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Hydrogeologic Assessment of Technical Area 54, Areas G and L Los Alamos National Laboratory

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EXECUTIVE SUMMARY

1.0 INTRODUCTION

Los Alamos National Laboratory has operated two chemical waste disposal facilities in Technical Area 54 on Mesita del Buey located in the southern half of Section 31, T19N, R7E (N.M.P.M.). These areas, designated Areas G and L, occupy 63 acres and approximately 2.5 acres, respectively. Area G, used primarily for disposal of low-level radioactive materials, has been in operation since 1957 and is expected to remain active through the foreseeable future. In addition to low-level waste, small quantities of asbestos, beryllium residues, empty pesticide containers, polychlorinated biphenyl (PCB) contaminated solids and solid trash-type wastes contaminated with known or suspected carcinogens were disposed of at Area G. Area L served as the Laboratory's principal chemical waste disposal area between 1964 and 1985 and a wide variety of organic and inorganic wastes were disposed of at this area. Wastes were disposed of in Areas G and L by emplacement in shafts, trenches and pits excavated in the Bandelier Tuff to depths of up to 65 feet.

This report presents a summary of the hydrogeology of Areas G and L and other data and discussions relevant to the potential for migration of hazardous waste from the disposal areas. This report was prepared in response to a Compliance Order/Schedule, dated May 7, 1985, issued to the Laboratory by the New Mexico Environmental Improvement Division, pursuant to the New Mexico Hazardous Waste Act. Paragraph 25 of the Order mandated that certain tests and investigations be performed at Areas G and L to obtain information on the hydrologic characteristics of the waste disposal areas relevant to the potential for migration of waste constituents into the area ground water.

Work was initiated in late 1985 to fulfill the testing requirements of the Order. Eighteen 100- to about 135-foot deep boreholes were drilled into the Bandelier Tuff from the top of Mesita del Buey, and approximately 1,700 feet of core were obtained. In addition, a 60-foot deep borehole was sunk near a surface impoundment at Area L. Selected core samples were analyzed for numerous parameters, and hydrologic testing and geophysical logging were performed in the boreholes. Selected boreholes were completed for pore gas sampling, neutron moisture monitoring, and psychrometer installation. In addition to the boreholes drilled from the top of the mesa, holes were drilled

in the adjacent canyons to investigate possible alluvial aquifers. Table ES-1 provides a list of Compliance Order Paragraph 25 tasks and a description of the activities undertaken to fulfill the task requirements. The purpose of this report is to summarize the results of the recent work (published and unpublished) and to combine these data with published information on site characteristics into a cogent report on the potential for chemical waste migration in the lithosphere at Areas G and L.

2.0 GEOLOGY

Los Alamos National Laboratory is located on the Pajarito Plateau on the east-central edge of the Jemez mountains. These mountains are formed by a complex pile of volcanic rocks along the northwest margin of the Rio Grande rift in north-central New Mexico. The plateau, which forms an apron of volcanic and sedimentary rocks along the eastern flank of the mountains, is aligned approximately north-south and is about 20 to 25 miles in length and five to ten miles wide. The plateau slopes gently eastward from an elevation of about 7,500 feet near the mountains toward the Rio Grande where it terminates at an elevation of about 6,200 feet in steep slopes and cliffs formed by down cutting of the river. The plateau has been dissected into a number of narrow mesas by southeastward-trending intermittent streams. One of these mesas, Mesita del Buey, near the eastern edge of the Pajarito Plateau, is the site of Technical Area 54, Areas G and L. Mesita del Buey is bounded on the north by Cañada del Buey and on the south by Pajarito Canyon.

The stratigraphy of Mesita del Buey is a series of sediments and volcanic extrusive rocks and is typical of a terrane produced by concurrent sedimentation and volcanism. In ascending order, the following rock units are present at Mesita del Buey: Tesuque Formation, Puye Conglomerate, basaltic rocks of Chino Mesa, and the Bandelier Tuff. The Tesuque, consisting of siltstone and sandstone with conglomerate lenses and basalt layers, is overlain by the conglomerates and sandstones of the Puye Conglomerate. Overlying and interfingering with the Puye are the dense basalt flows and scoria of the basaltic Chino Mesa rocks. The Bandelier Tuff, which consists of numerous ashfall and ashflow units and overlies the Puye and Chino Mesa flows, caps the mesa. The three to four-foot layer of soil present along the axis of the mesa thins appreciably towards the canyons, exposing the tuff in places.

Surface mapping and subsurface correlation of ash flow units, as well as the seismic line of the mesa, indicate no displacement (faults) of the tuff. The most prevalent structural features in the mesa rocks are the fractures or joints in the volcanic rocks caused by shrinkage upon cooling after deposition. Both horizontal and vertical joints have been observed in the Bandelier Tuff; however, vertical joints are much more prevalent. A joint traced vertically through an ashflow may be closed in places and open in others. Joints near the base of the soil are often clay-filled for three to four feet below the surface and either filled, or open with clay plating, below this depth. Vertical joint frequencies observed in horizontal borings are about one joint per three to six feet of core recovered.

3.0 HYDROLOGICAL CHARACTERIZATION OF THE VADOSE ZONE

Vadose zone characterization studies were undertaken in Technical Area 54, Areas G and L to provide a quantitative analysis of moisture movement in the Bandelier Tuff. These analyses aid in determining the likelihood of contaminants from Areas G and L migrating through the vadose zone and into ground water beneath the sites. A two-tiered approach to quantify moisture movement in tuff was utilized: (1) rock characteristics and hydraulic head were measured to calculate seepage velocity and rates of moisture flux, and (2) moisture content of the tuff following precipitation events was measured to determine changes in moisture content with depth.

To permit calculation of seepage velocity and rates of moisture flux in the tuff, hydrologic testing was performed in boreholes at Areas G and L and in the laboratory on core samples from the boreholes. The intrinsic permeability of the tuff was measured in boreholes through air injection and vacuum tests; laboratory tests included gas injection with correction for slippage and the Dynamic Method to measure gas-water relative permeability. Air injection tests were performed in five open boreholes on 25, six-foot test intervals, including seven intervals adjacent to fracture zones. Intrinsic permeability was found to range from about 10^{-8} to 10^{-9} square centimeters (cm^2) for fractured and unfractured intervals. Similar data were obtained from water injection tests performed in one borehole to verify the results of the air

injection tests. No significant difference between fractured and unfractured tuff was noted. Vacuum tests performed on 18 intervals in the same boreholes yielded slightly lower permeability values, but with an average also in the 10^{-8} to 10^{-9} cm^2 range. Laboratory tests of intrinsic permeability of core samples of the Bandelier Tuff yielded values in the low 10^{-9} cm^2 range. Lower values are expected for laboratory tests because discontinuities that occur in the rock intersected by the borehole are not typically present in the laboratory-tested core.

Gravimetric moisture content, soil-moisture characteristic curves, and unsaturated hydraulic conductivity of tuff samples for boreholes at Areas G and L were measured in the laboratory. The gravimetric moisture content of core segments from 12 drill holes was found to range generally from two to four percent with isolated intervals ranging up to 10 to 28 percent. Soil moisture characteristic curves were determined for 20 samples of the Bandelier Tuff. Moisture content was determined for capillary pressures in the range of -0.03 to -0.34 bar [0.5 to 5 pounds per square inch (psi)]. Attempts to measure moisture contents at lower capillary pressures were unsuccessful because samples disaggregated. Thus, moisture characteristic curves could only be determined for volumetric moisture contents above 22 percent, which is considerably higher than the values observed from testing core samples of field measurements. However, some conclusions can be reached from the characteristic curve data. Moisture retention values of the tuff are extremely high, ranging up to 80 percent (60 percent volumetric moisture). Since all of the moisture content measurements for the tuff are significantly below 80 percent, capillary transport of liquids does not contribute to moisture movement and vapor transport is clearly the major mechanism of water transport.

Actual measurement of moisture content at depth in the tuff tends to verify the conclusion regarding moisture movement. Neutron logging of one borehole in each of Areas G and L was performed every two weeks for an approximately eight month period. Borehole logging was also performed daily for a period after three major precipitation events in the area. Moisture profiles measured in this manner show the upper 10 to 20 feet of the tuff to be affected by precipitation events and subject to seasonal fluctuations. Below 20 feet, however, moisture content is extremely low and in the range of the gravimetric moisture determination.

To measure capillary potential, thermocouple psychrometers were installed at numerous depths in one borehole in each of Areas G and L. Though data obtained from the psychrometers are highly variable, they indicate soil moisture tensions ranging from 1 to 15 bars. Utilizing measured hydraulic conductivity values for the tuff and hydraulic head data from the psychrometers, moisture flux calculations were performed to determine maximum rates of moisture movement in the tuff. For Area L, a maximum downward flux of 0.25 feet per year (ft/yr) and a maximum upward flux of 0.20 ft/yr were calculated. For Area G, maximum downward and maximum upward fluxes of 0.49 ft/yr and 0.041 ft/yr, respectively, were calculated. These calculated flux rates very likely overestimate the moisture flux values at Areas G and L because only hydraulic conductivity values at higher percentages of saturation than those observed in the field are available. Because hydraulic conductivity in the vadose zone typically increases with increases in percent saturation, the measured hydraulic conductivity values are certainly greater than actual field conditions. Lower values of flux rates (by about an order of magnitude) are predicted if calculated (rather than measured) hydraulic conductivity values are used. Though highly conservative, these moisture flux values show that very long periods of time would be required for water and contaminants to move by unsaturated flow from the disposal facilities to the ground water. In addition, there is no evidence to suggest that saturation of the tuff and subsequent transport of contaminants by saturated flow is possible.

4.0 CHEMICAL CHARACTERIZATION OF THE VADOSE ZONE

Chemical characterization data on the Bandelier Tuff at Areas G and L were obtained by analysis of core samples and by sampling and analysis of gases in the rock pores. Core samples were collected at about ten-foot intervals from seven boreholes at Areas G and L for a total of 70 samples. With the exception of two samples in Area L, all cores exhibited Extraction Procedure (EP) Toxic metals below detection limit concentrations (which are well below EP Toxic regulated concentrations). One sample collected from the zero to ten-foot depth interval had a detectable (though below regulatory limit) EP concentration of barium. A second sample collected from the ten- to twenty-foot depth slightly exceeded the EP Toxic limit for chromium. All core

samples were also analyzed for volatile organic compounds. No volatile organics were detected in core samples from Area G; however, the lower limit of detection for most of the compounds was in the parts per million range, not permitting detection of trace concentrations possibly present. Volatile organics were detected in core samples from various depths in all four boreholes from which samples were obtained at Area L. The detected compounds, ranging from part per billion to part per million concentrations at depths up to 100 feet, consist of a suite of common solvents and ketones (i.e., methylene chloride, acetone, tetrahydrofuran, methyl ethyl ketone, etc.).

A total of 23 sampling ports were installed in the seven test holes to permit collection of pore gas at various depths. Pore gases were collected by pumping air from the sampling port through charcoal adsorption tubes. After collection, volatile organics were extracted from the charcoal and analyzed. The results of the analyses indicate that volatile organic compound vapors are present in the pore gas of the tuff in part per million concentrations at depths up to about 100 feet.

Core analyses and pore gas data suggest that volatile organic constituents of the waste disposed of at Area G and/or Area L have migrated into the tuff. Based on the vadose zone characterization studies, vapor diffusion is the most probable migration mechanism.

5.0 GROUND WATER HYDROLOGY IN AREAS G AND L

The main aquifer in the Los Alamos area is the only aquifer capable of producing a municipal and industrial water supply. The hydraulic and chemical properties of the main aquifer are reasonably well known from information obtained from supply wells, stock wells, test wells, and springs. The upper surface of the main aquifer slopes eastward from the major recharge area in the Valles Caldera (west of the Pajarito Plateau) to the Rio Grande (east of the plateau) where it discharges as springs and seeps into the river.

Beneath Areas G and L, the upper surface of the main aquifer is contained in the poorly consolidated conglomerates, sandstones and siltstones of the Tesuque Formation. The main aquifer was encountered at a depth of about 875

feet below the land surface just west of Areas G and L. Based on data from supply wells in the Los Alamos area, the Tesuque has an average saturated thickness of 1,470 feet and a hydraulic gradient of 0.015. Using this hydraulic gradient value for calculation, the depth to the main aquifer beneath Areas G and L is 850 feet and 950 feet, respectively. Based on test data obtained from supply wells and an assumed porosity value of 30 percent, the velocity of water in the main aquifer is about 0.18 feet per day.

Test holes were drilled and monitoring wells were installed in Cañada del Buey (bounding Mesita del Buey on the north) and Pajarito Canyon (which bounds the mesa to the south) to investigate the alluvial perched water systems potentially present in these canyons. The alluvium in Cañada del Buey was found to be confined to the canyon, and all test holes in the alluvium were dry. In Pajarito Canyon, the alluvium also does not extend beneath the mesa. In this canyon, however, a perched water system was intersected by the boreholes. The top of the perched water is about one to five feet below the surface of the alluvium, and the water level fluctuates significantly over short periods of time. The approximate saturated thickness encountered by the wells is eight to ten feet, and also exhibits substantial fluctuations.

Water samples were collected from the Pajarito Canyon wells and analyzed for volatile organic compounds, selected metals and radiological parameters. No volatile organics were detected in the samples and metal concentrations and radiological parameters were found to be below drinking water standards. Thus, there appears to be no discernable effect on water quality in Pajarito Canyon from disposal operations at Areas G and L.

6.0 CONCLUSIONS

Several specific conclusions, based on the hydrogeologic investigations performed at Mesita del Buey in 1985 and 1986 and on previous work, can be reached relative to the characteristics of Areas G and L and the potential for migration of contaminants from waste disposal units in these areas:

1. The Bandelier Tuff stratigraphy at Areas G and L is similar to that of the tuff throughout the western Pajarito Plateau.

2. Vertical and near-vertical fractures (formed during cooling of the volcanically deposited material) are common in the Bandelier Tuff on Mesita del Buey (and elsewhere), though the degree of openness or pervasiveness of individual fractures is not well characterized.

3. No major fault zones that could serve as conduits from the shallow subsurface to the regional water table are known to exist at or near Areas G and L.

4. The combination of very low moisture content in the tuff, empirical determination that moisture from precipitation does not infiltrate below a depth of ten to 22 feet, and very low calculated flux rates all suggest that aqueous transport of contaminants through Bandelier Tuff is not a viable mechanism for contaminant migration at Areas G and L.

5. Volatile organic waste constituents have migrated (probably in the vapor phase) from land disposal units at Areas G and L based on the results of core and pore gas analyses conducted in 1985 and 1986.

6. Metals contamination from the land disposal units at Areas G and L was detected in only two samples from shallow depths (20 feet or less) at Area L.

7. Chemical data from the core and pore gas analyses (and information obtained from vadose zone characterization) support vapor phase migration from Areas G and L as the dominant transport mechanism, based on the presence of volatile organic vapors at depths of up to 100 feet.

8. No perched bodies of water, which could be hydraulically connected to the main aquifer, have been detected beneath Areas G and L.

9. Perched water in Pajarito Canyon is confined to alluvium within the canyon and does not extend vertically or horizontally into the Bandelier Tuff which forms Mesita del Buey. No perched water was detected in Cañada del Buey.

10. There is no evidence of migration of hazardous waste constituents from Areas G and L into the perched water contained in the alluvium of Pajarito Canyon.

TABLE ES-1

SUMMARY OF REQUIREMENTS AND COMPLIANCE WITH COMPLIANCE ORDER PARAGRAPH 25

PARAGRAPH 25 REQUIREMENTS				TESTS CONDUCTED TO SATISFY REQUIREMENT		
TASK	ACCEPTABLE METHODS	SAMPLE FREQUENCY	SAMPLE LOCATIONS	TEST CONDUCTED	BOREHOLE	INTERVAL TESTED (FEET BELOW SURFACE)
1. Intrinsic Permeability of Tuff, k	• Constant head test • Flow test • Pressure transient test	• 5 holes 125 ft deep • 1 test per horizon • 6 tests per hole	• TA-54 Area G • TA-54 Area L	• Laboratory (Dynamic, Klinkenberg)	LLM-85-01 LLM-85-02 LLM-85-05 LGM-85-06 LGM-85-11	30, 52, 101, 124 7, 36, 67, 117 15, 36, 76, 123 29, 51, 99, 115 3, 30, 94, 115
				• Field Vacuum Tests (Pressure Transient)	LLM-85-01 LLM-85-02 LLM-85-05 LGM-85-06 LGM-85-11	30-33, 70-73, 80-83, 94-97 10-13, 25-28, 87-90, 87-90 15-18, 40-43, 50-53, 60-63 10-13, 40-43, 60-63, 82-85, 87-90, 100-103 35-38, 77-80, 110-113
				Air Injection Tests (Pressure Transient)	LLM-85-01 LLM-85-02 LLM-85-05 LGM-85-06 LGM-85-11	9-15, 30-36, 51-57, 72-78, 93-99 9-15, 24-30, 45-51, 66-72, 87-93 24-30, 45-51, 55-61, 75-81, 82-88 38-44, 60-66, 81-87 9-15, 14-20, 35-41, 56-62, 77-83, 99-105, 108-114
2. Moisture Characteristic Curves, $\psi(\theta)$	• Any standard lab method • Drying curve only • More than one method needed	• 5 samples from each of 4 horizons	• TA-54 Area G • TA-54 Area L	• Centrifugal Method	LLM-85-01 LLM-85-02 LLM-85-05 LGM-85-06 LGM-85-11	30, 52, 101, 124 7, 36, 67, 117 15, 36, 76, 123 29, 51, 99, 115 3, 30, 94, 115
				• Pressure Plate Method	Samples Disaggregated	

TABLE ES-1
SUMMARY OF REQUIREMENTS AND COMPLIANCE WITH COMPLIANCE ORDER PARAGRAPH 25
(Continued)

	PARAGRAPH 25 REQUIREMENTS			TESTS CONDUCTED TO SATISFY REQUIREMENT		
TASK	ACCEPTABLE METHODS	SAMPLE FREQUENCY	SAMPLE LOCATIONS	TEST CONDUCTED	BOREHOLE	INTERVAL TESTED (FEET BELOW SURFACE)
3. Unsaturated Hydraulic Conductivity of Tuff K(θ)	• Theoretical and laboratory methods required • Sufficient number of different methods must be employed to give trustworty predictions	• 5 samples from each of 4 horizons	• TA-54 Area G • TA-54 Area L	• Laboratory (Dynamic Method)	LLM-85-01 LLM-85-02 LLM-85-05 LGM-85-06 LGM-85-11	30, 52, 101, 124 7, 36, 67, 117 15, 36, 76, 123 29, 51, 99, 115 3, 30, 94, 115
				• Theoretical (Van Genuchten Method)	LLM-85-01 LLM-85-02 LLM-85-05 LGM-85-06 LGM-85-11	52, 101 36 123 99, 115 94
4. Infiltration and Redistribution of Meteoric Water Into Tuff	• Neutron logging and • Moisture blocks or psychrometry	• 4 holes, 2-50 ft deep and 2 100-ft deep • Neutron log each 2 weeks with daily logs after 2 autumn storms • 10 potential sensors per hole	• 2 at TA-54 Area G • 2 at TA-54 Area L	• Neutron Logging	LLN-85-04 LGN-85-08	108 ft 50 ft
				• Psychrometers	LLP-85-03 LGP-85-07	95 ft, 23 sensors 52 ft, 15 sensors

TABLE ES-1
SUMMARY OF REQUIREMENTS AND COMPLIANCE WITH COMPLIANCE ORDER PARAGRAPH 25
(Continued)

PARAGRAPH 25 REQUIREMENTS				TESTS CONDUCTED TO SATISFY REQUIREMENT		
TASK	ACCEPTABLE METHODS	SAMPLE FREQUENCY	SAMPLE LOCATIONS	TEST CONDUCTED	BOREHOLE	INTERVAL TESTED (FEET BELOW SURFACE)
5. Core and Pore Gas Analyses	• Standard methods for inorganics • GC or GC/MS for volatile organics	• At least 6 holes of varying depths • Cores analyzed for inorganics and volatile organics at 10 ft intervals • Pore gas samplers in bottom of holes • Analyze quarterly	• 2 at TA-54 Area G • 4 at TA-54 Area L	• Core Analyses	LGC-85-09	10 ft intervals
					LGC-85-10	10 ft intervals
					LLC-85-12	10 ft intervals
					LLC-85-14	10 ft intervals
					LLC-85-15	10 ft intervals
					LLC-85-16	10 ft intervals
				• Pore Gas Samplers	LGC-85-09	37, 63, 80, 91
					LGC-85-10	31, 53, 95
					LLC-85-12	6, 27, 41
					LLC-85-13	21, 43, 65
					LLC-85-14	13, 31, 46, 86
					LLC-85-15	19, 32, 82
					LLC-85-16	7, 17, 102
6. Analysis of Perched Water	• Observation wells in side canyons • Report summarizing applicability of research in Mortandad Canyon	• 6 wells bottoming in tuff • Samples and water levels collected quarterly	• 3 wells in Cañada del Buey • 3 wells in Pajarito Canyon	• Well Installation	CDBO-1	15 ft
					CDBO-2	18 ft
					CDBO-3	12 ft
					CDBO-4	12 ft
					PCO-1	22 ft
					PCO-2	22 ft
					PCO-3	20 ft
					PCM-1	60 ft
					PCM-2	120 ft
					PCM-3	60 ft
					PCM-4	60 ft

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1.0 INTRODUCTION

1.1 PURPOSE AND SCOPE

This report presents a summary of the geohydrology of Waste Disposal Areas G and L in Technical Area (TA) 54 at Los Alamos National Laboratory (see Figure 1-1 for site location). Also presented are other pertinent data and discussions relevant to the potential for migration of hazardous waste from the disposal areas. This report was prepared in response to a Compliance Order/Schedule dated May 7, 1985 (Docket Number 001007) issued to the U.S. Department of Energy, Los Alamos Area Office and the University of California, Los Alamos National Laboratory by the Environmental Improvement Division (EID) of the State of New Mexico Health and Environment Department. The Order, issued pursuant to the New Mexico Hazardous Waste Act, mandated that certain tests and investigations be performed at Areas G and L to obtain information on the geohydrological characteristics of the waste disposal area relevant to the potential for migration of contaminants into the area ground water. A copy of the Order is included as Appendix A.

Work was initiated in late 1985 to fulfill the testing requirements in the Order, and numerous reports on the results of individual tests or groups of tests have been prepared by Bendix Field Engineering Corporation/Grand Junction (BFEC, now UNC Technical Services, Inc.) and Los Alamos National Laboratory. Also, data have been obtained since publication of the most recent reports that are relevant to geohydrologic characterization of Areas G and L. The purpose of this report is to summarize the results of the recent work (published and unpublished) and to combine these data with published information on site characteristics into a cogent "publishable" report on the chemical waste migration potential in the lithosphere at Areas G and L.

The report is divided into six sections. The remainder of this section provides a brief summary of waste disposal operations at TA-54, Areas G and L, and a general description of the activities performed to satisfy individual test requirements in the Order. Section 2.0 provides a summary description of the regional and site geology. Sections 3.0 and 4.0 describe the hydrologic characteristics and chemical characteristics, respectively, of Areas G and L. A discussion of the ground water hydrology at Areas G and L is given in

Section 5.0 and a brief summary and conclusions are provided in Section 6.0. Table 1-1 provides a list of the tasks required by the Order and the numbers of the sections of this report that discuss the test and test results.

1.2 DESCRIPTION OF WASTE MANAGEMENT OPERATIONS

Los Alamos National Laboratory has operated two waste disposal facilities in Technical Area 54 on Mesita del Buey located in the southern half of Section 31, T19N, R7E (Figure 1-1). These areas, designated Areas G and L, occupy 63 acres and about 2.5 acres, respectively. Area G, used primarily for disposal of low-level radioactive materials, has been in operation since 1957 and is expected to remain active through the foreseeable future. Area L served as the Laboratory's principal chemical waste disposal area between 1964 and 1985. Currently, no disposal of hazardous chemical waste occurs at these areas.

1.2.1 Area G

Low-level radioactive waste has been disposed of in Area G since 1957. In addition to the low-level waste, small amounts of asbestos, beryllium residues, empty pesticide containers, PCB contaminated solids, and solid trash-type wastes contaminated with known or suspected carcinogens were disposed of at Area G. The Laboratory was granted approval in 1980 by the U.S. Environmental Protection Agency to dispose of PCB solid wastes in facilities at Area G. Hazardous wastes regulated under RCRA represent less than one percent of the total waste at Area G. Waste disposal practices at Area G include use of shafts, trenches and pits. Figure 1-2 shows the location of the waste disposal units.

1.2.1.1 Waste Disposal Pits

Currently there are 31 active and filled pits in Area G, 28 have been filled and 3 are open; some pits are yet to be excavated (see Figure 1-2). Burial pits vary in dimensions, the deepest being 65 feet deep; 15 feet is maintained between pits, and all pits are located a minimum of 50 feet from the edge of the mesa (Zygmunt, 1984).

After excavation of each pit into the Bandelier Tuff, geologic and photographic records are made of the floor and walls. Pit floors are then layered

with a one-half-foot blanket of compacted crushed tuff. Solid or solidified wastes are placed in the pits in layers with one-half-foot layers of crushed tuff between layers of waste. When the pits are filled to within about three feet of the lowest point of the pit rim, they are covered with crushed tuff and topsoil to minimize run-on and erosion (Zygmunt, 1984).

1.2.1.2 Area G Trenches

Eight trenches for storage of waste are present in Area G, four of which are not yet excavated. Trenches A and B are cored in the tuff with three-foot diameters by two-foot holes on about three-foot centers. Casks which contain waste are placed within the trenches. Each waste cask stores two 30-gallon drums of waste. After an array of casks has been placed into a trench, the trenches are backfilled with crushed tuff to the level of the casks. Corrugated decking is placed on top of the cask lids and the trenches are filled to the surface with crushed tuff (Rogers, 1977).

1.2.1.3 Disposal Shafts

About 100 disposal shafts in the Bandelier tuff are located in Area G disposal shaft field and are used for disposal of low-level radioactive waste (Rogers, 1977). The first shafts were completed at the end of 1965 and were put into use in early 1967. Two types of shafts were utilized in Area G: lined and unlined. Lined shafts, 14 through 23, used primarily for storage of tritium-contaminated waste, consist of three foot diameter borings, 25 feet deep; one foot diameter steel pipe is centered in the boring, and the annulus is filled with concrete. The remaining shafts range from two feet to six feet in diameter and 25 feet to 60 feet in depth. The Area G shafts are separated by a minimum distance of 7.5 feet. Wastes are layered in the shafts with one-half-foot layers of crushed tuff between layers of waste, shafts are filled to within about three feet of the lowest point of the shaft rim, covered with one-half foot of crushed tuff and finally covered with about three feet of uncontaminated concrete (Zygmunt, 1984).

1.2.2 Area L

Area L has been the principal chemical waste handling and disposal area at the Laboratory since 1964. From 1964 through May 1975, all chemical wastes were disposed of in one pit at the site, Pit A (Figure 1-3). Beginning in June

1975, the disposal pit was covered and shafts in the tuff were used for disposal of chemical waste until 1985. A surface impoundment that may have been used for hazardous waste disposal was also open during part of this time. All disposal of chemical waste at Area L was discontinued in 1985.

Thirty-four shafts are present in Area L; all have been sealed. Figure 1-3 shows the location of each shaft and contains information about the period of use and type of waste deposited in each. The Area L shafts are similar to those in Area G. They range from three feet to eight feet in diameter and are approximately 60 feet deep. The shafts are typically spaced about 15 feet apart (center to center). Upon completion of shafts, geologic records and photographs were made and a three-foot thick layer of crushed tuff was placed in the bottom. Containerized wastes were lowered into the shafts with one-half-foot layers of crushed tuff separating drums. As with the Area G shafts, when the shafts were filled to within about three feet of the surface, the wastes were covered with compacted crushed tuff and sealed with a minimum of three feet of concrete (Zygmunt, 1984).

Each shaft was dedicated to accept only compatible waste materials. A list of the hazardous waste materials which are known to have been placed into shafts 19 through 34 is provided in Appendix B. Waste disposal records for earlier shafts are incomplete. Prior to 1982, shaft disposal of liquid chemicals was conducted without the addition of absorbents. Calculations in DOE (1984) show that the volume of non-absorbed liquids is insufficient to support significant downward migration of liquid contaminants.

1.3 DESCRIPTION OF 1985-1986 INVESTIGATIONS

1.3.1 Drilling Activities

During 1985, test holes were drilled both from the top of Mesita del Buey and in the adjacent canyons to investigate the upper part of the vadose zone (Figure 1-4 and Table 1-2). Eighteen test holes were drilled into the Bandelier Tuff from the top of Mesita del Buey (the location of Technical Area 54, Areas G and L). The locations of these holes are shown on Figures 1-2 and 1-3. The 18 holes were drilled using a Central Mining Equipment (CME) Model 55 drilling rig equipped with standard six and five-eighth-inch outside diameter hollow-stem augers and a continuous sampling system. Core was

obtained using a two-inch diameter, five-foot long, split-barrel sampler attached to the center drill stem of the augers. Of the about 2,190 total footage drilled, 1,709 feet of core were obtained from 16 of the holes (Table 1-2). Standard four-inch outside diameter solid stem augers were used to bore the two drill holes from which no core was desired. Core was obtained in five-foot intervals and samples for the various tests planned were collected from the core and appropriately preserved. After samples were selected, a lithologic log was prepared (lithologic logs are provided in Appendix C) and the core was placed in labeled boxes for transfer to a storage facility. All down-hole equipment was decontaminated by steam cleaning followed by a methanol rinse and air-drying after completion of each test hole to obviate the potential for cross-contamination. In addition to these 18 holes, a 60-foot deep borehole was sunk near the surface impoundment at Area L (Figure 1-3) to obtain core samples for chemical analysis.

After drilling was complete, each hole was geophysically logged using four different probes to generate the following data: 1) spectral gamma and three-arm caliper logs, 2) natural gamma, epithermal neutron and vertical deviation logs, 3) magnetic susceptibility logs, and 4) moisture logs derived from epithermal neutron data. In addition, 16 of the 18 holes were logged with another probe to generate a gamma-gamma density, natural gamma and one-arm caliper log. Copies of all logs run are provided in BFEC (1985a).

The manner in which each test hole was completed depended on its primary purpose. The hole numbering scheme provides a code that indicates the general completion configuration for each hole and the sequence in which the holes were drilled. The first letter in each hole number, L, refers to Los Alamos. The second letter, G or L, identifies the waste disposal area in or near which the hole is located. The third letter indicates the primary purpose for which the hole was drilled; the codes were assigned as follows:

- M: Moisture Holes - To be used to determine intrinsic permeability and hydraulic conductivity of the tuff
- C: Core and Pore-Gas Sampling Holes - To be used to collect samples for EP-toxicity and volatile-organic analyses, and for the installation of pore-gas sampling apparatus

- P: Psychrometer Holes - To be used for the installation of thermocouple psychrometers and pressure transducers to determine local moisture conditions, temperature, and pressure

- N: Neutron Moisture Access Holes - To be used by LANL for moisture measurements.

The middle designation, 85, indicates the year that the test holes were drilled, and the final two digits refer to the drilling sequence. The construction details for each of the test holes are shown on the figures in Appendix C.

In addition to the holes drilled on Mesita del Buey, test holes were also sunk in the canyons that bound the mesa (Figure 1-4 and Table 1-2). Four test holes were drilled into the alluvium of Cañada del Buey and seven holes were sunk in Pajarito Canyon alluvium. These holes were drilled using a truck-mounted, continuous flight hollow-stem auger drilling rig. Test holes penetrated the alluvium and were drilled several feet into the underlying Bandelier Tuff. Lithologic logs were prepared during drilling and are included in Appendix C. All four holes in Cañada del Buey and three of the seven holes in Pajarito Canyon were completed as monitoring (or observation) wells. Construction details for these monitoring wells are also provided in Appendix C.

1.3.2 Hydrologic Testing

Samples of core from the holes drilled on Mesita del Buey were tested for a number of parameters that have import on the hydrologic behavior of the Bandelier Tuff. These tests, described in Sections 3.3 and 3.4 included those necessary to determine gravimetric moisture content, porosity, soil moisture characteristic curves, permeability and hydraulic conductivity. Samples of alluvium from some holes drilled in Cañada del Buey and Pajarito Canyon were also tested to determine gravimetric moisture content (see Section 5.2 for details).

In addition to laboratory tests to determine pertinent hydrologic parameters, field tests were also conducted in the test holes drilled on Mesita del Buey. These tests included two types of borehole injection tests and vacuum tests

(Section 3.2). Other investigations performed in these test holes over a period of months included atmospheric/rock-pore pressure monitoring, measurements of temperature and water potential, and neutron moisture measurements (Section 3.5). Hydrologic investigation activities in the holes in the canyons consisted only of measuring water levels over a period of months in those holes that encountered perched water (Section 5.2).

1.3.3 Chemical Analyses

Analyses of rock core and pore gases from the Mesita del Buey test holes and water samples collected from the canyon monitoring wells were performed for a selected group of parameters. Parameters included those needed to detect constituents of wastes disposed of at Areas G and L. A discussion of the sampling and analytical regimens and the analytical results for core samples and pore gas samples are presented in Sections 4.2 and 4.3, respectively. For water samples, analytical results are presented in Section 5.2.

TABLE 1-1

COMPLIANCE ORDER PARAGRAPH 25 TASKS AND CORRESPONDING REPORT SECTIONS

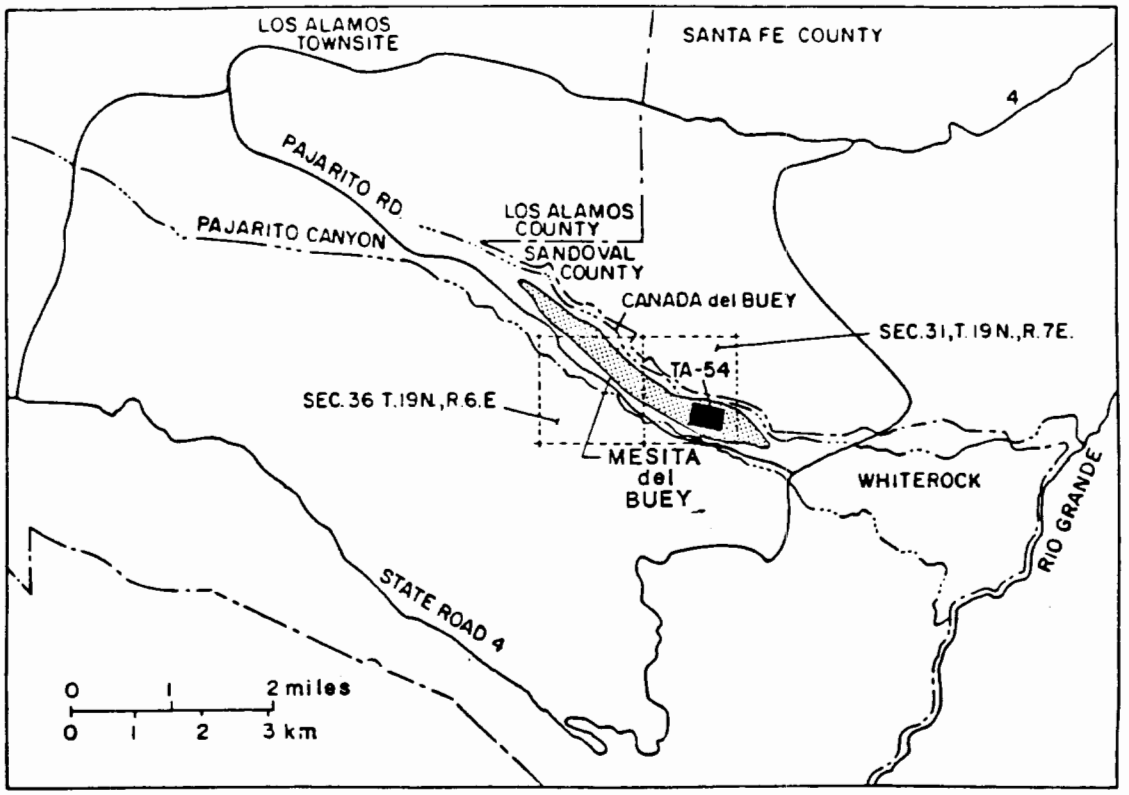
COMPLIANCE ORDER PARAGRAPH 25 TASK		REPORT SECTION
Task 1.	Intrinsic Permeability of Tuff, k	3.2
Task 2.	Soil Moisture Characteristic Curves, $\Psi(\theta)$	3.3.2
Task 3.	Unsaturated Hydraulic Conductivity of Tuff, $K(\theta)$	3.4
Task 4.	Infiltration and Redistribution of Meteoric Water into Tuff	3.5
Task 5.	Core and Pore Gas Analyses	4.1, 4.2, 4.3
Task 6.	Analysis of Perched Water	5.2

TABLE 1-2

TOTAL DEPTHS OF CORE AND DRILL HOLE FOR LOS ALAMOS 1985 TEST HOLES
(depths in feet)

DRILL-HOLE NUMBER	TOTAL DEPTH CORED	TOTAL DEPTH DRILLED
LLM-85-01	124	140
LLM-85-02	125	145
LLP-85-03	99	120
LLN-85-04(1)	0	120
LLM-85-05	124	145
LGM-85-06	124	145
LGP-85-07	49	60
LGN-85-08(1)	0	60
LGC-85-09	99	120
LGC-85-10	99	120
LGM-85-11	124	145
LLC-85-12	99	120
LLC-85-13	99	120
LLC-85-14	99	120
LLC-85-15	99	120
LLC-85-16	99	120
LLC-85-17	149	150
LLC-85-18	99	120
PCO-1	0	22
PCO-2	0	22
PCO-3	0	20
PCM-1	0	60
PCM-2	0	120
PCM-3	0	60
PCM-4	0	60
CDBO-1	0	15
CDBO-2	0	18
CDBO-3	0	12
CDBO-4	0	12

(1)Hole augered with a 4-inch-O.D. solid-stem auger.



From Rogers (1977)

FIGURE 1-1

LOCATION MAP
FOR MESITA DEL BUEY
AND TECHNICAL AREA 54

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LOS ALAMOS NATIONAL LABORATORY
LOS ALAMOS, NEW MEXICO

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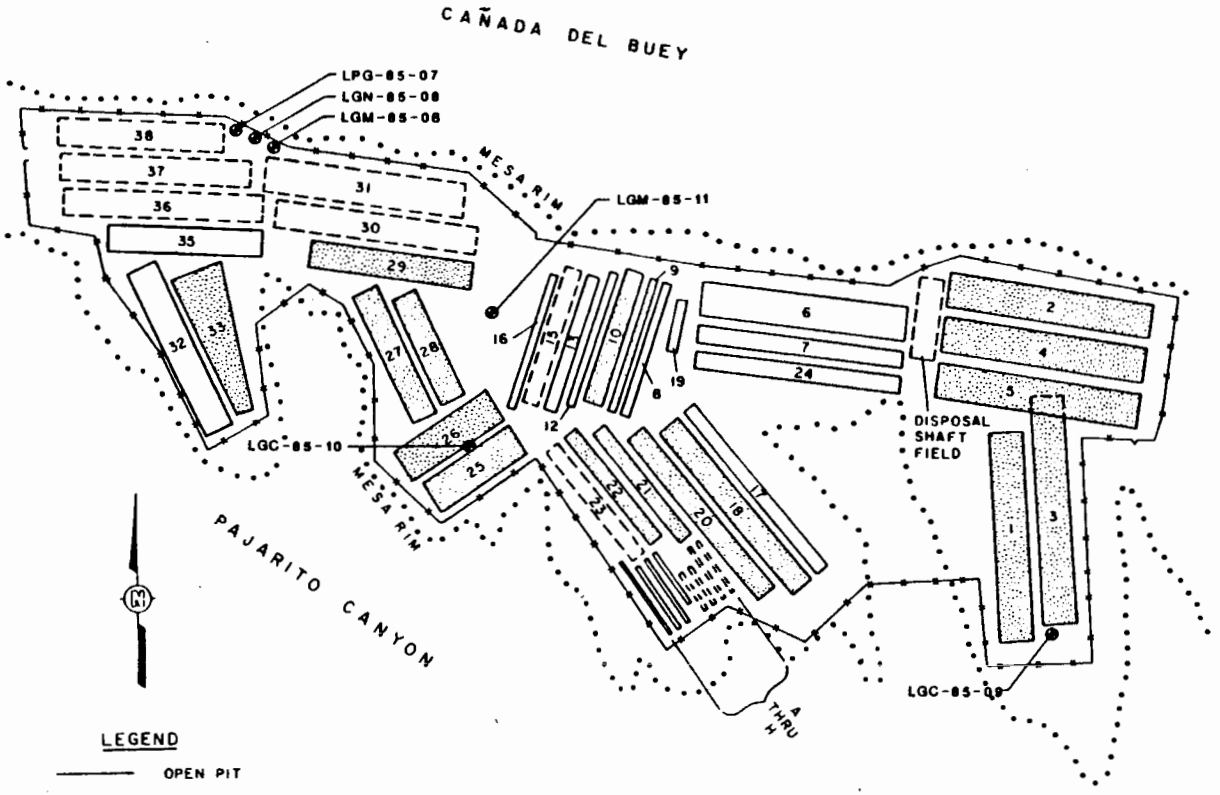

FIGURE 1-2
AREA G LANO DISPOSAL FACILITIES
(TA-54 AREA G)
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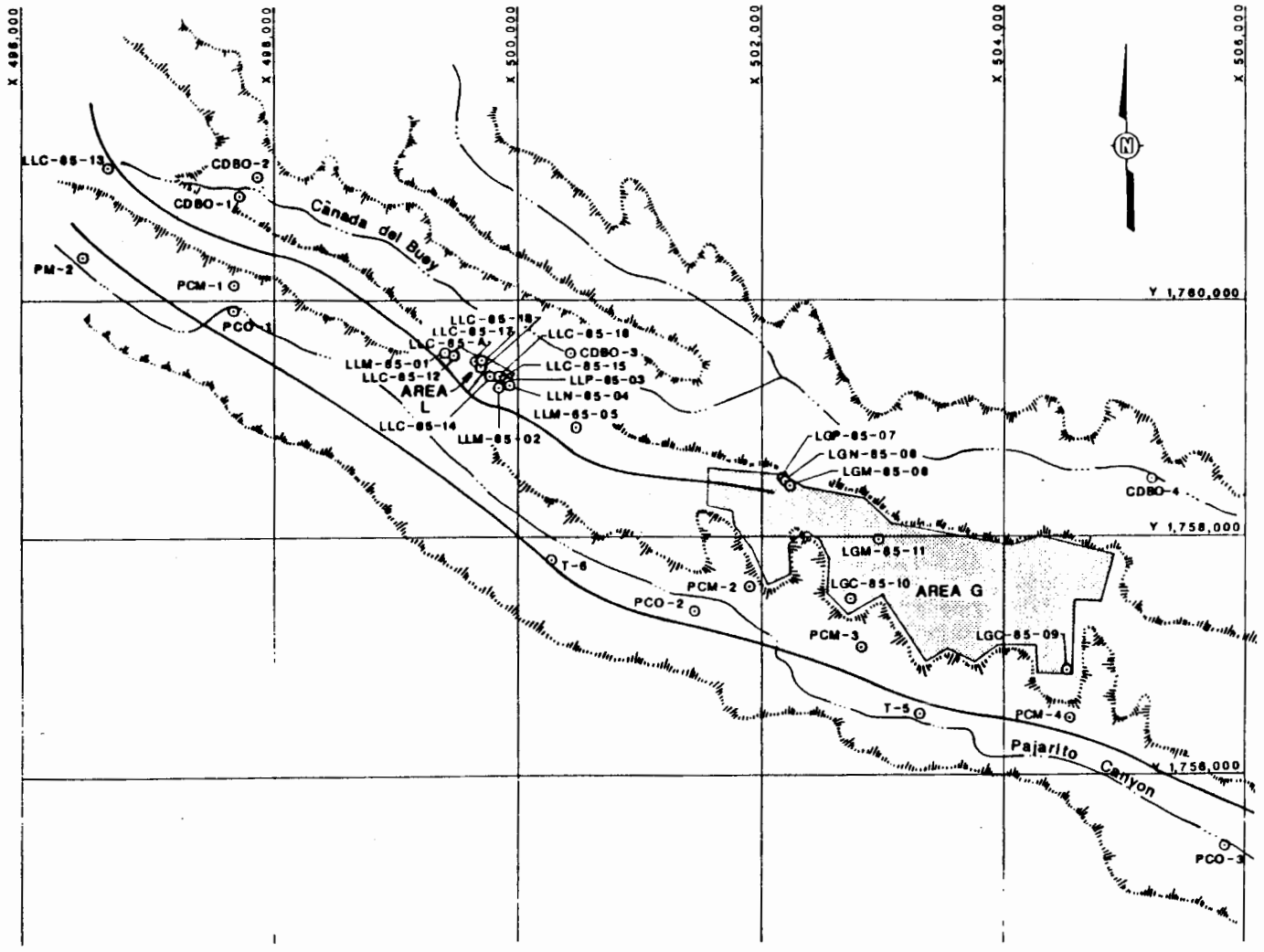

⊙ INSTRUMENTED BOREHOLES, TEST HOLES, AND MONITORING WELLS

WELL NO.	Y-COORDINATE	X-COORDINATE	ELEVATION (LAND SURFACE DATUM)
CDBO-1	1,760,881.92	497,724.37	675[illegible].5
CDBO-2	1,761,041.07	497,874.80	6748.2
CDBO-3	1,759,548.98	500,432.90	6673.2
CDBO-4	1,758,488.91	505,230.80	656[illegible].5
LLM-85-01	1,759,552.34	499,402.86	6797.4
LLM-85-02	1,759,260.86	499,851.04	679[illegible].7
LLP-85-03	1,759,269.11	499,923.76	6788.[illegible]
LLN-85-04	1,759,265.96	499,924.24	6788.3
LLM-85-05	1,758,919.02	500,471.44	6772.5
LGM-85-06	1,758,437.40	502,239.90	6736.3
LGP-85-07	1,758,462.39	502,195.69	673[illegible].[illegible]
LGN-85-08	1,758,457.04	502,205.42	673[illegible].5
LGC-85-09	1,756,884.15	504,521.44	665[illegible].9
LGC-85-10	1,757,487.94	502,748.67	6707.[illegible]
LGM-85-11	1,757,477.36	502,978.01	6715.9
LLC-85-12	1,759,536.30	499,477.89	679[illegible].[illegible]
LLC-85-13	1,761,119.07	496,648.14	685[illegible].[illegible]
LLC-85-14	1,759,355.53	499,782.26	679[illegible].4
LLC-85-15	1,759,315.73	499,895.35	6787.3
LLC-85-16	1,759,350.09	499,850.10	6788.3
LLC-85-17	1,759,485.35	499,703.83	6788.4
LLC-85-18	1,759,440.61	499,698.48	6790.4
PCO-1	1,759,928.36	497,674.98	6682.2
PCO-2	1,757,379.51	501,455.63	6612.3
PCO-3	1,755,423.76	505,841.81	65[illegible].3
PM-2	1,760,367.72	496,447.87	671[illegible].2
T-5	1,756,514.61	503,312.12	655[illegible].[illegible]
T-6	1,757,817.74	500,272.15	66[illegible].[illegible]
PCM-1			664[illegible].[illegible]
PCM-2			66[illegible].[illegible]
PCM-3			66[illegible].[illegible]
PCM-4			65[illegible].[illegible]

FIGURE 1-4

LOCATION MAP FOR INSTRUMENTED BOREHOLES, TEST HOLES, AND MONITORING WELLS IN TECHNICAL AREA 54, AREAS G AND L

PREPARED FOR

LOS ALAMOS NATIONAL LABORATORY
LOS ALAMOS, NEW MEXICO

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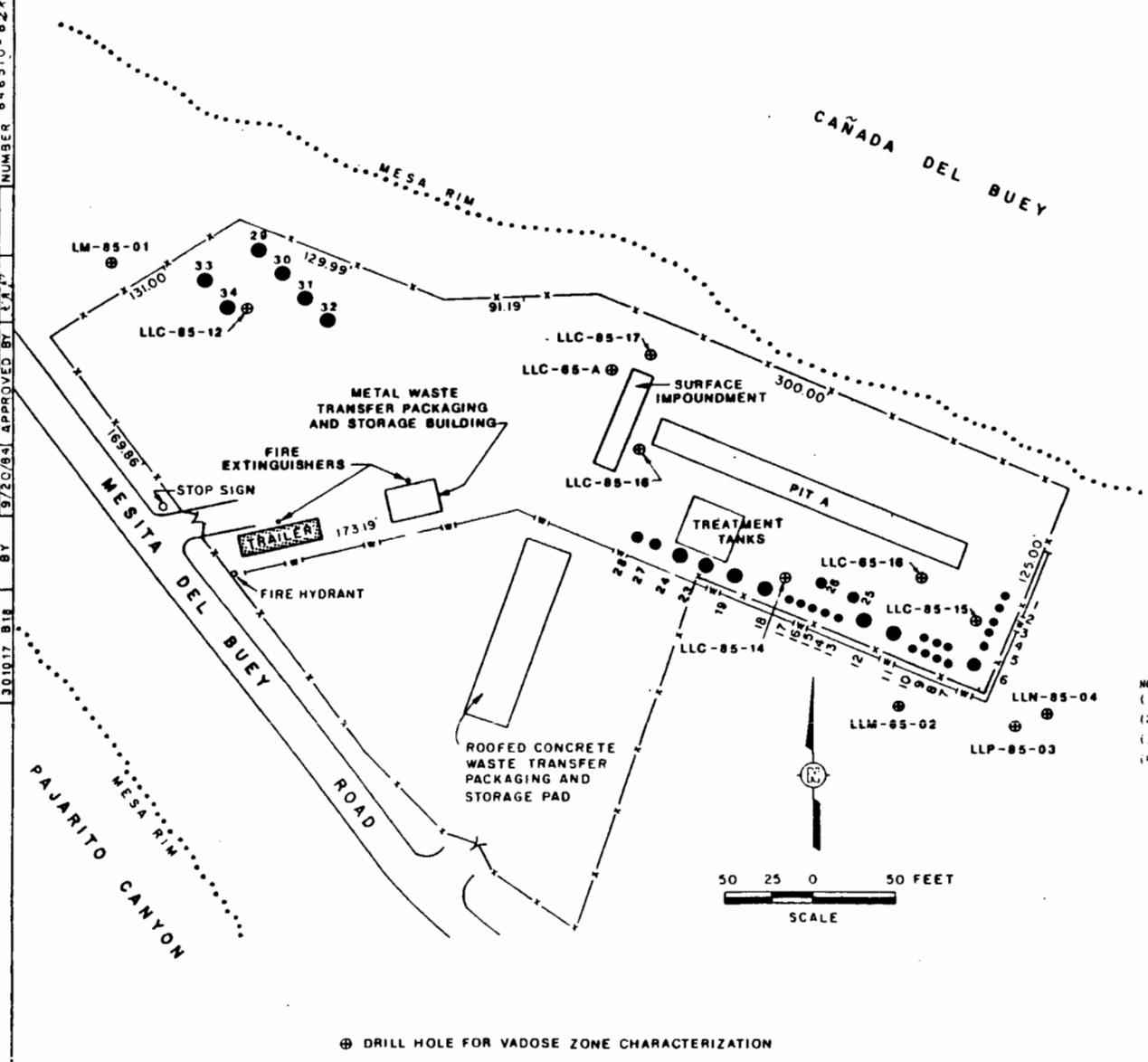

AREA L SHAFTS[1]
(INFORMATION CURRENT MARCH 1985)

SHAFT NO.	SHAFT DIAMETER (FEET)	DATE DRILLED	DATE CAPPED	CONTENTS
1	3	4/80	9/83	ORGANICS[2]
2	3	2/75	7/79	ACIDS & BASES
3	3	2/75	11/78	INORGANIC
4	3	2/75	5/80	ORGANIC
5	3	2/75	6/77	WASTE OIL
6	4	6/75	6/79	REACTIVE
7	3	6/75	6/79	REACTIVE
8	3	5/75	6/79	REACTIVE
9	3	6/75	6/79	GAS CYLINDERS
10	3	6/77	6/79	WASTE OIL
11	8	1/78	7/79	WASTE OIL/SOLVENT
12	4	1/78	7/79	WASTE OIL/SOLVENT
13	3	6/79	5/82	INORGANIC
14	3	6/79	5/82	REACTIVE
15	3	5/79	5/82	REACTIVE
16	3	5/79	5/82	GAS CYLINDERS
17	3	5/79	5/82	ORGANIC
18	8	5/79	6/80	WASTE OIL
19	8	4/80	5/82	WASTE OIL
20	3	4/80	9/83	INORGANIC
21	3	4/80	1/86	GAS CYLINDERS
22	3	4/80	9/83	ORGANIC
23[3]	8	4/82	3/84	WASTE OIL
24[4]	8	4/82	4/84	ORGANIC & WASTE OIL
25	6	9/82	5/85	INORGANIC
26	6	9/82	3/84	ORGANIC
27	4	1/83	2/85	SPECIAL[5]
28	4	1/82	5/85	SPECIAL
29	6	12/83	3/84	ORGANIC
30	6	12/83	3/84	ORGANIC
31	6	12/83	3/84	ORGANIC
32	4	3/84	3/84	ORGANIC
33	6	3/84	2/85	ORGANIC
34	6	2/85	5/85	ORGANIC

NOTES:
(1) ALL SHAFTS ARE APPROXIMATELY 60 FEET DEEP.
(2) PRIOR TO SHAFT 23, LIQUIDS WERE DISPOSED OF IN DRUMS WITHOUT ADDING ABSORBENTS.
(3) MIDDLE SECTION OF THIS SHAFT NOT USED.
(4) USED FOR MISCELLANEOUS WASTE REQUIRING GREATER ISOLATION.

FIGURE 1-3

TA-54 AREA L
WASTE MANAGEMENT FACILITIES

PREPARED FOR

LOS ALAMOS NATIONAL LABORATORY
LOS ALAMOS, NEW MEXICO

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Rev 3/23/87 301017 B18

2.0 GEOLOGY

Numerous subsurface geological investigations of the Pajarito Plateau and the Mesita del Buey portion of the plateau (the part of the plateau on which Areas G and L are located) have been performed during at least the past 40 years. Many studies of the plateau have been conducted in conjunction with hydrologic investigations performed to ascertain the adequacy of ground water resources for the Laboratory. Many other studies, concentrated solely on the geology of the plateau, have been undertaken to gain further basic knowledge of volcanic tuffs or the Jemez volcanic assemblage. In addition to studies of the entire Pajarito Plateau, detailed investigations of the geology of Mesita del Buey have been conducted during the past 20 years to ensure that the mesita terrane provides adequate containment for land disposal of hazardous and radioactive wastes. The more recent of these studies, performed by BFEC and the Laboratory primarily in 1985 and early 1986 and described in the previous section, have added detail to the knowledge of the upper 100 feet or so of the geology of Mesita del Buey. The results of these efforts have been combined with previously published information and are presented in the sections that follow to provide the geologic framework necessary to an understanding of the Mesita del Buey hydrology.

2.1 REGIONAL GEOLOGY

Los Alamos National Laboratory is located on the east-central edge of the Jemez Mountains. The Jemez Mountains are formed by a complex pile of volcanic rocks along the northwest margin of the Rio Grande rift in north-central New Mexico (Figure 2-1). The immense volume of Pliocene and Quaternary extrusive rocks that represents the Jemez volcanic field covers an area of over 30 miles east-to-west and 50 miles north-to-south and is over 4000 feet in thickness near the center (Woodward, 1974).

The Jemez volcanic field unconformably overlies the eastern part of the Nacimiento uplift and the southern Chama basin. The Chama basin, the San Juan Basin and the Gallina-Archuleta arch are part of the Colorado Plateau, whereas the Brazos and Nacimiento uplifts (Figure 2-1) are generally included with the Southern Rocky Mountains (Woodward, 1974). These features attained their present structural outlines during the Laramide orogeny of Late Cretaceous and

early Tertiary time. Superimposed on these Laramide structures is the Rio Grande rift that began to form during the Miocene. Volcanism in the Jemez area began in Pliocene time after initial development of the rift with extrusive rocks accumulating along the western margin of the rift contemporaneously with late stages of rifting (Woodward, 1974). Initial eruptions were dominantly mafic to intermediate flows, which probably formed low, coalescing shields. Eruptive activity culminated in the early Pleistocene with explosive, caldera-forming eruptions of ashflow tuffs, which covered most of the shields and formed two calderas, the largest and youngest of which is the Valles Caldera located seven to ten miles west of Los Alamos, New Mexico (Kudo, 1974). Extensive studies of the Jemez volcanism have been performed by Ross et al. (1961), Bailey et al. (1969), Smith and Bailey (1966, 1968) and Smith et al. (1970).

Major tectonic features here are dominated by vertical movements. Minor horizontal shift and compressional features, however, occur in parts of the Colorado Plateau and Southern Rocky Mountain structures. The stratigraphy, structure and tectonics of the Jemez Mountains and surrounding area have been the topics of a large number of reconnaissance and detailed studies (c.f., Dane, 1948; Kelley, 1954, 1955; Griggs, 1964; Woodward, et al., 1972, 1973, 1974).

2.2 SITE GEOLOGY

The Los Alamos facilities are located on the western part of the Pajarito Plateau (Figure 2-1), which forms an apron of volcanic and sedimentary rocks around the eastern flanks of the Jemez Mountains. The plateau is aligned approximately north-south and is about 20 to 25 miles in length and five to ten miles wide. It is bounded on the east by White Rock Canyon (which contains the Rio Grande), on the north and northeast by the Puye Escarpment and on the west by Sierra de los Valles. The plateau slopes gently eastward from an elevation of about 7,500 feet near the mountains toward the Rio Grande where it terminates at an elevation of about 5,400 feet in steep slopes and cliffs formed by down cutting of the river. The plateau has been dissected into a number of narrow mesas by southeastward-trending intermittent streams. One of these mesas, Mesita del Buey, is the site of Technical Area 54, Areas G and L, which have been utilized for disposal of Laboratory radioactive and hazardous waste.

Mesita del Buey is a narrow southeastward-trending mesa about two miles in length and one quarter mile wide. The mesa surface slopes gently from an altitude of about 6,900 feet at its western margin to about 6,600 feet near its eastern end (Purtymun and Kennedy, 1971). It is bounded on the north by Cañada del Buey and on the south by Pajarito Canyon. The canyons have cut 50 to 100 feet below the surface of the mesa producing near-vertical cliffs from the mesa top to the canyon floors. The stratigraphy and structure of Mesita del Buey and the Pajarito Plateau are described below.

2.2.1 Stratigraphy

2.2.1.1 General Stratigraphy of the Pajarito Plateau

The Pajarito Plateau is formed by a series of sediments and volcanic extrusive rocks and is typical of a terrane produced by concurrent sedimentation and volcanism. A generalized cross-section of the Pajarito Plateau is shown in Figure 2-2. The base of the plateau is represented by the Miocene Tesuque Formation, which in this area consists of friable to moderately well cemented siltstone and sandstones that contain lenses of conglomerate and clay (Purtymun and Johansen, 1974). Some basalt flows are interbedded with the sediments in the formation. The lower part of the Tesuque is comprised of fine arkosic sand and the upper part is composed of very coarse arkosic sand, latitic gravels and volcanic detritus. The late Pliocene to early Pleistocene basaltic rocks of Chino Mesa form the steep walls of White Rock Canyon and cap the high mesas to the east (Griggs, 1964). The basalts represent a series of flows that overlie the Tesuque Formation east of Pajarito Plateau and interfinger with and overlie the Puye Formation on the plateau.

Overlying the Tesuque Formation are the volcanic extrusives of the Pliocene to early Pleistocene Tschicoma Formation, which consist of latite, quartz-latite flows and pyroclastic rocks. The Tschicoma has been extruded through the Tesuque west of Los Alamos, forming the lower part of the Jemez Volcanic Pile. Penecontemporaneous with the Tschicoma Formation is the Puye Formation (Bailey, et al., 1969). It is described as a broad alluvial and pyroclastic fan flanking the east side of the northern Jemez Mountains. It interbeds with the Tschicoma Formation and the basalts of Chino Mesa and unconformably overlies the Tesuque Formation.

Blanketing much of the Pajarito Plateau are the ashflow and ashfall rhyolitic tuffs of the Pleistocene Bandelier Tuff. The Bandelier Tuff has been subdivided into three members (Griggs, 1964), which are from lowermost upward: the Guaje Member, a bedded pumice-fall deposit; the Otowi Member, a massive pumiceous tuff breccia of ashflow origin; and the Tshirege Member, a succession of cliff-forming welded ashflows. Other workers (e.g., Bailey et al., 1969) divide the Bandelier into two members, the Otowi and the Tshirege. Because most of the geologic investigations of Mesita del Buey and the Laboratory area consider the Bandelier Tuff to consist of three members, a three-member nomenclature will be used in this discussion.

A thin layer of soil cover overlies the Bandelier Tuff over much of the Pajarito Plateau although the soil thins considerably near canyon edges. Recent alluvium is present in the canyons cutting the plateau (Rogers, 1977). This alluvium consists primarily of detritus derived from the canyon walls formed by the Tschicoma Formation along the western edge of the plateau and by the Bandelier Tuff farther east.

2.1.1.2 Stratigraphy of Mesita del Buey

The general stratigraphy of Mesita del Buey is reasonably typical of the remainder of the Pajarito Plateau (Figure 2-2). However, the large number of drillholes that have been sunk on and adjacent to the mesa (Figure 1-4) permit detailed descriptions of the upper portion of the mesa stratigraphy. All of the boreholes shown on Figure 1-4 extend only into the Bandelier Tuff with the exception of boreholes PM-2, T-5 and T-6, which are of sufficient depth to penetrate portions of the Tesuque Formation, basalts of Chino Mesa and the Puye Conglomerate, respectively. Graphic lithologic logs for all boreholes (except PM-2 and LLC-85-A) are provided in Appendix C.

Borehole PM-2 penetrated the top 1,190 feet of the Tesuque Formation (Rogers, 1977), which in this location consists of a series of coarse sediments and basalt layers (Figure 2-3). The sediment layers range in thickness from about 75 to 250 feet and are comprised of silty sandstones, sandstones with lenses of clay and pebbly conglomerates (Purtymun and Kennedy, 1971). The two basalt layers encountered in PM-2 have thicknesses of about 50 to 100 feet.

Overlying the Tesuque Formation at Mesita del Buey are the Totavi Lentil and Fanglomerate Member of the Puye Conglomerate. West of Mesita del Buey, the Tschicoma Formation is often found above the Tesuque on the Pajarito Plateau; however, it is thought that the Tschicoma does not extend as far east as Mesita del Buey (Figure 2-2). The Totavi Lentil, the lower member of the Puye Conglomerate, consists of about 70 feet of subrounded quartzite, chalcedony and cobble-chip gravels in a sand matrix. The Fanglomerate Member of the Puye is comprised of a series of basalt, latite and quartzite gravel, pebble and cobble layers intercalated with sandy gravel layers. The Fanglomerate Member is about 640 feet in thickness at borehole PM-2.

Overlying and interfingering with the Puye Conglomerate at Mesita del Buey are the basaltic rocks of Chino Mesa (Figure 2-4). The Chino Mesa flows are described from boreholes PM-2 and T-5 to consist of layers of dense, olivene-containing, vuggy basalts intercalated with vuggy, scoria-containing basalt. Borehole logs from PM-2 indicate that the basalts of Chino Mesa are approximately 270 feet in thickness.

The ashfall and ashflow tuffs of the Bandelier Tuff overlie the Chino Mesa basalts. The Bandelier has been divided into three members, which are in ascending order, the Guaje, the Otowi and the Tshirege Members (Figure 2-3). The Guaje Member is an ashfall pumice with a thin layer of pumiceous tuff at its base. The Guaje consists of gray lump-pumice fragments as large as two inches in diameter, and glass shards and quartz and sanidine crystals are present in the cellular structure (Purtymun and Kennedy, 1971). The upper two to three feet of the member are reworked pumice and tuff. The Guaje ranges in thickness from about 30 feet on the western edge of Mesita del Buey to approximately ten feet at borehole T-5.

The Otowi Member is a light grey, nonwelded pumiceous, rhyolitic tuff, which contains quartz crystals, glass shards and minor amounts of mafic minerals. Also present are varying amounts of rock fragments of rhyolite, latite and pumice in a fine-grained ash (Purtymun and Kennedy, 1971). The Otowi is primarily ashflows but contains several beds of reworked tuff and pumice in the upper part of the member. The thickness of the Otowi Member ranges from about

120 to 180 feet at Mesita del Buey as recorded in borehole logs from T-5 and T-6 (Rogers, 1977). The thickness of the Otowi in borehole PM-2 is noted as 375 feet, however, the overlying Tshirege Member was not identified from borehole cuttings and may have been included with the Otowi.

The Tshirege Member of the Bandelier Tuff has been divided into three units, two of which (Units 1 and 2) occur at Mesita del Buey (Figure 2-5). The third unit, a non-welded to moderately welded pumiceous tuff is absent (Purtymun and Kennedy, 1971). The first two units dip two to three degrees to the southeast and thin in the direction of the dip and with increasing distance from their source in Valles Caldera. Each of Units 1 and 2 has been subdivided into two subunits (a and b) and are described as they appear at Mesita del Buey by Purtymun and Kennedy (1971) and BFEC (1986).

The lowermost subunit of the Tshirege Member (Unit 1a) is a non-welded, light orange to light brown, rhyolitic, vitric crystal, ashflow tuff (BFEC, 1986). At Mesita del Buey, Unit 1a consists of very uniform, non-welded ash composed of brown glass shards and fine, flattened pumice lapilli, neither of which has undergone discernable detrification. The ash also contains varying amounts of lumps of pumice lapilli and latitic to rhyolitic lithic lapilli. In the western part of Mesita del Buey, Unit 1a is about 30 feet thick (Purtymun and Kennedy, 1971), and though not entirely penetrated by any of the recent boreholes, at least 25 feet in thickness at Areas G and L (BFEC, 1986).

Unit 1b, which overlies Unit 1a, is differentiated from Unit 1a by a slight color change (light orange-brown of Unit 1a to grayish brown) and by the presence of larger quartz crystals and fewer and smaller rock fragments. In addition, magnetic susceptibility geophysical logs help locate the Unit 1a - Unit 1b contact in some boreholes (BFEC, 1986). Unit 1b is a rhyolitic ashflow tuff, ranging in color from pale red to orange-pink near its base to light gray to pink-gray near its top. The lower portion of Unit 1b contains gold-colored, bipyramidal quartz crystals up to about 3/16-inch in diameter (BFEC, 1986). At Mesita del Buey, the thickness of Unit 1b was found to range from about 30 feet in the southeast to 50 feet in the northwest.

Unit 2a is a light gray pumiceous tuff that contains rock fragments of pumice, latite and rhyolite, with some quartz crystals in a light gray ash (Purtymun and Kennedy, 1971). The contact between Units 1b and 2a is difficult to identify because Unit 1b is transitional into Unit 2a. In some cases, the contact can be estimated based on subtle color changes or by an increase in the size of the pumice lapilli from Unit 1b to Unit 2a. In addition, the magnetic susceptibility and apparent density geophysical logs run in some of the boreholes on Mesita del Buey helped to identify the Unit 1b - Unit 2a contact (BFEC, 1986). Unit 2a is thought to consist of two ashflows or ashfalls. In the western part of Mesita del Buey, Unit 2a appears as a moderately welded tuff that forms a vertical wall along the canyons. The unit becomes progressively less well welded eastward and is described as nonwelded along the eastern edge of Mesita del Buey (Purtymun and Kennedy, 1971). The nonwelded portion of Unit 2a is thought to be an ashfall, rather than ashflow tuff. Unit 2a is about 85 feet thick along the western edge of Mesita del Buey (Purtymun and Kennedy, 1971) and thins to approximately 20 feet along the eastern edge of the mesa (BFEC, 1986).

Unit 2b forms the cap rock at Mesita del Buey and consists of brownish gray, light gray and pinkish gray, slightly to moderately welded, rhyolitic ashflow tuff with light gray and occasional brown pumice lapilli (BFEC, 1986). Unit 2b is separated from the underlying Unit 2a by an erosional contact, marked by a thin layer of silt, sand and pumice (Purtymun and Kennedy, 1971). On Mesita del Buey, Unit 2b is composed of at least two ashflows that cooled as a single unit, based on field descriptions and apparent density and magnetic susceptibility geophysical logs (BFEC, 1986). The average thickness of Unit 2b on Mesita del Buey is about 60 feet (Purtymun and Kennedy, 1971); however, at the eastern edge of the mesa (the location of Areas G and L), the thickness of the unit (encountered in boreholes) ranges from about 45 to 28 feet (BFEC, 1986).

A three to four-foot layer of soil covers Unit 2b along the axis of the mesa. The soil cover thins appreciably towards the canyon rims, however, and the tuff is exposed in places along the mesa edges (Purtymun and Kennedy, 1971). The alluvium in the stream channels north of Mesita del Buey is up to 10 to 12 feet thick. It consists of sand-size quartz and sanidine crystals and crystal fragments and pebble to cobble-size fragments of latite, rhyolite

and pumice derived from weathering and erosion of the tuff (Purtymun and Kennedy, 1971). The alluvium in Pajarito Canyon, south of the mesa, is up tc 30 feet thick and is generally composed of the same tuff weathering products as the streams north of the mesa.

2.2.2 Structure

2.2.2.1 General Structure of the Pajarito Plateau

The geologic structure of surface rocks on Pajarito Plateau is simple, although the structure of underlying strata may be complex. The regional dip of surface rocks of the Pajarito Plateau is one to two degrees east. Beds of the Tesuque Formation, however, dip gently to the west in the easternmost part of the plateau (Griggs, 1964).

The rocks of the Pajarito Plateau are broken by several northward-trending normal faults. The Pajarito fault zone is located near the the western edge of the plateau in the southern part of the area (Figures 2-2 and 2-6). In this area, the Bandelier Tuff is downthrown about 300 feet on the east side of the Pajarito fault (Griggs, 1964). Farther north, the fault splits into two smaller subparallel faults, both downthrown to the east. Displacement decreases northward until both faults die out. The fault planes dip steeply to the east (note the vertical exaggeration on Figure 2-2). Just east of and parallel to the Pajarito fault zone is a normal fault with a displacement of about 30 feet. This fault, which extends through the Bandelier Tuff, also dips steeply to the east.

Two other normal faults, en echelon to Pajarito zone, are located to the northeast (Figure 2-6). These faults are downthrown to the west, and the fault planes also dip to the west. The westernmost of the faults extends southward for a short distance subparallel to the northern extension of the Pajarito zone. The area between the faults is a shallow syncline. The Bandelier Tuff is displaced about 50 feet along the en echelon faults; however, the Tschicoma Formation may be displaced as much as 500 feet along the easternmost fault. The difference in displacement seems to indicate recurring movement along a pre-Bandelier fault (Griggs, 1964).

The ashflows of the Bandelier Tuff are broken into a number of blocks by joints formed by shrinkage as the ashflow cooled. The near vertical attitude of most of the joints and the curved form of some are indicative of formation by cooling. The joints are more numerous in welded than in nonwelded tuffs because the welded tuffs were deposited at higher temperatures (Purtymun and Kennedy, 1971). The jointing in the Bandelier and other volcanic units in the Mesita del Buey area is discussed in the following section.

2.2.2.2 Structure of Mesita del Buey

No faults are known to break the rocks of Mesita del Buey (Figures 2-4 and 2-6). The ashflows of the Bandelier Tuff thin eastward because of the topographically high basalts of Chino Mesa on which they were deposited (Purtymun and Kennedy, 1971).

The most prevalent structural features in the rocks of Mesita del Buey are the fractures or joints in the volcanic rocks caused by shrinkage upon cooling after deposition. A good description of the jointing observed in the Bandelier Tuff is provided in Purtymun and Kennedy (1971); portions of their text have been reproduced below.

> The joints are classified as master and minor joints. Master joints are numerous and long, and may pass through one or more ashflows. A single unit may contain several ashflows emplaced at different times, but the joint pattern of the older layer may tend to govern formation of joints in the younger layer as it cools. Also, two or more ashflows may be laid down in rapid succession and cool as a single unit with joints forming in the flows at the same time.
>
> The master joints are vertical or nearly vertical and generally dip 70 degrees from the horizontal. The vertical trend may be straight or slightly curved. The dip is deflected slightly when the joint enters a unit with different density or degree of welding.
>
> Minor joints dip at angles less than 70 degrees. They are more numerous near the tops of ashflows and do not persist as they intersect the master joints.
>
> A joint traced vertically through an ashflow may be closed in places and open in others. Locally the opening may be as much as 2 in. wide, but most openings are less than 1/4 in. wide. Joints terminating in the base of the soil zone or in exposed tuff on the mesa surface are filled with

light-brown clay which may extend 3 to 4 feet below the surface. Below the brown clay, the joint openings are filled, or the joint faces are plated, with a light-gray clay. The light-gray clay is derived from weathering of the tuff and from minerals leached from the tuff by water and precipitated along joint openings before development of the near-surface brown clay that seals the joint at the surface.

The master joints are tension joints formed by the contraction of the tuff as it cooled. In a cooling homogeneous molten liquid, rupture occurs as three vertical fractures intersecting at angles of 120 degrees and radiating out from numerous centers. If the centers are evenly distributed, the fractures bound vertical hexagonal columns. A rose diagram illustrating the orientation of joints formed from a homogeneous molten liquid would show three joint sets (a number of joints with the same characteristic pattern) intersecting at angles of 60 degrees.

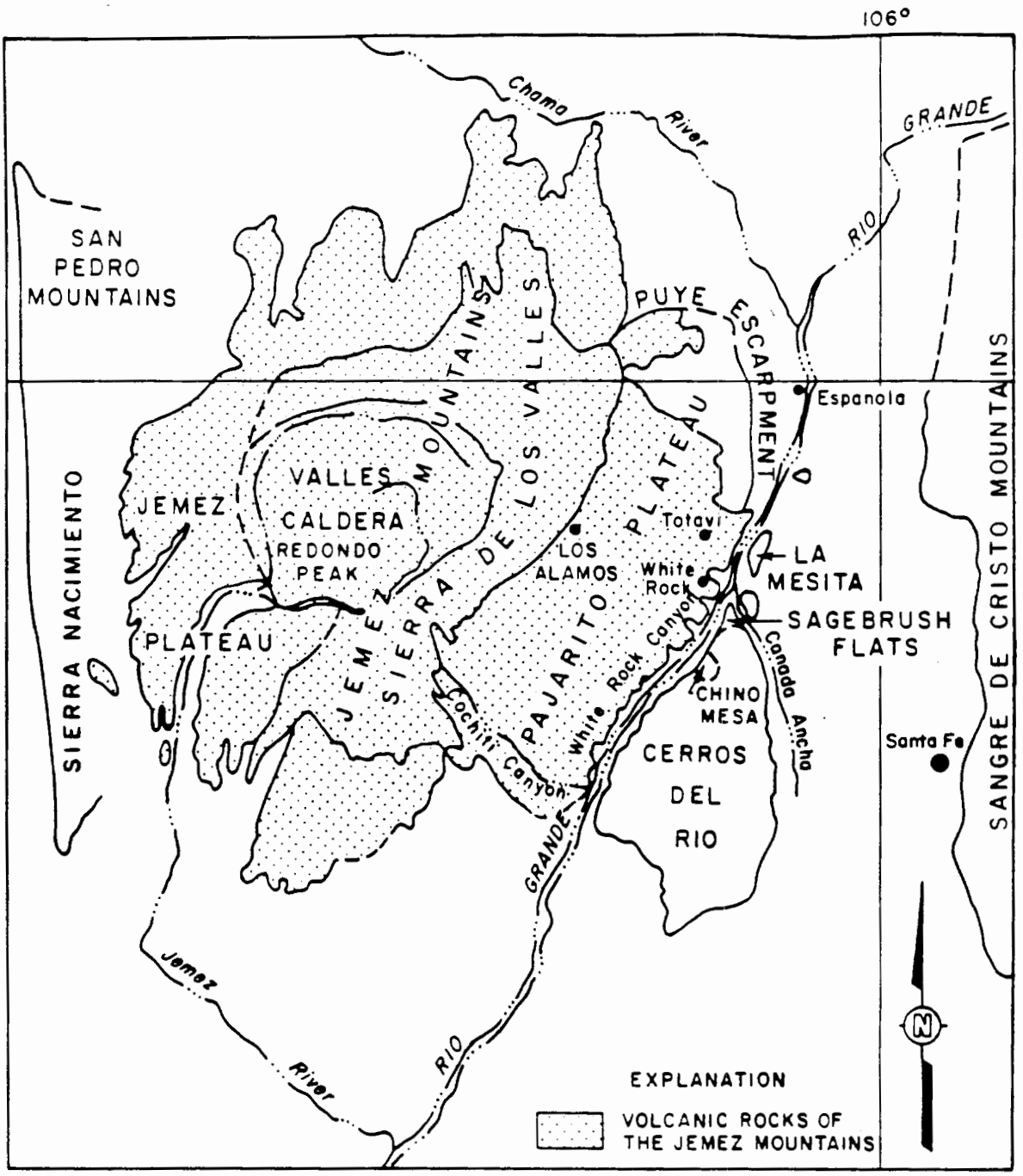
The heterogeneous characteristics of the tuff did not allow joint sets to form vertical hexagonal columns. A rose diagram prepared using the orientation of 1,078 master joints [at Mesita del Buey] showed the average of the three joint sets intersecting at angles of 30 and 90 degrees. The three joint sets, N30°W to N50°W, N60°W to N80°W and N40°E to N60°E, comprise 40% of the joints measured for the study.

The blocks formed by the joints range from a few square feet to as much as 500 square feet at the surface. In the walls of the pits there is about one master joint for every seven feet of horizontal wall.

Investigations of the subsurface at Areas G and L have also described jointing in the Bandelier Tuff. Purtymun and others (1978) drilled a number of subhorizontal core holes beneath a waste disposal pit (Pit 3) at Area G. The five borings, which extended 240 to 304 feet into Units 2a and 2b of the Bandelier, encountered near-vertical joints at frequencies ranging from about three to six feet of core recovered. Most of the joints were filled or plated with brown clay. The remainder were open with joint faces slightly weathered or plated with caliche. Many of the drillholes sunk by BFEC in 1985 encountered fractures in the upper three units of the Bandelier Tuff (BFEC, 1986). No fractures were intersected in Unit 1a; however, the entire thickness of this unit was not penetrated by any of the 1985 drillholes. Most of the fractures encountered are nearly vertical. Some of the fractures intersected in Units 2a and 2b have a dip of about 45 degrees and others, only in Unit 2b, are

nearly horizontal. Similar to the fractures described by Purtymun and Kennedy (1971) and Purtymun and others (1978), the fractures were found to be partially or completely filled with caliche, brown clay or limonitic material (BFEC, 1986). The locations of these fractures are noted on the lithologic logs in Appendix C.

In addition to the fractures or joints in the Bandelier Tuff, it is likely that similar features exist to some extent in the basaltic rocks of Chino Mesa at Mesita del Buey. Zones of lost circulation in the Chino Mesa rocks are noted at various depths in the borehole PM-2 drilling logs and in the drilling logs from other water supply wells drilled on Pajarito Plateau (Cooper et al., 1965). Whether the lost circulation zones represent subvertical fractures or cooling joints in the basalts or coarse sediment layers between flows is unknown.



Reference; R.L. Griggs, 1954

5 0 5 10 MILES

SCALE

FIGURE 2-1

PHYSIOGRAPHIC FEATURES OF THE JEMEZ MOUNTAINS

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APPROVED BY [illegible] 3/25/87
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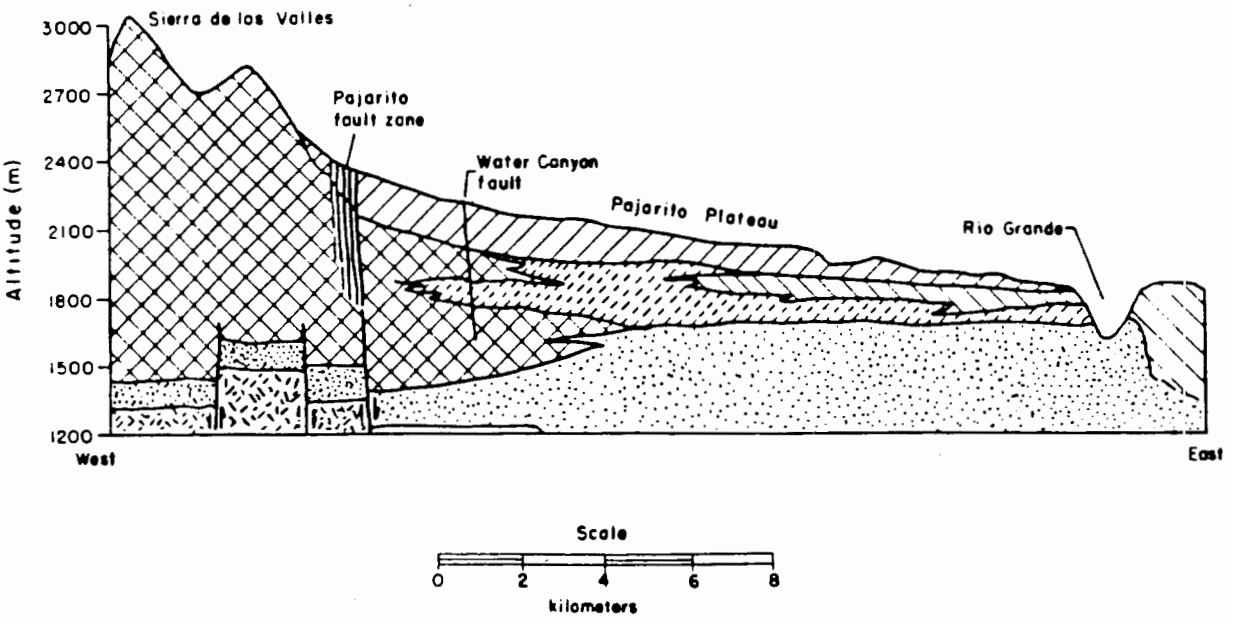

LEGEND

- Bandelier tuff
- Basaltic rocks of Chino Mesa
- Tschicoma formation
- Puye conglomerate
- Tesuque formation
- Precambrian crystalline rocks

Purtymun (Unpublished) as Cited in Rogers (1977)

FIGURE 2-2

GENERALIZED GEOLOGIC CROSS-SECTION OF PAJARITO PLATEAU

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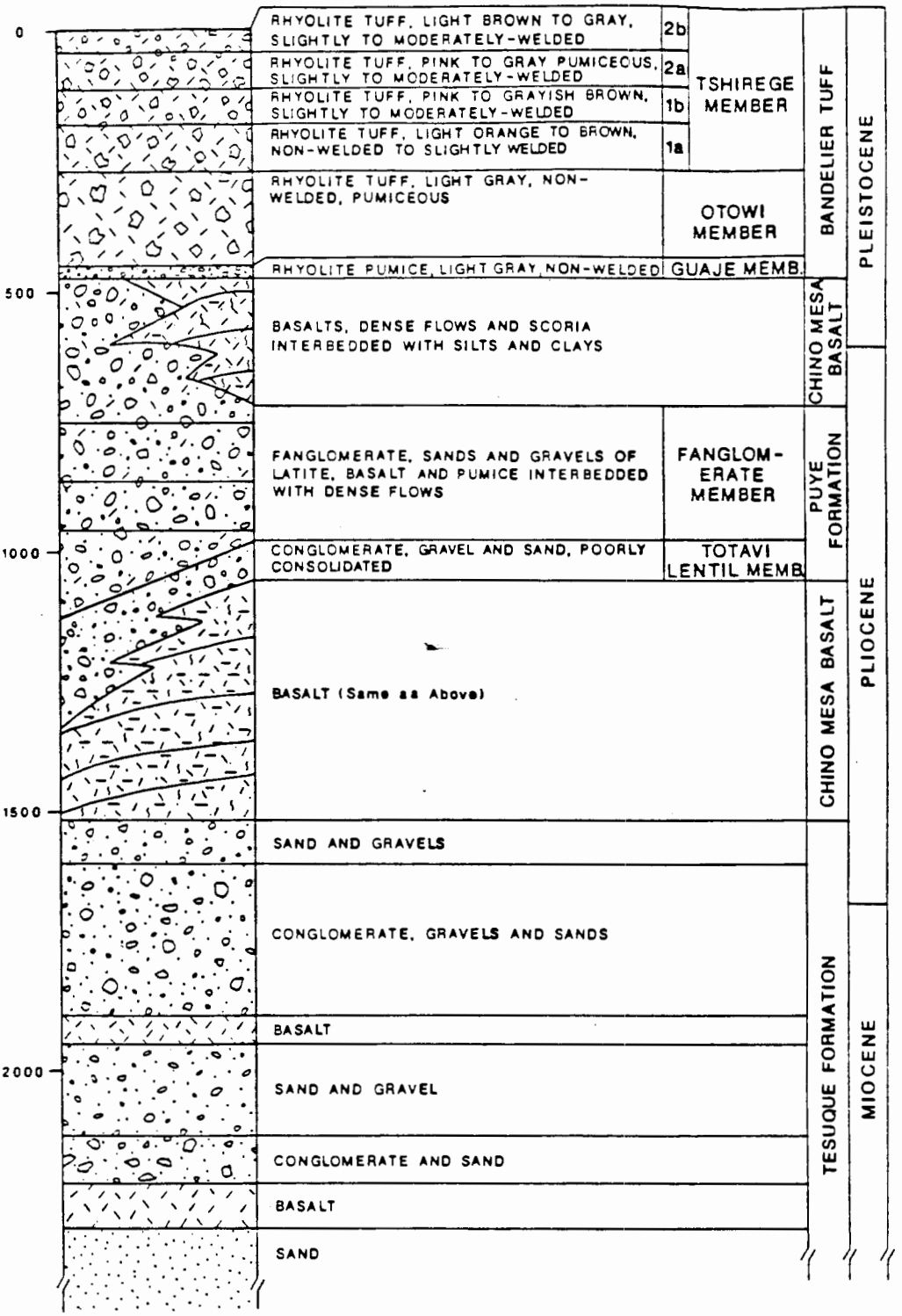

FIGURE 2-3

Compiled from: BFEC (1985a), Devaurs (1985), Griggs (1964), Rogers (1977)

GENERALIZED STRATIGRAPHIC COLUMN FOR MESITA DEL BUEY

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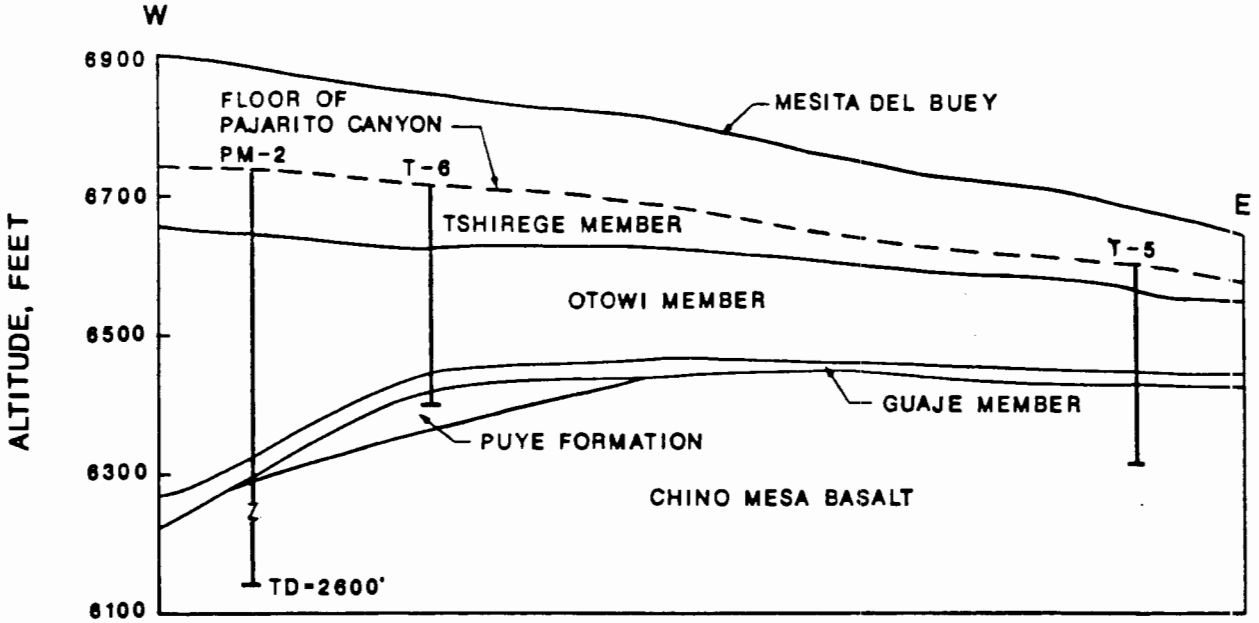

From Purtymun and Kennedy (1971)

FIGURE 2-4

GENERALIZED GEOLOGIC
CROSS-SECTION (EAST-WEST)
SHOWING RELATIONSHIP
OF THE CHINO MESA BASALT
TO THE BANDELIER TUFF

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	2/24/87	APPROVED BY			

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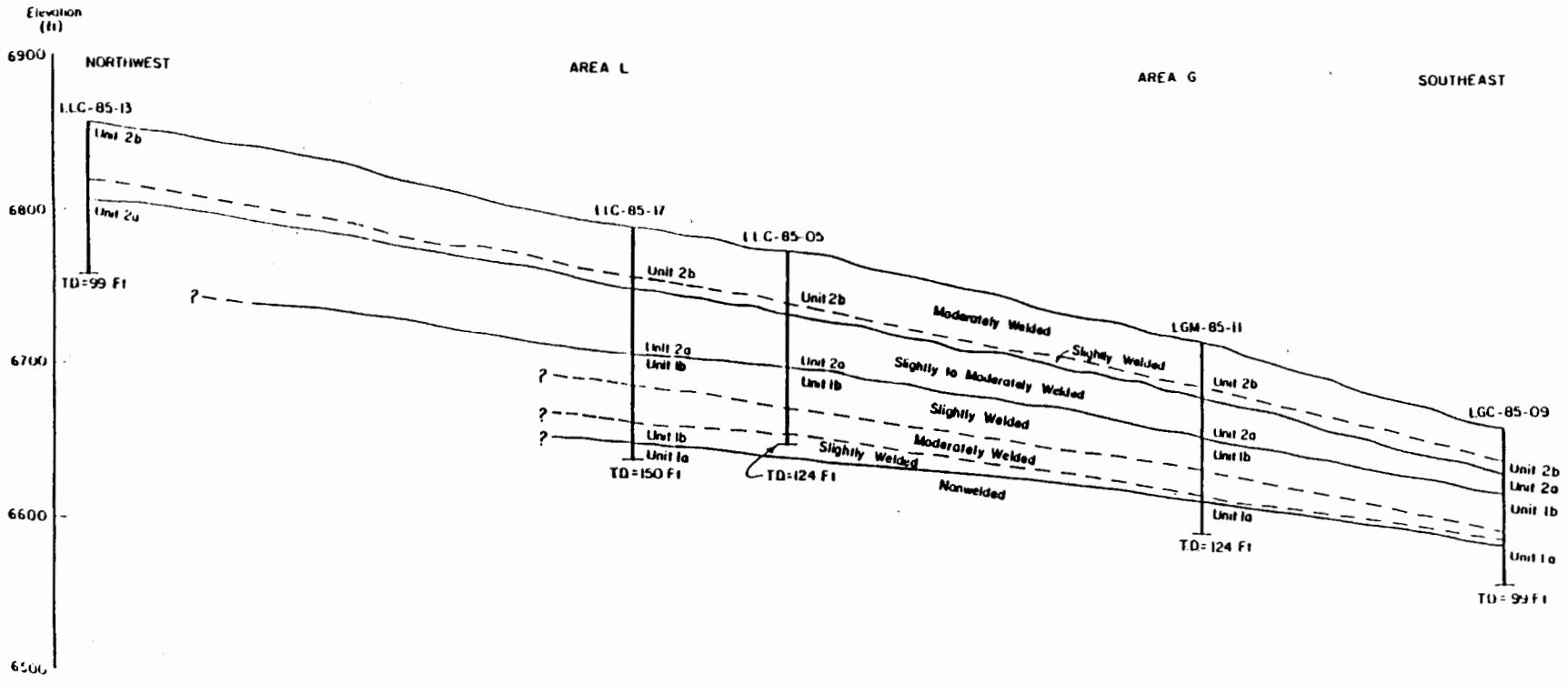

1000 500 0 2000 FEET

HORIZONTAL SCALE

From BFEC (1986)

FIGURE 2-5

GEOLOGIC CROSS-SECTION
OF THE TSHIREGE MEMBER
OF THE BANDELIER TUFF
AT MESITA DEL BUEY

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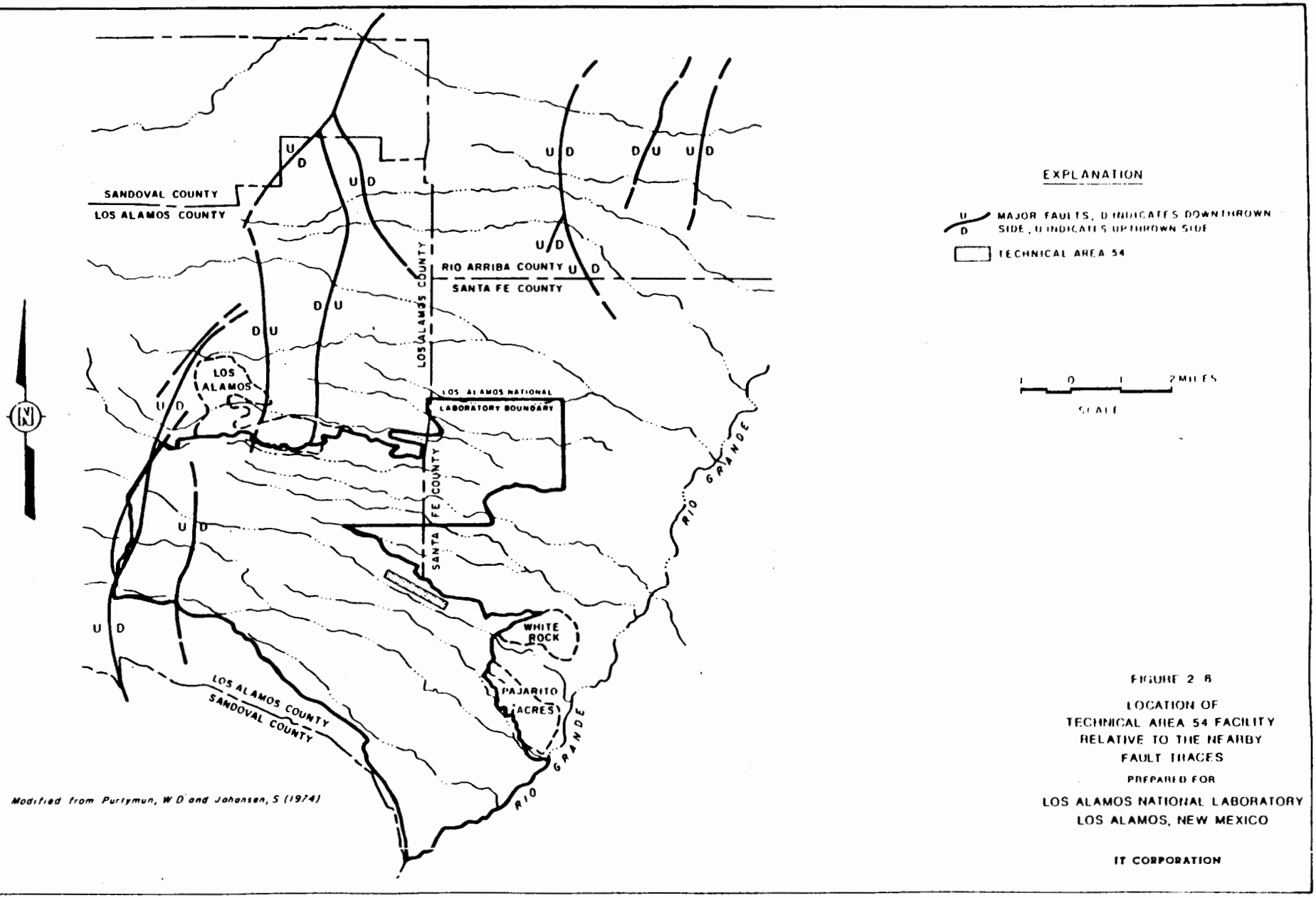

FIGURE 2-6

LOCATION OF
TECHNICAL AREA 54 FACILITY
RELATIVE TO THE NEARBY
FAULT TRACES

PREPARED FOR

LOS ALAMOS NATIONAL LABORATORY
LOS ALAMOS, NEW MEXICO

IT CORPORATION

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3.0 HYDROLOGIC CHARACTERIZATION OF THE VADOSE ZONE

Vadose zone hydrologic characterization studies were undertaken in Technical Area 54, Areas G and L to provide a quantitative analysis of moisture movement through the unsaturated Bandelier Tuff. These analyses aid in determining the likelihood of contaminants from Areas G and L migrating through the vadose zone and into the main aquifer approximately 850 to 950 feet beneath the sites. No perched water has been detected above the main aquifer; therefore, studies of moisture movement have been concentrated on unsaturated flow processes. The studies presented in this section fulfill requirements of paragraph 25, tasks 1-4 of the compliance order issued to the Laboratory on May 7, 1985 (see Section 1.0).

The Laboratory utilized a two-tiered approach to quantify moisture movement in the tuff: 1) hydrologic characteristics of the tuff and hydraulic head were measured in order to calculate seepage velocity and rates of moisture flux, and 2) moisture content of the tuff following precipitation events was measured to empirically determine changes in moisture content with depth. Tasks one through four of the compliance order are focused on collection of data necessary to calculate seepage velocity and rates of unsaturated flow; however, the order does not specify these analyses be conducted. The Laboratory has included these calculations for completeness.

The approach to calculation of seepage velocity and moisture flux rates for fluid movement through the vadose zone is similar to the approach used in determining rates of ground water movement within aquifers. Rates of ground water movement are primarily controlled by the hydraulic conductivity of an aquifer and changes in hydraulic head. The hydraulic conductivity of a saturated medium is a function both of the physical properties of the medium and the fluid. Hydraulic head (H) is equal to the sum of the elevation of the measuring point (z) and the pressure head (ψ) of the fluid at the measuring point. These two properties, hydraulic conductivity and hydraulic head, also govern rates of moisture movement in the vadose zone. However, in the vadose zone unsaturated hydraulic conductivity and pressure head are functions of moisture content (θ); that is, conductivity and pressure head decrease with decreasing moisture. In addition, pressure head (also termed capillary or matric potential) in the vadose zone is less than zero.

As described above, calculation of moisture flux in the vadose zone entails determination of unsaturated hydraulic conductivity and hydraulic head. Unsaturated hydraulic conductivity can be measured directly or it can be determined through measurement of rock permeability and relationships between moisture content and pressure head, also known as soil moisture characteristic curves [$\psi(\theta)$]. Therefore, in order to calculate rates of moisture flux the permeability, moisture content, relationships between moisture content and pressure head, unsaturated hydraulic conductivity, and pressure head of materials in the vadose zone must be determined. The very dry conditions present within the tuff pose difficulties in measuring the above listed properties. These difficulties will be explained along with discussion of data collection techniques.

Empirical determinations of moisture movement can be made directly with instruments such as neutron moisture probes. Also, pressure head can be monitored and converted to moisture determinations via the soil moisture characteristic curves.

The discussion provided below presents, summarizes and interprets data collected in order to quantify moisture movement in the vadose zone underlying Areas G and L during approximately the past eighteen months. Much of the data was collected by Bendix Field Engineering Company, Inc. (BFEC) and Laboratory personnel. Results of previous research are also incorporated as appropriate. The discussion relies heavily on BFEC (1986) as this report presents much of the collected data and the details of data collection methods.

Section 3.1 provides a brief discussion of the local climate and the importance of precipitation on evaluation of the vadose zone hydrology. Section 3.2 discusses permeability testing of the Bandelier Tuff (task 1). Section 3.3 discusses field moisture conditions, and measurement of soil moisture characteristic curves (task 2). Section 3.4 discusses unsaturated hydraulic conductivity determinations (task 3) and Section 3.5 presents the vadose zone moisture monitoring program at Areas G and L (task 4). In addition, empirical measurements of infiltration are provided in this section. Calculations of moisture flux rates are presented in Section 3.6 and the vadose zone hydrology

is summarized in Section 3.7. Definitions of terms and units used throughout this section are presented in Appendix D.

Units of measurement utilized in this report vary from British (foot, pound, second) to the International System (SI) and are sometimes inconsistent within each system. This is due to the different measurement units used in the original studies. Attempts were not made to convert these units to one system due to the loss of precision encountered in some conversions and the resulting "awkward" values associated with unit changes.

3.1 LOCAL CLIMATE

The climate of the study area can be characterized as a semi-arid, temperate mountain climate. Laboratory wide precipitation averages approximately 18 inches per year, with approximately 40 percent of this amount occurring in July and August. Temperatures are moderate, rarely exceeding 90°F (32°C) during the summer months or falling below 0°F (-18°C) during the winter. Mean monthly precipitation data for the Los Alamos area are presented in Table 3-1. Because studies of vadose zone hydrology presented herein are focused on quantitative analysis of moisture movement and redistribution of moisture within the tuff, it becomes important to determine if moisture conditions at the site are typical of those normally encountered at the site. Unusually wet or dry conditions during the study period may cause measurements of moisture content or pressure head to be abnormal. The Laboratory maintains a precipitation gage at TA-54, Area G. This is the closest weather data station to Areas G and L. Area G precipitation data for the year 1986 are presented in Appendix E and summarized in Table 3-2. Compared to mean precipitation data for Area G in Table 3-1, precipitation in 1986 was approximately 30 percent above average (18.85 inches as compared to 13.45 inches), thus, analyses of vadose zone hydrology conducted in 1986 should represent wetter than normal moisture conditions in Areas G and L.

3.2 INTRINSIC PERMEABILITY OF THE VADOSE ZONE

A variety of methods, including both field and laboratory procedures, were utilized to determine the intrinsic permeability (k) of the vadose zone at Areas G and L. Intrinsic permeability is a basic characteristic of the vadose zone that requires evaluation to determine the magnitude of fluid movement

through the tuff. Tests conducted to determine intrinsic permeability also fulfill requirements of paragraph 25 - task 1 of the compliance order issued to the Laboratory on May 7, 1985, by the State of New Mexico. The compliance order specifies that at least five boreholes 125 ft deep be tested; and at least one test per horizon per hole with a minimum of six tests per hole be included.

Field methods for determining intrinsic permeability included air injection and vacuum tests and a water injection test which is used for result comparison with air tests. Laboratory methods used were gas injection with correction for slippage (Klinkenberg Correction Method) and the Dynamic Method to measure gas-water relative permeability. Procedures utilized for conducting the tests and reduction of test data are presented in BFEC (1986).

3.2.1 Field Permeability Tests

3.2.1.1 Injection Tests

Conventional field methods for determination of unsaturated zone intrinsic permeability and hydraulic conductivity usually involve maintenance of a constant head of water in a borehole until flow becomes steady, e.g., Stephens and Neuman (1982a, 1982b) and Stephens and others (1983). Due to the potential for mobilization of contaminants in the vadose zone in Areas G and L by percolating water during and after infiltration tests, permeability tests involving injection of water at depth were discouraged; rather, injection and vacuum tests using air as the testing fluid were selected due to their lower potential for mobilizing contaminants. In addition, the use of water as an injection fluid above the water table has limitations as equations used to reduce data assume that horizontal flow occurs throughout the system (see BFEC, 1986).

It should be emphasized that air injection methods for determining vadose zone permeability are currently experimental and may permit only a qualitative analysis of the tested material. The use of air as an injection fluid requires compensation for gas compressibility and volume changes caused by changes in temperature and water vapor content. Attempts were made to compensate for these factors during testing through use of additional instrumentation which closely monitored temperature. Corrections to pressure data

necessary due to temperature changes could then be applied. Analysis of test data assumes tests are conducted at sufficiently low pressures such that gas compressibility is not significant.

Permeability tests using air injection were conducted in five boreholes such that each stratigraphic unit in each borehole was tested. Six-foot test intervals were isolated in open boreholes with a straddle packer assembly so that 25 intervals, including seven adjacent to fractured zones, were tested. BFEC (1986) describes test procedures and data reduction techniques. Table 3-3 presents the results of these tests. Eight, nine, seven, and one interval(s) in units 2b, 2a, 1b, and 1a were tested, respectively. Hydraulic conductivity results are expressed as air relative values in 10^{-3} centimeters per second (cm/s). The values range from a maximum of 2.8×10^{-3} cm/s along a fractured zone in unit 2a at a depth of 45 - 51 feet to a minimum of 3.0×10^{-5} cm/s in an unfractured interval of units 1a and 1b at 99 to 105 feet below the surface. The average hydraulic conductivity for fractured zones is 9.3×10^{-4} cm/s, based on 7 measurements, and the average for unfractured zones is 4.1×10^{-4} cm/s (18 measurements). The average conductivity for stratigraphic units 2b, 2a, 1b, and 1a are 7.5×10^{-4}, 6.8×10^{-4}, 2.4×10^{-4}, and 8.8×10^{-5} cm/s respectively, indicating a slight decrease in hydraulic conductivity with depth. Again, care should be used in application of these data as the test method used is currently experimental.

Permeability and hydraulic conductivity measurements of each stratigraphic unit were performed in borehole LLM-85-05 using a water injection test. Water was used in this borehole because it is located outside of Areas G and L and potential mobilization of contaminants was not of great concern. Testing procedures are described in BFEC (1986). The water injection tests yielded hydraulic conductivity measurements ranging from 1.0×10^{-3} cm/s to 4.6×10^{-4} cm/s with an average of 7.6×10^{-4} cm/s. These measurements compare favorably to those determined by air injection and thus lend credibility to the air injection method.

3.2.1.2 Vacuum Tests

In addition to the air injection tests described above, the Laboratory conducted a series of air vacuum tests to verify injection test results and

further characterize the in situ permeability of the Bandelier Tuff. Vacuum tests were conducted in the same boreholes as injection tests: LLM-85-01, LLM-85-02, LLM-85-05, LGM-85-06, and LGM-85-11. Twenty-one tests were conducted over one meter intervals. As with the injection tests, tested intervals were isolated by using a straddle packer assembly in an uncased borehole. Tests could not be performed in certain intervals due to the inability of the vacuum pump to sufficiently evacuate the test interval. Six, five, nine and one interval(s) in stratigraphic units 2b, 2a, 1b, and 1a were tested, respectively.

The air-vacuum test is based on methods used by the petroleum industry in evaluating permeability of gas producing intervals and is a pressure transient test. Horner (1951) presents a description and analysis of pressure buildup which results from closing in a gas well after a period of production. A similar analysis is used in the air-vacuum testing procedures. BFEC (1986) provides a detailed discussion of test procedures and data reduction techniques.

Table 3-4 presents results of the vacuum permeability tests conducted in Areas G and L. The average intrinsic permeability for test intervals adjacent to fractured zones is 1.28×10^{-8} cm^2 (square centimeters) (3 measurements), while permeability in unfractured zones averages 1.25×10^{-8} cm^2 (18 measurements); thus, vacuum tests, as described in BFEC (1986), do not yield differing results between fractured and unfractured zones of boreholes. As determined by vacuum tests, the average permeability of stratigraphic units 2b, 2a, 1b, and 1a are 2.37×10^{-8} cm^2, 1.42×10^{-8} cm^2, 5.3×10^{-9} and 2.7×10^{-9} cm^2. These averages indicate an order of magnitude decrease in intrinsic permeability with stratigraphic depth in the tuff.

Table 3-5 compares field derived intrinsic permeability values from air-injection with vacuum tests performed in the same boreholes at the same stratigraphic interval. Vacuum-test permeabilities are generally lower than permeabilities derived from air-injection tests although both methods indicate a decrease in permeability with depth. BFEC (1986) attributes the difference to the inability to perform vacuum tests in more permeable portions of the tuff, thus biasing samples to lower permeability zones.

3.2.2 Laboratory Permeability Tests

Intrinsic permeability of 20 core samples was determined in the laboratory by TerraTek Research Laboratory. TerraTek utilized two procedures for permeability determination, gas injection with correction for slippage (Klinkenberg Correction Method), and the Dynamic Method to measure gas-water relative and effective permeability. The following discussion of laboratory procedures are taken from BFEC (1986) and TerraTek Research Laboratory (1985).

> The measurement technique for the Klinkenberg Method consists of applying a confining pressure of approximately 100 psi and a slight pore pressure, and maintaining an approximate pressure drop of two psi across the sample during testing. Nitrogen gas is injected into the samples at mean pressure of 4, 9, 14, and 19 psi, and the permeability is calculated for each of the pressures. A graph of permeability versus the reciprocal mean pressure is constructed and the intercept of a best fit line through the data points with the permeability axis at zero reciprocal mean pressure yields the gas permeability corrected for gas slippage (Klinkenberg correction).
>
> The Dynamic Method measures the gas-water relative permeability of samples. Testing begins by vacuum-saturating the samples with tap water. Following saturation, each sample is placed in a hydrostatic core holder and subjected to a confining pressure of approximately 100 psi. Testing consists of displacing water from the samples with humidified nitrogen. Incremental production of gas and water is monitored against time and flow rate at constant injection pressure. The production data are used to calculate gas-water relative permeabilities according to the method of Johnson, Bossler, and Naumann (1959), and Welge (1952).

Laboratory derived intrinsic permeability values for samples of Bandelier Tuff are presented in Table 3-6. Results for the two methods are very similar with intrinsic permeability on the order of 10^{-9} cm^2. In general the Dynamic Method yielded slightly lower results. Klinkenberg Method permeabilities range from 1.4×10^{-9} cm^2 at a depth of 115 feet in borehole LGM-85-06 to 18.0×10^{-9} cm^2 at a depth of 99 feet for the same borehole. The average Klinkenberg permeability for units 2b, 2a, 1b, and 1a are 5.75×10^{-9} cm^2, 2.86×10^{-9} cm^2, 5.85×10^{-9} cm^2, and 2.4×10^{-9} cm^2 respectively. Laboratory derived intrinsic permeabilities do not appear to change systematically with depth.

3.2.3 Summary of Intrinsic Permeability Testing

Comparisons of average intrinsic permeability measurements determined by field and laboratory methods for the four stratigraphic units of Bandelier Tuff are presented in Table 3-7. Field derived permeability measurements tend to decrease with stratigraphic depth. In addition, laboratory derived permeabilities are generally lower than field derived values, which may be attributed to the fact that samples selected for laboratory analysis were those exhibiting the highest degree of consolidation (BFEC, 1986) and, thus, lower permeability. Also, field derived permeabilities are measured over a larger interval and may be more representative of actual formation permeability. However, it should be noted that methods utilized to determine field permeability values are experimental in nature and interpretation of these data should be made cautiously. Field methods do not indicate an increase in permeability in the vicinity of fractured intervals; although, field observations such as "case hardening" of fractures and measurements of moisture content indicate that some fractures may provide areas of increased permeability (see Section 2.2.2.2).

3.3 VADOSE ZONE MOISTURE CHARACTERISTICS

As discussed previously in this section, moisture characteristics of the vadose zone play a key role in determining unsaturated hydraulic conductivity and rates of fluid movement in the unsaturated zone. This section provides discussions of measurements of moisture content of the tuff under field conditions, and measurement of soil moisture characteristic curves.

3.3.1 Gravimetric Moisture Content

Gravimetric moisture content determinations were conducted on core segments of Bandelier Tuff recovered from 12 drill holes in Areas G and L to determine vertical moisture profiles in the tuff and to aid in interpretation of other vadose zone analyses. Although not specifically required by the compliance order, determination of moisture profiles within the tuff is critical to analysis of unsaturated flow and moisture movement in the vadose zone because hydraulic properties of the vadose zone change with changing moisture content.

Cores were collected and analyzed for moisture content by BFEC. Core was obtained using a split-barrel sampler in accordance with procedures discussed

in Section 1.0. Moisture determinations were made by weighing samples soon after removal from the borehole and after oven-drying at 105°C. Details of sampling procedure, analysis, and data reduction are presented in Section 3.1.1 of BFEC (1986).

Figure 3-1 presents typical moisture profiles of the tuff. In general, the tuff is characterized by very low volumetric moisture content. Moisture content for the tuff is typically 2 to 4 percent (volumetric), with isolated intervals ranging up to 10 to 28 percent. Many of the moisture profiles indicate an increase in moisture content in an interval between 100 to 150 feet below the surface. BFEC (1986) correlates the zone of increased moisture to the lower portion of Unit 1b which contains a moderately welded tuff zone. Additionally, BFEC observes that higher moisture contents occur in the vicinity of certain fractured intervals.

3.3.2 Soil Moisture Characteristic Curves

Soil moisture characteristic curves, relationships between moisture content and pressure head, have been determined for 20 samples of Bandelier Tuff so that hydrologic properties of the tuff could be analyzed and unsaturated hydraulic conductivity could be predicted. These analyses fulfill the requirements set forth in paragraph 25, task 2 of the May 7, 1985 compliance order issued to the Laboratory. The compliance order specifies that at least five samples from each of at least four horizons be tested by any of the standard lab methods and that more than one method is needed to include all moisture conditions.

Soil moisture characteristic curves are useful in vadose zone studies as they provide a means of converting moisture content measurements into capillary potential information. Both types of data are necessary in evaluating unsaturated flow of water and contaminants through the vadose zone.

Soil moisture characteristic curves were determined for 20 samples of intact Bandelier Tuff. The samples were collected by BFEC during the 1985 drilling program (see Section 1.0). Testing of the samples was performed by TerraTek Research Laboratory and consisted of vacuum-saturating the samples with tap water and spinning in a centrifuge at various speeds to simulate a range of

capillary pressures and determining the moisture content remaining in the sample. Drying curves only were determined for the samples and effects of hysteresis were not considered. BFEC (1986) provides additional discussion of procedures.

Results of the analyses and identification of the borehole, depth, and stratigraphic unit from which samples were obtained, are listed in Table 3-8. Moisture content was determined, in general, for capillary pressures in the range of -0.03 to -.34 bar [0.5 to 5 pounds per square inch (psi)] and 22 to 72 percent moisture. Graphical depictions of these data are contained in Appendix C of BFEC (1986). Attempts to increase centrifuge speed so that lower capillary pressures could be evaluated resulted in disaggreation of the samples. Attempts were made to use the pressure-plate method to measure soil water moisture characteristics at lower moisture-tension conditions. Even though cores displaying the greatest degree of consolidation were selected for testing, this attempt was also unsuccessful due to sample disaggreation (see BFEC, 1986, Section 3.1.3.4).

Measurements of moisture content from cores of Bandelier Tuff show that field moisture conditions range from 2 to 10 percent, occasionally ranging to 28 percent. Table 3-8 shows that capillary potential was determined for minimum volumetric moisture content of approximately 22 to 60 percent. Figure 3-2 presents a representative example of the characteristic curves.

BFEC (1986) draws the following conclusions from analysis of the soil moisture-characteristic curves:

> The most interesting data discernible from the moisture characteristic curves (BFEC, 1986 Appendix C) are the extremely high moisture-retention (θ_r) values, which range up to 80 percent. The moisture-retention value is important because it represents the point at which capillarity as a transport mechanism breaks down. Since all of the moisture-content measurements for the Bandelier Tuff are significantly below this value, vapor transport is clearly the major mechanism of water transport.

As used above, the term capillarity refers to the process of unsaturated flow, and the moisture retention value of 80 percent indicates that no liquid transport can occur at moisture content below this value.

Note that the moisture retention value of 80 percent discussed above, as are all the BFEC characteristic curve data, are presented in terms of percent saturation. The 80 percent value above represents approximately 60 percent volumetric moisture.

3.4 UNSATURATED HYDRAULIC CONDUCTIVITY AS A FUNCTION OF MOISTURE CONTENT

Two methods were utilized to determine the unsaturated hydraulic conductivity of the vadose zone as a function of moisture content $K(\theta)$: the Dynamic Method described in Section 3.2, and a theoretical method described by Mualem (1976). These analyses fulfill the requirements of paragraph 25, task 3 of the May 7, 1985 compliance order which specifies that five samples from each of at least four horizons be sampled. Analyses were conducted on four samples taken from each of five boreholes.

3.4.1 Measurement of Unsaturated Hydraulic Conductivity (Dynamic Method)

Freeze and Cherry (1979) explain that unsaturated flow is actually a special case of multiphase flow with two phases, air and water coexisting in the pore channels; therefore, each rock possesses two characteristic curves of fluid content versus pressure head, one for water and air. They further explain that when determining conductivity relationships, it is preferable to work with permeability (k) rather than hydraulic conductivity since k is independent of fluid properties. Flow parameters k_w and k_a are defined as the effective permeabilities of the medium to water and air. Each rock has characteristic curves of effective permeability versus pressure head for air $k_a(\psi)$ and water $k_w(\psi)$. Effective permeability depends not only on the rock, but also upon the relative amounts of different fluids in the pores (Schlumberger, 1972).

The following discussion of laboratory testing of unsaturated hydraulic conductivity by the Dynamic Method is taken from BFEC (1986).

> The Dynamic Method was also used to determine permeability as a function of moisture content for the 20 samples of Bandelier Tuff. These values, called effective permeabilities, are plotted as a function of total air saturation in the graphs presented in Appendix D of BFEC, 1986. Since the abscissa corresponds to total air saturation, the maximum effective permeabilities for water depicted on

the curves occur at an air saturation of 0.000, which is equivalent to a water saturation (θ_s) of 1.000. Therefore, as the water saturation decreases, the effective permeability for water decreases and the effective permeability for air increases.

The effective permeability values for the rock-core samples from the Bandelier Tuff range from 86.1 to 1301 millidarcys [(8.5×10^{-10} to 1.3×10^{-3} cm^2) or (9.1×10^{-13} to 1.4×10^{-11} ft^2)]. Residual water saturation following gas injection ranged from 0.64 to 0.95. Since moisture contents in the study area are much lower than this range (generally less than 10 percent), the effective permeabilities determined using the Dynamic Method are not indicative of the permeabilities one would expect to observe at depth in areas G and L. These data are therefore only applicable to the estimation of near-surface conditions following a heavy rainfall, when moisture contents might exceed residual water saturation.

It follows from the previous discussion that unsaturated hydraulic conductivity may be calculated from effective permeability data by the following equation:

$$K = \frac{k\rho g}{\mu} \qquad (3\text{-}1)$$

where

K = hydraulic conductivity at moisture content θ
k = effective water permeability at moisture content θ
ρ = density of water
g = gravitational acceleration
μ = dynamic viscosity of water

Since unsaturated hydraulic conductivity is proportional to moisture content, (i.e., conductivity decreases with decreasing moisture) and the permeability data collected are measured for greater moisture contents than observed in the field, calculations of unsaturated hydraulic conductivity are presented for the minimum moisture conditions measured in the laboratory. These data represent hydraulic conductivities greater than the maximum likely to be encountered under field conditions.

Effective permeability at minimum moisture content was measured from graphs of air and water permeability versus percent saturation presented in Appendix D

of BFEC (1986). These data and the results of hydraulic conductivity calculations are presented in Table 3-9. Constants used in the calculation of unsaturated conductivities are typical of ground water (Freeze and Cherry, 1979) and are as follows: ρ = 1.0 g/cm^3, g = 980 cm/s^2, and μ = 1.124 cP (centipoise). Unsaturated hydraulic conductivity calculated from measured effective permeability for 64 to 95 percent water saturation (25.2 to 61.3 percent volumetric water content) ranges from 1.63 x 10^{-7} to 3.01 x 10^{-9} cm/s (Table 3-9). Sample LGM-85-11, 30 feet, yielded a very high conductivity, two orders of magnitude above the average. The result of tests on this sample are thought to be erroneous due to its large deviation from the norm.

3.4.2 Theoretical Determination of Unsaturated Hydraulic Conductivity

Unsaturated hydraulic conductivity as a function of moisture content, $K(\theta)$, and as a function of capillary pressure, $K(\psi)$, was determined for samples of Bandelier Tuff using models described by van Genuchten (1978) and Mualem (1976). The models output graphs of $K(\psi)$ and $K(\theta)$ from saturated hydraulic conductivities and soil moisture characteristic curves. Saturated hydraulic conductivity values were calculated from intrinsic permeability measurements yielded by the Klinkenberg method. Additional discussion of the models used, input data, and methodology for determination of $K(\psi)$ and $K(\theta)$ are presented in BFEC (1986).

Graphs of unsaturated hydraulic conductivity as a function of moisture content and capillary pressure for representative samples of Bandelier Tuff are presented in Appendix F. The curves are of limited use because one of the model input parameters, the $\psi(\theta)$ relationship, could not be determined in the range of conditions present within the tuff [i.e., moisture content less than 10 percent and capillary pressure between -1 and -10 bar. However, since hydraulic conductivity decreases with decreasing capillary pressure and moisture content and $K(\psi)$ and $K(\theta)$ were determined for ranges higher than field conditions, it can be concluded that lowest measured $K(\psi)$ above the range of field conditions represents hydraulic conductivity greater than the maximum likely to be encountered in the field. Table 3-10 contains hydraulic conductivity derived for minimum moisture content as determined from the model outputs.

The average theoretically derived hydraulic conductivity for the minimum moisture conditions for which $K(\theta)$ was measured is approximately 7.8×10^{-3} cm/day or 9.1×10^{-8} cm/s at 36 percent moisture (volumetric). This is on the same order of magnitude as values determined from measurement of effective permeability (Table 3-9), thus the two methods of determining $K(\theta)$ support each other for the moisture conditions measured.

3.5 VADOSE ZONE MOISTURE MONITORING

Since late 1985 the Laboratory has been conducting a vadose zone moisture monitoring program at Areas G and L to analyze the infiltration and redistribution of meteoric water into the Bandelier Tuff and to monitor capillary potential in the tuff. This monitoring program fulfills the requirements of paragraph 25 - task 4 of the May 7, 1985 compliance order issued to the Laboratory. The monitoring system utilizes neutron logging to monitor moisture conditions at Areas G and L and thermocouple psychrometers at various depths for monitoring capillary potential.

Under ideal circumstances, soil moisture data collected by neutron moisture measurements can be converted to estimates of capillary pressure and capillary pressure measurements can be converted to soil moisture data through use of the $\psi(\theta)$ relationship or the soil characteristic curve. However, due to difficulties in measuring $\psi(\theta)$ relationships for very low moisture conditions present in the tuff, accurate conversions between moisture and tension data cannot be made.

3.5.1 Neutron Moisture Logging

The moisture content of the Bandelier Tuff is being measured with a neutron moisture probe in order to analyze infiltration and redistribution of moisture in the tuff.

Two boreholes, one each in Areas G and L, have been completed with cold drawn aluminum casing for neutron probe access. Boring numbers LLN-85-04 and LGN-85-08 have been completed to depths of 108 and 50 feet, respectively. The annular space around the casings were backfilled with cuttings from the borehole and compacted with a cement vibrator. Details of installation procedures for the access wells are provided in BFEC (1986) Section 4.2.

The Laboratory utilizes a Campbell Pacific moisture gauge to conduct measurements. Calibration of the instrument is conducted by recording the number of thermalized neutron counts in 16 second intervals from samples of known moisture content. Calibration curves for the instrument are then constructed. Further discussion of calibration procedures are presented in BFEC (1986).

Neutron moisture measurements were initiated on December 17, 1985 at the two areas. Measurements were collected approximately every two weeks through June 1986, after which data were not collected until early October due to equipment malfunction. The original moisture probe, a Campbell Pacific model 501DR was replaced during this time period with a model 503DR. The new probe was calibrated using the same procedures as for the model 501DR, using only the high and low moisture calibration samples, an internal auto calibration feature interpolates intermediate moisture conditions. Calibration data and curves for each of the instruments are provided in Appendix G. After calibration of the model 503DR, daily moisture profiles were collected from each area after precipitation events and the biweekly schedule was then continued.

Measurements of volumetric moisture content of Bandelier Tuff in Areas G and L are presented in tabular form in Appendix G. Figures 3-3 through 3-6 display monthly moisture-depth profiles for Areas G and L. As can be seen from comparing the graphs, moisture content remains essentially the same below 15 feet indicating that very little precipitation infiltrates below this depth. The moisture content of the tuff in both areas varies very little and remains between two and five percent; this range is comparable to the measured gravimetric moisture content of the tuff. The graphs also show a bimodal distribution of data, with data collected prior to October 1986 being grouped approximately one to one and one-half percent below data collected after October 1986. The uniformity of the apparent difference in moisture content with depth suggests that the change is due to instrument measurement rather than an actual change in moisture content. Data collected prior to October 1986 were collected with the Model 501DR while data collected after October were collected with the model 503DR. Slight differences in instrument calibration, source strength, and/or counting time may account for the small shift in moisture determinations.

In accordance with requirements of task four, measurements of soil moisture conditions were collected daily after autumn storms. Three storms were recorded in October and early November 1986. Precipitation data from Area G (Appendix E) indicate that 0.34 inches of rain fell between October 5 and 7, 1.63 inches between October 10 and 12, and 1.49 inches between November 1 and 4. Daily measurements of volumetric moisture content in the tuff, as measured by the neutron probe after each precipitation event, are presented in Appendix G and graphically summarized in Figures 3-7 through 3-10.

Graphs of moisture content versus time are presented for depths below the surface of 2, 6, 10, 22, 41, and 50 feet for Area L and 2, 6, 10, 22, 42, and 47 feet for Area G. Graphs for October storms (Figures 3-7 and 3-9) indicate slight increases in moisture after precipitation to a depth of ten feet; these changes are more visible in Area L data than Area G. Changes of one-half to one percent volumetric moisture appear to be indicated approximately six days after precipitation at ten foot depth (Figure 3-9). Moisture content of the tuff below ten feet depth does not appear to be influenced by autumn precipitation events. The difference in depth of infiltration between Areas G and L may be due to geographic differences at the sites such as wind sheltering, local differences in precipitation and evaporation or variable amounts of ground disturbance.

Precision of the instrument places limitations on measurement of low moisture conditions. Manufacturers of the neutron moisture probe calculate precision of the instrument as follows:

$$\% \text{ error} = \frac{100}{(x \bullet t/16)^{\frac{1}{2}}} \qquad (3\text{-}2)$$

where

x = number of slow neutron counts
t = counting time in seconds

The two point calibration for the model 503DR instrument yields an average of 157 counts per 16 second counting period at 0.075 percent moisture. These data yield a 7.98 percent error in precision for low moisture conditions.

Moisture profiles measured in 1986 in Areas G and L are consistent with moisture measurements conducted in previous studies of the Bandelier Tuff. Abeele and others (1981) present neutron-moisture data of the tuff for various locations at the Laboratory measured between 1960 and 1980; typically, the upper 10 to 15 feet of tuff exhibit moisture conditions ranging from 10 to 40 percent by volume. Moisture rarely exceeded 5 to 10 percent below 15 feet of depth. The data presented by Abeele and others for Area G show that significant seasonal fluctuations in moisture content exist in the uppermost four meters of disturbed areas in Area G. These older data are consistent with the 1986 data (Figures 3-3 and 3-4).

Gravimetric moisture data, and neutron-moisture data collected during the 1985-86 and 1960-70 studies are consistent in showing the following trends:

- The moisture content of the tuff throughout the area is low, typically between 2 to 5 percent with intervals ranging up to 10 to 28 percent
- Seasonal variation of moisture content occurs in the upper 10 to 20 feet of the tuff. Seasonal variations are not measurable below approximately 20 feet
- Precipitation from monitored autumn storms does not infiltrate below approximately ten feet.

Empirical studies of neutron-moisture measurement, described above, lead to the conclusion that the tuff is not saturated, in fact it is very dry, and moisture from precipitation does not appear to infiltrate to significant depth. Therefore, infiltration of meteoric water would not seem to be a viable process for transport of waste constituents from Areas G and L through the unsaturated zone.

3.5.2 Measurement of Capillary Potential

Task four of the compliance order specifies that in addition to neutron-moisture measurements, the Laboratory must monitor capillary potential with either moisture blocks or by psychrometry. Psychrometers were used rather than tensiometers or moisture blocks because the high soil water tensions present precluded the use of tensiometers and many problems are associated with use of moisture blocks. Psychrometers however also have inherent deficiencies in measuring high soil water tensions. Care must be taken in

interpreting the psychrometer data due to the placement and backfill surrounding the sensors. Everett and others (1984) explain that nonrepresentative measurements of tension may occur if a good contact is not maintained between the psychrometer cup and the surrounding formation. Proper contacts are especially difficult to achieve in coarse material, at greater depths, or when sensors are surrounded by well indurated material. Any or all of these factors may be present in the Area G and L boreholes and may account for fluctuation in data.

Boreholes LLP-85-03 and LGP-85-07 were instrumented with 23 and 15 psychrometers, respectively (Appendix C, Figures C-4 and C-7). Thermocouple psychrometers are designed to measure negative soil water pressure from relative humidity versus output voltage relationships. Details of the installation, calibration, and operation of the psychrometers at Areas G and L are provided in BFEC (1986), Section 3.3.1, and BFEC (1985b). Everett and others (1984) provide additional discussion of the use of psychrometers.

Each psychrometer is connected to an automatic data recorder which records soil water potential once per day. Psychrometers in borehole LGP-85-07 are connected to one data recorder, psychrometers below a depth of 41 feet in borehole LLP-85-03 are connected to a second recorder and psychrometers above 41 feet at Area L are connected to a third recorder. The psychrometers have been operational since October 1985. Data collected through November 1986 are presented in Appendix H. Data recording errors are indicated as zero soil-water potential in this appendix. The zero values are assigned to the reading and do not represent saturated conditions. Additionally, several blocks of data are not available due to malfunction of the data recorders. Table 3-11 contains a summary of data collected from selected psychrometers in Areas G and L. Monthly averages, maximum and minimum soil tension measurements are presented for Area G psychrometers at 22, 42,and 52 feet below the surface. Similar data are presented for Area L psychrometers at depths of 24, 50, 76, and 96 feet. These intervals were selected to provide a reasonable number of data to summarize and do not have any known hydrologic significance. Unfortunately, data below 41 feet in Area L are absent for several months due to data recording errors in the third recorder. Data from the 41 foot psychrometer are included in the table for periods in which psychrometer data are

unavailable for 50 to 96 foot depths. These data are also presented graphically in Figures 3-11 and 3-12.

The most apparent characteristic of the psychrometer data from Areas G and L is the high variability of the readings. The data range from less than one bar tension to over 18 bars. Monthly averages of soil water tension in Area L range from 2.96 to 6.95 bars and from 2.42 to 10.22 bars in Area G. Both the Area G and L psychrometers display a high rate of change during the October-November 1985 period. This is interpreted as a period of moisture conditions in the boreholes equilibrating with surrounding formation. After the initial one to two month equilibration period, the average readings tend to be more stable and fluctuate in the two to seven bar tension range.

Due to the data recording malfunctions described earlier, and the period required for the tensiometers to stabilize, tension measurements are not available through a complete year; thus, seasonal variations in matric forces cannot be evaluated.

Due to the inherent difficulty in measuring soil water tension at very low moisture conditions, the variability displayed in the psychrometer data collected, and the difficulty encountered in quantifying soil moisture characteristic curves, the psychrometer data are best utilized as a qualitative tool in judging relative moisture content. The data do, however, prove to be useful in calculation of average hydraulic head (Section 3.6).

3.6 GRADIENT DETERMINATIONS AND MOISTURE MOVEMENT

Moisture flux is defined as the volume of water crossing a unit area of porous material per unit time and is given by the equation:

$$J = -K(\theta)\nabla H \qquad \text{(Everett and others, 1984)} \qquad (3\text{-}3)$$

where

- J = specific discharge or flux (volume per unit area per unit time)
- $K(\theta)$ = hydraulic conductivity, expressed as a function of water content, θ
- H = total hydraulic head, the sum of soil-water pressure head, ψ, and potential head, z
- ∇H = the hydraulic gradient, expressed in vector form

Flux has units of velocity. The negative sign in the above equation is used by convention to indicate flow occurs in the direction of decreasing hydraulic head.

Hillel (1980, p. 108) describes the process of unsaturated flow as the movement of water along hydration films over particle surfaces in a tendency to equilibrate hydraulic potential. Additionally, Hillel explains that large interaggregate (or interparticle) spaces, which confer high hydraulic conductivity at saturation, become barriers to liquid flow when emptied. The process of unsaturated flow, and moisture flux calculations, therefore, assumes that a continuum of moisture exists throughout the region of flow. Given the very low moisture content of the tuff and the degree of discontinuity (e.g., fractures) it is doubtful that flow processes are continuous throughout the vadose zone. However, the following calculations of moisture flux are presented, assuming that moisture is uniformly and continuously distributed, to provide a logical completion of analysis of data collected under tasks one through four of compliance order paragraph 25.

The hydraulic conductivity of the Bandelier Tuff was determined via two methods: 1) measurement of gas-water effective permeability at various moisture content and calculation of hydraulic conductivity at given moisture conditions, and 2) a theoretical method based on the characteristic curves (Section 3.3.2.2). Due to experimental difficulties, $K(\theta)$ could not be determined for the range of conditions encountered in the field; however, the derived values serve well as estimates of maximum possible $K(\theta)$ likely to be encountered in the field. Values of $K(\theta)$ are presented in Tables 3-9 and 3-10; the two methods yield similar results with model predicted values being slightly greater than measured values, the average model predicted value at minimum measurable moisture conditions is 9.3×10^{-8} cm/s (2.64×10^{-4} ft/day) and 4.66×10^{-8} cm/s (1.32×10^{-4} ft/day) for measured conductivities.

Hydraulic head gradients are determined from monthly soil tension averages as measured by psychrometers located in Areas G and L. The total hydraulic head (H) can be calculated by the formula:

$$H = \psi + z \qquad \text{(Freeze and Cherry, 1979)} \qquad (3\text{-}4)$$

where

ψ = capillary pressure
z = elevation
In the unsaturated zone $\psi < 0$

Elevations in feet above mean sea level were determined for psychrometers located at depths of 24, 41, 50, 76, and 96 feet in area L and at depths of 22, 42, and 52 feet in area G; and mean monthly capillary pressure (Table 3-11) was added to the elevation to determine hydraulic head. These datum were arbitrarily selected as calculation intervals and do not represent any known hydrologic significance. Further, it is assumed that unsaturated flow occurs within the surface to 22 foot interval, as demonstrated by neutron moisture measurements. However, the emphasis of this study is to determine the likelihood of contaminant transport downward through the tuff, below the waste disposal facilities; therefore, analysis of the surface to 22 foot interval is unwarranted.

Hydraulic gradients were calculated between psychrometers by dividing the change in hydraulic head between two psychrometers by the distance separating the measuring points. Calculation spreadsheets showing the calculation procedures and data are presented in Appendix I. By convention, a change in hydraulic head less than zero indicates a decrease in hydraulic head in the downward direction. Moisture flux is next calculated using Equation 3-3. Calculations are shown using the average measured and average theoretical hydraulic conductivities. Table 3-12 summarizes the results of these calculations; more detailed results are presented in Appendix I. Moisture flux calculations were conducted for intervals between 24-50 feet, 50-76 feet, and 76-96 feet below the surface in Area L and 22-42 feet and 42-52 feet below the surface for Area G. The 24- to 41-foot interval was used in calculations for Area L during the month when data below 41 feet were not available. The flux calculations were conducted for 12-month periods using the average soil tension for that month.

Results of the calculations using model predicted hydraulic conductivity (2.64×10^{-4} ft/day) range from a maximum downward flux of 0.508 ft/yr (15.5 cm/yr)

to a maximum upward flux of 0.397 ft/yr (12.1 cm/yr) in Area L. Results of flux calculations in Area G using the model derived hydraulic conductivity range from a downward rate of 0.982 ft/yr (29.9 cm/yr) to a maximum upward rate of 0.081 ft/yr (2.5 cm/yr). Flux rates calculated using average measured hydraulic conductivity an Area L ranged from a maximum downward rate of 0.254 ft/yr (7.74 cm/yr) to a maximum upward rate of 0.198 ft/yr (6.03 cm/yr); Area G rates range from downward flux of 0.491 ft/yr (1.49 cm/yr) to upward flux of 0.041 ft/yr (1.25 cm/yr).

The calculations of flux should be viewed as highly conservative, representing the maximum movement of fluid likely to be encountered under field conditions as hydraulic conductivities used in the flux calculations are determined for moisture content above field conditions and therefore are of greater magnitude. Even though estimates of flux are conservative, they show that very long periods of time are required for water and contaminants to move by porous flow through the tuff and that aqueous movement of contaminants through the porous flow in the vadose zone is not a viable mechanism for contamination of ground water.

As described in Section 2.2.2 the tuff underlying Areas G and L contains numerous fractures and joints. These fractures may effectively serve as barriers to unsaturated flow of water and contaminants due to interruption of capillary pathways. Fractures however, may provide pathways for migration of vapor phase contaminants.

3.7 SUMMARY OF VADOSE ZONE HYDROLOGY

Based on the data collected in this report and from other studies the following conclusions can be made concerning the hydrologic characterization of the vadose zone and possible aqueous phase migration of chemical contaminants.

- The Bandelier Tuff is characterized by very low moisture content, typically in the range of two to five percent. This value is well below the porosity and thus moisture movement via unsaturated flow processes predominate over saturated flow.

- The tuff is very porous, averaging 50 percent porosity and has high moisture retention properties.

- Field and laboratory intrinsic permeability tests indicate average permeability of the tuff to be 10^{-8} to 10^{-9} cm^2. This represents moderate permeability similar to that of silty sand.

- Field permeability tests do not indicate increased permeability in zones adjacent to fractures in boreholes; however, the aperture, trace, and degree of fracture filling is variable and the permeability along fractures may vary significantly.

- The unsaturated hydraulic conductivity of the tuff was determined to be approximately 10^{-8} cm/s at approximately 20 to 40 percent moisture content as determined by measured effective permeability and using van Genuchten's model. Actual moisture conditions and $K(\theta)$ are likely lower than these values.

- Soil-characteristic curves for intact cores of Bandelier Tuff could not be determined for the range of moisture/tension conditions present in the field due to the low moisture content in the tuff and the low degree of consolidation within the tuff.

- Soil water tension as measured by thermocouple psychrometers range from one to fifteen bars. Monthly averages typically range from two to seven bars.

- Neutron measurements of vadose zone moisture show that seasonal variation of moisture occurs in the upper 10 to 15 feet of the vadose zone. Moisture content below 15 feet does not appear to change with time. Neutron measurements of moisture after precipitation events indicate the maximum depth of wetting to be approximately ten feet. No influence of precipitation on moisture content was observed at a depth of 22 feet and moisture is assumed to be returned to the surface by evapotranspiration.

- Maximum calculated moisture flux rates for porous flow are 0.508 ft/yr and 0.982 ft/yr for Areas L and G respectively. Mean flux rates for the areas are 0.070 and 0.421 ft/yr. These calculations are based on unsaturated hydraulic conductivities for greater moisture content than observed in the field and thus are greater than actual flux rates. The assumptions that underlie these calculations make it unlikely that unsaturated flow occurs over any significant distance.

Each of the above statements support the conclusion that aqueous transport of contaminants through Bandelier Tuff by saturated or unsaturated flow processes is not a viable mechanism for contaminant migration at Areas G and L.

TABLE 3-1
MEAN MONTHLY PRECIPITATION (INCHES)
LOS ALAMOS, NEW MEXICO[1]

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ANNUAL
White Rock	0.25	0.24	0.24	0.32	1.20	1.50	2.29	3.68	1.73	1.02	0.39	0.67	13.50
TA-59/TA-3	0.82	0.67	1.14	0.82	1.16	1.10	3.20	3.86	1.73	1.47	0.99	0.97	17.93
Los Alamos	0.84	0.70	1.01	1.01	1.25	1.33	3.29	3.69	2.01	1.61	0.70	0.93	18.37
TA-54													13.45[2]

(1) From NMEID (1985).
(2) Five years of record; annual total based on 75 percent of TA-59/TA-3.

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TABLE 3-2
PRECIPITATION MEASURED AT TA-54 AREA G, 1986

MONTH	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	Annual
Precipitation (inches)	0	0.91	0.81	1.46	1.38	3.45	2.19	1.12	2.34	2.10	2.45	0.64	18.85

TABLE 3-3
HYDRAULIC CONDUCTIVITY DETERMINED FROM AIR-INJECTION TESTS IN LOS ALAMOS DRILL HOLES

HOLE NUMBER	GEOLOGIC UNIT	TEST INTERVAL[1] (ft)	INTERVAL DESCRIPTION	FRACTURES PRESENT?	HYDRAULIC CONDUCTIVITY (K) cm/s x 10^{-3}	ft/s x 10^{-5}
LLM-85-01	2b	9-15	Upper 2b, Moderately Welded	No	1.2	4.1
LLM-85-01	2b	30-36	Lower 2b, Moderately to Slightly Welded	No	0.70	2.3
LLM-85-02	2b	9-15	Upper 2b, Moderately Welded	Yes	0.094	0.31
LLM-85-02	2b	24-30	Middle 2b, Moderately Welded	No	0.11	0.37
LLM-85-05	2b	24-30	Mid-Lower 2b, Moderately Welded	No	0.91	3.0
LGM-85-11	2b	9-15	Upper 2b, Moderately Welded	No	1.5	5.0
LGM-85-11	2b	14-20	Middle 2b, Moderately Welded	Yes	1.4	4.7
LGM-85-11	2b/2a	35-41	Contact 2b/2a, Slightly Welded	No	0.12	0.40
LLM-85-01	2a	51-57	Middle 2a, Slightly Welded	No	0.33	1.1
LLM-85-01	2a	72-78	Lower 2a, Slightly Welded	Yes	0.14	0.45
LLM-85-02	2a	45.5-51.5	Upper 2a, Slightly Welded	Yes	0.14	0.45
LLM-85-02	2a	66.5-72.5	Mid-Lower 2a, Moderately Welded	No	0.14	0.45
LLM-85-05	2a	45-51	Upper 2a, Slightly Welded	Yes	2.8	9.3
LLM-85-05	2a	55-61	Middle 2a, Slightly Welded	Yes	1.9	6.2
LGM-85-06	2a	38-44	Upper 2a, Slightly Welded	Yes	0.067	0.22
LLM-85-05	2a/1b	75-81	Contact 2a/1b, Slightly Welded	No	0.052	0.17
LGM-85-11	2a/1b	56-62	Contact 2a/1b, Slightly Welded	No	0.52	1.7
LLM-85-01	1b	93-99	Mid-Upper 1b, Slightly Welded	No	0.082	0.27
LLM-85-02	1b	87-93	Upper 1b, Slightly Welded	No	0.085	0.28
LLM-85-05	1b	82-88	Upper 1b, Slightly Welded	No	0.061	0.20

[1]Depth below ground level

TABLE 3-3

HYDRAULIC CONDUCTIVITY DETERMINED FROM AIR-INJECTION TESTS IN LOS ALAMOS DRILL HOLES

(Continued)

HOLE NUMBER	GEOLOGIC UNIT	TEST INTERVAL[1] (ft)	INTERVAL DESCRIPTION	FRACTURES PRESENT?	HYDRAULIC CONDUCTIVITY (K) cm/s x 10^{-3}	ft/s x 10^{-5}
LGM-85-06	1b	60-66	Upper 1b, Slightly Welded	No	0.64	2.1
LGM-85-06	1b	81-87	Middle 1b, Slightly to Moderately Welded	No	0.52	1.7
LGM-85-11	1a/1b	99-105	Contact 1a/1b, Slightly Welded	No	0.030	0.098
LGM-85-11	1b	77-83	Middle 1b, Slightly to Moderately Welded	No	0.23	0.77
LGM-85-11	1a	108-114	Upper 1a, Nonwelded	No	0.088	0.2

From BFEC (1986)

TABLE 3-4

PERMEABILITY VALUES DETERMINED FROM VACUUM TESTS IN LOS ALAMOS DRILL HOLES

HOLE NUMBER	GEOLOGIC UNIT	TEST INTERVAL[1] (ft)	INTERVAL DESCRIPTION	FRACTURES PRESENT?	INTRINSIC PERMEABILITY (k) $cm^2 \times 10^{-9}$	INTRINSIC PERMEABILITY (k) $ft^2 \times 10^{-12}$
LLM-85-01	2b	30-33.3	Lower 2b, Moderately Welded	No	39	42
LLM-85-02	2b	10-13.3	Upper 2b, Moderately Welded	Yes	14	15
LLM-85-02	2b	25-28.3	Middle 2b, Moderately Welded	Yes	22	24
LLM-85-05	2b	15-18.3	Middle 2b, Moderately Welded	No	24	2.6
LGM-85-06	2b	10-13.3	Upper 2b, Moderately Welded	No	38	41
LGM-85-11	2b/2a	35-38.3	Contact 2b/2a, Moderately Welded	No	5.5	5.9
LLM-85-01	2a	70-73.3	Lower 2a, Nonwelded	No	43	46
LLM-85-05	2a	40-43.3	Upper 2a, Slightly Welded	No	8.4	9.1
LLM-85-05	2a	50-53.3	Middle 2a, Slightly Welded	No	8.6	9.3
LLM-85-05	2a	60-63.3	Middle 2a, Moderately Welded	No	8.6	9.3
LLM-85-06	2a	40-43.3	Middle 2a, Moderately Welded	Yes	2.4	2.6
LLM-85-01	1b	80-83.3	Upper 1b, Slightly Welded	No	5.6	6.0
LLM-85-01	1b	94-97.3	Upper 1b, Slightly Welded	No	3.5	3.8
LLM-85-02	1b	87-90.3	Upper 1b, Slightly Welded	No	9.3	10
LGM-85-06	1b	82-85.3	Middle 1b, Slightly Welded	No	1.0	1.1
LGM-85-06	1b	100-103.3	Lower 1b, Moderately Welded	No	0.84	0.90
LGM-85-11	1b	77-80.3	Middle 1b, Slightly Welded	No	8.2	8.8
LGM-85-06	1b	60-63.3	Upper 1b, Slightly Welded	No	8.7	9.4
LGM-85-11	1a	110-113.3	Upper 1a, Nonwelded	No	2.7	2.9
LLM-85-02	1b	87-90.3	Upper 1b, Slightly Welded	No	8.6	9.3
LLM-85-06	1b	87-90.3	Mid-Lower 2b, Moderately Welded	No	2.4	2.6

Modified From BFEC (1986)

[1] Depth below ground level.

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TABLE 3-5
COMPARISON OF INTRINSIC PERMEABILITY VALUES DETERMINED FROM AIR-INJECTION AND VACUUM TESTS IN LOS ALAMOS DRILL HOLES

HOLE NUMBER	TEST INTERVAL (ft)[1]		INTRINSIC PERMEABILITY (k)			
	AIR-INJECTION TEST	VACUUM TEST	AIR-INJECTION TEST		VACUUM TEST	
			$cm^2 \times 10^{-9}$	$ft^2 \times 10^{-12}$	$cm^2 \times 10^{-9}$	$ft^2 \times 10^{-12}$
LLM-85-01	30-36	30-33.3	130	140	39	42
LLM-85-02	9-15	10-13.3	10	11	15	16
LLM-85-02	24-30	25-28.3	16	17	22	24
LGM-85-11	35-41	35-38.3	17	18	5.5	5.9
LLM-85-01	72-78	70-73.3	19	21	43	46
LLM-85-01	93-99	94-97.3	7.6	8.2	3.5	3.8
LLM-85-02	87-93	87-90.3	3.3	9.5	9.3	10
LGM-85-06	60-66	60-63.3	120	130	8.7	9.4
LGM-85-06	81-87	82-85.3	84	90	1.0	1.1
LGM-85-11	99-105	100-103.3	3.3	3.6	0.84	0.90
LGM-85-11	77-83	77-80.3	32	35	8.2	8.8
LGM-85-11	108-114	110-113.3	7.2	7.8	2.7	2.9

From BFEC (1986)

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[1] Depth below ground level

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TABLE 3-6
INTRINSIC PERMEABILITY VALUES DETERMINED FROM LABORATORY ANALYSIS OF CORE SAMPLES

HOLE NUMBER	GEOLOGIC UNIT	SAMPLE NUMBER	DEPTH OF SAMPLE (ft)[2]	INTERVAL DESCRIPTION	INTRINSIC PERMEABILITY/ KLINKENBERG METHOD $cm^2 \times 10^{-9}$	INTRINSIC PERMEABILITY/ KLINKENBERG METHOD $ft^2 \times 10^{-12}$	CORRELATION COEFFICIENT[1]	INTRINSIC PERMEABILITY/ DYNAMIC METHOD $cm^2 \times 10^{-9}$	INTRINSIC PERMEABILITY/ DYNAMIC METHOD $ft^2 \times 10^{-12}$
LGM-85-11	2b	MCG-618	3	Moderately Welded[3]	6.2	6.7	0.989	5.5	5.9
LLM-85-02	2b	MCG-606	7	Moderately Welded	6.6	7.1	0.745	4.5	4.9
LLM-85-05	2b	MCG-610	15	Moderately Welded	6.5	7.0	0.893	5.7	6.2
LLM-85-01	2b	MCG-602	30	Moderately Welded	2.7	2.9	0.958	1.1	1.2
LGM-85-11	2b	MCG-619	30	Moderately Welded	3.2	3.5	0.949	2.9	3.1
LLM-85-02	2b	MCG-607	36	Moderately Welded	11.0	12.0	0.714	1.2	1.3
LGM-85-06	2b	MCG-614	29	Moderately Welded	6.4	6.9	0.847	4.9	5.3
LLM-85-05	2b	MCG-611	36	Slightly Welded	3.5	3.8	0.984	2.4	2.6
LLM-85-01	2a	MCG-603	52	Slightly Welded	4.1	4.4	0.969	2.7	2.9
LGM-85-06	2a	MCG-615	51	Slightly Welded	2.5	2.7	0.954	0.86	0.93
LLM-85-02	2a	MCG-608	67	Moderately Welded	2.0	2.2	0.958	1.0	1.1
LLM-85-05	1b	MCG-612	76	Slightly Welded	2.1	2.3	0.944	1.3	1.4
LLM-85-01	1b	MCG-604	101	Slightly Welded	3.0	3.2	0.939	2.6	2.8
LGM-85-06	1b	MCG-616	99	Moderately Welded	18.0	19.0	0.917	13.0	14.0
LGM-85-11	1b	MCG-620	94	Moderately Welded	4.4	4.7	0.958	1.1	1.2
LLM-85-02	1b	MCG-609	117	Moderately Welded	3.3	3.6	0.973	1.7	1.8
LLM-85-05	1b	MCG-613	123	Slightly Welded	4.2	4.5	0.902	1.6	1.7
LLM-85-01	1b	MCG-605	124	Moderately Welded	6.0	6.5	0.850	2.3	2.5
LGM-85-11	1a	MCG-621	115	Nonwelded	3.4	3.7	0.933	1.8	1.9
LGM-85-06	1a	MCG-617	115	Nonwelded	1.4	1.5	0.970	0.93	1.0

FROM BFEC (1986)

(1) Determined for Klinkenberg permeabilities
(2) Below ground level
(3) Weathered

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TABLE 3-7
COMPARISON OF AVERAGE INTRINSIC PERMEABILITY VALUES FOR
THE MAJOR GEOLOGIC UNITS OF THE BANDELIER TUFF IN THE STUDY AREA

UNIT	INTRINSIC PERMEABILITY					
	AIR-INJECTION TEST		VACUUM TEST		LABORATORY ANALYSIS	
	$cm/^2 \times 10^{-9}$	$ft^2 \times 10^{-12}$	$cm/^2 \times 10^{-9}$	$ft^2 \times 10^{-12}$	$cm/^2 \times 10^{-9}$	$ft^2 \times 10^{-12}$
2b	93	100	23	25	5.7	6.2
2a	62	67	13	14	2.8	3.0
1b	26	28	5.7	6.2	5.7	6.2
1a	7.8(1)	7.8(1)	2.7(1)	2.9	2.4	2.6

From BFEC (1986)

(1) Intrinsic permeability for this unit is based on only one measurement.

TABLE 3-8

RESULTS OF MOISTURE/TENSION RELATIONSHIP TESTING FOR INTACT CORES OF BANDELIER TUFF[1]

BORING NUMBER	SAMPLE NUMBER	DEPTH (ft)	STRATIGRAPHIC UNIT	CAPILLARY PRESSURE (psi)	WETTING FLUID SATURATION (percent)	VOLUMETRIC MOISTURE (percent)
LLM-85-01	MCG-602	30	2b	0.510	91.6	36.3
				0.906	84.6	33.5
				1.420	81.2	32.1
				2.055	76.1	30.1
				2.814	70.9	28.1
				3.701	65.8	26.0
LLM-85-01	MCG-603	52	2a	0.455	90.0	58.
				0.823	84.7	54.5
				1.385	79.7	51.3
				2.230	74.9	48.2
				3.495	70.2	45.2
				5.403	65.8	42.4
LLM-85-01	MCG-604	101	1b	0.493	88.6	55.0
				0.955	82.1	51.
				1.738	76.6	47.6
				3.220	71.9	44.6
				6.555	67.8	42.1
LLM-85-01	MCG-605	124	1b	0.392	83.5	40.8
				0.620	76.9	37.6
				0.955	70.5	34.5
				1.450	64.4	31.5
				2.189	58.5	28.6
				3.319	52.9	25.9
LLM-85-02	MCG-606	7	2b	0.392	88.6	36.8
				0.812	81.1	33.7
				1.450	73.9	30.7
				2.372	66.8	27.7
				3.663	60.0	24.9
				5.440	53.3	22.1
LLM-85-02	MCG-607	36	2b	0.097	92.0	42.8
				0.181	87.3	40.6
				0.494	79.1	36.8
				0.799	75.8	35.2
				1.382	73.4	34.1
				2.975	71.8	33.4

[1] Modified from BFEC (1986)

TABLE 3-8

RESULTS OF MOISTURE/TENSION RELATIONSHIP TESTING FOR INTACT CORES OF BANDELIER TUFF
(Continued)

BORING NUMBER	SAMPLE NUMBER	DEPTH (ft)	STRATIGRAPHIC UNIT	CAPILLARY PRESSURE (psi)	WETTING FLUID SATURATION (percent)	VOLUMETRIC MOISTURE (percent)
LLM-85-02	MCG-608	67	2a	0.424	90.7	39.3
				0.681	86.6	37.5
				1.050	82.6	35.8
				1.573	78.7	34.1
				2.315	75.0	32.5
				3.375	71.5	30.9
LLM-85-02	MCG-609	117	1b	0.252	94.2	45.7
				0.626	89.3	43.3
				1.135	84.2	40.8
				1.757	79.1	38.4
				2.474	73.9	35.8
				3.268	68.6	33.3
LLM-85-05	MCG-610	15	2b	0.174	90.0	47.3
				0.328	84.5	44.4
				0.563	79.1	41.6
				0.913	73.9	38.9
				1.429	68.9	52.0
				2.188	64.2	33.8
LLM-85-05	MCG-611	36	2b	0.259	96.1	70.7
				1.014	90.8	66.8
				1.879	85.0	62.6
				2.715	78.5	57.8
				3.482	71.4	52.6
				4.171	63.7	46.9
LLM-85-05	MCG-612	76	1b	0.072	97.1	72.0
				0.344	94.0	69.7
				0.800	90.9	67.4
				1.424	87.8	65.1
				2.198	84.6	62.8
				3.109	81.4	60.4
LLM-85-05	MCG-613	123	1b	0.166	85.1	55.8
				0.243	82.4	54.1
				0.382	79.7	52.3
				0.671	77.1	50.6
				1.426	74.6	48.9
				4.598	72.1	47.3

TABLE 3-8
RESULTS OF MOISTURE/TENSION RELATIONSHIP TESTING FOR
INTACT CORES OF BANDELIER TUFF

(Continued)

BORING NUMBER	SAMPLE NUMBER	DEPTH (ft)	STRATIGRAPHIC UNIT	CAPILLARY PRESSURE (psi)	WETTING FLUID SATURATION (percent)	VOLUMETRIC MOISTURE (percent)
LGM-85-06	MCG-614	29	2b	0.446	83.2	35.4
				0.679	77.2	32.8
				1.020	71.4	30.3
				1.526	65.8	28.0
				2.295	60.5	25.7
				3.500	55.4	23.5
LGM-85-06	MCG-615	51	2a	0.419	90.8	36.5
				0.650	86.9	34.9
				0.970	83.1	33.4
				1.411	79.5	32.0
				2.016	76.0	30.6
				2.850	72.6	29.2
LGM-85-06	MCG-616	99	1b	0.322	85.6	45.0
				0.403	85.4	44.9
				0.542	84.5	44.4
				0.818	84.3	44.3
				1.527	83.4	43.9
				4.825	82.2	43.2
LGM-85-06	MCG-617	115	1a	0.068	96.9	54.6
				0.309	92.3	52.0
				0.810	87.8	49.4
				1.716	83.6	47.1
				2.388	81.6	45.9
				3.259	79.6	44.8
LGM-85-11	MCG-618	3	2b	0.296	88.7	48.2
				0.594	81.9	44.5
				1.063	75.3	40.9
				1.775	69.0	37.5
				2.841	62.9	34.2
				4.429	57.1	31.0
LGM-85-11	MCG-619	30	2b	0.491	90.5	46.6
				1.188	81.6	42.0
				2.040	72.3	37.2
				2.976	62.6	32.2
				3.950	52.5	27.0
				4.934	42.0	21.6

TABLE 3-8
RESULTS OF MOISTURE/TENSION RELATIONSHIP TESTING FOR
INTACT CORES OF BANDELIER TUFF

(Continued)

BORING NUMBER	SAMPLE NUMBER	DEPTH (ft)	STRATIGRAPHIC UNIT	CAPILLARY PRESSURE (psi)	WETTING FLUID SATURATION (percent)	VOLUMETRIC MOISTURE (percent)
LGM-85-11	MCG-620	94	1b	0.161	93.3	60.0
				0.376	88.7	57.0
				0.734	84.2	54.1
				1.297	79.9	51.4
				2.163	75.8	48.7
				3.483	71.9	46.2
LGM-85-11	MCG-621	115	1a	0.270	92.3	55.5
				0.446	89.2	53.6
				0.727	86.3	51.9
				1.191	83.5	50.2
				1.991	80.9	48.6
				3.463	78.5	47.2

TABLE 3-9

WATER EFFECTIVE PERMEABILITY AND
UNSATURATED HYDRAULIC CONDUCTIVITY
OF BANDELIER TUFF

WELL	DEPTH (ft)	PERCENT WATER SATURATION	VOLUMETRIC MOISTURE (percent)	EFFECTIVE PERMEABILITY (MD)	K (cm/s)	K (ft/day)
LLM-85-01	30	64	25	1.5×10^{-2}	1.29×10^{-8}	3.66×10^{-5}
LLM-85-01	52	80	51	9×10^{-2}	7.74×10^{-8}	2.19×10^{-4}
LLM-85-01	101	68	42	5×10^{-3}	4.3×10^{-9}	1.22×10^{-5}
LLM-85-01	124	86	42	4×10^{-2}	3.44×10^{-8}	9.75×10^{-5}
LLM-85-02	7	81	34	3.5×10^{-3}	3.01×10^{-9}	8.53×10^{-6}
LLM-85-02	36	83	39	6×10^{-3}	5.16×10^{-9}	1.46×10^{-5}
LLM-85-02	67	71	31	9×10^{-2}	7.74×10^{-8}	2.19×10^{-4}
LLM-85-02	117	72	35	5.5×10^{-2}	4.73×10^{-8}	1.34×10^{-4}
LLM-85-05	15	82	43	1.2×10^{-2}	1.03×10^{-8}	2.92×10^{-5}
LLM-85-05	36	87	64	9×10^{-3}	7.74×10^{-9}	2.19×10^{-5}
LLM-85-05	76	83	62	7×10^{-2}	6.02×10^{-8}	1.71×10^{-4}
LLM-85-05	123	85	56	9×10^{-2}	7.74×10^{-8}	2.19×10^{-4}
LGM-85-06	29	73	31	9.5×10^{-3}	8.17×10^{-9}	2.32×10^{-5}
LGM-85-06	51	77	31	4.5×10^{-2}	3.87×10^{-8}	1.09×10^{-4}
LGM-85-06	99	93	49	1×10^{-1}	8.6×10^{-8}	2.44×10^{-4}
LGM-85-06	115	78	44	6×10^{-2}	5.16×10^{-8}	1.46×10^{-4}
LGM-85-11	3	78	42	1.9×10^{-1}	1.63×10^{-7}	4.62×10^{-4}
LGM-85-11	30	69	36	2×10^{0}	1.72×10^{-6}	4.88×10^{-3}
LGM-85-11	94	95	61	5×10^{-2}	4.3×10^{-8}	1.22×10^{-4}
LGM-85-11	115	79	47	9×10^{-2}	7.74×10^{-8}	2.19×10^{-4}

TABLE 3-10

MODEL PREDICTED HYDRAULIC CONDUCTIVITY AT MINIMUM MEASURED MOISTURE

BORING	SAMPLE DEPTH	VOLUMETRIC MOISTURE (%)	K (cm/d)[1]	K (cm/s)
LLM-85-01	30	26	$2x10^{-2}$	$2.3x10^{-7}$
LLM-85-01	52	42	$2x10^{-3}$	$2.3x10^{-8}$
LLM-85-01	101	42	$3x10^{-4}$	$3.5x10^{-9}$
LLM-85-01	124	26	$5x10^{-4}$	$5.8x10^{-9}$
LLM-85-02	7	22	$5x10^{-3}$	$5.8x10^{-8}$
LLM-85-02	36	33	$3x10^{-5}$	$3.5x10^{-10}$
LLM-85-02	67	31	$1x10^{-3}$	$1.2x10^{-8}$
LLM-85-02	117	33	$1x10^{-2}$	$1.2x10^{-7}$
LLM-85-05	15	34	$2x10^{-3}$	$2.3X10^{-8}$
LLM-85-05	36	46	$1x10^{-1}$	$1.2x10^{-6}$
LLM-85-05	76	60	$1x10^{-3}$	$1.2x10^{-8}$
LLM-85-05	123	47	$1x10^{-6}$	$1.2x10^{-11}$
LGM-85-06	29	24	$1x10^{-3}$	$1.2x10^{-8}$
LGM-85-06	51	29	$4x10^{-3}$	$4.6x10^{-8}$
LGM-85-06	99	43	$1x10^{-7}$	$1.2x10^{-12}$
LGM-85-06	115	45	$1x10^{-4}$	$1.2x10^{-9}$
LGM-85-11	3	30	$9x10^{-4}$	$1.0x10^{-8}$
LGM-85-11	30	22	$8x10^{-3}$	$9.3x10^{-8}$
LGM-85-11	94	47	$7x10^{-4}$	$8.1x10^{-9}$
LGM-85-11	115	47	$2x10^{-4}$	$2.3x10^{-9}$

[1]Graphically determined from BFEC (1986)

TABLE 3-11

SUMMARY OF DATA FROM SELECTED PSYCHROMETERS AT TA-54 AREAS G AND L

AREA	MONTH	DEPTH	NUMBER OF READINGS	CAPILLARY POTENTIAL (-BARS) MEAN	MAX	MIN
L	Oct 85	24	20	3.02	4.24	0.78
L	Oct 85	50	16	4.24	8.55	0.29
L	Oct 85	76	16	3.92	5.98	2.97
L	Oct 85	96	16	3.14	5.35	1.26
L	Nov 85	24	60	3.41	8.32	0.57
L	Nov 85	50	53	5.85	11.33	0.3
L	Nov 85	76	60	3.50	5.77	1.85
L	Nov 85	96	62	3.10	6.66	0.97
L	Dec 85	24	16	3.63	4.59	2.84
L	Dec 85	50	38	6.95	10.96	2.89
L	Dec 85	76	38	2.97	4.47	1.42
L	Dec 85	96	38	2.96	5.17	0.98
L	Feb 86	24	55	5.61	9.45	1.68
L	Feb 86	41	54	5.54	10.69	1.24
L	Mar 86	24	32	4.48	8.17	1.03
L	Mar 86	41	30	5.60	11.14	0.25
L	Apr 86	24	34	5.92	8.75	1.69
L	Apr 86	50	34	6.60	10.97	0.31
L	Apr 86	76	34	4.90	7.55	1.89
L	Apr 86	96	33	4.11	10.07	1.33
L	May 86	24	59	4.92	9.16	0.75
L	May 86	50	37	5.28	11.53	0.59
L	May 86	76	39	3.90	8.49	0.56
L	May 86	96	39	3.62	7.82	0.31
L	Jun 86	24	30	4.81	8.09	0.79
L	Jun 86	50	16	5.86	9.29	0.30
L	Jun 86	76	16	3.31	6.00	1.19
L	Jun 86	96	15	3.68	11.01	0.34
L	Aug 86	24	30	5.67	8.82	1.31
L	Aug 86	41	29	5.52	10.36	1.33
L	Sep 86	24	59	6.00	10.12	1.98
L	Sep 86	41	56	5.63	10.59	0.30

TABLE 3-11
SUMMARY OF DATA FROM SELECTED PSYCHROMETERS AT TA-54 AREAS G AND L
(Continued)

AREA	MONTH	DEPTH	NUMBER OF READINGS	CAPILLARY POTENTIAL (-BARS) MEAN	MAX	MIN
L	Oct 86	24	56	5.57	10.49	0.88
L	Oct 86	41	55	5.45	11.44	0.30
L	Nov 86	24	33	4.94	11.19	0.95
L	Nov 86	41	32	4.91	11.49	0.92
G	Oct 85	22	10	3.29	3.85	1.36
G	Oct 85	42	10	8.79	12.95	6.57
G	Oct 85	52	10	10.22	18.	8.63
G	Nov 85	22	7	3.81	4.15	3.55
G	Nov 85	42	7	8.66	9.09	8.31
G	Nov 85	52	6	9.03	9.61	8.78
G	Mar 86	22	5	2.67	5.18	0.86
G	Mar 86	42	5	6.27	7.92	2.68
G	Mar 86	52	5	6.42	8.78	4.79
G	Apr 86	22	24	2.73	5.52	0.88
G	Apr 86	42	24	5.96	9.06	2.62
G	Apr 86	52	22	5.41	6.98	2.14
G	May 86	22	30	2.77	4.33	1.07
G	May 86	42	30	3.43	5.57	1.96
G	May 86	52	30	5.27	7.44	2.41
G	Jun 86	22	30	3.20	4.27	0.82
G	Jun 86	42	29	2.50	4.50	0.29
G	Jun 86	52	29	4.81	6.37	3.24
G	Jul 86	22	17	2.90	4.36	1.28
G	Jul 86	42	17	2.42	4.04	0.30
G	Jul 86	52	17	4.98	6.84	3.37
G	Oct 86	22	28	4.16	7.06	0.89
G	Oct 86	42	28	4.12	7.83	1.82
G	Oct 86	52	28	5.09	7.48	2.90
G	Nov 86	22	18	3.65	8.75	1.14
G	Nov 86	42	18	5.60	9.18	1.38
G	Nov 86	52	18	5.39	8.80	4.07

TABLE 3-12

SUMMARY OF MOISTURE FLUX CALCULATIONS

AREA	HYDRAULIC CONDUCTIVITY (FT/DAY)	MAXIMUM DOWNWARD FLUX (FT/YR)	MINIMUM DOWNWARD FLUX (FT/YR)	MEAN FLUX (FT/YR)
L	2.64×10^{-4} (1)	0.508	-0.397 (2)	0.070
L	1.32×10^{-4} (3)	0.254	-0.198	0.036
G	2.64×10^{-4}	0.982	-0.081	0.421
G	1.32×10^{-4}	0.491	-0.041	0.211

(1) Average unsaturated hydraulic conductivity determined from theoretical methods.
(2) Flux rates <0 indicate upward movement.
(3) Average unsaturated hydraulic conductivity determined from measurement methods.

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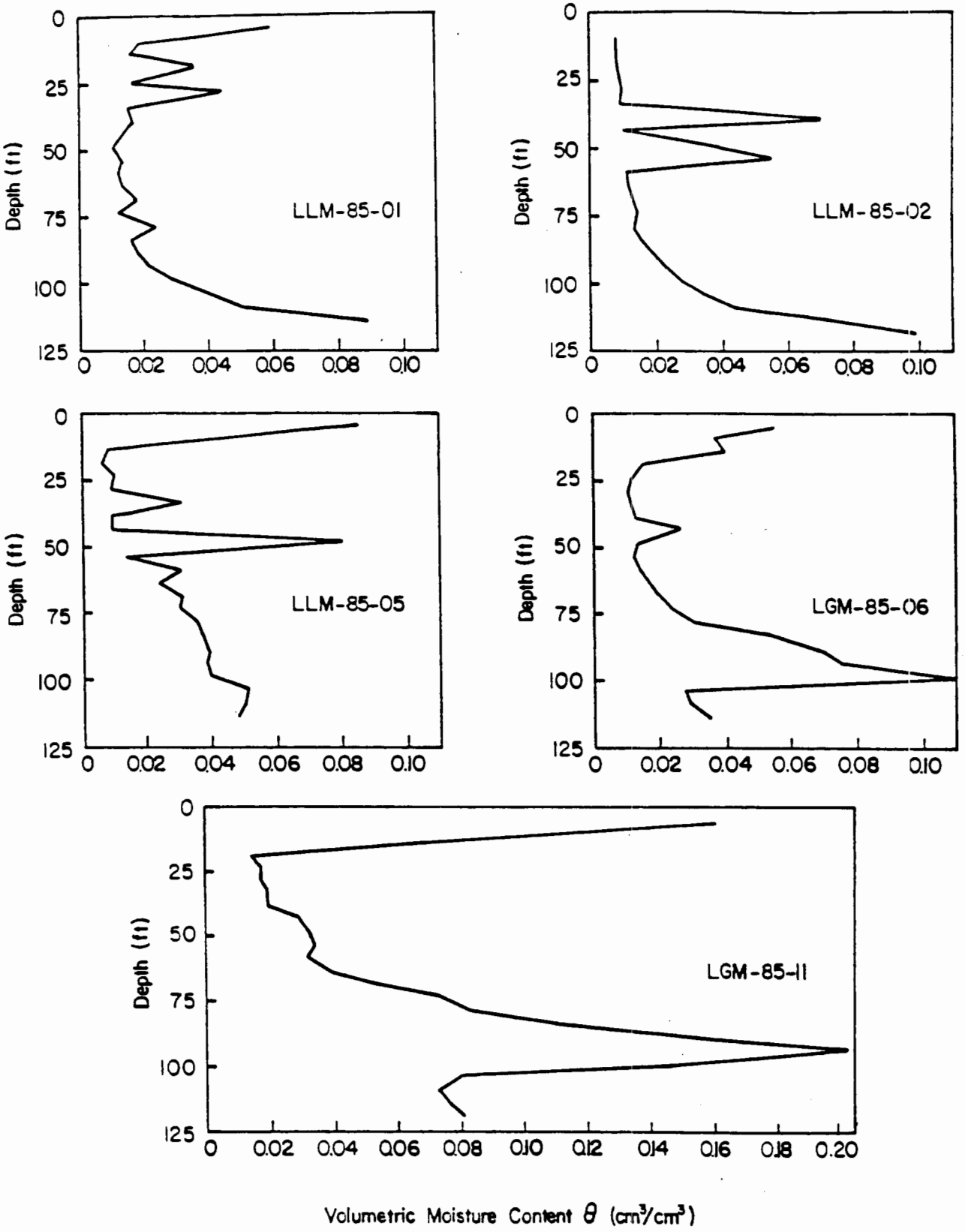

FIGURE 3-1 VOLUMETRIC MOISTURE PROFILES OF BANDELIER TUFF FROM SELECTED BORINGS IN TA-54 AREAS G AND L (BFEC, 1986)

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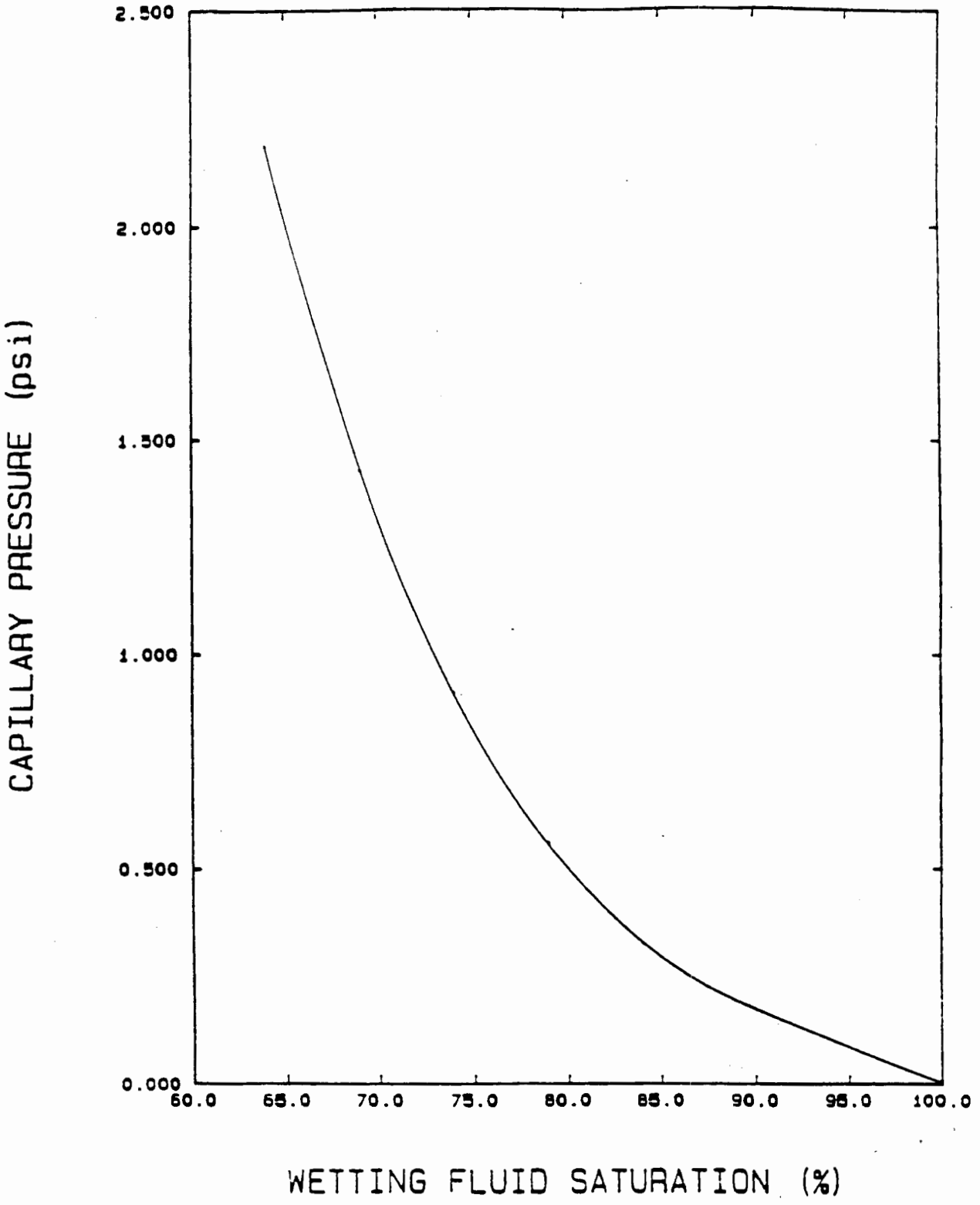

FIGURE 3-2. SOIL MOISTURE CHARACTERISTIC CURVE FOR A TYPICAL SAMPLE OF BANDELIER TUFF (BFEC, 1986)

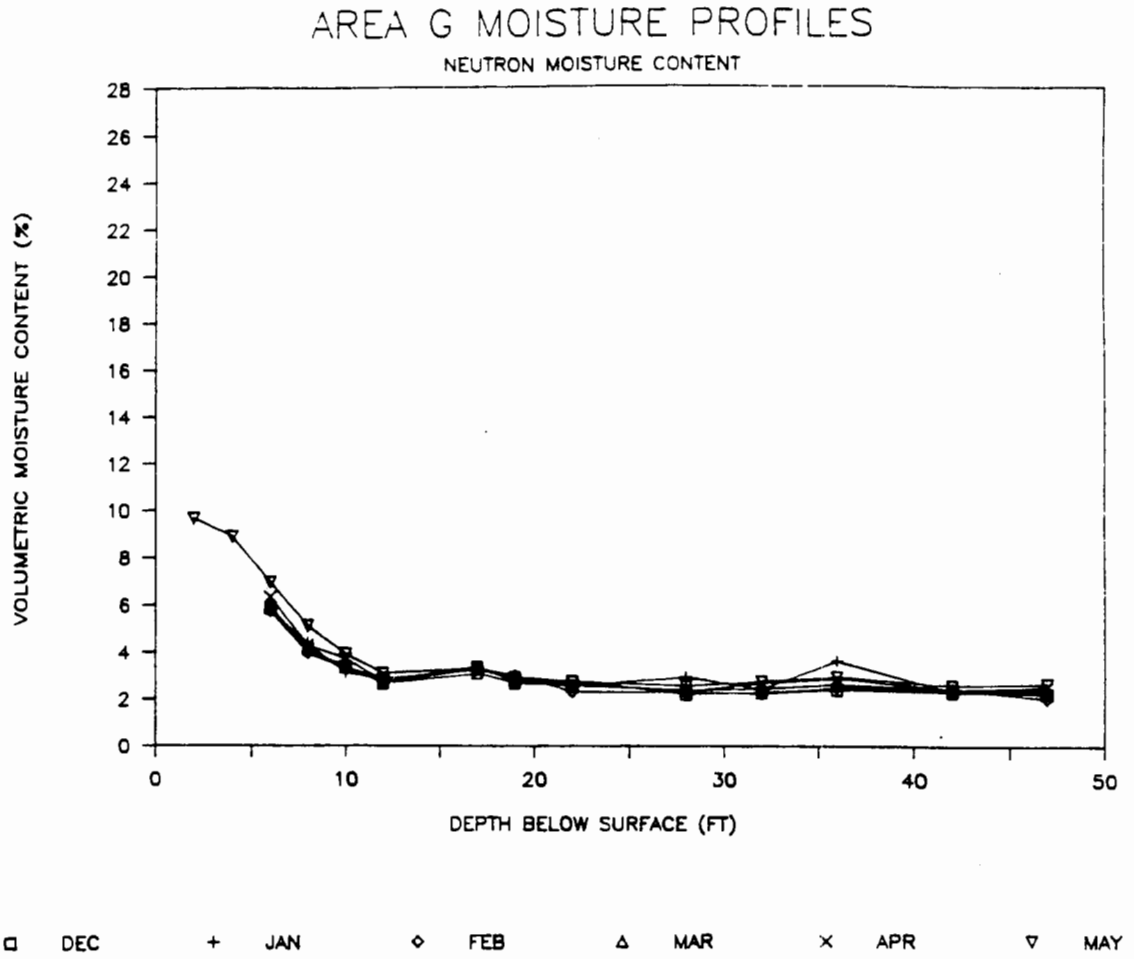

FIGURE 3-3

VOLUMETRIC MOISTURE CONTENT VERSUS DEPTH, IN AREA G, DECEMBER 1986 THROUGH MAY 1986

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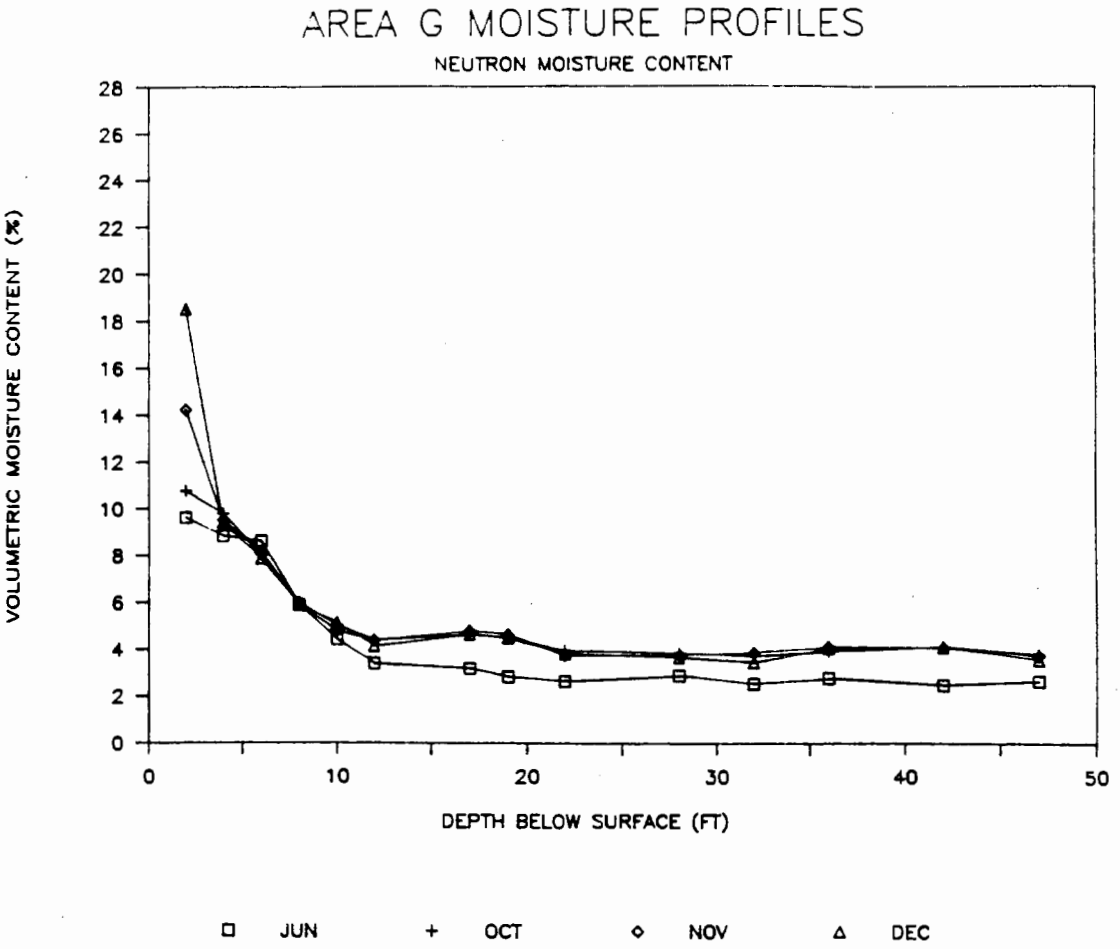

FIGURE 3-4

VOLUMETRIC MOISTURE CONTENT
VERSUS DEPTH, IN AREA G,
JUNE 1986 THROUGH DECEMBER 1986

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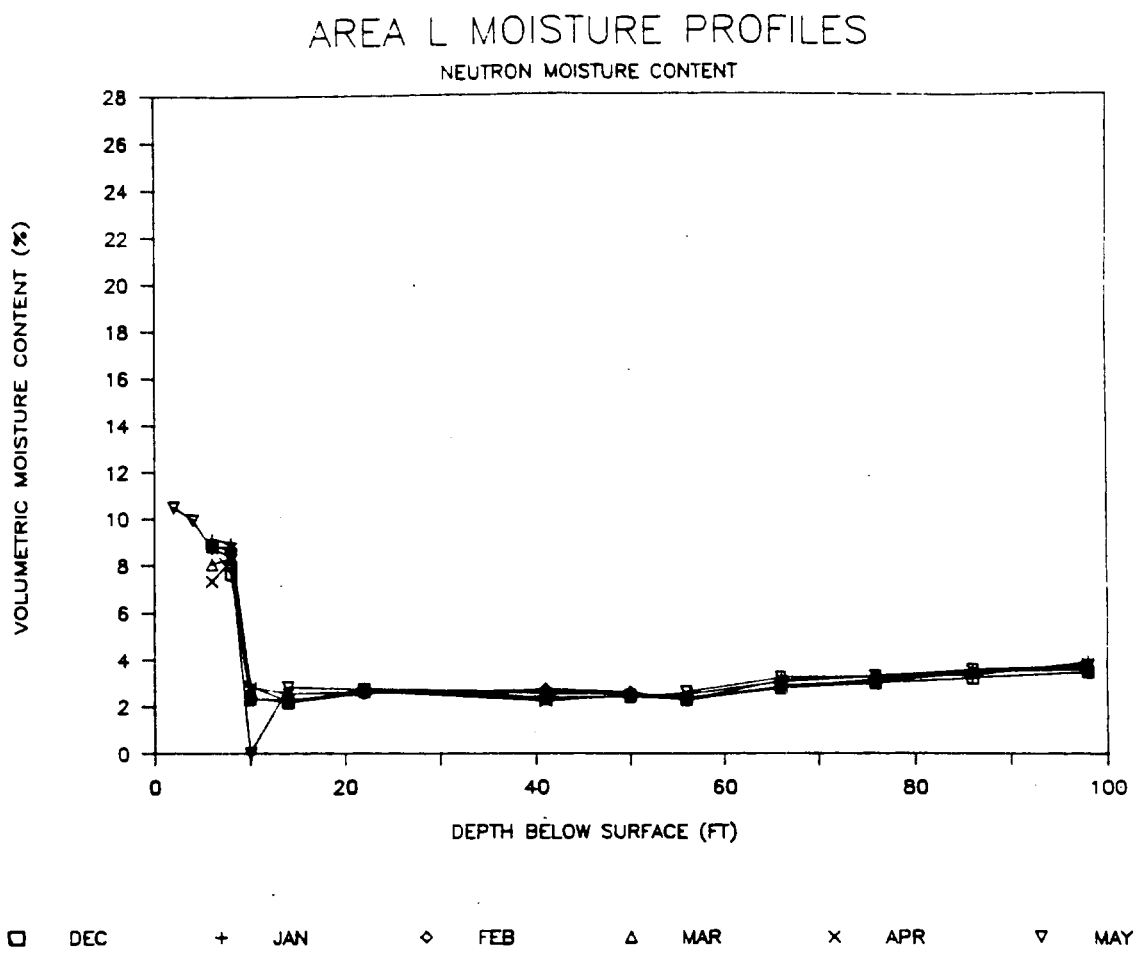

FIGURE 3-5

VOLUMETRIC MOISTURE CONTENT
VERSUS DEPTH, IN AREA L,
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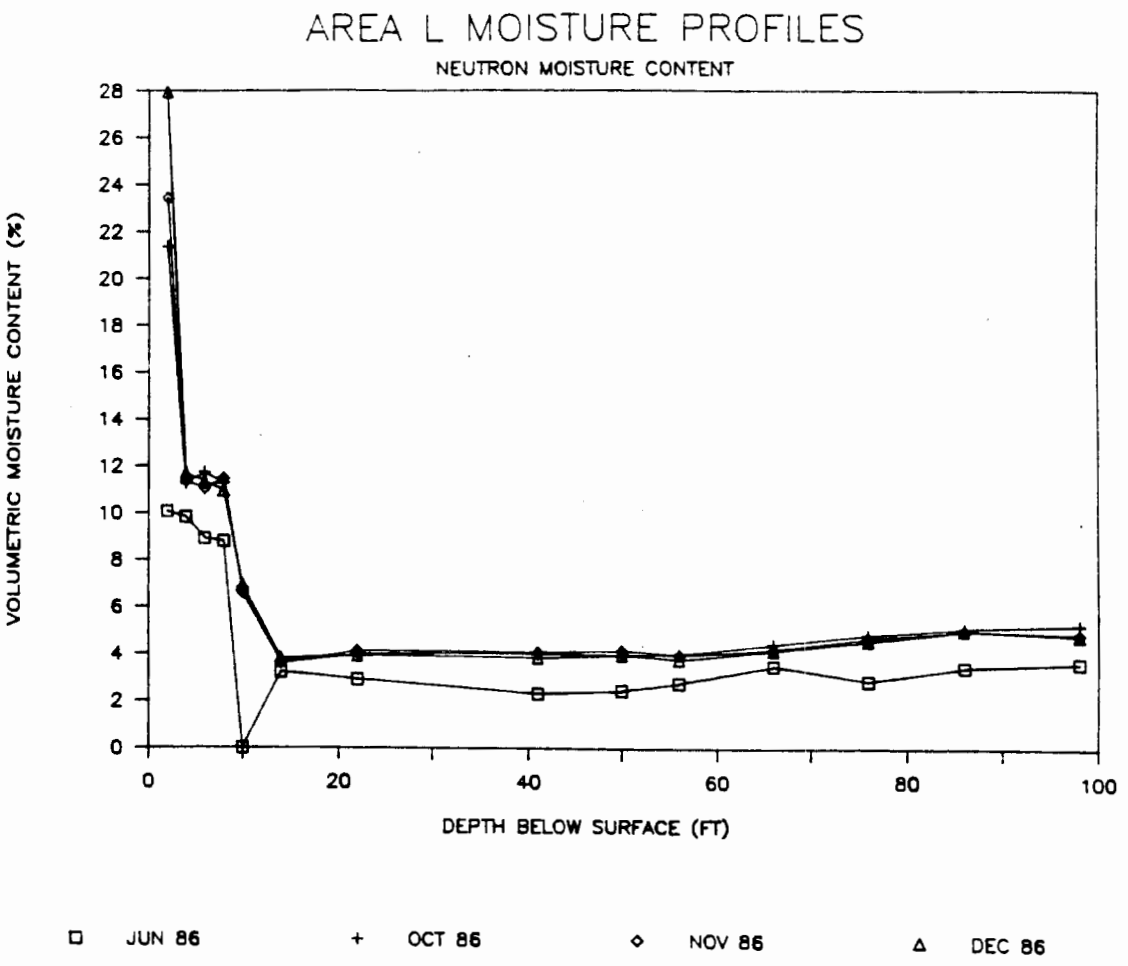

FIGURE 3-6

VOLUMETRIC MOISTURE CONTENT
VERSUS DEPTH, IN AREA L,
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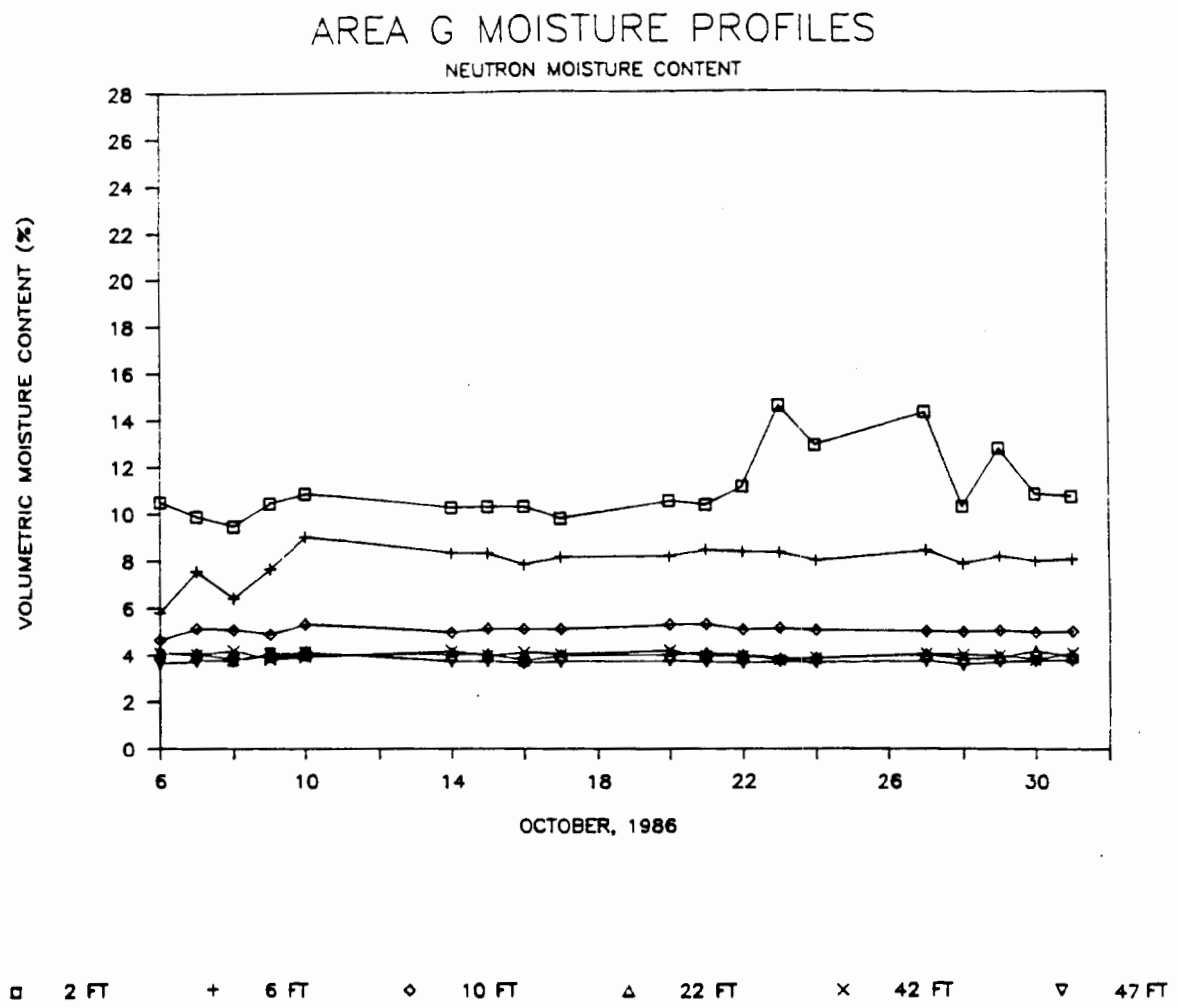

FIGURE 3-7

VOLUMETRIC MOISTURE CONTENT
AT SELECTED DEPTHS,
IN AREA G, OCTOBER 1986

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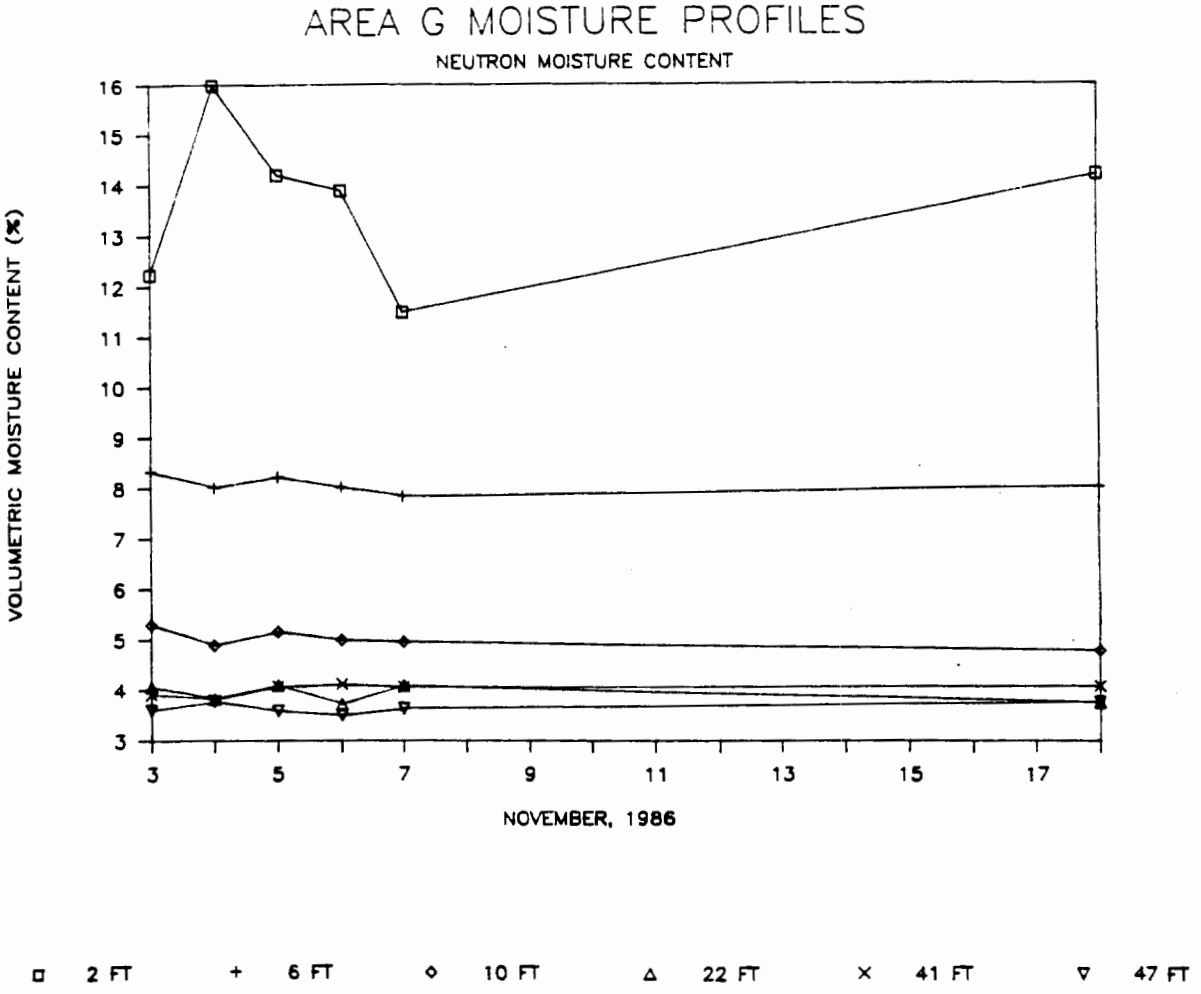

FIGURE 3-8

VOLUMETRIC MOISTURE CONTENT
AT SELECTED DEPTHS,
IN AREA G, NOVEMBER 1986

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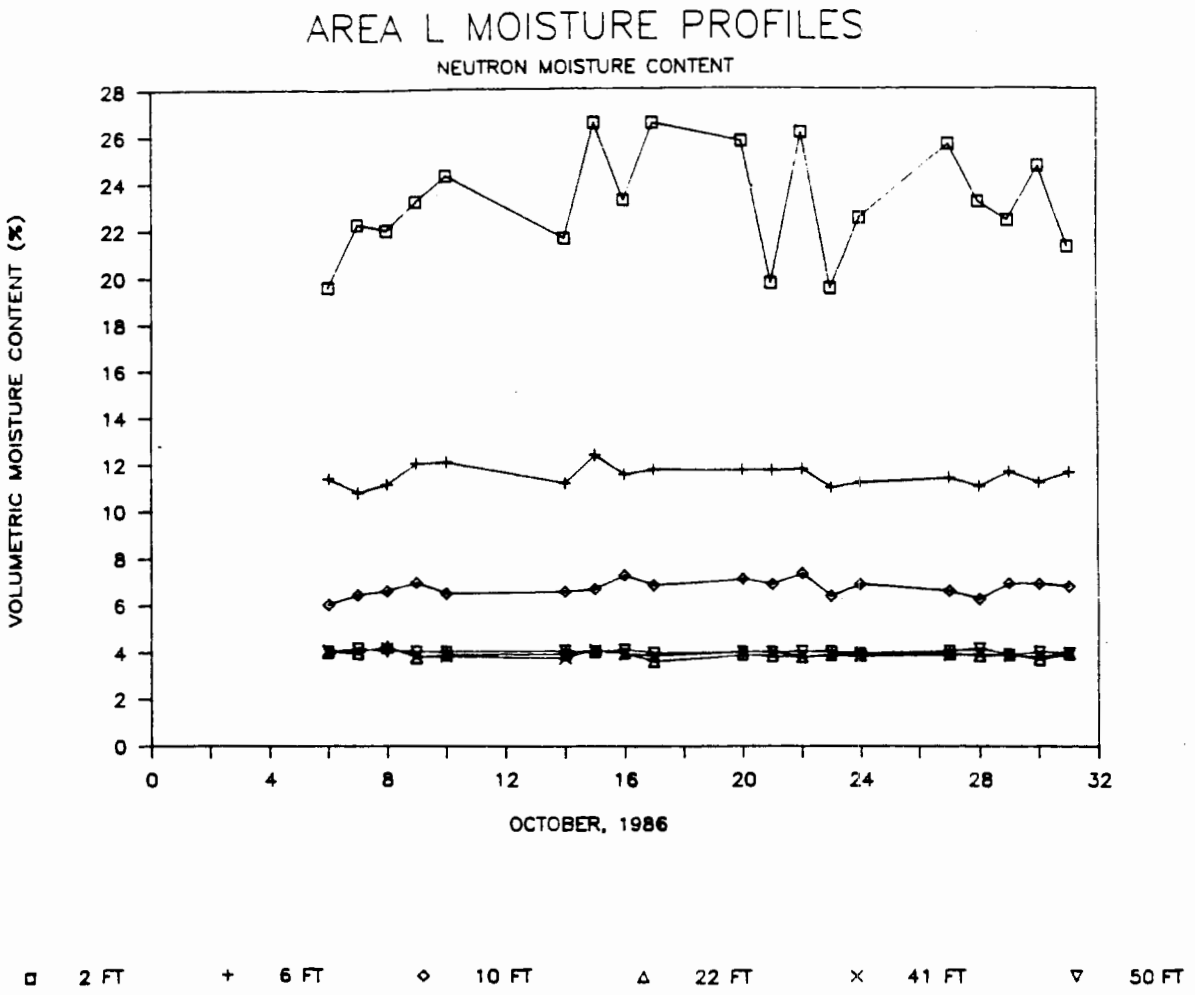

FIGURE 3-9

VOLUMETRIC MOISTURE CONTENT
AT SELECTED DEPTHS,
IN AREA L, OCTOBER 1986

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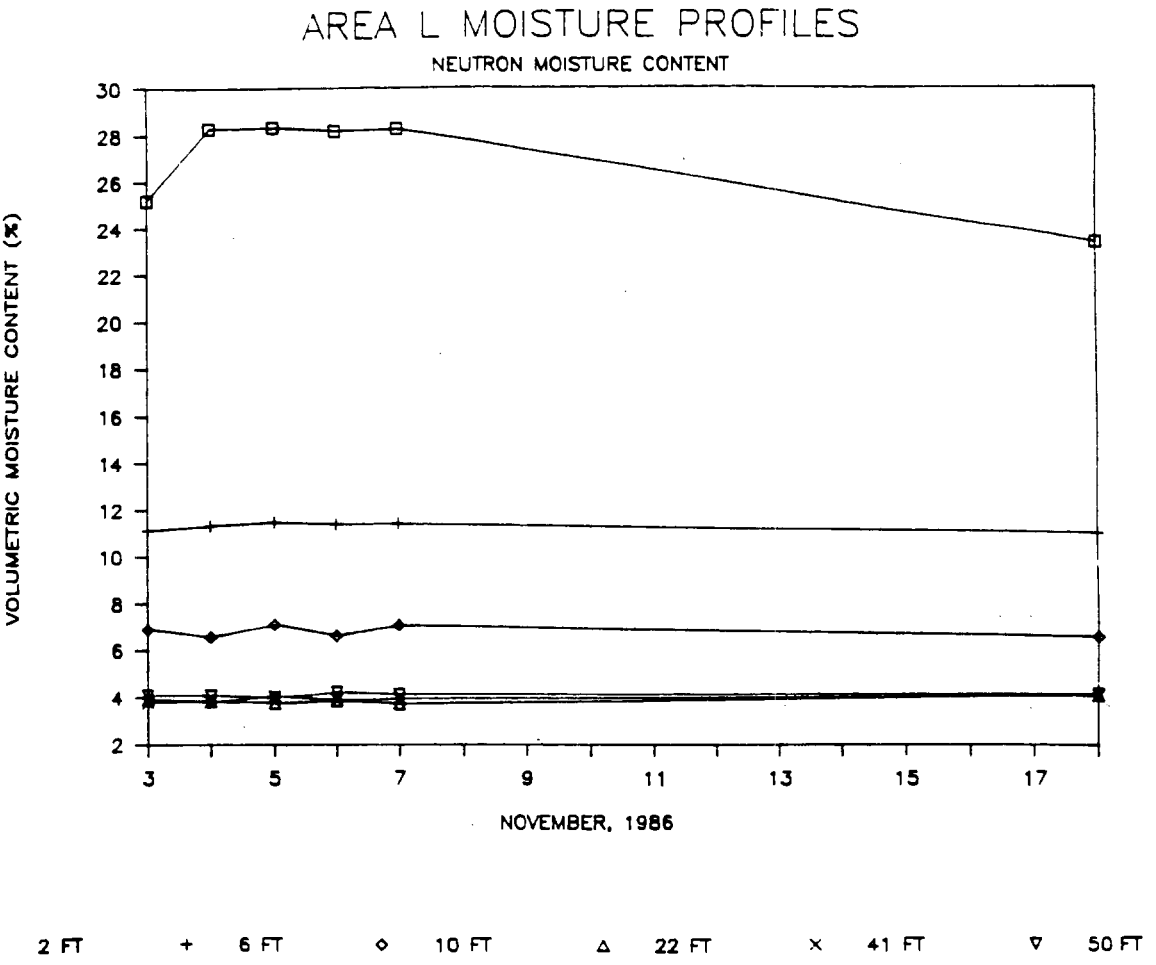

FIGURE 3-10

VOLUMETRIC MOISTURE CONTENT
AT SELECTED DEPTHS,
IN AREA L, NOVEMBER 1986

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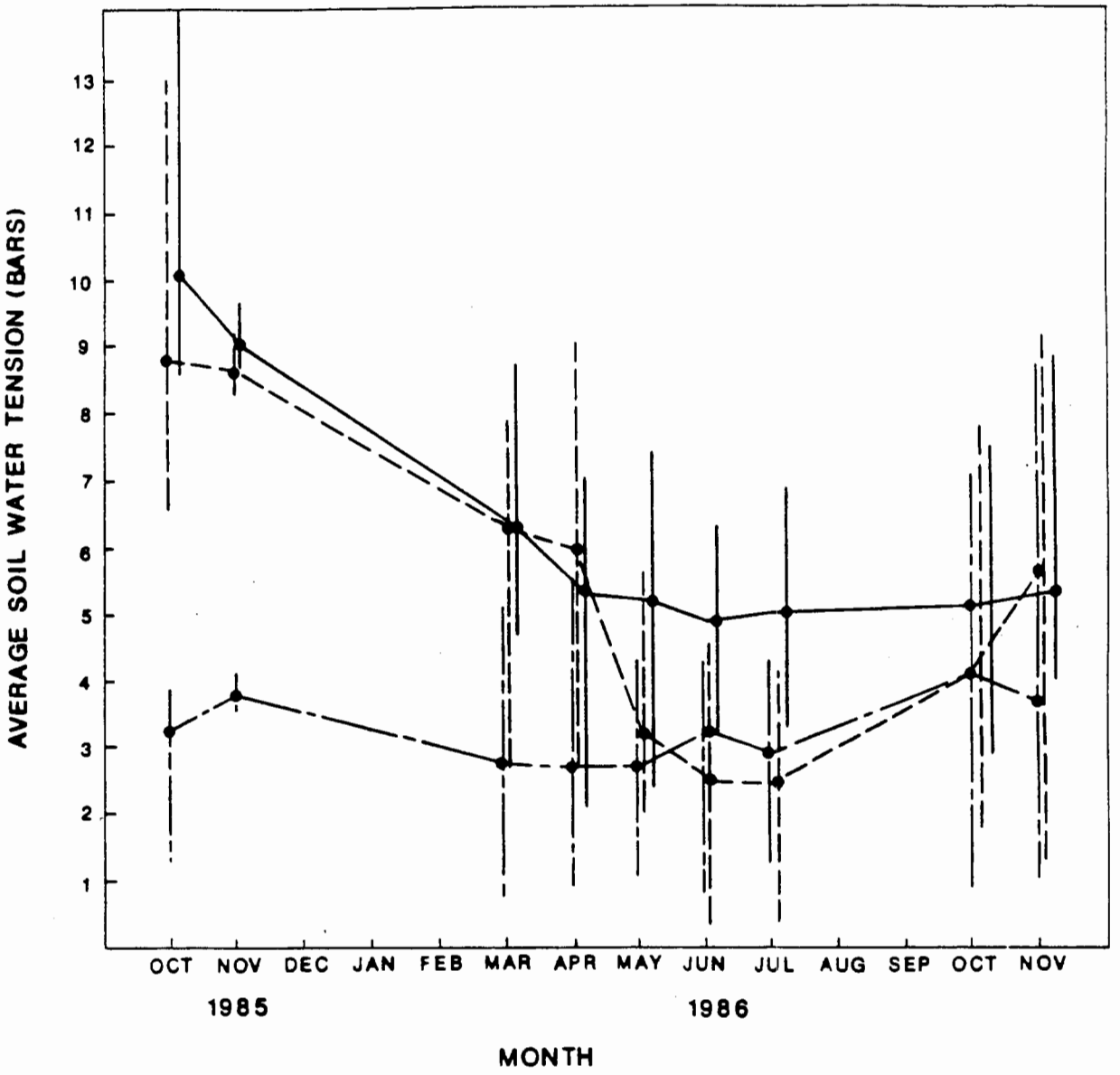

LEGEND

22 Feet

42 Feet

52 Feet

FIGURE 3-11

TA-54 AREA G

AVERAGE SOIL WATER TENSION

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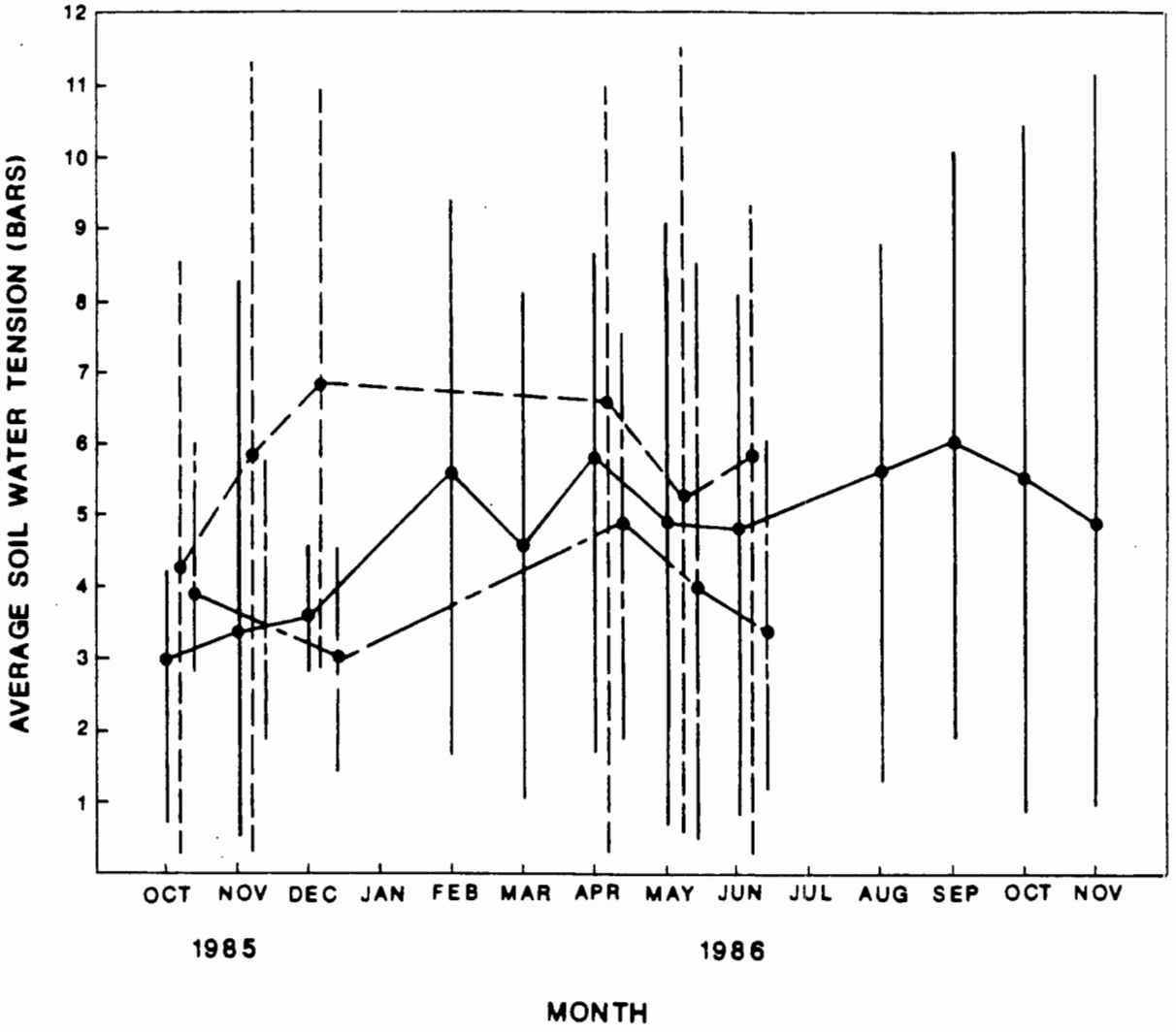

LEGEND

24 Feet

50 Feet

76 Feet

FIGURE 3-12

TA-54 AREA L

AVERAGE SOIL WATER TENSION

PREPARED FOR

LOS ALAMOS NATIONAL LABORATORY
LOS ALAMOS, NEW MEXICO

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4.0 CHEMICAL CHARACTERIZATION OF THE VADOSE ZONE

4.1 TEST HOLE CORING AND PORE GAS ANALYSES

Seven test hole locations were selected for coring and installation of pore gas samplers on Mesita del Buey to fulfill the requirements of Paragraph 25, Task 5 of the Order. One background test hole (LLC-85-13) was selected on the western end of the mesa. Of the remaining six test holes, two were located at Area G (LGC-85-09 and LGC-85-10) and four were located at Area L (LLC-85-12, LLC-85-14, LLC-85-15, and LLC-85-16) (Devaurs, 1985). In addition, three test hole locations were selected for coring adjacent to the Area L surface impoundment (LLC-85-17, LLC-85-18, and LLC-85-A) together with one shallow test hole location selected within the surface impoundment in conjunction with related investigatory activities required by Paragraph 24 of the Order (Department of Energy, 1986f). Six surface soil samples were also collected to establish background soil chemistry in Area L. The locations of the test holes in Areas G and L are shown on Figures 1-2 and 1-3, respectively.

4.2 TEST HOLE CORE

Core sampling was conducted in accordance with EPA procedures (U.S. EPA, 1985a). Two representative samples were taken from each ten feet of core, one for inorganic analyses and one for volatile organic analyses. Samples were collected in 500 ml wide-mouth glass bottles (Devaurs, 1985). The laboratories performing analyses on these samples were the Health and Environmental Chemistry Group (HSE-9) at Los Alamos National Laboratory and Rocky Mountain Analytical Laboratory in Colorado.

4.2.1 Core Sampling

Each 500 ml container for inorganic analyses was filled with rock core, labeled, and sealed in Parafilm® (intended to ensure sample integrity). A chain-of-custody tag was attached to each sample container. The seal had to be broken to open the container. Information pertinent to sampling was recorded in a field log book and samples were placed in boxes for transport to the laboratory. At the laboratory, sample custody was transferred to an inorganic chemist and samples were stored in a locked refrigerator in a secure laboratory. A sample analysis request sheet accompanied each sample to track laboratory analyses (Devaurs, 1985).

Prior to sample collection, sample jars were washed with soap and rinsed with distilled water. The jars were stored at 105°C until taken to the field for sample collection.

Sampling containers for organic analyses were completely filled with rock core and the jar cap sealed by teflon liner. Each was labeled and sealed in Parafilm® (intended to ensure sample integrity). A chain-of-custody tag was attached to each sample container. The seal had to be broken to open the container. Information pertinent to sampling was recorded in a field log book. In the field, samples were stored on ice in ice chests immediately after sample collection. For each drill hole, a water field blank was submitted with the samples. The blank consisted of a jar with organic-free water which was open to the atmosphere at the site while the hole was being drilled. Samples were transported to the laboratory on ice in ice chests and sample custody transferred to an organic chemist. Until analyses were conducted, samples were stored in a locked refrigerator in a secure laboratory. A sample analysis request sheet accompanied each sample to track laboratory analyses (Devaurs, 1985).

4.2.2 Analytical Methods

Core samples were analyzed for inorganic metals (EP Toxic) and volatile organics. All EP toxic metals were extracted and analyzed [by the Los Alamos Environmental Chemistry Group (HSE-9)] by an atomic absorption spectrophotometer using EPA methods. The volatile organic compounds were analyzed by HSE-9 using a purge and trap, gas chromatograph flame ionization detector (FID) procedure and gas chromatography/mass spectrometry (GC/MS) for confirmation (Devaurs, 1985). The methods of extraction and analysis for volatile organic compounds are provided in Appendix J and include modifications and compilations of recommended procedures (U.S. EPA, 1984; U.S. EPA, 1985a). Selected samples were also analyzed by the Rocky Mountain Analytical Laboratory (RMA) for volatile organic compounds using GC/MS.

4.2.3 Results of EP Toxicity Analyses

Results of the EP Toxicity analyses for the core samples are provided in Tables 4-1 through 4-11. All EP Toxic metals for test holes outside of the

Area L surface impoundment were below the EP Toxic regulated concentration (New Mexico Environmental Improvement Board, 1985a) with the exception of one chromium measurement in the 10 to 20 foot depth interval of core from drill hole LLC-85-18 (Table 4-7). Chromium and cadmium concentrations were also above the EP Toxic levels in the 8 to 29 inch (0.67-2.42 feet) depth interval in samples cored directly into the surface impoundment (Table 4-9). In addition, barium was detected at levels below the EP Toxic concentration in drill hole LGC-85-10 in the 0-10 foot depth interval (see Table 4-11). Miscellaneous chemical analytical results are presented in Tables 4-12 through 4-17.

4.2.4 Results of Core Analyses for Volatile Organic Compounds

Core samples from all ten test holes were analyzed for volatile organics by HSE-9 (Devaurs, 1985; Department of Energy, 1986f). Table 4-18 summarizes the volatile organic compounds analyzed for in each of the core samples. A limited number of core samples from selected test holes, were split for duplicate analyses by RMA. A summary of the volatile organic compounds analyzed for by RMA is given in Table 4-19. In general, the two laboratories conducted comparable volatile organic compound screens. However, the detection limit reported by RMA for each of the samples was more sensitive (parts per billion) than the detection limits reported by HSE-9 (parts per million). This difference in reported detection limits may account for the fewer number of compounds detected and reported by HSE-9 (Table 4-20).

No volatile organic compounds were detected by HSE-9 in the cores from Area G (LGC-85-09 and LGC-85-10) and no duplicate Area G core analyses were performed by RMA. In the background test hole, LLC-85-13, HSE reported 2-pentanone at a depth of 48 feet (Table 4-20). Because this test hole is located a great distance from Area L (3,200 feet), it is probable that the presence of 2-pentanone in the sample in a concentration at the reported detection limit, is due to laboratory contamination or sample/equipment handling during coring.

In Area L, volatile organic compounds were detected in core samples from various depth intervals in five of the seven test holes (LLC-85-12, LLC-85-14, LLC-85-15, LLC-85-16, and LLC-85-18; see Table 4-20). The compounds present are a suite of solvents and ketones [i.e., methylene chloride, acetone, tetrahydrofuran, 4-methyl-2-pentanone (MEK), etc.]. The compounds were detected in

parts per billion concentrations by RMA with the exception of acetone at a concentration of 4.3 mg/kg (parts per million) in test hole LLC-85-15 (18-19 foot interval) and acetonitrile at a concentration of 1.1 mg/kg in test hole LLC-85-14 (48-49 foot interval). In contrast, for compounds detected by both laboratories (i.e., tetrahydrofuran, acetone, etc.) the compound concentrations reported by HSE-9 are all in the part per million range whereas, RMA reported concentrations in the part per billion range. While identification of volatile organic compounds by HSE-9 appear accurate, the reported concentrations should be considered qualitative only, since the volatile organic concentrations reported in the HSE-9 data are very near the reported detection limits.

4.3 TEST HOLE PORE GAS ANALYSES

Following coring, a total of 23 sampling ports were installed in the seven test holes cored to fulfill Paragraph 25 of the Order to collect samples of pore gas at various depths (Devaurs and Bell, 1986). The sampling ports were constructed using low-pressure mobile-phase filters welded to a two-inch (I.D.) galvanized pipe (Figure 4-1). The filters consist of two-micrometer, porous, stainless steel elements. The ports are accessed on the surface via ¼-inch stainless steel tubing (Devaurs and Bell, 1986).

The sampling ports were installed by lowering the pre-assembled string of galvanized pipe downhole. The sampling ports were packed with sieve size 80 silica sand, isolated above and below with powdered bentonite. Due to concerns regarding the introduction of water into the vadose zone and the subsequent potential for mobilization of waste constituents, no water was mixed with the bentonite. As a result, there is some uncertainty as to the degree of isolation between sample ports. Additionally, one zone in test hole LGC-85-09 was packed with crushed tuff backfill due to caving of the hole (Devaurs and Bell, 1986).

Diagrams of the sampling port installations are provided in Appendix C. The selection of sampling port zones within each test hole was based on the stratigraphic unit encountered, the presence of fractures, and the presence of high organic vapor meter readings during drilling. Detailed information regarding the selection of each sampling port is provided in BFEC (1986).

4.3.1 Pore Gas Sampling

Pore gas samples were collected from each sampling port using a DESAGA gas sampler (BFEC, 1985b). The samples were initially collected monthly (January through April 1986) as procedures and protocols were refined and subsequently were collected quarterly as required by the Order. As a result of an auto-sampler malfunction, however, data from the third quarter (July through October 1986) are not available.

The DESAGA gas sampler pumps a known volume of gas through charcoal adsorption tubes which collect the organic compounds from the gas. Prior to sampling, a minimum of 50 liters of gas was purged through each sampling port (Devaurs and Bell, 1986). Between January and December 1986, pore gas samples of five, two and one liters were collected from the sampling ports. Initially, a gas sample volume of five liters was collected, but breakthrough (saturation of the quantitative region of the charcoal tube) occurred. Pore gas samples were subsequently reduced to two, and then one, liter volumes to eliminate the occurrence of breakthrough (Devaurs and Bell, 1986). Following collection, all charcoal tube samples were kept sealed and refrigerated until the samples were extracted by HSE-9 personnel.

4.3.2 Analytical Method

The charcoal tubes are desorbed with a carbon disulfide solution containing an internal standard. The extracted solution is then directly injected into a gas chromatograph/mass selective detector (GC/MSD) for analysis (Devaurs and Bell, 1986). Table 4-21 summarizes the volatile organic compounds analyzed for in the extract and representative detection limits are provided in Table 4-22. A detailed discussion of the analytical procedure is provided in Appendix K.

Analytical uncertainty exists in quantification of benzene and carbon tetrachloride in the January and February 1986 results. These two compounds co-elute and interferences were observed from benzene impurities in the carbon disulfide. In February 1986, 1,1-dichloroethene was detected. However, because 1,1-dichloroethene co-elutes with carbon disulfide, only qualitative information is provided for 1,1-dichloroethene (Devaurs and Bell, 1986).

4.3.3 Results of Pore Gas Analyses

Analytical results for pore gas samples collected January through April 1986 are summarized in Tables 4-23 through 4-29. During this period, no volatile organic compounds have been detected in the background hole LLC-85-13 (Table 4-24) which supports the conclusion that the one measurement of 2-pentanone (acetone) in core from the test hole is probably related to cross-contamination in the field or in the laboratory. In Areas G and L, a similar suite of volatile organic compounds were found in all test holes. In the two Area G test holes, 1,1,1-trichloroethane is the most prevalent compound and has been detected at concentrations ranging from 55 to 980 µg/ℓ air (parts per billion). Trichloroethene and tetrachloroethane were also found in both holes at low part per billion concentrations (less than 10 µg/ℓ air, see Tables 4-28 and 4-29).

In the four Area L test holes, the volatile organic compounds detected (in decreasing concentrations) are as follows:

- 1,1,1-trichloroethane
- trichlorofluoromethane
- trichloroethene
- toluene
- chloroform
- tetrachloroethene
- total xylenes
- ethylbenzene
- chlorobenzene
- carbon tetrachloride
- dichlorodifluoroethane
- 1,1-dichloroethene

While the compounds listed above occur at varying concentrations at different depths in different test holes, a comparison of 1,1,1-trichloroethane concentrations provides a common datum for a discussion of results. Figures 4-2 through 4-5 provide a graphical representation of 1,1,1-trichloroethane concentrations with depth in the Area L test holes. The highest concentrations of the compound occur in test holes LLC-85-14 and LLC-85-15 (approximately 10,000 µg/ℓ in the pore gas) which are located adjacent to organic waste shafts number 17 and number 4, respectively (see Figure 1-3). By comparison, the concentrations of 1,1,1-trichloroethane in Area G (approximately 300 µg/ℓ

in the pore gas), where a smaller volume of organic compounds have been disposed, are an order of magnitude less than the Area L concentrations (see Figures 4-6 and 4-7).

On the basis of existing pore gas data, there appears to be no relationship between the concentration of any volatile organic compounds and the stratigraphic unit or structural feature sampled for pore gas. For example, there were no significant increases in volatile organic concentrations from samples collected in test hole LLC-85-14 at the Tshirege Member Unit 2b-2a interface, 2a-1b interface, or at fractured zones.

4.4 SUMMARY OF CHEMICAL CHARACTERIZATION

No EP Toxic metals were detected in any test hole cores below a depth of 20 feet in Areas G and L. The core analyses and pore gas analyses do, however, indicate that volatile organic compounds are present at depths of up to 100 feet below the ground surface in Areas G and L. The suite of organic ketone compounds detected in the core analyses is different than the aromatic and halogenated hydrocarbons detected in the pore gas samples. This difference may be related to sampling device efficiencies, analytical detection limits, and the intrinsic physical properties of the volatile organic compounds (i.e., boiling point, specific gravity, etc.).

Based on the available chemical data, the results of the rock core and pore gas analyses indicate the following:

- No EP Toxic metals have been detected below a depth of 20 feet in Areas G or L in the cores analyzed
- Volatile organic compounds are present in rock core samples at 100 feet at part per billion concentrations in Area L (no volatile organic compounds were detected in rock core samples in Area G)
- Volatile organic compounds are present in pore gas samples at 100 feet at part per million concentrations in Area L and part per billion concentrations in Area G
- There is no apparent correlation between high pore gas concentrations and subsurface stratigraphy (ashflow interfaces) or structure (fractures)

- The highest pore gas concentrations of volatile organic compounds have been detected in test holes (LLC-85-14 and LLC-85-15) nearest organic disposal shafts (shaft numbers 17 and 4).

TABLE 4-1
EP TOXICITY ANALYTICAL RESULTS FOR
CORE FROM DRILL HOLE NUMBER LLC-85-12[1]

PARAMETER	EP TOXIC REGULATED CONCENTRATION[2] (mg/ℓ)	DETECTION LIMIT[3] (mg/ℓ)	DEPTH INTERVALS IN FEET									
			0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100
Arsenic	5.0	0.1 ± 0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Barium	100.0	1.0 ± 1.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cadmium	1.0	0.1 ± 0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chromium	5.0	0.2 ± 0.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Lead	5.0	0.5 ± 0.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Mercury	0.2	0.01 ± 0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Selenium	1.0	0.05 ± 0.020	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver	5.0	0.5 ± 0.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

(1) From Devaurs, 1985.
(2) New Mexico Environmental Improvement Board, 1985a.
(3) ND = Not detected.
The ± value represents the uncertainty term for the analysis.

TABLE 4-2
EP TOXICITY ANALYTICAL RESULTS FOR
CORE FROM DRILL HOLE NUMBER LLC-85-13[1]

PARAMETER	EP TOXIC REGULATED CONCENTRATION[2] (mg/ℓ)	DETECTION LIMIT[3] (mg/ℓ)	DEPTH INTERVALS IN FEET									
			0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100
Arsenic	5.0	0.05 ± 0.025	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Barium	100.0	1.0 ± 1.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cadmium	1.0	0.1 ± 0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chromium	5.0	0.2 ± 0.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Lead	5.0	0.5 ± 0.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Mercury	0.2	0.01 ± 0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Selenium	1.0	0.05 ± 0.025	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver	5.0	0.5 ± 0.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

(1) From Devaurs, 1985.
(2) New Mexico Environmental Improvement Board, 1985a.
(3) ND = Not detected.
The ± value represents the uncertainty term for the analysis.

TABLE 4-3
EP TOXICITY ANALYTICAL RESULTS FOR
CORE FROM DRILL HOLE NUMBER LLC-85-14[1]

PARAMETER	EP TOXIC REGULATED CONCENTRATION[2] (mg/ℓ)	DETECTION LIMIT[3] (mg/ℓ)	DEPTH INTERVALS IN FEET									
			0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100
Arsenic	5.0	0.05 ± 0.025	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Barium	100.0	1.0 ± 1.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cadmium	1.0	0.1 ± 0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chromium	5.0	0.2 ± 0.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Lead	5.0	0.5 ± 0.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Mercury	0.2	0.01 ± 0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Selenium	1.0	0.05 ± 0.025	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver	5.0	0.5 ± 0.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

(1) From Devaurs, 1985.
(2) New Mexico Environmental Improvement Board, 1985a.
(3) ND = Not detected.
The ± value represents the uncertainty term for the analysis.

TABLE 4-4
EP TOXICITY ANALYTICAL RESULTS FOR
CORE FROM DRILL HOLE NUMBER LLC-85-15[1]

PARAMETER	EP TOXIC REGULATED CONCENTRATION[2] (mg/ℓ)	DETECTION LIMIT[3] (mg/ℓ)	DEPTH INTERVALS IN FEET									
			0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100
Arsenic	5.0	0.05 ± 0.025	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Barium	100.0	1.0 ± 1.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cadmium	1.0	0.1 ± 0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chromium	5.0	0.2 ± 0.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Lead	5.0	0.5 ± 0.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Mercury	0.2	0.01 ± 0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Selenium	1.0	0.05 ± 0.025	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver	5.0	0.5 ± 0.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

(1) From Devaurs, 1985.
(2) New Mexico Environmental Improvement Board, 1985a.
(3) ND = Not detected.
The ± value represents the uncertainty term for the analysis.

TABLE 4-5
EP TOXICITY ANALYTICAL RESULTS FOR
CORE FROM DRILL HOLE NUMBER LLC-85-16[1]

PARAMETER	EP TOXIC REGULATED CONCENTRATION[2] (mg/ℓ)	DETECTION LIMIT[3] (mg/ℓ)	DEPTH INTERVALS IN FEET									
			0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100
Arsenic	5.0	0.05 ± 0.025	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Barium	100.0	1.0 ± 1.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cadmium	1.0	0.1 ± 0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chromium	5.0	0.2 ± 0.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Lead	5.0	0.5 ± 0.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Mercury	0.2	0.01 ± 0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Selenium	1.0	0.05 ± 0.025	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver	5.0	0.5 ± 0.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

(1) From Devaurs, 1985.
(2) New Mexico Environmental Improvement Board, 1985a.
(3) ND = Not detected.
The ± value represents the uncertainty term for the analysis.

TABLE 4-6
EP TOXICITY ANALYTICAL RESULTS FOR
CORE FROM DRILL HOLE NUMBER LLC-85-17[1]

PARAMETER	EP TOXIC REGULATED CONCENTRATION[2] (mg/ℓ)	DETECTION LIMIT[3] (mg/ℓ)	DEPTH INTERVALS IN FEET														
			0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	100-110	110-120	120-130	130-140	140-150
Arsenic	5.0	0.05 ± 0.025	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Barium	100.0	1.0 ± 1.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cadmium	1.0	0.1 ± 0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chromium	5.0	0.5 ± 0.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Lead	5.0	0.5 ± 0.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Mercury	0.2	0.01 ± 0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Selenium	1.0	0.05 ± 0.025	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver	5.0	0.5 ± 0.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

(1) From Devaurs, 1985.
(2) New Mexico Environmental Improvement Board, 1985a.
(3) ND = Not detected.
The ± value represents the uncertainty term for the analysis.

TABLE 4-7
EP TOXICITY ANALYTICAL RESULTS FOR
CORE FROM DRILL HOLE NUMBER LLC-85-18[1]

PARAMETER	EP TOXIC REGULATED CONCENTRATION[2] (mg/ℓ)	DETECTION LIMIT[3] (mg/ℓ)	DEPTH INTERVALS IN FEET									
			0-10	10-20	20-30	30-40	40-50	50-60	60-70[4]	70-80	80-90	90-100
Arsenic	5.0	0.05 ± 0.025	ND	ND	ND	ND	ND	ND	---	ND	ND	ND
Barium	100.0	1.0 ± 1.0	ND	ND	ND	ND	ND	ND	---	ND	ND	ND
Cadmium	1.0	0.1 ± 0.1	ND	ND	ND	ND	ND	ND	---	ND	ND	ND
Chromium	5.0	0.5 ± 0.5	ND	6.6	ND	ND	ND	ND	---	ND	ND	ND
Lead	5.0	0.5 ± 0.5	ND	ND	ND	ND	ND	ND	---	ND	ND	ND
Mercury	0.2	0.01 ± 0.01	ND	ND	ND	ND	ND	ND	---	ND	ND	ND
Selenium	1.0	0.05 ± 0.025	ND	ND	ND	ND	ND	ND	---	ND	ND	ND
Silver	5.0	0.5 ± 0.5	ND	ND	ND	ND	ND	ND	---	ND	ND	ND

(1) From Devaurs, 1985.
(2) New Mexico Environmental Improvement Board, 1985a.
(3) ND = Not detected.
(4) No sample available; no core recovery.

TABLE 4-8
EP TOXICITY ANALYTICAL RESULTS FOR
CORE FROM DRILL HOLE LLC-85-A[1]

PARAMETER	EP TOXIC REGULATED CONCENTRATION[2] (mg/ℓ)	DETECTION LIMIT[3] (mg/ℓ)	DEPTH INTERVALS IN FEET													
			0-5	5-6	9-10	14-15	19-20	24-25	29-30	34-35	39-40	44-45	49-50	49-50	54-55	59-60
Arsenic	5.0	0.5 ± 0.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Barium	100.0	0.22 ± 0.20	ND	ND	ND	ND	ND	0.26	ND	ND	ND	ND	ND	ND	ND	ND
Cadmium	1.0	0.01 ± 0.01	ND	ND	ND	ND	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND
Chromium	5.0	0.23 ± 0.20	ND	ND	ND	ND	ND	0.77	0.57	ND	ND	ND	ND	ND	ND	ND
Lead	5.0	0.07 ± 0.07	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Mercury	0.2	0.0002 ± 0.0002	0.0003	0.0002	0.0003	0.0003	0.0011	0.0003	ND	0.0003	ND	ND	ND	ND	ND	ND
Selenium	1.0	0.01 ± 0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver	5.0	0.20 ± 0.20	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

(1) From Department of Energy, 1986f.
(2) New Mexico Environmental Improvement Board, 1985a.
(3) ND = Not detected.
NOTE: The ± value represents the uncertainty term for the analysis.

TABLE 4-9
EP TOXICITY ANALYTICAL RESULTS FOR
SURFACE IMPOUNDMENT CORE SAMPLES[1]

PARAMETER	EP TOXIC REGULATED CONCENTRATION[2] (mg/ℓ)	DETECTION LIMIT (mg/ℓ)	DEPTH INTERVALS IN INCHES					
			0-4	4-8	8-12	12-16	16-20	20-29
Arsenic	5.0	0.002	0.015	0.006	0.005	0.002	0.002	0.002
Barium	100.0	0.10	0.184	<0.13	<0.13	0.87	0.83	<0.13
Cadmium	1.0	0.01	0.013	0.014	2.15	11.10	3.59	1.04
Chromium	5.0	0.05	0.23	1.06	8.51	20.8	15.8	13.2
Lead	5.0	0.50	<0.50	0.50	<0.50	<0.50	<0.50	<0.50
Mercury	0.2	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Silver	5.0	0.024	<0.024	<0.024	<0.024	<0.024	<0.024	<0.024

(1) From Department of Energy, 1986f.
(2) New Mexico Environmental Improvement Board, 1985a.

TABLE 4-10
EP TOXICITY ANALYTICAL RESULTS FOR
CORE FROM DRILL HOLE NUMBER LGC-85-09[1]

PARAMETER	EP TOXIC REGULATED CONCENTRATION[2] (mg/ℓ)	DETECTION LIMIT[3] (mg/ℓ)	DEPTH INTERVALS IN FEET									
			0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100
Arsenic	5.0	0.1 ± 0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Barium	100.0	1.0 ± 1.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cadmium	1.0	0.1 ± 0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chromium	5.0	0.2 ± 0.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Lead	5.0	0.5 ± 0.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Mercury	0.2	0.01 ± 0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Selenium	1.0	0.05 ± 0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver	5.0	0.5 ± 0.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

(1) From Devaurs, 1985.
(2) New Mexico Environmental Improvement Board, 1985a.
(3) ND = Not detected.
The ± value represents the uncertainty term for the analysis.

TABLE 4-11
EP TOXICITY ANALYTICAL RESULTS FOR
CORE FROM DRILL HOLE NUMBER LGC-85-10[1]

PARAMETER	EP TOXIC REGULATED CONCENTRATION[2] (mg/ℓ)	DETECTION LIMIT[3] (mg/ℓ)	DEPTH INTERVALS IN FEET									
			0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100
Arsenic	5.0	0.1 ± 0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Barium	100.0	1.0 ± 1.0	1.50 ±0.40	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cadmium	1.0	0.1 ± 0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chromium	5.0	0.2 ± 0.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Lead	5.0	0.5 ± 0.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Mercury	0.2	0.01 ± 0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Selenium	1.0	0.05 ± 0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver	5.0	0.5 ± 0.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

(1) From Devaurs, 1985.
(2) New Mexico Environmental Improvement Board, 1985a.
(3) ND = Not detected.
The ± value represents the uncertainty term for the analysis.

TABLE 4-12
MISCELLANEOUS CHEMICAL ANALYTICAL RESULTS FOR SIX BACKGROUND SOIL SAMPLES TAKEN NEAR AREA L[1]

PARAMETER	SAMPLE NUMBER NO. 1	NO. 2	NO. 3	NO. 4	NO. 5	NO. 6	MEAN ± STD. DEV.
Lithium (mg/ℓ)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05 ± 0
Copper (mg/ℓ)	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20 ± 0
NH_3-N (mg/ℓ)	0.0	0.02	0.14	0.0	0.0	0.0	0.03 ± 0.05
Fluoride (mg/ℓ)	0.32	<0.20	0.32	0.25	0.46	0.49	0.34 ± 0.11
TDS (mg/ℓ)	58	29	61	24	74	40	48 ± 20
pH	9.3	7.2	8.2	7.2	7.2	6.7	7.6 ± 1.0
Soil Moisture (%)	9.1	12.0	9.5	7.9	10.5	10.2	9.9 ± 1.4

[1]From Department of Energy, 1986f.

TABLE 4-13

LOCATION AND DESCRIPTION OF AREA L BACKGROUND SOIL SAMPLES[1]

SAMPLE IDENTIFICATION	SAMPLE LOCATION
No. 1	Two feet outside the Area L storage pad in tuff used as fill originating from Area G.
No. 2	24 feet west of the northwest corner of the Area L storage pad in undisturbed tuff.
No. 3	70 feet east of the northeast corner of the Area L storage pad in native, but disturbed, tuff.
No. 4	One foot outside the northeast corner of the Area L fence.
No. 5	20 feet outside the center of the east Area L fence.
No. 6	Ten feet outside the northwest corner of the Area L fence.

[1]From Department of Energy, 1986f.

TABLE 4-14
MISCELLANEOUS CHEMICAL ANALYTICAL RESULTS FOR
CORE FROM DRILL HOLE NUMBER LLC-85-17[1]

PARAMETER	BACKGROUND LEVEL[2]	DEPTH INTERVALS IN FEET													
		0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	100-110	110-120	120-130	130-140	140-150
Lithium (mg/ℓ)	<0.05 ± 0	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Copper (mg/ℓ)	<0.20 ± 0	<0.1	<0.1	<0.1	<0.1	<0.1	0.12	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
NH_3-N (mg/ℓ)	0.03 ± 0.05	0.41	0.22	0.97	3.10	0.83	0.90	0.24	1.30	0.25	0.25	0.32	0.82	0.087	0.32	0.33
Fluoride (mg/ℓ)	0.34 ± 0.11	0.31	3.59	3.76	1.44	3.96	5.59	5.10	6.64	4.90	5.68	6.66	6.68	6.87	6.80	6.27
TDS (mg/ℓ)	48 ± 20	17	54	79	185	34	40	43	47	27	30	51	39	74	66	46
pH	7.6 ± 1.0	6.6	6.0	7.9	8.8	5.9	5.8	5.5	6.0	5.9	6.0	5.8	5.8	6.1	6.1	6.6
Soil Moisture (%)	9.9 ± 1.4	9.1	4.0	7.4	5.5	4.1	0.7	0.9	0.6	1.2	2.5	5.3	5.7	8.4	3.0	4.3

(1) From Department of Energy, 1986f.
(2) Determined from six soil samples taken in Area L (see Table 4-12).

TABLE 4-15
MISCELLANEOUS CHEMICAL ANALYTICAL RESULTS FOR
CORE FROM DRILL HOLE NUMBER LLC-85-18[1]

PARAMETER	BACKGROUND LEVEL[2]	DEPTH INTERVALS IN FEET									
		0-10	10-20	20-30	30-40	40-50	50-60	60-70[3]	70-80	80-90	90-100
Lithium (mg/ℓ)	<0.05 ± 0	<0.05	0.12	<0.05	<0.05	<0.05	<0.05	---	<0.05	<0.05	<0.05
Copper (mg/ℓ)	<0.20 ± 0	<0.1	10.0	<0.1	<0.1	<0.1	<0.1	---	<0.1	<0.1	<0.1
NH_3-N (mg/ℓ)	0.03 ± 0.05	0.30	0.38	0.38	0.20	0.34	0.053	---	0.18	0.10	0.15
Fluoride (mg/ℓ)	0.34 ± 0.11	0.37	17.0	2.63	3.51	3.30	3.45	---	2.31	6.86	7.53
TDS (mg/ℓ)	48 ± 20	22	188	88	37	52	113	---	91	75	79
pH	7.6 ± 1.0	5.5	3.8	8.6	5.9	7.4	8.7	---	7.9	6.2	6.8
Soil Moisture (%)	9.9 ± 1.4	11.6	6.3	9.0	8.4	8.3	5.7	---	2.5	0.1	1.6

(1) From Department of Energy, 1986f.
(2) Determined from six soil samples taken in Area L (see Table 4-12).
(3) No sample available; all core lost in drilling accident.

TABLE 4-16
MISCELLANEOUS CHEMICAL ANALYTICAL RESULTS FOR
CORE FROM DRILL HOLE NUMBER LLC-85-A[1]

PARAMETER	BACKGROUND LEVEL[2]	DEPTH INTERVALS IN FEET													
		0-5	5-6	9-10	14-15	19-20	24-25	29-30	34-35	39-40	44-45	49-50	49-50	54-55	59-60
Lithium (mg/ℓ)	<0.05 ± 0	<0.02	<0.02	3.0	0.13	0.64	1.10	0.06	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Copper (mg/ℓ)	<0.20 ± 0	<0.03	<0.03	0.22	1.60	1.50	4.90	1.10	0.03	0.14	0.04	0.03	0.03	0.09	<0.03
NH_3-N (mg/ℓ)	0.03 ± 0.05	3.2	4.0	11.0	11.0	7.0	25.0	16.0	7.4	1.1	4.7	1.0	1.7	0.64	0.15
Fluoride (mg/ℓ)	0.34 ± 0.11	0.0139	0.0049	0.0053	0.0027	0.0028	0.0021	0.0015	0.0007	0.0013	0.0022	0.0030	0.0032	0.0030	0.0044
TDS (mg/ℓ)	48 ± 20	56.0	30.0	651.0	237.0	128.0	528.0	505.0	341.0	225.0	245.0	273.0	261.0	54.0	72.0
Soil Moisture (%)	9.9 ± 1.4	9.3	11.5	12.4	6.9	9.5	20.3	19.9	7.9	7.3	6.4	5.7	5.6	2.6	4.7

(1) From Department of Energy, 1986f.
(2) Determined from six soil samples taken in Area L (see Table 4-12).

TABLE 4-17
MISCELLANEOUS CHEMICAL ANALYTICAL RESULTS FOR SURFACE IMPOUNDMENT CORE SAMPLES[1]

PARAMETER	BACKGROUND LEVEL[2]	DEPTH INTERVALS IN INCHES					
		0-4	4-8	8-12	12-16	16-20	20-29
Lithium (mg/ℓ)	<0.05 ± 0	0.45	0.24	0.27	0.60	0.39	0.33
Copper (mg/ℓ)	<0.20 ± 0	13.6	7.6	73.4	178	93.5	61.0
Nitrate (mg/ℓ)	0.03 ± 0.05	<30.	<30.	<30.	<30.	<30.	<30.
Fluoride (mg/ℓ)	0.34 ± 0.11	28	28	13	10	10	10
TDS (mg/ℓ)	48 ± 20	2,928	973	941	2,159	1,894	1,404
pH	7.6 ± 1.0	8.9	8.9	8.6	8.4	8.0	8.0
Soil Moisture (%)	9.9 ± 1.4	----	----	----	----	----	----
Conductivity (mg/ℓ)	---	4,500	2,300	2,800	3,590	3,150	2,500
Chloride (mg/ℓ)	---	980	440	340	210	200	200
Sulfate (mg/ℓ)	---	36	20	19	490	540	440

(1) From Department of Energy, 1986f.
(2) Determined from six soil samples taken in Area L (see Table 4-12).

TABLE 4-18

VOLATILE ORGANIC COMPOUNDS ANALYZED BY
LOS ALAMOS NATIONAL LABORATORY IN CORES FROM DRILL HOLES[1]

TARGET COMPOUNDS	DETECTION LIMIT (µg/kg)
1,1-Dichloroethylene	---
Methylene Chloride	521
T-1,2-Dichloroethylene	521
1,1-Dichloroethane	1,042
Chloroform	1,042
1,1,1-Trichloroethane	1,563
1,2-Dichloroethane	833
Benzene	521
Carbon Tetrachloride	2,083
Trichloroethylene	521
1,2-Dichloropropane	521
Bromodichloromethane	1,042
Toluene	521
1,1,2-Trichloroethane	1,527
Chlorodibromomethane	1,042
Tetrachloroethylene	2,083
Chlorobenzene	1,250
Ethylbenzene	833
Bromoform	1,042
1,1,2,2-Tetrachloroethane	2,083
Bromobenzene	2,292
1,3-Dichlorobenzene	521
1,4-Dichlorobenzene	---
1,2-Dichlorobenzene	521

NON-TARGET COMPOUNDS

2-Hexanone
2-Pentanone
Acetone
Tetrahydrofuran
1-Butanol
1,4-Dioxane

[1] From Devaurs, 1985

TABLE 4-19

VOLATILE ORGANIC COMPOUNDS ANALYZED BY
ROCKY MOUNTAIN ANALYTICAL LABORATORY IN CORES FROM DRILL HOLES[1]

PRIORITY POLLUTANT PARAMETERS	DETECTION LIMIT (µg/kg)
Acrolein	100
Acrylonitrile	100
Benzene	5
Bromoform	5
Carbon tetrachloride	5
Chlorobenzene	5
Chlorodibromomethane	5
Chloroethane	10
2-Chloroethylvinyl ether	5
Chloroform	5
Dichlorobromomethane	5
1,1-Dichloroethane	5
1,2-Dichloroethane	5
1,1-Dichloroethylene	5
1,2-Dichloropropane	5
1,3-Dichloropropylene	5
Ethylbenzene	5
Methylbromide	10
Methylchloride	10
Methylene chloride	10
1,1,2,2-Tetrachloroethane	5
Tetrachlroethylene	5
Toluene	5
1,2-trans-Dichloroethylene	5
1,1,1-Trichloroethane	5
1,1,2-Trichloroethane	5
Trichloroethylene	5
Vinyl chloride	10

NON-PRIORITY POLLUTANT PARAMETERS

Acetone	Dimethoxymethane	Propanol
1,4-Dioxane	Ethanol	1-Butanol
Acetonitrile	2-Propanol	Tetramethyl pentanone
Tetrahydrofuran	2-Methyl-2-Propanol	Chlorodifluoromethane
2-Butanone	4-Methyl-2-Pentanone	Bisoxymethane

[1]From Rocky Mountain Analytical Laboratory, 1985.

TABLE 4-20

VOLATILE ORGANIC ANALYTICAL RESULTS FOR DRILL HOLE CORES
AUGUST 1985[1]

DRILL HOLE NUMBER	DEPTH INTERVAL (ft)	VOLATILE ORGANIC COMPOUND	CONCENTRATION (µg/kg)	DETECTION LIMIT (µg/kg)
LLC-85-12	38-39	2-Hexanone	3,710-4,130[a][c]	3,300
LLC-85-13	48-49	2-Pentanone (Acetone)	3,300[c]	3,300
LLC-85-14	28-29	Acetone	60[b]	---
		1,4-Dioxane	40[b]	---
		Tetrahydrofuran	16[c]	---
	38-39	2-Pentanone (Acetone)	3,640[c]	3,300
	38-39 (split)[f]	Acetone	190[b]	---
		Acetonitrile	27[b]	---
		Tetrahydrofuran	67[c]	---
	48-49	1-Butanol	83,330[c]	62,500

[a] Range given because two samples were prepared since portions of one sample were spilled.
[b] Concentration determined from analysis of analytical standard.
[c] Concentration estimated using total ionization peak area relative to the internal standard.
[d] Best computer match is [2,2'-Methylene bis (oxy)] bis propane.
[e] Several other volatile compounds were present in this drillhole, but they could not be definitely identified. The Mass spectrometer scans of these compounds were consistent with small chain alcohols. They were most concentrated at depth intervals of 18-19, 28-29, and 38-39 feet.
[f] Samples analyzed by Rocky Mountain Analytical Laboratory.
[1] Compiled from Devaurs, 1985, and Rocky Mountain Analytical Laboratory, 1985.

TABLE 4-20
VOLATILE ORGANIC ANALYTICAL RESULTS FOR DRILL HOLE CORES
AUGUST 1985
(Continued)

DRILL HOLE NUMBER	DEPTH INTERVAL (ft)	VOLATILE ORGANIC COMPOUND	CONCENTRATION (µg/kg)	DETECTION LIMIT (µg/kg)
LLC-85-14 (continued)	48-49 (split)[f]	Acetone	670[b]	---
		2-Butanone	100[b]	---
		4-Methyl-2-Pentanone	110[b]	---
		Acetonitrile	1,100[b]	---
		Tetrahydrofuran	520[c]	---
		Dimethoxymethane	25[c]	---
		Unknown (oxygenated HC)	10[c][d]	---
		Unknown (oxygenated HC)	7[c]	---
LLC-85-15	18-19[e]	Tetrahydrofuran	4,500[c]	3,000
	18-19 (split)[f]	Methylene Chloride	17	10
		Toluene	12	5
		Acetone	4,300[b]	---
		2-Butanone	470[b]	---
		4-Methyl-2-Pentanone	140[b]	---
		Ethanol	5[c]	---
		2-Propanol	6[c]	---
		Tetrahydrofuran	210[c]	---
		2-Methyl-2-Propanol	11[c]	---
	28-29	1,4-Dioxane	1,500[c]	1,500
	38-39	1,4-Dioxane	1,500[c]	1,500
		1-Butanol	100,000[c]	62,500

TABLE 4-20
VOLATILE ORGANIC ANALYTICAL RESULTS FOR DRILL HOLE CORES
AUGUST 1985
(Continued)

DRILL HOLE NUMBER	DEPTH INTERVAL (ft)	VOLATILE ORGANIC COMPOUND	CONCENTRATION (µg/kg)	DETECTION LIMIT (µg/kg)
LLC-85-15 (continued)	38-39 (split)[f]	Acetone	300[b]	---
		2-Butanone	170[b]	---
		4-Methyl-2-Pentanone	420[b]	---
		Ethanol	170[c]	---
		Bisoxymethane	270[c]	---
		Propanol	270[c]	---
		Propanol (Isomer)	150[c]	
		2-Methyl-2-Propanol	77[c]	---
		1,4-Dioxane	200[c]	---
		1-Butanol	280[c]	---
	88-89	2-Pentanone (Acetone)	3,300[b]	3,300
LLC-85-16	5.5-7.0[f]	1,2-Dichloroethane	19	5
		Methylene chloride	30	10
		Acetone	110[b]	---
		4-Methyl-2-Pentanone	27[b]	---
		2-Propanol	6[c]	---
		1-Butanol	17[c]	---
		Fluorinated Aliphatic	6[c]	---
		Tetramethylpentanone	7[c]	---
	17-19[f]	Methylene Chloride	18	10
		Acetone	82[c]	---
	97-99[f]	Methylene Chloride	15	10
		Acetone	110[b]	---
		4-Methyl-2-Pentanone	5[b]	---
		Chlorodifluoromethane	10[c]	---

TABLE 4-20
VOLATILE ORGANIC ANALYTICAL RESULTS FOR DRILL HOLE CORES
AUGUST 1985
(Continued)

DRILL HOLE NUMBER	DEPTH INTERVAL (ft)	VOLATILE ORGANIC COMPOUND	CONCENTRATION (µg/kg)	DETECTION LIMIT (µg/kg)
LLC-85-18	18-19[f]	Methylene Chloride	17	10
		Acetone	130[b]	---
		Chlorodifluoromethane	12[c]	---
		Unknown Hydrocarbon	20[c]	---
		Ethanol	190[c]	---
		C_6-Hydrocarbon	9[c]	---
	78-79[f]	Acetone	70[b]	---
		2-Butanone	55[b]	---
		Unknown Hydrocarbon	9[c]	---

TABLE 4-21

VOLATILE ORGANIC COMPOUNDS ANALYZED IN PORE GAS BY LOS ALAMOS NATIONAL LABORATORY

Chloromethane
Bromomethane
Vinyl Chloride
Chloroethane
Methylene Chloride
Acetone
1,1-Dichloroethane
1,1-Dichloroethene
trans-1,2-Dichloroethene
Chloroform
1,2-Dichloroethane
2-Butanone
1,1,1-Trichloroethane
Carbon Tetrachloride
Vinly Acetate
Bromodichloromethane
1,1,2,2-Tetrachloroethane
1,2-Dichloropropane
trans-1,3-Dichloropropene
Trichloroethene
Dibromochloromethane
1,1,2-Trichloroethane
Benzene
cis-1,3-Dichloropropene

Bromoform
2-Hexanone
4-Methyl-2-Pentanone
Tetrachloroethene
Toluene
Chlorobenzene
Ethylbenzene
Styrene
Total Xylenes
Trichlorofluoromethane
Tetrahydrofuran

TABLE 4-22

VOLATILE ORGANIC COMPOUND
DETECTION LIMITS FOR REPRESENTATIVE ANALYTES[1]

1986
DETECTION LIMITS
µg/TUBE

COMPOUND	JAN	FEB	MAR	APR	DEC
Trichlorofluoromethane	3	4.5	1	1	3.0
Dichlorodifluoromethane	3	---	---	---	---
Chloroform	1	1.2	1	1	3.0
1,1,1-Trichloroethane	3	1.3	1	1	3.0
Carbon Tetrachloride	1	---	1	1	3.0
Trichloroethene	1	1.2	1	1	3.0
Toluene	0.8	0.8	1	1	3.0
Tetrachloroethene	1.0	1.0	1	1	3.0
Total Xylenes	1.1	1.0	1	1	3.0
Chlorobenzene	---	1.2	---	1	3.0
1,1-Dichloroethene	---	---	1	---	3.0
Ethylbenzene	---	1.2	---	1	3.0

[1] Compiled from Devaurs and Bell, 1986; Department of Energy, 1986e; and unpublished laboratory data report (December).

TABLE 4-23

1986 PORE GAS SAMPLING[1]
DRILL HOLE LLC-85-12
µg/L AIR

COMPOUND	6 FT JAN	6 FT FEB	6 FT MAR	6 FT APR	6 FT DEC[2]	27 FT JAN	27 FT FEB	27 FT MAR	27 FT APR	27 FT DEC[2]	41 FT JAN	41 FT FEB	41 FT MAR	41 FT APR	41 FT DEC[2]
Dichlorodifluoromethane	ND<3	---	---	---	---	ND<3	---	---	---	---	ND<3	---	---	---	---
Trichlorofluoromethane	90	36	ND<1	ND<1	ND<3.0	273	32	ND<1	---	42.9	146	33	ND<1	ND<1	ND<3.0
Chloroform	ND<1	24	11	25	7.6	ND<1	37	29	---	25.5	3.8	88	47	30	38.3
1,1,1-trichloroethane	252	882	697	429	888.3	2,803	1,006	786	---	1,108.6	3,540	868	673	517	983.1
Carbon tetrachloride	19	TR<1.0	>0.5*	ND<1	>3.0	64	TR<1.0	>0.5*	---	>3.0	46	TR<1.0	>0.5*	ND<1	>3.0
Trichloroethene	988	384	416	223	410.6	1,355	580	440	---	726.7	760	394	273	260	609.0
Toluene	126	52	36	0.6	21.9	935	270	169	---	129.3	213	46	34	26	26.6
Tetrachloroethene	17	11	ND<1	ND<1	3.7	14	10	7.5	---	5.9	175	12	ND<1	ND<1	6.1
Total Xylenes	ND<1.1	ND<1.0	ND<1	ND<1	ND<3.0	14	3.6	ND<1	---	ND<3.0	1.1	ND<1.0	ND<1	ND<1	ND<3.0
Chlorobenzene	---	ND<1.2	---	ND<1	ND<3.0	---	ND<1.2	---	---	ND<3.0	---	ND<1.2	---	ND<1	ND<3.0
1,1-dichloroethene	---	---	ND<1	---	---	---	---	ND<1	---	---	---	---	ND<1	---	---
Ethylbenzene	---	ND<1.2	---	ND<1	ND<3.0	---	ND<1.2	---	---	ND<3.0	---	ND<1.2	---	ND<1	ND<3.0

*Calculated from tentative results.
ND = This compound was not detected; the limit of detection for this analysis is less than the amount stated in the table above.
TR = Trace; this compound was present, but was below the level at which concentration could be determined.
NA = Not available
(1)Compiled from Devaurs and Bell, 1986, and Department of Energy, 1986e.
(2)From unpublished Laboratory data report; analytical uncertainty ±15 percent µg/tube.

TABLE 4-24

1986 PORE GAS SAMPLING[1]
DRILL HOLE LLC-85-13
µg/L AIR

COMPOUND	21 FT JAN	FEB	MAR	APR	DEC[2]	43 FT JAN	FEB	MAR	APR	DEC[2]	65 FT JAN	FEB	MAR	APR	DEC[2]
Dichlorodifluoromethane	ND<3	---	---	---	---	ND<3	---	---	---	---	ND<3	---	---	---	---
Trichlorofluoromethane	ND<3	ND<4.5	ND<1	ND<1	ND<3.0	ND<3	ND<4.5	ND<1	ND<1	ND<3.0	ND<3	ND<4.5	ND<1	ND<1	ND<3.0
Chloroform	ND<1	ND<1.2	ND<1	ND<1	ND<3.0	ND<1	ND<1.2	ND<1	ND<1	ND<3.0	ND<1	ND<1.2	ND<1	ND<1	ND<3.0
1,1,1-trichloroethane	ND<3	ND<1.3	ND<1	ND<1	ND<3.0	ND<3	ND<1.3	ND<1	ND<1	ND<3.0	ND<3	ND<1.3	ND<1	ND<1	ND<3.0
Carbon tetrachloride	ND<1	---	ND<1	ND<1	ND<3.0	ND<1	---	ND<1	ND<1	ND<3.0	ND<1	---	ND<1	ND<1	ND<3.0
Trichloroethene	ND<1	ND<1.2	ND<1	ND<1	ND<3.0	ND<1	ND<1.2	ND<1	ND<1	ND<3.0	ND<1	ND<1.2	ND<1	ND<1	ND<3.0
Toluene	ND<0.8	ND<0.8	ND<1	ND<1	ND<3.0	ND<0.8	ND<0.8	ND<1	ND<1	ND<3.0	ND<0.8	ND<0.8	ND<1	ND<1	ND<3.0
Tetrachloroethene	ND<1.0	ND<1.0	ND<1	ND<1	ND<3.0	ND<1.0	ND<1.0	ND<1	ND<1	ND<3.0	ND<1.0	ND<1.0	ND<1	ND<1	ND<3.0
Total Xylenes	ND<1.1	ND<1.0	ND<1	ND<1	ND<3.0	ND<1.1	ND<1.0	ND<1	ND<1	ND<3.0	ND<1.1	ND<1.0	ND<1	ND<1	ND<3.0
Chlorobenzene	---	ND<1.0	---	ND<1	ND<3.0	---	ND<1.2	---	ND<1	ND<3.0	---	ND<1.2	---	ND<1	ND<3.0
1,1-dichloroethene	---	---	ND<1	---	---	---	---	ND<1	---	---	---	---	ND<1	---	---
Ethylbenzene	---	ND<1.2	---	ND<1	ND<3.0	---	ND<1.2	---	ND<1	ND<3.0	---	ND<1.2	---	ND<1	ND<3.0

ND = This compound was not detected; the limit of detection for this analysis is less than the amount stated in the table above.
NA = Not available
(1) Compiled from Devaurs and Bell, 1986, and Department of Energy, 1986e.
(2) From unpublished Laboratory data report; analytical uncertainty ±15 percent µg/tube.

TABLE 4-25

1986 PORE GAS SAMPLING[1]
DRILL HOLE LLC-85-14
μg/L AIR

COMPOUND	13 FT					31 FT					46 FT					86 FT				
	JAN	FEB	MAR	APR	DEC[2]	JAN	FEB	MAR	APR	DEC[2]	JAN	FEB	MAR	APR	DEC[2]	JAN	FEB	MAR	APR	DEC[2]
Dichlorodifluoro-methane	BRK	---	---	---	---	BRK	---	---	---	---	BRK	---	---	---	---	BRK	---	---	---	---
Trichlorofluoro-methane	BRK	ND<4.5	ND<1	ND<1	ND<3.0	BRK	45	ND<1	ND<1	ND<3.0	BRK	ND<4.5	ND<1	ND<1	ND<3.0	BRK	ND<4.5	<5*	ND<1	14.4
Chloroform	BRK	67	ND<1	86	ND<3.0	BRK	182	ND<1	109	68.5	BRK	184	ND<1	120	83.1	BRK	175	124	86	71.8
1,1,1-trichloro-ethane	BRK	7,335	BRK	7,554	9,463.4	BRK	BRK	BRK	9,148	12,117.4	BRK	171,080	BRK	10,140	12,367.3	BRK	BRK	BRK	8,717	11,546.2
Carbon tetra-chloride	BRK	TR<1.0	ND<1	TR<1	>3.0	BRK	TR<1.0	ND<1	TR<1	>3.0	BRK	TR<1.0	ND<1	TR<1	>3.0	BRK	TR<1.0	>0.5*	TR<1	>3.0
Trichloroethene	BRK	ND<1.2	713	912	800.5	BRK	1,350	879	946	1,039.6	BRK	2,715	1,036	812	931.1	BRK	1,060	730	720	918.3
Toluene	BRK	3	ND<1	ND<1	ND<3.0	BRK	51	ND<1	28	12.2	BRK	61	ND<1	37	311.3	BRK	101	64	58	31.0
Tetrachloroethene	BRK	2	ND<1	16	10.7	BRK	37	ND<1	25	20.0	BRK	52	ND<1	20	21.5	BRK	ND<1.0	<7.5*	17	23.9
Total Xylenes	BRK	14	ND<1	ND<1	ND<3.0	BRK	74	ND<1	57	ND<3.0	BRK	46	ND<1	18	ND<3.0	BRK	ND<1.0	ND<1	ND<1	ND<3.0
Chlorobenzene	---	ND<1.2	---	ND<1	ND<3.0	---	11	---	4.6	5.2	---	13	---	5.4	5.9	---	ND<1.2	---	ND<1	3.5
1,1-dichloroethene	---	---	ND<1	---	---	---	---	ND<1	---	---	---	---	ND<1	----	---	---	---	ND<1	---	---
Ethylbenzene	---	5	---	ND<1	3.0	---	30	---	23	8.0	---	16	---	6.3	12.8	---	ND<1.2	---	ND<1	5.1

*Calculated from tentative results.
ND = This compound was not detected; the limit of detection for this analysis is less than the amount stated in the table above.
TR = Trace; this compound was present, but was below the level at which concentration could be determined.
BRK = Breakthrough in charcoal tubes.
NA = Not available
(1)Compiled from Devaurs and Bell, 1986, and Department of Energy, 1986e.
(2)From unpublished Laboratory data report; analytical uncertainty ±15 percent μg/tube.

TABLE 4-26

1986 PORE GAS SAMPLING[1]
DRILL HOLE LLC-85-15
µg/L AIR

COMPOUND	19 FT JAN	FEB	MAR	APR	DEC[2]	32 FT JAN	FEB	MAR	APR	DEC[2]	82 FT JAN	FEB	MAR	APR	DEC[2]
Dichlorodifluoro-methane	BRK	---	ND<1	---	---	BRK	---	ND<1	---	---	BRK	---	ND<1	---	---
Trichlorofluoro-methane	BRK	ND<4.5	ND<1	ND<1	ND<3.0	BRK	BRK	ND<1	28	46.3	BRK	4,120	ND<1	167	19.2
Chloroform	BRK	47	308	142	115.9	BRK	BRK	510	399	283.7	BRK	240	ND<1	121	228.0
1,1,1-trichloro-ethane	BRK	1,045	BRK	4,833	3,586.4	BRK	BRK	BRK	8,294	15,218.9	BRK	12,927	BRK	8,618	8,713.3
Carbon tetra-chloride	BRK	ND<1.0	ND<1	TR<1	>3.0	BRK	BRK	ND<1	TR<1	>3.0	BRK	ND<1.0	ND<1	TR<1	>3.0
Trichloroethene	BRK	188	1,354	852	1,029.4	BRK	BRK	1,850	1,823	2,923.9	BRK	BRK	1,310	1,464	324.1
Toluene	BRK	40	512	139	90.5	BRK	BRK	817	573	624.8	BRK	593	482	349	1,008.8
Tetrachloroethene	BRK	111	457	406	395.4	BRK	BRK	635	48	406.9	BRK	111	ND<1	80	71.0
Total Xylenes	BRK	6	160	27	ND<3.0	BRK	BRK	332	219	ND<3.0	BRK	149	ND<1	107	ND<3.0
Chlorobenzene	---	---	---	7.7	97.1	---	BRK	---	21	25.6	---	ND<1.2	---	ND<1	ND<3.0
1,1-dichloroethene	---	---	---	---	---	---	---	---	---	---	---	---	---	---	--
Ethylbenzene	---	4.2	---	12	17.9	---	BRK	---	52	71.3	---	ND<1.2	---	22	11.6

ND = This compound was not detected; the limit of detection for this analysis is less than the amount stated in the table above.
TR = Trace; this compound was present, but was below the level at which concentration could be determined.
BRK = Breakthrough in charcoal tubes.
NA = Not available
(1) Compiled from Devaurs and Bell, 1986, and Department of Energy, 1986e.
(2) From unpublished Laboratory data report; analytical uncertainty ±15 percent µg/tube.

TABLE 4-27

1986 PORE GAS SAMPLING[1]
DRILL HOLE LLC-85-16
μg/L AIR

COMPOUND	7 FT JAN	7 FT FEB	7 FT MAR	7 FT APR	7 FT DEC[2]	17 FT JAN	17 FT FEB	17 FT MAR	17 FT APR	17 FT DEC[2]	102 FT JAN	102 FT FEB	102 FT MAR	102 FT APR	102 FT DEC[2]
Dichlorodifluoromethane	ND<3	---	---	---	---	ND<3	---	---	---	---	BRK	---	---	---	---
Trichlorofluoromethane	39	11	ND<1	NA	ND<3.0	ND<3	12	ND<1	ND<1	ND<3.0	BRK	BRK	ND<1	27	25.6
Chloroform	47	12	43	NA	72.7	92	16	20	82	ND<3.0	BRK	BRK	20	76	ND<3.0
1,1,1-trichloroethane	1,856	2,548	1,817	NA	4,143.2	2,030	3,326	3,081	3,625	4,786.7	BRK	BRK	3,745	5,901	7,403.1
Carbon tetrachloride	4.8	TR<1.0	>0.5*	NA	>3.0	ND<1	TR<1.0	>0.5*	ND<1	>3.0	BRK	ND<1.0	---	ND<1	>3.0
Trichloroethene	547	748	452	NA	1,050.8	749	1,126	870	950	1,220.6	BRK	1,080	757	999	1,181.6
Toluene	ND<0.8	ND<0.8	ND<1	NA	ND<3.0	ND<0.8	ND<0.8	ND<1	34	ND<3.0	BRK	300	ND<1	105	88.5
Tetrachloroethene	21	10	30	NA	21.1	45	13	50	ND<1	17.5	BRK	12	27	28	11.2
Total Xylenes	ND<1.1	ND<1.0	ND<1	NA	ND<3.0	ND<1.1	ND<1.0	ND<1	ND<1	ND<3.0	BRK	4	7.5	ND<1	ND<3.0
Chlorobenzene	---	---	---	NA	ND<3.0	---	---	---	ND<1	ND<3.0	---	---	---	ND<1	ND<3.0
1,1-dichloroethene	---	ND<18	ND<1	---	---	---	ND<18	ND<1	---	---	---	TR<18	ND<1	---	---
Ethylbenzene	---	ND<1.2	---	NA	ND<3.0	---	ND<1.2	---	ND<1	ND<3.0	---	1.8	---	ND<1	8.0

*Calculated from tentative results.
ND = This compound was not detected; the limit of detection for this analysis is less than the amount stated in the table above.
TR = Trace; this compound was present, but was below the level at which concentration could be determined.
BRK = Breakthrough in charcoal tubes.
NA = Not available
(1)Compiled from Devaura and Bell, 1986, and Department of Energy, 1986e.
(2)From unpublished Laboratory data report; analytical uncertainty ±15 percent μg/tube.

TABLE 4-28

1986 PORE GAS SAMPLING[1]
DRILL HOLE LGC-85-09
µg/L AIR

COMPOUND	JAN	FEB	37 FT MAR	APR	DEC[2]	JAN	FEB	63 FT MAR	APR	DEC[2]	JAN	FEB	80 FT MAR	APR	DEC[2]	JAN	FEB	91 FT MAR	APR	DEC[2]
Dichlorodifluoro-methane	ND<3	---	---	---	---	ND<3	---	---	---	---	---	---	---	---	---	ND<3	---	---	---	---
Trichlorofluoro-methane	ND<3	ND<4.5	ND<1	ND<1	ND<3.0	ND<3	ND<4.5	ND<1	ND<1	ND<3.0	---	ND<4.5	ND<1	ND<1	ND<3.0	ND<3	ND<4.5	ND<1	ND<1	ND<3.0
Chloroform	ND<1	ND<1.2	ND<1	ND<1	ND<3.0	ND<1	ND<1.2	ND<1	ND<1	ND<3.0	---	ND<1.2	ND<1	ND<1	ND<3.0	ND<1	ND<1.2	ND<1	ND<1	ND<3.0
1,1,1-trichloro-ethane	384	380	<250*	349	561.5	980	472	<250*	466	644.0	---	210	<250*	374	421.0	312	406	>250*	90	ND<3.0
Carbon tetra-chloride	ND<1	ND<1.0	ND<1	ND<1	ND<3.0	ND<1	ND<1.0	ND<1	ND<1	ND<3.0	---	ND<1.0	ND<1	ND<1	ND<3.0	ND<1	ND<1.0	ND<1	ND<1	ND<3.0
Trichloroethene	1.3	1.6	1	ND<1	ND<3.0	1.8	2.2	1.64	2.2	ND<3.0	---	1.2	1.6	2.7	ND<3.0	1.6	2.2	0.98	1.4	ND<3.0
Toluene	ND<0.8	ND<0.8	ND<1	ND<1	ND<3.0	ND<0.8	ND<0.8	ND<1	ND<1	ND<3.0	---	ND<0.8	ND<1	ND<1	ND<3.0	ND<0.8	0.4	ND<1	ND<1	ND<3.0
Tetrachloroethene	3.2	3.8	4	ND<1	ND<3.0	4.1	4.6	5	ND<1	ND<3.0	---	3	>0.5*	ND<1	ND<3.0	2.9	4	2.57	ND<1	ND<3.0
Total Xylenes	ND<1.1	ND<1.0	ND<1	ND<1	ND<3.0	ND<1.1	ND<1.0	ND<1	ND<1	ND<3.0	---	ND<1.0	ND<1	ND<1	ND<3.0	ND<1.1	0.8	ND<1	ND<1	ND<3.0
Chlorobenzene	---	---	---	ND<1	ND<3.0	---	---	---	ND<1	ND<3.0	---	---	---	ND<1	ND<3.0	---	---	---	ND<1	ND<3.0
1,1-dichloroethene	---	ND<18.0	>0.5*	---	---	---	TR<18.0	>0.5*	---	---	---	ND<18.0	>0.5*	---	---	---	TR<18.0	>0.5*	---	---
Ethylbenzene	---	ND<1.2	---	ND<1	ND<3.0	---	ND<1.2	---	ND<1	ND<3.0	---	ND<1.2	---	ND<1	ND<3.0	---	ND<1.2	---	ND<1	ND<3.0

*Calculated from tentative results.
ND = This compound was not detected; the limit of detection for this analysis is less than the amount stated in the table above.
TR = Trace; this compound was present, but was below the level at which concentration could be determined.
NA = Not available
(1)Compiled from Devaurs and Bell, 1986, and Department of Energy, 1986e.
(2)From unpublished Laboratory data report; analytical uncertainty ±15 percent µg/tube.

LAN:017-TABLE/1

TABLE 4-29

1986 PORE GAS SAMPLING[1]
DRILL HOLE LGC-85-10
μg/L AIR

COMPOUND	31 FT JAN	31 FT FEB	31 FT MAR	31 FT APR	31 FT DEC[2]	53 FT JAN	53 FT FEB	53 FT MAR	53 FT APR	53 FT DEC[2]	95 FT JAN	95 FT FEB	95 FT MAR	95 FT APR	95 FT DEC[2]
Dichlorodifluoro-methane	ND<3	---	---	---	---	4	---	---	---	---	4.4	---	---	---	---
Trichlorofluoro-methane	18	14	9.5	ND<1	ND<3.0	18	14	10.6	ND<1	ND<3.0	7.4	7.6	7.2	ND<1	ND<3.0
Chloroform	ND<1	ND<1.2	ND<1	ND<1	ND<3.0	ND<1	ND<1.2	ND<1	ND<1	ND<3.0	ND<1	ND<1.2	ND<1	ND<1	ND<3.0
1,1,1-trichloro-ethane	184	314	>250*	99	138.0	152	168	>250*	147	208.0	79	101	>250*	55	90.0
Carbon tetra-chlorlde	ND<1	ND<1.0	ND<1	ND<1	ND<3.0	ND<1	ND<1.0	ND<1	ND<1	ND<3.0	ND<1	ND<1.0	ND<1	ND<1	ND<3.0
Trichloroethene	2.6	2.6	2.2	ND<1	ND<3.0	4.4	4.4	4.15	ND<1	ND<3.0	ND<1	6.4	6.5	3.4	ND<3.0
Toluene	ND<0.8	ND<0.8	ND<1	ND<1	ND<3.0	ND<0.8	ND<0.8	ND<1	ND<1	ND<3.0	ND<0.8	ND<0.8	ND<1	ND<1	ND<3.0
Tetrachloroethene	2.8	3.0	3.19	ND<1	ND<3.0	3.4	3.6	4.08	ND<1	ND<3.0	2.8	3.2	3.55	ND<1	ND<3.0
Total Xylenes	ND<1.1	ND<1.0	ND<1	ND<1	ND<3.0	ND<1.1	ND<1.0	ND<1	ND<1	ND<3.0	ND<1.1	ND<1.0	ND<1	ND<1	ND<3.0
Chlorobenzene	---	---	---	ND<1	ND<3.0	---	---	---	ND<1	ND<3.0	---	---	---	ND<1	ND<3.0
1,1-dichloroethene	---	ND<18.0	ND<1	---	---	---	ND<18.0	ND<1	---	---	---	ND<18.0	ND<1	---	---
Ethylbenzene	---	ND<1.2	---	ND<1	ND<3.0	---	ND<1.2	---	ND<1	ND<3.0	---	ND<1.2	---	ND<1	ND<3.0

*Calculated from tentative results.
ND = This compound was not detected; the limit of detection for this analysis is less than the amount stated in the table above.
NA = Not available
(1)Compiled from Devaurs and Bell, 1986, and Department of Energy, 1986e.
(2)From unpublished Laboratory data report; analytical uncertainty ±15 percent μg/tube.

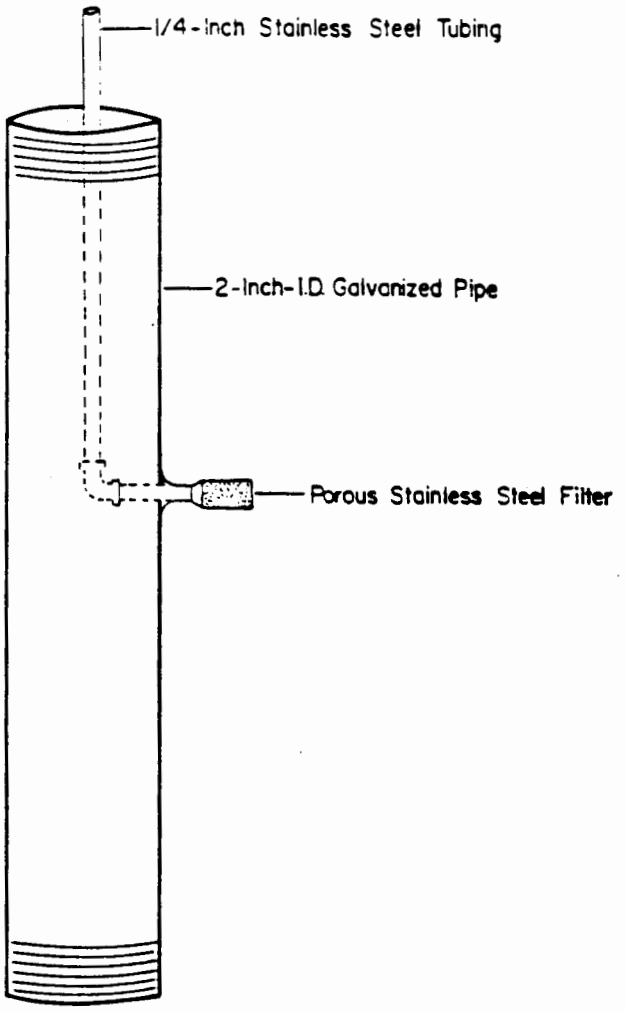
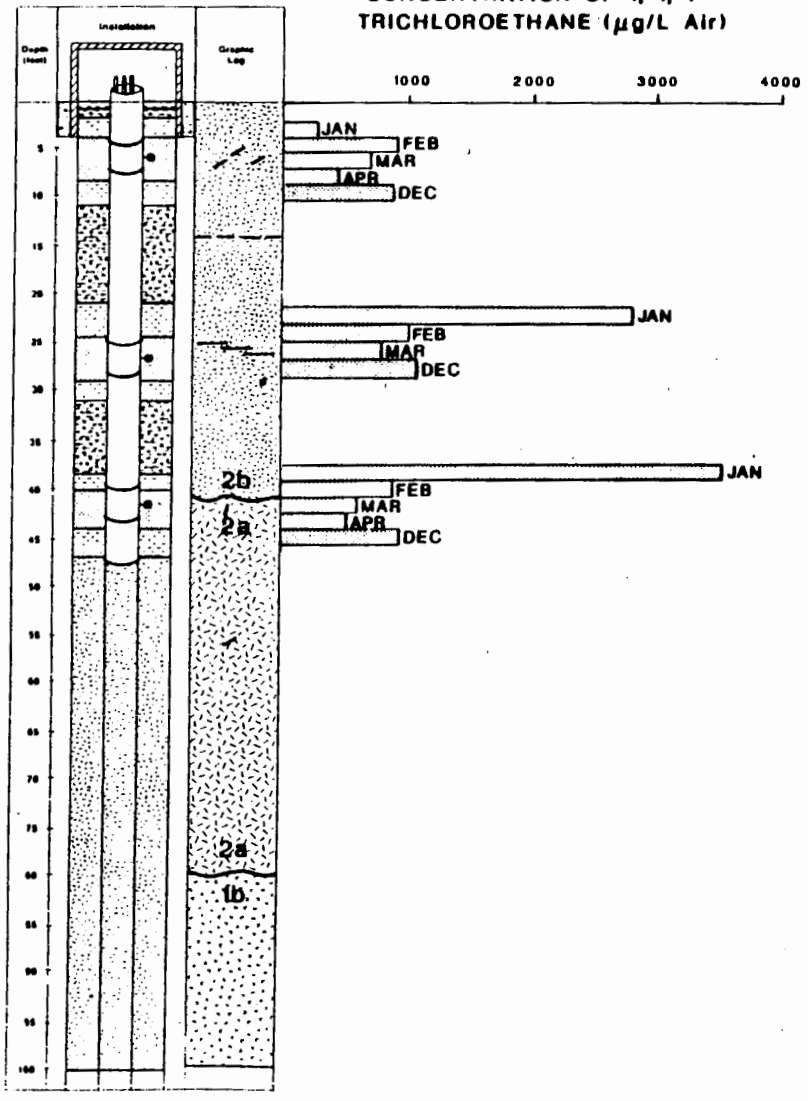


FIGURE 4-1. DIAGRAM OF A PORE-GAS SAMPLING PORT (DEVAURS AND BELL, 1986)

DRILLHOLE LLC-85-12



LEGEND FOR PORE-GAS SAMPLING-PORT INSTALLATIONS

- Gravel (0.25-inch)
- Tuff Backfill
- Gravel with Bentonite
- Tuff Cave-In Material
- Bentonite
- Sampling Port
- Well Sand (approximate sieve size = 8)
- Fractures
- 8-Inch Cemented Surface Casing
- Stainless Steel Tubing Exiting 2-Inch-I.D Galvanized Pipe, Showing Coupling

(Figure modified from BFEC, 1986; chemical data from Devaurs and Bell, 1986 and Department of Energy, 1986e)

FIGURE 4-2

1,1,1-TRICHLOROETHANE CONCENTRATIONS IN PORE GAS SAMPLES DRILLHOLE LLC-85-12, 1986

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LOS ALAMOS, NEW MEXICO

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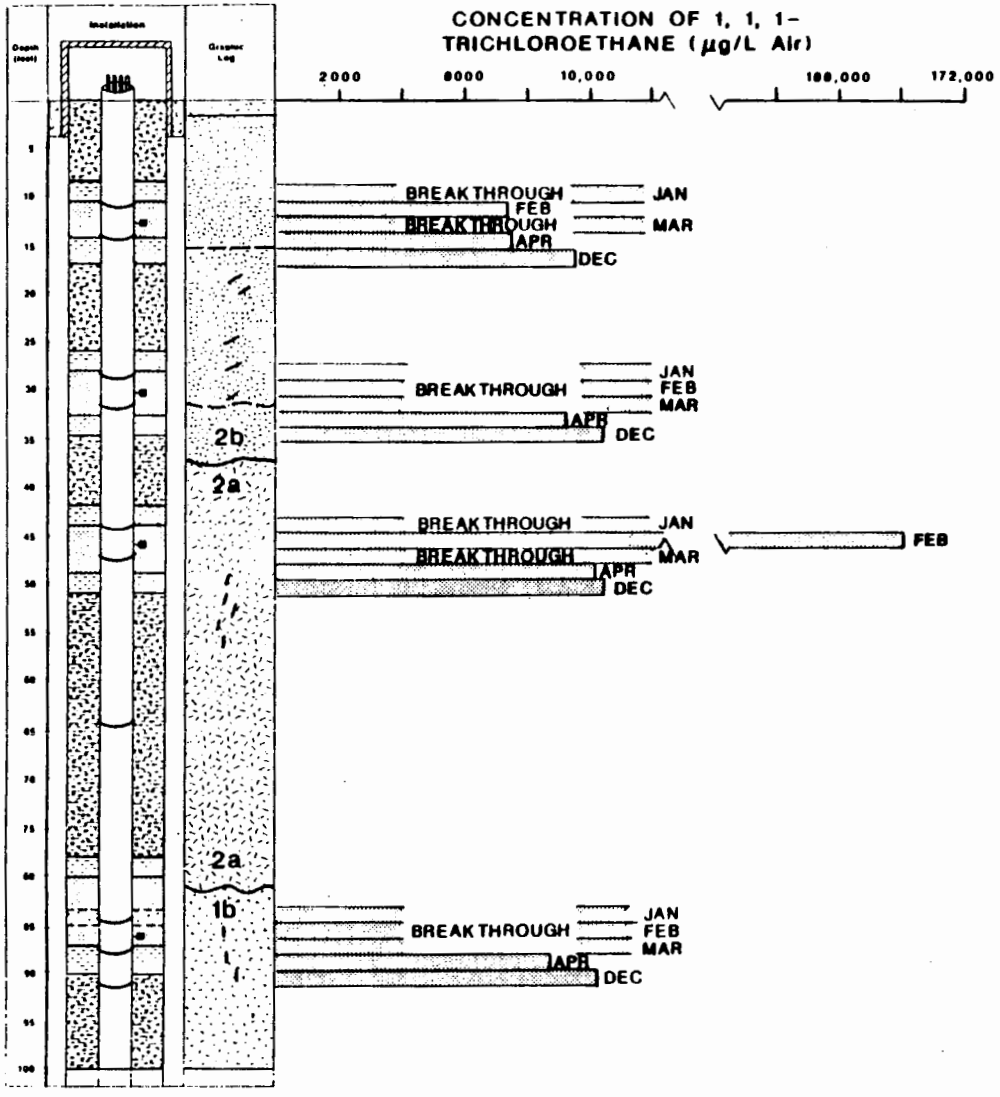
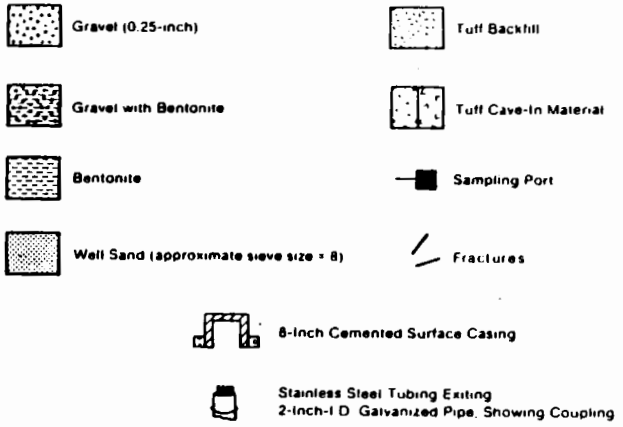
DRILLHOLE LLC-85-14



CONCENTRATION OF 1, 1, 1-TRICHLOROETHANE (µg/L Air)

LEGEND FOR PORE-GAS SAMPLING-PORT INSTALLATIONS



(Figure modified from BFEC, 1986; chemical data from Devaurs and Bell, 1986 and Department of Energy, 1986e)

FIGURE 4-3

1,1,1-TRICHLOROETHANE CONCENTRATIONS IN PORE GAS SAMPLES DRILLHOLE LLC-85-14, 1986

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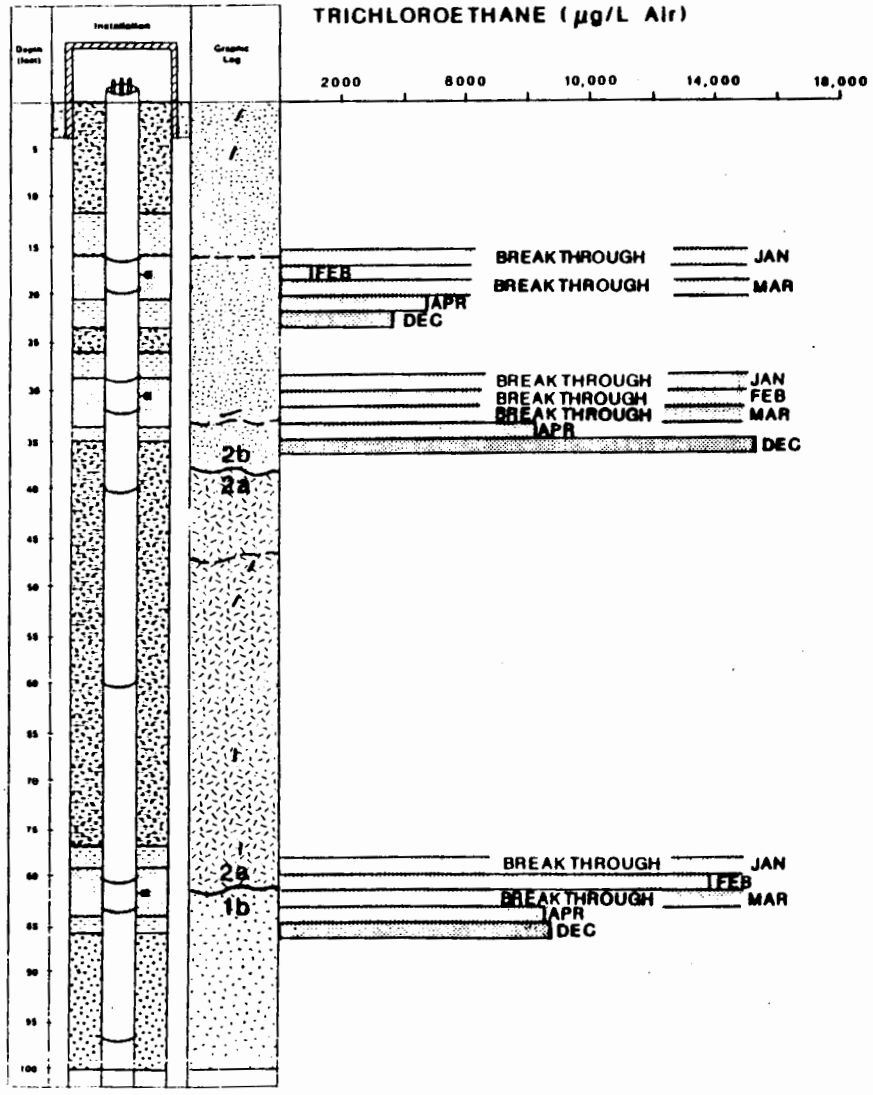
DRILLHOLE LLC-85-15



LEGEND FOR PORE-GAS SAMPLING-PORT INSTALLATIONS

- Gravel (0.25-inch)
- Tuff Backfill
- Gravel with Bentonite
- Tuff Cave-In Material
- Bentonite
- Sampling Port
- Well Sand (approximate sieve size = 8)
- Fractures
- 8-Inch Cemented Surface Casing
- Stainless Steel Tubing Exiting 2-Inch-I.D. Galvanized Pipe, Showing Coupling

(Figure modified from BFEC, 1986; chemical data from Devaurs and Bell, 1986 and Department of Energy, 1986e)

FIGURE 4-4

1,1,1-TRICHLOROETHANE CONCENTRATIONS IN PORE GAS SAMPLES DRILLHOLE LLC-85-15, 1986

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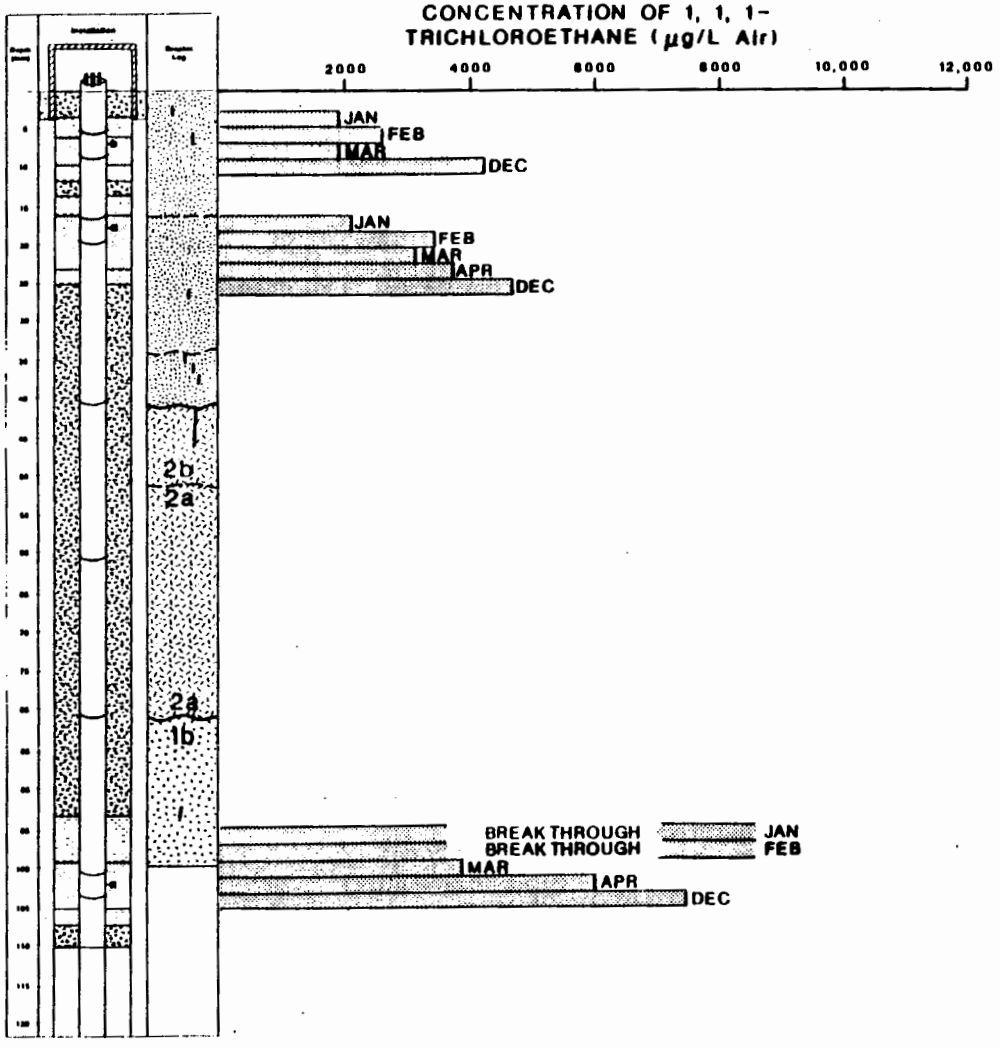
DRILLHOLE LLC-85-16



LEGEND FOR PORE-GAS SAMPLING-PORT INSTALLATIONS

- Gravel (0.25-inch)
- Tuff Backfill
- Gravel with Bentonite
- Tuff Cave-In Material
- Bentonite
- Sampling Port
- Well Sand (approximate sieve size = 8)
- Fractures
- 8-Inch Cemented Surface Casing
- Stainless Steel Tubing Exiting 2-Inch-I.D. Galvanized Pipe, Showing Coupling

(Figure modified from BFEC, 1986; chemical data from Devaurs and Bell, 1986 and Department of Energy, 1986e)

FIGURE 4-5

1,1,1-TRICHLOROETHANE CONCENTRATIONS IN PORE GAS SAMPLES DRILLHOLE LLC-85-16, 1986

PREPARED FOR

LOS ALAMOS NATIONAL LABORATORY
LOS ALAMOS, NEW MEXICO

DRAWING NUMBER 301017 02 810

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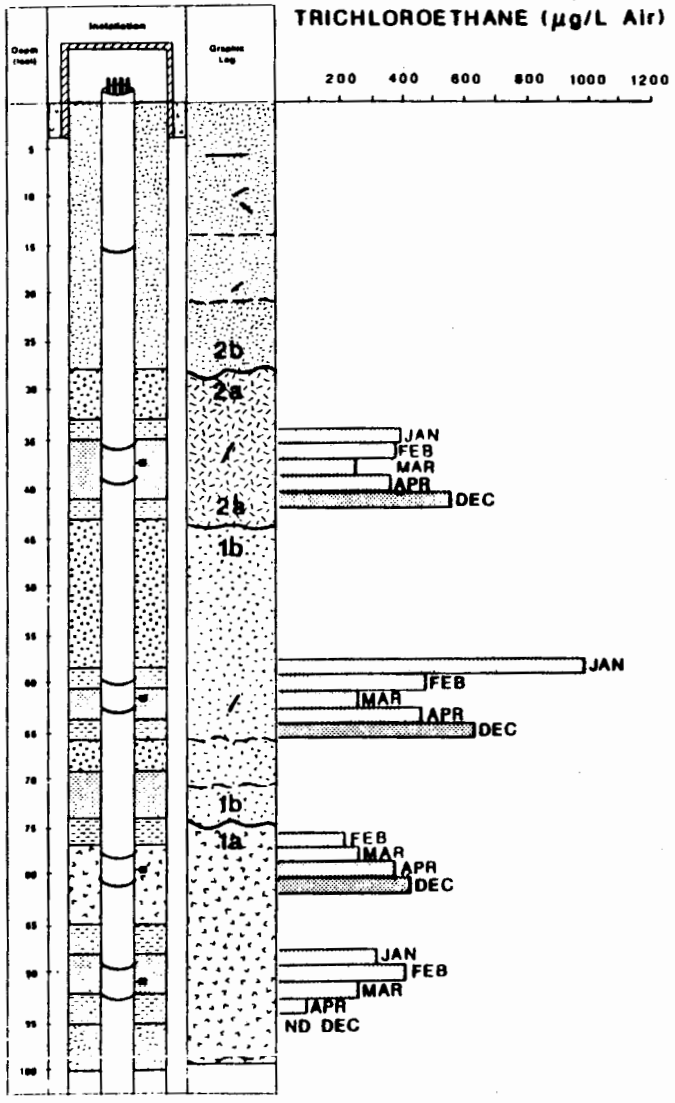
DRILLHOLE LGC-85-09



LEGEND FOR PORE-GAS SAMPLING-PORT INSTALLATIONS

- Gravel (0.25-inch)
- Gravel with Bentonite
- Bentonite
- Well Sand (approximate sieve size = 8)
- Tuff Backfill
- Tuff Cave-In Material
- Sampling Port
- Fractures
- 8-Inch Cemented Surface Casing
- Stainless Steel Tubing Exiting 2-Inch-I.D. Galvanized Pipe, Showing Coupling

(Figure modified from BFEC, 1986; chemical data from Devaurs and Bell, 1986 and Department of Energy, 1986e)

FIGURE 4-6

1,1,1-TRICHLOROETHANE CONCENTRATIONS IN PORE GAS SAMPLES DRILLHOLE LGC-85-09, 1986

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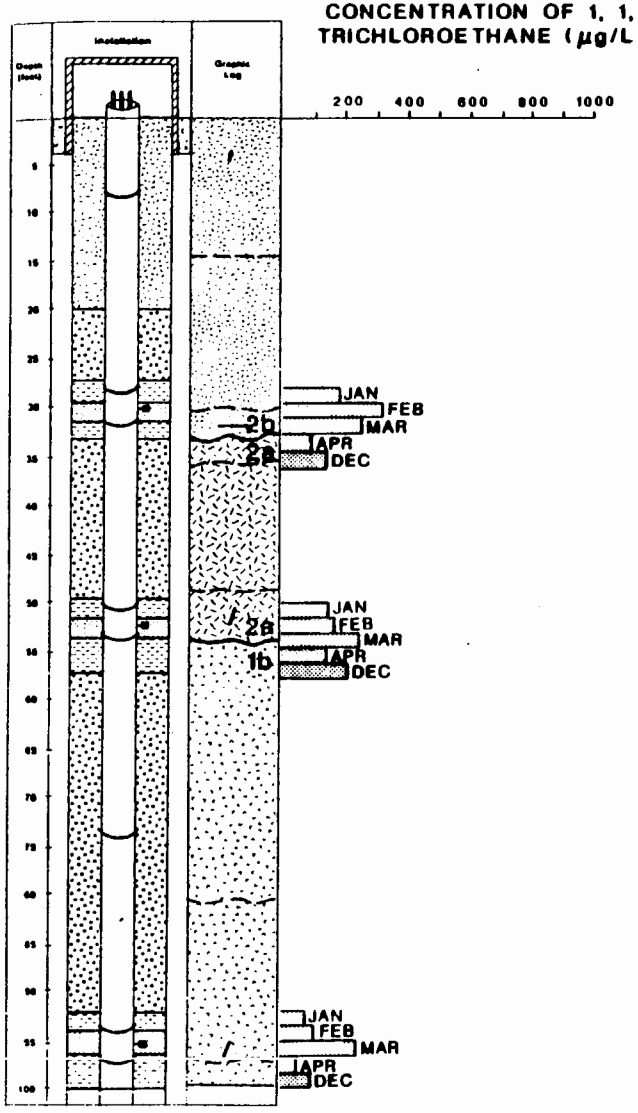
DRILLHOLE LGC-85-10

CONCENTRATION OF 1, 1, 1 - TRICHLOROETHANE (µg/L Air)



LEGEND FOR PORE-GAS SAMPLING-PORT INSTALLATIONS

- Gravel (0.25-inch)
- Tuff Backfill
- Gravel with Bentonite
- Tuff Cave-In Material
- Bentonite
- Sampling Port
- Well Sand (approximate sieve size = 8)
- Fractures
- 8-Inch Cemented Surface Casing
- Stainless Steel Tubing Exiting 2-Inch-I.D. Galvanized Pipe, Showing Coupling

(Figure modified from BFEC, 1986; chemical data from Devaurs and Bell, 1986 and Department of Energy, 1986e)

FIGURE 4-7

1,1,1-TRICHLOROETHANE CONCENTRATIONS IN PORE GAS SAMPLES DRILLHOLE LGC-85-10, 1986

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5.0 GROUND WATER HYDROLOGY IN AREAS G AND L

5.1 MAIN AQUIFER

5.1.1 Hydraulic Characteristics of the Main Aquifer

The main aquifer in the Los Alamos area is the only aquifer capable of producing a municipal and industrial water supply (Purtymun, 1984). Characterization of the hydraulic and chemical properties of the main aquifer, therefore, can be based on information obtained from supply wells, stock wells, test wells, and springs (Figure 5-1). The upper surface of the main aquifer slopes eastward from the major recharge area in the Valles Caldera to the Rio Grande where it discharges as springs and seeps into the river (Purtymun, 1984).

The major recharge area for the aquifer is an intermountain basin formed by the Valles Caldera (Figure 2-1). The basin is filled with lacustrine deposits underlain by volcanic debris resulting from the collapse of the Caldera (Conover, et al., 1963). The saturated basin fill is highly permeable and provides a source of recharge to sediments of the Tesuque Formation (Purtymun, 1984). Beneath Mesita del Buey, the main aquifer is contained in the poorly-consolidated conglomerates of the Puye Formation and the conglomerates, sandstones, and siltstones of the Tesuque Formation (see Section 2.2). The main aquifer was encountered at 874 feet below land surface when PM-2 was drilled in 1965 (Figure 5-1) (Cooper, et al., 1965). While the drillers reported a show of water at 335 feet in the lithologic log, subsequent geophysical logging did not confirm the presence of any water in this zone. It is probable, as is common with water-filled holes drilled with a cable tool rig, that circulation fluid lost from an upper fractured zone was re-encountered at this deeper zone. A summary of the lithologic log for PM-2 is provided in Table 5-1. In the Pajarito Well Field, the aquifer has an average saturated thickness of 1,470 feet and hydraulic gradient of 0.015 foot per foot (Figure 5-2). Based on the main aquifer elevation in well PM-2 and the hydraulic gradient, the depth to the main aquifer beneath Areas G and L is 850 feet and 950 feet, respectively. The transit time from recharge of the aquifer to discharge along the Rio Grande is estimated between 50 and 1,400 years based on tritium and carbon-14 analyses, respectively (Purtymun, 1984). The rate of movement of the main aquifer beneath Mesita del Buey can be estimated using the Darcian flow equation:

$$v = \frac{KI}{n} \qquad (5\text{-}1)$$

where

v = velocity (meters per second)
K = hydraulic conductivity (meters per second)
I = hydraulic gradient (meters per meter)
n = porosity

The hydraulic conductivity of the main aquifer as calculated for this study from pump testing of PM-2 is 4.2 feet per day. Transmissivity was calculated by Purtymun (1984) to be 40,000 gallons per day per foot. Using these values, together with an assumed sand to silt porosity of 30 percent (Freeze and Cherry, 1979), the velocity of ground water within the main aquifer beneath Mesita del Buey is 0.18 feet per day (5.7×10^{-2} meters per day). This rate correlates with the 95 feet per year (0.26 feet per day) movement calculated by Purtymun (1984) and shown in Figure 5-3.

5.1.2 Chemical Quality of the Main Aquifer Near Mesita del Buey

The chemical quality of the main aquifer has been characterized by sampling wells and in White Rock Canyon springs near the Rio Grande. In general, the water quality depends on the well depth, lithology of the aquifers, and yields from individual beds within the aquifer (Purtymun, 1984). In 1981, water samples from the Pajarito Well Field (Figure 5-1) were collected from well heads after periods of pumping. A summary of the Pajarito Well Field construction and water-quality results is provided in Table 5-2. Water from wells PM-2 and PM-4, the two wells nearest Mesita del Buey, are sodium bicarbonate water (Figure 5-4), while PM-1 and PM-3 are dominantly calcium bicarbonate (Figure 5-5). Although there are numerous deep canyons cut into the Bandelier Tuff of the Pajarito Plateau, there are no documented springs or seeps along the canyon wells (Griggs, 1964). Springs are located along White Rock Canyon near the Rio Grande and were sampled in 1981. Springs 4 and 5A in White Rock Canyon are both calcium bicarbonate (Figure 5-4). A summary of the hydrologic data for springs in White Rock Canyon is provided in Table 5-3.

5.2 HYDROGEOLOGY OF PERCHED WATERS ADJACENT TO MESITA DEL BUEY

Mesita del Buey is bounded on the north by Cañada del Buey and on the south by Pajarito Canyon (Figure 1-4). In response to Task 6 (paragraph 25) of the Compliance Order, the Laboratory investigated the alluvium in Cañada del Buey and Pajarito Canyon to determine:

1. If perched water is present in the alluvium and underlying tuff
2. The horizontal and vertical extent of the perched water
3. The chemical quality of the perched water
4. The hydrologic similarities among Cañada del Buey, Pajarito Canyon and Mortandad Canyon, and the applicability of previous research in Mortandad Canyon to items 1, 2, and 3 above.

In order to investigate the alluvial systems, test holes were drilled and monitoring wells were installed in both canyons. Test holes were drilled April 16-18, 1985 (PCO and CDBO series) and October 22, 1985 (PCM series) using a truck-mounted, continuous flight hollow-stem auger. The test holes penetrated the alluvium and were drilled to various depths into the underlying Bandelier Tuff. Monitoring wells were installed in selected test holes by casing the holes with four-inch diameter, schedule 40, PVC casing. The PVC casing was perforated with 0.25-inch holes and wrapped with approximately 0.050 slotted stainless steel mesh (Devaurs, 1985). The annular space between the test hole wall and the casing was gravel-packed to within two feet of the ground surface and completed with a concrete collar. Each monitoring well casing is protected with a nine-inch diameter steel casing with a locking cap. The wells were developed by jetting and pumping with a centrifugal pump (Devaurs, 1985). A construction schematic of the monitoring wells is given in Figure 5-6. Monitoring wells and test holes elevations were surveyed with horizontal and vertical control.

5.2.1 Relevant Hydrologic Studies in Mortandad Canyon

The following discussion of extensive hydrologic studies of Mortandad Canyon are largely derived from Purtymun (1975) and Devaurs and Purtymun (1985). The discussion focuses on hydrologic and geologic similarities among Cañada del Buey, Pajarito Canyon, and Mortandad Canyon.

Mortandad Canyon is a southeast-trending canyon approximately ten miles in length cut into the Pajarito Plateau, north of Cañada del Buey (Figure 5-1). The canyon drains an area of 2.86 square miles to the eastern Laboratory boundary and is a tributary to the Rio Grande in White Rock Canyon. Alluvium on the canyon floor ranges from less that 3 feet in the headwaters to over 120 feet to the east, and consists mainly of silt, sand, and gravel derived from erosion and weathering of tuff in the canyon. Thus, the geologic setting of Mortandad Canyon is comparable to those of Pajarito Canyon and Cañada del Buey. Portions of Mortandad Canyon are perennial due to the National Pollutant Discharge Elimination System (NPDES) permitted discharge of effluent from the TA-50 industrial waste water treatment plant. The plant began discharging treated liquid water in 1963. Prior to initiation of these discharges, no perennial flow existed in the canyon; however, alluvium in the canyon contained a small perched water body (Baltz, et al., 1963). Recharge of the alluvial system in the canyon currently occurs from infiltration of storm and snow melt runoff and from infiltration of the TA-50 discharge.

Several hydrologic studies of Mortandad Canyon have been conducted over the last 25 years to define the horizontal and vertical extent of saturation within the alluvium and surrounding consolidated deposits; c.f., Abrahams et al. (1962), Baltz et al. (1963), Purtymun (1974), Purtymun (1975), Purtymun et al. (1983), and Environmental Surveillance Group (1984). These studies have entailed installation of shallow observation wells, neutron-moisture access wells, and deep test wells. The above studies conclude that perched water in Mortandad Canyon is confined to alluvium within the channel and saturation does not extend horizontally or vertically into the tuff.

The similarities in the geologic setting among the three canyons suggests that the canyons may also be hydrologically similar. Mortandad Canyon, which receives perennial flow from the TA-50 industrial waste water treatment plant, does not contribute to recharge of the main aquifer within the study area; thus, it is likely that no recharge of the main aquifer occurs from the ephemeral flows in Cañada del Buey or Pajarito Canyon.

5.2.2 Cañada del Buey

Cañada del Buey bounds Mesita del Buey to the north and has a drainage area of 3.4 square miles within the Laboratory's boundary (Purtymun, 1975). Stream flow in the canyon is ephemeral and flows only in response to storm runoff or snow-melt. Four test holes (CDBO-1 through CDBO-4) were drilled into the Cañada del Buey alluvium near Mesita del Buey, two in the upper reach, one in the middle reach, and one in the lower reach (Figure 1-4). Based on the test hole borings, the alluvium in Cañada del Buey is derived from weathered Bandelier tuff (Devaurs and Purtymun, 1985) and is comprised of sands, silts, and clay with a few gravels. The alluvium is thin in the canyon, ranging from 9 to 12 feet in thickness (Table 5-4; see Appendix C for lithologic logs). The alluvium is confined to the canyon and does not extend beneath the Mesita del Buey. The stream channel in Cañada del Buey is not well-defined, braiding out in places along the canyon floor (Devaurs and Purtymun, 1985). During drilling operations, the alluvium was noted to appear relatively dry, containing an estimated ten percent moisture.

All four test holes were completed as monitoring wells in Cañada del Buey. Screens were set opposite the alluvium in the wells and a summary of the CDBO-Series well construction is given in Table 5-5. The wells are monitored quarterly and during the period June 1985 through September 1986, no water was detected in any of the four wells (Table 5-6). Consequently, no water samples have been collected for chemical analyses.

The current investigation of Cañada del Buey indicates that the alluvium contains no perched water. The absence of perched water is likely related to the small drainage area which produces little surface water to form and recharge a body of water in the alluvium (Devaurs and Purtymun, 1985) combined with a high evapotranspiration rate for the area (New Mexico Environmental Improvement Division, 1985).

5.2.3 Pajarito Canyon

Pajarito Canyon, which bounds Mesita del Buey to the south, heads on the flanks of Sierra de los Valles and drains an area of 10.6 square miles (Purtymun, 1975). While the canyon contains a perennial stream on the mountain flanks and western half of the Pajarito Plateau, stream flow on the

eastern half of the plateau near Mesita del Buey is ephemeral and flows only in response to storm runoff and snow-melt (Devaurs and Purtymun, 1985).

5.2.3.1 Nature and Extent of Perched Water in Pajarito Canyon

Seven test holes were drilled in Pajarito Canyon in 1985 to determine the presence and extent of perched water in the alluvium (Figure 1-4). Three of the seven test holes encountered perched water and were completed as monitoring wells designated PCO-1, PCO-2, and PCO-3. Well construction for the three monitoring wells is summarized in Table 5-5. The remaining four test holes (PCM-1 through PCM-4) were dry when drilled through the alluvium and were completed into the tuff. The PCM test holes were blank-cased with four-inch schedule 40 PVC (Devaurs and Purtymun, 1985). Drilling cuttings from the PCM-Series test holes were analyzed for moisture using a direct oven-drying method. The procedure involved weighing the cuttings before and after drying at 105°C and then calculating the original water content per unit mass of oven-dry soil. The average moisture content in the cuttings was 11 percent, ranging from 6 to 16 percent. A summary of the moisture contents is presented in Table 5-7. Based on the lithologic logs of three PCO-series monitoring wells, the alluvium in Pajarito Canyon is derived from Bandelier Tuff and Tschicoma Formation (Devaurs and Purtymun, 1985) and is comprised of boulders, cobbles, and gravels in a silty sand matrix (see Appendix C for lithologic logs). The alluvium ranges from 9 to 12 feet in thickness in the existing canyon channel (PCO-Series, Table 5-8) and thins towards the canyon flanks (PCM-Series, Table 5-9). Lithologic logs and installation diagrams for all seven test holes are provided in Appendix C.

In addition to the seven test holes drilled in 1985, the laboratory drilled two test holes in the canyon during March of 1950 as part of a water-supply study (Griggs, 1964; Purtymun, 1975). These holes, identified as T-5 and T-6 (Figure 1-4), were drilled to depths of 263 feet and 300 feet, respectively, and completely penetrated the Bandelier Tuff beneath the floor of Pajarito Canyon (Table 5-10; see Appendix C for lithologic logs). Although the test holes were blank-cased through the alluvium, no water was encountered in the underlying tuff and volcanic sediments (Griggs, 1964; Purtymun, 1975). The holes were also dry when measured in the spring of 1985 (Devaurs and Purtymun, 1985).

Nineteen test holes were drilled into the Bandelier Tuff on top of Mesita del Buey in Areas G (6 test holes), L (12 test holes), and one background hole northwest of Area L. One test hole in Area L (LLC-85-A) was abandoned following coring. In Area G, the test holes ranged in depth from 50 to 125 feet. Test holes LGC-85-09 and LGM-85-11 were drilled 40 feet and 9 feet, respectively, beneath the base of the alluvium in Pajarito Canyon. Neither of the test holes encountered perched water in the Bandelier Tuff. In Area L the test holes ranged in depth from 60 feet to 200 feet. Test holes LLC-85-17, LLM-85-01 and LLM-85-02 were drilled to depths extending approximately 2, 43, and 48 feet (respectively) beneath the base of alluvium in Pajarito Canyon. None of these three test holes encountered perched water in the Bandelier Tuff. A summary of the lithologic logs and installation diagrams for each test hole, with the exception of the abandoned test hole LLC-85-A, is provided in Appendix C.

Topographic profiles and geologic cross-sections through Mesita del Buey and the adjacent alluvium-filled canyons (Figures 5-7 and 5-8) illustrate that the perched water, found only in Pajarito Canyon, does not extend horizontally beneath the mesa into the adjacent tuff. Locations of sections A-A' through D-D' are shown on Figure 5-9. Figure 5-10 is a longitudinal channel cross-section through Pajarito Canyon which shows the hydrogeologic relationship between the deeper test holes (e.g., T-5) and perched water in the alluvium. These test holes illustrate that the perched water in the alluvium does not extend vertically into the basalts and sedimentary deposits which lie beneath the tuff.

5.2.3.2 Hydraulic Properties of the Perched Water in Pajarito Canyon

Water-levels in the PCO-Series monitoring wells have been measured quarterly since June 1985. Water-levels are measured to the nearest 0.01 foot using a weighted graduated steel tape. The depth to water is measured from the top of the well casing. A summary of the water-level measurements from June 1985 through September 1986 is given in Table 5-11 and water-level elevations for that same period are shown in Figure 5-11. Maximum fluctuations in water-levels, or maximum fluctuations in the saturated thickness of the perched water are 1.1 feet in PCO-1, 3.34 feet in PCO-2, and 0.59 feet in PCO-3. The

saturated thickness in wells PCO-1 and PCO-3 average 10.01 and 8.93, respectively. In contrast, the saturated thickness in PCO-2 is approximately one-half the thickness of the other two wells, averaging 3.91 feet. The greater range of water-level elevations in PCO-2 may reflect the thinner saturated thickness and bedrock channel configuration.

Seasonal fluctuations in water-levels were documented during the period June 1985 through September 1986, with the highest water-levels generally measured during the summer months (June through August) and the lowest water-levels measured during the winter months (December through March). While there are no direct discharge measurements in Pajarito Canyon during this time period, precipitation data from the Area G station are available for 1985-1986 (Figure 5-12). There appears to be a correlation in wells PCO-1 and PCO-2 between large precipitation events (October 10, 1985 and June 26, 1986) and increases in water-level elevations in all three wells. These correlations are preliminary, however, in the absence of actual precipitation-runoff relationship data for Pajarito Canyon. Summer thunderstorms in New Mexico are typically convective in nature (Environmental Surveillance Group, 1986), and therefore, precipitation duration, precipitation intensity, and antecedent moisture can vary significantly throughout the Pajarito Canyon drainage area.

The rate of movement of perched water in the Pajarito Canyon alluvium can be estimated using the Darcian flow equation (see Section 5.1). The average gradient measured in the monitoring wells is 0.015. Hydraulic conductivities in the alluvium ranges from 1.65×10^{-3} meters per second for a sand aquifer to 5.8×10^{-4} meters per second for a silty sand aquifer (Purtymun, 1981). Using these values, together with an assumed sand to silt porosity of 30 percent (Freeze and Cherry, 1979), the velocity of the perched water ranges from 8 to 23 feet per day (2 to 7 meters per day).

5.2.3.3 Quarterly Water Sampling Procedures in Pajarito Canyon

Prior to sampling, each monitoring well is purged to remove stagnant water from the well borehole. The borehole water is removed by bailing with a two-inch diameter brass bailer until a minimum of three borehole volumes are removed (or the well is bailed dry). Water samples are collected for inorganic and volatile organic analyses conducted by the Health and Environmental Chemistry Group (HSE-9).

Inorganic analyses performed each quarter include general chemistry, selected metals, and radiological parameters. Table 5-12 presents a summary of the inorganic parameters routinely quantified. One-gallon polyethylene bottles are used to collect water samples for inorganic analysis. The first one gallon unfiltered water sample is acidified with nitric acid in the field (for radiological parameters) and returned with the second unfiltered, non-acidified water sample within four hours to the laboratory's analytical facilities. Two aliquots are withdrawn from the unfiltered, non-acidified gallon sample. One aliquot is filtered and acidified with nitric acid for metals analyses and the second unfiltered, non-acidified aliquot is analyzed for general chemistry. All inorganic analyses are performed using approved EPA methods (U.S. EPA, 1976; U.S. EPA, 1979) and 40 CFR 141 regulations for radiological analyses. Water samples are also collected from each monitoring well in 40 milliliter vials with teflon-coated septa. These samples are analyzed for volatile organic compounds using purge and trap gas chromatography (GC) with gas chromatography/mass spectrometry (GC/MS) confirmation. Table 5-13 summarizes the volatile organic compounds routinely quantified. Volatile organic analyses are performed according to approved EPA methods (U.S. EPA, 1985a).

All samples are labeled in the field and sealed with a parafilm seal to ensure sample integrity. A chain of custody tag is attached to each sample container. The samples are placed in an ice chest and transferred to the laboratory's analytical facilities. Information pertinent to sampling is recorded in a field logbook and chain of custody is maintained on all samples. After sample custody is transferred to appropriate laboratory analytical personnel, the samples are placed in locked refrigerators in a secured building. A sample analysis request sheet accompanies each sample to track sample analyses.

5.2.3.4 Chemical Quality of Perched Water in the Alluvium of Pajarito Canyon

The concentration of dissolved solids in the perched water in the alluvium of Pajarito Canyon increases downgradient as shown by the analytical results of water samples collected from monitoring wells PCO-1, PCO-2, and PCO-3 (see Figure 1-4 for well locations). The water is characteristically sodium

bicarbonate upgradient in well PCO-1 (Figure 5-13). In well PCO-2, located approximately mid-reach, the water is a sodium-calcium bicarbonate (Figure 5-14). Downgradient, in well PCO-3 the water is characteristically calcium bicarbonate (Figure 5-15). Dissolved metals and radiological parameters (i.e., calcium, copper, zinc, manganese, total uranium and tritium, etc.) generally increase in concentration downgradient. Although the perched water in the alluvium of Pajarito Canyon is not a drinking water source, U.S. EPA and New Mexico Environmental Improvement Board (NMEIB) numeric drinking water standards have been included in Tables 5-14 through 5-16 for relative comparison of perched water quality. All chemical and radiological constituents were detected at concentrations below the primary and secondary maximum contaminant levels specified for drinking water (U.S. EPA, 1976; U.S. EPA, 1979; New Mexico Environmental Improvement Board, 1985b) with the exception of manganese (several quarterly measurements in PCO-1, PCO-2, and PCO-3), total uranium (one quarterly measurement each in PCO-2 and PCO-3) and total dissolved solids (one quarterly measurement in PCO-3). Tables 5-14 through 5-16 summarize the results of inorganic analyses conducted on well samples collected during the period June 1985 through September 1986.

In addition to changes in perched water quality downgradient, seasonal fluctuations in water quality related to saturated thickness were also observed in data collected from well PCO-3. Between December 1985 and March 1986, the concentrations of dissolved constituents (metals, anions, and radiological parameters) increased to two to three times the previous quarter's concentrations (see Table 5-16). This same time period corresponds to the minimum saturated thickness ("low-flow") of perched water measured in the alluvium. Concentrations of these same dissolved constituents are diluted during the "high-flow" spring and summer months which is in response to snow melt and precipitation runoff.

Results of volatile organic analyses of the perched water collected from each of the monitoring wells is summarized in Tables 5-17 through 5-19. None of the volatile organic compounds routinely analyzed (see Table 5-13) have ever been detected in any of the wells, including samples collected during periods of "low-flow" in the alluvium (December and March samples).

5.2.3.5 Summary of Perched Water Investigation in Pajarito Canyon

The investigation of the perched water system contained in Pajarito Canyon alluvium indicates that:

1. The canyon contains a body of perched water in the alluvium which was perennial during the period June 1985 through September 1986.

2. The perched water in the alluvium does not extend horizontally or vertically into the adjacent tuff that forms Mesita del Buey.

3. The concentration of dissolved solids in the perched water in the alluvium increases downgradient.

4. Chemical quality of the perched water in the alluvium is dependent on water volume which, in turn, is dependent on seasonal precipitation-runoff characteristics in the canyon.

5. The concentration of dissolved solids in the perched water in the alluvium decreased during periods of high-flow as a result of dilution.

5.3 SUMMARY OF GROUND WATER HYDROLOGY IN AREAS G AND L

Studies of the main aquifer (Purtymun, 1984) and perched water (Purtymun, 1975; Devaurs and Purtymun, 1985) at the Areas G and L supports the following findings:

- The depth to the main aquifer beneath Areas G and L is approximately 850 feet and 950 feet, respectively

- There are no perched bodies of water beneath Areas G and L which are hydraulically connected to the main aquifer

- There are no springs or seeps on the canyon walls in Pajarito Canyon or Cañada del Buey

- The perched body of water contained in the alluvium of Pajarito Canyon adjacent to Areas G and L does not extend horizontally or vertically into the adjacent tuff (similar to hydrologic findings in Mortandad Canyon) and is not hydraulically connected to the main aquifer

- Based on the available data, chemical quality of perched water in the alluvium has not been affected by the hazardous waste disposal areas on Mesita del Buey.

TABLE 5-1

LITHOLOGIC LOG OF WATER-SUPPLY WELL PAJARITO MESA #2 (PM-2)[1][2]

GEOLOGIC UNIT	LITHOLOGIC DESCRIPTION	DEPTH (FT) TO	FROM
Alluvium	Boulders and clay; boulders of latite as large as 12 inches and grayish-brown clay, some sand and gravel	0	7
	Sand and gravel; sand is light-gray, fine-to-coarse and composed of crystals and fragments of sanidine and quartz; gravel is fine-to-coarse and composed of latite and tuff	7	30
Bandelier Tuff (Otowi Member)	Tuff; buff, silty, consists mostly of sanidine and quartz crystals, many fragments of rhyolite and latite, trace of pumice near 105 feet	30	125
	Tuff; mostly crystals of sanidine and quartz with rhyolite and latite fragments; much white and tan pumice	125	165
	Tuff; light-gray, consists of crystals and fragments of sanidine, quartz, and glass, and many brown and gray rhyolite fragments to 1/8 inch	165	225
	Pumice; buff	225	235
	Tuff; crystals and fragments of sanidine, quartz, glass in sand-sized grains, and gravel of rhyolite, latite, and basalt, much white pumice	235	300
	Pumice; light-gray to tan	300	315
	Tuff; crystals and fragments of sanidine, quartz, glass and dark volcanic rocks with much white pumice (show of water at 335 feet)[3]	315	345

[1] From Cooper et al., 1965.
[2] PM-2 drilled in 1965.
[3] Show of water not confirmed by subsequent geophysical logging.

TABLE 5-1
LITHOLOGIC LOG OF WATER-SUPPLY WELL PAJARITO MESA #2 (PM-2)
(Continued)

GEOLOGIC UNIT	LITHOLOGIC DESCRIPTION	DEPTH (FT) TO	FROM
Bandelier Tuff (Otowi Member) (continued)	Tuff; gray, composed of sand-sized grains sanidine, quartz, and glass crystals and many gravels of rhyolite and latite, trace pumice	345	390
	Tuff; crystals and fragments of sand-sized sanidine, quartz, and glass	390	405
Bandelier Tuff (Guaje Member)	Pumice; light-tan to light-gray, lumps as large as 1/4 inch	405	432
Chino Mesa Basalt (Unit 3)	Basalt; black, dense, with some iron-staining, trace tan clayey silt, minor olivene, pyrite, and white crystalline material	432	505
	Basalt; dark reddish-brown and dark-gray, dense	505	515
	Basalt; dark-gray, dense with buff, clay and silt (caliper log indicates a zone of lost circulation 522-534 feet)	515	530
	Basalt; dark-gray to black, vuggy, trace olivene	530	550
	Basalt; scoria, dark-gray to reddish-brown, vuggy, trace buff clay (caliper log indicates a zone of lost circulation 546-564 feet)	550	570
	Basalt; gray to greenish-gray, granular to fine-grained glassy structure, much olivene and feldspar crystals	570	590
	Basalt; black, brown, and red, vuggy, contains scoria	590	605
	Basalt; dark grayish-red, dense, trace olivene and feldspar crystals	605	617
	Basalt (No samples. Electric logs and driller's logs indicate this interval to be basalt. Hole was drilled without circulation.)	617	700

TABLE 5-1
LITHOLOGIC LOG OF WATER-SUPPLY WELL PAJARITO MESA #2 (PM-2)
(Continued)

GEOLOGIC UNIT	LITHOLOGIC DESCRIPTION	DEPTH (FT) TO	FROM
Puye Conglomerate (Fanglomerate Member)	Conglomerate (No samples. Electric logs and driller's logs indicate this interval to be conglomerate. Hole was drilled without circulation.)	700	730
	Conglomerate; sand is fine-to-coarse, quartz, frosted and rounded; gravel is mostly latite, much basalt	730	734
	Basalt; dark-gray, dense	734	738
	Conglomerate; as 730 to 734 feet	738	758
	Basalt; as 734 to 738 feet	758	770
	Conglomerate; greenish-gray, sand is fine-to-coarse, subrounded-to-rounded frosted quartz and subrounded-to-subangular basalt and latite; gravel sizes are subangular-to-subrounded basalt and latite; contains crystals and fragments of sanidine, quartz, and glass	770	1,000
	Conglomerate; as 770 to 1,000 feet, but contains much larger percentage of gravel size particles and some chert and tan silty clay	1,000	1,168
	Conglomerate; as 1,000 to 1,168 feet, but contains white and tan fibrous pumice	1,168	1,186
	Conglomerate; gray-to-tan, mostly sand composed of subrounded basalt and latite and frosted quartz, occasional gravel size; contains tan pumice, and white to light-gray silt	1,186	1,250
	Conglomerate; mostly gravel size, subangular-to-subrounded basalt and latite, much pumice from 1,250 to 1,280	1,250	1,340
Puye Conglomerate (Totavi Lentil)	Gravel and sand; composed of subrounded gravels of quartzite, chalcedony, and quartz, and large chips from cobbles	1,340	1,410

TABLE 5-1
LITHOLOGIC LOG OF WATER-SUPPLY WELL PAJARITO MESA #2 (PM-2)
(Continued)

GEOLOGIC UNIT	LITHOLOGIC DESCRIPTION	DEPTH (FT) TO	FROM
Tesuque Formation	Sand; light pinkish-gray to dark-gray, fine-to-coarse, subrounded-to-rounded, quartz, some fine-to-coarse gravels of quartz and quartzite	1,410	1,548
	Conglomerate; sand is grayish-pink, subangular-to-subrounded quartz; gravel is subrounded quartz and quartzite and a few gravels of vuggy basalt	1,548	1,840
	Basalt; black to dark-gray, coarse crystalline with gray to green waxey clay filling some vugs and some vug lining of white crystals	1,840	1,892
	Sand and gravel; mostly sand-sized grains of fine-medium subrounded quartz, some subrounded gravels of basalt and latite, many chips of basalt. Interval may contain thin basalt flows	1,892	2,108
	Conglomerate; sand, well-sorted, fine-to-coarse, and subrounded gravels of latite and quartzite	2,108	2,218
	Basalt; brown, red, and black, weathered appearance, contains clay and white crystals in vugs	2,218	2,312
	Sand; grayish-pink, very fine-to-medium, subangular-to-subrounded, quartz, contains tan and cream clay and a few rounded basalt gravels	2,312	2,370
	Sand; as 2,312 to 2,370 feet, but coarser grained with white clay	2,370	2,410
	Sand; grayish-pink, coarse-to-very coarse, rounded-to-subrounded, quartz, some white and tan clay	2,410	2,460
	Clayey sand; fine-to-coarse sand with much white and tan clay	2,460	2,490

TABLE 5-1
LITHOLOGIC LOG OF WATER-SUPPLY WELL PAJARITO MESA #2 (PM-2)
(Continued)

GEOLOGIC UNIT	LITHOLOGIC DESCRIPTION	DEPTH (FT) TO	FROM
Tesuque Formation (continued)	Clay; tan to white, sandy	2,490	2,510
	Clayey sand; as 2,460 to 2,490, contains much basalt (possible basalt layer at 2,506 to 2,508 according to electric logs)	2,510	2,530
	Sand; pinkish-gray to tan, fine-to-coarse, Subangular-to-subrounded quartz and white to tan clay	2,530	2,600

Note 1: Sample obtained from bottom of drill bit after removal from hole at 2,600 feet is tan sandy clay and subangular fragments up to 1 inch of dark-gray, hard, structureless, very fine silty, non-calcareous shale. Exterior of shale fragments have lining of calcareous material on weathered surface.

Note 2: Samples of the drill cuttings were collected by the contractor at 5-foot intervals from 0 to 617 feet and at 10-foot intervals from 617 to 2,600 feet. These samples were then washed by the Geological Survey and studied under the binocular microscope. The samples were described dry. Thickness and depth intervals of drill cutting samples have been correlated with data interpreted from electric logs and driller's logs.

TABLE 5-2
CONSTRUCTION AND HYDROLOGIC DATA FOR WELLS IN THE PAJARITO WELL FIELD, LOS ALAMOS[1]

	Pajarito Field				
	PM-1	PM-2	PM-3	PM-4	PM-5
Date of Completion	1965	1965	1966	1981	1982
Elevation of LSD (ft)	6520	6715	6640	6920	7095
Construction					
Depth drilled (ft)	2501	2600	2552	2920	3120
Depth completed (ft)	2499	2300	2552	2875	3093
Diameter (in.)[b]	12	14	14	16	16
Water Levels					
Date	1982	1982	1982	1982	1982
Depth below LSD (ft)	748	874	762	1047	1208
Elevation (ft)	5772	5841	5878	5873	5887
Water-Level Fluctuations					
Period (yr)	1965-1982	1966-1982	1968-1982	1981-1982	---
Change (ft)	-2	-48	-19	5	---
Annual rate (ft/yr)	-0.1	-2.8	-1.3	---	---
Aquifer					
Formation	QTp-Tsf	QTp-Tsf	QTp-Tsf	QTp-Tsf	QTp-Tsf
Saturated thickness (ft)	1751	1426	1790	1828	1885
Yield					
Date	1982	1982	1982	1982	1982
Rate (gpm)	589	1386	1402	1473	1225
Drawdown (ft)	22	60	23	40	144
Specific capacity (gpm/ft)	26.8	23.1	60.9	36.8	8.5
Transmissivity (gpd/ft)	55 000	40 000	320 000	44 000	10 000
Field coefficient of permeability (gpd/ft^2)	31	28	179	24	5.3
Production					
Period (yr)	1965-1982	1966-1982	1968-1982	1982	---
Pumpage (10^6 gal.)	1593	5863	3478	76	---
Quality of Water					
Date	3-18-81	3-18-81	3-18-81	8-3-81	8-4-81
Chemical (mg/ℓ)					
SiO_2	77	81	88	87	86
Ca	28	8	24	9	14
Mg	6.9	3.1	8.4	3	4
Na	18	10	18	11	24
CO_3	0	0	0	0	0
HCO_3	144	65	148	70	106
SO_4	5	3	7	4	10
Cl	4	9	10	2	4
F	0.3	0.3	0.4	0.3	0.3
NO_3	2.0	<0.1	1.8	2	8
TDS	212	140	216	165	211
Hard	90	36	90	36	52
Specific conductance (μmho)	260	130	250	120	190
pH	8.0	7.8	8.3	8.2	8.2
Radiochemical					
Total uranium (μg/ℓ)	2.4 ± 0.8	0.0 ± 0.8	1.0 ± 0.8	0.8 ± 0.8	2.2 ± 0.4
Temperature (°F)	71	69	71	69	73

[a]Well was abandoned in 1956; data were not used in the average hydrologic characteristics. It is located 150 ft SW of well LA-1B.

[b]Wells have two different diameter sizes of casing; i.e., 12 (650 ft) 10 reads: 12-in. diameter to 650 ft, then 10-in. diameter to completed depth of well.

Note: QTp = Puye Conglomerate; Tsf = Tesuque Formation.

[1]From Purtymun, 1984.

TABLE 5-3
HYDROLOGIC DATA FOR SPRINGS IN THE WHITE ROCK CANYON AREA[1]

	Spring 3	Spring 3B	Spring 4	Spring 5A	Spring 5B	Spring 6	Spring 8A	Spring 10
Elevation of LSD (ft)	5560	5500	5500	5430	5400	5380	5370	5360
Aquifer	QTp	Tsf	QTp	Tsf	Tsf	Tsf	Tsf	Tsf
Discharge at Rio Grande (gpm)	20	30	80	30	10	60	30	20
Quality of Water								
Date	10-13-81	10-13-81	10-13-81	10-13-81	10-14-81	10-14-81	10-14-81	10-15-81
Chemical (mg/ℓ)								
SiO_2	52	46	60	60	64	74	75	69
Ca	20	24	28	24	17	12	11	12
Mg	1.6	2.0	5.7	2.7	4.4	3.6	2.8	3.2
Na	16	139	15	22	12	11	13	13
CO_3	0	0	0	0	0	0	0	0
HCO_3	99	392	132	124	87	74	56	80
SO_4	4	4	6	7	2	2	3	3
Cl	5	6	8	6	4	4	5	4
F	0.4	0.6	0.5	0.3	0.5	0.3	0.4	0.4
NO_3	2.6	8.4	<0.4	1.7	2.0	<0.4	<0.4	1.7
TDS	125	374	168	186	152	134	152	146
Hardness	56	64	92	69	56	44	39	42
Specific conductance (μmho)	210	610	220	240	150	140	130	120
pH	8.1	7.5	7.0	7.4	7.4	7.0	9.0	7.8
Radiochemical								
Total uranium (μg/ℓ)	2.3 ± 0.8	19 ± 4.0	1.5 ± 0.8	2.2 ± 0.8	1.9 ± 0.8	1.0 ± 0.8	1.7 ± 0.8	1.7 ± 0.8
Temperature (°F)	72	68	66	70	61	73	72	66

Note: Tsf = Tesuque Formation and QTp = Puye Conglomerate.

[1] From Purtymun, 1984.

TABLE 5-4

LITHOLOGIC LOGS OF MONITORING WELLS IN CAÑADA DEL BUEY[1]

WELL	LITHOLOGIC DESCRIPTION	DEPTH (FT) TO	FROM
CDBO-1	Alluvium; light brown, silty sand with some clay	0	9
	Tuff; brown, weathered with quartz and sanidine crystals and crystal fragments, some rock fragments (weathered tuff contains an estimated 20-30 percent silt and clay)	9	15
CDBO-2	Alluvium; light brown, silty sand with some clay	0	12
	Tuff; brown, weathered with quartz and sanidine crystals and crystal fragments, some rock fragments (weathered tuff contains an estimated 20-30 percent silt and clay)	12	18
CDBO-3	Alluvium; light brown, silty sand with some clay	0	8
	Tuff; light gray, quartz and sanidine crystals and crystal fragments, some small rock fragments, slight amount of clay as a result of weathering	8	12
CDBO-4	Alluvium; light brown, silty sand with some clay	0	9
	Tuff; light gray, quartz and sanidine crystals and crystal fragments, some small rock fragments, slight amount of clay as a result of weathering	9	12

[1] From Devaurs, 1985

TABLE 5-5

SUMMARY OF MONITORING WELL CONSTRUCTION AND TEST HOLE COMPLETION IN PAJARITO CANYON AND CAÑADA DEL BUEY[1]

WELL	LAND SURFACE ELEVATION (FT)	HEIGHT OF STEEL CASING[2] (FT)	TOTAL DEPTH[2] (FT)	CASED INTERVAL[2] (FT)	PERFORATED INTERVAL[2] (FT)	DATE INSTALLED
PAJARITO CANYON						
PCO-1	6687.0	1.2	12.3	0-4.3[3]	4.3-12.3[3]	4/16/85
PCO-2	6618.3	1.0	9.5	0-1.5[3]	1.5- 9.5[3]	4/17/85
PCO-3	6546.3	1.2	17.7	0-5.7[3]	5.7-17.7[3]	4/17/85
PCM-1	6697.6	1.35	60	0-8.3[3]	---	10/22/85
PCM-2	6640.1	1.35	120	0-7.2[3]	---	10/22/85
PCM-3	6615.0	1.35	60	0-8.3[3]	---	10/22/85
PCM-4	6584.7	0.7	60	0-9.7[3]	---	10/22/85
	6591.6	2.0	263	0-22[4]	---	3/1950
T-6	6642.1	2.75	300	0-30[4]	---	3/1950
CAÑADA DEL BUEY						
CDBO-1	6757.6	1.37	13.1	0-5.1[3]	5.1-13.1[3]	4/17/85
CDBO-2	6748.2	1.30	17.9	0-5.9[3]	5.9-17.9[3]	4/18/85
CDBO-3	6670.2	1.20	12.4	0-4.4[3]	4.4-12.4[3]	4/18/85
CDBO-4	6564.5	1.30	12.1	0-4.1[3]	4.1-12.1[3]	4/18/85

[1] Modified from Devaurs, 1985.
[2] All lengths cited in this table are measured from the land surface datum.
[3] Cased with four-inch O.D PVC pipe.
[4] Cased with six-inch carbon steel pipe.

TABLE 5-6

SUMMARY OF WATER-LEVEL MEASUREMENTS AND ELEVATIONS FOR MONITORING WELLS IN CAÑADA DEL BUEY[1]

WELL	CDBO-1	CDBO-2	CDBO-3	CDBO-4
LAND SURFACE ELEVATION (FT)	(6757.6)	(6748.2)	(6670.2)	(6564.5)
DATE MEASURED				
05/28/85	Dry	Dry	Dry	Dry
09/04/85	Dry	Dry	Dry	Dry
12/02/85	Dry	Dry	Dry	Dry
03/06/86	Dry	Dry	Dry	Dry
06/10/86	Dry	Dry	Dry	Dry
07/03/86	Dry	Dry	Dry	Dry
08/08/86	Dry	Dry	Dry	Dry
09/03/86	Dry	Dry	Dry	Dry

[1]From Department of Energy, 1987

TABLE 5-7

MOISTURE CONTENT OF
CUTTINGS FROM THE PCM-SERIES TEST HOLES[1]

DEPTH (FT)	PERCENT MOISTURE BY WEIGHT			
	PCM-1	PCM-2	PCM-3	PCM-4
3	8.7	12.3	12.9	12.0
8	5.7	6.5	15.7	5.6
13	9.0	3.8	5.4	6.0
18	11.0	2.9	11.5	2.1
23	11.1	5.6	8.9	2.5
28	11.1	7.3	6.8	4.1
33	11.7	4.4	6.8	6.6
38	11.7	4.2	6.8	8.4
43	12.1	4.8	7.6	9.5
48	12.2	5.3	7.7	11.5
53	14.4	5.4		12.6
58		6.5		
63		6.4		
68		8.2		
73		8.9		
78		7.9		
83		9.2		
88		9.6		
93		9.5		
98		9.7		
103		9.6		
108		9.8		
113		9.2		
118		9.2		

[1] From McInroy, 1985

TABLE 5-8

LITHOLOGIC LOGS OF MONITORING WELLS IN PAJARITO CANYON(1)

WELL	LITHOLOGIC DESCRIPTION	DEPTH (FT) TO	FROM
PCO-1	Alluvium; light brown, gravels, cobbles, and boulders intermixed with clays, silts and sands	0	11
	Tuff; light reddish-brown, non- to moderately-welded, quartz and sanidine crystals and crystal fragments, few small rock fragments	11	22
PCO-2	Alluvium; light brown, gravels, cobbles, and boulders intermixed with clays, silts, and sands	0	9
	Tuff; light reddish-brown, non- to moderately-welded, quartz and sanidine crystals and crystal fragments, few small rock fragments	9	22
PCO-3	Alluvium; light brown, gravels with a few cobbles in a matrix of silty sand	0	12
	Tuff; light gray to light brown, weathered, some quartz and sanidine crystals and crystal fragments, a few small rock fragments in a matrix of weathered tuff, mostly silts and clay	12	20

(1)From Devaurs, 1985

TABLE 5-9

LITHOLOGIC LOGS OF THE PCM-SERIES TEST HOLES IN PAJARITO CANYON[1]

TEST BORING	LITHOLOGIC DESCRIPTION	DEPTH (FT) TO	FROM
PCM-1	Alluvium	0	8
	Tuff; reddish-brown, pumice layer at 44 feet	8	60
PCM-2	Alluvium (weathered tuff)	0	6
	Tuff; light gray to pinkish-brown tuff, pumice fragments, and rock fragments	6	120
PCM-3	Alluvium	0	8
	Tuff; rock fragments at 13 feet, pink tuff and numerous pumice fragments at 14 feet	8	60
PCM-4	Alluvium	0	1
	Tuff; light grayish-pink, brownish-gray at 13 feet, pumice fragments at 14 feet, reddish brown tuff at 25 feet	1	60

[1] From McInroy, 1985

TABLE 5-10
LITHOLOGIC LOGS OF TEST HOLES T-5 AND T-6 IN PAJARITO CANYON[1][2]

GEOLOGIC UNIT	DEPTH (FT) TO	FROM
T-5		
Alluvium	0	23
Bandelier Tuff		
Tshirege Member	23	40
Otowi Member	40	160
Guaje Member	160	171
Chino Mesa Basalt	171	263
T-6		
Alluvium	0	25
Bandelier Tuff		
Tshirege Member	25	85
Otowi Member	85	265
Guaje Member	265	285
Puye Formation		
(Fanglomerate Member)	285	300

[1]From Purtymun, 1975.
[2]Test holes drilled in March 1950.

TABLE 5-11

SUMMARY OF WATER-LEVEL MEASUREMENTS AND ELEVATIONS FOR MONITORING WELLS IN PAJARITO CANYON[1]

WELL	PCO-1			PCO-2			PCO-3		
LAND SURFACE ELEVATION (FT)		(6687.0)			(6618.3)			(6546.3)	
DATE MEASURED	DEPTH BELOW LAND DATUM (FT)	ELEVATION (FT)	SATURATED THICKNESS (FT)	DEPTH BELOW LAND DATUM (FT)	ELEVATION (FT)	SATURATED THICKNESS (FT)	DEPTH BELOW LAND DATUM (FT)	ELEVATION (FT)	SATURATED THICKNESS (FT)
06/11/85	1.25	6685.75	9.75	3.63	6614.67	5.37	2.98	6543.32	9.02
09/12/85	1.29	6685.71	9.71	5.05	6613.25	3.95	3.30	6543.00	8.70
12/13/85	1.28	6685.72	9.72	6.26	6612.04	2.75	3.01	6543.29	8.99
03/06/86	1.59	6685.41	9.41	6.93	6611.37	2.07	3.08	6543.22	8.92
03/12/86	1.62	6685.38	9.38	6.97	6611.33	2.03	3.11	6543.19	8.89
06/10/86	0.78	6686.22	10.22	3.88	6614.42	5.12	3.29	6543.01	8.71
06/18/86	0.72	6686.28	10.28	3.83	6614.47	5.17	3.18	6543.12	8.82
07/03/86	0.54	6686.46	10.46	3.86	6614.44	5.14	2.71	6543.59	9.29
07/16/86	0.52	6686.48	10.48	3.99	6614.31	5.01	2.94	6543.36	9.06
08/08/86	0.69	6686.31	10.31	4.94	6613.36	4.06	3.03	6543.27	8.97
08/27/86	0.84	6686.16	10.16	5.48	6612.82	3.52	3.19	6543.11	8.81
09/03/86	0.86	6686.14	10.14	5.78	6612.52	3.22	3.13	6543.17	8.87
09/18/86	0.85	6686.15	10.15	5.61	6612.69	3.39	3.00	6543.30	9.00

[1]From Department of Energy, 1987

LAN:1702-T48b

TABLE 5-12
SUMMARY OF INORGANIC PARAMETERS ROUTINELY ANALYZED
IN MONITORING WELL SAMPLES

GENERAL CHEMISTRY	METALS	RADIOLOGICAL PARAMETERS
Calcium	Silver	Cesium-137
Magnesium	Arsenic	Plutonium-238
Potassium	Barium	Plutonium-239, 240
Sodium	Cadmium	Tritium
Chloride	Chromium	Total Uranium
Sulfate	Mercury	Gross Alpha
Nitrate (NO_3 as N)	Lead	Gross Beta
Fluoride	Selenium	Gross Gamma
Carbonate	Copper	
Bicarbonate	Iron	
Phosphorus	Manganese	
Total Hardness	Zinc	
Conductivity		
pH		
Total Dissolved Solids		
Silica		

TABLE 5-13

SUMMARY OF VOLATILE ORGANIC COMPOUNDS ROUTINELY ANALYZED
IN MONITORING WELL SAMPLES

1,4-Dichlorobenzene
1,2-Dichlorobenzene
Chloromethane
Bromomethane
Vinyl Chloride
Chloroethane
Acetone
2-Butanone
Vinyl Acetate
trans-1,3-Dichloropropene
cis-1,3-Dichloropropene
2-Hexanone
4-Methyl-2-Pentanone
Styrene
Total Xylenes
Trichlorofluoromethane
Tetrahydrofuran
Dibromochloromethane
Dibromomethane
1,2-Dibromo-3-Chloropropane
2-Chloroethylvinyl Ether
Carbon Disulfide
Purgeable Gases(1)
1,1-Dichloroethylene
Methylene Chloride
1,2-Dichloroethylene
1,1-Dichloroethane
Chloroform
1,1,1-Trichloroethane
1,2-Dichloroethane
Benzene
Carbon Tetrachloride
Trichloroethylene
1,2-Dichloropropane
Bromodichloromethane
Toluene
1,1,2-Trichloroethane
Chlorodibromomethane
Tetrachloroethylene
Chlorobenzene
Ethylbenzene
Bromoform
1,1,2,2-Tetrachloroethane
Bromobenzene
1,3-Dichlorobenzene

(1) Includes chloromethane, chloroethane, bromomethane, and vinyl chloride.

TABLE 5-14
INORGANIC WATER QUALITY RESULTS FROM MONITORING WELL PCO-1 IN PAJARITO CANYON[1]

DATE SAMPLED		06/11/85	09/03/85	12/04/85	03/06/86	06/10/86	09/18/86	NMEIB/ NMWQCC[2]	U.S. EPA[3]
GENERAL CHEMISTRY									
Ca	mg/ℓ	33	22	17	18	19	16		
Mg	mg/ℓ	9.9	6.6	5.1	4.9	6	5		
K	mg/ℓ	5.7	5.3	3.7	3.7	4.3	4.2		
Na	mg/ℓ	47	36	27	28	26	22		
Cl	mg/ℓ	68	35	16.7	22	27	10.7	250.0	250.0
SO_4	mg/ℓ	18.5	13.4	9.5	7.7	9	5.5	600.00	250.0
NO_3 (N)	mg/ℓ	1.7	0.2	<0.1	0.30	1.3	<0.2	10.0	10.0
F	mg/ℓ	0.5	0.4	<0.1	0.3	0.2	0.4	1.6	4.0
CO_3	mg/ℓ	0	0	<0.5	0.0	0.0	0.0		
HCO_3	mg/ℓ	97	101	92	93	82	88		
P	mg/ℓ	<0.2	<0.2	<0.1	0.0	<0.2	<0.2		
Total Hardness	mg/ℓ	122	89	68	88	74	55		
Conductivity	µmohs/cm	48	350	250	260	275	225		
pH		6.7	7.04	6.77	7.4	7.5	6.9	6-9	6.5-8.5
TDS	mg/ℓ	298	217	153	170	188	160	1,000.0	500.0
SiO_2	mg/ℓ	31	39	28	25.7	27	24		

(1) Compiled from Devaurs, 1985; Department of Energy (DOE), 1986a; DOE 1986b, DOE 1986c; DOE 1986d; DOE 1987.
(2) From New Mexico Environmental Improvement Board, 1985b; New Mexico Water Quality Control Commission, 1986.
(3) From U.S. EPA, 1976; U.S. EPA 1979.

TABLE 5-14
INORGANIC WATER QUALITY RESULTS FROM MONITORING WELL PCO-1 IN PAJARITO CANYON[1]
(Continued)

DATE SAMPLED		06/11/85	09/03/85	12/04/85	03/06/86	06/10/86	09/18/86	NMEIB/ NMWQCC[2]	U.S. EPA[3]
METALS									
Ag	mg/ℓ	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	0.05	0.05
As	mg/ℓ	0.004	<0.001	0.001	<0.002	0.002	<0.001	0.05	0.05
Ba	mg/ℓ	0.196	0.148	0.138	0.12	0.076	0.07	1.0	1.0
Cd	mg/ℓ	<0.001	0.005	0.00	<0.002	<0.001	0.0005	0.01	0.01
Cr	mg/ℓ	0.006	0.003	0.037	<0.003	0.0224	<0.001	0.05	0.05
Hg	mg/ℓ	<0.002	<0.001	<0.002	<0.005	<0.002	<0.002	0.002	0.002
Pb	mg/ℓ	<0.003	<0.001	<0.001	<0.005	0.003	0.003	0.05	0.05
Se	mg/ℓ	<0.003	<0.003	<0.001	<0.001	<0.002	<0.001	0.01	0.01
Cu	mg/ℓ	0.014	0.010	<0.010	0.010	0.005	0.004	1.0	1.0
Fe	mg/ℓ	0.095	0.012	0.098	0.005	0.017	<0.003	1.0	0.3
Mn	mg/ℓ	0.018	0.051	0.065	0.32	<0.003	0.115	0.2	0.05
Zn	mg/ℓ	0.029	0.025	0.013	0.005	<0.02	<0.001	10.0	5.0

(1) Compiled from Devaurs, 1985; Department of Energy (DOE), 1986a; DOE 1986b, DOE 1986c; DOE 1986d; DOE 1987.
(2) From New Mexico Environmental Improvement Board, 1985b; New Mexico Water Quality Control Commission, 1986.
(3) From U.S. EPA, 1976; U.S. EPA, 1979.

TABLE 5-14
INORGANIC WATER QUALITY RESULTS FROM MONITORING WELL
PCO-1 IN PAJARITO CANYON[1]
(Continued)

DATE SAMPLED		06/11/85	09/03/85	12/04/85	03/06/86	06/10/86	09/18/86	NMEIB/ NMWQCC[2]	U.S. EPA[3]
RADIOLOGICALS									
Cs-137	pCi/ℓ	74 ± 98	-17.3 ± 120	-36.1 ± 76.4	-17.4 ± 61	-28 ± 72	74 ± 41		200
Pu-238	pCi/ℓ	0.000 ± 0.020	0.013 ± 0.024	0.005 ± 0.02	0.016 ± 0.02	-0.010 ± 0.025	0.001 ± 0.01		15
Pu-239,240	pCi/ℓ	0.005 ± 0.016	0.000 ± 0.02	0.037 ± 0.032	0.021 ± 0.02	0.005 ± 0.033	0.01 ± 0.01		15
H-3	pCi/ℓ	-400 ± 800	3,200 ± 1,000	400 ± 800	-1,400 ± 800	800 ± 800	4,100 ± 600	20,000	20,000
Total U	mg/ℓ	1.4 ± 1.0	0.8 ± 0.4	0.5 ± 0.6	0.0 ± 0.2	1.0 ± 0.6	---	5.0	5.0
Gross Alpha	pCi/ℓ	2.0 ± 4.0	0.300 ± 1.6	1.7 ± 1.4	1.1 ± 1.4	0.8 ± 2	11.0 ± 3.0	15.0	15.0
Gross Beta	pCi/ℓ	8.0 ± 1.8	6.3 ± 1.6	1.7 ± 1.0	2.6 ± 1.0	5.9 ± 1.6	10.0 ± 1.0		
Gross Gamma	cpm/ℓ	-50 ± 120	160 ± 120	70.0 ± 120	-40 ± 120	-120 ± 120	146 ± 100		

[1]Compiled from Devaurs, 1985; Department of Energy (DOE), 1986a; DOE 1986b, DOE 1986c; DOE 1986d; DOE 1987.
[2]From New Mexico Environmental Improvement Board, 1985b; New Mexico Water Quality Control Commission, 1986.
[3]From U.S. EPA, 1976; U.S. EPA, 1979.

TABLE 5-15
INORGANIC WATER QUALITY RESULTS FROM MONITORING WELL PCO-2 IN PAJARITO CANYON[1]

DATE SAMPLED		06/11/85	09/03/85	12/04/85[2]	03/06/86[2]	06/10/86	09/18/86	NMEIB/ NMWQCC[3]	U.S. EPA[4]
GENERAL CHEMISTRY									
Ca	mg/ℓ	18	19	---	---	21	19		
Mg	mg/ℓ	5.1	5.7	---	---	6	5		
K	mg/ℓ	3.9	3.8	---	---	3.5	3.4		
Na	mg/ℓ	18	19	---	---	21	19		
Cl	mg/ℓ	14	17	---	---	25	14.2	250.0	250.0
SO_4	mg/ℓ	10.0	7.8	---	---	8	5.1	600.00	250.0
NO_3 (N)	mg/ℓ	0.3	0.3	---	---	0.8	<0.2	10.0	10.0
F	mg/ℓ	0.3	0.4	---	---	0.24	0.4	1.6	4.0
CO_3	mg/ℓ	0	0	---	---	0.0	0.0		
HCO_3	mg/ℓ	66	88	---	---	82	88		
P	mg/ℓ	<0.2	<0.2	---	---	<0.2	<0.2		
Total Hardness	mg/ℓ	62	80	---	---	75	61		
Conductivity	µmohs/cm	19	250	---	---	255	225		
pH		6.89	6.83	---	---	7.4	7.0	6-9	6.5-8.5
TDS	mg/ℓ	143	156	---	---	175	152	1,000.0	500.0
SiO_2	mg/ℓ	26	31	---	---	27	23		

(1) Compiled from Devaurs, 1985; Department of Energy (DOE), 1986a; DOE 1986b, DOE 1986c; DOE 1986d; DOE 1987.
(2) Volume of water in monitoring well insufficient to collect sample.
(3) From New Mexico Environmental Improvement Board, 1985b, New Mexico Water Quality Control Commission, 1986.
(4) From U.S. EPA, 1976; U.S. EPA, 1979.

TABLE 5-15
INORGANIC WATER QUALITY RESULTS FROM MONITORING WELL PCO-2 IN PAJARITO CANYON[1]
(Continued)

DATE SAMPLED		06/11/85	09/03/85	12/04/85[2]	03/06/86[2]	06/10/86	09/18/86	NMEIB/ NMWQCC[3]	U.S. EPA[4]
METALS									
Ag	mg/ℓ	<0.001	<0.001	---	---	<0.005	<0.001	0.05	0.05
As	mg/ℓ	0.001	<0.001	---	---	<0.002	<0.001	0.05	0.05
Ba	mg/ℓ	0.069	0.090	---	---	0.018	0.18	1.0	1.0
Cd	mg/ℓ	<0.001	0.002	---	---	0.0014	<0.0002	0.01	0.01
Cr	mg/ℓ	0.006	0.007	---	---	0.0206	<0.001	0.05	0.05
Hg	mg/ℓ	<0.002	<0.001	---	---	<0.002	<0.002	0.002	0.002
Pb	mg/ℓ	0.006	<0.001	---	---	0.003	<0.001	0.05	0.05
Se	mg/ℓ	<0.003	<0.003	---	---	<0.002	<0.001	0.01	0.01
Cu	mg/ℓ	<0.005	<0.005	---	---	<0.022	0.001	1.0	1.0
Fe	mg/ℓ	0.072	0.051	---	---	<0.002	<0.003	1.0	0.3
Mn	mg/ℓ	0.371	0.321	---	---	<0.003	0.291	0.2	0.05
Zn	mg/ℓ	<0.01	<0.010	---	---	0.01	<0.001	10.0	5.0

(1) Compiled from Devaurs, 1985; Department of Energy (DOE), 1986a; DOE 1986b, DOE 1986c; DOE 1986d; DOE 1987.
(2) Volume of water in monitoring well insufficient to collect sample.
(3) From New Mexico Environmental Improvement Board, 1985b; New Mexico Water Quality Control Commission, 1986.
(4) From U.S. EPA, 1976; U.S. EPA, 1979.

TABLE 5-15
INORGANIC WATER QUALITY RESULTS FROM MONITORING WELL PCO-2 IN PAJARITO CANYON[1]
(Continued)

DATE SAMPLED		06/11/85	09/03/85	12/04/85[2]	03/06/86[2]	06/10/86	09/18/86	NMEIB/ NMWQCC[3]	U.S. EPA[4]
RADIOLOGICALS									
Cs-137	pCi/ℓ	70 ± 82	97.8 ± 86	---	---	-38. ± 56	40 ± 38		200
Pu-238	pCi/ℓ	0.000 ± 0.0001	0.000 ± 0.02	---	---	0.006 ± 0.029	-0.02 ± 0.02		15.0
Pu-239,240	pCi/ℓ	0.000 ± 0.024	0.000 ± 0.02	---	---	-0.011 ± 0.027	0.01 ± 0.02		15.0
H-3	pCi/ℓ	600 ± 800	3,700 ± 1000	---	---	800 ± 800	3,600 ± 600	20,000	20,000
Total U	mg/ℓ	3.8 ± 1.6	5.1 ± 0.5	---	---	2.5 ± 0.6	---	5.0	5.0
Gross Alpha	pCi/ℓ	9.0 ± 26.0	6.0 ± 4.0	---	---	0.4 ± 2	14.0 ± 3.0	15.0	15.0
Gross Beta	pCi/ℓ	16.0 ± 4.0	17.0 ± 4.0	---	---	11 ± 2.0	15.0 ± 2.0		
Gross Gamma	cpm/ℓ	60 ± 120	190 ± 120	---	---	-190 ± 120	146 ± 100		

(1) Compiled from Devaurs, 1985; Department of Energy (DOE), 1986a; DOE 1986b, DOE 1986c; DOE 1986d; DOE 1987.
(2) Volume of water in monitoring well insufficient to collect sample.
(3) From New Mexico Environmental Improvement Board, 1985b; New Mexico Water Quality Control Commission, 1986.
(4) From U.S. EPA, 1976; U.S. EPA, 1979.

TABLE 5-16
INORGANIC WATER QUALITY RESULTS FROM MONITORING WELL PCO-3 IN PAJARITO CANYON[1]

DATE SAMPLED		06/11/85	09/03/85	12/04/85	03/06/86	06/10/86	09/18/86	NMEIB/ NMWQCC[2]	U.S. EPA[3]
GENERAL CHEMISTRY									
Ca	mg/ℓ	40	39	125	87	55	80		
Mg	mg/ℓ	9.8	9.5	29.7	18	12	16		
K	mg/ℓ	3.6	3.8	4.4	3.2	3.9	2.9		
Na	mg/ℓ	24	23	57	41	32	18		
Cl	mg/ℓ	22	22	74	40	24	42.7	250.0	250.0
SO_4	mg/ℓ	7.6	7.3	5.2	9.4	19	0.8	600.00	250.0
NO_3 (N)	mg/ℓ	0.5	<0.1	<0.1	0.0	0.9	<0.2	10.0	10.0
F	mg/ℓ	0.7	0.7	0.4	0.6	0.54	0.3	1.6	4.0
CO_3	mg/ℓ	0	0	<0.5	0.0	0.0	0.0		
HCO_3	mg/ℓ	150	158	477	287	212	281		
P	mg/ℓ	<0.2	<0.2	<0.1	0.0	<0.2	<0.2		
Total Hardness	mg/ℓ	141	149	478	302	183	229		
Conductivity	µmohs/cm	38	390	1080	660	520	650		
pH		7.5	7.46	7.32	8.0	7.8	7.0	6-9	6.5-8.5
TDS	mg/ℓ	251	246	659	438	350	408	1,000.0	500.0
SiO_2	mg/ℓ	35	38	35	34.9	30	32		

(1)Compiled from Devaurs, 1985; Department of Energy (DOE), 1986a; DOE 1986b, DOE 1986c; DOE 1986d; DOE 1987.
(2)From New Mexico Environmental Improvement Board, 1985b; New Mexico Water Quality Control Commission, 1986.
(3)From U.S. EPA, 1976; U.S. EPA, 1979.

TABLE 5-16
INORGANIC WATER QUALITY RESULTS FROM MONITORING WELL PCO-3 IN PAJARITO CANYON[1]
(Continued)

DATE SAMPLED		06/11/85	09/03/85	12/04/85	03/06/86	06/10/86	09/18/86	NMEIB/ NMWQCC[2]	U.S. EPA[3]
METALS									
Ag	mg/ℓ	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	0.05	0.05
As	mg/ℓ	0.001	0.002	0.001	<0.002	<0.002	0.002	0.05	0.05
Ba	mg/ℓ	0.104	0.100	0.303	0.17	0.099	0.04	1.0	1.0
Cd	mg/ℓ	<0.001	0.003	0.009	0.002	<0.001	0.0013	0.01	0.01
Cr	mg/ℓ	0.005	0.003	0.014	<0.003	0.0226	0.002	0.05	0.05
Hg	mg/ℓ	<0.002	<0.001	<0.002	<0.005	<0.002	<0.002	0.002	0.002
Pb	mg/ℓ	<0.003	<0.001	<0.001	<0.005	0.003	<0.001	0.05	0.05
Se	mg/ℓ	<0.003	<0.003	<0.001	<0.001	<0.002	<0.001	0.01	0.01
Cu	mg/ℓ	0.038	0.028	0.054	0.05	0.021	0.025	1.0	1.0
Fe	mg/ℓ	0.005	0.007	0.040	<0.003	0.019	0.003	1.0	0.3
Mn	mg/ℓ	0.388	0.026	2.86	1.72	<0.003	0.395	0.2	0.05
Zn	mg/ℓ	0.052	0.029	0.061	0.035	<0.01	<0.001	10.0	5.0

(1)Compiled from Devaurs, 1985; Department of Energy (DOE), 1986a; DOE 1986b, DOE 1986c; DOE 1986d; DOE 1987.
(2)From New Mexico Environmental Improvement Board, 1985b; New Mexico Water Quality Control Commission, 1986.
(3)From U.S. EPA, 1976; U.S. EPA, 1979.

TABLE 5-16
INORGANIC WATER QUALITY RESULTS FROM MONITORING WELL PCO-3 IN PAJARITO CANYON[1]

(Continued)

DATE SAMPLED		06/11/85	09/03/85	12/04/85	03/06/86	06/10/86	09/18/86	NMEIB/ NMWQCC[2]	U.S. EPA[3]
RADIOLOGICALS									
Cs-137	pCi/ℓ	-10 ± 84	48.1 ± 100	-29.3 ± 66.4	-44.5 ± 70	-10 ± 64	31 ± 43		200
Pu-238	pCi/ℓ	0.024 ± 0.030	0.004 ± 0.02	0.000 ± 0.02	0.012 ± 0.02	-0.027 ± 0.034	0.00 ± 0.001		15
Pu-239,240	pCi/ℓ	0.016 ± 0.022	0.014 ± 0.02	0.032 ± 0.02	0.015 ± 0.02	-0.005 ± 0.016	0.00 ± 0.01		15
H-3	pCi/ℓ	1,300 ± 800	4,800 ± 1,200	9,000 ± 800	1,200 ± 800	900 ± 800	1,900 ± 500	20,000	20,000
Total U	mg/ℓ	1.5 ± 1.0	1.4 ± 0.4	6.2 ± 1.2	0.5 ± 0.4	3.7 ± 0.8	---	5.0	5.0
Gross Alpha	pCi/ℓ	3.0 ± 4.0	0.3 ± 1.6	-40 ± 3.2	2.0 ± 4.0	0.1 ± 2	9.0 ± 3.0	15.0	15.0
Gross Beta	pCi/ℓ	4.8 ± 1.2	3.6 ± 1.0	2.3 ± 1.0	3.1 ± 1.0	10 ± 2.0	12.0 ± 1.0		
Gross Gamma	cpm/ℓ	40 ± 120	120 ± 120	0.0 ± 120	-50 ± 120	-160 ± 120	219 ± 100d		

[1]Compiled from Devaurs, 1985; Department of Energy (DOE), 1986a; DOE 1986b, DOE 1986c; DOE 1986d; DOE 1987.
[2]From New Mexico Environmental Improvement Board, 1985b; New Mexico Water Quality Control Commission, 1986.
[3]From U.S. EPA, 1976; U.S. EPA, 1979.

TABLE 5-17
VOLATILE ORGANIC WATER QUALITY RESULTS FROM MONITORING WELL PCO-1 IN PAJARITO CANYON[1]

DATE SAMPLED	06/11/85	09/03/85	12/04/85	03/06/86	06/10/86	09/18/86	NMWQCC[2]	U.S. EPA[3]
VOLATILE ORGANICS (mg/ℓ)								Proposed MCL's
1,1-Dichloroethylene	---	---	---	ND<0.001	ND<0.001	ND<0.001	0.005	0.007
Methylene Chloride	---	ND<0.005	ND<0.005	ND<0.001	ND<0.001	ND<0.001	0.10	
1,2-Dichloroethylene	---	ND<0.005	ND<0.005	ND<0.001	ND<0.001	ND<0.001		
1,1-Dichloroethane	---	ND<0.010	ND<0.010	ND<0.001	ND<0.001	ND<0.001	0.025	
Chloroform	---	ND<0.010	ND<0.010	ND<0.001	ND<0.001	ND<0.001	0.10	
1,1,1-Trichloroethane	---	ND<0.015	ND<0.015	ND<0.001	ND<0.001	ND<0.001	0.06	0.20
1,2-Dichloroethane	---	ND<0.008	ND<0.008	ND<0.001	ND<0.001	ND<0.001	0.01	0.005
Benzene	---	ND<0.005	ND<0.005	ND<0.001	ND<0.001	ND<0.001	0.01	0.005
Carbon Tetrachloride	---	ND<0.020	ND<0.020	ND<0.001	ND<0.001	ND<0.001	0.01	0.005
Trichloroethylene	---	ND<0.005	ND<0.005	ND<0.001	ND<0.001	ND<0.001	0.10	0.005
1,2-Dichloropropane	---	ND<0.005	ND<0.005	ND<0.001	ND<0.001	ND<0.001		
Bromodichloromethane	---	ND<0.010	ND<0.010	ND<0.001	ND<0.001	ND<0.001		
Toluene	---	ND<0.005	ND<0.005	ND<0.001	ND<0.001	ND<0.001	0.75	
1,1,2-Trichloroethane	---	ND<0.015	ND<0.015	ND<0.001	ND<0.001	ND<0.001	0.01	
Chlorodibromomethane	---	ND<0.010	ND<0.010	ND<0.005	ND<0.005	---		
Tetrachloroethylene	---	ND<0.020	ND<0.020	ND<0.001	ND<0.001	ND<0.001	0.02	
Chlorobenzene	---	ND<0.012	ND<0.012	ND<0.001	ND<0.001	ND<0.001		
Ethylbenzene	---	ND<0.008	ND<0.008	ND<0.001	ND<0.001	ND<0.001	0.750	
Bromoform	---	ND<0.010	ND<0.010	ND<0.001	ND<0.001	ND<0.001		
1,1,2,2-Tetrachloroethane	---	ND<0.020	ND<0.020	ND<0.001	ND<0.001	ND<0.001	0.01	
Bromobenzene	---	ND<0.022	ND<0.022	---	---	---		
1,3-Dichlorobenzene	---	ND<0.005	ND<0.005	---	---	ND<0.001		

(1) Compiled from Devaurs, 1985; Department of Energy (DOE), 1986a; DOE 1986b, DOE 1986c; DOE 1986d; DOE 1987.
(2) From New Mexico Water Quality Control Commission, 1986.
(3) From U.S. EPA, 1985b.

TABLE 5-17
VOLATILE ORGANIC WATER QUALITY RESULTS FROM MONITORING WELL PCO-1 IN PAJARITO CANYON[1]
(Continued)

DATE SAMPLED	06/11/85	09/03/85	12/04/85	03/06/86	06/10/86	09/18/86	NMWQCC[2]	U.S. EPA[3]
VOLATILE ORGANICS (mg/ℓ) (Continued)								Proposed MCL's
1,4-Dichlorobenzene	---	---	---	---	---	ND<0.001		0.75
1,2-Dichlorobenzene	---	ND<0.005	ND<0.005	---	---	ND<0.001		
Chloromethane	---	---	---	ND<0.005	ND<0.005	---		
Bromomethane	---	---	---	ND<0.005	ND<0.005	---		
Vinyl Chloride	---	---	---	ND<0.005	ND<0.005	---	0.001	0.001
Chloroethane	---	---	---	ND<0.005	ND<0.005	---		
Acetone	---	---	---	ND<0.005	ND<0.005	ND<0.005		
2-Butanone	---	---	---	ND<0.005	ND<0.005	---		
Vinyl Acetate	---	---	---	ND<0.005	ND<0.005	---		
trans-1,3-Dichloropropene	---	---	---	ND<0.005	ND<0.005	ND<0.005		
cis-1,3-Dichloropropene	---	---	---	ND<0.005	ND<0.005	ND<0.005		
2-Hexanone	---	---	---	ND<0.005	ND<0.005	---		
4-Methyl-2-Pentanone	---	---	---	ND<0.001	ND<0.001	ND<0.001		
Styrene	---	---	---	ND<0.005	ND<0.005	ND<0.005		
Total Xylenes	---	---	---	ND<0.001	ND<0.001	ND<0.001	0.620	
Trichlorofluoromethane	---	---	---	ND<0.005	ND<0.005	---		
Tetrahydrofuran	---	---	---	ND<0.005	ND<0.005	---		
Dibromochloromethane	---	---	---	---	---	ND<0.001		
Dibromomethane	---	---	---	---	---	ND<0.001		

(1) Compiled from Devaurs, 1985; Department of Energy (DOE), 1986a; DOE 1986b, DOE 1986c; DOE 1986d; DOE 1987.
(2) From New Mexico Water Quality Control Commission, 1986.
(3) From U.S. EPA, 1985b.

TABLE 5-17
VOLATILE ORGANIC WATER QUALITY RESULTS FROM MONITORING WELL PCO-1 IN PAJARITO CANYON[1]
(Continued)

DATE SAMPLED	06/11/85	09/03/85	12/04/85	03/06/86	06/10/86	09/18/86	NMWQCC[2]	U.S. EPA[3]
VOLATILE ORGANICS (mg/ℓ) (Continued)								Proposed MCL's
1,2-Dibromo-3-Chloropropane	---	---	---	---	---	ND<0.001		
2-Chloroethylvinyl Ether	---	---	---	---	---	ND<0.005		
Carbon Disulfide	---	---	---	---	---	ND<0.005		
Purgeable Gases[4]	---	---	---	---	---	ND<0.010		

(1) Compiled from Devaurs, 1985; Department of Energy (DOE), 1986a; DOE 1986b, DOE 1986c; DOE 1986d; DOE 1987.
(2) From New Mexico Water Quality Control Commission, 1986.
(3) From U.S. EPA, 1985b.
(4) Includes chloromethane, chloroethane, bromomethane, and vinyl chloride.

TABLE 5-18
VOLATILE ORGANIC WATER QUALITY RESULTS FROM MONITORING WELL PCO-2 IN PAJARITO CANYON[1]

DATE SAMPLED	06/11/85	09/03/85	12/04/85[2]	03/06/86[2]	06/10/86	09/18/86	NMWQCC[3]	U.S. EPA[4]
VOLATILE ORGANICS (mg/ℓ)								Proposed MCL's
1,1-Dichloroethylene	---	---	---	---	ND<0.001	ND<0.001	0.005	0.007
Methylene Chloride	---	ND<0.005	---	---	ND<0.001	ND<0.001	0.10	
1,2-Dichloroethylene	---	ND<0.005	---	---	ND<0.001	ND<0.001		
1,1-Dichloroethane	---	ND<0.010	---	---	ND<0.001	ND<0.001	0.025	
Chloroform	---	ND<0.010	---	---	ND<0.001	ND<0.001	0.10	
1,1,1-Trichloroethane	---	ND<0.015	---	---	ND<0.001	ND<0.001	0.06	0.20
1,2-Dichloroethane	---	ND<0.008	---	---	ND<0.001	ND<0.001	0.01	0.005
Benzene	---	ND<0.005	---	---	ND<0.001	ND<0.001	0.01	0.005
Carbon Tetrachloride	---	ND<0.020	---	---	ND<0.001	ND<0.001	0.01	0.005
Trichloroethylene	---	ND<0.005	---	---	ND<0.001	ND<0.001	0.10	0.005
1,2-Dichlorepropane	---	ND<0.005	---	---	ND<0.001	ND<0.001		
Bromodichloromethane	---	ND<0.010	---	---	ND<0.001	ND<0.001		
Toluene	---	ND<0.005	---	---	ND<0.001	ND<0.001	0.75	
1,1,2-Trichloroethane	---	ND<0.015	---	---	ND<0.001	ND<0.001	0.01	
Chlorodibromomethane	---	ND<0.010	---	---	ND<0.005	---		
Tetrachloroethylene	---	ND<0.020	---	---	ND<0.001	ND<0.001	0.02	
Chlorobenzene	---	ND<0.012	---	---	ND<0.001	ND<0.001		
Ethylbenzene	---	ND<0.008	---	---	ND<0.001	ND<0.001	0.750	
Bromoform	---	ND<0.010	---	---	ND<0.001	ND<0.001		
1,1,2,2-Tetrachloroethane	---	ND<0.020	---	---	ND<0.001	ND<0.001	0.01	

(1) Compiled from Devaurs, 1985; Department of Energy (DOE), 1986a; DOE 1986b, DOE 1986c; DOE 1986d; DOE 1987.
(2) Volume of water in monitoring well insufficient to collect sample.
(3) From New Mexico Water Quality Control Commission, 1986.
(4) From U.S. EPA, 1985b.

TABLE 5-18
VOLATILE ORGANIC WATER QUALITY RESULTS FROM MONITORING WELL PCO-2 IN PAJARITO CANYON[1]

(Continued)

DATE SAMPLED	06/11/85	09/03/85	12/04/85[2]	03/06/86[2]	06/10/86	09/18/86	NMWQCC[3]	U.S. EPA[4]
VOLATILE ORGANICS (mg/ℓ) (Continued)								Proposed MCL's
Bromobenzene	---	ND<0.022	---	---	---	---		
1,3-Dichlorobenzene	---	ND<0.005	---	---	---	ND<0.001		
1,4-Dichlorobenzene	---	---	---	---	---	ND<0.001		0.75
1,2-Dichlorobenzene	---	ND<0.005	---	---	---	ND<0.001		
Chloromethane	---	---	---	---	ND<0.005	---		
Bromomethane	---	---	---	---	ND<0.005	---		
Vinyl Chloride	---	---	---	---	ND<0.005	---	0.001	0.001
Chloroethane	---	---	---	---	ND<0.005	---		
Acetone	---	---	---	---	ND<0.005	ND<0.005		
2-Butanone	---	---	---	---	ND<0.005	---		
Vinyl acetate	---	---	---	---	ND<0.005	---		
trans-1,3-Dichloropropene	---	---	---	---	ND<0.005	ND<0.005		
cis-1,3-Dichloropropene	---	---	---	---	ND<0.005	ND<0.005		
2-Hexanone	---	---	---	---	ND<0.005	---		
4-Methyl-2-Pentanone	---	---	---	---	ND<0.005	ND<0.001		
Styrene	---	---	---	---	ND<0.005	ND<0.005		
Total Xylenes	---	---	---	---	ND<0.005	ND<0.001	0.620	
Trichlorofluoromethane	---	---	---	---	ND<0.005	---		
Tetrahydrofuran	---	---	---	---	ND<0.005	---		

(1) Compiled from Devaurs, 1985; Department of Energy (DOE), 1986a; DOE 1986b, DOE 1986c; DOE 1986d; DOE 1987.
(2) Volume of water in monitoring well insufficient to collect sample.
(3) From New Mexico Water Quality Control Commission, 1986.
(4) From U.S. EPA, 1985b.

TABLE 5-18
VOLATILE ORGANIC WATER QUALITY RESULTS FROM MONITORING WELL PCO-2 IN PAJARITO CANYON[1]
(Continued)

DATE SAMPLED	06/11/85	09/03/85	12/04/85[2]	03/06/86[2]	06/10/86	09/18/86	NMWQCC[3]	U.S. EPA[4]
VOLATILE ORGANICS (mg/ℓ) (Continued)								Proposed MCL's
Dibromochloromethane	---	---	---	---	---	ND<0.001		
Dibromomethane	---	---	---	---	---	ND<0.001		
1,2-Dibromo-3-Chloropropane	---	---	---	---	---	ND<0.001		
2-Chloroethylvinyl Ether	---	---	---	---	---	ND<0.005		
Carbon Disulfide	---	---	---	---	---	ND<0.005		
Purgeable Gases[5]	---	---	---	---	---	ND<0.010		

(1) Compiled from Devaurs, 1985; Department of Energy (DOE), 1986a; DOE 1986b, DOE 1986c; DOE 1986d; DOE 1987.
(2) Volume of water in monitoring well insufficient to sample.
(3) From New Mexico Water Quality Control Commission, 1986.
(4) From U.S. EPA, 1985b.
(5) Includes chloromethane, chloroethane, bromomethane, and vinyl chloride.

TABLE 5-19
VOLATILE ORGANIC WATER QUALITY RESULTS FROM MONITORING WELL PCO-3 IN PAJARITO CANYON[1]

DATE SAMPLED	06/11/85	09/03/85	12/04/85	03/06/86	06/10/86	09/18/86	NMWQCC[2]	U.S. EPA[3]
VOLATILE ORGANICS (mg/ℓ)								Proposed MCL's
1,1-Dichloroethylene	---	---	---	ND<0.001	ND<0.001	ND<0.001	0.005	0.007
Methylene Chloride	---	ND<0.005	ND<0.005	ND<0.001	ND<0.001	ND<0.001	0.10	
1,2-Dichloroethylene	---	ND<0.005	ND<0.005	ND<0.001	ND<0.001	ND<0.001		
1,1-Dichloroethane	---	ND<0.010	ND<0.010	ND<0.001	ND<0.001	ND<0.001	0.025	
Chloroform	---	ND<0.010	ND<0.010	ND<0.001	ND<0.001	ND<0.001	0.10	
1,1,1-Trichloroethane	---	ND<0.015	ND<0.015	ND<0.001	ND<0.001	ND<0.001	0.06	0.20
1,2-Dichloroethane	---	ND<0.008	ND<0.008	ND<0.001	ND<0.001	ND<0.001	0.01	0.005
Benzene	---	ND<0.005	ND<0.005	ND<0.001	ND<0.001	ND<0.001	0.01	0.005
Carbon tetrachloride	---	ND<0.020	ND<0.020	ND<0.001	ND<0.001	ND<0.001	0.01	0.005
Trichloroethylene	---	ND<0.005	ND<0.005	ND<0.001	ND<0.001	ND<0.001	0.10	0.005
1,2-Dichloropropane	---	ND<0.005	ND<0.005	ND<0.001	ND<0.001	ND<0.001		
Bromodichloromethane	---	ND<0.010	ND<0.010	ND<0.001	ND<0.001	ND<0.001		
Toluene	---	ND<0.005	ND<0.005	ND<0.001	ND<0.001	ND<0.001	0.75	
1,1,2-Trichloroethane	---	ND<0.015	ND<0.015	ND<0.001	ND<0.001	ND<0.001	0.01	
Chlorodibromomethane	---	ND<0.010	ND<0.010	ND<0.005	ND<0.005	---		
Tetrachlorethylene	---	ND<0.020	ND<0.020	ND<0.001	ND<0.001	ND<0.001	0.02	
Chlorobenzene	---	ND<0.012	ND<0.012	ND<0.001	ND<0.001	ND<0.001		
Ethylbenzene	---	ND<0.008	ND<0.008	ND<0.001	ND<0.001	ND<0.001	0.750	
Bromoform	---	ND<0.010	ND<0.010	ND<0.001	ND<0.001	ND<0.001		
1,1,2,2-Tetrachloroethane	---	ND<0.020	ND<0.020	ND<0.001	ND<0.001	ND<0.001	0.01	

(1) Compiled from Devaurs, 1985; Department of Energy (DOE), 1986a; DOE 1986b, DOE 1986c; DOE 1986d; DOE 1987.
(2) From New Mexico Water Quality Control Commission, 1986.
(3) From U.S. EPA, 1985b.

TABLE 5-19
VOLATILE ORGANIC WATER QUALITY RESULTS FROM MONITORING WELL PCO-3 IN PAJARITO CANYON[1]
(Continued)

DATE SAMPLED	06/11/85	09/03/85	12/04/85	03/06/86	06/10/86	09/18/86	NMWQCC[2]	U.S. EPA[3]
VOLATILE ORGANICS (mg/ℓ) (Continued)								Proposed MCL's
Bromobenzene	---	ND<0.022	ND<0.022	---	---	---		
1,3-Dichlorobenzene	---	ND<0.005	ND<0.005	---	---	ND<0.001		
1,4-Dichlorobenzene	---	---	---	---	---	ND<0.001		0.75
1,2-Dichlorobenzene	---	ND<0.005	ND<0.005	---	---	ND<0.001		
Chloromethane	---	---	---	ND<0.005	ND<0.005	---		
Bromomethane	---	---	---	ND<0.005	ND<0.005	---		
Vinyl Chloride	---	---	---	ND<0.005	ND<0.005	---	0.001	0.001
Chloroethane	---	---	---	ND<0.005	ND<0.005	---		
Acetone	---	---	---	ND<0.005	ND<0.005	ND<0.005		
2-Butanone	---	---	---	ND<0.005	ND<0.005	---		
Vinyl Acetate	---	---	---	ND<0.005	ND<0.005	---		
trans-1,3-Dichloropropene	---	---	---	ND<0.005	ND<0.005	ND<0.005		
cis-1,3-Dichloropropene	---	---	---	ND<0.005	ND<0.005	ND<0.005		
2-Hexanone	---	---	---	ND<0.005	ND<0.005	---		
4-Methyl-2-Pentanone	---	---	---	ND<0.001	ND<0.001	ND<0.001		
Styrene	---	---	---	ND<0.005	ND<0.005	ND<0.005		
Total Xylenes	---	---	---	ND<0.001	ND<0.001	ND<0.001	0.620	
Trichlorofluoromethane	---	---	---	ND<0.005	ND<0.005	---		
Tetrahydrofuran	---	---	---	ND<0.005	ND<0.005	---		

(1) Compiled from Devaurs, 1985; Department of Energy (DOE), 1986a; DOE 1986b, DOE 1986c; DOE 1986d; DOE 1987.
(2) From New Mexico Water Quality Control Commission, 1986.
(3) From U.S. EPA, 1985b.

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TABLE 5-19
VOLATILE ORGANIC WATER QUALITY RESULTS FROM MONITORING WELL PCO-3 IN PAJARITO CANYON[1]
(Continued)

DATE SAMPLED	06/11/85	09/03/85	12/04/85	03/06/86	06/10/86	09/18/86	NMWQCC[2]	U.S. EPA[3]
VOLATILE ORGANICS (mg/ℓ) (Continued)								Proposed MCL's
Dibromochloromethane	---	---	---	---	---	ND<0.001		
Dibromomethane	---	---	---	---	---	ND<0.001		
1,2-Dibromo-3-Chloropropane	---	---	---	---	---	ND<0.001		
2-Chloroethylvinyl Ether	---	---	---	---	---	ND<0.005		
Carbon Disulfide	---	---	---	---	---	ND<0.005		
Purgeable Gases[4]	---	---	---	---	---	ND<0.010		

(1) Compiled from Devaurs, 1985; Department of Energy (DOE), 1986a; DOE 1986b, DOE 1986c; DOE 1986d; DOE 1987.
(2) From New Mexico Water Quality Control Commission, 1986.
(3) From U.S. EPA, 1985b.
(4) Includes chloromethane, chloroethane, bromomethane, and vinyl chloride.

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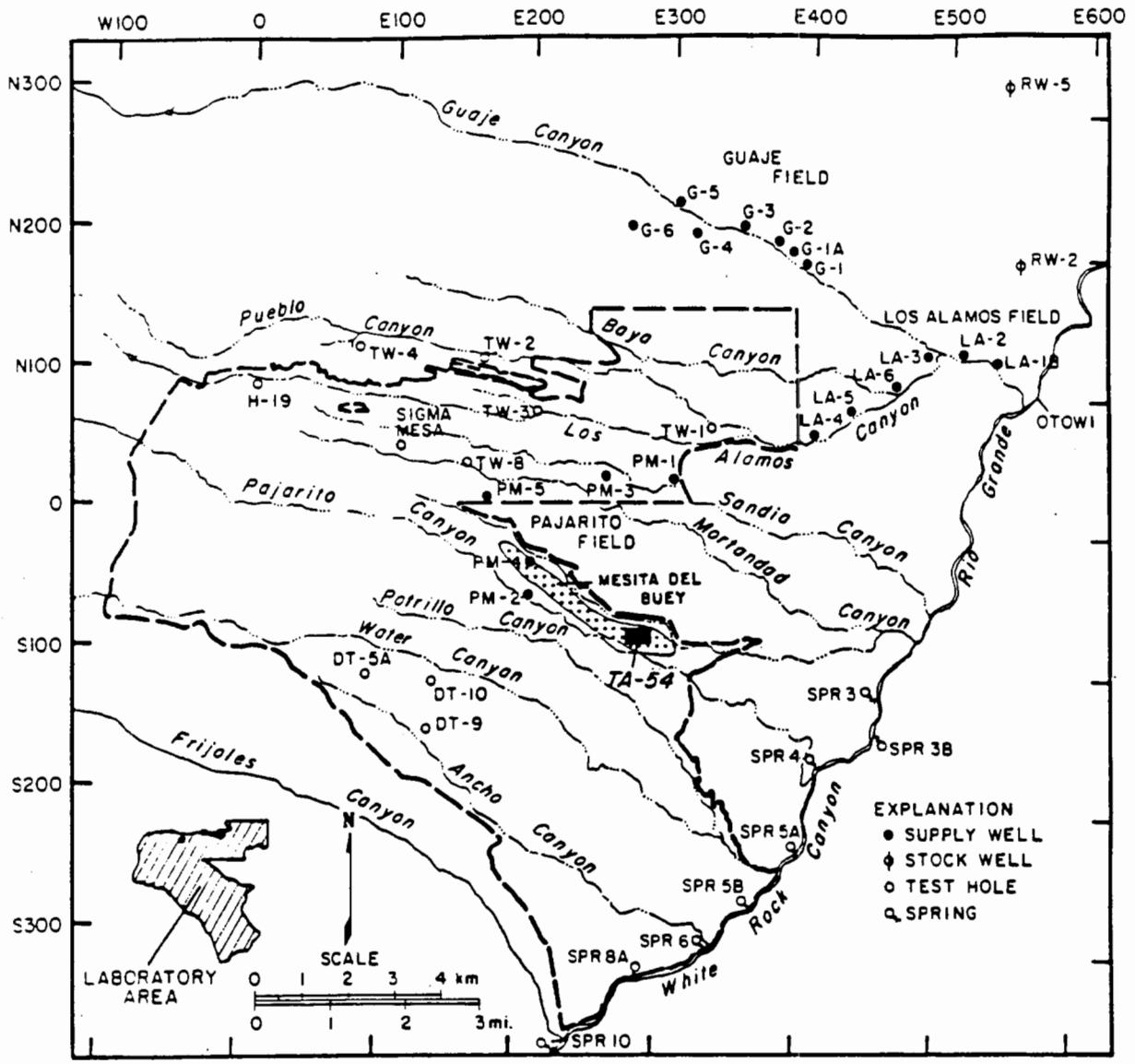

FIGURE 5-1 LOCATION OF SUPPLY WELLS, TEST WELLS, STOCK WELLS, AND SPRINGS IN THE MAN AQUIFER IN THE LOS ALAMOS AREA (PURTYMUN, 1984)

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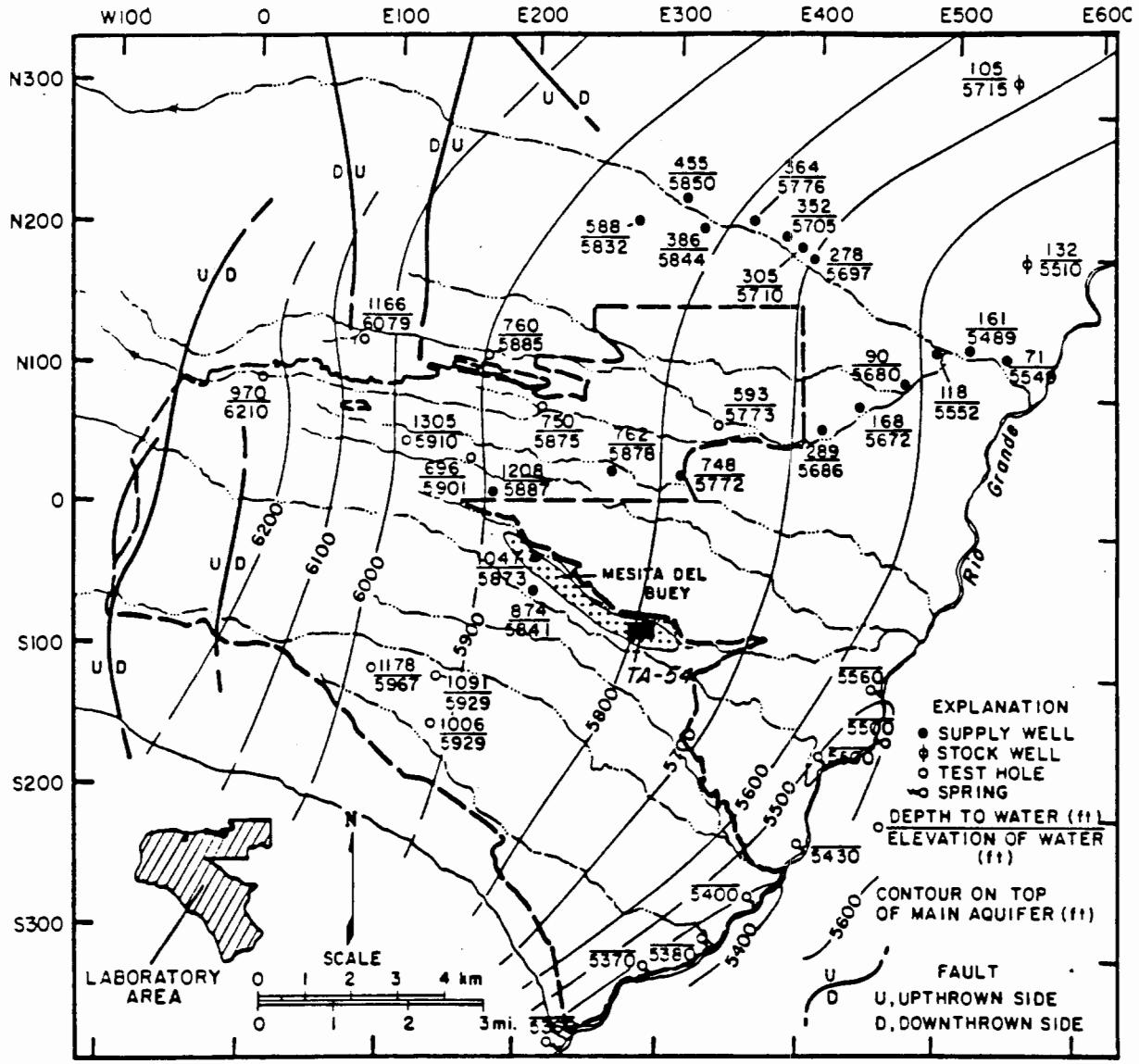

FIGURE 5-2 POTENTIOMETRIC SURFACE MAP OF THE MAIN AQUIFER IN THE LOS ALAMOS AREA (PURTYMUN, 1984)

301017 0

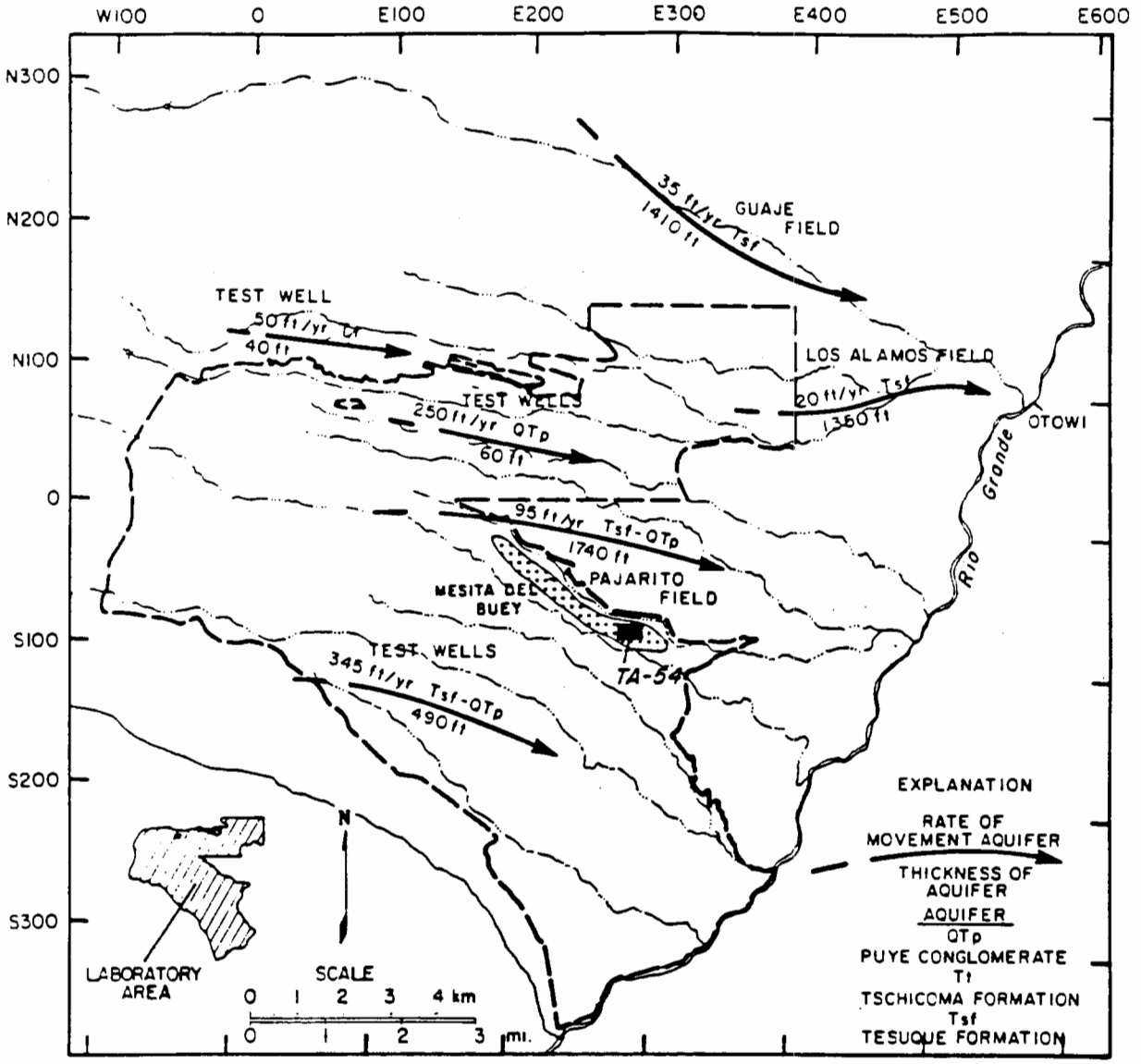

FIGURE 5-3 RATE OF MOVEMENT OF WATER IN THE MAIN AQUIFER IN THE LOS ALAMOS AREA (PURTYMUN, 1984)

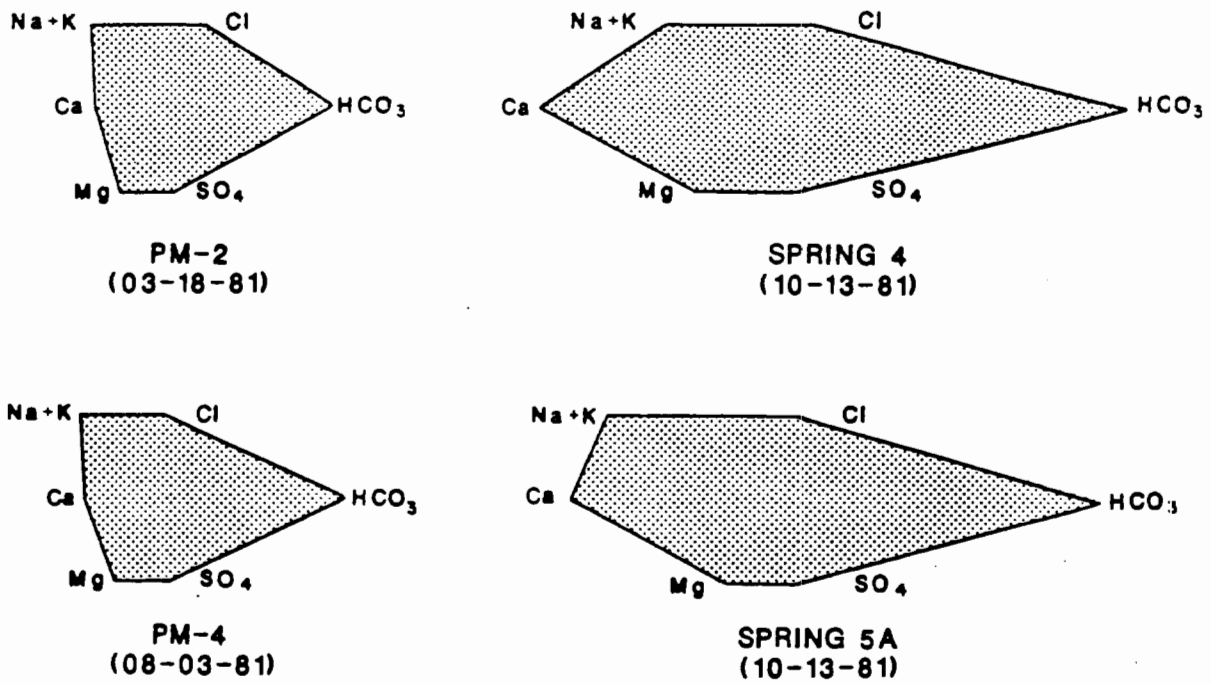

FIGURE 5-4

STIFF DIAGRAMS
FOR THE MAIN AQUIFER
NEAR MESITA DEL BUEY

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LOS ALAMOS, NEW MEXICO

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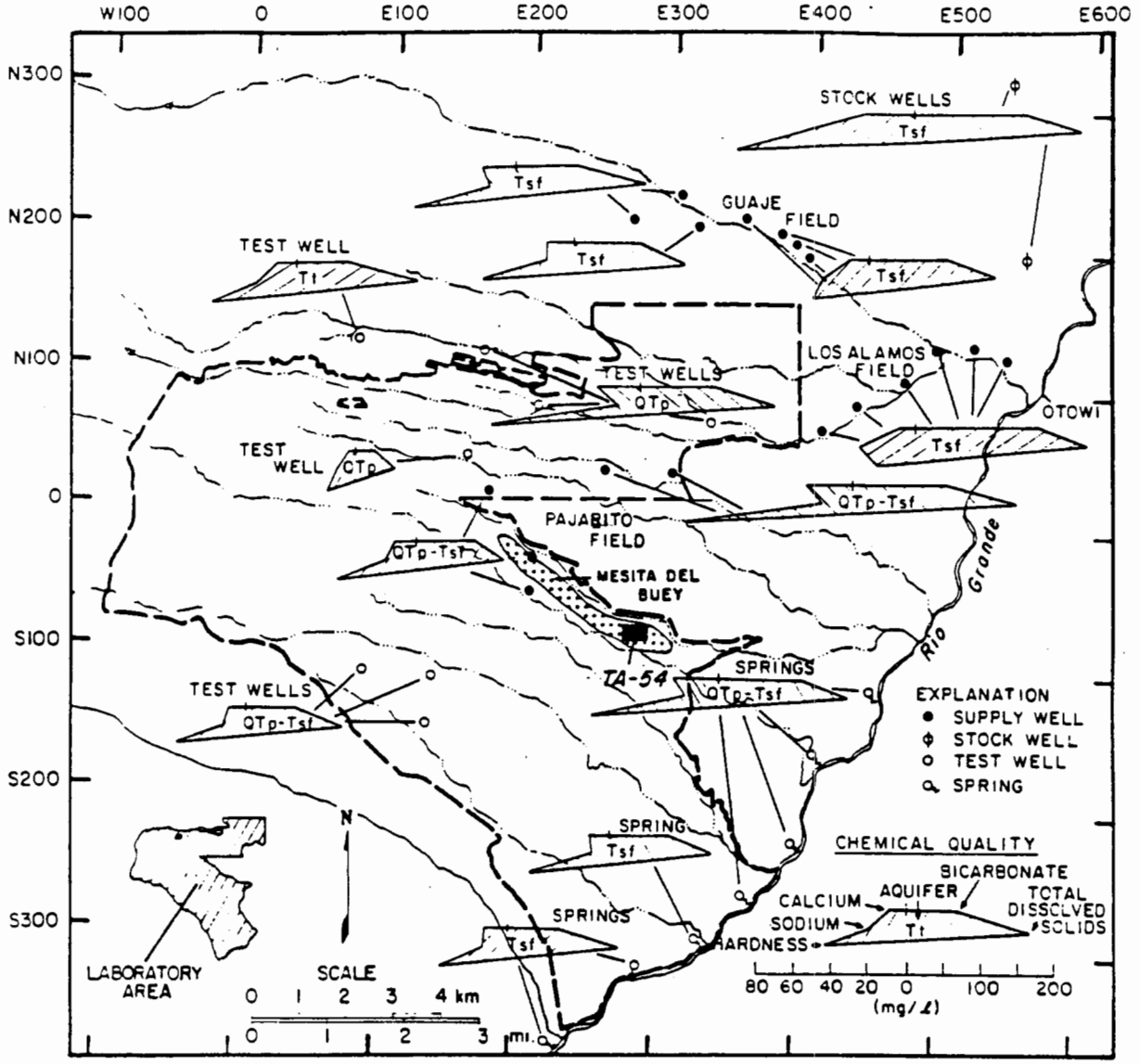

FIGURE 5-5 GRAPHIC COMPARISON OF CHEMICAL CONSTITUENTS IN THE MAIN AQUIFER FROM SUPPLY WELLS, TEST WELLS, STOCK WELLS, AND SPRINGS (PURTYMUN, 1984)

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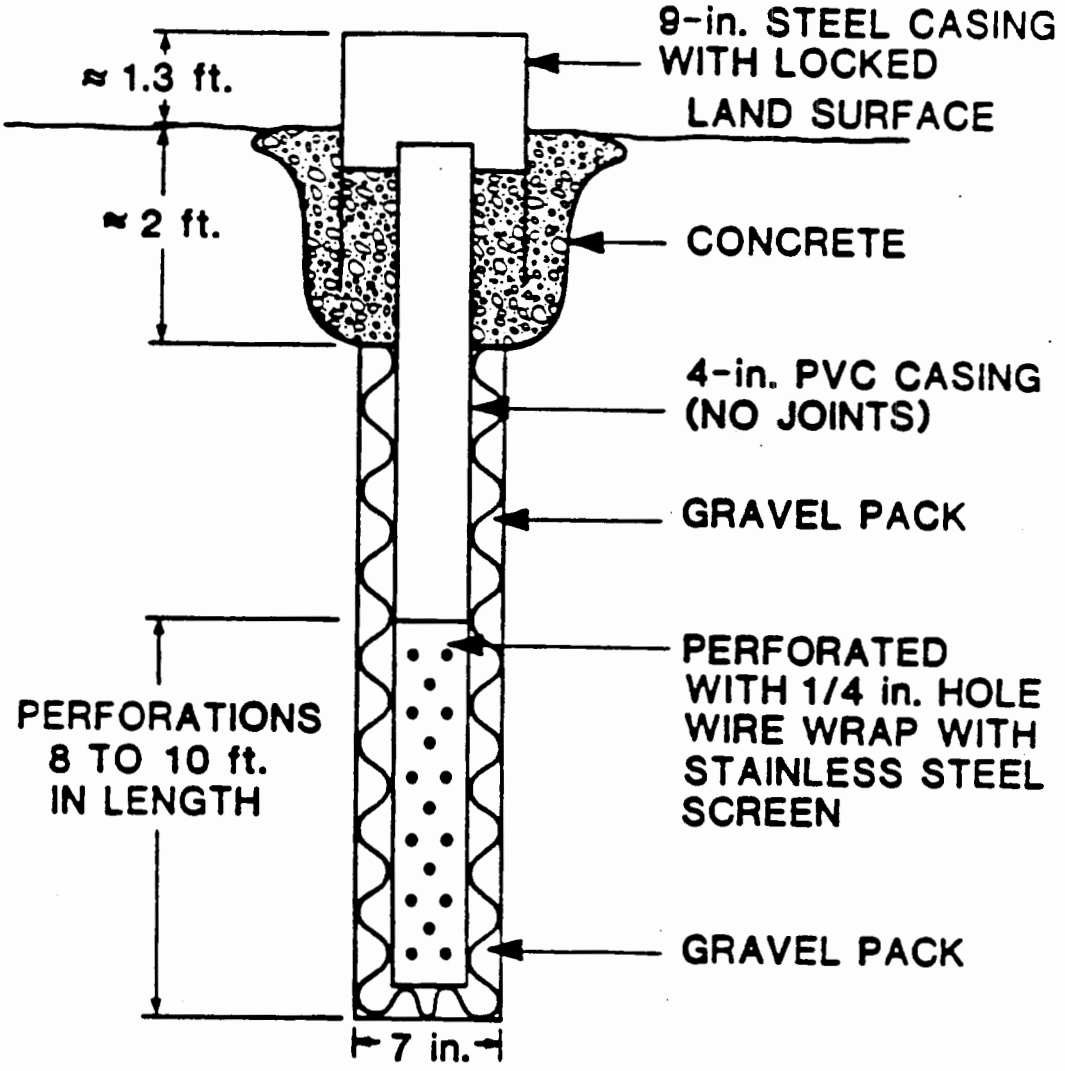
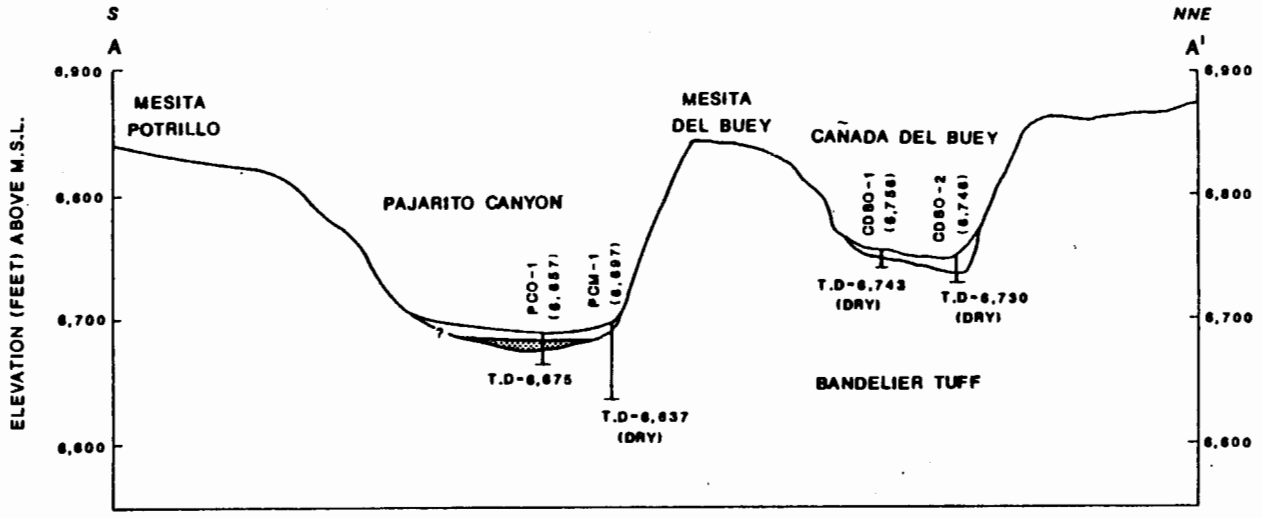
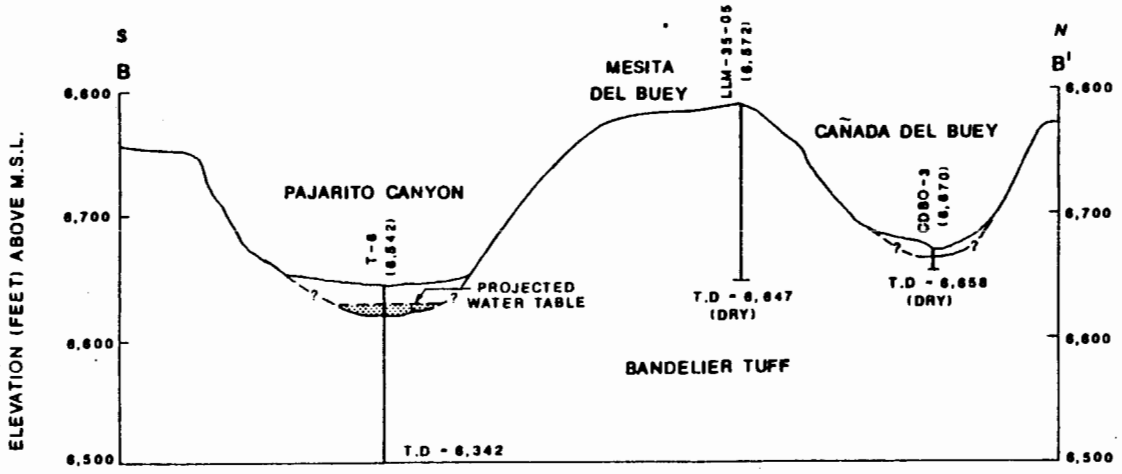


FIGURE 5-6 CONSTRUCTION SCHEMATIC OF MONITORING WELLS IN PAJARITO CANYON AND CAÑADA DEL BUEY (DEVAURS, 1985)





PERCHED WATER IN ALLUVIUM

400 200 0 400 FEET

HORIZONTAL SCALE

FIGURE 5-7

TOPOGRAPHIC PROFILES
A-A' AND B-B' AND
GEOLOGIC CROSS-SECTIONS
THROUGH MESITA DEL BUEY

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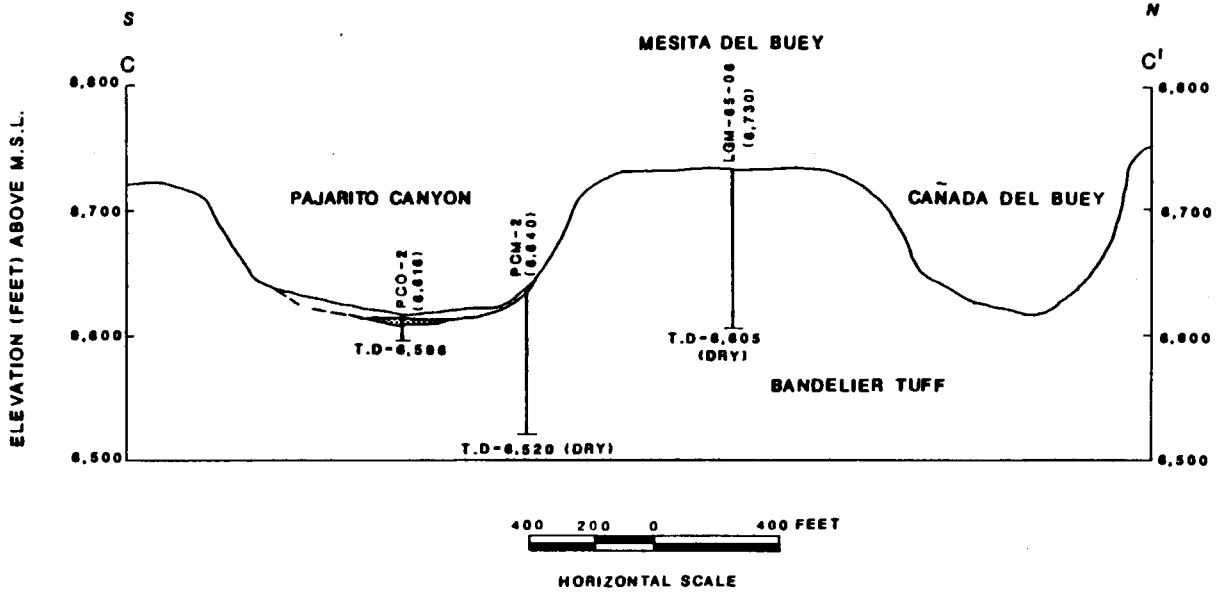

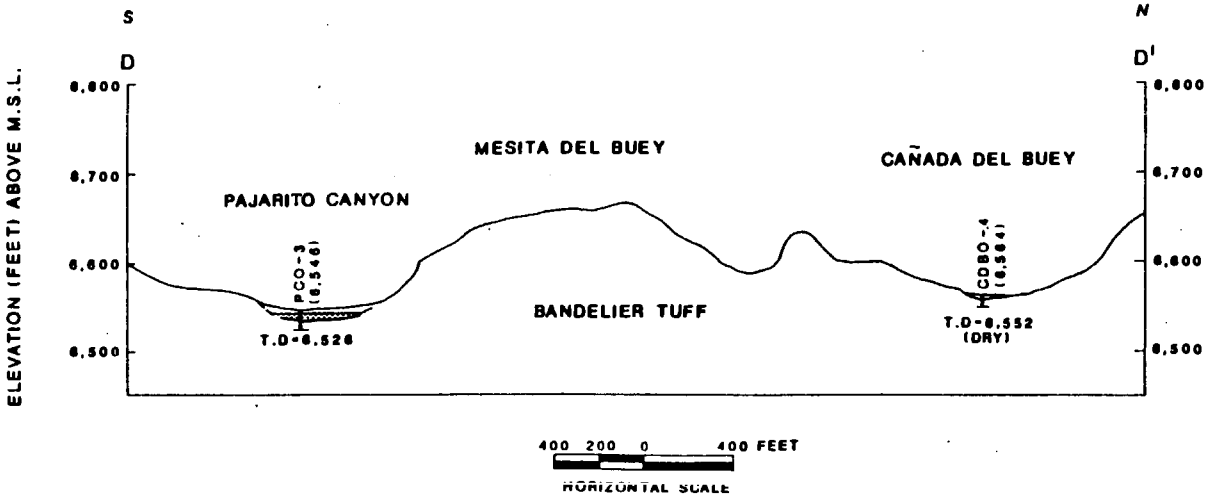

PERCHED WATER IN ALLUVIUM

FIGURE 5-8
TOPOGRAPHIC PROFILES
C-C' AND D-D' AND
GEOLOGIC CROSS-SECTIONS
OF MESITA DEL BUEY
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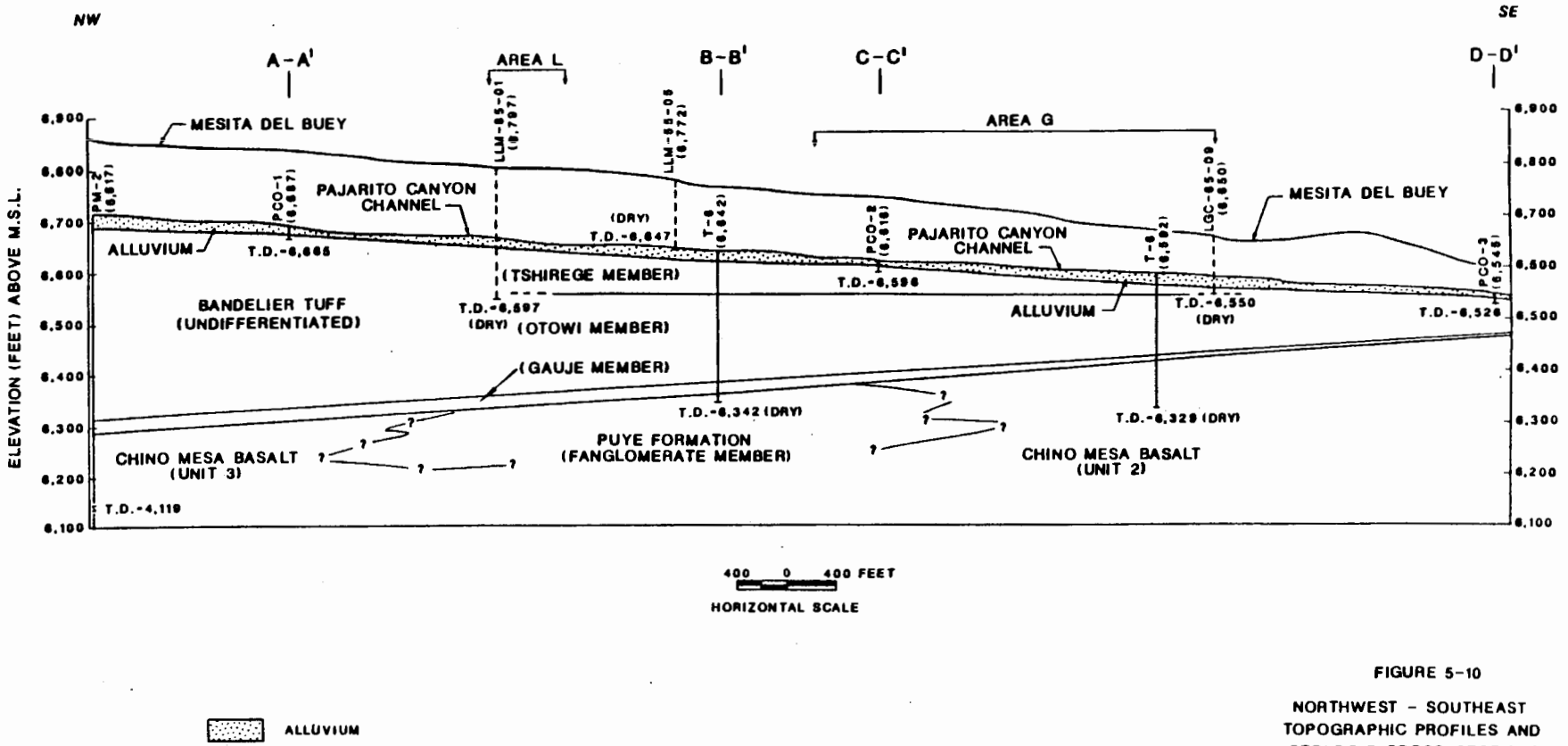

FIGURE 5-10

NORTHWEST - SOUTHEAST TOPOGRAPHIC PROFILES AND GEOLOGIC CROSS-SECTIONS OF MESITA DEL BUEY AND PAJARITO CANYON

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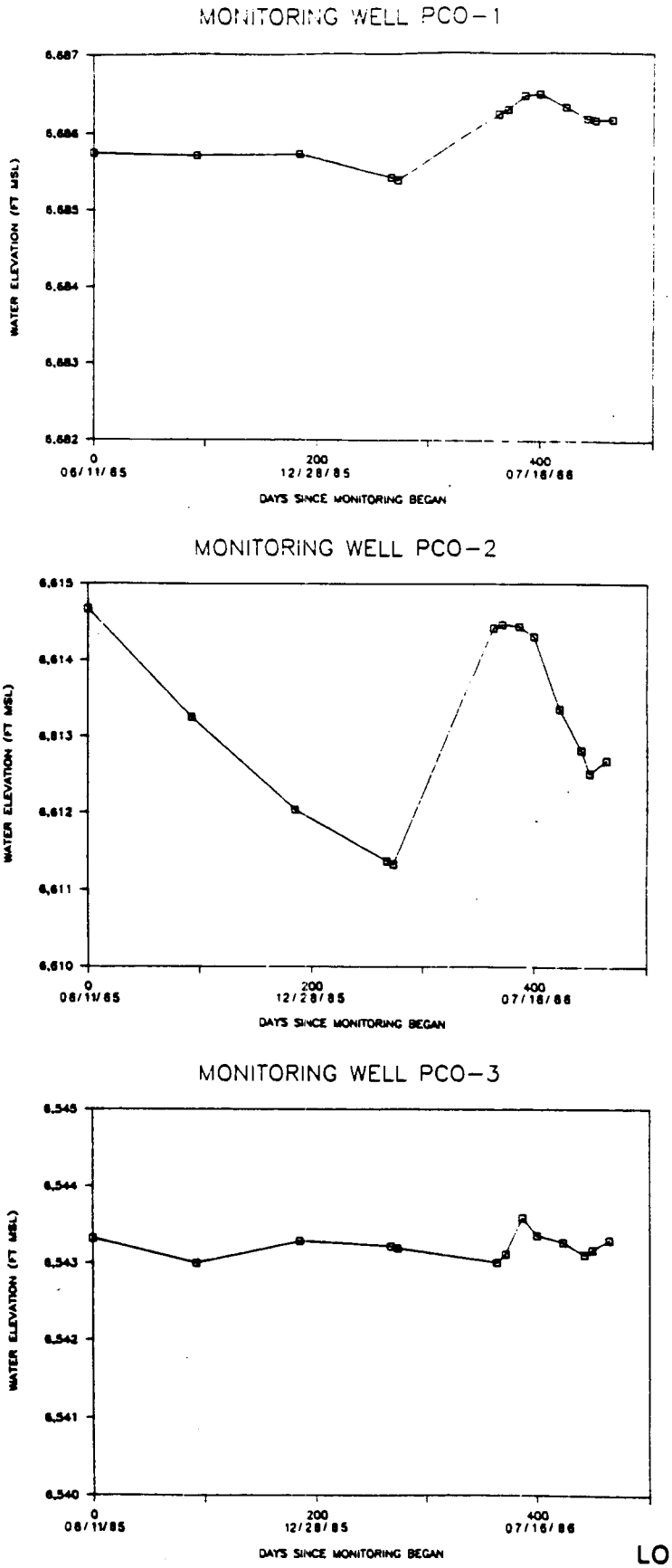

FIGURE 5-11

PLOT OF WATER-LEVEL ELEVATION VERSUS TIME FOR PAJARITO CANYON MONITORING WELLS

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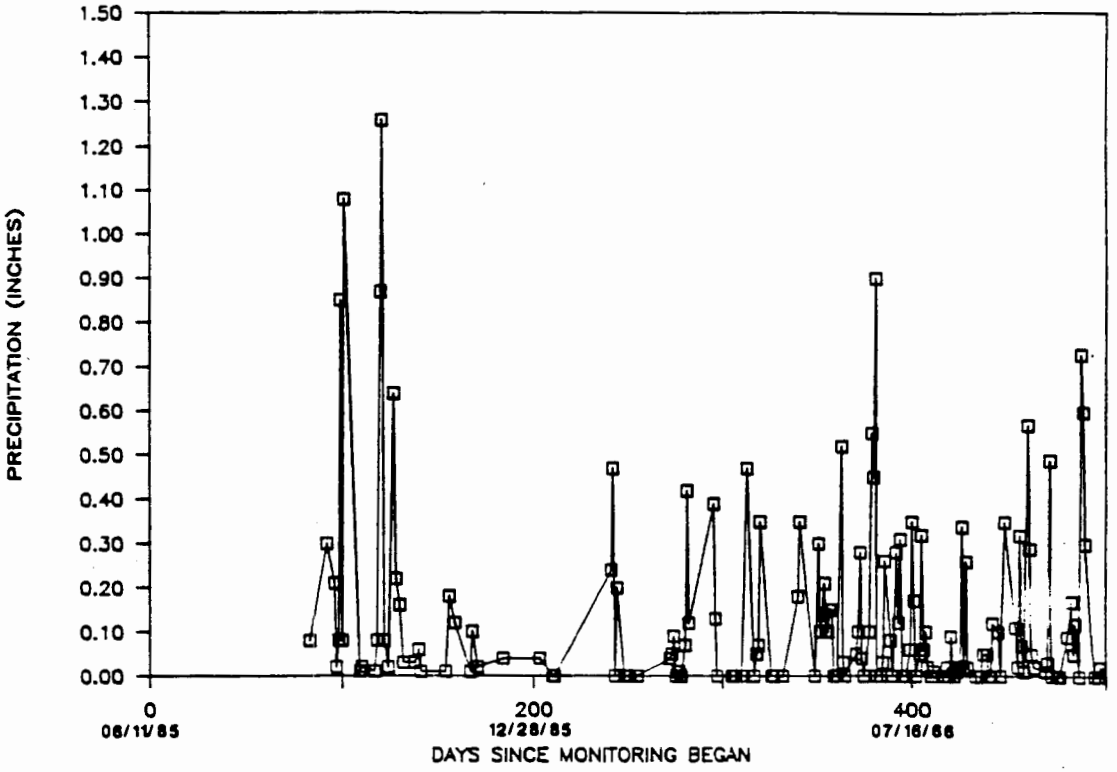
AREA G PRECIPITATION STATION



NOTE: 1985-1986 precipitation data is tabulated in Appendix F

FIGURE 5-12

SUMMARY OF THE 1985-1986 PRECIPITATION DATA IN AREA G

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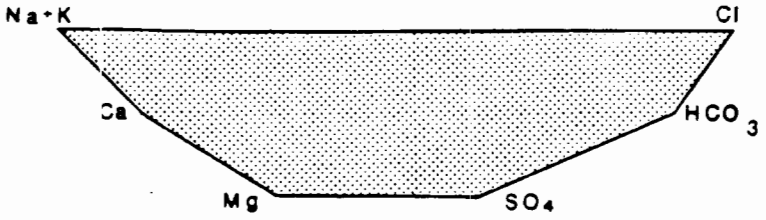

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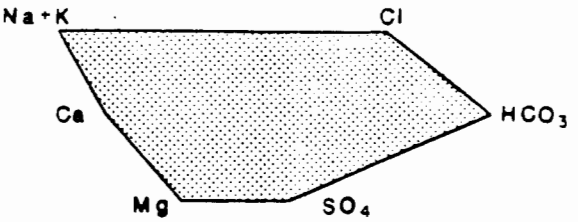

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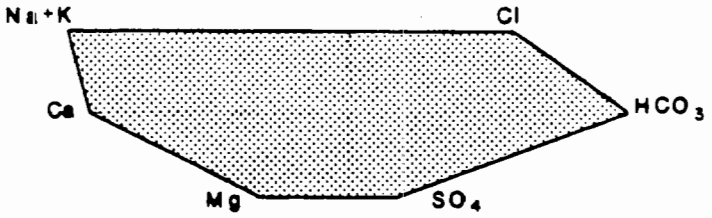

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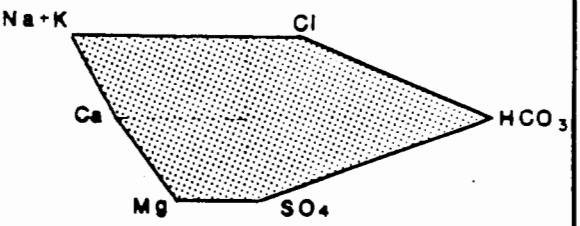

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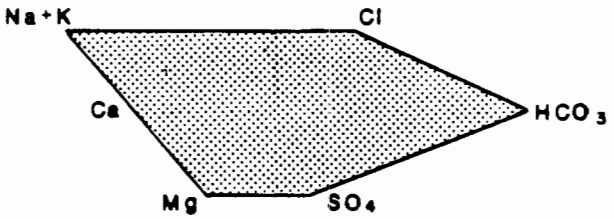

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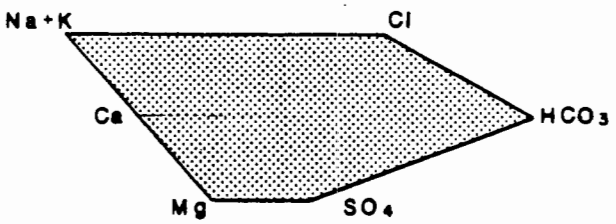

03-06-86

FIGURE 5-13

STIFF DIAGRAMS FOR PERCHED WATER
IN MONITORING WELL PCO-1
PAJARITO CANYON

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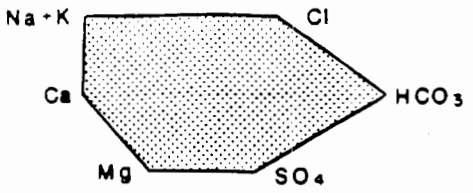

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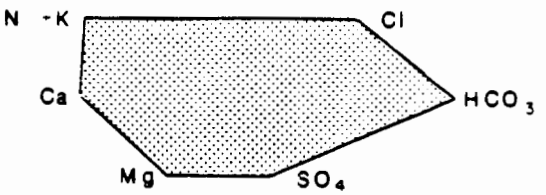

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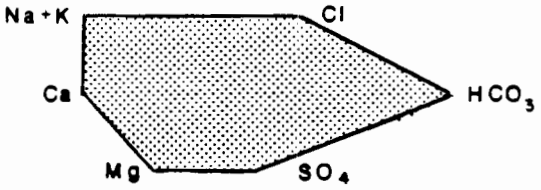
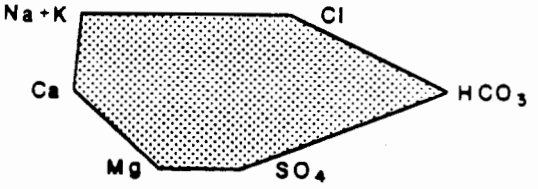


09-03-85



09-16-86

12-04-85
(NOT AVAILABLE)

03-06-86
(NOT AVAILABLE)

FIGURE 5-14

STIFF DIAGRAMS FOR PERCHED WATER IN MONITORING WELL PCO-2
PAJARITO CANYON

PREPARED FOR

LOS ALAMOS NATIONAL LABORATORY
LOS ALAMOS, NEW MEXICO

DRAWN BY LLF 2/17/86 | CHECKED BY SWJ 8/25/87 | APPROVED BY [illegible] 3/25/87 | DRAWING NUMBER 301017 A58

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Do Not Scale This Drawing

65360

AREA G: JULY 1986 PSYCHROMETER DATA

DATE	CORRECTION	TEMP (DEG C)	OFFSET (MICROVOLTS)	READING (MICROVOLTS)	DEPTH (FT)	WATER POTENTI. (-BARS)
01JUL86	0.89	14.5	1.9	8.3	4.5	20.89
01JUL86	0.89	14.4	2.3	2	6.5	4.828
01JUL86	0.85	10.3	0.3	2.4	8.5	6.439
01JUL86	0.91	10.1	0.3	2.7	10	7.834
01JUL86	0.91	10.7	0.2	1.6	12	4.501
01JUL86	0.86	9.8	0.3	2.5	14	6.925
01JUL86	0.84	9.3	0.1	1.6	17	4.388
01JUL86	0.87	10.2	0	2.1	19	5.783
01JUL86	0.92	7.7	0.3	0.9	22	2.87
01JUL86	0.92	8.5	0.7	2.4	29	7.48
01JUL86	1	12	0.1	36.9	32	.
01JUL86	1.04	13.3	0.2	3.2	37	9.507
01JUL86	0.95	11.6	0.1	1.1	42	3.118
01JUL86	0.85	11.4	0.4	1.6	47	4.095
01JUL86	0.89	10.2	0.3	1.6	52	4.484
02JUL86	0;89	18.4	2	7.9	4.5	17.67
02JUL86	0.89	15.9	1.6	2.8	6.5	6.523
02JUL86	0.85	14.8	0.3	1.9	8.5	4.366
02JUL86	0.91	13.2	0.8	1.6	10	4.117
02JUL86	0.91	10.7	0.2	1.1	12	3.083
02JUL86	0.86	7.4	0.6	0.2	14	0.6
02JUL86	0.84	11.7	0.4	1.4	17	3.499
02JUL86	0.87	12.1	0.1	1.9	19	4.87
02JUL86	0.92	11.6	0.4	1.5	22	4.12
02JUL86	0.92	11.7	0.6	2.5	29	6.891
02JUL86	1	12	0	32.6	32	.
02JUL86	1.04	13.4	0.9	2.6	37	7.644
02JUL86	0.95	10.1	1.5	0.9	42	2.674
02JUL86	0.85	9.7	0.9	1.5	47	4.079
02JUL86	0.89	9.4	1.2	1.8	52	5.192
03JUL86	0.89	14.4	0.9	7.9	4.5	19.98
03JUL86	0.89	12.7	1	2.2	6.5	5.646
03JUL86	0.85	12.9	0.5	2.3	8.5	5.616
03JUL86	0.91	12.8	0.4	0.5	10	1.297
03JUL86	0.91	12.6	0.4	2	12	5.273
03JUL86	0.86	12.3	0	2.7	14	6.841
03JUL86	0.84	9.9	0.2	1.5	17	4.012
03JUL86	0.87	10.2	0.1	1.9	19	5.222
03JUL86	0.92	9	0.3	1	22	3.023
03JUL86	0.92	7.5	0.8	2.7	29	8.808
03JUL86	1	10.2	2	34	32	.
03JUL86	1.04	11.9	0	2.8	37	8.706
03JUL86	0.95	9.9	0.3	0.5	42	1.5
03JUL86	0.85	13.7	0	2.2	47	5.244
03JUL86	0.89	12.3	0.2	1.3	52	3.373
04JUL86	0.89	15.8	2.7	8.2	4.5	19.71
04JUL86	0.89	14.2	2	2.2	6.5	5.357
04JUL86	0.85	10.7	0.4	1.2	8.5	3.141
04JUL86	0.91	9.1	0.8	1.3	10	3.8
04JUL86	0.91	12.5	0.1	2	12	5.297
04JUL86	0.86	11.6	0.3	3.5	14	9.13
04JUL86	0.84	11.5	1.2	1.3	17	3.258

AREA G: JULY 1986 PSYCHROMETER DATA

04JUL86	0.87	9.1	1.4	1.1	19	3.119
04JUL86	0.92	10.7	0.1	1.1	22	3.11
04JUL86	0.92	8.3	1.2	2.5	29	7.848
04JUL86	1	8.5	0.1	30.3	32	.
04JUL86	1.04	11.2	0.1	3.1	37	9.902
04JUL86	0.95	11.9	0.2	0.9	42	2.52
04JUL86	0.85	13.2	0.5	1.6	47	3.851
04JUL86	0.89	12.4	0.1	1.9	52	4.935
05JUL86	0.89	17.5	2.7	8.4	4.5	19.24
05JUL86	0.89	15.9	2.1	2.2	6.5	5.096
05JUL86	0.85	14.7	0.5	2.2	8.5	5.075
05JUL86	0.91	12.9	0.1	0.5	10	1.294
05JUL86	0.91	10.2	0.1	1.4	12	4.009
05JUL86	0.86	7.6	0.8	0.4	14	1.19
05JUL86	0.84	11.6	0.2	1.6	17	4.022
05JUL86	0.87	12	0.1	3.1	19	8.049
05JUL86	0.92	7.8	1.4	1.1	22	3.482
05JUL86	0.92	11.2	1.3	2.5	29	6.994
05JUL86	1	13	0.2	26.5	32	.
05JUL86	1.04	12.9	1.1	3.3	37	9.9
05JUL86	0.95	13.1	0.7	0.9	42	2.416
05JUL86	0.85	13.3	0.2	1.5	47	3.602
05JUL86	0.89	13	0.5	2.1	52	5.344
06JUL86	0.89	15.1	2.2	8.3	4.5	20.46
06JUL86	0.89	12.4	1.8	2.3	6.5	5.945
06JUL86	0.85	10.2	0.4	1.9	8.5	5.095
06JUL86	0.91	11.6	0.8	0.5	10	1.3
06JUL86	0.91	11.2	0.8	2.2	12	6.0
06JUL86	0.86	12	0.4	3.4	14	8.733
06JUL86	0.84	11.7	0.3	1.7	17	4.26
06JUL86	0.87	10.9	0	1.8	19	4.817
06JUL86	0.92	10.2	0.1	0.6	22	1.727
06JUL86	0.92	7.9	1	2.1	29	6.689
06JUL86	1	7.5	0.9	47.6	32	.
06JUL86	1.04	11.1	0.4	2.9	37	9.27
06JUL86	0.95	9.9	0.2	0.3	42	0.899
06JUL86	0.85	13.2	0.5	1.4	47	3.366
06JUL86	0.89	8.8	0.5	1.2	52	3.54
07JUL86	0.89	15.1	2	8.8	4.5	21.79
07JUL86	0.89	13.2	2.3	2.1	6.5	5.266
07JUL86	0.85	10.6	0.2	2.4	8.5	6.369
07JUL86	0.91	10.4	0	0.5	10	1.412
07JUL86	0.91	12.7	0	1.9	12	4.998
07JUL86	0.86	12.1	0.2	2.5	14	6.363
07JUL86	0.84	10.5	0.1	1.3	17	3.395
07JUL86	0.87	8.4	0.2	3.5	19	10.49
07JUL86	0.92	7	1	1	22	3.281
07JUL86	0.92	9	2.1	2.4	29	7.281
07JUL86	1	10.4	2.7	25.9	32	.
07JUL86	1.04	8.2	1.2	2.8	37	10.01
07JUL86	0.95	10.2	1.6	0.9	42	2.663
07JUL86	0.85	9.6	0.5	1.5	47	4.10
07JUL86	0.89	8.8	0.9	2.3	52	6.8
08JUL86	0.89	16.9	2.5	8.1	4.5	18.86
08JUL86	0.89	12.6	0.9	3	6.5	7.771
08JUL86	0.85	14.8	1.1	1.7	8.5	3.888

AREA G: JULY 1986 PSYCHROMETER DATA

08JUL86	0.91	9.6	0.3	0.9	10	2.625
08JUL86	0.91	12.5	0.3	1.9	12	5.02
08JUL86	0.86	9.1	0.2	3.5	14	10.06
08JUL86	0.84	6.8	0.9	1.4	17	4.25
08JUL86	0.87	6.8	1.2	1	19	3.128
08JUL86	0.92	7.5	0.7	0.4	22	1.279
08JUL86	0.92	8	2.1	2.5	29	7.919
08JUL86	1	9.1	1.5	24	32	.
08JUL86	1.04	9.5	1.4	3	37	10.16
08JUL86	0.95	9	1.6	1.3	42	4.044
08JUL86	0.85	12.6	0.3	2.2	47	5.427
08JUL86	0.89	12.8	0.1	2	52	5.13
09JUL86	0.89	16.1	1.3	9.2	4.5	22.22
09JUL86	0.89	14.8	1.1	2.5	6.5	6.015
09JUL86	0.85	14.5	0.1	2.4	8.5	5.587
09JUL86	0.91	13.6	0.1	0.9	10	2.284
09JUL86	0.91	9.7	0.2	1.3	12	3.791
09JUL86	0.86	7.4	0.7	0.7	14	2.107
09JUL86	0.84	11.5	0.3	1.6	17	4.034
09JUL86	0.87	10.4	0.2	2.2	19	6.012
09JUL86	0.92	7.1	1	1.1	22	3.597
09JUL86	0.92	7.4	1.6	2.6	29	8.483
09JUL86	1	7.8	0.6	20.2	32	.
09JUL86	1.04	8	1.4	2.9	37	10.45
09JUL86	0.95	9	1.5	1.1	42	3.418
09JUL86	0.85	11.4	0.6	2.1	47	5.39
09JUL86	0.89	12.9	0.4	2.1	52	5.36
10JUL86	0.89	15.5	2.5	9.4	4.5	23.6
10JUL86	0.89	16.2	1.9	1.8	6.5	4.13
10JUL86	0.85	13.9	0.6	2.3	8.5	5.437
10JUL86	0.91	11.3	0.7	1.5	10	4.116
10JUL86	0.91	12.4	0	1.8	12	4.779
10JUL86	0.86	11.8	0.5	0.3	14	0.759
10JUL86	0.84	11.5	0.6	0.9	17	2.255
10JUL86	0.87	8.6	1.4	1	19	2.892
10JUL86	0.92	10.5	0.1	0.7	22	1.993
10JUL86	0.92	12.4	0.8	2.8	29	7.541
10JUL86	1	12.5	0.1	17.3	32	59.73
10JUL86	1.04	12.7	0.4	3.2	37	9.689
10JUL86	0.95	12	0.5	0.9	42	2.508
10JUL86	0.85	10	0.4	1.7	47	4.587
10JUL86	0.89	8.5	0.4	1.7	52	5.101
11JUL86	0.89	18.8	1	9.5	4.5	21.33
11JUL86	0.89	15	1.5	2.7	6.5	6.453
11JUL86	0.85	15	0.2	2.4	8.5	5.502
11JUL86	0.91	13.6	0.2	0.4	10	1.012
11JUL86	0.91	12.5	0.3	2.3	12	6.099
11JUL86	0.86	11.1	0.2	2.8	14	7.402
11JUL86	0.84	9.1	0.1	1.4	17	3.864
11JUL86	0.87	7.6	0.9	0.5	19	1.505
11JUL86	0.92	11.5	0.2	0.8	22	2.198
11JUL86	0.92	12.5	0.8	2.5	29	6.694
11JUL86	1	9.4	0.2	17.5	32	.
11JUL86	1.04	11.2	0.4	3	37	9.562
11JUL86	0.95	9.8	0.4	0.1	42	0.3
11JUL86	0.85	13.1	0.1	1.4	47	3.383

AREA G: JULY 1986 PSYCHROMETER DATA

11JUL86	0.89	12.8	0.1	1.7	52	4.351
12JUL86	0.89	19.5	1.9	9.2	4.5	20.1
12JUL86	0.89	17	1.6	2	6.5	4.504
12JUL86	0.85	14.3	0.1	2.2	8.5	5.146
12JUL86	0.91	13.3	0.5	0.3	10	0.764
12JUL86	0.91	12.3	0.5	2.1	12	5.594
12JUL86	0.86	12.2	0.1	2.8	14	7.121
12JUL86	0.84	9.1	0.4	1.5	17	4.138
12JUL86	0.87	8.9	0.2	1.8	19	5.202
12JUL86	0.92	10.1	0.1	0.6	22	1.733
12JUL86	0.92	8	1.1	2.6	29	8.279
12JUL86	1	8.6	0.2	14.3	32	57.09
12JUL86	1.04	11.1	0.3	2.6	37	8.296
12JUL86	0.95	8.8	0.2	0.1	42	0.313
12JUL86	0.85	13	0.2	1.8	47	4.372
12JUL86	0.89	13.3	0.3	2.1	52	5.298
13JUL86	0.89	16.8	1.2	9.4	4.5	22.28
13JUL86	0.89	14.4	1.1	2.7	6.5	6.582
13JUL86	0.85	14.7	0.1	2.2	8.5	5.084
13JUL86	0.91	13.6	0.6	0.3	10	0.757
13JUL86	0.91	12.3	0.2	1.6	12	4.253
13JUL86	0.86	11.2	1.1	0.4	14	1.031
13JUL86	0.84	11.5	1	1.7	17	4.276
13JUL86	0.87	12	0.3	2.3	19	5.932
13JUL86	0.92	10.9	0.2	0.5	22	1.401
13JUL86	0.92	12.7	0.6	2.6	29	6.928
13JUL86	1	9.9	0	13.4	32	48.6
13JUL86	1.04	8.1	1.1	2.6	37	9.31
13JUL86	0.95	8.3	1.5	1.1	42	3.518
13JUL86	0.85	12.3	0.1	2.2	47	5.488
13JUL86	0.89	10.8	0.1	1.7	52	4.666
14JUL86	0.89	15.1	1.5	9.7	4.5	24.25
14JUL86	0.89	12.9	1.5	2.2	6.5	5.595
14JUL86	0.85	10.7	0.2	1.5	8.5	3.939
14JUL86	0.91	9.7	0.8	1.1	10	3.194
14JUL86	0.91	12.7	0.3	1.8	12	4.725
14JUL86	0.86	12.1	0.1	2.5	14	6.366
14JUL86	0.84	10.2	0.1	1.4	17	3.701
14JUL86	0.87	9.1	0	2.8	19	8.102
14JUL86	0.92	6.8	0.4	1.1	22	3.655
14JUL86	0.92	12.3	0.3	2.2	29	5.934
14JUL86	1	8.8	0	15.2	32	61.59
14JUL86	1.04	10	0.6	2.8	37	9.317
14JUL86	0.95	8.3	0.9	0.9	42	2.881
14JUL86	0.85	8.3	0.7	1.4	47	4.031
14JUL86	0.89	8.6	1.1	1.8	52	5.367
15JUL86	0.89	16.7	2.8	9.9	4.5	23.43
15JUL86	0.89	17.1	1.9	2	6.5	4.486
15JUL86	0.85	15.6	0	3.1	8.5	7.02
15JUL86	0.91	12.9	0.3	2.9	10	7.619
15JUL86	0.91	9.7	0.3	1.5	12	4.379
15JUL86	0.86	8.1	0.6	3.5	14	10.4
15JUL86	0.84	7.3	0.7	1.2	17	3.5
15JUL86	0.87	6.9	0.7	0	19	0
15JUL86	0.92	12.2	0.6	1.6	22	4.307
15JUL86	0.92	12.8	0.9	2.3	29	6.088

AREA G: JULY 1986 PSYCHROMETER DATA

15JUL86	1	13	0.4	16	32	52.8
15JUL86	1.04	12.4	0	2.7	37	8.24
15JUL86	0.95	9.4	0.7	0.6	42	1.834
15JUL86	0.85	13	0.9	1.5	47	3.625
15JUL86	0.89	9.7	1.2	1.7	52	4.842
16JUL86	0.89	17.1	2.5	10.2	4.5	23.94
16JUL86	0.89	15.8	2	2.1	6.5	4.878
16JUL86	0.85	15.3	0.4	2.6	8.5	5.91
16JUL86	0.91	13.8	0.3	0.6	10	1.509
16JUL86	0.91	10.6	0.1	1.8	12	5.093
16JUL86	0.86	10.3	0.1	2.5	14	6.798
16JUL86	0.84	9.9	0.1	1.6	17	4.285
16JUL86	0.87	11.6	0.1	1.9	19	4.96
16JUL86	0.92	10	0.3	1.1	22	3.199
16JUL86	0.92	8	1.4	2.5	29	7.943
16JUL86	1	7.5	0.7	15.2	32	67.44
16JUL86	1.04	8.9	0.4	3.1	37	10.82
16JUL86	0.95	10.1	0.5	1.3	42	3.891
16JUL86	0.85	10.4	0.2	1.3	47	3.447
16JUL86	0.89	9	0.1	1.7	52	5.004
17JUL86	0.89	17.8	1.2	10.5	4.5	24.36
17JUL86	0.89	14.9	1	2.4	6.5	5.756
17JUL86	0.85	13.8	0.4	2.7	8.5	6.425
17JUL86	0.91	13.3	0.7	0.4	10	1.019
17JUL86	0.91	10.6	1	2.1	12	5.931
17JUL86	0.86	7.6	0.4	3.3	14	10.09
17JUL86	0.84	7.6	0	1.5	17	4.41
17JUL86	0.87	8.1	0.4	3	19	9.05
17JUL86	0.92	6.6	0.6	1.3	22	4.363
17JUL86	0.92	7.6	1	2.1	29	6.777
17JUL86	1	7.1	0.6	15	32	68.22
17JUL86	1.04	9.6	0.3	3	37	10.17
17JUL86	0.95	11.2	0.2	0.9	42	2.582
17JUL86	0.85	9.6	0.2	0.9	47	2.453
17JUL86	0.89	12.8	0.3	2.3	52	5.905

AREA G: OCTOBER 1986 PSYCHROMETER DATA

DATE	CORRECTION	TEMP (DEG C)	OFFSET (MICROVOLTS)	READING (MICROVOLTS)	DEPTH (FT)	WATER POTENT (-BARS)
040CT86	0.89	14.6	0.5	8.9	4.5	22.58
040CT86	0.89	17.4	0.1	2.1	6.5	4.717
040CT86	0.85	17	0.5	1	8.5	2.151
040CT86	0.91	14.4	0.3	0.2	10	0.493
040CT86	0.91	15.6	0.4	2.2	12	5.296
040CT86	0.86	14.5	0.6	0.5	14	1.162
040CT86	0.84	13.5	0.6	1.9	17	4.483
040CT86	0.87	12.7	0.9	0.2	19	0.495
040CT86	0.92	7.1	1.1	1.3	22	4.256
040CT86	0.92	7	2.1	2.4	29	7.941
040CT86	1	8	34.9	80.5	32	.
040CT86	1.04	9.6	3.2	3.1	37	10.39
040CT86	0.95	11.7	1.3	1.7	42	4.796
040CT86	0.85	12.6	0.7	1.2	47	2.935
040CT86	0.89	12.6	0.1	1.8	52	4.641
050CT86	0.89	13.4	1.4	8.9	4.5	23.43
050CT86	0.89	15.6	1.1	3.6	6.5	8.517
050CT86	0.85	14.9	0.9	0.9	8.5	2.045
050CT86	0.91	13.8	0.4	1.1	10	2.774
050CT86	0.91	12.7	0.2	1.6	12	4.197
050CT86	0.86	13.6	0.4	0.8	14	1.915
050CT86	0.84	11.9	0.2	1.4	17	3.478
050CT86	0.87	12.1	0.8	2.5	19	6.
050CT86	0.92	10.3	0.4	1.3	22	3.
050CT86	0.92	6.8	1.8	2.1	29	7.001
050CT86	1	6.8	30.8	72.5	32	.
050CT86	1.04	10.5	2.8	3	37	9.711
050CT86	0.95	11.3	0.8	1.2	42	3.429
050CT86	0.85	8.9	1.2	1.5	47	4.206
050CT86	0.89	8.3	0	1.4	52	4.233
060CT86	0.89	13.7	1.8	9.4	4.5	24.54
060CT86	0.89	13.2	0	1.6	6.5	4.042
060CT86	0.85	16.2	0.1	1.2	8.5	2.644
060CT86	0.91	11.1	1.2	0.9	10	2.472
060CT86	0.91	12.9	0.2	1.3	12	3.381
060CT86	0.86	13.4	0.6	0.8	14	1.925
060CT86	0.84	9.8	0.5	2.5	17	6.758
060CT86	0.87	8.4	1.6	1.1	19	3.207
060CT86	0.92	8	1.3	0.9	22	2.821
060CT86	0.92	7.8	2.3	3.7	29	11.95
060CT86	1	9.4	0.5	41.5	32	.
060CT86	1.04	6.8	3.5	3	37	11.32
060CT86	0.95	8.8	1.9	1.4	42	4.389
060CT86	0.85	11.2	0.9	1.2	47	3.078
060CT86	0.89	6.6	0.8	1.7	52	5.536
070CT86	0.89	12.7	1.9	10.3	4.5	28.12
070CT86	0.89	15.9	0	0.8	6.5	1.857
070CT86	0.85	11.9	0.2	0.6	8.5	1.
070CT86	0.91	14.7	0.9	1.9	10	4.
070CT86	0.91	13	0.3	1.1	12	2.846
070CT86	0.86	13.4	0.5	0.5	14	1.202
070CT86	0.84	12.4	0.2	0.9	17	2.191

AREA G: OCTOBER 1986 PSYCHROMETER DATA

070CT86	0.87	8.5	1.9	0.5	19	1.44
070CT86	0.92	11.2	0.7	1.8	22	5.0
070CT86	0.92	10.2	1.2	2.7	29	7.858
070CT86	1	10	32.4	66.4	32	.
070CT86	1.04	6.3	3	2.4	37	9.237
070CT86	0.95	8.6	1.9	1.5	42	4.745
070CT86	0.85	11.1	1.3	1.9	47	4.907
070CT86	0.89	9.2	0.1	1	52	2.903
080CT86	0.89	13.7	2.1	10.7	4.5	28.23
080CT86	0.89	15.6	0.2	1.3	6.5	3.048
080CT86	0.85	11.7	0.3	1.2	8.5	3.032
080CT86	0.91	15.1	0	0.9	10	2.186
080CT86	0.91	11.9	0.2	1.6	12	4.312
080CT86	0.86	13.5	0.5	0.5	14	1.198
080CT86	0.84	12.3	0.2	1.3	17	3.183
080CT86	0.87	7	1.7	1	19	3.094
080CT86	0.92	10.5	0.5	1.5	22	4.289
080CT86	0.92	7.5	1.8	2.5	29	8.105
080CT86	1	6.7	31.2	80.3	32	.
080CT86	1.04	6	3.2	2.9	37	11.37
080CT86	0.95	6.2	1.6	1.2	42	4.214
080CT86	0.85	6.4	2	1.4	47	4.359
080CT86	0.89	6.8	0.6	2.1	52	6.807
090CT86	0.89	15	0.6	7.9	4.5	19.63
090CT86	0.89	13.5	1.3	3.2	6.5	8.042
090CT86	0.85	13.3	0.2	0.7	8.5	1.672
090CT86	0.91	11.2	1.1	1.9	10	5.2
090CT86	0.91	12.3	0.2	2.6	12	6.9
090CT86	0.86	12.8	0.3	0.1	14	0.245
090CT86	0.84	7.8	0.9	2.4	17	7.032
090CT86	0.87	12	0.9	2.7	19	6.964
090CT86	0.92	11.5	0.5	1.7	22	4.694
090CT86	0.92	8.9	1.5	2.2	29	6.708
090CT86	1	5.8	1.7	52.6	32	.
090CT86	1.04	6.5	2.7	3.5	37	13.51
090CT86	0.95	8.7	0.9	0.6	42	1.885
090CT86	0.85	11.2	1.8	1.9	47	4.878
090CT86	0.89	11.5	0.2	1.8	52	4.818
100CT86	0.89	13.7	2.1	10.6	4.5	27.94
100CT86	0.89	16.2	0.5	1.9	6.5	4.391
100CT86	0.85	12.9	0.5	0.5	8.5	1.207
100CT86	0.91	15.2	0.4	0.9	10	2.175
100CT86	0.91	11	0.1	1.2	12	3.331
100CT86	0.86	12.5	1.1	1	14	2.475
100CT86	0.84	7.7	0.3	1.3	17	3.798
100CT86	0.87	9.8	1.9	1	19	2.75
100CT86	0.92	11.5	1.5	1.3	22	3.563
100CT86	0.92	6.7	2.1	3.4	29	11.52
100CT86	1	9.4	2.4	53.1	32	.
100CT86	1.04	9.7	3.4	3.1	37	10.33
100CT86	0.95	10.4	1.7	0.8	42	2.346
100CT86	0.85	8.2	2.3	1.6	47	4.60
100CT86	0.89	6.5	0.5	1.7	52	5.
110CT86	0.89	13.9	1.9	10.6	4.5	27.76
110CT86	0.89	14.3	0.2	0.8	6.5	1.942
110CT86	0.85	14.6	0.9	1.9	8.5	4.38

AREA G: OCTOBER 1986 PSYCHROMETER DATA

110CT86	0.91	15.3	0.4	0.7	10	1.685
110CT86	0.91	14.4	0.1	1.9	12	4.7
110CT86	0.86	9.5	0.4	0.7	14	1.936
110CT86	0.84	11.5	0.2	1.8	17	4.547
110CT86	0.87	7.4	0.8	2.3	19	7.101
110CT86	0.92	9.6	0.8	0.5	22	1.467
110CT86	0.92	9.2	2.5	2.9	29	8.747
110CT86	1	5.8	17.7	55.1	32	.
110CT86	1.04	11.1	2.2	2.3	37	7.26
110CT86	0.95	11	1.3	1.4	42	4.041
110CT86	0.85	11.2	1.2	1.3	47	3.332
110CT86	0.89	11.3	0.4	1.9	52	5.121
120CT86	0.89	15.7	1.8	10.4	4.5	25.6
120CT86	0.89	16.2	0.8	2.8	6.5	6.494
120CT86	0.85	15.2	0.3	0.9	8.5	2.033
120CT86	0.91	15.2	0.1	0.8	10	1.935
120CT86	0.91	14.4	0.1	0.9	12	2.229
120CT86	0.86	9.5	1.1	0.7	14	1.927
120CT86	0.84	11.7	1.1	3.2	17	8.076
120CT86	0.87	10.9	0.7	2.7	19	7.253
120CT86	0.92	11.6	0.8	1.1	22	3.01
120CT86	0.92	10.9	2.4	2.3	29	6.464
120CT86	1	9	2.1	56.3	32	.
120CT86	1.04	6.2	2.5	3.2	37	12.5
120CT86	0.95	9.6	1	0.6	42	1.817
120CT86	0.85	11	2	1.6	47	4.125
120CT86	0.89	11	0.6	1.6	52	4.3
130CT86	0.89	11.6	1.6	9.2	4.5	25.
130CT86	0.89	14.4	1.3	2.9	6.5	7.072
130CT86	0.85	13.6	0.5	0.7	8.5	1.654
130CT86	0.91	13.2	0.3	3.4	10	8.875
130CT86	0.91	10.7	0.2	2.2	12	6.218
130CT86	0.86	13	0.4	0.3	14	0.73
130CT86	0.84	7.7	0.8	2.9	17	8.578
130CT86	0.87	11.8	0.8	2.4	19	6.223
130CT86	0.92	9.3	0.5	1.5	22	4.494
130CT86	0.92	6.7	2	2.6	29	8.743
130CT86	1	5.9	0.9	40.3	32	.
130CT86	1.04	6.3	3.1	2.5	37	9.627
130CT86	0.95	7	2	1.5	42	5.084
130CT86	0.85	10.7	2.4	1.7	47	4.427
130CT86	0.89	10.2	0.6	1.8	52	5.046
140CT86	0.89	10.9	1.6	8.5	4.5	24.49
140CT86	0.89	12.6	1.6	2.5	6.5	6.433
140CT86	0.85	15.1	0.5	1.3	8.5	2.949
140CT86	0.91	11.4	0.5	1	10	2.727
140CT86	0.91	12.1	0.3	0.9	12	2.396
140CT86	0.86	8.9	0.8	1	14	2.831
140CT86	0.84	10.1	0.4	0.9	17	2.376
140CT86	0.87	7	2.5	1	19	3.083
140CT86	0.92	10.8	1.1	1.2	22	3.377
140CT86	0.92	5.7	2.3	2.3	29	8.074
140CT86	1	10.2	1.4	44.4	32	.
140CT86	1.04	10.5	3	2.4	37	7.725
140CT86	0.95	5.9	2	1.5	42	5.349
140CT86	0.85	10.7	1.8	1.6	47	4.175

AREA G: OCTOBER 1986 PSYCHROMETER DATA

14OCT86	0.89	10.3	0.4	1.7	52	4.748
15OCT86	0.89	11.8	1.4	8.5	4.5	23.
15OCT86	0.89	11.4	0.8	0.8	6.5	2.126
15OCT86	0.85	10.8	0.4	0.2	8.5	0.518
15OCT86	0.91	12.9	1.6	1.7	10	4.404
15OCT86	0.91	13.7	0.6	2.8	12	7.153
15OCT86	0.86	13	0.9	1	14	2.437
15OCT86	0.84	8.8	0.4	0.9	17	2.501
15OCT86	0.87	7.3	2.4	0.7	19	2.125
15OCT86	0.92	10.9	1.7	2.5	22	7.059
15OCT86	0.92	8.2	1.8	1.9	29	5.943
15OCT86	1	5.9	0.9	54.3	32	.
15OCT86	1.04	6.6	3.9	3.5	37	13.38
15OCT86	0.95	10.4	1.7	1.5	42	4.422
15OCT86	0.85	7.5	2	0.6	47	1.766
15OCT86	0.89	9.7	0.7	2.6	52	7.476
16OCT86	0.89	11	3.1	10.4	4.5	30.25
16OCT86	0.89	15.2	1.4	2.8	6.5	6.66
16OCT86	0.85	13.9	0.3	3.5	8.5	8.349
16OCT86	0.91	11.3	0.5	0.9	10	2.462
16OCT86	0.91	13.1	0.5	1.4	12	3.615
16OCT86	0.86	8.9	0.4	0.5	14	1.412
16OCT86	0.84	11.4	0.1	1.1	17	2.776
16OCT86	0.87	8.4	2.4	1.6	19	4.668
16OCT86	0.92	9.2	0.9	0.3	22	0.892
16OCT86	0.92	6.5	2.6	2.4	29	8.109
16OCT86	1	8.2	2.2	77.7	32	.
16OCT86	1.04	6	3.4	2.9	37	11.
16OCT86	0.95	9	2.3	2.5	42	7.831
16OCT86	0.85	9.4	2	1.1	47	3.003
16OCT86	0.89	5.9	0.1	1.8	52	6.08
17OCT86	0.89	13.9	2.9	9.9	4.5	25.64
17OCT86	0.89	13.4	0.6	0.6	6.5	1.493
17OCT86	0.85	13.1	0.8	2	8.5	4.836
17OCT86	0.91	13.3	0.2	0.6	10	1.534
17OCT86	0.91	13.9	0.2	1.9	12	4.805
17OCT86	0.86	9.5	0.3	0.6	14	1.657
17OCT86	0.84	11.3	0	1.1	17	2.787
17OCT86	0.87	9.2	2.4	1.4	19	3.946
17OCT86	0.92	10	0.4	1.4	22	4.079
17OCT86	0.92	9.2	1.5	2.5	29	7.548
17OCT86	1	10.9	1.4	79	32	.
17OCT86	1.04	10.3	2.6	3	37	9.794
17OCT86	0.95	10	1	1.4	42	4.201
17OCT86	0.85	8.9	1.5	1.2	47	3.353
17OCT86	0.89	10.9	0.3	1.8	52	4.921
18OCT86	0.89	9.7	3.2	10.8	4.5	33.43
18OCT86	0.89	15	0.6	0.4	6.5	0.947
18OCT86	0.85	14	0.2	1.5	8.5	3.524
18OCT86	0.91	11.4	1	1.5	10	4.096
18OCT86	0.91	12.9	0.2	1	12	2.596
18OCT86	0.86	13.1	0.2	0.4	14	0.971
18OCT86	0.84	8.3	0.1	1.2	17	3.4
18OCT86	0.87	10.6	1.9	0.6	19	1.578
18OCT86	0.92	11.1	0.7	1.6	22	4.475
18OCT86	0.92	9.5	1.5	2.5	29	7.457

AREA G: OCTOBER 1986 PSYCHROMETER DATA

180CT86	1	6.9	1.3	9.9	32	39.44
180CT86	1.04	5.6	3.6	3	37	11.
180CT86	0.95	7	2.1	1.5	42	5.0[illegible]
180CT86	0.85	10.4	1.8	1.2	47	3.157
180CT86	0.89	10.7	0.1	2.1	52	5.803
190CT86	0.89	13.4	2.3	9.6	4.5	25.32
190CT86	0.89	10.7	1.5	2.5	6.5	6.886
190CT86	0.85	14.4	0.4	0.3	8.5	0.691
190CT86	0.91	10.4	0.7	0.8	10	2.258
190CT86	0.91	13.9	0.5	2.7	12	6.853
190CT86	0.86	10.5	0.5	0.9	14	2.395
190CT86	0.84	10.2	0.1	1.1	17	2.901
190CT86	0.87	10.8	1.8	0.4	19	1.055
190CT86	0.92	11.3	0.7	1.6	22	4.442
190CT86	0.92	9.5	1.8	2.1	29	6.235
190CT86	1	9.8	2.2	78.8	32	.
190CT86	1.04	10.7	2.7	3.3	37	10.63
190CT86	0.95	10	0.9	1.2	42	3.597
190CT86	0.85	8.3	1.4	1.7	47	4.892
190CT86	0.89	8.9	0.2	1.8	52	5.322
200CT86	0.89	9.3	2.4	9.2	4.5	28.52
200CT86	0.89	12.3	1.9	3.2	6.5	8.348
200CT86	0.85	12.9	0.4	0.8	8.5	1.935
200CT86	0.91	12.1	0.5	0.1	10	0.265
200CT86	0.91	14.1	0.1	1.1	12	2.753
200CT86	0.86	9.5	1.4	1.5	14	4.151
200CT86	0.84	11.4	0.1	1.2	17	3.0[illegible]
200CT86	0.87	11.5	1.5	0.6	19	1.[illegible]
200CT86	0.92	11.2	0.5	1.7	22	4.745
200CT86	0.92	9.1	1.5	2.6	29	7.889
200CT86	1	10.7	1.3	43.3	32	.
200CT86	1.04	10.8	3	3.1	37	9.919
200CT86	0.95	10.9	1.3	1.3	42	3.763
200CT86	0.85	10.7	1.4	1.6	47	4.182
200CT86	0.89	10.7	0.2	1.6	52	4.402
210CT86	0.89	13.1	2.7	11.2	4.5	30.27
210CT86	0.89	13.2	0.8	0.5	6.5	1.25
210CT86	0.85	10.8	0.7	0.8	8.5	2.078
210CT86	0.91	13.5	1.3	2	10	5.099
210CT86	0.91	11.9	0.3	0.8	12	2.143
210CT86	0.86	9.5	1.1	0.8	14	2.205
210CT86	0.84	12.1	0.8	3.1	17	7.719
210CT86	0.87	9.8	1	2.9	19	8.128
210CT86	0.92	11	1.6	1.4	22	3.908
210CT86	0.92	9.1	2.7	2.8	29	8.466
210CT86	1	8.3	1.9	81.9	32	.
210CT86	1.04	9.6	3.5	3	37	10.03
210CT86	0.95	9.8	2	1.2	42	3.607
210CT86	0.85	8.9	2.5	1.7	47	4.748
210CT86	0.89	8.8	0.8	2.4	52	7.143
220CT86	0.89	10.4	3	12	4.5	36.61
220CT86	0.89	12.3	1.4	1.7	6.5	4.39[illegible]
220CT86	0.85	15.1	0.1	1	8.5	2.
220CT86	0.91	13.2	0.2	0.7	10	1.7[illegible]
220CT86	0.91	11.7	0.2	1	12	2.702
220CT86	0.86	12.9	1.1	0.9	14	2.197

AREA G: OCTOBER 1986 PSYCHROMETER DATA

22OCT86	0.84	8.1	0.6	2.5	17	7.246
22OCT86	0.87	12.1	0.4	2	19	5.1
22OCT86	0.92	8.7	0.4	1.4	22	4.296
22OCT86	0.92	6.4	2	2.2	29	7.472
22OCT86	1	6.4	5.2	50.4	32	.
22OCT86	1.04	9.7	2.9	3	37	10.01
22OCT86	0.95	11	0.9	1.1	42	3.174
22OCT86	0.85	7.1	1.7	1.7	47	5.148
22OCT86	0.89	7.1	0.5	1.2	52	3.807
23OCT86	0.89	13.1	2.5	11.4	4.5	30.9
23OCT86	0.89	12	1	0.6	6.5	1.56
23OCT86	0.85	13.5	1	1.8	8.5	4.287
23OCT86	0.91	13	0.1	0.7	10	1.808
23OCT86	0.91	12.6	0.3	0.7	12	1.83
23OCT86	0.86	10.6	1.4	1.6	14	4.247
23OCT86	0.84	9.7	0.1	1.4	17	3.773
23OCT86	0.87	6.9	1.3	2.9	19	9.191
23OCT86	0.92	9.3	0.7	1.1	22	3.282
23OCT86	0.92	11	2.2	2.4	29	6.731
23OCT86	1	9.4	29.3	72	32	.
23OCT86	1.04	6.7	3.8	3.1	37	11.75
23OCT86	0.95	6.2	1.8	1.3	42	4.566
23OCT86	0.85	6.2	2.2	1.3	47	4.079
23OCT86	0.89	7.6	0.8	2.2	52	6.88
24OCT86	0.89	9.3	3	12	4.5	38.58
24OCT86	0.89	13.9	1.1	0.7	6.5	1.712
24OCT86	0.85	10.7	1.1	2.1	8.5	5.5
24OCT86	0.91	12.3	0.6	3.5	10	9.4
24OCT86	0.91	9.7	0.1	1.7	12	4.975
24OCT86	0.86	13.3	0.3	0.6	14	1.449
24OCT86	0.84	11.1	0.2	1.1	17	2.805
24OCT86	0.87	11.7	1.5	0.6	19	1.537
24OCT86	0.92	8.6	0.7	1.5	22	4.62
24OCT86	0.92	6.7	1.6	2.5	29	8.412
24OCT86	1	6.5	1.6	96.6	32	.
24OCT86	1.04	6	3.8	3.1	37	12.15
24OCT86	0.95	9.9	2.2	1.3	42	3.892
24OCT86	0.85	10	1.8	1.9	47	5.103
24OCT86	0.89	9.8	0.4	1.6	52	4.552
25OCT86	0.89	11	2.2	10.1	4.5	29.41
25OCT86	0.89	11.2	2.2	3	6.5	8.116
25OCT86	0.85	13.2	0.3	0.6	8.5	1.436
25OCT86	0.91	13.4	0.3	0.2	10	0.508
25OCT86	0.91	13.6	0.2	0.6	12	1.519
25OCT86	0.86	10.9	1.2	1.4	14	3.673
25OCT86	0.84	8.3	0.3	1.4	17	3.99
25OCT86	0.87	10.9	2	0.5	19	1.314
25OCT86	0.92	11.3	0.7	1.9	22	5.287
25OCT86	0.92	8.4	1.9	2.9	29	9.069
25OCT86	1	8.5	28.8	9.6	32	30.96
25OCT86	1.04	9.7	2.4	3.1	37	10.38
25OCT86	0.95	9.4	0.9	1.1	42	3.373
25OCT86	0.85	8.8	1.5	1.4	47	3.
25OCT86	0.89	10.7	0.1	1.9	52	5.242
26OCT86	0.89	12.4	1.7	10.4	4.5	28.78
26OCT86	0.89	9.9	1.8	1.6	6.5	4.506

AREA G: OCTOBER 1986 PSYCHROMETER DATA

260CT86	0.85	14.3	0.4	0.6	8.5	1.388
260CT86	0.91	14.2	1.3	1.7	10	4.[illegible]
260CT86	0.91	13.3	0	1.1	12	2.8[illegible]
260CT86	0.86	8.9	1.1	1.2	14	3.398
260CT86	0.84	11.6	0	0.9	17	2.253
260CT86	0.87	8.9	2.3	0.9	19	2.559
260CT86	0.92	11.4	0.4	1.5	22	4.152
260CT86	0.92	8.6	1.3	2.4	29	7.429
260CT86	1	10.5	1.2	97.7	32	.
260CT86	1.04	7.1	2.8	3.4	37	12.74
260CT86	0.95	8.7	0.9	1.2	42	3.788
260CT86	0.85	8.4	1.4	1.6	47	4.581
260CT86	0.89	10.8	0	2	52	5.504
270CT86	0.89	9.5	1.8	15.7	4.5	54.35
270CT86	0.89	9.9	1	1.6	6.5	4.522
270CT86	0.85	14.4	0.3	0.2	8.5	0.46
270CT86	0.91	14.2	1.4	0.9	10	2.229
270CT86	0.91	9.7	0	1.1	12	3.205
270CT86	0.86	12.4	1.4	1.5	14	3.733
270CT86	0.84	9.5	0.1	1	17	2.708
270CT86	0.87	8.6	2	1.3	19	3.758
270CT86	0.92	10.4	0.8	1.1	22	3.144
270CT86	0.92	11	1.8	2.3	29	6.457
270CT86	1	10.7	28.5	36.5	32	.
270CT86	1.04	7.2	3.8	2.9	37	10.72
270CT86	0.95	5.9	1.9	1.4	42	4.99
270CT86	0.85	6.2	2.5	2	47	6.3[illegible]
270CT86	0.89	6	0.4	1.4	52	4.[illegible]
280CT86	0.89	8	3.3	66.5	4.5	.
280CT86	0.89	9.6	1.8	1.3	6.5	3.696
280CT86	0.85	13.8	0.9	1.4	8.5	3.297
280CT86	0.91	11	1	1	10	2.761
280CT86	0.91	13.1	0	1.1	12	2.841
280CT86	0.86	8.7	1.1	1.1	14	3.138
280CT86	0.84	12.2	0.1	1.6	17	3.941
280CT86	0.87	7	1.8	0.1	19	0.307
280CT86	0.92	11.2	1.7	2.5	22	6.981
280CT86	0.92	7.4	1.8	2.4	29	7.809
280CT86	1	6	28.8	89.5	32	.
280CT86	1.04	9.7	3.7	4.3	37	14.46
280CT86	0.95	9.7	1.6	1.5	42	4.545
280CT86	0.85	10.6	1.8	1.7	47	4.456
280CT86	0.89	11	0.2	1.8	52	4.906
290CT86	0.89	9.4	25.9	89.5	4.5	.
290CT86	0.89	11.9	2.3	2.9	6.5	7.641
290CT86	0.85	12.7	0.3	0.6	8.5	1.46
290CT86	0.91	11.6	0.6	3.4	10	9.365
290CT86	0.91	10	0.5	1.8	12	5.201
290CT86	0.86	13	0.4	0.4	14	0.973
290CT86	0.84	8	0.7	2.5	17	7.274
290CT86	0.87	11.8	0.9	2.3	19	5.957
290CT86	0.92	8.5	0.8	1.7	22	5.264
290CT86	0.92	7.9	1.6	2.5	29	7.[illegible]
290CT86	1	6.7	28.5	89.5	32	.
290CT86	1.04	9.4	3.7	2.9	37	9.756
290CT86	0.95	6.8	2.2	1.3	42	4.434

AREA G: OCTOBER 1986 PSYCHROMETER DATA

29OCT86	0.85	10.1	1.8	1.8	47	4.812
29OCT86	0.89	10.5	0.3	1.2	52	3.3
30OCT86	0.89	8.9	26.4	89.5	4.5	.
30OCT86	0.89	10.3	2.4	2.6	6.5	7.247
30OCT86	0.85	14.1	0.1	0.6	8.5	1.398
30OCT86	0.91	14.1	0.7	0.8	10	1.993
30OCT86	0.91	13.5	0	1.1	12	2.805
30OCT86	0.86	8.8	1.1	0.6	14	1.698
30OCT86	0.84	12.2	0.1	1.6	17	3.941
30OCT86	0.87	7	2	0.8	19	2.467
30OCT86	0.92	11.1	0.8	1.5	22	4.19
30OCT86	0.92	10.3	1.6	2.7	29	7.814
30OCT86	1	10.3	28.9	93	32	.
30OCT86	1.04	9.7	2.5	3	37	10.03
30OCT86	0.95	6.4	1.6	1.1	42	3.824
30OCT86	0.85	6	2.1	1.5	47	4.762
30OCT86	0.89	6.1	0	1.4	52	4.668
31OCT86	0.89	11.7	26.7	89.5	4.5	.
31OCT86	0.89	11.8	2.2	2.5	6.5	6.595
31OCT86	0.85	10.3	0.4	0.3	8.5	0.792
31OCT86	0.91	14.1	0.6	0.7	10	1.744
31OCT86	0.91	12.7	0.2	0.6	12	1.564
31OCT86	0.86	10.2	1.5	1.6	14	4.31
31OCT86	0.84	12.2	0.1	0.8	17	1.96
31OCT86	0.87	7.7	2.2	1.5	19	4.51
31OCT86	0.92	8.4	0.8	1.6	22	4.971
31OCT86	0.92	7.2	1.6	2.8	29	9.234
31OCT86	1	9.2	29.3	68.5	32	.
31OCT86	1.04	9.6	2.4	3	37	10.08
31OCT86	0.95	8.3	1	1.3	42	4.174
31OCT86	0.85	8.2	1.6	1.8	47	5.202
31OCT86	0.89	9.3	0.3	1.4	52	4.058

AREA G: NOVEMBER 1986 PSYCHROMETER DATA

DATE	CORRECTION	TEMP (DEG C)	OFFSET (MICROVOLTS)	READING (MICROVOLTS)	DEPTH (FT)	WATER POTENT (-BARS)
01NOV86	0.89	9.3	26.5	89.5	4.5	.
01NOV86	0.89	9.3	2	2.6	6.5	7.553
01NOV86	0.85	12.2	0.1	0.3	8.5	0.741
01NOV86	0.91	9.8	0.7	3.4	10	10.02
01NOV86	0.91	9.9	0.3	1.8	12	5.226
01NOV86	0.86	13	0.5	0	14	0
01NOV86	0.84	12.2	0.1	1.2	17	2.948
01NOV86	0.87	8	2.3	1.5	19	4.45
01NOV86	0.92	10.2	0.5	1.5	22	4.338
01NOV86	0.92	9.1	1.5	2.6	29	7.889
01NOV86	1	10.4	0.6	42.4	32	.
01NOV86	1.04	10.4	2.7	3.3	37	10.75
01NOV86	0.95	10.2	0.9	1.1	42	3.269
01NOV86	0.85	10.7	1.6	1.5	47	3.914
01NOV86	0.89	10.2	0.3	1.7	52	4.768
02NOV86	0.89	10	27.1	89.5	4.5	.
02NOV86	0.89	12.8	1.7	1	6.5	2.53
02NOV86	0.85	10.5	1.2	0.8	8.5	2.096
02NOV86	0.91	9.4	1.6	1.1	10	3.221
02NOV86	0.91	13.7	0.4	2.1	12	5.346
02NOV86	0.86	8.6	1.2	1.5	14	4.309
02NOV86	0.84	10.7	0.1	1.4	17	3.6
02NOV86	0.87	11.9	0.9	3.3	19	8.
02NOV86	0.92	11.2	1.4	1.7	22	4.726
02NOV86	0.92	10.3	1.9	2.4	29	6.92
02NOV86	1	10.2	1.4	75	32	.
02NOV86	1.04	9.3	2.4	2.5	37	8.465
02NOV86	0.95	10.8	1.5	1.2	42	3.481
02NOV86	0.85	10.4	2.3	1.5	47	3.946
02NOV86	0.89	8.5	0.9	1.7	52	5.09
03NOV86	0.89	8.7	26.2	89.5	4.5	.
03NOV86	0.89	11.2	1.3	0.4	6.5	1.066
03NOV86	0.85	11.1	1.3	1.7	8.5	4.384
03NOV86	0.91	12.4	0.4	3.2	10	8.565
03NOV86	0.91	10.4	0.1	0.6	12	1.695
03NOV86	0.86	9.2	1.2	0.7	14	1.95
03NOV86	0.84	11.7	0.8	3.1	17	7.829
03NOV86	0.87	8.8	0.9	2.3	19	6.682
03NOV86	0.92	7.9	0.7	1.7	22	5.402
03NOV86	0.92	8.5	1.4	2.6	29	8.093
03NOV86	1	10.1	0.8	2.1	32	6.649
03NOV86	1.04	8.9	2.4	2.9	37	10.02
03NOV86	0.95	10.4	1	1.4	42	4.137
03NOV86	0.85	9.1	1.4	1.7	47	4.732
03NOV86	0.89	9.2	0.4	1.4	52	4.072
04NOV86	0.89	10.7	24.6	89.5	4.5	.
04NOV86	0.89	8.9	1.5	0.3	6.5	0.87
04NOV86	0.85	10.7	1.2	1.7	8.5	4.
04NOV86	0.91	13.5	0.9	0.4	10	1.012
04NOV86	0.91	9.1	0.6	1.7	12	5.084
04NOV86	0.86	12.5	1.4	1.4	14	3.47

AREA G: NOVEMBER 1986 PSYCHROMETER DATA

04NOV86	0.84	9.7	0.2	1.3	17	3.499
04NOV86	0.87	6.7	1.9	0.9	19	2.8
04NOV86	0.92	8.9	0.9	0.8	22	2.416
04NOV86	0.92	5.5	2.7	3.5	29	12.55
04NOV86	1	10.6	1.7	34.7	32	.
04NOV86	1.04	7.7	2.9	1.8	37	6.467
04NOV86	0.95	6.8	2	2	42	6.872
04NOV86	0.85	10.4	2	1.7	47	4.485
04NOV86	0.89	8.8	0.2	1.6	52	4.742
05NOV86	0.89	10.6	25.8	89.5	4.5	.
05NOV86	0.89	11.2	2.4	2.7	6.5	7.282
05NOV86	0.85	11.8	0.1	0.1	8.5	0.25
05NOV86	0.91	9.4	1	0.6	10	1.755
05NOV86	0.91	13.6	0.3	1.1	12	2.793
05NOV86	0.86	8.6	1.4	1	14	2.858
05NOV86	0.84	12.3	0.2	1.8	17	4.423
05NOV86	0.87	6.8	1.7	3.3	19	10.53
05NOV86	0.92	6.9	0.7	1.8	22	5.985
05NOV86	0.92	9	1.5	2.8	29	8.546
05NOV86	1	9.9	0.4	30.2	32	.
05NOV86	1.04	10.5	2.9	2.2	37	7.074
05NOV86	0.95	5.8	1.8	1.6	42	5.744
05NOV86	0.85	6.4	2.1	1.6	47	4.99
05NOV86	0.89	6.1	0.4	1.6	52	5.336
06NOV86	0.89	7.9	24.1	89.5	4.5	.
06NOV86	0.89	10.2	2.5	2.1	6.5	5.851
06NOV86	0.85	13.3	1.2	1.3	8.5	3.107
06NOV86	0.91	13.6	1.6	1.1	10	2.7
06NOV86	0.91	9.8	0.1	0.7	12	2.025
06NOV86	0.86	8.6	0.9	0.1	14	0.284
06NOV86	0.84	11.3	0.7	2.1	17	5.343
06NOV86	0.87	8	4.2	1.8	19	5.31
06NOV86	0.92	6.5	1	0.7	22	2.343
06NOV86	0.92	8.8	2.9	3	29	9.192
06NOV86	1	10	1.7	27.4	32	.
06NOV86	1.04	8.6	4	3.4	37	11.86
06NOV86	0.95	10.3	1.7	1.2	42	3.543
06NOV86	0.85	6.3	2.9	1.9	47	5.95
06NOV86	0.89	10.7	0	1.9	52	5.244
07NOV86	0.89	10.3	24.5	89.5	4.5	.
07NOV86	0.89	11.2	1.8	1.7	6.5	4.563
07NOV86	0.85	9.3	0.1	0.5	8.5	1.375
07NOV86	0.91	13.5	0.6	0.1	10	0.253
07NOV86	0.91	13.4	0.1	1.3	12	3.328
07NOV86	0.86	8.4	1.3	0.9	14	2.593
07NOV86	0.84	12.2	0.4	1.6	17	3.936
07NOV86	0.87	7.2	0.7	3.5	19	11.04
07NOV86	0.92	6.9	1.2	1.9	22	6.309
07NOV86	0.92	10.6	2.4	3.5	29	10.04
07NOV86	1	6.6	0.4	30.6	32	.
07NOV86	1.04	9.2	3.4	3.4	37	11.6
07NOV86	0.95	6.5	1.3	0.4	42	1.377
07NOV86	0.85	10	2.1	1.1	47	2.5
07NOV86	0.89	6	0.5	2.6	52	8.7
08NOV86	0.89	6.9	24.8	89.5	4.5	.
08NOV86	0.89	11.6	2.4	2.7	6.5	7.177

AREA G: NOVEMBER 1986 PSYCHROMETER DATA

08NOV86	0.85	11.4	0.4	0.2	8.5	0.507
08NOV86	0.91	10.5	0.6	0.4	10	1.1
08NOV86	0.91	11.2	0.3	1.1	12	3.0[illegible]
08NOV86	0.86	12.7	1.2	1.4	14	3.45
08NOV86	0.84	8.7	0	2.6	17	7.372
08NOV86	0.87	10.3	0.9	3.5	19	9.671
08NOV86	0.92	10.1	1.4	2	22	5.806
08NOV86	0.92	5.6	2.3	3.7	29	13.25
08NOV86	1	9.3	27.2	52.9	32	.
08NOV86	1.04	6	3.1	3.1	37	12.19
08NOV86	0.95	10.5	1.5	0.7	42	2.046
08NOV86	0.85	6	2.9	2.1	47	6.683
08NOV86	0.89	10.6	0.4	2	52	5.535
09NOV86	0.89	8.5	23.2	89.5	4.5	.
09NOV86	0.89	9	2.2	2	6.5	5.847
09NOV86	0.85	12.5	0.3	0	8.5	0
09NOV86	0.91	9.2	1.4	0.6	10	1.765
09NOV86	0.91	13	0.2	0.6	12	1.548
09NOV86	0.86	10.9	1.2	0.1	14	0.26
09NOV86	0.84	9.3	0.4	2.8	17	7.745
09NOV86	0.87	7.7	1.8	0.7	19	2.094
09NOV86	0.92	9.7	0.7	1	22	2.935
09NOV86	0.92	10.6	1.6	1.5	29	4.253
09NOV86	1	8	1.4	24.6	32	.
09NOV86	1.04	8.5	3	1.9	37	6.599
09NOV86	0.95	6.8	2.4	2.3	42	7.912
09NOV86	0.85	10.5	2.4	1	47	2.
09NOV86	0.89	6.9	0.7	2.5	52	8.
10NOV86	0.89	7	23.2	89.5	4.5	.
10NOV86	0.89	11	2.1	1.3	6.5	3.5
10NOV86	0.85	8.4	0.4	0	8.5	0
10NOV86	0.91	13	0.7	0.2	10	0.514
10NOV86	0.91	12.5	0.1	0.9	12	2.366
10NOV86	0.86	8.3	1.6	0.9	14	2.6
10NOV86	0.84	11.8	0.3	2.7	17	6.79
10NOV86	0.87	8.4	1	0	19	0
10NOV86	0.92	8.3	0.9	0.5	22	1.545
10NOV86	0.92	5.9	2.7	2.3	29	7.983
10NOV86	1	8.6	1.8	22.2	32	.
10NOV86	1.04	10.3	3	1.9	37	6.139
10NOV86	0.95	6.1	2.5	2.2	42	7.809
10NOV86	0.85	10.4	2.4	1	47	2.62
10NOV86	0.89	6.4	0.6	2.2	52	7.272
11NOV86	0.89	6.2	23.1	89.5	4.5	.
11NOV86	0.89	11.5	1.7	0.9	6.5	2.378
11NOV86	0.85	8.5	0	0.4	8.5	1.136
11NOV86	0.91	11	0.8	0.2	10	0.55
11NOV86	0.91	12.6	0.4	2.2	12	5.808
11NOV86	0.86	11.1	0.8	3.4	14	9.006
11NOV86	0.84	8.1	0.2	1	17	2.866
11NOV86	0.87	10.4	2	3.5	19	9.586
11NOV86	0.92	6.4	1.3	0.9	22	3.028
11NOV86	0.92	8.3	3.2	4.1	29	1
11NOV86	1	9	0.4	20.3	32	.
11NOV86	1.04	5.7	3.3	2.2	37	8.685
11NOV86	0.95	9.5	2.4	2.6	42	7.983

AREA G: NOVEMBER 1986 PSYCHROMETER DATA

11NOV86	0.85	9	2.1	1.6	47	4.455
11NOV86	0.89	9.5	0.3	1.6	52	4.6
12NOV86	0.89	5.8	23.3	89.5	4.5	.
12NOV86	0.89	9.5	1.7	0.3	6.5	0.85
12NOV86	0.85	11.3	0.7	0.5	8.5	1.273
12NOV86	0.91	9.2	1.1	3.3	10	9.941
12NOV86	0.91	8.9	0.7	1.8	12	5.429
12NOV86	0.86	12.2	1.3	1	14	2.498
12NOV86	0.84	7.6	0.2	1.2	17	3.52
12NOV86	0.87	10.1	2.3	0.8	19	2.168
12NOV86	0.92	8.1	0.9	0.5	22	1.558
12NOV86	0.92	5.7	2.6	2.3	29	8.064
12NOV86	1	8.6	1.9	22.8	32	.
12NOV86	1.04	9.3	3.1	2	37	6.723
12NOV86	0.95	6	2.5	2.5	42	8.943
12NOV86	0.85	9.6	2.2	1.7	47	4.622
12NOV86	0.89	9.7	0.3	1.7	52	4.861
13NOV86	0.89	8.3	23.3	89.5	4.5	.
13NOV86	0.89	8.5	2.9	2.6	6.5	7.778
13NOV86	0.85	8.6	0.7	0.6	8.5	1.695
13NOV86	0.91	12.4	0.6	0.1	10	0.262
13NOV86	0.91	8.7	1	2.7	12	8.265
13NOV86	0.86	9	1.3	0.6	14	1.683
13NOV86	0.84	11.8	0.3	1	17	2.485
13NOV86	0.87	10.9	1.6	0.1	19	0.263
13NOV86	0.92	10.8	0.8	1.2	22	3.381
13NOV86	0.92	5.5	3	2.6	29	9.21
13NOV86	1	9.9	0.3	21.2	32	.
13NOV86	1.04	9.3	3.8	3.8	37	12.43
13NOV86	0.95	6.8	2.4	1.8	42	6.163
13NOV86	0.85	6.8	2.7	1	47	3.037
13NOV86	0.89	10.4	0.1	1.6	52	4.454
14NOV86	0.89	6.8	23.4	89.5	4.5	.
14NOV86	0.89	9.4	3.2	2.3	6.5	6.603
14NOV86	0.85	12.3	1	1.1	8.5	2.712
14NOV86	0.91	10.2	1.2	3.2	10	9.25
14NOV86	0.91	9.2	0.2	0.9	12	2.668
14NOV86	0.86	10.2	1.8	1.7	14	4.577
14NOV86	0.84	9.6	0.4	1	17	2.693
14NOV86	0.87	10.8	1.8	3.1	19	8.343
14NOV86	0.92	7.6	1	0.4	22	1.272
14NOV86	0.92	7.8	2.9	2.8	29	8.94
14NOV86	1	7.9	1.4	21.9	32	.
14NOV86	1.04	5.5	3.4	2.1	37	8.359
14NOV86	0.95	7.4	2.2	1.3	42	4.317
14NOV86	0.85	8.9	3.2	2.7	47	7.582
14NOV86	0.89	9.8	0.1	1.8	52	5.136
15NOV86	0.89	8.6	22.9	89.5	4.5	.
15NOV86	0.89	7.3	2.7	1.3	6.5	4.053
15NOV86	0.85	11.8	1	1.3	8.5	3.265
15NOV86	0.91	10.2	0.9	3.5	10	10.16
15NOV86	0.91	8.4	0.5	1.1	12	3.371
15NOV86	0.86	11	1.6	1.5	14	3.
15NOV86	0.84	8	0.2	1.4	17	4.
15NOV86	0.87	10.2	2	0.3	19	0.808
15NOV86	0.92	10.7	1.3	0.9	22	2.534

AREA G: NOVEMBE PSYCHROMETER DATA

15NOV86	0.92	5.7	2.8	2.9	29	10.22
15NOV86	1	9.8	1.8	24.3	32	.
15NOV86	1.04	7.9	3.1	2.1	37	7.49
15NOV86	0.95	9.9	1.9	1.4	42	4.2
15NOV86	0.85	5.9	2.8	1.6	47	5.093
15NOV86	0.89	10.2	0.3	1.9	52	5.337
16NOV86	0.89	4.8	23.3	89.5	4.5	.
16NOV86	0.89	10.7	1.9	1.1	6.5	2.993
16NOV86	0.85	12.1	0.1	0.3	8.5	0.744
16NOV86	0.91	10.6	0.8	0.4	10	1.117
16NOV86	0.91	10.2	0.2	0.5	12	1.422
16NOV86	0.86	9.5	1.8	1.7	14	4.703
16NOV86	0.84	10.5	0.3	2	17	5.246
16NOV86	0.87	8	1.3	3.5	19	10.62
16NOV86	0.92	10.3	1	0.4	22	1.141
16NOV86	0.92	6	3.2	3.7	29	12.94
16NOV86	1	10.3	0.5	22.2	32	.
16NOV86	1.04	5.4	4.2	3.7	37	15.01
16NOV86	0.95	10.2	2	2.2	42	6.562
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16NOV86	0.89	10.3	0.1	1.7	52	4.754
17NOV86	0.89	4.7	23.8	89.5	4.5	.
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17NOV86	0.85	11.8	0.8	0.2	8.5	0.499
17NOV86	0.91	12.6	1	0.5	10	1.302
17NOV86	0.91	10.9	0.1	0.6	12	1.664
17NOV86	0.86	9.1	1.8	1.6	14	4.49
17NOV86	0.84	11.8	0.1	1.9	17	4.7
17NOV86	0.87	7	1.4	0.2	19	0.615
17NOV86	0.92	7.1	1	0.7	22	2.281
17NOV86	0.92	8.9	3.2	3.5	29	10.71
17NOV86	1	10.2	1.1	26.8	32	.
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17NOV86	0.95	5.8	2	2	42	7.202
17NOV86	0.85	9.8	2.3	0.9	47	2.412
17NOV86	0.89	5.5	0.1	1.3	52	4.454
18NOV86	0.89	7.2	24.4	89.5	4.5	.
18NOV86	0.89	10.1	2.5	1.1	6.5	3.053
18NOV86	0.85	7.7	1.1	0.6	8.5	1.757
18NOV86	0.91	12.4	1.4	0.8	10	2.097
18NOV86	0.91	10.2	0.2	0.6	12	1.707
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18NOV86	0.87	11.4	1.1	0	19	0
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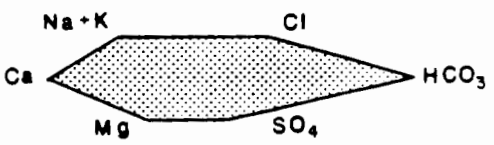
18NOV86	0.92	9.9	2.1	1.8	29	5.242
18NOV86	1	5.8	2.1	23.1	32	.
18NOV86	1.04	10.1	2.9	1.9	37	6.189
18NOV86	0.95	6.3	2.4	2.6	42	9.183
18NOV86	0.85	8	2.1	1.1	47	3.18
18NOV86	0.89	10.3	0.3	1.6	52	4.467



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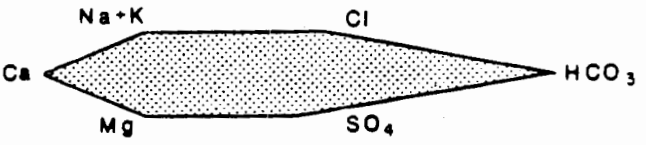

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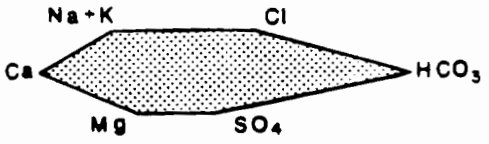

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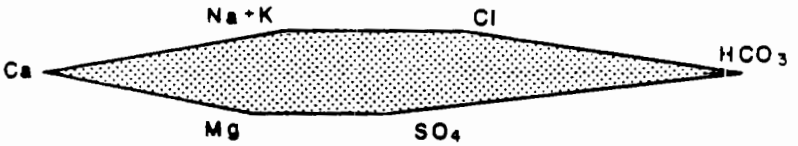

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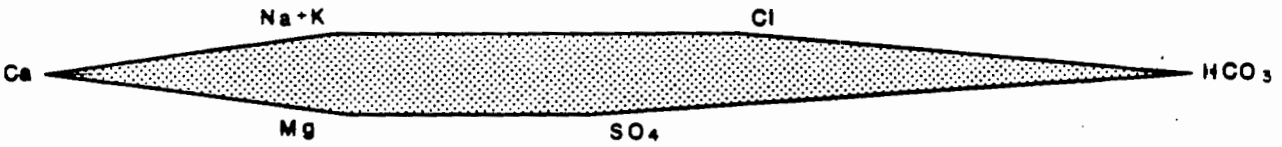

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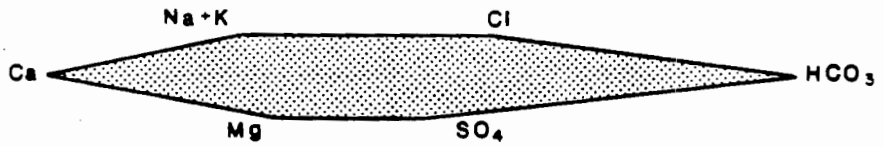

03-06-86

FIGURE 5-15
STIFF DIAGRAMS FOR PERCHED WATER
IN MONITORING WELL PCO-3
PAJARITO CANYON

PREPARED FOR

LOS ALAMOS NATIONAL LABORATORY
LOS ALAMOS, NEW MEXICO

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6.0 SUMMARY AND CONCLUSIONS

Hydrogeologic investigations of waste disposal Areas G and L at Los Alamos National Laboratory were conducted in response to a Compliance Order issued to the Laboratory by the State of New Mexico on May 7, 1985. Based on the investigations conducted during 1985 and 1986 in fulfillment of the Order and on previous investigations, several conclusions which reflect the current state of knowledge relative to the potential migration of hazardous waste constituents from the areas can be reached. These conclusions and brief summaries of data supporting each are provided below. Comprehensive discussions of data and conclusions concerning each area are provided in the accompanying text.

6.1 GEOLOGY OF TECHNICAL AREA 54, AREAS G AND L

Areas G and L are located on Mesita del Buey, a narrow southeast-trending mesa located on the western edge of the Pajarito Plateau. The plateau is comprised of an apron of volcanic and sedimentary rocks exceeding 2,000 feet in thickness on the eastern flanks of the Jemez mountains. Mesita del Buey is formed by approximately 475 feet of ashflows and ashfalls of the Bandelier Tuff which dip gently two to three degrees to the southeast. The tuff is underlain by 1,050 feet of interbedded Chino Mesa basalt and conglomerates of the Puye Formation. The Tesuque Formation, which underlies the Chino Mesa Basalt and Puye Formation, is comprised of coarse sediments interbedded with basalt flows and exceeds 1,000 feet in thickness beneath Mesita del Buey.

The geologic structure of the surface rocks which form Mesita del Buey are relatively simple; no faults are known to break the rocks of Mesita del Buey. The most prevalent structural features of Mesita del Buey are fractures in the volcanic rocks caused by shrinkage upon cooling after deposition. These fractures are nearly vertical with an average opening of $\frac{1}{4}$-inch. Most of the fractures encountered in the tuff are filled or plated with brown clay. The remainder are open with joint faces slightly weathered or plated with caliche. On the basis of this study and previous work the following conclusions concerning the geology of Mesita del Buey can be drawn:

- **The stratigraphy at Areas G and L is similar to that of the tuff throughout the western Pajarito Plateau**

- Vertical and near-vertical fractures (formed during cooling of the volcanically deposited material) are common in the Bandelier Tuff on Mesita del Buey (and elsewhere), though the degree of openness or pervasiveness of individual fractures is not well characterized

- No major fault zones that could serve as conduits from the shallow subsurface to the regional water table are known to exist at or near Areas G and L.

6.2 HYDROLOGIC CHARACTERIZATION OF THE VADOSE ZONE

Tasks one through four, paragraph 25 of the Order issued to the Laboratory specify testing and monitoring programs to be carried out to characterize the vadose zone hydrology at Areas G and L. The four tasks taken together provide the information necessary to calculate rates of moisture flux by unsaturated fluid flow through porous media. Task four also requires empirical measurement of infiltration and moisture redistribution within the tuff.

Task one requires measurement of the intrinsic permeability of the tuff. This task was satisfied utilizing both field and laboratory methods. Field methods included air injection and vacuum testing of five boreholes. (Due to the potential for mobilization of contaminants in the vadose zone by water introduced by testing, air permeability tests, which are experimental in nature, were utilized for field investigations). Water injection permeability tests were conducted in one borehole for comparison with results of air tests; tests conducted with water yield permeability of the same order of magnitude as air tests. Including both field methods, a minimum of nine intervals were tested in each borehole. Intrinsic permeability of four samples from each borehole was determined in the laboratory via the Klinkenberg Method and the Dynamic Method. Field methods yield intrinsic permeability in the range of 10^{-8} to 10^{-9} cm^2 and laboratory methods yield values of 10^{-9} cm^2. These values represent moderate permeability similar to that of silty sand. Each method indicates a slight decrease in intrinsic permeability with depth. In addition, intervals tested adjacent to fractures do not exhibit increased permeability.

Task two requires determination of soil moisture characteristic curves for five samples from each of at least four horizons. This requirement was satisfied by testing four samples (one per horizon) from five boreholes. The soil

moisture characteristic curves were determined by the centrifugal method. This method yielded characteristic curves in the 0.03 bar (0.5 psi) to 0.34 bar (5 psi) soil water tension range. Field conditions of soil water tension range from 1 to 15 bars. Attempts to evaluate higher tension ranges (lower moisture content) were made utilizing the centrifugal and pressure plate methods. These methods were unsuccessful due to sample disaggregation at higher tensions.

Task three of paragraph 25 requires determination of unsaturated hydraulic conductivity of the Bandelier Tuff; five samples from each of four horizons are required. Theoretical and laboratory methods were utilized to determine the unsaturated conductivity of four samples from five boreholes. Due to difficulties with the material strength of the tuff (sample disaggregation) discussed above, the hydraulic conductivity of samples in the range of moisture conditions naturally encountered in the tuff could not be determined. However, since hydraulic conductivity decreases with decreasing moisture content and the conductivity of samples was determined for moisture ranges above field moisture conditions, the determined values serve as maximum estimates of unsaturated hydraulic conductivity likely to be encountered under field conditions. Theoretical methods of determining hydraulic conductivity yield an average of 2.64×10^{-4} ft/day and measured values average 1.32×10^{-4} ft/day. Thus, the two methods yield similar results.

Task four requires an analysis of infiltration and redistribution of meteoric water into the tuff by neutron logging and either moisture blocks and/or psychrometry. The Laboratory satisfied this requirement by conducting neutron-moisture monitoring and measuring matric potential with thermocouple psychrometers. Neutron moisture monitoring and gravimetric moisture measurements indicate that the volumetric moisture content of the tuff below ten feet is approximately two to four percent. In addition, analysis of daily moisture logs after autumn precipitation indicate the depth of infiltration of meteoric water is approximately ten feet. Moisture is not observed to move deeper than this depth and is assumed to be returned to the surface through evapotranspiration. Psychrometers indicate that soil tensions range from just less than one bar to approximately 15 bars. Vertical hydraulic gradients, as determined by psychrometers, range from downward values of 10.20 ft/ft to upward gradients of 4.12 ft/ft.

The primary emphasis of tasks one through four of paragraph 25 of the Order is to gather data required to assess rates of liquid movement through the Bandelier Tuff both by calculation and empirically. Empirical measurements of moisture content in the tuff following precipitation events indicate that slight (0.5 percent) increases in moisture are observed at depths up to ten feet below the surface; no effects of precipitation or moisture were observed at 22 feet. Thus, empirical measurement of redistribution of meteoric water suggests that effects of precipitation are confined to the uppermost 22 feet of the vadose zone and therefore do not provide a viable means of contaminant transport below this depth.

Calculation of liquid flux rates through porous media using field derived hydraulic gradients and laboratory derived unsaturated hydraulic conductivities yield mean flux rates of 0.036 and 0.211 feet per year for Areas L and G, respectively. The calculations should be viewed as extremely conservative for the following reasons. Hillel (1980, p. 108) explains that unsaturated flow occurs in response to hydraulic gradients by fluid movement along hydration films over particle surfaces in a tendency to equilibrate the potential. At very low moisture content (two to four percent), it is doubtful whether or not continuous hydration films exist to provide for fluid movement. Further, fractures which may range from microstructures to master joint sets, may provide effective barriers to capillary flow.

Assuming that moisture is evenly distributed throughout the tuff, the flux rates determined by calculations may still be viewed as conservative because of values used for hydraulic conductivity. As stated previously, hydraulic conductivity decreases with decreasing moisture content. Unsaturated hydraulic conductivity for use in flux calculations was determined for wetting fluid saturations of 40 to 70 percent (22 to 60 percent volumetric moisture content) while in situ moisture measurements of tuff indicate two to four percent volumetric moisture. Thus, hydraulic conductivities utilized in flux calculations are greater than values under field conditions and therefore yield greater flux rates than can be reasonably expected to occur in the field. Though highly conservative, these moisture flux values show that very long periods of time would be required for water and contaminants to move by unsaturated flow from the disposal facilities to the ground water.

The discussion of vadose zone hydrologic characterization presented above leads to the following conclusion:

- **The combination of very low moisture content in the tuff, empirical determination that moisture from precipitation does not infiltrate below a depth of ten to 22 feet, and very low calculated flux rates all suggest that aqueous transport of contaminants through Bandelier Tuff is not a viable mechanism for contaminant migration at Areas G and L.**

6.3 CHEMICAL CHARACTERIZATION OF THE VADOSE ZONE

Seven test hole locations were selected for core and pore gas analyses of the Bandelier Tuff at Mesita del Buey to fulfill the requirements of Task 5 of the Order. In 1985, four test holes were drilled at Area L, two test holes at Area G, and one background hole on the western end of the mesa. Core samples were collected from each ten foot interval in all seven test holes and analyzed for EP Toxicity and volatile organic compounds.

No EP toxic metals were detected in test hole cores below a depth of 20 feet in Areas G and L. Part per million concentrations of volatile organic compounds were present in core samples from test holes in Area L at depths up to 100 feet (the maximum depth sampled). In Area G, no volatile organic compounds were detected at part per million concentrations (detection limit for Area G samples).

A total of 23 sampling ports were installed in the seven test holes (three or four per test hole) to collect samples of pore gas from the tuff at various depths. Samples were collected by pumping the pore gas through charcoal adsorption tubes and volatile organic analyses were subsequently performed on the charcoal desorption solution. Volatile organic compounds were detected in Area L in part per million concentrations at all depths sampled. There remains, however, some uncertainty as to the degree of isolation between sample ports within tests holes. In Area G, volatile organic compounds were detected in part per billion concentrations at all depths sampled. From this data, the following conclusions can be inferred:

- **Hazardous waste constituents have migrated from land disposal units at Areas G and L based on the results of core and pore gas analyses conducted in 1985 and 1986**

- Chemical data from the core and pore gas analyses (and information obtained from vadose zone characterization) support vapor phase migration from Areas G and L as the dominant transport mechanism, based on the presence of volatile organic vapors at depths of up to 100 feet.

6.4 GROUND WATER HYDROLOGY IN AREAS G AND L

Two distinct ground water systems are present within the Pajarito Plateau near Areas G and L on Mesita del Buey; the main aquifer which occurs at great depth in the Tesuque Formation and a shallow perched water system contained in the alluvium of Pajarito Canyon. No perched water is contained in the alluvium of Cañada del Buey. The main aquifer is the only ground water system in the Los Alamos area capable of producing a municipal and industrial water supply. Characterization of the hydraulic and chemical properties of the main aquifer is, therefore, based on information obtained from supply wells, stock wells, test wells, and springs. The main aquifer is located at a depth of approximately 950 and 850 feet below Areas L and G, respectively, and has an average saturated thickness of 1,470 feet. Beneath Mesita del Buey, the aquifer moves east-southeast towards the Rio Grande at a velocity of about 65 feet per year. Water from wells PM-2 and PM-4, the two supply wells nearest Mesita del Buey, are sodium bicarbonate and have less than 200 mg/ℓ total dissolved solids concentration.

Between June 1985 and September 1986, the alluvium in Pajarito Canyon contained a perennial body of perched water. Based on the 27 test holes drilled on Mesita del Buey and in Pajarito Canyon, the perched water contained in the alluvium does not extend horizontally or vertically into the tuff which forms Mesita del Buey. The saturated thickness of the perched water ranges from four to ten feet in the wells monitored and is dependent on both the channel bedrock configuration and the thickness of the alluvial deposits. The perched water moves east through the canyon to the Rio Grande with a velocity ranging from 8 to 23 feet per day. Upgradient from Areas G and L, the perched water is characteristically sodium bicarbonate with an average annual total dissolved solids concentration of 180 mg/ℓ. The perched water gradually becomes calcium bicarbonate downgradient and the average total dissolved solids concentration increases to 420 mg/ℓ. All chemical and radiological constituents in the perched water are at concentrations below the primary

standards for drinking water. No volatile organic compounds have been detected in the perched water. Fluctuations in the inorganic chemical quality in the perched water system are dependent on the saturated thickness of the water in the alluvium and, during periods of high flow, the concentrations of dissolved constituents are typically diluted.

Studies of the main aquifer and perched water systems near Mesita del Buey indicate that:

- **No perched bodies of water, which could be hydraulically connected to the main aquifer, are known to exist beneath Areas G and L**
- **Perched water in Pajarito Canyon is confined to alluvium within the canyon and does not extend vertically or horizontally into the Bandelier Tuff which forms Mesita del Buey**
- **There is no evidence of migration of hazardous waste constituents from Areas G and L into the perched water contained in the alluvium of Pajarito Canyon.**

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APPENDIX A

NEW MEXICO ENVIRONMENTAL IMPROVEMENT DIVISION
COMPLIANCE ORDER/SCHEDULE
DATED MAY 7, 1985

TONEY ANAYA
GOVERNOR

DENISE D. FORT
DIRECTOR

STATE OF NEW MEXICO
ENVIRONMENT DEPARTMENT
ENVIRONMENTAL IMPROVEMENT DIVISION
P.O. Box 968, Santa Fe, New Mexico 87504-0968
(505) 984-0020

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

May 7, 1985

Mr. Harold Valencia, Manager
US Department of Energy
Los Alamos Area Office
Los Alamos, N.M. 87544

Dr. Donald Kerr, Laboratory Director
The University of California
Los Alamos National Laboratory
Los Alamos, N.M. 87544

RE: COMPLIANCE ORDER/SCHEDULE

Dear Messers. Valencia and Kerr:

Enclosed herein is a COMPLIANCE ORDER/SCHEDULE filed against the Los Alamos National Laboratory (LANL) pursuant to the New Mexico Hazardous Waste Act, Laws of 1977, ch. 313, presently compiled as 74-4-1 to 74-4-3, 74-4-4, 74-4-5, 74-4-8, 74-4-11 and 74-4-12 NMSA 1978. The Compliance Order/Schedule states that LANL has failed to comply with the Hazardous Waste Management Regulations promulgated under the authority of the New Mexico Hazardous Waste Act. These violations are specifically set out.

You are required to respond to this Compliance Order/Schedule within the required time frames. These time frames were developed and agreed to by both the EID and your staff on their March 7, 1985 meeting in Santa Fe. (We apologize for the delay in issuing this Order; however, your staff has known about these agreed upon dates, so proceeding toward compliance shouldn't have been delayed.) These time frames are provided as required under Section 74-4-12 of the New Mexico Hazardous Waste Act. If these time frames are not adhered to penalties of up to ten thousand ($10,000) dollars per day per violation for failure to comply with this Compliance Order/Schedule will be sought in District Court by the EID. Note that each day the cited violations continue constitutes a new violation for which additional penalties may be imposed.

We await your response and are available for consultation on this matter. All questions should be addressed to Peter H. Pache of the Hazardous Waste staff. He can be reached at (505) 984-0020 Ext. 340.

Sincerely,

Denise Fort

Denise Fort
Director

DF/JE/mp

cc: Guanita Reiter, EPA Region VI
Tito Madrid, EID, District II
Duff Westbrook, EID, Legal

ENVIRONMENTAL IMPROVEMENT DIVISION

IN THE MATTER OF: Los Alamos National Laboratory Los Alamos, New Mexico EPA ID #NM0890010515	)))))	Docket Number NMHWA 001007 COMPLIANCE ORDER / SCHEDULE

The Compliance Order/Schedule is issued pursuant to Section 74-4-10 of the New Mexico Hazardous Waste Act, Laws of 1977, ch. 313, NMSA 1978 by the authority delegated by the New Mexico Legislature to the Director of the Environmental Improvement Division (EID).

Complainant, the Director of the EID, has determined that Los Alamos National Laboratory (this facility includes both the University of California [UC] and the Department of Energy [DOE]), EPA ID #NM0890010515, hereinafter referred to as Respondent, has violated the New Mexico Hazardous Waste Act and the regulations promulgated thereunder.

FINDINGS

1. Respondent is an owner or operator of a facility which generates and treats, stores and/or disposes of hazardous waste at its facility located at Los Alamos, New Mexico.

2. Pursuant to Section 202.B. & 202.D. of the New Mexico Hazardous Waste Management Regulations (HWMR-2), Respondent timely notified EPA that it was a generator and treatment, storage and/or disposal (TSD) facility for hazardous waste.

3. This notification and Part A submittal (dated August 12, 1980) included: disposal in a landfill (D80); disposal in a surface impoundment (D83); and treatment by physical, chemical, thermal or biological means (T04).

4. Since the initial notification and Part A submittal one valid subsequent Part A has been submitted; dated July 25-26, 1985. This included: storage in containers (S01); disposal in a landfill (D80); treatment in a tank (T01); and treatment by physical, chemical, thermal or biological means (T04). It deleted treatment in a surface impoundment (D83).

5. Since there was not a closure plan submitted and approved for the surface impoundment that component still has interim status and must comply with HWMR-2.

6. On or about May 22, 1984 LANL was conducting their business of operating a research laboratory and generating, treating, storing and/or disposing of hazardous waste.

7. On or about May 22, 1984 LANL was inspected by member(s) of the EID Hazardous Waste Section's staff.

8. On or about June 26, 1984 EID issued a Notice of Violation (NOV) enumerating the violations discovered as a result of the inspection.

9. LANL responded to the NOV in a letter dated July 26, 1984. This letter demonstrated compliance in six of the thirteen violations cited in the NOV.

10. The July 26, 1984 letter also responded to three of the four inquiries posed by the EID. These inquiries were part of the June 22, 1984 NOV.

11. On September 11, 1984, a meeting between LANL and EID was held. The purpose of the meeting was to discuss remaining issues and to present EID comments on several documents which had been submitted by LANL. EID posed two additional inquiries at this meeting.

12. On September 26, 1984 another meeting was held to discuss compliance issues. At that time the fourth inquiry of the June 22, 1984 NOV was responded to and LANL agreed to submit the following:

    A. By November 1, 1984 new evidence of compliance with:
       a. Waste analysis provisions;
       b. Personnel training provision;
       c. Submit an accurate Part A; and,
       d. Ground water monitoring waiver documentation.

    B. By December 1, 1984:
       a. Closure plans; and,
       b. Post-closure plans.

13. Subsequent submittals were made by LANL; one dated November 1, 1984, the other November 30, 1984.

14. EID reviewed all of the submittals made by LANL in response to the NOV issued. EID found six items to be in compliance, four items (closure, post-closure, waste analysis and contingency plans) to have been submitted as requested (their adequacy will be determined via a Part B review). Seven issues remaining to be corrected.

15. A meeting was held on February 5, 1985 to discuss EID's findings. At that time the following items were presented as still being in non-compliance:

    A. Ground water monitoring/waiver demonstration;
    B. Biennial reports, notifications and other RCRA related documents were not being signed by appropriate officials from both DOE and UC;
    C. All LANL TSD locations need to have and implement an inspection schedule;
    D. All inspections must be documented and must follow the schedule required in 15 C above;
    E. LANL personnel training program must be implemented;
    F. A closure and a post-closure plan for the surface impoundment that treats lithium hydride; and,

G. Account for past disposal of EP (extraction procedure as defined by Section 201 of HWMR-2) toxic high explosive (HE) sands.

16. The result of the February 5, 1985 meeting was to meet again in four weeks to finalize a compliance order/schedule. In the interim, representatives from both LANL and EID would meet on the ground water waiver documentation issue and develop a suitable plan. Additionally, LANL would be able to use the interim to comply with the other existing violations.

17. A meeting was held on March 7, 1985 to finalize a compliance order/schedule. At this meeting the following violations were addressed:

A. HWMR-2, Section 206.C.1.a.(1) requires any owner of hazardous waste surface impoundment, landfill or land treatment facility to implement a ground water monitoring program capable of determining the facility's impact on the uppermost aquifer.

LANL does not have a ground water monitoring program at this time. They have requested a waiver as provided for by HWMR-2, Section 206,C.1.a.(3), but have failed to provide the necessary documentation required under that Section.

B. HWMR-2, Section 202.B. and D., 203.A.3., and 203.C.3., requires the signature of the owner and/or operator of a facility on notifications and biennial reports. At the time of the inspection these documents were being signed by other facility personnel.

At the March 7, 1985 meeting EID was presented with a document authorizing other specific facility staff to sign for the owner/operator.

C. HWMR-2, Section 206.B.5.b. requires facilities to develop and follow a written schedule for inspecting equipment and physical structures.

At the time of the inspection LANL was unable to produce a document meeting the requirements of the above cite.

D. HWMR-2, Section 206.B.5.e. requires that a record of all inspections be kept in an inspection summary.

At the time of the inspection LANL was not keeping a summary log of all inspections conducted at the LANL facility components.

E. HWMR-2, Section 206.B.6. requires all facilities to implement a personnel training program. This program must be presented to all personnel within six months of their employment. All personnel must take part in an annual review of the training. All training must be documented.

At the time of the inspection LANL did not have a training program in place. Also, LANL did not have any of the documentation required by the above cite.

F. HWMR-2, Section 206.C.6.f. requires the owner/operator of a hazardous waste surface impoundment to develop and have available for review by an inspector a closure/post-closure plan.

At the time of the inspection LANL did not have closure/post-closure plan available for review by the inspector.

G. LANL was requested to submit documentation responding to EID's inquiry regarding the final disposition of EP toxic HE sands.

At the September 11, 1984 meeting LANL was requested to submit the documentation on the analytical results of EP toxic tests of the HE sands as well as a description of their final disposition.

COMPLIANCE ORDER/SCHEDULE

Based on the above findings the complainant hereby issues this compliance order/schedule (New Mexico Hazardous Waste Act, Section 74-4-10) to the Respondent. The following must be submitted (post-marked) to EID by the dates provided under each section.

18. LANL will submit a written schedule for conducting all inspections at each hazardous waste component of the LANL facility. This schedule must comply with all the provisions of Section 206.B.5. of HWMR-2. Included with the schedule will be a certification that the schedule has been implemented and the date when that implementation occurred. This task will be completed by May 1, 1985.

19. LANL will record the results of every inspection on each component of its hazardous waste facility. This record will be in log or summary form and will fulfill all the requirements of Section 206.B.5. of HWMR-2. Included with this documentation will be a certification declaring that each of the inspections will be conducted as scheduled and the date when the inspections were implemented. This task will be completed by May 1, 1985.

20. LANL will submit a copy of their personnel training program. This document will meet all the requirements of Section 206.B.6. of HWMR-2. This submittal will include but is not limited to: (1) Course outline; (2) A list of job titles and their associated job descriptions for all categories that are involved in the handling of hazardous waste; and, (3) A numerical figure that represents the number of individuals in each of the job classifications that handle hazardous waste, together with a generic description of these classifications, experience and education. This task will be completed by May 1, 1985.

21. LANL will implement the training program, required in 20, in its entirety. The implementation will follow all the requirements in Section 206.B.6. of HWMR-2. This task will include a submittal by LANL's responsible corporate or executive officer or his/her official designee, certifying the date which this program was implemented. This task will be completed by October 1, 1985.

22. LANL will be inspected for compliance with HWMR-2 in the fourth quarter, July through September, 1986. At that time LANL will have conducted its first annual review of the personnel training program.

23. LANL was required to submit documentation responding to EID's inquiry regarding the final disposition of HE EP toxic sands.

    Prior to March 7, 1985 meeting LANL provided EID with a report detailing a number of old waste sites they are currently looking at. One of those sites was the disposal location for the HE EP toxic sands.

    This will be addressed later under a corrective action program. This task is considered complete at this time.

24. LANL is required to submit a closure/post-closure plan for its surface impoundment. At the March 7, 1985 meeting the need for assessing the impoundment contents and any possible migration of contamination from the pond was discussed. It was decided that investigatory activities at the surface impoundment required activities similar to those negotiated for the ground water monitoring waiver demonstration. Therefore, the following tasks, with their completion dates, may coincide with waiver demonstration tasks:

    A. All drilling, coring and sampling will be completed within eight months from receipt of this action.

    B. All sample analysis and data interpretation will be complete in sixteen months from receipt of this letter.

    C. A written report documenting the findings will be submitted to EID within eighteen months from receipt of this letter.

25. LANL will implement the following ground water monitoring/ground water waiver demonstration activities and comply with the indicated dates.

    TASK 1.

    Parameter / Task
    Intrinsic permeability (k) of tuff.

    Acceptable Method(s)[1]
    Constant head tests[2,3].

    Frequency / No. of Samples
    a. At least 5 holes 125' deep; and,
    b. At least 1 test per horizon per hole with a minimum of 6 tests per hole.

    Location(s)
    Areas TA-54 area L and TA-51 area G

    Reporting Date

a. March 31,1986 (a coherent report)
b. March 31,1987 (a publishable report)

Importance
a. Basic rock characteristic
b. k is referenced in RCRA ammendments
c. Needed to analyze flow of gases

TASK 2.

Parameter / Task
Moisture characteristic curve for tuff $\psi(\theta)$ where is wetness and is matrix potential.

Acceptable Method(s)[1]
a. Any of the standard lab methods; and,
b. More than one method probably needed to include all moisture conditions[4].

Frequency / No. of Samples
At least 5 samples from each of at least 4 horizons.

Location(s)
Areas L and G

Reporting Date(s)
a. March 31, 1986 (a coherent report)
b. March 31, 1987 (a publishable report)

Importance
a. Basic rock characteristic
b. Needed to predict unsaturated conductivity, vapor diffusion, effective porosity, seepage velocity, and to interpret task 5.

TASK 3.

Parameter / Task
Unsaturated hydraulic conductivity k (θ) of tuff.

Acceptable Method(s)[1]
a. Both theoretical (based on task 2.) and laboratory methods are required; and,
b. sufficient number of different methods must be employed to give trustworthy predictions[4].

Frequency / No. of Samples
At least 5 samples from each of at least 4 horizons.

Location(s)
Areas L and G same location as task 2.

Reporting Date(s)
a. March 31, 1986 (a coherent report)
b. March 31, 1987 (a publishable report)

Importance
Needed to predict seepage velocity and fluxes and to intrepret task 5.

TASK 4.

Parameter / Task
Infiltration and redistribution of meteoric water into tuff.

Acceptable Method(s)[1]
Both tuff moisture content and matrix potential must be measured by neutron logging and either moisture blocks and/or psychrometry.

Frequency / No. of Samples
a. At least 4 holes; two 50' deep and two 100' deep;
b. Each two weeks neutron logging with daily logs after two autumn storms; and,
c. 10 potential sensors per hole.

Location(s)
Two at TA-54 Area L and two at TA-54 Area G.

Reporting Date(s)
a. Equipment in place and functioning by March 31, 1986 (a coherent report)
b. March 31,1987 (a publishable report).

Importance
a. Gives potential gradients in tuff;
b. Allows integration of tasks 2. and 3. into overall picture; and,
c. Gives actual infiltration rates and water fluxes.

TASK 5.

Parameter / Task
Core and pore gas analysis.

Acceptable Method(s)[1]
a. Standard methods of soil science for inorganics to be done on cores; and,
b. GC or GC/MS for VOs both on cores and on gas samples collected in field.

Frequency / No. of Samples
a. At least 6 holes of varying depths;
b. Cores analyzed for inorganic contaminants and VO scan at 10' intervals; and,

c. Pore gas samplers in bottoms of holes (at least one per hole); and,
d. Analyze quarterly.

Location(s)
4 at TA-54 Area L and 2 at TA-54 Area G.

Reporting Date(s)
a. Core analysis by November 30,1985; and,
b. Pore gas results by July 31,1986 and quarterly thereafter.

Importance
a. Direct measurement of movement of wastes in tuff; and,
b. Surveillance prior to closure of impoundment at Area L

TASK 6.

Parameter / Task
Analysis of perched water

Acceptable Method(s)
Observation wells in side canyons and report summarizing applicability of research in Mortandad Canyon

Frequency / No. of Samples
a. 6 wells bottoming in tuff screened throughout maximum saturated thickness ; and,
b. Samples and water levels quarterly.

Location(s)
Three in Canada del Buey and three in Pajarito Canyon

Reporting Date(s)
a. Analysis by November 30,1985; and,
b. Hence quarterly.

Importance
a. Monitoring of hazardous constituents in perched water
b. Helps quantify thickness, seasonal extent, and fate of perched water in side canyons.

1 This means a coherent (by March 31,1986) and publishable (by LANL standards by March 31,1987) report should be written based on the methods indicated and any other ancillary work required.
2 Tests conducted with water must involve CO_2 flooding and unsaturated flow analysis.
3 Flow tests or pressure transient tests may be used, as appropriate. Analysis must include fracture logging and may include analysis of fracture contribution.
4 Drying curve only required.

26. Compliance with these requirements does not relieve the Respondent of its responsibilities under any other statutes or regulations. Compliance with this order will not necessarily fulfill the requirements for completion of the Respondent's Part B application.

PENALTY

27. The Complainant, in accordance with its enforcement policy for the Hazardous Waste Section, has pursued this matter to the end of its administrative options. If for any reason the Respondent should default on any provision of the enclosed compliance order/schedule, the Complainant will file an action in District Court to enforce this order/schedule and seek court penalties pursuant to Section 74-4-12 (Civil Penalties) of the New Mexico Hazardous Waste Act which provides for a civil penalty of up to ten thousand ($10,000) dollars per day for each violation.

28. All correspondence relating to this compliance order/schedule shall be sent by Registered Mail or Certified Mail, return receipt requested, to the following address:

Peter H. Pache, Program Manager
Hazardous Waste Section
P. O. Box 968 - Crown Building
Santa Fe, New Mexico 87504-0968

Denise Fort

Denise Fort, Director
Environmental Improvement Division

APPENDIX B
AREA L WASTE LOGS

LOS ALAMOS NATIONAL LABORATORY
HAZARDOUS CHEMICAL WASTES DISPOSED
AT TA-54, AREA L IN DISPOSAL SHAFTS

SHAFT NUMBER: 19

H 830063L	TRANSFORMER OIL ON ZORBAL A VERMICULITE	H-CODE: 06	VOL=	.113562 M3	WGT=	60.0309 KG	D-DATE:	830325

GROSS-VOL THIS SHAFT= .113562 M3 GROSS-WGT THIS SHAFT= 60.0309 KG

SHAFT NUMBER: 20

H 830016N	CHROMIC ACID BURIED IN 15 GAL DRUM	H-CODE: 00	VOL=	.567812E-01 M3	WGT=	36.2874 KG	D-DATE:	830223
H 830020L	ALUMINUM CHLORIDE IN DRUM #17 PLUS BE	H-CODE: 00	VOL=	.113562 M3	WGT=	79.3708 KG	D-DATE:	830223
H 830021L	INORGANICS IN DRUM #18	H-CODE: 00	VOL=	.113562 M3	WGT=	79.3788 KG	D-DATE:	830223
H 830022L	INORGANICS IN DRUM #19	H-CODE: 00	VOL=	.113562 M3	WGT=	86.1027 KG	D-DATE:	830223
H 830027I	PERCHLORIC ACID	H-CODE: 03	VOL=	.378541E-02 M3	WGT=	.907186 KG	D-DATE:	830203
H 830052N	INORGANICS DISPOSED OF IN OWN DRUM	H-CODE: 00	VOL=	.454250 M3	WGT=	153.597 KG	D-DATE:	830324
H 830066N	10 GAL OF FUME LITHARGE (PBO)	H-CODE: 00	VOL=	.378541E-01 M3	WGT=	37.0297 KG	D-DATE:	830324
H 830195L	OIL ON VERMICULITE	H-CODE: 06	VOL=	.416375 M3	WGT=	226.726 KG	D-DATE:	830929
H 830196L	CUTTING OIL ON VERMICULITE	H-CODE: 06	VOL=	.454250 M3	WGT=	249.476 KG	D-DATE:	830929
H 830211L	OIL ABSORBED ON VERMICULITE	H-CODE: 06	VOL=	.624593 M3	WGT=	226.726 KG	D-DATE:	830929

GROSS-VOL THIS SHAFT= 2.38060 M3 GROSS-WGT THIS SHAFT= 1476.63 KG

SHAFT NUMBER: 21

H 830091N	CORRODED CL2 AND HF CYLINDERS-VENTED	H-CODE: 08	VOL=	.757003E-01 M3	WGT=	90.7186 KG	D-DATE:	830525
H 830205N	F2 CYCLINDER VENTED PUT IN SHAFT	H-CODE: 08	VOL=	.141504E-01 M3	WGT=	9.07186 KG	D-DATE:	830929
H 830281N	8 CYLINDERS FROM C AREA TO CYL. SHAFT	H-CODE: 08	VOL=	.200000 M3	WGT=	136.078 KG	D-DATE:	831215
H 840127N	EMPTY CYLINDERS TO SHAFT	H-CODE: 08	VOL=	.141504E-01 M3	WGT=	10.1437 KG	D-DATE:	840424
H 840306N	EMPTY GAS MIXING CYLINDER	H-CODE: 08	VOL=	.100000E-01 M3	WGT=	9.07186 KG	D-DATE:	840703
H 840353N	EMPTY GAS CYLINDERS	H-CODE: 08	VOL=	.566336E-01 M3	WGT=	10.1437 KG	D-DATE:	840806
H 840409N	EMPTY CYLINDERS	H-CODE: 08	VOL=	.141504 M3	WGT=	45.3593 KG	D-DATE:	840924
H 840411N	EMPTY CYLINDERS	H-CODE: 08	VOL=	.481384E-01 M3	WGT=	11.3398 KG	D-DATE:	840926
H 840454N	EMPTY GAS CYLINDERS	H-CODE: 08	VOL=	.849505E-01 M3	WGT=	22.6796 KG	D-DATE:	841120
H 840455N	EMPTY GAS CYLINDERS	H-CODE: 08	VOL=	.906130 M3	WGT=	90.7186 KG	D-DATE:	841120

H 850051N	GAS CYLINDERS THAT HAVE BEEN VENTED	H CODE: 00	VOL=	.113267 M3	WGT=	45.3593 KG	D DATE: 850319
H 850163N	EMPTY NEITON CYLINDERS	H-CODE: 00	VOL=	.500000E-02 M3	WGT=	13.6078 KG	D DATE: 850715
H 850165N	EMPTY KRYPTON CYLINDERS	H-CODE: 00	VOL=	.198210E-01 M3	WGT=	4.53593 KG	D DATE: 850725
H 850214N	EMPTY FLUORINE CYCLINDERS	H-CODE: 00	VOL=	.842500E-01 M3	WGT=	102.058 KG	D DATE: 850813
H 850215N	BATTERIES	H-CODE: 00	VOL=	.416395 M3	WGT=	181.432 KG	D DATE: 850805

GROSS VOL THIS SHAFT= 2.12021 M3 GROSS WGT THIS SHAFT= 928.324 KG

SHAFT NUMBER: 22

H 830009L	ORGANICS IN DRUM #40	H-CODE: 01	VOL=	.113562 M3	WGT=	104.326 KG	D DATE: 830223
H 830010L	ORGANIC SOLVENT WITH KEROSENE BASE	H-CODE: 01	VOL=	.113562 M3	WGT=	90.7105 KG	D DATE: 830223
H 830011L	ORGANIC CHEMICALS	H-CODE: 01	VOL=	.113562 M3	WGT=	83.9147 KG	D DATE: 830223
H 830012L	ORGANICS	H-CODE: 01	VOL=	.113562 M3	WGT=	77.1188 KG	D DATE: 830223
H 830013L	ORGANICS DRUM #44	H-CODE: 01	VOL=	.113562 M3	WGT=	61.6886 KG	D DATE: 830223
H 830014L	ORGANICS IN DRUM #45	H-CODE: 01	VOL=	.113562 M3	WGT=	91.1722 KG	D DATE: 830223
H 830017L	ORGANICS IN DRUM #46	H CODE: 01	VOL=	.113562 M3	WGT=	47.6273 KG	D DATE: 830223
H 830018L	ORGANICS IN DRUM #47	H CODE: 01	VOL=	.113562 M3	WGT=	81.6467 KG	D DATE: 830223
H 830019L	ORGANICS IN DRUM #39	H-CODE: 01	VOL=	.113562 M3	WGT=	99.7985 KG	D DATE: 830223
H 830023N	CUTTING OIL ON VERMICULITE	H-CODE: 06	VOL=	.340687 M3	WGT=	229.321 KG	D DATE: 830223
H 830024N	PAINT THINNER IN VERMICULITE	H CODE: 01	VOL=	.624593 M3	WGT=	635.036 KG	D DATE: 830223
H 830038L	ORGANICS DRUM #48	H-CODE: 01	VOL=	.200198 M3	WGT=	192.224 KG	D DATE: 830525
H 830039L	ORGANICS DRUM #49	H-CODE: 01	VOL=	.200198 M3	WGT=	183.419 KG	D DATE: 830325
H 830060N	CHEMICALS DISPOSED OF IN OWN CONTAINER	H CODE: 01	VOL=	.222125 M3	WGT=	93.9142 KG	D DATE: 830315
H 830061N	UNREACT ORGANICS BURIED IN OWN CONTAINER	H CODE: 01	VOL=	3.10000 M3	WGT=	1905.11 KG	D DATE: 830324

GROSS VOL THIS SHAFT= 5.23086 M3 GROSS WGT THIS SHAFT= 3087.77 KG

SHAFT NUMBER: 23

H 830086L	OIL ON VERMICULITE	H CODE: 06	VOL=	.032791 M3	WGT=	225.755 KG	D DATE: 830525
H 830087L	OIL ON VERMICULITE	H CODE: 06	VOL=	.032791 M3	WGT=	562.824 KG	D DATE: 830525
H 830088L	VACUUM PUMP OIL ON VERMICULITE	H CODE: 06	VOL=	.200198 M3	WGT=	136.078 KG	D DATE: 830525
H 830092L	OIL ABSORBED ON VERMICULITE	H-CODE: 06	VOL=	.113562 M3	WGT=	77.3208 KG	D DATE: 830525

H 830028I	REGAL OIL GR AND O	H CODE: 06	VOL = .3705415 01 M3	WGT=	40.8234 KG	D DATE:	830525
H 830141I	CUTTING OIL ON VERMICULITE	H CODE: 06	VOL = .454250 M3	WGT=	453.597 KG	D DATE:	830526
H 830260I	LOW PCB OIL FOR AREA L	H CODE: 06	VOL = 2.21477 M3	WGT=	1360.79 KG	D DATE:	831216
H 830269I	CUTTING OIL ON VERMICULITE	H CODE: 06	VOL = .454250 M3	WGT=	272.156 KG	D DATE:	831216
H 830273I	LOW PCB OIL ON VERMICULITE	H CODE: 06	VOL = 1.87378 M3	WGT=	1080.43 KG	D DATE:	831216
H 830274I	OIL AND H2O ABSORBED ON VERMICULITE	H CODE: 06	VOL = .624593 M3	WGT=	362.078 KG	D DATE:	831216
H 830275N	DIRTY OIL TO OIL SHAFT	H CODE: 06	VOL = .1022215 01 M3	WGT=	59.6726 KG	D DATE:	831216
H 830276I	DIESEL FUEL OIL ON VERMICULITE	H CODE: 06	VOL = 5.60000 M3	WGT=	1014.39 KG	D DATE:	831216
H 830286N	LIGHT WEIGHT OIL TO OIL SHAFT	H CODE: 06	VOL = .1000000E 03 M3	WGT=	2.26796 KG	D DATE:	831216
H 840030I	OIL ON VERMICULITE	H CODE: 06	VOL = .200190 M3	WGT=	136.078 KG	D DATE:	840223
H 840031N	PCB FREE OIL ON VERMICULITE	H CODE: 06	VOL = .832291 M3	WGT=	453.597 KG	D DATE:	840223
H 840032I	USED CUTTING OIL ON VERMICULITE	H CODE: 06	VOL = .454250 M3	WGT=	272.156 KG	D DATE:	840223

GROSS VOL THIS SHAFT = 15.4511 M3 GROSS WGT THIS SHAFT = 7504.13 KG

SHAFT NUMBER: 24

H 830259L	ORGANICS IN DRUM 91	H CODE: 01	VOL = .200190 M3	WGT=	192.777 KG	D DATE:	831216
H 830260L	OIL AND KEROSENE ON VERMICULITE	H CODE: 06	VOL = .832291 M3	WGT=	544.312 KG	D DATE:	831216
H 830261L	TRICHLOROETHANE ON VERMICULITE	H CODE: 01	VOL = .200190 M3	WGT=	90.7186 KG	D DATE:	831216
H 830262I	RESIN	H CODE: 01	VOL = .624593 M3	WGT=	453.597 KG	D DATE:	831216
H 830263I	ETHYLENE GLYCOL ON VERMICULITE	H CODE: 01	VOL= .200190 M3	WGT=	90.7186 KG	D DATE:	831216
H 830264L	STODDARD SOLVENT ON VERMICULITE	H CODE: 01	VOL .832291 M3	WGT=	544.312 KG	D DATE:	831216
H 830265I	ORGANICS IN DRUM 88	H CODE: 01	VOL = .200190 M3	WGT=	217.725 KG	D DATE:	831216
H 830266I	ORGANICS IN DRUM 89	H CODE: 01	VOL = .200000 M3	WGT=	204.117 KG	D DATE:	831216
H 830267I	ORGANICS IN DRUM 90	H CODE: 01	VOL = .200190 M3	WGT=	222.261 KG	D DATE:	831216
H 830280N	2-ETHYL 1-HEXANOL	H CODE: 08	VOL = .102933 M3	WGT=	102.542 KG	D DATE:	830929
H 840033L	PAINT THINNER ABSORBED ON VERMICULITE	H CODE: 01	VOL = .416395 M3	WGT=	181.437 KG	D DATE:	840223
H 840034I	2 PROPANOL ABSORBED ON VERMICULITE	H CODE: 01	VOL = .416395 M3	WGT=	181.437 KG	D DATE:	840223
H 840035L	ORGANICS IN DRUM 92	H CODE: 01	VOL = .200190 M3	WGT=	181.437 KG	D DATE:	840223
H 840036N	SURFACTANT OVERPACKED IN VERMICULITE	H CODE: 01	VOL = .321750 M3	WGT=	158.758 KG	D DATE:	840223
H 840037I	ORGANICS IN DRUM 93	H CODE: 01	VOL = .200190 M3	WGT=	204.117 KG	D DATE:	840223
H 840038I	ORGANICS IN DRUM 94	H CODE: 01	VOL = .200190 M3	WGT=	226.796 KG	D DATE:	840223
H 840039L	PAINT THINNER ON VERMICULITE	H CODE: 01	VOL = .416395 M3	WGT=	272.156 KG	D DATE:	840223
H 840040L	GLYCOL ETHER ED ON VERMICULITE	H CODE: 01	VOL = .132482 M3	WGT=	68.0389 KG	D DATE:	840223

LOS ALAMOS [illegible] OPAL LABORATORY
HAZARDOUS CHEMICAL WASTES DISPOSED
AT TA-54, AREA L, IN DISPOSAL SHAFTS

H 840041	OIL, WITH SOLVENT ON VERMICULITE	H CODE: 06	VOL = 2.29017 M3	WGT=	2267.99 KG	D DATE:	840223
H 840042	1,1,1 TRICHLOROETHANE ON VERMICULITE	H CODE: 01	VOL = 1.04099 M3	WGT=	987.194 KG	D DATE:	840223
H 840043	ORGANICS IN DRUM 95	H CODE: 01	VOL = .208190 M3	WGT=	204.117 KG	D DATE:	840223
H 840044	ORGANICS IN DRUM 94	H CODE: 01	VOL = .208190 M3	WGT=	204.117 KG	D DATE:	840223
H 840045	ORGANICS IN DRUM 93	H CODE: 01	VOL = .208190 M3	WGT=	120.589 KG	D DATE:	840223
H 840046	ORGANICS IN DRUM 92	H CODE: 01	VOL = .208190 M3	WGT=	204.117 KG	D DATE:	840223
H 840047	ORGANICS IN DRUM 91	H CODE: 01	VOL = .208190 M3	WGT=	226.226 KG	D DATE:	840223
H 840025	ORGANICS IN DRUM 111	H CODE: 01	VOL = .208190 M3	WGT=	170.097 KG	D DATE:	840405
H 840026	ORGANICS IN DRUM 110	H CODE: 01	VOL = .113562 M3	WGT=	90.7106 KG	D DATE:	840405
H 840027	ORGANICS IN DRUM 109 (BENZENE)	H CODE: 01	VOL = .113562 M3	WGT=	90.7106 KG	D DATE:	840405
H 840028	ORGANICS IN DRUM 108	H CODE: 01	VOL = .208190 M3	WGT=	181.437 KG	D DATE:	840405
H 840029	ORGANICS IN DRUM 107	H CODE: 01	VOL = .208190 M3	WGT=	181.437 KG	D DATE:	840405
H 840100	ORGANICS IN DRUM 106	H CODE: 01	VOL = .208190 M3	WGT=	181.437 KG	D DATE:	840405
H 840101	ORGANICS IN DRUM 105	H CODE: 01	VOL = .208190 M3	WGT=	181.437 KG	D DATE:	840405
H 840102	ORGANICS IN DRUM 104	H CODE: 01	VOL = .208190 M3	WGT=	181.437 KG	D DATE:	840405
H 840103	ORGANICS IN DRUM 103	H CODE: 01	VOL = .208190 M3	WGT=	150.750 KG	D DATE:	840405
H 840104	ORGANICS IN DRUM 102	H CODE: 01	VOL = .208190 M3	WGT=	170.097 KG	D DATE:	840405
H 840105	ORGANICS IN DRUM 101	H CODE: 01	VOL = .208190 M3	WGT=	181.437 KG	D DATE:	840405
H 840106	ORGANICS IN DRUM 100	H CODE: 01	VOL = .113562 M3	WGT=	113.320 KG	D DATE:	840405
H 840115	LOW LEVEL PCB OIL ON VERMICULITE	H CODE: 06	VOL = 2.91477 M3	WGT=	1814.39 KG	D DATE:	840405
H 840116	VACUUM PUMP OIL ON VERMICULITE	H CODE: 06	VOL = .340607 M3	WGT=	272.156 KG	D DATE:	840405
H 840117	TEXACO REGAL OIL ON VERMICULITE	H CODE: 06	VOL = 1.04099 M3	WGT=	725.755 KG	D DATE:	840405
H 840118	ORGANIC AND OIL ON VERMICULITE	H CODE: 06	VOL = 3.42185 M3	WGT=	2267.99 KG	D DATE:	840405

GROSS VOL THIS SHAFT= 20.7169 M3 GROSS WGT THIS SHAFT= 15504.8 KG

SHAFT NUMBER: 25

H 830034	INORGANIC IN DRUM 020	H-CODE: 00	VOL = .208190 M3	WGT=	80.4506 KG	D DATE:	830325
H 830035	INORGANICS IN DRUM 021	H CODE: 00	VOL = .113562 M3	WGT=	117.234 KG	D DATE:	830325
H 830036	INORGANICS IN DRUM 022	H-CODE: 00	VOL = .113562 M3	WGT=	24.0420 KG	D DATE:	830325
H 830037	GAS ABSORBED ON PAPER TOWELS DRUM 023	H-CODE: 00	VOL = .113562 M3	WGT=	181.437 KG	D DATE:	830325
H 830079	PICRIC ACID	H-CODE: 04	VOL = .1093215-01 M3	WGT=	4.53593 KG	D DATE:	830405
H 830104	PHOTOCHEMICAL WASTES IN DRUM 23	H CODE: 00	VOL = .208190 M3	WGT=	181.437 KG	D DATE:	830525
H 830105	INORGANICS IN DRUM 024	H-CODE: 01	VOL = .208190 M3	WGT=	190.509 KG	D DATE:	830525

HAZARDOUS CHEMICAL WASTES DISPOSED

AT TA-54 AREA L, IN DISPOSAL SHAFTS

H 830106I	PHOTOCHEMICALS INORGANIC DRUM #25	H-CODE : 02	VOL = .113562 M3	WGT= 90.7186 KG	D DATE :	830525
H 830107I	PHOTOCHEMICALS IN DRUM INORGANIC 26	H-CODE : 02	VOL = .113562 M3	WGT= 92.7205 KG	D DATE :	830525
H 830108I	UNKNOWN WHITE POWDER IN INORG. DRUM #27	H-CODE : 00	VOL = .208198 M3	WGT= 204.117 KG	D DATE :	830525
H 830134I	INORGANICS IN DRUM #29	H-CODE : 00	VOL = .208198 M3	WGT= 55.2024 KG	D DATE :	830725
H 830168I	INORGANICS IN DRUM #28	H-CODE : 00	VOL = .208198 M3	WGT= 158.758 KG	D DATE :	830725
H 830169I	INORGANICS IN DRUM #27	H-CODE : 00	VOL = .113562 M3	WGT= 92.9866 KG	D DATE :	830725
H 830170I	INORGANICS IN DRUM #30	H-CODE : 00	VOL = .208198 M3	WGT= 158.758 KG	D DATE :	830725
H 830171I	INORGANICS IN DRUM #31	H-CODE : 00	VOL = .208198 M3	WGT= 113.398 KG	D DATE :	830725
H 830209I	INORGANICS IN OWN CARTONS	H-CODE : 00	VOL = 1.36275 M3	WGT= 1360.79 KG	D DATE :	830929
H 830277L	INORGANICS IN DRUM #34	H-CODE : 00	VOL = .208198 M3	WGT= 170.502 KG	D DATE :	831216
H 830278N	SODA LIME IN OWN DRUM	H-CODE : 02	VOL = .113562 M3	WGT= 68.0389 KG	D DATE :	831216
H 830279I	INORGANICS IN DRUM #33	H-CODE : 00	VOL = .208198 M3	WGT= 272.136 KG	D DATE :	831216
H 840004N	INORGANICS BOXED IN OWN CONTAINERS	H-CODE : 00	VOL = .276545 M3	WGT= 204.117 KG	D DATE :	840127
H 840027L	INORGANICS IN DRUM 35	H-CODE : 00	VOL = .208198 M3	WGT= 204.117 KG	D DATE :	840223
H 840028N	DAKTIL SIKONG DEFICIENT	H-CODE : 01	VOL = .567012E-01 M3	WGT= 45.3593 KG	D DATE :	840223
H 840029M	CHEMICALS WITH OIL, ACIDS IN PLASTIC	H-CODE : 02	VOL = .113562 M3	WGT= 22.6796 KG	D DATE :	840223
H 840102I	INORGANICS IN DRUM 41	H-CODE : 00	VOL = .208198 M3	WGT= 181.437 KG	D DATE :	840405
H 840103L	INORGANICS IN DRUM 40	H-CODE : 00	VOL = .113562 M3	WGT= 90.7186 KG	D DATE :	840405
H 840109I	INORGANICS IN DRUM 39	H-CODE : 00	VOL = .208198 M3	WGT= 181.437 KG	D DATE :	840405
H 840110L	INORGANICS IN DRUM 38	H-CODE : 00	VOL = .208198 M3	WGT= 181.437 KG	D DATE :	840405
H 840111L	INORGANICS IN DRUM 37(HIS)	H-CODE : 00	VOL = .208198 M3	WGT= 181.437 KG	D DATE :	840405
H 840112L	INORGANICS IN DRUM 36	H-CODE : 00	VOL = .208198 M3	WGT= 181.437 KG	D DATE :	840405
H 840121N	GLASSWARE-HG CONTAMINATED	H-CODE : 02	VOL = .208198 M3	WGT= 113.398 KG	D DATE :	840405
H 840123N	VARIOUS ARTICLES CONTAM. WITH HG	H-CODE : 02	VOL = .113562 M3	WGT= 68.0389 KG	D DATE :	840405
H 840129L	INORGANICS IN DRUM #46	H-CODE : 00	VOL = .208198 M3	WGT= 204.117 KG	D DATE :	840426
H 840130L	INORGANICS IN DRUM #45	H-CODE : 00	VOL = .208198 M3	WGT= 204.117 KG	D DATE :	840426
H 840131I	INORGANICS IN DRUM #44	H-CODE : 00	VOL = .208198 M3	WGT= 226.796 KG	D DATE :	840426
H 840132L	INORGANICS IN DRUM 42	H-CODE : 00	VOL = .208198 M3	WGT= 158.758 KG	D DATE :	840426
H 840196L	INORGANICS IN DRUM #51	H-CODE : 00	VOL = .208198 M3	WGT= 181.437 KG	D DATE :	840618
H 840197I	GALLIUM ARSENIDE IN DRUM #50	H-CODE : 00	VOL = .113562 M3	WGT= 34.0195 KG	D DATE :	840618
H 840198L	INORGANICS IN DRUM #49	H-CODE : 00	VOL = .208198 M3	WGT= 204.117 KG	D DATE :	840618
H 840199I	INORGANICS IN DRUM #48	H-CODE : 00	VOL = .208198 M3	WGT= 192.777 KG	D DATE :	840618
H 840200N	SIGMA CHEMICALS DISPOSED OF IN OWN DRUMS	H-CODE : 02	VOL = .208198 M3	WGT= 204.117 KG	D DATE :	840618
H 840209I	BROKEN BATTERY PLUS CLEANUP ON 9-P.	H-CODE : 02	VOL = .208198 M3	WGT= 113.398 KG	D DATE :	840618
H 840210L	ENHOND Z 22	H-CODE : 02	VOL = .208198 M3	WGT= 90.7186 KG	D DATE :	840618
H 840305N	LEAD PIPES	H-CODE : 00	VOL = .113562 M3	WGT= 113.398 KG	D DATE :	840723

HAZARDOUS CHEMICAL WASTES DISPOSED
AT TA-54, AREA L, IN DISPOSAL SHAFTS

H 8403171	INORGANICS IN DRUM 57 COPTER FLUID	H-CODE: 02	VOL= .208190 M3	WGT= 217.725 KG	D DATE:	840724
H 8403181	INORGANICS IN DRUM 56 COPTER FLUID	H CODE: 02	VOL= .208198 M3	WGT= 204.117 KG	D DATE:	840724
H 8403191	INORGANICS IN DRUM 55 COPTER FLUID	H CODE: 02	VOL= .208190 M3	WGT= 204.117 KG	D DATE:	840724
H 840320L	INORGANICS IN DRUM 54	H CODE: 00	VOL= .208190 M3	WGT= 217.725 KG	D DATE:	840724
H 8403211	INORGANICS IN DRUM 53	H CODE: 00	VOL= .208198 M3	WGT= 204.117 KG	D DATE:	840724
H 840390L	INORGANICS IN DRUM 60	H CODE: 00	VOL= .208190 M3	WGT= 204.117 KG	D DATE:	841029
H 8403911	INORGANIC DRUM 59	H-CODE: 00	VOL= .208198 M3	WGT= 190.509 KG	D DATE:	840924
H 840392L	INORGANIC DRUM 58	H CODE: 00	VOL= .208198 M3	WGT= 122.777 KG	D DATE:	840924
H 840398N	SODIUM SILICATE	H-CODE: 00	VOL= .208198 M3	WGT= 204.117 KG	D DATE:	840924
H 8404351	RC WASTES PACKED IN VERMICULITE	H CODE: 00	VOL= .113562 M3	WGT= 36.2874 KG	D DATE:	841029
H 8404681	INORGANICS IN DRUM#64 (SALTS)	H-CODE: 00	VOL= .208198 M3	WGT= 215.457 KG	D DATE:	841219
H 840473N	ETCHANT-C	H CODE: 02	VOL= .302043 M3	WGT= 302.547 KG	D DATE:	841219
H 840474N	PHOTO RESIST STRIPPER	H-CODE: 02	VOL= .416395 M3	WGT= 453.597 KG	D DATE:	841219
H 840476N	AMMONIA ETCHANT	H-CODE: 00	VOL= .524523 M3	WGT= 535.036 KG	D DATE:	841219
H 8404791	INORGANICS IN DRUM #62	H-CODE: 00	VOL= .208198 M3	WGT= 208.653 KG	D DATE:	841219
H 840480L	INORGANICS IN DRUM #61	H CODE: 00	VOL= .208190 M3	WGT= 204.117 KG	D DATE:	841219
H 8404821	INORGANICS IN DRUM #63	H-CODE: 00	VOL= .208198 M3	WGT= .453593 KG	D DATE:	841219
H 840483L	INORGANICS IN DRUM 365	H-CODE: 00	VOL= .208190 M3	WGT= 249.476 KG	D DATE:	841219
H 8404911	HYDROGEN CHLORIDE ON SODIUM CARBONATE	H-CODE: 00	VOL= .113562 M3	WGT= 22.6796 KG	D DATE:	841219
H 8500221	INORGANICS IN DRUM #66	H CODE: 00	VOL= .208190 M3	WGT= 230.135 KG	D DATE:	850221
H 8500301	INORGANICS IN DRUM #67	H-CODE: 00	VOL= .208198 M3	WGT= 113.398 KG	D DATE:	850221
H 8500341	INORGANICS IN DRUM #68	H CODE: 00	VOL= .208190 M3	WGT= 130.758 KG	D DATE:	850221
H 8500411	INORGANICS IN DRUM #69	H-CODE: 00	VOL= .208190 M3	WGT= 204.117 KG	D DATE:	850426

GROSS VOL THIS SHAFT: 13.2676 M3 GROSS WGT THIS SHAFT: 12150.2 KG

SHAFT NUMBER: 26

H 8300401	ORGANICS IN DRUM #50	H-CODE: 01	VOL= .208198 M3	WGT= 104.326 KG	D DATE:	830325
H 830041L	ORGANICS IN DRUM #51	H CODE: 01	VOL= .208198 M3	WGT= 131.542 KG	D DATE:	830325
H 830042L	ORGANICS IN DRUM #52	H CODE: 01	VOL= .208198 M3	WGT= 122.016 KG	D DATE:	830325
H 8300431	ORGANICS DRUM #56	H CODE: 01	VOL= .208198 M3	WGT= 77.1103 KG	D DATE:	830325
H 830044L	ORGANICS IN DRUM #57	H CODE: 01	VOL= .208198 M3	WGT= 131.542 KG	D DATE:	830325
H 830045L	FLAMMABLE ORGANICS IN DRUM #58	H CODE: 01	VOL= .208198 M3	WGT= 147.410 KG	D DATE:	830325
H 830046L	ORGANICS IN DRUM #59	H CODE: 01	VOL= .208198 M3	WGT= 167.829 KG	D DATE:	830325

HAZARDOUS CHEMICAL WASTES DISPOSED
AT TA-54 AREA L, IN DISPOSAL SHAFTS

H 030041L	ORGANICS IN DRUM #60	H-CODE: 01	VOL = .208198 M3	WGT= 156.198 KG	D DATE:	830325
H 030062L	ORGANICS IN DRUM #61	H-CODE: 01	VOL = .208198 M3	WGT= 61.2350 KG	D DATE:	830325
H 030064P	PLASTIC PIPING AND CONTAMINATED EQUIPMENT	H-CODE: 01	VOL = .416395 M3	WGT= 272.156 KG	D DATE:	830325
H 030067L	1 PT. TRICHLOROMETHANE & SULFAMIC ACID	H-CODE: 01	VOL = .113562 M3	WGT= 31.7515 KG	D DATE:	830325
H 030092L	ETHANOL AND FREON ON VERMICULITE	H-CODE: 01	VOL = .208198 M3	WGT= 134.078 KG	D DATE:	830525
H 030101L	SOLVENT PACKED ON VERMICULITE	H-CODE: 01	VOL = .623593 M3	WGT= 453.597 KG	D DATE:	830525
H 030103L	CHLOROTHENE ON VERMICULITE	H-CODE: 01	VOL = .416395 M3	WGT= 226.796 KG	D-DATE:	830525
H 030109L	PHOTOCHEMICAL WASTES IN DRUM #61	H-CODE: 01	VOL = .208198 M3	WGT= 170.097 KG	D-DATE:	830525
H 030110L	ORGANICS IN DRUM #62	H-CODE: 01	VOL = .208198 M3	WGT= 170.509 KG	D DATE:	830525
H 030111L	ORGANICS IN DRUM #63	H-CODE: 01	VOL = .208198 M3	WGT= 204.117 KG	D DATE:	830525
H 030112L	ORGANICS IN DRUM #64	H-CODE: 01	VOL = .208198 M3	WGT= 204.117 KG	D-DATE:	830525
H 030113L	ORGANICS IN DRUM #65	H-CODE: 01	VOL = .208198 M3	WGT= 170.509 KG	D-DATE:	830525
H 030114L	ORGANICS IN DRUM #66	H-CODE: 01	VOL = .208198 M3	WGT= 158.258 KG	D DATE:	830525
H 030115L	ORGANICS IN DRUM #67	H-CODE: 01	VOL = .208198 M3	WGT= 170.509 KG	D DATE:	830525
H 030116L	ORGANICS IN DRUM #68	H-CODE: 01	VOL = .208198 M3	WGT= 181.437 KG	D-DATE:	830525
H 030117L	ORGANICS IN DRUM #69	H-CODE: 01	VOL = .113562 M3	WGT= 63.5030 KG	D DATE:	830525
H 030118L	CUSO4 AND OIL ON VERMICULITE IN DRUM #70	H-CODE: 01	VOL = .113562 M3	WGT= 99.0252 KG	D DATE:	830525
H 030119L	ORGANICS IN DRUM #71	H-CODE: 01	VOL = .113562 M3	WGT= 122.470 KG	D DATE:	830525
H 030120L	ETHYLENE DIAMINE LEAKING DRUM #72	H-CODE: 01	VOL = .113562 M3	WGT= 68.0389 KG	D DATE:	830525
H 030142P	4 5 GAL. CANS OF OIL	H-CODE: 06	VOL = .2570836-01 M3	WGT= 68.0389 KG	D-DATE:	830620
H 030163L	ORGANICS IN DRUM #77	H-CODE: 01	VOL = .208198 M3	WGT= 61.2350 KG	D DATE:	830725
H 030164L	CLEANING SOL. CONTAIN Hg ON VERMICULITE	H-CODE: 00	VOL = .832791 M3	WGT= 1360.79 KG	D-DATE:	830725
H 030173L	ORGANICS IN DRUM #73	H-CODE: 01	VOL = .208198 M3	WGT= 136.078 KG	D-DATE:	830725
H 030174L	ORGANICS IN DRUM #74	H-CODE: 01	VOL = .208198 M3	WGT= 113.398 KG	D DATE:	830725
H 030175L	ORGANICS IN DRUM #75	H-CODE: 01	VOL = .208198 M3	WGT= 158.258 KG	D DATE:	830725
H 030176L	ORGANICS IN DRUM #76	H-CODE: 01	VOL = .208198 M3	WGT= 147.418 KG	D DATE:	830725
H 030177L	ORGANICS IN DRUM #77	H-CODE: 01	VOL = .208198 M3	WGT= 181.437 KG	D-DATE:	830725
H 030178L	ORGANICS IN DRUM #78	H-CODE: 01	VOL = .208198 M3	WGT= 204.117 KG	D DATE:	830725
H 030179L	ORGANICS IN DRUM #79	H-CODE: 01	VOL = .208198 M3	WGT= 181.437 KG	D-DATE:	830725
H 030194L	ORGANIC CHEMICALS FROM S-SITE CLEANOUT	H-CODE: 01	VOL = 2.66072 M3	WGT= 2267.99 KG	D-DATE:	830929
H 030201L	SOLVENT BASED ON VERMICULITE	H-CODE: 01	VOL = .623593 M3	WGT= 635.036 KG	D-DATE:	830929
H 030203L	ORGANICS ABSORBED ON VERMICULITE	H-CODE: 01	VOL = .416395 M3	WGT= 226.796 KG	D DATE:	830929
H 030210L	ORGANICS IN DRUM 80	H-CODE: 01	VOL = .208198 M3	WGT= 122.365 KG	D-DATE:	830929
H 030219L	ORGANICS IN DRUM 81	H-CODE: 01	VOL = .113562 M3	WGT= 68.0389 KG	D DATE:	830929
H 030220L	DYE ON VERMICULITE DRUM 82	H-CODE: 01	VOL = .208198 M3	WGT= 181.437 KG	D DATE:	830929
H 030221L	ORGANICS IN DRUM 83	H-CODE: 01	VOL = .208198 M3	WGT= 181.437 KG	D DATE:	830929

H 830255I	ORGANICS IN DRUM 84 ON VERMICULITE	H CODE: 01	VOL=	.113562 M3	WGT=	34.0175 KG	D DATE:	830229
H 830223I	DRUM 05 DYE ON VERMICULITE	H-CODE: 01	VOL=	.113562 M3	WGT=	60.0389 KG	D DATE:	830329
H 830224I	ORGANICS IN DRUM 86	H CODE: 01	VOL=	.200120 M3	WGT=	204.117 KG	D DATE:	830329
H 830225I	ORGANICS IN DRUM 07	H-CODE: 01	VOL=	.200198 M3	WGT=	136.078 KG	D DATE:	830329
H 850104I	BERYLLIUM WASTE	H CODE: 00	VOL=	.454240 M3	WGT=	102.058 KG	D DATE:	850307

GROSS VOL THIS SHAFT= 13.8925 M3 GROSS WGT THIS SHAFT= 10504.0 KG

SHAFT NUMBER: 27

H 840078L	SULFAMIC ACID ABSORBED ON VERMICULITE	H-CODE: 01	VOL=	.567812E-01 M3	WGT=	45.3593 KG	D DATE:	830405
H 830029N	MERCURY WITH HIGH EXPLOSIVE TO SHAFT #27	H CODE: 00	VOL=	.200000E 03 M3	WGT=	15.8758 KG	D DATE:	830512
H 830102N	LIH ON MISC. ARTICLES 1-55 GAL, 1-30GAL	H-CODE: 05	VOL=	.321760 M3	WGT=	136.078 KG	D DATE:	830525
H 830165I	LIH CONTAMINATED ARTICLES	H-CODE: 03	VOL=	.200120 M3	WGT=	136.078 KG	D DATE:	830727
H 830172L	Na K CONTAMINATED MATERIAL IN DRUM #32	H CODE: 03	VOL=	.113562 M3	WGT=	49.8952 KG	D DATE:	830725
H 830204N	MERCURY VAPOR LIGHT IN SHAFT 27	H CODE: 02	VOL=	.500000E 03 M3	WGT=	.907186 KG	D DATE:	830928
H 830210L	Be WASTE IN SPECIAL SHAFT	H-CODE: 00	VOL=	.757003E-01 M3	WGT=	45.3593 KG	D DATE:	830909
H 840019N	BERYLLIUM OXIDE	H CODE: 00	VOL=	.302833E-02 M3	WGT=	1.51523 KG	D DATE:	840227
H 840024I	CLEANUP FROM HYDROXYL AMMINE NO3 SPILL	H-CODE: 02	VOL=	1.04099 M3	WGT=	453.597 KG	D DATE:	840223
H 840025N	BE TURNINGS	H-CODE: 00	VOL=	.032791 M3	WGT=	272.156 KG	D DATE:	840223
H 840026N	LASER CELL WITH OSMIUM TETROXIDE	H-CODE: 00	VOL=	.283160E-02 M3	WGT=	6.80389 KG	D DATE:	840201
H 840064I	CLOTHING,GLOVES ETC.CONTAMINATED WITH AS	H CODE: 00	VOL=	.113562 M3	WGT=	56.2824 KG	D DATE:	840223
H 840074N	PULL OF ASBESTOS	H CODE: 11	VOL=	.283168E-01 M3	WGT=	13.6078 KG	D DATE:	840309
H 840076N	MATERIALS CONTAMINATED WITH Na K	H CODE: 03	VOL=	.479541E-01 M3	WGT=	2.26796 KG	D DATE:	840423
H 840124I	LOW LEVEL PCB CONTAM. ARTICLES IN VERM.	H-CODE: 01	VOL=	.113562 M3	WGT=	45.3593 KG	D DATE:	840405
H 840150L	BE SCRAPS	H-CODE: 00	VOL=	.109271E 01 M3	WGT=	6.80389 KG	D DATE:	840426
H 840161L	CELLULOSE NITRATE FILM	H-CODE: 01	VOL=	.567812E-01 M3	WGT=	13.6070 KG	D DATE:	840514
H 840165N	HG VAPOR TUBE FROM OZALID MACHINE	H CODE: 00	VOL=	.283168E-02 M3	WGT=	.907186 KG	D DATE:	840510
H 840430N	BARIUM NITRATE	H-CODE: 04	VOL=	.900499 M3	WGT=	1179.35 KG	D DATE:	841022
H 840454N	4 EMPTY KRYPTON CYLINDERS	H CODE: 00	VOL=	.566336E-01 M3	WGT=	1.53523 KG	D DATE:	841114
H 840457L	PICRIC ACID	H CODE: 03	VOL=	.500000E-03 M3	WGT=	.453593 KG	D DATE:	841120
H 840480N	HEPA FILTERS WITH CARCINOGENS	H-CODE: 02	VOL=	.141504 M3	WGT=	31.7515 KG	D DATE:	841218
H 850014L	BERYLLIUM WASTE	H-CODE: 00	VOL=	.601324 M3	WGT=	204.117 KG	D DATE:	850221

GROSS VOL THIS SHAFT= 4.811240 M3 GROSS WGT THIS SHAFT= [illegible] KG

SHAFT NUMBER: 28

H 840352N	BERYLLIUM OXIDE FROM MACHINING	H-CODE: 00	VOL=	.141584E-01 M3	WGT=	4.53593 KG	D-DATE:	840806
H 850062L	ORGANICS IN DRUM #154	H-CODE: 01	VOL=	.208198 M3	WGT=	106.594 KG	D-DATE:	850426
H 850063L	PHOTO CHEMICALS IN DRUM #155	H-CODE: 01	VOL=	.208198 M3	WGT=	204.117 KG	D-DATE:	850426
H 850064L	EPOXY IN DRUMS #156 & 157	H-CODE: 01	VOL=	.227125 M3	WGT=	102.058 KG	D-DATE:	850426
H 850065L	ORGANICS IN DRUM #158	H-CODE: 01	VOL=	.208198 M3	WGT=	117.027 KG	D-DATE:	850426
H 850068L	ORGANICS IN DRUMS # 162,163 & 164	H-CODE: 01	VOL=	.624593 M3	WGT=	635.036 KG	D-DATE:	850426
H 850070N	PAINT ON VERMICULITE	H-CODE: 01	VOL=	1.87378 M3	WGT=	1905.11 KG	D-DATE:	850426
H 850071N	EPON RESIN	H-CODE: 01	VOL=	.208198 M3	WGT=	147.418 KG	D-DATE:	850426
H 850072N	OIL ON VERMICULITE	H-CODE: 06	VOL=	.624593 M3	WGT=	840.000 KG	D-DATE:	850426
H 850079N	WEED KILLER & COMPOUND SPRAY ON VERMIC.	H-CODE: 01	VOL=	.416395 M3	WGT=	249.476 KG	D-DATE:	850426
H 850080N	DISEL FUEL ON VERMICULITE	H-CODE: 06	VOL=	.208198 M3	WGT=	207.746 KG	D-DATE:	850426
H 850082N	USED CUTTING OIL ON VERMICULITE	H-CODE: 06	VOL=	.227125 M3	WGT=	226.796 KG	D-DATE:	850426
H 850083N	TRANSFORMER OIL ON VERMICULITE < 50 PPM	H-CODE: 06	VOL=	.416395 M3	WGT=	415.945 KG	D-DATE:	850426

GROSS VOL THIS SHAFT= 5.46515 M3 GROSS WGT THIS SHAFT= 5161.86 KG

SHAFT NUMBER: 29

H 840093L	ORGANICS IN DRUM 113-OIL	H-CODE: 06	VOL=	.208198 M3	WGT=	136.078 KG	D-DATE:	840405
H 840094L	ORGANICS IN DRUM 112	H-CODE: 01	VOL=	.208198 M3	WGT=	204.117 KG	D-DATE:	840405
H 840114L	OIL ON VERMICULITE	H-CODE: 06	VOL=	3.53936 M3	WGT=	2721.58 KG	D-DATE:	840405
H 840126N	HYDRAULIC OIL (REGAL 0) ON VERMICULITE	H-CODE: 06	VOL=	.208198 M3	WGT=	136.078 KG	D-DATE:	840405
H 840132L	ORGANICS IN DRUM #116	H-CODE: 01	VOL=	.208198 M3	WGT=	215.457 KG	D-DATE:	840426
H 840133L	ORGANICS IN DRUM #115 (METHANOL)	H-CODE: 01	VOL=	.208198 M3	WGT=	204.117 KG	D-DATE:	840426
H 840135L	VACUUM PUMP OIL ON VERMICULITE	H-CODE: 06	VOL=	.454250 M3	WGT=	226.796 KG	D-DATE:	840426
H 840137L	OIL ON VERMICULITE	H-CODE: 06	VOL=	4.80000 M3	WGT=	3628.78 KG	D-DATE:	840426
H 840138L	INORGANICS IN DRUM 43 (CD)	H-CODE: 00	VOL=	.208198 M3	WGT=	294.835 KG	D-DATE:	840426
H 840140L	ORGANICS IN DRUM 114	H-CODE: 01	VOL=	.208198 M3	WGT=	204.117 KG	D-DATE:	840426
H 840141L	MECHANICAL PUMP OIL	H-CODE: 06	VOL=	.208198 M3	WGT=	113.398 KG	D-DATE:	840426
H 840142L	CHLOROETHANE,LIOH AND ACETONE(ACETONE)	H-CODE: 01	VOL=	.208198 M3	WGT=	113.398 KG	D-DATE:	840426
H 840143L	DYE,METHANOL AND LIOH ON VERMICULITE	H-CODE: 01	VOL=	.208198 M3	WGT=	136.078 KG	D-DATE:	840426
H 840186L	ORGANICS IN DRUM #127	H-CODE: 01	VOL=	.208198 M3	WGT=	204.117 KG	D-DATE:	840618

H 8401821	ORGANICS IN DRUM #126	H-CODE: 01	VOL=	.208198 M3	WGT=	204.117 KG	D DATE:	840618
H 8401801	ORGANICS IN DRUM #125	H CODE: 01	VOL=	.208198 M3	WGT=	204.117 KG	D-DATE:	840618
H 8401821	ORGANICS IN DRUM #123	H-CODE: 01	VOL=	.208198 M3	WGT=	181.437 KG	D DATE:	840618
H 8401901	ORGANICS IN DRUM #122	H-CODE: 01	VOL=	.208198 M3	WGT=	204.117 KG	D DATE:	840618
H 8401911	ORGANICS IN DRUM #121	H CODE: 01	VOL=	.208198 M3	WGT=	204.117 KG	D DATE:	840618
H 8401921	ORGANICS IN DRUM #120	H-CODE: 01	VOL=	.208198 M3	WGT=	204.117 KG	D DATE:	840618
H 8401931	ORGANICS IN DRUM #119	H CODE: 01	VOL=	.208198 M3	WGT=	192.777 KG	D-DATE:	840618
H 8401941	ORGANICS IN DRUM #118	H-CODE: 01	VOL=	.208198 M3	WGT=	181.437 KG	D DATE:	840618
H 8401951	ORGANICS IN DRUM #117	H-CODE: 01	VOL=	.208198 M3	WGT=	181.437 KG	D-DATE:	840618
H 8402001	INORGANICS IN DRUM #47	H-CODE: 00	VOL=	.208198 M3	WGT=	204.117 KG	D DATE:	840618
H 8402011	SLUDGE WITH PCB <100PM	H CODE: 01	VOL=	.832791 M3	WGT=	635.036 KG	D-DATE:	840618
H 8402021	DIELECTRIC FLUID WITH TRACE OF AS	H CODE: 06	VOL=	.208198 M3	WGT=	136.078 KG	D DATE:	840618
H 8402031	MISC. ORGANIC FLUIDS ON VERMICULITE	H-CODE: 01	VOL=	.416395 M3	WGT=	272.156 KG	D-DATE:	840618
H 8402041	OIL WITH ACETONE ON VERMICULITE	H CODE: 06	VOL=	.208198 M3	WGT=	136.078 KG	D DATE:	840618
H 8402051	METHYL ETHYL KETONE ON VERMICULITE	H-CODE: 01	VOL=	.208198 M3	WGT=	136.078 KG	D DATE:	840618
H 8402061	OIL ON VERMICULITE	H-CODE: 06	VOL=	.208198 M3	WGT=	136.078 KG	D DATE:	840618
H 8402071	CHLORIDE CONCENTRATE P 16	H CODE: 01	VOL=	1.66560 M3	WGT=	1088.63 KG	D DATE:	840618
H 8402131	ORGANICS IN DRUM #26	H-CODE: 01	VOL=	.208198 M3	WGT=	192.777 KG	D DATE:	840618
H 8402141	OIL ABSORBED ON VERMICULITE	H CODE: 06	VOL=	.208198 M3	WGT=	136.078 KG	D DATE:	840618
H 8402161	OMSO ON VERMICULITE	H-CODE: 01	VOL=	.208198 M3	WGT=	136.078 KG	D DATE:	840618

GROSS VOL THIS SHAFT= 12.5322 M3 GROSS WGT THIS SHAFT= 13514.2 KG

SHAFT NUMBER: 30

H 8402181	OIL ON VERMICULITE	H-CODE: 06	VOL=	6.20000 M3	WGT=	4002.37 KG	D-DATE:	840618
H 8402031	MIXED ORGANIC WASTES ON VERMICULITE	H CODE: 01	VOL=	.624523 M3	WGT=	408.234 KG	D-DATE:	840723
H 8402041	SOLVENTS AND OILS ON VERMICULITE	H-CODE: 01	VOL=	.624593 M3	WGT=	408.234 KG	D DATE:	840723
H 8402061	SOLIDIFIED PAINT	H CODE: 01	VOL=	.320541 M3	WGT=	226.796 KG	D-DATE:	840723
H 8402871	DIBUTYL PHTHALATE ON VERMICULITE	H CODE: 01	VOL=	.416395 M3	WGT=	226.796 KG	D DATE:	840723
H 8402891	OIL ON VERMICULITE	H-CODE: 06	VOL=	3.03936 M3	WGT=	1925.83 KG	D-DATE:	840723
H 8402901	CHLOROETHANE,ETOH,ACETONE,OIL ON VERMIC.	H-CODE: 01	VOL=	.208198 M3	WGT=	136.078 KG	D DATE:	840723
H 8402911	ETHYL CARBITOL ON VERMICULITE	H CODE: 01	VOL=	.416395 M3	WGT=	226.796 KG	D DATE:	840723
H 8402921	STODDARD SOLVENT ON VERMICULITE	H CODE: 01	VOL=	.416395 M3	WGT=	226.796 KG	D DATE:	840723
H 8402941	TRICHLOROETHYLENE ON VERMICULITE	H CODE: 01	VOL=	.416395 M3	WGT=	226.796 KG	D DATE:	840723

H 840294L	ISOBUTYL ACETATE ON VERMICULITE	H CODE: 01	VOL= .416395 M3	WGT=	226.796 KG	D DATE:	840723
H 840295L	METHYL ISOBUTYLKETONE ON VERMICULITE	H CODE: 01	VOL= .416395 M3	WGT=	226.796 KG	D DATE:	840723
H 840296L	BENZENE ON VERMICULITE	H CODE: 08	VOL= .416395 M3	WGT=	226.796 KG	D DATE:	840723
H 840297L	CHLOROL FORM/ACETONE ON VERMICULITE	H CODE: 01	VOL= .416395 M3	WGT=	226.796 KG	D DATE:	840723
H 840298L	TRIBUTYL PHOSPHATE ON VERMICULITE	H CODE: 01	VOL= .416395 M3	WGT=	226.796 KG	D DATE:	840723
H 840300L	DIESEL OIL ON VERMICULITE	H CODE: 06	VOL= .208198 M3	WGT=	113.398 KG	D DATE:	840723
H 840301L	ACETONE ON VERMICULITE	H CODE: 01	VOL= .416395 M3	WGT=	226.796 KG	D DATE:	840723
H 840302L	METHYLENE CHLORIDE ON VERMICULITE	H CODE: 01	VOL= .416395 M3	WGT=	226.796 KG	D DATE:	840723
H 840303L	FREON ON VERMICULITE	H CODE: 01	VOL= .624593 M3	WGT=	340.195 KG	D DATE:	840723
H 840304L	WASTE OIL ON VERMICULITE	H CODE: 06	VOL= .208198 M3	WGT=	113.398 KG	D DATE:	840723
H 840320L	ORGANICS IN DRUM 132	H CODE: 01	VOL= .208198 M3	WGT=	192.777 KG	D DATE:	840723
H 840323L	ORGANICS IN DRUM 131	H CODE: 01	VOL= .208198 M3	WGT=	204.117 KG	D DATE:	840723
H 840324L	ORGANICS IN DRUM 130	H CODE: 01	VOL= .208198 M3	WGT=	204.117 KG	D DATE:	840723
H 840325L	ORGANICS IN DRUM 129	H CODE: 01	VOL= .208198 M3	WGT=	217.725 KG	D DATE:	840723

GROSS VOL THIS SHAFT= 11.0294 M3 GROSS WGT THIS SHAFT= 11138.0 KG

SHAFT NUMBER: 31

H 840312L	ORGANIC DYE ON VERMICULITE	H CODE: 01	VOL= .208198 M3	WGT=	136.078 KG	D DATE:	840724
H 840313L	PAINT THINNER ON VERMICULITE	H CODE: 01	VOL= .624593 M3	WGT=	340.195 KG	D DATE:	840724
H 840314L	VACUUM PUMP OIL ON VERMICULITE	H CODE: 06	VOL= .208198 M3	WGT=	90.7186 KG	D DATE:	840724
H 840315N	DIRT WITH ORGANICS	H CODE: 02	VOL= .032791 M3	WGT=	725.255 KG	D DATE:	840724
H 840383L	ORGANICS IN DRUM 139	H CODE: 01	VOL= .208198 M3	WGT=	204.117 KG	D DATE:	840924
H 840385L	ORGANICS IN DRUM 137	H CODE: 01	VOL= .208198 M3	WGT=	204.117 KG	D DATE:	840924
H 840386L	ORGANICS IN DRUM 136	H CODE: 01	VOL= .208198 M3	WGT=	192.777 KG	D DATE:	840924
H 840387L	ORGANICS IN DRUM 135	H CODE: 01	VOL= .208198 M3	WGT=	204.117 KG	D DATE:	840924
H 840395L	OILON VERMICULITE	H CODE: 06	VOL= .340607 M3	WGT=	340.195 KG	D DATE:	840924
H 840397L	TRICHLOROETHYLENE ON VERMICULITE	H CODE: 01	VOL= .416395 M3	WGT=	226.796 KG	D DATE:	840924
H 840403L	ORGANICS IN DRUM 143	H CODE: 01	VOL= .208198 M3	WGT=	204.117 KG	D DATE:	841029
H 840404L	ORGANICS IN DRUM 144	H CODE: 01	VOL= .208198 M3	WGT=	204.117 KG	D DATE:	841029
H 840406L	OIL ON VERMICULITE	H CODE: 06	VOL= 3.74756 M3	WGT=	2086.55 KG	D DATE:	840924

GROSS VOL THIS SHAFT= 7.54761 M3 GROSS WGT THIS SHAFT= 5152.55 KG

SHAFT NUMBER: 32

H 840394L	OIL ON VERMICULITE	H CODE: 06	VOL=	.624593 M3	WGT=	408.234 KG	D DATE:	840924
H 840426L	CHLORINATED SOLVENTS ON VERMICULITE	H CODE: 01	VOL=	1.04022 M3	WGT=	1542.21 KG	D DATE:	840924

GROSS VOL THIS SHAFT= 1.66558 M3 GROSS WGT THIS SHAFT= 1950.46 KG

SHAFT NUMBER: 33

H 840380L	ORGANICS IN DRUM 142	H CODE: 01	VOL=	.208198 M3	WGT=	204.117 KG	D DATE:	841029
H 840381L	ORGANICS IN DRUM 141	H CODE: 01	VOL=	.208198 M3	WGT=	215.457 KG	D DATE:	841029
H 840382L	ORGANICS IN DRUM 140	H CODE: 01	VOL=	.208198 M3	WGT=	204.117 KG	D DATE:	841029
H 840384L	ORGANICS IN DRUM 138	H CODE: 01	VOL=	.208198 M3	WGT=	204.117 KG	D DATE:	841029
H 840388L	ORGANICS IN DRUM 134	H CODE: 01	VOL=	.208198 M3	WGT=	204.117 KG	D DATE:	841029
H 840389L	ORGANICS IN DRUM 133	H CODE: 01	VOL=	.208198 M3	WGT=	198.862 KG	D DATE:	841029
H 840393L	ORGANICS SOLVENTS ON VERMICULITE	H CODE: 01	VOL=	.208198 M3	WGT=	136.078 KG	D DATE:	841029
H 840399L	LOW LEVEL PCB OIL ON VERMICULITE	H CODE: 06	VOL=	2.78657 M3	WGT=	1814.32 KG	D DATE:	841029
H 840436L	NON PCB TRANS. OIL AND H2O ON VERMIC.	H CODE: 06	VOL=	.208198 M3	WGT=	136.078 KG	D DATE:	841029
H 840466I	ORGANICS IN DRUM #148	H CODE: 01	VOL=	.208198 M3	WGT=	231.362 KG	D DATE:	841219
H 840467I	ORGANICS IN DRUM #149	H CODE: 01	VOL=	.208198 M3	WGT=	235.860 KG	D DATE:	841219
H 840469P	OIL ON VERMICULITE	H CODE: 06	VOL=	1.66558 M3	WGT=	907.124 KG	D DATE:	841219
H 840470I	ORGANICS IN DRUM #146	H CODE: 01	VOL=	.208198 M3	WGT=	226.796 KG	D DATE:	841219
H 840471L	ORGANICS IN DRUM #145	H CODE: 01	VOL=	.208198 M3	WGT=	213.169 KG	D DATE:	841219
H 840475L	ORGANICS IN DRUM #147	H CODE: 01	VOL=	.208198 M3	WGT=	222.261 KG	D DATE:	841219
H 840479L	MACHINE OIL ON VERMICULITE	H CODE: 06	VOL=	.208198 M3	WGT=	60.0369 KG	D DATE:	841219
H 840478N	TRICHLOROETHANE 1-1-1 ON VERMICULITE	H CODE: 01	VOL=	1.66560 M3	WGT=	1632.95 KG	D DATE:	841219
H 840480I	ORGANICS ON VERMICULITE	H CODE: 01	VOL=	.208198 M3	WGT=	215.457 KG	D DATE:	841219
H 840486N	USED PUMP OIL ON VERMICULITE	H CODE: 06	VOL=	.643520E-01 M3	WGT=	29.4835 KG	D DATE:	841219
H 840494L	USED VACUUM PUMP OIL ON VERMICULITE	H CODE: 06	VOL=	.282125 M3	WGT=	60.0302 KG	D DATE:	841219
H 850015L	CHLOROETHANE ON VERMICULITE	H CODE: 01	VOL=	.208198 M3	WGT=	181.437 KG	D DATE:	850221
H 850014I	ORGANICS	H CODE: 01	VOL=	.340482 M3	WGT=	150.750 KG	D DATE:	850221
H 850012L	ORGANICS IN DRUM #152	H CODE: 01	VOL=	.208198 M3	WGT=	235.860 KG	D DATE:	850221
H 850018L	METHANOL & LASER DYE ON VERMICULITE	H CODE: 01	VOL=	.113562 M3	WGT=	45.3523 KG	D DATE:	850221
H 850019L	MOTOR OIL ABSORBED ON VERMICULITE	H CODE: 06	VOL=	.113562 M3	WGT=	43.0913 KG	D DATE:	850221

H 850020L	ORGANICS IN DRUM #150	H-CODE: 01	VOL= .200128 M3	WGT=	96.6153 KG	D-DATE:	850221
H 850021L	ORGANICS IN DRUM #151	H-CODE: 01	VOL= .200190 M3	WGT=	249.476 KG	D-DATE:	850221
H 850022	ORGANICS IN DRUM #153	H-CODE: 01	VOL= .200128 M3	WGT=	217.725 KG	D-DATE:	850221
H 850024	USED TRANSFLUIDS IN VERMICULITE	H-CODE: 01	VOL= 1.04099 M3	WGT=	1360.79 KG	D-DATE:	850221
H 850025L	CHLOROFORM, ETHANOL 120, ACETONE, OIL	H-CODE: 01	VOL= .416325 M3	WGT=	385.564 KG	D-DATE:	850221
H 850026	ACETONE ON VERMICULITE	H-CODE: 01	VOL= .832291 M3	WGT=	1451.51 KG	D-DATE:	850221
H 850027L	VACUUM PUMP OIL ON VERMICULITE	H-CODE: 06	VOL= .111562 M3	WGT=	39.5554 KG	D-DATE:	850221
H 850028L	VACUUM PUMP OIL ON VERMICULITE	H-CODE: 06	VOL= .416395 M3	WGT=	367.410 KG	D-DATE:	850221

GROSS VOL THIS SHAFT= 13.0811 M3 GROSS WGT THIS SHAFT= 12110.1 KG

SHAFT NUMBER: 34

H 850066L	ORGANICS IN DRUM #159	H-CODE: 01	VOL= .200190 M3	WGT=	147.410 KG	D-DATE:	850426
H 850067L	ORGANICS IN DRUM #160	H-CODE: 01	VOL= .416325 M3	WGT=	115.945 KG	D-DATE:	850426
H 850069N	PSEUDO CUMENE (TRI-METHYL-BENZENE)	H-CODE: 01	VOL= 1.07370 M3	WGT=	1905.11 KG	D-DATE:	850426
H 850073N	LOW PCB OIL ON VERMICULITE	H-CODE: 06	VOL= 3.25506 M3	WGT=	5452.45 KG	D-DATE:	850426
H 850077N	NEUTRALIZED ACIDS HYDRIDES & SULFATES	H-CODE: 00	VOL= .321760 M3	WGT=	204.117 KG	D-DATE:	850426
H 850092L	ORGANICS IN DRUM #161	H-CODE: 01	VOL= .200190 M3	WGT=	113.329 KG	D-DATE:	850507
H 850098L	ORGANICS IN DRUM #165	H-CODE: 01	VOL= .200198 M3	WGT=	136.078 KG	D-DATE:	850507
H 850099L	TRICHLOROETHANE ON VERMICULITE	H-CODE: 01	VOL= 1.01822 M3	WGT=	725.795 KG	D-DATE:	850507
H 850100N	PHOTO STRIPPER ON VERMICULITE	H-CODE: 01	VOL= .738155 M3	WGT=	453.597 KG	D-DATE:	850507
H 850101L	WASTE FLUID MIXED WITH VERMICULITE	H-CODE: 06	VOL= .521593 M3	WGT=	645.046 KG	D-DATE:	850507
H 850106N	ORGANICS OF VARIOUS TYPES	H-CODE: 01	VOL= .200198 M3	WGT=	3004.46 KG	D-DATE:	850507

GROSS VOL THIS SHAFT= 7.00433 M3 GROSS WGT THIS SHAFT= 13173.1 KG

LOS ALAMOS N[illegible]ONAL LABORATORY

HAZARDOUS CHEMICAL WASTES DISPOSED
AT TA-54, AREA L, SURFACE IMPOUNDMENT 'B'

HSE-7 WASTE TYPE CODE: 00

H 030892N	DEVELOPER TO INORGANIC PIT	GROSS-VOL=	.151417E-01 M3	GROSS-WT=	10.1437 KG	D DATE:	030525
H 030231N	CORROSIVE LIQUID TO PIT B	GROSS-VOL=	.378541E-02 M3	GROSS-WT=	3.62074 KG	D DATE:	831024
H 030239N	AQUEOUS SOLUTION TO INORGANIC PIT	GROSS-VOL=	.100000E-01 M3	GROSS-WT=	60.0389 KG	D DATE:	831101
H 840007N	BORIC ACID SOL TO PIT	GROSS-VOL=	.624593 M3	GROSS-WT=	635.036 KG	D DATE:	840126
H 840309N	AMMONIUM BIFLUORIDE	GROSS-VOL=	2.27125 M3	GROSS-WT=	2177.27 KG	D DATE:	840713
H 840310N	P.T.ACTIVATOR-DEVELOPER	GROSS-VOL=	.283706E-01 M3	GROSS-WT=	27.2156 KG	D DATE:	840716
H 840326N	AMMONIUM BIFLUORIDE	GROSS-VOL=	1.89271 M3	GROSS-WT=	1814.39 KG	D DATE:	840725
H 840351N	AMMONIUM BIFLUORIDE	GROSS-VOL=	2.27125 M3	GROSS-WT=	2267.92 KG	D DATE:	840801

HSE-7 WASTE TYPE CODE: 01

H 840354N	ZN,NI,AS MELPHALAN	GROSS-VOL=	.800000E-02 M3	GROSS-WT=	0.16467 KG	D DATE:	840807

HSE-7 WASTE TYPE CODE: 02

H 030203N	AMMONIA FROM OZALID MACHINE TO PIT	GROSS-VOL=	.757083E-02 M3	GROSS-WT=	6.80389 KG	D DATE:	830902
H 830243N	AMMONIA FROM OZALID MACHINE TO PIT	GROSS-VOL=	.378541E-02 M3	GROSS-WT=	3.62074 KG	D DATE:	831114
H 830244N	AMMONIA FROM OZALID MACHINE TO PIT	GROSS-VOL=	.189271E-02 M3	GROSS-WT=	2.26796 KG	D DATE:	831129
H 830280N	PHOTOCHEMICALS TO PIT	GROSS-VOL=	.454250E-02 M3	GROSS-WT=	4.53593 KG	D DATE:	831220
H 840005N	BASIC PHOTO CHEMICALS IN INORGANIC PIT	GROSS-VOL=	.681374 M3	GROSS-WT=	635.036 KG	D DATE:	840119

HSE-7 WASTE TYPE CODE: 03

H 830240N	LIH REACTED IN PIT	GROSS-VOL=	.189271E-02 M3	GROSS-WT=	2.26796 KG	D DATE:	831117

LOS ALAMOS NATIONAL LABORATORY

HAZARDOUS CHEMICAL WASTES DISPOSED
AT TA-54, AREA L, SURFACE IMPOUNDMENT 'B'

TOTAL GROSS VOLUME = 2.02617 M3

TOTAL GROSS WEIGHT= 2674.41 KG

APPENDIX C

LITHOLOGIC LOGS AND CONSTRUCTION DETAILS FOR 1985 BOREHOLES

2/28/87 3\ 7-A60

LEGEND FOR PORE-GAS SAMPLING-PORT INSTALLATIONS

Gravel (0.25-inch)

Tuff Backfill from Unit 2b

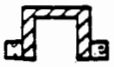
Gravel with Bentonite

Tuff Cave-In Material

Bentonite

Sampling Port

Well Sand (approximate sieve size = 8)


8-Inch Cemented Surface Casing

Stainless Steel Tubing Exiting
2-Inch-I.D. Galvanized Pipe, Showing Coupling

LEGEND FOR PSYCHROMETER AND TRANSDUCER INSTALLATIONS

Tuff Backfill

2-Inch PVC Pipe (used to support psychrometers and transducers)

Bentonite

Psychrometer

Pressure Transducer

FIGURE C-1. LEGENDS FOR THE INSTRUMENT INSTALLATIONS (BFEC, 1986)

2/28/87 3010 61

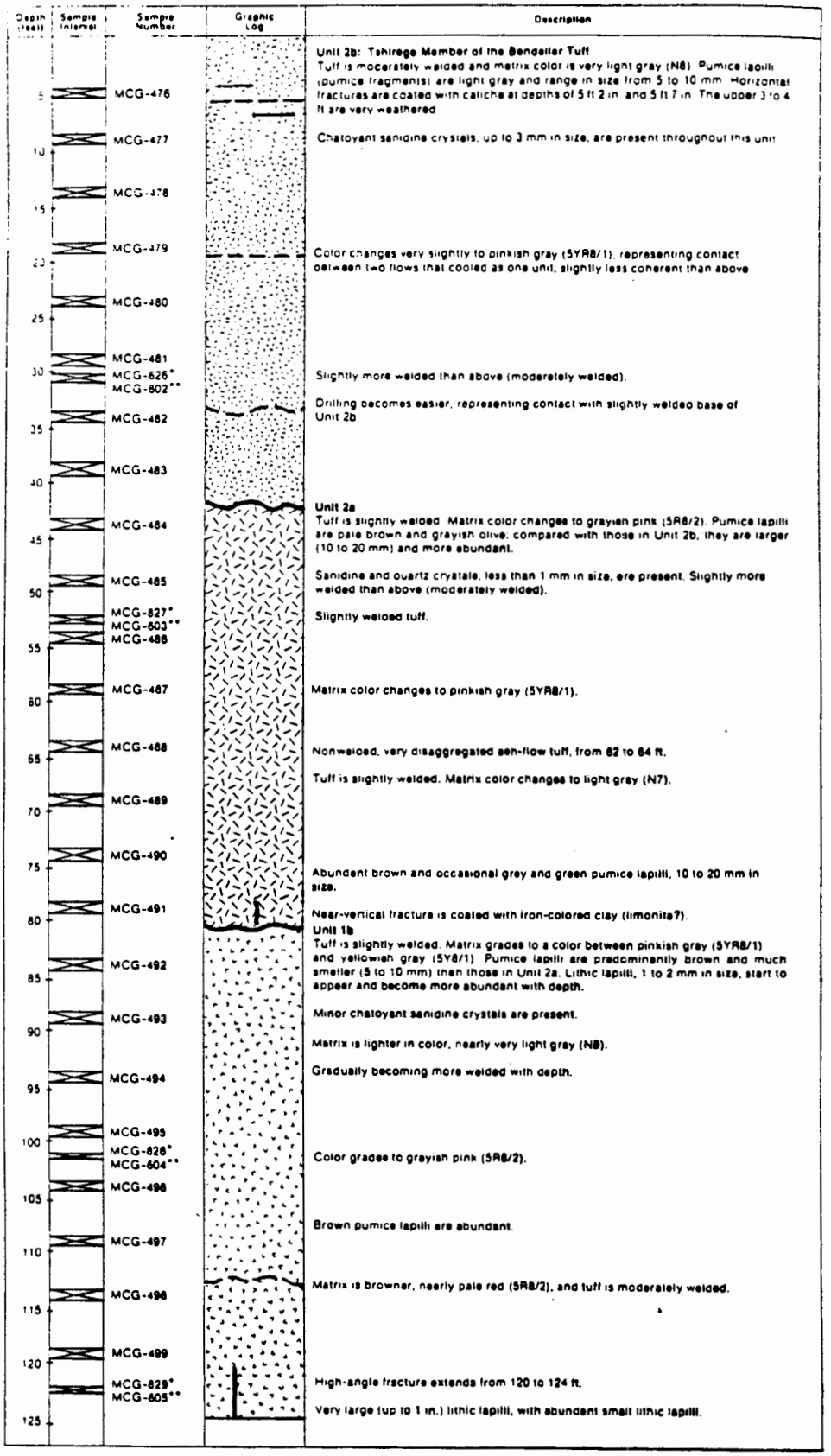


FIGURE C-2. LITHOLOGIC LOG OF HOLE LLM-85-01 (BFEC, 1986)

2/28/87 301 A62

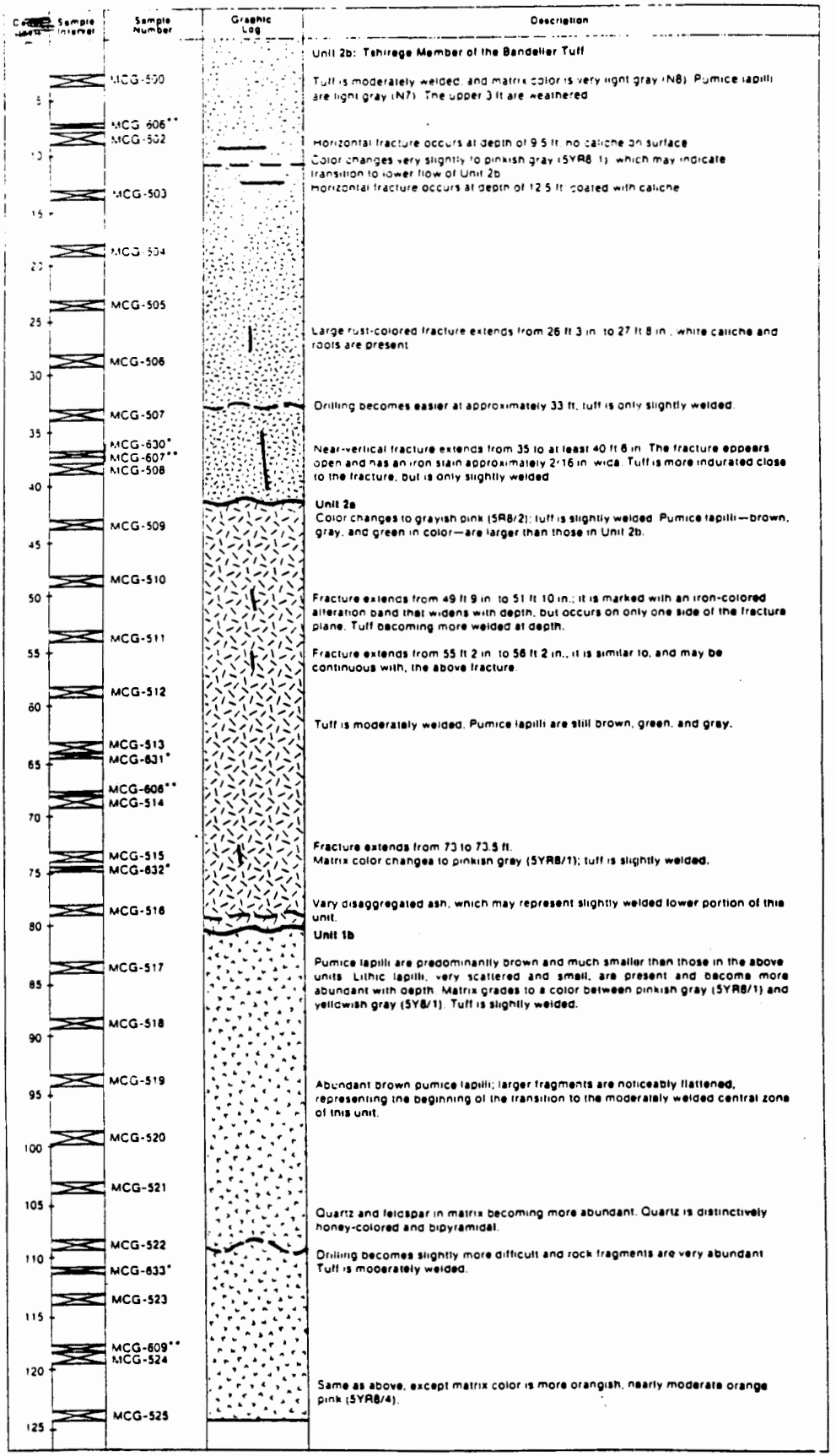


FIGURE C-3. LITHOLOGIC LOG OF HOLE LLM-85-02 (BFEC, 1986)

2/28/87 3010, 63

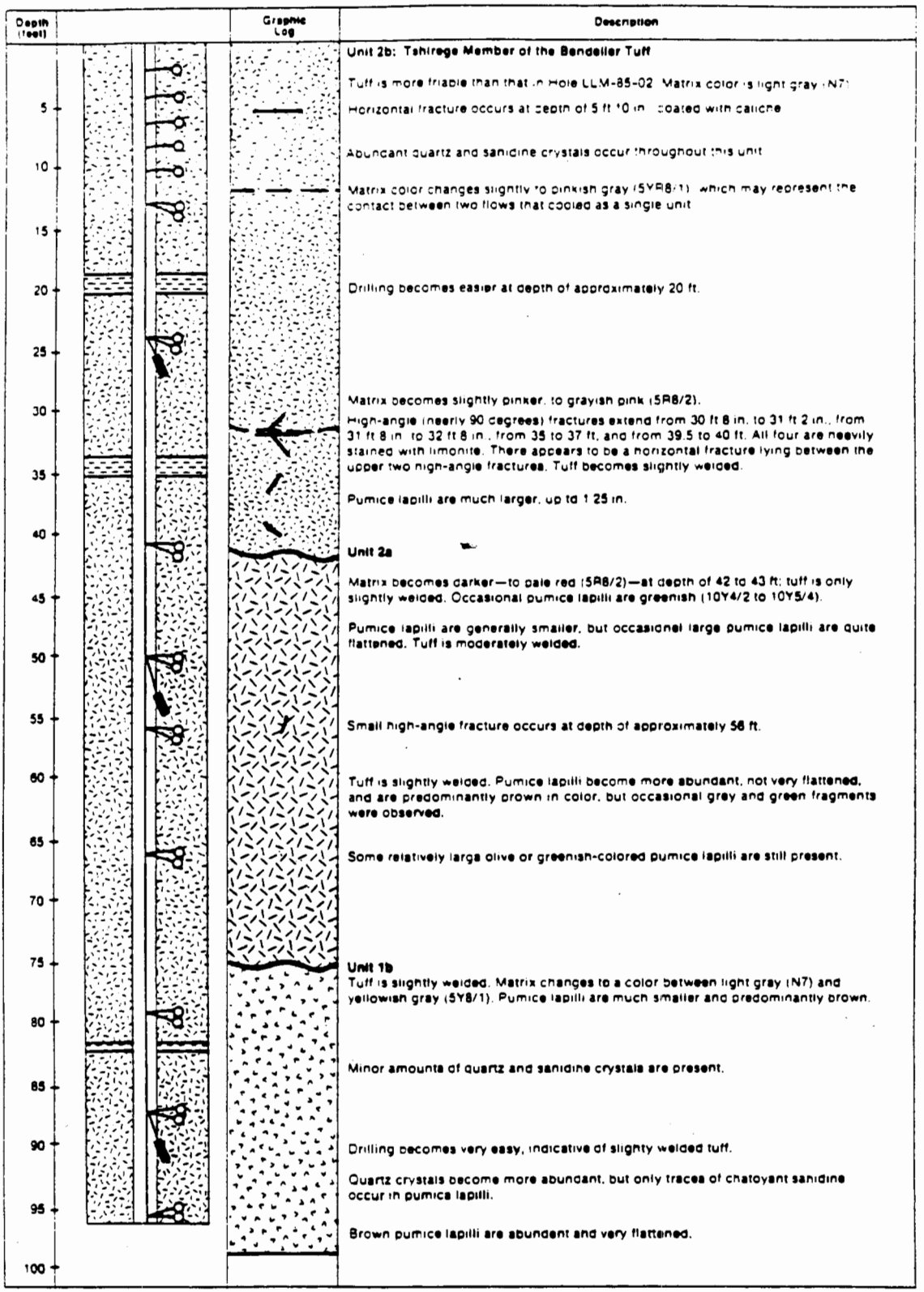


FIGURE C-4. INSTALLATION OF THERMOCOUPLE PSYCHROMETERS AND PRESSURE TRANSDUCERS IN HOLE LLP-85-03 (NOTE: THE PSYCHROMETERS IN THE UPPER 10 FT ARE LOCATED IN A SHALLOW BORING ADJACENT TO THE MAIN HOLE.) (BFEC, 1986)

2/28/87 3010 464

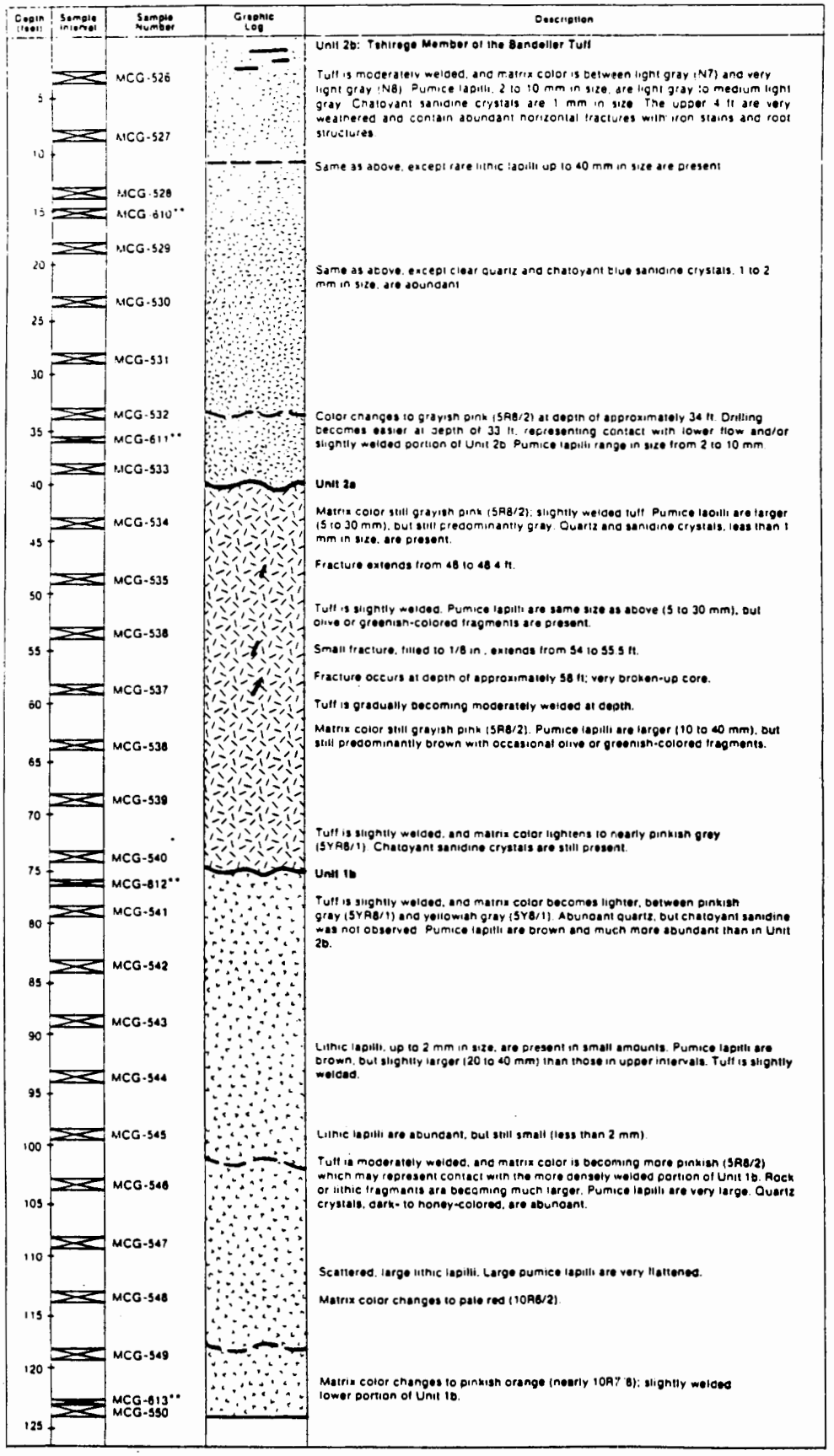


FIGURE C-5. LITHOLOGIC LOG OF HOLE LLM-85-05 (BFEC, 1986)

2/28/87 3r -A65

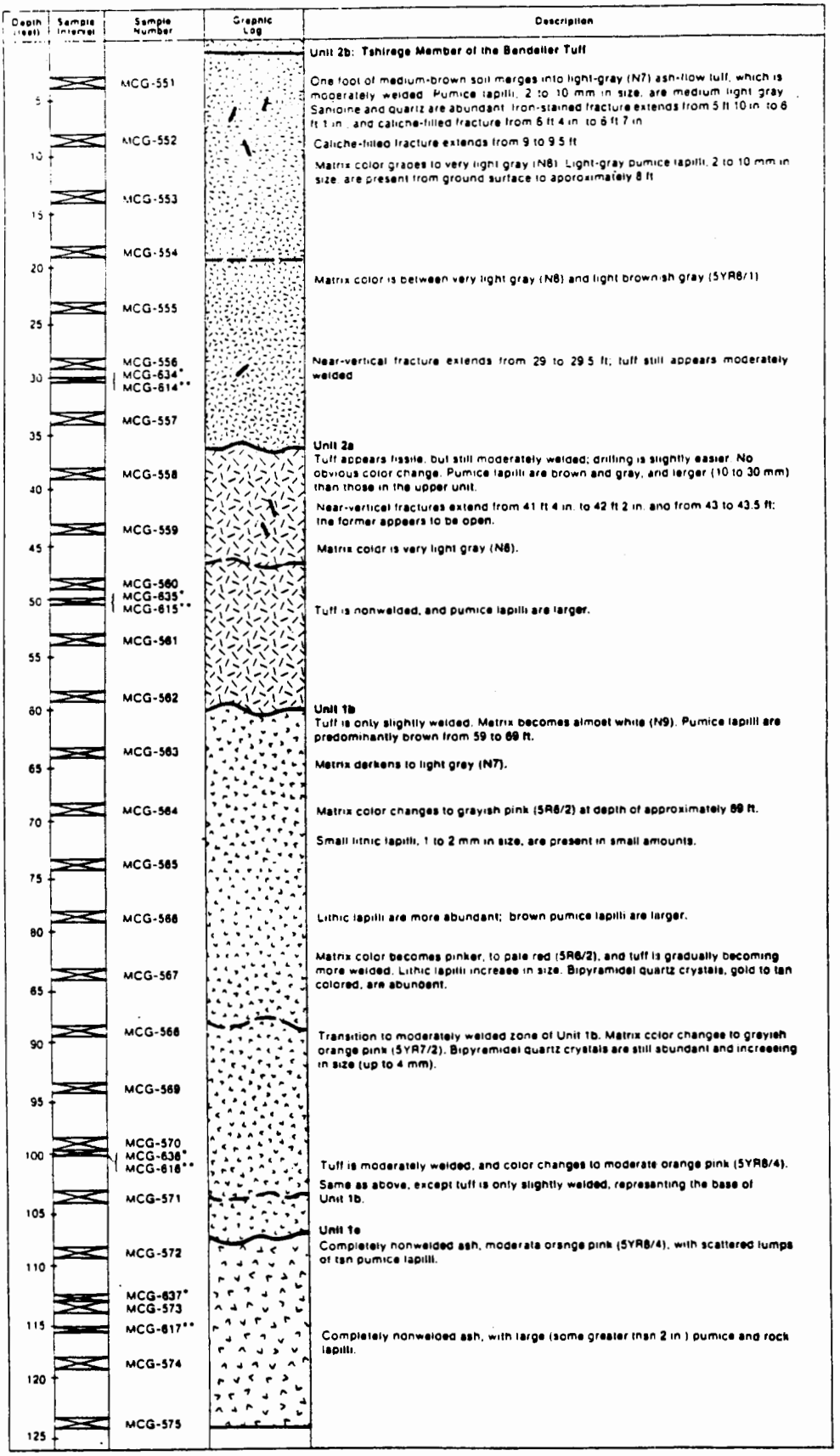


FIGURE C-6. LITHOLOGIC LOG OF HOLE LGM-85-06 (BFEC, 1986)

2/28/87 3010 66

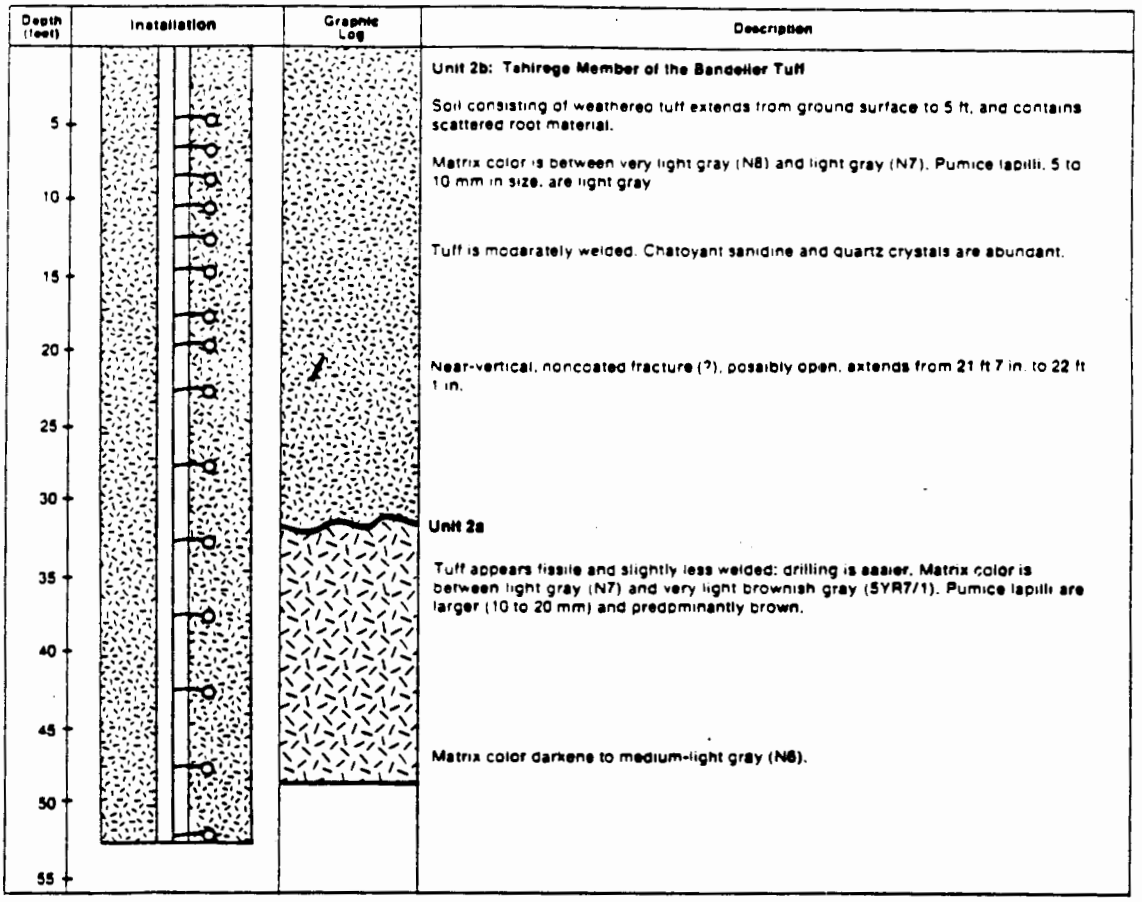


FIGURE C-7. INSTALLATION OF THERMOCOUPLE PSYCHROMETERS IN HOLE LGP-85-07 (BFEC, 1986)

2/28/87 301017 37

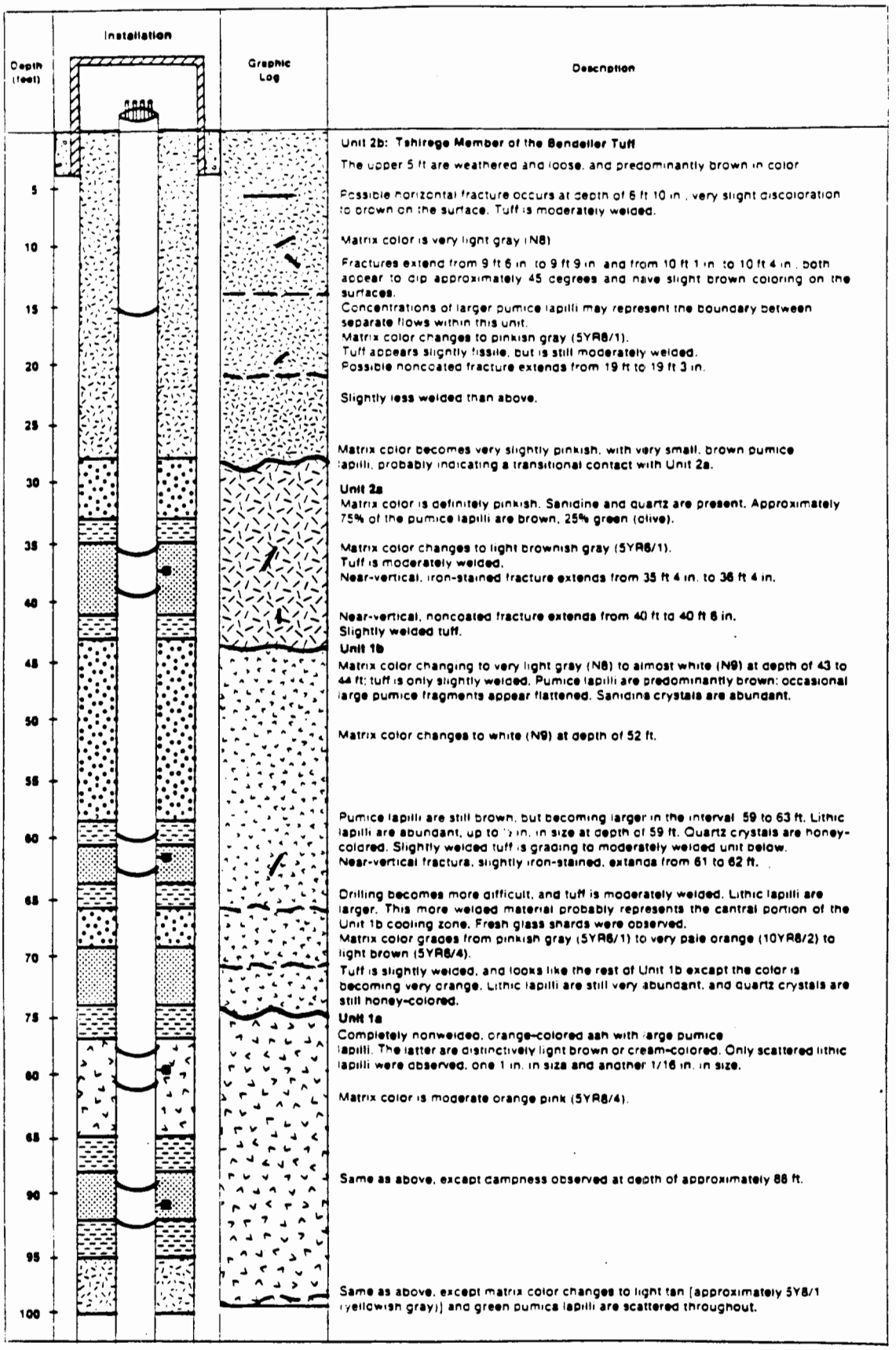


FIGURE C-8. INSTALLATION OF PORE-GAS SAMPLING PORTS IN HOLE LGC-85-09 (BFEC, 1986)

2/28/87 30' 7-A68

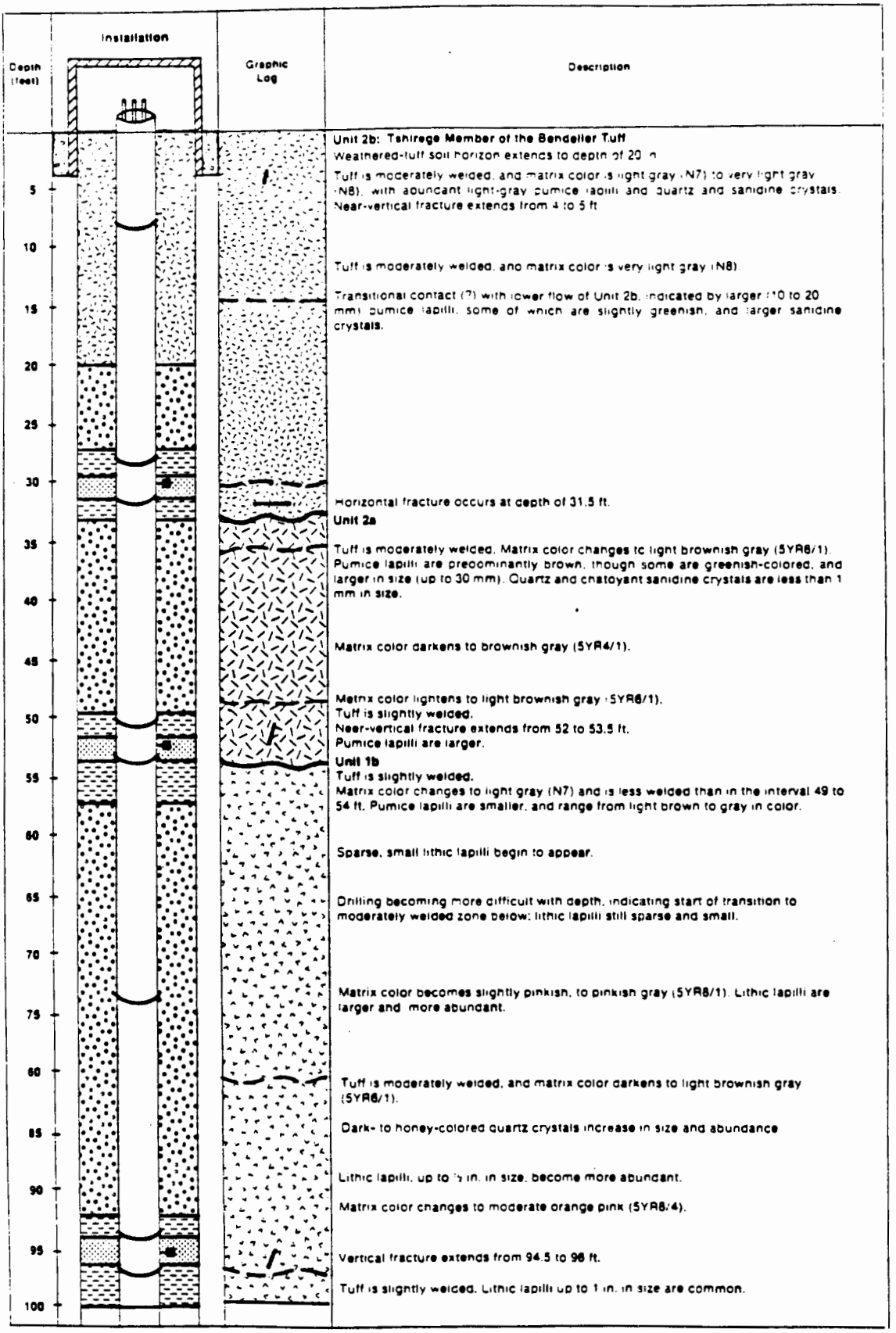


FIGURE C-9. INSTALLATION OF PORE-GAS SAMPLING PORTS IN HOLE LGC-85-10 (BFEC, 1986)

2/28/87 17-A69

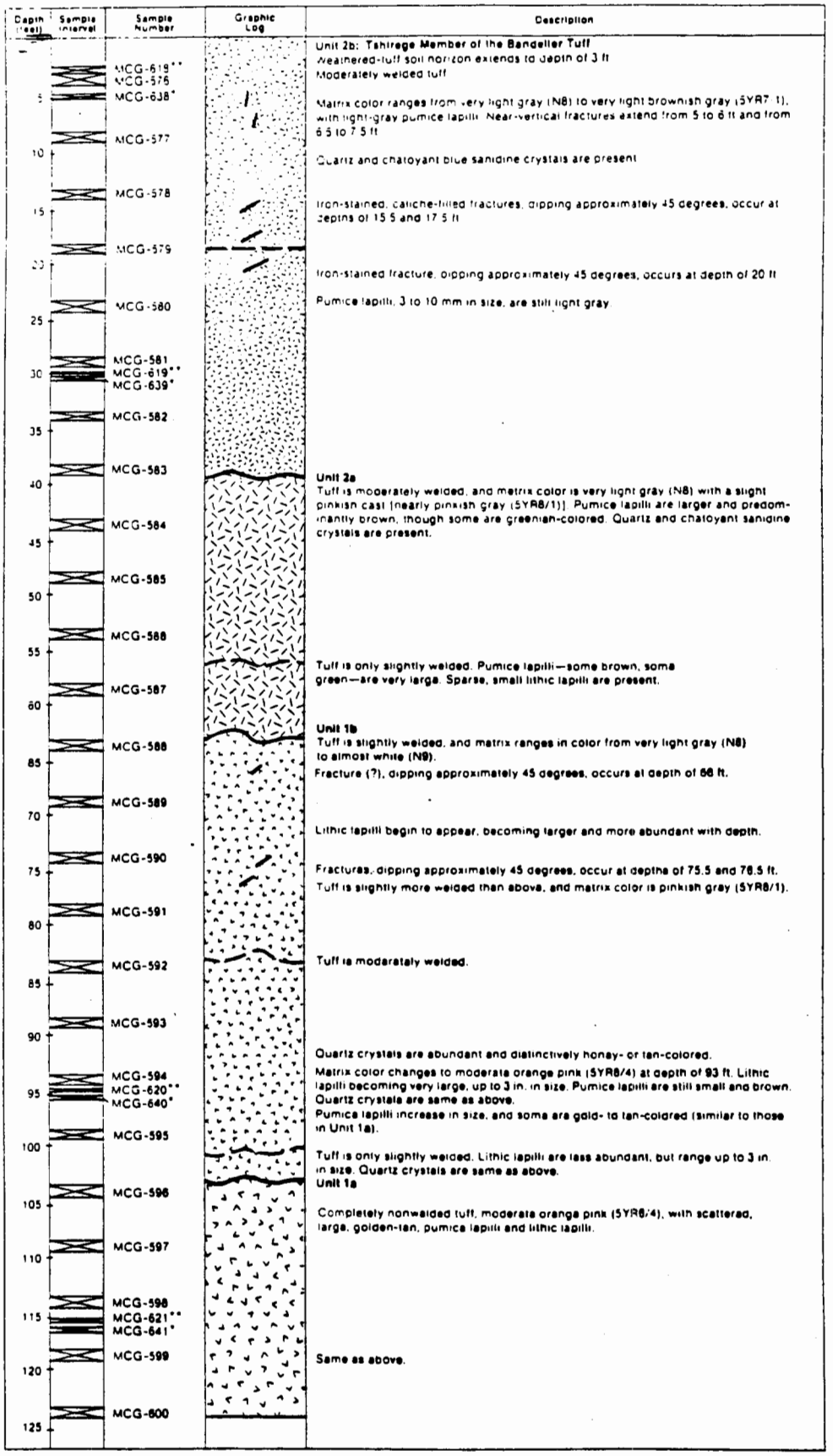


FIGURE C-10. LITHOLOGIC LOG OF HOLE LGM-85-11 (BFEC, 1986)

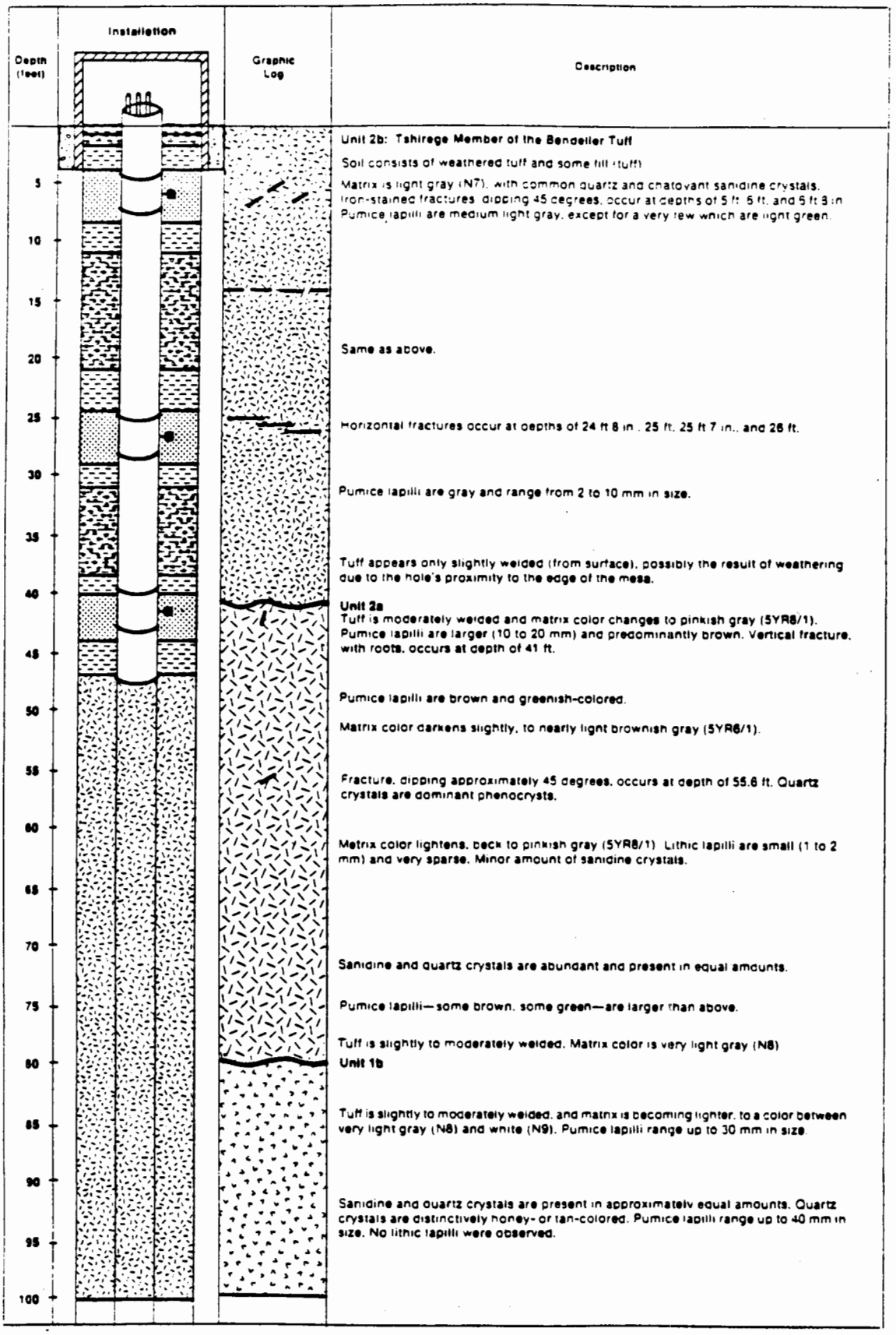


FIGURE C-11. INSTALLATION OF PORE-GAS SAMPLING PORTS IN HOLE LLC-85-12 (BFEC, 1986)

2/28/87 30101 71

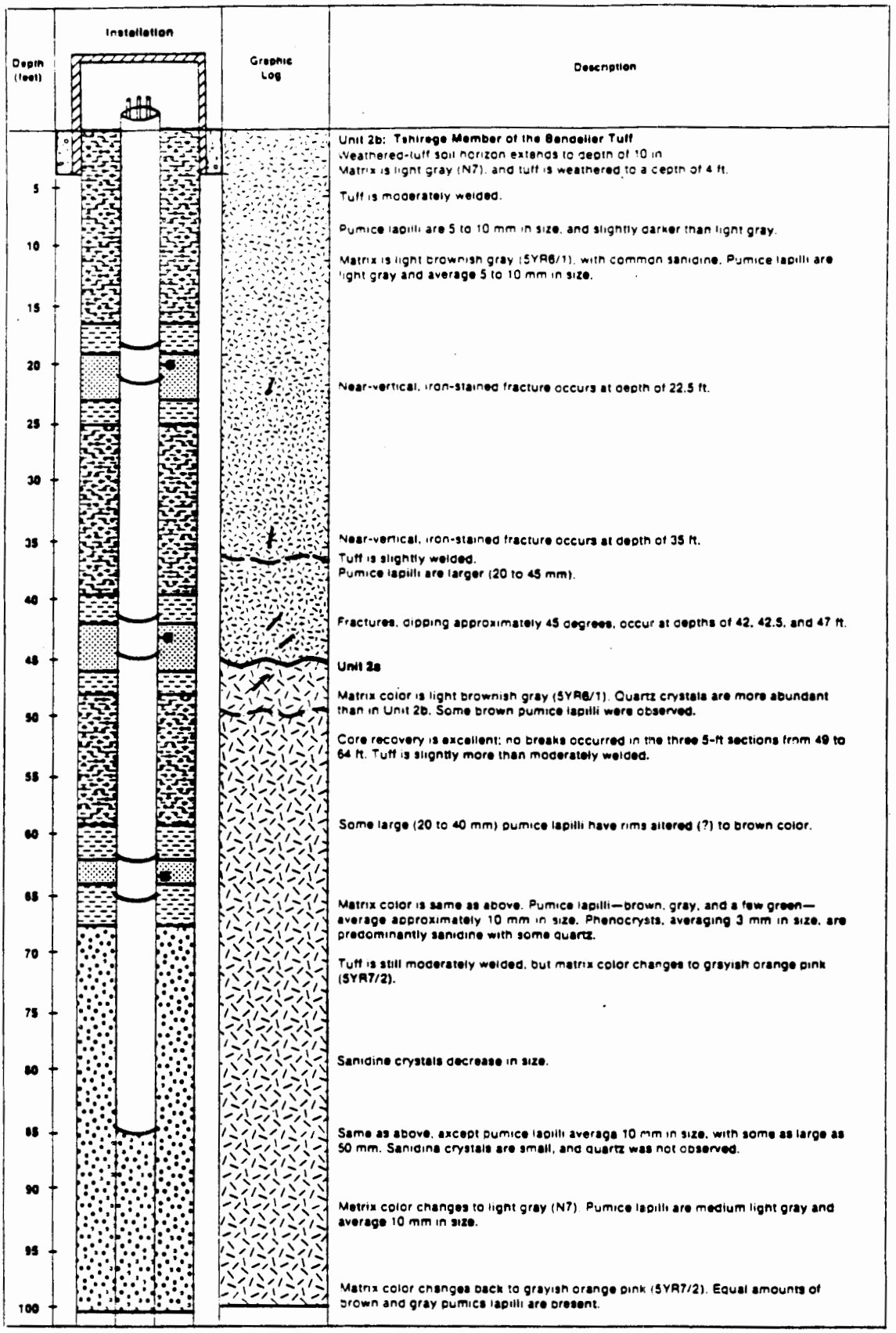


FIGURE C-12. INSTALLATION OF PORE-GAS SAMPLING PORTS IN HOLE LLC-85-13 (BFEC, 1986)

2/28/87 301017-A

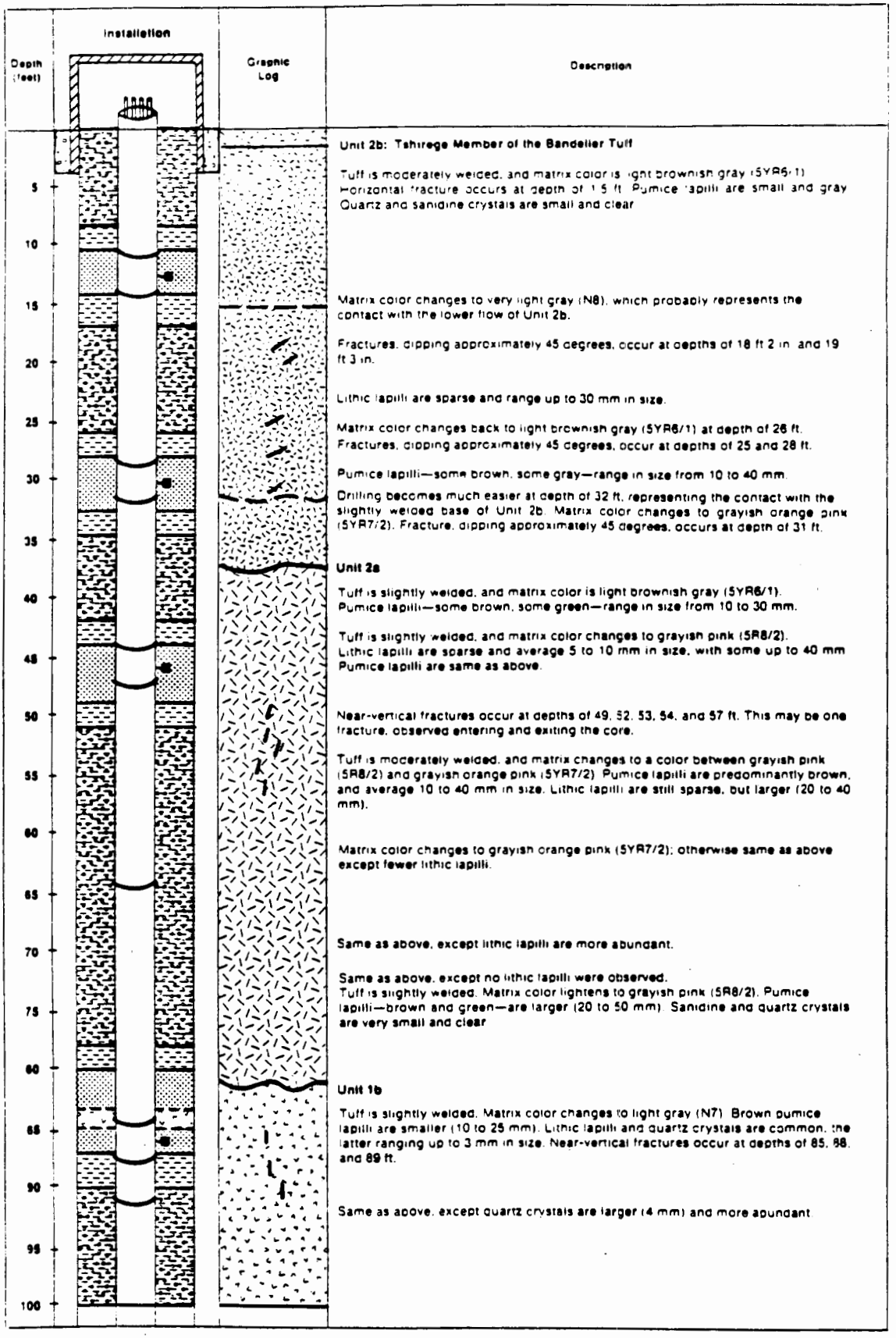


FIGURE C-13. INSTALLATION OF PORE-GAS SAMPLING PORTS IN HOLE LLC-85-14 (BFEC, 1986)

2/28/87 301017

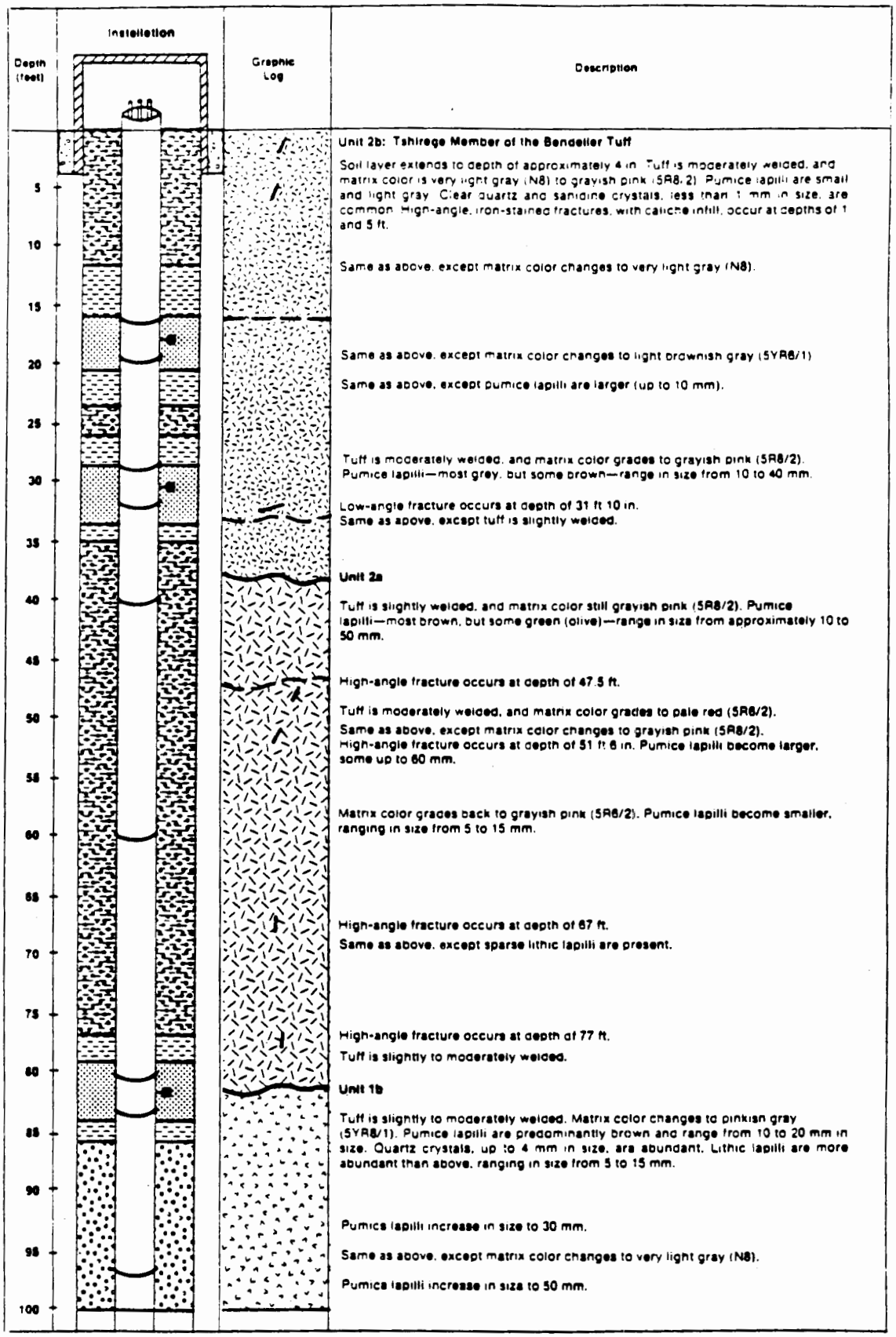


FIGURE C-14. INSTALLATION OF PORE-GAS SAMPLING PORTS IN HOLE LLC-85-15 (BFEC, 1986)

APPENDIX H

AREAS G AND L THERMOCOUPLE PSYCHROMETER DATA

AREA L: OCTOBER 1985 PSYCHROMETER DATA

DATE	CORRECTION	TEMP (DEG C)	OFFSET (MICROVOLTS)	READING (MICROVOLTS)	DEPTH (FT)	WATER POTENTIAL (-BARS)
220CT85	1	7.5	8.3	44.8	0	
220CT85	0.85	6.8	2.7	0.5	2	1.512
220CT85	0.84	11.1	2.9	0.5	4	1.254
220CT85	0.84	11.4	2.9	0.5	6	1.241
220CT85	0.89	13.2	2.9	0.9	8	2.234
220CT85	0.84	12.2	3.6	0.9	10	2.172
220CT85	0.81	12.7	2.5	1.2	13	2.765
220CT85	0.88	12.7	2.4	0.5	13	1.247
220CT85	0.87	10.3	3.1	0.5	24	1.337
220CT85	0.85	10.4	2.4	0.3	24	0.782
220CT85	1	10.4	5	0.7	41	2.129
220CT85	0.9	10.8	1	2.2	41	6.104
230CT85	1	4.8	14.8	0.2	0	0.743
230CT85	0.85	8.9	2.4	2.8	2	7.897
230CT85	0.84	11.3	2	3.5	4	8.947
230CT85	0.84	12.5	2.6	0.4	6	0.957
230CT85	0.89	13.1	1.5	1.1	8	2.76
230CT85	0.84	12.7	1.8	0.9	10	2.153
230CT85	0.81	12	1.1	1.5	13	3.569
230CT85	0.88	11.9	1.6	0.1	13	0.256
230CT85	0.87	9.1	2	1.3	24	3.682
230CT85	0.85	9	1.4	1	24	2.779
230CT85	1	8.8	2.8	0.9	41	2.946
230CT85	0.9	8.9	1.2	1.1	41	3.256
230CT85	1	11.2	1	2.8	50	8.545
230CT85	0.94	11.3	1.3	1.3	50	3.67
230CT85	0.85	11.3	1	2.5	56	6.447
230CT85	1.03	29.5	1.5	2.1	56	4.148
230CT85	0.84	11.1	0.9	3.1	66	7.998
230CT85	0.96	11.1	1	2	66	5.846
230CT85	0.94	11	0.8	1.5	76	4.297
230CT85	0.89	11.1	0.6	2.2	76	5.981
230CT85	0.9	11	1.1	0.4	86	1.087
230CT85	1	11.1	1.6	1.6	96	4.844
230CT85	1	11.1	0	0.7	96	2.121
240CT85	1	5.8	18.3	0.1	0	0.349
240CT85	0.85	8.4	2.5	3.4	2	9.843
240CT85	0.84	11.1	1.9	3.5	4	9.017
240CT85	0.84	12.3	2.2	0.5	6	1.207
240CT85	0.89	12.8	1.6	1.2	8	3.041
240CT85	0.84	12.5	1.9	1.1	10	2.652
240CT85	0.81	11.8	1.2	1.8	13	4.319
240CT85	0.88	11.8	1.7	0.2	13	0.515
240CT85	0.87	8.9	2	1.3	24	3.712
240CT85	0.85	8.9	1.4	1	24	2.791
240CT85	1	8.8	2.8	0.9	41	2.946
240CT85	0.9	8.8	1.5	1.1	41	3.265
250CT85	1	6.7	12.6	0.4	0	1.371
250CT85	0.85	8.3	2.6	3	2	8.687
250CT85	0.84	11.1	1.9	3.2	4	8.225
250CT85	0.84	12.3	2.3	0.2	6	0.482
250CT85	0.89	12.8	1.6	0.9	8	2.276

AREA L: OCTOBER 1985 PSYCHROMETER DATA

250CT85	0.84	12.7	1.8	0.8	10	1.913
250CT85	0.81	11.9	1.1	1.2	13	2.859
250CT85	0.88	11.9	1.8	0.2	13	0.513
250CT85	0.85	9	1.4	0.9	24	2.499
250CT85	0.87	9	2	1.3	24	3.697
250CT85	0.9	8.9	1.3	1.1	41	3.254
250CT85	1	8.9	2.6	0.8	41	2.609
250CT85	0.94	9.7	0.5	0.2	50	0.597
250CT85	1	10.1	0.3	2.3	50	7.31
250CT85	1.03	29.5	0.1	0.9	56	1.786
250CT85	0.85	9.9	0.1	1.3	56	3.515
250CT85	0.84	9.9	0.4	2.5	66	6.735
250CT85	0.96	9.8	0.5	1.8	66	5.53
250CT85	0.89	10	0.1	1.4	76	3.951
250CT85	0.94	9.9	0.8	1	76	2.974
250CT85	0.9	9.8	1.2	0.2	86	0.567
250CT85	1	9.8	0.5	0.5	96	1.584
250CT85	1	9.9	1.8	1.3	96	4.104
260CT85	1	8.7	12.3	0.2	0	0.628
260CT85	0.85	8.2	2.1	2.9	2	8.444
260CT85	0.84	10.9	2	3.3	4	8.548
260CT85	0.84	12.1	2.2	0.3	6	0.728
260CT85	0.89	12.7	1.7	1.1	8	2.793
260CT85	0.84	12.6	2	1.2	10	2.884
260CT85	0.88	11.9	1.6	0.2	13	0.513
260CT85	0.81	11.9	1.1	1.7	13	4.064
260CT85	0.87	9	1.8	1.2	24	3.413
260CT85	0.85	9.1	1.4	1.2	24	3.327
260CT85	0.9	8.9	1.3	1.2	41	3.553
260CT85	1	8.8	2.7	0.6	41	1.96
260CT85	1	10.2	0.2	2.4	50	7.608
260CT85	0.94	10.1	0.4	0.1	50	0.294
260CT85	0.85	10	0.3	1.6	56	4.316
260CT85	1.03	29.5	0.6	2	56	3.968
260CT85	0.96	10	0.5	1.8	66	5.487
260CT85	0.84	10.4	0.6	2.8	66	7.409
260CT85	0.89	10.1	0.1	1.4	76	3.936
260CT85	0.94	10	1	1.6	76	4.758
260CT85	0.9	9.9	1.1	3.5	86	10.15
260CT85	1	10	0.2	0.4	96	1.258
260CT85	1	10.1	1.6	1.7	96	5.347
270CT85	1	9.5	17.1	0.3	0	0.895
270CT85	0.85	8.3	2.1	3	2	8.706
270CT85	0.84	10.7	1.9	3.2	4	8.349
270CT85	0.84	11.9	2.1	0.1	6	0.244
270CT85	0.89	12.7	1.5	0.7	8	1.775
270CT85	0.84	12.4	1.6	0.7	10	1.691
270CT85	0.88	11.8	1.6	0.1	13	0.257
270CT85	0.81	11.7	1	1.1	13	2.638
270CT85	0.85	9.1	1.1	0.9	24	2.493
270CT85	0.87	9	1.7	1.1	24	3.127
270CT85	1	8.8	2.7	0.7	41	2.289
270CT85	0.9	8.9	1.3	1.1	41	3.254
270CT85	0.94	10	0.3	0.1	50	0.295
270CT85	1	9.9	0.2	2.4	50	7.697
270CT85	0.85	10.1	0.1	1.3	56	3.488

AREA L: OCTOBER 1985 PSYCHROMETER DATA

270CT85	1.03	29.5	0.5	1.2	56	2.378
270CT85	0.84	10	0.4	2.6	66	6.982
270CT85	0.96	10	0.7	1.8	66	5.482
270CT85	0.89	10.1	0.2	1.4	76	3.934
270CT85	0.94	9.9	0.9	1.3	76	3.873
270CT85	0.9	9.9	1.1	0.1	86	0.282
270CT85	1	10	0.4	0.7	96	2.205
270CT85	1	10	1.4	1.2	96	3.778
280CT85	1	6.3	9.1	12	0	49.57
280CT85	0.85	8.3	2	3	2	8.71
280CT85	0.84	10.6	1.9	3.2	4	8.381
280CT85	0.84	11.8	2.4	0.3	6	0.735
280CT85	0.89	12.5	1.7	0.9	8	2.298
280CT85	0.84	12.4	2.1	0.9	10	2.172
280CT85	0.81	11.9	1.6	1.5	13	3.573
280CT85	0.88	11.9	1.8	0.1	13	0.256
280CT85	0.85	9	1.5	1.1	24	3.058
280CT85	0.87	9.1	2	1.2	24	3.396
280CT85	1	8.8	2.8	0.8	41	2.617
280CT85	0.9	8.9	1.5	1	41	2.953
280CT85	0.94	10	0.6	0.3	50	0.885
280CT85	1	10.2	0	2.4	50	7.615
280CT85	1.03	29.5	0.8	2.3	56	4.562
280CT85	0.85	10	0.2	1.7	56	4.591
280CT85	0.96	10	0.7	1.8	66	5.482
280CT85	0.84	10	0.6	3.2	66	8.628
280CT85	0.94	9.8	0.9	1.3	76	3.888
280CT85	0.89	10	0	1.4	76	3.953
280CT85	0.9	9.8	1	3.5	86	10.2
280CT85	1	9.8	1.5	1.4	96	4.446
280CT85	1	10	0.5	0.7	96	2.204
290CT85	1	7.6	13.3	14.4	0	56.88
290CT85	0.85	8.2	1.9	3	2	8.751
290CT85	0.84	10.4	1.9	3.1	4	8.175
290CT85	0.84	11.7	2.4	0.2	6	0.491
290CT85	0.89	12.5	1.6	0.9	8	2.299
290CT85	0.84	12.4	2	0.9	10	2.173
290CT85	0.88	11.9	1.6	0.1	13	0.256
290CT85	0.81	11.9	1.3	1.5	13	3.578
290CT85	0.85	9	1.4	1.3	24	3.622
290CT85	0.87	9	1.9	1.4	24	3.987
290CT85	1	8.9	2.8	0.9	41	2.934
290CT85	0.9	9	1.4	1.2	41	3.537
290CT85	1	10.4	0.2	2.2	50	6.91
290CT85	0.94	10	0.8	0.4	50	1.18
290CT85	0.85	9.9	0.1	1.4	56	3.788
290CT85	1.03	29.5	1.1	1.7	56	3.362
290CT85	0.96	10	0.5	1.5	66	4.562
290CT85	0.84	10	0.4	2.7	66	7.257
290CT85	0.94	9.9	0.5	1.1	76	3.278
290CT85	0.89	10	0.1	1.2	76	3.382
290CT85	0.9	10	1.1	0.1	86	0.281
290CT85	1	10	0.4	0.7	96	2.205
290CT85	1	10	1.3	1.3	96	4.097
300CT85	1	6.7	16.7	0.1	0	0.336
300CT85	0.85	8.1	2	2.9	2	8.485

AREA L: OCTOBER 1985 PSYCHROMETER DATA

30OCT85	0.84	10.3	2	3.3	4	8.746
30OCT85	0.84	11.5	2.4	0.2	6	0.495
30OCT85	0.89	12.2	1.5	0.8	8	2.064
30OCT85	0.84	12.3	2.1	0.6	10	1.45
30OCT85	0.88	11.6	1.6	3.3	13	8.744
30OCT85	0.81	11.6	0.9	1	13	2.406
30OCT85	0.85	9.1	1.3	0.7	24	1.934
30OCT85	0.87	9	1.8	1	24	2.84
30OCT85	0.9	8.8	1.4	0.8	41	2.37
30OCT85	1	8.8	2.5	0.2	41	0.652
30OCT85	0.94	10	0.6	0.1	50	0.295
30OCT85	1	10	0.2	2.3	50	7.342
30OCT85	0.85	10	0	1.5	56	4.048
30OCT85	1.03	29.5	0.9	1.6	56	3.167
30OCT85	0.96	10	0.9	1.9	66	5.786
30OCT85	0.84	10.1	0.7	2.9	66	7.766
30OCT85	0.94	10	1	1.2	76	3.557
30OCT85	0.89	10	0.2	1.2	76	3.38
30OCT85	0.9	10	1.4	0.1	86	0.281
30OCT85	1	10	1.4	1.3	96	4.096
30OCT85	1	10	0.4	0.6	96	1.889
31OCT85	1	5.8	10.4	0.1	0	0.36
31OCT85	0.85	8	2.2	2.9	2	8.514
31OCT85	0.84	10.3	1.7	3.1	4	8.214
31OCT85	0.84	11.5	2.5	0.2	6	0.495
31OCT85	0.89	12.3	1.6	0.8	8	2.056
31OCT85	0.84.	12.3	2.2	1.4	10	3.4
31OCT85	0.88	11.8	1.6	0.4	13	1.031
31OCT85	0.81	11.7	1.2	1.8	13	4.334
31OCT85	0.85	9.1	1.3	1.3	24	3.609
31OCT85	0.87	9.2	1.8	1.5	24	4.242
31OCT85	1	8.9	2.9	1.5	41	4.912
31OCT85	0.9	8.9	1.3	1.4	41	4.152
31OCT85	1	9.9	0.2	2.2	50	7.045
31OCT85	0.94	9.9	0.5	0.2	50	0.592
31OCT85	0.85	10	0	1.4	56	3.775
31OCT85	1.03	29.5	0.9	1.6	56	3.167
31OCT85	0.84	9.9	0.3	2.6	66	7.013
31OCT85	0.96	9.8	0.4	1.6	66	4.91
31OCT85	0.89	9.9	0	1.5	76	4.255
31OCT85	0.94	9.9	0.7	1.1	76	3.275
31OCT85	0.9	9.8	0.9	0	86	0
31OCT85	1	9.9	1.5	1.1	96	3.472
31OCT85	1	9.9	0.6	0.8	96	2.529

AREA L: NOVEMBER 1985 PSYCHROMETER DATA

DATE	CORRECTION	TEMP (DEG C)	OFFSET (MICROVOLTS)	READING (MICROVOLTS)	DEPTH (FT)	WATER POTENTIAL (-BARS)
01NOV85	1	1.9	1.8	0.3	0	1.364
01NOV85	0.85	7.8	2.4	3	2	8.886
01NOV85	0.84	10.1	1.8	3.1	4	8.275
01NOV85	0.84	11.5	2.5	0.2	6	0.495
01NOV85	0.89	12.2	1.6	0.7	8	1.804
01NOV85	0.84	12.3	2.1	0.8	10	1.936
01NOV85	0.81	11.7	0.9	1	13	2.398
01NOV85	0.88	11.8	1.6	3.5	13	9.221
01NOV85	0.87	9.2	1.8	1	24	2.817
01NOV85	0.85	9.1	1.2	0.6	24	1.657
01NOV85	0.9	8.9	1.1	0.9	41	2.661
01NOV85	1	8.9	2.4	0	41	0
01NOV85	1	10.1	0.1	2	50	6.347
01NOV85	0.94	9.9	0.3	3.5	50	10.64
01NOV85	1.03	29.5	0.8	1.7	56	3.367
01NOV85	0.85	10	0.2	1.5	56	4.044
01NOV85	0.96	10	0.4	1.5	66	4.564
01NOV85	0.84	9.9	0.4	2.7	66	7.285
01NOV85	0.94	10	0.9	1.2	76	3.559
01NOV85	0.89	9.9	0.2	1.4	76	3.965
01NOV85	0.9	9.9	1.1	0.2	86	0.565
01NOV85	1	10	1.4	1.3	96	4.096
01NOV85	1	10	0.4	0.7	96	2.205
02NOV85	1				0	
02NOV85	0.85	7.2	2.7	2.9	2	8.804
02NOV85	0.84	9.8	1.7	3	4	8.1
02NOV85	0.84	11.1	2.5	0.3	6	0.753
02NOV85	0.89	11.8	1.3	0.5	8	1.306
02NOV85	0.84	12	2.1	0.8	10	1.956
02NOV85	0.81	11.5	0.7	1.6	13	3.883
02NOV85	0.88	11.6	1.7	0.2	13	0.518
02NOV85	0.87	9.1	1.8	1.4	24	3.972
02NOV85	0.85	8.9	1.4	1.2	24	3.354
02NOV85	0.9	8.7	1	1.4	41	4.192
02NOV85	1	8.8	2.9	1.6	41	5.266
02NOV85	0.94	10.1	0.4	0	50	0
02NOV85	1	10	0.4	2.3	50	7.335
02NOV85	0.85	10.1	0.2	1.4	56	3.757
02NOV85	1.03	29.5	0.9	1.5	56	2.968
02NOV85	0.96	10	0.7	1.7	66	5.173
02NOV85	0.84	10	0.4	2.5	66	6.708
02NOV85	0.89	10.1	0.1	1.5	76	4.22
02NOV85	0.94	9.9	1	1	76	2.971
02NOV85	0.9	9.7	1.2	0.1	86	0.285
02NOV85	1	9.9	0.4	0.7	96	2.214
02NOV85	1	9.9	1.8	1.6	96	5.063
03NOV85	1	1.8	6.3	0.3	0	1.348
03NOV85	0.85	6.6	2.9	2.8	2	8.723
03NOV85	0.84	9.6	1.7	2.7	4	7.33
03NOV85	0.84	11.1	2.5	0.1	6	0.251
03NOV85	0.89	11.7	1.6	0.8	8	2.098

AREA L: NOVEMBER 1985 PSYCHROMETER DATA

03NOV85	0.84	11.8	2.2	1	10	2.464
03NOV85	0.81	11.4	0.9	1.3	13	3.157
03NOV85	0.88	11.5	1.5	3.3	13	8.779
03NOV85	0.85	8.9	1.2	0.7	24	1.95
03NOV85	0.87	9	1.4	0.7	24	1.987
03NOV85	0.9	8.7	0.8	0.8	41	2.386
03NOV85	1	8.7	2.2	0	41	0
03NOV85	1	9.9	0.1	2.1	50	6.722
03NOV85	0.94	9.6	0.7	0.1	50	0.299
03NOV85	0.85	9.7	0.3	1.2	56	3.264
03NOV85	1.03	29.5	1.1	1.5	56	2.965
03NOV85	0.84	9.6	0.3	2.4	66	6.54
03NOV85	0.96	9.8	0.8	1.6	66	4.901
03NOV85	0.94	9.6	1.2	1	76	3.004
03NOV85	0.89	9.8	0	1.3	76	3.696
03NOV85	0.9	9.6	1.5	0.1	86	0.285
03NOV85	1	9.6	1.9	1.4	96	4.474
03NOV85	1	9.6	0.4	0.5	96	1.597
04NOV85	1	2.5	7.9	0.1	0	0.429
04NOV85	0.85	6.3	2.9	2.9	2	9.172
04NOV85	0.84	9.5	1.8	2.8	4	7.635
04NOV85	0.84	11	2.4	0.2	6	0.504
04NOV85	0.89	11.6	1.4	0.6	8	1.579
04NOV85	0.84	11.9	2.3	1	10	2.454
04NOV85	0.81	11.4	1	1.4	13	3.401
04NOV85	0.88	11.4	1.7	3.5	13	9.351
04NOV85	0.85	8.9	1.6	1.1	24	3.069
04NOV85	0.87	9	2	1.1	24	3.123
04NOV85	1	8.7	3.2	0.8	41	2.623
04NOV85	0.9	8.7	1.6	1	41	2.976
04NOV85	0.94	9.6	0.5	0	50	0
04NOV85	1	9.6	0.6	2.2	50	7.116
04NOV85	1.03	29.5	0.9	1.6	56	3.167
04NOV85	0.85	9.6	0.2	1.4	56	3.831
04NOV85	0.84	9.7	0.4	2.5	66	6.788
04NOV85	0.96	9.8	0.7	1.4	66	4.284
04NOV85	0.94	9.7	1	1.1	76	3.296
04NOV85	0.89	9.7	0.1	1.3	76	3.709
04NOV85	0.9	9.6	1.4	0	86	0
04NOV85	1	9.7	0.4	0.6	96	1.911
04NOV85	1	9.7	1.8	1.3	96	4.136
05NOV85	1	5.5	11.7	0.2	0	0.727
05NOV85	0.85	6.3	2.8	3	2	9.503
05NOV85	0.84	9.4	2	2.6	4	7.1
05NOV85	0.84	10.8	2.4	0	6	0
05NOV85	0.89	11.7	1.7	0.6	8	1.571
05NOV85	0.84	11.8	2.3	1	10	2.463
05NOV85	0.88	11.5	1.7	0	13	0
05NOV85	0.81	11.6	1.1	1.4	13	3.375
05NOV85	0.85	9	1.3	1.4	24	3.905
05NOV85	0.87	9.1	1.9	1.5	24	4.258
05NOV85	1	8.8	2.9	1.3	41	4.268
05NOV85	0.9	8.9	1	1.3	41	3.857
05NOV85	0.94	9.7	0.5	0.1	50	0.298
05NOV85	1	9.7	0.4	1.9	50	6.112
05NOV85	0.85	9.7	0.2	1.3	56	3.541

AREA L: NOVEMBER 1985 PSYCHROMETER DATA

05NOV85	1.03	29.5	1	1.6	56	3.165
05NOV85	0.84	9.7	0.3	2.5	66	6.791
05NOV85	0.96	9.8	0.7	1.5	66	4.593
05NOV85	0.94	9.8	1.2	1.2	76	3.582
05NOV85	0.89	9.8	0.1	1.3	76	3.695
05NOV85	0.9	9.6	1.4	0	86	0
05NOV85	1	9.9	1.9	1.3	96	4.102
05NOV85	1	9.7	0.5	0.6	96	1.91
06NOV85	1	2.3	5.7	0.3	0	1.315
06NOV85	0.85	6.3	2.4	3	2	9.519
06NOV85	0.84	9.2	1.9	2.6	4	7.161
06NOV85	0.84	10.8	2.6	0.2	6	0.507
06NOV85	0.89	11.5	1.5	0.6	8	1.583
06NOV85	0.84	11.9	2.3	1	10	2.454
06NOV85	0.88	11.5	1.7	3.5	13	9.317
06NOV85	0.81	11.5	1	1.4	13	3.389
06NOV85	0.85	9.1	1.2	1.1	24	3.05
06NOV85	0.87	9.1	1.8	0.9	24	2.543
06NOV85	1	8.8	2.4	0	41	0
06NOV85	0.9	8.8	1	0.7	41	2.075
06NOV85	1	9.9	0.3	2	50	6.391
06NOV85	0.94	9.7	0.5	0.2	50	0.597
06NOV85	1.03	29.5	1	1.6	56	3.165
06NOV85	0.85	9.8	0.3	1.5	56	4.074
06NOV85	0.84	9.8	0.6	2.8	66	7.584
06NOV85	0.96	9.7	0.7	1.6	66	4.922
06NOV85	0.94	9.7	1	1.3	76	3.902
06NOV85	0.89	9.9	0.2	1.1	76	3.108
06NOV85	0.9	9.7	1.4	0.2	86	0.569
06NOV85	1	9.9	1.6	1.3	96	4.108
06NOV85	1	9.7	0.5	0.7	96	2.23
07NOV85	1				0	
07NOV85	0.85	6	2.3	2.4	2	7.681
07NOV85	0.84	8.8	1.8	2.6	4	7.284
07NOV85	0.84	10.5	2.6	0.1	6	0.256
07NOV85	0.89	11.3	1.5	0.8	8	2.129
07NOV85	0.84	11.6	2.3	0.9	10	2.23
07NOV85	0.88	11.3	1.8	3.5	13	9.381
07NOV85	0.81	11.2	0.9	1.4	13	3.427
07NOV85	0.87	9.1	1.8	1.5	24	4.259
07NOV85	0.85	8.9	1.3	1	24	2.792
07NOV85	0.9	8.6	1.1	1.3	41	3.903
07NOV85	1	8.7	3.1	1.6	41	5.283
07NOV85	1	9.9	0.5	2	50	6.385
07NOV85	0.94	9.8	0.5	0.1	50	0.297
07NOV85	0.85	9.6	0.4	1.3	56	3.551
07NOV85	1.03	29.5	1.1	1.4	56	2.767
07NOV85	0.96	9.8	0.6	1.6	66	4.905
07NOV85	0.84	9.8	0.6	2.4	66	6.48
07NOV85	0.89	9.7	0.3	1.2	76	3.418
07NOV85	0.94	9.6	1.1	0.8	76	2.4
07NOV85	0.9	9.6	1.3	0.1	86	0.285
07NOV85	1	9.6	0.3	0.5	96	1.598
07NOV85	1	9.8	1.8	1.3	96	4.12
08NOV85	1	2.9	12.7	0.2	0	0.826
08NOV85	0.85	5.5	2.4	2.2	2	7.195

AREA L: NOVEMBER 1985 PSYCHROMETER DATA

08NOV85	0.84	8.6	1.9	2.5	4	7.053
08NOV85	0.84	10.4	2.6	0.2	6	0.314
08NOV85	0.89	11.2	1.6	0.5	8	1.332
08NOV85	0.84	11.4	2.3	0.8	10	1.995
08NOV85	0.81	11.2	1.1	1.5	13	3.671
08NOV85	0.88	11.2	1.8	3.5	13	9.416
08NOV85	0.87	8.9	1.8	1	24	2.851
08NOV85	0.85	8.9	1.3	1	24	2.792
08NOV85	0.9	8.6	0.7	0.7	41	2.095
08NOV85	1	8.6	2	3.4	41	11.51
08NOV85	1.89	20.8	1.9	2.3	58	7.143
08NOV85	1.78	21	2.8	0.9	60	2.294
08NOV85	1.91	40.7	2.8	4.9	69	12.184
08NOV85	1.66	20.8	1.4	2.7	69	6.948
08NOV85	0.9	9.8	1.5	0.1	86	0.283
08NOV85	1.69	18.5	1.8	3.6	90	9.382
08NOV85	1.83	18.5	2.5	2.3	90	6.857
08NOV85	1	9.6	0.4	0.5	96	1.597
08NOV85	1	9.7	2.1	1.3	96	4.131
08NOV85	1.79	18.2	0.7	2.1	117	6.11
08NOV85	1.94	18.3	3.2	4.6	117	15.106
09NOV85	1	4.3	17.4	0.2	0	0.754
09NOV85	0.85	5.4	2.4	2	2	6.559
09NOV85	0.84	8.6	2	2.4	4	6.762
09NOV85	0.84	10.3	2.6	0	6	0
09NOV85	0.89	11.2	1.7	0.6	8	1.599
09NOV85	0.84	11.5	2.4	0.9	10	2.237
09NOV85	0.88	11.2	1.7	3.5	13	9.42
09NOV85	0.81	11.2	1.2	1.5	13	3.669
09NOV85	0.85	9	1.3	1.1	24	3.061
09NOV85	0.87	9	1.8	1.3	24	3.7
09NOV85	1	8.6	3.2	1.6	41	5.303
09NOV85	0.9	8.7	1.2	1.4	41	4.188
09NOV85	1	9.6	0.2	1.8	50	5.813
09NOV85	0.94	9.5	0.7	0.1	50	0.3
09NOV85	0.85	9.6	0.3	1.1	56	3.002
09NOV85	1.03	29.5	1	1.4	56	2.768
09NOV85	0.84	9.5	0.5	2.7	66	7.399
09NOV85	0.96	9.7	0.8	1.5	66	4.609
09NOV85	0.89	9.5	0	1.4	76	4.031
09NOV85	0.94	9.6	1.2	1.1	76	3.306
09NOV85	0.9	9.6	1.6	0	86	0
09NOV85	1	9.7	1.9	1.3	96	4.134
09NOV85	1	9.6	0.4	0.5	96	1.597
10NOV85	1	2.5	12.8	0.3	0	1.267
10NOV85	0.85	5.2	2.1	2	2	6.632
10NOV85	0.84	8.2	1.8	2.5	4	7.177
10NOV85	0.84	10.2	2.6	0.1	6	0.259
10NOV85	0.89	11.1	1.5	0.5	8	1.337
10NOV85	0.84	11.4	2.2	0.8	10	1.996
10NOV85	0.81	11.2	1	1.3	13	3.178
10NOV85	0.88	11.2	1.8	3.5	13	9.416
10NOV85	0.87	9.1	1.8	1.1	24	3.114
10NOV85	0.85	8.9	1.2	0.9	24	2.512
10NOV85	0.9	8.6	1	1	41	2.996
10NOV85	1	8.7	2.9	0.7	41	2.296

AREA L: NOVEMBER 1985 PSYCHROMETER DATA

10NOV85	1	9.8	0.4	2	50	6.413
10NOV85	0.94	9.6	0.6	0.1	50	0.299
10NOV85	1.03	29.5	1	1.5	56	2.966
10NOV85	0.85	9.7	0.2	1.3	56	3.541
10NOV85	0.96	9.6	0.7	1.4	66	4.317
10NOV85	0.84	9.7	0.4	2.5	66	6.788
10NOV85	0.89	9.7	0.1	1.1	76	3.133
10NOV85	0.94	9.5	1	1.3	76	3.933
10NOV85	0.9	9.6	1.5	0.1	86	0.285
10NOV85	1	9.5	0.5	0.5	96	1.603
10NOV85	1	9.6	1.9	1.3	96	4.151
11NOV85	1	6.8	16.1	0.3	0	1.009
11NOV85	0.85	5.2	2	1.8	2	5.959
11NOV85	0.84	8.2	2.2	2.5	4	7.165
11NOV85	0.84	10	2.7	0	6	0
11NOV85	0.89	11.2	1.7	0.4	8	1.064
11NOV85	0.84	11.4	2.4	1	10	2.496
11NOV85	0.81	11.2	1.2	1.4	13	3.422
11NOV85	0.88	11.1	1.7	0.1	13	0.264
11NOV85	0.87	9.1	1.7	1.3	24	3.687
11NOV85	0.85	9	1.2	1.1	24	3.062
11NOV85	0.9	8.7	1.1	1.1	41	3.284
11NOV85	1	8.7	2.8	0.7	41	2.297
11NOV85	0.94	9.5	0.7	3.5	50	10.8
11NOV85	1	9.5	0.1	1.8	50	5.839
11NOV85	0.85	9.6	0.4	1.3	56	3.551
11NOV85	1.03	29.5	1	1.5	56	2.966
11NOV85	0.96	9.6	0.6	1.3	66	4.008
11NOV85	0.84	9.6	0.5	2.7	66	7.369
11NOV85	0.94	9.7	1	1	76	2.994
11NOV85	0.89	9.5	0.1	1.1	76	3.158
11NOV85	0.9	9.6	1.4	0.1	86	0.285
11NOV85	1	9.6	1.9	1.5	96	4.797
11NOV85	1	9.5	0.5	0.5	96	1.603
12NOV85	1	5.3	9.3	0.1	0	0.37
12NOV85	0.85	5.5	1.8	2	2	6.544
12NOV85	0.84	8.2	2.1	2.2	4	6.291
12NOV85	0.84	10	2.7	0	6	0
12NOV85	0.89	11.1	1.7	0.5	8	1.336
12NOV85	0.84	11.5	2.5	1	10	2.486
12NOV85	0.88	11.2	1.7	3.5	13	9.42
12NOV85	0.81	11.3	1.2	1.4	13	3.41
12NOV85	0.87	9.2	1.7	1.2	24	3.387
12NOV85	0.85	9.2	1.2	1	24	2.759
12NOV85	1	8.9	2.8	0.8	41	2.606
12NOV85	0.9	8.8	1.1	1	41	2.971
12NOV85	1	9.8	0.3	1.8	50	5.765
12NOV85	0.94	9.7	0.6	3.5	50	10.71
12NOV85	0.85	9.8	0.3	1.3	56	3.525
12NOV85	1.03	29.5	0.8	1.6	56	3.168
12NOV85	0.96	9.6	0.7	1.5	66	4.629
12NOV85	0.84	10	0.5	2.7	66	7.254
12NOV85	0.89	9.7	0.1	1.2	76	3.421
12NOV85	0.94	9.6	1.1	1.3	76	3.915
12NOV85	0.9	9.6	1.3	0	86	0
12NOV85	1	9.7	0.5	0.6	96	1.91

AREA L: NOVEMBER 1985 PSYCHROMETER DATA

12NOV85	1	9.6	1.6	1.2	96	3.834
13NOV85	1	0.3	1.1	0.2	0	0.99
13NOV85	0.85	5.5	1.6	2.1	2	6.884
13NOV85	0.84	7.9	2	2.6	4	7.562
13NOV85	0.84	9.8	2.8	3.5	6	9.443
13NOV85	0.89	10.9	1.6	0.5	8	1.346
13NOV85	0.84	11.4	2.2	0.8	10	1.996
13NOV85	0.88	11.2	1.8	3.5	13	9.416
13NOV85	0.81	11.1	1	1.3	13	3.19
13NOV85	0.87	9.1	1.8	1.2	24	3.399
13NOV85	0.85	9.1	1.2	1	24	2.77
13NOV85	1	8.8	2.9	0.7	41	2.287
13NOV85	0.9	8.7	1	0.9	41	2.684
13NOV85	1	9.9	0.4	1.8	50	5.74
13NOV85	0.94	9.7	0.6	3.5	50	10.71
13NOV85	0.85	9.8	0.2	1.2	56	3.253
13NOV85	1.03	29.5	0.8	1.4	56	2.771
13NOV85	0.96	9.7	0.6	1.4	66	4.302
13NOV85	0.84	9.7	0.3	2.5	66	6.791
13NOV85	0.94	9.6	1.2	1.4	76	4.218
13NOV85	0.89	9.6	0.1	1.2	76	3.434
13NOV85	0.9	9.6	1.3	0	86	0
13NOV85	1	9.8	1.9	1.2	96	3.799
13NOV85	1	9.7	0.8	0.9	96	2.867
14NOV85	1				0	
14NOV85	0.85	5.4	1.8	2	2	6.576
14NOV85	0.84	7.9	1.8	2.8	4	8.166
14NOV85	0.84	9.8	2.8	3.5	6	9.443
14NOV85	0.89	10.8	1.6	0.5	8	1.351
14NOV85	0.84	11.5	2.5	0.9	10	2.236
14NOV85	0.81	11.1	0.9	1.3	13	3.191
14NOV85	0.88	11.1	1.9	3.5	13	9.447
14NOV85	0.85	9	1.3	1	24	2.78
14NOV85	0.87	9.1	1.7	1.1	24	3.115
14NOV85	1	8.7	2.9	0.7	41	2.296
14NOV85	0.9	8.6	1.1	1.2	41	3.6
14NOV85	0.94	9.6	0.6	3.5	50	10.76
14NOV85	1	9.8	0.4	1.7	50	5.438
14NOV85	0.94	9.8	0.5	3.3	50	10.05
14NOV85	1	9.6	0.5	1.8	50	5.806
14NOV85	0.85	9.6	0.2	1.1	56	3.003
14NOV85	1.03	29.5	1.1	1.4	56	2.767
14NOV85	0.85	9.8	0.6	1.4	56	3.794
14NOV85	1.03	29.5	1.3	1.3	56	2.566
14NOV85	0.96	9.8	0.6	1.2	66	3.668
14NOV85	0.96	9.8	0.9	1.5	66	4.589
14NOV85	0.84	9.5	0.4	2.5	66	6.842
14NOV85	0.84	9.7	0.6	2.5	66	6.782
14NOV85	0.94	9.9	1.3	1.1	76	3.267
14NOV85	0.89	9.6	0.2	1.1	76	3.144
14NOV85	0.94	9.7	1.2	1	76	2.992
14NOV85	0.89	9.8	0.2	1.4	76	3.98
14NOV85	0.9	9.6	1.4	0	86	0
14NOV85	0.9	9.7	1.5	0	86	0
14NOV85	1	10	1.9	1.2	96	3.769
14NOV85	1	9.7	0.4	0.5	96	1.591

AREA L: NOVEMBER 1985 PSYCHROMETER DATA

14NOV85	1	9.5	0.5	0.6	96	1.925
14NOV85	1	9.6	2	1.4	96	4.472
15NOV85	1				0	
15NOV85	0.85	4.6	2.1	2.2	2	7.534
15NOV85	0.84	7.5	1.5	2.7	4	8.018
15NOV85	0.84	9.5	2.7	3.5	6	9.562
15NOV85	0.89	10.4	1.3	0.4	8	1.098
15NOV85	0.84	11.2	2.4	1	10	2.514
15NOV85	0.88	11	2	0.1	13	0.264
15NOV85	0.81	10.8	0.6	1.5	13	3.733
15NOV85	0.87	9	1.9	1.2	24	3.412
15NOV85	0.85	8.9	1.3	1	24	2.792
15NOV85	0.9	8.4	0.9	1.1	41	3.328
15NOV85	1	8.7	3	0.6	41	1.966
15NOV85	1	9.8	0.5	1.7	50	5.436
15NOV85	0.94	9.8	0.7	3.4	50	10.35
15NOV85	0.85	9.6	0.3	1.2	56	3.277
15NOV85	1.03	29.5	1.3	1.2	56	2.368
15NOV85	0.84	9.5	0.5	2.4	66	6.56
15NOV85	0.96	9.7	0.8	1.1	66	3.37
15NOV85	0.89	9.6	0.2	1	76	2.856
15NOV85	0.94	9.7	1.7	1.1	76	3.286
15NOV85	0.9	9.5	2	0	86	0
15NOV85	1	9.5	0.5	0.5	96	1.603
15NOV85	1	9.6	2.4	1.1	96	3.499
16NOV85	1				0	
16NOV85	0.85	3.8	2.4	2.2	2	7.841
16NOV85	0.84	7.3	1.6	2.5	4	7.474
16NOV85	0.84	9.2	2.6	3.5	6	9.685
16NOV85	0.89	10.3	1.4	0.4	8	1.101
16NOV85	0.84	11.1	2.4	0.9	10	2.269
16NOV85	0.81	10.7	0.6	1.3	13	3.242
16NOV85	0.88	10.8	2	0	13	0
16NOV85	0.87	9	1.9	1.2	24	3.412
16NOV85	0.85	8.8	1.3	1.1	24	3.086
16NOV85	1	8.5	2.9	0.5	41	1.651
16NOV85	0.9	8.5	0.9	0.9	41	2.707
16NOV85	1	9.5	0.4	1.5	50	4.848
16NOV85	0.94	9.6	0.6	0	50	0
16NOV85	0.85	9.6	0.4	1.2	56	3.276
16NOV85	1.03	29.5	1.3	1.3	56	2.566
16NOV85	0.96	9.7	0.7	1.2	66	3.68
16NOV85	0.84	9.5	0.4	2.3	66	6.284
16NOV85	0.94	9.6	1.6	1	76	2.998
16NOV85	0.89	9.5	0	1.2	76	3.449
16NOV85	0.9	9.5	1.9	0.2	86	0.572
16NOV85	1	9.6	2.6	1.4	96	4.46
16NOV85	1	9.4	0.6	0.4	96	1.286
17NOV85	1				0	
17NOV85	0.85	3.5	2.8	2.5	2	9.069
17NOV85	0.84	7.4	1.9	2.6	4	7.735
17NOV85	0.84	9.3	2.9	3.5	6	9.632
17NOV85	0.89	10.4	1.6	0.4	8	1.096
17NOV85	0.84	11.1	2.5	0.8	10	2.015
17NOV85	0.81	11	0.8	1.3	13	3.204
17NOV85	0.88	10.9	1.9	3.4	13	9.238

AREA L: NOVEMBER 1985 PSYCHROMETER DATA

19NOV85	0.89	9.7	0	1.1	76	3.135
19NOV85	0.94	9.5	1.4	1.3	76	3.926
19NOV85	0.9	9.5	1.7	0.1	86	0.286
19NOV85	1	9.7	2.6	1.4	96	4.442
19NOV85	1	10	0.2	0.6	96	1.69
20NOV85	1		8.8	8.2	0	
20NOV85	0.85	2.3	2.1	2.4	2	9.304
20NOV85	0.84	6.4	1.4	2.5	4	7.796
20NOV85	0.84	8.9	2.5	3.5	6	9.811
20NOV85	0.89	9.9	0.7	0.3	8	0.841
20NOV85	0.84	10.6	2	0.9	10	2.315
20NOV85	0.81	10.4	0	1.3	13	3.288
20NOV85	0.88	10.6	1.4	3.5	13	9.648
20NOV85	0.85	8.7	0.7	1.2	24	3.392
20NOV85	0.87	8.9	1.3	1.4	24	4.013
20NOV85	1	8.5	2.5	0.8	41	2.653
20NOV85	0.9	8.2	0.1	1.2	41	3.677
20NOV85	1	9.6	0.3	1.4	50	4.505
20NOV85	0.94	9.7	0.2	2.9	50	8.849
20NOV85	0.85	9.6	0	1.2	56	3.282
20NOV85	1.03	29.5	1.3	0.7	56	1.38
20NOV85	0.96	9.5	1	1.3	66	4.016
20NOV85	0.84	9.6	0	1.9	66	5.163
20NOV85	0.94	9.5	1.6	1	76	3.01
20NOV85	0.89	9.5	0.2	1.1	76	3.157
20NOV85	0.9	9.4	2	0	86	0
20NOV85	1	9.4	0.8	0.8	96	2.577
20NOV85	1	9.5	2.6	1.3	96	4.154
21NOV85	1		3.5	7.1	0	
21NOV85	0.85	5.5	3.2	0.8	2	2.571
21NOV85	0.84	5.8	0.8	1.5	4	4.777
21NOV85	0.84	5.2	1.9	2.6	6	8.582
21NOV85	0.89	6.1	0.1	2.1	8	7.048
21NOV85	0.84	8	1.1	3.3	10	9.657
21NOV85	0.81	7	0.3	0	13	0
21NOV85	0.88	5.7	1.6	0.9	13	2.989
21NOV85	0.87	11.8	2.5	1	24	2.548
21NOV85	0.85	12.8	2.3	3.4	24	8.324
21NOV85	0.9	29.5	21.7	21	41	34.56
21NOV85	1	2.6	2.2	2.1	41	9.383
21NOV85	1	9.7	1.3	2.7	50	8.707
21NOV85	0.94	29.5	33.6	32	50	54.23
21NOV85	1.03	29.5	1.5	1.9	56	3.751
21NOV85	0.85	6.6	0.5	0.1	56	0.307
21NOV85	0.96	10.4	0.5	1.4	66	4.19
21NOV85	0.84	11.4	0.6	1.7	66	4.299
21NOV85	0.94	8.6	1.1	1.1	76	3.444
21NOV85	0.89	9.5	0.9	1.2	76	3.436
21NOV85	0.9	8	1.6	3.1	86	9.68
21NOV85	1	5.6	1	1.2	96	4.575
21NOV85	1	6.6	2.7	0.6	96	2.156
22NOV85	1		10.3	9.7	0	
22NOV85	0.85		2.4	2.3	2	
22NOV85	0.84	4.6	1.5	2.3	4	7.811
22NOV85	0.84	9.4	3.4	0.1	6	0.266
22NOV85	0.89	9	1.4	0.2	8	0.578

AREA L: NOVEMBER 1985 PSYCHROMETER DATA

17NOV85	0.87	9	1.8	1.1	24	3.126
17NOV85	0.85	9	1.2	1	24	2.782
17NOV85	0.9	8.6	0.8	1	41	2.999
17NOV85	1	8.7	3	0.6	41	1.966
17NOV85	0.94	9.7	0.7	3.4	50	10.4
17NOV85	1	9.3	0.3	1.8	50	5.881
17NOV85	1.03	29.5	1	0.9	56	1.777
17NOV85	0.85	9.4	0.1	1	56	2.751
17NOV85	0.96	9.3	0.6	1.4	66	4.371
17NOV85	0.84	9.4	0.7	2.6	66	7.141
17NOV85	0.89	9.4	0.1	1.3	76	3.753
17NOV85	0.94	9.7	0.8	0.8	76	2.394
17NOV85	0.9	9.4	1.4	3.3	86	9.739
17NOV85	1	9.4	0.5	0.6	96	1.932
17NOV85	1	9.6	1.9	1.1	96	3.507
18NOV85	1				0	
18NOV85	0.85	3.3	3.3	2.2	2	8.021
18NOV85	0.84	7.5	2.2	2.4	4	7.086
18NOV85	0.84	9.5	3.9	3.4	6	9.232
18NOV85	0.89	10.6	1.9	0.2	8	0.543
18NOV85	0.84	11.2	3.1	0.6	10	1.5
18NOV85	0.81	11.1	1.2	1.3	13	3.187
18NOV85	0.88	11.1	2.3	3.4	13	9.153
18NOV85	0.87	9.3	2.6	1.1	24	3.078
18NOV85	0.85	9	1.9	1.1	24	3.053
18NOV85	0.9	8.7	0.8	0.9	41	2.686
18NOV85	1	9	3.6	0.7	41	2.262
18NOV85	1	10	0.7	1.7	50	5.389
18NOV85	0.94	10	0.7	0	50	0
18NOV85	1.03	29.5	2	1.3	56	2.557
18NOV85	0.85	9.9	0.4	1.3	56	3.51
18NOV85	0.96	9.9	1.9	2	66	6.092
18NOV85	0.84	9.9	0.5	2.5	66	6.732
18NOV85	0.94	9.7	2.6	1.3	76	3.875
18NOV85	0.89	9.6	0.5	1.2	76	3.428
18NOV85	0.9	9.6	3	0.4	86	1.136
18NOV85	1	9.9	1.2	0.6	96	1.889
18NOV85	1	9.7	3.8	2.1	96	6.665
19NOV85	1		0.9	3.4	0	
19NOV85	0.85	3.1	3.3	2.6	2	9.628
19NOV85	0.84	7.6	2.3	2.9	4	8.56
19NOV85	0.84	9.3	4	0	6	0
19NOV85	0.89	10.8	2.5	1	8	2.702
19NOV85	0.84	11.1	3.5	1.1	10	2.764
19NOV85	0.88	11.1	2.3	0.3	13	0.79
19NOV85	0.81	11.2	1.6	1.6	13	3.91
19NOV85	0.85	9.3	2	1.2	24	3.292
19NOV85	0.87	9.2	2.2	1.1	24	3.096
19NOV85	0.9	29.5	25.6	27.5	41	45.51
19NOV85	1	8.9	3.4	0.8	41	2.6
19NOV85	1	10	0.4	1.8	50	5.718
19NOV85	0.94	9.4	1.1	0	50	0
19NOV85	1.03	29.5	1.9	1.4	56	2.755
19NOV85	0.85	9.6	0.4	1.4	56	3.828
19NOV85	0.84	9.8	1	2.6	66	7.019
19NOV85	0.96	9.6	1.4	1.6	66	4.927

AREA L: NOVEMBER 1985 PSYCHROMETER DATA

22NOV85	0.84	8.9	1.7	0.7	10	1.923
22NOV85	0.88	8.4	2.1	0.1	13	0.292
22NOV85	0.81	9	0	0.7	13	1.861
22NOV85	0.87	10.5	1.8	1.2	24	3.219
22NOV85	0.85	10.7	1.5	2.7	24	7.113
22NOV85	1	10.6	3.2	2	41	6.143
22NOV85	0.9	8	0.4	0.6	41	1.842
22NOV85	1	10.7	0.5	1.7	50	5.253
22NOV85	0.94	9.5	0.8	0.8	50	2.413
22NOV85	1.03	29.5	0.7	1.3	56	2.574
22NOV85	0.85	10.5	0.5	1.3	56	3.43
22NOV85	0.96	7.8	0.3	0.9	66	2.982
22NOV85	0.84	11.6	0.1	2.2	66	5.557
22NOV85	0.94	10.8	1.8	2	76	5.767
22NOV85	0.89	7.7	0.2	1.1	76	3.4
22NOV85	0.9	11.9	1.2	0.5	86	1.317
22NOV85	1	8.6	1	1.7	96	5.693
22NOV85	1	8.2	2.1	0.7	96	2.353
23NOV85	1		11.2	3.2	0	
23NOV85	0.85	2.3	3.6	3.2	2	12.46
23NOV85	0.84	5.8	1.9	3.1	4	9.989
23NOV85	0.84	6.6	2.3	2.8	6	8.643
23NOV85	0.89	8.8	0.5	3	8	8.987
23NOV85	0.84	9	1.7	0.4	10	1.092
23NOV85	0.81	9.3	0.2	0.9	13	2.366
23NOV85	0.88	9.5	1.5	2.3	13	6.552
23NOV85	0.85	8.9	1	1.6	24	4.495
23NOV85	0.87	8.8	1.6	0.2	24	0.569
23NOV85	0.9	7.2	0.6	0	41	0
23NOV85	1	10.4	3.2	1.9	41	5.875
23NOV85	0.94	11.1	0.7	0.5	50	1.418
23NOV85	1	10.9	0.7	2.4	50	7.393
23NOV85	0.85	10.2	0.8	1.4	56	3.733
23NOV85	1.03	29.5	1.2	1.6	56	3.162
23NOV85	0.84	10.5	0.9	3.2	66	8.451
23NOV85	0.96	10.7	1	2.2	66	6.536
23NOV85	0.89	11.4	0.3	1.7	76	4.561
23NOV85	0.94	8.9	0.7	0.6	76	1.851
23NOV85	0.9	7.1	1.6	0.7	86	2.225
23NOV85	1	11.4	2.5	1.7	96	5.075
23NOV85	1	9.9	0.1	1.2	96	3.814
24NOV85	1		13.6	0.3	0	
24NOV85	0.85	0.6	3.7	3.3	2	14.15
24NOV85	0.84	5	1.7	2.4	4	7.991
24NOV85	0.84	9.2	3.6	0.5	6	1.344
24NOV85	0.89	11.5	1.8	1.5	8	3.978
24NOV85	0.84	12.2	2.6	1.7	10	4.143
24NOV85	0.81	12	1	2.8	13	6.726
24NOV85	0.88	12.2	1.9	0.8	13	2.037
24NOV85	0.87	10.4	2.3	1.9	24	5.132
24NOV85	0.85	10.8	1.5	2.2	24	5.752
24NOV85	1	10.3	3.2	1.9	41	5.898
24NOV85	0.9	10.6	1.1	2.6	41	7.288
24NOV85	1	8.4	0.1	0.9	50	3.031
24NOV85	0.94	7.7	0.3	3.4	50	11.33
24NOV85	1.03	29.5	0.4	1.3	56	2.578

AREA L: NOVEMBER 1985 PSYCHROMETER DATA

24NOV85	0.85	7.8	0	0.6	56	1.758
24NOV85	0.96	7.7	0.2	0.9	66	2.996
24NOV85	0.84	8.4	0.1	2.1	66	6.001
24NOV85	0.89	7.7	0.8	0.9	76	2.77
24NOV85	0.94	7.8	1.1	0.8	76	2.584
24NOV85	0.9	8.8	1.7	0	86	0
24NOV85	1	8.2	2.7	1.4	96	4.721
24NOV85	1	7.7	0.7	0.6	96	2.071
25NOV85	1		16.8	3.5	0	
25NOV85	0.85	2.3	3.1	0.5	2	1.886
25NOV85	0.84	6.3	1.9	3.1	4	9.751
25NOV85	0.84	6.8	3.1	3	6	9.161
25NOV85	0.89	8.3	0.6	0.3	8	0.897
25NOV85	0.84	11.6	1.8	1.1	10	2.736
25NOV85	0.81	10.2	0.2	0.5	13	1.265
25NOV85	0.88	8.3	1.1	3.2	13	9.674
25NOV85	0.85	6.4	1	0.6	24	1.862
25NOV85	0.87	9.8	2.4	2.1	24	5.811
25NOV85	0.9	10.4	0.5	1.9	41	5.351
25NOV85	1	10.7	2.6	1.2	41	3.66
25NOV85	0.94	11.3	0.4	0.2	50	0.563
25NOV85	1	10.1	0.6	2.2	50	6.978
25NOV85	0.85	9.4	0.5	0.8	56	2.193
25NOV85	1.03	29.5	0.5	1.4	56	2.775
25NOV85	0.84	8.6	0.3	2.9	66	8.269
25NOV85	0.96	7.7	0.3	1.1	66	3.666
25NOV85	0.89	9.1	0.1	1.4	76	4.094
25NOV85	0.94	10	1.3	1.7	76	5.052
25NOV85	0.9	11.7	1.5	0.7	86	1.856
25NOV85	1	7.1	0.5	0.3	96	1.061
25NOV85	1	10.1	2	1	96	3.123
26NOV85	1	4.1	47	0.2	0	0.685
26NOV85	0.85	1.5	2.9	3	2	12.22
26NOV85	0.84	5.9	2.5	2.4	4	7.62
26NOV85	0.84	8.2	3.4	3.2	6	9.181
26NOV85	0.89	9.9	2	0.2	8	0.557
26NOV85	0.84	10.8	2.5	0.7	10	1.781
26NOV85	0.81	11	1.4	1.3	13	3.196
26NOV85	0.88	10.5	2.1	0.2	13	0.538
26NOV85	0.85	9.2	1.2	1.1	24	3.038
26NOV85	0.87	9.5	1.7	1.4	24	3.911
26NOV85	0.9	7.8	0.9	1.3	41	4.041
26NOV85	1	8.9	3	1	41	3.26
26NOV85	0.94	8.9	3.4	2.3	50	7.112
26NOV85	1	10.7	0.4	1.9	50	5.882
26NOV85	0.85	10.5	0.1	1.3	56	3.436
26NOV85	1.03	29.5	1.8	1.8	56	3.548
26NOV85	0.96	9.7	1.3	1.7	66	5.22
26NOV85	0.84	10.8	0.7	2.7	66	7.029
26NOV85	0.89	11	0.1	1.2	76	3.258
26NOV85	0.94	9.5	1.2	1.8	76	5.462
26NOV85	0.9	9.4	1.5	0.7	86	2.022
26NOV85	1	11.2	0.1	0.5	96	1.507
26NOV85	1	10.9	1.9	1.2	96	3.644
27NOV85	1	3.7	5.5	12.2	0	62.25
27NOV85	0.85	0.8	2.7	3.2	2	13.6

AREA L: NOVEMBER 1985 PSYCHROMETER DATA

27NOV85	0.84	4.7	2.4	2.7	4	9.13
27NOV85	0.84	7.5	3.3	3.3	6	9.779
27NOV85	0.89	9.4	1.6	0.2	8	0.569
27NOV85	0.84	10.1	2.6	0.9	10	2.353
27NOV85	0.88	10.3	1.8	0	13	0
27NOV85	0.81	10.3	0.9	1.5	13	3.798
27NOV85	0.87	8.7	1.5	1.6	24	4.628
27NOV85	0.85	8.6	1	1.3	24	3.688
27NOV85	0.9	8.2	0.3	1.1	41	3.365
27NOV85	1	8.4	2.6	1.2	41	4.007
27NOV85	0.94	9.7	0.6	0.1	50	0.298
27NOV85	1	9.6	0.3	1.4	50	4.505
27NOV85	1.03	29.5	0.8	1.5	56	2.969
27NOV85	0.85	9.6	0.3	1.2	56	3.277
27NOV85	0.84	10.2	0.2	2.1	66	5.579
27NOV85	0.96	8.9	0.5	1.1	66	3.483
27NOV85	0.94	8.8	1.2	1	76	3.101
27NOV85	0.89	8.7	0.3	1.1	76	3.259
27NOV85	0.9	9.9	1.5	0.5	86	1.414
27NOV85	1	9.3	0.3	0.3	96	0.969
27NOV85	1	10.8	1.6	1.5	96	4.588
28NOV85	1		11.8	0.7	0	
28NOV85	0.85	0.9	2.1	3.1	2	13.11
28NOV85	0.84	4.6	2	2.7	4	9.192
28NOV85	0.84	7.2	3.3	3.3	6	9.914
28NOV85	0.89	8.7	1.3	0.1	8	0.293
28NOV85	0.84	9.7	2.5	0.8	10	2.123
28NOV85	0.81	9.9	0.7	1.4	13	3.6
28NOV85	0.88	10	1.8	3.3	13	9.279
28NOV85	0.87	8.7	1.4	1	24	2.88
28NOV85	0.85	8.6	0.9	1.1	24	3.117
28NOV85	1	8	2.3	0.4	41	1.351
28NOV85	0.9	8.1	0.1	0.7	41	2.145
28NOV85	1	9.5	0.3	1.5	50	4.85
28NOV85	0.94	9.6	0.2	2.9	50	8.884
28NOV85	1.03	29.5	0.9	1.4	56	2.769
28NOV85	0.85	9.3	0.1	1.1	56	3.04
28NOV85	0.84	10.2	0	2.3	66	6.125
28NOV85	0.96	8.6	0.5	1	66	3.203
28NOV85	0.94	10.1	1.4	1.7	76	5.031
28NOV85	0.89	9.2	0.5	0.8	76	2.315
28NOV85	0.9	10.4	1.4	0	86	0
28NOV85	1	9.1	0.3	0.5	96	1.63
28NOV85	1	9	1.9	1.2	96	3.921
29NOV85	1		15.2	0.1	0	
29NOV85	0.85	0.8	2.1	3.2	2	13.63
29NOV85	0.84	4.2	2.1	2.9	4	10.1
29NOV85	0.84	6.8	3.3	3.2	6	9.783
29NOV85	0.89	8.8	1.3	0	8	0
29NOV85	0.84	9.5	2.5	0.8	10	2.14
29NOV85	0.88	9.7	2	0.2	13	0.555
29NOV85	0.81	10	0.8	1.2	13	3.068
29NOV85	0.85	8.6	0.9	1.3	24	3.69
29NOV85	0.87	8.4	1.5	1.5	24	4.39
29NOV85	1	8.1	2.5	1.2	41	4.06
29NOV85	0.9	7.9	0.2	1.2	41	3.722

AREA L: NOVEMBER 1985 PSYCHROMETER DATA

29NOV85	1	9.2	0.1	1.2	50	3.921
29NOV85	0.94	10	0.1	3	50	9.057
29NOV85	0.85	8.9	0.4	1	56	2.803
29NOV85	1.03	29.5	0.6	1.1	56	2.178
29NOV85	0.96	9.4	0.4	1.6	66	4.988
29NOV85	0.84	8.7	0.1	2.6	66	7.369
29NOV85	0.94	9.2	0.6	1.1	76	3.368
29NOV85	0.89	10.2	0.5	1.6	76	4.48
29NOV85	0.9	8.5	0.8	0	86	0
29NOV85	1	9.1	0.3	0.4	96	1.303
29NOV85	1	8.9	1.5	1	96	3.282
30NOV85	1	1.7	5.5	2.1	0	9.73
30NOV85	0.85	0.9	2.3	3.1	2	13.1
30NOV85	0.84	4.4	1.9	2.8	4	9.646
30NOV85	0.84	6.9	3.4	3.3	6	10.05
30NOV85	0.89	8.7	1.5	3.4	8	10.22
30NOV85	0.84	9.9	2.5	0.9	10	2.372
30NOV85	0.81	10.1	0.9	1.3	13	3.312
30NOV85	0.88	9.8	1.8	3.5	13	9.937
30NOV85	0.85	8.5	0.7	1	24	2.845
30NOV85	0.87	8.5	1.3	1.2	24	3.492
30NOV85	1	8.4	2.4	0.7	41	2.33
30NOV85	0.9	8	0.1	1	41	3.085
30NOV85	0.94	9.1	0.7	0	50	0
30NOV85	1	9	0.1	1.2	50	3.952
30NOV85	1.03	29.5	0.8	1.2	56	2.374
30NOV85	0.85	8.8	0.2	0.4	56	1.121
30NOV85	0.96	10.2	0.3	1.4	66	4.226
30NOV85	0.84	9.5	0.5	2.9	66	7.96
30NOV85	0.94	8.9	0.7	0.7	76	2.162
30NOV85	0.89	9.5	0.7	1.3	76	3.728
30NOV85	0.9	8.6	1	0.1	86	0.297
30NOV85	1	10.7	0.1	0.8	96	2.46
30NOV85	1	10.4	1.6	1.5	96	4.657

AREA L: DECEMBER 1985 PSYCHROMETER DATA

DATE	CORRECTION	TEMP (DEG C)	OFFSET (MICROVOLTS)	READING (MICROVOLTS)	DEPTH (FT)	WATER POTENTIAL (-BARS)
01DEC85	1		10.7	0.4	0	
01DEC85	0.85	1	2.1	3.3	2	13.92
01DEC85	0.84	4.3	1.9	2.6	4	8.982
01DEC85	0.84	7	3.3	3.3	6	10.01
01DEC85	0.89	8.8	1.6	0	8	0
01DEC85	0.84	10	2.5	0.9	10	2.363
01DEC85	0.88	9.9	1.7	3.5	13	9.902
01DEC85	0.81	10.1	0.6	1.3	13	3.316
01DEC85	0.85	8.5	0.9	1.2	24	3.417
01DEC85	0.87	8.9	1.5	1.6	24	4.59
01DEC85	0.9	8.4	0.1	1.3	41	3.953
01DEC85	1	8.4	2.6	0.9	41	2.998
01DEC85	1	9.5	0.2	1.6	50	5.18
01DEC85	0.94	8.8	0.6	3.2	50	10.14
01DEC85	1.03	29.5	1.2	1.6	56	3.162
01DEC85	0.85	10.3	0	1.4	56	3.732
01DEC85	0.96	9	0.4	1	66	3.153
01DEC85	0.84	10.5	0.5	2	66	5.242
01DEC85	0.94	9	1	1	76	3.079
01DEC85	0.89	8.9	0.3	0.9	76	2.64
01DEC85	0.9	10.4	1.1	0.5	86	1.39
01DEC85	1	10	0.4	0.5	96	1.573
01DEC85	1	9.8	1.6	1.5	96	4.766
02DEC85	1		6.3	0.2	0	
02DEC85	0.85	1.1	2	3.1	2	12.97
02DEC85	0.84	4.2	1.7	2.9	4	10.11
02DEC85	0.84	6.5	3.2	3.1	6	9.606
02DEC85	0.89	8.6	1.6	0.2	8	0.587
02DEC85	0.84	9.8	2.6	0.9	10	2.38
02DEC85	0.88	9.8	1.6	3.5	13	9.946
02DEC85	0.81	10	0.8	1.5	13	3.844
02DEC85	0.85	8.5	0.7	1	24	2.845
02DEC85	0.87	8.7	1.5	1.4	24	4.043
02DEC85	0.9	8.1	0.1	1.2	41	3.692
02DEC85	1	8.4	2.7	0.9	41	2.997
02DEC85	1	9.5	0.4	1.6	50	5.175
02DEC85	0.94	9.9	0.7	3.4	50	10.31
02DEC85	0.85	10.2	0.1	1.2	56	3.205
02DEC85	1.03	29.5	1.2	1.4	56	2.765
02DEC85	0.84	9.8	0.3	2	66	5.39
02DEC85	0.96	9.2	0.5	0.8	66	2.497
02DEC85	0.89	8.9	0.4	1	76	2.935
02DEC85	0.94	8.8	1.1	0.7	76	2.167
02DEC85	0.9	8.8	1.8	0.1	86	0.294
02DEC85	1	10	0.3	0.9	96	2.841
02DEC85	1	9.3	2.4	1.6	96	5.171
03DEC85	1		17.1	0.8	0	
03DEC85	0.85	0.7	2.2	3.2	2	13.7
03DEC85	0.84	3.8	1.7	2.7	4	9.593
03DEC85	0.84	6.4	3.3	3.1	6	9.647
03DEC85	0.89	8.4	1.5	0.1	8	0.296
03DEC85	0.84	9.4	2.6	0.8	10	2.148

AREA L: DECEMBER 1985 PSYCHROMETER DATA

03DEC85	0.81	9.5	0.8	1.3	13	3.392
03DEC85	0.88	9.6	1.8	3.5	13	10.02
03DEC85	0.87	8.6	1.4	1.3	24	3.768
03DEC85	0.85	8.3	0.9	1	24	2.867
03DEC85	0.9	8.2	0	0.8	41	2.444
03DEC85	1	8.1	2.4	0.5	41	1.683
03DEC85	1	9.5	0	1.1	50	3.55
03DEC85	0.94	9	1.2	3.3	50	10.35
03DEC85	0.85	10.2	0.1	1.1	56	2.936
03DEC85	1.03	29.5	0.8	1.2	56	2.374
03DEC85	0.84	8.8	0.4	2.7	66	7.617
03DEC85	0.96	9.3	0.6	1.3	66	4.055
03DEC85	0.89	10.3	0	1.6	76	4.473
03DEC85	0.94	9	1.1	1	76	3.078
03DEC85	0.9	10.2	1	3.5	86	10.04
03DEC85	1	8.7	0.1	0.8	96	2.659
03DEC85	1	10.3	1.6	1.2	96	3.731
04DEC85	1		10.8	0	0	
04DEC85	0.85	0.5	2.4	3.3	2	14.29
04DEC85	0.84	3.7	1.6	2.8	4	10.02
04DEC85	0.84	6.4	3.2	3.3	6	10.3
04DEC85	0.89	8.1	1.6	0.1	8	0.3
04DEC85	0.84	9.5	2.7	0.9	10	2.407
04DEC85	0.81	9.9	1	1.3	13	3.336
04DEC85	0.88	9.6	2	3.5	13	10.01
04DEC85	0.85	8.7	0.8	1.1	24	3.105
04DEC85	0.87	8.6	1.3	1.3	24	3.77
04DEC85	1	8.1	2.6	0.9	41	3.036
04DEC85	0.9	7.9	0	1.1	41	3.412
04DEC85	1	10.1	0.2	1.6	50	5.06
04DEC85	0.94	9.2	0.3	3.1	50	9.664
04DEC85	0.85	9	0.1	1.2	56	3.359
04DEC85	1.03	29.5	1.3	1.5	56	2.962
04DEC85	0.84	9.9	0.7	2.5	66	6.726
04DEC85	0.96	10.1	0.7	1.1	66	3.319
04DEC85	0.89	9.2	0.4	1.4	76	4.072
04DEC85	0.94	9.2	1	0.9	76	2.747
04DEC85	0.9	9.2	1.7	0.8	86	2.329
04DEC85	1	8.8	0.1	0.7	96	2.315
04DEC85	1	10.3	1.5	0.9	96	2.794
05DEC85	1		8.8	0.3	0	
05DEC85	0.85	0.5	2.3	3.3	2	14.3
05DEC85	0.84	3.6	1.7	2.8	4	10.07
05DEC85	0.84	6.2	3.2	3.1	6	9.744
05DEC85	0.89	7.9	1.5	0	8	0
05DEC85	0.84	9	2.6	0.7	10	1.908
05DEC85	0.81	9.5	0.8	1.2	13	3.128
05DEC85	0.88	9.4	1.8	3.5	13	10.1
05DEC85	0.87	8.5	1.7	1.4	24	4.073
05DEC85	0.85	8.3	0.8	1.1	24	3.157
05DEC85	0.9	8.2	0	1.1	41	3.369
05DEC85	1	8.3	2.4	0.5	41	1.669
05DEC85	0.94	9.1	0.7	3.3	50	10.33
05DEC85	1	8.9	0.2	1.1	50	3.633
05DEC85	1.03	29.5	0.9	1.3	56	2.571
05DEC85	0.85	10.2	0.1	1.4	56	3.745

AREA L: DECEMBER 1985 PSYCHROMETER DATA

05DEC85	0.84	9.3	0.2	2.2	66	6.06
05DEC85	0.96	8.9	0.9	1	66	3.159
05DEC85	0.89	8.7	0.5	1	76	2.957
05DEC85	0.94	8.8	0.8	0.9	76	2.794
05DEC85	0.9	8.3	1.3	0.1	86	0.301
05DEC85	1	9.7	1.9	1.4	96	4.456
05DEC85	1	10.4	0.2	0.5	96	1.551
06DEC85	1		10.2	1.7	0	
06DEC85	0.85	0.5	2.3	3.4	2	14.75
06DEC85	0.84	3.4	1.5	2.9	4	10.56
06DEC85	0.84	6	3.1	3.2	6	10.17
06DEC85	0.89	7.6	1.4	3.5	8	11.05
06DEC85	0.84	9.1	2.4	0.7	10	1.902
06DEC85	0.88	9.5	2.1	0	13	0
06DEC85	0.81	9.5	0.9	1.4	13	3.654
06DEC85	0.85	8.5	0.9	1.2	24	3.417
06DEC85	0.87	8.6	1.6	1.5	24	4.351
06DEC85	0.9	7.7	0	1	41	3.126
06DEC85	1	7.8	2.5	0.8	41	2.733
06DEC85	0.94	8.9	0.4	3.1	50	9.781
06DEC85	1	9	0.3	1.2	50	3.949
06DEC85	0.85	8.7	0.1	0.9	56	2.544
06DEC85	1.03	29.5	1	1.3	56	2.57
06DEC85	0.84	10.1	0.6	2.2	66	5.861
06DEC85	0.96	9.8	0.6	1.2	66	3.668
06DEC85	0.89	10	0.2	1.4	76	3.949
06DEC85	0.94	9.1	1.4	0.8	76	2.445
06DEC85	0.9	8.7	1.7	0	86	0
06DEC85	1	9.7	2.3	1.5	96	4.77
06DEC85	1	10.2	0.5	0.6	96	1.874
07DEC85	1		10.1	4.5	0	
07DEC85	0.85	0.1	2.3	3.3	2	14.59
07DEC85	0.84	3.6	1.7	3	4	10.81
07DEC85	0.84	6	3.2	3.2	6	10.17
07DEC85	0.89	7.6	1.3	3.4	8	10.73
07DEC85	0.84	9.2	2.7	0.7	10	1.892
07DEC85	0.88	9.5	1.9	0	13	0
07DEC85	0.81	9.4	0.9	1.3	13	3.404
07DEC85	0.85	8.6	0.8	1.1	24	3.118
07DEC85	0.87	8.8	1.5	1.4	24	4.026
07DEC85	1	7.9	2.7	0.8	41	2.719
07DEC85	0.9	7.8	0	1.2	41	3.742
07DEC85	1	10.2	0.1	1.2	50	3.771
07DEC85	0.94	9	0.3	3.3	50	10.39
07DEC85	0.85	9.1	0.2	1.6	56	4.474
07DEC85	1.03	29.5	1	1.5	56	2.966
07DEC85	0.84	10.1	0.3	2.2	66	5.869
07DEC85	0.96	8.9	0.7	0.9	66	2.843
07DEC85	0.94	8.7	1.2	1	76	3.114
07DEC85	0.89	9	0.4	0.9	76	2.628
07DEC85	0.9	8.5	1.5	3.5	86	10.74
07DEC85	1	10.3	0.3	0.6	96	1.868
07DEC85	1	10.3	2.2	1.5	96	4.662
08DEC85	1		1.8	0.3	0	
08DEC85	0.85		2.3	3.3	2	
08DEC85	0.84	3.1	1.5	3.2	4	11.89

AREA L: DECEMBER 1985 PSYCHROMETER DATA

08DEC85	0.84	5.9	3.3	3.2	6	10.21
08DEC85	0.89	7.5	1.3	3.4	8	10.78
08DEC85	0.84	9.1	2.7	0.7	10	1.9
08DEC85	0.88	9.4	2.1	0.1	13	0.28
08DEC85	0.81	9.4	0.6	1.3	13	3.408
08DEC85	0.87	8.5	1.5	1.2	24	3.488
08DEC85	0.85	8.4	0.8	1.4	24	4.012
08DEC85	0.9	7.7	0.1	1	41	3.125
08DEC85	1	8	2.6	0.8	41	2.708
08DEC85	1	10	0.2	1.3	50	4.117
08DEC85	0.94	9	0.2	3	50	9.426
08DEC85	0.85	8.8	0.1	0.9	56	2.534
08DEC85	1.03	29.5	1	1.2	56	2.371
08DEC85	0.96	8.9	0.6	1.1	66	3.482
08DEC85	0.84	9	0.3	2.4	66	6.701
08DEC85	0.94	9.9	1.5	1.3	76	3.863
08DEC85	0.89	9.1	0.1	1.3	76	3.798
08DEC85	0.9	10.1	1.3	0.1	86	0.28
08DEC85	1	8.7	0.5	0.9	96	2.988
08DEC85	1	8.7	2.1	1	96	3.3
09DEC85	1		13.1	10.1	0	
09DEC85	0.85		2.3	3.4	2	
09DEC85	0.84	3.3	1.7	3.3	4	12.13
09DEC85	0.84	5.6	3.1	3	6	9.702
09DEC85	0.89	7.4	1.3	3.4	8	10.83
09DEC85	0.84	8.9	2.6	0.8	10	2.191
09DEC85	0.94	9.2	0.7	3.4	50	10.61
09DEC85	1	8.9	0.4	1.1	50	3.63
09DEC85	0.85	9.9	0.3	1.5	56	4.058
09DEC85	1.03	29.5	1.1	1.3	56	2.568
09DEC85	0.96	10	0.8	1.3	66	3.942
09DEC85	0.84	9.8	0.7	2.4	66	6.477
09DEC85	0.94	8.6	1.4	0.9	76	2.809
09DEC85	0.89	10.1	0.5	1	76	2.798
09DEC85	0.9	9.5	1.8	0.2	86	0.572
09DEC85	1	10.1	0.5	0.5	96	1.566
09DEC85	1	9.5	2.5	1.6	96	5.127
10DEC85	1	9.1	0.4	1.2	50	3.931
10DEC85	0.94	8.6	0.5	3.4	50	10.89
10DEC85	0.85	8.9	0	1	56	2.808
10DEC85	1.03	29.5	0.8	1.2	56	2.374
10DEC85	0.96	8.7	0.6	1.1	66	3.51
10DEC85	0.84	8.8	0.4	2.4	66	6.753
10DEC85	0.89	8.7	0.3	1	76	2.96
10DEC85	0.94	8.5	1.3	0.9	76	2.822
10DEC85	0.9	8.8	1.6	0.1	86	0.294
10DEC85	1	8.5	0.5	0.4	96	1.334
10DEC85	1	8.4	2.4	1.3	96	4.349
11DEC85	0.94	9.2	0.3	3	50	9.344
11DEC85	1	10	0.4	1.3	50	4.114
11DEC85	0.85	9	0.2	1.5	56	4.208
11DEC85	1.03	29.5	1.2	1.5	56	2.963
11DEC85	0.96	8.9	0.8	1.1	66	3.479
11DEC85	0.84	10.1	0.4	2.2	66	5.866
11DEC85	0.94	10.1	1.2	0.9	76	2.649
11DEC85	0.89	9.1	0.1	1.3	76	3.798

AREA L: DECEMBER 1985 PSYCHROMETER DATA

11DEC85	0.9	8.5	1.6	3.4	86	10.42
11DEC85	1	9.5	2.3	1.1	96	3.514
11DEC85	1	8.6	0.5	0.4	96	1.328
12DEC85	0.94	9.6	0.3	2.8	50	8.567
12DEC85	1	10.1	0.2	1.4	50	4.421
12DEC85	0.85	9.8	0.1	1.3	56	3.529
12DEC85	1.03	29.5	1	1.3	56	2.57
12DEC85	0.84	8.7	0.4	2.4	66	6.781
12DEC85	0.96	9.7	0.8	1.4	66	4.299
12DEC85	0.89	10	0.4	1.1	76	3.093
12DEC85	0.94	8.9	1.3	0.7	76	2.156
12DEC85	0.9	9	1.8	0.3	86	0.876
12DEC85	1	9.9	2.5	1.5	96	4.728
12DEC85	1	10.2	0.5	0.6	96	1.874
13DEC85	0.94	9.7	0.3	3	50	9.157
13DEC85	1	9.5	0.4	0.9	50	2.895
13DEC85	0.85	9.5	0.2	0.8	56	2.188
13DEC85	1.03	29.5	0.3	0.4	56	0.792
13DEC85	0.84	9.7	0.5	2.2	66	5.956
13DEC85	0.96	9.7	0.6	1.1	66	3.372
13DEC85	0.89	9.5	0.9	0.5	76	1.424
13DEC85	0.94	10	1.4	0.8	76	2.36
13DEC85	0.9	9.7	2	0.3	86	0.852
13DEC85	1	9.4	2.8	1.3	96	4.167
13DEC85	1	10	0.4	0.4	96	1.257
14DEC85	1	9.5	0.7	1.3	50	4.189
14DEC85	0.94	9.3	0.1	3	50	9.315
14DEC85	1.03	29.5	1	1.3	56	2.57
14DEC85	0.85	9.2	0.4	1.2	56	3.328
14DEC85	0.84	9.3	0.6	2.6	66	7.173
14DEC85	0.96	9.5	0.8	1.3	66	4.02
14DEC85	0.89	9.4	0.7	0.9	76	2.583
14DEC85	0.94	9.1	2	1	76	3.053
14DEC85	0.9	8.9	1.9	0	86	0
14DEC85	1	9.4	2.9	1.2	96	3.842
14DEC85	1	9.3	0.6	0.5	96	1.615
15DEC85	0.94	9.2	0.5	3	50	9.336
15DEC85	1	9.4	0.8	1.3	50	4.204
15DEC85	0.85	9.2	0.6	1.2	56	3.325
15DEC85	1.03	29.5	1.6	1.4	56	2.759
15DEC85	0.84	9.1	0.8	2.4	66	6.658
15DEC85	0.96	9.3	0.9	1.4	66	4.365
15DEC85	0.89	9.2	0.3	1.1	76	3.193
15DEC85	0.94	9	2	1	76	3.065
15DEC85	0.9	8.8	2.5	0.3	86	0.881
15DEC85	1	8.5	0.7	0.7	96	2.338
15DEC85	1	8.9	2.5	1	96	3.267
16DEC85	1	9.5	0.8	1.3	50	4.187
16DEC85	0.94	9.1	1	3.5	50	10.96
16DEC85	1.03	29.5	1.4	1.4	56	2.762
16DEC85	0.85	9	0.3	1.4	56	3.922
16DEC85	0.84	9.2	0.4	2.1	66	5.798
16DEC85	0.96	9	0.8	0.8	66	2.514
16DEC85	0.94	9.3	1.8	1	76	3.031
16DEC85	0.89	8.8	0	1.2	76	3.548
16DEC85	0.9	9.2	2.1	0	86	0

AREA L: DECEMBER 1985 PSYCHROMETER DATA

16DEC85	1	9.5	2.8	1.3	96	4.151
16DEC85	1	8.9	0.5	0.4	96	1.312
17DEC85	1	9.1	0.5	1.1	50	3.599
17DEC85	0.94	9.4	0.8	3.2	50	9.881
17DEC85	0.85	9.2	0.1	0.9	56	2.493
17DEC85	1.03	29.5	1.1	1	56	1.974
17DEC85	0.84	8.9	0.4	2	66	5.585
17DEC85	0.96	9.5	0.9	1.2	66	3.706
17DEC85	0.89	9.3	0.5	1.1	76	3.178
17DEC85	0.94	9.3	1.8	0.8	76	2.421
17DEC85	0.9	8.7	1.9	0	86	0
17DEC85	1	9.2	0.5	0.4	96	1.296
17DEC85	1	9.4	2.7	1.3	96	4.169
18DEC85	0.94	9	0.5	2.9	50	9.092
18DEC85	1	8.9	0.5	1	50	3.296
18DEC85	0.85	9	0.1	0.9	56	2.514
18DEC85	1.03	29.5	1.2	1.2	56	2.369
18DEC85	0.96	9.5	0.8	1.3	66	4.02
18DEC85	0.84	9.4	0.4	2	66	5.473
18DEC85	0.89	9.1	0.3	1	76	2.912
18DEC85	0.94	9.3	1.7	1	76	3.033
18DEC85	0.9	8.8	1.8	0	86	0
18DEC85	1	8.9	2.7	1.1	96	3.594
18DEC85	1	9	0.6	0.4	96	1.306
19DEC85	0.94	9.2	0.5	3	50	9.336
19DEC85	1	9.4	0.4	1.3	50	4.211
19DEC85	0.85	8.9	0.1	1	56	2.806
19DEC85	1.03	29.5	1	1.1	56	2.173
19DEC85	0.84	9	0.4	2.1	66	5.846
19DEC85	0.96	9.4	0.8	1.2	66	3.722
19DEC85	0.89	9	0.3	0.9	76	2.63
19DEC85	0.94	9.1	1.7	0.9	76	2.749
19DEC85	0.9	8.9	1.9	0	86	0
19DEC85	1	9	2.7	1.2	96	3.908
19DEC85	1	9	0.6	0.3	96	0.979

AREA L: FEBRUARY 1986 PSYCHROMETER DATA

01FEB86	1	13	3.8	1.1	0	3.079
01FEB86	0.85	2.4	3.1	1.1	2	4.157
01FEB86	0.84	5.8	3.4	2.4	4	7.628
01FEB86	0.84	6.9	4.1	0.9	6	2.671
01FEB86	0.89	8.5	3.3	0.8	8	2.353
01FEB86	0.84	8.8	3.3	2.9	10	8.092
01FEB86	0.88	12.1	2.1	2.9	13	7.509
01FEB86	0.81	12.6	1.7	2.7	13	6.328
01FEB86	0.85	15.4	0.7	2.8	24	6.345
01FEB86	0.87	.	.		24	.
01FEB86	1	15.1	2.1	3.6	41	9.665
01FEB86	0.9	5.9	2.3	0.5	41	1.671
02FEB86	1	7.4	0	0.3	0	1.049
02FEB86	0.85	.	1.5	3.2	2	.
02FEB86	0.84	0.4	1.3	0	4	0
02FEB86	0.84	3.7	2.1	0	6	0
02FEB86	0.89	7	1.1	0.5	8	1.579
02FEB86	0.84	8.1	1.7	1.2	10	3.422
02FEB86	0.88	10.4	0.9	0.9	13	2.456
02FEB86	0.81	10.4	1.2	2.6	13	6.606
02FEB86	0.85	12.3	0.7	2.3	24	5.725
02FEB86	0.87	11.4	0.5	2.8	24	7.397
02FEB86	0.9	12.6	0	2.4	41	6.286
02FEB86	1	12.2	1.2	2.9	41	8.539
03FEB86	1	10	0.1	3.5	0	11.29
03FEB86	0.85	1.4	1.8	0.7	2	2.792
03FEB86	0.84	3.9	2	1	4	3.463
03FEB86	0.84	4	1.9	2.6	6	9.123
03FEB86	0.89	4.7	1.1	0.7	8	2.468
03FEB86	0.84	8.7	1.2	1.2	10	3.345
03FEB86	0.81	8.3	0.1	0.8	13	2.189
03FEB86	0.88	6.9	0.2	0.5	13	1.575
03FEB86	0.85	11	0.3	1.5	24	3.894
03FEB86	0.87	12.4	0.3	2.8	24	7.148
03FEB86	0.9	12.7	0.5	2.8	41	7.313
03FEB86	1	9.9	0.2	1.5	41	4.777
04FEB86	1	6.6	3.4	0.2	0	0.714
04FEB86	0.85	.	0.8	2.8	2	.
04FEB86	0.84	.	1.4	1.6	4	.
04FEB86	0.84	2	3.2	0.5	6	1.894
04FEB86	0.89	7.5	1.3	0.6	8	1.854
04FEB86	0.84	5.8	1.8	0.6	10	1.886
04FEB86	0.88	9.8	0.6	0.3	13	0.835
04FEB86	0.81	9.6	1.2	3	13	7.891
04FEB86	0.85	8.6	0.3	1.4	24	3.987
04FEB86	0.87	11.1	0.3	1.9	24	5.045
04FEB86	1	7.6	0.6	1.2	41	4.183
04FEB86	0.9	10.7	1.7	0.6	41	1.646
05FEB86	1	10	2.6	3.4	0	10.83
05FEB86	0.85	0.8	2	0.6	2	2.465
05FEB86	0.84	3.3	1.9	0.8	4	2.852
05FEB86	0.84	3.6	2.2	3.2	6	11.54
05FEB86	0.89	3.5	1.5	3.2	8	12.33
05FEB86	0.84	6.8	1.2	0	10	0
05FEB86	0.88	10.1	0.8	1.2	13	3.32
05FEB86	0.81	7.9	1.2	2.5	13	7.03

AREA L: FEBRUARY 1986 PSYCHROMETER DATA

05FEB86	0.85	11.2	0.8	1.7	24	4.378
05FEB86	0.87	9	0.6	2	24	5.756
05FEB86	0.9	8.4	0.4	2.1	41	6.421
05FEB86	1	11.6	1.3	3.1	41	9.332
06FEB86	1	.	1.1	11.1	0	.
06FEB86	0.85	0.1	0.7	2.9	2	12.81
06FEB86	0.84	.	1.9	0.9	4	.
06FEB86	0.84	4.6	2.6	0.5	6	1.659
06FEB86	0.89	6.4	1.3	0.7	8	2.274
06FEB86	0.84	7.6	1.7	1.8	10	5.273
06FEB86	0.81	10.3	0.7	2.2	13	5.606
06FEB86	0.88	10	1.6	0.8	13	2.208
06FEB86	0.87	10.2	0.3	3.4	24	9.45
06FEB86	0.85	10.7	0.3	2.1	24	5.537
06FEB86	1	8.5	0.6	1.5	41	5.044
06FEB86	0.9	8.4	1.1	1	41	3.02
07FEB86	1	.	5.1	2.3	0	.
07FEB86	0.85	.	0.9	3.5	2	.
07FEB86	0.84	1.3	2.7	3.1	4	12.65
07FEB86	0.84	4.3	3.1	1	6	3.378
07FEB86	0.89	6.8	1.1	0.1	8	0.318
07FEB86	0.84	5.4	1.7	0.6	10	1.923
07FEB86	0.88	9.4	0.1	0.5	13	1.418
07FEB86	0.81	8.8	1.2	3.2	13	8.713
07FEB86	0.85	11.6	0.7	0.8	24	2.019
07FEB86	0.87	9.8	0.4	2.8	24	7.862
07FEB86	0.9	12.6	0.6	3.1	41	8.137
07FEB86	1	9.5	0.2	1.1	41	3.547
08FEB86	1	.	1.7	1.6	0	.
08FEB86	0.85	.	1.9	3.2	2	.
08FEB86	0.84	3.1	1.7	0.5	4	1.797
08FEB86	0.84	4.3	2.2	3.3	6	11.48
08FEB86	0.89	7	2.2	1	8	3.158
08FEB86	0.84	8.5	2.4	1.8	10	5.058
08FEB86	0.81	9.8	1.2	2.9	13	7.561
08FEB86	0.88	10.2	1	1.3	13	3.583
08FEB86	0.85	11.1	0.7	1	24	2.573
08FEB86	0.87	8.8	0.3	2.5	24	7.295
08FEB86	1	12.6	0.2	1.6	41	4.627
08FEB86	0.9	10.8	0.2	3.3	41	9.269
09FEB86	1	.	2.4	0.1	0	.
09FEB86	0.85	.	0.7	2.9	2	.
09FEB86	0.84	.	1.7	0.8	4	.
09FEB86	0.84	2.7	2.2	0.1	6	0.365
09FEB86	0.89	6.9	1.4	0.9	8	2.862
09FEB86	0.84	7.6	1.4	1.6	10	4.685
09FEB86	0.81	8.7	0.1	1.7	13	4.61
09FEB86	0.88	7.7	0.2	3.4	13	10.61
09FEB86	0.85	8.7	0.8	1.1	24	3.105
09FEB86	0.87	8.7	0.3	2.4	24	7.027
09FEB86	0.9	11.1	0.4	3.3	41	9.157
09FEB86	1	10.8	0.2	1.1	41	3.376
10FEB86	1	2	13.3	3.4	0	15.3
10FEB86	0.85	.	1.3	0.2	2	.
10FEB86	0.84	1.3	1.3	1.2	4	4.794
10FEB86	0.84	2	2.9	3.2	6	12.56

AREA L: FEBRUARY 1986 PSYCHROMETER DATA

10FEB86	0.89	5.7	0.8	3.1	8	10.69
10FEB86	0.84	5.3	1.4	0.3	10	0.965
10FEB86	0.88	7.7	0.8	1.1	13	3.354
10FEB86	0.81	7.1	1	1.8	13	5.215
10FEB86	0.87	11.8	0	1.6	24	4.14
10FEB86	0.85	12.2	0.4	2.5	24	6.262
10FEB86	0.9	12.3	0.9	2.6	41	6.861
10FEB86	1	12	0.1	1.2	41	3.533
11FEB86	1	5.4	18	4.9	0	18.3
11FEB86	0.85	1.2	0.7	2.5	2	10.37
11FEB86	0.84	3.5	1.9	0.6	4	2.113
11FEB86	0.84	3.7	2	3.4	6	12.24
11FEB86	0.89	3.6	2	1	8	3.726
11FEB86	0.84	8.8	2.2	2.2	10	6.131
11FEB86	0.88	7.3	0.1	0.2	13	0.618
11FEB86	0.81	10.1	0	1.7	13	4.362
11FEB86	0.85	12.7	0.1	2.6	24	6.416
11FEB86	0.87	10.3	0.6	1.9	24	5.19
11FEB86	1	12.3	0.6	2.8	41	8.233
11FEB86	0.9	7.6	1.1	1.2	41	3.756
12FEB86	1	2.3	0.4	3	0	13.89
12FEB86	0.85	1.4	1.2	0	2	0
12FEB86	0.84	0.5	1.4	1.5	4	6.274
12FEB86	0.84	1.9	2.1	0.2	6	0.762
12FEB86	0.89	6.9	1.6	1	8	3.18
12FEB86	0.84	8.7	2	2.2	10	6.162
12FEB86	0.81	9	0.1	0.7	13	1.86
12FEB86	0.88	6.1	0.7	1	13	3.275
12FEB86	0.85	11.4	0.7	1.8	24	4.608
12FEB86	0.87	10.3	0.7	1.9	24	5.188
12FEB86	1	9.3	0.4	2.3	41	7.542
12FEB86	0.9	7.7	0.4	0.9	41	2.806
13FEB86	1	12	3	1.4	0	4.074
13FEB86	0.85	1.1	1.7	1.1	2	4.482
13FEB86	0.84	2.5	1.1	1	4	3.739
13FEB86	0.84	1.8	1.4	3.3	6	13.2
13FEB86	0.89	3.1	1.1	0.1	8	0.38
13FEB86	0.84	8.2	2.2	2.6	10	7.458
13FEB86	0.81	9.7	0.1	1.7	13	4.428
13FEB86	0.88	5.9	0.6	3.4	13	11.52
13FEB86	0.87	9.4	0.2	2.8	24	7.996
13FEB86	0.85	9.4	1.1	0.7	24	1.913
13FEB86	0.9	12.9	0.5	2.5	41	6.472
13FEB86	1	12.6	0.7	3.1	41	9.037
14FEB86	1	6.5	5.3	3.5	0	12.85
14FEB86	0.85	1.4	1.7	0.5	2	1.99
14FEB86	0.84	3.4	1.5	3	4	10.94
14FEB86	0.84	2.3	2.7	0.1	6	0.372
14FEB86	0.89	5.8	1.7	0.3	8	0.997
14FEB86	0.84	5.3	2	1	10	3.229
14FEB86	0.81	7.7	0.5	1.8	13	5.089
14FEB86	0.88	8.1	1.3	0.3	13	0.891
14FEB86	0.85	9.3	0.5	1.4	24	3.872
14FEB86	0.87	8.7	0.6	2	24	5.828
14FEB86	1	7.5	0.2	1.1	41	3.854
14FEB86	0.9	7.5	1.8	0.4	41	1.245

AREA L: FEBRUARY 1986 PSYCHROMETER DATA

15FEB86	1	9.3	0.6	0.7	0	2.264
15FEB86	0.85	1.1	1.4	0.8	2	3.251
15FEB86	0.84	2.7	1	1.3	4	4.829
15FEB86	0.84	1.6	1.6	3.4	6	13.76
15FEB86	0.89	2.9	0.4	3.4	8	13.63
15FEB86	0.84	4.3	1.1	0.1	10	0.337
15FEB86	0.81	7.3	0.9	2.3	13	6.638
15FEB86	0.88	8.9	1.3	0.8	13	2.309
15FEB86	0.87	12	0.1	1.7	24	4.37
15FEB86	0.85	11.7	0.2	3.2	24	8.206
15FEB86	0.9	10.8	1.9	1	41	2.739
15FEB86	1	7.6	0.1	0.7	41	2.435
16FEB86	1	14.9	2.9	0.3	0	0.792
16FEB86	0.85		1.5	3.1	2	
16FEB86	0.84	3.2	2	2.5	4	9.137
16FEB86	0.84	2.4	1.9	0.3	6	1.115
16FEB86	0.89	7	1.6	1.1	8	3.486
16FEB86	0.84	8	2.3	2.2	10	6.34
16FEB86	0.88	8	1.2	0.6	13	1.795
16FEB86	0.81	9.7	0.9	2	13	5.204
16FEB86	0.85	11.1	0.2	2.4	24	6.252
16FEB86	0.87	10.8	0.5	3.3	24	8.948
16FEB86	0.9	11.3	0.2	2.3	41	6.293
16FEB86	1	12.2	0.9	3.1	41	9.153
17FEB86	1	20	4.8	0.5	0	1.152
17FEB86	0.85		0.5	3.4	2	
17FEB86	0.84	2.2	2.4	3.5	4	13.67
17FEB86	0.84	1	2.4	3.2	6	13.31
17FEB86	0.89	4.3	0.3	3.2	8	11.88
17FEB86	0.84	7.9	2.4	2.4	10	6.956
17FEB86	0.81	9.8	0.8	2.6	13	6.774
17FEB86	0.88	9.3	1	1.4	13	4
17FEB86	0.87	12	0	1.7	24	4.372
17FEB86	0.85	12.6	0	3.1	24	7.706
17FEB86	1	7.5	0.1	1	41	3.502
17FEB86	0.9	9.9	1.5	1	41	2.839
18FEB86	1	22.4	9.9	0.5	0	1.067
18FEB86	0.85		0.5	0.4	2	
18FEB86	0.84	3.3	1.3	3	4	11.01
18FEB86	0.84	1.4	2.1	2.9	6	11.76
18FEB86	0.89	5.1	0.3	3.2	8	11.4
18FEB86	0.84	7.7	2.4	1.7	10	4.939
18FEB86	0.81	9.1	1	1.9	13	5.057
18FEB86	0.88	6.6	0.8	1.4	13	4.495
18FEB86	0.85	12.7	0	3.3	24	8.187
18FEB86	0.87	11.1	0.6	1.4	24	3.699
18FEB86	1	11.8	0.2	2.3	41	6.869
18FEB86	0.9	7.9	1.7	3.4	41	10.69
19FEB86	1	23.4	8.5	3.4	0	7.216
19FEB86	0.85	3.1	0.4	3.4	2	12.87
19FEB86	0.84	0.9	2	0.5	4	2.017
19FEB86	0.84	3.4	1.4	3.3	6	12.08
19FEB86	0.89	2.7	1.1	3.2	8	12.9
19FEB86	0.84	5.7	1	0.4	10	1.265
19FEB86	0.88	9.3	0.4	2.3	13	6.637
19FEB86	0.81	5.7	0	0.9	13	2.77

AREA L: FEBRUARY 1986 PSYCHROMETER DATA

19FEB86	0.85	8.7	1.4	0.6	24	1.683
19FEB86	0.87	11.8	0.4	2.4	24	6.235
20FEB86	1	12	3	1.4	0	4.074
20FEB86	0.85	1.1	1.7	1.1	2	4.482
20FEB86	0.84	2.5	1.1	1	4	3.739
20FEB86	0.84	1.8	1.4	3.3	6	13.2
20FEB86	0.89	3.1	1.1	0.1	8	0.38
20FEB86	0.84	8.2	2.2	2.6	10	7.458
20FEB86	0.88	5.9	0.6	3.4	13	11.52
20FEB86	0.81	9.7	0.1	1.7	13	4.428
20FEB86	0.85	9.4	1.1	0.7	24	1.913
20FEB86	0.87	9.4	0.2	2.8	24	7.996
20FEB86	1	12.6	0.7	3.1	41	9.037
20FEB86	0.9	12.9	0.5	2.5	41	6.472
21FEB86	1	6.5	5.3	3.5	0	12.85
21FEB86	0.85	1.4	1.7	0.5	2	1.99
21FEB86	0.84	3.4	1.5	3	4	10.94
21FEB86	0.84	2.3	2.7	0.1	6	0.372
21FEB86	0.89	5.8	1.7	0.3	8	0.997
21FEB86	0.84	5.3	2	1	10	3.229
21FEB86	0.88	8.1	1.3	0.3	13	0.891
21FEB86	0.81	7.7	0.5	1.8	13	5.089
21FEB86	0.87	8.7	0.6	2	24	5.828
21FEB86	0.85	9.3	0.5	1.4	24	3.872
21FEB86	1	7.5	0.2	1.1	41	3.854
21FEB86	0.9	7.5	1.8	0.4	41	1.245
22FEB86	1	9.3	0.6	0.7	0	2.264
22FEB86	0.85	1.1	1.4	0.8	2	3.251
22FEB86	0.84	2.7	1	1.3	4	4.829
22FEB86	0.84	1.6	1.6	3.4	6	13.76
22FEB86	0.89	2.9	0.4	3.4	8	13.63
22FEB86	0.84	4.3	1.1	0.1	10	0.337
22FEB86	0.88	8.9	1.3	0.8	13	2.309
22FEB86	0.81	7.3	0.9	2.3	13	6.638
22FEB86	0.85	11.7	0.2	3.2	24	8.206
22FEB86	0.87	12	0.1	1.7	24	4.37
22FEB86	1	7.6	0.1	0.7	41	2.435
22FEB86	0.9	10.8	1.9	1	41	2.739
23FEB86	1	14.9	2.9	0.3	0	0.792
23FEB86	0.85		1.5	3.1	2	
23FEB86	0.84	3.2	2	2.5	4	9.137
23FEB86	0.84	2.4	1.9	0.3	6	1.115
23FEB86	0.89	7	1.6	1.1	8	3.486
23FEB86	0.84	8	2.3	2.2	10	6.34
23FEB86	0.81	9.7	0.9	2	13	5.204
23FEB86	0.88	8	1.2	0.6	13	1.795
23FEB86	0.87	10.8	0.5	3.3	24	8.948
23FEB86	0.85	11.1	0.2	2.4	24	6.252
23FEB86	1	12.2	0.9	3.1	41	9.153
23FEB86	0.9	11.3	0.2	2.3	41	6.293
24FEB86	1	20	4.8	0.5	0	1.152
24FEB86	0.85		0.5	3.4	2	
24FEB86	0.84	2.2	2.4	3.5	4	13.67
24FEB86	0.84	1	2.4	3.2	6	13.31
24FEB86	0.89	4.3	0.3	3.2	8	11.88
24FEB86	0.84	7.9	2.4	2.4	10	6.956

AREA L: FEBRUARY 1986 PSYCHROMETER DATA

24FEB86	0.81	9.8	0.8	2.6	13	6.774
24FEB86	0.88	9.3	1	1.4	13	4
24FEB86	0.87	12	0	1.7	24	4.372
24FEB86	0.85	12.6	0	3.1	24	7.706
24FEB86	1	7.5	0.1	1	41	3.502
24FEB86	0.9	9.9	1.5	1	41	2.839
25FEB86	1	22.4	9.9	0.5	0	1.067
25FEB86	0.85		0.5	0.4	2	
25FEB86	0.84	3.3	1.3	3	4	11.01
25FEB86	0.84	1.4	2.1	2.9	6	11.76
25FEB86	0.89	5.1	0.3	3.2	8	11.4
25FEB86	0.84	7.7	2.4	1.7	10	4.939
25FEB86	0.88	6.6	0.8	1.4	13	4.495
25FEB86	0.81	9.1	1	1.9	13	5.057
25FEB86	0.87	11.1	0.6	1.4	24	3.699
25FEB86	0.85	12.7	0	3.3	24	8.187
25FEB86	0.9	7.9	1.7	3.4	41	10.69
25FEB86	1	11.8	0.2	2.3	41	6.869
26FEB86	1	23.4	8.5	3.4	0	7.216
26FEB86	0.85	3.1	0.4	3.4	2	12.87
26FEB86	0.84	0.9	2	0.5	4	2.017
26FEB86	0.84	3.4	1.4	3.3	6	12.08
26FEB86	0.89	2.7	1.1	3.2	8	12.9
26FEB86	0.84	5.7	1	0.4	10	1.265
26FEB86	0.88	5.8	0.8	1.3	13	4.328
26FEB86	0.81	5.7	0	0.6	13	1.841
26FEB86	0.85	12	1.1	1.6	24	3.997
26FEB86	0.87	8.6	0.8	2.1	24	6.145
26FEB86	0.9	8.1	0.2	2	41	6.194
26FEB86	1	12.3	1	3	41	8.817
27FEB86	1	17.4	7.5	0.5	0	1.21
27FEB86	0.85	1.5	0.2	3.1	2	12.78
27FEB86	0.84	3.8	1.7	2.3	4	8.133
27FEB86	0.84	4.6	2.8	0.9	6	2.995
27FEB86	0.89	4.8	1.3	0.4	8	1.398
27FEB86	0.84	7.4	2.1	1.5	10	4.414
27FEB86	0.81	6.2	0.3	1.8	13	5.451
27FEB86	0.88	9.2	1.3	0.2	13	0.568
27FEB86	0.87	10.6	0.2	2.8	24	7.629
27FEB86	0.85	8.2	1.1	2.1	24	6.098
27FEB86	0.9	10.3	0.6	1.2	41	3.373
27FEB86	1	7.3	0.3	1.5	41	5.319
28FEB86	1	10.7	2.8	1.3	0	3.964
28FEB86	0.85	2.8	0.2	2.4	2	9.124
28FEB86	0.84	1	0.9	2.7	4	11.21
28FEB86	0.84	2.2	2.5	0.7	6	2.636
28FEB86	0.89	7.1	1.2	1.1	8	3.476
28FEB86	0.84	7.2	1.1	0.8	10	2.37
28FEB86	0.81	7.4	0.2	0.9	13	2.561
28FEB86	0.88	5.3	0.4	0.4	13	1.354
28FEB86	0.87	8.9	0.9	1.8	24	5.186
28FEB86	0.85	10.9	0.9	0.9	24	2.329
28FEB86	0.9	8.5	1.4	0.5	41	1.496
28FEB86	1	8.2	0.2	1.5	41	5.117

AREA L: MARCH 1986 PSYCHROMETER DATA

DATE	CORRECTION	TEMP (DEG C)	OFFSET (MICROVOLTS)	READING (MICROVOLTS)	DEPTH (FT)	WATER POTENTIAL (-BARS)
01MAR86	1	19.6	1.1	3.5	0	8.387
01MAR86	0.85	1.8	0	0	2	0
01MAR86	0.84	2	0.1	2	4	7.81
01MAR86	0.84	1.8	2.8	0.1	6	0.382
01MAR86	0.89	6.6	2	1.2	8	3.869
01MAR86	0.84	7.8	2.2	2	10	5.806
01MAR86	0.81	8.6	0.6	2	13	5.448
01MAR86	0.88	7.3	0.3	3.3	13	10.47
01MAR86	0.85	8.5	0.8	0.6	24	1.701
01MAR86	0.87	8.2	0.5	2	24	5.954
01MAR86	0.9	9.5	0.1	2	41	5.849
01MAR86	1	12.4	0.7	2.3	41	6.713
02MAR86	1	14.6	0.7	1.1	0	2.972
02MAR86	0.85	1.4	0.3	2.8	2	11.55
02MAR86	0.84	1.8	0.2	2.2	4	8.704
02MAR86	0.84	3.6	2.8	1	6	3.505
02MAR86	0.89	6.1	0.8	3.5	8	11.88
02MAR86	0.84	4.2	2.1	1.7	10	5.839
02MAR86	0.81	9.4	0.6	1.7	13	4.471
02MAR86	0.88	5.4	1.2	1.1	13	3.72
02MAR86	0.87	10.9	0.1	1.5	24	4.004
02MAR86	0.85	11.1	0.7	0.4	24	1.025
02MAR86	0.9	10.1	1.3	0.2	41	0.561
02MAR86	1	12.2	0.6	2.5	41	7.36
03MAR86	1	18.5	6.1	0	0	0
03MAR86	0.85	1.3	0.7	0.3	2	1.202
03MAR86	0.84	4.2	0.9	2.5	4	8.708
03MAR86	0.84	4.4	2.1	3.4	6	11.79
03MAR86	0.89	6.8	1.4	0	8	0
03MAR86	0.84	4.1	2.2	1.9	10	6.571
03MAR86	0.88	9	0.2	0.1	13	0.287
03MAR86	0.81	6	1.4	2.2	13	6.721
03MAR86	0.87	8.3	0.2	2	24	5.937
03MAR86	0.85	11.9	1.1	0.6	24	1.494
03MAR86	0.9	12.9	0.6	1.7	41	4.376
03MAR86	1	8.8	0	0.3	41	0.989
04MAR86	0.85	3.7	0.4	0.3	2	1.061
04MAR86	0.84	2.1	0.5	2.6	4	10.16
04MAR86	0.84	3.2	2.6	1.2	6	4.308
04MAR86	0.89	4.4	0.9	0.3	8	1.07
04MAR86	0.84	6.5	0.9	3.2	10	10.02
04MAR86	0.88	6.8	0	3.4	13	11.07
04MAR86	0.81	8.7	0.5	1.8	13	4.877
04MAR86	0.87	9.9	0.2	2.7	24	7.552
04MAR86	0.85	8.2	0.1	1.2	24	3.472
04MAR86	1	12.4	0.6	2.4	41	7.013
04MAR86	0.9	9.3	0	2.3	41	6.8
05MAR86	1	20.6	3.4	3.3	0	7.635
05MAR86	0.85	5.4	0.7	1	2	3.27
05MAR86	0.84	4.6	1.4	3	4	10.27
05MAR86	0.84	1.8	1.5	3.3	6	13.19

AREA L: MARCH 1986 PSYCHROMETER DATA

05MAR86	0.89	2.9	0.8	0	8	0
05MAR86	0.84	7.8	2	2	10	5.811
05MAR86	0.81	9.2	1.1	2.6	13	6.93
05MAR86	0.88	7.8	0.8	0.7	13	2.118
05MAR86	0.87	11.2	0.2	1.2	24	3.16
05MAR86	0.85	12.5	0.1	2.5	24	6.207
05MAR86	1	7.4	0.2	0.6	41	2.102
05MAR86	0.9	9.4	1.4	0	41	0
06MAR86	1	23.4	3.1	0.9	0	1.945
06MAR86	0.85	4.2	0.4	0.3	2	1.034
06MAR86	0.84	1.7	0.2	1.7	4	6.718
06MAR86	0.84	1.8	1.4	0.1	6	0.384
06MAR86	0.89	6.4	1.4	0.8	8	2.6
06MAR86	0.84	7.5	1.6	1.7	10	5
06MAR86	0.88	6.4	0.1	2.7	13	8.888
06MAR86	0.81	8.1	0.3	1.4	13	3.88
06MAR86	0.85	9.8	0.4	1.7	24	4.623
06MAR86	0.87	9.6	0.4	0.9	24	2.509
06MAR86	0.9	10.2	1.4	3.4	41	9.727
06MAR86	1	12.4	1.1	2.6	41	7.59
07MAR86	1	16.6	0.3	1.3	0	3.332
07MAR86	0.85	4.9	0.2	1.1	2	3.697
07MAR86	0.84	2.1	0	2.4	4	9.374
07MAR86	0.84	2.2	2	3.1	6	12.06
07MAR86	0.89	6.1	1.2	0.7	8	2.307
07MAR86	0.84	6.7	1	0.9	10	2.731
07MAR86	0.81	7.6	0.3	1.4	13	3.965
07MAR86	0.88	6.6	0.1	2.7	13	8.805
07MAR86	0.85	9.3	0.7	0.9	24	2.477
07MAR86	0.87	8.8	0.8	0.8	24	2.297
07MAR86	0.9	8.9	1.4	0.8	41	2.36
07MAR86	1	9.1	0.1	1.2	41	3.936
08MAR86	1	12	0.8	0.6	0	1.754
08MAR86	0.85	5.6	0.6	1.8	2	5.878
08MAR86	0.84	5.3	0.5	2.7	4	8.931
08MAR86	0.84	3.9	2.3	0.4	6	1.375
08MAR86	0.89	6.2	1.8	1.4	8	4.611
08MAR86	0.84	7.1	0.7	3.5	10	10.7
08MAR86	0.81	9.4	0.9	2.5	13	6.61
08MAR86	0.88	7.9	0.5	3	13	9.236
08MAR86	0.85	8.6	0.2	1	24	2.84
08MAR86	0.87	9.9	0.4	2.2	24	6.123
08MAR86	0.9	13.2	1.4	0.1	41	0.251
08MAR86	1	8	1	2.2	41	7.59
09MAR86	1		2.2	0.8	0	
09MAR86	0.85	6.3	0.7	1.4	2	4.404
09MAR86	0.84	3.5	0.3	1.5	4	5.369
09MAR86	0.84	2.9	1.3	3.5	6	13.21
09MAR86	0.89	3.4	0.5	3.3	8	12.85
09MAR86	0.84	4.9	0.8	3.1	10	10.49
09MAR86	0.88	7.6	0.4	0.4	13	1.22
09MAR86	0.81	8.8	0.4	2.1	13	5.683
09MAR86	0.87	9.3	0	2.4	24	6.865
09MAR86	0.85	11.8	0.6	0.5	24	1.251
09MAR86	0.9	12.5	0.4	2.5	41	6.563
09MAR86	1	12	0.1	0.6	41	1.76

AREA L: MARCH 1986 PSYCHROMETER DATA

10MAR86	1	1	1.8	0.2	0	0.953
10MAR86	0.85	4.1	0.9	1.5	2	5.254
10MAR86	0.84	4.4	0.8	2.6	4	8.977
10MAR86	0.84	2.6	1.7	3.2	6	12.21
10MAR86	0.89	7.3	1.2	1.3	8	4.079
10MAR86	0.84	8.1	2.3	2.4	10	6.899
10MAR86	0.81	9.1	0.2	2.4	13	6.438
10MAR86	0.88	8.7	1.1	1.1	13	3.211
10MAR86	0.87	12	0.1	1.2	24	3.074
10MAR86	0.85	12.3	0.1	2.8	24	7.014
10MAR86	1	12.4	1	2.9	41	8.488
10MAR86	0.9	11.8	1.2	2.1	41	5.611
11MAR86	1	7.8	19.9	9.5	0	32.92
11MAR86	0.85	6.3	2.4	2.2	2	6.924
11MAR86	0.84	5.9	1.7	2.7	4	8.629
11MAR86	0.84	2.6	1.4	0.4	6	1.476
11MAR86	0.89	6.8	1.8	1	8	3.192
11MAR86	0.84	6.7	0.9	0.6	10	1.816
11MAR86	0.81	7.7	0.5	2	13	5.665
11MAR86	0.88	8.2	0.3	1.6	13	4.806
11MAR86	0.87	8.9	0.1	2.8	24	8.166
11MAR86	0.85	11.4	0.3	1.5	24	3.838
11MAR86	0.9	9.9	0	1.9	41	5.467
11MAR86	1	12.5	0.6	2	41	5.808
12MAR86	1	7.6	2.2	1	0	3.456
12MAR86	0.85	5.8	2.4	1.4	2	4.477
12MAR86	0.84	4.1	1	3.1	4	10.93
12MAR86	0.84	2.8	1.7	3.2	6	12.07
12MAR86	0.89	5.9	1.1	3.5	8	11.98
12MAR86	0.84	6.7	2.7	0.7	10	2.105
12MAR86	0.88	6.7	1.3	0.8	13	2.537
12MAR86	0.81	7.6	1.8	1.5	13	4.224
12MAR86	0.85	10.9	0.1	1.6	24	4.176
12MAR86	0.87	9.7	0.1	1.7	24	4.756
12MAR86	0.9	7.8	0.9	0	41	0
12MAR86	1	7.9	0.9	1.2	41	4.123
13MAR86	1	5	4.9	0.6	0	2.304
13MAR86	0.85	3.2	3	1.7	2	6.202
13MAR86	0.84	4.7	2.1	2.7	4	9.142
13MAR86	0.84	3	1.6	3.5	6	13.12
13MAR86	0.89	5.1	0.7	0.2	8	0.689
13MAR86	0.84	7.8	2.7	2.3	10	6.68
13MAR86	0.88	7.7	1.1	3	13	9.293
13MAR86	0.81	9	1.1	2.9	13	7.813
13MAR86	0.87	11.3	0.9	2	24	5.262
13MAR86	0.85	8.6	0.1	1.1	24	3.128
13MAR86	1	8.4	1	1.3	41	4.375
13MAR86	0.9	11.4	1.4	0.8	41	2.146
14MAR86	1	2	2.9	1	0	4.541
14MAR86	0.85	3.3	2.7	0.9	2	3.24
14MAR86	0.84	3.3	2.1	3.3	4	12.11
14MAR86	0.84	5.1	2.4	1.4	6	4.576
14MAR86	0.89	6.6	1.9	0.4	8	1.281
14MAR86	0.84	6	2.9	1.4	10	4.373
14MAR86	0.81	7.3	1.5	1.9	13	5.449
14MAR86	0.88	7.3	2.1	0.3	13	0.919

AREA L: MARCH 1986 PSYCHROMETER DATA

14MAR86	0.85	10.8	1	2.4	24	6.299
14MAR86	0.87	11	1.2	3	24	8.029
14MAR86	1	12.6	1.6	2.2	41	6.347
14MAR86	0.9	12.3	0	2.1	41	5.545
15MAR86	1	15.7	4.4	0.5	0	1.283
15MAR86	0.85	2.7	1.8	1.1	2	4.112
15MAR86	0.84	3.4	0.8	0.8	4	2.85
15MAR86	0.84	4.1	1.2	0.4	6	1.367
15MAR86	0.89	3.8	0.6	3.2	8	12.18
15MAR86	0.84	4.4	1.8	0.8	10	2.697
15MAR86	0.88	4.8	1	0.4	13	1.384
15MAR86	0.81	5.7	0.3	0.7	13	2.147
15MAR86	0.85	12.2	0.1	2.6	24	6.526
15MAR86	0.87	11	0.1	1.8	24	4.798
15MAR86	0.9	7.7	1.2	3.5	41	11.14
15MAR86	1	12.4	1	2.7	41	7.891
16MAR86	1	8.4	5.3	2.9	0	9.713
16MAR86	0.85	4.7	2.7	2.2	2	7.477
16MAR86	0.84	6	2.4	2.7	4	8.562
16MAR86	0.84	3.4	1.4	0.3	6	1.06
16MAR86	0.89	3.6	0.6	0.1	8	0.371
16MAR86	0.84	7.9	2.8	2.2	10	6.354
16MAR86	0.88	8.9	1.8	1.4	13	4.051
16MAR86	0.81	9	1.3	2.8	13	7.531
16MAR86	0.87	9.6	0.4	1.2	24	3.353
16MAR86	0.85	12.4	0.1	2.2	24	5.469
16MAR86	0.9	7.9	0.5	3.5	41	11.07
16MAR86	1	12.4	1.3	2.9	41	8.476

AREA L: APRIL 1986 PSYCHROMETER DATA

DATE	CORRECTION	TEMP (DEG C)	OFFSET (MICROVOLTS)	READING (MICROVOLTS)	DEPTH (FT)	WATER POTENTIAL (-BARS)
13APR86	1	10.8	0.6	0.3	0	0.914
13APR86	0.85	9.8	0.7	2.6	2	7.112
13APR86	0.84	9.5	0.1	0.6	4	1.62
13APR86	0.84	6.4	0.7	0.8	6	2.462
13APR86	0.89	4.8	0.4	3.5	8	12.7
13APR86	0.84	8.7	1.3	1.6	10	4.473
13APR86	0.88	6	0.2	3.5	13	11.84
13APR86	0.81	7.3	0.3	1.5	13	4.308
13APR86	0.85	12.2	0.2	2.8	24	7.035
13APR86	0.87	11.9	0.2	3	24	7.807
13APR86	1	11	0.3	1.8	41	5.509
13APR86	0.9	12.3	0.5	1.7	41	4.466
13APR86	0.94	11.3	0.7	2.7	50	7.722
13APR86	1	10.5	0.5	1.7	50	5.292
13APR86	1.03	29.5	1.1	0.6	56	1.183
13APR86	0.85	11.1	0.2	1.8	56	4.668
13APR86	0.84	9.4	0.8	2.1	66	5.741
13APR86	0.96	11	0.8	1.7	66	4.98
13APR86	0.94	11.2	1.3	1.7	76	4.83
13APR86	0.89	11.6	0.1	2	76	5.344
13APR86	0.9	11.5	1.8	0.8	86	2.135
13APR86	1	10.8	1.6	0.7	96	2.129
13APR86	1	11.1	1.7	1.3	96	3.926
14APR86	1	11.3	0.6	3.4	0	10.4
14APR86	0.85	11.3	0.9	2.4	2	6.187
14APR86	0.84	7.5	1.5	0.1	4	0.29
14APR86	0.84	5.6	0.1	1.2	6	3.858
14APR86	0.89	5.6	0.3	0.9	8	3.054
14APR86	0.84	7.9	0.1	0.7	10	2.019
14APR86	0.81	5.6	0.4	0.7	13	2.157
14APR86	0.88	5.8	0	0	13	0
14APR86	0.85	11.1	0.1	3	24	7.854
14APR86	0.87	12	0.4	1.7	24	4.364
14APR86	0.9	13.4	0.8	2.3	41	5.843
14APR86	1	13	0.1	2.4	41	6.889
14APR86	1	9.8	0.8	1.6	50	5.105
14APR86	0.94	10.7	1.1	3.2	50	9.377
14APR86	1.03	29.5	1.3	1	56	1.972
14APR86	0.85	11.3	0.4	2.1	56	5.414
14APR86	0.96	9.8	1.1	1.3	66	3.968
14APR86	0.84	11.4	0.5	2.4	66	6.103
14APR86	0.89	8.7	0.3	1.4	76	4.158
14APR86	0.94	9.2	1.4	1.9	76	5.835
14APR86	0.9	11.2	1.1	3.5	86	9.66
14APR86	1	8.1	2.1	1	96	3.384
14APR86	1	8.5	1.3	0.4	96	1.329
15APR86	1	18.3	0.5	1.5	0	3.684
15APR86	0.85	11	1.1	1.5	2	3.88
15APR86	0.84	6.9	1.5	3.2	4	9.813
15APR86	0.84	5.5	0.3	0	6	0
15APR86	0.89	5.7	0.7	0.7	8	2.356
15APR86	0.84	8	1.1	2.9	10	8.455

AREA L: APRIL 1986 PSYCHROMETER DATA

15APR86	0.81	8.4	0.8	0.4	13	1.083
15APR86	0.88	5.4	0.5	0.8	13	2.705
15APR86	0.85	12.4	0.4	2.9	24	7.235
15APR86	0.87	9.7	1.2	2	24	5.582
15APR86	1	13.1	0.8	1.1	41	3.111
15APR86	0.9	10.4	0.4	2.7	41	7.656
15APR86	0.94	8.7	1.3	3.4	50	10.8
15APR86	1	8.6	0.7	1.3	50	4.345
15APR86	0.85	11.1	0.4	1.9	56	4.927
15APR86	1.03	29.5	1.5	1.4	56	2.761
15APR86	0.96	8.6	1.3	1.3	66	4.16
15APR86	0.84	11.4	1.1	3	66	7.642
15APR86	0.94	11	1.1	1.6	76	4.58
15APR86	0.89	9.9	1	2.1	76	5.959
15APR86	0.9	8.4	1.4	3.4	86	10.47
15APR86	1	9.1	1.5	0.8	96	2.6
15APR86	1	9.2	1.6	1.6	96	5.21
16APR86	1	13.7	0.5	1	0	2.777
16APR86	0.85	10.4	1.4	1.2	2	3.163
16APR86	0.84	6.4	0.2	0.6	4	1.847
16APR86	0.84	8.3	1	2.1	6	6.003
16APR86	0.89	8.8	1	1.8	8	5.325
16APR86	0.84	9	0.9	2.6	10	7.252
16APR86	0.88	6	0.7	3.4	13	11.46
16APR86	0.81	9.3	0.6	1.6	13	4.222
16APR86	0.87	9.4	1.2	1.9	24	5.362
16APR86	0.85	8.9	1.3	1.5	24	4.205
16APR86	0.9	8.2	1.2	0.4	41	1.212
16APR86	1	12.6	0.2	2.8	41	8.164
16APR86	0.94	8.4	0.7	3.4	50	10.97
16APR86	1	11.2	0.3	1.2	50	3.631
16APR86	1.03	29.5	1	0.6	56	1.184
16APR86	0.85	10.5	0.9	2	56	5.295
16APR86	0.96	9.8	1.2	1.6	66	4.892
16APR86	0.84	11	0.8	2.8	66	7.237
16APR86	0.89	11.5	0.7	2.1	76	5.62
16APR86	0.94	11.4	0.9	1.7	76	4.805
16APR86	0.9	10.5	1	3.3	86	9.341
16APR86	1	11.2	1.6	1.3	96	3.913
16APR86	1	8.6	0.5	0.4	96	1.328
17APR86	1	8.6	0.6	0	0	0
17APR86	0.85	10.6	0.3	3.5	2	9.366
17APR86	0.84	10.1	0.3	1.5	4	3.98
17APR86	0.84	8.6	1.1	2.2	6	6.212
17APR86	0.89	8.6	1	2.2	8	6.585
17APR86	0.84	8.9	0.6	1.9	10	5.297
17APR86	0.81	7.1	0.9	1.2	13	3.459
17APR86	0.88	6.1	0.8	3.5	13	11.75
17APR86	0.85	8.5	1.3	1.8	24	5.143
17APR86	0.87	9.9	0.6	1.3	24	3.59
17APR86	0.9	10.2	2	3.1	41	8.823
17APR86	1	11.2	0.8	1.2	41	3.623
17APR86	0.94	9.1	0.4	2.6	50	8.1
17APR86	1	10.1	0.5	0.9	50	2.827
17APR86	1.03	29.5	0.7	0.5	56	0.988
17APR86	0.85	8.9	0.1	0.6	56	1.678

AREA L: APRIL 1986 PSYCHROMETER DATA

17APR86	0.84	9.2	0.4	1.6	66	4.399
17APR86	0.96	11.1	0.9	1.1	66	3.196
17APR86	0.94	11.1	1	1.5	76	4.277
17APR86	0.89	10.7	0.5	2.1	76	5.792
17APR86	0.9	10.1	1	0	86	0
17APR86	1	11.6	1.7	1.6	96	4.756
17APR86	1	11.2	0.8	1.1	96	3.318
19APR86	1	9.3	27.3	0	0	0
19APR86	0.85	11.6	0.1	2.3	2	5.883
19APR86	0.84	7.3	1.1	3.3	4	9.963
19APR86	0.84	6.8	0	0.8	6	2.424
19APR86	0.89	8.6	0.1	1.9	8	5.695
19APR86	0.84	6.3	0.5	1	10	3.1
19APR86	0.81	7.6	0.5	3.2	13	9.207
19APR86	0.88	9.4	0.1	1.7	13	4.868
19APR86	0.85	9.5	0.9	1.5	24	4.111
19APR86	0.87	8.5	0.1	2.4	24	7.092
19APR86	1	9.8	0.7	0.5	41	1.583
19APR86	0.9	11.5	2.2	3	41	8.118
19APR86	1	11	0.2	0.9	50	2.738
19APR86	0.94	9	0.7	3.3	50	10.37
19APR86	0.85	10.5	0.5	0.6	56	1.575
19APR86	1.03	29.5	0.3	0.4	56	0.792
19APR86	0.96	8.4	0.4	1.1	66	3.557
19APR86	0.84	8.6	0.7	2.8	66	7.962
19APR86	0.89	11.5	0.2	1.3	76	3.467
19APR86	0.94	8.9	1.1	2	76	6.231
19APR86	0.9	9.8	0.8	3.1	86	9.011
19APR86	1	11.8	0.3	0.6	96	1.77
19APR86	1	8.5	1.7	1.3	96	4.344
20APR86	1	13.9	27.9	0	0	0
20APR86	0.85	9.2	0	0.8	2	2.216
20APR86	0.84	6.7	1.2	1	4	3.034
20APR86	0.84	8.2	0.3	2.2	6	6.341
20APR86	0.89	6.9	0.4	0.2	8	0.635
20APR86	0.84	5.1	0.9	1.4	10	4.605
20APR86	0.81	6.9	0.5	2.3	13	6.771
20APR86	0.88	7.2	0.5	1.1	13	3.432
20APR86	0.87	11.2	0.9	1.8	24	4.746
20APR86	0.85	12.1	0.3	3.4	24	8.605
20APR86	0.9	8.8	2.1	3	41	9.024
20APR86	1	11.3	0.7	0.8	41	2.401
20APR86	0.94	10.2	0.8	3.3	50	9.879
20APR86	1	9.8	0.7	1.2	50	3.819
20APR86	0.85	11.3	0	1.9	56	4.9
20APR86	1.03	29.5	0.9	1.6	56	3.167
20APR86	0.84	11.4	0.2	2.8	66	7.151
20APR86	0.96	9.8	0.7	1.8	66	5.525
20APR86	0.89	11.1	0.3	2.7	76	7.378
20APR86	0.94	10.7	0.4	1.1	76	3.182
20APR86	0.9	7.5	1.1	3.4	86	10.91
20APR86	1	8.9	0.5	0.7	96	2.302
20APR86	1	10.6	1.4	1.4	96	4.315
21APR86	1	17.3	29.4	0	0	0
21APR86	0.85	11.2	1.1	1.8	2	4.632
21APR86	0.84	6.6	1.4	0.5	4	1.516

AREA L: APRIL 1986 PSYCHROMETER DATA

21APR86	0.84	8	0.8	1.4	6	4.032
21APR86	0.89	6.1	0.5	0.8	8	2.647
21APR86	0.84	5	0.1	1.6	10	5.317
21APR86	0.88	9.3	0.3	1.8	13	5.175
21APR86	0.81	7.6	0.1	2.9	13	8.334
21APR86	0.87	11.9	0.1	2.3	24	5.958
21APR86	0.85	12.5	0.1	3.5	24	8.751
21APR86	0.9	13.5	0.5	1.9	41	4.806
21APR86	1	12.6	0.7	2.1	41	6.079
21APR86	1	8.7	0.1	1.2	50	4.001
21APR86	0.94	11.2	1	3	50	8.619
21APR86	0.85	11.5	0.4	1.9	56	4.856
21APR86	1.03	29.5	0.3	1.1	56	2.181
21APR86	0.96	11.2	0.6	1.7	66	4.949
21APR86	0.84	8.9	0.3	2.1	66	5.872
21APR86	0.94	11	1.1	1.7	76	4.87
21APR86	0.89	11.5	0.2	2.2	76	5.906
21APR86	0.9	11	1.5	0.8	86	2.176
21APR86	1	11.2	1.8	2.1	96	6.352
21APR86	1	11.9	1.2	1.6	96	4.717
22APR86	1	22.9	30.3	0	0	0
22APR86	0.85	9.2	0.1	1.9	2	5.307
22APR86	0.84	9	0.3	1.8	4	5
22APR86	0.84	9.1	0.5	2.7	6	7.52
22APR86	0.89	9	0.1	1.9	8	5.602
22APR86	0.84	7.6	0	1.1	10	3.226
22APR86	0.81	5.6	0.1	1.2	13	3.72
22APR86	0.88	6.6	0.6	1.7	13	5.478
22APR86	0.85	12.3	0.1	3.3	24	8.296
22APR86	0.87	11.8	0.2	2	24	5.185
22APR86	1	11.7	0.5	1.8	41	5.368
22APR86	0.9	12.2	1.8	1.2	41	3.134
22APR86	1	10.4	0.7	2	50	6.258
22APR86	0.94	11.1	0.5	3.1	50	8.966
22APR86	0.85	9.3	0.2	0.9	56	2.482
22APR86	1.03	29.5	0.2	0.7	56	1.387
22APR86	0.84	7.9	0.7	2.1	66	6.115
22APR86	0.96	9.9	0.4	1.5	66	4.581
22APR86	0.94	8	1	1	76	3.209
22APR86	0.89	9	0.1	1.5	76	4.408
22APR86	0.9	9.2	1.6	0.8	86	2.33
22APR86	1	11.5	1.5	2.2	96	6.597
22APR86	1	9.3	0.4	0	96	0
23APR86	1	17.2	0.6	0.2	0	0.501
23APR86	0.85	9.9	1.5	2.1	2	5.678
23APR86	0.84	7.5	1.4	3.4	4	10.17
23APR86	0.84	6.3	0.3	0.8	6	2.477
23APR86	0.89	5.5	0.4	1.1	8	3.756
23APR86	0.84	6.3	0	1.5	10	4.681
23APR86	0.81	6.7	0.8	1.7	13	5.015
23APR86	0.88	6.5	0.8	0.5	13	1.599
23APR86	0.85	10.4	0.6	2.8	24	7.498
23APR86	0.87	12	0.1	2.6	24	6.726
23APR86	0.9	13.4	0.2	1.8	41	4.57
23APR86	1	12.6	0.6	2.9	41	8.446
23APR86	0.94	8.2	0.2	3.3	50	10.76

AREA L: APRIL 1986 PSYCHROMETER DATA

23APR86	1	10.4	0	1.2	50	3.744
23APR86	1.03	29.5	0.6	1.7	56	3.37
23APR86	0.85	8.6	0.9	1.2	56	3.403
23APR86	0.84	11.6	0.8	2.9	66	7.339
23APR86	0.96	9.5	1	2.1	66	6.53
23APR86	0.94	11.4	1.1	2.2	76	6.235
23APR86	0.89	11.2	0.5	2.4	76	6.514
23APR86	0.9	11.7	1.4	1.2	86	3.194
23APR86	1	10.2	1.3	1.9	96	5.97
23APR86	1	10.2	0.6	1.2	96	3.762
24APR86	1	20	2.8	2.2	0	5.152
24APR86	0.85	12.1	1.3	1.3	2	3.227
24APR86	0.84	6.9	0.2	1.4	4	4.243
24APR86	0.84	9.1	0	1.9	6	5.268
24APR86	0.89	6.8	0.5	3.5	8	11.51
24APR86	0.84	8.5	0.1	1.9	10	5.397
24APR86	0.88	6.5	0.6	2.3	13	7.489
24APR86	0.81	6.7	0.6	0.8	13	2.342
24APR86	0.87	10	0.1	2.2	24	6.108
24APR86	0.85	11.8	1.2	0.9	24	2.252
24APR86	0.9	10.1	1.8	3.1	41	8.866
24APR86	1	11.8	0.7	0.7	41	2.063
24APR86	1	10.6	0.1	0.8	50	2.469
24APR86	0.94	8.5	0.5	3.4	50	10.93
24APR86	1.03	29.5	0.7	1.7	56	3.369
24APR86	0.85	9.3	0.3	1.8	56	4.999
24APR86	0.84	11.8	0.4	2.1	66	5.256
24APR86	0.96	11.4	0	0.8	66	2.304
24APR86	0.89	11.1	0	2.2	76	5.997
24APR86	0.94	8.5	0.1	0.6	76	1.887
24APR86	0.9	8.9	1.3	0.8	86	2.361
24APR86	1	11.8	1.1	1.1	96	3.244
24APR86	1	8.3	1.3	0.9	96	3.028
25APR86	1	6.9	0.2	0	0	0
25APR86	0.85	10	1.3	1.5	2	4.025
25APR86	0.84	7.7	1.5	3.5	4	10.38
25APR86	0.84	6.7	0.4	0.4	6	1.211
25APR86	0.89	6.7	0.6	1.3	8	4.202
25APR86	0.84	8.5	1.3	2.4	10	6.812
25APR86	0.88	9.9	0.5	2.4	13	6.765
25APR86	0.81	8.5	0.4	3.6	13	10
25APR86	0.87	10.5	1.1	1.7	24	4.592
25APR86	0.85	11.5	0.9	2.4	24	6.143
25APR86	0.9	9.1	2.1	3.2	41	9.523
25APR86	1	13.7	0.1	2.8	41	7.879
25APR86	1	11.4	0.1	1	50	3.002
25APR86	0.94	8.6	0.3	3.4	50	10.9
25APR86	1.03	29.5	0.4	0.5	56	0.99
25APR86	0.85	8.7	0.2	1.1	56	3.114
25APR86	0.84	8.9	0.2	2.1	66	5.875
25APR86	0.96	8.8	0.2	1.2	66	3.824
25APR86	0.94	8.7	0.6	0.9	76	2.808
25APR86	0.89	8.6	0.1	1.7	76	5.087
25APR86	0.9	9.3	1.5	0.5	86	1.447
25APR86	1	12.1	0.3	1	96	2.928
25APR86	1	11.3	1.8	2.2	96	6.636

AREA L: APRIL 1986 PSYCHROMETER DATA

26APR86	1	12.7	1	0.4	0	1.14
26APR86	0.85	10.4	0.4	1.9	2	5.056
26APR86	0.84	8.6	0.6	0.2	4	0.557
26APR86	0.84	6.4	0	0.6	6	1.848
26APR86	0.89	5.6	0.1	0.3	8	1.013
26APR86	0.84	5.4	0.1	1.1	10	3.567
26APR86	0.88	5.7	0.9	0.7	13	2.327
26APR86	0.81	6.5	0.2	2.2	13	6.599
26APR86	0.87	10.1	0.7	1.6	24	4.392
26APR86	0.85	11.8	0.5	2.5	24	6.347
26APR86	0.9	13.6	0.7	1.6	41	4.023
26APR86	1	12.6	0.6	2.1	41	6.082
26APR86	0.94	10.6	0.5	3.5	50	10.35
26APR86	1	10.6	0.1	1.6	50	4.967
26APR86	0.85	9.9	0.2	1.3	56	3.513
26APR86	1.03	29.5	0.8	1.3	56	2.572
26APR86	0.96	10.8	0.8	1.5	66	4.42
26APR86	0.84	9.2	0	2.2	66	6.09
26APR86	0.89	8.4	0.9	1.7	76	5.112
26APR86	0.94	10.1	0.1	1.2	76	3.558
26APR86	0.9	9.3	0.3	0.2	86	0.581
26APR86	1	10	0.4	0.8	96	2.522
26APR86	1	8.9	0.9	1.6	96	5.29
27APR86	1	10	27.8	0	0	0
27APR86	0.85	12.2	0.9	2.4	2	5.993
27APR86	0.84	10.9	0.1	2.3	4	5.963
27APR86	0.84	9.5	0.2	2.4	6	6.569
27APR86	0.89	7.8	0.4	0.7	8	2.145
27APR86	0.84	6	0.1	0.7	10	2.198
27APR86	0.88	9.2	0.3	2	13	5.783
27APR86	0.81	6.7	0.2	2.7	13	8.064
27APR86	0.87	8.2	0.7	2.7	24	8.082
27APR86	0.85	11.3	0.9	2.2	24	5.663
27APR86	0.9	8.5	1.4	0.2	41	0.597
27APR86	1	10.7	0.6	3	41	9.358
27APR86	0.94	8.4	0.3	3.3	50	10.66
27APR86	1	11	0.2	0.8	50	2.432
27APR86	0.85	8.9	0.3	1.8	56	5.08
27APR86	1.03	29.5	0.4	0.6	56	1.188
27APR86	0.84	9.9	0.6	2.6	66	7.003
27APR86	0.96	8.1	0.2	1.1	66	3.606
27APR86	0.94	11.4	0.5	1.8	76	5.1
27APR86	0.89	9.9	0	2.2	76	6.275
27APR86	0.9	10.7	0.7	3.4	86	9.572
27APR86	1	11.4	1.6	1.8	96	5.399
27APR86	1	11.4	0.6	1.1	96	3.298
28APR86	1	17.9	29.3	0	0	0
28APR86	0.85	11.7	0.7	2.5	2	6.363
28APR86	0.84	10	1.5	0	4	0
28APR86	0.84	9.7	0.7	2.6	6	7.056
28APR86	0.89	9.6	0.7	2.4	8	6.917
28APR86	0.84	8	0.2	0.3	10	0.858
28APR86	0.88	9	0.4	1.9	13	5.531
28APR86	0.81	6.2	0.6	2.7	13	8.241
28APR86	0.87	8	0.6	2.6	24	7.846
28APR86	0.85	11.8	0.8	2.	24	5.052

AREA L: APRIL 1986 PSYCHROMETER DATA

28APR86	0.9	10.4	0.4	2.2	41	6.214
28APR86	1	13	0.1	2.3	41	6.598
28APR86	1	9.2	0	0.5	50	1.625
28APR86	0.94	8.2	0.7	0.1	50	0.316
29APR86	0.85	9.2	0.3	0.9	56	2.491
28APR86	1.03	29.5	0.2	0.6	56	1.189
28APR86	0.84	9.4	1	2.7	66	7.412
28APR86	0.96	8.2	0.4	0.9	66	2.93
28APR86	0.89	9.1	0.4	2	76	5.87
28APR86	0.94	11.3	0.5	1.7	76	4.83
28APR86	0.9	10	0.7	3.2	86	9.241
28APR86	1	11.6	1.5	1.6	96	4.76
28APR86	1	8.9	0.2	3	96	10.07
29APR86	1	20.7	31	0	0	0
29APR86	0.85	10.2	0.7	0.2	2	0.529
29APR86	0.84	8.5	0.3	1.5	4	4.243
29APR86	0.84	9.8	0.7	2.7	6	7.304
29APR86	0.89	9.8	0.8	2.5	8	7.151
29APR86	0.84	8.7	0.2	1.9	10	5.35
29APR86	0.81	6.7	0.6	0.9	13	2.638
29APR86	0.88	9	0.3	0.7	13	2.019
29APR86	0.87	8.9	0.1	1.9	24	5.498
29APR86	0.85	8.7	1	0.6	24	1.686
29APR86	1	12.4	0.6	1.2	41	3.478
29APR86	0.9	12.5	1.9	3.1	41	8.116
29APR86	1	11.2	0.3	1.1	50	3.326
29APR86	0.94	8.7	0.4	3.3	50	10.52
29APR86	0.85	9.1	0.6	2.1	56	5.886
29APR86	1.03	29.5	0.7	2	56	3.966
29APR86	0.96	9.6	0.1	0.8	66	2.462
29APR86	0.84	9.7	0.2	1.8	66	4.864
29APR86	0.94	11.5	0.2	0.9	76	2.528
29APR86	0.89	8.5	0.4	2.5	76	7.554
29APR86	0.9	7.8	0.6	3.5	86	11.12
29APR86	1	8.3	1.2	1.4	96	4.731
29APR86	1	9.7	1	0.8	96	2.545
30APR86	1	23.4	0.1	1.3	0	2.856
30APR86	0.85	12.4	0	2.8	2	6.993
30APR86	0.84	10.3	0.4	0.7	4	1.831
30APR86	0.84	7.2	0.1	0.8	6	2.38
30APR86	0.89	5.9	0.2	3.5	8	12.03
30APR86	0.84	8.2	0.2	1.9	10	5.464
30APR86	0.88	9.5	0.4	1.5	13	4.266
30APR86	0.81	9.5	0.3	2.9	13	7.683
30APR86	0.87	10.3	1.1	1.8	24	4.903
30APR86	0.85	12.5	0.3	3.1	24	7.722
30APR86	1	13.2	0.2	2.8	41	8.003
30APR86	0.9	7.9	1.7	3.3	41	10.36
30APR86	1	9.5	0.3	1.9	50	6.163
30APR86	0.94	10.2	0.2	3.1	50	9.29
30APR86	0.85	8.2	0.6	1.1	56	3.174
30APR86	1.03	29.5	0.1	1.3	56	2.582
30APR86	0.84	8.9	0.3	2.1	66	5.872
30APR86	0.96	11.1	0.4	2	66	5.861
30APR86	0.94	8.1	1	1.3	76	4.165
30APR86	0.89	9.3	0.2	1.1	76	3.182

AREA L: APRIL 1986 PSYCHROMETER DATA

30APR86	0.9	10.3	1.4	1	86	2.797
30APR86	1	11.6	1.4	2.1	96	6.273
30APR86	1	9.7	1.1	0.9	96	2.864

AREA L: MAY 1986 PSYCHROMETER DATA

DATE	CORRECTION	TEMP (DEG C)	OFFSET (MICROVOLTS)	READING (MICROVOLTS)	DEPTH (FT)	WATER POTENTIAL (-BARS)
01MAY86	1	21.4	0.3	2.7	0	6.215
01MAY86	0.85	12.2	2	1.2	2	2.957
01MAY86	0.84	7.4	0.3	1.4	4	4.148
01MAY86	0.84	9.9	0.7	1.4	6	3.734
01MAY86	0.89	7	0.9	0.9	8	2.856
01MAY86	0.84	7.9	0.6	3.4	10	10.03
01MAY86	0.81	8.1	1.2	0	13	0
01MAY86	0.88	5.9	0.1	0.7	13	2.313
01MAY86	0.87	10.7	1.4	1.1	24	2.932
01MAY86	0.85	12.6	0.7	2.6	24	6.42
01MAY86	0.9	7.9	0.4	2.4	41	7.518
01MAY86	1	10.5	0.6	0.4	41	1.233
01MAY86	0.94	11	0.4	3.4	50	9.898
01MAY86	1	9.5	0.4	2.2	50	7.15
01MAY86	0.85	9	0.6	2.8	56	7.927
01MAY86	1.03	29.5	0.8	2.2	56	4.362
01MAY86	0.84	11	0.2	2.4	66	6.201
01MAY86	0.96	8.5	1.3	2.3	66	7.454
01MAY86	0.94	7.9	1.2	2.6	76	8.492
01MAY86	0.89	11.6	0.5	2	76	5.335
01MAY86	0.9	10.5	0.3	0.2	86	0.555
01MAY86	1	8.6	1.5	1.9	96	6.36
01MAY86	1	9.9	0.8	0.8	96	2.527
02MAY86	1	24	1.5	1.6	0	3.45
02MAY86	0.85	14	1.7	3.5	2	8.269
02MAY86	0.84	10.9	0.9	1.4	4	3.592
02MAY86	0.84	8.2	1.1	3.5	6	10.17
02MAY86	0.89	10.1	0.3	1.6	8	4.501
02MAY86	0.84	8.2	0.4	1.2	10	3.427
02MAY86	0.81	6.4	1	0.2	13	0.589
02MAY86	0.88	5.8	0.3	0	13	0
02MAY86	0.85	12.2	0.2	2.9	24	7.291
02MAY86	0.87	11.9	0.5	1.1	24	2.82
02MAY86	1	9.8	0.7	1.5	41	4.785
02MAY86	0.9	11.5	1.7	0.7	41	1.868
02MAY86	1	8.5	0.3	0.9	50	3.016
02MAY86	0.94	9.8	0.8	0.2	50	0.594
02MAY86	1.03	29.5	0	0.9	56	1.786
02MAY86	0.85	9.1	0.3	1.2	56	3.343
02MAY86	0.84	8.2	0.2	2	66	5.757
02MAY86	0.96	9.8	0.3	1.5	66	4.601
02MAY86	0.89	9.1	0.2	1.6	76	4.684
02MAY86	0.94	8	0.4	1.2	76	3.868
02MAY86	0.9	9.9	0.9	0.5	86	1.418
02MAY86	1	10.8	0.5	0.4	96	1.22
02MAY86	1	10.4	1.6	2.5	96	7.822
03MAY86	1	20.5	0.6	0.1	0	0.232
03MAY86	0.85	11.1	2	1.5	2	3.85
03MAY86	0.84	7.6	1.9	3.3	4	9.795
03MAY86	0.84	6.9	1.2	0.1	6	0.298
03MAY86	0.89	5.7	0.5	3.2	8	11.06
03MAY86	0.84	7.9	0	2.2	10	6.432

AREA L: MAY 1986 PSYCHROMETER DATA

03MAY86	0.81	8.9	0.4	2.4	13	6.485
03MAY86	0.88	8.4	1	2.7	13	8.094
03MAY86	0.85	9.9	1.3	1.9	24	5.134
03MAY86	0.87	10.2	1.4	0.3	24	0.81
03MAY86	1	13	0	2.5	41	7.184
03MAY86	0.9	11.8	1.2	1.7	41	4.529
03MAY86	0.94	9.6	0.8	0.3	50	0.898
03MAY86	1	9.1	0.5	1.6	50	5.256
03MAY86	0.85	11.4	0	2.5	56	6.453
03MAY86	1.03	29.5	0.4	1.5	56	2.976
03MAY86	0.96	8	0.3	1.4	66	4.618
03MAY86	0.84	11.4	0.4	2.8	66	7.145
03MAY86	0.89	9.2	0.3	2.2	76	6.444
03MAY86	0.94	9.9	0.5	1.4	76	4.182
03MAY86	0.9	8.6	0.8	3.5	86	10.73
03MAY86	1	10.6	1.2	1.8	96	5.569
03MAY86	1	8.8	0.9	1	96	3.304
04MAY86	1	19.5	0.6	2.9	0	6.964
04MAY86	0.85	14.5	1.7	3.1	2	7.193
04MAY86	0.84	10.4	2	3.4	4	8.984
04MAY86	0.84	7.3	1.1	3.3	6	9.963
04MAY86	0.89	9.9	0.1	2	8	5.693
04MAY86	0.84	7.5	0.8	0.1	10	0.291
04MAY86	0.88	5.8	0.8	0.6	13	1.984
04MAY86	0.81	5.9	0.9	0.3	13	0.906
04MAY86	0.85	12.5	1	2.1	24	5.178
04MAY86	0.87	9.1	1.6	0.9	24	2.546
04MAY86	0.9	8.2	1.7	3.5	41	10.87
04MAY86	1	13	0.4	3.1	41	8.929
04MAY86	0.94	8.8	0.7	0	50	0
04MAY86	1	9.1	0.1	0.8	50	2.616
04MAY86	0.85	9.2	0	1	56	2.774
04MAY86	1.03	29.5	0.2	0.6	56	1.189
04MAY86	0.96	10.9	0.4	1.5	66	4.412
04MAY86	0.84	8.4	0.2	2	66	5.708
04MAY86	0.94	8.1	0.8	1.1	76	3.521
04MAY86	0.89	9.4	0.1	1.3	76	3.753
04MAY86	0.9	8.3	0.8	0.2	86	0.603
04MAY86	1	11.6	1.4	2	96	5.97
04MAY86	1	12	0.6	1	96	2.934
05MAY86	1	19.6	31.2	0	0	0
05MAY86	0.85	12.1	0.9	2.4	2	6.014
05MAY86	0.84	9.7	0.8	0.5	4	1.334
05MAY86	0.84	8.5	0.2	2.1	6	5.973
05MAY86	0.89	10.1	0.4	2.2	8	6.216
05MAY86	0.84	8.8	0.3	1.4	10	3.908
05MAY86	0.88	6.1	0.1	1	13	3.283
05MAY86	0.81	6.8	1.3	0	13	0
05MAY86	0.85	12.5	0.4	3	24	7.464
05MAY86	0.87	10	1.3	1.7	24	4.676
05MAY86	1	12.2	0.6	0.8	41	2.328
05MAY86	0.9	7.9	1.6	3.2	41	10.05
05MAY86	1	10.6	0	1.2	50	3.716
05MAY86	0.94	8	0.2	3.5	50	11.53
05MAY86	1.03	29.5	0.5	1.5	56	2.974
05MAY86	0.85	9.8	0.5	2	56	5.449

AREA L: MAY 1986 PSYCHROMETER DATA

05MAY86	0.84	11.3	0.4	2.6	66	6.649
05MAY86	0.96	9.4	0.5	1.7	66	5.301
05MAY86	0.89	11	0	2.1	76	5.741
05MAY86	0.94	7.9	0.2	0.7	76	2.258
05MAY86	0.9	8.3	1	0.8	86	2.423
05MAY86	1	11.6	1.6	2.3	96	6.874
05MAY86	1	10.8	1.1	1	96	3.054
06MAY86	1	20.9	10.4	0	0	0
06MAY86	0.85	11.5	1.6	1.5	2	3.802
06MAY86	0.84	10.6	0.2	2.3	4	6.027
06MAY86	0.84	10.8	1.4	1.4	6	3.598
06MAY86	0.89	9.4	1.3	3.1	8	9.035
06MAY86	0.84	6.7	1.6	0.2	10	0.602
06MAY86	0.81	11	0.8	1.6	13	3.952
06MAY86	0.88	10.7	0.8	0.3	13	0.806
06MAY86	0.85	13.6	0.9	2.1	24	4.998
06MAY86	0.87	12.2	1.2	0.3	24	0.755
06MAY86	1	10.7	0.8	2.1	41	6.499
06MAY86	0.9	29.5	35.3	36.3	41	59.87
06MAY86	1	11.2	0.2	1.2	50	3.632
06MAY86	0.94	8.6	0.8	3.3	50	10.54
06MAY86	1.03	29.5	2.8	1.5	56	2.939
06MAY86	0.85	9.9	0.7	1.3	56	3.506
06MAY86	0.96	11.8	3.2	2.6	66	7.37
06MAY86	0.84	10.3	1	2	66	5.27
06MAY86	0.94	10.7	1.6	1	76	2.875
06MAY86	0.89	12	1.1	1.6	76	4.185
06MAY86	0.9	12.5	2.5	0.5	86	1.283
06MAY86	1	11.6	1.9	1	96	2.957
06MAY86	1	12.2	3	1.1	96	3.173
07MAY86	1	18.6	5	0.1	0	0.237
07MAY86	0.85	13.3	0.5	2.8	2	6.771
07MAY86	0.84	10.6	0.9	0.8	4	2.067
07MAY86	0.84	9.3	0.2	2.4	6	6.622
07MAY86	0.89	10.4	0.2	1.7	8	4.734
07MAY86	0.84	8.6	0.8	1.3	10	3.648
07MAY86	0.81	7.8	1.5	0.1	13	0.276
07MAY86	0.88	5.6	1.4	3.5	13	12.01
07MAY86	0.85	7.9	2.1	0	24	0
07MAY86	0.87	8	1.3	1.5	24	4.469
07MAY86	1	11.9	0.2	2.3	41	6.845
07MAY86	0.9	8.7	1.3	1.2	41	3.582
07MAY86	0.94	8.4	0.2	3.3	50	10.66
07MAY86	1	10.6	0.2	1	50	3.089
07MAY86	0.85	8.6	0.4	1.1	56	3.124
07MAY86	1.03	29.5	0.1	1.3	56	2.582
07MAY86	0.96	8.4	0.3	1	66	3.233
07MAY86	0.84	8.5	0.5	2.3	66	6.545
07MAY86	0.94	8.2	0.1	1	76	3.195
07MAY86	0.89	9.1	0.5	1.9	76	5.569
07MAY86	0.9	8.1	0.5	3.5	86	10.98
07MAY86	1	12	1	1.9	96	5.599
07MAY86	1	11.8	1.5	1.2	96	3.535
08MAY86	1	5.3	21.3	0.7	0	2.485
08MAY86	0.85	13.4	0.4	2.8	2	6.752
08MAY86	0.84	10.7	1.3	0.7	4	1.797

AREA L: MAY 1986 PSYCHROMETER DATA

08MAY86	0.84	9.7	0.4	1.3	6	3.496
08MAY86	0.89	9.2	0.1	0.9	8	2.611
08MAY86	0.84	8.1	0.3	1.3	10	3.733
08MAY86	0.81	9.5	0.8	1	13	2.603
08MAY86	0.88	8.6	0.5	0.8	13	2.345
08MAY86	0.87	12.2	0.8	1	24	2.533
08MAY86	0.85	12.7	0.9	2.1	24	5.146
08MAY86	1	10.5	0.7	1.8	41	5.603
08MAY86	0.9	10.2	1.9	0.2	41	0.557
08MAY86	1	5.3	1.2	1.3	50	5.03
08MAY86	0.94	4.1	2.6	0.2	50	0.759
08MAY86	1.03	29.5	0	0.8	56	1.588
08MAY86	0.85	5.4	0	1	56	3.279
08MAY86	0.84	5.2	0.8	2.5	66	8.282
08MAY86	0.96	5	1.7	1.5	66	5.653
08MAY86	0.94	3.8	1.2	0.2	76	0.775
08MAY86	0.89	5.3	1.5	0.8	76	2.738
08MAY86	0.9	6.8	1.4	0.3	86	0.964
08MAY86	1	8.3	3.2	2.2	96	7.422
08MAY86	1	11.3	0.9	1	96	3.002
10MAY86	1	16.1	6.6	0.9	0	2.266
10MAY86	0.85	14.2	0	3.1	2	7.318
10MAY86	0.84	12.8	1	2.7	4	6.54
10MAY86	0.84	11	0.2	2.9	6	7.522
10MAY86	0.89	10.4	0.3	2.5	8	7.002
10MAY86	0.84	9.6	0.5	3.5	10	9.618
10MAY86	0.81	9.7	0.3	2.9	13	7.622
10MAY86	0.88	9	0.7	0.7	13	2.015
10MAY86	0.87	11.5	0.3	3	24	7.916
10MAY86	0.85	12.3	0.1	2.6	24	6.503
10MAY86	0.9	29.5	32.3	0	41	0
10MAY86	1	9.4	0.7	1	41	3.228
11MAY86	1	18.9	0.3	3.2	0	7.817
11MAY86	0.85	14.7	0.2	3.3	2	7.675
11MAY86	0.84	13.4	0.4	2.5	4	5.946
11MAY86	0.84	10.9	0.1	2.4	6	6.227
11MAY86	0.89	9.8	0.7	1.6	8	4.546
11MAY86	0.84	7.8	0.8	2.5	10	7.335
11MAY86	0.81	8.7	1	2.2	13	5.968
11MAY86	0.88	8.8	0	0.3	13	0.871
11MAY86	0.85	10.7	0.1	2.3	24	6.079
11MAY86	0.87	10.8	0.3	3	24	8.122
11MAY86	1	10.4	0.4	1.8	41	5.631
11MAY86	0.9	29.5	33.5	0	41	0
12MAY86	1	20.1	2.8	3.4	0	7.984
12MAY86	0.85	15.1	0.2	2.7	2	6.183
12MAY86	0.84	11.7	0.5	1.2	4	2.994
12MAY86	0.84	9.7	0.4	1.3	6	3.496
12MAY86	0.89	7.9	0.4	1.2	8	3.678
12MAY86	0.84	6.6	0.5	1.9	10	5.858
12MAY86	0.81	6.9	0.3	1.2	13	3.499
12MAY86	0.88	5.9	1.2	3.5	13	11.84
12MAY86	0.87	10.2	1	1.3	24	3.542
12MAY86	0.85	8.6	1.2	2.1	24	5.993
12MAY86	0.9	29.5	33.6	0	41	0
12MAY86	1	11.4	0.5	1.5	41	4.512

AREA L: MAY 1986 PSYCHROMETER DATA

13MAY86	1	22.8	3.3	3.2	0	7.053
13MAY86	0.85	15.5	1	3.5	2	7.93
13MAY86	0.84	11.6	1.8	2.8	4	7.049
13MAY86	0.84	11.6	0.5	2.5	6	6.317
13MAY86	0.89	8.9	0.8	0	8	0
13MAY86	0.84	6.2	0.4	1.1	10	3.43
13MAY86	0.81	7.5	0.4	1.3	13	3.693
13MAY86	0.88	6.2	0.1	0.9	13	2.938
13MAY86	0.87	11	1	1.5	24	3.973
13MAY86	0.85	12.3	0.2	3.2	24	8.035
13MAY86	0.9	29.5	33.9	0	41	0
13MAY86	1	13.4	0.4	2.6	41	7.367
14MAY86	1	22	8.9	2.9	0	6.323
14MAY86	0.85	16.1	0.9	3.2	2	7.12
14MAY86	0.84	13.3	0.6	1.6	4	3.792
14MAY86	0.84	11.5	0.2	2.9	6	7.386
14MAY86	0.89	10.3	0.7	0.9	8	2.495
14MAY86	0.84	6.8	0.5	0.6	10	1.811
14MAY86	0.81	6.5	0.2	1.5	13	4.469
14MAY86	0.88	8.6	0.1	0.9	13	2.645
14MAY86	0.87	9.9	0.9	0.8	24	2.198
14MAY86	0.85	12.2	0.2	3	24	7.548
14MAY86	0.9	29.5	33.5	0	41	0
14MAY86	1	13.1	0.5	1.5	41	4.259
15MAY86	1	24.7	2.5	0.4	0	0.843
15MAY86	0.85	15.7	1.6	3.1	2	6.948
15MAY86	0.84	12.6	1.9	0.3	4	0.717
15MAY86	0.84	8.4	1.1	0.4	6	1.122
15MAY86	0.89	7.4	0.1	0.7	8	2.186
15MAY86	0.84	7.6	0.5	1.4	10	4.108
15MAY86	0.88	8.7	0	1	13	2.931
15MAY86	0.81	8.9	0.9	2.2	13	5.921
15MAY86	0.87	11.2	0.7	1	24	2.624
15MAY86	0.85	12.6	0.3	2.9	24	7.189
15MAY86	1	13.4	0.1	2.6	41	7.377
15MAY86	0.9	29.5	33.8	0	41	0
16MAY86	1	21.4	6.8	0	0	0
16MAY86	0.85	15.6	1.1	3	2	6.755
16MAY86	0.84	14.1	1.5	1.7	4	3.916
16MAY86	0.84	12	0.8	2.2	6	5.462
16MAY86	0.89	9.6	1	0.1	8	0.283
16MAY86	0.84	6.6	0.6	0.3	10	0.911
16MAY86	0.81	7.1	0.2	1.4	13	4.055
16MAY86	0.88	7.2	0.5	1.4	13	4.38
16MAY86	0.87	12.2	0.3	1.3	24	3.307
16MAY86	0.85	11.9	0.6	2.5	24	6.322
16MAY86	0.9	29.5	33.5	0	41	0
16MAY86	1	11.2	0.7	2.4	41	7.312
17MAY86	1	12.8	1.8	0.6	0	1.7
17MAY86	0.85	15.3	2.1	1.1	2	2.46
17MAY86	0.84	11.8	1.8	1.5	4	3.715
17MAY86	0.84	11.6	1.3	0.7	6	1.74
17MAY86	0.89	7.1	0.3	0.6	8	1.895
17MAY86	0.84	9.6	0.2	2.5	10	6.821
17MAY86	0.88	7.8	0.1	1.8	13	5.514
17MAY86	0.81	8.8	1	0.5	13	1.332

AREA L: MAY 1986 PSYCHROMETER DATA

17MAY86	0.85	12	0.8	1.3	24	3.246
17MAY86	0.87	8.2	0.3	2.6	24	7.789
17MAY86	1	8.3	0	1	41	3.386
17MAY86	0.9	29.5	31.2	0	41	0
18MAY86	1	14.4	3.9	3.4	0	9.233
18MAY86	0.85	16.3	0.2	2.1	2	4.634
18MAY86	0.84	11.3	3.2	0.3	4	0.745
18MAY86	0.84	11.2	1.3	1	6	2.527
18MAY86	0.89	7.5	1.1	3.2	8	10.13
18MAY86	0.84	9.8	0.4	1.9	10	5.114
18MAY86	0.81	10.1	0.2	2.6	13	6.713
18MAY86	0.88	9.1	1	0.5	13	1.43
18MAY86	0.87	10.2	1	1.1	24	2.993
18MAY86	0.85	10.6	0.9	2.1	24	5.543
18MAY86	1	9.6	0.5	2	41	6.461
18MAY86	0.9	29.5	32.2	89.5	41	
19MAY86	1	21.9	0.1	3.2	0	7.308
19MAY86	0.85	15.8	0.1	2.3	2	5.153
19MAY86	0.84	12.2	3.2	3.3	4	8.111
19MAY86	0.84	8.6	0.5	1.5	6	4.222
19MAY86	0.89	11.1	0.5	1.1	8	2.968
19MAY86	0.84	6.3	0.5	0.6	10	1.853
19MAY86	0.88	9.7	0	1.5	13	4.24
19MAY86	0.81	8.8	0.8	2.4	13	6.501
19MAY86	0.87	10.7	0.2	1.9	24	5.122
19MAY86	0.85	9	1.1	0.7	24	1.943
19MAY86	0.9	7.6	16.5	72.5	41	
19MAY86	1	12.1	0.8	0.3	41	0.872
20MAY86	1	26.9	7.8	1	0	1.961
20MAY86	0.85	16	0.7	2.5	2	5.561
20MAY86	0.84	12.9	2.9	2.5	4	5.975
20MAY86	0.84	9.5	1.7	1.1	6	2.96
20MAY86	0.89	8.2	1.1	1	8	3.012
20MAY86	0.84	10.3	0.7	1.7	10	4.475
20MAY86	0.88	9.2	0.2	1.3	13	3.739
20MAY86	0.81	9.8	0.5	0.6	13	1.541
20MAY86	0.87	11.7	0.2	2.1	24	5.468
20MAY86	0.85	8.7	0.9	1.5	24	4.247
20MAY86	0.9		34.2	48.1	41	
20MAY86	1	8.8	0.2	1.5	41	4.991
20MAY86	0.94	8.9	0.5	3	50	9.453
20MAY86	1	10.6	0.4	0.7	50	2.156
20MAY86	1.03	29.5	0.1	1	56	1.984
20MAY86	0.85	8.8	0.3	1.1	56	3.099
20MAY86	0.84	9.8	0.6	2.2	66	5.93
20MAY86	0.96	9.7	0.1	1.3	66	4.001
20MAY86	0.89	8.9	0.3	1.2	76	3.529
20MAY86	0.94	9.9	0.7	1.8	76	5.389
20MAY86	0.9	11.9	0.7	0.7	86	1.85
20MAY86	1	11.1	0.4	0.2	96	0.603
20MAY86	1	11.9	1.2	2.3	96	6.814
21MAY86	1	24.2	5.4	0.2	0	0.419
21MAY86	0.85	14.8	2	1.8	2	4.102
21MAY86	0.84	12	2.6	0.3	4	0.729
21MAY86	0.84	11.4	1.6	0.9	6	2.253
21MAY86	0.89	8.5	1.2	0.2	8	0.591

AREA L: MAY 1986 PSYCHROMETER DATA

21MAY86	0.84	6.5	0.8	0.1	10	0.304
21MAY86	0.81	8.4	0.9	2.3	13	6.327
21MAY86	0.88	9	0.1	0.5	13	1.441
21MAY86	0.87	11.6	0.9	1.5	24	3.89
21MAY86	0.85	11	0.1	3.4	24	8.963
21MAY86	0.9	29.5	34	0	41	0
21MAY86	1	13.3	0.1	2.5	41	7.111
21MAY86	1	11.8	0.6	2	50	5.949
21MAY86	0.94	11.8	0.3	2.9	50	8.173
21MAY86	0.85	11.2	0.2	1.5	56	3.868
21MAY86	1.03	29.5	0.5	2.3	56	4.569
21MAY86	0.96	9	0.8	1.7	66	5.381
21MAY86	0.84	10.6	0.1	2.1	66	5.497
21MAY86	0.89	11.5	0.5	2.6	76	6.991
21MAY86	0.94	9.9	0	0.9	76	2.684
21MAY86	0.9	8.5	0.1	3.2	86	9.853
21MAY86	1	10.3	0.4	0.5	96	1.555
21MAY86	1	8.3	0.4	0.3	96	1.008
22MAY86	1	21.7	1.8	2.6	0	5.9
22MAY86	0.85	16.4	1.8	2.8	2	6.139
22MAY86	0.84	13	2.9	2.7	4	6.44
22MAY86	0.84	9.7	1.8	0.2	6	0.53
22MAY86	0.89	8.6	0	1.5	8	4.483
22MAY86	0.84	10.6	0.3	2.1	10	5.492
22MAY86	0.81	8.2	0.8	1.3	13	3.577
22MAY86	0.88	6.9	1.4	0.4	13	1.252
22MAY86	0.85	11.4	1.2	0.7	24	1.774
22MAY86	0.87	8.3	0.9	2	24	5.919
22MAY86	0.9	29.5	33.6	0	41	0
22MAY86	1	9.1	0.3	1.9	41	6.263
22MAY86	1	11.3	0.6	2.2	50	6.671
22MAY86	0.94	9.9	0.3	2.3	50	6.925
22MAY86	1.03	29.5	0	1.7	56	3.381
22MAY86	0.85	9.5	0	1	56	2.741
22MAY86	0.96	10.3	0.8	1.7	66	5.112
22MAY86	0.84	9.7	0.1	2.3	66	6.243
22MAY86	0.89	9.2	0.2	1.7	76	4.961
22MAY86	0.94	8.6	0.2	0.8	76	2.508
22MAY86	0.9	8.4	0.5	0.4	86	1.205
22MAY86	1	12	0.5	1.1	96	3.231
22MAY86	1	10.5	1.2	2.1	96	6.537
23MAY86	1	9	6.8	2.6	0	8.414
23MAY86	0.85	18	0.6	2.4	2	5.067
23MAY86	0.84	14.6	2.7	3.2	4	7.287
23MAY86	0.84	10.4	0.7	1.1	6	2.872
23MAY86	0.89	9.3	0.1	1.2	8	3.475
23MAY86	0.84	11.1	0.4	2.1	10	5.389
23MAY86	0.88	8.6	1.3	0.6	13	1.75
23MAY86	0.81	8.9	1	1.8	13	4.826
23MAY86	0.87	8.9	1	1.3	24	3.729
23MAY86	0.85	11.6	0.4	2	24	5.097
23MAY86	1	12.3	0.7	1.4	41	4.075
23MAY86	0.9	8.5	1.6	3.1	41	9.473
23MAY86	0.94	9.8	0.4	0	50	0
23MAY86	1	12.1	0.7	1.5	50	4.399
23MAY86	0.85	11.6	0.3	2.1	56	5.358

AREA L: MAY 1986 PSYCHROMETER DATA

23MAY86	1.03	29.5	0.7	1.7	56	3.369
23MAY86	0.96	12.2	0.6	1.9	66	5.348
23MAY86	0.84	10.9	0.7	2.1	66	5.422
23MAY86	0.89	11.5	0.6	1.7	76	4.539
23MAY86	0.94	8.9	0.1	1.1	76	3.417
23MAY86	0.9	9.9	0.4	0.6	86	1.706
23MAY86	1	12.3	1.2	1.6	96	4.653
23MAY86	1	9.1	0.6	0.8	96	2.61
24MAY86	1	16.7	9.1	3.2	0	7.931
24MAY86	0.85	14.1	0.8	0.4	2	0.928
24MAY86	0.84	14.6	0.9	1.6	4	3.638
24MAY86	0.84	13.7	0.8	2.7	6	6.357
24MAY86	0.89	11.7	0.9	0.9	8	2.37
24MAY86	0.84	7.5	1	0	10	0
24MAY86	0.88	10.1	0.7	0.6	13	1.654
24MAY86	0.81	7.8	0.3	2.2	13	6.221
24MAY86	0.87	11.9	0.4	1.3	24	3.339
24MAY86	0.85	7.8	0.2	2.3	24	6.834
24MAY86	0.9	10.3	1.6	2.8	41	7.933
24MAY86	1	12.3	0.7	0.6	41	1.737
24MAY86	0.94	8.5	0.7	0	50	0
24MAY86	1	11.1	0.2	0.6	50	1.815
24MAY86	0.85	8.9	0	0.4	56	1.118
24MAY86	1.03	29.5	0.1	0.5	56	0.991
24MAY86	0.84	9.1	1.1	3.1	66	8.641
24MAY86	0.96	9	0.8	1.6	66	5.06
24MAY86	0.89	11.4	0.7	2.6	76	7.009
24MAY86	0.94	11.3	0	0.5	76	1.412
24MAY86	0.9	8.6	0.8	0.7	86	2.094
24MAY86	1	12.1	0.8	2	96	5.882
24MAY86	1	9.7	0.1	0.1	96	0.318
25MAY86	1	12.8	10.6	0.5	0	1.362
25MAY86	0.85	14.7	0.6	1.4	2	3.213
25MAY86	0.84	14.4	2.3	2.9	4	6.644
25MAY86	0.84	11.1	1.3	0.5	6	1.263
25MAY86	0.89	10.2	0.4	1.8	8	5.05
25MAY86	0.84	10.4	0.2	2.4	10	6.342
25MAY86	0.88	8.9	1.4	0.5	13	1.439
25MAY86	0.81	10.7	0.7	2.5	13	6.289
25MAY86	0.85	11.8	0.9	0.8	24	2.003
25MAY86	0.87	8.2	0.3	2.2	24	6.567
25MAY86	1	13.4	0.2	2.2	41	6.223
25MAY86	0.9	12.8	0.2	2.3	41	5.975
25MAY86	1	9.6	0.1	1.2	50	3.859
25MAY86	0.94	9.6	0.3	2.5	50	7.63
25MAY86	0.85	10.5	0.4	1.7	56	4.5
25MAY86	1.03	29.5	0.3	1.7	56	3.376
25MAY86	0.96	8.3	0.1	1.1	66	3.577
25MAY86	0.84	11.2	1.2	2.8	66	7.171
25MAY86	0.89	8.7	0.1	1.4	76	4.161
25MAY86	0.94	8.5	0.1	0.7	76	2.203
25MAY86	0.9	8.2	0.1	0.1	86	0.304
25MAY86	1	10	0.2	0.1	96	0.314
25MAY86	1	11.3	0.6	1.6	96	4.831
26MAY86	1	20.7	8.3	3.3	0	7.441
26MAY86	0.85	15.5	1.6	2.3	2	5.161

AREA L: MAY 1986 PSYCHROMETER DATA

26MAY86	0.84	14.4	1.9	2.3	4	5.259
26MAY86	0.84	11.1	1.3	0.4	6	1.01
26MAY86	0.89	10.7	0.5	2.8	8	7.765
26MAY86	0.84	11.4	0.9	0.9	10	2.26
26MAY86	0.88	9.6	0.1	2	13	5.696
26MAY86	0.81	7	0.3	1.2	13	3.483
26MAY86	0.87	9	0.3	2.4	24	6.94
26MAY86	0.85	11.6	1	0.5	24	1.258
26MAY86	0.9	13.9	0.5	2.1	41	5.252
26MAY86	1	10.3	0.6	0.4	41	1.242
26MAY86	1	10.8	0.2	1.4	50	4.306
26MAY86	0.94	9.2	0.1	2.5	50	7.761
26MAY86	1.03	29.5	0.2	0.9	56	1.785
26MAY86	0.85	8.6	0.1	0.9	56	2.555
26MAY86	0.96	8.3	0.8	1.9	66	6.202
26MAY86	0.84	9.8	0.8	2.8	66	7.578
26MAY86	0.89	11.4	0.4	1.8	76	4.831
26MAY86	0.94	9.3	0.1	0.3	76	0.911
26MAY86	0.9	8.7	1.4	0.9	86	2.679
26MAY86	1	9.9	0.1	0.5	96	1.581
26MAY86	1	12	1.1	1.7	96	5
27MAY86	1	12.9	9.2	1.2	0	3.292
27MAY86	0.85	12.3	0.4	0.1	2	0.246
27MAY86	0.84	11.9	1.4	0.4	4	0.982
27MAY86	0.84	14.1	1	2	6	4.626
27MAY86	0.89	10	1	0.9	8	2.52
27MAY86	0.84	9.1	1.1	1.3	10	3.569
27MAY86	0.88	11.2	0	1.1	13	2.931
27MAY86	0.81	9.2	0.2	2.7	13	7.231
27MAY86	0.87	10.9	0.2	3	24	8.095
27MAY86	0.85	12.1	0.5	2.4	24	6.025
27MAY86	1	13.2	0.5	2.8	41	7.992
27MAY86	0.9	12.6	0	1.8	41	4.695
27MAY86	0.94	11.8	0	2.5	50	7.035
27MAY86	1	11.5	2.8	1.2	50	3.552
27MAY86	1.03	29.5	0.8	1.1	56	2.176
27MAY86	0.85	11.7	4.5	1.1	56	2.726
27MAY86	0.96	8.2	1.5	0.8	66	2.59
27MAY86	0.84	10.8	2.6	2.2	66	5.657
27MAY86	0.89	9.2	3.4	1.9	76	5.476
27MAY86	0.94	11.3	0.9	1.3	76	3.677
27MAY86	0.9	12.1	2.3	0.3	86	0.78
27MAY86	1	11.2	0.5	0.9	96	2.715
27MAY86	1	9	4.1	0.2	96	0.642
28MAY86	1	19.9	14.3	2.7	0	6.016
28MAY86	0.85	15	1.3	2.5	2	5.705
28MAY86	0.84	15.4	1	0.6	4	1.325
28MAY86	0.84	12	1.4	0.4	6	0.978
28MAY86	0.89	8.4	0.6	0.2	8	0.595
28MAY86	0.84	7.9	0.1	1.5	10	4.356
28MAY86	0.81	10.4	0.5	3.4	13	8.722
28MAY86	0.88	10.7	0.8	1	13	2.701
28MAY86	0.87	7.5	1	2.1	24	6.437
28MAY86	0.85	8.3	1.2	0.8	24	2.287
28MAY86	0.9	8.2	0.9	0.1	41	0.303
28MAY86	1	7.8	0.6	0.6	41	2.063

AREA L: MAY 1986 PSYCHROMETER DATA

28MAY86	0.94	8.3	0.6	2.6	50	8.369
28MAY86	1	9.6	3.8	0.8	50	2.524
28MAY86	0.85	8.6	5.5	3.5	56	9.924
28MAY86	1.03	29.5	1.3	1.2	56	2.368
28MAY86	0.96	8.2	1.9	0.7	66	2.261
28MAY86	0.84	8.5	4	1.7	66	4.74
28MAY86	0.94	8.6	2.4	0.3	76	0.928
28MAY86	0.89	9	4.9	0.8	76	2.289
28MAY86	0.9	12.5	2.6	0.1	86	0.256
28MAY86	1	11.7	3.8	0.8	96	2.335
28MAY86	1	11.7	0.5	1.3	96	3.863
29MAY86	1	22.7	2.1	0	0	0
29MAY86	0.85	12.1	0.3	0.1	2	0.247
29MAY86	0.84	13.7	0.2	0.4	4	0.931
29MAY86	0.84	13.7	0.1	3	6	7.101
29MAY86	0.89	10.9	1.2	3.2	8	8.808
29MAY86	0.84	10.6	1.2	0.8	10	2.064
29MAY86	0.81	7.7	0.9	1.5	13	4.222
29MAY86	0.88	6.9	1.3	0.9	13	2.831
29MAY86	0.85	12	1.2	0.8	24	1.987
29MAY86	0.87	7.6	0.2	2.3	24	7.056
29MAY86	1	13.7	0.5	2.9	41	8.151
29MAY86	0.9	13.9	0	2.3	41	5.773
29MAY86	0.94	11.8	0.1	2	50	5.605
29MAY86	1	9.2	3.4	0.9	50	2.892
29MAY86	1.03	29.5	1.1	0.5	56	0.986
29MAY86	0.85	9.8	4.9	0.2	56	0.527
29MAY86	0.84	9	3.2	1.9	66	5.216
29MAY86	0.96	9.5	1.8	0.6	66	1.837
29MAY86	0.89	9	4.1	1.1	76	3.166
29MAY86	0.94	11.4	1.5	1.1	76	3.087
29MAY86	0.9	9.8	2.7	3.2	86	9.231
29MAY86	1	9.6	0.1	1.1	96	3.535
29MAY86	1	8.6	4.5	0	96	0
30MAY86	1	18	0.6	2.4	0	5.961
30MAY86	0.85	14.6	2.7	3.2	2	7.373
30MAY86	0.84	10.4	0.7	1.1	4	2.872
30MAY86	0.84	9.3	0.1	1.2	6	3.28
30MAY86	0.89	11.1	0.4	2.1	8	5.71
30MAY86	0.84	8.9	1	1.8	10	5.005
30MAY86	0.81	8.6	1.3	0.6	13	1.611
30MAY86	0.88	11.6	0.4	2	13	5.277
30MAY86	0.87	8.5	1.6	3.1	24	9.157
30MAY86	0.85	8.9	1	1.3	24	3.643
30MAY86	0.9	12.3	0.7	1.4	41	3.667
30MAY86	0.94	9.3	0.3	2.3	50	7.093
30MAY86	1	11.3	3.6	1.2	50	3.565
30MAY86	0.85	9.3	3.5	2.1	56	5.764
30MAY86	1.03	29.5	0.3	2	56	3.974
30MAY86	0.84	10.3	3.4	2.2	66	5.744
30MAY86	0.96	8.8	0.8	1.7	66	5.425
30MAY86	0.89	11.3	4.1	2.1	76	5.576
30MAY86	0.94	9.7	2.3	0	76	0
30MAY86	0.9	9.5	2.3	0.6	86	1.719
30MAY86	1	11	0.9	0.7	96	2.12
30MAY86	1	11.8	4.1	0.8	96	2.324

AREA L: MAY 1986 PSYCHROMETER DATA

31MAY86	1	16.7	9.1	3.2	0	7.931
31MAY86	0.85	14.1	0.8	0.4	2	0.928
31MAY86	0.84	14.6	0.9	1.6	4	3.638
31MAY86	0.84	13.7	0.8	2.7	6	6.357
31MAY86	0.89	11.7	0.9	0.9	8	2.37
31MAY86	0.84	7.5	1	0	10	0
31MAY86	0.88	10.1	0.7	0.6	13	1.654
31MAY86	0.81	7.8	0.3	2.2	13	6.221
31MAY86	0.85	7.8	0.2	2.3	24	6.834
31MAY86	0.87	11.9	0.4	1.3	24	3.339
31MAY86	1	12.3	0.7	0.6	41	1.737
31MAY86	0.9	10.3	1.6	2.8	41	7.933
31MAY86	1	9.6	3.6	0.7	50	2.208
31MAY86	0.94	9.3	0.4	1.6	50	4.903
31MAY86	1.03	29.5	0.7	1.5	56	2.971
31MAY86	0.85	10.2	4.6	0.5	56	1.303
31MAY86	0.96	9.2	1	1.4	66	4.381
31MAY86	0.84	10	3.5	1.6	66	4.205
31MAY86	0.89	11.2	3.5	2	76	5.34
31MAY86	0.94	11.1	1.7	0.2	76	0.563
31MAY86	0.9	8.2	2.5	3.2	86	9.876
31MAY86	1	8.2	0.3	1.8	96	6.154
31MAY86	1	12.2	4.1	0.4	96	1.143

AREA L: JUNE 1986 PSYCHROMETER DATA

DATE	CORRECTION	TEMP (DEG C)	OFFSET (MICROVOLTS)	READING (MICROVOLTS)	DEPTH (FT)	WATER POTENTIAL (-BARS)
01JUN86	1	12.8	10.6	0.5	0	1.362
01JUN86	0.85	14.7	0.6	1.4	2	3.213
01JUN86	0.84	14.4	2.3	2.9	4	6.644
01JUN86	0.84	11.1	1.3	0.5	6	1.265
01JUN86	0.89	10.2	0.4	1.8	8	5.05
01JUN86	0.84	10.4	0.2	2.4	10	6.342
01JUN86	0.88	8.9	1.4	0.5	13	1.439
01JUN86	0.81	10.7	0.7	2.5	13	6.289
01JUN86	0.87	8.2	0.3	2.2	24	6.567
01JUN86	0.85	11.8	0.9	0.8	24	2.003
01JUN86	0.9	12.8	0.2	2.3	41	5.975
01JUN86	1	13.4	0.2	2.2	41	6.223
01JUN86	0.94	10.1	0.4	2.3	50	6.869
01JUN86	1	11.2	3.7	1.8	50	5.387
01JUN86	1.03	29.5	1	1	56	1.975
01JUN86	0.85	9.1	4.7	0.9	56	2.454
01JUN86	0.96	9.8	1.3	2	66	6.132
01JUN86	0.84	11.7	3.5	2.5	66	6.21
01JUN86	0.89	12	5	0.9	76	2.303
01JUN86	0.94	8.4	1.2	1.3	76	4.109
01JUN86	0.9	12.5	3.5	3.3	86	8.589
01JUN86	1	10.4	4.2	1.2	96	3.675
01JUN86	1	8.8	0.7	0.4	96	1.316
02JUN86	1	20.7	8.3	3.3	0	7.441
02JUN86	0.85	15.5	1.6	2.3	2	5.161
02JUN86	0.84	14.4	1.9	2.3	4	5.259
02JUN86	0.84	11.1	1.3	0.4	6	1.01
02JUN86	0.89	10.7	0.5	2.8	8	7.765
02JUN86	0.84	11.4	0.9	0.9	10	2.26
02JUN86	0.81	7			13	
02JUN86	0.88	9.6	0.1	2	13	5.696
02JUN86	0.87	9	0.3	2.4	24	6.94
02JUN86	0.85	11.6	1	0.5	24	1.258
02JUN86	1	10.3	0.6	0.4	41	1.242
02JUN86	0.9	13.9	0.5	2.1	41	5.252
02JUN86	0.94	11.9	0.2	3	50	8.435
02JUN86	1	10.7	3.5	1.3	50	3.952
02JUN86	0.85	11.3	4.4	1.6	56	4.037
02JUN86	1.03	29.5	1	0.8	56	1.579
02JUN86	0.96	8.9	1.6	1	66	3.149
02JUN86	0.84	10.3	3.3	2.3	66	6.013
02JUN86	0.89	9.1	5.2	1.1	76	3.139
02JUN86	0.94	8.7	1.5	0.6	76	1.86
02JUN86	0.9	10	3.5	2.9	86	8.25
02JUN86	1	10.7	0.7	1.1	96	3.381
02JUN86	1	10.1	4.9	3.5	96	11.01
03JUN86	1	12.9	9.2	1.2	0	3.292
03JUN86	0.85	12.3	0.4	0.1	2	0.246
03JUN86	0.84	11.9	1.4	0.4	4	0.982
03JUN86	0.84	14.1	1	2	6	4.626
03JUN86	0.89	10	1	0.9	8	2.52

AREA L: JUNE 1986 PSYCHROMETER DATA

03JUN86	0.84	9.1	1.1	1.3	10	3.569
03JUN86	0.88	11.2	0	1.1	13	2.931
03JUN86	0.81	9.2	0.2	2.7	13	7.231
03JUN86	0.85	12.1	0.5	2.4	24	6.025
03JUN86	0.87	10.9	0.2	3	24	8.095
03JUN86	0.9	12.6	0	1.8	41	4.695
03JUN86	1	13.2	0.5	2.8	41	7.992
03JUN86	1	8.6	4	0.6	50	1.966
03JUN86	0.94	9.2	0.2	2.3	50	7.124
03JUN86	0.85	11.9	4.9	1.5	56	3.695
03JUN86	1.03	29.5	0.6	1.6	56	3.171
03JUN86	0.96	9.8	1	2	66	6.14
03JUN86	0.84	12	3.1	2.5	66	6.155
03JUN86	0.94	9.7	1.4	0.4	76	1.19
03JUN86	0.89	11.8	4.3	2.3	76	6.002
03JUN86	0.9	7.9	2.9	0.5	86	1.524
03JUN86	1	8	4	0	96	0
03JUN86	1	10.4	0.7	0.6	96	1.858
04JUN86	1	19.9	14.3	2.7	0	6.016
04JUN86	0.85	15	1.3	2.5	2	5.705
04JUN86	0.84	15.4	1	0.6	4	1.325
04JUN86	0.84	12	1.4	0.4	6	0.978
04JUN86	0.89	8.4	0.6	0.2	8	0.595
04JUN86	0.84	7.9	0.1	1.5	10	4.356
04JUN86	0.88	10.7	0.8	1	13	2.701
04JUN86	0.81	10.4	0.5	3.4	13	8.722
04JUN86	0.87	7.5	1	2.1	24	6.437
04JUN86	0.85	8.3	1.2	0.8	24	2.287
04JUN86	0.9	8.2	0.9	0.1	41	0.303
04JUN86	1	7.8	0.6	0.6	41	2.063
04JUN86	0.94	9.3	0.7	3	50	9.29
04JUN86	1	10.7	3.8	0.1	50	0.301
04JUN86	1.03	29.5	0.7	1.4	56	2.772
04JUN86	0.85	11.7	4.3	1.9	56	4.738
04JUN86	0.84	12	3.1	2.4	66	5.905
04JUN86	0.96	11.3	0.7	1.9	66	5.517
04JUN86	0.94	8.3	0.2	0.9	76	2.86
04JUN86	0.89	10	4	0.9	76	2.487
04JUN86	0.9	10.8	2.2	1	86	2.736
04JUN86	1	10	0.4	0.3	96	0.942
04JUN86	1	9.4	2.5	1.7	96	5.474
05JUN86	1	22.7	2.1	0	0	0
05JUN86	0.85	12.1	0.3	0.1	2	0.247
05JUN86	0.84	13.7	0.2	0.4	4	0.931
05JUN86	0.84	13.7	0.1	3	6	7.101
05JUN86	0.89	10.9	1.2	3.2	8	8.808
05JUN86	0.84	10.6	1.2	0.8	10	2.064
05JUN86	0.81	7.7	0.9	1.5	13	4.222
05JUN86	0.88	6.9	1.3	0.9	13	2.831
05JUN86	0.87	7.6	0.2	2.3	24	7.056
05JUN86	0.85	12	1.2	0.8	24	1.987
05JUN86	1	13.7	0.5	2.9	41	8.151
05JUN86	0.9	13.9	0	2.3	41	5.773
05JUN86	0.94	8.2	0.2	2.8	50	9.084
05JUN86	1	10.5	1.8	0.9	50	2.769
05JUN86	0.85	8.8	2.2	0.7	56	1.95

AREA L: JUNE 1986 PSYCHROMETER DATA

05JUN86	1.03	29.5	0.5	1	56	1.98
05JUN86	0.84	9.1	0.3	2	66	5.542
05JUN86	0.96	8.3	0.5	1.2	66	3.899
05JUN86	0.94	7.8	0.3	0.5	76	1.617
05JUN86	0.89	8.3	1.8	1.3	76	3.897
05JUN86	0.9	8.2	0.8	0.1	86	0.303
05JUN86	1	9.8	0.6	1.2	96	3.82
05JUN86	1	7.8	1.5	0.1	96	0.341
06JUN86	1	24.7	9.6	3.5	0	7.186
06JUN86	0.85	12.7	0.3	1.4	2	3.424
06JUN86	0.84	14.7	0.1	1.8	4	4.101
06JUN86	0.84	13.7	0.4	2.6	6	6.129
06JUN86	0.89	12.6	0	2.6	8	6.744
06JUN86	0.84	11	0.9	1.9	10	4.876
06JUN86	0.81	10.5	0.1	3	13	7.655
06JUN86	0.88	9.1	1.1	0.7	13	2.004
06JUN86	0.87	11.6	0.3	3	24	7.887
06JUN86	0.85	10.8	0.6	2.2	24	5.776
06JUN86	0.9	11.9	0.3	0.2	41	0.528
06JUN86	1	8.2	0.7	1.6	41	5.451
06JUN86	1	10	0.8	2.2	50	6.998
06JUN86	0.94	11.7	0.8	2.6	50	7.321
06JUN86	1.03	29.5	0.1	1.9	56	3.778
06JUN86	0.85	10.3	0.6	0.8	56	2.118
06JUN86	0.96	8.3	0.1	1.1	66	3.577
06JUN86	0.84	11.1	0.2	1.9	66	4.873
06JUN86	0.89	8.6	0.4	1.6	76	4.777
06JUN86	0.94	8	0.3	1	76	3.219
06JUN86	0.9	8.9	0.3	0.2	86	0.59
06JUN86	1	12.3	0.7	1.6	96	4.663
06JUN86	1	11.6	0.9	1.9	96	5.68
07JUN86	1	29.6	4.3	0.7	0	1.316
07JUN86	0.85	16.1	0.3	2.9	2	6.46
07JUN86	0.84	15.2	0	0.6	4	1.339
07JUN86	0.84	13.4	0.1	3	6	7.169
07JUN86	0.89	13	0.1	2.4	8	6.131
07JUN86	0.84	11.5	0.4	2.3	10	5.826
07JUN86	0.81	10	0.7	1.9	13	4.886
07JUN86	0.88	7.7	1.6	3.5	13	10.87
07JUN86	0.85	7.8	1.4	0.6	24	1.747
07JUN86	0.87	7.4	1.1	1.7	24	5.213
07JUN86	1	12.7	0.4	1.4	41	4.026
07JUN86	0.9	7.8	0.9	3.1	41	9.796
07JUN86	0.94	9.1	0.2	2.8	50	8.746
07JUN86	1	11.2	0.1	1.1	50	3.329
07JUN86	1.03	29.5	0.4	2.1	56	4.172
07JUN86	0.85	9.1	0.3	1	56	2.781
07JUN86	0.96	12.2	0.6	2.2	66	6.205
07JUN86	0.84	12.1	0.1	2	66	4.957
07JUN86	0.94	9.6	0.4	1.1	76	3.318
07JUN86	0.89	10.8	0.2	1.7	76	4.664
07JUN86	0.9	9.7	0.1	3.4	86	9.98
07JUN86	1	8.5	0.4	0.7	96	2.341
07JUN86	1	9.1	1	0.7	96	2.278
08JUN86	1	28.9	8.3	0.5	0	0.936
08JUN86	0.85	16.1	1.7	2.9	2	6.417

AREA L: JUNE 1986 PSYCHROMETER DATA

08JUN86	0.84	15.7	0.4	1.5	4	3.311
08JUN86	0.84	14	0.7	2.1	6	4.882
08JUN86	0.89	11.1	1.1	1.1	8	2.96
08JUN86	0.84	11.9	0.1	2.5	10	6.262
08JUN86	0.88	11.4	0.3	1.9	13	5.048
08JUN86	0.81	11.4	0.6	3.1	13	7.638
08JUN86	0.87	10.9	0.4	1.1	24	2.924
08JUN86	0.85	12.4	0.9	2.5	24	6.205
08JUN86	0.9	13.1	0.2	3.2	41	8.281
08JUN86	1	13.6	0.6	2.8	41	7.886
08JUN86	0.94	11.4	0.4	2.7	50	7.704
08JUN86	1	9.3	0.4	1.4	50	4.557
08JUN86	0.85	11.1	0.3	1.3	56	3.358
08JUN86	1.03	29.5	0.3	1.8	56	3.575
08JUN86	0.96	11.9	0.7	2.5	66	7.137
08JUN86	0.84	10.7	0.2	1.5	66	3.893
08JUN86	0.94	9.6	0	0.8	76	2.412
08JUN86	0.89	11.4	0.6	1.9	76	5.098
08JUN86	0.9	8.6	0.3	0.4	86	1.196
08JUN86	1	10.3	1.3	1.2	96	3.736
08JUN86	1	10.4	0.9	1.5	96	4.672
09JUN86	1	14	11.3	3.6	0	9.586
09JUN86	0.85	15	1	2	2	4.557
09JUN86	0.84	14.4	0.5	1.4	4	3.205
09JUN86	0.84	14.2	0	2.7	6	6.282
09JUN86	0.89	13.3	0.4	2.2	8	5.551
09JUN86	0.84	10.9	1	0.8	10	2.043
09JUN86	0.88	7.1	0.7	0	13	0
09JUN86	0.81	8	1.1	1.2	13	3.323
09JUN86	0.85	11.8	0	3	24	7.662
09JUN86	0.87	8.9	1	1.9	24	5.476
09JUN86	1	12.8	0.7	1.1	41	3.143
09JUN86	0.9	10.7	0.1	2.8	41	7.866
13JUN86	1	9.5	7.9	2.4	0	7.561
13JUN86	0.85	17.8	0.2	3.4	2	7.264
13JUN86	0.84	15.2	1.9	0.6	4	1.327
13JUN86	0.84	12.3	1.3	0.7	6	1.699
13JUN86	0.89	9.4	0.1	1.7	8	4.924
13JUN86	0.84	12.4	0.2	3.1	10	7.66
13JUN86	0.81	10.4	1.3	1.7	13	4.287
13JUN86	0.88	8.7	1.7	3.5	13	10.4
13JUN86	0.85	9.1	0.9	1.3	24	3.615
13JUN86	0.87	9.1	0.7	2.2	24	6.314
13JUN86	0.9	12.1	0.1	2.8	41	7.478
13JUN86	1	12.6	0.8	0.7	41	2.007
14JUN86	1	11.3	10.5	0.9	0	2.589
14JUN86	0.85	18.6	1.2	1.7	2	3.515
14JUN86	0.84	12.4	0.5	1.5	4	3.661
14JUN86	0.84	14.7	0.5	2.6	6	5.941
14JUN86	0.89	11.2	0.9	0.4	8	1.068
14JUN86	0.84	8.7	0.5	0.8	10	2.229
14JUN86	0.88	10.9	0.2	2.3	13	6.244
14JUN86	0.81	8.8	0.4	2.5	13	6.789
14JUN86	0.87	8.9	1	1.6	24	4.6
14JUN86	0.85	11.5	1	0.9	24	2.278
14JUN86	1	11.9	0.9	1.4	41	4.127

AREA L: JUNE 1986 PSYCHROMETER DATA

14JUN86	0.9	8.6	0.9	3.5	41	10.72
15JUN86	1	35.4	12.9	3.3	0	5.248
15JUN86	0.85	18.2	2.4	3.1	2	6.478
15JUN86	0.84	14.5	2.2	3	4	6.859
15JUN86	0.84	11.3	1.6	0	6	0
15JUN86	0.89	11	0.4	2.9	8	7.962
15JUN86	0.84	12.1	0.6	1.4	10	3.448
15JUN86	0.88	10.4	0.1	2.2	13	6.084
15JUN86	0.81	7.4	0.3	1.5	13	4.289
15JUN86	0.85	10.1	1.3	0.3	24	0.795
15JUN86	0.87	8.4	0	2.4	24	7.125
15JUN86	0.9	13.6	0.3	1.3	41	3.268
15JUN86	1	11.1	0.5	1.6	41	4.868
16JUN86	1	28.1	0.2	2.6	0	5.183
16JUN86	0.85	20.5	1.9	4	2	7.966
16JUN86	0.84	16.9	1.2	2.2	4	4.702
16JUN86	0.84	13.7	1.8	0.6	6	1.388
16JUN86	0.89	9.5	0.9	0	8	0
16JUN86	0.84	10.9	0.5	2.8	10	7.274
16JUN86	0.88	11.6	1	0.7	13	1.825
16JUN86	0.81	12	0.2	3.2	13	7.737
16JUN86	0.85	9.1	1.2	0.3	24	0.827
16JUN86	0.87	9.9	0.2	2.5	24	6.981
16JUN86	0.9	14.1	0.4	2.1	41	5.222
16JUN86	1	14.3	0.4	2.3	41	6.324
17JUN86	1	20.2	2.3	0.4	0	0.928
17JUN86	0.85	23.7	1.8	3.7	2	6.861
17JUN86	0.84	21.6	1	2.7	4	5.18
17JUN86	0.84	19.5	1	3.2	6	6.451
17JUN86	0.89	17.5	0.7	2.6	8	5.823
17JUN86	0.84	14.6	1.3	1.7	10	3.861
17JUN86	0.88	10.8	2.1	1.1	13	2.946
17JUN86	0.81	11.7	1.6	1.5	13	3.598
17JUN86	0.85	12.5	0.5	1.4	24	3.443
17JUN86	0.87	10.7	1.3	1.6	24	4.282
17JUN86	1	14.9	0.7	2.1	41	5.657
17JUN86	0.9	9.7	1	2.8	41	8.144
18JUN86	1	18	1.9	2.5	0	6.174
18JUN86	0.85	23	1.3	1.8	2	3.375
18JUN86	0.84	16.7	2.3	0.2	4	0.423
18JUN86	0.84	14.5	1.5	1.1	6	2.495
18JUN86	0.89	13.1	0.2	2.7	8	6.886
18JUN86	0.84	14.4	0.2	3.5	10	8.128
18JUN86	0.88	9.5	1.6	0	13	0
18JUN86	0.81	13	1	2.3	13	5.322
18JUN86	0.85	10.2	0.4	2	24	5.367
18JUN86	0.87	10.4	0.3	2.6	24	7.124
18JUN86	0.9	14.2	0.1	2.3	41	5.717
18JUN86	1	13.9	0.1	2.6	41	7.261

AREA L: AUGUST 1986 PSYCHROMETER DATA

DATE	CORRECTION	TEMP (DEG C)	OFFSET (MICROVOLTS)	READING (MICROVOLTS)	DEPTH (FT)	WATER POTENTIAL (-BARS)
17AUG86	1	11.7	9.3	2.5	0	7.205
17AUG86	0.85	19.8	0.8	2.4	2	4.85
17AUG86	0.84	20.4	0.7	2.6	4	5.128
17AUG86	0.84	18.2	0.6	2.7	6	5.613
17AUG86	0.89	15	0.4	2.3	8	5.512
17AUG86	0.84	12.8	0.2	1.9	10	4.594
17AUG86	0.81	10	0.3	2.2	13	5.681
17AUG86	0.88	9.6	2	0.3	13	0.836
17AUG86	0.85	8.6	0.7	2	24	5.715
17AUG86	0.87	11.3	0	1.7	24	4.481
17AUG86	0.9	14.2	0.3	1	41	2.464
17AUG86	1	10.1	0.3	1.5	41	4.738
18AUG86	1	14.9	8.8	1.6	0	4.142
18AUG86	0.85	23.4	0.2	3.4	2	6.391
18AUG86	0.84	21.3	1.3	3	4	5.792
18AUG86	0.84	18.1	1.6	2.9	6	6.021
18AUG86	0.89	16.5	0.5	2.8	8	6.45
18AUG86	0.84	14.4	0.9	2.7	10	6.218
18AUG86	0.81	12.6	0.7	2.9	13	6.838
18AUG86	0.88	12	2.2	0.3	13	0.765
18AUG86	0.87	10.6	0.7	1.8	24	4.856
18AUG86	0.85	8.4	0.7	1.7	24	4.886
18AUG86	0.9	8.7	1.1	3	41	9.102
18AUG86	1	12.6	0.1	2.3	41	6.686
19AUG86	1	24.5	48	0.1	0	0.172
19AUG86	0.85	20	0.8	1.3	2	2.603
19AUG86	0.84	17.6	1.6	0.7	4	1.456
19AUG86	0.84	16.5	0.9	2.6	6	5.636
19AUG86	0.89	16	0.4	3.5	8	8.21
19AUG86	0.84	14.9	0.3	3.4	10	7.769
19AUG86	0.88	12.2	2	0.8	13	2.036
19AUG86	0.81	12.7	0.5	3.2	13	7.543
19AUG86	0.87	8.2	0	2.7	24	8.107
19AUG86	0.85	8.8	1.1	1	24	2.806
19AUG86	1	13	0.4	2.5	41	7.171
19AUG86	0.9	10.2	0.4	1.5	41	4.246
20AUG86	1	24.7	7.4	3.4	0	7.054
20AUG86	0.85	23.4	0	2.8	2	5.257
20AUG86	0.84	20.1	2.2	1.2	4	2.352
20AUG86	0.84	19.1	1	3.3	6	6.719
20AUG86	0.89	17.4	0	3.4	8	7.691
20AUG86	0.84	14.9	0.8	2.5	10	5.668
20AUG86	0.88	10.1	2	1.5	13	4.138
20AUG86	0.81	11.2	0.9	2	13	4.917
20AUG86	0.85	12.7	0.2	3	24	7.42
20AUG86	0.87	12	0.4	1.2	24	3.07
20AUG86	1	13.6	0.1	2.5	41	7.043
20AUG86	0.9	12.5	0.4	1.9	41	4.967
21AUG86	1	13.1	6.5	0.9	0	2.478
21AUG86	0.85	22.8	0.1	3.4	2	6.477
21AUG86	0.84	21.6	1.5	1.7	4	3.241
21AUG86	0.84	16.8	1.9	1	6	2.123

AREA L: AUGUST 1986 PSYCHROMETER DATA

21AUG86	0.89	15.1	0.3	2.7	8	6.471
21AUG86	0.84	14.9	0	3.6	10	8.248
21AUG86	0.88	11.6	2.1	0.1	13	0.258
21AUG86	0.81	14.1	0.7	2.9	13	6.514
21AUG86	0.85	10.5	0.5	2.5	24	6.656
21AUG86	0.87	11.7	0.6	2.3	24	5.986
21AUG86	1	12.3	0.4	2.2	41	6.447
21AUG86	0.9	13.8	0.3	1.8	41	4.511
22AUG86	1	26.5	32.9	17.3	0	31.9
22AUG86	0.85	22.7	0.2	3	2	5.716
22AUG86	0.84	21.1	0.3	2.8	4	5.452
22AUG86	0.84	18.9	0.9	3.2	6	6.547
22AUG86	0.89	17.2	0.2	3.4	8	7.724
22AUG86	0.84	15.1	0.2	3.5	10	7.959
22AUG86	0.81	13.9	0.4	3.8	13	8.652
22AUG86	0.88	13.7	0.7	2.2	13	5.412
22AUG86	0.87	11.8	0.6	2.4	24	6.229
22AUG86	0.85	12.2	0.2	2.9	24	7.291
22AUG86	0.9	13.9	0.2	2.4	41	6.022
22AUG86	1	12.9	0.2	2.6	41	7.495
23AUG86	1	15.3	29.2	2.8	0	6.604
23AUG86	0.85	22	1.4	1.6	2	3.061
23AUG86	0.84	19.9	1.8	1.8	4	3.56
23AUG86	0.84	20.4	0.8	2.6	6	5.126
23AUG86	0.89	17.8	0.3	2.7	8	6.016
23AUG86	0.84	15.5	0	3	10	6.729
23AUG86	0.88	14.9	0.8	1.8	13	4.258
23AUG86	0.81	14.5	0.4	3.7	13	8.263
23AUG86	0.87	11.2	0.4	3.3	24	8.819
23AUG86	0.85	11.7	0.5	2	24	5.077
23AUG86	0.9	11.7	0.1	0.8	41	2.136
23AUG86	1	11.1	0.2	1.4	41	4.259
24AUG86	1	15.8	1.1	8.3	0	22.61
24AUG86	0.85	21.2	1	0.5	2	0.971
24AUG86	0.84	17.8	1.6	0.1	4	0.206
24AUG86	0.84	17.3	0.7	2.7	6	5.739
24AUG86	0.89	17.2	0.3	2.9	8	6.568
24AUG86	0.84	14.5	0.1	2.9	10	6.692
24AUG86	0.88	14.7	1.3	2.3	13	5.476
24AUG86	0.81	13.4	0.3	4.3	13	9.988
24AUG86	0.87	8.7	0.6	2.3	24	6.719
24AUG86	0.85	10.8	0.7	0.9	24	2.339
24AUG86	1	14	0.3	2.7	41	7.515
24AUG86	0.9	11	0.3	2.1	41	5.798
25AUG86	1	21.9	28	0.4	0	0.795
25AUG86	0.85	21	0.5	0.8	2	1.566
25AUG86	0.84	17.6	1.6	3.4	4	7.167
25AUG86	0.84	18.2	1.6	2.7	6	5.587
25AUG86	0.89	15.9	0.9	2.2	8	5.125
25AUG86	0.84	13.1	1.4	1	10	2.368
25AUG86	0.88	12.5	0.7	2.8	13	7.192
25AUG86	0.81	10.3	0	2.5	13	6.406
25AUG86	0.85	12.5	0.1	2.2	24	5.45
25AUG86	0.87	8.3	0	2.3	24	6.851
25AUG86	1	8.6	0.5	0.4	41	1.328
25AUG86	0.9	13.8	0.7	1.1	41	2.74

AREA L: AUGUST 1986 PSYCHROMETER DATA

26AUG86	1	27.2	49.6	0.5	0	0.807
26AUG86	0.85	18.8	0.6	1	2	2.057
26AUG86	0.84	18.1	1.7	3.5	4	7.285
26AUG86	0.84	16.4	2	2.2	6	4.747
26AUG86	0.89	15.9	0.5	3	8	7.033
26AUG86	0.84	14.7	0.1	3.1	10	7.119
26AUG86	0.81	14	0.6	2.8	13	6.308
26AUG86	0.88	9.8	1.9	1.3	13	3.624
26AUG86	0.87	9.2	0.4	2.7	24	7.76
26AUG86	0.85	13	0.4	2	24	4.86
26AUG86	0.9	8	0.9	3.3	41	10.36
26AUG86	1	14.1	0.3	1.9	41	5.246
27AUG86	1	16.5	8	1	0	2.477
27AUG86	0.85	23.2	0.2	2.7	2	5.084
27AUG86	0.84	21.2	0.8	2.2	4	4.254
27AUG86	0.84	18.5	1.7	2.3	6	4.713
27AUG86	0.89	16.3	0.6	2.8	8	6.482
27AUG86	0.84	15.1	1.1	2.6	10	5.855
27AUG86	0.88	11.2	2.2	0.2	13	0.524
27AUG86	0.81	12.3	1.2	1.9	13	4.484
27AUG86	0.87	8.8	0.8	2.1	24	6.094
27AUG86	0.85	8.3	0.8	0.8	24	2.291
27AUG86	1	8.9	0.3	0.6	41	1.973
27AUG86	0.9	8.5	0.9	0	41	0
28AUG86	1	28.4	44	0	0	0
28AUG86	0.85	20.9	0.4	3.5	2	6.944
28AUG86	0.84	21.3	1	1.7	4	3.27
28AUG86	0.84	17.3	1.8	2.2	6	4.64
28AUG86	0.89	15.7	0.9	2.1	8	4.916
28AUG86	0.84	12.3	1.3	1	10	2.432
28AUG86	0.88	14.1	1.2	2.5	13	6.071
28AUG86	0.81	11.1	0.6	3.6	13	9.004
28AUG86	0.87	8.3	0.1	2.8	24	8.375
28AUG86	0.85	10.4	1.2	0.5	24	1.312
28AUG86	0.9	12.2	0.4	2.8	41	7.442
28AUG86	1	11.6	0.7	1.7	41	5.08
29AUG86	1	34.5	21.7	2.3	0	3.572
29AUG86	0.85	20.2	0.9	2.8	2	5.613
29AUG86	0.84	21.6	1.4	1.7	4	3.243
29AUG86	0.84	17.9	2	0.6	6	1.236
29AUG86	0.89	13.9	0.1	2.5	8	6.21
29AUG86	0.84	15.8	0.1	3.8	10	8.487
29AUG86	0.81	14.8	0.6	4.1	13	9.088
29AUG86	0.88	14.8	0.9	2.9	13	6.922
29AUG86	0.85	12.5	0.8	2.2	24	5.433
29AUG86	0.87	9	1	1.7	24	4.872
29AUG86	1	13.1	0.4	2.2	41	6.278
29AUG86	0.9	7.9	1	2.7	41	8.459
30AUG86	1	16.7	10.1	2.3	0	5.649
30AUG86	0.85	24.6	1.4	3.3	2	6.007
30AUG86	0.84	21.2	1.2	2.3	4	4.44
30AUG86	0.84	19.3	1.3	2.6	6	5.244
30AUG86	0.89	16.6	0.7	2.6	8	5.961
30AUG86	0.84	14.5	1.5	1.1	10	2.495
30AUG86	0.81	11.1	0	3.1	13	7.744
30AUG86	0.88	14.9	0.8	2.1	13	4.976

AREA L: AUGUST 1986 PSYCHROMETER DATA

30AUG86	0.87	11	0.7	2.1	24	5.595
30AUG86	0.85	13.1	0.1	2.8	24	6.828
30AUG86	0.9	13.1	0.3	2.4	41	6.174
30AUG86	1	14.4	0.1	2.5	41	6.871
31AUG86	1	26.7	21.8	2.8	0	5.184
31AUG86	0.85	24	0.7	3.3	2	6.106
31AUG86	0.84	20.9	0.5	2.5	4	4.879
31AUG86	0.84	19.1	0.6	2.7	6	5.493
31AUG86	0.89	17.4	0.5	2.9	8	6.528
31AUG86	0.84	14.7	0.1	2.5	10	5.72
31AUG86	0.81	12.6	0.5	3.2	13	7.568
31AUG86	0.88	13.7	0.7	1.7	13	4.169
31AUG86	0.87	11.9	0.7	2.7	24	6.995
31AUG86	0.85	11.1	0.3	2.7	24	7.046
31AUG86	0.9	13.6	0.6	1.5	41	3.771
31AUG86	1	11.7	0.3	1.3	41	3.867

AREA L: SEPTEMBER 1986 PSYCHROMETER DATA

DATE	CORRECTION	TEMP (DEG C)	OFFSET (MICROVOLTS)	READING (MICROVOLTS)	DEPTH (FT)	WATER POTENTIAL (-BARS)
01SEP86	1	29.3	20.3	1.5	0	2.632
01SEP86	0.85	24.3	1.3	2.5	2	4.57
01SEP86	0.84	19.6	2.1	0.2	4	0.395
01SEP86	0.84	16.1	0.9	2	6	4.368
01SEP86	0.89	16.6	0.4	2	8	4.577
01SEP86	0.84	13.5	0.3	2	10	4.729
01SEP86	0.81	12.9	0.5	2.8	13	6.538
01SEP86	0.88	11.9	1.1	1.6	13	4.153
01SEP86	0.85	12.5	0.2	3.4	24	8.491
01SEP86	0.87	12.6	0.5	1.1	24	2.755
01SEP86	1	14	0	2.4	41	6.676
01SEP86	0.9	10.6	1.3	2.8	41	7.854
02SEP86	1	13.7	15.1	20.8	0	66.51
02SEP86	0.85	24.9	0.1	1.9	2	3.444
02SEP86	0.84	19.1	1.1	1.6	4	3.231
02SEP86	0.84	19.7	0.4	2.8	6	5.625
02SEP86	0.89	17	0.4	2.5	8	5.677
02SEP86	0.84	15.4	0.1	2.9	10	6.517
02SEP86	0.88	11.1	1.8	0.8	13	2.117
02SEP86	0.81	13.9	0.1	2.7	13	6.112
02SEP86	0.85	8.6	0.9	2	24	5.71
02SEP86	0.87	11.9	0.3	1.3	24	3.341
02SEP86	0.9	13.8	0.2	2.4	41	6.041
02SEP86	1	14.3	0.4	2.7	41	7.442
03SEP86	1	26.9	51.1	0.1	0	0.161
03SEP86	0.85	21.4	0.5	3.4	2	6.665
03SEP86	0.84	21.9	0.9	2.6	4	4.956
03SEP86	0.84	19.5	0.8	3.3	6	6.662
03SEP86	0.89	18	0.2	3.3	8	7.341
03SEP86	0.84	16	0.3	3.5	10	7.752
03SEP86	0.88	12.4	2.5	1	13	2.525
03SEP86	0.81	14.4	0.6	3.4	13	7.594
03SEP86	0.87	8.1	0	2.5	24	7.525
03SEP86	0.85	8.5	1.1	0.7	24	1.983
03SEP86	1	13.6	0.4	2.8	41	7.893
03SEP86	0.9	13.1	0.3	2.5	41	6.436
04SEP86	1	15.4	6	0.5	0	1.284
04SEP86	0.85	20.5	0.9	1	2	1.977
04SEP86	0.84	18.5	2.1	0.5	4	1.014
04SEP86	0.84	16.8	2.2	0.8	6	1.694
04SEP86	0.89	14	0	1.9	8	4.689
04SEP86	0.84	14.1	0.1	3.3	10	7.728
04SEP86	0.88	15.4	2	2.6	13	6.056
04SEP86	0.81	14.9	0.4	4.2	13	9.296
04SEP86	0.85	11.6	0.6	2.4	24	6.129
04SEP86	0.87	11.2	0.9	1.1	24	2.886
04SEP86	0.9	8.7	1.2	3.1	41	9.41
04SEP86	1	14.1	0.2	2.2	41	6.088
05SEP86	1	15.1	12.3	5	0	12.92
05SEP86	0.85	22.7	1	2.7	2	5.118
05SEP86	0.84	22.2	0.7	2.5	4	4.738
05SEP86	0.84	20.1	1.6	2.2	6	4.343

AREA L: SEPTEMBER 1986 PSYCHROMETER DATA

05SEP86	0.89	14.7	1.1	0.7	8	1.671
05SEP86	0.84	12.8	0.9	1.5	10	3.606
05SEP86	0.81	12.3	0	3.3	13	7.909
05SEP86	0.88	15.1	1.9	2.6	13	6.111
05SEP86	0.87	12.7	0.2	1.7	24	4.266
05SEP86	0.85	12.9	0.6	3.5	24	8.613
05SEP86	0.9	14	0.2	2.2	41	5.496
05SEP86	1	11.9	0.5	2	41	5.931
06SEP86	1	23.7	49.3	1	0	1.75
06SEP86	0.85	22	0	2.1	2	4.053
06SEP86	0.84	21.6	0.2	1	4	1.914
06SEP86	0.84	17	1.5	1.6	6	3.395
06SEP86	0.89	14.2	0.9	2.2	8	5.384
06SEP86	0.84	16.2	0.2	2.7	10	5.923
06SEP86	0.88	12.5	3	1.8	13	4.544
06SEP86	0.81	11.9	0.8	2.9	13	7.002
06SEP86	0.85	12.3	0	2.5	24	6.252
06SEP86	0.87	11.2	0.6	0	24	0
06SEP86	1	11.7	0.5	1.5	41	4.464
06SEP86	0.9	12.4	0.1	1.2	41	3.137
07SEP86	1	23.9	24.3	3.1	0	6.04
07SEP86	0.85	21.3	0.2	0.3	2	0.583
07SEP86	0.84	17.7	1.5	0.6	4	1.245
07SEP86	0.84	19.8	0.6	2.4	6	4.797
07SEP86	0.89	16.5	0.4	2.3	8	5.286
07SEP86	0.84	15.2	0.1	2.9	10	6.554
07SEP86	0.88	13.1	1.8	1.7	13	4.228
07SEP86	0.81	13.8	0.6	3.3	13	7.505
07SEP86	0.87	11.4	0.6	3	24	7.933
07SEP86	0.85	10.6	0.5	2.3	24	6.091
07SEP86	1	13.2	0.5	2.1	41	5.966
07SEP86	0.9	14.1	0.3	2.6	41	6.489
08SEP86	1	14	6.1	0.6	0	1.606
08SEP86	0.85	22.6	0.9	2.1	2	3.983
08SEP86	0.84	22	0.2	2.5	4	4.77
08SEP86	0.84	20.3	1.1	2.8	6	5.529
08SEP86	0.89	16.9	0.8	2.5	8	5.681
08SEP86	0.84	15.4	1.3	2	10	4.446
08SEP86	0.81	11.1	0.6	2	13	4.941
08SEP86	0.88	11.7	2.4	1.1	13	2.848
08SEP86	0.87	11.8	0.6	2.7	24	7.023
08SEP86	0.85	11.5	0.5	2.6	24	6.676
08SEP86	0.9	14.1	0.3	2.5	41	6.235
08SEP86	1	14	0	2.6	41	7.242
09SEP86	1	22	41.5	0.5	0	0.937
09SEP86	0.85	19.1	0.5	1.2	2	2.455
09SEP86	0.84	19.3	0.8	1.6	4	3.221
09SEP86	0.84	19.4	0.5	2.6	6	5.252
09SEP86	0.89	17.5	0.5	2.2	8	4.922
09SEP86	0.84	13.8	0.2	2.5	10	5.877
09SEP86	0.88	13.5	1.7	2.3	13	5.671
09SEP86	0.81	13.5	0.3	3.3	13	7.588
09SEP86	0.87	12.2	0.1	1.6	24	4.082
09SEP86	0.85	12	0.6	3.2	24	8.105
09SEP86	0.9	12.7	0.1	2.2	41	5.733
09SEP86	1	13.3	0	2.3	41	6.537

AREA L: SEPTEMBER 1986 PSYCHROMETER DATA

10SEP86	1	23.7	18.2	1.2	0	2.401
10SEP86	0.85	21.7	0.4	0.9	2	1.737
10SEP86	0.84	18.3	1.4	0.9	4	1.844
10SEP86	0.84	19.9	0.5	3.3	6	6.61
10SEP86	0.89	18.5	0.1	3	8	6.585
10SEP86	0.84	14.1	1.4	1	10	2.395
10SEP86	0.81	11.5	0.1	2.6	13	6.374
10SEP86	0.88	12	2	2.7	13	7.009
10SEP86	0.85	12.9	0.2	3.5	24	8.629
10SEP86	0.87	12.2	0.8	1.6	24	4.069
10SEP86	1	12.7	0.5	1.6	41	4.605
10SEP86	0.9	8.8	1.3	2.7	41	8.129
11SEP86	1	13.4	15.4	1.1	0	2.889
11SEP86	0.85	21.3	0.1	0.2	2	0.389
11SEP86	0.84	17.5	0.3	0.6	4	1.258
11SEP86	0.84	19.8	0	3.6	6	7.255
11SEP86	0.89	17.7	0.4	1.4	8	3.106
11SEP86	0.84	17.1	0.7	0.5	10	1.057
11SEP86	0.81	13.9	0.5	0.5	13	1.114
11SEP86	0.88	12.9	0.4	1.6	13	4.028
11SEP86	0.87	15.8	2.8	3	24	6.82
11SEP86	0.85	14.5	0.3	4.3	24	10.12
11SEP86	0.9	12.9	0.5	3.5	41	9.124
11SEP86	1	12.5	0.1	2.2	41	6.412
12SEP86	1	1.8	15.3	3.1	0	13.94
12SEP86	0.85	18.6	2.2	1.5	2	3.084
12SEP86	0.84	19	0.7	1.6	4	3.245
12SEP86	0.84	18.3	0.5	2.3	6	4.763
12SEP86	0.89	17.7	1.1	2.3	8	5.108
12SEP86	0.84	16.4	0.5	2.4	10	5.221
12SEP86	0.88	11.4	3.9	1.9	13	4.967
12SEP86	0.81	12.2	0.5	2.6	13	6.207
12SEP86	0.85	10.2	0.6	2	24	5.363
12SEP86	0.87	10.5	0.1	1.4	24	3.79
12SEP86	1	13.2	0.9	2.2	41	6.243
12SEP86	0.9	12.4	0.6	1.2	41	3.13
13SEP86	1	9.5	10.8	3.9	0	12.28
13SEP86	0.85	16	3.2	1.2	2	2.62
13SEP86	0.84	18.7	0.7	1.2	4	2.447
13SEP86	0.84	16.5	0.5	0.5	6	1.074
13SEP86	0.89	13.8	0.4	0.8	8	1.97
13SEP86	0.84	14	0.6	2.6	10	6.066
13SEP86	0.88	15.3	3.9	2.2	13	5.082
13SEP86	0.81	14.1	0.4	4.5	13	10.23
13SEP86	0.87	12.1	0.1	2.4	24	6.178
13SEP86	0.85	8.6	0.2	1.5	24	4.277
13SEP86	0.9	7.9	0.7	0.2	41	0.614
13SEP86	1	12	0.8	2.9	41	8.614
14SEP86	1	12.4	51	2.9	0	6.909
14SEP86	0.85	16.4	3	1.4	2	3.03
14SEP86	0.84	18.4	1.2	1.8	4	3.698
14SEP86	0.84	17.7	0.3	2.6	6	5.478
14SEP86	0.89	17.7	0.9	2.5	8	5.563
14SEP86	0.84	16.2	0.5	3.4	10	7.478
14SEP86	0.88	15.3	3.4	3.3	13	7.69
14SEP86	0.81	15.2	0.2	4.7	13	10.35

AREA L: SEPTEMBER 1986 PSYCHROMETER DATA

14SEP86	0.87	10.9	0.3	3.4	24	9.2
14SEP86	0.85	12.7	0.4	2.9	24	7.161
14SEP86	1	11.2	0.8	2.3	41	6.999
14SEP86	0.9	12	0.2	1.3	41	3.446
15SEP86	1	10.8	18	3.2	0	9.233
15SEP86	0.85	16.1	2.8	1.1	2	2.398
15SEP86	0.84	17.9	1	1.3	4	2.699
15SEP86	0.84	17.2	0.1	1.3	6	2.759
15SEP86	0.89	13.8	0.1	0.7	8	1.725
15SEP86	0.84	13.7	0.4	2.6	10	6.129
15SEP86	0.88	14.8	2.8	3.8	13	9.04
15SEP86	0.81	14	0.4	3.9	13	8.857
15SEP86	0.85	12	0.7	2.5	24	6.297
15SEP86	0.87	10.6	0.7	1.9	24	5.13
15SEP86	0.9	8.3	1.5	0.4	41	1.205
15SEP86	1	9.3	0.2	1.3	41	4.232
16SEP86	1	7.8	1.6	0.7	0	2.398
16SEP86	0.85	15.4	1.4	3.1	2	7.014
16SEP86	0.84	17.9	1.7	1.7	4	3.525
16SEP86	0.84	18.1	0.1	1.9	6	3.954
16SEP86	0.89	15.4	0.5	0.5	8	1.172
16SEP86	0.84	13	0.1	2.3	10	5.542
16SEP86	0.81	14.6	0.3	4.3	13	9.615
16SEP86	0.88	15.7	3.3	3.2	13	7.371
16SEP86	0.85	12.7	0.1	2.9	24	7.171
16SEP86	0.87	11.5	0.8	1.5	24	3.906
16SEP86	0.9	10	1.5	0	41	0
16SEP86	1	8.3	0.1	0.9	41	3.043
17SEP86	1	12.3	16.4	0.6	0	1.622
17SEP86	0.85	14.5	1.1	0.1	2	0.229
17SEP86	0.84	15.9	0.2	2.7	4	5.973
17SEP86	0.84	15.1	0.7	1	6	2.236
17SEP86	0.89	16.1	0.7	2.8	8	6.514
17SEP86	0.84	14.9	0.6	1.2	10	2.703
17SEP86	0.81	13.1	0.2	4.6	13	10.82
17SEP86	0.88	15.6	4	2	13	4.574
17SEP86	0.85	8.2	0.1	1.7	24	4.94
17SEP86	0.87	11.1	0.3	2.4	24	6.396
17SEP86	0.9	8.8	1.2	0.2	41	0.59
17SEP86	1	13	0.7	3	41	8.623
18SEP86	1	12.2	16.3	0	0	0
18SEP86	0.85	15.7	1.2	0	2	0
18SEP86	0.84	16.5	0.3	0.1	4	0.215
18SEP86	0.84	14.6	0.8	1.3	6	2.952
18SEP86	0.89	17.3	0.1	0.4	8	0.893
18SEP86	0.84	16.3	0.6	1.4	10	3.036
18SEP86	0.88	11.2	2.9	3.9	13	10.47
18SEP86	0.81	12.3	0.2	3.6	13	8.639
18SEP86	0.85	10.4	0.3	2.8	24	7.508
18SEP86	0.87	11.5	0.4	1.6	24	4.177
18SEP86	0.9	11.5	1.3	3.5	41	9.546
18SEP86	1	8.1	0.9	3	41	10.39
19SEP86	1	20.1	0.1	1.2	0	2.829
19SEP86	0.85	18.4	0.6	2.5	2	5.229
19SEP86	0.84	17	0.4	2.1	4	4.491
19SEP86	0.84	14.3	1.2	2.1	6	4.826

AREA L: SEPTEMBER 1986 PSYCHROMETER DATA

19SEP86	0.89	12.3	1.3	1.7	8	4.401
19SEP86	0.84	11	3.6	0.9	10	2.266
19SEP86	0.81	8.1	0.3	1.4	13	3.88
19SEP86	0.88	10.4	0.6	3.4	13	9.471
19SEP86	0.85	12.7	0.5	1.8	24	4.41
19SEP86	0.87	13	0.5	2.8	24	6.999
20SEP86	1	7.5	8.6	0.2	0	0.671
20SEP86	0.85	15.8	0.7	0.4	2	0.885
20SEP86	0.84	19.6	0.4	1.4	4	2.802
20SEP86	0.84	17.6	0.9	1	6	2.09
20SEP86	0.89	14.1	0.3	0.7	8	1.708
20SEP86	0.84	12.9	0.6	1.7	10	4.084
20SEP86	0.88	11.1	3.3	1.1	13	2.898
20SEP86	0.81	11.3	0.8	2.4	13	5.899
20SEP86	0.85	9	0.2	1.5	24	4.208
20SEP86	0.87	9.8	0.2	3.1	24	8.734
20SEP86	0.9	10.8	0.2	1.2	41	3.317
20SEP86	1	13	0.7	2.5	41	7.161
21SEP86	1	18.2	40.9	0	0	0
21SEP86	0.85	18.4	2	1.1	2	2.271
21SEP86	0.84	19.3	1.3	0.4	4	0.799
21SEP86	0.84	16.2	0.4	1.6	6	3.486
21SEP86	0.89	15.5	0.5	1.6	8	3.763
21SEP86	0.84	13.9	0.2	2.4	10	5.62
21SEP86	0.81	12.7	0.1	3	13	7.074
21SEP86	0.88	14	2.6	2.5	13	6.051
21SEP86	0.87	10.9	0.9	3.3	24	8.898
21SEP86	0.85	10.9	0.4	2.3	24	6.026
21SEP86	0.9	12.7	0.2	2.3	41	5.994
21SEP86	1	13.1	0.3	2.4	41	6.86
22SEP86	1	18.5	10.1	0.2	0	0.465
22SEP86	0.85	15.9	0.3	3.5	2	7.867
22SEP86	0.84	17.9	0.9	3.4	4	7.136
22SEP86	0.84	18.9	0.4	2.4	6	4.904
22SEP86	0.89	18.3	0.6	3.2	8	7.049
22SEP86	0.84	16.6	0.1	3.5	10	7.633
22SEP86	0.81	15.5	0.3	4	13	8.691
22SEP86	0.88	15.6	2.6	3.4	13	7.889
22SEP86	0.85	13	0.6	2.8	24	6.835
22SEP86	0.87	11.7	0.6	1.3	24	3.36
22SEP86	0.9	11.8	0.8	1.5	41	3.998
22SEP86	1	12.3	0.1	2.3	41	6.754
23SEP86	1	9.4	6.6	0.4	0	1.253
23SEP86	0.85	17.9	0.5	0.7	2	1.47
23SEP86	0.84	17.7	0	0.7	4	1.464
23SEP86	0.84	18.2	0	2.3	6	4.786
23SEP86	0.89	16.2	0.5	1.1	8	2.531
23SEP86	0.84	13.3	0.9	1.4	10	3.309
23SEP86	0.81	11.7	1	1.9	13	4.583
23SEP86	0.88	11.5	3.8	0.9	13	2.329
23SEP86	0.87	8.9	0.5	2.6	24	7.556
23SEP86	0.85	8.3	0.6	0.9	24	2.581
23SEP86	0.9	8.2	0.9	3.4	41	10.59
23SEP86	1	14	0.5	2.3	41	6.379
24SEP86	1	16.2	16.4	21.6	0	61.35
24SEP86	0.85	15.4	0.8	0.6	2	1.342

AREA L: SEPTEMBER 1986 PSYCHROMETER DATA

24SEP86	0.84	18.9	0.7	1.5	4	3.048
24SEP86	0.84	17	0.7	0.2	6	0.423
24SEP86	0.89	15.4	0.8	3.2	8	7.607
24SEP86	0.84	15.5	1	1	10	2.207
24SEP86	0.88	15.6	2.9	3.2	13	7.406
24SEP86	0.81	12.7	0.5	4.1	13	9.727
24SEP86	0.87	9	0.5	2.6	24	7.524
24SEP86	0.85	12.7	0.5	2.1	24	5.155
24SEP86	0.9	9.1	0.3	2.2	41	6.543
24SEP86	1	13.4	0.1	1.1	41	3.091
25SEP86	1	13.7	5.8	0.8	0	2.166
25SEP86	0.85	19.2	1.1	1.6	2	3.262
25SEP86	0.84	19.2	0.4	1.4	4	2.828
25SEP86	0.84	17.1	0.7	0.5	6	1.057
25SEP86	0.89	13.9	0.5	0.5	8	1.225
25SEP86	0.84	12.9	0.4	1.6	10	3.845
25SEP86	0.88	15.8	2.8	3	13	6.899
25SEP86	0.81	14.5	0.3	4.3	13	9.645
25SEP86	0.85	12.9	0.5	3.5	24	8.617
25SEP86	0.87	12.5	0.1	2.2	24	5.579
25SEP86	0.9	8.4	1	0.1	41	0.3
25SEP86	1	13.4	0.6	2.4	41	6.785
26SEP86	1	1.8	15.3	3.1	0	13.94
26SEP86	0.85	18.6	2.2	1.5	2	3.084
26SEP86	0.84	19	0.7	1.6	4	3.245
26SEP86	0.84	18.3	0.5	2.3	6	4.763
26SEP86	0.89	17.7	1.1	2.3	8	5.108
26SEP86	0.84	16.4	0.5	2.4	10	5.221
26SEP86	0.88	11.4	3.9	1.9	13	4.967
26SEP86	0.81	12.2	0.5	2.6	13	6.207
26SEP86	0.85	10.2	0.6	2	24	5.363
26SEP86	0.87	10.5	0.1	1.4	24	3.79
26SEP86	1	13.2	0.9	2.2	41	6.243
26SEP86	0.9	12.4	0.6	1.2	41	3.13
27SEP86	1	9.5	10.8	3.9	0	12.28
27SEP86	0.85	16	3.2	1.2	2	2.62
27SEP86	0.84	18.7	0.7	1.2	4	2.447
27SEP86	0.84	16.5	0.5	0.5	6	1.074
27SEP86	0.89	13.8	0.4	0.8	8	1.97
27SEP86	0.84	14	0.6	2.6	10	6.066
27SEP86	0.88	15.3	3.9	2.2	13	5.082
27SEP86	0.81	14.1	0.4	4.5	13	10.23
27SEP86	0.87	12.1	0.1	2.4	24	6.178
27SEP86	0.85	8.6	0.2	1.5	24	4.277
27SEP86	1	12	0.8	2.9	41	8.614
27SEP86	0.9	7.9	0.7	0.2	41	0.614
28SEP86	1	12.4	51	2.9	0	6.909
28SEP86	0.85	16.4	3	1.4	2	3.03
28SEP86	0.84	18.4	1.2	1.8	4	3.698
28SEP86	0.84	17.7	0.3	2.6	6	5.478
28SEP86	0.89	17.7	0.9	2.5	8	5.563
28SEP86	0.84	16.2	0.5	3.4	10	7.478
28SEP86	0.81	15.2	0.2	4.7	13	10.35
28SEP86	0.88	15.3	3.4	3.3	13	7.69
28SEP86	0.85	12.7	0.4	2.9	24	7.161
28SEP86	0.87	10.9	0.3	3.4	24	9.2

AREA L: SEPTEMBER 1986 PSYCHROMETER DATA

28SEP86	0.9	12	0.2	1.3	41	3.446
28SEP86	1	11.2	0.8	2.3	41	6.999
29SEP86	1	10.8	18	3.2	0	9.233
29SEP86	0.85	16.1	2.8	1.1	2	2.398
29SEP86	0.84	17.9	1	1.3	4	2.699
29SEP86	0.84	17.2	0.1	1.3	6	2.759
29SEP86	0.89	13.8	0.1	0.7	8	1.725
29SEP86	0.84	13.7	0.4	2.6	10	6.129
29SEP86	0.88	14.8	2.8	3.8	13	9.04
29SEP86	0.81	14	0.4	3.9	13	8.857
29SEP86	0.87	10.6	0.7	1.9	24	5.13
29SEP86	0.85	12	0.7	2.5	24	6.297
29SEP86	1	9.3	0.2	1.3	41	4.232
29SEP86	0.9	8.3	1.5	0.4	41	1.205
30SEP86	1	7.8	1.6	0.7	0	2.398
30SEP86	0.85	15.4	1.4	3.1	2	7.014
30SEP86	0.84	17.9	1.7	1.7	4	3.525
30SEP86	0.84	18.1	0.1	1.9	6	3.954
30SEP86	0.89	15.4	0.5	0.5	8	1.172
30SEP86	0.84	13	0.1	2.3	10	5.542
30SEP86	0.88	15.7	3.3	3.2	13	7.371
30SEP86	0.81	14.6	0.3	4.3	13	9.615
30SEP86	0.87	11.5	0.8	1.5	24	3.906
30SEP86	0.85	12.7	0.1	2.9	24	7.171
30SEP86	0.9	10	1.5	0	41	0
30SEP86	1	8.3	0.1	0.9	41	3.043

AREA L: OCTOBER 1986 PSYCHROMETER DATA

DATE	CORRECTION	TEMP (DEG C)	OFFSET (MICROVOLTS)	READING (MICROVOLTS)	DEPTH (FT)	WATER POTENTIAL (-BARS)
030CT86	1	16.4	1.3	1	0	2.561
030CT86	0.85	17.7	0.2	2.3	2	4.899
030CT86	0.84	14.4	1.3	0.5	4	1.134
030CT86	0.84	12.8	3	2.7	6	6.48
030CT86	0.89	11	0.7	3.1	8	8.513
030CT86	0.84	13.2	1.2	3.2	10	7.668
030CT86	0.88	17.4	0.6	0.9	13	1.982
030CT86	0.81	19.3	50.2	0.5	13	0.781
030CT86	0.85	17.9	0.1	2.8	24	5.952
030CT86	0.87	15.8	0.1	4.4	24	10.21
030CT86	1	11.5	0.9	0.1	41	0.296
030CT86	0.9	13.4	0.8	3.4	41	8.7
040CT86	1	12.2	0.3	0.2	0	0.581
040CT86	0.85	16.7	0	0.6	2	1.301
040CT86	0.84	12.4	0.4	3.7	4	9.174
040CT86	0,84	15.4	3.8	2.9	6	6.405
040CT86	0.89	10.9	0.7	1.9	8	5.189
040CT86	0.84	7.9	1.2	1.7	10	4.922
040CT86	0.81	12.6	20.3	15.6	13	37.75
040CT86	0.88	17.1	0.5	1.1	13	2.445
040CT86	0.87	11.1	0.5	3	24	8.025
040CT86	0.85	15.7	1.8	0.4	24	0.882
040CT86	1	13.1	0.6	0.9	41	2.544
040CT86	0.9	12.4	0.2	3.8	41	10.11
050CT86	1	14.9	0.6	3.4	0	9.235
050CT86	0.85	16.8	0.1	0.4	2	0.864
050CT86	0.84	16.2	1.2	0.6	4	1.296
050CT86	0.84	13.8	3.4	1.5	6	3.453
050CT86	0.89	10.2	0.1	2.8	8	7.929
050CT86	0.84	8.5	1.6	3.3	10	9.429
050CT86	0.81	11.7	48.3	2.8	13	5.596
050CT86	0.88	16.5	0.2	0.4	13	0.901
050CT86	0.87	15	0.9	2.5	24	5.85
050CT86	0.85	14.1	0.8	1.5	24	3.503
050CT86	1	12.7	0.4	0.3	41	0.857
050CT86	0.9	7.9	0.4	3.3	41	10.42
060CT86	1	11.6	0.7	2.9	0	8.741
060CT86	0.85	13.6	0.3	0.4	2	0.945
060CT86	0.84	11.9	0.7	1	4	2.472
060CT86	0.84	13.1	2.3	3.7	6	8.881
060CT86	0.89	12.2	0.3	2	8	5.229
060CT86	0.84	7.6	0.6	1.1	10	3.218
060CT86	0.81	16.6	23.8	1.1	13	2.054
060CT86	0.88	16.2	0.1	3.4	13	7.849
060CT86	0.85	16.7	0.2	2.6	24	5.692
060CT86	0.87	15.1	0.8	3.7	24	8.7
060CT86	1	9.9	0.5	1.9	41	6.061
060CT86	0.9	10.6	1.9	0.4	41	1.099
070CT86	1	14.8	1	0.7	0	1.873
070CT86	0.85	16.1	0.2	0.8	2	1.763
070CT86	0.84	12.5	0.9	0.8	4	1.933
070CT86	0.84	12.7	2.3	2.8	6	6.769

AREA L: OCTOBER 1986 PSYCHROMETER DATA

07OCT86	0.89	11.5	0.8	2.8	8	7.529
07OCT86	0.84	13	0.7	2.7	10	6.506
07OCT86	0.81	15	15.8	10.3	13	22.06
07OCT86	0.88	15.3	0.3	3.5	13	8.285
07OCT86	0.87	12.4	0.3	3.3	24	8.454
07OCT86	0.85	12.8	1.1	0.4	24	0.965
07OCT86	0.9	12	0.3	3.8	41	10.25
07OCT86	1	12.6	0.5	3.9	41	11.44
08OCT86	1	15.5	1.7	3.4	0	9.028
08OCT86	0.85	15.3	0	1.2	2	2.711
08OCT86	0.84	13.5	0.9	2.3	4	5.433
08OCT86	0.84	15.4	2.5	2.4	6	5.317
08OCT86	0.89	12.4	0.8	0	8	0
08OCT86	0.84	9	0.2	1.1	10	3.039
08OCT86	0.81	9.7	3.4	11.1	13	31.37
08OCT86	0.88	15.3	0.2	0.7	13	1.631
08OCT86	0.87	15.3	0.2	4.4	24	10.36
08OCT86	0.85	16.6	0.4	2.5	24	5.479
08OCT86	0.9	12.8	0.6	3.1	41	8.082
08OCT86	1	29.5	33.4	34.2	41	62.47
09OCT86	1	15.1	1.9	0.2	0	0.527
09OCT86	0.85	16.6	1.3	2.1	2	4.573
09OCT86	0.84	16.5	0.5	2.9	4	6.309
09OCT86	0.84	14.3	2	1.7	6	3.883
09OCT86	0.89	10.6	0.8	0.1	8	0.272
09OCT86	0.84	9.4	0.1	0.5	10	1.354
09OCT86	0.81	2.9	0.4	2.9	13	10.51
09OCT86	0.88	16.8	0.7	1.3	13	2.912
09OCT86	0.85	17.2	1	2	24	4.292
09OCT86	0.87	14.2	1.6	2.2	24	5.246
09OCT86	1	13.2	0.1	2.4	41	6.844
09OCT86	0.9	8.3	0.8	2	41	6.125
10OCT86	1	11.6	1	2.4	0	7.198
10OCT86	0.85	15.8	0.2	1.9	2	4.246
10OCT86	0.84	16	0.7	1.9	4	4.163
10OCT86	0.84	12.1	2.9	0.9	6	2.186
10OCT86	0.89	8.7	0.5	2.5	8	7.488
10OCT86	0.84	8.4	1.1	1.4	10	3.959
10OCT86	0.81	6.8	2.5	0.8	13	2.313
10OCT86	0.88	16	0.7	1.4	13	3.205
10OCT86	0.85	16.4	1.3	0.8	24	1.74
10OCT86	0.87	11.8	1.5	2	24	5.155
10OCT86	1	8.3	0.5	0.3	41	1.008
10OCT86	0.9	8			41	
11OCT86	1	12.1	0.4	3.5	0	10.42
11OCT86	0.85	13.8	0.2	1.2	2	2.831
11OCT86	0.84	12.7	1.3	0.8	4	1.917
11OCT86	0.84	11.4	3.2	1	6	2.487
11OCT86	0.89	8.7	0.6	2.2	8	6.569
11OCT86	0.84	8.1	0.2	1.4	10	4.026
11OCT86	0.88	16.3	0.5	1.2	13	2.725
11OCT86	0.81	2.9	8.5	3	13	10.54
11OCT86	0.85	16.7	0.8	2	24	4.352
11OCT86	0.87	14.6	1.5	3.2	24	7.589
11OCT86	0.9	10.3	1.8	1.7	41	4.771
11OCT86	1	10	1.1	0.5	41	1.568

AREA L: OCTOBER 1986 PSYCHROMETER DATA

120CT86	1	11.2	2	0.6	0	1.794
120CT86	0.85	16.5	0.9	2.6	2	5.703
120CT86	0.84	15.7	0.9	2.6	4	5.761
120CT86	0.84	13.7	3.1	2.3	6	5.345
120CT86	0.89	10.6	0.6	1.8	8	4.97
120CT86	0.84	8.8	0.2	1.4	10	3.91
120CT86	0.81	.	.	.	13	.
120CT86	0.88	15.9	0.4	1.2	13	2.755
120CT86	0.85	16.6	0.8	1.8	24	3.923
120CT86	0.87	15.1	0.5	3.3	24	7.751
120CT86	1	8.6	0.9	1	41	3.331
120CT86	0.9	9.7	0.6	1.9	41	5.496
130CT86	1	11.6	1.5	3.4	0	10.25
130CT86	0.85	14.9	1.3	2.1	2	4.795
130CT86	0.84	15.8	0.5	3.8	4	8.471
130CT86	0.84	15	3	1.5	6	3.337
130CT86	0.89	8.5	0	2.8	8	8.498
130CT86	0.84	11.9	1.5	2.7	10	6.729
130CT86	0.88	15.6	0.3	1.2	13	2.78
130CT86	0.81	0.2	10.2	0.8	13	3.143
130CT86	0.85	15	1.6	1.1	24	2.487
130CT86	0.87	11.9	2	2.5	24	6.429
130CT86	1	8.2	0.1	1.7	41	5.812
130CT86	0.9	8.5	2	0.6	41	1.792
140CT86	1	11.1	3.7	0.3	0	0.892
140CT86	0.85	14.6	0.6	1.1	2	2.527
140CT86	0.84	12.1	0	1.7	4	4.207
140CT86	0.84	11.6	2.9	2.4	6	5.994
140CT86	0.89	10.2	0.4	1.5	8	4.199
140CT86	0.84	12.8	1.3	2.6	10	6.285
140CT86	0.81	.	.	.	13	.
140CT86	0.88	12.2	0.2	0.1	13	0.255
140CT86	0.87	13.8	1.1	3.1	24	7.545
140CT86	0.85	13.3	1.6	1.3	24	3.098
140CT86	0.9	11	0.6	2.1	41	5.79
140CT86	1	8.1	1	0.9	41	3.057
150CT86	1	8.7	2.4	3.5	0	11.78
150CT86	0.85	15	1.2	2.3	2	5.245
150CT86	0.84	16.1	0.5	3.4	4	7.498
150CT86	0.84	15.2	2.2	3.6	6	8.091
150CT86	0.89	12.2	0.3	2.1	8	5.495
150CT86	0.84	8.2	0.5	0.9	10	2.563
150CT86	0.88	14	0.2	3.2	13	7.867
150CT86	0.81	.	.	.	13	.
150CT86	0.87	13.3	1.9	3.2	24	7.891
150CT86	0.85	16.4	0.8	2	24	4.387
150CT86	0.9	12.6	1	3.2	41	8.39
150CT86	1	13	0.3	2	41	5.721
160CT86	1	9.7	3.4	0.5	0	1.57
160CT86	0.85	15.4	1.3	2	2	4.499
160CT86	0.84	16.2	0.4	3.3	4	7.257
160CT86	0.84	15.3	2.4	3.4	6	7.603
160CT86	0.89	12.3	0.2	1.8	8	4.686
160CT86	0.84	10.6	0.1	2.1	10	5.497
160CT86	0.81	1.8	0.2	2.9	13	11.17
160CT86	0.88	14.8	0.4	0.2	13	0.471

AREA L: OCTOBER 1986 PSYCHROMETER DATA

160CT86	0.85	12.5	0.9	0.5	24	1.22
160CT86	0.87	14.8	0.8	4.4	24	10.49
160CT86	1	11.3	0	2.3	41	6.999
160CT86	0.9	11.4	2.1	0.5	41	1.335
170CT86	1	7.3	2.1	3	0	10.7
170CT86	0.85	15.7	1	2.2	2	4.92
170CT86	0.84	15.6	0.4	2.3	4	5.114
170CT86	0.84	12.2	3.3	1.7	6	4.13
170CT86	0.89	9	0.4	2.9	8	8.612
170CT86	0.84	9.5	1	1.7	10	4.61
170CT86	0.81	2	4.2	1.1	13	4.03
170CT86	0.88	13.9	1.1	1.3	13	3.155
170CT86	0.87	11.4	1.6	2	24	5.226
170CT86	0.85	15.1	1.6	0.4	24	0.898
170CT86	1	9.9	0.1	1.3	41	4.135
170CT86	0.9	8.8	0.9	1.7	41	5.084
180CT86	1	8.7	1.4	2.7	0	9.066
180CT86	0.85	15.8	0.9	1.8	2	4.007
180CT86	0.84	16.1	0.4	3.4	4	7.502
180CT86	0.84	15.2	2.9	2.9	6	6.469
180CT86	0.89	12.3	0.1	2	8	5.216
180CT86	0.84	11.1	0.1	0.8	10	2.036
180CT86	0.81	0.6	1.3	2.8	13	11.45
180CT86	0.88	14.3	0.6	0.4	13	0.956
180CT86	0.87	11.2	1.2	2.3	24	6.078
180CT86	0.85	13.2	1.5	0	24	0
180CT86	0.9	8.8	1.1	1.5	41	4.474
180CT86	1	9	0.1	0.9	41	2.957
190CT86	1	10.9	1.7	0.7	0	2.12
190CT86	0.85	13.2	0.6	0.1	2	0.238
190CT86	0.84	12.4	0.2	1.7	4	4.16
190CT86	0.84	13.4	1.8	3	6	7.113
190CT86	0.89	11.7	0.5	0.1	8	0.262
190CT86	0.84	9.3	0.1	0.4	10	1.087
190CT86	0.81	2.1	0.7	0.7	13	2.573
190CT86	0.88	13.2	1.5	1.4	13	3.468
190CT86	0.87	14.9	1.2	3.7	24	8.735
190CT86	0.85	16.1	0.8	1.7	24	3.753
190CT86	1	10.4	1.1	0.1	41	0.308
190CT86	0.9	11.8	1.6	2.5	41	6.687
200CT86	1	9	2.4	1.5	0	4.903
200CT86	0.85	15.4	0.9	1.7	2	3.825
200CT86	0.84	14.3	0.8	1.9	4	4.369
200CT86	0.84	12.8	3.2	1.1	6	2.61
200CT86	0.89	12	0.4	2.4	8	6.333
200CT86	0.84	8	1.1	2	10	5.783
200CT86	0.88	10.2	1.4	0.7	13	1.917
200CT86	0.81	8.8	2.1	0.6	13	1.592
200CT86	0.87	11.1	0.5	3.3	24	8.848
200CT86	0.85	16.2	1.1	0.5	24	1.092
200CT86	0.9	12.2	0.7	3.6	41	9.61
200CT86	1	11.8	1.1	0	41	0
210CT86	1	7.7	1.6	3.4	0	11.99
210CT86	0.85	14.4	0.8	1.5	2	3.472
210CT86	0.84	16	0.1	3	4	6.632
210CT86	0.84	14.4	2.8	2.7	6	6.164

AREA L: OCTOBER 1986 PSYCHROMETER DATA

210CT86	0.89	12.5	0.6	0	8	0
210CT86	0.84	9	0	0.3	10	0.824
210CT86	0.88	12.2	1.3	1.4	13	3.588
210CT86	0.81	1.8	4.7	4.2	13	16.2
210CT86	0.85	15.8	0.6	1.8	24	4.012
210CT86	0.87	13.7	1.9	2	24	4.831
210CT86	1	13	0.3	1.8	41	5.142
210CT86	0.9	8.1	0.8	2.2	41	6.806
220CT86	1	10.3	2	1.7	0	5.297
220CT86	0.85	14.4	0.4	0.4	2	0.922
220CT86	0.84	11.7	0.2	1.4	4	3.502
220CT86	0.84	14.7	2.1	3.3	6	7.517
220CT86	0.89	10	0.3	3	8	8.568
220CT86	0.84	11.9	0.8	2.8	10	7.006
220CT86	0.81	.	.	.	13	.
220CT86	0.88	13.5	0.1	0	13	0
220CT86	0.87	14	2	1.5	24	3.577
220CT86	0.85	14.5	1.5	3.1	24	7.2
220CT86	0.9	9	0.5	3.4	41	10.25
220CT86	1	13.1	1.1	3.4	41	9.749
230CT86	1	7.7	2.6	0.7	0	2.398
230CT86	0.85	14.2	1.7	2.2	2	5.123
230CT86	0.84	15.7	0.4	2.4	4	5.325
230CT86	0.84	12.9	3.1	1.3	6	3.08
230CT86	0.89	8.7	0	2.9	8	8.736
230CT86	0.84	12.2	1.2	3	10	7.425
230CT86	0.88	13.5	0.3	3.4	13	8.499
230CT86	0.81	1	4.2	3.1	13	12.33
230CT86	0.85	15.6	0.4	1.7	24	3.812
230CT86	0.87	12.5	1.7	1.8	24	4.519
230CT86	0.9	8.8	0.6	2.3	41	6.922
230CT86	1	11.5	0.4	2.2	41	6.63
240CT86	1	10.6	1.9	1	0	3.066
240CT86	0.85	12.6	0.4	0	2	0
240CT86	0.84	11.4	0.6	2.4	4	6.1
240CT86	0.84	14.9	1.7	3.4	6	7.718
240CT86	0.89	12.3	0.2	2.1	8	5.478
240CT86	0.84	11.1	0.1	1.5	10	3.838
240CT86	0.81	2	2.9	0.4	13	1.461
240CT86	0.88	10	0.3	0.2	13	0.553
240CT86	0.85	15.2	0.5	1.6	24	3.625
240CT86	0.87	15	1.3	3.5	24	8.225
240CT86	0.9	11.5	1.3	3	41	8.151
240CT86	1	11.2	1	1.1	41	3.315
250CT86	1	7.8	2	0.2	0	0.681
250CT86	0.85	14.4	1.2	1.8	2	4.166
250CT86	0.84	13.5	0.8	1.2	4	2.816
250CT86	0.84	11.6	2.9	0.9	6	2.224
250CT86	0.89	10	0.5	3.1	8	8.853
250CT86	0.84	13	0.4	1.5	10	3.591
250CT86	0.81	.	.	.	13	.
250CT86	0.88	12.4	0	2.9	13	7.504
250CT86	0.87	13.6	1.8	2.6	24	6.327
250CT86	0.85	11.4	0.8	3.5	24	9.069
250CT86	0.9	9.5	2.1	0.4	41	1.145
250CT86	1	10	0.3	2.5	41	7.99

AREA L: OCTOBER 1986 PSYCHROMETER DATA

26OCT86	1	9.4	1.4	0.6	0	1.925
26OCT86	0.85	12.2	1.2	0.4	2	0.984
26OCT86	0.84	14.7	0.7	3.3	4	7.566
26OCT86	0.84	15	2.5	2.7	6	6.062
26OCT86	0.89	10.5	0.6	2.8	8	7.82
26OCT86	0.84	9.4	1.3	2.1	10	5.729
26OCT86	0.88	11.9	0	3.1	13	8.173
26OCT86	0.81	2.1	0.6	1.1	13	4.065
26OCT86	0.87	15.1	0.6	4.1	24	9.674
26OCT86	0.85	11.4	1	3.4	24	8.795
26OCT86	0.9	12.7	1.8	1.9	41	4.903
26OCT86	1	9.4	1.2	0.6	41	1.926
27OCT86	1	8.2	1.4	0.1	0	0.335
27OCT86	0.85	11.2	1.1	0.3	2	0.764
27OCT86	0.84	14.4	0.8	3.1	4	7.16
27OCT86	0.84	15.1	2.3	2.8	6	6.278
27OCT86	0.89	10.6	0.8	2.5	8	6.933
27OCT86	0.84	9.1	1.4	3	10	8.344
27OCT86	0.88	9.9	0.1	3.3	13	9.388
27OCT86	0.81	2.4	2.9	0	13	0
27OCT86	0.85	11.6	0.2	1.3	24	3.3
27OCT86	0.87	15.1	1.4	2.4	24	5.584
27OCT86	1	13.1	0.7	1.3	41	3.683
27OCT86	0.9	8.2	1.4	2	41	6.136
28OCT86	1	6.4	1.9	3.1	0	11.55
28OCT86	0.85	12.2	0.8	3.4	2	8.556
28OCT86	0.84	14	0.7	0.5	4	1.151
28OCT86	0.84	11.3	1.3	3	6	7.663
28OCT86	0.89	12.4	0.8	3.1	8	8.094
28OCT86	0.84	13.9	2.2	2.9	10	6.75
28OCT86	0.81	10.1	0.5	3.2	13	8.291
28OCT86	0.88	9	1.4	3.2	13	9.379
28OCT86	0.87	10.4	0.3	3.1	24	8.528
28OCT86	0.85	.	.	.	24	.
28OCT86	0.9	13.3	0.3	1.6	41	4.068
28OCT86	1	13.7	2.3	3.2	41	8.937
29OCT86	1	2.4	3.3	0.4	0	1.763
29OCT86	0.85	12.1	1	0.2	2	0.494
29OCT86	0.84	10.2	1	3.2	4	8.546
29OCT86	0.84	14	2.5	2.5	6	5.778
29OCT86	0.89	9.7	0.6	3	8	8.659
29OCT86	0.84	10.7	1.4	2.9	10	7.566
29OCT86	0.88	9.7	1.5	0.2	13	0.556
29OCT86	0.81	.	.	.	13	.
29OCT86	0.87	13.2	3.2	1.4	24	3.403
29OCT86	0.85	13.6	0.7	1.2	24	2.842
29OCT86	1	12.5	1.1	0.7	41	2.011
29OCT86	0.9	9.4	0.8	3.6	41	10.68
30OCT86	1	2.2	2.6	0.3	0	1.338
30OCT86	0.85	9.1	0.8	0	2	0
30OCT86	0.84	10	0.3	1.2	4	3.189
30OCT86	0.84	10.4	1.8	1.9	6	4.966
30OCT86	0.89	8.9	0.4	3.4	8	10.18
30OCT86	0.84	9.3	1	1.8	10	4.925
30OCT86	0.81	.	.	.	13	.
30OCT86	0.88	7.5	0.3	2.2	13	6.848

AREA L: OCTOBER 1986 PSYCHROMETER DATA

30OCT86	0.87	11	2.1	2	24	5.291
30OCT86	0.85	13.3	0.8	0.8	24	1.907
30OCT86	1	12.5	0.3	2	41	5.816
30OCT86	0.9	10.3	0.9	3.4	41	9.711
31OCT86	1	3	3.7	0.9	0	3.857
31OCT86	0.85	10.7	2.3	1.4	2	3.639
31OCT86	0.84	13.4	1.1	3.3	4	7.865
31OCT86	0.84	13.8	2.3	2.8	6	6.531
31OCT86	0.89	10.7	0.8	2.4	8	6.626
31OCT86	0.84	7.7	0.9	1.2	10	3.494
31OCT86	0.88	9.2	0.8	3.4	13	9.927
31OCT86	0.81	.	.	.	13	.
31OCT86	0.85	9.5	0.8	3.2	24	8.899
31OCT86	0.87	12.2	2.7	2.5	24	6.343
31OCT86	0.9	10.2	2.2	1.1	41	3.08
31OCT86	1	7.6	1	0.4	41	1.382

AREA L: NOVEMBER 1986 PSYCHROMETER DATA

DATE	CORRECTION	TEMP (DEG C)	OFFSET (MICROVOLTS)	READING (MICROVOLTS)	DEPTH (FT)	WATER POTENTIAL (-BARS)
01NOV86	1	3.1	2.2	2.9	0	12.74
01NOV86	0.85	11.7	1.7	1.6	2	4.028
01NOV86	0.84	13	0.5	0.2	4	0.475
01NOV86	0.84	11.1	1.2	3.6	6	9.312
01NOV86	0.89	12.2	0.4	3.1	8	8.165
01NOV86	0.84	8.9	0.9	1.8	10	5.007
01NOV86	0.81	.	.	.	13	.
01NOV86	0.88	9.1	1	3.3	13	9.658
01NOV86	0.87	10.7	1.4	4.1	24	11.19
01NOV86	0.85	13.2	1.3	0.4	24	0.952
01NOV86	0.9	10.6	1.9	1.1	41	3.038
01NOV86	1	11.7	0.1	2.1	41	6.288
02NOV86	1	3.3	2.7	0.8	0	3.385
02NOV86	0.85	8.7	2.2	1.2	2	3.37
02NOV86	0.84	14	0.3	0.3	4	0.691
02NOV86	0.84	11.6	1.2	3.9	6	9.927
02NOV86	0.89	11	0.6	2.7	8	7.395
02NOV86	0.84	11.8	1	2.8	10	7.024
02NOV86	0.88	7	0.8	2.1	13	6.664
02NOV86	0.81	.	.	.	13	.
02NOV86	0.85	10.6	0.7	0.4	24	1.044
02NOV86	0.87	13.4	2.4	1.4	24	3.393
02NOV86	1	8.7	0.2	2.5	41	8.424
02NOV86	0.9	11.7	1.9	1.3	41	3.455
03NOV86	1	2	2	2.3	0	10.65
03NOV86	0.85	10.3	1.2	2.9	2	7.78
03NOV86	0.84	12.9	0.3	0.8	4	1.913
03NOV86	0.84	10.1	1.8	1.7	6	4.487
03NOV86	0.89	9.3	0	3.1	8	9.125
03NOV86	0.84	12.5	1.1	2.9	10	7.102
03NOV86	0.88	5.4	1.1	2.6	13	8.933
03NOV86	0.81	0.1	4	0.3	13	1.202
03NOV86	0.87	11.7	2.6	2.4	24	6.195
03NOV86	0.85	12.6	0.8	0.6	24	1.461
03NOV86	1	7.7	0.6	0.6	41	2.072
03NOV86	0.9	9.2	2.2	0.9	41	2.616
04NOV86	1	14.7	0.1	2.3	0	6.257
04NOV86	0.85	12.1	2.8	1.2	2	2.957
04NOV86	0.84	8.9	0.3	2.9	4	8.165
04NOV86	0.84	12.8	0	1.4	6	3.377
04NOV86	0.89	.	.	.	8	.
04NOV86	0.84	12	0.5	2.8	10	6.991
04NOV86	0.88	11.9	2.7	1.6	13	4.123
04NOV86	0.81	13.3	0.2	1.6	13	3.663
04NOV86	0.87	11.3	1.1	0	24	0
04NOV86	0.85	10.6	0.7	3.8	24	10.18
05NOV86	1	5.5	2.7	0.8	0	3.031
05NOV86	0.85	12.3	1.7	2.1	2	5.197
05NOV86	0.84	14.7	0.1	2.4	4	5.488
05NOV86	0.84	11.7	2.9	1.8	6	4.461
05NOV86	0.89	9.7	1	2.4	8	6.88
05NOV86	0.84	8	0.6	1.2	10	3.453

AREA L: NOVEMBER 1986 PSYCHROMETER DATA

05NOV86	0.88	10.8	0.7	0.1	13	0.268
05NOV86	0.81	.	.	.	13	.
05NOV86	0.85	14.3	0.5	1.5	24	3.487
05NOV86	0.87	14.1	2.4	3.6	24	8.656
05NOV86	0.9	12.2	1.9	2.5	41	6.585
05NOV86	1	10.4	1.1	0.3	41	0.925
06NOV86	1	6.2	3.3	1.6	0	5.895
06NOV86	0.85	13.1	0.6	0.4	2	0.958
06NOV86	0.84	10.5	0.4	1.4	4	3.654
06NOV86	0.84	13	1.4	3.2	6	7.712
06NOV86	0.89	12.2	0.3	2.4	8	6.293
06NOV86	0.84	8.3	0.2	0.7	10	1.984
06NOV86	0.88	8	0.5	3.1	13	9.511
06NOV86	0.81	.	.	.	13	.
06NOV86	0.87	14.4	2.9	2.6	24	6.141
06NOV86	0.85	10.2	0.4	1.1	24	2.932
06NOV86	1	8.8	0.2	1.4	41	4.654
06NOV86	0.9	8.6	1.9	1	41	2.985
07NOV86	1	4.9	2.8	3.5	0	14.05
07NOV86	0.85	12.6	0.8	1.1	2	2.688
07NOV86	0.84	11.2	0	1	4	2.541
07NOV86	0.84	14.5	1.4	3.4	6	7.822
07NOV86	0.89	12.4	0.2	2.1	8	5.46
07NOV86	0.84	11.2	0.2	2.2	10	5.635
07NOV86	0.88	11.5	0.7	0.1	13	0.261
07NOV86	0.81	1.6	1	3.7	13	14.54
07NOV86	0.87	13.6	2.2	3.4	24	8.302
07NOV86	0.85	14.1	0.5	1.3	24	3.037
07NOV86	1	12.8	0.2	2.3	41	6.638
07NOV86	0.9	12.8	0.8	3.4	41	8.875
08NOV86	1	7.6	3.4	1.7	0	5.881
08NOV86	0.85	12.7	1.5	1.8	2	4.39
08NOV86	0.84	14.5	0.5	3.1	4	7.149
08NOV86	0.84	14	2.3	3	6	6.963
08NOV86	0.89	10.4	0.9	2.9	8	8.126
08NOV86	0.84	9.7	1.2	2.7	10	7.317
08NOV86	0.81	.	.	.	13	.
08NOV86	0.88	10.3	0.9	0.4	13	1.091
08NOV86	0.85	10.5	0.7	3.5	24	9.385
08NOV86	0.87	12.1	2.8	1.7	24	4.302
08NOV86	1	12.4	0.7	1.8	41	5.235
08NOV86	0.9	9	0.7	3.8	41	11.49
09NOV86	1	6.5	3.6	1.9	0	6.914
09NOV86	0.85	11.8	0.6	3.4	2	8.685
09NOV86	0.84	14	0.5	1.1	4	2.544
09NOV86	0.84	10.4	1.9	2	6	5.229
09NOV86	0.89	10.1	0.4	0.4	8	1.115
09NOV86	0.84	11.1	0	0.6	10	1.526
09NOV86	0.81	.	.	.	13	.
09NOV86	0.88	7.6	0.5	2.3	13	7.128
09NOV86	0.87	13.8	2.7	2.3	24	5.528
09NOV86	0.85	11.9	1.4	0.6	24	1.492
09NOV86	0.9	8	1.3	2	41	6.191
09NOV86	1	12.1	0.1	2.5	41	7.402
10NOV86	1	6.7	2.9	0.7	0	2.504
10NOV86	0.85	10	1.3	0.2	2	0.531

2/28/87 30101

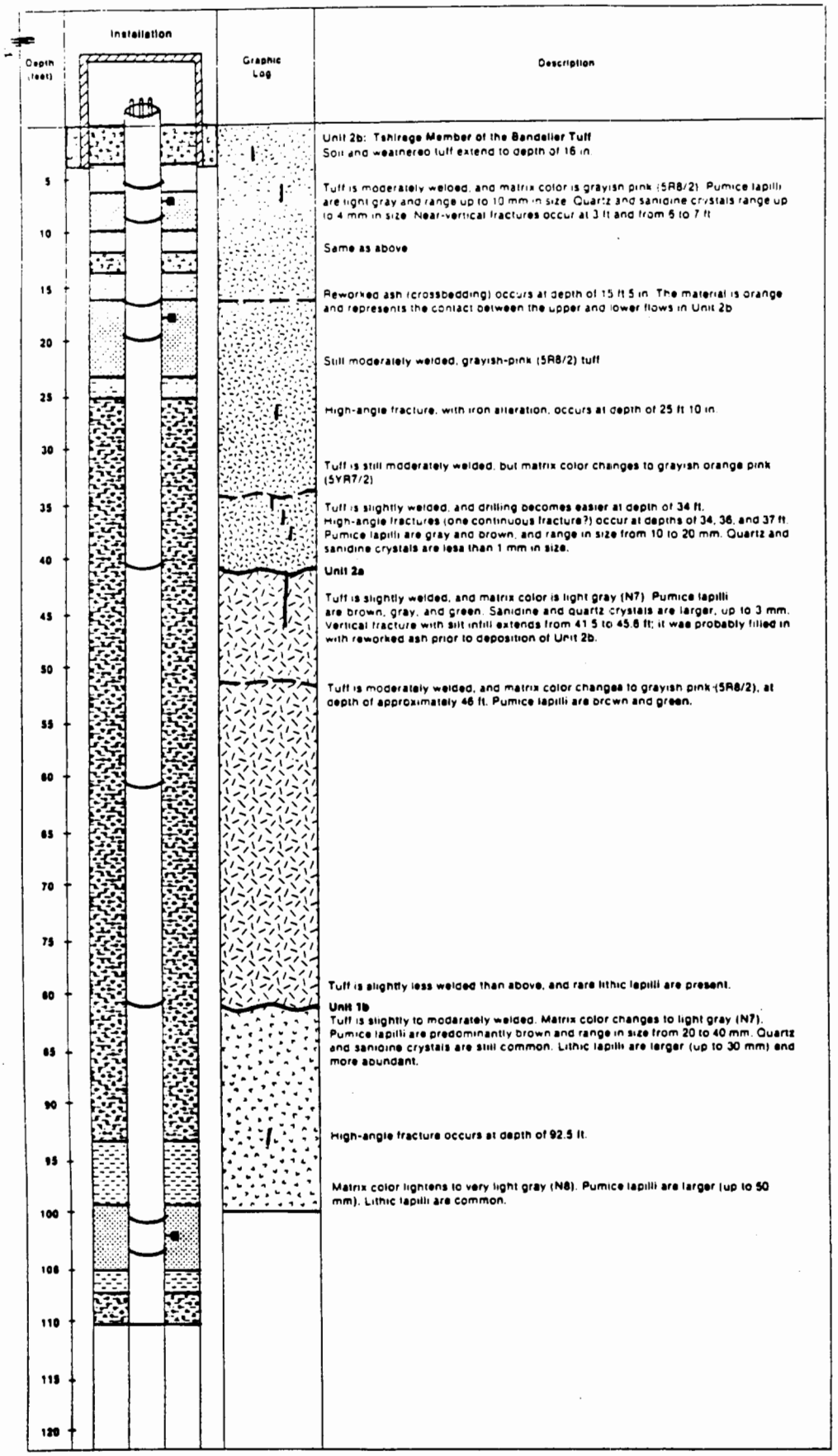


FIGURE C-15. INSTALLATION OF PORE-GAS SAMPLING PORTS IN HOLE LLC-85-16 (BFEC, 1986)

2/28/87 30101.5

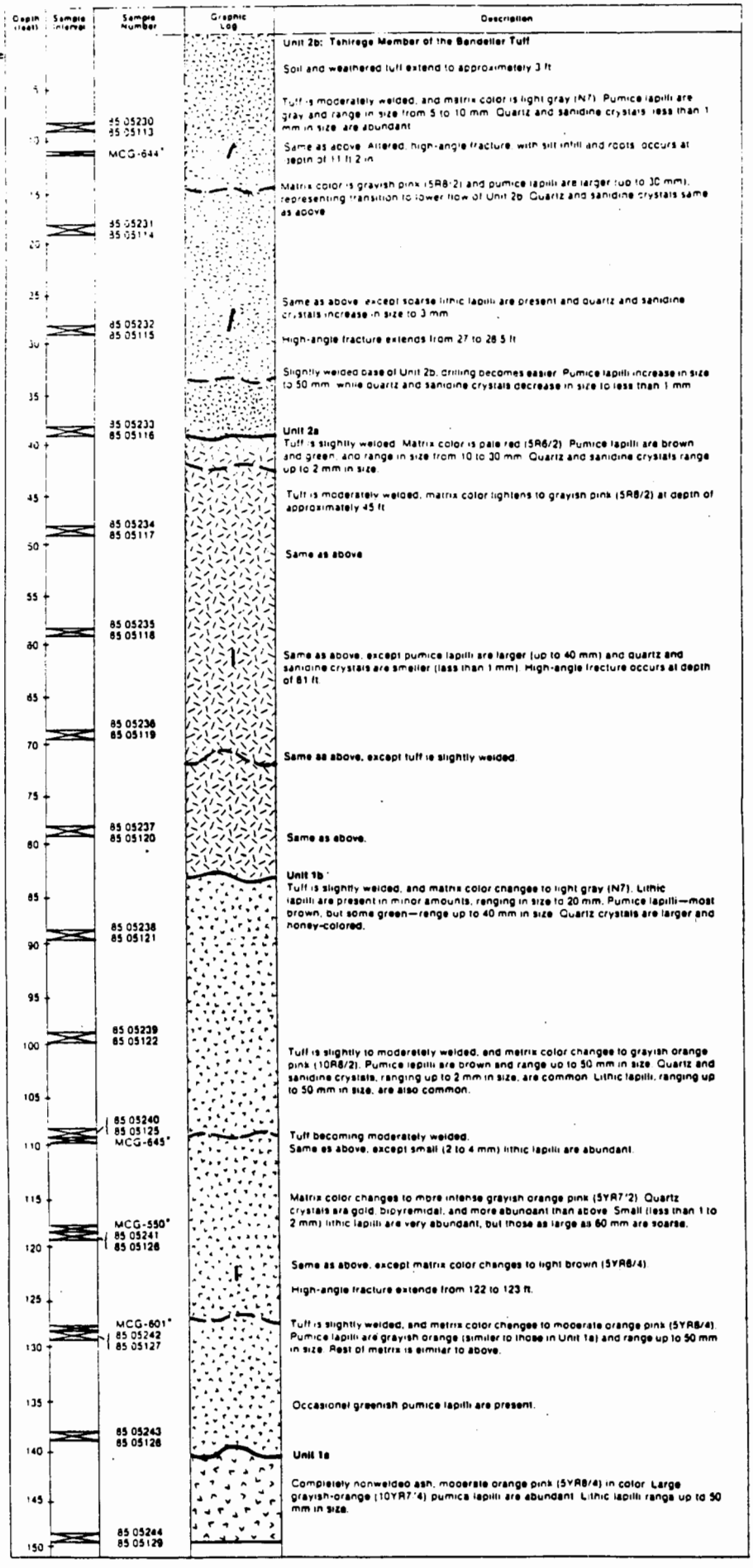


FIGURE C-16. LITHOLOGIC LOG OF HOLE LLC-85-17 (BFEC, 1986)

2/28/87 301017

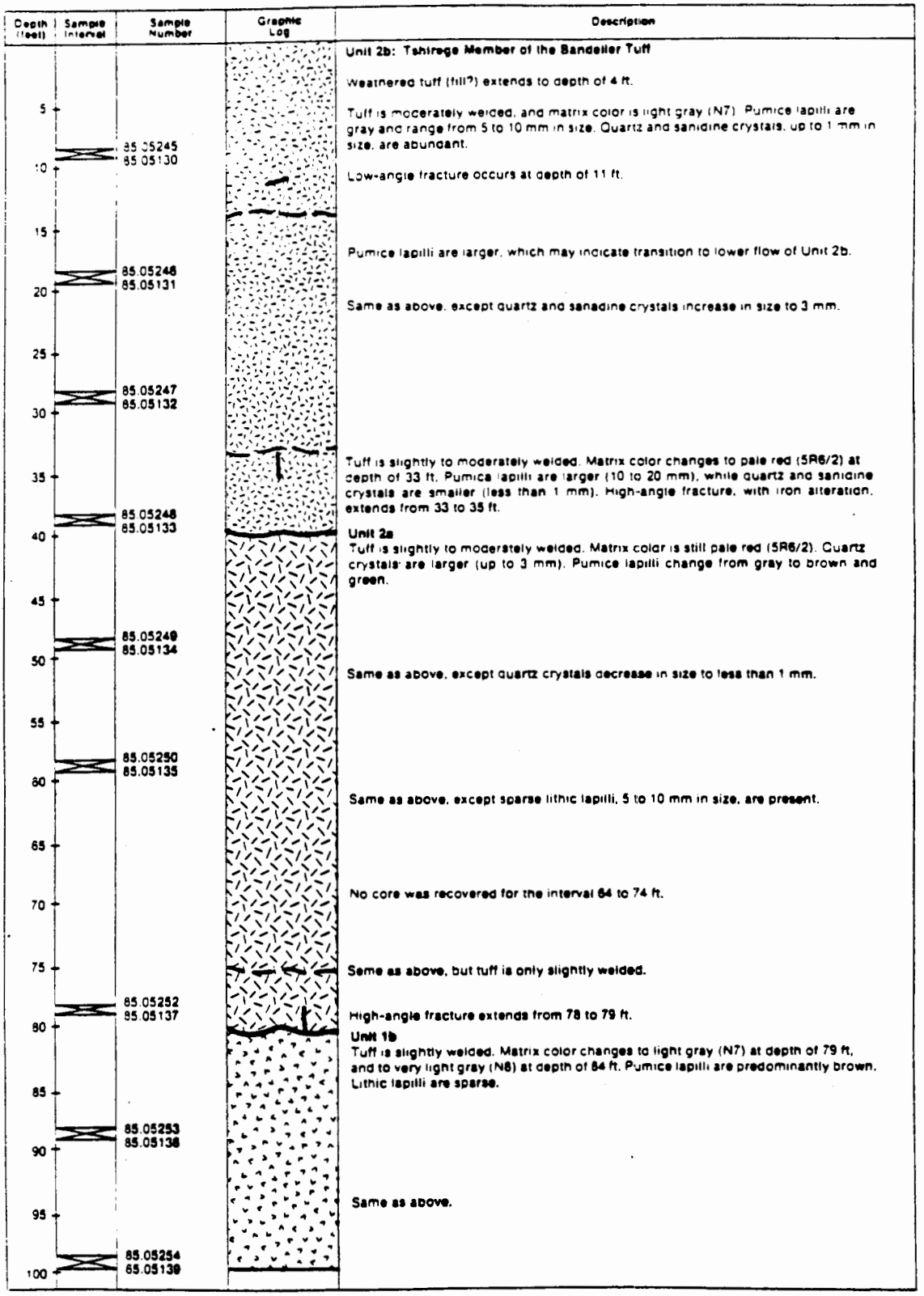


FIGURE C-17. LITHOLOGIC LOG OF HOLE LLC-85-18 (BFEC, 1986)

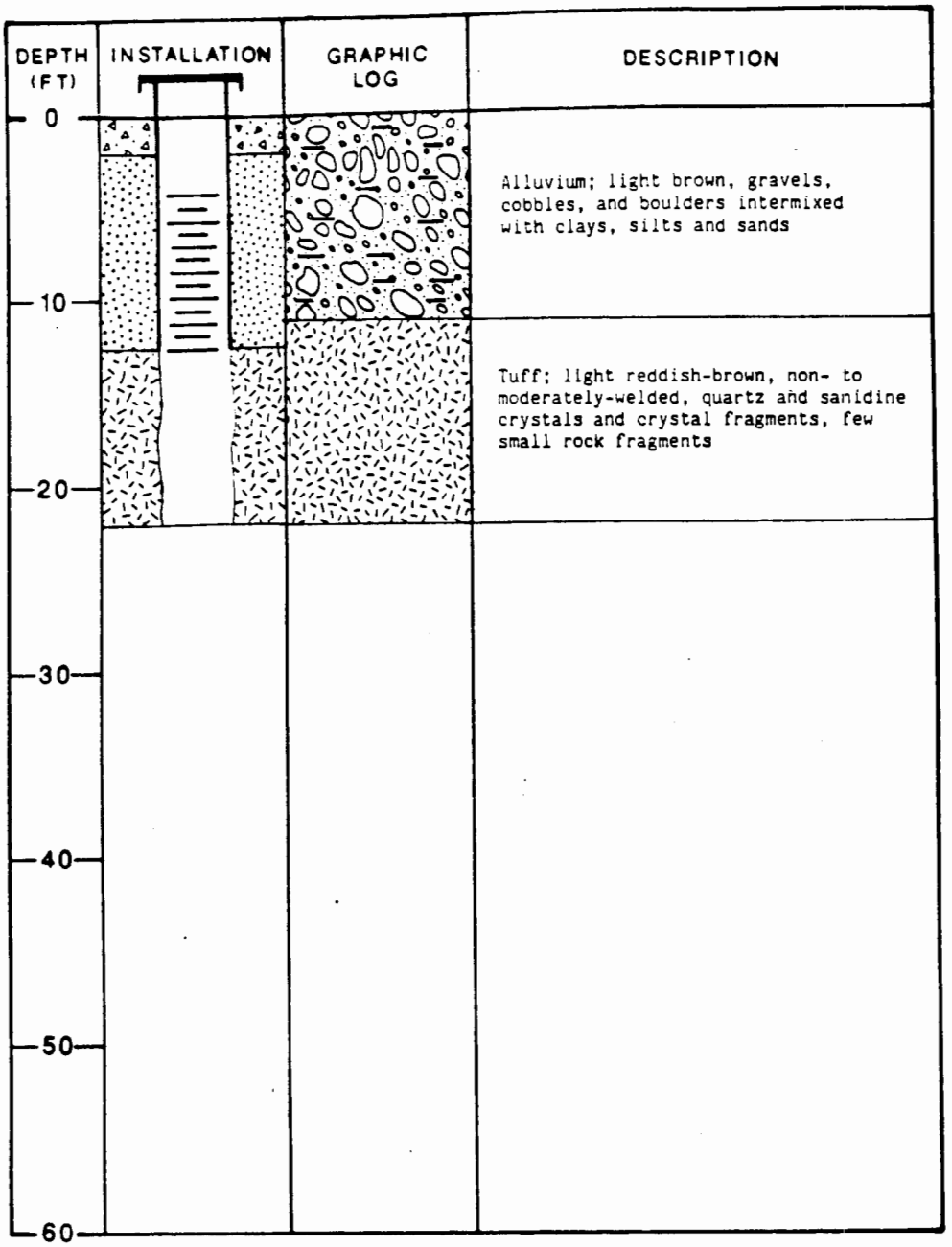


FIGURE C-18.

LITHOLOGIC LOG AND INSTALLATION DIAGRAM FOR MONITORING WELL PCO-1

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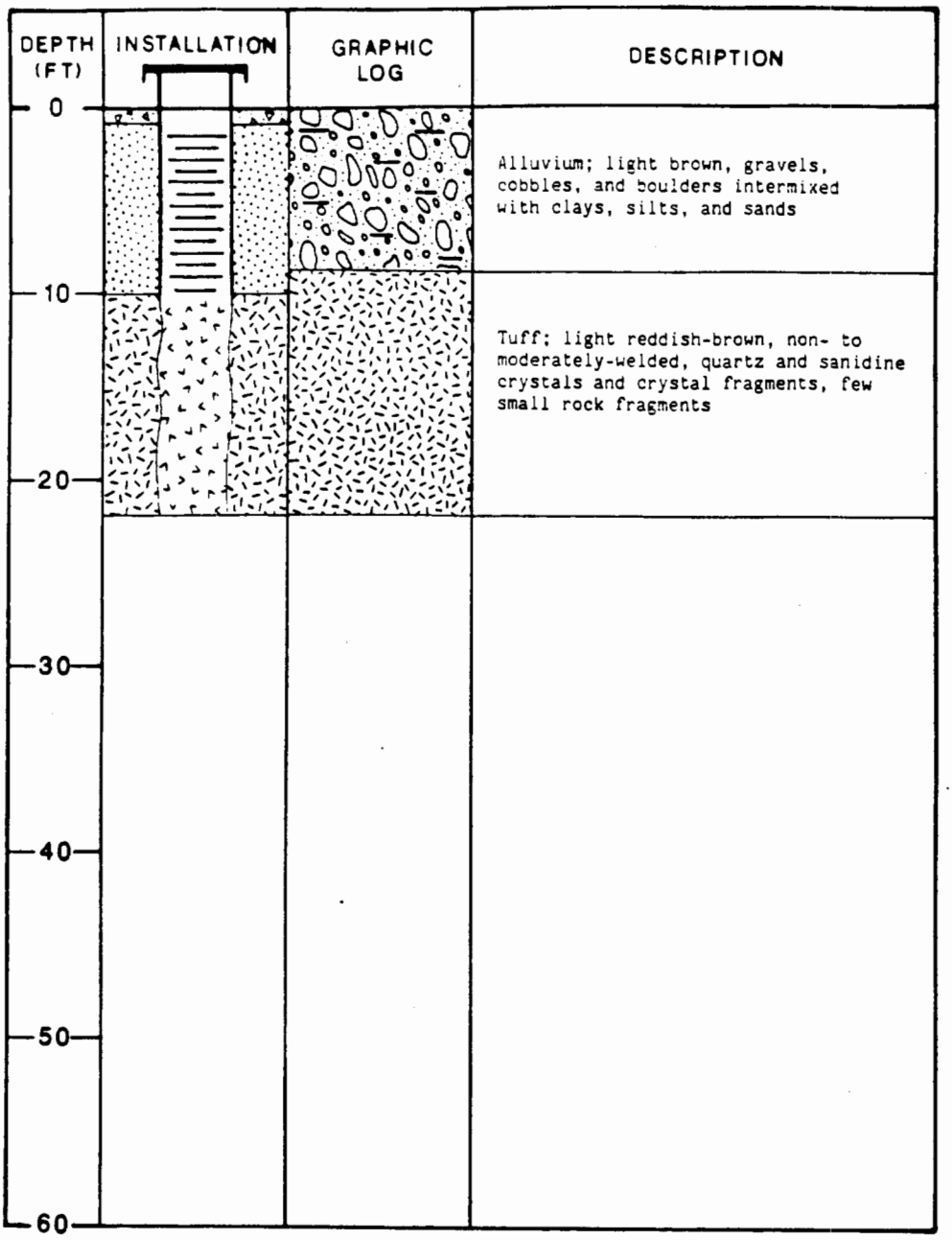

FIGURE C-19.

LITHOLOGIC LOG AND INSTALLATION DIAGRAM FOR MONITORING WELL PCO-2

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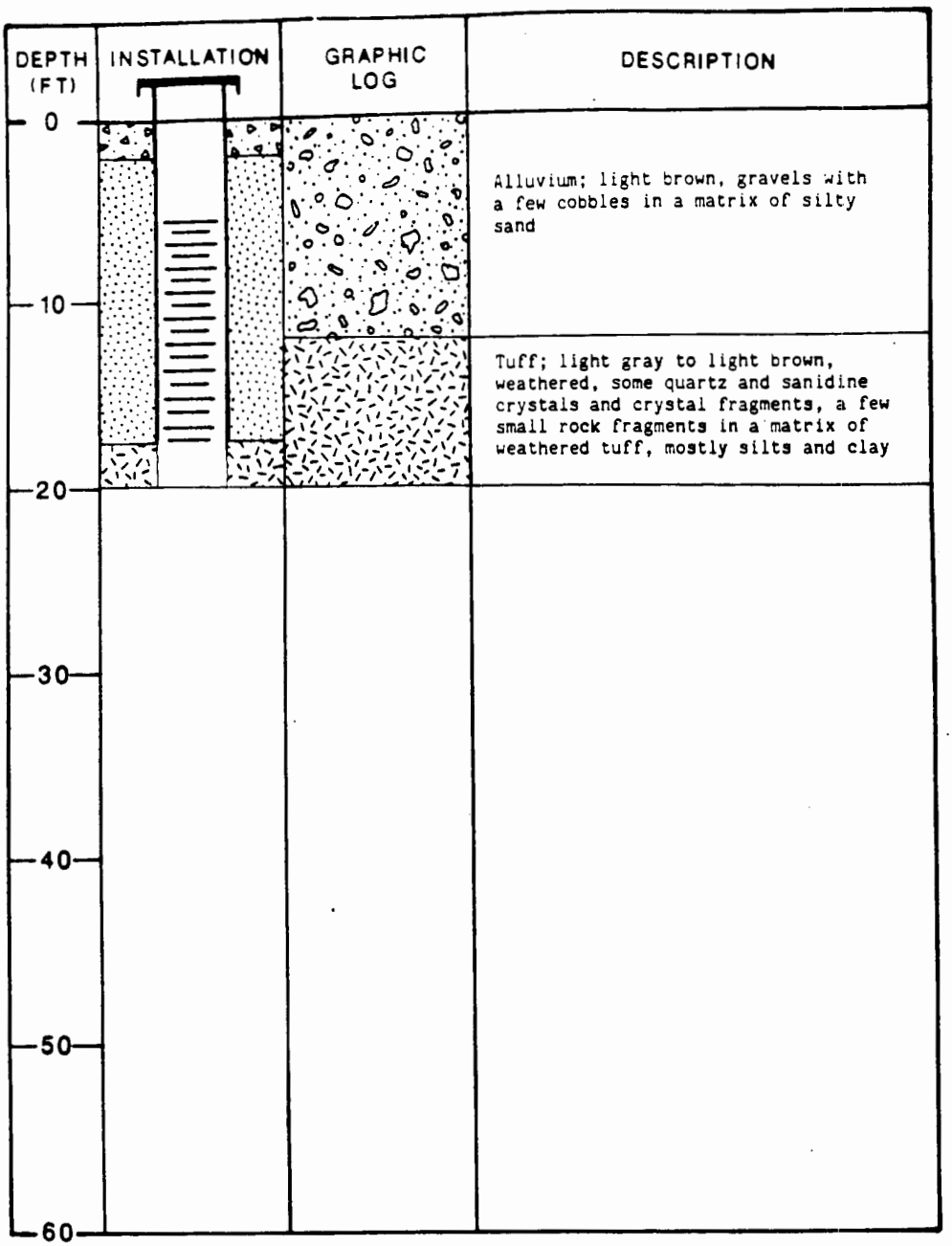

FIGURE C-20.

LITHOLOGIC LOG AND INSTALLATION DIAGRAM FOR MONITORING WELL PCO-3

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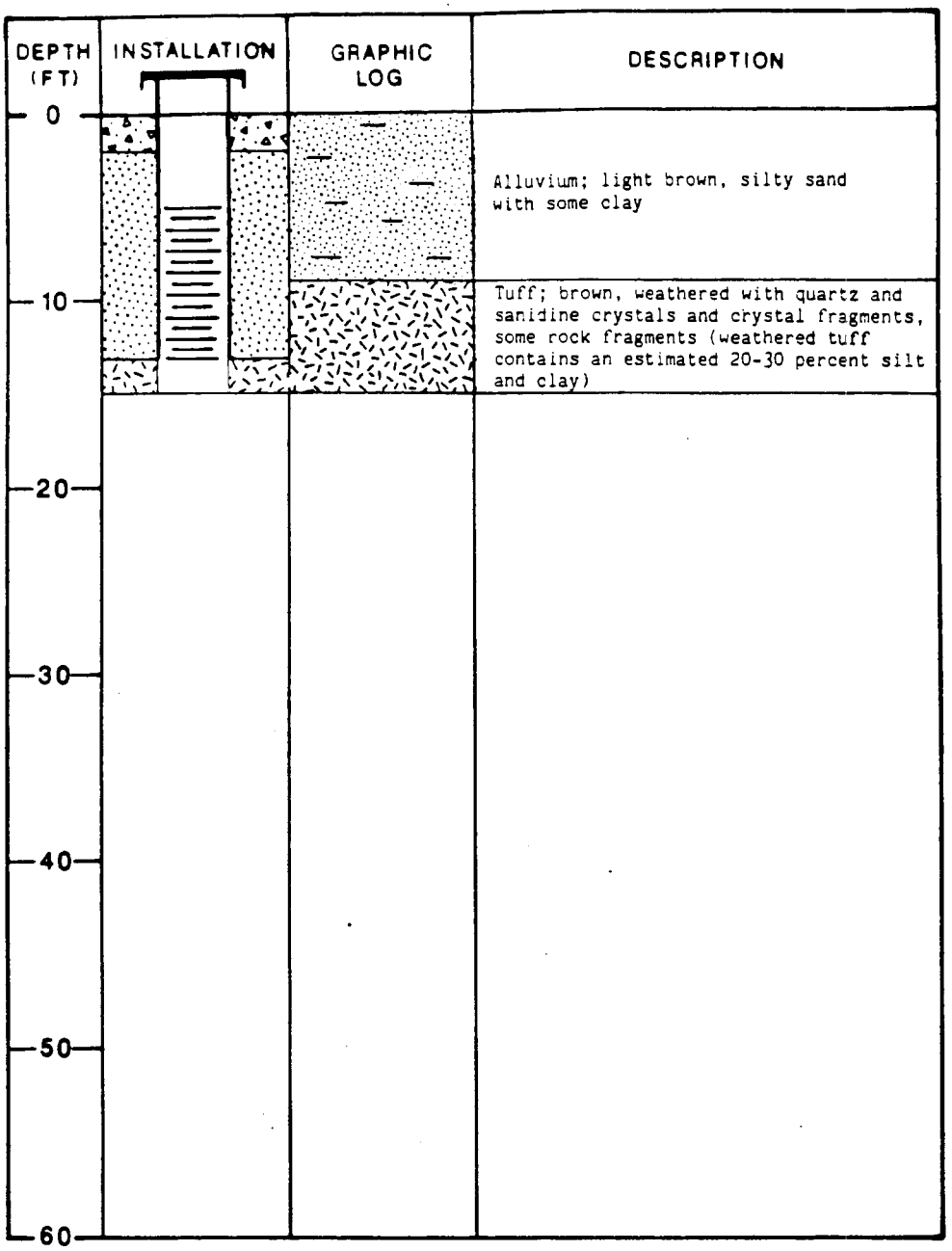

FIGURE C-21.

LITHOLOGIC LOG AND INSTALLATION DIAGRAM FOR MONITORING WELL CDBO-1

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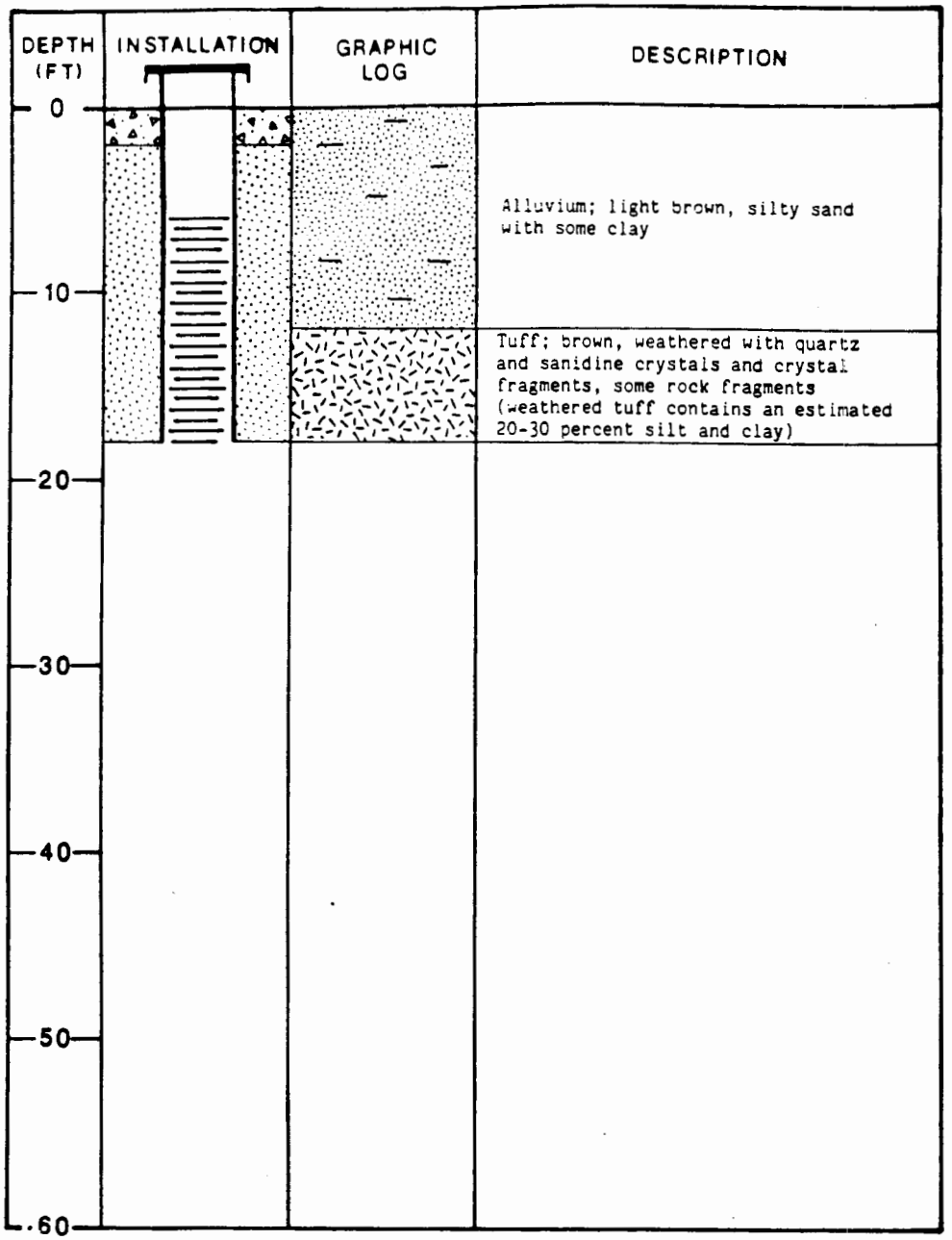

FIGURE C-22.

LITHOLOGIC LOG AND INSTALLATION DIAGRAM FOR MONITORING WELL CDBO-2

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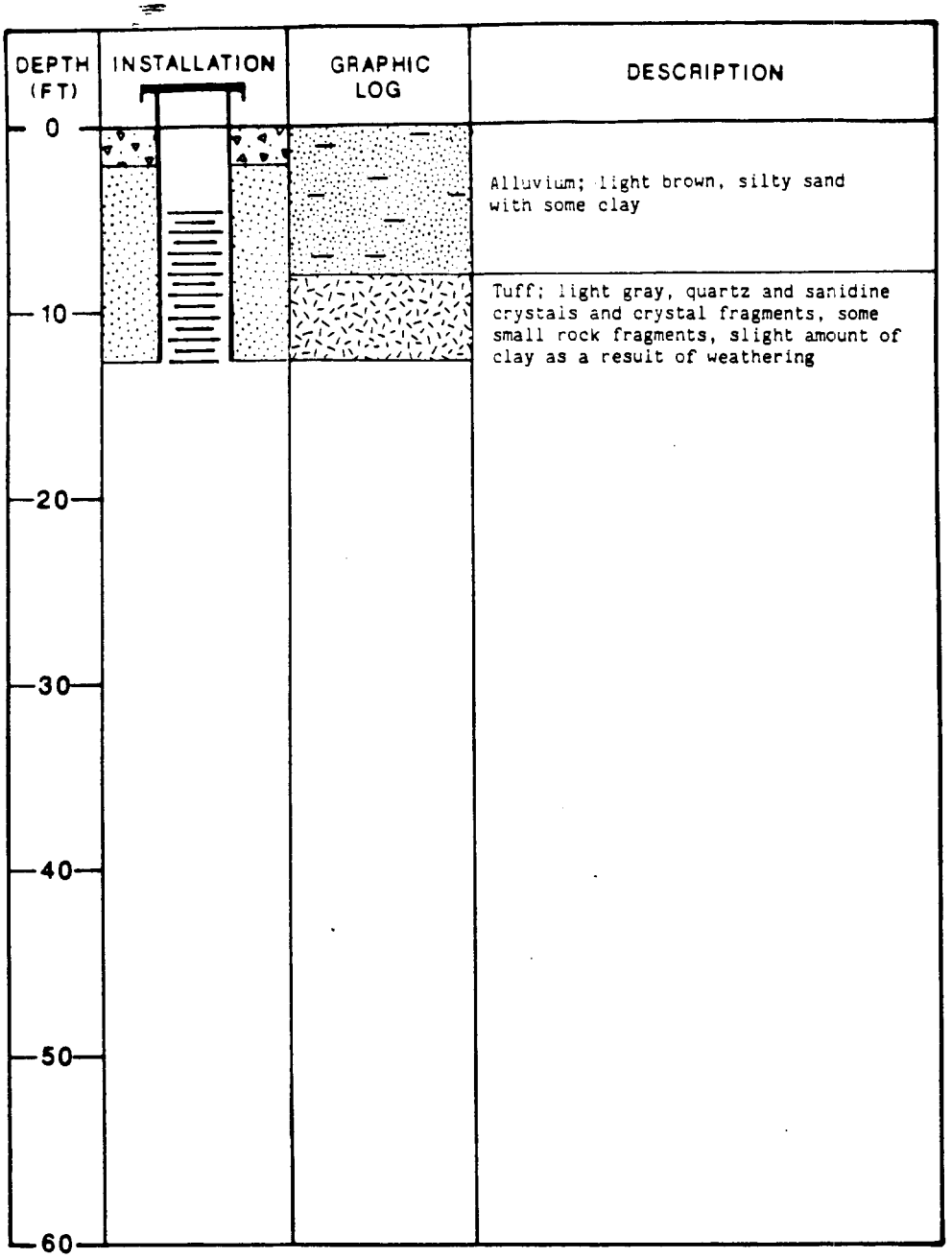

FIGURE C-23.

LITHOLOGIC LOG AND INSTALLATION DIAGRAM FOR MONITORING WELL CDBO-3

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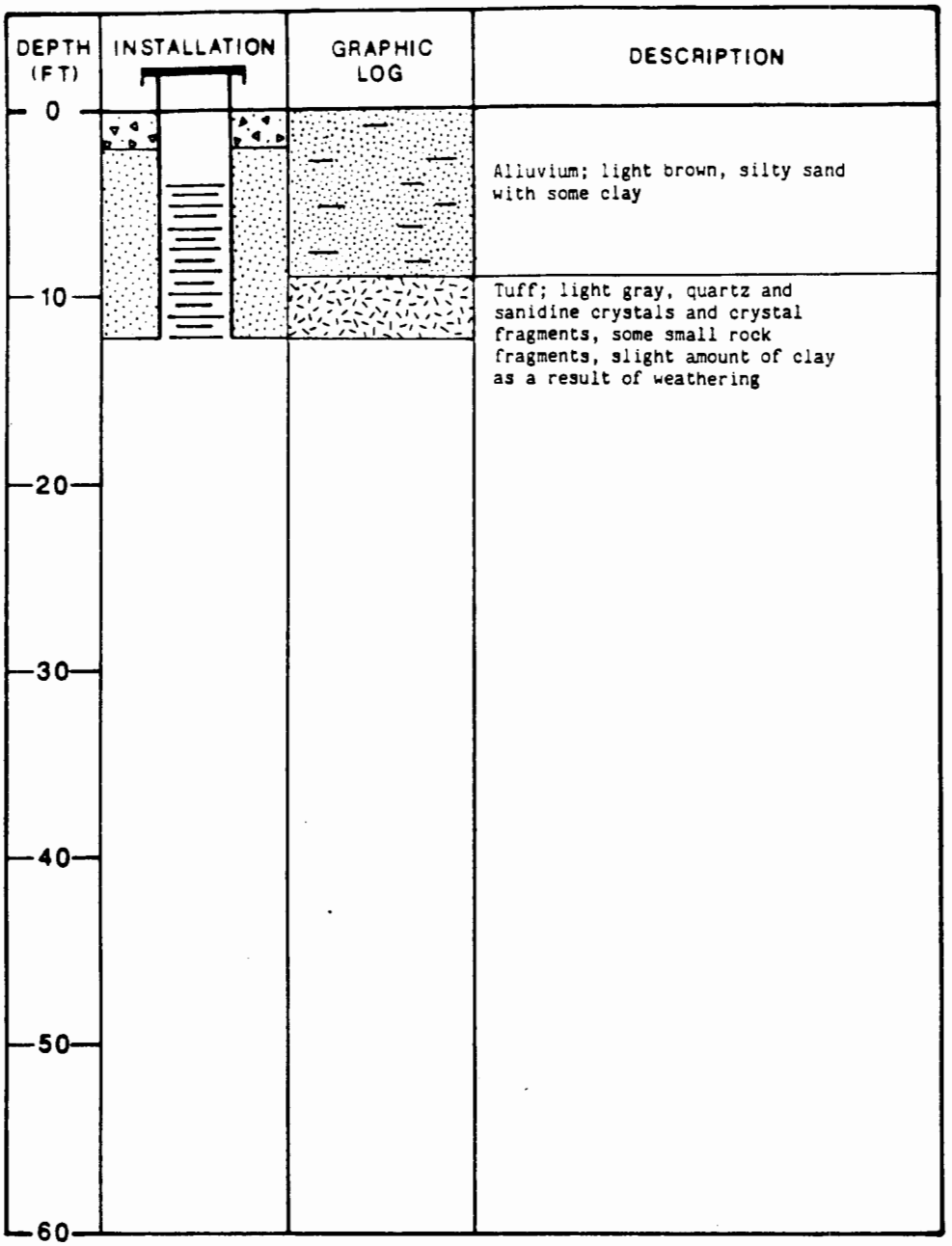

FIGURE C-24.

LITHOLOGIC LOG AND INSTALLATION DIAGRAM FOR MONITORING WELL CDBO-4

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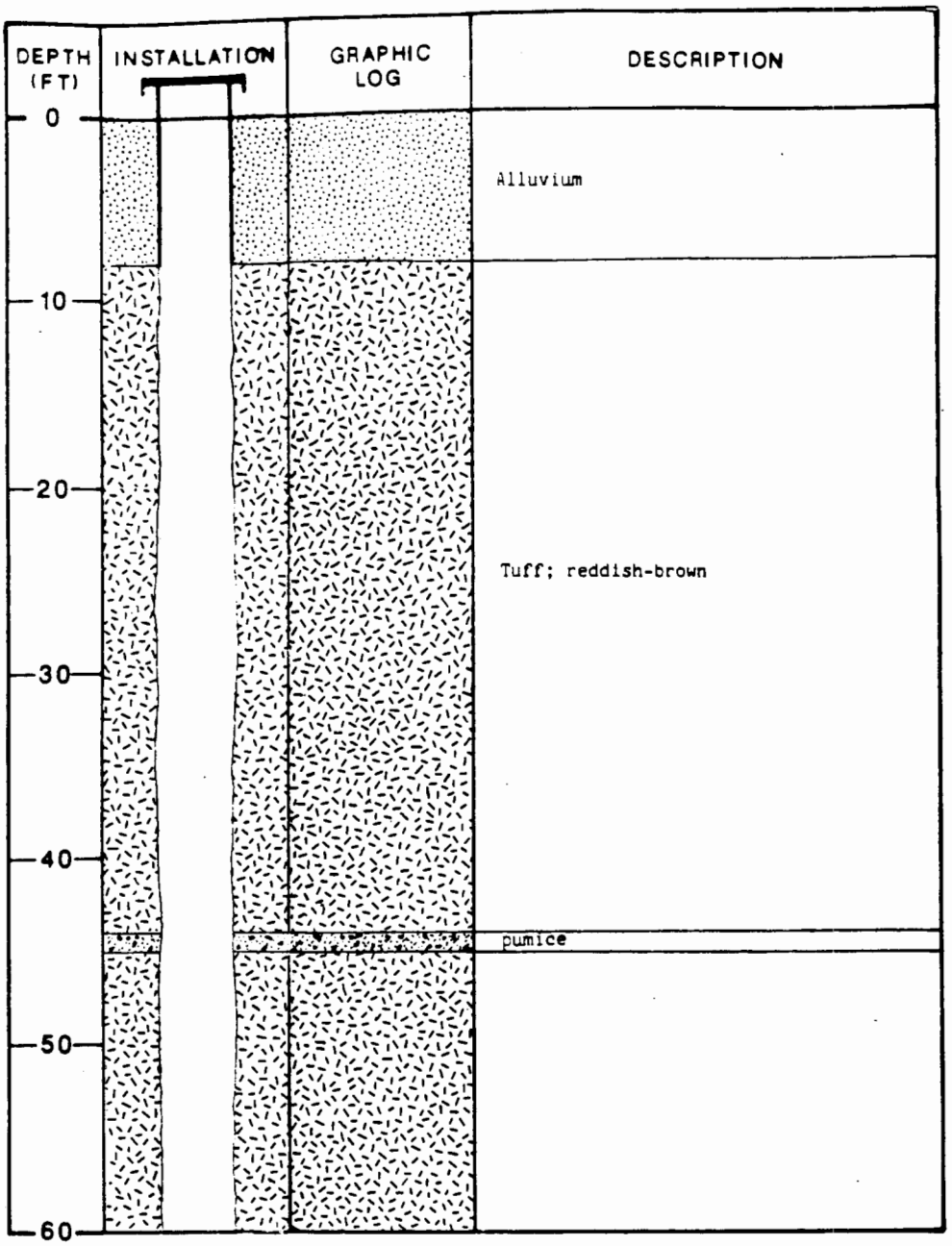

FIGURE C-25.

LITHOLOGIC LOG AND
INSTALLATION DIAGRAM FOR
TEST HOLE PCM-1

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DEPTH (FT)	INSTALLATION	GRAPHIC LOG	DESCRIPTION
0			Alluvium (weathered tuff)
10			
20			
30			Tuff; light gray to pinkish-brown pumice fragments, and rock fragments
40			
50			
120			

FIGURE C-26.

LITHOLOGIC LOG AND
INSTALLATION DIAGRAM FOR
TEST HOLE PCM-2

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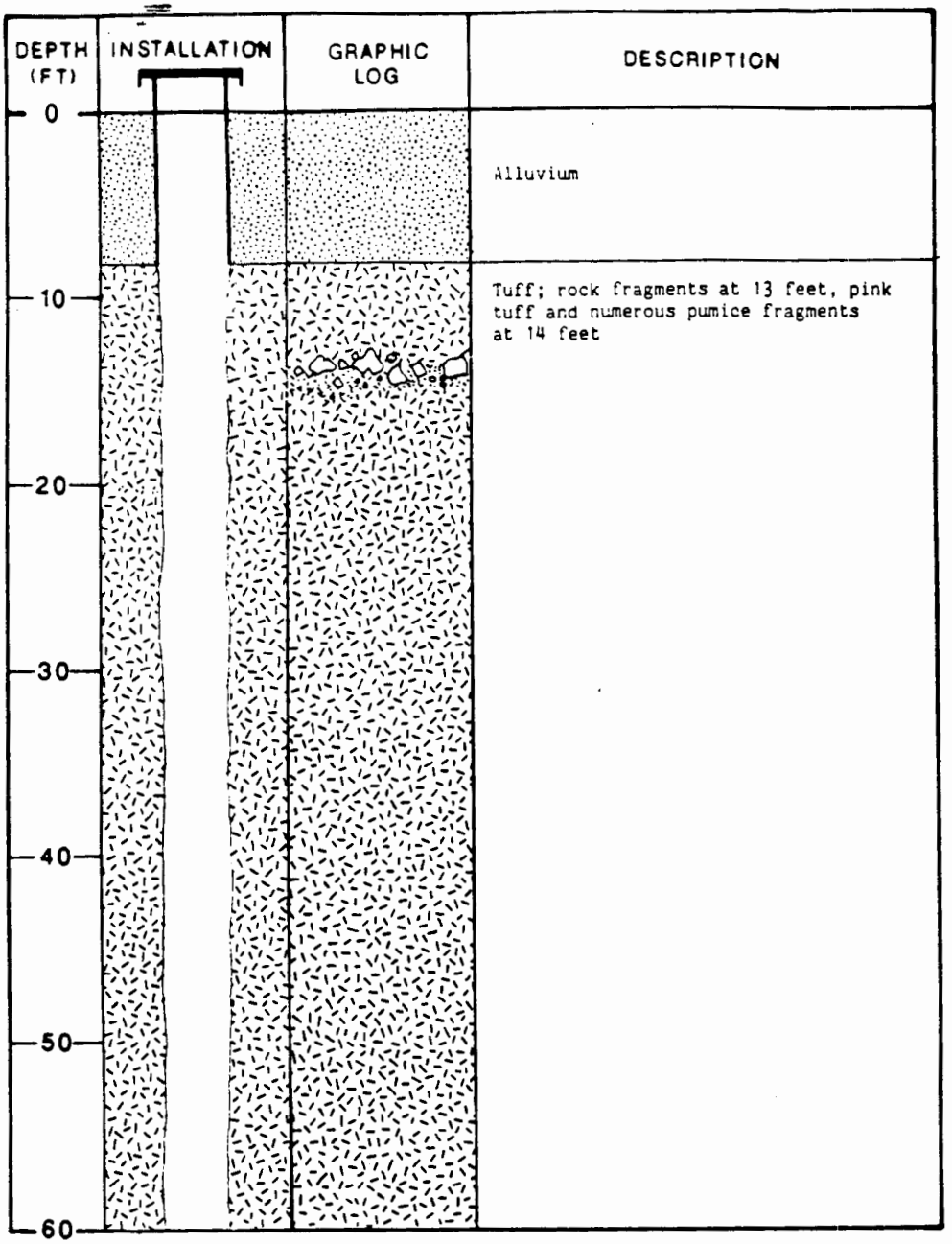

FIGURE C-27.

LITHOLOGIC LOG AND INSTALLATION DIAGRAM FOR TEST HOLE PCM-3

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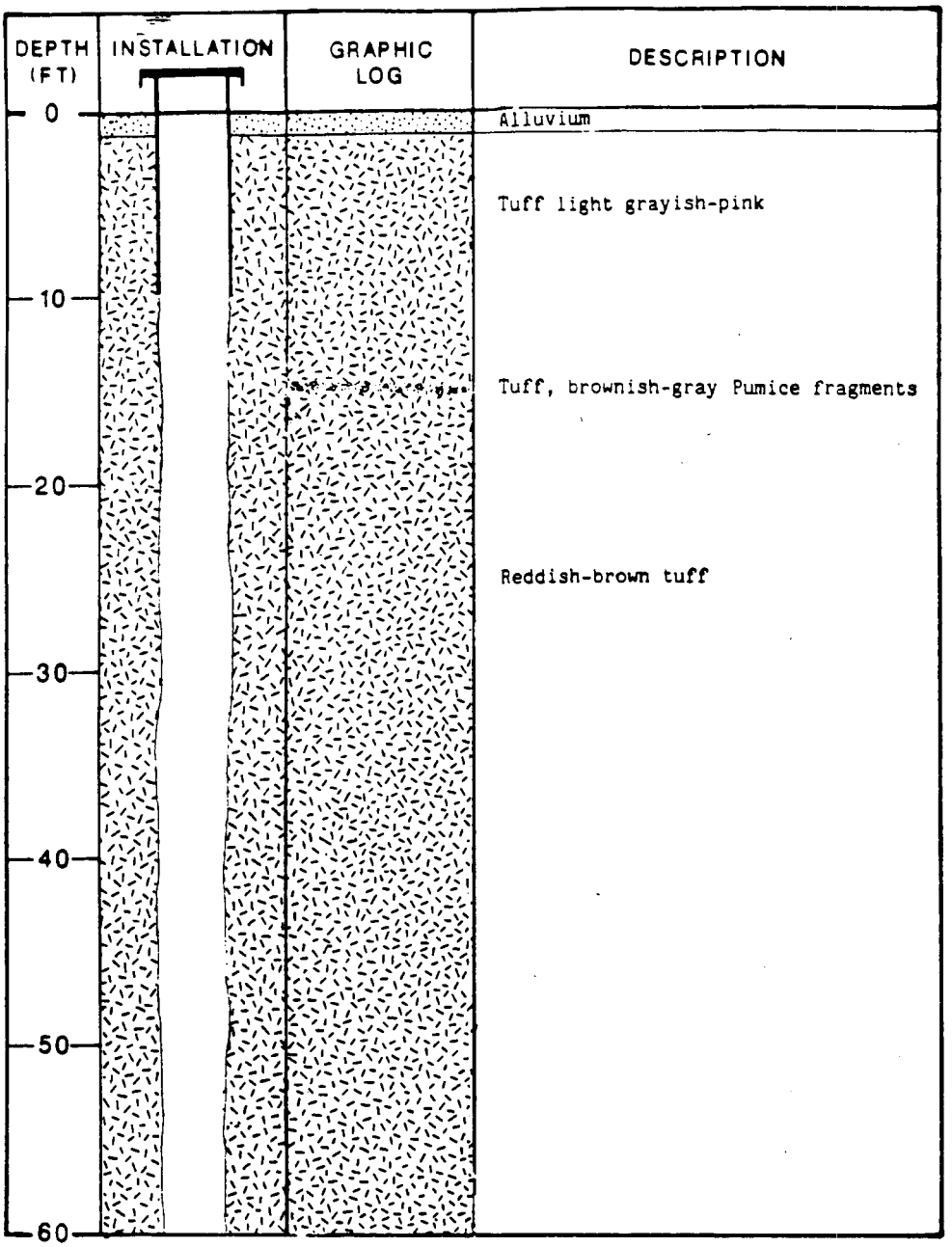

FIGURE C-28.

LITHOLOGIC LOG AND
INSTALLATION DIAGRAM FOR
TEST HOLE PCM-4

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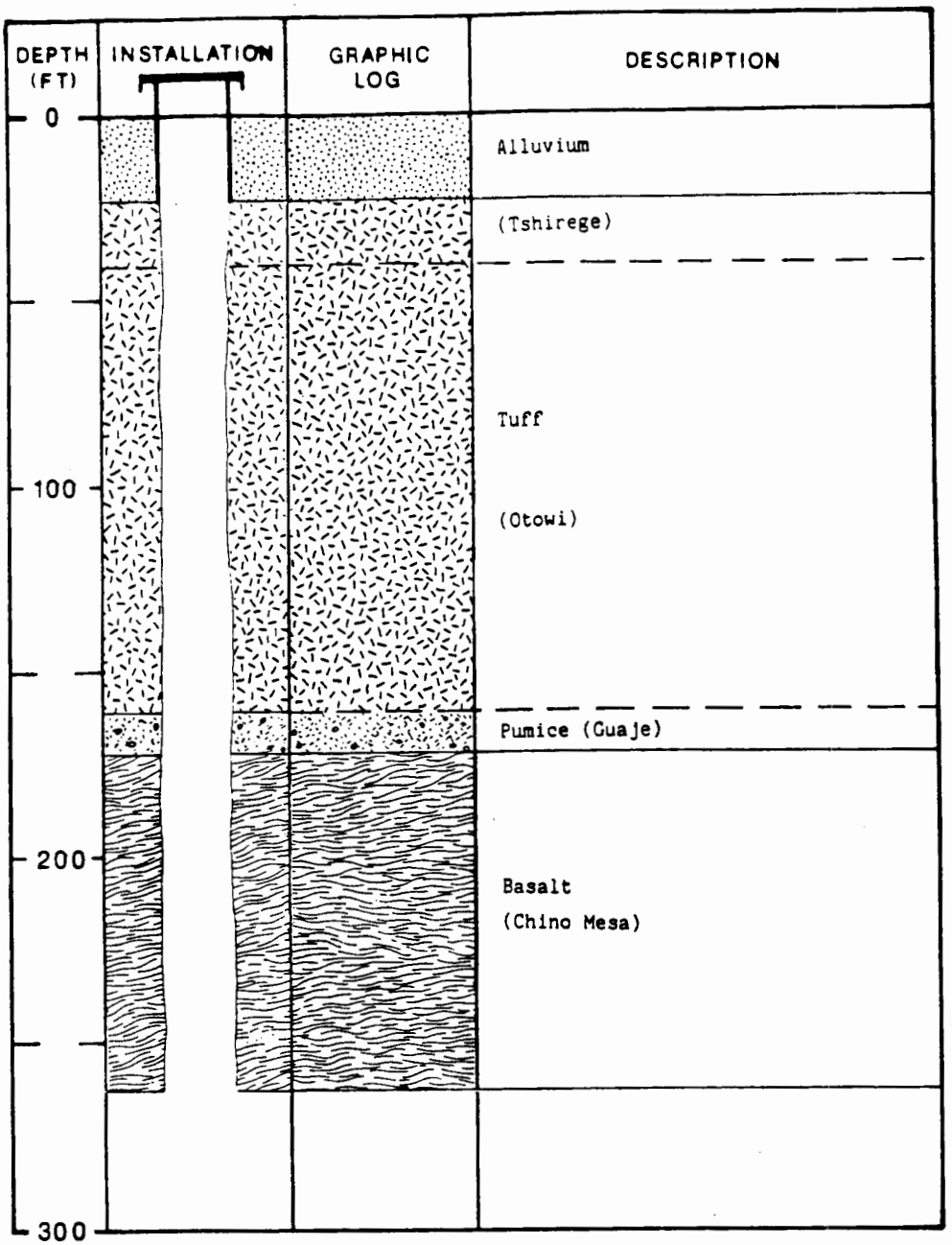

FIGURE C-29.

LITHOLOGIC LOG AND
INSTALLATION DIAGRAM FOR
TEST HOLE T-5

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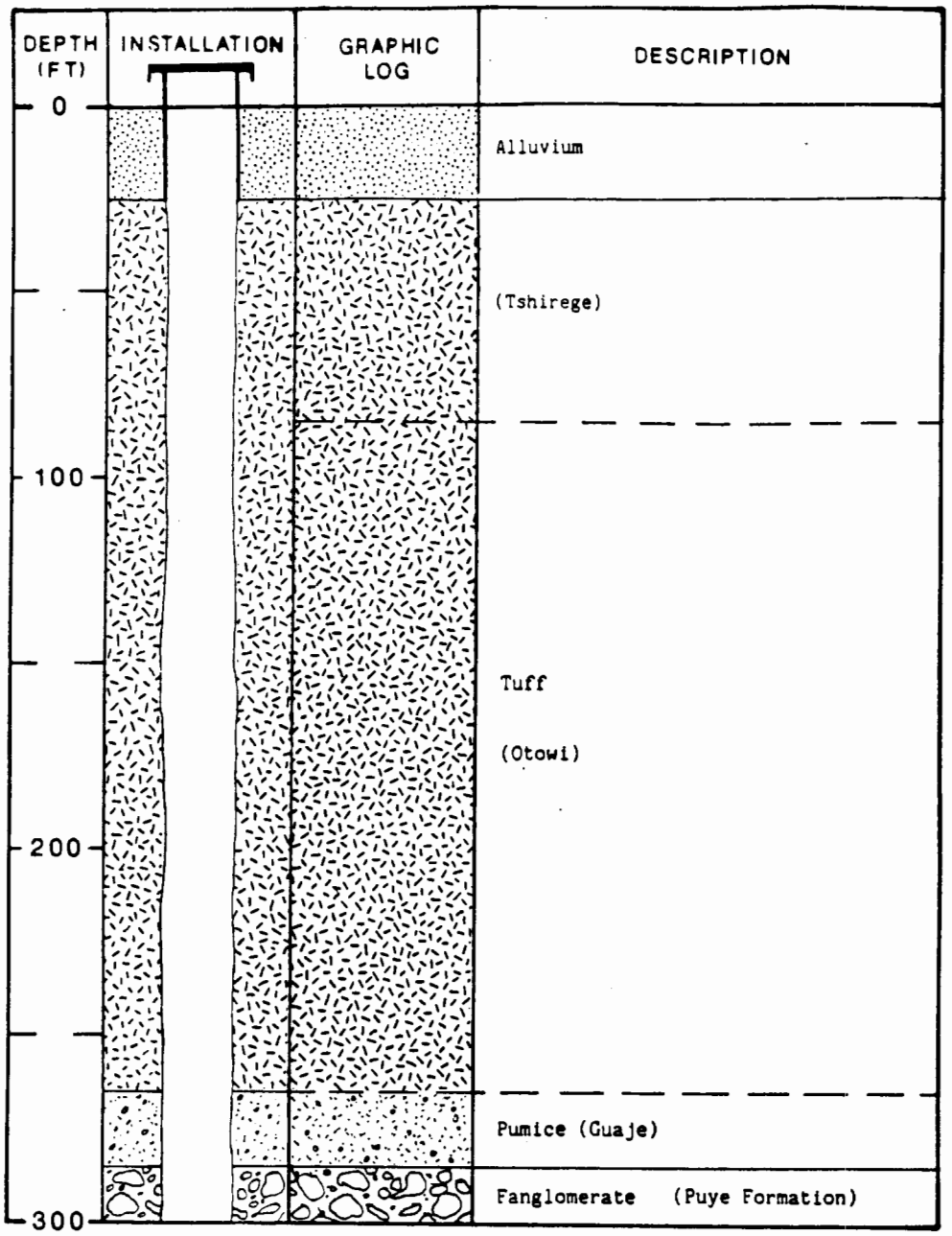

FIGURE C-30.

LITHOLOGIC LOG AND
INSTALLATION DIAGRAM FOR
TEST HOLE T-6

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APPENDIX D

GLOSSARY OF VADOSE ZONE TERMINOLOGY

APPENDIX D

CAPILLARY POTENTIAL (Ψ)	A negative pressure potential resulting from capillary and adsorptive forces due to the soil matrix. These forces attract and bind water in the soil and lower its potential energy below that of bulk water. Synonyms: matric potential, soil-water tension, capillary pressure, pressure head, soil-water suction.
HYDRAULIC CONDUCTIVITY (K)	A coefficient of proportionality describing the rate at which fluid can move through a permeable medium. The density and kinematic viscosity of the fluid must be considered in determining hydraulic conductivity. When the medium is not saturated, hydraulic conductivity is expressed as a function of moisture content $K(\theta)$ or capillary tension $K(\Psi)$.
HYDRAULIC HEAD (H)	The sum of the elevation of the point of measurement, or elevation head (Z), and the pressure head (Ψ).
INTRINSIC PERMEABILITY (k)	Pertains to the relative ease with which a porous medium can transmit a fluid under a hydraulic or potential gradient. It is a property of the porous medium and is independent of the nature of the fluid or the potential field.
MATRIC POTENTIAL	See CAPILLARY POTENTIAL.
MOISTURE FLUX (J)	The volume of liquid crossing a unit cross-sectional area per unit time.
MOISTURE RETENTION VALUE (θ_r)	The moisture content at which the change in moisture content for change in capillary pressure ($d\theta/d\Psi$) approaches zero. This represents the moisture content at which capillarity as a liquid transport mechanism ceases.
POROSITY (n)	The ratio of the volume of void spaces in a rock or sediment to the total volume of the material.
PRESSURE HEAD	See CAPILLARY POTENTIAL.
SATURATION, DEGREE OF (θ_s)	The ratio of the volume of liquid in a sample to the volume of liquid and gas in the sample.

SOIL MOISTURE CHARACTERISTIC CURVE	The graphical representation of the relationship between wetness and matric potential.
UNSATURATED ZONE	The subsurface area above the water table in which porous material contains both air and water. Water in the unsaturated zone is under less that atmospheric pressure.
VADOSE ZONE	The subsurface area above the water table in which porous material contains both air and water. Perched water, at pressure greater than atmospheric, may occur in the vadose zone.
VOLUMETRIC MOISTURE CONTENT (θ)	The ratio of the volume of liquid in a sample to the total volume of the sample.

APPENDIX E

1985-1986 PRECIPITATION MEASUREMENTS, LOS ALAMOS NATIONAL LABORATORY

1985/1986 PRECIPITATION DATA (INCHES)

JULIAN DAY #	NORTH COMM.	S SITE	OHL	EAST GATE	AREA G	WHITE ROCK	WHITE ROCK Y
1985							
245					0.08		
254					0.30		
258					0.21		
259					0.02		
260					0.08		
261					0.85		
262					0.08		
263					1.08		
271					0.01		
272					0.02		
279					0.01		
280					0.08		
282					0.87		
283					1.26		
284					0.08		
286					0.02		
289					0.64		
290					0.22		
292					0.16		
294					0.03		
300					0.03		
302					0.06		
303					0.01		
316					0.01		
318					0.18		
321					0.12		
329					0.01		
330					0.10		
333					0.02		
344					0.04		
365					0.04		
1986							
6	0.01	0.00	0.00	0.00	0.00	0.01	0.00
7	0.02	0.01	0.01	0.00	0.00	0.00	0.00
37	0.39	0.42	0.27	0.22	0.24	0.22	0.14
38	0.45	0.46	0.46	0.30	0.47	0.48	0.34
39	0.00	0.00	0.00	0.01	0.00	0.00	0.00
40	0.36	0.38	0.22	0.19	0.20	0.17	0.20
44	0.01	0.04	0.03	0.01	0.00	0.00	0.00
46	0.08	0.06	0.02	0.00	0.00	0.00	0.00
47	0.03	0.03	0.01	0.00	0.00	0.00	0.00
51	0.01	0.00	0.00	0.00	0.00	0.00	0.00
68	0.11	0.14	0.08	0.03	0.04	0.02	0.03
69	0.06	0.08	0.04	0.03	0.05	0.04	0.02
70	0.02	0.07	0.04	0.03	0.09	0.05	0.04
71	0.00	0.00	0.00	0.01	0.00	0.00	0.00
72	0.04	0.01	0.08	0.03	0.01	0.01	0.03

1985/1986 PRECIPITATION DATA (INCHES)

73	0.02	0.07	0.07	0.02	0.01	0.00	0.01
74	0.00	0.00	0.01	0.00	0.00	0.00	0.00
76	0.08	0.01	0.02	0.03	0.07	0.12	0.08
77	0.25	0.43	0.37	0.50	0.42	0.48	0.22
78	0.20	0.11	0.08	0.12	0.12	0.12	0.32
91	0.50	0.43	0.36	0.29	0.39	0.29	0.33
92	0.43	0.47	0.35	0.17	0.13	0.13	0.18
93	0.01	0.02	0.01	0.00	0.00	0.00	0.00
101	0.00	0.00	0.00	0.00	0.00	0.00	0.01
102	0.05	0.03	0.02	0.00	0.00	0.00	0.00
103	0.00	0.00	0.00	0.00	0.00	0.01	0.00
106	0.03	0.01	0.02	0.01	0.00	0.00	0.00
109	0.23	0.25	0.24	0.32	0.47	0.38	0.33
113	0.00	0.01	0.00	0.00	0.00	0.00	0.00
114	0.11	0.12	0.11	0.09	0.05	0.05	0.04
115	0.27	0.21	0.18	0.13	0.07	0.08	0.09
116	1.08	0.90	0.56	0.37	0.35	0.27	0.43
122	0.01	0.02	0.01	0.02	0.00	0.02	0.04
123	0.16	0.21	0.22	0.12	0.00	0.06	0.05
128	0.03	0.00	0.00	0.00	0.00	0.00	0.02
136	0.13	0.11	0.09	0.22	0.18	0.22	0.20
137	0.64	0.60	0.48	0.28	0.35	0.25	0.27
145	0.08	0.61	0.03	0.01	0.00	0.00	0.04
147	0.42	0.40	0.41	0.30	0.30	0.27	0.37
148	0.67	0.30	0.16	0.20	0.10	0.08	0.10
149	0.02	0.01	0.05	0.08	0.14	0.17	0.06
150	0.26	0.18	0.16	0.22	21	0.24	0.20
151	0.05	0.02	0.03	0.06	0.10	0.14	0.07
152	0.07	0.06	0.03	0.04	0.10	0.12	0.03
153	0.02	0.06	0.02	0.03	0.15	0.21	0.06
154	1.45	0.70	1.58	0.18	0.15	0.08	0.10
155	0.07	0.19	0.07	0.02	0.00	0.01	0.00
156	0.24	0.11	0.04	0.01	0.00	0.00	0.02
157	0.00	0.00	0.00	0.02	0.00	0.00	0.01
159	1.00	0.89	0.54	0.88	0.52	0.56	0.73
160	0.01	0.06	0.07	0.07	0.03	0.01	0.08
161	0.03	0.04	0.00	0.18	0.00	0.00	0.16
167	0.43	0.01	0.39	0.25	0.05	0.00	0.29
168	0.01	0.10	0.02	0.02	0.10	0.12	0.04
169	1.16	0.67	0.51	0.54	0.28	0.16	0.41
170	0.09	0.14	0.07	0.01	0.04	0.02	0.00
171	0.00	0.00	0.03	0.00	0.00	0.00	0.00
174	0.17	0.11	0.10	0.05	0.10	0.10	0.06
175	0.63	0.75	0.70	0.41	0.55	0.45	0.30
176	0.78	1.03	0.61	0.51	0.45	0.40	0.37
177	0.42	0.32	0.19	0.43	0.90	1.01	1.22
178	0.02	0.00	0.01	0.00	0.00	0.01	0.00
180	0.74	0.69	0.69	0.14	0.00	0.00	0.01
181	0.08	0.01	0.00	0.06	0.03	0.00	0.03
182	0.05	0.08	0.04	0.63	0.26	0.62	0.58
185	0.10	0.11	0.16	0.12	0.08	0.04	0.06
186	0.07	0.03	0.02	0.09	0.00	0.02	0.03
188	0.17	0.10	0.13	0.15	0.28	0.24	0.23
189	0.09	0.14	0.15	0.32	0.12	0.29	0.07
190	0.50	0.35	0.34	0.12	0.31	0.32	0.18
191	0.00	0.00	0.01	0.03	0.00	0.00	0.02

1985/1986 PRECIPITATION DATA (INCHES)

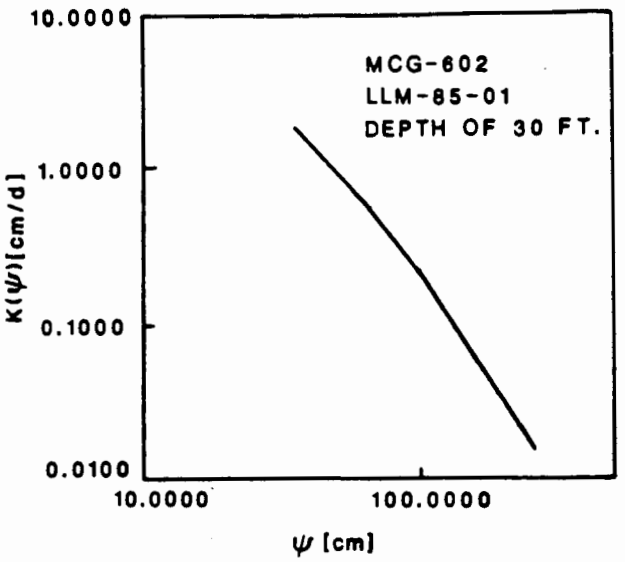
193	0.19	0.00	0.00	0.00	0.00	0.00	0.00
195	0.00	0.00	0.00	0.00	0.06	0.00	0.01
196	0.40	0.34	0.28	0.34	0.35	0.32	0.30
197	0.33	0.57	0.41	0.25	0.17	0.19	0.33
198	0.01	0.00	0.00	0.00	0.00	0.01	0.00
200	0.49	0.06	0.22	0.05	0.05	0.00	0.10
201	0.23	0.33	0.36	0.16	0.32	0.17	0.10
202	0.00	0.00	0.00	0.03	0.06	0.09	0.02
203	0.01	0.01	0.02	0.14	0.10	0.31	0.23
204	0.20	0.12	0.04	0.01	0.02	0.08	0.22
206	0.09	0.00	0.00	0.00	0.00	0.00	0.00
207	0.00	0.00	0.00	0.00	0.01	0.00	0.00
212	0.00	0.15	0.01	0.00	0.00	0.00	0.00
213	0.03	0.04	0.05	0.04	0.00	0.00	0.01
214	0.30	0.05	0.17	0.07	0.02	0.00	0.03
215	0.09	0.16	0.08	0.05	0.00	0.03	0.02
216	0.16	0.25	0.21	0.05	0.09	0.01	0.02
218	0.00	0.04	0.01	0.00	0.00	0.00	0.00
219	0.00	0.00	0.06	0.03	0.01	0.02	0.02
220	0.15	0.25	0.13	0.02	0.02	0.01	0.01
221	0.00	0.01	0.00	0.03	0.02	0.00	0.06
222	0.87	0.33	0.59	0.56	0.34	0.33	0.36
223	0.00	0.01	0.00	0.03	0.02	0.00	0.07
224	0.81	1.00	0.54	0.46	0.26	0.21	0.15
225	0.01	0.02	0.02	0.02	0.02	0.07	0.09
229	0.12	0.01	0.00	0.72	0.00	0.02	0.35
232	0.04	0.00	0.21	0.00	0.00	0.00	0.00
233	0.14	0.68	0.18	0.00	0.05	0.01	0.00
235	0.00	0.04	0.02	0.01	0.05	0.06	0.06
236	0.00	0.00	0.03	0.07	0.00	0.00	0.00
237	0.04	0.31	0.72	0.00	0.00	0.00	0.00
238	0.12	0.14	0.12	0.12	0.12	0.12	0.31
241	0.17	0.48	0.17	0.06	0.10	0.07	0.06
242	0.00	0.00	0.00	0.00	0.00	0.01	0.00
244	0.00	0.03	0.01	0.03	0.35	0.46	0.07
250	0.00	0.02	0.01	0.02	0.11	0.25	0.14
251	0.04	0.00	0.08	0.12	0.02	0.03	0.08
252	0.30	0.15	0.13	0.32	0.32	0.26	0.42
253	0.03	0.13	0.06	0.05	0.07	0.09	0.05
254	0.00	0.00	0.00	0.00	0.01	0.00	0.00
256	1.15	1.08	0.82	0.82	0.57	0.59	0.53
257	0.32	0.29	0.24	0.23	0.29	0.25	0.16
258	0.05	0.05	0.07	0.08	0.05	0.03	0.05
259	0.13	0.02	0.01	0.04	0.02	0.04	0.02
265	0.00	0.00	0.00	0.00	0.01	0.00	0.03
266	0.03	0.02	0.00	0.00	0.03	0.01	0.02
267	0.74	0.66	0.57	0.48	0.49	0.46	0.44
268	0.01	0.00	0.00	0.00	0.00	0.00	0.00
271	0.04	0.01	0.02	0.00	0.00	0.00	0.00
272	0.00	0.00	0.01	0.00	0.00	0.00	0.00
276	0.03	0.03	0.05	0.00	0.09	0.26	0.03
278	0.14	0.20	0.17	0.17	0.17	0.09	0.19
279	0.13	0.09	0.08	0.06	0.05	0.13	0.03
280	0.03	0.06	0.08	0.04	0.12	0.02	0.02
282	0.02	0.03	0.02	0.02	0.00	0.00	0.00
283	0.66	0.88	0.79	0.49	0.73	0.52	0.53

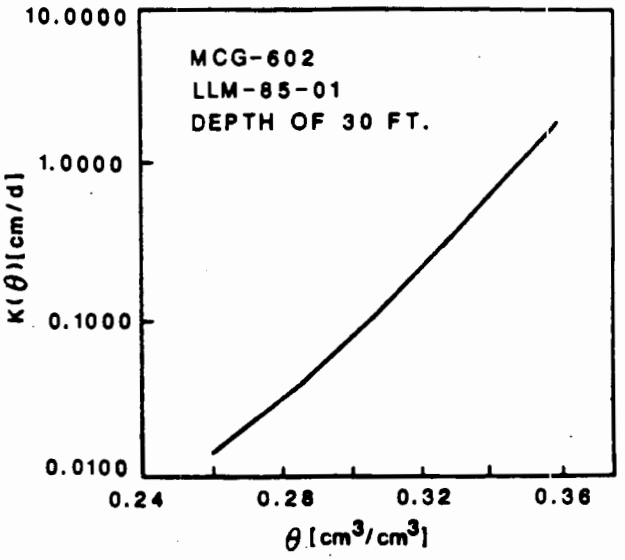
1985/1986 PRECIPITATION DATA (INCHES)

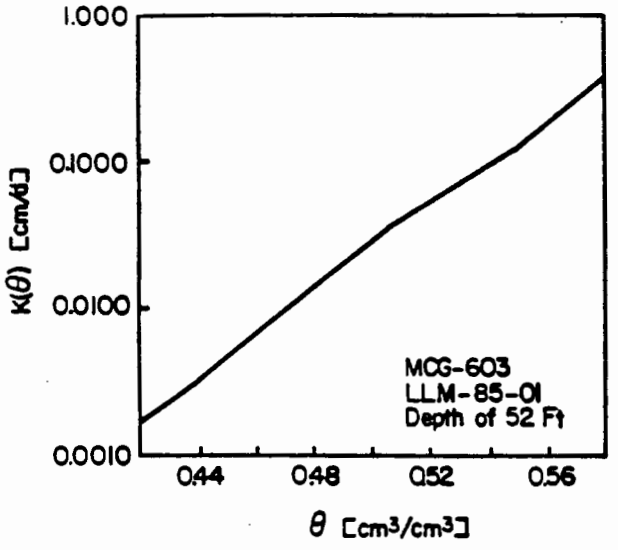
284	0.52	0.62	0.61	0.51	0.60	0.57	0.41
285	0.35	0.31	0.30	0.17	0.30	0.29	0.21
290	0.26	0.05	0.07	0.05	0.00	0.00	0.00
292	0.30	0.17	0.07	0.00	0.00	0.00	0.00
293	0.48	0.53	0.64	0.26	0.02	0.07	0.04
304	0.10	0.09	0.08	0.02	0.02	0.00	0.03
305	0.60	0.63	0.49	0.30	0.24	0.21	0.18
306	0.47	0.52	0.51	0.42	0.56	0.55	0.46
307	0.40	0.25	0.26	0.36	0.42	0.42	0.34
308	0.27	0.25	0.27	0.26	0.27	0.20	0.29
310	0.20	0.11	0.08	0.05	0.07	0.11	0.07
311	0.03	0.03	0.04	0.01	0.04	0.12	0.00
322	0.38	0.33	0.24	0.18	0.17	0.17	0.17
323	0.01	0.01	0.01	0.00	0.00	0.00	0.00
326	0.11	0.08	0.06	0.18	0.28	0.24	0.31
327	0.24	0.18	0.27	0.29	0.40	0.52	0.48
340	0.24	0.36	0.19	0.22	0.35	0.37	0.25
341	0.09	0.11	0.09	0.07	0.10	0.07	0.09
342	0.16	0.04	0.07	0.03	0.12	0.05	0.01
343	0.03	0.05	0.02	0.03	0.00	0.01	0.03
344	0.01	0.02	0.01	0.00	0.01	0.01	0.00
351	0.08	0.05	0.02	0.04	0.04	0.09	0.04
352	0.01	0.03	0.01	0.01	0.01	0.02	0.01
358	0.06	0.07	0.03	0.01	0.00	0.00	0.00
359	0.04	0.02	0.00	0.00	0.01	0.00	0.00

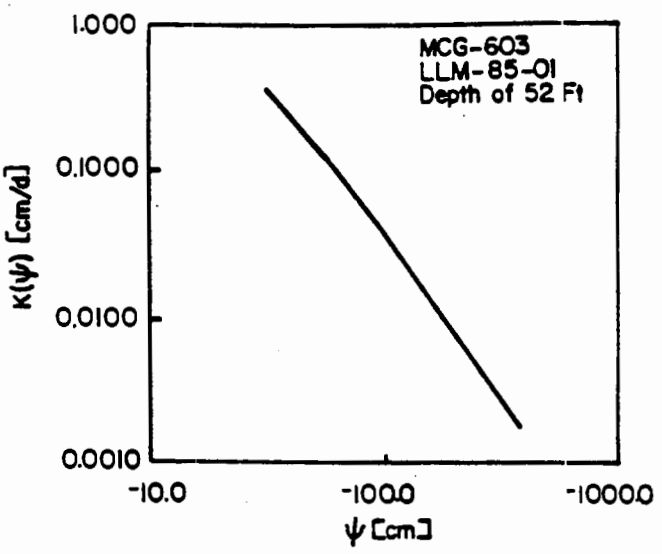
APPENDIX F

SOIL-MOISTURE CHARACTERISTIC CURVES AND UNSATURATED HYDRAULIC CONDUCTIVITY

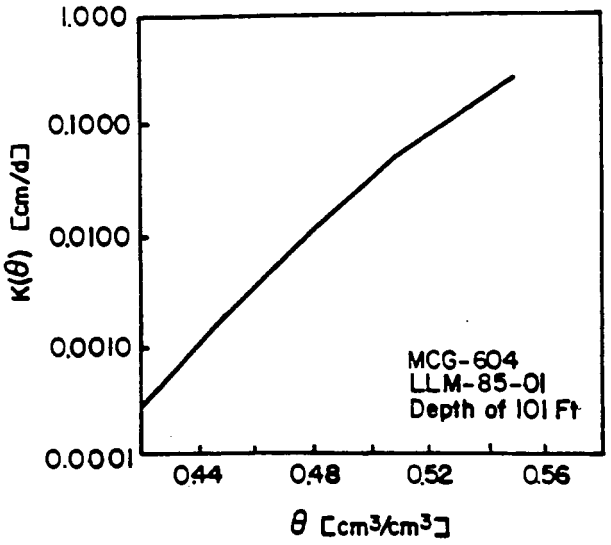


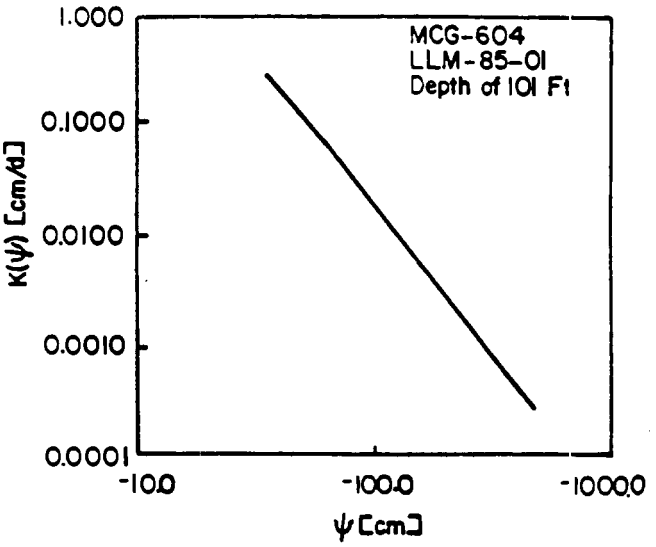


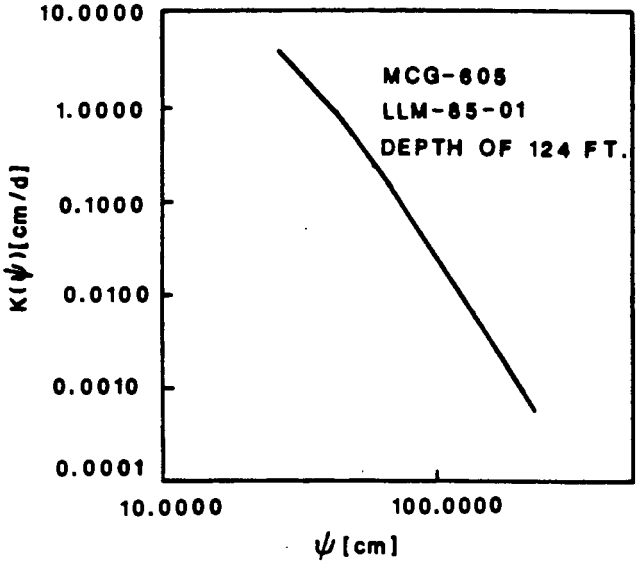




GURE F-1 THEORETICALLY DETERMINED HYDRAULIC CONDUCTIVITY AS A FUNCTION OF MOISTURE CONTENT AND CAPILLARY TENSION, SAMPLES MCG-602 AND MCG-603 (BFEC, 1986 and BFEC unpublished)







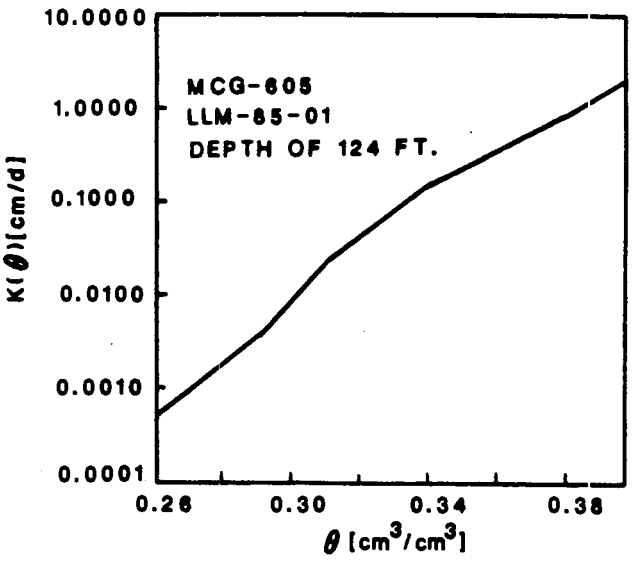
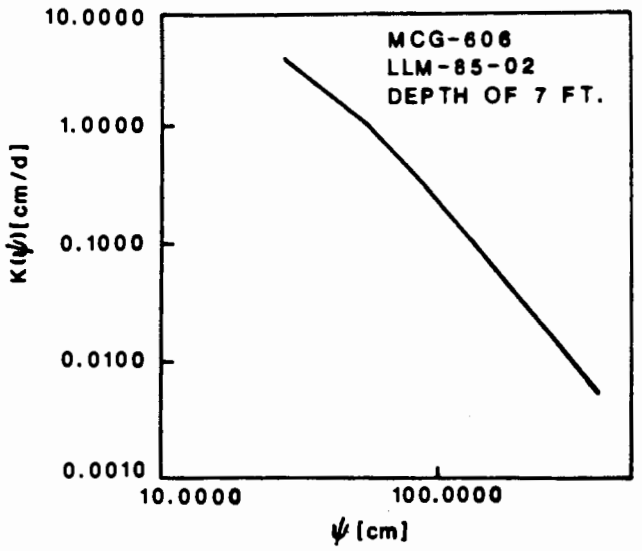
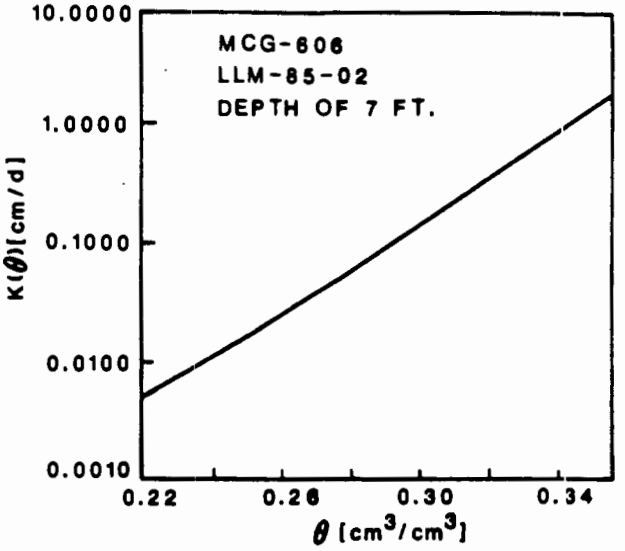
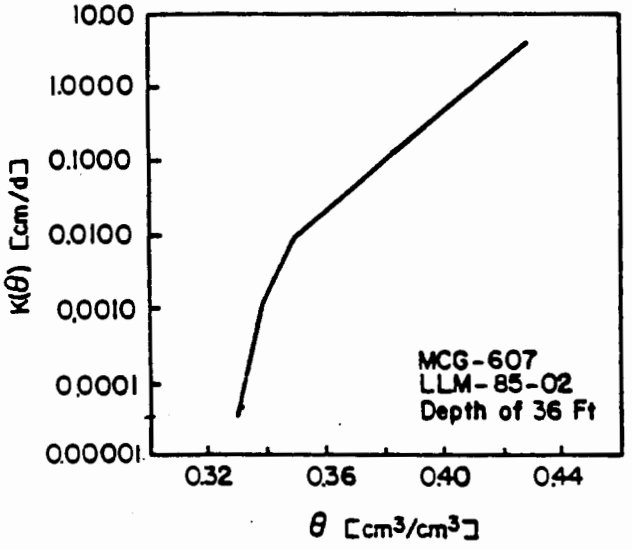


FIGURE F-2 THEORETICALLY DETERMINED HYDRAULIC CONDUCTIVITY AS A FUNCTION OF MOISTURE CONTENT AND CAPILLARY TENSION, SAMPLES MCG-604 AND MCG-605 (BFEC, 1986 and BFEC unpublished)







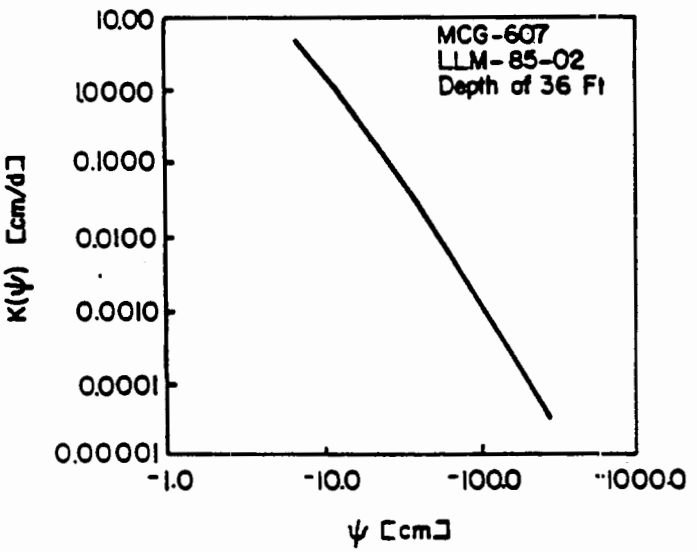


FIGURE F-3 THEORETICALLY DETERMINED HYDRAULIC CONDUCTIVITY AS A FUNCTION OF MOISTURE CONTENT AND CAPILLARY TENSION, SAMPLES MCG-606 AND MCG-607 (BFEC, 1986 and BFEC unpublished)

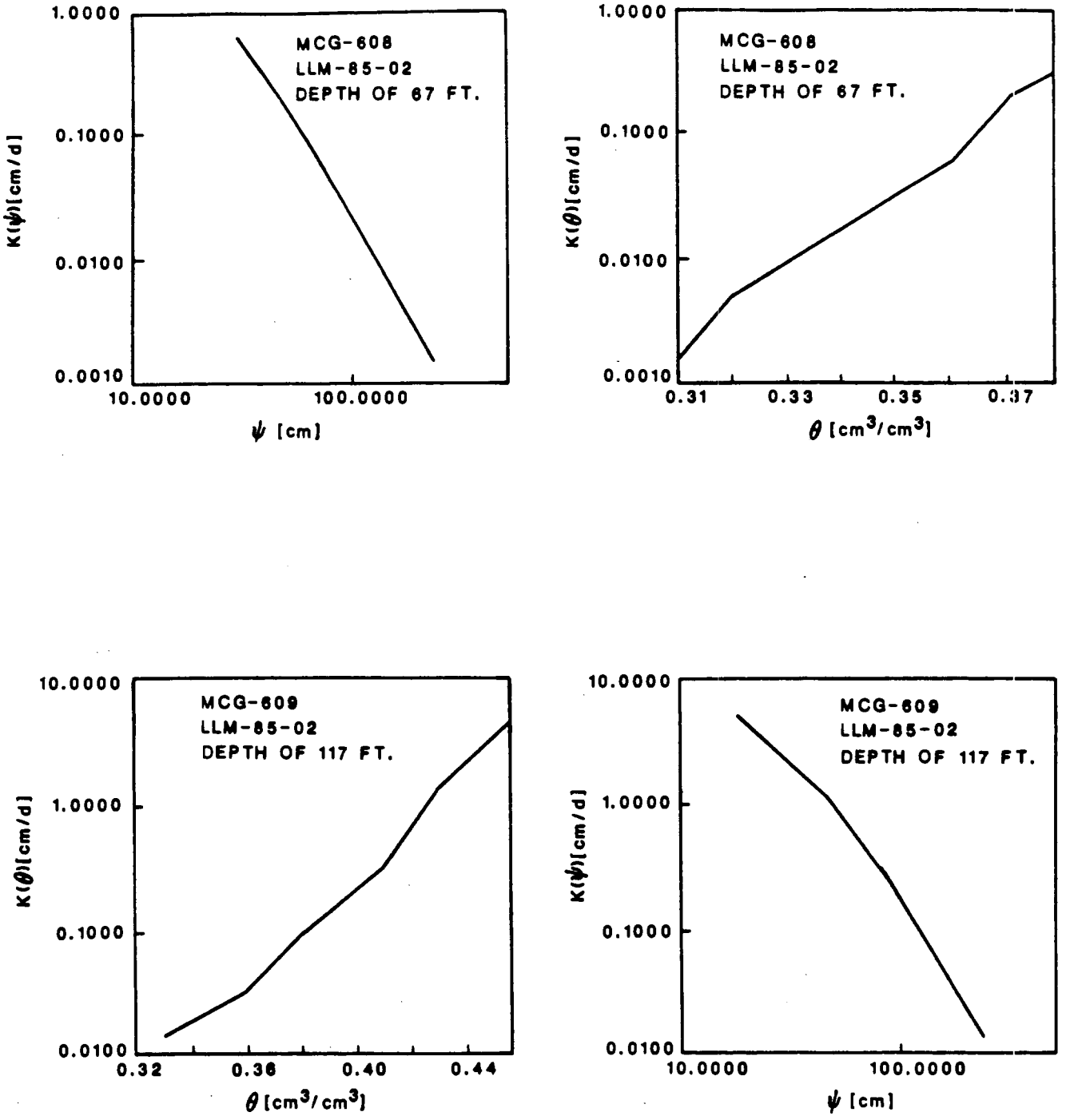


FIGURE F-4 THEORETICALLY DETERMINED HYDRAULIC CONDUCTIVITY AS A FUNCTION OF MOISTURE CONTENT AND CAPILLARY TENSION, SAMPLES MCG-608 AND MCG-609 (BFEC, unpublished)

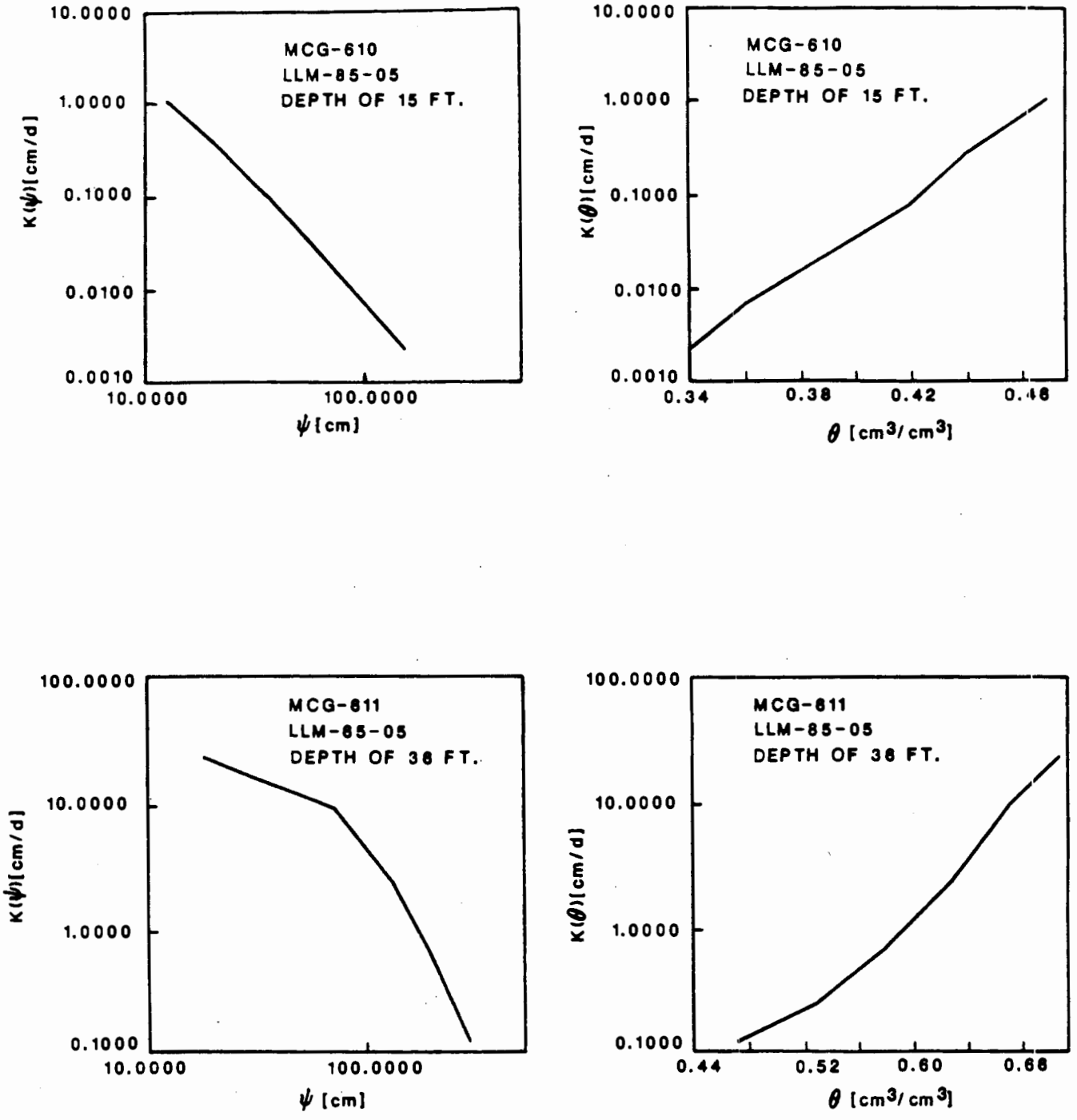


FIGURE F-5 THEORETICALLY DETERMINED HYDRAULIC CONDUCTIVITY AS A FUNCTION OF MOISTURE CONTENT AND CAPILLARY TENSION, SAMPLES MCG-610 AND MCG-611 (BFEC, unpublished)

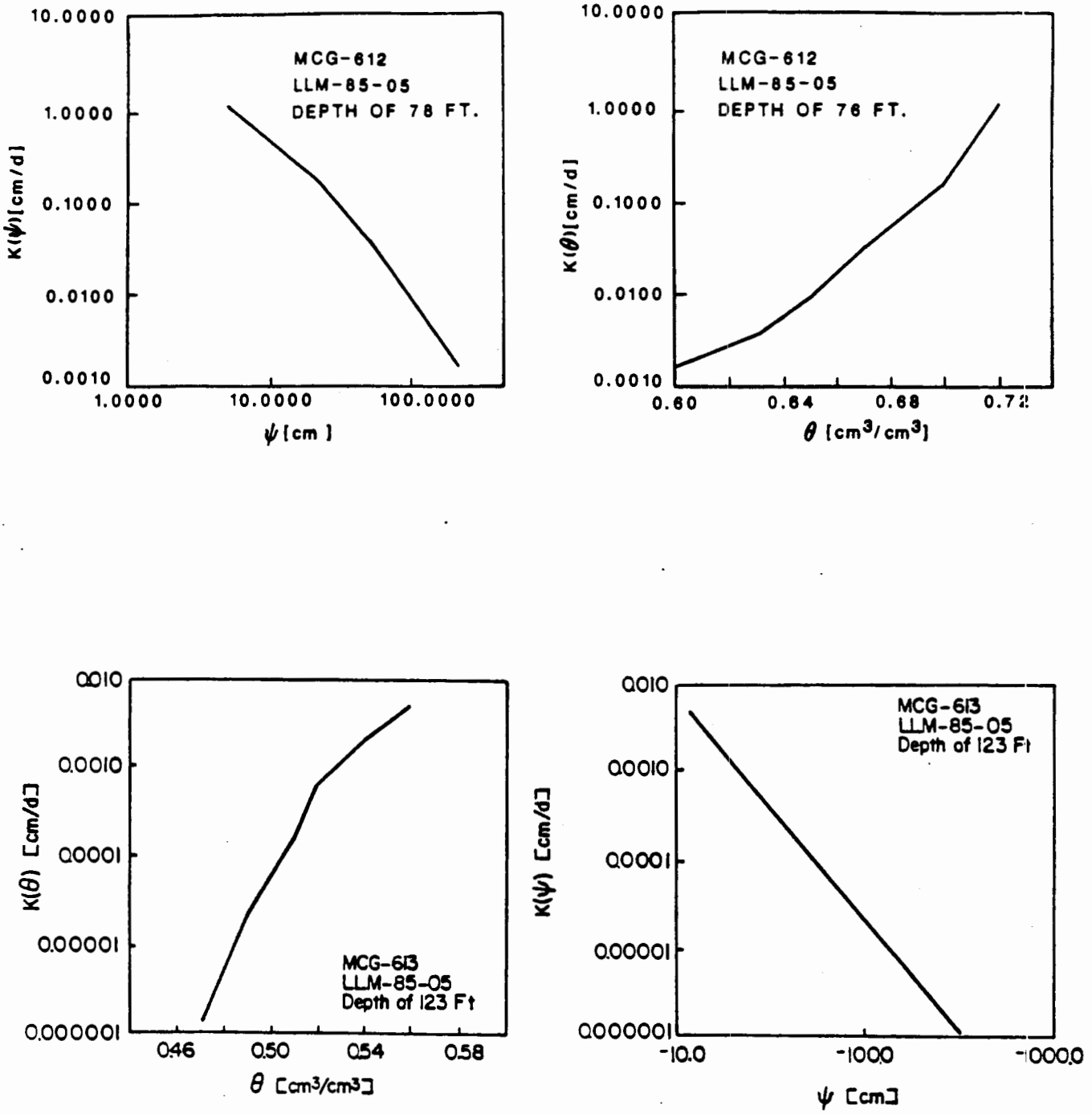
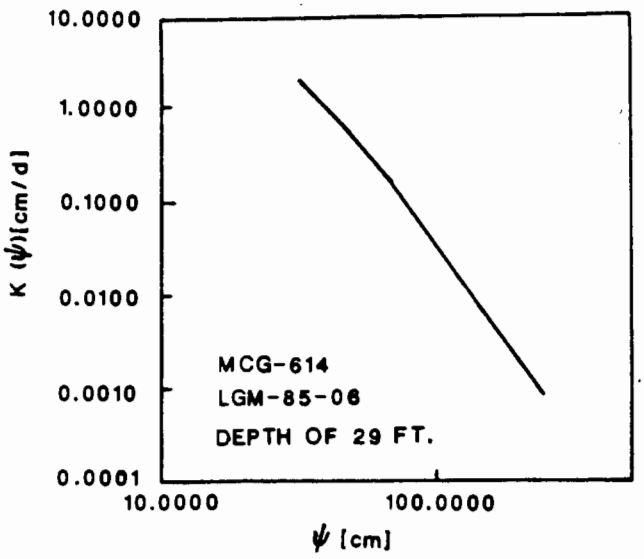
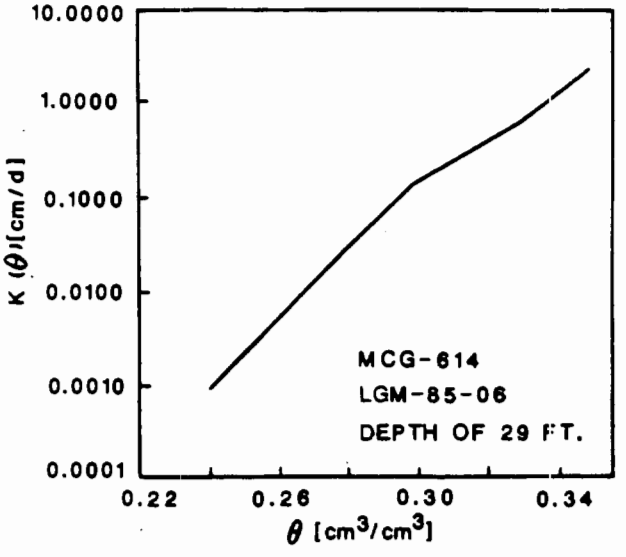
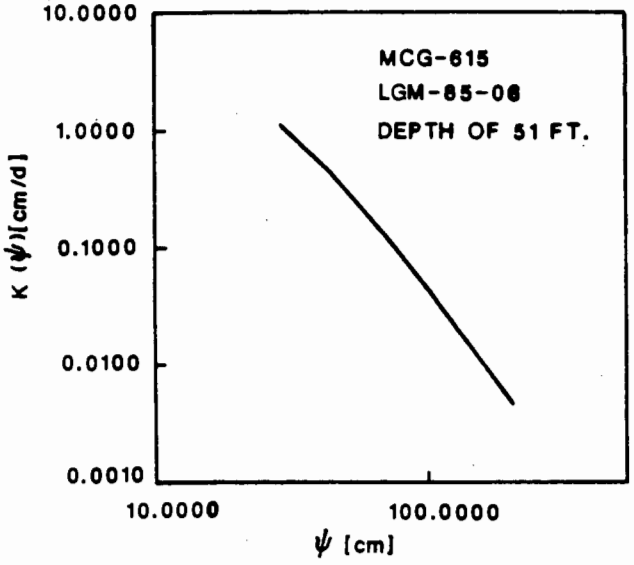


FIGURE F-6 THEORETICALLY DETERMINED HYDRAULIC CONDUCTIVITY AS A FUNCTION OF MOISTURE CONTENT AND CAPILLARY TENSION, SAMPLES MCG-612 AND MCG-613 (BFEC, 1986 and BFEC unpublished)







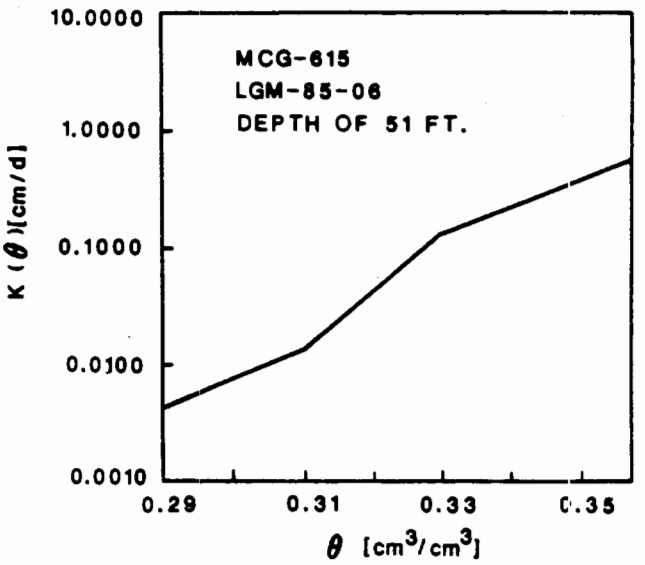


FIGURE F-7 THEORETICALLY DETERMINED HYDRAULIC CONDUCTIVITY AS A FUNCTION OF MOISTURE CONTENT AND CAPILLARY TENSION, SAMPLES MCG-614 AND MCG-615 (BFEC, unpublished)

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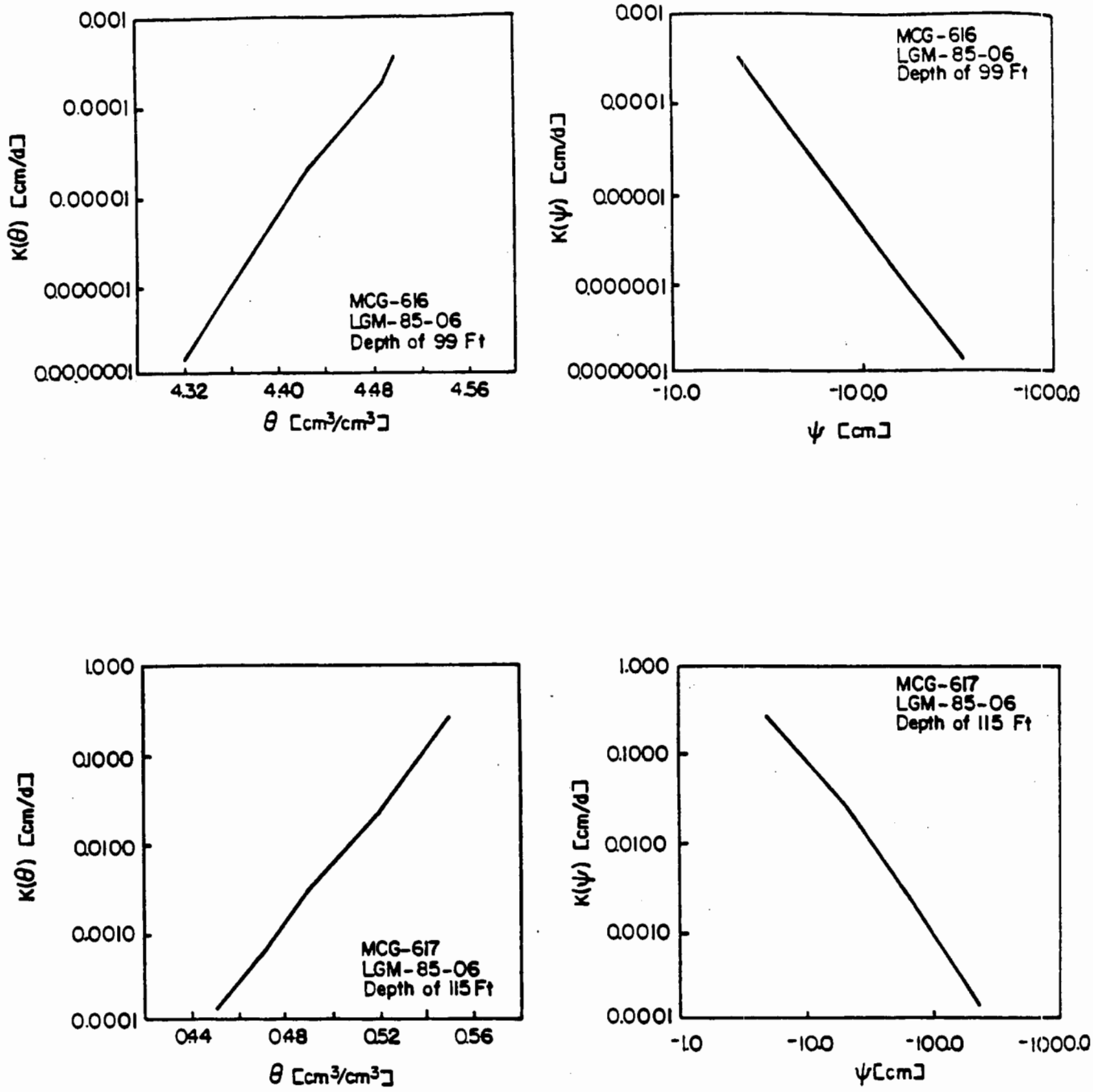


FIGURE F-8 THEORETICALLY DETERMINED HYDRAULIC CONDUCTIVITY AS A FUNCTION OF MOISTURE CONTENT AND CAPILLARY TENSION, SAMPLES MCG-616 AND MCG-617 (BFEC, 1986)

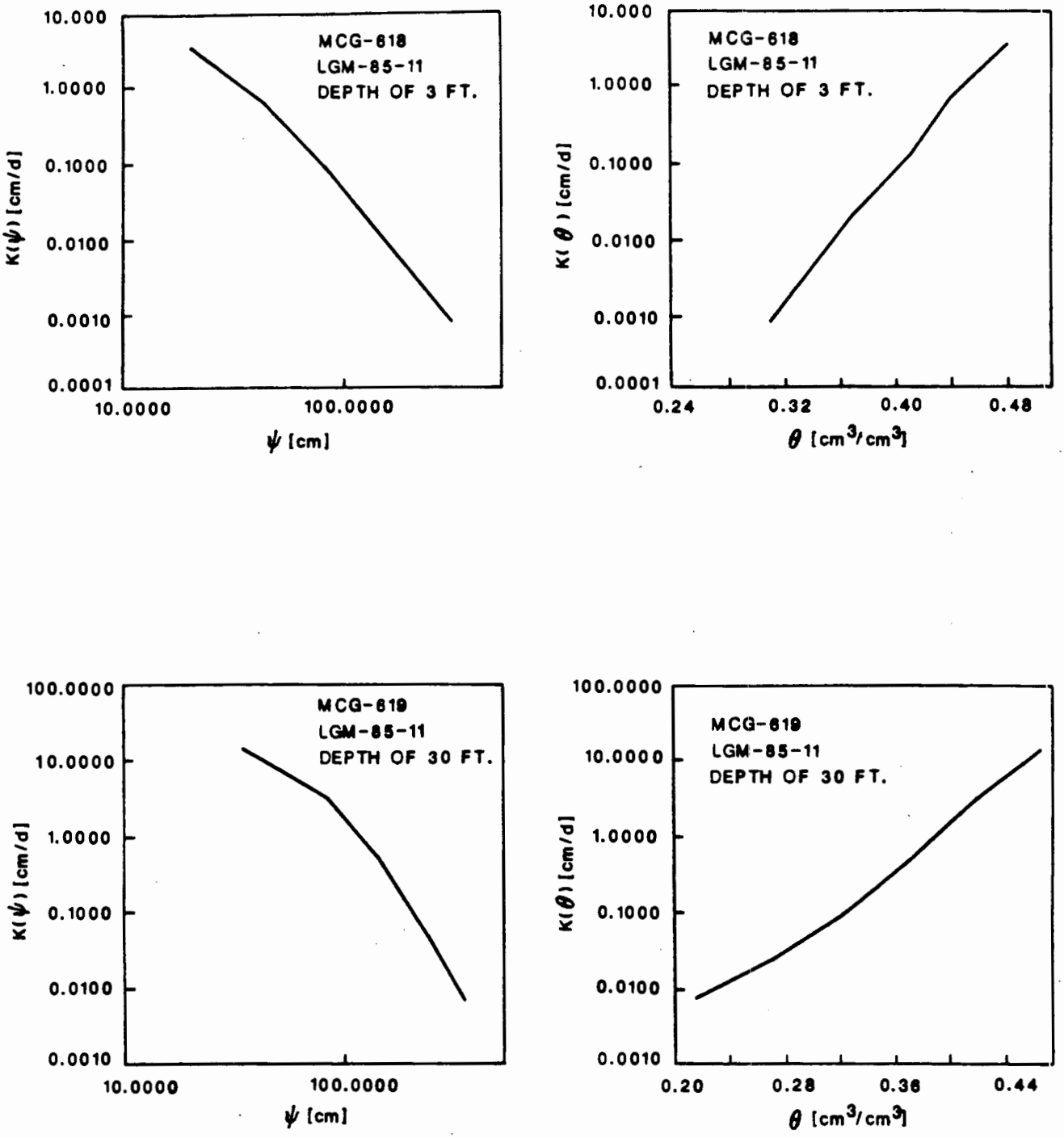


FIGURE F-9 THEORETICALLY DETERMINED HYDRAULIC CONDUCTIVITY AS A FUNCTION OF MOISTURE CONTENT AND CAPILLARY TENSION, SAMPLES MCG-618 AND MCG-619 (BFEC, unpublished)

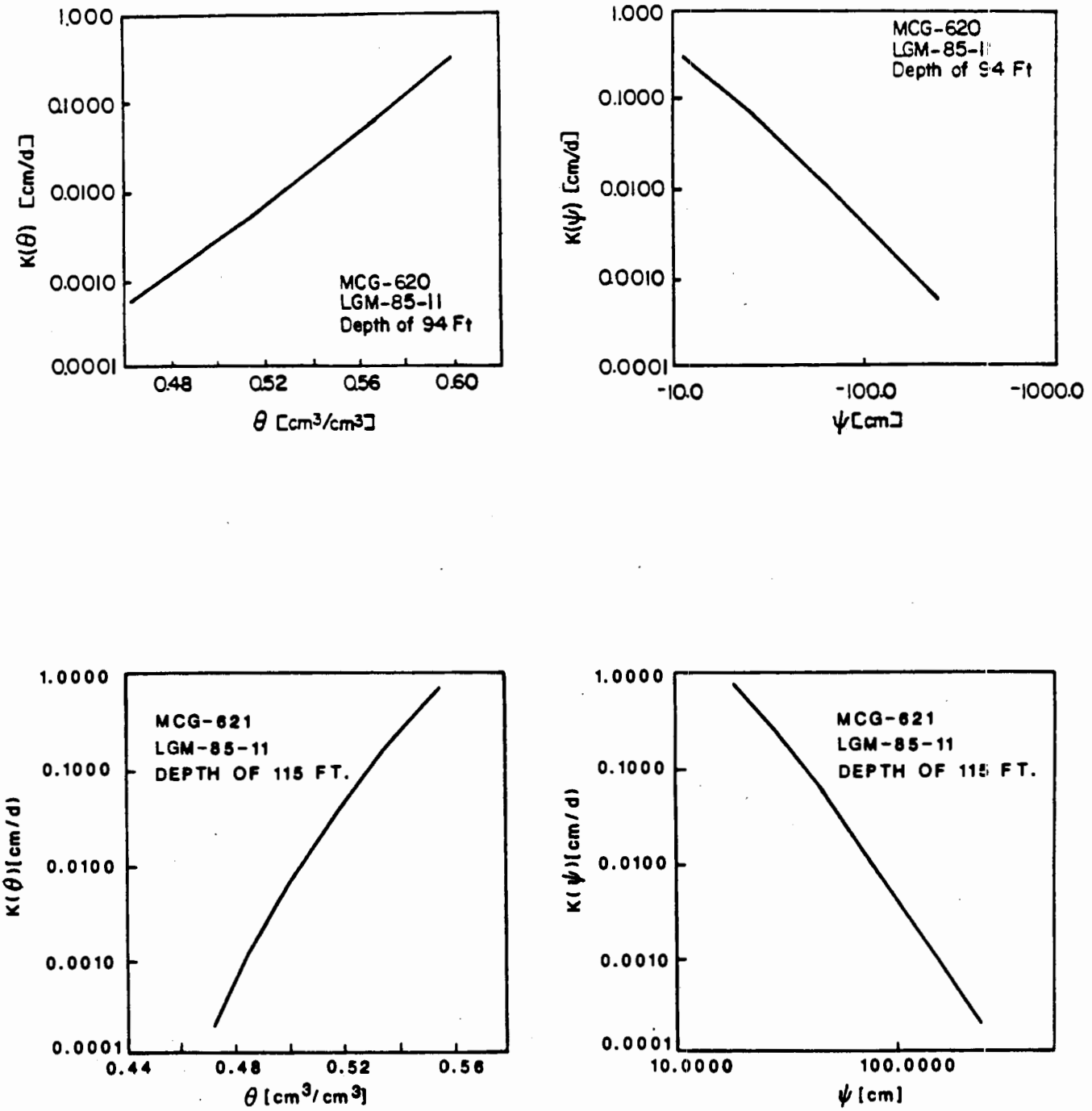


FIGURE F-10 THEORETICALLY DETERMINED HYDRAULIC CONDUCTIVITY AS A FUNCTION OF MOISTURE CONTENT AND CAPILLARY TENSION, SAMPLES MCG-620 AND MCG-621 (BFEC, 1986 and BFEC unpublished)

APPENDIX G

AREAS G AND L NEUTRON MOISTURE MEASUREMENTS AND NEUTRON PROBE CALIBRATION DATA

VOLUMETRIC MOISTURE (HOLES LLN-85-04 & LGN-85-08)

DATE>>	121785	123185	011586	012986	021486	022786	031386
LLN							
DEPTHS							
2							
4							
6	8.84	8.82	8.74	9.12	9.19	8.81	7.89
8	7.46	7.65	7.78	8.95	8.90	8.72	8.29
10	2.22	2.32	2.29	2.92	2.42	2.44	2.31
14	2.19	2.27	2.35	2.21	2.20	2.21	2.29
22	2.51	2.64	2.60	2.76	2.60	2.55	2.66
41	2.24	2.34	2.42	2.64	2.55	2.76	2.59
50	2.29	2.41	2.30	2.49	2.36	2.62	2.36
56	2.23	2.30	2.32	2.31	2.38	2.27	2.27
66	2.80	2.80	2.87	3.12	2.79	2.86	2.69
76	2.92	3.00	2.98	3.29	3.31	3.09	2.58
86	3.15	3.20	3.23	3.32	3.39	3.40	3.30
98	3.56	3.47	3.44	3.94	3.65	3.72	3.66
LGN							
DEPTHS							
2							
4							
6	5.62	5.85	5.68	5.75	5.80	5.74	5.59
8	3.74	4.13	4.25	4.37	4.03	3.95	3.85
10	3.11	3.37	3.32	3.13	3.30	3.27	3.50
12	2.67	2.85	2.81	2.81	2.78	2.71	2.57
17	2.98	3.28	3.03	3.37	3.34	3.30	3.01
19	2.89	2.95	3.02	2.81	2.95	3.00	2.47
22	2.50	2.77	2.71	2.60	2.50	2.32	2.65
28	2.13	2.22	2.27	2.96	2.42	2.29	2.32
32	2.09	2.29	2.25	2.44	2.39	2.23	2.35
36	2.38	2.40	2.44	3.65	2.53	2.52	2.64
42	2.34	2.31	2.40	2.34	2.54	2.43	2.49
47	2.25	2.26	2.31	2.36	2.29	2.04	2.29

VOLUMETRIC MOISTURE (HOLES LLN-85-04 & LGN-85-08)

DATE>>	032786	041586	052186	061786	063086	* 100686	* 100786
LLN							
DEPTHS						6.00	7.00
2			10.50	8.28	10.05	19.61	22.26
4			9.94	8.94	9.82	11.98	11.76
6	8.05	7.34	8.70	8.60	8.90	11.39	10.77
8	8.33	8.23	8.38	8.48	8.77	11.75	11.30
10	2.42	2.84	*	*	*	6.03	6.44
14	2.19	2.56	2.83	2.90	3.23	3.80	3.81
22	2.74	2.66	2.74	2.95	2.90	4.00	3.95
41	2.55	2.24	2.37	2.41	2.32	4.11	4.04
50	2.54	2.50	2.41	2.56	2.46	4.03	4.16
56	2.40	2.54	2.63	2.99	2.77	4.11	3.95
66	2.82	3.06	3.24	3.22	3.51	4.54	4.26
76	3.17	3.31	3.31	3.40	2.85	4.93	4.80
86	3.45	3.51	3.58	3.76	3.43	5.32	4.83
98	3.59	3.84	3.75	3.79	3.65	5.30	4.74
LGN							
DEPTHS							
2			9.64	8.56	9.61	10.50	9.89
4			8.87	8.99	8.83	8.24	8.18
6	5.90	6.34	6.95	8.56	8.60	5.81	7.55
8	4.16	4.30	5.11	5.92	5.89	5.54	5.73
10	3.35	3.73	3.92	4.50	4.42	4.65	5.15
12	2.67	2.78	3.09	3.57	3.39	4.44	4.25
17	3.10	3.31	3.35	3.33	3.19	4.86	4.91
19	2.69	2.83	2.78	2.61	2.85	4.49	4.37
22	2.58	2.68	2.75	2.77	2.65	4.14	4.08
28	2.39	2.34	2.58	2.44	2.90	3.74	3.87
32	2.47	2.70	2.77	2.71	2.54	3.75	3.71
36	2.66	2.89	2.96	2.77	2.79	4.07	4.08
42	2.43	2.42	2.60	2.61	2.49	4.10	4.04
47	2.43	2.56	2.69	2.68	2.67	3.65	3.77

VOLUMETRIC MOISTURE (HOLES LLN-85-04 & LGN-85-08)

DATE>>	* 100886	* 100986	* 101086	* 101486	* 101586	* 101686	* 101786
LLN	8.00	9.00	10.00	14.00	15.00	16.00	17.00
DEPTHS							
2	22.03	23.25	24.35	21.72	26.58	23.34	26.58
4	12.00	11.34	11.90	11.87	12.07	11.42	11.67
6	11.16	12.06	12.14	11.24	12.46	11.61	11.84
8	12.12	11.49	11.79	11.78	12.07	11.33	11.48
10	6.59	6.96	6.51	6.59	6.70	7.29	6.86
14	3.81	3.75	3.87	3.65	3.66	3.75	3.44
22	4.25	3.77	3.90	3.95	4.05	3.96	3.62
41	4.17	3.83	3.83	3.75	4.12	3.93	3.87
50	4.03	4.01	4.01	4.08	4.01	4.11	3.98
56	4.05	3.99	3.92	4.05	4.05	3.84	3.71
66	4.34	4.14	4.20	4.23	4.51	4.43	4.55
76	5.05	4.83	4.89	4.52	4.76	4.76	4.91
86	5.07	4.85	4.97	4.73	4.91	4.65	4.76
98	5.33	4.97	5.07	4.97	5.30	5.00	5.00
LGN							
DEPTHS							
2	9.47	10.44	10.86	10.29	10.34	10.34	9.81
4	9.26	9.30	10.47	8.63	8.99	10.19	10.34
6	6.42	7.67	9.03	8.36	8.36	7.86	8.18
8	5.55	5.57	5.69	5.75	5.91	5.69	5.99
10	5.09	4.89	5.31	4.95	5.13	5.12	5.12
12	4.35	4.28	4.22	4.44	4.35	4.35	4.26
17	4.88	4.62	4.31	4.64	4.86	4.79	4.88
19	4.79	4.58	4.40	4.40	4.56	4.73	4.64
22	3.83	3.98	4.04	4.01	4.05	3.80	3.99
28	3.66	3.83	3.90	3.60	3.89	3.92	3.78
32	3.74	3.77	3.84	3.68	3.81	3.99	3.81
36	3.90	4.14	4.22	4.14	3.95	3.98	4.08
42	4.20	3.84	3.93	4.17	3.98	4.14	4.05
47	3.80	4.08	4.11	3.71	3.74	3.66	3.74

VOLUMETRIC MOISTURE (HOLES LLN-85-04 & LGN-85-08)

DATE>>	* 102086	* 102186	* 102286	* 102386	* 102486	* 102786	* 102886
LLN	20.00	21.00	22.00	23.00	24.00	27.00	28.00
DEPTHS							
2	25.80	19.83	26.16	19.62	22.58	25.68	23.27
4	11.63	11.48	11.75	11.63	11.94	11.55	11.64
6	11.84	11.82	11.88	11.07	11.31	11.51	11.12
8	11.30	11.91	11.01	11.42	11.58	11.64	11.37
10	7.16	6.92	7.40	6.42	6.92	6.62	6.27
14	3.71	3.74	3.72	3.84	3.66	3.60	3.74
22	3.92	3.86	3.83	3.92	3.90	3.96	3.87
41	4.04	4.02	3.84	3.90	3.86	3.90	3.93
50	4.04	4.02	4.07	4.04	3.96	4.08	4.17
56	4.02	4.01	4.13	3.96	4.05	3.89	3.95
66	4.25	4.50	4.23	4.22	4.37	4.52	4.40
76	4.92	4.62	4.70	4.59	4.59	4.80	4.73
86	5.06	4.77	4.98	4.85	4.86	4.86	4.89
98	5.27	4.97	5.10	5.10	5.30	5.30	5.48
LGN							
DEPTHS							
2	10.59	10.41	11.21	14.67	12.99	14.40	10.32
4	9.77	10.23	9.77	5.52	9.90	10.29	9.71
6	8.22	8.49	8.42	8.40	8.06	8.46	7.88
8	5.76	6.00	6.12	5.81	5.69	6.15	5.96
10	5.30	5.31	5.10	5.16	5.09	5.04	5.01
12	4.49	4.44	4.52	4.19	4.32	4.68	4.26
17	4.71	4.88	4.86	4.79	4.65	4.83	4.94
19	4.58	4.67	4.76	4.37	4.61	4.73	4.67
22	4.02	4.11	4.02	3.90	3.90	4.05	3.84
28	3.87	4.02	3.75	3.62	3.68	3.65	3.96
32	3.89	3.78	3.84	3.72	3.78	3.90	3.74
36	3.98	3.81	4.02	3.83	3.89	4.02	4.08
42	4.22	3.96	3.98	3.81	3.90	4.08	4.02
47	3.77	3.71	3.66	3.75	3.69	3.77	3.59

VOLUMETRIC MOISTURE (HOLES LLN-85-04 & LGN-85-08)

DATE>>	* 102986	* 103086	* 103186	* 110386	* 110486	* 110586	* 110686
LLN	29.00	30.00	31.00	3.00	4.00	5.00	6.00
DEPTHS							
2	22.49	24.78	21.38	25.20	28.26	28.32	28.16
4	11.48	11.43	11.24	11.36	11.43	11.69	10.83
6	11.76	11.30	11.73	11.13	11.33	11.49	11.39
8	11.48	11.91	11.27	11.46	11.37	11.27	11.33
10	6.96	6.93	6.83	6.92	6.59	7.10	6.62
14	3.69	3.68	3.62	3.66	3.83	3.83	3.45
22	3.92	3.71	3.96	3.93	3.84	3.77	3.86
41	3.89	3.83	4.01	3.81	3.83	4.07	3.89
50	3.92	4.04	3.96	4.11	4.10	4.01	4.22
56	3.96	3.95	3.99	3.92	3.98	3.93	3.80
66	4.34	4.25	4.46	4.34	3.96	4.01	4.28
76	4.83	4.61	4.85	4.73	4.52	4.58	4.64
86	4.86	4.88	5.12	5.07	4.94	4.65	4.70
98	5.06	5.00	5.28	5.28	5.01	5.03	4.98
LGN							
DEPTHS							
2	12.84	10.88	10.77	12.24	15.98	14.21	13.89
4	9.56	10.17	9.78	9.98	9.80	10.10	10.23
6	8.21	8.01	8.10	8.33	8.01	8.22	8.01
8	6.02	5.66	5.97	5.97	5.88	5.88	5.97
10	5.06	4.98	5.04	5.30	4.88	5.15	4.98
12	4.58	4.43	4.40	4.47	4.44	4.38	4.40
17	4.86	4.70	4.65	4.83	4.53	4.52	4.49
19	4.77	4.52	4.50	4.61	4.55	4.77	4.67
22	3.92	4.20	3.96	4.07	3.83	4.10	3.72
28	3.75	3.90	3.86	3.75	3.56	3.62	3.78
32	3.66	3.77	3.74	3.71	3.83	3.83	3.81
36	4.22	4.20	3.93	4.19	4.07	4.05	4.07
42	3.99	3.83	4.13	3.92	3.81	4.07	4.11
47	3.72	3.77	3.81	3.60	3.77	3.59	3.50

VOLUMETRIC MOISTURE (HOLES LLN-85-04 & LGN-85-08)

DATE>>	110786 *	111886	120186
LLN	7.00	18.00	
DEPTHS			
2	28.29	23.45	27.93
4	11.37	11.33	11.70
6	11.42	11.03	11.34
8	11.13	11.48	10.95
10	7.05	6.60	6.93
14	3.69	3.65	3.84
22	3.74	4.11	3.90
41	3.95	4.08	3.84
50	4.13	4.16	3.96
56	3.65	3.96	3.78
66	4.07	4.20	4.17
76	4.73	4.68	4.56
86	5.01	5.01	5.03
98	5.09	4.88	4.82
LGN			
DEPTHS			
2	11.49	14.24	18.53
4	9.47	9.50	9.41
6	7.85	8.06	7.86
8	5.61	5.90	5.88
10	4.94	4.79	5.13
12	4.35	4.38	4.14
17	4.68	4.80	4.64
19	4.77	4.64	4.50
22	4.08	3.75	3.84
28	3.80	3.80	3.68
32	3.74	3.89	3.47
36	4.26	4.13	4.07
42	4.05	4.08	4.11
47	3.63	3.77	3.59

TWO POINT CALIBRATION DATA

COUNTS	RATIO	%MOIST	EST-Y
12834	1.536637	48	47.92911
13023	1.559267	48	48.64252
12860	1.539750	48	48.02725
12953	1.550886	48	48.37830
12927	1.547772	48	48.28015
12705	1.521192	48	47.44218
12985	1.554717	48	48.49909
12715	1.522389	48	47.47992
12917	1.546575	48	48.24241
12855	1.539152	48	48.00838
12840	1.537356	48	47.95176
12813	1.534123	48	47.84984
13078	1.565852	48	48.85013
12845	1.537954	48	47.97063
12797	1.532207	48	47.78945
12806	1.533285	48	47.82342
12712	1.522030	48	47.46860
12803	1.532926	48	47.81209
12709	1.521671	48	47.45728
12862	1.539990	48	48.03480
134	0.016044	0.075	-0.00925
150	0.017959	0.075	0.051141
166	0.019875	0.075	0.111535
159	0.019037	0.075	0.085113
172	0.020593	0.075	0.134183
161	0.019276	0.075	0.092662
140	0.016762	0.075	0.013394
152	0.018199	0.075	0.058690
167	0.019995	0.075	0.115310
162	0.019396	0.075	0.096437
146	0.017480	0.075	0.036042
171	0.020474	0.075	0.130409
152	0.018199	0.075	0.058690
168	0.020114	0.075	0.119085
159	0.019037	0.075	0.085113
157	0.018797	0.075	0.077563
149	0.017840	0.075	0.047366
166	0.019875	0.075	0.111535
143	0.017121	0.075	0.024718
169	0.020234	0.075	0.122859

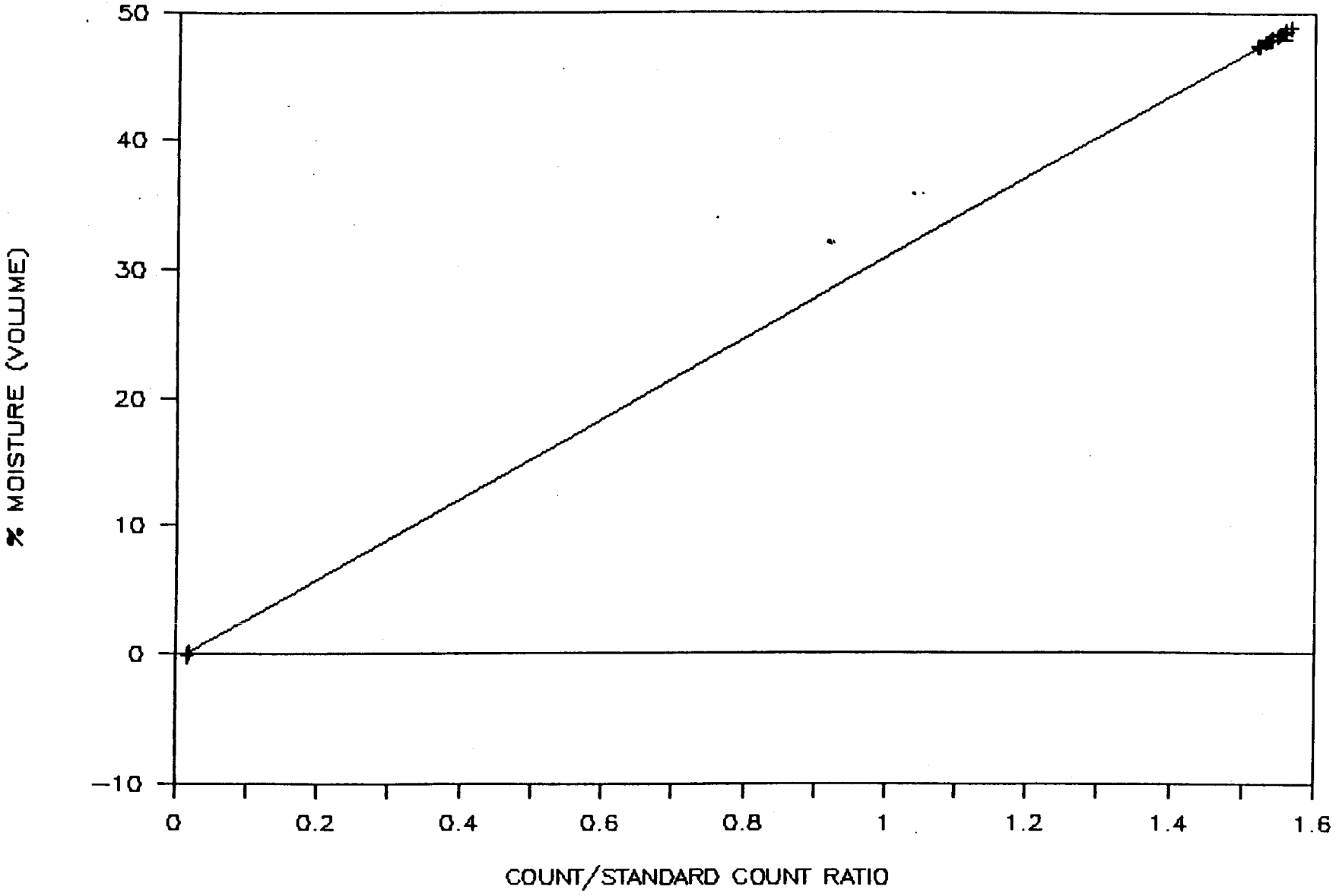
Regression Output:

Constant	-0.51506
Std Err of Y Est	0.280979
R Squared	0.999869
No. of Observations	40
Degrees of Freedom	38
X Coefficient(s)	31.52608
Std Err of Coef.	0.058453

STD.COUNT= 8352

CALIBRATION CURVE

R SQUARED = .99



THREE POINT CALIBRATION DATA

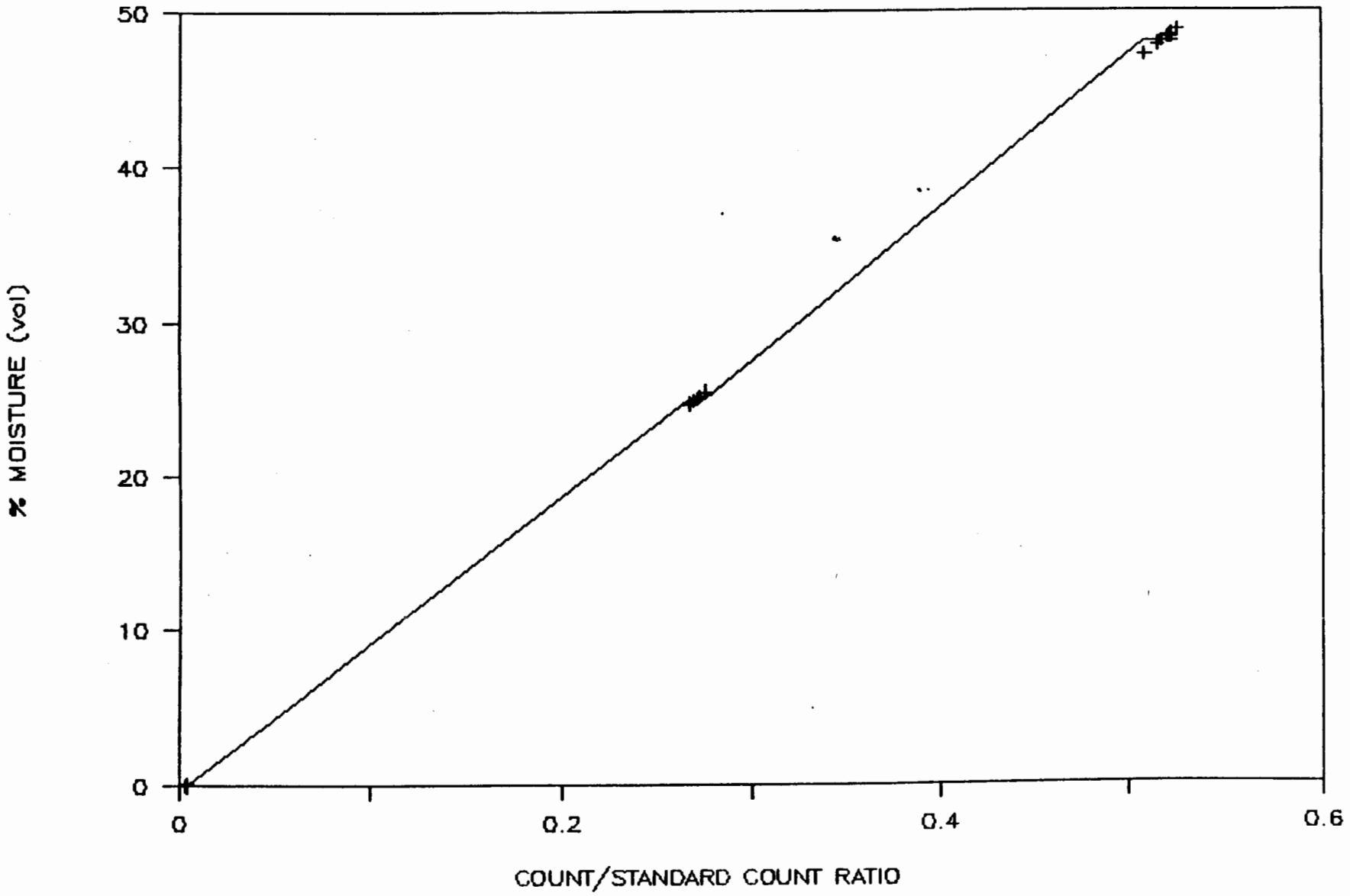
COUNTS	RATIO	MOIST	Y
31	0.003	0.08	0.06
32	0.004	0.08	0.07
33	0.004	0.08	0.08
34	0.004	0.08	0.09
35	0.004	0.08	0.10
35	0.004	0.08	0.10
35	0.004	0.08	0.10
35	0.004	0.08	0.10
35	0.004	0.08	0.10
35	0.004	0.08	0.10
36	0.004	0.08	0.11
38	0.004	0.08	0.13
2392	0.266	25.00	24.60
2410	0.268	25.00	24.79
2411	0.269	25.00	24.80
2427	0.270	25.00	24.97
2437	0.272	25.00	25.07
2469	0.275	25.00	25.40
4550	0.507	48.00	47.04
4614	0.514	48.00	47.71
4614	0.514	48.00	47.71
4616	0.514	48.00	47.73
4634	0.516	48.00	47.91
4659	0.519	48.00	48.17
4659	0.519	48.00	48.17
4660	0.519	48.00	48.18
4663	0.519	48.00	48.22
4669	0.520	48.00	48.28
4677	0.521	48.00	48.36
4706	0.524	48.00	48.66

REGRESSION OUTPUT

Constant	-0.27
Std Err of Y Est	0.29
R Squared	1.000
No. of Observations	30
Degrees of Freedom	28.00
X Coefficient(	93.32
Std Err of Coe	0.23

CALIBRATION CURVE

R SQUARED = .99



AREA L: NOVEMBER 1986 PSYCHROMETER DATA

10NOV86	0.84	12.5	1	3.3	4	8.109
10NOV86	0.84	13.9	2.6	1.7	6	3.92
10NOV86	0.89	8.8	0.4	3.1	8	9.299
10NOV86	0.84	12.5	0.2	1.2	10	2.917
10NOV86	0.81	.	.	.	13	.
10NOV86	0.88	10.6	0.4	3.5	13	9.692
10NOV86	0.87	13.7	2.6	2.5	24	6.039
10NOV86	0.85	12.2	0	1.9	24	4.748
10NOV86	0.9	8.2	1.5	1.4	41	4.271
10NOV86	1	8.6	0.6	0.7	41	2.329
11NOV86	1	6.2	3	0.8	0	2.929
11NOV86	0.85	10.1	1.2	0.2	2	0.53
11NOV86	0.84	13.8	0.8	3.1	4	7.295
11NOV86	0.84	13.9	2.2	2.9	6	6.75
11NOV86	0.89	10.1	0.5	3.2	8	9.11
11NOV86	0.84	9	1.4	3.2	10	8.953
11NOV86	0.81	.	.	.	13	.
11NOV86	0.88	10.4	0.3	3.1	13	8.626
11NOV86	0.85	13.3	0.3	1.6	24	3.842
11NOV86	0.87	13.7	2.3	3.2	24	7.775
11NOV86	1	8	0.5	0.7	41	2.389
11NOV86	0.9	10.1	2.2	1	41	2.808
12NOV86	1	2.4	3.3	0.4	0	1.763
12NOV86	0.85	12.1	1	0.2	2	0.494
12NOV86	0.84	10.2	1	3.2	4	8.546
12NOV86	0.84	14	2.5	2.5	6	5.778
12NOV86	0.89	9.7	0.6	3	8	8.659
12NOV86	0.84	10.7	1.4	2.9	10	7.566
12NOV86	0.88	9.7	1.5	0.2	13	0.556
12NOV86	0.81	.	.	.	13	.
12NOV86	0.85	13.6	0.7	1.2	24	2.842
12NOV86	0.87	13.2	3.2	1.4	24	3.403
12NOV86	1	12.5	1.1	0.7	41	2.011
12NOV86	0.9	9.4	0.8	3.6	41	10.68
13NOV86	1	2.2	2.6	0.3	0	1.338
13NOV86	0.85	9.1	0.8	0	2	0
13NOV86	0.84	10	0.3	1.2	4	3.189
13NOV86	0.84	10.4	1.8	1.9	6	4.966
13NOV86	0.89	8.9	0.4	3.4	8	10.18
13NOV86	0.84	9.3	1	1.8	10	4.925
13NOV86	0.81	.	.	.	13	.
13NOV86	0.88	7.5	0.3	2.2	13	6.848
13NOV86	0.87	11	2.1	2	24	5.291
13NOV86	0.85	13.3	0.8	0.8	24	1.907
13NOV86	1	12.5	0.3	2	41	5.816
13NOV86	0.9	10.3	0.9	3.4	41	9.711
14NOV86	1	3	3.7	0.9	0	3.857
14NOV86	0.85	10.7	2.3	1.4	2	3.639
14NOV86	0.84	13.4	1.1	3.3	4	7.865
14NOV86	0.84	13.8	2.3	2.8	6	6.531
14NOV86	0.89	10.7	0.8	2.4	8	6.626
14NOV86	0.84	7.7	0.9	1.2	10	3.494
14NOV86	0.88	9.2	0.8	3.4	13	9.927
14NOV86	0.81	.	.	.	13	.
14NOV86	0.87	12.2	2.7	2.5	24	6.343
14NOV86	0.85	9.5	0.8	3.2	24	8.899

AREA L: NOVEMBER 1986 PSYCHROMETER DATA

14NOV86	0.9	10.2	2.2	1.1	41	3.08
14NOV86	1	7.6	1	0.4	41	1.382
15NOV86	1	3.1	2.2	2.9	0	12.74
15NOV86	0.85	11.7	1.7	1.6	2	4.028
15NOV86	0.84	13	0.5	0.2	4	0.475
15NOV86	0.84	11.1	1.2	3.6	6	9.312
15NOV86	0.89	12.2	0.4	3.1	8	8.165
15NOV86	0.84	8.9	0.9	1.8	10	5.007
15NOV86	0.81	.	.	.	13	.
15NOV86	0.88	9.1	1	3.3	13	9.658
15NOV86	0.85	13.2	1.3	0.4	24	0.952
15NOV86	0.87	10.7	1.4	4.1	24	11.19
15NOV86	1	11.7	0.1	2.1	41	6.288
15NOV86	0.9	10.6	1.9	1.1	41	3.038
16NOV86	1	3.3	2.7	0.8	0	3.385
16NOV86	0.85	8.7	2.2	1.2	2	3.37
16NOV86	0.84	14	0.3	0.3	4	0.691
16NOV86	0.84	11.6	1.2	3.9	6	9.927
16NOV86	0.89	11	0.6	2.7	8	7.395
16NOV86	0.84	11.8	1	2.8	10	7.024
16NOV86	0.88	7	0.8	2.1	13	6.664
16NOV86	0.81	.	.	.	13	.
16NOV86	0.85	10.6	0.7	0.4	24	1.044
16NOV86	0.87	13.4	2.4	1.4	24	3.393
16NOV86	1	8.7	0.2	2.5	41	8.424
16NOV86	0.9	11.7	1.9	1.3	41	3.455
17NOV86	.1	2	2	2.3	0	10.65
17NOV86	0.85	10.3	1.2	2.9	2	7.78
17NOV86	0.84	12.9	0.3	0.8	4	1.913
17NOV86	0.84	10.1	1.8	1.7	6	4.487
17NOV86	0.89	9.3	0	3.1	8	9.125
17NOV86	0.84	12.5	1.1	2.9	10	7.102
17NOV86	0.88	5.4	1.1	2.6	13	8.933
17NOV86	0.81	0.1	4	0.3	13	1.202
17NOV86	0.85	12.6	0.8	0.6	24	1.461
17NOV86	0.87	11.7	2.6	2.4	24	6.195
17NOV86	0.9	9.2	2.2	0.9	41	2.616
17NOV86	1	7.7	0.6	0.6	41	2.072

AREA G: OCTOBER 1985 PSYCHROMETER DATA

DATE	CORRECTION	TEMP (DEG C)	OFFSET (MICROVOLTS)	READING (MICROVOLTS)	DEPTH (FT)	WATER POTENTIAL (-BARS)
220CT85	0.89	14.7	31.3	64.9	4.5	.
220CT85	0.89	15.7	1.5	1	6.5	2.321
220CT85	0.85	15.8	1	0.7	8.5	1.548
220CT85	0.91	15	2.8	0.5	10	1.199
220CT85	0.91	14.8	0.8	0.2	12	0.486
220CT85	0.86	13.9	1.8	0.5	14	1.176
220CT85	0.84	12.8	0.8	0.8	17	1.915
220CT85	0.87	12	0.8	0.5	19	1.271
220CT85	0.92	11.5	0.9	0.5	22	1.367
220CT85	0.92	11.2	2.2	2.9	29	8.104
220CT85	1	11.1	32.6	0.5	32	1.321
220CT85	1.04	11.3	2.7	7.9	37	25.88
220CT85	0.95	11.1	1.2	4.4	42	12.95
220CT85	0.85	11.7	1.8	7.9	47	20.92
220CT85	0.89	11.5	0.9	6.5	52	18
230CT85	0.89	14.3	0.6	7.7	4.5	19.54
230CT85	0.89	15.5	1.3	1.4	6.5	3.277
230CT85	0.85	15.7	1.2	2.1	8.5	4.689
230CT85	0.91	15.1	3.2	1	10	2.394
230CT85	0.91	14.7	0.8	1.7	12	4.18
230CT85	0.86	14.1	1.7	0.3	14	0.701
230CT85	0.84	12.8	0.7	1.5	17	3.609
230CT85	0.87	12.5	0.7	0	19	0
230CT85	0.92	11.6	0.9	1	22	2.733
230CT85	0.92	11.5	1.7	2.4	29	6.624
230CT85	1	11.2	32	5.7	32	15.57
230CT85	1.04	11.5	2.5	4.1	37	12.91
230CT85	0.95	11.5	0.9	2.3	42	6.574
230CT85	0.85	11.7	1.6	4	47	10.25
230CT85	0.89	11.6	0	3.2	52	8.631
240CT85	0.89	12.6	22.8	23.4	4.5	.
240CT85	0.89	13.9	1.3	1.8	6.5	4.427
240CT85	0.85	13.9	0.4	2.3	8.5	5.442
240CT85	0.91	13.9	0.4	1.1	10	2.766
240CT85	0.91	13.2	0.1	1.9	12	4.915
240CT85	0.86	12.4	0.9	0.7	14	1.737
240CT85	0.84	11.3	0.1	1.5	17	3.81
240CT85	0.87	10.9	1.2	0.4	19	1.054
240CT85	0.92	10	0.8	1.2	22	3.485
240CT85	0.92	9.7	1.7	2.4	29	7.09
240CT85	1	9.5	24.9	0	32	0
240CT85	1.04	9.9	2.3	4.3	37	14.44
240CT85	0.95	9.8	1.1	2.8	42	8.559
240CT85	0.85	9.9	2.1	4.2	47	11.53
240CT85	0.89	9.9	0.1	3.2	52	9.199
250CT85	0.89	12	22.6	23.2	4.5	.
250CT85	0.89	13.2	1.5	1.8	6.5	4.522
250CT85	0.85	13.4	0.5	2.2	8.5	5.282
250CT85	0.91	13.2	0.2	1.2	10	3.089
250CT85	0.91	12.7	0.3	2	12	5.257
250CT85	0.86	11.8	0.9	0.7	14	1.772
250CT85	0.84	10.8	0.3	1.6	17	4.138

AREA G: OCTOBER 1985 PSYCHROMETER DATA

25OCT85	0.87	10.1	1.4	0.4	19	1.085
25OCT85	0.92	9.5	0.9	1.1	22	3.253
25OCT85	0.92	9.1	1.7	2.6	29	7.882
25OCT85	1	9	25.2	41.5	32	.
25OCT85	1.04	9.1	2.3	4.1	37	14.2
25OCT85	0.95	9.1	1.1	2.7	42	8.482
25OCT85	0.85	9.3	2.4	4.3	47	12.09
25OCT85	0.89	9.4	0.2	3.2	52	9.381
26OCT85	0.89	12.2	22.2	22.8	4.5	.
26OCT85	0.89	13.5	1.4	1.7	6.5	4.229
26OCT85	0.85	13.5	0.5	2.2	8.5	5.265
26OCT85	0.91	13.4	0.3	1.1	10	2.81
26OCT85	0.91	12.8	0.1	1.9	12	4.979
26OCT85	0.86	12.3	0.9	0.8	14	1.993
26OCT85	0.84	11.1	0.4	1.8	17	4.609
26OCT85	0.87	10.7	1.2	0.1	19	0.265
26OCT85	0.92	9.9	1.1	1.2	22	3.494
26OCT85	0.92	9.6	1.7	2.5	29	7.421
26OCT85	1	9.4	24.6	.	32	.
26OCT85	1.04	9.7	2.5	4.2	37	14.19
26OCT85	0.95	9.7	0.8	2.6	42	7.976
26OCT85	0.85	9.8	2.2	4.2	47	11.57
26OCT85	0.89	9.8	0.1	3.3	52	9.532
27OCT85	0.89	11.6	3	18	4.5	58.17
27OCT85	0.89	12.8	1.6	1.5	6.5	3.808
27OCT85	0.85	13.3	0.5	2.2	8.5	5.299
27OCT85	0.91	13	0.5	1.4	10	3.626
27OCT85	0.91	12.5	0.4	2.2	12	5.827
27OCT85	0.86	11.7	1.2	0.8	14	2.031
27OCT85	0.84	10.6	0.4	1.8	17	4.695
27OCT85	0.87	9.8	1.7	0.3	19	0.821
27OCT85	0.92	9.6	1.1	1.3	22	3.832
27OCT85	0.92	9	2	2.6	29	7.904
27OCT85	1	8.8	24.8	0	32	0
27OCT85	1.04	9	2.1	4.1	37	14.27
27OCT85	0.95	9	1.2	2.7	42	8.513
27OCT85	0.85	9.1	2.3	4.2	47	11.9
27OCT85	0.89	9.1	0.2	3.3	52	9.802
28OCT85	0.89	12.1	22.5	43	4.5	.
28OCT85	0.89	13.4	1.3	2	6.5	5.003
28OCT85	0.85	13.4	0.6	2.4	8.5	5.767
28OCT85	0.91	13.4	0.4	1.3	10	3.324
28OCT85	0.91	12.8	0.4	2.1	12	5.503
28OCT85	0.86	12	1	0.6	14	1.507
28OCT85	0.84	11	0.1	1.6	17	4.111
28OCT85	0.87	10.4	1.2	0.5	19	1.343
28OCT85	0.92	9.8	0.9	1.2	22	3.51
28OCT85	0.92	9.4	1.8	2.5	29	7.478
28OCT85	1	9.1	24.9	0	32	0
28OCT85	1.04	9.5	2.2	4	37	13.62
28OCT85	0.95	9.5	1.3	2.8	42	8.654
28OCT85	0.85	9.7	2.1	4.1	47	11.33
28OCT85	0.89	9.6	0.2	3.2	52	9.305
29OCT85	0.89	11.7	2.4	16.6	4.5	51.64
29OCT85	0.89	12.8	1.7	1.7	6.5	4.32
29OCT85	0.85	13.2	0.3	2.1	8.5	5.076

AREA G: OCTOBER 1985 PSYCHROMETER DATA

29OCT85	0.91	13.1	0.3	1.2	10	3.097
29OCT85	0.91	12.6	0.3	2.1	12	5.542
29OCT85	0.86	11.8	0.9	0.6	14	1.518
29OCT85	0.84	10.7	0.2	1.6	17	4.155
29OCT85	0.87	10	1.3	0.3	19	0.817
29OCT85	0.92	9.5	1	1.3	22	3.849
29OCT85	0.92	9	1.6	2.4	29	7.297
29OCT85	1	9	25.4	37.9	32	.
29OCT85	1.04	9	2.3	4.2	37	14.62
29OCT85	0.95	9.2	1.2	2.8	42	8.764
29OCT85	0.85	9.2	2.3	4.3	47	12.14
29OCT85	0.89	9.4	0.2	3.2	52	9.381
30OCT85	0.89	11.9	2.2	15.6	4.5	47.15
30OCT85	0.89	13	1.5	1.8	6.5	4.551
30OCT85	0.85	13.4	0.4	2.3	8.5	5.528
30OCT85	0.91	13.2	0.5	1.2	10	3.084
30OCT85	0.91	12.7	0.2	2	12	5.26
30OCT85	0.86	12	0.8	0.6	14	1.508
30OCT85	0.84	11	0.1	1.5	17	3.852
30OCT85	0.87	10.3	1.3	0.4	19	1.077
30OCT85	0.92	9.9	0.9	1.2	22	3.497
30OCT85	0.92	9.4	1.6	2.6	29	7.79
30OCT85	1	9.2	25.5	40.5	32	.
30OCT85	1.04	9.5	2.3	4	37	13.61
30OCT85	0.95	9.5	1.3	2.8	42	8.654
30OCT85	0.85	9.5	2.1	4.1	47	11.43
30OCT85	0.89	9.5	0.2	3.3	52	9.643
31OCT85	0.89	11.5	2.3	16.6	4.5	52.22
31OCT85	0.89	12.6	1.7	1.7	6.5	4.349
31OCT85	0.85	13.3	0.5	2.2	8.5	5.299
31OCT85	0.91	13	0.2	1.2	10	3.109
31OCT85	0.91	12.5	0.2	1.8	12	4.759
31OCT85	0.86	11.8	0.9	0.7	14	1.772
31OCT85	0.84	10.8	0.4	1.7	17	4.398
31OCT85	0.87	10.1	1.3	0.4	19	1.085
31OCT85	0.92	9.5	1	1.3	22	3.849
31OCT85	0.92	9	1.7	2.5	29	7.604
31OCT85	1	9.1	25.7	39.8	32	.
31OCT85	1.04	9.1	2.2	4	37	13.85
31OCT85	0.95	9.2	1	2.8	42	8.772
31OCT85	0.85	9.2	2.1	4	47	11.28
31OCT85	0.89	9.5	0.1	3.2	52	9.347

AREA G: NOVEMBER 1985 PSYCHROMETER DATA

DATE	CORRECTION	TEMP (DEG C)	OFFSET (MICROVOLTS)	READING (MICROVOLTS)	DEPTH (FT)	WATER POTENTIAL (-BARS)
01NOV85	0.89	11.8	2.1	16	4.5	48.99
01NOV85	0.89	13.2	1.6	1.7	6.5	4.266
01NOV85	0.85	13.4	0.5	2.1	8.5	5.039
01NOV85	0.91	13.5	0.5	1.2	10	3.055
01NOV85	0.91	12.7	0.2	2	12	5.26
01NOV85	0.86	12.3	1	0.8	14	1.992
01NOV85	0.84	11.1	0.3	1.7	17	4.352
01NOV85	0.87	10.5	1.3	0.4	19	1.069
01NOV85	0.92	9.8	1	1.3	22	3.804
01NOV85	0.92	9.5	1.8	2.5	29	7.448
01NOV85	1	9.2	25.2	41.2	32	.
01NOV85	1.04	9.4	2.3	4.1	37	14.02
01NOV85	0.95	9.4	1.2	2.8	42	8.693
01NOV85	0.85	9.6	2.2	4.1	47	11.37
01NOV85	0.89	9.6	0.1	3.3	52	9.609
02NOV85	0.89	11.4	2.2	17	4.5	54.33
02NOV85	0.89	12.6	1.8	1.8	6.5	4.605
02NOV85	0.85	13	0.5	2.2	8.5	5.351
02NOV85	0.91	12.8	0.2	1.2	10	3.129
02NOV85	0.91	12.4	0.3	1.9	12	5.042
02NOV85	0.86	11.7	0.9	0.6	14	1.523
02NOV85	0.84	10.7	0.4	1.7	17	4.414
02NOV85	0.87	10	1.4	0.5	19	1.362
02NOV85	0.92	9.5	1.1	1.3	22	3.847
02NOV85	0.92	9	1.8	2.5	29	7.601
02NOV85	1	8.9	25.7	40.9	32	.
02NOV85	1.04	9.1	2.3	4	37	13.84
02NOV85	0.95	9.2	1.1	2.8	42	8.768
02NOV85	0.85	9.2	2.3	4.1	47	11.56
02NOV85	0.89	9.2	0.2	3	52	8.851
03NOV85	0.89	11.8	2.5	17.1	4.5	53.48
03NOV85	0.89	13.1	1.5	1.7	6.5	4.282
03NOV85	0.85	13.5	0.5	2.1	8.5	5.023
03NOV85	0.91	13.4	0.7	1.3	10	3.319
03NOV85	0.91	12.9	0.3	1.9	12	4.958
03NOV85	0.86	12.2	0.9	0.7	14	1.748
03NOV85	0.84	11.1	0.5	1.6	17	4.089
03NOV85	0.87	10.7	1.1	0.4	19	1.062
03NOV85	0.92	10	0.9	1.3	22	3.776
03NOV85	0.92	9.5	1.7	2.5	29	7.451
03NOV85	1	9.4	25.7	43.3	32	.
03NOV85	1.04	9.6	2.4	4	37	13.55
03NOV85	0.95	9.5	1	2.7	42	8.349
03NOV85	0.85	9.9	1.9	4	47	10.97
03NOV85	0.89	9.9	0.1	3.1	52	8.904
04NOV85	0.89	11.3	22.8	23.5	4.5	.
04NOV85	0.89	12.6	1.6	1.5	6.5	3.834
04NOV85	0.85	13	0.5	2.1	8.5	5.104
04NOV85	0.91	12.7	0.4	1.1	10	2.873
04NOV85	0.91	12.4	0.3	2	12	5.311
04NOV85	0.86	11.8	1	0.6	14	1.517
04NOV85	0.84	10.8	0.3	1.7	17	4.4

AREA G: NOVEMBER 1985 PSYCHROMETER DATA

04NOV85	0.87	10.1	1.4	0.3	19	0.813
04NOV85	0.92	9.5	1	1.2	22	3.55
04NOV85	0.92	9.1	1.7	2.6	29	7.882
04NOV85	1	9	25.5	40.6	32	.
04NOV85	1.04	9	2.3	4	37	13.9
04NOV85	0.95	9.2	1.1	2.9	42	9.089
04NOV85	0.85	9.3	2.2	4	47	11.22
04NOV85	0.89	9.4	0.1	3	52	8.783
05NOV85	0.89	11.6	22.8	23.5	4.5	.
05NOV85	0.89	13	1.3	1.4	6.5	3.534
05NOV85	0.85	13.2	0.4	2	8.5	4.829
05NOV85	0.91	13.3	0.6	1.1	10	2.815
05NOV85	0.91	12.7	0.3	1.9	12	4.991
05NOV85	0.86	12.3	1	0.7	14	1.742
05NOV85	0.84	11.1	0.3	1.6	17	4.093
05NOV85	0.87	10.6	1.3	0.4	19	1.065
05NOV85	0.92	9.9	1	1.3	22	3.789
05NOV85	0.92	9.6	1.7	2.5	29	7.421
05NOV85	1	9.5	25.2	42.4	32	.
05NOV85	1.04	9.5	2.4	4	37	13.61
05NOV85	0.95	9.6	1.2	2.9	42	8.939
05NOV85	0.85	9.8	2.3	4.1	47	11.28
05NOV85	0.89	9.9	0.3	3.1	52	8.896
06NOV85	0.89	11.1	23.1	24.5	4.5	.
06NOV85	0.89	12.4	1.8	1.4	6.5	3.596
06NOV85	0.85	12.8	0.5	2.1	8.5	5.138
06NOV85	0.91	12.7	0.4	1.2	10	3.136
06NOV85	0.91	12.4	0.3	1.8	12	4.773
06NOV85	0.86	11.7	1	0.7	14	1.778
06NOV85	0.84	10.7	0.3	1.5	17	3.891
06NOV85	0.87	10	1.4	0.4	19	1.089
06NOV85	0.92	9.5	1	1.4	22	4.148
06NOV85	0.92	9.1	1.6	2.4	29	7.267
06NOV85	1	8.9	25.8	42.2	32	.
06NOV85	1.04	9.1	2.2	4.1	37	14.21
06NOV85	0.95	9.1	1.2	2.7	42	8.478
06NOV85	0.85	9.2	2.2	4	47	11.27
06NOV85	0.89	9.2	0.1	3.1	52	9.158
07NOV85	0.89	11.4	22.8	24.6	4.5	.
07NOV85	0.89	12.8	1.6	1.3	6.5	3.296
07NOV85	0.85	13	0.4	1.9	8.5	4.614
07NOV85	0.91	13	0.8	1	10	2.58
07NOV85	0.91	12.5	0.1	1.9	12	5.029
07NOV85	0.86	12.2	0.8	0.7	14	1.749
07NOV85	0.84	11.2	0.3	1.6	17	4.078
07NOV85	0.87	10.6	1.2	0.4	19	1.066
07NOV85	0.92	9.9	0.8	1.3	22	3.793
07NOV85	0.92	9.5	1.8	2.7	29	8.057
07NOV85	1	9.5	24.9	0	32	0
07NOV85	1.04	9.4	.	.	37	.
07NOV85	0.95	9.6	1.1	2.7	42	8.312

AREA G: MARCH 1986 PSYCHROMETER DATA

DATE	CORRECTION	TEMP (DEG C)	OFFSET (MICROVOLTS)	READING (MICROVOLTS)	DEPTH (FT)	WATER POTENTIAL (-BARS)
27MAR86	0.89	6.9	0.3	14.9	4.5	61.21
27MAR86	0.89	6.6	0.4	1.1	6.5	3.568
27MAR86	0.85	3.9	0	3.4	8.5	12.35
27MAR86	0.91	5	2.1	0.4	10	1.411
27MAR86	0.91	7.6	0.3	0.6	12	1.896
27MAR86	0.86	6.2	1.3	0.5	14	1.581
27MAR86	0.84	10.4	0	1.2	17	3.145
27MAR86	0.87	9.6	0.7	2.7	19	7.626
27MAR86	0.92	7.4	1.2	1.6	22	5.181
27MAR86	0.92	13.1	1.4	2.2	29	5.749
27MAR86	1	8.2	28.4	42.2	32	.
27MAR86	1.04	11.1	1.5	2.8	37	8.899
27MAR86	0.95	8.7	1.6	2.3	42	7.305
27MAR86	0.85	11.4	0.5	3	47	7.755
27MAR86	0.89	10.6	0.1	2.1	52	5.824
28MAR86	0.89	4.4	0.2	74.6	4.5	.
28MAR86	0.89	3	1.3	2.4	6.5	9.409
28MAR86	0.85	3.7	0.3	0.8	8.5	2.845
28MAR86	0.91	8.2	2.8	0.7	10	2.135
28MAR86	0.91	5.3	1.2	1.9	12	6.731
28MAR86	0.86	10.4	1.5	0.2	14	0.529
28MAR86	0.84	10.9	0.1	0.3	17	0.767
28MAR86	0.87	12.5	0.7	2.3	19	5.82
28MAR86	0.92	12.1	0.1	0.5	22	1.344
28MAR86	0.92	8.2	2.2	2.3	29	7.207
28MAR86	1	11.1	29.1	45	32	.
28MAR86	1.04	9.7	1.4	2.4	37	8.026
28MAR86	0.95	9.8	1.6	2.6	42	7.917
28MAR86	0.85	12.8	0.1	2.3	47	5.645
28MAR86	0.89	8.2	1.2	2.5	52	7.625
29MAR86	0.89	4.1	27.1	90.6	4.5	.
29MAR86	0.89	4.6	1.2	2.1	6.5	7.549
29MAR86	0.85	3.4	0.9	1.8	8.5	6.561
29MAR86	0.91	8.6	2.2	0.5	10	1.501
29MAR86	0.91	8	0.5	1	12	3.114
29MAR86	0.86	10.2	1.4	0.2	14	0.533
29MAR86	0.84	9.4	0.1	0.3	17	0.811
29MAR86	0.87	12.5	0.7	2.3	19	5.82
29MAR86	0.92	10.3	0.3	0.3	22	0.857
29MAR86	0.92	10	2.2	3.3	29	9.684
29MAR86	1	12.9	29.6	44.6	32	.
29MAR86	1.04	13.3	1.6	3.3	37	9.747
29MAR86	0.95	13.2	0.3	2.2	42	5.947
29MAR86	0.85	10.9	0.3	2.1	47	5.496
29MAR86	0.89	8.5	0.7	1.6	52	4.791
30MAR86	0.89	5.1	27.5	.	4.5	.
30MAR86	0.89	5.8	0.3	0.8	6.5	2.686
30MAR86	0.85	7.4	0.3	0.2	8.5	0.593
30MAR86	0.91	8.8	2.1	0.7	10	2.088
30MAR86	0.91	8	0.2	0	12	0
30MAR86	0.86	9.7	2.2	0.7	14	1.903
30MAR86	0.84	6.9	1.2	2.1	17	6.379

AREA G: MARCH 1986 PSYCHROMETER DATA

30MAR86	0.87	7.7	1.2	0.6	19	1.798
30MAR86	0.92	9.4	0.6	0.5	22	1.48
30MAR86	0.92	10.9	1.8	3.4	29	9.663
30MAR86	1	9.5	30	46.9	32	.
30MAR86	1.04	11	2	3.4	37	10.87
30MAR86	0.95	13.2	0.2	1	42	2.684
30MAR86	0.85	11.2	0.2	1.9	47	4.913
30MAR86	0.89	8.5	0.8	2.9	52	8.779
31MAR86	0.89	7.9	0.6	41.6	4.5	.
31MAR86	0.89	4.8	0.9	1.9	6.5	6.756
31MAR86	0.85	4	0.8	2	8.5	7.084
31MAR86	0.91	5.8	2.8	1.1	10	3.748
31MAR86	0.91	5.7	1.1	2.2	12	7.67
31MAR86	0.86	7.7	1.5	3	14	9.066
31MAR86	0.84	6.9	1.1	1.8	17	5.455
31MAR86	0.87	7.3	1.7	0.8	19	2.438
31MAR86	0.92	12.7	0.4	1.7	22	4.507
31MAR86	0.92	11.9	1.1	2.1	29	5.718
31MAR86	1	12.9	30.6	48.2	32	.
31MAR86	1.04	10.6	2.2	3.3	37	10.69
31MAR86	0.95	9.2	1.2	2.4	42	7.486
31MAR86	0.85	8.3	1	2.5	47	7.257
31MAR86	0.89	8.4	1	1.7	52	5.109

AREA G: APRIL 1986 PSYCHROMETER DATA

DATE	CORRECTION	TEMP (DEG C)	OFFSET (MICROVOLTS)	READING (MICROVOLTS)	DEPTH (FT)	WATER POTENTIAL (-BARS)
01APR86	0.89	6.1	25.7	94	4.5	
01APR86	0.89	6.8	0.7	1.8	6.5	5.816
01APR86	0.85	3.7	0.1	3.5	8.5	12.86
01APR86	0.91	5.4	1.5	0.2	10	0.692
01APR86	0.91	8.7	0.9	1.4	12	4.24
01APR86	0.86	5.9	1.4	0.5	14	1.603
01APR86	0.84	9.1	0.2	0.7	17	1.92
01APR86	0.87	11.6	1.9	0.4	19	1.025
01APR86	0.92	7.4	1	1.7	22	5.515
01APR86	0.92	9.4	1.5	2.7	29	8.1
01APR86	1	11.6	0.4	14.2	32	48.25
01APR86	1.04	10.2	1	3.2	37	10.58
01APR86	0.95	7.5	1.6	2.7	42	9.064
01APR86	0.85	12.2	0.4	2.7	47	6.772
01APR86	0.89	11.5	0	2	52	5.366
02APR86	0.89	3.3	23.8	63.3	4.5	
02APR86	0.89	4	0.9	2.1	6.5	7.794
02APR86	0.85	2.6	0.8	2.2	8.5	8.413
02APR86	0.91	5.7	1.7	0.3	10	1.024
02APR86	0.91	8.4	0.7	0.8	12	2.443
02APR86	0.86	5.8	2.2	1.5	14	4.862
02APR86	0.84	8.2	0.3	0.4	17	1.135
02APR86	0.87	10.6	1.4	2.7	19	7.312
02APR86	0.92	9.5	0.6	0.4	22	1.178
02APR86	0.92	11.7	1.9	2.8	29	7.689
02APR86	1	11.4	0.2	14.4	32	49.61
02APR86	1.04	11	1.3	2.7	37	8.614
02APR86	0.95	9.1	0.9	2.8	42	8.812
02APR86	0.85	9.7	0.7	2	47	5.465
02APR86	0.89	7.7	1	2	52	6.211
03APR86	0.89	5.7	24	89.5	4.5	
03APR86	0.89	5.7	0.1	1.6	6.5	5.446
03APR86	0.85	5	0.4	0.8	8.5	2.665
03APR86	0.91	7.9	2.6	1	10	3.099
03APR86	0.91	8.6	1.1	1.9	12	5.797
03APR86	0.86	6.9	1.3	0.4	14	1.224
03APR86	0.84	10	0.4	1.3	17	3.456
03APR86	0.87	9.4	1	2.2	19	6.229
03APR86	0.92	8.5	0.1	0.9	22	2.777
03APR86	0.92	8.2	2.1	2.6	29	8.172
03APR86	1	7.5	0	15.2	32	67.81
03APR86	1.04	9.7	1.5	3.1	37	10.42
03APR86	0.95	12.1	0.7	2.4	42	6.728
03APR86	0.85	11.2	0.5	2.5	47	6.485
03APR86	0.89	10.6	0.1	2.1	52	5.824
04APR86	0.89	4.2	24.2		4.5	
04APR86	0.89	5.1	0.4	1.3	6.5	4.535
04APR86	0.85	3	0.8	2.3	8.5	8.618
04APR86	0.91	7.3	1.5	0.5	10	1.591
04APR86	0.91	7.3	0.1	0.1	12	0.319
04APR86	0.86	8.8	2	0.7	14	1.975

AREA G: APRIL 1986 PSYCHROMETER DATA

04APR86	0.84	6.2	0.3	1.6	17	5.015
04APR86	0.87	11.5	1.2	2.9	19	7.615
04APR86	0.92	11.9	1	1.8	22	4.893
04APR86	0.92	11.8	1.7	2.7	29	7.389
04APR86	1	11.6	0.1	18.9	32	73
04APR86	1.04	9.1	2.1	3.4	37	11.71
04APR86	0.95	7.6	1.3	2.3	42	7.668
04APR86	0.85	7.7	0.8	2.2	47	6.542
04APR86	0.89	7.5	0.7	1.9	52	5.955
05APR86	0.89	4.2	25.1	81.3	4.5	
05APR86	0.89	7	0.3	1.6	6.5	5.122
05APR86	0.85	5.9	0.6	1	8.5	3.194
05APR86	0.91	4.5	2.5	1.2	10	4.367
05APR86	0.91	6.2	0.9	1.4	12	4.733
05APR86	0.86	9.7	1.4	0.4	14	1.089
05APR86	0.84	9.4	0.2	0.5	17	1.353
05APR86	0.87	11.3	1.1	2.8	19	7.403
05APR86	0.92	11.7	0.3	1.3	22	3.558
05APR86	0.92	9.2	1.8	2.7	29	8.155
05APR86	1	8.3	0	18.4	32	
05APR86	1.04	7.8	2.1	3.5	37	12.76
05APR86	0.95	7.7	1.5	2.2	42	7.29
05APR86	0.85	9.1	1.5	2.6	47	7.289
05APR86	0.89	11.7	0.4	2.2	52	5.859
06APR86	0.89	7.3	27.1	80.3	4.5	
06APR86	0.89	3.7	0.6	1.4	6.5	5.242
06APR86	0.85	3.9	1	2.1	8.5	7.48
06APR86	0.91	3.9	2.4	1	10	3.745
06APR86	0.91	8.3	0.2	0.5	12	1.533
06APR86	0.86	9.8	1	0	14	0
06APR86	0.84	6.3	0.4	1.2	17	3.728
06APR86	0.87	11.8	1.3	3.1	19	8.061
06APR86	0.92	12.2	0.6	1.1	22	2.951
06APR86	0.92	12.7	1.4	1.5	29	3.953
06APR86	1	7.9	1	17.9	32	
06APR86	1.04	7.8	1.4	3.5	37	12.8
06APR86	0.95	8.9	0.6	1.6	42	5.032
06APR86	0.85	7.8	0.9	2.4	47	7.116
06APR86	0.89	7.9	0.8	1.9	52	5.849
07APR86	0.89	4.9	0.2	33.9	4.5	
07APR86	0.89	6.2	0.3	1.4	6.5	4.641
07APR86	0.85	3.5	0.8	1.3	8.5	4.688
07APR86	0.91	8.6	2	0.5	10	1.502
07APR86	0.91	9.1	0.6	0.1	12	0.295
07APR86	0.86	7.9	2.3	1.2	14	3.525
07APR86	0.84	11.1	0	0.2	17	0.507
07APR86	0.87	12.1	0.5	2.1	19	5.385
07APR86	0.92	7.2	1.3	0.9	22	2.921
07APR86	0.92	10.5	2.1	3.1	29	8.911
07APR86	1	13	0.6	18.9	32	65.9
07APR86	1.04	12.9	1	3.2	37	9.597
07APR86	0.95	9.2	0.5	2.2	42	6.872
07APR86	0.85	9	0.4	1.9	47	5.343
07APR86	0.89	8	0.7	1.9	52	5.826
13APR86	0.89	5.3	29.6	78.1	4.5	
13APR86	0.89	4.4	0.6	1.6	6.5	5.793

AREA G: APRIL 1986 PSYCHROMETER DATA

13APR86	0.85	3.9	0.4	1.3	8.5	4.6
13APR86	0.91	6.1	1.6	0.3	10	1.006
13APR86	0.91	8.1	0.7	0.9	12	2.786
13APR86	0.86	10	1.5	3.4	14	9.364
13APR86	0.84	6.8	0.9	1.5	17	4.557
13APR86	0.87	11.2	1	2.7	19	7.163
13APR86	0.92	11.9	1.9	1.1	22	2.964
13APR86	0.92	8.6	2.1	2.8	29	8.667
13APR86	1	9.8	0.3	16.2	32	63.41
13APR86	1.04	12.6	2.2	3.3	37	9.95
13APR86	0.95	10.1	1.9	2.6	42	7.814
13APR86	0.85	3	28.5	31	47	
13APR86	0.89	12.1			52	
14APR86	0.89	4.6	29.2	78	4.5	
14APR86	0.89	3.3	0.8	2.1	6.5	8.089
14APR86	0.85	7.1	0.2	1.1	8.5	3.334
14APR86	0.91	6.9	1.2	0.3	10	0.971
14APR86	0.91	6.3	0.8	1.1	12	3.692
14APR86	0.86	8.1	1	0.1	14	0.29
14APR86	0.84	8.8	0.8	0.9	17	2.497
14APR86	0.87	10.7	1.1	2	19	5.374
14APR86	0.92	9.7	0.7	0.3	22	0.876
14APR86	0.92	11.2	2.9	2.4	29	6.661
14APR86	1	8.6	2	17.2	32	
14APR86	1.04	8.9	2.6	3.5	37	12.14
14APR86	0.95	10.6	1.8	2.3	42	6.768
14APR86	0.85	11.2	1.3	2.1	47	5.412
14APR86	0.89	10.2	0.9	1.8	52	5.039
15APR86	0.89	9.5	1.2	29.8	4.5	
15APR86	0.89	6.5	0.8	0.8	6.5	2.595
15APR86	0.85	3.9	1.2	0.6	8.5	2.1
15APR86	0.91	5.8	2.5	0.3	10	1.016
15APR86	0.91	8	1.8	1.1	12	3.409
15APR86	0.86	8.7	1.8	0.5	14	1.415
15APR86	0.84	11.3	0.8	0.8	17	2.016
15APR86	0.87	11.7	1.4	0.2	19	0.511
15APR86	0.92	7.8	0.4	0.6	22	1.899
15APR86	0.92	8.1	1.6	2.3	29	7.257
15APR86	1	7.7	0.8	16.3	32	
15APR86	1.04	8.6	1.6	2.8	37	9.819
15APR86	0.95	8.3	2.1	2.4	42	7.742
15APR86	0.85	13.1	0.2	2.4	47	5.834
15APR86	0.89	11.3	0.3	0.8	52	2.14
16APR86	0.89	9.1	1.6	27	4.5	
16APR86	0.89	7.5	0.4	1.6	6.5	5.007
16APR86	0.85	8.3	0.5	1.1	8.5	3.162
16APR86	0.91	8.8	1.6	0.4	10	1.193
16APR86	0.91	6.4	1.1	1.1	12	3.671
16APR86	0.86	10	1.1	0	14	0
16APR86	0.84	6.8	0.9	1.5	17	4.557
16APR86	0.87	9.7	0.8	1.9	19	5.308
16APR86	0.92	9.8	0.4	0.7	22	2.044
16APR86	0.92	8.2	1.6	2.8	29	8.836
16APR86	1	10.1	0.5	15.7	32	59.38
16APR86	1.04	10.5	1.1	2.9	37	9.451
16APR86	0.95	8.4	1.5	1.9	42	6.093

AREA G: APRIL 1986 PSYCHROMETER DATA

16APR86	0.85	8.1	0.3	2.5	47	7.342
16APR86	0.89	8.9	0	2	52	5.928
17APR86	0.89	5.7	0.7	39.2	4.5	
17APR86	0.89	4.1	0.4	1.9	6.5	7.014
17APR86	0.85	8	0.6	1.9	8.5	5.567
17APR86	0.91	7.4	1.3	0.1	10	0.316
17APR86	0.91	8.6	0.8	0.5	12	1.51
17APR86	0.86	5.1	1.8	0.4	14	1.329
17APR86	0.84	10.5	0.7	0.5	17	1.295
17APR86	0.87	7.1	2.2	0.8	19	2.454
17APR86	0.92	8.1	0.7	0.7	22	2.187
17APR86	0.92	12.3	2.2	2.3	29	6.155
17APR86	1	12	1.3	16.8	32	58.44
17APR86	1.04	11.2	1.8	3.4	37	10.8
17APR86	0.95	11.9	1.9	2.2	42	6.168
17APR86	0.85	12	1.1	2.1	47	5.265
17APR86	0.89	10.8	1	2.2	52	6.037
19APR86	0.89	7.8	28.1	43.3	4.5	
19APR86	0.89	6	0.7	2.2	6.5	7.407
19APR86	0.85	3.9	1	1.9	8.5	6.752
19APR86	0.91	4.1	2.7	1.3	10	4.829
19APR86	0.91	6.7	0.8	0.4	12	1.31
19APR86	0.86	8.6	2.3	0.4	14	1.133
19APR86	0.84	10.4	0.5	1.3	17	3.402
19APR86	0.87	9	0.6	4.4	19	12.94
19APR86	0.92	10.5	0.6	1.1	22	3.135
19APR86	0.92	7.6	2.8	2.2	29	7.051
19APR86	1	11	0.7	18.1	32	69.94
19APR86	1.04	8.8	2.7	2.8	37	9.69
19APR86	0.95	7.5	1.9	2.2	42	7.342
19APR86	0.85	29.5	30.8	2.4	47	3.403
19APR86	0.89	10.1			52	
20APR86	0.89	9.2	0.4	6.9	4.5	21.12
20APR86	0.89	5.3	0	1.2	6.5	4.149
20APR86	0.85	8.2	0.5	1.3	8.5	3.759
20APR86	0.91	3.9	1.9	0.3	10	1.118
20APR86	0.91	8.6	0.9	1.6	12	4.874
20APR86	0.86	5.7	1.7	0.1	14	0.322
20APR86	0.84	6.4	0.9	0.5	17	1.533
20APR86	0.87	10.6	1.3	0.6	19	1.6
20APR86	0.92	11.3	1.4	1.3	22	3.59
20APR86	0.92	12	1.7	2.6	29	7.061
20APR86	1	10.5	0.4	11.2	32	38.3
20APR86	1.04	9	2.2	3.3	37	11.4
20APR86	0.95	9.3	0.6	1.6	42	4.951
20APR86	0.85	10.5	1.3	2	47	5.285
20APR86	0.89	8	1.4	2.1	52	6.431
21APR86	0.89	10	0.2	13.6	4.5	44.04
21APR86	0.89	5.2	0.1	2	6.5	7.003
21APR86	0.85	5.5	0	0	8.5	0
21APR86	0.91	7.9	2.2	1.2	10	3.731
21APR86	0.91	9.4	1.9	1.7	12	4.995
21APR86	0.86	5.2	1.2	2.4	14	8.117
21APR86	0.84	8.2	0.4	1.1	17	3.139
21APR86	0.87	10.3	0.5	1.7	19	4.639
21APR86	0.92	11	0.7	0.7	22	1.952

AREA G: APRIL 1986 PSYCHROMETER DATA

21APR86	0.92	12.5	2.6	2.1	29	5.564
21APR86	1	10.2	2.1	18.2	32	.
21APR86	1.04	7.6	2.7	3.2	37	11.71
21APR86	0.95	7.6	1.4	1.7	42	5.635
21APR86	0.85	7.3	0.8	52.5	47	.
21APR86	0.89	12.5	1.1	1.9	52	4.896
22APR86	0.89	10.8	0.7	9	4.5	26.39
22APR86	0.89	9.2	0.2	2	6.5	5.851
22APR86	0.85	9.2	0.2	1	8.5	2.771
22APR86	0.91	8.4	1.2	2.4	10	7.414
22APR86	0.91	8	0.3	0.8	12	2.489
22APR86	0.86	5.8	1.4	3.4	14	11.28
22APR86	0.84	6.4	1.3	0.8	17	2.455
22APR86	0.87	7.6	2.3	1.2	19	3.612
22APR86	0.92	11.2	0.4	0.8	22	2.219
22APR86	0.92	8.5	1.4	2.5	29	7.775
22APR86	1	10.1	0.9	11.6	32	40.52
22APR86	1.04	8	2.6	3	37	10.77
22APR86	0.95	8	1.9	1.8	42	5.856
22APR86	0.85	8.3	1.6	5.5	47	16.39
22APR86	0.89	9.3	1.5	2.2	52	6.384
23APR86	0.89	8.6	0	7.9	4.5	25.17
23APR86	0.89	6.1	0.6	1.7	6.5	5.671
23APR86	0.85	4.5	0.9	1.1	8.5	3.76
23APR86	0.91	4.6	2	0.1	10	0.359
23APR86	0.91	9.3	1.6	1.2	12	3.53
23APR86	0.86	7.4	2.2	1.4	14	4.212
23APR86	0.84	10.4	0.7	0.5	17	1.3
23APR86	0.87	11.6	2.3	1	19	2.568
23APR86	0.92	12.2	1.1	1	22	2.675
23APR86	0.92	12.9	2.6	2.3	29	6.021
23APR86	1	11.3	1.4	12.8	32	42.95
23APR86	1.04	10.9	2.7	3.3	37	10.55
23APR86	0.95	8.9	1.1	1.7	42	5.339
23APR86	0.85	7.8	0.7	2.4	47	7.122
23APR86	0.89	8.9	0.1	1.8	52	5.324
24APR86	0.89	7.2	0.2	9.2	4.5	31.92
24APR86	0.89	8.5	0.2	2.2	6.5	6.636
24APR86	0.85	7.9	0.4	1	8.5	2.922
24APR86	0.91	6.4	1.3	3	10	10.19
24APR86	0.91	5	1.8	1.2	12	4.272
24APR86	0.86	6.9	2.3	0.8	14	2.447
24APR86	0.84	11.1	0.4	0	17	0
24APR86	0.87	11.8	0.7	2.1	19	5.436
24APR86	0.92	6.8	1.8	0.9	22	2.967
24APR86	0.92	8.6	3	2.5	29	7.688
24APR86	1	10.8	1.7	14	32	48.9
24APR86	1.04	11.8	2	3.5	37	10.88
24APR86	0.95	11.7	0.4	1.6	42	4.529
24APR86	0.85	10.4	0.3	2.1	47	5.6
24APR86	0.89	8.9	0.2	1.2	52	3.53
25APR86	0.89	6.9	1.2	8.2	4.5	28.32
25APR86	0.89	8.6	0.6	1.5	6.5	4.471
25APR86	0.85	9	0.5	0.9	8.5	2.509
25APR86	0.91	7	1.8	2.7	10	8.873
25APR86	0.91	7.3	0.8	1.3	12	4.178

AREA G: APRIL 1986 PSYCHROMETER DATA

25APR86	0.86	7.7	1.4	3.5	14	10.63
25APR86	0.84	11	0.8	1.1	17	2.808
25APR86	0.87	7.5	2	1.3	19	3.939
25APR86	0.92	11	0	0.9	22	2.521
25APR86	0.92	10	1.2	2.5	29	7.321
25APR86	1	10.9	0.3	17.5	32	66.63
25APR86	1.04	11.6	1.4	3.3	37	10.34
25APR86	0.95	11.7	0.4	1.5	42	4.243
25APR86	0.85	9	0.2	1.9	47	5.348
25APR86	0.89	8.3	0.6	1.9	52	5.755
26APR86	0.89	6.7	0.5	6.7	4.5	22.98
26APR86	0.89	7.8	0.8	1.3	6.5	3.998
26APR86	0.85	9.1	0.2	1.1	8.5	3.063
26APR86	0.91	9.2	2.3	0.7	10	2.053
26APR86	0.91	6.4	0.7	1.4	12	4.693
26APR86	0.86	9.9	2.2	1.2	14	3.25
26APR86	0.84	9.6	1.5	1.5	17	4.036
26APR86	0.87	9.3	1	2.4	19	6.834
26APR86	0.92	12.1	1.4	0.8	22	2.141
26APR86	0;92	7.8	1.9	2.8	29	8.979
26APR86	1	10.1	0.1	11.8	32	41.51
26APR86	1.04	11.1	1.6	3.1	37	9.871
26APR86	0.95	12	0.7	1	42	2.786
26APR86	0.85	12.4	1.3	23.5	47	
26APR86	0.89	8	0.3	2.2	52	6.776
27APR86	0.89	7	1.7	11.3	4.5	40.8
27APR86	0.89	8.6	0.1	1.5	6.5	4.481
27APR86	0.85	8.6	0.3	0.7	8.5	1.982
27APR86	0.91	4.4	2.3	1.2	10	4.393
27APR86	0.91	8.4	0.7	0.2	12	0.608
27APR86	0.86	7.2	2.3	1.2	14	3.634
27APR86	0.84	7	0.8	0.7	17	2.093
27APR86	0.87	10.6	1.6	3.3	19	8.971
27APR86	0.92	11.3	0.3	1.1	22	3.049
27APR86	0.92	9.8	1.6	2.4	29	7.065
27APR86	1	12.1	0.5	16.9	32	58.9
27APR86	1.04	10.7	2.2	3.2	37	10.32
27APR86	0.95	11.6	0.7	1.7	42	4.826
27APR86	0.85	11.9	1	17.9	47	54.82
27APR86	0.89	8.9	1	1.8	52	5.303
28APR86	0.89	6.6	0.3	8.2	4.5	28.89
28APR86	0.89	5.5	0.7	1.5	6.5	5.136
28APR86	0.85	5.3	1.1	1.2	8.5	3.944
28APR86	0.91	5.9	2.3	1.4	10	4.772
28APR86	0.91	6.8	0.9	1	12	3.276
28APR86	0.86	4.9	2	1.1	14	3.712
28APR86	0.84	7.4	0.6	0.7	17	2.058
28APR86	0.87	5.9	1.6	0	19	0
28APR86	0.92	11.1	0.6	0.9	22	2.505
28APR86	0.92	7.9	1.8	2.4	29	7.638
28APR86	1	8.9	0.4	14.4	32	56.54
28APR86	1.04	9.3	2.1	3.1	37	10.56
28APR86	0.95	7.9	0.7	1.5	42	4.914
28APR86	0.85	7.4	1.3	2.2	47	6.615
28APR86	0.89	7.9	0.9	1.6	52	4.91
29APR86	0.89	8.2	0.7	16.4	4.5	66.07

AREA G: APRIL 1986 PSYCHROMETER DATA

29APR86	0.89	5.8	0.1	0.9	6.5	3.028
29APR86	0.85	5.6	1.2	1	8.5	3.232
29APR86	0.91	6.8	2.4	0.4	10	1.295
29APR86	0.91	9.3	1.4	2.2	12	6.53
29APR86	0.86	8.2	1.1	0.2	14	0.578
29APR86	0.84	8.3	1.3	0.6	17	1.691
29APR86	0.87	9.2	2.1	0.5	19	1.401
29APR86	0.92	6.9	1.7	0.8	22	2.624
29APR86	0.92	10	2.2	3.3	29	9.684
29APR86	1	11.9	0.2	17.9	32	64.85
29APR86	1.04	9.7	1.6	2.6	37	8.701
29APR86	0.95	7.7	1.2	1.2	42	3.946
29APR86	0.85	8.2	1.4	0.1	47	0.285
29APR86	0.89	11.3	0.5	1	52	2.677
30APR86	0.89	6.9	0.8	5.8	4.5	19.45
30APR86	0.89	9.9	0.6	1.7	6.5	4.817
30APR86	0.85	5.2	0.7	1.2	8.5	3.97
30APR86	0.91	4.7	1.6	3.3	10	12.21
30APR86	0.91	5.2	1	1	12	3.53
30APR86	0.86	5.3	1.5	3.3	14	11.2
30APR86	0.84	6.7	0.9	1.2	17	3.652
30APR86	0.87	7.3	1	2.9	19	9.037
30APR86	0.92	7	1.4	0.7	22	2.287
30APR86	0.92	7.7	2.4	2.4	29	7.685
30APR86	1	7.4	1.5	12	32	48.33
30APR86	1.04	7.6	2.1	2.9	37	10.61
30APR86	0.95	7.7	1.2	0.8	42	2.622
30APR86	0.85	8.1	1.5	2	47	5.817
30APR86	0.89	11.5	1	2.6	52	6.975

AREA G: MAY 1986 PSYCHROMETER DATA

DATE	CORRECTION	TEMP (DEG C)	OFFSET (MICROVOLTS)	READING (MICROVOLTS)	DEPTH (FT)	WATER POTENTIAL (-BARS)
01MAY86	0.89	11.1	1.7	6.9	4.5	19.41
01MAY86	0.89	8.6	0.9	0.7	6.5	2.07
01MAY86	0.85	10	0.4	0.1	8.5	0.267
01MAY86	0.91	9.8	1.6	0.6	10	1.723
01MAY86	0.91	7.9	0.7	1.1	12	3.44
01MAY86	0.86	9.7	0.9	2.3	14	6.369
01MAY86	0.84	7.4	0.7	0.9	17	2.65
01MAY86	0.87	12	0.8	1.9	19	4.875
01MAY86	0.92	10.2	0.5	0.8	22	2.302
01MAY86	0.92	12.8	1.1	1	29	2.622
01MAY86	1	10.3	1.1	13.4	32	47.63
01MAY86	1.04	10.8	1.3	2.1	37	6.719
01MAY86	0.95	8.5	1.6	1.6	42	5.094
01MAY86	0.85	12.2	0.3	2.6	47	6.52
01MAY86	0.89	12	0.2	1	52	2.616
02MAY86	0.89	8.7	1.5	5.5	4.5	16.87
02MAY86	0.89	8.1	1.3	1.3	6.5	3.938
02MAY86	0.85	7	0	1	8.5	3.045
02MAY86	0.91	9.1	1	2.2	10	6.595
02MAY86	0.91	8.2	0.4	1	12	3.089
02MAY86	0.86	8.8	1	2.3	14	6.603
02MAY86	0.84	7.6	0.6	0.1	17	0.29
02MAY86	0.87	11.8	1.6	0.5	19	1.275
02MAY86	0.92	8.2	0.8	0.6	22	1.864
02MAY86	0.92	7.5	1.9	2.6	29	8.434
02MAY86	1	8.4	0.7	12.1	32	46.41
02MAY86	1.04	7.8	1.9	2.8	37	10.15
02MAY86	0.95	7.9	1.1	0.9	42	2.928
02MAY86	0.85	9.2	1.4	4.1	47	11.6
02MAY86	0.89	12.3	0.8	2.4	52	6.257
03MAY86	0.89	11	1	5.6	4.5	15.68
03MAY86	0.89	8.1	0.6	1.8	6.5	5.493
03MAY86	0.85	5.1	0.9	1.2	8.5	3.986
03MAY86	0.91	4.8	1.7	0.3	10	1.069
03MAY86	0.91	10.1	0.5	1.1	12	3.149
03MAY86	0.86	10.3	1	2.3	14	6.219
03MAY86	0.84	9.4	0.3	1	17	2.716
03MAY86	0.87	8.2	0.7	2.3	19	6.86
03MAY86	0.92	7.6	0.4	1.3	22	4.176
03MAY86	0.92	9.5	1.4	2.3	29	6.853
03MAY86	1	12.3	0.4	12.2	32	39.11
03MAY86	1.04	13.2	1.9	3	37	8.86
03MAY86	0.95	13.1	0.6	1.5	42	4.044
03MAY86	0.85	10.5	0.1	5	47	13.62
03MAY86	0.89	8.3	0.9	1.3	52	3.912
04MAY86	0.89	7.9	0.6	7.9	4.5	25.94
04MAY86	0.89	6.6	0.4	1.5	6.5	4.883
04MAY86	0.85	5.5	0.8	0.7	8.5	2.27
04MAY86	0.91	6	2.4	1.4	10	4.747
04MAY86	0.91	7.9	0.2	0.2	12	0.622

AREA G: MAY 1986 PSYCHROMETER DATA

04MAY86	0.86	10.4	1.8	0.2	14	0.529
04MAY86	0.84	11.5	0.8	0.7	17	1.75
04MAY86	0.87	11.8	1.4	3.1	19	8.058
04MAY86	0.92	12.5	0.6	1.1	22	2.921
04MAY86	0.92	12.4	1.2	2.4	29	6.434
04MAY86	1	11.6	0.3	12.7	32	42.23
04MAY86	1.04	11	1.5	3.1	37	9.912
04MAY86	0.95	9	0.7	1	42	3.116
04MAY86	0.85	7.7	1.1	2	47	5.929
04MAY86	0.89	8.2	1.3	1.9	52	5.761
05MAY86	0.89	11.8	1	7.9	4.5	21.9
05MAY86	0.89	8.4	0.3	1.7	6.5	5.125
05MAY86	0.85	6	1	1.1	8.5	3.495
05MAY86	0.91	7.2	2.4	1.2	10	3.844
05MAY86	0.91	8.9	0.2	1	12	3.003
05MAY86	0.86	6.7	1.1	2.7	14	8.528
05MAY86	0.84	6.6	1.1	0.6	17	1.823
05MAY86	0.87	7	2	1.1	19	3.402
05MAY86	0.92	10.2	0.7	1.1	22	3.169
05MAY86	0.92	12.4	1.2	2.7	29	7.253
05MAY86	1	11.8	0.1	11.9	32	38.87
05MAY86	1.04	8.1	1.8	3.1	37	11.13
05MAY86	0.95	8	1.2	0.9	42	2.914
05MAY86	0.85	7.9	1	1.5	47	4.391
05MAY86	0.89	9.4	1.3	1.9	52	5.483
06MAY86	0.89	10	1	8.8	4.5	26.5
06MAY86	0.89	10.4	0.6	1.8	6.5	5.007
06MAY86	0.85	10.3	0.5	1.2	8.5	3.187
06MAY86	0.91	8.9	1.2	2.3	10	6.952
06MAY86	0.91	8.5	0.3	1.2	12	3.668
06MAY86	0.86	8.2	1	2.3	14	6.772
06MAY86	0.84	9.6	0.9	0.5	17	1.339
06MAY86	0.87	11.3	1.5	3.4	19	9.015
06MAY86	0.92	12.5	0.8	0.9	22	2.385
06MAY86	0.92	12.4	2.4	2.3	29	6.128
06MAY86	1	9.1	1.2	18.9	32	
06MAY86	1.04	11.1	1.2	3.2	37	10.22
06MAY86	0.95	11.7	0.4	0.9	42	2.535
06MAY86	0.85	13	1	2	47	4.847
06MAY86	0.89	13	1.1	1.8	52	4.559
07MAY86	0.89	10.1	2.1	8.5	4.5	25.27
07MAY86	0.89	9.2	1	1.6	6.5	4.649
07MAY86	0.85	9.3	0.4	1	8.5	2.758
07MAY86	0.91	5.9	1.2	2.8	10	9.725
07MAY86	0.91	6.8	0.7	1.1	12	3.61
07MAY86	0.86	6	1.6	0	14	0
07MAY86	0.84	11.2	0.7	0.9	17	2.278
07MAY86	0.87	11.7	1.2	2.8	19	7.294
07MAY86	0.92	12.5	0.8	0.5	22	1.321
07MAY86	0.92	11.6	2.6	3.1	29	8.535
07MAY86	1	7.7	0.9	47.1	32	
07MAY86	1.04	12.4	2	3.2	37	9.717
07MAY86	0.95	13.3	1.1	1.5	42	4.009
07MAY86	0.85	13	1.2	1.8	47	4.353
07MAY86	0.89	8.3	0.8	2.2	52	6.675
08MAY86	0.89	8.8	1.1	8.3	4.5	26.2

AREA G: MAY 1986 PSYCHROMETER DATA

08MAY86	0.89	7.8	0.2	1.7	6.5	5.26
08MAY86	0.85	7.5	0.9	1.1	8.5	3.266
08MAY86	0.91	5.9	2.2	1	10	3.397
08MAY86	0.91	8.6	0.6	1.4	12	4.263
08MAY86	0.86	9.7	1.3	2.6	14	7.205
08MAY86	0.84	9.6	0.4	1.1	17	2.965
08MAY86	0.87	9.8	0.9	2.5	19	6.987
08MAY86	0.92	12	0.8	1.2	22	3.24
08MAY86	0.92	11.7	1.7	2.7	29	7.416
08MAY86	1	10.5	0.5	22.4	32	
08MAY86	1.04	10.8	1.9	3.3	37	10.63
08MAY86	0.95	10.4	0.8	0.9	42	2.652
08MAY86	0.85	8.1	1.2	1.6	47	4.643
08MAY86	0.89	8.4	1.2	2	52	6.021
10MAY86	0.89	12.6	1.9	8.4	4.5	22.6
10MAY86	0.89	10.2	0.8	1.9	6.5	5.325
10MAY86	0.85	9.7	0.6	1.1	8.5	2.986
10MAY86	0.91	7.8	1.7	0.9	10	2.809
10MAY86	0.91	9.3	1.3	1.2	12	3.535
10MAY86	0.86	7.8	1.9	0.6	14	1.764
10MAY86	0.84	10	1.2	1	17	2.643
10MAY86	0.87	11	0.6	2.6	19	6.956
10MAY86	0.92	11.6	0.7	1.2	22	3.287
10MAY86	0.92	11.9	1.5	2.8	29	7.649
10MAY86	1	12.4	1.6	23.1	32	
10MAY86	1.04	12	2.1	3.3	37	10.16
10MAY86	0.95	11.7	1.2	1.2	42	3.375
10MAY86	0.85	10.3	1.5	12.1	47	35.74
10MAY86	0.89	7.9	0.8	2.1	52	6.476
11MAY86	0.89	12.5	1.9	8.4	4.5	22.69
11MAY86	0.89	10.7	0.3	1.6	6.5	4.4
11MAY86	0.85	8.9	0.6	1.3	8.5	3.649
11MAY86	0.91	6.3	1.8	1.3	10	4.354
11MAY86	0.91	8.4	0.2	1.2	12	3.685
11MAY86	0.86	9.5	1.4	0.6	14	1.649
11MAY86	0.84	6.9	0.5	1.1	17	3.32
11MAY86	0.87	10.1	0.5	1.6	19	4.396
11MAY86	0.92	9.6	0.2	0.8	22	2.358
11MAY86	0.92	8.8	1.1	2.3	29	7.06
11MAY86	1	9.5	0.3	19.1	32	
11MAY86	1.04	12.4	1.5	3.1	37	9.428
11MAY86	0.95	12.6	0.5	0.8	42	2.183
11MAY86	0.85	11.4	1.5	2	47	5.108
11MAY86	0.89	8.8	0.7	2.4	52	7.146
12MAY86	0.89	8.8	1.9	8.7	4.5	27.49
12MAY86	0.89	9.3	1.3	1.7	6.5	4.917
12MAY86	0.85	9.5	0	1.1	8.5	3.018
12MAY86	0.91	9.9	1.3	0.5	10	1.431
12MAY86	0.91	6.7	0.2	0.6	12	1.973
12MAY86	0.86	9.9	2	1.3	14	3.527
12MAY86	0.84	8.7	0.4	1	17	2.792
12MAY86	0.87	11	0.2	1.8	19	4.795
12MAY86	0.92	11.6	0.2	1.1	22	3.018
12MAY86	0.92	10.9	1.2	2.5	29	7.074
12MAY86	1	11.8	0.7	22.4	32	
12MAY86	1.04	10.6	2.4	3.5	37	11.35

AREA G: MAY 1986 PSYCHROMETER DATA

12MAY86	0.95	7.6	0.7	0.8	42	2.639
12MAY86	0.85	7.6	0.8	1.9	47	5.66
12MAY86	0.89	7.6	0.3	2	52	6.257
13MAY86	0.89	12.8	1.7	9.7	4.5	26.25
13MAY86	0.89	10.6	1.3	1.4	6.5	3.842
13MAY86	0.85	6.2	0.1	0.7	8.5	2.203
13MAY86	0.91	5.3	1.8	1.2	10	4.21
13MAY86	0.91	8.2	0.2	0.9	12	2.78
13MAY86	0.86	5.4	1.9	0.9	14	2.96
13MAY86	0.84	11.1	0.6	1.1	17	2.8
13MAY86	0.87	10.6	0.3	2.1	19	5.688
13MAY86	0.92	6.8	0.6	0.8	22	2.648
13MAY86	0.92	7.2	1.3	2.3	29	7.56
13MAY86	1	7.8	0.5	20	32	.
13MAY86	1.04	7.9	1.6	3.1	37	11.24
13MAY86	0.95	7.8	0.8	0.6	42	1.958
13MAY86	0.85	7.6	1.1	2	47	5.955
13MAY86	0.89	7.6	0.5	1.4	52	4.353
14MAY86	0.89	11.4	3.2	14.4	4.5	43.43
14MAY86	0.89	9.3	0.2	1.9	6.5	5.532
14MAY86	0.85	9.7	0.8	1.4	8.5	3.806
14MAY86	0.91	8.4	1.8	1.1	10	3.352
14MAY86	0.91	7	0.4	1.5	12	4.903
14MAY86	0.86	7.9	0.6	2.2	14	6.567
14MAY86	0.84	9.2	0.4	0.8	17	2.186
14MAY86	0.87	7.4	0.7	3.1	19	9.648
14MAY86	0.92	7	1.5	1.2	22	3.936
14MAY86	0.92	8.2	2.5	2.7	29	8.479
14MAY86	1	9.3	1.7	18.1	32	.
14MAY86	1.04	9.8	2.5	3.4	37	11.36
14MAY86	0.95	8.7	1.5	1.4	42	4.415
14MAY86	0.85	8.6	1.1	1.6	47	4.549
14MAY86	0.89	10.7	0.8	2	52	5.505
15MAY86	0.89	12.2	2.1	9.9	4.5	27.41
15MAY86	0.89	11.3	0.4	1.6	6.5	4.303
15MAY86	0.85	8	0.7	1.1	8.5	3.199
15MAY86	0.91	7.3	1.8	0.7	10	2.228
15MAY86	0.91	10.4	0.5	1.4	12	3.972
15MAY86	0.86	10.5	1.1	3	14	8.091
15MAY86	0.84	10.4	0.3	1.2	17	3.141
15MAY86	0.87	9.4	0.2	1.7	19	4.811
15MAY86	0.92	9.5	0.1	1.1	22	3.265
15MAY86	0.92	8.1	1.6	2.4	29	7.579
15MAY86	1	7.8	0.4	18.7	32	.
15MAY86	1.04	10.5	1	2.7	37	8.789
15MAY86	0.95	8.6	0.4	0.9	42	2.852
15MAY86	0.85	8.3	0.3	1.3	47	3.746
15MAY86	0.89	8.1	1	1.8	52	5.484
16MAY86	0.89	12	1.2	10.5	4.5	29.62
16MAY86	0.89	9.2	0.5	2.2	6.5	6.438
16MAY86	0.85	6.6	0.4	1.7	8.5	5.296
16MAY86	0.91	6.3	1.5	0.4	10	1.33
16MAY86	0.91	10.6	0.3	1.3	12	3.661
16MAY86	0.86	10	0.7	2.4	14	6.579
16MAY86	0.84	9.3	0.2	1.1	17	3.003
16MAY86	0.87	8.5	0.2	3.1	19	9.214

AREA G: MAY 1986 PSYCHROMETER DATA

16MAY86	0.92	7.3	1.3	1.3	22	4.215
16MAY86	0.92	7.9	1.6	2.9	29	9.28
16MAY86	1	9.7	0	23.1	32	
16MAY86	1.04	13.4	1.1	3.2	37	9.437
16MAY86	0.95	13.5	0.7	1.3	42	3.454
16MAY86	0.85	13.5	0.3	2.1	47	5.027
16MAY86	0.89	13.5	0.1	2.3	52	5.778
17MAY86	0.89	13.3	1.8	7	4.5	18.16
17MAY86	0.89	7.6	1	1.7	6.5	5.288
17MAY86	0.85	10.3	0.4	1.7	8.5	4.534
17MAY86	0.91	9.7	1	0.4	10	1.154
17MAY86	0.91	8.5	0.2	0.6	12	1.826
17MAY86	0.86	9.7	1.6	0.5	14	1.361
17MAY86	0.84	9.8	0.1	0.3	17	0.799
17MAY86	0.87	10.4	0.9	2.9	19	7.944
17MAY86	0.92	10.7	0.1	0.7	22	1.979
17MAY86	0.92	7.4	2.1	2.4	29	7.798
17MAY86	1	10.9	1	12.5	32	42.61
17MAY86	1.04	12.3	2	3.6	37	11
17MAY86	0.95	11.6	0.2	1.1	42	3.116
17MAY86	0.85	9.9	0.5	1.8	47	4.877
17MAY86	0.89	9.4	0.1	2	52	5.807
18MAY86	0.89	10.7	2.2	10.9	4.5	32.46
18MAY86	0.89	8.5	1.4	1.9	6.5	5.686
18MAY86	0.85	7.6	0.6	1.4	8.5	4.155
18MAY86	0.91	6.7	0.5	2.4	10	6.018
18MAY86	0.91	8.5	0.1	1.3	12	3.98
18MAY86	0.86	6.3	1.3	3.4	14	11.01
18MAY86	0.84	6.1	0.7	1.2	17	3.758
18MAY86	0.87	5.9	0.6	2.9	19	9.665
18MAY86	0.92	7.2	0.5	1	22	3.259
18MAY86	0.92	7	1.7	2.8	29	9.316
18MAY86	1	8.5	0.1	13.9	32	55.28
18MAY86	1.04	10.3	1.6	3.4	37	11.19
18MAY86	0.95	11.4	0.2	1.2	42	3.426
18MAY86	0.85	11.3	0.5	1.7	47	4.368
18MAY86	0.89	12.4	0.4	1.7	52	4.404
19MAY86	0.89	12	1.7	10.4	4.5	29.23
19MAY86	0.89	7.5	0.7	1.6	6.5	5.001
19MAY86	0.85	6.9	0.7	1.4	8.5	4.284
19MAY86	0.91	8	1.3	0.8	10	2.478
19MAY86	0.91	8.7	0.2	1.2	12	3.639
19MAY86	0.86	6.1	1.4	0.5	14	1.588
19MAY86	0.84	10.5	0.2	0.7	17	1.819
19MAY86	0.87	6	1.8	1.3	19	4.221
19MAY86	0.92	8.7	0.4	0.8	22	2.443
19MAY86	0.92	12.3	1.4	2.6	29	6.997
19MAY86	1	12	0.2	11.7	32	37.79
19MAY86	1.04	7.5	2.4	2.9	37	10.64
19MAY86	0.95	8.3	1.8	1.6	42	5.132
19MAY86	0.85	12.1	0.7	2.1	47	5.256
19MAY86	0.89	9.4	0	0.9	52	2.591
20MAY86	0.89	14.6	2	11	4.5	28.2
20MAY86	0.89	10.5	1.4	0.9	6.5	2.469
20MAY86	0.85	7.7	0.6	1.5	8.5	4.437
20MAY86	0.91	8.5	1.6	0.5	10	1.511

AREA G: MAY 1986 PSYCHROMETER DATA

20MAY86	0.91	10.5	0.3	1.6	12	4.533
20MAY86	0.86	9.9	0.8	2.5	14	6.883
20MAY86	0.84	8.5	0.3	1.2	17	3.386
20MAY86	0.87	10	0.3	2	19	5.539
20MAY86	0.92	7.5	0.3	0.6	22	1.925
20MAY86	0.92	12.7	1.5	2.5	29	6.63
20MAY86	1	7.4	1.6	13.9	32	58.69
20MAY86	1.04	10.9	1.7	3.8	37	12.25
20MAY86	0.95	10.7	0.4	1.1	42	3.216
20MAY86	0.85	10.8	0.5	2.2	47	5.778
20MAY86	0.89	11.3	0.4	0.9	52	2.409
21MAY86	0.89	10.6	1.8	11.2	4.5	33.69
21MAY86	0.89	9.7	1.6	1.9	6.5	5.411
21MAY86	0.85	10.4	0.8	1.3	8.5	3.438
21MAY86	0.91	8.4	0.2	2.2	10	6.814
21MAY86	0.91	10	0	1.4	12	4.042
21MAY86	0.86	8.3	0.5	2.6	14	7.66
21MAY86	0.84	6.8	0.7	0.8	17	2.417
21MAY86	0.87	6.4	1	3	19	9.755
21MAY86	0.92	6.8	1	0.5	22	1.648
21MAY86	0.92	8.5	2.6	2.5	29	7.734
21MAY86	1	10.4	1.7	13.1	32	45.96
21MAY86	1.04	8	2.2	2.9	37	10.42
21MAY86	0.95	9.8	1.4	1.4	42	4.226
21MAY86	0.85	12.1	0.6	2	47	5.005
21MAY86	0.89	13.1	1	2.1	52	5.315
22MAY86	0.89	11.3	2.1	10.8	4.5	31.32
22MAY86	0.89	9.2	1.2	2.3	6.5	6.716
22MAY86	0.85	8.1	0.5	1.4	8.5	4.068
22MAY86	0.91	7.1	1	3.4	10	11.24
22MAY86	0.91	6.1	1	1.2	12	4.066
22MAY86	0.86	6.5	1.7	1.2	14	3.761
22MAY86	0.84	10.1	0.3	0.7	17	1.846
22MAY86	0.87	12.1	0	1.8	19	4.616
22MAY86	0.92	9	0.3	1.2	22	3.633
22MAY86	0.92	12	0.6	2.5	29	6.818
22MAY86	1	10	0.2	13.1	32	47.24
22MAY86	1.04	8.2	1.9	3	37	10.71
22MAY86	0.95	8.6	1	0.9	42	2.844
22MAY86	0.85	8.9	0.9	1.9	47	5.353
22MAY86	0.89	10.8	1	2.7	52	7.437
23MAY86	0.89	11.5	1	11.1	4.5	32.21
23MAY86	0.89	8.1	0.4	1.8	6.5	5.498
23MAY86	0.85	6.9	0	0.7	8.5	2.135
23MAY86	0.91	6.9	1.5	1.2	10	3.911
23MAY86	0.91	9.4	0.3	1.6	12	4.73
23MAY86	0.86	8.5	0.8	2.6	14	7.585
23MAY86	0.84	10.2	0.3	1.1	17	2.899
23MAY86	0.87	10.2	0.3	2.5	19	6.897
23MAY86	0.92	11.9	1.3	1.3	22	3.517
23MAY86	0.92	11.8	2.4	2.5	29	6.811
23MAY86	1	10.2	1.5	13.4	32	47.76
23MAY86	1.04	10.3	2.4	3.2	37	10.47
23MAY86	0.95	12.1	0.8	1.3	42	3.615
23MAY86	0.85	12.6	0.9	2	47	4.914
23MAY86	0.89	12.7	0	2.4	52	6.195

AREA G: MAY 1986 PSYCHROMETER DATA

24MAY86	0.89	11	1.4	11.2	4.5	33.18
24MAY86	0.89	8.9	1.8	1.8	6.5	5.285
24MAY86	0.85	12.3	0	1.1	8.5	2.725
24MAY86	0.91	10	2.1	1.4	10	4.004
24MAY86	0.91	9.8	0.4	1.2	12	3.48
24MAY86	0.86	11.1	1.2	0.5	14	1.294
24MAY86	0.84	7.9	0.4	0.6	17	1.727
24MAY86	0.87	11.9	1.4	1.1	19	2.809
24MAY86	0.92	12.1	0.3	0.4	22	1.073
24MAY86	0.92	12.1	2.2	2.9	29	7.847
24MAY86	1	8	0.3	12.4	32	49
24MAY86	1.04	13	2.1	3.5	37	10.43
24MAY86	0.95	8.3	0.2	1.2	42	3.863
24MAY86	0.85	13.1	0.4	1.9	47	4.599
24MAY86	0.89	13.5	1	1.9	52	4.741
25MAY86	0.89	12.9	2.6	11	4.5	29.91
25MAY86	0.89	9.4	1.4	1.7	6.5	4.895
25MAY86	0.85	8	0.2	0.7	8.5	2.033
25MAY86	0.91	6.7	1.5	1.3	10	4.28
25MAY86	0.91	7.9	0.2	0.7	12	2.186
25MAY86	0.86	6.1	1.4	0.6	14	1.907
25MAY86	0.84	11.5	0.3	0.7	17	1.754
25MAY86	0.87	6.8	1	0.4	19	1.246
25MAY86	0.92	12	0	0.4	22	1.078
25MAY86	0.92	7.7	1.4	1.7	29	5.433
25MAY86	1	8.2	1.6	13.3	32	52.62
25MAY86	1.04	10.2	2	3.5	37	11.55
25MAY86	0.95	12.8	1.4	1.3	42	3.522
25MAY86	0.85	13.4	0.6	1.3	47	3.102
25MAY86	0.89	11.8	1.3	2.2	52	5.814
26MAY86	0.89	10.8	2	11.4	4.5	34.05
26MAY86	0.89	9	1.6	2	6.5	5.863
26MAY86	0.85	9.6	0.8	1.1	8.5	2.995
26MAY86	0.91	11.1	0.7	0.2	10	0.548
26MAY86	0.91	7.3	0	1.4	12	4.519
26MAY86	0.86	8.8	0.7	2.8	14	8.084
26MAY86	0.84	11.4	1.2	1.4	17	3.523
26MAY86	0.87	11.8	1.3	0.9	19	2.304
26MAY86	0.92	10.4	0	1.2	22	3.444
26MAY86	0.92	11.8	1.3	2.5	29	6.845
26MAY86	1	13.3	0.9	12.8	32	39.6
26MAY86	1.04	11.1	2.3	3.2	37	10.16
26MAY86	0.95	12.2	1.5	1.4	42	3.87
26MAY86	0.85	12.7	1.4	1.8	47	4.392
26MAY86	0.89	9.2	0.6	2.3	52	6.734
27MAY86	0.89	15	2.5	10.9	4.5	27.47
27MAY86	0.89	12.8	1.1	2.1	6.5	5.365
27MAY86	0.85	11.7	0.2	1.8	8.5	4.569
27MAY86	0.91	10.7	0.4	2.8	10	7.943
27MAY86	0.91	10.6	0.4	1.8	12	5.086
27MAY86	0.86	9.3	0.9	2.6	14	7.334
27MAY86	0.84	9.7	0.3	1	17	2.684
27MAY86	0.87	6.8	1	0.6	19	1.872
27MAY86	0.92	8.3	0.7	0.6	22	1.857
27MAY86	0.92	8	2.6	2.5	29	7.902
27MAY86	1	10.3	1.2	14.5	32	52.56

AREA G: MAY 1986 PSYCHROMETER DATA

27MAY86	1.04	12.6	2.2	3.5	37	10.57
27MAY86	0.95	12.8	0.5	1.1	42	2.988
27MAY86	0.85	11.9	0.3	1.6	47	4.026
27MAY86	0.89	9.1	0.1	1.7	52	4.983
28MAY86	0.89	11	1.8	11.7	4.5	34.81
28MAY86	0.89	8.9	1.4	2.1	6.5	6.192
28MAY86	0.85	8	0.6	1.3	8.5	3.789
28MAY86	0.91	7	0.4	2.5	10	8.25
28MAY86	0.91	7.8	0.2	1.4	12	4.418
28MAY86	0.86	8.2	0.7	2.6	14	7.686
28MAY86	0.84	11	0.5	1.3	17	3.327
28MAY86	0.87	10	0.2	1.9	19	5.26
28MAY86	0.92	8.9	0.1	0.6	22	1.817
28MAY86	0.92	7.2	1.8	2.7	29	8.889
28MAY86	1	8.6	0.2	24.7	32	.
28MAY86	1.04	10.7	1.2	2.9	37	9.375
28MAY86	0.95	10.1	0.5	1.1	42	3.288
28MAY86	0.85	8.1	1	1.4	47	4.06
28MAY86	0.89	8.2	1.1	2	52	6.075
29MAY86	0.89	11.4	1.3	11.3	4.5	32.96
29MAY86	0.89	9.1	0.5	2	6.5	5.867
29MAY86	0.85	11.1	0.3	1.4	8.5	3.619
29MAY86	0.91	8.8	1.5	1.2	10	3.604
29MAY86	0.91	9.8	0.6	1.5	12	4.356
29MAY86	0.86	10.6	1	3	14	8.064
29MAY86	0.84	6.3	1.1	1.4	17	4.345
29MAY86	0.87	6.4	0.7	2.5	19	8.099
29MAY86	0.92	9	0.1	1	22	3.025
29MAY86	0.92	10.8	1.1	2.5	29	7.104
29MAY86	1	12.8	0.8	27.2	32	.
29MAY86	1.04	8.3	2	3.5	37	12.49
29MAY86	0.95	9.6	0.2	1	42	3.049
29MAY86	0.85	12.2	0.2	1.8	47	4.491
29MAY86	0.89	12	0.1	2	52	5.27
30MAY86	0.89	12.3	0.9	13.2	4.5	38.04
30MAY86	0.89	12.6	1.8	1	6.5	2.545
30MAY86	0.85	11.3	0.3	0.6	8.5	1.531
30MAY86	0.91	8.5	1.8	1.3	10	3.951
30MAY86	0.91	7.2	0.4	1.1	12	3.551
30MAY86	0.86	10.5	1.1	0.2	14	0.528
30MAY86	0.84	10	0.1	0.5	17	1.323
30MAY86	0.87	10.9	1.1	0.6	19	1.584
30MAY86	0.92	7.3	0.5	1.2	22	3.901
30MAY86	0.92	7.5	1.7	2.8	29	9.108
30MAY86	1	8.1	0.3	32.2	32	.
30MAY86	1.04	10.6	1	3.1	37	10.09
30MAY86	0.95	12.1	0.3	1.1	42	3.062
30MAY86	0.85	12	0.3	2.1	47	5.284
30MAY86	0.89	9.9	0.2	1.6	52	4.538
31MAY86	0.89	15	1.5	11.2	4.5	28.44
31MAY86	0.89	13	1.6	2.4	6.5	6.089
31MAY86	0.85	10.6	1	1.3	8.5	3.409
31MAY86	0.91	7.6	0.6	2.9	10	9.342
31MAY86	0.91	7.3	0.5	1.2	12	3.858
31MAY86	0.86	6.2	1.9	1.4	14	4.454
31MAY86	0.84	8.8	0.2	1	17	2.783

AREA G: MAY 1986 PSYCHROMETER DATA

31MAY86	0.87	6.5	0.8	3.5	19	11.4
31MAY86	0.92	6.7	1.4	1.3	22	4.328
31MAY86	0.92	10.4	2.1	3.3	29	9.538
31MAY86	1	12.6	0.1	31.5	32	
31MAY86	1.04	8.9	1.9	2.2	37	7.57
31MAY86	0.95	10.7	1.1	1.9	42	5.57
31MAY86	0.85	12.2	0.3	1.9	47	4.741
31MAY86	0.89	9.1	0.3	1.2	52	3.5

AREA G: JUNE 1986 PSYCHROMETER DATA

DATE	CORRECTION	TEMP (DEG C)	OFFSET (MICROVOLTS)	READING (MICROVOLTS)	DEPTH (FT)	WATER POTENTIAL (-BARS)
01JUN86	0.89	14.6	1.1	12	4.5	31.19
01JUN86	0.89	9.8	1.8	1.2	6.5	3.382
01JUN86	0.85	7.8	0.2	1.5	8.5	4.425
01JUN86	0.91	6.6	1	0.6	10	1.976
01JUN86	0.91	8	0.1	1.6	12	5.016
01JUN86	0.86	9.5	1	0.4	14	1.099
01JUN86	0.84	8.9	0.1	0.3	17	0.827
01JUN86	0.87	8.6	1.7	1.1	19	3.179
01JUN86	0.92	8.7	0.2	1.3	22	3.989
01JUN86	0.92	10.4	1.1	2.3	29	6.625
01JUN86	1	8.1	0.5	21.5	32	
01JUN86	1.04	7.9	2.2	2.8	37	10.09
01JUN86	0.95	8.4	1.6	1.4	42	4.468
01JUN86	0.85	11.3	0.9	1.8	47	4.62
01JUN86	0.89	11.9	0.5	2.2	52	5.815
02JUN86	0.89	13.8	1.6	11	4.5	29.07
02JUN86	0.89	10.1	1.4	1.9	6.5	5.332
02JUN86	0.85	7.9	0.4	0.6	8.5	1.747
02JUN86	0.91	7.8	1.5	1.5	10	4.711
02JUN86	0.91	8.2	0.2	1.4	12	4.343
02JUN86	0.86	5.8	1.6	1.1	14	3.56
02JUN86	0.84	9.7	0.1	1.4	17	3.773
02JUN86	0.87	8.7	0.4	2.9	19	8.524
02JUN86	0.92	6.3	1.3	0.9	22	3.042
02JUN86	0.92	11.7	1.5	2.9	29	7.984
02JUN86	1	11.7	0.2	23.8	32	
02JUN86	1.04	9.1	1.7	2.8	37	9.612
02JUN86	0.95	7.6	1.5	0.9	42	2.961
02JUN86	0.85	10.5	1.3	2.6	47	6.903
02JUN86	0.89	12.8	0.3	1.9	52	4.865
03JUN86	0.89	11.6	0.9	11.3	4.5	32.75
03JUN86	0.89	10.5	1.5	2	6.5	5.529
03JUN86	0.85	8.1	0.2	1.2	8.5	3.486
03JUN86	0.91	7.3	1.7	0.6	10	1.909
03JUN86	0.91	10.9	1.1	1.5	12	4.169
03JUN86	0.86	9.1	1.7	1.4	14	3.928
03JUN86	0.84	10.1	0.1	1.4	17	3.715
03JUN86	0.87	9.5	0.2	1.6	19	4.506
03JUN86	0.92	10.8	0.1	1.3	22	3.677
03JUN86	0.92	12.9	1.2	2	29	5.258
03JUN86	1	12.8	1.4	24.5	32	
03JUN86	1.04	8.2	1.3	3.5	37	12.58
03JUN86	0.95	10.8	0.1	1.1	42	3.208
03JUN86	0.85	10.7	0.2	1.9	47	5.004
03JUN86	0.89	11.5	0.1	1.7	52	4.549
04JUN86	0.89	14.9	0	11.8	4.5	30.46
04JUN86	0.89	13.7	1.2	2.2	6.5	5.461
04JUN86	0.85	12.3	0.9	1.6	8.5	3.96
04JUN86	0.91	9.8	0.2	2.6	10	7.631
04JUN86	0.91	10.4	0.3	1.5	12	4.263
04JUN86	0.86	9.2	0.5	2.4	14	6.798
04JUN86	0.84	7.3	0.4	1.3	17	3.863

AREA G: JUNE 1986 PSYCHROMETER DATA

04JUN86	0.87	7.7	0.4	2.6	19	7.957
04JUN86	0.92	7.3	0.7	1	22	3.242
04JUN86	0.92	6.8	2.3	2.4	29	8.007
04JUN86	1	8	1.9	13.9	32	56.38
04JUN86	1.04	8.3	2.5	3.1	37	11
04JUN86	0.95	9.4	1.6	1.2	42	3.671
04JUN86	0.85	9.2	1.6	2	47	5.554
04JUN86	0.89	8.3	0.7	2.1	52	6.369
05JUN86	0.89	15.3	1.4	11	4.5	27.62
05JUN86	0.89	11.6	1.5	1.9	6.5	5.042
05JUN86	0.85	9.8	1	0.8	8.5	2.155
05JUN86	0.91	6.7	1.4	1.1	10	3.616
05JUN86	0.91	11	0.1	1.5	12	4.173
05JUN86	0.86	7.4	0.6	2.7	14	8.278
05JUN86	0.84	8.2	0.3	0.8	17	2.278
05JUN86	0.87	6.1	1.7	1.3	19	4.203
05JUN86	0.92	8.9	0.2	0.4	22	1.209
05JUN86	0.92	12.8	1.3	2.3	29	6.077
05JUN86	1	13.2	0.7	22.5	32	
05JUN86	1.04	12.7	0.9	3.1	37	9.358
05JUN86	0.95	11.4	0.3	0.7	42	1.991
05JUN86	0.85	13.1	0	1.2	47	2.897
05JUN86	0.89	13.5	0.5	2	52	5.005
06JUN86	0.89	12.9	0.8	10.8	4.5	29.57
06JUN86	0.89	8.9	0.7	1.4	6.5	4.116
06JUN86	0.85	9.6	0.6	1.4	8.5	3.824
06JUN86	0.91	9.4	1.2	0.6	10	1.753
06JUN86	0.91	10.6	1	1.4	12	3.933
06JUN86	0.86	9.7	1.6	0.5	14	1.361
06JUN86	0.84	11	0.4	1.4	17	3.587
06JUN86	0.87	10.6	0.3	1.7	19	4.591
06JUN86	0.92	11.7	0.2	1.5	22	4.112
06JUN86	0.92	11.8	1.1	2.6	29	7.13
06JUN86	1	12.9	0.9	22.8	32	
06JUN86	1.04	12.1	2.4	2.7	37	8.24
06JUN86	0.95	8	1	1.2	42	3.899
06JUN86	0.85	8.3	0.3	1.3	47	3.746
06JUN86	0.89	13	1.1	1.6	52	4.048
07JUN86	0.89	14.9	0.4	12.2	4.5	31.55
07JUN86	0.89	11.3	0.1	2.2	6.5	5.951
07JUN86	0.85	12.1	0.1	2.3	8.5	5.781
07JUN86	0.91	11	0.2	2.6	10	7.289
07JUN86	0.91	7.9	0	0.7	12	2.188
07JUN86	0.86	5.8	0.7	2.7	14	8.915
07JUN86	0.84	9.5	0.4	1.5	17	4.072
07JUN86	0.87	10.4	0.2	1.8	19	4.904
07JUN86	0.92	11	0.3	0.6	22	1.675
07JUN86	0.92	12.6	1.6	2.6	29	6.92
07JUN86	1	13.2	1.1	22.3	32	
07JUN86	1.04	12.7	1.2	3	37	9.037
07JUN86	0.95	12.9	0.5	0.8	42	2.162
07JUN86	0.85	13	0.5	2.1	47	5.104
07JUN86	0.89	11.7	0.2	1.8	52	4.784
08JUN86	0.89	15.7	0.9	12	4.5	30.07
08JUN86	0.89	13.8	0.6	1.7	6.5	4.205
08JUN86	0.85	12	0.4	1.3	8.5	3.251

AREA G: JUNE 1986 PSYCHROMETER DATA

08JUN86	0.91	10.3	0.9	1.3	10	3.693
08JUN86	0.91	8.1	0.2	1.5	12	4.677
08JUN86	0.86	9.2	0.7	3	14	8.534
08JUN86	0.84	11.3	0.4	1.3	17	3.293
08JUN86	0.87	9	0.2	1.9	19	5.473
08JUN86	0.92	8.8	0.2	0.9	22	2.741
08JUN86	0.92	9.7	1.1	2.3	29	6.807
08JUN86	1	13.2	0.8	29.9	32	
08JUN86	1.04	9.3	2.6	3.1	37	10.54
08JUN86	0.95	9.8	1.7	0.8	42	2.401
08JUN86	0.85	8.1	1.2	2.2	47	6.418
08JUN86	0.89	7.7	0.6	1.6	52	4.959
09JUN86	0.89	11.5	0.8	14.6	4.5	44.56
09JUN86	0.89	11.1	1.2	1.9	6.5	5.14
09JUN86	0.85	9.3	0.8	1.6	8.5	4.426
09JUN86	0.91	8.5	0.7	3.4	10	10.58
09JUN86	0.91	7	0.8	2	12	6.557
09JUN86	0.86	6.7	1	0.5	14	1.548
09JUN86	0.84	11.1	0	1.2	17	3.065
09JUN86	0.87	10.1	0.2	2.1	19	5.8
09JUN86	0.92	7.1	0.5	1.2	22	3.936
09JUN86	0.92	7.5	1.5	2.8	29	9.116
09JUN86	1	9.3	0.2	21.1	32	
09JUN86	1.04	9.3	1	2.5	37	8.517
09JUN86	0.95	7.9	1.4	0.7	42	2.271
09JUN86	0.85	10.2	0.7	2.5	47	6.727
09JUN86	0.89	12.9	0.3	1.4	52	3.561
10JUN86	0.89	13.7	2.3	13.7	4.5	37.25
10JUN86	0.89	15.8	0.8	1.6	6.5	3.727
10JUN86	0.85	12.8	0.7	1.3	8.5	3.161
10JUN86	0.91	7.7	1.5	0.3	10	0.937
10JUN86	0.91	12.3	0.1	1.7	12	4.524
10JUN86	0.86	10.6	1.2	0.4	14	1.053
10JUN86	0.84	10.3	0.1	1.4	17	3.687
10JUN86	0.87	29.5	38.4	56.8	19	.
10JUN86	0.92	10	2	1.2	22	3.466
10JUN86	0.92	8.6	2.9	2.9	29	8.953
10JUN86	1	9	0.5	23.2	32	.
10JUN86	1.04	12.4	3.3	2.5	37	7.51
10JUN86	0.95	14.1	1.2	0.9	42	2.337
10JUN86	0.85	8.8	4.2	3.2	47	9.023
10JUN86	0.89	7.8	0.8	2	52	6.189
11JUN86	0.89	14.2	0.7	14.9	4.5	40.65
11JUN86	0.89	13.4	0.7	2	6.5	5.017
11JUN86	0.85	11.9	0.8	1.7	8.5	4.271
11JUN86	0.91	8.4	1.5	1.1	10	3.356
11JUN86	0.91	10.3	0	1.5	12	4.284
11JUN86	0.86	8.4	0.6	2.8	14	8.225
11JUN86	0.84	8.4	0.2	1.2	17	3.401
11JUN86	0.87	7.9	0.3	58.6	19	.
11JUN86	0.92	7.8	1	1.2	22	3.808
11JUN86	0.92	7.9	1.5	2.9	29	9.284
11JUN86	1	9.8	0.2	23	32	.
11JUN86	1.04	10.2	0.5	3.4	37	11.29
11JUN86	0.95	10.2	0.5	0.9	42	2.676
11JUN86	0.85	10.7	0.5	1.9	47	4.998

AREA G: JUNE 1986 PSYCHROMETER DATA

11JUN86	0.89	13.4	.	.	52	.
12JUN86	0.89	15.5	2	14.5	4.5	37.25
12JUN86	0.89	14.4	1.7	2.1	6.5	5.086
12JUN86	0.85	12.8	0.4	1.2	8.5	2.92
12JUN86	0.91	12.4	1.1	0.3	10	0.785
12JUN86	0.91	11.5	1.1	1.9	12	5.183
12JUN86	0.86	10.4	1.5	1.5	14	4.007
12JUN86	0.84	10.9	0.3	1.4	17	3.602
12JUN86	0.87	12.2	0.1	34.3	19	.
12JUN86	0.92	10.4	1.4	1.4	22	3.999
12JUN86	0.92	12.9	1.4	2.5	29	6.589
12JUN86	1	13.2	0	21.8	32	.
12JUN86	1.04	11	0.2	3	37	9.641
12JUN86	0.95	8.7	0.5	0.8	42	2.521
12JUN86	0.85	13.5	0.3	2.3	47	5.513
12JUN86	0.89	12.7	0.1	1.9	52	4.886
13JUN86	0.89	13.5	2.4	14.7	4.5	40.77
13JUN86	0.89	14.8	1.7	1.9	6.5	4.542
13JUN86	0.85	13.6	0.2	1.1	8.5	2.61
13JUN86	0.91	11.5	1.2	1.6	10	4.353
13JUN86	0.91	10.4	0	1.1	12	3.121
13JUN86	0.86	11.1	1.4	1.5	14	3.906
13JUN86	0.84	11.3	0.5	0.5	17	1.259
13JUN86	0.87	10.6	1.1	26.6	19	.
13JUN86	0.92	7.1	0.2	1.3	22	4.273
13JUN86	0.92	10.1	0.6	2.6	29	7.611
13JUN86	1	11.2	0.5	19.8	32	.
13JUN86	1.04	13.6	1.2	3.1	37	9.073
13JUN86	0.95	12.4	1.4	1	42	2.74
13JUN86	0.85	9.6	0.2	2.2	47	6.059
13JUN86	0.89	12.1	0.1	1.8	52	4.72
14JUN86	0.89	12.8	1.6	14.8	4.5	42.52
14JUN86	0.89	10.7	0.6	2	6.5	5.51
14JUN86	0.85	11.8	0.6	2	8.5	5.057
14JUN86	0.91	12.8	0.6	0.7	10	1.816
14JUN86	0.91	9.8	0.3	1.6	12	4.656
14JUN86	0.86	9.4	0.2	2.8	14	7.904
14JUN86	0.84	9	0.3	0.8	17	2.204
14JUN86	0.87	12.7	0.3	53.3	19	.
14JUN86	0.92	7.5	0.9	0.8	22	2.564
14JUN86	0.92	13.2	0.2	1.7	29	4.438
14JUN86	1	8.2	0.3	25.8	32	.
14JUN86	1.04	8.8	0.9	2.7	37	9.41
14JUN86	0.95	10	1.2	1.5	42	4.5
14JUN86	0.85	13.8	0.7	1.3	47	3.062
14JUN86	0.89	8.8	0.5	1.3	52	3.838
15JUN86	0.89	14.3	2.3	15.3	4.5	41.43
15JUN86	0.89	11.9	2	1.9	6.5	4.978
15JUN86	0.85	10.8	0.7	1.8	8.5	4.709
15JUN86	0.91	11.9	0.5	0.5	10	1.336
15JUN86	0.91	10.6	0.3	1.6	12	4.516
15JUN86	0.86	10.2	0.5	2.6	14	7.09
15JUN86	0.84	9.9	0.2	1.2	17	3.202
15JUN86	0.87	29.5	36.1	89.5	19	.
15JUN86	0.92	7.5	0.9	1.3	22	4.185
15JUN86	0.92	8.2	0.9	2.9	29	9.188

AREA G: JUNE 1986 PSYCHROMETER DATA

15JUN86	1	9.8	0.1	20.8	32	.
15JUN86	1.04	13.8	1.1	2.8	37	8.131
15JUN86	0.95	10.9	1.3	0.8	42	2.308
15JUN86	0.85	9	0.4	1.9	47	5.343
15JUN86	0.89	13.7	0.9	1.7	52	4.212
16JUN86	0.89	17.5	2.6	15.3	4.5	36.89
16JUN86	0.89	15.1	1.2	1.8	6.5	4.273
16JUN86	0.85	11.6	0.6	2	8.5	5.093
16JUN86	0.91	8.5	1.2	0.8	10	2.428
16JUN86	0.91	12.5	0.6	1.2	12	3.154
16JUN86	0.86	10.9	1.2	1.4	14	3.673
16JUN86	0.84	9.9	0.3	1.4	17	3.74
16JUN86	0.87	29.5	36.7	89.5	19	.
16JUN86	0.92	9.2	0.3	1.2	22	3.604
16JUN86	0.92	11.7	0.2	2.3	29	6.342
16JUN86	1	13.7	0.1	25.1	32	.
16JUN86	1.04	13.9	0.9	2.6	37	7.524
16JUN86	0.95	11.1	1.2	0.6	42	1.717
16JUN86	0.85	9.6	0.1	2.2	47	6.062
16JUN86	0.89	12.1	0.1	2	52	5.252
17JUN86	0.89	16.1	1.7	14.9	4.5	37.69
17JUN86	0.89	10.7	1.7	2.4	6.5	6.599
17JUN86	0.85	12.1	0.8	1.6	8.5	3.989
17JUN86	0.91	12.1	0.1	2.9	10	7.837
17JUN86	0.91	12.2	0.5	1.4	12	3.724
17JUN86	0.86	11.5	1.1	0.6	14	1.533
17JUN86	0.84	11.6	1	1.4	17	3.502
17JUN86	0.87	11.7	3.8	42.2	19	.
17JUN86	0.92	12	0.1	1.2	22	3.251
17JUN86	0.92	12.7	0.2	2.7	29	7.213
17JUN86	1	10.5	0.3	28.5	32	.
17JUN86	1.04	12.5	0	3.1	37	9.461
17JUN86	0.95	10.5	0.2	0.3	42	0.879
17JUN86	0.85	14	0.2	1.7	47	3.999
17JUN86	0.89	13.9	0.3	2.4	52	5.952
18JUN86	0.89	17.4	32.8	42.4	4.5	.
18JUN86	0.89	10.7	0.9	2.4	6.5	6.623
18JUN86	0.85	13.5	0.3	2	8.5	4.785
18JUN86	0.91	12.8	0.5	0.5	10	1.296
18JUN86	0.91	11	0.2	1.8	12	5.016
18JUN86	0.86	10.8	0.3	2.7	14	7.209
18JUN86	0.84	11.2	0.3	1.5	17	3.82
18JUN86	0.87	11.4	0.2	28.4	19	.
18JUN86	0.92	12.3	0.7	1	22	2.671
18JUN86	0.92	13.2	1.1	2.4	29	6.268
18JUN86	1	13.4	1.1	24	32	.
18JUN86	1.04	8.6	0.1	3	37	10.61
18JUN86	0.95	9.9	0.2	0.8	42	2.407
18JUN86	0.85	12.9	0.2	2.1	47	5.128
18JUN86	0.89	10.9	0	1.6	52	4.374
19JUN86	0.89	16.2	2.9	8.7	4.5	20.71
19JUN86	0.89	15	1	2	6.5	4.772
19JUN86	0.85	12.5	0.8	2.5	8.5	6.187
19JUN86	0.91	8.3	0.9	3.4	10	10.66
19JUN86	0.91	8.6	0.3	1.6	12	4.887
19JUN86	0.86	10.5	0.4	2.9	14	7.84

AREA G: JUNE 1986 PSYCHROMETER DATA

19JUN86	0.84	11.8	1.2	1.4	17	3.474
19JUN86	0.87	10.8	1.2	2.3	19	6.168
19JUN86	0.92	11.2	0.6	1.4	22	3.897
19JUN86	0.92	13	0.5	2.1	29	5.525
19JUN86	1	13.6	1.3	21.1	32	.
19JUN86	1.04	10.5	1.1	3.2	37	10.45
19JUN86	0.95	12.2	0.4	1.1	42	3.05
19JUN86	0.85	12.5	0.5	1.6	47	3.941
19JUN86	0.89	10	0.4	2.1	52	5.951
20JUN86	0.89	14.9	2	14.1	4.5	36.86
20JUN86	0.89	11.7	1.2	2.1	6.5	5.568
20JUN86	0.85	10	0.8	1.9	8.5	5.125
20JUN86	0.91	11	1.2	0.5	10	1.374
20JUN86	0.91	12.2	0.4	1.5	12	3.995
20JUN86	0.86	11.9	1	0.3	14	0.755
20JUN86	0.84	11.7	1	1.7	17	4.246
20JUN86	0.87	12.4	0.6	2.9	19	7.398
20JUN86	0.92	12.5	0.3	1.5	22	4
20JUN86	0.92	13.4	0.8	2.4	29	6.236
20JUN86	1	13.6	0.4	26.6	32	.
20JUN86	1.04	12	0.1	2.8	37	8.671
20JUN86	0.95	9.8	0.3	0.3	42	0.902
20JUN86	0.85	13.9	0.1	2.1	47	4.969
20JUN86	0.89	12.9	0.2	2	52	5.11
21JUN86	0.89	17.4	1.7	15	4.5	36.36
21JUN86	0.89	12.5	1.3	2.1	6.5	5.414
21JUN86	0.85	9.9	0.1	1.5	8.5	4.062
21JUN86	0.91	8.4	1.2	0.7	10	2.131
21JUN86	0.91	12.5	0.3	1.6	12	4.223
21JUN86	0.86	12.3	1	0.6	14	1.492
21JUN86	0.84	11.9	0.4	1.5	17	3.725
21JUN86	0.87	12.5	0.1	2	19	5.065
21JUN86	0.92	10.2	0	1.2	22	3.47
21JUN86	0.92	9.6	0.3	2.4	29	7.163
21JUN86	1	9.5	0.5	31.6	32	.
21JUN86	1.04	13.2	0	2.8	37	8.331
21JUN86	0.95	10.4	0.3	0.1	42	0.294
21JUN86	0.85	14.1	0.2	2	47	4.698
21JUN86	0.89	10.5	0.4	1.3	52	3.592
22JUN86	0.89	17.6	3.2	16.5	4.5	39.96
22JUN86	0.89	16	1.9	1.6	6.5	3.688
22JUN86	0.85	12.9	0.7	1.8	8.5	4.377
22JUN86	0.91	8.6	1	1.1	10	3.335
22JUN86	0.91	12.3	0.2	1.8	12	4.791
22JUN86	0.86	11.4	0.2	2.5	14	6.523
22JUN86	0.84	9	0.2	1.2	17	3.318
22JUN86	0.87	11.6	0.4	80.5	19	.
22JUN86	0.92	7.2	1.1	0.9	22	2.923
22JUN86	0.92	8.6	1.5	2.1	29	6.478
22JUN86	1	10.9	1.2	40	32	.
22JUN86	1.04	10.1	1.3	3.1	37	10.27
22JUN86	0.95	8.8	1.1	1.4	42	4.404
22JUN86	0.85	13.8	0	2.1	47	4.987
22JUN86	0.89	13.6	0.1	1.3	52	3.235
23JUN86	0.89	17.4	1.8	18.2	4.5	45.52
23JUN86	0.89	11.5	1.9	3	6.5	8.039

AREA G: JUNE 1986 PSYCHROMETER DATA

23JUN86	0.85	11.8	0.9	2	8.5	5.05
23JUN86	0.91	9.8	0.1	2.8	10	8.235
23JUN86	0.91	8.4	0.4	1.5	12	4.614
23JUN86	0.86	7.4	0.6	2.8	14	8.593
23JUN86	0.84	9.3	0.1	1.4	17	3.833
23JUN86	0.87	9.3	0.1	24.9	19	.
23JUN86	0.92	9.8	0.3	0.7	22	2.045
23JUN86	0.92	9.2	0.8	2.1	29	6.339
23JUN86	1	7.8	0.1	19	32	.
23JUN86	1.04	10.9	0.1	3.1	37	10.01
23JUN86	0.95	12.1	0.5	0.7	42	1.941
23JUN86	0.85	13.9	0.1	2.2	47	5.209
23JUN86	0.89	13.3	0.2	2.1	52	5.3
24JUN86	0.89	16.7	1.5	19.4	4.5	50.68
24JUN86	0.89	11.5	1.1	2.1	6.5	5.61
24JUN86	0.85	11.9	0.6	2	8.5	5.039
24JUN86	0.91	9.9	1.2	1.5	10	4.328
24JUN86	0.91	11.2	0.1	1.7	12	4.702
24JUN86	0.86	9.7	0.1	2.5	14	6.959
24JUN86	0.84	8.8	0.1	1.4	17	3.911
24JUN86	0.87	9.2	0.2	2.2	19	6.302
24JUN86	0.92	6.9	0.1	1.2	22	3.978
24JUN86	0.92	10.1	0.8	2.6	29	7.604
24JUN86	1	11.5	0.4	24.2	32	.
24JUN86	1.04	9.8	0.2	2.8	37	9.407
24JUN86	0.95	9.6	0.4	0.3	42	0.909
24JUN86	0.85	13.5	0.1	1.3	47	3.099
24JUN86	0.89	12.5	1	1.8	52	4.638
25JUN86	0.89	17.7	2.8	21	4.5	53.53
25JUN86	0.89	13.6	2.4	2.1	6.5	5.197
25JUN86	0.85	9.6	0.1	2	8.5	5.502
25JUN86	0.91	8.3	0.5	3.4	10	10.68
25JUN86	0.91	8.5	0.1	1.9	12	5.847
25JUN86	0.86	11.5	0.2	2.7	14	7.03
25JUN86	0.84	9.5	0.1	1.2	17	3.254
25JUN86	0.87	7.8	0.4	0.1	19	0.298
25JUN86	0.92	10	0.3	0.8	22	2.321
25JUN86	0.92	7.5	1.6	2.5	29	8.112
25JUN86	1	7.4	0.8	38	32	.
25JUN86	1.04	10.7	0	2.8	37	9.094
25JUN86	0.95	9.8	0.1	1	42	3.027
25JUN86	0.85	12.1	0.4	1.6	47	3.996
25JUN86	0.89	13.4	0.4	1.3	52	3.251
26JUN86	0.89	18.7	1.7	17.6	4.5	41.89
26JUN86	0.89	15.4	1.5	2.4	6.5	5.66
26JUN86	0.85	13.5	0.3	2.1	8.5	5.027
26JUN86	0.91	12.6	0.7	0.3	10	0.781
26JUN86	0.91	11.9	1.1	1.6	12	4.294
26JUN86	0.86	8.9	1.3	0.5	14	1.407
26JUN86	0.84	11.4	0.9	1.3	17	3.274
26JUN86	0.87	12.1	0.2	7.1	19	18.96
26JUN86	0.92	12	0.2	1.3	22	3.522
26JUN86	0.92	11.2	0.4	2.2	29	6.166
26JUN86	1	8.8	0.2	38.6	32	.
26JUN86	1.04	12.1	0.2	3	37	9.267
26JUN86	0.95	8.9	0.4	0.6	42	1.873

AREA G: JUNE 1986 PSYCHROMETER DATA

26JUN86	0.85	8.5	0.4	1.4	47	4.002
26JUN86	0.89	10.2	0.9	1.8	52	5.039
27JUN86	0.89	15.5	2.1	7.1	4.5	17.14
27JUN86	0.89	16	2.1	2.7	6.5	6.254
27JUN86	0.85	14.2	0.8	2.1	8.5	4.908
27JUN86	0.91	12.5	0	0.5	10	1.312
27JUN86	0.91	10.5	0	1.6	12	4.539
27JUN86	0.86	10.1	0.3	2.7	14	7.404
27JUN86	0.84	7.9	0.1	1	17	2.891
27JUN86	0.87	6.9	0.7	3.4	19	10.86
27JUN86	0.92	6.8	0.8	1.2	22	3.984
27JUN86	0.92	7.6	1.4	2.6	29	8.415
27JUN86	1	7.8	0.2	27.4	32	.
27JUN86	1.04	10.3	0.6	3	37	9.882
27JUN86	0.95	8.1	1.2	0.6	42	1.93
27JUN86	0.85	10.2	0.6	1.6	47	4.277
27JUN86	0.89	12.3	0.9	1.9	52	4.934
28JUN86	0.89	16.2	0.9	7.6	4.5	18.14
28JUN86	0.89	12.2	1.1	2.7	6.5	7.068
28JUN86	0.85	13.9	0.3	2.1	8.5	4.965
28JUN86	0.91	13.1	0.5	0.4	10	1.026
28JUN86	0.91	12.4	0.1	1.3	12	3.439
28JUN86	0.86	12	0.6	0.4	14	1.005
28JUN86	0.84	7.5	0.6	1.1	17	3.232
28JUN86	0.87	6.9	1.2	1	19	3.114
28JUN86	0.92	9.2	0.2	0.5	22	1.494
28JUN86	0.92	7.5	1.6	2.4	29	7.781
28JUN86	1	7.8	1	21.4	32	.
28JUN86	1.04	9	1.1	2.9	37	10.03
28JUN86	0.95	9	1.3	1.1	42	3.421
28JUN86	0.85	11.6	0.6	2.1	47	5.351
28JUN86	0.89	13.4	0.1	2	52	5.031
29JUN86	0.89	18.3	1.8	7.8	4.5	17.5
29JUN86	0.89	16.1	1.6	1.8	6.5	4.147
29JUN86	0.85	12.8	0.4	2.2	8.5	5.389
29JUN86	0.91	12.5	0.9	1.5	10	3.945
29JUN86	0.91	10.1	0.2	1.4	12	4.023
29JUN86	0.86	8	0.6	3.4	14	10.22
29JUN86	0.84	6.9	1.3	1.3	17	3.918
29JUN86	0.87	10.9	0.6	2.9	19	7.805
29JUN86	0.92	11.7	0.1	0.3	22	0.816
29JUN86	0.92	12.8	0.7	2.5	29	6.632
29JUN86	1	12.4	0.2	34.5	32	.
29JUN86	1.04	9.4	0.5	2.9	37	9.895
29JUN86	0.95	8.4	1	0.5	42	1.588
29JUN86	0.85	9.4	0.9	1.8	47	4.965
29JUN86	0.89	12.7	0.5	2.2	52	5.658
30JUN86	0.89	17.9	2.1	8	4.5	18.14
30JUN86	0.89	16.2	1.9	2	6.5	4.594
30JUN86	0.85	14.8	0.9	2.3	8.5	5.283
30JUN86	0.91	12	0.1	3.3	10	8.975
30JUN86	0.91	7.7	0.4	1.6	12	5.075
30JUN86	0.86	7.3	0.8	1	14	3.029
30JUN86	0.84	10	0.5	1.1	17	2.918
30JUN86	0.87	6.9	0.3	3.1	19	9.888
30JUN86	0.92	7	1.5	1.3	22	4.268

AREA G: JUNE 1986 PSYCHROMETER DATA

30JUN86	0.92	12.5	1.3	2.4	29	6.409
30JUN86	1	13.1	0.7	29	32	
30JUN86	1.04	13.6	0.4	3.3	37	9.707
30JUN86	0.95	11.8	0.2	0	42	0
30JUN86	0.85	13.2	0.2	2.3	47	5.569
30JUN86	0.89	11.4	0.1	1.6	52	4.294

AREA G: JULY 1986 PSYCHROMETER DATA

DATE	CORRECTION	TEMP (DEG C)	OFFSET (MICROVOLTS)	READING (MICROVOLTS)	DEPTH (FT)	WATER POTENTIAL (-BARS)
01JUL86	0.89	14.5	1.9	8.3	4.5	20.89
01JUL86	0.89	14.4	2.3	2	6.5	4.828
01JUL86	0.85	10.3	0.3	2.4	8.5	6.439
01JUL86	0.91	10.1	0.3	2.7	10	7.834
01JUL86	0.91	10.7	0.2	1.6	12	4.501
01JUL86	0.86	9.8	0.3	2.5	14	6.925
01JUL86	0.84	9.3	0.1	1.6	17	4.388
01JUL86	0.87	10.2	0	2.1	19	5.783
01JUL86	0.92	7.7	0.3	0.9	22	2.87
01JUL86	0.92	8.5	0.7	2.4	29	7.48
01JUL86	1	12	0.1	36.9	32	.
01JUL86	1.04	13.3	0.2	3.2	37	9.507
01JUL86	0.95	11.6	0.1	1.1	42	3.118
01JUL86	0.85	11.4	0.4	1.6	47	4.095
01JUL86	0.89	10.2	0.3	1.6	52	4.484
02JUL86	0;89	18.4	2	7.9	4.5	17.67
02JUL86	0.89	15.9	1.6	2.8	6.5	6.523
02JUL86	0.85	14.8	0.3	1.9	8.5	4.366
02JUL86	0.91	13.2	0.8	1.6	10	4.117
02JUL86	0.91	10.7	0.2	1.1	12	3.083
02JUL86	0.86	7.4	0.6	0.2	14	0.6
02JUL86	0.84	11.7	0.4	1.4	17	3.499
02JUL86	0.87	12.1	0.1	1.9	19	4.874
02JUL86	0.92	11.6	0.4	1.5	22	4.123
02JUL86	0.92	11.7	0.6	2.5	29	6.891
02JUL86	1	12	0	32.6	32	.
02JUL86	1.04	13.4	0.9	2.6	37	7.644
02JUL86	0.95	10.1	1.5	0.9	42	2.674
02JUL86	0.85	9.7	0.9	1.5	47	4.079
02JUL86	0.89	9.4	1.2	1.8	52	5.192
03JUL86	0.89	14.4	0.9	7.9	4.5	19.98
03JUL86	0.89	12.7	1	2.2	6.5	5.646
03JUL86	0.85	12.9	0.5	2.3	8.5	5.616
03JUL86	0.91	12.8	0.4	0.5	10	1.297
03JUL86	0.91	12.6	0.4	2	12	5.273
03JUL86	0.86	12.3	0	2.7	14	6.841
03JUL86	0.84	9.9	0.2	1.5	17	4.012
03JUL86	0.87	10.2	0.1	1.9	19	5.222
03JUL86	0.92	9	0.3	1	22	3.023
03JUL86	0.92	7.5	0.8	2.7	29	8.808
03JUL86	1	10.2	2	34	32	.
03JUL86	1.04	11.9	0	2.8	37	8.706
03JUL86	0.95	9.9	0.3	0.5	42	1.5
03JUL86	0.85	13.7	0	2.2	47	5.244
03JUL86	0.89	12.3	0.2	1.3	52	3.373
04JUL86	0.89	15.8	2.7	8.2	4.5	19.71
04JUL86	0.89	14.2	2	2.2	6.5	5.357
04JUL86	0.85	10.7	0.4	1.2	8.5	3.141
04JUL86	0.91	9.1	0.8	1.3	10	3.872
04JUL86	0.91	12.5	0.1	2	12	5.297
04JUL86	0.86	11.6	0.3	3.5	14	9.13
04JUL86	0.84	11.5	1.2	1.3	17	3.258

AREA G: JULY 1986 PSYCHROMETER DATA

04JUL86	0.87	9.1	1.4	1.1	19	3.119
04JUL86	0.92	10.7	0.1	1.1	22	3.119
04JUL86	0.92	8.3	1.2	2.5	29	7.848
04JUL86	1	8.5	0.1	30.3	32	.
04JUL86	1.04	11.2	0.1	3.1	37	9.902
04JUL86	0.95	11.9	0.2	0.9	42	2.52
04JUL86	0.85	13.2	0.5	1.6	47	3.851
04JUL86	0.89	12.4	0.1	1.9	52	4.935
05JUL86	0.89	17.5	2.7	8.4	4.5	19.24
05JUL86	0.89	15.9	2.1	2.2	6.5	5.096
05JUL86	0.85	14.7	0.5	2.2	8.5	5.075
05JUL86	0.91	12.9	0.1	0.5	10	1.294
05JUL86	0.91	10.2	0.1	1.4	12	4.009
05JUL86	0.86	7.6	0.8	0.4	14	1.19
05JUL86	0.84	11.6	0.2	1.6	17	4.022
05JUL86	0.87	12	0.1	3.1	19	8.049
05JUL86	0.92	7.8	1.4	1.1	22	3.482
05JUL86	0.92	11.2	1.3	2.5	29	6.994
05JUL86	1	13	0.2	26.5	32	.
05JUL86	1;04	12.9	1.1	3.3	37	9.9
05JUL86	0.95	13.1	0.7	0.9	42	2.416
05JUL86	0.85	13.3	0.2	1.5	47	3.602
05JUL86	0.89	13	0.5	2.1	52	5.344
06JUL86	0.89	15.1	2.2	8.3	4.5	20.46
06JUL86	0.89	12.4	1.8	2.3	6.5	5.945
06JUL86	0.85	10.2	0.4	1.9	8.5	5.095
06JUL86	0.91	11.6	0.8	0.5	10	1.348
06JUL86	0.91	11.2	0.8	2.2	12	6.088
06JUL86	0.86	12	0.4	3.4	14	8.733
06JUL86	0.84	11.7	0.3	1.7	17	4.26
06JUL86	0.87	10.9	0	1.8	19	4.817
06JUL86	0.92	10.2	0.1	0.6	22	1.727
06JUL86	0.92	7.9	1	2.1	29	6.689
06JUL86	1	7.5	0.9	47.6	32	.
06JUL86	1.04	11.1	0.4	2.9	37	9.27
06JUL86	0.95	9.9	0.2	0.3	42	0.899
06JUL86	0.85	13.2	0.5	1.4	47	3.366
06JUL86	0.89	8.8	0.5	1.2	52	3.54
07JUL86	0.89	15.1	2	8.8	4.5	21.79
07JUL86	0.89	13.2	2.3	2.1	6.5	5.266
07JUL86	0.85	10.6	0.2	2.4	8.5	6.369
07JUL86	0.91	10.4	0	0.5	10	1.412
07JUL86	0.91	12.7	0	1.9	12	4.998
07JUL86	0.86	12.1	0.2	2.5	14	6.363
07JUL86	0.84	10.5	0.1	1.3	17	3.395
07JUL86	0.87	8.4	0.2	3.5	19	10.49
07JUL86	0.92	7	1	1	22	3.281
07JUL86	0.92	9	2.1	2.4	29	7.281
07JUL86	1	10.4	2.7	25.9	32	.
07JUL86	1.04	8.2	1.2	2.8	37	10.01
07JUL86	0.95	10.2	1.6	0.9	42	2.663
07JUL86	0.85	9.6	0.5	1.5	47	4.103
07JUL86	0.89	8.8	0.9	2.3	52	6.836
08JUL86	0.89	16.9	2.5	8.1	4.5	18.86
08JUL86	0.89	12.6	0.9	3	6.5	7.771
08JUL86-	0.85	14.8	1.1	1.7	8.5	3.888

AREA G: JULY 1986 PSYCHROMETER DATA

08JUL86	0.91	9.6	0.3	0.9	10	2.625
08JUL86	0.91	12.5	0.3	1.9	12	5.025
08JUL86	0.86	9.1	0.2	3.5	14	10.06
08JUL86	0.84	6.8	0.9	1.4	17	4.25
08JUL86	0.87	6.8	1.2	1	19	3.128
08JUL86	0.92	7.5	0.7	0.4	22	1.279
08JUL86	0.92	8	2.1	2.5	29	7.919
08JUL86	1	9.1	1.5	24	32	.
08JUL86	1.04	9.5	1.4	3	37	10.16
08JUL86	0.95	9	1.6	1.3	42	4.044
08JUL86	0.85	12.6	0.3	2.2	47	5.427
08JUL86	0.89	12.8	0.1	2	52	5.13
09JUL86	0.89	16.1	1.3	9.2	4.5	22.22
09JUL86	0.89	14.8	1.1	2.5	6.5	6.015
09JUL86	0.85	14.5	0.1	2.4	8.5	5.587
09JUL86	0.91	13.6	0.1	0.9	10	2.284
09JUL86	0.91	9.7	0.2	1.3	12	3.791
09JUL86	0.86	7.4	0.7	0.7	14	2.107
09JUL86	0.84	11.5	0.3	1.6	17	4.034
09JUL86	0.87	10.4	0.2	2.2	19	6.012
09JUL86	0.92	7.1	1	1.1	22	3.597
09JUL86	0.92	7.4	1.6	2.6	29	8.483
09JUL86	1	7.8	0.6	20.2	32	.
09JUL86	1.04	8	1.4	2.9	37	10.45
09JUL86	0.95	9	1.5	1.1	42	3.418
09JUL86	0.85	11.4	0.6	2.1	47	5.39
09JUL86	0.89	12.9	0.4	2.1	52	5.364
10JUL86	0.89	15.5	2.5	9.4	4.5	23.03
10JUL86	0.89	16.2	1.9	1.8	6.5	4.13
10JUL86	0.85	13.9	0.6	2.3	8.5	5.437
10JUL86	0.91	11.3	0.7	1.5	10	4.116
10JUL86	0.91	12.4	0	1.8	12	4.779
10JUL86	0.86	11.8	0.5	0.3	14	0.759
10JUL86	0.84	11.5	0.6	0.9	17	2.255
10JUL86	0.87	8.6	1.4	1	19	2.892
10JUL86	0.92	10.5	0.1	0.7	22	1.993
10JUL86	0.92	12.4	0.8	2.8	29	7.541
10JUL86	1	12.5	0.1	17.3	32	59.73
10JUL86	1.04	12.7	0.4	3.2	37	9.689
10JUL86	0.95	12	0.5	0.9	42	2.508
10JUL86	0.85	10	0.4	1.7	47	4.587
10JUL86	0.89	8.5	0.4	1.7	52	5.101
11JUL86	0.89	18.8	1	9.5	4.5	21.33
11JUL86	0.89	15	1.5	2.7	6.5	6.453
11JUL86	0.85	15	0.2	2.4	8.5	5.502
11JUL86	0.91	13.6	0.2	0.4	10	1.012
11JUL86	0.91	12.5	0.3	2.3	12	6.099
11JUL86	0.86	11.1	0.2	2.8	14	7.402
11JUL86	0.84	9.1	0.1	1.4	17	3.864
11JUL86	0.87	7.6	0.9	0.5	19	1.505
11JUL86	0.92	11.5	0.2	0.8	22	2.198
11JUL86	0.92	12.5	0.8	2.5	29	6.696
11JUL86	1	9.4	0.2	17.5	32	.
11JUL86	1.04	11.2	0.4	3	37	9.562
11JUL86	0.95	9.8	0.4	0.1	42	0.3
11JUL86	0.85	13.1	0.1	1.4	47	3.383

AREA G: JULY 1986 PSYCHROMETER DATA

11JUL86	0.89	12.8	0.1	1.7	52	4.351
12JUL86	0.89	19.5	1.9	9.2	4.5	20.15
12JUL86	0.89	17	1.6	2	6.5	4.504
12JUL86	0.85	14.3	0.1	2.2	8.5	5.146
12JUL86	0.91	13.3	0.5	0.3	10	0.764
12JUL86	0.91	12.3	0.5	2.1	12	5.594
12JUL86	0.86	12.2	0.1	2.8	14	7.121
12JUL86	0.84	9.1	0.4	1.5	17	4.138
12JUL86	0.87	8.9	0.2	1.8	19	5.202
12JUL86	0.92	10.1	0.1	0.6	22	1.733
12JUL86	0.92	8	1.1	2.6	29	8.279
12JUL86	1	8.6	0.2	14.3	32	57.09
12JUL86	1.04	11.1	0.3	2.6	37	8.296
12JUL86	0.95	8.8	0.2	0.1	42	0.313
12JUL86	0.85	13	0.2	1.8	47	4.372
12JUL86	0.89	13.3	0.3	2.1	52	5.298
13JUL86	0.89	16.8	1.2	9.4	4.5	22.28
13JUL86	0.89	14.4	1.1	2.7	6.5	6.582
13JUL86	0.85	14.7	0.1	2.2	8.5	5.084
13JUL86	0.91	13.6	0.6	0.3	10	0.757
13JUL86	0.91	12.3	0.2	1.6	12	4.253
13JUL86	0.86	11.2	1.1	0.4	14	1.031
13JUL86	0.84	11.5	1	1.7	17	4.276
13JUL86	0.87	12	0.3	2.3	19	5.932
13JUL86	0.92	10.9	0.2	0.5	22	1.401
13JUL86	0.92	12.7	0.6	2.6	29	6.928
13JUL86	1	9.9	0	13.4	32	48.88
13JUL86	1.04	8.1	1.1	2.6	37	9.318
13JUL86	0.95	8.3	1.5	1.1	42	3.518
13JUL86	0.85	12.3	0.1	2.2	47	5.488
13JUL86	0.89	10.8	0.1	1.7	52	4.666
14JUL86	0.89	15.1	1.5	9.7	4.5	24.25
14JUL86	0.89	12.9	1.5	2.2	6.5	5.595
14JUL86	0.85	10.7	0.2	1.5	8.5	3.939
14JUL86	0.91	9.7	0.8	1.1	10	3.194
14JUL86	0.91	12.7	0.3	1.8	12	4.725
14JUL86	0.86	12.1	0.1	2.5	14	6.366
14JUL86	0.84	10.2	0.1	1.4	17	3.701
14JUL86	0.87	9.1	0	2.8	19	8.102
14JUL86	0.92	6.8	0.4	1.1	22	3.655
14JUL86	0.92	12.3	0.3	2.2	29	5.934
14JUL86	1	8.8	0	15.2	32	61.59
14JUL86	1.04	10	0.6	2.8	37	9.317
14JUL86	0.95	8.3	0.9	0.9	42	2.881
14JUL86	0.85	8.3	0.7	1.4	47	4.031
14JUL86	0.89	8.6	1.1	1.8	52	5.367
15JUL86	0.89	16.7	2.8	9.9	4.5	23.43
15JUL86	0.89	17.1	1.9	2	6.5	4.486
15JUL86	0.85	15.6	0	3.1	8.5	7.02
15JUL86	0.91	12.9	0.3	2.9	10	7.619
15JUL86	0.91	9.7	0.3	1.5	12	4.379
15JUL86	0.86	8.1	0.6	3.5	14	10.48
15JUL86	0.84	7.3	0.7	1.2	17	3.558
15JUL86	0.87	6.9	0.7	0	19	0
15JUL86	0.92	12.2	0.6	1.6	22	4.307
15JUL86	0.92	12.8	0.9	2.3	29	6.088

AREA G: JULY 1986 PSYCHROMETER DATA

15JUL86	1	13	0.4	16	32	52.5
15JUL86	1.04	12.4	0	2.7	37	8.245
15JUL86	0.95	9.4	0.7	0.6	42	1.834
15JUL86	0.85	13	0.9	1.5	47	3.625
15JUL86	0.89	9.7	1.2	1.7	52	4.842
16JUL86	0.89	17.1	2.5	10.2	4.5	23.94
16JUL86	0.89	15.8	2	2.1	6.5	4.878
16JUL86	0.85	15.3	0.4	2.6	8.5	5.91
16JUL86	0.91	13.8	0.3	0.6	10	1.509
16JUL86	0.91	10.6	0.1	1.8	12	5.093
16JUL86	0.86	10.3	0.1	2.5	14	6.798
16JUL86	0.84	9.9	0.1	1.6	17	4.285
16JUL86	0.87	11.6	0.1	1.9	19	4.96
16JUL86	0.92	10	0.3	1.1	22	3.199
16JUL86	0.92	8	1.4	2.5	29	7.943
16JUL86	1	7.5	0.7	15.2	32	67.44
16JUL86	1.04	8.9	0.4	3.1	37	10.82
16JUL86	0.95	10.1	0.5	1.3	42	3.891
16JUL86	0.85	10.4	0.2	1.3	47	3.447
16JUL86	0.89	9	0.1	1.7	52	5.004
17JUL86	0.89	17.8	1.2	10.5	4.5	24.36
17JUL86	0.89	14.9	1	2.4	6.5	5.756
17JUL86	0.85	13.8	0.4	2.7	8.5	6.425
17JUL86	0.91	13.3	0.7	0.4	10	1.019
17JUL86	0.91	10.6	1	2.1	12	5.931
17JUL86	0.86	7.6	0.4	3.3	14	10.09
17JUL86	0.84	7.6	0	1.5	17	4.415
17JUL86	0.87	8.1	0.4	3	19	7.055
17JUL86	0.92	6.6	0.6	1.3	22	4.363
17JUL86	0.92	7.6	1	2.1	29	6.777
17JUL86	1	7.1	0.6	15	32	68.22
17JUL86	1.04	9.6	0.3	3	37	10.17
17JUL86	0.95	11.2	0.2	0.9	42	2.582
17JUL86	0.85	9.6	0.2	0.9	47	2.453
17JUL86	0.89	12.8	0.3	2.3	52	5.905

AREA G: OCTOBER 1986 PSYCHROMETER DATA

DATE	CORRECTION	TEMP (DEG C)	OFFSET (MICROVOLTS)	READING (MICROVOLTS)	DEPTH (FT)	WATER POTENTIAL (-BARS)
040CT86	0.89	14.6	0.5	8.9	4.5	22.58
040CT86	0.89	17.4	0.1	2.1	6.5	4.717
040CT86	0.85	17	0.5	1	8.5	2.151
040CT86	0.91	14.4	0.3	0.2	10	0.493
040CT86	0.91	15.6	0.4	2.2	12	5.296
040CT86	0.86	14.5	0.6	0.5	14	1.162
040CT86	0.84	13.5	0.6	1.9	17	4.483
040CT86	0.87	12.7	0.9	0.2	19	0.495
040CT86	0.92	7.1	1.1	1.3	22	4.256
040CT86	0.92	7	2.1	2.4	29	7.941
040CT86	1	8	34.9	80.5	32	.
040CT86	1.04	9.6	3.2	3.1	37	10.39
040CT86	0.95	11.7	1.3	1.7	42	4.796
040CT86	0.85	12.6	0.7	1.2	47	2.935
040CT86	0.89	12.6	0.1	1.8	52	4.641
050CT86	0.89	13.4	1.4	8.9	4.5	23.43
050CT86	0.89	15.6	1.1	3.6	6.5	8.517
050CT86	0.85	14.9	0.9	0.9	8.5	2.045
050CT86	0.91	13.8	0.4	1.1	10	2.774
050CT86	0.91	12.7	0.2	1.6	12	4.197
050CT86	0.86	13.6	0.4	0.8	14	1.915
050CT86	0.84	11.9	0.2	1.4	17	3.478
050CT86	0.87	12.1	0.8	2.5	19	6.42
050CT86	0.92	10.3	0.4	1.3	22	3.742
050CT86	0.92	6.8	1.8	2.1	29	7.001
050CT86	1	6.8	30.8	72.5	32	.
050CT86	1.04	10.5	2.8	3	37	9.711
050CT86	0.95	11.3	0.8	1.2	42	3.429
050CT86	0.85	8.9	1.2	1.5	47	4.206
050CT86	0.89	8.3	0	1.4	52	4.233
060CT86	0.89	13.7	1.8	9.4	4.5	24.54
060CT86	0.89	13.2	0	1.6	6.5	4.042
060CT86	0.85	16.2	0.1	1.2	8.5	2.644
060CT86	0.91	11.1	1.2	0.9	10	2.472
060CT86	0.91	12.9	0.2	1.3	12	3.381
060CT86	0.86	13.4	0.6	0.8	14	1.925
060CT86	0.84	9.8	0.5	2.5	17	6.758
060CT86	0.87	8.4	1.6	1.1	19	3.207
060CT86	0.92	8	1.3	0.9	22	2.821
060CT86	0.92	7.8	2.3	3.7	29	11.95
060CT86	1	9.4	0.5	41.5	32	.
060CT86	1.04	6.8	3.5	3	37	11.32
060CT86	0.95	8.8	1.9	1.4	42	4.389
060CT86	0.85	11.2	0.9	1.2	47	3.078
060CT86	0.89	6.6	0.8	1.7	52	5.536
070CT86	0.89	12.7	1.9	10.3	4.5	28.12
070CT86	0.89	15.9	0	0.8	6.5	1.857
070CT86	0.85	11.9	0.2	0.6	8.5	1.5
070CT86	0.91	14.7	0.9	1.9	10	4.675
070CT86	0.91	13	0.3	1.1	12	2.846
070CT86	0.86	13.4	0.5	0.5	14	1.202
070CT86	0.84	12.4	0.2	0.9	17	2.191

AREA G: OCTOBER 1986 PSYCHROMETER DATA

070CT86	0.87	8.5	1.9	0.5	19	1.443
070CT86	0.92	11.2	0.7	1.8	22	5.023
070CT86	0.92	10.2	1.2	2.7	29	7.858
070CT86	1	10	32.4	66.4	32	.
070CT86	1.04	6.3	3	2.4	37	9.237
070CT86	0.95	8.6	1.9	1.5	42	4.745
070CT86	0.85	11.1	1.3	1.9	47	4.907
070CT86	0.89	9.2	0.1	1	52	2.903
080CT86	0.89	13.7	2.1	10.7	4.5	28.23
080CT86	0.89	15.6	0.2	1.3	6.5	3.048
080CT86	0.85	11.7	0.3	1.2	8.5	3.032
080CT86	0.91	15.1	0	0.9	10	2.186
080CT86	0.91	11.9	0.2	1.6	12	4.312
080CT86	0.86	13.5	0.5	0.5	14	1.198
080CT86	0.84	12.3	0.2	1.3	17	3.183
080CT86	0.87	7	1.7	1	19	3.094
080CT86	0.92	10.5	0.5	1.5	22	4.289
080CT86	0.92	7.5	1.8	2.5	29	8.105
080CT86	1	6.7	31.2	80.3	32	.
080CT86	1.04	6	3.2	2.9	37	11.37
080CT86	0.95	6.2	1.6	1.2	42	4.214
080CT86	0.85	6.4	2	1.4	47	4.359
080CT86	0.89	6.8	0.6	2.1	52	6.807
090CT86	0.89	15	0.6	7.9	4.5	19.63
090CT86	0.89	13.5	1.3	3.2	6.5	8.042
090CT86	0.85	13.3	0.2	0.7	8.5	1.672
090CT86	0.91	11.2	1.1	1.9	10	5.239
090CT86	0.91	12.3	0.2	2.6	12	6.959
090CT86	0.86	12.8	0.3	0.1	14	0.245
090CT86	0.84	7.8	0.9	2.4	17	7.032
090CT86	0.87	12	0.9	2.7	19	6.964
090CT86	0.92	11.5	0.5	1.7	22	4.694
090CT86	0.92	8.9	1.5	2.2	29	6.708
090CT86	1	5.8	1.7	52.6	32	.
090CT86	1.04	6.5	2.7	3.5	37	13.51
090CT86	0.95	8.7	0.9	0.6	42	1.885
090CT86	0.85	11.2	1.8	1.9	47	4.878
090CT86	0.89	11.5	0.2	1.8	52	4.818
100CT86	0.89	13.7	2.1	10.6	4.5	27.94
100CT86	0.89	16.2	0.5	1.9	6.5	4.391
100CT86	0.85	12.9	0.5	0.5	8.5	1.207
100CT86	0.91	15.2	0.4	0.9	10	2.175
100CT86	0.91	11	0.1	1.2	12	3.331
100CT86	0.86	12.5	1.1	1	14	2.475
100CT86	0.84	7.7	0.3	1.3	17	3.798
100CT86	0.87	9.8	1.9	1	19	2.75
100CT86	0.92	11.5	1.5	1.3	22	3.563
100CT86	0.92	6.7	2.1	3.4	29	11.52
100CT86	1	9.4	2.4	53.1	32	.
100CT86	1.04	9.7	3.4	3.1	37	10.33
100CT86	0.95	10.4	1.7	0.8	42	2.346
100CT86	0.85	8.2	2.3	1.6	47	4.602
100CT86	0.89	6.5	0.5	1.7	52	5.568
110CT86	0.89	13.9	1.9	10.6	4.5	27.76
110CT86	0.89	14.3	0.2	0.8	6.5	1.942
110CT86	0.85	14.6	0.9	1.9	8.5	4.38

AREA G: OCTOBER 1986 PSYCHROMETER DATA

11OCT86	0.91	15.3	0.4	0.7	10	1.685
11OCT86	0.91	14.4	0.1	1.9	12	4.735
11OCT86	0.86	9.5	0.4	0.7	14	1.933
11OCT86	0.84	11.5	0.2	1.8	17	4.547
11OCT86	0.87	7.4	0.8	2.3	19	7.101
11OCT86	0.92	9.6	0.8	0.5	22	1.467
11OCT86	0.92	9.2	2.5	2.9	29	8.747
11OCT86	1	5.8	17.7	55.1	32	.
11OCT86	1.04	11.1	2.2	2.3	37	7.26
11OCT86	0.95	11	1.3	1.4	42	4.041
11OCT86	0.85	11.2	1.2	1.3	47	3.332
11OCT86	0.89	11.3	0.4	1.9	52	5.121
12OCT86	0.89	15.7	1.8	10.4	4.5	25.6
12OCT86	0.89	16.2	0.8	2.8	6.5	6.494
12OCT86	0.85	15.2	0.3	0.9	8.5	2.033
12OCT86	0.91	15.2	0.1	0.8	10	1.935
12OCT86	0.91	14.4	0.1	0.9	12	2.229
12OCT86	0.86	9.5	1.1	0.7	14	1.927
12OCT86	0.84	11.7	1.1	3.2	17	8.076
12OCT86	0.87	10.9	0.7	2.7	19	7.253
12OCT86	0.92	11.6	0.8	1.1	22	3.01
12OCT86	0.92	10.9	2.4	2.3	29	6.464
12OCT86	1	9	2.1	56.3	32	.
12OCT86	1.04	6.2	2.5	3.2	37	12.5
12OCT86	0.95	9.6	1	0.6	42	1.817
12OCT86	0.85	11	2	1.6	47	4.125
12OCT86	0.89	11	0.6	1.6	52	4.346
13OCT86	0.89	11.6	1.6	9.2	4.5	25.96
13OCT86	0.89	14.4	1.3	2.9	6.5	7.072
13OCT86	0.85	13.6	0.5	0.7	8.5	1.654
13OCT86	0.91	13.2	0.3	3.4	10	8.875
13OCT86	0.91	10.7	0.2	2.2	12	6.218
13OCT86	0.86	13	0.4	0.3	14	0.73
13OCT86	0.84	7.7	0.8	2.9	17	8.578
13OCT86	0.87	11.8	0.8	2.4	19	6.223
13OCT86	0.92	9.3	0.5	1.5	22	4.494
13OCT86	0.92	6.7	2	2.6	29	8.743
13OCT86	1	5.9	0.9	40.3	32	.
13OCT86	1.04	6.3	3.1	2.5	37	9.627
13OCT86	0.95	7	2	1.5	42	5.084
13OCT86	0.85	10.7	2.4	1.7	47	4.427
13OCT86	0.89	10.2	0.6	1.8	52	5.046
14OCT86	0.89	10.9	1.6	8.5	4.5	24.49
14OCT86	0.89	12.6	1.6	2.5	6.5	6.433
14OCT86	0.85	15.1	0.5	1.3	8.5	2.949
14OCT86	0.91	11.4	0.5	1	10	2.727
14OCT86	0.91	12.1	0.3	0.9	12	2.396
14OCT86	0.86	8.9	0.8	1	14	2.831
14OCT86	0.84	10.1	0.4	0.9	17	2.376
14OCT86	0.87	7	2.5	1	19	3.083
14OCT86	0.92	10.8	1.1	1.2	22	3.377
14OCT86	0.92	5.7	2.3	2.3	29	8.074
14OCT86	1	10.2	1.4	44.4	32	.
14OCT86	1.04	10.5	3	2.4	37	7.725
14OCT86	0.95	5.9	2	1.5	42	5.349
14OCT86	0.85	10.7	1.8	1.6	47	4.175

AREA G: OCTOBER 1986 PSYCHROMETER DATA

140CT86	0.89	10.3	0.4	1.7	52	4.748
150CT86	0.89	11.8	1.4	8.5	4.5	23.65
150CT86	0.89	11.4	0.8	0.8	6.5	2.128
150CT86	0.85	10.8	0.4	0.2	8.5	0.518
150CT86	0.91	12.9	1.6	1.7	10	4.404
150CT86	0.91	13.7	0.6	2.8	12	7.153
150CT86	0.86	13	0.9	1	14	2.437
150CT86	0.84	8.8	0.4	0.9	17	2.501
150CT86	0.87	7.3	2.4	0.7	19	2.125
150CT86	0.92	10.9	1.7	2.5	22	7.059
150CT86	0.92	8.2	1.8	1.9	29	5.943
150CT86	1	5.9	0.9	54.3	32	.
150CT86	1.04	6.6	3.9	3.5	37	13.38
150CT86	0.95	10.4	1.7	1.5	42	4.422
150CT86	0.85	7.5	2	0.6	47	1.766
150CT86	0.89	9.7	0.7	2.6	52	7.476
160CT86	0.89	11	3.1	10.4	4.5	30.25
160CT86	0.89	15.2	1.4	2.8	6.5	6.66
160CT86	0.85	13.9	0.3	3.5	8.5	8.349
160CT86	0.91	11.3	0.5	0.9	10	2.462
160CT86	0.91	13.1	0.5	1.4	12	3.615
160CT86	0.86	8.9	0.4	0.5	14	1.412
160CT86	0.84	11.4	0.1	1.1	17	2.776
160CT86	0.87	8.4	2.4	1.6	19	4.668
160CT86	0.92	9.2	0.9	0.3	22	0.892
160CT86	0.92	6.5	2.6	2.4	29	8.109
160CT86	1	8.2	2.2	77.7	32	.
160CT86	1.04	6	3.4	2.9	37	11.36
160CT86	0.95	9	2.3	2.5	42	7.831
160CT86	0.85	9.4	2	1.1	47	3.003
160CT86	0.89	5.9	0.1	1.8	52	6.08
170CT86	0.89	13.9	2.9	9.9	4.5	25.64
170CT86	0.89	13.4	0.6	0.6	6.5	1.493
170CT86	0.85	13.1	0.8	2	8.5	4.836
170CT86	0.91	13.3	0.2	0.6	10	1.534
170CT86	0.91	13.9	0.2	1.9	12	4.805
170CT86	0.86	9.5	0.3	0.6	14	1.657
170CT86	0.84	11.3	0	1.1	17	2.787
170CT86	0.87	9.2	2.4	1.4	19	3.946
170CT86	0.92	10	0.4	1.4	22	4.079
170CT86	0.92	9.2	1.5	2.5	29	7.548
170CT86	1	10.9	1.4	79	32	.
170CT86	1.04	10.3	2.6	3	37	9.794
170CT86	0.95	10	1	1.4	42	4.201
170CT86	0.85	8.9	1.5	1.2	47	3.353
170CT86	0.89	10.9	0.3	1.8	52	4.921
180CT86	0.89	9.7	3.2	10.8	4.5	33.43
180CT86	0.89	15	0.6	0.4	6.5	0.947
180CT86	0.85	14	0.2	1.5	8.5	3.524
180CT86	0.91	11.4	1	1.5	10	4.096
180CT86	0.91	12.9	0.2	1	12	2.596
180CT86	0.86	13.1	0.2	0.4	14	0.971
180CT86	0.84	8.3	0.1	1.2	17	3.417
180CT86	0.87	10.6	1.9	0.6	19	1.596
180CT86	0.92	11.1	0.7	1.6	22	4.475
180CT86	0.92	9.5	1.5	2.5	29	7.457

AREA G: OCTOBER 1986 PSYCHROMETER DATA

180CT86	1	6.9	1.3	9.9	32	39.44
180CT86	1.04	5.6	3.6	3	37	11.99
180CT86	0.95	7	2.1	1.5	42	5.082
180CT86	0.85	10.4	1.8	1.2	47	3.157
180CT86	0.89	10.7	0.1	2.1	52	5.803
190CT86	0.89	13.4	2.3	9.6	4.5	25.32
190CT86	0.89	10.7	1.5	2.5	6.5	6.886
190CT86	0.85	14.4	0.4	0.3	8.5	0.691
190CT86	0.91	10.4	0.7	0.8	10	2.258
190CT86	0.91	13.9	0.5	2.7	12	6.853
190CT86	0.86	10.5	0.5	0.9	14	2.395
190CT86	0.84	10.2	0.1	1.1	17	2.901
190CT86	0.87	10.8	1.8	0.4	19	1.055
190CT86	0.92	11.3	0.7	1.6	22	4.442
190CT86	0.92	9.5	1.8	2.1	29	6.235
190CT86	1	9.8	2.2	78.8	32	.
190CT86	1.04	10.7	2.7	3.3	37	10.63
190CT86	0.95	10	0.9	1.2	42	3.597
190CT86	0.85	8.3	1.4	1.7	47	4.892
190CT86	0.89	8.9	0.2	1.8	52	5.322
200CT86	0.89	9.3	2.4	9.2	4.5	28.52
200CT86	0.89	12.3	1.9	3.2	6.5	8.348
200CT86	0.85	12.9	0.4	0.8	8.5	1.935
200CT86	0.91	12.1	0.5	0.1	10	0.265
200CT86	0.91	14.1	0.1	1.1	12	2.753
200CT86	0.86	9.5	1.4	1.5	14	4.151
200CT86	0.84	11.4	0.1	1.2	17	3.031
200CT86	0.87	11.5	1.5	0.6	19	1.548
200CT86	0.92	11.2	0.5	1.7	22	4.745
200CT86	0.92	9.1	1.5	2.6	29	7.889
200CT86	1	10.7	1.3	43.3	32	.
200CT86	1.04	10.8	3	3.1	37	9.919
200CT86	0.95	10.9	1.3	1.3	42	3.763
200CT86	0.85	10.7	1.4	1.6	47	4.182
200CT86	0.89	10.7	0.2	1.6	52	4.402
210CT86	0.89	13.1	2.7	11.2	4.5	30.27
210CT86	0.89	13.2	0.8	0.5	6.5	1.25
210CT86	0.85	10.8	0.7	0.8	8.5	2.078
210CT86	0.91	13.5	1.3	2	10	5.099
210CT86	0.91	11.9	0.3	0.8	12	2.143
210CT86	0.86	9.5	1.1	0.8	14	2.205
210CT86	0.84	12.1	0.8	3.1	17	7.719
210CT86	0.87	9.8	1	2.9	19	8.128
210CT86	0.92	11	1.6	1.4	22	3.908
210CT86	0.92	9.1	2.7	2.8	29	8.466
210CT86	1	8.3	1.9	81.9	32	.
210CT86	1.04	9.6	3.5	3	37	10.03
210CT86	0.95	9.8	2	1.2	42	3.607
210CT86	0.85	8.9	2.5	1.7	47	4.748
210CT86	0.89	8.8	0.8	2.4	52	7.143
220CT86	0.89	10.4	3	12	4.5	36.61
220CT86	0.89	12.3	1.4	1.7	6.5	4.399
220CT86	0.85	15.1	0.1	1	8.5	2.269
220CT86	0.91	13.2	0.2	0.7	10	1.796
220CT86	0.91	11.7	0.2	1	12	2.702
220CT86	0.86	12.9	1.1	0.9	14	2.197

AREA G: OCTOBER 1986 PSYCHROMETER DATA

220CT86	0.84	8.1	0.6	2.5	17	7.246
220CT86	0.87	12.1	0.4	2	19	5.127
220CT86	0.92	8.7	0.4	1.4	22	4.296
220CT86	0.92	6.4	2	2.2	29	7.472
220CT86	1	6.4	5.2	50.4	32	
220CT86	1.04	9.7	2.9	3	37	10.01
220CT86	0.95	11	0.9	1.1	42	3.174
220CT86	0.85	7.1	1.7	1.7	47	5.148
220CT86	0.89	7.1	0.5	1.2	52	3.807
230CT86	0.89	13.1	2.5	11.4	4.5	30.9
230CT86	0.89	12	1	0.6	6.5	1.56
230CT86	0.85	13.5	1	1.8	8.5	4.287
230CT86	0.91	13	0.1	0.7	10	1.808
230CT86	0.91	12.6	0.3	0.7	12	1.83
230CT86	0.86	10.6	1.4	1.6	14	4.247
230CT86	0.84	9.7	0.1	1.4	17	3.773
230CT86	0.87	6.9	1.3	2.9	19	9.191
230CT86	0.92	9.3	0.7	1.1	22	3.282
230CT86	0.92	11	2.2	2.4	29	6.731
230CT86	1	9.4	29.3	72	32	
230CT86	1.04	6.7	3.8	3.1	37	11.75
230CT86	0.95	6.2	1.8	1.3	42	4.566
230CT86	0.85	6.2	2.2	1.3	47	4.079
230CT86	0.89	7.6	0.8	2.2	52	6.88
240CT86	0.89	9.3	3	12	4.5	38.58
240CT86	0.89	13.9	1.1	0.7	6.5	1.712
240CT86	0.85	10.7	1.1	2.1	8.5	5.517
240CT86	0.91	12.3	0.6	3.5	10	9.412
240CT86	0.91	9.7	0.1	1.7	12	4.975
240CT86	0.86	13.3	0.3	0.6	14	1.449
240CT86	0.84	11.1	0.2	1.1	17	2.805
240CT86	0.87	11.7	1.5	0.6	19	1.537
240CT86	0.92	8.6	0.7	1.5	22	4.62
240CT86	0.92	6.7	1.6	2.5	29	8.412
240CT86	1	6.5	1.6	96.6	32	
240CT86	1.04	6	3.8	3.1	37	12.15
240CT86	0.95	9.9	2.2	1.3	42	3.892
240CT86	0.85	10	1.8	1.9	47	5.103
240CT86	0.89	9.8	0.4	1.6	52	4.552
250CT86	0.89	11	2.2	10.1	4.5	29.41
250CT86	0.89	11.2	2.2	3	6.5	8.116
250CT86	0.85	13.2	0.3	0.6	8.5	1.436
250CT86	0.91	13.4	0.3	0.2	10	0.508
250CT86	0.91	13.6	0.2	0.6	12	1.519
250CT86	0.86	10.9	1.2	1.4	14	3.673
250CT86	0.84	8.3	0.3	1.4	17	3.99
250CT86	0.87	10.9	2	0.5	19	1.314
250CT86	0.92	11.3	0.7	1.9	22	5.287
250CT86	0.92	8.4	1.9	2.9	29	9.069
250CT86	1	8.5	28.8	9.6	32	30.96
250CT86	1.04	9.7	2.4	3.1	37	10.38
250CT86	0.95	9.4	0.9	1.1	42	3.373
250CT86	0.85	8.8	1.5	1.4	47	3.934
250CT86	0.89	10.7	0.1	1.9	52	5.242
260CT86	0.89	12.4	1.7	10.4	4.5	28.78
260CT86	0.89	9.9	1.8	1.6	6.5	4.506

AREA G: OCTOBER 1986 PSYCHROMETER DATA

26OCT86	0.85	14.3	0.4	0.6	8.5	1.388
26OCT86	0.91	14.2	1.3	1.7	10	4.233
26OCT86	0.91	13.3	0	1.1	12	2.823
26OCT86	0.86	8.9	1.1	1.2	14	3.398
26OCT86	0.84	11.6	0	0.9	17	2.253
26OCT86	0.87	8.9	2.3	0.9	19	2.559
26OCT86	0.92	11.4	0.4	1.5	22	4.152
26OCT86	0.92	8.6	1.3	2.4	29	7.429
26OCT86	1	10.5	1.2	97.7	32	.
26OCT86	1.04	7.1	2.8	3.4	37	12.74
26OCT86	0.95	8.7	0.9	1.2	42	3.788
26OCT86	0.85	8.4	1.4	1.6	47	4.581
26OCT86	0.89	10.8	0	2	52	5.504
27OCT86	0.89	9.5	1.8	15.7	4.5	54.35
27OCT86	0.89	9.9	1	1.6	6.5	4.522
27OCT86	0.85	14.4	0.3	0.2	8.5	0.46
27OCT86	0.91	14.2	1.4	0.9	10	2.229
27OCT86	0.91	9.7	0	1.1	12	3.205
27OCT86	0.86	12.4	1.4	1.5	14	3.733
27OCT86	0.84	9.5	0.1	1	17	2.708
27OCT86	0.87	8.6	2	1.3	19	3.758
27OCT86	0.92	10.4	0.8	1.1	22	3.144
27OCT86	0.92	11	1.8	2.3	29	6.457
27OCT86	1	10.7	28.5	36.5	32	.
27OCT86	1.04	7.2	3.8	2.9	37	10.72
27OCT86	0.95	5.9	1.9	1.4	42	4.99
27OCT86	0.85	6.2	2.5	2	47	6.309
27OCT86	0.89	6	0.4	1.4	52	4.682
28OCT86	0.89	8	3.3	66.5	4.5	.
28OCT86	0.89	9.6	1.8	1.3	6.5	3.696
28OCT86	0.85	13.8	0.9	1.4	8.5	3.297
28OCT86	0.91	11	1	1	10	2.761
28OCT86	0.91	13.1	0	1.1	12	2.841
28OCT86	0.86	8.7	1.1	1.1	14	3.138
28OCT86	0.84	12.2	0.1	1.6	17	3.941
28OCT86	0.87	7	1.8	0.1	19	0.307
28OCT86	0.92	11.2	1.7	2.5	22	6.981
28OCT86	0.92	7.4	1.8	2.4	29	7.809
28OCT86	1	6	28.8	89.5	32	.
28OCT86	1.04	9.7	3.7	4.3	37	14.46
28OCT86	0.95	9.7	1.6	1.5	42	4.545
28OCT86	0.85	10.6	1.8	1.7	47	4.456
28OCT86	0.89	11	0.2	1.8	52	4.906
29OCT86	0.89	9.4	25.9	89.5	4.5	.
29OCT86	0.89	11.9	2.3	2.9	6.5	7.641
29OCT86	0.85	12.7	0.3	0.6	8.5	1.46
29OCT86	0.91	11.6	0.6	3.4	10	9.365
29OCT86	0.91	10	0.5	1.8	12	5.201
29OCT86	0.86	13	0.4	0.4	14	0.973
29OCT86	0.84	8	0.7	2.5	17	7.274
29OCT86	0.87	11.8	0.9	2.3	19	5.957
29OCT86	0.92	8.5	0.8	1.7	22	5.264
29OCT86	0.92	7.9	1.6	2.5	29	7.971
29OCT86	1	6.7	28.5	89.5	32	.
29OCT86	1.04	9.4	3.7	2.9	37	9.756
29OCT86	0.95	6.8	2.2	1.3	42	4.434

AREA G: OCTOBER 1986 PSYCHROMETER DATA

29OCT86	0.85	10.1	1.8	1.8	47	4.812
29OCT86	0.89	10.5	0.3	1.2	52	3.315
30OCT86	0.89	8.9	26.4	89.5	4.5	.
30OCT86	0.89	10.3	2.4	2.6	6.5	7.247
30OCT86	0.85	14.1	0.1	0.6	8.5	1.398
30OCT86	0.91	14.1	0.7	0.8	10	1.993
30OCT86	0.91	13.5	0	1.1	12	2.805
30OCT86	0.86	8.8	1.1	0.6	14	1.698
30OCT86	0.84	12.2	0.1	1.6	17	3.941
30OCT86	0.87	7	2	0.8	19	2.467
30OCT86	0.92	11.1	0.8	1.5	22	4.19
30OCT86	0.92	10.3	1.6	2.7	29	7.814
30OCT86	1	10.3	28.9	93	32	.
30OCT86	1.04	9.7	2.5	3	37	10.03
30OCT86	0.95	6.4	1.6	1.1	42	3.824
30OCT86	0.85	6	2.1	1.5	47	4.762
30OCT86	0.89	6.1	0	1.4	52	4.668
31OCT86	0.89	11.7	26.7	89.5	4.5	.
31OCT86	0.89	11.8	2.2	2.5	6.5	6.595
31OCT86	0.85	10.3	0.4	0.3	8.5	0.792
31OCT86	0.91	14.1	0.6	0.7	10	1.744
31OCT86	0.91	12.7	0.2	0.6	12	1.564
31OCT86	0.86	10.2	1.5	1.6	14	4.31
31OCT86	0.84	12.2	0.1	0.8	17	1.96
31OCT86	0.87	7.7	2.2	1.5	19	4.51
31OCT86	0.92	8.4	0.8	1.6	22	4.971
31OCT86	0.92	7.2	1.6	2.8	29	9.236
31OCT86	1	9.2	29.3	68.5	32	.
31OCT86	1.04	9.6	2.4	3	37	10.08
31OCT86	0.95	8.3	1	1.3	42	4.174
31OCT86	0.85	8.2	1.6	1.8	47	5.202
31OCT86	0.89	9.3	0.3	1.4	52	4.058

AREA G: NOVEMBER 1986 PSYCHROMETER DATA

DATE	CORRECTION	TEMP (DEG C)	OFFSET (MICROVOLTS)	READING (MICROVOLTS)	DEPTH (FT)	WATER POTENTIAL (-BARS)
01NOV86	0.89	9.3	26.5	89.5	4.5	.
01NOV86	0.89	9.3	2	2.6	6.5	7.553
01NOV86	0.85	12.2	0.1	0.3	8.5	0.741
01NOV86	0.91	9.8	0.7	3.4	10	10.02
01NOV86	0.91	9.9	0.3	1.8	12	5.226
01NOV86	0.86	13	0.5	0	14	0
01NOV86	0.84	12.2	0.1	1.2	17	2.948
01NOV86	0.87	8	2.3	1.5	19	4.45
01NOV86	0.92	10.2	0.5	1.5	22	4.338
01NOV86	0.92	9.1	1.5	2.6	29	7.889
01NOV86	1	10.4	0.6	42.4	32	.
01NOV86	1.04	10.4	2.7	3.3	37	10.75
01NOV86	0.95	10.2	0.9	1.1	42	3.269
01NOV86	0.85	10.7	1.6	1.5	47	3.914
01NOV86	0.89	10.2	0.3	1.7	52	4.768
02NOV86	0.89	10	27.1	89.5	4.5	.
02NOV86	0.89	12.8	1.7	1	6.5	2.53
02NOV86	0.85	10.5	1.2	0.8	8.5	2.096
02NOV86	0.91	9.4	1.6	1.1	10	3.221
02NOV86	0.91	13.7	0.4	2.1	12	5.346
02NOV86	0.86	8.6	1.2	1.5	14	4.309
02NOV86	0.84	10.7	0.1	1.4	17	3.632
02NOV86	0.87	11.9	0.9	3.3	19	8.579
02NOV86	0.92	11.2	1.4	1.7	22	4.726
02NOV86	0.92	10.3	1.9	2.4	29	6.92
02NOV86	1	10.2	1.4	75	32	.
02NOV86	1.04	9.3	2.4	2.5	37	8.465
02NOV86	0.95	10.8	1.5	1.2	42	3.481
02NOV86	0.85	10.4	2.3	1.5	47	3.946
02NOV86	0.89	8.5	0.9	1.7	52	5.09
03NOV86	0.89	8.7	26.2	89.5	4.5	.
03NOV86	0.89	11.2	1.3	0.4	6.5	1.066
03NOV86	0.85	11.1	1.3	1.7	8.5	4.384
03NOV86	0.91	12.4	0.4	3.2	10	8.565
03NOV86	0.91	10.4	0.1	0.6	12	1.695
03NOV86	0.86	9.2	1.2	0.7	14	1.95
03NOV86	0.84	11.7	0.8	3.1	17	7.829
03NOV86	0.87	8.8	0.9	2.3	19	6.682
03NOV86	0.92	7.9	0.7	1.7	22	5.402
03NOV86	0.92	8.5	1.4	2.6	29	8.093
03NOV86	1	10.1	0.8	2.1	32	6.649
03NOV86	1.04	8.9	2.4	2.9	37	10.02
03NOV86	0.95	10.4	1	1.4	42	4.137
03NOV86	0.85	9.1	1.4	1.7	47	4.732
03NOV86	0.89	9.2	0.4	1.4	52	4.072
04NOV86	0.89	10.7	24.6	89.5	4.5	.
04NOV86	0.89	8.9	1.5	0.3	6.5	0.871
04NOV86	0.85	10.7	1.2	1.7	8.5	4.451
04NOV86	0.91	13.5	0.9	0.4	10	1.012
04NOV86	0.91	9.1	0.6	1.7	12	5.084
04NOV86	0.86	12.5	1.4	1.4	14	3.47

AREA G: NOVEMBER 1986 PSYCHROMETER DATA

04NOV86	0.84	9.7	0.2	1.3	17	3.499
04NOV86	0.87	6.7	1.9	0.9	19	2.817
04NOV86	0.92	8.9	0.9	0.8	22	2.418
04NOV86	0.92	5.5	2.7	3.5	29	12.55
04NOV86	1	10.6	1.7	34.7	32	.
04NOV86	1.04	7.7	2.9	1.8	37	6.467
04NOV86	0.95	6.8	2	2	42	6.872
04NOV86	0.85	10.4	2	1.7	47	4.485
04NOV86	0.89	8.8	0.2	1.6	52	4.742
05NOV86	0.89	10.6	25.8	89.5	4.5	.
05NOV86	0.89	11.2	2.4	2.7	6.5	7.282
05NOV86	0.85	11.8	0.1	0.1	8.5	0.25
05NOV86	0.91	9.4	1	0.6	10	1.755
05NOV86	0.91	13.6	0.3	1.1	12	2.793
05NOV86	0.86	8.6	1.4	1	14	2.858
05NOV86	0.84	12.3	0.2	1.8	17	4.423
05NOV86	0.87	6.8	1.7	3.3	19	10.53
05NOV86	0.92	6.9	0.7	1.8	22	5.985
05NOV86	0.92	9	1.5	2.8	29	8.546
05NOV86	1	9.9	0.4	30.2	32	.
05NOV86	1.04	10.5	2.9	2.2	37	7.074
05NOV86	0.95	5.8	1.8	1.6	42	5.744
05NOV86	0.85	6.4	2.1	1.6	47	4.99
05NOV86	0.89	6.1	0.4	1.6	52	5.336
06NOV86	0.89	7.9	24.1	89.5	4.5	.
06NOV86	0.89	10.2	2.5	2.1	6.5	5.851
06NOV86	0.85	13.3	1.2	1.3	8.5	3.103
06NOV86	0.91	13.6	1.6	1.1	10	2.776
06NOV86	0.91	9.8	0.1	0.7	12	2.025
06NOV86	0.86	8.6	0.9	0.1	14	0.284
06NOV86	0.84	11.3	0.7	2.1	17	5.343
06NOV86	0.87	8	4.2	1.8	19	5.31
06NOV86	0.92	6.5	1	0.7	22	2.343
06NOV86	0.92	8.8	2.9	3	29	9.192
06NOV86	1	10	1.7	27.4	32	.
06NOV86	1.04	8.6	4	3.4	37	11.86
06NOV86	0.95	10.3	1.7	1.2	42	3.543
06NOV86	0.85	6.3	2.9	1.9	47	5.95
06NOV86	0.89	10.7	0	1.9	52	5.244
07NOV86	0.89	10.3	24.5	89.5	4.5	.
07NOV86	0.89	11.2	1.8	1.7	6.5	4.563
07NOV86	0.85	9.3	0.1	0.5	8.5	1.375
07NOV86	0.91	13.5	0.6	0.1	10	0.253
07NOV86	0.91	13.4	0.1	1.3	12	3.328
07NOV86	0.86	8.4	1.3	0.9	14	2.593
07NOV86	0.84	12.2	0.4	1.6	17	3.936
07NOV86	0.87	7.2	0.7	3.5	19	11.04
07NOV86	0.92	6.9	1.2	1.9	22	6.309
07NOV86	0.92	10.6	2.4	3.5	29	10.04
07NOV86	1	6.6	0.4	30.6	32	.
07NOV86	1.04	9.2	3.4	3.4	37	11.6
07NOV86	0.95	6.5	1.3	0.4	42	1.377
07NOV86	0.85	10	2.1	1.1	47	2.932
07NOV86	0.89	6	0.5	2.6	52	8.797
08NOV86	0.89	6.9	24.8	89.5	4.5	.
08NOV86	0.89	11.6	2.4	2.7	6.5	7.177

AREA G: NOVEMBER 1986 PSYCHROMETER DATA

08NOV86	0.85	11.4	0.4	0.2	8.5	0.507
08NOV86	0.91	10.5	0.6	0.4	10	1.122
08NOV86	0.91	11.2	0.3	1.1	12	3.026
08NOV86	0.86	12.7	1.2	1.4	14	3.45
08NOV86	0.84	8.7	0	2.6	17	7.372
08NOV86	0.87	10.3	0.9	3.5	19	9.671
08NOV86	0.92	10.1	1.4	2	22	5.806
08NOV86	0.92	5.6	2.3	3.7	29	13.25
08NOV86	1	9.3	27.2	52.9	32	.
08NOV86	1.04	6	3.1	3.1	37	12.19
08NOV86	0.95	10.5	1.5	0.7	42	2.046
08NOV86	0.85	6	2.9	2.1	47	6.683
08NOV86	0.89	10.6	0.4	2	52	5.535
09NOV86	0.89	8.5	23.2	89.5	4.5	.
09NOV86	0.89	9	2.2	2	6.5	5.847
09NOV86	0.85	12.5	0.3	0	8.5	0
09NOV86	0.91	9.2	1.4	0.6	10	1.765
09NOV86	0.91	13	0.2	0.6	12	1.548
09NOV86	0.86	10.9	1.2	0.1	14	0.26
09NOV86	0.84	9.3	0.4	2.8	17	7.745
09NOV86	0.87	7.7	1.8	0.7	19	2.094
09NOV86	0.92	9.7	0.7	1	22	2.935
09NOV86	0.92	10.6	1.6	1.5	29	4.253
09NOV86	1	8	1.4	24.6	32	.
09NOV86	1.04	8.5	3	1.9	37	6.599
09NOV86	0.95	6.8	2.4	2.3	42	7.912
09NOV86	0.85	10.5	2.4	1	47	2.61
09NOV86	0.89	6.9	0.7	2.5	52	8.095
10NOV86	0.89	7	23.2	89.5	4.5	.
10NOV86	0.89	11	2.1	1.3	6.5	3.5
10NOV86	0.85	8.4	0.4	0	8.5	0
10NOV86	0.91	13	0.7	0.2	10	0.514
10NOV86	0.91	12.5	0.1	0.9	12	2.366
10NOV86	0.86	8.3	1.6	0.9	14	2.6
10NOV86	0.84	11.8	0.3	2.7	17	6.79
10NOV86	0.87	8.4	1	0	19	0
10NOV86	0.92	8.3	0.9	0.5	22	1.545
10NOV86	0.92	5.9	2.7	2.3	29	7.983
10NOV86	1	8.6	1.8	22.2	32	.
10NOV86	1.04	10.3	3	1.9	37	6.139
10NOV86	0.95	6.1	2.5	2.2	42	7.809
10NOV86	0.85	10.4	2.4	1	47	2.62
10NOV86	0.89	6.4	0.6	2.2	52	7.272
11NOV86	0.89	6.2	23.1	89.5	4.5	.
11NOV86	0.89	11.5	1.7	0.9	6.5	2.378
11NOV86	0.85	8.5	0	0.4	8.5	1.136
11NOV86	0.91	11	0.8	0.2	10	0.55
11NOV86	0.91	12.6	0.4	2.2	12	5.808
11NOV86	0.86	11.1	0.8	3.4	14	9.006
11NOV86	0.84	8.1	0.2	1	17	2.866
11NOV86	0.87	10.4	2	3.5	19	9.586
11NOV86	0.92	6.4	1.3	0.9	22	3.028
11NOV86	0.92	8.3	3.2	4.1	29	12.95
11NOV86	1	9	0.4	20.3	32	.
11NOV86	1.04	5.7	3.3	2.2	37	8.685
11NOV86	0.95	9.5	2.4	2.6	42	7.983

AREA G: NOVEMBER 1986 PSYCHROMETER DATA

11NOV86	0.85	9	2.1	1.6	47	4.455
11NOV86	0.89	9.5	0.3	1.6	52	4.608
12NOV86	0.89	5.8	23.3	89.5	4.5	.
12NOV86	0.89	9.5	1.7	0.3	6.5	0.85
12NOV86	0.85	11.3	0.7	0.5	8.5	1.273
12NOV86	0.91	9.2	1.1	3.3	10	9.941
12NOV86	0.91	8.9	0.7	1.8	12	5.429
12NOV86	0.86	12.2	1.3	1	14	2.498
12NOV86	0.84	7.6	0.2	1.2	17	3.52
12NOV86	0.87	10.1	2.3	0.8	19	2.168
12NOV86	0.92	8.1	0.9	0.5	22	1.558
12NOV86	0.92	5.7	2.6	2.3	29	8.064
12NOV86	1	8.6	1.9	22.8	32	.
12NOV86	1.04	9.3	3.1	2	37	6.723
12NOV86	0.95	6	2.5	2.5	42	8.943
12NOV86	0.85	9.6	2.2	1.7	47	4.622
12NOV86	0.89	9.7	0.3	1.7	52	4.861
13NOV86	0.89	8.3	23.3	89.5	4.5	.
13NOV86	0.89	8.5	2.9	2.6	6.5	7.778
13NOV86	0.85	8.6	0.7	0.6	8.5	1.695
13NOV86	0.91	12.4	0.6	0.1	10	0.262
13NOV86	0.91	8.7	1	2.7	12	8.265
13NOV86	0.86	9	1.3	0.6	14	1.683
13NOV86	0.84	11.8	0.3	1	17	2.485
13NOV86	0.87	10.9	1.6	0.1	19	0.263
13NOV86	0.92	10.8	0.8	1.2	22	3.381
13NOV86	0.92	5.5	3	2.6	29	9.219
13NOV86	1	9.9	0.3	21.2	32	.
13NOV86	1.04	9.3	3.8	3.8	37	12.93
13NOV86	0.95	6.8	2.4	1.8	42	6.163
13NOV86	0.85	6.8	2.7	1	47	3.037
13NOV86	0.89	10.4	0.1	1.6	52	4.454
14NOV86	0.89	6.8	23.4	89.5	4.5	.
14NOV86	0.89	9.4	3.2	2.3	6.5	6.603
14NOV86	0.85	12.3	1	1.1	8.5	2.712
14NOV86	0.91	10.2	1.2	3.2	10	9.25
14NOV86	0.91	9.2	0.2	0.9	12	2.668
14NOV86	0.86	10.2	1.8	1.7	14	4.577
14NOV86	0.84	9.6	0.4	1	17	2.693
14NOV86	0.87	10.8	1.8	3.1	19	8.343
14NOV86	0.92	7.6	1	0.4	22	1.272
14NOV86	0.92	7.8	2.9	2.8	29	8.94
14NOV86	1	7.9	1.4	21.9	32	.
14NOV86	1.04	5.5	3.4	2.1	37	8.359
14NOV86	0.95	7.4	2.2	1.3	42	4.317
14NOV86	0.85	8.9	3.2	2.7	47	7.582
14NOV86	0.89	9.8	0.1	1.8	52	5.136
15NOV86	0.89	8.6	22.9	89.5	4.5	.
15NOV86	0.89	7.3	2.7	1.3	6.5	4.053
15NOV86	0.85	11.8	1	1.3	8.5	3.265
15NOV86	0.91	10.2	0.9	3.5	10	10.16
15NOV86	0.91	8.4	0.5	1.1	12	3.371
15NOV86	0.86	11	1.6	1.5	14	3.917
15NOV86	0.84	8	0.2	1.4	17	4.043
15NOV86	0.87	10.2	2	0.3	19	0.808
15NOV86	0.92	10.7	1.3	0.9	22	2.534

AREA G: NOVEMBER 1986 PSYCHROMETER DATA

15NOV86	0.92	5.7	2.8	2.9	29	10.22
15NOV86	1	9.8	1.8	24.3	32	.
15NOV86	1.04	7.9	3.1	2.1	37	7.493
15NOV86	0.95	9.9	1.9	1.4	42	4.2
15NOV86	0.85	5.9	2.8	1.6	47	5.093
15NOV86	0.89	10.2	0.3	1.9	52	5.337
16NOV86	0.89	4.8	23.3	89.5	4.5	.
16NOV86	0.89	10.7	1.9	1.1	6.5	2.993
16NOV86	0.85	12.1	0.1	0.3	8.5	0.744
16NOV86	0.91	10.6	0.8	0.4	10	1.117
16NOV86	0.91	10.2	0.2	0.5	12	1.422
16NOV86	0.86	9.5	1.8	1.7	14	4.703
16NOV86	0.84	10.5	0.3	2	17	5.246
16NOV86	0.87	8	1.3	3.5	19	10.62
16NOV86	0.92	10.3	1	0.4	22	1.141
16NOV86	0.92	6	3.2	3.7	29	12.94
16NOV86	1	10.3	0.5	22.2	32	.
16NOV86	1.04	5.4	4.2	3.7	37	15.01
16NOV86	0.95	10.2	2	2.2	42	6.562
16NOV86	0.85	9.3	2.4	1.6	47	4.395
16NOV86	0.89	10.3	0.1	1.7	52	4.754
17NOV86	0.89	4.7	23.8	89.5	4.5	.
17NOV86	0.89	7.9	2.2	0.9	6.5	2.73
17NOV86	0.85	11.8	0.8	0.2	8.5	0.499
17NOV86	0.91	12.6	1	0.5	10	1.302
17NOV86	0.91	10.9	0.1	0.6	12	1.664
17NOV86	0.86	9.1	1.8	1.6	14	4.495
17NOV86	0.84	11.8	0.1	1.9	17	4.755
17NOV86	0.87	7	1.4	0.2	19	0.615
17NOV86	0.92	7.1	1	0.7	22	2.281
17NOV86	0.92	8.9	3.2	3.5	29	10.71
17NOV86	1	10.2	1.1	26.8	32	.
17NOV86	1.04	9	3	1.8	37	6.118
17NOV86	0.95	5.8	2	2	42	7.202
17NOV86	0.85	9.8	2.3	0.9	47	2.412
17NOV86	0.89	5.5	0.1	1.3	52	4.454
18NOV86	0.89	7.2	24.4	89.5	4.5	.
18NOV86	0.89	10.1	2.5	1.1	6.5	3.053
18NOV86	0.85	7.7	1.1	0.6	8.5	1.757
18NOV86	0.91	12.4	1.4	0.8	10	2.097
18NOV86	0.91	10.2	0.2	0.6	12	1.707
18NOV86	0.86	10.2	1.5	1.5	14	4.037
18NOV86	0.84	8.6	0.2	1.9	17	5.373
18NOV86	0.87	11.4	1.1	0	19	0
18NOV86	0.92	6.7	1.8	2.6	22	8.75
18NOV86	0.92	9.9	2.1	1.8	29	5.242
18NOV86	1	5.8	2.1	23.1	32	.
18NOV86	1.04	10.1	2.9	1.9	37	6.189
18NOV86	0.95	6.3	2.4	2.6	42	9.183
18NOV86	0.85	8	2.1	1.1	47	3.18
18NOV86	0.89	10.3	0.3	1.6	52	4.467

APPENDIX I

HYDRAULIC HEAD AND MOISTURE FLUX CALCULATION WORKSHEETS

HYDRAULIC HEAD CALCULATIONS

AREA	MONTH	DEPTH	PSYCHROMETER ELEVATION (FT MSL)	READINGS	MEAN CAPILLARY PRESSURE (-BARS)	MEAN CAPILLARY PRESSURE (FT H2O)	TOTAL HYDRAULIC HEAD (FT)
L	OCT 85	24	6764.7	20	3.02	101.019	6663.681
L	OCT 85	50	6738.7	16	4.24	141.828	6596.872
L	OCT 85	76	6712.7	16	3.92	131.124	6581.576
L	OCT 85	96	6692.7	16	3.14	105.033	6587.667
L	NOV 85	24	6764.7	60	3.41	114.0645	6650.635
L	NOV 85	50	6738.7	53	5.85	195.6825	6543.017
L	NOV 85	76	6712.7	60	3.5	117.075	6595.625
L	NOV 85	96	6692.7	62	3.1	103.695	6589.005
L	DEC 85	24	6764.7	16	3.63	121.4235	6643.276
L	DEC 85	50	6738.7	38	6.95	232.4775	6506.222
L	DEC 85	76	6712.7	38	2.97	99.3465	6613.353
L	DEC 85	96	6692.7	38	2.96	99.012	6593.688
L	FEB 86	24	6764.7	55	5.61	187.6545	6577.045
L	FEB 86	41	6747.7	54	5.54	185.313	6562.387
L	MAR 86	24	6764.7	32	4.48	149.856	6614.844
L	MAR 86	41	6747.7	30	5.6	187.32	6560.38
L	APR 86	24	6764.7	34	5.92	198.024	6566.676
L	APR 86	50	6738.7	34	6.6	220.77	6517.93
L	APR 86	76	6712.7	34	4.9	163.905	6548.795
L	APR 86	96	6692.7	33	4.11	137.4795	6555.220
L	MAY 86	24	6764.7	59	4.92	164.574	6600.126
L	MAY 86	50	6738.7	37	5.28	176.616	6562.084
L	MAY 86	76	6712.7	39	3.9	130.455	6582.245
L	MAY 86	96	6692.7	39	3.62	121.089	6571.611
L	JUN 86	24	6764.7	30	4.81	160.8945	6603.805
L	JUN 86	50	6738.7	16	5.86	196.017	6542.683
L	JUN 86	76	6712.7	16	3.31	110.7195	6601.980
L	JUN 86	96	6692.7	15	3.68	123.096	6569.604
L	AUG 86	24	6764.7	30	5.67	189.6615	6575.038
L	AUG 86	41	6747.7	29	5.52	184.644	6563.056
L	SEP 86	24	6764.7	59	6	200.7	6564
L	SEP 86	41	6747.7	56	5.63	188.3235	6559.376
L	OCT 86	24	6764.7	56	5.57	186.3165	6578.383
L	OCT 86	41	6747.7	55	5.45	182.3025	6565.397
L	NOV 86	24	6764.7	33	4.94	165.243	6599.457
L	NOV 86	41	6747.7	32	4.91	164.2395	6583.460
						0	
G	OCT 85	22	6709.7	10	3.29	110.0505	6599.649
G	OCT 85	42	6689.7	10	8.79	294.0255	6395.674
G	OCT 85	52	6679.7	10	10.22	341.859	6337.841
G	NOV 85	22	6709.7	7	3.81	127.4445	6582.255
G	NOV 85	42	6689.7	7	8.66	289.677	6400.023
G	NOV 85	52	6679.7	6	9.03	302.0535	6377.646
G	MAR 86	22	6709.7	5	2.67	89.3115	6620.388
G	MAR 86	42	6689.7	5	6.27	209.7315	6479.968
G	MAR 86	52	6679.7	5	6.42	214.749	6464.951
G	APR 86	22	6709.7	24	2.73	91.3185	6618.381
G	APR 86	42	6689.7	24	5.96	199.362	6490.338
G	APR 86	52	6679.7	22	5.41	180.9645	6498.735
G	MAY 86	22	6709.7	30	2.77	92.6565	6617.043
G	MAY 86	42	6689.7	30	3.43	114.7335	6574.966

HYDRAULIC HEAD CALCULATIONS

G	MAY 86	52	6679.7	30	5.27	176.2815	6503.418
G	JUN 86	22	6709.7	30	3.2	107.04	6602.66
G	JUN 86	42	6689.7	29	2.5	83.625	6606.075
G	JUN 86	52	6679.7	29	4.81	160.8945	6518.805
G	JUL 86	22	6709.7	17	2.9	97.005	6612.695
G	JUL 86	42	6689.7	17	2.42	80.949	6608.751
G	JUL 86	52	6679.7	17	4.98	166.581	6513.119
G	OCT 86	22	6709.7	28	4.16	139.152	6570.548
G	OCT 86	42	6689.7	28	4.12	137.814	6551.886
G	OCT 86	52	6679.7	28	5.09	170.2605	6509.439
G	NOV 86	22	6709.7	18	3.65	122.0925	6587.607
G	NOV 86	42	6689.7	18	5.6	187.32	6502.38
G	NOV 86	52	6679.7	18	5.39	180.2955	6499.404

MOISTURE FLUX CALCULATIONS, K=AVERAGE MEASURED VALUE

AREA	MONTH	INTERVAL (FT)	DEL H (FT)	DEL Z (FT)	HYDRAULIC GRADIENT (FT/FT)	K() (FT/DAY)	FLUX (FT/DAY)	FLUX (FT/YR)
L	OCT 85	24-50	-66.8	26	-2.57	1.32E-04	0.000339	0.123785
L	OCT 85	50-76	-15.3	26	-0.59	1.32E-04	0.000077	0.028352
L	OCT 85	76-96	6.1	20	0.31	1.32E-04	-0.00004	-0.01469
L	NOV 85	24-50	-107.6	26	-4.14	1.32E-04	0.000546	0.199391
L	NOV 85	50-76	52.6	26	2.02	1.32E-04	-0.00026	-0.09747
L	NOV 85	76-96	-6.6	20	-0.33	1.32E-04	0.000043	0.015899
L	DEC 85	24-50	-137.1	26	-5.27	1.32E-04	0.000696	0.254056
L	DEC 85	50-76	107.1	26	4.12	1.32E-04	-0.00054	-0.19846
L	DEC 85	76-96	-19.7	20	-0.99	1.32E-04	0.000130	0.047457
L	FEB 86	24-41	-14.7	17	-0.86	1.32E-04	0.000114	0.041661
L	MAR 86	24-41	-54.5	17	-3.21	1.32E-04	0.000423	0.154459
L	APR 86	24-50	-48.7	26	-1.87	1.32E-04	0.000247	0.090244
L	APR 86	50-76	30.9	26	1.19	1.32E-04	-0.00015	-0.05726
L	APR 86	76-96	6.4	20	0.32	1.32E-04	-0.00004	-0.01541
L	MAY 86	24-50	-38	26	-1.46	1.32E-04	0.000192	0.070416
L	MAY 86	50-76	20.2	26	0.78	1.32E-04	-0.00010	-0.03743
L	MAY 86	76-96	-10.6	20	-0.53	1.32E-04	0.000069	0.025535
L	JUN 86	24-50	-61.1	26	-2.35	1.32E-04	0.000310	0.113223
L	JUN 86	50-76	59.3	26	2.28	1.32E-04	-0.00030	-0.10988
L	JUN 86	76-96	-32.4	20	-1.62	1.32E-04	0.000213	0.078051
L	AUG 86	24-41	-12	17	-0.71	1.32E-04	0.000093	0.034009
L	SEP 86	24-41	-4.6	17	-0.27	1.32E-04	0.000035	0.013036
L	OCT 86	24-41	-13	17	-0.76	1.32E-04	0.000100	0.036843
L	NOV 86	24-41	-16	17	-0.94	1.32E-04	0.000124	0.045345
G	OCT 85	22-42	-204	20	-10.20	1.32E-04	0.001346	0.491436
G	OCT 85	42-52	-57.8	10	-5.78	1.32E-04	0.000762	0.278480
G	NOV 85	22-42	-182.2	20	-9.11	1.32E-04	0.001202	0.438919
G	NOV 85	42-52	-22.4	10	-2.24	1.32E-04	0.000295	0.107923
G	MAR 86	22-42	-140.4	20	-7.02	1.32E-04	0.000926	0.338223
G	MAR 86	42-52	-15	10	-1.50	1.32E-04	0.000198	0.07227
G	APR 86	22-42	-128	20	-6.40	1.32E-04	0.000844	0.308352
G	APR 86	42-52	8.4	10	0.84	1.32E-04	-0.00011	-0.04047
G	MAY 86	22-42	-42.1	20	-2.11	1.32E-04	0.000277	0.101418
G	MAY 86	42-52	-71.5	10	-7.15	1.32E-04	0.000943	0.344487
G	JUN 86	22-42	3.4	20	0.17	1.32E-04	-0.00002	-0.00819
G	JUN 86	42-52	-87.3	10	-8.73	1.32E-04	0.001152	0.420611
G	JUL 86	22-42	-3.9	20	-0.20	1.32E-04	0.000025	0.009395
G	JUL 86	42-52	-95.6	10	-9.56	1.32E-04	0.001261	0.460600
G	OCT 86	22-42	-18.7	20	-0.94	1.32E-04	0.000123	0.045048
G	OCT 86	42-52	-42.4	10	-4.24	1.32E-04	0.000559	0.204283
G	NOV 86	22-42	-85.2	20	-4.26	1.32E-04	0.000562	0.205246
G	NOV 86	42-52	-3	10	-0.30	1.32E-04	0.000039	0.014454

MOISTURE FLUX CALCULATIONS. K=AVERAGE THEORITICAL VALUE

AREA	MONTH	INTERVAL (FT)	DEL H (FT)	DEL Z (FT)	HYDRAULIC GRADIENT (FT/FT)	K() (FT/DAY)	FLUX (FT/DAY)	FLUX (FT/YR)
L	OCT 85	24-50	-66.8	26	-2.57	2.64E-04	0.000678	0.247571
L	OCT 85	50-76	-15.3	26	-0.59	2.64E-04	0.000155	0.056704
L	OCT 85	76-96	6.1	20	0.31	2.64E-04	-0.00008	-0.02938
L	NOV 85	24-50	-107.6	26	-4.14	2.64E-04	0.001092	0.398782
L	NOV 85	50-76	52.6	26	2.02	2.64E-04	-0.00053	-0.19494
L	NOV 85	76-96	-6.6	20	-0.33	2.64E-04	0.000087	0.031798
L	DEC 85	24-50	-137.1	26	-5.27	2.64E-04	0.001392	0.508113
L	DEC 85	50-76	107.1	26	4.12	2.64E-04	-0.00108	-0.39692
L	DEC 85	76-96	-19.7	20	-0.99	2.64E-04	0.000260	0.094914
L	FEB 86	24-41	-14.7	17	-0.86	2.64E-04	0.000228	0.083323
L	MAR 86	24-41	-54.5	17	-3.21	2.64E-04	0.000846	0.308918
L	APR 86	24-50	-48.7	26	-1.87	2.64E-04	0.000494	0.180489
L	APR 86	50-76	30.9	26	1.19	2.64E-04	-0.00031	-0.11452
L	APR 86	76-96	6.4	20	0.32	2.64E-04	-0.00008	-0.03083
L	MAY 86	24-50	-38	26	-1.46	2.64E-04	0.000385	0.140833
L	MAY 86	50-76	20.2	26	0.78	2.64E-04	-0.00020	-0.07486
L	MAY 86	76-96	-10.6	20	-0.53	2.64E-04	0.000139	0.051070
L	JUN 86	24-50	-61.1	26	-2.35	2.64E-04	0.000620	0.226446
L	JUN 86	50-76	59.3	26	2.28	2.64E-04	-0.00060	-0.21977
L	JUN 86	76-96	-32.4	20	-1.62	2.64E-04	0.000427	0.156103
L	AUG 86	24-41	-12	17	-0.71	2.64E-04	0.000186	0.068018
L	SEP 86	24-41	-4.6	17	-0.27	2.64E-04	0.000071	0.026073
L	OCT 86	24-41	-13	17	-0.76	2.64E-04	0.000201	0.073687
L	NOV 86	24-41	-16	17	-0.94	2.64E-04	0.000248	0.090691
						2.64E-04		
G	OCT 85	22-42	-204	20	-10.20	2.64E-04	0.002692	0.982872
G	OCT 85	42-52	-57.8	10	-5.78	2.64E-04	0.001525	0.556960
G	NOV 85	22-42	-182.2	20	-9.11	2.64E-04	0.002405	0.877839
G	NOV 85	42-52	-22.4	10	-2.24	2.64E-04	0.000591	0.215846
G	MAR 86	22-42	-140.4	20	-7.02	2.64E-04	0.001853	0.676447
G	MAR 86	42-52	-15	10	-1.50	2.64E-04	0.000396	0.14454
G	APR 86	22-42	-128	20	-6.40	2.64E-04	0.001689	0.616704
G	APR 86	42-52	8.4	10	0.84	2.64E-04	-0.00022	-0.08094
G	MAY 86	22-42	-42.1	20	-2.11	2.64E-04	0.000555	0.202837
G	MAY 86	42-52	-71.5	10	-7.15	2.64E-04	0.001887	0.688974
G	JUN 86	22-42	3.4	20	0.17	2.64E-04	-0.00004	-0.01638
G	JUN 86	42-52	-87.3	10	-8.73	2.64E-04	0.002304	0.841222
G	JUL 86	22-42	-3.9	20	-0.20	2.64E-04	0.000051	0.018790
G	JUL 86	42-52	-95.6	10	-9.56	2.64E-04	0.002523	0.921201
G	OCT 86	22-42	-18.7	20	-0.94	2.64E-04	0.000246	0.090096
G	OCT 86	42-52	-42.4	10	-4.24	2.64E-04	0.001119	0.408566
G	NOV 86	22-42	-85.2	20	-4.26	2.64E-04	0.001124	0.410493
G	NOV 86	42-52	-3	10	-0.30	2.64E-04	0.000079	0.028908

APPENDIX J

CORE AND WATER ANALYSIS FOR VOLATILE ORGANIC COMPOUNDS, PURGE AND TRAP METHOD

R.C.R.A PROJECT

SOIL AND WATER ANALYSIS FOR VOLATILE ORGANIC COMPOUNDS

PURGE AND TRAP METHOD

PREPARED BY:

SUZANNE EHART
LOS ALAMOS NATIONAL LABORATORY
HSE-9

OCTOBER 22, 1985

FINAL DRAFT

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INTRODUCTION

THE ANALYSIS OF SOIL SAMPLES FOR VOLATILE ORGANICS IN CONJUNCTION WITH THE RCRA PROJECT WAS ASSIGNED TO ME IN JUNE OF 1985. THE WORK ON THE PROJECT WAS DIVIDED INTO FOUR STAGES DESCRIBED BELOW:

1. INITIAL ASSEMBLY OF THE PURGE AND TRAP APPARATUS

   THE ASSEMBLY OF THE INSTRUMENTAL SYSTEM TOOK APPROXIMATELY 2 WEEKS. SEVERAL DAYS WERE USED IN LEARNING ABOUT THE INSTRUMENT AND IN RUNNINNING PRELIMINARY SAMPLES AND EFFICIENCY TESTS.

2. PREPARATORY WORK

   THIS STAGE OF THE PROJECT INVOLVED ANALYZING STANDARD COMPOUNDS TO DETERMINE RETENTION TIMES AND REPRODUCIBILITY. THE RESULTS OF THESE RUNS DETERMINED WHICH COMPOUNDS COULD BE SUCCESSFULLY IDENTIFIED AND QUANTITATED USING THIS PARTICULAR SYSTEM. CALIBRATION OF THE SYSTEM TO ALLOW QUANTITATION WAS ALSO PERFORMED, AS WELL AS SYSTEM OPTIMIZATION. A METHOD FOR SAMPLE EXTRACTION WAS DEVELOPED.

3. SAMPLE EXTRACTION AND ANALYSIS

   A TOTAL OF 117 SOILS AND 3 WATERS WERE RECEIVED FOR TESTING IN ADDITION TO 10 SOIL QUALITY CONTROL (QC) SAMPLES AND 1 WATER QC SAMPLE.

4. GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)

   SAMPLES SHOWING NONBACKGROUND RESPONSES AND/OR UNUSUAL RESPONSES WERE SUBJECTED TO GC/MS ANALYSIS TO ATTEMPT TO IDENTIFY THE COMPONENTS RESPONSIBLE.

RETENTION TIMES AND ESTIMATED DETECTION LIMITS

COMPOUND	RT	DETECTION LIMIT H20 PPB	DETECTION LIMIT SOIL ug/kg	IS	LAB NOTEBOOK PAGE
11 DICHLOROETHYLENE	4.26				103
METHYLENE CHLORIDE	4.36	5	521	BCM	103
T 1,2 DICHLOROETHYLENE	4.63	5	521	BCM	104
11 DICHLOROETHANE	4.76	10	1042	BCM	90
CHLOROFORM	5.27	10	1042	1C2BP	99
111 TRICHLOROETHANE	5.68	15	1563	BCM	91
12 DICHLOROETHANE	5.72	8	833	BCM	93
BENZENE	5.96	5	521	BCM	93
CARBON TETRACHLORIDE	5.98	20	2083	BCM	91
TRICHLOROETHYLENE	6.65	5	521	1C2BP	91
12 DICHLOROPROPANE	6.69	5	521	BCM	109
BROMODICHLOROMETHANE	6.86	10	1042	14 DCB	100
TOLUENE	8.36	5	521	1C2BP	92,105
112 TRICHLOROETHANE	8.37	15	1527	1C2BP	92
CHLORODIBROMOMETHANE	9.15	10	1042	14 DCB	101
TETRACHLOROETHYLENE	9.52	20	2083	1C2BP	95
CHLOROBENZENE	10.56	12	1250	1C2BP	95
ETHYLBENZENE	10.83	8	833	14 DCB	94
BROMOFORM	11.71	10	1042	14 DCB	102
1122 TETRACHLOROETHANE	12.35	20	2083	14 DCB	96
BROMOBENZENE	12.95	22	2292	1C2BP	96
13 DICHLOROBENZENE	14.75	5	521	14 DCB	107
14 DICHLOROBENZENE	14.91				
12 DICHLOROBENZENE	15.48	5	521	14 DCB	108

INTERNAL STANDARDS	
BROMOCHLOROMETHANE	5.23
1-CHLORO-2-BROMOPROPANE	8.52
14 DICHLOROBUTANE	12.15

(RT=RETENTION TIME)
(IS=INTERNAL STANDARD)
(BLANK LINE: NO QUANTITATION STANDARD AVAILABLE)

THE RETENTION TIME OF THESE COMPOUNDS CHANGED DURING THE COURSE OF THE ANALYSES AS THE SYSTEM WAS MODIFIED (PART OF THE COLUMN WAS BROKEN OFF, GAS FLOWS ALTERED, ETC) BUT REMAINED STABLE AND REPRODUCEABLE BETWEEN RUNS MADE WITH SIMILAR PARAMETERS.

THESE COMPOUNDS WILL BE REFERRED TO AS THE "TARGET" VOLATILE ORGANICS THROUGHOUT THE REPORT

THE LIMIT OF DETECTION IS BASED ON THE INTERCEPT OF THE EXTERNAL STANDARD CALIBRATION CURVE AND ASSUMES 100% RECOVERY

INSTRUMENTAL PARAMETERS

THE INSTRUMENTAL SYSTEM WAS A FIVE COMPONENT SYSTEM OPERATING IN TANDEM AND CONTROLLED BY EITHER THE OPERATOR OR BY A BASIC LANGUAGE PROGRAM FOR AUTOMATED OPERATIONS. EACH OF THESE COMPONENTS IS DESCRIBED IN DETAIL BELOW.

DATA AQUISITION SYSTEM

HEWLETT-PACKARD 5880 SERIES TERMINAL LEVEL FOUR

THE TERMINAL WAS THE MAIN CONTROLLING MODULE OF THE SYSTEM AND MAINTAINED 2-WAY COMMUNICATION WITH THE OTHER MODULES. A BASIC LANGUAGE PROGRAM ENTERED INTO THE TERMINAL CONTROLLED UNATTENDED OPERATIONS. THE TERMINAL WAS RESPONSIBLE FOR SENSING THE READINESS STATE OF THE GAS CHROMATOGRAPH (GC) AND OF THE PURGE AND TRAP (PT) MODULES, AND FOR COORDINATING INSTRUMENTAL OPERATIONS.

THE TERMINAL ALSO SERVED AS A RECORDER AND INTEGRATOR, AND PROCESSED ALL DATA GENERATED BY THE GC. THE TEMPERATURE PROGRAM, GC CONDITIONS, AND RUN TABLE PARAMETERS WERE ALL CONTROLLED BY THE TERMINAL.

GAS CHROMATOGRAPHIC SYSTEM (GC)

HEWLETT-PACKARD MODEL 5880A GC
FLAME IONIZATION DETECTOR
HEWLETT-PACKARD "ULTRA" CAPILLARY COLUMN
    5% CROSSLINKED PHENYL METHYL SILICONE
    60 m LENGTH, .32 mm ID, .25um FILM THICKNESS

GASES

    CARRIER: HELIUM @ 2.0 ml/min (+/- .2 ml/min)
    COMPRESSED AIR @ 46 PSI
    HYDROGEN @ 35 PSI

NOTE: NO MAKEUP GAS WAS USED

PURGE AND TRAP SYSTEM

TEKMAR MODEL 4000 DYNAMIC HEADSPACE ANALYZER (DHS)

THE DHS EMBODIED THE TRAP, MAIN TEMPERATURE CONTROLS, AND PURGE AND TRAP CONTROLS.

TRAP: TENAX
TEMPERATURE SETTINGS: (DEGREES C)
VALVES: 100-120
LINES: 100-120
DESORB: 180
DESORB PREHEAT: 100
BAKE: 220

TIME SETTINGS: (MINUTES)
PURGE: 11
DRY PURGE: 6 (TO REMOVE WATER FROM THE TRAP)
DESORB: 4
BAKE: 10-20

PURGE PRESSURE: 20 psi
PURGE FLOW: 40 ml/min

TEKMAR AUTOMATIC LIQUID SAMPLER (ALS)

THE ALS HOUSED 10 SAMPLES AND CONTROLLED THE VALVING TO SWITCH BETWEEN THESE SAMPLES AS DIRECTED BY THE DHS. THE HEATER WAS LEFT AT FACTORY SETTING OF APPROXIMATELY 120 c.

TEKMAR MODEL 1000 CRYOGENIC CAPILLARY INTERFACE

THE MODEL 1000 CONSISTED OF A SMALL "CROSS" UNIT WHICH WAS SUPPLIED WITH LIQUID NITROGEN FOR COOLING AND EQUIPPED WITH A FLASH HEATING UNIT FOR INTRODUCTION OF THE COOLED, CONCENTRATED SAMPLE INTO THE GC. INITIALLY, THE COLUMN WAS DIRECTLY CONNECTED TO THE CROSS BY PULLING IT OUT OF THE GC OVEN AND CONNECTING IT DIRECTLY TO THE SAMPLE TRANSFER LINE. IN THE COURSE OF THE ANALYSIS, IT WAS DISCOVERED THAT THE PORTION OF THE COLUMN EXPOSED TO THE FLASH HEATING BROKE DOWN QUICKLY. THE BAD PORTIONS OF THE COLUMN WERE THEN BROKEN OFF AND THE COLUMN REPLACED IN THE OVEN AND CONNECTED TO THE MODEL 1000 BY MEANS OF A ZERO DEAD VOLUME UNION AND HOLLOW FUSED SILICA CAPILLARY COLUMN. MATERIAL DESORBED OFF OF THE TENAX TRAP ENTERED THE CROSS WHICH HAD BEEN PREVIOUSLY SIGNALED BY THE DHS AND GC TO COOL TO -50c. THE SAMPLE SLUGS WERE COLD TRAPPED ON THE PORTION OF THE COLUMN OR TUBING IN THE CROSS UNIT UNTIL THE GC AND DHS SIGNALED THE CROSS TO FLASH HEAT AND THUS INTRODUCE THE SAMPLE INTO THE GC AND BEGIN DATA ACQUISITION.

COOLING TEMPERATURE: -50c
FLASH HEATING TIME: 4-10 SECONDS
HEATING RATE: APPROXIMATELY 50c PER SECOND

NOTE: PARAMETERS WERE ADJUSTED THROUGHOUT THE COURSE OF SAMPLE ANALYSIS AS NECCESSARY.

GC/MASS SPECTROMETER SYSTEM (GC/MS)

HEWLETT-PACKARD 5993A GC/MS AND COMPUTER SYSTEM
COLUMN:
SPB-5
0.24 mm ID
30 m
1.0 um FILM THICKNESS

ANY SAMPLES DISPLAYING SUSPICIOUS OR NONBACKGROUND PEAKS WERE TURNED OVER TO STUART NIELSEN FOR ANALYSIS. ALSO SUBMITTED WERE A METHANOL BLANK, A QC SAMPLE, AND ALL OF THE SAMPLES FROM LL-85-15. THE DATA FILES GENERATED WERE ANALYZED BY MYSELF. MOST OF THE SAMPLES WERE ANALYZED BY INJECTION OF 5 ul, BUT SOME OF THE MORE CONCENTRATED SAMPLES REQUIRED SMALLER INJECTIONS. ESTIMATED LIMITS OF DETECTION WERE PROVIDED BY STUART. THESE VALUES WERE USED TO ESTIMATE CONCENTRATIONS OF THE COMPOUNDS FOUND.

SUMMARY OF OPERATION

TEN INDIVIDUAL SAMPLES WERE LOADED INTO THE ALS. ONCE THE DHS REACHED THE READY STATE, PURGING OF THE FIRST SAMPLE WAS INITIATED. A BASIC PROGRAM ON THE LEVEL 4 TERMINAL CONTROLLED THE TIMING OF THE CRYOGENIC COOLING WHICH BEGAN ONCE PURGING WAS COMPLETE. WHEN THE CRYOGENIC CROSS REACHED -50c, DESORPTION OF THE SAMPLE OFF THE TENAX TRAP BEGAN. FLASH HEATING OF THE COLD INTERFACE FOLLOWED DESORBTION. THE INITIATION OF FLASH HEATING COINCIDED WITH THE BEGINNING OF THE GC OVEN PROGRAM AND DATA ACQUISITION. WHILE THE GC WAS RUNNING, THE DHS CYCLED TO BAKE TO REMOVE RESIDUAL MATERIAL FROM THE TENAX TRAP. WHEN BOTH THE GC AND THE DHS HAD COMPLETED THEIR CYCLES AND RETURNED TO READY, THE ALS VALVED TO THE NEXT SAMPLE AND REPEATED THE PROCESS. THIS CYCLE WAS REPEATED FOR THE 10 LOADED SAMPLES. WHEN THE LAST SAMPLE RUN WAS COMPLETE, THE TEKMAR SYSTEM REMAINED AT READY, AND THE GC WAS PROGRAMMED TO SHUT THE OVEN OFF AFTER REACHING AMBIENT TEMPERATURE.

SAMPLE PREPARATION

THE SAMPLES RECEIVED CONSISTED OF LARGE (APPROXIMATELY 500 ml) JARS OF SOIL. PROPERLY COLLECTED SAMPLES HAD MINIMAL HEADSPACE AND WERE SEALED WITH A TEFLON LINER BETWEEN THE JAR AND THE LID. THE JARS WERE SEALED WITH PARAFILM AND INITIALED BY THE COLLECTOR. UPON RECEIPT, THE SAMPLES WERE PLACED INTO A LOCKED REFRIGERATOR AND STORED UNTIL EXTRACTION.

THE SOIL WAS EXTRACTED WITHIN 24 HOURS OF RECEIPT. EXTRACTION WAS CARRIED OUT BY FIRST AGITATING THE SOIL IN ORDER TO ACHIEVE SOME DEGREE OF HOMOGENEITY. THE SAMPLE CONTAINERS WERE OPENED AND ANY ODORS NOTED. THE COLOR AND CONSISTENCY OF THE SOIL WAS ALSO NOTED. APPROXIMATELY 4 GRAMS OF THE SOIL WAS REMOVED AND TRANSFERRED TO A TARED 10 ml REACTION VIAL AND THE WEIGHT RECORDED TO THE NEAREST .0001 gm. THE VIAL WAS IMMEDIATELY SEALED USING A TEFLON SEPTA AND TEAR-AWAY SEAL. 4 TO 5 SOILS WERE WEIGHTED OUT IN THIS MANNER AND THEN THE METHANOL EXTRACTION WAS CARRIED OUT. 2.5 mls OF ABSOLUTE METHANOL WERE INJECTED INTO THE SAMPLE AND THE MIXTURE WAS VIGOROUSLY SHAKEN FOR APPROXIMATELY 2 MINUTES BY HAND. THE VIAL WAS THEN OPENED AND THE LIQUID DRAWN OFF BY PIPETTE AND TRANSFERED TO A 1 ml REACTION VIAL AND AGAIN SEALED WITH A TEFLON SEPTUM AND SEAL. THE 10 ml REACTION VIAL WAS DISCARDED. IMMEDIATELY AFTER THE 4 gm ALIQUIOT OF SOIL WAS REMOVED THE JAR WAS SEALED WITH TAPE TO INDICATE COMPLETION OF EXTRACTION. ONCE EXTRACTED, THE SOILS WERE REPLACED IN THE REFRIGERATOR UNTIL RETURNED TO THE SUBMITTORS. THE 1 ml REACTION VIALS CONTAINING THE METHANOLIC EXTRACTS WERE PLACED IN THE REFRIGERATOR UNTIL ANALYSIS. ALL SAMPLES WERE RUN FOR THE FIRST TIME WITHIN 10 DAYS.

THE SAMPLES WERE PREPARED FOR PURGE AND TRAP ANALYSIS IMMEDIATELY PRIOR TO PURGING. 10 SAMPLES (INCLUDING BLANKS, SPIKES, AND QUALITY CONTROL SAMPLES) COULD BE PREPARED AND RUN AT ONE TIME. DAILY, AN AQUEOUS SOLUTION OF THE INTERNAL STANDARD MIXTURE WAS PRERARED USING A SECONDARY DILUTION OF A SUPELCO MIXTURE CONTAINING 20 mg/ml OF BROMOCHLOROMETHANE, 1-BROMO-2-CHLOROPROPANE, AND 1,4 DICHLOROBUTANE IN METHANOL. 5 mls OF THE AQUEOUS SOLUTION WERE PIPETTED INTO A 5 ml PURGING VESSEL USING A GLASS PIPETTE. APPROXIMATELY 30 ul OF THE METHANOLIC EXTRACT WAS INJECTED INTO THIS MIXTURE, AND THE VESSEL ASSEMBLED AND PLACED ON THE PURGE AND TRAP APPARATUS. ALL 10 SAMPLES WERE PREPARED IN THE SAME MANNER. THE EXACT AMOUNT OF THE METHANOLIC EXTRACT USED WAS RECORDED TO THE NEAREST ul. THE INJECTION ITSELF WAS CARRIED OUT BY RINSING THE SYRINGE WITH METHANOL SEVERAL TIMES, THEN DRAWING IN SEVERAL ALIQUOITS OF THE SAMPLE AND DISCARDING. THE SYRINGE WAS THEN FILLED WITH SAMPLE EXTRACT TO APPROXIMATELY 30 ul AND ALL AIR BUBBLES REMOVED. THE EXACT VOLUME OF THE SYRINGE WAS THEN NOTED, INCLUDING NEEDLE VOLUME, AND THEN THE INJECTION WAS MADE BY FULLY DEPRESSING THE PLUNGER ONE TIME. THE SYRINGE WAS REMOVED FROM THE AQUEOUS SOLUTION AND THE RESIDUAL VOLUME NOTED. THE ACTUAL INJECTED VOLUME WAS CALCULATED AND RECORDED. REFER TO THE INSTRUMENTAL SECTION FOR INFORMATION ON HOW THE ACTUAL ANALYSIS WAS CARRIED OUT. AFTER AN ALIQUOT OF METHANOLIC EXTRACT WAS REMOVED FROM A 1 ml SAMPLE VIAL, THE VIAL WAS RESEALED WITH A NEW TEFLON SEAL.

THESE METHODS OF EXTRACTION AND ANALYSIS ARE MODIFICATIONS AND COMPILATIONS OF SEVERAL RECOMMENDED PROCEDURES. PLEASE REFER TO THE FOLLOWING REFERENCES FOR MORE INFORMATION:

CHARACTERIZATION OF HAZARDOUS WASTE SITES, A METHODS MANUAL, VOLUME 3. AVAILABLE LABORATORY ANALYTICAL METHODS

LOCKHEED ENGINEERING MANAGEMENT SERVICES COMPANY
LAS VEGAS, NEVADA MAY 1984
NATIONAL TECHNICAL INFORMATION SERVICE #PB84-191048
EPA-600/4-84-038

BY RUSSELL PLUMB JR.

SEE ESPECIALLY CHAPTER 3, SECTIONS J.1.1, J.2.1, J.3.1

TEST METHODS FOR EVALUATING SOLID WASTE
PHYSICAL/CHEMICAL METHODS SW-846
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

SEE ESPECIALLY SECTION 8 , METHODS 8010, 8015, 8020, AND 8030

CHAIN OF CUSTODY

SAMPLES ARRIVING AT THE LAB WERE ACCOMPANIED BY A CHAIN OF CUSTODY TAG WHICH WAS ATTACHED TO EACH INDIVIDUAL JAR. THE PERSON DELIVERING THE SAMPLE AND THE PERSON RECEIVING IT BOTH PRINTED AND SIGNED THEIR NAMES ON THE CARD IN THE APPROPRIATE PLACE AND NOTED THE DATE AND TIME OF SUBMISSION. THE SAMPLES WERE THEN PLACED IN A LOCKED REFRIGERATOR UNTIL EXTRACTION. ONLY 3 PEOPLE HAD ACCESS TO THE REFRIGERATOR (MYSELF, CAROL SUTCLIFFE, AND ROBIN WALKER). THE EXTRACTION WAS CARRIED OUT BY ONE OF THESE 3 PERSONS, AND THE DATE AND PERSON PERFORMING THE EXTRACTION WAS NOTED IN THE APPROPRIATE LABORATORY NOTEBOOK. ONCE EXTRACTED, THE JARS WERE SEALED AND REPLACED IN THE REFRIGERATOR, AND THE VIALS CONTAINING THE EXTRACT WERE PLACED IN ANOTHER REFRIGERATOR UNTIL ANALYSIS. AGAIN THE DATE OF ANALYSIS AND WHO SET UP THE RUN WERE NOTED IN THE LABORATORY NOTEBOOKS. ACCESS TO THE ROOMS WHERE SAMPLES WERE KEPT WERE LIMITED, AND THE CONDITION OF THE SEALS OF THE JARS AND VIALS WAS CHECK FREQUENTLY. RETURN OF THE SOIL SAMPLES WAS ACCOMPLISHED BY SIGNING, PRINTING, AND DATING THE CHAIN OF CUSTODY CARD AS ABOVE. I WAS ULTIMATELY RESPONSIBLE FOR THE SECURITY OF ALL OF THE SAMPLES AND EXTRACTS.

BLANKS, SPIKES, AND QUALITY CONTROL

FIELD BLANKS

SAMPLES WERE DELIVERED IN BATCHES OF APPROXIMATELY 10 SAMPLES PER HOLE DRILLED. FOR EACH BATCH, FIELD BLANKS WERE REQUESTED AND RECEIVED. GENERALLY, ONE JAR REPORTEDLY PREPARED EXACTLY AS A SAMPLE VESSEL WAS TAKEN TO THE FIELD FILLED WITH ORGANIC FREE WATER. THIS JAR WAS LEFT OPEN TO THE ATMOSPHERE ON SITE AND THEN SEALED AS THE OTHER SAMPLES UPON COMPLETION OF DRILLING. A SECOND BLANK EMPTY JAR WAS USUALLY SUBMITTED, ALTHOUGH IT WAS DECIDED THAT THE WATER BLANK WAS OF MORE VALUE AND MOST OF THE EMPTY JAR BLANKS WERE NOT PROCESSED. 5 ml OF THE WATER WAS ADDED TO A PURGE VESSEL AND RUN AS THE OTHER SAMPLES. THE RESULTING CHROMATOGRAPHS WERE USED TO DEFINE BACKGROUND PEAKS ALONG WITH OTHER BACKGROUND RUNS DESCRIBED BELOW.

METHANOL BLANKS

FOR EACH BATCH OF SAMPLES EXTRACTED, A METHANOL BLANK WAS PREPARED USING THE SAME EXTRACTION TECHNIQUE AS THE SOILS. THESE BLANKS WERE RUN ALONGSIDE THE SOIL SAMPLES OF THE CORRESPONDING BATCH AND THE RESULTING CHROMATOGRAPHS USED TO HELP DEFINE BACKGROUND.

SYSTEM BLANKS

5 ml ALIQUOTS OF ORGANIC FREE WATER WERE PURGED IN BETWEEN ALMOST ALL SAMPLES. THIS PRACTICE WAS REDUCED AS THE DEADLINE FOR COMPLETION OF THE INITIAL RUNS APPROACHED. IF A WATER BLANK SHOWED EXCESSIVE CARRYOVER FROM PRIOR SAMPLES, THE SYSTEM WAS BAKED AND IF NECCESSARY, SAMPLES WERE RERUN. LATER RUNS OF ORGANIC FREE WATER INCLUDED APPROXIMATELY 10ul OF METHANOL. THE CHARACTERISTIC PRODUCTS OF INTERFACE TUBING AND COLUMN BREAKDOWN WERE FOUND TO BE WATER INSOLUBLE BUT METHANOL SOLUBLE AND THUS PROBLEMS WITH THE INTERFACE WERE DIFFICULT TO DETECT AS THE WATER BLANKS SHOWED ESSENTIALLY NO PEAKS. THIS PROBLEM AROSE TWICE DURING THE COURSE OF THE PROJECT. ONCE THE PROBLEM WAS DETECTED (USUALLY DURING THE RUNNING OF A METHANOL BLANK) IT WAS CORRECTED BY BREAKING OFF THE TOP OF THE COLUMN AND LATER BY REPLACING THE COLUMN WITH THE ZERO DEAD VOLUME/HOLLOW CAPILLARY TUBING ARRANGEMENT. BY THE TIME THE PROBLEM WAS FINALLY SOLVED, THE DEADLINE FOR RUNNING THE SAMPLES HAD PASSED SO RERUNNING THEM WAS NOT FEASIBLE. HOWEVER, ALL THE SAMPLES HAD BEEN RUN AT LEAST ONCE. THE ELUTION OF THE BREAKDOWN PRODUCTS DID NOT MASK THE ELUTION OF ANY OF THE TARGET VOLATILE ORGANICS OR INTERNAL STANDARDS AND THE RATE OF RECOVERY OF THE INTERNAL STANDARDS REMAINED GOOD. AS AN ADDITIONAL PRECAUTION, MOST OF THE SAMPLES RUN DURING TIMES WHEN BREAKDOWN WAS SUSPECTED WERE SUBJECTED TO GC/MS ANALYSIS.

THE RESULTS OF THE FIELD BLANKS, METHANOL BLANKS, AND SYSTEM BLANKS WERE COMBINED IN ORDER TO DEFINE THE BACKGROUND FOR EACH BATCH OF SAMPLES.

SPIKES

ONE SOIL SAMPLE PER BATCH WAS SPIKED WITH A KNOWN AMOUNT OF A METHANOLIC SOLUTION CONTAINING 1,2 DICHLOROETHANE, BENZENE, AND ETHYL BENZENE. THE SPIKE SOIL WAS PREPARED BY SELECTING A SOIL SAMPLE AT RANDOM AND WEIGHING OUT APPROXIMATELY 4 gms AS DESCRIBED IN THE SAMPLE PREPARATION SECTION. PRIOR TO EXTRACTION, A ALIQUOT OF THE STOCK SPIKE SOLUTION WAS INJECTED INTO THE SEALED VIAL AND THE VIAL AGITATED. EXTRACTION THEN PROCEEDED AS WITH ALL SAMPLES. THE SPIKE WAS THEN RUN ALONG WITH THE CORRESPONDING SOIL SAMPLES. IN ALL CASES IN THE INITIAL RUNS, THE RECOVERY OF THE BENZENE AND 1,2 DICHLOROETHANE WAS VERY GOOD AND THAT OF THE ETHYL BENZENE WAS LOW. SUBSEQUENT RUNS MADE APPROXIMATELY ONE WEEK LATER SHOWED EXCELLENT RECOVERIES ON ALL OF THE SPIKES. THE RECOVERY OF THE INTERNAL STANDARDS WAS IN ALL CASES ACCEPTABLE.

QUALITY CONTROL SAMPLES

A TOTAL OF 10 QC SAMPLES WERE RECEIVED FROM THE QC SECTION AT HSE-9. THESE CONSISTED OF VIALS CONTAINING PREWEIGHED AND SPIKED SOILS. THESE WERE EXTRACTED AND RUN AS THE SAMPLES WERE. THE SPIKES EACH CONTAINED 6 COMPOUNDS WHICH WERE ALL SUCESSFULLY IDENTIFIED EACH TIME THEY WERE RUN. QUANTITATION OF THE QC SAMPLES WAS PERFORMED BOTH WITH AND WITHOUT ADJUSTING FOR RECOVERY (BASED ON THE RECOVERY RATES OF THE SPIKES). THE FIRST BATCH OF 5 QC SAMPLES WERE EXTRACTED WITHIN 8 HOURS OF RECEIPT, AND THE SECOND BATCH SAT AT 20c FOR 24 HOURS PRIOR TO EXTRACTION. THE CALCULATED QUANTITIES OF 4 OF THE COMPOUNDS IN THE FIRST BATCH (BENZENE, 1,2 DICHLOROETHANE, 1,1,1 TRICHLOROETHANE, AND BROMOCHLOROMETHANE) AGREED WELL WITH THE REPORTED VALUE (CONSIDERING UNCERTAINTIES). THE RECOVERIES OF TRICHLOROETHYLENE AND 1,3 DICHLOROBENZENE WERE LOW. THIS TREND REPEATED ITSELF WITH THE SECOND BATCH OF 5 SAMPLES EXCEPT THAT ALL OF THE RECOVERIES WERE LOW. THIS WAS NOT UNEXPECTED CONSIDERING THE AMOUNT OF HEADSPACE IN THE STORAGE VIALS AND THE TIME FACTORS INVOLVED. ALL OF THE REGULAR SOIL SAMPLES WERE EXTRACTED WITHIN 30 MINUTES OF BEING WEIGHED OUT SO THE PROBLEM OF LOSS TO HEADSPACE WHILE AWAITING EXTRACTION WOULD BE A MINOR ONE.

THE EXPECTED AREA COUNTS OF THE INTERNAL STANDARDS WAS ALSO USED TO INTERPRET RESULTS AND TO FLAG ANY SAMPLE DISPLAYING UNUSUALLY LOW RECOVERIES.

RESULTS

HOLE DESIGNATION: LGC-85-09
SAMPLE NUMBERS: 85.05026-85.05035
FIELD BLANKS: 85.05036-85.05037
DATE RECEIVED: 8/13/85

PURGE AND TRAP/GC/FID RESULTS:
NONE OF THE TARGET VOLATILE ORGANICS WERE DETECTED. ONE NON-BACKGROUND PEAK WAS FOUND IN SAMPLES 85.05031 AND 85.05033. 85.05031 WAS SUBJECTED TO GC/MS ANALYSIS.

GC/MS RESULTS:
85.05031: NO VOLATILE ORGANICS OF SIGNIFICANCE WERE DETECTED

HOLE DESIGNATION: LGC-85-10
SAMPLE NUMBERS: 85.05038-85.05047
FIELD BLANKS: 85.05048-85.05049
DATE RECEIVED: 8/14/85

PURGE AND TRAP/GC/FID RESULTS:
NONE OF THE TARGET VOLATILE ORGANICS WERE DETECTED.
CHROMATOGRAPHS OF 85.05042, 85.05043, 85.05044, AND 84.05047 SHOWED SEVERAL SMALL NON-BACKGROUND PEAKS.
85.05042 AND 85.05044 WERE SUBJECTED TO GC/MS ANALYSIS.

GC/MS RESULTS:
NO VOLATILE ORGANICS OF SIGNIFICANCE WERE DETECTED.

HOLE DESIGNATION: LLC-85-12
SAMPLE NUMBERS: 85.05050-85.05059
FIELD BLANKS: 85.05060-85.05062
DATE RECEIVED: 8/15/85

PURGE AND TRAP/GC/FID RESULTS:

NONE OF THE TARGET VOLATILE ORGANICS WERE DETECTED. CHROMATOGRAPH OF 85.05052 HAD A SERIES OF UNIDENTIFIED PEAKS WHICH ELUTED WITHIN ONE MINUTE OF THE SOLVENT. CHROMATOGRAPH OF 85.05053 HAD A SIMILAR PATTERN AS WELL AS A PEAK ELUTING AT APPROXIMATELY 7.79 MINUTES. THESE SAMPLES WERE SUBJECTED TO GC/MS ANALYSIS.

GC/MS RESULTS:

85.05053A: 6 CARBON KETONE IDENTIFIED (2-HEXANONE / 4-METHYL-2-PENTANONE)
ESTIMATED CONCENTRATION: 4125 ug/kg SOIL
ESTIMATED LIMIT OF DETECTION: 3300 ug/kg

85.05053B: 6 CARBON KETONE IDENTIFIED AS ABOVE
ESTIMATED CONCENTRATION: 3712 ug/kg SOIL

NOTE: 2 SAMPLES OF 85.05053 WERE PREPARED SINCE PORTIONS OF THE FIRST SAMPLE WERE SPILLED.

HOLE DESIGNATION: LLC-85-13 (BACKGROUND)
SAMPLE NUMBERS: 85.05063-85.05072
FIELD BLANKS: 85.05073-85.05074
DATE RECEIVED: 8/16/85

PURGE AND TRAP/GC/FID ANALYSIS:

NONE OF THE TARGET VOLATILE ORGANICS WERE DETECTED. SAMPLE NUMBER 85.05067 SHOWED AN UNUSUALLY LARGE SOLVENT PEAK AND WAS SUBJECTED TO GC/MS ANALYSIS.

GC/MS ANALYSIS:

85.05067: A TRACE AMOUNT OF A 5 CARBON KETONE WAS IDENTIFIED (2-PENTANONE)
ESTIMATED CONCENTRATION: 3300 ug/kg SOIL
ESTIMATED LIMIT OF DETECTION: 3300 ug/kg

HOLE DESIGNATION: LLC-85-14
SAMPLE NUMBERS: 85.05075-85.05084
FIELD BLANKS: 85.05085-85.05086
DATE RECEIVED: 8/17/85

PURGE AND TRAP/GC/FID RESULTS:

NONE OF THE TARGET VOLATILE ORGANICS WERE DETECTED. CHROMATOGRAPHS OF SAMPLE NUMBERS 85.05075, 85.05077, 85.05078, 85.05079, 85.05080, 85.05081, AND 85.05082 SHOWED VARIOUS NON-BACKGROUND PEAKS. SAMPLE NUMBERS 85.05075, 85.05077, 85.05078, 85.05079, 85.05080, AND 85.05081 WERE SUBJECTED TO GC/MS ANALYSIS

GC/MS RESULTS:

85.05078: 2-PENTANONE (METHLYPROPYL KETONE) IDENTIFIED
ESTIMATED CONCENTRATION: 3636 ug/kg SOIL
ESTIMATED LIMIT OF DETECTION : 3300 ug/kg

85.05079: 1-BUTANOL IDENTIFIED
ESTIMATED CONCENTRATION: 83,331 ug/kg SOIL
ESTIMATED LIMIT OF DETECTION: 62,500 ug/kg

NO OTHER VOLATILE ORGANICS OF SIGNIFICANCE WERE DETECTED

HOLE DESIGNATION: LLC-85-1S
SAMPLE NUMBERS: 85.05087-85.05096 (85.05093 WAS LOST)
FIELD BLANKS: 85.05097-85.05098
DATE RECEIVED: 8/19/85

PURGE AND TRAP/GC/FID RESULTS:
NONE OF THE TARGET VOLATILE ORGANICS WERE DETECTED. ALL OF THE CHROMATOGRAPHS SHOWED NON-BACKGROUND PEAKS AND WERE SUBJECTED TO GC/MS ANALYSIS.

GC/MS RESULTS:

#	COMPOUND	EST. CONC.	EST. LOD
85.05088	TETROHYDROFURAN	4500	3000
85.05089	1,4 DIOXAN	1500	1500
85.05090	1,4 DIOXAN	1500	1500
	1 BUTANOL	100,000	62,500
85.05093	1 BUTANOL	93750	62,500
85.05095	2 PENTANONE (3-METHYL-2-BUTANONE)	3300	3300

EST. CONC.=ESTIMATED CONCENTRATION
EST.LOD =ESTIMATED LIMIT OF DETECTION
CONCENTRATIONS IN ug/kg SOIL

SEVERAL OTHER VOLATILES WERE PRESENT BUT COULD NOT BE DEFINITIVELY IDENTIFIED. THE MS SCANS OF THESE COMPOUNDS WERE CONSISTANT WITH SMALL CHAIN ALCHOLS. THEY WERE MOST CONCENTRATED IN SAMPLE NUMBERS 85.05088, 85.05089, AND 85.05090

HOLE DESIGNATION: LLC-85-16
SAMPLE NUMBERS: 85.05099-85.05108
FIELD BLANKS: 85.05109-85.05110
DATE RECEIVED: 8/19/85

PURGE AND TRAP/GC/FID RESULTS:

NONE OF THE TARGET VOLATILE ORGANICS WERE DETECTED. CHROMATOGRAPHS OF SAMPLE NUMBERS 85.05101-85.05106 DISPLAYED SOME EARLY ELUTING NON-BACKGROUND PEAKS. SAMPLE NUMBERS 85.05101, 85.905102, AND 85.05104 WERE SUBJECTED TO GC/MS ANALYSIS.

GC/MS RESULTS:

NO VOLATILE ORGANICS OF SIGNIFICANCE WERE DETECTED.

HOLE DESIGNATION: LLC-85-17
SAMPLE NUMBERS: 85.05113-85.05122
FIELD BLANKS: 85.05123-85.05124
DATE RECEIVED: 8/19/85

PURGE AND TRAP/GC/FID RESULTS:
NONE OF THE TARGET VOLATILE ORGANICS WERE DETECTED. SAMPLE NUMBERS 85.05117 AND 85.05125 WERE SUBJECTED TO GC/MS ANALYSIS FOR CONFIRMATION.

GC/MS RESULTS:
NO VOLATILE ORGANICS OF SIGNIFICANCE WERE DETECTED.

HOLE OESIGNATION: LLC-85-18
SAMPLE NUMBERS: 85.05130-85.05140 (85.05136 NOT SUBMITTED)
FIELD BLANKS: 85.05141
DATE RECEIVED: 8/21/85

PURGE AND TRAP/GC/FID RESULTS:

NONE OF THE TARGET VOLATILE ORGANICS WERE DETECTED. CHROMATOGRAPHS OF 85.05131 AND 85.05138 SHOWED A FEW PEAKS NON-BACKGROUND PEAKS. THESE TWO SAMPLES WERE SUBJECTED TO GC/MS ANALYSIS.

GC/MS RESULTS:

NO VOLATILE ORGANIC$ OF SIGNIFICANCE WERE DETECTED.

WATER SAMPLES

ON SEPTEMBER 9, 1985 THREE WATER SAMPLES WERE DELIVERED TO ME FOR PURGE AND TRAP ANALYSIS AS PART OF THE SAME PROGRAM AS THE SOIL SAMPLES. THESE WERE ANALYZED USING THE SAME INSTRUMENTAL PROCEDURES PREVIOUSLY DESCRIBED. THERE WAS NO SAMPLE PREPARATION INVOLVED; 5 mls OF THE WATER WAS ADDED TO THE PURGING VESSEL AND ANALYZED. SYSTEM BLANKS WERE UTILIZED AS DESCRIBED PREVIOUSLY. ONE EPA QUALITY CONTROL SAMPLE WAS RECEIVED FROM THE QUALITY CONTROL SECTION OF HSE-9 FOR ANALYSIS ALONG WITH THE SAMPLES. THE QC SAMPLE CONTAINED 9 VOLATILE ORGANIC COMPUNDS OF WHICH ALL 9 WERE DETECTED AND 4 QUANTITATED (ONLY THOSE COMPOUNDS FOR WHICH A VALID CALIBRATION CURVE WAS AVAILABLE WERE QUANTITATED). THE VALUES CALCULATED AGREED VERY CLOSELY WITH THE "TRUE" AND AVERAGE REPORTED VALUES.

RESULTS:

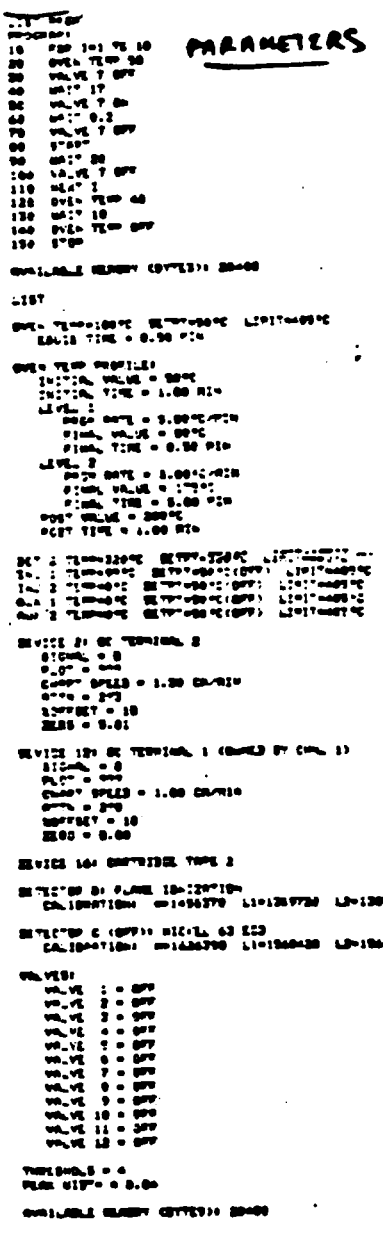
SAMPLES NUMBERS:

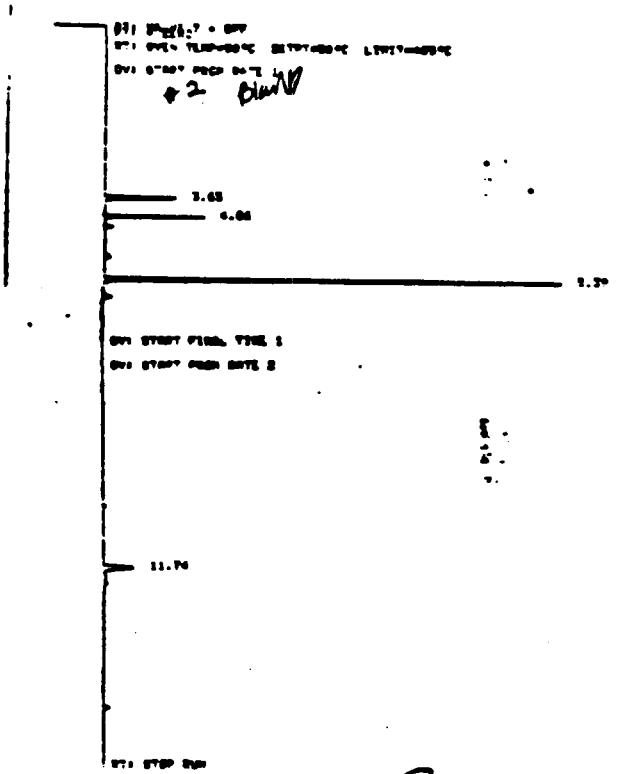
85.05142
85.05143
85.05144

NONE OF THE TARGET VOLATILE ORGANICS WERE DETECTED AND NO PEAKS OTHER THAN BACKGROUND WERE NOTED ON THE CHROMATOGRAPHS.

SAMPLE CHROMATOGRAPHS

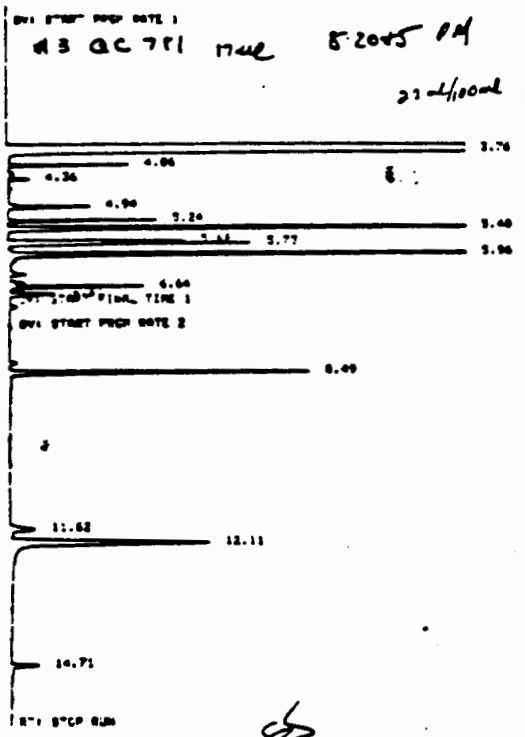
PARAMETERS





RT	AREA	TYPE	AREA %
3.63	104.78	BB	11.695
4.06	84.87	BB	9.319
9.39	680.99	BB	73.113
11.74	63.82	BB	6.963

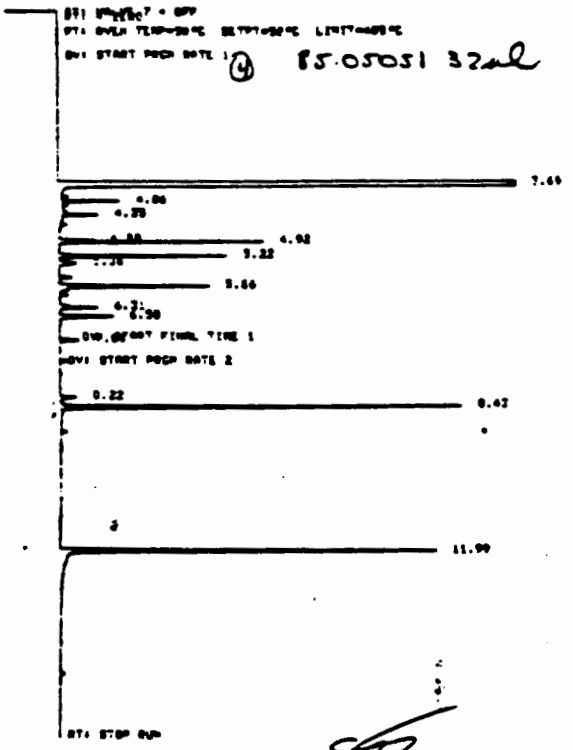
TOTAL AREA = 933.19
MULTIPLIER = 1



E=5 5000A MANUAL INJECTION @ 22:20 AUG 10, 1995
AREA %

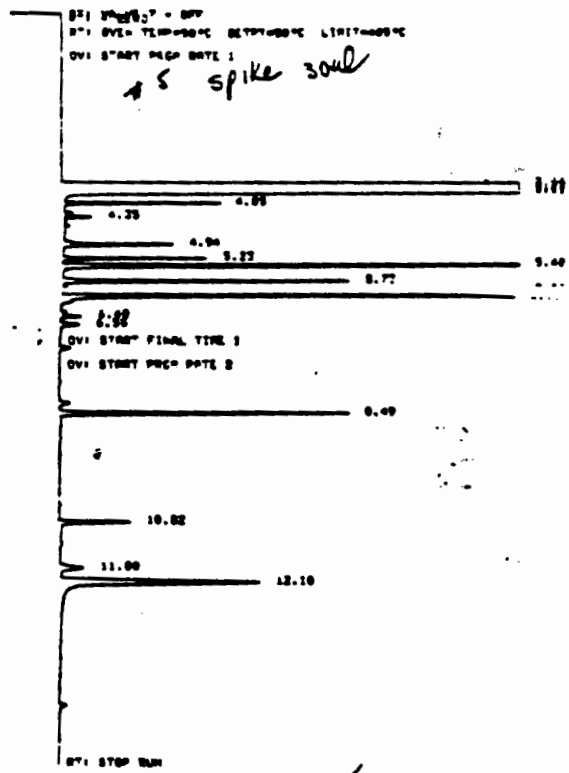
RT	AREA	TYPE	AREA %
3.76	4103.91	SS	50.522
4.06	97.90	SS	1.170
4.36	17.83	VV	0.215
4.94	107.32	VS	1.296
4.94	147.47	SS	1.974
5.40	972.62	SS	11.749
5.60	184.15	SV	2.224
5.73	277.79	VS	3.354
5.96	950.21	SV	11.474
6.64	155.16	VS	1.874
6.81	69.95	SS	0.845
8.49	456.01	SS	5.506
11.62	57.23	SS	0.691
12.11	547.00	SS	6.605
14.71	40.90	SS	0.494

TOTAL AREA = 8281.32
MULTIPLIER = 1



RT	AREA	TYPE	AREA %
3.69	7949.29	BB	88.888
4.06	52.41	PV	0.561
4.29	30.87	VB	0.330
4.88	26.84	PV	0.287
4.98	183.39	VB	1.963
9.22	166.87	BB	1.799
9.36	31.46	BB	0.339
9.66	179.72	BV	1.881
6.31	41.83	VB	0.448
6.99	63.64	BV	0.681
7.61	21.83	BB	0.234
9.22	22.22	BB	0.238
0.42	479.96	VB	5.898
11.99	498.93	BB	5.341

TOTAL AREA = 9348.36
MULTIPLIER = 1

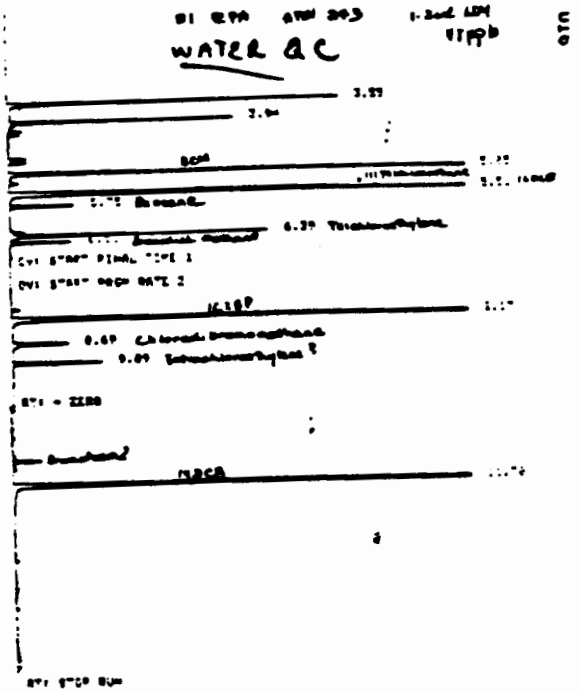


S=2 5000R MANUAL INJECTION 0 00:45 AUG [illegible] 1988
AREA %

RT	AREA	TYPE	AREA %
3.66	1354.00	BV	13.891
3.73	2160.03	VV	22.220
3.81	2594.17	VV	26.597
4.05	126.79	VB	1.320
4.35	22.71	VB	0.233
4.94	154.00	VB	1.579
5.23	165.30	BB	1.695
5.40	939.01	BB	9.506
5.73	329.03	BP	3.382
8.96	670.03	VV	6.968
6.40	34.66	VB	0.355
6.50	36.23	BV	0.371
0.49	451.76	PB	4.632
10.81	113.63	BB	1.169
11.00	54.49	BB	0.559
12.10	531.25	BB	5.447

TOTAL AREA = 9753.57
MULTIPLIER = 1

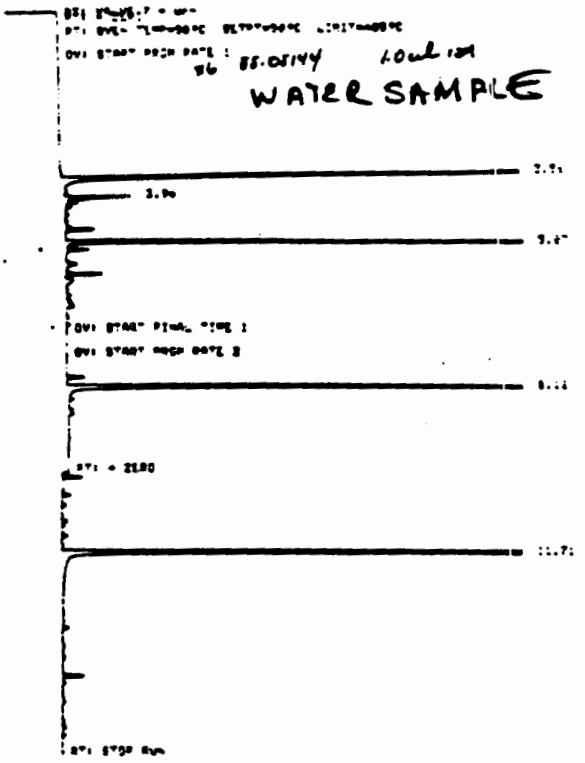
130



E=3 5600A MANUAL INJECTION @ 06:37 SEP 13, 1995
AREA %

RT	AREA	TYPE	AREA %
3.55	154.10	BV	5.296
3.94	97.53	BV	3.352
[illegible]	449.12	BB	15.434
[illegible]	111.12	BV	5.010
[illegible]	350.6	VB	11.049
[illegible]	31.31	BB	[illegible]
[illegible]	170.1	VB	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	643.96	BB	22.096
[illegible]	31.49	BV	1.082
[illegible]	49.24	BB	1.692
[illegible]	808.40	BB	27.783

TOTAL AREA = 2969.94
MULTIPLIER = 1



E=3 5600A MANUAL INJECTION @ 13:30 SEP 13, 1995
AREA %

RT	AREA	TYPE	AREA %
3.56	349.16	BB	17.824
3.96	15.71	BV	5.766
5.07	239.77	BB	[illegible]
5.10	649.55	BB	29.726
11.71	837.61	BB	40.797

TOTAL AREA = 2081.63
MULTIPLIER = 1

APPENDIX K

ANALYTICAL PROCEDURE FOR ANALYSIS OF VOLATILE ORGANICS PRESENT ON CHARCOAL TUBES

VOLATILE ORGANICS
PORE GAS ANALYSIS
CHARCOAL TUBES/SOLVENT DESORBTION/GC/MS

Analyte: Volatile Organics Method No.:

Matrix: Charcoal tubes Detection Limits: See Table 1

Procedure: CS2 desorption of charcoal tubes,direct injection into GC/MS.

Precision and Accuracy (based on spikes samples and blind QC samples):

Precision: +/- 10.7% Accuracy: +/- 5.0%

Effective Date: 01/01/86

Author: Suzanne C. Bell

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1. Principle of Method

1.1 Gases from the pore holes are pumped through charcoal tubes (ORB032) at volumes from 1 to 5 liters. The tubes are desorbed with CS2 containing the internal standard mixture. A constant volume of the extract is injected into the gas chromatograph/mass selective detector (GC/MSD, GC/MS).

1.2 The resulting peaks are identified by a 3 step process and the areas of the analyte peaks and the area of the internal standard peaks are used in conjunction with calibration tables to quantitate the analytes.

1.3 Only those compounds listed in Table 2 are routinely quantitated, unless the submittor has made specific special requests.

2. Detection Limits and Range

2.1 The limits of detection (LOD) vary among the analytes. Table 1 lists some representative analytes and detection limits. The working range of the method is approximately 2.0-40 ug/tube.

2.2 The detection limit is expressed in terms of an estimated limit of identification, i.e. the minimum quantity per tube needed to yield an identifiable MS scan. The limits of detection based on the 3 x S/N (signal/noise) standard are in the range of 5-25 picograms per tube.

TABLE 1

DETECTION LIMITS OF REPRESENTATIVE ANALYTES

Compound	Detection limit ug/tube
Trichlorofluoromethane	3.0
Dichlorodifluoromethane	3.0
Chloroform	1.0
111 Trichloroethane	3.0
Carbon tetrachloride	1.0
Trichloroethene	1.0
Toluene	0.8
1,1,2,2 Tetrachloroethane	1.0
Xylenes	1.1
Ethyl benzene	1.0
Chlorobenzene	1.0
1,2 Dichloroethane	0.8
Tetrachloroethene	1.0
Methylcyclopentane	0.8
Dibromomethane	1.6

TABLE 2

ROUTINELY QUANTITATED COMPOUNDS

Chloromethane
Bromomethane
Vinyl chloride
Chloroethane
Methylene chloride
Acetone
1,1 Dichloroethane
1,1 Dichloroethene
trans-1,2 Dichloroethene
Chloroform
1,2 Dichloroethane
2-Butanone
1,1,1 Trichloroethane
Carbon tetrachloride
Vinyl acetate
Bromodichloromethane
1,1,2,2 Tetrachloroethane
1,2 Dichloropropane
trans-1,3 Dichloropropene
Trichloroethene
Dibromochloromethane
1,1,2 Trichloroethane
Benzene
cis-1,3 Dichloropropene

Bromoform
2-Hexanone
4-Methyl-2-Pentanone
Tetrachloroethene
Toluene
Chlorobenzene
Ethyl benzene
Styrene
Total xylenes
Trichlorofluoromethane
Tetrohydrofuran

3.0 Accuracy and Precision

3.1 Spiked tubes and blind quality control (QC) samples are used to calculate recovery factors, accuracy, and precision. Any of the routinely quantitated compounds may be used for these analyses.

3.2 The average percent recovery calculated from spikes is 95.3% for 11 compounds. Accuracy calculated (from QC samples) when considering this recovery factor is 95.3% [relative standard deviation (RSD) of 2.6%]. Precision calculated using spiked samples (n=60) is 10.7%. These values are modified as more QC and spike data becomes available.

4. Interferences

4.1 Compounds that coelute with each other will prevent accurate quantitation and definitive identification.

4.2 Compounds that coelute with the internal standards will hamper quantitation of any other analytes and force the use of different internal standards.

4.3 Benzene is a common contaminant of CS2 and may prohibit the accurate quantitation of any benzene or carbon tetrachloride that might be in the sample (benzene and carbon tetrachloride coelute).

5. Storage of Samples

5.1 Samples are stored in the freezer upon receipt and until extraction.

5.2 Samples may be stored for 8 weeks.

6. Apparatus

6.1 Hewlett-Packard 5880A Gas Chromatograph (GC) equipped with a 5880 Series Level 4 Treminal.

6.2 Column: SPB-5 or DB-5, 60 m length, 1.0 um film thickness, .25mm ID.

6.3 Hewlett-Packard 5970B Mass Selective Detector (MSD) and accompanying workstation.

6.4 Glassware

6.4.1 Note that all nondisposable glassware is cleaned by the following procedure:

6.4.1.1 Rinse with acetone followed by methanol

6.4.1.2 Wash in detergent solution.

6.4.1.3 Rinse with tap water followed by organic free water (OFW).

6.4.1.4 Store at 100-150c.

6.4.2 Volumetric flasks

6.4.3 Amber bottles, 1 oz, with teflon lined screw caps

6.4.4 Microsyringes

6.4.5 Disposable pasture pipettes

6.4.6 Small (2.5ml-10ml) vials with teflon screw caps for sample extraction and storage of stock solutions.

6.5 Laboratory agitator for sample extraction

6.6 Wide, shallow container for icing samples

6.7 Diamond tipped pencil for scoring charcoal tubes

6.8 Gas purification cartridge for the GC/MS gas supply

6.9 Analytical balance

7. Reagents

7.1 Ultrapure helium gas for the GC/MS

7.2 Spectrophotometric grade CS2

7.3 Individual standard grade standards and internal standards

7.4 Liquid nitrogen for GC cooling

7.5 Organic free water:

7.5.1 Boil 1000 ml of distilled water for 20 minutes

7.5.2 Bubble through nitrogen or helium until cool enough to handle

7.5.3 Transfer to a clean glass container

7.5.4 Continue to bubble through helium until cool. Seal with a ground glass stopper or teflon lined screw cap. Replace after 2 weeks.

8. Calibration and standards

8.1 Internal standard solution (ISM)

8.1.1. The internal standards used are 2-bromo-1-chloropropane and 1,4 dichlorobutane. To prepare the stock internal standard solution, fill a clean 10 ml volumetric flask to just below the neck area with CS2 and allow any extra solvent to evaporate from the neck and stopper area.

8.1.2 Place the stoppered flask on an analytical balance and tare. Inject 15-20 ul of the neat internal standard by placing the needle as far down into the liquid as possible, quickly expelling the material, removing the syringe, and capping the flask. Record the weight. Retare and repeat until all the internal standards have been added.

8.1.3 Dilute the material in the flask with CS2 to 10ml. Mix by inverting 3 times only. Allow the flask to rest for 2-3 minutes.

8.1.4 Discard the material in the neck of the flask and transfer the remaining material to a small(8 to 10 ml), prechilled screw top glass vial and seal immediately.

8.1.5 Store at 0c until used. Always allow all reagents, stock solutions, and glassware to reach room temperature prior to usage.

8.2 Prepare the working stock solution of the internal standard by diluting the stock solution by a factor of 1 in 100.

8.2.1 At least 25mls of the internal standard working stock needs to be prepared for sample extraction and the preparation of standards.

8.2.2 Prepare and fill a 25ml volumetric flask as described in section 8.1.1.

8.2.3 Inject 250 ul of the stock solution into the CS_2, dilute and mix as described in section 8.1.2

8.2.4 Store the working dilution of the internal standard in a 1 oz amber bottle at 0c until used.

8.3 Prepare stock standard solutions for the samples, QC samples, and spikes in the manner described in section 8.1. Store in the small vials at 0c until used. No dilution of these stock solutions is necessary.

8.4 Calibration

8.4.1 Calibration curves for all analytes (sample, QC, and spike) are prepared in the range of .002 to .02 ug/ul as needed.

8.4.2 Calculate the volumes (ul) of the stock solution necessary to achieve these concentrations in 1.0ml of the 1/100 dilute internal standard mix as follows.

$Vs = (Cx \times 1000 \text{ ug/ul}) / Cs$

where:

Cx = the concentration of the analyte in ug/ul desired
Cs = the concentration of the stock solution in ug/ul(mg/ml)
Vs = the volume of the stock solution needed in ul

8.4.3 The calibration table is generated by running several concentrations of the analyte of interest in the 1/100 ISM. Each concentration of analyte is run in duplicate and the mean area ratios and response factors used in construction of the final table. Mixtures containing several analytes may be run to save time.

8.4.3.1 Fill a clean 1.0ml volumetric flask to the line with the 1/100 ISM.

8.4.3.2 Inject the calculated volume of the analyte stock into the liquid as described in section 8.1.2

8.4.3.3 Mix by briefly (2-3 seconds) spinning on a vortex mixer. Extreme care must be taken to avoid splashing of the liquid or excessive bubbling.. Ideally, the material will be swirled without ever coming into contact with the stopper of the volumetric. Practice of this technique is advised prior to attempting it.

8.4.3.4 Immediately inject 1.5ul (or other volume as long as it is consistent throughout the analysis) into the GC/MS as described in section 8.5. Place the 1ml mix into the freezer until the second injection is made. This solution is good only for 1 hour. The calibration table should be generated by running the lowest concentration first and continuing through to the highest in sequential order.

8.4.3.5 Always run the samples to be quantitated and the corresponding calibration table on the same AUTOTUNE of the MSD to prevent variations of the area counts. This will require that all of this work be completed within 2 or 3 days.

8.4.3.6 For each sample in each level of the calibration table, calculate the area ratio and the response factor as follows:

$$Rf = (Ax / Ais) \times (Cis / Cx)$$

where:

Ax = the area of the analyte peak
Ais = the area of the corresponding internal standard
Ax / Ais = the area ratio
Rf = the response factor

8.4.3.7 Construct the calibration curve by plotting the mean Ax / Ais of each level vs. the mean Rf of that level. Alternatively, calculate the mean, standard deviation and RSD of all of the Rf's. If the RSD is less than or equal to 4.0% over the entire calibration range, the mean Rf may be used in calculation of concentration.

8.4.3.8 Recalibrate as needed, or once a week. Check the curve if a new AUTOTUNE is generated on the MSD.

8.5 Injection technique

8.5.1 Use the same syringe for injection into the GC/MS throughout the analysis. The calculations assume a constant, reproducibile volume.

8.5.2 The injection is made in the splitless mode. The splitless valve (valve 6) is controlled by the Run Table of the GC, and will control the timing of the injection (see section 9.2.5).

8.5.3 Load the syringe with 1.5ul (or other constant volume) after the GC/MS has reached the ready state with the proper temperatures (see section 9.2).

8.5.4 Start the GC run which activates the Run Table sequence.

8.5.5 When the light on the top of the GC comes on (indicating that the Run Table has initiated the splitless mode) immediately insert the syringe into the injector port and slowly inject the solution. The injection should take at least 5 seconds.

8.5.6 When the light extinguishes, quickly remove the syringe.

9. Procedure

9.1 Sample preparation

9.1.1 Each sample tube is to be divided into front and back sections relative to the incoming pumped air flow.

9.1.2 Cut the front end of the tube off and pour the charcoal into a small vial (2-8ml) and seal. Pour the charcoal from the rear section into a separate vial and seal. Store the vials in the freezer until extraction.

9.1.3 Prior to extraction, fill a shallow, wide tray with ice to a depth sufficient to cover the sample vials 2/3 to the top. Place the vials to be extracted into the ice bath.

9.1.4 Inject each sample vial with 1.0ml of the 1/100 ISM. Inject very slowly, watching for any signs of evaporation/condensation in the vials. Seal the vials immediately.

9.1.5 Prepare a maximum of 10 vials. When all vials have had solvent added, place them on the agitator and extract for 30 minutes. Freeze until analysis.

9.2 Set the GC/MS parameters

9.2.1 Autotune the MSD. Retain the same parameters until all samples and calibration curves have been run (3 days at most).

9.2.2 MSD method: PORE.M

9.2.3 MSD/GC interface temperature: 250c

9.2.4 GC oven temperature program: 0c for 0.1 minute to 45c for .5 minutes at 20c/min. 45c to 70c at 10c/minute, hold for .5 minutes. 70c to 90c for 1 minute at 2c/minute. 90c to 200c for 4 minutes at 8c/minute. Post value of 220c for 5 minutes. These parameters may be altered as needed.

9.2.5 GC Run Table: At 0.01 minute, valve 6 is turned on (splitless on) and valve 7 (MSD) is turned on. At 0.06 minute, valve 7 is turned off (this starts the MSD). At 0.30 minutes, valve 6 is turned off. The run is stopped at 30 minutes.

9.2.6 Injector temperature: 250c

9.2.7 For more information, refer to the instrument manuals.

9.3 Sample analysis

9.3.1 Allow the cold extracts to reach room temperature.

9.3.2 Inject the sample extract as described in section 8.5.

9.3.3 For each set of samples, first determine the background. Extract blank tubes as if they were actual sample tubes. Inject these extracts first (refer to section 8.5) and determine what compounds and peaks are the result of the extraction process and the instrumental system. Determine the mean, standard deviation, and RSD of the areas of these peaks.

9.3.4 After determining the background, run the extracts that were made from the backs of the charcoal tubes. If any nonbackground peaks are observed, it may be assumed that breakthrough has occurred, and this will prevent the meaningful quantitation of the front end of the tubes. Notify the submittor and have the pores resampled at a lower volume of flowthrough. Do not analyze the front sections of those samples showing breakthrough.

9.3.5 Run the remaining extracts. Any sample that requires quantitation should be run in duplicate and the mean area ratios used in the calculations.

9.3.6 Determine what calibration curves are to run and generate them as soon after the sample runs as possible. Several analytes may be run in a mixture to expedite this process.

10. Interpretation of results

10.1 Determine which peaks of the resulting total ion chromatograph (TIC) are the result of background. If any of the background peaks shows an area greater than the mean + 2 standard deviation units as calculated in section 9.3.3, assume that there are compounds in the sample causing the area increase, and attempt to identify these compounds.

10.2 The identification of the compounds in the sample is a three stage process:

10.2.1 Integrate the TIC and use one of the user libraries to obtain a preliminary identification of the mass spectra of the peaks of interest. Further efforts will focus on any compounds that might be one of those in Table 2, unless the submittor specifically requested definitive information on other compounds.

10.2.2 Confirm the identifications by using reference scans and by examining the fragmentation patterns to be sure that these identifications are reasonable.

10.2.3 Final confirmation is made by comparing the retention time of the unknown with that of the standard material used to construct the calibration table.

10.3 Quantitation

10.3.1 Calculate the area ratios of the analytes and their corresponding internal standard (see section 8.4.3.6).

10.3.2 Using the appropriate calibration curve, calculate the Rf to be used or use the mean Rf if the criteria in section 8.4.3.6 have been met.

10.3.3 Calculate the concentration of the unknown as follows:

$$Cx = (Ax / Ais) \times (Cis / Rf)$$

where:

Cx = the concentration of the unknown in ug/ul

See section 8.4.3.6 for the other definitions

Total concentration (ug/tube) = Cx x 1000ul extraction volume

10.3.4 Report out the concentration as total ug/tube. The value of ug/liter of air may be reported as long as it is made clear that the actual volume of air is known only insofar as reported by the submittor.