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MARINE CORPS AIR STATION EL TORO, CALIFORNIA

ADDENDUM 1B TO SITE ASSESSMENT REPORT FOR TANK 398 AREA

PILOT TEST OF SOIL VAPOR EXTRACTION SYSTEM

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ABBREVIATIONS/ACRONYMS

BTEX	Benzene, Toluene, Ethylbenzene, and Total Xylenes
BTU	British Thermal Unit
CLEAN	Comprehensive Long-Term Environmental Action Navy
CTO	Contract Task Order
EPA	U.S. Environmental Protection Agency
GC	Gas Chromatograph
Hermit	In Situ Hermit 2000 Data Logger
HSA	Hollow Stem Augers
Jacobs	Jacobs Engineering Group, Inc.
MCAS	Marine Corps Air Station
MOD	Modification
Navy	Southwest Division Naval Facilities Engineering Command
PID	Photoionization Detector
PVC	Polyvinyl Chloride
ppmv	Parts Per Million Volume
RWQCB	California Regional Water Quality Control Board
SAR	Site Assessment Report
TPH	Total Petroleum Hydrocarbons
VES	Vapor Extraction System

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ADDENDUM 1B
PILOT TEST OF SOIL VAPOR EXTRACTION SYSTEM
1.0 INTRODUCTION

This report is an addendum to the Site Assessment Report (SAR) prepared under Contract Task Order (CTO) #0150, issued by the Southwest Division Naval Facilities Engineering Command (Navy) to the Jacobs Engineering Group, Inc. (Jacobs) under the Comprehensive Long-Term Environmental Action Navy (CLEAN) program, Contract No. N68711-89-D-9296. This addendum was prepared in partial fulfillment of Work Scope Modification No. 1 (MOD 1) issued to CTO #0150.

1.1 Project Background and Objectives

The vapor extraction system (VES) pilot test reported herein was an optional task in the Site Assessment Plan prepared by Jacobs for the Navy, dated 30 April 1991. Except where noted, the work described herein was conducted in accordance with the Site Assessment Plan (Navy, 1991).

The SAR (Navy, 1992a) reports activities conducted to assess JP-5 contamination in soil and groundwater in the vicinity of Tank 398 of the El Toro Marine Corps Air Station. At a meeting with the regulatory agencies on 6 April 1992 (Navy, 1992b), it was decided that vapor extraction was the preferred choice for remediation. Subsequently, the option to perform a VES pilot test was exercised and funded on 5 May 1992. Since the scope of work included the installation of vapor extraction wells, it was decided that it would be most cost-effective to install the wells in conjunction with the new groundwater wells described in Addendum 2 to the SAR.

As described in the Site Assessment Plan, the objectives of this pilot test were to determine the optimum vapor flow rate and radius of influence that can be achieved at the site.

1.2 Site Description

The Tank 398 area is described in detail in the SAR. Cross-sections D, E, and F of the SAR show the area of soil contamination by JP-5. The unsaturated zone impacted by the JP-5 is identified by existing data; it is predominantly in the area of wells MW398-02

and MW398-10 (Figure 1). Hydrocarbon concentrations in soil for the area are also shown on the boring logs included in the SAR. The area surrounding MW398-10 was chosen for the installation of three VES wells (Figure 1). due to the nearly continuous vertical soil saturation of the soil by JP-5 in that area.

2.0 TECHNICAL APPROACH

The technical approach taken towards fulfillment of the stated goals was arrived at after several detailed discussions with California Regional Water Quality Control Board (RWQCB) - Santa Ana Region.

2.1 Vapor Extraction Wells

The vapor extraction wells were designed and installed for optimum efficiency in both cost and JP-5 reduction.

2.1.1 Well Design

It was decided that three VES wells would be installed to 160 feet with 40 feet of screen, from 120 to 160 feet below ground surface. The boring log of MW398-10 (Navy, 1992a) was used to design the screened interval of the wells.

Multiple screened intervals were avoided due to the complexity of the well installation techniques needed and the greater margin for error associated with the multiple screens.

During drilling, soil samples collected from monitoring well borings were scanned for the presence of organic compounds using a photoionization detector (PID). Maximum PID readings were recorded between 120 and 160 feet in MW398-10, (thus the screened interval in the VES wells). The relatively small vertical distance between the bottom of the VES wells and the top of the screen in MW398-10 will allow air flow between them.

The silts and fine sands were targeted for the pilot test because they are expected to hold more JP-5 than the coarse sand and gravel. In the coarse sand and gravel, the JP-5 appears to have partially vaporized, migrated out of the area, or perhaps been reduced by natural bioremediation. The migration of JP-5 from the clays is less of a concern at this time and the more clay rich intervals were not targeted for screening.

Reducing the JP-5 content of the soil at depth will produce a barrier for further vertical migration of JP-5 from above.

The configuration of the wells installed is shown on Figure 1 of this addendum. A rectangular configuration between the three VES wells and groundwater monitoring well MW398-10 was designed. Horizontal distances between wells range from 25 to approximately 40 feet.

Although an isosceles triangle configuration is preferred for long-term remediation, for the purposes of this pilot test variable distances between wells were chosen. The varied distance between wells allows for more accurate calculation of the radius of influence and estimation of average soil permeability. The configuration chosen herein may also be used for remediation. Confirmation borings may be placed within the triangle formed by the three VES wells.

2.1.2 Well Installation

Permits for well installation were acquired from State and local agencies and are presented in Appendix A.

Three vapor extraction wells, VW-398-22, VW-398-23, and VW-398-24 were installed in February 1993. The same drilling method, materials, and well installation procedures described in the SAR were used to install the VES wells. No water was introduced during the drilling of VW-398-22 and -23; however, due to clogging of the pipe with clay, some water was introduced during the drilling of VW-398-24. Individual well construction details are on the respective boring logs in Appendix B.

The air percussion (AP1000) rig was preferred because the multiple tube air percussion method results in less smearing of the borehole walls than hollow-stem auger drilling.

Soil samples were collected at 125, 135, 145, and 155 feet (depth below ground surface) and analyzed for benzene, toluene, ethylbenzene, and total xylenes (BTEX) and total petroleum hydrocarbons (TPH) quantified as JP-5, by Calscience Environmental Laboratories, Inc. in Stanton, California. The sample

collection procedures used are described in detail in the Site Assessment Plan as well as in the SAR. Certificates of analysis and chain-of-custody records are presented in Appendix C.

Lithologic logs were prepared from the soil cuttings and samples collected along the screened interval. Geophysical borehole logging of the VES wells was also conducted as partial fulfillment of the CTO 150 MOD 2 Scope of Work. The electromagnetic induction logging techniques used are described in Addendum 2 to the SAR (Navy, 1993).

The logs were placed on a profile through the VE wells and monitoring well MW398-10 and a geologic cross-section was drawn through them. Figure 1 shows the location of the cross-section. It was found that the induction logs generally had better resolution than the lithologic logs, and that depths to interfaces did not always agree. This is probably due to gradational recovery as a result of the dual-wall percussion drilling method used to drill the holes, as well as uncertainty in the time it takes the cuttings to make it back to the surface. The depths determined from the induction logs were used for the geologic cross-section, which is presented in Figure 2.

2.2 Pilot Test

A vapor extraction pilot study that incorporated two separate vapor extraction pilot tests was performed on 16 and 17 February 1993. The first test utilized VW-398-23 (VW-23) as the extraction well, and VW-398-22 (VW-22) and VW-398-24 (VW-24) as observation wells. The second test used VW-24 as the extraction well, and VW-22 and VW-23 as observation wells. The pilot study evaluated the applicability of soil vapor extraction technology to the site by identifying sustainable air flow rates, evaluating air flow patterns in the zone of contamination, estimating the "effective" radius of influence from the test wells, and measuring contaminant composition for estimates of removal rates.

The vacuum test system consisted of a VR Systems Model V3 internal combustion engine (vapor abatement system) with vacuum blower, vacuum and flow gages, a temperature indicator, and associated piping. An In Situ Hermit 2000 data logger (Hermit) was modified for collecting vacuum pressure data, and was used during testing at the observation wells to monitor changes in the field subsurface vacuum pressure.

During groundwater pump applications, the Hermit is typically used with a pressure transducer to log changes in the water head pressure as drawdown occurs. For vacuum pressure application, the pressure transducer was placed in a 4-inch polyvinyl chloride (PVC) standpipe filled with water and closed and sealed to the atmosphere. The transducer was calibrated to atmospheric pressure. A 1/4-inch section of thick-walled tygon tubing connected the standpipe to the well. When vacuum was applied to the field, the pressure transducer sensed the change in atmospheric pressure and recorded the reduction in water head pressure in the standpipe. In addition to the Hermit, gages were installed on monitoring wells so that pressure changes could be visually monitored.

Each extraction well was subjected to a constant flow rate, while measuring and recording the transient subsurface pressure distribution at two observation wells. The data logger allowed for instantaneous data collection during the initial stages of the test, when the pressure field was changing rapidly. The vacuum gages allowed for visual monitoring, as well as data quality control. Flow readings at the extraction well and vacuum pressure readings at the observation wells were used to estimate the permeability of the soil and the vacuum radius of influence in the test field. Initially, the vacuum at the extraction well was permitted to increase so that a maximum vacuum and air flow rate could be established. The vacuum and air flow rates stabilized almost instantaneously. The pilot test operated under these conditions until the monitoring points indicated stable vacuum pressure.

Once the vacuum pressure field stabilized, step tests were performed on each extraction well so that the vapor extraction system design parameters could be established. This was executed by altering the flow rate in the extraction well by predetermined quantities and allowing the vacuum pressure field to stabilize. Following stabilization, the flow rate was changed to the next predetermined quantity.

Vapor extraction field parameters, including extraction well air flow rate and vacuum, are summarized in Table 2. The maximum flow rates and vacuums during testing were limited to the pump capacity, and not the venting sources.

3.0 FINDINGS

This section presents the results of the vapor extraction study, including soil permeability to air flow calculations, radius of influence estimates, and analytical results.

3.1 Soil Permeability to Air Flow Results

The soil permeability to air flow was calculated using data collected from the data logger, which measured and recorded the change in vacuum pressure over time. This information was used to create a plot of the vacuum change versus time on a semi-logarithmic scale, as shown in Figures 3 through 6. The value of the slope of the straight line that best fit the curve was inserted into the following equation to estimate the average permeability of the soil between the extraction well and each observation well (Johnson, et al., 1990):

$$k = 2.3 \cdot \frac{Q \cdot u}{4 \cdot A \cdot \pi \cdot m}$$

Where:
- k = permeability (darcy)
- Q = volumetric flow rate (cm^3/s)
- μ = vapor viscosity (g/cm·s)
- m = thickness of permeable unit (cm)
- A = slope of semilog curve

The equation is based on the following assumptions:

- All flow to the well is horizontal, or nearly so, in the permeable unit.
- The permeable unit is homogeneous and isotropic within a cylindrical section centered on the extraction well, with a depth equal to the thickness (m) and a radius slightly larger than the distance (r) to the monitoring point.
- The flow (Q) is constant from the extraction well.

The values for soil permeability to air flow calculated for the first test were 27.2 darcy for the soil between extraction well VW-23 and monitoring well VW-22, and 25.1 darcy for the soil between extraction well VW-23 and monitoring well VW-24. The values for soil permeability to air flow calculated for the second test were 23.9 darcy for the soil between extraction well VW-24 and monitoring well VW-22, and 17.4 darcy for the soil

between extraction well VW-23 and monitoring well VW-24. These permeability values fall in the range predicted by literature for medium to fine sands, and in the upper range of silty sands (Freeze and Cherry, 1979).

An evaluation of the semilogarithmic curves for Test 2 on 17 February 1993 (Figure 5) shows that after the initial stabilization at the observation wells, there was a dramatic drop in vacuum over time. This was caused by decreasing barometric pressure due to a low pressure storm system moving in. Comparing the values calculated for permeability between wells VW-23 and VW-24 from 16 and 17 February 1993, a decrease in permeability from 25.1 darcy to 17.4 darcy is evident, possibly due to the decrease in barometric pressure. However, a difference of 8 darcy, or 8 x 10-7 cm^2, is minimal. Therefore, although the effect of the barometric pressure change appears significant, it did not appear to affect the results of the permeability test. Appendix D includes the field log which documents the hourly barometric pressure readings for 17 February 1993, obtained from the El Toro Marine Corps Air Station (MCAS) air traffic control tower. Soil permeability to air flow calculations are included as Appendix E.

3.2 Radius of Influence Estimates

The vacuum radius of influence is defined as the radial distance from a vacuum extraction well at which soil pore pressure is equal to ambient atmospheric pressure (U.S. Environmental Agency [EPA], 1993). It is a common practice to measure vacuum pressure at selected monitoring points and determine the radial distance at which the vacuum can no longer be observed, and to design the vapor extraction system for site remediation based on this information. The measurable vacuum pressure readings define a zone of containment and are no guarantee of significant vapor flow or remediation (EPA, 1993). Studies by Chevron Research and Technology Company, based on empirical data, have defined the "effective" radius of influence as the region that contributes 90 percent of the total air flow to the vapor extraction well, and roughly corresponds to that area where measured soil vacuum is greater than one percent of the applied vacuum at the extraction well. Anywhere beyond that distance will result in insignificant or no air flow, and thus, negligible removal of hydrocarbons from the soil (EPA, 1993).

The "effective" radius of influence for this vapor extraction pilot study was estimated using the vapor pressure data gathered during the tests at the monitoring wells.

Because the vacuum pressure decreases exponentially with increasing distance from the well, semilogarithmic plots of vacuum change versus distance were generated. A straight line then was drawn from the extraction well vacuum point through the monitoring well vacuum point (steady-state value), then extrapolated to the point where the vacuum equaled approximately 1 percent of the extraction well vacuum. This distance is the estimated "effective" radius of influence (Figures 7 through 13). The linearity of this data has been demonstrated through field trials for monitoring points greater than approximately 5 to 10 feet from the extraction well (EPA, 1993). Table 2 summarizes the "effective" radius of influence estimates.

3.3 Vapor Recovery

Two soil vapor samples were collected from each vapor extraction well during the pilot study, one at the onset of each test and one just prior to test termination. The samples were sent to Cal Science Analytical Laboratories, Inc. of Tustin, California. The concentration of hydrocarbons detected in the vapor stream samples was used to estimate initial vapor stream composition (the concentration of hydrocarbons in the vapor stream), as well as to determine the most appropriate system to treat these vapors prior to their release into the atmosphere, should soil vapor extraction be used to remediate hydrocarbon-affected soils at the site.

The samples were analyzed for BTEX by EPA Method T0-14, for total methane hydrocarbons quantified as methane, for nonmethane hydrocarbons quantified as JP-5 by ASTM Method 3416M, for permanent gases by Method MASA 133, and for boiling point analysis by the Hach Carle AGC 400 Method. Laboratory certificates of analysis are contained in Appendix C.

Soil gas samples were analyzed for BTEX compounds because soil samples collected from the site indicated the presence of these compounds. In addition, this information is valuable for a risk assessment. Table 3 presents the results of the BTEX analysis.

Nonmethane hydrocarbon concentrations in the vapor stream are determined by the partitioning of the spill mass into the liquid phase, the dissolved phase (into soil pore water), the sorbed phase, and the vapor phase. Partitioning of contaminants into these phases is governed by the physical and chemical properties of the compound, the length of time the mass has been in the soil, and the soil characteristics. The partitioning of the

contaminants from the liquid phase and the dissolved phase is explained and predicted by Raoult's Law and Henry's Law, respectively. Basically, these laws are based upon vapor pressure principles. The higher the vapor pressure, the higher the concentrations of nonmethane hydrocarbons in the vapor stream, provided the soil conditions allow sufficient air to flow past the spill mass. At the onset of vapor extraction at sites with large spill masses, vapor phase concentration and composition are usually the result of partitioning from the liquid phase. Therefore, the vapor phase concentrations observed at the commencement of vapor extraction are at their most elevated levels, and will decrease over time. Thus, nonmethane hydrocarbon analysis gives a vapor concentration baseline for the site. The results of the nonmethane hydrocarbon analyses are shown in Table 3.

Analysis of permanent gases determines the concentration of N_2, CO_2, O_2, and CH_4 in the vapor stream. Initially, vadose zone pore gases are relatively low in oxygen, especially in circumstances where the contaminated zone is not close to the ground surface. In cases such as these, if naturally occurring microorganisms are present in the soil pore spaces, high levels of methane can be present. As soil vapor extraction is initiated, oxygen is introduced, and aerobic biodegradation is stimulated in the soil pore spaces. Because microorganisms consume oxygen and respirate carbon dioxide, an increase in carbon dioxide levels in the vapor stream is evidenced. Therefore, permanent gases analysis can be an indicator for microbiological activity at a site. These laboratory results are presented in Table 3.

Boiling point analysis using a gas chromatograph/flame ionization detector (GC/FID) determines the gas composition of the vapor stream. The values are reported in mole percent. Using these mole percent values and the published heat of combustion values of the vapor stream components, the total heat of combustion of the vapor stream can be calculated. These values can be used initially to determine the appropriate vapor abatement system, and in the long term, can be used to monitor the chemical composition change of the vapor stream, which can be used to gage remediation progress. Boiling point analysis results are shown in Table 4.

4.0 CONCLUSIONS AND RECOMMENDATIONS

The vapor extraction pilot study performed at MCAS El Toro, California, showed fairly low concentrations of nonmethane hydrocarbons in samples collected from extraction wells VW-23 and VW-24. The boiling point analysis presented indicates that the major contributor to the total British thermal unit (BTU) content of the vapor stream is methane. As the methane is removed and the system changes from anaerobic to aerobic, the vapor composition in the effluent should change, and there may be more of the JP-5 constituents showing up in the vapor stream. However, because JP-5 contains long-chain hydrocarbons containing approximately 10 to 16 carbon atoms per molecule (Lewis, 1992) and a low vapor pressure of 1 millimeter of mercury at 68 degrees Fahrenheit (MSDS, 1989), it is not anticipated that the concentrations of the C5+ constituents will increase significantly. In addition, any rise would be a temporary and short-lived condition, because as vapor extraction progresses, the more volatile end compounds of C5+ series would be removed quickly, and the concentrations would drop rapidly. The vapor stream composition more likely will change in the favor of carbon dioxide.

Based on the composition and concentrations of the vapor stream and the vapor pressure of JP-5, it is not recommended that soil vapor extraction be used for remediation of the soils at this particular site. The effluent concentrations are fairly low and would be expected to decrease quickly in a vapor extraction scenario. Due to the low volatility of JP-5 and the structure of this long-chained compound, a large portion of the spill mass would remain in the soil following the completion of vapor extraction. Vapor extraction would, however, be effective in removing the BTEX components present in the soil.

Soil gas samples collected during the pilot study indicate that bioventing may be effective in removing the spill mass from the soil. Bioventing is a process that is similar to vapor extraction in that air is passed through the vadose zone to remove hydrocarbons from the soil. However, whereas the objective of soil vapor extraction is to strip the volatile compounds out of the soil, the objective of bioventing is to supply the indigenous microorganisms with oxygen, so that biological activity is stimulated. A major advantage of bioventing is that the microorganisms will consume light, volatile organic compounds as well as the heavier, less volatile compounds.

All samples showed elevated methane concentrations above 24,000 parts per million volume (ppmv). These levels were supported by the permanent gas analysis and the boiling point analysis. Methane is an indicator of anaerobic microbiological activity in the subsurface. Evaluation of the results in Table 3 indicates that as each test progressed, the oxygen levels in the soil gas increased, as expected. In addition, carbon dioxide levels showed an increase, which could be an indication that the conditions were changing from an anaerobic to an aerobic state.

In order for bioventing to be effective, oxygen must be supplied to the microorganisms. Therefore, the soil conditions at the site play an important role. Relatively high air permeability in the soil between vapor extraction wells VW-22, VW-23, and VW-24 was evidenced during the pilot study. The range of permeability values is typical for medium to fine sands with some silts. However, soil boring logs indicate the presence of more silty sands than sands. The maximum air flow rates obtained during the test ranged between 70 and 80 cubic feet per minute (ft^3/min), or about 2 ft^3/min per foot of well screen (40 feet of well screen per well). These flow rates at the vacuums encountered during the study are characteristic of fine sands. Therefore, it appears that there may be some fairly permeable sand zones present between the extraction wells along with some less permeable silty sands. Based on soil conditions, it appears that adequate air flow can pass through the soil pore spaces to consider bioventing as a remediation technology for the site.

As presented in Table 2 and Figures 6 through 12, the "effective" radius of influence observed during the first test ranged from 25 feet in the direction of well VW-22 to 45 feet in the direction of well VW-24 when applying vacuum to well VW-23. The "effective" radius of influence observed when extracting from well VW-24 was approximately 50 feet in the direction of wells VW-22 and VW-23. As mentioned in Section 2.2, step tests were performed on each extraction well so that system design parameters could be established. The data in Table 2 indicate that in almost all cases, decreasing the air flow rates and extraction vacuums actually increased the ranges of "effective" radius of influence from both extraction wells. This is encouraging for a bioventing scenario because the bioventing process utilizes only about 0.1 to 0.5 pore volumes of air per day, whereas vapor extraction requires approximately one or more pore volumes of air per day. Thus, at these lower flow rates, each well may affect a fairly large volume of soil.

In light of the findings of this vapor extraction pilot study, IT recommends that bioventing be investigated as a possible remedial technology for soils at this site. An in situ respiration test should be conducted so that oxygen utilization rates, and thus, biodegradation rates, can be determined for the site.

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5.0 REFERENCES

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TABLE 1
Soil Analytical Data

Well No.	Depth (ft)	TPH (mg/kg)	Benzene (µg/kg)	Toluene (ug/kg)	Ethyl-benzene (ug/kg)	Total Xylenes (ug/kg)
VW398-22	125	4810	1860	685	2600	5270
VW398-22	135	8430	3830	2230	6580	16300
VW398-22	145	3300	4650	2170	6090	19500
VW398-22	155	5640	14800	7270	16100	45300
VW398-23	125	83400	4230	5410	15800	58600
VW398-23	135	4700	4020	5720	16900	60500
VW398-23	145	315	1850	2590	6800	30100
VW398-23	155	1230	1480	1640	4060	18800
VW398-24	125	5750	252	189	1990	11200
VW398-24	135	3220	122	122	1190	6340
VW398-24	145	3990	289	261	2070	11300
VW398-24	155	2940	354	297	3560	16200

TABLE 2
Vapor Extraction Field Parameters
Marine Corps Naval Air Station
El Toro, California
Project No. 243150

		Extraction Well	Date	Average Flow Rate (cu. ft./min.)	Average Vacuum (inch water)	Radius of Influence VW-22 (feet)	Radius of Influence VW-23 (feet)	Radius of Influence VW-24 (feet)
TEST #1	Steady State	VW-23	2/16/93	76	32	25	NA	45
	Step Test #1		2/16/93	73	27	28	NA	51
	Step Test #2		2/16/93	60	24	26	NA	48
	Step Test #3		2/16/93	43	18	26	NA	50
TEST #2	Steady State	VW-24	2/17/93	73	39	54	52	NA
	Step Test #1		2/17/93	60	28	50	49	NA
	Step Test #2		2/17/93	48	23	51	52	NA

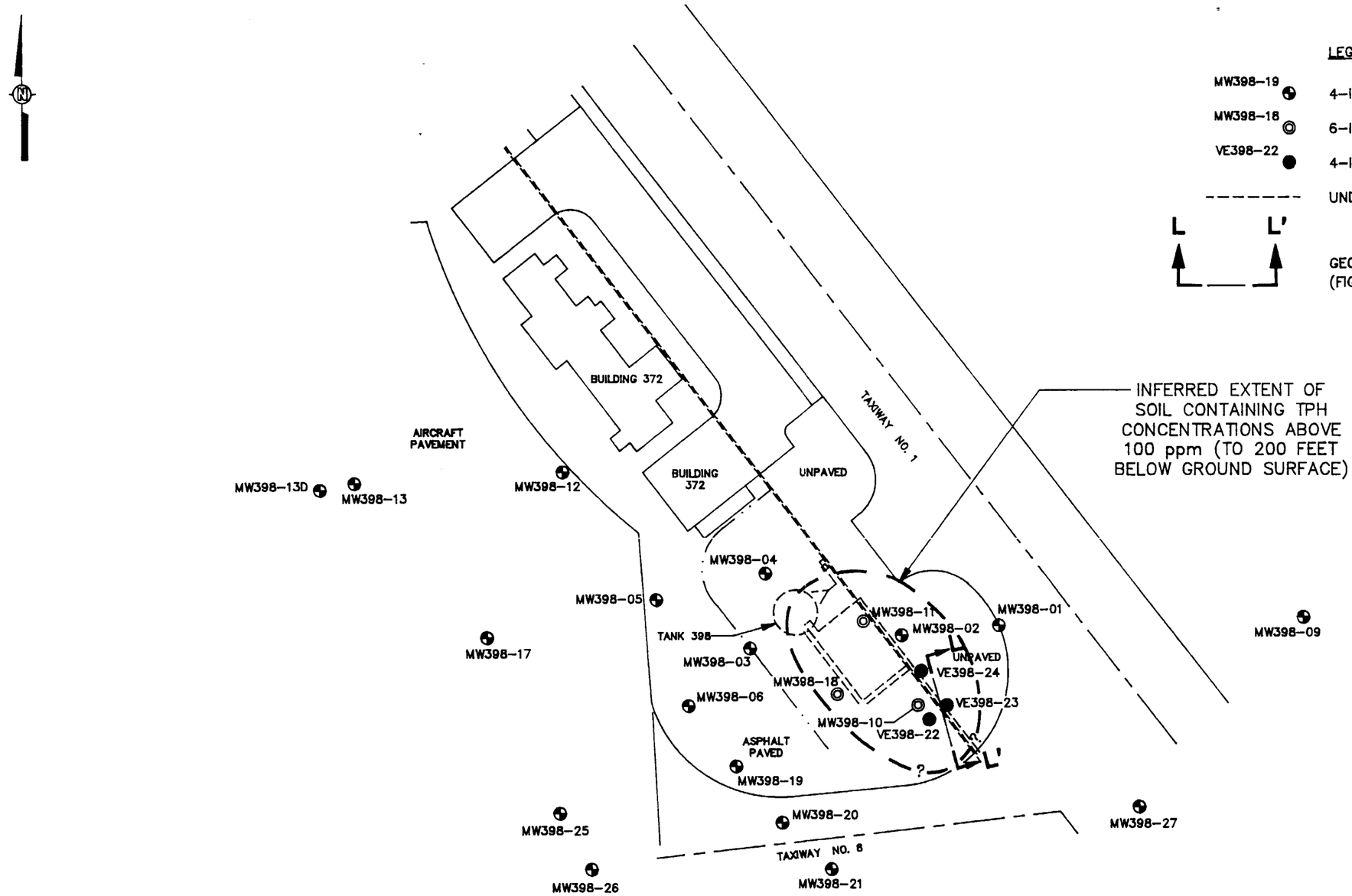
TABLE 3
Vapor Analytical Data
Marine Corps Naval Air Station
El Toro, California
Project No. 243150

Well No.	Sample No.	Methane Conc'n. (ppmv)	Non-Methane Conc'n. as JP-5 (ppmv)	Benzene (ppb)	Toluene (ppb)	Ethylbenzene (ppb)	Total Xylenes (ppb)	Hydrogen (volume %)	Oxygen (volume %)	Nitrogen (volume %)	Methane (volume %)	Carbon Monoxide (volume %)	Carbon Dioxide (volume %)
VW-23	CEL-D026	24,600	3,780	33,200	24,000	188,000	244,000	ND	4.0	78.0	2.5	ND	11.0
	CEL-D023	25,800	3,980	34,800	19,900	36,400	208,000	ND	4.6	78.0	2.6	ND	12.6
VW-24	VW-24-1	27,900	311	1,270	1,820	3,820	22,600	ND	2.7	78.0	2.8	ND	8.2
	CEL-D027	28,600	429	1,720	2,000	4,220	26,200	ND	6.4	78.0	2.9	ND	11.8

TABLE 4
Boiling Point Analysis for BTU Content
Marine Corps Naval Air Station
El Toro, California
Project No. 243150

Component	Sample No. D026 Concentration (mole %)	Sample No. D023 Concentration (mole %)	Sample No. VW-24-1 Concentration (mole %)	Sample No. D027 Concentration (mole %)
Hydrogen	<0.1	<0.1	<0.1	<0.1
Carbon Dioxide	24.3	25.4	14.7	26.7
Carbon Monoxide	<0.1	<0.1	<0.1	<0.1
Nitrogen	66.8	65.5	78	64.6
Oxygen	0.9	1.4	1.6	1.1
Hydrogen Sulfide	<0.1	<0.1	<0.1	<0.1
Methane	6.5	6.2	5.6	7.5
Ethylene	<0.1	<0.1	<0.1	<0.1
Ethane	<0.1	<0.1	<0.1	<0.1
Propane	<0.1	<0.1	<0.1	<0.1
Propylene	<0.1	<0.1	<0.1	<0.1
Isobutane	<0.1	<0.1	<0.1	<0.1
t-2-Butene	<0.1	<0.1	<0.1	<0.1
c-2-Butene	<0.1	<0.1	<0.1	<0.1
1,3-Butadiene	<0.1	<0.1	<0.1	<0.1
Isopentane	<0.1	<0.1	<0.1	<0.1
n-Pentane	<0.1	<0.1	<0.1	<0.1
C5+	1.5	1.5	<0.1	0.1
Total BTU Content (Btu/cu. ft.)	143	138	59	80

DRAWN BY	CHECKED BY		DRAWING NUMBER
SDJF 3-15-93	APPROVED BY	4-19-93 4-19-93	243150-B30



LEGEND

MW398-19 — 4-INCH GROUNDWATER MONITORING WELL

MW398-18 — 6-INCH GROUNDWATER MONITORING WELL

VE398-22 — 4-INCH VAPOR EXTRACTION WELL

UNDERGROUND PIPING

L — L' GEOLOGIC CROSS SECTION LOCATION (FIGURE 2)

INFERRED EXTENT OF SOIL CONTAINING TPH CONCENTRATIONS ABOVE 100 ppm (TO 200 FEET BELOW GROUND SURFACE)

SCALE:
0 100 200 FEET

REFERENCE: SITE ASSESSMENT REPORT (NAVY, 1992a)

SOURCE: DEPARTMENT OF THE NAVY 1990

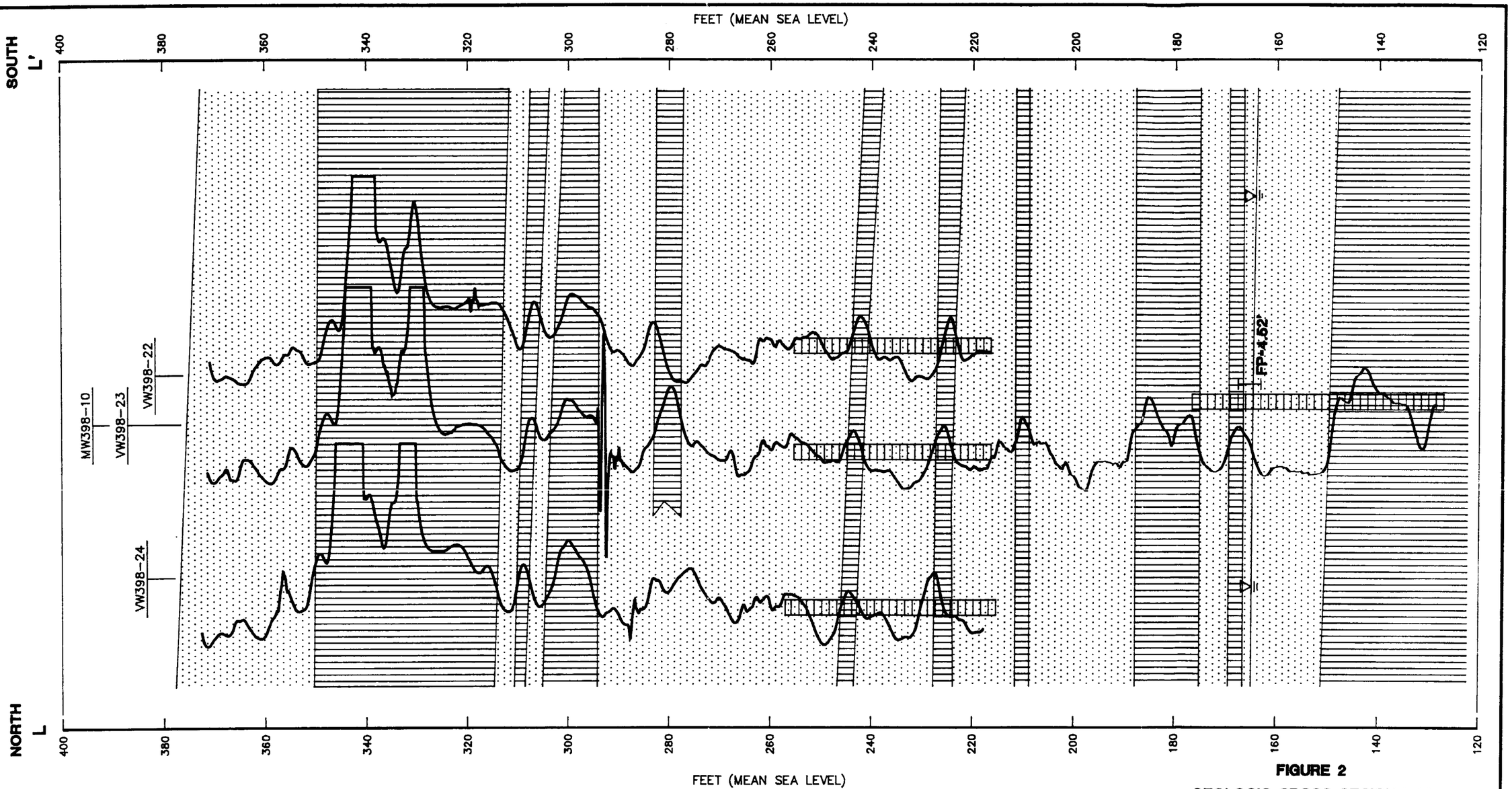
FIGURE 1

SITE PLAN
MARINE CORPS AIR STATION
EL TORO, CALIFORNIA

PREPARED FOR

SOUTHWEST DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
CONTRACT NO. N68711-89-D-9296
CLE-101-01F150-B0-0003

INTERNATIONAL TECHNOLOGY CORPORATION



DRAWN BY	CHECKED BY		DRAWING NUMBER
SDJF 4-14-93	APPROVED BY	MPS 4-19-93	243150-B40

FIGURE 2

GEOLOGIC CROSS-SECION L-L'
TANK 398 AREA
MARINE CORPS AIR STATION
EL TORO, CALIFORNIA

PREPARED FOR

SOUTHWEST DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
CONTRACT NO. N68711-89-D-9296
CLE-101-01F150-B0-0003

INTERNATIONAL TECHNOLOGY CORPORATION

LEGEND:

STATIC WATER LEVELS MEASURED ON MARCH 16, 1993

PREDOMINANTLY SILTS AND CLAYS WITH MINOR SAND AND GRAVEL

PREDOMINANTLY SANDS AND GRAVELS WITH MINOR SILTS AND CLAYS

NOTE:

CORRELATIONS BETWEEN BORINGS ARE INFERRED AND SCHEMATIC

HORIZONTAL SCALE: 0 20 40 FEET

VERTICAL SCALE: 0 20 40 FEET

DRAWN BY	J. WALL 3-25-93	CHECKED BY	KJM 4-19-93	DRAWING NUMBER	24	A11
		APPROVED BY	MPS 4-19-93			

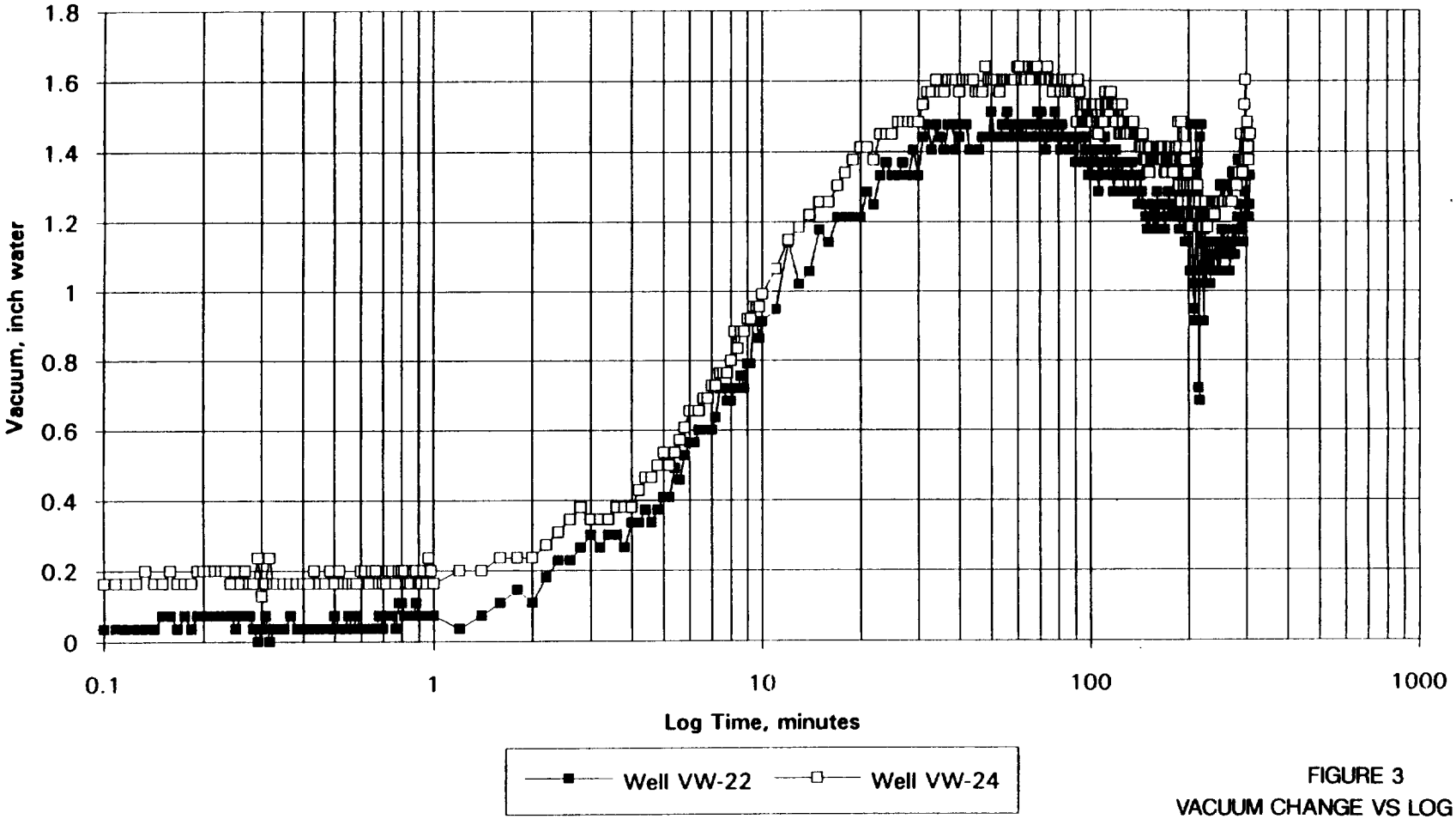


FIGURE 3
VACUUM CHANGE VS LOG TIME
TEST #1
VAPOR EXTRACTION WELL VW-23
MARINE CORPS AIR STATION
EL TORO, CALIFORNIA

PREPARED FOR

SOUTHWEST DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
CONTRACT NO. N68711-89-D-9296
CLE-I01-01F150-B6-0003

INTERNATIONAL TECHNOLOGY CORPORATION

"Do Not Scale This Drawing"

069908

WN	J. WALL	CHECKED BY	KWM	4-19-93	DRAWING
BY	3-25-93	APPROVED BY	MPS	4-19-93	NUMBER 24

A12

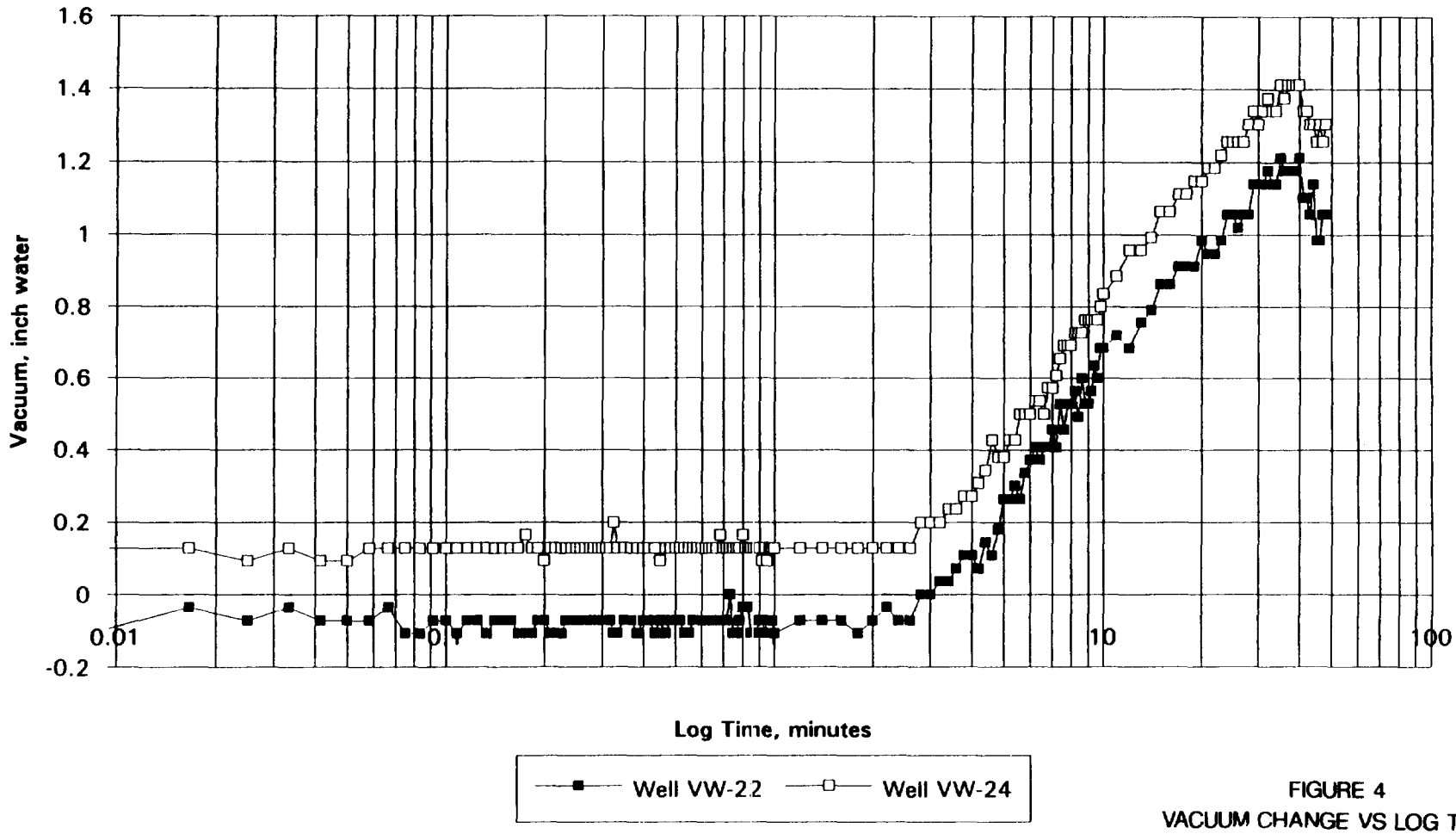


FIGURE 4
VACUUM CHANGE VS LOG TIME
TEST #1, STEP TEST #1
VAPOR EXTRACTION WELL VW-23
MARINE CORPS AIR STATION
EL TORO, CALIFORNIA

PREPARED FOR

SOUTHWEST DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
CONTRACT NO. N68711-89-D-9296
CLE-I01-01F150-B6-0003

INTERNATIONAL TECHNOLOGY CORPORATION

"Do Not Scale This Drawing"

069908

DRAWN BY	J. WALL 3-25-93	CHECKED BY / APPROVED BY	KMM / MPS	4-19-93 / 4-19-93	DRAWING NUMBER	245...-A13

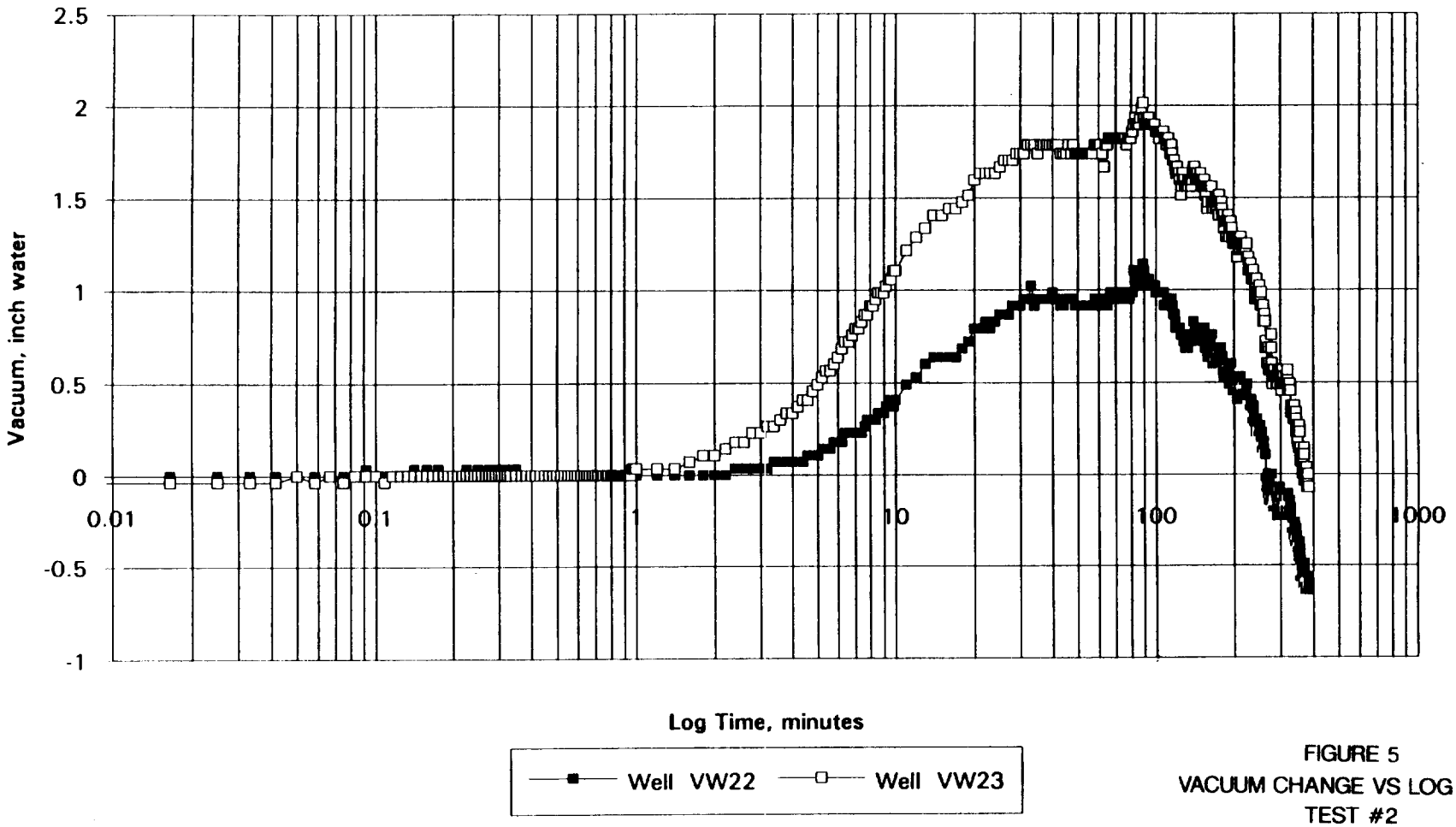


FIGURE 5
VACUUM CHANGE VS LOG TIME
TEST #2
VAPOR EXTRACTION WELL VW-24
MARINE CORPS AIR STATION
EL TORO, CALIFORNIA
PREPARED FOR
SOUTHWEST DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
CONTRACT NO. N68711-89-D-9296
CLE-I01-01F150-B6-0003

INTERNATIONAL TECHNOLOGY CORPORATION

Do Not Scale This Drawing

069908

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	3-25-93	APPROVED BY	MPS	4-19-93		

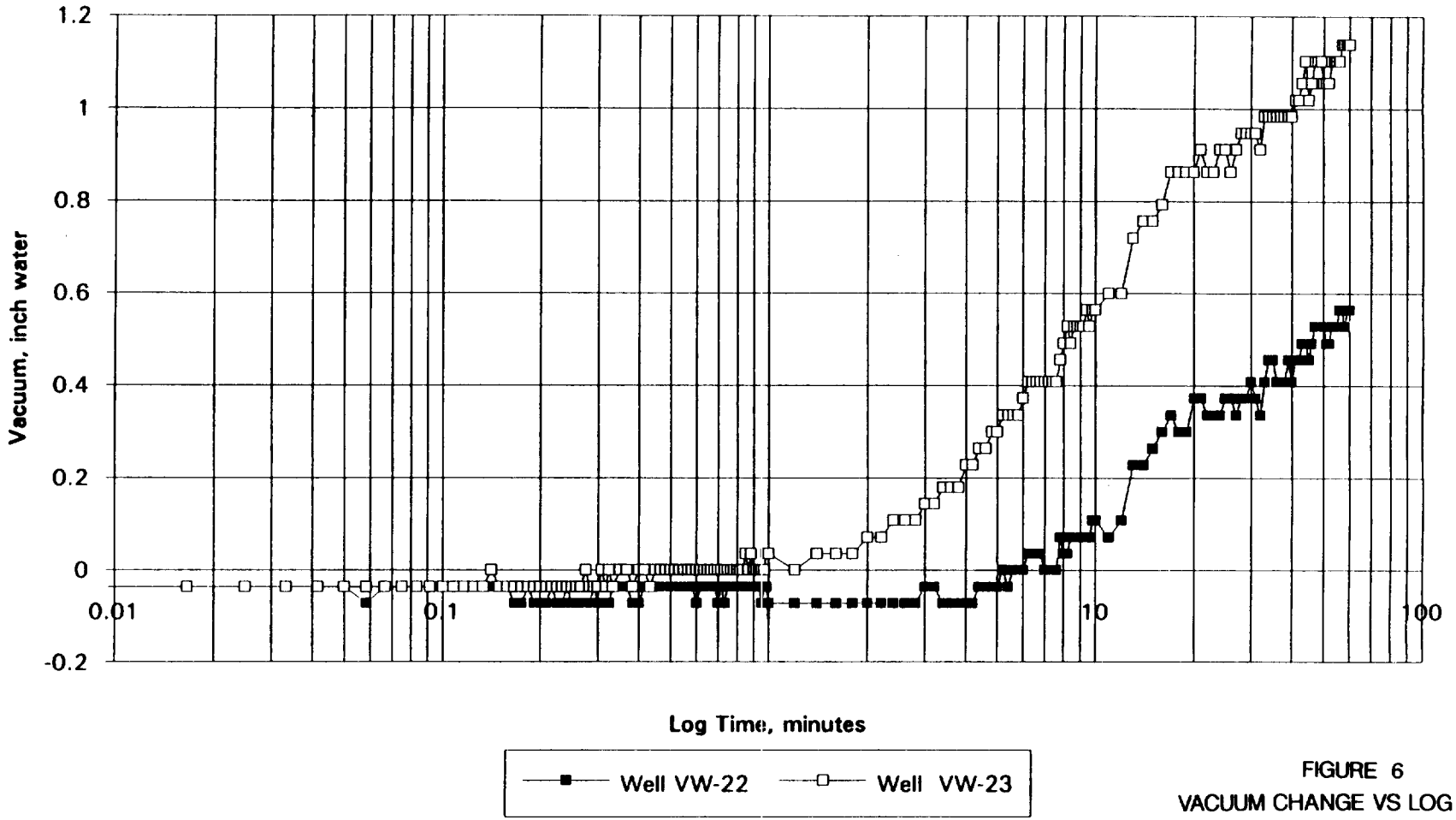


FIGURE 6
VACUUM CHANGE VS LOG TIME
TEST #2, STEP TEST #1
VAPOR EXTRACTION WELL VW-24
MARINE CORPS AIR STATION
EL TORO, CALIFORNIA

PREPARED FOR

SOUTHWEST DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
CONTRACT NO. N68711-89-D-9296
CLE-I01-01F150-B6-0003

INTERNATIONAL TECHNOLOGY CORPORATION

"Do Not Scale This Drawing"

069908

WN BY	J. WALL 3-25-93	CHECKED BY APPROVED BY	RHM MPS	4-19-93 4-19-93	DRAWING NUMBER	24

A15

FIGURE 7

RADIUS OF INFLUENCE

TEST #1

MARINE CORPS AIR STATION
EL TORO, CALIFORNIA

PREPARED FOR

SOUTHWEST DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
CONTRACT NO. N68711-89-D-9296
CLE-I01-01F150-B6-0003

INTERNATIONAL TECHNOLOGY CORPORATION

LEGEND:

- WELL VW-23 - EXTRACTION WELL
- WELL VW-22 - MONITORING WELL
- WELL VW-24 - MONITORING WELL

Do Not Scale This Drawing

069908

DRAWN BY	J. WALL	CHECKED BY		4-19-93	DRAWING NUMBER	24	A16
	3-25-93	APPROVED BY	MPS	4-19-93			

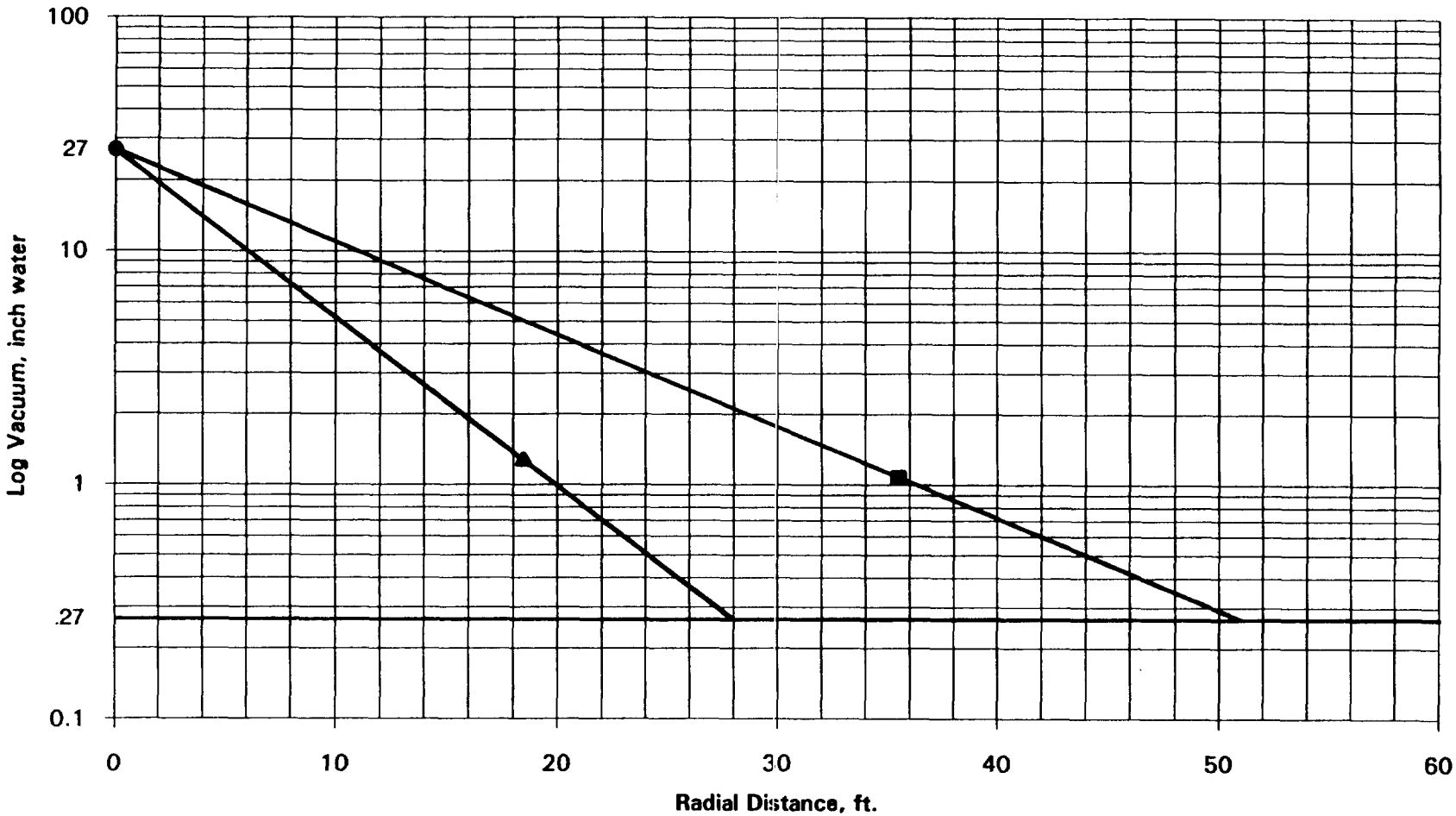


FIGURE 8
RADIUS OF INFLUENCE
TEST #1, STEP TEST #1
MARINE CORPS AIR STATION
EL TORO, CALIFORNIA

PREPARED FOR
SOUTHWEST DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
CONTRACT NO. N68711-89-D-9296
CLE-I01-01F150-B6-0003

INTERNATIONAL TECHNOLOGY CORPORATION

LEGEND:

- WELL VW-23 - EXTRACTION WELL
- WELL VW-22 - MONITORING WELL
- WELL VW-24 - MONITORING WELL

069908

Do Not Scale This Drawing

DRAWN BY	J. WALL	CHECKED BY	KWM	4-19-93	DRAWING NUMBER	24	A17
	3-25-93	APPROVED BY	MPS	4-19-93			

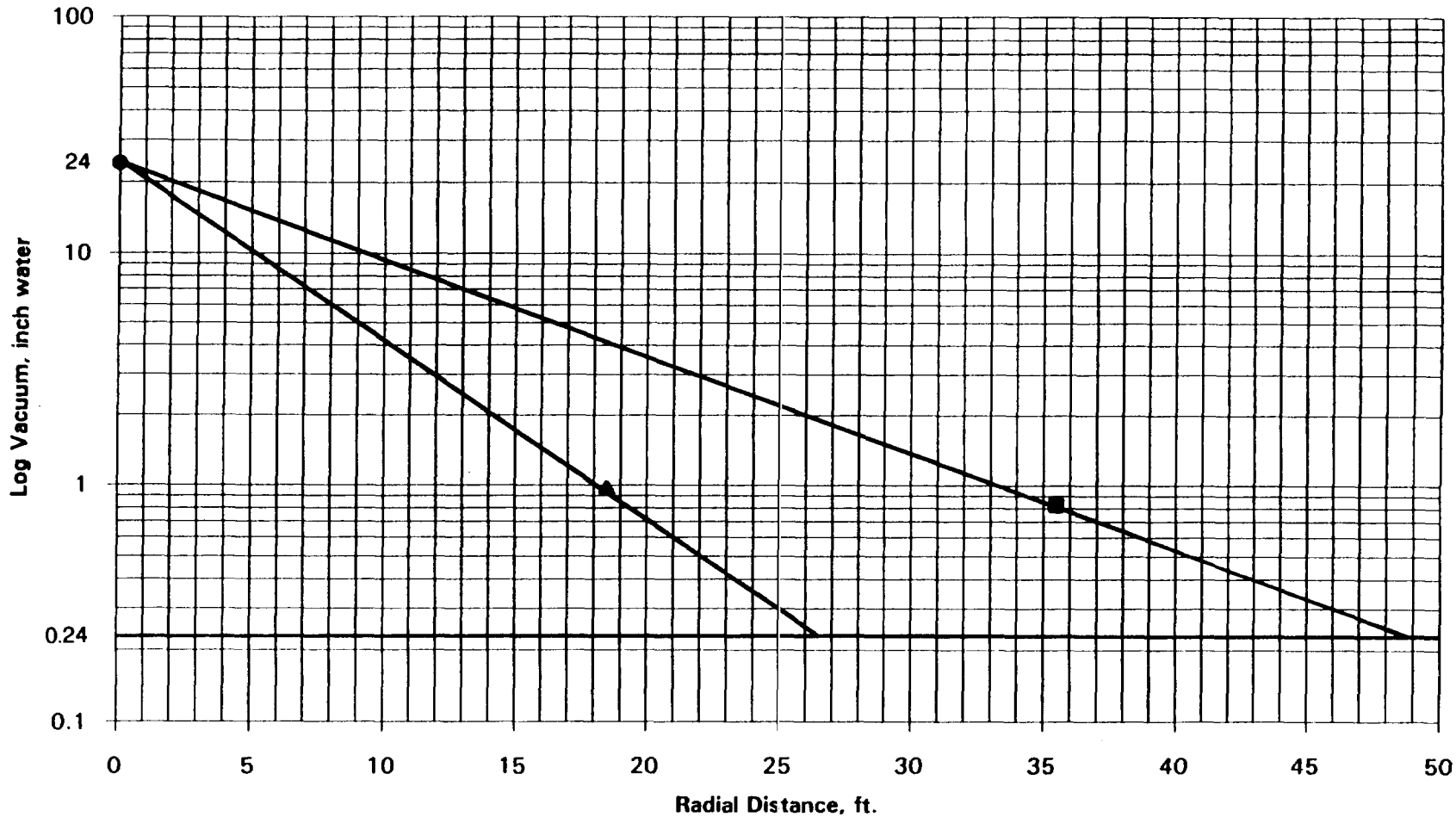


FIGURE 9
RADIUS OF INFLUENCE
TEST #1, STEP TEST #2
MARINE CORPS AIR STATION
EL TORO, CALIFORNIA

PREPARED FOR

SOUTHWEST DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
CONTRACT NO. N68711-89-D-9296
CLE-I01-01F150-B6-0003

INTERNATIONAL TECHNOLOGY CORPORATION

LEGEND:

- WELL VW-23- EXTRACTON WELL
- WELL VW-22- MONITORING WELL
- WELL VW-24- MONITORING WELL

069908

Do Not Scale This Drawing

NN	J. WALL	CHECKED BY		4-19-93	DRAWING
Y	3-25-93	APPROVED BY	MPS	4-19-93	NUMBER 24

A18

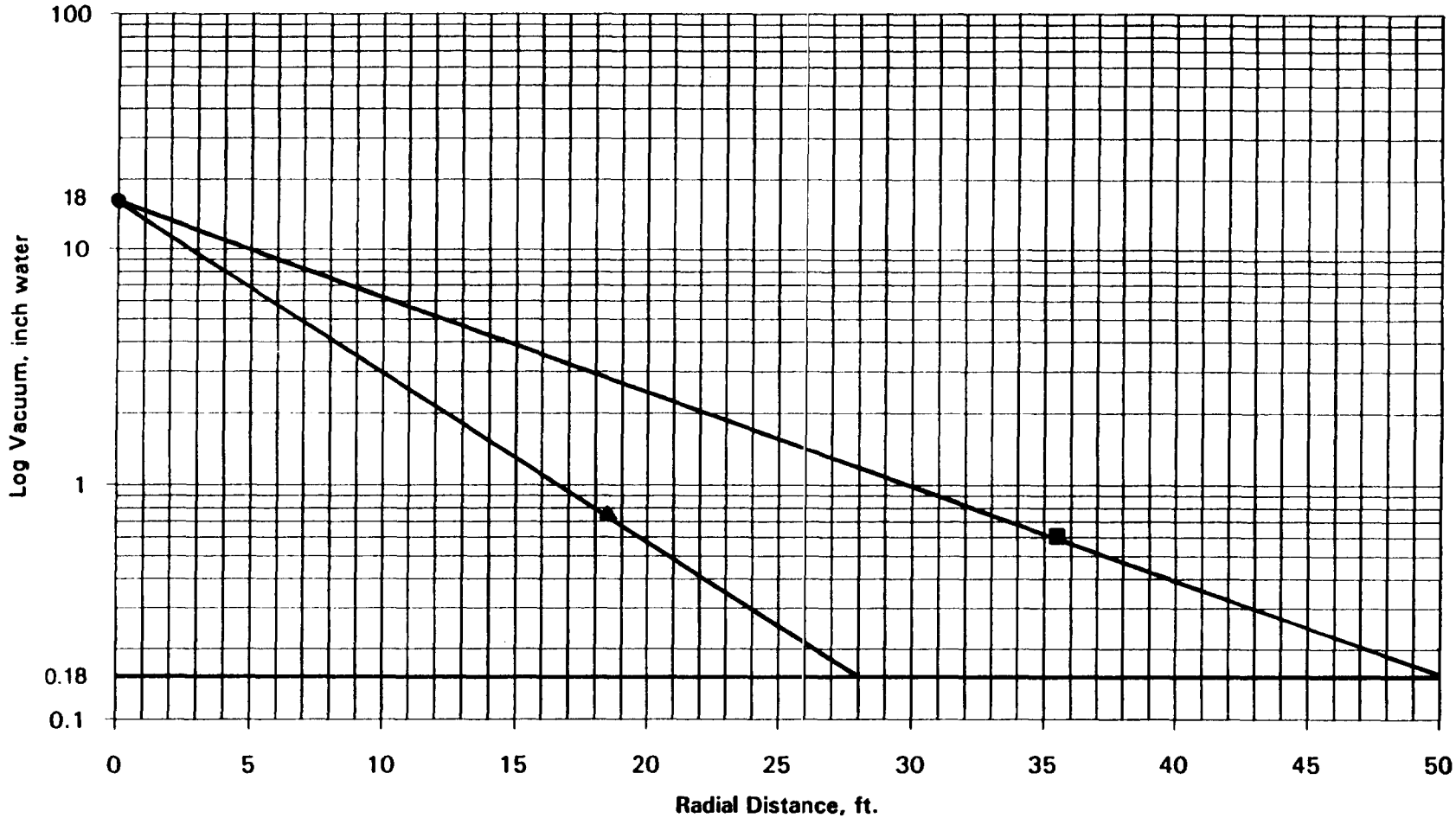


FIGURE 10
RADIUS OF INFLUENCE
TEST #1, STEP TEST #3
MARINE CORPS AIR STATION
EL TORO, CALIFORNIA

PREPARED FOR

SOUTHWEST DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
CONTRACT NO. N68711-89-D-9296
CLE-I01-01F150-B6-0003

INTERNATIONAL TECHNOLOGY CORPORATION

LEGEND:

- WELL VW-23 - EXTRACTION WELL
- WELL VW-22 - MONITORING WELL
- WELL VW-24 - MONITORING WELL

Do Not Scale This Drawing

069908

WN BY	J. WALL 3-25-93	CHECKED BY APPROVED BY	KMM MPS	4-19-93 4-19-93	DRAWING NUMBER	24	A19

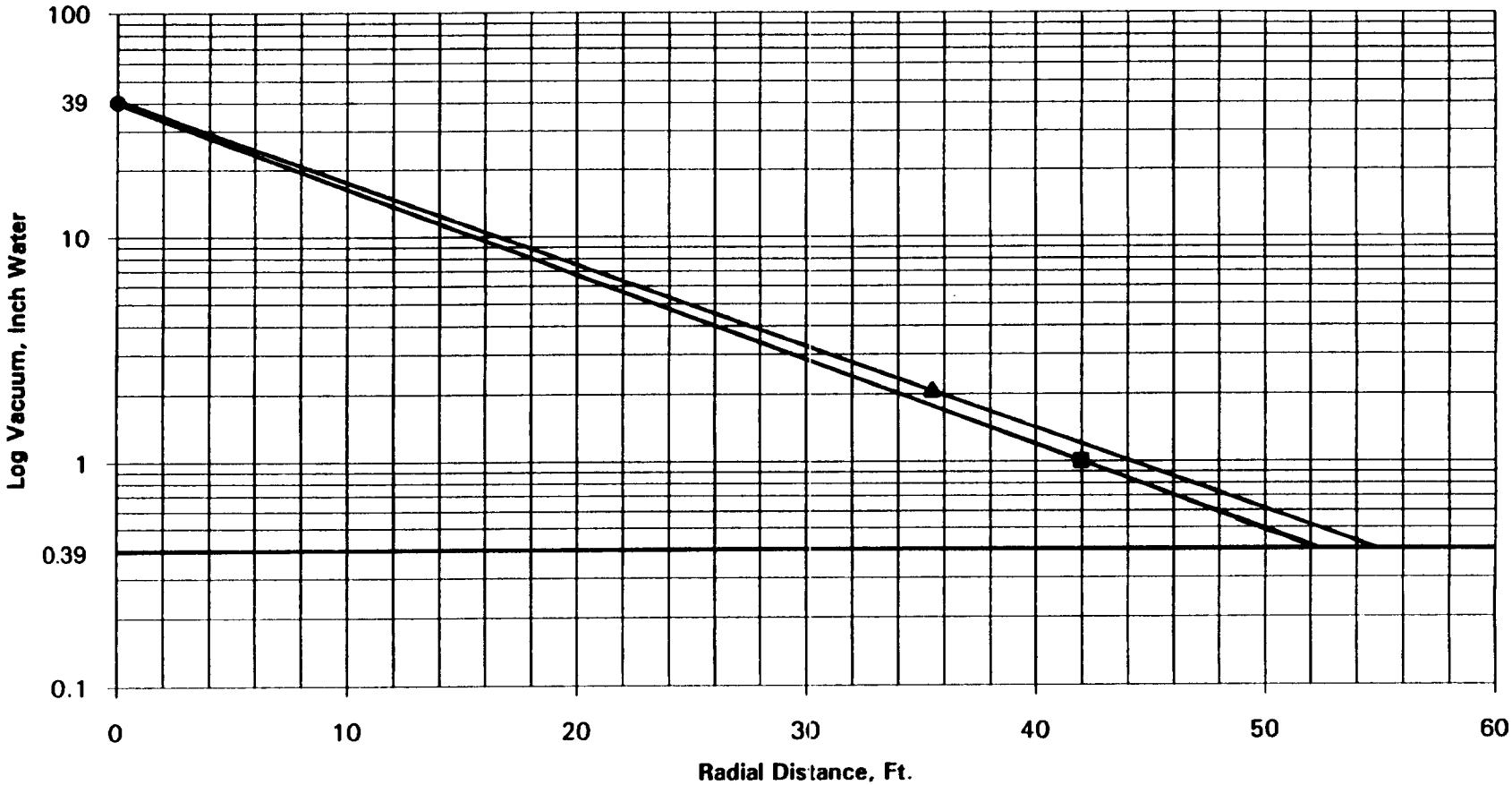


FIGURE 11
RADIUS OF INFLUENCE
TEST #2
MARINE CORPS AIR STATION
EL TORO, CALIFORNIA

PREPARED FOR

SOUTHWEST DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
CONTRACT NO. N68711-89-D-9296
CLE-I01-01F150-B6-0003

INTERNATIONAL TECHNOLOGY CORPORATION

LEGEND:

- WELL VW-24 - EXTRACTION WELL
- WELL VW-23 - MONITORING WELL
- WELL VW-22 - MONITORING WELL

069908

"Do Not Scale This Drawing"

WN	J. WALL	CHECKED BY	RWM	4-19-93	DRAWING
BY	3-25-93	APPROVED BY	MFS	4-19-93	NUMBER 24

A20

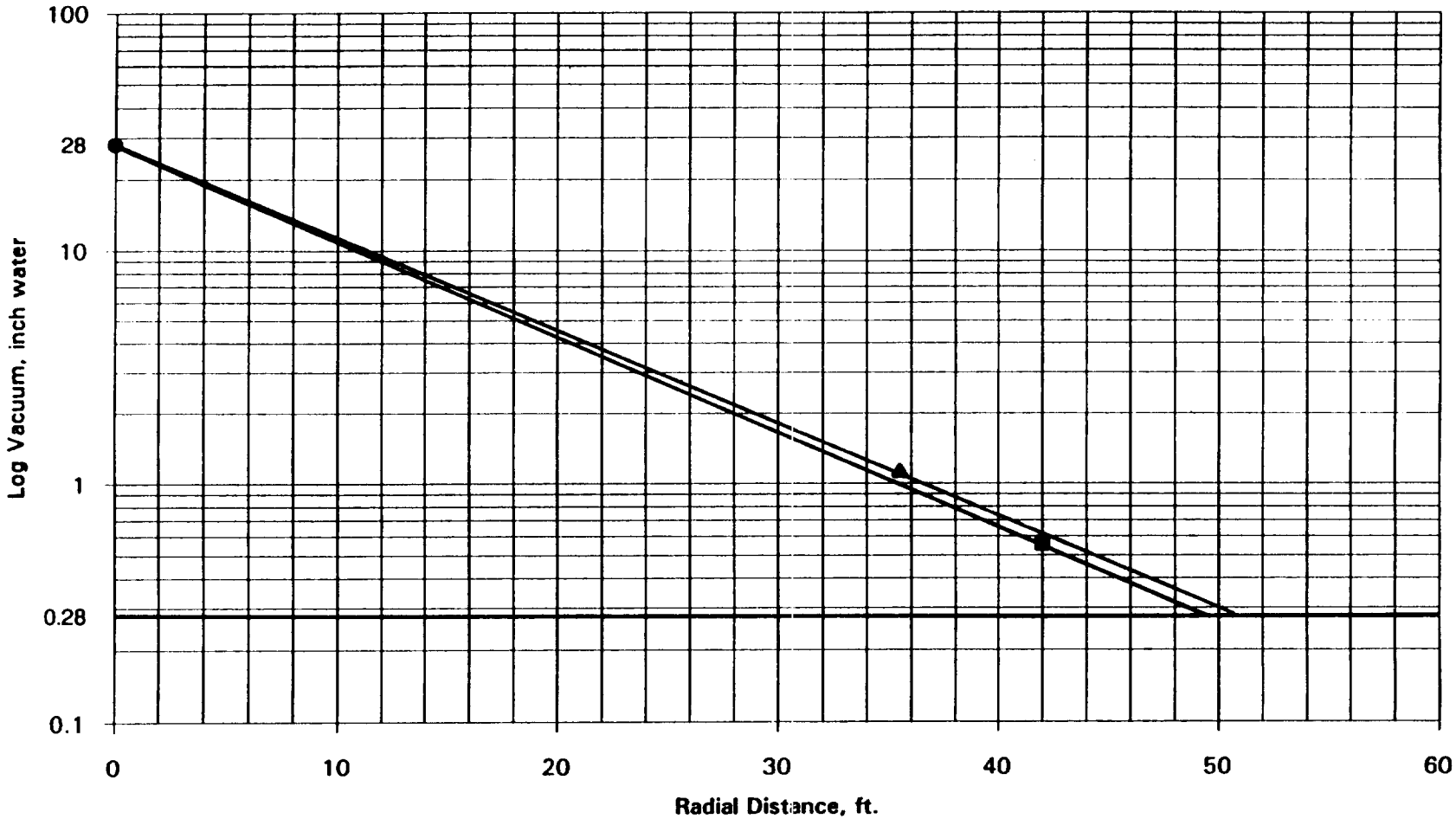


FIGURE 12
RADIUS OF INFLUENCE
TEST #2, STEP TEST #1
MARINE CORPS AIR STATION
EL TORO, CALIFORNIA

PREPARED FOR

SOUTHWEST DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
CONTRACT NO. N68711-89-D-9296
CLE-101-01F150-B6-0003

INTERNATIONAL TECHNOLOGY CORPORATION

LEGEND:

- WELL VW-24 - EXTRACTION WELL
- WELL VW-23 - MONTORING WELL
- WELL VW-22 - MONITORING WELL

069908

Do Not Scale This Drawing

AWN BY	J. WALL 3-25-93	CHECKED BY / APPROVED BY	KMM / MPS	4-19-93 / 4-19-93	DRAWING NUMBER	2

J-A21

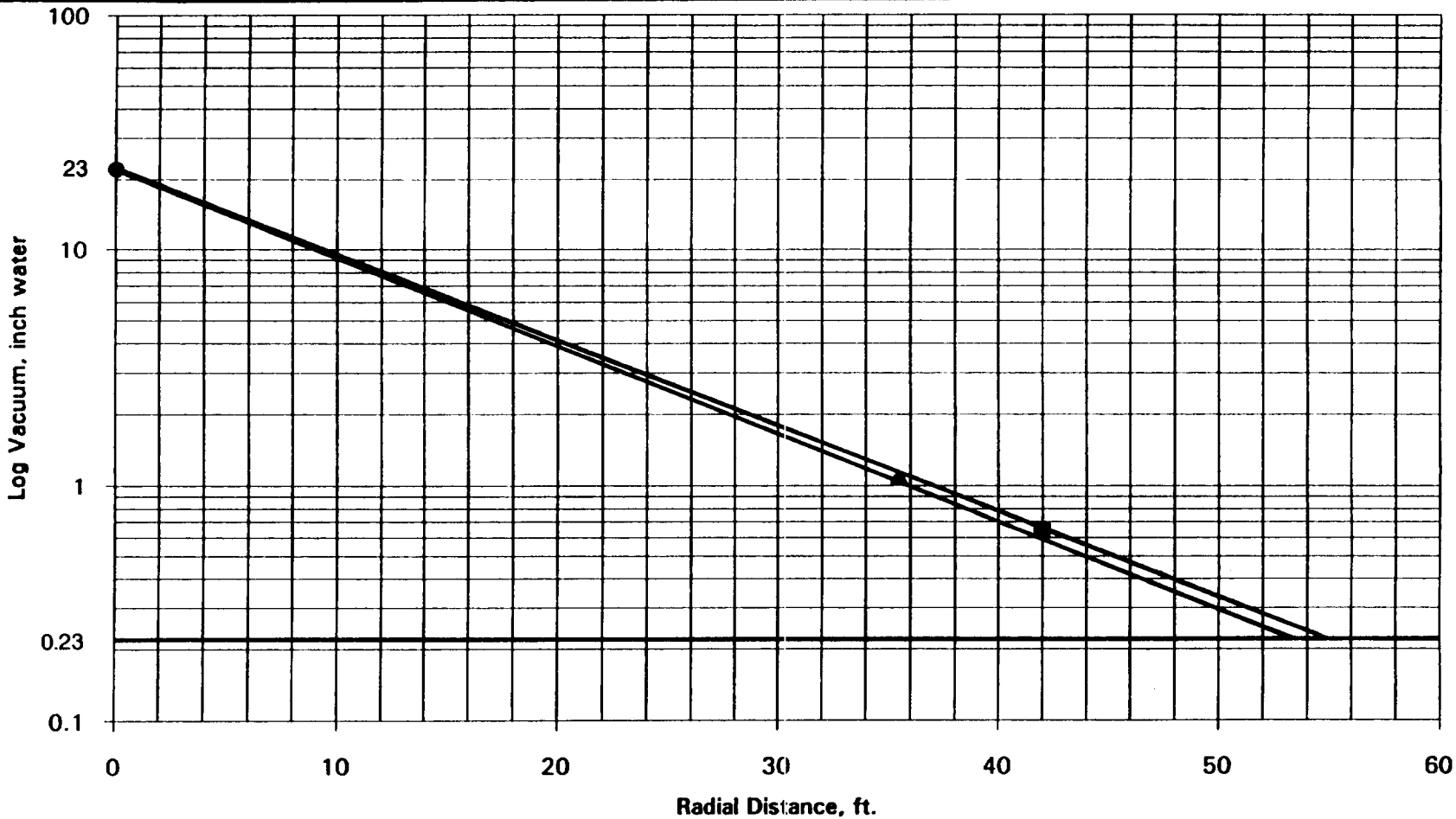


FIGURE 13
RADIUS OF INFLUENCE
TEST #2, STEP TEST #2
MARINE CORPS AIR STATION
EL TORO, CALIFORNIA

PREPARED FOR

SOUTHWEST DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
CONTRACT NO. N68711-89-D-9296
CLE-I01-01F150-B6-0003

INTERNATIONAL TECHNOLOGY CORPORATION

LEGEND:

- WELL VW-24 - EXTRACTION WELL
- WELL VW-23 - MONITORING WELL
- WELL VW-22 - MONITORING WELL

069908

"Do Not Scale This Drawing"

APPENDIX A
WELL PERMITS

APPLICATION FOR WELL CONSTRUCTION PERMIT

ORANGE COUNTY HEALTH CARE AGENCY
ENVIRONMENTAL HEALTH DIVISION

2009 E. EDINGER
SANTA ANA, CA
(714) 667-3601

MAILING ADDRESS:
P.O. BOX 355
SANTA ANA, CA 92702

WELL PERMIT NUMBER 93-01-06

1. CITY: U.S. Marine Corps Air Station EL TORO

2. DATE: 6 Jan '93

3. WELL LOCATION (NEAREST INTERSECTION): 250 feet north of runway, by building 372 and taxi island C.

4. NAME OF WELL OWNER: US MCHS Attn. Chrisa Mitchell

ADDRESS: Facilities Management Dept. 15G.30

CITY: Santa Ana TELEPHONE: (714) 726 6607

5. NAME OF CONSULTING FIRM: IT Corporation

BUSINESS ADDRESS: 2355 Main St. Ste 100

CITY: Irvine 92714 TELEPHONE: (714) 261 6441

6. NAME OF CONTRACTOR: Layne Env. Svcs. Inc. CONTRACTOR'S LICENSE NO.: 600467

CITY: Fontana TELEPHONE: (714) 355 3355

7. TYPE OF WELL (CHECK):
- [ ] PRIVATE DOMESTIC
- [ ] PUBLIC DOMESTIC
- [ ] IRRIGATION
- [ ] SOIL BORING/TOTAL NUMBER ____
- [ ] CATHODIC
- [x] MONITORING/TOTAL NUMBER 6
- [x] OTHER 3 Vapor Extraction

8. TYPE OF CASING: PVC 4 inch sch 40 .01 slots

9. METHOD OF SEALING CASING AND/OR EXCAVATION (Use additional sheets): Bentonite Pellets (Hydrated) and Volclay® Grout, Concrete

DEPTH OF SEAL: 0-57, 0-197 ft

10. DIAGRAM OF WELL SITE (Use additional sheets and/or attachments): see attached

PLEASE ATTACH WELL CONSTRUCTION SPECIFICATION AND SITE PLAN TO THIS PERMIT

[X] ATTACHED

I hereby agree to comply in every respect with all requirements of the Health Care Agency and with all ordinances and laws of the County of Orange and of the State of California pertaining to well construction, reconstruction and destruction, including the requirements to maintain the integrity of all significant confining zones.

Maria P. Shayegan 1-7-93
APPLICANT'S SIGNATURE DATE

MARIA SHAYEGAN
PRINT NAME

(714) 660 5317
PHONE NUMBER

FOR ACCOUNTING USE ONLY:

HSO NO. ____ CHECK NO. ____

DATE 1-12-93 AMOUNT EXEMPT

INTL. ____ LOG ____

APPROVAL BY OTHER AGENCIES:

JURISDICTION ____

REMARKS ____

AUTHORIZED SIGNATURE ____ DATE ____

DISPOSITION OF PERMIT (DO NOT FILL IN):

[X] APPROVED SUBJECT TO THE FOLLOWING CONDITIONS:

A. NOTIFY THIS AGENCY ____ HOURS
- [ ] PRIOR TO START. 1-19-93
- [ ] PRIOR TO SEALING THE ANNULAR SPACE OR FILLING OF THE CONDUCTOR CASING.

B. [ ] SUBMIT TO THE AGENCY WITHIN 30 DAYS AFTER COMPLETION OF WORK, A WELL COMPLETION REPORT. (DWR FORM 188)

C. [ ] SECURE ALL MONITORING WELLS TO PREVENT TAMPERING

D. [ ] OTHER ____

[ ] DENIED ____

PERMIT ISSUED BY DAN MATSUI DATE 1-12-92

WHEN SIGNED BY ORANGE COUNTY HEALTH CARE AGENCY REPRESENTATIVE, THIS APPPLICATION IS A PERMIT.

DUPLICATE
RETAIN THIS COPY

№ 226029

NOTICE OF INTENT

DEPARTMENT OF WATER RESOURCES: 4 January 19 93

On or about 20 January 19 93, I plan to commence drilling ☒, deepening ☐, reconditioning ☐, or destruction of ☐ a cable ☐, rotary ☐, or other dual wall type well, for environmental monitoring purposes. The work will be done for
(Proposed use of well)

U.S. Marine Corps Air Station El Toro
(Name of client and address)

Approximate location of well is south of building 372 (tower) in the northeastern corner of the runway
(Legal subdivision or by reference to some landmark)

, in Orange County.

IT Corporation Lic. No. 137422
(Well driller)

2355 Main St. Irvine, CA 92714
(Address)

Need log forms ☐ Need notice cards ☐

ORIGINAL
File with DWR

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet

Page 1 of (9 wells) MW398-19, 20, 21, 22,
Owner's Well No. 23, 24, 25, 26, 27
No. 392166
Date Work Began 1-21-93, Ended 2-12-93
Local Permit Agency Orange County Health Care Agency
Permit No. 93-01-06 Permit Date 12 Jan 93

DWR USE ONLY — DO NOT FILL IN
STATE WELL NO./STATION NO.
LATITUDE LONGITUDE
APN/TRS/OTHER

GEOLOGIC LOG

ORIENTATION (✓) X VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)
DEPTH TO FIRST WATER ___ (Ft.) BELOW SURFACE

DEPTH FROM SURFACE Ft. to Ft.	DESCRIPTION *Describe material, grain size, color, etc.*
	See attached logs

TOTAL DEPTH OF BORING ___ (Feet)
TOTAL DEPTH OF COMPLETED WELL ___ (Feet)

WELL OWNER
Name MCAS El Toro
Mailing Address
Santa Ana CA 92709-5001
CITY STATE ZIP

WELL LOCATION
Address
City Santa Ana
County Orange
APN Book ___ Page ___ Parcel ___
Township T6S Range R8W Section 154
Latitude ___ DEG. MIN. SEC. NORTH Longitude ___ DEG. MIN. SEC. WEST

LOCATION SKETCH
NORTH
WEST — See attached map — EAST
SOUTH
Illustrate or Describe Distance of Well from Landmarks such as Roads, Buildings, Fences, Rivers, etc. PLEASE BE ACCURATE & COMPLETE.

ACTIVITY (✓)
X NEW WELL
MODIFICATION/REPAIR
___ Deepen
___ Other (Specify)
___ DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

PLANNED USE(S) (✓)
X MONITORING
WATER SUPPLY
___ Domestic
___ Public
___ Irrigation
___ Industrial
___ "TEST WELL"
___ CATHODIC PROTECTION
___ OTHER (Specify)

DRILLING METHOD reverse air percussion FLUID air

WATER LEVEL & YIELD OF COMPLETED WELL
DEPTH OF STATIC WATER LEVEL ___ (Ft.) & DATE MEASURED ___
ESTIMATED YIELD* ___ (GPM) & TEST TYPE ___
TEST LENGTH ___ (Hrs.) TOTAL DRAWDOWN ___ (Ft.)
* *May not be representative of a well's long-term yield.*

CASING(S)

DEPTH FROM SURFACE Ft. to Ft.	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CON-DUCTOR	FILL PIPE	MATERIAL/GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
	9 7/8"	x				PVC	4	SCH40	
	9 7/8"		x			PVC	4	SCH40	0.01
See attached logs									

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft. to Ft.	TYPE: CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
0 10	x			
		x		
		x		
				#3 sand
See attached logs				

ATTACHMENTS (✓)
X Geologic Log
X Well Construction Diagram
___ Geophysical Log(s)
___ Soil/Water Chemical Analyses
X Other location map
ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT
I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.
NAME I.T. Corporation
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)
2355 Main Street Irvine CA 92714
ADDRESS CITY STATE ZIP
Signed Maria P. Shayegan 4-19-93 137422
WELL DRILLER/AUTHORIZED REPRESENTATIVE DATE SIGNED C-57 LICENSE NUMBER

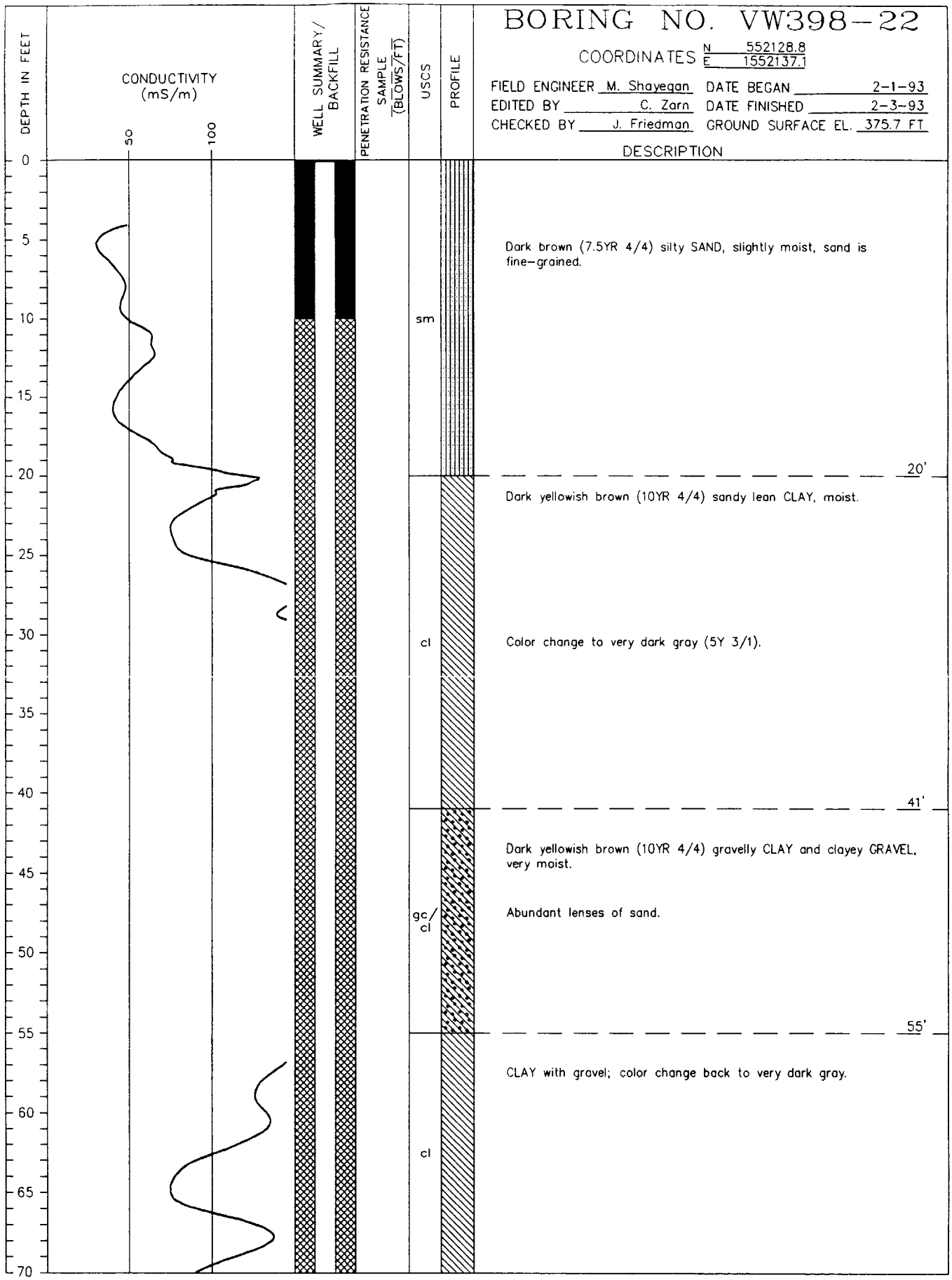
DWR 188 REV. 7-90 IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

APPENDIX B
BORING LOGS

BORING NO. VW398-22

COORDINATES N 552128.8 E 1552137.1

FIELD ENGINEER M. Shayegan DATE BEGAN 2-1-93
EDITED BY C. Zarn DATE FINISHED 2-3-93
CHECKED BY J. Friedman GROUND SURFACE EL. 375.7 FT



DESCRIPTION

Dark brown (7.5YR 4/4) silty SAND, slightly moist, sand is fine-grained.

Dark yellowish brown (10YR 4/4) sandy lean CLAY, moist.

Color change to very dark gray (5Y 3/1).

Dark yellowish brown (10YR 4/4) gravelly CLAY and clayey GRAVEL, very moist.

Abundant lenses of sand.

CLAY with gravel; color change back to very dark gray.

PROJECT NO. 243150
CLIENT: MCAS EL TORO

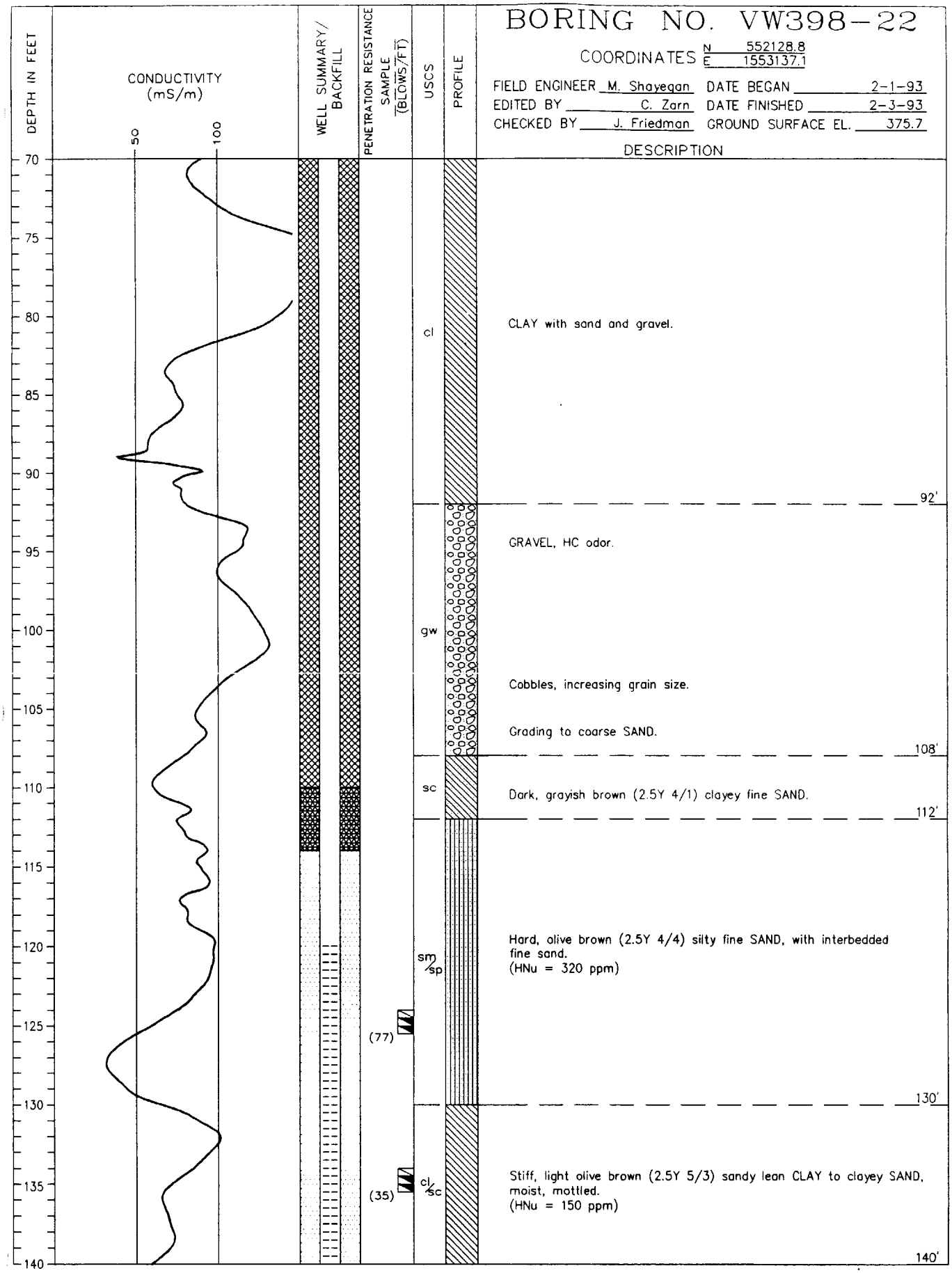
SEE LEGEND FOR LOGS AND TEST PITS FOR EXPLANATION OF SYMBOLS AND TERMS

IT ...Creating a Safer Tomorrow

BORING NO. VW398-22

COORDINATES N 552128.8 E 1553137.1

FIELD ENGINEER M. Shayegan DATE BEGAN 2-1-93
EDITED BY C. Zarn DATE FINISHED 2-3-93
CHECKED BY J. Friedman GROUND SURFACE EL. 375.7



PROJECT NO. 243150
CLIENT: MCAS EL TORO

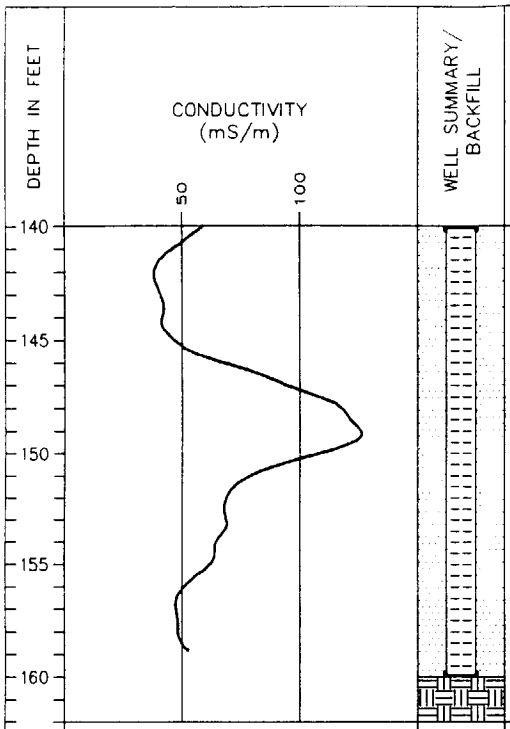
SEE LEGEND FOR LOGS AND TEST PITS FOR EXPLANATION OF SYMBOLS AND TERMS

IT ...Creating a Safer Tomorrow

BORING NO. VW398-22

COORDINATES N 552128.8 E 1552137.1

FIELD ENGINEER M. Shayegan DATE BEGAN 2-1-93
EDITED BY C. Zarn DATE FINISHED 2-3-93
CHECKED BY J. Friedman GROUND SURFACE EL. 375.5 FT



DESCRIPTION

sm	Silty SAND. 143'
cl	Hard, dark gray lean CLAY with trace gravel, very moist, HC odor. (HNu = 85 ppm) 153'
cl/ml	Hard, olive gray (5Y 4/2) lean CLAY and SILT, very moist, mottled with sand, gravel and weathered gravel grains. 157'
sw	Olive gray (5Y 5/2) SAND, with trace gravel and fines, very moist, fine grained, HC odor. 162'

TOTAL DEPTH = 162.0 FEET

WELL CONSTRUCTION DETAILS:

4-inch diameter 0.01-inch slotted schedule 40 PVC screen from 160' to 120' below ground surface. #3 sand to 114'. Volclay grout from 114' to approximately 7'. Concrete from approximately 7' to surface.

NOTES:

1) Boring was drilled by Layne Environmental Services using a dual-tube, reverse air circulation percussion rig. Boring diameter was 9 7/8-inches.
2) Samples were collected using a 2.5-inch O.D. modified California split spoon sampler lined with three 2-inch diameter brass sample liners.
3) Soil descriptions are from air transported cuttings.
4) Water was introduced during drilling to help return of cuttings.
5) HC - hydrocarbon.

REGISTERED GEOLOGIST
JEFFREY A. FRIEDMAN
No. 5677
STATE OF CALIFORNIA

PROJECT NO. 243150
CLIENT: MCAS EL TORO

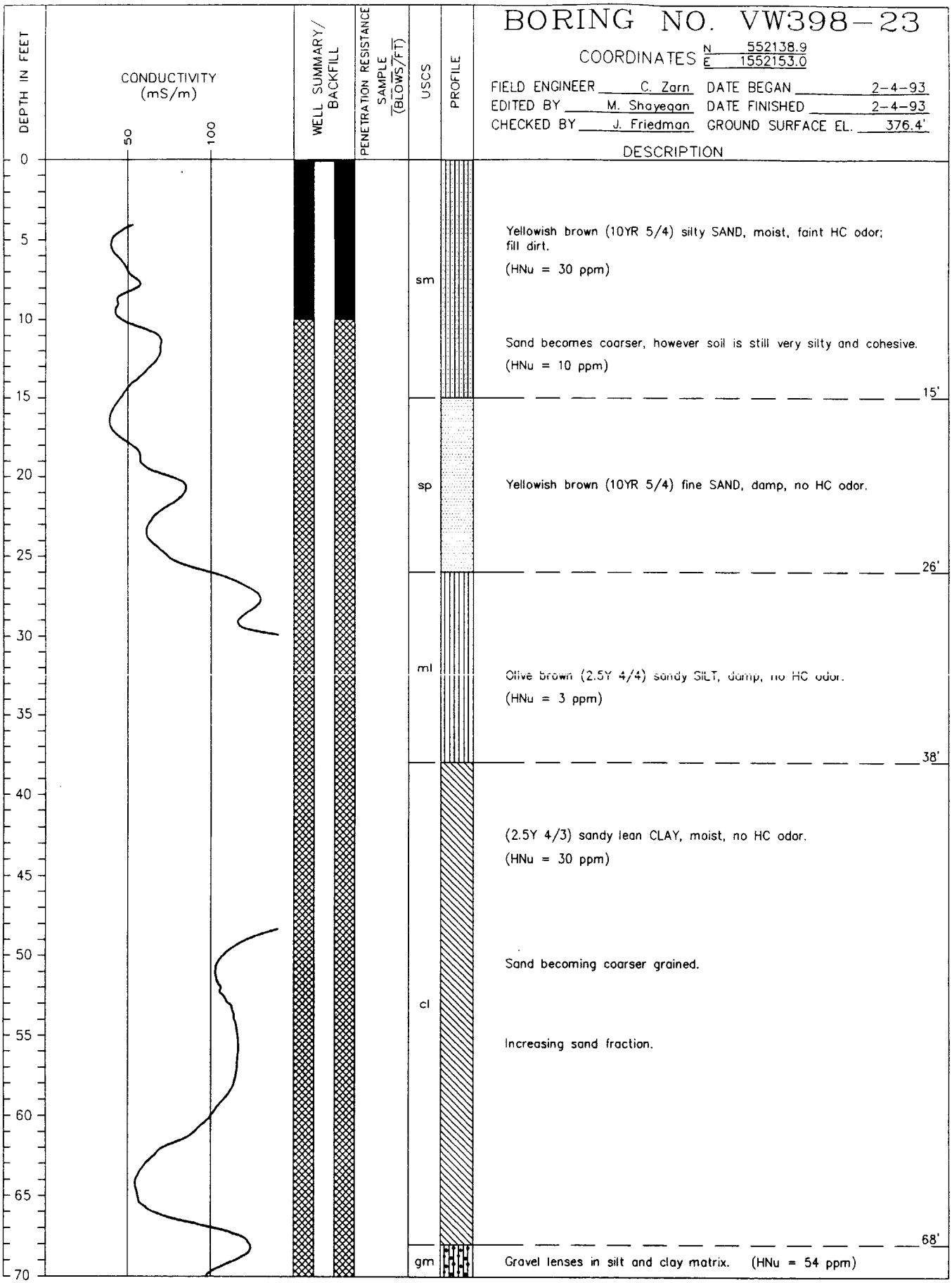
SEE LEGEND FOR LOGS AND TEST PITS FOR EXPLANATION OF SYMBOLS AND TERMS

IT ...Creating a Safer Tomorrow

BORING NO. VW398-23

COORDINATES N 552138.9 E 1552153.0

FIELD ENGINEER C. Zarn DATE BEGAN 2-4-93
EDITED BY M. Shayegan DATE FINISHED 2-4-93
CHECKED BY J. Friedman GROUND SURFACE EL. 376.4'



PROJECT NO. 243150
CLIENT: MCAS EL TORO

SEE LEGEND FOR LOGS AND TEST PITS
FOR EXPLANATION OF SYMBOLS AND TERMS

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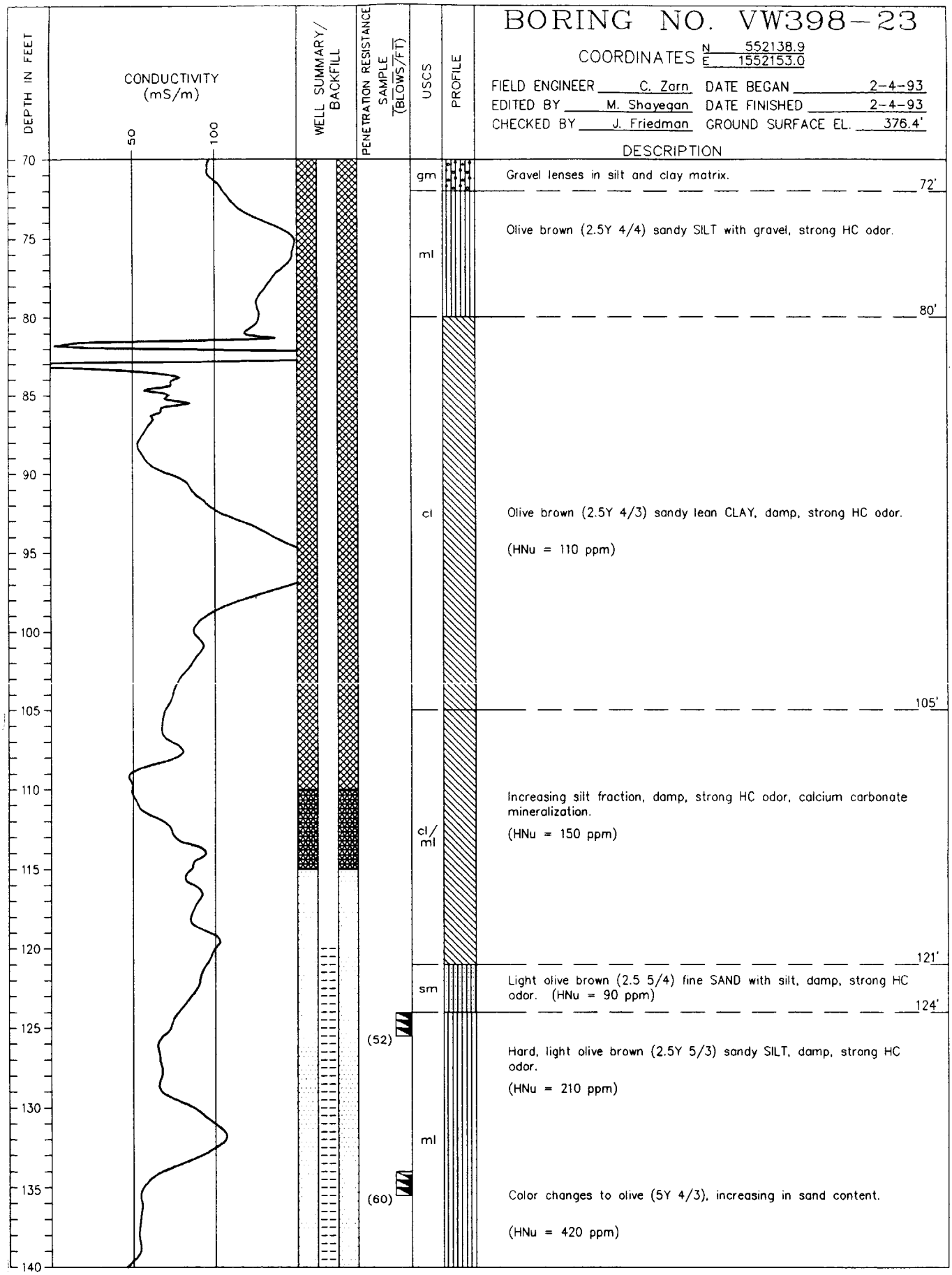

USCS	DESCRIPTION	
gm	Gravel lenses in silt and clay matrix.	72'
ml	Olive brown (2.5Y 4/4) sandy SILT with gravel, strong HC odor.	80'
cl	Olive brown (2.5Y 4/3) sandy lean CLAY, damp, strong HC odor. (HNu = 110 ppm)	105'
cl/ml	Increasing silt fraction, damp, strong HC odor, calcium carbonate mineralization. (HNu = 150 ppm)	121'
sm	Light olive brown (2.5 5/4) fine SAND with silt, damp, strong HC odor. (HNu = 90 ppm)	124'
ml	Hard, light olive brown (2.5Y 5/3) sandy SILT, damp, strong HC odor. (HNu = 210 ppm)	
	Color changes to olive (5Y 4/3), increasing in sand content. (HNu = 420 ppm)	

PROJECT NO. 243150
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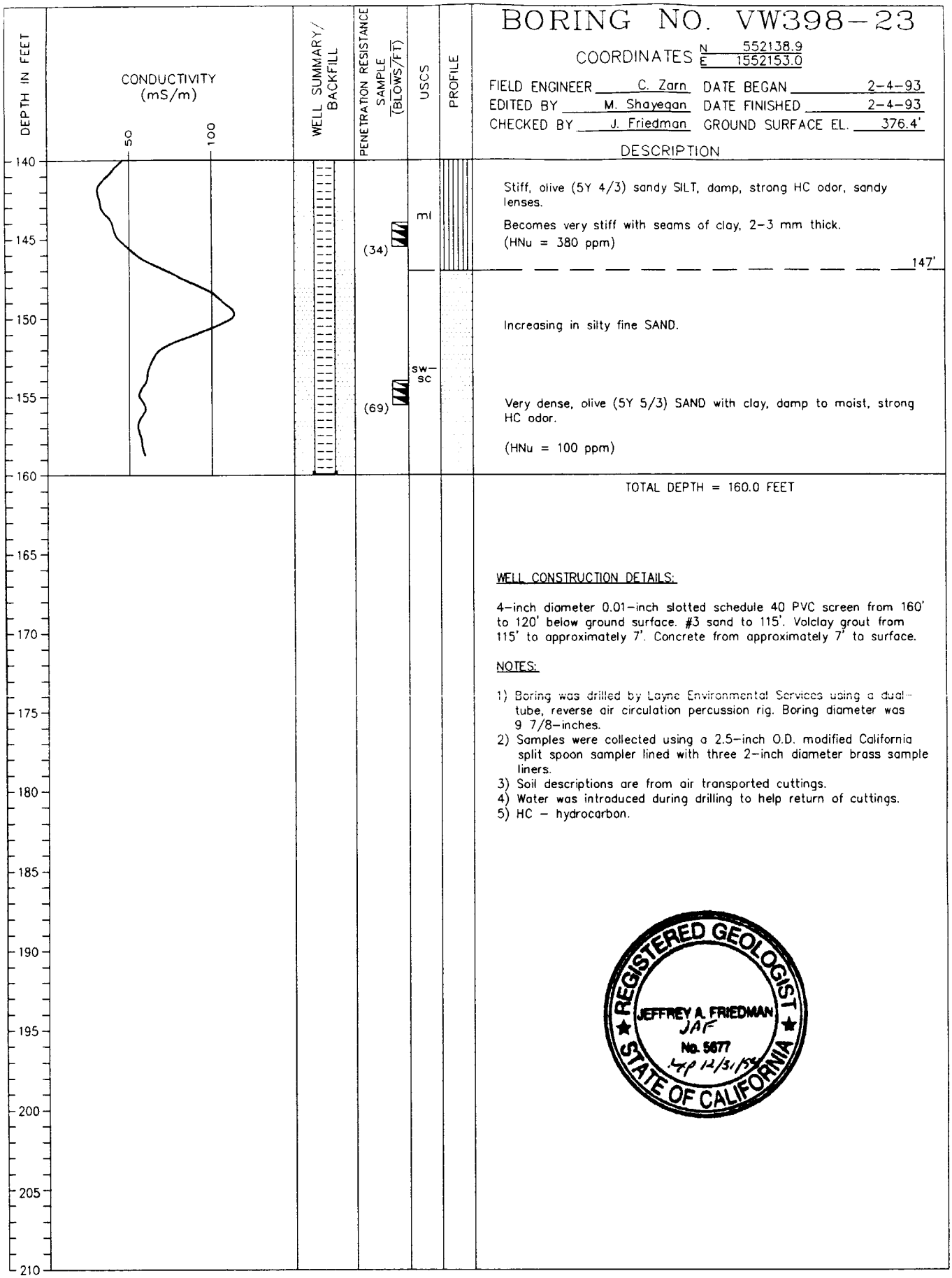
COORDINATES N 552138.9 E 1552153.0

FIELD ENGINEER C. Zarn DATE BEGAN 2-4-93
EDITED BY M. Shayegan DATE FINISHED 2-4-93
CHECKED BY J. Friedman GROUND SURFACE EL. 376.4'



DESCRIPTION

Stiff, olive (5Y 4/3) sandy SILT, damp, strong HC odor, sandy lenses.

Becomes very stiff with seams of clay, 2-3 mm thick.
(HNu = 380 ppm)

147'

Increasing in silty fine SAND.

Very dense, olive (5Y 5/3) SAND with clay, damp to moist, strong HC odor.

(HNu = 100 ppm)

TOTAL DEPTH = 160.0 FEET

WELL CONSTRUCTION DETAILS:

4-inch diameter 0.01-inch slotted schedule 40 PVC screen from 160' to 120' below ground surface. #3 sand to 115'. Volclay grout from 115' to approximately 7'. Concrete from approximately 7' to surface.

NOTES:

1) Boring was drilled by Layne Environmental Services using a dual-tube, reverse air circulation percussion rig. Boring diameter was 9 7/8-inches.
2) Samples were collected using a 2.5-inch O.D. modified California split spoon sampler lined with three 2-inch diameter brass sample liners.
3) Soil descriptions are from air transported cuttings.
4) Water was introduced during drilling to help return of cuttings.
5) HC - hydrocarbon.

REGISTERED GEOLOGIST
JEFFREY A. FRIEDMAN
JAF
No. 5677
Exp 12/31/94
STATE OF CALIFORNIA

PROJECT NO. 243150
CLIENT: MCAS EL TORO

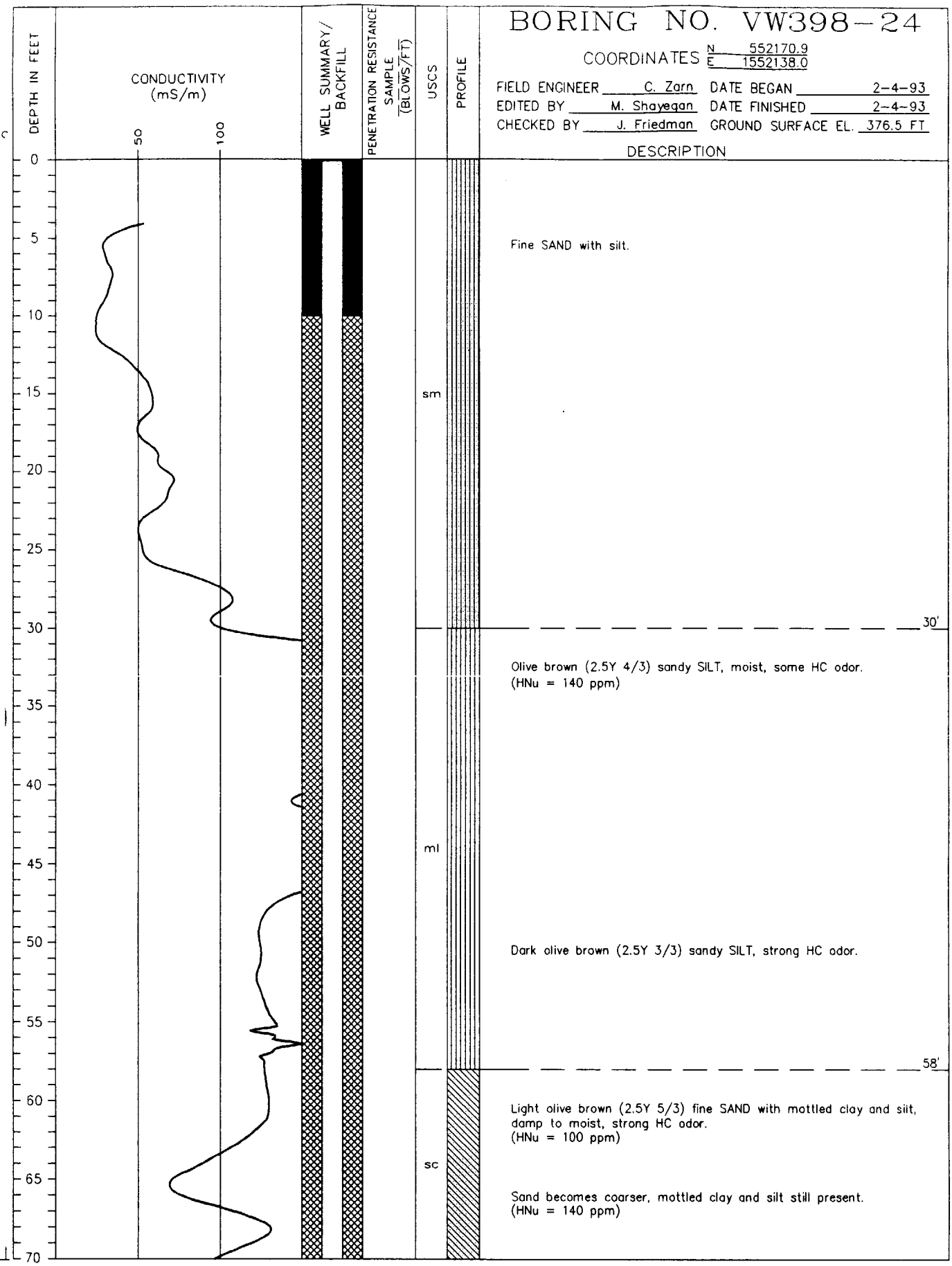
SEE LEGEND FOR LOGS AND TEST PITS
FOR EXPLANATION OF SYMBOLS AND TERMS

IT ...Creating a Safer Tomorrow

BORING NO. VW398-24

COORDINATES N 552170.9 E 1552138.0

FIELD ENGINEER C. Zarn DATE BEGAN 2-4-93
EDITED BY M. Shayegan DATE FINISHED 2-4-93
CHECKED BY J. Friedman GROUND SURFACE EL. 376.5 FT



DESCRIPTION

Fine SAND with silt.

Olive brown (2.5Y 4/3) sandy SILT, moist, some HC odor.
(HNu = 140 ppm)

Dark olive brown (2.5Y 3/3) sandy SILT, strong HC odor.

Light olive brown (2.5Y 5/3) fine SAND with mottled clay and silt, damp to moist, strong HC odor.
(HNu = 100 ppm)

Sand becomes coarser, mottled clay and silt still present.
(HNu = 140 ppm)

PROJECT NO. 243150
CLIENT: MCAS EL TORO

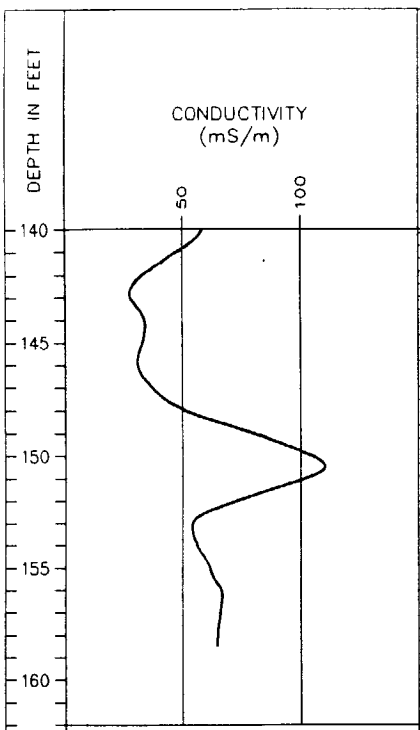
SEE LEGEND FOR LOGS AND TEST PITS
FOR EXPLANATION OF SYMBOLS AND TERMS

...Creating a Safer Tomorrow

BORING NO. VW398-24

COORDINATES N 552170.9 E 1552138.0

FIELD ENGINEER C. Zarn DATE BEGAN 2-4-93
EDITED BY M. Shayegan DATE FINISHED 2-4-93
CHECKED BY J. Friedman GROUND SURFACE EL. 376.5 FT



DESCRIPTION	USCS
	ml
142'	
Dense, light olive brown (2.5Y 5/4) fine SAND with silt and gravel, dry to damp, faint HC odor. (HNU = 20 ppm)	sw-sm
152'	
Hard, olive gray (5Y 5/2) sandy lean CLAY, dry, faint HC odor. (HNu = 40 ppm)	cl
155'	
Light olive brown to olive gray (5Y 5/2) fine SAND, dry.	sp

TOTAL DEPTH = 162.0 FEET

WELL CONSTRUCTION DETAILS:

4-inch diameter 0.01-inch slotted schedule 40 PVC screen from 160' to 120' below ground surface. #3 sand to 45'. Volclay grout from 45' to approximately 7'. Concrete from approximately 7' to surface.

NOTES:

1) Boring was drilled by Layne Environmental Services using a dual-tube, reverse air circulation percussion rig. Boring diameter was 9 7/8-inches.
2) Samples were collected using a 2.5-inch O.D. modified California split spoon sampler lined with three 2-inch diameter brass sample liners.
3) Soil descriptions are from air transported cuttings.
4) Water was introduced during drilling to help return of cuttings.
5) HC - hydrocarbon.

REGISTERED GEOLOGIST
JEFFREY A. FRIEDMAN
JAF
No. 5677
12/21/94
STATE OF CALIFORNIA

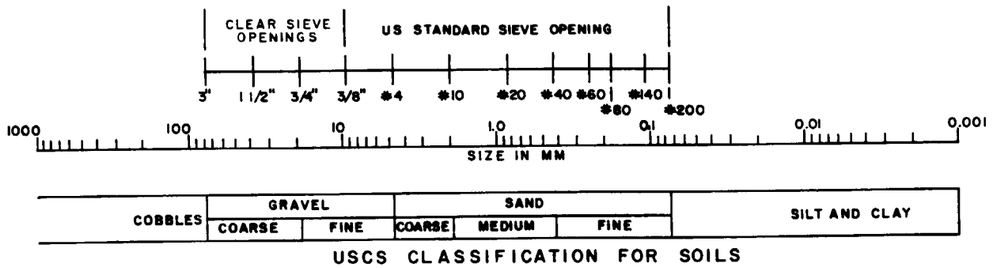
PROJECT NO. 243150
CLIENT: MCAS EL TORO

SEE LEGEND FOR LOGS AND TEST PITS FOR EXPLANATION OF SYMBOLS AND TERMS

IT ...Creating a Safer Tomorrow

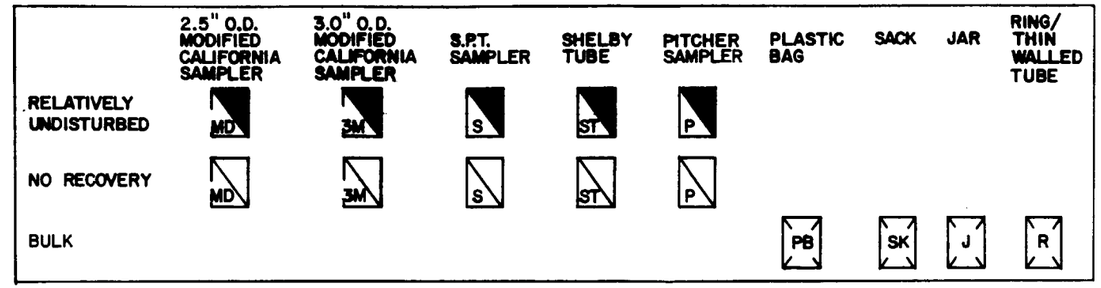
DRAWN BY	A.R.A. 9/30/87	CHECKED BY RSL	9-3-92	DRAWING NUMBER B3551A-B2
		APPROVED BY RSL	9-3-92	

USCS CLASSIFICATION OF COARSE GRAINED MATERIALS

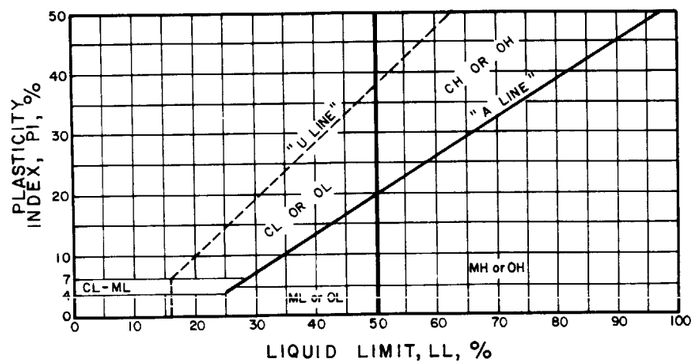


USCS CLASSIFICATION FOR SOILS

SAMPLE TYPES



USCS CLASSIFICATION OF FINE GRAINED MATERIALS



ABBREVIATIONS FOR LABORATORY TESTS

COMP— COMPACTION TEST
PI — ATTERBERG LIMITS
SA — SIEVE ANALYSIS
MA — MECHANICAL ANALYSIS
HYD — HYDROMETER ANALYSIS
CONS— CONSOLIDATION TEST

UNIFIED SOIL CLASSIFICATION SYSTEM (USCS)(ASTM D2487-85)

MAJOR DIVISIONS			GROUP SYMBOL	GRAPHIC SYMBOL	GROUP NAME
COARSE-GRAINED SOILS MORE THAN 50% RETAINED ON NO. 200 SIEVE*	GRAVELS 50% Or More of Coarse Fraction Retained on No. 4 Sieve	CLEAN GRAVELS	GW		Well-graded gravel Well-graded gravel with sand
			GP		Poorly graded gravel Poorly graded gravel with sand
		GRAVELS WITH FINES	GM		Silty gravel Silty gravel with sand
			GC		Clayey gravel Clayey gravel with sand
	SANDS More than 50% of Coarse Fraction Passes No. 4 Sieve	CLEAN SANDS	SW		Well-graded sand Well-graded sand with gravel
			SP		Poorly graded sand Poorly graded sand with gravel
		SANDS WITH FINES	SM		Silty sand Silty sand with gravel
			SC		Clayey sand Clayey sand with gravel
FINE-GRAINED SOILS 50% OR MORE PASSES NO. 200 SIEVE*	SILTS AND CLAYS Liquid Limit 50% or Less		ML		Inorganic silt · Silt with sand or gravel Sandy silt • Sandy silt with gravel Gravelly silt • Gravelly silt with sand
			CL		Lean clay • Lean clay with sand or gravel Sandy lean clay • Sandy lean clay with gravel Gravelly lean clay • Gravelly lean clay with sand
			OL		Organic silts or organic clays of low plasticity
	SILTS AND CLAYS Liquid Limit Greater Than 50%		MH		Inorganic silt · Inorganic silt with sand or gravel Sandy inorganic silt · Sandy inorganic silt with gravel Gravelly inorganic silt · Gravelly inorganic silt with sand
			CH		Fat clay • Fat clay with sand or gravel Sandy fat clay • Sandy fat clay with gravel Gravelly fat clay • Gravelly fat clay with sand
			OH		Organic clays or organic silts of medium to high plasticity
HIGHLY ORGANIC SOILS			PT		Peat, muck and other highly organic soils

*BASED ON THE MATERIAL PASSING THE 3-INCH (75-mm) SIEVE
REFERENCE: ASTM STANDARD D2487-85

CONSISTENCY OF COHESIVE SOIL

CONSISTENCY	FIELD IDENTIFICATION	UNCONFINED COMPRESSIVE STRENGTH qu (TONS/SQ.FT.)
VERY SOFT	EASILY PENETRATED SEVERAL INCHES BY FIST	LESS THAN 0.25
SOFT	EASILY PENETRATED SEVERAL INCHES BY THUMB	0.25— 0.5
MEDIUM STIFF	PENETRATED SEVERAL INCHES BY THUMB WITH MODERATE PRESSURE	0.5 — 1.0
STIFF	READILY INDENTED BY THUMB BUT PENETRATED WITH GREAT EFFORT	1.0 — 2.0
VERY STIFF	READILY INDENTED BY THUMBNAIL	2.0 — 4.0
HARD	INDENTED WITH DIFFICULTY BY THUMBNAIL	OVER 4.0

DENSITY OF GRANULAR SOILS

DENSITY	SPT BLOWS PER FOOT
VERY LOOSE	0 - 4
LOOSE	5 - 10
MEDIUM DENSE	11 - 30
DENSE	31 - 50
VERY DENSE	OVER 50

NOTES:

(1) UPPER CASE USED FOR LABORATORY VERIFIED USCS CLASSIFICATIONS.

(2) LOWER CASE USED FOR FIELD USCS CLASSIFICATIONS.

(3) DUAL USCS SYMBOL, SUCH AS (SP-SM) DENOTES 5 TO 12% OF MINOR CONSTITUENT.

(4) BORDER LINE SYMBOL, SUCH AS (CL/CH) DENOTES SOIL HAVING PROPERTIES THAT DO NOT DISTINCTLY PLACE THE SOIL IN A SPECIFIC GROUP.

(5) SUBSURFACE INFORMATION FROM BORING AND TEST PIT LOGS DEPICT CONDITIONS ONLY AT THE SPECIFIC LOCATIONS AND DATES INDICATED. SOIL CONDITIONS AND WATER LEVELS AT OTHER LOCATIONS MAY DIFFER FROM CONDITIONS AT THESE LOCATIONS. ALSO THE CONDITIONS AT THESE LOCATIONS MAY CHANGE WITH TIME.

(6) BLOW COUNTS ON LOGS ARE THE NUMBER OF BLOWS TO DRIVE THE SAMPLER 12 INCHES WITH A 140 POUND HAMMER FALLING 30 INCHES.

▽ GROUND WATER FIRST ENCOUNTERED

▼ 1-1-84 WATER LEVEL AND DATE MEASURED

LEGEND FOR LOG OF BORINGS AND TEST PITS

IT ... Creating a Safer Tomorrow

132297

"Do Not Scale This Drawing"

APPENDIX C
CERTIFICATES OF ANALYSIS

Calscience Environmental Laboratories, Inc.

ANALYTICAL REPORT

International Technology Corporation	Date Sampled: 02/16-17/93
1425 South Victoria Court, Suite A	Date Received: 02/18/93
San Bernardino, CA 92408	Date Analyzed: 02/19/93
	Work Order No.: 93-02-225
Attn: Mark Thomas	
RE: Navy Clean/243150-18/PO #151749	Method: ASTM 3416M

Methane and total non-methane hydrocarbon concentration values contained herein are reported "as methane" and "as JP-5", respectively, in ppm (v/v).

Sample Number	CH_4 Concentration	Non-CH_4 HC Concentration	Det'n Limit
CEL-D026	24600	3780	1.0
CEL-D023	25800	3980	1.0
VW-24-1	27900	311	0.5
CEL-D027	28600	429	1.0

Reviewed and Approved William H. Christensen on 2/25/1993.
William H. Christensen
Laboratory Operations
Manager

ND denotes not detected at indicated detection limit.

Each sample was received by CEL intact and with chain-of-custody attached.

11631 Seaboard Circle, Stanton, CA 90680 • TEL: (714) 895-5494 • FAX: (714) 894-7501

Calscience Environmental Laboratories, Inc.

ANALYTICAL REPORT

International Technology Corporation	Date Sampled: 02/16-17/93
1425 South Victoria Court, Suite A	Date Received: 02/18/93
San Bernardino, CA 92408	Date Analyzed: 02/22/93
	Work Order No.: 93-02-225
Attn: Mark Thomas	
RE: Navy Clean/243150-18/PO #151749	Method: EPA TO-14 (BTEX)

All concentrations are reported in ppb (v/v).

Sample Number: CEL-D026

	Concentration	Det'n Limit
Benzene	33200	2000
Toluene	24000	2000
Ethylbenzene	188000	2000
Total Xylenes	244000	4000

Sample Number: CEL-D023

Benzene	34800	2000
Toluene	19900	2000
Ethylbenzene	36400	2000
Total Xylenes	208000	4000

Sample Number: VW-24-1

Benzene	1270	200
Toluene	1820	200
Ethylbenzene	3820	200
Total Xylenes	22600	400

Sample Number: CEL-D027

Benzene	1720	200
Toluene	2000	200
Ethylbenzene	4220	200
Total Xylenes	26200	400

Reviewed and Approved William H. Christensen on 02/25/1993.
William H. Christensen
Laboratory Operations
Manager

ND denotes not detected at indicated detection limit.

Each sample was received by CEL intact and with chain-of-custody attached.

Calscience Environmental Laboratories, Inc.

ANALYTICAL REPORT

International Technology Corporation	Date Sampled: 02/16-17/93
1425 South Victoria Court, Suite A	Date Received: 02/18/93
San Bernardino, CA 92408	Date Analyzed: 02/19/93
	Work Order No.: 93-02-225
	Page 1 of 2
Attn: Mark Thomas	
RE: Navy Clean/243150-18/PO #151749	Method: MASA 133

All concentration values are reported in volume %. Unless noted otherwise below, the detection limits are as follows: H_2 = 0.5%, O_2 = 0.2%, and the remaining analytes = 0.1%.

Sample Number: CEL-D026

Analyte	Concentration
Hydrogen (H_2)	ND
Oxygen (O_2)	4.0
Nitrogen (N_2)	78.0
Methane (CH_4)	2.5
Carbon Monoxide (CO)	ND
Carbon Dioxide (CO_2)	11.0

Sample Number: CEL-D023

Hydrogen (H_2)	ND
Oxygen (O_2)	4.6
Nitrogen (N_2)	78.0
Methane (CH_4)	2.6
Carbon Monoxide (CO)	ND
Carbon Dioxide (CO_2)	12.6

Sample Number: VW-24-1

Hydrogen (H_2)	ND
Oxygen (O_2)	2.7
Nitrogen (N_2)	78.0
Methane (CH_4)	2.8
Carbon Monoxide (CO)	ND
Carbon Dioxide (CO_2)	8.2

Cuiscience
Environmental
Laboratories, Inc.

ANALYTICAL REPORT

International Technology Corporation	Date Sampled: 02/16-17/93
1425 South Victoria Court, Suite A	Date Received: 02/18/93
San Bernardino, CA 92408	Date Analyzed: 02/19/93
	Work Order No.: 93-02-225
	Page 2 of 2
Attn: Mark Thomas	
RE: Navy Clean/243150-18/PO #151749	Method: MASA 133

All concentration values are reported in volume %. Unless noted otherwise below, the detection limits are as follows: H_2 = 0.5%, O_2 = 0.2%, and the remaining analytes = 0.1%.

Sample Number: CEL-D027

Analyte	Concentration
Hydrogen (H_2)	ND
Oxygen (O_2)	6.4
Nitrogen (N_2)	78.0
Methane (CH_4)	2.9
Carbon Monoxide (CO)	ND
Carbon Dioxide (CO_2)	11.8

Reviewed and Approved William H. Christensen on 02/25/1993.
William H. Christensen
Laboratory Operations
Manager

ND denotes not detected at indicated detection limit.

Each sample was received by CEL intact and with chain-of-custody attached.

11631 Seaboard Circle, Stanton, CA 90680 • TEL: (714) 895-5494 • FAX: (714) 894-7501

Western Atlas International

CORE LABORATORIES

LABORATORY TESTS RESULTS
02/24/93

JOB NUMBER: 930339 CUSTOMER: Calscience Environmental Labs, Inc ATTN: Robert Stearns

CLIENT I.D.....: IT Cord-Navy Clean #243150
DATE SAMPLED.....: 02/16/93
TIME SAMPLED.....: 11:07
WORK DESCRIPTION...: D026

LABORATORY I.D...: 930339-0003
DATE RECEIVED....: 02/19/93
TIME RECEIVED....: 12:00
REMARKS.....: steel sphere

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Refinery Gas Analysis (Mole %)		*1		Hach Carle AGC 400	02/23/93	CSS
Hydrogen	<0.1	0.1	Mole %	Hach Carle AGC 400		
Carbon Dioxide	24.3	0.1	Mole %	Hach Carle AGC 400		
Carbon Monoxide	<0.1	0.1	Mole %	Hach Carle AGC 400		
Nitrogen	66.8	0.1	Mole %	Hach Carle AGC 400		
Oxygen	0.9	0.1	Mole %	Hach Carle AGC 400		
Hydrogen Sulfide	<0.1	0.1	Mole %	Hach Carle AGC 400		
Methane	6.5	0.1	Mole %	Hach Carle AGC 400		
Ethylene	<0.1	0.1	Mole %	Hach Carle AGC 400		
Ethane	<0.1	0.1	Mole %	Hach Carle AGC 400		
Propane	<0.1	0.1	Mole %	Hach Carle AGC 400		
Propylene	<0.1	0.1	Mole %	Hach Carle AGC 400		
Isobutane	<0.1	0.1	Mole %	Hach Carle AGC 400		
Butane	<0.1	0.1	Mole %	Hach Carle AGC 400		
Butene	<0.1	0.1	Mole %	Hach Carle AGC 400		
Isobutylene	<0.1	0.1	Mole %	Hach Carle AGC 400		
t-2-Butene	<0.1	0.1	Mole %	Hach Carle AGC 400		
c-2-Butene	<0.1	0.1	Mole %	Hach Carle AGC 400		
1,3-Butadiene	<0.1	0.1	Mole %	Hach Carle AGC 400		
Isopentane	<0.1	0.1	Mole %	Hach Carle AGC 400		
n-Pentane	<0.1	0.1	Mole %	Hach Carle AGC 400		
C5+	1.5	0.1	Mole %	Hach Carle AGC 400		
Specific Gravity (Air=1.0000)	1.1080	0		Hach Carle AGC 400		
Gross Heat of Combustion	143	0	BTU/Cubic Ft	Hach Carle AGC 400		

	Boiling Point Deg F @14.696 psi
Carbon Dioxide	-109.257
Nitrogen	-320.451
Oxygen	-297.332
Methane	-258.720
C5+	-139.580

3700 Cherry Avenue
Long Beach, CA 90807
(310) 595-8401

analyses, opinions or interpretations contained in this report are based upon observations and material supplied by the client for whose exclusive and confidential use this report has been made. The interpretations or opinions expressed
Core Laboratories

Western Atlas International

CORE LABORATORIES

LABORATORY TESTS RESULTS
02/24/93

JOB NUMBER: 930339 CUSTOMER: Calscience Environmental Labs, Inc ATTN: Robert Stearns

LIENT I.D.....: IT Cord-Navy Clean #243150
DATE SAMPLED.....: 02/16/93
TIME SAMPLED.....: 17:30
ORK DESCRIPTION...: D023

LABORATORY I.D...: 930339-0002
DATE RECEIVED....: 02/19/93
TIME RECEIVED....: 12:00
REMARKS.....: steel sphere

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
efinery Gas Analysis (Mole %)		*1		Hach Carle AGC 400	02/23/93	CSS
Hydrogen	<0.1	0.1	Mole %	Hach Carle AGC 400		
Carbon Dioxide	25.4	0.1	Mole %	Hach Carle AGC 400		
Carbon Monoxide	<0.1	0.1	Mole %	Hach Carle AGC 400		
Nitrogen	65.5	0.1	Mole %	Hach Carle AGC 400		
Oxygen	1.4	0.1	Mole %	Hach Carle AGC 400		
Hydrogen Sulfide	<0.1	0.1	Mole %	Hach Carle AGC 400		
Methane	6.2	0.1	Mole %	Hach Carle AGC 400		
Ethylene	<0.1	0.1	Mole %	Hach Carle AGC 400		
Ethane	<0.1	0.1	Mole %	1ach Carle AGC 400		
Propane	<0.1	0.1	Mole %	Hach Carle AGC 400		
Propylene	<0.1	0.1	Mole %	Hach Carle AGC 400		
Isobutane	<0.1	0.1	Mole %	Hach Carle AGC 400		
utane	<0.1	0.1	Mole %	Hach Carle AGC 400		
utene	<0.1	0.1	Mole %	Hach Carle AGC 400		
obutylene	<0.1	0.1	Mole %	Hach Carle AGC 400		
t-2-Butene	<0.1	0.1	Mole %	Hach Carle AGC 400		
c-2-Butene	<0.1	0.1	Mole %	Hach Carle AGC 400		
1,3-Butadiene	<0.1	0.1	Mole %	Hach Carle AGC 400		
Isopentane	<0.1	0.1	Mole %	Hach Carle AGC 400		
n-Pentane	<0.1	0.1	Mole %	Hach Carle AGC 400		
C5+	1.5	0.1	Mole %	Hach Carle AGC 400		
Specific Gravity (Air=1.0000)	1.1155	0		Hach Carle AGC 400		
Gross Heat of Combustion	138	0	BTU/Cubic Ft	Hach Carle AGC 400		

	Boiling Point Deg F. @14.696 psi
Carbon Dioxide	-109.257
Nitrogen	-320.451
Oxygen	-297.332
Methane	-258.720
C5+	-139.580

3700 Cherry Avenue
Long Beach, CA 90807
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Western Atlas International
A Litton/Dresser Company

CORE LABORATORIES

LABORATORY TESTS RESULTS
02/22/93

JOB NUMBER: 930339 CUSTOMER: Calscience Environmental Labs, Inc ATTN: Robert Stearns

CLIENT I.D.....: IT Cord-Navy Clean #243150
DATE SAMPLED.....: 02/17/93
TIME SAMPLED.....: 08:30
WORK DESCRIPTION...: VW-24-1

LABORATORY I.D...: 930339-0001
DATE RECEIVED....: 02/19/93
TIME RECEIVED....: 12:00
REMARKS.....: tedlar bag

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Refinery Gas Analysis (Mole %)		*1		Hach Carle AGC 400	02/19/93	CSS
Hydrogen	<0.1	0.1	Mole %	Hach Carle AGC 400		
Carbon Dioxide	14.7	0.1	Mole %	Hach Carle AGC 400		
Carbon Monoxide	<0.1	0.1	Mole %	Hach Carle AGC 400		
Nitrogen	78.0	0.1	Mole %	Hach Carle AGC 400		
Oxygen	1.6	0.1	Mole %	Hach Carle AGC 400		
Hydrogen Sulfide	<0.1	0.1	Mole %	Hach Carle AGC 400		
Methane	5.6	0.1	Mole %	Hach Carle AGC 400		
Ethylene	<0.1	0.1	Mole %	Hach Carle AGC 400		
Ethane	<0.1	0.1	Mole %	Hach Carle AGC 400		
Propane	<0.1	0.1	Mole %	Hach Carle AGC 400		
Propylene	<0.1	0.1	Mole %	Hach Carle AGC 400		
Isobutane	<0.1	0.1	Mole %	Hach Carle AGC 400		
Butane	<0.1	0.1	Mole %	Hach Carle AGC 400		
Butene	<0.1	0.1	Mole %	Hach Carle AGC 400		
Isobutylene	<0.1	0.1	Mole %	Hach Carle AGC 400		
t-2-Butene	<0.1	0.1	Mole %	Hach Carle AGC 400		
c-2-Butene	<0.1	0.1	Mole %	Hach Carle AGC 400		
1,3-Butadiene	<0.1	0.1	Mole %	Hach Carle AGC 400		
Isopentane	<0.1	0.1	Mole %	Hach Carle AGC 400		
n-Pentane	<0.1	0.1	Mole %	Hach Carle AGC 400		
C5+	<0.1	0.1	Mole %	Hach Carle AGC 400		
Specific Gravity (Air=1.0000)	1.0294	0		Hach Carle AGC 400		
Gross Heat of Combustion	59	0	BTU/Cubic Ft	Hach Carle AGC 400		

	Boiling Point Deg. F @14.696 psi
Carbon Dioxide	-109.257
Nitrogen	-320.451
Oxygen	-297.332
Methane	-258.720

3700 Cherry Avenue
Long Beach, CA 90807
(310) 595-8401

All opinions or interpretations contained in this report are based upon observations and material supplied by the client for whose exclusive and confidential use this report has been made. The interpretations or opinions expressed represent the best judgement of Core Laboratories (all errors and omissions excepted); but Core Laboratories makes no warranty or representations, express or implied, as to the productivity, proper operation, or profitableness of any oil, gas, or other mineral well or sand in connection with which such report is used or relied upon.

Western Atlas International

CORE LABORATORIES

LABORATORY TESTS RESULTS
03/04/93

JOB NUMBER: 930339 CUSTOMER: Calscience Environmental Labs, Inc ATTN: Robert Stearns

CLIENT I.D.....: IT Cord-Navy Clean #243150
DATE SAMPLED.....: 02/17/93
TIME SAMPLED.....: 14:35
WORK DESCRIPTION...: D027

LABORATORY I.D...: 930339-0004
DATE RECEIVED....: 02/19/93
TIME RECEIVED....: 12:00
REMARKS.....: steel sphere

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Refinery Gas Analysis (Mole %)		*1		Hach Carle AGC 400	02/23/93	CSS
Hydrogen	<0.1	0.1	Mole %	Hach Carle AGC 400		
Carbon Dioxide	26.7	0.1	Mole %	Hach Carle AGC 400		
Carbon Monoxide	<0.1	0.1	Mole %	Hach Carle AGC 400		
Nitrogen	64.6	0.1	Mole %	Hach Carle AGC 400		
Oxygen	1.1	0.1	Mole %	Hach Carle AGC 400		
Hydrogen Sulfide	<0.1	0.1	Mole %	Hach Carle AGC 400		
Methane	7.5	0.1	Mole %	Hach Carle AGC 400		
Ethylene	<0.1	0.1	Mole %	Hach Carle AGC 400		
Ethane	<0.1	0.1	Mole %	Hach Carle AGC 400		
Propane	<0.1	0.1	Mole %	Hach Carle AGC 400		
Propylene	<0.1	0.1	Mole %	Hach Carle AGC 400		
Isobutane	<0.1	0.1	Mole %	Hach Carle AGC 400		
n-Butane	<0.1	0.1	Mole %	Hach Carle AGC 400		
Butene	<0.1	0.1	Mole %	Hach Carle AGC 400		
Isobutylene	<0.1	0.1	Mole %	Hach Carle AGC 400		
t-2-Butene	<0.1	0.1	Mole %	Hach Carle AGC 400		
c-2-Butene	<0.1	0.1	Mole %	Hach Carle AGC 400		
1,3-Butadiene	<0.1	0.1	Mole %	Hach Carle AGC 400		
Isopentane	<0.1	0.1	Mole %	Hach Carle AGC 400		
n-Pentane	<0.1	0.1	Mole %	Hach Carle AGC 400		
C5+	0.1	0.1	Mole %	Hach Carle AGC 400		
Specific Gravity (Air=1.0000)	1.0892	0		Hach Carle AGC 400		
Gross Heat of Combustion	80	0	BTU/Cubic Ft	Hach Carle AGC 400		

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Western Atlas International

CORE LABORATORIES

QUALITY ASSURANCE REPORT
02/24/93

JOB NUMBER: 930339 CUSTOMER: Calscience Environmental Labs, Inc ATTN: Robert Stearns

REFG DATE ANALYZED: 02/23/93 TIME ANALYZED: 09:51 METHOD: Hach Carle AGC 400 QC NUMBER:937316

BLANKS

TEST DESCRIPTION	ANALY SUB-TYPE	ANALYSIS I.D.	DILUTION FACTOR	ANALYZED VALUE	DETECTION LIMIT	UNITS OF MEASURE
Refinery Gas Analysis - Total	Reagent	Helium	1	<0.1	0.1	mole %

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CORE LABORATORIES

QUALITY ASSURANCE REPORT
02/24/93

JOB NUMBER: 930339 CUSTOMER: Calscience Environmental Labs, Inc ATTN: Robert Stearns

REFG DATE ANALYZED: 02/23/93 TIME ANALYZED: 09:51 METHOD: Hach Carle AGC 400 QC NUMBER:937316

REFERENCE STANDARDS

TEST DESCRIPTION	ANALYSIS SUB-TYPE	ANALYSIS I. D.	DILUTION FACTOR	ANALYZED VALUE	TRUE VALUE	PERCENT RECOVERY	DETECTION LIMITS	UNITS OF MEASURE
Refinery Gas Analysis - Total	Reference	Butane	1	4.1	4.0	102	0.1	mole %

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A Dresser Company

CORE LABORATORIES

QUALITY ASSURANCE REPORT
02/24/93

JOB NUMBER: 930339 CUSTOMER: Calscience Environmental Labs, Inc ATTN: Robert Stearns

EFG DATE ANALYZED: 02/23/93 TIME ANALYZED: 09:51 METHOD: Hach Carle AGC 400 QC NUMBER:937316

DUPLICATES

TEST DESCRIPTION	ANALYSIS SUB-TYPE	ANALYSIS I. D.	DILUTION FACTOR	ANALYZED VALUE (A)	DUPLICATE VALUE (B)	RPD or (|A-B|)	DETECTION LIMITS	UNITS OF MEASURE
efinery Gas Analysis - Total	Analytical	930339-2	1	<0.1	<0.1	NC	0.1	mole %

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QUALITY ASSURANCE FOOTER
02/24/93

Analyses performed in accordance with ASTM Testing Procedures.

Samples retained for thirty days after report submission. After thirty days, samples are disposed in accordance with Core Laboratories' Disposal Policy. Samples will be retained longer with prior arrangement. Storage fees may apply.

The acceptance criteria for duplicate analyses are the applicable ASTM Repeatability Statements.

The "Time Analyzed" in the QA Report refers to the start time of the analytical batch. It may not reflect the actual analysis time. The "Date Analyzed" reflects the actual analysis date.

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The analyses, opinions or interpretations contained in this report are based upon observations and material supplied by the client for whose exclusive and confidential use this report has been made. The interpretations or opinions expressed [illegible] as to the accuracy, adequacy or completeness of any [illegible] without the written approval of Core Laboratories

(225)

I[illegible]NATIONAL TE[illegible]NOLOGY CORPORATION

ANALYSIS R[illegible]JEST AND CHAIN OF CUSTODY RECORD*

Reference Document N. 83714
Page 1 of 1

Project Name/No. [1] Navy Clean/243150-18
Sample Team Members [2] M. Thomas
Profit Center No. [3] 3552
Project Manager [4] M. Thomas
Purchase Order No. [6] 151749
Required Report Date [11]

Samples Shipment Date [7] 2/18/93
Lab Destination [8] Cal Science
Lab Contact [9] Bob Sterns
Project Contact/Phone [12] Mark Thomas/(909) 799-6869
Carrier/Waybill No. [13]

Bill to: [5] IT Corporation
2355 Main St. Ste 100
Irvine, CA 92714

Report to: [10] IT Corporation
Mark Thomas
1425 S Victoria Ct ~~#101~~ Ste A
San Bernardino, CA 92408

ONE CONTAINER PER LINE

Sample Number [14]	Sample Description/Type [15]	Date/Time Collected [16]	Container Type [17]	Sample Volume [18]	Pre-servative [19]	Requested Testing Program [20]	Condition on Receipt [21]	Disposal Record No. [22]
CEL-D026	Summa Can / Air	2/16/93/1107	Summa	—	—	- Permanent Gases - Boiling Point for BTEX-GC/FID - TPH as JP-5 - BTEX		
CEL-D023	Air	2/16/93/1730	Summa	—	—	- Permanent Gases - Boiling Point for BTEX-GC/FID - TPH as JP-5 - BTEX		
VW-24-1	Air	2/17/93/0835	Tedlar bag	—	—	- Permanent Gases - Boiling Point for BTEX-GC/FID - TPH as JP-5 - BTEX		
CEL-D027	Air	2/17/93/1435	Summa	—	—	- Permanent Gases - Boiling Point for BTEX-GC/FID - TPH as JP-5 - ~~Boiling Pt~~ BTEX		

Special Instructions: [23] none

Possible Hazard Identification: [24]
Non-hazard ☐ Flammable ☑ Skin Irritant ☐ Poison B ☐ Unknown ☐

Sample Disposal: [25]
Return to Client ☐ Disposal by Lab ☑ Archive (mos.)

Turnaround Time Required: [26]
Normal ☑ Rush ☐

QC Level: [27]
I. ☐ II. ☐ III. ☐ Project Specific (specify):

1. Relinquished by [28] (Signature/Affiliation) Mark Thomas	Date: 2/18/93 Time: 1510	1. Received by [28] (Signature/Affiliation) [illegible]	Date: 2/18/93 Time: 1515
2. Relinquished by (Signature/Affiliation) [illegible]	Date: 2/18/93 Time: [illegible]	2. Received by (Signature/Affiliation)	Date: Time:
3. Relinquished by (Signature/Affiliation)	Date: Time:	3. Received by (Signature/Affiliation) [illegible]	Date: 2/18/93 Time: 1720

Comments: [29]

White: To accompany samples
Yellow: Field copy
*See back of form for special instructions.

MCA 3/15/91

Calscience Environmental Laboratories, Inc.

ANALYTICAL REPORT

International Technology Corporation	Date Sampled:	02/03/93
2355 Main Street, Suite 100	Date Received:	02/03/93
Irvine, CA 92714	Date Extracted:	02/04/93
	Date Analyzed:	02/05/93
	Work Order No.:	93-02-033
Attn: Maria Shayegan		
RE: 243150/MCAS EL TORO	Method:	EPA 8015M

All total petroleum hydrocarbon concentrations are reported in mg/kg (ppm) using JP-5 as a standard.

Sample Number	Concentration	Det'n Limit
398-22-125	4810	100
398-22-135	8430	100
398-22-145	3300	100
398-22-155	5640	100
Method Blank	ND	100

Sample Number	Conc. Added	Conc. Rec.	%D
Control Standard	400	392	2

Reviewed and Approved William H. Christensen on 02/12/1993.
William H. Christensen
Laboratory Operations
Manager

EPA 8015M is conducted in accordance with the DHS Method for Total Petroleum Hydrocarbons.

ND denotes not detected at indicated detection limit.

Each sample was received by CEL in a chilled state, intact and with chain-of-custody attached.

11631 Seaboard Circle, Stanton, CA 90680 • TEL: (714) 895-5494 • FAX: (714) 894-7501

Calscience Environmental Laboratories, Inc.

ANALYTICAL REPORT

International Technology Corporation	Date Sampled: 02/03/93
2355 Main Street, Suite 100	Date Received: 02/03/93
Irvine, CA 92714	Date Extracted: 02/04/93
	Date Analyzed: 02/04/93
	Work Order No.: 93-02-033
	Page 1 of 2
Attn: Maria Shayegan	
RE: 243150/MCAS EL TORO	Method: EPA 8020

All concentrations are reported in ug/kg (ppb).

	Concentration	Det'n Limit
Sample Number: 398-22-125		
Benzene	1860	100
Toluene	685	100
Ethylbenzene	2600	100
Total Xylenes	5270	200
Sample Number: 398-22-135		
Benzene	3830	100
Toluene	2230	100
Ethylbenzene	6580	100
Total Xylenes	16300	200
Sample Number: 398-22-145		
Benzene	4650	100
Toluene	2170	100
Ethylbenzene	6090	100
Total Xylenes	19500	200
Sample Number: 398-22-155		
Benzene	14800	100
Toluene	7270	100
Ethylbenzene	16100	100
Total Xylenes	45300	200
Sample Number: Method Blank		
Benzene	ND	5
Toluene	ND	5
Ethylbenzene	ND	5
Total Xylenes	ND	10

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Calscience
Environmental
Laboratories, Inc.

ANALYTICAL REPORT

International Technology Corporation	Date Sampled: 02/03/93
2355 Main Street, Suite 100	Date Received: 02/03/93
Irvine, CA 92714	Date Extracted: 02/04/93
	Date Analyzed: 02/04/93
	Work Order No.: 93-02-033
	Page 2 of 2
Attn: Maria Shayegan	
RE: 243150/MCAS EL TORO	Method: EPA 8020

All concentrations are reported in ug/kg (ppb).

	Conc. Added	Conc. Rec.	%D
Sample Number: Control Standard			
Benzene	20	17	16.2
Toluene	20	18	10.5
Ethylbenzene	20	18	10.5
Total Xylenes	60	54	10.5

Reviewed and Approved William H. Christensen on 02/12/1993.
William H. Christensen
Laboratory Operations
Manager

ND denotes not detected at indicated detection limit.

Each sample was received by CEL in a chilled state, intact and with chain-of-custody attached.

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Calscience Environmental Laboratories, Inc.
Analytical Quality Control Report

Client: International Technology Corporation
Work Order No.: 93-02-033
Method: EPA 8015M (Solid) {DHS Method}
Date(s) Analyzed: 02/05/93
Page: 1 of 2

Reviewed by: V. Hung

Date Reviewed: 2/12/93

Matrix Spike and Spike Replicate Results

Analyte	[Sample]	[Spike] Added	[Matrix Spike]	%REC	Replicate [Matrix Spike]	%REC	Control Limit %REC	%RPD	Control Limit %RPD
Total Petroleum Hydrocarbons	ND	400	453	113	442	110	70 - 130	3	0 - 20

Page 1 of 2 notes:
1. All concentration values contained herein are in mg/kg (ppm).

Calscience Envir(nental Laboratories, Inc.
Analytical Quality Control Report

Client: International Technology Corporation
Work Order No.: 93-02-033
Method: EPA 8020
Date(s) Analyzed: 02/04/93
Page: 2 of 2

Reviewed by: V. Huang
Date Reviewed: 2/12/93

Matrix Spike and Spike Replicate Results

Analyte	[Sample]	[Spike] Added	[Matrix Spike]	%REC	Replicate [Matrix Spike]	%REC	Control Limit %REC	%RPD	Control Limit %RPD
Chlorobenzene	ND	20	20	100	20	100	70 - 130	0	0 - 20
Ethylbenzene	ND	20	19	95	20	100	70 - 130	5	0 - 20
Toluene	ND	20	17	85	18	90	70 - 130	6	0 - 20

Page 2 of 2 notes:
1. All concentration values contained herein are in ug/kg (ppb).

C...CIENCE ENVIRONMENTAL
LABORATORIES, INC.
631 SEABOARD CIRCLE
STANTON, CA 90680
TEL: (714) 895-5494 • FAX: (714) 894-7501

(033)

IT Corporation
~~MOBIL OIL CORPORATION PROJECT~~
~~LAB CONTRACT #CALSE092090~~
CLEAN Contract

CHAIN OF CUS / RECORD

Date 3 Feb 1993

Page 1 of 1

~~MOBIL OIL'S CONSULTANT~~ IT Corporation

ADDRESS: 2355 Main St

CITY Irvine STATE CA ZIP 92714

TEL: 714 660 5317 FAX:

PROJECT/S.S. # 243150 MCAS EL TORO

PROJECT CONTACT: Maria Shayegan (714) 660 5317

SAMPLER(S): (SIGNATURE) Maria P. Shayegan

TURNAROUND TIME[1]

☐ SAME DAY (≤6 HR)[2], 100% ☐ 24 HOURS, 50% ☐ 48 HOURS, 25% ☑ 5 DAYS[3] ☐ 10 DAYS ☐ RUSH WRITTEN REPORT, 10% (see contract w/ IT)

1. All turnaround times are based on working hours of 8 a.m. - 5 p.m., M - F. 2. Prior confirmation is strongly recommended. 3. 3 days for Tedlar bag air samples.

SPECIAL INSTRUCTIONS/REQUIREMENTS:
ORIGINAL REPORT TO CONSULTANT
~~COPY TO MOBIL OIL CORP., BURBANK, CA ATT~~: Maria Shayegan
(MOBIL PROJECT ENGINEER)
~~BILL TO: MOBIL OIL CORP., BURBANK, CA BILLING CODE:~~ IT Corp

WRITTEN QC REPORT REQUIRED?
☐ ROUTINE QC ($25) Spike, Spike Duplicate Results %REC, %RPD Results and Associated Control Limits
☑ RWQCB QC ($50) NORMAL QC Plus Method blanks Laboratory Control Standards Extraction Logs

SAMPLE ID	LOCATION/DESCRIPTION	SAMPLING DATE	SAMPLING TIME	WATER Comp.	WATER Grab	AIR Intg.	AIR Grab	SOLID/ SOIL	NO. OF Contnrs	ANALYSES REQUIRED
398-22-125	MW 398-22	3 Feb						✓	1	8015/8020 BTEX, EPA DHS/TPH
398-22-135	"	"						✓	1	8015/8020 "
398-22-145	"	"						✓	1	8015/8020 "
398-22-155	"	"						✓	1	8015/8020 "

Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
Maria P. Shayegan	[signature]	2/3/93	3:40PM
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature) [signature]	Received for Laboratory by: (Signature) [signature]	Date: 2/3/93	Time: 5:00PM

Unless otherwise requested, all samples will be disposed of 30 days after receipt.

DISTRIBUTION: White with report, Yellow to CEL, Pink to Client

Calscience
Environmental
Laboratories, Inc.

ANALYTICAL REPORT

International Technology Corporation	Date Sampled: 02/04-05/93
2355 Main Street, Suite 100	Date Received: 02/05/93
Irvine, CA 92714	Date Extracted: 02/09/93
	Date Analyzed: 02/09/93
	Work Order No.: 93-02-075
Attn: Maria Shayegan	
RE: 243150/El Toro MCAS	Method: EPA 8015M

All total petroleum hydrocarbon concentrations are reported in mg/kg (ppm) using JP-5 as a standard.

Sample Number	Concentration	Det'n Limit
MW-398-23-125	83400	100
MW-398-23-135	4700	100
MW-398-23-145	315	100
MW-398-23-155	1230	100
MW-398-24-125	5750	100
MW-398-24-135	3220	100
MW-398-24-145	3990	100
MW-398-24-155	2940	100

Reviewed and Approved William H. Christensen on 02/12/1993.
William H. Christensen
Laboratory Operations
Manager

EPA 8015M is conducted in accordance with the DHS Method for Total Petroleum Hydrocarbons.

ND denotes not detected at indicated detection limit.

Each sample was received by CEL in a chilled state, intact and with chain-of-custody attached.

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Calscience Environmental Laboratories, Inc.

ANALYTICAL REPORT

International Technology Corporation	Date Sampled: 02/04-05/93
2355 Main Street, Suite 100	Date Received: 02/05/93
Irvine, CA 92714	Date Extracted: 02/08/93
	Date Analyzed: 02/08/93
	Work Order No.: 93-02-075
	Page 1 of 2
Attn: Maria Shayegan	
RE: 243150/El Toro MCAS	Method: EPA 8020

All concentrations are reported in ug/kg (ppb).

	Concentration	Det'n Limit
Sample Number: MW-398-23-125		
Benzene	4230	100
Toluene	5410	100
Ethylbenzene	15800	100
Total Xylenes	58600	200
Sample Number: MW-398-23-135		
Benzene	4020	100
Toluene	5720	100
Ethylbenzene	16900	100
Total Xylenes	60500	200
Sample Number: MW-398-23-145		
Benzene	1850	100
Toluene	2590	100
Ethylbenzene	6800	100
Total Xylenes	30100	200
Sample Number: MW-398-23-155		
Benzene	1480	50
Toluene	1640	50
Ethylbenzene	4060	50
Total Xylenes	18800	100
Sample Number: MW-398-24-125		
Benzene	252	100
Toluene	189	100
Ethylbenzene	1990	100
Total Xylenes	11200	200

Calscience
Environmental
Laboratories, Inc.

ANALYTICAL REPORT

International Technology Corporation	Date Sampled: 02/04-05/93
2355 Main Street, Suite 100	Date Received: 02/05/93
Irvine, CA 92714	Date Extracted: 02/08/93
	Date Analyzed: 02/08/93
	Work Order No.: 93-02-075
	Page 2 of 2
Attn: Maria Shayegan	
RE: 243150/El Toro MCAS	Method: EPA 8020

All concentrations are reported in ug/kg (ppb).

	Concentration	Det'n Limit
Sample Number: MW-398-24-135		
Benzene	122	100
Toluene	122	100
Ethylbenzene	1190	100
Total Xylenes	6340	200
Sample Number: MW-398-24-145		
Benzene	289	100
Toluene	261	100
Ethylbenzene	2070	100
Total Xylenes	11300	200
Sample Number: MW-398-24-155		
Benzene	354	100
Toluene	297	100
Ethylbenzene	3560	100
Total Xylenes	16200	200

Reviewed and Approved William H. Christensen on 02/12/1993.
William H. Christensen
Laboratory Operations
Manager

ND denotes not detected at indicated detection limit.

Each sample was received by CEL in a chilled state, intact and with chain-of-custody attached.

11631 Seaboard Circle, Stanton, CA 90680 • TEL: (714) 895-5494 • FAX: (714) 894-7501

IT INTERNATIONAL TECHNOLOGY CORPORATION

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD*

(615)

Reference Document 393017
Page 1 of ___

Project Name/No. [1] EL TORO MCAS 243150
Sample Team Members [2] C. ZARN
Profit Center No. [3] 3551
Project Manager [4] MARIA SHAYGAN
Purchase Order No. [6]
Required Report Date [11]

Samples Shipment Date [7] 4 Feb '93
Lab Destination [8] CAL SCIENCE/Stanton
Lab Contact [9] See Contract w/IT
Project Contact/Phone [12] (714) 660-5317
Carrier/Waybill No. [13]

Bill to: [5] ~~IT CORPORATION~~ SEE IT CORP CONTRACT

Report to: [10] MARIA SHAYEGAN
IT CORPORATION
2355 MAIN ST, SUITE 100
IRVINE, CA 92714

ONE CONTAINER PER LINE

Sample Number [14]	Sample Description/Type [15]	Date/Time Collected [16]	Container Type [17]	Sample Volume [18]	Pre-servative [19]	Requested Testing Program [20]	Condition on Receipt [21]	Disposal Record No. [22]
MW-398-23-125	Soil	4 FEB '93	BRASS/Sleeves	3"x6"	NONE	8015 8020 BTEX, EPA/DHS TPH		
MW 398-23-135	Soil		BRASS Sleeves	3"x6"	ICE	8015 8020 BTEX EPA/DHS TPH		
MW-398-23-145	Soil		BRASS Sleeves	3"x6"		8015 8020 BTEX EPA/DHS TPH		
MW-398-23-155	Soil		BRASS Sleeves	3"x6"		8015 8020 BTEX EPA ~~BTEX~~ DHS/TPH		
MW-398-24-125		5-2-93			ICE			
MW-398-24-135								
MW-398-24-145								
MW-398-24-155								

Special Instructions: [23]

Possible Hazard Identification: [24]
Non-hazard ☐ Flammable ☒ Skin Irritant ☐ Poison B ☐ Unknown ☐

Sample Disposal: [25]
Return to Client ☐ Disposal by Lab ☑ Archive ____ (mos.)

Turnaround Time Required: [26] SEE IT CORP. CONTRACT
Normal ☒ Rush ☐ 5 DAYS

QC Level: [27]
I. ☐ II. ☐ III. ☐ Project Specific (specify):

1. Relinquished by [28] (Signature/Affiliation) IT Corp	Date: 2-5-93 Time: 1655	1. Received by [28] (Signature/Affiliation)	Date: 2/5/93 Time: 4:55 PM
2. Relinquished by (Signature/Affiliation)	Date: 2-5-93 Time: 6:00 PM	2. Received by (Signature/Affiliation)	Date: Time:
3. Relinquished by (Signature/Affiliation)	Date: Time:	3. Received by (Signature/Affiliation) CEL	Date: 2/5/93 Time: 5:45 PM

Comments: [29]

MCA 3/15/91

WHITE: To accompany samples YELLOW: Field copy SEE BACK OF FORM FOR SPECIAL INSTRUCTIONS

APPENDIX D
VACUUM EXTRACTION DATA

			EL TORO VET DATA COLLECTION FORM			DATE: 2/16/93
	TIME	FLOWRATE (CFM)	TEMPERATURE (F)	EXT WELL VW-23 VACUUM ("H20)	WELL VW-22 VACUUM ("H20)	WELL VW-24 VACUUM ("H20)
	Test 0 ST Test 0		~~(Test 1)~~ MAT	~~0~~		
1	1040	0	—	0	0.57	0.35
2	1045	75.8	71	27	0.57	0.35
3	1047	75.8	71	34	0.70	0.48
4	1049	75.5	71	32	0.89	0.61
5	1052	75.5	71	32	1.15	0.90
6	1100	75.5	71	32	1.37	1.15
7	1105	75.5	71	32	1.8	1.30
8	1115	75.5	71	32	1.95	1.45
9	1130	75.5	71	32	1.97	1.50
10	1145	75.5	71	32	2.0	1.50
11	1200	76.2	71	32	1.95	1.47
12	1220	76.1	71	32	1.86	1.40
13	1235	77	71	32	MAT ~~2.0~~ 1.90	1.40
14	1248	77	72	32	MAT ~~1.95~~ 1.87	1.40
15	1307	74.6	72	32	MAT ~~1.86~~ 1.82	1.35
16	1318	75.1	72	32	1.80	1.34
17	1333	76.6	72	32	1.77	1.32
18	1346	75.7	72	32	1.79	1.30
19	1400	76.9	72	32	1.73	1.26
20	1415	76.8	72	32	1.70	1.25
21	1435	76.3	72	32	1.65	1.20
22	1447	76.8	72	32	1.70	1.21
23	1512	74.7	72	32	1.70	1.22
24	1545	75.0	72	32	1.85	1.36
25	Recovery	Test 0 st test 1				
26	1554				1.85	1.36
27	1556				1.65	1.20
28	1558				1.35	0.95
29	1600				1.10	0.75
30	1604				0.95	0.60
31	1608				0.85	0.45
32	1612				0.70	0.35
33		Test 1 St. 0	~~(Test 1 Step~~ MAT Test 1)			
34	1617	69.5	72	26	0.60	0.30
35	1620	74.7	72	26	0.70	0.35
36	1625	75.6	72	29	1.30	0.85
37	1636	75	72	28	1.65	1.16
38	1655	75	72	28	1.85	1.40
39	1700	72	72	22	1.85	1.36
40		Test 1	St 1			
41	1709	60.4	72	24	1.75	1.30
42	1713	60.4	72	24	1.70	1.25
43	1720	60.5	72	24	1.65	1.20
44	1735	60.5	72	24	1.55	1.12
45		Test 1 St. 2				
46	1737	47.5	72	20	1.55	1.12
47	1741	40.3	72	17	1.46	1.04
48	1745	40.5	72	17	1.35	0.93
49	1750	40.5	72	16.3	1.30	0.88
50	1800	40.3	72	16.3	MAT ~~1.30~~ 1.33	0.90
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			EL TORO VET DATA COLLECTION FORM			DATE: 2/17/93 Sheet 1 of 2
	TIME	FLOWRATE (CFM)	TEMPERATURE (F)	EXT WELL VW- 24 VACUUM ("H20)	WELL VW- 22 VACUUM ("H20)	WELL VW- 23 VACUUM ("H20)
		Test 2 St 0				
1	0819	0	—	0	0.45	~~0.48~~
2	0820	56.7	72	30	0.45	MAT ~~0.45~~ 0.52
3	0821	56.7		30	0.45	0.64
4	0822	64.7		32	0.47	0.75
5	0823	76.3	72	40	0.53	0.90
6	0824	81.7		42	0.60	1.10
7	0825	81.5		42	0.70	1.30
8	0833	77.9		41	1.0	1.85
9	0840	77.0		41	1.15	2.00
10	0855	77.1	72	40	1.30	2.30
11	0905	76.5		40	1.30	2.30
12	0915	76.6		40	1.30	2.30
13	0930	75.2		40	1.35	2.40
14	0945	75.0	72	40	1.45	2.50
15	1000	76.1	74	40	1.45	2.50
16	1015	75.6		40	1.34	2.40
17	1030	75.6		40	1.20	2.20
18	1045	76.0		40	1.25	2.25
19	1100	76.0	74	39	1.21	2.20
20	1115	75.3		40	1.15	2.15
21	1130	75.4		39	1.07	2.09
22	1145	75.0		39	1.04	2.00
23	1200	75.0	75	39	0.97	1.95
24	1220	75.7		39	0.85	1.80
25	1240	75.5	77	39	0.70	1.65
26	1300	75.2		39	0.55	1.45
27	1320	75.2	76	39	0.52	1.40
28	1340	74.9		39	0.55	1.42
29	1400	75.2	74	39	0.35	1.30
30	1420	75.4		39	0.25	1.10
31	1440	74.8		38	0.18	1.00
32	Recovery	Test 2 St 1				
33	1445				0.18	0.90
34	1447				0.18	0.75
35	1449				0.15	0.60
36	1450				0.12	0.45
37	1451				0.07	0.35
38	1452				0.05	0.25
39	1453				0.01	0.15
40	1454				- 0.33 (pos. pressure)	0.05
41	1456				- 0.36	0.00
42	1458				- 0.40	- 0.22 (pos pressure)
43	1500				- 0.45	-0.30
44	1502				- 0.51	-0.38
45	1505				- 0.53	-0.45
46	1509				- 0.55	-0.50
47	1511				- 0.55	-0.50
48	1515				- 0.55	-0.50
49	1520				- 0.55	-0.50
50		Test 3 St. 0			recal to zero	
51	1531	0		0	0	0
52	1533	60		27	0	0
53	1535	60		27	0	0
54	1536	59.8		27	0	0.2
55	1538	59.6		27	0.04	0.35
56	1540	59.7	74	28	0.10	0.45
57	1544	59.5		28	0.22	0.65
58	1548	59.6	73	28	0.30	0.80
59	1555	59.9		28	0.35	MAT ~~1.00~~ 0.85
60	1610	59.6		28	0.47	1.00
	1620	59.5		28	0.50	1.05
	1630	59.5	72	28	0.56	1.10

			EL TORO VET DATA COLLECTION FORM			DATE: 2/17/93 Sheet 2 of 2
	TIME	FLOWRATE (CFM)	TEMPERATURE (F)	EXT WELL VW-24 VACUUM ("H20)	WELL VW-22 VACUUM ("H20)	WELL VW-23 VACUUM ("H20)
1	1632	59.5		28	0.56	1.10
2	1634	50.5		23	0.60	1.15
3	1636	48.2		24	0.61	1.15
4	1638	44.8	72	23	0.63	1.12
5	1640	44.9		22	0.65	1.12
6	1644	44.9		22	0.65	1.12
7	1650	45	71	22	0.64	1.05
8	1700	45		22	0.64	1.05
9	1710	45		22	0.64	1.05
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INTERNATIONAL TECHNOLOGY CORPORATION

372

FIELD ACTIVITY DAILY LOG

DAILY LOG			
DATE	2	16	93
NO.	0	0	1
SHEET	2 OF 2		

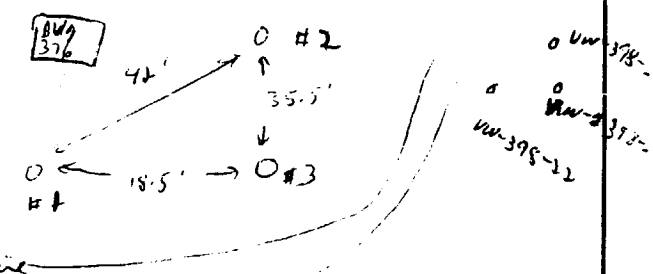
PROJECT NAME: Navy Clean - El Toro

PROJECT NO. 243150-18

FIELD ACTIVITY SUBJECT: El Toro Vapor Extraction Test

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

0710 Arrived on site. Kyle from IT already here.
0800 Met w/ Wesley of Enviro supply
0805 H&S. Meeting (Jacobs) w/ Bonnie
0825 Meeting Adjourned.
0835 At site - setting up - called Kathy Peale - not in
0915 Called Kathy Peale - to see where she sent OVA & Suma canisters - sent Suma canisters on base - not sure where - have to talk to Maria, but she's in meeting
0940 Kyle trying to locate canisters - ready to run test
1015 Called Kathy Peale - need Bldg # for FedEx pickup #372. She said that they were supposed to call Maria - need to speak to Maria to see if they were sent



1041 Start test 0 - ~~recovery~~ extraction well VW-23 vacuum VW-24 monitoring wells
1107 Collected sample # CEL0026
1210 Kyle left for OVA pickup - Smith & Denison Long Beach
1430 Kyle back - calibrating OVA - 25,000 ppm as methane
1555 Field stabilizing - will take 2 more readings then begin step test.
1554 ~~Step~~ System shutdown for no apparent reason - will do step test for drawdown (recovery) Test 0 step 1
1617 Start ~~Step~~ Test 1 - Step 0
1622 Began Dropping flowrate
1640 Pitot tube reading 0.44" H_2O ≈ 2800 ft³/min (from chart) x 0.0873 ft² = erroneous reading - bad gauge
Using valve @ well head to control flow - not working - went to manual control w/ FCG only

VISITORS ON SITE:
Bonnie - Jacobs
Wesley - EnviroSupply

CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS.

WEATHER CONDITIONS:
Cloudy & cool 65°F Morn
Barom. Press. 29.92 (morn) R 59°F Afternoon
30.09 R (evening)

IMPORTANT TELEPHONE CALLS:
See above

IT PERSONNEL ON SITE: Kyle

SIGNATURE: Mark J. Thomas

DATE: 2/16/93

327A-7-86

INTERNATIONAL TECHNOLOGY CORPORATION

FIELD ACTIVITY DAILY LOG

DAILY LOG			
DATE	2	16	93
NO.	0	0	2
SHEET 2 OF 2			

PROJECT NAME: Navy Hill - G1 Two

PROJECT NO. 243150.18

FIELD ACTIVITY SUBJECT: G1 Two Vapor Extraction Test

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

1709 Began step Test 1 of Test 1 - changed flow to 60 cfm
1725 Kyle left site
1730 Spoke w/ Maria UVA reading - 11,000 ppmv
Collected Sample # CEL D023
1737 Began Step Test 2 of Test 1 - changed flow to 40.3
1800 ended Step Test 2 of Test 1
1815 Mobilized & left for the day

- 2 min differential between data logger & my readings - my readings same as VE system printout - Hermit 2 min faster
However, @ 1700 my readings = Hermit

VISITORS ON SITE:
Bonnie - Jacobs
Wesley - Environmental

CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS.

WEATHER CONDITIONS:
see previous page

IMPORTANT TELEPHONE CALLS:
see above

IT PERSONNEL ON SITE: Kyle

SIGNATURE: Mark J. Thomas

DATE: 2/16/93

327A-7-86

INTERNATIONAL TECHNOLOGY CORPORATION

FIELD ACTIVITY DAILY LOG

DAILY LOG			
DATE	2	17	93
NO.	0	0	3
SHEET	1	OF	2

PROJECT NAME: Navy Clean - El Toro

PROJECT NO. 243150-18

FIELD ACTIVITY SUBJECT: El Toro vapor extraction Test

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

0700 Arrived on site - paper work, demobilization, test set-up.

0800 Programmed Data logger - offset for unit #2 programmed @ 0.049 when should have been -0.049 - yesterday - not sure how many tests this was run this way. Changed for today's test

Will extract from VW-24 & use VW-22 & VW-23 as monitoring wells.

0819 Started Test 2 - 2 min time differential between my readings & VR System printout

VR 2 min slow

0835 collected Tedlar bag sample VW-24-1 - calibrated OVA to 15,000 ppm (methane) - read 0.025 - Took reading 20,000 ppm

0845 changed gauge on VW-23 - changing OVA

Battery low - may be erroneous.

1040 OVA reading 8,000 ppmv in methane from extraction well

1245 OVA reading 5,000 ppmv from extraction well

Data logger reading different from gauges - barometric pressure must be changing (~~rising~~ dropping)

~~1300~~ see attachment (El Toro Control Tower)

435 collected sample # CEL-D027. OVA reading - 7,000 ppmv

443 Shut down Test 2 - step Test 1 for recovery

1520 Recovery test complete - see positive pressure out of monitoring wells, probably as a result of the barometric pressure changes.

1525 Monitoring wells reading positive VW-22 = 0.55" H_2O VW-23 = 0.50" H_2O - set these (gauges) = 0 for next test - need to add/subtract from pressure

1531 start Test 3 Constant flow rate of ~ 60 cfm

1632 Step Test 1 of Test 3 Constant flow rate of 45 cfm

1710 End step Test 1 of Test 3 - mobilization.

1745 Left site

1830 Dinner

1930 Back to San Bernardino

2030 At office. Demob in morning

VISITORS ON SITE:

Wesley from EnviroSupply

CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS.

VW-24

VW-22

VW-23

WEATHER CONDITIONS:

cool & overcast	- 0700	58°F
warm & sunny	- 0830	58°F
hot & sunny	- 1000 - 1:00	75°F
clouds rolling in, windy	- 1:00	70°F
Sunny & windy	- 3:00	70°F

IMPORTANT TELEPHONE CALLS:

IT PERSONNEL ON SITE: Kyle

SIGNATURE: Mark J Thomas

DATE: 2/17/93

327A-7-86

INTERNATIONAL TECHNOLOGY CORPORATION

FIELD ACTIVITY DAILY LOG

DAILY LOG			
DATE	2	17	93
NO.	0	0	4
SHEET 2 OF 2			

PROJECT NAME: Clean

PROJECT NO. 243150-18

FIELD ACTIVITY SUBJECT: VET - barometric pressure data from Control Tower

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

El Toro weather station Barometric Readings (El Toro Control Tower)

A.M.

400 = 29.685

500 = 29.685

600 = 29.700

700 = 29.700

800 = 29.705

900 = 29.735

1000 = 29.745

1100 29.720

(PM)

1200 29.700

~~1300 29.655~~ → 1300 29.655

~~1400 28.905~~

1400 29.640

1500 29.600

1600 29.600

(Inches of Mercury to Millibars)

VISITORS ON SITE:

CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS.

WEATHER CONDITIONS:

IMPORTANT TELEPHONE CALLS:

IT PERSONNEL ON SITE: Kyle

SIGNATURE: Marlot Thomas

DATE: 2/17/93

327A-7-86

SE2000
Environmental Logger
02/22 11:11

Unit# 463 Test 0

Setups:	INPUT 1	INPUT 2
Type	Level (F)	Level (F)
Mode	TOC	TOC
I.D.	1	2
Reference	0.000	0.000
SG	1.000	1.000
Linearity	0.037	0.047
Scale factor	10.040	10.038
Offset	-0.062	0.049
Delay mSEC	50.000	50.000

Step 0 02/16 10:48:26

Elapsed Time	INPUT 1	INPUT 2
0.0000	0.006	-0.003
0.0083	0.006	-0.003
0.0166	0.003	-0.003
0.0250	0.006	-0.003
0.0333	0.000	0.000
0.0416	0.006	0.000
0.0500	0.006	-0.003
0.0583	0.003	-0.003
0.0666	0.006	0.003
0750	0.000	-0.003
0.0833	0.003	-0.003
0.0916	0.003	-0.003
0.1000	0.003	-0.003
0.1083	0.003	-0.003
0.1166	0.003	-0.003
0.1250	0.003	-0.003
0.1333	0.003	0.000
0.1416	0.003	-0.003
0.1500	0.006	-0.003
0.1583	0.006	0.000
0.1666	0.003	-0.003
0.1750	0.006	-0.003
0.1833	0.003	-0.003
0.1916	0.006	0.000
0.2000	0.006	0.000
0.2083	0.006	0.000
0.2166	0.006	0.000
0.2250	0.006	0.000
0.2333	0.006	0.000
0.2416	0.006	-0.003
0.2500	0.003	0.000
0.2583	0.006	-0.003
0.2666	0.006	0.000
0.2750	0.006	-0.003
0.2833	0.003	-0.003
2916	0.000	0.003
3000	0.003	-0.006
0.3083	0.006	-0.003
0.3166	0.000	0.003
0.3250	0.003	-0.003
0.3333	0.003	-0.003
0.3500	0.003	-0.003

0.3666	0.006	-0.003
0.3833	0.003	-0.003
0.4000	0.003	-0.003
4166	0.003	-0.003
.4333	0.003	0.000
0.4500	0.003	-0.003
0.4666	0.003	-0.003
0.4833	0.003	0.000
0.5000	0.006	-0.003
0.5166	0.003	0.000
0.5333	0.003	-0.003
0.5500	0.006	-0.003
0.5666	0.003	-0.003
0.5833	0.006	-0.003
0.6000	0.003	0.000
0.6166	0.003	0.000
0.6333	0.003	-0.003
0.6500	0.003	0.000
0.6666	0.003	0.000
0.6833	0.006	-0.003
0.7000	0.003	-0.003
0.7166	0.006	-0.003
0.7333	0.006	0.000
0.7500	0.006	0.000
0.7666	0.003	-0.003
0.7833	0.009	0.000
0.8000	0.009	0.000
0.8166	0.006	0.000
0.8333	0.006	-0.003
0.8500	0.006	-0.003
0.8666	0.006	0.000
0.8833	0.009	0.000
0.9000	0.006	-0.003
9166	0.006	-0.003
.9333	0.006	0.000
0.9500	0.006	-0.003
0.9666	0.006	0.003
0.9833	0.006	0.000
1.0000	0.006	-0.003
1.2000	0.003	0.000
1.4000	0.006	0.000
1.6000	0.009	0.003
1.8000	0.012	0.003
2.0000	0.009	0.003
2.2000	0.015	0.006
2.4000	0.019	0.009
2.6000	0.019	0.012
2.8000	0.022	0.015
3.0000	0.025	0.012
3.2000	0.022	0.012
3.4000	0.025	0.012
3.6000	0.025	0.015
3.8000	0.022	0.015
4.0000	0.028	0.015
4.2000	0.028	0.019
4.4000	0.031	0.022
4.6000	0.028	0.022
4.8000	0.031	0.025
5.0000	0.034	0.028
2000	0.034	0.025
000	0.041	0.028
.6000	0.038	0.031
5.8000	0.044	0.034
6.0000	0.047	0.038
6.2000	0.047	0.038
6.4000	0.050	0.038

6.6000	0.050	0.041
6.8000	0.050	0.041
7.0000	0.050	0.044
2000	0.053	0.044
.4000	0.060	0.047
7.6000	0.060	0.047
7.8000	0.057	0.047
8.0000	0.057	0.050
8.2000	0.060	0.057
8.4000	0.060	0.053
8.6000	0.063	0.057
8.8000	0.060	0.057
9.0000	0.066	0.060
9.2000	0.066	0.060
9.4000	0.076	0.063
9.6000	0.076	0.063
9.8000	0.072	0.063
10.0000	0.076	0.066
11.0000	0.079	0.072
12.0000	0.095	0.079
13.0000	0.085	0.082
14.0000	0.088	0.085
15.0000	0.098	0.088
16.0000	0.095	0.088
17.0000	0.101	0.092
18.0000	0.101	0.095
19.0000	0.101	0.098
20.0000	0.101	0.101
21.0000	0.107	0.101
22.0000	0.104	0.098
23.0000	0.111	0.104
24.0000	0.114	0.104
.0000	0.111	0.104
0000	0.111	0.107
..0000	0.114	0.107
28.0000	0.111	0.107
29.0000	0.117	0.107
30.0000	0.111	0.107
31.0000	0.120	0.111
32.0000	0.123	0.114
33.0000	0.117	0.114
34.0000	0.123	0.117
35.0000	0.120	0.114
36.0000	0.117	0.114
37.0000	0.123	0.117
38.0000	0.123	0.117
39.0000	0.117	0.117
40.0000	0.120	0.114
41.0000	0.123	0.117
42.0000	0.123	0.117
43.0000	0.117	0.117
44.0000	0.117	0.117
45.0000	0.117	0.114
46.0000	0.117	0.114
47.0000	0.120	0.114
48.0000	0.120	0.120
49.0000	0.120	0.117
50.0000	0.126	0.117
51.0000	0.120	0.117
9000	0.120	0.117
000	0.120	0.114
..0000	0.123	0.117
55.0000	0.123	0.117
56.0000	0.126	0.117
57.0000	0.120	0.117
58.0000	0.123	0.117

59.0000	0.120	0.117
60.0000	0.123	0.120
1.0000	0.120	0.120
0000	0.123	0.117
.0000	0.120	0.117
64.0000	0.123	0.117
65.0000	0.123	0.120
66.0000	0.123	0.117
67.0000	0.123	0.120
68.0000	0.120	0.120
69.0000	0.126	0.120
70.0000	0.123	0.117
71.0000	0.126	0.117
72.0000	0.120	0.117
73.0000	0.117	0.117
74.0000	0.123	0.120
75.0000	0.123	0.117
76.0000	0.120	0.117
77.0000	0.123	0.114
78.0000	0.126	0.117
79.0000	0.123	0.117
80.0000	0.120	0.117
81.0000	0.117	0.114
82.0000	0.123	0.117
83.0000	0.120	0.117
84.0000	0.120	0.114
85.0000	0.120	0.117
86.0000	0.117	0.114
87.0000	0.120	0.117
88.0000	0.120	0.114
89.0000	0.120	0.114
90.0000	0.114	0.114
0000	0.114	0.107
0000	0.120	0.117
.0000	0.120	0.114
94.0000	0.114	0.111
95.0000	0.114	0.107
96.0000	0.120	0.111
97.0000	0.117	0.107
98.0000	0.114	0.111
99.0000	0.111	0.107
100.000	0.114	0.107
101.000	0.111	0.107
102.000	0.117	0.111
103.000	0.117	0.111
104.000	0.114	0.111
105.000	0.117	0.107
106.000	0.107	0.104
107.000	0.114	0.107
108.000	0.114	0.111
109.000	0.111	0.107
110.000	0.117	0.107
111.000	0.120	0.114
112.000	0.117	0.111
113.000	0.114	0.111
114.000	0.111	0.111
115.000	0.117	0.114
116.000	0.117	0.114
117.000	0.114	0.111
000	0.107	0.107
000	0.114	0.111
120.000	0.117	0.107
121.000	0.111	0.111
122.000	0.114	0.111
123.000	0.111	0.104
124.000	0.111	0.104

125.000	0.114	0.111
126.000	0.111	0.107
127.000	0.107	0.104
128.000	0.107	0.104
129.000	0.107	0.104
130.000	0.107	0.104
131.000	0.111	0.107
132.000	0.111	0.107
133.000	0.111	0.104
134.000	0.114	0.107
135.000	0.111	0.107
136.000	0.111	0.107
137.000	0.111	0.104
138.000	0.107	0.104
139.000	0.107	0.104
140.000	0.104	0.104
141.000	0.104	0.104
142.000	0.111	0.101
143.000	0.107	0.104
144.000	0.107	0.101
145.000	0.104	0.104
146.000	0.104	0.098
147.000	0.104	0.101
148.000	0.101	0.098
149.000	0.098	0.098
150.000	0.101	0.095
151.000	0.098	0.101
152.000	0.101	0.095
153.000	0.104	0.101
154.000	0.104	0.098
155.000	0.104	0.098
156.000	0.098	0.098
157.000	0.101	0.098
158.000	0.104	0.098
159.000	0.098	0.098
160.000	0.107	0.101
161.000	0.098	0.098
162.000	0.104	0.098
163.000	0.104	0.101
164.000	0.104	0.098
165.000	0.104	0.101
166.000	0.104	0.098
167.000	0.104	0.101
168.000	0.104	0.098
169.000	0.098	0.095
170.000	0.101	0.095
171.000	0.101	0.095
172.000	0.101	0.098
173.000	0.101	0.098
174.000	0.107	0.101
175.000	0.104	0.098
176.000	0.101	0.098
177.000	0.104	0.101
178.000	0.101	0.098
179.000	0.104	0.095
180.000	0.101	0.095
181.000	0.101	0.098
182.000	0.104	0.098
183.000	0.107	0.101
[illegible].000	0.101	0.101
[illegible].000	0.107	0.098
[illegible].000	0.111	0.107
187.000	0.101	0.092
188.000	0.098	0.101
189.000	0.104	0.098
190.000	0.101	0.107

191.000	0.104	0.088
192.000	0.107	0.098
193.000	0.098	0.098
.000	0.101	0.092
.000	0.095	0.098
196.000	0.104	0.098
197.000	0.098	0.101
198.000	0.098	0.092
199.000	0.098	0.095
200.000	0.095	0.088
201.000	0.107	0.085
202.000	0.088	0.082
203.000	0.123	0.092
204.000	0.104	0.082
205.000	0.114	0.085
206.000	0.085	0.085
207.000	0.088	0.088
208.000	0.076	0.092
209.000	0.079	0.085
210.000	0.104	0.088
211.000	0.123	0.088
212.000	0.111	0.085
213.000	0.114	0.092
214.000	0.060	0.085
215.000	0.085	0.082
216.000	0.057	0.088
217.000	0.120	0.082
218.000	0.088	0.085
219.000	0.123	0.082
220.000	0.095	0.082
221.000	0.085	0.085
222.000	0.088	0.082
.000	0.076	0.085
.000	0.098	0.085
.5.000	0.092	0.088
226.000	0.088	0.085
227.000	0.085	0.082
228.000	0.095	0.085
229.000	0.088	0.082
230.000	0.092	0.085
231.000	0.088	0.085
232.000	0.095	0.085
233.000	0.085	0.085
234.000	0.092	0.085
235.000	0.092	0.085
236.000	0.088	0.085
237.000	0.095	0.088
238.000	0.088	0.085
239.000	0.088	0.088
240.000	0.092	0.085
241.000	0.095	0.088
242.000	0.092	0.088
243.000	0.095	0.088
244.000	0.092	0.088
245.000	0.088	0.088
246.000	0.092	0.088
247.000	0.092	0.088
248.000	0.095	0.088
249.000	0.088	0.088
.000	0.092	0.088
000	0.095	0.092
252.000	0.098	0.092
253.000	0.098	0.092
254.000	0.092	0.092
255.000	0.092	0.088
256.000	0.095	0.092

257.000	0.098	0.088
258.000	0.092	0.092
259.000	0.092	0.092
0.000	0.095	0.092
1.000	0.095	0.092
262.000	0.092	0.092
263.000	0.095	0.092
264.000	0.098	0.092
265.000	0.092	0.088
266.000	0.095	0.092
267.000	0.088	0.092
268.000	0.092	0.092
269.000	0.095	0.092
270.000	0.095	0.088
271.000	0.092	0.088
272.000	0.095	0.092
273.000	0.098	0.092
274.000	0.098	0.095
275.000	0.095	0.092
276.000	0.092	0.092
277.000	0.092	0.095
278.000	0.098	0.095
279.000	0.095	0.095
280.000	0.098	0.095
281.000	0.098	0.092
282.000	0.098	0.095
283.000	0.101	0.095
284.000	0.095	0.095
285.000	0.098	0.098
286.000	0.098	0.095
287.000	0.104	0.098
288.000	0.101	0.098
289.000	0.098	0.098
0.000	0.104	0.104
1.000	0.098	0.098
292.000	0.098	0.098
293.000	0.101	0.095
294.000	0.095	0.098
295.000	0.101	0.098
296.000	0.104	0.111
297.000	0.107	0.117
298.000	0.101	0.101
299.000	0.101	0.098
300.000	0.111	0.101
301.000	0.101	0.104
302.000	0.111	0.107
303.000	0.104	0.101
304.000	0.104	0.101
305.000	0.104	0.098
306.000	0.101	0.098
307.000	0.104	0.104
308.000	0.111	0.104

SE2000
Environmental Logger
02/22 11:08

Unit# 463 Test 0

Setups:	INPUT 1	INPUT 2
Type	Level (F)	Level (F)
Mode	TOC	TOC
I.D.	1	2
Reference	0.000	0.000
SG	1.000	1.000
Linearity	0.037	0.047
Scale factor	10.040	10.038
Offset	-0.062	0.049
Delay mSEC	50.000	50.000

Step 1 02/16 15:57:16

Elapsed Time	INPUT 1	INPUT 2
0.0000	0.104	0.101
0.0083	0.104	0.101
0.0166	0.104	0.104
0.0250	0.104	0.101
0.0333	0.104	0.104
0.0416	0.104	0.104
0.0500	0.104	0.104
0.0583	0.104	0.104
0.0666	0.104	0.104
.0750	0.104	0.104
0.0833	0.104	0.104
0.0916	0.104	0.104
0.1000	0.104	0.104
0.1083	0.104	0.104
0.1166	0.104	0.104
0.1250	0.104	0.101
0.1333	0.104	0.104
0.1416	0.104	0.104
0.1500	0.104	0.104
0.1583	0.104	0.104
0.1666	0.104	0.104
0.1750	0.104	0.101
0.1833	0.104	0.101
0.1916	0.104	0.101
0.2000	0.104	0.104
0.2083	0.104	0.101
0.2166	0.104	0.101
0.2250	0.104	0.101
0.2333	0.104	0.104
0.2416	0.104	0.101
0.2500	0.104	0.101
0.2583	0.104	0.101
0.2666	0.104	0.101
0.2750	0.104	0.104
0.2833	0.104	0.101
2916	0.104	0.104
3000	0.104	0.101
0.3083	0.101	0.104
0.3166	0.104	0.104
0.3250	0.104	0.101
0.3333	0.104	0.101
0.3500	0.101	0.101

0.3666	0.104	0.101
0.3833	0.101	0.101
0.4000	0.101	0.101
.4166	0.101	0.101
.4333	0.101	0.101
0.4500	0.101	0.101
0.4666	0.101	0.101
0.4833	0.104	0.098
0.5000	0.101	0.101
0.5166	0.101	0.101
0.5333	0.101	0.101
0.5500	0.101	0.101
0.5666	0.101	0.101
0.5833	0.101	0.101
0.6000	0.101	0.101
0.6166	0.098	0.098
0.6333	0.098	0.098
0.6500	0.098	0.098
0.6666	0.098	0.098
0.6833	0.098	0.098
0.7000	0.098	0.098
0.7166	0.098	0.101
0.7333	0.098	0.101
0.7500	0.098	0.098
0.7666	0.098	0.098
0.7833	0.095	0.098
0.8000	0.098	0.098
0.8166	0.095	0.098
0.8333	0.098	0.098
0.8500	0.095	0.098
0.8666	0.098	0.095
0.8833	0.095	0.098
0.9000	0.095	0.095
.9166	0.095	0.098
0.9333	0.095	0.098
0.9500	0.095	0.098
0.9666	0.095	0.098
0.9833	0.095	0.098
1.0000	0.095	0.095
1.2000	0.092	0.092
1.4000	0.088	0.092
1.6000	0.088	0.088
1.8000	0.085	0.088
2.0000	0.085	0.085
2.2000	0.079	0.082
2.4000	0.079	0.079
2.6000	0.076	0.072
2.8000	0.072	0.076
3.0000	0.072	0.072
3.2000	0.069	0.072
3.4000	0.069	0.069
3.6000	0.066	0.069
3.8000	0.063	0.066
4.0000	0.063	0.063
4.2000	0.057	0.063
4.4000	0.060	0.060
4.6000	0.057	0.063
4.8000	0.060	0.057
5.0000	0.053	0.057
.2000	0.053	0.057
4000	0.057	0.053
.6000	0.050	0.053
5.8000	0.047	0.053
6.0000	0.047	0.050
6.2000	0.047	0.050
6.4000	0.050	0.047

6.6000	0.044	0.047
6.8000	0.044	0.047
7.0000	0.047	0.044
2000	0.044	0.044
.4000	0.044	0.041
7.6000	0.038	0.044
7.8000	0.038	0.041
8.0000	0.038	0.041
8.2000	0.038	0.041
8.4000	0.041	0.038
8.6000	0.034	0.041
8.8000	0.038	0.038
9.0000	0.038	0.034
9.2000	0.031	0.038
9.4000	0.038	0.034
9.6000	0.038	0.034
9.8000	0.038	0.034
10.0000	0.031	0.034
11.0000	0.025	0.031
12.0000	0.031	0.031
13.0000	0.025	0.028
14.0000	0.028	0.025
15.0000	0.022	0.022
16.0000	0.019	0.019
17.0000	0.019	0.019
18.0000	0.015	0.015

SE2000
Environmental Logger
02/22 11:06

Unit# 463 Test 1

Setups:	INPUT 1	INPUT 2
Type	Level (F)	Level (F)
Mode	TOC	TOC
I.D.	1	2
Reference	0.000	0.000
SG	1.000	1.000
Linearity	0.037	0.047
Scale factor	10.040	10.038
Offset	-0.062	0.049
Delay mSEC	50.000	50.000

Step 0 02/16 16:21:03

Elapsed Time	INPUT 1	INPUT 2
0.0000	-0.009	-0.006
0.0083	-0.009	-0.006
0.0166	-0.003	-0.006
0.0250	-0.006	-0.009
0.0333	-0.003	-0.006
0.0416	-0.006	-0.009
0.0500	-0.006	-0.009
0.0583	-0.006	-0.006
0.0666	-0.003	-0.006
0750	-0.009	-0.006
0.0833	-0.009	-0.006
0.0916	-0.006	-0.006
0.1000	-0.006	-0.006
0.1083	-0.009	-0.006
0.1166	-0.006	-0.006
0.1250	-0.006	-0.006
0.1333	-0.009	-0.006
0.1416	-0.006	-0.006
0.1500	-0.006	-0.006
0.1583	-0.006	-0.006
0.1666	-0.009	-0.006
0.1750	-0.009	-0.003
0.1833	-0.009	-0.006
0.1916	-0.006	-0.006
0.2000	-0.006	-0.009
0.2083	-0.009	-0.006
0.2166	-0.009	-0.006
0.2250	-0.009	-0.006
0.2333	-0.006	-0.006
0.2416	-0.006	-0.006
0.2500	-0.006	-0.006
0.2583	-0.006	-0.006
0.2666	-0.006	-0.006
0.2750	-0.006	-0.006
0.2833	-0.006	-0.006
2916	-0.006	-0.006
5000	-0.006	-0.006
0.3083	-0.006	-0.006
0.3166	-0.006	-0.006
0.3250	-0.009	0.000
0.3333	-0.009	-0.006
0.3500	-0.006	-0.006

0.3666	-0.006	-0.006
0.3833	-0.009	-0.006
0.4000	-0.006	-0.006
4166	-0.006	-0.006
.4333	-0.009	-0.006
0.4500	-0.006	-0.009
0.4666	-0.009	-0.006
0.4833	-0.006	-0.006
0.5000	-0.006	-0.006
0.5166	-0.006	-0.006
0.5333	-0.009	-0.006
0.5500	-0.009	-0.006
0.5666	-0.006	-0.006
0.5833	-0.006	-0.006
0.6000	-0.006	-0.006
0.6166	-0.006	-0.006
0.6333	-0.006	-0.006
0.6500	-0.006	-0.006
0.6666	-0.006	-0.006
0.6833	-0.006	-0.003
0.7000	-0.006	-0.006
0.7166	-0.006	-0.006
0.7333	0.000	-0.006
0.7500	-0.009	-0.006
0.7666	-0.009	-0.006
0.7833	-0.006	-0.006
0.8000	-0.003	-0.003
0.8166	-0.003	-0.006
0.8333	-0.003	-0.006
0.8500	-0.009	-0.006
0.8666	-0.009	-0.006
0.8833	-0.009	-0.006
.9000	-0.006	-0.006
9166	-0.006	-0.009
.9333	-0.009	-0.006
0.9500	-0.006	-0.009
0.9666	-0.006	-0.006
0.9833	-0.006	-0.006
1.0000	-0.009	-0.006
1.2000	-0.006	-0.006
1.4000	-0.006	-0.006
1.6000	-0.006	-0.006
1.8000	-0.009	-0.006
2.0000	-0.006	-0.006
2.2000	-0.003	-0.006
2.4000	-0.006	-0.006
2.6000	-0.006	-0.006
2.8000	0.000	0.000
3.0000	0.000	0.000
3.2000	0.003	0.000
3.4000	0.003	0.003
3.6000	0.006	0.003
3.8000	0.009	0.006
4.0000	0.009	0.006
4.2000	0.006	0.009
4.4000	0.012	0.012
4.6000	0.009	0.019
4.8000	0.015	0.015
5.0000	0.022	0.015
2000	0.022	0.019
000	0.025	0.019
.6000	0.022	0.025
5.8000	0.028	0.025
6.0000	0.031	0.025
6.2000	0.034	0.028
6.4000	0.031	0.028

6.6000	0.034	0.025
6.8000	0.034	0.031
7.0000	0.038	0.031
2000	0.034	0.034
.4000	0.044	0.038
7.6000	0.038	0.041
7.8000	0.044	0.041
8.0000	0.044	0.041
8.2000	0.047	0.044
8.4000	0.041	0.044
8.6000	0.050	0.044
8.8000	0.044	0.047
9.0000	0.044	0.047
9.2000	0.047	0.047
9.4000	0.053	0.047
9.6000	0.050	0.047
9.8000	0.057	0.050
10.0000	0.057	0.053
11.0000	0.060	0.057
12.0000	0.057	0.063
13.0000	0.063	0.063
14.0000	0.066	0.066
15.0000	0.072	0.072
16.0000	0.072	0.072
17.0000	0.076	0.076
18.0000	0.076	0.076
19.0000	0.076	0.079
20.0000	0.082	0.079
21.0000	0.079	0.082
22.0000	0.079	0.082
23.0000	0.082	0.085
24.0000	0.088	0.088
.0000	0.088	0.088
0000	0.085	0.088
.0000	0.088	0.088
28.0000	0.088	0.092
29.0000	0.095	0.095
30.0000	0.095	0.092
31.0000	0.095	0.095
32.0000	0.098	0.098
33.0000	0.095	0.095
34.0000	0.095	0.095
35.0000	0.101	0.101
36.0000	0.098	0.098
37.0000	0.098	0.101
38.0000	0.098	0.101
39.0000	0.098	0.101
40.0000	0.101	0.101
41.0000	0.092	0.095
42.0000	0.092	0.095
43.0000	0.088	0.092
44.0000	0.095	0.092
45.0000	0.082	0.088
46.0000	0.082	0.092
47.0000	0.088	0.088
48.0000	0.088	0.092

SE2000
Environmental Logger
02/22 11:03

Unit# 463 Test 1

Setups:	INPUT 1	INPUT 2
Type	Level (F)	Level (F)
Mode	TOC	TOC
I.D.	1	2
Reference	0.000	0.000
SG	1.000	1.000
Linearity	0.037	0.047
Scale factor	10.040	10.038
Offset	-0.062	0.049
Delay mSEC	50.000	50.000

Step 1 02/16 17:09:21

Elapsed Time	INPUT 1	INPUT 2
0.0000	0.085	0.092
0.0083	0.085	0.092
0.0166	0.085	0.092
0.0250	0.088	0.088
0.0333	0.088	0.095
0.0416	0.088	0.088
0.0500	0.092	0.092
0.0583	0.092	0.095
0.0666	0.085	0.092
.0750	0.082	0.095
0.0833	0.085	0.092
0.0916	0.088	0.092
0.1000	0.085	0.092
0.1083	0.085	0.095
0.1166	0.085	0.092
0.1250	0.092	0.095
0.1333	0.085	0.092
0.1416	0.088	0.095
0.1500	0.085	0.095
0.1583	0.101	0.098
0.1666	0.092	0.101
0.1750	0.088	0.095
0.1833	0.092	0.095
0.1916	0.092	0.092
0.2000	0.085	0.095
0.2083	0.095	0.095
0.2166	0.088	0.095
0.2250	0.085	0.095
0.2333	0.088	0.095
0.2416	0.088	0.095
0.2500	0.092	0.092
0.2583	0.092	0.098
0.2666	0.088	0.095
0.2750	0.095	0.088
0.2833	0.088	0.088
0.2916	0.082	0.098
.3000	0.088	0.085
0.3083	0.076	0.092
0.3166	0.079	0.092
0.3250	0.088	0.101
0.3333	0.085	0.098
0.3500	0.092	0.082

0.3666	0.088	0.085
0.3833	0.088	0.092
0.4000	0.092	0.092
4166	0.092	0.092
.4333	0.088	0.085
0.4500	0.088	0.101
0.4666	0.088	0.088
0.4833	0.085	0.095
0.5000	0.085	0.085
0.5166	0.085	0.095
0.5333	0.088	0.088
0.5500	0.085	0.095
0.5666	0.092	0.066
0.5833	0.092	0.092
0.6000	0.092	0.088
0.6166	0.085	0.098
0.6333	0.092	0.082
0.6500	0.085	0.104
0.6666	0.088	0.101
0.6833	0.085	0.104
0.7000	0.095	0.085
0.7166	0.085	0.085
0.7333	0.092	0.095
0.7500	0.088	0.092
0.7666	0.082	0.092
0.7833	0.088	0.092
0.8000	0.088	0.092
0.8166	0.088	0.092
0.8333	0.088	0.088
0.8500	0.085	0.092
0.8666	0.085	0.095
0.8833	0.088	0.092
0.9000	0.088	0.092
.9166	0.092	0.092
0.9333	0.088	0.088
0.9500	0.092	0.092
0.9666	0.085	0.092
0.9833	0.088	0.085
1.0000	0.085	0.098
1.2000	0.082	0.095
1.4000	0.082	0.101
1.6000	0.088	0.088
1.8000	0.088	0.076
2.0000	0.085	0.095
2.2000	0.082	0.088
2.4000	0.082	0.088
2.6000	0.079	0.088
2.8000	0.085	0.085
3.0000	0.082	0.092
3.2000	0.082	0.088
3.4000	0.088	0.092
3.6000	0.082	0.088
3.8000	0.085	0.095
4.0000	0.082	0.085
4.2000	0.082	0.098
4.4000	0.079	0.085
4.6000	0.085	0.082
4.8000	0.082	0.079
5.0000	0.079	0.085
5.2000	0.085	0.076
.4000	0.079	0.085
5.6000	0.092	0.082
5.8000	0.079	0.095
6.0000	0.085	0.079
6.2000	0.085	0.079
6.4000	0.085	0.082

6.6000	0.079	0.082
6.8000	0.082	0.079
7.0000	0.085	0.079
?000	0.082	0.079
+000	0.082	0.082
7.6000	0.082	0.079
7.8000	0.079	0.079
8.0000	0.076	0.079
8.2000	0.082	0.079
8.4000	0.082	0.088
8.6000	0.082	0.079
8.8000	0.079	0.079
9.0000	0.076	0.082
9.2000	0.082	0.079
9.4000	0.076	0.079
9.6000	0.072	0.082
9.8000	0.072	0.082
10.0000	0.076	0.079
11.0000	0.076	0.079
12.0000	0.079	0.082
13.0000	0.079	0.079
14.0000	0.076	0.079
15.0000	0.076	0.079
16.0000	0.072	0.079
17.0000	0.079	0.079
18.0000	0.072	0.076
19.0000	0.076	0.079
20.0000	0.076	0.076
21.0000	0.079	0.079
22.0000	0.076	0.079
23.0000	0.079	0.079
24.0000	0.072	0.076
[illegible].0000	0.076	0.079
0000	0.072	0.076
.0000	0.069	0.076
28.0000	0.079	0.079

SE2000
Environmental Logger
02/22 11:01

Unit# 463 Test 1

Setups:	INPUT 1	INPUT 2
Type	Level (F)	Level (F)
Mode	TOC	TOC
I.D.	1	2
Reference	0.000	0.000
SG	1.000	1.000
Linearity	0.037	0.047
Scale factor	10.040	10.038
Offset	-0.062	0.049
Delay mSEC	50.000	50.000

Step 2 02/16 17:37:30

Elapsed Time	INPUT 1	INPUT 2
0.0000	0.069	0.076
0.0083	0.076	0.076
0.0166	0.069	0.076
0.0250	0.069	0.076
0.0333	0.072	0.076
0.0416	0.079	0.076
0.0500	0.072	0.076
0.0583	0.072	0.076
.0666	0.079	0.079
0750	0.076	0.072
0.0833	0.076	0.072
0.0916	0.076	0.072
0.1000	0.076	0.076
0.1083	0.072	0.060
0.1166	0.072	0.079
0.1250	0.076	0.069
0.1333	0.072	0.069
0.1416	0.076	0.079
0.1500	0.076	0.069
0.1583	0.072	0.079
0.1666	0.076	0.072
0.1750	0.072	0.079
0.1833	0.076	0.079
0.1916	0.076	0.076
0.2000	0.076	0.072
0.2083	0.072	0.076
0.2166	0.072	0.076
0.2250	0.076	0.072
0.2333	0.079	0.076
0.2416	0.072	0.079
0.2500	0.072	0.079
0.2583	0.072	0.079
0.2666	0.072	0.079
0.2750	0.076	0.076
0.2833	0.076	0.079
2916	0.076	0.076
3000	0.076	0.076
0.3083	0.072	0.076
0.3166	0.072	0.079
0.3250	0.076	0.076
0.3333	0.076	0.076
0.3500	0.072	0.079

0.3666	0.079	0.076
0.3833	0.076	0.076
^ 4000	0.072	0.076
166	0.076	0.076
,333	0.076	0.076
0.4500	0.076	0.076
0.4666	0.072	0.076
0.4833	0.072	0.076
0.5000	0.072	0.076
0.5166	0.072	0.072
0.5333	0.076	0.076
0.5500	0.072	0.076
0.5666	0.072	0.076
0.5833	0.076	0.079
0.6000	0.076	0.072
0.6166	0.069	0.076
0.6333	0.072	0.079
0.6500	0.079	0.076
0.6666	0.072	0.079
0.6833	0.072	0.079
0.7000	0.076	0.076
0.7166	0.069	0.076
0.7333	0.072	0.072
0.7500	0.072	0.076
0.7666	0.072	0.072
0.7833	0.079	0.076
0.8000	0.076	0.076
0.8166	0.076	0.076
0.8333	0.069	0.076
0.8500	0.069	0.076
0.8666	0.076	0.076
0.8833	0.076	0.076
9000	0.069	0.076
?166	0.076	0.076
,.9333	0.076	0.076
0.9500	0.076	0.079
0.9666	0.079	0.076
0.9833	0.072	0.079
1.0000	0.076	0.076
1.2000	0.069	0.076
1.4000	0.076	0.076
1.6000	0.076	0.072
1.8000	0.069	0.072
2.0000	0.069	0.076
2.2000	0.069	0.072
2.4000	0.066	0.076
2.6000	0.072	0.072
2.8000	0.072	0.076
3.0000	0.069	0.072
3.2000	0.076	0.069
3.4000	0.069	0.072
3.6000	0.072	0.072
3.8000	0.066	0.072
4.0000	0.066	0.069
4.2000	0.066	0.069
4.4000	0.063	0.069
4.6000	0.063	0.069
4.8000	0.069	0.069
5.0000	0.063	0.069
2000	0.069	0.066
,000	0.063	0.066
,.6000	0.063	0.066
5.8000	0.060	0.066
6.0000	0.066	0.063
6.2000	0.060	0.066
6.4000	0.057	0.063

6.6000	0.057	0.063
6.8000	0.060	0.063
7.0000	0.057	0.063
.2000	0.063	0.063
.4000	0.060	0.063
7.6000	0.053	0.063
7.8000	0.053	0.060
8.0000	0.057	0.063
8.2000	0.060	0.060
8.4000	0.060	0.060
8.6000	0.060	0.060
8.8000	0.050	0.060
9.0000	0.053	0.060
9.2000	0.057	0.060
9.4000	0.060	0.057
9.6000	0.050	0.057
9.8000	0.060	0.057
10.0000	0.053	0.060
11.0000	0.053	0.057
12.0000	0.053	0.057
13.0000	0.050	0.053
14.0000	0.057	0.057
15.0000	0.057	0.057
16.0000	0.053	0.057
17.0000	0.050	0.057
18.0000	0.050	0.057
19.0000	0.053	0.057
20.0000	0.060	0.060
21.0000	0.060	0.060
22.0000	0.053	0.060
23.0000	0.060	0.060
24.0000	0.057	0.060

SE2000
Environmental Logger
02/22 10:53

Unit# 463 Test 2

Setups:	INPUT 1	INPUT 2
Type	Level (F)	Level (F)
Mode	TOC	TOC
I.D.	VW-22	VW-23
Reference	0.000	0.000
SG	1.000	1.000
Linearity	0.037	0.047
Scale factor	10.040	10.038
Offset	-0.062	-0.049
Delay mSEC	50.000	50.000

Step 0 02/17 08:19:30

Elapsed Time	INPUT 1	INPUT 2
0.0000	0.003	0.000
0.0083	0.000	-0.003
0.0166	0.000	-0.003
0.0250	0.000	-0.003
0.0333	0.000	-0.003
0.0416	0.000	-0.003
0.0500	0.000	0.000
0.0583	0.000	-0.003
0666	0.000	0.000
750	0.000	-0.003
.0833	0.000	0.000
0.0916	0.003	0.000
0.1000	0.000	0.000
0.1083	0.000	-0.003
0.1166	0.000	0.000
0.1250	0.000	0.000
0.1333	0.000	0.000
0.1416	0.003	0.000
0.1500	0.000	0.000
0.1583	0.003	0.000
0.1666	0.000	0.000
0.1750	0.003	0.000
0.1833	0.000	0.000
0.1916	0.000	0.000
0.2000	0.000	0.000
0.2083	0.000	0.000
0.2166	0.000	0.000
0.2250	0.003	0.000
0.2333	0.000	0.000
0.2416	0.000	0.000
0.2500	0.003	0.000
0.2583	0.000	0.000
0.2666	0.000	0.000
0.2750	0.003	0.000
0.2833	0.000	0.000
916	0.000	0.000
000	0.003	0.000
.3083	0.000	0.000
0.3166	0.003	0.000
0.3250	0.003	0.000
0.3333	0.000	0.000
0.3500	0.003	0.000

0.3666	0.000	0.000
0.3833	0.000	0.000
0.4000	0.000	0.000
4166	0.000	0.000
4333	0.000	0.000
0.4500	0.000	0.000
0.4666	0.000	0.000
0.4833	0.000	0.000
0.5000	0.000	0.000
0.5166	0.000	0.000
0.5333	0.000	0.000
0.5500	0.000	0.000
0.5666	0.000	0.000
0.5833	0.000	0.000
0.6000	0.000	0.000
0.6166	0.000	0.000
0.6333	0.000	0.000
0.6500	0.000	0.000
0.6666	0.000	0.000
0.6833	0.000	0.000
0.7000	0.000	0.000
0.7166	0.000	0.000
0.7333	0.000	0.000
0.7500	0.000	0.000
0.7666	0.000	0.000
0.7833	0.000	0.000
0.8000	0.000	0.000
0.8166	0.000	0.000
0.8333	0.000	0.000
0.8500	0.000	0.000
0.8666	0.000	0.000
0.8833	0.000	0.000
.9000	0.000	0.000
9166	0.000	0.000
.9333	0.000	0.000
0.9500	0.000	0.000
0.9666	0.000	0.003
0.9833	0.000	0.003
1.0000	0.000	0.003
1.2000	0.000	0.003
1.4000	0.000	0.003
1.6000	0.000	0.006
1.8000	0.000	0.009
2.0000	0.000	0.009
2.2000	0.000	0.012
2.4000	0.003	0.015
2.6000	0.003	0.015
2.8000	0.003	0.019
3.0000	0.003	0.019
3.2000	0.003	0.022
3.4000	0.006	0.022
3.6000	0.006	0.025
3.8000	0.006	0.028
4.0000	0.006	0.028
4.2000	0.006	0.031
4.4000	0.006	0.034
4.6000	0.009	0.034
4.8000	0.009	0.038
5.0000	0.009	0.041
2000	0.012	0.044
,000	0.012	0.047
.6000	0.012	0.047
5.8000	0.015	0.050
6.0000	0.015	0.053
6.2000	0.015	0.057
6.4000	0.019	0.060

6.6000	0.019	0.060
6.8000	0.019	0.063
7.0000	0.019	0.066
)000	0.019	0.066
,000	0.019	0.069
7.6000	0.022	0.072
7.8000	0.025	0.072
8.0000	0.025	0.076
8.2000	0.025	0.076
8.4000	0.025	0.079
8.6000	0.028	0.082
8.8000	0.028	0.082
9.0000	0.028	0.082
9.2000	0.031	0.085
9.4000	0.031	0.088
9.6000	0.034	0.088
9.8000	0.031	0.092
10.0000	0.034	0.092
11.0000	0.041	0.101
12.0000	0.044	0.107
13.0000	0.050	0.111
14.0000	0.053	0.117
15.0000	0.053	0.117
16.0000	0.053	0.120
17.0000	0.053	0.120
18.0000	0.057	0.123
19.0000	0.060	0.126
20.0000	0.066	0.133
21.0000	0.066	0.136
22.0000	0.069	0.136
23.0000	0.066	0.136
24.0000	0.069	0.136
0000	0.072	0.139
)000	0.072	0.142
.0000	0.072	0.142
28.0000	0.076	0.142
29.0000	0.076	0.145
30.0000	0.076	0.145
31.0000	0.079	0.145
32.0000	0.079	0.149
33.0000	0.085	0.149
34.0000	0.076	0.149
35.0000	0.079	0.145
36.0000	0.079	0.149
37.0000	0.079	0.149
38.0000	0.079	0.149
39.0000	0.079	0.149
40.0000	0.082	0.149
41.0000	0.079	0.149
42.0000	0.079	0.149
43.0000	0.076	0.145
44.0000	0.076	0.145
45.0000	0.079	0.145
46.0000	0.079	0.149
47.0000	0.079	0.145
48.0000	0.079	0.149
49.0000	0.076	0.145
50.0000	0.076	0.145
51.0000	0.076	0.145
0000	0.076	0.145
000	0.076	0.145
..0000	0.076	0.145
55.0000	0.076	0.145
56.0000	0.076	0.145
57.0000	0.076	0.145
58.0000	0.079	0.149

59.0000	0.076	0.149
60.0000	0.079	0.149
1.0000	0.079	0.149
0000	0.079	0.145
.0000	0.079	0.139
64.0000	0.076	0.149
65.0000	0.076	0.149
66.0000	0.079	0.152
67.0000	0.082	0.152
68.0000	0.082	0.152
69.0000	0.082	0.152
70.0000	0.079	0.152
71.0000	0.082	0.152
72.0000	0.082	0.152
73.0000	0.079	0.152
74.0000	0.079	0.152
75.0000	0.082	0.152
76.0000	0.079	0.152
77.0000	0.079	0.149
78.0000	0.079	0.152
79.0000	0.079	0.152
80.0000	0.082	0.152
81.0000	0.082	0.155
82.0000	0.092	0.158
83.0000	0.088	0.161
84.0000	0.088	0.158
85.0000	0.085	0.158
86.0000	0.085	0.158
87.0000	0.088	0.161
88.0000	0.092	0.165
89.0000	0.095	0.168
90.0000	0.092	0.161
.0000	0.085	0.158
0000	0.088	0.161
3.0000	0.088	0.158
94.0000	0.088	0.161
95.0000	0.085	0.158
96.0000	0.085	0.158
97.0000	0.085	0.158
98.0000	0.085	0.158
99.0000	0.085	0.158
100.000	0.082	0.155
101.000	0.082	0.155
102.000	0.082	0.155
103.000	0.082	0.152
104.000	0.082	0.155
105.000	0.082	0.155
106.000	0.082	0.155
107.000	0.082	0.155
108.000	0.076	0.152
109.000	0.076	0.152
110.000	0.079	0.149
111.000	0.079	0.152
112.000	0.079	0.152
113.000	0.079	0.149
114.000	0.076	0.145
115.000	0.079	0.149
116.000	0.076	0.145
117.000	0.072	0.142
.000	0.072	0.142
.000	0.069	0.139
120.000	0.066	0.136
121.000	0.066	0.139
122.000	0.066	0.136
123.000	0.066	0.136
124.000	0.066	0.133

125.000	0.063	0.126
126.000	0.063	0.130
127.000	0.063	0.136
.000	0.060	0.133
129.000	0.060	0.133
130.000	0.063	0.130
131.000	0.057	0.130
132.000	0.057	0.130
133.000	0.057	0.130
134.000	0.063	0.133
135.000	0.063	0.133
136.000	0.063	0.133
137.000	0.060	0.130
138.000	0.060	0.133
139.000	0.063	0.136
140.000	0.069	0.139
141.000	0.066	0.139
142.000	0.066	0.136
143.000	0.063	0.133
144.000	0.063	0.133
145.000	0.066	0.136
146.000	0.066	0.133
147.000	0.063	0.133
148.000	0.063	0.133
149.000	0.063	0.136
150.000	0.063	0.133
151.000	0.063	0.133
152.000	0.060	0.130
153.000	0.060	0.130
154.000	0.066	0.133
155.000	0.060	0.130
156.000	0.057	0.126
157.000	0.060	0.130
.000	0.053	0.120
159.000	0.053	0.123
160.000	0.060	0.130
161.000	0.063	0.130
162.000	0.060	0.130
163.000	0.057	0.130
164.000	0.063	0.130
165.000	0.057	0.123
166.000	0.050	0.120
167.000	0.053	0.120
168.000	0.053	0.123
169.000	0.053	0.123
170.000	0.053	0.123
171.000	0.050	0.120
172.000	0.057	0.120
173.000	0.053	0.123
174.000	0.057	0.123
175.000	0.053	0.117
176.000	0.057	0.126
177.000	0.057	0.123
178.000	0.057	0.123
179.000	0.053	0.123
180.000	0.053	0.120
181.000	0.047	0.117
182.000	0.047	0.117
183.000	0.050	0.117
.000	0.044	0.111
.000	0.047	0.114
186.000	0.047	0.114
187.000	0.044	0.107
188.000	0.047	0.114
189.000	0.050	0.114
190.000	0.050	0.117

191.000	0.047	0.114
192.000	0.041	0.107
193.000	0.044	0.111
.000	0.044	0.111
.000	0.050	0.114
196.000	0.044	0.111
197.000	0.044	0.111
198.000	0.041	0.107
199.000	0.038	0.104
200.000	0.041	0.107
201.000	0.044	0.107
202.000	0.038	0.104
203.000	0.044	0.107
204.000	0.038	0.104
205.000	0.034	0.098
206.000	0.038	0.104
207.000	0.041	0.107
208.000	0.041	0.107
209.000	0.038	0.104
210.000	0.038	0.101
211.000	0.044	0.107
212.000	0.041	0.107
213.000	0.041	0.104
214.000	0.038	0.104
215.000	0.038	0.101
216.000	0.038	0.101
217.000	0.041	0.104
218.000	0.041	0.104
219.000	0.041	0.101
220.000	0.038	0.104
221.000	0.041	0.104
222.000	0.038	0.101
3.000	0.041	0.104
.000	0.041	0.104
25.000	0.034	0.098
226.000	0.034	0.098
227.000	0.031	0.098
228.000	0.031	0.092
229.000	0.031	0.095
230.000	0.031	0.095
231.000	0.031	0.095
232.000	0.034	0.095
233.000	0.025	0.092
234.000	0.025	0.092
235.000	0.025	0.088
236.000	0.031	0.092
237.000	0.028	0.092
238.000	0.025	0.092
239.000	0.025	0.088
240.000	0.022	0.088
241.000	0.019	0.079
242.000	0.019	0.082
243.000	0.019	0.085
244.000	0.019	0.082
245.000	0.025	0.088
246.000	0.019	0.082
247.000	0.019	0.079
248.000	0.019	0.082
249.000	0.022	0.082
.000	0.019	0.082
.000	0.022	0.085
2.000	0.015	0.079
253.000	0.015	0.076
254.000	0.015	0.076
255.000	0.019	0.082
256.000	0.012	0.076

257.000	0.015	0.076
258.000	0.015	0.076
259.000	0.015	0.076
.000	0.012	0.069
.000	0.009	0.072
262.000	0.009	0.072
263.000	0.009	0.069
264.000	-0.003	0.060
265.000	-0.003	0.057
266.000	-0.006	0.057
267.000	-0.003	0.057
268.000	-0.009	0.050
269.000	-0.009	0.050
270.000	0.000	0.057
271.000	-0.003	0.057
272.000	-0.012	0.050
273.000	-0.012	0.047
274.000	-0.009	0.047
275.000	-0.009	0.047
276.000	-0.009	0.047
277.000	0.000	0.063
278.000	0.000	0.057
279.000	-0.009	0.050
280.000	-0.015	0.041
281.000	-0.015	0.044
282.000	-0.015	0.044
283.000	-0.012	0.044
284.000	-0.009	0.047
285.000	-0.012	0.047
286.000	-0.012	0.044
287.000	-0.012	0.044
288.000	-0.012	0.044
9.000	-0.012	0.044
.000	-0.012	0.044
1.000	-0.019	0.041
292.000	-0.015	0.041
293.000	-0.012	0.041
294.000	-0.009	0.047
295.000	-0.009	0.044
296.000	-0.009	0.044
297.000	-0.006	0.047
298.000	-0.012	0.044
299.000	-0.009	0.047
300.000	-0.012	0.044
301.000	-0.012	0.041
302.000	-0.009	0.044
303.000	-0.015	0.038
304.000	-0.009	0.044
305.000	-0.009	0.047
306.000	-0.009	0.047
307.000	-0.019	0.041
308.000	-0.012	0.044
309.000	-0.009	0.044
310.000	-0.012	0.041
311.000	-0.015	0.041
312.000	-0.015	0.041
313.000	-0.015	0.041
314.000	-0.015	0.041
315.000	-0.015	0.041
.000	-0.009	0.044
.000	-0.012	0.041
8.000	-0.012	0.044
319.000	-0.012	0.044
320.000	-0.009	0.047
321.000	-0.012	0.041
322.000	-0.015	0.041

323.000	-0.015	0.038
324.000	-0.015	0.038
325.000	-0.015	0.038
5.000	-0.012	0.041
7.000	-0.015	0.038
328.000	-0.019	0.038
329.000	-0.025	0.028
330.000	-0.025	0.031
331.000	-0.025	0.028
332.000	-0.022	0.031
333.000	-0.025	0.031
334.000	-0.022	0.031
335.000	-0.025	0.028
336.000	-0.025	0.028
337.000	-0.025	0.028
338.000	-0.028	0.025
339.000	-0.022	0.031
340.000	-0.022	0.028
341.000	-0.031	0.025
342.000	-0.028	0.025
343.000	-0.025	0.028
344.000	-0.028	0.025
345.000	-0.028	0.022
346.000	-0.028	0.019
347.000	-0.031	0.022
348.000	-0.031	0.019
349.000	-0.034	0.015
350.000	-0.031	0.019
351.000	-0.031	0.019
352.000	-0.034	0.019
353.000	-0.038	0.012
354.000	-0.031	0.022
55.000	-0.034	0.019
6.000	-0.038	0.012
57.000	-0.041	0.012
358.000	-0.047	0.006
359.000	-0.044	0.009
360.000	-0.044	0.006
361.000	-0.041	0.006
362.000	-0.044	0.006
363.000	-0.044	0.009
364.000	-0.047	0.003
365.000	-0.050	0.003
366.000	-0.050	0.006
367.000	-0.050	0.000
368.000	-0.047	0.003
369.000	-0.041	0.012
370.000	-0.044	0.009
371.000	-0.050	0.003
372.000	-0.050	-0.003
373.000	-0.053	0.000
374.000	-0.050	0.000
375.000	-0.047	0.000
376.000	-0.050	0.000
377.000	-0.047	0.003
378.000	-0.050	0.000
379.000	-0.053	-0.006
380.000	-0.053	-0.003
381.000	-0.050	-0.003
2.000	-0.050	0.000
.000	-0.047	0.000
4.000	-0.050	-0.006

SE2000
Environmental Logger
02/22 10:50

Unit# 463 Test 2

Setups:	INPUT 1	INPUT 2
Type	Level (F)	Level (F)
Mode	TOC	TOC
I.D.	VW-22	VW-23
Reference	0.000	0.000
SG	1.000	1.000
Linearity	0.037	0.047
Scale factor	10.040	10.038
Offset	-0.062	-0.049
Delay mSEC	50.000	50.000

Step 1 02/17 14:43:41

Elapsed Time	INPUT 1	INPUT 2
0.0000	-0.053	-0.006
0.0083	-0.053	-0.006
0.0166	-0.053	-0.003
0.0250	-0.053	-0.006
0.0333	-0.053	-0.003
0.0416	-0.053	-0.006
0.0500	-0.053	-0.006
0.0583	-0.053	-0.006
` 0666	-0.053	-0.006
)750	-0.053	-0.003
.0833	-0.053	-0.003
0.0916	-0.050	-0.006
0.1000	-0.053	-0.003
0.1083	-0.053	-0.006
0.1166	-0.053	-0.003
0.1250	-0.053	-0.006
0.1333	-0.053	-0.003
0.1416	-0.050	-0.003
0.1500	-0.053	-0.006
0.1583	-0.053	-0.006
0.1666	-0.053	-0.006
0.1750	-0.053	-0.006
0.1833	-0.053	-0.006
0.1916	-0.053	-0.006
0.2000	-0.053	-0.006
0.2083	-0.053	-0.006
0.2166	-0.053	-0.006
0.2250	-0.053	-0.006
0.2333	-0.053	-0.003
0.2416	-0.053	-0.006
0.2500	-0.053	-0.003
0.2583	-0.053	-0.006
0.2666	-0.053	-0.006
0.2750	-0.053	-0.006
0.2833	-0.053	-0.006
2916	-0.053	-0.006
000	-0.053	-0.006
.3083	-0.053	-0.006
0.3166	-0.053	-0.003
0.3250	-0.053	-0.006
0.3333	-0.053	-0.006
0.3500	-0.053	-0.006

0.3666	-0.053	-0.006
0.3833	-0.053	-0.006
0.4000	-0.053	-0.006
4166	-0.053	-0.006
.4333	-0.053	-0.006
0.4500	-0.053	-0.003
0.4666	-0.053	-0.006
0.4833	-0.053	-0.006
0.5000	-0.053	-0.006
0.5166	-0.053	-0.006
0.5333	-0.053	-0.006
0.5500	-0.053	-0.006
0.5666	-0.053	-0.003
0.5833	-0.053	-0.006
0.6000	-0.053	-0.006
0.6166	-0.053	-0.003
0.6333	-0.053	-0.003
0.6500	-0.050	-0.006
0.6666	-0.053	-0.006
0.6833	-0.053	-0.006
0.7000	-0.053	-0.003
0.7166	-0.053	-0.003
0.7333	-0.053	-0.006
0.7500	-0.053	-0.006
0.7666	-0.053	-0.006
0.7833	-0.053	-0.006
0.8000	-0.053	-0.003
0.8166	-0.050	-0.003
0.8333	-0.053	-0.006
0.8500	-0.053	-0.006
0.8666	-0.053	-0.006
0.8833	-0.053	-0.006
.9000	-0.053	-0.003
9166	-0.053	-0.006
.9333	-0.053	-0.006
0.9500	-0.053	-0.006
0.9666	-0.053	-0.006
0.9833	-0.053	-0.006
1.0000	-0.053	-0.006
1.2000	-0.053	-0.006
1.4000	-0.050	-0.006
1.6000	-0.050	-0.006
1.8000	-0.050	-0.006
2.0000	-0.050	-0.006
2.2000	-0.050	-0.009
2.4000	-0.050	-0.009
2.6000	-0.050	-0.009
2.8000	-0.050	-0.015
3.0000	-0.050	-0.015
3.2000	-0.053	-0.019
3.4000	-0.057	-0.022
3.6000	-0.053	-0.025
3.8000	-0.053	-0.025
4.0000	-0.053	-0.028
4.2000	-0.053	-0.028
4.4000	-0.057	-0.028
4.6000	-0.053	-0.031
4.8000	-0.053	-0.034
5.0000	-0.057	-0.038
2000	-0.057	-0.038
,000	-0.057	-0.041
.6000	-0.060	-0.044
5.8000	-0.060	-0.044
6.0000	-0.060	-0.047
6.2000	-0.060	-0.047
6.4000	-0.060	-0.047

6.6000	-0.060	-0.050
6.8000	-0.066	-0.053
7.0000	-0.066	-0.057
[illegible]000	-0.066	-0.057
[illegible]4000	-0.066	-0.060
7.6000	-0.066	-0.060
7.8000	-0.066	-0.060
8.0000	-0.066	-0.060
8.2000	-0.069	-0.063
8.4000	-0.069	-0.063
8.6000	-0.066	-0.063
8.8000	-0.069	-0.066
9.0000	-0.069	-0.066
9.2000	-0.069	-0.066
9.4000	-0.072	-0.069
9.6000	-0.072	-0.072
9.8000	-0.076	-0.072
10.0000	-0.072	-0.072
11.0000	-0.072	-0.076
12.0000	-0.076	-0.079
13.0000	-0.079	-0.082
14.0000	-0.082	-0.085
15.0000	-0.079	-0.085
16.0000	-0.079	-0.085
17.0000	-0.082	-0.092
18.0000	-0.082	-0.092
19.0000	-0.085	-0.095
20.0000	-0.085	-0.095
21.0000	-0.088	-0.101
22.0000	-0.095	-0.107
23.0000	-0.092	-0.101
24.0000	-0.098	-0.107
[illegible]0000	-0.101	-0.107
[illegible]0000	-0.101	-0.111
[illegible].0000	-0.098	-0.107
28.0000	-0.095	-0.111
29.0000	-0.098	-0.111
30.0000	-0.101	-0.111
31.0000	-0.098	-0.111
32.0000	-0.095	-0.107
33.0000	-0.098	-0.114

SE2000
Environmental Logger
02/22 10:47

Unit# 463 Test 3

Setups:	INPUT 1	INPUT 2
Type	Level (F)	Level (F)
Mode	TOC	TOC
I.D.	VW-22	VW-23
Reference	0.000	0.000
SG	1.000	1.000
Linearity	0.037	0.047
Scale factor	10.040	10.038
Offset	-0.062	-0.049
Delay mSEC	50.000	50.000

Step 0 02/17 15:32:14

Elapsed Time	INPUT 1	INPUT 2
0.0000	-0.003	-0.003
0.0083	-0.003	-0.003
0.0166	-0.003	-0.003
0.0250	-0.003	-0.003
0.0333	-0.003	-0.003
0.0416	-0.003	-0.003
0.0500	-0.003	-0.003
0.0583	-0.006	-0.003
0.0666	-0.003	-0.003
0.0750	-0.003	-0.003
0.0833	-0.003	-0.003
0.0916	-0.003	-0.003
0.1000	-0.003	-0.003
0.1083	-0.003	-0.003
0.1166	-0.003	-0.003
0.1250	-0.003	-0.003
0.1333	-0.003	-0.003
0.1416	-0.003	0.000
0.1500	-0.003	-0.003
0.1583	-0.003	-0.003
0.1666	-0.006	-0.003
0.1750	-0.006	-0.003
0.1833	-0.003	-0.003
0.1916	-0.006	-0.003
0.2000	-0.006	-0.003
0.2083	-0.006	-0.003
0.2166	-0.003	-0.003
0.2250	-0.006	-0.003
0.2333	-0.006	-0.003
0.2416	-0.003	-0.003
0.2500	-0.006	-0.003
0.2583	-0.006	-0.003
0.2666	-0.006	-0.003
0.2750	-0.006	0.000
0.2833	-0.006	-0.003
0.2916	-0.003	-0.003
0.3000	-0.006	-0.003
0.3083	-0.006	0.000
0.3166	-0.006	-0.003
0.3250	-0.006	0.000
0.3333	-0.003	-0.003
0.3500	-0.003	0.000

0.3666	-0.003	0.000
0.3833	-0.006	-0.003
0.4000	-0.006	0.000
0.4166	-0.003	0.000
0.4333	-0.003	-0.003
0.4500	-0.003	0.000
0.4666	-0.003	0.000
0.4833	-0.003	0.000
0.5000	-0.003	0.000
0.5166	-0.003	0.000
0.5333	-0.003	0.000
0.5500	-0.003	0.000
0.5666	-0.003	0.000
0.5833	-0.003	0.000
0.6000	-0.006	0.000
0.6166	-0.003	0.000
0.6333	-0.003	0.000
0.6500	-0.003	0.000
0.6666	-0.003	0.000
0.6833	-0.003	0.000
0.7000	-0.006	0.000
0.7166	-0.003	0.000
0.7333	-0.006	0.000
0.7500	-0.003	0.000
0.7666	-0.003	0.000
0.7833	-0.003	0.000
0.8000	-0.003	0.000
0.8166	-0.003	0.000
0.8333	-0.003	0.000
0.8500	-0.003	0.003
0.8666	-0.003	0.000
0.8833	-0.003	0.003
0.9000	-0.003	0.000
0.9166	-0.003	0.000
0.9333	-0.003	0.000
0.9500	-0.006	0.000
0.9666	-0.003	0.000
0.9833	-0.003	0.003
1.0000	-0.006	0.003
1.2000	-0.006	0.000
1.4000	-0.006	0.003
1.6000	-0.006	0.003
1.8000	-0.006	0.003
2.0000	-0.006	0.006
2.2000	-0.006	0.006
2.4000	-0.006	0.009
2.6000	-0.006	0.009
2.8000	-0.006	0.009
3.0000	-0.003	0.012
3.2000	-0.003	0.012
3.4000	-0.006	0.015
3.6000	-0.006	0.015
3.8000	-0.006	0.015
4.0000	-0.006	0.019
4.2000	-0.006	0.019
4.4000	-0.003	0.022
4.6000	-0.003	0.022
4.8000	-0.003	0.025
5.0000	-0.003	0.025
5.2000	0.000	0.028
5.4000	-0.003	0.028
5.6000	0.000	0.028
5.8000	0.000	0.028
6.0000	0.000	0.031
6.2000	0.003	0.034
6.4000	0.003	0.034

6.6000	0.003	0.034
6.8000	0.003	0.034
7 0000	0.000	0.034
000	0.000	0.034
.000	0.000	0.034
7.6000	0.000	0.034
7.8000	0.006	0.038
8.0000	0.003	0.041
8.2000	0.003	0.044
8.4000	0.006	0.041
8.6000	0.006	0.044
8.8000	0.006	0.044
9.0000	0.006	0.044
9.2000	0.006	0.044
9.4000	0.006	0.047
9.6000	0.006	0.044
9.8000	0.009	0.047
10.0000	0.009	0.047
11.0000	0.006	0.050
12.0000	0.009	0.050
13.0000	0.019	0.060
14.0000	0.019	0.063
15.0000	0.022	0.063
16.0000	0.025	0.066
17.0000	0.028	0.072
18.0000	0.025	0.072
19.0000	0.025	0.072
20.0000	0.031	0.072
21.0000	0.031	0.076
22.0000	0.028	0.072
23.0000	0.028	0.072
24.0000	0.028	0.076
0000	0.031	0.076
0000	0.031	0.072
..0000	0.028	0.076
28.0000	0.031	0.079
29.0000	0.031	0.079
30.0000	0.034	0.079
31.0000	0.031	0.079
32.0000	0.028	0.076
33.0000	0.034	0.082
34.0000	0.038	0.082
35.0000	0.038	0.082
36.0000	0.034	0.082
37.0000	0.034	0.082
38.0000	0.034	0.082
39.0000	0.038	0.082
40.0000	0.034	0.082
41.0000	0.038	0.085
42.0000	0.038	0.085
43.0000	0.041	0.088
44.0000	0.041	0.092
45.0000	0.038	0.085
46.0000	0.041	0.088
47.0000	0.044	0.092
48.0000	0.044	0.092
49.0000	0.044	0.092
50.0000	0.044	0.088
51.0000	0.041	0.088
0000	0.041	0.088
0000	0.044	0.092
.4.0000	0.044	0.092
55.0000	0.044	0.092
56.0000	0.047	0.092
57.0000	0.047	0.095
58.0000	0.044	0.095

59.0000	0.047	0.095
60.0000	0.047	0.095

SE2000
Environmental Logger
02/22 10:23

Unit# 463 Test 3

Setups:	INPUT 1	INPUT 2
Type	Level (F)	Level (F)
Mode	TOC	TOC
I.D.	VW-22	VW-23
Reference	0.000	0.000
SG	1.000	1.000
Linearity	0.037	0.047
Scale factor	10.040	10.038
Offset	-0.062	-0.049
Delay mSEC	50.000	50.000

Step 1 02/17 16:32:26

Elapsed Time	INPUT 1	INPUT 2
0.0000	0.047	0.095
0.0083	0.044	0.092
0.0166	0.044	0.092
0.0250	0.044	0.092
0.0333	0.047	0.095
0.0416	0.044	0.095
0.0500	0.047	0.095
0.0583	0.047	0.095
.0666	0.044	0.092
.0750	0.047	0.095
0.0833	0.044	0.092
0.0916	0.047	0.095
0.1000	0.047	0.095
0.1083	0.044	0.095
0.1166	0.047	0.095
0.1250	0.047	0.095
0.1333	0.047	0.095
0.1416	0.047	0.095
0.1500	0.047	0.095
0.1583	0.047	0.095
0.1666	0.047	0.095
0.1750	0.047	0.095
0.1833	0.047	0.095
0.1916	0.047	0.095
0.2000	0.044	0.095
0.2083	0.044	0.095
0.2166	0.047	0.092
0.2250	0.044	0.095
0.2333	0.047	0.095
0.2416	0.047	0.095
0.2500	0.047	0.095
0.2583	0.047	0.095
0.2666	0.047	0.095
0.2750	0.047	0.095
0.2833	0.047	0.095
.2916	0.047	0.095
.3000	0.047	0.095
0.3083	0.047	0.095
0.3166	0.047	0.095
0.3250	0.047	0.095
0.3333	0.047	0.095
0.3500	0.044	0.095

0.3666	0.047	0.095
0.3833	0.047	0.095
0.4000	0.047	0.095
[illegible]166	0.047	0.095
[illegible]4333	0.047	0.095
0.4500	0.047	0.095
0.4666	0.047	0.095
0.4833	0.047	0.095
0.5000	0.047	0.095
0.5166	0.047	0.095
0.5333	0.047	0.095
0.5500	0.047	0.095
0.5666	0.047	0.095
0.5833	0.047	0.095
0.6000	0.047	0.095
0.6166	0.047	0.095
0.6333	0.047	0.095
0.6500	0.047	0.095
0.6666	0.047	0.095
0.6833	0.047	0.095
0.7000	0.047	0.095
0.7166	0.047	0.095
0.7333	0.047	0.095
0.7500	0.047	0.095
0.7666	0.047	0.095
0.7833	0.047	0.095
0.8000	0.047	0.095
0.8166	0.047	0.095
0.8333	0.047	0.095
0.8500	0.047	0.095
0.8666	0.047	0.095
0.8833	0.047	0.095
[illegible].9000	0.047	0.095
[illegible]9166	0.047	0.095
[illegible].9333	0.047	0.095
0.9500	0.047	0.095
0.9666	0.047	0.095
0.9833	0.047	0.095
1.0000	0.047	0.095
1.2000	0.047	0.095
1.4000	0.047	0.095
1.6000	0.047	0.095
1.8000	0.047	0.095
2.0000	0.047	0.095
2.2000	0.047	0.092
2.4000	0.047	0.092
2.6000	0.047	0.092
2.8000	0.047	0.092
3.0000	0.047	0.092
3.2000	0.047	0.092
3.4000	0.047	0.092
3.6000	0.047	0.092
3.8000	0.047	0.092
4.0000	0.047	0.092
4.2000	0.047	0.092
4.4000	0.047	0.092
4.6000	0.047	0.092
4.8000	0.047	0.092
5.0000	0.047	0.092
[illegible]2000	0.047	0.092
[illegible]4000	0.047	0.092
[illegible].6000	0.047	0.092
5.8000	0.047	0.092
6.0000	0.047	0.092
6.2000	0.047	0.092
6.4000	0.047	0.092

6.6000	0.047	0.092
6.8000	0.047	0.092
0000	0.050	0.092
000	0.050	0.092
.4000	0.050	0.092
7.6000	0.050	0.092
7.8000	0.053	0.092
8.0000	0.050	0.092
8.2000	0.053	0.092
8.4000	0.050	0.092
8.6000	0.050	0.092
8.8000	0.050	0.092
9.0000	0.050	0.092
9.2000	0.050	0.092
9.4000	0.050	0.092
9.6000	0.053	0.092
9.8000	0.053	0.092
10.0000	0.053	0.092
11.0000	0.057	0.095
12.0000	0.053	0.095
13.0000	0.050	0.092
14.0000	0.053	0.092
15.0000	0.053	0.092
16.0000	0.053	0.092
17.0000	0.053	0.088
18.0000	0.053	0.088
19.0000	0.053	0.088
20.0000	0.053	0.088
21.0000	0.053	0.088
22.0000	0.053	0.088
23.0000	0.053	0.088
24.0000	0.053	0.092
0000	0.053	0.092
.0000	0.057	0.092
27.0000	0.053	0.092
28.0000	0.057	0.092
29.0000	0.057	0.092
30.0000	0.057	0.092
31.0000	0.057	0.095
32.0000	0.057	0.092
33.0000	0.057	0.092
34.0000	0.057	0.092
35.0000	0.057	0.092
36.0000	0.053	0.092
37.0000	0.053	0.092
38.0000	0.057	0.092

RESTART AT: 02/16/92 08:49:16 (02/10/92 12:31:30) S5255 V2.21 .
MANUFACTURED BY V.R.SYSTEMS INC. MODEL V3 S/N 34
OWNER

02/16/92 08:49:19 UNIT 34

101	102	103	104	105	106	107	108	109
G HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5362.	-2.	56.6	55.0	22.4	12.4	15.2	60.1	0.675

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
0.00	705	156	0.3	9.0	13.4	-0.3	-9.7

Start Extraction MW-3

02/16/92 10:46:05 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5364.	1709.	121.6	158.5	85.7	13.6	5.6	742.6	0.610

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
2.07	705	254	62.3	9.0	46.7	-0.4	-27.6

02/16/92 10:46:28 UNIT 34

101	102	103	104	105	106	107	108	109

ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5364.	1349.	122.9	159.5	85.4	13.7	10.3	748.6	0.609

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.80	705	254	57.3	9.0	46.2	-0.4	-26.2

02/16/92 10:47:01 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5364.	1699.	122.5	158.6	83.1	13.8	17.1	905.4	0.614

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.43	705	255	51.5	9.2	43.5	-0.4	-24.3

MANUFACTURED BY V.R.SYSTEMS INC. MODEL V3 S/N 34
OWNER

02/16/92 10:49:03 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5364.	1728.	121.6	158.3	87.8	13.6	23.2	1051.9	0.616

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.57	705	258	66.8	9.0	43.1	14.0	-30.1

2/16/92 10:50:06 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5364.	1729.	120.7	157.6	80.8	13.7	33.6	1238.4	0.617

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.61	705	260	75.8	9.0	41.7	28.4	-34.3

02/16/92 10:50:53 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5364.	1726.	120.2	156.8	80.4	13.7	38.8	1282.5	0.616

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.66	705	261	77.3	9.0	41.8	38.3	-35.2

02/16/92 10:51:48 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5364.	1736.	119.6	156.8	86.4	13.7	42.2	1298.9	0.617

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.73	705	263	78.7	9.0	38.1	49.9	-36.1

02/16/92 10:52:03 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5364.	1732.	119.5	157.1	83.3	13.6	43.2	1305.2	0.617

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.73	705	263	77.9	9.0	31.6	50.4	-36.1

MANUFACTURED BY V.R.SYSTEMS INC. MODEL V3 S/N 34
OWNER

02/16/92 10:54:08 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5364.	1793.	118.9	156.4	82.8	13.6	44.1	1271.5	0.619

110	111	112	113	114	115	116	201
G-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.83	705	267	76.7	9.0	41.5	50.4	-36.2

02/16/92 11:06:33 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5364.	1794.	117.9	156.0	85.0	13.6	43.7	1274.5	0.620

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.82	705	291	77.7	17.0	50.6	50.4	-37.1

16/92 11:10:10 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5364.	1802.	116.0	156.5	87.4	13.7	43.7	1276.0	0.619

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.81	705	297	77.5	11.5	36.4	50.4	-36.9

02/16/92 11:17:04 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5364.	1876.	117.6	156.1	82.3	13.7	47.3	1244.3	0.622

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.88	705	311	76.9	30.6	38.9	50.4	-36.8

02/16/92 11:26:11 UNIT 34

101	102	103	104	105	106	107	108	109
G HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
364.	1865.	117.4	155.9	80.6	13.6	47.4	1242.8	0.622

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.89	705	328	75.5	13.4	36.2	50.4	-36.5

MANUFACTURED BY V.R.SYSTEMS INC. MODEL V3 S/N 34
OWNER

02/16/92 11:48:34 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5365.	1850.	117.0	156.3	80.4	13.7	46.6	1244.3	0.620

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC

02/16/92 11:52:53 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
365.	1861.	116.4	156.7	86.8	13.6	47.2	1242.7	0.623

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.88	705	380	76.5	29.9	41.3	50.3	-36.6

02/16/92 11:55:55 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5365.	1852.	114.9	156.8	79.7	13.6	47.3	1242.1	0.622

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.89	705	386	76.7	31.5	43.7	50.3	-36.7

02/16/92 12:02:20 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5365.	1891.	113.9	157.1	85.9	13.7	47.1	1248.1	0.620

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.87	705	398	76.2	32.0	44.7	50.3	-36.8

/16/92 12:21:10 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5365.	1875.	119.8	155.4	82.5	13.7	46.9	1245.1	0.618

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.83	705	434	76.1	25.1	39.5	50.3	-36.7

MANUFACTURED BY V.R.SYSTEMS INC. MODEL V3 S/N 34
OWNER

02/16/92 12:25:37 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5365.	1848.	119.1	156.5	80.0	13.6	47.3	1240.4	0.622

110	111	112	113	114	115	116	201

LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.87	705	443	75.9	23.0	27.7	50.3	-36.6

02/16/92 12:33:25 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5365.	1865.	119.8	156.2	85.6	13.6	48.0	1242.8	0.623

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.89	705	458	77.0	32.0	46.8	50.3	-36.5

02/16/92 12:48:30 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5366.	1873.	118.8	157.0	86.8	13.6	46.8	1233.9	0.620

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.87	705	487	76.6	25.6	37.5	50.3	-36.7

02/16/92 12:55:19 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5366.	1888.	119.3	156.0	84.7	13.6	46.9	1242.2	0.622

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.86	705	500	76.9	32.0	48.9	50.3	-36.7

02/16/92 13:04:32 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5366.	1879.	120.5	156.9	80.8	13.7	47.0	1240.6	0.622

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.88	705	518	75.1	23.7	45.2	50.3	-37.0

MANUFACTURED BY V.R.SYSTEMS INC. MODEL V3 S/N 34
OWNER

02/16/92 13:06:22 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5366.	1876.	121.0	156.6	85.0	13.7	46.5	1243.3	0.623

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.86	705	521	74.6	20.5	47.6	50.3	-36.8

02/16/92 13:18:15 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5366.	1871.	120.0	156.6	80.6	13.7	46.0	1243.7	0.619

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.83	705	544	75.1	11.3	37.3	50.3	-36.8

02/16/92 13:25:01 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5366.	1863.	119.3	156.7	87.5	13.6	46.6	1235.8	0.624

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.85	705	557	77.1	32.0	47.9	50.2	-36.9

02/16/92 13:32:20 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5366.	1880.	120.4	157.2	86.9	13.7	46.6	1224.1	0.623

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.90	705	571	76.6	32.0	34.9	50.2	-36.9

02/16/92 13:46:16 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5367.	1873.	123.0	158.4	83.8	13.7	46.1	1240.0	0.621

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.84	705	598	75.7	26.0	49.3	50.2	-37.0

MANUFACTURED BY V.R.SYSTEMS INC. MODEL V3 S/N 34
OWNER

02/16/92 13:54:43 UNIT 34

ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5367.	1879.	123.6	159.8	86.8	13.6	45.3	1236.3	0.620

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
.85	705	614	77.2	27.2	37.4	50.2	-37.2

02/16/92 13:59:20 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5367.	1870.	119.0	158.2	83.6	13.6	45.8	1235.9	0.621

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.89	705	623	76.9	32.0	48.0	50.2	-36.9

02/16/92 14:13:57 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5367.	1860.	121.7	157.2	80.9	13.8	45.8	1237.1	0.620

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.85	705	651	76.8	26.8	32.3	50.2	-36.8

02/16/92 14:22:55 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5367.	1866.	119.1	157.2	81.1	13.7	46.1	1235.0	0.621

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.86	705	668	74.5	17.3	44.8	50.2	-36.7

02/16/92 14:23:22 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5367.	1870.	119.9	156.4	80.3	13.7	46.0	1238.1	0.622

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.85	705	669	74.1	14.3	46.1	50.2	-36.5

02/16/92 14:24:24 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5367.	1890.	120.3	156.7	80.6	13.7	46.6	1234.8	0.620

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.85	705	671	76.7	32.0	44.8	50.2	-36.9

02/16/92 14:33:53 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5367.	1859.	119.3	156.7	84.7	13.7	46.5	1241.1	0.620

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.85	705	689	76.3	25.3	31.3	50.2	-36.7

02/16/92 14:47:20 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5368.	1857.	119.2	157.0	82.0	13.8	46.7	1232.9	0.622

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.86	705	715	76.8	32.0	43.2	50.2	-36.5

02/16/92 14:54:06 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5368.	1867.	119.3	157.6	87.5	13.6	46.8	1226.5	0.622

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.84	705	728	76.7	32.0	43.7	50.2	-36.7

02/16/92 15:12:02 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5368.	1860.	116.0	156.7	80.3	13.8	46.8	1231.8	0.625

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.90	705	762	74.7	9.0	35.8	50.3	-36.5

OWNER

02/16/92 15:23:48 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5368.	1874.	115.9	156.7	86.3	13.7	46.8	1235.0	0.623

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.90	705	785	74.2	15.0	42.0	50.3	-36.7

02/16/92 15:30:09 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5368.	1869.	114.9	156.8	80.4	13.8	46.5	1225.8	0.623

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.88	705	797	75.0	28.3	48.8	50.3	-37.2

02/16/92 15:39:05 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5368.	1879.	116.7	155.9	80.1	13.8	46.9	1241.4	0.621

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.86	705	814	76.2	23.3	31.5	50.3	-36.8

02/16/92 15:44:08 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5369.	1862.	115.7	156.6	80.5	13.8	46.6	1231.0	0.622

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.87	705	824	75.0	13.6	36.5	50.3	-37.0

System shut Down

RESTART AT: 02/16/92 15:55:22 (02/16/92 15:53:28) S5255 V2.21 .

02/16/92 15:55:25 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5369.	1148.	126.1	140.1	22.7	12.5	48.3	804.3	0.625

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.90	705	842	76.2	9.0	99.8	50.3	-9.8

Ø2/16/92 15:55:26 LIMIT 8Ø2 OIL PSI 22.7 LOW OIL PSI SD UNIT 34

MANUFACTURED BY V.R.SYSTEMS INC. MODEL V3 S/N 34
OWNER

Ø2/16/92 15:56:4Ø UNIT 34

1Ø1	1Ø2	1Ø3	1Ø4	1Ø5	1Ø6	1Ø7	1Ø8	1Ø9
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5369.	-1.	126.7	132.6	24.9	12.2	39.8	677.2	Ø.675

11Ø	111	112	113	114	115	116	2Ø1
-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
.ØØ	7Ø5	842	Ø.3	9.Ø	12.6	5Ø.3	-1Ø.1

Ø2/16/92 15:57:52 UNIT 34

1Ø1	1Ø2	1Ø3	1Ø4	1Ø5	1Ø6	1Ø7	1Ø8	1Ø9
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5369.	-1.	129.7	129.1	25.1	12.Ø	26.4	592.3	Ø.675

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
0.00	705	842	0.3	9.0	12.6	50.3	-10.3

02/16/92 16:18:02 LIMIT 802 OIL PSI 30.6 LOW OIL PSI SD UNIT 34

02/16/92 16:18:03 LIMIT 613 ENG FAIL 1.00 ENGINE FAILED UNIT 34

02/16/92 16:18:08 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5369.	516.	117.8	156.9	25.7	13.0	14.0	702.9	0.632

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
2.00	705	880	0.2	9.0	12.8	50.3	-13.4

02/16/92 16:18:19 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5369.	241.	124.5	154.4	25.2	12.2	14.6	692.2	0.661

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
2.00	705	880	0.3	9.0	12.8	50.3	-11.3

MANUFACTURED BY V.R.SYSTEMS INC. MODEL V3 S/N 34
OWNER

02/16/92 16:20:19 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5369.	1674.	118.2	157.2	82.8	13.7	27.3	1038.0	0.620

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.59	705	883	69.5	9.0	39.6	50.3	-31.6

02/16/92 16:21:26 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5369.	1602.	117.0	157.5	76.5	13.7	40.4	1212.1	0.621

110	111	112	113	114	115	116	201

1.74	705	885	77.5	9.0	38.7	50.4	-36.0

02/16/92 16:22:14 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
369.	1785.	116.4	156.6	76.3	13.6	49.6	1271.6	0.620

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.75	705	887	75.1	9.0	33.7	50.3	-35.5

02/16/92 16:22:51 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5369.	1839.	116.0	156.7	79.2	13.7	50.9	1245.8	0.623

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.83	705	888	75.6	21.4	30.7	50.3	-35.7

02/16/92 16:23:11 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5369.	1858.	115.6	156.4	76.5	13.7	51.0	1233.4	0.623

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.90	705	888	74.7	22.6	43.4	50.3	-35.7

MANUFACTURED BY V.R.SYSTEMS INC. MODEL V3 S/N 34
OWNER

02/16/92 16:24:02 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5369.	1862.	114.5	156.8	76.1	13.4	51.3	1204.1	0.622

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
.94	705	890	75.0	20.3	30.2	50.3	-35.8

02/16/92 16:24:26 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5369.	1874.	114.6	157.0	79.2	13.6	51.1	1202.4	0.626

LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.93	705	891	76.1	32.0	41.0	50.3	-36.1

02/16/92 16:24:54 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5369.	1880.	114.4	156.7	78.2	13.6	50.1	1200.4	0.624

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.93	705	892	75.3	19.1	29.5	50.3	-36.1

02/16/92 16:25:25 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5369.	1887.	114.9	156.7	76.8	13.6	49.5	1200.0	0.624

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.93	705	893	75.7	32.0	29.8	50.3	-36.9

02/16/92 16:26:16 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5369.	1885.	115.2	156.6	77.5	13.6	47.3	1196.6	0.624

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.93	705	895	74.7	32.0	49.4	50.3	-37.1

MANUFACTURED BY V.R.SYSTEMS INC. MODEL V3 S/N 34
OWNER

02/16/92 16:28:05 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5369.	1871.	115.9	156.6	76.4	13.5	47.0	1207.2	0.623

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.90	705	898	73.4	17.5	41.9	50.3	-37.1

02/16/92 16:30:12 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5369.	1859.	116.0	156.6	76.5	13.6	47.0	1216.2	0.624

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.88	705	902	75.2	24.6	27.8	50.3	-37.1

16/92 16:36:15 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5369.	1858.	118.9	155.6	79.6	13.6	45.8	1211.8	0.622

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.90	705	914	75.6	32.0	34.3	50.3	-37.5

02/16/92 16:53:25 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5370.	1852.	115.2	156.3	76.9	13.6	44.1	1231.7	0.622

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.90	705	948	75.7	13.8	27.9	50.3	-37.6

02/16/92 16:54:21 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5370.	1884.	114.9	156.9	81.8	13.6	43.7	1226.7	0.623

110	111	112	113	114	115	116	201
-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
.89	705	949	76.1	32.0	47.5	50.3	-38.1

MANUFACTURED BY V.R.SYSTEMS INC. MODEL V3 S/N 34
OWNER

02/16/92 16:55:49 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5370.	2057.	115.0	156.3	80.4	13.8	41.0	1148.2	0.624

110	111	112	113	114	115	116	201
-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.96	705	952	73.8	32.0	29.8	50.3	-43.9

02/16/92 16:56:08 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.98	705	953	75.4	32.0	40.3	50.3	-45.1

16/92 16:57:13 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5370.	2482.	115.8	155.6	76.4	13.6	31.8	1076.2	0.628

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
2.09	705	955	62.7	32.0	31.3	50.3	-69.6

02/16/92 16:57:48 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5370.	2219.	117.0	155.4	79.2	13.6	24.8	1028.5	0.622

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
2.43	705	957	69.3	32.0	35.9	50.3	-80.2

Skip Down

02/16/92 16:58:06 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5370.	1942.	117.9	155.7	79.5	13.8	21.5	1036.5	0.620

110	111	112	113	114	115	116	201
-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
2.16	705	957	72.4	32.0	44.3	50.3	-86.5

MANUFACTURED BY V.R.SYSTEMS INC. MODEL V3 S/N 34
OWNER

02/16/92 17:03:04 UNIT 34

101	102	103	104	105	106	107	108	109
S HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
70.	1684.	119.8	155.9	82.4	13.6	35.0	1269.8	0.618

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.63	705	966	76.1	9.0	41.3	40.5	-38.1

02/16/92 17:03:59 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5370.	1870.	118.9	155.6	83.6	13.6	39.3	1246.9	0.620

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.75	705	968	74.9	32.0	41.9	34.7	-35.7

02/16/92 17:04:36 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5370.	1917.	118.5	155.6	82.9	13.7	35.3	1199.7	0.617

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.81	705	969	72.7	30.4	37.9	27.2	-35.0

02/16/92 17:05:19 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5370.	1940.	118.3	155.3	76.6	13.6	28.2	1168.3	0.616

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.80	705	970	66.3	32.0	39.0	17.0	-32.7

02/16/92 17:05:44 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5370.	1917.	118.3	156.0	80.0	13.5	24.1	1122.7	0.616

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.77	705	971	62.2	23.0	42.6	12.4	-31.0

MANUFACTURED BY V.R.SYSTEMS INC. MODEL V3 S/N 34
OWNER

16/92 17:06:58 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5370.	1918.	118.9	155.9	77.5	13.7	23.3	1095.8	0.618

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.48	705	973	59.2	32.0	44.8	9.7	-29.6

02/16/92 17:07:14 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5370.	1863.	118.9	156.6	82.5	13.7	22.8	1074.3	0.617

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.70	705	974	60.4	19.3	42.4	10.6	-29.8

02/16/92 17:10:18 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5370.	1855.	119.2	156.0	76.1	13.7	23.1	1088.2	0.617

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.67	705	979	60.4	20.7	41.4	10.6	-29.6

02/16/92 17:18:03 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5370.	1860.	118.3	157.1	76.4	13.7	23.2	1089.1	0.617

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.69	705	992	60.5	23.5	44.8	10.6	-29.6

/16/92 17:27:29 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5370.	1855.	119.1	157.0	80.8	13.5	23.3	1087.5	0.616

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.68	706	9	60.5	21.6	39.8	10.6	-29.4

MANUFACTURED BY V.R.SYSTEMS INC. MODEL V3 S/N 34
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02/16/92 17:27:41 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5370.	1860.	119.4	156.5	76.0	13.6	23.3	1087.9	0.617

110	111	112	113	114	115	116	201

1.68	706	7	60.3	22.3	37.2	10.6	-29.4

02/16/92 17:32:38 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
70.	1866.	122.4	156.9	110.0	13.6	23.0	1091.9	0.616

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.68	706	18	60.5	30.2	43.5	10.5	-29.4

02/16/92 17:33:52 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5370.	1834.	122.5	156.8	110.0	13.6	22.7	1096.2	0.615

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.65	706	20	60.4	12.2	39.1	10.5	-29.5

Step Down

16/92 17:35:39 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5370.	1841.	123.5	157.5	110.0	13.6	19.2	1006.9	0.615

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.65	706	23	48.1	19.8	42.2	0.2	-25.3

02/16/92 17:35:48 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5370.	1843.	123.5	157.6	110.0	13.6	19.2	1002.9	0.615

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.65	706	23	47.8	19.8	42.7	-0.2	-25.1

OWNER

Ø2/16/92 17:36:Ø3 UNIT 34

1Ø1	1Ø2	1Ø3	1Ø4	1Ø5	1Ø6	1Ø7	1Ø8	1Ø9
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
570.	1849.	123.5	157.4	110.Ø	13.6	19.2	995.6	Ø.615

11Ø	111	112	113	114	115	116	2Ø1
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.63	7Ø6	24	47.9	24.4	42.5	-Ø.2	-25.1

Ø2/16/92 17:36:21 UNIT 34

1Ø1	1Ø2	1Ø3	1Ø4	1Ø5	1Ø6	1Ø7	1Ø8	1Ø9
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5370.	1853.	123.6	157.5	110.Ø	13.6	19.2	993.7	Ø.616

11Ø	111	112	113	114	115	116	2Ø1
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.65	7Ø6	24	47.8	26.2	45.5	-Ø.2	-25.1

Ø2/16/92 17:36:38 UNIT 34

1Ø1	1Ø2	1Ø3	1Ø4	1Ø5	1Ø6	1Ø7	1Ø8	1Ø9
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5370.	1861.	123.8	157.5	110.Ø	13.6	19.2	991.8	Ø.615

11Ø	111	112	113	114	115	116	2Ø1
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.65	7Ø6	25	47.3	22.3	4Ø.7	-Ø.2	-24.8

Ø2/16/92 17:36:57 UNIT 34

1Ø1	1Ø2	1Ø3	1Ø4	1Ø5	1Ø6	1Ø7	1Ø8	1Ø9
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5370.	1861.	123.7	157.1	110.Ø	13.6	18.3	988.3	Ø.615

11Ø	111	112	113	114	115	116	2Ø1
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.66	7Ø6	25	46.5	12.4	44.4	-Ø.2	-24.5

Ø2/16/92 17:37:18 UNIT 34

1Ø1	1Ø2	1Ø3	1Ø4	1Ø5	1Ø6	1Ø7	1Ø8	1Ø9
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5370.	1877.	123.5	157.1	110.Ø	13.6	17.8	980.Ø	Ø.614

11Ø	111	112	113	114	115	116	2Ø1
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.66	7Ø6	26	41.5	18.Ø	45.6	-Ø.3	-23.2

OWNER

02/16/92 17:37:32 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5370.	1851.	123.7	157.4	110.0	13.6	17.8	968.6	0.614

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.66	706	26	39.2	19.1	39.6	-0.3	-22.6

02/16/92 17:37:49 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5370.	1853.	123.6	157.2	110.0	13.5	17.8	952.4	0.615

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.67	706	27	39.4	21.6	43.2	-0.3	-22.5

02/16/92 17:38:02 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5370.	1838.	123.7	157.3	110.0	13.6	17.8	946.2	0.615

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.66	706	27	42.4	9.0	41.2	-0.3	-22.9

/16/92 17:38:22 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5370.	1868.	123.8	157.2	110.0	13.6	17.1	946.1	0.615

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.67	706	28	39.4	12.2	46.0	-0.3	-22.3

02/16/92 17:38:36 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5370.	1816.	123.6	157.2	110.0	13.6	17.5	938.5	0.614

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.65	706	28	40.3	9.0	40.6	-0.3	-22.5

OWNER

Ø2/16/92 17:42:31 UNIT 34

1Ø1	1Ø2	1Ø3	1Ø4	1Ø5	1Ø6	1Ø7	1Ø8	1Ø9
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
7Ø.	1843.	123.8	158.2	11Ø.Ø	13.6	17.7	93Ø.8	Ø.614

11Ø	111	112	113	114	115	116	2Ø1
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.65	7Ø6	33	4Ø.5	23.7	46.9	-Ø.3	-22.2

Ø2/16/92 17:49:26 UNIT 34

1Ø1	1Ø2	1Ø3	1Ø4	1Ø5	1Ø6	1Ø7	1Ø8	1Ø9
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5371.	1853.	125.5	16Ø.6	11Ø.Ø	13.5	17.7	93Ø.7	Ø.613

11Ø	111	112	113	114	115	116	2Ø1
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.65	7Ø6	47	4Ø.5	19.6	44.8	-Ø.3	-22.8

Ø2/16/92 17:56:46 UNIT 34

1Ø1	1Ø2	1Ø3	1Ø4	1Ø5	1Ø6	1Ø7	1Ø8	1Ø9
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5371.	1844.	124.4	159.3	11Ø.Ø	13.6	17.7	932.7	Ø.613

11Ø	111	112	113	114	115	116	2Ø1
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.64	7Ø6	59	4Ø.3	2Ø.3	44.2	-Ø.3	-22.4

16/92 17:57:11 UNIT 34

1Ø1	1Ø2	1Ø3	1Ø4	1Ø5	1Ø6	1Ø7	1Ø8	1Ø9
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5371.	1842Ø.	124.8	159.9	11Ø.Ø	13.5	17.7	931.8	Ø.613

11Ø	111	112	113	114	115	116	2Ø1
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.64	7Ø6	6Ø	4Ø.5	18.Ø	43.3	-Ø.3	-22.4

Ø2/16/92 18:Ø2:29 LIMIT 613 ENG FAIL 1.ØØ ENGINE FAILED UNIT 34

RESTART AT: Ø2/17/92 Ø7:4Ø:49 (Ø2/16/92 18:Ø9:37) S5255 V2.21 .

Start Well 24 (2nd Day Test)

MANUFACTURED BY V.R.SYSTEMS INC. MODEL V3 S/N 34
OWNER

Ø2/17/92 Ø7:4Ø:52 UNIT 34

1Ø1	1Ø2	1Ø3	1Ø4	1Ø5	1Ø6	1Ø7	1Ø8	1Ø9
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
8371.	-4.	6Ø.5	55.9	25.3	12.5	14.8	53.4	Ø.5Ø1

11Ø	111	112	113	114	115	116	2Ø1
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
Ø.ØØ	7Ø6	63	Ø.3	9.Ø	1ØØ.Ø	-Ø.2	-8.8

RESTART AT: Ø2/17/92 Ø7:54:35 (Ø2/17/92 Ø7:48:Ø1) S5255 V2.21 .
Ø2/17/92 Ø7:54:38 UNIT 34

1Ø1	1Ø2	1Ø3	1Ø4	1Ø5	1Ø6	1Ø7	1Ø8	1Ø9
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
8371	-2.	61.Ø	56.4	24.4	12.4	21.4	56.5	Ø.635

LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
[illegible]	706	[illegible]	0.4	9.0	100.0	-0.3	-8.8

Open well

02/17/92 08:19:03 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
[illegible]	1743.	117.1	154.0	90.3	13.8	12.0	736.7	0.615

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.53	706	70	56.7	9.0	42.2	-0.2	-32.6

02/17/92 08:19:03 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5371.	1746.	117.0	154.3	87.0	13.8	15.1	837.2	0.616

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.76	706	72	64.7	9.0	44.1	7.8	-36.7

02/17/92 08:19:55 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5371.	1744.	116.3	154.6	91.0	13.8	18.4	978.6	0.617

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.57	706	74	76.3	9.0	41.9	17.8	-42.9

MANUFACTURED BY V.R.SYSTEMS INC. MODEL V3 S/N 34
OWNER

02/17/92 08:21:00 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
[illegible]	1740.	114.9	154.5	57.9	13.8	24.4	1143.0	0.618

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
2.04	706	76	81.1	9.0	40.1	50.2	-46.1

02/17/92 08:21:41 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5571.	1747.	114.1	155.2	84.7	13.8	26.3	1194.4	0.619

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
2.13	706	78	81.7	9.0	42.0	37.3	-46.6

02/17/92 08:22:22 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
[illegible]	1749.	113.[illegible]	155.[illegible]	90.4	13.6	27.8	1221.9	0.619

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
2.20	706	79	80.3	9.0	43.5	43.2	-46.3

02/17/92 08:22:56 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5571.	1749.	112.6	155.3	84.6	13.7	28.7	1226.5	0.619

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
2.24	706	80	81.5	9.0	40.3	48.0	-46.3

02/17/92 08:23:11 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5571.	1754.	112.2	155.1	91.0	13.7	29.5	1230.9	0.620

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
2.23	706	81	81.1	9.0	47.5	50.4	-46.1

MANUFACTURED BY W.R.SYSTEMS INC. MODEL W3 S/N 34
OWNER

02/17/92 08:30:51 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
[illegible]	[illegible]	[illegible]	[illegible]	87.8	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
[illegible]	706	[illegible]	[illegible]	[illegible]	18.0	[illegible]	-43.6

02/17/92 08:37:46 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
[illegible]	1795.	109.6	155.3	69.3	13.9	33.2	1199.7	0.623

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
2.33	706	116	77.0	9.0	39.2	50.3	-43.4

02/17/92 08:53:54 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
[illegible]	1790.	111.1	155.[illegible]	[illegible]	13.8	33.5	1206.3	0.623

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
2.31	706	154	76.4	9.0	30.3	50.2	-43.0

02/17/92 08:54:03 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5372.	1797.	111.3	155.9	57.6	13.8	33.8	1200.2	0.624

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
2.31	706	154	77.1	15.4	37.4	30.2	-43.1

02/17/92 08:54:12 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5372.	1797.	111.3	155.8	53.7	13.8	33.6	1201.6	0.623

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
2.34	706	155	76.9	9.0	39.0	50.2	-43.1

02/17/92 08:55:40 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5372.	1790.	111.7	155.8	83.2	13.8	33.7	1208.5	0.623

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.33	706	158	76.7	9.0	35.2	50.2	-43.0

02/17/92 09:03:54 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5372.	1784.	112.9	156.4	87.9	13.6	33.5	1217.8	0.623

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
2.30	706	177	76.5	9.0	40.2	50.1	-42.8

02/17/92 09:14:20 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5372.	1752.	116.2	155.6	83.7	13.7	33.6	1224.7	0.621

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
2.26	706	202	76.6	9.0	40.1	50.1	-42.7

02/17/92 09:28:33 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5372.	1795.	121.4	157.3	87.3	13.6	33.7	1207.7	0.621

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
2.29	706	235	75.2	9.0	45.3	50.2	-42.7

02/17/92 09:49:44 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5373.	1790.	115.7	156.9	82.4	13.7	34.0	1219.5	0.622

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
2.29	706	284	75.0	9.0	40.5	50.1	-43.0

MANUFACTURED BY V.R.SYSTEMS INC. MODEL V3 S/N 34
OWNER

02/17/92 09:37:19 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5373.	1790.	116.3	157.1	87.0	13.7	34.1	1223.7	0.621

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
2.26	706	302	76.1	9.0	35.0	50.1	-43.4

02/17/92 10:07:54 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5373.	1787.	120.2	157.3	85.2	13.7	34.5	1243.2	0.620

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
2.26	706	326	75.8	9.7	42.2	50.2	-43.7

02/17/92 10:11:07 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5373.	1787.	121.5	157.4	83.7	13.7	34.0	1247.7	0.620

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
2.26	706	334	75.6	9.0	36.5	50.2	-43.6

02/17/92 10:19:25 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5373.	1798.	121.7	155.8	83.3	13.7	34.7	1218.0	0.621

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
2.27	706	353	74.6	9.0	40.8	50.2	-43.0

02/17/92 10:25:39 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5373.	1784.	123.2	157.2	88.9	13.7	34.1	1243.0	0.618

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
2.24	706	367	76.2	9.0	47.0	50.1	-43.9

MANUFACTURED BY M.R.SYSTEMS INC. MODEL V3 S/N 34
OWNER

02/17/92 10:37:39 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
1373.	1783.	122.2	157.3	83.4	13.7	34.1	1229.8	0.620

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
2.26	706	373	75.6	9.0	33.1	50.1	-43.6

02/17/92 10:43:34 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5374.	1791.	124.5	159.3	85.2	13.7	34.3	1231.2	0.618

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
2.26	706	409	76.0	9.0	44.4	50.1	-43.1

02/17/92 10:49:07 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5374.	1798.	123.5	159.2	86.6	13.5	34.6	1240.5	0.618

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
2.26	706	422	76.1	12.0	44.1	50.2	-42.9

02/17/92 10:57:34 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5374.	1790.	123.7	158.3	83.6	13.7	34.4	1239.6	0.618

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
2.26	706	441	76.0	9.0	38.3	50.2	-43.1

02/17/92 11:13:22 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5374.	1796.	119.9	157.2	90.1	13.7	34.7	1226.8	0.620

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
2.26	706	478	75.3	9.0	42.2	50.1	-43.0

MANUFACTURED BY V.R.SYSTEMS INC. MODEL VS S/N 34
OWNER

02/17/92 11:18:48 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5374.	1792.	125.3	156.6	87.0	13.5	34.6	1237.4	0.618

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
2.25	706	490	75.9	9.0	39.6	50.1	-42.9

02/17/92 11:28:57 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5374.	1793.	125.0	160.4	83.6	13.7	34.7	1240.6	0.618

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
2.25	706	513	75.4	9.0	41.8	50.1	-43.1

02/17/92 11:42:47 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5375.	1793.	128.0	162.7	83.6	13.7	34.6	1228.8	0.617

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
2.26	706	545	75.0	9.0	42.4	50.2	-43.0

02/17/92 11:48:30 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5375.	1789.	123.7	159.6	88.8	13.5	34.5	1237.8	0.619

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
2.24	706	559	76.0	9.0	43.0	50.2	-42.9

02/17/92 11:53:02 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5375.	1792.	122.8	157.9	89.2	13.7	34.6	1245.3	0.618

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
2.24	706	569	75.2	9.0	41.1	50.1	-42.9

MANUFACTURED BY V.R.SYSTEMS INC. MODEL V3 S/N 34
OWNER

Ø2/17/92 12:ØØ:Ø7 UNIT 34

1Ø1	1Ø2	1Ø3	1Ø4	1Ø5	1Ø6	1Ø7	1Ø8	1Ø9
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5375.	1791.	122.9	157.5	83.1	13.7	35.Ø	1236.6	Ø.619

11Ø	111	112	113	114	115	116	2Ø1
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
2.26	7Ø6	585	75.Ø	9.Ø	35.8	5Ø.1	-42.7

Ø2/17/92 12:16:59 UNIT 34

1Ø1	1Ø2	1Ø3	1Ø4	1Ø5	1Ø6	1Ø7	1Ø8	1Ø9
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5375.	1797.	124.Ø	158.2	82.9	13.7	35.2	1237.4	Ø.618

11Ø	111	112	113	114	115	116	2Ø1
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
2.27	7Ø6	624	75.7	9.5	38.7	5Ø.2	-42.6

Ø2/17/92 12:18:11 UNIT 34

1Ø1	1Ø2	1Ø3	1Ø4	1Ø5	1Ø6	1Ø7	1Ø8	1Ø9
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5375.	1792.	123.2	158.Ø	82.5	13.6	35.2	1229.2	Ø.619

11Ø	111	112	113	114	115	116	2Ø1
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
2.24	7Ø6	627	75.2	9.Ø	41.5	5Ø.2	-42.7

Ø2/17/92 12:36:43 UNIT 34

1Ø1	1Ø2	1Ø3	1Ø4	1Ø5	1Ø6	1Ø7	1Ø8	1Ø9
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5376.	1789.	123.1	158.2	87.Ø	13.7	34.9	1241.Ø	Ø.618

11Ø	111	112	113	114	115	116	2Ø1
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
2.27	7Ø6	67Ø	75.5	9.Ø	45.3	5Ø.1	-43.Ø

Ø2/17/92 12:47:52 UNIT 34

1Ø1	1Ø2	1Ø3	1Ø4	1Ø5	1Ø6	1Ø7	1Ø8	1Ø9
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5376.	18ØØ.	127.3	163.Ø	82.Ø	13.5	35.2	1235.8	Ø.618

11Ø	111	112	113	114	115	116	2Ø1
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
2.23	7Ø6	695	74.8	9.Ø	44.8	5Ø.1	-42.8

MANUFACTURED BY V.R.SYSTEMS INC. MODEL V3 S/N 34
OWNER

Ø2/17/92 13:ØØ:27 UNIT 34

1Ø1	1Ø2	1Ø3	1Ø4	1Ø5	1Ø6	1Ø7	1Ø8	1Ø9
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5376.	1785.	128.Ø	163.7	83.6	13.6	35.1	1243.5	Ø.616

11Ø	111	112	113	114	115	116	2Ø1
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
2.26	7Ø6	724	75.2	9.Ø	35.7	5Ø.1	-43.Ø

Ø2/17/92 13:15:15 UNIT 34

1Ø1	1Ø2	1Ø3	1Ø4	1Ø5	1Ø6	1Ø7	1Ø8	1Ø9
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5376.	179Ø.	128.1	163.2	9Ø.8	13.7	35.4	1239.2	Ø.618

11Ø	111	112	113	114	115	116	2Ø1
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
2.28	7Ø6	758	75.2	9.Ø	45.7	5Ø.2	-42.6

/17/92 13:17:34 UNIT 34

1Ø1	1Ø2	1Ø3	1Ø4	1Ø5	1Ø6	1Ø7	1Ø8	1Ø9
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5376.	1789.	125.6	161.2	83.2	13.6	35.4	1228.8	Ø.618

11Ø	111	112	113	114	115	116	2Ø1
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
2.27	7Ø6	764	75.2	9.Ø	34.3	5Ø.2	-43.Ø

Ø2/17/92 13:4Ø:Ø7 UNIT 34

1Ø1	1Ø2	1Ø3	1Ø4	1Ø5	1Ø6	1Ø7	1Ø8	1Ø9
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5377.	1795.	126.2	16Ø.Ø	88.3	13.6	35.5	1232.5	Ø.618

11Ø	111	112	113	114	115	116	2Ø1
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
2.26	7Ø6	816	74.9	9.Ø	38.5	5Ø.1	-43.2

Ø2/17/92 13:47:16 UNIT 34

1Ø1	1Ø2	1Ø3	1Ø4	1Ø5	1Ø6	1Ø7	1Ø8	1Ø9
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5377.	1794.	125.2	159.5	82.7	13.5	35.4	1236.1	Ø.618

11Ø	111	112	113	114	115	116	2Ø1
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
2.26	7Ø6	832	75.4	9.Ø	38.1	5Ø.2	-43.4

MANUFACTURED BY V.R.SYSTEMS INC. MODEL V3 S/N 34
OWNER

02/17/92 13:50:20 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5377.	1780.	125.9	160.3	82.2	13.6	35.6	1233.1	0.619

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
2.28	706	839	75.1	9.0	34.0	50.2	-43.3

02/17/92 13:57:36 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5377.	1793.	123.8	158.8	81.9	13.7	35.4	1248.0	0.618

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
2.26	706	856	75.2	9.0	38.0	50.2	-43.6

02/17/92 14:16:57 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5377.	1785.	122.7	157.6	82.2	13.6	35.4	1235.5	0.618

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
2.27	706	901	75.2	9.0	39.5	50.1	-43.6

02/17/92 14:17:42 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5377.	1785.	122.6	157.2	84.6	13.7	35.3	1230.1	0.620

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
2.26	706	902	75.4	9.0	39.2	50.1	-43.5

17/92 14:38:42 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5378.	1800.	124.5	158.9	81.9	13.7	36.2	1221.8	0.618

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
2.28	706	951	74.8	9.0	40.9	50.1	-43.1

System shut down to Equil. then Step.

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02/17/92 14:46:39 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5378.	1785.	128.4	164.0	85.1	13.6	13.2	722.1	0.607

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
.71	706	967	0.5	10.1	49.7	-0.3	-9.1

02/17/92 15:16:19 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5378.	1408.	122.7	156.9	83.4	13.7	9.7	610.4	0.604

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.32	707	13	0.4	9.0	50.6	-0.4	-9.5

Step 60 CFM

17/92 15:29:27 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5378.	1742.	123.8	157.6	85.7	13.9	17.9	789.0	0.617

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
[illegible]	707	33	49.5	8.0	44.5	-0.4	-25.8

02/17/92 15:29:56 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5378.	1739.	124.0	158.7	83.1	13.9	18.0	853.5	0.616

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.72	707	34	48.5	9.0	44.2	-0.2	-26.5

02/17/92 15:30:23 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5378.	1760.	124.4	157.6	82.2	13.8	18.1	887.2	0.616

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.82	707	35	48.5	9.0	44.4	-0.2	-26.8

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02/17/92 15:30:57 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5378.	1738.	124.5	158.3	87.1	13.8	19.2	923.4	0.617

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.86	707	36	56.5	9.0	41.9	6.5	-29.8

02/17/92 15:31:18 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5378.	1732.	125.0	157.4	81.0	13.8	21.6	983.5	0.617

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.87	707	36	60.0	9.0	40.2	10.3	-32.1

17/92 15:33:33 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5379.	1774.	124.7	157.8	81.0	13.8	21.6	1054.0	0.617

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.96	707	41	59.8	9.0	43.9	10.3	-32.9

02/17/92 15:34:10 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5379.	1782.	124.5	157.5	84.2	13.8	21.6	1058.3	0.617

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.96	707	42	59.8	9.0	41.2	10.3	-33.0

02/17/92 15:37:33 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5379.	1781.	126.3	157.8	85.0	13.8	21.6	1072.7	0.616

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.96	707	49	59.6	9.0	41.4	10.3	-33.2

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02/17/92 15:42:09 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5379.	1789.	124.5	158.0	82.5	13.7	21.6	1074.5	0.616

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.97	707	58	59.7	9.0	41.5	10.3	-33.2

02/17/92 15:46:00 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5379.	1783.	126.2	159.6	85.2	13.6	21.6	1076.9	0.615

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.98	707	66	59.6	9.0	42.6	10.3	-33.4

02/17/92 15:46:57 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5379.	1781.	126.0	159.2	86.4	13.6	21.6	1076.0	0.615

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC

1.96	707	68	59.5	9.0	41.1	10.3	-33.4

/17/92 15:53:21 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5379.	1779.	126.3	159.7	88.2	13.6	21.5	1078.4	0.615

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.96	707	81	59.6	9.0	41.7	10.3	-33.7

02/17/92 16:08:34 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5379.	1785.	124.6	158.6	81.1	13.6	21.6	1084.7	0.616

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.97	707	112	59.9	9.0	43.3	10.3	-33.9

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02/17/92 16:15:42 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5379.	1782.	122.7	158.4	87.5	13.7	21.5	1084.8	0.617

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.97	707	126	59.8	9.0	41.9	10.3	-34.0

02/17/92 16:19:37 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5379.	1785.	122.3	158.7	83.8	13.7	21.5	1085.1	0.617

110	111	112	113	114	115	116	201
-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.96	707	134	59.6	9.0	42.7	10.3	-34.0

02/17/92 16:27:35 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5379.	1778.	121.8	157.8	84.8	13.8	21.5	1082.1	0.617

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.98	707	150	59.6	9.0	39.5	10.3	-34.1

Shut Down
50 CFM

02/17/92 16:29:39 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5379.	1809.	121.5	157.9	86.6	13.6	20.4	1069.2	0.617

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.96	707	155	53.8	12.0	42.8	5.8	-32.0

02/17/92 16:29:51 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5379.	1811.	121.5	157.9	84.8	13.8	19.0	1049.4	0.616

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.97	707	155	51.3	9.0	40.8	3.6	-30.7

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02/17/92 16:30:05 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5379.	1808.	121.6	158.1	80.8	13.8	19.0	1030.2	0.616

110	111	112	113	114	115	116	201
-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.97	707	155	49.9	9.0	40.6	2.5	-30.0

02/17/92 16:30:18 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5379.	1774.	121.6	158.1	80.9	13.8	18.8	1017.5	0.616

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.95	707	156	50.8	9.0	40.4	2.8	-30.0

X17/92 16:30:32 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5379.	1760.	121.5	158.3	81.9	13.8	18.8	1009.0	0.615

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.93	707	156	50.5	9.0	42.3	2.6	-29.9

Down
45 cfm

02/17/92 16:33:25 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5380.	1799.	121.7	157.9	84.7	13.8	18.7	989.5	0.616

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.88	707	162	48.2	9.0	40.2	0.6	-28.7

17/92 16:33:55 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5380.	1803.	121.9	158.2	82.9	13.7	18.7	985.5	0.616

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.89	707	163	47.3	11.5	43.6	-0.2	-28.5

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02/17/92 16:34:15 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5380.	1789.	121.7	157.6	81.3	13.8	18.4	982.6	0.616

110	111	112	113	114	115	116	201

1.89	707	163	47.4	9.0	39.4	-0.3	-28.4

02/17/92 16:34:31 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
580.	1798.	121.2	158.4	85.0	13.7	18.4	979.8	0.616

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.88	707	164	46.9	9.0	39.7	-0.3	-28.3

02/17/92 16:34:43 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5380.	1795.	121.2	158.3	86.2	13.8	18.4	978.8	0.616

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.88	707	164	46.6	9.0	39.1	-0.3	-28.1

02/17/92 16:34:57 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5380.	1790.	121.1	158.6	82.4	13.7	18.1	974.5	0.617

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.89	707	165	46.3	9.0	43.3	-0.3	-28.0

17/92 16:35:10 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5380.	1787.	121.1	158.8	80.3	13.7	18.1	973.7	0.617

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.88	707	165	45.7	9.0	38.9	-0.3	-27.8

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02/17/92 16:35:22 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5380.	1797.	121.0	158.9	87.4	13.7	18.1	973.0	0.617

110	111	112	113	114	115	116	201

1.88	707	166	45.4	16.6	43.9	-0.3	-27.6

02/17/92 16:35:37 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5380.	1797.	121.0	158.7	81.3	13.8	18.0	967.3	0.617

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.87	707	166	44.8	9.0	40.1	-0.3	-27.5

02/17/92 16:38:19 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5380.	1791.	121.7	158.7	87.1	13.7	18.0	964.7	0.616

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.86	707	171	44.9	10.1	45.0	-0.3	-27.2

02/17/92 16:41:29 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5380.	1782.	122.0	159.0	83.1	13.8	17.8	958.6	0.615

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.84	707	177	44.9	9.0	44.6	-0.3	-27.2

/17/92 16:45:24 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5380.	1785.	121.7	158.6	85.1	13.7	17.8	962.7	0.615

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.85	707	185	44.9	9.0	40.3	-0.3	-27.3

MANUFACTURED BY V.R.SYSTEMS INC. MODEL V3 S/N 34
OWNER

02/17/92 16:48:22 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5380.	1776.	122.1	158.4	83.3	13.7	17.8	959.5	0.615

110	111	112	113	114	115	116	201

1.84	707	190	45.0	9.0	43.2	-0.3	-27.2

02/17/92 16:57:49 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
180.	1732.	121.9	158.7	82.2	13.8	17.8	963.6	0.615

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.85	707	208	45.0	9.0	41.5	-0.3	-27.3

02/17/92 17:06:55 UNIT 34

101	102	103	104	105	106	107	108	109
ENG HRS	RPM	H2O TEMP	OIL TEMP	OIL PSI	BAT.VOLT	CARB.POS	EXH TEMP	OXYGEN
5380.	1779.	121.8	158.9	82.0	13.7	17.8	961.7	0.615

110	111	112	113	114	115	116	201
LPG-CFM	LPG-THOU	LPG-UNIT	FLOW CFM	DEG.BTC	DUTY CYC	BYPASS	WELL VAC
1.85	707	226	45.0	9.0	44.8	-0.3	-27.2

02/17/92 17:13:34 LIMIT 802 OIL PSI 30.3 LOW OIL PSI SD UNIT 34

02/17/92 17:13:34 LIMIT 613 ENG FAIL 1.00 ENGINE FAILED UNIT 34

APPENDIX E
SOIL PERMEABILITY TO AIR FLOW CALCULATIONS

PURPOSE: The calculation uses the pressure distribution equation to analyze the transient vacuum buildup at a monitor point during a soil vapor extraction test. The following calculates a value of intrinsic permeability (k).

REFERENCE: Johnson, P. C., M. W. Kemlowski, and J. D. Colthart. Quantitative Analysis for the Cleanup of Hydrocarbon-Contaminated Soils by In-Situ Soil Venting. GROUNDWATER 28:3 (1990), pp. 413-429.

ASSUMPTIONS:

1. All flow to the well is horizontal, or nearly so, in the permeable unit.
2. The permeable unit is homogeneous and isotropic within the cylindrical section centered on the extraction well, with a depth equal to the thickness (m) and a radius slightly larger than the distance (r) to the monitoring point.
3. The flow (Q) is constant from the extraction well.

CONVERSIONS/ UNITS:

inw= atm/407 darcy= 1*10E-8cm2

GIVEN:

u=	0.00018 gm/cm*sec	Viscosity of air	u=	0.00018 gm/cm*sec
m=	40 ft	Thickness of permeable unit	m=	1219.2 cm
Q=	76 ft3/min	Constant pumping rate (STP)	Q=	35864.4 cm3/sec
A=	1.55 inw	Slope of the base 10 semilog transient vacuum buildup	A=	3859.5 gm/cm*sec2
B=	3 min	y-intercept of the semilog transient vacuum buildup	B=	180 sec
r=	35.5 ft	Distance of the monitor point from the extraction well	r=	1082.04 cm

CALCULATIONS:

k=	2.30*Q*u/4*A*PI*m	Intrinsic permeability	k=	2.51E-07 cm2

CONCLUSIONS:

k= 25.11 darcy

PURPOSE: The calculation uses the pressure distribution equation to analyze the transient vacuum buildup at a monitor point during a soil vapor extraction test. The following calculates a value of intrinsic permeability (k).

REFERENCE: Johnson, P. C., M. W. Kemlowski, and J.D. Colthart. Quantitative Analysis for the Cleanup of Hydrocarbon-Contaminated Soils by In-Situ Soil Venting. GROUNDWATER 28:3 (1990), pp. 413-429.

ASSUMPTIONS:

1. All flow to the well is horizontal, or nearly so, in the permeable unit.
2. The permeable unit is homogeneous and isotropic within the cylindrical section centered on the extraction well, with a depth equal to the thickness (m) and a radius slightly larger than the distance (r) to the monitoring point.
3. The flow (Q) is constant from the extraction well.

CONVERSIONS/ UNITS:

inw= atm/407 darcy= 1*10E-8cm2

GIVEN:

u=	0.00018 gm/cm*sec	Viscosity of air	u=	0.00018	gm/cm*sec
m=	40 ft	Thickness of permeable unit	m=	1219.2	cm
Q=	73 ft3/min	Constant pumping rate (STP)	Q=	34448.7	cm3/sec
A=	2.15 inw	Slope of the base 10 semilog transient vacuum buildup	A=	5353.5	gm/cm*sec2
B=	3 min	y-intercept of the semilog transient vacuum buildup	B=	180	sec
r=	35.5 ft	Distance of the monitor point from the extraction well	r=	1082.04	cm

CALCULATIONS:

k=	2.30*Q*u/4*A*PI*m	Intrinsic permeability	k=	1.74E-07	cm2

CONCLUSIONS:

k= 17.388 darcy

PURPOSE: The calculation uses the pressure distribution equation to analyze the transient vacuum buildup at a monitor point during a soil vapor extraction test. The following calculates a value of intrinsic permeability (k).

REFERENCE: Johnson, P. C., M. W. Kemlowski, and J. D. Colthart. Quantitative Analysis for the Cleanup of Hydrocarbon-Contaminated Soils by In-Situ Soil Venting. GROUNDWATER 28:3 (1990), pp. 413-429.

ASSUMPTIONS:

1. All flow to the well is horizontal, or nearly so, in the permeable unit.
2. The permeable unit is homogeneous and isotropic within the cylindrical section centered on the extraction well, with a depth equal to the thickness (m) and a radius slightly larger than the distance (r) to the monitoring point.
3. The flow (Q) is constant from the extraction well.

CONVERSIONS/ UNITS:

inw= atm/407 darcy= 1*10E-8cm2

GIVEN:

u=	0.00018 gm/cm*sec	Viscosity of air	u=	0.00018	gm/cm*sec
m=	40 ft	Thickness of permeable unit	m=	1219.2	cm
Q=	76 ft3/min	Constant pumping rate (STP)	Q=	35864.4	cm3/sec
A=	1.43 inw	Slope of the base 10 semilog transient vacuum buildup	A=	3560.7	gm/cm*sec2
B=	2.7 min	y-intercept of the semilog transient vacuum buildup	B=	162	sec
r=	18.5 ft	Distance of the monitor point from the extraction well	r=	563.88	cm

CALCULATIONS:

k=	2.30*Q*u/4*A*PI*m	Intrinsic permeability	k=	2.72E-07	cm2

CONCLUSIONS:

k= 27.2172 darcy

PURPOSE: The calculation uses the pressure distribution equation to analyze the transient vacuum buildup at a monitor point during a soil vapor extraction test. The following calculates a value of intrinsic permeability (k).

REFERENCE: Johnson, P. C., M. W. Kemlowski, and J. D. Colthart. Quantitative Analysis for the Cleanup of Hydrocarbon-Contaminated Soils by In-Situ Soil Venting. GROUNDWATER 28:3 (1990), pp. 413-429.

ASSUMPTIONS:

1. All flow to the well is horizontal, or nearly so, in the permeable unit.
2. The permeable unit is homogeneous and isotropic within the cylindrical section centered on the extraction well, with a depth equal to the thickness (m) and a radius slightly larger than the distance (r) to the monitoring point.
3. The flow (Q) is constant from the extraction well.

CONVERSIONS/ UNITS:

inw= atm/407 darcy= 1*10E-8cm2

GIVEN:

u=	0.00018 gm/cm*sec	Viscosity of air	u=	0.00018 gm/cm*sec
m=	40 ft	Thickness of permeable unit	m=	1219.2 cm
Q=	73 ft3/min	Constant pumping rate (STP)	Q=	34448.7 cm3/sec
A=	1.56 inw	Slope of the base 10 semilog transient vacuum buildup	A=	3884.4 gm/cm*sec2
B=	6 min	y-intercept of the semilog transient vacuum buildup	B=	360 sec
r=	42 ft	Distance of the monitor point from the extraction well	r=	1280.16 cm

CALCULATIONS:

k=	2.30*Q*u/4*A*PI*m	Intrinsic permeability	k=	2.4E-07 cm2

CONCLUSIONS:

k= 23.9642 darcy