RESULTS OF DRILLING AND TESTING

Southeast Water Treatment Plant

Production Well Nos. 1 and 2

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TABLE OF CONTENTS

RESULTS OF DRILLING AND TESTING
Southeast Water Treatment Plant
Production Well Nos. 1 and 2

TABLES

FIGURES

APPENDICIES

1.0 INTRODUCTION

1.1 Purpose and Scope

Orlando Utilities Commission (OUC) is in the process of expanding their water supply system to serve the projected growth in its southern service area near the Orlando International Airport. The Southeast Water Treatment Plant (Figure 1) will supply the surrounding areas with approximately five million gallons per day (MGD) capacity at this time.

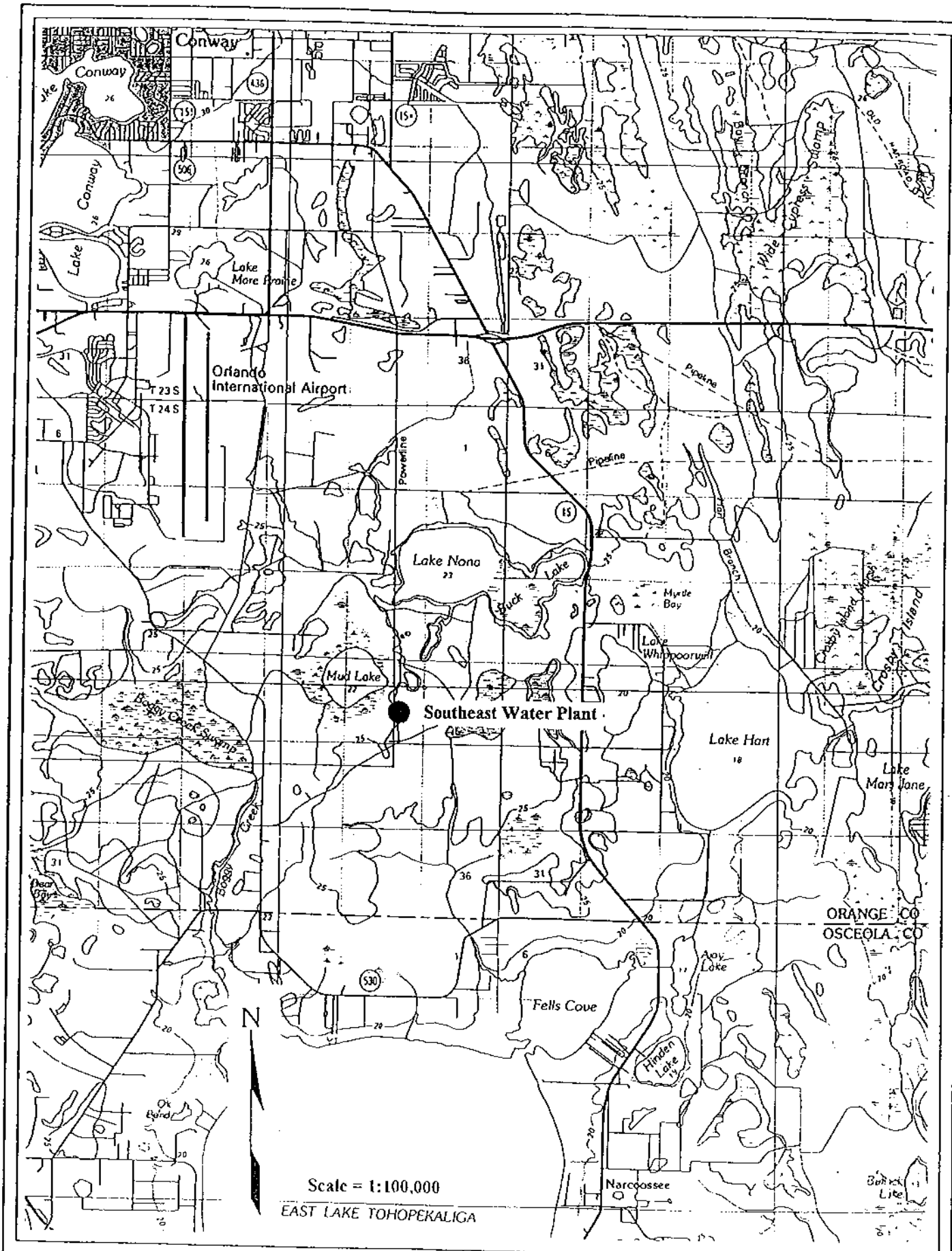
Two high capacity test/production wells (Well Nos. 1 & 2) were installed at the new OUC Southeast WTP facility. These wells were constructed by Diverified Drilling Corporation, from Tampa, Florida. Barnes, Ferland and Associates, Inc. (BFA) provided hydrogeological consulting and well construction management services under a Sub-Consultant Agreement with Sverdrup Civil, Inc., the Design Builder. The drilling and testing program was designed to determine if the Upper or Lower Floridan aquifer would be used as the source. The following report provides a summary of well construction and testing and presents all data that were collected. This information will be useful for future permitting and expansions of this well field.

1.2 Regional Hydrogeologic Setting

The hydrogeology of southeast Orange County is characterized by a thin, surficial-sand aquifer underlain by the thick, highly productive carbonate rocks of the Floridan aquifer system. The Floridan aquifer is overlain and confined throughout the study area by the intermediate confining unit, a less permeable and unconsolidated sequence of interbedded sands, silts and clays. The Floridan aquifer system is subdivided into two major permeable zones, the Upper and Lower aquifer, separated by a less permeable zone, the middle semiconfining unit. The relationship between the geologic units and hydrogeologic units in the study area is shown in Figure 2.

2.0 WELL CONSTRUCTION SUMMARY

Two new high capacity production wells were completed at the Southeast WTP at the general location shown on Figure 3. Both supply wells were constructed into the Lower Floridan



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LOCATION OF THE SOUTHEAST WATER PLANT

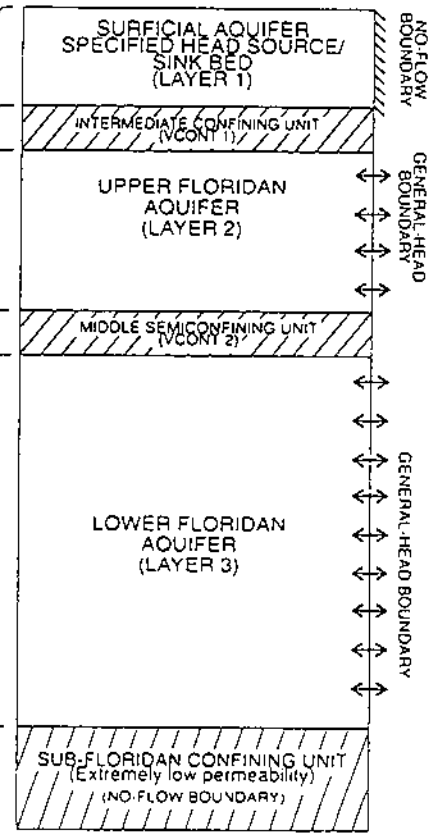
FIGURE 1

DWG_NAME

GEOLOGIC UNITS
(Modified from Tibbals, 1990, fig. 8)

SYSTEM	SERIES		STRATIGRAPHIC UNIT	THICKNESS (feet)	LITHOLOGY	AQUIFER
QUATERNARY	RECENT		UNDIFFERENTIATED DEPOSITS	0-150	Alluvium, freshwater marl, peats and muds in stream and lake bottoms. Also, some dunes and other windblown sand.	SURFICIAL AQUIFER SYSTEM
	PLEISTOCENE				Mostly marine quartz sand, unconsolidated and generally well graded. Also, some fluviatile and lacustrine sand, clay and marl.	
TERTIARY	PLIOCENE			0-100	Interbedded deposits of sand, shell, and sandy clay; base characterized by phosphatic clay and rubble.	
	MIOCENE		HAWTHORN GROUP	0-250	Cream to light green to greenish-gray clayey quartz sand, silt, and sandy clay; often contains phosphatic sands and clays; phosphatic limestone often found at base of formation.	
	EOCENE	UPPER	OCALA LIMESTONE	0-200	Marine foraminiferal limestone, white to cream to tan, soft to hard, granular, highly porous, sometimes dolomitic.	FLORIDAN AQUIFER SYSTEM
		MIDDLE	AVON PARK FORMATION	600-1600	Marine limestone, light brown to brown, fragmental, poor to good porosity, highly fossiliferous, slightly carbonaceous; and dolomite, brown to dark brown, crystalline.	
		LOWER	OLDSMAR FORMATION	300-1350	Marine limestone, light brown to white, chalky, porous, fossiliferous with interbedded brown crystalline dolomite.	
	PALEOCENE		CEDAR KEYS FORMATION	500-2200	Marine dolomite, light gray; hard, slightly porous to porous, crystalline, in part fossiliferous, with considerable anhydrite and gypsum; some limestone.	

PRINCIPAL HYDROGEOLOGIC UNITS, EQUIVALENT LAYERS IN COMPUTER MODEL, AND BOUNDARY CONDITIONS



SOURCE: Murray and Halford, 1996

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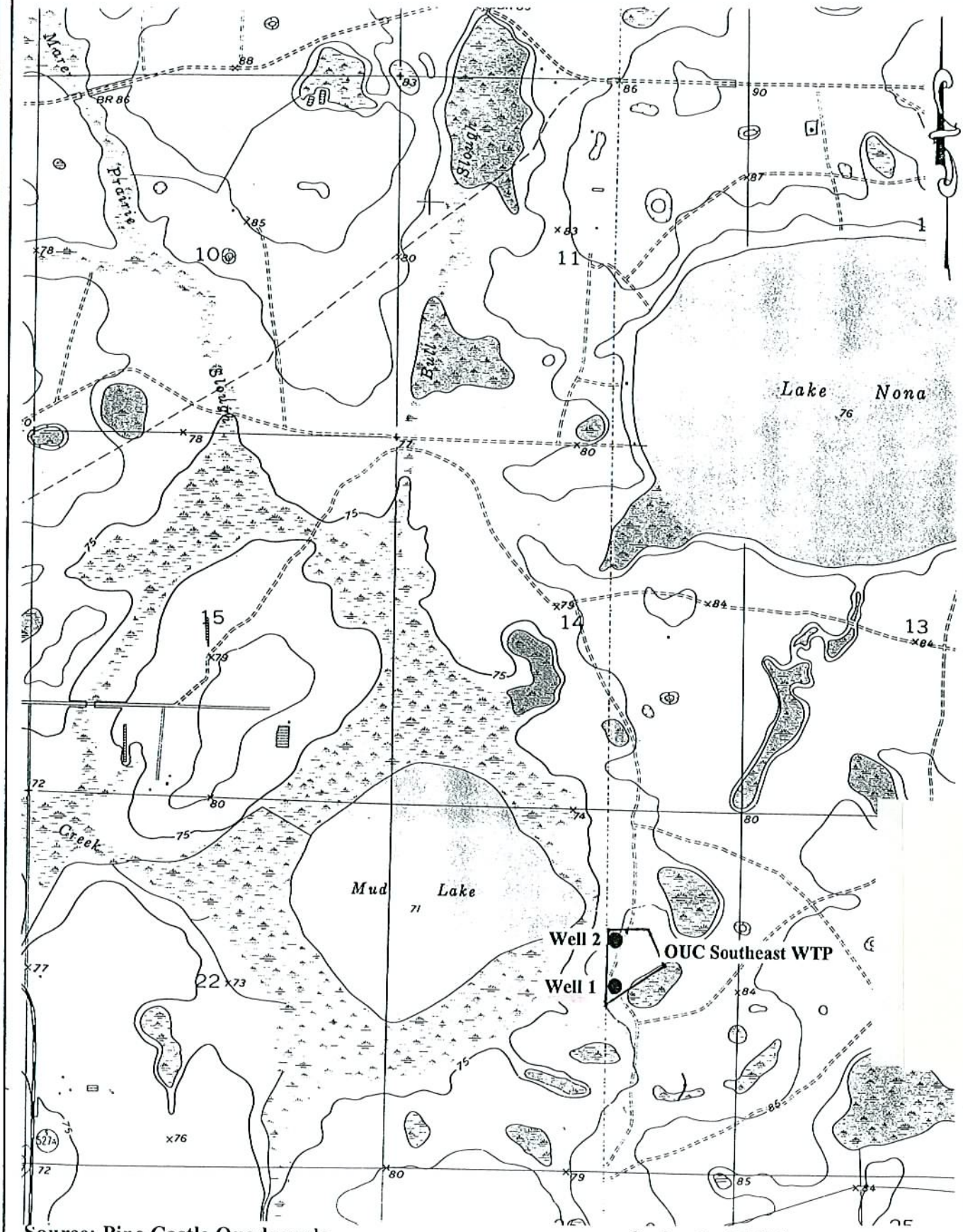
Hydrogeologic Units in the Orange County, Florida Vicinity

FIGURE 2



Source: Pine Castle Quadrangle

Scale : 1 : 24,000

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Location of Well Nos. 1 and 2

FIGURE 3

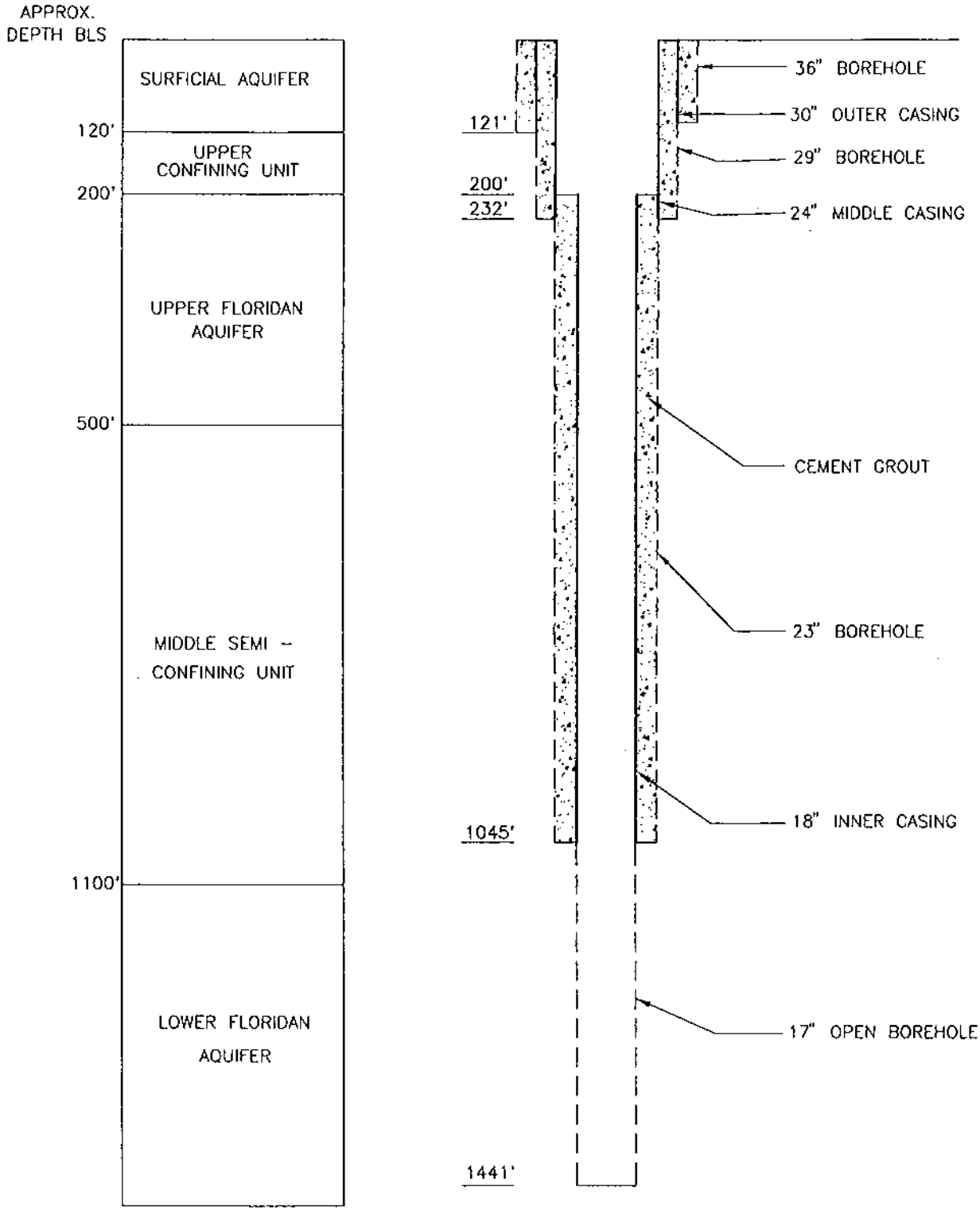
DWG_NAME

aquifer, based primarily on water quality results. The construction details of Wells Nos. 1 and 2 are illustrated in Figures 4 and 5, respectively. Well construction correspondence is provided in Appendix 1 that led to the final construction of these wells. The South Florida Water Management District Well Construction Permit and the Drilling Contractor's Well Completion Report are included in Appendix 2. Submittals for well construction materials are contained in Appendix 3.

The wells were constructed between the period October 24, 1998 to April 27, 1999. The outer and middle casings for Well Nos. 1 and 2 were installed simultaneously using two drill rigs. Once the middle casing for Well No. 2 was installed, the second rig was removed from the site/project. These wells were drilled using conventional mud-rotary within the unconsolidated sand, shell and clay materials and with reverse-air rotary within the consolidated limestone and dolomite of the Floridan aquifer. No notable difficulties were experienced while drilling these wells, although a sediment filled cavity was encountered while drilling Well No. 2 at a depth of 978 to 982 feet below land surface.

Extensive sampling and testing were performed during drilling of Well No. 1 to determine what depth/aquifer zone to complete the wells. Formation cuttings were collected every ten foot interval to total depth to assist in determining the outer and middle casing setting depths and the rock properties/nature. Lithologic logs are provided in Appendix 4. Static and pumping geophysical logs were performed within Well No. 1 pilot hole to 1,300 feet and within both completed wells. Geophysical logs are contained in Appendix 5 and described in Section 3. TV video logs were also performed within the pilot hole of Well No. 1 and within each completed well.

Groundwater quality was an important factor in evaluating treatment processes and selecting what aquifer zone to complete these wells. All water quality data collected is provide in Appendix 6 and discussed in Section 5. Water samples were collected from the reverse air discharge, every ten feet within the Floridan aquifer and field tested during drilling. Within Well No. 1, the pilot hole was drilled to a depth of 600 feet and a submersible pump was installed to collect water samples representative of the Upper Floridan aquifer. The pilot hole was advanced



SCALE : N.T.S.

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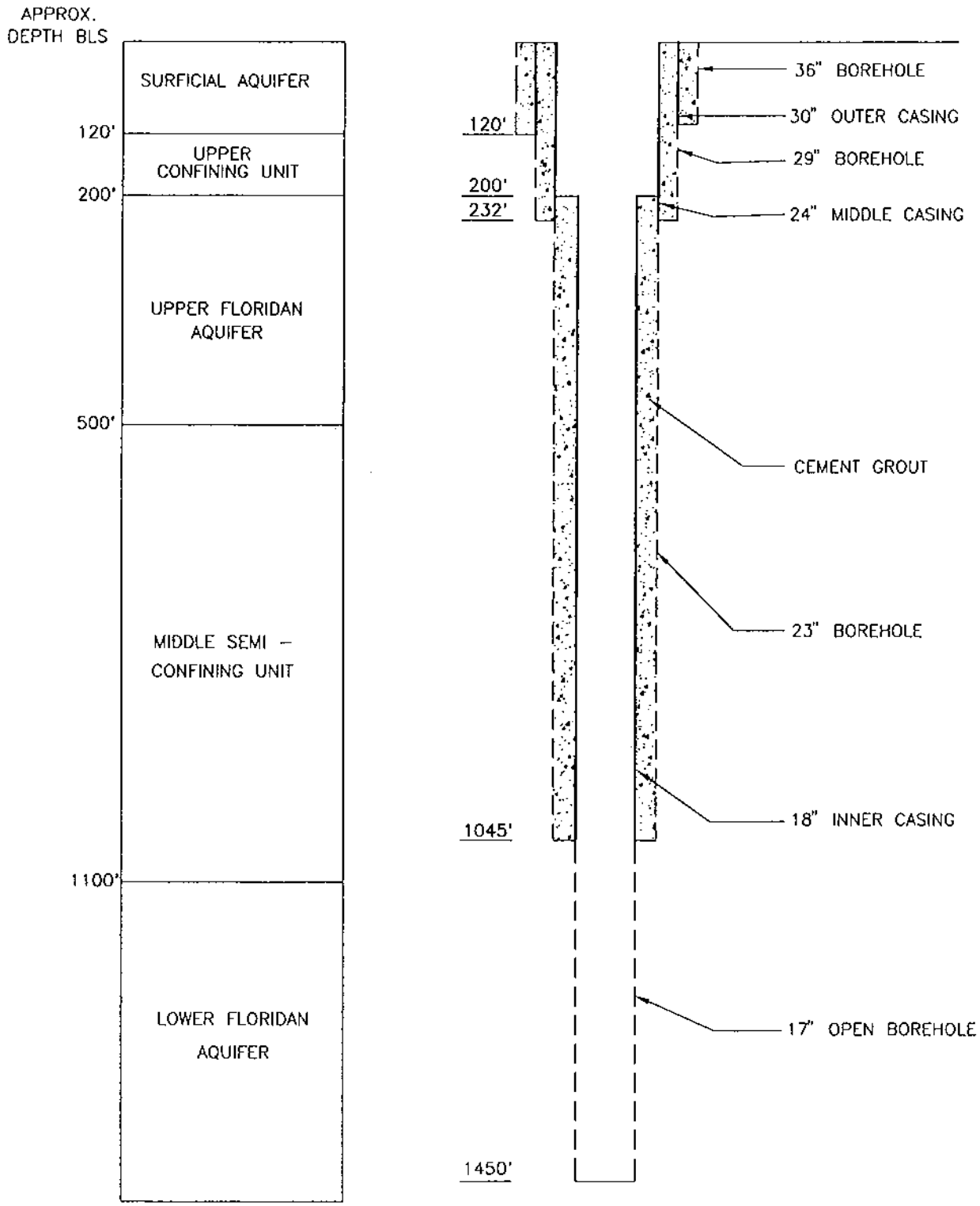
OUC Southeast Water Plant
Construction Details of Well No. 2

FIGURE
5

SEAST.DWG



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OUC Southeast Water Plant
Construction Details of Well No. 1

FIGURE
4

SEAST.DWG

to a depth of 1,300 feet and a single packer was set at 1,085 feet to collect representative samples of the Lower Floridan aquifer. The Lower Floridan aquifer was selected to complete the wells based primarily on water quality results and treatment process options/compatibility.

Once the inner casing was installed to 1,045 feet for Well No. 1, the borehole was reamed to a depth of 1,300 feet and a test pump was installed to determine well capacity/yield and groundwater quality. The well had a relatively low capacity and it was decided to deepen the open hole to a depth of 1,450 feet. A much higher capacity was achieved at this depth. Variable rate and constant rate test data are provided in Appendix 7 and discussed in Section 4. Well No. 2 was completed to a similar open interval (1,045-1,440).

The wells were developed by pumping and surging for several hours each. At the end of well development, the groundwater appeared visibly clear and no sediment was observed in the samples collected using an Imhoff Cone. Turbidity was less than 1 NTU for each well.

The Drilling Contractor conducted a plumbness test within the 24-inch middle well casing to a depth of 200 feet. Results for each well test were within the specified requirements, and the plumbness was determined to be acceptable for each well.

The Contractor's total cost for constructing Well No. 1 was $402,878.98 and Well No. 2 was $362,750.98. This includes site preparation and testing but does not include outfitting the well with the permanent pumping equipment. The unit costs for completing these wells are provided in Tables 1 and 2.

3.0 BOREHOLE GEOPHYSICAL LOGGING

Borehole geophysical logging involves lowering measuring devices down a borehole on a wire line to record various parameters related to the borehole and the rocks that it penetrates. Appendix 5 contains a description of the borehole log parameters and copies of all geophysical logs that were obtained for this project.

Table 1 - Construction Cost Summary for Well No 1

DESCRIPTION	BUDGETED QUANTITY				COMPLETED QUANTITIES			
	UNIT	QTY	UNIT COST	BID TOTAL	UNIT	QTY	UNIT COST	TOTAL COST
1. INDEMNIFICATION	LS	0.5	$3,000	$1,500	LS	0.5	$3,000	$1,500
2. PERFORMANCE / PAYMENT BONDS	LS	0.5	$10,000	$5,000	LS	0.5	$10,000	$5,000
3. INSURANCE	LS	0.5	$2,000	$1,000	LS	0.5	$2,000	$1,000
4. MOBILIZATION	LS	0.5	$93,329	$46,665	LS	0.5	$93,329	$46,665
5. INSTALL / OUTFIT 75 GPM WELL	EA	1	$6,000	$6,000	EA	1	$6,000	$6,000
6. PREPARE / STABILIZE ACCESS ROAD	LS	0.5	$50,000	$25,000	LS	0.5	$50,000	$25,000
7. MAINTAIN ACCESS ROAD	MON	4	$1,000	$4,000	MON	5	$1,000	$5,000
8. CLEAR / PREPARE WELL PAD / ENTRY	EA	1	$4,000	$4,000	EA	1	$4,000	$4,000
9. TEMP. FARM FENCE AROUND SITE	EA	1	$2,000	$2,000	EA	1	$2,000	$2,000
10. OFF SITE DISPOSAL OF MUD / CUTTING	LS	0.5	$15,000	$7,500	LS	0.5	$15,000	$7,500
11. ON SITE HANDLING OF DREDGE	CY	50	$5	$250	CY	0	$0	$0
12. DRILL 10" PILOT HOLE (0 - 250')	LF	250	$30	$7,500	LF	250	$30	$7,500
13. REAM PILOT HOLE FOR 30" CASING (0 - 100	LS	110	$70	$7,700	LS	120	$70	$8,400
14. SET 30" CASING (0 - 100')	LF	100	$120	$12,000	LF	120	$120	$14,400
15. REAM HOLE FOR 24" CASING (100 - 280')	LF	160	$55	$8,800	LF	112	$55	$6,160
16. SET 24" CASING (0 - 250')	LF	250	$91	$22,723	LF	232	$91	$21,086
17. DRILL 10" PILOT HOLE (280 - 1050')	LF	1025	$30	$30,750	LF	1050	$30	$31,500
18. REAM HOLE FOR 18" CASING (250 - 1060')	LF	810	$45	$36,450	LF	813	$45	$36,585
19. CALIPER LOG BOREHOLE - SET 1	SET	1.5	$2,000	$3,000	SET	1	$2,000	$2,000
20. SET 18" CASING (150 - 1050')	LF	900	$65	$58,500	LF	845	$65	$54,925
21. CEMENT GROUT (ALL CASING)	SK	4000	$10	$40,000	SK	3777	$10	$37,770
22. CEMENT GROUT UNSTABLE ZONE	SK	750	$10	$7,500	SK	0	$0	$0
23. PLACE LIMEROCK GRAVEL	CY	50	$150	$7,500	CY	27.5	$150	$4,125
24. RIG TIME	HR	100	$150	$15,000	HR	7	$150	$1,050
25. DRILL 16" PILOT HOLE (1040 - 1450')	LF	400	$30	$12,000	LF	405	$30	$12,150
26. REMOVE UPPER 150' OF 18" CASING	EA	1	$4,000	$4,000	EA	1	$4,000	$4,000
27. SET / REMOVE TEST PUMP	EA	1.5	$4,500	$6,750	EA	3	$4,500	$13,500
28. PUMP DISCHARGE PIPE	LS	250	$15	$3,750	LS	200	$15	$3,000
29. WELL DEVELOPMENT	HR	10	$250	$2,500	HR	21.5	$250	$5,375
30. GEOPHYSICAL LOGGING - SET 2	SET	1	$5,000	$5,000	SET	2	$5,000	$10,000
31. TEST PUMPING	HR	18	$250	$4,500	HR	12.5	$250	$3,125
32. COLOR TV VIDEO LOG	EA	1	$3,000	$3,000	EA	2	$3,000	$6,000
33. TEMP. WELL COVER & ACCESS PORT	EA	1	$3,000	$3,000	EA	1	$3,000	$3,000
34. DEMOBILIZATION & CLEANUP	LS	0.5	$2,000	$1,000	LS	0.5	$2,000	$1,000
35. WELL DEVELOPMENT THRU STEM	HR	12	$200	$2,400	HR	28	$200	$5,600
36. SET & REMOVE PACKER EQUIPMENT	EA	2	$3,000	$6,000	EA	2	$3,000	$6,000
SUB-TOTAL				$414,237				$401,916
ALTERNATIVE ITEMS								
37. MOVE DRILL RIG / EQUIPMENT	LS	0.5	$18,000	$9,000	LS	0	$0	$0
38. RECYCLED CONCRETE @ RR CROSS	CY	300	$15	$4,500	CY	64.2	$15	$963
39. BENTONITE GEL	SK	250	$9	$2,250	SK	0	$0	$0
40. WELL PLUGGING / ABANDONMENT	SK	750	$15	$11,250	SK	0	$0	$0
SUB-TOTAL				$27,000				$963
CUMULATIVE TOTAL								*$402,879*

Table 2 - Construction Cost Summary for Well No. 2

DESCRIPTION	BUDGETED AMOUNT				COMPLETED QUANTITIES			
	UNIT	QTY	UNIT COST	BID TOTAL	UNIT	QTY	UNIT COST	TOTAL COST
1. INDEMNIFICATION	LS	0.5	$3,000	$1,500	LS	0.5	$3,000	$1,500
2. PERFORMANCE / PAYMENT BONDS	LS	0.5	$10,000	$5,000	LS	0.5	$10,000	$5,000
3. INSURANCE	LS	0.5	$2,000	$1,000	LS	0.5	$2,000	$1,000
4. MOBILIZATION	LS	0.5	$93,329	$46,665	LS	0.5	$93,329	$46,665
5. INSTALL / OUTFIT 75 GPM WELL	EA	1	$6,000	$6,000	EA	1	$6,000	$6,000
6. PREPARE / STABILIZE ACCESS ROAD	LS	0.5	$50,000	$25,000	LS	0.5	$50,000	$25,000
7. MAINTAIN ACCESS ROAD	MO.	4	$1,000	$4,000	MO.	0.66	$1,000	$660
8. CLEAR / PREPARE WELL PAD / ENTRY	EA	1	$4,000	$4,000	EA	1	$4,000	$4,000
9. TEMP. FARM FENCE AROUND SITE	EA	1	$2,000	$2,000	EA	1	$2,000	$2,000
10. OFF SITE DISPOSAL OF MUD / CUTTING	LS	0.5	$15,000	$7,500	LS	0.5	$15,000	$7,500
11. ON SITE HANDLING OF DREDGE	CY	50	$5	$250	CY	0	$0	$0
12. DRILL 10" PILOT HOLE (0 - 250')	LF	250	$30	$7,500	LF	250	$30	$7,500
13. REAM PILOT HOLE FOR 30" CASING)	LS	110	$70	$7,700	LS	121	$70	$8,470
14. SET 30" CASING (0 - 100')	LF	100	$120	$12,000	LF	121	$120	$14,520
15. REAM HOLE FOR 24" CASING (100 - 280')	LF	160	$55	$8,800	LF	111	$55	$6,105
16. SET 24" CASING (0 - 250')	LF	250	$91	$22,723	LF	232	$91	$21,086
17. DRILL 10" PILOT HOLE (280 - 1050')	LF	1025	$30	$30,750	LF	850	$30	$25,500
18. REAM HOLE FOR 18" CASING (250 - 1060')	LF	810	$45	$36,450	LF	813	$45	$36,585
19. CALIPER LOG BOREHOLE - SET 1	SET	1.5	$2,000	$3,000	SET	1	$2,000	$2,000
20. SET 18" CASING (150 - 1050')	LF	900	$65	$58,500	LF	845	$65	$54,925
21. CEMENT GROUT (ALL CASING)	SK	4000	$10	$40,000	SK	4161	$10	$41,610
22. CEMENT GROUT UNSTABLE ZONE	SK	750	$10	$7,500	SK	0	$0	$0
23. PLACE LIMEROCK GRAVEL	CY	50	$150	$7,500	CY	29.5	$150	$4,425
24. RIG TIME	HR	100	$150	$15,000	HR	0	$0	$0
25. DRILL 16" PILOT HOLE (1040 - 1450')	LF	400	$30	$12,000	LF	395	$30	$11,850
26. REMOVE UPPER 150' OF 18" CASING	EA	1	$4,000	$4,000	EA	1	$4,000	$4,000
27. SET / REMOVE TEST PUMP	EA	1.5	$4,500	$6,750	EA	1	$4,500	$4,500
28. PUMP DISCHARGE PIPE	LS	250	$15	$3,750	LS	340	$15	$5,100
29. WELL DEVELOPMENT	HR	10	$250	$2,500	HR	6	$250	$1,500
30. GEOPHYSICAL LOGGING - SET 2	SET	1	$5,000	$5,000	SET	0.75	$5,000	$3,750
31. TEST PUMPING	HR	18	$250	$4,500	HR	12	$250	$3,000
32. COLOR TV VIDEO LOG	EA	1	$3,000	$3,000	EA	1	$3,000	$3,000
33. TEMP. WELL COVER & ACCESS PORT	EA	1	$3,000	$3,000	EA	1	$3,000	$3,000
34. DEMOBILIZATION & CLEANUP	LS	0.5	$2,000	$1,000	LS	0.5	$2,000	$1,000
35. WELL DEVELOPMENT THRU STEM	HR	12	$200	$2,400	HR	0	$0	$0
36. SET & REMOVE PACKER EQUIPMENT	EA	2	$3,000	$6,000	EA	0	$0	$0
CUMULATIVE TOTAL				*$414,237*				*$362,751*

Two suites of borehole geophysical logs were obtained for Well No. 1. The first suite was performed on November 25, 1998 when the borehole was cased to 232 feet and the pilot hole was drilled to a total depth of 1,300 feet. The second suite of geophysical logs was obtained on February 3, 1999 when the completed well was cased to 1,045 feet and finished to a total depth of 1,450 feet. Both suites consisted of caliper, gamma ray, multipoint electric, and static and pumped fluid flow, fluid resistivity and temperature.

On April 27, 1999, one suite of borehole geophysical logs was performed for Well No. 2 when the completed well was cased to 1,045 feet and open to total depth of 1,440 feet. This suite consisted of the caliper, gamma ray, multipoint electric and pumping fluid flow, and static fluid temperature and resistivity. Interpretive summaries of logging results are provided below.

3.1. Southeast Well Field Hydrogeologic Units

Interpretation of hydrogeologic units at the OUC Southeast Well Field is based on the two suites of logs for Well No. 1, formation cuttings and TV video logs to a depth of about 1,450 feet. Based on this information, the approximate depths of the hydrogeologic units at the Southeast WTP site are summarized as follows:

- Surficial aquifer system – 5 to 120 feet;
- Intermediate confining unit – 120 to 200 feet;
- Upper Floridan aquifer – 200 to 500 feet;
- Middle semi-confining unit – 500 to 1,120 feet;
- Upper zone of the Lower Floridan aquifer – 1,120 to about 1,450 feet;

The hydrogeologic units penetrated are further described as follows. The surficial aquifer, composed primarily of sandy material, occurs from the water table to depths of about 120 feet, where clayey materials begin to predominate. The proportion of clay increases downward and the intermediate confining unit occurs from about 120 feet to base of the Hawthorn Formation at about 200 feet. These two upper most hydrogeologic units are defined by the gamma-ray logs obtained within the well casing.

Caliper and multipoint electric logs were most useful in defining the underlying hydrogeologic units within the Floridan aquifer. The Upper Floridan aquifer occurs from depths of about 200 to 500 feet. Relatively soft limestone, with few fractures and solution cavities, occurs from bottom of casing (232 feet) to about 335 feet. From 335 feet to about 390 feet depth, more fractures and cavities are noted. From 390 feet to base of the Upper Floridan aquifer at about 500 feet, the rock appears more dolomitic and there are numerous fracture and solution zones. All of the Upper Floridan aquifer in this area is commonly assigned to the Avon Park formation, but the 200-335 feet interval in this borehole may be composed of the Ocala Limestone.

The contact between the base of the Upper Floridan aquifer and the top of the middle semiconfining unit is picked at about 500 feet depth where the lithology changes from a brownish dolomitic limestone containing some fracture and solution zones to a lighter colored limestone or dolomite, which is more massive (homogeneous and unfractured). This semiconfining unit continues to depth of about 1,120 feet and, though generally less permeable than the overlying and underlying aquifers, contains some zones of fractures and cavities that probably could be developed as moderately productive aquifers. The thicker massive zones, which occur in the intervals between 635-690 feet, 770-850 feet, 870-950 feet, and 1,020-1,120 feet appear to be the most confining parts of this hydrogeologic unit, and should function to maintain hydraulic isolation between the Upper and Lower Floridan aquifers in this area. The top of the Lower Floridan aquifer is at about 1,120 feet, with occurrence of more prominent solution features in dolomitic limestones, which continue to bottom of hole at 1,450 feet.

3.2 Distribution of Formation Yield

Fluid flow, temperature and resistivity logs, along with the caliper logs, were used to determine the distribution of yield zones in the Floridan aquifer and their relative yields. These interpretations are discussed below for each suite of logs obtained at Well No. 1 and for the single suite of logs obtained for Well No. 2.

3.2.1 Well No. 1 Yield Distribution (232-1,300 feet)

The first suite of logs was obtained when Well No. 1 was open to depths of 232 and 1,300 feet; that is, to all of the Upper Floridan aquifer and middle semiconfining unit and to approximately the upper 200 feet of Lower Floridan aquifer. Well No. 1 was pumped at about 3,000 gpm during fluid flow logging. The general distribution of yield is summarized as follows:

1) Essentially all the total yield is present in the borehole at about 440 feet depth, and the majority (perhaps 75-80 percent) of this total appears to be from a cavernous and fractured zone in the Upper Floridan aquifer at about 458-466 feet depth;
2) 20-25 percent below about 515 feet depth;
3) 15-20 percent below about 660 feet depth;
4) 10-15 percent below depth of about 835 feet; and
5) The remaining 10 percent, or less, is present at depth of about 1,130 feet.
6) Very little flow enters the borehole from below about 1,250 feet to bottom of hole at 1,300 feet.

This general distribution of yield zones is obtained from calculations based on the pumping fluid flow log at intervals where the cross sectional area of the borehole can be estimated with some confidence from the caliper log. An attempt was made to locate a suitable interval for calculation above each zone where significant flow entered the well as indicated by the pumping flow log. Some zones where significant flow entered the borehole (for example, at approximate depths of 460, 505, 1,140 and 1,240 feet) are also indicated on the fluid temperature and resistivity logs.

3.2.2 Well No. 1 Yield Distribution (1,045-1,450 feet)

The second suite of logs was obtained when Well No.1 was finished and open between depths of 1,045-1,450 feet, thus essentially being open only to the upper part of the Lower Floridan aquifer. The well was pumped at about 3,000 gpm during fluid flow logging. The general distribution of yield is summarized as follows:

1) At depth 1,310-1,320 feet, about 70 percent of total flow is present in borehole; most of which appear to enter from the prominent cavity at 1,373-1,379 feet;

2) At depth 1,220 feet, about 80 percent of total flow is present in borehole; this additional increment appears to enter the borehole between depth intervals of 1,225-1,255 feet depth;

3) The remaining approximately 20 percent of total flow enters the borehole in the interval 1,220 upward to 1,140 feet.

4) Essentially the total yield is present in the borehole at about 1,140 feet depth.

This distribution of yield zones is also generally shown by deviations on the pumping fluid temperature and resistivity log at approximate depths of 1,180, 1,240 and 1,375 feet.

3.2.3 Well No. 2 Yield Distribution (1,045-1,440 feet)

The single suite of geophysical logs for Well No. 2 was obtained when the well was finished and open to the 1,045 -1,440 depth interval; that is to the upper part of the Lower Floridan aquifer. During fluid flow logging, the well was pumped at about 3,000 gpm. The general distribution of yield is summarized as follows:

1) At depth 1,400 feet, about 20 percent of total yield is present in borehole; appearing to enter from the cavity system near the bottom of borehole;

2) At 1,334 feet, about 35 percent of total flow is present; with this additional increment appearing to enter from cavities at about 1,340 and 1,370 feet depth;

3) From 1,334 upward to 1,130 feet, remainder of total flow appears to enter the borehole in relatively even increments from the series of small cavities and solution features in this interval.

4) Essentially the total yield is present in the borehole at about 1,130 feet depth.

The above distribution of yield, from the pumping flow log, is generally verified by the fluid temperature and resistivity log, where the fluid temperature curve indicates presence of slightly cooler water in the borehole at depths of about 1,385 and 1,350 feet and from about 1,310 upward to 1,130 feet. Though this log was obtained under static conditions, it was made immediately after cessation of pumping so the borehole fluid temperature and resistivity conditions are essentially those that would have been obtained under pumping conditions.

4.0 AQUIFER PERFORMANCE TESTING

Both variable rate and constant rate tests were conducted for each of the new production wells. These tests were performed to determine; 1) Floridan aquifer characteristics; 2) the groundwater quality; and 3) drawdown information for final pump size and setting selection. A flow meter was used to measure the discharge rates. Water levels were measured within wells using a data logger and transducer equipment and backed up with an electronic water level sounder/tape. Appendix 7 contains measurement of water levels data made during testing. Results of variable rate and constant rate analyses are summarized in Table 3 and further discussed below:

4.1 Well No. 1 Variable Rate Test Results

Specific capacity, or the quotient of pumping rate and drawdown for a well, is an empirical determination which is necessary for proper pump selection and setting. The basic purpose of variable rate (also called step-drawdown) well and aquifer tests is to determine the drawdown at various pumping rates in order to establish a range of specific capacities and the optimal pumping rate for each production well. A preliminary variable rate pumping test was conducted when Well No. 1 was open to the Lower Floridan aquifer from bottom of casing at 1,045 feet to bottom of hole at 1,300 feet. On January 20, 1999, drawdown measurements were made while the well was pumped about 1 1/2 hours with the pump set at depth 120 feet. Results were:

Pumping Rate (gpm)	Pumping Level (feet bmp)	Static Level (feet bmp)	Drawdown (feet)	Specific Capacity (gpm/ft)
1,300	73.66	37.30	36.36	36
1,750	90.54	37.30	53.24	33

The pumping rate was also increased to 2,500 gpm, but the pumping level was greater than 100 feet depth; so pumping was stopped to avoid possible cavitation. Lower Floridan aquifer wells in Orange County typically have a much higher specific capacity than that obtained for Well 1 finished to total depth of 1,300 feet. It was thus recommended to deepen Well No. 1 to 1,450

Table 3- OUC Souteast WTP Results of Variable Rate and Constant Rate Testing

Well ID	Date	Open Interval (ft. BLS)	Pumping Rate (gpm)	Static Level (ft. BMP)	Static Level (ft. BMP)	Drawdown (feet)	Specific Capacity (gpm/ft)
No. 1	2/2/99	1045-1450	1780	45.93	34.8	11.13	160
No. 1	2/2/99	1045-1450	2380	52.43	34.8	17.63	135
No. 1	2/2/99	1045-1450	3490	66.52	34.8	31.72	110
No. 1	2/2/99	1045-1450	4950	89.80	34.8	55.00	90
No. 2	4/27/99	1045-1440	1750	51.44	39.6	11.84	150
No. 2	4/27/99	1045-1440	2450	56.89	39.6	17.29	140
No. 2	4/27/99	1045-1440	3500	69.08	39.6	29.48	120
No. 2	4/27/99	1045-1440	5000	92.83	39.6	53.23	95

Pumped Well ID	Report Figure No.	Analysis of Well ID	Method of Analysis	Test Phase	Trans-missivity (ft2/day)	Storage Coeff.
No. 1	8	No. 1	Cooper-Jacob	Pumping	91,000	---
No. 1	9	No. 1	Theis-Jacob	Recovery	81,000	---
No. 2	12	No. 2	Cooper-Jacob	Pumping	81,000	---
No. 2	13	No. 2	Theis-Jacob	Recovery	71,000	---
No. 2	14	No. 1 (Obs.)	Cooper-Jacob	Pumping	93,000	0.0003
No. 2	15	No. 1 (Obs.)	Theis-Jacob	Recovery	107,000	---
AVE.	---	---	---	---	87,000	---

feet which, based on extrapolation of stratigraphic data from other test sites in the area, should significantly increase the yield.

Subsequently, on February 2, 1999, a variable rate test was conducted with Well No. 1 now open to the Upper Floridan aquifer from bottom of casing at 1,045 feet to bottom of hole at 1,450 feet. This test consisted of four one-hour pumping steps at rates of about 1,780, 2,380, 3,490 and 4,950 gpm. Figure 6 shows the water levels in Well No. 1 during this variable rate test. This figure, which shows successive increases in drawdown with each increase in pumping rate, and is useful for comparison of well drawdown and capacity. Specific capacity values computed from the test data are shown in Table 3, which indicates that they ranged from 160 gpm/ft at the lowest pumping rate (1,780 gpm) to 90 gpm/ft at the highest pumping rate (4,950 gpm). These values of specific capacity are significantly higher than those obtained in the preliminary test, described above, which was conducted prior to Well No. 1 being deepened to total depth of 1,450 feet.

4.2 Well No. 1 Constant Rate Test Results

Constant rate tests provide data that can allow determination of aquifer quantitative parameters, such as transmissivity, storativity and leakance. These tests are conducted by pumping a well at as high a constant rate as practical, while monitoring the drawdown in the pumping well and other observation wells as available. It is also useful to monitor water-level recovery following cessation of pumping. On February 8, 1999, Well No. 1 was pumped for a period of 8 hours at rate of about 3,500 gpm. An observation well was not available, so water level monitoring was confined to the pumped well. Water levels were monitored, by use of a transducer in Well No. 1, during the 8 hours (480 minutes) of pumping and for 160 minutes of recovery. The tabulated water level data are included in Appendix 7. Figure 7 is a plot of water levels in Well No. 1 during this period of pumping and recovery plotted versus the logarithm of time since pumping began. There is an initial drawdown of more than 30 feet, accompanied by surging, until a relatively steady pumping level is established after about two minutes of pumping. There then appears to be a small, but continuing decline in pumping level until about 40 minutes into the test when the declining trend in pumping levels tends to flatten out. The section of semi-logarithmic

FIGURE 6 - OUC SOUTHEAST WTP
Well No. 1 Step Drawdown Test Results (2/2/99)

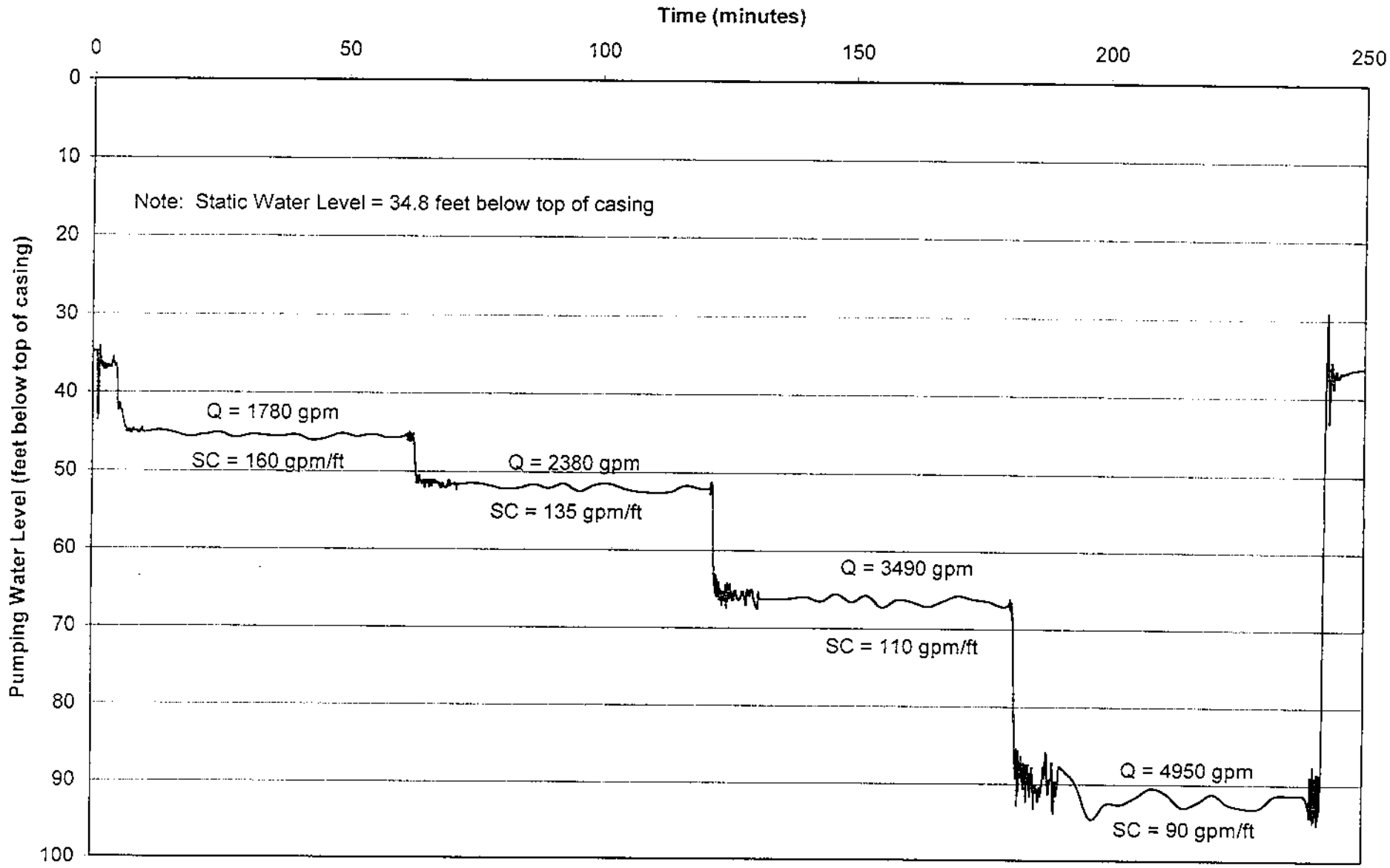
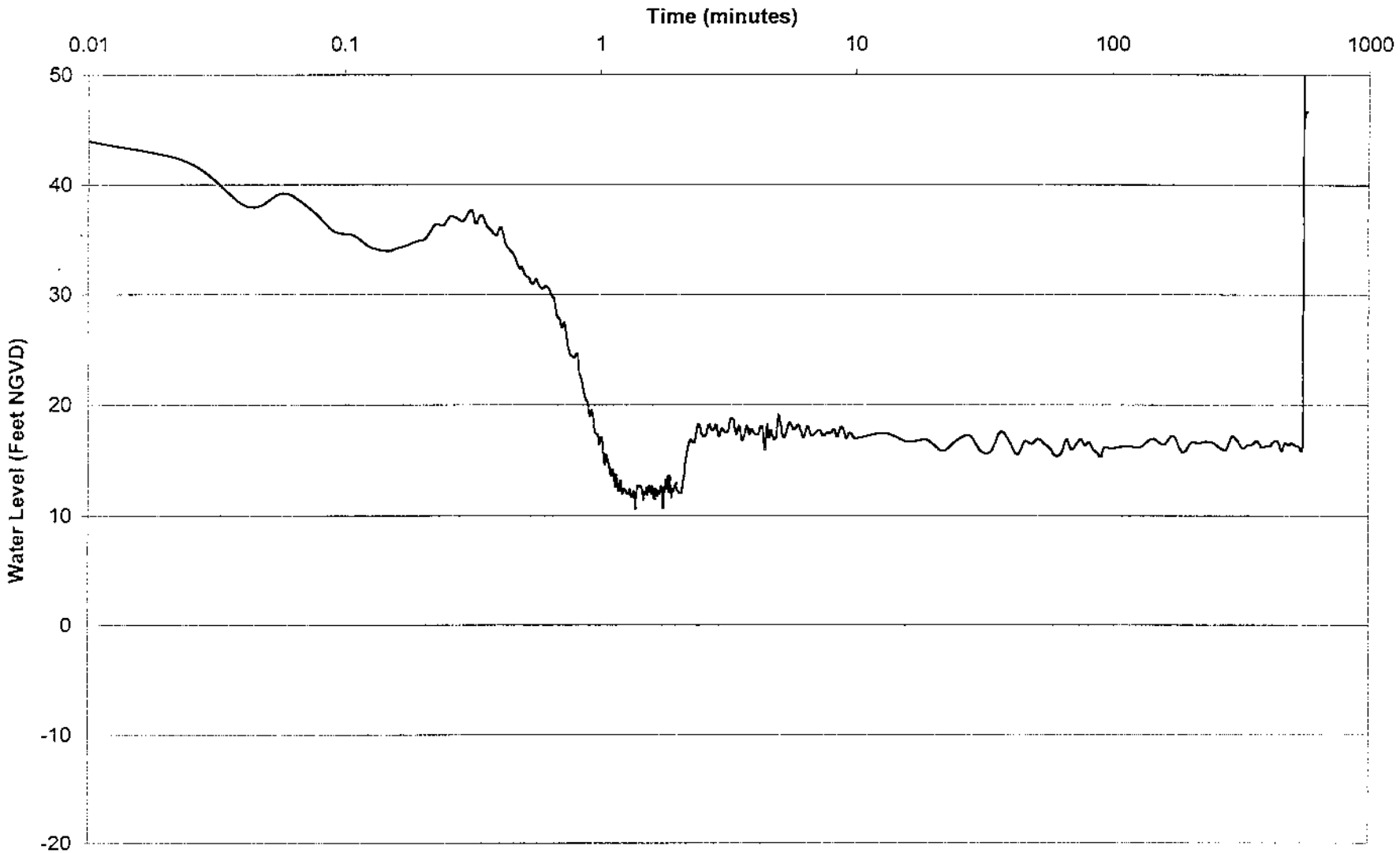


FIGURE 7 - OUC SOUTHEAST WTP
Well No.1 Pumped For 8 Hrs At 3500 gpm (2/8/99)



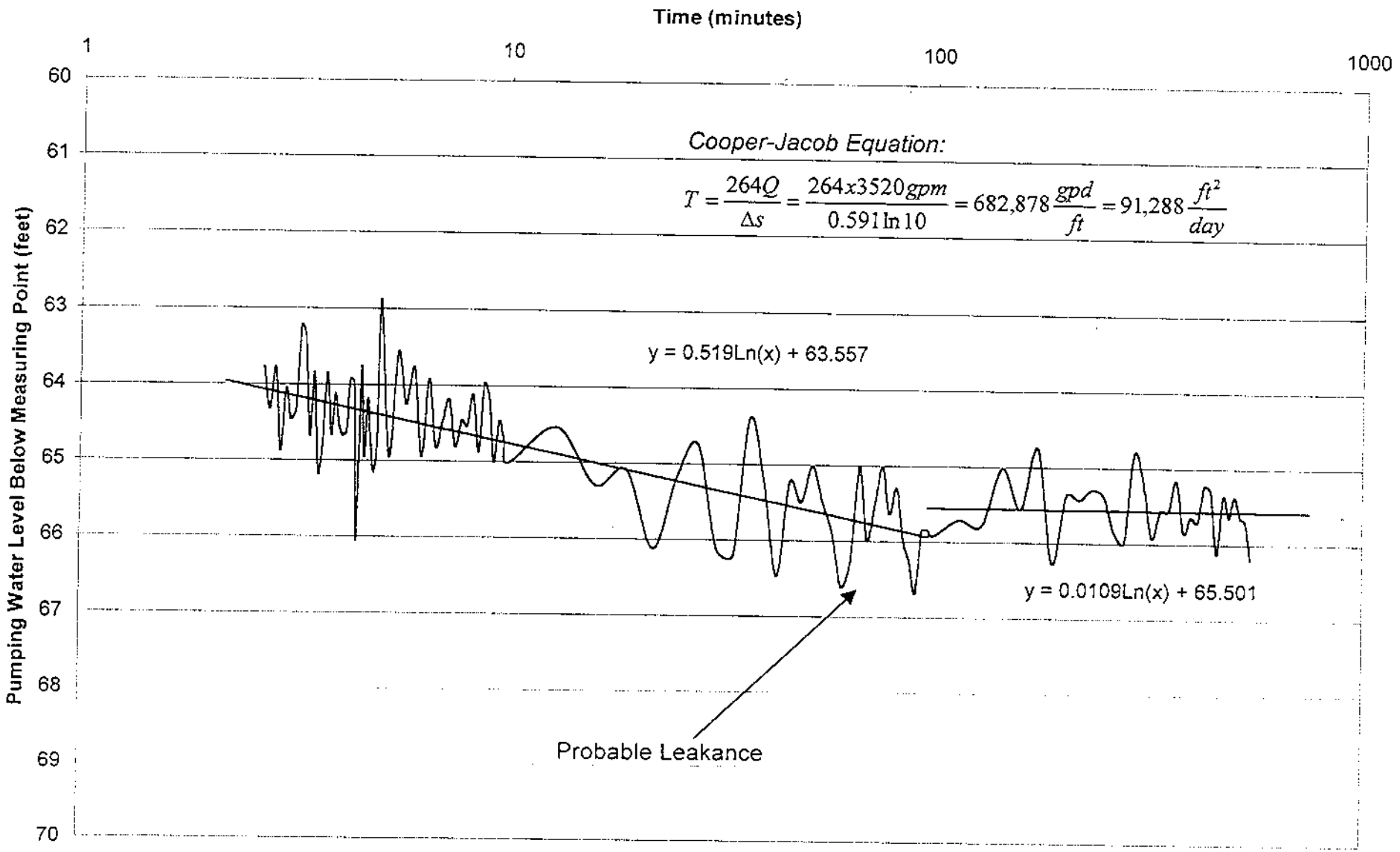
curve after about two minutes of pumping is then plotted at expanded scale (Figure 8) to allow better analysis. Plotting at this expanded scale appears to verify that a slight, but steady, drawdown trend persisted from about 2 to 40 minutes into the test, at which time the declining trend in water levels in Well No. 1 stopped. This indicates that enough leakage had been induced by pumping Well No. 1 to counterbalance the decline in aquifer pressures related to pumping at constant rate of about 3,500 gpm; so the water levels in Well No. 1 were essentially in equilibrium at this pumping rate.

The straight-line segment of Figure 7 , between about 2 minutes and 40 minutes after pumping began, was used to determine a value for aquifer transmissivity (T) using the Cooper-Jacobs (1946) method of analysis. This resulted in a computed value of about 91,000 ft2/d for T. The recovery data were also plotted (Figure 9) and analyzed by a variation of the conventional straight-line method (Theis and Jacob Recovery Test Method) in which the residual drawdown is plotted vs the logarithm of the ratio of time since pumping began to time after pumping stops. This resulted in computing a T value of about 81,000 ft2/d, which is comparable with the T value obtained from drawdown data. Use of recovery data for an additional computation of transmissivity is often an advisable procedure because it can avoid some of the problems related to effects of surging of the pumped well in early drawdown data. Determination of storativity, or other parameters, is not practical with data from Well No. 1 because all water level data had to be collected from the pumping well.

4.3 Well No. 2 Variable Rate Test Results

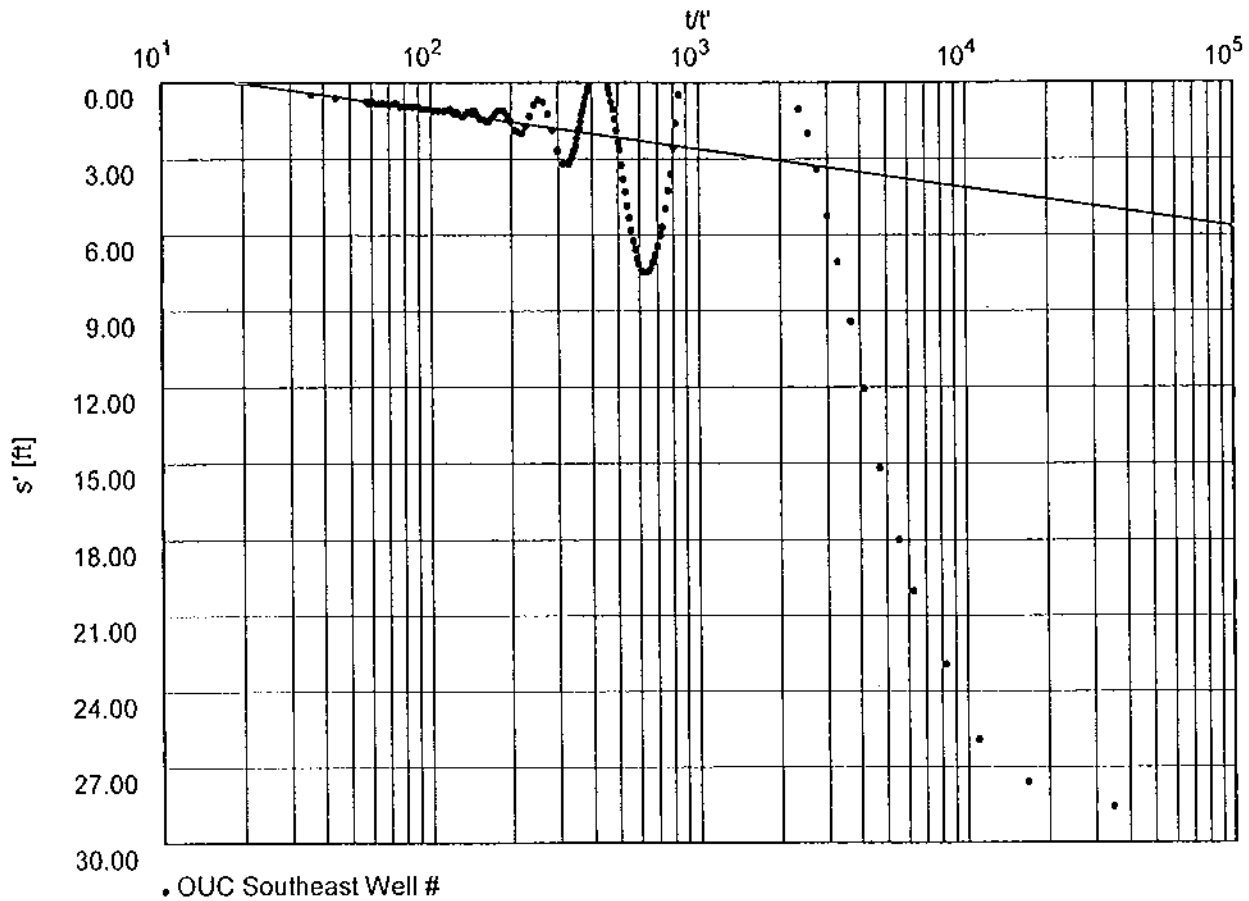
A variable rate (step-drawdown) was conducted with well Well No. 2 on April 27, 1999, which was cased to depth of 1,045 feet and open to total depth of 1,440 feet. Four uninterrupted one-hour pumping steps were run, at rates of about 1,750, 2,450, 3,500 and 5,000 gpm. Figure 10 shows the water levels during this variable rate test. Specific capacity values computed from these data (Figure 10 and Table 3) ranged from about 150 gpm/ft at the lowest pumping rate (1,750 gpm) to about 95 gpm/ft at the highest pumping rate (5,000 gpm). These specific capacity values are very similar to those obtained from pumping well Well No. 1 at similar rates.

FIGURE 8 - OUC SOUTHEAST WTP
Pumped Well No.1 Expanded Semi-Log Plot of Water Level vs. Time



Barnes, Ferland & Associates 3655 Maguire Boulevard, Suite 150 Orlando, Florida 32803 ph.(407) 896-8608	Pumping test analysis Recovery method after THEIS & JACOB Confined aquifer	Page 1 Project: OUC Southeast Evaluated by: BFA Date: 2/9/99

Pumping Test No. 1	Test conducted on: 2/8/99
Well #1	
Discharge 3520.00 U.S.gal/min	
	Pumping test duration: 0.38194 d



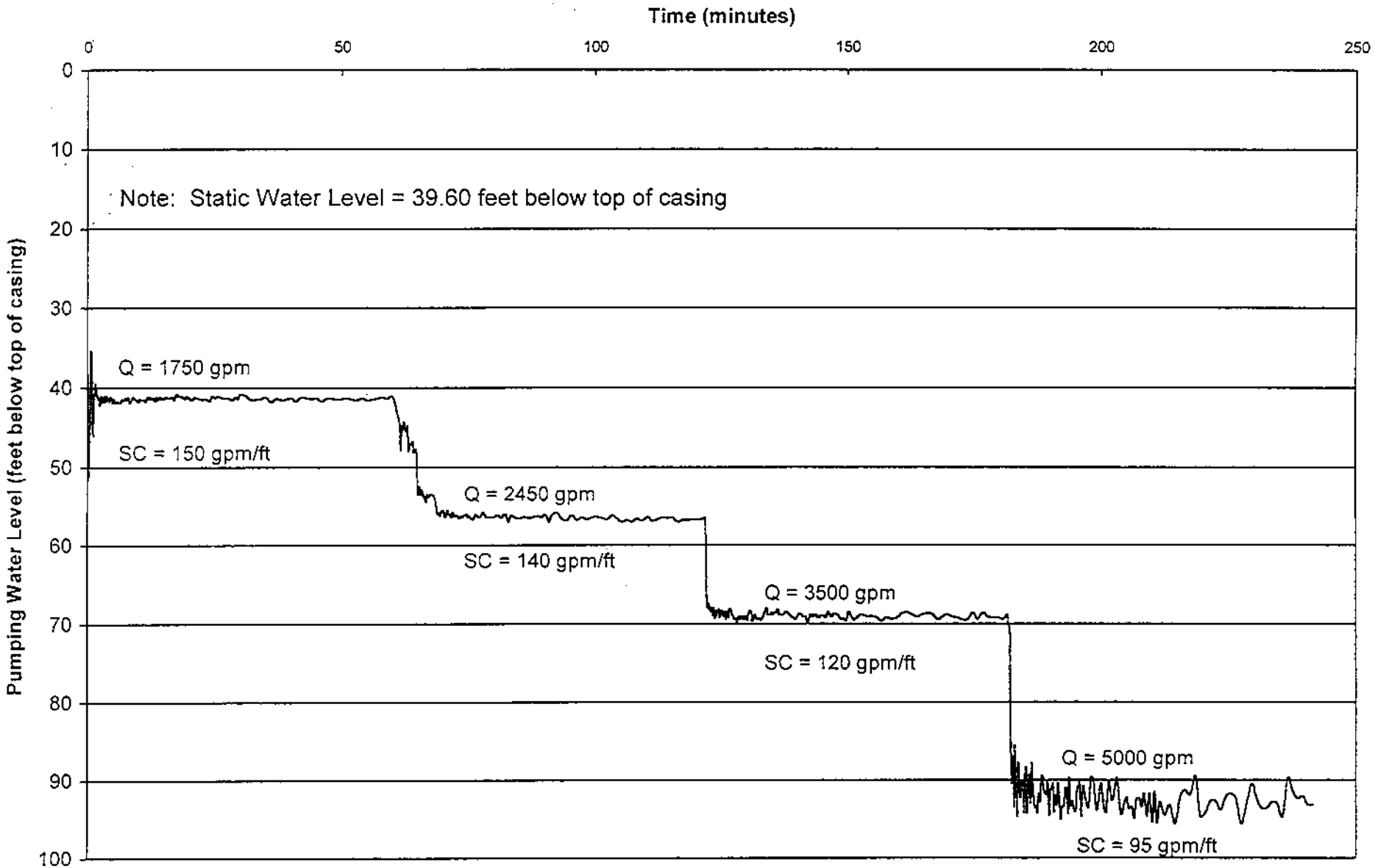
Transmissivity [ft²/d]: 8.14×10^4

Hydraulic conductivity [ft/d]: 2.01×10^2

Aquifer thickness [ft]: 405.00

Figure 9

FIGURE 10 - OUC SOUTHEAST WTP
Well No. 2 Step Drawdown Test Results (4/27/99)



4.4 Well No. 2 Constant Rate Test Results

On April 26, 1999, well Well No. 2 was pumped at a constant rate of 5,000 gpm for an eight-hour (480-minute) period. Water levels were monitored during pumping and recovery by transducers in the pumped well and in well Well No. 1,750 feet away, which was used as an observation well. Tabulated water level data from the test are included in Appendix 7. Figure 11 is a plot of water levels in the pumping well, Well No. 2, and in the observation well, Well No. 1, adjusted to msl, vs the logarithm of time in minutes during the 8-hour pumping period. The plot for the pumped well shows an initial drawdown of about 50 feet, accompanied by surges, occurs within the first two minutes of pumping. Continuing water-level oscillations of about three to more than six feet then tend to distort the remaining majority of the drawdown record. Fitting straight-line curve segments to these data at this scale is very difficult because of the magnitude of the continuing oscillations. So the data were then plotted at expanded scale (Figure 12), and it is possible to fit two straight-line curve segments as shown. The straight-line segment extending from about two minutes after pumping began to about 40-50 minutes into the test appears to be directly representative of aquifer drawdown in response to pumping at the rate of 5,000 gpm. Analysis of this segment by the Cooper-Jacob straight-line method indicates a transmissivity of about 81,000 ft2/d. The affects of leakage begin to appear after about 40-50 minutes of pumping and the slope begins to decrease, although it does not become completely flat as was observed in a similar plot of drawdown vs logarithm for well Well No. 1. Recovery data from Well No. 2 were easier to analyze, because they are relatively free of the problems with oscillations. These data (Figure 13) were analyzed by the Cooper-Jacob straight-line method, resulting in computation of a transmissivity value of about 71,000 ft2/d.

Drawdown data for the observation, Well No. 1 (also shown in Figure 14) are easier to work with. This observation well was about 750 feet from the pumping well and its drawdown data produce a smooth curve without interference from the surges and oscillation that inhibited analysis of the drawdown data for the pumped well. Figure 14 is a plot of drawdown in Well No. 1 vs logarithm of time, which was analyzed by the Cooper-Jacobs method to obtain a transmissivity of about 93,000 ft2/d and storativity of about 0.0003. Recovery data for this well,

FIGURE 11 - OUC SOUTHEAST WTP
Well No. 2 Pumped For 8 Hrs at 5,000 GPM (4/26/99)

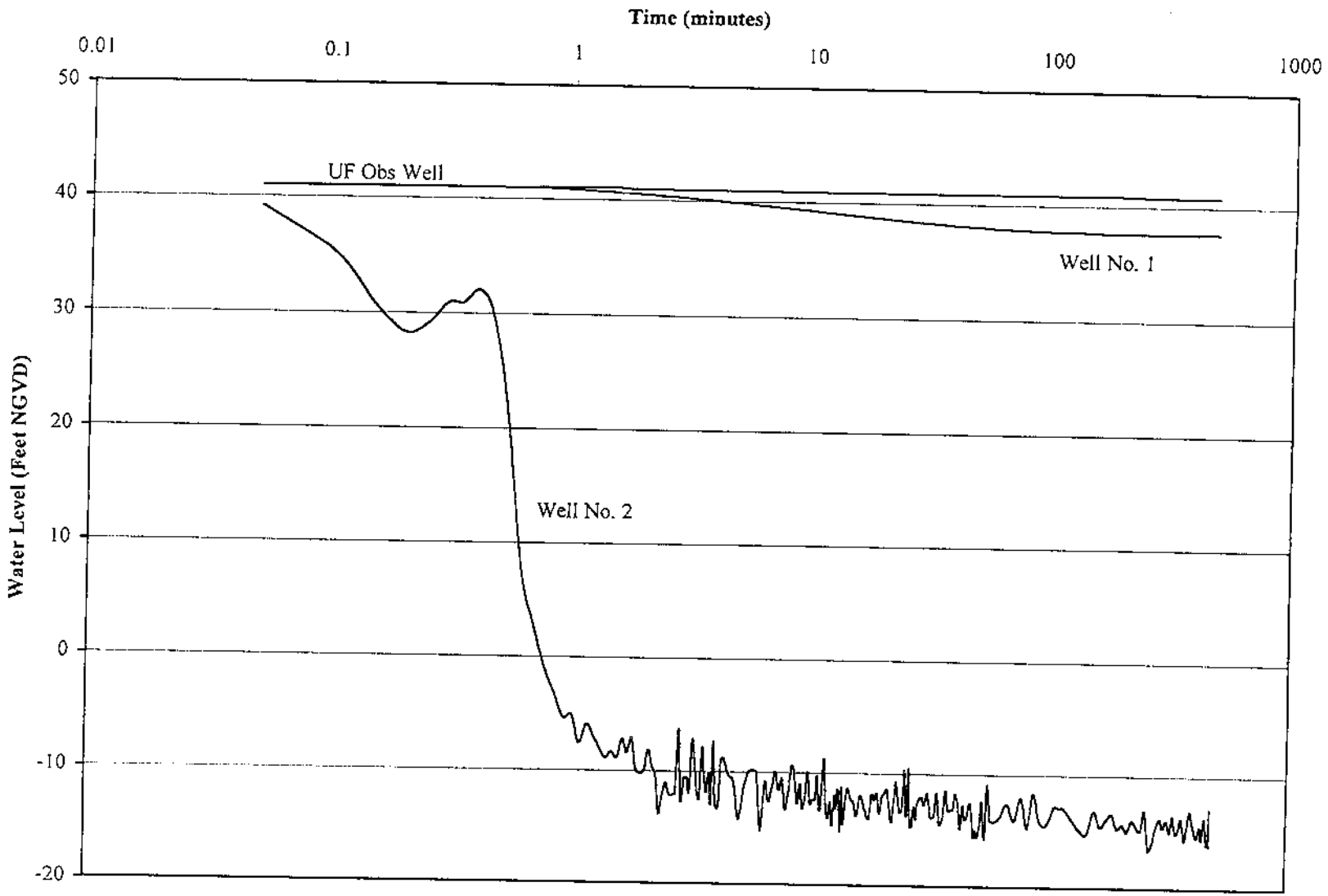
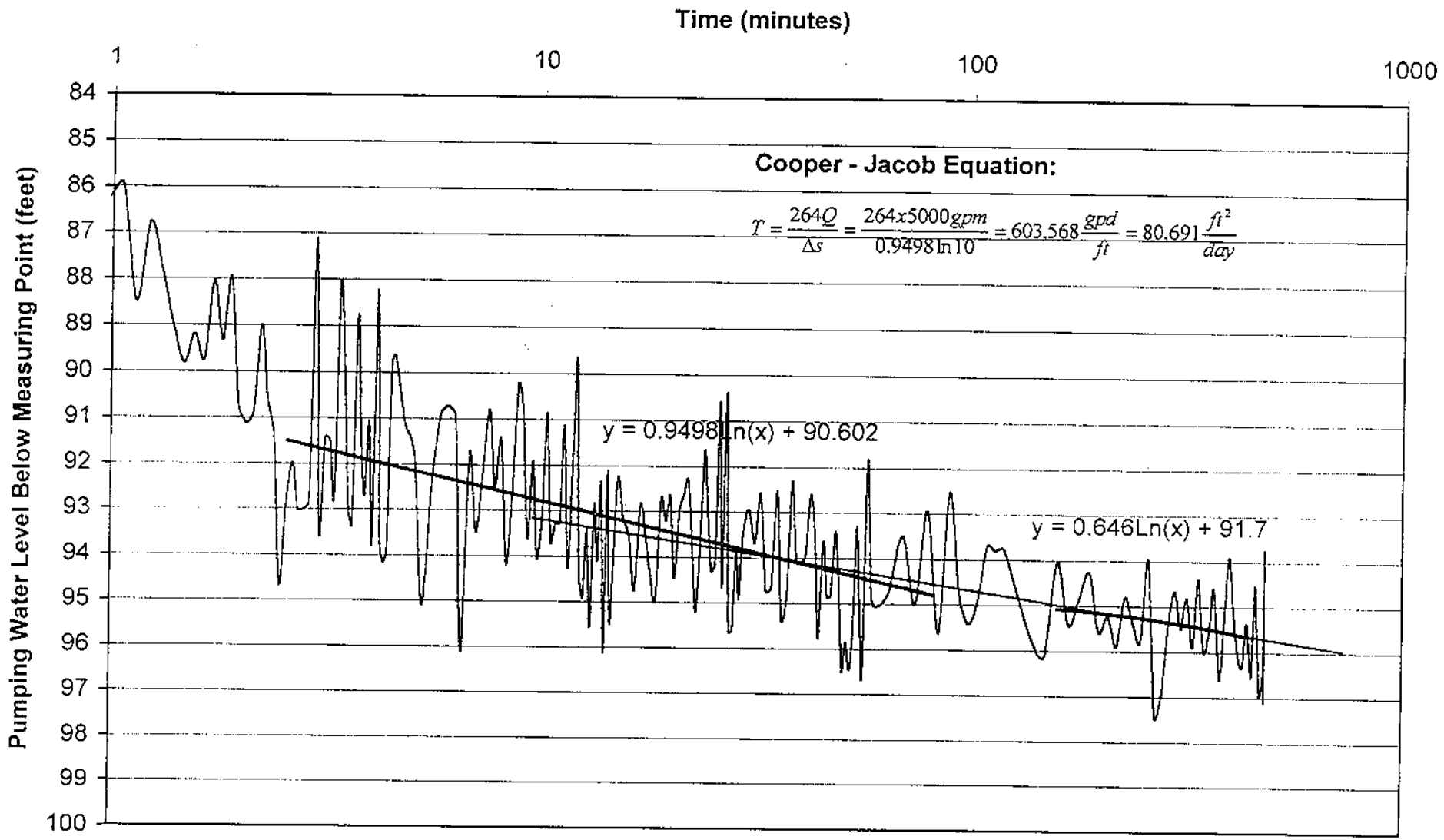
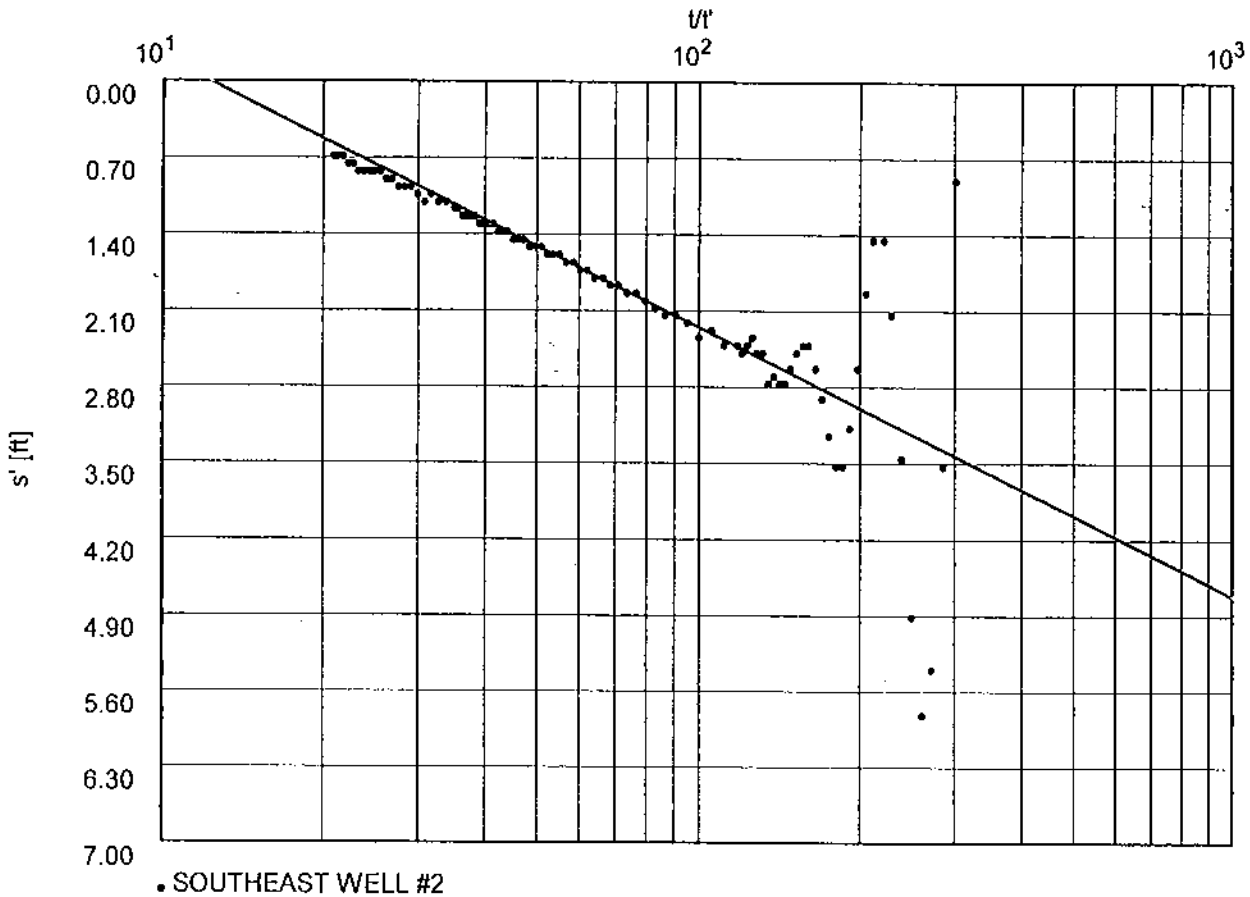


FIGURE 12 - OUC SOUTHEAST WTP
Pumped Well No. 2 Expanded Semi-Log Plot of Water Levels vs Time



Barnes, Ferland & Associates 3655 Maguire Boulevard, Suite 150 Orlando, Florida 32803 ph.(407) 896-8608	Pumping test analysis Recovery method after THEIS & JACOB Confined aquifer	Page 1 Project: OUC SOUTHEAST Evaluated by: JDW Date: 5/4/99

Pumping Test No. 2	Test conducted on: 4/26/99
WELL #2	
Discharge 5000.00 U.S.gal/min	
	Pumping test duration: 0.33330 d



Transmissivity [ft²/d]: 7.14×10^4

Hydraulic conductivity [ft/d]: 1.78×10^2

Aquifer thickness [ft]: 400.00

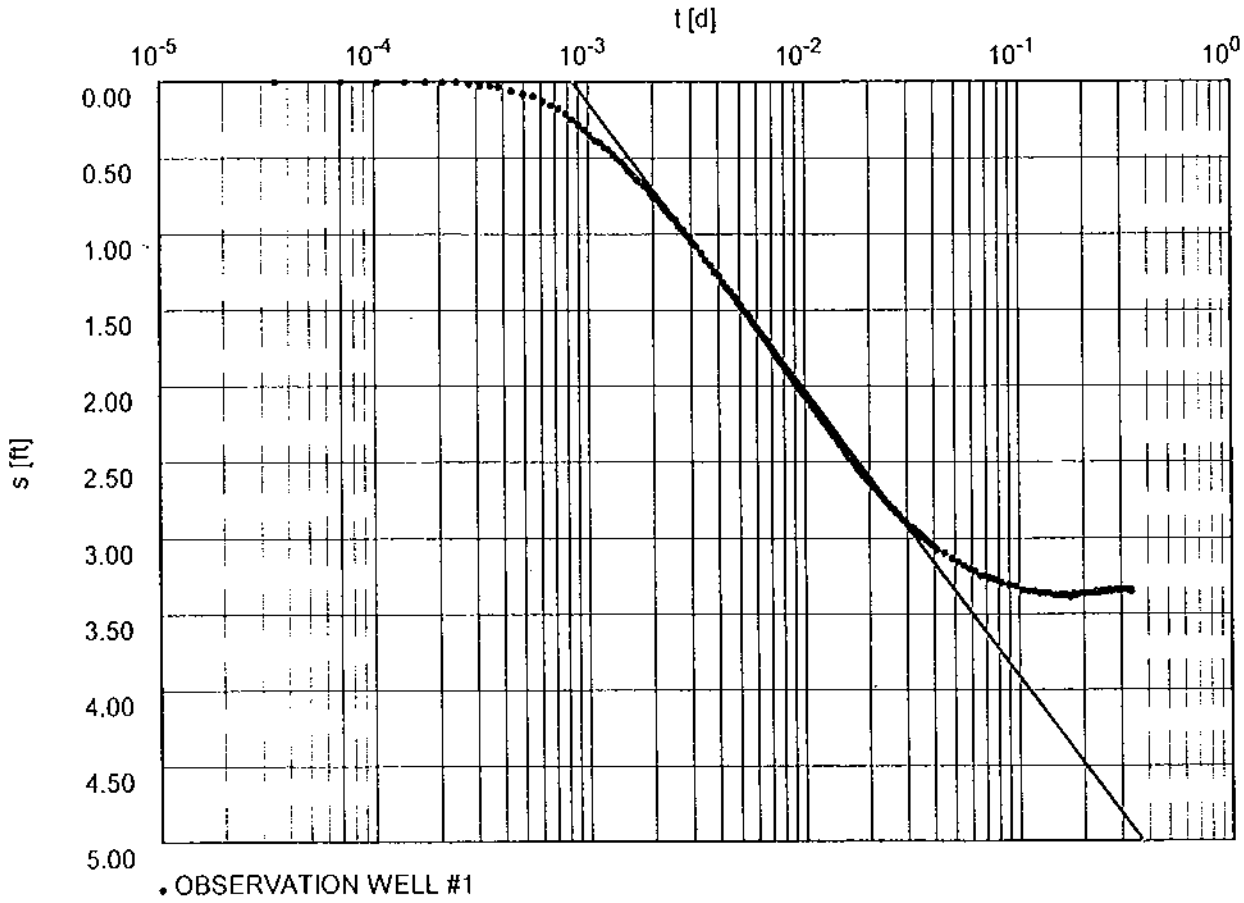
Figure 13

Barnes, Ferland & Associates 3655 Maguire Boulevard, Suite 150 Orlando, Florida 32803 ph.(407) 896-8608	Pumping test analysis Time-Drawdown-method after COOPER & JACOB Confined aquifer	Page 1 Project: OUC SOUTHEAST Evaluated by: JDW Date: 5/4/99

Pumping Test No. 2 — Test conducted on: 4/26/99

Obs. Well #1

Discharge 5000.00 U.S.gal/min



Transmissivity [ft²/d]: 9.31×10^{4}

Storativity: 3.18×10^{-4}

Figure 14

shown in Figure 15, indicate transmissivity of about 107,000 ft2/d from analysis by the Theis & Jacob method.

5.0 GROUNDWATER QUALITY

Groundwater samples were collected from the reverse air discharge during drilling of Well No. 1 and field tested for selected parameters (Appendix 6). Well No. 2 was spot checked during drilling and resulted in similar concentrations. Samples were collected in ten foot intervals, resulting in the following range of concentrations: pH range 7.6-8.3; conductivity range 370-570 uS/cm; and chloride range 25-40 mg/l. Upon well completion, the following range of concentrations resulted during constant rate testing: pH range 7.4-7.8; conductivity range 540-580 uS/cm; and chloride range 30-35 mg/l.

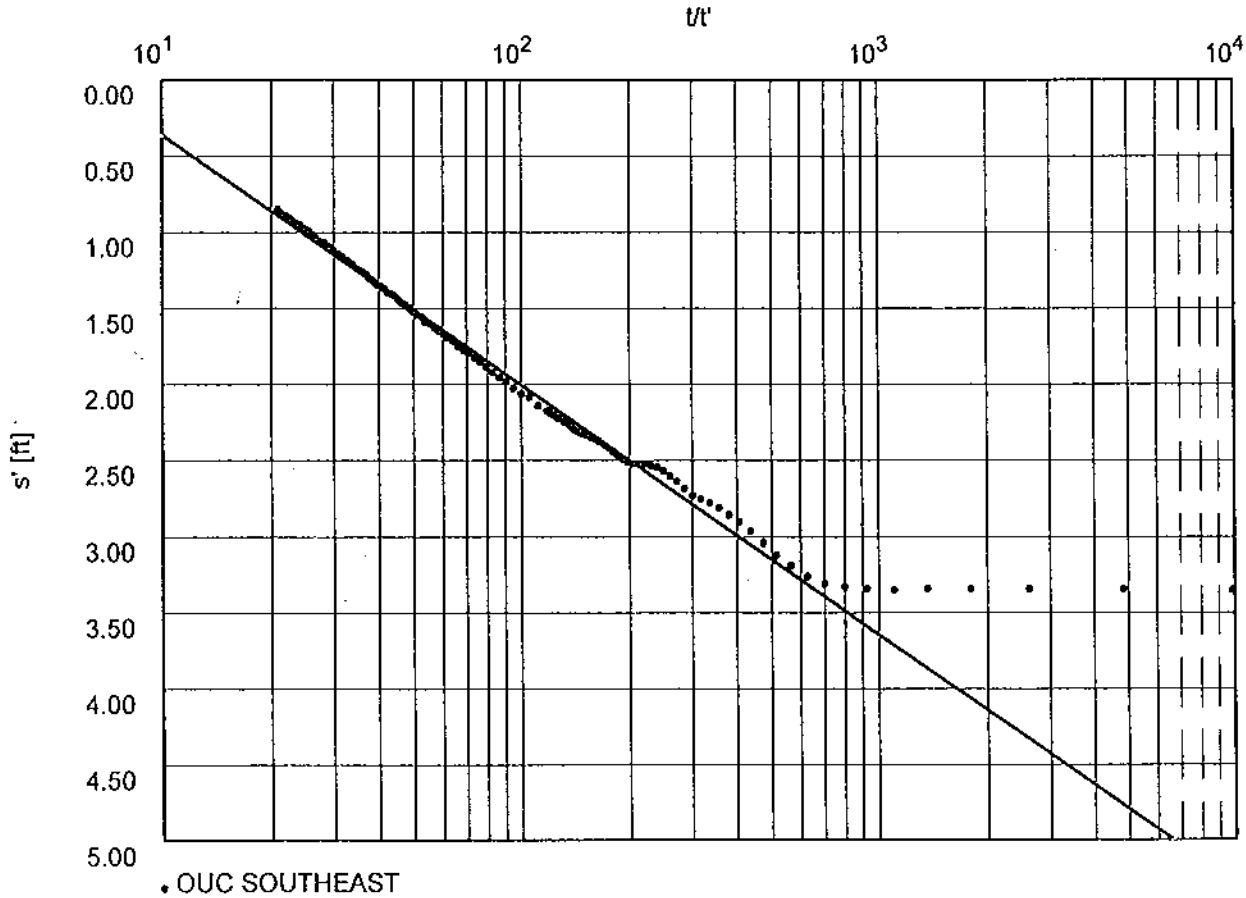
Additional water samples were collected and tested by OUC at the end of constant rate testing for more comprehensive Drinking Water Parameter analyses (Appendix 6). Laboratory results for samples collected from completed Well Nos. 1 and 2 appear to meet all Florida Department of Environmental Protection (FDEP) requirements (Chapter 62-550 F.A.C. - Drinking Water Standards, Monitoring and Reporting). Mineralized groundwater parameters are listed as follows:

	Well 1 (mg/l)	**Well 2** (mg/l)
TDS	377	360
Chloride	17.4	16.6
Sulfate	18.7	132
Total Hardness	269	268
H^2S	2.75	1.82

Fresh water with relatively low concentrations of total dissolved solids, chloride and sulfate were reported for completed wells. However, concentrations of hardness and hydrogen sulfide are

Barnes, Ferland & Associates 3655 Maguire Boulevard, Suite 150 Orlando, Florida 32803 ph.(407) 896-8608	Pumping test analysis Recovery method after THEIS & JACOB Confined aquifer	Page 1 Project: OUC SOUTHEAST Evaluated by: JDW Date: 05.04.1999

Pumping Test No. 2	Test conducted on: 4/26/99
WELL #1	
Discharge 5000.00 U.S.gal/min	
	Pumping test duration: 0.33333 d



Transmissivity [ft²/d]: 1.07×10^5

Hydraulic conductivity [ft/d]: 2.68×10^2

Aquifer thickness [ft]: 400.00

Figure 15

elevated. Once the well is outfitted with permanent pumping equipment, OUC plans to disinfect the well and test it for bacteriological results.

Samples were also collected and tested for cation-anion parameters that are indicative of groundwater origin (Figure 16). These concentrations are typical of calcium sulfate bicarbonate water type. Water in the Lower Floridan aquifer tends to be more highly mineralized than water in the Upper Floridan aquifer, indicative of longer flow paths and greater contact time with the aquifer matrix (Murray and Halford, 1996 Pg. 24).

6.0 SUMMARY AND CONCLUSIONS

1) Two high capacity test/production wells (Well Nos. 1 & 2) were installed at the new OUC Southeast WTP facility. These wells were constructed by Diverified Drilling Corporation, from Tampa, during the period October 24, 1998 to April 27, 1999. The wells were completed into the Lower Floridan aquifer based primarily on water quality analysis. Both wells were constructed with three telescoped steel casings 30/24/18 inch diameter to depths of about 120/230/1,045 feet, respectively. The open borehole interval was drilled to approximately 1,450 feet for each well. Both wells appear to be constructed in accordance with the design specifications based on field observations, TV video logs, geophysical logs and results of plumbness tests.

2) The Contractor's total cost for constructing and testing Well No. 1 was $402,879 and Well No. 2 was $362,751. This includes site preparation and testing but does not include outfitting the well with the permanent pumping equipment. Well No. 1 costs were greater due to packer testing and additional pump testing.

3) Based on the lithologic formation cuttings and the geophysical logs, the hydrogeologic units and depths at the Southeast WTP are summarized as follows: surficial aquifer system (to 120 feet); intermediate confining unit (120 to 200 feet); Upper Floridan aquifer (200 to 500 feet); middle semi-confining unit (500 to 1,120 feet); upper zone of the Lower Floridan aquifer (1,120 to about 1450 feet).

OUC Southeast Well #2

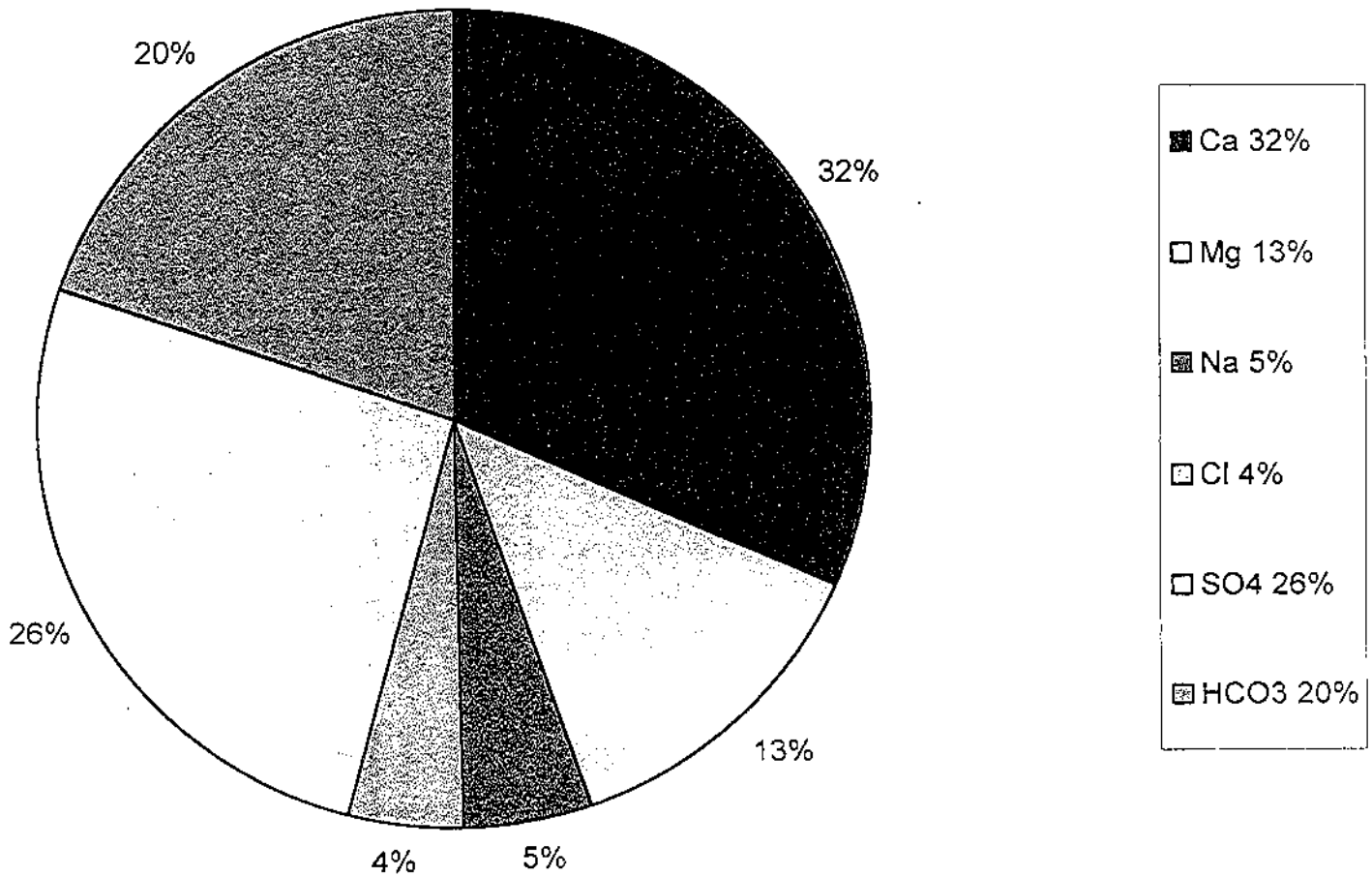


Figure 16

4) A preliminary variable rate pumping test was conducted when Well No. 1 was open to the Lower Floridan aquifer from bottom of the casing at 1,045 feet to bottom of the borehole at 1,300 feet. A low specific capacity resulted, thus it was recommended to deepen this well to 1,450 feet. The specific capacity of the completed wells was found to be much higher and a similar capacity was achieved (110 and 120 gpm/ft at 3,500 gpm for Well Nos. 1 & 2, respectively).

5) The aquifer parameters were computed for the constant rate tests at the Southeast WTP. Transmissivity of the aquifer zone penetrated within the Lower Floridan is estimated to range from about 71,000 ft2/day to 107,000 ft2/day and averaged 87,000 ft2/day. The storage coefficient was estimated to be 0.0003.

6) The geophysical logs of both wells show the occurrence of numerous cavities in the Floridan aquifer system. Both wells have a similar yield, although the entry of flow into these wells is not that consistent. Based on pumping fluid flow, resistivity, and temperature logs, significant flow enters Well No.1 at approximate depths of 460, 505, 1,140, 1,180, 1,240 and 1,375 foot depths. Flow entered Well No. 2 throughout the open borehole from the bottom up to about 1,130 feet in depth. The logs of both wells suggest entry of flow into the borehole at depths between 1,350-1,385 feet.

7) Groundwater quality from both wells appear to meet OUC's treatment goals and compliance with FDEP's regulations. Fresh water with relatively low concentrations of total dissolved solids (377 mg/L), chlorides (17.4 mg/L) and sulfates (132 mg/L) were reported. However, the total hardness (269 mg/L) and hydrogen sulfide (2.75 mg/L) concentrations are relatively high. The cation-anion concentrations are typical of calcium sulfate bicarbonate type water.

Appendix 1
Well Construction Correspondence

BFA Environmental Consultants
Barnes, Ferland and Associates, Inc.

January 21,1999

Ms Deborah Bradshaw, P.E., Project Manager
Water Project 2000
Orlando Utilities Commission
3800 Gardenia Ave.
Orlando, Florida 32839

SUBJECT: Yield of Well No. 1 at the Southeast Water Plant (open 1045'–1300')

Dear Ms Bradshaw:

On Wednesday afternoon Well No. 1 was pumped for 1.5 hours to test the equipment setup and begin well development. The pump was set to a depth of 120 feet. After 30 minutes of pumping, the discharge water appeared clear. Preliminary water level measurements were taken to observe pumping level drawdown within the well and determine the specific capacity. Results are as follows:

Pumping Rate (gpm)	Pumping Level (feet)	Static Level (feet)	Drawdown (feet)	Specific Capacity (gpm/ft)
1,300	73.66'	37.30'	36.36'	36
1,750	90.54'	37.30'	53.24'	33

The pumping rate was also increased to 2,500 gpm, however, the pumping level was greater than 100 feet depth. Since the length of my electric water level tape is only 100 feet and the pump was set at 120 feet, the pumping was stopped to avoid possible cavitation.

Lower Floridan aquifer wells in the Orange County region typically have a much higher transmissivity and related specific capacity (Table 1) than what was experienced above. Although numerous cavities were observed on the TV video within the pilot hole of this well from 1,000 to 1,300 feet, they apparently are not that extensive/productive.

In order to improve the yield of this well, Barnes, Ferland and Associates, Inc. recommends deepening the open borehole to about 1,450 feet to intercept more productive cavities within the Lower Floridan aquifer. Based on results of the Dowden Road Test Well, the chlorides levels increase above 250 mg/l at about 2,080 foot depth. Also, several dense dolomitic confining layers were encountered between 1,400 and 2,000

feet within the Lower Floridan aquifer during drilling of this well. This 600 foot buffer will likely provide adequate protection from upward movement of saline groundwater at the proposed pumping rates.

Please let me know, as soon as possible, if OUC would like to: 1) obtain groundwater samples for laboratory testing that are representative of this open zone 1,045 – 1,300 feet; 2) perform a two step drawdown test at rates of 1,500 and 2,000 gpm and graphically present the data (see attached example); and 3) deepen the well to 1,450 feet.

Sincerely,
Barnes, Ferland and Associates, Inc.

John Watson, P.HGW
Sr. Hydrologist

cc: Dave Quesada /OUC/
Roy Schultz /Sverdrup/
Mike Cliburn /Sverdrup/
Pat Barnes /BFA/

Table 1 - Results of Lower Floridan Aquifer Pumping Tests

Test Location	Depth of Well (feet)	Casing Depth (feet)	Transmissivity (ft2/day)	Reference
Orlando Utilities Commission Orange and Southeast Test Wells	1400	1100	>500,000	CH2M HILL/BFA, 1996
Orange County Public Utilities Southern Regional Wellfield	1690	1100	410,000	BOYLE, 1996
Orlando Utilities Commission Lake Highland WTP	1145		668,000	CH2M HILL, 1979
Orlando Utilities Commission Primrose WTP	1240	1053	575,000	LICHTER, 1968
Orange County Public Utilities Western Regional WTP	1450	1032	632,000	PBSJ, 1989
Orlando Utilities Commission Conway WTP	1450	1050	630,000	BFA, 1997

BFA Environmental Consultants
Barnes, Ferland and Associates, Inc.

October 21, 1998

FAXED AND MAILED

Mr.Robert Matthews, President
Diversified Drilling Corporation
P.O. Box 290699
Tampa, Florida 33637-0699

SUBJECT: Presence of the BFA Hydrogeologist During Construction of Wells at the Orlando Utilities Commission's Southeast Water Plant.

Dear Bob:

The major activities for constructing each well are listed below in the order that they must be completed. The following does not substitute any incidental work covered in the Contract Specifications. The presence of a BFA Hydrogeologist will be required for the following underlined work activities.

Activity Description

1. Obtain a Well Construction Permit;
2. Prepare/stabilize access road and drilling pads;
3. Mobilize and set up equipment;
4. Drill 10" diameter pilot hole to ±250 feet;
5. Ream 34" diameter borehole to ±110 feet;
6. Furnish and install 30" diameter casing and grout to ±100 feet;
7. Allow grout to set 24 hours;
8. Ream a 28" borehole from ±100 to ±260 feet;
9. Furnish and install a 24" diameter casing and grout to ±250 feet;
10. Well plumbness and alignment test;
11. Allow grout to set 24 hours;
12. Drill a 10" diameter pilot hole from ±250 to ±600 feet (Upper Floridan);
13. Develop well through drill stem and collect water samples;
14. Continue drilling 10" pilot hole to ±1,250 feet (into Lower Floridan);
15. Develop well through drill stem;
16. Perform Set 1 geophysical logs (caliper only)to determine packer setting;
17. Set packer at ±1,000 depth, develop the well and collect water samples.

The SUBCONTRACTOR shall allow up to 10 working days to evaluate data collected at no additional cost to the Owner. If the water quality is suitable, then the SUBCONTRACTOR will continue Well No. 1 as a Lower Floridan well as follows:

18. Ream a 22" diameter borehole from ±250 to ±1,060 feet;
19. Perform Set 1 (caliper only) geophysical logs to determine a grouting plan;
20. Furnish and install an 18" diameter casing and grout to ±1,050 feet;
21. Allow grout to set 24 hours;
22. Ream a 16" diameter open borehole from ±1,050 to ±1,250 feet;
23. Cut and remove 18" casing at ±150 feet depth;
24. Set test pump and develop the well;
25. Perform Set 2 suite of geophysical logs;
26. Conduct variable rate and constant rate pumping tests.

The SUBCONTRACTOR shall allow up to 5 working days to evaluate data collected at no additional cost to the Owner. If the well yield/drawdown is suitable at the design rate of 3500 gpm, then Well No. 1 will be completed as follows (If not, see below):

27. Color TV Video Log;
28. Cap well;
29. Cleanup site to pre-drilling conditions and mobilize to Well No. 2.

If the well yield/drawdown is not suitable, then Well No. 1 will be completed deeper into the Lower Floridan aquifer as follows:

27a. Continue drilling 10" pilot hole from 1,250 to ±1,450 feet;
28a. Develop well through drill stem;
29a. Perform Set 1 geophysical logs (caliper only)to determine packer setting;
30a. Set packer at ±1,250 depth, develop the well and collect water samples.

The SUBCONTRACTOR shall allow up to 10 working days to evaluate data collected at no additional cost to the Owner. If the water quality is suitable, then the SUBCONTRACTOR will continue Well No. 1 as a Lower Floridan well as follows:

Activity Description

31a. Continue to ream a 16" diameter open borehole from ±1,250 to ±1,450 feet;
32a. Set test pump and develop the well;
33a. Perform Set 2 suite of geophysical logs;
34a. Conduct variable rate and constant rate pumping tests;
35a. Color TV Video Log;
36a. Cap well;
37a. Cleanup site to pre-drilling conditions and mobilize to Well No. 2.

If the water quality is not suitable in the Lower Floridan aquifer, as determined in Activity No. 17, then the SUBCONTRACTOR will complete Well No. 1 as an Upper Floridan well as follows:

18a. Cement plug the 10"pilot hole from ±600 to ±1,250 feet;
19a. Ream a 22" diameter borehole from ±250 to ±600 feet;
20a. Set test pump and develop the well;
21a. Perform Set 2 suite of geophysical logs;
22a. Conduct variable rate and constant rate pumping tests;
23a. Color TV Video Log;
24a. Cap well;
25a. Cleanup site to pre-drilling conditions and mobilize to next well;

Well No 2 will be constructed based on the water quality and yield testing results of Well No.1. Well No. 2 will be completed within the same aquifer as Well No.1 and will have the same construction design. If water quality is suitable within the Lower Floridan aquifer, then Well No. 2 will be constructed as a Lower Floridan well in the following sequence:

Activity	Description
1.	Obtain a Well Construction Permit;
2.	Mobilize and setup equipment;
3.	Drill 10" diameter pilot hole to ±250 feet;
4.	Ream 34" diameter borehole to ±110 feet;
5.	Furnish and Install 30" diameter casing and grout to ±100 feet;
6.	Allow grout to set 24 hours;
7.	Ream a 28" borehole from ±100 to ±260 feet;
8.	Furnish and Install a 24" diameter casing and grout to ±250 feet;
9.	Well plumbness and alignment test;
10.	Allow grout to set 24 hours;
11.	Drill a 10" diameter pilot hole from ±250 to ±1,100 feet;
12.	Ream a 22" diameter borehole from ±250 to ±1,060 feet;
13.	Perform Set 1 geophysical logs (caliper only) to determine a grouting plan;
14.	Furnish and Install an 18" diameter casing and grout to ±1,050 feet;
15.	Allow grout to set 24 hours;

Activity	Description
16.	Drill a 16" diameter open borehole from ±1,050 to ±1,200 or ±1,400 feet; (same as Well No. 1 total depth);
17.	Cut and remove 18" casing at ±150 feet depth;
18.	Set test pump and develop the well;
19.	Perform Set 2 suite of geophysical logs;
20.	Conduct variable rate and constant rate pumping tests;
21.	Color TV video log;
22.	Cap well;
23.	Cleanup well site to pre-drilling conditions and demobilize;

If water quality is not suitable within the Lower Floridan aquifer, then Well No 2 will be constructed as an Upper Floridan well in the following sequence:

Activity	Description
1.	Obtain a Well Construction Permit;
2.	Mobilize equipment to site;
3.	Drill 10" diameter pilot hole to ±250 feet;
4.	Ream 34" diameter borehole to ±110 feet;
5.	Furnish and Install 30" diameter casing and grout to ±100 feet;
6.	Allow grout to set 24 hours;
7.	Ream a 28" borehole from ±100 to ±260 feet;
8.	Furnish and Install a 24" diameter casing and grout to ±250 feet;
9.	Well plumbness and alignment test;
10.	Allow grout to set 24 hours;
11.	Ream a 22" diameter borehole from ±250 to ±600 feet;
12.	Set test pump and develop the well;
13.	Perform Set 2 suite of geophysical logs;
14.	Conduct variable rate and constant rate pumping tests;
15.	Color TV Video Log;
16.	Cap well;
17.	Cleanup site to pre-drilling conditions and demobilize;

I will be the primary BFA contact for well construction related activities. Please notify me 24 hours in advance when the above underlined drilling activities will take place for Wells 1 and 2. Also, notify me of any anticipated delays as soon as they become apparent. If I can not be reached, then contact Murdock Munroe or Pat Barnes with BFA. We can be reached at the following phone numbers:

BFA Hydrogeologists	Office	Car	Home
John Watson	407/896-8608	407/808-6782	407/658-6497
Murdock Munroe		407/808-6785	407/359-3515
Pat Barnes		407/808-6780	407/282-5849

BFA looks forward to working with Diversified Drilling Corporation again. Call me if you have any questions.

Sincerely,
Barnes, Ferland and Associates, Inc.

John Watson, P.H.
Sr. Hydrologist

cc: Stuart Anderson /Diversified/
Deborah Bradshaw /OUC/
Dave Quesada /OUC/
Grant Guerri /Sverdrup/
Roy Schultz /Sverdrup/
Mike Cliburn /Sverdrup/
Pat Barnes /BFA/
Murdock Munroe /BFA/

BFA Environmental Consultants
Barnes, Ferland and Associates, Inc.

December 1, 1998

Ms Deborah Bradshaw, P.E.
Project Manager
Orlando Utilities Commission
3800 Gardenia Avenue
Orlando, Florida 32839

SUBJECT: Production interval for wells at the planned Southeast Water Plant.

Dear Ms Bradshaw:

As we discussed, Orlando Utilities Commission (OUC) has decided to produce groundwater from the Lower Floridan aquifer as a source for their planned Southeast Water Plant Facility. This was primarily decided based on Upper vs Lower Floridan aquifer groundwater quality results from Test/Production Well No. 1 and the associated long term water treatment costs. Other advantages of using the Lower Floridan as a source include:

- Less water use density and potential impacts to adjacent water users;
- Less drawdown related impact potential (hydraulic connection) to surface water and wetlands;
- Less potential for sinkhole development;
- Generally higher transmissivity, thus greater well specific capacity; and
- Less potential for contamination from surface sources.

The planned wells at Southeast Water Plant should be cased into a dense dolomitic zone within the middle semiconfining unit to avoid vertical interchange of groundwater between the Upper and Lower Floridan aquifers at this site. The well should be drilled to a depth that will provide the design capacity (3,500 gpm) without excessive drawdown and also provide an adequate buffer to avoid upward movement of saline water. At the nearby OUC Southeast Test/Monitor Well, located off Dowden Road, the chloride level increased above 250 mg/l at a depth of about 2,080 feet.

In order to identify the optimal production zone for wells at the Southeast Water Plant, a series of geophysical logs and a color TV video log were performed on November 25, 1998. The geophysical parameters measured were:

Static Logs: Caliper, Gamma-Ray, Multipoint Electric, Fluid Flow, Resistivity and Temperature, TV Video; and

Pumping Logs: Fluid Flow, Resistivity and Temperature.

The borehole geophysical logs, along with the lithologic and TV video logs, allowed interpretation of depths and thickness of the major hydrogeologic units, and the distribution and relative potential yield of various producing zones. These logs were conducted within the 14.75 inch diameter pilot hole that was open to both the Upper and Lower Floridan aquifers from a depth of about 230 to 1300 feet below land surface. The following is a discussion of borehole log parameters as they relate to selecting the production interval.

Hydrogeologic units penetrated by the borehole are, in descending order 1) the surficial aquifer; 2) intermediate confining unit; 3) Upper Floridan aquifer; 4) middle semiconfining unit; and 5) Lower Floridan aquifer (Figure 1). The surficial aquifer, composed primarily of sandy material, occurs from the water table to depths of about 120 feet., where clayey materials begin to predominate. The proportion of clayey materials increases downward and compose the upper or intermediate confining unit from depths of about 120 feet to the base of the Hawthorn Formation at 200 feet. These two uppermost hydrogeologic units are defined by the gamma-ray log as obtained within the well casing.

The Upper Floridan aquifer occurs from depths of about 200 to 500 feet. Relatively soft limestone, with few fractures and solution cavities, occurs from bottom of casing (232 feet) to about 335 feet. From 335 to about 390 feet depth, more fractures and cavities are noted and their density increases. From 390 feet to base of the Upper Floridan aquifer at 500 feet, the rock appears more dolomitic and contains more zones of fractures and solution. All of the Upper Floridan aquifer in this area is commonly assigned to the Avon Park Formation, but the 200-335 feet interval in this borehole may be in the Ocala Limestone.

The contact between the base of the Upper Floridan aquifer and the top of the middle semiconfining unit is picked at about 500 feet depth where the lithology changes from a brownish dolomitic limestone containing some fracture and solution zones to a lighter colored limestone or dolomite, which is more massive (homogeneous and unfractured). This semiconfining unit continues to depth of about 1,100 feet and, though generally less permeable than the overlying and underlying aquifers, contains some zones of fractures and cavities that probably could be developed as moderately productive aquifers. The thicker massive zones, which occur in the intervals between 635-690 feet, 770-850, 870-950 feet, and 1020-1,100 feet appear to be the most confining parts of this hydrogeologic unit, and should function to maintain hydraulic isolation between the Upper and Lower Floridan aquifer in this area. The top of the Lower Floridan aquifer occurs at about 1,100 feet, with occurrence of more prominent solution features in dolomitic limestone which continue to bottom of hole at 1,300 feet.

Caliper and electric logs were particularly useful in initially defining the hydrogeologic units within the Floridan aquifer. Then information from the flow, temperature and resistivity logs were used to better define flow zones and relative yields; and the TV video log was a valuable adjunct to finalizing all the interpretations.

During fluid flow logging, essentially all the total yield is present in the borehole at about 440 feet depth, and the majority (perhaps 75-80 percent) of this total appears to be from a cavernous and fractured zone in the Upper Floridan aquifer at about 458-466 feet depth. Distribution of the remaining part of total yield from deeper zones is as follows: About 20-25 percent of total yield has entered the borehole below depth of about 515 feet; about 15-20 percent below depth of about 660 feet; about 10-15 percent below depth of about 835 feet; and 10 percent, or less, is present at depth of about 1,130 feet. Very little flow appears to enter the borehole below about 1,250 feet.

This general distribution of yield to the well is obtained from calculations based on the pumping flow log at intervals where the cross sectional area of the borehole can be estimated with some confidence, and an attempt was made to locate a suitable interval for calculation above each zone where some significant flow entered the well. Some zones where significant flow entered the well (for example, at approximate depths of 460, 505, 1,140 and 1,240 feet) are also indicated on the fluid temperature and resistivity logs. *The observation that about 75-80 percent of total yield is from the Upper Floridan aquifer needs to be kept in perspective by considering that the borehole was open from 232-1,300 feet and the test pump was set at depth of 105 feet, thus having less effects on creating pumping gradients with increasing depth of borehole.* The cavernous and fractured zone from about 458-466 feet is the zone of high transmissivity nearest to the pump, and thus the major source of yield with this pump and casing setting. Progressively lower amounts of the yield are contributed from deeper permeable zones. *Examination of the caliper, fluid flow and TV video logs appears to indicate significant permeability in deeper sections of borehole, particularly below 1,100 feet depth, that could yield much larger quantities with either deeper casing or pump settings.* Another indication of this deeper transmissivity is that the static fluid flow log indicates interzonal downward flow in the borehole, entering the borehole from the high yielding zone at 458-466 feet and persisting downward to below 1,250 feet before completely reentering the formation.

In summary, very little flow is contributed from the middle semiconfining unit between depths of 500 to 1,100 feet. The most restrictive interval is at the base of this unit between 1,020 and 1,100 feet depth. Significant permeability was noted from the logs within the 1,100 to 1,300 foot zone. Figure 2 shows the recommended well construction details for wells at the Southeast Water Plant and the hydrologic units based on analyses of these logs.

If you have any questions regarding the above, please contact us at 896-8608.

Sincerely,
Barnes, Ferland and Associates, Inc.

John Watson, P.HGW
Project Manager

Joel Kimrey, P.G.
Sr. Hydrogeologist

cc: Rick Coleman /OUC/
Dave Quesada /OUC/
Roy Schultz /Sverdrup/
Mike Cliburn /Sverdrup/
Patrick Barnes /BFA/

Appendix 2
Well Construction Permit
Well Compliance Report

South Florida Water Management District

3301 Gun Club Road, West Palm Beach, Florida 33406 • (561) 686-8800 • FL WATS 1-800-432-2045
TDD (561) 697-2574

CON 24-06

October 23, 1998

PERMITTEE
ORLANDO UTILITIES COMMISSION
3800 GARDENIA AVENUE
ORLANDO, FL 32802

CONTRACTOR
MATTHEWS, BOB
P.O. BOX 290699
TAMPA, FL 33687
LICENSE NO:2805

WATER WELL CONSTRUCTION PERMIT # SF1015988A
EXPIRATION DATE: April 23, 1999

PROJECT: ORLANDO UTILITES SE WATER TREATMENT PLANT WELL 1
TYPE OF USE: PUBLIC WATER SUPPLY
COUNTY: ORANGE SEC: 23 TWP: 24 RGE: 30

WELL CONSTRUCTION SPECIFICATIONS:	INNER	OUTER
CASING DIAMETER:	18"	
CASING DEPTH:	1050.00'	
SCREENED INTERVAL:		
OPEN HOLE INTERVAL:	1050' - 1450'	
TOTAL DEPTH OF WELL:	1450.00'	

GROUT REQUIREMENT:
Inner casing shall be grouted bottom to top.

See additional conditions of permit on attached sheet.

We appreciate your assistance and cooperation in better managing the water resources of the District. If you have any questions on this matter, please call Ann-Marie Superchi at extension 6929.

Sincerely,

Jeffrey Rosenfeld, P.G., Supervising Professional
Water Use Division, Regulation Department

Attachment: Additional Conditions of Permit
c: MR. FRANK HUTTNER

ORLANDO UTILITES SE WATER TREATMENT PLANT WELL 1
October 23, 1998

COMPLETION REPORT REQUIRED

A Water Well Completion Report (Form 0124) must be filed with the District within 30 days of completion of work.

ADDITIONAL CONDITIONS OF PERMIT

The well must be cleaned, disinfected and bacteriologically cleared in accordance with Chapter 62-555, F.A.C. The bacteriological clearance data shall be submitted to the County Health Unit or appropriate office of the Department of Environmental Protection and release for use must be obtained prior to placing the well in service.

A grouting card (Form 0196) must be supplied to the District prior to beginning construction.

Well Completion Report

Form #0633
Rev. 11/91

CONSTRUCTION PERMIT NO. SF101598A

CARD-Collier COUNTY
SHEET-DRILLER

ORLANDO UTILITIES COMMISSION 3800 GARDENIA AVENUE ORLANDO FL 32802
Owner — Address — City — State — Zip

Contractor's Signature — 2805 License No. — 1/29/99 Completion Date — 1045' Casing Depth — 1450' Total Depth — 1 Well #

STEVEN UNDERWOOD
Driller's Name — Registration No

TYPE OF WORK: Construct (X) Repair ( ) Abandon ( )
WELL USE: Private Well ( ) Public (X) Monitor ( ) Test ( )
Irrigation ( ) Fire Well ( ) Other _____
METHOD: Rotary with MUD (X) or Air ( ), Cable Tool ( ), Jet ( )
Casing Driven ( ), Other _____
STATIC WATER LEVEL 34.80' Ft. below top of casing
PUMPING WATER LEVEL 92.0 Ft. after 4 Hrs. at 4950 GPM
PUMP SIZE _____ H P CAPACITY _____ GPM
PUMP TYPE _____ INTAKE DEPTH _____

LOCATION

Located Near _____

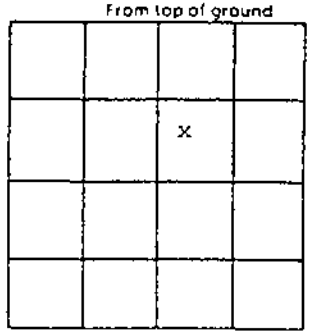
County ORANGE

SW NE 23 24 30
1/4 1/4 Section Township Range

Unit Block Lot Subdivision

Cuttings sent to District? ( ) Yes ( ) No

From top of ground



LOCATE IN SECTION

No cuttings sent "COLLECT" will be accepted

Note: PWS Wells attach a site map if well location is different from site location on permit application.

Grout	Casing & Screen		Depth (ft.)		DRILL CUTTINGS LOG Examine cuttings every 20 ft or at formation changes Give color, grain size, and type of material Note cavities, depth to producing zones.
Thickness & Depth	Diameter & Depth		From	To	
			0	30	BROWN SAND
			30	75	SILTY CLAY W/SAND
			75	115	SHELL W/CLAY
			115	190	GRAY CLAY W/SHELL
			190	420	TAN LIMESTONE
			420	990	TAN DOLOMITE
			990	1000	TAN DOLOMITE W/CLAY
			1000	1370	TAN DOLOMITE
			1370	1380	BROWN CHERT
			1380	1450	TAN DOLOMITE
Number of bags					

Casing: Black Steel (x) Galv ( ) PVC ( ) Fiberglass ( )
Screen: Type _____ Slot size _____
Screened from _____ (ft.) to _____ (ft.)
Type of grout with % additives NEAT
Water: Clear (x) Colored ( ) Sulphur ( ) Salty ( ) Iron ( )
Conductivity _____ Chlorides _____ mg/l

30" x .375" STEEL CASING SET FROM 0 to 120',
CEMENTED WITH 218 SACKS OF NEAT CEMENT

24" x .375" STEEL CASING SET FROM +2' to 232',
CEMENTED WITH #@(SACKS OF NEAT CEMENT

18" x .500" STEEL CASING SEY FROM 200' to 1045',
CEMENTED WITH 3,230 SACKS OF NEAT CEMENT & 27.5 CU YD GRAVEL

South Florida Water Management District

3301 Gun Club Road, West Palm Beach, Florida 33406 • (561) 686-8800 • FL WATS 1-800-432-2045
TDD (561) 697-2574

CON 24-06

October 23, 1998

PERMITTEE
ORLANDO UTILITIES COMMISSION
3800 GARDENIA AVENUE
ORLANDO, FL 32802

CONTRACTOR
MATTHEWS, BOB
P.O. BOX 290699
TAMPA, FL 33687
LICENSE NO:2805

WATER WELL CONSTRUCTION PERMIT # SF1015988
EXPIRATION DATE: April 23, 1999

PROJECT: ORLANDO UTILITES SE WATER TREATMENT PLANT WELL 2
TYPE OF USE: PUBLIC WATER SUPPLY
COUNTY: ORANGE SEC: 23 TWP: 24 RGE: 30

WELL CONSTRUCTION SPECIFICATIONS:	INNER	OUTER
CASING DIAMETER:	18"	
CASING DEPTH:	1050.00'	
SCREENED INTERVAL:	-	
OPEN HOLE INTERVAL:	1050' - 1450'	
TOTAL DEPTH OF WELL:	1450.00'	

GROUT REQUIREMENT:
Inner casing shall be grouted bottom to top.

See additional conditions of permit on attached sheet.

We appreciate your assistance and cooperation in better managing the water resources of the District. If you have any questions on this matter, please call Ann-Marie Superchi at extension 6929.

Sincerely,

Jeffrey Rosenfeld, P.G., Supervising Professional
Water Use Division, Regulation Department

Attachment: Additional Conditions of Permit
c: MR. FRANK HUTTNER

ORLANDO UTILITES SE WATER TREATMENT PLANT WELL 2
October 23, 1998

COMPLETION REPORT REQUIRED

A Water Well Completion Report (Form 0124) must be filed with the District within 30 days of completion of work.

ADDITIONAL CONDITIONS OF PERMIT

The well must be cleaned, disinfected and bacteriologically cleared in accordance with Chapter 62-555, F.A.C. The bacteriological clearance data shall be submitted to the County Health Unit or appropriate office of the Department of Environmental Protection and release for use must be obtained prior to placing the well in service.

A grouting card (Form 0196) must be supplied to the District prior to beginning construction.

WELL COMPLETION REPORT

CONSTRUCTION PERMIT NO. SF101598B

ORLANDO UTILITIES COMMISSION 3800 GARDENIA AVE. ORLANDO, FL 32802
OWNER'S NAME

CONTRACTOR'S SIGNATURE	LICENSE NO.	COMPLETION DATE	CASING DEPTH	TOTAL DEPTH	WELL #
	2805	4/26/99	1045'	1441'	2

STEVEN UNDERWOOD
DRILLER'S NAME

TYPE OF WORK: CONSTRUCT X REPAIR ____ ABANDON ____
WELL USE: PRIVATE WELL ____ PUBLIC X MONITOR ____
IRRIGATION ____ FIRE WELL ____ OTHER ____
METHOD: ROTARY WITH MU X OR AIR ____ CABLE TOOL ____
JET ____ CASING DRIVEN ____ OTHER ____

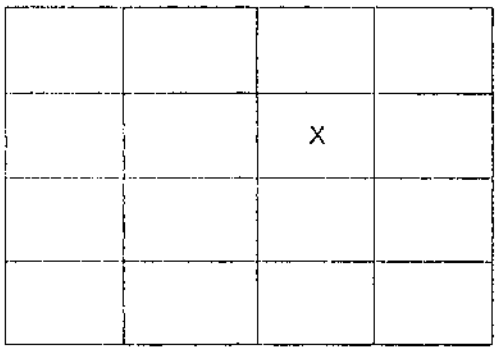
STATIC WATER LEVEL 35.6 FT. BELOW TOP OF CASING
PUMPING WATER LEVEL 87.1 FT AFTER 4 HRS. AT 5000
PUMP SIZE ____ HP CAPACITY ____ GPM
PUMP TYPE ____ INTAKE DEPTH ____
(FROM TOP OF GROUND)

LOCATION
LOCATED NEAR BOGGY CREEK ROAD & CENTRAL
FLORIDA GREENWAY
COUNTY ORANGE

SW	NE	23	24	30
1/4	1/4	SEC	TWP	RGE

UNIT ____ BLOCK ____ LOT ____ SUBDIVISION ____

CUTTINGS SENT TO DISTRICT?
( ) YES
(X) NO



LOCATE IN SECTION

GROUT THICK-NESS & DEPTH	CASING & SCREEN DIAMETER & DEPTH	DEPTH (ft>) FROM	TO	DRILLING CUTTINGS LOG EXAMINE CUTTINGS EVERY 20' OR AT FORMATION CHANGES GIVE COLOR, GRAIN SIZE, & TYPE NOTE CAVITIES, ETC.
		0	30	TAN SAND
		30	70	GREEN CLAY
		70	117	SHELL
		117	170	GREEN CLAY W/SHELL
		170	220	CLAY W/LIMESTONE
		220	420	TAN LIMESTONE
		420	520	BROWN DOLOMITE
		520	1060	TAN LIMESTONE
		1060	1441	BROWN DOLOMITE
# OF BAGS				

CASING:
Blk Stee X Galv. ____ PVC ____ Other ____
SCREEN: TYPE ____ SLOT SIZE: ____
SCREENED FROM ____ (FT) TO ____ (FT)
TYPE OF GROUT WITH % ADDITIVES ____
WATER:
CLEAR X COLORED SULPHUR SALTY IRON
CONDUCTIVITY ____ CHLORIDES ____ mg/l

ADDITIONAL DETAILS:
30" x .375" STEEL CASING SET FROM 0' TO 121', CEMENTED WITH 328 SACKS OF NEAT CEMENT
24" x .375" STEEL CASING SET FROM +2' TO 232', CEMENTED WITH 288 SACKS OF NEAT CEMENT
18" x .500" STEEL CASING SET FROM 200' TO 1045', CEMENTED WITH 3545 SACKS OF NEAT CEMENT & 29.5 CU YD OF GRAVEL

Appendix 3

Material Submittals

Sverdrup Civil Inc./ Southeast Water Treatment Plant

Submittal Package No. 014095 (Contract) - 8 (Submittal No.) - 02670 (/spec. Section) - Part 2.03A (Rev.)

PROJECT: SOTHEAST WATER TREATMENT PLANT

Description:

SUBMITTED BY: CONTRACTOR SUB-CONTRACTOR SUPPLIER

Contractor	Diversified Drilling Corporation
Name	Stuart C. Anderson
Address	P.O. Box 290699 Tampa, FL 33687-0699
Telephone	813/988-1132

From Sub-Contractor/Date:	To Designer/Date:	Designer Due Date	From Designer/Date:	To Sub-Contractor/Date:
10/20/98				

ITEM #	SPEC. PARA. REF.	TYPE	PAGES	CPM #	DESCRIPTION	DISPOSITION
8	02670 Part 2.03A	QC	2		ASTM C150 Portland Cement	

CONTRACTOR'S APPROVAL STAMP

SHOP SUBMITTAL NUMBER 8

DEVIATIONS: NONE X ; AS LISTED

REFERENCE SPECIFICATION NUMBER 02670 Part 2.03A

REFERENCE DRAWING NUMBER

CONTRACTOR HAS REVIEWED AND SUBMITTED FOR REVIEW

SIGNATURE Stuart C. Anderson DATE 10/19/98

DIVERSIFIED DRILLING CORPORATION TAMPA, FLORIDA

1 – APPROVED
2 – APPROVED AS NOTED
3 – NOT APPROVED
4 – WORK MAY PROCEED
5 – DO NOT PROCEED WITH WORK
6 – MAKE CORRECTION NOTED
7 – RESUBMIT
8 – DO NOT RESUBMIT
9 – SUBMIT FINAL CERTIFIED
10 – REVIEW NOT REQUIRED BY CONTRACT DOCUMENTS

SEE TRANSMITTAL FOR ADDITIONAL INFORMATION AS APPLICABLE.

ACTION SHOWN ABOVE IS ONLY FOR CONFORMANCE WITH THE DESIGN CONCEPT OF THE WORK AND WITH THE INFORMATION IN THE CONTRACT DOCUMENTS.

BY APPROVAL AND SUBMISSION, CONTRACTOR REPRESENTS THAT HE HAS DETERMINED AND VERIFIED MATERIALS, FIELD MEASUREMENTS AND CONSTRUCTION CRITERIA AND SIMILAR DATA.

DEVIATIONS FROM CONTRACT DOCUMENTS ARE NOT REVIEWED UNLESS SPECIFICALLY REQUESTED IN WRITING BY CONTRACTOR. REVIEW ON RESUBMISSION WILL COVER ONLY DESIGNATED CHANGES ON THIS SUBMITTAL AND OTHER CHANGES CLEARLY IDENTIFIED BY CONTRACTOR WITH AN ENCIRCLEMENT.

REVIEWED BY DATE

SVERDRUP

3417 Port Sutton Road
Tampa, Florida 33619
800/922-8152
813/248-3129
Fax: 813/247-5187

HOLNAM

Gentlemen:

This letter is to certify that **HOLNAM. INC.**, Type I/II Portland Cement, as manufactured at Theodore, Alabama, either meets or exceeds ASTM C-150 specifications. Please do not hesitate to contact us if you require further assistance.

Sincerely,

Marvin L. Stokoe

HOLNAM INC.
Marvin L. Stokoe
Tech Service

Sworn before me on this 19th day of October, 19 98

Barbara V Walker
Notary Public

12/6-98
My Commission Expires

NOTARY PUBLIC STATE OF FLORIDA

HOLNAM

Test Certificate
Average of Test Results

Consignee:

Car or Truck No. _____
Date Shipped _____
Quantity _____
Silo _____

PORTLAND CEMENT - Type I/II A.S.T.M. SPECIFICATION: C-150
Meets AASHTO specifications for type I

				PERCENT
1. Chemical Composition:	Silicon Dioxide (SiO2)			21.0
	Aluminum Oxide (AL2O3)			5.2
	Ferric Oxide (Fe2O3)			3.7
	Calcium Oxide (CaO)			63.2
	Magnesium Oxide (MgO)			1.7
	Sulfur Trioxide (SO3)			2.7
	Loss On Ignition			1.3
	Insoluble Residue			0.26
	Tricalcium Silicate (C3S)			50
	Dicalcium Silicate (C2S)			22
	Tricalcium Aluminate (C3A)			8
	Tetracalcium Aluminoferrite (C4AF)			11
	Na2O Equivalent			0.48
2. Specific Surface:	Blaine, Sq. Metres per Kilogram			383
	Wagner, Sq. Metres per Kilogram			
3. Soundness:	Autoclave Expansion			0.04
4. Time of Setting:	Vicat, Initial Set	110	Min.	
	Vicat, Final Set	210	Min.	
	Gilmore Initial Set	150	Min.	
	Gilmore Final Set	240	Min.	
5. Compressive Strength Tests:	3 Days	3590 psi	24.8 MPa	
	7 Days	4500 psi	31.0 MPa	
6. Air Entrainment:	% by Volume	6.9		

Holnam Cement is warranted to conform at the time of shipment with the specification designated above. No other warranty is made or implied. Having no control over the use of its cements, Holnam Inc. does not guarantee finished work.

HO-09-98

Holnam Inc.
Theodore, Alabama Plant

By J. F. Wright
Quality Control Manager

SPEC-DATA®

This Spec-Data sheet conforms to editorial style prescribed by The Construction Specifications Institute. The manufacturer is responsible for technical accuracy.

3 CAST-IN-PLACE CONCRETE
Portland Cement

HOLNAM INC.
May 1994
(Supersedes November 1992)

HOLNAM

1. PRODUCT NAME

HOLNAM Portland Cement

2. MANUFACTURER

HOLNAM INC.
PO Box 122
6211 Ann Arbor Road
Dundee, MI 48131
Phone: (800) 831-9507
(313) 529-2411
FAX: (313) 529-2575

3. PRODUCT DESCRIPTION

Basic Use: HOLNAM Portland Cement is a cost-effective, basic raw building material which is used in a wide variety of commercial and architectural concrete construction applications. Uses include: cast-in-place, precast, tilt-up, water tanks, drains, bridges, roads, pipe, blocks, prestress concrete members, masonry mortars and grouts. When used to make concrete with the proper mix design, HOLNAM Portland Cement is able to resist the attack of harsh environmental influences such as frost, water, oil and de-icing chemicals.

Composition and Materials: The primary ingredients of HOLNAM Portland Cement are portland clinker and gypsum ground to a fine powder that, when mixed with water, sets and hardens into a solid monolithic mass. The hydration of calcium silicates forms a gel-like material called calcium silicate hydrate. All HOLNAM manufacturing is quality controlled to ensure optimum product performance and uniformity.

Types: HOLNAM Portland Cements are produced to meet the requirements of ASTM C 150. HOLNAM manufactures four types of portland cement which are classified as Types I, II, III and V. Some may meet the requirements of more than one specification such as Type I/II and Type II/V. HOLNAM also manufactures air-entrained portland cements—Types IA, IIA, IIIA, as well as low-alkali (LA) Types ILA, IILA, IIILA and VLA.

Limitations: There are many variables that affect concrete performance beyond the control of the cement manufacturer. Good concreting practices are required in order to achieve desired results. Special attention must be given to form work, batching, mixing, placing, finishing and curing. In special applications, selection of aggregates, admixtures and additives may need to be scrutinized.

Sizes: HOLNAM Portland Cement can be shipped by bulk rail and truck quantities measured in tons or packaged in standard bags.

4. TECHNICAL DATA

Applicable Standards: HOLNAM Portland Cements are manufactured to conform to all requirements of ASTM C 150, "Standard Specification for Portland Cement."

Physical Properties: HOLNAM Portland Cements are formulated to provide consistent strength, durability and workability as well as finished product appearance.

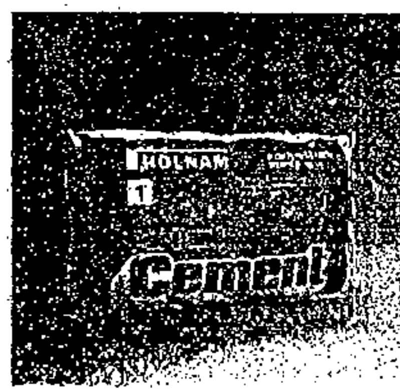
5. INSTALLATION

Concrete is a structural material consisting of hard, chemically-inert material (usually sand and gravel) bonded together by cement and water. The character of structural concrete is largely determined by the water-cement ratio. The amount of cement in relation to the amount of aggregate is especially critical to a durable, strong concrete. Paste is composed of portland cement, water and, if required, entrained air for freeze-thaw durability.

Freshly mixed (plastic) and hardened properties of concrete may be changed by adding chemical and mineral admixtures to concrete during batching. These admixtures are used to:

- Adjust setting time and/or hardening
- Reduce water demand
- Increase workability
- Entrain air
- Provide cost-effectiveness
- Adjust other concrete properties

Good concreting practices are required for proper, durable,



Physical Property	ASTM C 150 Specification				ASTM Test
	Type I	II	III	V	
Fineness, cm^2/g					
Turbidimeter, Minimum	1600	1600	—	1600	C 115
Air Permeability, Minimum	2800	2800	—	2800	C 204
Time of Set					
Vicat, Minutes					C 191
Initial, Minimum	45	45	45	45	
Final, Maximum	375	375	375	375	
Gillmore, Minutes					C 266
Initial, Minimum	60	60	60	60	
Final, Maximum	600	600	600	600	
Air Content % Maximum	12	12	12	12	C 185
Autoclave Expansion % Maximum	0.80	0.80	0.80	0.80	C 151
Compressive Strength psi, Minimum					
1 day	—	—	1800	—	C 109
3 day	1800	1500	3500	1200	
7 day	2800	2500	—	2200	
28 day	—	—	—	3000	

CSI

HOLNAM
HOLNAM INC.
May 1994
(Supersedes November 1992)
3 CAST-IN-PLACE CONCRETE
Portland Cement

strong concrete. Proper proportioning, batching, mixing, placing, consolidating, finishing and curing, as well as proper sub-grade preparation, form work, uniform slump and other special techniques are critical to achieving the desired results.

Freshly mixed concrete should be plastic or semifluid and moldable.

HOLNAM Portland Cements are manufactured under controlled conditions and laboratory tested to ensure consistent quality and uniformity. Never change sources or proportions during a construction project.

Precautions: Fresh, ready-mixed concrete may cause minor irritation to the skin. Direct contact with the skin should be avoided as much as possible, and if it does occur, the skin should be washed with water as soon as possible. If fresh, ready-mixed concrete or portland cement gets into the eyes, rinse them thoroughly with water and seek medical attention. Material Safety Data sheets are available for additional information.

6. AVAILABILITY AND COST

Availability: HOLNAM Portland Cement is available through HOLNAM dealers and distributors throughout the United States. Price information is available through HOLNAM regional sales offices. Please see the listing below.

7. WARRANTY

HOLNAM INC. will provide written certification that HOLNAM Portland Cements of each type meet appropriate ASTM specifications. For more warranty information, contact HOLNAM INC.

8. MAINTENANCE

In areas where cleaners and sealers are required, proper instructions should be followed. Contact HOLNAM INC. or the proprietary manufacturer before application.

9. TECHNICAL SERVICES

Technical service is available by contacting the HOLNAM INC technical services department or a local HOLNAM INC. market manager.

With advance notice, technical service may be also provided at job site locations.

10. FILING SYSTEMS

- SPEC-DATA® II
- Additional product data is available upon request.

HOLNAM INC. DIVISION AND REGIONAL OFFICES

CORPORATE HEADQUARTERS
6211 Ann Arbor Road
PO Box 122
Dundee, MI 48131
Phone: (313) 529-2411
(800) 831-9507
FAX: (313) 529-2575

CENTRAL DIVISION
SOUTH CENTRAL REGION
Suite 100
3221 McKelvey Road
Bridgeton, MO 63044
Phone: (314) 344-1144
(800) 325-1176
FAX: (314) 344-0222

MID CENTRAL REGION
Suite 171
1313 East Kemper Road
Cincinnati, OH 45246
Phone: (513) 671-3770
(800) 962-1191
FAX: (513) 671-2937

MIDWEST REGION
Suite 206
2215 York Road
Oak Brook, IL 60521
Phone: (708) 571-4321
(800) 832-5742
FAX: (708) 571-0952

NORTH CENTRAL REGION
Suite 303
2001 Commonwealth Boulevard
Ann Arbor, MI 48105
Phone: (313) 663-1532
(800) 624-2840
FAX: (313) 663-1436

NORTHERN REGION
12200 River Ridge Boulevard
Burnsville, MN 55337
Phone: (612) 890-2732
(800) 562-3989
FAX: (612) 890-2109

SOUTHEAST DIVISION
SANTEE REGION
One Windsor Cove
Columbia, SC 29223 (UPS)
PO Box 23189
Columbia, SC 29224
Phone: (803) 736-0702
(800) 845-1120
FAX: (803) 736-6769

FLORIDA/GEORGIA REGION
Suite 730
3100 Breckinridge Boulevard
Duluth, GA 30136
Phone: (404) 381-8177
(800) 292-4355
FAX: (404) 381-8607

SOUTH ATLANTIC REGION
Suite 102
3120 Poplar Wood Court
Raleigh, NC 27604 (UPS)
PO Box 40788
Raleigh, NC 27629-0788
Phone: (919) 878-7297
(800) 923-6368
FAX: (919) 878-7473

SOUTHERN REGION
6576 Airport Blvd. Bldg. B 200
Mobile, AL 36608 (UPS)
PO Box 850789
Mobile, AL 36685-0789
Phone: (205) 344-3109
(800) 422-6849
FAX: (205) 344-5786

RAINBOW PRODUCTS
Suite 102
500 Chase Park South
Birmingham, AL 35244 (UPS)
PO Box 360956
Birmingham, AL 35236
Phone: (205) 985-0700
(800) 524-6586
FAX: (205) 985-0611

WEST DIVISION
Cherry Creek Plaza II
Suite 720
650 South Cherry Street
Denver, CO 80222
Phone: (303) 331-0610
(800) 545-0266
FAX: (303) 331-0605

COLORADO REGION
Cherry Creek Plaza II
Suite 710
650 South Cherry Street
Denver, CO 80222
Phone: (303) 320-1177
(800) 331-4233
FAX: (303) 320-1690

NEW MEXICO REGION
1 Cement Plant Lane
South Highway 14
PO Box 100
Tijeras, NM 87059
Phone: (505) 281-3351
(800) 234-2266
FAX: (505) 281-3353

MONTANA/NORTHWEST REGION
4070 Trident Road
Three Forks, MT 59752
Phone: (406) 285-3241
(800) 548-7606
FAX: (406) 285-3491

OKLAHOMA/ARKANSAS REGION
Suite 520
9400 North Broadway
Oklahoma City, OK 73114
Phone: (405) 478-8702
(800) 762-3613
FAX: (405) 478-8706

PACIFIC REGION
5400 West Marginal Way SW
Seattle, WA 98106
Phone: (206) 937-8025
(800) 424-3889
FAX: (206) 932-3803

TEXAS GULF REGION
1800 Dove Lane
PO Box 1170
Midlothian, TX 76065-4405
Phone: (214) 299-6350
(800) 326-1821
FAX: (214) 299-6960

UTAH REGION
554 South 400 West
Salt Lake City, UT 84101 (UPS)
PO Box 477
Salt Lake City, UT 84110
Phone: (801) 363-6755
(800) 662-9553
FAX: (801) 363-7581

OUC Southeast Water Plant Well No. 1
Grouting Summary for 30"/24"/18" Diameter Casings

Casing Diameter	Stage No.	Date Installed	Starting Depth (Feet BLS)	Cement Installed (Sacks)	Gravel Installed (Cubic Yds.)	Theroetical Rise (Feet)	Theroetical Depth (Feet BLS)	Ending Rise (Feet)	Ending Depth (Feet BLS)
30 INCH	STAGE 1	Thur. 10/29	125	218	—	155	-30	125	0
24 INCH	STAGE 1	Wed. 11/4	235	329	—	288	-53	235	0
18 INCH	STAGE 1	Fri. 12/18	1,050	500	—	565	485	(A)	(A)
	STAGE 2	Sat. 12/19	(A)	300	—	339	(A)	(A)	(A)
	STAGE 3	Mon. 12/21	(A)	—	16	390	(A)	(A)	804
	STAGE 4	Tue. 12/22	804	335	2	379	425	90	714
	STAGE 5	Tue. 12/22	714	300	—	339	375	128	586
	STAGE 6	Wed. 12/23	586	250	1.5	283	304	50	536
	STAGE 7	Wed. 12/23	536	300	0.5	339	197	54	482
	STAGE 8	Thur. 12/24	482	—	3	73	409	(B)	(B)
	STAGE 9	Thur. 12/24	(B)	300	—	339	(B)	(B)	474
	STAGE 10	Mon. 12/28	474	—	1.5	37	437	30	444
	STAGE 11	Mon. 12/28	444	300	—	339	105	54	390
	STAGE 12	Tue. 12/29	390	200	—	226	164	28	362
	STAGE 13	Tue. 12/29	362	175	—	198	164	38	324
	STAGE 14	Wed. 12/30	324	165	—	186	138	(C)	(C)
	**STAGE 15*	Thur. 12/31	(C)	40	—	45	(C)	(C)	(C)
	**STAGE 16*	Thur. 12/31	(C)	40	3	45	(C)	(C)	268
	STAGE 17	Mon. 1/4	268	70	—	79	189	(D)	(D)
	**STAGE 18*	Tue. 1/5	(D)	25	—	28	(D)	(D)	(D)
	**STAGE 19*	Tue. 1/5	(D)	25	—	28	(D)	(D)	(D)
	**STAGE 20*	Wed. 1/6	(D)	25	—	28	(D)	(D)	230
	STAGE 21	Fri. 1/15	230	20	—	23	207	21	209
	STAGE 22	Sat. 1/16	209	15	—	17	192	8.5	200.5
TOTALS	—	—	—	3932	27.5	—	—	—	—

NOTES: 1) False tag on ledge at: (A - 505 ft. bls), (B - 436 ft.bls), (C - 235 ft. bls), and (D - @ 230 feet casing was cut short).
* No payment required as per Stuart Anderson w/ Diversified.

OUC Southeast Water Plant Well No. 2
Grouting Summary for 30"/24"/18" Diameter Casings

Casing Diameter	Stage No.	Date Installed	Starting Depth (Feet BLS)	Cement Installed (Sacks)	Gravel Installed (Cubic Yds.)	Ending Depth (Feet BLS)	Ending Rise (Feet)
30 INCH	STAGE 1	10/30/98	125	338	---	0	125
24 INCH	STAGE 1	11/4/98	235	288	---	0	235
18 INCH	STAGE 1	17-Mar	1,060	500	---	928	132
	STAGE 2	18-Mar	928	300	---	835	93
	STAGE 3	18-Mar	835	300	---	732	103
	STAGE 4	21-Mar	732	300	---	610	122
	STAGE 5	22-Mar	610	300	---	570	40
	STAGE 6	23-Mar	570	---	2	543	27
	STAGE 7	24-Mar	543	300	---	507	36
	STAGE 8	25-Mar	507	---	11	451	56
	STAGE 9	25-Mar	451	300	---	445	6
	STAGE 10	26-Mar	445	---	1.5	425	20
	STAGE 11	26-Mar	425	300	---	416	9
	STAGE 12	29-Mar	416	---	14.5	385	31
	STAGE 13	29-Mar	385	300	---	345	40
	STAGE 14	31-Mar	345	300	---	300	45
	STAGE 15	1-Apr	300	300	---	232	68
	STAGE 16	1-Apr	232	35	---	200	32
TOTALS	—			**4161**	**29.0**		

DIVERSIFIED DRILLING CORPORATION

LETTER OF TRANSMITTAL

Job No. 981001

Date 11/06/98

P.O. BOX 290699 · Tampa, Florida 33687-0699

TO Mr. Grant Guerri
Sverdrup Civil, Inc.
5750 Major Blvd.
Suite 500
Orlando, Florida 32819-7946

RE OUC/Southeast Water Plant

NOV 09 1998

WE ARE FORWARDING TO YOU:

- ☐ Estimates
- ☐ Plans
- ☐ Shop Drawings
- ☐ Copy of letter
- ☐ Proposals
- ☐ Prints
- ☐ Samples
- ☐ Change order
- ☐ Reports
- ☐ Under separate cover via: _____
- ☐ Specifications
- ☒ Submittal

NO. OF COPIES	DRAWING NO.	LAST DATED	CODE	DESCRIPTION
6		11/06/98		Submittal No. 11 - 18" Casing

THESE ARE TRANSMITTED

- ☒ For approval
- ☐ For your use
- ☐ As requested
- ☐ For review and comment
- ☐ Resubmit _____ Copies for review
- ☐ Submit _____ copies for distribution
- ☐ Return _____ corrected prints
- ☐ _____
- ☐ No exceptions taken (NE)
- ☐ Make corrections noted (MCN)
- ☐ Amend and resubmit. (AR)

PLEASE NOTE: _____

CC: John Watson
Well File

DIVERSIFIED DRILLING CORPORATION

Per Stuart C. Anderson

Submittal Package No. 014095 - 11 - 02670 - Part 2.02B2
(Contract) (Submittal No.) (Spec Section) (Rev.)

PROJECT: SOTHEAST WATER TREATMENT PLANT
Description:

SUBMITTED BY: CONTRACTOR SUB-CONTRACTOR SUPPLIER

Contractor Name	Diversified Drilling Corp. Stuart C. Anderson
Address	P.O. Box 290699 Tampa, Florida 33687-0699
Telephone	813/988-1132

From Sub-Contractor/Date:	To Designer/Date:	Designer Due Date	From Designer/Date:	To Sub-Contractor/Date:

ITEM #	SPEC. PARA. REF	TYPE	PAGES	CPM #	DESCRIPTION	DISPOSITION
11	02670 Part 2.02B2	QC	8		18" Casing	

CONTRACTOR'S APPROVAL STAMP

HOP SUBMITTAL NUMBER 11

... X ; AS LISTED

... SPECIFICATION ... Sec 02670, Part 2 02B2

...ERENCE DRAWING NUMBER

CONTRACTOR HAS REVIEWED AND SUBMITTED FOR REVIEW

SIGNATURE Stuart C. Anderson DATE 11/06/98

DIVERSIFIED DRILLING CORPORATION TAMPA, FLORIDA

1 - APPROVED
2 - APPROVED AS NOTED
3 - NOT APPROVED
4 - WORK MAY PROCEED
5 - DO NOT PROCEED WITH WORK
6 - MAKE CORRECTION NOTED
7 - RESUBMIT
8 - DO NOT RESUBMIT
9 - SUBMIT FINAL CERTIFIED
10 - REVIEW NOT REQUIRED BY CONTRACT DOCUMENTS

SEE TRANSMITTAL FOR ADDITIONAL INFORMATION AS APPLICABLE.

ACTION SHOWN ABOVE IS ONLY FOR CONFORMANCE WITH THE DESIGN CONCEPT OF THE WORK AND WITH THE INFORMATION IN THE CONTRACT DOCUMENTS.

BY APPROVAL AND SUBMISSION, CONTRACTOR REPRESENTS THAT HE HAS DETERMINED AND VERIFIED MATERIALS, FIELD MEASUREMENTS AND CONSTRUCTION CRITERIA AND SIMILAR DATA.

DEVIATIONS FROM CONTRACT DOCUMENTS ARE NOT REVIEWED UNLESS SPECIFICALLY REQUESTED IN WRITING BY CONTRACTOR. REVIEW ON RESUBMISSION WILL COVER ONLY DESIGNATED CHANGES ON THIS SUBMITTAL AND OTHER CHANGES CLEARLY IDENTIFIED BY CONTRACTOR WITH AN ENCIRCLEMENT.

REVIEWED BY DATE

SVERDRUP

INSPECTION CERTIFICATE

(주) 신 호 스 틸
SHINHO STEEL CO., LTD.

HEAD OFFICE : DONGWON BLDG. 275, YANGWAE DONG, SEOCHO-KU, SEOUL, KOREA
INCHUN PLANT : 468, HAGIK-DONG, NAM-KU, INCHON, KOREA
DAEBUL PLANT : 11 BLOCK, DAEBUL NATIONAL INDUSTRIAL COMPLEX, NASUL-RI, SAMHO-MYEON, YOUNGAM-KUN, CHULLANAM-DO, KOREA
KUMI PLANT : 293, KONGDAN-DONG, KUMI-SHI, KYONGSANGBUK-DO, KOERA

신용장번호 L/C No. : NY7532K
발급일자 ISSUED DATE : 1997. 12. 30
제품명 COMMODITY : E.R.W. STEEL PIPE
제품규격 SPECIFICATION : API 5LB/ASTM A53B

증명서번호 CERTIFICATE No. : D971229 - 357 - 3
제조번호 MANUFACTURED No. : 97 - 11 - 211
주문자 SUPPLIER : HYUNDAI CORPORATION
수요가 CUSTOMER : HYUNDAI CORPORATION, U.S.A.

ITEM NO.	HEAT NO. (LOT)	관종 TYPE ①	수량 QUANTITY (PIECES)	호칭경 NOMINAL SIZE (in)	주문치수 ORDER SIZE 바깥지름 O.D. (mm) ②	두께 W.T. (in) ③	길이 LENGTH (ft)	중량 WEIGHT (kg/ft)	인장시험 TENSILE TEST 인장강도 TENSILE STRENGTH (psi)	항복강도 YIELD STRENGTH (psi)	연신율 ELONG-ATION (%)	화학성분 CHEMICAL COMPOSITION(%) C	Si	Mn	P	S	Cu	Ni	Cr	Mo	V
													2		3			2			3
																	④				
1	Y15910	BPEB	41	18	457.2	0.500	42'	42.43	71000	50000	34	15	1	73	11	6	3	3	3	TR	3
2	Y15911	BPEB	2	18	457.2	0.500	42'	42.43	71000	50000	35	15	1	72	12	5	2	3	3	1	2
3	A22721	BPEB	14	20	508.0	0.250	42'	23.94	71000	51000	34	15	TR	73	12	6	3	2	2	1	4
4	A22722	BPEB	19	20	508.0	0.250	42'	23.94	73000	50000	35	16	1	72	13	6	3	3	2	1	3
5	A22723	BPEB	10	20	508.0	0.250	42'	23.94	73000	50000	34	16	TR	72	12	5	3	2	3	TR	3
6	Y16192	BPEB	70	20	508.0	0.375	42'	35.69	74000	53000	33	15	1	73	14	5	2	2	2	TR	3
7	X21701	BPEB	6	20	508.0	0.375	42'	35.69	70000	50000	34	15	1	72	13	4	3	3	3	1	2
8	X21705	BPEB	42	20	508.0	0.375	42'	35.69	73000	51000	33	16	1	72	13	5	3	3	2	1	3
9	A37800	BPEB	9	20	508.0	0.500	42'	47.28	71000	51000	33	17	TR	73	13	4	3	2	2	1	2
10	A37811	BPEB	2	20	508.0	0.500	42'	47.28	73000	50000	34	14	TR	72	13	6	3	2	2	1	3

ITEM NO.	수압시험 HYDROSTATIC TEST TP (PSI) ⑤	RE-SULT	열처리온도 HEAT TREATMENT (℃)	비파괴시험 NOT (U.T) ⑥	경도시험 HARDNESS TEST (HrB)	외주장 CIRCUMFERENCE (mm) END	BODY	용접부인장강도 TENSILE STRENGTH OF WELDS (kgf/㎟)	아연도금시험 ZINC COATING TEST WZC (g/m²) ⑦	CST (TIMES)	VISUAL & DIMEN-SION	FLATT-ENING (BEND) TEST	W D T	R G T	F R T	C R T	R F T	S.T (%)	충격시험 IMPACT TEST ENE-RGY (J)	SHEAR AREA (%)	비고 REMARKS
																⑧			(	)℃	
1	1170	GOOD	950	ACCEPT				53			ACCEPT	GOOD									
2	1170	GOOD	950	ACCEPT				53			ACCEPT	GOOD									
3	520	GOOD	830	ACCEPT				53			ACCEPT	GOOD									
4	520	GOOD	830	ACCEPT				54			ACCEPT	GOOD									
5	520	GOOD	830	ACCEPT				54			ACCEPT	GOOD									
6	790	GOOD	880	ACCEPT				55			ACCEPT	GOOD									
7	790	GOOD	880	ACCEPT				52			ACCEPT	GOOD									
8	790	GOOD	880	ACCEPT				54			ACCEPT	GOOD									
9	1050	GOOD	950	ACCEPT				53			ACCEPT	GOOD									
10	1050	GOOD	950	ACCEPT				54			ACCEPT	GOOD									

NOTE
①TYPE BPE BLACK PLAIN ENDS BPEB BPE BEVELLED BTE BLACK THREADED ENDS BTC BLACK THREADED&COUPLED GPE GALVANIZED PLAIN ENDS GTE GALVANIZED THREADED ENDS GTC GALVANIZED THREAD&COUPLED
②O.D. OUTSIDE DIAMETER ③W.T. WALL THICKNESS ④CHEMICAL COMPOSITION CHECK ANALYSIS 2: ×100 3: ×1000 ⑤TP TESTING PRESSURE ⑥NDT NONDESTRUCTIVE TEST
E.T EDDY CURRENT TEST U.T ULTRASONIC TEST ⑦WZC WEIGHT OF ZINC COATING CST COPPER SULPHATE TEST ⑧WOT WELD DUCTILITY TEST RGT RING GAGE TEST FAT FRANGE TEST
CRT CRUSH TEST RFT REVERSE FLATTENING TEST S.T STRAIGHTNESS

SIGNATURE
SURVEYOR TO:

본 제품은 관련 규격이 정한 시험 및 검사에 합격하였음을 증명합니다.
WE HEREBY CERTIFY THAT THE PRODUCTS HEREIN HAVE BEEN MADE AND TESTED IN ACCORDANCE WITH THE ABOVE SPECIFICATION AND ALSO WITH THE REQUIREMENTS CALLED FOR THE ORDER.

SIGNATURE
MANAGER OF QUALITY ASSURANCE TEAM

SMS C-30-05-(21)

검 사 증 명 서 (A)
MILL INSPECTION CERTIFICATE

현 대 강 관 주 식 회 사
HYUNDAI PIPE CO., LTD.
*본 사 · 공 장 경남 울산시 중구 염포동 265번지 (682-040)
ULSAN PLANT : # 265, YUMPO-DONG, JUNG-KU, ULSAN, KOREA
TEL : 87-2101~9 FAX : (0522) 87-8916
TLX : HDPIPE K 53776
*서 울 사 무 소 서울특별시 중구 무교동 77번지 (100-170)
SEOUL OFFICE : # 77, MUKYO-DONG, JUNG-KU, SEOUL, KOREA
TEL : 773-0522 FAX : 775-7095
TLX : HDPIPE K 24656, K 22956

성적서번호 CERTIFICATE NO : E-7-08-112 페이지 PAGE 1
발 행 일 자 DATE OF ISSUE : AUG. 14. 1997. E4739300
계 약 번 호 CONTRACT P/O NO :
품 명 COMMODITY : E.R.W. STEEL PIPE
제 품 규 격 SPECIFICATION : API 5LB/ASTM A53B

수 요 가 CUSTOMER

G : GOOD

관종 TYPE OF PIPE END ※1	치수 DIMENSION 외경 / 두께 / 길이 (OUTDIA × THICK. × LENGTH) ※2 ※3 ※4	수량 QUANTITY (PCS)	중량 WEIGHT (KG)	수압시험 HYDRO-STATIC TEST Mpa kg/cm² PSI ※5	※6 VISUAL & DIMENSION TEST	※7 FLATTENING OR BEND TEST	※8 WELD DUCTILITY TEST	※9 N	※10 DRIFT TEST	※11 FLARING TEST	※12 CRUSH TEST	※13 R-FLATTENING TEST	도막시험 COATING TEST 아연부착량 WEIGHT OF ZINC COAT g/m² OZ/Ft²	균일성 DIP TEST Hr MES ※5	제강번호 HEAT NO.	항복강도 YIELD STRENGTH PSI	인장강도 TENSILE STRENGTH B ※14 kg/mm²	W ※15 N/mm²	연신율 ELONGATION %	C ※16 ×100	Si	Mn	P ×1000	S	Cu	Ni	Cr	Mo ×100	V	충격시험 IMPACT 흡수에너지 ENERGY JOULE	전단파면율 SHEAR VALUE %	비고 REMARK
BPEB	OD 16" × .375" x21.000'	100	59,661	69	G	G	G	G	G						7306369	31.6	48.7	51.3	28	15	Tr	75	14	13								
	(406.4mm x 9.53mm x 6.401M)			980												44900	69300	73000														
															7306379	30.6	48.6	51.2	28	15	Tr	74	11	11								
																43500	69100	72800														
															7306389	32.7	47.5	50.1	27	16	Tr	75	15	21								
																46500	67600	71300														
BPEB	OD 18" × .250" x42.000'	75	67,783	41	G	G	G	G	G						A16402	31.3	46.8	49.4	38	15	1	68	17	8								
	(457.0mm x 6.35mm x 12.802M)			580												44500	66600	70300														
															A16404	30.9	47.0	50.4	38	14	1	69	17	9								
																44000	66900	71700														
BPEB	OD 18" × .500" x42.000'	28	49,893	82	G	G	G	G	G						1-41992	32.6	48.7	51.3	38	17	2	79	14	11								
	(457.0mm x12.70mm x 12.602M)			1170												46400	69300	73000														
															4-21804	33.6	46.1	49.5	42	15	Tr	75	19	5								
																47800	65600	70400														
	TOTAL ->	203	177,347																													

참고—NOTES ※1 Type of pipe End 관종

BPE : Black Plain End Square-cut	GPE : Galvanized Plain End Square-cut
BPEB : Black Plain End Beveled	GPEB : Galvanized Plain End Beveled
BTC : Black Threaded & Coupled	GTC : Galvanized Threaded & Coupled
BVJ : Black Victaulic Joint	GVJ : Galvanized Victaulic Joint
ETC : Enameled Threaded & Coupled	

※2 NB : Norminal Bore호칭경, OD : Outside Diameter
※4 Unit 단위 (M : Meter, F : Feet, I : Inch)
※7 Flattening or Bending Test 편평 또는 굽힘시험
※9 Nondestructive Test 비파괴검사
※12 Crush Test 중압시험
※15 W : Weld Part 용접부
※5 G : Good
※10 Drift Test 관통시험
※13 Reverse Flattening Test 전개시험
※16 H : Heat (Ladle) Analysis 용연분석, P : Product Analysis 제품분석
※3 Unit 단위 (M : mm, I : Inch)
※6 Visual & Dimension Test 육안 및 치수검사
※8 Weld Ductility Test 용접부 연성시험
※11 Flaring Test 입확시험
※14 B : Base Metal 모재부

본 제품은 관련규격에 합격되었음을 보증합니다.

WE HEREBY CERTIFY THAT THE MATERIAL DESCRIBED HEREIN HAS BEEN ACCEPTED IN ACCORDANCE WITH THE PRESCRIBED SPECIFICATION AND ORDER

SURVEYOR

H. Kim
INSPECTION MANAGER

HPS-B301-019-OLT (350 × 280)

현 대 강 관 주 식 회 사
HYUNDAI PIPE CO.,LTD.
*본 사·공 장 경남 울산시 중구 염포동 265번지 (6,8[illegible]1-[illegible]4[illegible])
ULSAN PLANT : # 265,YUMPO-DONG, JUNG-KU,ULSAN,KOREA
TEL : 87-2101~9 FAX : (0522) 87-8916
TLX : HDPIPE K 53776
*서 울 사 무 소 서울특별시 중구 무교동 77번지 (1[illegible]0 - 1[illegible]7[illegible])
SEOUL OFFICE : # 77,MUKYO-DONG, JUNG-KU,SEOUL, KOREA
TEL : 773-0522 FAX : 775-7095
TLX : HDPIPE K 24656, K 22956

검 사 증 명 서 (A)

MILL INSPECTION CERTIFICATE

성적서번호 CERTIFICATE NO : E-7-08-112 페이지 PAGE : 1
발행일자 DATE OF ISSUE : AUG. 14. 1997. E4739300
계약번호 CONTRACT/P/O NO :
품명 COMMODITY : E.R.W. STEEL PIPE
제품규격 SPECIFICATION : API 5LB/ASTM A53B
수요가 CUSTOMER :

G : GOOD

관종 TYPE OF PIPE END ※1	치수 DIMENSION 외경 × 두께 × 길이 (OUT DIA × THICK × LENGTH) ※2 ※3 ※4	수량 QUANTITY (PCS)	중량 WEIGHT (KG)	수압시험 HYDROSTATIC TEST Mpa kg/cm² PSI ※5	※6 VISUAL & DIMENSION TEST	※7 FLATTENING (BEND) TEST	※8 WELD DUCTILITY TEST	※9	※10 DRIFT TEST	※11 FLARING TEST	※12 CRUSH TEST	※13 R.FLATTENING TEST	도금시험 COATING TEST 아연부착량 WEIGHT OF ZINC COAT g/m² OZ/Ft²	균일성 DIP TEST ※5	제강번호 HEAT NO	항복강도 YIELD STRENGTH PSI	인장강도 TENSILE STRENGTH B ※14 kg/mm²	인장강도 W ※15 N/mm²	연신율 ELONGATION % ※16	C ×100	Si	Mn	P ×1000	S	Cu ×100	Ni	Cr	Mo	V	충격시험 IMPACT ENERGY	충격시험 %	비고 REMARK
BPEB	OD 16" × .375" x21.000'	100	59,66	69	G	G	G	G	G						7306369	31.6	48.7	51.3	28	15	Tr	75	14	13								
	(406.4mm × 9.53mm × 6.401M)			980												44900	69300	73000														
															7306379	30.6	48.6	51.2	28	15	Tr	74	11	11								
																43500	69100	72800														
															7306389	32.7	47.5	50.1	27	16	Tr	75	15	21								
																46500	67600	71300														
BPEB	OD 18" × .250" x42.000'	75	67,788	41	G	G	G	G	G						A16402	31.3	46.8	49.4	38	15	1	68	17	8								
	(457.0mm × 6.35mm × 12.802M)			580												44500	66600	70300														
															A16404	30.9	47.0	50.4	38	14	1	69	17	9								
																44000	66900	71700														
BPEB	OD 18" × .500" x42.000'	28	49,893	82	G	G	G	G	G						1-41992	32.6	48.7	51.3	38	17	2	79	14	11								
	(457.0mm x12.70mm × 12.802M)			1170												46400	69300	73000														
															4-21804	33.6	46.1	49.5	42	15	Tr	75	19	5								
																47800	65600	70400														
	TOTAL ->	203	177,347																													

참고--NOTES ※1 Type of pipe End 관종

BPE	:Black Plain End Square-cut	GPE	:Galvanized Plain End Square-cut
BPEB	:Black Plain End Beveled	GPEB	:Galvanized Plain End Beveled
BTC	:Black Threaded & Coupled	GTC	:Galvanized Threaded & Coupled
BVJ	:Black Victaulic Joint	GVJ	:Galvanized Victaulic Joint
ETC	:Enameled Threaded & Coupled		

※2 NB : Nominal Bore호칭경, OD : Outside Diameter
※3 Unit 단위(M : mm, I : Inch)
※4 Unit 단위(M : Meter, F : Feet, I : Inch)
※5 G : Good
※6 Visual & Dimension Test육안 및 치수검사
※7 Flattening or Bending Test 편평 또는 굽힘시험
※8 Weld Ductility Test 용접부 연성시험
※9 Nondestructive Test 비파괴검사
※10 Drift Test관통시험
※11 Flaring Test 압착시험
※12 Crush Test 종압시험
※13 Reverse Flattening Test전개시험
※14 B : Base Metal모재부
※15 W : Weld Part 용접부
※16 H : Heat (Ladle) Analysis 용연분석, P : Product Analysis 제품분석

본 제품은 관련규격에 합격되었음을 보증합니다.

WE HEREBY CERTIFY THAT THE MATERIAL DESCRIBED HEREIN HAS BEEN ACCEPTED IN ACCORDANCE WITH THE PRESCRIBED SPECIFICATION AND ORDER.

SURVEYOR

H. Kim

INSPECTION MANAGER

(350×280)

검 사 증 명 서 (A)
MILL INSPECTION CERTIFICATE

현 대 강 관 주 식 회 사
HYUNDAI PIPE CO.,LTD.
*본 사·공 장 경남 울산시 중구 염포동 265번지 ㉾682-090
ULSAN PLANT : # 265,YUMPO-DONG, JUNG-KU,ULSAN,KOREA
TEL : 87-2101~9 FAX : (0522) 87-8916
TLX : HDPIPE K 53776
*서울사무소 서울특별시 중구 무교동 77번지 ㉾100-170
SEOUL OFFICE : # 77,MUKYO-DONG,JUNG-KU,SEOUL,KOREA
TEL : 773-0522 FAX : 775-7095
TLX : HDPIPE K 24656,K 22956

성적서번호 CERTIFICATE NO : E-7-11-430 페이지 PAGE : 1
발행일자 DATE OF ISSUE : NOV. 28. 1997. E4739300
계약번호 CONTRACT P.O NO :
품명 COMMODITY : E.R.W. STEEL PIPE
규격 SPECIFICATION : API 5LB/ASTM A53B
수요가 CUSTOMER :

G : GOOD

관종 TYPE OF PIPE END ※1,※2	치수 DIMENSION 외경·두께·길이 OUTDIA. · THICK. · LENGTH ※3 ※4	수량 QUANTITY PCS	중량 WEIGHT KG	수압시험 HYDROSTATIC TEST Min kg/cm² PSI ※5	※6 Visual & Dimension Test	※7 Flattening Test	※8 Weld Ductility Test	※9	※10 Drift Test	※11 Flaring Test	※12 Crush Test	※13 R.Flattening Test	도금시험 COATING TEST 아연부착량 Weight of Zinc Coat g/m² OZ/FT²	균일성 DIP TEST Tr/MIS	제강번호 HEAT NO	항복강도 YIELD STRENGTH PSI	인장강도 TENSILE STRENGTH B ※14 kg/mm²	인장강도 W ※15 N/mm²	연신율 ELONGATION % ※16	C ×100	Si	Mn	P ×1000	S	Cu ×100	Ni	Cr	Mo	V	충격에너지 ENERGY J(Cal)	연성파면율 SHEAR VALUE %	비고 REMARK
BPEB	OD 18" x .500" x42.000'	3	5,346	82	G	G	G	G	G						Y13761	34.0	49.5	52.1	36	18	1	78	12	10	6	1	2	1	Tr			
	(457.0mm x12.70mm x 12.802M)			1170												48400	70400	74100														
BPEB	OD 24" x .500" x40.000'	16	36,429	62	G	G	G	G	G						A22579	31.2	49.0	52.4	36	16	1	73	17	10	6	1	2	1	Tr			
	(610.0mm x12.70mm x 12.192M)			880												44400	69700	74500														
															A24179	30.7	47.6	50.2	42	16	Tr	79	14	10	6	1	2	1	Tr			
																43700	67700	71400														
	TOTAL ->	19	41,775																													

참고—NOTES ※1 Type of pipe End 관종

BPE	:Black Plain End Square-cut	GPE	:Galvanized Plain End Square-cut
BPEB	:Black Plain End Beveled	GPEB	:Galvanized Plain End Beveled
BTC	:Black Threaded & Coupled	GTC	:Galvanized Threaded & Coupled
BVJ	:Black Victaulic Joint	GVJ	:Galvanized Victaulic Joint
ETC	:Enameled Threaded & Coupled		

※2 NB : Nominal Bore호칭경, OD : Outside Diameter
※3 Unit 단위(M : mm, I : Inch)
※4 Unit 단위(M : Meter, F : Feet, I : Inch)
※5 G : Good
※6 Visual & Dimension Test 육안 및 치수검사
※7 Flattening or Bending Test 편평 또는 굴힘시험
※8 Weld Ductility Test 용접부 연성시험
※9 Nondestructive Test 비파괴검사
※10 Drift Test 관통시험
※11 Flaring Test 압확시험
※12 Crush Test 충압시험
※13 Reverse Flattening Test 전개시험
※14 B : Base Metal 모재부
※15 W : Weld Part 용접부
※16 H : Heat (Ladle) Analysis 용탕분석, P : Product Analysis 제품분석

본 제품은 관련규격에 합격되었음을 보증합니다.

WE HEREBY CERTIFY THAT THE MATERIAL DESCRIBED HEREIN HAS BEEN ACCEPTED IN ACCORDANCE WITH THE PRESCRIBED SPECIFICATION AND ORDER.

SURVEYOR

INSPECTION MANAGER

검 사 증 명 서 (A)

MILL INSPECTION CERTIFICATE

현 대 강 관 주 식 회 사
HYUNDAI PIPE CO.,LTD.
*울 산 · 공 장 경남 울산시 중구 염포동 265번지 682-070
ULSAN PLANT : # 265, YUMPO-DONG, JUNG-KU, ULSAN, KOREA
TEL : 87-2101~9 FAX : (0522) 87-8916
TLX : HDPIPE K 53776
*서 울 사 무 소 서울특별시 중구 무교동 77번지 100-010
SEOUL OFFICE : # 77, MUKYO-DONG, JUNG-KU, SEOUL, KOREA
TEL : 773-0522 FAX : 775-7095
TLX : HDPIPE K 24656, K 22956

검사번호 CERTIFICATE NO : E-7-11-189 페이지 PAGE : 1
발행일자 DATE OF ISSUE : NOV. 28. 1997. E4739300
계약번호 CONTRACT P.O NO :
품명 COMMODITY : E.R.W. STEEL PIPE
규격 SPECIFICATION : API 5LB/ASTM A53B ✓

수요가 CUSTOMER

G : GOOD

	치수 DIMENSION 외경·두께·길이 OUTDIA·THICK.·LENGTH ※2	※3	※4	수량 QUANTITY PCS	중량 WEIGHT KG	수압시험 HYDRO-STATIC TEST Mpa kg/cm² PSI	S	6 VISUAL & DIMENSION TEST	7 FLATTENING TEST	8 WELD DUCTILITY TEST	9 NDT	10 DRIFT TEST	11 FLARING TEST	12 CRUSH TEST	13 REVERSE FLATTENING TEST	도막시험 COATING TEST 아연부착량 WEIGHT OF ZINC COAT g/m² OZ/FT²	균일성 DIP TEST TIMES ※13	S ※13	체깅번호 HEAT NO.	인장시험 TENSILE TEST 항복강도 YIELD STRENGTH	인장강도 TENSILE STRENGTH B ※14	W ※15	연신율 ELONGATION % ※16	화학성분 CHEMICAL COMPOSITION C	Si	Mn	P	S	Cu	Ni	Cr	Mo	V	충격시험 IMPACT 흡수에너지 ENERGY JOULE	강도비율 RATIO %	비고 REMARK
FEB	OD 10-3/4"	x .365"	x21.000'	30	11,579	101	G	G	G	G	G								A22541	29.9	48.7	51.3	39	17	1	78	17	10	6	1	2	1	Tr			
	(273.1mm	x 9.27mm	x 6.401M)			1440														42500	69300	73000														
FEB	OD 18"	x ✓ .500"	x42.000'	11	19,603	171	G	G	G	G	G								A17726	29.1	50.3	53.7	37	18	1	80	18	6	6	1	2	1	Tr			
	(457.0mm	x12.70mm	x 12.802M)			2430														41400	71500	76400														
	TOTAL ->			41	31,182																															

비고-NOTES ※1 Type of pipe End 끝종

PE : Black Plain End Square-cut	GPE : Galvanized Plain End Square-cut
PEB : Black Plain End Beveled	GPEB : Galvanized Plain End Beveled
TC : Black Threaded & Coupled	GTC : Galvanized Threaded & Coupled
VJ : Black Victaulic Joint	GVJ : Galvanized Victaulic Joint
TC : Enameled Threaded & Coupled	

※2 NB : Norminal Bore호칭경, OD : Outside Diameter
※3 Unit 단위 (M : Meter, F : Feet, I : Inch)
※4 Unit 단위 (M : m m, I : Inch)
※5 G : Good
※6 Visual & Dimension Test육안 및 치수검사
※7 Flattening or Bending Test 편평 또는 굽힘시험
※8 Weld Ductility Test 용접부 연성시험
※9 Nondestructive Test 비파괴검사
※10 Drift Test 관통시험
※11 Flaring Test 압착시험
※12 Crush Test 충압시험
※13 Reverse Flattening Test 전개시험
※14 B : Base Metal 모재부
※15 W : Weld Part 용접부
※16 H : Heat (Ladle) Analysis 열연분석, P : Product Analysis 제품분석

본 제품은 관련규격에 합격되었음을 보증합니다.

WE HEREBY CERTIFY THAT THE MATERIAL DESCRIBED HEREIN HAS BEEN ACCEPTED IN ACCORDANCE WITH THE PRESCRIBED SPECIFICATION AND ORDER.

SURVEYOR

INSPECTION MANAGER

검 사 증 명 서 (A)
MILL INSPECTION CERTIFICATE

현대강관주식회사
HYUNDAI PIPE CO.,LTD.
ULSAN PLANT : # 265,YUMPO-DONG, JUNG KU, ULSAN, KOREA
TEL : 87-2101~9 FAX : (0522) 87-5916
TLX : HDPIPE K 52776
SEOUL OFFICE : # 77,MUKYO-DONG, JUNG KU, SEOUL, KOREA
TEL : 773-0522 FAX : 775-7055
TLX : HDPIPE K 24655, K 22956

증 명 서 번 호 / CERTIFICATE NO : E-7-08-123 페이지 / PAGE : 1
발 행 일 자 / DATE OF ISSUE : AUG. 18. 1997. E0714701
계 약 번 호 / CONTRACT NO :
품 명 / COMMODITY : E.R.W. STEEL PIPE
규 격 / SPECIFICATION : API 5L B/ASTM A53
수 요 가 / CUSTOMER :

TYPE OF PIPE S/O	DIMENSION (OUTDIA x THICK x LENGTH)	QUANTITY (PCS)	WEIGHT (KG)	HYDROSTATIC TEST (Kg/cm² / PSI)	NDT / TESTS	HEAT NO	YIELD STRENGTH	TENSILE STRENGTH	ELONGATION (%)	C	Si	Mn	P	S
BPSB	OD 18" x .500" x21.000'	9	8.019	82	G G G G G	A16908	32.9	51.2	54.6	37	17	1	80	20	10
	(457.0mm x12.70mm x 6.401M)			1170			46800	72800	77700					
						3-40725	32.7	46.4	49.8	42	15	1	76	12	3
							46500	56000	70600					
BPSB	OD 18" x .500" x42.000'	17	30.295	82	G G G G G	A1831O	32.9	51.2	54.6	37	17	1	20	20	10
	(457.0mm x12.70mm x 12.802M)			1170			46800	72800	77700					
						3-40723	32.7	45.4	49.8	42	15	1	76	12	8
							46500	66000	70300					
						4-21804	33.6	48.1	49.5	42	15	Tr	75	10	5
							47300	55000	70400					
	TOTAL ->	26	38.314											

참고 - NOTES

SURVEYOR

INSPECTION MANAGER

검 사 증 명 서 (A)
MILL INSPECTION CERTIFICATE

현 대 강 관 주 식 회 사
HYUNDAI PIPE CO.,LTD.
본사·공장 경남 울산시 중구 염포동 265번지
ULSAN PLANT : # 265,YUMPO-DONG, JUNG KU,ULSAN,KOREA
TEL : 87-2101~9 FAX : (0522) 87-8916
TLX : HDPIPE K 52776
서울사무소 서울특별시 중구 무교동 77번지
SEOUL OFFICE : #77,MUKYO-DONG, JUNG KU,SEOUL,KOREA
TEL : 773-0527 FAX : 775-7055
TLX : HDPIPE K 24655, K 22956

증 명 서 번 호 / CERTIFICATE NO : E-7-08-125 페이지 / PAGE : 1
발 행 일 자 / DATE OF ISSUE : AUG. 18. 1997. E4714701
계 약 번 호 / CONTRACT NO :
품 명 / COMMODITY : E.R.W. STEEL PIPE
규 격 / SPECIFICATION : API 5LB/ASTM A53
수 요 가 / CUSTOMER :

TYPE OF PIPE END	DIMENSION (OUTDIA x THICK x LENGTH)	QUANTITY (PCS)	WEIGHT (KG)	HYDROSTATIC TEST (kg/cm² / PSI)	VISUAL / TESTS	HEAT NO	YIELD STRENGTH	TENSILE STRENGTH		ELONGATION	C	Si	Mn	P	S	REMARK
BPSB	OD 18" x .500" x21.000'	9	8,019	82	G G G G G	A16308	32.9	51.2	54.6	37	17	1	80	20	0	
	(457.0mm x12.70mm x 6.401M)			1170			46800	72800	77700							
						3-40723	32.7	45.4	49.8	42	15	1	76	12	3	
							46500	56000	70800							
BPSB	OD 18" x .500" x42.000'	17	30,295	82	G G G G G	A16310	32.9	51.2	54.5	37	17	1	20	20	0	
	(457.0mm x12.70mm x 12.802M)			1170			46800	72800	77700							
						3-40723	32.7	45.4	49.8	42	15	1	76	12	8	
							46500	60000	70800							
						4-21804	33.6	40.1	49.5	42	15	Tr	75	10	5	
							47300	55000	70100							
	TOTAL ->	26	38,314													

비고 - NOTES: Type of pipe End 표시
BPE : Black Pipe End Plain; BPSB : Black Pipe End Beveled; BTC : Black Threaded & Coupled; GPE : Galvanized Pipe End Plain; TPE; STC : Threaded & Coupled
[illegible]

SURVEYOR

INSPECTION MANAGER

P. 002   201 816 4036   DEC- 8-1997(MON) 16:50

검 사 증 명 서 (A)
MILL INSPECTION CERTIFICATE

현 대 강 관 주 식 회 사
HYUNDAI PIPE CO., LTD.
본사·공장 경남 울산시 중구 염포동 265번지
ULSAN PLANT : 265, YUMPO-DONG, JUNG-KU, ULSAN, KOREA
TEL : 87-2101~9 FAX : (0522) 87-6916
TLX : HDPIPE K 52776
서울사무소 서울특별시 중구 무교동 77번지
SEOUL OFFICE : 77, MUKYO-DONG, JUNG-KU, SEOUL, KOREA
TEL : 773-0522 FAX : 775-7055
TLX : HDPIPE K 24655, K 22956

검사서번호 CERTIFICATE NO. : E-7-08-123　　페이지 PAGE : 1
발행일자 DATE OF ISSUE : AUG. 18. 1997.　　E4714701
계약번호 CONTRACT P/O NO. :
품명 COMMODITY : E.R.W. STEEL PIPE
규격 SPECIFICATION : API 5LB/ASTM A53

수요가 CUSTOMER :

관종 TYPE OF PIPE END	치수 DIMENSION 외경 OUTSIDE DIA × 두께 THICK × 길이 LENGTH	수량 QUANTITY (PCS)	중량 WEIGHT (KG)	수압시험 HYDROSTATIC TEST (kgf/cm² / PSI)	외관·치수 검사 등	시험번호 HEAT NO	항복강도 YIELD STRENGTH	인장강도 TENSILE STRENGTH	연신율 ELONGATION (%)	C	Si	Mn	P	S	비고 REMARK
BPCD	CD, 18" × .500" × 21.000'	9	8.013	82	G G G G G	A16508	32.9	51.2 / 54.6	37	17	1	80	20	10	
	(457.0mm × 12.70mm × 6.401M)			1170			46800	72800 / 77700							
						3-40723	32.7	46.4 / 49.8	42	15	1	78	12	3	
							46500	66000 / 70800							
BPCB	CD, 18" × .500" × 42.000'	17	30.295	82	G G G G G	A1651 0	32.9	51.2 / 54.5	37	17	1	80	20	10	
	(457.0mm × 12.70mm × 12.802M)			1170			46800	72800 / 77700							
						3-40723	32.7	46.4 / 49.8	42	15	1	78	12	3	
							46500	66000 / 70800							
						4-21804	33.6	40.1 / 49.5	42	15	Tr	75	19	5	
							47800	55000 / 70400							
	TOTAL ->	26	38.314												

참고 NOTES
BPE : Black Pipe End Square cut　　GPE : Galvanized Pipe End Square cut
BPBE : Black Pipe End Beveled　　GPBE : Galvanized Pipe End Beveled
BTC : Black Threaded & Coupled　　GTC : Galvanized Threaded & Coupled

SURVEYOR　　　　INSPECTION MANAGER

DIVERSIFIED DRILLING CORPORATION

LETTER OF TRANSMITTAL

Job No. 981001

Date 3/26/99

P.O. BOX 290699 · Tampa, Florida 33687-0699

TO John Watson
BARNES FERLAND AND ASSOC., INC.
3655 Maguire Blvd.
Suite 150
Orlando, Fl. 32803

RE OUC
S.E. Water Treatment Plant
Well No. 2

WE ARE FORWARDING TO YOU:

- ☐ Estimates
- ☐ Plans
- ☐ Shop Drawings
- ☐ Copy of letter
- ☐ Proposals
- ☐ Prints
- ☐ Samples
- ☐ Change order
- ☐ Reports
- ☐ Under separate cover via: _____
- ☐ Specifications
- ☒ Mill Certifications

NO. OF COPIES	DRAWING NO.	LAST DATED	CODE	DESCRIPTION
1				Mill Certification For 18" Steel Casing

THESE ARE TRANSMITTED

- ☐ For approval
- ☒ For your use
- ☐ As requested
- ☐ For review and comment
- ☐ Resubmit _____ Copies for review
- ☐ Submit _____ copies for distribution
- ☐ Return _____ corrected prints
- ☐ _____
- ☐ No exceptions taken (NE)
- ☐ Make corrections noted (MCN)
- ☐ Amend and resubmit. (AR)

PLEASE NOTE: Additional Casing For Well No. 2.

CC: Well File

DIVERSIFIED DRILLING CORPORATION

Per Stuart C. Anderson

검 사 증 명 서 (A)

MILL INSPECTION CERTIFICATE

현대강관주식회사
HYUNDAI PIPE CO., LTD.
본사·공장 경남 울산시 중구 염포동 265번지
ULSAN PLANT : # 265, YUMPO-DONG, JUNG-KU, ULSAN, KOREA
TEL : 87-2101~9 FAX : (0522) 87-5916
TLX : HDPIPE K 53776
서울사무소 서울특별시 중구 무교동 77번지
SEOUL OFFICE : # 77, MUKYO-DONG, JUNG-KU, SEOUL, KOREA
TEL : 773-0522 FAX : 775-7055
TLX : HDPIPE K 24656, K 22956

증명서번호 CERTIFICATE NO. : E-7-08-125 페이지 PAGE : 1
발행일자 DATE OF ISSUE : AUG. 18, 1997. E0714701
계약번호 CONTRACT P/O NO. :
품명 COMMODITY : E.R.W. STEEL PIPE
규격 SPECIFICATION : API 5L B/ASTM A53

THESE MILL TEST REPORTS APPLY TO
YOUR P.O. # 3541
수요가 CUSTOMER BARTOW STEEL REF. # S675

관종 TYPE OF PIPE END	치수 DIMENSION 외경 OD × 두께 THICK. × 길이 LENGTH	수량 QUANTITY (PCS)	중량 WEIGHT (KG)	수압시험 HYDROSTATIC TEST Max kg/cm² PSI	Tests (G: GOOD)	제강번호 HEAT NO.	항복강도 YIELD STRENGTH	인장강도 TENSILE STRENGTH B	인장강도 TENSILE STRENGTH W	연신율 ELONGATION %	C	Si	Mn	P	S	REMARK
BPEB	OD. 18" x .500" x21.000'	9	8.015	821	G G G G G											
	(457.0mm x12.70mm x 6.401M)			1170		A16908	32.9	51.2	54.6	37	17	1	80	20	0	
							46800	72800	77700							
						3-40723	32.7	46.4	49.8	42	15	1	76	12	3	
							46500	56000	70800							
BPEB	OD. 18" x .500" x42.000'	17	30.295	821	G G G G G											
	(457.0mm x12.70mm x 12.802M)			1170		A16310	32.9	51.2	54.6	37	17	1	80	20	0	
							46800	72800	77700							
						3-40723	32.7	46.4	49.8	42	15	1	76	12	3	
							46500	66000	70800							
						4-21804	33.6	40.1	49.5	42	15	Tr	75	10	5	
							47300	55000	70400							
	TOTAL ->	26	38.314													

참고 NOTES: Type of pipe End 관종
BPE: Black Plain End [illegible]
SPE: [illegible]
BPEB: Black Plain End Beveled
SPEB: [illegible]
BTC: Black Threaded & Coupled
STC: [illegible]
ETC: [illegible]

[illegible]

SURVEYOR

INSPECTION MANAGER

HPS 8301-013-QLT

HYUNDAI PIPE CO., LTD.

INSPECTION CERTIFICATE

(주) 신 호 스 틸

SHINHO STEEL CO., LTD.

HEAD OFFICE : DONGSON BLDG. 275, YANGWAE DONG, SEOCHO-KU, SEOUL, KOREA
INCHUN PLANT : 468, MAGIK-DONG, NAM-KU, INCHON, KOREA
OKEBUL PLANT : 11 BLOCK, DAEBUL NATIONAL INDUSTRIAL COMPLEX, NAMUL-RI, SAMHO-MYEON, YOUNGAM-KUN, CHULLANAM-DO, KOREA
KUMI PLANT : 293, KONGDAN-DONG, KUMI-SHI, KYONGSANGBUK-DO, KOREA

계약서번호 L/C No. : NY7532K
발급일자 ISSUED DATE : 1997. 12. 30
제품명 COMMODITY : E.R.W. STEEL PIPE
제품규격 SPECIFICATION : API 5LB/ASTM A53B

증명서번호 CERTIFICATE No. : D971229 - 357 - 3
제조번호 MANUFACTURED No. : 97 - 11 - 211
수문자 SUPPLIER : HYUNDAI CORPORATION
수요가 CUSTOMER : HYUNDAI CORPORATION, U.S.A.

ITEM NO.	HEAT NO. (LOT)	관종 TYPE ①	수량 QUANTITY (PIECES)	호칭경 NOMINAL SIZE (in)	주문치수 ORDER SIZE 바깥지름 O.D. (mm) ②	두께 W.T. (in) ③	길이 LENGTH (ft)	중량 WEIGHT (kg/ft)	인장시험 TENSILE TEST 인장강도 TENSILE STRENGTH (psi)	항복강도 YIELD STRENGTH (psi)	연신율 ELONGATION (%)	화학성분 CHEMICAL COMPOSITION(%) C	Si	Mn	P	S	Cu	Ni	Cr	Mo	V
												2			3		④				
1	Y15910	BPEB	41	18	457.2	0.500	42'	42.43	71000	50000	34	15	1	73	11	6	3	3	3	TR	3
2	Y15911	BPEB	2	18	457.2	0.500	42'	42.43	71000	50000	35	15	1	72	12	5	2	3	3	1	2
3	A22721	BPEB	14	20	508.0	0.250	42'	23.94	71000	51000	34	15	TR	73	12	6	3	2	2	1	4
4	A22722	BPEB	19	20	508.0	0.250	42'	23.94	73000	50000	35	16	1	72	13	6	3	3	2	1	3
5	A22723	BPEB	10	20	508.0	0.250	42'	23.94	73000	50000	34	16	TR	72	12	5	3	2	3	TR	3
6	Y16192	BPEB	70	20	508.0	0.375	42'	35.69	74000	53000	33	15	1	73	14	5	2	2	2	TR	3
7	X21701	BPEB	6	20	508.0	0.375	42'	35.69	70000	50000	34	15	1	72	13	4	3	3	3	1	2
8	X21705	BPEB	42	20	508.0	0.375	42'	35.69	73000	51000	33	16	1	72	13	5	3	3	2	1	3
9	A37800	BPEB	9	20	508.0	0.500	42'	47.28	71000	51000	33	17	TR	73	13	4	3	2	2	1	2
10	A37811	BPEB	2	20	508.0	0.500	42'	47.28	73000	50000	34	14	TR	72	13	6	3	2	2	1	3

ITEM NO.	수압시험 HYDROSTATIC TEST TP (PSI) ⑤	RE-SULT	열처리온도 HEAT TREATMENT (℃)	비파괴시험 NDT (U.T) ⑥	경도시험 HARDNESS TEST (HrB)	외주장 CIRCUMFERENCE (㎜) END	BODY	용접부인장강도 TENSILE STRENGTH OF WELDS (kgf/㎟)	아연도금시험 ZINC COATING TEST WZC (g/㎡) ⑦	CST (TIMES)	VISUAL & DIMEN-SION	FLATT-ENING (BEND) TEST	충격시험 IMPACT TEST WDT ⑨	RGT	FRT	CRT	AFT	S.T (%)	ENE-RGY (J) ( )℃	SHEAR AREA (%)	비고 REMARKS
1	1170	GOOD	950	ACCEPT				53			ACCEPT	GOOD									
2	1170	GOOD	950	ACCEPT				53			ACCEPT	GOOD									
3	520	GOOD	830	ACCEPT				53			ACCEPT	GOOD									
4	520	GOOD	830	ACCEPT				54			ACCEPT	GOOD									
5	520	GOOD	830	ACCEPT				54			ACCEPT	GOOD									
6	790	GOOD	880	ACCEPT				55			ACCEPT	GOOD									
7	790	GOOD	880	ACCEPT				52			ACCEPT	GOOD									
8	790	GOOD	880	ACCEPT				54			ACCEPT	GOOD									
9	1050	GOOD	950	ACCEPT				53			ACCEPT	GOOD									
10	1050	GOOD	950	ACCEPT				54			ACCEPT	GOOD									

NOTE
① TYPE BPE BLACK PLAIN ENDS BPEB BPE BEVELLED BTE BLACK THREADED ENDS BTC BLACK THREADED&COUPLED GPE GALVANIZED PLAIN ENDS GTE GALVANIZED THREADED ENDS GTC GALVANIZED THREAD&COUPLED
② O.D. OUTSIDE DIAMETER ③ W.T. WALL THICKNESS ④ CHEMICAL COMPOSITION CHECK ANALYSIS 2 : ×100 3 : ×1000 ⑤ TP TESTING PRESSURE ⑥ NDT NONDESTRUCTIVE TEST
E.T EDDY CURRENT TEST U.T ULTRASONIC TEST ⑦ WZC WEIGHT OF ZINC COATING CST COPPER SULPHATE TEST ⑧ WDT WELD DUCTILITY TEST RGT RING GAGE TEST FRT FRANCE TEST
CRT CRUSH TEST AFT REVERSE FLATTENING TEST S.T STRAIGHTNESS

SIGNATURE
SURVEYOR TO:

본 제품은 관련 규격이 정한 시험 및 검사에 합격하였음을 증명합니다.
WE HEREBY CERTIFY THAT THE PRODUCTS HEREIN HAVE BEEN MADE AND TESTED IN ACCORDANCE WITH THE ABOVE SPECIFICATION AND ALSO WITH THE REQUIREMENTS CALLED FOR THE ORDER.

SIGNATURE
MANAGER OF QUALITY ASSURANCE TEAM

PAGE : 3 / 5

SMS C-30-05-(21)

THESE MILL TEST REPORTS APPLY TO
YOUR P.O. # 3541
BARTOW STEEL REF. # 5625

검 사 증 명 서 (A)

MILL INSPECTION CERTIFICATE

현 대 강 관 주 식 회 사
HYUNDAI PIPE CO., LTD.
*본 사 · 공 장 경남 울산시 중구 염포동 265번지 ☏ 680-040
ULSAN PLANT : # 265, YUMPO-DONG, JUNG-KU, ULSAN, KOREA
TEL : 87-2101~9 FAX : (0522) 67-6916
TLX : HDPIPE K 53776
*서울사무소 서울특별시 중구 무교동 77번지 ☏ 100-170
SEOUL OFFICE : # 77, MUKYO-DONG, JUNG-KU, SEOUL, KOREA
TEL : 773-0522 FAX : 775-7095
TLX : HDPIPE K 24656, K 22956

검사번호 CERTIFICATE NO : E-7-11-189 페이지 PAGE : 1
발행일자 DATE OF ISSUE : NOV. 28. 1997. E4739300
계약번호 CONTRACT P/O NO :
품명 COMMODITY : E.R.W. STEEL PIPE
규격 SPECIFICATION : API 5LB/ASTM A53B
수요가 CUSTOMER

THESE MILL TEST REPORTS APPLY TO
YOUR P.O. # 3541
BARTOW STEEL REF. # 5675

G : GOOD

치수 DIMENSION 외경 × 두께 × 길이 (OUTDIA. × THICK. × LENGTH) ※2 ※3 ※4	수량 QUANTITY (PCS)	중량 WEIGHT (KG)	수압시험 HYDROSTATIC TEST Mpa kg/cm² PSI	※5	※6 VISUAL & DIMENSION TEST	※7 FLATTENING (N) TEST	※8 WELD DUCTILITY TEST	※9	−	※10 DRIFT TEST	※11 FLARING TEST	※12 CRUSH TEST	※13 R-FLATTENING TEST	도금시험 COATING TEST 아연부착량 WEIGHT OF ZINC COAT g/m² OZ/ft²	균일성 DIP TEST Tr NILS	제강번호 HEAT NO.	항복강도 YIELD STRENGTH PSI	인장강도 TENSILE STRENGTH B ※14 kg/mm²	W ※15 N/mm²	연신율 ELONGATION %	C ×100	Si	Mn	P ×1000	S	Cu ×100	Ni	Cr	Mo	V	충격시험 IMPACT ENERGY 흡수에너지 J	연성파면율 %	비고 REMARK
OD 10-3/4" × .365" x21.000'	30	11,579	101	G	G	G	G	G								A22541	29.9	48.7	51.3	39	17	1	78	17	10	6	1	2	1	Tr			
(273.1mm x 9.27mm x 6.401M)			1440														42500	69300	73000														
OD 18" × .500" x42.000'	11	19,603	171	G	G	G	G	G								A17725	29.1	50.3	53.7	37	18	1	80	18	6	6	1	2	1	Tr			
(457.0mm x12.70mm x 12.802M)			2430														41400	71500	76400														
TOTAL ->	41	31,182																															

NOTES ※1 Type of pipe End 관종

	:Black Plain End Square-cut	GPE	:Galvanized Plain End Square-out
B	: Black Plain End Beveled	GPEB	:Galvanized Plain End Beveled
	:Black Threaded & Coupled	GTC	:Galvanized Threaded & Coupled
	:Black Victaulic Joint	GVJ	:Galvanized Victaulic Joint
	:Enameled Threaded & Coupled		

※2 NB : Nominal Bore호칭경, OD : Outside Diameter
※3 Unit 단위(M : mm, I : Inch)
※4 Unit 단위(M : Meter, F : Feet, I : Inch)
※5 G : Good
※6 Visual & Dimension Test육안 및 치수검사
※7 Flattening or Bending Test 편평 또는 굽힘시험
※8 Weld Ductility Test 용접부 연성시험
※9 Nondestructive Test 비파괴검사
※10 Drift Test 관통시험
※11 Flaring Test 압확시험
※12 Crush Test 중압시험
※13 Reverse Flattening Test전개시험
※14 B : Base Metal모재부
※15 W : Weld Part 용접부
※16 H : Heat (Ladle) Analysis 용련분석, P : Product Analysis 제품분석

본 제품은 관련규격에 합격되었음을 보증합니다.

[signature]

검 사 증 명 서 (A)
MILL INSPECTION CERTIFICATE

현 대 강 관 주 식 회 사
HYUNDAI PIPE CO., LTD.
ULSAN PLANT : 265, YUMPO-DONG, JUNG-KU, ULSAN, KOREA
TEL : 87-2101~9 FAX : 10522, 87-8916
TLX : HOPIPE K 53776
SEOUL OFFICE : 77, MUKYO-DONG, JUNG-KU, SEOUL, KOREA
TEL : 773-0577 FAX : 775-7055
TLX : HOPIPE K 74656, K 22956

증명서 번호 CERTIFICATE NO. : E-7-08-123 페이지 PAGE : 1
발행일자 DATE OF ISSUE : AUG. 18. 1997. E0714701
계약번호 CONTRACT NO. :
품명 COMMODITY : E.R.W. STEEL PIPE
규격 SPECIFICATION : API 5L B/ASTM A53

수요가 CUSTOMER

THESE MILL TEST REPORTS APPLY TO
YOUR P.O. # 3541
BARTOW STEEL REF. # S675

TYPE OF PIPE END	DIMENSION O.D. x THICK. x LENGTH	QUANTITY (PCS)	WEIGHT (KG)	HYDROSTATIC TEST (PSI)	Tests	HEAT NO.	YIELD STRENGTH	TENSILE STRENGTH (B)	TENSILE STRENGTH (W)	ELONGATION	C	Si	Mn	P	S
BPED	OD. 18" x .500" x21.000'	9	8,019	82	G G G G G	A18308	32.9	51.2	54.6	37	17	1	80	20	9
	(457.0mm x12.70mm x 6.401M)			1170			46800	72800	77700						
						3-40728	32.7	46.4	49.8	42	15	1	76	12	3
							46500	66000	70800						
BPED	OD. 18" x .500" x42.000'	17	30,295	82	G G G G G	A1831	32.9	51.2	54.6	37	17	1	80	20	10
	(457.0mm x12.70mm x 12.802M)			1170			46800	72800	77700						
						3-40728	32.7	46.4	49.8	42	15	1	76	12	3
							46500	66000	70800						
						4-21804	33.6	46.1	49.5	42	15	Tr	75	10	5
							47800	35000	70400						
	TOTAL ->	26	38,314												

참고 NOTES

SURVEYOR

INSPECTION MANAGER

Sverdrup Civil Inc./ Southeast Water Treatment Plant

Submittal Package No. 014095 - 10 - 02670 - Part 2.0282
(Contract) (Submittal No.) (/spec. Section) (Rev.)

PROJECT: SOTHEAST WATER TREATMENT PLANT
Description:

SUBMITTED BY: CONTRACTOR SUB-CONTRACTOR SUPPLIER

Contractor	Diversified Drilling Corporation
Name	Stuart C. Anderson
Address	P.O. Box 290699 Tampa, FL 33687-0699
Telephone	813/988-1132

From Sub-Contractor/Date:	To Designer/Date:	Designer Due Date	From Designer/Date:	To Sub-Contractor/Date:
[illegible]	11/04/98	11/17/98		

ITEM #	SPEC. PARA. REF.	TYPE	PAGES	CPM #	DESCRIPTION	DISPOSITION
10	02670 Part 2.02B2	OC			24" Steel Casing	

CONTRACTOR'S APPROVAL STAMP

SHOP SUBMITTAL NUMBER 10

DEVIATIONS: NONE x ; AS LISTED

REFERENCE SPECIFICATION NUMBER 02670 Part 2.02B2

REFERENCE DRAWING NUMBER

CONTRACTOR HAS REVIEWED AND SUBMITTED FOR REVIEW

SIGNATURE [signature] DATE 10/23/98

DIVERSIFIED DRILLING CORPORATION TAMPA, FLORIDA

1 – APPROVED
2 – APPROVED AS NOTED
3 – NOT APPROVED
4 – WORK MAY PROCEED
5 – DO NOT PROCEED WITH WORK
6 – MAKE CORRECTION NOTED
7 – RESUBMIT
8 – DO NOT RESUBMIT
9 – SUBMIT FINAL CERTIFIED
10 – REVIEW NOT REQUIRED BY CONTRACT DOCUMENTS

SEE TRANSMITTAL FOR ADDITIONAL INFORMATION AS APPLICABLE.

ACTION SHOWN ABOVE IS ONLY FOR CONFORMANCE WITH THE DESIGN CONCEPT OF THE WORK AND WITH THE INFORMATION IN THE CONTRACT DOCUMENTS.

BY APPROVAL AND SUBMISSION, CONTRACTOR REPRESENTS THAT HE HAS DETERMINED AND VERIFIED MATERIALS, FIELD MEASUREMENTS AND CONSTRUCTION CRITERIA AND SIMILAR DATA.

DEVIATIONS FROM CONTRACT DOCUMENTS ARE NOT REVIEWED UNLESS SPECIFICALLY REQUESTED IN WRITING BY CONTRACTOR. REVIEW ON RESUBMISSION WILL COVER ONLY DESIGNATED CHANGES ON THIS SUBMITTAL AND OTHER CHANGES CLEARLY IDENTIFIED BY CONTRACTOR WITH AN ENCIRCLEMENT.

REVIEWED BY DATE

SVERDRUP

검 사 증 명 서 (A)
MILL INSPECTION CERTIFICATE

현 대 강 관 주 식 회 사
HYUNDAI PIPE CO., LTD.

CERTIFICATE NO.: E-7-10-3107
DATE OF ISSUE: OCT. 21, 1997. E6720300
CONTRACT PIPE NO.:
COMMODITY: E.R.W. STEEL PIPE
SPECIFICATION: API 5L B/ASTM A53B

TYPE OF PIPE END	DIMENSION (O.D. × THICK. × LENGTH)	QUANTITY (PCS)	WEIGHT (KG)	HYDROSTATIC TEST	HEAT NO.	YIELD STRENGTH	TENSILE STRENGTH		ELONG.	CHEMICAL COMPOSITION								REMARK
BPEB	10-3/4" × .250" × 42.000' (273.1mm × 6.35mm × 12.802M)	40	28.108	69/080	B36113	32.3 / 45900	45.0 / 65400	40.3 / 70300	35	15	1	74	14	8	6	1 2	1 Tr	
					YT3246	37.1 / 52800	49.7 / 70700	52.3 / 74400	37	15	1	69	17	8	8	1 2	1 Tr	
					1B7789	33.5 / 47600	45.9 / 65300	48.0 / 69150	30	14	1	75	15	9	8	1 2	1 Tr	
BPEB	24" × .500" × 40.000' (609.6mm × 12.70mm × 12.192M)	72	163.020	62/880	4-23181	33.2 / 47200	47.6 / 67700	50.2 / 71400	36	18	1	75	12	8	6	1 2	1 Tr	
					8-10292	33.2 / 47200	47.3 / 67300	50.5 / 71800	42	18	1	79	17	6	6	1 2	1 Tr	
	TOTAL ->	121	199.128															

WE HEREBY CERTIFY THAT THE MATERIAL DESCRIBED HEREIN HAS BEEN MADE IN ACCORDANCE WITH THE ABOVE SPECIFICATION AND ORDER.

SURVEYOR

INSPECTION MANAGER

HYUNDAI PIPE CO., LTD.

A-23181

6-10292

Sverdrup Civil Inc./ Southeast Water Treatment Plant

Submittal Package No. 014095 - 9 - 02670 - Part 2.02B2
(Contract) (Submittal No.) (Spec. Section) (Rev.)

PROJECT: SOTHEAST WATER TREATMENT PLANT
Description:

SUBMITTED BY: CONTRACTOR SUB-CONTRACTOR SUPPLIER

Contractor	Diversified Drilling Corporation
Name	Stuart C. Anderson
Address	P.O. Box 290699 Tampa, FL 33687-0699
Telephone	813-988-1132

From Sub-Contractor/Date:	To Designer/Date:	Designer Due Date	From Designer/Date:	To Sub-Contractor/Date:
10/20/98				

ITEM #	SPEC. PARA. REF.	TYPE	PAGES	CPM #	DESCRIPTION	DISPOSITION
9	02670 Part 2.02B2	QC	1		30" Steel Casing	

CONTRACTOR'S APPROVAL STAMP

SHOP SUBMITTAL NUMBER 9

DEVIATIONS: NONE X ; AS LISTED

REFERENCE SPECIFICATION NUMBER 02670 Part 2.02B2

REFERENCE DRAWING NUMBER

CONTRACTOR HAS REVIEWED AND SUBMITTED FOR REVIEW

SIGNATURE Stuart C. Anderson DATE 10/19/98

DIVERSIFIED DRILLING CORPORATION TAMPA, FLORIDA

1 – APPROVED
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REVIEWED BY DATE

SVERDRUP

SAW FORM NO. 10
1997

SAW Pipes USA, Inc.
P.O. Box 2349
Baytown, TX 77522-2349
(281) 383 3300

METALLURGICAL AND PIPE TEST REPORT

CUSTOMER | P.O. DATE: 4/3/95 | P.O. NUMBER: 440621

SHIP TO:

This is to certify that the product described herein was manufactured, sampled, and tested in accordance with the specifications and requirements in such specifications.

Approved: [signature]

Date: 7/7/28

API 5L APRIL 1995 41ST EDITION

GUIDED BEND TEST:
FACE BEND: SATISFACTORY
ROOT BEND: SATISFACTORY
FRACTURE LOCATION:
WELD TENSILE: BASE METAL

WELD SEAM INSPECTED BY FLOUROSCOPIC RADIOLOGICAL METHOD

ITEM NO.	MATERIAL DESCRIPTION SPECIFICATION AND GRADE	MAT	HEATLOT	HYDRO	YIELD PSI	TENSILE PSI	ELON %	C WIDTH	CHARPY %SHEAR	CHARPY ENERGY	DWTT %SHEAR	DWTT ENERGY
1	30" X 0.375" 5L GRADE BX42 A. LONGITUDINAL B. TRANSVERSE C. WELD	DSAW	5G00400	940 PSI 10 SECONDS (MIN)	58,100 61,900 60,100	74,000 75,400 74,700	37.0 38.0	1.526 1.548 1.522				

HEAT NO.	C	Mn	P	S	Si	Cu	Ni	Cr	Mo	Al	Nb	V	N	Ti	C.E.
5G00400	0.18	0.500	0.015	0.017	0.260					0.020					
PRODUCT	0.17	0.510	0.014	0.017	0.250					0.022					
PRODUCT	0.17	0.510	0.013	0.012	0.260					0.024					

YIELD STRENGTH DETERMINED AT 0.5% EXT.

SAW Pipes USA, Inc.
P.O. Box 2049
Baytown, TX 77522-2349
(281) 383-3300

SAW FORM NO. 2E
11989

METALLURGICAL AND PIPE TEST REPORT

CUSTOMER	P.O. DATE	P.O. NUMBER	
	4/3/98	4406PT	This is to certify that the product described herein was manufactured, sampled, and tested in accordance with the specifications and requirements in such specifications.
	SHIP TO:		Approved: [signature]
			Date: 7/7/98

API 5L APRIL 1995 41ST EDITION

GUIDED BEND TEST:
FACE BEND: SATISFACTORY
ROOT BEND: SATISFACTORY
FRACTURE LOCATION:
WELD TENSILE: BASE METAL

WELD SEAM INSPECTED BY FLOUROSCOPIC RADIOLOGICAL METHOD

ITEM NO.	MATERIAL DESCRIPTION SPECIFICATION AND GRADE	MAT	HEAT/LOT	HYDRO	YIELD PSI	TENSILE PSI	ELON %	C WIDTH	CHARPY %SHEAR	CHARPY ENERGY	DWTT %SHEAR	DWTT ENERGY
	30" X 0.375" 5L GRADE B/X42	DSAW	5G00349	940 PSI								
	A. LONGITUDINAL			10 SECONDS	55,000	80,600	33.0	1.573				
	B. TRANSVERSE			(MIN)	63,700	80,500	36.0	1.511				
	C. WELD				61,000	81,500		1.519				

HEAT NO.	C	Mn	P	S	Si	Cu	Ni	Cr	Mo	Al	Nb	V	N	Ti	C.E.	YIELD STRENGTH DETERMINED AT
5G00349	0.21	0.550	0.022	0.013	0.240					0.020						0.5% EXT.
PRODUCT	0.21	0.130	0.023	0.009	0.250					0.032						
PRODUCT	0.20	0.550	0.016	0.010	0.270					0.041						

SAW Pipes USA, Inc.
P.O. Box 2349
Bayfown, TX 77522-2349
(281) 383-2300

SAW PIPES NO 20
12373

METALLURGICAL AND PIPE TEST REPORT

CUSTOMER

P.O. DATE: 4/3/98

P.O. NUMBER: 440627

SHIP TO:

This is to certify that the product described herein was manufactured, sampled, and tested in accordance with the specifications and requirements in such specifications.

Approved:

Date: 7/14/98

API 5L APRIL 1995 41ST EDITION

GUIDED BEND TEST:
FACE BEND SATISFACTORY
ROOT BEND. SATISFACTORY
FRACTURE LOCATION:
WELD TENSILE: BASE METAL

WELD SEAM INSPECTED BY FLOUROSCOPIC RADIOLOGICAL METHOD

ITEM NO.	MATERIAL DESCRIPTION SPECIFICATION AND GRADE	MAT	HEAT/LOT	HYDRO	YIELD PSI	TENSILE PSI	ELON %	C WIDTH	CHARPY %SHEAR	CHARPY ENERGY	DWTT %SHEAR	DWTT ENERGY
	30" X 0.375" SL GRADE B/X42	DSAW	USD00539	940 PSI								
	A LONGITUDINAL			10 SECONDS	55,100	73,100	38.0	1.491				
	B TRANSVERSE			(HH)	55,800	73,100	43.0	1.533				
	C. WELD				58,000	72,800		1.458				

HEAT NO.	C	Mn	P	S	Si	Cu	Ni	Cr	Mo	Al	Nb	V	N	Ti		C E			YIELD STRENGTH DETERMINED AT 0.5% EXT.
USD00539	0.18	0.490	0.016	0.007	0.200					0.022									
PRODUCT	0.17	0.530	0.017	0.014	0.270					0.034									
PRODUCT	0.18	0.630	0.017	0.013	0.270					0.023									

Appendix 4

Lithologic Logs

LITHOLOGIC DESCRIPTION FOR THE SOUTHEAST PRODUCTION WELL NO. 1

Depth (Ft)	Description
0 – 5	Sand, fine grained, light brown, trace silt.
5 – 10	Sand, as above.
10 – 15	Sand, fine grained, brown, trace silt.
15 – 20	Sand, as above.
20 -- 25	Sand, as above.
25 – 30	Sand, as above.
30 – 35	Silty clay, gray, over all plasticity high
35 – 40	Silty clay, as above.
40 – 45	Silty clay, as above.
45 – 50	Silty clay, as above.
50 -- 55	Silty clay, as above.
55 -- 60	Silty clay, as above.
60 – 65	Silty clay, as above.
65 – 70	Silty clay, as above.
70 – 75	Silty clay, as above.
75 – 80	Shell, coarse, tan, very loose.
80 – 85	Shell, as above.
85 – 90	Shell, as above.
90 – 95	Shell, as above.
95 – 100	Shell, as above.
100 – 105	Shell, as above.
105 – 110	Shell as above.
110 – 115	Shell, as above.
115 – 120	Clay, gray, overall plasticity high, and shell.

LITHOLOGIC DESCRIPTION FOR THE SOUTHEAST PRODUCTION WELL NO. 1

(Continued)

Depth (Ft)	Description
120 – 125	Clay, gray, overall plasticity high, some shell.
125 – 130	Clay, shell, as above.
130 – 135	Clay, shell, as above.
135 – 140	Clay, shell, as above.
140 – 145	Clay, shell, as above.
145 – 150	Clay, shell, as above.
150 – 155	Clay, shell, as above.
155 – 160	Clay, shell, as above.
160 – 165	Clay, shell, as above.
165 – 170	Clay, shell, as above.
170 – 175	Clay, shell, as above.
175 – 180	Clay, shell, as above.
180 – 185	Clay, shell, as above.
185 – 190	Shell, some gray clay, trace limestone, light brown.
190 – 195	Limestone, fine grained, light brown, chalky, some shell fragments.
195 – 200	Limestone, as above, trace shell fragments
200 – 205	Limestone, as above.
205 – 210	Limestone, as above.
210 – 215	Limestone, as above.
215 – 220	Limestone, as above, trace echinoids.
220 – 225	Limestone, as above.
225 – 230	Limestone, as above.
230 – 235	Limestone, as above.

LITHOLOGIC DESCRIPTION FOR THE SOUTHEAST PRODUCTION WELL NO. 1

(Continued)

Depth (Ft)	Description
235 – 240	Limestone, as above.
240 – 245	Limestone, as above.
245 – 250	Limestone, as above.
250 – 255	Limestone, as above.
255 – 260	Limestone, as above.
260 – 265	Limestone, as above.
265 – 270	Limestone, as above.
270 – 280	Limstone, as above.
280 – 290	Limestone, as above.
290 – 300	Limestone, as above.
300 – 310	Limestone, as above.
310 – 320	Limestone, as above.
320 – 330	Limestone, as above.
330 – 340	Limestone, as above.
340 – 350	Limestone, as above.
350 – 360	Limestone, as above.
360 – 370	Limstone, as above.
370 – 380	Limestone, as above.
380 – 390	Limestone, as above.
390 – 400	Limestone, as above.
400 – 410	Limestone, as above.
410 – 420	Limestone, as above.
420 – 430	Dolomitic limestone, very fine grained, tan, siliceous cement, small vugs.

LITHOLOGIC DESCRIPTION FOR THE SOUTHEAST PRODUCTION WELL NO. 1

(Continued)

Depth (Ft)	Description
430 – 440	Dolomitic limestone, as above.
440 – 450	Dolomitic limestone, as above.
450 – 460	Dolomitic limestone, as above.
460 – 470	Dolomitic limestone, as above.
470 – 480	Dolomitic limestone, as above.
480 – 490	Dolomitic limestone, as above.
490 – 500	Dolomitic limestone, as above.
500 – 510	Dolomitic limestone, as above.
510 – 520	Dolomitic limestone, as above.
520 – 530	Dolomitic limestone, as above.
530 – 540	Dolomitic limestone, as above.
540 – 550	Dolomitic limestone, as above.
550 – 560	Dolomitic limestone, as above.
560 – 570	Dolomitic limestone, as above.
570 – 580	Dolomitic limestone, as above.
580 – 590	Dolomitic limestone, as above.
590 – 600	Dolomitic limestone, as above.
600 – 610	Dolomitic limestone, as above.
610 – 620	Dolomitic limestone, as above.
620 – 630	Dolomitic limestone, as above.
630 – 640	Dolomitic limestone, as above.
640 – 650	Dolomitic limestone, as above.
650 – 660	Dolomitic limestone, as above.

LITHOLOGIC DESCRIPTION FOR THE SOUTHEAST PRODUCTION WELL NO. 1

(Continued)

Depth (Ft)	Description
660 – 670	Dolomitic limestone, as above.
670 – 680	Dolomitic limestone, as above.
680 – 690	Dolomitic limestone, as above.
690 – 700	Dolomitic limestone, as above.
700 – 710	Dolomitic limestone, as above.
710 – 720	Dolomitic limestone, as above.
720 – 730	Dolomitic limestone, as above.
730 – 740	Dolomitic limestone, as above.
740 – 750	Dolomitic limestone, as above.
750 – 760	Dolomitic limestone, as above.
760 – 770	Dolomitic limestone, as above.
770 – 780	Dolomitic limestone, as above.
780 – 790	Dolomitic limestone, as above.
790 – 800	Dolomitic limestone, as above.
800 – 810	Dolomitic limestone, as above.
810 – 820	Dolomitic limestone, as above.
820 – 830	Dolomitic limestone, as above.
830 – 840	Dolomitic limestone, as above.
840 – 850	Dolomitic limestone, as above.
850 – 860	Dolomitic limestone, as above.
860 – 870	Dolomitic limestone, as above.
870 – 880	Dolomitic limestone, as above.
880 – 890	Dolomitic limestone, as above.

LITHOLOGIC DESCRIPTION FOR THE SOUTHEAST PRODUCTION WELL NO. 1

(Continued)

Depth (Ft)	Description
890 – 900	Dolomitic limestone, as above.
900 – 910	Dolomitic limestone, as above.
910 – 920	Dolomitic limestone, as above.
920 – 930	Dolomitic limestone, as above.
930 – 940	Dolomitic limestone, as above.
940 – 950	Dolomitic limestone, as above.
950 – 960	Dolomitic limestone, as above.
960 – 970	Dolomitic limestone, as above.
970 – 980	Dolomitic limestone, as above.
980 – 990	Dolomitic limestone, as above.
990 – 1000	Dolomitic limestone, as above, with green clay., overall plasticity high.
1000 – 1010	Dolomitic limestone, as above, without clay.
1010 – 1020	Dolomitic limestone, as above.
1020 – 1030	Dolomitic limestone, as above.
1030 – 1040	Dolomitic limestone, as above.
1040 – 1050	Dolomitic limestone, as above.
1050 – 1060	Dolomitic limestone, as above.
1060 – 1070	Dolomitic limestone, as above.
1070 – 1080	Dolomitic limestone, as above.
1080 – 1090	Dolomitic limestone, as above.
1090 – 1100	Dolomitic limestone, as above.
1100 – 1110	Dolomitic limestone, as above.
1110 – 1120	Dolomitic limestone, as above.

LITHOLOGIC DESCRIPTION FOR THE SOUTHEAST PRODUCTION WELL NO. 1

(Continued)

Depth (Ft)	Description
1120 – 1130	Dolomitic limestone, as above.
1130 – 1140	Dolomitic microcrystalline, light brown, some small vugs, hard.
1140 – 1150	Dolomitic, microcrystalline, light gray, some small vugs, hard.
1150 – 1160	Dolomitic, as above.
1160 – 1170	Dolomitic, as above.
1170 – 1180	Dolomitic, microcrystalline, tan, hard.
1180 – 1190	Dolomitic, as above.
1190 – 1200	Dolomitic, as above.
1200 – 1210	Dolomitic, as above.
1210 – 1220	Dolomitic, as above.
1220 – 1230	Dolomitic, as above.
1230 – 1240	Dolomitic, as above.
1240 – 1250	Dolomitic, as above.
1250 – 1260	Dolomitic, as above.
1260 – 1270	Dolomitic, as above.
1270 – 1280	Dolomitic, as above.
1280 – 1290	Dolomitic, as above.
1290 – 1300	Dolomitic, as above.
1300 – 1310	Dolomitic, as above.
1310 – 1320	Dolomitic, as above.
1320 – 1330	Dolomitic, as above.
1330 – 1340	Dolomitic, as above.

LITHOLOGIC DESCRIPTION FOR THE SOUTHEAST PRODUCTION WELL NO. 1

(Continued)

Depth (Ft)	Description
1340 – 1350	Dolomitic, as above.
1350 – 1360	Dolomitic, as above.
1360 – 1370	Dolomitic, as above, some chert.
1370 – 1380	Chert, brown gray, very fine grained, siliceous cement.
1380 – 1390	Dolomitic, as above, trace chert.
1390 – 1400	Dolomitic, as above.
1400 – 1410	Dolomitic, as above.
1410 – 1420	Dolomitic, as above, some chert.
1420 – 1430	Dolomitic, as above, trace chert.
1430 – 1440	Dolomitic, as above.
1440 – 1450	Dolomitic, as above.

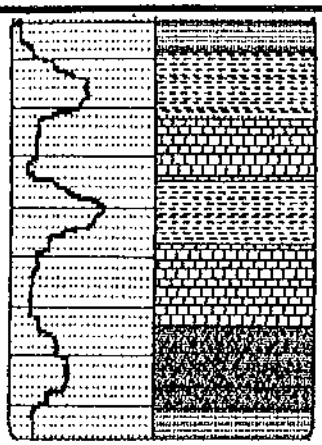
Appendix 5

Geophysical Logs

Summary of Geophysical Logging of Wells 1 and 2 at the OUC Southeast WTP

Well ID	Log Date	Depth	Log Type	Notes
1	11/25/98	150-1303	Caliper	
			Static Flow	Down
			Static Flow	Up
			Pumping Flow	Down
1	11/25/98	0-1300	Gamma	
			Res 16-64	
			SP	
1	11/25/99	150-1300	Static Temp	
			Pumping Temp	
			Static Fl. Res.	
			Pumping Fl. Res.	
1	2/3/99	895-1446	Caliper	
1	2/3/99	744-1446	Gamma	
			Res 16-64	
			SP	
1	2/3/99	929-1446	Static Flow	
1	2/3/99	909-1446	Static Temp	
			Static Fl. Res.	
1	2/3/99	896-1446	Pumped Temp	
			Pumped Fl. Res.	
1	2/3/99	937-1446	Pumped Flow	Down
2	3/15/99	0-1062	Caliper	
2	4/27/99	990-1440	Caliper	
2	4/27/99	927-1440	Gamma	
			Res 16-64	
			SP	
2	4/27/99	927-1441	Static Temp	
			Static Fl. Res.	
2	4/27/99	944-1440	Pumped Flow	Down

Note: The temperature and fluid conductivity probe did not work during pumping log of Well No. 2.



Southern Resource Exploration

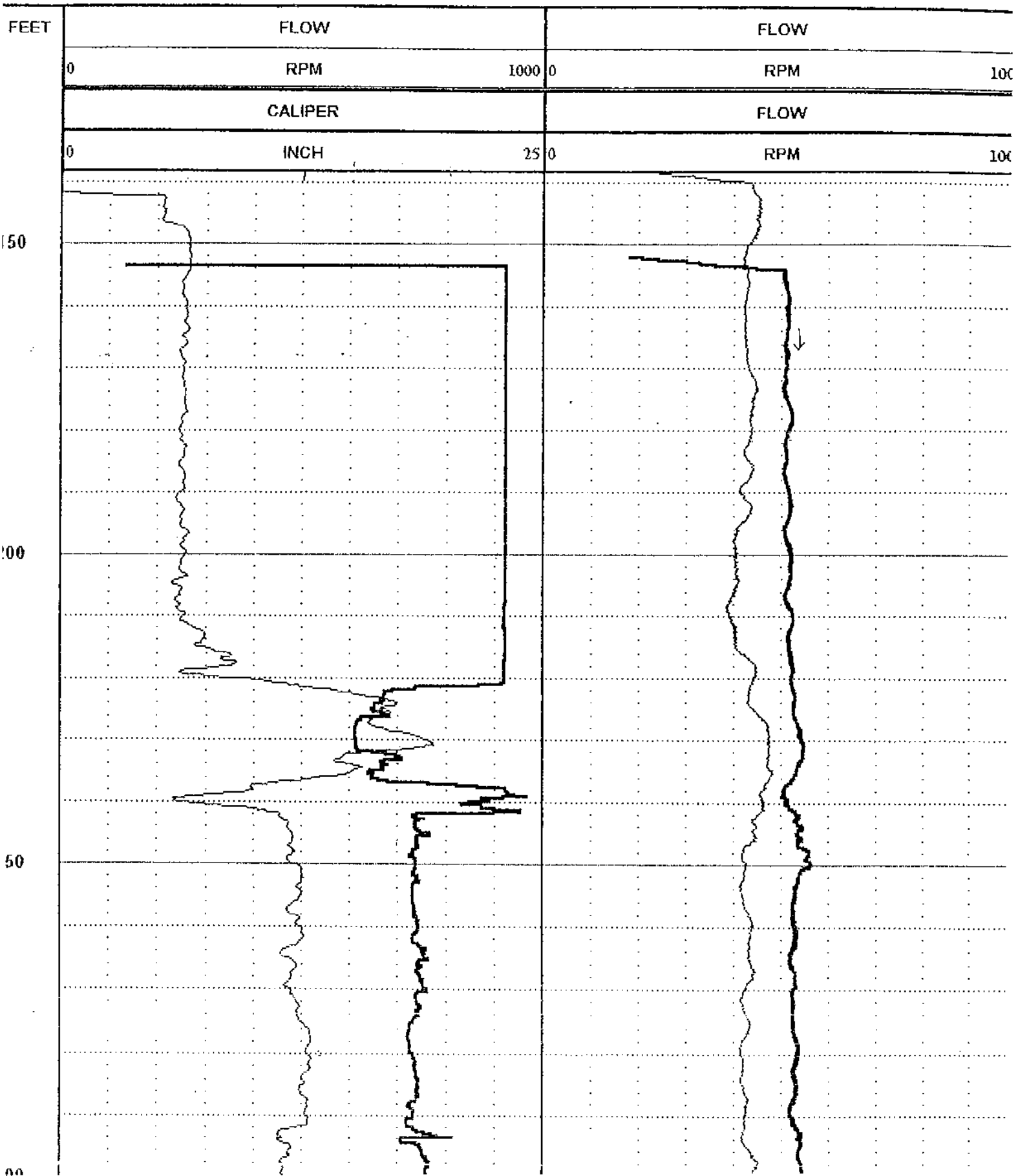
#1

P.O. Box 14311
Gainesville, Florida 32604
Phone 352-372-5950

COMPANY	: DIVERSIFIED DRILLING			OTHER SERVICES:	
WELL	: #1				
LOCATION/FIELD	: OUC SOUTHEAST				
COUNTY	: ORANGE				
STATE	: FL				
SECTION	:	TOWNSHIP	:	RANGE	:
D...E	: 11/25/98	PERMANENT DATUM	:	ELEVATIONS:	
DEPTH DRILLER	: 1300'	ELEV. PERM. DATUM	:	KB	:
LOG BOTTOM	: 1303.00	LOG MEASURED FROM:	GL	DF	:
LOG TOP	: 153.40	DRL MEASURED FROM	: GL	GL	:
CASING DRILLER	: 232	LOGGING UNIT	: BWT		
CASING TYPE	: STEEL	FIELD OFFICE	: GVL		
CASING THICKNESS:	-	RECORDED BY	: MAF		
BIT SIZE	: 14	BOREHOLE FLUID	: WATER	FILE	: PROCESSED
MAGNETIC DECL.	:	RM	:	TYPE	: 9065A2
MATRIX DENSITY	:	RM TEMPERATURE	:	LOG	: 8.
FLUID DENSITY	:	MATRIX DELTA T	:	PLOT	:
NEUTRON MATRIX	:	FLUID DELTA T	: 189	THRESH:	5000

REMARKS:

FLOW LOGS RUN @ 40'/MIN. STATIC DOWN RUN IN BOLD.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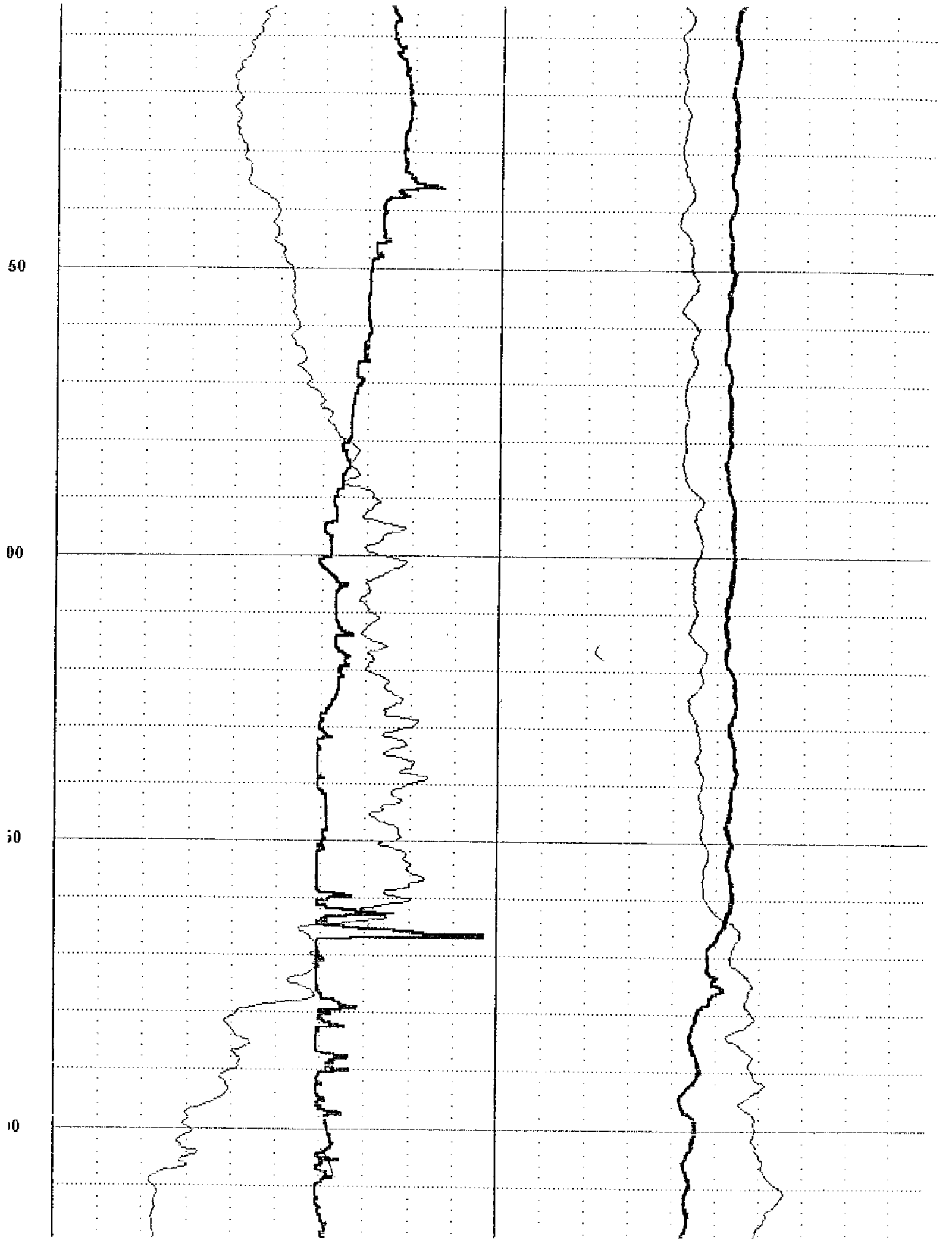
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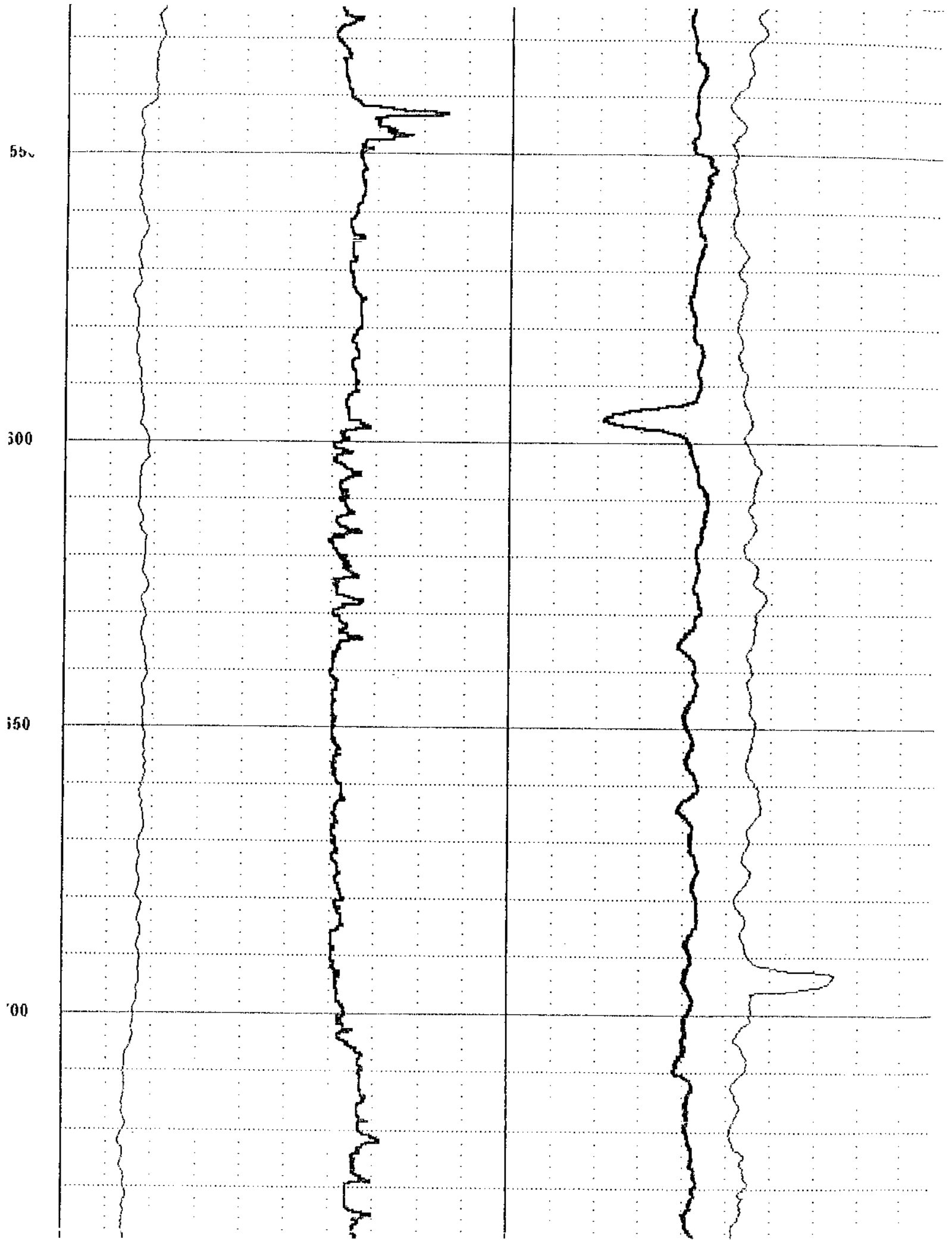
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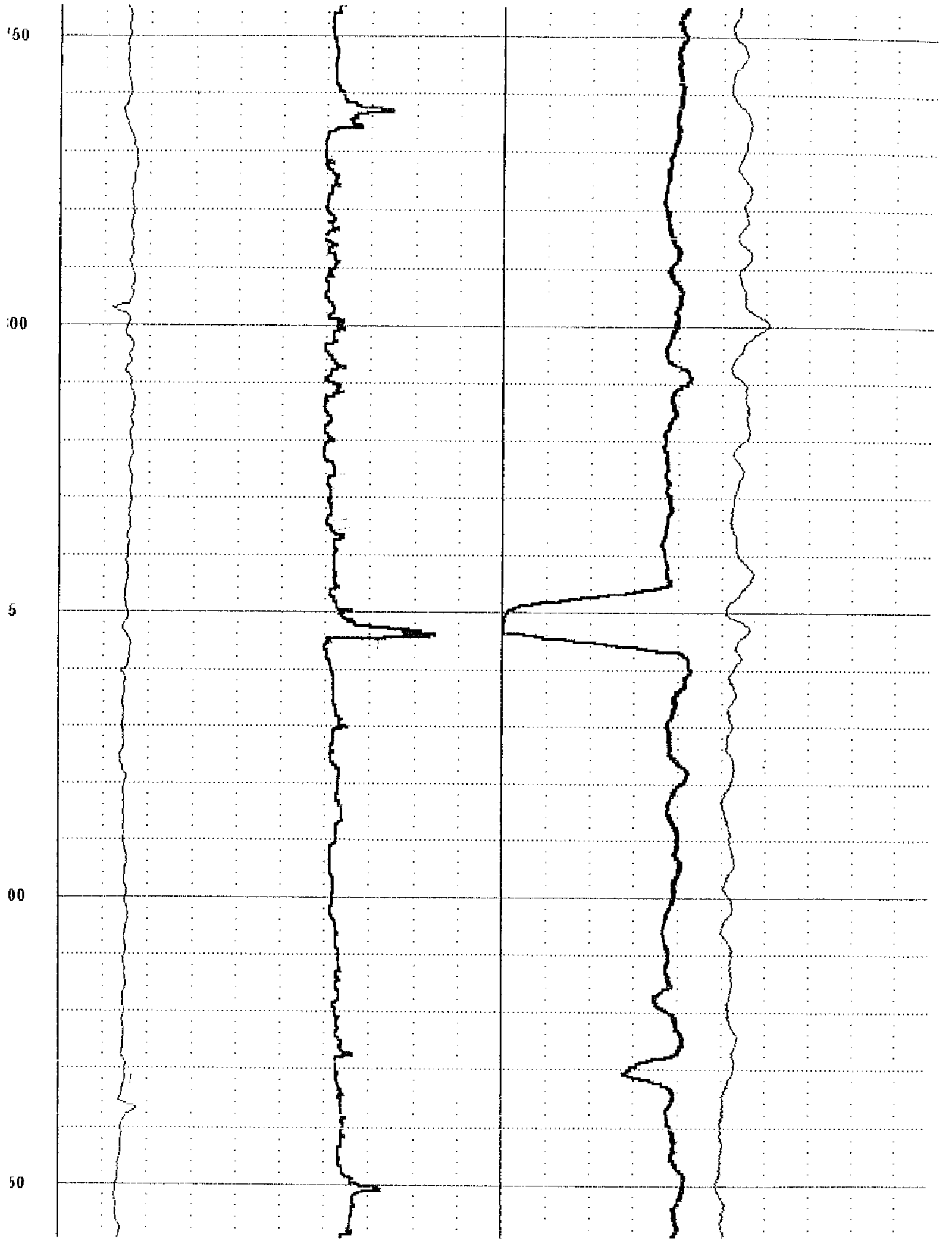
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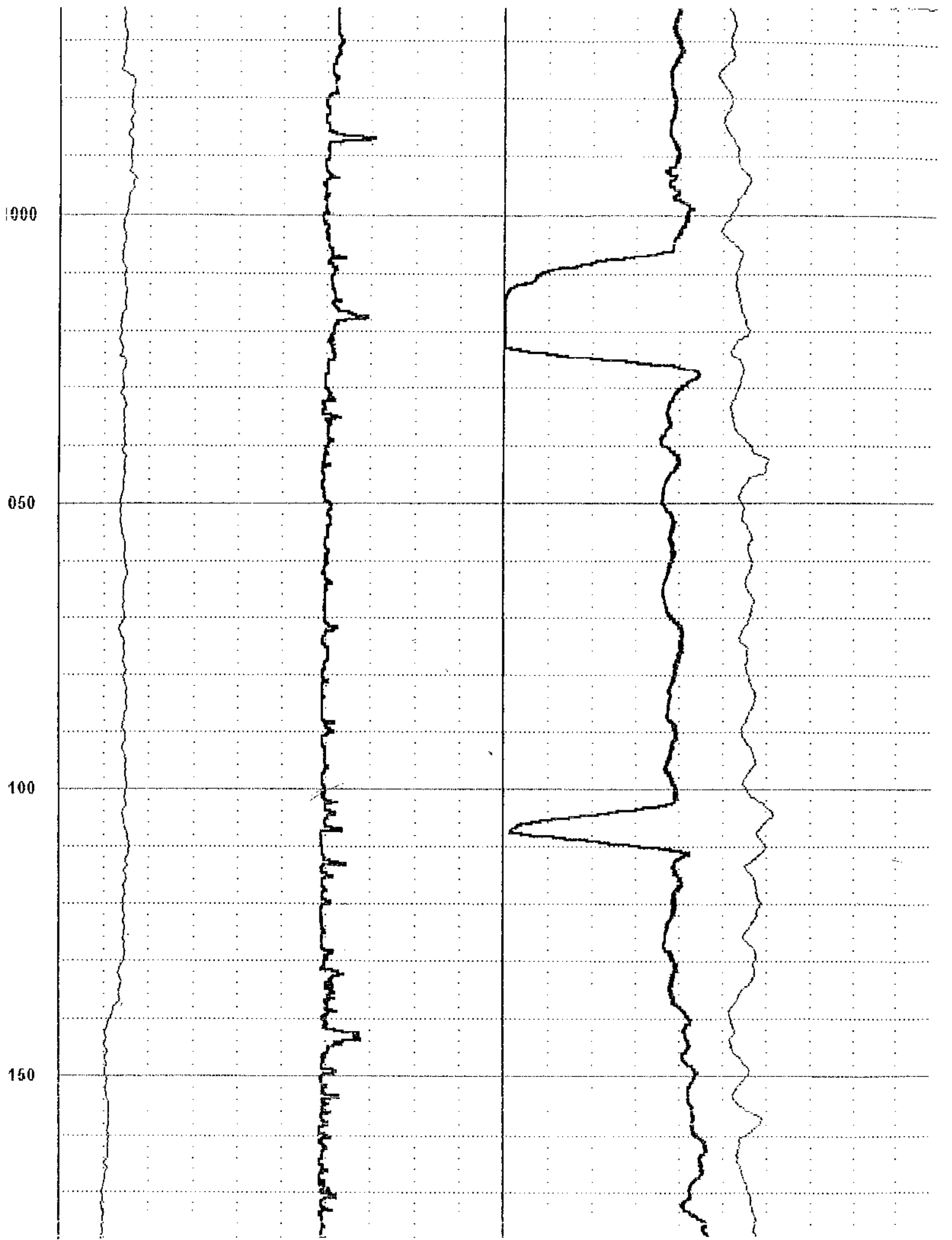
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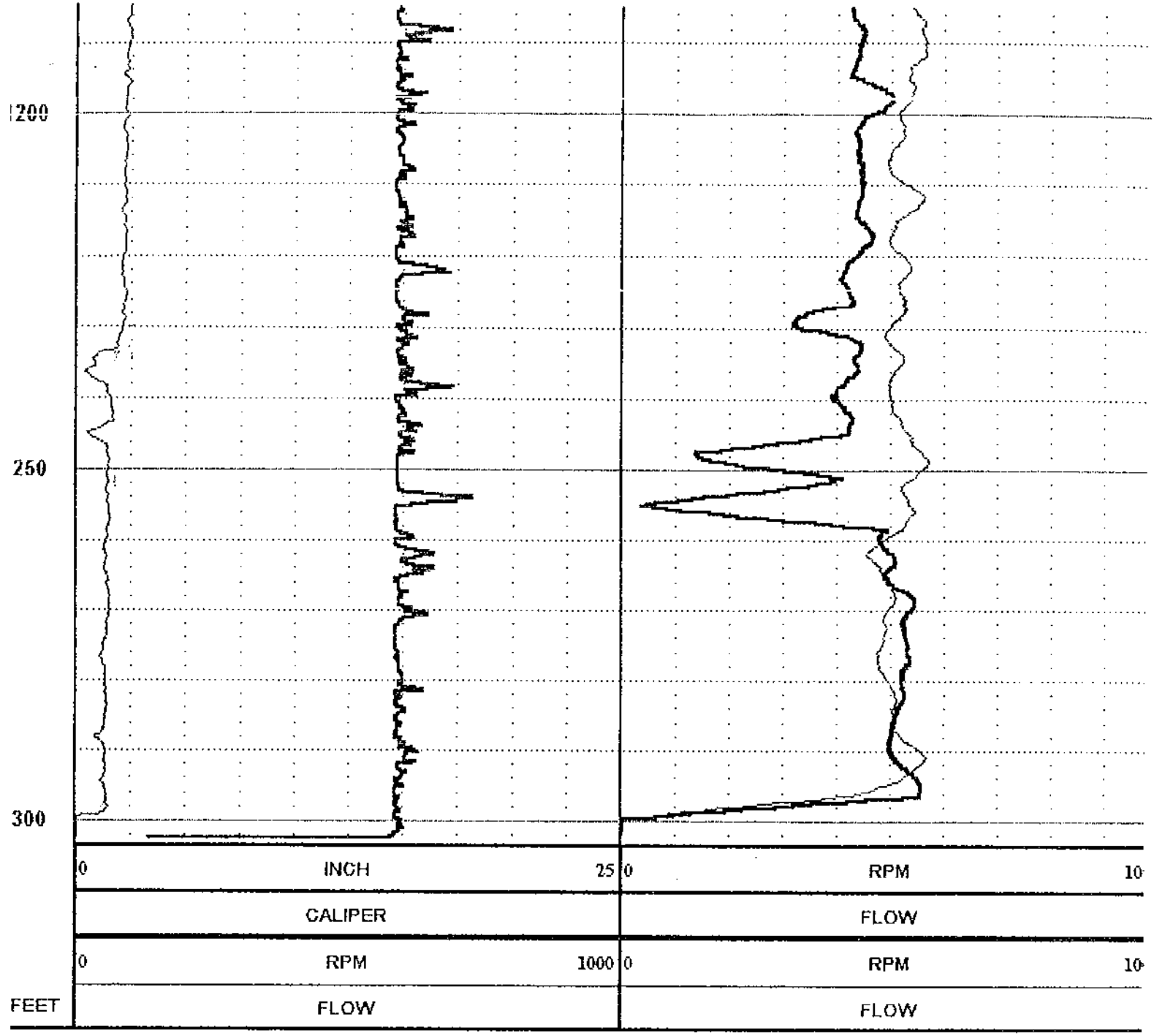
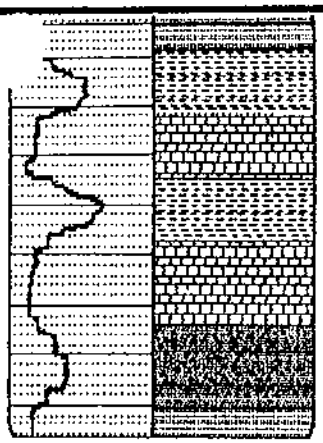
100
150


200
250
300
0
INCH
25
CALIPER
0
RPM
1000
FLOW
FEET
0
RPM
10
FLOW
0
RPM
10
FLOW



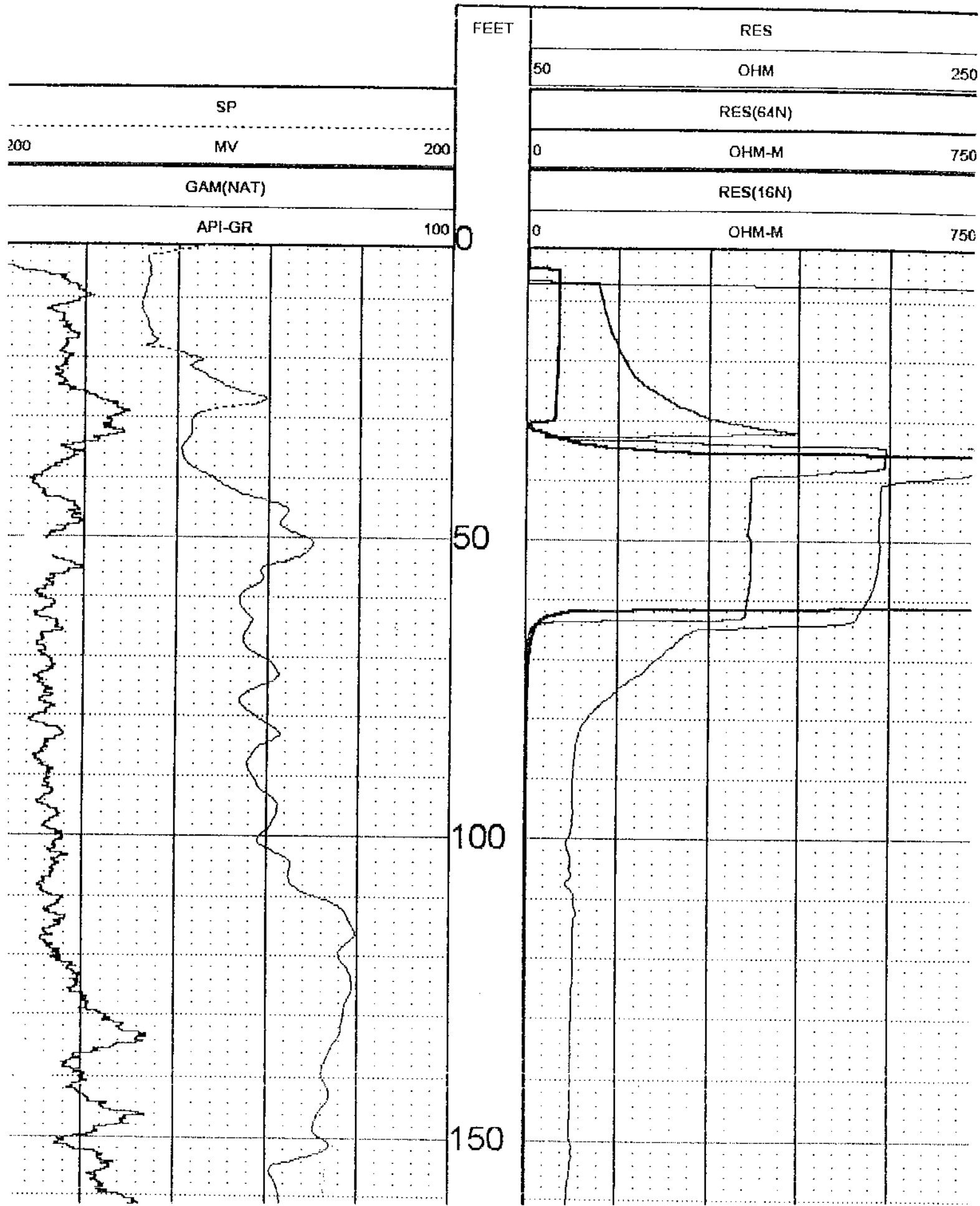
Southern Resource Exploration

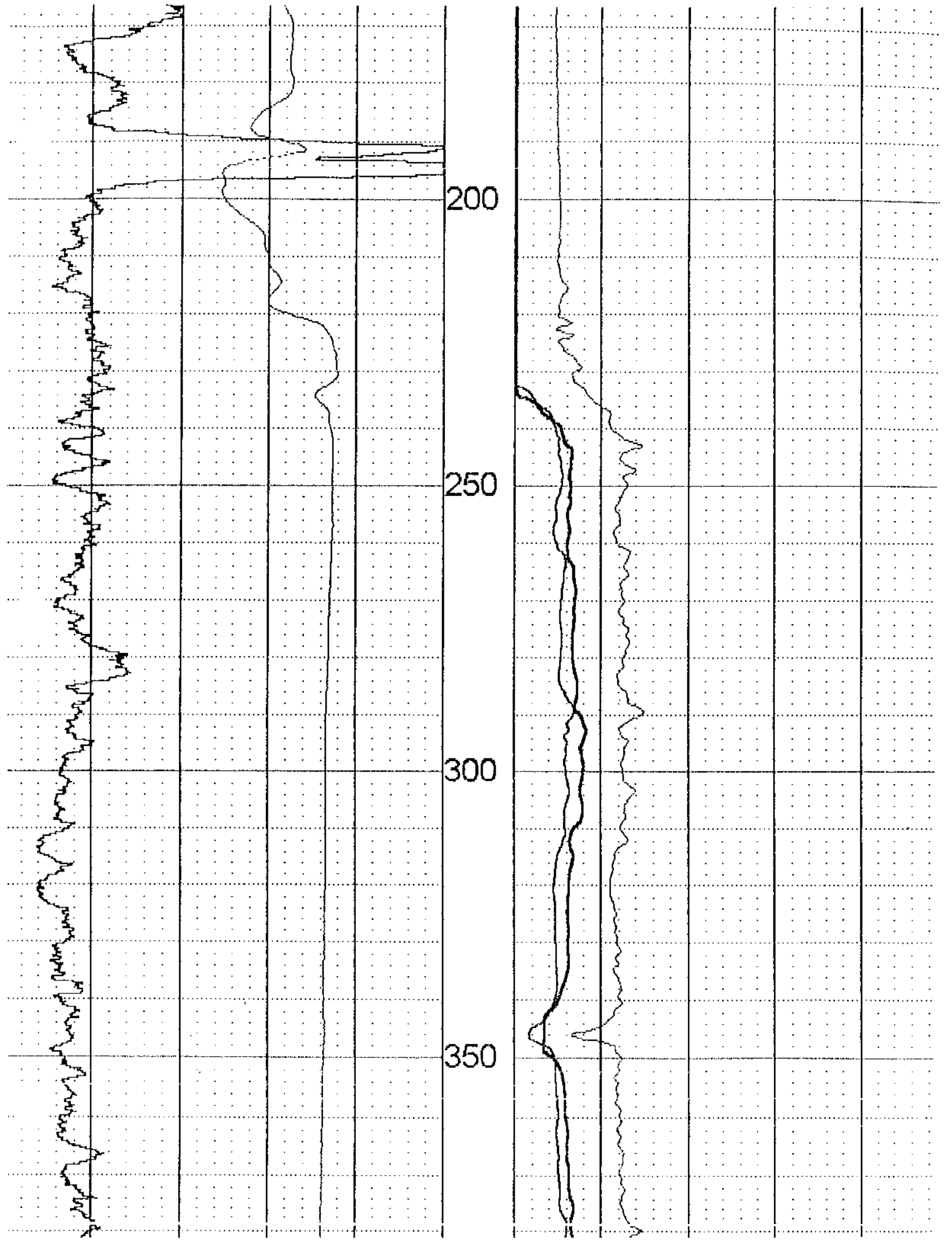
P.O. Box 14311
Gainesville, Florida 32604
Phone 352-372-5950

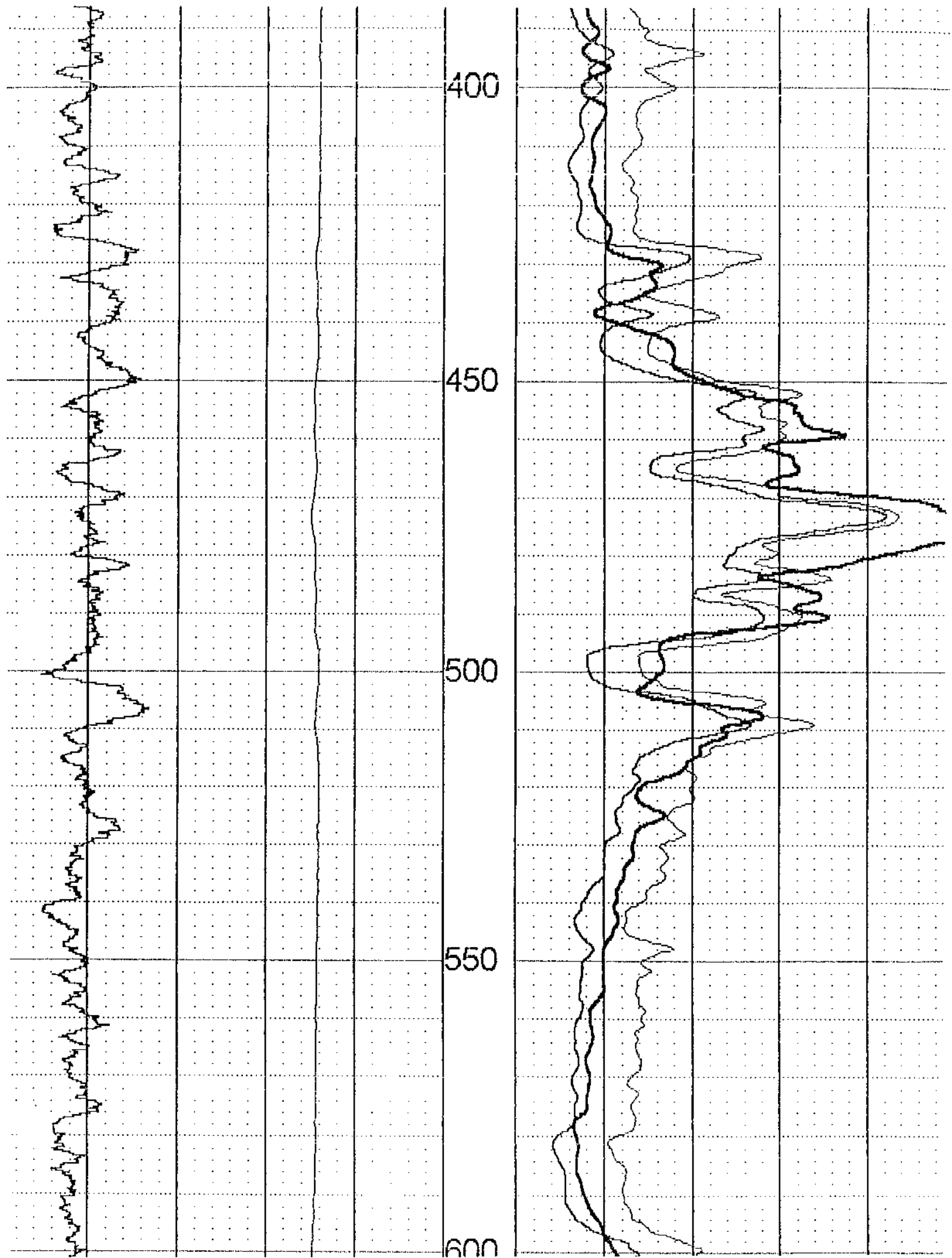
GAMMA, RES 16-64, SP

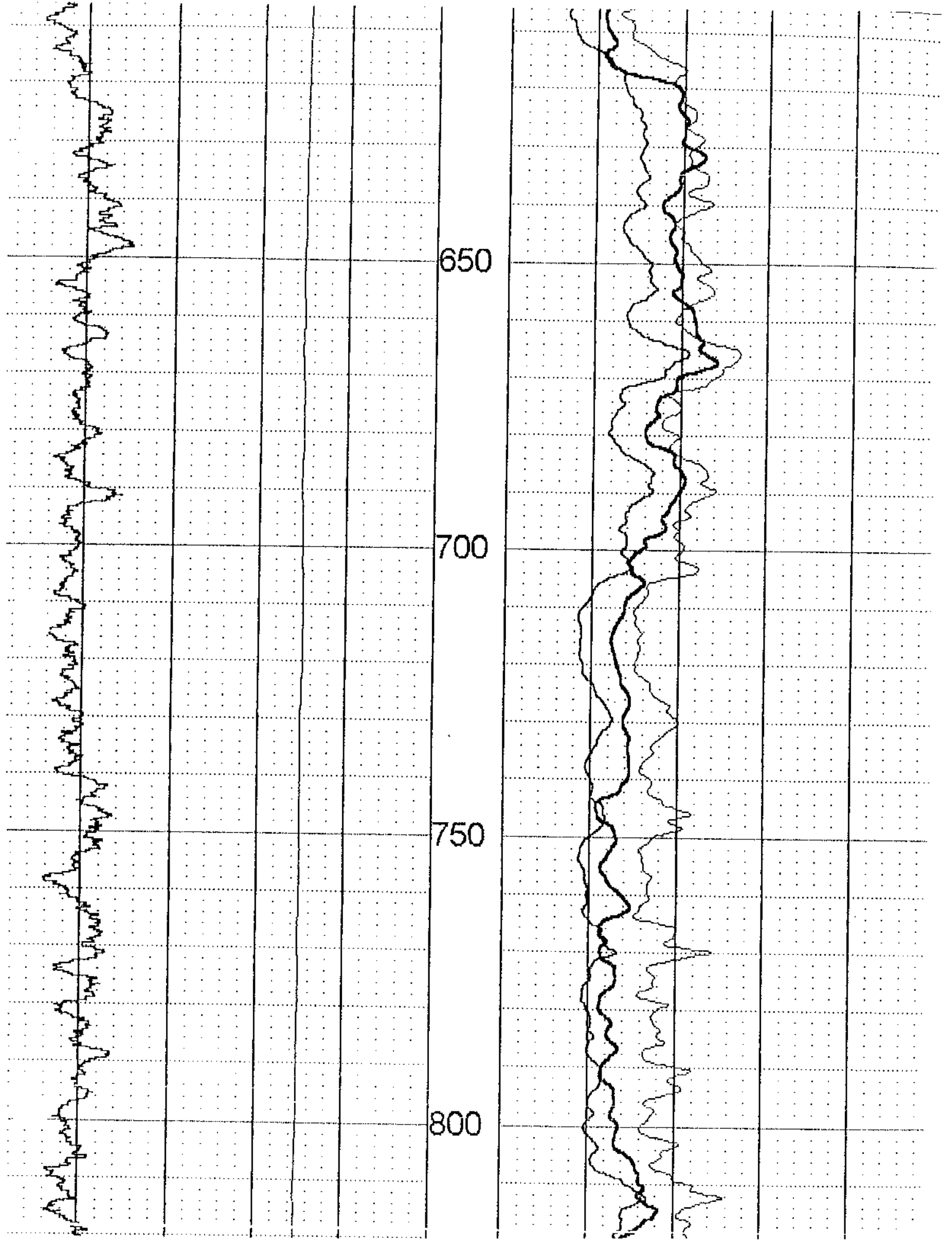
COMPANY	: DIVERSIFIED DRILLING			OTHER SERVICES:	
WELL	: #1				
LOCATION/FIELD	: OUC SOUTHEAST				
COUNTY	: ORANGE				
STATE	: FL				
SECTION	:	TOWNSHIP	:	RANGE	:
DATE	: 11/25/98	PERMANENT DATUM	:	ELEVATIONS:	
DEPTH DRILLER	: 1300'	ELEV. PERM. DATUM	:	KB	:
LOG BOTTOM	: 1301.40	LOG MEASURED FROM:	GL	DF	:
LOG TOP	: 1.20	DRL MEASURED FROM:	GL	GL	:
CASING DRILLER	: 232	LOGGING UNIT	: BWT		
CASING TYPE	: STEEL	FIELD OFFICE	: GVL		
CASING THICKNESS:	-	RECORDED BY	: MAF		
BIT SIZE	: 14	BOREHOLE FLUID	: WATER	FILE	: ORIGINAL
MAGNETIC DECL.	:	RM	:	TYPE	: 9041A
MATRIX DENSITY	:	RM TEMPERATURE	:	LOG	: 1.
FLUID DENSITY	:	MATRIX DELTA T	:	PLOT	:
NEUTRON MATRIX	:	FLUID DELTA T	: 189	THRESH:	5000

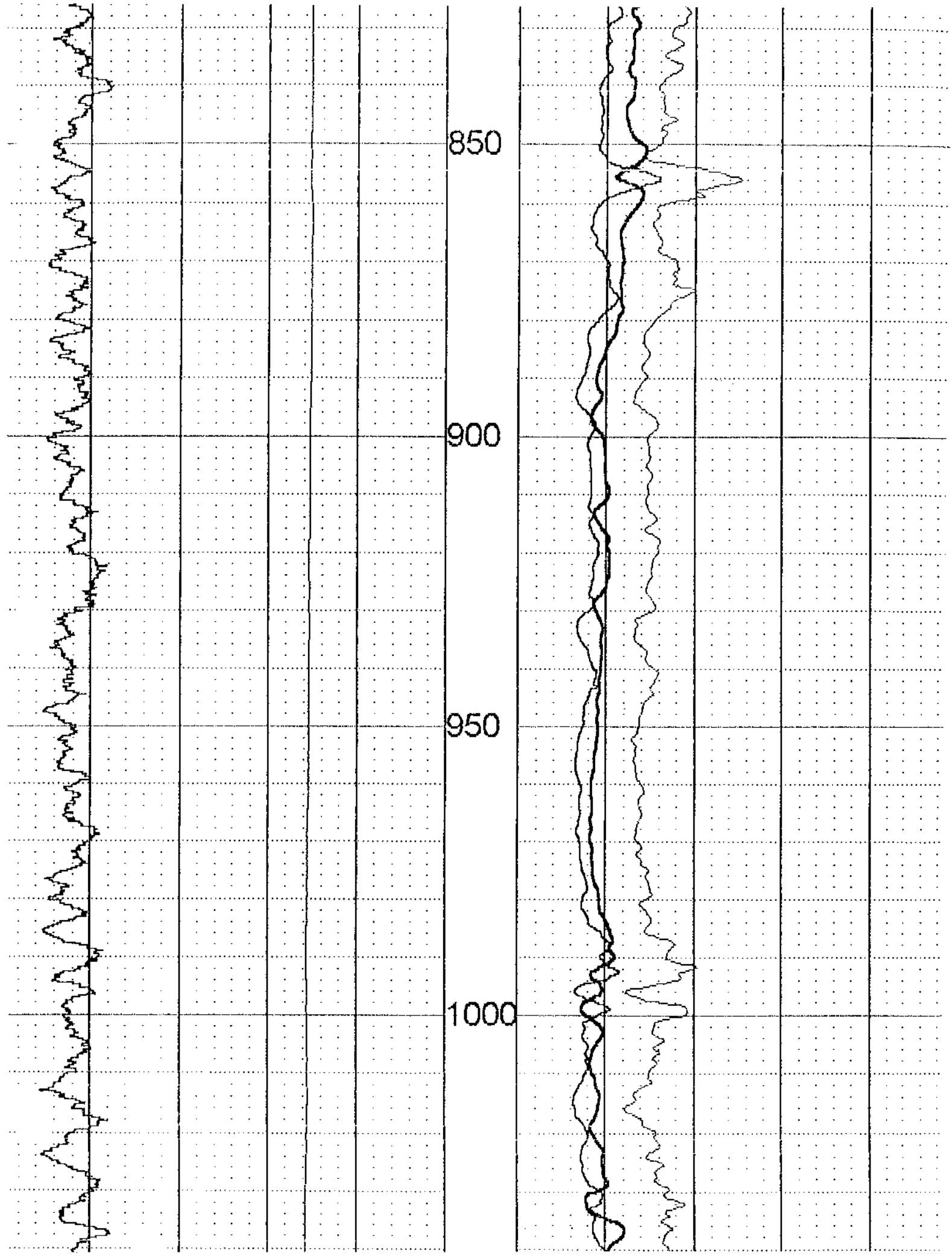
REMARKS:

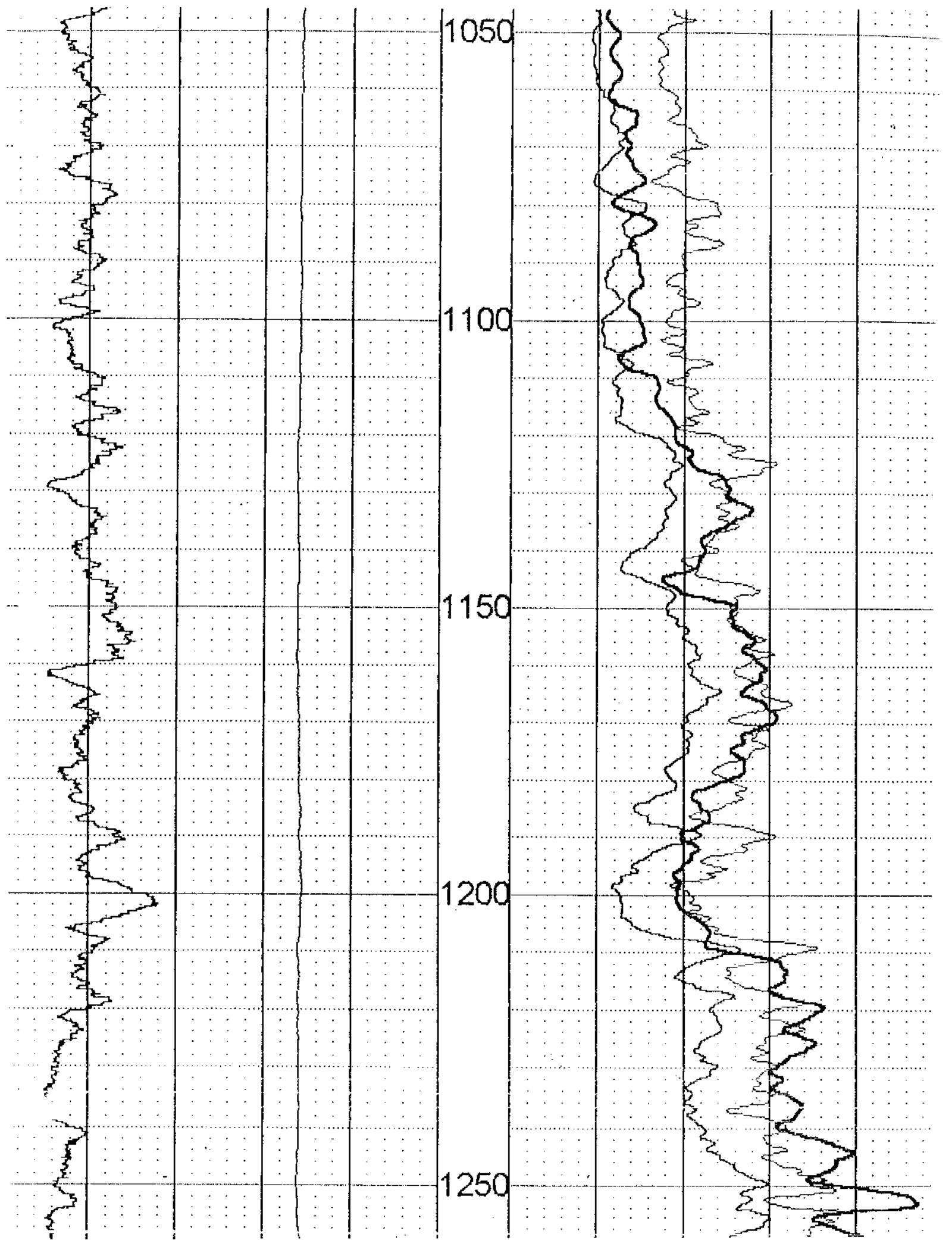

FEET
SP
200
MV
200
GAM(NAT)
API-GR
100
RES
50
OHM
250
RES(64N)
0
OHM-M
750
RES(16N)
0
OHM-M
750
0
50
100
150

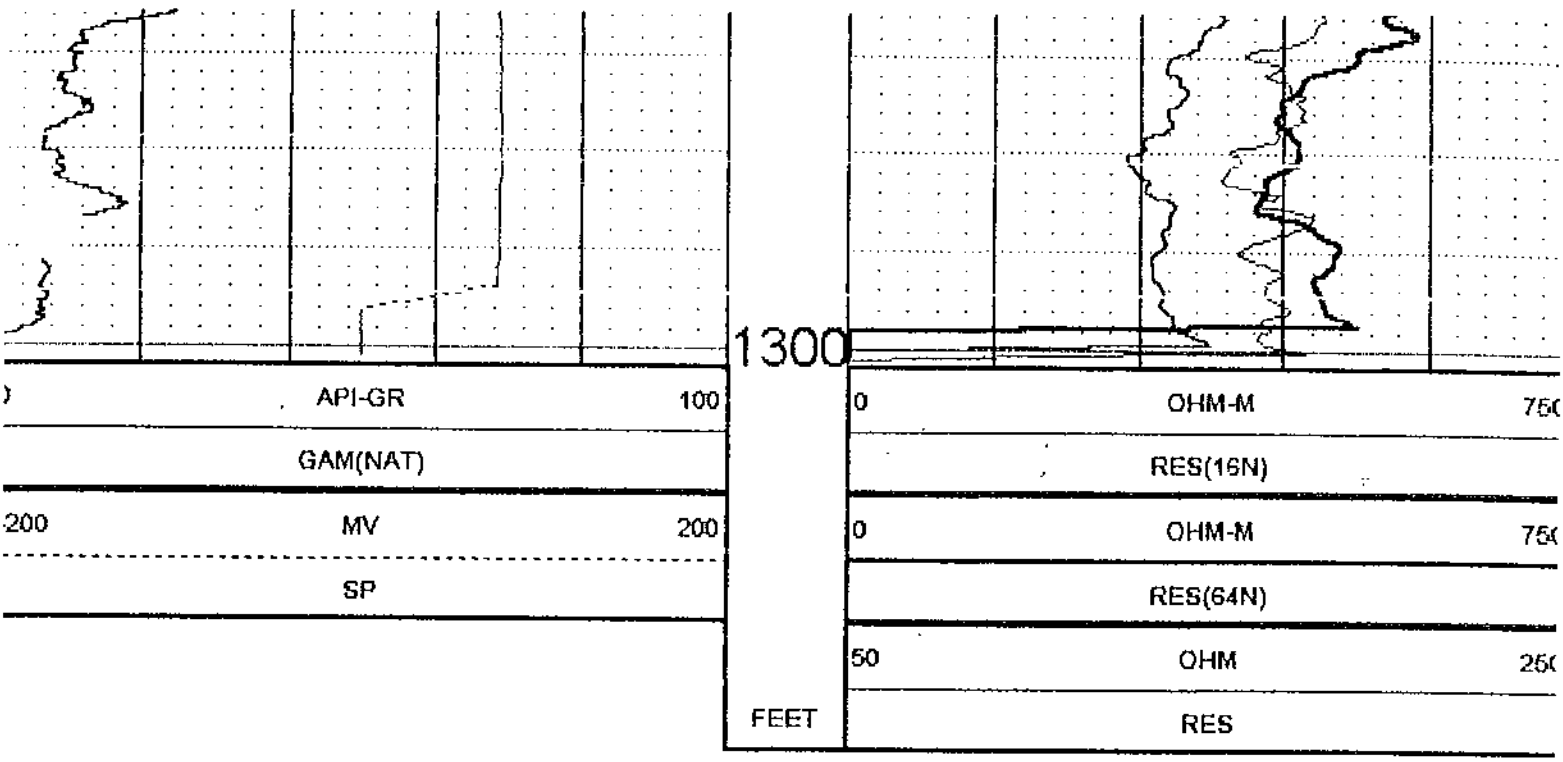

200
250
300
350

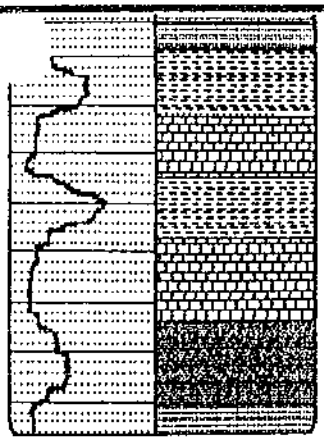

400
450
500
550
600


650
700
750
800


850
900
950
1000


1050
1100
1150
1200
1250


1300
) API-GR 100
GAM(NAT)
200 MV 200
SP
0 OHM-M 750
RES(16N)
0 OHM-M 750
RES(64N)
50 OHM 250
FEET
RES



Southern Resource Exploration

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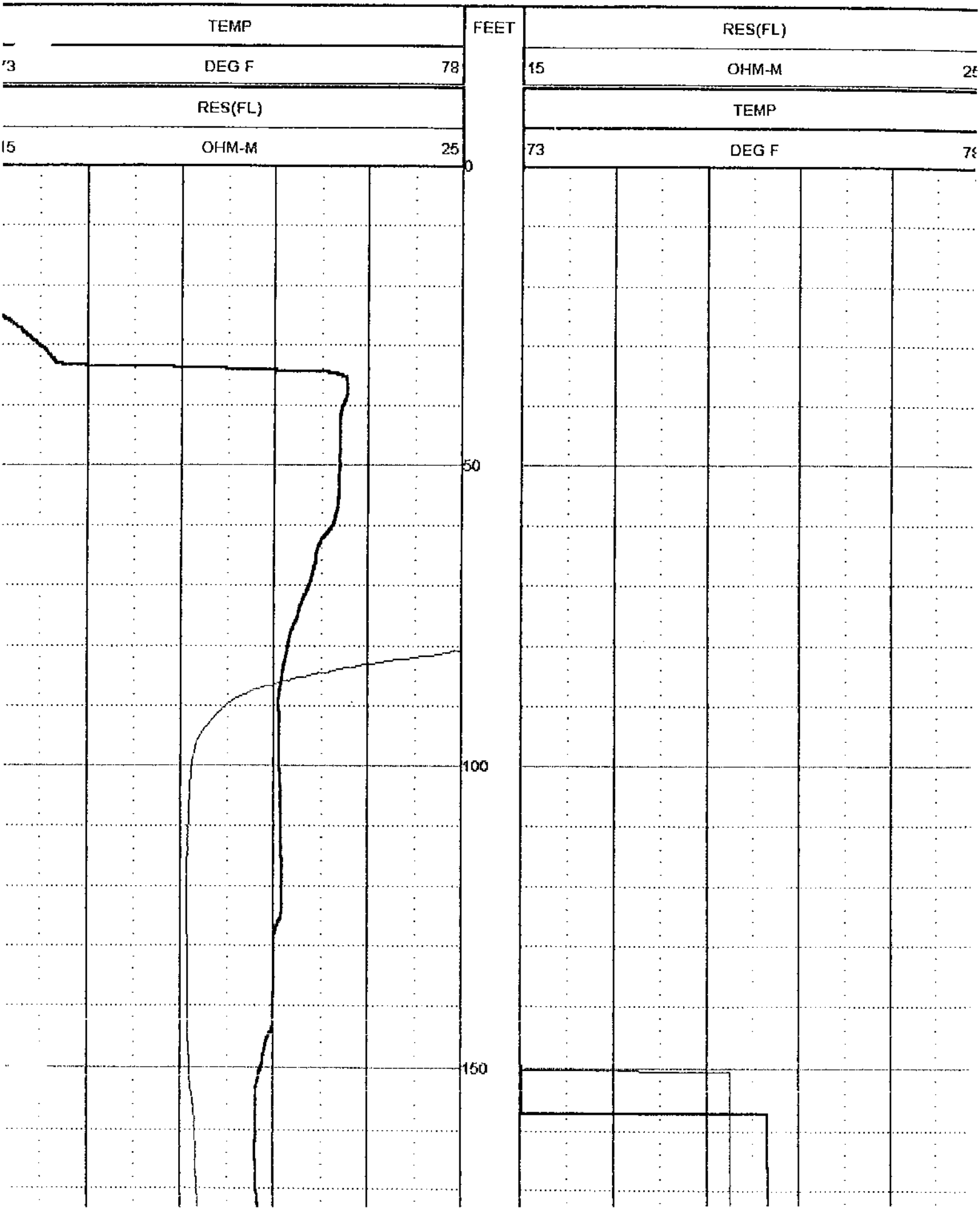
Phone 352-372-5950

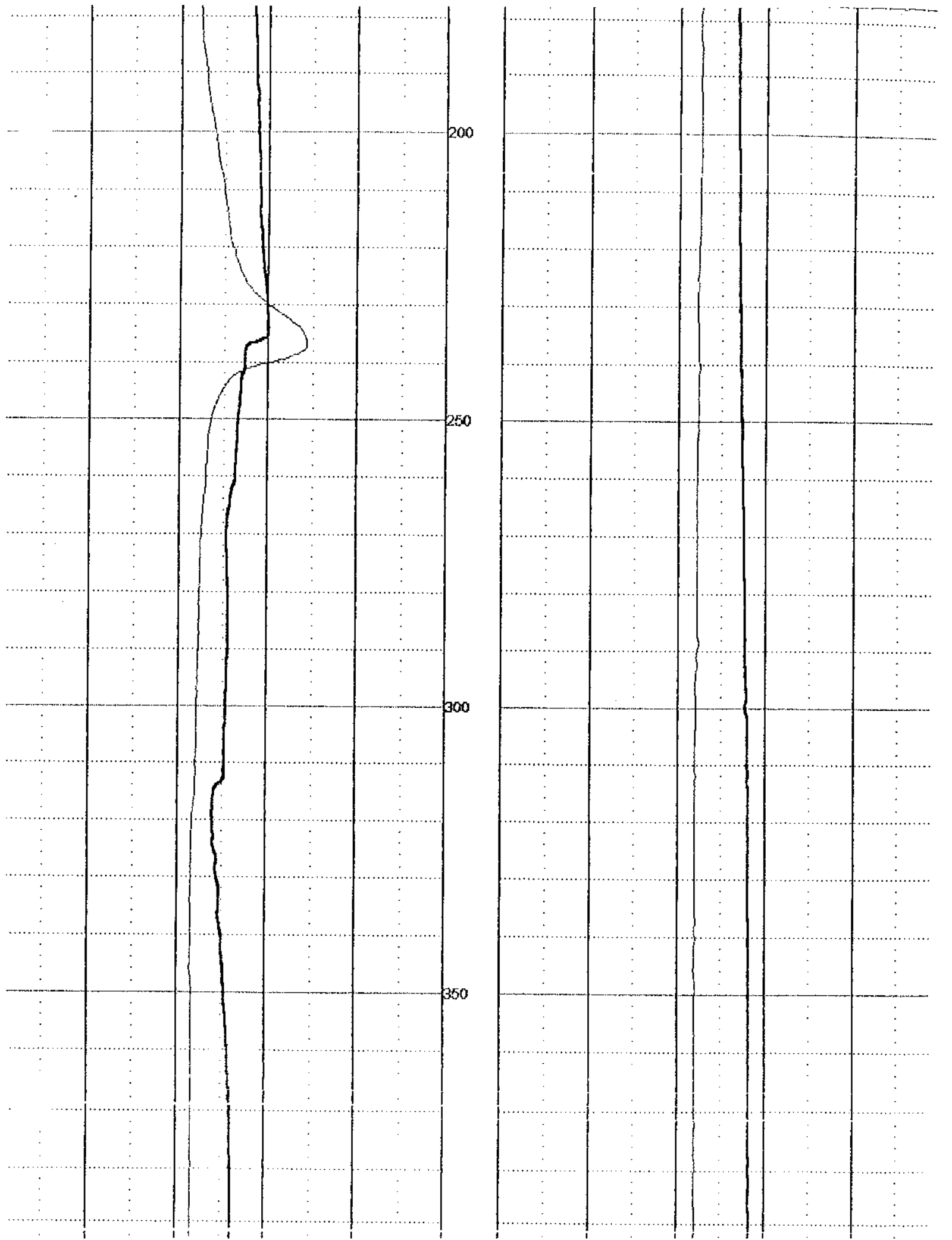
TEMP - FLUID RES

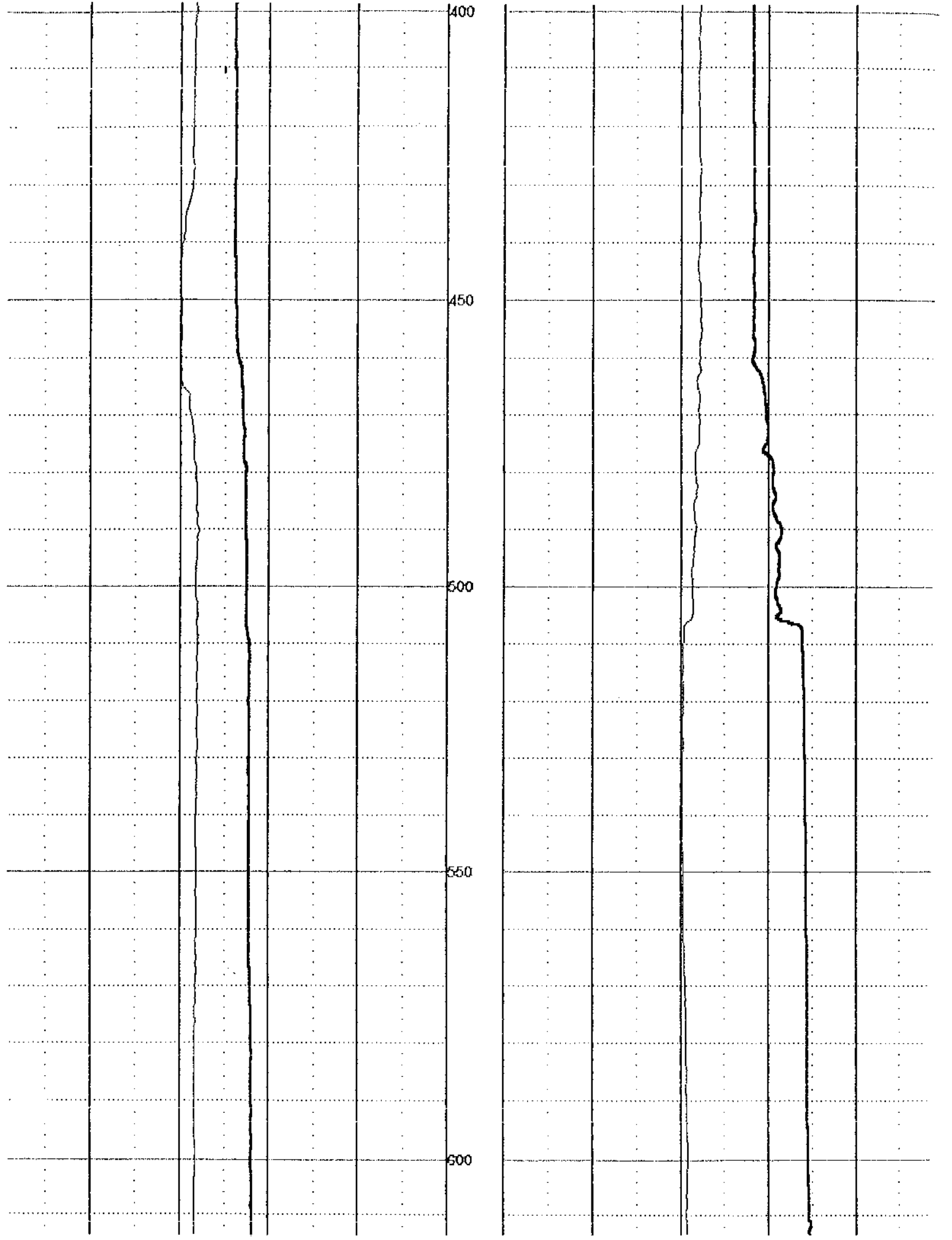
COMPANY	: DIVERSIFIED DRILLING			OTHER SERVICES:	
WELL	: #1				
LOCATION/FIELD	: OUC SOUTHEAST				
COUNTY	: ORANGE				
STATE	: FL				
SECTION	:	TOWNSHIP	:	RANGE	:
DATE	: 11/25/98	PERMANENT DATUM	:	ELEVATIONS:	
DEPTH DRILLER	: 1300'	ELEV. PERM. DATUM	:	KB	:
LOG BOTTOM	: 1301.40	LOG MEASURED FROM:	GL	DF	:
LOG TOP	: 1.20	DRL MEASURED FROM:	GL	GL	:
CASING DRILLER	: 232	LOGGING UNIT	: BWT		
CASING TYPE	: STEEL	FIELD OFFICE	: GVL		
CASING THICKNESS:	-	RECORDED BY	: MAF		
BIT SIZE	: 14	BOREHOLE FLUID	: WATER	FILE	: ORIGINAL
MAGNETIC DECL.	:	RM	:	TYPE	: 9041A
MATRIX DENSITY	:	RM TEMPERATURE	:	LOG	: 1.
FLUID DENSITY	:	MATRIX DELTA T	:	PLOT	:
NEUTRON MATRIX	:	FLUID DELTA T	: 189	THRESH:	5000

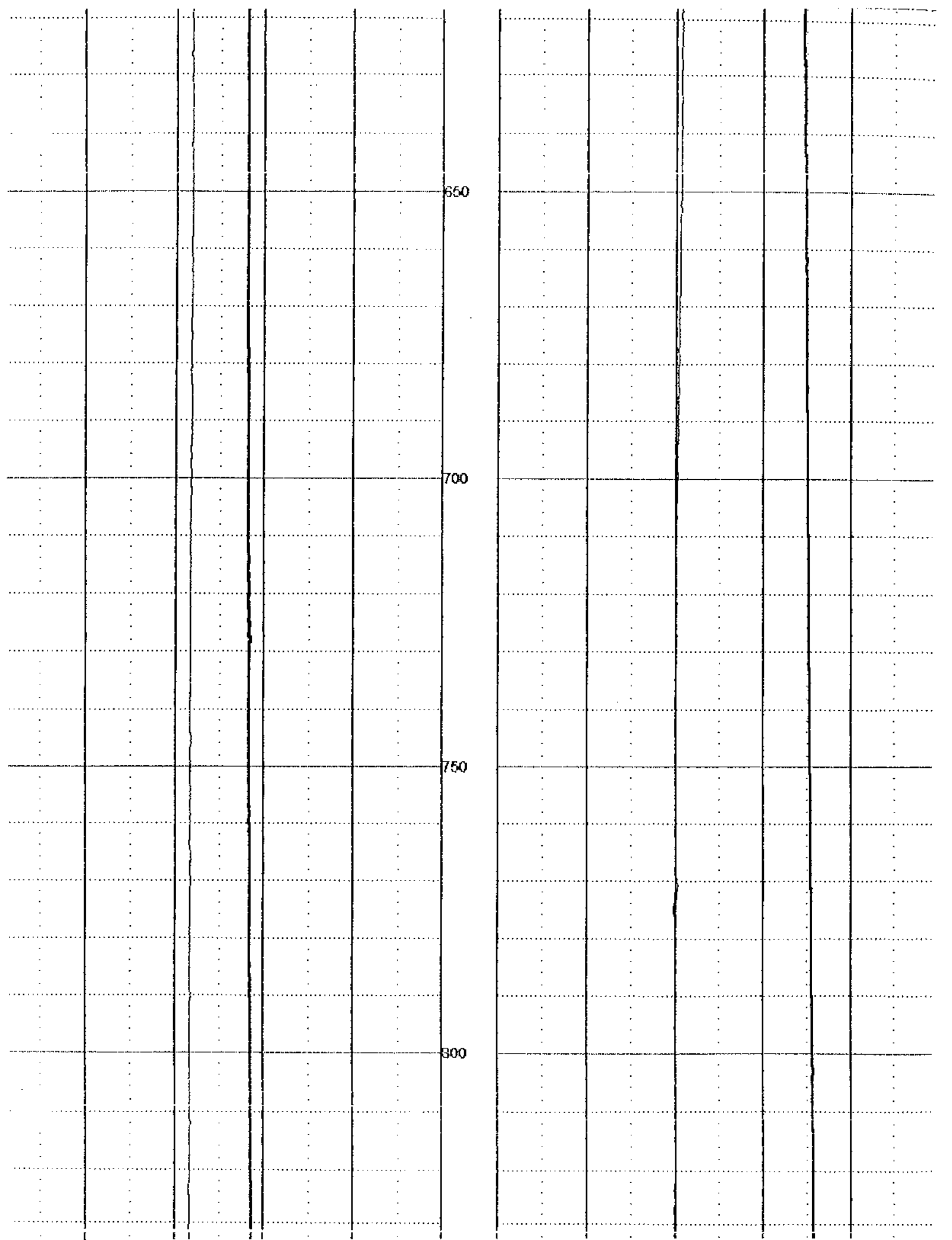
REMARKS:

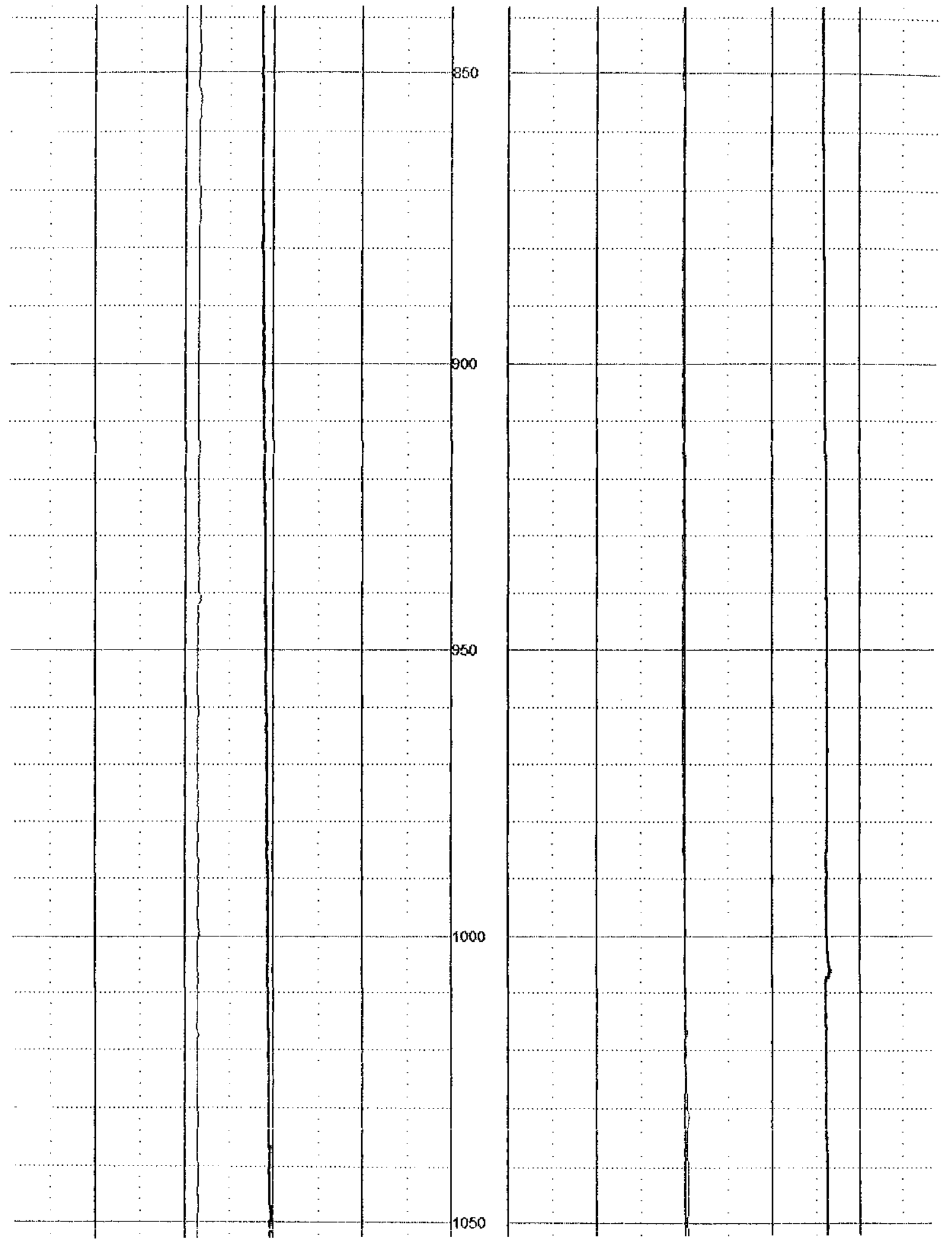
PUMPED LOGS IN RIGHT TRACK.

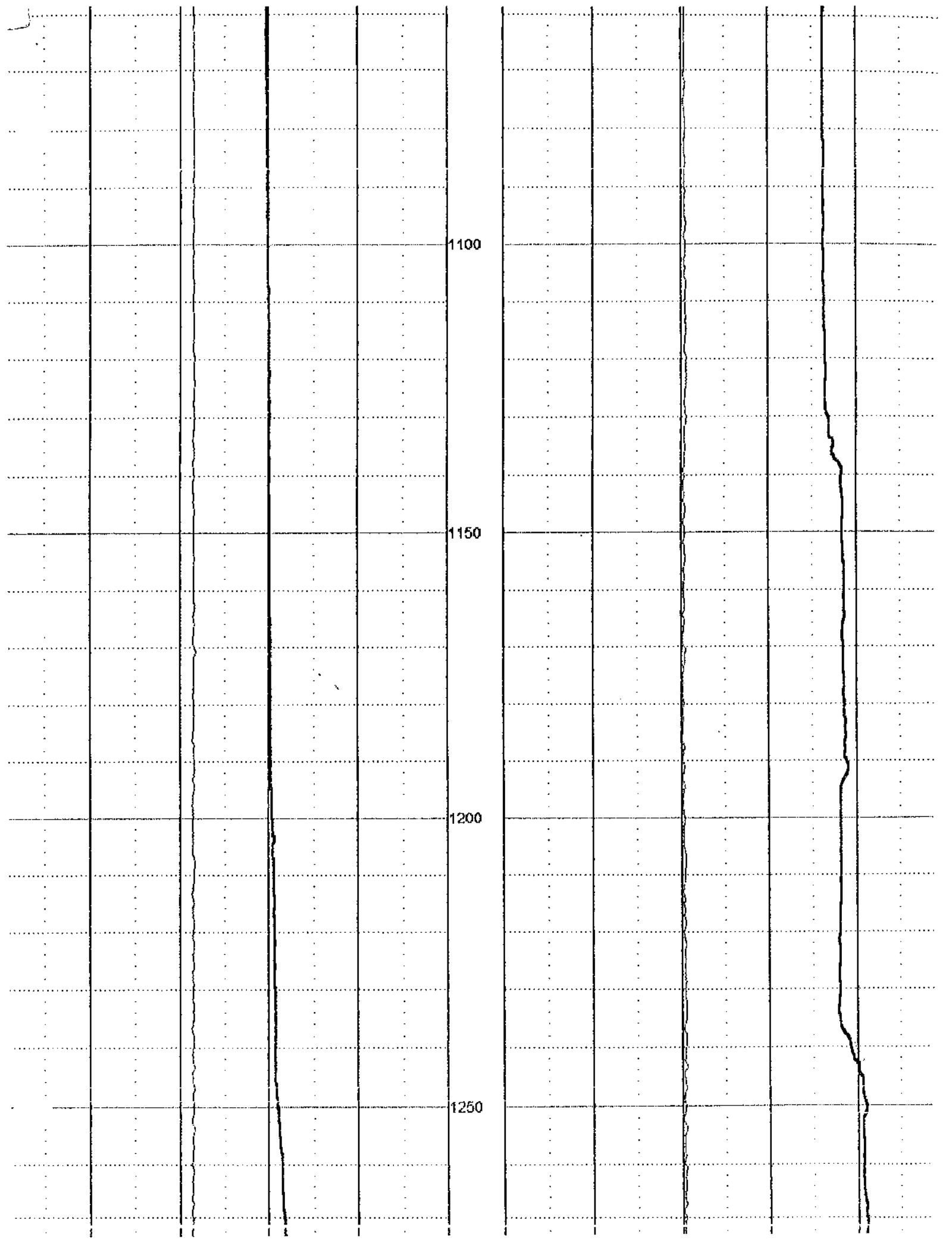

TEMP
73
DEG F
78
RES(FL)
15
OHM-M
25
FEET
0
50
100
150
RES(FL)
15
OHM-M
25
TEMP
73
DEG F
78

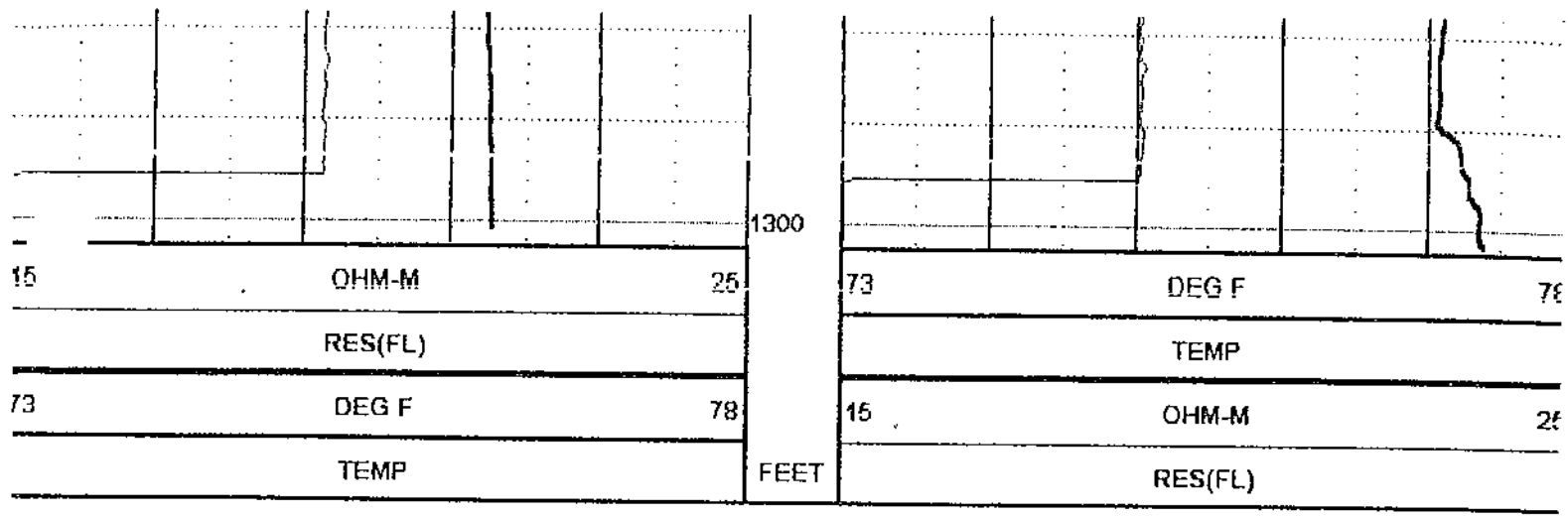

200
250
300
350


400
450
500
550
600

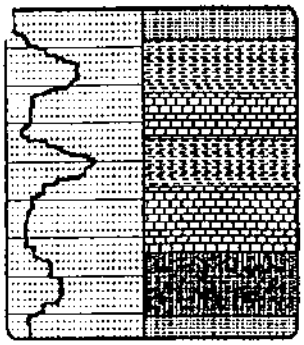

650
700
750
800


850
900
950
1000
1050


1100
1150
1200
1250


1300
15
OHM-M
25
RES(FL)
73
DEG F
78
TEMP
FEET
73
DEG F
TEMP
15
OHM-M
RES(FL)

JUN 2 8 1999



Southern Resource Exploration

P.O. Box 14311
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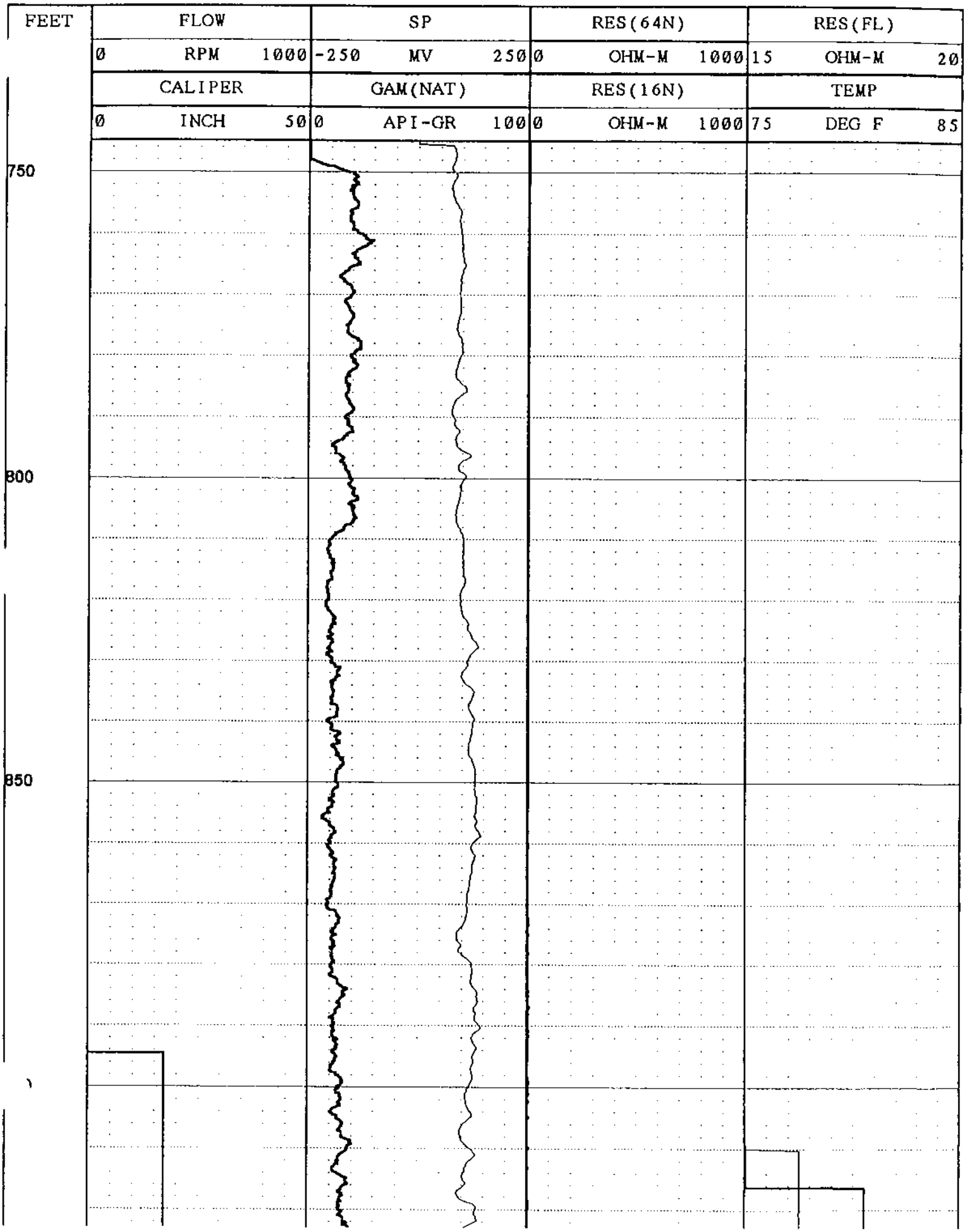
Phone 352-3725950

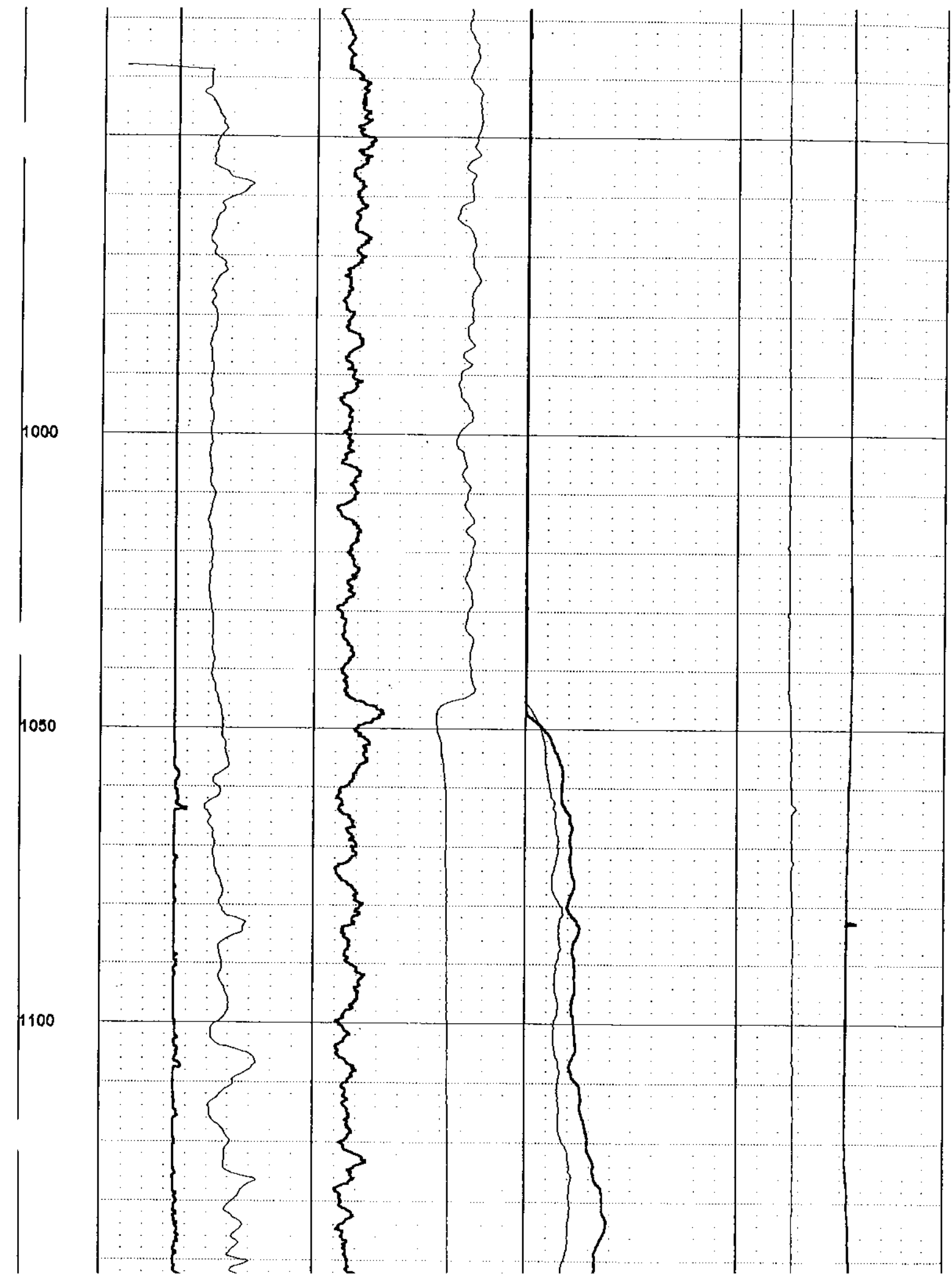
#1

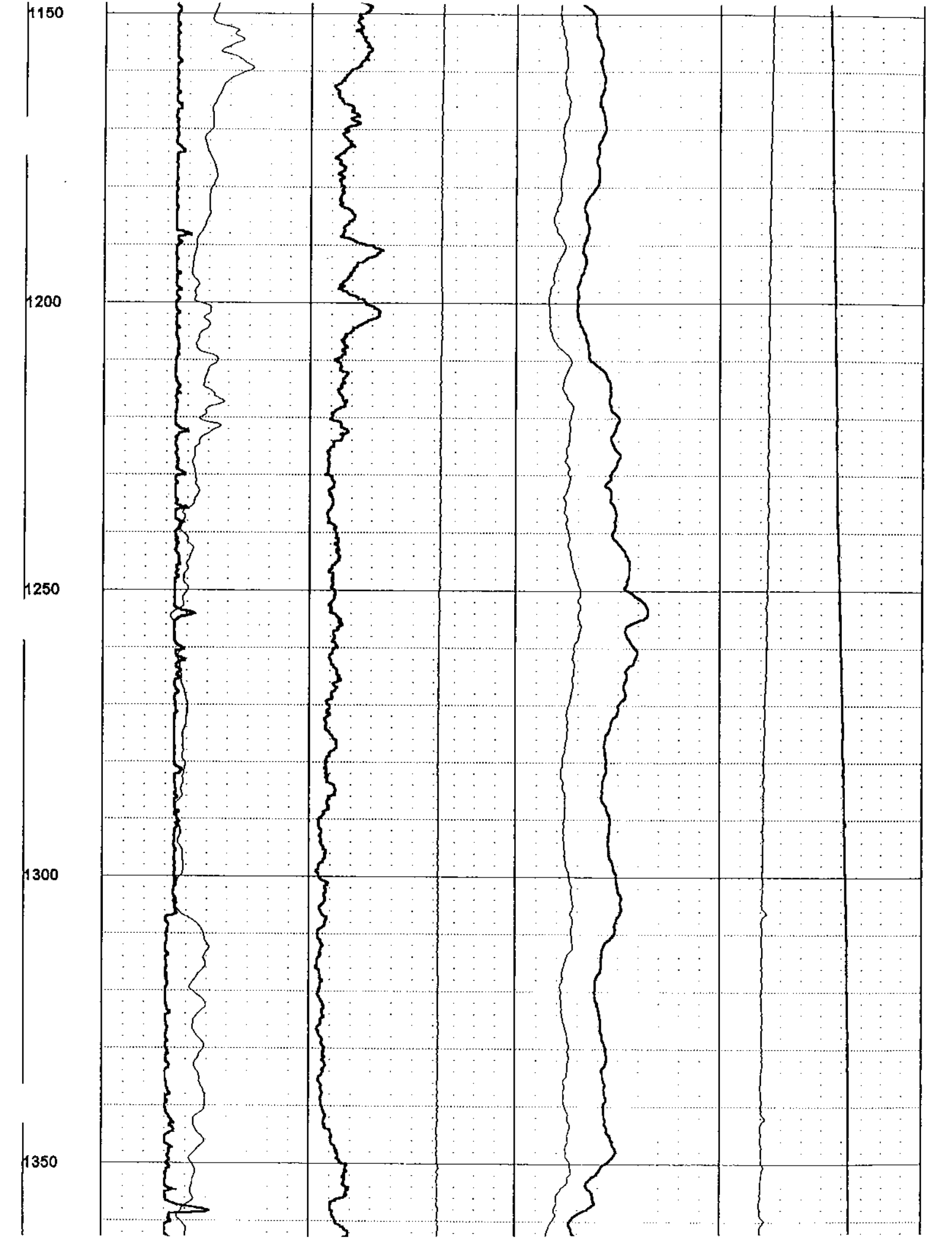
Company	: DIVERSIFIED DRILLING			OTHER SERVICES:	
Well	: #1				
Location/Field	: OUC SOUTHEAST				
County	: ORANGE				
State	: FL				
Section	: .	Township	: .	Range	: .
Date	: 02/03/99	Permanent Datum	: GL	ELEVATIONS:	
Depth Driller	: 1450'	Elev. Perm. Datum	: .	KB	:
)G BOTTOM	: 1446.60	Log Meas. From	: GL	DF	:
JG TOP	: 894.40	Drl Meas. Frommom:	GL	GL	:
Casing Driller	: 1045	Logging Unit	: BWT		
Casing Type	: STEEL	Field Office	: GVL		
Cas. Thicknessss:	.375	Recorded By	: MAF		
Bit Size	: -	Borehole Fluid	: WATER	FILE	: PROCESSED
Magnetic Decl.	:	RM	:	TYPE	: 9065A2
Matrix Density	:	RM Temperature	:	LOG	: ouc1
Fluid Density	:	Matrix Delta T	:	PLOT	:
Neutron Matrix	:	Fluid Delta T	: 189	THRESH:	5000

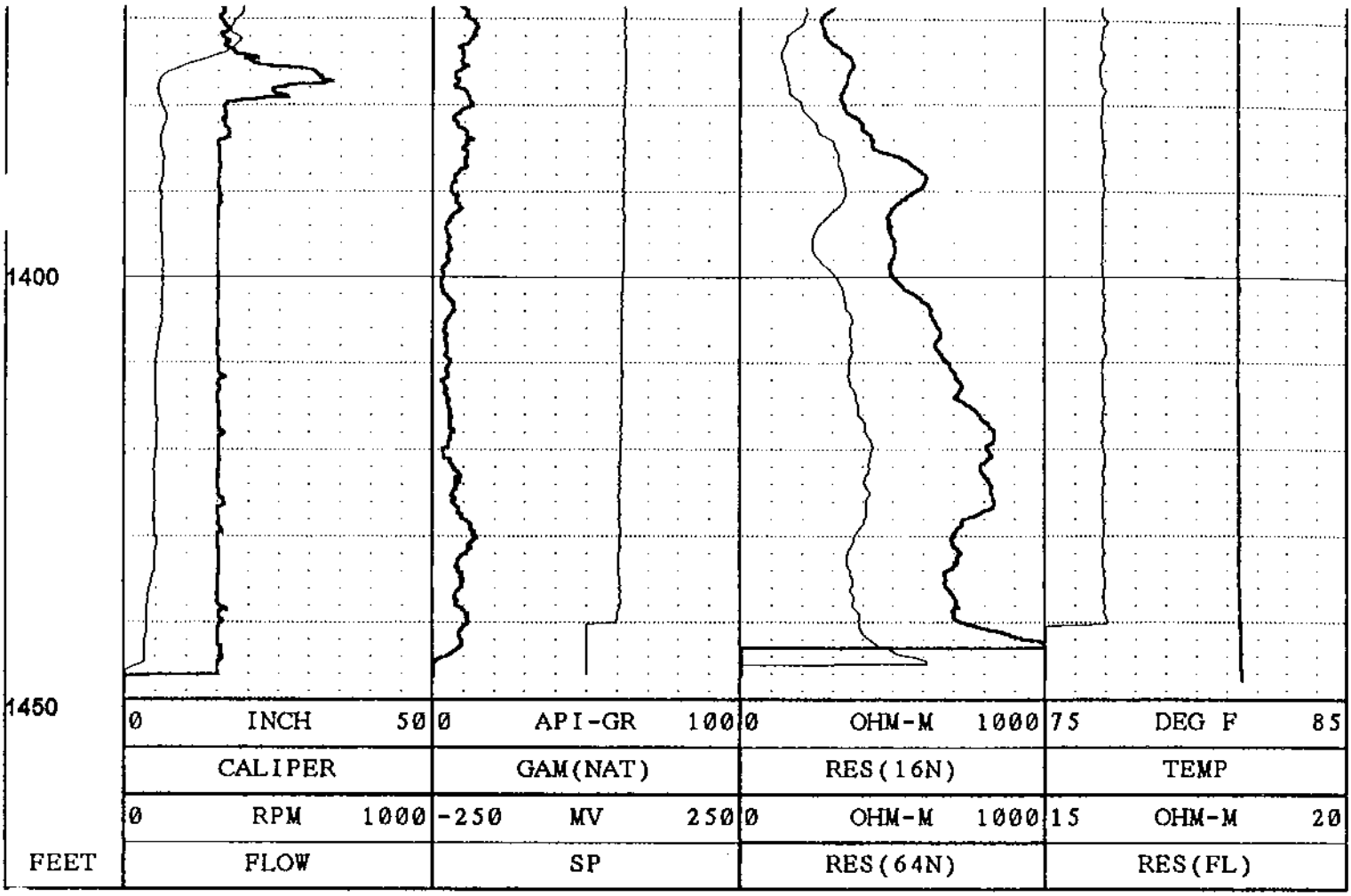
REMARKS:

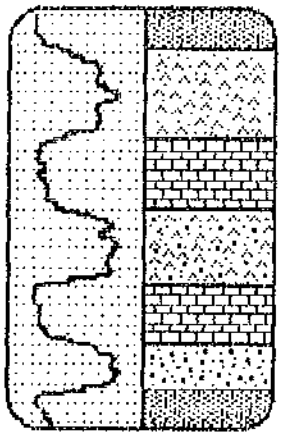
PUMPED FLOW LOG RUN DOWN AT 40'/MIN.


FEET
FLOW
0 RPM 1000
SP
-250 MV 250
RES(64N)
0 OHM-M 1000
RES(FL)
15 OHM-M 20
CALIPER
0 INCH 50
GAM(NAT)
0 API-GR 100
RES(16N)
0 OHM-M 1000
TEMP
75 DEG F 85
750
800
850


1000
1050
1100


1150
1200
1250
1300
1350


1400
1450
0 INCH 50
CALIPER
0 RPM 1000
FLOW
0 API-GR 100
GAM(NAT)
-250 MV 250
SP
0 OHM-M 1000
RES(16N)
0 OHM-M 1000
RES(64N)
75 DEG F 85
TEMP
15 OHM-M 20
RES(FL)
FEET



Southern Resource Exploration Inc.

P.O. Box 14311
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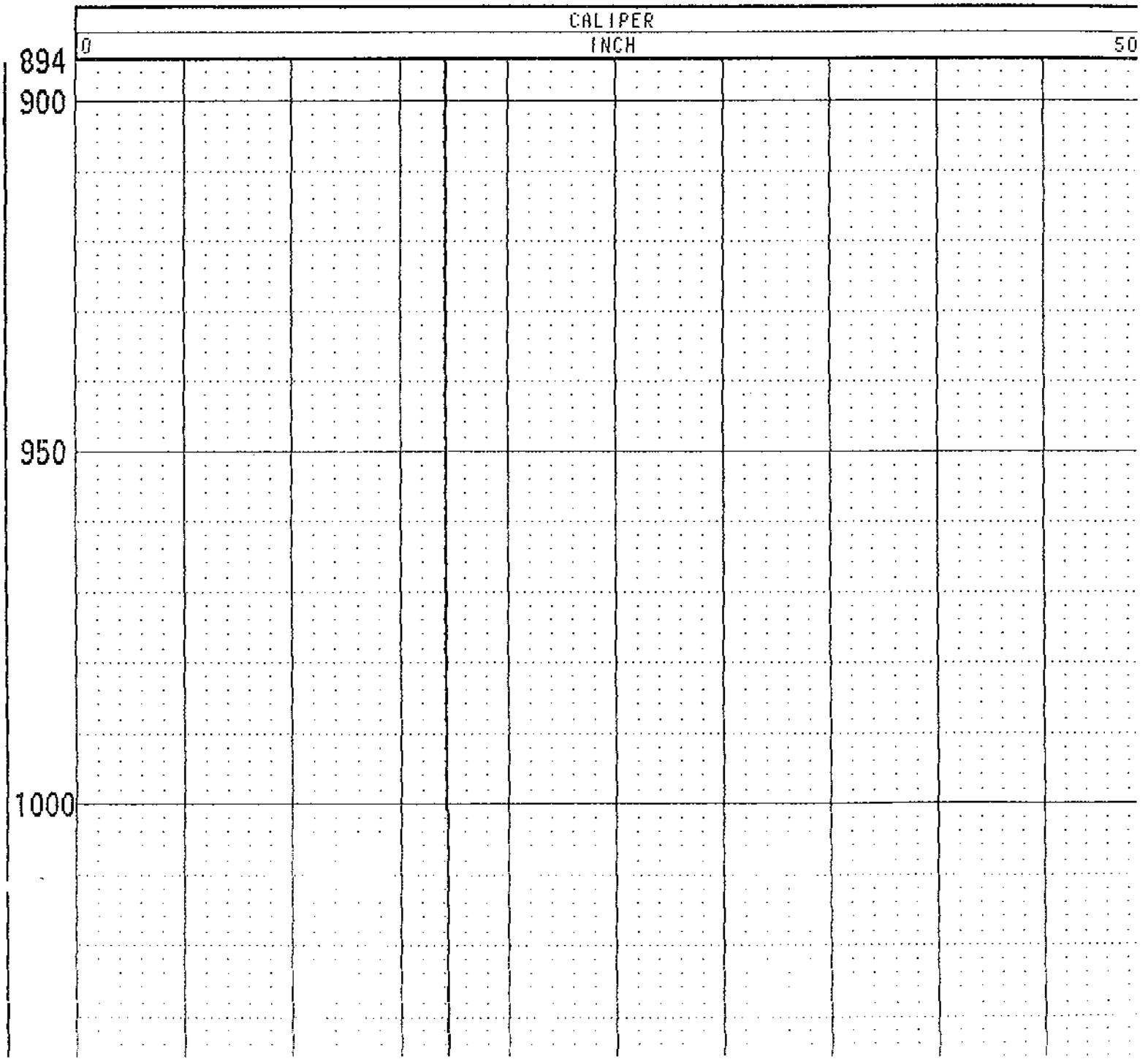
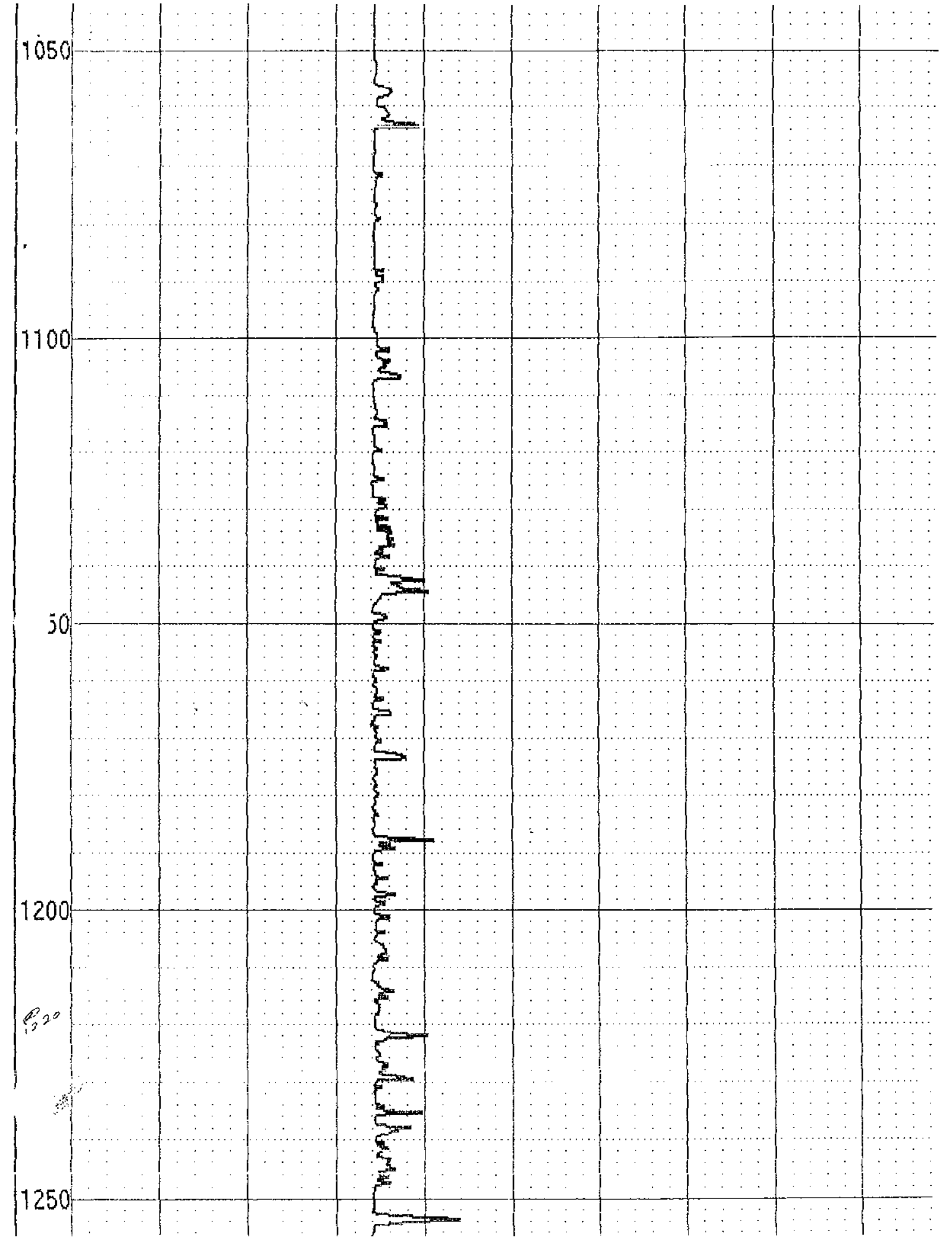
Phone 352-372-5950

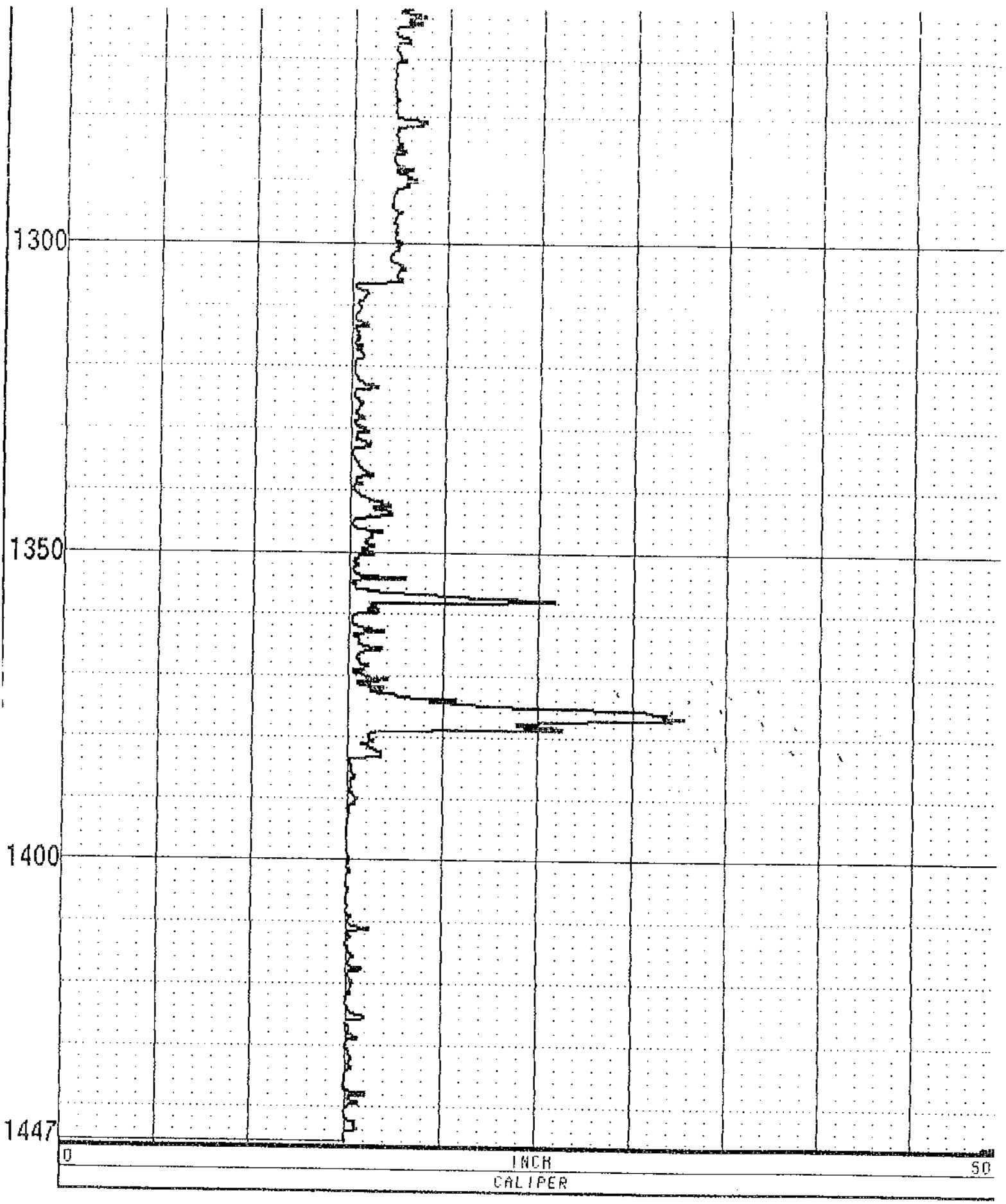
CALIPER LOG

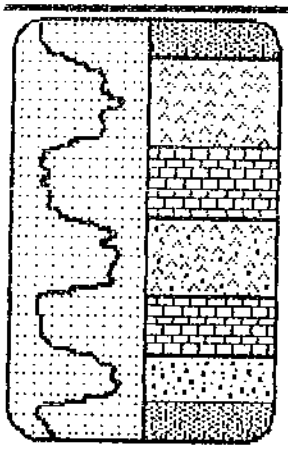
COMPANY	: DIVERSIFIED DRILLING				
WELL	: #1				
LOCATION/FIELD	: OUC SOUTHEAST				
COUNTY	: ORANGE				
STATE	: FL				
SECTION	: .	TOWNSHIP	: .	RANGE	: .
DATE	: 02/03/99	PERMANENT DATUM	: GL	ELEVATIONS	
DEPTH DRILLER	: 1450'	ELEV. PERM. DATUM	: .	KB	:
LOG BOTTOM	: 1446.60	LOG MEASURED FROM	: GL	DF	:
LOG TOP	: 894.40	DRL MEASURED FROM	: GL	GL	:
CASING DRILLER	: 1045	LOGGING UNIT	: BNT		
CASING TYPE	: STEEL	FIELD OFFICE	: GVL		
CASING THICKNESS	: .375	RECORDED BY	: MAF		
BIT SIZE	: -	BOREHOLE FLUID	: WATER	FILE	: PROCESSED
MAGNETIC DECL.	:	RM	:	TYPE	: 9065A2
MATRIX DENSITY	:	RM TEMPERATURE	:	LOG	: 1
FLUID DENSITY	:	MATRIX DELTA T	:	PLOT	: CALIPER 2
NEUTRON MATRIX	:	FLUID DELTA T	: 189	THRESH	: 5000
REMARKS	:				

OTHER SERVICES:


CALIPER
0
INCH
50
894
900
950
1000


1050
1100
50
1200
1250


1300
1350
1400
1447
0
INCH
50
CALIPER



Southern Resource Exploration Inc.

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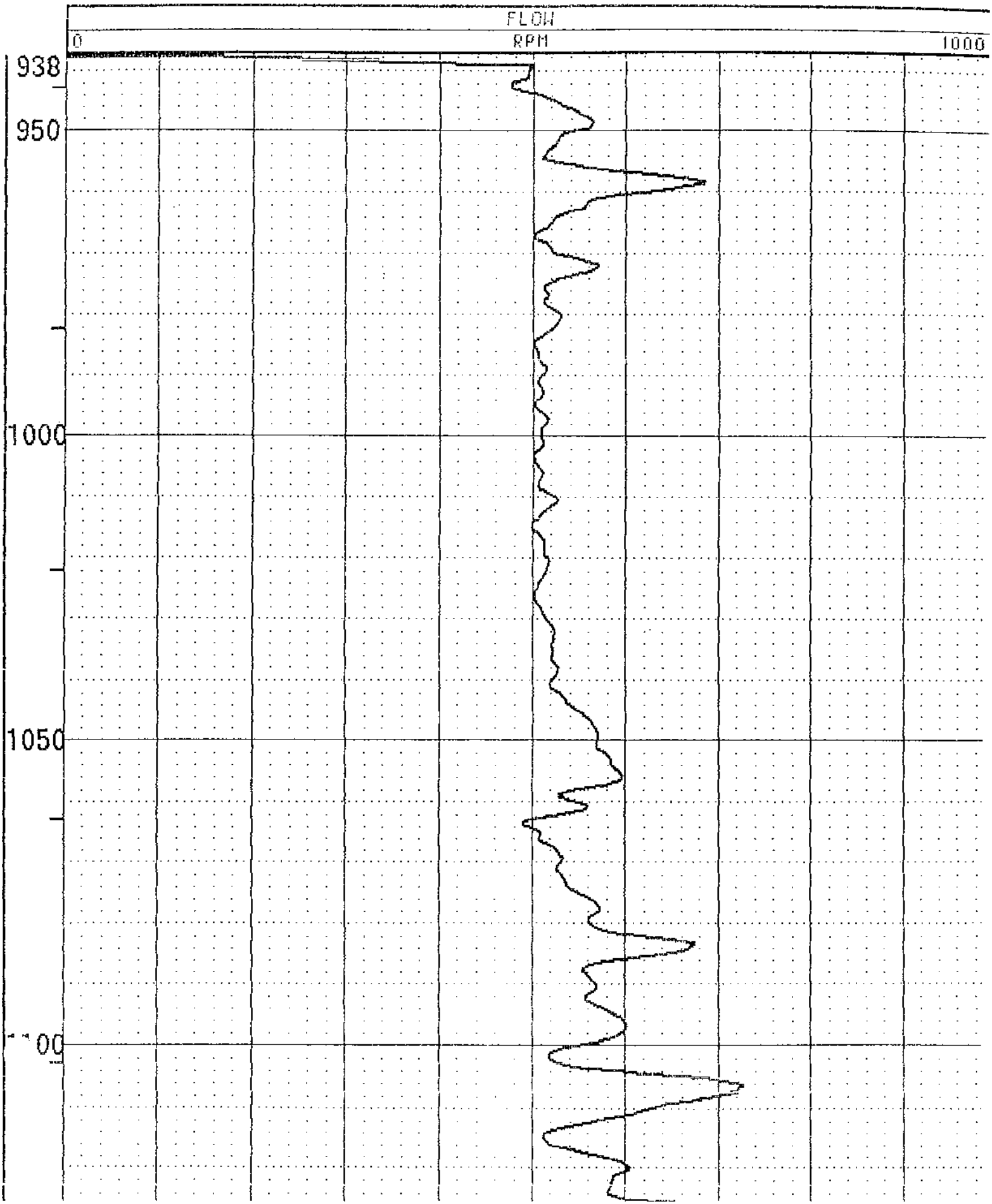
Gainesville, Florida 32604
Phone 352-372-5950

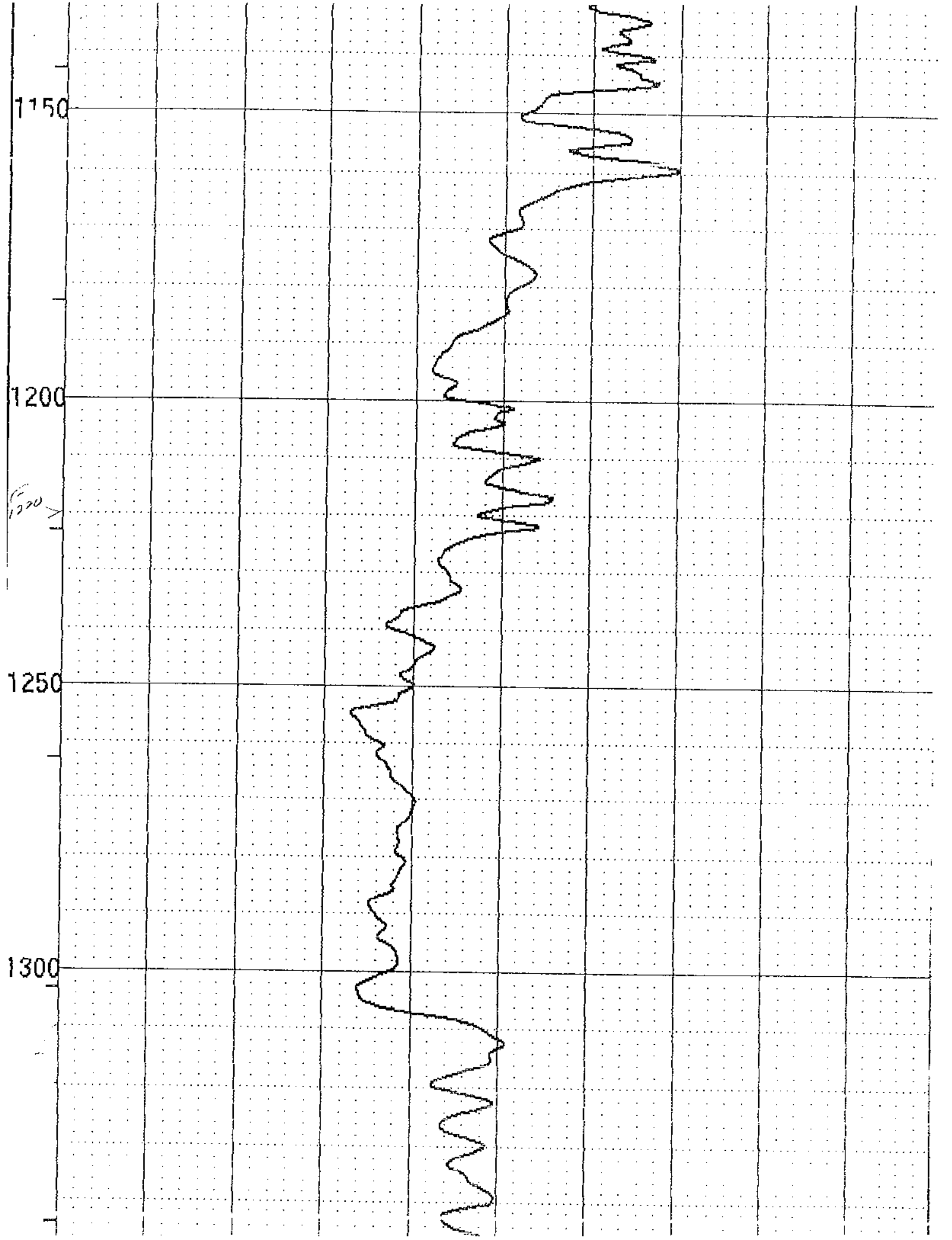
FLOWMETER LOG

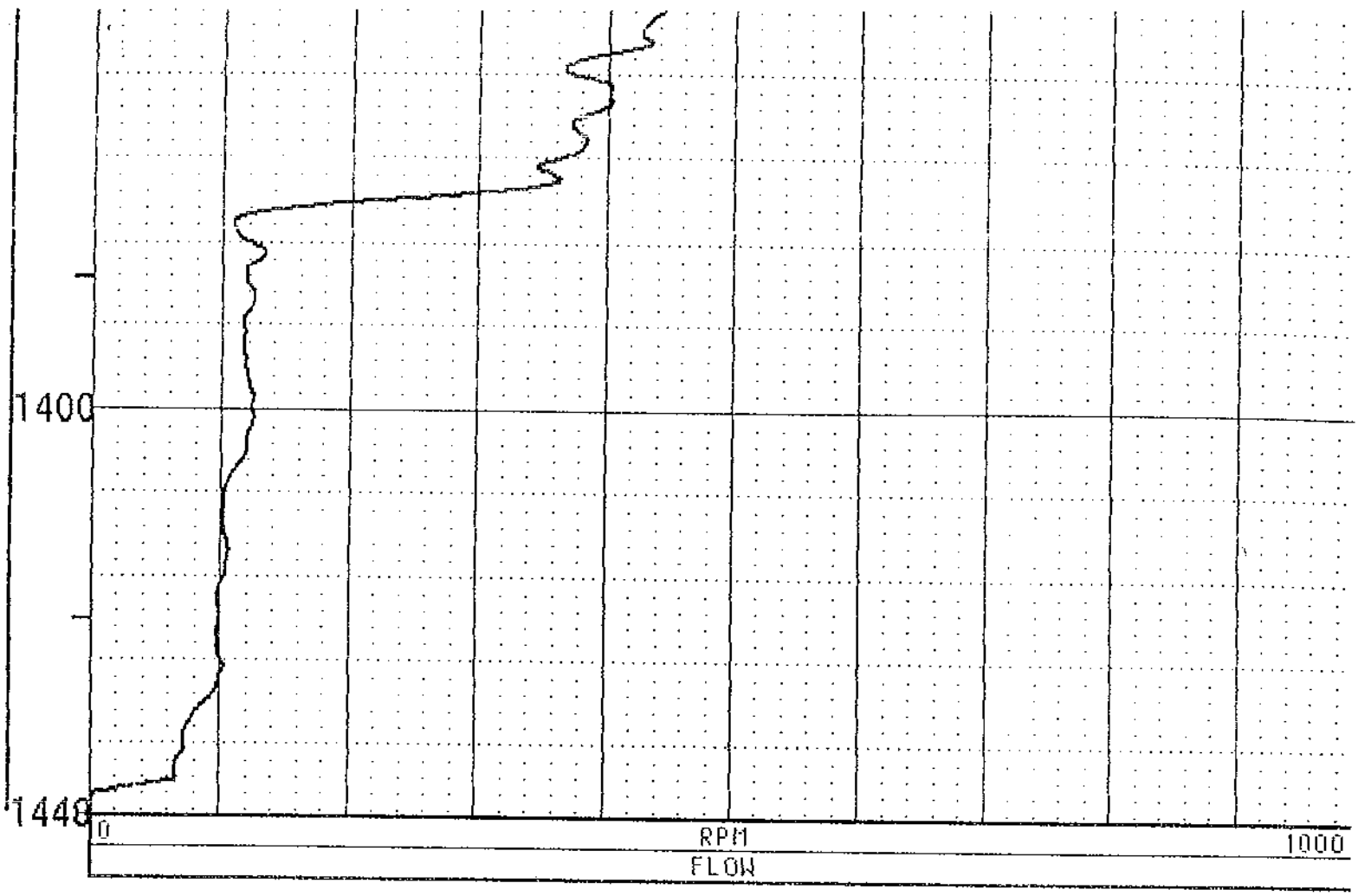
COMPANY	: DIVERSIFIED DRILLING			OTHER SERVICES:	
WELL	: #1				
LOCATION/FIELD	: OUC SOUTHEAST				
COUNTY	: ORANGE				
STATE	: FL				
SECTION	: .	TOWNSHIP	: .	RANGE	: .
ATE	: 02/03/99	PERMANENT DATUM	: GL	ELEVATIONS	
EPTH DRILLER	: 1450'	ELEV. PERM. DATUM	: .	KB	:
LOG BOTTOM	: 508.20	LOG MEASURED FROM	: GL	DF	:
LOG TOP	: 937.80	DRL MEASURED FROM	: GL	GL	:
CASING DRILLER	: 1045	LOGGING UNIT	: BWT		
CASING TYPE	: STEEL	FIELD OFFICE	: GVL		
CASING THICKNESS	: .375	RECORDED BY	: MAF		
BIT SIZE	: -	BOREHOLE FLUID	: WATER	FILE	: ORIGINAL
MAGNETIC DECL.	:	RM	:	TYPE	: ANIMF
MATRIX DENSITY	:	RM TEMPERATURE	:	LOG	: 7
FLUID DENSITY	:	MATRIX DELTA T	:	PLOT	: FLOW 11
NEUTRON MATRIX	:	FLUID DELTA T	: 189	THRESH	: 5000

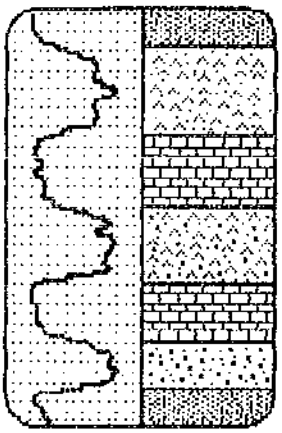
REMARKS :

PUMPED FLOW LOG RUN @ 40'/MIN. DOWN.


FLOW
0
RPM
1000
938
950
1000
1050


1150
1200
1220
1250
1300


1400
1440
0
RPM
1000
FLOW



Southern Resource Exploration Inc.

P.O. Box 14311
Gainesville, Florida 32604
Phone 352-372-5950

TEMPERATURE-FLUID RES

COMPANY	: DIVERSIFIED DRILLING			OTHER SERVICES:	
WELL	: #1				
LOCATION/FIELD	: OUC SOUTHEAST				
COUNTY	: ORANGE				
STATE	: FL				
SECTION	: .	TOWNSHIP	: .	RANGE	: .
TE	: 02/03/99	PERMANENT DATUM	: GL	ELEVATIONS	
DEPTH DRILLER	: 1450'	ELEV. PERM. DATUM	: .	KB	:
LOG BOTTOM	: [redacted]	LOG MEASURED FROM	: GL	DF	:
LOG TOP	: 896.20	DRL MEASURED FROM	: GL	GL	:
CASING DRILLER	: 1045 '	LOGGING UNIT	: BWT		
CASING TYPE	: STEEL	FIELD OFFICE	: GVL		
CASING THICKNESS	: .375	RECORDED BY	: MAF		
BIT SIZE	: -	BOREHOLE FLUID	: WATER	FILE	: ORIGINAL
MAGNETIC DECL.	:	RM	:	TYPE	: 9041A
MATRIX DENSITY	:	RM TEMPERATURE	:	LOG	: 6
FLUID DENSITY	:	MATRIX DELTA T	:	PLOT	: TEMP-FR 1
NEUTRON MATRIX	:	FLUID DELTA T	: 189	THRESH	: 5000

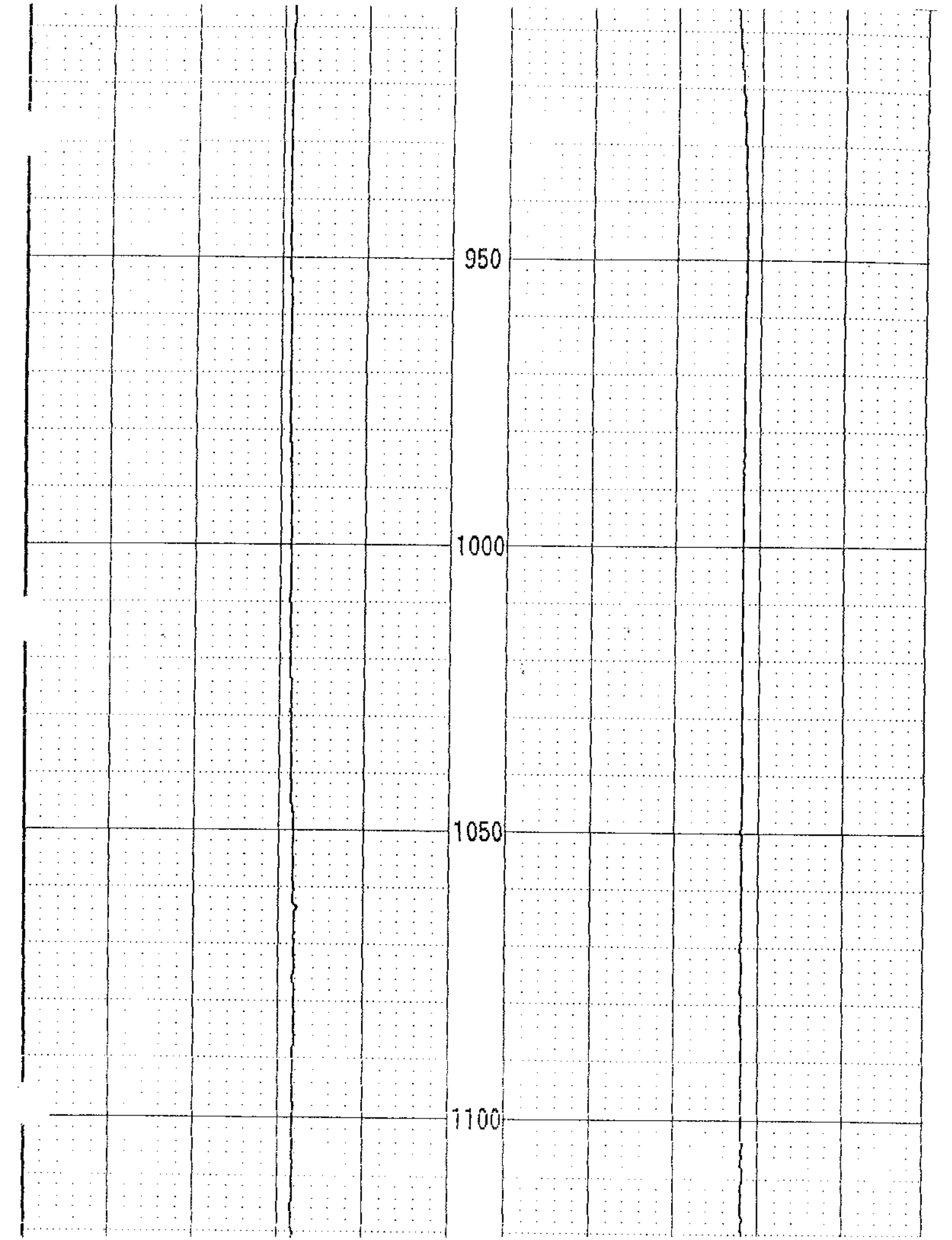
REMARKS :
PUMPED TEMPERATURE AND FLUID RES.

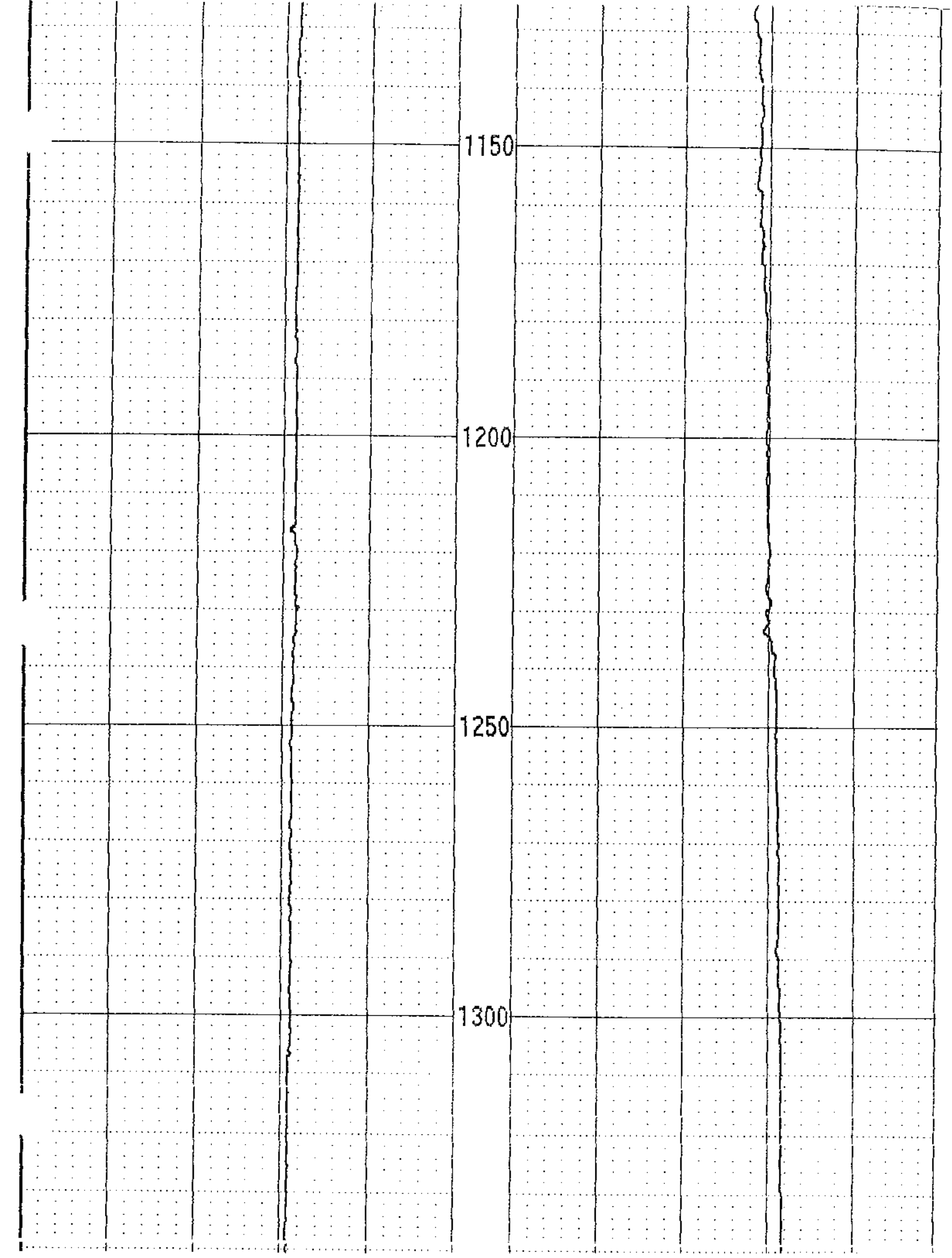
ALL SERVICES PROVIDED SUBJECT TO STANDARD TERMS AND CONDITIONS

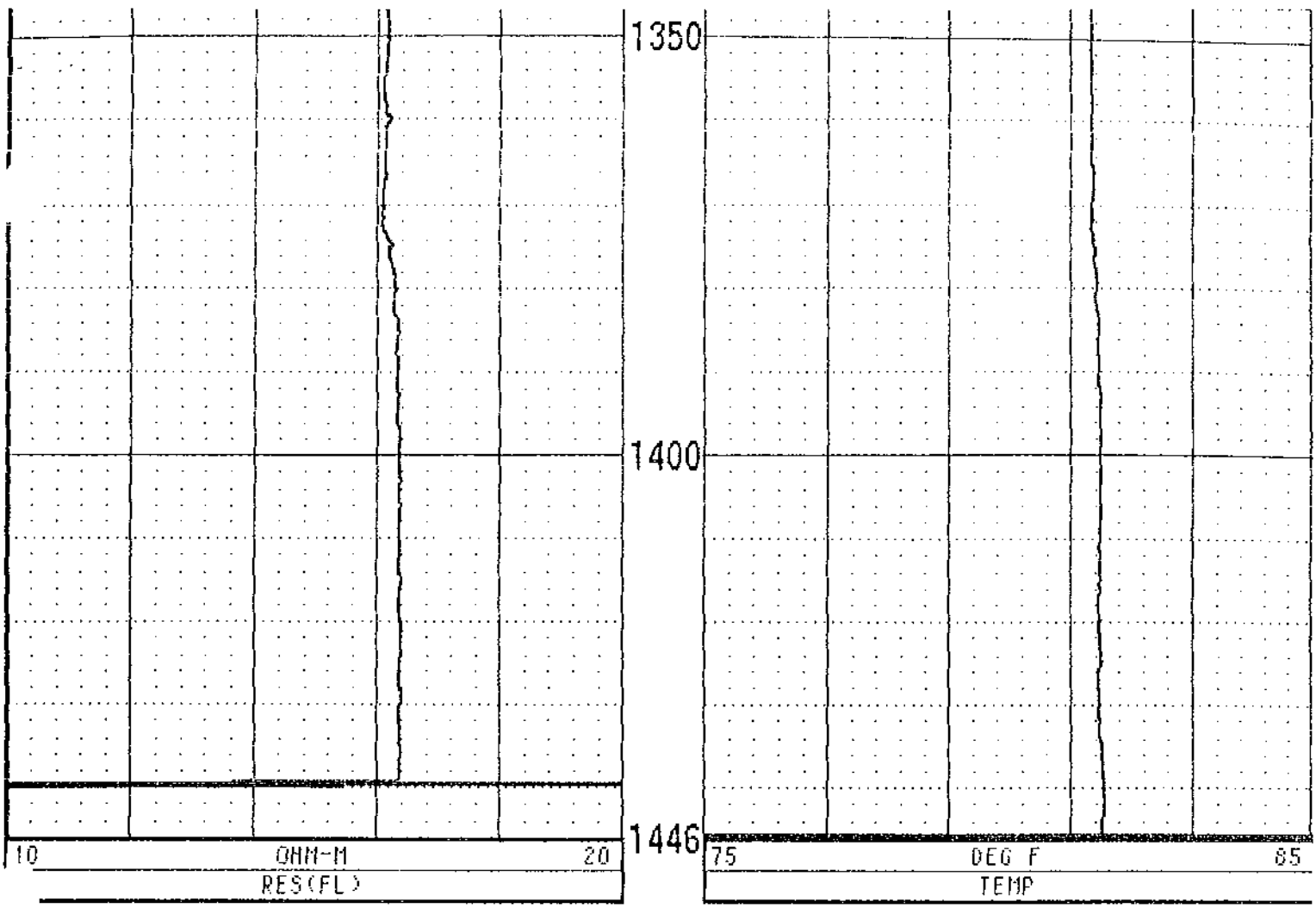
RES(FL)		
10	OHM-M	20

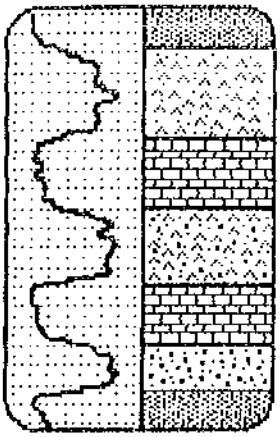
896

TEMP		
75	DEG F	85


950
1000
1050
1100


1150
1200
1250
1300


1350
1400
1446
10
OHM-M
20
RES(FL)
75
DEG F
85
TEMP



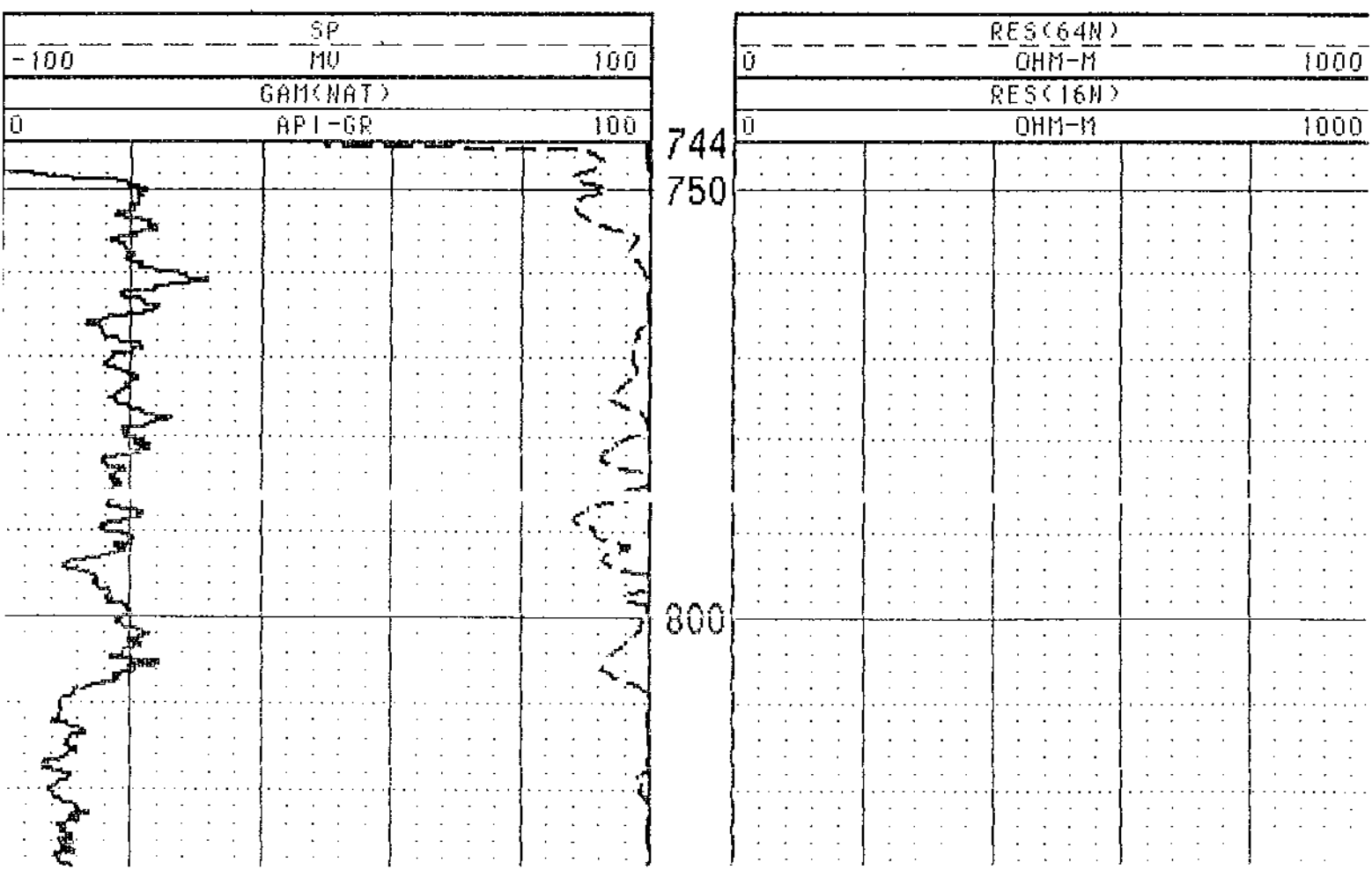
Southern Resource Exploration Inc.

P.O. Box 14311
Gainesville, Florida 32604
Phone 352-372-5950

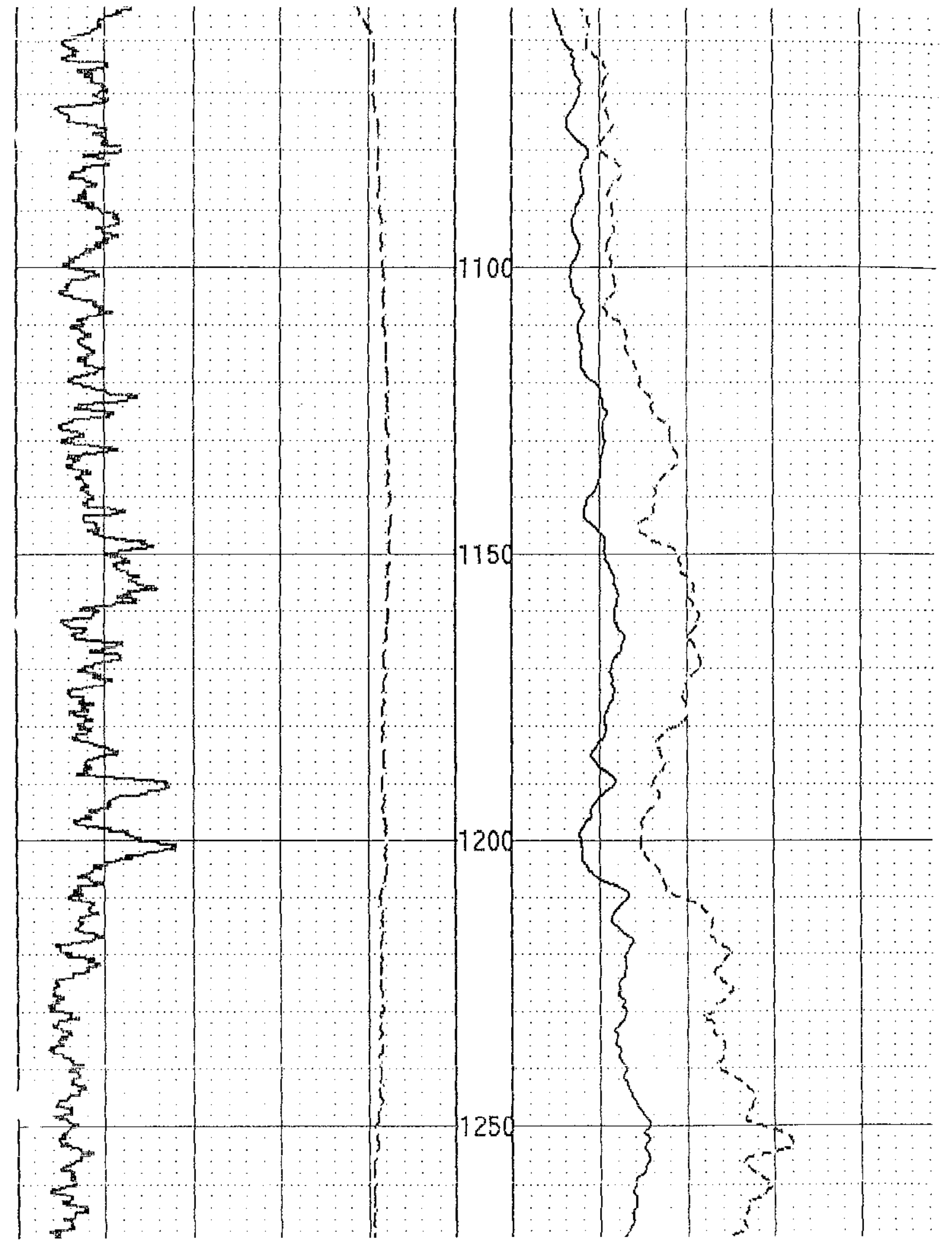
GAM, RES (16-64), SP

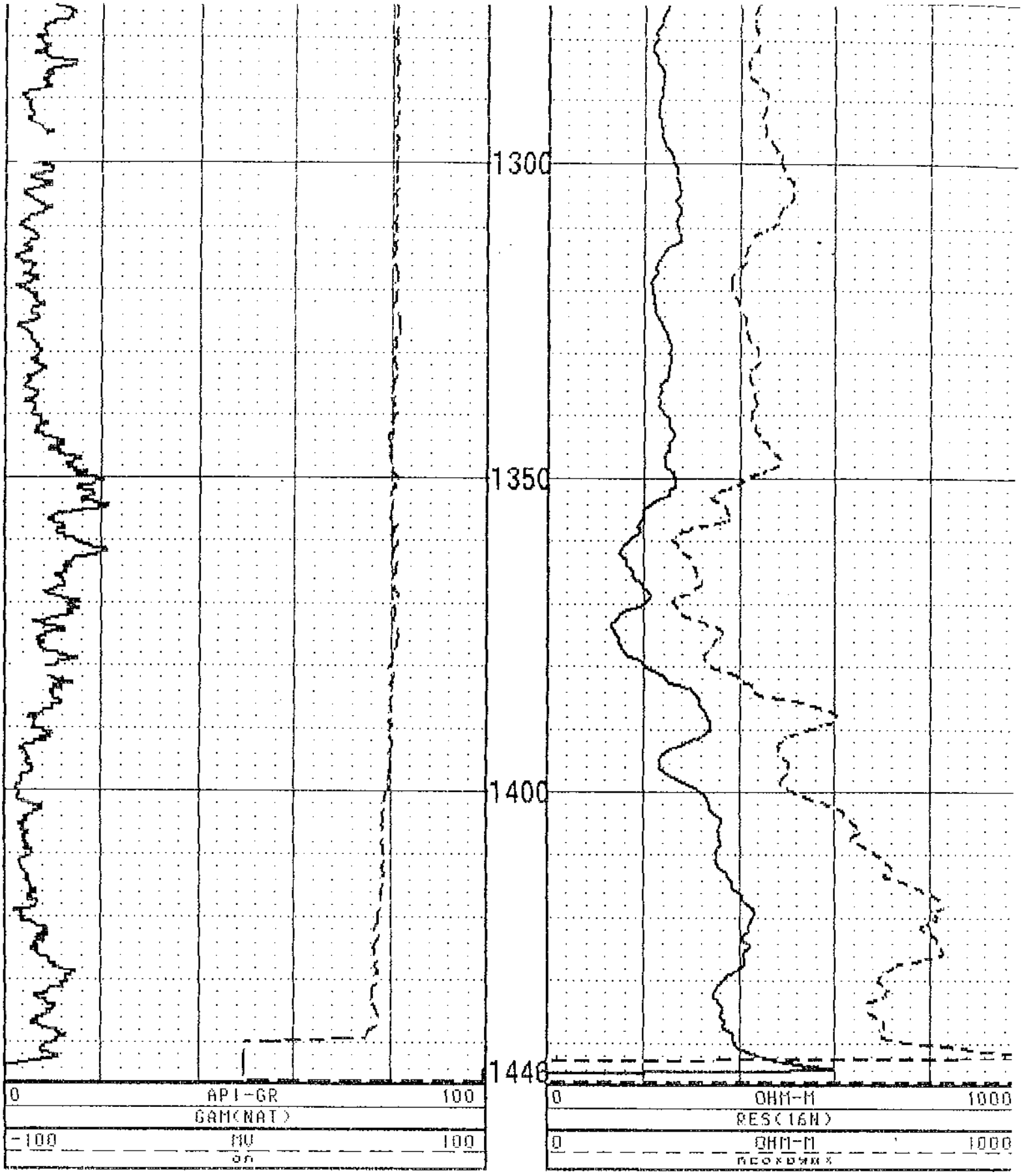
COMPANY	: DIVERSIFIED DRILLING				
WELL	: #1				
LOCATION/FIELD	: OUC SOUTHEAST				
COUNTY	: ORANGE				
STATE	: FL				
SECTION	: .	TOWNSHIP	: .	RANGE	: .
DATE	: 02/03/99	PERMANENT DATUM	: GL	ELEVATIONS	
DEPTH DRILLER	: 1450'	ELEV. PERM. DATUM	: .	KB	:
LOG BOTTOM	: 1446.40	LOG MEASURED FROM	: GL	DF	:
LOG TOP	: 744.80	DRL MEASURED FROM	: GL	GL	:
CASING DRILLER	: 1045	LOGGING UNIT	: BWT		
CASING TYPE	: STEEL	FIELD OFFICE	: GVL		
CASING THICKNESS	: .375	RECORDED BY	: MAF		
BIT SIZE	: -	BOREHOLE FLUID	: WATER	FILE	: ORIGINAL
MAGNETIC DECL.	:	RM	:	TYPE	: 9041A
MATRIX DENSITY	:	RM TEMPERATURE	:	LOG	: 5
FLUID DENSITY	:	MATRIX DELTA T	:	PLOT	: 9040B 0
NEUTRON MATRIX	:	FLUID DELTA T	: 189	THRESH	: 5000
REMARKS	:				

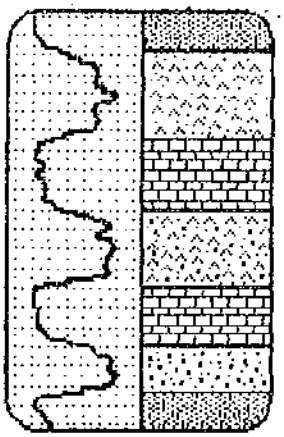
OTHER SERVICES:


SP
-100
MV
100
GAM(NAT)
0
API-GR
100
RES(64N)
0
OHM-M
1000
RES(16N)
0
OHM-M
1000
744
750
800

850
900
950
1000


1100
1150
1200
1250


1300
1350
1400
1446
0
API-GR
100
GAM(NAT)
-100
MV
100
SP
0
OHM-M
1000
RES(16M)
0
OHM-M
1000
RESXBHM



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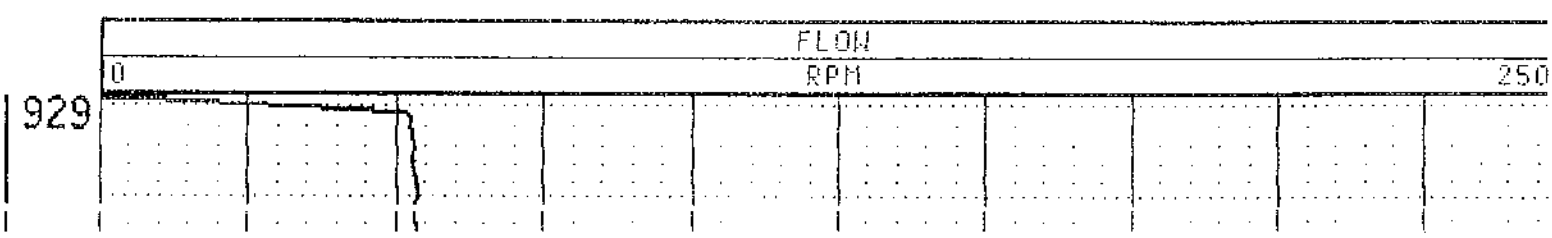
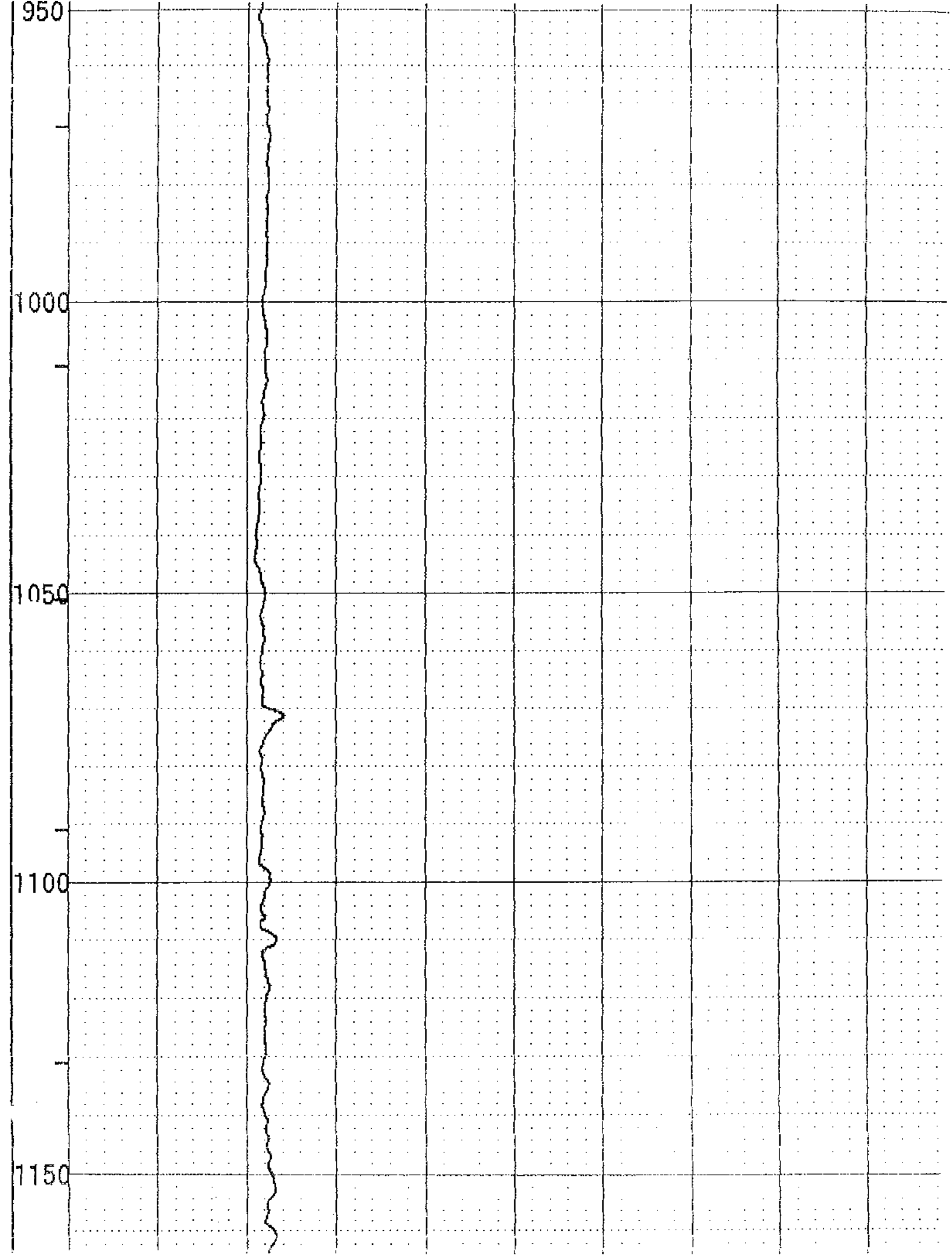
FLOWMETER LOG

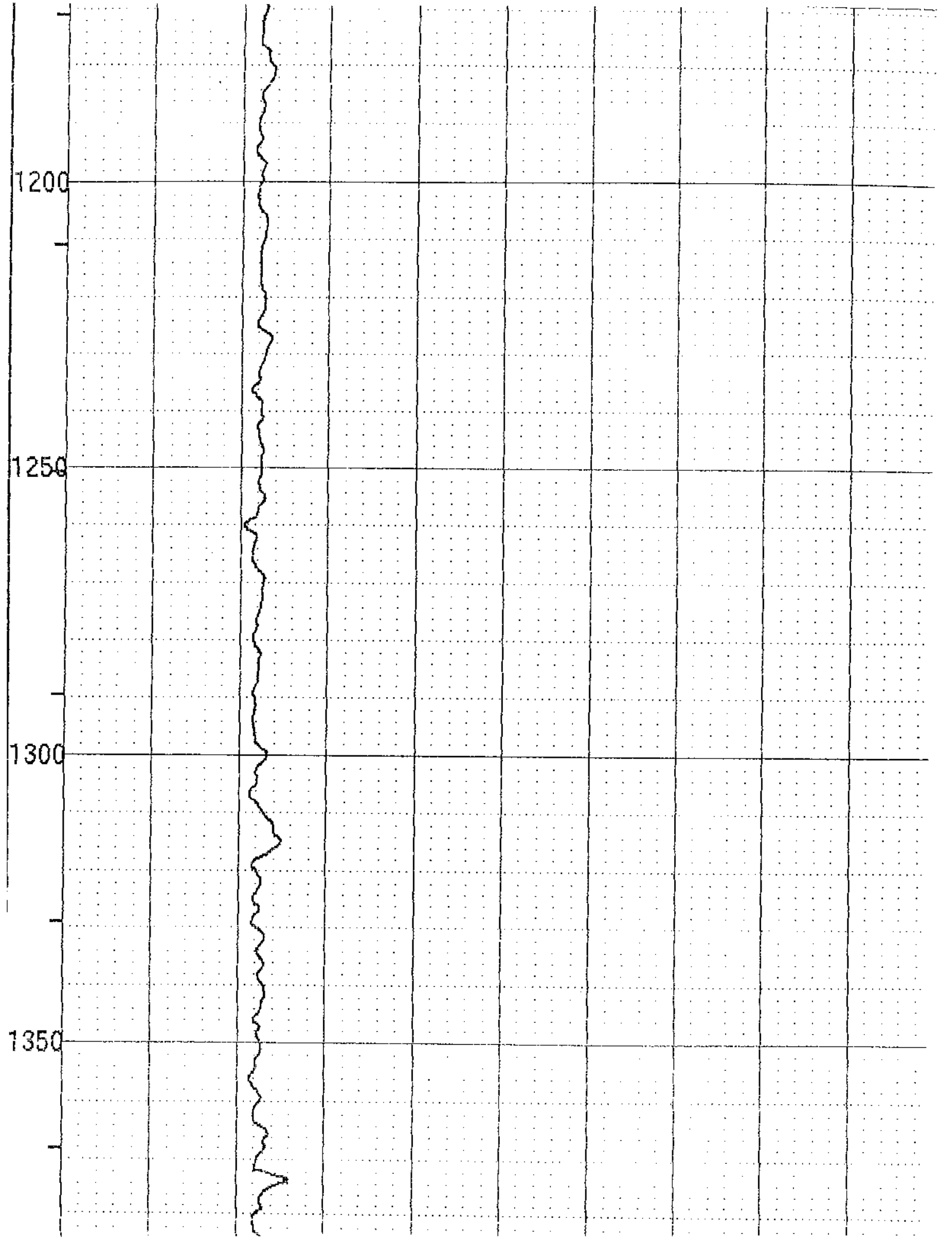
COMPANY	: DIVERSIFIED DRILLING			OTHER SERVICES:	
WELL	: #1				
LOCATION/FIELD	: OUC SOUTHEAST				
COUNTY	: ORANGE				
STATE	: FL				
SECTION	: .	TOWNSHIP	: .	RANGE	: .
ATE	: 02/03/99	PERMANENT DATUM	: GL	ELEVATIONS	
DEPTH DRILLER	: 1450'	ELEV. PERM. DATUM	: .	KB	:
LOG BOTTOM	:1446~~508~~20	LOG MEASURED FROM	: GL	DF	:
LOG TOP	: 929.20	DRL MEASURED FROM	: GL	GL	:
CASING DRILLER	: 1045	LOGGING UNIT	: BHT		
CASING TYPE	: STEEL	FIELD OFFICE	: GVL		
CASING THICKNESS	: .375	RECORDED BY	: MAF		
BIT SIZE	: -	BOREHOLE FLUID	: WATER	FILE	: ORIGINAL
MAGNETIC DECL.	:	RM	:	TYPE	: ANIMF
MATRIX DENSITY	:	RM TEMPERATURE	:	LOG	: 9
FLUID DENSITY	:	MATRIX DELTA T	:	PLOT	: FLOW 11
NEUTRON MATRIX	:	FLUID DELTA T	: 189	THRESH	: 5000

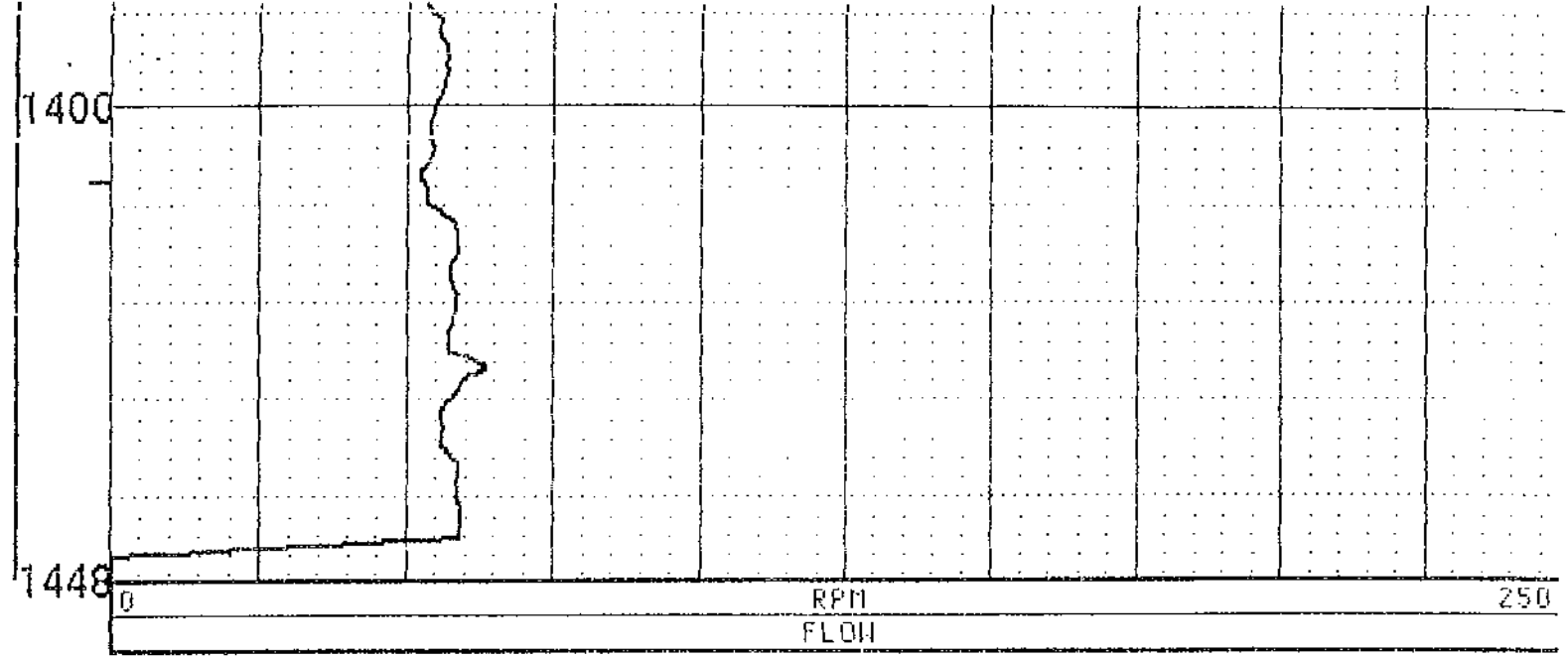
REMARKS :
STATIC FLOW LOG RUN DOWN @ 40'/MIN.

ALL SERVICES PROVIDED SUBJECT TO STANDARD TERMS AND CONDITIONS




950
1000
1050
1100
1150


1200
1250
1300
1350


1400
1448
0
RPM
250
FLOW

Southern Resource Exploration Inc.

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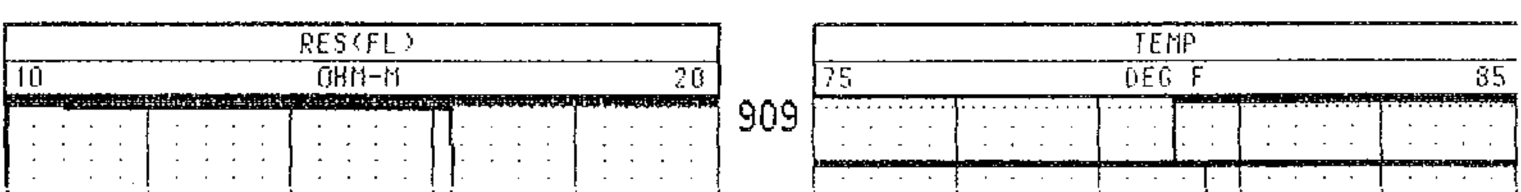
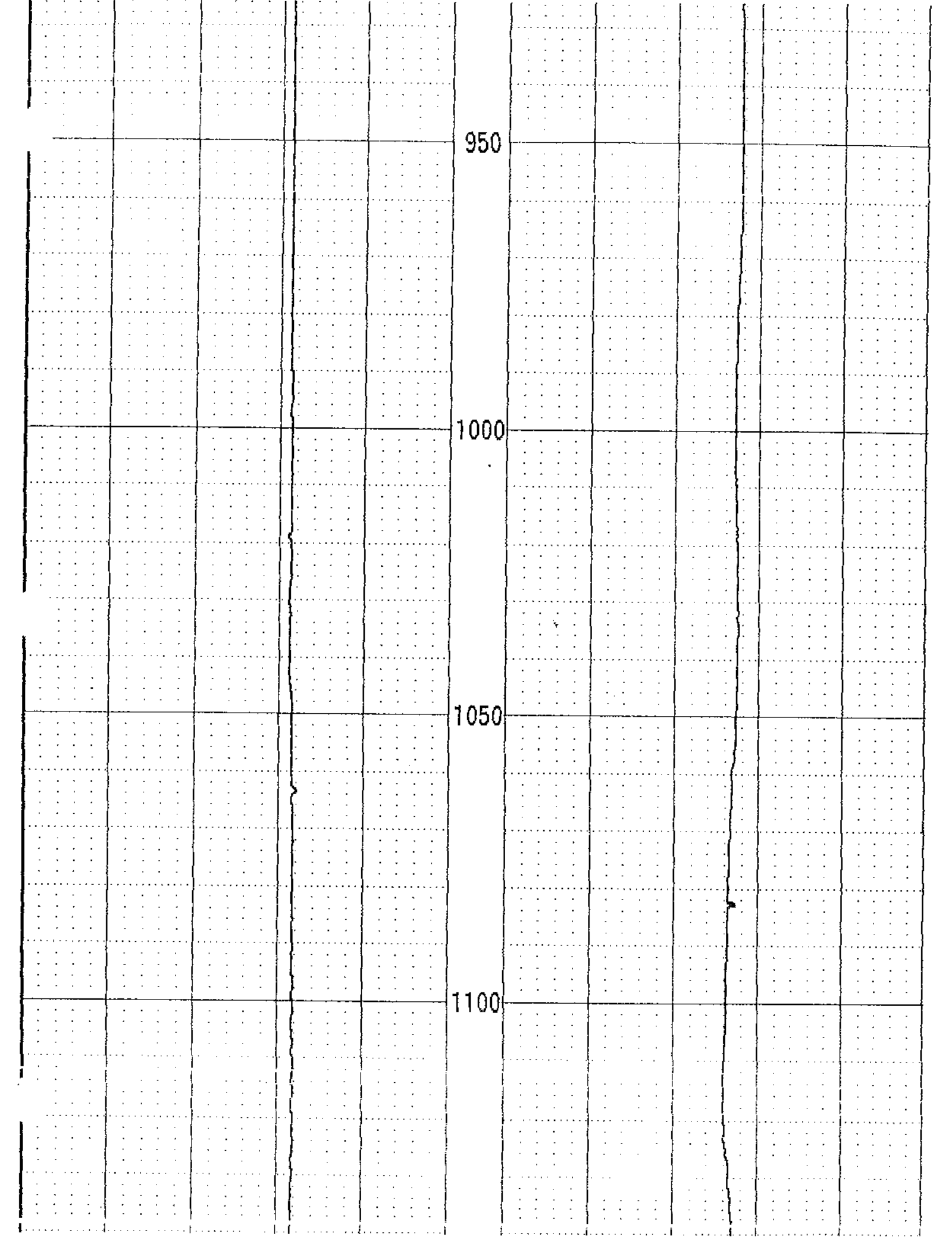
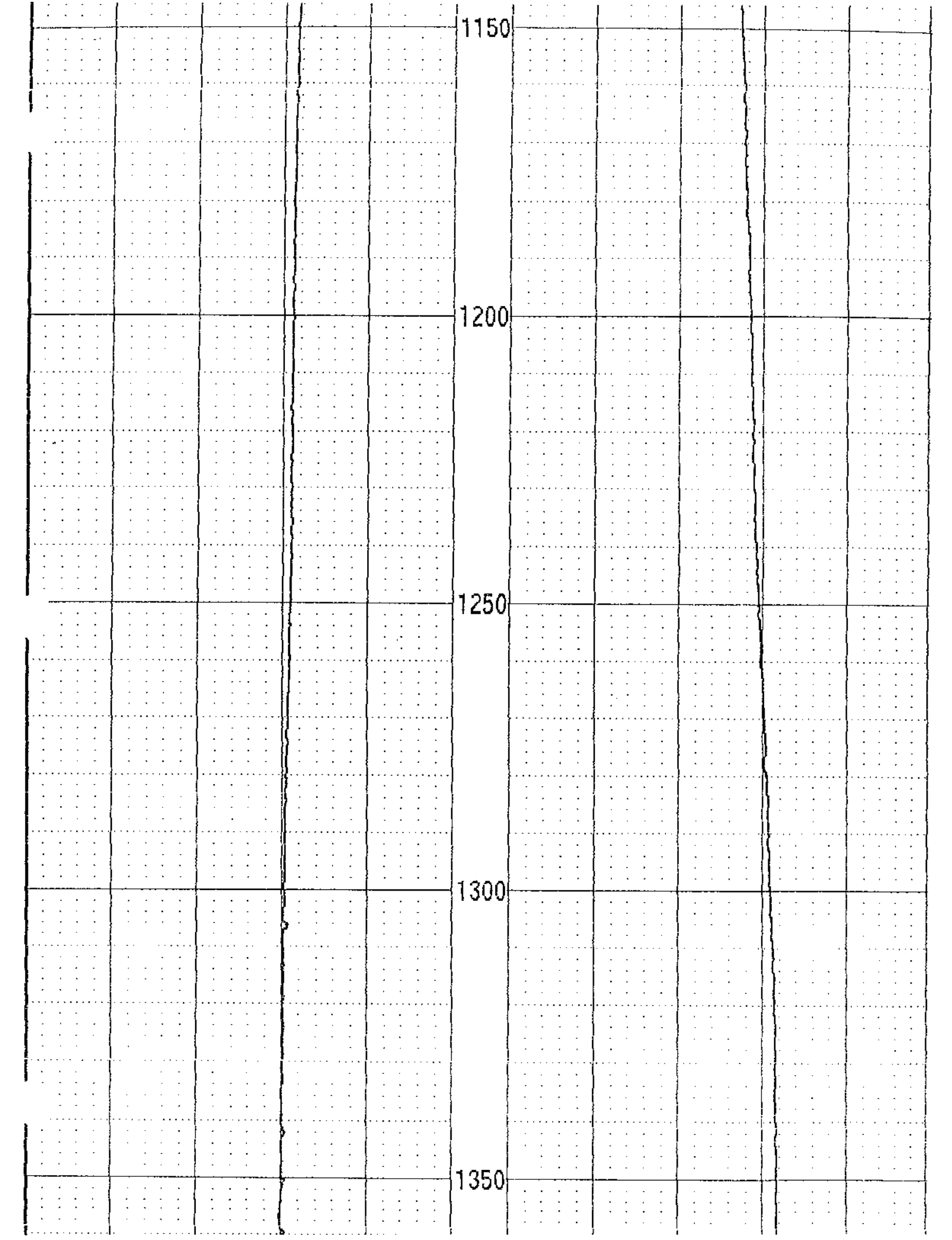
TEMPERATURE-FLUID RES

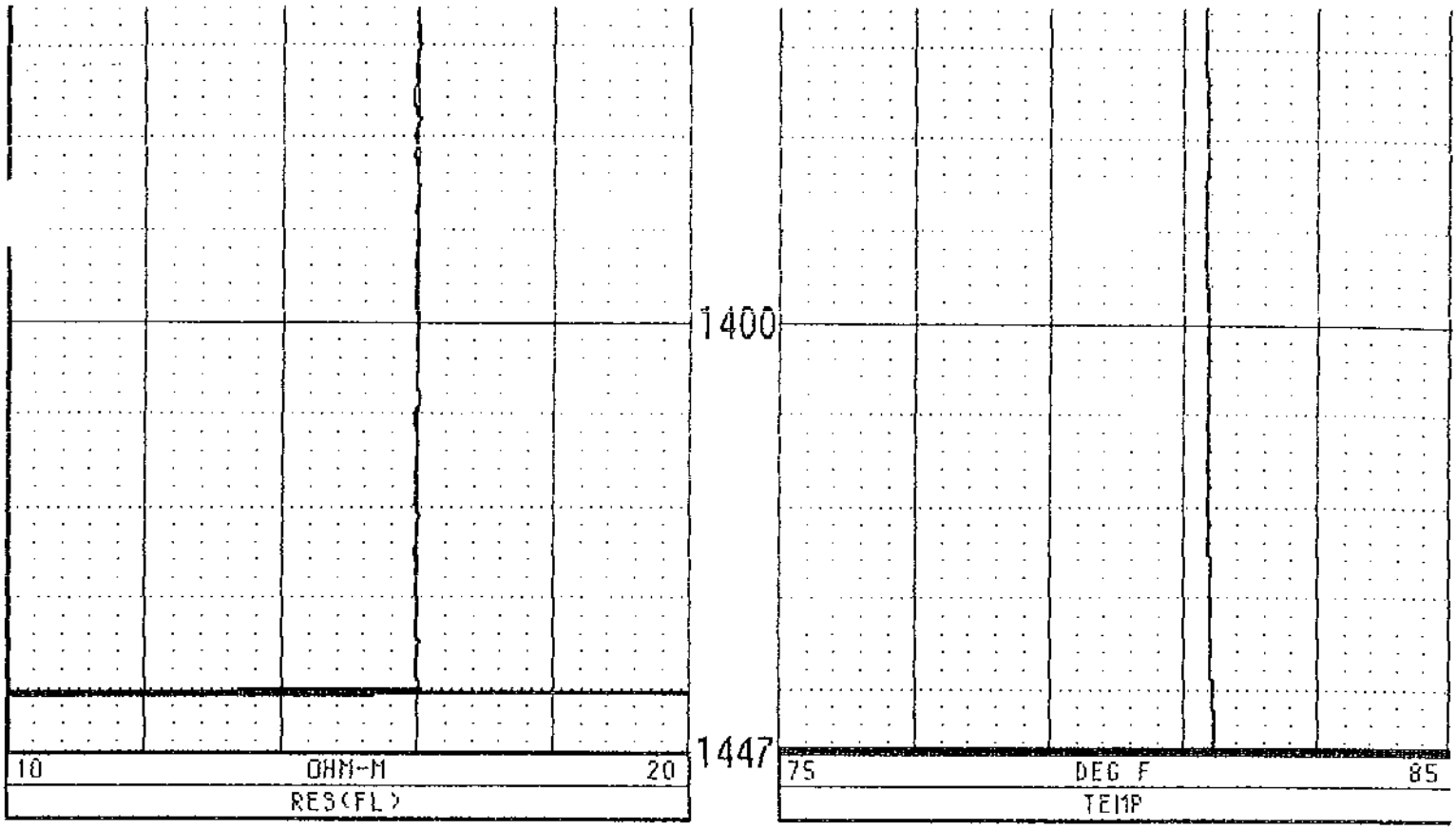
COMPANY	: DIVERSIFIED DRILLING	OTHER SERVICES:			
WELL	: #1				
LOCATION/FIELD	: OUC SOUTHEAST				
COUNTY	: ORANGE				
STATE	: FL				
SECTION	: .	TOWNSHIP	: .	RANGE	: .
·TE	: 02/03/99	PERMANENT DATUM	: GL	ELEVATIONS	
·PTH DRILLER	: 1450'	ELEV. PERM. DATUM	: .	KB	:
LOG BOTTOM	: 508.20	LOG MEASURED FROM	: GL	DF	:
LOG TOP	: 909.40	DRL MEASURED FROM	: GL	GL	:
CASING DRILLER	: 1045	LOGGING UNIT	: BWT		
CASING TYPE	: STEEL	FIELD OFFICE	: GVL		
CASING THICKNESS	: .375	RECORDED BY	: MAF		
BIT SIZE	: -	BOREHOLE FLUID	: WATER	FILE	: ORIGINAL
MAGNETIC DECL.	:	RM	:	TYPE	: 9041A
MATRIX DENSITY	:	RM TEMPERATURE	:	LOG	: 4
FLUID DENSITY	:	MATRIX DELTA T	:	PLOT	: TEMP-FR 1
NEUTRON MATRIX	:	FLUID DELTA T	: 189	THRESH	: 5000
REMARKS	:				

STATIC TEMPERATURE AND FLUID RES.

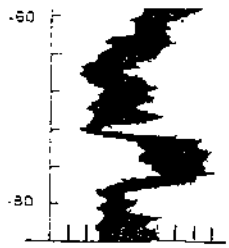



950
1000
1050
1100


1150
1200
1250
1300
1350


1400
1447
10
OHM-M
20
RES(FL)
75
DEG F
85
TEMP

ABS



Advanced Borehole Services

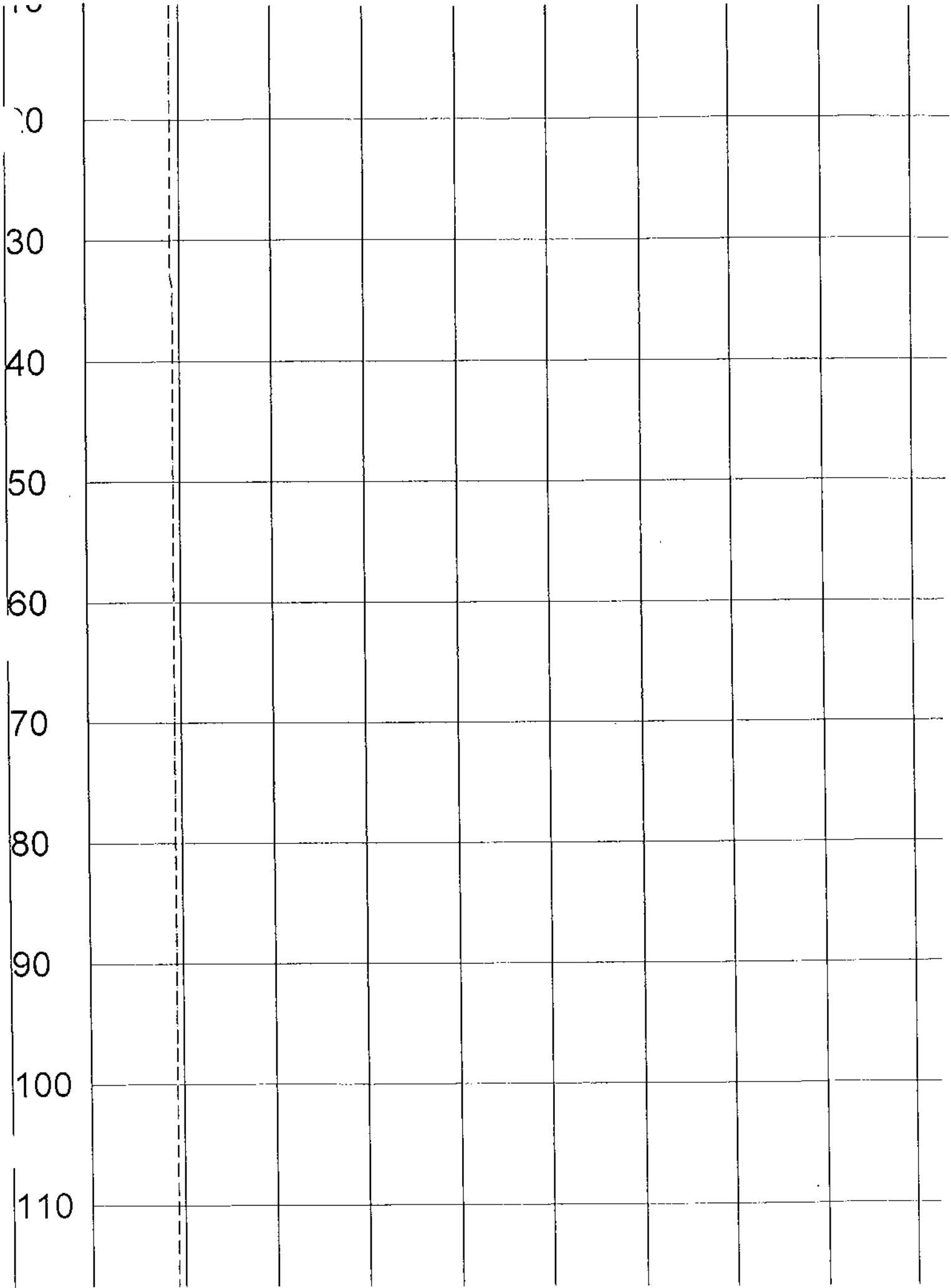
SEWTP OUC #2

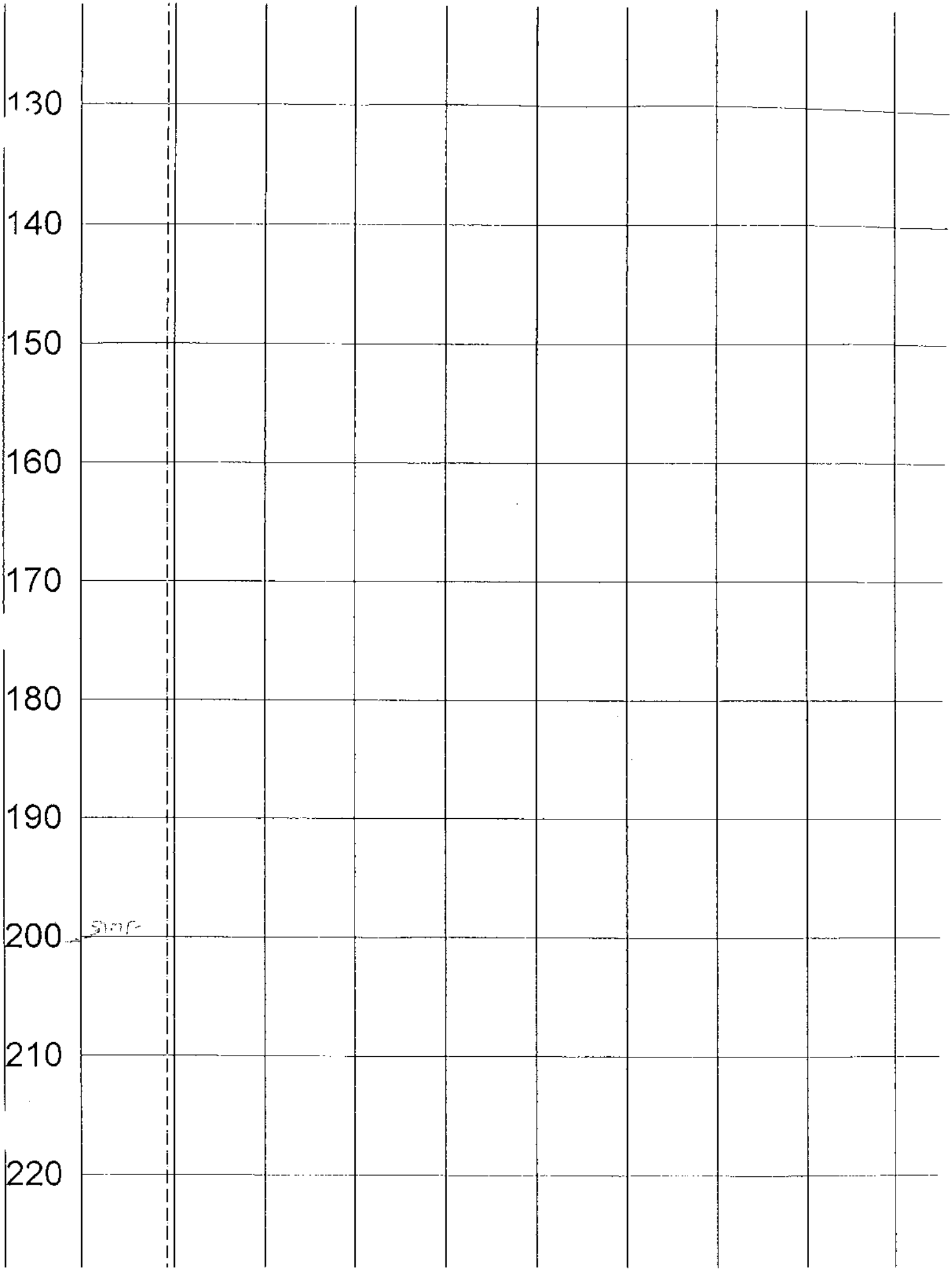
COMPANY	: Diversified Drilling Corp.			OTHER SERVICES:	
WELL	: SEWTP OUC #2			None	
LOCATION/FIELD	: Boggy Creek			None	
COUNTY	: Orange			None	
STATE	: Florida				
SECTION	: None	TOWNSHIP	: None	RANGE	: None
DATE	: 03/15/99	PERMANENT DATUM	: None		
DEPTH DRILLER	: 1055			KB	: None
LOG BOTTOM	: 1062.20	LOG MEASURED FROM:	None	DF	: None
LOG TOP	: 6.60	DRL MEASURED FROM:	None	GL	: None
CASING DIAMETER	: 0	LOGGING UNIT	: None		
CASING TYPE	: None	FIELD OFFICE	: None		
CASING THICKNESS:	0	RECORDED BY	: None		
BIT SIZE	: 23	BOREHOLE FLUID	: 0	FILE	: ORIGINAL
MAGNETIC DECL.	: 0	RM	: 0	TYPE	: 9065A1
MATRIX DENSITY	: 2.71	RM TEMPERATURE	: 0		
NEUTRON MATRIX	: Dolomite	MATRIX DELTA T	: 54		
				THRESH:	2500

None
None

ALL SERVICES PROVIDED SUBJECT TO STANDARD TERMS AND CONDITIONS

	CALIPER	
20	INCH	5
	CALIPER	
0	INCH	2


0
30
40
50
60
70
80
90
100
110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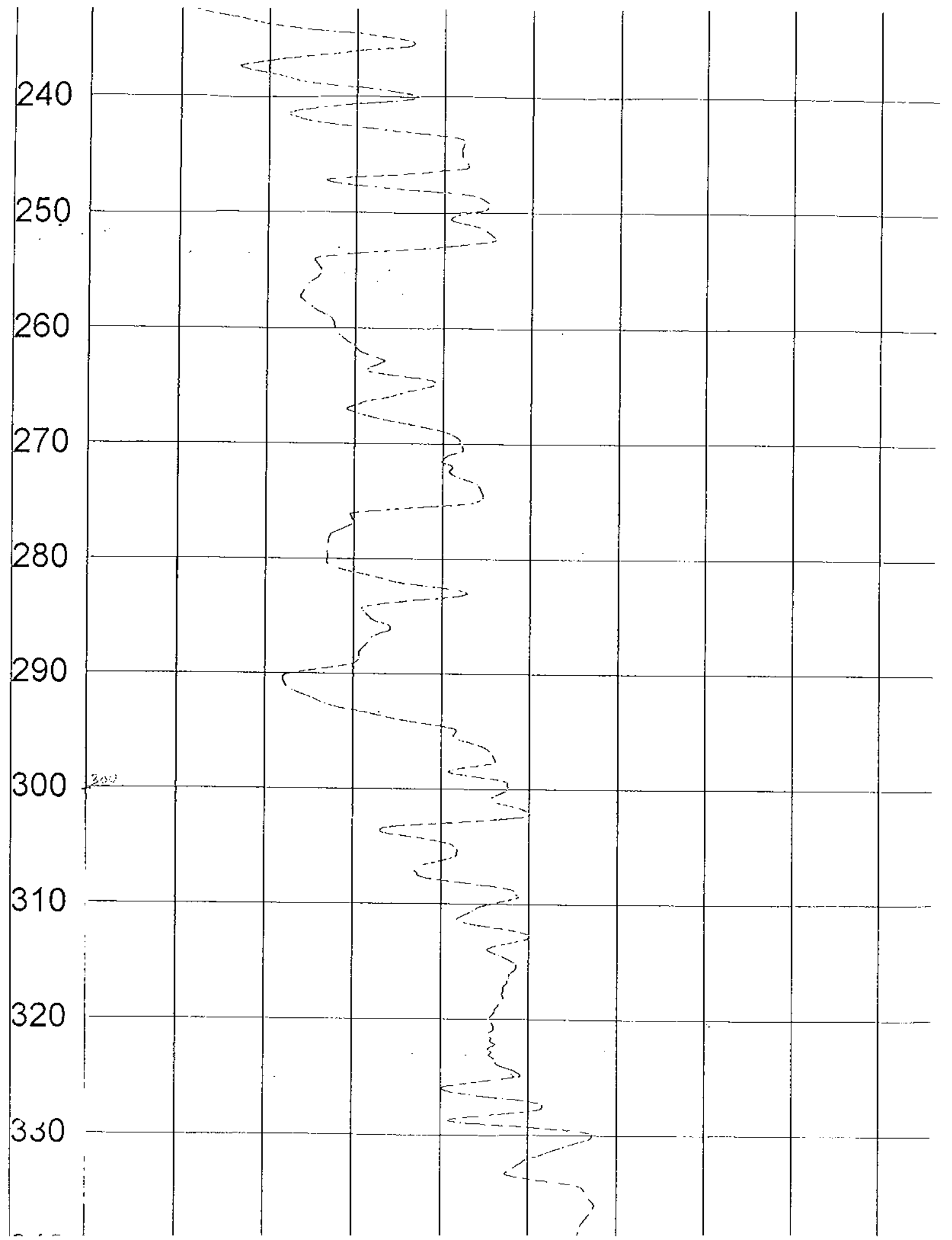
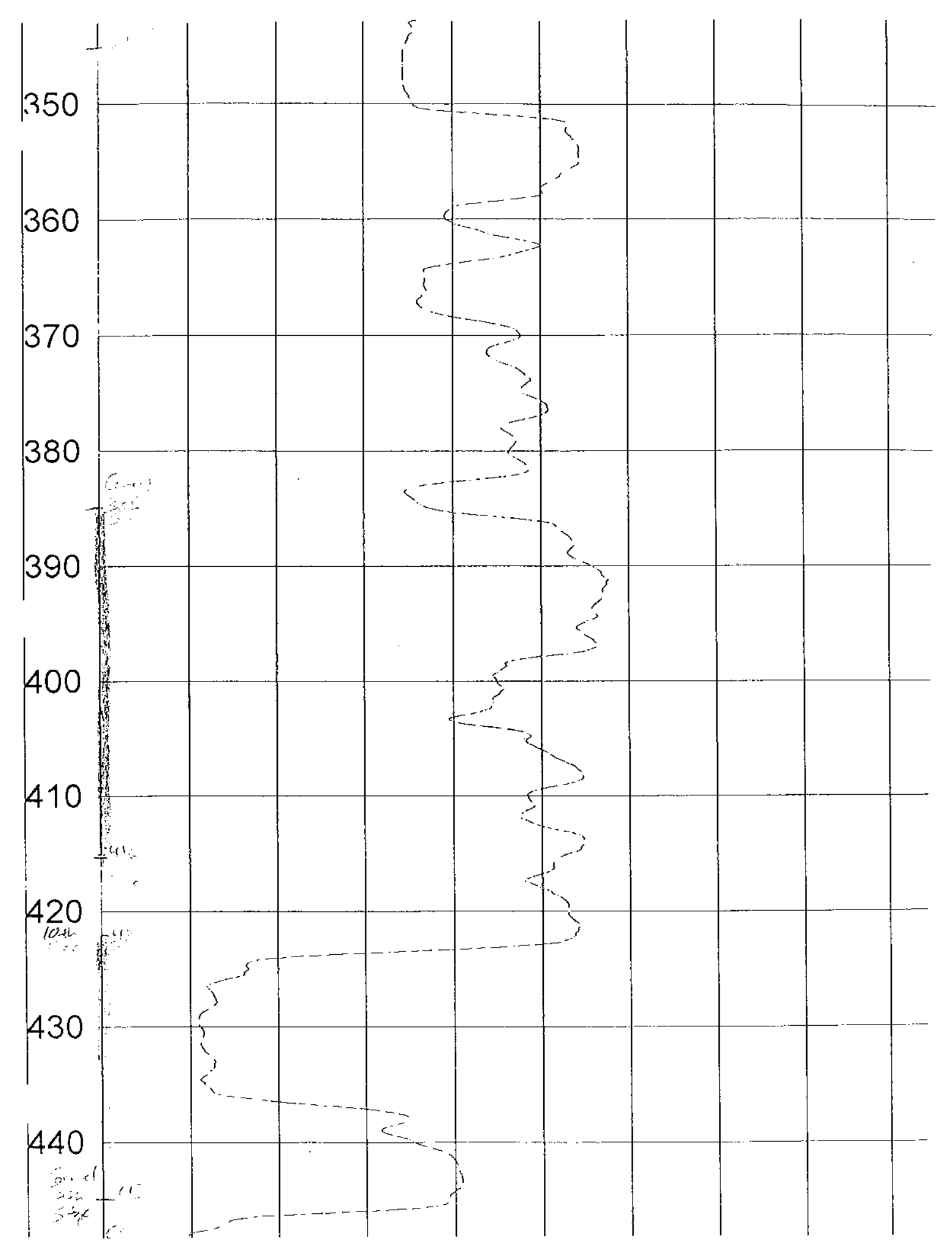
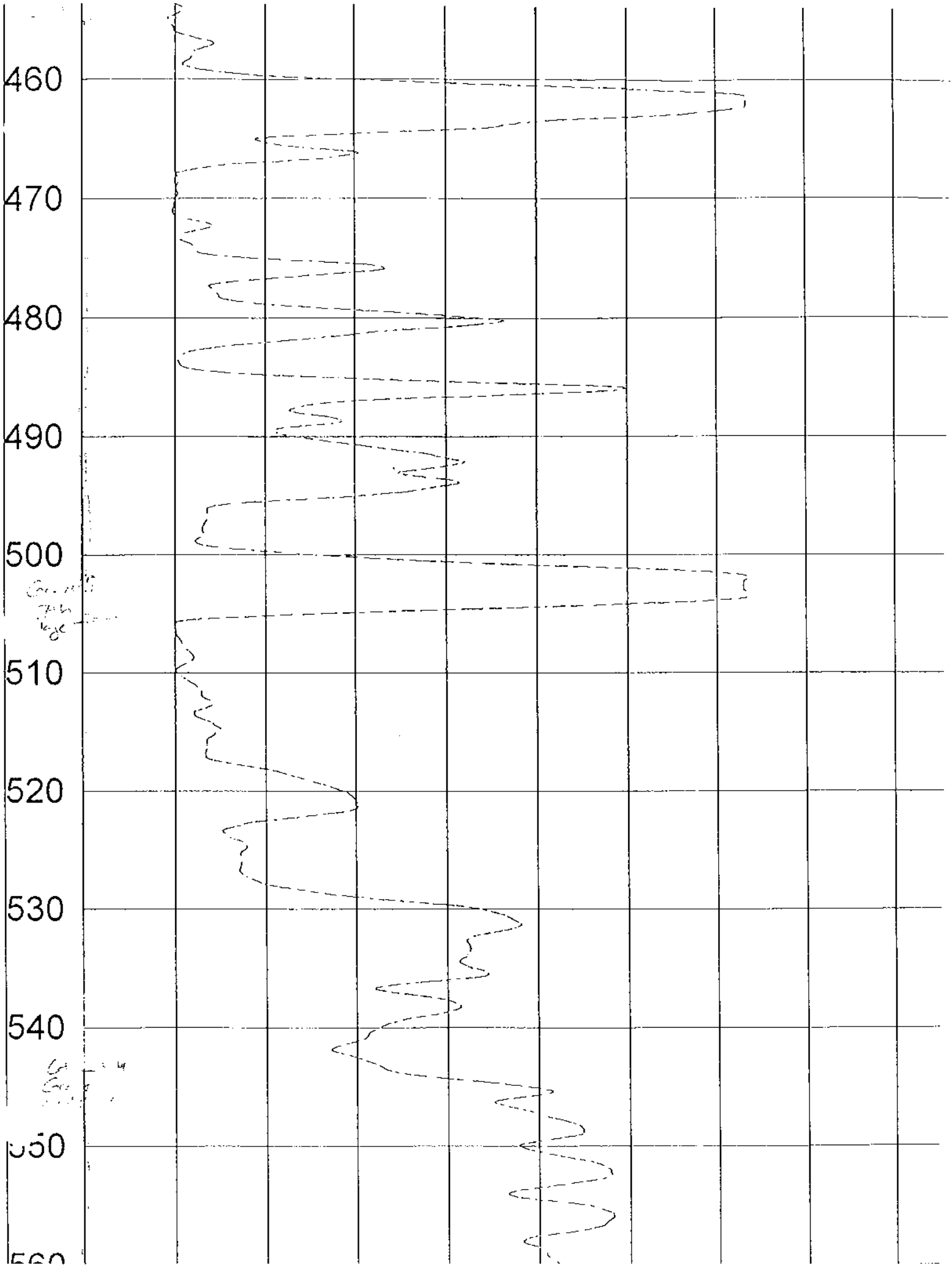
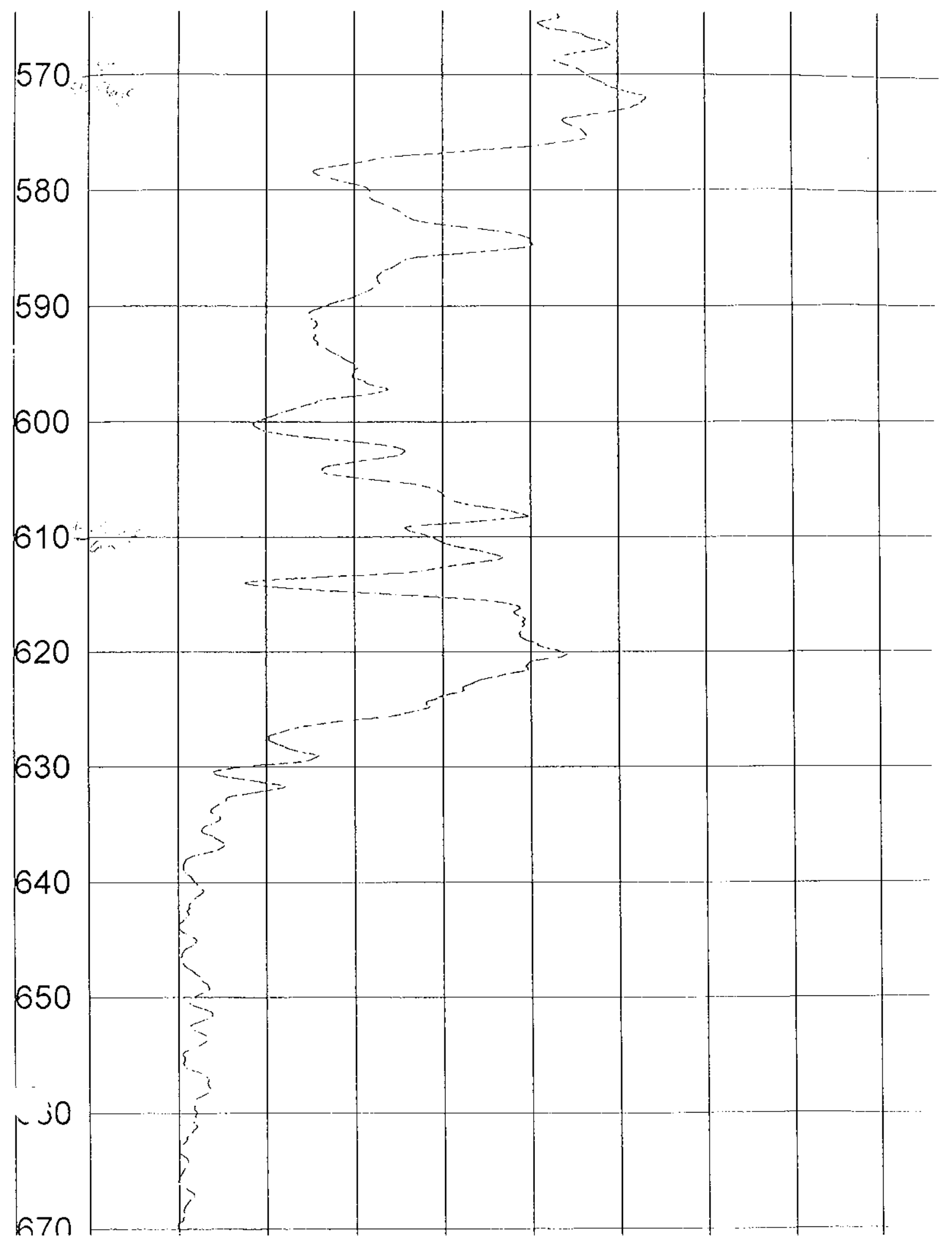
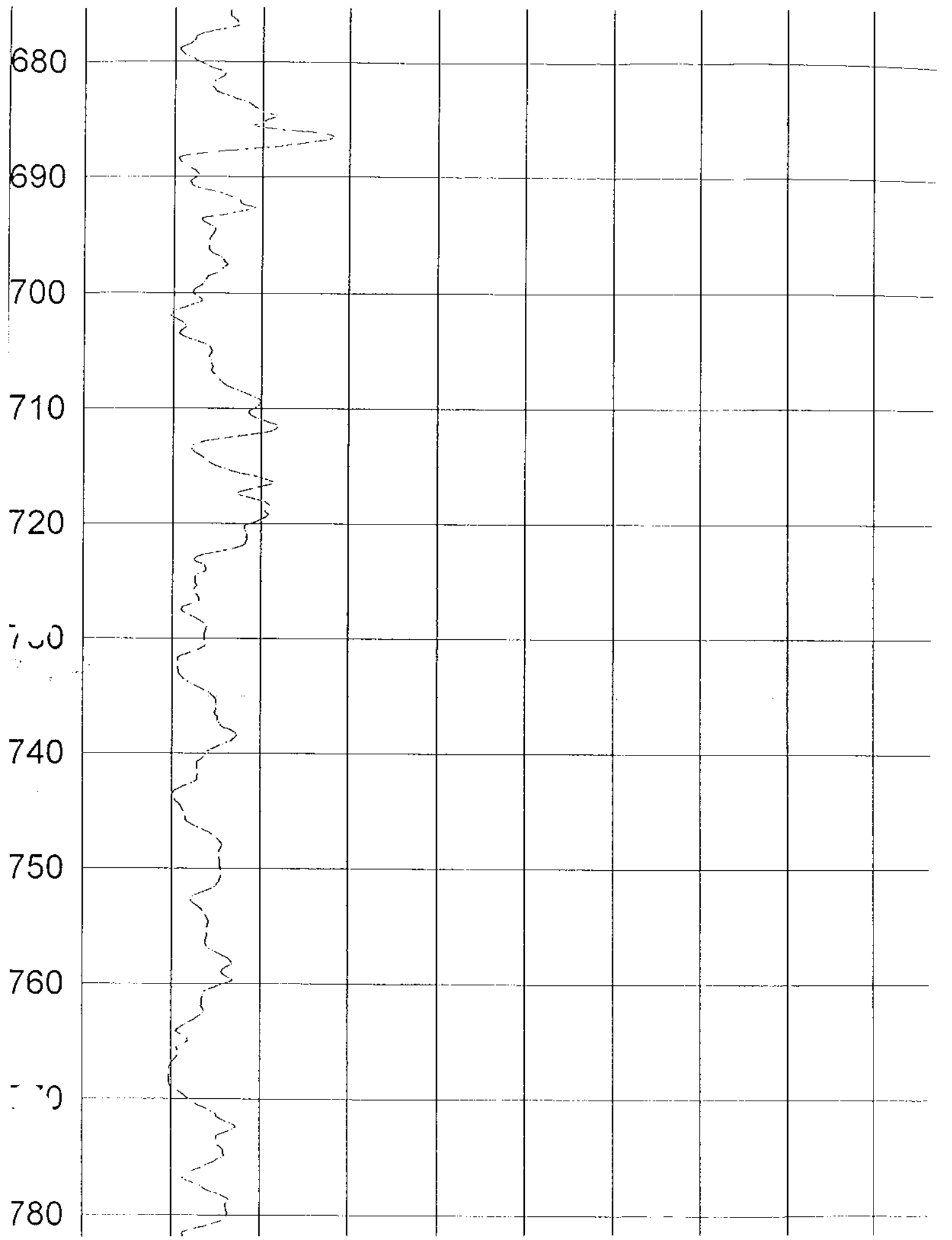
140
150
160
170
180
190
200
210
220

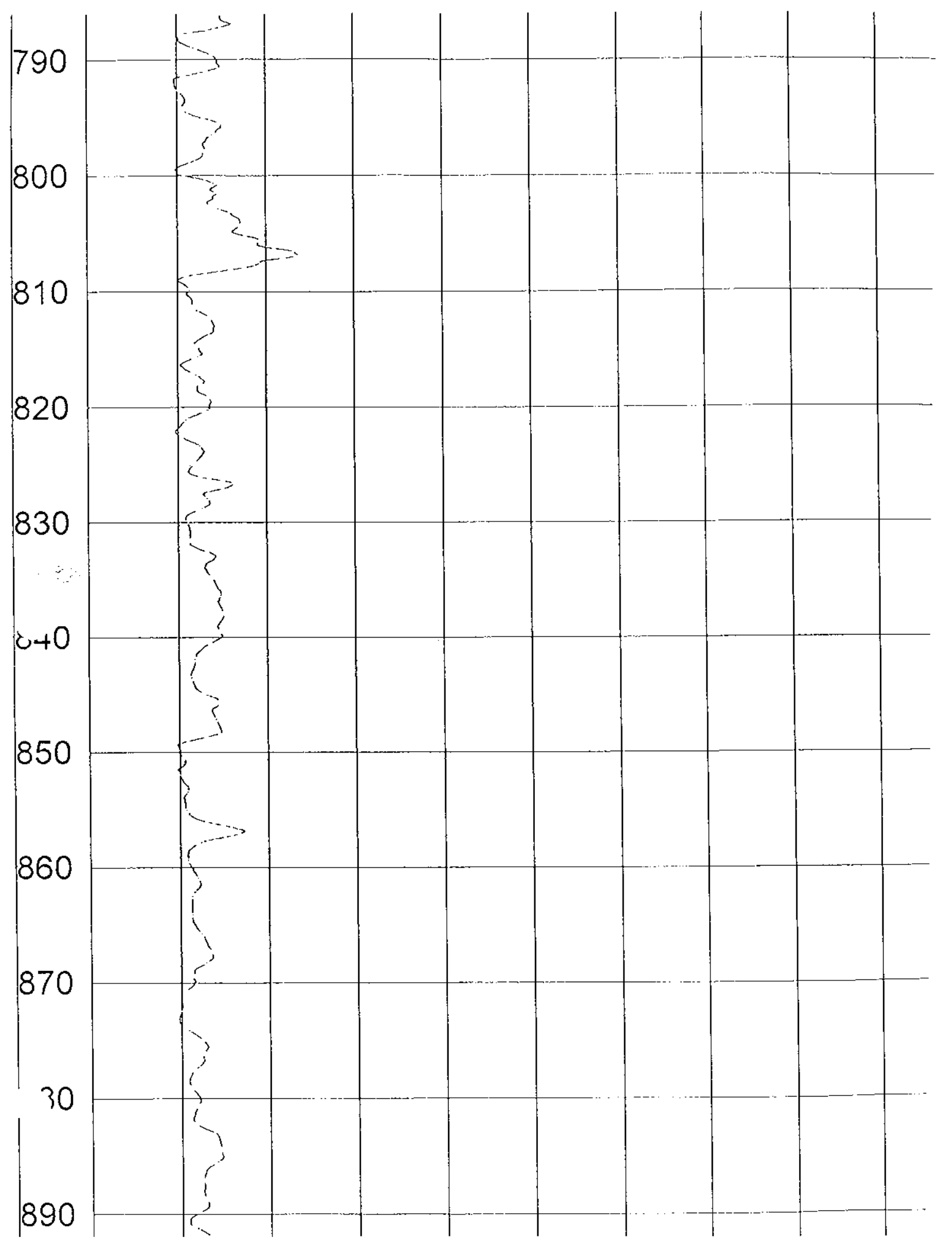

240
250
260
270
280
290
300
310
320
330


350
360
370
380
390
400
410
420
430
440


460
470
480
490
500
510
520
530
540
550
560


570
580
590
600
610
620
630
640
650
670


680
690
700
710
720
740
750
760
780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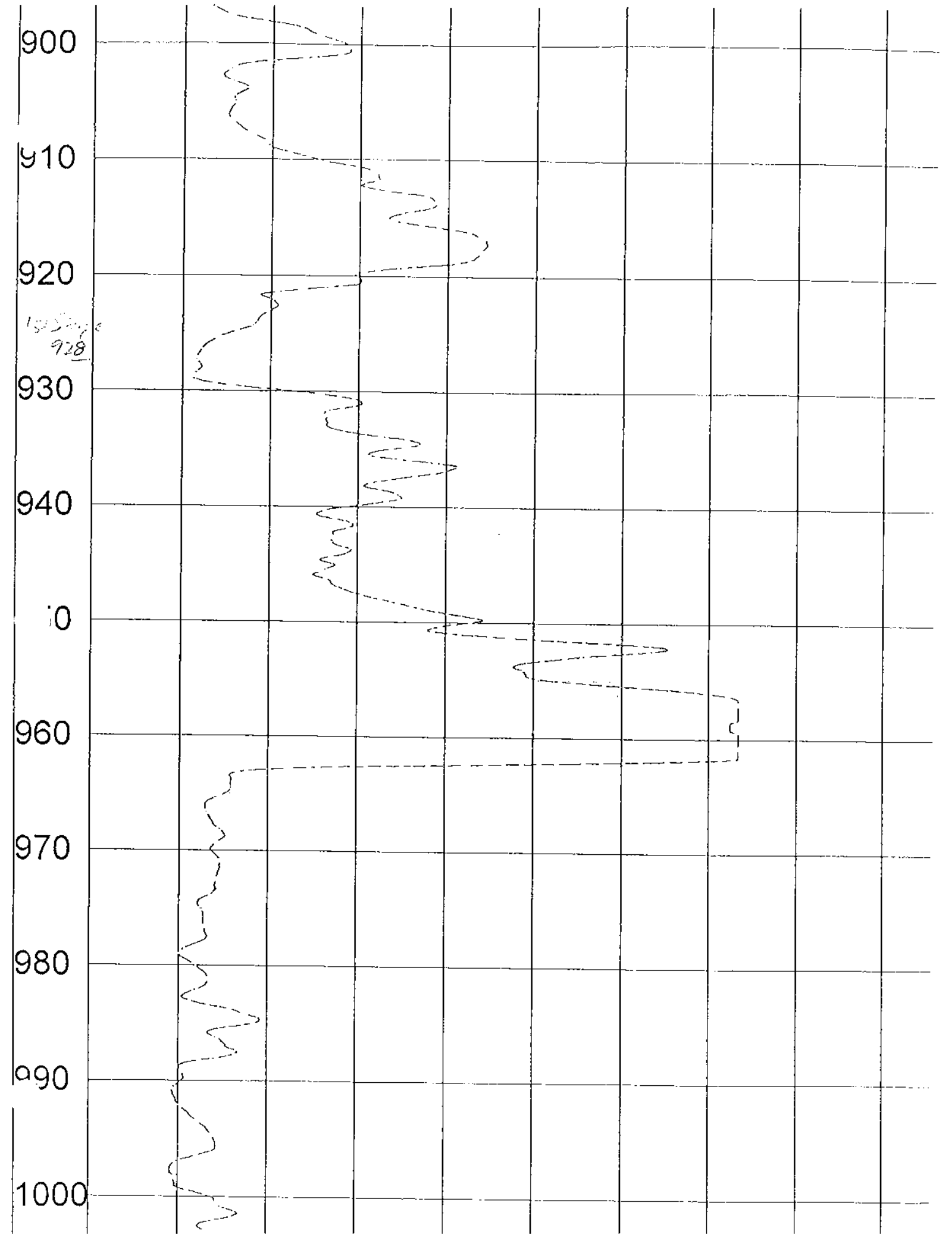
800
810
820
830
850
860
870
890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910
920
928
930
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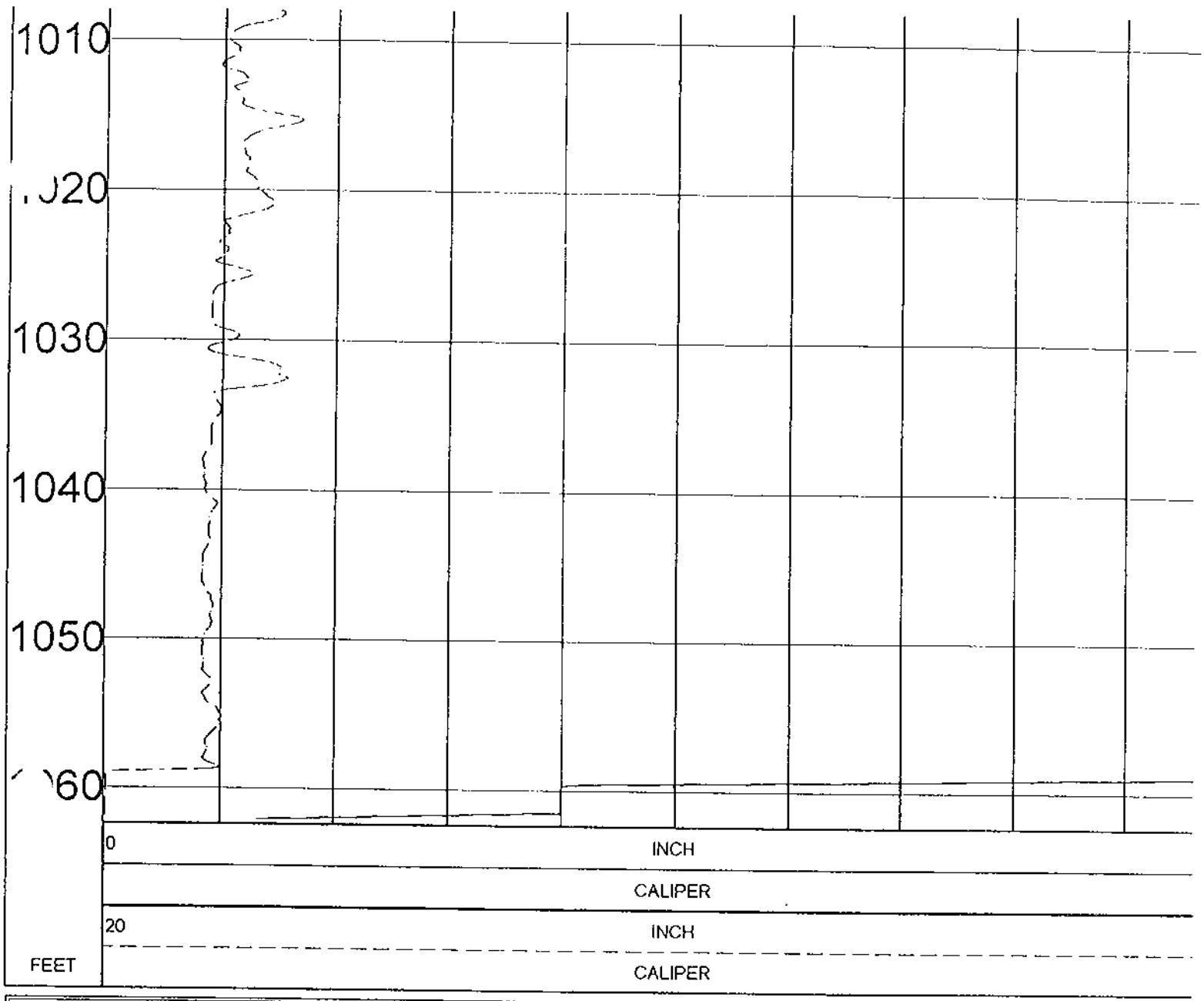
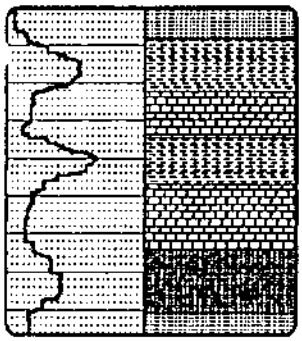
960
970
980
990
1000



TOOL CALIBRATION SEWTP OUC #2 03/15/99 15:41
TOOL 9065A1
SERIAL NUMBER 593

	DATE	TIME	SENSOR	STANDARD
1	Mar04,99	13:55:32	CALIPER	Default [INCH]
	Mar04,99	13:55:32	CALIPER	Default [INCH]
2	Mar15,99	14:29:40	CALIPERL	8.000 [INCH]
	Mar15,99	14:29:40	CALIPERL	22.500 [INCH]
3	Mar04,99	13:55:32	CALIPERX	Default [INCH]
	Mar04,99	13:55:32	CALIPERX	Default [INCH]



Southern Resource Exploration

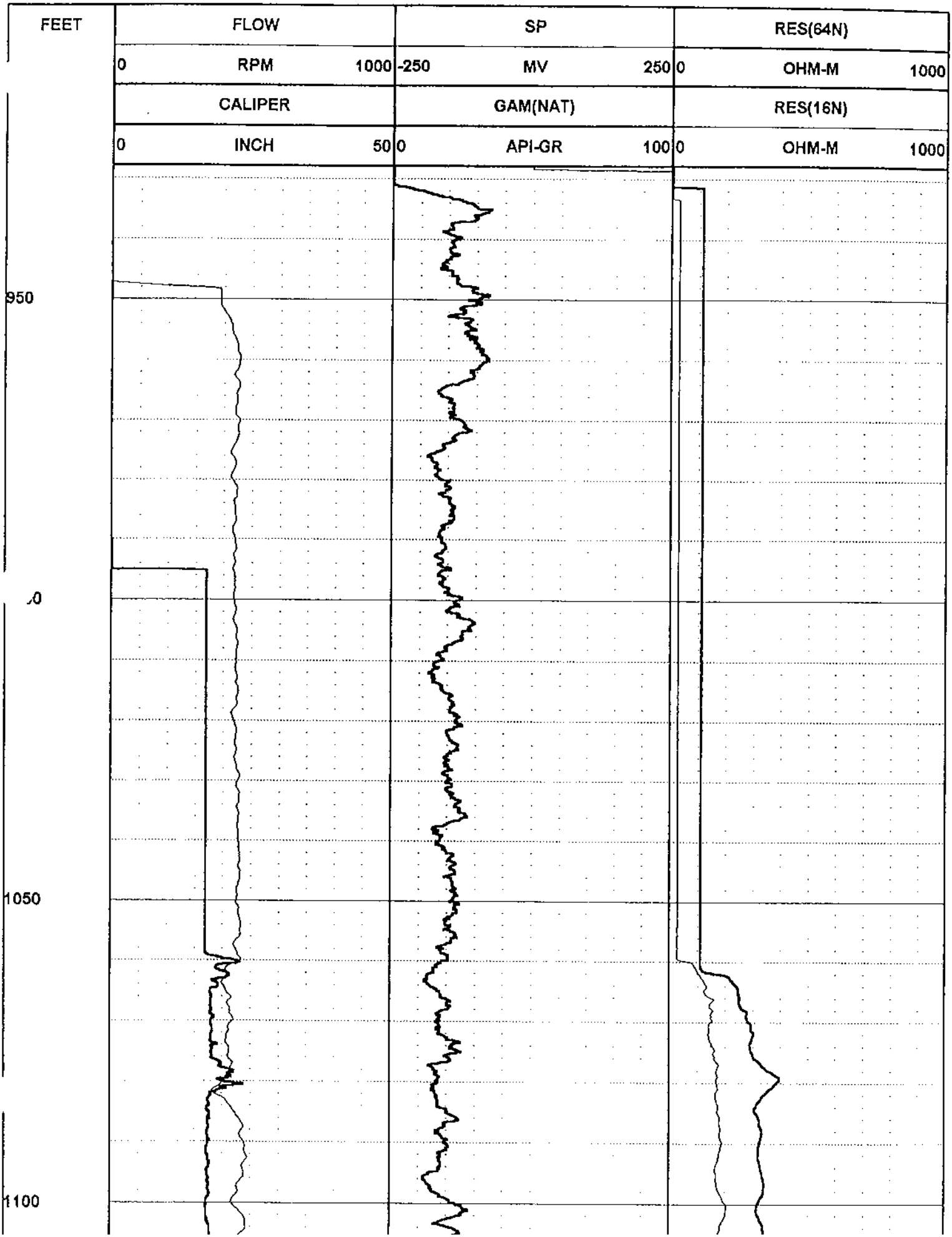
P.O. Box 14311
Gainesville, Florida 32604
Phone 352-3725950

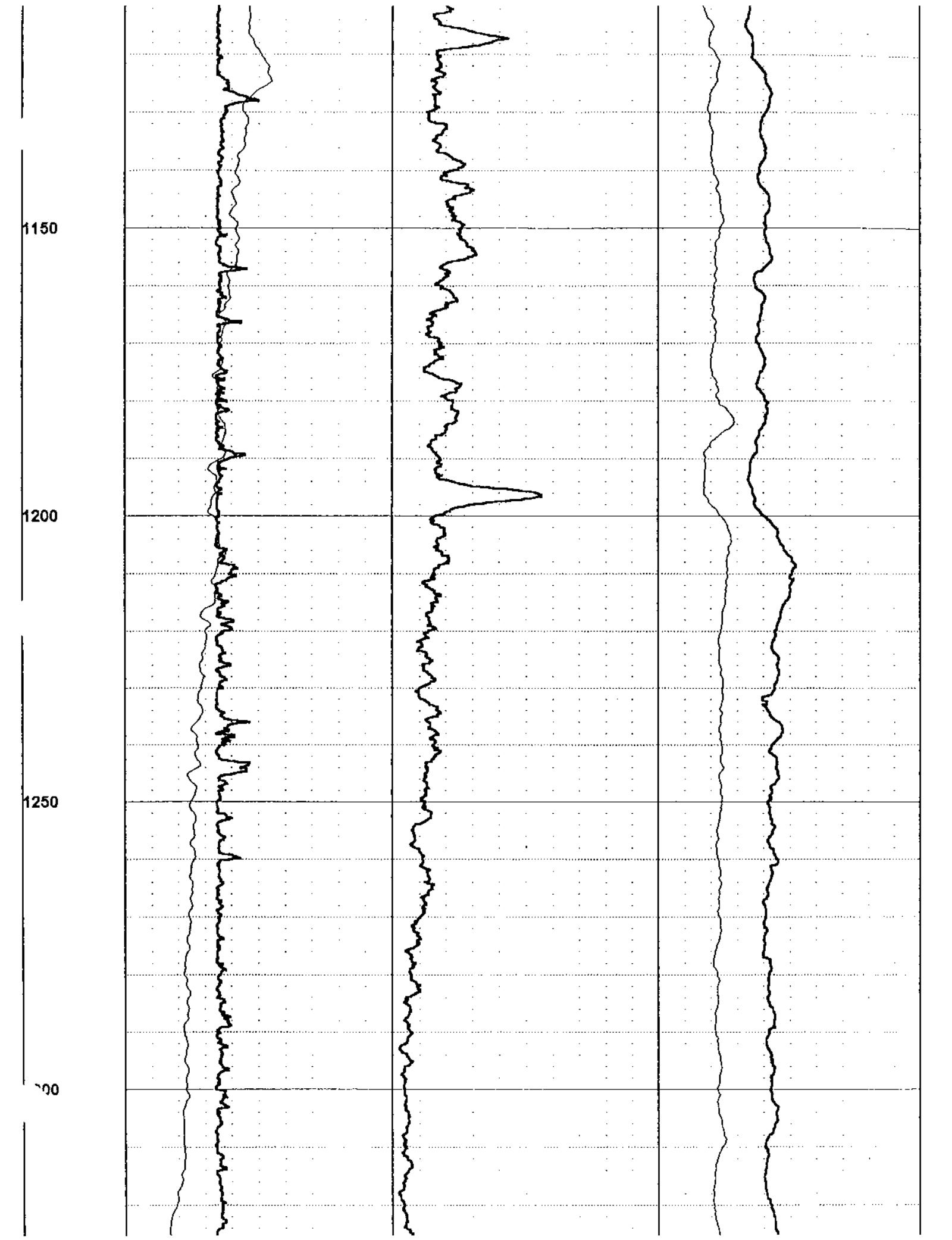
OUC SOUTHEAST # 2

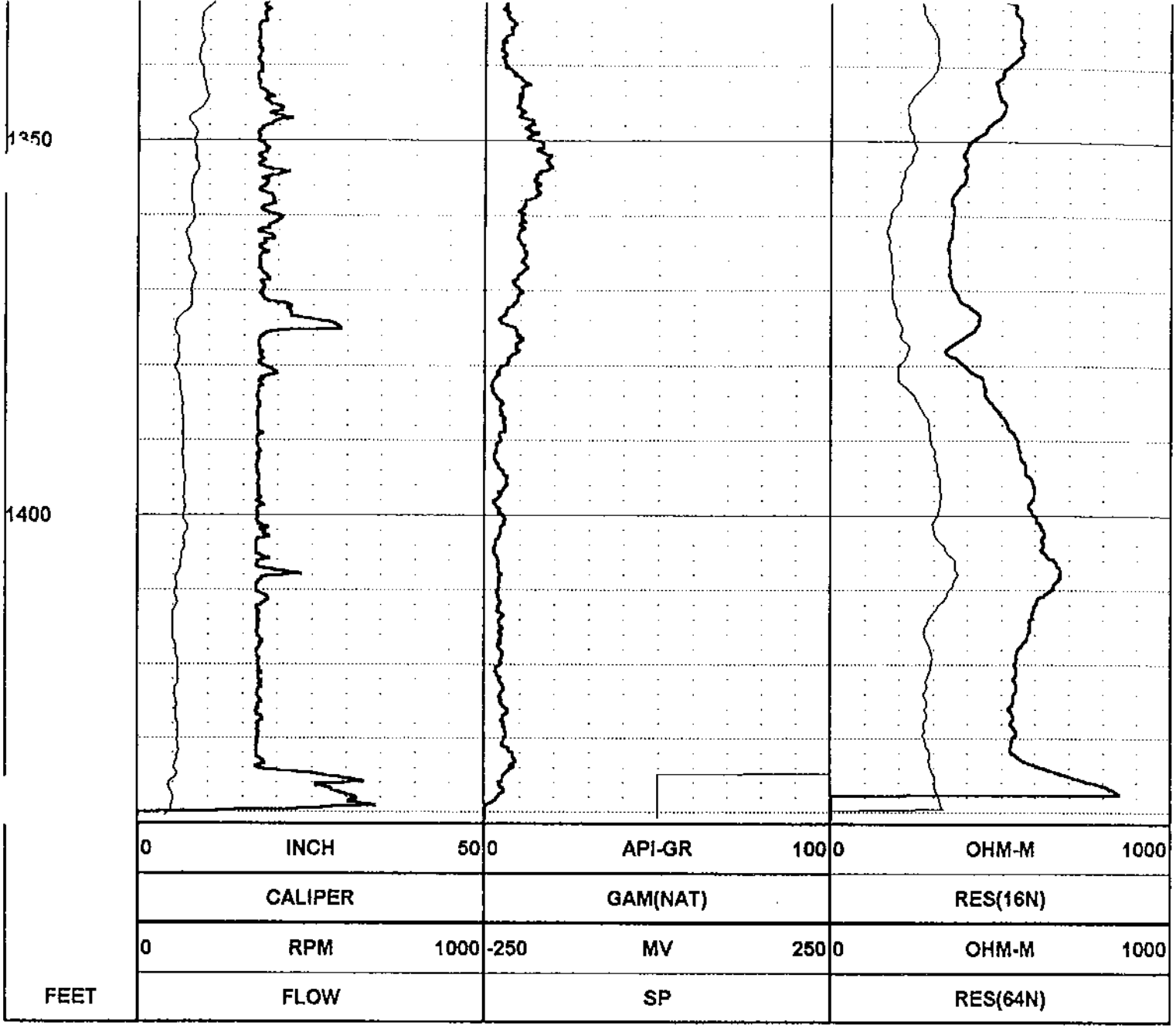
Company	: DIVERSIFIED DRILLING INC.			OTHER SERVICES:	
Well	: OUC SOUTHEAST # 2				
Location/Field	: OUC SOUTHEAST WTP				
County	: ORANGE				
State	: FL.				
Section	: .	Township	:	Range	:
Date	: 04/27/99	Permanent Datum	: -	ELEVATIONS:	
Depth Driller	: 1440	Elev. Perm. Datum	:	KB	:
LOG BOTTOM	: 1440.40	Log Meas. From	: 24" TOC	DF	:
OG TOP	: 990.00	Drl Meas. Frommom:	GL	GL	:
Casing Driller	: 1045	Logging Unit	: LWT		
Casing Type	: STEEL	Field Office	: GVL		
Cas. Thicknessss:	.5	Recorded By	: JCP		
Bit Size	: 17	Borehole Fluid	: WATER	FILE	: PROCESSED
Magnetic Decl.	:	RM	:	TYPE	: CAL2L
Matrix Density	:	RM Temperature	:	LOG	: 2cgrf
Fluid Density	:	Matrix Delta T	:	PLOT	:
Neutron Matrix	:	Fluid Delta T	:	THRESH:	4000

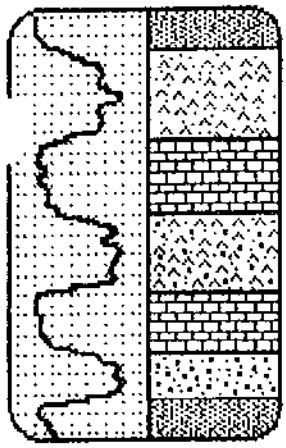
REMARKS:

FLOW LOG RUN @40'/MIN. DOWN..


FEET
FLOW
0 RPM 1000
CALIPER
0 INCH 50
SP
-250 MV 250
GAM(NAT)
0 API-GR 100
RES(64N)
0 OHM-M 1000
RES(16N)
0 OHM-M 1000
950
,0
1050
1100


1150
1200
1250


1350
1400
0 INCH 50
CALIPER
0 RPM 1000
FLOW
0 API-GR 100
GAM(NAT)
-250 MV 250
SP
0 OHM-M 1000
RES(16N)
0 OHM-M 1000
RES(64N)
FEET



Southern Resource Exploration Inc.

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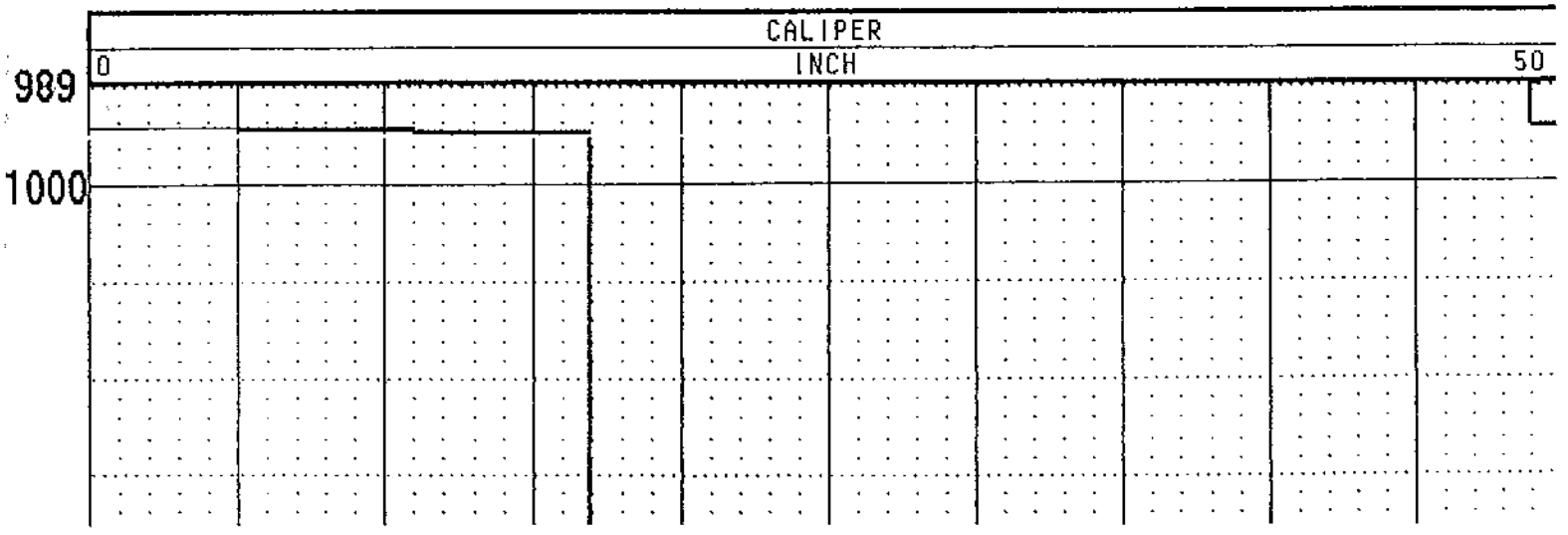
Phone 352-3725950

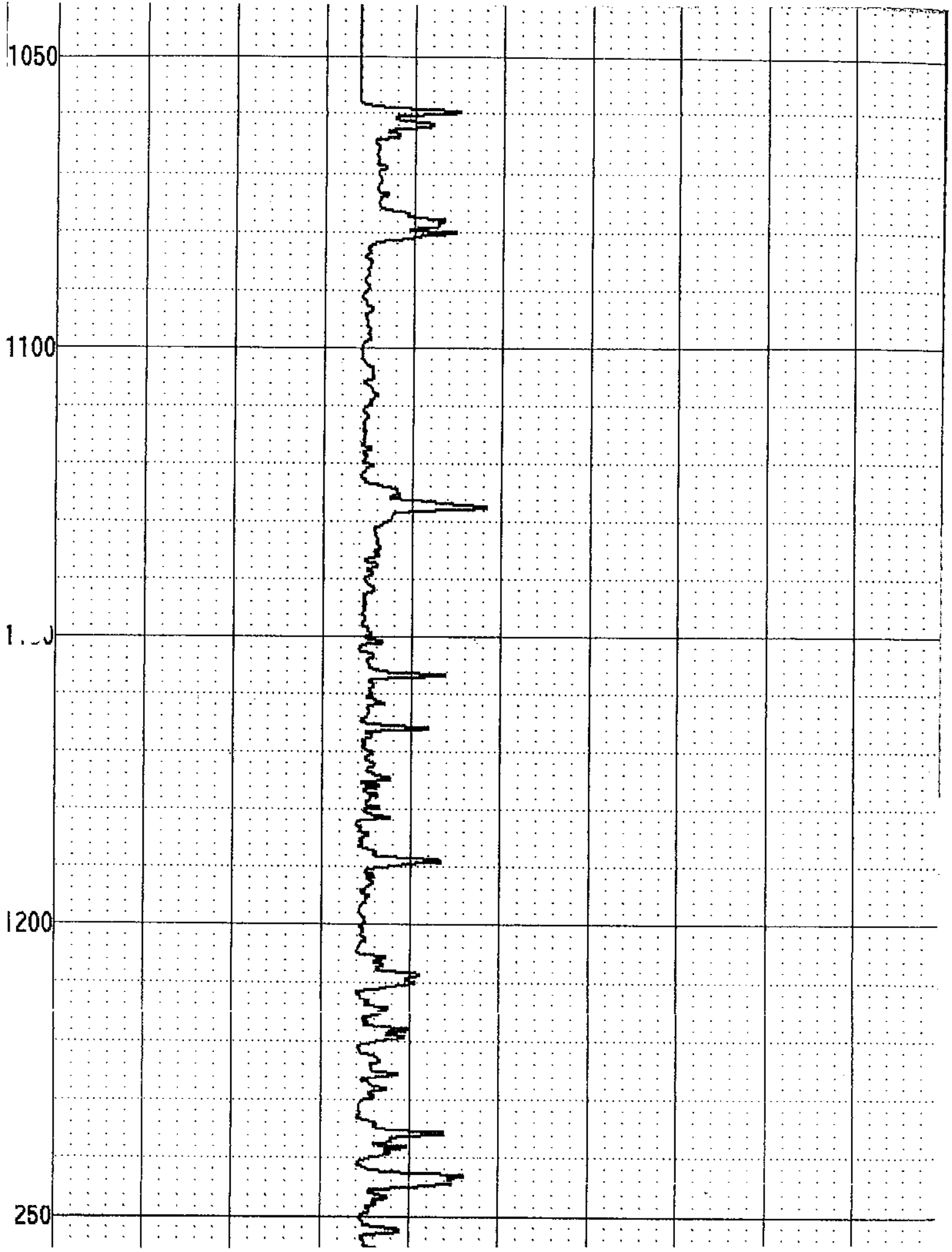
CALIPER LOG

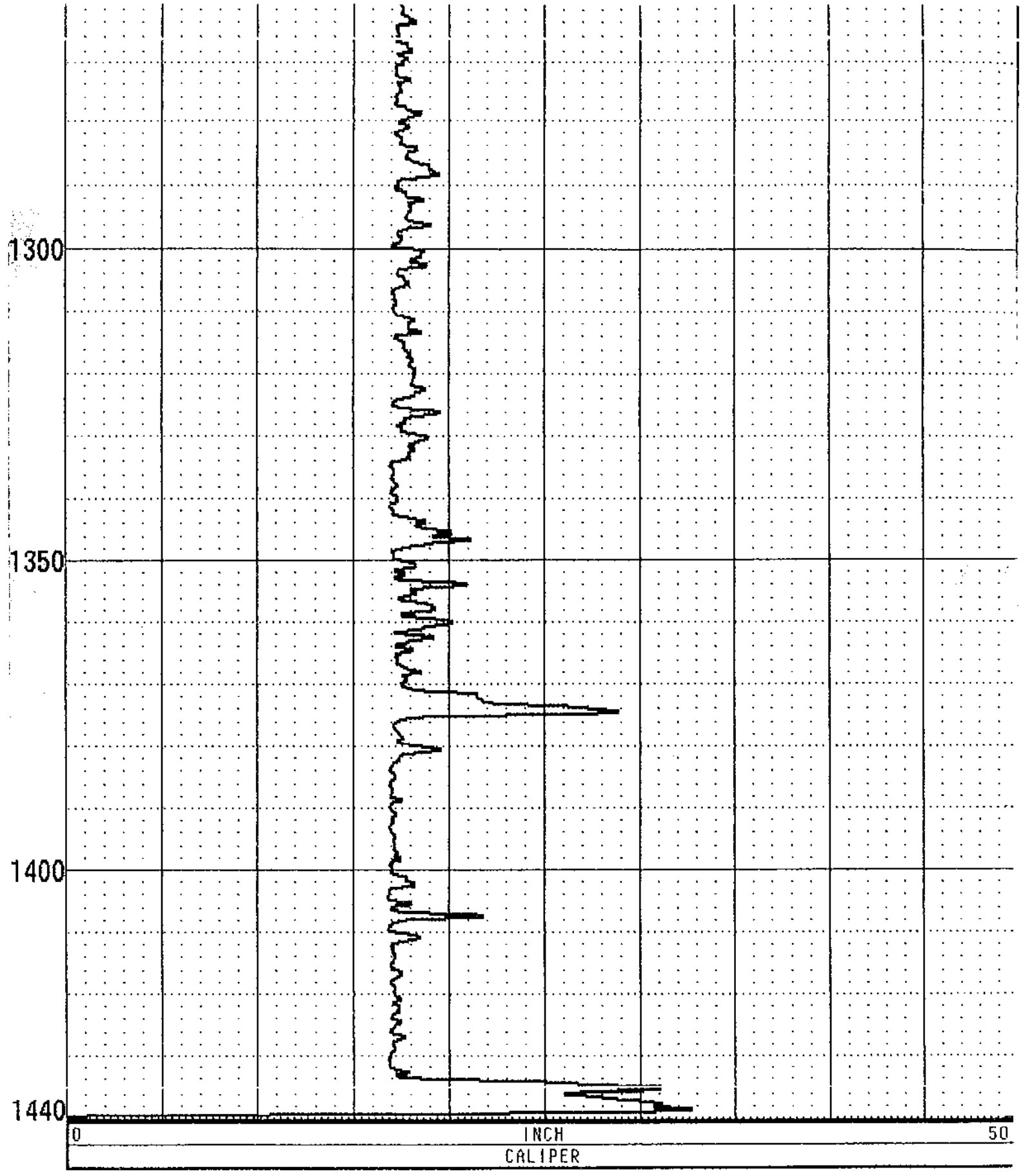
COMPANY	: DIVERSIFIED DRILLING INC.				
WELL	: OUC SOUTHEAST # 2				
LOCATION/FIELD	: OUC SOUTHEAST WTP				
COUNTY	: ORANGE				
STATE	: FL.				
SECTION	: .	TOWNSHIP	:	RANGE	:
DATE	: 04/27/99	PERMANENT DATUM	: -	ELEVATIONS	
DEPTH DRILLER	: 1440	ELEV. PERM. DATUM	:	KB	:
LOG BOTTOM	: 1440.40	LOG MEASURED FROM	: 24" TOC	DF	:
LOG TOP	: 990.00	DRL MEASURED FROM	: GL	GL	:
CASING DRILLER	: 1045	LOGGING UNIT	: LWT		
CASING TYPE	: STEEL	FIELD OFFICE	: GVL		
CASING THICKNESS	: .5	RECORDED BY	: JCP		
BIT SIZE	: 17	BOREHOLE FLUID	: WATER	FILE	: PROCESSED
MAGNETIC DECL.	:	RM	:	TYPE	: CAL2L
MATRIX DENSITY	:	RM TEMPERATURE	:	LOG	: 2
FLUID DENSITY	:	MATRIX DELTA T	:	PLOT	: CALIPER 2
NEUTRON MATRIX	:	FLUID DELTA T	:	THRESH	: 4000
REMARKS	:				

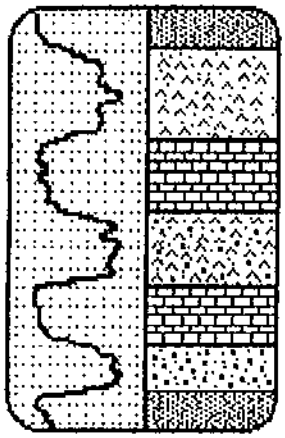
OTHER SERVICES:

ALL SERVICES PROVIDED SUBJECT TO STANDARD TERMS AND CONDITIONS




1050
1100
1200
250


1300
1350
1400
1440
0
INCH
50
CALIPER



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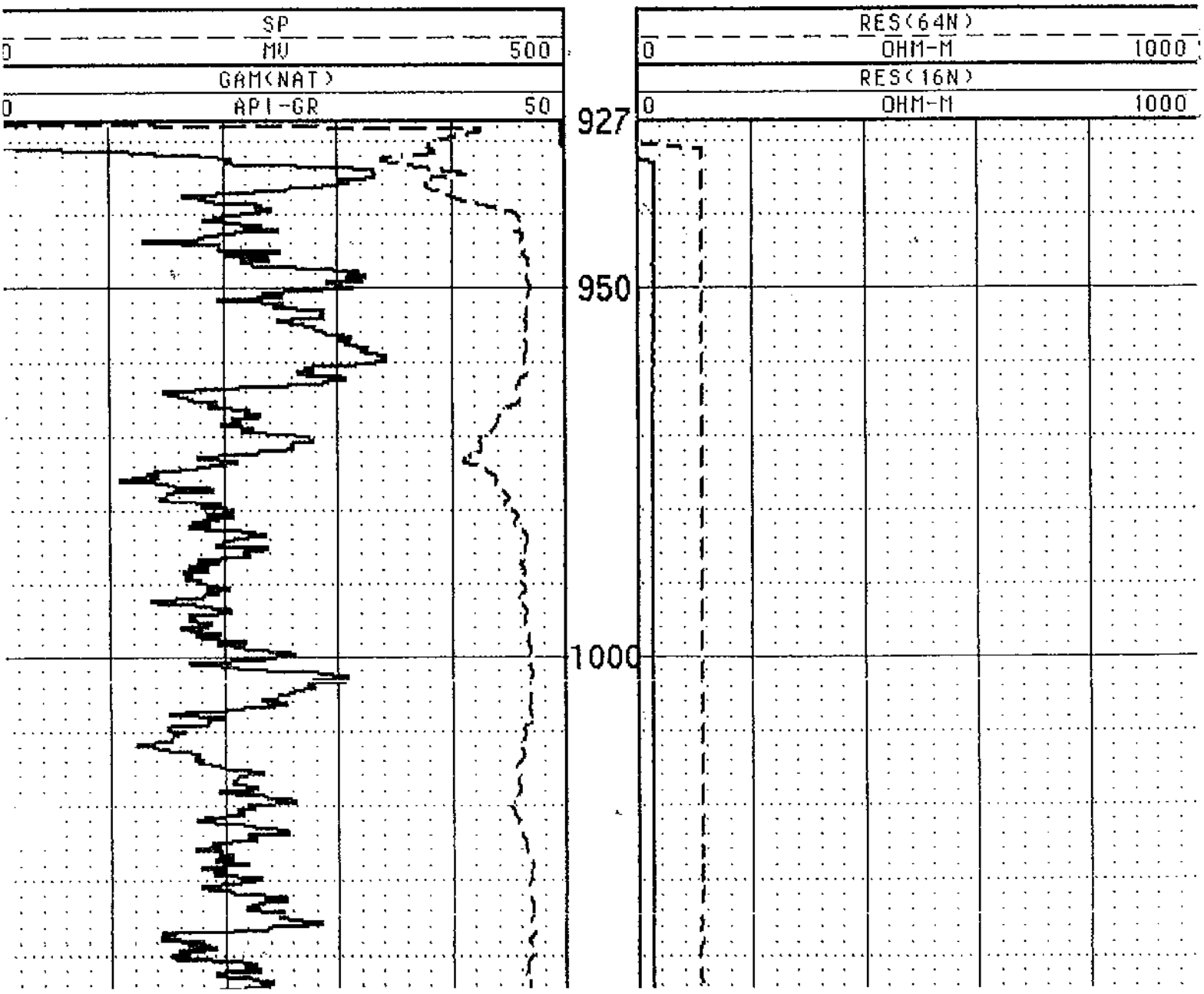
Phone 352-3725950

GAM, RES (16-64), SP

COMPANY	: DIVERSIFIED DRILLING INC.			OTHER SERVICES:	
WELL	: OUC SOUTHEAST # 2				
LOCATION/FIELD	: OUC SOUTHEAST WTP				
COUNTY	: ORANGE				
STATE	: FL.				
SECTION	: .	TOWNSHIP	:	RANGE	:
DATE	: 04/27/99	PERMANENT DATUM	: -	ELEVATIONS	
DEPTH DRILLER	: 1440	ELEV. PERM. DATUM	:	KB	:
LOG BOTTOM	: 1441.20	LOG MEASURED FROM	: 24" TOC	DF	:
LOG TOP	: 927.80	DRL MEASURED FROM	: GL	GL	:
CASING DRILLER	: 1045	LOGGING UNIT	: LWT		
CASING TYPE	: STEEL	FIELD OFFICE	: GVL		
CASING THICKNESS	: .5	RECORDED BY	: JCP		
BIT SIZE	: 17	BOREHOLE FLUID	: WATER	FILE	: ORIGINAL
MAGNETIC DECL.	:	RM	:	TYPE	: 9041A
MATRIX DENSITY	:	RM TEMPERATURE	:	LOG	: 0
FLUID DENSITY	:	MATRIX DELTA T	:	PLOT	: 9040B 0
NEUTRON MATRIX	:	FLUID DELTA T	:	THRESH	: 4000
REMARKS	:				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MV
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GAM(NAT)
0
API-GR
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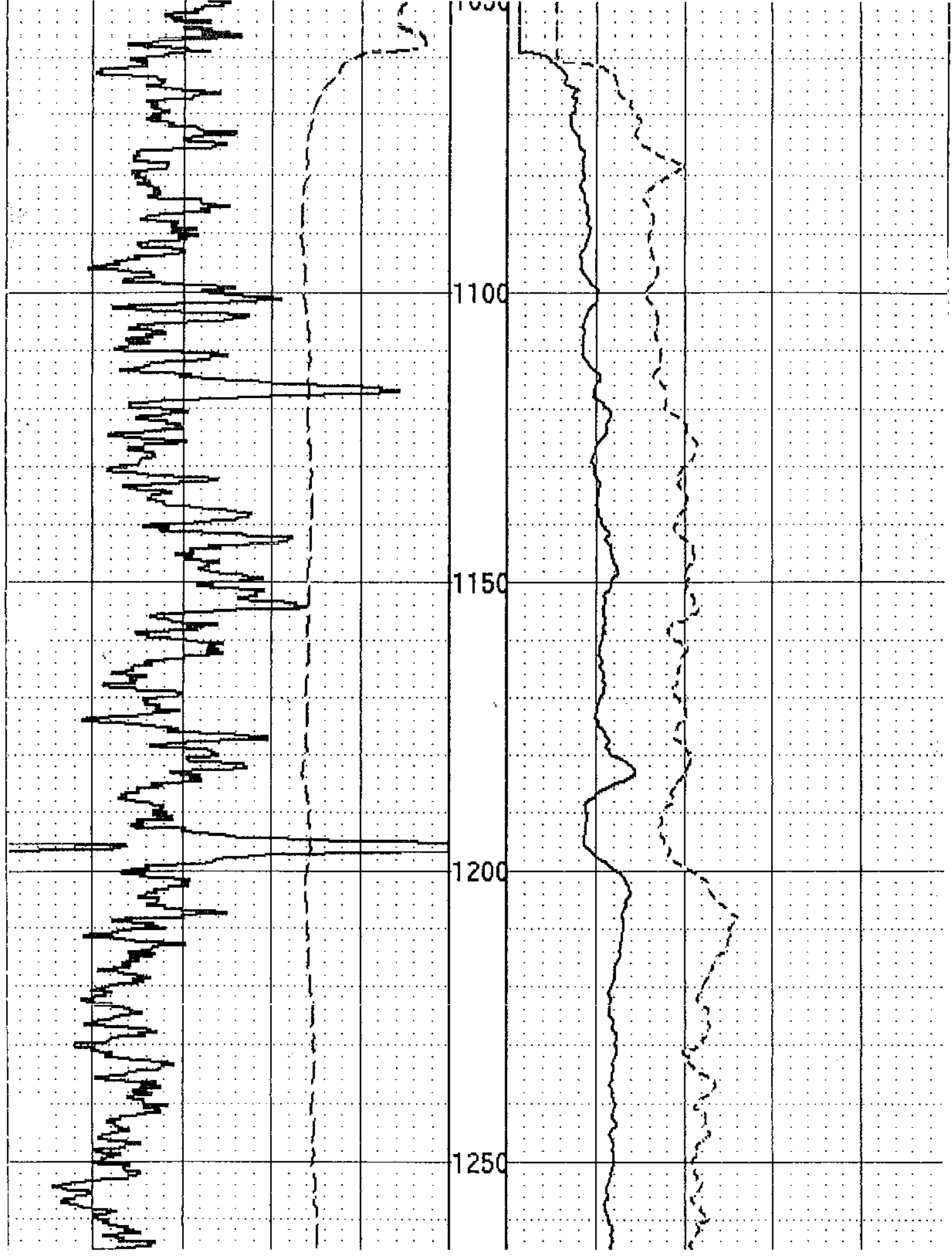
RES(64N)
0
OHM-M
1000
RES(16N)
0
OHM-M
1000
927
950
1000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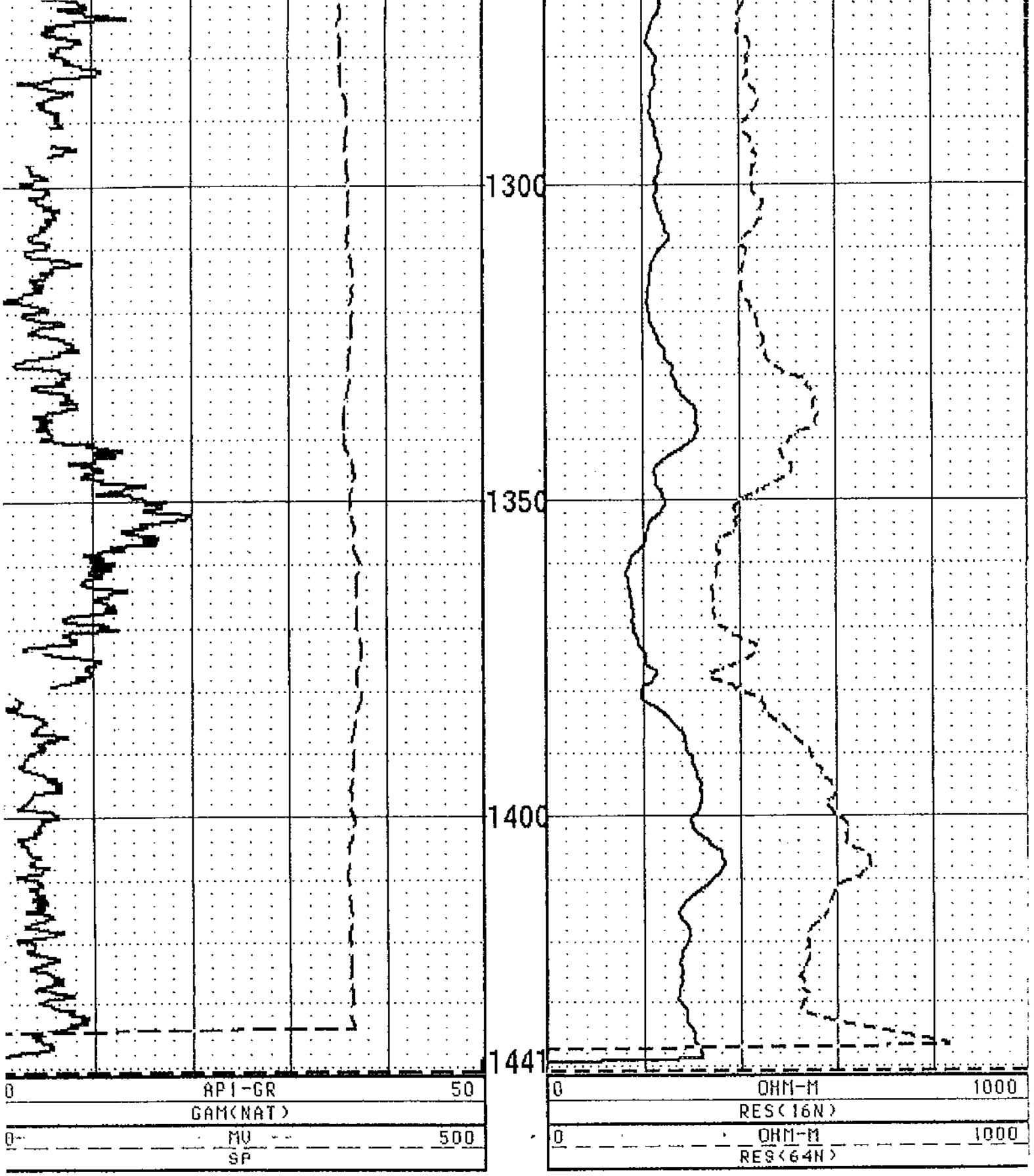
1150
1200
1250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API-GR
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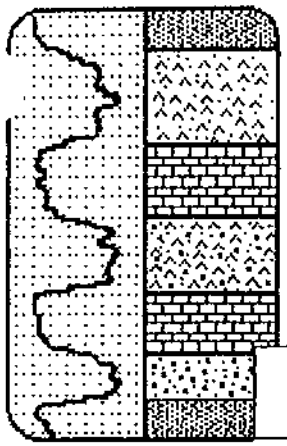
GAM(NAT)
0
MV
500
SP
0
OHM-M
1000
RES(16N)
0
OHM-M
1000
RES(64N)



Southern Resource Exploration Inc.

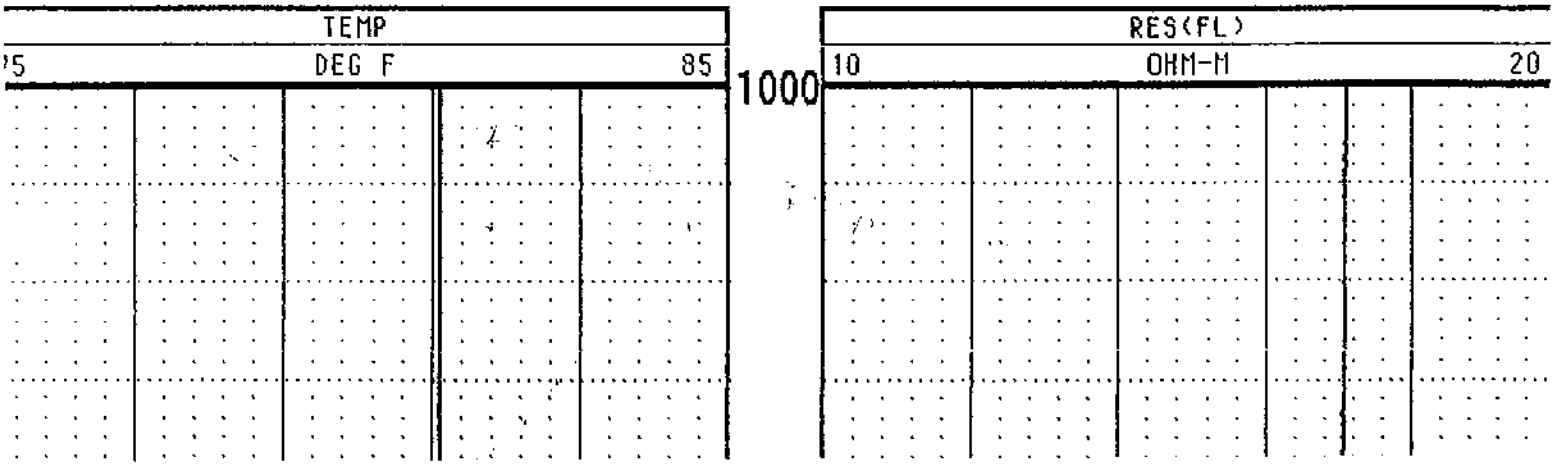
P.O. Box 14311
Gainesville, Florida 32604
Phone 352-3725950

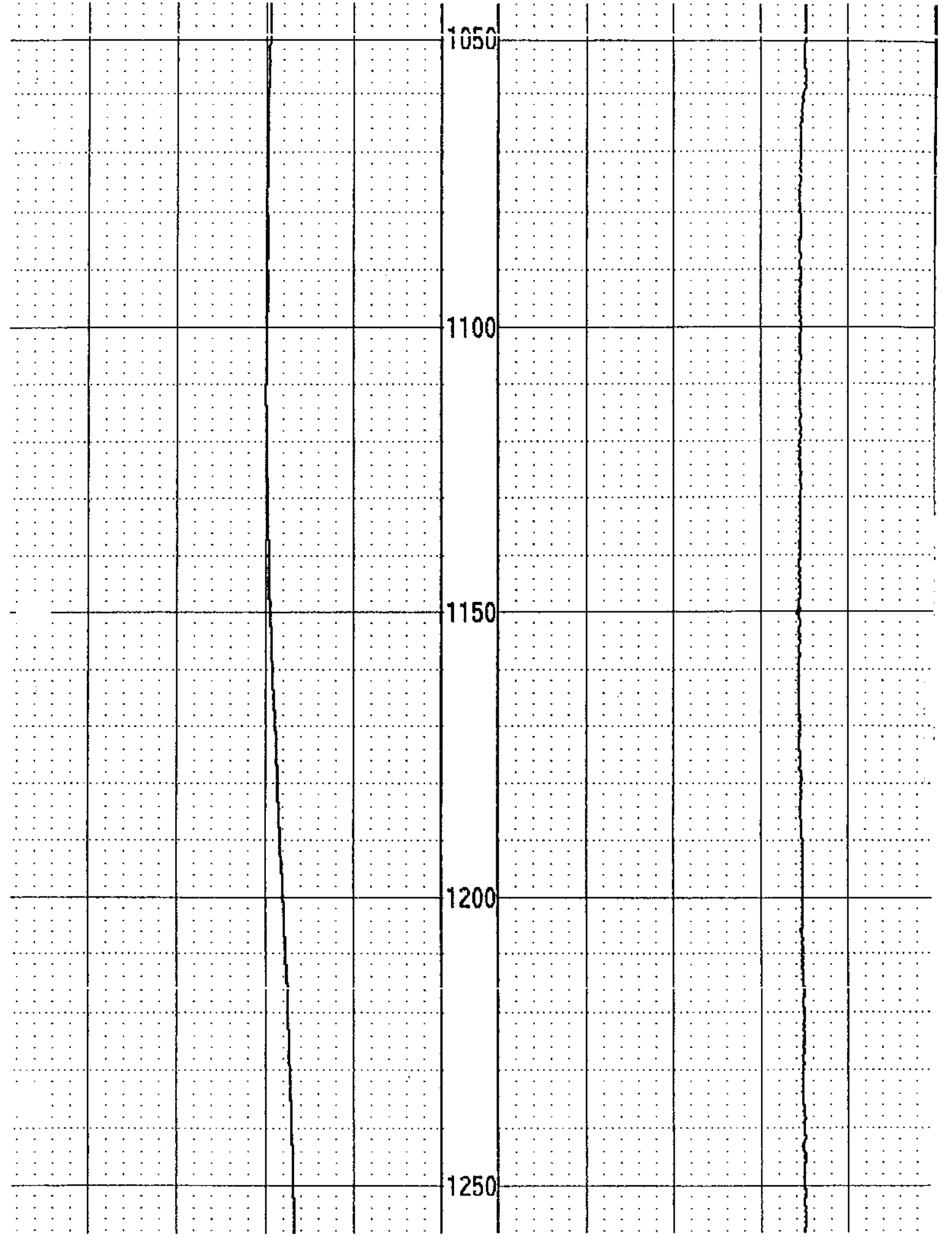
TEMPERATURE - FLUID RES

OTHER SERVICES:

COMPANY	: DIVERSIFIED DRILLING INC.				
WELL	: OUC SOUTHEAST # 2				
LOCATION/FIELD	: OUC SOUTHEAST WTP				
COUNTY	: ORANGE				
STATE	: FL.				
SECTION	: .	TOWNSHIP	:	RANGE	:
DATE	: 04/27/99	PERMANENT DATUM	: -	ELEVATIONS	
DEPTH DRILLER	: 1440	ELEV. PERM. DATUM	:	KB	:
LOG BOTTOM	: 1441.20	LOG MEASURED FROM	: 24" TOC	DF	:
LOG TOP	: 927.80	DRL MEASURED FROM	: GL	GL	:
CASING DRILLER	: 1045	LOGGING UNIT	: LWT		
CASING TYPE	: STEEL	FIELD OFFICE	: GVL		
CASING THICKNESS	: .5	RECORDED BY	: JCP		
BIT SIZE	: 17	BOREHOLE FLUID	: WATER	FILE	: PROCESSED
MAGNETIC DECL.	:	RM	:	TYPE	: 9041A
MATRIX DENSITY	:	RM TEMPERATURE	:	LOG	: 7
FLUID DENSITY	:	MATRIX DELTA T	:	PLOT	: TEMP-FR 1
NEUTRON MATRIX	:	FLUID DELTA T	:	THRESH	: 4000
REMARKS	:				

STATIC

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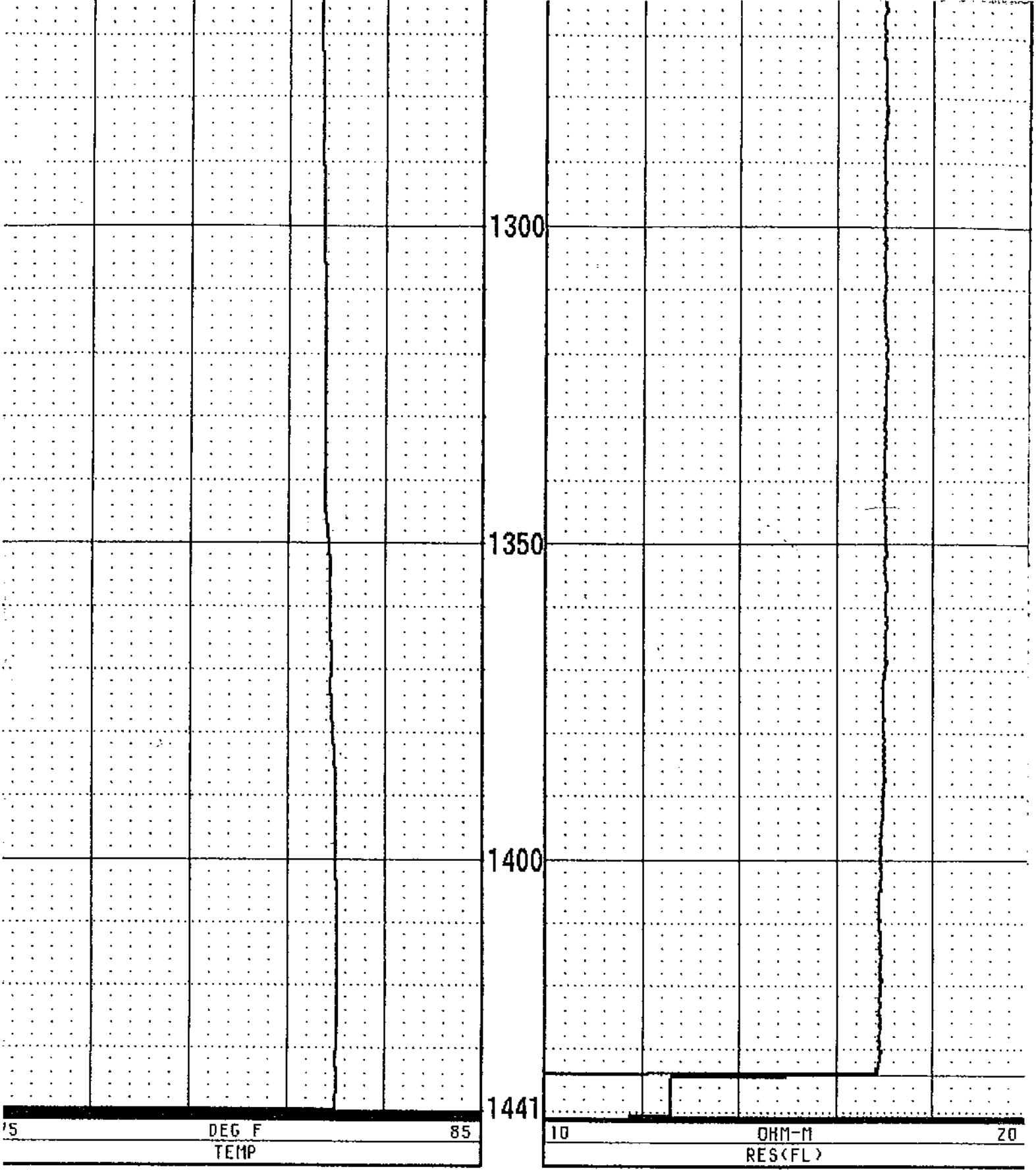
1150
1200
1250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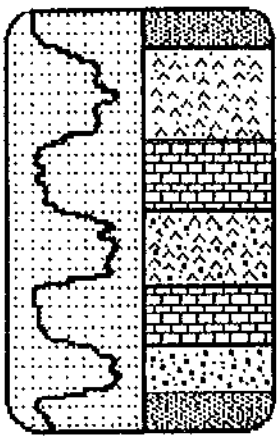
1350
1400
1441
'5
DEG F
85
TEMP
10
OHM-M
20
RES(FL)



Southern Resource Exploration Inc.

P.O. Box 14311
Gainesville, Florida 32604
Phone 352-3725950

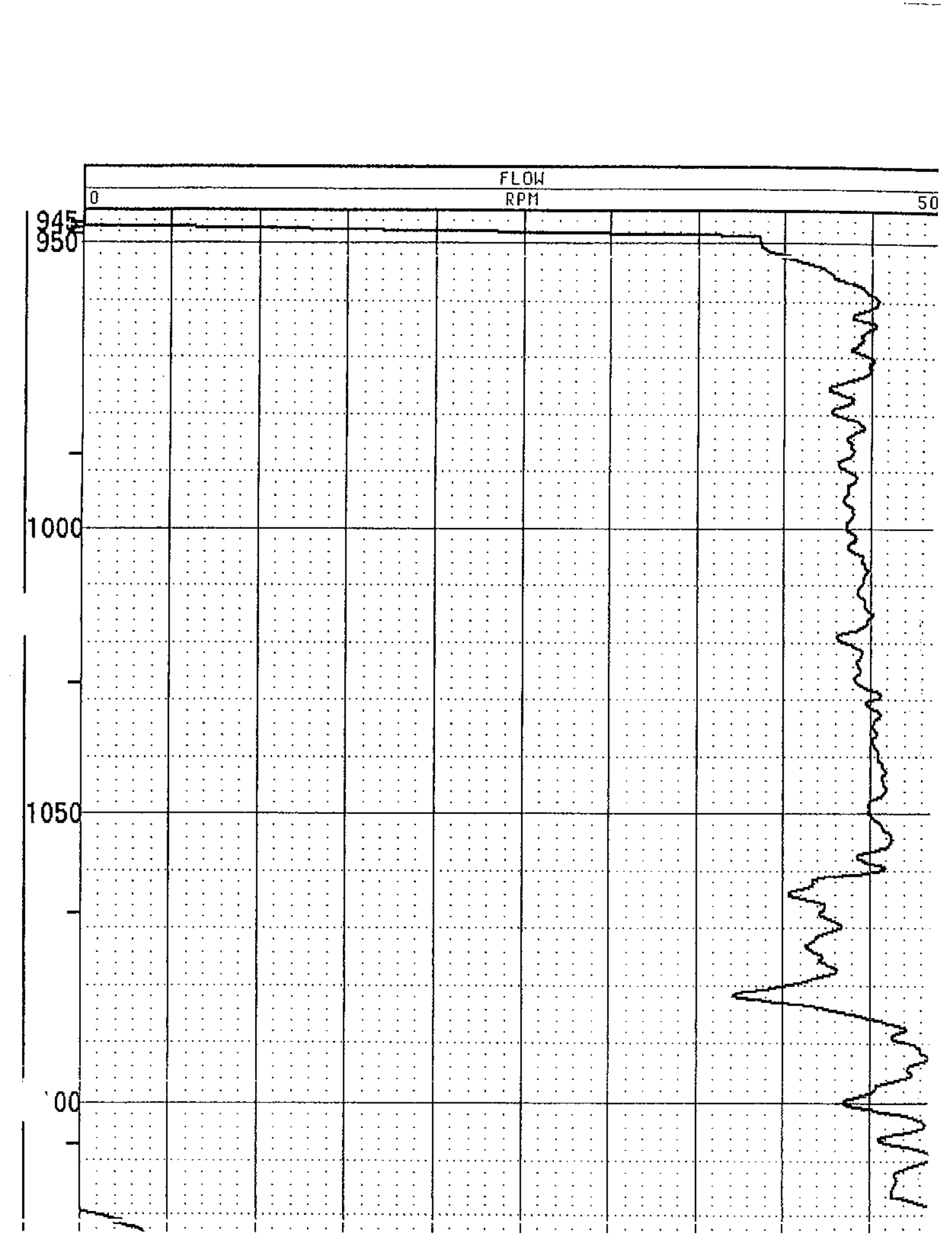
FLOWMETER LOG

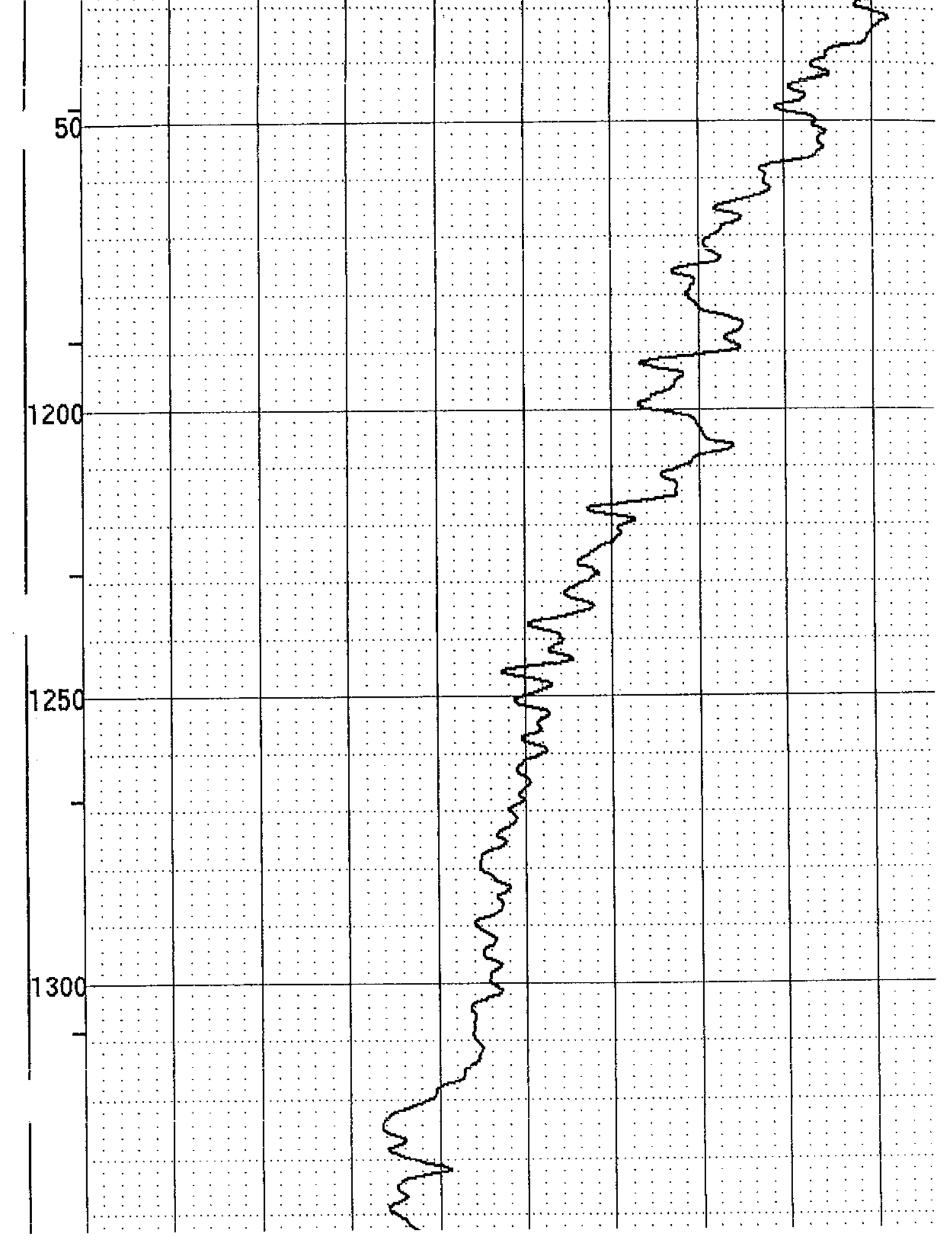
COMPANY	: DIVERSIFIED DRILLING INC.			OTHER SERVICES:	
WELL	: OUC SOUTHEAST # 2				
LOCATION/FIELD	: OUC SOUTHEAST WTP				
COUNTY	: ORANGE				
STATE	: FL.				
SECTION	: .	TOWNSHIP	:	RANGE	:
DATE	: 04/27/99	PERMANENT DATUM	: -	ELEVATIONS	
DEPTH DRILLER	: 1440	ELEV. PERM. DATUM	:	KB	:
LOG BOTTOM	: 1440 ~~971.00~~	LOG MEASURED FROM	: 24" TOC	DF	:
LOG TOP	: 944.80	DRL MEASURED FROM	: GL	GL	:
CASING DRILLER	: 1045	LOGGING UNIT	: LWT		
CASING TYPE	: STEEL	FIELD OFFICE	: GVL		
CASING THICKNESS	: .5	RECORDED BY	: JCP		
BIT SIZE	: 17	BOREHOLE FLUID	: WATER	FILE	: ORIGINAL
MAGNETIC DECL.	:	RM	:	TYPE	: WFLO
MATRIX DENSITY	:	RM TEMPERATURE	:	LOG	: 3
FLUID DENSITY	:	MATRIX DELTA T	:	PLOT	: FLOW 11
NEUTRON MATRIX	:	FLUID DELTA T	:	THRESH	: 4000

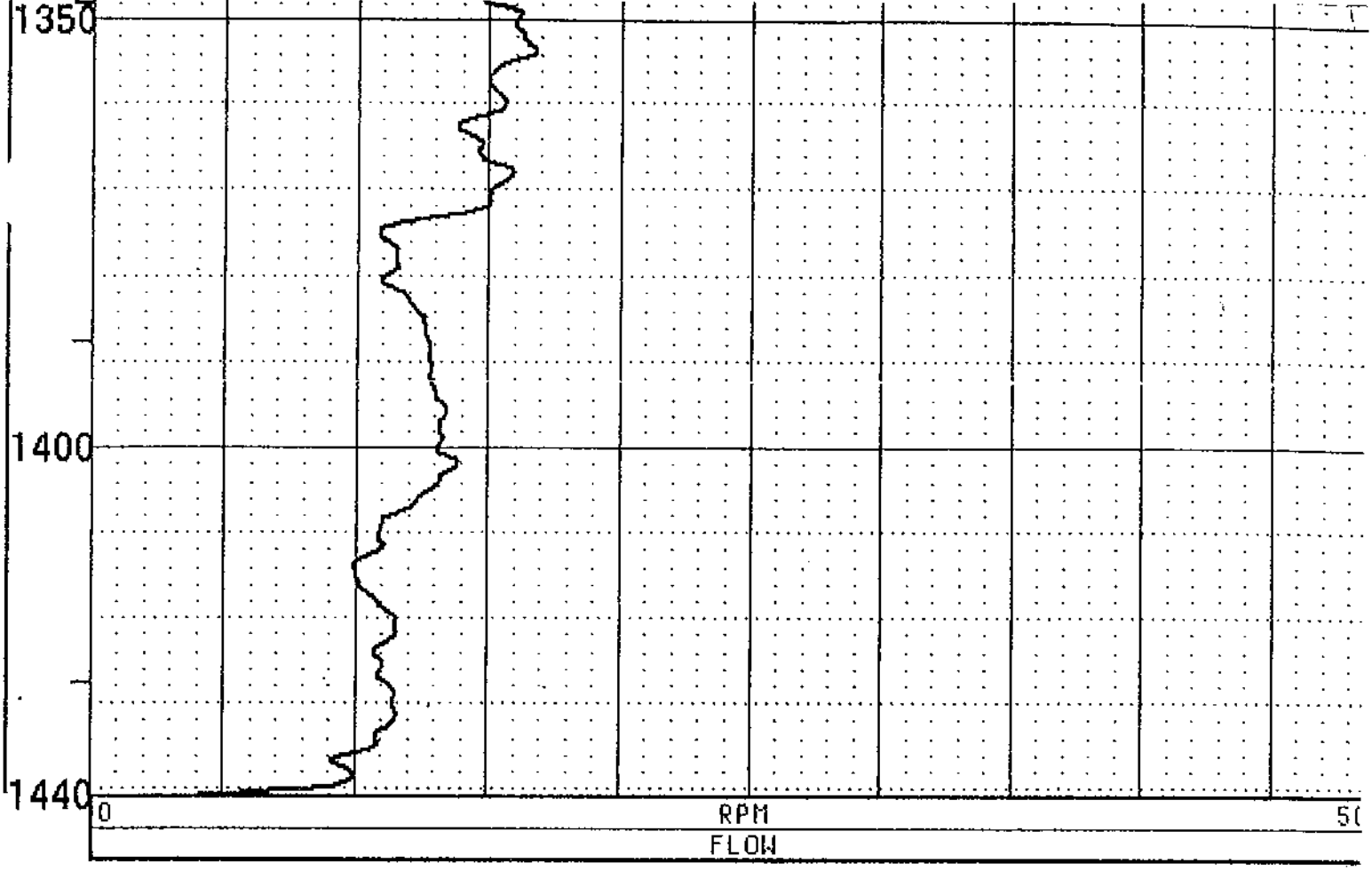
REMARKS :

PUMPED FLOWMETER LOG RUN DOWN AT 40 FT/MIN.

-


FLOW
0
RPM
50
945
950
1000
1050


50
1200
1250
1300


1350
1400
1440
0
RPM
FLOW

Appendix 6

Water Quality Results

OUC SOUTHEAST WATER PLANT
WELL NO. 1 WATER QUALITY PROFILE DURING DRILLING

BOREHOLE DEPTH (FT)	pH	TEMP. (oF)	CHLORIDE (mg/l)	CONDUCTIVITY (umhos/cm)
400	10.87	79.50	25	431
410	7.92	78.50	25	378
420	7.89	77.40	30	419
430	7.90	78.10	25	368
440	8.10	77.50	30	442
450	8.07	77.30	25	368
460	7.94	75.50	35	473
470	7.95	74.20	35	471
480	7.83	78.90	35	456
490	7.87	78.60	35	446
500	7.90	77.40	35	428
510	7.93	78.10	35	438
520	7.96	78.70	35	445
530	7.76	77.70	35	468
540	7.83	77.20	35	473
550	7.81	77.50	35	485
560	7.76	76.80	40	489
570	7.79	76.60	40	491
580	7.79	75.90	35	482
590	7.78	75.70	35	490
600	7.79	75.30	40	484
610	7.91	75.00	35	511
620	7.91	74.50	35	504
630	7.90	74.50	35	507

BOREHOLE DEPTH (FT)	pH	TEMP. (oF)	CHLORIDE (mg/l)	CONDUCTIVITY (umhos/cm)
640	7.89	74.70	35	506
650	7.94	74.40	35	505
660	7.93	73.60	35	505
670	7.79	73.80	35	494
680	7.75	74.00	35	482
690	7.76	73.90	35	488
700	7.78	73.40	35	493
710	7.79	73.40	35	496
720	7.81	73.50	35	496
730	7.80	73.40	35	503
740	7.83	73.00	35	494
750	7.89	72.20	35	490
760	7.89	71.80	35	505
770	7.91	72.70	35	513
780	7.86	72.70	35	506
790	7.86	72.60	35	511
800	7.81	72.90	35	514
810	7.82	72.60	35	517
820	7.84	73.20	35	520
830	7.84	73.10	35	513
840	7.66	72.60	35	497
850	7.68	72.60	35	509
860	7.70	72.70	35	507
870	7.68	72.70	35	505

OUC SOUTHEAST WATER PLANT
WELL NO. 1 WATER QUALITY PROFILE DURING DRILLING

BOREHOLE DEPTH (FT)	pH	TEMP. (oF)	CHLORIDE (mg/l)	CONDUCTIVITY (umhos/cm)
880	7.68	72.40	35	512
890	7.68	72.30	35	514
900	7.71	72.20	35	517
910	7.73	72.00	35	518
920	7.71	71.60	35	514
930	7.71	71.30	35	519
940	7.67	71.60	35	523
950	7.89	71.00	35	511
960	7.82	72.00	35	495
970	7.85	73.30	35	511
980	7.84	73.00	35	489
990	7.83	73.00	35	499
1000	7.84	73.00	35	494
1010	7.81	73.00	35	491
1020	7.82	73.60	35	486
1030	7.83	73.80	35	493
1040	7.80	73.30	35	478
1050	7.87	67.00	35	557
1060	7.87	68.90	35	550
1070	7.84	71.10	35	541
1080	7.83	73.00	35	542
1090	7.82	72.30	35	526
1100	7.67	73.30	35	538
1110	7.72	73.80	35	553

BOREHOLE DEPTH (FT)	pH	TEMP. (oF)	CHLORIDE (mg/l)	CONDUCTIVITY (umhos/cm)
1120	7.70	74.30	35	546
1130	7.68	73.50	35	524
1140	7.69	74.70	35	526
1150	7.68	74.40	35	529
1160	7.64	74.30	35	523
1170	7.71	74.30	35	557
1180	7.65	73.90	35	523
1190	7.71	73.90	40	541
1200	7.64	73.60	35	518
1210	7.67	73.80	35	524
1220	7.64	73.30	35	522
1230	7.65	72.50	35	537
1240	7.63	68.60	35	531
1250	7.47	72.40	35	543
1260	7.70	72.10	35	520
1270	7.75	74.50	35	549
1280	7.66	76.00	35	542
1290	7.73	74.80	35	524
1300	7.76	76.60	35	532
1310	8.26	75.30	35	555
1320	8.26	75.80	35	577
1330	8.17	76.30	35	562
1340	8.19	76.00	35	555
1350	8.09	70.00	35	522

OUC SOUTHEAST WATER PLANT

WELL NO. 1 WATER QUALITY PROFILE DURING DRILLING

BOREHOLE DEPTH (FT)	pH	TEMP. (oF)	CHLORIDE (mg/l)	CONDUCTIVITY (umhos/cm)
1360	8.17	77.20	30	522
1370	8.07	80.10	30	521
1380	8.10	80.10	30	530
1390	8.16	80.00	30	537
1400	8.27	67.40	30	635
1410	8.16	74.00	30	609
1420	8.17	77.20	30	621
1430	8.12	78.50	30	601
1440	8.21	78.00	30	605
1450	8.05	74.90	25	577

BOREHOLE DEPTH (FT)	pH	TEMP. (oF)	CHLORIDE (mg/l)	CONDUCTIVITY (umhos/cm)

Orlando Utilities Commission Southeast Water Plant
Field Water Quality Results During Constant Rate Testing

Well ID	Date	Time	Temp. (deg. F)	pH	Specific Cond. (uS/cm)	Chloride (mg/l)	Hydrogen Sulfide (mg/l)	Turbidity (NTU)
No.1	2/8/99	8:15 AM	76	7.42	547	35	5	1.47
No.1	2/8/99	9:00 AM	73	7.50	554	35	5-	0.78
No.1	2/8/99	10:00 AM	75	7.45	569	35	2+	0.56
No.1	2/8/99	11:00 AM	77	7.48	576	35	2+	0.47
No.1	2/8/99	12:00 PM	80	7.51	583	35	5	0.73
No.1	2/8/99	1:00 PM	80	7.55	564	35	1+	0.66
No.1	2/8/99	2:00 PM	83	7.55	563	35	2	0.59
No.1	2/8/99	3:00 PM	84	7.54	564	35	2-	0.46
No.1	2/8/99	5:15 PM	84	7.43	574	35	2-	0.39
No. 2	4/26/99	9:40 AM	79	7.84	563	30	---	0.74
No. 2	4/26/99	10:30 AM	80	7.66	560	30	---	---
No. 2	4/26/99	11:30 AM	81	7.67	572	30	---	---
No. 2	4/26/99	12:30 AM	83	7.76	551	30	---	---
No. 2	4/26/99	1:30 AM	83	7.64	538	30	---	---
No. 2	4/26/99	2:30 AM	84	7.66	554	30	---	---
No. 2	4/26/99	3:30 AM	83	7.75	551	30	5	---
No. 2	4/26/99	4:30 AM	83	7.81	538	30	---	---
No. 2	4/26/99	5:30 AM	84	7.80	552	30	---	0.41

Chloride Test Kit - HACH Model 8-P No. 1440-01
Hydrogen Sulfide Test Kit - HACH HS-C No. 25378-00
Conductivity, Temperature and pH - HyDAC Model 910
Turbidity - HF Scientific

PUBLIC WATER SYSTEM INFORMATION

System Name: ORLANDO UTILITIES COMMISSION I.D. #: UNKNOWN

Address: 500 S. ORANGE AVE., P.O. BOX 3193, ORLANDO FLORIDA 32802 Phone #: 407 244-8779

Type (check one): (X) Community ( ) Nontransient Noncommunity ( ) Noncommunity

SAMPLE INFORMATION

Sample Date: 02/08/99 Sample Time: 16:00

Sample Location: SOUTHEAST WTP WELL #1

Sampler Name: D. BRADSHAW Phone #: 407 244-8779

Sampler's Signature: D J Bradshaw Title: SR. ENGINEER

Check Type(s):

- [ ] Distribution
- [ ] Clearance
- [ ] Distrib entry pt
- [ ] Recheck of MCL
- [ ] Thm Max Res Time
- [X] Raw
- [ ] Resample of Lab Invalidated Sample
- [ ] Plant Tap
- [ ] Composite of Multiple Sites
  Attach a format for each site

LABORATORY CERTIFICATION INFORMATION

Lab Name: Orlando Utilities Commission HRS #: 53089 Expiration Date: 6/30/99

Address: 3800 Gardenia Ave., Orlando, Florida 32803 Phone #: 407 244-8779

Subcontracted Lab HRS #:

ANALYSIS INFORMATION: SAMPLE #: WQL990428

Date Sample(s) Received: 02/09/99 Group(s) Analyzed & Results attached for compliance with 62-550, F.A.C.:

- [ ] Nitrate Only
- [ ] Nitrite Only
- [ ] Asbestos Only
- [ ] Trihalomethanes
- Inorganics [X] All [ ] Partial
- Volatile Organics-- [X] All [ ] Partial
- Secondaries-- [X] All [ ] Partial
- Pesticide/PCBs-- [X] ALL [ ] PARTIAL
- Group I Unregulateds [X] All [ ] Partial
- Group II Unregulateds-- [X] All [ ] Partial
- Group III Unregulateds-- [ ] All [ ] Partial
- Radiochemicals-- [ ] Single Sample [ ] Qtrly Composite**

**Provide radiochemical sample dates & locations for each quarter

I, Richard A. Dunham, do HEREBY CERTIFY that all attached analytical data are correct.

Signature Richard A Dunham

Title Manager, Water Quality Laboratory Date 03/22/99

COMPLIANCE INFORMATION

Sample Collection Satisfactory: Sample Analysis Satisfactory:

Resample Requested for: Reason:

Person notified to resample: Date Notified:

DEP/HRS Reviewing Official:

VOLATILE ORGANIC ANALYSIS
62-550.310 (2)(b)
(PWS028)

Parameter ID	Name	(MCL ug/l)	Sample Number	Analysis Result (ug/l)	Analysis Method	Analysis Date	MDL (ug/L)	Lab ID
2378	1,2,4-Trichlorobenzene	(70)	WQL990428	BDL	524.2	2/15/99	0.37	53089
2380	Cis-1,2-Dichloroethylene	(70)	WQL990428	BDL	524.2	2/15/99	0.22	53089
2955	Xylenes (Total)	(10,000	WQL990428	BDL	524.2	2/15/99	0.46	53089
2964	Dichloromethane	(5)	WQL990428	BDL	524.2	2/15/99	0.21	53089
2968	O-Dichlorobenzene	(600)	WQL990428	BDL	524.2	2/15/99	0.22	53089
2969	Para-Dichlorobenzene	(75)	WQL990428	BDL	524.2	2/15/99	0.35	53089
2976	Vinyl Chloride	(1)	WQL990428	BDL	524.2	2/15/99	0.14	53089
2977	1,1-Dichloroethylene	(7)	WQL990428	BDL	524.2	2/15/99	0.36	53089
2979	Trans-1,2-dichloroethylene	(100)	WQL990428	BDL	524.2	2/15/99	0.28	53089
2980	1,2-Dichloroethane	(3)	WQL990428	BDL	524.2	2/15/99	0.20	53089
2981	1,1,1-Trichloroethane	(200)	WQL990428	BDL	524.2	2/15/99	0.24	53089
2982	Carbon Tetrachloride	(3)	WQL990428	BDL	524.2	2/15/99	0.29	53089
2983	1,2-Dichloropropane	(5)	WQL990428	BDL	524.2	2/15/99	0.25	53089
2984	Trichloroethylene	(3)	WQL990428	BDL	524.2	2/15/99	0.24	53089
2985	1,1,2-Trichloroethane	(5)	WQL990428	BDL	524.2	2/15/99	0.42	53089
2987	Tetrachloroethylene	(3)	WQL990428	BDL	524.2	2/15/99	0.27	53089
2989	Monochlorobenzene	(100)	WQL990428	BDL	524.2	2/15/99	0.18	53089
2990	Benzene	(1)	WQL990428	BDL	524.2	2/15/99	0.23	53089
2991	Toluene	(1,000)	WQL990428	BDL	524.2	2/15/99	0.32	53089
2992	Ethylbenzene	(700)	WQL990428	BDL	524.2	2/15/99	0.23	53089
2996	Styrene	(100)	WQL990428	BDL	524.2	2/15/99	0.22	53089

PESTICIDE/PCB CHEMICAL ANALYSIS
62-550.310 (2) (c)
(PWS029)

Parameter ID	Name	(MCL ug/l)	Sample Number	Analysis Result (ug/l)	Analysis Method	Analysis Date	MDL ug/l	Lab ID
2005	Endrin	(2)	WQL990428	BDL	505	2/15/99	0.56	53089
2010	Lindane	(.2)	WQL990428	BDL	505	2/15/99	0.20	53089
2015	Methoxychlor	(40)	WQL990428	BDL	505	2/15/99	6	53089
2020	Toxaphene	(3)	WQL990428	BDL	505	2/15/99	1.97	53089
2031	Dalapon	(200)	WQL990428	BDL	515.1	2/18/99	19.4	53089
2032	Diquat	(20)	WQL990428	BDL	549.1	2/19/99	1.5	53089
2033	Endothall	(100)	WQL990428	BDL	548.1	2/16/99	1.5	53089
2034	Glyphosate	(700)	WQL990428	BDL	547	2/11/99	20.3	53089
2035	Di(2-Ethyhexyl) Adipate	(400)	WQL990428	BDL	506	2/15/99	2.03	53089
2036	Oxamyl (Vydate)	(200)	WQL990428	BDL	531.1	3/5/99	2.14	53089
2037	Simazine	(4)	WQL990428	BDL	507	2/9/99	85	53089
2039	Di(2-Ethylhexyl) Phthalate	(6)	WQL990428	BDL	506	2/15/99	1.34	53089
2040	Picloram	(500)	WQL990428	BDL	515.1	2/18/99	6.63	53089
2041	Dinoseb	(7)	WQL990428	BDL	515.1	2/18/99	5.1	53089
2043	Hexachlorocyclopentadiene	(50)	WQL990428	BDL	505	2/15/99	0.38	53089
2046	Carbofuran	(40)	WQL990428	BDL	531.1	3/5/99	1.4	53089
2050	Atrazine	(3)	WQL990428	BDL	507	2/9/99	1.01	53089
2051	Alachlor	(2)	WQL990428	BDL	507	2/9/99	1.13	53089
2065	Heptachlor	(.4)	WQL990428	BDL	505	2/15/99	0.36	53089
2067	Heptachlor Epoxide	(.2)	WQL990428	BDL	505	2/15/99	0.32	53089
2105	2,4-D	(70)	WQL990428	BDL	515.1	2/18/99	0.20	53089
2110	2,4,5-TP (Silvex)	50)	WQL990428	BDL	515.1	2/18/99	0.23	53089
2274	Hexachlorobenzene	(1)	WQL990428	BDL	505	2/15/99	0.16	53089
2306	Benzo (A) Pyrene	(.2)	WQL990428	BDL	550.1	2/15/99	0.096	53089
2326	Pentachlorophenol	(1)	WQL990428	BDL	515.1	2/18/99	0.21	53089
2383	PCB	(.5)	WQL990428	BDL	505	2/15/99	0.5	53089
2931	Dibromochloropropane	(.2)	WQL990428	BDL	504.1	2/12/99	0.025	53089
2946	Ethylene Dibromide	(.02)	WQL990428	BDL	504.1	2/12/99	0.02	53089
2959	Chlordane	(2)	WQL990428	BDL	505	2/15/99	0.46	53089

INORGANIC ANALYSIS
62-550.310 (1)
(PWS030)

Parameter ID	Name	(MCL mg/l)	Sample Number	Analysis Result (mg/l)	Analysis Method	Analysis Date	MDL (mg/l)	Lab ID
1005	ARSENIC	(.05)	WQL990428	BDL	SM3113B	3/15/99	0.001	53089
1010	BARIUM	(2)	WQL990428	0.080	SM3113B	3/16/99	0.003	53089
1015	CADMIUM	(.005)	WQL990428	BDL	SM3113B	2/25/99	0.0002	53089
1020	CHROMIUM	(0.1)	WQL990428	BDL	SM3113B	2/25/99	0.0005	53089
1024	CYANIDE	(0.2)	WQL990428	BDL	SM4500CNE	2/16/99	0.05	53089
1025	FLUORIDE	(4)	WQL990428	0.27	300.0A	2/9/99	0.01	53089
1030	LEAD	(0.015)	WQL990428	BDL	SM3113B	2/16/99	0.001	53089
1035	MERCURY	(0.002)	WQL990428	BDL	245.1	3/22/99	0.0005	53089
1036	NICKEL	0.1)	WQL990428	0.004	SM3113B	3/8/99	0.001	53089
1040	NITRATE	(10)	WQL990428	0.20	300.0A	2/9/99	0.10	53089
1041	NITRITE	(1)	WQL990428	BDL	300.0A	2/9/99	0.05	53089
1045	SELENIUM	(0.05)	WQL990428	BDL	SM3113B	3/15/99	0.002	53089
1052	SODIUM	(160)	WQL990428	12.7	SM3111B	2/23/99	0.006	53089
1074	ANTIMONY	(0.006)	WQL990428	BDL	SM3113B	2/25/99	0.002	53089
1075	BERYLLIUM	(0.004)	WQL990428	BDL	SM3113B	3/16/99	0.0001	53089
1085	THALLIUM	(0.002)	WQL990428	BDL	200.9	3/16/99	0.0002	53089

SECONDARY CHEMICAL ANALYSIS
62-550.320
(PWS031)

Parameter ID	Name	(MCL mg/l)	Sample Number	Analysis Result (mg/l)	Analysis Method	Analysis Date	MDL (mg/L)	Lab ID
1002	ALUMINUM	(0.2)	WQL990428	BDL	SM3113B	2/26/99	0.002	53089
1017	CHLORIDE	(250)	WQL990428	17.4	300.0A	2/9/99	0.46	53089
1022	COPPER	(1)	WQL990428	0.002	SM3113B	2/16/99	0.001	53089
1025	FLUORIDE	(2.0)	WQL990428	0.27	300.0A	2/9/99	0.05	53089
1028	IRON	(0.3)	WQL990428	0.015	SM3113B	3/4/99	0.001	53089
1032	MANGANESE	(0.05)	WQL990428	BDL	SM3113B	2/25/99	0.02	53089
1050	SILVER	(0.1)	WQL990428	BDL	SM3113B	2/26/99	0.0003	53089
1055	SULFATE	(250)	WQL990428	18.7	300.0A	2/9/99	0.08	53089
1095	ZINC	(5)	WQL990428	0.010	SM3111B	2/25/99	0.01	53089
1905	COLOR	(15 COLOR UNITS)	WQL990428	6	SM2120B	2/9/99	0	53089
1920	ODOR	(3 threshold odor number)	WQL990428	5	SM2150B	2/9/99	1	53089
1925	pH	(6.5 - 8.5)	WQL990428	7.53	SM4500H B	2/9/99	0.1	53089
1930	TOTAL DISSOVED SOLIDS	(500)	WQL990428	377	SM2540C	2/10/99	5	53089
2905	FOAMING AGENTS	(0.5)	WQL990428	BDL	SM5540C	2/10/99	0.02	53089
	TOTAL HARDNESS		WQL990428	269	SM2340-C	2/9/99	1.0	53089
	CALCIUM		WQL990428	79.6	SM3500Ca-D	2/10/99	1.0	53089
	HYDROGEN SULFIDE		WQL990428	2.75	SM4500S-G	2/9/99	0.1	53089
	TOC		WQL980428	1.78	SM5310C	3/1/99	0.2	53089

UNREGULATED GROUP II ANALYSIS
62-550.410
(PWS034)

Parameter ID	Name	Sample Number	Analysis Result (ug/L)	Analysis Method	Analysis Date	MDL (ug/L)	Lab ID
2210	Chloromethane	WQL990428	BDL	524.2	2/15/99	0.41	53089
2212	Dichlorodifluoromethane	WQL990428	BDL	524.2	2/15/99	0.43	53089
2214	Bromomethane	WQL990428	BDL	524.2	2/15/99	1.04	53089
2216	Chloroethane	WQL990428	BDL	524.2	2/15/99	0.49	53089
2218	Trichlorofluoromethane	WQL990428	BDL	524.2	2/15/99	0.40	53089
2251	Methyl-Tert-Butyl-Ether	WQL990428	BDL	524.2	2/15/99	0.22	53089
2408	Dibromomethane	WQL990428	BDL	524.2	2/15/99	0.31	53089
2410	1,1-Dichloropropylene	WQL990428	BDL	524.2	2/15/99	0.24	53089
2412	1,3-Dichloropropane	WQL990428	BDL	524.2	2/15/99	0.21	53089
2413	1,3-Dichloropropene	WQL990428	BDL	524.2	2/15/99	0.42	53089
2414	1,2,3-Trichloropropane	WQL990428	BDL	524.2	2/15/99	0.22	53089
2416	2,2-Dichloropropane	WQL990428	BDL	524.2	2/15/99	0.25	53089
2941	Chloroform	WQL990428	BDL	524.2	2/15/99	0.28	53089
2942	Bromoform	WQL990428	BDL	524.2	2/15/99	0.27	53089
2943	Bromodichloromethane	WQL990428	BDL	524.2	2/15/99	0.21	53089
2944	Dibromochloromethane	WQL990428	BDL	524.2	2/15/99	0.34	53089
2965	O-Chlorotoluene	WQL990428	BDL	524.2	2/15/99	0.25	53089
2966	P-Chlorotoluene	WQL990428	BDL	524.2	2/15/99	0.26	53089
2967	M-Dichlorobenzene	WQL990428	BDL	524.2	2/15/99	0.40	53089
2978	1,1-Dichloroethane	WQL990428	BDL	524.2	2/15/99	0.23	53089
2986	1,1,1,2-Tetrachloroethane	WQL990428	BDL	524.2	2/15/99	0.24	53089
2988	1,1,2,2-Tetrachloroethane	WQL990428	BDL	524.2	2/15/99	0.22	53089
2993	Bromobenzene	WQL990428	BDL	524.2	2/15/99	0.24	53089

UNREGULATED GROUP I ANALYSIS
62-550.405
(PWS035)

Parameter ID	Name	Sample Number	Analysis Result (mg/l)	Analysis Method	Analysis Date	MDL (mg/l)	Lab ID
2021	CARBARYL	WQL990428	BDL	531.1	3/5/99	1.97	53089
2022	METHOMYL	WQL990428	BDL	531.1	3/5/99	1.54	53089
2043	ALDICARB SULFOXIDE	WQL990428	BDL	531.1	3/5/99	1.77	53089
2044	ALDICARB SULFONE	WQL990428	BDL	531.1	3/5/99	1.77	53089
2045	METOLACHLOR	WQL990428	BDL	507	2/9/99	1.1	53089
2047	ALDICARB	WQL990428	BDL	531.1	3/5/99	2.03	53089
2066	3-HYDROXYCARBOFURAN	WQL990428	BDL	531.1	3/5/99	3.62	53089
2076	BUTACHLOR	WQL990428	BDL	507	2/9/99	1.13	53089
2077	PROPACHLOR	WQL990428	BDL	507	2/9/99	0.88	53089
2356	ALDRIN	WQL990428	BDL	505	2/15/99	0.29	53089
2364	DIELDRIN	WQL990428	BDL	505	2/15/99	0.34	53089
2440	DICAMBA	WQL990428	BDL	515.1	2/18/99	2.10	53089
2595	METRIBUZIN	WQL990428	BDL	507	2/9/99	0.79	53089

PUBLIC DRINKING WATER ANALYSIS

PUBLIC WATER SYSTEM INFORMATION

System Name: ORLANDO UTILITIES COMMISSION I.D. #: UNKNOWN

Address: 500 S. ORANGE AVE., P.O. BOX 3193, ORLANDO FLORIDA 32802 Phone #: 407 244-8779

Type (check one): (X) Community ( ) Nontransient Noncommunity ( ) Noncommunity

SAMPLE INFORMATION

Sample Date: 02/08/99 Sample Time: 16:00

Sample Location: SOUTHEAST WTP WELL #1

Sampler Name: D. BRADSHAW Phone #: 407 244-8779

Sampler's Signature: D J Bradshaw Title: SR. ENGINEER

Check Type(s):

- [ ] Distribution
- [ ] Clearance
- [ ] Distrib entry pt
- [ ] Recheck of MCL
- [ ] Thm Max Res Time
- [X] Raw
- [ ] Resample of Lab Invalidated Sample
- [ ] Plant Tap
- [ ] Composite of Multiple Sites
  Attach a format for each site

LABORATORY CERTIFICATION INFORMATION

Lab Name: Orlando Utilities Commission HRS #: 53089 Expiration Date: 6/30/99

Address: 3800 Gardenia Ave., Orlando, Florida 32803 Phone #: 407 244-8779

Subcontracted Lab HRS #: 83170

ANALYSIS INFORMATION: SAMPLE #: 9903022-01

Date Sample(s) Received: 02/09/99 Group(s) Analyzed & Results attached for compliance with 62-550, F.A.C.:

- [ ] Nitrate Only
- [ ] Nitrite Only
- [ ] Asbestos Only
- [ ] Trihalomethanes
- Inorganics [ ] All [ ] Partial
- Volatile Organics– [ ] All [ ] Partial
- Secondaries– [ ] All [ ] Partial
- Pesticide/PCBs– [ ] ALL [ ] PARTIAL
- Group I Unregulateds [ ] All [ ] Partial
- Group II Unregulateds– [ ] All [ ] Partial
- Group III Unregulateds– [ ] All [ ] Partial
- Radiochemicals– [X] Single Sample [ ] Qtrly Composite**

**Provide radiochemical sample datas & locations for each quarter

I, Richard A. Dunham, do HEREBY CERTIFY that all attached analytical data are correct.

Signature Richard A Dunham

Title Manager, Water Quality Laboratory Date 03/22/99

COMPLIANCE INFORMATION

Sample Collection Satisfactory: _____ Sample Analysis Satisfactory: _____

Resample Requested for: _____ Reason: _____

Person notified to resample: _____ Date Notified: _____

DEP/HRS Reviewing Official: _____

RADIOCHEMICAL ANALYSIS
62-550.310(5)
(PWS033)

Parameter ID	Name	Sample Number	Analysis Result (pCi/L)	Analysis Method	Analysis Date	ERROR	Lab ID
4000	GROSS ALPHA	9903022-01	3.6	EPA900.0	3/3/99	2.3	83170

PUBLIC DRINKING WATER ANALYSIS

PUBLIC WATER SYSTEM INFORMATION

System Name: ORLANDO UTILITIES COMMISSION I.D. #: UNKNOWN

Address: 500 S. ORANGE AVE., P.O. BOX 3193, ORLANDO FLORIDA 32802 Phone #: 407 244-8779

Type (check one): (X) Community ( ) Nontransient Noncommunity ( ) Noncommunity

SAMPLE INFORMATION

Sample Date: 04/27/99 Sample Time: 1600

Sample Location: SOUTHEAST WTP WELL #2

Sampler Name: D. BRADSHAW Phone #: 407 244-8779

Sampler's Signature: Richard J. Bradshaw Title: SR. ENGINEER

Check Type(s):

- [ ] Distribution
- [ ] Clearance
- [ ] Distrib entry pt
- [ ] Recheck of MCL
- [ ] Thm Max Res Time
- [X] Raw
- [ ] Resample of Lab Invalidated Sample
- [ ] Plant Tap
- [ ] Composite of Multiple Sites
  Attach a format for each site

LABORATORY CERTIFICATION INFORMATION

Lab Name: Orlando Utilities Commission HRS #: 53089 Expiration Date: 6/30/00

Address: 3800 Gardenia Ave., Orlando, Florida 32803 Phone #: 407 244-8779

Subcontracted Lab HRS #:

ANALYSIS INFORMATION: SAMPLE #: WQL990873

Date Sample(s) Received: 04/27/99 Group(s) Analyzed & Results attached for compliance with 62-550, F.A.C.:

- [ ] Nitrate Only
- [ ] Nitrite Only
- [ ] Asbestos Only
- [ ] Trihalomethanes
- Inorganics [X] All [ ] Partial
- Volatile Organics-- [X] All [ ] Partial
- Secondaries-- [X] All [ ] Partial
- Pesticide/PCBs-- [X] ALL [ ] PARTIAL
- Group I Unregulateds [X] All [ ] Partial
- Group II Unregulateds-- [X] All [ ] Partial
- Group III Unregulateds-- [X] All [ ] Partial
- Radiochemicals-- [ ] Single Sample [ ] Qtrly Composite**

**Provide radiochemical sample dates & locations for each quarter

I, Richard A. Dunham, do HEREBY CERTIFY that all attached analytical data are correct.

Signature Richard A. Dunham

Title Manager, Water Quality Laboratory Date 07/02/99

COMPLIANCE INFORMATION

Sample Collection Satisfactory: Sample Analysis Satisfactory:

Resample Requested for: Reason:

Person notified to resample: Date Notified:

DEP/HRS Reviewing Official:

INORGANIC ANALYSIS
62-550.310 (1)
(PWS030) 4
SE-2 (4/99)

Parameter ID	Name	(MCL mg/l)	Sample Number	Analysis Result (mg/l)	Analysis Method	Analysis Date	MDL (mg/l)	Lab ID
1005	ARSENIC	(.05)	WQL990873	BDL	SM3113B	5/26/99	0.001	53089
1010	BARIUM	(2)	WQL990873	0.092	SM3113B	5/21/99	0.001	53089
1015	CADMIUM	(.005)	WQL990873	BDL	SM3113B	5/21/99	0.0002	53089
1020	CHROMIUM	(0.1)	WQL990873	BDL	SM3113B	5/3/99	0.002	53089
1024	CYANIDE	(0.2)	WQL990873	BDL	SM4500CNE	5/5/99	0.05	53089
1025	FLUORIDE	(4)	WQL990873	0.28	300.0A	4/28/99	0.01	53089
1030	LEAD	(0.015)	WQL990873	BDL	SM3113B	5/3/99	0.001	53089
1035	MERCURY	(0.002)	WQL990873	BDL	245.1	6/1/99	0.0005	53089
1036	NICKEL	0.1)	WQL990873	BDL	SM3113B	5/26/99	0.001	53089
1040	NITRATE	(10)	WQL990873	BDL	300.0A	4/28/99	0.013	53089
1041	NITRITE	(1)	WQL990873	BDL	300.0A	4/28/99	0.003	53089
1045	SELENIUM	(0.05)	WQL990873	BDL	SM3113B	5/27/99	0.002	53089
1052	SODIUM	(160)	WQL990873	12.4	SM3111B	5/3/99	0.030	53089
1074	ANTIMONY	(0.006)	WQL990873	BDL	SM3113B	5/4/99	0.001	53089
1075	BERYLLIUM	(0.004)	WQL990873	BDL	SM3113B	5/28/99	0.0001	53089
1085	THALLIUM	(0.002)	WQL990873	BDL	200.9	5/4/99	0.0003	53089

SECONDARY CHEMICAL ANALYSIS
62-550.320
(PWS031)
SE-2 (4/99)

Parameter ID	Name	(MCL mg/l)	Sample Number	Analysis Result (mg/l)	Analysis Method	Analysis Date	MDL (mg/L)	Lab ID
1002	ALUMINUM	(0.2)	WQL990873	0.006	SM3113B	5/4/99	0.003	53089
1017	CHLORIDE	(250)	WQL990873	16.6	300.0A	4/28/99	0.14	53089
1022	COPPER	(1)	WQL990873	0.003	SM3113B	5/13/99	0.001	53089
1025	FLUORIDE	(2.0)	WQL990873	0.28	300.0A	4/28/99	0.05	53089
1028	IRON	(0.3)	WQL990873	0.042	SM3113B	5/27/99	0.001	53089
1032	MANGANESE	(0.05)	WQL990873	BDL	SM3113B	5/13/99	0.02	53089
1050	SILVER	(0.1)	WQL990873	BDL	SM3113B	5/20/99	0.0003	53089
1055	SULFATE	(250)	WQL990873	132	300.0A	4/28/99	0.05	53089
1095	ZINC	(5)	WQL990873	0.010	SM3111B	5/13/99	0.01	53089
1905	COLOR	(15 COLOR UNITS)	WQL990873	7	SM2120B	4/27/99	0	53089
1920	ODOR	(3 threshold odor number)	WQL990873	50	SM2150B	4/27/99	1	53089
1925	pH	(6.5 - 8.5)	WQL990873	7.53	SM4500H B	4/27/99	0.1	53089
1930	TOTAL DISSOVED SOLIDS	(500)	WQL990873	360	SM2540C	5/3/99	5	53089
2905	FOAMING AGENTS	(0.5)	WQL990873	BDL	SM5540C	4/28/99	0.02	53089
	TOTAL HARDNESS		WQL990873	268	SM2340-C	4/28/99	1.0	53089
	CALCIUM		WQL990873	66.4	SM3500Ca-D	5/11/99	1.0	53089
	HYDROGEN SULFIDE		WQL990873	1.82	SM4500S-G	4/30/99	0.1	53089
	TOC		WQL990873	1.72	SM5310C	5/4/99	0.2	53089
	TURBIDITY		WQL990873	0.13 NTU	SM 2130B	4/27/99	0.01	53089
	TOTAL ALKALINITY		WQL990873	126	SM 2320B	4/28/99	1	53089

VOLATILE ORGANIC ANALYSIS
62-550.310 (2)(b)
(PWS028)

Parameter ID	Name	(MCL ug/l)	Sample Number	Analysis Result (ug/l)	Analysis Method	Analysis Date	MDL (ug/L)	Lab ID
2378	1,2,4-Trichlorobenzene	(70)	WQL990873	BDL	524.2	5/11/99	0.30	53089
2380	Cis-1,2-Dichloroethylene	(70)	WQL990873	BDL	524.2	5/11/99	0.22	53089
2955	Xylenes (Total)	(10,000	WQL990873	BDL	524.2	5/11/99	0.46	53089
2964	Dichloromethane	(5)	WQL990873	BDL	524.2	5/11/99	0.21	53089
2968	O-Dichlorobenzene	(600)	WQL990873	BDL	524.2	5/11/99	0.22	53089
2969	Para-Dichlorobenzene	(75)	WQL990873	BDL	524.2	5/11/99	0.25	53089
2976	Vinyl Chloride	(1)	WQL990873	BDL	524.2	5/11/99	0.14	53089
2977	1,1-Dichloroethylene	(7)	WQL990873	BDL	524.2	5/11/99	0.23	53089
2979	Trans-1,2-dichloroethylene	(100)	WQL990873	BDL	524.2	5/11/99	0.28	53089
2980	1,2-Dichloroethane	(3)	WQL990873	BDL	524.2	5/11/99	0.20	53089
2981	1,1,1-Trichloroethane	(200)	WQL990873	BDL	524.2	5/11/99	0.24	53089
2982	Carbon Tetrachloride	(3)	WQL990873	BDL	524.2	5/11/99	0.29	53089
2983	1,2-Dichloropropane	(5)	WQL990873	BDL	524.2	5/11/99	0.25	53089
2984	Trichloroethylene	(3)	WQL990873	BDL	524.2	5/11/99	0.24	53089
2985	1,1,2-Trichloroethane	(5)	WQL990873	BDL	524.2	5/11/99	0.20	53089
2987	Tetrachloroethylene	(3)	WQL990873	BDL	524.2	5/11/99	0.27	53089
2989	Monochlorobenzene	(100)	WQL990873	BDL	524.2	5/11/99	0.18	53089
2990	Benzene	(1)	WQL990873	BDL	524.2	5/11/99	0.23	53089
2991	Toluene	(1,000)	WQL990873	BDL	524.2	5/11/99	0.22	53089
2992	Ethylbenzene	(700)	WQL990873	BDL	524.2	5/11/99	0.23	53089
2996	Styrene	(100)	WQL990873	BDL	524.2	5/11/99	0.21	53089

PESTICIDE/PCB CHEMICAL ANALYSIS
62-550.310 (2) (c)
(PWS029)

Parameter ID	Name	(MCL ug/l)	Sample Number	Analysis Result (ug/l)	Analysis Method	Analysis Date	MDL ug/l	Lab ID
2005	Endrin	(2)	WQL990873	BDL	505	5/3/99	0.39	53089
2010	Lindane	(.2)	WQL990873	BDL	505	5/3/99	0.20	53089
2015	Methoxychlor	(40)	WQL990873	BDL	505	5/3/99	12.3	53089
2020	Toxaphene	(3)	WQL990873	BDL	505	5/3/99	1.97	53089
2031	Dalapon	(200)	WQL990873	BDL	515.1	5/7/99	6.9	53089
2032	Diquat	(20)	WQL990873	BDL	549.1	5/17/99	1.5	53089
2033	Endothall	(100)	WQL990873	BDL	548.1	5/13/99	62.1	53089
2034	Glyphosate	(700)	WQL990873	BDL	547	5/4/99	14.6	53089
2035	Di(2-Ethyhexyl) Adipate	(400)	WQL990873	BDL	506	5/18/99	2.03	53089
2036	Oxamyl (Vydate)	(200)	WQL990873	BDL	531.1	5/20/99	2.14	53089
2037	Simazine	(4)	WQL990873	BDL	507	5/30/99	0.85	53089
2039	Di(2-Ethylhexyl) Phthalate	(6)	WQL990873	BDL	506	5/18/99	1.34	53089
2040	Picloram	(500)	WQL990873	BDL	515.1	5/7/99	0.57	53089
2041	Dinoseb	(7)	WQL990873	BDL	515.1	5/7/99	1.17	53089
2043	Hexachlorocyclopentadiene	(50)	WQL990873	BDL	505	5/3/99	0.24	53089
2046	Carbofuran	(40)	WQL990873	BDL	531.1	5/20/99	1.4	53089
2050	Atrazine	(3)	WQL990873	BDL	507	5/30/99	1.01	53089
2051	Alachlor	(2)	WQL990873	BDL	507	5/30/99	1.13	53089
2065	Heptachlor	(.4)	WQL990873	BDL	505	5/3/99	0.21	53089
2067	Heptachlor Epoxide	(.2)	WQL990873	BDL	505	5/3/99	0.18	53089
2105	2,4-D	(70)	WQL990873	BDL	515.1	5/7/99	1.47	53089
2110	2,4,5-TP (Silvex)	50)	WQL990873	BDL	515.1	5/7/99	0.51	53089
2274	Hexachlorobenzene	(1)	WQL990873	BDL	505	5/3/99	0.11	53089
2306	Benzo (A) Pyrene	(.2)	WQL990873	BDL	550.1	5/27/99	0.082	53089
2326	Pentachlorophenol	(1)	WQL990873	BDL	515.1	5/7/99	0.45	53089
2383	PCB	(.5)	WQL990873	BDL	505	5/3/99	0.5	53089
2931	Dibromochloropropane	(.2)	WQL990873	BDL	504.1	5/5/99	0.047	53089
2946	Ethylene Dibromide	(.02)	WQL990873	BDL	504.1	5/5/99	0.0172	53089
2959	Chlordane	(2)	WQL990873	BDL	505	5/3/99	0.46	53089

UNREGULATED GROUP I ANALYSIS
62-550.405
(PWS035)

Parameter ID	Name	Sample Number	Analysis Result (ug/l)	Analysis Method	Analysis Date	MDL (ug/l)	Lab ID
2021	CARBARYL	WQL990873	BDL	531.1	5/20/99	1.97	53089
2022	METHOMYL	WQL990873	BDL	531.1	5/20/99	1.54	53089
2043	ALDICARB SULFOXIDE	WQL990873	BDL	531.1	5/20/99	1.77	53089
2044	ALDICARB SULFONE	WQL990873	BDL	531.1	5/20/99	1.77	53089
2045	METOLACHLOR	WQL990873	BDL	507	5/30/99	1.1	53089
2047	ALDICARB	WQL990873	BDL	531.1	5/20/99	2.03	53089
2066	3-HYDROXYCARBOFURAN	WQL990873	BDL	531.1	5/20/99	3.62	53089
2076	BUTACHLOR	WQL990873	BDL	507	5/30/99	1.13	53089
2077	PROPACHLOR	WQL990873	BDL	508	5/30/99	2.0	53089
2356	ALDRIN	WQL990873	BDL	505	5/3/99	0.26	53089
2364	DIELDRIN	WQL990873	BDL	505	5/3/99	0.18	53089
2440	DICAMBA	WQL990873	BDL	515.1	5/7/99	0.36	53089
2595	METRIBUZIN	WQL990873	BDL	507	5/30/99	0.79	53089

PUBLIC DRINKING WATER ANALYSIS

PUBLIC WATER SYSTEM INFORMATION

System Name: ORLANDO UTILITIES COMMISSION I.D. #: UNKNOWN

Address: 500 S. ORANGE AVE., P.O. BOX 3193, ORLANDO FLORIDA 32802 Phone #: 407 244-8779

Type (check one): (X) Community ( ) Nontransient Noncommunity ( ) Noncommunity

SAMPLE INFORMATION

Sample Date: 02/08/99 Sample Time: 16:00

Sample Location: SOUTHEAST WTP WELL #1

Sampler Name: D. BRADSHAW Phone #: 407 244-8779

Sampler's Signature: D J Bradshaw Title: SR. ENGINEER

Check Type(s):

[ ] Distribution	[ ] Recheck of MCL	[ ] Resample of Lab Invalidated Sample
[ ] Clearance	[ ] Thm Max Res Time	[ ] Plant Tap
[ ] Distrib entry pt	[X] Raw	[ ] Composite of Multiple Sites
		Attach a format for each site

LABORATORY CERTIFICATION INFORMATION

Lab Name: Orlando Utilities Commission HRS #: 53089 Expiration Date: 6/30/99

Address: 3800 Gardenia Ave., Orlando, Florida 32803 Phone #: 407 244-8779

Subcontracted Lab HRS #: 83170

ANALYSIS INFORMATION: SAMPLE #: 9903022-01

Date Sample(s) Received: 02/09/99 Group(s) Analyzed & Results attached for compliance with 62-550, F.A.C.:

[ ] Nitrate Only	[ ] Nitrite Only	[ ] Asbestos Only	[ ] Trihalomethanes
Inorganics [ ] All [ ] Partial	Volatile Organics– [ ] All [ ] Partial	Secondaries– [ ] All [ ] Partial	Pesticide/PCBs– [ ] ALL [ ] PARTIAL
Group I Unregulateds [ ] All [ ] Partial	Group II Unregulateds– [ ] All [ ] Partial	Group III Unregulateds– [ ] All [ ] Partial	Radiochemicals– [X] Single Sample [ ] Qtrly Composite**

**Provide radiochemical sample dates & locations for each quarter

I, Richard A. Dunham, do HEREBY CERTIFY that all attached analytical data are correct.

Signature Richard A. Dunham

Title Manager, Water Quality Laboratory Date 03/22/99

COMPLIANCE INFORMATION

Sample Collection Satisfactory: _____ Sample Analysis Satisfactory: _____

Resample Requested for: _____ Reason: _____

Person notified to resample: _____ Date Notified: _____

DEP/HRS Reviewing Official: _____

RADIOCHEMICAL ANALYSIS
62-550.310(5)
(PWS033)

Parameter ID	Name	Sample Number	Analysis Result (pCi/L)	Analysis Method	Analysis Date	ERROR	Lab ID
4000	GROSS ALPHA	9903022-01	3.6	EPA900.0	3/3/99	2.3	83170

PUBLIC DRINKING WATER ANALYSIS

PUBLIC WATER SYSTEM INFORMATION

System Name: ORLANDO UTILITIES COMMISSION I.D. #: UNKNOWN

Address: 500 S. ORANGE AVE., P.O. BOX 3193, ORLANDO FLORIDA 32802 Phone #: 407 244-8779

Type (check one): (X) Community ( ) Nontransient Noncommunity ( ) Noncommunity

SAMPLE INFORMATION

Sample Date: 04/27/99 Sample Time: 1600

Sample Location: SOUTHEAST WTP WELL #2

Sampler Name: D. BRADSHAW Phone #: 407 244-8779

Sampler's Signature: Deborah J. Bradshaw Title: SR. ENGINEER

Check Type(s):

- [ ] Distribution
- [ ] Clearance
- [ ] Distrib entry pt
- [ ] Recheck of MCL
- [ ] Thm Max Res Time
- [X] Raw
- [ ] Resample of Lab Invalidated Sample
- [ ] Plant Tap
- [ ] Composite of Multiple Sites
  Attach a format for each site

LABORATORY CERTIFICATION INFORMATION

Lab Name: Orlando Utilities Commission HRS #: 53089 Expiration Date: 6/30/00

Address: 3800 Gardenia Ave., Orlando, Florida 32803 Phone #: 407 244-8779

Subcontracted Lab HRS #:

ANALYSIS INFORMATION: SAMPLE #: WQL990873

Date Sample(s) Received: 04/27/99 Group(s) Analyzed & Results attached for compliance with 62-550, F.A.C.:

- [ ] Nitrate Only
- [ ] Nitrite Only
- [ ] Asbestos Only
- [ ] Trihalomethanes
- Inorganics [X] All [ ] Partial
- Volatile Organics-- [X] All [ ] Partial
- Secondaries-- [X] All [ ] Partial
- Pesticide/PCBs-- [X] ALL [ ] PARTIAL
- Group I Unregulateds [X] All [ ] Partial
- Group II Unregulateds-- [X] All [ ] Partial
- Group III Unregulateds-- [X] All [ ] Partial
- Radiochemicals-- [ ] Single Sample [ ] Qrtly Composite**

**Provide radiochemical sample dates & locations for each quarter

I, Richard A. Dunham, do HEREBY CERTIFY that all attached analytical data are correct.

Signature Richard A. Dunham

Title Manager, Water Quality Laboratory Date 07/02/99

COMPLIANCE INFORMATION

Sample Collection Satisfactory: Sample Analysis Satisfactory:

Resample Requested for: Reason:

Person notified to resample: Date Notified:

DEP/HRS Reviewing Official:

INORGANIC ANALYSIS
62-550.310 (1)
(PWS030) 4
SE-2 (8/99)

Parameter ID	Name	(MCL mg/l)	Sample Number	Analysis Result (mg/l)	Analysis Method	Analysis Date	MDL (mg/l)	Lab ID
1005	ARSENIC	(.05)	WQL990873	BDL	SM3113B	5/26/99	0.001	53089
1010	BARIUM	(2)	WQL990873	0.092	SM3113B	5/21/99	0.001	53089
1015	CADMIUM	(.005)	WQL990873	BDL	SM3113B	5/21/99	0.0002	53089
1020	CHROMIUM	(0.1)	WQL990873	BDL	SM3113B	5/3/99	0.002	53089
1024	CYANIDE	(0.2)	WQL990873	BDL	SM4500CNE	5/5/99	0.05	53089
1025	FLUORIDE	(4)	WQL990873	0.28	300.0A	4/28/99	0.01	53089
1030	LEAD	(0.015)	WQL990873	BDL	SM3113B	5/3/99	0.001	53089
1035	MERCURY	(0.002)	WQL990873	BDL	245.1	6/1/99	0.0005	53089
1036	NICKEL	0.1)	WQL990873	BDL	SM3113B	5/26/99	0.001	53089
1040	NITRATE	(10)	WQL990873	BDL	300.0A	4/28/99	0.013	53089
1041	NITRITE	(1)	WQL990873	BDL	300.0A	4/28/99	0.003	53089
1045	SELENIUM	(0.05)	WQL990873	BDL	SM3113B	5/27/99	0.002	53089
1052	SODIUM	(160)	WQL990873	12.4	SM3111B	5/3/99	0.030	53089
1074	ANTIMONY	(0.006)	WQL990873	BDL	SM3113B	5/4/99	0.001	53089
1075	BERYLLIUM	(0.004)	WQL990873	BDL	SM3113B	5/28/99	0.0001	53089
1085	THALLIUM	(0.002)	WQL990873	BDL	200.9	5/4/99	0.0003	53089

SECONDARY CHEMICAL ANALYSIS
62-550.320
(PWS031)
SE-2 (4/99)

Parameter ID	Name	(MCL mg/l)	Sample Number	Analysis Result (mg/l)	Analysis Method	Analysis Date	MDL (mg/L)	Lab ID
1002	ALUMINUM	(0.2)	WQL990873	0.006	SM3113B	5/4/99	0.003	53089
1017	CHLORIDE	(250)	WQL990873	16.6	300.0A	4/28/99	0.14	53089
1022	COPPER	(1)	WQL990873	0.003	SM3113B	5/13/99	0.001	53089
1025	FLUORIDE	(2.0)	WQL990873	0.28	300.0A	4/28/99	0.05	53089
1028	IRON	(0.3)	WQL990873	0.042	SM3113B	5/27/99	0.001	53089
1032	MANGANESE	(0.05)	WQL990873	BDL	SM3113B	5/13/99	0.02	53089
1050	SILVER	(0.1)	WQL990873	BDL	SM3113B	5/20/99	0.0003	53089
1055	SULFATE	(250)	WQL990873	132	300.0A	4/28/99	0.05	53089
1095	ZINC	(5)	WQL990873	0.010	SM3111B	5/13/99	0.01	53089
1905	COLOR	(15 COLOR UNITS)	WQL990873	7	SM2120B	4/27/99	0	53089
1920	ODOR	(3 threshold odor number)	WQL990873	50	SM2150B	4/27/99	1	53089
1925	pH	(6.5 - 8.5)	WQL990873	7.53	SM4500H B	4/27/99	0.1	53089
1930	TOTAL DISSOVED SOLIDS	(500)	WQL990873	360	SM2540C	5/3/99	5	53089
2905	FOAMING AGENTS	(0.5)	WQL990873	BDL	SM5540C	4/28/99	0.02	53089
	TOTAL HARDNESS		WQL990873	268	SM2340-C	4/28/99	1.0	53089
	CALCIUM		WQL990873	66.4	SM3500Ca-D	5/11/99	1.0	53089
	HYDROGEN SULFIDE		WQL990873	1.82	SM4500S-G	4/30/99	0.1	53089
	TOC		WQL990873	1.72	SM5310C	5/4/99	0.2	53089
	TURBIDITY		WQL990873	0.13 NTU	SM 2130B	4/27/99	0.01	53089
	TOTAL ALKALINITY		WQL990873	126	SM 2320B	4/28/99	1	53089

VOLATILE ORGANIC ANALYSIS
62-550.310 (2)(b)
(PWS028)

Parameter ID	Name	(MCL ug/l)	Sample Number	Analysis Result (ug/l)	Analysis Method	Analysis Date	MDL (ug/L)	Lab ID
2378	1,2,4-Trichlorobenzene	(70)	WQL990873	BDL	524.2	5/11/99	0.30	53089
2380	Cis-1,2-Dichloroethylene	(70)	WQL990873	BDL	524.2	5/11/99	0.22	53089
2955	Xylenes (Total)	(10,000	WQL990873	BDL	524.2	5/11/99	0.46	53089
2964	Dichloromethane	(5)	WQL990873	BDL	524.2	5/11/99	0.21	53089
2968	O-Dichlorobenzene	(600)	WQL990873	BDL	524.2	5/11/99	0.22	53089
2969	Para-Dichlorobenzene	(75)	WQL990873	BDL	524.2	5/11/99	0.25	53089
2976	Vinyl Chloride	(1)	WQL990873	BDL	524.2	5/11/99	0.14	53089
2977	1,1-Dichloroethylene	(7)	WQL990873	BDL	524.2	5/11/99	0.23	53089
2979	Trans-1,2-dichloroethylene	(100)	WQL990873	BDL	524.2	5/11/99	0.28	53089
2980	1,2-Dichloroethane	(3)	WQL990873	BDL	524.2	5/11/99	0.20	53089
2981	1,1,1-Trichloroethane	(200)	WQL990873	BDL	524.2	5/11/99	0.24	53089
2982	Carbon Tetrachloride	(3)	WQL990873	BDL	524.2	5/11/99	0.29	53089
2983	1,2-Dichloropropane	(5)	WQL990873	BDL	524.2	5/11/99	0.25	53089
2984	Trichloroethylene	(3)	WQL990873	BDL	524.2	5/11/99	0.24	53089
2985	1,1,2-Trichloroethane	(5)	WQL990873	BDL	524.2	5/11/99	0.20	53089
2987	Tetrachloroethylene	(3)	WQL990873	BDL	524.2	5/11/99	0.27	53089
2989	Monochlorobenzene	(100)	WQL990873	BDL	524.2	5/11/99	0.18	53089
2990	Benzene	(1)	WQL990873	BDL	524.2	5/11/99	0.23	53089
2991	Toluene	(1,000)	WQL990873	BDL	524.2	5/11/99	0.22	53089
2992	Ethylbenzene	(700)	WQL990873	BDL	524.2	5/11/99	0.23	53089
2996	Styrene	(100)	WQL990873	BDL	524.2	5/11/99	0.21	53089

PESTICIDE/PCB CHEMICAL ANALYSIS
62-550.310 (2) (c)
(PWS029)

Parameter ID	Name	(MCL ug/l)	Sample Number	Analysis Result (ug/l)	Analysis Method	Analysis Date	MDL ug/l	Lab ID
2005	Endrin	(2)	WQL990873	BDL	505	5/3/99	0.39	53089
2010	Lindane	(.2)	WQL990873	BDL	505	5/3/99	0.20	53089
2015	Methoxychlor	(40)	WQL990873	BDL	505	5/3/99	12.3	53089
2020	Toxaphene	(3)	WQL990873	BDL	505	5/3/99	1.97	53089
2031	Dalapon	(200)	WQL990873	BDL	515.1	5/7/99	6.9	53089
2032	Diquat	(20)	WQL990873	BDL	549.1	5/17/99	1.5	53089
2033	Endothall	(100)	WQL990873	BDL	548.1	5/13/99	62.1	53089
2034	Glyphosate	(700)	WQL990873	BDL	547	5/4/99	14.6	53089
2035	Di(2-Ethyhexyl) Adipate	(400)	WQL990873	BDL	506	5/18/99	2.03	53089
2036	Oxamyl (Vydate)	(200)	WQL990873	BDL	531.1	5/20/99	2.14	53089
2037	Simazine	(4)	WQL990873	BDL	507	5/30/99	0.85	53089
2039	Di(2-Ethylhexyl) Phthalate	(6)	WQL990873	BDL	506	5/18/99	1.34	53089
2040	Picloram	(500)	WQL990873	BDL	515.1	5/7/99	0.57	53089
2041	Dinoseb	(7)	WQL990873	BDL	515.1	5/7/99	1.17	53089
2043	Hexachlorocyclopentadiene	(50)	WQL990873	BDL	505	5/3/99	0.24	53089
2046	Carbofuran	(40)	WQL990873	BDL	531.1	5/20/99	1.4	53089
2050	Atrazine	(3)	WQL990873	BDL	507	5/30/99	1.01	53089
2051	Alachlor	(2)	WQL990873	BDL	507	5/30/99	1.13	53089
2065	Heptachlor	(.4)	WQL990873	BDL	505	5/3/99	0.21	53089
2067	Heptachlor Epoxide	(.2)	WQL990873	BDL	505	5/3/99	0.18	53089
2105	2,4-D	(70)	WQL990873	BDL	515.1	5/7/99	1.47	53089
2110	2,4,5-TP (Silvex)	50)	WQL990873	BDL	515.1	5/7/99	0.51	53089
2274	Hexachlorobenzene	(1)	WQL990873	BDL	505	5/3/99	0.11	53089
2306	Benzo (A) Pyrene	(.2)	WQL990873	BDL	550.1	5/27/99	0.082	53089
2326	Pentachlorophenol	(1)	WQL990873	BDL	515.1	5/7/99	0.45	53089
2383	PCB	(.5)	WQL990873	BDL	505	5/3/99	0.5	53089
2931	Dibromochloropropane	(.2)	WQL990873	BDL	504.1	5/5/99	0.047	53089
2946	Ethylene Dibromide	(.02)	WQL990873	BDL	504.1	5/5/99	0.0172	53089
2959	Chlordane	(2)	WQL990873	BDL	505	5/3/99	0.46	53089

UNREGULATED GROUP I ANALYSIS
62-550.405
(PWS035)

Parameter ID	Name	Sample Number	Analysis Result (ug/l)	Analysis Method	Analysis Date	MDL (ug/l)	Lab ID
2021	CARBARYL	WQL990873	BDL	531.1	5/20/99	1.97	53089
2022	METHOMYL	WQL990873	BDL	531.1	5/20/99	1.54	53089
2043	ALDICARB SULFOXIDE	WQL990873	BDL	531.1	5/20/99	1.77	53089
2044	ALDICARB SULFONE	WQL990873	BDL	531.1	5/20/99	1.77	53089
2045	METOLACHLOR	WQL990873	BDL	507	5/30/99	1.1	53089
2047	ALDICARB	WQL990873	BDL	531.1	5/20/99	2.03	53089
2066	3-HYDROXYCARBOFURAN	WQL990873	BDL	531.1	5/20/99	3.62	53089
2076	BUTACHLOR	WQL990873	BDL	507	5/30/99	1.13	53089
2077	PROPACHLOR	WQL990873	BDL	508	5/30/99	2.0	53089
2356	ALDRIN	WQL990873	BDL	505	5/3/99	0.26	53089
2364	DIELDRIN	WQL990873	BDL	505	5/3/99	0.18	53089
2440	DICAMBA	WQL990873	BDL	515.1	5/7/99	0.36	53089
2595	METRIBUZIN	WQL990873	BDL	507	5/30/99	0.79	53089

UNREGULATED GROUP II ANALYSIS
62-550.410
(PWS034)

Parameter ID	Name	Sample Number	Analysis Result (ug/L)	Analysis Method	Analysis Date	MDL (ug/L)	Lab ID
2210	Chloromethane	WQL990873	BDL	524.2	5/11/99	0.41	53089
2212	Dichlorodifluoromethane	WQL990873	BDL	524.2	5/11/99	0.43	53089
2214	Bromomethane	WQL990873	BDL	524.2	5/11/99	1.04	53089
2216	Chloroethane	WQL990873	BDL	524.2	5/11/99	0.49	53089
2218	Trichlorofluoromethane	WQL990873	BDL	524.2	5/11/99	0.57	53089
2251	Methyl-Tert-Butyl-Ether	WQL990873	BDL	524.2	5/11/99	0.70	53089
2408	Dibromomethane	WQL990873	BDL	524.2	5/11/99	0.28	53089
2410	1,1-Dichloropropylene	WQL990873	BDL	524.2	5/11/99	0.24	53089
2412	1,3-Dichloropropane	WQL990873	BDL	524.2	5/11/99	0.21	53089
2413	1,3-Dichloropropene	WQL990873	BDL	524.2	5/11/99	0.42	53089
2414	1,2,3-Trichloroptopane	WQL990873	BDL	524.2	5/11/99	0.22	53089
2416	2,2-Dichloropropane	WQL990873	BDL	524.2	5/11/99	0.26	53089
2941	Chloroform	WQL990873	BDL	524.2	5/11/99	0.28	53089
2942	Bromoform	WQL990873	BDL	524.2	5/11/99	0.50	53089
2943	Bromodichloromethane	WQL990873	BDL	524.2	5/11/99	0.21	53089
2944	Dibromochloromethane	WQL990873	BDL	524.2	5/11/99	0.34	53089
2965	O-Chlorotoluene	WQL990873	BDL	524.2	5/11/99	0.25	53089
2966	P-Chlorotoluene	WQL990873	BDL	524.2	5/11/99	0.26	53089
2967	M-Dichlorobenzene	WQL990873	BDL	524.2	5/11/99	0.26	53089
2978	1,1-Dichloroethane	WQL990873	BDL	524.2	5/11/99	0.23	53089
2986	1,1,1,2-Tetrachloroethane	WQL990873	BDL	524.2	5/11/99	0.24	53089
2988	1,1,2,2-Tetrachloroethane	WQL990873	BDL	524.2	5/11/99	0.22	53089
2993	Bromobenzene	WQL990873	BDL	524.2	5/11/99	0.25	53089

UNREGULATED GROUP III ANALYSIS
62-550.415
(PWS036 & 037*)

Parameter ID	Name	Sample Number	Analysis Result (ug/L)	Analysis Method	Analysis Date	MDL (ug/L)	Lab ID
2262	Isophorone	WQL990873	BDL	625	6/11/99	2.7	53089
2270	2,4-Dinitrotoluene	WQL990873	BDL	625	6/11/99	1.12	53089
2282	Dimethylphthalate	WQL990873	BDL	625	6/11/99	0.97	53089
2284	Diethylphthalate	WQL990873	BDL	625	6/11/99	1.05	53089
2290	Di-N-Butylphthalate	WQL990873	BDL	625	6/11/99	0.92	53089
2294	Butyl Benzyl Phthalate	WQL990873	BDL	625	6/11/99	0.89	53089
9089	Di-n-octyl phthalate	WQL990873	BDL	625	6/11/99	1.5	53089
9108*	2-Chlorophenol	WQL990873	BDL	625	6/11/99	6.3	53089
9112*	2-Methyl-4,6-Dinitrophenol	WQL990873	BDL	625	6/11/99	6.0	53089
9115*	Phenol	WQL990873	BDL	625	6/11/99	5.5	53089
9116*	2,4,6-Trichlorophenol	WQL990873	BDL	625	6/11/99	3.5	53089

PUBLIC DRINKING WATER ANALYSIS

PUBLIC WATER SYSTEM INFORMATION

System Name: ORLANDO UTILITIES COMMISSION I.D. #: UNKNOWN

Address: 500 S. ORANGE AVE., P.O. BOX 3193, ORLANDO FLORIDA 32802 Phone #: 407 244-8779

Type (check one): (X) Community ( ) Nontransient Noncommunity ( ) Noncommunity

SAMPLE INFORMATION

Sample Date: 04/27/99 Sample Time: 16:00

Sample Location: SOUTHEAST WTP WELL #2

Sampler Name: D. BRADSHAW Phone #: 407 244-8779

Sampler's Signature: Deborah J. Bradshaw Title: SR. ENGINEER

Check Type(s):

- [ ] Distribution
- [ ] Clearance
- [ ] Distrib entry pt
- [ ] Recheck of MCL
- [ ] Thm Max Res Time
- [X] Raw
- [ ] Resample of Lab Invalidated Sample
- [ ] Plant Tap
- [ ] Composite of Multiple Sites
  Attach a format for each site

LABORATORY CERTIFICATION INFORMATION

Lab Name: Orlando Utilities Commission HRS #: 53089 Expiration Date: 6/30/00

Address: 3800 Gardenia Ave., Orlando, Florida 32803 Phone #: 407 244-8779

Subcontracted Lab HRS #: 83170

ANALYSIS INFORMATION:

SAMPLE #: 9904494-01

Date Sample(s) Received: 04/29/99 Group(s) Analyzed & Results attached for compliance with 62-550, F.A.C.:

- [ ] Nitrate Only
- [ ] Nitrite Only
- [ ] Asbestos Only
- [ ] Trihalomethanes
- Inorganics [ ] All [ ] Partial
- Volatile Organics– [ ] All [ ] Partial
- Secondaries– [ ] All [ ] Partial
- Pesticide/PCBs– [ ] ALL [ ] PARTIAL
- Group I Unregulateds [ ] All [ ] Partial
- Group II Unregulateds– [ ] All [ ] Partial
- Group III Unregulateds– [ ] All [ ] Partial
- Radiochemicals– [X] Single Sample [ ] Qtrly Composite**

**Provide radiochemical sample dates & locations for each quarter

I, Richard A. Dunham, do HEREBY CERTIFY that all attached analytical data are correct.

Signature Richard A. Dunham

Title Manager, Water Quality Laboratory Date 07/02/99

COMPLIANCE INFORMATION

Sample Collection Satisfactory: _____ Sample Analysis Satisfactory: _____

Resample Requested for: _____ Reason: _____

Person notified to resample: _____ Date Notified: _____

DEP/HRS Reviewing Official:

RADIOCHEMICAL ANALYSIS
62-550.310(5)
(PWS033)

Parameter ID	Name	Sample Number	Analysis Result (pCi/L)	Analysis Method	Analysis Date	ERROR	Lab ID
4000	GROSS ALPHA	9904494-01	5.2	EPA900.0	4/29/99	2.6	83170

OUC
Orlando Utilities Commission
The *Reliable* One

ORLANDO UTILITIES COMMISSION

WATER ENGINEERING & TECHNICAL SUPPORT
3800 GARDENIA AVE. P.O. BOX 3193 ORLANDO, FLORIDA 32839
TELEPHONE: (407)-244-8703 FAX: (407)-649-4420

DATE: 6/9/99 **TIME SENT:** 4:00 **TOTAL NO. OF PAGES:** 1

SEND TO: **NAME:** Jon W

COMPANY:

FAX NUMBER:

FROM: **NAME:** Bob B **EXT:**

COMMENTS:

ORLANDO UTILITIES COMMISSION

To: Jon W 896-1132 fax

Date: Well # 2 (SE)

Ca	66.4 mg/L
Mg	14.3
Na	12.4
Cl⁻	16.6
Sulfate	129 mg/L
Bicarbonate (Total Alk)	126 mg/L

K:\DES\REEWETSFAX.WPD

Appendix 7

Aquifer Testing Results

Date Tuesday February 2, 1999 1:38 PM
PlotFile C:\OUCSE101.PRN
DataFile C:\OUCSE1.DAT
OUC SE WELL #1 Step Test
Time of First Log in Specified Window
2/2/99 9:13:36

Static = 34.8'

Date	Time	Minutes	30 psi	WL	
2/2/99	9:13:36	0.00	0.03	34.83	1780 gpm
2/2/99	9:13:38	0.02	0.03	34.83	
2/2/99	9:13:38	0.03	-0.04	34.76	
2/2/99	9:13:39	0.05	-0.04	34.76	
2/2/99	9:13:40	0.06	-0.04	34.76	
2/2/99	9:13:41	0.08	0.03	34.83	
2/2/99	9:13:42	0.10	0.03	34.83	
2/2/99	9:13:43	0.12	-0.04	34.76	
2/2/99	9:13:44	0.13	0.03	34.83	
2/2/99	9:13:45	0.15	-0.11	34.69	
2/2/99	9:13:47	0.17	-0.04	34.76	
2/2/99	9:13:48	0.19	-0.04	34.76	
2/2/99	9:13:48	0.20	0.03	34.83	
2/2/99	9:13:49	0.22	0.03	34.83	
2/2/99	9:13:50	0.23	-0.04	34.76	
2/2/99	9:13:51	0.25	-0.04	34.76	
2/2/99	9:13:52	0.26	0.03	34.83	
2/2/99	9:13:53	0.28	-0.04	34.76	
2/2/99	9:13:54	0.30	0.03	34.83	
2/2/99	9:13:56	0.32	-0.04	34.76	
2/2/99	9:13:57	0.34	-0.04	34.76	
2/2/99	9:13:57	0.35	0.03	34.83	
2/2/99	9:13:58	0.37	-0.04	34.76	
2/2/99	9:13:59	0.38	-0.04	34.76	
2/2/99	9:14:00	0.40	-0.04	34.76	
2/2/99	9:14:01	0.41	0.03	34.83	
2/2/99	9:14:02	0.43	0.03	34.83	
2/2/99	9:14:03	0.45	-0.04	34.76	
2/2/99	9:14:05	0.48	-0.04	34.76	
2/2/99	9:14:06	0.49	-0.04	34.76	
2/2/99	9:14:06	0.50	-0.04	34.76	
2/2/99	9:14:07	0.52	-0.11	34.69	
2/2/99	9:14:08	0.53	0.03	34.83	
2/2/99	9:14:09	0.55	0.03	34.83	
2/2/99	9:14:10	0.57	0.03	34.83	
2/2/99	9:14:11	0.58	-0.04	34.76	
2/2/99	9:14:12	0.60	-0.04	34.76	
2/2/99	9:14:14	0.62	0.03	34.83	
2/2/99	9:14:15	0.64	-0.04	34.76	
2/2/99	9:14:15	0.65	-0.04	34.76	

2/2/99	9:14:16	0.67	-0.04	34.76
2/2/99	9:14:17	0.68	0.03	34.83
2/2/99	9:14:18	0.70	-0.04	34.76
2/2/99	9:14:19	0.72	-0.04	34.76
2/2/99	9:14:20	0.73	-0.04	34.76
2/2/99	9:14:21	0.75	-0.04	34.76
2/2/99	9:14:23	0.77	-0.04	34.76
2/2/99	9:14:24	0.78	0.03	34.83
2/2/99	9:14:24	0.79	0.03	34.83
2/2/99	9:14:25	0.82	-0.04	34.76
2/2/99	9:14:26	0.83	0.03	34.83
2/2/99	9:14:27	0.85	-0.04	34.76
2/2/99	9:14:28	0.87	0.03	34.83
2/2/99	9:14:29	0.88	2.18	36.98
2/2/99	9:14:30	0.90	2.59	37.39
2/2/99	9:14:32	0.92	4.19	38.99
2/2/99	9:14:33	0.94	4.88	39.68
2/2/99	9:14:33	0.94	5.57	40.37
2/2/99	9:14:34	0.96	6.82	41.62
2/2/99	9:14:35	0.98	7.79	42.59
2/2/99	9:14:36	1.00	8.07	42.87
2/2/99	9:14:37	1.02	8.83	43.63
2/2/99	9:14:38	1.03	8.27	43.07
2/2/99	9:14:39	1.05	8.07	42.87
2/2/99	9:14:41	1.07	8.48	43.28
2/2/99	9:14:42	1.08	7.86	42.66
2/2/99	9:14:42	1.10	7.72	42.52
2/2/99	9:14:43	1.12	7.30	42.10
2/2/99	9:14:44	1.13	6.33	41.13
2/2/99	9:14:45	1.15	5.57	40.37
2/2/99	9:14:46	1.16	5.43	40.23
2/2/99	9:14:47	1.18	4.46	39.26
2/2/99	9:14:48	1.20	3.49	38.29
2/2/99	9:14:50	1.22	3.28	38.08
2/2/99	9:14:51	1.24	2.31	37.11
2/2/99	9:14:51	1.25	2.04	36.84
2/2/99	9:14:52	1.27	1.48	36.28
2/2/99	9:14:53	1.28	1.14	35.94
2/2/99	9:14:54	1.30	0.72	35.52
2/2/99	9:14:55	1.31	-0.04	34.76
2/2/99	9:14:56	1.33	0.03	34.83
2/2/99	9:14:57	1.35	-0.18	34.62
2/2/99	9:14:59	1.37	-0.74	34.07
2/2/99	9:15:00	1.39	-0.74	34.07
2/2/99	9:15:00	1.40	-0.74	34.07
2/2/99	9:15:01	1.42	-0.53	34.27
2/2/99	9:15:02	1.43	-0.46	34.34
2/2/99	9:15:03	1.45	-0.46	34.34
2/2/99	9:15:04	1.47	-0.46	34.34
2/2/99	9:15:05	1.48	-0.25	34.55
2/2/99	9:15:06	1.50	-0.04	34.76

2/2/99	9:15:08	1.52	0.37	35.17
2/2/99	9:15:09	1.54	0.51	35.31
2/2/99	9:15:09	1.55	0.65	35.45
2/2/99	9:15:10	1.57	0.72	35.52
2/2/99	9:15:11	1.58	0.93	35.73
2/2/99	9:15:12	1.60	1.21	36.01
2/2/99	9:15:13	1.62	1.27	36.07
2/2/99	9:15:14	1.63	1.62	36.42
2/2/99	9:15:15	1.65	1.55	36.35
2/2/99	9:15:17	1.67	1.76	36.56
2/2/99	9:15:18	1.68	1.76	36.56
2/2/99	9:15:18	1.69	1.90	36.70
2/2/99	9:15:19	1.72	1.83	36.63
2/2/99	9:15:20	1.73	1.90	36.70
2/2/99	9:15:21	1.75	1.69	36.49
2/2/99	9:15:22	1.77	1.55	36.35
2/2/99	9:15:23	1.78	1.76	36.56
2/2/99	9:15:24	1.80	1.76	36.56
2/2/99	9:15:26	1.82	1.69	36.49
2/2/99	9:15:27	1.84	1.62	36.42
2/2/99	9:15:27	1.84	1.76	36.56
2/2/99	9:15:28	1.86	1.41	36.21
2/2/99	9:15:29	1.88	1.55	36.35
2/2/99	9:15:30	1.90	1.55	36.35
2/2/99	9:15:31	1.92	1.62	36.42
2/2/99	9:15:32	1.93	1.41	36.21
2/2/99	9:15:33	1.95	1.83	36.63
2/2/99	9:15:35	1.97	1.34	36.14
2/2/99	9:15:36	1.99	1.76	36.56
2/2/99	9:15:36	2.00	1.83	36.63
2/2/99	9:15:41	2.08	2.24	37.04
2/2/99	9:15:46	2.17	2.24	37.04
2/2/99	9:15:51	2.25	1.55	36.35
2/2/99	9:15:56	2.33	1.76	36.56
2/2/99	9:16:01	2.41	1.90	36.70
2/2/99	9:16:06	2.50	2.31	37.11
2/2/99	9:16:11	2.58	1.90	36.70
2/2/99	9:16:16	2.67	1.90	36.70
2/2/99	9:16:21	2.75	1.83	36.63
2/2/99	9:16:26	2.83	1.76	36.56
2/2/99	9:16:31	2.92	2.11	36.91
2/2/99	9:16:36	3.00	1.69	36.49
2/2/99	9:16:41	3.08	1.97	36.77
2/2/99	9:16:46	3.17	2.04	36.84
2/2/99	9:16:51	3.25	1.83	36.63
2/2/99	9:16:56	3.33	1.90	36.70
2/2/99	9:17:01	3.42	1.83	36.63
2/2/99	9:17:06	3.50	1.97	36.77
2/2/99	9:17:11	3.58	1.97	36.77
2/2/99	9:17:16	3.66	2.04	36.84
2/2/99	9:17:21	3.75	1.41	36.21

2/2/99	9:17:26	3.83	1.21	36.01
2/2/99	9:17:31	3.92	1.14	35.94
2/2/99	9:17:36	4.00	0.65	35.45
2/2/99	9:17:41	4.08	0.72	35.52
2/2/99	9:17:46	4.17	1.21	36.01
2/2/99	9:17:51	4.25	1.34	36.14
2/2/99	9:17:56	4.33	1.69	36.49
2/2/99	9:18:01	4.42	1.83	36.63
2/2/99	9:18:06	4.50	1.90	36.70
2/2/99	9:18:11	4.58	1.76	36.56
2/2/99	9:18:16	4.67	1.62	36.42
2/2/99	9:18:21	4.75	3.08	37.88
2/2/99	9:18:26	4.83	3.98	38.78
2/2/99	9:18:31	4.91	5.85	40.65
2/2/99	9:18:36	5.00	7.51	42.31
2/2/99	9:18:51	5.25	6.61	41.41
2/2/99	9:19:06	5.50	7.44	42.24
2/2/99	9:19:21	5.75	7.65	42.45
2/2/99	9:19:36	6.00	8.69	43.49
2/2/99	9:19:51	6.25	9.59	44.39
2/2/99	9:20:06	6.50	9.66	44.46
2/2/99	9:20:21	6.75	10.35	45.15
2/2/99	9:20:36	7.00	10.08	44.88
2/2/99	9:20:51	7.25	9.87	44.67
2/2/99	9:21:06	7.50	10.42	45.22
2/2/99	9:21:21	7.75	10.21	45.01
2/2/99	9:21:36	8.00	9.80	44.60
2/2/99	9:21:51	8.25	10.15	44.95
2/2/99	9:22:06	8.50	10.21	45.01
2/2/99	9:22:21	8.75	10.08	44.88
2/2/99	9:22:36	9.00	10.42	45.22
2/2/99	9:22:51	9.25	10.21	45.01
2/2/99	9:23:06	9.50	10.08	44.88
2/2/99	9:23:21	9.75	9.73	44.53
2/2/99	9:23:36	10.00	10.28	45.08
2/2/99	9:26:36	13.00	10.01	44.81
2/2/99	9:29:36	16.00	10.35	45.15
2/2/99	9:32:36	19.00	10.84	45.64
2/2/99	9:35:36	22.00	10.56	45.36
2/2/99	9:38:36	25.00	10.28	45.08
2/2/99	9:41:36	28.00	10.98	45.78
2/2/99	9:44:36	31.00	10.56	45.36
2/2/99	9:47:36	34.00	10.70	45.50
2/2/99	9:50:36	37.00	10.77	45.57
2/2/99	9:53:36	40.00	10.56	45.36
2/2/99	9:56:36	43.00	11.25	46.05
2/2/99	9:59:36	46.00	10.98	45.78
2/2/99	10:02:36	49.00	10.35	45.15
2/2/99	10:05:36	52.00	10.77	45.57
2/2/99	10:08:36	55.00	10.49	45.29
2/2/99	10:11:36	58.00	10.91	45.71

2/2/99	10:14:36	61.00	10.77	45.57
2/2/99	10:15:24	61.79	10.35	45.15
2/2/99	10:15:25	61.81	10.84	45.64
2/2/99	10:15:26	61.83	10.84	45.64
2/2/99	10:15:27	61.85	10.70	45.50
2/2/99	10:15:28	61.87	10.98	45.78
2/2/99	10:15:29	61.88	11.25	46.05
2/2/99	10:15:30	61.90	10.70	45.50
2/2/99	10:15:31	61.92	10.91	45.71
2/2/99	10:15:32	61.93	10.77	45.57
2/2/99	10:15:33	61.95	10.91	45.71
2/2/99	10:15:35	61.97	10.91	45.71
2/2/99	10:15:36	61.98	10.56	45.36
2/2/99	10:15:36	61.99	11.12	45.92
2/2/99	10:15:37	62.02	10.56	45.36
2/2/99	10:15:38	62.03	10.84	45.64
2/2/99	10:15:39	62.05	10.77	45.57
2/2/99	10:15:40	62.07	10.84	45.64
2/2/99	10:15:41	62.08	11.25	46.05
2/2/99	10:15:42	62.10	10.49	45.29
2/2/99	10:15:44	62.13	10.49	45.29
2/2/99	10:15:45	62.14	11.19	45.99
2/2/99	10:15:45	62.14	11.12	45.92
2/2/99	10:15:46	62.16	11.12	45.92
2/2/99	10:15:47	62.18	10.70	45.50
2/2/99	10:15:48	62.20	10.63	45.43
2/2/99	10:15:49	62.22	11.25	46.05
2/2/99	10:15:50	62.23	10.42	45.22
2/2/99	10:15:51	62.25	10.15	44.95
2/2/99	10:15:53	62.28	10.35	45.15
2/2/99	10:15:54	62.29	11.46	46.26
2/2/99	10:15:54	62.30	10.91	45.71
2/2/99	10:15:55	62.32	10.98	45.78
2/2/99	10:15:56	62.33	10.56	45.36
2/2/99	10:15:57	62.35	10.56	45.36
2/2/99	10:15:58	62.36	10.35	45.15
2/2/99	10:15:59	62.38	10.63	45.43
2/2/99	10:16:00	62.40	11.12	45.92
2/2/99	10:16:02	62.43	10.42	45.22
2/2/99	10:16:03	62.44	10.56	45.36
2/2/99	10:16:03	62.45	10.84	45.64
2/2/99	10:16:04	62.47	10.42	45.22
2/2/99	10:16:05	62.48	10.49	45.29
2/2/99	10:16:06	62.50	10.70	45.50
2/2/99	10:16:07	62.51	11.39	46.19
2/2/99	10:16:08	62.53	10.70	45.50
2/2/99	10:16:09	62.55	10.91	45.71
2/2/99	10:16:11	62.58	10.42	45.22
2/2/99	10:16:12	62.59	10.77	45.57
2/2/99	10:16:12	62.60	10.35	45.15
2/2/99	10:16:13	62.62	11.12	45.92

2/2/99	10:16:14	62.63	11.25	46.05	
2/2/99	10:16:15	62.65	10.84	45.64	
2/2/99	10:16:16	62.67	10.56	45.36	
2/2/99	10:16:17	62.68	10.56	45.36	
2/2/99	10:16:18	62.70	10.70	45.50	
2/2/99	10:16:20	62.72	10.98	45.78	
2/2/99	10:16:21	62.74	10.84	45.64	
2/2/99	10:16:21	62.75	10.84	45.64	
2/2/99	10:16:22	62.77	10.77	45.57	
2/2/99	10:16:23	62.78	10.84	45.64	
2/2/99	10:16:24	62.80	10.77	45.57	
2/2/99	10:16:25	62.82	10.56	45.36	
2/2/99	10:16:26	62.83	11.05	45.85	
2/2/99	10:16:27	62.85	10.91	45.71	
2/2/99	10:16:29	62.87	11.12	45.92	
2/2/99	10:16:30	62.88	11.12	45.92	
2/2/99	10:16:30	62.89	10.77	45.57	
2/2/99	10:16:31	62.92	10.70	45.50	
2/2/99	10:16:32	62.93	10.77	45.57	
2/2/99	10:16:33	62.95	10.70	45.50	
2/2/99	10:16:34	62.97	10.77	45.57	
2/2/99	10:16:35	62.98	10.56	45.36	
2/2/99	10:16:36	63.00	11.19	45.99	
2/2/99	10:16:38	63.03	11.25	46.05	
2/2/99	10:16:39	63.04	11.12	45.92	
2/2/99	10:16:39	63.04	10.35	45.15	
2/2/99	10:16:40	63.06	10.91	45.71	
2/2/99	10:16:41	63.08	10.91	45.71	
2/2/99	10:16:42	63.10	11.19	45.99	
2/2/99	10:16:43	63.12	11.19	45.99	
2/2/99	10:16:44	63.13	11.39	46.19	
2/2/99	10:16:45	63.15	11.53	46.33	
2/2/99	10:16:47	63.18	11.81	46.61	
2/2/99	10:16:48	63.19	11.53	46.33	
2/2/99	10:16:48	63.20	12.02	46.82	2380 gpm
2/2/99	10:16:49	63.22	12.22	47.02	
2/2/99	10:16:50	63.23	12.85	47.65	
2/2/99	10:16:51	63.25	12.64	47.44	
2/2/99	10:16:52	63.26	12.78	47.58	
2/2/99	10:16:53	63.28	13.26	48.06	
2/2/99	10:16:54	63.30	13.33	48.13	
2/2/99	10:16:56	63.33	14.03	48.83	
2/2/99	10:16:57	63.34	13.61	48.41	
2/2/99	10:16:57	63.35	13.96	48.76	
2/2/99	10:16:58	63.37	14.16	48.96	
2/2/99	10:16:59	63.38	14.03	48.83	
2/2/99	10:17:00	63.40	14.44	49.24	
2/2/99	10:17:01	63.41	14.23	49.03	
2/2/99	10:17:02	63.43	14.51	49.31	
2/2/99	10:17:03	63.45	15.20	50.00	
2/2/99	10:17:05	63.48	14.86	49.66	

2/2/99	10:17:06	63.49	14.72	49.52
2/2/99	10:17:06	63.50	15.27	50.07
2/2/99	10:17:07	63.52	14.65	49.45
2/2/99	10:17:08	63.53	15.20	50.00
2/2/99	10:17:09	63.55	15.20	50.00
2/2/99	10:17:10	63.57	15.90	50.70
2/2/99	10:17:11	63.58	15.69	50.49
2/2/99	10:17:12	63.60	16.31	51.11
2/2/99	10:17:14	63.62	15.97	50.77
2/2/99	10:17:15	63.64	16.66	51.46
2/2/99	10:17:15	63.65	16.31	51.11
2/2/99	10:17:16	63.67	15.62	50.42
2/2/99	10:17:17	63.68	15.83	50.63
2/2/99	10:17:18	63.70	15.76	50.56
2/2/99	10:17:19	63.72	15.76	50.56
2/2/99	10:17:20	63.73	16.59	51.39
2/2/99	10:17:21	63.75	15.83	50.63
2/2/99	10:17:23	63.77	16.59	51.39
2/2/99	10:17:24	63.78	16.17	50.97
2/2/99	10:17:24	63.79	16.11	50.91
2/2/99	10:17:29	63.88	16.31	51.11
2/2/99	10:17:34	63.96	16.73	51.53
2/2/99	10:17:39	64.05	16.66	51.46
2/2/99	10:17:44	64.13	15.76	50.56
2/2/99	10:17:49	64.22	16.45	51.25
2/2/99	10:17:54	64.30	15.62	50.42
2/2/99	10:17:59	64.38	16.11	50.91
2/2/99	10:18:04	64.47	16.38	51.18
2/2/99	10:18:09	64.55	16.38	51.18
2/2/99	10:18:14	64.63	16.45	51.25
2/2/99	10:18:19	64.72	16.80	51.60
2/2/99	10:18:24	64.80	16.45	51.25
2/2/99	10:18:29	64.88	16.73	51.53
2/2/99	10:18:34	64.97	16.59	51.39
2/2/99	10:18:39	65.05	16.73	51.53
2/2/99	10:18:44	65.13	16.31	51.11
2/2/99	10:18:49	65.21	16.24	51.04
2/2/99	10:18:54	65.30	17.28	52.08
2/2/99	10:18:59	65.38	16.31	51.11
2/2/99	10:19:04	65.47	17.14	51.94
2/2/99	10:19:09	65.55	16.38	51.18
2/2/99	10:19:14	65.63	16.45	51.25
2/2/99	10:19:19	65.72	16.52	51.32
2/2/99	10:19:24	65.80	16.66	51.46
2/2/99	10:19:29	65.88	16.24	51.04
2/2/99	10:19:34	65.96	16.31	51.11
2/2/99	10:19:39	66.05	16.24	51.04
2/2/99	10:19:44	66.13	17.21	52.01
2/2/99	10:19:49	66.22	16.94	51.74
2/2/99	10:19:54	66.30	17.01	51.81
2/2/99	10:19:59	66.38	16.73	51.53

2/2/99	10:20:04	66.46	16.17	50.97
2/2/99	10:20:09	66.55	17.01	51.81
2/2/99	10:20:14	66.63	16.66	51.46
2/2/99	10:20:19	66.72	17.08	51.88
2/2/99	10:20:24	66.80	16.31	51.11
2/2/99	10:20:39	67.05	16.66	51.46
2/2/99	10:20:54	67.30	16.17	50.97
2/2/99	10:21:09	67.55	16.73	51.53
2/2/99	10:21:24	67.80	16.66	51.46
2/2/99	10:21:39	68.05	16.52	51.32
2/2/99	10:21:54	68.30	17.01	51.81
2/2/99	10:22:09	68.55	17.35	52.15
2/2/99	10:22:24	68.80	16.59	51.39
2/2/99	10:22:39	69.05	17.21	52.01
2/2/99	10:22:54	69.30	17.08	51.88
2/2/99	10:23:09	69.55	17.28	52.08
2/2/99	10:23:24	69.80	16.87	51.67
2/2/99	10:23:39	70.05	16.17	50.97
2/2/99	10:23:54	70.30	17.08	51.88
2/2/99	10:24:09	70.55	16.66	51.46
2/2/99	10:24:24	70.80	16.87	51.67
2/2/99	10:24:39	71.05	16.87	51.67
2/2/99	10:24:54	71.30	16.59	51.39
2/2/99	10:25:09	71.55	17.49	52.29
2/2/99	10:25:24	71.80	16.87	51.67
2/2/99	10:28:24	74.80	16.66	51.46
2/2/99	10:31:24	77.80	16.94	51.74
2/2/99	10:34:24	80.80	17.35	52.15
2/2/99	10:37:24	83.80	17.28	52.08
2/2/99	10:40:24	86.80	16.80	51.60
2/2/99	10:43:24	89.80	17.28	52.08
2/2/99	10:46:24	92.80	16.66	51.46
2/2/99	10:49:24	95.80	17.70	52.50
2/2/99	10:52:24	98.80	16.87	51.67
2/2/99	10:55:24	101.80	16.66	51.46
2/2/99	10:58:24	104.80	17.35	52.15
2/2/99	11:01:24	107.80	17.70	52.50
2/2/99	11:04:24	110.80	17.84	52.64
2/2/99	11:07:24	113.80	17.70	52.50
2/2/99	11:10:24	116.80	16.87	51.67
2/2/99	11:13:24	119.80	17.28	52.08
2/2/99	11:15:13	121.60	17.21	52.01
2/2/99	11:15:14	121.62	17.08	51.88
2/2/99	11:15:14	121.63	17.21	52.01
2/2/99	11:15:15	121.65	17.01	51.81
2/2/99	11:15:16	121.67	17.42	52.22
2/2/99	11:15:17	121.68	17.01	51.81
2/2/99	11:15:18	121.70	16.87	51.67
2/2/99	11:15:19	121.72	17.91	52.71
2/2/99	11:15:20	121.73	17.42	52.22
2/2/99	11:15:21	121.75	16.52	51.32

2/2/99	11:15:23	121.78	16.80	51.60	
2/2/99	11:15:24	121.79	16.73	51.53	
2/2/99	11:15:24	121.80	17.08	51.88	
2/2/99	11:15:25	121.82	16.38	51.18	
2/2/99	11:15:26	121.83	16.87	51.67	
2/2/99	11:15:27	121.85	17.56	52.36	
2/2/99	11:15:28	121.87	17.08	51.88	
2/2/99	11:15:29	121.88	16.38	51.18	
2/2/99	11:15:30	121.90	17.70	52.50	
2/2/99	11:15:32	121.92	16.45	51.25	
2/2/99	11:15:33	121.93	17.49	52.29	
2/2/99	11:15:33	121.94	17.63	52.43	
2/2/99	11:15:34	121.97	16.94	51.74	
2/2/99	11:15:35	121.98	17.49	52.29	
2/2/99	11:15:36	122.00	16.66	51.46	
2/2/99	11:15:37	122.02	17.21	52.01	
2/2/99	11:15:38	122.03	16.94	51.74	
2/2/99	11:15:39	122.05	16.73	51.53	
2/2/99	11:15:41	122.08	17.49	52.29	
2/2/99	11:15:42	122.08	17.14	51.94	
2/2/99	11:15:42	122.09	17.28	52.08	
2/2/99	11:15:43	122.11	17.98	52.78	
2/2/99	11:15:44	122.13	16.80	51.60	
2/2/99	11:15:45	122.15	17.70	52.50	
2/2/99	11:15:46	122.17	18.95	53.75	
2/2/99	11:15:47	122.18	19.36	54.16	
2/2/99	11:15:48	122.20	19.57	54.37	
2/2/99	11:15:50	122.23	20.89	55.69	
2/2/99	11:15:51	122.24	21.37	56.17	
2/2/99	11:15:51	122.25	21.44	56.24	3490 gpm
2/2/99	11:15:52	122.26	22.41	57.21	
2/2/99	11:15:53	122.28	25.25	60.05	
2/2/99	11:15:54	122.30	24.84	59.64	
2/2/99	11:15:55	122.32	25.46	60.26	
2/2/99	11:15:56	122.33	27.19	61.99	
2/2/99	11:15:57	122.35	25.60	60.40	
2/2/99	11:15:59	122.38	28.44	63.24	
2/2/99	11:16:00	122.39	27.89	62.69	
2/2/99	11:16:00	122.40	27.96	62.76	
2/2/99	11:16:01	122.42	28.79	63.59	
2/2/99	11:16:02	122.43	29.41	64.21	
2/2/99	11:16:03	122.45	29.00	63.80	
2/2/99	11:16:04	122.46	28.93	63.73	
2/2/99	11:16:05	122.48	29.20	64.00	
2/2/99	11:16:06	122.50	29.62	64.42	
2/2/99	11:16:08	122.53	28.93	63.73	
2/2/99	11:16:09	122.54	29.34	64.14	
2/2/99	11:16:09	122.55	29.00	63.80	
2/2/99	11:16:10	122.57	29.90	64.70	
2/2/99	11:16:11	122.58	29.48	64.28	
2/2/99	11:16:12	122.60	29.90	64.70	

2/2/99	11:16:13	122.62	29.13	63.93
2/2/99	11:16:14	122.63	29.76	64.56
2/2/99	11:16:15	122.65	29.83	64.63
2/2/99	11:16:17	122.68	28.23	63.03
2/2/99	11:16:18	122.69	30.38	65.18
2/2/99	11:16:18	122.70	29.76	64.56
2/2/99	11:16:19	122.72	28.79	63.59
2/2/99	11:16:20	122.73	30.59	65.39
2/2/99	11:16:21	122.75	29.90	64.70
2/2/99	11:16:22	122.77	29.13	63.93
2/2/99	11:16:23	122.78	28.16	62.96
2/2/99	11:16:24	122.80	28.93	63.73
2/2/99	11:16:26	122.82	30.10	64.90
2/2/99	11:16:27	122.83	29.69	64.49
2/2/99	11:16:27	122.84	28.44	63.24
2/2/99	11:16:28	122.87	30.59	65.39
2/2/99	11:16:29	122.88	31.00	65.80
2/2/99	11:16:30	122.90	30.66	65.46
2/2/99	11:16:31	122.92	31.00	65.80
2/2/99	11:16:32	122.93	30.59	65.39
2/2/99	11:16:33	122.95	29.69	64.49
2/2/99	11:16:35	122.98	29.69	64.49
2/2/99	11:16:36	122.98	30.80	65.60
2/2/99	11:16:36	122.99	30.59	65.39
2/2/99	11:16:37	123.01	29.62	64.42
2/2/99	11:16:38	123.03	29.69	64.49
2/2/99	11:16:39	123.05	29.13	63.93
2/2/99	11:16:40	123.07	28.79	63.59
2/2/99	11:16:41	123.08	29.20	64.00
2/2/99	11:16:42	123.10	28.93	63.73
2/2/99	11:16:44	123.13	30.45	65.25
2/2/99	11:16:45	123.14	30.80	65.60
2/2/99	11:16:45	123.15	31.14	65.94
2/2/99	11:16:46	123.16	30.66	65.46
2/2/99	11:16:47	123.18	30.52	65.32
2/2/99	11:16:48	123.20	30.31	65.11
2/2/99	11:16:49	123.22	31.00	65.80
2/2/99	11:16:50	123.23	30.45	65.25
2/2/99	11:16:51	123.25	29.62	64.42
2/2/99	11:16:53	123.28	30.24	65.04
2/2/99	11:16:54	123.29	30.52	65.32
2/2/99	11:16:54	123.30	29.62	64.42
2/2/99	11:16:55	123.32	29.97	64.77
2/2/99	11:16:56	123.33	29.97	64.77
2/2/99	11:16:57	123.35	29.55	64.35
2/2/99	11:16:58	123.36	29.83	64.63
2/2/99	11:16:59	123.38	30.17	64.97
2/2/99	11:17:00	123.40	30.66	65.46
2/2/99	11:17:02	123.43	30.45	65.25
2/2/99	11:17:03	123.44	29.34	64.14
2/2/99	11:17:03	123.45	30.03	64.83

2/2/99	11:17:04	123.47	29.90	64.70
2/2/99	11:17:05	123.48	29.27	64.07
2/2/99	11:17:06	123.50	30.38	65.18
2/2/99	11:17:07	123.52	30.38	65.18
2/2/99	11:17:08	123.53	29.97	64.77
2/2/99	11:17:09	123.55	30.87	65.67
2/2/99	11:17:11	123.58	30.03	64.83
2/2/99	11:17:12	123.59	31.56	66.36
2/2/99	11:17:12	123.60	30.10	64.90
2/2/99	11:17:17	123.68	30.94	65.74
2/2/99	11:17:22	123.77	30.38	65.18
2/2/99	11:17:27	123.85	30.31	65.11
2/2/99	11:17:32	123.93	30.31	65.11
2/2/99	11:17:37	124.02	32.18	66.98
2/2/99	11:17:42	124.10	30.80	65.60
2/2/99	11:17:47	124.18	31.07	65.87
2/2/99	11:17:52	124.26	30.73	65.53
2/2/99	11:17:57	124.35	31.63	66.43
2/2/99	11:18:02	124.43	30.38	65.18
2/2/99	11:18:07	124.52	31.49	66.29
2/2/99	11:18:12	124.60	30.45	65.25
2/2/99	11:18:17	124.68	31.70	66.50
2/2/99	11:18:22	124.77	29.62	64.42
2/2/99	11:18:27	124.85	31.28	66.08
2/2/99	11:18:32	124.93	32.53	67.33
2/2/99	11:18:37	125.02	29.97	64.77
2/2/99	11:18:42	125.10	29.34	64.14
2/2/99	11:18:47	125.18	30.59	65.39
2/2/99	11:18:52	125.27	31.70	66.50
2/2/99	11:18:57	125.35	30.38	65.18
2/2/99	11:19:02	125.43	30.31	65.11
2/2/99	11:19:07	125.51	29.76	64.56
2/2/99	11:19:12	125.60	31.35	66.15
2/2/99	11:19:17	125.68	29.48	64.28
2/2/99	11:19:22	125.77	30.73	65.53
2/2/99	11:19:27	125.85	31.14	65.94
2/2/99	11:19:32	125.93	31.21	66.01
2/2/99	11:19:37	126.02	30.52	65.32
2/2/99	11:19:42	126.10	30.73	65.53
2/2/99	11:19:47	126.18	31.63	66.43
2/2/99	11:19:52	126.26	30.80	65.60
2/2/99	11:19:57	126.35	31.14	65.94
2/2/99	11:20:02	126.43	31.56	66.36
2/2/99	11:20:07	126.52	30.38	65.18
2/2/99	11:20:12	126.60	30.73	65.53
2/2/99	11:20:27	126.85	30.31	65.11
2/2/99	11:20:42	127.10	31.28	66.08
2/2/99	11:20:57	127.35	31.63	66.43
2/2/99	11:21:12	127.60	31.56	66.36
2/2/99	11:21:27	127.85	31.07	65.87
2/2/99	11:21:42	128.10	30.38	65.18

2/2/99	11:21:57	128.35	30.66	65.46
2/2/99	11:22:12	128.60	31.42	66.22
2/2/99	11:22:27	128.85	32.18	66.98
2/2/99	11:22:42	129.10	30.17	64.97
2/2/99	11:22:57	129.35	31.00	65.80
2/2/99	11:23:12	129.60	31.00	65.80
2/2/99	11:23:27	129.85	30.17	64.97
2/2/99	11:23:42	130.10	30.31	65.11
2/2/99	11:23:57	130.35	31.49	66.29
2/2/99	11:24:12	130.60	31.98	66.78
2/2/99	11:24:27	130.85	32.46	67.26
2/2/99	11:24:42	131.10	32.67	67.47
2/2/99	11:24:57	131.35	30.45	65.25
2/2/99	11:25:12	131.60	31.42	66.22
2/2/99	11:28:12	134.60	31.42	66.22
2/2/99	11:31:12	137.60	31.35	66.15
2/2/99	11:34:12	140.60	31.14	65.94
2/2/99	11:37:12	143.60	31.70	66.50
2/2/99	11:40:12	146.60	30.73	65.53
2/2/99	11:43:12	149.60	31.77	66.57
2/2/99	11:46:12	152.60	30.87	65.67
2/2/99	11:49:12	155.60	32.46	67.26
2/2/99	11:52:12	158.60	31.42	66.22
2/2/99	11:55:12	161.60	31.70	66.50
2/2/99	11:58:12	164.60	32.32	67.12
2/2/99	12:01:12	167.60	31.63	66.43
2/2/99	12:04:12	170.60	30.87	65.67
2/2/99	12:07:12	173.60	31.35	66.15
2/2/99	12:10:12	176.60	31.63	66.43
2/2/99	12:13:12	179.60	32.32	67.12
2/2/99	12:14:27	180.84	31.77	66.57
2/2/99	12:14:28	180.87	32.39	67.19
2/2/99	12:14:29	180.88	31.28	66.08
2/2/99	12:14:31	180.91	31.49	66.29
2/2/99	12:14:32	180.92	31.70	66.50
2/2/99	12:14:32	180.93	31.49	66.29
2/2/99	12:14:33	180.95	31.84	66.64
2/2/99	12:14:34	180.96	31.28	66.08
2/2/99	12:14:35	180.98	31.91	66.71
2/2/99	12:14:36	181.00	32.60	67.40
2/2/99	12:14:37	181.02	32.46	67.26
2/2/99	12:14:38	181.03	31.77	66.57
2/2/99	12:14:40	181.06	31.98	66.78
2/2/99	12:14:41	181.07	32.18	66.98
2/2/99	12:14:41	181.08	31.70	66.50
2/2/99	12:14:42	181.10	32.81	67.61
2/2/99	12:14:43	181.12	32.53	67.33
2/2/99	12:14:44	181.13	32.88	67.68
2/2/99	12:14:45	181.15	32.88	67.68
2/2/99	12:14:46	181.16	32.04	66.84
2/2/99	12:14:47	181.18	32.39	67.19

2/2/99	12:14:49	181.21	31.70	66.50	
2/2/99	12:14:50	181.22	32.25	67.05	
2/2/99	12:14:50	181.23	33.15	67.95	
2/2/99	12:14:51	181.25	33.08	67.88	
2/2/99	12:14:52	181.27	32.88	67.68	
2/2/99	12:14:53	181.28	33.64	68.44	
2/2/99	12:14:54	181.30	32.25	67.05	
2/2/99	12:14:55	181.31	32.74	67.54	
2/2/99	12:14:56	181.33	32.74	67.54	
2/2/99	12:14:58	181.36	33.15	67.95	
2/2/99	12:14:59	181.37	33.57	68.37	
2/2/99	12:14:59	181.38	33.15	67.95	
2/2/99	12:15:00	181.40	34.40	69.20	
2/2/99	12:15:01	181.42	33.64	68.44	
2/2/99	12:15:02	181.43	33.08	67.88	
2/2/99	12:15:03	181.45	33.50	68.30	
2/2/99	12:15:04	181.47	33.01	67.81	
2/2/99	12:15:05	181.48	34.54	69.34	
2/2/99	12:15:07	181.51	34.40	69.20	
2/2/99	12:15:08	181.52	34.26	69.06	4950 gpm
2/2/99	12:15:08	181.53	35.99	70.79	
2/2/99	12:15:09	181.55	35.16	69.96	
2/2/99	12:15:10	181.57	36.96	71.76	
2/2/99	12:15:11	181.58	35.44	70.24	
2/2/99	12:15:12	181.60	38.42	73.22	
2/2/99	12:15:13	181.62	38.28	73.08	
2/2/99	12:15:14	181.63	40.01	74.81	
2/2/99	12:15:16	181.66	41.05	75.85	
2/2/99	12:15:17	181.67	43.20	78.00	
2/2/99	12:15:17	181.68	43.27	78.07	
2/2/99	12:15:18	181.70	44.17	78.97	
2/2/99	12:15:19	181.72	45.63	80.43	
2/2/99	12:15:20	181.73	45.28	80.08	
2/2/99	12:15:21	181.75	46.39	81.19	
2/2/99	12:15:22	181.77	48.54	83.34	
2/2/99	12:15:23	181.78	47.43	82.23	
2/2/99	12:15:25	181.81	51.31	86.11	
2/2/99	12:15:26	181.82	46.25	81.05	
2/2/99	12:15:26	181.83	49.58	84.38	
2/2/99	12:15:27	181.85	50.34	85.14	
2/2/99	12:15:28	181.86	49.85	84.65	
2/2/99	12:15:29	181.88	47.71	82.51	
2/2/99	12:15:30	181.90	52.28	87.08	
2/2/99	12:15:31	181.92	50.06	84.86	
2/2/99	12:15:32	181.93	51.03	85.83	
2/2/99	12:15:34	181.96	52.42	87.22	
2/2/99	12:15:35	181.97	50.13	84.93	
2/2/99	12:15:35	181.98	49.44	84.24	
2/2/99	12:15:36	182.00	51.79	86.59	
2/2/99	12:15:37	182.02	53.04	87.84	
2/2/99	12:15:38	182.03	50.62	85.42	

2/2/99	12:15:39	182.05	53.87	88.67
2/2/99	12:15:40	182.06	54.36	89.16
2/2/99	12:15:41	182.08	54.08	88.88
2/2/99	12:15:43	182.11	53.67	88.47
2/2/99	12:15:44	182.12	54.15	88.95
2/2/99	12:15:44	182.13	52.56	87.36
2/2/99	12:15:45	182.15	51.73	86.53
2/2/99	12:15:46	182.17	52.49	87.29
2/2/99	12:15:47	182.18	52.07	86.87
2/2/99	12:15:48	182.20	52.07	86.87
2/2/99	12:15:49	182.21	53.25	88.05
2/2/99	12:15:50	182.23	50.55	85.35
2/2/99	12:15:52	182.26	53.04	87.84
2/2/99	12:15:53	182.27	54.15	88.95
2/2/99	12:15:53	182.28	52.28	87.08
2/2/99	12:15:54	182.30	52.63	87.43
2/2/99	12:15:55	182.32	53.94	88.74
2/2/99	12:15:56	182.33	54.01	88.81
2/2/99	12:15:57	182.35	53.80	88.60
2/2/99	12:15:58	182.37	51.24	86.04
2/2/99	12:15:59	182.38	53.25	88.05
2/2/99	12:16:01	182.41	52.35	87.15
2/2/99	12:16:02	182.42	53.11	87.91
2/2/99	12:16:02	182.43	52.90	87.70
2/2/99	12:16:03	182.45	52.63	87.43
2/2/99	12:16:04	182.47	51.24	86.04
2/2/99	12:16:05	182.48	57.82	92.62
2/2/99	12:16:06	182.50	55.40	90.20
2/2/99	12:16:07	182.52	51.10	85.90
2/2/99	12:16:08	182.53	52.21	87.01
2/2/99	12:16:10	182.56	54.15	88.95
2/2/99	12:16:11	182.57	54.36	89.16
2/2/99	12:16:11	182.58	53.39	88.19
2/2/99	12:16:12	182.60	53.53	88.33
2/2/99	12:16:13	182.62	56.58	91.38
2/2/99	12:16:14	182.63	54.84	89.64
2/2/99	12:16:15	182.65	52.28	87.08
2/2/99	12:16:16	182.67	53.46	88.26
2/2/99	12:16:17	182.68	54.50	89.30
2/2/99	12:16:19	182.71	50.76	85.56
2/2/99	12:16:20	182.72	53.39	88.19
2/2/99	12:16:20	182.73	54.91	89.71
2/2/99	12:16:21	182.75	55.88	90.68
2/2/99	12:16:22	182.76	52.21	87.01
2/2/99	12:16:23	182.78	55.40	90.20
2/2/99	12:16:24	182.80	52.07	86.87
2/2/99	12:16:25	182.82	54.77	89.57
2/2/99	12:16:26	182.83	54.98	89.78
2/2/99	12:16:28	182.86	55.05	89.85
2/2/99	12:16:32	182.93	52.90	87.70
2/2/99	12:16:37	183.02	54.22	89.02

2/2/99	12:16:42	183.10	52.49	87.29
2/2/99	12:16:47	183.18	52.56	87.36
2/2/99	12:16:52	183.27	53.32	88.12
2/2/99	12:16:57	183.35	51.52	86.32
2/2/99	12:17:02	183.43	54.71	89.51
2/2/99	12:17:07	183.52	53.18	87.98
2/2/99	12:17:12	183.60	55.26	90.06
2/2/99	12:17:17	183.68	55.74	90.54
2/2/99	12:17:22	183.77	52.42	87.22
2/2/99	12:17:27	183.85	52.56	87.36
2/2/99	12:17:32	183.93	54.84	89.64
2/2/99	12:17:37	184.01	54.43	89.23
2/2/99	12:17:42	184.10	52.83	87.63
2/2/99	12:17:47	184.18	55.61	90.41
2/2/99	12:17:52	184.27	57.41	92.21
2/2/99	12:17:57	184.35	52.77	87.57
2/2/99	12:18:02	184.43	53.87	88.67
2/2/99	12:18:07	184.52	53.67	88.47
2/2/99	12:18:12	184.60	52.63	87.43
2/2/99	12:18:17	184.68	55.33	90.13
2/2/99	12:18:22	184.76	53.67	88.47
2/2/99	12:18:27	184.85	55.40	90.20
2/2/99	12:18:32	184.93	56.09	90.89
2/2/99	12:18:37	185.02	56.78	91.58
2/2/99	12:18:42	185.10	55.81	90.61
2/2/99	12:18:47	185.18	53.87	88.67
2/2/99	12:18:52	185.26	54.57	89.37
2/2/99	12:18:57	185.35	52.97	87.77
2/2/99	12:19:02	185.43	55.19	89.99
2/2/99	12:19:07	185.52	53.94	88.74
2/2/99	12:19:12	185.60	55.68	90.48
2/2/99	12:19:17	185.68	56.30	91.10
2/2/99	12:19:22	185.77	58.45	93.25
2/2/99	12:19:27	185.85	55.40	90.20
2/2/99	12:19:42	186.10	55.19	89.99
2/2/99	12:19:57	186.35	55.95	90.75
2/2/99	12:20:12	186.60	57.48	92.28
2/2/99	12:20:27	186.85	55.47	90.27
2/2/99	12:20:42	187.10	56.78	91.58
2/2/99	12:20:57	187.35	55.33	90.13
2/2/99	12:21:12	187.60	52.83	87.63
2/2/99	12:21:27	187.85	54.29	89.09
2/2/99	12:21:42	188.10	51.03	85.83
2/2/99	12:21:57	188.35	54.91	89.71
2/2/99	12:22:12	188.60	56.51	91.31
2/2/99	12:22:27	188.85	54.64	89.44
2/2/99	12:22:42	189.10	54.36	89.16
2/2/99	12:22:57	189.35	52.49	87.29
2/2/99	12:23:12	189.60	59.00	93.80
2/2/99	12:23:27	189.85	54.84	89.64
2/2/99	12:23:42	190.10	56.72	91.52

2/2/99	12:23:57	190.35	56.02	90.82
2/2/99	12:24:12	190.60	52.90	87.70
2/2/99	12:24:27	190.85	52.90	87.70
2/2/99	12:27:27	193.85	54.98	89.78
2/2/99	12:30:27	196.85	59.76	94.56
2/2/99	12:33:27	199.85	57.75	92.55
2/2/99	12:36:27	202.85	57.82	92.62
2/2/99	12:39:27	205.85	56.85	91.65
2/2/99	12:42:27	208.85	55.68	90.48
2/2/99	12:45:27	211.85	56.44	91.24
2/2/99	12:48:27	214.85	58.17	92.97
2/2/99	12:51:27	217.85	57.55	92.35
2/2/99	12:54:27	220.85	56.44	91.24
2/2/99	12:57:27	223.85	57.75	92.55
2/2/99	13:00:27	226.85	58.24	93.04
2/2/99	13:03:27	229.85	58.24	93.04
2/2/99	13:06:27	232.85	56.65	91.45
2/2/99	13:09:27	235.85	56.58	91.38
2/2/99	13:12:27	238.85	56.72	91.52
2/2/99	13:13:22	239.76	59.42	94.22
2/2/99	13:13:23	239.78	56.99	91.79
2/2/99	13:13:24	239.80	54.15	88.95
2/2/99	13:13:25	239.81	55.68	90.48
2/2/99	13:13:26	239.83	56.85	91.65
2/2/99	13:13:27	239.85	56.02	90.82
2/2/99	13:13:28	239.87	54.64	89.44
2/2/99	13:13:29	239.88	57.27	92.07
2/2/99	13:13:30	239.90	56.99	91.79
2/2/99	13:13:31	239.92	54.08	88.88
2/2/99	13:13:33	239.94	54.57	89.37
2/2/99	13:13:34	239.95	58.10	92.90
2/2/99	13:13:34	239.96	59.49	94.29
2/2/99	13:13:35	239.98	59.14	93.94
2/2/99	13:13:36	240.00	56.99	91.79
2/2/99	13:13:37	240.01	58.10	92.90
2/2/99	13:13:38	240.03	57.06	91.86
2/2/99	13:13:39	240.05	57.96	92.76
2/2/99	13:13:40	240.07	57.89	92.69
2/2/99	13:13:42	240.09	57.48	92.28
2/2/99	13:13:43	240.10	57.82	92.62
2/2/99	13:13:43	240.11	56.99	91.79
2/2/99	13:13:44	240.13	55.47	90.27
2/2/99	13:13:45	240.15	56.23	91.03
2/2/99	13:13:46	240.16	56.85	91.65
2/2/99	13:13:47	240.18	58.59	93.39
2/2/99	13:13:48	240.20	57.48	92.28
2/2/99	13:13:49	240.22	58.59	93.39
2/2/99	13:13:51	240.24	54.22	89.02
2/2/99	13:13:52	240.25	56.23	91.03
2/2/99	13:13:52	240.26	57.96	92.76
2/2/99	13:13:53	240.28	56.65	91.45

2/2/99	13:13:54	240.30	54.71	89.51
2/2/99	13:13:55	240.32	55.88	90.68
2/2/99	13:13:56	240.33	54.43	89.23
2/2/99	13:13:57	240.35	52.97	87.77
2/2/99	13:13:58	240.36	60.25	95.05
2/2/99	13:14:00	240.39	55.19	89.99
2/2/99	13:14:01	240.40	57.34	92.14
2/2/99	13:14:01	240.41	58.86	93.66
2/2/99	13:14:02	240.43	57.41	92.21
2/2/99	13:14:03	240.45	56.51	91.31
2/2/99	13:14:04	240.47	56.51	91.31
2/2/99	13:14:05	240.48	55.47	90.27
2/2/99	13:14:06	240.50	54.57	89.37
2/2/99	13:14:07	240.52	58.38	93.18
2/2/99	13:14:09	240.54	56.65	91.45
2/2/99	13:14:10	240.55	57.20	92.00
2/2/99	13:14:10	240.56	56.72	91.52
2/2/99	13:14:11	240.58	57.27	92.07
2/2/99	13:14:12	240.60	54.77	89.57
2/2/99	13:14:13	240.62	54.22	89.02
2/2/99	13:14:14	240.63	54.36	89.16
2/2/99	13:14:15	240.65	56.23	91.03
2/2/99	13:14:16	240.67	59.83	94.63
2/2/99	13:14:18	240.69	55.33	90.13
2/2/99	13:14:19	240.70	55.81	90.61
2/2/99	13:14:19	240.71	56.65	91.45
2/2/99	13:14:20	240.73	57.96	92.76
2/2/99	13:14:21	240.75	54.50	89.30
2/2/99	13:14:22	240.77	55.68	90.48
2/2/99	13:14:23	240.78	56.37	91.17
2/2/99	13:14:24	240.80	58.86	93.66
2/2/99	13:14:25	240.82	58.52	93.32
2/2/99	13:14:27	240.84	54.77	89.57
2/2/99	13:14:28	240.85	57.48	92.28
2/2/99	13:14:28	240.86	58.59	93.39
2/2/99	13:14:29	240.88	57.55	92.35
2/2/99	13:14:30	240.90	55.47	90.27
2/2/99	13:14:31	240.91	54.50	89.30
2/2/99	13:14:32	240.93	56.44	91.24
2/2/99	13:14:33	240.95	54.22	89.02
2/2/99	13:14:34	240.97	56.58	91.38
2/2/99	13:14:36	240.99	55.05	89.85
2/2/99	13:14:37	241.00	55.05	89.85
2/2/99	13:14:37	241.01	59.14	93.94
2/2/99	13:14:38	241.03	58.03	92.83
2/2/99	13:14:39	241.05	54.98	89.78
2/2/99	13:14:40	241.06	58.72	93.52
2/2/99	13:14:41	241.08	54.84	89.64
2/2/99	13:14:42	241.10	55.05	89.85
2/2/99	13:14:43	241.12	53.80	88.60
2/2/99	13:14:45	241.14	57.69	92.49

2/2/99	13:14:46	241.15	60.39	95.19	
2/2/99	13:14:46	241.16	54.57	89.37	
2/2/99	13:14:47	241.18	54.22	89.02	
2/2/99	13:14:48	241.20	57.34	92.14	
2/2/99	13:14:49	241.22	58.93	93.73	
2/2/99	13:14:50	241.23	55.68	90.48	
2/2/99	13:14:51	241.25	57.62	92.42	
2/2/99	13:14:52	241.26	54.01	88.81	
2/2/99	13:14:54	241.29	56.99	91.79	
2/2/99	13:14:55	241.30	57.82	92.62	
2/2/99	13:14:55	241.31	54.77	89.57	
2/2/99	13:14:56	241.33	53.80	88.60	
2/2/99	13:14:57	241.35	57.13	91.93	
2/2/99	13:14:58	241.37	59.14	93.94	
2/2/99	13:14:59	241.38	57.06	91.86	
2/2/99	13:15:00	241.40	59.70	94.50	
2/2/99	13:15:01	241.42	58.31	93.11	
2/2/99	13:15:03	241.44	55.19	89.99	
2/2/99	13:15:04	241.45	55.68	90.48	
2/2/99	13:15:04	241.46	58.93	93.73	
2/2/99	13:15:05	241.48	57.82	92.62	
2/2/99	13:15:06	241.50	57.96	92.76	
2/2/99	13:15:07	241.52	53.87	88.67	
2/2/99	13:15:08	241.53	58.93	93.73	
2/2/99	13:15:09	241.55	58.79	93.59	
2/2/99	13:15:10	241.57	57.41	92.21	
2/2/99	13:15:12	241.59	56.37	91.17	
2/2/99	13:15:13	241.60	54.84	89.64	
2/2/99	13:15:13	241.61	54.15	88.95	
2/2/99	13:15:14	241.63	57.20	92.00	
2/2/99	13:15:15	241.65	57.62	92.42	
2/2/99	13:15:16	241.67	56.92	91.72	
2/2/99	13:15:17	241.68	54.29	89.09	
2/2/99	13:15:18	241.70	58.45	93.25	
2/2/99	13:15:19	241.72	56.16	90.96	
2/2/99	13:15:21	241.74	56.92	91.72	
2/2/99	13:15:22	241.75	57.69	92.49	
2/2/99	13:15:22	241.76	56.99	91.79	
2/2/99	13:15:27	241.85	58.31	93.11	Recovery
2/2/99	13:15:32	241.93	51.93	86.73	
2/2/99	13:15:37	242.02	43.76	78.56	
2/2/99	13:15:42	242.10	33.50	68.30	
2/2/99	13:15:47	242.18	24.21	59.01	
2/2/99	13:15:52	242.27	19.02	53.82	
2/2/99	13:15:57	242.35	12.92	47.72	
2/2/99	13:16:02	242.43	6.33	41.13	
2/2/99	13:16:07	242.51	2.38	37.18	
2/2/99	13:16:12	242.60	-1.15	33.65	
2/2/99	13:16:17	242.68	-5.79	29.01	
2/2/99	13:16:22	242.77	-5.79	29.01	
2/2/99	13:16:27	242.85	-3.99	30.81	

2/2/99	13:16:32	242.93	1.34	36.14
2/2/99	13:16:37	243.02	5.85	40.65
2/2/99	13:16:42	243.10	8.14	42.94
2/2/99	13:16:47	243.18	8.41	43.21
2/2/99	13:16:52	243.26	6.82	41.62
2/2/99	13:16:57	243.35	4.39	39.19
2/2/99	13:17:02	243.43	2.18	36.98
2/2/99	13:17:07	243.52	0.79	35.59
2/2/99	13:17:12	243.60	0.51	35.31
2/2/99	13:17:17	243.68	1.00	35.80
2/2/99	13:17:22	243.76	1.97	36.77
2/2/99	13:17:27	243.85	3.15	37.95
2/2/99	13:17:32	243.93	3.77	38.57
2/2/99	13:17:37	244.02	3.98	38.78
2/2/99	13:17:42	244.10	3.70	38.50
2/2/99	13:17:47	244.18	3.01	37.81
2/2/99	13:17:52	244.27	2.31	37.11
2/2/99	13:17:57	244.35	1.90	36.70
2/2/99	13:18:02	244.43	1.62	36.42
2/2/99	13:18:07	244.51	1.76	36.56
2/2/99	13:18:12	244.60	1.97	36.77
2/2/99	13:18:17	244.68	2.31	37.11
2/2/99	13:18:22	244.77	2.59	37.39
2/2/99	13:18:37	245.02	2.45	37.25
2/2/99	13:18:52	245.27	1.90	36.70
2/2/99	13:19:07	245.52	2.04	36.84
2/2/99	13:19:22	245.76	2.18	36.98
2/2/99	13:19:37	246.02	1.90	36.70
2/2/99	13:19:52	246.27	1.83	36.63
2/2/99	13:20:07	246.52	1.97	36.77
2/2/99	13:20:22	246.77	1.76	36.56
2/2/99	13:20:37	247.01	1.69	36.49
2/2/99	13:20:52	247.27	1.62	36.42
2/2/99	13:21:07	247.52	1.62	36.42
2/2/99	13:21:22	247.76	1.55	36.35
2/2/99	13:21:37	248.02	1.55	36.35
2/2/99	13:21:52	248.26	1.55	36.35
2/2/99	13:22:07	248.52	1.48	36.28
2/2/99	13:22:22	248.77	1.48	36.28
2/2/99	13:22:37	249.01	1.41	36.21
2/2/99	13:22:52	249.27	1.48	36.28
2/2/99	13:23:07	249.52	1.41	36.21
2/2/99	13:23:22	249.77	1.34	36.14

Date Monday February 8, 1999 5:44 PM
PlotFile C:\AQTST\OUCSEW01.PRN
DataFile C:\AQTST\OUCSEW1B.DAT
OUCSE WTP - Pumped Well No. 1 3500gpm

Date	Time	Minutes	Well 1
02/08/99	8:09:55 AM	0.01	37.99
02/08/99	8:09:56 AM	0.02	39.93
02/08/99	8:09:57 AM	0.04	43.95
02/08/99	8:09:58 AM	0.06	42.77
02/08/99	8:09:59 AM	0.07	44.36
02/08/99	8:10:00 AM	0.09	46.24
02/08/99	8:10:01 AM	0.11	46.58
02/08/99	8:10:02 AM	0.13	47.69
02/08/99	8:10:04 AM	0.15	48.04
02/08/99	8:10:04 AM	0.16	47.83
02/08/99	8:10:05 AM	0.17	47.55
02/08/99	8:10:06 AM	0.19	47.14
02/08/99	8:10:07 AM	0.21	46.86
02/08/99	8:10:08 AM	0.22	45.61
02/08/99	8:10:09 AM	0.24	45.68
02/08/99	8:10:10 AM	0.26	44.85
02/08/99	8:10:11 AM	0.28	45.06
02/08/99	8:10:12 AM	0.29	45.26
02/08/99	8:10:14 AM	0.31	44.22
02/08/99	8:10:14 AM	0.32	45.54
02/08/99	8:10:15 AM	0.34	44.71
02/08/99	8:10:16 AM	0.36	45.75
02/08/99	8:10:17 AM	0.37	46.24
02/08/99	8:10:18 AM	0.39	46.58
02/08/99	8:10:19 AM	0.41	45.82
02/08/99	8:10:20 AM	0.42	47.41
02/08/99	8:10:21 AM	0.44	47.90
02/08/99	8:10:22 AM	0.46	48.45
02/08/99	8:10:24 AM	0.48	49.63
02/08/99	8:10:24 AM	0.49	49.49
02/08/99	8:10:25 AM	0.51	50.32
02/08/99	8:10:26 AM	0.52	50.46
02/08/99	8:10:27 AM	0.54	51.09
02/08/99	8:10:28 AM	0.56	50.60
02/08/99	8:10:29 AM	0.57	51.16
02/08/99	8:10:30 AM	0.59	51.50
02/08/99	8:10:31 AM	0.61	51.22
02/08/99	8:10:32 AM	0.62	51.43
02/08/99	8:10:34 AM	0.65	52.19
02/08/99	8:10:34 AM	0.66	52.33
02/08/99	8:10:35 AM	0.68	53.93
02/08/99	8:10:36 AM	0.69	54.20

02/08/99	8:10:37 AM	0.71	54.97
02/08/99	8:10:38 AM	0.72	54.55
02/08/99	8:10:39 AM	0.74	56.01
02/08/99	8:10:40 AM	0.76	57.32
02/08/99	8:10:41 AM	0.77	57.60
02/08/99	8:10:42 AM	0.79	57.74
02/08/99	8:10:44 AM	0.81	57.32
02/08/99	8:10:44 AM	0.83	59.06
02/08/99	8:10:45 AM	0.84	59.54
02/08/99	8:10:46 AM	0.86	60.44
02/08/99	8:10:47 AM	0.87	61.34
02/08/99	8:10:48 AM	0.89	61.76
02/08/99	8:10:49 AM	0.91	63.01
02/08/99	8:10:50 AM	0.92	62.45
02/08/99	8:10:51 AM	0.94	63.28
02/08/99	8:10:52 AM	0.96	64.46
02/08/99	8:10:54 AM	0.98	64.67
02/08/99	8:10:54 AM	0.99	65.57
02/08/99	8:10:55 AM	1.01	64.88
02/08/99	8:10:56 AM	1.03	65.36
02/08/99	8:10:57 AM	1.04	67.37
02/08/99	8:10:58 AM	1.06	66.47
02/08/99	8:10:59 AM	1.07	66.96
02/08/99	8:11:00 AM	1.09	67.72
02/08/99	8:11:01 AM	1.11	68.34
02/08/99	8:11:02 AM	1.12	67.86
02/08/99	8:11:04 AM	1.15	69.45
02/08/99	8:11:04 AM	1.16	68.20
02/08/99	8:11:05 AM	1.18	69.31
02/08/99	8:11:06 AM	1.19	69.80
02/08/99	8:11:07 AM	1.21	68.76
02/08/99	8:11:08 AM	1.22	70.00
02/08/99	8:11:09 AM	1.24	69.59
02/08/99	8:11:10 AM	1.26	69.66
02/08/99	8:11:11 AM	1.27	69.94
02/08/99	8:11:12 AM	1.29	70.00
02/08/99	8:11:14 AM	1.31	69.59
02/08/99	8:11:14 AM	1.32	70.21
02/08/99	8:11:15 AM	1.34	70.35
02/08/99	8:11:16 AM	1.36	69.80
02/08/99	8:11:17 AM	1.38	71.39
02/08/99	8:11:18 AM	1.39	70.07
02/08/99	8:11:19 AM	1.41	69.24
02/08/99	8:11:20 AM	1.42	69.38
02/08/99	8:11:21 AM	1.44	69.31
02/08/99	8:11:22 AM	1.46	69.38
02/08/99	8:11:24 AM	1.48	70.56
02/08/99	8:11:24 AM	1.49	69.87
02/08/99	8:11:25 AM	1.51	70.07
02/08/99	8:11:26 AM	1.52	69.45
02/08/99	8:11:27 AM	1.54	70.14

02/08/99	8:11:28 AM	1.56	69.31
02/08/99	8:11:29 AM	1.58	69.45
02/08/99	8:11:30 AM	1.59	70.07
02/08/99	8:11:31 AM	1.61	69.31
02/08/99	8:11:32 AM	1.62	70.35
02/08/99	8:11:34 AM	1.65	70.49
02/08/99	8:11:34 AM	1.66	69.52
02/08/99	8:11:35 AM	1.67	70.21
02/08/99	8:11:36 AM	1.69	69.73
02/08/99	8:11:37 AM	1.71	70.07
02/08/99	8:11:38 AM	1.73	69.45
02/08/99	8:11:39 AM	1.74	69.31
02/08/99	8:11:40 AM	1.76	69.73
02/08/99	8:11:41 AM	1.77	71.32
02/08/99	8:11:42 AM	1.79	69.45
02/08/99	8:11:44 AM	1.81	68.69
02/08/99	8:11:44 AM	1.82	69.59
02/08/99	8:11:45 AM	1.84	68.41
02/08/99	8:11:46 AM	1.86	69.87
02/08/99	8:11:47 AM	1.87	68.34
02/08/99	8:11:48 AM	1.89	68.90
02/08/99	8:11:49 AM	1.91	70.35
02/08/99	8:11:50 AM	1.93	69.59
02/08/99	8:11:51 AM	1.94	69.87
02/08/99	8:11:52 AM	1.96	69.24
02/08/99	8:11:54 AM	1.98	69.31
02/08/99	8:11:54 AM	1.99	68.97
02/08/99	8:11:55 AM	2.01	69.66
02/08/99	8:12:00 AM	2.09	69.94
02/08/99	8:12:05 AM	2.17	66.68
02/08/99	8:12:10 AM	2.26	65.15
02/08/99	8:12:15 AM	2.34	65.36
02/08/99	8:12:20 AM	2.42	63.70
02/08/99	8:12:25 AM	2.51	64.67
02/08/99	8:12:30 AM	2.59	64.81
02/08/99	8:12:35 AM	2.67	63.77
02/08/99	8:12:40 AM	2.76	64.32
02/08/99	8:12:45 AM	2.84	63.77
02/08/99	8:12:50 AM	2.92	64.88
02/08/99	8:12:55 AM	3.01	64.05
02/08/99	8:13:00 AM	3.09	64.46
02/08/99	8:13:05 AM	3.18	64.32
02/08/99	8:13:10 AM	3.26	63.21
02/08/99	8:13:15 AM	3.34	63.35
02/08/99	8:13:20 AM	3.42	64.67
02/08/99	8:13:25 AM	3.51	63.84
02/08/99	8:13:30 AM	3.59	65.15
02/08/99	8:13:35 AM	3.67	64.74
02/08/99	8:13:40 AM	3.76	63.84
02/08/99	8:13:45 AM	3.84	64.67
02/08/99	8:13:50 AM	3.92	64.11

02/08/99	8:13:55 AM	4.01	64.53
02/08/99	8:14:00 AM	4.09	64.67
02/08/99	8:14:05 AM	4.17	64.60
02/08/99	8:14:10 AM	4.26	63.91
02/08/99	8:14:15 AM	4.34	63.98
02/08/99	8:14:20 AM	4.43	66.05
02/08/99	8:14:25 AM	4.51	63.77
02/08/99	8:14:30 AM	4.59	64.95
02/08/99	8:14:35 AM	4.67	64.18
02/08/99	8:14:40 AM	4.76	64.74
02/08/99	8:14:45 AM	4.84	65.15
02/08/99	8:14:50 AM	4.92	64.74
02/08/99	8:14:55 AM	5.01	62.87
02/08/99	8:15:10 AM	5.26	64.95
02/08/99	8:15:25 AM	5.51	63.56
02/08/99	8:15:40 AM	5.76	64.25
02/08/99	8:15:55 AM	6.01	63.77
02/08/99	8:16:10 AM	6.26	64.95
02/08/99	8:16:25 AM	6.51	63.91
02/08/99	8:16:40 AM	6.76	64.81
02/08/99	8:16:55 AM	7.01	64.46
02/08/99	8:17:10 AM	7.26	64.18
02/08/99	8:17:25 AM	7.51	64.81
02/08/99	8:17:40 AM	7.76	64.46
02/08/99	8:17:55 AM	8.01	64.53
02/08/99	8:18:10 AM	8.26	64.11
02/08/99	8:18:25 AM	8.51	64.88
02/08/99	8:18:40 AM	8.76	63.98
02/08/99	8:18:55 AM	9.01	64.18
02/08/99	8:19:10 AM	9.26	65.02
02/08/99	8:19:25 AM	9.51	64.46
02/08/99	8:19:40 AM	9.76	64.74
02/08/99	8:19:55 AM	10.01	65.02
02/08/99	8:22:55 AM	13.01	64.53
02/08/99	8:25:55 AM	16.01	65.29
02/08/99	8:28:55 AM	19.01	65.08
02/08/99	8:31:55 AM	22.01	66.12
02/08/99	8:34:55 AM	25.01	65.15
02/08/99	8:37:55 AM	28.01	64.74
02/08/99	8:40:55 AM	31.01	66.12
02/08/99	8:43:55 AM	34.01	66.19
02/08/99	8:46:55 AM	37.01	64.39
02/08/99	8:49:55 AM	40.01	65.22
02/08/99	8:52:55 AM	43.01	66.47
02/08/99	8:55:55 AM	46.01	65.22
02/08/99	8:58:55 AM	49.01	65.50
02/08/99	9:01:55 AM	52.01	65.02
02/08/99	9:04:55 AM	55.01	65.50
02/08/99	9:07:55 AM	58.01	65.92
02/08/99	9:10:55 AM	61.01	66.61
02/08/99	9:13:55 AM	64.01	66.26

02/08/99	9:16:55 AM	67.01	65.02
02/08/99	9:19:55 AM	70.01	65.99
02/08/99	9:22:55 AM	73.01	65.50
02/08/99	9:25:55 AM	76.01	65.02
02/08/99	9:28:55 AM	79.01	65.64
02/08/99	9:31:55 AM	82.01	65.29
02/08/99	9:34:55 AM	85.01	65.99
02/08/99	9:37:55 AM	88.01	66.26
02/08/99	9:40:55 AM	91.01	66.68
02/08/99	9:43:55 AM	94.01	65.85
02/08/99	9:46:55 AM	97.01	65.85
02/08/99	9:49:55 AM	100.01	65.92
02/08/99	10:04:55 AM	115.01	65.71
02/08/99	10:19:55 AM	130.01	65.78
02/08/99	10:34:55 AM	145.01	65.02
02/08/99	10:49:55 AM	160.01	65.57
02/08/99	11:04:55 AM	175.01	64.74
02/08/99	11:19:55 AM	190.01	66.26
02/08/99	11:34:55 AM	205.01	65.36
02/08/99	11:49:55 AM	220.01	65.43
02/08/99	12:04:55 PM	235.01	65.29
02/08/99	12:19:55 PM	250.01	65.36
02/08/99	12:34:55 PM	265.01	65.85
02/08/99	12:49:55 PM	280.01	65.99
02/08/99	1:04:55 PM	295.01	64.81
02/08/99	1:19:55 PM	310.01	65.15
02/08/99	1:34:55 PM	325.01	65.92
02/08/99	1:49:55 PM	340.01	65.57
02/08/99	2:04:55 PM	355.01	65.57
02/08/99	2:19:55 PM	370.01	65.15
02/08/99	2:34:55 PM	385.01	65.85
02/08/99	2:49:55 PM	400.01	65.64
02/08/99	3:04:55 PM	415.01	65.71
02/08/99	3:19:55 PM	430.01	65.22
02/08/99	3:34:55 PM	445.01	65.29
02/08/99	3:49:55 PM	460.01	66.12
02/08/99	4:04:55 PM	475.01	65.36
02/08/99	4:19:55 PM	490.01	65.64
02/08/99	4:34:55 PM	505.01	65.36
02/08/99	4:49:55 PM	520.01	65.64
02/08/99	5:04:55 PM	535.01	65.71
02/08/99	5:19:55 PM	550.01	66.19
02/08/99	5:28:20 PM	558.42	65.29
02/08/99	5:28:21 PM	558.44	64.95
02/08/99	5:28:22 PM	558.46	64.74
02/08/99	5:28:23 PM	558.48	65.50
02/08/99	5:28:25 PM	558.50	64.18
02/08/99	5:28:25 PM	558.51	65.50
02/08/99	5:28:26 PM	558.52	65.08
02/08/99	5:28:27 PM	558.54	65.29
02/08/99	5:28:28 PM	558.56	65.50

02/08/99	5:28:29 PM	558.57	65.50
02/08/99	5:28:30 PM	558.59	65.08
02/08/99	5:28:31 PM	558.61	64.88
02/08/99	5:28:32 PM	558.62	65.50
02/08/99	5:28:33 PM	558.64	64.11
02/08/99	5:28:35 PM	558.66	64.88
02/08/99	5:28:35 PM	558.67	65.36
02/08/99	5:28:36 PM	558.69	65.08
02/08/99	5:28:37 PM	558.71	64.88
02/08/99	5:28:38 PM	558.72	63.98
02/08/99	5:28:39 PM	558.74	65.78
02/08/99	5:28:40 PM	558.76	63.35
02/08/99	5:28:41 PM	558.77	62.38
02/08/99	5:28:42 PM	558.79	60.72
02/08/99	5:28:43 PM	558.81	57.74
02/08/99	5:28:45 PM	558.83	54.83
02/08/99	5:28:45 PM	558.84	52.82
02/08/99	5:28:46 PM	558.86	49.98
02/08/99	5:28:47 PM	558.87	46.86
02/08/99	5:28:48 PM	558.89	44.22
02/08/99	5:28:49 PM	558.91	41.87
02/08/99	5:28:50 PM	558.92	40.07
02/08/99	5:28:51 PM	558.94	38.20
02/08/99	5:28:52 PM	558.96	36.81
02/08/99	5:28:53 PM	558.97	35.84
02/08/99	5:28:55 PM	559.00	32.93
02/08/99	5:28:55 PM	559.01	32.10
02/08/99	5:28:56 PM	559.03	31.06
02/08/99	5:28:57 PM	559.04	29.95
02/08/99	5:28:58 PM	559.06	29.26
02/08/99	5:28:59 PM	559.07	29.26
02/08/99	5:29:00 PM	559.09	29.26
02/08/99	5:29:01 PM	559.11	29.26
02/08/99	5:29:02 PM	559.12	29.26
02/08/99	5:29:03 PM	559.14	29.26
02/08/99	5:29:05 PM	559.16	29.26
02/08/99	5:29:05 PM	559.18	29.26
02/08/99	5:29:06 PM	559.19	29.26
02/08/99	5:29:07 PM	559.21	29.26
02/08/99	5:29:08 PM	559.22	29.26
02/08/99	5:29:09 PM	559.24	29.26
02/08/99	5:29:10 PM	559.26	29.26
02/08/99	5:29:11 PM	559.27	29.26
02/08/99	5:29:12 PM	559.29	29.26
02/08/99	5:29:13 PM	559.31	29.95
02/08/99	5:29:15 PM	559.33	31.40
02/08/99	5:29:15 PM	559.34	31.89
02/08/99	5:29:16 PM	559.36	33.41
02/08/99	5:29:17 PM	559.38	34.59
02/08/99	5:29:18 PM	559.39	35.29
02/08/99	5:29:19 PM	559.41	36.39

02/08/99	5:29:20 PM	559.42	37.36
02/08/99	5:29:21 PM	559.44	38.40
02/08/99	5:29:22 PM	559.46	39.03
02/08/99	5:29:23 PM	559.47	39.79
02/08/99	5:29:25 PM	559.50	40.48
02/08/99	5:29:25 PM	559.51	40.83
02/08/99	5:29:26 PM	559.52	41.25
02/08/99	5:29:27 PM	559.54	41.59
02/08/99	5:29:28 PM	559.56	41.87
02/08/99	5:29:29 PM	559.57	42.15
02/08/99	5:29:30 PM	559.59	42.22
02/08/99	5:29:31 PM	559.61	42.28
02/08/99	5:29:32 PM	559.62	42.28
02/08/99	5:29:33 PM	559.64	42.22
02/08/99	5:29:35 PM	559.66	41.94
02/08/99	5:29:35 PM	559.67	41.73
02/08/99	5:29:36 PM	559.69	41.38
02/08/99	5:29:37 PM	559.71	41.04
02/08/99	5:29:38 PM	559.73	40.62
02/08/99	5:29:39 PM	559.74	40.14
02/08/99	5:29:40 PM	559.76	39.65
02/08/99	5:29:41 PM	559.77	39.10
02/08/99	5:29:42 PM	559.79	38.61
02/08/99	5:29:43 PM	559.81	38.06
02/08/99	5:29:45 PM	559.83	37.43
02/08/99	5:29:45 PM	559.84	37.16
02/08/99	5:29:46 PM	559.86	36.67
02/08/99	5:29:47 PM	559.87	36.26
02/08/99	5:29:48 PM	559.89	35.84
02/08/99	5:29:49 PM	559.91	35.56
02/08/99	5:29:50 PM	559.93	35.22
02/08/99	5:29:51 PM	559.94	35.01
02/08/99	5:29:52 PM	559.96	34.66
02/08/99	5:29:53 PM	559.97	34.52
02/08/99	5:29:55 PM	560.00	34.32
02/08/99	5:29:55 PM	560.01	34.32
02/08/99	5:29:56 PM	560.02	34.25
02/08/99	5:29:57 PM	560.04	34.18
02/08/99	5:29:58 PM	560.06	34.18
02/08/99	5:29:59 PM	560.08	34.25
02/08/99	5:30:00 PM	560.09	34.32
02/08/99	5:30:01 PM	560.11	34.45
02/08/99	5:30:02 PM	560.12	34.59
02/08/99	5:30:03 PM	560.14	34.73
02/08/99	5:30:05 PM	560.16	35.01
02/08/99	5:30:05 PM	560.17	35.15
02/08/99	5:30:06 PM	560.19	35.35
02/08/99	5:30:07 PM	560.21	35.63
02/08/99	5:30:08 PM	560.22	35.84
02/08/99	5:30:09 PM	560.24	36.05
02/08/99	5:30:10 PM	560.26	36.32

02/08/99	5:30:11 PM	560.28	36.60
02/08/99	5:30:12 PM	560.29	36.74
02/08/99	5:30:13 PM	560.31	37.02
02/08/99	5:30:15 PM	560.33	37.29
02/08/99	5:30:15 PM	560.34	37.43
02/08/99	5:30:16 PM	560.36	37.57
02/08/99	5:30:17 PM	560.37	37.71
02/08/99	5:30:18 PM	560.39	37.78
02/08/99	5:30:19 PM	560.41	37.92
02/08/99	5:30:20 PM	560.42	37.99
02/08/99	5:30:25 PM	560.51	37.99
02/08/99	5:30:30 PM	560.59	37.50
02/08/99	5:30:35 PM	560.67	36.67
02/08/99	5:30:40 PM	560.76	36.05
02/08/99	5:30:45 PM	560.84	35.56
02/08/99	5:30:50 PM	560.92	35.49
02/08/99	5:30:55 PM	561.01	35.70
02/08/99	5:31:00 PM	561.09	36.12
02/08/99	5:31:05 PM	561.18	36.53
02/08/99	5:31:10 PM	561.26	36.81
02/08/99	5:31:15 PM	561.34	36.74
02/08/99	5:31:20 PM	561.42	36.67
02/08/99	5:31:25 PM	561.51	36.32
02/08/99	5:31:30 PM	561.59	36.12
02/08/99	5:31:35 PM	561.67	35.91
02/08/99	5:31:40 PM	561.76	35.91
02/08/99	5:31:45 PM	561.84	35.91
02/08/99	5:31:50 PM	561.92	36.05
02/08/99	5:31:55 PM	562.01	36.19
02/08/99	5:32:00 PM	562.09	36.32
02/08/99	5:32:05 PM	562.17	36.32
02/08/99	5:32:10 PM	562.26	36.26
02/08/99	5:32:15 PM	562.34	36.26
02/08/99	5:32:20 PM	562.43	36.12
02/08/99	5:32:25 PM	562.51	35.91
02/08/99	5:32:30 PM	562.59	35.91
02/08/99	5:32:35 PM	562.67	35.98
02/08/99	5:32:40 PM	562.76	35.98
02/08/99	5:32:45 PM	562.84	36.05
02/08/99	5:32:50 PM	562.92	36.12
02/08/99	5:32:55 PM	563.01	36.12
02/08/99	5:33:00 PM	563.09	36.05
02/08/99	5:33:05 PM	563.18	35.98
02/08/99	5:33:10 PM	563.26	36.05
02/08/99	5:33:15 PM	563.34	35.98
02/08/99	5:33:20 PM	563.42	35.84
02/08/99	5:33:35 PM	563.68	35.91
02/08/99	5:33:50 PM	563.92	35.91
02/08/99	5:34:05 PM	564.17	35.91
02/08/99	5:34:20 PM	564.43	35.84
02/08/99	5:34:35 PM	564.67	35.84

02/08/99	5:34:50 PM	564.92	35.77
02/08/99	5:35:05 PM	565.17	35.77
02/08/99	5:35:20 PM	565.42	35.77
02/08/99	5:35:35 PM	565.68	35.77
02/08/99	5:35:50 PM	565.92	35.77
02/08/99	5:36:05 PM	566.17	35.63
02/08/99	5:36:20 PM	566.42	35.63
02/08/99	5:36:35 PM	566.67	35.70
02/08/99	5:36:50 PM	566.93	35.63
02/08/99	5:37:05 PM	567.17	35.63
02/08/99	5:37:20 PM	567.42	35.63
02/08/99	5:37:35 PM	567.68	35.63
02/08/99	5:37:50 PM	567.92	35.56
02/08/99	5:38:05 PM	568.18	35.63
02/08/99	5:38:20 PM	568.42	35.56
02/08/99	5:41:20 PM	571.43	35.42
02/08/99	5:44:20 PM	574.42	35.29

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Pumping test analysis
Recovery method after
THEIS & JACOB
Confined aquifer

Project: OUC Southeast

Evaluated by: BFA | Date: 2/9/99

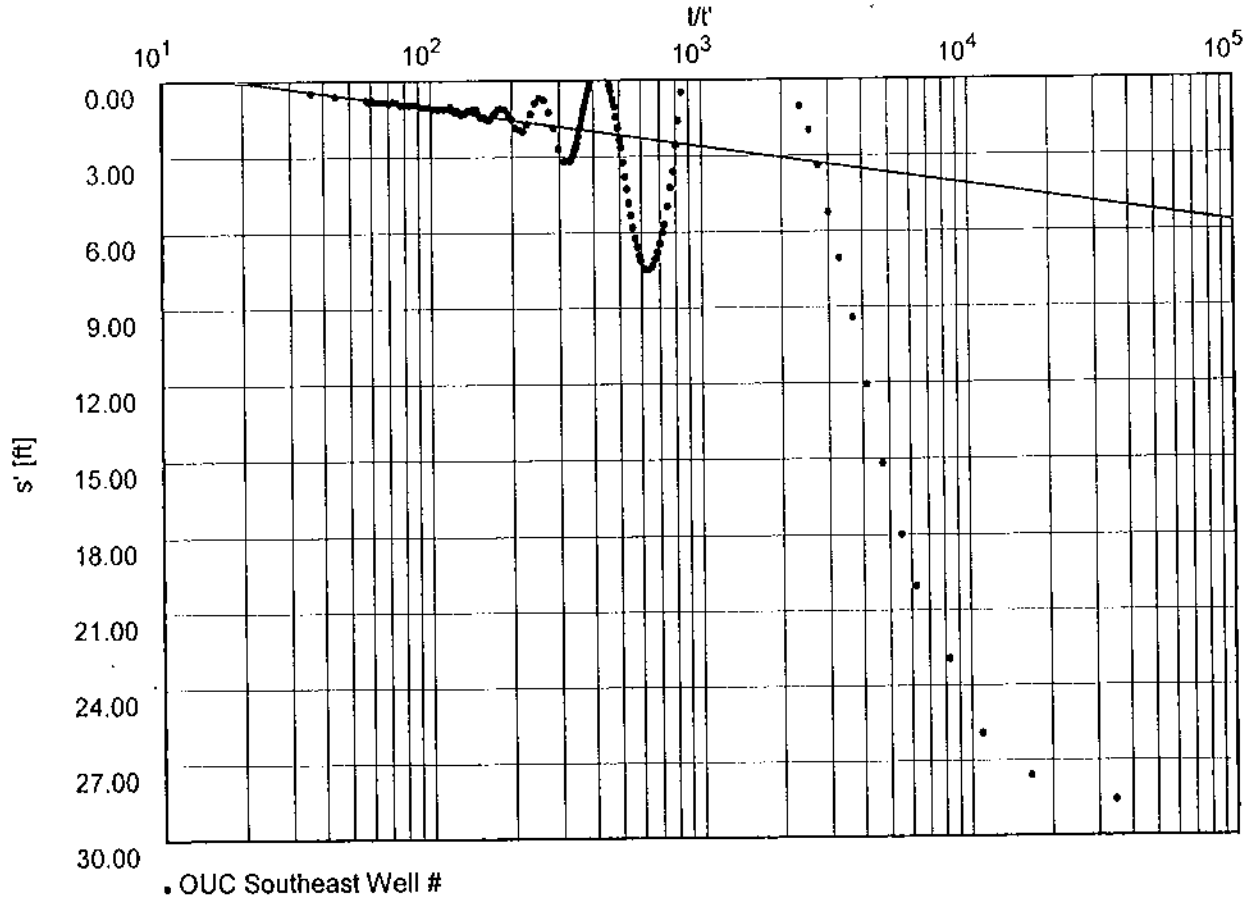
Pumping Test No. 1

Test conducted on: 2/8/99

Well #1

Discharge 3520.00 U.S.gal/min

Pumping test duration: 0.38194 d



• OUC Southeast Well #

Transmissivity [ft²/d]: 8.14×10^4

Hydraulic conductivity [ft/d]: 2.01×10^2

Aquifer thickness [ft]: 405.00

Barnes, Ferland & Associates 3655 Maguire Boulevard, Suite 150 Orlando, Florida 32803 ph.(407) 896-8608	Pumping test analysis Recovery method after THEIS & JACOB Confined aquifer	Page 2 Project: OUC Southeast Evaluated by: BFADate: 2/9/99

Pumping Test No. 1	Test conducted on: 2/8/99
Well #1	OUC Southeast Well #1
Discharge 3520.00 U.S.gal/min	
Static water level: 34.80 ft below datum	Pumping test duration: 0.38194 d

	Time from end of pumping [d]	Water level [ft]	Residual drawdown [ft]
2	0.00001	63.35	28.55
3	0.00002	62.38	27.58
4	0.00004	60.72	25.92
5	0.00005	57.74	22.94
6	0.00006	54.83	20.03
7	0.00007	52.82	18.02
8	0.00008	49.98	15.18
9	0.00009	46.86	12.06
10	0.00010	44.22	9.42
11	0.00012	41.87	7.07
12	0.00013	40.07	5.27
13	0.00014	38.20	3.40
14	0.00015	36.81	2.01
15	0.00016	35.84	1.04
16	0.00018	32.93	-1.87
17	0.00018	32.10	-2.70
18	0.00020	31.06	-3.74
19	0.00021	29.95	-4.85
20	0.00022	29.26	-5.54
21	0.00023	29.26	-5.54
22	0.00024	29.26	-5.54
23	0.00025	29.26	-5.54
24	0.00027	29.26	-5.54
25	0.00028	29.26	-5.54
26	0.00029	29.26	-5.54
27	0.00030	29.26	-5.54
28	0.00031	29.26	-5.54
29	0.00032	29.26	-5.54
30	0.00033	29.26	-5.54
31	0.00035	29.26	-5.54
32	0.00036	29.26	-5.54
33	0.00037	29.26	-5.54
34	0.00038	29.26	-5.54
35	0.00039	29.95	-4.85
36	0.00041	31.40	-3.40
37	0.00042	31.89	-2.91
38	0.00043	33.41	-1.39
39	0.00044	34.59	-0.21
40	0.00045	35.29	0.49
41	0.00046	36.39	1.59
42	0.00047	37.36	2.56
43	0.00049	38.40	3.60
44	0.00050	39.03	4.23
45	0.00051	39.79	4.99
46	0.00052	40.48	5.68
47	0.00053	40.83	6.03
48	0.00054	41.25	6.45
49	0.00056	41.59	6.79
50	0.00057	41.87	7.07

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Pumping test analysis
Recovery method after
THEIS & JACOB
Confined aquifer

Project: OUC Southeast

Evaluated by: BFADate: 2/9/99

Pumping Test No. 1

Test conducted on: 2/8/99

Well #1

OUC Southeast Well #1

Discharge 3520.00 U.S.gal/min

Static water level: 34.80 ft below datum

Pumping test duration: 0.38194 d

	Time from end of pumping [d]	Water level [ft]	Residual drawdown [ft]
51	0.00058	42.15	7.35
52	0.00059	42.22	7.42
53	0.00060	42.28	7.48
54	0.00061	42.28	7.48
55	0.00062	42.22	7.42
56	0.00064	41.94	7.14
57	0.00065	41.73	6.93
58	0.00066	41.38	6.58
59	0.00067	41.04	6.24
60	0.00068	40.62	5.82
61	0.00069	40.14	5.34
62	0.00071	39.65	4.85
63	0.00072	39.10	4.30
64	0.00073	38.61	3.81
65	0.00074	38.06	3.26
66	0.00076	37.43	2.63
67	0.00076	37.16	2.36
68	0.00077	36.67	1.87
69	0.00079	36.26	1.46
70	0.00080	35.84	1.04
71	0.00081	35.56	0.76
72	0.00082	35.22	0.42
73	0.00083	35.01	0.21
74	0.00084	34.66	-0.14
75	0.00086	34.52	-0.28
76	0.00087	34.32	-0.48
77	0.00088	34.32	-0.48
78	0.00089	34.25	-0.55
79	0.00090	34.18	-0.62
80	0.00091	34.18	-0.62
81	0.00093	34.25	-0.55
82	0.00094	34.32	-0.48
83	0.00095	34.45	-0.35
84	0.00096	34.59	-0.21
85	0.00097	34.73	-0.07
86	0.00099	35.01	0.21
87	0.00099	35.15	0.35
88	0.00101	35.35	0.55
89	0.00102	35.63	0.83
90	0.00103	35.84	1.04
91	0.00104	36.05	1.25
92	0.00105	36.32	1.52
93	0.00107	36.60	1.80
94	0.00108	36.74	1.94
95	0.00109	37.02	2.22
96	0.00110	37.29	2.49
97	0.00111	37.43	2.63
98	0.00112	37.57	2.77
99	0.00113	37.71	2.91
		37.78	2.98

Barnes, Ferland & Associates 3655 Maguire Boulevard, Suite 150 Orlando, Florida 32803 ph.(407) 896-8608	Pumping test analysis Recovery method after THEIS & JACOB Confined aquifer	Page 4 Project: OUC Southeast Evaluated by: BFADate: 2/9/99

Pumping Test No. 1	Test conducted on: 2/8/99
Well #1	OUC Southeast Well #1
Discharge 3520.00 U.S.gal/min	
Static water level: 34.80 ft below datum	Pumping test duration: 0.38194 d

	Time from end of pumping [d]	Water level [ft]	Residual drawdown [ft]
101	0.00116	37.92	3.12
102	0.00117	37.99	3.19
103	0.00123	37.99	3.19
104	0.00128	37.50	2.70
105	0.00134	36.67	1.87
106	0.00140	36.05	1.25
107	0.00146	35.56	0.76
108	0.00152	35.49	0.69
109	0.00157	35.70	0.90
110	0.00163	36.12	1.32
111	0.00169	36.53	1.73
112	0.00175	36.81	2.01
113	0.00180	36.74	1.94
114	0.00186	36.67	1.87
115	0.00192	36.32	1.52
116	0.00198	36.12	1.32
117	0.00204	35.91	1.11
118	0.00210	35.91	1.11
119	0.00215	35.91	1.11
120	0.00221	36.05	1.25
121	0.00227	36.19	1.39
122	0.00233	36.32	1.52
123	0.00238	36.32	1.52
124	0.00244	36.26	1.46
125	0.00250	36.26	1.46
126	0.00256	36.12	1.32
127	0.00262	35.91	1.11
128	0.00267	35.91	1.11
129	0.00273	35.98	1.18
130	0.00279	35.98	1.18
131	0.00285	36.05	1.25
132	0.00290	36.12	1.32
133	0.00296	36.12	1.32
134	0.00302	36.05	1.25
135	0.00308	35.98	1.18
136	0.00314	36.05	1.25
137	0.00319	35.98	1.18
138	0.00325	35.84	1.04
139	0.00343	35.91	1.11
140	0.00360	35.91	1.11
141	0.00377	35.91	1.11
142	0.00395	35.84	1.04
143	0.00412	35.84	1.04
144	0.00429	35.77	0.97
145	0.00447	35.77	0.97
146	0.00464	35.77	0.97
147	0.00481	35.77	0.97
148	0.00499	35.77	0.97
149	0.00516	35.63	0.83
150	0.00533	35.63	0.83

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Pumping test analysis
Recovery method after
THEIS & JACOB
Confined aquifer

Project: OUC Southeast

Evaluated by: BFADate: 2/9/99

Pumping Test No. 1

Test conducted on: 2/8/99

Well #1

OUC Southeast Well #1

Discharge 3520.00 U.S.gal/min

Static water level: 34.80 ft below datum

Pumping test duration: 0.38194 d

	Time from end of pumping [d]	Water level [ft]	Residual drawdown [ft]
151	0.00551	35.70	0.90
152	0.00568	35.63	0.83
153	0.00586	35.63	0.83
154	0.00603	35.63	0.83
155	0.00620	35.63	0.83
156	0.00638	35.56	0.76
157	0.00655	35.63	0.83
158	0.00672	35.56	0.76
159	0.00881	35.42	0.62
160	0.01089	35.29	0.49

OUCSE WTP #2 Step Test

Date	Time	Minutes	Pumped Well (#2)	Observ. Well (#1)	
4/27/99	9:17:55 AM	0	38.28	41.06	1750 gpm
4/27/99	9:17:58 AM	0.05	40.84	41.06	
4/27/99	9:18:01 AM	0.10	48.12	41.06	
4/27/99	9:18:03 AM	0.15	50.68	41.06	
4/27/99	9:18:06 AM	0.20	51.59	41.06	
4/27/99	9:18:09 AM	0.25	50.55	41.06	
4/27/99	9:18:12 AM	0.30	47.43	41.06	
4/27/99	9:18:15 AM	0.35	47.36	41.07	
4/27/99	9:18:18 AM	0.40	46.11	41.07	
4/27/99	9:18:21 AM	0.45	44.24	41.07	
4/27/99	9:18:24 AM	0.50	43.48	41.08	
4/27/99	9:18:27 AM	0.55	42.09	41.09	
4/27/99	9:18:30 AM	0.60	39.73	41.10	
4/27/99	9:18:33 AM	0.65	37.52	41.12	
4/27/99	9:18:36 AM	0.69	35.58	41.13	
4/27/99	9:18:39 AM	0.75	35.37	41.14	
4/27/99	9:18:42 AM	0.80	36.06	41.14	
4/27/99	9:18:45 AM	0.85	38.07	41.15	
4/27/99	9:18:48 AM	0.90	39.80	41.15	
4/27/99	9:18:51 AM	0.95	43.06	41.15	
4/27/99	9:18:54 AM	1.00	45.49	41.14	
4/27/99	9:18:59 AM	1.08	46.04	41.12	
4/27/99	9:19:04 AM	1.16	45.49	41.10	
4/27/99	9:19:09 AM	1.25	42.65	41.09	
4/27/99	9:19:14 AM	1.33	40.84	41.08	
4/27/99	9:19:19 AM	1.41	40.98	41.09	
4/27/99	9:19:24 AM	1.50	40.22	41.12	
4/27/99	9:19:29 AM	1.58	39.46	41.14	
4/27/99	9:19:34 AM	1.66	39.67	41.16	
4/27/99	9:19:39 AM	1.75	40.15	41.16	
4/27/99	9:19:44 AM	1.83	40.77	41.16	
4/27/99	9:19:49 AM	1.91	40.71	41.15	
4/27/99	9:19:54 AM	2.00	41.05	41.14	
4/27/99	9:19:59 AM	2.08	41.12	41.12	
4/27/99	9:20:04 AM	2.16	41.40	41.12	
4/27/99	9:20:09 AM	2.25	41.40	41.12	
4/27/99	9:20:14 AM	2.33	41.54	41.12	
4/27/99	9:20:19 AM	2.41	42.16	41.14	
4/27/99	9:20:24 AM	2.50	41.26	41.15	
4/27/99	9:20:29 AM	2.58	41.88	41.16	
4/27/99	9:20:34 AM	2.66	40.91	41.16	
4/27/99	9:20:39 AM	2.75	41.19	41.16	
4/27/99	9:20:44 AM	2.83	41.61	41.15	
4/27/99	9:20:49 AM	2.91	41.26	41.15	
4/27/99	9:20:54 AM	3.00	41.68	41.15	
4/27/99	9:20:59 AM	3.08	41.74	41.14	
4/27/99	9:21:04 AM	3.16	41.19	41.15	

4/27/99	9:21:09 AM	3.25	41.40	41.15
4/27/99	9:21:14 AM	3.33	41.81	41.16
4/27/99	9:21:19 AM	3.41	41.19	41.16
4/27/99	9:21:24 AM	3.50	40.91	41.17
4/27/99	9:21:29 AM	3.58	41.33	41.17
4/27/99	9:21:34 AM	3.66	41.68	41.17
4/27/99	9:21:39 AM	3.75	41.47	41.17
4/27/99	9:21:44 AM	3.83	40.91	41.17
4/27/99	9:21:49 AM	3.91	41.47	41.16
4/27/99	9:21:54 AM	4.00	41.33	41.16
4/27/99	9:21:59 AM	4.08	41.54	41.16
4/27/99	9:22:04 AM	4.16	41.33	41.17
4/27/99	9:22:09 AM	4.25	41.68	41.17
4/27/99	9:22:14 AM	4.33	41.54	41.17
4/27/99	9:22:19 AM	4.41	41.40	41.17
4/27/99	9:22:24 AM	4.50	41.12	41.18
4/27/99	9:22:29 AM	4.58	41.40	41.17
4/27/99	9:22:34 AM	4.66	41.54	41.17
4/27/99	9:22:39 AM	4.75	41.19	41.18
4/27/99	9:22:44 AM	4.83	41.47	41.18
4/27/99	9:22:49 AM	4.91	41.95	41.18
4/27/99	9:22:54 AM	5.00	41.33	41.18
4/27/99	9:23:09 AM	5.25	41.47	41.20
4/27/99	9:23:24 AM	5.50	41.88	41.20
4/27/99	9:23:39 AM	5.75	41.68	41.20
4/27/99	9:23:54 AM	6.00	41.74	41.21
4/27/99	9:24:09 AM	6.25	41.88	41.21
4/27/99	9:24:24 AM	6.50	41.95	41.21
4/27/99	9:24:39 AM	6.75	41.40	41.21
4/27/99	9:24:54 AM	7.00	41.61	41.21
4/27/99	9:25:09 AM	7.25	41.54	41.21
4/27/99	9:25:24 AM	7.50	41.26	41.22
4/27/99	9:25:39 AM	7.75	41.47	41.22
4/27/99	9:25:54 AM	8.00	41.19	41.22
4/27/99	9:26:09 AM	8.25	41.88	41.22
4/27/99	9:26:24 AM	8.50	41.74	41.23
4/27/99	9:26:39 AM	8.75	41.26	41.23
4/27/99	9:26:54 AM	9.00	41.12	41.23
4/27/99	9:27:09 AM	9.25	41.40	41.23
4/27/99	9:27:24 AM	9.50	41.54	41.23
4/27/99	9:27:39 AM	9.75	41.54	41.23
4/27/99	9:27:54 AM	10.00	41.81	41.24
4/27/99	9:28:09 AM	10.25	41.40	41.24
4/27/99	9:28:24 AM	10.50	41.54	41.24
4/27/99	9:28:39 AM	10.75	41.54	41.24
4/27/99	9:28:54 AM	11.00	41.47	41.24
4/27/99	9:29:09 AM	11.25	41.74	41.24
4/27/99	9:29:24 AM	11.50	41.61	41.25
4/27/99	9:29:39 AM	11.75	41.12	41.25
4/27/99	9:29:54 AM	12.00	41.40	41.25
4/27/99	9:30:09 AM	12.25	41.12	41.24

4/27/99	9:30:24 AM	12.50	41.40	41.25
4/27/99	9:30:39 AM	12.75	41.33	41.25
4/27/99	9:30:54 AM	13.00	41.26	41.25
4/27/99	9:31:09 AM	13.25	41.68	41.25
4/27/99	9:31:24 AM	13.50	41.19	41.27
4/27/99	9:31:39 AM	13.75	41.47	41.27
4/27/99	9:31:54 AM	14.00	41.33	41.25
4/27/99	9:32:09 AM	14.25	41.12	41.25
4/27/99	9:32:24 AM	14.50	41.33	41.27
4/27/99	9:32:39 AM	14.75	41.33	41.27
4/27/99	9:32:54 AM	15.00	41.40	41.27
4/27/99	9:33:24 AM	15.50	41.12	41.27
4/27/99	9:33:54 AM	16.00	41.33	41.27
4/27/99	9:34:24 AM	16.50	41.12	41.27
4/27/99	9:34:54 AM	17.00	41.54	41.28
4/27/99	9:35:24 AM	17.50	40.77	41.28
4/27/99	9:35:54 AM	18.00	41.12	41.28
4/27/99	9:36:24 AM	18.50	41.05	41.28
4/27/99	9:36:54 AM	19.00	41.40	41.28
4/27/99	9:37:24 AM	19.50	41.05	41.28
4/27/99	9:37:54 AM	20.00	41.33	41.28
4/27/99	9:38:24 AM	20.50	41.54	41.29
4/27/99	9:38:54 AM	21.00	41.19	41.29
4/27/99	9:39:24 AM	21.50	41.26	41.29
4/27/99	9:39:54 AM	22.00	41.40	41.29
4/27/99	9:40:24 AM	22.50	41.54	41.29
4/27/99	9:40:54 AM	23.00	41.33	41.29
4/27/99	9:41:24 AM	23.50	41.54	41.29
4/27/99	9:41:54 AM	24.00	41.68	41.29
4/27/99	9:42:24 AM	24.50	40.98	41.30
4/27/99	9:42:54 AM	25.00	41.26	41.29
4/27/99	9:43:24 AM	25.50	41.05	41.30
4/27/99	9:43:54 AM	26.00	41.19	41.30
4/27/99	9:44:24 AM	26.50	41.26	41.30
4/27/99	9:44:54 AM	27.00	41.33	41.30
4/27/99	9:45:24 AM	27.50	41.33	41.30
4/27/99	9:45:54 AM	28.00	41.33	41.30
4/27/99	9:46:24 AM	28.50	41.61	41.30
4/27/99	9:46:54 AM	29.00	41.19	41.30
4/27/99	9:47:24 AM	29.50	41.40	41.30
4/27/99	9:47:54 AM	30.00	40.84	41.31
4/27/99	9:48:54 AM	31.00	40.91	41.31
4/27/99	9:49:54 AM	32.00	41.47	41.31
4/27/99	9:50:54 AM	33.00	41.47	41.31
4/27/99	9:51:54 AM	34.00	41.40	41.32
4/27/99	9:52:54 AM	35.00	41.19	41.31
4/27/99	9:53:54 AM	36.00	41.81	41.32
4/27/99	9:54:54 AM	37.00	41.33	41.32
4/27/99	9:55:54 AM	38.00	41.54	41.32
4/27/99	9:56:54 AM	39.00	41.47	41.32
4/27/99	9:57:54 AM	40.00	41.26	41.34

4/27/99	9:58:54 AM	41.00	41.68	41.34
4/27/99	9:59:54 AM	42.00	41.19	41.34
4/27/99	10:00:54 AM	43.00	41.26	41.34
4/27/99	10:01:54 AM	44.00	41.40	41.34
4/27/99	10:02:54 AM	45.00	41.26	41.34
4/27/99	10:03:54 AM	46.00	41.68	41.35
4/27/99	10:04:54 AM	47.00	41.33	41.35
4/27/99	10:05:54 AM	48.00	41.33	41.35
4/27/99	10:06:54 AM	49.00	41.47	41.35
4/27/99	10:07:54 AM	50.00	41.40	41.35
4/27/99	10:08:54 AM	51.00	41.26	41.35
4/27/99	10:09:54 AM	52.00	41.47	41.35
4/27/99	10:10:54 AM	53.00	41.54	41.35
4/27/99	10:11:54 AM	54.00	41.26	41.35
4/27/99	10:12:54 AM	55.00	41.61	41.35
4/27/99	10:13:54 AM	56.00	41.47	41.35
4/27/99	10:14:54 AM	57.00	41.33	41.35
4/27/99	10:15:54 AM	58.00	41.19	41.36
4/27/99	10:16:54 AM	59.00	41.33	41.35
4/27/99	10:17:54 AM	60.00	41.12	41.35
4/27/99	10:19:21 AM	61.44	44.59	41.35
4/27/99	10:19:24 AM	61.50	46.73	41.36
4/27/99	10:19:27 AM	61.55	47.43	41.35
4/27/99	10:19:30 AM	61.60	47.84	41.35
4/27/99	10:19:33 AM	61.65	47.08	41.35
4/27/99	10:19:36 AM	61.69	46.60	41.35
4/27/99	10:19:39 AM	61.75	45.69	41.35
4/27/99	10:19:42 AM	61.80	45.63	41.36
4/27/99	10:19:45 AM	61.85	45.49	41.36
4/27/99	10:19:48 AM	61.90	44.79	41.36
4/27/99	10:19:51 AM	61.94	45.28	41.37
4/27/99	10:19:54 AM	62.00	45.35	41.38
4/27/99	10:19:57 AM	62.04	44.66	41.38
4/27/99	10:20:00 AM	62.10	45.28	41.39
4/27/99	10:20:03 AM	62.15	44.45	41.39
4/27/99	10:20:06 AM	62.20	44.24	41.40
4/27/99	10:20:09 AM	62.24	44.45	41.40
4/27/99	10:20:12 AM	62.30	44.38	41.40
4/27/99	10:20:15 AM	62.35	44.72	41.42
4/27/99	10:20:18 AM	62.39	44.86	41.42
4/27/99	10:20:21 AM	62.45	45.07	41.40
4/27/99	10:20:26 AM	62.53	45.07	41.40
4/27/99	10:20:31 AM	62.61	45.42	41.40
4/27/99	10:20:36 AM	62.70	45.28	41.40
4/27/99	10:20:41 AM	62.78	45.28	41.42
4/27/99	10:20:46 AM	62.86	45.35	41.42
4/27/99	10:20:51 AM	62.95	44.72	41.43
4/27/99	10:20:56 AM	63.03	45.14	41.43
4/27/99	10:21:01 AM	63.11	46.73	41.44
4/27/99	10:21:06 AM	63.20	47.98	41.44
4/27/99	10:21:11 AM	63.28	47.77	41.44

4/27/99	10:21:16 AM	63.36	47.57	41.44	
4/27/99	10:21:21 AM	63.45	46.94	41.44	
4/27/99	10:21:26 AM	63.53	47.01	41.45	
4/27/99	10:21:31 AM	63.61	47.15	41.46	
4/27/99	10:21:36 AM	63.70	47.08	41.46	
4/27/99	10:21:41 AM	63.78	47.15	41.46	
4/27/99	10:21:46 AM	63.86	47.01	41.47	
4/27/99	10:21:51 AM	63.95	46.80	41.49	
4/27/99	10:21:56 AM	64.03	46.73	41.49	
4/27/99	10:22:01 AM	64.11	47.64	41.49	
4/27/99	10:22:06 AM	64.20	48.12	41.49	
4/27/99	10:22:11 AM	64.28	47.91	41.50	
4/27/99	10:22:16 AM	64.36	47.70	41.50	
4/27/99	10:22:21 AM	64.45	48.05	41.50	
4/27/99	10:22:26 AM	64.53	47.64	41.50	
4/27/99	10:22:31 AM	64.61	48.05	41.51	
4/27/99	10:22:36 AM	64.70	47.70	41.52	
4/27/99	10:22:41 AM	64.78	47.98	41.52	2450 gpm
4/27/99	10:22:46 AM	64.86	49.23	41.52	
4/27/99	10:22:51 AM	64.95	51.86	41.52	
4/27/99	10:22:56 AM	65.03	53.39	41.53	
4/27/99	10:23:01 AM	65.11	53.46	41.53	
4/27/99	10:23:06 AM	65.20	53.53	41.54	
4/27/99	10:23:11 AM	65.28	53.04	41.54	
4/27/99	10:23:16 AM	65.36	52.42	41.55	
4/27/99	10:23:21 AM	65.45	52.49	41.57	
4/27/99	10:23:26 AM	65.53	52.76	41.58	
4/27/99	10:23:31 AM	65.61	53.53	41.58	
4/27/99	10:23:36 AM	65.70	53.53	41.59	
4/27/99	10:23:41 AM	65.78	53.18	41.60	
4/27/99	10:23:46 AM	65.86	52.83	41.61	
4/27/99	10:23:51 AM	65.95	53.25	41.61	
4/27/99	10:23:56 AM	66.03	53.73	41.62	
4/27/99	10:24:01 AM	66.11	53.39	41.62	
4/27/99	10:24:06 AM	66.20	53.46	41.62	
4/27/99	10:24:11 AM	66.28	53.32	41.64	
4/27/99	10:24:16 AM	66.36	54.01	41.65	
4/27/99	10:24:21 AM	66.45	53.73	41.65	
4/27/99	10:24:36 AM	66.70	54.50	41.67	
4/27/99	10:24:51 AM	66.95	53.46	41.68	
4/27/99	10:25:06 AM	67.20	53.80	41.70	
4/27/99	10:25:21 AM	67.45	53.53	41.72	
4/27/99	10:25:36 AM	67.70	53.46	41.73	
4/27/99	10:25:51 AM	67.95	53.46	41.74	
4/27/99	10:26:06 AM	68.20	53.73	41.76	
4/27/99	10:26:21 AM	68.45	54.01	41.76	
4/27/99	10:26:36 AM	68.70	54.98	41.79	
4/27/99	10:26:51 AM	68.95	55.95	41.80	
4/27/99	10:27:06 AM	69.20	55.81	41.81	
4/27/99	10:27:21 AM	69.45	56.23	41.82	
4/27/99	10:27:36 AM	69.70	55.60	41.83	

4/27/99	10:27:51 AM	69.95	55.47	41.85
4/27/99	10:28:06 AM	70.20	55.74	41.87
4/27/99	10:28:21 AM	70.45	56.37	41.88
4/27/99	10:28:36 AM	70.70	55.88	41.89
4/27/99	10:28:51 AM	70.95	55.47	41.90
4/27/99	10:29:06 AM	71.20	56.09	41.91
4/27/99	10:29:21 AM	71.45	55.95	41.92
4/27/99	10:29:36 AM	71.70	56.37	41.92
4/27/99	10:29:51 AM	71.95	55.67	41.94
4/27/99	10:30:06 AM	72.20	56.30	41.95
4/27/99	10:30:21 AM	72.45	56.16	41.96
4/27/99	10:30:36 AM	72.70	56.23	41.97
4/27/99	10:30:51 AM	72.95	56.16	41.98
4/27/99	10:31:06 AM	73.20	56.58	41.99
4/27/99	10:31:21 AM	73.45	56.44	41.99
4/27/99	10:31:36 AM	73.70	56.16	42.01
4/27/99	10:31:51 AM	73.95	56.37	42.02
4/27/99	10:32:06 AM	74.20	56.09	42.02
4/27/99	10:32:21 AM	74.45	56.09	42.03
4/27/99	10:32:36 AM	74.70	55.88	42.04
4/27/99	10:32:51 AM	74.95	56.37	42.04
4/27/99	10:33:06 AM	75.20	56.16	42.05
4/27/99	10:33:21 AM	75.45	56.44	42.05
4/27/99	10:33:36 AM	75.70	56.58	42.06
4/27/99	10:33:51 AM	75.95	56.71	42.07
4/27/99	10:34:06 AM	76.20	56.44	42.07
4/27/99	10:34:21 AM	76.45	55.95	42.07
4/27/99	10:34:51 AM	76.95	56.37	42.09
4/27/99	10:35:21 AM	77.45	56.30	42.10
4/27/99	10:35:51 AM	77.95	55.67	42.12
4/27/99	10:36:21 AM	78.45	56.37	42.12
4/27/99	10:36:51 AM	78.95	56.44	42.13
4/27/99	10:37:21 AM	79.45	56.30	42.14
4/27/99	10:37:51 AM	79.95	56.37	42.16
4/27/99	10:38:21 AM	80.45	56.23	42.17
4/27/99	10:38:51 AM	80.95	56.09	42.17
4/27/99	10:39:21 AM	81.45	56.51	42.18
4/27/99	10:39:51 AM	81.95	56.02	42.19
4/27/99	10:40:21 AM	82.45	55.95	42.19
4/27/99	10:40:51 AM	82.95	56.99	42.20
4/27/99	10:41:21 AM	83.45	56.23	42.21
4/27/99	10:41:51 AM	83.95	56.30	42.21
4/27/99	10:42:21 AM	84.45	56.51	42.22
4/27/99	10:42:51 AM	84.95	56.51	42.24
4/27/99	10:43:21 AM	85.45	56.51	42.24
4/27/99	10:43:51 AM	85.95	56.30	42.25
4/27/99	10:44:21 AM	86.45	56.30	42.25
4/27/99	10:44:51 AM	86.95	56.51	42.26
4/27/99	10:45:21 AM	87.45	56.44	42.26
4/27/99	10:45:51 AM	87.95	56.37	42.27
4/27/99	10:46:21 AM	88.45	56.23	42.27

4/27/99	10:46:51 AM	88.95	56.23	42.28	
4/27/99	10:47:21 AM	89.45	56.44	42.28	
4/27/99	10:47:51 AM	89.95	56.02	42.28	
4/27/99	10:48:21 AM	90.45	56.23	42.29	
4/27/99	10:48:51 AM	90.95	56.99	42.31	
4/27/99	10:49:21 AM	91.45	56.16	42.29	
4/27/99	10:50:21 AM	92.45	55.74	42.32	
4/27/99	10:51:21 AM	93.45	56.58	42.32	
4/27/99	10:52:21 AM	94.45	56.85	42.33	
4/27/99	10:53:21 AM	95.45	56.09	42.34	
4/27/99	10:54:21 AM	96.45	56.78	42.35	
4/27/99	10:55:21 AM	97.45	56.37	42.35	
4/27/99	10:56:21 AM	98.45	56.64	42.36	
4/27/99	10:57:21 AM	99.45	56.37	42.36	
4/27/99	10:58:21 AM	100.45	56.30	42.37	
4/27/99	10:59:21 AM	101.45	56.51	42.39	
4/27/99	11:00:21 AM	102.45	56.64	42.39	
4/27/99	11:01:21 AM	103.45	56.09	42.40	
4/27/99	11:02:21 AM	104.45	56.58	42.40	
4/27/99	11:03:21 AM	105.45	56.99	42.41	
4/27/99	11:04:21 AM	106.45	56.71	42.41	
4/27/99	11:05:21 AM	107.45	56.99	42.41	
4/27/99	11:06:21 AM	108.45	56.58	42.42	
4/27/99	11:07:21 AM	109.45	56.85	42.42	
4/27/99	11:08:21 AM	110.45	56.30	42.43	
4/27/99	11:09:21 AM	111.45	56.92	42.43	
4/27/99	11:10:21 AM	112.45	56.64	42.43	
4/27/99	11:11:21 AM	113.45	56.37	42.44	
4/27/99	11:12:21 AM	114.45	56.51	42.44	
4/27/99	11:13:21 AM	115.45	56.37	42.44	
4/27/99	11:14:21 AM	116.45	56.99	42.46	
4/27/99	11:15:21 AM	117.45	56.71	42.46	
4/27/99	11:16:21 AM	118.45	56.78	42.47	
4/27/99	11:17:21 AM	119.45	56.64	42.47	
4/27/99	11:18:21 AM	120.45	56.71	42.47	
4/27/99	11:19:40 AM	121.75	56.44	42.48	
4/27/99	11:19:43 AM	121.80	56.30	42.47	
4/27/99	11:19:46 AM	121.85	56.99	42.47	
4/27/99	11:19:48 AM	121.90	57.06	42.47	
4/27/99	11:19:51 AM	121.95	56.30	42.48	
4/27/99	11:19:54 AM	122.00	57.41	42.48	
4/27/99	11:19:57 AM	122.04	60.11	42.47	
4/27/99	11:20:00 AM	122.10	61.84	42.48	3500 gpm
4/27/99	11:20:03 AM	122.14	64.75	42.47	
4/27/99	11:20:06 AM	122.20	65.79	42.48	
4/27/99	11:20:09 AM	122.24	66.97	42.48	
4/27/99	11:20:12 AM	122.30	67.46	42.48	
4/27/99	11:20:15 AM	122.35	67.80	42.48	
4/27/99	11:20:18 AM	122.39	67.87	42.48	
4/27/99	11:20:21 AM	122.45	67.39	42.48	
4/27/99	11:20:24 AM	122.49	68.01	42.48	

4/27/99	11:20:27 AM	122.54	67.87	42.49
4/27/99	11:20:30 AM	122.60	67.66	42.49
4/27/99	11:20:33 AM	122.65	67.73	42.50
4/27/99	11:20:36 AM	122.69	67.80	42.51
4/27/99	11:20:39 AM	122.75	67.52	42.51
4/27/99	11:20:44 AM	122.83	68.22	42.52
4/27/99	11:20:49 AM	122.91	68.08	42.52
4/27/99	11:20:54 AM	123.00	68.29	42.54
4/27/99	11:20:59 AM	123.08	68.43	42.55
4/27/99	11:21:04 AM	123.16	67.94	42.56
4/27/99	11:21:09 AM	123.25	68.36	42.56
4/27/99	11:21:14 AM	123.33	68.91	42.56
4/27/99	11:21:19 AM	123.41	68.29	42.57
4/27/99	11:21:24 AM	123.50	68.91	42.58
4/27/99	11:21:29 AM	123.58	68.08	42.58
4/27/99	11:21:34 AM	123.66	67.94	42.59
4/27/99	11:21:39 AM	123.75	69.12	42.59
4/27/99	11:21:44 AM	123.83	69.33	42.61
4/27/99	11:21:49 AM	123.91	68.36	42.61
4/27/99	11:21:54 AM	124.00	69.19	42.62
4/27/99	11:21:59 AM	124.08	68.63	42.62
4/27/99	11:22:04 AM	124.16	68.22	42.62
4/27/99	11:22:09 AM	124.25	68.63	42.63
4/27/99	11:22:14 AM	124.33	68.22	42.64
4/27/99	11:22:19 AM	124.41	68.56	42.64
4/27/99	11:22:24 AM	124.50	68.56	42.64
4/27/99	11:22:29 AM	124.58	68.08	42.65
4/27/99	11:22:34 AM	124.66	68.63	42.65
4/27/99	11:22:39 AM	124.75	69.26	42.66
4/27/99	11:22:44 AM	124.83	68.63	42.66
4/27/99	11:22:49 AM	124.91	68.22	42.66
4/27/99	11:22:54 AM	125.00	68.98	42.66
4/27/99	11:22:59 AM	125.08	68.56	42.67
4/27/99	11:23:04 AM	125.16	68.22	42.67
4/27/99	11:23:09 AM	125.25	68.29	42.69
4/27/99	11:23:14 AM	125.33	68.29	42.69
4/27/99	11:23:19 AM	125.41	68.43	42.69
4/27/99	11:23:24 AM	125.50	69.05	42.70
4/27/99	11:23:29 AM	125.58	68.84	42.70
4/27/99	11:23:34 AM	125.66	68.43	42.70
4/27/99	11:23:39 AM	125.75	69.05	42.70
4/27/99	11:23:44 AM	125.83	68.77	42.71
4/27/99	11:23:49 AM	125.91	68.43	42.71
4/27/99	11:23:54 AM	126.00	69.46	42.71
4/27/99	11:23:59 AM	126.08	68.91	42.72
4/27/99	11:24:04 AM	126.16	68.36	42.72
4/27/99	11:24:09 AM	126.25	68.98	42.72
4/27/99	11:24:14 AM	126.33	68.84	42.73
4/27/99	11:24:19 AM	126.41	68.98	42.73
4/27/99	11:24:24 AM	126.50	68.70	42.73
4/27/99	11:24:29 AM	126.58	69.19	42.73

4/27/99	11:24:34 AM	126.66	68.36	42.74
4/27/99	11:24:39 AM	126.75	68.08	42.74
4/27/99	11:24:54 AM	127.00	68.29	42.76
4/27/99	11:25:09 AM	127.25	68.91	42.76
4/27/99	11:25:24 AM	127.50	69.12	42.77
4/27/99	11:25:39 AM	127.75	69.46	42.78
4/27/99	11:25:54 AM	128.00	69.33	42.79
4/27/99	11:26:09 AM	128.25	69.88	42.79
4/27/99	11:26:24 AM	128.50	69.05	42.80
4/27/99	11:26:39 AM	128.75	69.46	42.80
4/27/99	11:26:54 AM	129.00	68.98	42.81
4/27/99	11:27:09 AM	129.25	69.12	42.83
4/27/99	11:27:24 AM	129.50	69.46	42.83
4/27/99	11:27:39 AM	129.75	68.98	42.83
4/27/99	11:27:54 AM	130.00	69.26	42.84
4/27/99	11:28:09 AM	130.25	69.53	42.85
4/27/99	11:28:24 AM	130.50	68.77	42.85
4/27/99	11:28:39 AM	130.75	68.29	42.86
4/27/99	11:28:54 AM	131.00	68.49	42.87
4/27/99	11:29:09 AM	131.25	69.67	42.87
4/27/99	11:29:24 AM	131.50	69.26	42.87
4/27/99	11:29:39 AM	131.75	68.84	42.88
4/27/99	11:29:54 AM	132.00	69.26	42.88
4/27/99	11:30:09 AM	132.25	69.40	42.88
4/27/99	11:30:24 AM	132.50	69.33	42.89
4/27/99	11:30:39 AM	132.75	69.40	42.89
4/27/99	11:30:54 AM	133.00	69.53	42.91
4/27/99	11:31:09 AM	133.25	69.19	42.91
4/27/99	11:31:24 AM	133.50	68.70	42.91
4/27/99	11:31:39 AM	133.75	68.36	42.92
4/27/99	11:31:54 AM	134.00	68.01	42.92
4/27/99	11:32:09 AM	134.25	68.84	42.92
4/27/99	11:32:24 AM	134.50	68.91	42.93
4/27/99	11:32:39 AM	134.75	68.84	42.93
4/27/99	11:32:54 AM	135.00	68.56	42.93
4/27/99	11:33:09 AM	135.25	68.84	42.93
4/27/99	11:33:24 AM	135.50	68.56	42.93
4/27/99	11:33:39 AM	135.75	68.63	42.94
4/27/99	11:33:54 AM	136.00	68.56	42.94
4/27/99	11:34:09 AM	136.25	68.15	42.94
4/27/99	11:34:24 AM	136.50	68.91	42.94
4/27/99	11:34:39 AM	136.75	68.77	42.95
4/27/99	11:35:09 AM	137.25	68.91	42.95
4/27/99	11:35:39 AM	137.75	68.56	42.96
4/27/99	11:36:09 AM	138.25	68.56	42.96
4/27/99	11:36:39 AM	138.75	68.98	42.96
4/27/99	11:37:09 AM	139.25	69.19	42.98
4/27/99	11:37:39 AM	139.75	69.46	42.99
4/27/99	11:38:09 AM	140.25	68.91	42.99
4/27/99	11:38:39 AM	140.75	68.70	42.99
4/27/99	11:39:09 AM	141.25	69.12	43.00

4/27/99	11:39:39 AM	141.75	69.05	43.00
4/27/99	11:40:09 AM	142.25	69.74	43.00
4/27/99	11:40:39 AM	142.75	68.77	43.01
4/27/99	11:41:09 AM	143.25	69.12	43.01
4/27/99	11:41:39 AM	143.75	68.84	43.01
4/27/99	11:42:09 AM	144.25	69.26	43.02
4/27/99	11:42:39 AM	144.75	68.98	43.02
4/27/99	11:43:09 AM	145.25	68.91	43.03
4/27/99	11:43:39 AM	145.75	69.19	43.03
4/27/99	11:44:09 AM	146.25	68.49	43.04
4/27/99	11:44:39 AM	146.75	69.12	43.03
4/27/99	11:45:09 AM	147.25	68.77	43.03
4/27/99	11:45:39 AM	147.75	68.70	43.04
4/27/99	11:46:09 AM	148.25	68.98	43.04
4/27/99	11:46:39 AM	148.75	69.40	43.06
4/27/99	11:47:09 AM	149.25	69.33	43.06
4/27/99	11:47:39 AM	149.75	69.67	43.07
4/27/99	11:48:09 AM	150.25	68.43	43.06
4/27/99	11:48:39 AM	150.75	68.91	43.07
4/27/99	11:49:09 AM	151.25	69.53	43.07
4/27/99	11:49:39 AM	151.75	69.33	43.07
4/27/99	11:50:39 AM	152.75	68.84	43.08
4/27/99	11:51:39 AM	153.75	69.05	43.08
4/27/99	11:52:39 AM	154.75	68.98	43.09
4/27/99	11:53:39 AM	155.75	69.19	43.09
4/27/99	11:54:39 AM	156.75	69.67	43.09
4/27/99	11:55:39 AM	157.75	69.19	43.09
4/27/99	11:56:39 AM	158.75	69.40	43.10
4/27/99	11:57:39 AM	159.75	69.26	43.11
4/27/99	11:58:39 AM	160.75	68.63	43.11
4/27/99	11:59:39 AM	161.75	68.49	43.11
4/27/99	12:00:39 PM	162.75	68.84	43.11
4/27/99	12:01:39 PM	163.75	69.05	43.13
4/27/99	12:02:39 PM	164.75	68.84	43.13
4/27/99	12:03:39 PM	165.75	68.63	43.13
4/27/99	12:04:39 PM	166.75	68.70	43.13
4/27/99	12:05:39 PM	167.75	69.46	43.14
4/27/99	12:06:39 PM	168.75	69.12	43.14
4/27/99	12:07:39 PM	169.75	68.77	43.14
4/27/99	12:08:39 PM	170.75	69.12	43.14
4/27/99	12:09:39 PM	171.75	69.19	43.15
4/27/99	12:10:39 PM	172.75	69.46	43.15
4/27/99	12:11:39 PM	173.75	69.46	43.15
4/27/99	12:12:39 PM	174.75	68.56	43.15
4/27/99	12:13:39 PM	175.75	69.40	43.16
4/27/99	12:14:39 PM	176.75	68.56	43.16
4/27/99	12:15:39 PM	177.75	69.12	43.16
4/27/99	12:16:39 PM	178.75	69.19	43.16
4/27/99	12:17:39 PM	179.75	69.19	43.17
4/27/99	12:18:39 PM	180.75	69.40	43.16
4/27/99	12:19:31 PM	181.60	68.77	43.16

4/27/99	12:19:34 PM	181.66	68.84	43.16	
4/27/99	12:19:37 PM	181.71	69.19	43.17	
4/27/99	12:19:40 PM	181.76	69.19	43.17	
4/27/99	12:19:43 PM	181.81	69.60	43.17	
4/27/99	12:19:46 PM	181.86	70.09	43.16	
4/27/99	12:19:49 PM	181.91	69.95	43.16	
4/27/99	12:19:52 PM	181.96	70.23	43.17	
4/27/99	12:19:55 PM	182.01	70.23	43.17	
4/27/99	12:19:58 PM	182.06	70.50	43.16	
4/27/99	12:20:01 PM	182.11	72.51	43.17	
4/27/99	12:20:04 PM	182.16	76.95	43.17	5000 gpm
4/27/99	12:20:07 PM	182.21	80.90	43.17	
4/27/99	12:20:10 PM	182.26	83.19	43.17	
4/27/99	12:20:13 PM	182.31	84.99	43.17	
4/27/99	12:20:16 PM	182.36	87.97	43.17	
4/27/99	12:20:19 PM	182.41	86.65	43.17	
4/27/99	12:20:22 PM	182.46	87.41	43.17	
4/27/99	12:20:25 PM	182.51	90.39	43.17	
4/27/99	12:20:28 PM	182.56	90.39	43.18	
4/27/99	12:20:31 PM	182.61	87.00	43.18	
4/27/99	12:20:36 PM	182.70	88.25	43.19	
4/27/99	12:20:41 PM	182.78	89.08	43.21	
4/27/99	12:20:46 PM	182.86	89.63	43.22	
4/27/99	12:20:51 PM	182.95	87.97	43.24	
4/27/99	12:20:56 PM	183.03	93.44	43.25	
4/27/99	12:21:01 PM	183.11	85.75	43.26	
4/27/99	12:21:06 PM	183.20	88.04	43.28	
4/27/99	12:21:11 PM	183.28	88.80	43.29	
4/27/99	12:21:16 PM	183.36	92.20	43.29	
4/27/99	12:21:21 PM	183.45	90.19	43.30	
4/27/99	12:21:26 PM	183.53	90.74	43.31	
4/27/99	12:21:31 PM	183.61	91.85	43.32	
4/27/99	12:21:36 PM	183.70	94.55	43.33	
4/27/99	12:21:41 PM	183.78	87.83	43.34	
4/27/99	12:21:46 PM	183.86	91.50	43.36	
4/27/99	12:21:51 PM	183.95	87.90	43.36	
4/27/99	12:21:56 PM	184.03	91.50	43.37	
4/27/99	12:22:01 PM	184.11	90.19	43.38	
4/27/99	12:22:06 PM	184.20	92.20	43.38	
4/27/99	12:22:11 PM	184.28	92.06	43.39	
4/27/99	12:22:16 PM	184.36	90.12	43.40	
4/27/99	12:22:21 PM	184.45	91.36	43.40	
4/27/99	12:22:26 PM	184.53	91.43	43.41	
4/27/99	12:22:31 PM	184.61	90.60	43.43	
4/27/99	12:22:36 PM	184.70	90.46	43.43	
4/27/99	12:22:41 PM	184.78	90.81	43.44	
4/27/99	12:22:46 PM	184.86	89.98	43.44	
4/27/99	12:22:51 PM	184.95	94.21	43.45	
4/27/99	12:22:56 PM	185.03	89.42	43.46	
4/27/99	12:23:01 PM	185.11	89.91	43.46	
4/27/99	12:23:06 PM	185.20	92.33	43.47	

4/27/99	12:23:11 PM	185.28	90.81	43.47
4/27/99	12:23:16 PM	185.36	88.31	43.48
4/27/99	12:23:21 PM	185.45	90.39	43.48
4/27/99	12:23:26 PM	185.53	94.14	43.50
4/27/99	12:23:31 PM	185.61	93.37	43.50
4/27/99	12:23:36 PM	185.70	90.39	43.51
4/27/99	12:23:41 PM	185.78	91.23	43.52
4/27/99	12:23:46 PM	185.86	89.35	43.52
4/27/99	12:23:51 PM	185.95	91.16	43.52
4/27/99	12:23:56 PM	186.03	89.98	43.53
4/27/99	12:24:01 PM	186.11	92.33	43.53
4/27/99	12:24:06 PM	186.20	89.22	43.53
4/27/99	12:24:11 PM	186.28	92.89	43.54
4/27/99	12:24:16 PM	186.36	91.09	43.55
4/27/99	12:24:21 PM	186.45	87.83	43.55
4/27/99	12:24:26 PM	186.53	89.15	43.55
4/27/99	12:24:31 PM	186.61	90.05	43.56
4/27/99	12:24:46 PM	186.86	92.06	43.58
4/27/99	12:25:01 PM	187.11	93.51	43.59
4/27/99	12:25:16 PM	187.36	93.30	43.60
4/27/99	12:25:31 PM	187.61	94.14	43.61
4/27/99	12:25:46 PM	187.86	91.78	43.62
4/27/99	12:26:01 PM	188.11	92.82	43.63
4/27/99	12:26:16 PM	188.36	90.05	43.65
4/27/99	12:26:31 PM	188.61	89.42	43.66
4/27/99	12:26:46 PM	188.86	91.50	43.67
4/27/99	12:27:01 PM	189.11	91.71	43.68
4/27/99	12:27:16 PM	189.36	91.85	43.68
4/27/99	12:27:31 PM	189.61	90.12	43.70
4/27/99	12:27:46 PM	189.86	94.48	43.70
4/27/99	12:28:01 PM	190.11	91.92	43.71
4/27/99	12:28:16 PM	190.36	91.02	43.71
4/27/99	12:28:31 PM	190.61	90.46	43.73
4/27/99	12:28:46 PM	190.86	94.07	43.74
4/27/99	12:29:01 PM	191.11	91.92	43.74
4/27/99	12:29:16 PM	191.36	93.17	43.75
4/27/99	12:29:31 PM	191.61	90.39	43.76
4/27/99	12:29:46 PM	191.86	91.78	43.76
4/27/99	12:30:01 PM	192.11	95.04	43.77
4/27/99	12:30:16 PM	192.36	93.37	43.78
4/27/99	12:30:31 PM	192.61	93.51	43.78
4/27/99	12:30:46 PM	192.86	92.40	43.80
4/27/99	12:31:01 PM	193.11	90.95	43.81
4/27/99	12:31:16 PM	193.36	91.16	43.81
4/27/99	12:31:31 PM	193.61	94.34	43.81
4/27/99	12:31:46 PM	193.86	89.70	43.82
4/27/99	12:32:01 PM	194.11	93.30	43.82
4/27/99	12:32:16 PM	194.36	92.61	43.83
4/27/99	12:32:31 PM	194.61	93.03	43.83
4/27/99	12:32:46 PM	194.86	93.93	43.84
4/27/99	12:33:01 PM	195.11	94.00	43.84

4/27/99	12:33:16 PM	195.36	91.57	43.84
4/27/99	12:33:31 PM	195.61	90.81	43.85
4/27/99	12:33:46 PM	195.86	90.25	43.85
4/27/99	12:34:01 PM	196.11	94.62	43.86
4/27/99	12:34:16 PM	196.36	92.82	43.86
4/27/99	12:34:31 PM	196.61	90.74	43.88
4/27/99	12:35:01 PM	197.11	92.54	43.88
4/27/99	12:35:31 PM	197.61	93.44	43.89
4/27/99	12:36:01 PM	198.11	89.63	43.90
4/27/99	12:36:31 PM	198.61	89.91	43.91
4/27/99	12:37:01 PM	199.11	93.72	43.92
4/27/99	12:37:31 PM	199.61	92.75	43.92
4/27/99	12:38:01 PM	200.11	90.32	43.93
4/27/99	12:38:31 PM	200.61	93.51	43.93
4/27/99	12:39:01 PM	201.11	94.07	43.95
4/27/99	12:39:31 PM	201.61	90.05	43.96
4/27/99	12:40:01 PM	202.11	92.54	43.96
4/27/99	12:40:31 PM	202.61	91.99	43.97
4/27/99	12:41:01 PM	203.11	89.70	43.97
4/27/99	12:41:31 PM	203.61	92.47	43.98
4/27/99	12:42:01 PM	204.11	94.41	43.98
4/27/99	12:42:31 PM	204.61	93.03	43.99
4/27/99	12:43:01 PM	205.11	92.20	43.99
4/27/99	12:43:31 PM	205.61	93.58	44.00
4/27/99	12:44:01 PM	206.11	93.37	44.00
4/27/99	12:44:31 PM	206.61	94.83	44.01
4/27/99	12:45:01 PM	207.11	92.40	44.01
4/27/99	12:45:31 PM	207.61	92.33	44.03
4/27/99	12:46:01 PM	208.11	93.37	44.03
4/27/99	12:46:31 PM	208.61	91.78	44.03
4/27/99	12:47:01 PM	209.11	94.69	44.04
4/27/99	12:47:31 PM	209.61	91.71	44.04
4/27/99	12:48:01 PM	210.11	95.45	44.04
4/27/99	12:48:31 PM	210.61	91.50	44.05
4/27/99	12:49:01 PM	211.11	95.52	44.05
4/27/99	12:49:31 PM	211.61	92.82	44.06
4/27/99	12:50:31 PM	212.61	94.48	44.06
4/27/99	12:51:31 PM	213.61	93.17	44.07
4/27/99	12:52:31 PM	214.61	95.59	44.07
4/27/99	12:53:31 PM	215.61	92.13	44.08
4/27/99	12:54:31 PM	216.61	91.29	44.08
4/27/99	12:55:31 PM	217.61	91.85	44.10
4/27/99	12:56:31 PM	218.61	89.56	44.10
4/27/99	12:57:31 PM	219.61	94.69	44.11
4/27/99	12:58:31 PM	220.61	94.14	44.12
4/27/99	12:59:31 PM	221.61	92.61	44.12
4/27/99	1:00:31 PM	222.61	92.68	44.12
4/27/99	1:01:31 PM	223.61	93.86	44.13
4/27/99	1:02:31 PM	224.61	92.06	44.14
4/27/99	1:03:31 PM	225.61	91.78	44.14
4/27/99	1:04:31 PM	226.61	92.40	44.14

4/27/99	1:05:31 PM	227.61	95.66	44.15
4/27/99	1:06:31 PM	228.61	92.96	44.15
4/27/99	1:07:31 PM	229.61	90.39	44.15
4/27/99	1:08:31 PM	230.61	92.33	44.15
4/27/99	1:09:31 PM	231.61	93.65	44.16
4/27/99	1:10:31 PM	232.61	93.51	44.16
4/27/99	1:11:31 PM	233.61	92.82	44.18
4/27/99	1:12:31 PM	234.61	92.96	44.16
4/27/99	1:13:31 PM	235.61	94.69	44.19
4/27/99	1:14:31 PM	236.61	89.70	44.18
4/27/99	1:15:31 PM	237.61	91.36	44.18
4/27/99	1:16:31 PM	238.61	92.33	44.19
4/27/99	1:17:31 PM	239.61	91.99	44.20
4/27/99	1:18:31 PM	240.61	93.17	44.20
4/27/99	1:19:31 PM	241.61	93.10	44.21

Date Wednesday April 28, 1999 9:10 AM
PlotFile C:\TERRA3\STSE201.PRN
DataFile C:\TERRA3\STSE2.DAT
1-May
Time of First Log in Specified Window
3.63E+04 3.99E-01

Date	Time	Minutes	Pumped Well (#2)	Observ. Well (#1)	
8 Hr Constant Rate Test #2					
4/26/99	9:34:36 AM	0.00	39.78	40.97	5000 gpm
4/26/99	9:34:39 AM	0.05	41.65	40.97	
4/26/99	9:34:42 AM	0.10	45.74	40.97	
4/26/99	9:34:45 AM	0.15	50.17	40.97	
4/26/99	9:34:48 AM	0.20	52.60	40.97	
4/26/99	9:34:51 AM	0.25	51.77	40.97	
4/26/99	9:34:54 AM	0.30	49.96	40.97	
4/26/99	9:34:57 AM	0.35	49.96	40.97	
4/26/99	9:35:00 AM	0.40	48.85	40.98	
4/26/99	9:35:03 AM	0.45	49.96	40.99	
4/26/99	9:35:06 AM	0.50	54.12	40.99	
4/26/99	9:35:09 AM	0.55	60.50	41.00	
4/26/99	9:35:14 AM	0.64	73.46	41.02	
4/26/99	9:35:19 AM	0.72	78.03	41.05	
4/26/99	9:35:24 AM	0.80	81.70	41.06	
4/26/99	9:35:29 AM	0.89	84.06	41.09	
4/26/99	9:35:34 AM	0.97	86.21	41.12	
4/26/99	9:35:39 AM	1.05	85.93	41.14	
4/26/99	9:35:44 AM	1.13	88.49	41.17	
4/26/99	9:35:49 AM	1.22	86.76	41.21	
4/26/99	9:35:54 AM	1.30	87.80	41.24	
4/26/99	9:35:59 AM	1.39	88.98	41.28	
4/26/99	9:36:04 AM	1.47	89.81	41.31	
4/26/99	9:36:09 AM	1.55	89.19	41.35	
4/26/99	9:36:14 AM	1.64	89.74	41.36	
4/26/99	9:36:19 AM	1.72	88.01	41.39	
4/26/99	9:36:24 AM	1.80	89.33	41.40	
4/26/99	9:36:29 AM	1.88	87.94	41.44	
4/26/99	9:36:34 AM	1.97	90.71	41.46	
4/26/99	9:36:39 AM	2.05	91.13	41.49	
4/26/99	9:36:44 AM	2.14	90.85	41.51	
4/26/99	9:36:49 AM	2.22	88.98	41.54	
4/26/99	9:36:54 AM	2.30	90.57	41.57	
4/26/99	9:36:59 AM	2.39	91.47	41.59	
4/26/99	9:37:04 AM	2.47	94.66	41.61	
4/26/99	9:37:09 AM	2.55	92.93	41.62	
4/26/99	9:37:14 AM	2.64	91.96	41.65	
4/26/99	9:37:19 AM	2.72	93.00	41.66	
4/26/99	9:37:24 AM	2.80	93.00	41.69	

4/26/99	9:37:29 AM	2.89	92.86	41.72
4/26/99	9:37:34 AM	2.97	87.11	41.73
4/26/99	9:37:39 AM	3.05	93.48	41.74
4/26/99	9:37:44 AM	3.13	91.41	41.76
4/26/99	9:37:49 AM	3.22	91.47	41.79
4/26/99	9:37:54 AM	3.30	92.72	41.81
4/26/99	9:37:59 AM	3.39	88.08	41.82
4/26/99	9:38:04 AM	3.47	90.02	41.84
4/26/99	9:38:09 AM	3.55	92.93	41.85
4/26/99	9:38:14 AM	3.64	93.35	41.87
4/26/99	9:38:19 AM	3.72	88.77	41.89
4/26/99	9:38:24 AM	3.80	91.41	41.91
4/26/99	9:38:29 AM	3.89	92.72	41.92
4/26/99	9:38:34 AM	3.97	91.06	41.94
4/26/99	9:38:39 AM	4.05	93.76	41.96
4/26/99	9:38:44 AM	4.14	88.22	41.97
4/26/99	9:38:49 AM	4.22	93.76	41.98
4/26/99	9:38:54 AM	4.30	94.18	42.01
4/26/99	9:38:59 AM	4.38	93.90	42.02
4/26/99	9:39:04 AM	4.47	89.81	42.03
4/26/99	9:39:09 AM	4.55	89.60	42.04
4/26/99	9:39:24 AM	4.80	91.13	42.09
4/26/99	9:39:39 AM	5.05	91.75	42.13
4/26/99	9:39:54 AM	5.30	95.08	42.17
4/26/99	9:40:09 AM	5.55	92.58	42.21
4/26/99	9:40:24 AM	5.80	90.92	42.24
4/26/99	9:40:39 AM	6.05	90.71	42.28
4/26/99	9:40:54 AM	6.30	90.92	42.32
4/26/99	9:41:09 AM	6.55	96.12	42.34
4/26/99	9:41:24 AM	6.80	91.75	42.37
4/26/99	9:41:39 AM	7.05	93.48	42.41
4/26/99	9:41:54 AM	7.30	92.24	42.43
4/26/99	9:42:09 AM	7.55	90.78	42.47
4/26/99	9:42:24 AM	7.80	92.51	42.49
4/26/99	9:42:39 AM	8.05	91.41	42.51
4/26/99	9:42:54 AM	8.30	94.18	42.55
4/26/99	9:43:09 AM	8.55	92.72	42.57
4/26/99	9:43:24 AM	8.80	90.23	42.59
4/26/99	9:43:39 AM	9.05	90.78	42.62
4/26/99	9:43:54 AM	9.30	93.62	42.64
4/26/99	9:44:09 AM	9.55	91.89	42.66
4/26/99	9:44:24 AM	9.80	94.04	42.69
4/26/99	9:44:39 AM	10.05	93.21	42.71
4/26/99	9:44:54 AM	10.30	90.85	42.73
4/26/99	9:45:09 AM	10.55	93.69	42.76
4/26/99	9:45:24 AM	10.80	93.28	42.78
4/26/99	9:45:39 AM	11.05	93.28	42.80
4/26/99	9:45:54 AM	11.30	91.13	42.81
4/26/99	9:46:09 AM	11.55	94.25	42.84
4/26/99	9:46:24 AM	11.80	92.24	42.86
4/26/99	9:46:39 AM	12.05	89.67	42.87

4/26/99	9:46:54 AM	12.30	94.32	42.89
4/26/99	9:47:09 AM	12.55	94.94	42.91
4/26/99	9:47:24 AM	12.80	93.41	42.93
4/26/99	9:47:39 AM	13.05	95.56	42.94
4/26/99	9:47:54 AM	13.30	92.86	42.96
4/26/99	9:48:09 AM	13.55	94.11	42.98
4/26/99	9:48:24 AM	13.80	92.38	42.99
4/26/99	9:48:39 AM	14.05	96.12	43.01
4/26/99	9:48:54 AM	14.30	92.10	43.02
4/26/99	9:49:09 AM	14.55	95.49	43.03
4/26/99	9:49:39 AM	15.05	92.31	43.06
4/26/99	9:50:09 AM	15.55	93.14	43.09
4/26/99	9:50:39 AM	16.05	93.55	43.11
4/26/99	9:51:09 AM	16.55	94.73	43.15
4/26/99	9:51:39 AM	17.05	92.86	43.17
4/26/99	9:52:09 AM	17.55	93.55	43.19
4/26/99	9:52:39 AM	18.05	94.39	43.22
4/26/99	9:53:09 AM	18.55	94.94	43.24
4/26/99	9:53:39 AM	19.05	92.72	43.26
4/26/99	9:54:09 AM	19.55	93.21	43.29
4/26/99	9:54:39 AM	20.05	92.65	43.30
4/26/99	9:55:09 AM	20.55	94.45	43.32
4/26/99	9:55:39 AM	21.05	92.93	43.34
4/26/99	9:56:09 AM	21.55	92.65	43.36
4/26/99	9:56:39 AM	22.05	92.31	43.38
4/26/99	9:57:09 AM	22.55	93.83	43.40
4/26/99	9:57:39 AM	23.05	95.22	43.43
4/26/99	9:58:09 AM	23.55	93.69	43.44
4/26/99	9:58:39 AM	24.05	91.61	43.45
4/26/99	9:59:09 AM	24.55	93.21	43.47
4/26/99	9:59:39 AM	25.05	94.32	43.48
4/26/99	10:00:09 AM	25.55	94.11	43.51
4/26/99	10:00:39 AM	26.05	90.57	43.52
4/26/99	10:01:09 AM	26.55	94.66	43.53
4/26/99	10:01:39 AM	27.05	90.37	43.55
4/26/99	10:02:09 AM	27.55	95.63	43.55
4/26/99	10:02:39 AM	28.05	95.63	43.58
4/26/99	10:03:09 AM	28.55	93.83	43.59
4/26/99	10:03:39 AM	29.05	94.94	43.60
4/26/99	10:04:09 AM	29.55	93.55	43.61
4/26/99	10:05:09 AM	30.55	92.93	43.63
4/26/99	10:06:09 AM	31.55	93.69	43.66
4/26/99	10:07:09 AM	32.55	92.58	43.68
4/26/99	10:08:09 AM	33.55	94.73	43.70
4/26/99	10:09:09 AM	34.55	94.66	43.73
4/26/99	10:10:09 AM	35.55	92.51	43.74
4/26/99	10:11:09 AM	36.55	95.36	43.76
4/26/99	10:12:09 AM	37.55	94.80	43.77
4/26/99	10:13:09 AM	38.55	92.31	43.80
4/26/99	10:14:09 AM	39.55	94.11	43.81
4/26/99	10:15:09 AM	40.55	94.11	43.83

4/26/99	10:16:09 AM	41.55	93.90	43.84
4/26/99	10:17:09 AM	42.55	92.58	43.85
4/26/99	10:18:09 AM	43.55	93.55	43.88
4/26/99	10:19:09 AM	44.55	95.77	43.89
4/26/99	10:20:09 AM	45.55	93.62	43.89
4/26/99	10:21:09 AM	46.55	94.87	43.90
4/26/99	10:22:09 AM	47.55	94.80	43.91
4/26/99	10:23:09 AM	48.55	93.41	43.92
4/26/99	10:24:09 AM	49.55	94.32	43.93
4/26/99	10:25:09 AM	50.55	96.46	43.95
4/26/99	10:26:09 AM	51.55	95.84	43.96
4/26/99	10:27:09 AM	52.55	96.46	43.97
4/26/99	10:28:09 AM	53.55	95.63	43.98
4/26/99	10:29:09 AM	54.55	93.28	43.99
4/26/99	10:30:09 AM	55.55	95.36	44.00
4/26/99	10:31:09 AM	56.55	96.53	44.00
4/26/99	10:32:09 AM	57.55	91.89	44.01
4/26/99	10:33:09 AM	58.55	93.48	44.03
4/26/99	10:34:09 AM	59.55	95.01	44.04
4/26/99	10:39:09 AM	64.55	94.80	44.06
4/26/99	10:44:09 AM	69.55	93.48	44.10
4/26/99	10:49:09 AM	74.55	95.01	44.12
4/26/99	10:54:09 AM	79.55	92.93	44.14
4/26/99	10:59:09 AM	84.55	95.63	44.16
4/26/99	11:04:09 AM	89.55	92.51	44.18
4/26/99	11:09:09 AM	94.55	94.80	44.21
4/26/99	11:14:09 AM	99.55	95.42	44.21
4/26/99	11:19:09 AM	104.55	94.87	44.22
4/26/99	11:24:09 AM	109.55	93.69	44.23
4/26/99	11:29:09 AM	114.55	93.83	44.25
4/26/99	11:34:09 AM	119.55	93.76	44.26
4/26/99	11:44:09 AM	129.55	94.80	44.27
4/26/99	11:54:09 AM	139.55	95.77	44.28
4/26/99	12:04:09 PM	149.55	96.12	44.30
4/26/99	12:14:09 PM	159.55	94.04	44.32
4/26/99	12:24:09 PM	169.55	95.42	44.32
4/26/99	12:34:09 PM	179.55	94.87	44.33
4/26/99	12:44:09 PM	189.55	94.25	44.33
4/26/99	12:54:09 PM	199.55	95.56	44.33
4/26/99	1:04:09 PM	209.55	95.22	44.34
4/26/99	1:14:09 PM	219.55	95.91	44.34
4/26/99	1:24:09 PM	229.55	94.80	44.34
4/26/99	1:34:09 PM	239.55	95.36	44.34
4/26/99	1:44:09 PM	249.55	95.77	44.35
4/26/99	1:54:09 PM	259.55	93.97	44.33
4/26/99	2:04:09 PM	269.55	97.43	44.34
4/26/99	2:14:09 PM	279.55	96.95	44.33
4/26/99	2:24:09 PM	289.55	95.42	44.33
4/26/99	2:34:09 PM	299.55	94.66	44.33
4/26/99	2:44:09 PM	309.55	95.49	44.33
4/26/99	2:54:09 PM	319.55	94.80	44.33

4/26/99	3:04:09 PM	329.55	95.91	44.32	
4/26/99	3:14:09 PM	339.55	94.39	44.33	
4/26/99	3:24:09 PM	349.55	95.98	44.32	
4/26/99	3:34:09 PM	359.55	95.56	44.32	
4/26/99	3:44:09 PM	369.55	94.59	44.32	
4/26/99	3:54:09 PM	379.55	96.60	44.30	
4/26/99	4:04:09 PM	389.55	95.49	44.32	
4/26/99	4:14:09 PM	399.55	93.90	44.30	
4/26/99	4:24:09 PM	409.55	95.01	44.30	
4/26/99	4:34:09 PM	419.55	96.05	44.30	
4/26/99	4:44:09 PM	429.55	96.33	44.30	
4/26/99	4:54:09 PM	439.55	95.36	44.30	
4/26/99	5:04:09 PM	449.55	96.53	44.30	
4/26/99	5:14:09 PM	459.55	94.52	44.30	
4/26/99	5:24:09 PM	469.55	96.95	44.30	
4/26/99	5:34:09 PM	479.55	96.46	44.30	
4/26/99	5:36:11 PM	481.57	93.76	44.30	
4/26/99	5:36:14 PM	481.62	95.63	44.30	
4/26/99	5:36:16 PM	481.67	95.56	44.30	
4/26/99	5:36:19 PM	481.72	96.60	44.30	
4/26/99	5:36:22 PM	481.77	96.74	44.30	
4/26/99	5:36:25 PM	481.82	93.83	44.32	
4/26/99	5:36:29 PM	481.87	95.63	44.30	
4/26/99	5:36:32 PM	481.92	97.09	44.32	
4/26/99	5:36:35 PM	481.98	94.80	44.30	
4/26/99	5:36:37 PM	482.02	96.67	44.32	
4/26/99	5:36:41 PM	482.07	95.84	44.32	
4/26/99	5:36:44 PM	482.12	94.73	44.30	
4/26/99	5:36:46 PM	482.17	95.77	44.30	
4/26/99	5:36:49 PM	482.22	95.42	44.32	
4/26/99	5:36:52 PM	482.27	96.12	44.32	
4/26/99	5:36:55 PM	482.32	95.29	44.32	
4/26/99	5:36:58 PM	482.37	95.70	44.32	
4/26/99	5:37:01 PM	482.42	95.36	44.32	
4/26/99	5:37:04 PM	0.00	95.42	44.32	Recovery
4/26/99	5:37:07 PM	0.05	94.80	44.32	
4/26/99	5:37:10 PM	0.10	93.07	44.30	
4/26/99	5:37:15 PM	0.18	84.48	44.30	
4/26/99	5:37:20 PM	0.27	68.33	44.30	
4/26/99	5:37:25 PM	0.35	50.80	44.30	
4/26/99	5:37:30 PM	0.43	38.60	44.32	
4/26/99	5:37:35 PM	0.52	33.40	44.30	
4/26/99	5:37:40 PM	0.60	32.29	44.29	
4/26/99	5:37:45 PM	0.68	34.30	44.27	
4/26/99	5:37:50 PM	0.77	37.56	44.22	
4/26/99	5:37:55 PM	0.85	38.94	44.15	
4/26/99	5:38:00 PM	0.93	38.88	44.08	
4/26/99	5:38:05 PM	1.02	38.39	44.00	
4/26/99	5:38:10 PM	1.10	37.49	43.92	
4/26/99	5:38:15 PM	1.18	36.73	43.86	
4/26/99	5:38:20 PM	1.27	36.24	43.82	

4/26/99	5:38:25 PM	1.35	36.38	43.77
4/26/99	5:38:30 PM	1.43	35.96	43.74
4/26/99	5:38:35 PM	1.52	37.97	43.71
4/26/99	5:38:40 PM	1.60	40.68	43.69
4/26/99	5:38:45 PM	1.68	43.31	43.65
4/26/99	5:38:50 PM	1.77	45.18	43.60
4/26/99	5:38:55 PM	1.85	45.60	43.56
4/26/99	5:39:00 PM	1.93	44.70	43.53
4/26/99	5:39:05 PM	2.02	43.24	43.51
4/26/99	5:39:10 PM	2.10	41.92	43.50
4/26/99	5:39:15 PM	2.18	41.23	43.48
4/26/99	5:39:20 PM	2.27	41.23	43.48
4/26/99	5:39:25 PM	2.35	41.72	43.48
4/26/99	5:39:30 PM	2.43	42.41	43.47
4/26/99	5:39:35 PM	2.52	42.96	43.45
4/26/99	5:39:40 PM	2.60	43.31	43.43
4/26/99	5:39:45 PM	2.68	43.31	43.40
4/26/99	5:39:50 PM	2.77	43.03	43.38
4/26/99	5:39:55 PM	2.85	42.69	43.36
4/26/99	5:40:00 PM	2.93	42.41	43.33
4/26/99	5:40:05 PM	3.02	42.20	43.32
4/26/99	5:40:10 PM	3.10	42.20	43.31
4/26/99	5:40:15 PM	3.18	42.27	43.30
4/26/99	5:40:20 PM	3.27	42.41	43.29
4/26/99	5:40:25 PM	3.35	42.55	43.28
4/26/99	5:40:30 PM	3.43	42.55	43.26
4/26/99	5:40:35 PM	3.52	42.48	43.24
4/26/99	5:40:40 PM	3.60	42.55	43.22
4/26/99	5:40:45 PM	3.68	42.27	43.21
4/26/99	5:40:50 PM	3.77	42.27	43.18
4/26/99	5:40:55 PM	3.85	42.13	43.18
4/26/99	5:41:00 PM	3.93	42.20	43.16
4/26/99	5:41:05 PM	4.02	42.27	43.15
4/26/99	5:41:10 PM	4.10	42.20	43.14
4/26/99	5:41:25 PM	4.35	42.20	43.10
4/26/99	5:41:40 PM	4.60	42.06	43.04
4/26/99	5:41:55 PM	4.85	42.13	43.02
4/26/99	5:42:10 PM	5.10	41.99	42.99
4/26/99	5:42:25 PM	5.35	41.92	42.94
4/26/99	5:42:40 PM	5.60	41.92	42.92
4/26/99	5:42:55 PM	5.85	41.86	42.88
4/26/99	5:43:10 PM	6.10	41.79	42.85
4/26/99	5:43:25 PM	6.35	41.72	42.81
4/26/99	5:43:40 PM	6.60	41.72	42.79
4/26/99	5:43:55 PM	6.85	41.65	42.76
4/26/99	5:44:10 PM	7.10	41.65	42.73
4/26/99	5:44:25 PM	7.35	41.58	42.71
4/26/99	5:44:40 PM	7.60	41.58	42.67
4/26/99	5:44:55 PM	7.85	41.51	42.65
4/26/99	5:45:10 PM	8.10	41.51	42.63
4/26/99	5:45:25 PM	8.35	41.44	42.61

4/26/99	5:45:40 PM	8.60	41.44	42.58
4/26/99	5:45:55 PM	8.85	41.37	42.56
4/26/99	5:46:10 PM	9.10	41.37	42.55
4/26/99	5:46:25 PM	9.35	41.37	42.51
4/26/99	5:46:40 PM	9.60	41.30	42.50
4/26/99	5:46:55 PM	9.85	41.30	42.48
4/26/99	5:47:10 PM	10.10	41.30	42.46
4/26/99	5:47:25 PM	10.35	41.23	42.43
4/26/99	5:47:40 PM	10.60	41.23	42.42
4/26/99	5:47:55 PM	10.85	41.23	42.40
4/26/99	5:48:10 PM	11.10	41.16	42.37
4/26/99	5:48:25 PM	11.35	41.16	42.36
4/26/99	5:48:40 PM	11.60	41.16	42.35
4/26/99	5:48:55 PM	11.85	41.09	42.33
4/26/99	5:49:10 PM	12.10	41.09	42.32
4/26/99	5:49:25 PM	12.35	41.09	42.31
4/26/99	5:49:40 PM	12.60	41.09	42.29
4/26/99	5:49:55 PM	12.85	41.02	42.27
4/26/99	5:50:10 PM	13.10	41.02	42.26
4/26/99	5:50:25 PM	13.35	41.02	42.24
4/26/99	5:50:40 PM	13.60	41.02	42.22
4/26/99	5:50:55 PM	13.85	40.95	42.21
4/26/99	5:51:10 PM	14.10	40.95	42.20
4/26/99	5:51:40 PM	14.60	40.89	42.17
4/26/99	5:52:10 PM	15.10	40.89	42.14
4/26/99	5:52:40 PM	15.60	40.82	42.12
4/26/99	5:53:10 PM	16.10	40.89	42.10
4/26/99	5:53:40 PM	16.60	40.82	42.07
4/26/99	5:54:10 PM	17.10	40.75	42.05
4/26/99	5:54:40 PM	17.60	40.75	42.03
4/26/99	5:55:10 PM	18.10	40.75	42.02
4/26/99	5:55:40 PM	18.60	40.68	41.99
4/26/99	5:56:10 PM	19.10	40.68	41.97
4/26/99	5:56:40 PM	19.60	40.61	41.95
4/26/99	5:57:10 PM	20.10	40.61	41.94
4/26/99	5:57:40 PM	20.60	40.61	41.91
4/26/99	5:58:10 PM	21.10	40.61	41.90
4/26/99	5:58:40 PM	21.60	40.61	41.89
4/26/99	5:59:10 PM	22.10	40.54	41.87
4/26/99	5:59:40 PM	22.60	40.54	41.85
4/26/99	6:00:10 PM	23.10	40.47	41.84
4/26/99	6:00:40 PM	23.60	40.47	41.83
4/26/99	6:01:10 PM	24.10	40.47	41.81

Barnes, Ferland & Associates
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ph.(407) 896-8608

Pumping test analysis
Recovery method after
THEIS & JACOB
Confined aquifer

Project: OUC SOUTHEAST

Evaluated by: JDW Date: 5/4/99

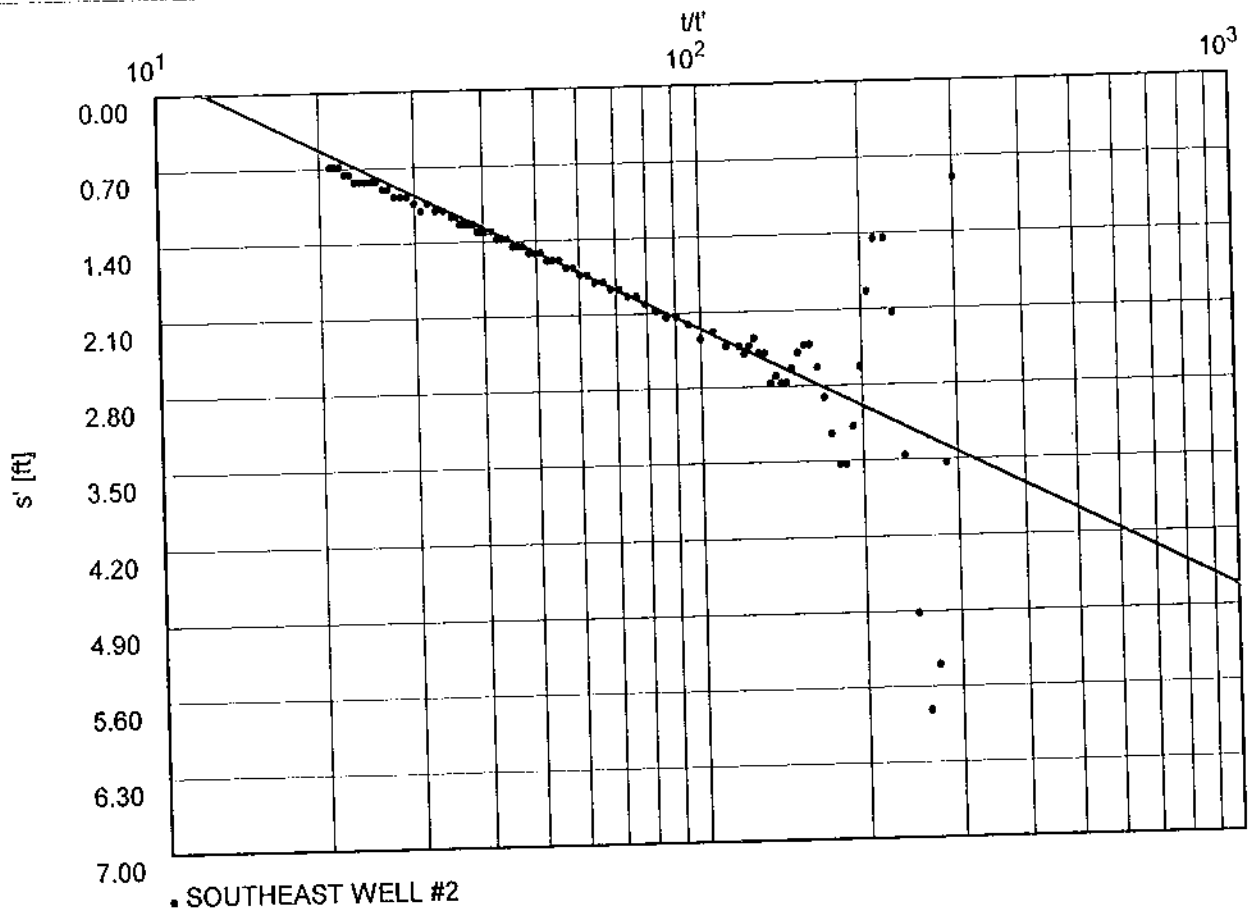
Pumping Test No. 2

Test conducted on: 4/26/99

WELL #2

Discharge 5000.00 U.S.gal/min

Pumping test duration: 0.33330 d



Transmissivity [ft²/d]: 7.14×10^4

Hydraulic conductivity [ft/d]: 1.78×10^2

Aquifer thickness [ft]: 400.00

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Pumping test analysis
Recovery method after
THEIS & JACOB
Confined aquifer

Project: OUC SOUTHEAST

Evaluated by: JDW Date: 5/4/99

Pumping Test No. 2

Test conducted on: 4/26/99

WELL #2

SOUTHEAST WELL #2

Discharge 5000.00 U.S.gal/min

Static water level: 39.78 ft below datum

Pumping test duration: 0.33330 d

	Time from end of pumping [d]	Water level [ft]	Residual drawdown [ft]
1	0.00036	33.40	-6.38
2	0.00042	32.29	-7.49
3	0.00047	34.30	-5.48
4	0.00053	37.56	-2.22
5	0.00059	38.94	-0.84
6	0.00065	38.88	-0.90
7	0.00071	38.39	-1.39
8	0.00076	37.49	-2.29
9	0.00082	36.73	-3.05
10	0.00088	36.24	-3.54
11	0.00094	36.38	-3.40
12	0.00099	35.96	-3.82
13	0.00106	37.97	-1.81
14	0.00111	40.68	0.90
15	0.00117	43.31	3.53
16	0.00123	45.18	5.40
17	0.00128	45.60	5.82
18	0.00134	44.70	4.92
19	0.00140	43.24	3.46
20	0.00146	41.92	2.14
21	0.00151	41.23	1.45
22	0.00158	41.23	1.45
23	0.00163	41.72	1.94
24	0.00169	42.41	2.63
25	0.00175	42.96	3.18
26	0.00181	43.31	3.53
27	0.00186	43.31	3.53
28	0.00192	43.03	3.25
29	0.00198	42.69	2.91
30	0.00203	42.41	2.63
31	0.00210	42.20	2.42
32	0.00215	42.20	2.42
33	0.00221	42.27	2.49
34	0.00227	42.41	2.63
35	0.00233	42.55	2.77
36	0.00238	42.55	2.77
37	0.00244	42.48	2.70
38	0.00250	42.55	2.77
39	0.00256	42.27	2.49
40	0.00262	42.27	2.49
41	0.00267	42.13	2.35
42	0.00273	42.20	2.42
43	0.00279	42.27	2.49
44	0.00285	42.20	2.42
45	0.00302	42.20	2.42
46	0.00319	42.06	2.28
47	0.00337	42.13	2.35
48	0.00354	41.99	2.21
49	0.00372	41.92	2.14
50	0.00389	41.92	2.14

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Pumping test analysis
Recovery method after
THEIS & JACOB
Confined aquifer

Project: OUC SOUTHEAST

Evaluated by: JDW Date: 5/4/99

Pumping Test No. 2

Test conducted on: 4/26/99

WELL #2

SOUTHEAST WELL #2

Discharge 5000.00 U.S.gal/min

Static water level: 39.78 ft below datum

Pumping test duration: 0.33330 d

	Time from end of pumping [d]	Water level [ft]	Residual drawdown [ft]
51	0.00406	41.86	2.08
52	0.00424	41.79	2.01
53	0.00441	41.72	1.94
54	0.00458	41.72	1.94
55	0.00476	41.65	1.87
56	0.00493	41.65	1.87
57	0.00510	41.58	1.80
58	0.00528	41.58	1.80
59	0.00545	41.51	1.73
60	0.00563	41.51	1.73
61	0.00580	41.44	1.66
62	0.00597	41.44	1.66
63	0.00615	41.37	1.59
64	0.00632	41.37	1.59
65	0.00649	41.37	1.59
66	0.00667	41.30	1.52
67	0.00684	41.30	1.52
68	0.00701	41.30	1.52
69	0.00719	41.23	1.45
70	0.00736	41.23	1.45
71	0.00753	41.23	1.45
72	0.00771	41.16	1.38
73	0.00788	41.16	1.38
74	0.00806	41.16	1.38
75	0.00823	41.09	1.31
76	0.00840	41.09	1.31
77	0.00858	41.09	1.31
78	0.00875	41.09	1.31
79	0.00892	41.02	1.24
80	0.00910	41.02	1.24
81	0.00927	41.02	1.24
82	0.00944	41.02	1.24
83	0.00962	40.95	1.17
84	0.00979	40.95	1.17
85	0.01014	40.89	1.11
86	0.01049	40.89	1.11
87	0.01083	40.82	1.04
88	0.01118	40.89	1.11
89	0.01153	40.82	1.04
90	0.01188	40.75	0.97
91	0.01222	40.75	0.97
92	0.01257	40.75	0.97
93	0.01292	40.68	0.90
94	0.01326	40.68	0.90
95	0.01361	40.61	0.83
96	0.01396	40.61	0.83
97	0.01431	40.61	0.83
98	0.01465	40.61	0.83
99	0.01500	40.61	0.83
100	0.01535	40.54	0.76

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Pumping test analysis
Recovery method after
THEIS & JACOB
Confined aquifer

Project: OUC SOUTHEAST

Evaluated by: JDW Date: 5/4/99

Pumping Test No. 2

Test conducted on: 4/26/99

WELL #2

SOUTHEAST WELL #2

Discharge 5000.00 U.S.gal/min

Static water level: 39.78 ft below datum

Pumping test duration: 0.33330 d

	Time from end of pumping [d]	Water level [ft]	Residual drawdown [ft]
101	0.01569	40.54	0.76
102	0.01604	40.47	0.69
103	0.01639	40.47	0.69
104	0.01674	40.47	0.69

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Pumping test analysis
Time-Drawdown-method after
COOPER & JACOB
Confined aquifer

Project: OUC SOUTHEAST

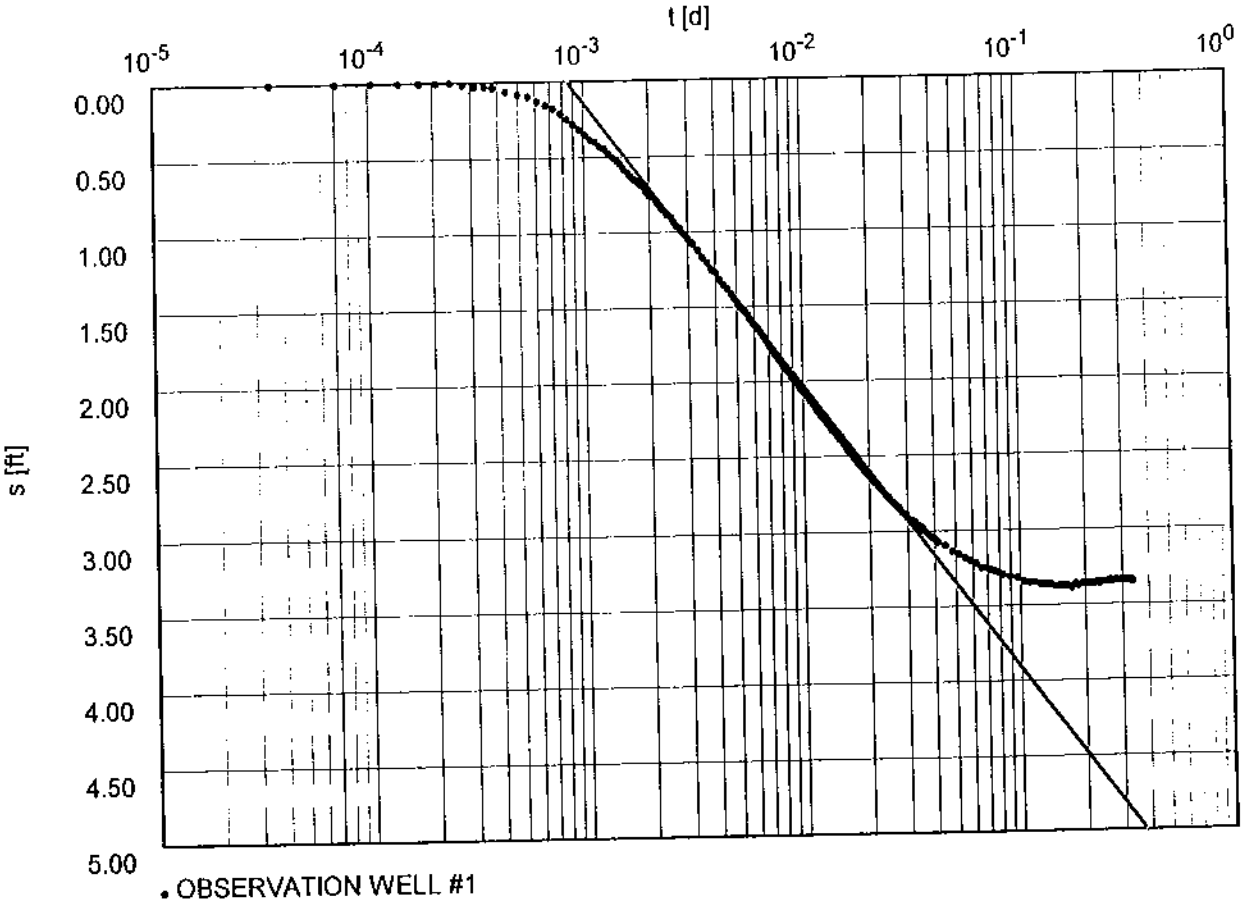
Evaluated by: JDW Date: 5/4/99

Pumping Test No. 2

Test conducted on: 4/26/99

Obs. Well #1

Discharge 5000.00 U.S.gal/min



Transmissivity [ft²/d]: 9.31×10^{4}

Storativity: 3.18×10^{-4}

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Pumping test analysis
Time-Drawdown-method after
COOPER & JACOB
Confined aquifer

Project: OUC SOUTHEAST

Evaluated by: JDW Date: 5/4/99

Pumping Test No. 2

Test conducted on: 4/26/99

Obs. Well #1

OBSERVATION WELL #1

Discharge 5000.00 U.S.gal/min

Distance from the pumping well 750.00 ft

Static water level: 40.96 ft below datum

	Pumping test duration [d]	Water level [ft]	Drawdown [ft]
1	0.00004	40.97	0.01
2	0.00007	40.97	0.01
3	0.00010	40.97	0.01
4	0.00014	40.97	0.01
5	0.00017	40.97	0.01
6	0.00021	40.97	0.01
7	0.00024	40.97	0.01
8	0.00028	40.98	0.02
9	0.00031	40.99	0.03
10	0.00035	40.99	0.03
11	0.00038	41.00	0.04
12	0.00044	41.02	0.06
13	0.00050	41.05	0.09
14	0.00056	41.06	0.10
15	0.00061	41.09	0.13
16	0.00067	41.12	0.16
17	0.00073	41.14	0.18
18	0.00079	41.17	0.21
19	0.00085	41.21	0.25
20	0.00090	41.24	0.28
21	0.00096	41.28	0.32
22	0.00102	41.31	0.35
23	0.00108	41.35	0.39
24	0.00114	41.36	0.40
25	0.00119	41.39	0.43
26	0.00125	41.40	0.44
27	0.00131	41.44	0.48
28	0.00137	41.46	0.50
29	0.00142	41.49	0.53
30	0.00148	41.51	0.55
31	0.00154	41.54	0.58
32	0.00160	41.57	0.61
33	0.00166	41.59	0.63
34	0.00171	41.61	0.65
35	0.00177	41.62	0.66
36	0.00183	41.65	0.69
37	0.00189	41.66	0.70
38	0.00195	41.69	0.73
39	0.00200	41.72	0.76
40	0.00206	41.73	0.77
41	0.00212	41.74	0.78
42	0.00218	41.76	0.80
43	0.00223	41.79	0.83
44	0.00229	41.81	0.85
45	0.00235	41.82	0.86
46	0.00241	41.84	0.88
47	0.00247	41.85	0.89
48	0.00252	41.87	0.91
49	0.00258	41.89	0.93
50	0.00264	41.91	0.95

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Pumping test analysis
Time-Drawdown-method after
COOPER & JACOB
Confined aquifer

Project: OUC SOUTHEAST

Evaluated by: JDW Date: 5/4/99

Pumping Test No. 2

Test conducted on: 4/26/99

Obs. Well #1

OBSERVATION WELL #1

Discharge 5000.00 U.S.gal/min

Distance from the pumping well 750.00 ft

Static water level: 40.96 ft below datum

	Pumping test duration	Water level	Drawdown
	[d]	[ft]	[ft]
51	0.00270	41.92	0.96
52	0.00276	41.94	0.98
53	0.00281	41.96	1.00
54	0.00287	41.97	1.01
55	0.00293	41.98	1.02
56	0.00299	42.01	1.04
57	0.00304	42.02	1.06
58	0.00310	42.03	1.07
59	0.00316	42.04	1.08
60	0.00333	42.09	1.13
61	0.00351	42.13	1.17
62	0.00368	42.17	1.21
63	0.00386	42.21	1.25
64	0.00403	42.24	1.28
65	0.00420	42.28	1.32
66	0.00438	42.32	1.36
67	0.00455	42.34	1.38
68	0.00472	42.37	1.41
69	0.00490	42.41	1.45
70	0.00507	42.43	1.47
71	0.00524	42.47	1.51
72	0.00542	42.49	1.53
73	0.00559	42.51	1.55
74	0.00577	42.55	1.59
75	0.00594	42.57	1.61
76	0.00611	42.59	1.63
77	0.00629	42.62	1.66
78	0.00646	42.64	1.68
79	0.00663	42.66	1.70
80	0.00681	42.69	1.73
81	0.00698	42.71	1.75
82	0.00715	42.73	1.77
83	0.00733	42.76	1.80
84	0.00750	42.78	1.82
85	0.00767	42.80	1.84
86	0.00785	42.81	1.85
87	0.00802	42.84	1.88
88	0.00820	42.86	1.90
89	0.00837	42.87	1.91
90	0.00854	42.89	1.93
91	0.00872	42.91	1.95
92	0.00889	42.93	1.97
93	0.00906	42.94	1.98
94	0.00924	42.96	2.00
95	0.00941	42.98	2.02
96	0.00959	42.99	2.03
97	0.00976	43.01	2.05
98	0.00993	43.02	2.06
99	0.01011	43.03	2.07
100	0.01045	43.06	2.10

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Pumping test analysis
Time-Drawdown-method after
COOPER & JACOB
Confined aquifer

Project: OUC SOUTHEAST

Evaluated by: JDW Date: 5/4/99

Pumping Test No. 2

Test conducted on: 4/26/99

Obs. Well #1

OBSERVATION WELL #1

Discharge 5000.00 U.S.gal/min

Distance from the pumping well 750.00 ft

Static water level: 40.96 ft below datum

	Pumping test duration	Water level	Drawdown
	[d]	[ft]	[ft]
101	0.01080	43.09	2.13
102	0.01115	43.11	2.15
103	0.01149	43.15	2.19
104	0.01184	43.17	2.21
105	0.01219	43.19	2.23
106	0.01254	43.22	2.26
107	0.01288	43.24	2.28
108	0.01323	43.26	2.30
109	0.01358	43.29	2.33
110	0.01392	43.30	2.34
111	0.01427	43.32	2.36
112	0.01462	43.34	2.38
113	0.01497	43.36	2.40
114	0.01531	43.38	2.42
115	0.01566	43.40	2.44
116	0.01601	43.43	2.47
117	0.01636	43.44	2.48
118	0.01670	43.45	2.49
119	0.01705	43.47	2.51
120	0.01740	43.48	2.52
121	0.01774	43.51	2.55
122	0.01809	43.52	2.56
123	0.01844	43.53	2.57
124	0.01879	43.55	2.59
125	0.01913	43.55	2.59
126	0.01948	43.58	2.62
127	0.01983	43.59	2.63
128	0.02017	43.60	2.64
129	0.02052	43.61	2.65
130	0.02122	43.63	2.67
131	0.02191	43.66	2.70
132	0.02261	43.68	2.72
133	0.02330	43.70	2.74
134	0.02399	43.73	2.77
135	0.02469	43.74	2.78
136	0.02538	43.76	2.80
137	0.02608	43.77	2.81
138	0.02677	43.80	2.84
139	0.02747	43.81	2.85
140	0.02816	43.83	2.87
141	0.02886	43.84	2.88
142	0.02955	43.85	2.89
143	0.03024	43.88	2.92
144	0.03094	43.89	2.93
145	0.03163	43.89	2.93
146	0.03233	43.90	2.94
147	0.03302	43.91	2.95
148	0.03372	43.92	2.96
149	0.03441	43.93	2.97
150	0.03511	43.95	2.99

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Pumping test analysis
Time-Drawdown-method after
COOPER & JACOB
Confined aquifer

Project: OUC SOUTHEAST

Evaluated by: JDW Date: 5/4/99

Pumping Test No. 2

Test conducted on: 4/26/99

Obs. Well #1

OBSERVATION WELL #1

Discharge 5000.00 U.S.gal/min

Distance from the pumping well 750.00 ft

Static water level: 40.96 ft below datum

	Pumping test duration [d]	Water level [ft]	Drawdown [ft]
151	0.03580	43.96	3.00
152	0.03649	43.97	3.01
153	0.03719	43.98	3.02
154	0.03788	43.99	3.03
155	0.03858	44.00	3.04
156	0.03927	44.00	3.04
157	0.03997	44.01	3.05
158	0.04066	44.03	3.07
159	0.04136	44.04	3.08
160	0.04483	44.06	3.10
161	0.04830	44.10	3.14
162	0.05177	44.12	3.16
163	0.05524	44.14	3.18
164	0.05872	44.16	3.20
165	0.06219	44.18	3.22
166	0.06566	44.21	3.25
167	0.06913	44.21	3.25
168	0.07261	44.22	3.26
169	0.07608	44.23	3.27
170	0.07955	44.25	3.29
171	0.08302	44.26	3.30
172	0.08997	44.27	3.31
173	0.09691	44.28	3.32
174	0.10386	44.30	3.34
175	0.11080	44.32	3.35
176	0.11774	44.32	3.35
177	0.12469	44.33	3.37
178	0.13163	44.33	3.37
179	0.13858	44.33	3.37
180	0.14552	44.34	3.38
181	0.15247	44.34	3.38
182	0.15941	44.34	3.38
183	0.16636	44.34	3.38
184	0.17330	44.35	3.39
185	0.18024	44.33	3.37
186	0.18719	44.34	3.38
187	0.19413	44.33	3.37
188	0.20108	44.33	3.37
189	0.20802	44.33	3.37
190	0.21497	44.33	3.37
191	0.22191	44.33	3.37
192	0.22886	44.32	3.35
193	0.23580	44.33	3.37
194	0.24274	44.32	3.35
195	0.24969	44.32	3.35
196	0.25663	44.32	3.35
197	0.26358	44.30	3.34
198	0.27052	44.32	3.35
199	0.27747	44.30	3.34
200	0.28441	44.30	3.34

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Pumping test analysis
Time-Drawdown-method after
COOPER & JACOB
Confined aquifer

Project: OUC SOUTHEAST

Evaluated by: JDW Date: 5/4/99

Pumping Test No. 2

Test conducted on: 4/26/99

Obs. Well #1

OBSERVATION WELL #1

Discharge 5000.00 U.S.gal/min

Distance from the pumping well 750.00 ft

Static water level: 40.96 ft below datum

	Pumping test duration	Water level	Drawdown
	[d]	[ft]	[ft]
201	0.29136	44.30	3.34
202	0.29830	44.30	3.34
203	0.30524	44.30	3.34
204	0.31219	44.30	3.34
205	0.31913	44.30	3.34
206	0.32608	44.30	3.34
207	0.33302	44.30	3.34
208	0.33443	44.30	3.34
209	0.33446	44.30	3.34
210	0.33449	44.30	3.34
211	0.33453	44.30	3.34
212	0.33456	44.30	3.34
213	0.33460	44.32	3.35
214	0.33463	44.30	3.34
215	0.33467	44.32	3.35
216	0.33471	44.30	3.34
217	0.33474	44.32	3.35
218	0.33477	44.32	3.35
219	0.33481	44.30	3.34
220	0.33484	44.30	3.34
221	0.33487	44.32	3.35
222	0.33491	44.32	3.35
223	0.33494	44.32	3.35
224	0.33498	44.32	3.35
225	0.33501	44.32	

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Pumping test analysis
Recovery method after
THEIS & JACOB
Confined aquifer

Project: OUC SOUTHEAST

Evaluated by: JDW Date: 05.04.1999

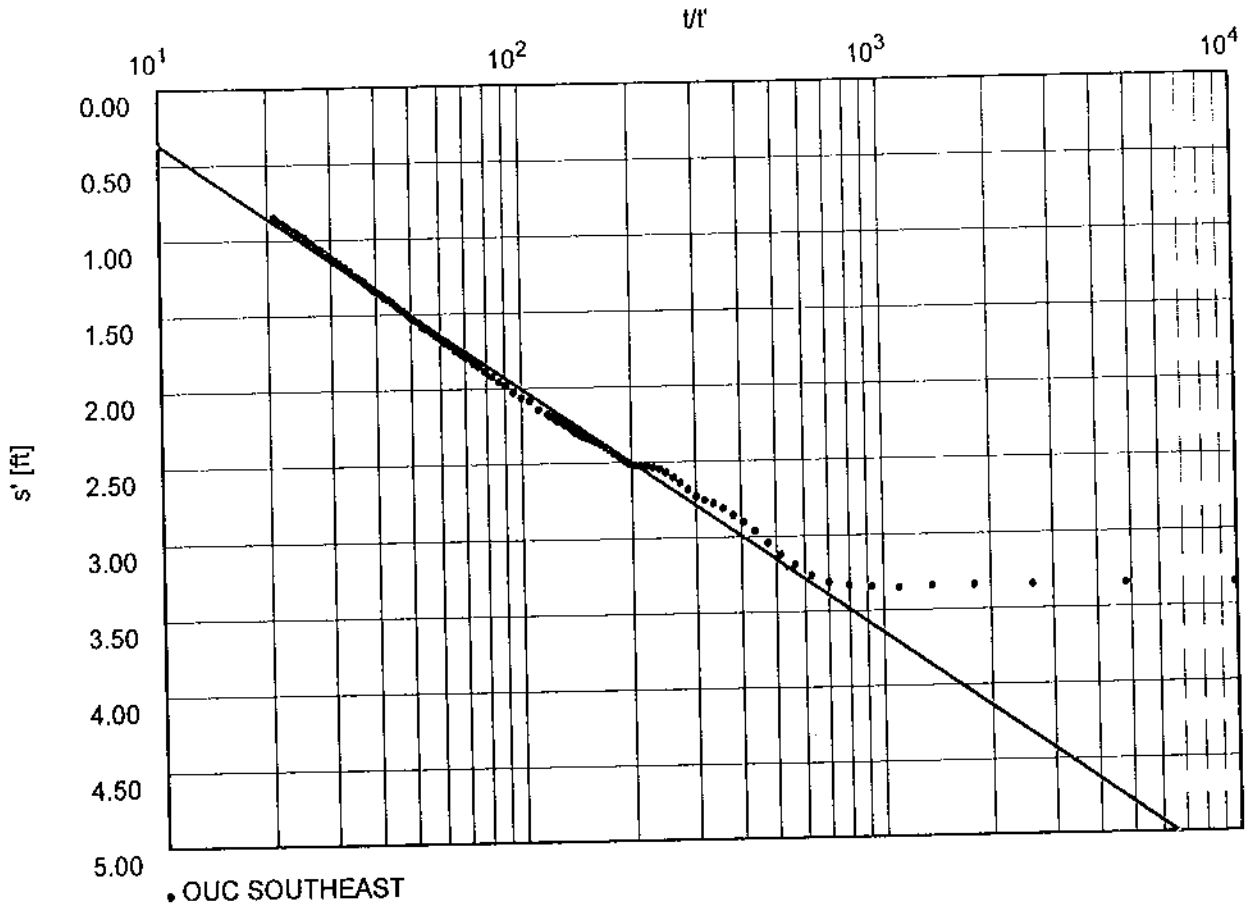
Pumping Test No. 2

Test conducted on: 4/26/99

WELL #1

Discharge 5000.00 U.S.gal/min

Pumping test duration: 0.33333 d



Transmissivity [ft²/d]: 1.07×10^5

Hydraulic conductivity [ft/d]: 2.68×10^2

Aquifer thickness [ft]: 400.00

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Pumping test analysis
Recovery method after
THEIS & JACOB
Confined aquifer

Project: OUC SOUTHEAST

Evaluated by: JDW Date: 05.04.1999

Pumping Test No. 2

Test conducted on: 4/26/99

WELL #1

OUC SOUTHEAST

Discharge 5000.00 U.S.gal/min

Distance from the pumping well 750.00 ft

Static water level: 40.96 ft below datum

Pumping test duration: 0.33333 d

	Time from end of pumping [d]	Water level [ft]	Residual drawdown [ft]
1	0.00003	44.32	3.35
2	0.00007	44.30	3.34
3	0.00013	44.30	3.34
4	0.00018	44.30	3.34
5	0.00024	44.30	3.34
6	0.00030	44.32	3.35
7	0.00036	44.30	3.34
8	0.00042	44.29	3.33
9	0.00047	44.27	3.31
10	0.00053	44.22	3.26
11	0.00059	44.15	3.19
12	0.00065	44.08	3.12
13	0.00071	44.00	3.04
14	0.00076	43.92	2.96
15	0.00082	43.86	2.90
16	0.00088	43.82	2.86
17	0.00094	43.77	2.81
18	0.00099	43.74	2.78
19	0.00105	43.71	2.75
20	0.00111	43.69	2.73
21	0.00117	43.65	2.69
22	0.00123	43.60	2.64
23	0.00128	43.56	2.60
24	0.00134	43.53	2.57
25	0.00140	43.51	2.55
26	0.00146	43.49	2.53
27	0.00152	43.48	2.52
28	0.00157	43.48	2.52
29	0.00163	43.48	2.52
30	0.00169	43.47	2.51
31	0.00175	43.45	2.49
32	0.00180	43.43	2.47
33	0.00186	43.40	2.44
34	0.00192	43.38	2.42
35	0.00198	43.36	2.40
36	0.00204	43.33	2.37
37	0.00210	43.32	2.36
38	0.00215	43.31	2.35
39	0.00221	43.30	2.34
40	0.00227	43.29	2.33
41	0.00233	43.28	2.32
42	0.00238	43.26	2.30
43	0.00244	43.24	2.28
44	0.00250	43.22	2.26
45	0.00256	43.21	2.25
46	0.00261	43.18	2.22
47	0.00267	43.18	2.22
48	0.00273	43.16	2.20
49	0.00279	43.15	2.19
50	0.00285	43.14	2.18

Barnes, Ferland & Associates 3655 Maguire Boulevard, Suite 150 Orlando, Florida 32803 ph.(407) 896-8608	Pumping test analysis Recovery method after THEIS & JACOB Confined aquifer	Page 3 Project: OUC SOUTHEAST Evaluated by: JDW Date: 05.04.1999

Pumping Test No. 2 — Test conducted on: 4/26/99

WELL #1 — OUC SOUTHEAST

Discharge 5000.00 U.S.gal/min — Distance from the pumping well 750.00 ft

Static water level: 40.96 ft below datum — Pumping test duration: 0.33333 d

	Time from end of pumping [d]	Water level [ft]	Residual drawdown [ft]
51	0.00302	43.10	2.14
52	0.00319	43.04	2.08
53	0.00337	43.02	2.06
54	0.00354	42.99	2.03
55	0.00371	42.94	1.98
56	0.00389	42.92	1.96
57	0.00406	42.88	1.92
58	0.00424	42.85	1.89
59	0.00441	42.81	1.85
60	0.00458	42.79	1.83
61	0.00476	42.76	1.80
62	0.00493	42.73	1.77
63	0.00510	42.71	1.75
64	0.00528	42.67	1.71
65	0.00545	42.65	1.69
66	0.00563	42.63	1.67
67	0.00580	42.61	1.65
68	0.00597	42.58	1.62
69	0.00615	42.56	1.60
70	0.00632	42.55	1.59
71	0.00649	42.51	1.55
72	0.00667	42.50	1.54
73	0.00684	42.48	1.52
74	0.00701	42.46	1.50
75	0.00719	42.43	1.47
76	0.00736	42.42	1.46
77	0.00753	42.40	1.44
78	0.00771	42.37	1.41
79	0.00788	42.36	1.40
80	0.00805	42.35	1.39
81	0.00823	42.33	1.37
82	0.00840	42.32	1.36
83	0.00858	42.31	1.35
84	0.00875	42.29	1.33
85	0.00892	42.27	1.31
86	0.00910	42.26	1.30
87	0.00927	42.24	1.28
88	0.00944	42.22	1.26
89	0.00962	42.21	1.25
90	0.00979	42.20	1.24
91	0.01014	42.17	1.21
92	0.01049	42.14	1.18
93	0.01083	42.12	1.16
94	0.01118	42.10	1.14
95	0.01153	42.07	1.11
96	0.01188	42.05	1.09
97	0.01222	42.03	1.07
98	0.01257	42.02	1.06
99	0.01292	41.99	1.03
100	0.01326	41.97	1.01

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Pumping test analysis
Recovery method after
THEIS & JACOB
Confined aquifer

Project: OUC SOUTHEAST

Evaluated by: JDW Date: 05.04.1999

Pumping Test No. 2

Test conducted on: 4/26/99

WELL #1

OUC SOUTHEAST

Discharge 5000.00 U.S.gal/min

Distance from the pumping well 750.00 ft

Static water level: 40.96 ft below datum

Pumping test duration: 0.33333 d

	Time from end of pumping [d]	Water level [ft]	Residual drawdown [ft]
101	0.01361	41.95	0.99
102	0.01396	41.94	0.98
103	0.01430	41.91	0.95
104	0.01465	41.90	0.94
105	0.01500	41.89	0.93
106	0.01535	41.87	0.91
107	0.01569	41.85	0.89
108	0.01604	41.84	0.88
109	0.01639	41.83	0.87
110	0.01674	41.81	0.85