Hole Diameter	10	in.	Maximum		
Casing Diameter	4	in.	Depth	25	ft.
Surface Seal Depth	5	ft.	Number	5	

GEOTECHNICAL PROJECTS

Number of Borings	___		Maximum		
Hole Diameter	___	in	Depth	___	ft

ESTIMATED STARTING DATE 6-3-92
ESTIMATED COMPLETION DATE 6-3-92

I hereby agree to comply with all requirements of this permit and Alameda County Ordinance No. 73-68

APPLICANT'S SIGNATURE [signature] Date 5-29-92

FOR OFFICE USE

PERMIT NUMBER 92276
LOCATION NUMBER ___

PERMIT CONDITIONS

Circled Permit Requirements Apply

(A.) GENERAL
1. A permit application should be submitted so as to arrive at the Zone 7 office five days prior to proposed starting date.
2. Submit to Zone 7 within 60 days after completion of permitted work the original Department of Water Resources Water Well Drillers Report or equivalent for well Projects, or drilling logs and location sketch for geotechnical projects.
3. Permit is void if project not begun within 90 days of approval date.

(B.) WATER WELLS, INCLUDING PIEZOMETERS
1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth is 50 feet for municipal and industrial wells or 20 feet for domestic and irrigation wells unless a lesser depth is specially approved. Minimum seal depth for monitoring wells is the maximum depth practicable or 20 feet.

C. GEOTECHNICAL. Backfill bore hole with compacted cuttings or heavy bentonite and upper two feet with compacted material. In areas of known or suspected contamination, tremied cement grout shall be used in place of compacted cuttings.

D. CATHODIC. Fill hole above anode zone with concrete placed by tremie.

E. WELL DESTRUCTION. See attached.

Approved [signature] Date 1 Jun 92
Wyman Hong

31992

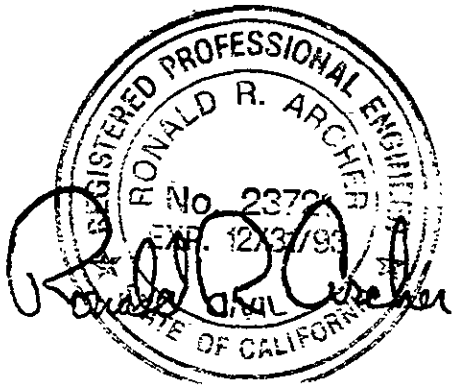
APPENDIX D

WELLHEAD SURVEY

RON ARCHER
CIVIL ENGINEER, INC.

CONSULTING • PLANNING • DESIGN • SURVEYING

4133 Mohr Ave., Suite E • Pleasanton, CA 94566
(510) 462-9372



MARCH 26, 1992
* REVISED JUNE 22, 1992

JOB NO. 1779

ELEVATION OF EXISTING MONITOR WELLS AT THE LEWIS BAY STREET AUTO REPAIR SERVICE FACILITY (FORMERLY TEXACO) LOCATED AT 1127 LINCOLN AVENUE (FORMERLY RAILROAD AVENUE) AT BAY STREET. CITY OF ALAMEDA, ALAMEDA COUNTY ,CALIFORNIA.

FOR: RESNA INDUSTRIES
PROJECT NO. 61006.04

BENCHMARK:
TOP OF FOUND BRASS PLUG SET IN TOP OF CURB AT MID RETURN AT THE NORTHWEST CORNER OF SANTA CLARA AVENUE AT BAY STREET. ELEVATION TAKEN AS 21.155, CITY OF ALAMEDA DATUM

MONITOR WELL DATA TABLE

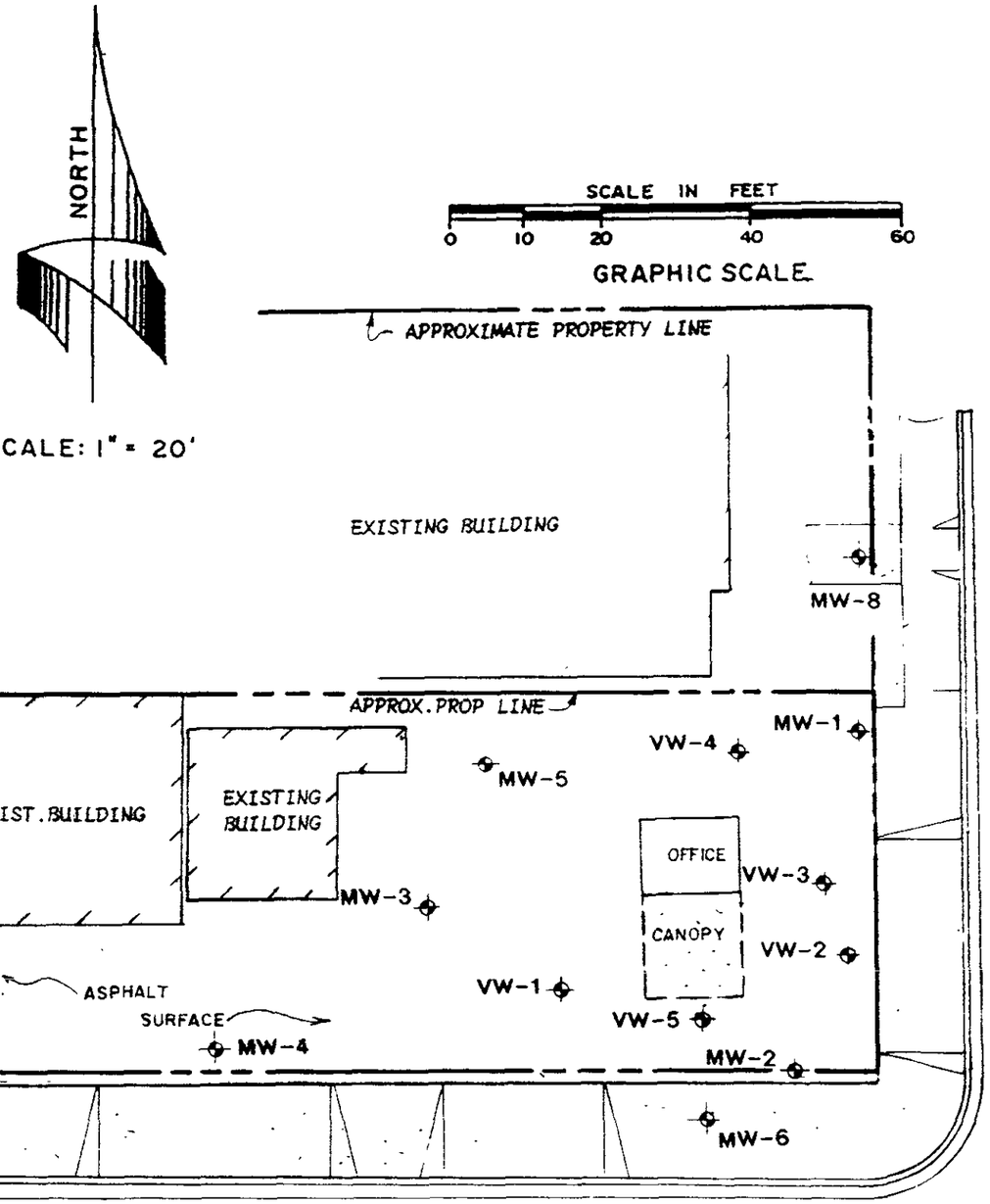
WELL NO.	ELEVATION	DESCRIPTION
MW1	16.49	TOP OF PVC CASING
	16.94	TOP OF BOX
MW2	17.14	TOP OF PVC CASING
	17.61	TOP OF BOX
MW3	16.91	TOP OF PVC CASING
	17.30	TOP OF BOX
* MW4	17.18	TOP OF PVC CASING
	17.51	TOP OF BOX
* MW5	16.37	TOP OF PVC CASING
	16.78	TOP OF BOX
* MW6	17.12	TOP OF PVC CASING
	17.55	TOP OF BOX
* MW7	16.71	TOP OF PVC CASING
	17.15	TOP OF BOX
* MW8	[illegible]	TOP OF PVC CASING
	[illegible]	TOP OF BOX

MONITOR WELL DATA TABLE

WELL NO.	ELEVATION	DESCRIPTION
VW1	16.83	TOP OF PVC CASING
	17.38	TOP OF BOX
VW2	17.00	TOP OF PVC CASING
	17.43	TOP OF BOX
VW3	16.94	TOP OF PVC CASING
	17.21	TOP OF BOX
VW4	16.81	TOP OF PVC CASING
	17.07	TOP OF BOX
VW5	17.20	TOP OF PVC CASING
	17.65	TOP OF BOX

61006.04

VICINITY MAP
NO SCALE



MARCH 26, 1991 JOB NO. 1779
* REVISED JUNE 22, 1992.

PLAT SHOWING EXISTING MONITOR WELLS AT THE LEWIS BAY STREET AUTO REPAIR SERVICE FACILITY (FORMERLY TEXACO) LOCATED AT 1127 LINCOLN AVENUE (FORMERLY RAILROAD AVENUE) AT BAY STREET. CITY OF ALAMEDA, ALAMEDA COUNTY, CALIFORNIA.

FOR: RESNA INDUSTRIES
PROJECT NO. 61006.04

REGISTERED PROFESSIONAL ENGINEER
RONALD R. ARCHER
No. 23721
EXP. 12/31/93
CIVIL
STATE OF CALIFORNIA

RON ARCHER
CIVIL ENGINEER, INC.
CONSULTING • PLANNING • DESIGN • SURVEYING
4133 Mohr Ave Suite E • Pleasanton, CA 94566
(415) 462 9372

APPENDIX E

CHAIN OF CUSTODY RECORDS
LABORATORY ANALYSIS REPORTS

MOBILE CHEM LABS INC.

5021 Blum Road, Suite 3 • Martinez, CA 94553
Phone (415) 372-3700 • Fax (415) 372-6955

61006.04/011960

RESNA Industries
3315 Alamden Expressway, #34
San Jose, CA 95118
Attn: Phillip Mayberry
Project Manager

Date Sampled: 06-19-92
Date Received: 06-22-92
Date Reported: 06-25-92

Sample Number	Sample Description
062151	Project # 61006.04 Texaco - Alameda 1127 Lincoln Avenue S-5 1/2-MW6 SOIL

ANALYSIS

	Detection Limit	Sample Results
	ppm	ppm
Total Petroleum Hydrocarbons as Gasoline	1.0	<1.0
Benzene	0.005	<0.005
Toluene	0.005	<0.005
Xylenes	0.005	<0.005
Ethylbenzene	0.005	<0.005

QA/QC: Sample blank is none detected
Spike Recovery is 94%

Note: Analysis was performed using EPA methods 5030 and TPH LUFT with method 8020 used for BTX distinction.
(ppm) = (mg/kg)

MOBILE CHEM LABS

Ronald G. Evans
Lab Director

MOBILE CHEM LABS INC.

5021 Blum Road, Suite 3 • Martinez, CA 94553
Phone (415) 372-3700 • Fax (415) 372-6955

61006.04/011960

RESNA Industries
3315 Alamden Expressway, #34
San Jose, CA 95118
Attn: Phillip Mayberry
Project Manager

Date Sampled: 06-19-92
Date Received: 06-22-92
Date Reported: 06-25-92

Sample Number	Sample Description
062152	Project # 61006.04 Texaco - Alameda 1127 Lincoln Avenue S-10-MW6 SOIL

ANALYSIS

	Detection Limit	Sample Results
	ppm	ppm
Total Petroleum Hydrocarbons as Gasoline	1.0	<1.0
Benzene	0.005	<0.005
Toluene	0.005	<0.005
Xylenes	0.005	<0.005
Ethylbenzene	0.005	<0.005

QA/QC: Sample blank is none detected

Note: Analysis was performed using EPA methods 5030 and TPH LUFT with method 8020 used for BTX distinction.
(ppm) = (mg/kg)

MOBILE CHEM LABS

Ronald G. Evans
Lab Director

MOBILE CHEM LABS INC.

5021 Blum Road, Suite 3 • Martinez, CA 94553
Phone (415) 372-3700 • Fax (415) 372-6955

61006.04/011960

RESNA Industries
3315 Alamden Expressway, #34
San Jose, CA 95118
Attn: Phillip Mayberry
Project Manager

Date Sampled: 06-19-92
Date Received: 06-22-92
Date Reported: 06-25-92

Sample Number	Sample Description
062153	Project # 61006.04 Texaco - Alameda 1127 Lincoln Avenue S-6-MW7 SOIL

ANALYSIS

	Detection Limit	Sample Results
	ppm	ppm
Total Petroleum Hydrocarbons as Gasoline	1.0	<1.0
Benzene	0.005	<0.005
Toluene	0.005	<0.005
Xylenes	0.005	<0.005
Ethylbenzene	0.005	<0.005

QA/QC: Sample blank is none detected

Note: Analysis was performed using EPA methods 5030 and TPH LUFT with method 8020 used for BTX distinction.
(ppm) = (mg/kg)

MOBILE CHEM LABS

Ronald G. Evans
Lab Director

MOBILE CHEM LABS INC.

5021 Blum Road, Suite 3 • Martinez, CA 94553
Phone (415) 372-3700 • Fax (415) 372-6955

61006.04/011960

RESNA Industries
3315 Alamden Expressway, #34
San Jose, CA 95118
Attn: Phillip Mayberry
Project Manager

Date Sampled: 06-19-92
Date Received: 06-22-92
Date Reported: 06-25-92

Sample Number	Sample Description
062154	Project # 61006.04 Texaco - Alameda 1127 Lincoln Avenue S-9 1/2-MW7 SOIL

ANALYSIS

	Detection Limit	Sample Results
	ppm	ppm
Total Petroleum Hydrocarbons as Gasoline	1.0	<1.0
Benzene	0.005	<0.005
Toluene	0.005	<0.005
Xylenes	0.005	<0.005
Ethylbenzene	0.005	<0.005

QA/QC: Sample blank is none detected

Note: Analysis was performed using EPA methods 5030 and TPH LUFT with method 8020 used for BTX distinction.
(ppm) = (mg/kg)

MOBILE CHEM LABS

Ronald G. Evans
Lab Director

RESNA

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST

PROJECT NO: 61006 04

PROJECT NAME/SITE: TEXACO - ALAMEDA, 1127 LINCOLN AVE., ALAMEDA, CA.

SAMPLERS (SIGN): Philip J. Mayberry (PRINT): PHILIP MAYBERRY

P.O. #:

SAMPLE IDENTIFICATION	DATE	TIME	COMP	GRAB	PRES. USED	ICED	NO. CONTAINERS	SAMPLE TYPE	BTEX (602/8020)	TPHg (8015)	TPHd (8015)	TOG 418.1/5520	601/8010	624/8240	625/8270	REMARKS
S - 5½ - MW6	6-19-92	10:45				✓	1	S	X	X						
S - 10 - MW6	↓	11:00				✓	1	S	X	X						
S - 6 - MW7		2:30				✓	1	S	X	X						
S - 9½ - MW7		2:45				✓	1	S	X	X						

RELINQUISHED BY	DATE	TIME	RECEIVED BY:
Philip J. Mayberry	6.19.92	2:15	David Rhein
RELINQUISHED BY	DATE	TIME	RECEIVED BY:
RELINQUISHED BY	DATE	TIME	RECEIVED BY:
RELINQUISHED BY	DATE	TIME	RECEIVED BY LABORATORY:

LABORATORY: Mobile Chem Labs

REQUESTED TURNAROUND TIME: 2 WK.

RECEIPT CONDITION:

PLEASE SEND RESULTS TO:
RESNA
ATTN: P. MAYBERRY
3315 ALMADEN EXPRESSWAY
SUITE 34
SAN JOSE, CA. 95118

PROJECT MANAGER: PHILIP MAYBERRY

MOBILE CHEM LABS INC.

5021 Blum Road, Suite 3 • Martinez, CA 94553
Phone (415) 372-3700 • Fax (415) 372-6955

61006.04/011959

RESNA Industries
3315 Alamden Expressway, #34
San Jose, CA 95118
Attn: Phillip Mayberry
Project Manager

Date Sampled: 06-17-92
Date Received: 06-19-92
Date Reported: 06-25-92

Sample Number	Sample Description
062133	Project # 61006.04 Texaco - Alameda 1127 Lincoln Avenue S-5 1/2-B13 SOIL

ANALYSIS

	Detection Limit	Sample Results
	ppm	ppm
Total Petroleum Hydrocarbons as Gasoline	1.0	<1.0
Benzene	0.005	<0.005
Toluene	0.005	<0.005
Xylenes	0.005	<0.005
Ethylbenzene	0.005	<0.005

QA/QC: Sample blank is none detected

Note: Analysis was performed using EPA methods 5030 and TPH LUFT with method 8020 used for BTX distinction.
(ppm) = (mg/kg)

MOBILE CHEM LABS

Ronald G. Evans
Lab Director

MOBILE CHEM LABS INC.

5021 Blum Road, Suite 3 • Martinez, CA 94553
Phone (415) 372-3700 • Fax (415) 372-6955

61006.04/011959

RESNA Industries
3315 Alamden Expressway, #34
San Jose, CA 95118
Attn: Phillip Mayberry
Project Manager

Date Sampled: 06-17-92
Date Received: 06-19-92
Date Reported: 06-25-92

Sample Number	Sample Description
062134	Project # 61006.04 Texaco - Alameda 1127 Lincoln Avenue S-10 1/2-B13 SOIL

ANALYSIS

	Detection Limit	Sample Results
	ppm	ppm
Total Petroleum Hydrocarbons as Gasoline	1.0	21
Benzene	0.005	0.21
Toluene	0.005	0.54
Xylenes	0.005	7.6
Ethylbenzene	0.005	1.6

QA/QC: Sample blank is none detected
Duplicate Deviation is 5.5%

Note: Analysis was performed using EPA methods 5030 and TPH LUFT with method 8020 used for BTX distinction.
(ppm) = (mg/kg)

MOBILE CHEM LABS

Ronald G. Evans
Lab Director

MOBILE CHEM LABS INC.

5021 Blum Road, Suite 3 • Martinez, CA 94553
Phone (415) 372-3700 • Fax (415) 372-6955

61006.04/011959

RESNA Industries
3315 Alamden Expressway, #34
San Jose, CA 95118
Attn: Phillip Mayberry
Project Manager

Date Sampled: 06-17-92
Date Received: 06-19-92
Date Reported: 06-25-92

Sample Number	Sample Description
062135	Project # 61006.04 Texaco - Alameda 1127 Lincoln Avenue S-5 1/2-B16 SOIL

ANALYSIS

	Detection Limit	Sample Results
	ppm	ppm
Total Petroleum Hydrocarbons as Gasoline	1.0	<1.0
Benzene	0.005	<0.005
Toluene	0.005	<0.005
Xylenes	0.005	<0.005
Ethylbenzene	0.005	<0.005

QA/QC: Sample blank is none detected

Note: Analysis was performed using EPA methods 5030 and TPH LUFT with method 8020 used for BTX distinction.
(ppm) = (mg/kg)

MOBILE CHEM LABS

Ronald G. Evans
Lab Director

MOBILE CHEM LABS INC.

5021 Blum Road, Suite 3 • Martinez, CA 94553
Phone (415) 372-3700 • Fax (415) 372-6955

61006.04/011959

RESNA Industries
3315 Alamden Expressway, #34
San Jose, CA 95118
Attn: Phillip Mayberry
Project Manager

Date Sampled: 06-17-92
Date Received: 06-19-92
Date Reported: 06-25-92

Sample Number	Sample Description
062136	Project # 61006.04 Texaco - Alameda 1127 Lincoln Avenue S-10 1/2-B16 SOIL

ANALYSIS

	Detection Limit	Sample Results
	ppm	ppm
Total Petroleum Hydrocarbons as Gasoline	1.0	<1.0
Benzene	0.005	0.051
Toluene	0.005	<0.005
Xylenes	0.005	0.013
Ethylbenzene	0.005	0.007

QA/QC: Sample blank is none detected

Note: Analysis was performed using EPA methods 5030 and TPH LUFT with method 8020 used for BTX distinction.
(ppm) = (mg/kg)

MOBILE CHEM LABS

Ronald G. Evans
Lab Director

MOBILE CHEM LABS INC.

5021 Blum Road, Suite 3 • Martinez, CA 94553
Phone (415) 372-3700 • Fax (415) 372-6955

61006.04/011959

RESNA Industries
3315 Alamden Expressway, #34
San Jose, CA 95118
Attn: Phillip Mayberry
Project Manager

Date Sampled: 06-18-92
Date Received: 06-19-92
Date Reported: 06-25-92

Sample Number	Sample Description
062137	Project # 61006.04 Texaco - Alameda 1127 Lincoln Avenue S-5 1/2-B12 SOIL

ANALYSIS

	Detection Limit	Sample Results
	ppm	ppm
Total Petroleum Hydrocarbons as Gasoline	1.0	<1.0
Benzene	0.005	<0.005
Toluene	0.005	<0.005
Xylenes	0.005	<0.005
Ethylbenzene	0.005	<0.005

QA/QC: Sample blank is none detected

Note: Analysis was performed using EPA methods 5030 and TPH LUFT with method 8020 used for BTX distinction.
(ppm) = (mg/kg)

MOBILE CHEM LABS

Ronald G. Evans
Lab Director

MOBILE CHEM LABS INC.

5021 Blum Road, Suite 3 • Martinez, CA 94553
Phone (415) 372-3700 • Fax (415) 372-6955

61006.04/011959

RESNA Industries
3315 Alamden Expressway, #34
San Jose, CA 95118
Attn: Phillip Mayberry
Project Manager

Date Sampled: 06-18-92
Date Received: 06-19-92
Date Reported: 06-25-92

Sample Number	Sample Description
062138	Project # 61006.04 Texaco - Alameda 1127 Lincoln Avenue S-9 1/2-B12 SOIL

ANALYSIS

	Detection Limit	Sample Results
	ppm	ppm
Total Petroleum Hydrocarbons as Gasoline	1.0	<1.0
Benzene	0.005	<0.005
Toluene	0.005	<0.005
Xylenes	0.005	<0.005
Ethylbenzene	0.005	<0.005

QA/QC: Sample blank is none detected

Note: Analysis was performed using EPA methods 5030 and TPH LUFT with method 8020 used for BTX distinction.
(ppm) = (mg/kg)

MOBILE CHEM LABS

Ronald G. Evans
Lab Director

RESNA

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST

PROJECT NO	PROJECT NAME/SITE		P.O. #:
[illegible]	Texaco Alameda	1127 Lincoln Ave. Alameda, CA	

SAMPLERS (SIGN) [illegible] / (PRINT) Kathy Thomas

SAMPLE IDENTIFICATION	DATE	TIME	COMP	GRAB	PRES. USED	ICED	NO. CONTAINERS	SAMPLE TYPE	BTEX (602/8020)	TPHg (8015)	TPHd (8015)	TOG 418.1/5520	601/8010	624/8240	625/8270						REMARKS
[illegible]	10/17/92			X		X	1	S	X	X											
[illegible]	"			X		X	1	S	X	X											
[illegible]	"			X		X	1	S	X	X											
[illegible]	"			X		X	1	S	X	X											
[illegible]	10/18/92			X		X	1	S	X	X											
[illegible]	"			X		X	1	S	X	X											

RELINQUISHED BY	DATE	TIME	RECEIVED BY:	LABORATORY:	PLEASE SEND RESULTS TO:
[illegible]	10/19/92	2:00	[signature]	Mobil Chem Lab	RESNA 3315 Almaden Expressway Suite 34 San Jose, CA 95118
RELINQUISHED BY	DATE	TIME	RECEIVED BY:		
RELINQUISHED BY	DATE	TIME	RECEIVED BY:	REQUESTED TURNAROUND TIME:	
RELINQUISHED BY	DATE	TIME	RECEIVED BY LABORATORY:	RECEIPT CONDITION:	PROJECT MANAGER: Phil Mayberry

MOBILE CHEM LABS INC.

5021 Blum Road, Suite 3 • Martinez, CA 94553
Phone (415) 372-3700 • Fax (415) 372-6955

61006.04/011970

RESNA Industries
3315 Alamden Expressway, #34
San Jose, CA 95118
Attn: Phillip Mayberry
Project Manager

Date Sampled: 06-25-92
Date Received: 06-26-92
Date Reported: 06-29-92

Sample Number	Sample Description
062210	Project # 61006.04 Texaco - Alameda S-pile-(A-D) SOIL

ANALYSIS

	Detection Limit	Sample Results
	ppm	ppm
Total Petroleum Hydrocarbons as Gasoline	1.0	<1.0
Benzene	0.005	<0.005
Toluene	0.005	<0.005
Xylenes	0.005	0.010
Ethylbenzene	0.005	<0.005

QA/QC: Sample blank is none detected

Note: Analysis was performed using EPA methods 5030 and TPH LUFT with method 8020 used for BTX distinction.
(ppm) = (mg/kg)

MOBILE CHEM LABS

Ronald G. Evans
Lab Director

MOBILE CHEM LABS INC.

5021 Blum Road, Suite 3 • Martinez, CA 94553
Phone (415) 372-3700 • Fax (415) 372-6955

61006.04/011970

RESNA Industries
3315 Alamden Expressway, #34
San Jose, CA 95118
Attn: Phillip Mayberry
Project Manager

Date Sampled: 06-25-92
Date Received: 06-26-92
Date Reported: 06-29-92

Sample Number	Sample Description
062209	Project # 61006.04 Texaco - Alameda W-7-MW8 WATER

ANALYSIS

	Detection Limit	Sample Results
	ppb	ppb
Total Petroleum Hydrocarbons as Gasoline	50	11,000
Benzene	0.5	1,100
Toluene	0.5	29
Xylenes	0.5	190
Ethylbenzene	0.5	150

QA/QC: Sample blank is none detected

Note: Analysis was performed using EPA methods 5030 and TPH LUFT with method 602 used for BTX distinction.
(ppb) = (μg/L)

MOBILE CHEM LABS

Ronald G. Evans
Lab Director

RESNA

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST

PROJECT NO.: [illegible]

PROJECT NAME/SITE: Texaco / Alameda

SAMPLERS (SIGN): [illegible] (PRINT): Jeanne Buckhal

P.O. #:

SAMPLE IDENTIFICATION	DATE	TIME	COMP	GRAB	PRES. USED	ICED	NO. CONTAINERS	SAMPLE TYPE	BTEX (602/8020)	TPHg (8015)	TPHd (8015)	TOG 418.1/5520	601/8010	624/8240	625/8270	hold				REMARKS
[illegible]	6 25 92	10 05				Y	1	W								X				
[illegible]		10.15					3	W	X	X										
[illegible]		18:20		X				S												composite 4 samples into one
[illegible] composite		18:25		X				S												
		18 30		X				S												
[illegible]		18:35		X				S												

RELINQUISHED BY	DATE	TIME	RECEIVED BY:	LABORATORY:	PLEASE SEND RESULTS TO:
[illegible]	10.26.92	9.30	Dave P. Kearns	Mobile Chem	San Jose office
RELINQUISHED BY	DATE	TIME	RECEIVED BY:		
RELINQUISHED BY	DATE	TIME	RECEIVED BY:	REQUESTED TURNAROUND TIME: 2 weeks (standard)	
RELINQUISHED BY	DATE	TIME	RECEIVED BY LABORATORY:	RECEIPT CONDITION:	PROJECT MANAGER:

MOBILE CHEM LABS INC.

5021 Blum Road, Suite 3 • Martinez, CA 94553
Phone (415) 372-3700 • Fax (415) 372-6955

61006.04/011970

RESNA Industries
3315 Alamden Expressway, #34
San Jose, CA 95118
Attn: Phillip Mayberry
Project Manager

Date Sampled: 06-25-92
Date Received: 06-26-92
Date Reported: 06-29-92

Sample Number	Sample Description
062194	Project # 61006.04 Texaco - Alameda W-8-MW1R WATER

ANALYSIS

	Detection Limit	Sample Results
	ppb	ppb
Total Petroleum Hydrocarbons as Gasoline	50	<50
Benzene	0.5	<0.5
Toluene	0.5	<0.5
Xylenes	0.5	<0.5
Ethylbenzene	0.5	<0.5

QA/QC: Sample blank is none detected

Note: Analysis was performed using EPA methods 5030 and TPH LUFT with method 602 used for BTX distinction.
(ppb) = (µg/L)

MOBILE CHEM LABS

Ronald G. Evans
Lab Director

MOBILE CHEM LABS INC.

5021 Blum Road, Suite 3 • Martinez, CA 94553
Phone (415) 372-3700 • Fax (415) 372-6955

61006.04/011970

RESNA Industries
3315 Alamden Expressway, #34
San Jose, CA 95118
Attn: Phillip Mayberry
Project Manager

Date Sampled: 06-25-92
Date Received: 06-26-92
Date Reported: 06-29-92

Sample Number	Sample Description
062195	Project # 61006.04 Texaco - Alameda W-8-MW1 WATER

ANALYSIS

	Detection Limit	Sample Results
	ppb	ppb
Total Petroleum Hydrocarbons as Gasoline	50	4,000
Benzene	0.5	680
Toluene	0.5	110
Xylenes	0.5	140
Ethylbenzene	0.5	73

QA/QC: Sample blank is none detected

Note: Analysis was performed using EPA methods 5030 and TPH LUFT with method 602 used for BTX distinction.
(ppb) = (µg/L)

MOBILE CHEM LABS

Ronald G. Evans
Lab Director

MOBILE CHEM LABS INC.

5021 Blum Road, Suite 3 • Martinez, CA 94553
Phone (415) 372-3700 • Fax (415) 372-6955

61006.04/011970

RESNA Industries
3315 Alamden Expressway, #34
San Jose, CA 95118
Attn: Phillip Mayberry
Project Manager

Date Sampled: 06-25-92
Date Received: 06-26-92
Date Reported: 06-29-92

Sample Number	Sample Description
062197	Project # 61006.04 Texaco - Alameda W-8-MW2 WATER

ANALYSIS

	Detection Limit	Sample Results
	ppb	ppb
Total Petroleum Hydrocarbons as Gasoline	50	4,700
Benzene	0.5	590
Toluene	0.5	24
Xylenes	0.5	160
Ethylbenzene	0.5	290

QA/QC: Sample blank is none detected

Note: Analysis was performed using EPA methods 5030 and TPH LUFT with method 602 used for BTX distinction.
(ppb) = (µg/L)

MOBILE CHEM LABS

Ronald G. Evans
Lab Director

MOBILE CHEM LABS INC.

5021 Blum Road, Suite 3 • Martinez, CA 94553
Phone (415) 372-3700 • Fax (415) 372-6955

61006.04/011970

RESNA Industries
3315 Alamden Expressway, #34
San Jose, CA 95118
Attn: Phillip Mayberry
Project Manager

Date Sampled: 06-25-92
Date Received: 06-26-92
Date Reported: 06-29-92

Sample Number	Sample Description
062199	Project # 61006.04 Texaco - Alameda W-8-MW3 WATER

ANALYSIS

	Detection Limit	Sample Results
	ppb	ppb
Total Petroleum Hydrocarbons as Gasoline	50	4,900
Benzene	0.5	350
Toluene	0.5	11
Xylenes	0.5	570
Ethylbenzene	0.5	330

QA/QC: Sample blank is none detected

Note: Analysis was performed using EPA methods 5030 and TPH LUFT with method 602 used for BTX distinction.
(ppb) = (µg/L)

MOBILE CHEM LABS

Ronald G. Evans
Lab Director

MOBILE CHEM LABS INC.

5021 Blum Road, Suite 3 • Martinez, CA 94553
Phone (415) 372-3700 • Fax (415) 372-6955

61006.04/011970

RESNA Industries
3315 Alamden Expressway, #34
San Jose, CA 95118
Attn: Phillip Mayberry
Project Manager

Date Sampled: 06-25-92
Date Received: 06-26-92
Date Reported: 06-29-92

Sample Number	Sample Description
062201	Project # 61006.04 Texaco - Alameda W-8-MW4 WATER

ANALYSIS

	Detection Limit	Sample Results
	ppb	ppb
Total Petroleum Hydrocarbons as Gasoline	50	<50
Benzene	0.5	<0.5
Toluene	0.5	<0.5
Xylenes	0.5	<0.5
Ethylbenzene	0.5	<0.5

QA/QC: Sample blank is none detected

Note: Analysis was performed using EPA methods 5030 and TPH LUFT with method 602 used for BTX distinction.
(ppb) = (µg/L)

MOBILE CHEM LABS

Ronald G. Evans
Lab Director

MOBILE CHEM LABS INC.

5021 Blum Road, Suite 3 • Martinez, CA 94553
Phone (415) 372-3700 • Fax (415) 372-6955

61006.04/011970

RESNA Industries
3315 Alamden Expressway, #34
San Jose, CA 95118
Attn: Phillip Mayberry
Project Manager

Date Sampled: 06-25-92
Date Received: 06-26-92
Date Reported: 06-29-92

Sample Number	Sample Description
062203	Project # 61006.04 Texaco - Alameda W-7-MW5 WATER

ANALYSIS

	Detection Limit	Sample Results
	ppb	ppb
Total Petroleum Hydrocarbons as Gasoline	50	18,000
Benzene	0.5	310
Toluene	0.5	1,200
Xylenes	0.5	2,400
Ethylbenzene	0.5	750

QA/QC: Sample blank is none detected

Note: Analysis was performed using EPA methods 5030 and TPH LUFT with method 602 used for BTX distinction.
(ppb) = (µg/L)

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Lab Director

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61006.04/011970

RESNA Industries
3315 Alamden Expressway, #34
San Jose, CA 95118
Attn: Phillip Mayberry
Project Manager

Date Sampled: 06-25-92
Date Received: 06-26-92
Date Reported: 06-29-92

Sample Number	Sample Description
062205	Project # 61006.04 Texaco - Alameda W-8-MW6 WATER

ANALYSIS

	Detection Limit	Sample Results
	ppb	ppb
Total Petroleum Hydrocarbons as Gasoline	50	990
Benzene	0.5	10
Toluene	0.5	240
Xylenes	0.5	310
Ethylbenzene	0.5	55

QA/QC: Sample blank is none detected

Note: Analysis was performed using EPA methods 5030 and TPH LUFT with method 602 used for BTX distinction.
(ppb) = (µg/L)

MOBILE CHEM LABS

Ronald G. Evans
Lab Director

MOBILE CHEM LABS INC.

5021 Blum Road, Suite 3 • Martinez, CA 94553
Phone (415) 372-3700 • Fax (415) 372-6955

61006.04/011970

RESNA Industries
3315 Alamden Expressway, #34
San Jose, CA 95118
Attn: Phillip Mayberry
Project Manager

Date Sampled: 06-25-92
Date Received: 06-26-92
Date Reported: 06-29-92

Sample Number	Sample Description
062207	Project # 61006.04 Texaco - Alameda W-7-MW7 WATER

ANALYSIS

	Detection Limit	Sample Results
	ppb	ppb
Total Petroleum Hydrocarbons as Gasoline	50	<50
Benzene	0.5	<0.5
Toluene	0.5	<0.5
Xylenes	0.5	<0.5
Ethylbenzene	0.5	<0.5

QA/QC: Sample blank is none detected

Note: Analysis was performed using EPA methods 5030 and TPH LUFT with method 602 used for BTX distinction.
(ppb) = (µg/L)

MOBILE CHEM LABS

Ronald G. Evans
Lab Director

RESNA

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST

PROJECT NO: [illegible]

PROJECT NAME/SITE: Texaco / Alameda

SAMPLERS (SIGN): [signature] / (PRINT): Jeanne Bucknall

ANALYSIS REQUESTED | P.O. #:

SAMPLE IDENTIFICATION	DATE	TIME	COMP	GRAB	PRES. USED	ICED	NO. CONTAINERS	SAMPLE TYPE	BTEX (602/8020)	TPHg (8015)	TPHd (8015)	TOG 418.1/5520	601/8010	624/8240	625/8270	[illegible]	[illegible]	[illegible]	[illegible]	REMARKS
[illegible]	6-25-92	14:55				Y	1	W	X	X										
[illegible]		15:00					3		X	X										
[illegible]		16:55					1									X				
[illegible]		17:00					3		X	X										
[illegible]		17:20					1									X				
[illegible]		17:25					3		X	X										
[illegible]		12:00					1									X				
[illegible]		17:05					3		X	X										
[illegible]		14 35					1									X				
[illegible]		14:40					3		X	X										
[illegible]		11:40					1									X				
[illegible]		11:45					3		X	X										
[illegible]		9:20					1									X				
[illegible]	↓	9:25				↓	3	↓	X	X										

RELINQUISHED BY	DATE	TIME	RECEIVED BY:	LABORATORY:	PLEASE SEND RESULTS TO:
[signature]	6-24-92	9:30	[signature]	Mobile Chem	San Jose office
RELINQUISHED BY	DATE	TIME	RECEIVED BY:		
RELINQUISHED BY	DATE	TIME	RECEIVED BY:	REQUESTED TURNAROUND TIME: 2 weeks (standard)	
RELINQUISHED BY	DATE	TIME	RECEIVED BY LABORATORY:	RECEIPT CONDITION:	PROJECT MANAGER:

APPENDIX F

SIEVE ANALYSIS REPORT

DRILLER HEW DRILLING INC.

ENGINEER

ANALYSIS BY BILL SCHAFER
DATE July 1, 1992

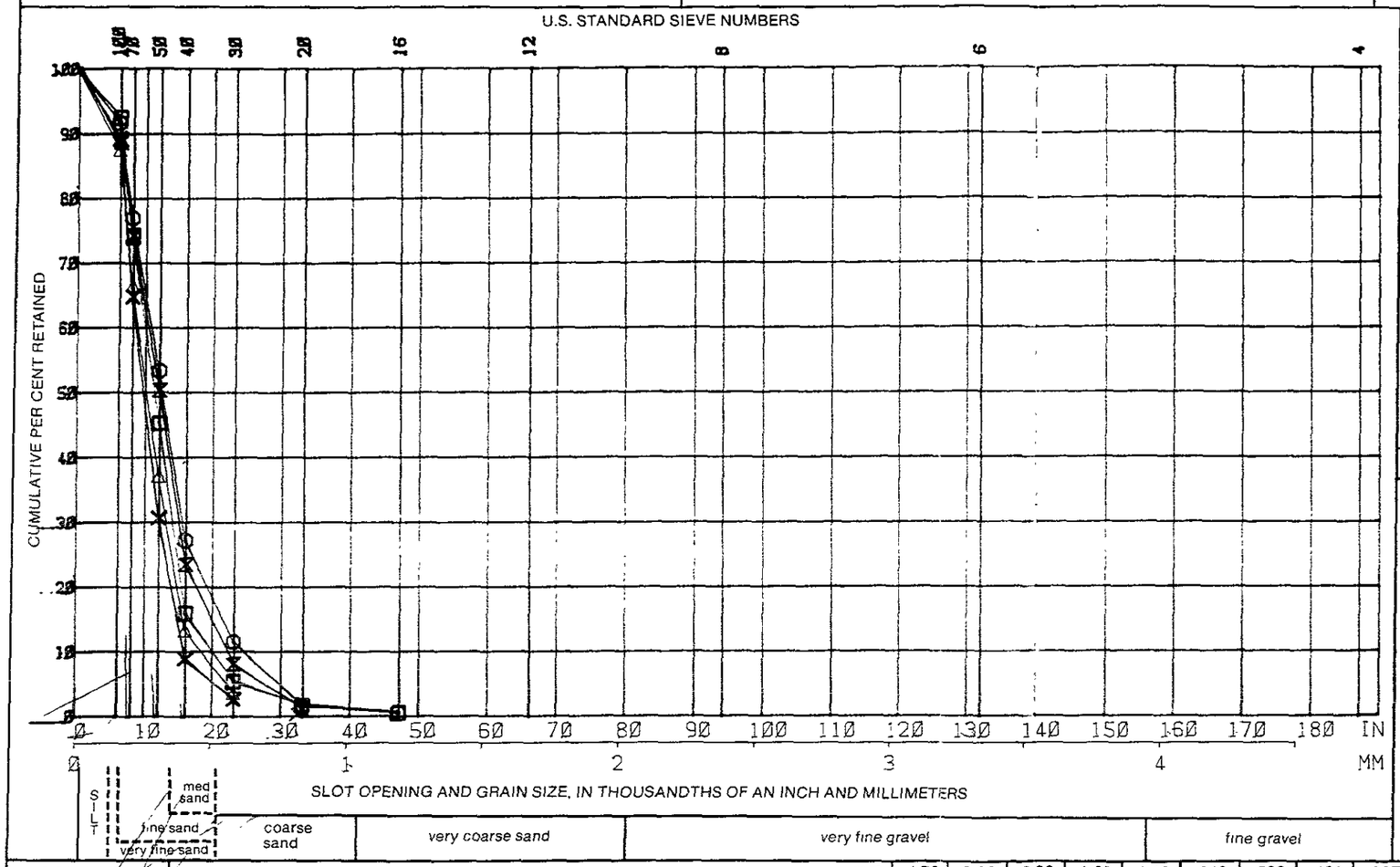
JOB NAME TEXACO ALAMEDA

LOCATION ALAMEDA
CA

JOHNSON I.D. NUMBER 92182
SAMPLE SENT IN BY RESNA

SAND ANALYSIS REPORT

Johnson Filtration Systems Inc.
World Leader through Talent & Technology™
P.O. Box 64118 • St. Paul, Minnesota 55164-0118
612-636-3900 • 1-800-VEE-WIRE • FAX 612-638-3171



TEST HOLE DATA

DIAMETER 10.000

DEPTH 20

DRILLING METHOD
AUGER

DRILLING FLUID

GEOPHYSICAL LOGS

STATIC WATER LEVEL
7

COMMENTS

WELL DATA

CASING DIAMETER 4.000

DESIRED YIELD

WELL APPLICATION
MONITORING

DESIGN RECOMMENDATIONS

RECOMMEND:
JOHNSON SCREENS 30 SLOT
(0.030IN.) WITH A
10-20 SILICA PACK OR
EQUIVALENT.

SCREEN RECOMMENDATIONS

DIAMETER

SLOT	LENGTH	SETTING

COMBINED SAMPLE DEPTHS	PHYSICAL SAMPLE DESCRIPTION	mm	4.76	3.36	2.38	1.68	1.19	.840	.590	.420	.297	.210	.149	.074	.053	TOTAL WT
		Inches	187	132	094	066	047	033	023	016	012	008	006	003	002	
		U.S. Sieve	4	6	8	12	16	20	30	40	50	70	100	200	270	
[illegible]	[illegible] SILT TO COARSE SAND	(CUMULATIVE PER CENT RETAINED)	[illegible]													
[illegible]	[illegible] SILT TO MEDIUM SAND		[illegible]													
[illegible]	[illegible] SILT TO COARSE SAND		[illegible]													
[illegible]	X SILT TO COARSE SAND		[illegible]													
[illegible]	X SILT TO MEDIUM SAND		[illegible]													

SO MANY CONSIDERATIONS ENTER INTO THE MAKING OF A GOOD WELL THAT WHILE WE BELIEVE SLOT SIZES FURNISHED OR RECOMMENDED FROM SAND SAMPLES ARE CORRECT WE ASSUME NO RESPONSIBILITY FOR THE SUCCESSFUL OPERATION OF JOHNSON WELL SCREENS

APPENDIX G

PUMPING AND RECOVERY TEST DATA AND ANALYSES

PUMPING AND RECOVERY TEST DATA AND ANALYSES
1127 Lincoln Avenue, Alameda, California

Data from measurements for drawdown as a function of time for wells MW-1 through MW-3 (datalogger and manually obtained), and MW-4, MW-6, and MW-8 are tabulated on pages G1 through G28 of this Appendix.

The drawdown data collected were analyzed using the method of the Jacob (1950) approximation for the Theis (1935) equation (see Plates G5 through G13). For the Jacob approximation the transmissivity (T) was calculated as

$$T = 2.3\ Q\ /\ [4\ \pi\ s]$$

where the discharge (Q) was 1.2 gpm and "s" is the drawdown per log cycle, for both the pumping and the recovery data.

The water level in the pumping well recovered fairly rapidly, being about 96% recovered within 5 hours. Recovery data for the surrounding monitoring wells are plotted on Plates G14 through G22 where the residual drawdown is plotted versus normalized recovery (time since the start of pumping divided by time since the cessation of pumping).

The value of "s" for each well is also shown on Plates G5 through G22. The storativity (S) was calculated as

$$S = 2.25\ T\ t_o\ /\ r^2$$

where "t_o" is the x-intercept for the pumping data and "r" is the radial distance from the pumping well to the observation well.

For reasons described in the text of this report, the data were also analyzed using the Graphical Well Analysis Package (GWAP) (1991) software using the methods of Hantush (1956) and Neuman (1975). The Neuman analysis for unconfined aquifers was conducted for both elastic and delayed response. Details and solutions of these pumping test analyses are presented on Plates G23 through G31 (Hantush); Plates G32 through G40 (Neuman elastic response); and Plates G41 through G49 (Neuman delayed response).

The transmissivity values obtained by the above methods are shown in Table 5 of the present report. The storativity values are shown in Table 6

Discussion. The sustainable extraction rate from this well appears to be around 1.2 gpm. The transmissivities estimated with the observation wells (MW-1, MW-2, MW-3, MW-4, MW-6 and MW-8) by all five methods described above are in very good agreement, generally varying by less than 50%. Results from all the wells produce an average transmissivity of 1,124 gpd/ft or 150.3 ft^2/d. Hydraulic conductivity values could not be estimated because the thickness of the water-bearing zone was not known.

The storage coefficients estimated are in very close agreement. The storage coefficients are in the range generally considered to be representative of a confined aquifer, which seems to conflict with observed soil stratigraphy but is supported by the behavior of water levels in the borings after water was encountered.

Zone of Capture Calculation. The steady-state zone of capture (Bear, 1979) for this well can be estimated for a pumping rate (Q) of 1.2 gpm (= 231 ft^3/d), an average transmissivity (T) of 1,124 gpd/ft (= 150.3 ft^2/d), and the observed hydraulic gradient (dh/dl) of 0.01. The width (w) of the zone of capture up-gradient of MW-5 is 154 ft and the distance to the down-gradient stagnation point (r) is 24 ft.

$$w = Q/T(dh/dl) = 231\ ft^3/d\ /\ [150.3\ ft^2/d\ (0.01)] = 154\ ft$$

$$r = Q/2\pi T(dh/dl)$$
$$= 231\ ft^3/d\ /\ [2\ (3.1416)\ 150.3\ ft^2/d\ (0.01)]$$
$$= 24\ ft$$

This predicted zone of capture is depicted on Plate G4 of this report. It is in quite good agreement with the zone being captured at the end of the pumping test, as depicted on Plate G2.

Data for Pump Test

Well Name: MW-1 Date of Test: 7-28-92
Aquifer Thickness (b): 15.000 ft
Pumped Well Discharge(Q) = 1.200 gpm
Radius of Pumping Well = 0.167 ft
Distance of Observation Well from Pumping Well = 51.000 ft

Entry No.	Time(t) (min)	Drawdown(s) (ft)	t / d^2 (min/sq ft)
1	0.000	0.000	
2	0.008	0.005	3.076E-0006
3	0.017	0.005	6.536E-0006
4	0.025	0.005	9.612E-0006
5	0.033	0.000	1.269E-0005
6	0.042	0.005	1.615E-0005
7	0.050	0.005	1.922E-0005
8	0.058	0.005	2.230E-0005
9	0.067	0.000	2.576E-0005
10	0.075	0.000	2.884E-0005
11	0.083	0.000	3.191E-0005
12	0.100	0.000	3.845E-0005
13	0.117	0.005	4.498E-0005
14	0.133	0.005	5.113E-0005
15	0.150	0.005	5.767E-0005
16	0.167	0.005	6.421E-0005
17	0.183	0.010	7.036E-0005
18	0.200	0.005	7.689E-0005
19	0.217	0.005	8.343E-0005
20	0.233	0.000	8.958E-0005
21	0.250	0.010	9.612E-0005
22	0.267	0.000	1.027E-0004
23	0.283	0.005	1.088E-0004
24	0.300	0.000	1.153E-0004
25	0.317	0.010	1.219E-0004
26	0.333	0.005	1.280E-0004
27	0.417	0.000	1.603E-0004
28	0.500	0.005	1.922E-0004
29	0.583	0.005	2.241E-0004
30	0.916	0.000	3.522E-0004
31	1.583	0.005	6.086E-0004
32	1.666	0.000	6.405E-0004
33	1.750	0.005	6.728E-0004
34	4.000	0.010	1.538E-0003
35	4.500	0.014	1.730E-0003
36	5.500	0.010	2.115E-0003
37	6.000	0.018	2.307E-0003
38	7.500	0.023	2.884E-0003
39	8.000	0.028	3.076E-0003
40	9.500	0.032	3.652E-0003
41	12.000	0.051	4.614E-0003
42	16.000	0.061	6.151E-0003
43	18.000	0.070	6.920E-0003
44	22.000	0.089	8.458E-0003

45	24.000	0.098	9.227E-0003
46	28.000	0.112	1.077E-0002
47	30.000	0.117	1.153E-0002
48	32.000	0.122	1.230E-0002
49	34.000	0.131	1.307E-0002
50	36.000	0.136	1.384E-0002
51	38.000	0.141	1.461E-0002
52	40.000	0.150	1.538E-0002
53	42.000	0.159	1.615E-0002
54	44.000	0.164	1.692E-0002
55	46.000	0.173	1.769E-0002
56	50.000	0.183	1.922E-0002
57	52.000	0.188	1.999E-0002
58	54.000	0.197	2.076E-0002
59	58.000	0.202	2.230E-0002
60	62.000	0.211	2.384E-0002
61	64.000	0.216	2.461E-0002
62	68.000	0.225	2.614E-0002
63	72.000	0.235	2.768E-0002
64	74.000	0.244	2.845E-0002
65	80.000	0.249	3.076E-0002
66	86.000	0.258	3.306E-0002
67	94.000	0.268	3.614E-0002
68	105.000	0.282	4.037E-0002
69	110.000	0.291	4.229E-0002
70	115.000	0.286	4.421E-0002
71	120.000	0.291	4.614E-0002
72	125.000	0.301	4.806E-0002
73	135.000	0.305	5.190E-0002
74	140.000	0.319	5.383E-0002
75	150.000	0.324	5.767E-0002
76	165.000	0.338	6.344E-0002
77	170.000	0.329	6.536E-0002
78	175.000	0.343	6.728E-0002
79	180.000	0.343	6.920E-0002
80	190.000	0.352	7.305E-0002
81	200.000	0.357	7.689E-0002
82	215.000	0.366	8.266E-0002
83	220.000	0.357	8.458E-0002
84	235.000	0.385	9.035E-0002
85	265.000	0.390	1.019E-0001
86	275.000	0.404	1.057E-0001
87	290.000	0.409	1.115E-0001
88	305.000	0.413	1.173E-0001
89	315.000	0.418	1.211E-0001
90	325.000	0.423	1.250E-0001
91	360.000	0.432	1.384E-0001
92	380.000	0.437	1.461E-0001
93	395.000	0.442	1.519E-0001
94	415.000	0.446	1.596E-0001
95	420.000	0.451	1.615E-0001
96	445.000	0.451	1.711E-0001
97	455.000	0.460	1.749E-0001
98	485.000	0.470	1.865E-0001
99	495.000	0.475	1.903E-0001
100	510.000	0.479	1.961E-0001
101	525.000	0.484	2.018E-0001
102	540.000	0.489	2.076E-0001
103	550.000	0.493	2.115E-0001
104	565.000	0.498	2.172E-0001
105	575.000	0.503	2.211E-0001

106	580.000	0.508	2.230E-0001
107	585.000	0.512	2.249E-0001
108	595.000	0.508	2.288E-0001
109	600.000	0.517	2.307E-0001
110	620.000	0.522	2.384E-0001
111	645.000	0.526	2.480E-0001
112	670.000	0.531	2.576E-0001
113	690.000	0.526	2.653E-0001
114	710.000	0.531	2.730E-0001
115	725.000	0.536	2.787E-0001
116	750.000	0.540	2.884E-0001
117	785.000	0.545	3.018E-0001
118	860.000	0.550	3.306E-0001
119	915.000	0.559	3.518E-0001
120	955.000	0.564	3.672E-0001
121	975.000	0.564	3.749E-0001
122	990.000	0.569	3.806E-0001
123	1015.000	0.578	3.902E-0001
124	1030.000	0.583	3.960E-0001
125	1055.000	0.578	4.056E-0001
126	1070.000	0.583	4.114E-0001
127	1085.000	0.588	4.171E-0001
128	1105.000	0.588	4.248E-0001
129	1135.000	0.592	4.364E-0001
130	1145.000	0.597	4.402E-0001
131	1160.000	0.592	4.460E-0001
132	1170.000	0.597	4.498E-0001
133	1180.000	0.602	4.537E-0001
134	1205.000	0.606	4.633E-0001
135	1220.000	0.611	4.691E-0001
136	1230.000	0.606	4.729E-0001
137	1235.000	0.616	4.748E-0001
138	1245.000	0.611	4.787E-0001
139	1255.000	0.616	4.825E-0001
140	1280.000	0.611	4.921E-0001
141	1295.000	0.616	4.979E-0001
142	1310.000	0.620	5.037E-0001
143	1345.000	0.616	5.171E-0001
144	1365.000	0.620	5.248E-0001
145	1385.000	0.616	5.325E-0001
146	1405.000	0.620	5.402E-0001
147	1430.000	0.620	5.498E-0001
148	1435.000	0.620	5.517E-0001

Data for Pump Test

Well Name: MW-1M Date of Test: 7-28-92
Aquifer Thickness (b): 15.000 ft
Pumped Well Discharge(Q) = 1.200 gpm
Radius of Pumping Well = 0.167 ft
Distance of Observation Well from Pumping Well = 51.000 ft

Entry No.	Time(t) (min)	Drawdown(s) (ft)	t / d^2 (min/sq ft)
1	31.000	0.110	1.192E-0002
2	37.000	0.150	1.423E-0002
3	42.000	0.160	1.615E-0002
4	49.000	0.170	1.884E-0002
5	58.000	0.240	2.230E-0002
6	69.000	0.240	2.653E-0002
7	79.000	0.230	3.037E-0002
8	100.000	0.260	3.845E-0002
9	125.000	0.280	4.806E-0002
10	145.000	0.320	5.575E-0002
11	165.000	0.310	6.344E-0002
12	195.000	0.350	7.497E-0002
13	225.000	0.370	8.651E-0002
14	255.000	0.370	9.804E-0002
15	285.000	0.390	1.096E-0001
16	315.000	0.390	1.211E-0001
17	375.000	0.420	1.442E-0001
18	435.000	0.440	1.672E-0001
19	495.000	0.460	1.903E-0001
20	555.000	0.470	2.134E-0001
21	615.000	0.520	2.364E-0001
22	675.000	0.520	2.595E-0001
23	735.000	0.530	2.826E-0001
24	795.000	0.530	3.057E-0001
25	855.000	0.540	3.287E-0001
26	915.000	0.550	3.518E-0001
27	975.000	0.560	3.749E-0001
28	1035.000	0.570	3.979E-0001
29	1095.000	0.580	4.210E-0001
30	1155.000	0.580	4.441E-0001
31	1215.000	0.610	4.671E-0001
32	1275.000	0.600	4.902E-0001
33	1335.000	0.610	5.133E-0001
34	1395.000	0.610	5.363E-0001

Data for Pump Test

Well Name: MW-2 Date of Test: 7-28-92
Aquifer Thickness (b): 15.000 ft
Pumped Well Discharge(Q) = 1.200 gpm
Radius of Pumping Well = 0.167 ft
Distance of Observation Well from Pumping Well = 58.400 ft

Entry No.	Time(t) (min)	Drawdown(s) (ft)	t / d^2 (min/sq ft)
1	0.000	0.000	
2	0.100	0.000	2.932E-0005
3	0.233	0.000	6.841E-0005
4	0.583	0.000	1.710E-0004
5	1.583	0.000	4.642E-0004
6	2.000	0.000	5.864E-0004
7	5.000	0.000	1.466E-0003
8	7.000	0.005	2.052E-0003
9	9.500	0.013	2.785E-0003
10	10.000	0.009	2.932E-0003
11	12.000	0.023	3.518E-0003
12	14.000	0.013	4.105E-0003
13	16.000	0.027	4.691E-0003
14	22.000	0.042	6.451E-0003
15	24.000	0.046	7.037E-0003
16	26.000	0.051	7.623E-0003
17	28.000	0.056	8.210E-0003
18	30.000	0.061	8.796E-0003
19	34.000	0.061	9.969E-0003
20	38.000	0.075	1.114E-0002
21	40.000	0.080	1.173E-0002
22	44.000	0.084	1.290E-0002
23	48.000	0.089	1.407E-0002
24	50.000	0.099	1.466E-0002
25	52.000	0.094	1.525E-0002
26	54.000	0.099	1.583E-0002
27	58.000	0.103	1.701E-0002
28	62.000	0.108	1.818E-0002
29	64.000	0.113	1.877E-0002
30	68.000	0.118	1.994E-0002
31	70.000	0.122	2.052E-0002
32	72.000	0.118	2.111E-0002
33	74.000	0.127	2.170E-0002
34	76.000	0.132	2.228E-0002
35	82.000	0.141	2.404E-0002
36	88.000	0.137	2.580E-0002
37	92.000	0.141	2.698E-0002
38	94.000	0.146	2.756E-0002
39	96.000	0.151	2.815E-0002
40	98.000	0.156	2.873E-0002
41	105.000	0.170	3.079E-0002
42	110.000	0.180	3.225E-0002
43	120.000	0.165	3.518E-0002
44	130.000	0.175	3.812E-0002

45	135.000	0.165	3.958E-0002
46	145.000	0.179	4.252E-0002
47	150.000	0.184	4.398E-0002
48	160.000	0.189	4.691E-0002
49	165.000	0.184	4.838E-0002
50	170.000	0.194	4.985E-0002
51	190.000	0.203	5.571E-0002
52	195.000	0.208	5.718E-0002
53	200.000	0.213	5.864E-0002
54	205.000	0.208	6.011E-0002
55	215.000	0.217	6.304E-0002
56	220.000	0.213	6.451E-0002
57	230.000	0.217	6.744E-0002
58	235.000	0.232	6.890E-0002
59	240.000	0.222	7.037E-0002
60	245.000	0.227	7.184E-0002
61	255.000	0.232	7.477E-0002
62	275.000	0.241	8.063E-0002
63	285.000	0.236	8.356E-0002
64	295.000	0.246	8.650E-0002
65	300.000	0.241	8.796E-0002
66	305.000	0.246	8.943E-0002
67	315.000	0.251	9.236E-0002
68	325.000	0.255	9.529E-0002
69	350.000	0.260	1.026E-0001
70	365.000	0.265	1.070E-0001
71	405.000	0.270	1.187E-0001
72	415.000	0.274	1.217E-0001
73	445.000	0.279	1.305E-0001
74	470.000	0.284	1.378E-0001
75	480.000	0.289	1.407E-0001
76	495.000	0.293	1.451E-0001
77	515.000	0.298	1.510E-0001
78	525.000	0.303	1.539E-0001
79	540.000	0.308	1.583E-0001
80	555.000	0.312	1.627E-0001
81	565.000	0.317	1.657E-0001
82	580.000	0.322	1.701E-0001
83	595.000	0.322	1.745E-0001
84	600.000	0.327	1.759E-0001
85	615.000	0.331	1.803E-0001
86	635.000	0.336	1.862E-0001
87	645.000	0.341	1.891E-0001
88	675.000	0.341	1.979E-0001
89	690.000	0.346	2.023E-0001
90	715.000	0.350	2.096E-0001
91	735.000	0.360	2.155E-0001
92	745.000	0.355	2.184E-0001
93	760.000	0.355	2.228E-0001
94	775.000	0.360	2.272E-0001
95	815.000	0.365	2.390E-0001
96	870.000	0.369	2.551E-0001
97	895.000	0.374	2.624E-0001
98	885.000	0.374	2.629E-0001
99	875.000	0.379	2.859E-0001
00	[illegible]	[illegible]	[illegible]
01	1005.000	[illegible]	[illegible]
02	1015.000	[illegible]	2.976E-0001
03	1030.000	[illegible]	3.020E-0001
04	1055.000	[illegible]	3.093E-0001
05	1080.000	0.384	3.167E-0001

106	1085.000	0.393	3.181E-0001
107	1110.000	0.379	3.255E-0001
108	1140.000	0.384	3.343E-0001
109	1225.000	0.388	3.592E-0001
110	1260.000	0.393	3.694E-0001
111	1285.000	0.384	3.768E-0001
112	1295.000	0.388	3.797E-0001
113	1300.000	0.393	3.812E-0001
114	1325.000	0.398	3.885E-0001
115	1350.000	0.393	3.958E-0001
116	1370.000	0.398	4.017E-0001
117	1400.000	0.403	4.105E-0001
118	1420.000	0.412	4.164E-0001
119	1435.000	0.403	4.208E-0001

Data for Pump Test

Well Name: MW-2M Date of Test: 7-28-92
Aquifer Thickness (b): 15.000 ft
Pumped Well Discharge(Q) = 1.200 gpm
Radius of Pumping Well = 0.167 ft
Distance of Observation Well from Pumping Well = 58.400 ft

Entry No.	Time(t) (min)	Drawdown(s) (ft)	t / d^2 (min/sq ft)
1	31.000	0.070	9.089E-0003
2	37.000	0.080	1.085E-0002
3	42.000	0.090	1.231E-0002
4	49.000	0.110	1.437E-0002
5	58.000	0.120	1.701E-0002
6	69.000	0.130	2.023E-0002
7	79.000	0.140	2.316E-0002
8	100.000	0.160	2.932E-0002
9	125.000	0.170	3.665E-0002
10	145.000	0.180	4.252E-0002
11	165.000	0.200	4.838E-0002
12	195.000	0.200	5.718E-0002
13	225.000	0.220	6.597E-0002
14	255.000	0.240	7.477E-0002
15	285.000	0.240	8.356E-0002
16	315.000	0.250	9.236E-0002
17	375.000	0.270	1.100E-0001
18	435.000	0.270	1.275E-0001
19	495.000	0.280	1.451E-0001
20	555.000	0.310	1.627E-0001
21	615.000	0.340	1.803E-0001
22	675.000	0.340	1.979E-0001
23	735.000	0.360	2.155E-0001
24	795.000	0.360	2.331E-0001
25	855.000	0.370	2.507E-0001
26	915.000	0.380	2.683E-0001
27	975.000	0.390	2.859E-0001
28	1035.000	0.390	3.035E-0001
29	1095.000	0.400	3.211E-0001
30	1155.000	0.430	3.387E-0001
31	1215.000	0.430	3.562E-0001
32	1275.000	0.430	3.738E-0001
33	1335.000	0.430	3.914E-0001
34	1395.000	0.430	4.090E-0001

Data for Pump Test

Well Name: MW-3 Date of Test: 7-28-92
Aquifer Thickness (b): 15.000 ft
Pumped Well Discharge(Q) = 1.200 gpm
Radius of Pumping Well = 0.167 ft
Distance of Observation Well from Pumping Well = 20.700 ft

Entry No.	Time(t) (min)	Drawdown(s) (ft)	t / d^2 (min/sq ft)
1	0.000	0.000	
2	0.008	0.000	1.937E-0005
3	0.067	0.000	1.554E-0004
4	0.150	0.000	3.501E-0004
5	0.250	0.000	5.834E-0004
6	0.300	0.005	7.001E-0004
7	0.417	0.005	9.723E-0004
8	0.667	0.000	1.556E-0003
9	0.917	0.009	2.139E-0003
10	1.167	0.013	2.723E-0003
11	1.333	0.009	3.112E-0003
12	1.500	0.018	3.501E-0003
13	1.583	0.013	3.695E-0003
14	1.750	0.023	4.084E-0003
15	2.500	0.027	5.834E-0003
16	3.000	0.041	7.001E-0003
17	3.500	0.051	8.168E-0003
18	4.000	0.056	9.335E-0003
19	4.500	0.065	1.050E-0002
20	5.000	0.070	1.167E-0002
21	5.500	0.079	1.284E-0002
22	6.000	0.088	1.400E-0002
23	7.000	0.107	1.634E-0002
24	7.500	0.112	1.750E-0002
25	8.000	0.121	1.867E-0002
26	8.500	0.131	1.984E-0002
27	9.000	0.135	2.100E-0002
28	9.500	0.140	2.217E-0002
29	10.000	0.150	2.334E-0002
30	12.000	0.183	2.801E-0002
31	14.000	0.197	3.267E-0002
32	16.000	0.220	3.734E-0002
33	18.000	0.248	4.201E-0002
34	20.000	0.262	4.668E-0002
35	22.000	0.286	5.134E-0002
36	24.000	0.305	5.601E-0002
37	26.000	0.314	6.068E-0002
38	28.000	0.338	6.535E-0002
39	30.000	0.347	7.001E-0002
40	34.000	0.375	7.935E-0002
41	36.000	0.385	8.402E-0002
42	40.000	0.404	9.335E-0002

43	42.000	0.408	9.802E-0002
44	44.000	0.413	1.027E-0001
45	46.000	0.422	1.074E-0001
46	48.000	0.432	1.120E-0001
47	52.000	0.451	1.214E-0001
48	54.000	0.455	1.260E-0001
49	58.000	0.465	1.354E-0001
50	62.000	0.469	1.447E-0001
51	64.000	0.479	1.494E-0001
52	68.000	0.483	1.587E-0001
53	72.000	0.493	1.680E-0001
54	74.000	0.498	1.727E-0001
55	76.000	0.502	1.774E-0001
56	82.000	0.512	1.914E-0001
57	86.000	0.516	2.007E-0001
58	94.000	0.526	2.194E-0001
59	96.000	0.531	2.240E-0001
60	100.000	0.535	2.334E-0001
61	105.000	0.540	2.450E-0001
62	110.000	0.545	2.567E-0001
63	115.000	0.549	2.684E-0001
64	120.000	0.554	2.801E-0001
65	130.000	0.568	3.034E-0001
66	135.000	0.559	3.151E-0001
67	140.000	0.573	3.267E-0001
68	145.000	0.582	3.384E-0001
69	150.000	0.578	3.501E-0001
70	160.000	0.582	3.734E-0001
71	165.000	0.587	3.851E-0001
72	170.000	0.592	3.967E-0001
73	175.000	0.596	4.084E-0001
74	180.000	0.601	4.201E-0001
75	185.000	0.596	4.317E-0001
76	200.000	0.606	4.668E-0001
77	205.000	0.615	4.784E-0001
78	215.000	0.620	5.018E-0001
79	220.000	0.629	5.134E-0001
80	225.000	0.625	5.251E-0001
81	235.000	0.629	5.484E-0001
82	240.000	0.634	5.601E-0001
83	245.000	0.639	5.718E-0001
84	260.000	0.643	6.068E-0001
85	275.000	0.648	6.418E-0001
86	280.000	0.653	6.535E-0001
87	290.000	0.657	6.768E-0001
88	305.000	0.667	7.118E-0001
89	310.000	0.657	7.235E-0001
90	315.000	0.667	7.351E-0001
91	325.000	0.662	7.585E-0001
92	335.000	0.662	7.818E-0001
93	350.000	0.667	8.168E-0001
94	360.000	0.672	8.402E-0001
95	370.000	0.676	8.635E-0001
96	390.000	0.681	9.102E-0001
97	400.000	0.686	9.335E-0001
98	410.000	0.681	9.568E-0001
99	420.000	0.686	9.802E-0001
100	430.000	0.690	1.004E+0000
101	435.000	0.695	1.015E+0000
102	445.000	0.695	1.039E+0000
103	465.000	0.704	1.085E+0000

104	490.000	0.714	1.144E+0000
105	495.000	0.709	1.155E+0000
106	500.000	0.714	1.167E+0000
107	510.000	0.719	1.190E+0000
108	525.000	0.723	1.225E+0000
109	530.000	0.728	1.237E+0000
110	550.000	0.728	1.284E+0000
111	555.000	0.737	1.295E+0000
112	560.000	0.742	1.307E+0000
113	570.000	0.756	1.330E+0000
114	580.000	0.761	1.354E+0000
115	590.000	0.766	1.377E+0000
116	600.000	0.770	1.400E+0000
117	605.000	0.775	1.412E+0000
118	625.000	0.780	1.459E+0000
119	635.000	0.784	1.482E+0000
120	665.000	0.789	1.552E+0000
121	675.000	0.794	1.575E+0000
122	685.000	0.789	1.599E+0000
123	690.000	0.794	1.610E+0000
124	700.000	0.798	1.634E+0000
125	710.000	0.794	1.657E+0000
126	715.000	0.798	1.669E+0000
127	720.000	0.803	1.680E+0000
128	730.000	0.808	1.704E+0000
129	740.000	0.813	1.727E+0000
130	755.000	0.808	1.762E+0000
131	770.000	0.813	1.797E+0000
132	785.000	0.817	1.832E+0000
133	825.000	0.817	1.925E+0000
134	840.000	0.822	1.960E+0000
135	865.000	0.831	2.019E+0000
136	880.000	0.827	2.054E+0000
137	895.000	0.827	2.089E+0000
138	905.000	0.836	2.112E+0000
139	920.000	0.831	2.147E+0000
140	930.000	0.836	2.170E+0000
141	945.000	0.831	2.205E+0000
142	950.000	0.841	2.217E+0000
143	975.000	0.846	2.275E+0000
144	990.000	0.850	2.310E+0000
145	1005.000	0.860	2.345E+0000
146	1020.000	0.855	2.380E+0000
147	1030.000	0.860	2.404E+0000
148	1045.000	0.855	2.439E+0000
149	1060.000	0.864	2.474E+0000
150	1065.000	0.869	2.485E+0000
151	1080.000	0.869	2.520E+0000
152	1115.000	0.874	2.602E+0000
153	1150.000	0.869	2.684E+0000
154	1155.000	0.878	2.696E+0000
155	1160.000	0.883	2.707E+0000
156	1175.000	0.888	2.742E+0000
157	1190.000	0.878	2.777E+0000
158	1200.000	0.888	2.801E+0000
159	1225.000	0.893	2.859E+0000
160	1240.000	0.888	2.894E+0000
161	1255.000	0.893	2.929E+0000
162	1285.000	0.897	2.999E+0000
163	1290.000	0.902	3.011E+0000
164	1310.000	0.902	3.057E+0000

Data for Pump Test

Well Name: MW-3M Date of Test: 7-28-92
Aquifer Thickness (b): 15.000 ft
Pumped Well Discharge(Q) = 1.200 gpm
Radius of Pumping Well = 0.167 ft
Distance of Observation Well from Pumping Well = 20.700 ft

Entry No.	Time(t) (min)	Drawdown(s) (ft)	t / d^2 (min/sq ft)
1	31.000	0.370	7.235E-0002
2	37.000	0.400	8.635E-0002
3	42.000	0.420	9.802E-0002
4	49.000	0.440	1.144E-0001
5	58.000	0.480	1.354E-0001
6	69.000	0.500	1.610E-0001
7	79.000	0.510	1.844E-0001
8	100.000	0.540	2.334E-0001
9	125.000	0.580	2.917E-0001
10	145.000	0.590	3.384E-0001
11	165.000	0.610	3.851E-0001
12	195.000	0.630	4.551E-0001
13	225.000	0.630	5.251E-0001
14	255.000	0.630	5.951E-0001
15	285.000	0.670	6.651E-0001
16	315.000	0.680	7.351E-0001
17	375.000	0.690	8.752E-0001
18	435.000	0.700	1.015E+0000
19	495.000	0.720	1.155E+0000
20	555.000	0.730	1.295E+0000
21	615.000	0.790	1.435E+0000
22	675.000	0.800	1.575E+0000
23	735.000	0.830	1.715E+0000
24	795.000	0.830	1.855E+0000
25	855.000	0.840	1.995E+0000
26	915.000	0.850	2.135E+0000
27	975.000	0.850	2.275E+0000
28	1035.000	0.880	2.415E+0000
29	1095.000	0.880	2.555E+0000
30	1155.000	0.890	2.696E+0000
31	1215.000	0.900	2.836E+0000
32	1275.000	0.910	2.976E+0000
33	1335.000	0.930	3.116E+0000
34	1395.000	0.930	3.256E+0000

165	1325.000	0.907	3.092E+0000
166	1345.000	0.911	3.139E+0000
167	1360.000	0.907	3.174E+0000
168	1375.000	0.911	3.209E+0000
169	1405.000	0.916	3.279E+0000
170	1420.000	0.916	3.314E+0000
171	1435.000	0.916	3.349E+0000

Data for Pump Test

Well Name: MW-4M Date of Test: 7-28-92
Aquifer Thickness (b): 15.000 ft
Pumped Well Discharge(Q) = 1.200 gpm
Radius of Pumping Well = 0.167 ft
Distance of Observation Well from Pumping Well = 52.600 ft

Entry No.	Time(t) (min)	Drawdown(s) (ft)	t / d^2 (min/sq ft)
1	0.000	0.000	
2	31.000	0.100	1.120E-0002
3	37.000	0.120	1.337E-0002
4	42.000	0.120	1.518E-0002
5	49.000	0.130	1.771E-0002
6	58.000	0.150	2.096E-0002
7	69.000	0.160	2.494E-0002
8	79.000	0.160	2.855E-0002
9	100.000	0.190	3.614E-0002
10	125.000	0.210	4.518E-0002
11	145.000	0.220	5.241E-0002
12	165.000	0.220	5.964E-0002
13	195.000	0.240	7.048E-0002
14	225.000	0.260	8.132E-0002
15	255.000	0.270	9.217E-0002
16	285.000	0.270	1.030E-0001
17	315.000	0.290	1.139E-0001
18	375.000	0.310	1.355E-0001
19	435.000	0.320	1.572E-0001
20	495.000	0.340	1.789E-0001
21	555.000	0.350	2.006E-0001
22	615.000	0.370	2.223E-0001
23	675.000	0.380	2.440E-0001
24	735.000	0.420	2.657E-0001
25	795.000	0.420	2.873E-0001
26	855.000	0.430	3.090E-0001
27	915.000	0.450	3.307E-0001
28	975.000	0.460	3.524E-0001
29	1035.000	0.460	3.741E-0001
30	1095.000	0.470	3.958E-0001
31	1155.000	0.480	4.175E-0001
32	1215.000	0.490	4.391E-0001
33	1275.000	0.500	4.608E-0001
34	1335.000	0.510	4.825E-0001
35	1335.000	0.520	5.042E-0001

Data for Pump Test

Well Name: MW-6M Date of Test: 7-28-92
Aquifer Thickness (b): 15.000 ft
Pumped Well Discharge(Q) = 1.200 gpm
Radius of Pumping Well = 0.167 ft
Distance of Observation Well from Pumping Well = 55.800 ft

Entry No.	Time(t) (min)	Drawdown(s) (ft)	t / d^2 (min/sq ft)
1	31.000	0.060	9.956E-0003
2	37.000	0.070	1.188E-0002
3	42.000	0.080	1.349E-0002
4	49.000	0.090	1.574E-0002
5	58.000	0.110	1.863E-0002
6	69.000	0.130	2.216E-0002
7	79.000	0.130	2.537E-0002
8	100.000	0.150	3.212E-0002
9	125.000	0.160	4.015E-0002
10	145.000	0.170	4.657E-0002
11	165.000	0.190	5.299E-0002
12	195.000	0.200	6.263E-0002
13	225.000	0.230	7.226E-0002
14	255.000	0.220	8.190E-0002
15	285.000	0.230	9.153E-0002
16	315.000	0.230	1.012E-0001
17	375.000	0.250	1.204E-0001
18	435.000	0.260	1.397E-0001
19	495.000	0.270	1.590E-0001
20	555.000	0.300	1.782E-0001
21	615.000	0.310	1.975E-0001
22	675.000	0.330	2.168E-0001
23	735.000	0.340	2.361E-0001
24	795.000	0.350	2.553E-0001
25	855.000	0.350	2.746E-0001
26	915.000	0.350	2.939E-0001
27	975.000	0.360	3.131E-0001
28	1035.000	0.370	3.324E-0001
29	1095.000	0.370	3.517E-0001
30	1155.000	0.380	3.709E-0001
31	1215.000	0.400	3.902E-0001
32	1275.000	0.400	4.095E-0001
33	1335.000	0.410	4.288E-0001
34	1395.000	0.410	4.480E-0001

Data for Pump Test

Well Name: MW-8M Date of Test: 7-28-92
Aquifer Thickness (b): 15.000 ft
Pumped Well Discharge(Q) = 1.200 gpm
Radius of Pumping Well = 0.167 ft
Distance of Observation Well from Pumping Well = 56.900 ft

Entry No.	Time(t) (min)	Drawdown(s) (ft)	t / d^2 (min/sq ft)
1	31.000	0.140	9.575E-0003
2	37.000	0.150	1.143E-0002
3	42.000	0.160	1.297E-0002
4	49.000	0.180	1.513E-0002
5	58.000	0.210	1.791E-0002
6	69.000	0.210	2.131E-0002
7	79.000	0.220	2.440E-0002
8	100.000	0.240	3.089E-0002
9	125.000	0.260	3.861E-0002
10	145.000	0.290	4.479E-0002
11	165.000	0.290	5.096E-0002
12	195.000	0.310	6.023E-0002
13	225.000	0.330	6.950E-0002
14	255.000	0.340	7.876E-0002
15	285.000	0.350	8.803E-0002
16	315.000	0.370	9.729E-0002
17	375.000	0.390	1.158E-0001
18	435.000	0.410	1.344E-0001
19	495.000	0.430	1.529E-0001
20	555.000	0.450	1.714E-0001
21	615.000	0.470	1.900E-0001
22	675.000	0.480	2.085E-0001
23	735.000	0.490	2.270E-0001
24	795.000	0.500	2.456E-0001
25	855.000	0.500	2.641E-0001
26	915.000	0.510	2.826E-0001
27	975.000	0.510	3.011E-0001
28	1035.000	0.530	3.197E-0001
29	1095.000	0.530	3.382E-0001
30	1155.000	0.540	3.567E-0001
31	1215.000	0.560	3.753E-0001
32	1275.000	0.560	3.938E-0001
33	1335.000	0.570	4.123E-0001
34	1395.000	0.570	4.309E-0001

Data for Recovery Test

Well Name: MW-1R Date of Test: 7-29-92
Aquifer Thickness (b): 15.000 ft
Pumped Well Discharge(Q) = 1.200 gpm
Radius of Pumping Well = 0.167 ft
Distance of Observation Well from Pumping Well = 51.000 ft

Entry No.	Time(t) (min)	Residual Drawdown(s) (ft)	t / d^2 (min/sq ft)
1	1.000	0.620	3.845E-0004
2	1.083	0.620	4.165E-0004
3	1.250	0.615	4.806E-0004
4	1.417	0.620	5.446E-0004
5	1.500	0.615	5.767E-0004
6	1.666	0.620	6.405E-0004
7	1.750	0.615	6.728E-0004
8	1.917	0.610	7.369E-0004
9	3.000	0.615	1.153E-0003
10	3.500	0.610	1.346E-0003
11	4.000	0.615	1.538E-0003
12	5.500	0.610	2.115E-0003
13	7.500	0.606	2.884E-0003
14	9.000	0.601	3.460E-0003
15	9.500	0.596	3.652E-0003
16	10.000	0.606	3.845E-0003
17	12.000	0.601	4.614E-0003
18	14.000	0.592	5.383E-0003
19	16.000	0.577	6.151E-0003
20	20.000	0.559	7.689E-0003
21	22.000	0.549	8.458E-0003
22	26.000	0.540	9.996E-0003
23	28.000	0.530	1.077E-0002
24	30.000	0.521	1.153E-0002
25	32.000	0.507	1.230E-0002
26	34.000	0.512	1.307E-0002
27	36.000	0.497	1.384E-0002
28	38.000	0.488	1.461E-0002
29	40.000	0.483	1.538E-0002
30	42.000	0.479	1.615E-0002
31	44.000	0.474	1.692E-0002
32	46.000	0.469	1.769E-0002
33	48.000	0.465	1.845E-0002
34	50.000	0.460	1.922E-0002
35	54.000	.441	2.076E-0002
36	56.000	.432	2.230E-0002
37	[illegible]	[illegible]	2.307E-0002
38	[illegible]	[illegible]	2.384E-0002
39	[illegible]	.417	2.461E-0002
40	[illegible]	.413	2.537E-0002
41	[illegible]	.409	2.614E-0002
42	[illegible]	.394	2.768E-0002

Normalized Time

				Time
43	74.000	0.399	2.845E-0002	20.46
44	76.000	0.389	2.922E-0002	
45	82.000	0.380	3.153E-0002	
46	86.000	0.375	3.306E-0002	
47	88.000	0.370	3.383E-0002	
48	94.000	0.366	3.614E-0002	
49	96.000	0.356	3.691E-0002	
50	105.000	0.347	4.037E-0002	
51	110.000	0.337	4.229E-0002	
52	115.000	0.333	4.421E-0002	
53	120.000	0.328	4.614E-0002	
54	125.000	0.323	4.806E-0002	
55	130.000	0.314	4.998E-0002	
56	135.000	0.309	5.190E-0002	
57	140.000	0.305	5.383E-0002	
58	145.000	0.300	5.575E-0002	
59	155.000	0.286	5.959E-0002	
60	165.000	0.281	6.344E-0002	
61	180.000	0.272	6.920E-0002	
62	185.000	0.262	7.113E-0002	
63	195.000	0.257	7.497E-0002	
64	205.000	0.257	7.882E-0002	
65	210.000	0.239	8.074E-0002	
66	215.000	0.248	8.266E-0002	
67	220.000	0.243	8.458E-0002	
68	225.000	0.239	8.651E-0002	
69	230.000	0.216	8.843E-0002	
70	245.000	0.229	9.419E-0002	
71	250.000	0.225	9.612E-0002	
72	260.000	0.220	9.996E-0002	
73	265.000	0.215	1.019E-0001	
74	280.000	0.206	1.077E-0001	
75	290.000	0.210	1.115E-0001	
76	300.000	0.192	1.153E-0001	

Data for Recovery Test

Well Name: MW-1M R Date of Test: 7-29-92
Aquifer Thickness (b): 15.000 ft
Pumped Well Discharge(Q) = 1.200 gpm
Radius of Pumping Well = 0.167 ft
Distance of Observation Well from Pumping Well = 51.000 ft

Entry No.	Time(t) (min)	Residual Drawdown(s) (ft)	t / d^2 (min/sq ft)
1	1.000	0.600	3.845E-0004
2	7.000	0.610	2.691E-0003
3	12.000	0.580	4.614E-0003
4	17.000	0.560	6.536E-0003
5	22.000	0.530	8.458E-0003
6	27.000	0.510	1.038E-0002
7	42.000	0.470	1.615E-0002
8	57.000	0.420	2.191E-0002
9	85.000	0.350	3.268E-0002
10	115.000	0.320	4.421E-0002
11	145.000	0.280	5.575E-0002
12	175.000	0.260	6.728E-0002
13	205.000	0.230	7.882E-0002
14	235.000	0.220	9.035E-0002
15	265.000	0.210	1.019E-0001
16	295.000	0.190	1.134E-0001

43	98.000	0.236	2.873E-0002	
44	100.000	0.246	2.932E-0002	
45	105.000	0.227	3.079E-0002	
46	110.000	0.222	3.225E-0002	
47	120.000	0.213	3.518E-0002	
48	130.000	0.203	3.812E-0002	
49	135.000	0.198	3.958E-0002	
50	140.000	0.203	4.105E-0002	
51	145.000	0.189	4.252E-0002	
52	150.000	0.194	4.398E-0002	
53	155.000	0.189	4.545E-0002	
54	160.000	0.194	4.691E-0002	
55	170.000	0.189	4.985E-0002	
56	175.000	0.184	5.131E-0002	
57	180.000	0.179	5.278E-0002	
58	185.000	0.184	5.424E-0002	
59	190.000	0.175	5.571E-0002	
60	200.000	0.170	5.864E-0002	
61	210.000	0.165	6.157E-0002	
62	215.000	0.160	6.304E-0002	
63	220.000	0.156	6.451E-0002	
64	225.000	0.160	6.597E-0002	
65	230.000	0.156	6.744E-0002	
66	235.000	0.151	6.890E-0002	
67	250.000	0.146	7.330E-0002	
68	255.000	0.151	7.477E-0002	
69	260.000	0.146	7.623E-0002	
70	265.000	0.141	7.770E-0002	
71	275.000	0.132	8.063E-0002	
72	285.000	0.127	8.356E-0002	
73	290.000	0.132	8.503E-0002	
74	295.000	0.127	8.650E-0002	

Data for Recovery Test

Well Name: MW-2R Date of Test: 7-29-92
Aquifer Thickness (b): 15.000 ft
Pumped Well Discharge(Q) = 1.200 gpm
Radius of Pumping Well = 0.167 ft
Distance of Observation Well from Pumping Well = 58.400 ft

Entry No.	Time(t) (min)	Residual Drawdown(s) (ft)	t / d^2 (min/sq ft)
1	1.000	0.403	2.932E-0004
2	1.083	0.398	3.176E-0004
3	1.250	0.403	3.665E-0004
4	1.417	0.398	4.154E-0004
5	1.583	0.403	4.642E-0004
6	1.666	0.398	4.885E-0004
7	1.750	0.403	5.131E-0004
8	1.833	0.398	5.375E-0004
9	1.917	0.403	5.620E-0004
10	2.000	0.393	5.864E-0004
11	2.500	0.398	7.330E-0004
12	4.000	0.398	1.173E-0003
13	5.500	0.393	1.613E-0003
14	6.500	0.398	1.906E-0003
15	7.500	0.393	2.199E-0003
16	9.500	0.388	2.785E-0003
17	10.000	0.393	2.932E-0003
18	14.000	0.379	4.105E-0003
19	16.000	0.379	4.691E-0003
20	20.000	0.365	5.864E-0003
21	22.000	0.360	6.451E-0003
22	28.000	0.350	8.210E-0003
23	30.000	0.341	8.796E-0003
24	36.000	0.327	1.056E-0002
25	38.000	0.331	1.114E-0002
26	40.000	0.322	1.173E-0002
27	42.000	0.317	1.231E-0002
28	46.000	0.308	1.349E-0002
29	52.000	0.303	1.525E-0002
30	54.000	0.293	1.583E-0002
31	58.000	0.289	1.701E-0002
32	60.000	0.284	1.759E-0002
33	66.000	0.279	1.935E-0002
34	68.000	0.279	1.994E-0002
35	76.000	0.266	2.228E-0002
36	78.000	0.260	2.287E-0002
37	84.000	0.256	2.463E-0002
38	88.000	0.251	2.580E-0002
39	90.000	0.246	2.639E-0002
40	92.000	0.251	2.698E-0002
41	94.000	0.246	2.756E-0002
42	96.000	0.241	2.815E-0002

Data for Recovery Test

Well Name: MW-2M R Date of Test: 7-29-92
Aquifer Thickness (b): 15.000 ft
Pumped Well Discharge(Q) = 1.200 gpm
Radius of Pumping Well = 0.167 ft
Distance of Observation Well from Pumping Well = 58.400 ft

Entry No.	Time(t) (min)	Residual Drawdown(s) (ft)	t / d^2 (min/sq ft)	Normalized Time
1	1.000	0.440	2.932E-0004	1441.33
2	7.000	0.430	2.052E-0003	[illegible]
3	12.000	0.440	3.518E-0003	[illegible]
4	17.000	0.420	4.985E-0003	[illegible]
5	22.000	0.400	6.451E-0003	[illegible]
6	27.000	0.390	7.917E-0003	[illegible]
7	42.000	0.370	1.231E-0002	[illegible]
8	57.000	0.340	1.671E-0002	26.26
9	85.000	0.310	2.492E-0002	17.94
10	115.000	0.270	3.372E-0002	3.52
11	145.000	0.250	4.252E-0002	[illegible]
12	175.000	0.230	5.131E-0002	[illegible]
13	205.000	0.210	6.011E-0002	[illegible]
14	235.000	0.200	6.890E-0002	[illegible]
15	265.000	0.190	7.770E-0002	[illegible]
16	295.000	0.180	8.650E-0002	[illegible]

Data for Recovery Test

Well Name: MW-3R Date of Test: 7-29-92
Aquifer Thickness (b): 15.000 ft
Pumped Well Discharge(Q) = 1.200 gpm
Radius of Pumping Well = 0.167 ft
Distance of Observation Well from Pumping Well = 20.700 ft

Entry No.	Time(t) (min)	Residual Drawdown(s) (ft)	t / d^2 (min/sq ft)
1	1.000	0.916	2.334E-0003
2	1.410	0.911	3.291E-0003
3	1.500	0.916	3.501E-0003
4	1.917	0.911	4.473E-0003
5	2.500	0.906	5.834E-0003
6	3.000	0.902	7.001E-0003
7	3.500	0.906	8.168E-0003
8	4.000	0.892	9.335E-0003
9	5.000	0.887	1.167E-0002
10	5.500	0.878	1.284E-0002
11	6.000	0.873	1.400E-0002
12	6.500	0.869	1.517E-0002
13	7.000	0.864	1.634E-0002
14	7.500	0.855	1.750E-0002
15	8.000	0.845	1.867E-0002
16	8.500	0.836	1.984E-0002
17	9.000	0.831	2.100E-0002
18	9.500	0.826	2.217E-0002
19	10.000	0.822	2.334E-0002
20	12.000	0.803	2.801E-0002
21	14.000	0.770	3.267E-0002
22	16.000	0.746	3.734E-0002
23	18.000	0.723	4.201E-0002
24	20.000	0.695	4.668E-0002
25	22.000	0.676	5.134E-0002
26	24.000	0.657	5.601E-0002
27	26.000	0.643	6.068E-0002
28	28.000	0.624	6.535E-0002
29	30.000	0.610	7.001E-0002
30	32.000	0.591	7.468E-0002
31	34.000	0.582	7.935E-0002
32	36.000	0.568	8.402E-0002
33	38.000	0.558	8.868E-0002
34	40.000	0.549	9.335E-0002
35	42.000	0.540	9.802E-0002
36	44.000	0.535	1.027E-0001
37	46.000	0.521	1.074E-0001
38	48.000	0.511	1.120E-0001
39	50.000	0.502	1.167E-0001
40	54.000	0.483	1.260E-0001
41	56.000	0.483	1.307E-0001
42	60.000	0.474	1.400E-0001

43	62.000	0.469	1.447E-0001	24.23
44	64.000	0.460	1.494E-0001	23.50
45	66.000	0.455	1.540E-0001	22.82
46	68.000	0.450	1.587E-0001	22.15
47	70.000	0.445	1.634E-0001	21.57
48	72.000	0.441	1.680E-0001	21.00
49	74.000	0.436	1.727E-0001	20.46
50	78.000	0.427	1.820E-0001	19.46
51	84.000	0.417	1.960E-0001	18.12
52	86.000	0.413	2.007E-0001	17.74
53	88.000	0.408	2.054E-0001	17.36
54	92.000	0.403	2.147E-0001	16.65
55	96.000	0.389	2.240E-0001	16.03
56	105.000	0.380	2.450E-0001	14.71
57	115.000	0.375	2.684E-0001	13.52
58	120.000	0.361	2.801E-0001	13.00
59	130.000	0.351	3.034E-0001	12.09
60	135.000	0.342	3.151E-0001	11.67
61	140.000	0.337	3.267E-0001	11.29
62	150.000	0.323	3.501E-0001	10.60
63	155.000	0.318	3.617E-0001	10.29
64	160.000	0.314	3.734E-0001	10.00
65	180.000	0.304	4.201E-0001	9.00
66	185.000	0.300	4.317E-0001	8.78
67	190.000	0.295	4.434E-0001	8.57
68	200.000	0.286	4.668E-0001	8.20
69	210.000	0.276	4.901E-0001	7.90
70	230.000	0.267	5.368E-0001	7.24
71	240.000	0.262	5.601E-0001	7.00
72	250.000	0.257	5.834E-0001	6.82
73	255.000	0.253	5.951E-0001	6.71
74	270.000	0.248	6.301E-0001	6.33
75	275.000	0.243	6.418E-0001	6.24
76	280.000	0.234	6.535E-0001	6.14
77	285.000	0.239	6.651E-0001	6.04
78	295.000	0.234	6.885E-0001	5.88
79	300.000	0.224	7.001E-0001	5.80

Data for Recovery Test

Well Name: MW-3M R Date of Test: 7-29-92
Aquifer Thickness (b): 15.000 ft
Pumped Well Discharge(Q) = 1.200 gpm
Radius of Pumping Well = 0.167 ft
Distance of Observation Well from Pumping Well = 20.700 ft

Entry No.	Time(t) (min)	Residual Drawdown(s) (ft)	t / d^2 (min/sq ft)
1	1.000	0.930	2.334E-0003
2	7.000	0.900	1.634E-0002
3	12.000	0.830	2.801E-0002
4	17.000	0.760	3.967E-0002
5	22.000	0.690	5.134E-0002
6	27.000	0.640	6.301E-0002
7	42.000	0.540	9.802E-0002
8	57.000	0.490	1.330E-0001
9	85.000	0.410	1.984E-0001
10	115.000	0.380	2.684E-0001
11	145.000	0.340	3.384E-0001
12	175.000	0.320	4.084E-0001
13	205.000	0.290	4.784E-0001
14	235.000	0.270	5.484E-0001
15	265.000	0.260	6.185E-0001
16	295.000	0.230	6.885E-0001

Data for Recovery Test

Well Name: MW-4M R Date of Test: 7-29-92
Aquifer Thickness (b): 15.000 ft
Pumped Well Discharge(Q) = 1.200 gpm
Radius of Pumping Well = 0.167 ft
Distance of Observation Well from Pumping Well = 52.600 ft

Entry No.	Time(t) (min)	Residual Drawdown(s) (ft)	t / d^2 (min/sq ft)
1	1.000	0.510	3.614E-0004
2	7.000	0.510	2.530E-0003
3	12.000	0.500	4.337E-0003
4	17.000	0.480	6.144E-0003
5	22.000	0.460	7.952E-0003
6	27.000	0.450	9.759E-0003
7	42.000	0.410	1.518E-0002
8	57.000	0.380	2.060E-0002
9	85.000	0.370	3.072E-0002
10	115.000	0.310	4.156E-0002
11	145.000	0.300	5.241E-0002
12	175.000	0.280	6.325E-0002
13	205.000	0.260	7.409E-0002
14	235.000	0.240	8.494E-0002
15	265.000	0.230	9.578E-0002
16	295.000	0.210	1.066E-0001

Data for Recovery Test

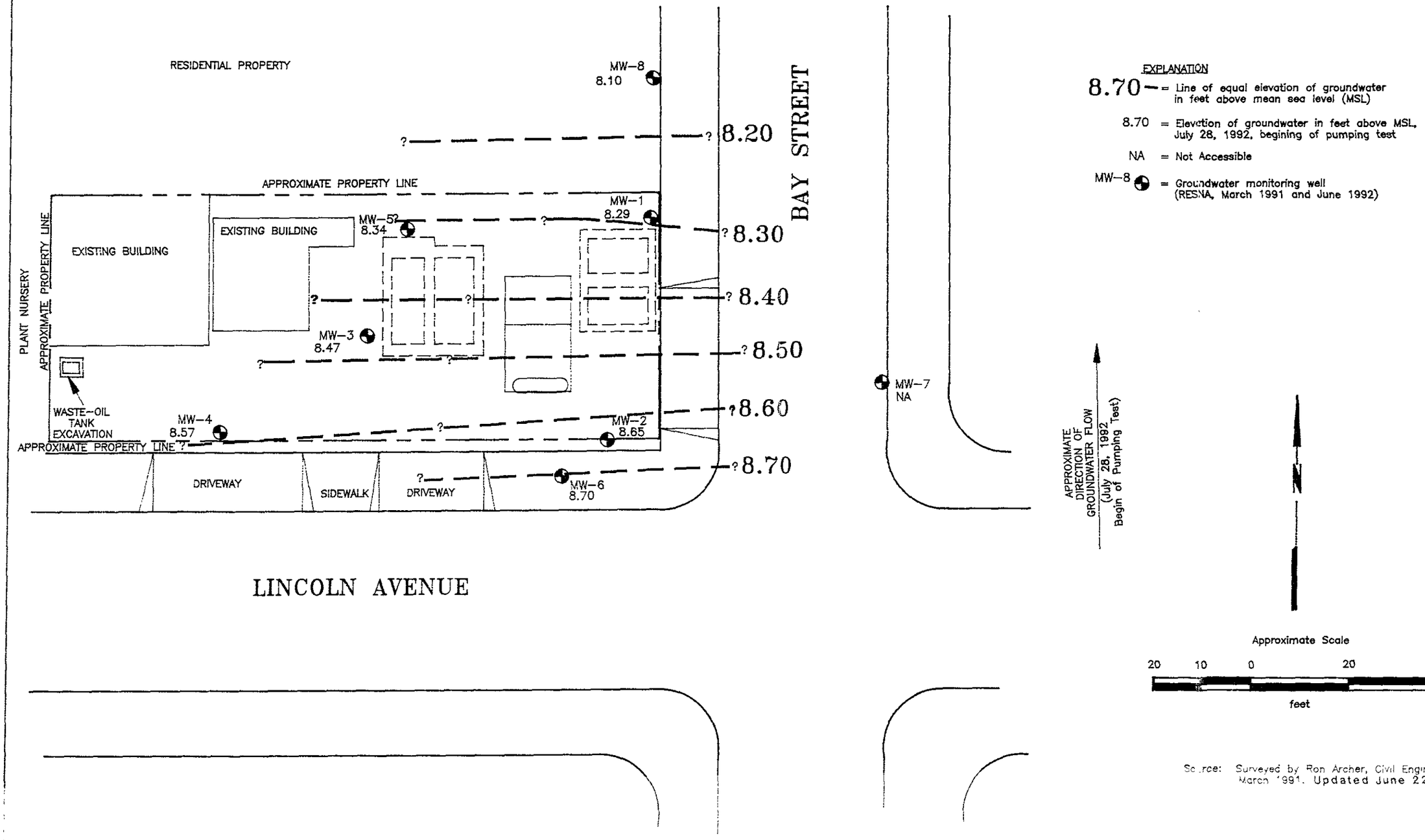
Well Name: MW-6M R Date of Test: 7-29-92
Aquifer Thickness (b): 15.000 ft
Pumped Well Discharge(Q) = 1.200 gpm
Radius of Pumping Well = 0.167 ft
Distance of Observation Well from Pumping Well = 55.800 ft

Entry No.	Time(t) (min)	Residual Drawdown(s) (ft)	t / d 2 (min/sq ft)
1	1.000	0.400	3.212E-0004
2	7.000	0.420	2.248E-0003
3	12.000	0.410	3.854E-0003
4	17.000	0.380	5.460E-0003
5	22.000	0.370	7.066E-0003
6	27.000	0.350	8.672E-0003
7	42.000	0.330	1.349E-0002
8	57.000	0.320	1.831E-0002
9	85.000	0.300	2.730E-0002
10	115.000	0.270	3.693E-0002
11	145.000	0.250	4.657E-0002
12	175.000	0.230	5.620E-0002
13	205.000	0.220	6.584E-0002
14	235.000	0.210	7.547E-0002
15	265.000	0.200	8.511E-0002
16	295.000	0.180	9.474E-0002

Data for Recovery Test

Well Name: MW-8M R Date of Test: 7-29-92
Aquifer Thickness (b): 15.000 ft
Pumped Well Discharge(Q) = 1.200 gpm
Radius of Pumping Well = 0.167 ft
Distance of Observation Well from Pumping Well = 56.900 ft

Entry No.	Time(t) (min)	Residual Drawdown(s) (ft)	t / d^2 (min/sq ft)
1	1.000	0.580	3.089E-0004
2	7.000	0.560	2.162E-0003
3	12.000	0.550	3.706E-0003
4	17.000	0.520	5.251E-0003
5	22.000	0.490	6.795E-0003
6	27.000	0.480	8.339E-0003
7	42.000	0.440	1.297E-0002
8	57.000	0.400	1.761E-0002
9	85.000	0.350	2.625E-0002
10	115.000	0.320	3.552E-0002
11	145.000	0.280	4.479E-0002
12	175.000	0.260	5.405E-0002
13	205.000	0.240	6.332E-0002
14	235.000	0.220	7.258E-0002
15	265.000	0.210	8.185E-0002
16	295.000	0.200	9.112E-0002



Source: Surveyed by Ron Archer, Civil Engineer, Inc. March 1991. Updated June 22, 1992.

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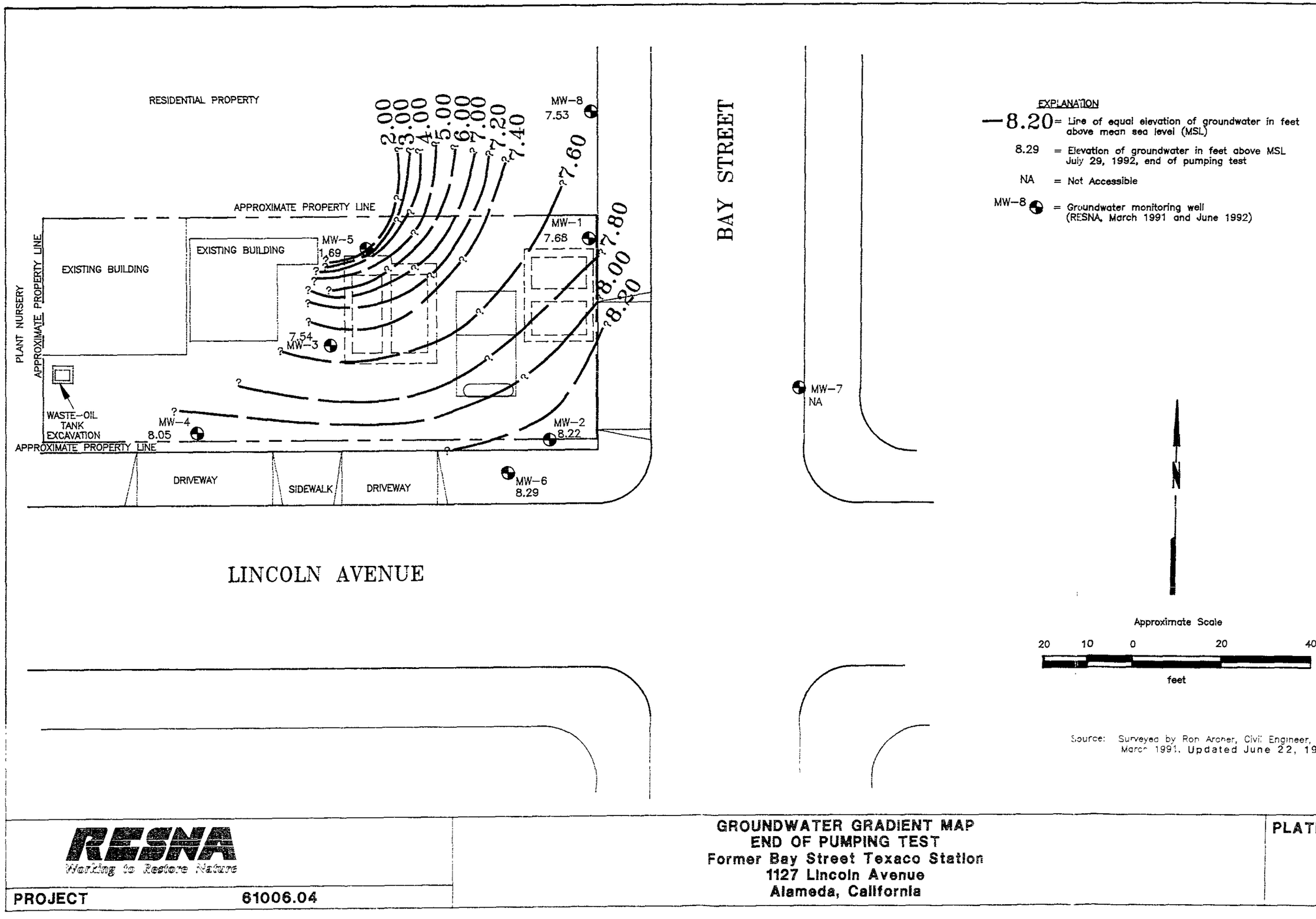
GROUNDWATER GRADIENT MAP
BEGINNING OF PUMPING TEST
Former Bay Street Texaco Station
1127 Lincoln Avenue
Alameda, California

PLATE
G1



Source: Surveyed by Ron Archer, Civil Engineer, inc March 1991. Updated June 22, 1992.

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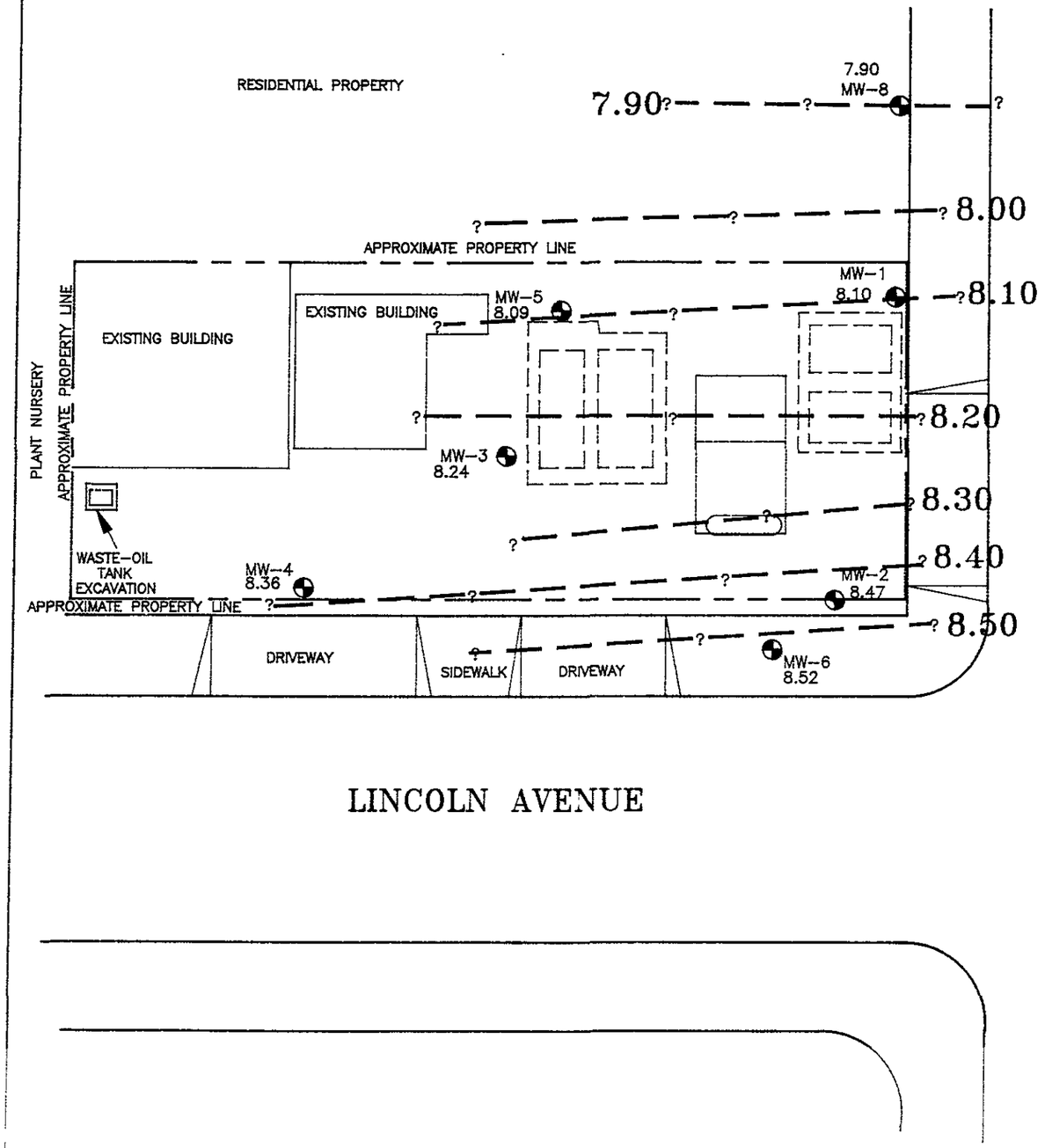
GROUNDWATER GRADIENT MAP
END OF PUMPING TEST
Former Bay Street Texaco Station
1127 Lincoln Avenue
Alameda, California

PLATE
G2



EXPLANATION

−8.50 = Line of equal elevation of groundwater in feet above mean sea level (MSL)

8.52 = Elevation of groundwater in feet above MSL July 29, 1992, end of recovery test

NA = Not Accessible

MW-8 = Groundwater monitoring well (RESNA, March 1991 and June 1992)

N

Approximate Scale

20 10 0 20 40

feet

Source: Surveyed by Ron Archer, Civil Engineer, Inc. March 1991. Updated June 22, 1992.

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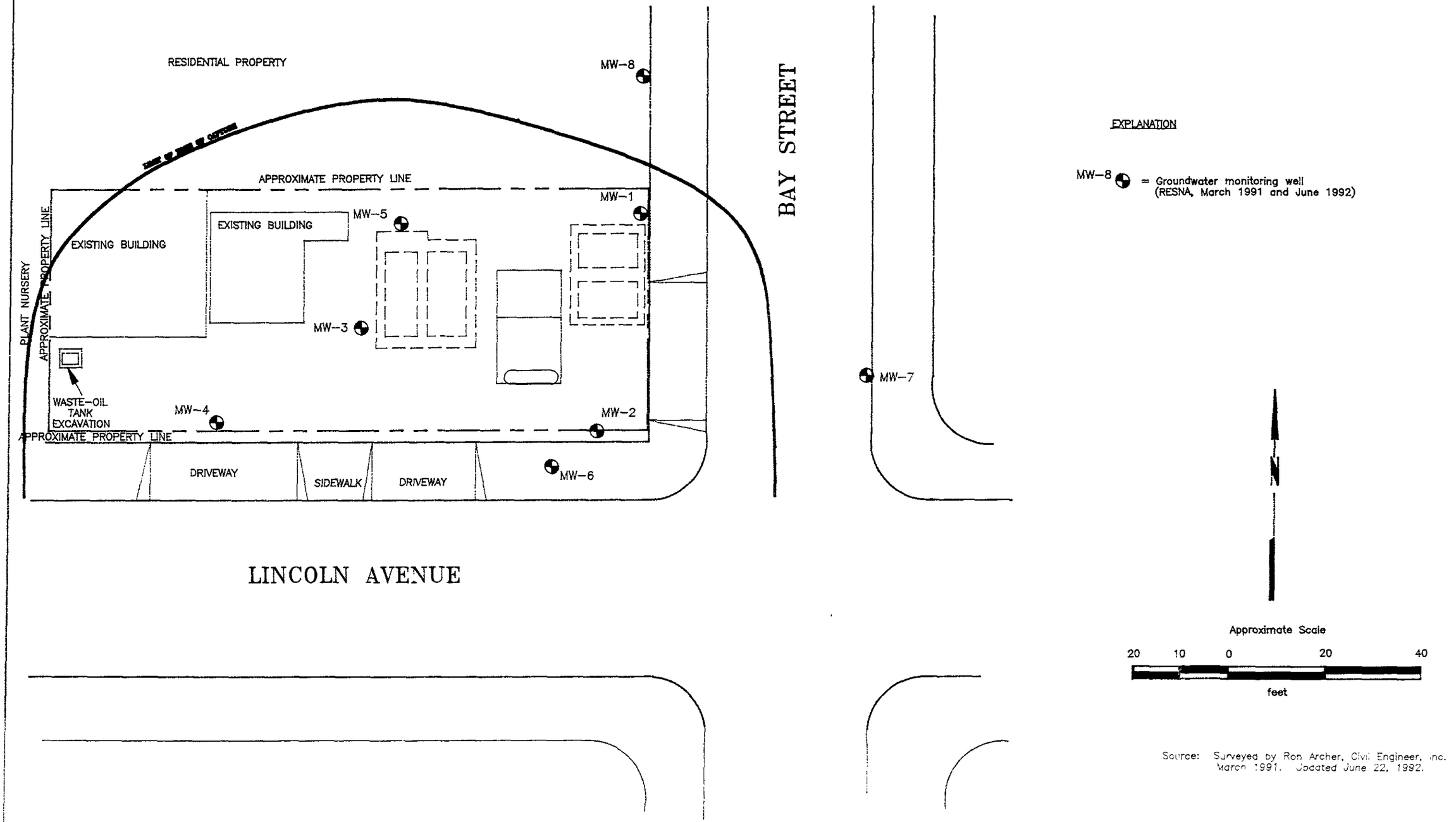
GROUNDWATER GRADIENT MAP
END OF RECOVERY TEST
Former Bay Street Texaco Station
1127 Lincoln Avenue
Alameda, California

PLATE
G3



Source: Surveyed by Ron Archer, Civil Engineer, Inc. March 1991. Updated June 22, 1992.

RESNA
Working to Restore Nature

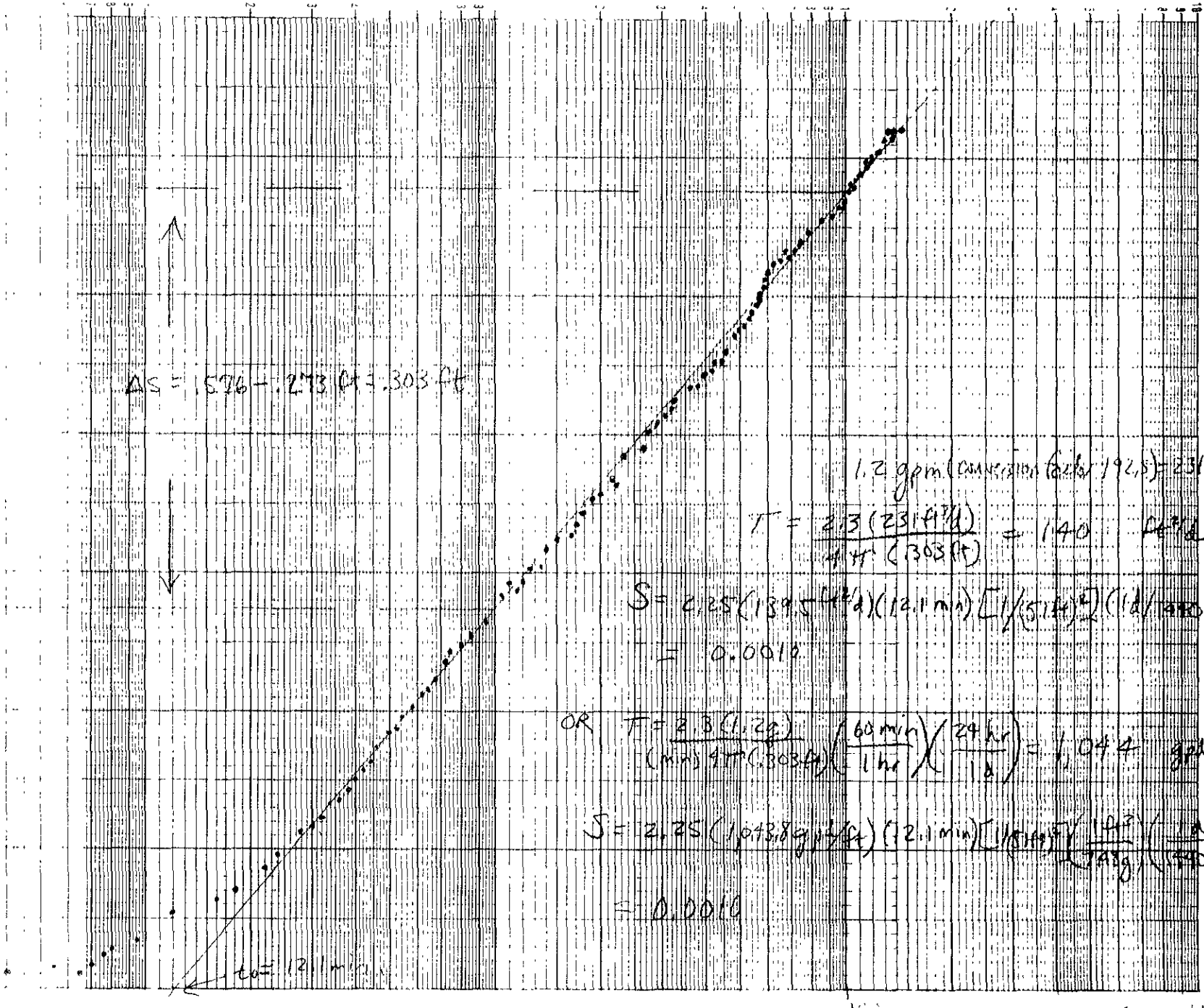
PROJECT 61006.04

PREDICTED ZONE OF CAPTURE
Former Bay Street Texaco Station
1127 Lincoln Avenue
Alameda, California

PLATE
G4

SEMI-LOGARITHMIC 4 CYCLES X 70 DIVISIONS AD 0813 GT

DRAWDOWN TEST WELL MW-1 OF [illegible] TEST



1.2 gpm (conversion factor 192.5) = 231 ft²/d

$$T = \frac{2.3\,(231\ ft^2/d)}{4\pi\,(.303\ ft)} = 140\ ft^2/d$$

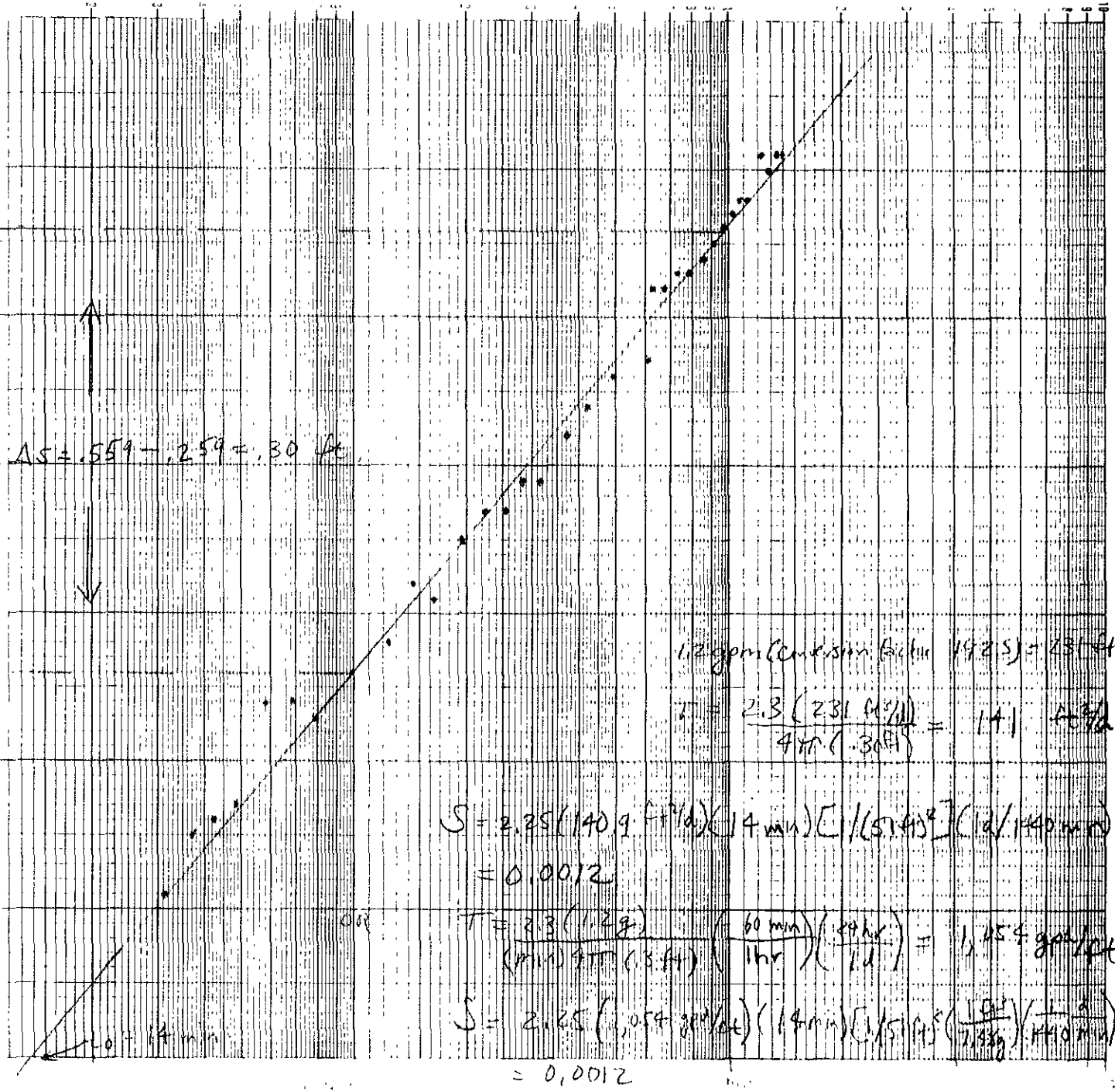
$$S = 2.25\,(139.5\ ft^2/d)(12.1\ min)\left[\frac{1}{(51\ ft)^2}\right]\left(\frac{1\ d}{1440\ min}\right)$$

$$= 0.0019$$

OR $$T = \frac{2.3\,(1.2\ gpm)}{(min)\,4\pi\,(.303\ ft)}\left(\frac{60\ min}{1\ hr}\right)\left(\frac{24\ hr}{1\ d}\right) = 1.04 \ gpd/ft$$

$$S = 2.25\,(1.04\ gpd/ft)(12.1\ min)\left[\frac{1\ ft^3}{7.48\ gal}\right]\left[\frac{1\ ft^2}{(51\ ft)^2}\right]\left(\frac{1\ d}{1440\ min}\right)$$

$$= 0.0019$$



1 log cycle conversion factor (Δs) = 231 ft³/d

$$T = \frac{2.3\,(231\ ft^3/d)}{4\pi\,(.30\ ft)} = 141\ ft^2/d$$

$$S = 2.25\,(140.9\ ft^2/d)(.14\ min)[1/(5.1\times10^{-3})^2](1d/1440\ min)$$

$$= 0.0012$$

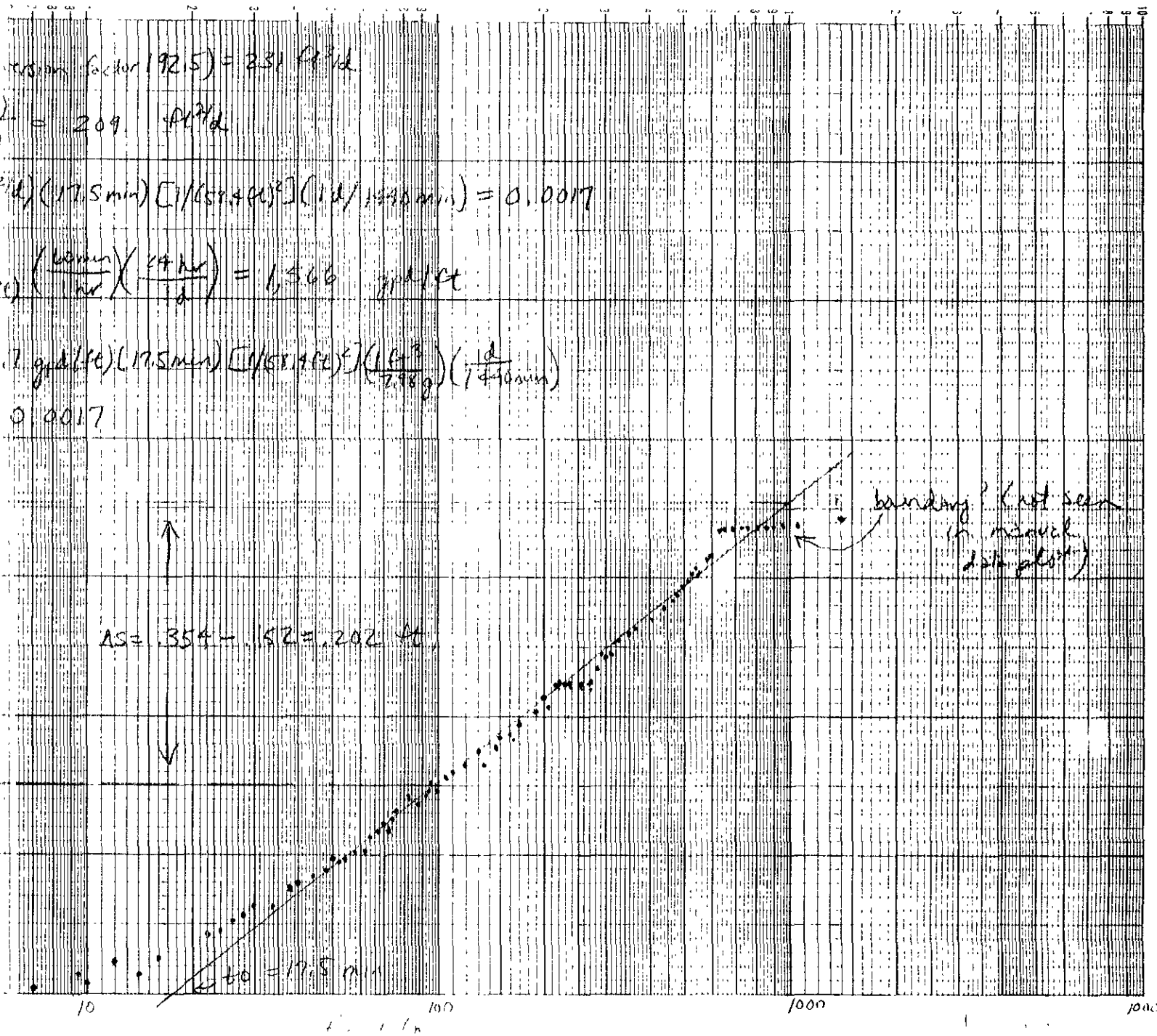
$$T = \frac{2.3\,(1.2\ gpm)}{(min)\,4\pi\,(.3\ ft)}\left(\frac{60\ min}{1\ hr}\right)\left(\frac{24\ hr}{1\ d}\right) = 1,054\ gpd/ft$$

$$S = 2.25\,(.054\ gpd/ft)(.14\ min)[1/(5.1\times10^{-3})^2]\left(\frac{1\ ft^3}{7.48\ gal}\right)\left(\frac{1\ d}{1440\ min}\right)$$

$$= 0.0012$$

SEMI-LOGARITHMIC 4 CYCLES X 70 DIVISIONS AD 0843 GT

DRAWDOWN/TIME (SEMI-LOG) & SEMI-LOGARITHMIC PLOT



12 ppm (Conversion factor 192.5) = 231 ft²/d

T = 3.1416 (209 ft²/d) / 4π (.202 ft) = 209 ft²/d

(209.3 ft²/d)(17.5 min)[1/(5.14 ft)²](1 d / 1440 min) = 0.0017

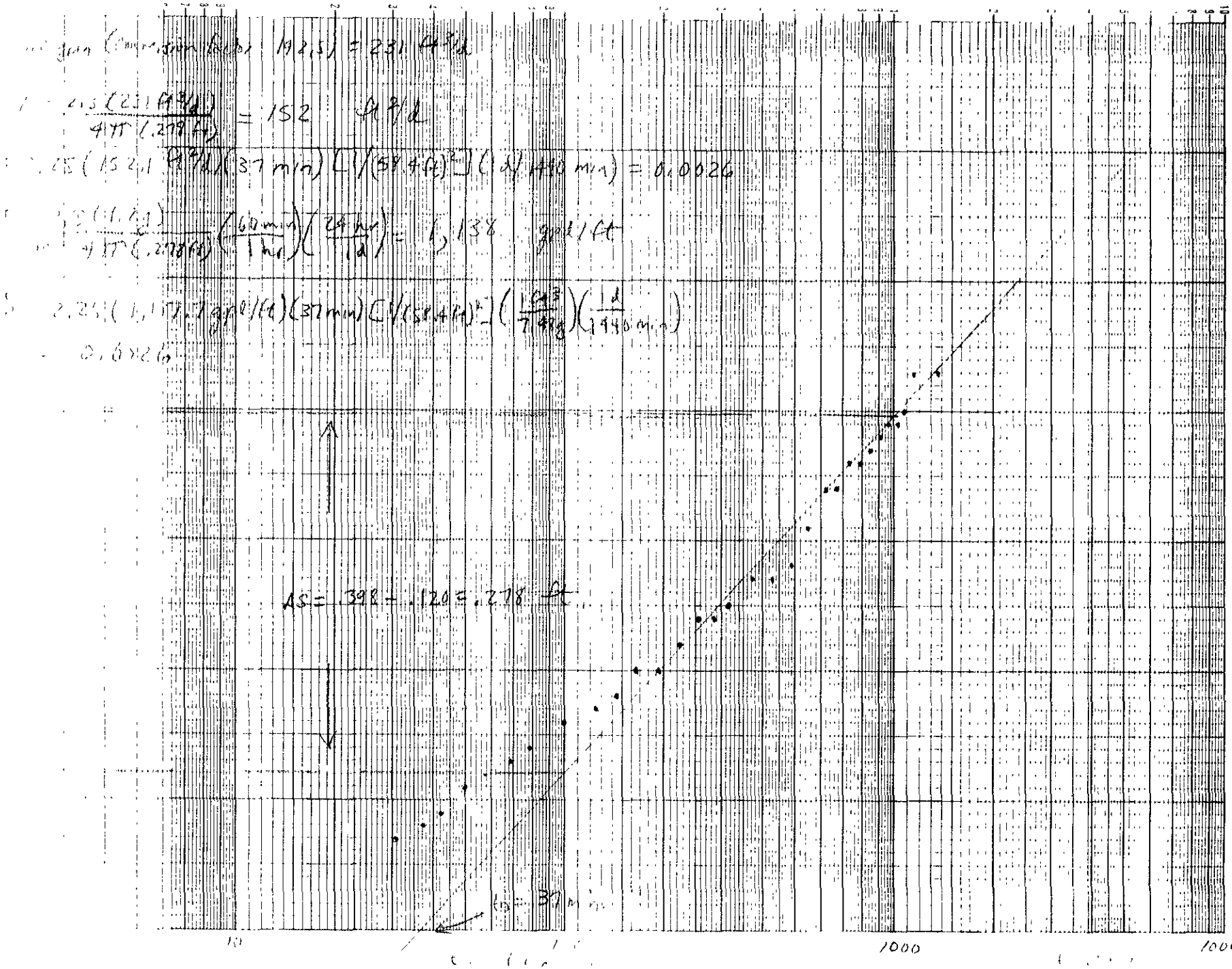
2.3 (1.2.9) / 4π (.202 ft) (60 min / 1 hr)(24 hr / 1 d) = 1,566 gpd/ft

2.3 (1,566.7 gpd/ft)(17.5 min)[1/(5.14 ft)²](1 ft³ / 7.48 g)(1 d / 1440 min)

= 0.0017

SEMI LOGARITHMIC 4 CYCLES x 70 DIVISIONS AD 0843 - GT

DRAWDOWN/TIME DATA - MODIFIED SEMILOGARITHMIC PLOT

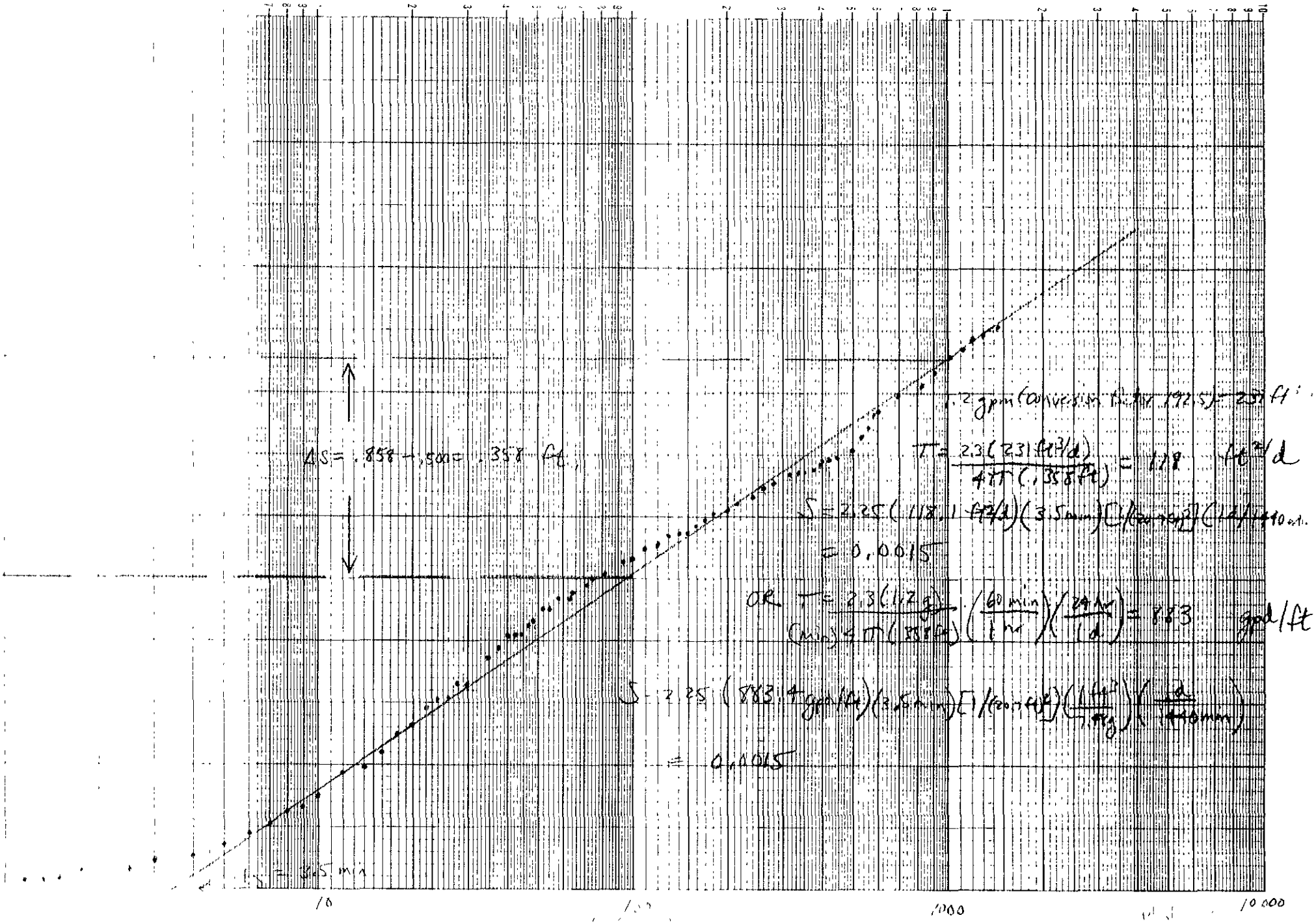


$$\Delta s = .398 - .120 = .278 \text{ ft}$$

$t_0 = 37$ min

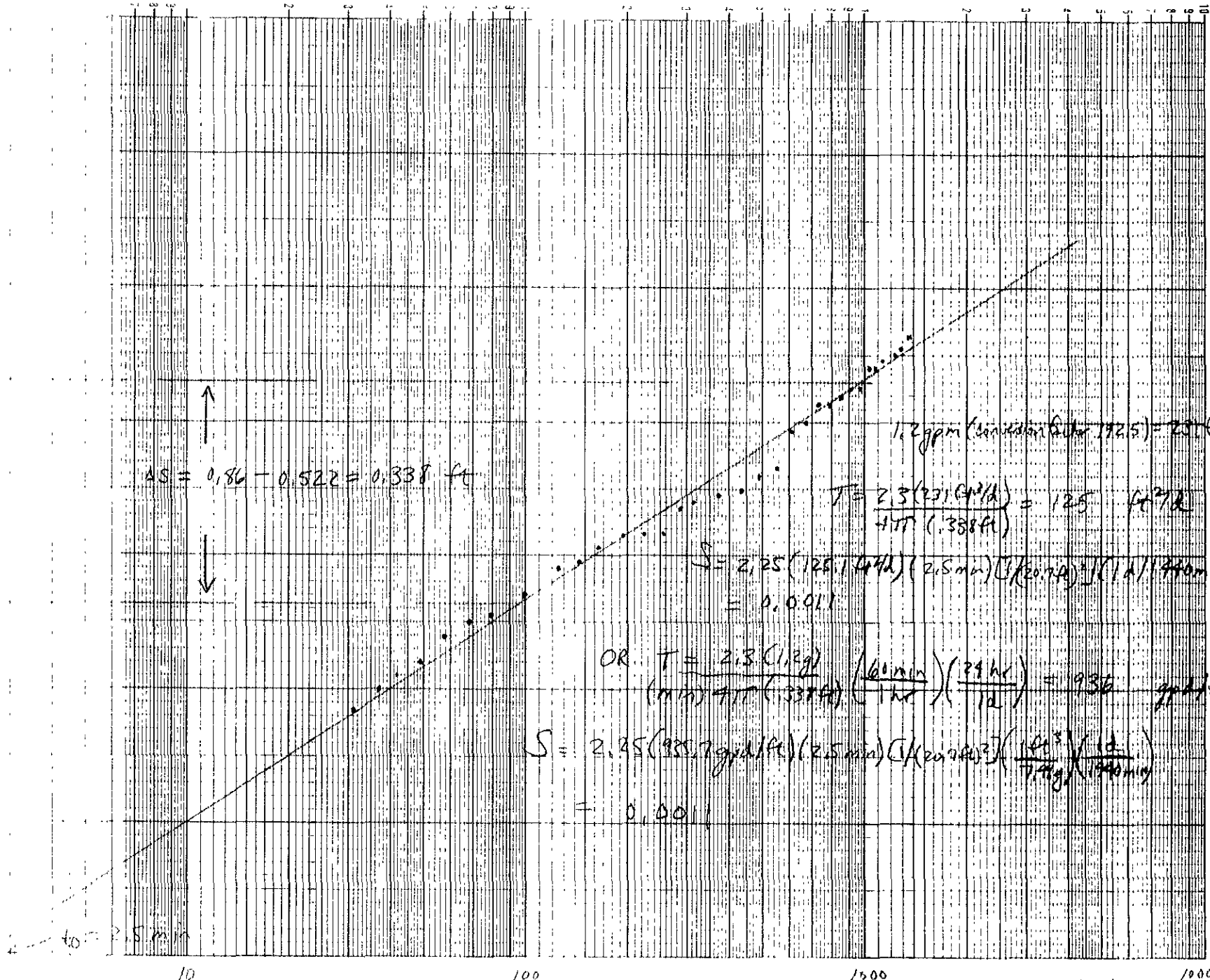
SEMI LOGARITHMIC 4 CYCLES × 70 DIVISIONS AD 0843 GT

DRAWDOWN/TIME WELL MW-3 SEMILOGARITHMIC PLOT



SEMI-LOGARITHMIC 4 CYCLES X 70 DIVISIONS AD 0843 GT

DRAWDOWN/TIME CALC MAY 84 SEMILOGARITHMIC PLOT



$\Delta S = 0.86 - 0.522 = 0.338$ ft

$t_0 = 2.5$ min

1.2 gpm (1 cu ft/7.48 gal)(60 min/1 hr) = 9.63 cu ft/hr

$T = \frac{2.3(23)(ft^3/hr)}{4\pi(.338 ft)} = 12.5 \quad ft^2/hr$

$S = 2.25(12.5\ ft^2/hr)(2.5\ min)[1\ hr/(20\ min)^2][(1\ hr/60\ min)^2]$

$= 0.001$

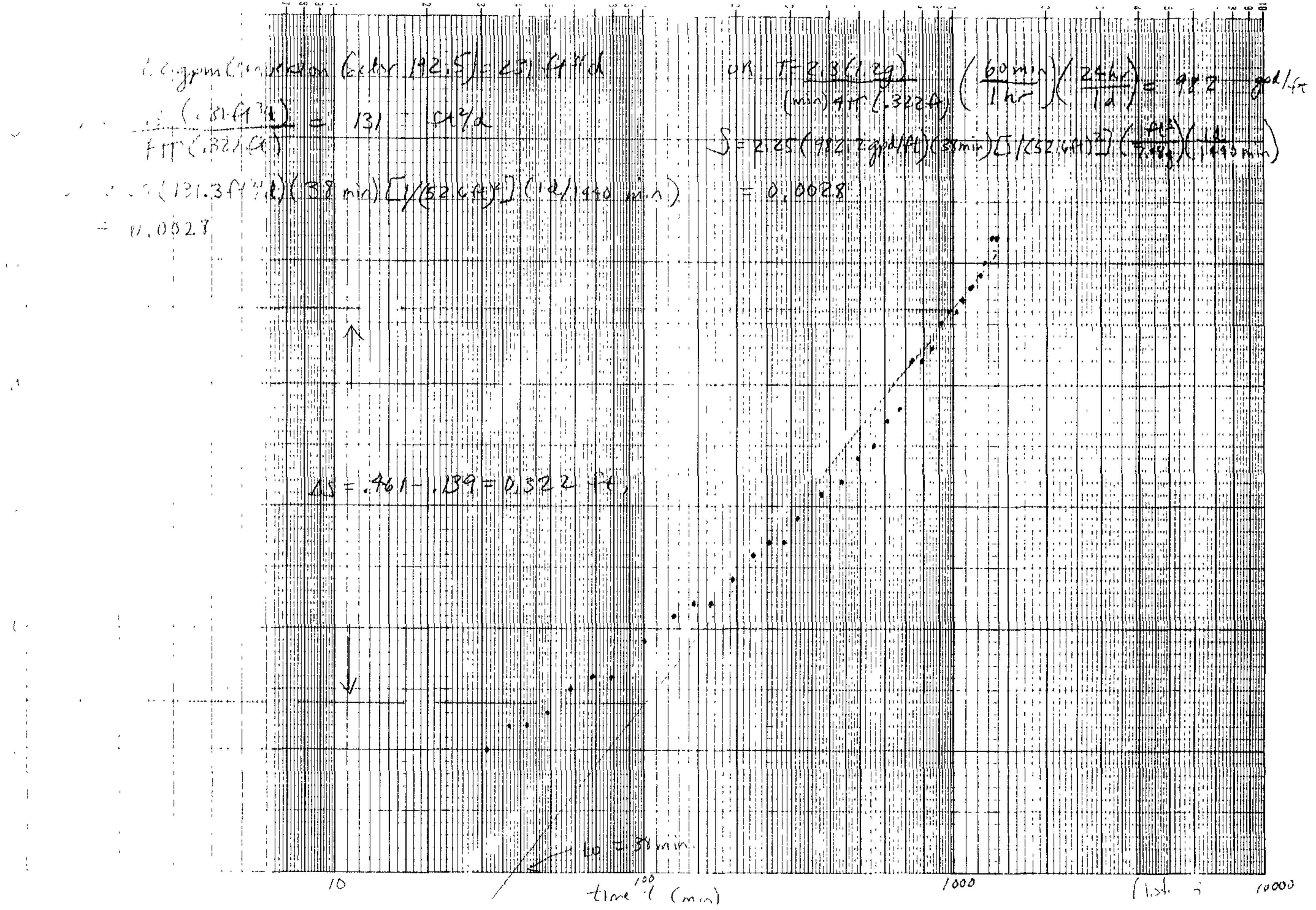
OR $T = \frac{2.3(1.2\ gal)}{(1\ min)4\pi(.338 ft)}\left(\frac{60\ min}{1\ hr}\right)\left(\frac{24\ hr}{1\ d}\right) = 936 \quad gpd/ft$

$S = 2.25(935.7\ gpd/ft)(2.5\ min)[1\ d/(20\ min)^2]\left(\frac{ft^3}{7.48\ gal}\right)\left(\frac{1\ d}{1440\ min}\right)^2$

$= 0.001$

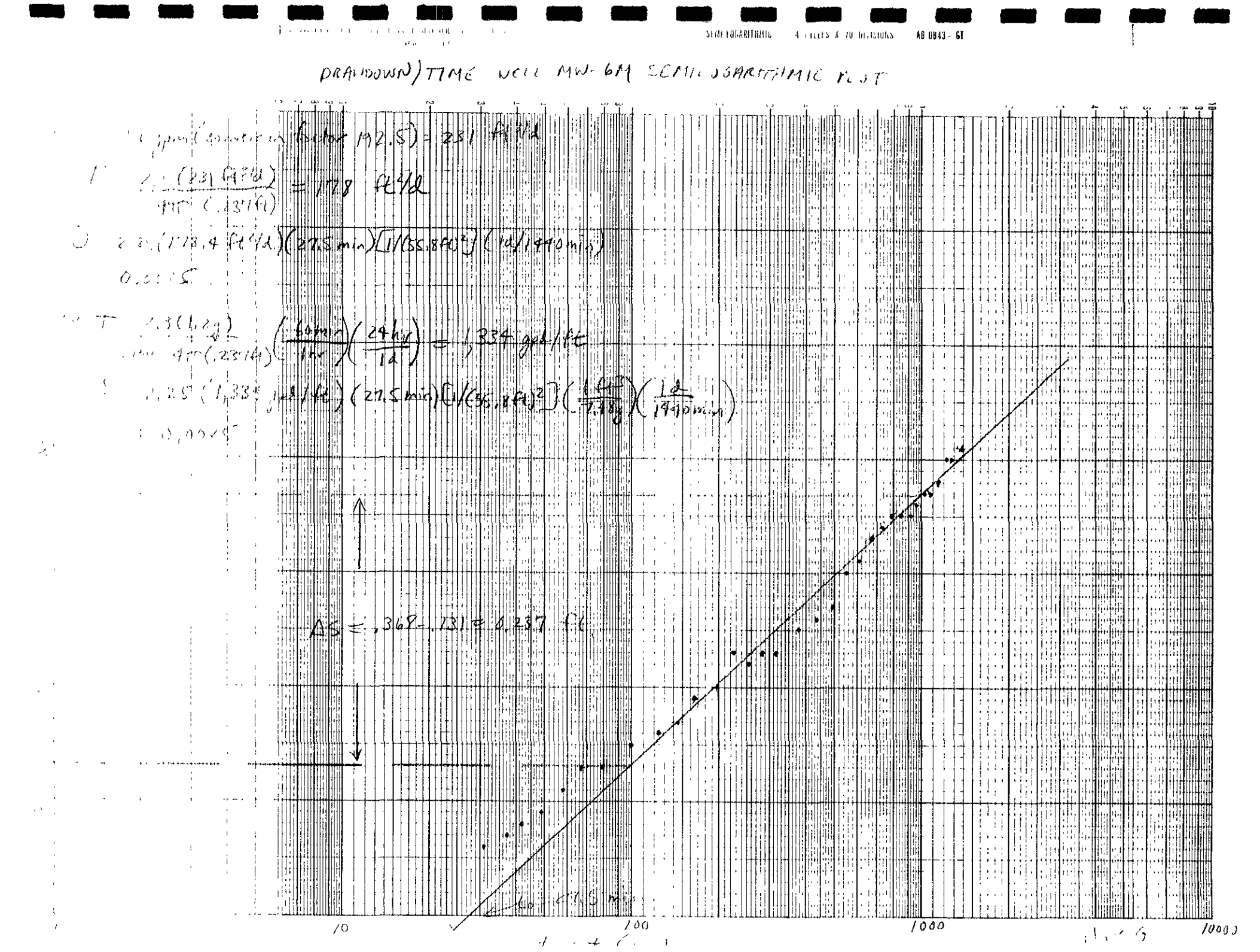
SEMI-LOGARITHMIC 4 CYCLES X 70 DIVISIONS AD 0843 GT

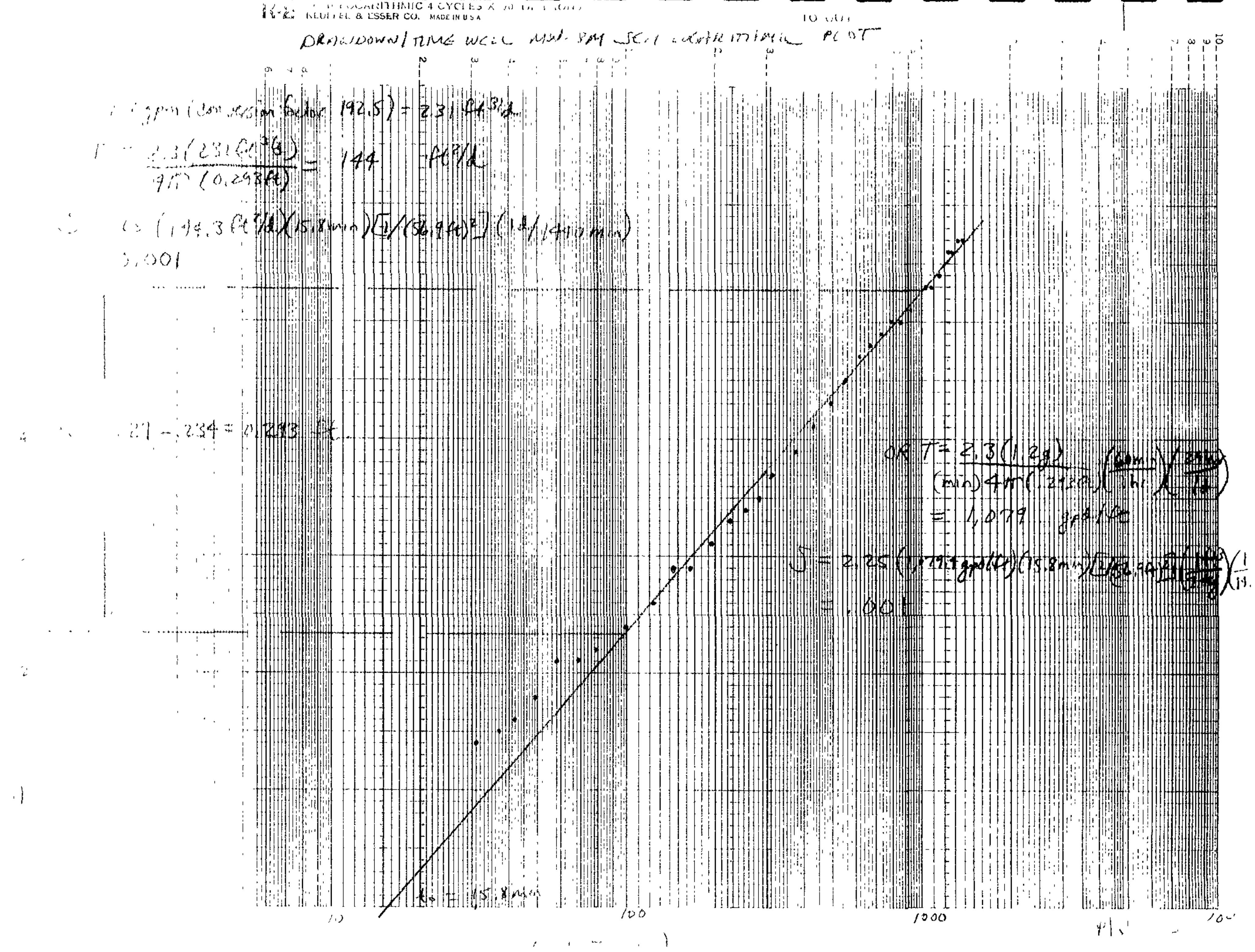
DRAWDOWN/TIME WELL MW 4M SEMILOGARITHMIC PLOT



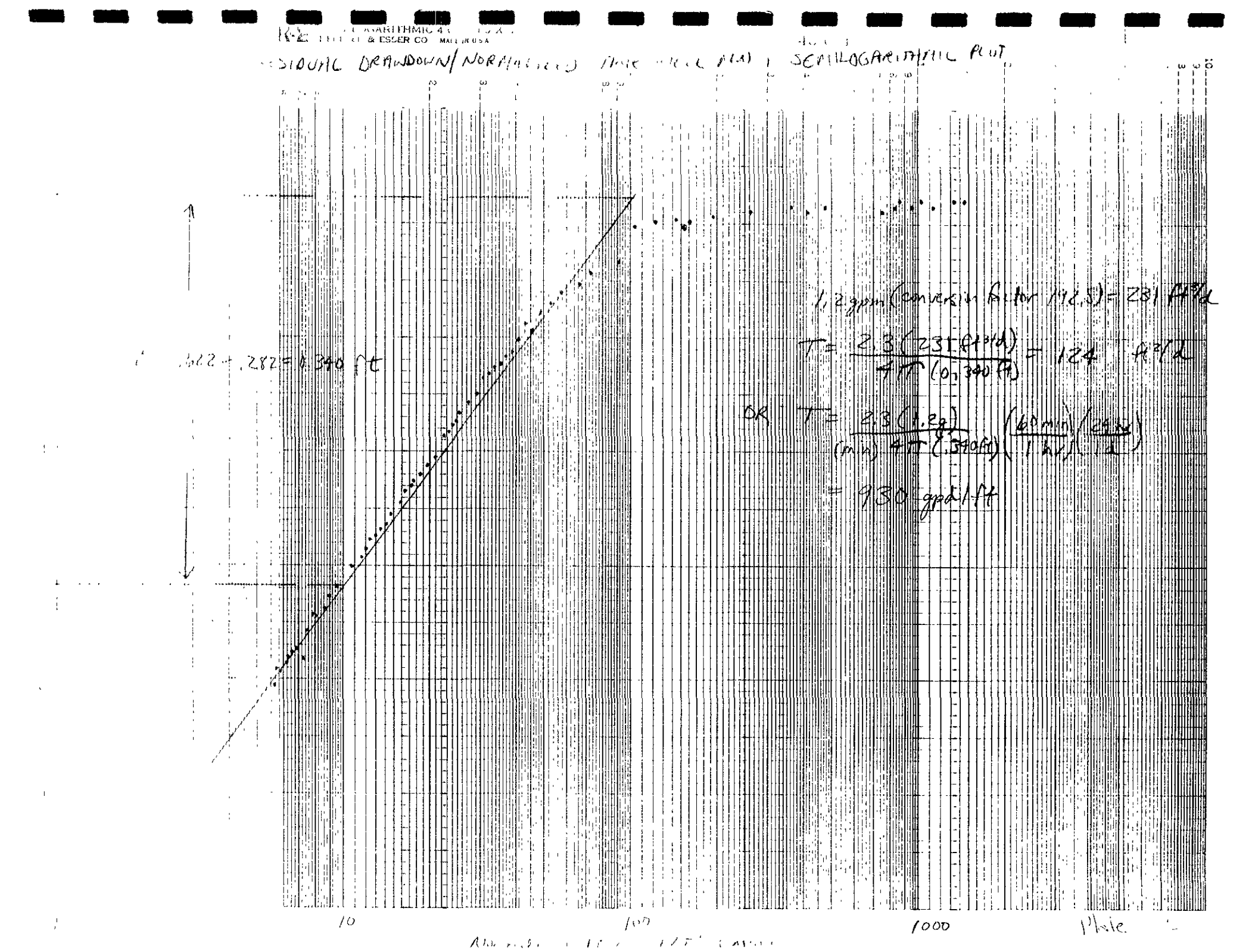
SEMILOGARITHMIC 4 CYCLES X 70 DIVISIONS AB 0843 - GY

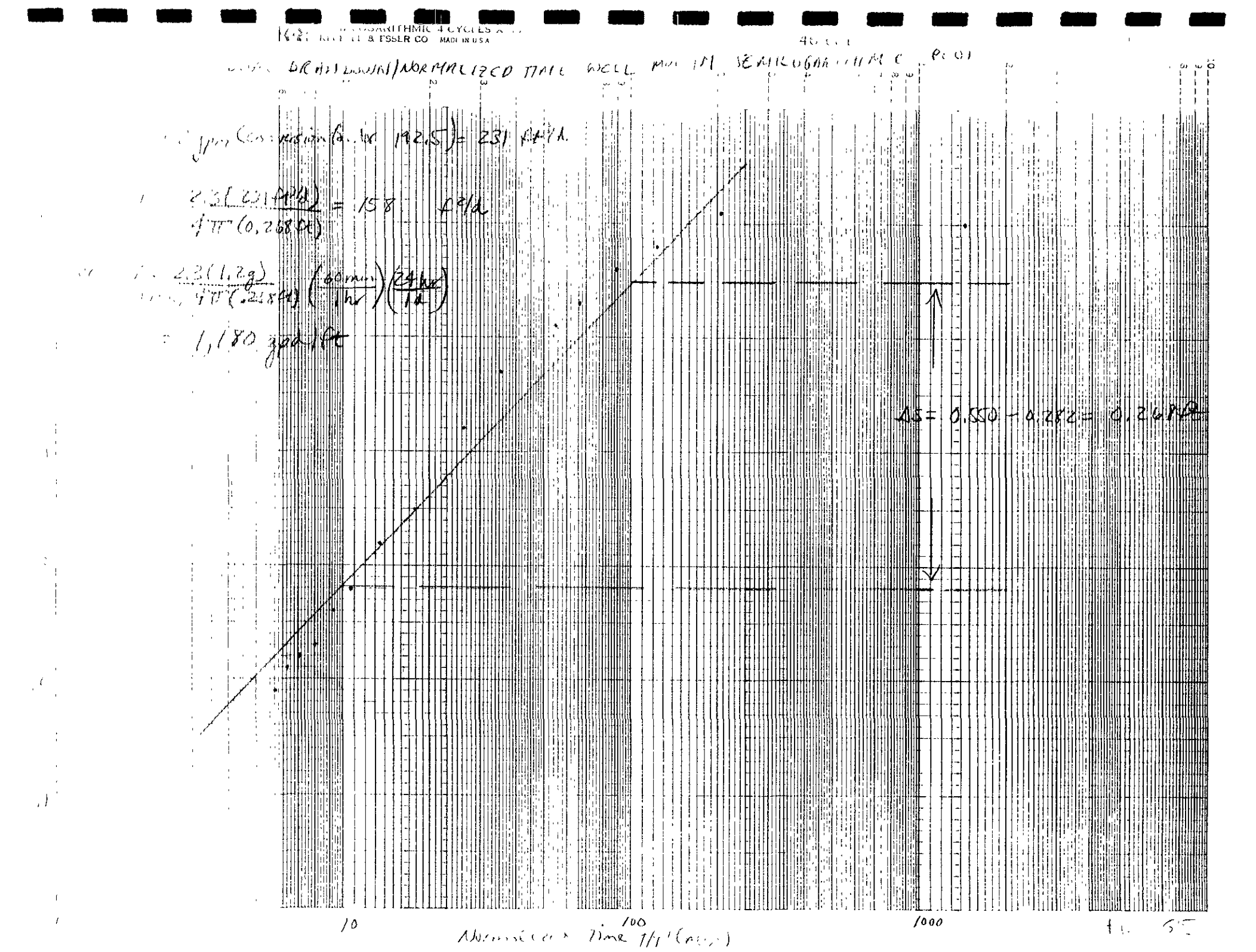
DRAWDOWN) TIME WELL MW-6M SEMILOGARITHMIC PLOT

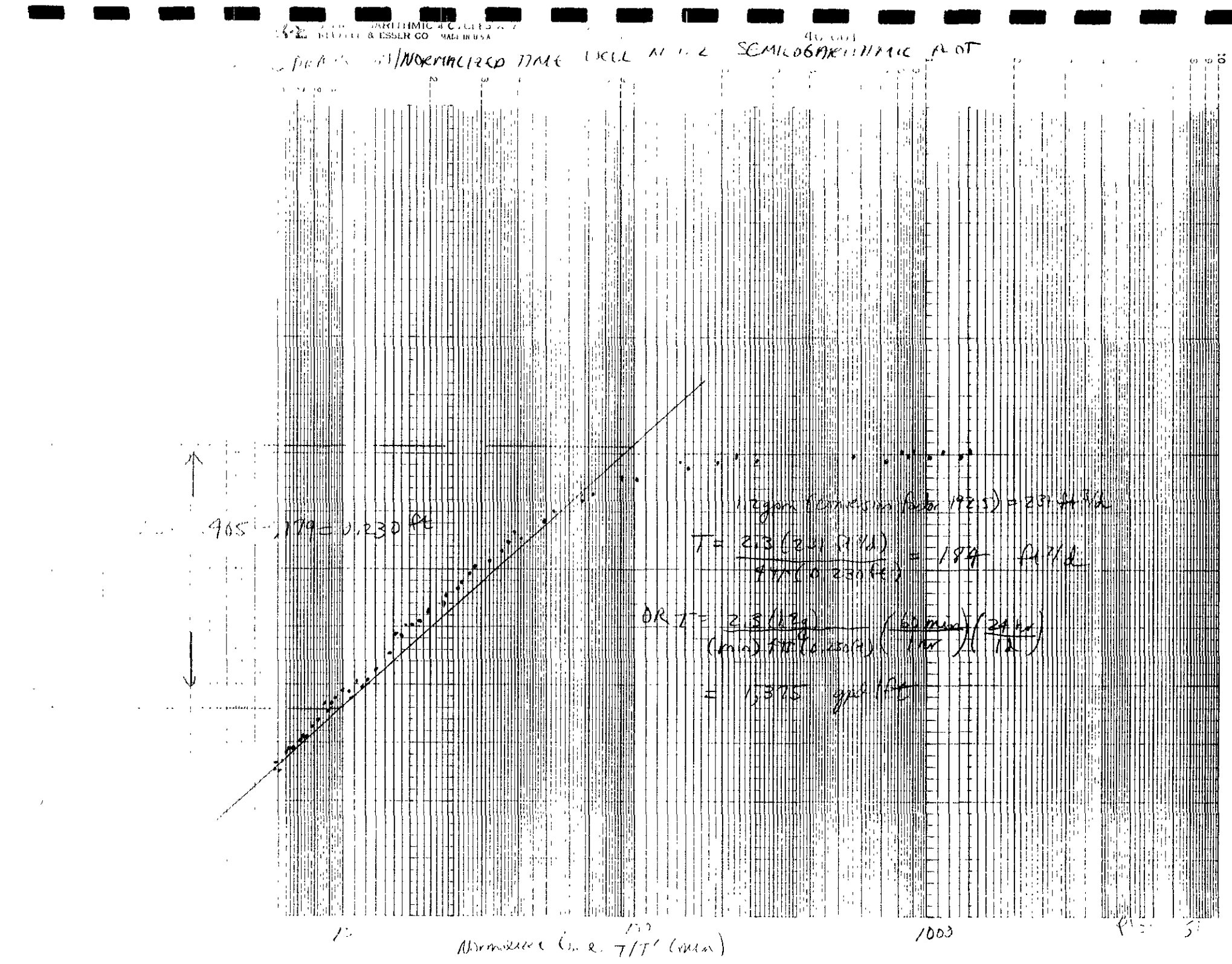


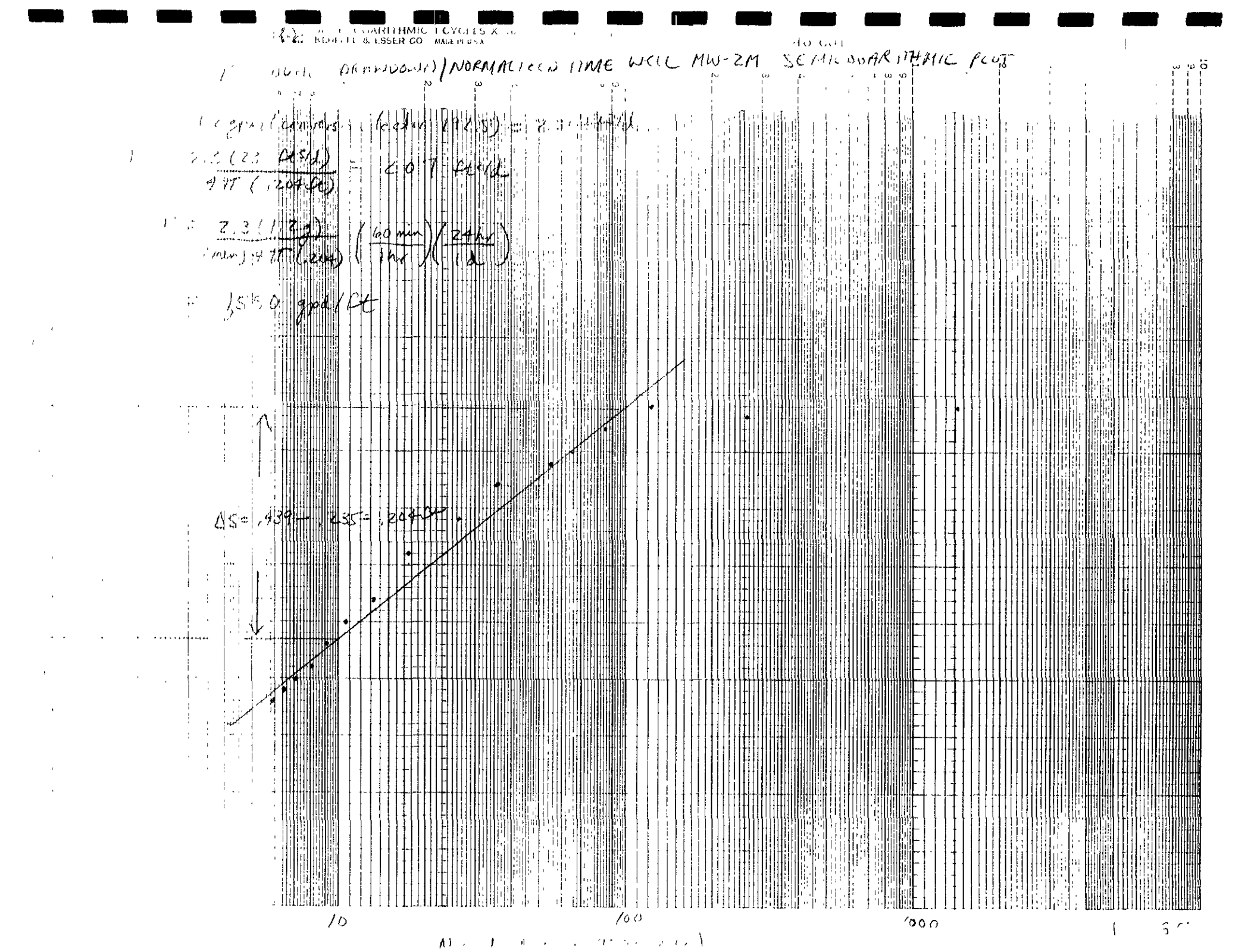


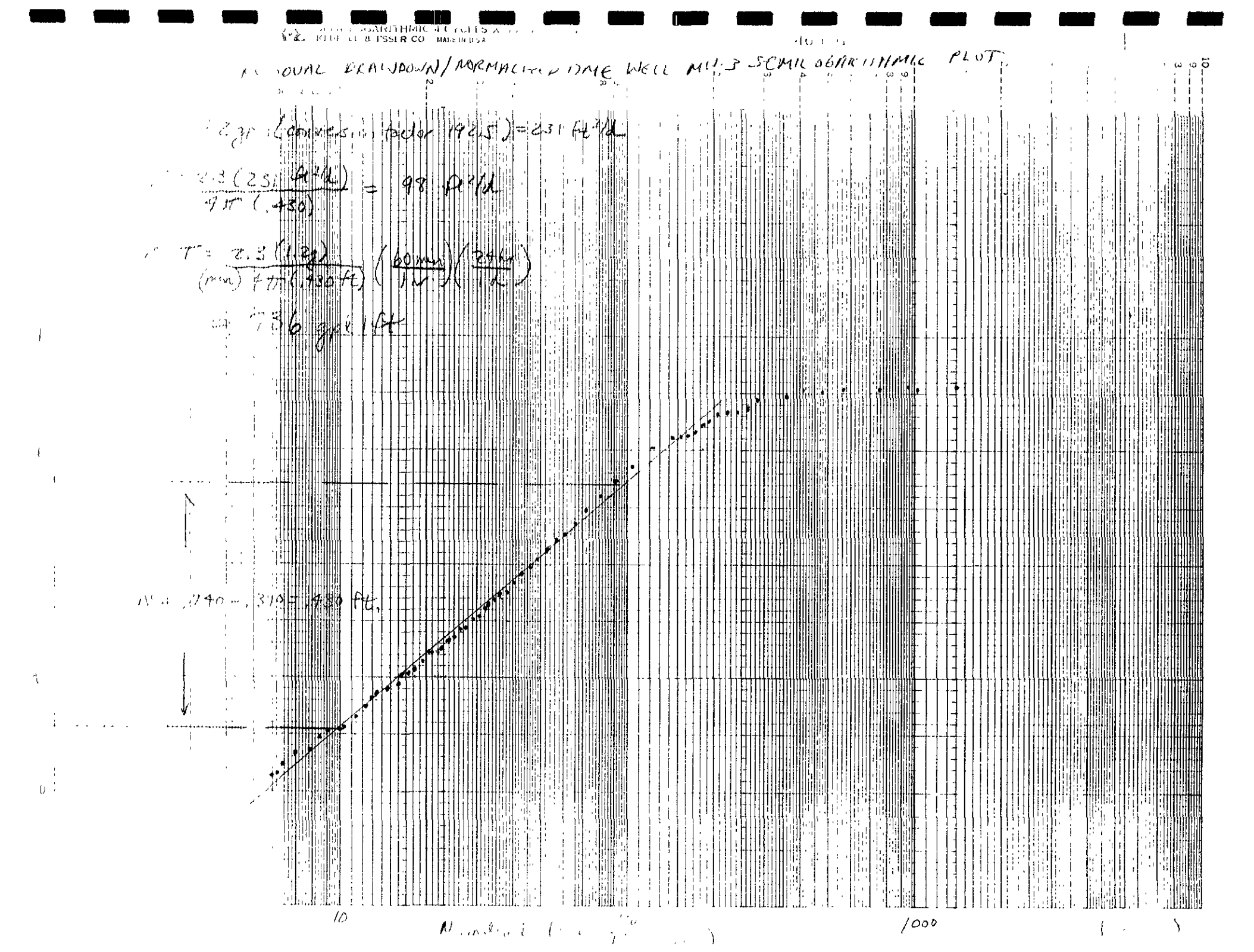
KEUFFEL & ESSER CO. MADE IN U.S.A.
DRAWDOWN/TIME WELL SEMILOGARITHMIC PLOT
= 231 ft³/d
= 144 ft²/d
0.293 ft
.001
OR T = 2.3 (1.2g)
= 1,079 gpd/ft
S = 2.25
= .001
t₀ = 15.8 min
10
100
1000

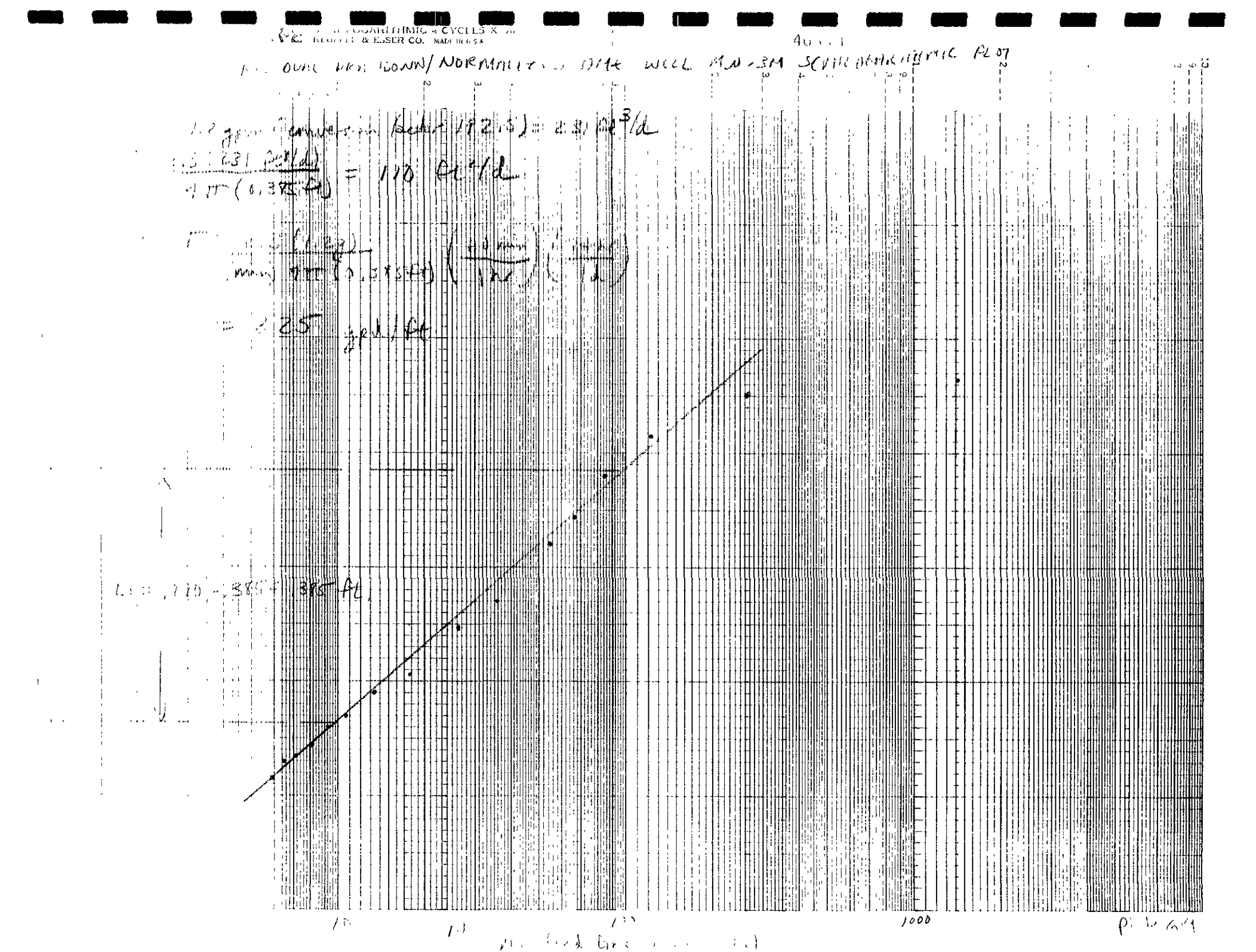

SEMILOGARITHMIC PLOT
.282 + .282 = 0.340 ft
1.2 gpm (conversion factor 192.5) = 231 ft²/d
T = 2.3 (231 ft²/d) / 4π (0.340 ft) = 124 ft²/d
OR T = 2.3 (1.2 gal/min) / 4π (.340 ft) (60 min/1 hr) (24 hr/1 d)
= 930 gpd/ft
10
100
1000

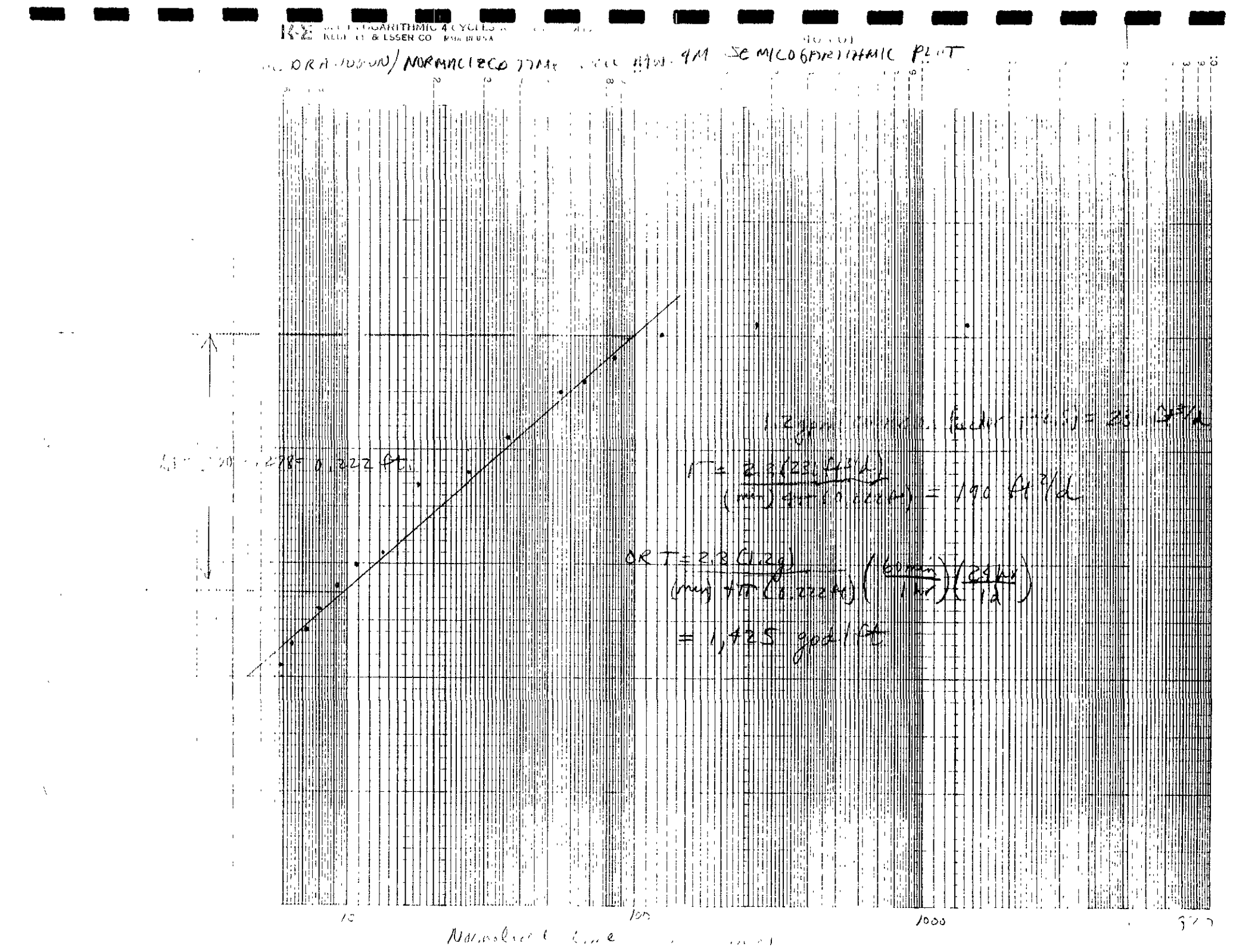

KEUFFEL & ESSER CO MADE IN U.S.A.
DRAWDOWN/NORMALIZED TIME WELL
SEMILOGARITHMIC
$\Delta s = 0.550 - 0.282 = 0.268$ ft
10
100
1000

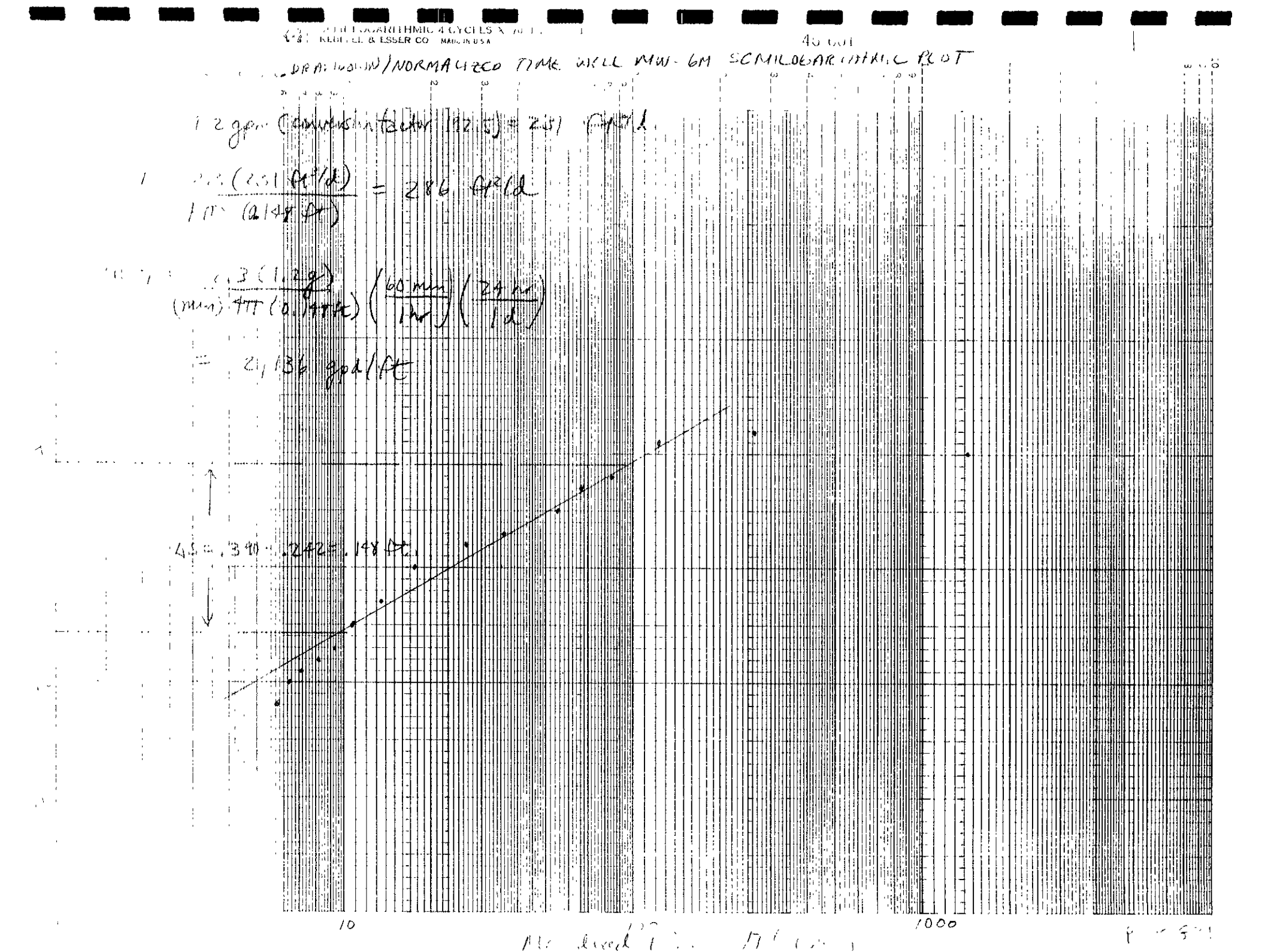

SEMILOGARITHMIC PLOT
Normalized (i.e. T/T' (min)
1000
705 - 179 = 0.230 ft
1 gpm (conversion factor 192.5) = 231 ft²/d
T = 2.3(231 ft²/d) / 4π(0.230 ft) = 184 ft²/d
OR T = 2.3(1 gal/min) / (4π) ft(0.230 ft)² (60 min/1 hr)(24 hr/1 d)
= 1,375 gpd/ft

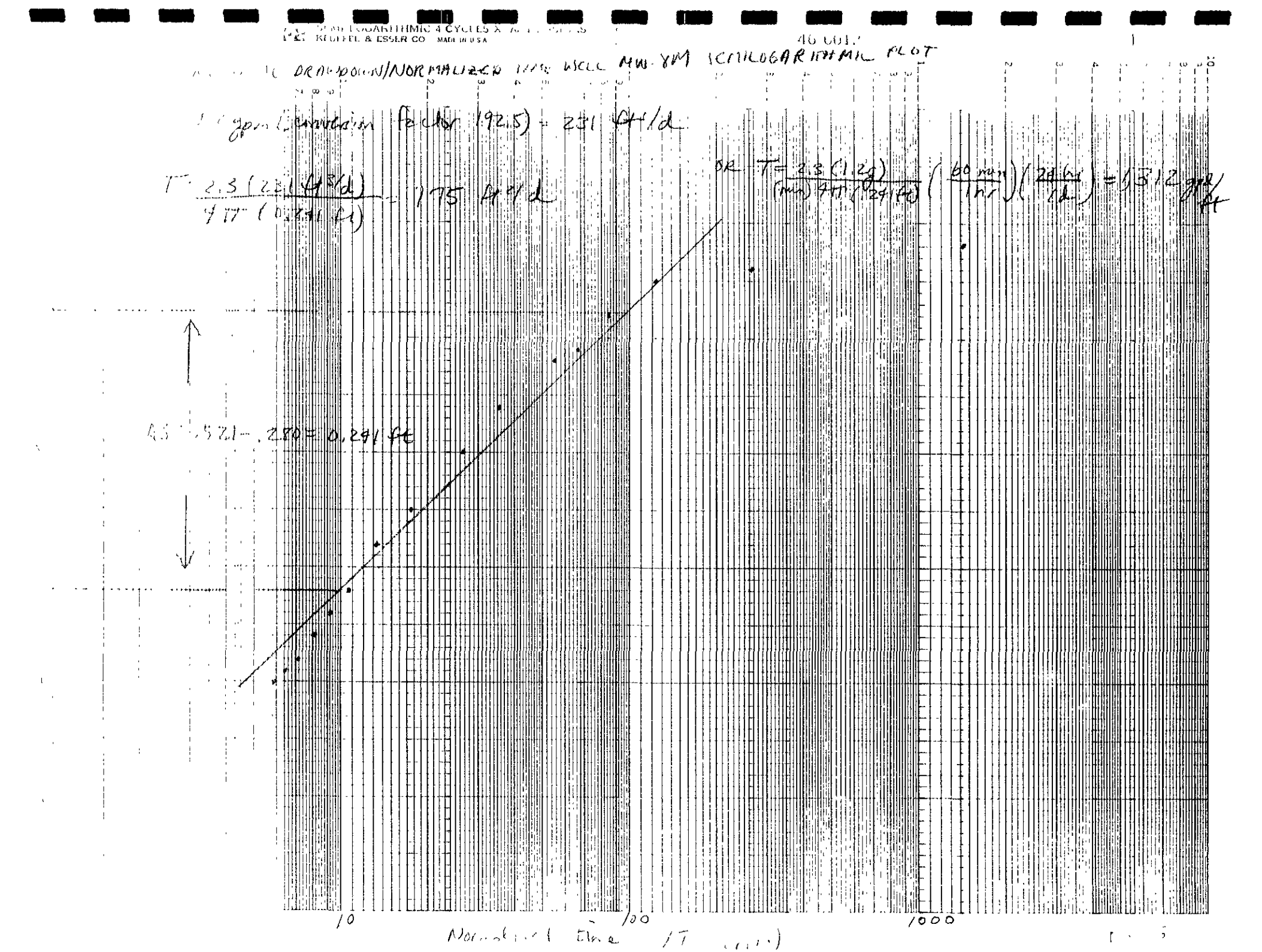

KEUFFEL & ESSER CO
DRAWDOWN / NORMALIZED TIME WELL MW-2M SEMILOGARITHMIC PLOT
10
100
1000


RESIDUAL DRAWDOWN/RECOVERY TIME WELL MW-3 SEMILOGARITHMIC PLOT
10
1000

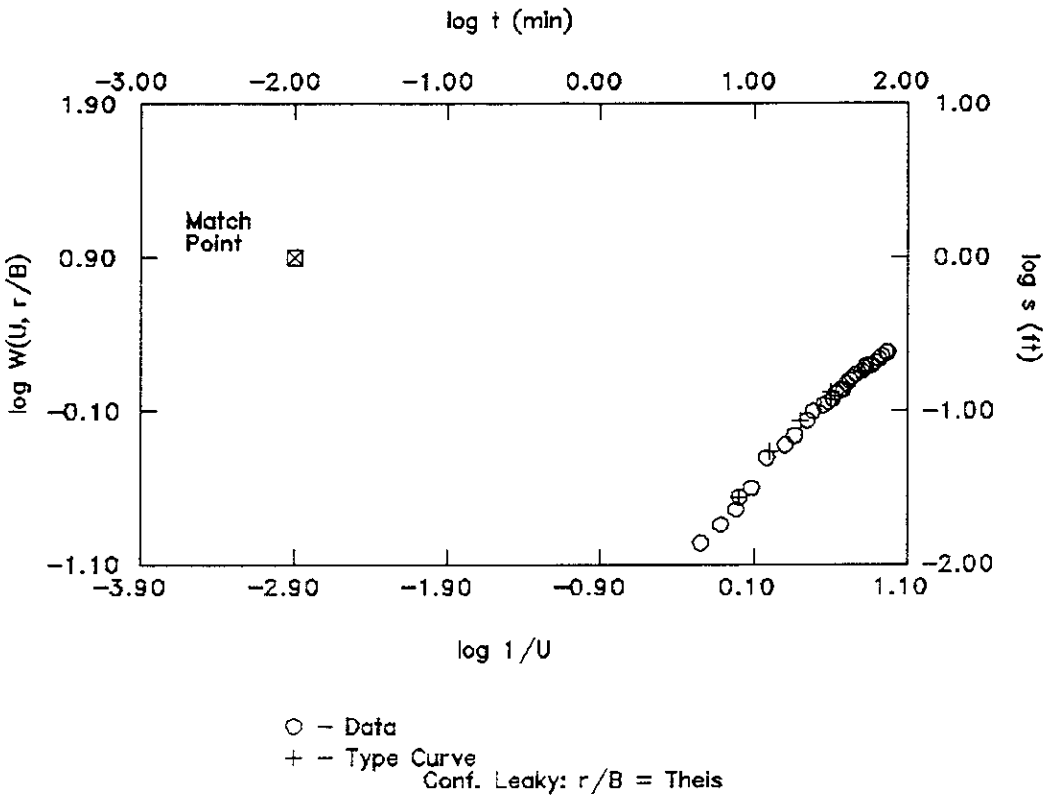

1000


SEMILOGARITHMIC 4 CYCLES
KEUFFEL & ESSER CO.
SEMILOGARITHMIC PLOT
10
100
1000
Normalized Line


DRAWDOWN/NORMALIZED TIME WELL MW-6M SEMILOGARITHMIC PLOT
10
1000


SEMILOGARITHMIC 4 CYCLES X
KEUFFEL & ESSER CO MADE IN U.S.A.
DRAWDOWN/NORMALIZED
Normalized time

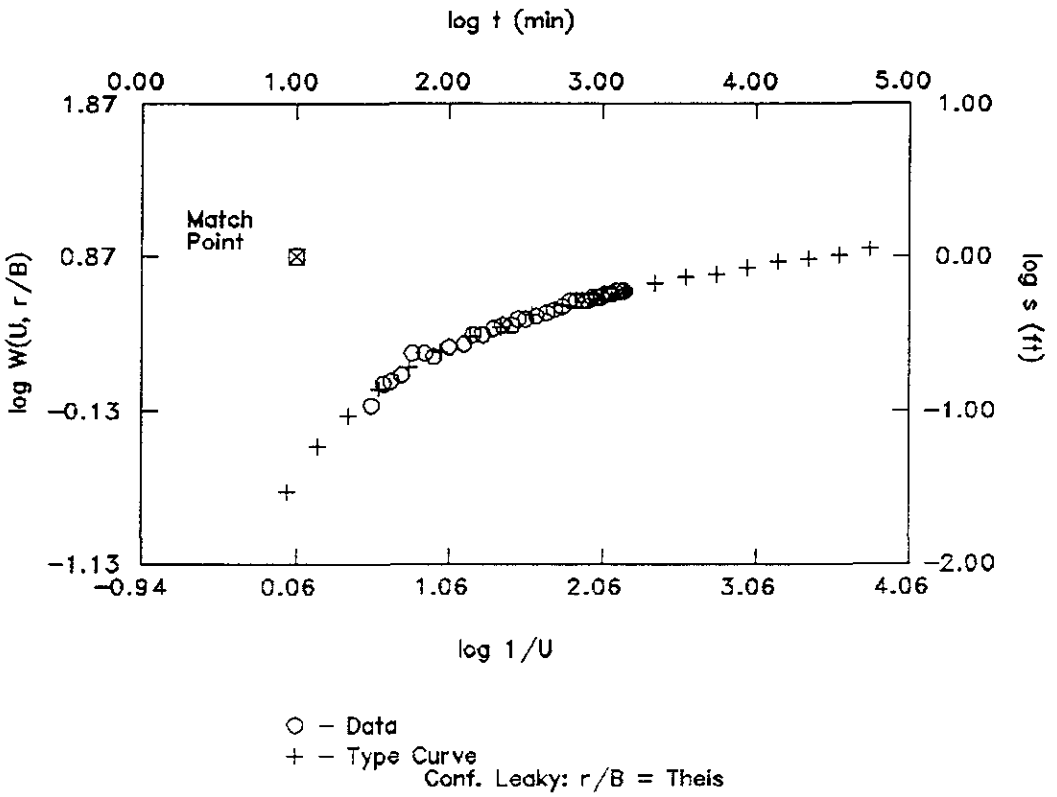
MW-1 LOGARITHMIC PLOT



MATCH POINT			SOLUTION		
t	=	1.000E-0002	Transmissivity (T)	=	1.092E+0003 gpd/ft
s	=	1.000E+0000	Hydraulic Conductivity (K)	=	7.281E+0001 gpd/sq ft
1/U	=	1.259E-0003	Storativity (S)	=	1.239E-0003
W(U, r/B)	=	7.943E+0000			

WELL INFORMATION	
WELL IDENTIFICATION	: MW-1
DATE OF AQUIFER TEST	: 7-28-92
AQUIFER THICKNESS (b)	: 1.500E+0001 ft
DISCHARGE RATE (Q)	: 1.200E+0000 gpm
PUMPING WELL RADIUS (r)	: 1.670E-0001 ft
DISTANCE OF OBSERVATION WELL FROM PUMPING WELL (d)	: 5.100E+0001 ft

MW-1M LOGARITHMIC PLOT

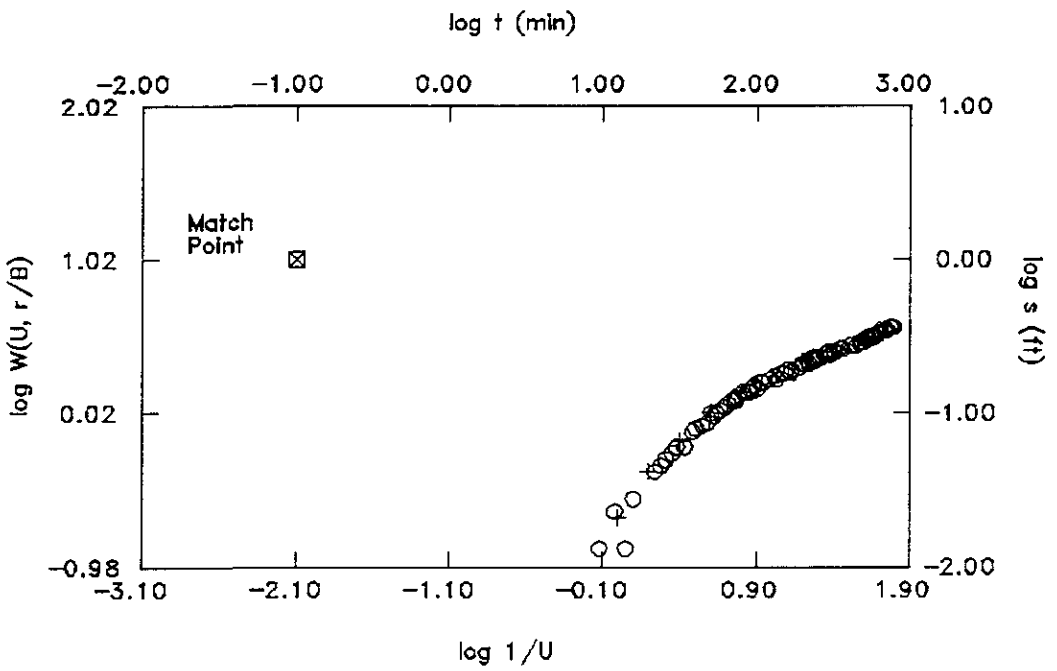


MATCH POINT			SOLUTION		
t	=	1.000E+0001	Transmissivity (T)	=	1.019E+0003 gpd/ft
s	=	1.000E+0000	Hydraulic Conductivity (K)	=	6.795E+0001 gpd/sq ft
1/U	=	1.148E+0000	Storativity (S)	=	1.268E−0003
W(U, r/B)	=	7.413E+0000			

WELL INFORMATION

WELL IDENTIFICATION	: MW-1M
DATE OF AQUIFER TEST	: 7-28-92
AQUIFER THICKNESS (b)	: 1.500E+0001 ft
DISCHARGE RATE (Q)	: 1.200E+0000 gpm
PUMPING WELL RADIUS (r)	: 1.670E-0001 ft
DISTANCE OF OBSERVATION WELL FROM PUMPING WELL (d)	: 5.100E+0001 ft

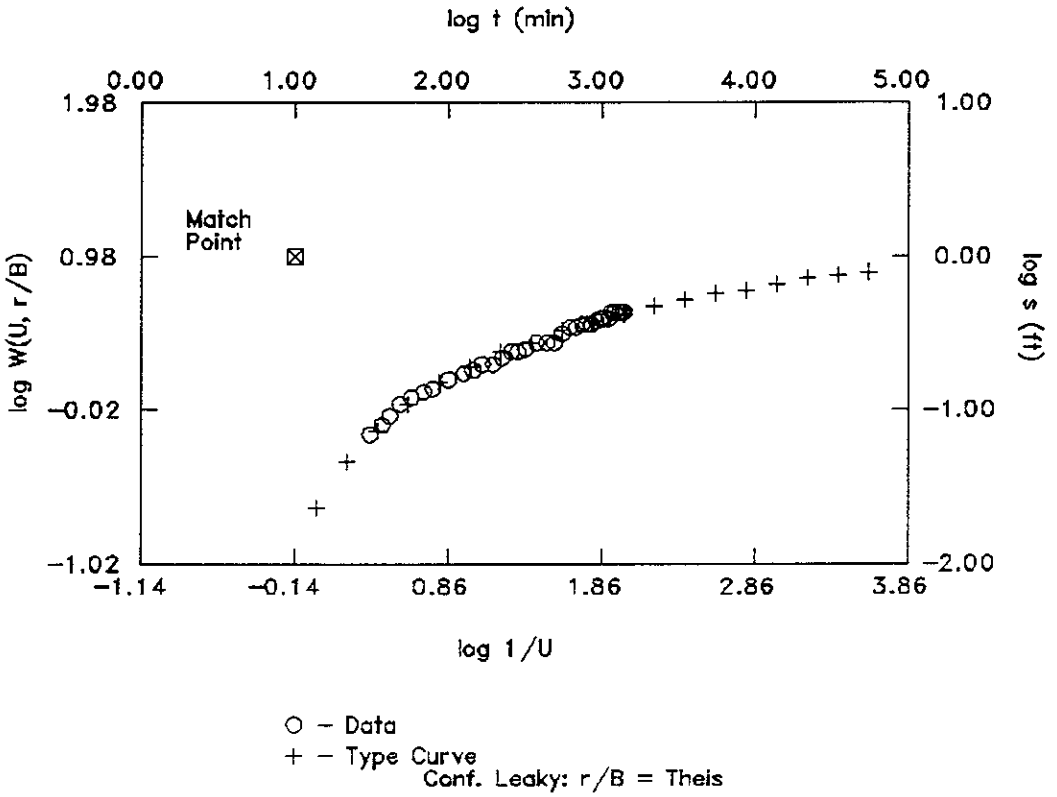
MW-2 LOGARITHMIC PLOT



MATCH POINT			SOLUTION		
t	=	1.000E-0001	Transmissivity (T)	=	1.440E+0003 gpd/ft
s	=	1.000E+0000	Hydraulic Conductivity (K)	=	9.598E+0001 gpd/sq ft
1/U	=	7.943E-0003	Storativity (S)	=	1.974E-0003
W(U, r/B)	=	1.047E+0001			

WELL INFORMATION	
WELL IDENTIFICATION	: MW-2
DATE OF AQUIFER TEST	: 7-28-92
AQUIFER THICKNESS (b)	: 1.500E+0001 ft
DISCHARGE RATE (Q)	: 1.200E+0000 gpm
PUMPING WELL RADIUS (r)	: 1.670E-0001 ft
DISTANCE OF OBSERVATION WELL FROM PUMPING WELL (d)	: 5.840E+0001 ft

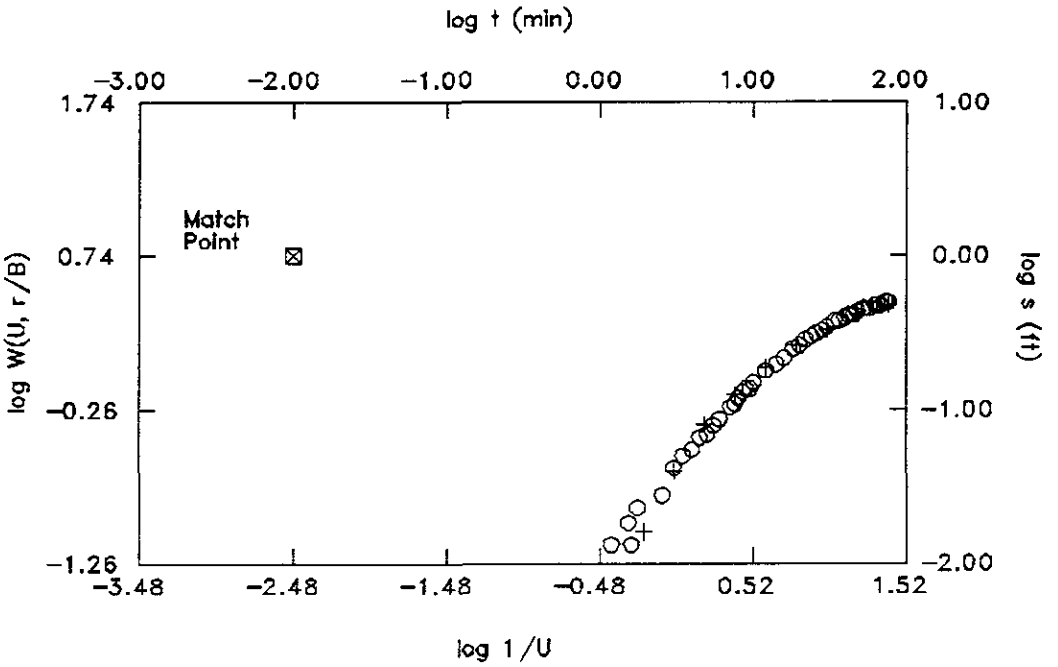
MW-2M LOGARITHMIC PLOT



MATCH POINT			SOLUTION		
t	=	1.000E+0001	Transmissivity (T)	=	1.313E+0003 gpd/ft
s	=	1.000E+0000	Hydraulic Conductivity (K)	=	8.753E+0001 gpd/sq ft
1/U	=	7.244E−0001	Storativity (S)	=	1.974E−0003
W(U, r/B)	=	9.550E+0000			

WELL INFORMATION	
WELL IDENTIFICATION	: MW-2M
DATE OF AQUIFER TEST	: 7-28-92
AQUIFER THICKNESS (b)	: 1.500E+0001 ft
DISCHARGE RATE (Q)	: 1.200E+0000 gpm
PUMPING WELL RADIUS (r)	: 1.670E−0001 ft
DISTANCE OF OBSERVATION WELL FROM PUMPING WELL (d)	: 5.840E+0001 ft

MW-3 LOGARITHMIC PLOT



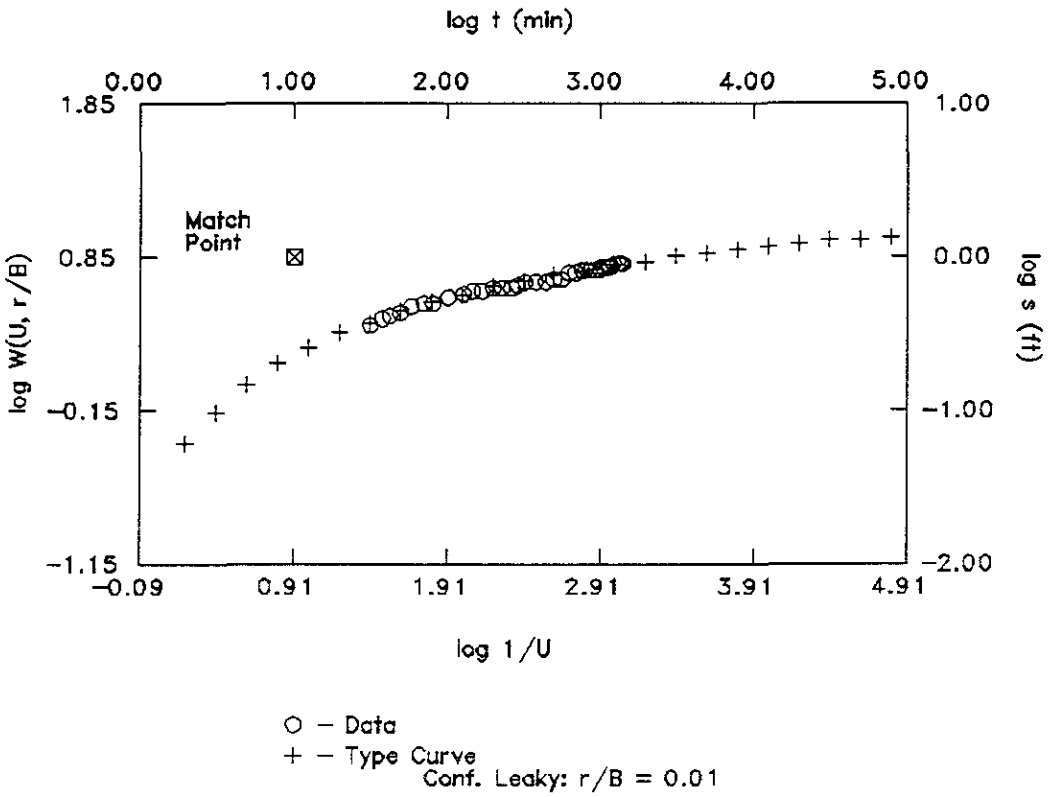
○ – Data
+ – Type Curve
Conf. Leaky: r/B = Theis

MATCH POINT			SOLUTION		
t	=	1.000E-0002	Transmissivity (T)	=	7.555E+0002 gpd/ft
s	=	1.000E+0000	Hydraulic Conductivity (K)	=	5.037E+0001 gpd/sq ft
1/U	=	3.311E-0003	Storativity (S)	=	1.978E-0003
W(U, r/B)	=	5.495E+0000			

WELL INFORMATION

WELL IDENTIFICATION	: MW-3
DATE OF AQUIFER TEST	: 7-28-92
AQUIFER THICKNESS (b)	: 1.500E+0001 ft
DISCHARGE RATE (Q)	: 1.200E+0000 gpm
PUMPING WELL RADIUS (r)	: 1.670E-0001 ft
DISTANCE OF OBSERVATION WELL FROM PUMPING WELL (d)	: 2.070E+0001 ft

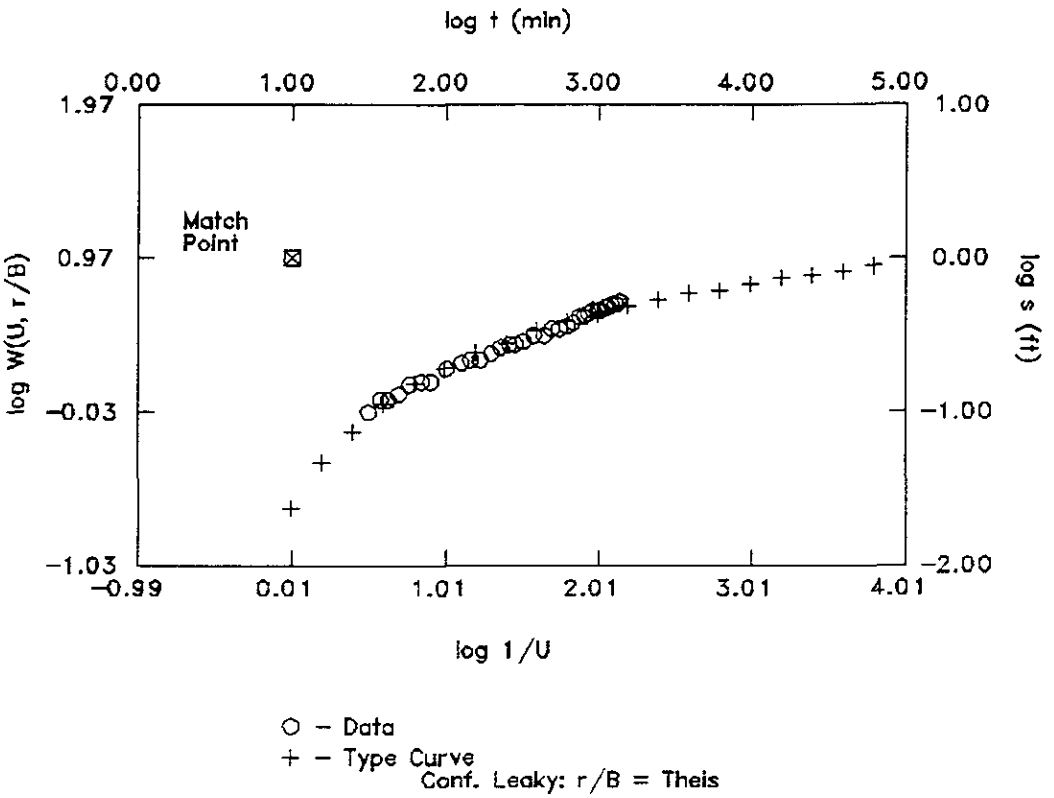
MW-3M LOGARITHMIC PLOT



MATCH POINT			SOLUTION		
t	=	1.000E+0001	Transmissivity (T)	=	9.733E+0002 gpd/ft
s	=	1.000E+0000	Hydraulic Conductivity (K)	=	6.489E+0001 gpd/sq ft
1/U	=	8.128E+0000	Storativity (S)	=	1.038E-0003
W(U, r/B)	=	7.079E+0000	Leakage Factor (B)	=	2.070E+0003 ft

WELL INFORMATION	
WELL IDENTIFICATION	: MW-3M
DATE OF AQUIFER TEST	: 7-28-92
AQUIFER THICKNESS (b)	: 1.500E+0001 ft
DISCHARGE RATE (Q)	: 1.200E+0000 gpm
PUMPING WELL RADIUS (r)	: 1.670E-0001 ft
DISTANCE OF OBSERVATION WELL FROM PUMPING WELL (d)	: 2.070E+0001 ft

MW-4M LOGARITHMIC PLOT

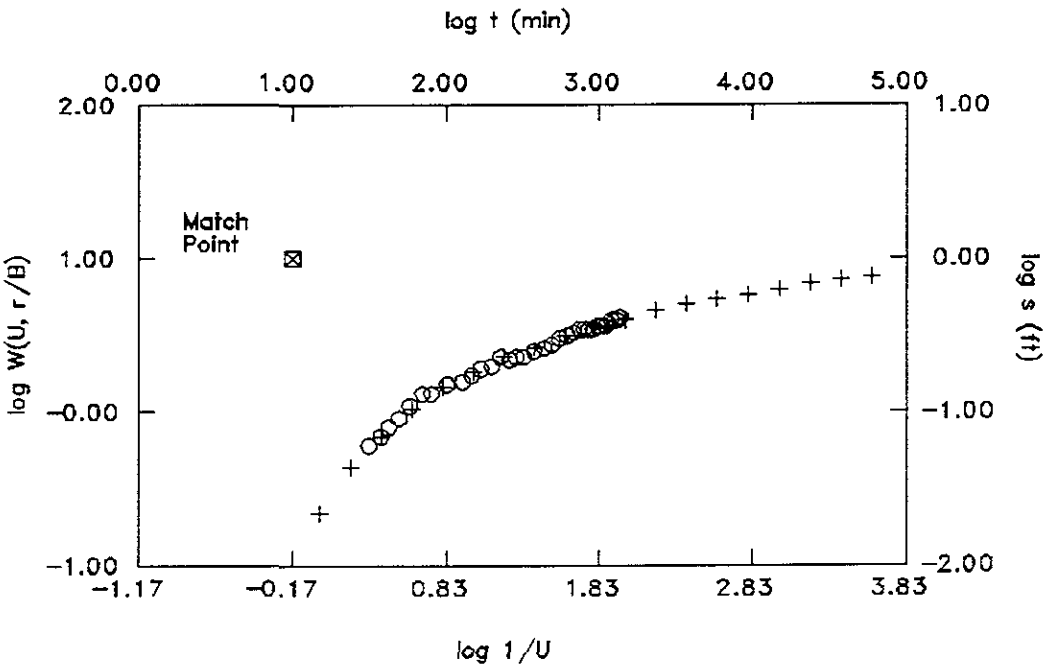


MATCH POINT			SOLUTION		
t	=	1.000E+0001	Transmissivity (T)	=	1.283E+0003 gpd/ft
s	=	1.000E+0000	Hydraulic Conductivity (K)	=	8.554E+0001 gpd/sq ft
1/U	=	1.023E+0000	Storativity (S)	=	1.683E-0003
W(U, r/B)	=	9.333E+0000			

WELL INFORMATION

WELL IDENTIFICATION	: MW-4M
DATE OF AQUIFER TEST	: 7-28-92
AQUIFER THICKNESS (b)	: 1.500E+0001 ft
DISCHARGE RATE (Q)	: 1.200E+0000 gpm
PUMPING WELL RADIUS (r)	: 1.670E-0001 ft
DISTANCE OF OBSERVATION WELL FROM PUMPING WELL (d)	: 5.260E+0001 ft

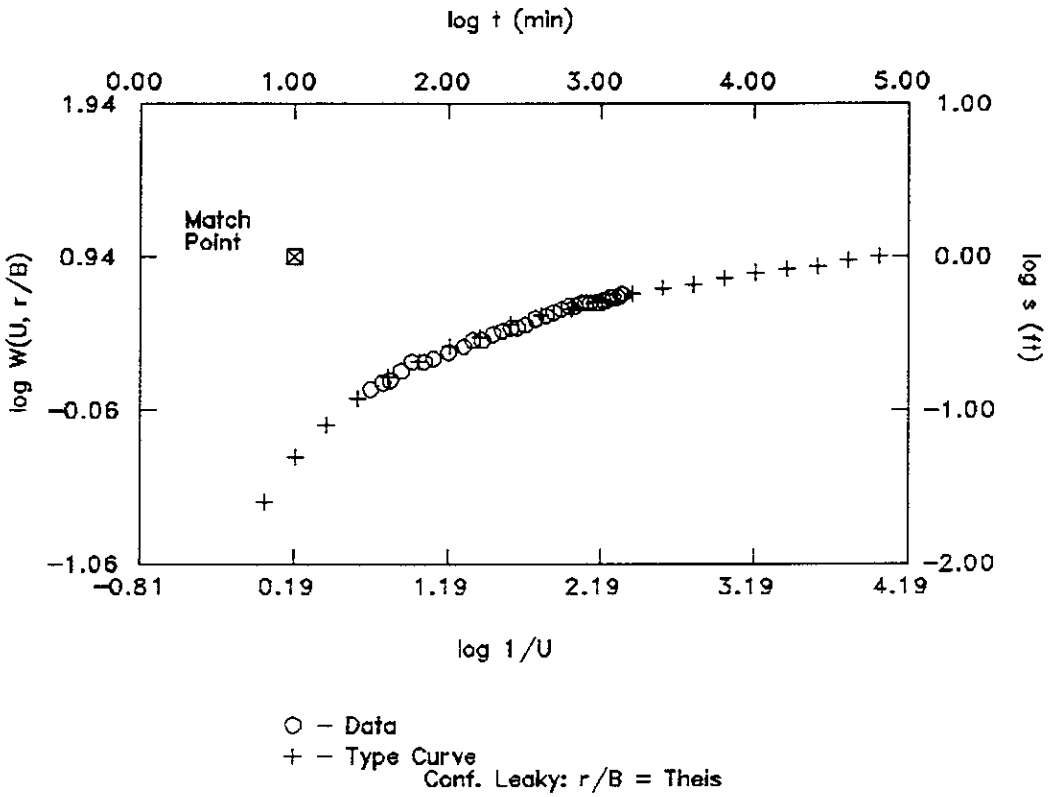
MW-6M LOGARITHMIC PLOT



MATCH POINT			SOLUTION		
t	=	1.000E+0001	Transmissivity (T)	=	1.375E+0003 gpd/ft
s	=	1.000E+0000	Hydraulic Conductivity (K)	=	9.166E+0001 gpd/sq ft
1/U	=	6.761E-0001	Storativity (S)	=	2.426E-0003
W(U, r/B)	=	1.000E+0001			

WELL INFORMATION	
WELL IDENTIFICATION	: MW-6M
DATE OF AQUIFER TEST	: 7-28-92
AQUIFER THICKNESS (b)	: 1.500E+0001 ft
DISCHARGE RATE (Q)	: 1.200E+0000 gpm
PUMPING WELL RADIUS (r)	: 1.670E-0001 ft
DISTANCE OF OBSERVATION WELL FROM PUMPING WELL (d)	: 5.580E+0001 ft

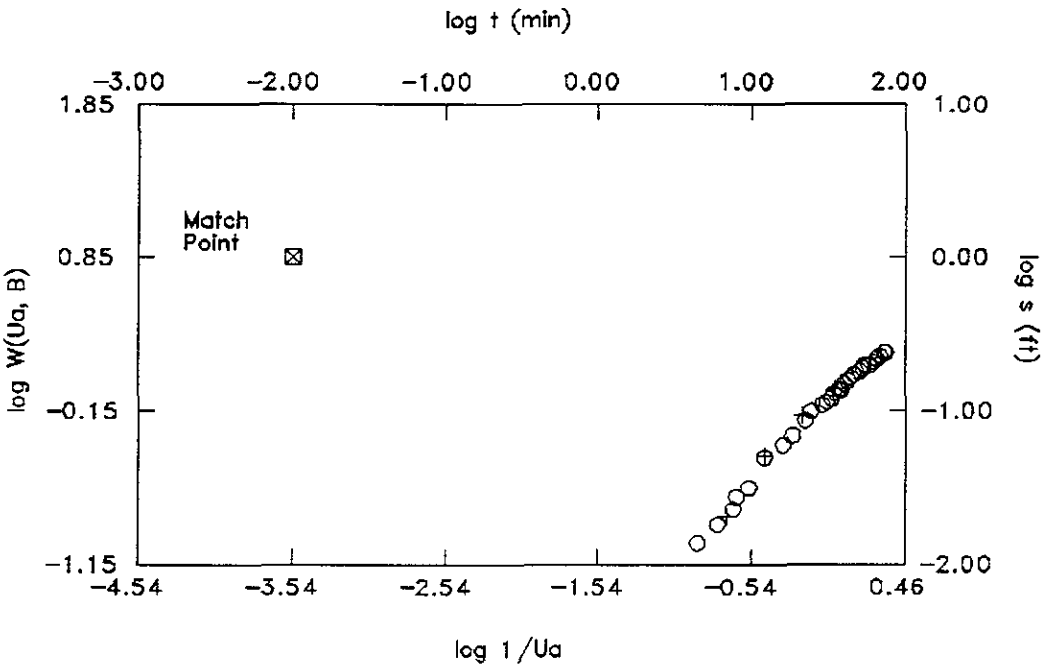
MW-8M LOGARITHMIC PLOT



MATCH POINT			SOLUTION		
t	=	1.000E+0001	Transmissivity (T)	=	1.197E+0003 gpd/ft
s	=	1.000E+0000	Hydraulic Conductivity (K)	=	7.983E+0001 gpd/sq ft
1/U	=	1.549E+0000	Storativity (S)	=	8.869E-0004
W(U, r/B)	=	8.710E+0000			

WELL INFORMATION	
WELL IDENTIFICATION	: MW-8M
DATE OF AQUIFER TEST	: 7-28-92
AQUIFER THICKNESS (b)	: 1.500E+0001 ft
DISCHARGE RATE (Q)	: 1.200E+0000 gpm
PUMPING WELL RADIUS (r)	: 1.670E-0001 ft
DISTANCE OF OBSERVATION WELL FROM PUMPING WELL (d)	: 5.690E+0001 ft

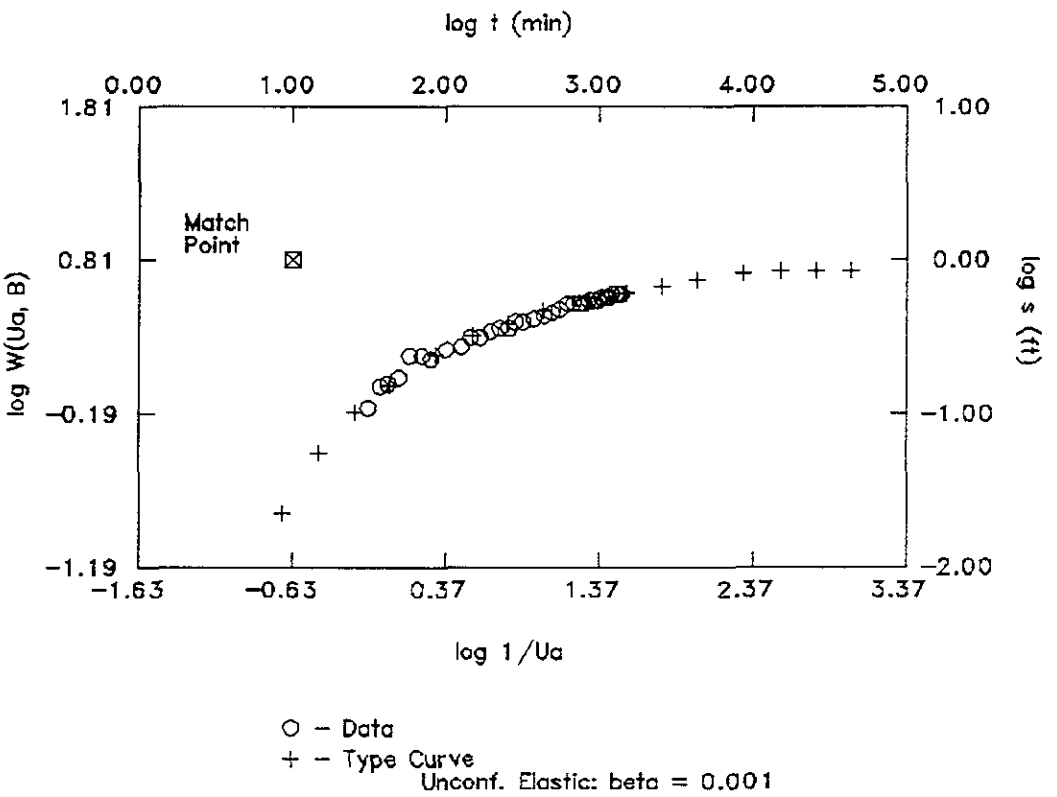
MW-1 LOGARITHMIC PLOT



MATCH POINT			SOLUTION		
t	=	1.000E-0002	Transmissivity (T)	=	9.733E+0002 gpd/ft
s	=	1.000E+0000	Hydraulic Conductivity (K)	=	6.489E+0001 gpd/sq ft
1/Ua	=	2.884E-0004	Storativity (S)	=	1.205E-0003
W(Ua, B)	=	7.079E+0000			

WELL INFORMATION	
WELL IDENTIFICATION	: MW-1
DATE OF AQUIFER TEST	: 7-28-92
AQUIFER THICKNESS (b)	: 1.500E+0001 ft
DISCHARGE RATE (Q)	: 1.200E+0000 gpm
PUMPING WELL RADIUS (r)	: 1.670E-0001 ft
DISTANCE OF OBSERVATION WELL FROM PUMPING WELL (d)	: 5.100E+0001 ft

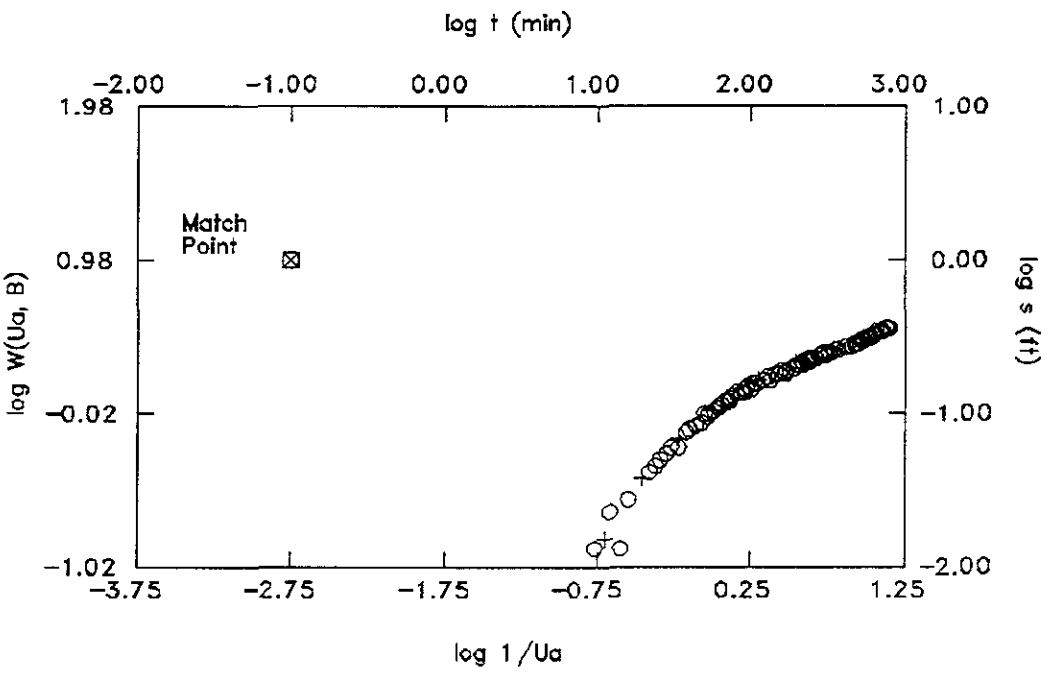
MW-1M LOGARITHMIC PLOT



MATCH POINT			SOLUTION		
t	=	1.000E+0001	Transmissivity (T)	=	8.877E+0002 gpd/ft
s	=	1.000E+0000	Hydraulic Conductivity (K)	=	5.918E+0001 gpd/sq ft
1/Ua	=	2.344E-0001	Storativity (S)	=	1.352E-0003
W(Ua, B)	=	6.457E+0000			

WELL INFORMATION	
WELL IDENTIFICATION	: MW-1M
DATE OF AQUIFER TEST	: 7-28-92
AQUIFER THICKNESS (b)	: 1.500E+0001 ft
DISCHARGE RATE (Q)	: 1.200E+0000 gpm
PUMPING WELL RADIUS (r)	: 1.670E-0001 ft
DISTANCE OF OBSERVATION WELL FROM PUMPING WELL (d)	: 5.100E+0001 ft

MW–2 LOGARITHMIC PLOT



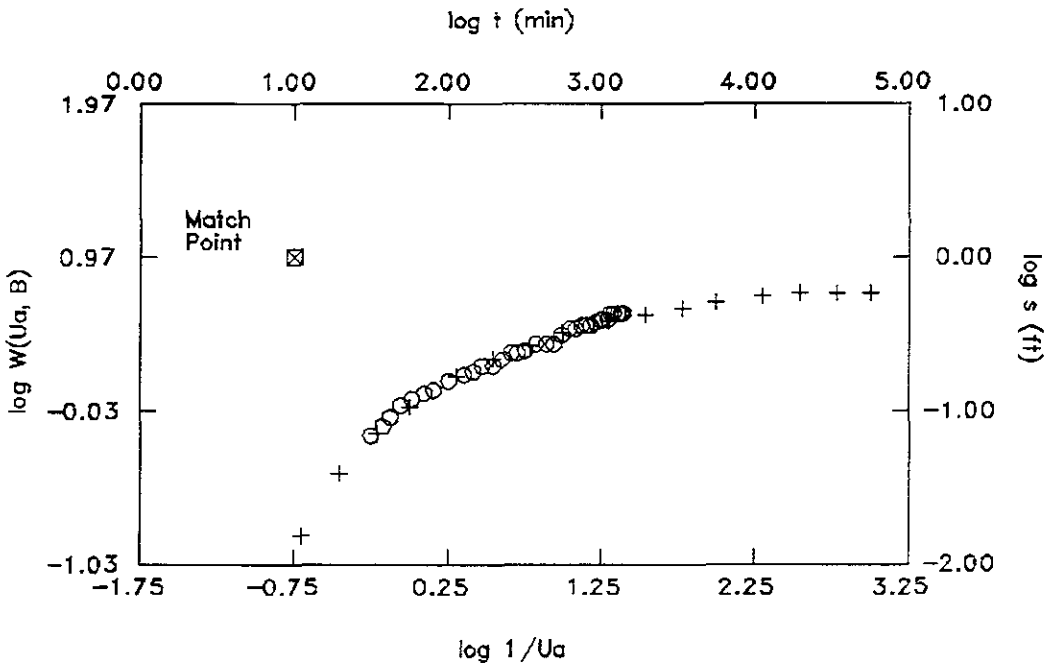
○ – Data
+ – Type Curve
Unconf. Elastic: beta = 0.001

MATCH POINT			SOLUTION		
t	=	1.000E–0001	Transmissivity (T)	=	1.313E+0003 gpd/ft
s	=	1.000E+0000	Hydraulic Conductivity (K)	=	8.753E+0001 gpd/sq ft
1/Ua	=	1.778E–0003	Storativity (S)	=	2.010E–0003
W(Ua, B)	=	9.550E+0000			

WELL INFORMATION

WELL IDENTIFICATION	: MW–2
DATE OF AQUIFER TEST	: 7–28–92
AQUIFER THICKNESS (b)	: 1.500E+0001 ft
DISCHARGE RATE (Q)	: 1.200E+0000 gpm
PUMPING WELL RADIUS (r)	: 1.670E–0001 ft
DISTANCE OF OBSERVATION WELL FROM PUMPING WELL (d)	: 5.840E+0001 ft

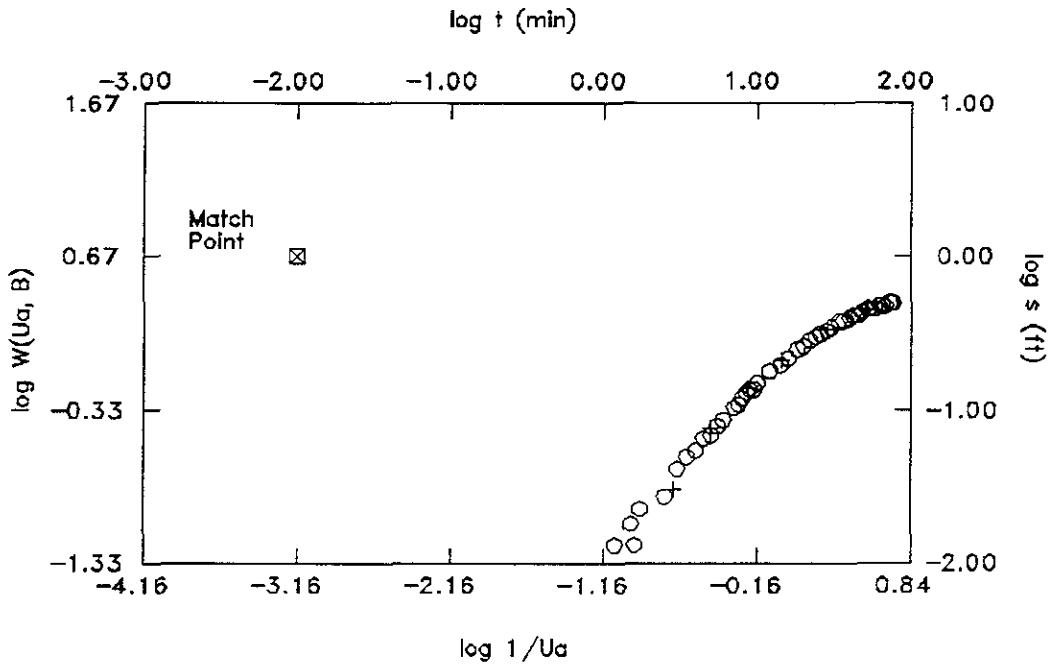
MW-2M LOGARITHMIC PLOT



MATCH POINT			SOLUTION		
t	=	1.000E+0001	Transmissivity (T)	=	1.283E+0003 gpd/ft
s	=	1.000E+0000	Hydraulic Conductivity (K)	=	8.554E+0001 gpd/sq ft
1/Ua	=	1.778E-0001	Storativity (S)	=	1.964E-0003
W(Ua, B)	=	9.333E+0000			

WELL INFORMATION	
WELL IDENTIFICATION	: MW-2M
DATE OF AQUIFER TEST	: 7-28-92
AQUIFER THICKNESS (b)	: 1.500E+0001 ft
DISCHARGE RATE (Q)	: 1.200E+0000 gpm
PUMPING WELL RADIUS (r)	: 1.670E-0001 ft
DISTANCE OF OBSERVATION WELL FROM PUMPING WELL (d)	: 5.840E+0001 ft

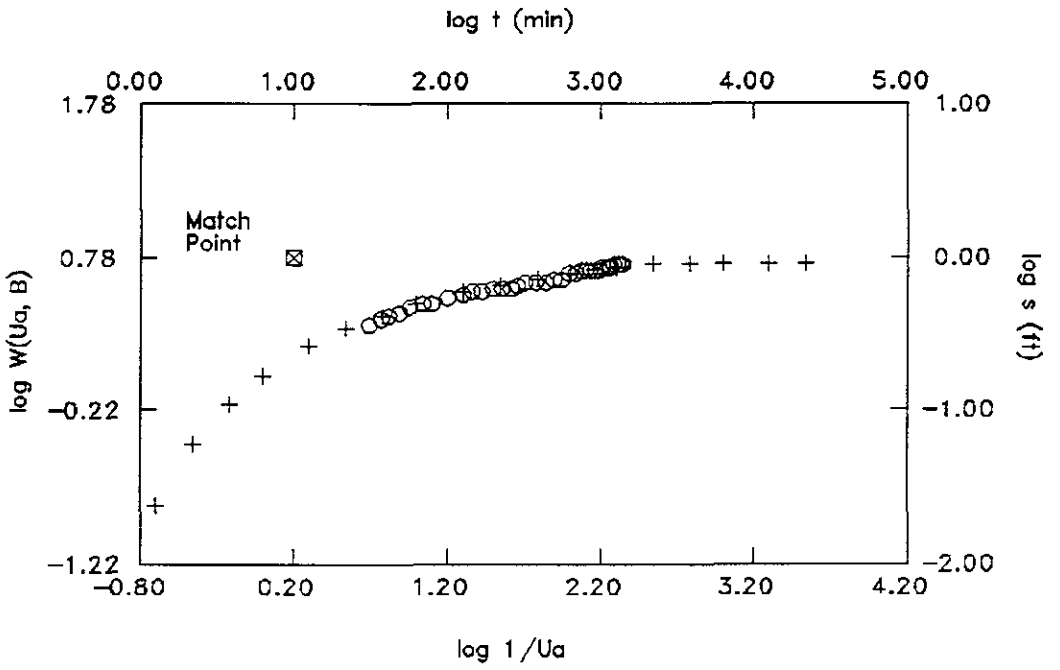
MW-3 LOGARITHMIC PLOT



MATCH POINT			SOLUTION		
t	=	1.000E-0002	Transmissivity (T)	=	6.431E+0002 gpd/ft
s	=	1.000E+0000	Hydraulic Conductivity (K)	=	4.287E+0001 gpd/sq ft
1/Ua	=	6.918E-0004	Storativity (S)	=	2.014E-0003
W(Ua, B)	=	4.677E+0000			

WELL INFORMATION	
WELL IDENTIFICATION	: MW-3
DATE OF AQUIFER TEST	: 7-28-92
AQUIFER THICKNESS (b)	: 1.500E+0001 ft
DISCHARGE RATE (Q)	: 1.200E+0000 gpm
PUMPING WELL RADIUS (r)	: 1.670E-0001 ft
DISTANCE OF OBSERVATION WELL FROM PUMPING WELL (d)	: 2.070E+0001 ft

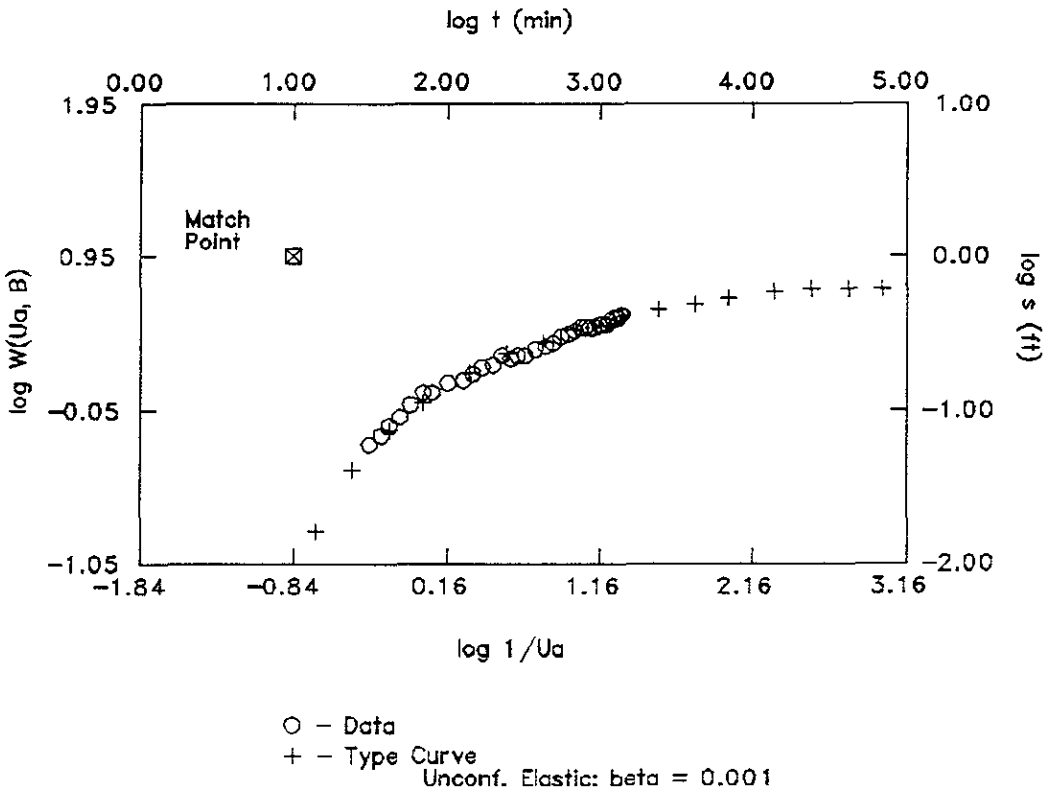
MW-3M LOGARITHMIC PLOT



MATCH POINT			SOLUTION		
t	=	1.000E+0001	Transmissivity (T)	=	8.284E+0002 gpd/ft
s	=	1.000E+0000	Hydraulic Conductivity (K)	=	5.523E+0001 gpd/sq ft
1/Ua	=	1.585E+0000	Storativity (S)	=	1.133E-0003
W(Ua, B)	=	6.026E+0000			

WELL INFORMATION	
WELL IDENTIFICATION	: MW-3M
DATE OF AQUIFER TEST	: 7-28-92
AQUIFER THICKNESS (b)	: 1.500E+0001 ft
DISCHARGE RATE (Q)	: 1.200E+0000 gpm
PUMPING WELL RADIUS (r)	: 1.670E-0001 ft
DISTANCE OF OBSERVATION WELL FROM PUMPING WELL (d)	: 2.070E+0001 ft

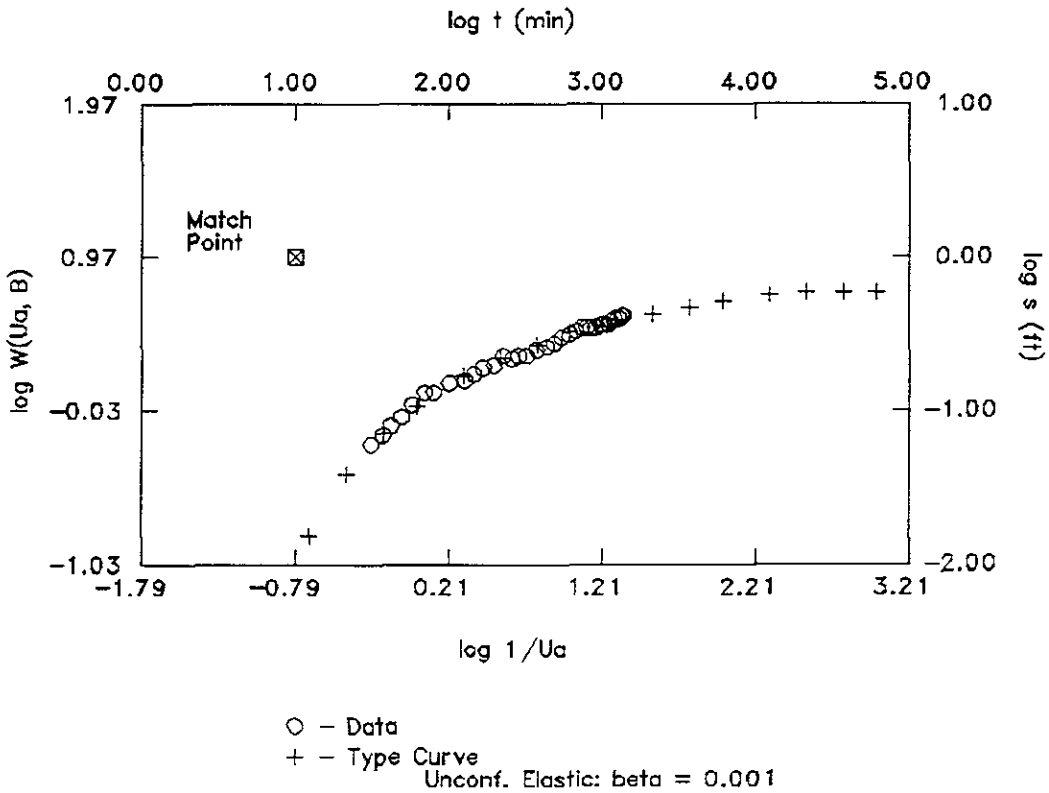
MW-4M LOGARITHMIC PLOT



MATCH POINT			SOLUTION		
t	=	1.000E+0001	Transmissivity (T)	=	1.225E+0003 gpd/ft
s	=	1.000E+0000	Hydraulic Conductivity (K)	=	8.169E+0001 gpd/sq ft
1/Ua	=	1.445E-0001	Storativity (S)	=	2.528E-0003
W(Ua, B)	=	8.912E+0000			

WELL INFORMATION	
WELL IDENTIFICATION	: MW-6M
DATE OF AQUIFER TEST	: 7-28-92
AQUIFER THICKNESS (b)	: 1.500E+0001 ft
DISCHARGE RATE (Q)	: 1.200E+0000 gpm
PUMPING WELL RADIUS (r)	: 1.670E-0001 ft
DISTANCE OF OBSERVATION WELL FROM PUMPING WELL (d)	: 5.580E+0001 ft

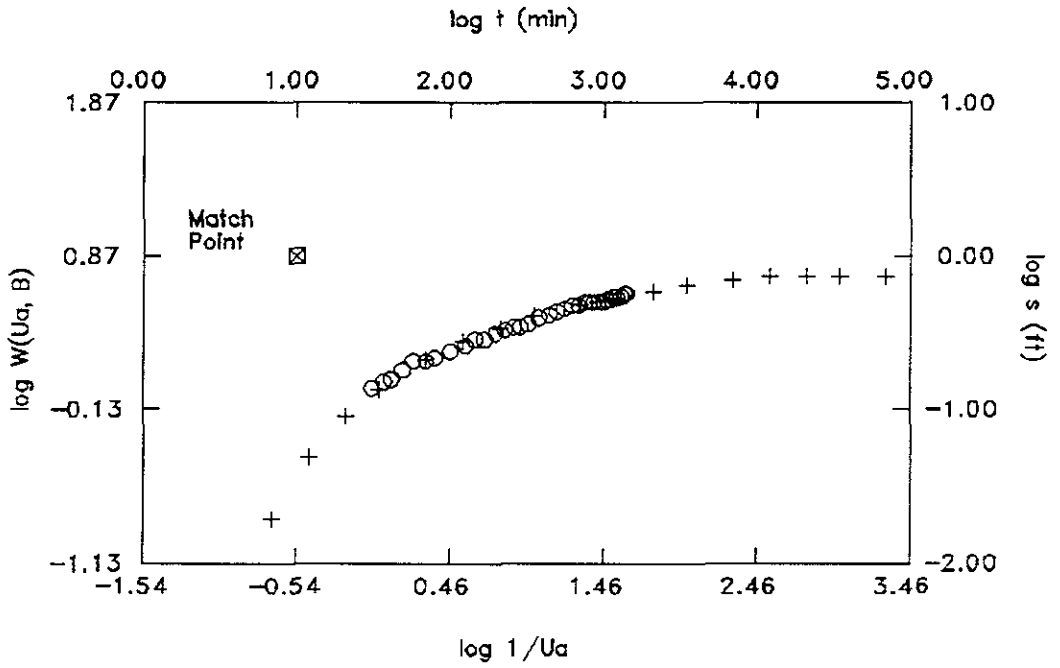
MW-6M LOGARITHMIC PLOT



MATCH POINT			SOLUTION		
t	=	1.000E+0001	Transmissivity (T)	=	1.283E+0003 gpd/ft
s	=	1.000E+0000	Hydraulic Conductivity (K)	=	8.554E+0001 gpd/sq ft
1/Ua	=	1.622E-0001	Storativity (S)	=	2.359E-0003
W(Ua, B)	=	9.333E+0000			

WELL INFORMATION	
WELL IDENTIFICATION	: MW-6M
DATE OF AQUIFER TEST	: 7-28-92
AQUIFER THICKNESS (b)	: 1.500E+0001 ft
DISCHARGE RATE (Q)	: 1.200E+0000 gpm
PUMPING WELL RADIUS (r)	: 1.670E-0001 ft
DISTANCE OF OBSERVATION WELL FROM PUMPING WELL (d)	: 5.580E+0001 ft

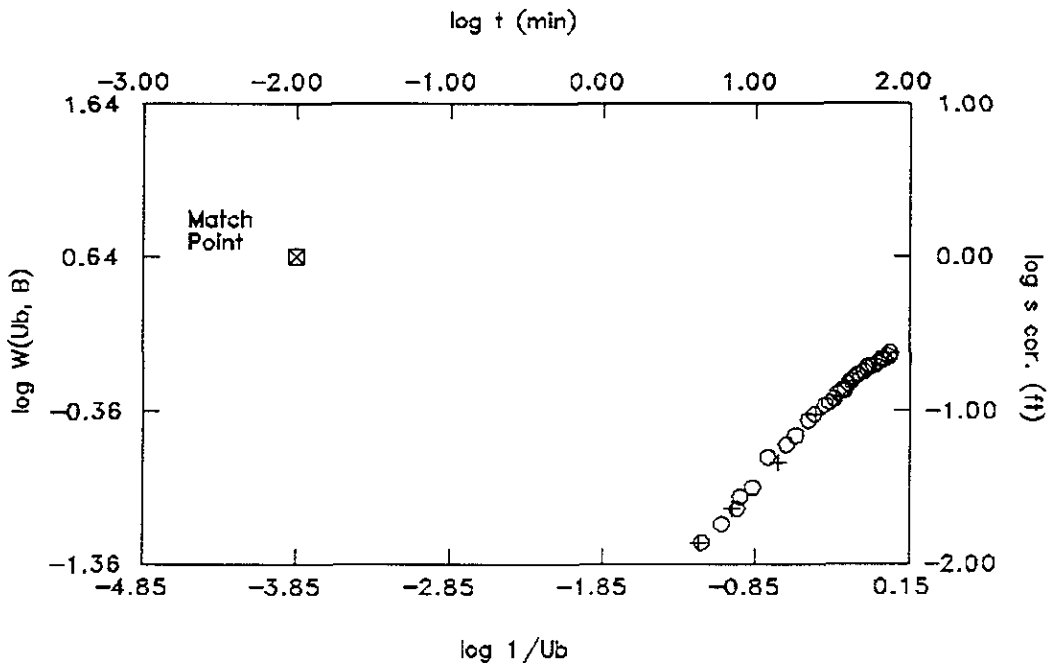
MW-8M LOGARITHMIC PLOT



MATCH POINT			SOLUTION		
t	=	1.000E+0001	Transmissivity (T)	=	1.019E+0003 gpd/ft
s	=	1.000E+0000	Hydraulic Conductivity (K)	=	6.795E+0001 gpd/sq ft
1/Ua	=	2.884E-0001	Storativity (S)	=	1.013E-0003
W(Ua, B)	=	7.413E+0000			

WELL INFORMATION	
WELL IDENTIFICATION	: MW-8M
DATE OF AQUIFER TEST	: 7-28-92
AQUIFER THICKNESS (b)	: 1.500E+0001 ft
DISCHARGE RATE (Q)	: 1.200E+0000 gpm
PUMPING WELL RADIUS (r)	: 1.670E-0001 ft
DISTANCE OF OBSERVATION WELL FROM PUMPING WELL (d)	: 5.690E+0001 ft

MW-1 LOGARITHMIC PLOT



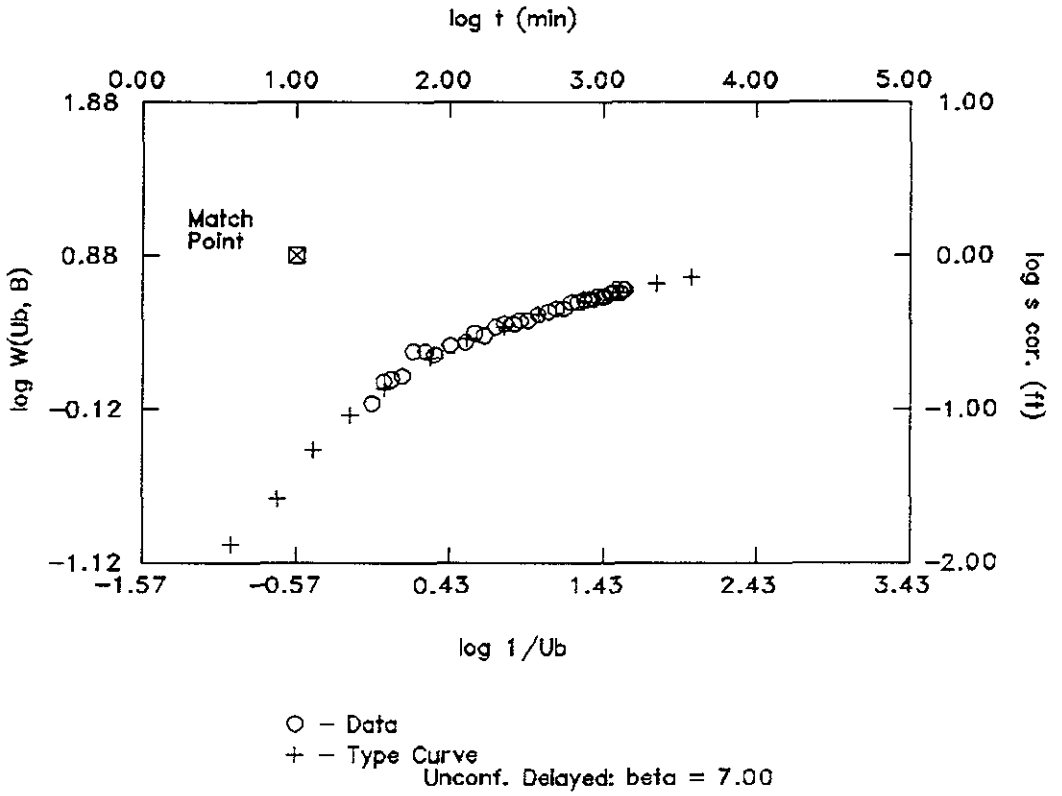
○ – Data
\+ – Type Curve
Unconf. Delayed: beta = 7.00

MATCH POINT			SOLUTION		
t	=	1.000E-0002	Transmissivity (T)	=	6.001E+0002 gpd/ft
s	=	1.000E+0000	Hydraulic Conductivity (K)	=	4.001E+0001 gpd/sq ft
1/Ub	=	1.413E-0004	Specific Yield (Sy)	=	1.517E-0003
W(Ub, B)	=	4.365E+0000			

WELL INFORMATION

WELL IDENTIFICATION	: MW-1
DATE OF AQUIFER TEST	: 7-28-92
AQUIFER THICKNESS (b)	: 1.500E+0001 ft
DISCHARGE RATE (Q)	: 1.200E+0000 gpm
PUMPING WELL RADIUS (r)	: 1.670E-0001 ft
DISTANCE OF OBSERVATION WELL FROM PUMPING WELL (d)	: 5.100E+0001 ft

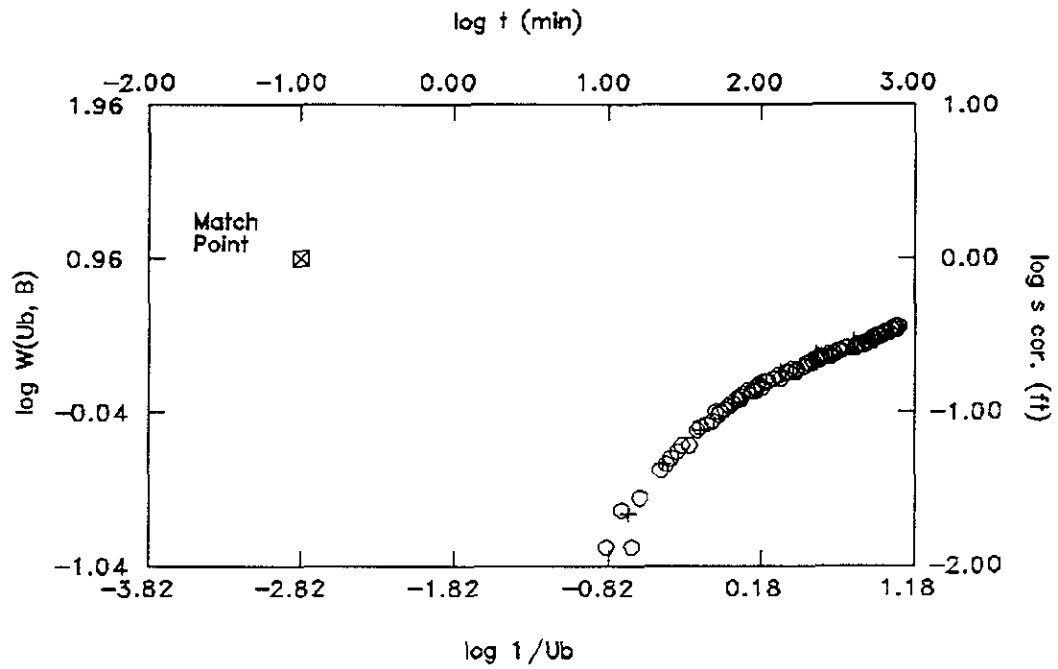
MW-1M LOGARITHMIC PLOT



MATCH POINT			SOLUTION		
t	=	1.000E+0001	Transmissivity (T)	=	1.043E+0003 gpd/ft
s	=	1.000E+0000	Hydraulic Conductivity (K)	=	6.953E+0001 gpd/sq ft
1/Ub	=	2.692E-0001	Specific Yield (Sy)	=	1.383E-0003
W(Ub, B)	=	7.586E+0000			

WELL INFORMATION	
WELL IDENTIFICATION	: MW-1M
DATE OF AQUIFER TEST	: 7-28-92
AQUIFER THICKNESS (b)	: 1.500E+0001 ft
DISCHARGE RATE (Q)	: 1.200E+0000 gpm
PUMPING WELL RADIUS (r)	: 1.670E-0001 ft
DISTANCE OF OBSERVATION WELL FROM PUMPING WELL (d)	: 5.100E+0001 ft

MW-2 LOGARITHMIC PLOT

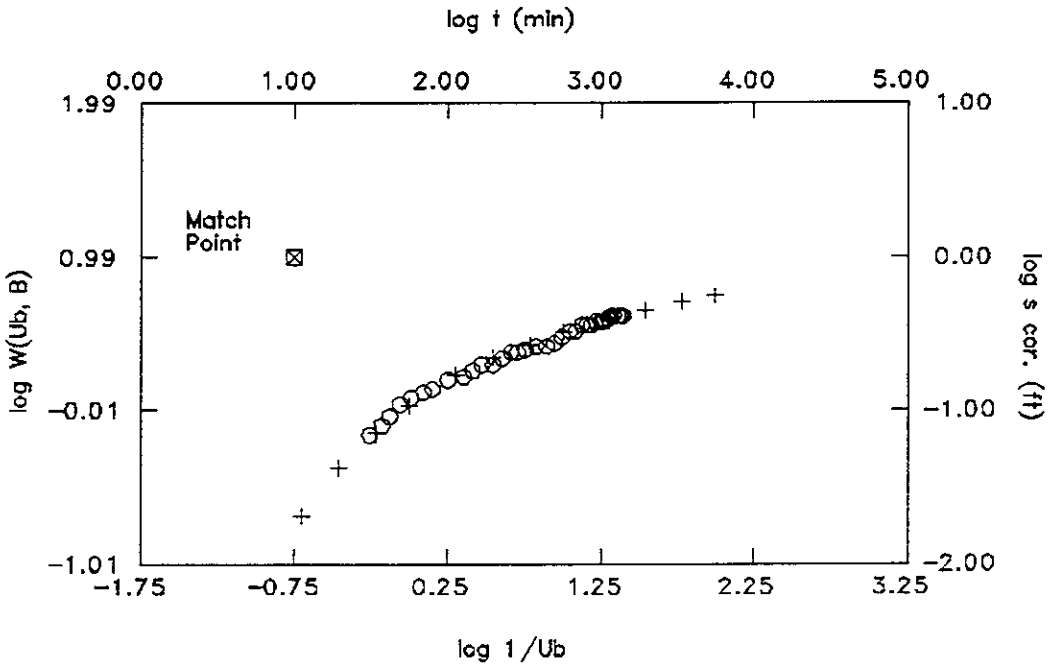


○ – Data
\+ – Type Curve
Unconf. Delayed: beta = 7.00

MATCH POINT			SOLUTION		
t	=	1.000E-0001	Transmissivity (T)	=	1.254E+0003 gpd/ft
s	=	1.000E+0000	Hydraulic Conductivity (K)	=	8.359E+0001 gpd/sq ft
1/Ub	=	1.514E-0003	Specific Yield (Sy)	=	2.255E-0003
W(Ub, B)	=	9.120E+0000			

WELL INFORMATION	
WELL IDENTIFICATION	: MW-2
DATE OF AQUIFER TEST	: 7-28-92
AQUIFER THICKNESS (b)	: 1.500E+0001 ft
DISCHARGE RATE (Q)	: 1.200E+0000 gpm
PUMPING WELL RADIUS (r)	: 1.670E-0001 ft
DISTANCE OF OBSERVATION WELL FROM PUMPING WELL (d)	: 5.840E+0001 ft

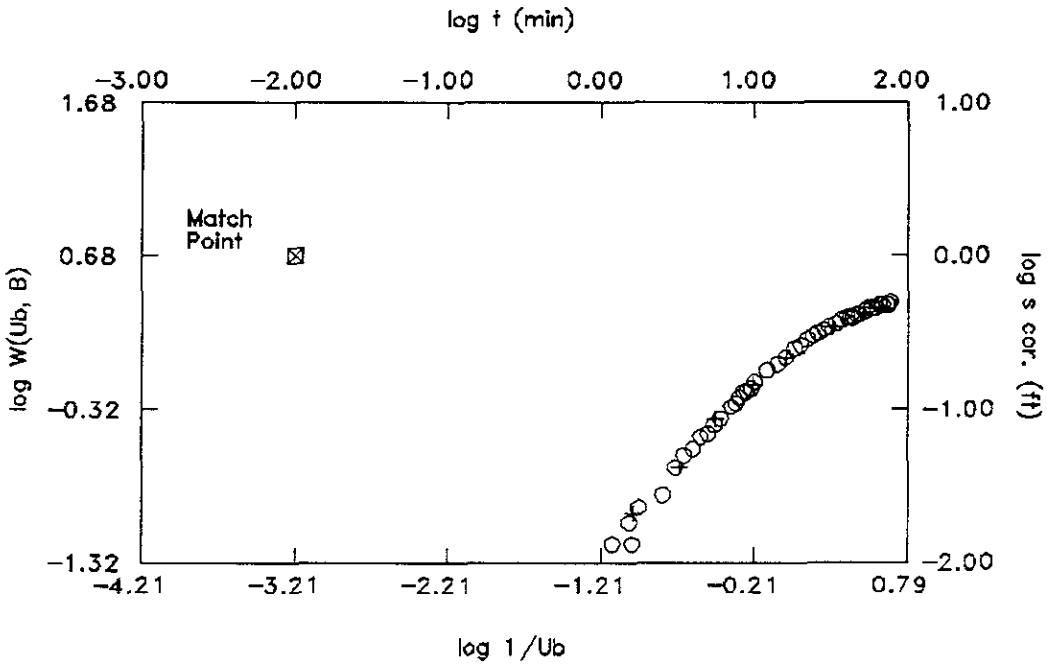
MW-2M LOGARITHMIC PLOT



MATCH POINT			SOLUTION		
t	=	1.000E+0001	Transmissivity (T)	=	1.344E+0003 gpd/ft
s	=	1.000E+0000	Hydraulic Conductivity (K)	=	8.957E+0001 gpd/sq ft
1/Ub	=	1.778E-0001	Specific Yield (Sy)	=	2.057E-0003
W(Ub, B)	=	9.772E+0000			

WELL INFORMATION	
WELL IDENTIFICATION	: MW-2M
DATE OF AQUIFER TEST	: 7-28-92
AQUIFER THICKNESS (b)	: 1.500E+0001 ft
DISCHARGE RATE (Q)	: 1.200E+0000 gpm
PUMPING WELL RADIUS (r)	: 1.670E-0001 ft
DISTANCE OF OBSERVATION WELL FROM PUMPING WELL (d)	: 5.840E+0001 ft

MW-3 LOGARITHMIC PLOT



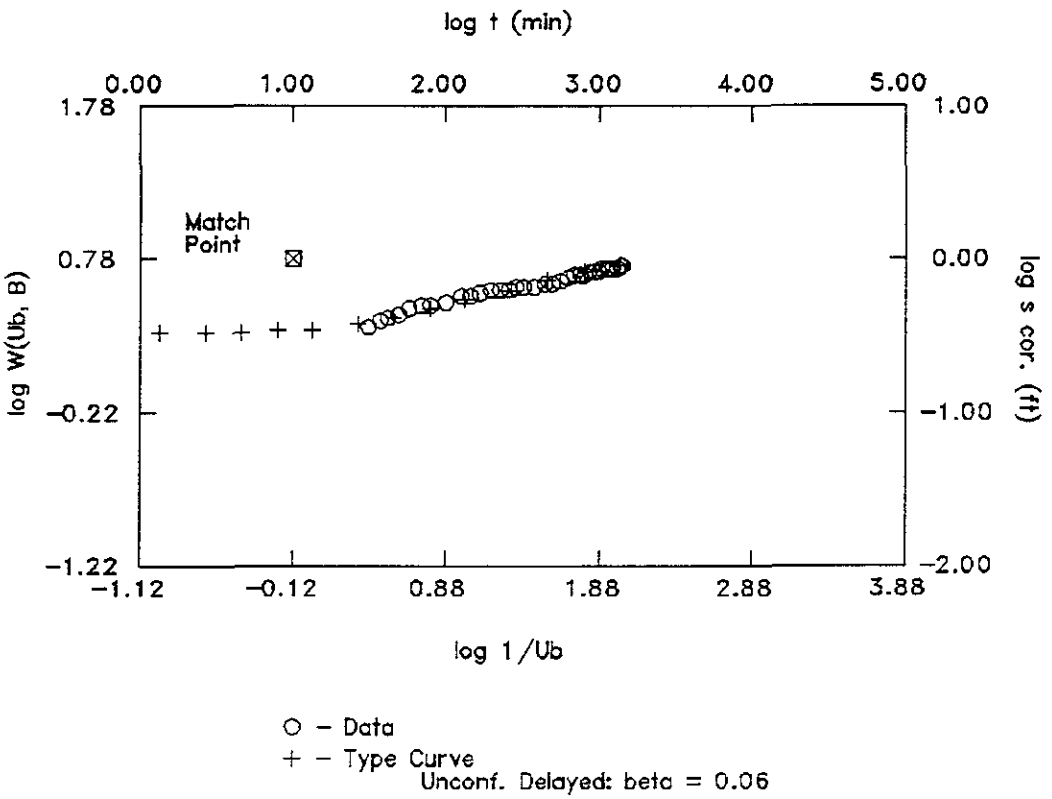
○ – Data
\+ – Type Curve
Unconf. Delayed: beta = 7.00

MATCH POINT			SOLUTION		
t	=	1.000E-0002	Transmissivity (T)	=	6.580E+0002 gpd/ft
s	=	1.000E+0000	Hydraulic Conductivity (K)	=	4.387E+0001 gpd/sq ft
1/Ub	=	6.166E-0004	Specific Yield (Sy)	=	2.313E-0003
W(Ub, B)	=	4.786E+0000			

WELL INFORMATION

WELL IDENTIFICATION	: MW-3
DATE OF AQUIFER TEST	: 7-28-92
AQUIFER THICKNESS (b)	: 1.500E+0001 ft
DISCHARGE RATE (Q)	: 1.200E+0000 gpm
PUMPING WELL RADIUS (r)	: 1.670E-0001 ft
DISTANCE OF OBSERVATION WELL FROM PUMPING WELL (d)	: 2.070E+0001 ft

MW-3M LOGARITHMIC PLOT

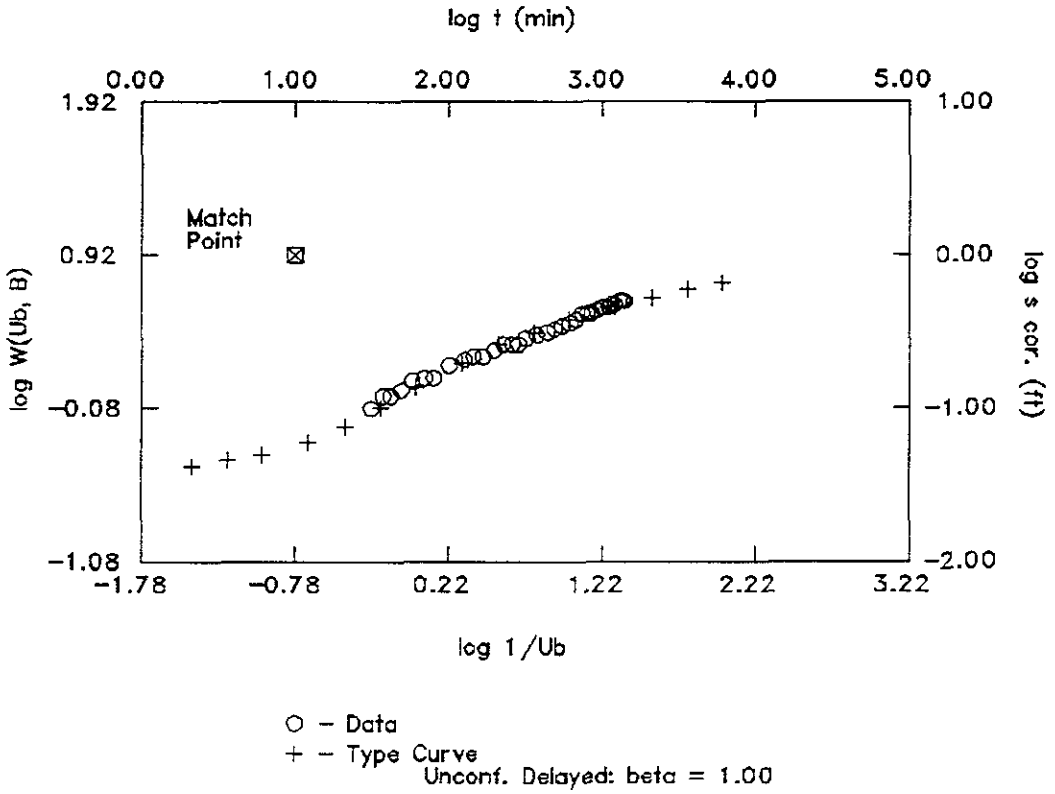


MATCH POINT			SOLUTION		
t	=	1.000E+0001	Transmissivity (T)	=	8.284E+0002 gpd/ft
s	=	1.000E+0000	Hydraulic Conductivity (K)	=	5.523E+0001 gpd/sq ft
1/Ub	=	7.586E-0001	Specific Yield (Sy)	=	2.366E-0003
W(Ub, B)	=	6.026E+0000			

WELL INFORMATION

WELL IDENTIFICATION	: MW-3M
DATE OF AQUIFER TEST	: 7-28-92
AQUIFER THICKNESS (b)	: 1.500E+0001 ft
DISCHARGE RATE (Q)	: 1.200E+0000 gpm
PUMPING WELL RADIUS (r)	: 1.670E-0001 ft
DISTANCE OF OBSERVATION WELL FROM PUMPING WELL (d)	: 2.070E+0001 ft

MW–4M LOGARITHMIC PLOT

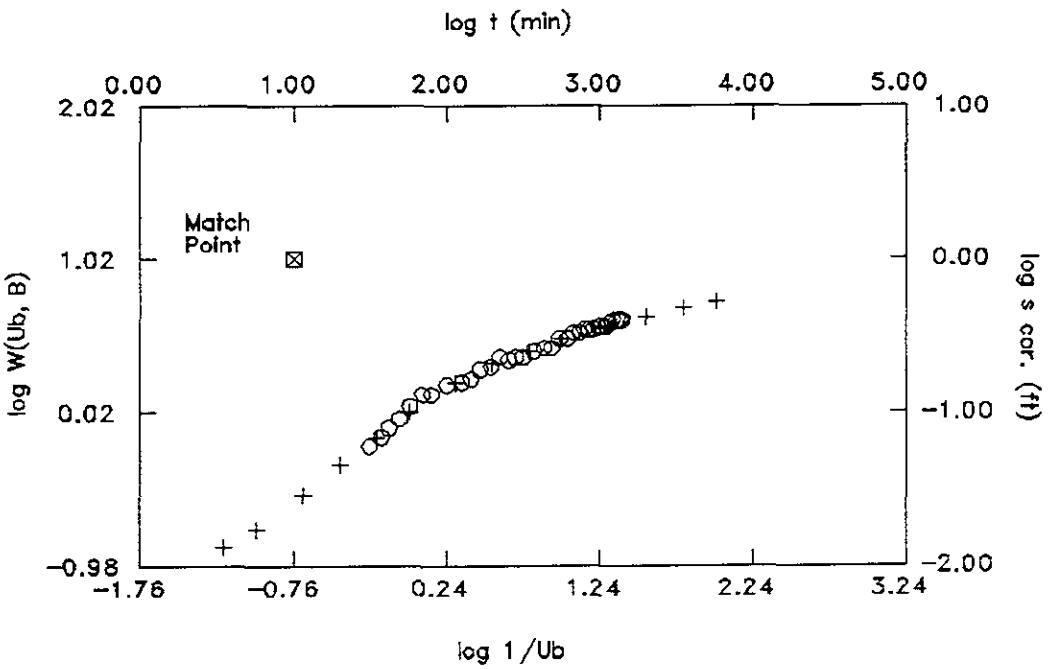


MATCH POINT			SOLUTION		
t	=	1.000E+0001	Transmissivity (T)	=	1.144E+0003 gpd/ft
s	=	1.000E+0000	Hydraulic Conductivity (K)	=	7.624E+0001 gpd/sq ft
1/Ub	=	1.660E–0001	Specific Yield (Sy)	=	2.312E–0003
W(Ub, B)	=	8.318E+0000			

WELL INFORMATION

WELL IDENTIFICATION	: MW–4M
DATE OF AQUIFER TEST	: 7–28–92
AQUIFER THICKNESS (b)	: 1.500E+0001 ft
DISCHARGE RATE (Q)	: 1.200E+0000 gpm
PUMPING WELL RADIUS (r)	: 1.670E–0001 ft
DISTANCE OF OBSERVATION WELL FROM PUMPING WELL (d)	: 5.260E+0001 ft

MW-6M LOGARITHMIC PLOT

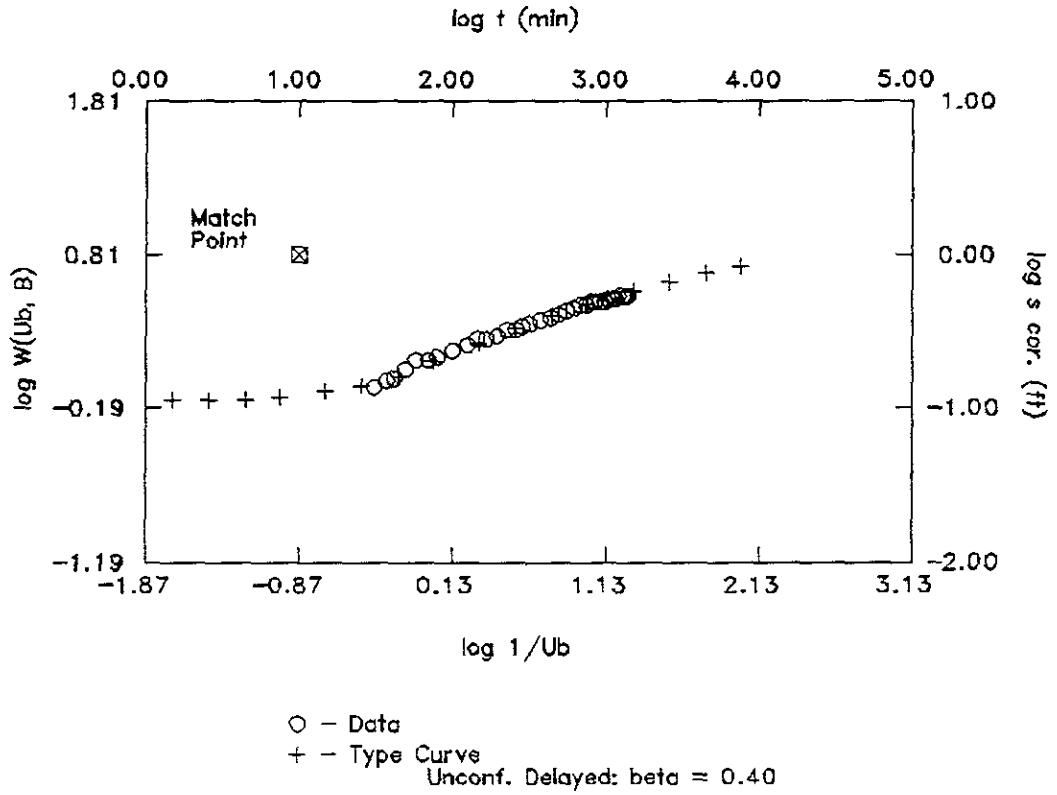


○ – Data
\+ – Type Curve
Unconf. Delayed: beta = 3.00

MATCH POINT			SOLUTION		
t	=	1.000E+0001	Transmissivity (T)	=	1.440E+0003 gpd/ft
s	=	1.000E+0000	Hydraulic Conductivity (K)	=	9.598E+0001 gpd/sq ft
1/Ub	=	1.738E-0001	Specific Yield (Sy)	=	2.470E-0003
W(Ub, B)	=	1.047E+0001			

WELL INFORMATION	
WELL IDENTIFICATION	: MW-6M
DATE OF AQUIFER TEST	: 7-28-92
AQUIFER THICKNESS (b)	: 1.500E+0001 ft
DISCHARGE RATE (Q)	: 1.200E+0000 gpm
PUMPING WELL RADIUS (r)	: 1.670E-0001 ft
DISTANCE OF OBSERVATION WELL FROM PUMPING WELL (d)	: 5.580E+0001 ft

MW-8M LOGARITHMIC PLOT



MATCH POINT			SOLUTION		
t	=	1.000E+0001	Transmissivity (T)	=	8.877E+0002 gpd/ft
s	=	1.000E+0000	Hydraulic Conductivity (K)	=	5.918E+0001 gpd/sq ft
1/Ub	=	1.349E-0001	Specific Yield (Sy)	=	1.887E-0003
W(Ub, B)	=	6.457E+0000			

WELL INFORMATION	
WELL IDENTIFICATION	: MW-8M
DATE OF AQUIFER TEST	: 7-28-92
AQUIFER THICKNESS (b)	: 1.500E+0001 ft
DISCHARGE RATE (Q)	: 1.200E+0000 gpm
PUMPING WELL RADIUS (r)	: 1.670E-0001 ft
DISTANCE OF OBSERVATION WELL FROM PUMPING WELL (d)	: 5.690E+0001 ft