Gerhardt M.
Witt
& Associates, Inc.

LaGorce Country Club
Floridan Aquifer Production Well
Well Completion Report

Permt 13-01556-W

Hydrogeology, Geology, and Water Resources

LaGorce Country Club
Floridan Aquifer Production Well
Well Completion Report

Prmt 13-01556-W

Prepared for:

LaGorce Country Club
5685 Alton Road
Miami, FL 33140
(305) 866-1923

Prepared by:

Gerhardt M. Witt & Associates, Inc.
1495 Forest Hill Boulevard, Suite F
West Palm Beach, Florida 33406-6073
(561) 642-9923

August 29, 2002

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Gerhardt M.
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Sent via: **PRIORITY MAIL**

August 29, 2002

Mr. Ralph Pecca
General Manager
LaGorce Country Club
5685 Alton Road
Miami, Florida 33140

RE: LAGORCE COUNTRY CLUB
FLORIDAN AQUIFER PRODUCTION WELL
WELL COMPLETION REPORT

Dear Mr. Pecca:

As per our Scope of Services dated November 20, 2000, enclosed are five (5) copies of the above-referenced report. Please note that we have sent four (4) copies of same to the South Florida Water Management District.

Should you have any questions, please feel free to call.

As always,
Respectfully yours,

GERHARDT M. WITT & ASSOCIATES, INC.

Gerhardt M. Witt, P.G. 08-29-02
Principal Hydrogeologist #447

c: Todd [illegible], LaGorce Country Club
Ana Maria Monte Flores, South Florida Water Management District
Anne Dodd, Gerhardt M. Witt & Associates, Inc.
Michael Caglioni, Gerhardt M. Witt & Associates, Inc.

Gerhardt M. Witt & Associates, Inc.

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INTRODUCTION

1.0 INTRODUCTION

Gerhardt M. Witt & Associates, Inc. ("GMW&A") was contracted by the LaGorce Country Club **(Figure 1-1: Project Location Map)** to assist with the installation of one (1), new, Floridan aquifer well. The location of the new, Floridan aquifer well is shown in **Figure 1-2: Site Location Map**. The LaGorce Country Club ("LaGorce") is currently permitted to withdraw 187 million gallons per year total from the Floridan aquifer system. This will eliminate the need to utilize the City of Miami's potable water supply for irrigation purposes and therefore constitutes a reasonable and beneficial use of the State's resources. GMW&A's work included technical well specifications, assistance with the well head design, bidding services, hydrogeologic field services, and preparation of this well completion report. A later addition to GMW&A's work was coordination in the building of the reverse osmosis ("RO") plant.

Project Location Map

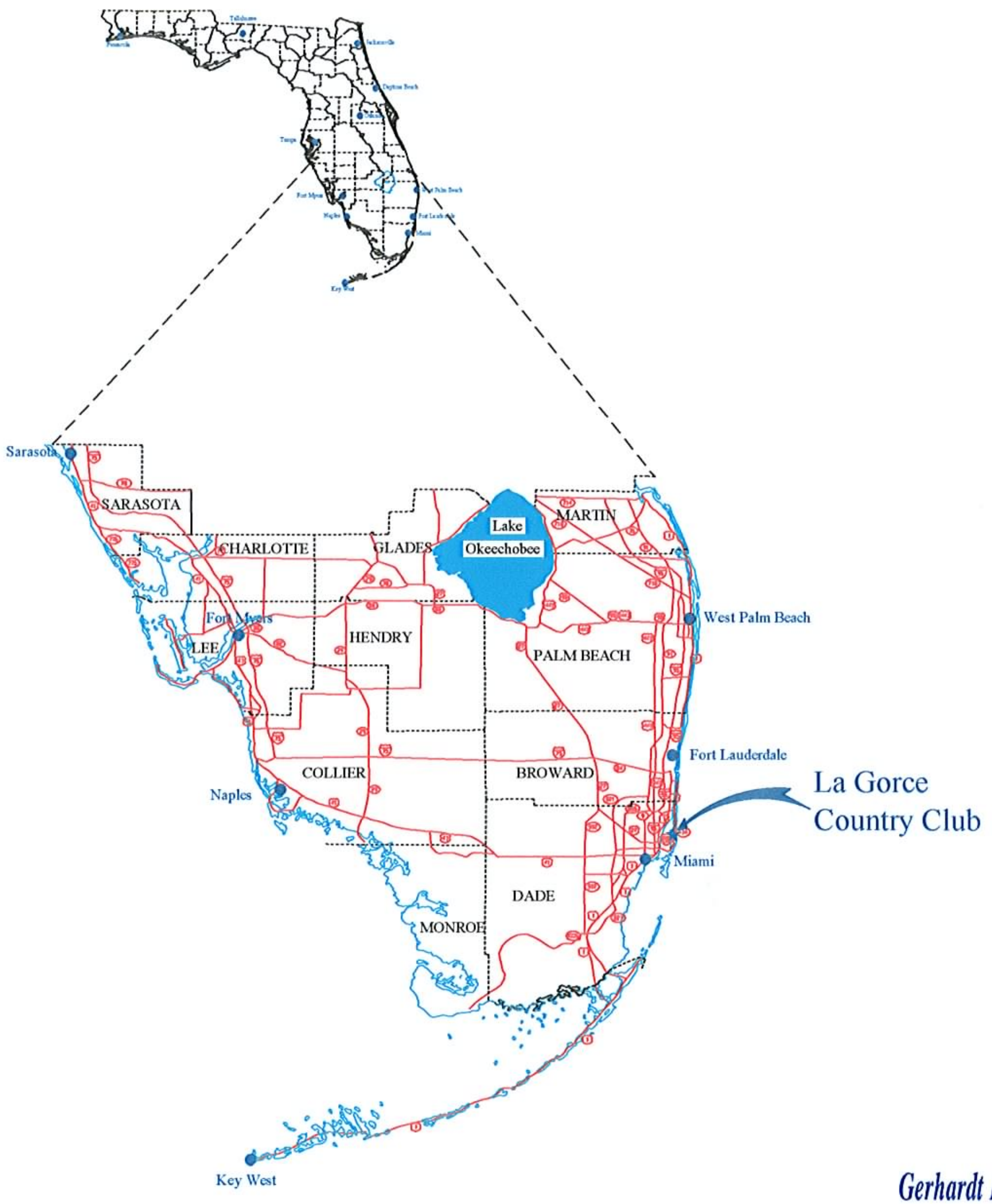

Figure 1-1

Gerhardt M. Witt & Associates, Inc.

La Gorce country Club
Site Location Map

Figure 1-2

Gerhardt M. Witt & Associates, Inc.

SECTION 2

GEOLOGY AND HYDROGEOLOGY

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GEOLOGY AND HYDROGEOLOGY

2.0 REGIONAL GEOLOGY AND HYDROGEOLOGY

The geology of southeast Florida consists of approximately 16,000 vertical feet of sedimentary rocks ranging in age from Holocene (recent) to Cretaceous (140 million years in age). Underlying the sedimentary rock is a complex sequence of older, igneous and metamorphic rock that makes up the base (or basement complex) of the Florida Peninsula. Since the geology occurring within 4,000 feet below land surface ("bls") is the unit of primary interest to the people in southeast Florida, this report briefly describes that geologic section.

Generally, in eastern Dade County, the first 250 feet bls consist of a series of Late Pleistocene to Miocene formations composed of limestone, sandstone, sand, and clay. The formations consist (from top to bottom) of the Pamlico Sand, the Miami Limestone, and the Key Largo Limestone; the Anastasia Formation; and the upper portion of the Tamiami Formation. These formations comprise the Biscayne aquifer (in the Dade County area), which serves as a source of most irrigation and potable water for the people of Dade County.

Underlying the Biscayne Aquifer System is a Miocene aquiclude/aquitard consisting of the lower units of the Tamiami Formation and the Hawthorn Formation, referred to collectively as the Hawthorn Group. The aquiclude consists of clay, marl, limestone, and chert from depths of approximately 250 to 850 feet bls. The major significance of this unit is that it is the confining sequence that separates the Biscayne Aquifer System from the Floridan Aquifer System.

The upper Floridan Aquifer System is composed of several geologic units of Eocene age, the most prominent being (from top to bottom) the Ocala Group, the Avon Park Limestone, and the Lake City Limestone. Current convention is that the upper aquifer extends from 850 bls to a depth of approximately 2,300 feet bls. Underlying the Lake City Limestone is the Eocene Oldsmar Formation, which consists of two (2) units, the upper Oldsmar (2,300 to 3,000 feet bls) and the lower Oldsmar (from 3,000 to 4,000 feet bls). The upper Oldsmar is a confining unit that separates the upper Floridan aquifer from the lower Oldsmar Formation and the lower Floridan aquifer. The lower Oldsmar, commonly called the Boulder Zone, is highly transmissive, contains non-potable water, and has been used for the disposal of waste products such as industrial by-products (including RO concentrate) and treated wastewater. Below the lower Oldsmar is the Paleocene Cedar Keys Limestone that acts as a lower confining unit for the Boulder Zone. **Figure 2-1: General Lithology** shows the lithology of the eastern Dade County area.

La Gorce Country Club
General Lithology

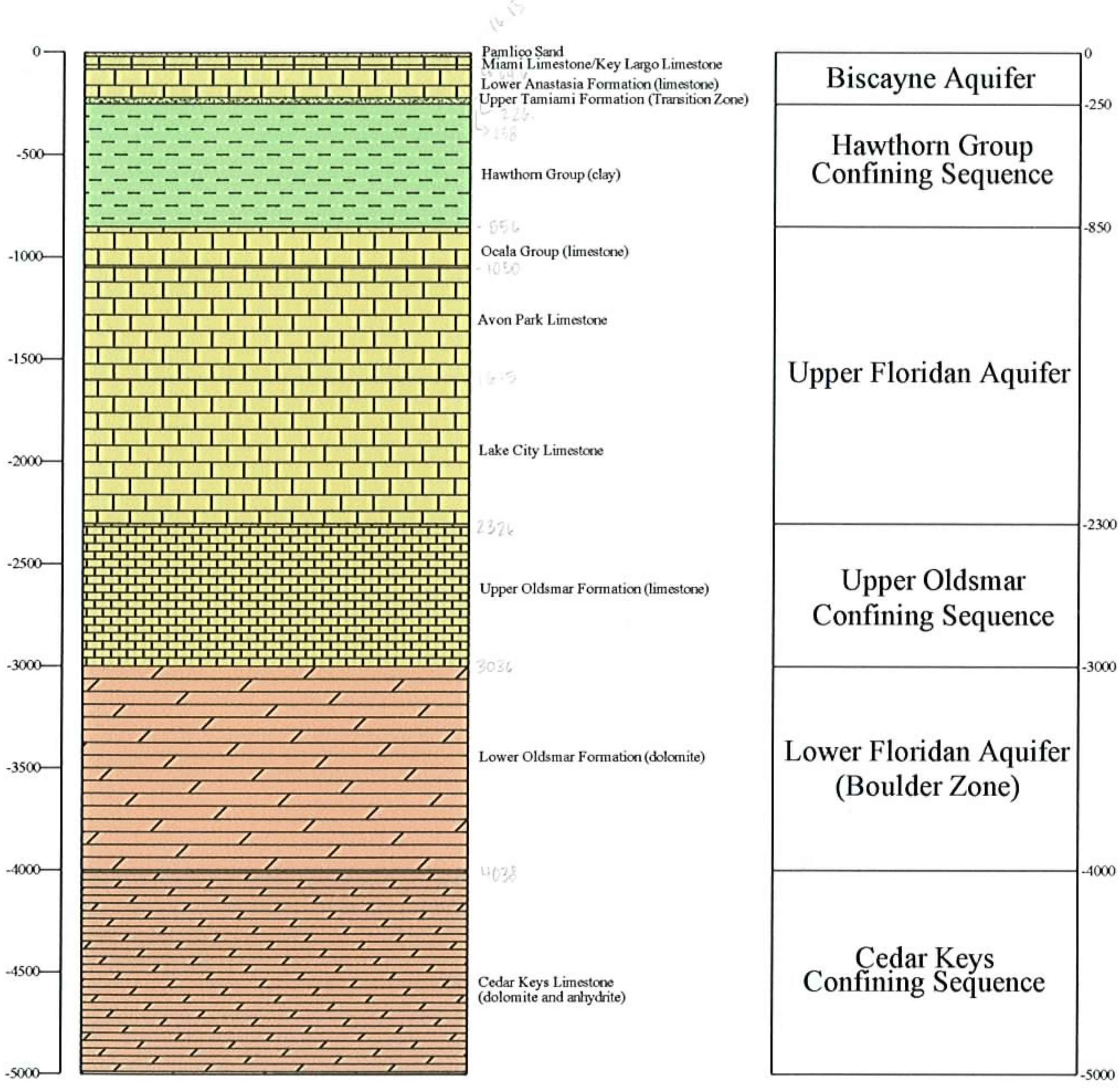


Figure 2-1

Gerhardt M. Witt & Associates, Inc.

2.1 BISCAYNE AQUIFER SYSTEM

The Biscayne Aquifer System in the LaGorce Country Club area is considered a water table aquifer exhibiting a delayed yield response. This means that the aquifer is stratified and that water moves faster laterally than vertically (downward and/or upward). Therefore, total drawdown of the aquifer is "delayed" as water moves vertically through the aquifer. Drawdown in a Biscayne aquifer well will continue until the cone of depression/impression reaches a recharge boundary such as the Intracoastal Waterway and/or the Atlantic Ocean.

The upper Biscayne aquifer water at the LaGorce site is brackish, having an average chloride concentration of approximately 2,200 milligrams per liter ("mg/L"), sulfates of approximately 100 mg/L, and Total Dissolved Solids ("TDS") of approximately 3,500 mg/L. The aquifer exists from the surface to approximately 250 feet bls. Because water levels change in the Biscayne aquifer, thereby affecting the saturated thickness of the aquifer, the aquifer's characteristics (transmissivity, specific yield, storage coefficient, and delayed yield) change with time. However, these changes are small and, for the most part, are considered negligible.

The Biscayne Aquifer System at LaGorce is used for injection of storm water with two (2), Class V, Group 6, stormwater injection wells, each constructed to an approximate total depth of 90 feet bls. These wells are permitted under FDEP Underground Injection Control 62-528 FAC, permit number 0162552-001-UC.

2.2 FLORIDAN AQUIFER SYSTEM

The Floridan aquifer is considered a leaky confined aquifer. In essence, this means that the aquifer is under artesian pressure. In the case of LaGorce, the pressure is significant enough that under non-pumping conditions, the water level in a Floridan aquifer well should rise to approximately 15 to 25 feet above National Geodetic Vertical Datum ("NGVD") (mean sea level ("msl") 1929). Since the elevation of LaGorce's Floridan well will be approximately six (6) feet above msl, this well should flow under non-pumping conditions. Therefore, the <u>flowing conditions in the well must be controlled or suppressed at all times.</u>

In the leaky artesian Floridan aquifer, the drawdown in a well will continue until flow from the aquifer and the amount of leakance (water leaking in from above and below) are equal to the amount of water being removed (pumped). The cone of depression will continue outward, widening and deepening, until equilibrium is met.

The water in the Floridan aquifer is brackish, having a chloride concentration of approximately 9,000 mg/L, sulfates of approximately 1,700 mg/L, and TDS of approximately 14,000 mg/L, based on data taken in the field. The water quality data is further discussed in Section 4.6 of this report.

Floridan aquifer water levels are a function of a number of factors: rainfall at the point of outcrop of the Floridan aquifer (along the Lake Wales Ridge), withdrawals from the aquifer, downward and upward leakance within the aquifer, the density of the water, the head at the discharge point (in the Atlantic Ocean at a depth of 1,000 feet below msl, approximately 16 miles from land), and the transmissivity of the aquifer. In areas where withdrawals are occurring, the recharge is through leakance. Water levels recover as wells cease pumping. Since the withdrawals at LaGorce are only projected for short periods of time (12 hours per day) and not during rain events, the potential impacts to existing legal users are limited.

SECTION 3

WELL CONSTRUCTION

SECTION 3

WELL CONSTRUCTION

3.0 WELL CONSTRUCTION

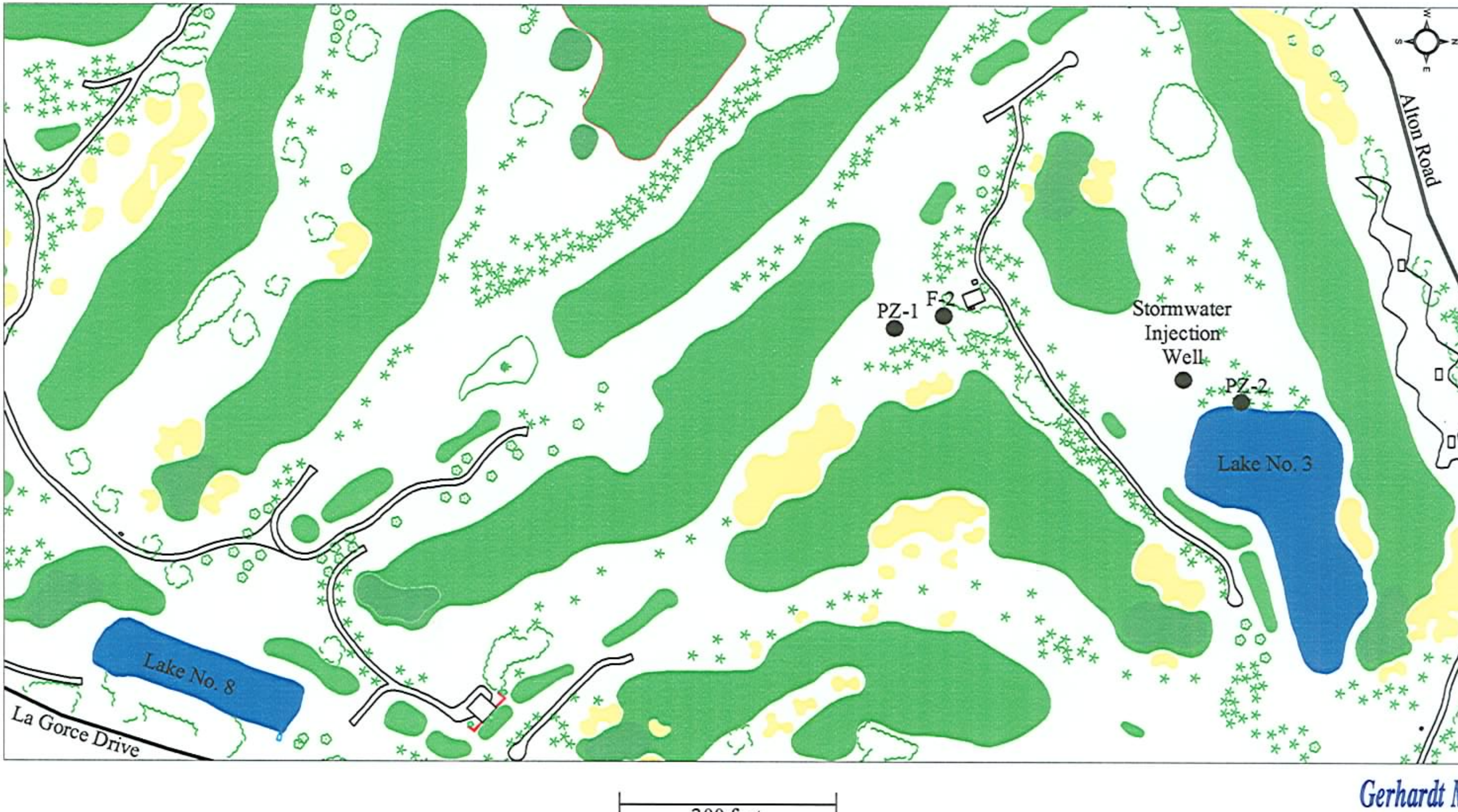
LaGorce obtained a cost proposal from a licensed, water well contractor, Jaffer Associates, Ltd. ("Jaffer"). This proposal was compared with recent bids for similar jobs and was found to be comparable. LaGorce negotiated with Jaffer as the water well contractor.

The Floridan aquifer well was constructed by Jaffer between May and December 2001. The well design is such that it will meet the total, raw water, annual, maximum requirements of 187 million gallons or monthly, maximum allocation of 26.7146 million gallons. (Although the annual irrigation requirement is approximately 140 million gallons, or approximately 20 million gallons per month, an additional 25% raw water will be required to produce the necessary quantities of finished water because LaGorce will be using a reverse osmosis water treatment system for water treatment.)

Jaffer vibrated the 48-inch diameter, 0.375-inch wall thickness, steel surface casing to 47 feet below land surface ("bls"). A 22-inch diameter pilot hole was drilled from 47 feet to 250 feet bls, and the pilot hole was reamed with a 36-inch diameter bit. The 30-inch diameter, 0.375-inch wall thickness, steel casing was installed in the 36-inch diameter hole. The 30-inch diameter casing was cemented in place using 1,485 cubic feet of Type I, neat, cement grout, and a nine (9)-inch diameter, pilot hole was drilled to 928 feet bls. After geophysical logging, the pilot hole was reamed out to 915 feet bls with a 28-inch diameter bit, and the 17.4-inch outside diameter (15.079-inch minimum inside diameter), SDR 17, PVC casing was installed to a depth of 915 feet bls. The PVC casing was cemented in place using 391.5 cubic feet of neat cement and 1,296 cubic feet of 50/50 Pozmix cement. The one and one-half (1½)-inch diameter, monitor tube was set to approximately 98 feet bls. The open hole was drilled with a 12¾-inch diameter bit to 1,206 feet bls. The well was then pump tested and geophysically logged and television surveyed. **Figure 3-1: Well Location Map** shows the location of the new Floridan aquifer well (F-2), and **Figure 3-2: Floridan Aquifer Well** shows the construction details for the production well.

The theoretical volume of the annular space between the 30-inch outside diameter casing and the 36-inch diameter borehole to a depth of 250 feet bls was calculated to be 799 cubic feet. Jaffer used 1,485 cubic feet of cement to grout the 30-inch diameter casing in place. The greater than theoretical volume of cement used is common with this type of grout process and is most likely due to the loss of cement grout to the formation as the grout was being pumped in under pressure.

La Gorce Country Club
Well Location Map



Gerhardt M. Witt & Associates, Inc.

Figure 3-1

La Gorce Country Club
Floridan Aquifer Well

F-2

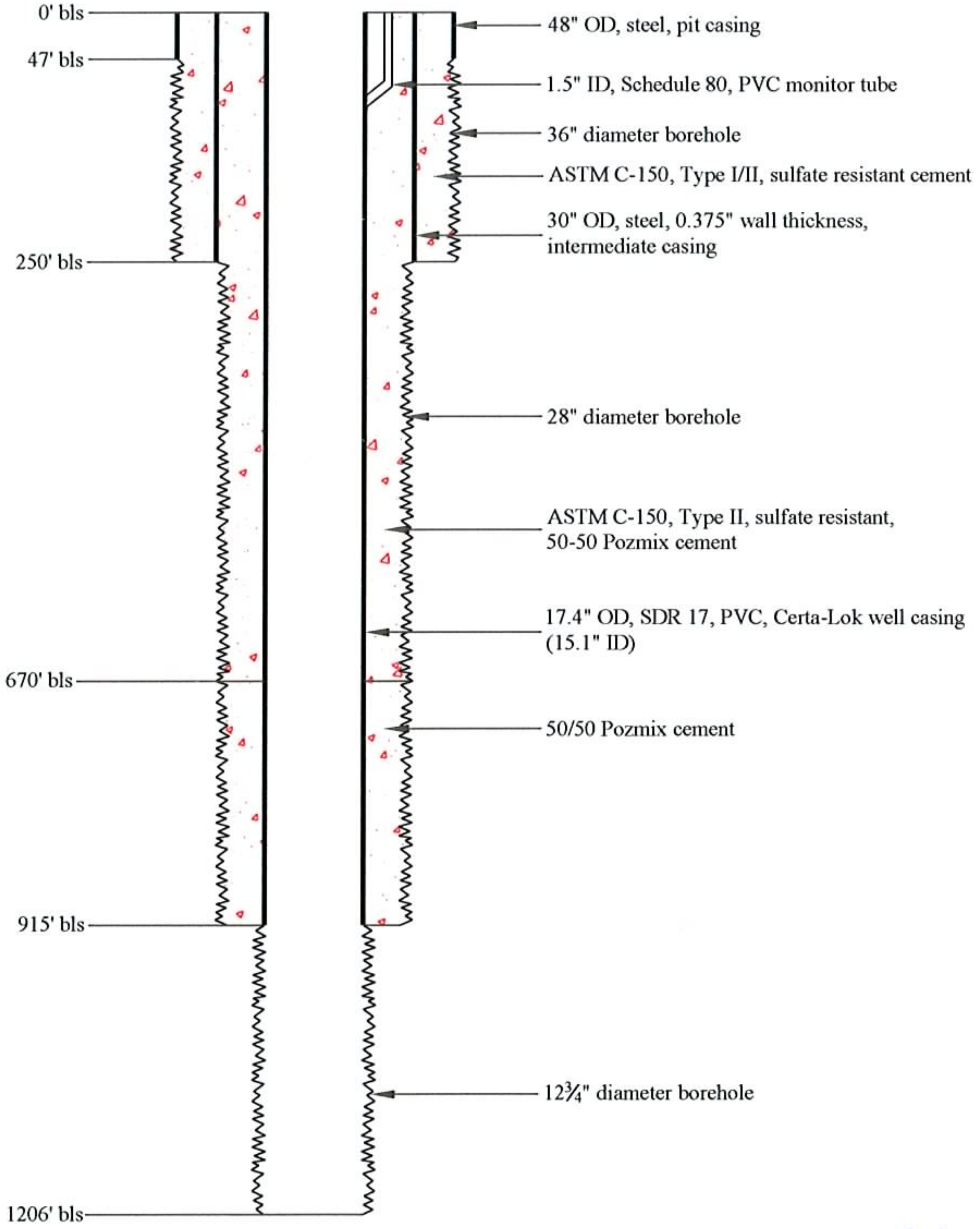


Figure 3-2

Gerhardt M. Witt & Associates, Inc.

The theoretical volume of the annular space between the 17.4-inch outside diameter casing and the 28-inch diameter borehole to a depth of 915 feet bls was calculated to be 2,560 cubic feet. Jaffer used 1,688 cubic feet of cement to grout the 17.4-inch diameter casing in place. This less than theoretical volume of cement used is probably due to some swelling of the Hawthorn clays in the borehole walls while the casing was being installed. This swelling of clays is a common occurrence within the Hawthorn Group.

The chronology of the construction of the well is given in **Appendix A: Well Construction Chronology**.

3.1 WELL DEVELOPMENT

The well was developed using compressed air, natural artesian flow, and downhole pumping until it was free of sand (based on visual observations). The compressed air method consisted of using the drill-rig mounted, air compressor. Over pumping of the well as a means of development was not possible due to the volume of flow naturally issuing from the formation.

The geologist's estimate of development time was 20 hours for air development and 10 hours for natural development (artesian flow). Thirty hours of pump development occurred prior to and during well testing. This development time was under the original estimate for the well. The less than estimated number of development hours was possible due to development during production interval (open hole) drilling (using the reverse air method) and natural development due to artesian conditions.

SECTION 4

WELL TESTING

SECTION 4

WELL TESTING

4.0 WELL TESTING

Testing of the pilot hole consisted of collection of geologic samples and geophysical logging. Testing of the new production well consisted of step-drawdown, sand concentration, silt density index, water quality, and microbiological testing, as well as geophysical logging and color television surveying.

4.1 GEOLOGIC LOGGING

Geologic logging consisted of the collection of lithologic samples at ten (10) foot intervals throughout the drilling of the pilot hole. The samples were described to compile a geologic log and to obtain the physical characteristics of the rock.

The geology encountered from 0 to ten (10) feet bls consisted of fine- to medium-grained calcium carbonate and quartz sands. The geology from ten (10) to 47 feet bls was not collected due to the surface casing being vibrated into the ground until refusal at 47 feet bls. Onsite observation during the vibrating of the surface casing indicated sands and silts or possibly clayey silt, as the casing seemed to be vibrating in "jelly" at times. Jaffer did not obtain samples from 47 feet to 80 feet, and therefore the first lithologic sample was 80 feet bls. From 80 to 100 feet bls, the geology comprised fine- to coarse-sized pieces of calcium carbonate shell fragments and limestone with fine- to medium-grained quartz sand and some phosphate. Based on the lithologic logs of the storm water injection wells previously installed by Jaffer to a depth of 88 and 92 feet bls, the lithology from 15 to 90 feet bls consisted of quartz sand, sandstone, and limestone. The interval from 100 to 130 feet bls contained mostly sandstone with calcium carbonate shell fragments. The interval from 130 feet to 230 feet bls contained medium- to gravel-sized mixtures of calcium carbonate shell fragments and quartz sand with some limestone. The interval from 230 to 250 feet bls contained mostly fine- to medium-grained limestone with some quartz and shell fragments. Based on the pilot hole lithology, the transition zone between the Biscayne aquifer and the Hawthorn Group is between 240 feet and 250 feet bls. The geologic samples between 250 and 420 feet bls were inadvertently mislabeled by Jaffer personnel and were not distinguishable from other samples. The interval 420 to 840 feet bls mostly contained fine-grained material (sand, silt, and clay) with poorly cemented siltstone and various amounts of silt and sandstone. The lithologic samples from this interval had a light green color. The interval from 840 to 920 feet bls consisted mostly of limestone with phosphate (the amount of phosphate decreasing with depth). From 920 to 1,206 feet bls, the geology contained mostly limestone with ten (10) to 40% various marine fossils, including various index fossil foraminifera from the Suwanee Limestone and Avon Park formations.

A generalized, geologic cross-section has been drawn from the lithologic information obtained during the drilling of the pilot holes and is presented in **Figure 4-1: Floridan Well Lithology**. Detailed geologic logs are provided in **Appendix B: Geologic Logs**.

4.2 GEOPHYSICAL LOGGING

After the pilot hole for the well casing was drilled, the hole was geophysically logged by Advanced Borehole Services, ("ABS") of Tampa, Florida. The completed well was also logged by ABS. Geophysical logging included natural gamma ray, electric (spontaneous potential, single point resistivity, short normal resistivity, long normal resistivity, and focus guard), temperature (static and flowing), fluid resistivity (static and flowing), flow meter (static and flowing), and caliper logs. The geophysical logs are included as **Appendix C: Geophysical Logs**. Geophysical logging was completed January 12, 2002.

4.2.1 GEOPHYSICAL LOGS

Geophysical well logging (testing) uses a sensing device, lowered into a well and/or borehole, to record various physical parameters. The physical parameters/measurements indicate characteristics of the rock, the fluid contained in the rock and borehole, and/or the construction characteristics of the well. The following is a brief technical description of the function of each geophysical log and its purpose in the logging program of this project.

Caliper Log: The caliper log is a tool that determines the average gauge of the borehole, i.e., measures the diameter of the borehole. The caliper tool is used to find cavities, washouts, and fractures in the borehole. The log can be used to determine the proper casing seat for the well and to determine more accurate volumetric calculations for cementing and gravel packing of a well. The log can also be used to assist in finding holes, splits, and separations in well casings. The caliper tool measurement in these logs is in inches.

Gamma Ray Log: The gamma ray log measures the amount of radioactivity naturally present in the formation. Gamma radiation is emitted from formation material such as clays and sands with heavy phosphatic constituents. The gamma ray log is usually effective in determining formation breaks and may be utilized in stratigraphic correlation over relatively areally extensive areas. Gamma ray logs are measured in gamma ray counts, recorded as American Petroleum Institute-Gamma Ray ("API-GR") units.

La Gorce Country Club
Floridan Well F-2
Lithology

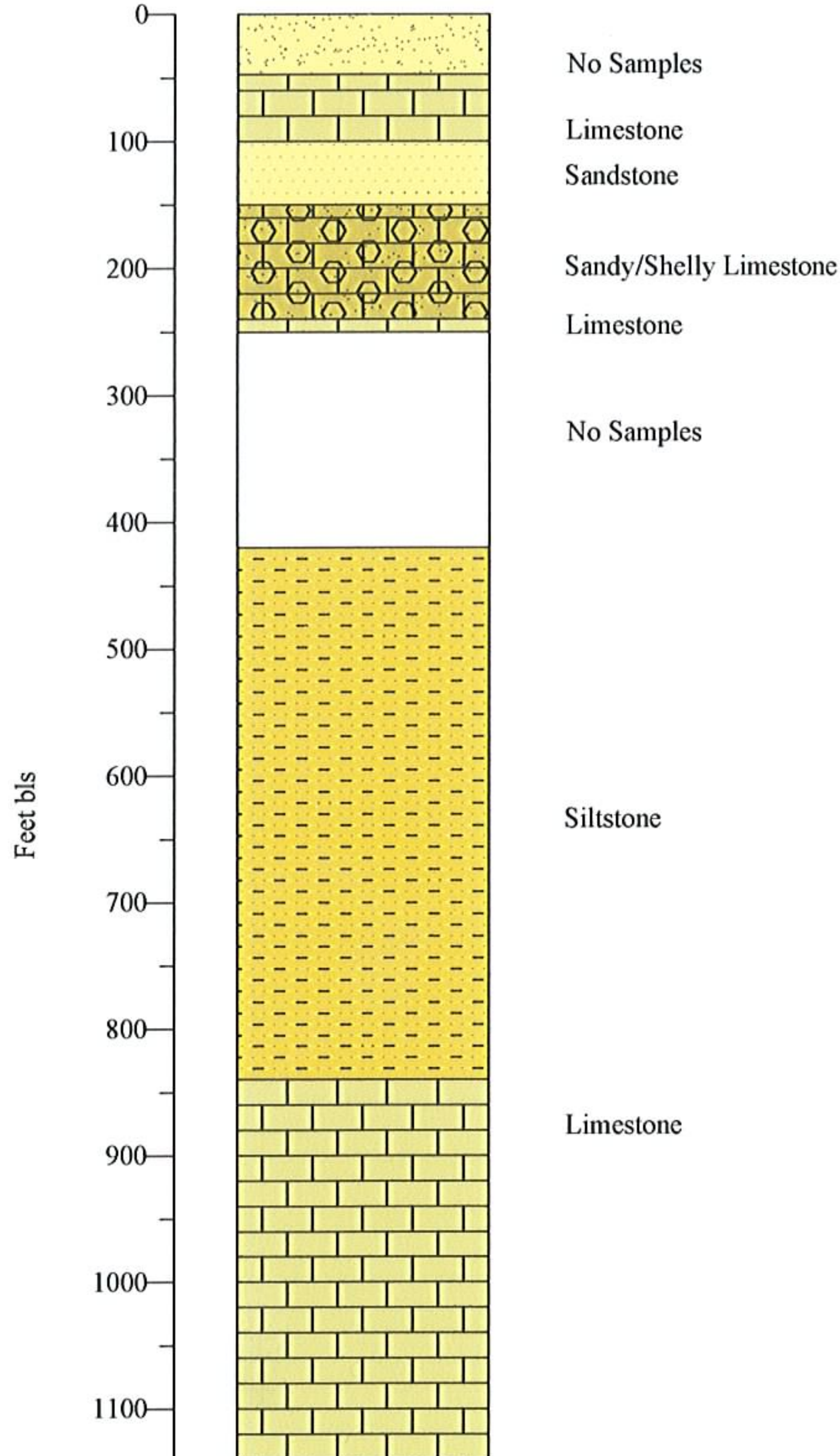


Figure 4-1

Gerhardt M. Witt & Associates, Inc.

Electric Logs: The electric logs are a suite of logs consisting, in this case, of spontaneous potential, single point resistivity, and long and short normal resistivity.

Spontaneous Potential Log: The spontaneous potential (S.P.) is a small electric voltage generated at the boundaries of permeable rock units, especially between such strata and less permeable units. The contact between drilling mud and formation fluid is another area where S.P. may be generated. Generally, in limestones and sandstones of similar water quality in the Biscayne/Turnpike aquifer, the S.P. log generates little useful or correlatable data. The logging tool can pick up clay units that might otherwise not be noted during the drilling of the formation. Spontaneous potential log readings are in millivolts ("MV").

Resistivity Logs: The electric resistivity of a rock (resistance per unit volume) depends primarily on the amount of fluid contained in the rock and its electrical resistance and/or ionic characteristics. The amount of fluid in the rock is a function of the porosity, hence the porosity of the rock is related to its resistivity. Therefore, a formation with less porosity would be more resistive than a formation with a greater porosity, assuming the water quality was the same in both formations. A porous rock with saline water would have a low resistivity, while the same rock unit invaded by drilling mud might imitate high resistivity and therefore, low porosity. Resistivity is the inverse of conductivity. To measure resistivity, three (3) types of resistivity logs were used:

a. Single Point Resistivity Log: The single point resistivity log sends an electrical impulse into the formation and receives it back at the same point. The current therefore measures resistivity of the formation at the face of the borehole wall. This log is acceptable in a clean borehole uncontaminated by drilling muds. The single point resistivity readings are in ohms (OHM).

b. Short Normal Resistivity Log: The short normal resistivity log sends an electrical impulse at one (1) point and receives the signal back at a receiver located 16 inches above the transmitter, hence, the electrical current transmits beyond the borehole wall and into the formation. The short normal resistivity readings are in ohm-meters (ohm-m).

c. Long Normal Resistivity Log: The long normal resistivity log behaves as the short normal, except that the spacing between the transmitter and the receiver is 64 inches. This allows determination of the resistance at a considerable distance from the borehole. The long normal resistivity readings are in ohm-meters (ohm-m).

Focus Guard Log: The focus guard log is yet another system for measuring electrical conductivity and resistance of the formation. Focus guard probes use guard electrodes above and below the current electrode to direct the flow of the electrical current as it leaves the probe. These guard electrodes act to focus the electric current into the formation. This system can provide high resolution and penetration under conditions where other resistivity systems may fail.

Temperature Log: The temperature log senses the ambient temperature of the fluid in the borehole and well casing. The temperature is a function of the water temperature in the formation. Usually the ambient temperature of ground water increases with depth at a fairly constant rate of one degree Celsius (1°C) per 100 meters (0.5° Fahrenheit ("F") per 100 feet). However, in the Floridan aquifer there exists a negative temperature gradient. If naturally occurring flow exists between two (2) units of different temperatures, then the temperature log will detect the change in temperature between the two (2) zones of flow. Therefore temperature logs are useful for determining the locations of flow zones in the well. Temperature logs may also be used to determine leaks in casings and/or flow behind casings. Measurements are in degrees Fahrenheit and/or degrees Celsius. Under pumping conditions, the temperature log should show a constant temperature from the bottom of the borehole to land surface, provided there is water moving throughout the entire length of the borehole and no significant quantities of water are entering or leaving the borehole at a specific point or interval.

Fluid Resistivity/Conductivity Log: The fluid resistivity/conductivity log is used to determine the resistance/conductance of the fluid in the borehole. Fluid resistivity/conductivity is a measurement of the ionic potential (relative concentration) of the fluid. The readings are indicative of the concentration of Total Dissolved Solids such as chlorides, sulfates, sulfides, etc. The log is useful for determining water quality concerns independent of the porosity of the formation. The fluid conductivity log is also useful for identifying zones of flow (both in to and out of the borehole), especially of differing qualities of water. Fluid resistivity/conductivity logs can be run in cased holes and may be used to locate holes in the casing. Fluid resistivity/conductivity is measured in ohm meters (ohm-m).

Specific Conductivity Log: The specific conductivity log is a calculated value based on the fluid resistivity measurements. The specific capacity is basically a calculated inverse of the fluid resistivity and is measure in micro-Siemens per centimeter ("μS/cm").

Flow Meter Log: The flow meter log measures fluid movement within a borehole and/or well casing. The flow meter log uses an impeller which is run down the borehole (well) at a constant speed. The impeller reflects a constant revolutions per minute ("rpm"). Any change in the rpm, provided the speed of the tool is the same, the borehole is of the same diameter, and flow is kept constant, indicates flow in to or out of the borehole. Such data reveals zones contributing water to a well, flow from one (1) stratum to another within a well, hydraulic differences between aquifers intersected by a well, and/or casing leaks. Flow meter logs can yield quantitative and/or qualitative data, depending on the type of flow meter. Since a flow meter measures velocity, which is dependent on the size of the borehole, the flow meter logs must be compared to caliper logs to obtain a quantitative flow.

4.2.2 GEOPHYSICAL LOG INTERPRETATIONS

Pilot Hole: Jaffer drilled a nine (9)-inch diameter pilot hole from 250 feet bls to a depth of 928 feet bls. The geophysical logs performed on the pilot hole were caliper, gamma ray, and electric logs. During the geophysical logging event of the nine (9)-inch diameter pilot hole, ABS's electric logging tool was not able to read the conductivity in the borehole, as the conductivity was above the range of the tool; however, gamma ray and caliper log interpretations were able to be made from this logging event.

Caliper Log: The caliper logging began at the bottom of the pilot hole at 922 feet bls with a reading of seven (7) inches in diameter. From 922 to 892 feet bls, the caliper log increased to the size of the drill bit (nine (9) inches in diameter) and indicated a gauged hole up to 840 feet bls. From 840 to 795 feet bls, the caliper log showed three (3) areas where the pilot hole decreased in size (836 feet bls to seven (7) inches in diameter, 815 feet bls to 5.7-inches in diameter, and 797 feet bls to 7.2 inches in diameter). From 795 to 755 feet bls, the borehole diameter slightly increased from nine and one-half (9½) inches to 10 inches in diameter. From 755 to 730 feet bls, the caliper log again decreased to an average of seven (7) inches in diameter. From 730 to 680 feet bls, the caliper log indicated a borehole size of just over ten (10) inches in diameter. From 680 to 670 feet bls, the borehole size decreased to 7.2 inches in diameter at 674 feet bls. The above mentioned decreases in borehole size may be attributed to swelling clays found in the Hawthorn Group. From 670 to the intermediate casing seat at 250 feet bls, the borehole size gradually increased in size from 10 inches to 12 inches in diameter. The caliper log then entered the 30-inch outside diameter steel casing to land surface.

Gamma Ray Log: The gamma ray log began at 920 feet bls in the pilot hole with a reading of 40 API-GR units. From 920 to 888 feet bls, the gamma ray log ranged from 25 to 65 API-GR units. From 888 to 870 feet bls, the gamma ray log spiked to 210 API-GR units at 885 feet bls, and 280 API-GR units at 876 feet bls. The gamma ray log then decreased to 47 API-GR units at 868 feet bls. From 868 to 828 feet bls, the gamma ray log indicated three (3) spikes (in two (2) intervals) to greater then 300 API-GR units (maximum of the logging tool). The two (2) intervals where the gamma ray log indicates readings off scale were expected and indicated high phosphate zones (rubble zones) within the Hawthorn Group. The bottom of the lower rubble zone is the transgressive sequence overlying the unconformity at the top of the Floridan Aquifer System. From 828 to 270 feet bls, the gamma ray log ranged from 20 to 74 API-GR units. From 270 feet bls to 256 feet bls, the gamma ray log increased to 115 API-GR units and then decreased to 30 API-GR units at 250 feet bls. The intermediate steel casing was set at 250 feet bls. The gamma ray fluctuations in this area are caused by the gamma ray logging tool leaving the open borehole and entering the steel casing. From 250 feet bls to the end of the logging at 30 feet bls, the gamma ray log ranged from ten (10) to 42 API-GR units.

Well Casing Seat Selection

GMW&A recommended that the casing seat be set to a depth between 913 to 918 feet bls. This selection was based on being below (35 feet) the last gamma ray peak and the presence of Floridan aquifer indicator fossils in the drill cuttings. The caliper log in this interval showed a fairly tight formation and a nearly gauged hole, indicating competent rock for setting the casing. During pilot hole drilling, circulation was lost at 928 feet bls. This fluid loss indicated formation capable of receiving/producing water.

Production Well Geophysics

Caliper Log: From the bottom of the well at 1,185 feet bls to 1,130 feet bls, the borehole size gradually increased from approximately 16 inches in diameter to approximately 20 inches. From approximately 1,130 feet bls to approximately 1,041 feet bls, the borehole ranged from 20 to 24 inches in diameter. From 1,041 to 980 feet bls, the borehole caliper log measured 45 inches in diameter, which is the maximum size that this caliper tool measures. This interval contained the maximum diameter of the open hole, which is larger than 45 inches in diameter. From 980 to 925 feet bls the diameter gradually decreased in diameter from 45 to 20 inches. From 925 to the bottom of the well casing at 916 feet bls, the borehole was approximately 28 inches in diameter. The caliper log then proceeded inside the well casing to land surface and indicated the inside diameter of the well casing to be just over 15 inches, as expected. The areas where the borehole was dramatically oversized most likely indicated softer formation.

Gamma Ray Log: The gamma ray log started at the bottom of the well at 1,185 feet bls with a reading of approximately 28 API-GR units. From 1,185 to 1,114 feet bls, the gamma ray log indicated readings from 14 to 40 API-GR units. From 1,114 to 1,075 feet bls, the gamma ray log indicated readings between seven (7) and 23 API-GR units. From 1,075 to 1,045 feet bls, the gamma ray log indicated readings between 10 and 29 API-GR units. From 1,045 to 967 feet bls, the gamma ray log indicated readings between two (2) and ten (10) API-GR units. From 967 feet bls to the casing seat at 916 feet bls, the gamma ray log indicated a gradual increase from approximately ten (10) API-GR units to 50 API-GR units. The fluctuations in gamma ray readings in the open borehole can be correlated with the caliper log, which indicated a larger borehole that attenuated the gamma ray readings. From the casing seat at 916 feet bls to 834 feet bls, the gamma ray log indicated readings from 12 to 240 API-GR units. This interval included the two (2) major gamma ray spikes indicative of the Hawthorn Group. The lower gamma ray peak indicated that the base of the Hawthorn Group occurs at approximately 903 feet bls. The maximum gamma ray peaks between 875 to 837 feet bls indicated the phosphatic rubble zone near the bottom of the Hawthorn Group. The remainder of the gamma ray log from 835 feet bls to land surface ranged between 18 and 65 API-GR units and is unremarkable.

Temperature Log: The static temperature log indicated a bottom hole temperature of 65.3 degrees Fahrenheit ("°F"). This temperature gradually increased to 67.5°F at 950 feet bls. From 950 to 800 feet bls (inside the casing), where the temperature log stops, the temperature change increased slightly to 67.9°F.

The dynamic (flowing) temperature log indicated a bottom hole temperature of 65.3°F. The flowing temperature log increased gradually from 65.3°F to 66.7°F at the casing seat depth of 916 feet bls. Between 1,078 and 1,077 feet bls and again between 1,056 and 1,054 feet bls there were two (2) small jumps in temperature of approximately two (2) tenths of one (1) degree (0.2°F) each. These small temperature increases may be due to small flow zones where the formation at that interval is transmitting more water to the open borehole than the surrounding formation. At the casing seat depth of 916 feet bls to just a few feet inside the well casing, the temperature jumped approximately one half of one degree (0.5°F). This temperature increase may most likely be attributed to the turbulent hydraulic flow of the formation water as it squeezes inside the well casing. After the first two (2) to three (3) feet inside the well casing the temperature of the water leveled off to 67.1°F and remained constant to 900 feet bls, where the dynamic temperature log ended.

Fluid Resistivity Log: The static fluid resistivity log indicated a reading of 0.25 Ohm-meters ("Ohm-m") from the bottom of the borehole to 1,182 feet bls. At 1,182 feet bls, the fluid resistivity dropped to approximately 0.17 Ohm-m, where it remained steady to approximately 1,120 feet bls. From 1,120 to 1,100 feet bls, the fluid resistivity increased slightly to approximately 0.20 Ohm-m. The fluid resistivity remained at approximately 0.20 Ohm-m from 1,100 to 1,000 feet bls. From 1,000 feet bls, the fluid resistivity made a gradual increase to 0.70 Ohm-m at 970 feet bls. From 970 to 935 feet bls, the fluid resistivity made an overall slight but erratic increase to 0.75 Ohm-m. From 935 feet bls, up inside the casing, to 890 feet bls, the fluid resistivity made a slight but erratic decrease to 0.60 Ohm-m. From 890 to 800 feet bls, where the log ended, the fluid resistivity continued a gradual but smooth decrease to approximately 0.40 Ohm-m. The increase in fluid resistivity in proximity to the bottom of the well casing may, as with the specific conductance log, be the result of fresh water (pumped in to dilute the salt kill) coming out of formation. Otherwise, the fluid resistivity is fairly constant.

The flowing fluid resistivity log indicated a reading of near zero (0) Ohm-m from the bottom of the borehole to 1,180 feet bls. At 1,180 feet bls, the fluid resistivity increased to approximately 0.20 Ohm-m. From 1,180 to 950 feet bls, the fluid resistivity remained at approximately 0.20 Ohm-m. From 950 to 915 feet bls the fluid resistivity gradually increased to approximately 0.35 Ohm-m. From 915 to 910, inside the well casing, the fluid resistivity erratically increased to approximately 0.40 Ohm-m. From 910 to 900 feet bls, where the log ended, the fluid resistivity remained at 0.40 Ohm-m. The flowing fluid resistivity log, like the static fluid resistivity log, remained low and fairly constant, as is expected in this well. The erratic and slight increase in fluid resistivity at the well casing seat may be the result of left over fresh water (pumped in to dilute the salt kill) coming out of formation. The result is less dramatic in the flowing log compared to the static log because the flowing water will mix faster and smooth the transition. The small shift near the bottom of the borehole at 1,180 to 1,181 feet bls on both the static and flowing fluid resistivity logs may be the peculiarity of the logging tool as it begins its readings.

<u>Specific Conductivity Log</u>: The static specific conductivity log indicated a bottom hole reading of approximately 62,000 μS/cm. From the bottom of the borehole to 1,120 feet bls, the conductivity slowly decreased to 58,000 μS/cm. Between 1,120 and 1,100 feet bls, the conductivity decreased from 58,000 μS/cm to 48,000 μS/cm. The conductivity was fairly steady between 1,100 feet bls and 1,020 feet bls, decreasing from 48,000 μS/cm to 46,000 μS/cm. From 1,020 to 995 feet bls, the overall change was relatively small, decreasing from 46,000 μS/cm to 44,000 μS/cm. However, there were several, very short interval peaks ranging from 26,000 μS/cm to 58,000 μS/cm. From 995 to 970 feet bls, the decreased at a relatively dramatic pace, dropping from 44,000 μS/cm to 15,000 μS/cm, again marked by short interval peaks ranging from approximately 28,000 μS/cm to 65,000 μS/cm. From 970 to 800 feet bls, where the static log ended, the conductivity increased slowly from 15,000 μS/cm to 23,000 μS/cm, with several small, short interval peaks ranging from 8,000 μS/cm

to 22,000 μS/cm. The lower readings from 995 feet bls up into the casing seat may have been the result of fresh water being pumped into the well to dilute the salt "kill" in the well prior to the geophysical logging. This fresh water may have been forced into the formation by the denser, more saline formation water below.

The dynamic (flowing) specific conductivity log indicated a bottom hole reading of approximately 60,000 μS/cm. From the bottom of the borehole to 1,080 feet bls, the flowing steadily dropped to approximately 53,000 μS/cm, with several high and low peaks ranging between 44,000 μS/cm and 74,000 μS/cm. Some of these fluctuations correspond to temperature changes, borehole diameter fluctuations, and flow meter fluctuations, and may be intermittent beds containing water with slightly greater or lesser specific conductivity. From 1,080 to 1,068 feet bls, the specific conductance continued a downward trend from 53,000 μS/cm to 48,000 μS/cm. At 1,068 feet bls, the sharply increased to 54,000 μS/cm, where it again began a slow, steady decrease to 52,000 μS/cm at 1,059 feet bls. There is no correlation between the sharp increase at 1,068 feet bls and other geophysical logs. From 1,059 feet bls, the conductivity decreased rather inconsistently to a low of 45,000 μS/cm at 1,043 feet bls. The inconsistencies of the specific conductance log in this interval correlate again to temperature changes, borehole diameter fluctuations, and flow meter fluctuations. At 1,043 feet bls the conductivity sharply increased from 45,000 μS/cm to 50,000 μS/cm. This increase correlates to the borehole diameter greatly increasing in size and a significant reduction in flow. From 1,043 to 950 feet bls, the conductivity was near constant, only decreasing to 48,000 μS/cm. From 950 to 940 feet bls, the specific conductance decreased to 44,000 μS/cm, and at 940 feet bls, the measurement sharply dropped to 38,000 μS/cm, where it began a more gradual decrease to 30,000 μS/cm at the well casing seat depth of 916 feet bls. The sharp drop at 940 feet bls does not correlate to other geophysical logs. At the well casing seat and the first five (5) feet inside the well casing, the specific conductance was erratic and at its lowest levels, reading 20,000 μS/cm at 915 feet bls. The erratic readings at this depth may be attributed to the turbulence of the formation water making its way into the well casing. From 910 to 900 feet bls, where the specific conductance log ends, the readings were stable at 25,000 μS/cm and were expected, as the upward flow of water had thoroughly mixed by this point. Again, the lower readings from near the casing seat may have been the result of fresh water that was pumped into the well to dilute the salt "kill" in the well prior to the geophysical logging.

Flow Meter Log: The static flow meter log indicated approximate flow rates between 30 and 130 cycles per second ("cps"). There was significant flow in the open hole interval under static conditions from 965 and 990 feet bls, and again from approximately 1,040 feet bls to the bottom of the borehole. Slight fluctuations in cps can be attributed to slight change in logging rate. Larger flow rate changes or trends may be attributed to changes in borehole diameter or potential flow zones.

The dynamic flow meter log indicated approximate flow rates between 34 and 170 cps in the open borehole. The highest flow rate occurred, as expected, just inside the well casing to 204 cps. The dynamic flow rate was fairly constant, ranging from approximately 75 to 136 cps between 920 to 980 feet bls and again from 1,040 feet bls to the bottom of the borehole. From 990 to 1,040 feet bls the flow rate decreased to a range of 40 to 75 cps. This correlates to the larger diameter of the open borehole in this interval. The rate of flow will decrease as water moves from a smaller diameter hole to a larger one, and inversely, will increase as water moves from a larger diameter hole into a smaller one.

Focus Guard Log: The focus guard log measures the resistivity of the surrounding formation. A larger borehole diameter and the presence of saline fluids may attenuate the focus guard log results. The focus guard log started near the bottom of the borehole at approximately 1,184 feet bls, where the four (4) focus guard logs indicated readings between approximately 52 and 62 Ohm-m of resistance for the surrounding formation. From 1,184 to 1,043 feet bls, the four (4) logs paralleled each other and remained fairly constant, with short interval variations of only a few Ohm-m. At 1,043 feet bls, the four (4) logs made a small drop in resistivity of three (3) to five (5) Ohm-m. At 1,040 feet bls, the logs stabilized and remained almost constant to approximately 1,000 feet bls. From 1,000 to 960 feet bls, the logs trended, in unison, towards a gradual increase in resistivity. In this 1,000 to 960 feet bls interval, there was an approximate five (5) to 12 Ohm-m rise in resistivity among the four (4) logs. From 960 feet bls to the well casing seat at 915 feet bls and to 900 feet bls, where the logs ended, the resistivity logs were not uniform and did not parallel each other as before but did generally trend towards increased resistivity, with all four (4) logs being above 75 Ohm-m and one (1) log being over 100 Ohm-m. The generally stable readings from the bottom of the borehole to approximately 980 feet bls indicated a fairly uniform borehole resistivity, where any changes in resistivity correlated with the borehole diameter changes. The increase in resistivity from 980 feet bls to the casing seat at 915 feet bls and continuing on to 900 feet bls, may be due to fresh water (introduced during the flushing of salt "kill" from the well) being retained in the formation below the bottom of the well casing seat.

Spontaneous Potential Log: When a spontaneous potential log is run in boreholes with formation fluid and borehole fluid of similar salinity, as is the case with La Gorce F-2, the spontaneous potential readings are meaningless. Therefore, the spontaneous potential log provided no useful information.

4.3 STEP-DRAWDOWN TESTING

Step-drawdown testing was performed on the production well in conjunction with sand testing. The purpose of step-drawdown testing is to evaluate the performance of the well. A step-drawdown test is performed on a well in order to determine aquifer characteristics and to quantify the deterioration in well performance over time. Step-drawdown tests yield information regarding well efficiency, well development, and well screen/borehole clogging. The results also help determine possible rehabilitative procedures and optimum pumping rates. The data collected during the step-drawdown tests are used in the evaluation of the performance, efficiency, and specific capacity of the well at the different pumping rates, and for the calculation of the transmissivity of the aquifer.

Step-drawdown testing involves pumping a well for a predetermined amount of time (approximately 60 minutes), until water level stabilization is reached, at each of three (3) increasing pumping rates. Ideally, the three (3) rates should be at 50, 100, and 150 percent of the design pumping rate. For instance, if the design production rate is 1,400 gpm, then the three (3) rates for the step-drawdown test would be 700 gpm, 1,400 gpm, and 2,100 gpm. Before each increase in pumping rate, water levels are allowed to recover to static levels for at least the same amount of time as the well was pumped. The changes in water levels within the well may be measured by hand with an electric water level probe ("M-scope") or pressure gauge during both the drawdown and recovery periods. The time increments for manual measurements are as follows: one (1) minute readings for the first ten (10) minutes, two (2) minute readings from 10 to 20 minutes, and five (5) minute readings from 20 to 60 minutes and/or the end of the test. For the LaGorce well, a pressure transducer/data logger was used to measure the water levels. The time increment for the readings from the data logger was two (2) seconds. **Appendix D: Step-Drawdown Test Results** gives the step-drawdown testing results for the newly installed production well at 30 second intervals. Please note that because the Floridan aquifer is artesian, the static water levels are measured above land surface ("als").

4.3.1 DRAWDOWN

The total drawdown (measured in the field) in a well is a function of the drawdown due to aquifer characteristics and the drawdown due to the loss of efficiency from the well. Total drawdown(s) can be written as the following equation (Dawson and Istok, 1991):

$$s = BQ + CQ^2 \qquad \textbf{(4.1)}$$

where:	s	=	drawdown in the well casing, feet
	B	=	(264/T) log [(0.3Tt) / (r^2S)], gallons per day per foot
	Q	=	pumping rate, gallons per minute
	C	=	well loss coefficient, $second^2$ per $foot^5$
	T	=	transmissivity, gallons per day per foot
	t	=	time, minutes
	r	=	radius of the well, feet
	S	=	storage coefficient, dimensionless

Because the transmissivity and storage coefficient of an artesian aquifer and a leaky aquifer are constant, the *BQ* term in the equation does not affect the determination of well loss using the Jacob method discussed in equation 4.4. Assuming that the well is not developing, the total drawdown can be used to determine transmissivity. However, this method gives lower transmissivity values than those calculated without accounting for drawdown due to well loss. The drawdowns observed in the LaGorce well are shown in **Table 4-1: Step-Drawdown Test Results**.

Table 4-1

Step-Drawdown Test Results

Well Number	F-2		
Step	1	2	3
Pumping Rate (gpm)	986.50	1,907.50	2,598.30
Drawdown (ft)	27.67	67.77	81.06
Specific Capacity (gpm/ft at 60 min)	35.65	28.15	32.05
Well Loss 1 and 2 (sec^2/ft^5)	1.6357611		
Well Loss 2 and 3 (sec^2/ft^5)	-3.0368790		
Well Loss (1+2) and 3 (sec^2/ft^5)	-1.2628343		
Well Loss 1 and (2+3) (sec^2/ft^5)	0.3934203		
Average Well Loss Constant (sec^2/ft^5)	-0.5676		
Well Loss (ft)	-2.74	-10.25	-19.03
Well Efficiency (%)	109.91	115.13	123.47

4.3.2 SPECIFIC CAPACITY

The productivity (quantity of water produced) of a production well can be expressed in terms of specific capacity. The specific capacity of a well is defined as the ratio of the pumping rate to the drawdown at a given time:

$$C_s = \frac{Q}{s} \quad (4.2)$$

where: C_s = specific capacity of the well, gallons per minute per foot of drawdown at a unit of time
Q = pumping rate, gallons per minute
s = drawdown, feet

Estimating the specific capacity of a well requires determining the drawdown from a static water level to a pumping water level within the well at a known pumping rate after a known span of time. Specific capacity is measured in gallons per minute per foot of drawdown at a given period of time (gpm/ft at a unit of time) and is used to calculate well efficiency. The higher the specific capacity, the more efficient the well, as long as all other factors are equal. Specific capacity changes in a non-linear fashion with increased pumping rates because a well cannot, in reality, be one-hundred percent (100%) efficient. Slight decreases in the specific capacity with increased pumping rates are to be expected in wells that have been fully stabilized and are no longer developing. Specific capacities increasing at higher pumping rates indicate that the well is developing. The specific capacities for the well are shown in **Table 4-1: Step-Drawdown Test Results**. These data indicate that the well was developing during the latter part of the test.

4.3.3 WELL LOSS CONSTANT

Well loss is defined as head loss attributable to well inefficiency due to the turbulent flow of water through the well screen and/or inside the casing to the pump intake (Jacob, 1946.) Well loss can be expressed as a well loss constant (C) and the well loss in feet (S_w).

The well loss constant is derived from a comparison of the drawdown data at the various pumping rates of the step-drawdown test. This constant is in turn expressed as well loss in feet or as well efficiency. The value of C may be computed from step-drawdown test data using the following equation (Jacob, 1946):

$$C = \frac{(\Delta s^{i}/\Delta Q_{i}) - (\Delta s^{i-1}/\Delta Q_{i-1})}{\Delta Q_{i-1} + \Delta Q_{i}} \qquad \textbf{(4.3)}$$

where:	C	=	well loss constant, second^2 per feet^5
	i	=	any given pumping step
	Δs^i	=	incremental drawdown associated with step i, feet
	ΔQ_i	=	incremental pumping that produces incremental drawdown (s^i) associated with step i, feet^3 per second

Changes in C values are affected by changes in discharge rates, shifting of the gravel outside the wells, and/or development of the formation.

Equation 4.3 assumes that the production well is stable and that the value of C does not change during the well production test. New wells, improperly designed and/or constructed wells, and old wells can be unstable, and the calculated value of *C* can be affected by changes in the discharge rate. The value of *C* calculated for steps 1 and 2 of the step-drawdown test may be greater or less than that calculated for steps 2 and 3. Sand and gravel often shift outside the production well during discharge periods under the influence of high discharge rates. This may result in either the development or clogging of the pores of the well face. If the value of *C* for steps 2 and 3 is considerably less than the value of *C* for steps 1 and 2, it is probable that development has occurred during the well production (step-drawdown) test. A large increase in the value of *C* with higher discharge rates indicates clogging has occurred during the production well test. Clogging may be a function of a number of items: fine-grained material clogging boreholes, the presence of bacteria, and/or formation collapse. Formation collapse may be an indication of sink hole formation. Negative C values indicate that the well was developing during testing. If the production well is unstable, *C* may be calculated with Equation 4.3 and data from steps 1+2 and 3, or 2+3 and 1.

Borehole clogging due to incomplete well development or well deterioration by bacteria or other concerns is generally negligible when *C* is less than 5.0 sec^2/ft^5. Values of *C* between 5.0 and 10.0 sec^2/ft^5 indicate mild clogging or well deterioration, and clogging or well deterioration is severe when *C* is greater than 40.0 sec^2/ft^5 (Walton, 1962, p. 27). Deteriorated wells may be returned to near original yields by one (1) or more of several rehabilitation methods. The success of the rehabilitation can be appraised with the results of well production tests conducted prior to and after rehabilitation.

The average well loss coefficient for Well No. F-2 was -0.5676 sec^2/ft^5. The values of C for the well are presented in **Table 4-1: Step-Drawdown Test Results**. Although the negative C values for steps 2 and 3 and for steps (1+2) and 3 indicate that the well was developing at the higher pumping rates during testing, overall the well appears relatively stable and should function as expected at the design pumping rate.

Please note that Jaffer had to kill the well after all of the development had occurred (but prior to testing) because of pump problems. This probably adversely affected the results of the test. These results indicate that the well should be pumped with the production well pump to finalize well development prior to flowing water to the membrane system.

4.3.4 WELL LOSS

Well loss in feet is the approximate head loss in feet due to the well's inefficiency. Well loss in feet may be computed using the following equation (Jacob, 1946):

$$s_w = CQ^2 \qquad \textbf{(4.4)}$$

where: s_w = well loss, feet
C = well loss coefficient, second^2 per feet^5
Q = production well discharge, feet^3 per second

Well loss is used to calculate the well efficiency. The well losses for Well No. F-2 at each tested rate are shown in **Table 4-1: Step-Drawdown Test Results**.

4.3.5 WELL EFFICIENCY

Well efficiency is defined as the percentage of total drawdown that is attributable to well loss. This number can be obtained by dividing the theoretical drawdown by the total drawdown, and multiplying by 100 to yield a percentage.

$$\frac{s_t}{s} \times 100 = Percent\ Efficiency \qquad \textbf{(4.5)}$$

where: s_t = theoretical drawdown, feet
s = actual drawdown, feet

The theoretical drawdown is calculated as the total (measured) drawdown minus the well loss. The name "well efficiency," in this context, can be misleading because is does not confer that the efficiency (productivity) is due to both the well characteristics (well loss) and aquifer characteristics (theoretical drawdown). Therefore, wells with lower well efficiencies should not be thought of as necessarily inferior to wells with higher well efficiencies. Well efficiencies of greater than 100% indicate that the wells are developing. The well efficiencies for Well No. F-2 are shown in **Table 4-1: Step-Drawdown Test Results**. The well efficiencies for Well No. F-2 are greater than 100%, indicating that the well was developing during testing.

4.3.6 AQUIFER TRANSMISSIVITY

From the data gathered during the step-drawdown tests, it is possible to calculate aquifer transmissivity using the Jacob method (also called the Cooper-Jacob method). The criteria for this method are as follows:

1. Flow is entirely horizontal, radial, and laminar.

2. The well fully penetrates the aquifer.

3. There are no vertical components of flow.

4. No water is stored in the well (i.e., drawdown and recovery data are not affected by well storage capacity).

5. The uniformly porous aquifer is overlain and underlain by aquicludes, with negligible vertical hydraulic conductivity (except in a water table aquifer that is of uniform grain size, i.e., no delayed-yield response. Under this condition the Jacob method can apply to water table conditions).

6. The aquifer is homogenous, isotropic, infinite in areal extent, and has a constant thickness throughout.

7. Wells have infinitesimal diameter, and discharge is constant.

8. There are no boundaries and/or discontinuities.

9. Before pumping, the piezometric surface is horizontal.

10. There is no recharge to the aquifer.

11. The groundwater density and viscosity are constant.

12. Groundwater flow can be described by Darcy's Law.

13. Head losses through the well screen and pump intake are negligible.

14. The aquifer is compressible and completely elastic.

These conditions must be met during the duration of the pumpage and in the area of influence of the well(s) during the time of pumpage, and/or corrections must be made to account for conditions not met. The following remarks note for each criterion how the aquifer and/or well(s) meet the conditions and/or how corrections were made:

1. The majority of flow during the duration of pumping is horizontal, radial, and laminar.

2. The well(s) fully penetrates the producing unit of the aquifer.

3. The vertical components of flow are a delayed yield response and are seen "instantaneously" in the production well.

4. The water stored in the well is negligible compared to the amount withdrawn.

5. This statement is valid.

6. For the area tested, over the duration of the test, this statement is valid, as evidenced by the drawdown data.

7. Discharge was constant. Well diameter does not effect the calculation of the transmissivity in this equation, only the storage coefficient.

8. No boundary conditions are indicated in the drawdown data during the duration of the test.

9. Because the hydraulic gradient is negligible (based on regional canal elevations and flow data), this statement is valid.

10. Based on the step-drawdown data, recharge was negligible.

11. Based on chemical analysis, this does not appear to be a concern.

12. This statement is valid.

13. The head losses are constant at a given pumping rate and therefore do not affect the calculation of transmissivity, i.e., head losses do not affect the change in drawdown, Δs, between log cycles.

14. This statement is valid, based on the information available.

The Jacob method uses the equation:

$$T = \frac{264Q}{\Delta s} \quad \textbf{(4.6)}$$

where:
- T = transmissivity, gallons per day per foot
- Q = pumping rate, gallons per minute
- Δs = the slope of the time-drawdown graph expressed as the change in drawdown between any two values of time on the log scale whose ratio is 10.

The time-drawdown graphs for the well are shown in **Appendix E: Step-Drawdown Graphs**. Transmissivity values are given in **Table 4-2: Transmissivity Results.**

Table 4-2

Transmissivity Results

Well Number	Rate (gpm)	Transmissivity (gpd/ft)
F-2	986.5	30,943.8
	1,907.5	91,474.6
	2,598.3	89,879.7
	Average	70,766.0

4.4 SAND TESTING

Sand testing was performed on the production well in conjunction with step-drawdown testing. Testing was performed using and a Lakos Laval Sand Separator. Although the Rossum Sand Tester is the American Water Works Association ("AWWA") standard to measure sand concentration, GMW&A has found the Lakos Laval Sand Separator to provide a more accurate sand concentration due to the greater volume of water that flows through the separator. GMW&A used a Lakos Laval Sand Separator to obtain sand concentration data discussed in this report.

The purpose of sand testing is to determine the amount of sand being pumped from a well. This is important because sand, especially quartz sand, can adversely affect the longevity of pumps, motors, column pipes, and pipe lines due to its ability to abrade steel. The abrasion then has the ability to create points of potential corrosion by both electrolysis and bacteria. In a membrane plant, sand can also clog pre-filters (if present in the plant, or the membranes themselves if no pre-filters exist), and therefore sand production should be avoided.

4.4.1 SAND STANDARDS

Under normal operating conditions, the concentration of sand produced by a water supply well should be less than the AWWA Standard for Water Wells A100-97 of 5.0 mg/L. Any recommendations for limiting sediment concentration must take into account the water use, the method of treatment, the type of sediment, and the source of the sediment. The U.S. Environmental Protection Agency and the National Water Well Association (1975) have recommended the following limits:

A. 1 mg/L — water to be used directly in contact with, or in the processing of, food and beverages.

B. 5 mg/L — water for homes, institutions, municipalities, and industries.

C. 10 mg/L — water for sprinkler irrigation systems, industrial evaporative cooling systems, and other uses where a moderate amount of sand is not especially harmful.

D. 15 mg/L — water for flood-type irrigation and where the nature of the water-bearing formations and the overlying strata are such that pumping this amount of sand will not seriously shorten the useful life of the well.

The limits suggest reasonable goals that can be achieved if good well design, construction, and development practices are followed. In older wells or wells in problem aquifers, a well may pump unacceptable amounts of sediment. If the well cannot be redeveloped by conventional techniques, a special sand separator can be installed as a permanent part of the well system. Although sand separators are efficient, they may not remove all sediment and should not be used as a substitute for good well design and construction practices. In addition, removal of sufficient sand could cause catastrophic collapse of the formation.

There is no current standard for sand production for a membrane process well. However, the amount of sand can adversely impact the life expectancy of the pre-filters. Good well design and velocity control (less than 2.5 fps in a membrane plant, and less than 5.0 fps in a non-membrane pant) may limit sand production in a well. GMW&A recommends sand concentration to be maintained below 1.0 mg/L for production wells.

4.4.2 LAKOS LAVAL SAND SEPARATOR

While the Rossum Sand Tester is the method accepted by the AWWA, GMW&A's experience has indicated that the use of a Lakos Laval Sand Separator provides a better method of quantifying sand produced from a well. This is primarily due to the larger volumes of water tested over a greater period of time with the Lakos Laval Sand Separator. In this procedure, sand testing was performed in conjunction with step-drawdown testing. Approximately ten (10) to 15 gallons per minute of water were diverted through the sand separator during each step of the step-drawdown test. Upon completion of each step, the sand was removed from the sand separator. These sand samples were dried and analyzed for weight.

The amount of sand produced in milligrams per liter for each individual pumping rate is determined by the following equation:

$$S = \frac{S_{wt}(1000)}{3.785Qt} \qquad \textbf{(4.7)}$$

where:	S	=	sand content, milligrams per liter
	S_{wt}	=	weight of sand, grams
	1000	=	equation constant, milligrams per gram
	3.785	=	equation constant, liters per gallon
	Q	=	rate through the sand separator, gallons per minute
	t	=	time, minutes

The amount of sand that the well pumps during the step-drawdown test should increase with each increase in the pumping rate. Upon the completion of recovery of the final pumping step of the step tests, the well was pumped at its design rate for two (2) hours, and sand samples were collected at 5, 30, 60, and 120 minutes without stopping the pumping. The amount of sand pumped during normal operation is reflected in the fourth (120 minutes) sand sample. This sample is a realistic figure for the quantity of sand which will be produced during normal well operations.

Large discrepancies in the amount of sand collected at the five (5)-minute sample as compared to the amount of the 120-minute sample are of concern and are an indication of water hammer to the formation. Therefore, it is imperative that appropriate engineering is provided in the well pump and valving design to mitigate these concerns.

It should be noted that the Lakos Laval Sand Separator only removes sand particles in the range of 6.35 mm to 74 microns, with ninety-eight percent (98%) efficiency. This means that particles less than 74 microns will pass through the sand separator and into a pre-filter in a membrane plant, which screens particles that are greater than 5.0 microns in size.

4.4.3 RESULTS OF SAND TESTING

The sand test was performed on Well No. F-2 in conjunction with the step-drawdown testing using a Lakos Level Sand Separator. The sand concentration increased during each step, partly due to the fact that the well was still developing. As expected, the two (2)-hour sand test showed a higher sand concentration during the first five (5) minutes of pumping than at 120 minutes. The amount of sand pumped during normal operation is reflected in the 120 minutes sand sample. This sample is a realistic figure for the quantity of sand which will be produced during normal well operations and is less than 1.0 mg/L.

There is a large discrepancy in the amount of sand collected at the five (5)-minute sample as compared to the amount of the 120-minute sample. This may indicate water hammer to the formation and may require mitigation. However, the amount of sand at 120 minutes is less than 1.0 mg/L at a pumping rate of 1,900 gpm. Pumping the well at the design rate of 2,000 gpm is not anticipated to be a problem. provided a slow start-up is incorporated into the plant design.

Table 4-3: Sand Test Results presents the quantities of sand collected during sand testing on the production well.

Table 4-3

Sand Test Results

Test Number	Pumping Rate (gpm)	Sand Concentration (mg/L)
Step 1	986.5	0.12
Step 2	1,907.5	2.79
Step 3	2,598.3	5.13
5 min	1,897	5.39
30 min	1,897	0.31
60 min	1,897	0.16
120 min	1,897	0.04

4.5 SILT DENSITY INDEX TESTING

Silt Density Index ("SDI") testing, ASTM Standard D-4189, is an empirical measurement to test for the potential of silt, colloidals, bacteria, and other substances to foul a membrane. SDI testing is used to predict the tendency of a water supply to foul membranes.

The SDI test simply measures the decay in flow rate through a 47-millimeter ("mm") diameter, 0.45-micron ("µm") pore size membrane. The 0.45-micron membrane is used because it is more susceptible to clogging from colloidal matter than from hard particles such as sand and scale. Furthermore, the 0.45-micron size is smaller than the 5.0-micron size of the pre-filter and therefore measures particles that would pass through the 5.0-micron size pre-filter and clog the membrane. (The membrane is approximately 0.5 microns in size.) The measured decay in flow rate is converted to a number between 1 and 100.

The SDI number is a function of the rate at which the filter (membrane) clogs with colloidal material. The larger the SDI number, the greater the fouling tendency of the water. "*Generally, RO systems operating on feed water supplies with SDI values less than 1 run for years without problems, and those operating on supplies with SDI values less than 3 run for months without need of membrane cleaning. However, systems operating on supplies with values between 3 and 5 are cleaned regularly and are often considered problem systems. SDI values greater than 5 are not acceptable at this time.*" (Amjad, 1993)

During SDI testing of the production well, a colloidal filter was installed and SDI's were taken before and after the water had passed through the colloidal filter. The filter pore spaces are 5.0 microns in size. This filter size allows the capture of most clay- and silt-sized particles.

In order to calculate the SDI of a given water, the following formula is used:

$$SDI = \left(1 - \frac{T_I}{T_F}\right) \times 100 \div T_T \qquad \textbf{(4.8)}$$

where:

where:	SDI	=	Silt Density Index (an empirical number between 1 and 100)
	T_I	=	the initial time to fill 500 milliliters, seconds
	T_F	=	the final time to fill 500 milliliters, seconds
	T_T	=	the total time test is performed, minutes

4.5.1 RESULTS OF SDI TESTING

SDI's were performed on the new production well throughout the well testing. During the two (2)-hour sand test, SDI's were obtained both before and after water passed through the 5.0 micron colloidal filter. **Table 4-4: SDI Results** presents the results of the SDI testing.

Pre-colloidal filter SDI's were obtained during each of the three (3) steps during the step-drawdown testing. Pre- and post-colloidal filter SDI's were performed during the two (2)-hour pump test. SDI values were greater than the desired 3.00 in each test conducted during the step-drawdown testing, ranging from 5.04 to 6.30. The data collected indicate that the SDI values decrease with the increase in duration of pumping for each pumping rate. The finer particles are developed out as the well is continuously pumped. The SDI values of the pre-colloidal filter test compared to the post-colloidal filter test indicate that the size of the particles flowing through the testing apparatus is greater than 5.0 microns (the SDI's are higher before the water has flowed through the 5.0- micron colloidal filter).

Based on the SDI test results, membrane fouling due to these silt-sized particles may be a concern. However, the SDI decreases with increases in the duration of pumping, and therefore should decline as the well is operated. In addition, most of the silt-sized particles should be trapped by the pre-filter, mitigating fouling of the membranes. If membrane fouling due to silt remains a problem as the well is operated, then LaGorce should consider additional filtration and further water hammer mitigation.

Table 4-4

SDI Results

Test Number	Pre / Post Filter	SDI
Step 1 Test 1	Pre	5.37
Step 1 Test 2	Pre	5.04
Step 2 Test 1	Pre	6.09
Step 2 Test 2	Pre	5.93
Step 3 Test 1	Pre	6.30
Step 3 Test 2	---	---
Pre-Filter 1	Pre	2.40
Pre-Filter 2	Pre	---
Post-Filter 1	Post	0.51
Post-Filter 2	Post	0.33

4.5.2 UPHOLE VELOCITY

One method of controlling the SDI is through the regulation of the uphole velocity of water in the well. Decreasing the velocity will decrease the SDI of the water. For membrane processes, an uphole velocity of less than 2.5 feet per second ("fps") is recommended. However, this recommendation of velocity may be adjusted (increased or decreased) based on the nature of the formation and/or surface water hammer mitigation procedures. The following formula is used to calculate the uphole velocity (Heald, 1994):

$$V = \frac{.4085\ Q}{d^2} \qquad \textbf{(4.9)}$$

where:
V = uphole velocity, feet per second
Q = pumpage rate, gallons per minute
d = inner diameter of the well, inches

Using the design pumping rate of 2,000 gpm and a pipe minimum inner diameter of 15.106 inches, the calculation yields an uphole velocity of 3.58 fps for the new production well. This velocity is larger than desired, however because of the quantity of water necessary and the prohibitive cost of installing an additional well or installing larger casing, this design was required. In order for the velocity not to rise above the suggested 2.5 fps for a membrane plant, the pumpage rate should not be greater than 1,390 gpm. However, because of the design limitations of the well and pumping rates for the irrigation system, these concerns must be addressed at the surface (if required). This reduction of rate should be implemented only if high SDI values are a concern.

4.6 WATER QUALITY TESTING

Field water quality sampling was performed during the drilling of the open hole section of the well. The samples were analyzed for temperature in degrees Centigrade ("°C"), conductivity in milli-Siemens per centimeter ("mS/cm"), and salinity in parts per thousand ("ppt"). The results of these tests are presented in **Table 4-5: Field Water Quality During Drilling.**

As can be seen in the data and graph (**Figure 4-2: Field Water Quality**), temperature drops sharply at approximately 955 feet bls and then is relatively steady with depth. Conductivity and salinity show an overall increase with increasing depth, but show zones of lower readings at approximately 1,065 to 1,110 feet bls; 1,140 feet bls; and 1,180 feet bls to the bottom of the hole at 1,206 feet bls. These lower conductivity/lower salinity measurements may be due to the influence of zones of better quality water. These zones should assist in the plant's operation and are not of concern.

A raw water sample from the production well was obtained on December 4, 2001, and analyzed by Envirodyne, Inc., a licensed, Florida Department of Environmental Protection ("FDEP")-certified laboratory. Of the parameters tested, the following were above the maximum contaminant level ("MCL") for primary or secondary drinking water standards: sodium, chloride, gross alpha, odor, Radium 226, sulfate, and total dissolved solids. High levels of sodium, chloride, sulfate, and total dissolved solids are expected in this aquifer and will be managed by membrane treatment. Odor can be managed through routine disinfections. The water is slightly encrusting (non-corrosive). All other tested primary and secondary drinking water parameters were below the MCL or guidance concentration for each parameter.

As the results for chlorides, TDS, and specific conductance were greater than the anticipated concentrations and would necessitate a redesign of the R.O. treatment system, GMW&A recommended resampling to confirm the initial results. The well was flowed to ensure a representative water quality sample could be obtained. During the flow period (estimated at eight (8) to ten (10) hours per day for 15 days), Jaffer and GMW&A personnel conducted periodic water quality testing in the field. On March 22, 2002, water quality samples were obtained and analyzed by Envirodyne for chlorides, TDS, and specific conductance. The results of this sampling episode indicated decreased concentrations (from the December 4, 2001, sampling event) of the tested

La Gorce Country Club
Well F-2
Field Water Quality

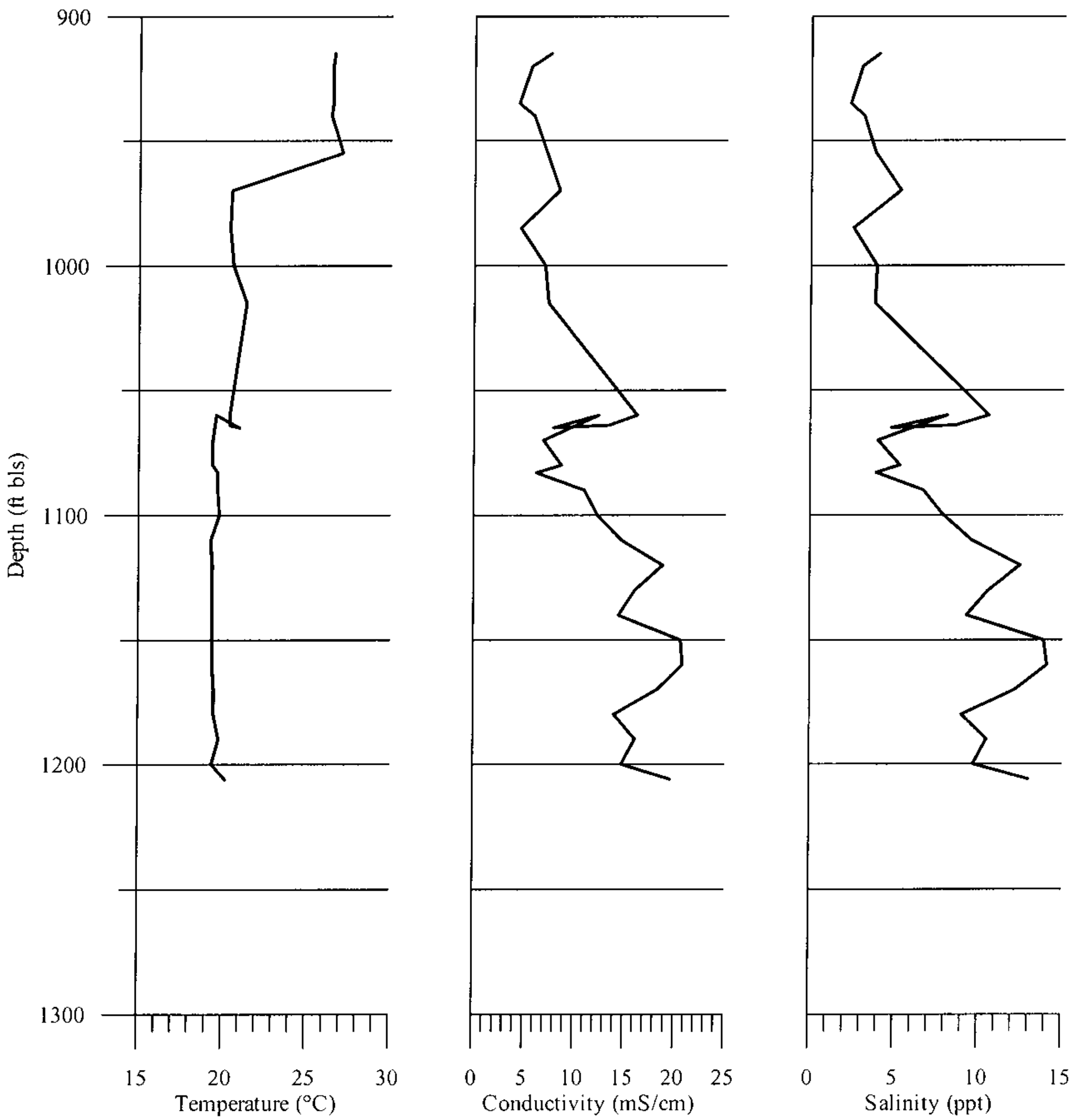


Figure 4-2

Gerhardt M. Witt & Associates, Inc.

parameters. However, the concentrations were still greater than anticipated. The well was again allowed to flow. On April 19, 2002, water quality samples were obtained and analyzed by Envirodyne for chloride and TDS concentrations. These results indicated concentrations greater than the March 22, 2002, sampling event. The results of the additional sampling episodes indicated representative production interval concentrations of the tested parameters.

Based on this data, GMW&A recommended that the well be retested for primary and secondary drinking water standards to provide a current baseline for water quality that could be used to properly design the R.O. plant.

On May 2, 2002, Envirodyne obtained water samples from F-2 and analyzed them for primary and secondary drinking water standards. Of the parameters tested, the following were above the MCL for primary or secondary drinking water standards: sodium, chloride, odor, sulfate, and TDS. High levels of sodium, chloride, sulfate, and TDS are again expected in this aquifer and will be managed by membrane treatment. The concentrations of gross alpha and Radium 226 had decreased since the December 4, 2001, sampling episode to below the MCL for primary drinking water standards. All other tested parameters were below the MCL or guidance concentration for each parameter.

This water is not for human consumption and therefore does not need to meet drinking water standards. However, for aesthetic concerns and because of the potential for human contact, the water quality should be monitored and maintained.

The results of the water quality tests performed by Envirodyne, Inc. are presented in **Appendix F: Envirodyne Water Quality Results**.

Table 4-5

Field Water Quality During Drilling

Depth (ft)	Temperature (°C)	Conductivity (mS/cm)	Salinity (ppt)
915	26.6	7.53	4.0
920	26.5	5.65	3.0
935	26.5	4.39	2.3
940	26.4	5.87	3.1
955	27.1	7.16	3.8
970	20.5	8.45	5.3
985	20.4	4.58	2.5
1,000	20.6	7.04	3.9
1,015	21.4	7.38	3.8
1,060	20.4	16.27	10.6
1,064	20.4	13.44	8.6
1,065	21.0	7.90	4.8
1,070	19.4	6.90	4.0
1,080	19.4	8.70	5.3
1,083	19.7	6.20	3.9
1,090	19.7	11.00	6.7
1,100	19.8	12.30	7.9
1,110	19.3	14.73	9.6
1,120	19.4	18.85	12.5
1,130	19.4	16.08	10.6
1,140	19.4	14.45	9.3
1,150	19.4	20.61	13.9
1,160	19.4	20.82	14.1
1,170	19.5	18.30	12.2
1,180	19.5	14.01	9.0
1,190	19.8	16.15	10.5
1,200	19.4	14.78	9.7
1,206	20.2	19.62	13.0

4.7 MICROBIOLOGICAL TESTING

Two (2) microbiological samples were collected, by personnel from GMW&A, from the new Floridan aquifer well on December 4, 2001, and May 2, 2002. The samples were collected aseptically and delivered to Micrim Labs, Inc. ("Micrim") for analysis. Results of the microbiological sampling are included in **Appendix G: Microbiological Sample Results**.

4.7.1 EXPLANATION OF MICROBIOLOGICAL TEST PARAMETERS

HPC: Heterotrophic Plate Count. This is an estimate of the number of heterotrophic bacteria found in the water sample. Heterotrophic bacteria are bacteria that utilize organic substances as principal sources of energy for growth and reproduction. This includes most bacteria encountered in nature. The HPC is reported in colony forming units per milliliter ("CFU/mL") and represents the number of viable organisms per milliliter of water. (*Standard Methods* 9215B)

TCC: Total Coliform Count. This is an estimate of the number of coliform bacteria present in the water sample. Coliform bacteria are defined as bacteria capable of fermenting lactose to acid and gas within 48 hours at 35°C (95°F). The presence of coliform bacteria indicates the presence of contaminating waste in the water sample. The TCC is measured in colony forming units per 100 milliliters of water ("CFU/100mL"). (*Standard Methods* 9222B)

FCC: Fecal Coliform Count. This is an estimate of the number of fecal coliform bacteria present in the water sample. Fecal coliform bacteria are differentiated from total coliform bacteria by the fermentation of lactose to acid and gas within 24 hours at 44.5°C (112°F). The most widely known and often isolated fecal coliform is *Escherichia coli* ("*E. coli*"). Fecal coliforms are an indication of fecal contamination of the water sample. The FCC is measured in colony forming units per 100 milliliters of water ("CFU/100mL"). (*Standard Methods* 9222D)

Bacterial I.D.: This is a list of all of the bacterial species that were isolated (grown) from the sample.

TFC: Total Fungal Count. This is an estimate of the number of the fungal organisms found in the water sample. The TFC is measured in colony forming units per 100 milliliters of water ("CFU/100mL"). (*Standard Methods* 9215D)

Fungal I.D.: This is a list of all of the fungal species that were isolated from the sample. Certain types of fungi are considered pathogenic organisms.

Algal I.D.: This is a list of the algal morphologies that were identified by direct microscopic examination of the sample. The presence of algae in a water sample from a well usually indicates that there is a direct connection between the well and a surface water source. In addition to algae, bacterial species that are difficult to grow in the laboratory environment but are distinguishable by microscopic examination (such as the iron bacteria *Gallionella ferruginea* and *Sphaerotilus natans*) will also be identified in this section, if noted in the sample.

4.7.2 MICROBIOLOGICAL SAMPLE RESULTS

Six (6) bacterial species were isolated from the water samples. In addition, iron encrusted filaments morphologically consistent with the iron bacteria *Sphaerotilus natans* were present in one (1) of the samples. Two (2) of the bacterial species isolated, *Micrococcus luteus* and *Bacillus* sp. are considered environmental contaminants and should be of little or no concern. Two (2) of the bacterial species isolated, *Aeromonas hydrophila* and *Enterobacter agglomerans*, are considered opportunistic pathogens capable of causing disease in debilitated or susceptible people. *Enterobacter agglomerans*, *Pseudomonas alcaligenes*, *Pseudomonas stutzeri*, and *Sphaerotilus natans* are considered biofouling organisms capable of producing biofilms by the production of extracellular polymeric substances such as alginate and capsules. Several significant problems can be caused by the presence of these biofilms (Characklis and Marshall, 1990):

1. Reduced Flow

   Biofilms can form in distribution pipes, column pipes, membranes, wellscreens, and the formation. The presence of biofilms in these locations will restrict water flow, thereby increasing energy costs for water withdrawal and transport.

2. Increased Capital Cost

   There are several ways that biofouling may lead to increased capital costs. First, additional extraction wells will be required to compensate for reduced flow. Second, unscheduled downtime and extended turnaround times to clean biofouled equipment will result in the use of expensive, temporary measures to compensate. Third, and most important, replacement of equipment due to biofouling and/or corrosion will be required prematurely. For example, a nuclear power plant had to replace a condenser after approximately six (6) years of operation because of severe corrosion due, in part, to microbial action (Geesey, et. al., 1994). The presence of biofilms can initiate and increase the rate of corrosion of certain materials, especially ferrous materials such as iron and stainless steel. Listed below are the main mechanisms of microbiologically influenced corrosion (Videla, 1996).

A. Production of corrosive metabolites: Certain bacteria directly and/or indirectly produce acids or other corrosion enhancing products as a by-product of metabolism. These products can include hydrogen sulfide produced by sulfur-reducing bacteria (Cullimore, 1993), strong acids such as sulfuric acid produced by sulfur-oxidizing bacteria, weak organic acids produced by some *Pseudomonas* and *Clostridium* species, and ferric and manganic chlorides produced by iron-oxidizing bacteria such as *Sphaerotilus natans*. The biofilm will trap and concentrate these corrosive by-products near the metal surface, thereby enhancing their corrosive action on the metal.

B. Establishment of differential aeration cells: As a biofilm matures, the areas around and beneath the biofilm will become depleted of oxygen. Areas of depleted oxygen will become anodic and will release metal ions to cathodic regions (oxygenated regions). In addition, the areas of depleted oxygen will be suitable environments for destructive anaerobic bacteria such as the sulfur-reducing bacteria.

3. Health Issues

Certain bacterial species that form biofilms are pathogenic to humans. The nature of the biofilm helps prevent the effective action of biocides and allows potentially harmful bacteria to flourish in biofouled systems.

The December sample had an HPC of one (1) CFU/mL, and the May sample had an HPC of five (5) CFU/mL. Both of the samples had a TCC and FCC of less than one (<1) CFU/100mL These bacterial counts do not indicate a significant presence of microorganisms in the well.

4.8 TELEVISION SURVEYING

On January 12, 2002, in addition to geophysical logging of the well, a downhole color television video of the well was performed. The downhole color television video is performed in order to enable visual observation of the entire well casing and open hole interval (production interval). The video is performed using a tool with a light source and a color video camera that can view straight down the well for general observation of interior well casing condition, general visual water quality, and general formation and open hole interval condition. The camera can also view the sides of the well for close up observation of items such as the casing joints, monitor tube port, cement grout seal at the casing seat, flowing sands, and the condition of the open hole interval (fracturing; locations of washout areas, holes, or caverns; and formation changes). The video survey was performed by Advanced Borehole Services ("ABS") of Tampa, Florida, with a representative from Jaffer onsite to assist and observe, and GMW&A personnel onsite to observe.

The downhole color television video camera tool was lowered into the well connected to a wire line. A riser pipe was used to contain the head of the well and allow the wire line to raise or lower the camera. This configuration is used in artesian well situations in order to allow for both static (non-flowing) and flowing conditions during the video. The well was in a static condition during the trip down the entire well, and the well was allowed to flow during the trip up the open hole interval and into the bottom few feet of the well casing in order to locate any flowing sands. The following is a description of the video:

The water clarity was good upon the start and remained good throughout the entire well video under both static and flowing conditions. The video began at approximately land surface, inside the well casing (17.4-inch diameter PVC). From land surface to approximately 100 feet below land surface ("bls"), the well casing was coated with a gray to black substance. This is the natural build up of hydrogen sulfide from the ground water oxidizing the inside of the well casing. The hydrogen sulfide build up was curtailed with increasing pressure (depth), so the gray/black coating slowly faded away with depth. In addition, the pipe dope (drill pipe lubricant) smearing generally decreased with depth, as the pipe dope was worn off in the first hundred feet or so. At 98.6 feet bls, the port for the one and one-half (1½)-inch diameter, monitor tube was observed with a good seal. Below 100 feet bls, the hydrogen sulfide and pipe dope residue began to fade away. From approximately 775 feet through 787 feet bls, smearing of pipe dope was evident in the well casing. This was where the drill pipe may have been leaning during much of the open hole interval drilling, causing staining. This should not affect the water quality from the well. At 915 feet bls, the bottom of the casing was observed. The bottom of the casing was cut in a short corkscrew shape prior to installation to assist in moving the casing off ledges where it might have become hung up during installation. The well casing and joints appeared to be in satisfactory condition, and no problems were apparent. Below the well casing was the open hole interval. The visibility of the bottom few feet of casing and just below the casing was blurred. This may have been the result of a temperature change or, more likely, the mixing of water of different quality. The presence of fresher water may be the result of introducing fresh water into the well to flush the dense, salt water plug or "kill" that had been containing the artesian flow of the well. This introduced fresh water would have been forced into the formation just outside of the bottom of the casing by the denser, saline water below. As the well was allowed to flow, the fresh water was forced out of the formation by the saline formation water. No debris or particulate matter was evident in the video. From the bottom of the casing to approximately 925 feet bls, the borehole was pitted and showed some cavities. Below this to approximately 950 feet bls, the borehole was well gauged, meaning the borehole was very cylindrical and tight, with less cavities and holes, indicating potentially harder, more competent rock. However, from 940 feet bls to 950 feet bls, the borehole diameter started to increase, and from 950 feet bls to 1,040 feet bls, the borehole diameter increased such that it was difficult to view the low side of the borehole. This was a poorly gauged section, possibly indicating a softer, limestone formation. This trend of increasing borehole diameter continued from 1,040 feet bls to 1,140 feet bls, but to a lesser degree. From 1,140 feet bls to the total depth of the well, 1,185 feet bls, the borehole was well gauged. No particulate matter was observed flowing around the well casing seat or any casing joints, all of which appear to be structurally sound.

This television survey presents the condition of the well at the time of installation and should be used for reference when future video surveys are performed. A copy of the video survey is presented in **Appendix H: Television Video Survey**.

SECTION 5

WELLFIELD MAINTENANCE AND OPERATION

SECTION 5

WELLFIELD MAINTENANCE AND OPERATION

5.0 WELLFIELD MAINTENANCE AND OPERATION

In order to maintain well performance and increase well life, LaGorce Country Club should monitor and evaluate the performance of its well through specific testing procedures and regular maintenance on the well. It is important that LaGorce staff recognize changes in the well and/or wellfield, and notify the appropriate personnel of these changes. Analysis of data requires interpretation by a qualified, Professional Geologist.

5.1 RECOMMENDED TESTING AND MAINTENANCE PROCEDURES

GMW&A strongly recommends that LaGorce Country Club's regular maintenance program include the following testing and preventative maintenance procedures to enhance well life and well efficiency:

5.1.1 MONTHLY

Each month the LaGorce Country Club staff should:

A. Maintain daily records of static water level, drawdown, and water quality (as per Hach field test kits).

B. Physically inspect the well to determine the following:

1. Flow meters are functioning properly.
2. All valves are operating under design parameters.
3. No leaks and/or damage to the well has occurred.
4. All pressure gauges are operating as designed.
5. Any and all repairs are noted and reported to supervisors.
6. SDI's are taken on wells where water may go to a membrane processing system.

C. Record static water levels in the well. (The LaGorce Country Club should obtain a proper measuring device [pressure/vacuum gauge]).

D. Record the drawdowns from the static water levels after 60 minutes of continuous pumping at the design pumping rate of the production well.

E. Record the pumping rate of the well (gpm).

F. Calculate the specific capacity using the following formula:

$$Specific\ Capacity\ (gpm/ft) = Pumping\ Rate\ (gpm) \div drawdown\ (feet) \qquad \textbf{(5.1)}$$

The original specific capacity of Well No. F-2 was 28.15 gpm per foot of drawdown after 60 minutes of pumping at 1,907 gpm. If the specific capacity drops by 20% or more of the original specific capacity, then the LaGorce Country Club staff should:

1. Contact a hydrogeologist.
2. Take water samples as described in this report to be analyzed for total bacterial (including total coliform), algal, and fungal, as performed by Micrim Labs, Inc. of Fort Lauderdale, Florida.
3. Perform a step-drawdown test as described in this report.
4. Perform a sand content test as described in this report.
5. Perform a colloidal test as described in this report
6. Perform Silt Density Index testing as described in this report.
7. Send all data to a qualified hydrogeologist for analysis.

5.1.2 YEARLY

Each year the LaGorce Country Club staff should:

A. Take water samples from the well to be analyzed for total bacterial (including total coliform), algal, and fungal identification as performed by Micrim Labs, Inc. of Fort Lauderdale, Florida.

B. Perform a step-drawdown test on the well.

C. Perform a sand content test on the well.

D. Shock chlorinate the well with a 6,000 mg/L solution of calcium hypochlorite and dispose to waste. <u>The chlorine **must not** come in contact with the membranes</u>. This disinfection should be performed by a licensed, water well contractor with Floridan aquifer well experience.

5.1.3 EVERY FIVE YEARS

Every five (5) years the LaGorce Country Club staff should:

A. Pull and visually inspect the well pumps for wear/corrosion. For the Floridan aquifer well, this procedure should be performed by a licensed, water well contractor with Floridan aquifer well experience.

B. Television survey each well. For the Floridan aquifer well, this procedure should be performed by a licensed, water well contractor with Floridan aquifer well experience.

It should be noted that these procedures should be considered minimal. Operational data on the well will further determine how frequently disinfection and certain tests are performed. It is imperative that the LaGorce Country Club staff maintain records as scheduled testing is done.

5.2 RECORD KEEPING

It is extremely important for the LaGorce staff to maintain records on step-drawdown testing and specific capacity, sand concentration, colloidal, silt density index, microbiological, and water quality testing.

SECTION 6

CONCLUSIONS, RECOMMENDATIONS, AND SUMMARY

SECTION 6

CONCLUSIONS, RECOMMENDATIONS, AND SUMMARY

6.0 CONCLUSIONS, RECOMMENDATIONS, AND SUMMARY

Based on the findings submitted in this report, GMW&A has made conclusions and recommendations regarding the LaGorce Country Club's new, Floridan aquifer production well.

6.1 CONCLUSIONS

The following is the summary of relevant findings of this project.

1. The drilling of the production well proceeded as expected. The well was constructed in accordance with AWWA and FDEP standards.

2. Geologic, television, and geophysical logging did not indicate any unusual or unexpected occurrences.

3. Step-drawdown testing indicated that the well is developing at high pumping rates.

4. Step-drawdown testing indicated that the well is relatively stable and should function as expected at the design pumping rate. The average transmissivity calculated from the step-drawdown testing is 48,820.5 gpd/ft.

5. The sand concentration results at 120 minutes at a pumping rate of 1,897 gpm meet the standard of less than 1.0 mg/L.

6. Based on the SDI test results, membrane fouling due to silt-sized particles may be a concern. However, most of the silt-sized particles should by trapped by the pre-filter, mitigating fouling of the membranes.

7. An uphole velocity of 3.58 fps was calculated for the new production well. In order for the velocity not to rise above the suggested 2.5 fps for a membrane plant, the pumpage rate should not be greater than 1,390 gpm.

8. The following constituents are above the maximum contaminant level ("MCL") for primary or secondary drinking water standards: sodium, chloride, odor, sulfate, and total dissolved solids. However, the concentration of these parameters should diminish with treatment.

9. Upon final testing of the well, there was no significant population of bacteria, algae, or fungi present in the well.

10. The well should be able to function withing its design parameters.

6.2 RECOMMENDATIONS

GMW&A recommends the LaGorce Country Club take the following actions:

1. Due to concerns of killing the well and development, the well should be pumped with the production well pump to finalize development prior to flowing water to the membrane system.

2. The pumping rate should be lowered if high SDI values become a concern.

3. The well should be sampled every six (6) months to determine the presence of any potentially problematic bacterial species.

4. The well pump and appurtenances should be exercised regularly.

5. As a minimum, the LaGorce Country Club should perform the recommended testing and maintenance procedures outlined in Section 5 of this report. Routine maintenance and testing will most likely detect a possible problem before it causes failure of the well, the wellfield, and/or the water production system.

6.3 SUMMARY

The well as constructed by Jaffer should function within the final design parameters of the well, provided the LaGorce Country Club maintains, operates, and tests the well as recommended.

This report is respectfully submitted to the LaGorce Country Club. GMW&A wants to express our thanks to the LaGorce Country Club for the opportunity to provide our knowledge and expertise to this project.

REFERENCES

American Standard for Testing and Materials, ASTM Standard D 4195-88, *Standard Guide for Water Analysis for Reverse Osmosis Application*, Philadelphia, Pennsylvania, 1988.

American Standard for Testing and Materials, ASTM Standard D 4189-94, *Standard Method for Silt Density Index (SDI) of Water*, Philadelphia, Pennsylvania, 1994.

Amjad, Z. (editor), *Reverse Osmosis: Membrane Technology, Water Chemistry and Industrial Applications,* Van Nostrand Reinhold, New York, 1993.

AWWA Standard for Water Wells, ANSI/AWWA A100-97. American Water Works Association, 1997.

Bloetscher, F., Fergen, R.E., and Witt, G.M., 2000. "Biofouling Concerns from Raw Water Sources in Membrane Water Treatment," American Desalting Association 2000 Conference, Lake Tahoe, Nevada.

Bloetscher, F., and Witt, G.M., May 2001. "Effects of Sand and Silt on Membrane Treatment Processes," Florida Water Resources Journal.

Bloetscher, F., Witt, G.M., Dodd, A.E., and Dodd, C.P., 1998. "Prevention of Biofouling in Membrane Water Treatment Plants," American Water Works Association 1998 Annual Conference, Dallas, Texas.

Bloetscher, F., Witt, G.M., Dodd, A.E., and Dodd, C.P., 1998. "Groundwater Treatment Needs for Membrane Treatment Processes," American Water Works Association 1998 Annual Conference, Dallas, Texas.

Characklis, W.G., Marshall, K.C., (eds.), *Biofilms*, John Wiley & Sons, New York, 1990.

Cullimore, D. Roy, *Practical Manual of Groundwater Microbiology*, Lewis Publishers, Boca Raton, 1993.

Dawson, K.J., and Istok, J.D., Aquifer Testing: Design and Analysis of Pumping and Slug Tests. Lewis Publishers, Inc., 1991.

Driscoll, Fletcher G., *Groundwater and Wells*, Second Edition, Johnson Filtration Systems Inc., St. Paul, Minnesota, 1986.

Eaton, A.D., Clesceri, L.S., and Greenberg, A.E., (eds.), *Standard Methods for the Examination of Water and Wastewater*, 19th ed., American Public Health Association, Washington DC, 1995.

Geesey, G.G., Lewandowski, Z., Flemming, H., (eds), *Biofouling and Biocorrosion in Industrial Water Systems*, Lewis Publishers, Boca Raton, 1994.

Heald, C.C. (editor), *Cameron Hydraulic Data*, Ingersoll-Dresser Pump Co., Liberty Corner, N.J., 1994.

Jacob, C.E., "Drawdown Test to Determine Effective Radius of Artesian Well." Proceedings, American Society of Civil Engineers, Vol. 79, No. 5, 1946.

Krieg, Noel R., (ed.), *Bergey's Manual of Systematic Bacteriology*, Williams & Wilkins, Baltimore, Vol. 1, 1984.

Manual of Water Well Construction Practices. EPA - 570/9-75-001, Environmental Protection Agency and National Water Well Association, Washington, D.C., 1975.

Park, S.F., and Witt, G.M., 1998. "Wellfield Management, From the Membrane Plant Operator's Standpoint," Southeast Desalting Association Handbook For Plant Operator Training, First Edition, Venice, Florida.

Staley, James T., (ed.), *Bergey's Manual of Systematic Bacteriology*, Williams & Wilkins, Baltimore, Vol. 3, 1989.

Theis, C. V., "Relation Between the Lowering of the Piezometric Surface and the Rate and Duration of Discharge of a Well Using Groundwater Storage," Geophysical Union Transactions, Volume 16, 1935.

Videla, Hector A., *Manual of Biocorrosion*, Lewis Publishers, Boca Raton, 1996.

Walton, William C., *Selected Analytical Methods for Well and Aquifer Evaluation*, Illinois State Water Survey, Urbana, Illinois, 1962.

APPENDIX A

WELL CONSTRUCTION CHRONOLOGY

Gerhardt M.
Witt
& Associates, Inc.

LaGorce Country Club Floridan Production Well
Well Construction Chronology

Date	Work Description
May 9, 2001	Pre-construction meeting at LaGorce Country Club ("LaGorce") with personnel from Jaffer Associates, Ltd. ("Jaffer"), Gerhardt M. Witt & Associates, Inc. ("GMW&A"), and LaGorce.
May 10-30, 2001	Jaffer mobilizes 48-inch diameter surface casing, crane, and vibration hammer to site.
May 31, 2001	Jaffer installs 48-inch diameter surface casing to a depth of 47 feet below land surface ("bls") using the vibration hammer and crane.
June 1, 2001	Jaffer begins removal of crane and vibration hammer and begins setting up drill rig, mud tank, etc.
July 12, 2001	Jaffer steam cleans drill rods and equipment.
July 14, 2001	Jaffer mixes drill mud and continues final preparation of rig.
July 16-25, 2001	Jaffer drills 22-inch diameter pilot hole to 250 feet bls.
July 26, 2001- August 5, 2001	Jaffer reams out 22-inch diameter pilot hole with 36-inch diameter bit.
August 6, 2001	Jaffer installs 30-inch diameter, steel casing to 250 feet bls.
August 7-9, 2001	Jaffer pumps 1,485 cubic feet of Type I/II, sulfate resistant, neat cement to grout the 30-inch diameter, steel casing in place.
August 10-18, 2001	Jaffer sets up and drills a nine (9)-inch diameter pilot hole to 928 feet bls in order to determine PVC well casing seat depth.
August 19, 2001	Geophysical logging of pilot hole performed.
August 20, 2001- September 9, 2001	Jaffer reams out the nine (9)-inch diameter pilot hole with 27-inch diameter bit.

LaGorce Country Club Floridan Production Well
Well Construction Chronology
(continued)

Date	Work Description
September 10-12, 2001	Jaffer installs 17.4-inch diameter, PVC well casing to 915 feet bls.
September 13, 2001	Jaffer pumps 67.5 cubic feet of Type I/II, sulfate resistant, neat cement (Stage I).
September 14-16, 2001	Jaffer tags cement at 895 feet bls. Tremie pipe clogged with cement. Jaffer cleans pipe and re-installs clean pipe.
September 17, 2001	Jaffer tags cement at 895 feet bls and pumps 324 cubic feet of Type I/II, sulfate resistant, neat cement (Stage II).
September 18, 2001	Jaffer tags cement at 670 feet bls and pumps 648 cubic feet of 50/50 Pozmix cement (Stage III).
September 19, 2001	Jaffer tags cement at 300 feet bls and pumps 648 cubic feet of 50/50 Pozmix cement (Stage IV).
September 20, 2001	Jaffer tags cement at 11 feet bls.
September 21-27, 2001	Jaffer prepares to drill production interval (open hole).
September 28, 2001-October 12, 2001	Jaffer drills out the production interval (open hole) to 1,206 feet bls using a 12¾-inch diameter bit and begins air development of the well.
October 13-17, 2001	Jaffer continues air development of the well.
October 18, 2001	Jaffer pours salt into the well, creating a heavy column of saline water that serves to suppress (kill) the artesian flow of water from the well so Jaffer can remove the drill rods and install a downhole test pump and header on the well.

LaGorce Country Club Floridan Production Well
Well Construction Chronology
(continued)

Date	Work Description
October 19, 2001- November 19, 2001	Jaffer removes all drilling equipment from site and stages downhole pump while waiting on drive motor.
November 20, 2001- December 3, 2001	Jaffer installs the downhole test pump, column pipe, and drive motor. They use the pump to continue development of the well.
December 4, 2001	Jaffer and GMW&A perform a pump test of well, including sand content and SDI testing. Envirodyne, Inc obtains water quality samples.
January 12, 2002	ABS performs the final, geophysical logging and television video survey of the completed well.
March 2002	La Gorce flows Well No. F-2 at approximately 70 to 80 gpm.
March 12, 2002	GMW&A performs field, water quality sampling.
March 18, 2002	GMW&A performs field, water quality sampling.
March 22, 2002	GMW&A performs field, water quality sampling, and Envirodyne obtains water quality samples for chloride, TDS, and specific conductance.
April 2002	Jaffer flows Well No. F-2 at approximately 700 to 800 gpm.
April 19, 2002	GMW&A performs field, water quality testing and obtains samples to be analyzed for chloride and TDS by Envirodyne.
May 2, 2002	GMW&A performs field, water quality testing, and Envirodyne samples for primary and secondary drinking water standards. A microbiological sample is also obtained for analysis by Micrim Labs, Inc.

Gerhardt M.
Witt
& Associates, Inc.

APPENDIX B

GEOLOGIC LOGS

Geologic Log

La Gorce Country Club

F-2

Depth 80 feet to 90 feet

Color: 10YR7/1-7/2 light gray to very pale brown

Composition: $CaCO_3$ and quartz

Size: Fine - Medium

Roundness: Subround - Subangular

Sphericity: Low - Moderate

Frosting: Mixed

Shells: Fragments

Percentage: 80 %

Weathering: Extensive

Cementation: Fair

Texture:

Porosity: Not Discernible

Hardness: Moderately Hard

Comments: Coarse sand to fine gravel sized limestone pieces with appreciable amounts of fine to medium quartz grains and phosphate in matrix. Individual $CaCO_3$ grains are fine to medium sand size, all fairly well cemented with calcite most likely.

Depth 90 feet to 100 feet

Color: 10YR 7/1 light gray

Composition: $CaCO_3$ and quartz

Size: Fine - Medium

Roundness: Subround - Subangular

Sphericity: Low - Moderate

Frosting: Mixed

Shells: Fragments

Percentage: 80 %

Weathering: Extensive

Cementation: Fair - Good

Texture:

Porosity: Not Discernible

Hardness: Moderately Hard

Comments: Coarse sand to fine gravel sized limestone pieces with appreciable amounts of fine to medium quartz grains and phosphate in matrix. Individual $CaCO_3$ grains are fine to medium sand size, all fairly well cemented with calcite most likely.

Depth 100 feet to 110 feet

Color: 10YR 7/1-7/2

Composition: quartz and $CaCO_3$

Size: Fine - Medium

Roundness: Subround - Subangular

Sphericity: Low - Moderate

Frosting: Mixed

Shells: Fragments

Percentage: 25 %

Weathering: Extensive

Cementation: Fair - Good

Texture:

Porosity: Not Discernible

Hardness: Moderately Hard

Comments: Sandstone consisting of approximately 80% quartz grain sand 20% shell fragments cemented fairly well with calcite, most likely. Pieces are fine sand to gravel sized.

Depth 110 feet to 120 feet

Color: 10YR 7/1, 10YR 8/2, and 10YR 7/2

Composition: quartz and $CaCO_3$

Size: Fine - Medium

Roundness: Subround

Sphericity: Low - Moderate

Frosting: Mixed

Shells: Fragments

Percentage: 20 %

Weathering: Extensive

Cementation: Fair - Good

Texture:

Porosity: Not Discernible

Hardness: Moderately Hard

Comments: Sandstone consisting of mostly quartz fine to medium sand sized grains cemented most likely with calcite. Also $CaCO_3$ shell fragments.

Geologic Log

La Gorce Country Club

F-2

Depth 120 feet to 130 feet

Color: 10YR 7/1-10YR 7/2

Composition: quartz and CaCO3 shell fragments

Size: Fine - Medium

Roundness: Subround - Subangular

Sphericity: Low - Moderate

Frosting: Mixed

Shells: Fragments

Percentage: 20 %

Weathering: Extensive

Cementation: Fair - Good

Texture:

Porosity: Not Discernible

Hardness: Moderately Hard

Comments: Gravel sized pieces of sandstone made up mostly of fine to medium sized quartz sand and CaCO3 sand cemented with calcite most likely. Some phosphate in matrix.

Depth 130 feet to 140 feet

Color: 2.5Y 7/1-2.5Y 7/2

Composition: quartz and CaCO3 shell fragments

Size: Fine - Medium

Roundness: Subround - Subangular

Sphericity: Low - Moderate

Frosting: Mixed

Shells: Fragments

Percentage: 25 %

Weathering: Extensive

Cementation: Fair - Good

Texture:

Porosity: Not Discernible

Hardness: Moderately Hard

Comments: Fine to medium sand to gravel sized pieces and individual grains of quartz and CaCO3 cemented with calcite and some phosphate in matrix.

Depth 140 feet to 150 feet

Color: 2.5Y 7/1-2.5Y 7/2

Composition: quartz and CaCO3 shell fragments

Size: Fine - Medium

Roundness: Subround - Subangular

Sphericity: Low - Moderate

Frosting: Mixed

Shells: Fragments

Percentage: 25 %

Weathering: Extensive

Cementation: Fair - Good

Texture:

Porosity: Not Discernible

Hardness: Moderately Hard

Comments: Fine to medium sand to gravel sized pieces and individual grains of quartz and CaCO3 cemented with calcite and some phosphate in matrix.

Depth 150 feet to 160 feet

Color: 2.5Y 8/1 2.5Y 7/1

Composition: quartz and CaCO3

Size: Fine - Medium

Roundness: Subangular

Sphericity: Low - Moderate

Frosting: Mixed

Shells: Fragments

Percentage: 40 %

Weathering: Extensive

Cementation: Fair - Good

Texture:

Porosity: Not Discernible

Hardness: Moderately Hard

Comments: Mostly fine to some medium grained quartz and CaCO3 shell fragments cemented to limestone with calcite. Some phosphate in matrix.

Geologic Log

La Gorce Country Club

F-2

Depth 160 feet to 170 feet

Color: 2.5Y 8/1 2.5Y 7/1

Composition: quartz and $CaCO_3$

Size: Fine - Medium

Roundness: Subangular

Sphericity: Low - Moderate

Frosting: Mixed

Shells: Fragments

Percentage: 40 %

Weathering: Extensive

Cementation: Fair - Good

Texture:

Porosity: Not Discernible

Hardness: Moderately Hard

Comments: Mostly fine to some medium grained quartz and $CaCO_3$ shell fragments cemented to limestone with calcite. Some phosphate in matrix.

Depth 170 feet to 180 feet

Color: 2.5Y 8/1 2.5Y 7/1

Composition: $CaCO_3$ and quartz

Size: Fine - Medium

Roundness: Subround - Subangular

Sphericity: Low - Moderate

Frosting: Mixed

Shells: Fragments

Percentage: 70 %

Weathering: Extensive

Cementation: Fair

Texture:

Porosity: Not Discernible

Hardness: Moderately Hard

Comments: Fine to medium grains of $CaCO_3$ sand and quartz sand cemented with calcite. Small specks of phosphate in matrix.

Depth 180 feet to 190 feet

Color: 2.5Y 8/1 2.5Y 7/1

Composition: $CaCO_3$ and quartz

Size: Fine - Medium

Roundness: Subround - Subangular

Sphericity: Low - Moderate

Frosting: Mixed

Shells: Fragments

Percentage: 70 %

Weathering: Extensive

Cementation: Fair

Texture:

Porosity: Not Discernible

Hardness: Moderately Hard

Comments: Fine to medium grains of $CaCO_3$ sand and quartz sand cemented with calcite. Small specks of phosphate in matrix.

Depth 190 feet to 200 feet

Color: 2.5Y 8/1 2.5Y 7/1

Composition: $CaCO_3$ and quartz

Size: Fine - Medium

Roundness: Subround - Subangular

Sphericity: Low - Moderate

Frosting: Mixed

Shells: Fragments

Percentage: 70 %

Weathering: Extensive

Cementation: Fair

Texture:

Porosity: Not Discernible

Hardness: Moderately Hard

Comments: Gravel sized pieces of shell fragments and quartz cemented together with calcite. Very small amount of phosphate in matrix. Some larger shell fragment up to 0.75".

Geologic Log

La Gorce Country Club

F-2

Depth 200 feet to 210 feet

Color: 2.5Y 8/1 2.5Y 7/1

Composition: $CaCO_3$ and quartz

Size: Fine - Medium

Roundness: Subround - Subangular

Sphericity: Low - Moderate

Frosting: Mixed

Shells: Fragments

Percentage: 70 %

Weathering: Extensive

Cementation: Fair

Texture:

Porosity: Not Discernible

Hardness: Moderately Hard

Comments: Gravel sized pieces of shell fragments and quartz cemented together with calcite. Very small amount of phosphate in matrix.

Depth 210 feet to 230 feet

Color: 2.5Y 8/1 2.5Y 7/1

Composition: $CaCO_3$ and quartz

Size: Fine - Medium

Roundness: Subround - Subangular

Sphericity: Low - Moderate

Frosting: Mixed

Shells: Fragments

Percentage: 70 %

Weathering: Extensive

Cementation: Fair

Texture:

Porosity: Not Discernible

Hardness: Moderately Hard

Comments: Gravel sized pieces of shell fragments and quartz cemented together with calcite. Very small amount of phosphate in matrix.

Depth 230 feet to 240 feet

Color: 2.5Y 8/2

Composition: $CaCO_3$

Size: Fine - Medium

Roundness: Subround - Subangular

Sphericity: Low - Moderate

Frosting: Frosted

Shells: Fragments

Percentage: 100 %

Weathering: Extensive

Cementation: Fair - Good

Texture:

Porosity: Not Discernible

Hardness: Soft - Moderately Hard

Comments: Sand to gravel sized pieces of limestone consisting of fine to medium sand sized grains of broken up $CaCO_3$ shell fragments. No phosphate. Fair amount of fines (silts/clays).

Depth 240 feet to 250 feet

Color: 5Y7/2 - 5Y 6/2

Composition: 99% $CaCO_3$, <1% quartz

Size: Fine

Roundness: Subround - Subangular

Sphericity: Low - Moderate

Frosting: Mixed

Shells: Fragments

Percentage: 99 %

Weathering: Extensive

Cementation: Fair

Texture:

Porosity: Not Discernible

Hardness: Soft - Moderately Hard

Comments: Sand to gravel sized pieces of limestone consisting of fine grained $CaCO_3$ and <1% quartz sand, also <1% phosphate with greenish gray color. Fair amount of fines (silts/clays).

Geologic Log

La Gorce Country Club

F-2

Depth 420 feet to 430 feet

Color: 5YR 7/1
Composition: 90% siltstone and 10% sandy silt
Size: Very Fine
Roundness: Angular
Sphericity: Low
Frosting: Clear
Shells: None
Percentage:
Weathering:
Cementation: Good
Texture:
Porosity: Not Discernible
Hardness: Moderately Hard
Comments: Siltstone from 2-20mm and strong HCl reaction on outside of siltstone, weak reaction below surface.

Depth 430 feet to 440 feet

Color: 5YR 7/1
Composition: 90% siltstone and 10% sandy silt
Size: Very Fine
Roundness: Angular
Sphericity: Low
Frosting: Clear
Shells: None
Percentage:
Weathering:
Cementation: Good
Texture:
Porosity: Not Discernible
Hardness: Moderately Hard
Comments: Siltstone from 2-20mm and strong HCl reaction on outside of siltstone, weak reaction below surface.

Depth 440 feet to 450 feet

Color: 5Y 8/2 - 7/2
Composition: 85% siltstone, 10% silt, 3% quartz sand, and 2% sandstone
Size: Very Fine
Roundness: Angular
Sphericity: Low
Frosting: Clear
Shells: None
Percentage:
Weathering:
Cementation: Fair
Texture:
Porosity: Not Discernible
Hardness: Moderately Hard
Comments: Siltstone 1-2mm to 12mm.

Depth 450 feet to 490 feet

Color: 5Y 7/1 - 6/1
Composition: 55% silt, 44% siltstone, and 1% quartz sand
Size: Very Fine
Roundness: Angular
Sphericity: Low
Frosting: Clear
Shells: None
Percentage:
Weathering:
Cementation: Not Discernible
Texture:
Porosity: Not Discernible
Hardness: Soft - Moderately Hard
Comments:

Geologic Log

La Gorce Country Club

F-2

Depth 490 feet to 500 feet

Color: 5YR 7/2
Composition: 80% siltstone, 20% silt
Size: Silt
Roundness:
Sphericity:
Frosting:
Shells:
Percentage:
Weathering: None
Cementation: Good
Texture:
Porosity: Not Discernible
Hardness: Moderately Hard
Comments: Siltstone 2mm - 20mm

Depth 500 feet to 520 feet

Color: 5Y 7/1 - 6/2
Composition: 75% siltstone, 22% silt, and 3% sandstone
Size: Silt
Roundness:
Sphericity:
Frosting:
Shells: None
Percentage:
Weathering:
Cementation: Fair
Texture:
Porosity: Not Discernible
Hardness: Soft
Comments:

Depth 520 feet to 530 feet

Color: 5Y 7/2
Composition: 50% silt, 47% siltstone, and 3% sandstone
Size: Silt
Roundness:
Sphericity:
Frosting:
Shells: None
Percentage:
Weathering:
Cementation: Poor
Texture:
Porosity: Not Discernible
Hardness: Soft
Comments: Friable siltstone 2mm - 15mm.

Depth 530 feet to 540 feet

Color: 5Y 7/2
Composition: 50% silt, 47% siltstone, and 3% sandstone
Size: Silt
Roundness:
Sphericity:
Frosting:
Shells: None
Percentage:
Weathering:
Cementation: Poor
Texture:
Porosity: Not Discernible
Hardness: Soft
Comments:

Geologic Log

La Gorce Country Club

F-2

Depth 540 feet to 550 feet

Color: 5Y 7/2
Composition: 50% silt, 47% siltstone, and 3% sandstone
Size: Silt
Roundness:
Sphericity:
Frosting:
Shells: None
Percentage:
Weathering:
Cementation: Poor
Texture:
Porosity: Not Discernible
Hardness: Soft
Comments: Friable siltstone 2mm - 15mm.

Depth 550 feet to 560 feet

Color: 5Y 7/2
Composition: 50% silt, 47% siltstone, and 3% sandstone
Size: Silt
Roundness:
Sphericity:
Frosting:
Shells: None
Percentage:
Weathering:
Cementation: Poor
Texture:
Porosity: Not Discernible
Hardness: Soft
Comments: Friable siltstone 2mm - 15mm.

Depth 560 feet to 570 feet

Color: 5Y 7/2
Composition: 80% silt, 18% siltstone, and 2% sandstone
Size: Silt
Roundness:
Sphericity:
Frosting:
Shells: None
Percentage:
Weathering:
Cementation: Poor
Texture:
Porosity: Not Discernible
Hardness: Soft
Comments: Siltstone 2mm - 8mm.

Depth 570 feet to 580 feet

Color: 5Y 7/2
Composition: 80% silt, 18% siltstone, and 2% sandstone
Size: Silt
Roundness:
Sphericity:
Frosting:
Shells: None
Percentage:
Weathering:
Cementation: Poor
Texture:
Porosity: Not Discernible
Hardness: Soft
Comments: Siltstone 2mm - 8mm.

Geologic Log

La Gorce Country Club

F-2

Depth 580 feet to 590 feet

Color: 5Y 7/2

Composition: 80% silt, 18% siltstone, and 2% sandstone

Size: Silt

Roundness:

Sphericity:

Frosting:

Shells: None

Percentage:

Weathering:

Cementation: Poor

Texture:

Porosity: Not Discernible

Hardness: Soft

Comments: Siltstone 2mm - 12mm.

Depth 590 feet to 600 feet

Color: 5Y 7/2

Composition: 80% siltstone, 18% silt, 2% sandstone

Size: Very Fine

Roundness:

Sphericity:

Frosting:

Shells: None

Percentage:

Weathering:

Cementation: Poor

Texture:

Porosity: Not Discernible

Hardness: Soft

Comments: Friable siltstone 2-15mm.

Depth 600 feet to 700 feet

Color: 5Y 7/2

Composition: 80% siltstone, 18% silt, 2% sandstone

Size: Very Fine

Roundness:

Sphericity:

Frosting:

Shells: None

Percentage:

Weathering:

Cementation: Poor

Texture:

Porosity: Not Discernible

Hardness: Soft

Comments: Siltstone 2mm - 12mm.

Depth 700 feet to 750 feet

Color: 5Y 7/3

Composition: 80% siltstone, 18% silt, 2% sandstone

Size: Very Fine

Roundness:

Sphericity:

Frosting:

Shells: None

Percentage:

Weathering:

Cementation: Poor

Texture:

Porosity: Not Discernible

Hardness: Soft

Comments: Color slightly more olive yellow but lithology remains same as above.

Geologic Log

La Gorce Country Club

F-2

Depth 750 feet to 800 feet

Color: 5Y 7/2 - 7/3

Composition: 50% siltstone and 50% silt

Size: Silt

Roundness:

Sphericity:

Frosting:

Shells: None

Percentage:

Weathering:

Cementation: Poor

Texture:

Porosity: Not Discernible

Hardness: Soft

Comments: Siltstone 1mm - 5mm.

Depth 800 feet to 840 feet

Color: 5Y 7/2 - 7/3

Composition: 75% siltstone and 25% silt

Size: Silt

Roundness:

Sphericity:

Frosting:

Shells: None

Percentage:

Weathering:

Cementation: Poor

Texture:

Porosity: Not Discernible

Hardness: Soft

Comments: Siltstone 2mm - 7mm (Note: the previous 100 feet (as a minimum) is suspect as to actual depth of samples obtained.)

Depth 840 feet to 850 feet

Color: 5Y 8/1 - 8/2

Composition: 90% dense limestone with phosphate inclusions and 10% sandy silt

Size: Very Fine

Roundness: Angular

Sphericity: Low

Frosting: Clear

Shells: Fragments

Percentage: 1 %

Weathering: Extensive

Cementation: Not Discernible

Texture:

Porosity: Not Discernible

Hardness: Moderately Hard

Comments: Moderate acid reaction to limestone, small foraminifera. (Note: 850-920' were recollected during borehole reaming and should be representative of actual geology.)

Depth 850 feet to 860 feet

Color: 5Y 8/1 - 8/1 - 7/1

Composition: 90% limestone (50% with phosphate inclusions) and 10% other (phosphate, silt, very fine quartz sand, and shell fragments)

Size: Very Fine

Roundness: Angular

Sphericity: Low

Frosting: Mixed

Shells: Fragments

Percentage: 1.5 %

Weathering: Extensive

Cementation: Not Discernible

Texture:

Porosity: Not Discernible

Hardness:

Comments: Moderate to strong acid reaction on limestone.

Geologic Log

La Gorce Country Club

F-2

Depth 860 feet to 870 feet

Color: 5Y 8/1 - 8/2

Composition: 95% limestone (50% with phosphate inclusions) and 5% other (phosphate, silt, very fine quartz sand, and shell fragments)

Size: Very Fine

Roundness: Angular

Sphericity: Low

Frosting: Mixed

Shells: Fragments

Percentage: 1.5 %

Weathering: Extensive

Cementation: Not Discernible

Porosity: Not Discernible

Texture:

Hardness:

Comments: Moderate to strong acid reaction on limestone.

Depth 870 feet to 880 feet

Color: 5Y 8/1

Composition: 95% limestone (10% with phosphate inclusions) and 5% other (shell fragments, silt, and foraminifera)

Size:

Roundness:

Sphericity:

Frosting:

Shells:

Percentage:

Weathering:

Cementation: Not Discernible - Not Discernible

Porosity:

Texture:

Hardness: Moderately Hard

Comments:

Depth 880 feet to 890 feet

Color: 10YR 8/1

Composition: 95% limestone (5% with phosphate) and 5% other as above

Size:

Roundness:

Sphericity:

Frosting:

Shells: None

Percentage:

Weathering:

Cementation: Not Discernible

Porosity: Not Discernible

Texture:

Hardness: Moderately Hard

Comments: Small foraminifera and medium grain sized limestone

Depth 890 feet to 900 feet

Color: 10YR 8/1

Composition: 95% limestone (5% with phosphate) and 5% other as above

Size:

Roundness:

Sphericity:

Frosting:

Shells: None

Percentage:

Weathering:

Cementation: Not Discernible

Porosity: Not Discernible

Texture:

Hardness: Moderately Hard

Comments: Small foraminifera and medium grain sized limestone

Geologic Log

La Gorce Country Club

F-2

Depth 900 feet to 910 feet

Color: 10YR 8/1

Composition: 95% limestone (5% with phosphate) and 5% other as above

Size:

Roundness:

Sphericity:

Frosting:

Shells: None

Percentage:

Weathering:

Cementation: Not Discernible

Porosity: Not Discernible

Texture:

Hardness: Moderately Hard

Comments: Small foraminifera and medium grain sized limestone

Depth 920 feet to 930 feet

Color: 2.5Y 8/2 - 2.5Y 7/1

Composition: >90% limestone rock, <10% CaCO3 fines, <5% sandstone, and <1% phosphate

Size: Very Fine - Coarse

Roundness: Subround - Subangular

Sphericity: Moderate

Frosting: Frosted

Shells: Fragments

Percentage: 1 %

Weathering: Extensive

Cementation: Fair - Good

Porosity: Not Discernable

Texture: Coarse

Hardness: Moderately Hard

Comments: Limestone rock ground up 1mm to 3/4", and sandstone = 1/2" with small amount of coarse sand sized phosphate.

Depth 930 feet to 940 feet

Color: 2.5Y 8/2 - 2.5Y 7/1

Composition: >90% limestone rock, <10% CaCO3 fines, <5% sandstone, and <1% phosphate

Size: Very Fine - Coarse

Roundness: Subround - Subangular

Sphericity: Moderate

Frosting: Frosted

Shells: Fragments

Percentage: 1 %

Weathering: Extensive

Cementation: Fair - Good

Porosity: Not Discernable

Texture: Coarse

Hardness: Moderately Hard

Comments: Limestone rock ground up 1mm to 3/4", and sandstone = 1/2" with small amount of coarse sand sized phosphate.

Depth 940 feet to 950 feet

Color: 2.5Y 8/2

Composition: >90% limestone rock, <10% CaCO3 fines and fossil shells (CaCO3)

Size: Fine - Coarse

Roundness: Subround - Subangular

Sphericity: Moderate

Frosting: Frosted

Shells: Fragments - Whole

Percentage: 1.5 %

Weathering: Moderate - Extensive

Cementation: Fair - Good

Porosity: Not Discernable

Texture: Coarse

Hardness: Moderately Hard

Comments: Limestone rock 1mm - 1/2" with CaCO3 fines including various froaminifera (possible Dictyoconus cookei).

Geologic Log

La Gorce Country Club

F-2

Depth 950 feet to 960 feet

Color: 2.5Y 8/2

Composition: >80% limestone, <10% $CaCO_3$ fines, and <10% $CaCO_3$ fossil shells

Size: Very Fine - Medium

Roundness: Subround - Subangular

Sphericity: Moderate

Frosting: Frosted

Shells: Fragments - Whole

Percentage: 10 %

Weathering: Moderate - Extensive

Cementation: Fair

Texture: Coarse or gritty

Porosity: Not Discernable

Hardness: Moderately Hard

Comments: Limestone rock broken down to 1-2mm with $CaCO_3$ fines including various foraminifera (Dictyoconus cookei or Dictyoconus americanus and unidentified disk shapes).

Depth 960 feet to 970 feet

Color: 2.5Y 8/2

Composition: >80% limestone, <10% $CaCO_3$ fines, and <10% $CaCO_3$ fossil shells

Size: Very Fine - Medium

Roundness: Subround - Subangular

Sphericity: Moderate

Frosting: Frosted

Shells: Fragments - Whole

Percentage: 10 %

Weathering: Moderate - Extensive

Cementation: Fair

Texture: Coarse or gritty

Porosity: Not Discernable

Hardness: Moderately Hard

Comments: Limestone rock broken down to 1-2mm with $CaCO_3$ fines including various foraminifera (Dictyoconus cookei or Dictyoconus americanus and unidentified disk shapes).

Note: Sample in bag is not representative.

Depth 970 feet to 980 feet

Color: 2.5Y 8/2

Composition: >80% limestone, <10% $CaCO_3$ fines, and <10% $CaCO_3$ fossil shells

Size: Very Fine - Medium

Roundness: Subround - Subangular

Sphericity: Moderate

Frosting: Frosted

Shells: Fragments

Percentage: 10 %

Weathering: Moderate - Extensive

Cementation: Fair

Texture: Coarse or gritty

Porosity: Not Discernable

Hardness: Moderately Hard

Comments: Limestone rock to 1/2" with $CaCO_3$ fines including various foraminifera (Dictyoconus cookei or Dictyoconus americanus and unidentified disk shapes).

Note: Sample in bag is not representative.

Geologic Log

La Gorce Country Club

F-2

Depth 980 feet to 990 feet

Color: 2.5Y 8/2

Composition: 60% limestone rock, 30% foraminifera (CaCO3 shells), and 10% CaCO3 fines

Size: Very Fine - Medium

Roundness: Subround - Subangular

Sphericity: Moderate

Frosting: Frosted

Shells: Fragments

Percentage: 10 %

Weathering: Moderate - Extensive

Cementation: Fair

Texture: Coarse or gritty

Porosity: Not Discernable

Hardness: Moderately Hard

Comments: Limestone rock to 1/2" with CaCO3 fines including various foraminifera (Dictyoconus cookei or Dictyoconus americanus and Pararotalia (Rotalia) byramensis).

Note: Sample in bag is not representative.

Depth 990 feet to 1000 feet

Color: 2.5Y 8/2

Composition: 50% limestone rock, 40% foraminifera shells (CaCO3), and 10% CaCO3 fines

Size: Very Fine - Medium

Roundness: Subround - Subangular

Sphericity: Moderate

Frosting: Frosted

Shells: Fragments - Whole

Percentage: 40 %

Weathering: Moderate - Extensive

Cementation: Fair

Texture: Coarse or gritty

Porosity: Not Discernable

Hardness: Moderately Hard

Comments: Limestone rock 1mm - 15mm and 40% of sample is either Dictyoconus cookei or Dictyoconus americanus.

Depth 1000 feet to 1010 feet

Color: 10 YR 8/2

Composition: 60% limestone rock, 30% foraminifera shells (CaCO3), and 10% CaCO3 fines

Size: Very Fine - Medium

Roundness: Subround - Subangular

Sphericity: Moderate

Frosting: Frosted

Shells: Fragments - Whole

Percentage: 30 %

Weathering: Moderate - Extensive

Cementation: Fair - Good

Texture: Coarse or gritty

Porosity: Not Discernable

Hardness: Moderately Hard

Comments: Limestone rock 1mm - 1" with abundant foraminifera (same as above and Spirolina coryensis) and some calcite recrystallization.

Geologic Log

La Gorce Country Club

F-2

Depth 1010 feet to 1020 feet

Color: 10 YR 8/2

Composition: 60% limestone rock, 30% foraminifera shells ($CaCO_3$), and 10% $CaCO_3$ fines

Size: Very Fine - Medium

Roundness: Subround - Subangular

Sphericity: Moderate

Frosting: Frosted

Shells: Fragments - Whole

Percentage: 30 %

Weathering: Moderate - Extensive

Cementation: Fair - Good

Texture: Coarse or gritty

Porosity: Not Discernable

Hardness: Moderately Hard

Comments: Limestone rock 1-3mm with some foraminifera plus noticed litonella floridiana.

Depth 1020 feet to 1030 feet

Color: 10YR 8/1 - 10YR 8/2

Composition: 60-70% limestone rock, 20-30% foraminifera shells ($CaCO_3$), and 10% $CaCO_3$ fines

Size: Very Fine - Medium

Roundness: Subround - Subangular

Sphericity: Moderate

Frosting: Frosted

Shells: Fragments - Whole

Percentage: 25 %

Weathering: Moderate - Extensive

Cementation: Fair - Good

Texture: Gritty

Porosity: Not Discernable

Hardness: Moderately Hard

Comments: Limestone rock 2mm - 1/3" with some various foraminifera.

Depth 1030 feet to 1040 feet

Color: 10YR 8/1 - 10YR 8/2

Composition: 60-70% limestone rock, 20-30% foraminifera shells ($CaCO_3$), and 10% $CaCO_3$ fines

Size: Very Fine - Medium

Roundness: Subround - Subangular

Sphericity: Moderate

Frosting: Frosted

Shells: Fragments - Whole

Percentage: 25 %

Weathering: Moderate - Extensive

Cementation: Fair - Good

Texture: Gritty

Porosity: Not Discernable

Hardness: Moderately Hard

Comments: Limestone rock 2mm - 1/3" with some various foraminifera.

Depth 1040 feet to 1050 feet

Color: 10YR 8/1 - 10YR 8/2

Composition: 60-70% limestone rock, 20-30% foraminifera shells ($CaCO_3$), and 10% $CaCO_3$ fines

Size: Very Fine - Medium

Roundness: Subround - Subangular

Sphericity: Moderate

Frosting: Frosted

Shells: Fragments - Whole

Percentage: 25 %

Weathering: Moderate - Extensive

Cementation: Fair - Good

Texture: Gritty

Porosity: Not Discernable

Hardness: Moderately Hard

Comments: Limestone rock 2mm - 1/3" with some various foraminifera.

Geologic Log

La Gorce Country Club

F-2

Depth 1050 feet to 1060 feet

Color: 10 YR 8/2

Composition: 90% limestone rock, <10% foraminifera shells (CaCO3), and <2% CaCO3 fines

Size:

Roundness:

Sphericity:

Frosting:

Shells: Fragments - Whole

Percentage: 10 %

Weathering: Moderate - Extensive

Cementation: Fair - Good

Texture: Gritty or coarse

Porosity: Not Discernable

Hardness: Moderately Hard

Comments: Limestone rock to 1 1/2" with some foraminifera as above including abundance of an echinoderm (doughnut shaped = 1/4").

Depth 1060 feet to 1070 feet

Color: 10 YR 8/2

Composition: 80% limestone rock, 10% formainifera shells (CaCO3), and 10% CaCO3 fines

Size:

Roundness:

Sphericity:

Frosting:

Shells: Fragments - Whole

Percentage: 10 %

Weathering: Moderate - Extensive

Cementation: Fair - Good

Texture: Gritty or coarse

Porosity: Not Discernable

Hardness: Moderately Hard

Comments: Limestone rock to 3/4" with some foraminifera as above including abundance of an echinoderm (doughnut shaped = 1/4").

Depth 1070 feet to 1080 feet

Color: 10 YR 8/2

Composition: 60% limestone rock, 20% foraminifera shells (CaCO3), 10-15% CaCO3 fines, and 5% dolomite

Size:

Roundness:

Sphericity:

Frosting:

Shells: Fragments - Whole

Percentage: 20 %

Weathering: Moderate - Extensive

Cementation: Fair - Good

Texture: Limestone coarse, dolomite smooth

Porosity: Not Discernable

Hardness: Moderately Hard - Hard

Comments: Limestone rock to 1/2" and foraminifera as before with chunk of dolomite 1".

Depth 1080 feet to 1090 feet

Color: 10 YR 8/2

Composition: 60% limestone rock, 30% fossil foraminifera (CaCO3), and 10% CaCO3 fines

Size: Very Fine - Medium

Roundness: Subround - Subangular

Sphericity: Moderate

Frosting: Frosted

Shells: Fragments - Whole

Percentage: 30 %

Weathering: Extensive

Cementation: Fair

Texture: Coarse

Porosity: Not Discernable

Hardness: Moderately Hard

Comments: Limestone rock 1mm - 1/2" with some fossils and noticed remineralized pieces of coral.

Geologic Log

La Gorce Country Club

F-2

Depth 1090 feet to 1100 feet

Color: 10 YR 8/2

Composition: 60% limestone rock, 20% fossil froaminifera ($CaCO3$), and 20% $CaCO3$ fines

Size: Very Fine - Medium

Roundness: Subround - Subangular

Sphericity: Moderate

Frosting: Frosted

Shells: Fragments - Whole

Percentage: 20 %

Weathering: Moderate - Extensive

Cementation: Fair - Good

Texture: Coarse

Porosity: Not Discernable

Hardness: Moderately Hard

Comments: Limestone rock fragments 1mm - 3/4" with fossils same as above.

Depth 1100 feet to 1110 feet

Color: 10 YR 8/2

Composition: 60% limestone rock, 20% fossil froaminifera ($CaCO3$), and 20% $CaCO3$ fines

Size: Very Fine - Medium

Roundness: Subround - Subangular

Sphericity: Moderate

Frosting: Frosted

Shells: Fragments - Whole

Percentage: 20 %

Weathering: Moderate - Extensive

Cementation: Fair - Good

Texture: Coarse

Porosity: Not Discernable

Hardness: Moderately Hard

Comments: Limestone fragments to 1 1/2" with <1% siltstone and 30-40% foraminifera and fine $CaCO3$.

Depth 1110 feet to 1120 feet

Color: 10 YR 8/2

Composition: 60% limestone rock, 20% fossil froaminifera ($CaCO3$), and 20% $CaCO3$ fines

Size: Very Fine - Medium

Roundness: Subround - Subangular

Sphericity: Moderate

Frosting: Frosted

Shells: Fragments - Whole

Percentage: 20 %

Weathering: Moderate - Extensive

Cementation: Fair - Good

Texture: Coarse

Porosity: Not Discernable

Hardness: Moderately Hard

Comments: Limestone fragments to 1 1/2" with <1% siltstone and 30-40% foraminifera and fine $CaCO3$.

Depth 1120 feet to 1130 feet

Color: 10YR 8/2

Composition: 90% limestone rock, 10% fossil froaminifera shells and $CaCO3$ fines

Size: Very Fine - Medium

Roundness: Subround - Subangular

Sphericity: Moderate

Frosting: Frosted

Shells: Fragments - Whole

Percentage: 5 %

Weathering: Moderate - Extensive

Cementation: Fair

Texture: Coarse

Porosity: Not Discernable

Hardness: Moderately Hard

Comments: Limestone rock 1mm - 1" with small amount of foraminifera and $CaCO3$ fines.

Geologic Log

La Gorce Country Club

F-2

Depth 1130 feet to 1140 feet

Color: 10YR 8/2

Composition: 90% limestone rock, 10% fossil froaminifera shells and $CaCO_3$ fines

Size: Very Fine - Medium

Roundness: Subround - Subangular

Sphericity: Moderate

Frosting: Frosted

Shells: Fragments - Whole

Percentage: 5 %

Weathering: Moderate - Extensive

Cementation: Fair

Texture: Coarse

Porosity: Not Discernable

Hardness: Moderately Hard

Comments: Limestone rock 1mm - 1" with small amount of foraminifera and $CaCO_3$ fines.

Depth 1140 feet to 1150 feet

Color: 10 YR 8/1 - 10YR 8/2

Composition: 95% limestone rock, <5% $CaCO_3$ fines, and <1% $CaCO_3$ fossil foraminifera and echinoderms

Size: Very Fine - Medium

Roundness: Subround - Subangular

Sphericity: Moderate

Frosting: Frosted

Shells: Fragments - Whole

Percentage: 1 %

Weathering: Moderate - Extensive

Cementation: Fair - Good

Texture: Coarse

Porosity: Not Discernable

Hardness: Moderately Hard

Comments: Limestone rock fragments 2mm - 1" with just a few fossil foraminifera (Dictyoconus cookei or Dictyoconus americanus) and small echinoderms (sea biscuit like).

Depth 1150 feet to 1160 feet

Color: 10 YR 8/1 - 10YR 8/2

Composition: 95% limestone rock, <5% $CaCO_3$ fines, and <1% $CaCO_3$ fossil foraminifera and echinoderms

Size: Very Fine - Medium

Roundness: Subround - Subangular

Sphericity: Moderate

Frosting: Frosted

Shells: Fragments - Whole

Percentage: 1 %

Weathering: Moderate - Extensive

Cementation: Fair - Good

Texture: Coarse

Porosity: Not Discernable

Hardness: Moderately Hard

Comments: Limestone rock fragments 2mm - 1" with 1% dolomite, just a few fossil foraminifera (Dictyoconus cookei or Dictyoconus americanus) and small echinoderms (sea biscuit like).

Depth 1160 feet to 1170 feet

Color: 10 YR 8/2 - 10YR 7/2

Composition: 70% limestone rock, 20% fossil $CaCO_3$ shells, and 10% $CaCO_3$ fines

Size: Very Fine - Medium

Roundness: Subround - Subangular

Sphericity: Moderate

Frosting: Frosted

Shells: Fragments - Whole

Percentage: 20 %

Weathering: Moderate - Extensive

Cementation: Fair - Good

Texture: Coarse

Porosity: Not Discernable

Hardness: Moderately Hard

Comments: Limestone rock to 1/2" with small amount of (siltstone or dolomite) and fossils slightly more prevalent than above, and some recrystallization of fossil shells (calcite or quartzite).

Geologic Log

La Gorce Country Club

F-2

Depth 1170 feet to 1180 feet

Color: 10 YR 8/2 - 10YR 7/2

Composition: 70% limestone rock, 20% fossil $CaCO_3$ shells, and 10% $CaCO_3$ fines

Size: Very Fine - Medium

Roundness: Subround - Subangular

Sphericity: Moderate

Frosting: Frosted

Shells: Fragments - Whole

Percentage: 20 %

Weathering: Moderate - Extensive

Cementation: Fair - Good

Texture: Coarse

Porosity: Not Discernable

Hardness: Moderately Hard

Comments: Limestone rock to 1/2" with small amount of siltstone or dolomite and fossils slightly more prevalent than above, and some recrystallization of fossil shells (calcite or quartzite).

Depth 1180 feet to 1190 feet

Color: 10 YR 8/2, 7/2, 6/2

Composition: 50% limestone rock, 20% fossil ($CaCO_3$), 10% dolomite, 10% siltstone, and 10% $CaCO_3$ fines

Size: Very Fine - Fine

Roundness: Subround - Subangular

Sphericity: Moderate

Frosting: Frosted

Shells: Fragments - Whole

Percentage: 20 %

Weathering: Moderate - Extensive

Cementation: Fair - Good

Texture: Coarse - smooth

Porosity: Not Discernable

Hardness: Moderately Hard - Hard

Comments: Limestone, siltstone, and dolomite rock fragments to 3/4" with numerous Dictyoconus, echinoderma and possibly Pararotelia sp. fossils.

Depth 1190 feet to 1200 feet

Color: 10YR 7/2 - 10YR 6/2

Composition: 50% limestone rock, 20% fossil ($CaCO_3$), 10% dolomite, 10% siltstone, and 10% $CaCO_3$ fines

Size: Very Fine - Fine

Roundness: Subround - Subangular

Sphericity: Moderate

Frosting: Frosted

Shells: Fragments - Whole

Percentage: 20 %

Weathering: Moderate - Extensive

Cementation: Fair - Good

Texture: Coarse - smooth

Porosity: Not Discernable

Hardness: Moderately Hard - Hard

Comments: Limestone, siltstone, and dolomite rock fragments to 3/4" with numerous Dictyoconus, echinoderma, possibly Pararotelia sp., and possibly Cribrabulimina (valvulina) cushmani.

Depth 1200 feet to 1206 feet

Color: 10 YR 8/2 - 10 YR 7/2

Composition: 60% limestone rock, 15% siltstone, 15% $CaCO_3$ fossils, and 10% $CaCO_3$ fines

Size: Very Fine - Fine

Roundness: Subround - Subangular

Sphericity: Moderate

Frosting: Frosted

Shells: Fragments - Whole

Percentage: 15 %

Weathering: Moderate - Extensive

Cementation: Fair - Good

Texture: Coarse

Porosity: Not Discernable

Hardness: Moderately Hard

Comments: Limestone, dolomite, and siltstone rock fragments to 1" with fairly abundant foraminifera of same type as above.

Geologic Log

La Gorce Country Club

F-2

Depth 1206 feet

Color: 10YR 8/2 - 10 YR 6/2

Composition: 50% limestone rock, 15% dolomite, 15% siltstone, 10% CaCO3 fossils, and 10% CaCO3 fines

Size: Very Fine - Fine

Roundness: Subround - Subangular

Sphericity: Moderate

Frosting: Frosted

Shells: Fragments - Whole

Percentage: 10 %

Weathering: Moderate - Extensive

Cementation: Fair - Good

Texture: Coarse - smooth

Porosity: Not Discernable

Hardness: Moderately Hard - Hard

Comments: Limestone, dolomite, and siltstone rock fragments to 1" with same foraminifera as previous.

APPENDIX C

GEOPHYSICAL LOGS

ABS

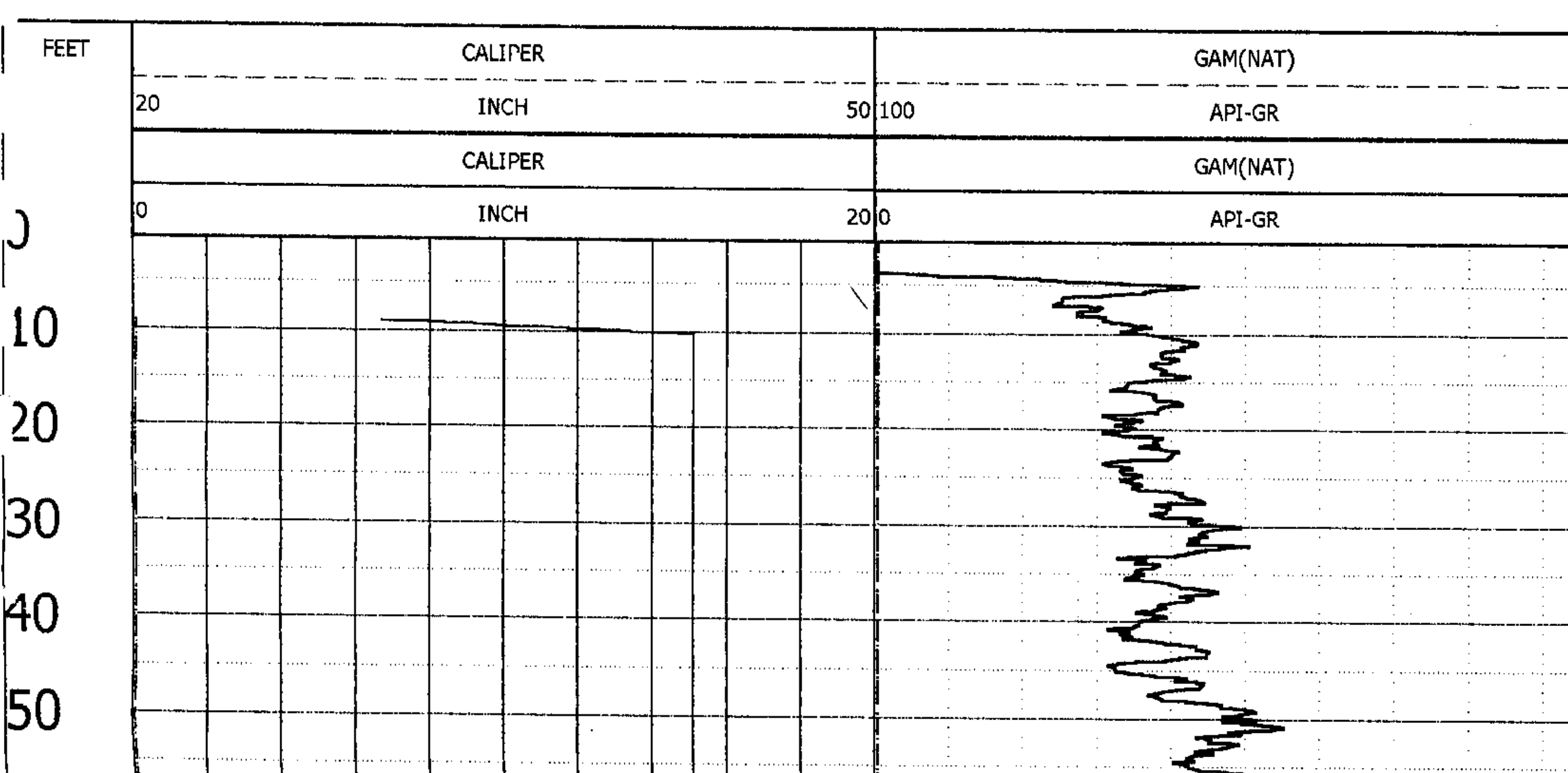
Advanced Borehole Services

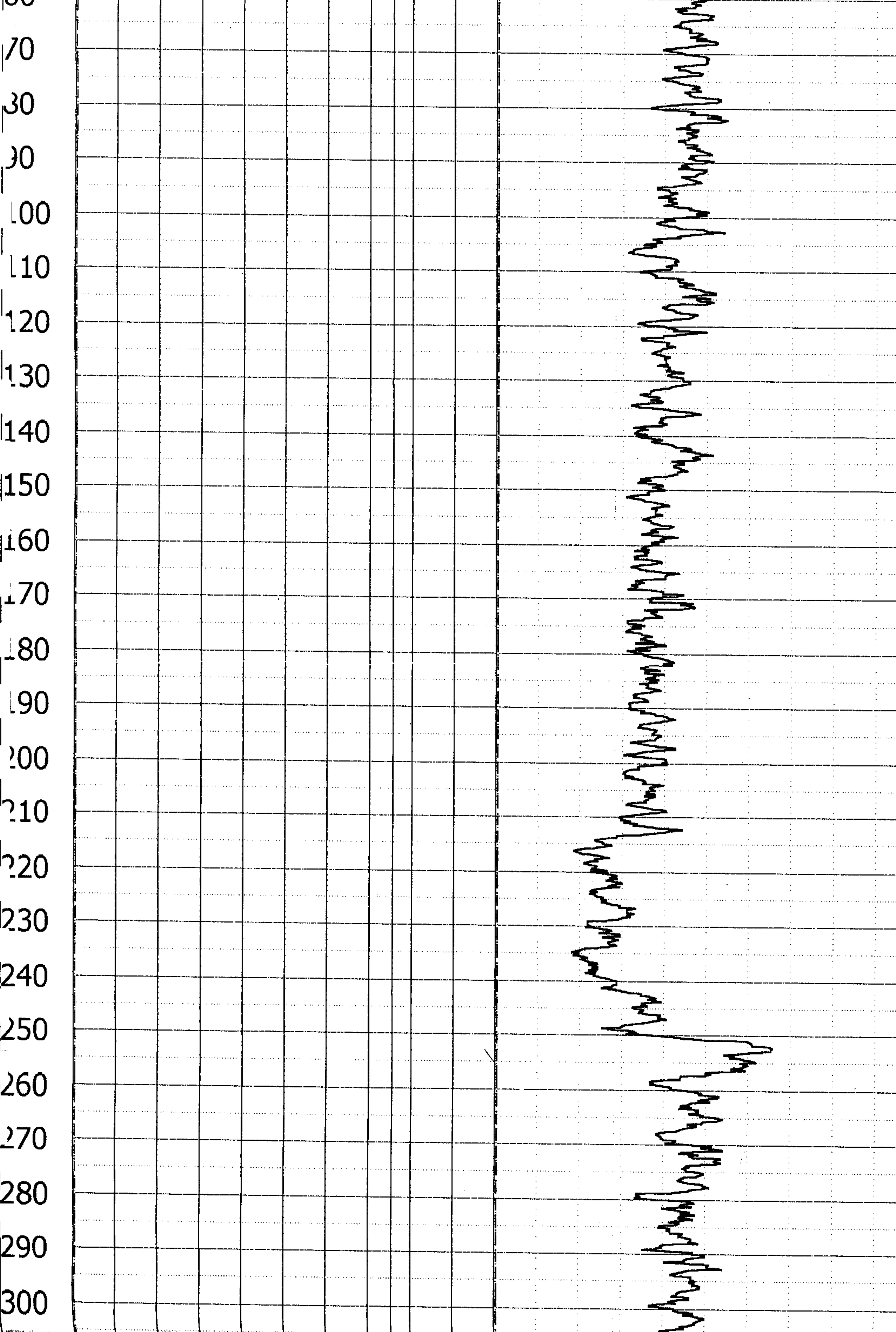
Caliper/Gamma Ray

COMPANY	: Jaffer & Associates	OTHER SERVICES: 9041 8711 9065			
WELL	: La Gorce F-2				
LOCATION/FIELD	: Miami Beach				
COUNTY	: Dade				
STATE	: Fl				
SECTION	:	TOWNSHIP	:	RANGE	:
DATE	: 01/12/02	PERMANENT DATUM	:		
DEPTH DRILLER	:			KB	:
LOG BOTTOM	: 1188.25	LOG MEASURED FROM:	Top Gn	DF	:
LOG TOP	: 0.50	DRL MEASURED FROM:		GL	:
CASING DIAMETER	: 17	LOGGING UNIT	: Blu		
CASING TYPE	: CLock	FIELD OFFICE	: Tpa		
CASING THICKNESS:	0	RECORDED BY	: AFB		
BIT SIZE	: 12	BOREHOLE FLUID	: For	FILE	: PROCESSED
MAGNETIC DECL.	: 0	RM	: 0	TYPE	: 9065A1
MATRIX DENSITY	: 2.71	RM TEMPERATURE	: 0		
NEUTRON MATRIX	: Dolomite	MATRIX DELTA T	: 140		
				THRESH:	20000

Static Well

ALL SERVICES PROVIDED SUBJECT TO STANDARD TERMS AND CONDITIONS

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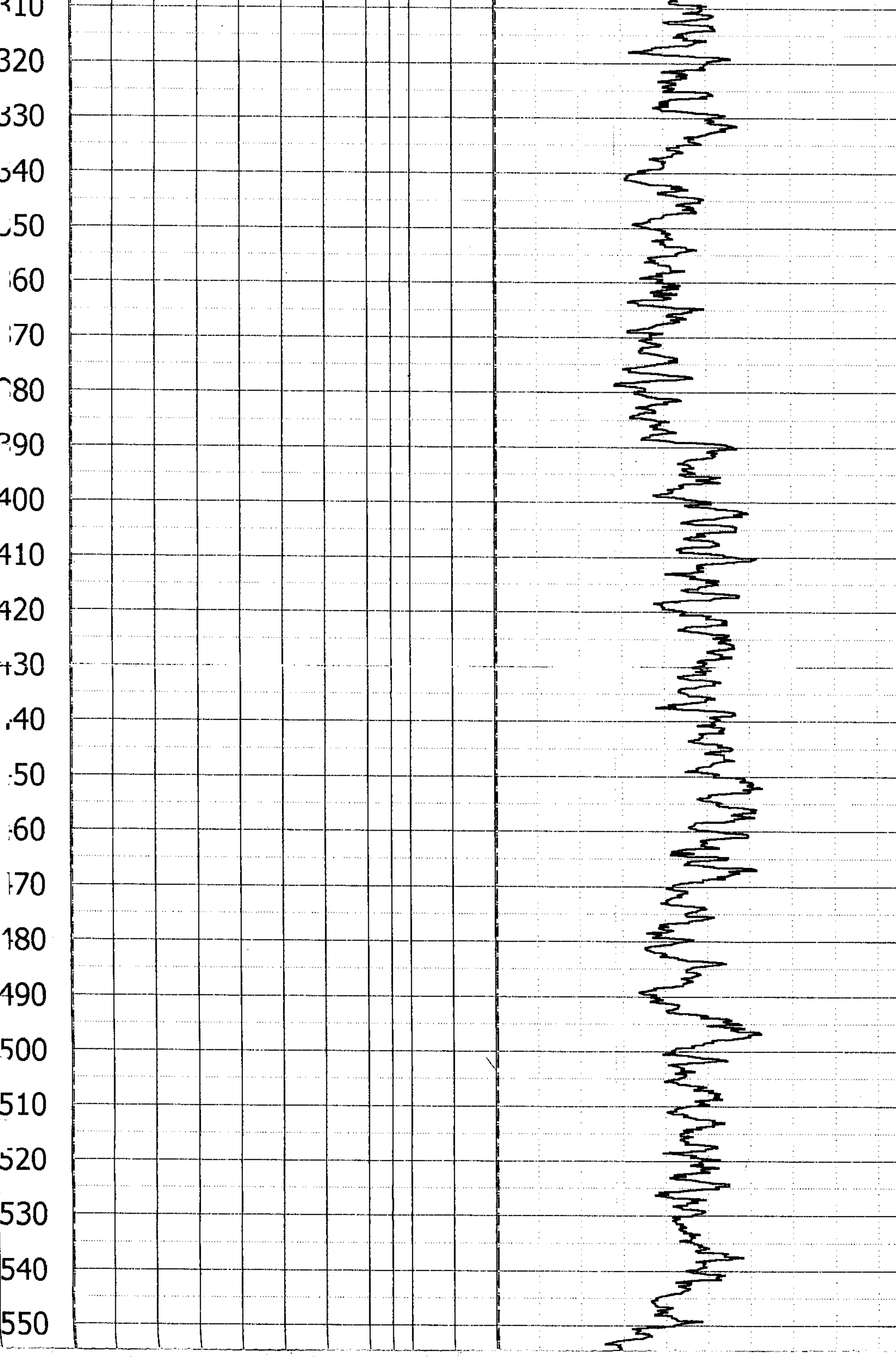
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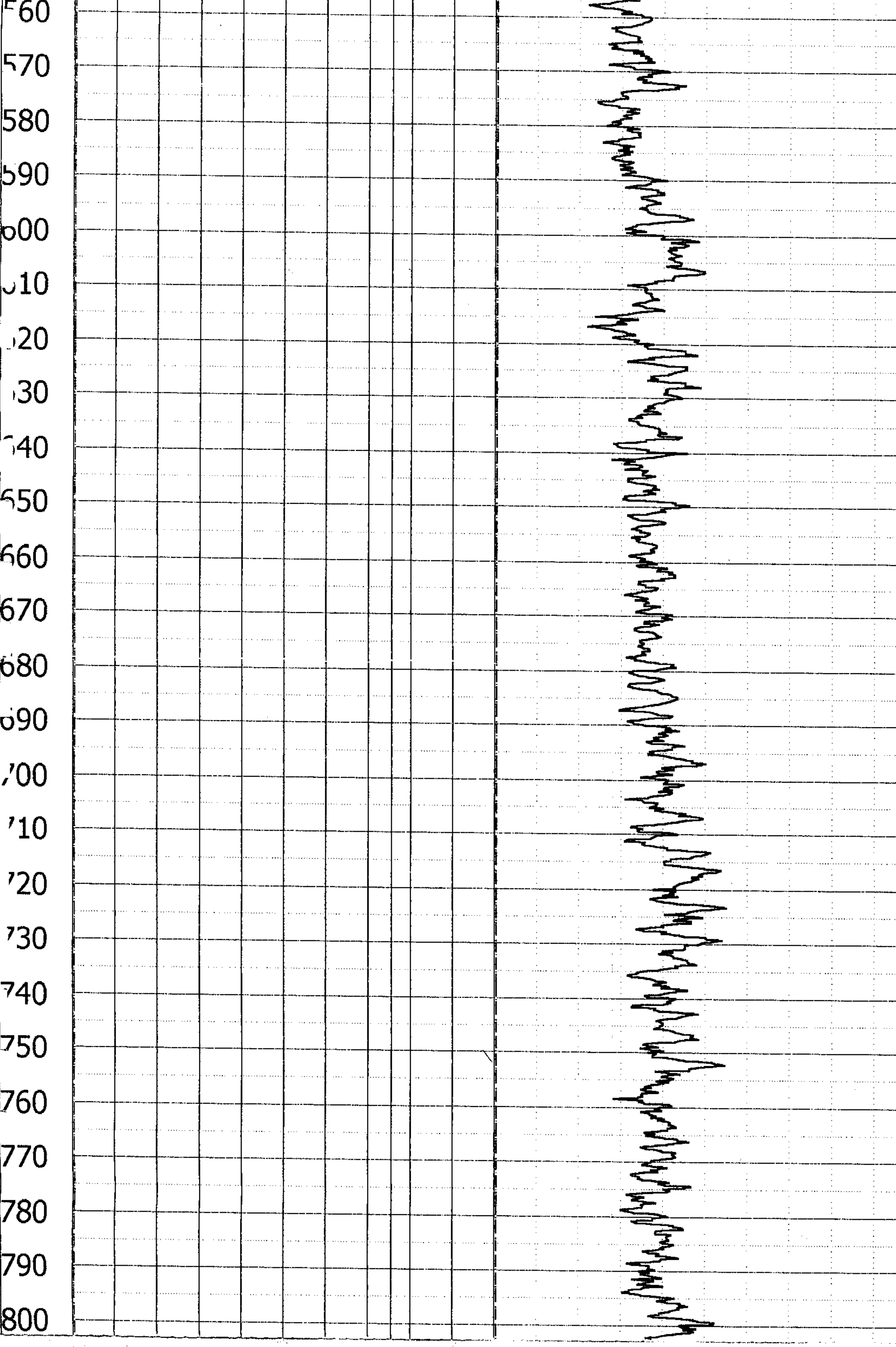
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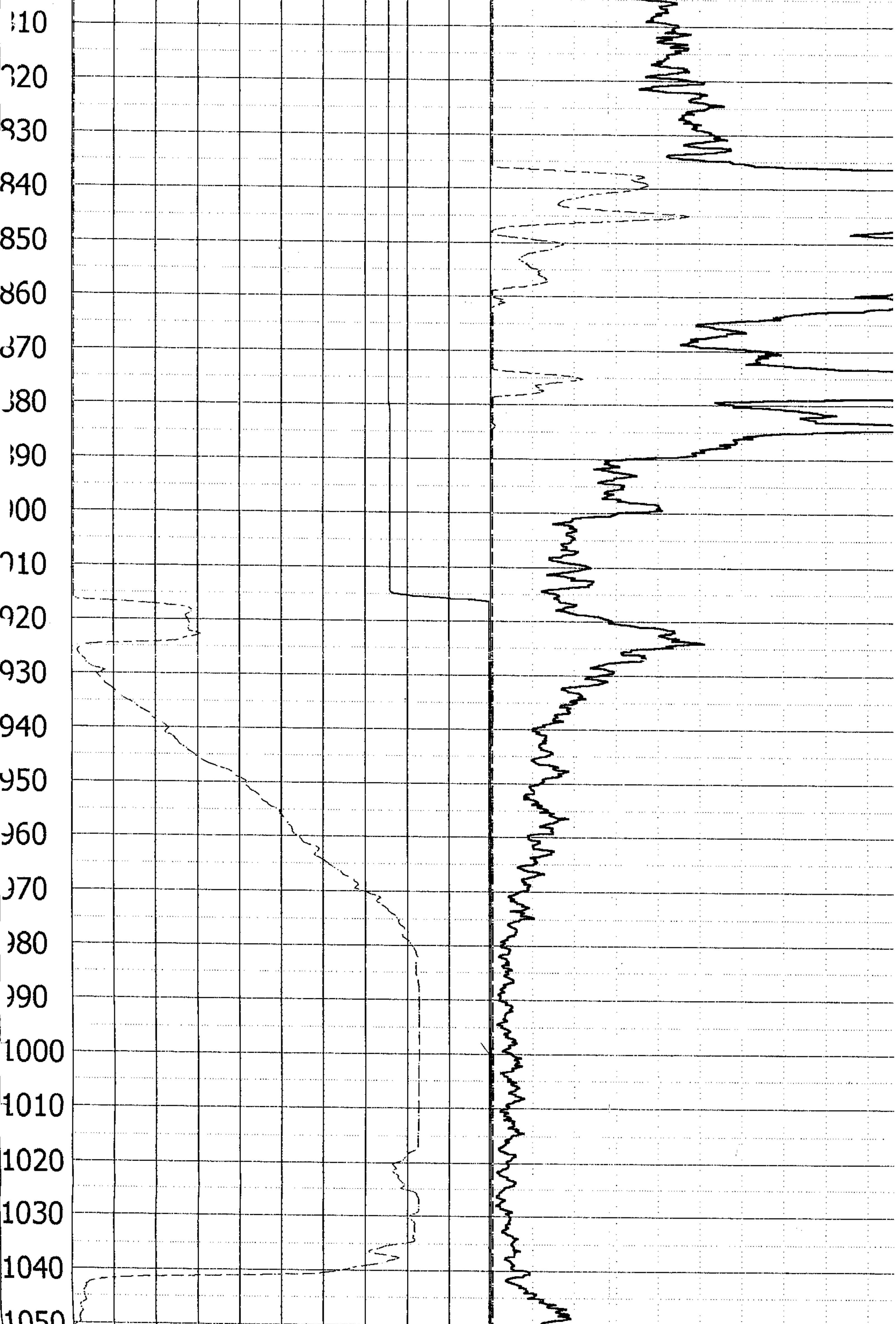

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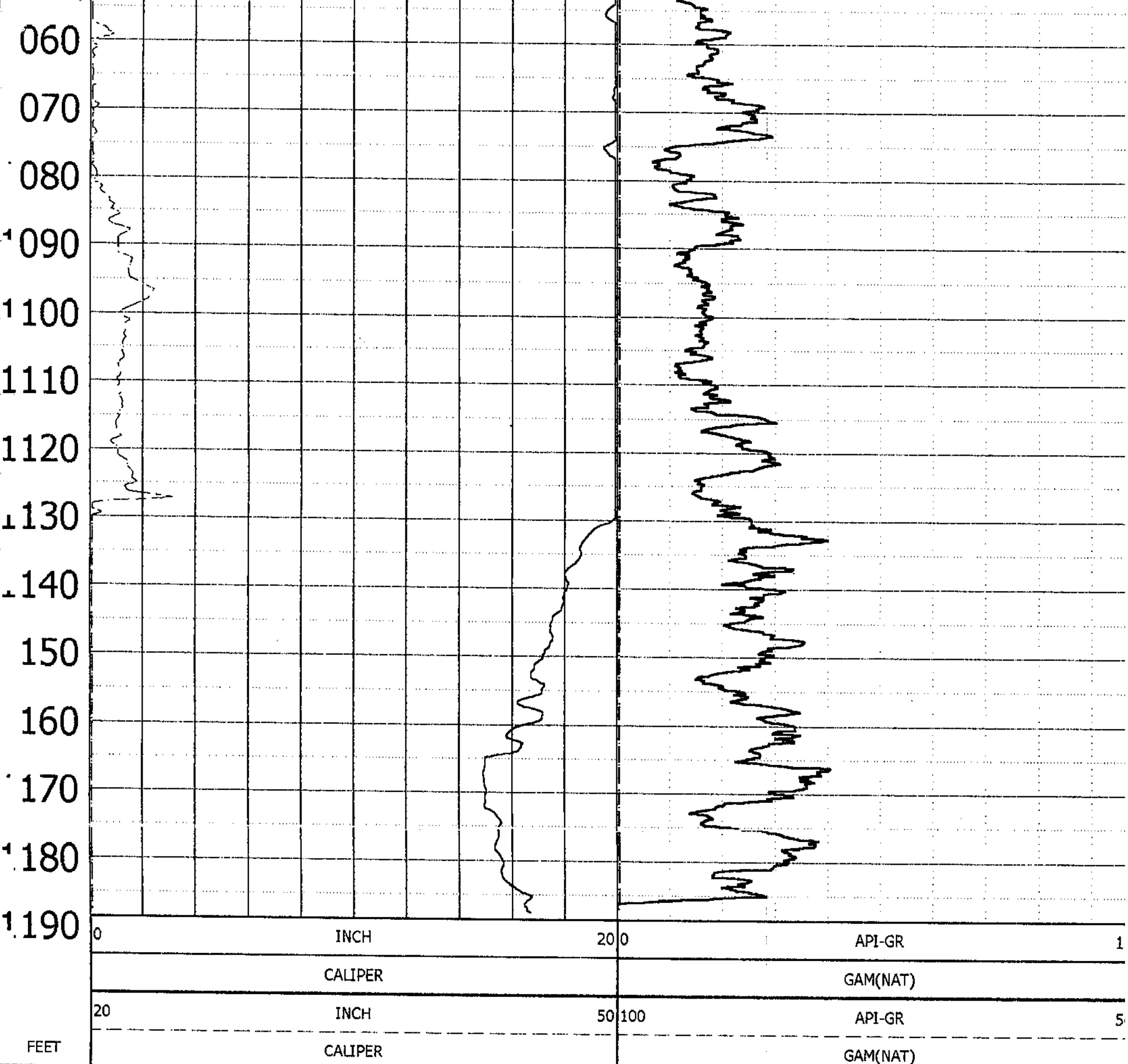


TOOL CALIBRATION La Gorce F-2 01/12/02 14:36
TOOL 9065A1
SERIAL NUMBER 718

	DATE	TIME	SENSOR	STANDARD	RESPONSE
1	Sep10,01	23:48:36	CALIPER	3.000 [INCH]	72449.00 [CPS]
	Sep10,01	20:48:36	CALIPER	6.000 [INCH]	87545.00 [CPS]
2	Jan05,02	21:37:25	CALIPERL	5.000 [INCH]	57470.00 [CPS]
	Jan05,02	21:37:25	CALIPERL	10.000 [INCH]	68630.00 [CPS]
3	Oct04,00	22:12:17	CALIPERX	Default [INCH]	Default [CPS]
	Oct04,00	22:12:17	CALIPERX	Default [INCH]	Default [CPS]

ABS

Advanced Borehole Services

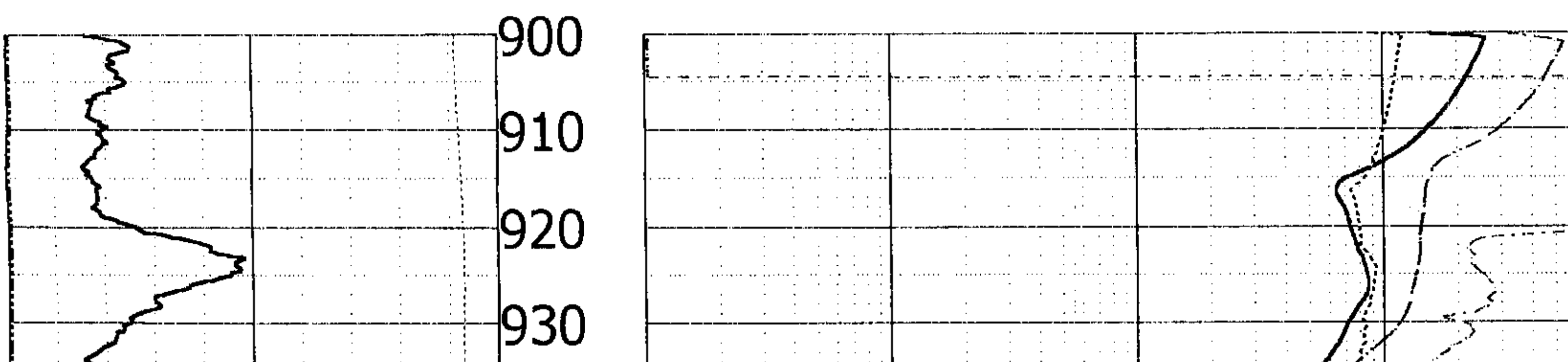
Gamma Ray/Resistivity

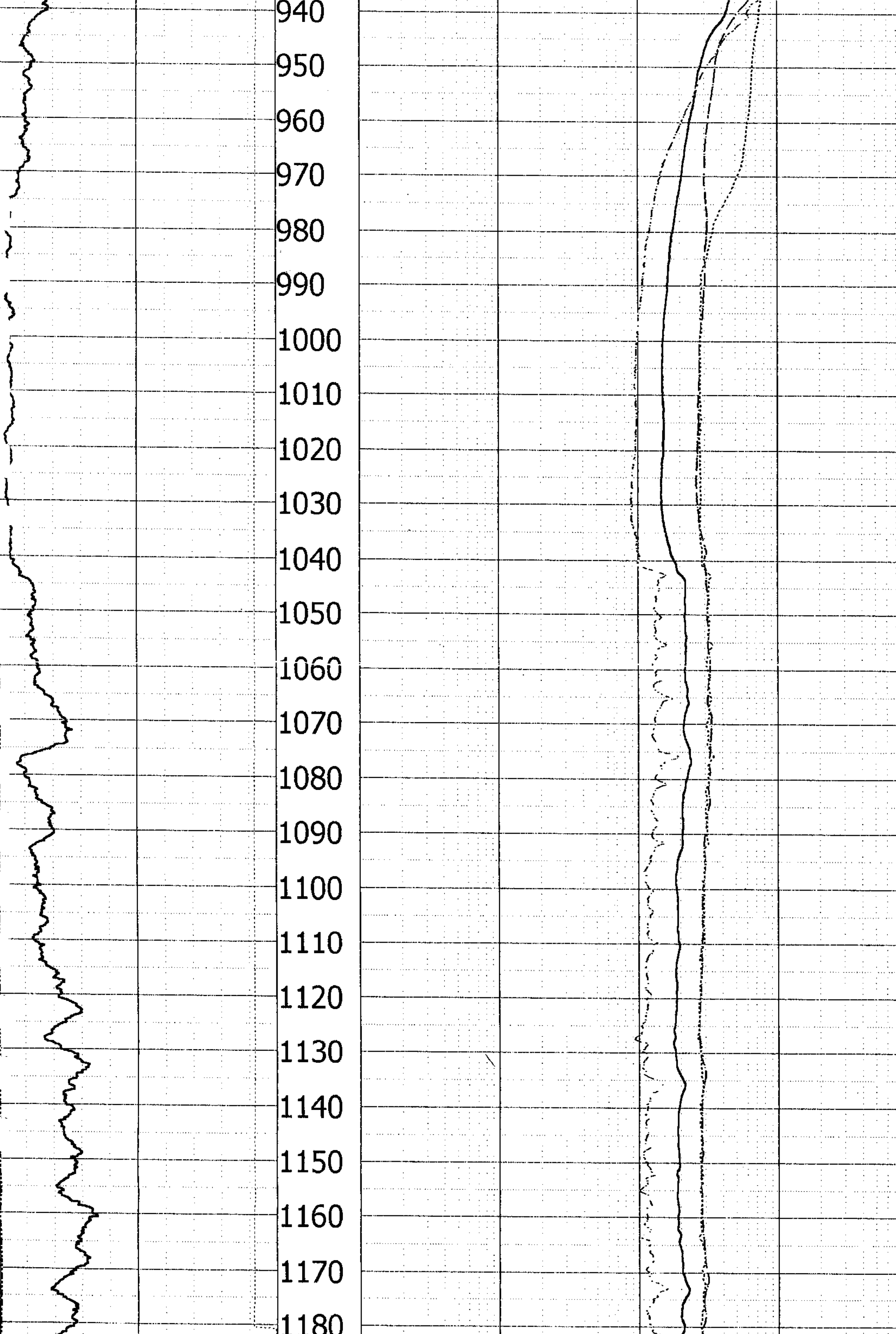
COMPANY	: Jaffer & Associates			OTHER SERVICES: 9041 8711 9065	
WELL	: La Gorce F-2				
LOCATION/FIELD	: Miami Beach				
COUNTY	: Dade				
STATE	: Fl				
SECTION	:	TOWNSHIP	:	RANGE	:
DATE	: 01/12/02	PERMANENT DATUM	:		
DEPTH DRILLER	:			KB	:
LOG BOTTOM	: 1188.25	LOG MEASURED FROM:	Top Gn	DF	:
LOG TOP	: 889.25	DRL MEASURED FROM:		GL	:
CASING DIAMETER	: 17	LOGGING UNIT	: Blu		
CASING TYPE	: CLock	FIELD OFFICE	: Tpa		
CASING THICKNESS:	0	RECORDED BY	: AFB		
BIT SIZE	: 12	BOREHOLE FLUID	: For	FILE	: PROCESSED
MAGNETIC DECL.	: 0	RM	: 0	TYPE	: 9041A
MATRIX DENSITY	: 2.71	RM TEMPERATURE	: 0		
NEUTRON MATRIX	: Dolomite	MATRIX DELTA T	: 140		
				THRESH:	20000

Static Well

ALL SERVICES PROVIDED SUBJECT TO STANDARD TERMS AND CONDITIONS

	FEET	
		RES
		0.01 OHM
SP		RES(DG)
-500 MV 0		0.01 OHM-M
GAM(NAT)		RES(64N)
100 API-GR 300		0.01 OHM-M
GAM(NAT)		RES(16N)

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1180

API-GR 100	1190	0.01	OHM-M 1
GAM(NAT)			RES(16N)
0 API-GR 300		0.01	OHM-M 1
GAM(NAT)			RES(64N)
00 MV 0		0.01	OHM-M 1
SP			RES(DG)
		0.01	OHM 1
	FEET		RES

TOOL CALIBRATION La Gorce F-2 01/12/02 12:15
TOOL 9041A
SERIAL NUMBER 266

	DATE	TIME	SENSOR	STANDARD	RESPONSE
1	Dec31,01	20:45:20	GAM(NAT)	Default [API-GR]	Default [CPS]
	Dec31,01	17:45:20	GAM(NAT)	Default [API-GR]	Default [CPS]
2	Jan12,02	17:15:28	RES(FL)	0.150 [OHM-M]	1262.00 [CPS]
	Jan12,02	17:15:28	RES(FL)	23.800 [OHM-M]	25675.00 [CPS]
3	Dec31,01	18:18:17	SP	0.000 [MV]	59997.00 [CPS]
	Dec31,01	18:18:17	SP	376.000 [MV]	20909.00 [CPS]
4	Dec31,01	18:18:56	RES(16N)	0.000 [OHM-M]	3865.00 [CPS]
	Dec31,01	18:18:56	RES(16N)	1998.000 [OHM-M]	98503.00 [CPS]
5	Dec31,01	18:19:24	RES(64N)	0.000 [OHM-M]	3820.00 [CPS]
	Dec31,01	18:19:24	RES(64N)	1991.000 [OHM-M]	100150.00 [CPS]
6	Dec31,01	17:45:20	TEMP	Default [DEG F]	Default [CPS]
	Dec31,01	17:45:20	TEMP	Default [DEG F]	Default [CPS]
7	Dec31,01	18:17:53	RES	0.000 [OHM]	1040.00 [CPS]
	Dec31,01	18:17:53	RES	994.000 [OHM]	31547.00 [CPS]

ABS

Advanced Borehole Services

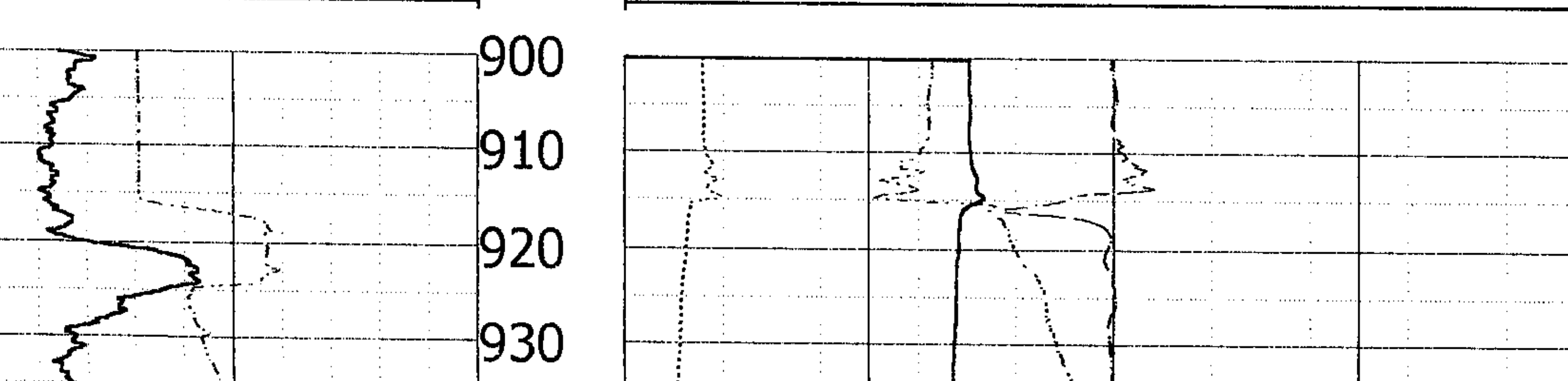
Flowing Water Quality

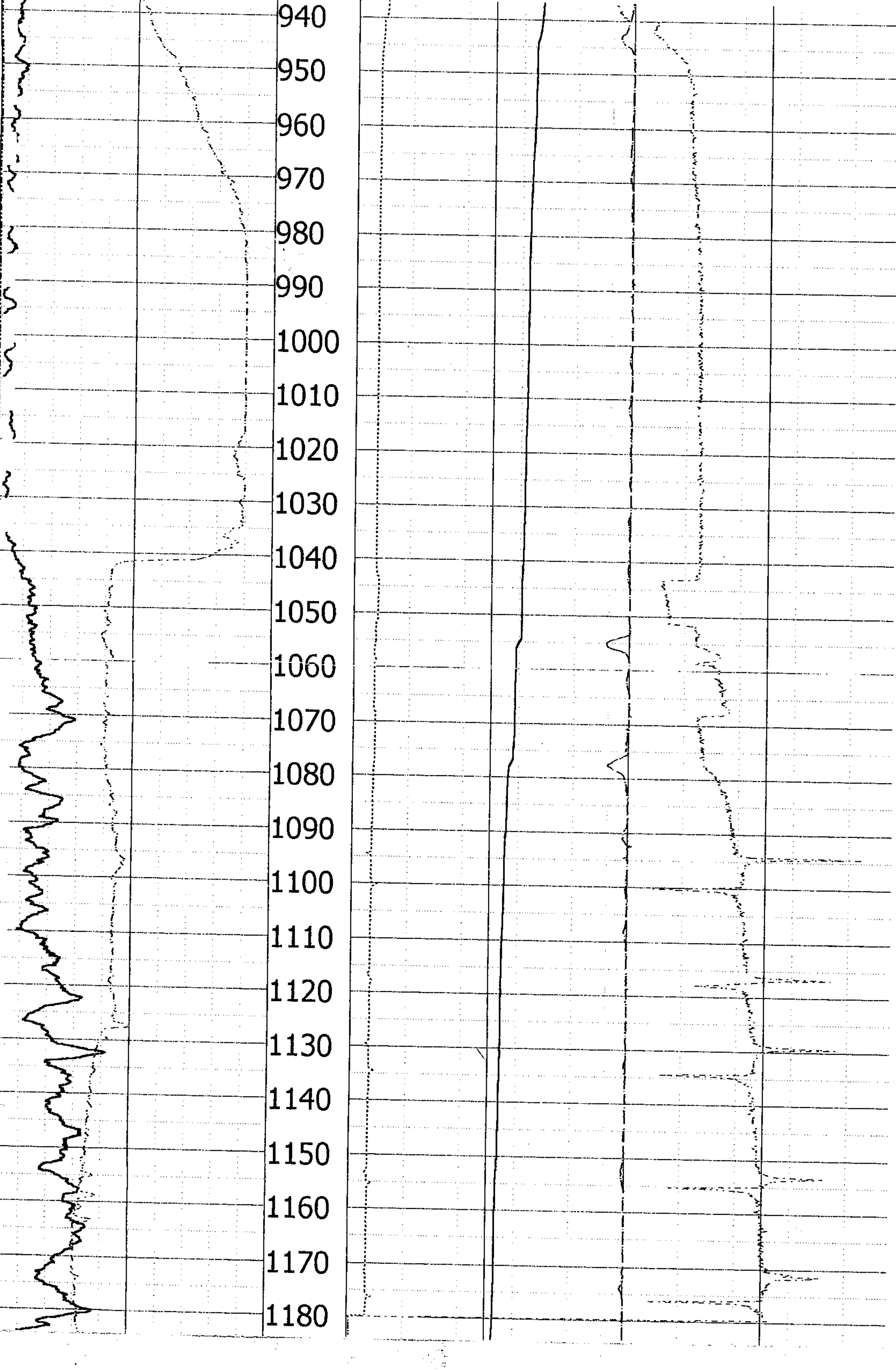
COMPANY	: Jaffer & Associates			OTHER SERVICES: 9041 8711 9065	
WELL	: La Gorce F-2				
LOCATION/FIELD	: Miami Beach				
COUNTY	: Dade				
STATE	: Fl				
SECTION	:	TOWNSHIP	:	RANGE	:
DATE	: 01/12/02	PERMANENT DATUM	:		
DEPTH DRILLER	:			KB	:
LOG BOTTOM	: 1188.25	LOG MEASURED FROM:	Top Gn	DF	:
LOG TOP	: 9.00	DRL MEASURED FROM:		GL	:
CASING DIAMETER	: 17	LOGGING UNIT	: Blu		
CASING TYPE	: CLock	FIELD OFFICE	: Tpa		
CASING THICKNESS	: 0	RECORDED BY	: AFB		
BIT SIZE	: 12	BOREHOLE FLUID	: For	FILE	: PROCESSED
MAGNETIC DECL.	: 0	RM	: 0	TYPE	. 9041A
MATRIX DENSITY	: 2.71	RM TEMPERATURE	: 0		
NEUTRON MATRIX	: Dolomite	MATRIX DELTA T	: 140		
				THRESH:	20000

Static Well

ALL SERVICES PROVIDED SUBJECT TO STANDARD TERMS AND CONDITIONS

	FEET	
		SP COND
		0 US/CM 800(
CALIPER		RES(FL)
INCH 50		0 OHM-M
GAM(NAT)		DEL TEMP
)0 API-GR 300		-0.25 DEG F 0.:
GAM(NAT)		TEMP

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	API-GR	100	1190	60	DEG F	8
	GAM(NAT)				TEMP	
0	API-GR	300		-0.25	DEG F	0.2
	GAM(NAT)				DEL TEMP	
	INCH	50		0	OHM-M	
	CALIPER				RES(FL)	
				0	US/CM	8000
			FEET		SP COND	

TOOL CALIBRATION La Gorce F-2 01/12/02 15:33
TOOL 9041A
SERIAL NUMBER 266

	DATE	TIME	SENSOR	STANDARD	RESPONSE
1	Dec31,01	20:45:20	GAM(NAT)	Default [API-GR]	Default [CPS]
	Dec31,01	17:45:20	GAM(NAT)	Default [API-GR]	Default [CPS]
2	Jan12,02	17:15:28	RES(FL)	0.150 [OHM-M]	1262.00 [CPS]
	Jan12,02	17:15:28	RES(FL)	23.800 [OHM-M]	25675.00 [CPS]
3	Dec31,01	18:18:17	SP	0.000 [MV]	59997.00 [CPS]
	Dec31,01	18:18:17	SP	376.000 [MV]	20909.00 [CPS]
4	Dec31,01	18:18:56	RES(16N)	0.000 [OHM-M]	3865.00 [CPS]
	Dec31,01	18:18:56	RES(16N)	1998.000 [OHM-M]	98503.00 [CPS]
5	Dec31,01	18:19:24	RES(64N)	0.000 [OHM-M]	3820.00 [CPS]
	Dec31,01	18:19:24	RES(64N)	1991.000 [OHM-M]	100150.00 [CPS]
6	Dec31,01	17:45:20	TEMP	Default [DEG F]	Default [CPS]
	Dec31,01	17:45:20	TEMP	Default [DEG F]	Default [CPS]
7	Dec31,01	18:17:53	RES	0.000 [OHM]	1040.00 [CPS]
	Dec31,01	18:17:53	RES	994.000 [OHM]	31547.00 [CPS]

ABS

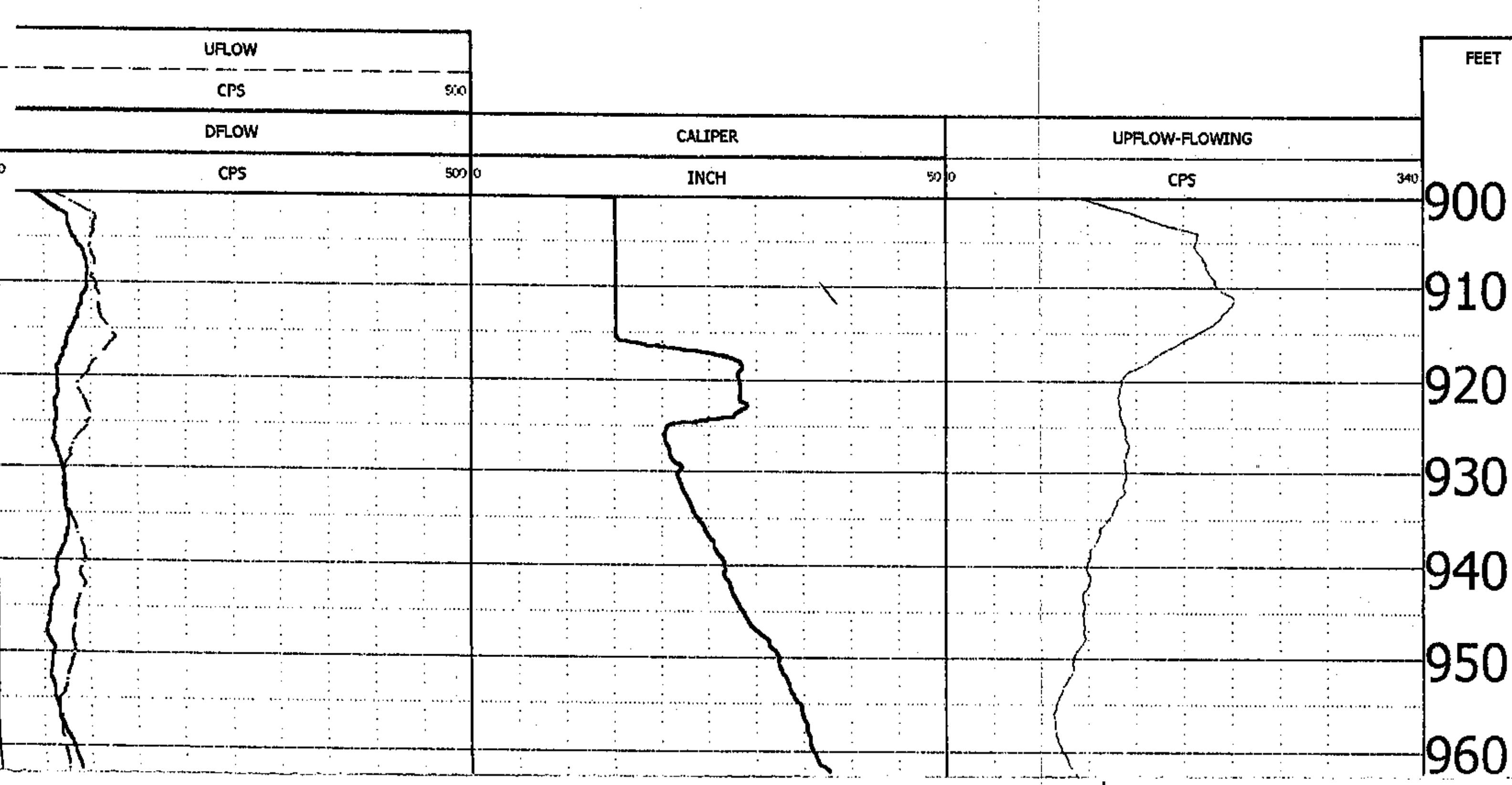
Advanced Borehole Services

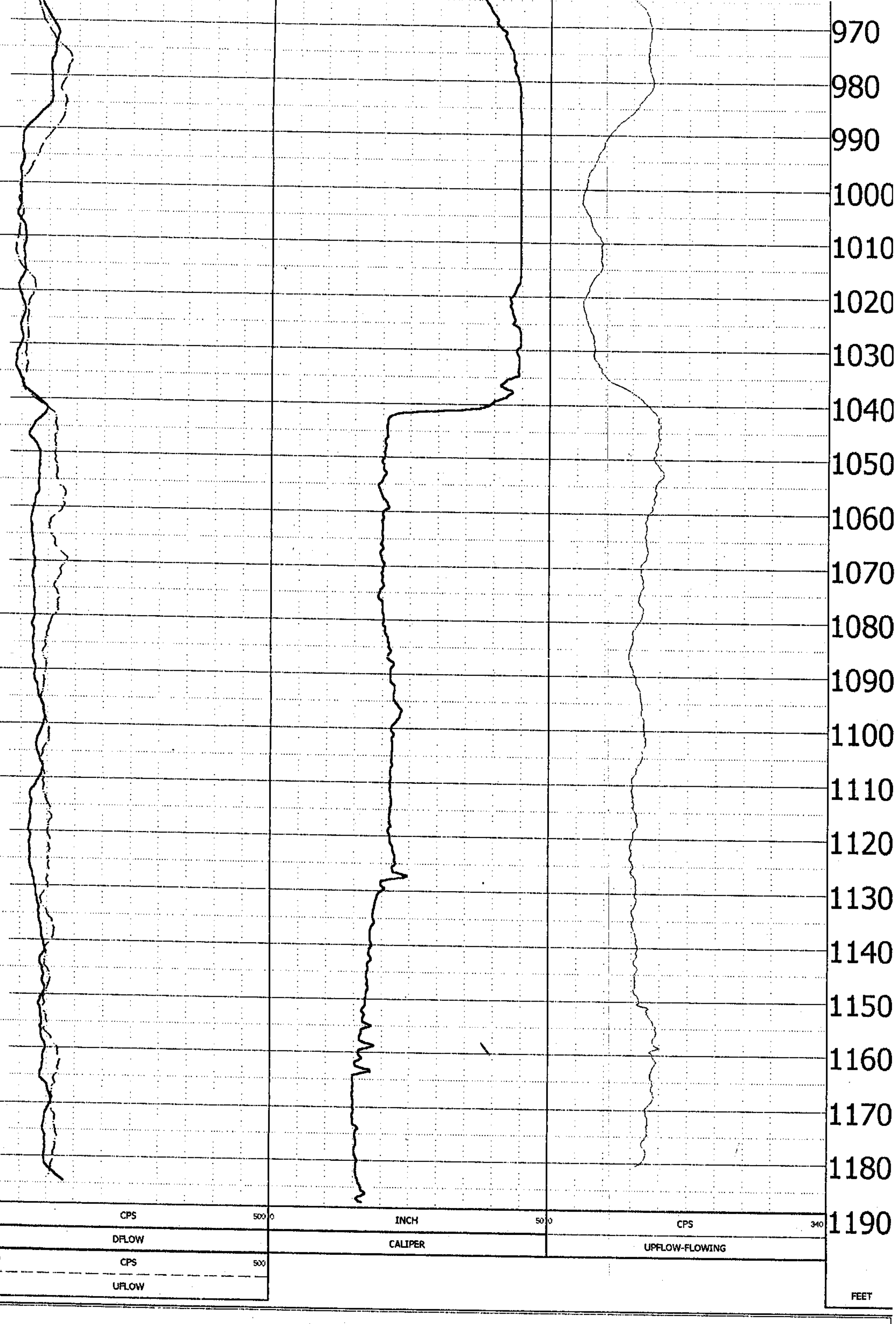
Flow - Static/ Flowing Well

COMPANY	: Jaffer & Associates	OTHER SERVICES: 9041 8711 9065			
WELL	: La Gorce F-2				
LOCATION/FIELD	: Miami Beach				
COUNTY	: Dade				
STATE	: Fl				
SECTION	:	TOWNSHIP	:	RANGE	:
DATE	: 01/12/02	PERMANENT DATUM	:		
DEPTH DRILLER	:			KB	:
LOG BOTTOM	: 1184 00	LOG MEASURED FROM:	Top Gn	DF	:
LOG TOP	: 860.75	DRL MEASURED FROM:		GL	:
CASING DIAMETER	: 17	LOGGING UNIT	: Blu		
CASING TYPE	: CLock	FIELD OFFICE	: Tpa		
CASING THICKNESS:	0	RECORDED BY	: AFB		
BIT SIZE	. 12	BOREHOLE FLUID	: For	FILE	: PROCESSED
MAGNETIC DECL.	: 0	RM	: 0	TYPE	. 8711A
MATRIX DENSITY	: 2.71	RM TEMPERATURE	: 0		
NEUTRON MATRIX	: Dolomite	MATRIX DELTA T	: 140		
				THRESH:	20000

Static Well

ALL SERVICES PROVIDED SUBJECT TO STANDARD TERMS AND CONDITIONS





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UPFLOW-FLOWING
FEET

TOOL CALIBRATION La Gorce F-2 01/12/02 12:48
TOOL 8711A
SERIAL NUMBER 227

	DATE	TIME	SENSOR	STANDARD	RESPONSE
1	Jun29,01	20:37:45	DFLOW	Default [FT/MIN]	Default [CPS]
	Jun29,01	17:37:45	DFLOW	Default [FT/MIN]	Default [CPS]
2	Jun29,01	17:37:45	UFLOW	Default [FT/MIN]	Default [CPS]
	Jun29,01	17:37:45	UFLOW	Default [FT/MIN]	Default [CPS]

ABS

Advanced Borehole Services

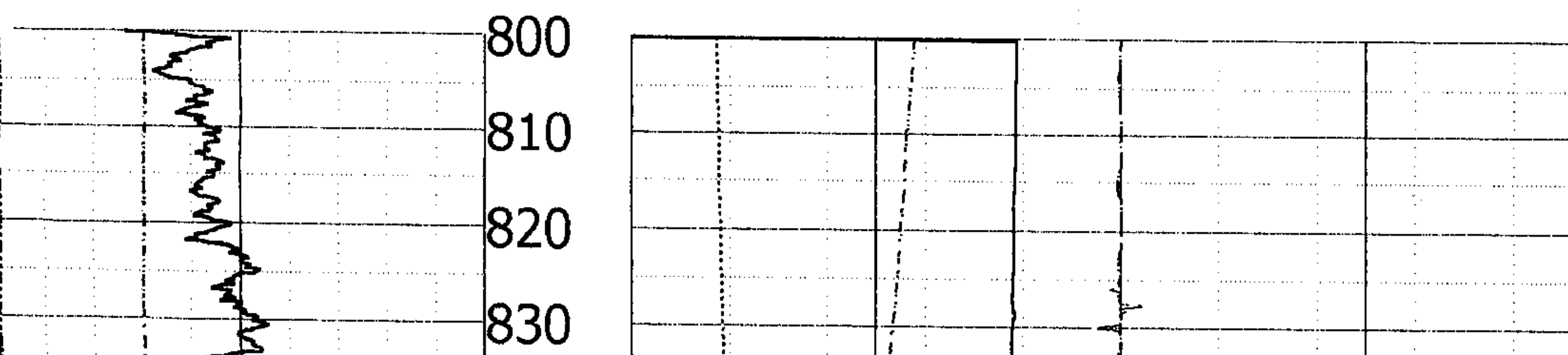
Static Water Quality

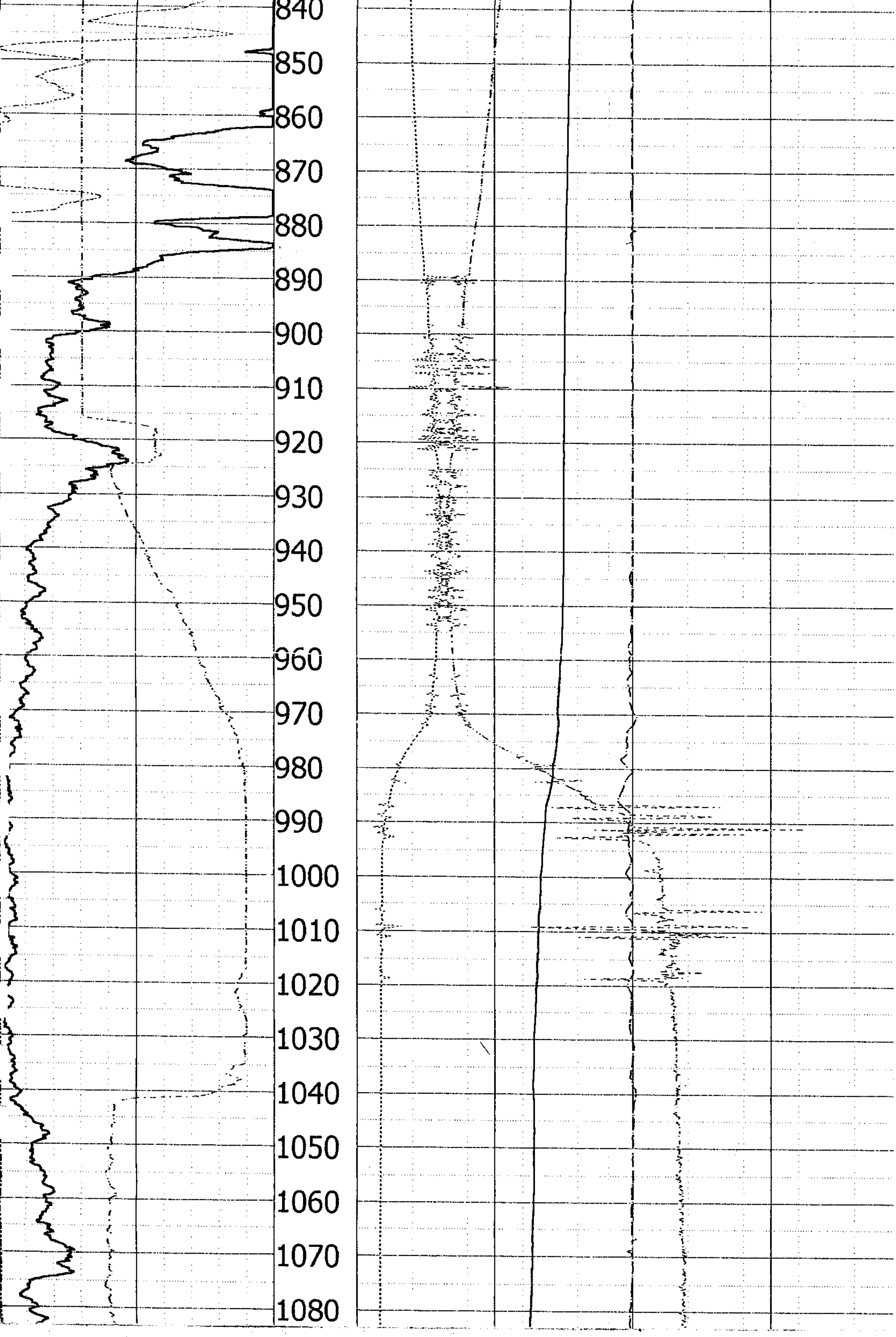
COMPANY	: Jaffer & Associates	OTHER SERVICES:			
WELL	: La Gorce F-2	9041			
LOCATION/FIELD	: Miami Beach	8711			
COUNTY	: Dade	9065			
STATE	: Fl				
SECTION	:	TOWNSHIP	:	RANGE	:
DATE	: 01/12/02	PERMANENT DATUM	:		
DEPTH DRILLER	:			KB	:
LOG BOTTOM	: 1188.25	LOG MEASURED FROM:	Top Gn	DF	:
LOG TOP	: 0.50	DRL MEASURED FROM:		GL	:
CASING DIAMETER	: 17	LOGGING UNIT	: Blu		
CASING TYPE	: CLock	FIELD OFFICE	: Tpa		
CASING THICKNESS:	0	RECORDED BY	: AFB		
BIT SIZE	: 12	BOREHOLE FLUID	: For	FILE	: PROCESSED
MAGNETIC DECL.	: 0	RM	: 0	TYPE	: 9041A
MATRIX DENSITY	: 2.71	RM TEMPERATURE	: 0		
NEUTRON MATRIX	: Dolomite	MATRIX DELTA T	: 140		
				THRESH:	20000

Static Well

ALL SERVICES PROVIDED SUBJECT TO STANDARD TERMS AND CONDITIONS

	FEET	
		SP COND
		0 US/CM 800
CALIPER		RES(FL)
INCH 50		0 OHM-M
GAM(NAT)		DEL TEMP
00 API-GR 300		-0.25 DEG F 0.
GAM(NAT)		TEMP





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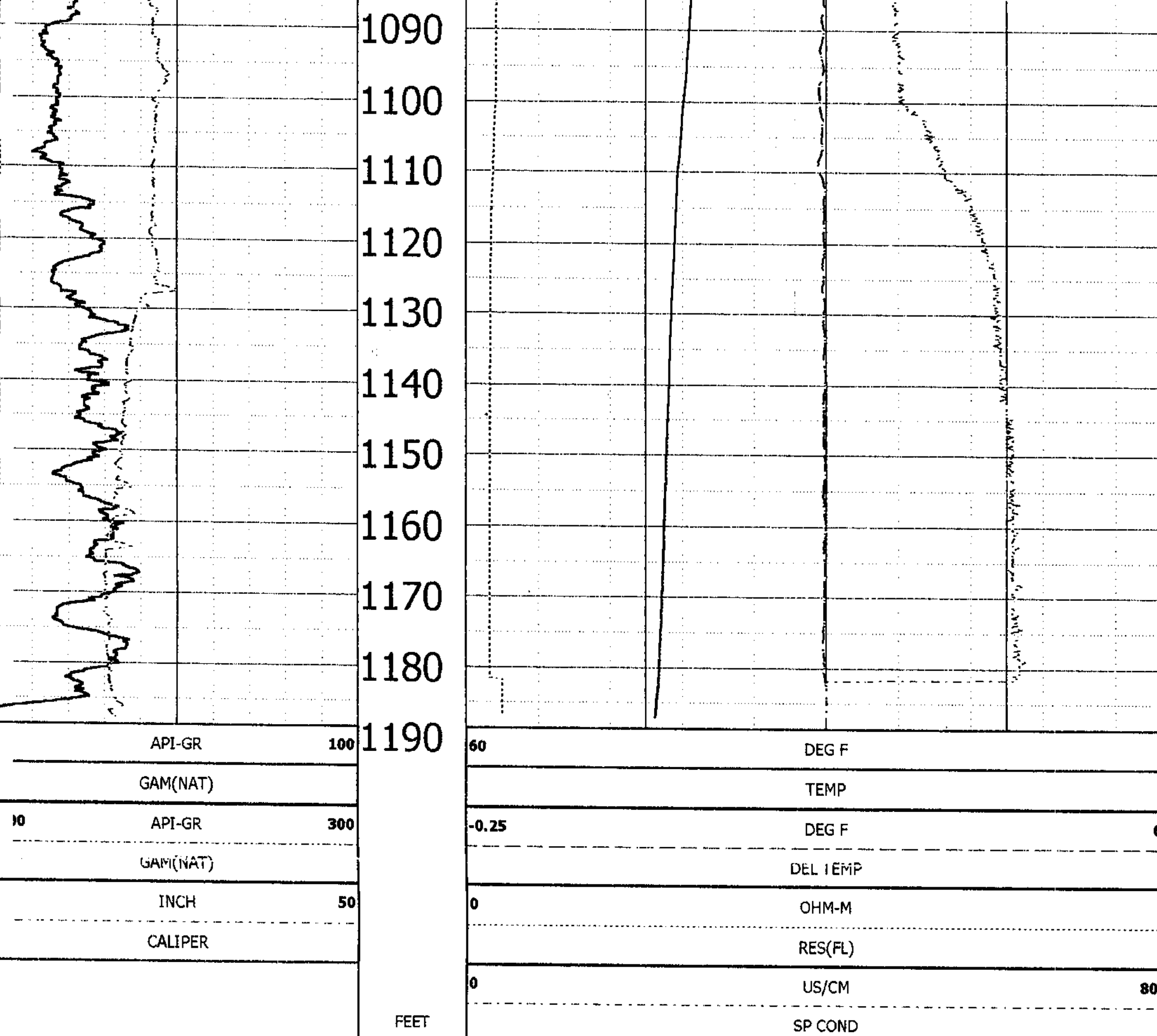


TOOL CALIBRATION La Gorce F-2 01/12/02 10:52
TOOL 9041A
SERIAL NUMBER 266

	DATE	TIME	SENSOR	STANDARD	RESPONSE
1	Dec31,01	20:45:20	GAM(NAT)	Default [API-GR]	Default [CPS]
	Dec31,01	17:45:20	GAM(NAT)	Default [API-GR]	Default [CPS]
2	Dec31,01	17:59:23	RES(FL)	2.010 [OHM-M]	3418.00 [CPS]
	Dec31,01	17:59:23	RES(FL)	23.800 [OHM-M]	25675.00 [CPS]
3	Dec31,01	18:18:17	SP	0.000 [MV]	59997.00 [CPS]
	Dec31,01	18:18:17	SP	376.000 [MV]	20909.00 [CPS]
4	Dec31,01	18:18:56	RES(16N)	0.000 [OHM-M]	3865.00 [CPS]
	Dec31,01	18:18:56	RES(16N)	1998.000 [OHM-M]	98503.00 [CPS]
5	Dec31,01	18:19:24	RES(64N)	0.000 [OHM-M]	3820.00 [CPS]
	Dec31,01	18:19:24	RES(64N)	1991.000 [OHM-M]	100150.00 [CPS]
6	Dec31,01	17:45:20	TEMP	Default [DEG F]	Default [CPS]
	Dec31,01	17:45:20	TEMP	Default [DEG F]	Default [CPS]
7	Dec31,01	18:17:53	RES	0.000 [OHM]	1040.00 [CPS]
	Dec31,01	18:17:53	RES	994.000 [OHM]	31547.00 [CPS]

APPENDIX D

STEP-DRAWDOWN TEST RESULTS

La Gorce Country Club Well No. F-2
Step 1 Drawdown

Date	Time	Elapsed Time (min)	Water Level (ft als)	Drawdown (ft)
12/04/01	08:11:01 AM	0	30.34	0.00
12/04/01	08:11:31 AM	0.5	26.70	3.64
12/04/01	08:12:01 AM	1	26.63	3.71
12/04/01	08:12:31 AM	1.5	26.63	3.71
12/04/01	08:13:01 AM	2	23.36	6.98
12/04/01	08:13:31 AM	2.5	-8.30	38.64
12/04/01	08:14:01 AM	3	5.20	25.14
12/04/01	08:14:31 AM	3.5	8.43	21.91
12/04/01	08:15:01 AM	4	8.38	21.96
12/04/01	08:15:31 AM	4.5	4.76	25.58
12/04/01	08:16:01 AM	5	12.68	17.66
12/04/01	08:16:31 AM	5.5	12.05	18.29
12/04/01	08:17:01 AM	6	12.13	18.21
12/04/01	08:17:31 AM	6.5	12.16	18.18
12/04/01	08:18:01 AM	7	6.35	23.99
12/04/01	08:18:31 AM	7.5	4.94	25.40
12/04/01	08:19:01 AM	8	4.71	25.63
12/04/01	08:19:31 AM	8.5	4.40	25.94
12/04/01	08:20:01 AM	9	4.34	26.00
12/04/01	08:20:31 AM	9.5	4.42	25.92
12/04/01	08:21:01 AM	10	4.55	25.79
12/04/01	08:21:31 AM	10.5	4.35	25.99
12/04/01	08:22:01 AM	11	4.19	26.15
12/04/01	08:22:31 AM	11.5	4.38	25.96
12/04/01	08:23:01 AM	12	4.01	26.33
12/04/01	08:23:31 AM	12.5	4.34	26.00
12/04/01	08:24:01 AM	13	3.95	26.39
12/04/01	08:24:31 AM	13.5	4.13	26.21
12/04/01	08:25:01 AM	14	4.19	26.15
12/04/01	08:25:31 AM	14.5	4.17	26.17
12/04/01	08:26:01 AM	15	4.30	26.04
12/04/01	08:26:31 AM	15.5	3.91	26.43
12/04/01	08:27:01 AM	16	3.95	26.39
12/04/01	08:27:31 AM	16.5	3.59	26.75
12/04/01	08:28:01 AM	17	3.87	26.47
12/04/01	08:28:31 AM	17.5	3.70	26.64
12/04/01	08:29:01 AM	18	3.64	26.70
12/04/01	08:29:31 AM	18.5	3.14	27.20
12/04/01	08:30:01 AM	19	2.93	27.41
12/04/01	08:30:31 AM	19.5	3.05	27.29
12/04/01	08:31:01 AM	20	3.08	27.26
12/04/01	08:31:31 AM	20.5	2.86	27.48
12/04/01	08:32:01 AM	21	3.18	27.16
12/04/01	08:32:31 AM	21.5	3.35	26.99
12/04/01	08:33:01 AM	22	2.32	28.02
12/04/01	08:33:31 AM	22.5	2.40	27.94
12/04/01	08:34:01 AM	23	2.45	27.89
12/04/01	08:34:31 AM	23.5	2.29	28.05
12/04/01	08:35:01 AM	24	2.34	28.00
12/04/01	08:35:31 AM	24.5	2.27	28.07
12/04/01	08:36:01 AM	25	1.75	28.59
12/04/01	08:36:31 AM	25.5	1.86	28.48
12/04/01	08:37:01 AM	26	1.94	28.40
12/04/01	08:37:31 AM	26.5	1.19	29.15
12/04/01	08:38:01 AM	27	1.47	28.87

La Gorce Country Club Well No. F-2
Step 1 Drawdown

Date	Time	Elapsed Time (min)	Water Level (ft als)	Drawdown (ft)
12/04/01	08:38:31 AM	27.5	1.50	28.84
12/04/01	08:39:01 AM	28	1.01	29.33
12/04/01	08:39:31 AM	28.5	-2.21	32.55
12/04/01	08:40:01 AM	29	-2.51	32.85
12/04/01	08:40:31 AM	29.5	-2.31	32.65
12/04/01	08:41:01 AM	30	-2.81	33.15
12/04/01	08:41:31 AM	30.5	0.05	30.29
12/04/01	08:42:01 AM	31	0.55	29.79
12/04/01	08:42:31 AM	31.5	0.44	29.90
12/04/01	08:43:01 AM	32	0.43	29.91
12/04/01	08:43:31 AM	32.5	0.43	29.91
12/04/01	08:44:01 AM	33	0.51	29.83
12/04/01	08:44:31 AM	33.5	0.46	29.88
12/04/01	08:45:01 AM	34	0.44	29.90
12/04/01	08:45:31 AM	34.5	0.46	29.88
12/04/01	08:46:01 AM	35	0.82	29.52
12/04/01	08:46:31 AM	35.5	0.76	29.58
12/04/01	08:47:01 AM	36	1.10	29.24
12/04/01	08:47:31 AM	36.5	1.16	29.18
12/04/01	08:48:01 AM	37	0.80	29.54
12/04/01	08:48:31 AM	37.5	1.56	28.78
12/04/01	08:49:01 AM	38	1.26	29.08
12/04/01	08:49:31 AM	38.5	1.44	28.90
12/04/01	08:50:01 AM	39	1.22	29.12
12/04/01	08:50:31 AM	39.5	1.73	28.61
12/04/01	08:51:01 AM	40	1.64	28.70
12/04/01	08:51:31 AM	40.5	1.49	28.85
12/04/01	08:52:01 AM	41	1.79	28.55
12/04/01	08:52:31 AM	41.5	2.28	28.06
12/04/01	08:53:01 AM	42	2.57	27.77
12/04/01	08:53:31 AM	42.5	2.71	27.63
12/04/01	08:54:01 AM	43	2.42	27.92
12/04/01	08:54:31 AM	43.5	2.50	27.84
12/04/01	08:55:01 AM	44	2.66	27.68
12/04/01	08:55:31 AM	44.5	2.52	27.82
12/04/01	08:56:01 AM	45	2.33	28.01
12/04/01	08:56:31 AM	45.5	2.45	27.89
12/04/01	08:57:01 AM	46	2.71	27.63
12/04/01	08:57:31 AM	46.5	2.44	27.90
12/04/01	08:58:01 AM	47	2.49	27.85
12/04/01	08:58:31 AM	47.5	2.27	28.07
12/04/01	08:59:01 AM	48	2.45	27.89
12/04/01	08:59:31 AM	48.5	2.32	28.02
12/04/01	09:00:01 AM	49	2.45	27.89
12/04/01	09:00:31 AM	49.5	2.34	28.00
12/04/01	09:01:01 AM	50	2.57	27.77
12/04/01	09:01:31 AM	50.5	2.45	27.89
12/04/01	09:02:01 AM	51	2.53	27.81
12/04/01	09:02:31 AM	51.5	2.17	28.17
12/04/01	09:03:01 AM	52	2.29	28.05
12/04/01	09:03:31 AM	52.5	2.55	27.79
12/04/01	09:04:01 AM	53	2.41	27.93
12/04/01	09:04:31 AM	53.5	2.50	27.84
12/04/01	09:05:01 AM	54	2.33	28.01
12/04/01	09:05:31 AM	54.5	2.70	27.64

La Gorce Country Club Well No. F-2
Step 1 Drawdown

Date	Time	Elapsed Time (min)	Water Level (ft als)	Drawdown (ft)
12/04/01	09:06:01 AM	55	2.65	27.69
12/04/01	09:06:31 AM	55.5	2.24	28.10
12/04/01	09:07:01 AM	56	2.67	27.67
12/04/01	09:07:31 AM	56.5	2.45	27.89
12/04/01	09:08:01 AM	57	2.41	27.93
12/04/01	09:08:31 AM	57.5	2.42	27.92
12/04/01	09:09:01 AM	58	2.33	28.01
12/04/01	09:09:31 AM	58.5	2.15	28.19
12/04/01	09:10:01 AM	59	2.48	27.86
12/04/01	09:10:31 AM	59.5	2.45	27.89
12/04/01	09:11:01 AM	60	2.48	27.86
12/04/01	09:11:31 AM	60.5	2.20	28.14
12/04/01	09:12:01 AM	61	2.45	27.89
12/04/01	09:12:31 AM	61.5	2.23	28.11
12/04/01	09:13:01 AM	62	1.90	28.44

La Gorce Country Club Well No. F-2
Step 1 Recovery

Date	Time	Elapsed Time (min)	Water Level (ft als)	Drawdown (ft)
12/04/01	09:13:05 AM	0.01	5.55	25.76
12/04/01	09:13:35 AM	0.5	26.67	4.64
12/04/01	09:14:05 AM	1	25.44	5.87
12/04/01	09:14:35 AM	1.5	26.56	4.75
12/04/01	09:15:05 AM	2	27.27	4.04
12/04/01	09:15:35 AM	2.5	27.35	3.96
12/04/01	09:16:05 AM	3	27.89	3.42
12/04/01	09:16:35 AM	3.5	27.44	3.87
12/04/01	09:17:05 AM	4	28.86	2.45
12/04/01	09:17:35 AM	4.5	28.52	2.79
12/04/01	09:18:04 AM	5	29.17	2.14
12/04/01	09:18:34 AM	5.5	28.73	2.58
12/04/01	09:19:04 AM	6	28.93	2.38
12/04/01	09:19:34 AM	6.5	27.97	3.34
12/04/01	09:20:04 AM	7	28.95	2.36
12/04/01	09:20:34 AM	7.5	28.83	2.48
12/04/01	09:21:04 AM	8	29.20	2.11
12/04/01	09:21:34 AM	8.5	29.44	1.87
12/04/01	09:22:04 AM	9	29.23	2.08
12/04/01	09:22:34 AM	9.5	29.44	1.87
12/04/01	09:23:04 AM	10	29.38	1.93
12/04/01	09:23:34 AM	10.5	29.45	1.86
12/04/01	09:24:04 AM	11	29.52	1.79
12/04/01	09:24:34 AM	11.5	29.57	1.74
12/04/01	09:25:04 AM	12	29.62	1.69
12/04/01	09:25:34 AM	12.5	29.65	1.66
12/04/01	09:26:04 AM	13	29.70	1.61
12/04/01	09:26:34 AM	13.5	29.77	1.54
12/04/01	09:27:04 AM	14	29.77	1.54
12/04/01	09:27:34 AM	14.5	29.82	1.49
12/04/01	09:28:04 AM	15	29.87	1.44
12/04/01	09:28:34 AM	15.5	29.87	1.44
12/04/01	09:29:04 AM	16	29.95	1.36
12/04/01	09:29:34 AM	16.5	30.22	1.09
12/04/01	09:30:04 AM	17	30.07	1.24
12/04/01	09:30:34 AM	17.5	30.12	1.19
12/04/01	09:31:04 AM	18	30.11	1.20
12/04/01	09:31:34 AM	18.5	30.16	1.15
12/04/01	09:32:04 AM	19	30.20	1.11
12/04/01	09:32:34 AM	19.5	30.24	1.07
12/04/01	09:33:04 AM	20	30.29	1.02
12/04/01	09:33:34 AM	20.5	30.28	1.03
12/04/01	09:34:04 AM	21	30.34	0.97
12/04/01	09:34:34 AM	21.5	30.34	0.97
12/04/01	09:35:04 AM	22	30.34	0.97
12/04/01	09:35:34 AM	22.5	30.38	0.93
12/04/01	09:36:04 AM	23	30.38	0.93
12/04/01	09:36:34 AM	23.5	30.45	0.86
12/04/01	09:37:04 AM	24	30.43	0.88
12/04/01	09:37:34 AM	24.5	30.47	0.84
12/04/01	09:38:04 AM	25	30.51	0.80
12/04/01	09:38:34 AM	25.5	30.53	0.78
12/04/01	09:39:04 AM	26	30.57	0.74
12/04/01	09:39:34 AM	26.5	30.57	0.74
12/04/01	09:40:04 AM	27	30.59	0.72

La Gorce Country Club Well No. F-2
Step 1 Recovery

Date	Time	Elapsed Time (min)	Water Level (ft als)	Drawdown (ft)
12/04/01	09:40:34 AM	27.5	30.61	0.70
12/04/01	09:41:04 AM	28	30.63	0.68
12/04/01	09:41:34 AM	28.5	30.64	0.67
12/04/01	09:42:04 AM	29	30.66	0.65
12/04/01	09:42:34 AM	29.5	30.66	0.65
12/04/01	09:43:04 AM	30	30.68	0.63
12/04/01	09:43:34 AM	30.5	30.71	0.60
12/04/01	09:44:04 AM	31	30.75	0.56
12/04/01	09:44:34 AM	31.5	30.75	0.56
12/04/01	09:45:04 AM	32	30.75	0.56
12/04/01	09:45:34 AM	32.5	30.76	0.55
12/04/01	09:46:04 AM	33	30.78	0.53
12/04/01	09:46:34 AM	33.5	30.80	0.51
12/04/01	09:47:04 AM	34	30.81	0.50
12/04/01	09:47:34 AM	34.5	30.84	0.47
12/04/01	09:48:04 AM	35	30.84	0.47
12/04/01	09:48:34 AM	35.5	30.88	0.43
12/04/01	09:49:04 AM	36	30.89	0.42
12/04/01	09:49:34 AM	36.5	30.89	0.42
12/04/01	09:50:04 AM	37	30.91	0.40
12/04/01	09:50:34 AM	37.5	30.91	0.40
12/04/01	09:51:04 AM	38	30.92	0.39
12/04/01	09:51:34 AM	38.5	30.96	0.35
12/04/01	09:52:04 AM	39	30.97	0.34
12/04/01	09:52:34 AM	39.5	31.00	0.31
12/04/01	09:53:04 AM	40	30.99	0.32
12/04/01	09:53:34 AM	40.5	31.00	0.31
12/04/01	09:54:04 AM	41	31.01	0.30
12/04/01	09:54:34 AM	41.5	31.00	0.31
12/04/01	09:55:04 AM	42	31.05	0.26
12/04/01	09:55:34 AM	42.5	31.05	0.26
12/04/01	09:56:04 AM	43	31.10	0.21
12/04/01	09:56:34 AM	43.5	31.09	0.22
12/04/01	09:57:04 AM	44	31.09	0.22
12/04/01	09:57:34 AM	44.5	31.12	0.19
12/04/01	09:58:04 AM	45	31.13	0.18
12/04/01	09:58:34 AM	45.5	31.13	0.18
12/04/01	09:59:04 AM	46	31.18	0.13
12/04/01	09:59:34 AM	46.5	31.18	0.13
12/04/01	10:00:04 AM	47	31.18	0.13
12/04/01	10:00:34 AM	47.5	31.16	0.15
12/04/01	10:01:04 AM	48	31.18	0.13
12/04/01	10:01:34 AM	48.5	31.22	0.09
12/04/01	10:02:04 AM	49	31.22	0.09
12/04/01	10:02:34 AM	49.5	31.21	0.10
12/04/01	10:03:04 AM	50	31.21	0.10
12/04/01	10:03:34 AM	50.5	31.25	0.06
12/04/01	10:04:04 AM	51	31.29	0.02
12/04/01	10:04:34 AM	51.5	31.26	0.05
12/04/01	10:05:04 AM	52	31.30	0.01
12/04/01	10:05:34 AM	52.5	31.30	0.01
12/04/01	10:06:04 AM	53	31.30	0.01
12/04/01	10:06:34 AM	53.5	31.34	-0.03
12/04/01	10:07:04 AM	54	31.33	-0.02
12/04/01	10:07:34 AM	54.5	31.34	-0.03

La Gorce Country Club Well No. F-2
Step 1 Recovery

Date	Time	Elapsed Time (min)	Water Level (ft als)	Drawdown (ft)
12/04/01	10:08:04 AM	55	31.35	-0.04
12/04/01	10:08:34 AM	55.5	31.35	-0.04
12/04/01	10:09:04 AM	56	31.38	-0.07
12/04/01	10:09:34 AM	56.5	31.41	-0.10
12/04/01	10:10:04 AM	57	31.38	-0.07
12/04/01	10:10:34 AM	57.5	31.43	-0.12
12/04/01	10:11:04 AM	58	31.42	-0.11
12/04/01	10:11:34 AM	58.5	31.42	-0.11
12/04/01	10:12:04 AM	59	31.39	-0.08
12/04/01	10:12:34 AM	59.5	31.31	0.00

La Gorce Country Club Well No. F-2
Step 2 Drawdown

Date	Time	Elapsed Time (min)	Water Level (ft als)	Drawdown (ft)
12/04/01	10:12:36 AM	0	31.25	0.00
12/04/01	10:13:06 AM	0.5	7.96	23.29
12/04/01	10:13:36 AM	1	-22.60	53.85
12/04/01	10:14:06 AM	1.5	-30.67	61.92
12/04/01	10:14:36 AM	2	-35.22	66.47
12/04/01	10:15:06 AM	2.5	-51.28	82.53
12/04/01	10:15:36 AM	3	-52.42	83.67
12/04/01	10:16:06 AM	3.5	-51.32	82.57
12/04/01	10:16:36 AM	4	-51.03	82.28
12/04/01	10:17:06 AM	4.5	-46.82	78.07
12/04/01	10:17:36 AM	5	-46.30	77.55
12/04/01	10:18:06 AM	5.5	-39.29	70.54
12/04/01	10:18:36 AM	6	-38.63	69.88
12/04/01	10:19:06 AM	6.5	-34.31	65.56
12/04/01	10:19:36 AM	7	-34.06	65.31
12/04/01	10:20:06 AM	7.5	-32.88	64.13
12/04/01	10:20:36 AM	8	-31.58	62.83
12/04/01	10:21:06 AM	8.5	-31.51	62.76
12/04/01	10:21:36 AM	9	-32.67	63.92
12/04/01	10:22:06 AM	9.5	-31.66	62.91
12/04/01	10:22:36 AM	10	-32.99	64.24
12/04/01	10:23:06 AM	10.5	-31.61	62.86
12/04/01	10:23:36 AM	11	-31.56	62.81
12/04/01	10:24:06 AM	11.5	-31.96	63.21
12/04/01	10:24:36 AM	12	-32.21	63.46
12/04/01	10:25:06 AM	12.5	-32.63	63.88
12/04/01	10:25:36 AM	13	-32.38	63.63
12/04/01	10:26:06 AM	13.5	-32.76	64.01
12/04/01	10:26:36 AM	14	-32.84	64.09
12/04/01	10:27:06 AM	14.5	-33.50	64.75
12/04/01	10:27:36 AM	15	-32.99	64.24
12/04/01	10:28:06 AM	15.5	-33.77	65.02
12/04/01	10:28:36 AM	16	-33.21	64.46
12/04/01	10:29:06 AM	16.5	-33.74	64.99
12/04/01	10:29:36 AM	17	-34.16	65.41
12/04/01	10:30:06 AM	17.5	-33.46	64.71
12/04/01	10:30:36 AM	18	-33.37	64.62
12/04/01	10:31:06 AM	18.5	-33.68	64.93
12/04/01	10:31:36 AM	19	-34.22	65.47
12/04/01	10:32:06 AM	19.5	-34.29	65.54
12/04/01	10:32:36 AM	20	-34.54	65.79
12/04/01	10:33:06 AM	20.5	-34.31	65.56
12/04/01	10:33:36 AM	21	-34.69	65.94
12/04/01	10:34:06 AM	21.5	-35.01	66.26
12/04/01	10:34:36 AM	22	-34.21	65.46
12/04/01	10:35:06 AM	22.5	-34.44	65.69
12/04/01	10:35:36 AM	23	-35.09	66.34
12/04/01	10:36:06 AM	23.5	-33.88	65.13
12/04/01	10:36:36 AM	24	-33.96	65.21
12/04/01	10:37:06 AM	24.5	-33.92	65.17
12/04/01	10:37:36 AM	25	-34.96	66.21
12/04/01	10:38:06 AM	25.5	-34.68	65.93
12/04/01	10:38:36 AM	26	-34.85	66.10
12/04/01	10:39:06 AM	26.5	-35.06	66.31
12/04/01	10:39:36 AM	27	-34.08	65.33

La Gorce Country Club Well No. F-2
Step 2 Drawdown

Date	Time	Elapsed Time (min)	Water Level (ft als)	Drawdown (ft)
12/04/01	10:40:06 AM	27.5	-33.88	65.13
12/04/01	10:40:36 AM	28	-34.17	65.42
12/04/01	10:41:06 AM	28.5	-34.04	65.29
12/04/01	10:41:36 AM	29	-34.17	65.42
12/04/01	10:42:06 AM	29.5	-35.48	66.73
12/04/01	10:42:36 AM	30	-35.30	66.55
12/04/01	10:43:06 AM	30.5	-35.57	66.82
12/04/01	10:43:36 AM	31	-35.81	67.06
12/04/01	10:44:06 AM	31.5	-35.06	66.31
12/04/01	10:44:36 AM	32	-34.63	65.88
12/04/01	10:45:06 AM	32.5	-34.30	65.55
12/04/01	10:45:36 AM	33	-35.80	67.05
12/04/01	10:46:06 AM	33.5	-35.60	66.85
12/04/01	10:46:36 AM	34	-34.89	66.14
12/04/01	10:47:06 AM	34.5	-35.51	66.76
12/04/01	10:47:36 AM	35	-35.59	66.84
12/04/01	10:48:06 AM	35.5	-35.76	67.01
12/04/01	10:48:36 AM	36	-35.89	67.14
12/04/01	10:49:06 AM	36.5	-35.66	66.91
12/04/01	10:49:36 AM	37	-35.70	66.95
12/04/01	10:50:06 AM	37.5	-35.30	66.55
12/04/01	10:50:36 AM	38	-34.64	65.89
12/04/01	10:51:06 AM	38.5	-35.80	67.05
12/04/01	10:51:36 AM	39	-35.47	66.72
12/04/01	10:52:06 AM	39.5	-34.90	66.15
12/04/01	10:52:36 AM	40	-34.92	66.17
12/04/01	10:53:06 AM	40.5	-35.56	66.81
12/04/01	10:53:36 AM	41	-35.56	66.81
12/04/01	10:54:06 AM	41.5	-34.84	66.09
12/04/01	10:54:36 AM	42	-35.48	66.73
12/04/01	10:55:06 AM	42.5	-35.76	67.01
12/04/01	10:55:36 AM	43	-35.48	66.73
12/04/01	10:56:06 AM	43.5	-35.22	66.47
12/04/01	10:56:36 AM	44	-34.97	66.22
12/04/01	10:57:06 AM	44.5	-35.68	66.93
12/04/01	10:57:36 AM	45	-35.52	66.77
12/04/01	10:58:06 AM	45.5	-35.43	66.68
12/04/01	10:58:36 AM	46	-35.61	66.86
12/04/01	10:59:06 AM	46.5	-35.51	66.76
12/04/01	10:59:36 AM	47	-35.73	66.98
12/04/01	11:00:06 AM	47.5	-36.43	67.68
12/04/01	11:00:36 AM	48	-36.12	67.37
12/04/01	11:01:06 AM	48.5	-35.31	66.56
12/04/01	11:01:36 AM	49	-36.03	67.28
12/04/01	11:02:06 AM	49.5	-35.57	66.82
12/04/01	11:02:36 AM	50	-35.36	66.61
12/04/01	11:03:06 AM	50.5	-35.35	66.60
12/04/01	11:03:36 AM	51	-35.56	66.81
12/04/01	11:04:06 AM	51.5	-35.52	66.77
12/04/01	11:04:36 AM	52	-35.45	66.70
12/04/01	11:05:06 AM	52.5	-35.78	67.03
12/04/01	11:05:36 AM	53	-35.94	67.19
12/04/01	11:06:06 AM	53.5	-36.03	67.28
12/04/01	11:06:36 AM	54	-36.16	67.41
12/04/01	11:07:06 AM	54.5	-35.93	67.18

La Gorce Country Club Well No. F-2
Step 2 Drawdown

Date	Time	Elapsed Time (min)	Water Level (ft als)	Drawdown (ft)
12/04/01	11:07:36 AM	55	-35.65	66.90
12/04/01	11:08:06 AM	55.5	-35.53	66.78
12/04/01	11:08:36 AM	56	-36.52	67.77
12/04/01	11:09:06 AM	56.5	-36.08	67.33

La Gorce Country Club Well No. F-2
Step 2 Recovery

Date	Time	Elapsed Time (min)	Water Level (ft als)	Drawdown (ft)
12/04/01	11:09:16 AM	0	-33.98	64.48
12/04/01	11:09:46 AM	0.5	0.44	30.06
12/04/01	11:10:16 AM	1	19.16	11.34
12/04/01	11:10:46 AM	1.5	21.00	9.50
12/04/01	11:11:16 AM	2	22.34	8.16
12/04/01	11:11:46 AM	2.5	23.15	7.35
12/04/01	11:12:16 AM	3	23.64	6.86
12/04/01	11:12:46 AM	3.5	24.15	6.35
12/04/01	11:13:16 AM	4	24.57	5.93
12/04/01	11:13:46 AM	4.5	24.86	5.64
12/04/01	11:14:16 AM	5	25.15	5.35
12/04/01	11:14:46 AM	5.5	25.41	5.09
12/04/01	11:15:16 AM	6	25.70	4.80
12/04/01	11:15:46 AM	6.5	25.88	4.62
12/04/01	11:16:16 AM	7	26.17	4.33
12/04/01	11:16:46 AM	7.5	26.38	4.12
12/04/01	11:17:16 AM	8	26.42	4.08
12/04/01	11:17:46 AM	8.5	26.52	3.98
12/04/01	11:18:16 AM	9	26.85	3.65
12/04/01	11:18:46 AM	9.5	26.70	3.80
12/04/01	11:19:16 AM	10	27.06	3.44
12/04/01	11:19:46 AM	10.5	27.08	3.42
12/04/01	11:20:16 AM	11	27.14	3.36
12/04/01	11:20:46 AM	11.5	27.35	3.15
12/04/01	11:21:16 AM	12	27.60	2.90
12/04/01	11:21:46 AM	12.5	27.56	2.94
12/04/01	11:22:16 AM	13	27.72	2.78
12/04/01	11:22:46 AM	13.5	27.52	2.98
12/04/01	11:23:16 AM	14	27.89	2.61
12/04/01	11:23:46 AM	14.5	27.98	2.52
12/04/01	11:24:16 AM	15	27.95	2.55
12/04/01	11:24:46 AM	15.5	28.07	2.43
12/04/01	11:25:16 AM	16	28.14	2.36
12/04/01	11:25:46 AM	16.5	28.16	2.34
12/04/01	11:26:16 AM	17	28.26	2.24
12/04/01	11:26:46 AM	17.5	28.32	2.18
12/04/01	11:27:16 AM	18	28.39	2.11
12/04/01	11:27:46 AM	18.5	28.41	2.09
12/04/01	11:28:16 AM	19	28.48	2.02
12/04/01	11:28:46 AM	19.5	28.55	1.95
12/04/01	11:29:16 AM	20	28.58	1.92
12/04/01	11:29:46 AM	20.5	28.64	1.86
12/04/01	11:30:16 AM	21	28.69	1.81
12/04/01	11:30:46 AM	21.5	28.73	1.77
12/04/01	11:31:16 AM	22	28.78	1.72
12/04/01	11:31:46 AM	22.5	28.79	1.71
12/04/01	11:32:16 AM	23	28.83	1.67
12/04/01	11:32:46 AM	23.5	28.90	1.60
12/04/01	11:33:16 AM	24	28.97	1.53
12/04/01	11:33:46 AM	24.5	28.98	1.52
12/04/01	11:34:16 AM	25	29.06	1.44
12/04/01	11:34:46 AM	25.5	29.07	1.43
12/04/01	11:35:16 AM	26	29.11	1.39
12/04/01	11:35:46 AM	26.5	29.15	1.35
12/04/01	11:36:16 AM	27	29.16	1.34

La Gorce Country Club Well No. F-2
Step 2 Recovery

Date	Time	Elapsed Time (min)	Water Level (ft als)	Drawdown (ft)
12/04/01	11:36:46 AM	27.5	29.21	1.29
12/04/01	11:37:16 AM	28	29.24	1.26
12/04/01	11:37:46 AM	28.5	29.27	1.23
12/04/01	11:38:16 AM	29	29.29	1.21
12/04/01	11:38:46 AM	29.5	29.33	1.17
12/04/01	11:39:16 AM	30	29.37	1.13
12/04/01	11:39:46 AM	30.5	29.40	1.10
12/04/01	11:40:16 AM	31	29.42	1.08
12/04/01	11:40:46 AM	31.5	29.46	1.04
12/04/01	11:41:16 AM	32	29.49	1.01
12/04/01	11:41:46 AM	32.5	29.53	0.97
12/04/01	11:42:16 AM	33	29.56	0.94
12/04/01	11:42:46 AM	33.5	29.57	0.93
12/04/01	11:43:16 AM	34	29.59	0.91
12/04/01	11:43:46 AM	34.5	29.61	0.89
12/04/01	11:44:16 AM	35	29.66	0.84
12/04/01	11:44:46 AM	35.5	29.69	0.81
12/04/01	11:45:16 AM	36	29.67	0.83
12/04/01	11:45:46 AM	36.5	29.74	0.76
12/04/01	11:46:16 AM	37	29.75	0.75
12/04/01	11:46:46 AM	37.5	29.77	0.73
12/04/01	11:47:16 AM	38	29.78	0.72
12/04/01	11:47:46 AM	38.5	29.82	0.68
12/04/01	11:48:16 AM	39	29.83	0.67
12/04/01	11:48:46 AM	39.5	29.87	0.63
12/04/01	11:49:16 AM	40	29.87	0.63
12/04/01	11:49:46 AM	40.5	29.90	0.60
12/04/01	11:50:16 AM	41	29.94	0.56
12/04/01	11:50:46 AM	41.5	29.96	0.54
12/04/01	11:51:16 AM	42	29.96	0.54
12/04/01	11:51:46 AM	42.5	30.00	0.50
12/04/01	11:52:16 AM	43	30.01	0.49
12/04/01	11:52:46 AM	43.5	30.01	0.49
12/04/01	11:53:16 AM	44	30.03	0.47
12/04/01	11:53:46 AM	44.5	30.05	0.45
12/04/01	11:54:16 AM	45	30.08	0.42
12/04/01	11:54:46 AM	45.5	30.08	0.42
12/04/01	11:55:16 AM	46	30.11	0.39
12/04/01	11:55:46 AM	46.5	30.13	0.37
12/04/01	11:56:16 AM	47	30.16	0.34
12/04/01	11:56:46 AM	47.5	30.19	0.31
12/04/01	11:57:16 AM	48	30.17	0.33
12/04/01	11:57:46 AM	48.5	30.21	0.29
12/04/01	11:58:16 AM	49	30.21	0.29
12/04/01	11:58:46 AM	49.5	30.21	0.29
12/04/01	11:59:16 AM	50	30.22	0.28
12/04/01	11:59:46 AM	50.5	30.26	0.24
12/04/01	12:00:16 PM	51	30.28	0.22
12/04/01	12:00:46 PM	51.5	30.36	0.14
12/04/01	12:01:16 PM	52	30.32	0.18
12/04/01	12:01:46 PM	52.5	30.33	0.17
12/04/01	12:02:16 PM	53	30.36	0.14
12/04/01	12:02:46 PM	53.5	30.33	0.17
12/04/01	12:03:16 PM	54	30.38	0.12
12/04/01	12:03:46 PM	54.5	30.38	0.12

La Gorce Country Club Well No. F-2
Step 2 Recovery

Date	Time	Elapsed Time (min)	Water Level (ft als)	Drawdown (ft)
12/04/01	12:04:16 PM	55	30.41	0.09
12/04/01	12:04:46 PM	55.5	30.42	0.08
12/04/01	12:05:16 PM	56	30.43	0.07
12/04/01	12:05:46 PM	56.5	30.42	0.08
12/04/01	12:06:16 PM	57	30.45	0.05
12/04/01	12:06:46 PM	57.5	30.46	0.04
12/04/01	12:07:16 PM	58	30.47	0.03
12/04/01	12:07:46 PM	58.5	30.47	0.03
12/04/01	12:08:16 PM	59	30.50	0.00
12/04/01	12:08:46 PM	59.5	30.53	-0.03
12/04/01	12:09:16 PM	60	30.55	-0.05
12/04/01	12:09:46 PM	60.5	30.55	-0.05
12/04/01	12:10:16 PM	61	30.55	-0.05
12/04/01	12:10:46 PM	61.5	30.57	-0.07
12/04/01	12:11:16 PM	62	30.62	-0.12
12/04/01	12:11:46 PM	62.5	30.66	-0.16
12/04/01	12:12:16 PM	63	30.5	0
12/04/01	12:12:46 PM	63.5	30.47	0.03
12/04/01	12:13:16 PM	64	30.5	0

La Gorce Country Club Well No. F-2
Step 3 Drawdown

Date	Time	Elapsed Time (min)	Water Level (ft als)	Drawdown (ft)
12/04/01	12:41:04 PM	27.5	-50.56	81.06
12/04/01	12:41:34 PM	28	-50.54	81.04
12/04/01	12:42:04 PM	28.5	-50.50	81.00
12/04/01	12:42:34 PM	29	-50.54	81.04
12/04/01	12:43:04 PM	29.5	-50.54	81.04
12/04/01	12:43:34 PM	30	-50.52	81.02
12/04/01	12:44:04 PM	30.5	-50.58	81.08
12/04/01	12:44:34 PM	31	-50.52	81.02
12/04/01	12:45:04 PM	31.5	-50.54	81.04
12/04/01	12:45:34 PM	32	-50.57	81.07
12/04/01	12:46:04 PM	32.5	-50.52	81.02
12/04/01	12:46:34 PM	33	-50.50	81.00
12/04/01	12:47:04 PM	33.5	-50.50	81.00
12/04/01	12:47:34 PM	34	-50.46	80.96
12/04/01	12:48:04 PM	34.5	-50.52	81.02
12/04/01	12:48:34 PM	35	-50.50	81.00
12/04/01	12:49:04 PM	35.5	-50.50	81.00
12/04/01	12:49:34 PM	36	-50.49	80.99
12/04/01	12:50:04 PM	36.5	-50.50	81.00
12/04/01	12:50:34 PM	37	-50.50	81.00
12/04/01	12:51:04 PM	37.5	-50.53	81.03
12/04/01	12:51:34 PM	38	-50.52	81.02
12/04/01	12:52:04 PM	38.5	-50.52	81.02
12/04/01	12:52:34 PM	39	-50.53	81.03
12/04/01	12:53:04 PM	39.5	-50.56	81.06
12/04/01	12:53:34 PM	40	-50.53	81.03
12/04/01	12:54:04 PM	40.5	-50.52	81.02
12/04/01	12:54:34 PM	41	-50.52	81.02
12/04/01	12:55:04 PM	41.5	-50.48	80.98
12/04/01	12:55:34 PM	42	-50.52	81.02
12/04/01	12:56:04 PM	42.5	-50.52	81.02
12/04/01	12:56:34 PM	43	-50.50	81.00
12/04/01	12:57:04 PM	43.5	-50.50	81.00
12/04/01	12:57:34 PM	44	-50.52	81.02
12/04/01	12:58:04 PM	44.5	-50.53	81.03
12/04/01	12:58:34 PM	45	-50.56	81.06
12/04/01	12:59:04 PM	45.5	-50.52	81.02
12/04/01	12:59:34 PM	46	-50.52	81.02
12/04/01	01:00:04 PM	46.5	-50.53	81.03
12/04/01	01:00:34 PM	47	-50.53	81.03
12/04/01	01:01:04 PM	47.5	-50.53	81.03
12/04/01	01:01:34 PM	48	-50.50	81.00
12/04/01	01:02:04 PM	48.5	-50.50	81.00
12/04/01	01:02:34 PM	49	-50.49	80.99
12/04/01	01:03:04 PM	49.5	-50.53	81.03
12/04/01	01:03:34 PM	50	-50.53	81.03
12/04/01	01:04:04 PM	50.5	-50.52	81.02
12/04/01	01:04:34 PM	51	-50.50	81.00
12/04/01	01:05:04 PM	51.5	-50.53	81.03
12/04/01	01:05:34 PM	52	-50.53	81.03
12/04/01	01:06:04 PM	52.5	-50.54	81.04
12/04/01	01:06:34 PM	53	-50.53	81.03
12/04/01	01:07:04 PM	53.5	-50.50	81.00
12/04/01	01:07:34 PM	54	-50.54	81.04
12/04/01	01:08:04 PM	54.5	-50.54	81.04

La Gorce Country Club Well No. F-2
Step 3 Drawdown

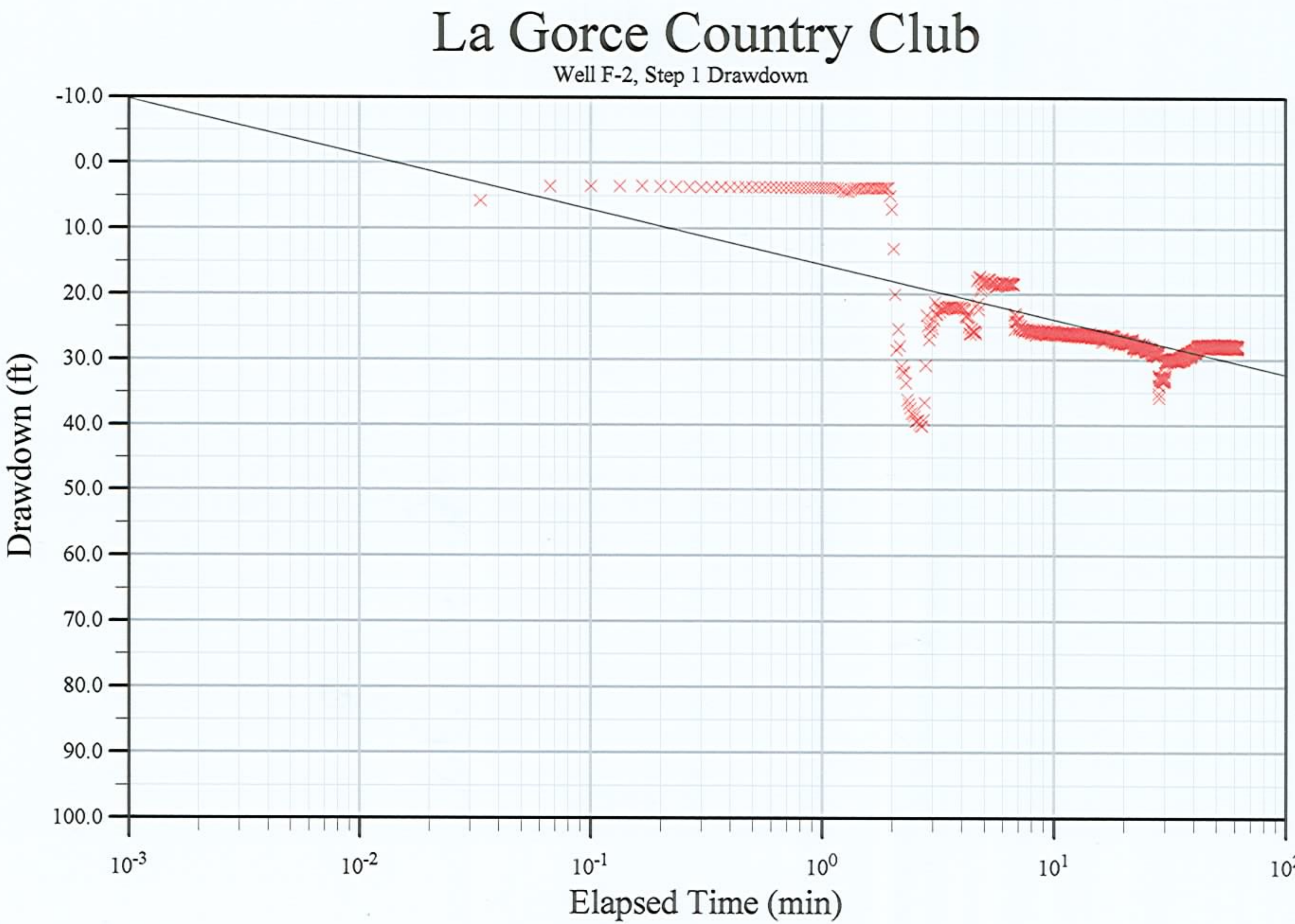
Date	Time	Elapsed Time (min)	Water Level (ft als)	Drawdown (ft)
12/04/01	01:08:34 PM	55	-50.54	81.04
12/04/01	01:09:04 PM	55.5	-50.52	81.02
12/04/01	01:09:34 PM	56	-50.56	81.06
12/04/01	01:10:04 PM	56.5	-50.52	81.02
12/04/01	01:10:34 PM	57	-50.52	81.02
12/04/01	01:11:04 PM	57.5	-50.53	81.03
12/04/01	01:11:34 PM	58	-50.53	81.03

La Gorce Country Club Well No. F-2
Step 3 Drawdown

Date	Time	Elapsed Time (min)	Water Level (ft als)	Drawdown (ft)
12/04/01	12:13:34 PM	0	30.50	0.00
12/04/01	12:14:04 PM	0.5	-16.69	47.19
12/04/01	12:14:34 PM	1	-36.07	66.57
12/04/01	12:15:04 PM	1.5	-44.09	74.59
12/04/01	12:15:34 PM	2	-50.71	81.21
12/04/01	12:16:04 PM	2.5	-51.54	82.04
12/04/01	12:16:34 PM	3	-51.16	81.66
12/04/01	12:17:04 PM	3.5	-50.71	81.21
12/04/01	12:17:34 PM	4	-48.01	78.51
12/04/01	12:18:04 PM	4.5	-50.79	81.29
12/04/01	12:18:34 PM	5	-50.75	81.25
12/04/01	12:19:04 PM	5.5	-50.87	81.37
12/04/01	12:19:34 PM	6	-50.80	81.30
12/04/01	12:20:04 PM	6.5	-50.78	81.28
12/04/01	12:20:34 PM	7	-50.71	81.21
12/04/01	12:21:04 PM	7.5	-50.71	81.21
12/04/01	12:21:34 PM	8	-50.77	81.27
12/04/01	12:22:04 PM	8.5	-50.79	81.29
12/04/01	12:22:34 PM	9	-50.75	81.25
12/04/01	12:23:04 PM	9.5	-50.77	81.27
12/04/01	12:23:34 PM	10	-50.74	81.24
12/04/01	12:24:04 PM	10.5	-50.74	81.24
12/04/01	12:24:34 PM	11	-50.74	81.24
12/04/01	12:25:04 PM	11.5	-50.71	81.21
12/04/01	12:25:34 PM	12	-50.74	81.24
12/04/01	12:26:04 PM	12.5	-50.73	81.23
12/04/01	12:26:34 PM	13	-50.67	81.17
12/04/01	12:27:04 PM	13.5	-50.70	81.20
12/04/01	12:27:34 PM	14	-50.69	81.19
12/04/01	12:28:04 PM	14.5	-50.69	81.19
12/04/01	12:28:34 PM	15	-50.69	81.19
12/04/01	12:29:04 PM	15.5	-50.67	81.17
12/04/01	12:29:34 PM	16	-50.70	81.20
12/04/01	12:30:04 PM	16.5	-50.69	81.19
12/04/01	12:30:34 PM	17	-50.67	81.17
12/04/01	12:31:04 PM	17.5	-50.65	81.15
12/04/01	12:31:34 PM	18	-50.67	81.17
12/04/01	12:32:04 PM	18.5	-50.66	81.16
12/04/01	12:32:34 PM	19	-50.66	81.16
12/04/01	12:33:04 PM	19.5	-50.65	81.15
12/04/01	12:33:34 PM	20	-50.61	81.11
12/04/01	12:34:04 PM	20.5	-50.57	81.07
12/04/01	12:34:34 PM	21	-50.59	81.09
12/04/01	12:35:04 PM	21.5	-50.58	81.08
12/04/01	12:35:34 PM	22	-50.61	81.11
12/04/01	12:36:04 PM	22.5	-50.59	81.09
12/04/01	12:36:34 PM	23	-50.58	81.08
12/04/01	12:37:04 PM	23.5	-50.58	81.08
12/04/01	12:37:34 PM	24	-50.57	81.07
12/04/01	12:38:04 PM	24.5	-50.57	81.07
12/04/01	12:38:34 PM	25	-50.56	81.06
12/04/01	12:39:04 PM	25.5	-50.56	81.06
12/04/01	12:39:34 PM	26	-50.56	81.06
12/04/01	12:40:04 PM	26.5	-50.54	81.04
12/04/01	12:40:34 PM	27	-50.53	81.03

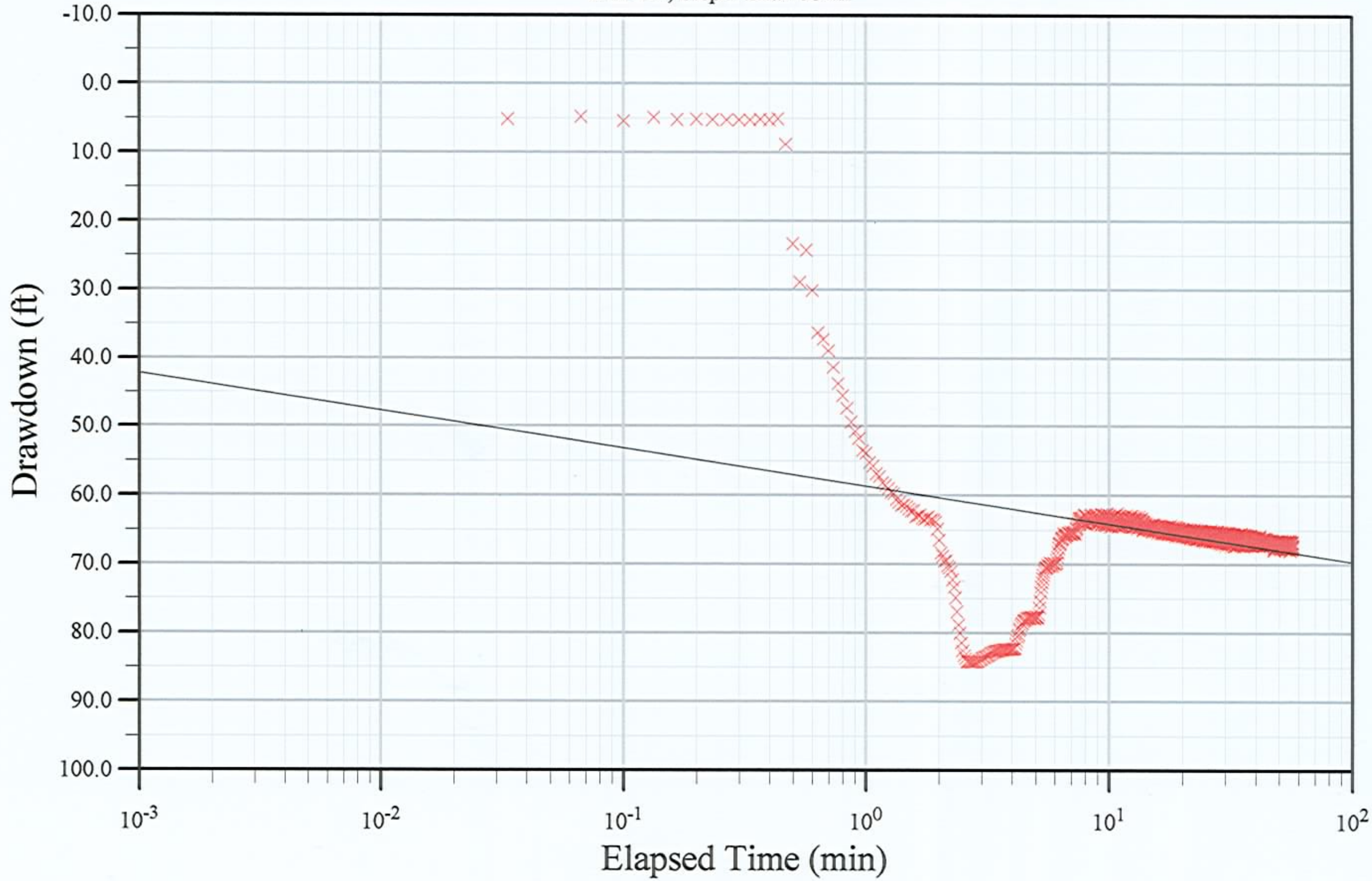
APPENDIX E

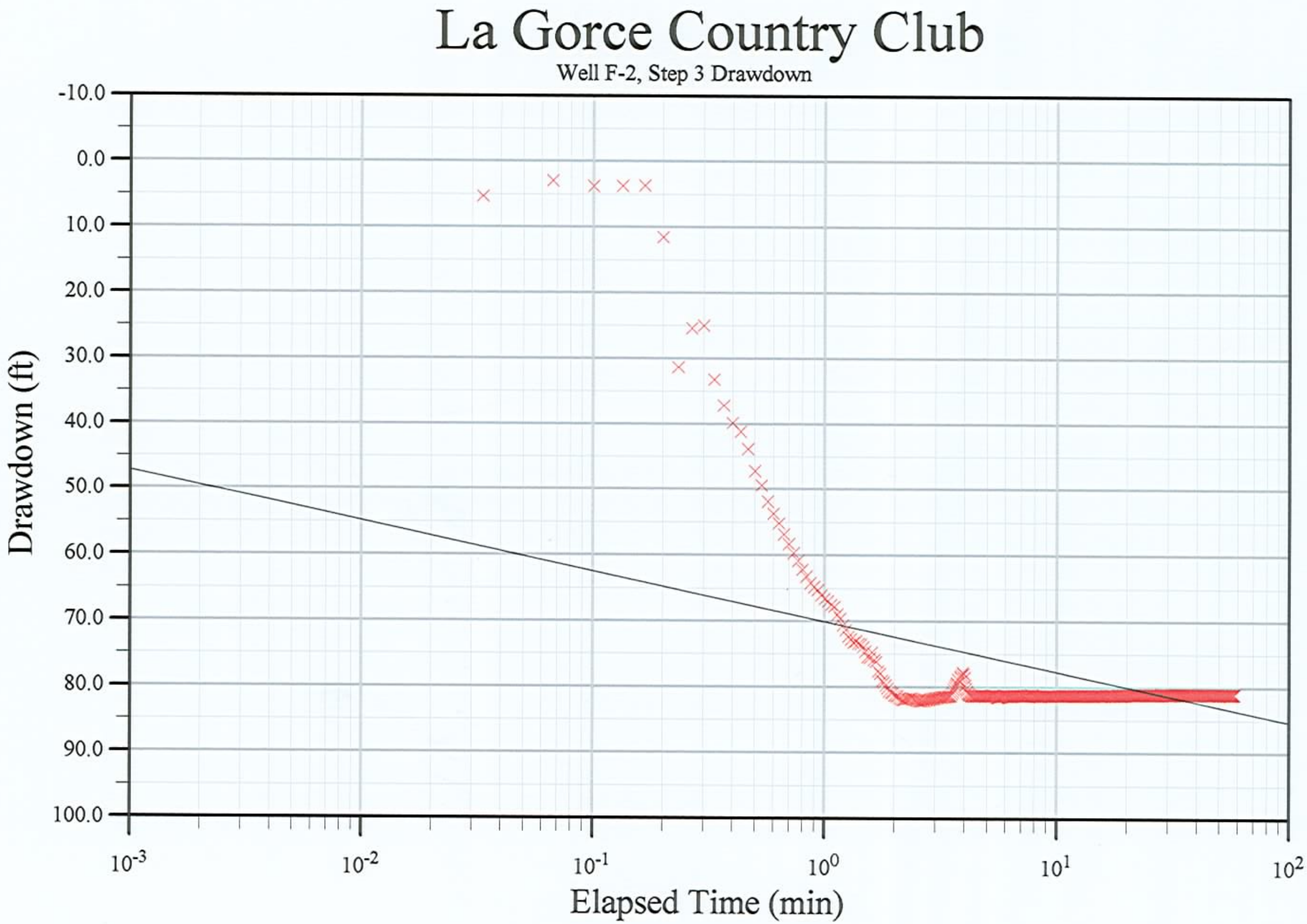
STEP-DRAWDOWN GRAPHS


La Gorce Country Club
Well F-2, Step 1 Drawdown
Drawdown (ft)
-10.0
0.0
10.0
20.0
30.0
40.0
50.0
60.0
70.0
80.0
90.0
100.0
10^{-3}
10^{-2}
10^{-1}
10^{0}
10^{1}
10^{2}
Elapsed Time (min)

La Gorce Country Club

Well F-2, Step 2 Drawdown




La Gorce Country Club
Well F-2, Step 3 Drawdown
Drawdown (ft)
-10.0
0.0
10.0
20.0
30.0
40.0
50.0
60.0
70.0
80.0
90.0
100.0
10^{-3}
10^{-2}
10^{-1}
10^{0}
10^{1}
10^{2}
Elapsed Time (min)

APPENDIX F

ENVIRODYNE WATER QUALITY RESULTS

Envirodyne Inc.

4805 N.W. 2nd Avenue
Boca Raton, FL 33431
561-989-5225
edyne@bellsouth.net

CERTIFICATE OF ANALYSIS

Gerhardt M. Witt & Associates, Inc.
1495 Forest Hill Blvd Suite F
West Palm Beach, FL 33406-6073

January 7, 2002
Report: 2001/12053
Sample No: 2001/12053- 1

Attention: Mike Caglioni

Project: 68-2-150 La Gorce Country Club
5685 Alton Road Miami Beach, FL

SAMPLE ID: Production Well F-2

Collected by: Bevin L. Morris

Collected on: 12/04/01
Received on: 12/04/01

PARAMETER	RESULT	METHOD	DL UNITS	DATE	ANALYST
Aluminum	BDL	200.7	0.10 mg/L	12/05/01	YJC
Aluminum, Dissolved	BDL	200.7	0.10 mg/L	12/05/01	YJC
Arsenic	BDL	200.7	0.010 mg/L	12/05/01	YJC
Barium	0.027	200.7	0.010 mg/L	12/05/01	YJC
Beryllium	BDL	200.7	0.0030 mg/L	12/05/01	YJC
Cadmium	BDL	200.7	0.0040 mg/L	12/05/01	YJC
Calcium	370	200.7	10 mg/L	12/05/01	YJC
Chromium	BDL	200.7	0.010 mg/L	12/05/01	YJC
Copper	BDL	200.7	0.010 mg/L	12/05/01	YJC
Iron	0.058	200.7	0.010 mg/L	12/05/01	YJC
Iron, Dissolved	0.014	200.7	0.010 mg/L	12/06/01	YJC
Lead	BDL	200.7	0.0050 mg/L	12/05/01	YJC
Magnesium	510	200.7	5.0 mg/L	12/05/01	YJC
Manganese	BDL	200.7	0.010 mg/L	12/05/01	YJC
Manganese, Dissolved	BDL	200.7	0.010 mg/L	12/05/01	YJC
Nickel	BDL	200.7	0.010 mg/L	12/05/01	YJC
Potassium	140	200.7	0.50 mg/L	12/05/01	YJC
Selenium	BDL	200.7	0.010 mg/L	12/05/01	YJC

Analysis Performed in Accordance with E.P.A. Methods
Laboratory Certification No. E86188

QA/QC Review
BDL=Below Detection Limit
DL=Detection Limit

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5685 Alton Road Miami Beach, FL

SAMPLE ID: Production Well F-2

Collected by: Bevin L. Morris

Collected on: 12/04/01
Received on: 12/04/01

PARAMETER	RESULT	METHOD	DL UNITS	DATE	ANALYST
Silver	BDL	200.7	0.010 mg/L	12/05/01	YJC
Sodium	5500	200.7	1000 mg/L	12/05/01	YJC
Strontium	22	200.7	0.050 mg/L	12/05/01	YJC
Zinc	0.044	200.7	0.010 mg/L	12/05/01	YJC
Thallium	BDL	200.9	0.0010 mg/L	12/05/01	YJC
Mercury	BDL	245.1	0.00020 mg/L	12/05/01	MHA
Dibromochloropropane (DBCP)	BDL	EPA 504.1	0.020 µg/L	12/10/01	CMM
1,2-Dibromoethane (EDB)	BDL	EPA 504.1	0.020 µg/L	12/10/01	CMM
Benzo(a)pyrene	BDL	EPA 525.2	0.2 µg/L	12/15/01	SPH
Di(2-ethylhexyl)adipate	BDL	EPA 525.2	1.0 µg/L	12/15/01	SPH
Di(2-ethylhexyl)phthalate	BDL	EPA 525.2	1.0 µg/L	12/15/01	SPH
Carbofuran	BDL	EPA 531.1	0.50 µg/L	12/12/01	E84129
Oxamyl (Vydate)	BDL	EPA 531.1	0.50 µg/L	12/12/01	E84129
Glyphosate	BDL	EPA 547	10 µg/L	12/10/01	E84129
Endothall	BDL	EPA 548.1	20 µg/L	12/13/01	E84129
Diquat	BDL	EPA 549.2	1.0 µg/L	12/19/01	E84129
Alkalinity, Total	110	310.1	1.0 mg/L	12/05/01	DNS
Bicarbonate	110	SM2320	0.01 mg/L	12/05/01	DNS

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SAMPLE ID: Production Well F-2

Collected by: Bevin L. Morris

Collected on: 12/04/01
Received on: 12/04/01

PARAMETER	RESULT	METHOD	DL UNITS	DATE	ANALYST
Carbonate	0.31	SM2320	0.010 mg/L	12/05/01	DNS
Chloride	9000	SM4500CL-B	100.0 mg/L	12/05/01	DNS
Chlorine, Free	BDL	330.5	0.1 mg/L	12/04/01	BLM
Color	5	110.2	5 CU	12/05/01	DNS
Specific Conductance (Field)	22400	120.1	µmhos/cm	12/04/01	BLM
Corrosivity, L.S.I.	0.7487	SM2330B	L.I.	12/05/01	DNS
Cyanide, Total	BDL	335.2	0.0040 mg/L	12/05/01	JCB
Dissolved Oxygen	3.4	360.1	0.1 mg/L	12/04/01	BLM
Fluoride	0.56	SM4500F-C	0.10 mg/L	12/06/01	JCB
Gross Alpha	207±312	900.0	1.0 pCi/L	12/12/01	E84088
Hardness, Total	3024	SM2340B	1 mg/L	12/05/01	YJC
Hydrogen Sulfide	0.31	9030/376.2	0.04 mg/L	12/06/01	DNS
Iron, Ferrous	BDL	SM3500FE-D	0.10 mg/L	12/06/01	DNS
Surfactants (as LAS, MW=340)	0.33	425.1	0.010 mg/L	12/05/01	DNS
Nitrite, as Nitrogen	BDL	353.2	0.020 mg/L	12/06/01	DNS
Nitrate, as Nitrogen	0.020	353.2	0.020 mg/L	12/06/01	DNS
Nitrate-Nitrite, as Nitrogen	0.020	353.2	0.020 mg/L	12/06/01	DNS
Odor	4	140.1	1 T.O.N.	12/05/01	DNS

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SAMPLE ID: Production Well F-2

Collected by: Bevin L. Morris

Collected on: 12/04/01
Received on: 12/04/01

PARAMETER	RESULT	METHOD	DL UNITS	DATE	ANALYST
pH (Field)	7.2	150.1	pH Units	12/04/01	BLM
Radium 226	5.2±0.3	903.1	0.1 pCi/L	12/18/01	E84088
Radium 228	1.3±0.5	RA-05	0.5 pCi/L	12/18/01	E84088
Silica, Dissolved	8.8	370.1	2.0 mg/L	12/10/01	JCB
Silica, Total	8.8	SM3120B	0.5 mg/L	12/05/01	YJC
Antimony	BDL	SM3113B	0.0050 mg/L	12/05/01	YJC
Sulfate	1700	375.4	250.0 mg/L	12/06/01	DNS
Total Coliform by MMO-MUG	Absent	SM9223	1 cfu/100 ml	12/04/01	JMJ
Total Dissolved Solids	14000	160.1	10 mg/L	12/04/01	DNS
Temperature	20.7	170.1	°C	12/04/01	BLM
Total Organic Carbon	BDL	415.1	1.0 mg/L	12/12/01	JCB
Phosphorus, Total	0.074	365.4	0.010 mg/L	01/05/02	JDD
Turbidity-Field	1.67	180.1	0.10 ntu	12/04/01	BLM

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January 7, 2002
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Attention: Mike Caglioni

Project: 68-2-150 La Gorce Country Club
5685 Alton Road Miami Beach, FL

SAMPLE ID: Production Well F-2

Collected by: Bevin L. Morris

Collected on: 12/04/01
Received on: 12/04/01

Date of Analysis: 12/08/01
Date of Extraction: 12/06/01

508 ORGANOHALIDE PESTICIDES 62-550.310(2)(c) FAC

PARAMETER	RESULT	DL	UNITS	ANALYST
Chlordane	BDL	0.50	µg/L	CMM
Endrin	BDL	0.10	µg/L	CMM
Heptachlor	BDL	0.10	µg/L	CMM
Heptachlor epoxide	BDL	0.10	µg/L	CMM
Hexachlorobenzene	BDL	0.10	µg/L	CMM
Lindane	BDL	0.10	µg/L	CMM
Methoxychlor	BDL	0.20	µg/L	CMM
Toxaphene	BDL	3.0	µg/L	CMM
PCB 1016	BDL	0.50	µg/L	CMM
PCB-1221	BDL	0.50	µg/L	CMM
PCB 1240	BDL	0.50	µg/L	CMM
PCB 1242	BDL	0.50	µg/L	CMM
PCB 1248	BDL	0.50	µg/L	CMM
PCB 1254	BDL	0.50	µg/L	CMM
PCB 1260	BDL	0.50	µg/L	CMM

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CERTIFICATE OF ANALYSIS

Gerhardt M. Witt & Associates, Inc.
1495 Forest Hill Blvd Suite F
West Palm Beach, FL 33406-6073

January 7, 2002
Report: 2001/12053
Sample No: 2001/12053- 1

Attention: Mike Caglioni

Project: 68-2-150 La Gorce Country Club
5685 Alton Road Miami Beach, FL

SAMPLE ID: Production Well F-2

Collected by: Bevin L. Morris

Collected on: 12/04/01
Received on: 12/04/01

Date of Analysis: 12/08/01
Date of Extraction: 12/06/01

508.1 CHLORINATED PESTICIDES (62-550 FAC)

PARAMETER	RESULT	DL	UNITS	ANALYST
Alachlor	BDL	0.10	µg/L	CMM
Atrazine	BDL	3.0	µg/L	CMM
Hexachlorocyclopentadiene	BDL	0.10	µg/L	CMM
Simazine	BDL	3.0	µg/L	CMM

Analysis Performed in Accordance with E.P.A. Methods
Laboratory Certification No. E86188

QA/QC Review
BDL=Below Detection Limit
DL=Detection Limit

Envirodyne Inc.

4805 N.W. 2nd Avenue
Boca Raton, FL 33431
561-989-5225
edyne@bellsouth.net

CERTIFICATE OF ANALYSIS

Gerhardt M. Witt & Associates, Inc.
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West Palm Beach, FL 33406-6073

January 7, 2002
Report: 2001/12053
Sample No: 2001/12053- 1

Attention: Mike Caglioni

Project: 68-2-150 La Gorce Country Club
5685 Alton Road Miami Beach, FL

SAMPLE ID: Production Well F-2

Collected by: Bevin L. Morris

Collected on: 12/04/01
Received on: 12/04/01

Date of Analysis: 12/11/01
Date of Extraction: 12/10/01

515.1 HERBICIDES (62-550 FAC)

PARAMETER	RESULT	DL	UNITS	ANALYST
Dalapon	BDL	0.50	µg/L	CMM
Dinoseb	BDL	0.50	µg/L	CMM
Pentachlorophenol	BDL	0.50	µg/L	CMM
Picloram	BDL	0.50	µg/L	CMM
2,4-D	BDL	0.50	µg/L	CMM
2,4,5-TP (Silvex)	BDL	0.10	µg/L	CMM

Analysis Performed in Accordance with E.P.A. Methods
Laboratory Certification No. E86188

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January 7, 2002
Report: 2001/12053
Sample No: 2001/12053- 1

Attention: Mike Caglioni

Project: 68-2-150 La Gorce Country Club
5685 Alton Road Miami Beach, FL

SAMPLE ID: Production Well F-2

Collected by: Bevin L. Morris

Collected on: 12/04/01
Received on: 12/04/01

Date of Analysis: 12/05/01

524.2 TRIHALOMETHANES (THM'S)

PARAMETER	RESULT	DL	UNITS	ANALYST
Bromodichloromethane	BDL	0.5	µg/L	EMH
Bromoform	BDL	0.5	µg/L	EMH
Chloroform	BDL	0.5	µg/L	EMH
Dibromochloromethane	BDL	0.5	µg/L	EMH
Total Trihalomethanes	BDL		µg/L	EMH

Analysis Performed in Accordance with E.P.A. Methods
Laboratory Certification No. E86188

QA/QC Review UB
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CERTIFICATE OF ANALYSIS

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January 7, 2002
Report: 2001/12053
Sample No: 2001/12053- 1

Attention: Mike Caglioni

Project: 68-2-150 La Gorce Country Club
5685 Alton Road Miami Beach, FL

SAMPLE ID: Production Well F-2

Collected by: Bevin L. Morris

Collected on: 12/04/01
Received on: 12/04/01

Date of Analysis: 12/05/01

524.2 VOLATILE ORGANIC COMPOUNDS (62-550)

PARAMETER	RESULT	DL UNITS	ANALYST
Benzene	BDL	1.0 μg/L	EMH
Carbon tetrachloride	BDL	1.0 μg/L	EMH
Chlorobenzene	BDL	1.0 μg/L	EMH
1,2-Dichlorobenzene	BDL	1.0 μg/L	EMH
1,4-Dichlorobenzene	BDL	1.0 μg/L	EMH
1,2-Dichloroethane	BDL	1.0 μg/L	EMH
1,1-Dichloroethene	BDL	1.0 μg/L	EMH
cis-1,2-Dichloroethene	BDL	1.0 μg/L	EMH
trans-1,2-Dichloroethene	BDL	1.0 μg/L	EMH
Dichloromethane	BDL	1.0 μg/L	EMH
1,2-Dichloropropane	BDL	1.0 μg/L	EMH
Ethylbenzene	BDL	1.0 μg/L	EMH
Styrene	BDL	1.0 μg/L	EMH
Tetrachloroethylene	BDL	1.0 μg/L	EMH
Toluene	BDL	1.0 μg/L	EMH
1,2,4-Trichlorobenzene	BDL	1.0 μg/L	EMH
1,1,1-Trichloroethane	BDL	1.0 μg/L	EMH
1,1,2-Trichloroethane	BDL	1.0 μg/L	EMH
Trichloroethylene	BDL	1.0 μg/L	EMH
Vinyl chloride	BDL	1.0 μg/L	EMH
Xylenes, Total	BDL	1.0 μg/L	EMH

Analysis Performed in Accordance with E.P.A. Methods
Laboratory Certification No. E86188

QA/QC Review
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CERTIFICATE OF ANALYSIS

Gerhardt M. Witt & Associates, Inc.
1495 Forest Hill Blvd Suite F
West Palm Beach, FL 33406-6073

January 7, 2002
Report: 2001/12053
Sample No: 2001/12053- 1

Attention: Mike Caglioni

Project: 68-2-150 La Gorce Country Club
5685 Alton Road Miami Beach, FL

SAMPLE ID: Production Well F-2

Collected by: Bevin L. Morris

Collected on: 12/04/01
Received on: 12/04/01

Date of Analysis: 12/07/01
Date of Extraction: 12/06/01

608 ORGANOCHLORINE PESTICIDES & PCB'S

PARAMETER	RESULT	DL	UNITS	ANALYST
Aldrin	BDL	0.05	µg/L	CMM
alpha-BHC	BDL	0.05	µg/L	CMM
beta-BHC	BDL	0.10	µg/L	CMM
delta-BHC	BDL	0.05	µg/L	CMM
gamma-BHC (Lindane)	BDL	0.10	µg/L	CMM
Chlordane	BDL	1.0	µg/L	CMM
4,4'-DDD	BDL	0.10	µg/L	CMM
4,4'-DDE	BDL	0.10	µg/L	CMM
4,4'-DDT	BDL	0.10	µg/L	CMM
Dieldrin	BDL	0.10	µg/L	CMM
Endosulfan I	BDL	0.10	µg/L	CMM
Endosulfan II	BDL	0.10	µg/L	CMM
Endosulfan sulfate	BDL	0.10	µg/L	CMM
Endrin	BDL	0.10	µg/L	CMM
Endrin aldehyde	BDL	0.10	µg/L	CMM
Heptachlor	BDL	0.10	µg/L	CMM
Heptachlor epoxide	BDL	0.10	µg/L	CMM
Toxaphene	BDL	2.0	µg/L	CMM
PCB-1016	BDL	1.0	µg/L	CMM
PCB-1221	BDL	1.0	µg/L	CMM
PCB-1232	BDL	1.0	µg/L	CMM
PCB-1242	BDL	1.0	µg/L	CMM
PCB-1248	BDL	1.0	µg/L	CMM
PCB-1254	BDL	1.0	µg/L	CMM
PCB-1260	BDL	1.0	µg/L	CMM

Analysis Performed in Accordance with E.P.A. Methods
Laboratory Certification No. E86188

QA/QC Review [signature]
BDL = Below Detection Limit
DL = Detection Limit

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CERTIFICATE OF ANALYSIS

Gerhardt M. Witt & Associates, Inc.
1495 Forest Hill Blvd Suite F
West Palm Beach, FL 33406-6073

January 7, 2002
Report: 2001/12053
Sample No: 2001/12053- 1

Attention: Mike Caglioni

Project: 68-2-150 La Gorce Country Club
5685 Alton Road Miami Beach, FL

SAMPLE ID: Production Well F-2

Collected by: Bevin L. Morris

Collected on: 12/04/01
Received on: 12/04/01

Date of Analysis: 12/05/01

624 VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	DL	UNITS	ANALYST
Acrolein	BDL	40	µg/L	EMH
Acrylonitrile	BDL	40	µg/L	EMH
Benzene	BDL	1.0	µg/L	EMH
Bromodichloromethane	BDL	1.0	µg/L	EMH
Bromoform	BDL	1.0	µg/L	EMH
Bromomethane	BDL	1.0	µg/L	EMH
Carbon tetrachloride	BDL	1.0	µg/L	EMH
Chlorobenzene	BDL	1.0	µg/L	EMH
Chloroethane	BDL	1.0	µg/L	EMH
2-Chloroethylvinyl ether	BDL	1.0	µg/L	EMH
Chloroform	BDL	1.0	µg/L	EMH
Chloromethane	BDL	1.0	µg/L	EMH
Dibromochloromethane	BDL	1.0	µg/L	EMH
1,2-Dichlorobenzene	BDL	1.0	µg/L	EMH
1,3-Dichlorobenzene	BDL	1.0	µg/L	EMH
1,4-Dichlorobenzene	BDL	1.0	µg/L	EMH
1,1-Dichloroethane	BDL	1.0	µg/L	EMH
1,2-Dichloroethane	BDL	1.0	µg/L	EMH
1,1-Dichloroethene	BDL	1.0	µg/L	EMH
trans-1,2-Dichloroethene	BDL	1.0	µg/L	EMH
1,2-Dichloropropane	BDL	1.0	µg/L	EMH
cis-1,3-Dichloropropene	BDL	1.0	µg/L	EMH
trans-1,3-Dichloropropene	BDL	1.0	µg/L	EMH
Ethylbenzene	BDL	1.0	µg/L	EMH
Methylene chloride	BDL	1.0	µg/L	EMH
1,1,2,2-Tetrachloroethane	BDL	1.0	µg/L	EMH
Tetrachloroethylene	BDL	1.0	µg/L	EMH
Toluene	BDL	1.0	µg/L	EMH
1,1,1-Trichloroethane	BDL	1.0	µg/L	EMH
1,1,2-Trichloroethane	BDL	1.0	µg/L	EMH
Trichloroethylene	BDL	1.0	µg/L	EMH

Analysis Performed in Accordance with E.P.A. Methods
Laboratory Certification No. E86188

QA/QC Review
BDL=Below Detection Limit
DL=Detection Limit

Envirodyne Inc.

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CERTIFICATE OF ANALYSIS

Gerhardt M. Witt & Associates, Inc.
1495 Forest Hill Blvd Suite F
West Palm Beach, FL 33406-6073

January 7, 2002
Report: 2001/12053
Sample No: 2001/12053- 1

Attention: Mike Caglioni

Project: 68-2-150 La Gorce Country Club
5685 Alton Road Miami Beach, FL

SAMPLE ID: Production Well F-2

Collected by: Bevin L. Morris

Collected on: 12/04/01
Received on: 12/04/01

Date of Analysis: 12/05/01

624 VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	DL UNITS	ANALYST
Trichlorofluoromethane	BDL	1.0 µg/L	EMH
Vinyl chloride	BDL	1.0 µg/L	EMH
Xylenes, total	BDL	1.0 µg/L	EMH

Analysis Performed in Accordance with E.P.A. Methods
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Gerhardt M. Witt & Associates, Inc.
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West Palm Beach, FL 33406-6073

January 7, 2002
Report: 2001/12053
Sample No: 2001/12053- 1

Attention: Mike Caglioni

Project: 68-2-150 La Gorce Country Club
5685 Alton Road Miami Beach, FL

SAMPLE ID: Production Well F-2

Collected by: Bevin L. Morris

Collected on: 12/04/01
Received on: 12/04/01

Date of Analysis: 12/10/01
Date of Extraction: 12/06/01

625 BASE NEUTRAL/ACID/PESTICIDE EXTRACTABLES

PARAMETER	RESULT	DL	UNITS	ANALYST
Acenaphthene	BDL	1.0	µg/L	SPH
Acenaphthylene	BDL	1.0	µg/L	SPH
Aldrin	BDL	1.0	µg/L	SPH
Anthracene	BDL	1.0	µg/L	SPH
Benzidine	BDL	1.0	µg/L	SPH
Benzo(a)anthracene	BDL	1.0	µg/L	SPH
Benzo(b)fluoranthene	BDL	1.0	µg/L	SPH
Benzo(k)fluoranthene	BDL	1.0	µg/L	SPH
Benzo(g,h,i)perylene	BDL	1.0	µg/L	SPH
Benzo(a)pyrene	BDL	1.0	µg/L	SPH
Benzyl butyl phthalate	BDL	1.0	µg/L	SPH
alpha-BHC	BDL	1.0	µg/L	SPH
beta-BHC	BDL	1.0	µg/L	SPH
delta-BHC	BDL	1.0	µg/L	SPH
gamma-BHC	BDL	1.0	µg/L	SPH
Bis(2-chloroethyl)ether	BDL	1.0	µg/L	SPH
Bis(2-chloroethoxy)methane	BDL	1.0	µg/L	SPH
Bis(2-ethylhexyl)phthalate	BDL	1.0	µg/L	SPH
Bis(2-chloroisopropyl) ether	BDL	1.0	µg/L	SPH
4-Bromophenyl phenyl ether	BDL	1.0	µg/L	SPH
Chlordane	BDL	1.0	µg/L	SPH
4-Chloro-3-methylphenol	BDL	1.0	µg/L	SPH
2-Chloronaphthalene	BDL	1.0	µg/L	SPH
2-Chlorophenol	BDL	1.0	µg/L	SPH
4-Chlorophenyl phenyl ether	BDL	1.0	µg/L	SPH
Chrysene	BDL	1.0	µg/L	SPH
4,4'-DDD	BDL	1.0	µg/L	SPH
4,4'-DDE	BDL	1.0	µg/L	SPH
4,4'-DDT	BDL	1.0	µg/L	SPH
Dibenzo(a,h)anthracene	BDL	1.0	µg/L	SPH
Di-n-butyl phthalate	BDL	1.0	µg/L	SPH

Analysis Performed in Accordance with E.P.A. Methods
Laboratory Certification No. E86188

QA/QC Review
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CERTIFICATE OF ANALYSIS

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West Palm Beach, FL 33406-6073

January 7, 2002
Report: 2001/12053
Sample No: 2001/12053- 1

Attention: Mike Caglioni

Project: 68-2-150 La Gorce Country Club
5685 Alton Road Miami Beach, FL

SAMPLE ID: Production Well F-2

Collected by: Bevin L. Morris

Collected on: 12/04/01
Received on: 12/04/01

Date of Analysis: 12/10/01
Date of Extraction: 12/06/01

625 BASE NEUTRAL/ACID/PESTICIDE EXTRACTABLES

PARAMETER	RESULT	DL	UNITS	ANALYST
1,2-Dichlorobenzene	BDL	1.0	µg/L	SPH
1,3-Dichlorobenzene	BDL	1.0	µg/L	SPH
1,4-Dichlorobenzene	BDL	1.0	µg/L	SPH
3,3'-Dichlorobenzidine	BDL	1.0	µg/L	SPH
2,4-Dichlorophenol	BDL	1.0	µg/L	SPH
Dieldrin	BDL	1.0	µg/L	SPH
Diethyl phthalate	BDL	1.0	µg/L	SPH
Dimethyl phthalate	BDL	1.0	µg/L	SPH
2,4-Dimethylphenol	BDL	1.0	µg/L	SPH
2,4-Dinitrophenol	BDL	1.0	µg/L	SPH
2,4-Dinitrotoluene	BDL	1.0	µg/L	SPH
2,6-Dinitrotoluene	BDL	1.0	µg/L	SPH
Di-n-octyl phthalate	BDL	1.0	µg/L	SPH
Endosulfan I	BDL	1.0	µg/L	SPH
Endosulfan II	BDL	1.0	µg/L	SPH
Endosulfan sulfate	BDL	1.0	µg/L	SPH
Endrin	BDL	1.0	µg/L	SPH
Endrin aldehyde	BDL	1.0	µg/L	SPH
Fluoranthene	BDL	1.0	µg/L	SPH
Fluorene	BDL	1.0	µg/L	SPH
Heptachlor	BDL	1.0	µg/L	SPH
Heptachlor epoxide	BDL	1.0	µg/L	SPH
Hexachlorobenzene	BDL	1.0	µg/L	SPH
Hexachlorobutadiene	BDL	1.0	µg/L	SPH
Hexachlorocyclopentadiene	BDL	5.0	µg/L	SPH
Hexachloroethane	BDL	2.0	µg/L	SPH
Indeno(1,2,3-c,d)pyrene	BDL	1.0	µg/L	SPH
Isophorone	BDL	1.0	µg/L	SPH
2-Methyl-4,6-dinitrophenol	BDL	1.0	µg/L	SPH
1-Methylnaphthalene	BDL	1.0	µg/L	SPH
2-Methylnaphthalene	BDL	1.0	µg/L	SPH

Analysis Performed in Accordance with E.P.A. Methods
Laboratory Certification No. E86188

QA/QC Review VS
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CERTIFICATE OF ANALYSIS

Gerhardt M. Witt & Associates, Inc.
1495 Forest Hill Blvd Suite F
West Palm Beach, FL 33406-6073

January 7, 2002
Report: 2001/12053
Sample No: 2001/12053- 1

Attention: Mike Caglioni

Project: 68-2-150 La Gorce Country Club
5685 Alton Road Miami Beach, FL

SAMPLE ID: Production Well F-2

Collected by: Bevin L. Morris

Collected on: 12/04/01
Received on: 12/04/01

Date of Analysis: 12/10/01
Date of Extraction: 12/06/01

625 BASE NEUTRAL/ACID/PESTICIDE EXTRACTABLES

PARAMETER	RESULT	DL	UNITS	ANALYST
Naphthalene	BDL	1.0	µg/L	SPH
Nitrobenzene	BDL	1.0	µg/L	SPH
2-Nitrophenol	BDL	1.0	µg/L	SPH
4-Nitrophenol	BDL	3.0	µg/L	SPH
n-Nitrosodimethylamine	BDL	1.0	µg/L	SPH
n-Nitrosodi-n-propylamine	BDL	1.0	µg/L	SPH
n-Nitrosodiphenylamine	BDL	1.0	µg/L	SPH
PCB-1016	BDL	5.0	µg/L	SPH
PCB-1221	BDL	5.0	µg/L	SPH
PCB-1232	BDL	5.0	µg/L	SPH
PCB-1242	BDL	5.0	µg/L	SPH
PCB-1248	BDL	5.0	µg/L	SPH
PCB-1254	BDL	5.0	µg/L	SPH
PCB-1260	BDL	5.0	µg/L	SPH
Pentachlorophenol	BDL	1.0	µg/L	SPH
Phenanthrene	BDL	1.0	µg/L	SPH
Phenol	BDL	1.0	µg/L	SPH
Pyrene	BDL	1.0	µg/L	SPH
Toxaphene	BDL	1.0	µg/L	SPH
1,2,4-Trichlorobenzene	BDL	1.0	µg/L	SPH
2,4,6-Trichlorophenol	BDL	1.0	µg/L	SPH

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Laboratory Certification No. E86188

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CERTIFICATE OF ANALYSIS

Analysis contained herein conform to EPA, Standard Methods and DEP approved methods per Envirodyne Comprehensive Quality Assurance Plan No. 890041. Subcontracted analyses are denoted by certification number in the analyst column. All relevant quality assurance samples were within specified control limits unless otherwise stated. Uncertainties for test results are available upon request. Envirodyne certifies its test results meet all requirements of the NELAC Standards, where applicable. For questions, please call the project manager at the number listed above.

This is the last page of the report. See bottom of page for total pages.

Project Manager

Quality Assurance Director

Analysis Performed in Accordance with E.P.A. Methods
Laboratory Certification No. E86188

QA/QC Review
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DL=Detection Limit

Envirodyne Inc.

CHAIN OF CUSTODY RECORD
AND
ANALYSIS REQUEST

4805 NW 2nd Avenue • Boca Raton, FL 33431
(561) 989-5225 • Fax (561) 989-5204

PROJECT NUMBER	PROJECT NAME	P.O. NUMBER	SAMPLE TYPE	PRESERVATIVE
68-2-150	LaGorce Country Club			

PROJECT LOCATION: 5685 Alton Road Miami Beach, FL.

CLIENT NAME: Gerhardt M. Witt & Associates Inc

CLIENT ADDRESS: 1495 Forest Hill Blvd. Suite F WPB, FL 33406-6073

PHONE:

FAX:

RUSH TAT (SURCHARGE) ☐

DUE DATE:

SAMPLE INFORMATION

NUMBER	DATE	TIME	IDENTIFICATION	SOLID	LIQUID	AIR	NON-AQUEOUS LIQUID	504.1 EDB & DBCP	524.2 VOC's & Trihm's	508, 515.1, 525.2, 531.1	547, 548.1	549.1	Gross Alpha Rad. 226, 228	Prim. & Sec. Metals	Total Coliform	NO. OF CONTAINERS	REMARKS
1	12-4-01	1435	Production Well F-2		✓			✓	✓	✓	✓	✓	✓	✓	✓	36	
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

SAMPLE COLLECTED BY: Brian L. Morris

ARE THESE SAMPLES LISTED OR CHARACTERISTIC HAZARDOUS WASTE? ☐ YES ☐ NO
ARE THESE SAMPLES FROM ☐ PETROLEUM ☐ DRY CLEANER OR ☐ OTHER SITE?

TOTAL OF ALL CONTAINERS: 36

SEND REPORT TO (PERSON): Michael Gaglioni

SAMPLES CONDITION: [signature] 4°C

LOG NUMBER: 2001 12053

	RELINQUISHED BY	DATE	TIME		RECEIVED BY	DATE	TIME
1	[signature]	12/4/01	16:00	2	Jeffrey Tang	12/4/01	1602
3				4			
5				6			

Envirodyne Inc.

CHAIN OF CUSTODY RECORD
AND
ANALYSIS REQUEST

4805 NW 2nd Avenue • Boca Raton, FL 33431
(561) 989-5225 • Fax (561) 989-5204

PROJECT NUMBER: 68-2-150
PROJECT NAME: LaGorce Country Club
P.O. NUMBER:
PROJECT LOCATION: 5685 Alton Road Miami Beach, FL.
CLIENT NAME: Gerhardt Witt & Associates Inc.
CLIENT ADDRESS: 1495 Forest Hill Blvd. WPB, FL. 33406-6073
PHONE:
FAX:

SAMPLE TYPE: Solid / Liquid / Air / Non-Aqueous Liquid

PRESERVATIVE

ANALYSES REQUESTED: Total Cyanide; Odor, Color; Wet Chem. Preserved; Wet Chem Unpreserved; 8260; 8270, 8081; H_2S; TOC; Dissolved Metals

NO. OF CONTAINERS

RUSH TAT (SURCHARGE) ☐

DUE DATE:

SAMPLE INFORMATION

NUMBER	DATE	TIME	IDENTIFICATION	SOLID	LIQUID	AIR	NON-AQUEOUS LIQUID	Total Cyanide	Odor, Color	Wet Chem. Preserved	Wet Chem Unpreserved	8260	8270, 8081	H_2S	TOC	Dissolved Metals	NO. OF CONTAINERS	REMARKS
1	12-4-01	1435	Production Well F-2		✓			✓	✓	✓	✓	✓	✓	✓	✓	✓		
2																		pH = 7.2
3																		Temp - 20.7
4																		Cond = 22,400
5																		Free Chlorine
6																		= 0.01
7																		Total Chlorine
8																		0.01
9																		Turb = 1.57
10																		D.O. = 3.4

SAMPLE COLLECTED BY: Bevin L. Morris

ARE THESE SAMPLES LISTED OR CHARACTERISTIC HAZARDOUS WASTE? ☐ YES ☐ NO
ARE THESE SAMPLES FROM ☐ PETROLEUM ☐ DRY CLEANER OR ☐ OTHER SITE? ________

TOTAL OF ALL CONTAINERS:

SEND REPORT TO (PERSON): Michael Gaglini

SAMPLES CONDITION: [illegible] 4°C

LOG NUMBER: 2001 12057

	RELINQUISHED BY	DATE	TIME		RECEIVED BY	DATE	TIME
1	[signature]	12/4/01	16:00	2	[signature]	12/4/01	16:02
3				4			
5				6			

Envirodyne Inc.

4805 N.W. 2nd Avenue
Boca Raton, FL 33431
561-989-5225
edyne@bellsouth.net

CERTIFICATE OF ANALYSIS

Gerhardt M. Witt & Associates, Inc.
1495 Forest Hill Blvd Suite F
West Palm Beach, FL 33406-6073

March 27, 2002
Report: 2002/03457
Sample No: 2002/03457- 1

Attention: Michael Black

Project: La Gorce Country Club
5685 Alton Road Miami Beach, FL

SAMPLE ID: Irrigation Well

Collected by: Bevin L. Morris

Collected on: 03/22/02
Received on: 03/22/02

PARAMETER	RESULT	METHOD	DL UNITS	DATE	ANALYST
Chloride	6200	SM4500CL-B	50.0 mg/L	03/27/02	JMJ
Specific Conductance	17000	120.1	µmhos/cm	03/26/02	JMJ
Total Dissolved Solids	12000	160.1	10 mg/L	03/25/02	JCB

Analysis contained herein conform to EPA, Standard Methods and DEP approved methods per Envirodyne Comprehensive Quality Assurance Plan No. 890041. Subcontracted analyses are denoted by certification number in the analyst column. All relevant quality assurance samples were within specified control limits unless otherwise stated. Uncertainties for test results are available upon request. Envirodyne certifies its test results meet all requirements of the NELAC Standards, where applicable. For questions, please call the project manager at the number listed above.

This is the last page of the report. See bottom of page for total pages.

Adrian D. Moran
Project Manager

Quality Assurance Director

Analysis Performed in Accordance with E.P.A. Methods
Laboratory Certification No. E86188

QA/QC Review
BDL=Below Detection Limit
DL=Detection Limit

Envirodyne Inc.

CHAIN OF CUSTODY RECORD
AND
ANALYSIS REQUEST

4805 NW 2nd Avenue • Boca Raton, FL 33431
(561) 989-5225 • Fax (561) 989-5204

PROJECT NUMBER	PROJECT NAME	P.O. NUMBER	SAMPLE TYPE	PRESERVATIVE
	LaGorce Country Club			Ice

PROJECT LOCATION: 5685 Alton Rd. Miami Beach, FL.

CLIENT NAME: G.M. Witt & Assoc.

CLIENT ADDRESS: – On File –

PHONE:

FAX:

RUSH TAT (SURCHARGE) ☐

DUE DATE: ____

SAMPLE INFORMATION

NUMBER	DATE	TIME	IDENTIFICATION	SOLID	LIQUID	AIR	NON-AQUEOUS LIQUID	TDS + Cl	Conductivity							NO. OF CONTAINERS	REMARKS
1	3-22-02	10:25	Irrigation Well F2		✓			✓	✓							1	
2																	
3			Recv'd 4/3/02 SMK														
4																	
5																	
6																	
7																	
8																	
9																	
10																	

SAMPLE COLLECTED BY: Brian L. Morris

ARE THESE SAMPLES LISTED OR CHARACTERISTIC HAZARDOUS WASTE? ☐ YES ☐ NO

ARE THESE SAMPLES FROM ☐ PETROLEUM ☐ DRY CLEANER OR ☐ OTHER SITE? ____

TOTAL OF ALL CONTAINERS: 1

SEND REPORT TO (PERSON): Michael Black

SAMPLES CONDITION: intact ice

LOG NUMBER: 2002/03457

	RELINQUISHED BY	DATE	TIME		RECEIVED BY	DATE	TIME
1	[signature]	3/22/02	16:53	2	Jeff Tang	3/22/01	1653
3				4			
5				6			

Envirodyne Inc.

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CERTIFICATE OF ANALYSIS

Gerhardt M. Witt & Associates, Inc.
1495 Forest Hill Blvd Suite F
West Palm Beach, FL 33406-6073

April 22, 2002
Report: 2002/04417
Sample No: 2002/04417- 1

Attention: Gerhardt M. Witt

Project: La Gorce Country Club
Alton Road Miami Beach, FL

SAMPLE ID: F2-041902

Collected by: Michael Caglioni

Collected on: 04/19/02
Received on: 04/19/02

PARAMETER	RESULT	METHOD	DL UNITS	DATE	ANALYST
Chloride	8200	SM4500CL-B	100.0 mg/L	04/22/02	DNS
Total Dissolved Solids	15000	160.1	10 mg/L	04/22/02	JCB

Analysis contained herein conform to EPA, Standard Methods and DEP approved methods per Envirodyne Comprehensive Quality Assurance Plan No. 890041. Subcontracted analyses are denoted by certification number in the analyst column. All relevant quality assurance samples were within specified control limits unless otherwise stated. Uncertainties for test results are available upon request. Envirodyne certifies its test results meet all requirements of the NELAC Standards, where applicable. For questions, please call the project manager at the number listed above.

This is the last page of the report. See bottom of page for total pages.

Project Manager

Quality Assurance Director

Analysis Performed in Accordance with E.P.A. Methods
Laboratory Certification No. E86188

QA/QC Review
BDL=Below Detection Limit
DL=Detection Limit

Envirodyne Inc.

CHAIN OF CUSTODY RECORD
AND
ANALYSIS REQUEST

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PROJECT NUMBER	PROJECT NAME	P.O. NUMBER	SAMPLE TYPE	PRESERVATIVE
68-2-1.50	Laborca Country Club			

PROJECT LOCATION: Alton Rd, Miami FL

CLIENT NAME: ~~Laborca Country Club~~ ~~GM Witt &~~ ~~Todd Evans Assoc~~

CLIENT ADDRESS: 5685 Alton Rd. Miami FL 33140

PHONE 305-866-4421 FAX 305-861-4931

ANALYSES REQUESTED

RUSH TAT (SURCHARGE) [X]

DUE DATE: 4-22-02

SAMPLE INFORMATION

NUMBER	DATE	TIME	IDENTIFICATION	SOLID	LIQUID	AIR	NON-AQUEOUS LIQUID	TDS	Chlorides							NO. OF CONTAINERS	REMARKS
1	4-19-02	1400	LG-TDS-F2-041902		✓			✓								1	
2	4-19-02	1400	LG-CL-F2-041902		✓				✓							1	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

RUSH

SAMPLE COLLECTED BY: Michael Caglioni

SEND REPORT TO (PERSON): Gary Witt 561-642-9923

SAMPLES CONDITION: intact 4°C

LOG NUMBER: 2002-04417

ARE THESE SAMPLES LISTED OR CHARACTERISTIC HAZARDOUS WASTE? ☐ YES ☒ NO

ARE THESE SAMPLES FROM ☐ PETROLEUM ☐ DRY CLEANER OR ☐ OTHER SITE? No

TOTAL OF ALL CONTAINERS: 2

	RELINQUISHED BY	DATE	TIME		RECEIVED BY	DATE	TIME
1	Michael Caglioni	4-19-02	1550	2	Jeff Tarz	41902	1550
3				4			
5				6			

Envirodyne Inc.

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CERTIFICATE OF ANALYSIS

Gerhardt M. Witt & Associates, Inc.
1495 Forest Hill Blvd Suite F
West Palm Beach, FL 33406-6073

May 29, 2002
Report: 2002/05042
Sample No: 2002/05042- 1

Attention: Michael J. Caglioni, P.G.

Project: La Gorce Country Club
5685 Alton Road Miami Beach, FL

SAMPLE ID: Production Well F-2

Collected by: Bevin L. Morris

Collected on: 05/02/02
Received on: 05/02/02

PARAMETER	RESULT	METHOD	DL UNITS	DATE	ANALYST
Aluminum	BDL	200.7	0.10 mg/L	05/03/02	YJC
Aluminum, Dissolved	BDL	200.7	0.10 mg/L	05/03/02	YJC
Barium	0.022	200.7	0.010 mg/L	05/03/02	MHA
Beryllium	BDL	200.7	0.0030 mg/L	05/03/02	MHA
Cadmium	BDL	200.7	0.0040 mg/L	05/03/02	MHA
Calcium	290	200.7	10 mg/L	05/03/02	YJC
Chromium	BDL	200.7	0.010 mg/L	05/03/02	MHA
Copper	BDL	200.7	0.010 mg/L	05/03/02	MHA
Iron	0.023	200.7	0.010 mg/L	05/03/02	YJC
Iron, Dissolved	0.012	200.7	0.010 mg/L	05/03/02	YJC
Manganese	BDL	200.7	0.010 mg/L	05/03/02	MHA
Manganese, Dissolved	BDL	200.7	0.010 mg/L	05/03/02	MHA
Nickel	BDL	200.7	0.010 mg/L	05/03/02	MHA
Silver	BDL	200.7	0.010 mg/L	05/03/02	MHA
Sodium	3900	200.7	1000 mg/L	05/03/02	YJC
Zinc	0.035	200.7	0.010 mg/L	05/03/02	YJC
Thallium	BDL	200.9	0.0010 mg/L	05/03/02	MHA
Mercury	BDL	245.1	0.00020 mg/L	05/03/02	MHA

Analysis Performed in Accordance with E.P.A. Methods
Laboratory Certification No. E86188

QA/QC Review
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DL=Detection Limit

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CERTIFICATE OF ANALYSIS

Gerhardt M. Witt & Associates, Inc.
1495 Forest Hill Blvd Suite F
West Palm Beach, FL 33406-6073

May 29, 2002
Report: 2002/05042
Sample No: 2002/05042- 1

Attention: Michael J. Caglioni, P.G.

Project: La Gorce Country Club
5685 Alton Road Miami Beach, FL

SAMPLE ID: Production Well F-2

Collected by: Bevin L. Morris

Collected on: 05/02/02
Received on: 05/02/02

PARAMETER	RESULT	METHOD	DL UNITS	DATE	ANALYST
Dibromochloropropane (DBCP)	BDL	EPA 504.1	0.020 µg/L	05/09/02	CMM
1,2-Dibromoethane (EDB)	BDL	EPA 504.1	0.020 µg/L	05/09/02	CMM
Benzo(a)pyrene	BDL	EPA 525.2	0.2 µg/L	05/05/02	SPH
Di(2-ethylhexyl)adipate	BDL	EPA 525.2	1.0 µg/L	05/05/02	SPH
Di(2-ethylhexyl)phthalate	BDL	EPA 525.2	1.0 µg/L	05/05/02	SPH
Carbofuran	BDL	EPA 531.1	0.50 µg/L	05/16/02	E84129
Oxamyl (Vydate)	BDL	EPA 531.1	0.50 µg/L	05/16/02	E84129
Glyphosate	BDL	EPA 547	10 µg/L	05/14/02	E84129
Endothall	BDL	EPA 548.1	20 µg/L	05/22/02	E84129
Diquat	BDL	EPA 549.2	1.0 µg/L	05/09/02	E84129
Alkalinity, Total	110	310.1	1.0 mg/L	05/07/02	DNS
Bicarbonate	110	SM2320	0.01 mg/L	05/07/02	DNS
Carbon Dioxide	110	SM4500CO2D	0.1 mg/L	05/07/02	DNS
Carbonate	0.44	SM2320	0.010 mg/L	05/07/02	DNS
Chloride	5900	SM4500CL-B	50.0 mg/L	05/07/02	JMJ
Chlorine, Free	BDL	330.5	0.1 mg/L	05/02/02	BLM
Color	BDL	110.2	5 CU	05/03/02	DNS
Specific Conductance (Field)	16921	120.1	µmhos/cm	05/02/02	BLM

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Laboratory Certification No. E86188

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CERTIFICATE OF ANALYSIS

Gerhardt M. Witt & Associates, Inc.
1495 Forest Hill Blvd Suite F
West Palm Beach, FL 33406-6073

May 29, 2002
Report: 2002/05042
Sample No: 2002/05042- 1

Attention: Michael J. Caglioni, P.G.

Project: **La Gorce Country Club**
5685 Alton Road Miami Beach, FL

SAMPLE ID: Production Well F-2

Collected by: Bevin L. Morris

Collected on: 05/02/02
Received on: 05/02/02

PARAMETER	RESULT	METHOD	DL UNITS	DATE	ANALYST
Cyanide, Total	BDL	335.2	0.0040 mg/L	05/03/02	JCB
Dissolved Oxygen	0.5	360.1	0.1 mg/L	05/02/02	BLM
Fluoride	0.71	SM4500F-C	0.10 mg/L	05/08/02	DNS
Gross Alpha	1±97	900.0	1.0 pCi/L	05/13/02	E84088
Hardness, Total	2248	SM2340B	1 mg/L	05/03/02	YJC
Hydrogen Sulfide	0.38	9030/376.2	0.040 mg/L	05/09/02	DNS
Iron, Ferrous	BDL	SM3500FE-D	0.10 mg/L	05/07/02	DNS
Surfactants	0.30	SM5540C	0.010 mg/L	05/03/02	DNS
Nitrite, as Nitrogen	BDL	353.2	0.020 mg/L	05/03/02	DNS
Nitrate, as Nitrogen	BDL	353.2	0.020 mg/L	05/03/02	DNS
Nitrate-Nitrite, as Nitrogen	BDL	353.2	0.020 mg/L	05/03/02	DNS
Odor	16	140.1	1 T.O.N.	05/03/02	DNS
pH (Field)	7.0	150.1	pH Units	05/02/02	BLM
Radium 226	4.1±0.3	903.1	0.1 pCi/L	05/13/02	E84088
Radium 228	0.5±0.5	RA-05	0.5 pCi/L	05/13/02	E84088
Silica, Dissolved	11	370.1	2.0 mg/L	05/07/02	DNS
Silica, Total	12	SM3120B	0.5 mg/L	05/03/02	MHA
Lead	BDL	SM3113B	0.0050 mg/L	05/03/02	MHA

Analysis Performed in Accordance with E.P.A. Methods
Laboratory Certification No. E86188

QA/QC Review
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Gerhardt M. Witt & Associates, Inc.
1495 Forest Hill Blvd Suite F
West Palm Beach, FL 33406-6073

May 29, 2002
Report: 2002/05042
Sample No: 2002/05042- 1

Attention: Michael J. Caglioni, P.G.

Project: La Gorce Country Club
5685 Alton Road Miami Beach, FL

SAMPLE ID: Production Well F-2

Collected by: Bevin L. Morris

Collected on: 05/02/02
Received on: 05/02/02

PARAMETER	RESULT	METHOD	DL UNITS	DATE	ANALYST
Antimony	BDL	SM3113B	0.0050 mg/L	05/03/02	MHA
Arsenic	BDL	SM3113B	0.010 mg/L	05/03/02	MHA
Selenium	BDL	SM3113B	0.010 mg/L	05/03/02	MHA
Sulfate	860	375.4	250.0 mg/L	05/06/02	JMJ
Total Coliform by MMO-MUG	Absent	SM9223	1 cfu/100 ml	05/02/02	JMJ
Total Dissolved Solids	12000	160.1	10 mg/L	05/07/02	JCB
Temperature	21.1	170.1	°C	05/02/02	BLM
Total Organic Carbon	BDL	415.1	1.0 mg/L	05/07/02	DNS
Phosphorus, Total	0.010	365.4	0.010 mg/L	05/29/02	DNS
Turbidity-Field	0.21	180.1	0.10 ntu	05/02/02	BLM

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1495 Forest Hill Blvd Suite F
West Palm Beach, FL 33406-6073

May 29, 2002
Report: 2002/05042
Sample No: 2002/05042- 1

Attention: Michael J. Caglioni, P.G.

Project: La Gorce Country Club
5685 Alton Road Miami Beach, FL

SAMPLE ID: Production Well F-2

Collected by: Bevin L. Morris

Collected on: 05/02/02
Received on: 05/02/02

Date of Analysis: 05/08/02
Date of Extraction: 05/07/02

508 ORGANOHALIDE PESTICIDES 62-550.310(2)(c) FAC

PARAMETER	RESULT	DL	UNITS	ANALYST
Chlordane	BDL	0.50	μg/L	CMM
Endrin	BDL	0.10	μg/L	CMM
Heptachlor	BDL	0.10	μg/L	CMM
Heptachlor epoxide	BDL	0.10	μg/L	CMM
Hexachlorobenzene	BDL	0.10	μg/L	CMM
Lindane	BDL	0.10	μg/L	CMM
Methoxychlor	BDL	0.20	μg/L	CMM
Toxaphene	BDL	3.0	μg/L	CMM
PCB 1016	BDL	0.50	μg/L	CMM
PCB-1221	BDL	0.50	μg/L	CMM
PCB 1240	BDL	0.50	μg/L	CMM
PCB 1242	BDL	0.50	μg/L	CMM
PCB 1248	BDL	0.50	μg/L	CMM
PCB 1254	BDL	0.50	μg/L	CMM
PCB 1260	BDL	0.50	μg/L	CMM

Analysis Performed in Accordance with E.P.A. Methods
Laboratory Certification No. E86188

QA/QC Review
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Gerhardt M. Witt & Associates, Inc.
1495 Forest Hill Blvd Suite F
West Palm Beach, FL 33406-6073

May 29, 2002
Report: 2002/05042
Sample No: 2002/05042- 1

Attention: Michael J. Caglioni, P.G.

Project: La Gorce Country Club
5685 Alton Road Miami Beach, FL

SAMPLE ID: Production Well F-2

Collected by: Bevin L. Morris

Collected on: 05/02/02
Received on: 05/02/02

Date of Analysis: 05/09/02
Date of Extraction: 05/07/02

508.1 CHLORINATED PESTICIDES (62-550 FAC)

PARAMETER	RESULT	DL	UNITS	ANALYST
Alachlor	BDL	0.10	µg/L	CMM
Atrazine	BDL	3.0	µg/L	CMM
Hexachlorocyclopentadiene	BDL	0.10	µg/L	CMM
Simazine	BDL	3.0	µg/L	CMM

Analysis Performed in Accordance with E.P.A. Methods
Laboratory Certification No. E86188

QA/QC Review
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CERTIFICATE OF ANALYSIS

Gerhardt M. Witt & Associates, Inc.
1495 Forest Hill Blvd Suite F
West Palm Beach, FL 33406-6073

May 29, 2002
Report: 2002/05042
Sample No: 2002/05042- 1

Attention: Michael J. Caglioni, P.G.

Project: La Gorce Country Club
5685 Alton Road Miami Beach, FL

SAMPLE ID: Production Well F-2

Collected by: Bevin L. Morris

Collected on: 05/02/02
Received on: 05/02/02

Date of Analysis: 05/09/02
Date of Extraction: 05/07/02

515.1 HERBICIDES (62-550 FAC)

PARAMETER	RESULT	DL	UNITS	ANALYST
Dalapon	BDL	0.50	µg/L	CMM
Dinoseb	BDL	0.50	µg/L	CMM
Pentachlorophenol	BDL	0.50	µg/L	CMM
Picloram	BDL	0.50	µg/L	CMM
2,4-D	BDL	0.50	µg/L	CMM
2,4,5-TP (Silvex)	BDL	0.10	µg/L	CMM

Analysis Performed in Accordance with E.P.A. Methods
Laboratory Certification No. E86188

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CERTIFICATE OF ANALYSIS

Gerhardt M. Witt & Associates, Inc.
1495 Forest Hill Blvd Suite F
West Palm Beach, FL 33406-6073

May 29, 2002
Report: 2002/05042
Sample No: 2002/05042- 1

Attention: Michael J. Caglioni, P.G.

Project: La Gorce Country Club
5685 Alton Road Miami Beach, FL

SAMPLE ID: Production Well F-2

Collected by: Bevin L. Morris

Collected on: 05/02/02
Received on: 05/02/02

Date of Analysis: 05/04/02

524.2 TRIHALOMETHANES (THM'S)

PARAMETER	RESULT	DL	UNITS	ANALYST
Bromodichloromethane	BDL	0.5	µg/L	EMH
Bromoform	BDL	0.5	µg/L	EMH
Chloroform	BDL	0.5	µg/L	EMH
Dibromochloromethane	BDL	0.5	µg/L	EMH
Total Trihalomethanes	BDL		µg/L	EMH

Analysis Performed in Accordance with E.P.A. Methods
Laboratory Certification No. E86188

QA/QC Review
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DL=Detection Limit

Envirodyne Inc.

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CERTIFICATE OF ANALYSIS

Gerhardt M. Witt & Associates, Inc.
1495 Forest Hill Blvd Suite F
West Palm Beach, FL 33406-6073

May 29, 2002
Report: 2002/05042
Sample No: 2002/05042- 1

Attention: Michael J. Caglioni, P.G.

Project: La Gorce Country Club
5685 Alton Road Miami Beach, FL

SAMPLE ID: Production Well F-2

Collected by: Bevin L. Morris

Collected on: 05/02/02
Received on: 05/02/02

Date of Analysis: 05/04/02

524.2 VOLATILE ORGANIC COMPOUNDS (62-550)

PARAMETER	RESULT	DL	UNITS	ANALYST
Benzene	BDL	0.5	µg/L	EMH
Carbon tetrachloride	BDL	0.5	µg/L	EMH
Chlorobenzene	BDL	0.5	µg/L	EMH
1,2-Dichlorobenzene	BDL	0.5	µg/L	EMH
1,4-Dichlorobenzene	BDL	0.5	µg/L	EMH
1,2-Dichloroethane	BDL	0.5	µg/L	EMH
1,1-Dichloroethene	BDL	0.5	µg/L	EMH
cis-1,2-Dichloroethene	BDL	0.5	µg/L	EMH
trans-1,2-Dichloroethene	BDL	0.5	µg/L	EMH
Dichloromethane	BDL	0.5	µg/L	EMH
1,2-Dichloropropane	BDL	0.5	µg/L	EMH
Ethylbenzene	BDL	0.5	µg/L	EMH
Styrene	BDL	0.5	µg/L	EMH
Tetrachloroethylene	BDL	0.5	µg/L	EMH
Toluene	BDL	0.5	µg/L	EMH
1,2,4-Trichlorobenzene	BDL	0.5	µg/L	EMH
1,1,1-Trichloroethane	BDL	0.5	µg/L	EMH
1,1,2-Trichloroethane	BDL	0.5	µg/L	EMH
Trichloroethylene	BDL	0.5	µg/L	EMH
Vinyl chloride	BDL	0.5	µg/L	EMH
Xylenes, Total	BDL	0.5	µg/L	EMH

Analysis Performed in Accordance with E.P.A. Methods
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CERTIFICATE OF ANALYSIS

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1495 Forest Hill Blvd Suite F
West Palm Beach, FL 33406-6073

May 29, 2002
Report: 2002/05042
Sample No: 2002/05042- 1

Attention: Michael J. Caglioni, P.G.

Project: La Gorce Country Club
5685 Alton Road Miami Beach, FL

SAMPLE ID: Production Well F-2

Collected by: Bevin L. Morris

Collected on: 05/02/02
Received on: 05/02/02

Date of Analysis: 05/08/02
Date of Extraction: 05/07/02

608 ORGANOCHLORINE PESTICIDES & PCB'S

PARAMETER	RESULT	DL	UNITS	ANALYST
Aldrin	BDL	0.05	µg/L	CMM
alpha-BHC	BDL	0.05	µg/L	CMM
beta-BHC	BDL	0.10	µg/L	CMM
delta-BHC	BDL	0.05	µg/L	CMM
gamma-BHC (Lindane)	BDL	0.10	µg/L	CMM
Chlordane	BDL	1.0	µg/L	CMM
4,4'-DDD	BDL	0.10	µg/L	CMM
4,4'-DDE	BDL	0.10	µg/L	CMM
4,4'-DDT	BDL	0.10	µg/L	CMM
Dieldrin	BDL	0.10	µg/L	CMM
Endosulfan I	BDL	0.10	µg/L	CMM
Endosulfan II	BDL	0.10	µg/L	CMM
Endosulfan sulfate	BDL	0.10	µg/L	CMM
Endrin	BDL	0.10	µg/L	CMM
Endrin aldehyde	BDL	0.10	µg/L	CMM
Heptachlor	BDL	0.10	µg/L	CMM
Heptachlor epoxide	BDL	0.10	µg/L	CMM
Toxaphene	BDL	2.0	µg/L	CMM
PCB-1016	BDL	1.0	µg/L	CMM
PCB-1221	BDL	1.0	µg/L	CMM
PCB-1232	BDL	1.0	µg/L	CMM
PCB-1242	BDL	1.0	µg/L	CMM
PCB-1248	BDL	1.0	µg/L	CMM
PCB-1254	BDL	1.0	µg/L	CMM
PCB-1260	BDL	1.0	µg/L	CMM

Analysis Performed in Accordance with E.P.A. Methods
Laboratory Certification No. E86188

QA/QC Review
BDL=Below Detection Limit
DL=Detection Limit

Envirodyne Inc.

4805 N.W. 2nd Avenue
Boca Raton, FL 33431
561-989-5225
edyne@bellsouth.net

CERTIFICATE OF ANALYSIS

Gerhardt M. Witt & Associates, Inc.
1495 Forest Hill Blvd Suite F
West Palm Beach, FL 33406-6073

May 29, 2002
Report: 2002/05042
Sample No: 2002/05042- 1

Attention: Michael J. Caglioni, P.G.

Project: La Gorce Country Club
5685 Alton Road Miami Beach, FL

SAMPLE ID: Production Well F-2

Collected by: Bevin L. Morris

Collected on: 05/02/02
Received on: 05/02/02

Date of Analysis: 05/04/02

624 VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	DL	UNITS	ANALYST
Acrolein	BDL	40	µg/L	EMH
Acrylonitrile	BDL	40	µg/L	EMH
Benzene	BDL	1.0	µg/L	EMH
Bromodichloromethane	BDL	1.0	µg/L	EMH
Bromoform	BDL	1.0	µg/L	EMH
Bromomethane	BDL	1.0	µg/L	EMH
Carbon tetrachloride	BDL	1.0	µg/L	EMH
Chlorobenzene	BDL	1.0	µg/L	EMH
Chloroethane	BDL	1.0	µg/L	EMH
2-Chloroethylvinyl ether	BDL	1.0	µg/L	EMH
Chloroform	BDL	1.0	µg/L	EMH
Chloromethane	BDL	1.0	µg/L	EMH
Dibromochloromethane	BDL	1.0	µg/L	EMH
1,2-Dichlorobenzene	BDL	1.0	µg/L	EMH
1,3-Dichlorobenzene	BDL	1.0	µg/L	EMH
1,4-Dichlorobenzene	BDL	1.0	µg/L	EMH
1,1-Dichloroethane	BDL	1.0	µg/L	EMH
1,2-Dichloroethane	BDL	1.0	µg/L	EMH
1,1-Dichloroethene	BDL	1.0	µg/L	EMH
trans-1,2-Dichloroethene	BDL	1.0	µg/L	EMH
1,2-Dichloropropane	BDL	1.0	µg/L	EMH
cis-1,3-Dichloropropene	BDL	1.0	µg/L	EMH
trans-1,3-Dichloropropene	BDL	1.0	µg/L	EMH
Ethylbenzene	BDL	1.0	µg/L	EMH
Methylene chloride	BDL	1.0	µg/L	EMH
1,1,2,2-Tetrachloroethane	BDL	1.0	µg/L	EMH
Tetrachloroethylene	BDL	1.0	µg/L	EMH
Toluene	BDL	1.0	µg/L	EMH
1,1,1-Trichloroethane	BDL	1.0	µg/L	EMH
1,1,2-Trichloroethane	BDL	1.0	µg/L	EMH
Trichloroethylene	BDL	1.0	µg/L	EMH

Analysis Performed in Accordance with E.P.A. Methods
Laboratory Certification No. E86188

QA/QC Review
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DL=Detection Limit

Envirodyne Inc.

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edyne@bellsouth.net

CERTIFICATE OF ANALYSIS

Gerhardt M. Witt & Associates, Inc.
1495 Forest Hill Blvd Suite F
West Palm Beach, FL 33406-6073

May 29, 2002
Report: 2002/05042
Sample No: 2002/05042- 1

Attention: Michael J. Caglioni, P.G.

Project: La Gorce Country Club
5685 Alton Road Miami Beach, FL

SAMPLE ID: Production Well F-2

Collected by: Bevin L. Morris

Collected on: 05/02/02
Received on: 05/02/02

Date of Analysis: 05/04/02

624 VOLATILE ORGANIC COMPOUNDS

PARAMETER	RESULT	DL UNITS	ANALYST
Trichlorofluoromethane	BDL	1.0 µg/L	EMH
Vinyl chloride	BDL	1.0 µg/L	EMH
Xylenes, total	BDL	1.0 µg/L	EMH

Analysis Performed in Accordance with E.P.A. Methods
Laboratory Certification No. E86188

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CERTIFICATE OF ANALYSIS

Gerhardt M. Witt & Associates, Inc.
1495 Forest Hill Blvd Suite F
West Palm Beach, FL 33406-6073

May 29, 2002
Report: 2002/05042
Sample No: 2002/05042- 1

Attention: Michael J. Caglioni, P.G.

Project: La Gorce Country Club
5685 Alton Road Miami Beach, FL

SAMPLE ID: Production Well F-2

Collected by: Bevin L. Morris

Collected on: 05/02/02
Received on: 05/02/02

Date of Analysis: 05/05/02
Date of Extraction: 05/03/02

625 BASE NEUTRAL/ACID/PESTICIDE EXTRACTABLES

PARAMETER	RESULT	DL	UNITS	ANALYST
Acenaphthene	BDL	1.0	µg/L	SPH
Acenaphthylene	BDL	1.0	µg/L	SPH
Aldrin	BDL	1.0	µg/L	SPH
Anthracene	BDL	1.0	µg/L	SPH
Benzidine	BDL	1.0	µg/L	SPH
Benzo(a)anthracene	BDL	1.0	µg/L	SPH
Benzo(b)fluoranthene	BDL	1.0	µg/L	SPH
Benzo(k)fluoranthene	BDL	1.0	µg/L	SPH
Benzo(g,h,i)perylene	BDL	1.0	µg/L	SPH
Benzo(a)pyrene	BDL	1.0	µg/L	SPH
Benzyl butyl phthalate	BDL	1.0	µg/L	SPH
alpha-BHC	BDL	1.0	µg/L	SPH
beta-BHC	BDL	1.0	µg/L	SPH
delta-BHC	BDL	1.0	µg/L	SPH
gamma-BHC	BDL	1.0	µg/L	SPH
Bis(2-chloroethyl)ether	BDL	1.0	µg/L	SPH
Bis(2-chloroethoxy)methane	BDL	1.0	µg/L	SPH
Bis(2-ethylhexyl)phthalate	BDL	1.0	µg/L	SPH
Bis(2-chloroisopropyl) ether	BDL	1.0	µg/L	SPH
4-Bromophenyl phenyl ether	BDL	1.0	µg/L	SPH
Chlordane	BDL	1.0	µg/L	SPH
4-Chloro-3-methylphenol	BDL	1.0	µg/L	SPH
2-Chloronaphthalene	BDL	1.0	µg/L	SPH
2-Chlorophenol	BDL	1.0	µg/L	SPH
4-Chlorophenyl phenyl ether	BDL	1.0	µg/L	SPH
Chrysene	BDL	1.0	µg/L	SPH
4,4'-DDD	BDL	1.0	µg/L	SPH
4,4'-DDE	BDL	1.0	µg/L	SPH
4,4'-DDT	BDL	1.0	µg/L	SPH
Dibenzo(a,h)anthracene	BDL	1.0	µg/L	SPH
Di-n-butyl phthalate	BDL	1.0	µg/L	SPH

Analysis Performed in Accordance with E.P.A. Methods
Laboratory Certification No. E86188

QA/QC Review
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DL=Detection Limit

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CERTIFICATE OF ANALYSIS

Gerhardt M. Witt & Associates, Inc.
1495 Forest Hill Blvd Suite F
West Palm Beach, FL 33406-6073

May 29, 2002
Report: 2002/05042
Sample No: 2002/05042- 1

Attention: Michael J. Caglioni, P.G.

Project: La Gorce Country Club
5685 Alton Road Miami Beach, FL

SAMPLE ID: Production Well F-2

Collected by: Bevin L. Morris

Collected on: 05/02/02
Received on: 05/02/02

Date of Analysis: 05/05/02
Date of Extraction: 05/03/02

625 BASE NEUTRAL/ACID/PESTICIDE EXTRACTABLES

PARAMETER	RESULT	DL	UNITS	ANALYST
1,2-Dichlorobenzene	BDL	1.0	µg/L	SPH
1,3-Dichlorobenzene	BDL	1.0	µg/L	SPH
1,4-Dichlorobenzene	BDL	1.0	µg/L	SPH
3,3'-Dichlorobenzidine	BDL	1.0	µg/L	SPH
2,4-Dichlorophenol	BDL	1.0	µg/L	SPH
Dieldrin	BDL	1.0	µg/L	SPH
Diethyl phthalate	BDL	1.0	µg/L	SPH
Dimethyl phthalate	BDL	1.0	µg/L	SPH
2,4-Dimethylphenol	BDL	1.0	µg/L	SPH
2,4-Dinitrophenol	BDL	1.0	µg/L	SPH
2,4-Dinitrotoluene	BDL	1.0	µg/L	SPH
2,6-Dinitrotoluene	BDL	1.0	µg/L	SPH
Di-n-octyl phthalate	BDL	1.0	µg/L	SPH
Endosulfan I	BDL	1.0	µg/L	SPH
Endosulfan II	BDL	1.0	µg/L	SPH
Endosulfan sulfate	BDL	1.0	µg/L	SPH
Endrin	BDL	1.0	µg/L	SPH
Endrin aldehyde	BDL	1.0	µg/L	SPH
Fluoranthene	BDL	1.0	µg/L	SPH
Fluorene	BDL	1.0	µg/L	SPH
Heptachlor	BDL	1.0	µg/L	SPH
Heptachlor epoxide	BDL	1.0	µg/L	SPH
Hexachlorobenzene	BDL	1.0	µg/L	SPH
Hexachlorobutadiene	BDL	1.0	µg/L	SPH
Hexachlorocyclopentadiene	BDL	5.0	µg/L	SPH
Hexachloroethane	BDL	2.0	µg/L	SPH
Indeno(1,2,3-c,d)pyrene	BDL	1.0	µg/L	SPH
Isophorone	BDL	1.0	µg/L	SPH
2-Methyl-4,6-dinitrophenol	BDL	1.0	µg/L	SPH
1-Methylnaphthalene	BDL	1.0	µg/L	SPH
2-Methylnaphthalene	BDL	1.0	µg/L	SPH

Analysis Performed in Accordance with E.P.A. Methods
Laboratory Certification No. E86188

QA/QC Review
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CERTIFICATE OF ANALYSIS

Gerhardt M. Witt & Associates, Inc.
1495 Forest Hill Blvd Suite F
West Palm Beach, FL 33406-6073

May 29, 2002
Report: 2002/05042
Sample No: 2002/05042- 1

Attention: Michael J. Caglioni, P.G.

Project: La Gorce Country Club
5685 Alton Road Miami Beach, FL

SAMPLE ID: Production Well F-2

Collected by: Bevin L. Morris

Collected on: 05/02/02
Received on: 05/02/02

Date of Analysis: 05/05/02
Date of Extraction: 05/03/02

625 BASE NEUTRAL/ACID/PESTICIDE EXTRACTABLES

PARAMETER	RESULT	DL UNITS	ANALYST
Naphthalene	BDL	1.0 µg/L	SPH
Nitrobenzene	BDL	1.0 µg/L	SPH
2-Nitrophenol	BDL	1.0 µg/L	SPH
4-Nitrophenol	BDL	3.0 µg/L	SPH
n-Nitrosodimethylamine	BDL	1.0 µg/L	SPH
n-Nitrosodi-n-propylamine	BDL	1.0 µg/L	SPH
n-Nitrosodiphenylamine	BDL	1.0 µg/L	SPH
PCB-1016	BDL	5.0 µg/L	SPH
PCB-1221	BDL	5.0 µg/L	SPH
PCB-1232	BDL	5.0 µg/L	SPH
PCB-1242	BDL	5.0 µg/L	SPH
PCB-1248	BDL	5.0 µg/L	SPH
PCB-1254	BDL	5.0 µg/L	SPH
PCB-1260	BDL	5.0 µg/L	SPH
Pentachlorophenol	BDL	1.0 µg/L	SPH
Phenanthrene	BDL	1.0 µg/L	SPH
Phenol	BDL	1.0 µg/L	SPH
Pyrene	BDL	1.0 µg/L	SPH
Toxaphene	BDL	1.0 µg/L	SPH
1,2,4-Trichlorobenzene	BDL	1.0 µg/L	SPH
2,4,6-Trichlorophenol	BDL	1.0 µg/L	SPH

Analysis Performed in Accordance with E.P.A. Methods
Laboratory Certification No. E86188

QA/QC Review
BDL = Below Detection Limit
DL = Detection Limit

Envirodyne Inc.

CHAIN OF CUSTODY RECORD
AND
ANALYSIS REQUEST

4805 NW 2nd Avenue • Boca Raton, FL 33431
(561) 989-5225 • Fax (561) 989-5204

PROJECT NUMBER:

PROJECT NAME: Lagorce Country Club

P.O. NUMBER:

PROJECT LOCATION: 5685 Alton Road Miami Beach, FL

CLIENT NAME: Gerhardt M. Witt & Associates Inc.

CLIENT ADDRESS: 1495 Forest Hill Blvd. West Palm Beach, FL 33406

PHONE: FAX:

SAMPLE TYPE: SOLID / LIQUID / AIR / NON-AQUEOUS LIQUID

PRESERVATIVE

ANALYSES REQUESTED: 504.1 EDB & DBCP; 524.2 VOC's THM; 508/508.1/515C; 525.2/531.1; 547/548; 549; Gross Alpha, Rad 226, 228; Prim & Sec Metals; Total Coliform

NO. OF CONTAINERS

RUSH TAT (SURCHARGE) ☐

DUE DATE:

SAMPLE INFORMATION

NUMBER	DATE	TIME	IDENTIFICATION	SOLID	LIQUID	AIR	NON-AQUEOUS LIQUID	504.1 EDB & DBCP	524.2 VOC's THM	508/508.1/515C	525.2/531.1	547/548	549	Gross Alpha, Rad 226, 228	Prim & Sec Metals	Total Coliform	NO. OF CONTAINERS	REMARKS
1	5-2-02	12:15	Production Well F-2		✓			✓	✓	✓	✓	✓	✓	✓	✓			
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		

SAMPLE COLLECTED BY: Bevin L. Morris

ARE THESE SAMPLES LISTED OR CHARACTERISTIC HAZARDOUS WASTE? ☐ YES ☐ NO

ARE THESE SAMPLES FROM ☐ PETROLEUM ☐ DRY CLEANER OR ☐ OTHER SITE? ________

TOTAL OF ALL CONTAINERS:

SEND REPORT TO (PERSON): Michael Caglioni

SAMPLES CONDITION: intact 4°C

LOG NUMBER: 2002/05042

	RELINQUISHED BY	DATE	TIME		RECEIVED BY	DATE	TIME
1	[signature]	05/02/02	16:40	2	Candida DeAmoes	5/02/02	16:40
3				4			
5				6			

Envirodyne Inc.

4805 NW 2nd Avenue • Boca Raton, FL 33431
(561) 989-5225 • Fax (561) 989-5204

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST

PROJECT NUMBER	PROJECT NAME	P.O. NUMBER	SAMPLE TYPE	PRESERVATIVE
	LAGORCE COUNTRY CLUB			

PROJECT LOCATION: 5685 ALTON ROAD MIAMI BEACH, FL.

CLIENT NAME: GERHARDT WITT & ASSOCIATES INC.

CLIENT ADDRESS: 1495 FOREST HILL BLVD. WPB, FL. 33406-6073

PHONE: FAX:

ANALYSES REQUESTED: TOTAL CYANIDE; COLOR / ODOR; WET CHEM. PRESERVED; WET CHEM. UNPRESERVED; 8260; 8270 / 808.1; H2S; TOC / DISSOLVED METALS

RUSH TAT (SURCHARGE) ☐

DUE DATE: ______

SAMPLE INFORMATION

NUMBER	DATE	TIME	IDENTIFICATION	SOLID	LIQUID	AIR	NON-AQUEOUS LIQUID	TOTAL CYANIDE	COLOR / ODOR	WET CHEM. PRESERVED	WET CHEM. UNPRESERVED	8260	8270 / 808.1	H2S	TOC / DISSOLVED METALS	NO. OF CONTAINERS	REMARKS
1	5-2-02	12:15	PRODUCTION WELL F-2		✓			✓	✓	✓	✓	/	/	/	✓		PH - 7.0
2																	TEMP - 21.1
3																	COND - 16,921
4																	FREE CHLORIDE
5																	0.01
6																	TOTAL CHLORIDE
7																	
8																	TURB - 0.21
9																	DO - 0.45
10																	

SAMPLE COLLECTED BY: Bevin L. Morris

ARE THESE SAMPLES LISTED OR CHARACTERISTIC HAZARDOUS WASTE? ☐ YES ☐ NO

ARE THESE SAMPLES FROM ☐ PETROLEUM ☐ DRY CLEANER OR ☐ OTHER SITE? ______

TOTAL OF ALL CONTAINERS:

SEND REPORT TO (PERSON): Michael Caglioni

SAMPLES CONDITION: Intact 4°C

LOG NUMBER: 2002/05042

	RELINQUISHED BY	DATE	TIME		RECEIVED BY	DATE	TIME
1	[signature]	5/02/02	16:40	2	Candida DeLama	5/02/02	16:40
3				4			
5				6			

APPENDIX G

MICROBIOLOGICAL SAMPLE RESULTS

MICRIM LABS, INC.
800 N.E. 62ND STREET, SUITE 202
FT. LAUDERDALE, FLORIDA 33334
TEL: (954) 776-9479
FAX: (954) 776-9481

REPORT NUMBER: 01L286
01L287
01L288
01L289
01L290
01L291

DATE RECEIVED:	12-05-01
SAMPLE:	LAG – F2 – 120401 – 1
MATERIAL:	H2O

LAB I.D. CLIA # 10D0282547
HRS: 900001156
HRS: E86773

GERHARDT M. WITT & ASSOCIATES, INC.
1495 FOREST HILL BLVD. SUITE F.
WEST PALM BEACH, FL. 33406, 6073

TEL: (561) 642-9923
FAX: (561) 642-3327

COMMENTS OR FINDINGS

PARAMETER	RESULTS	UNITS	METHOD
HPC:	HPC – 1 CFU / ML		
TCC:	TCC - <1 CFU / 100 ML		
BACTERIAL ID:	AEROMONAS HYDROPHILA MICROCOCCUS LUTEUS PSEUDOMONAS ALCALIGENES		

NO FUNGAL GROWTH ISOLATED

NO ALGAL MORPHOLOGIES SEEN

FCC:	FCC - < 1 CFU/100 ML		

SET UP DATE/TIME	ANALYSIS DATE	ANALYST
12-05-01 9:00 P.M.	12 - 10 - 01	

MICRIM LABS, INC.
800 N.E. 62ND STREET, SUITE 202
FT. LAUDERDALE, FLORIDA 33334
TEL: (954) 776-9479
FAX: (954) 776-9481

RECEIVED
JUN 2 6 2002

REPORT NUMBER: 02E195
02E196
02E197
02E198
02E199
02E200

DATE RECEIVED: 05-02-02
SAMPLE ID: GMWA-FAGF2-050202-1
MATERIAL: GROUND WATER
PROJECT LOCATION: MIAMI BCH FLORIDA
SAMPLE SOURCE: GROUNDWATER FROM F-2

LAB I.D. CLIA # 10D0282547
HRS: 900001156
HRS: E86773

GERHARDT M. WITT & ASSOCIATES, INC.
1495 FOREST HILL BLVD. ~~SUITE~~ F.
WEST PALM BEACH, FL. 33406, 6073

TEL: (561) 642-9923
FAX: (561) 642-3327

COMMENTS OR FINDINGS

PARAMETER	RESULTS	UNITS	METHOD
TCC:	TCC – < 1 CFU / 100 ML		
HPC:	HPC - 5 CFU / ML		
BACTERIAL ID:	ENTEROBACTER AGGLOMERANS PSEUDOMONAS STUTZERI BACILLUS SP		

NO FUNGAL GROWTH ISOLATED

NO ALGAL MORPHOLOGIES SEEN
FEW IRON ENCRUSTED FILAMENTS MORPHOLOGICALLY CONSISTENT WITH THOSE OF THE IRON BACTERIA SPHAEROTILUS NATANS SEEN

FCC: FCC - < 1 CFU/100 ML

SET UP DATE/TIME	ANALYSIS DATE	ANALYST
05-01-02 2:00	05 - 07 - 02	

APPENDIX H

TELEVISION VIDEO SURVEY