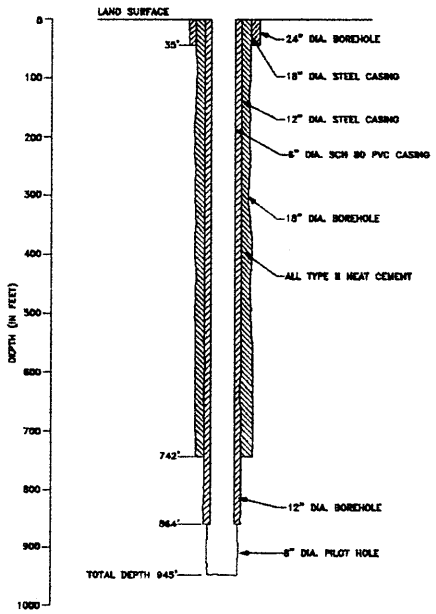
Completion Report for:

Lee County Utilities
Observation Wells #1 (LM-6209) and #3 (LM-6615) at the Olga WTP Site, Lee County, Fl.

LEE COUNTY
SOUTHWEST FLORIDA



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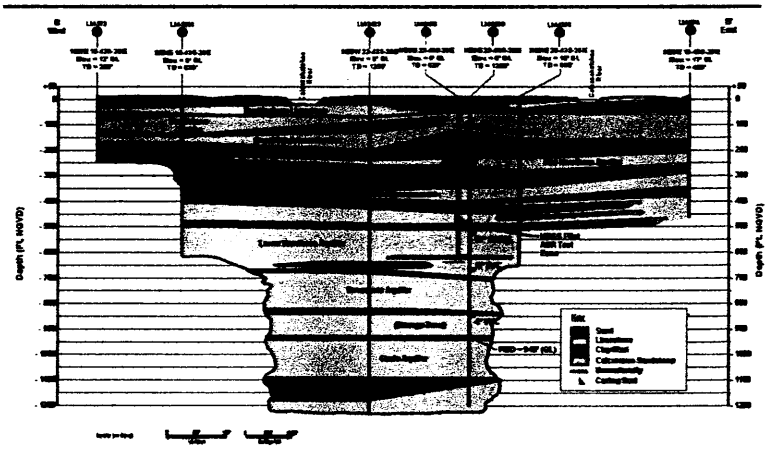

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A. Conclusions

The following conclusions are made as a result of this investigation:

- Suwannee Zone II, at depths of approximately 840 to 940 feet below land surface at the site, has been identified as having the best potential for use as an ASR zone.

- Overlying confinement, above Suwannee Zone II, is comprised of interbedded low permeability mudstones, lime muds, and argillaceous limestones.

- Overlying confinement is evidenced by a significant change in lithology, representing distinct depositional environments, and significant differences in groundwater quality, for the porous zones above and below the confining interval.

- The packer test results of the Suwannee Zone II tend to confirm isolation from overlying porous zones. However, the best aquifer test information regarding the confinement can only be obtained from an extended-duration constant-rate pumping test of the planned test ASR well using Observation Wells #1 and #3 to monitor water level drawdowns.

- Preliminary modelling of an ASR system at the site using the Suwannee Zone II as the storage zone, and incorporating an estimated relatively high leakance value, was conducted. The model simulations used injected volumes of 100 million gallons per cycle. Recovery efficiencies increased from 26% for the first cycle to 75% for the fourth cycle.

B. Recommendations

The following recommendations are made as a result of this investigation:

- The test ASR well planned for this site should be installed and completed open-hole in Suwannee Zone II.

- The planned extended-duration constant-rate pumping test should be conducted to accurately determine aquifer hydraulic parameters.

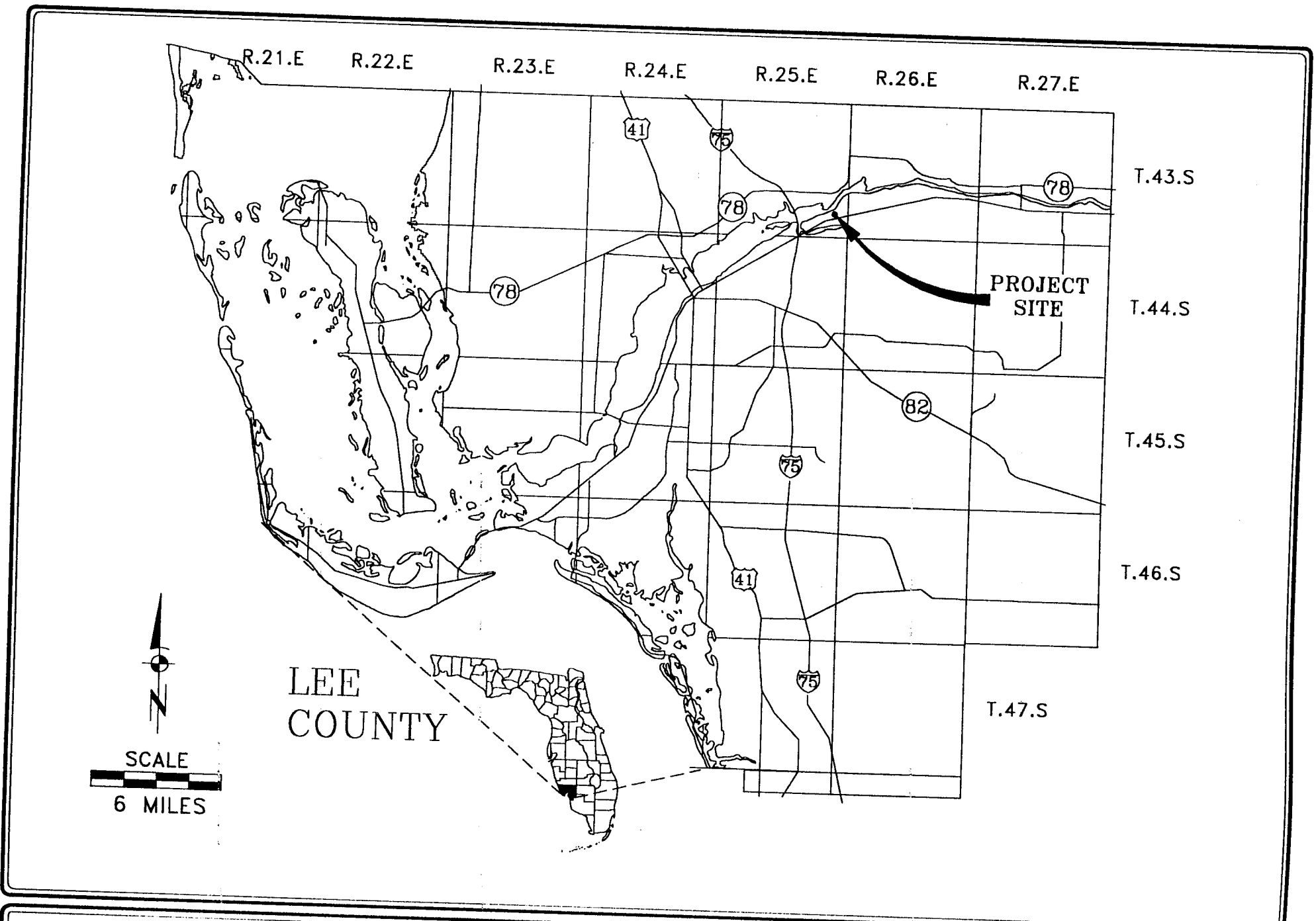
- The preliminary model simulations should be updated after the more precise aquifer hydraulic data is obtained.

II. INTRODUCTION

A. Purpose and Scope of Investigation

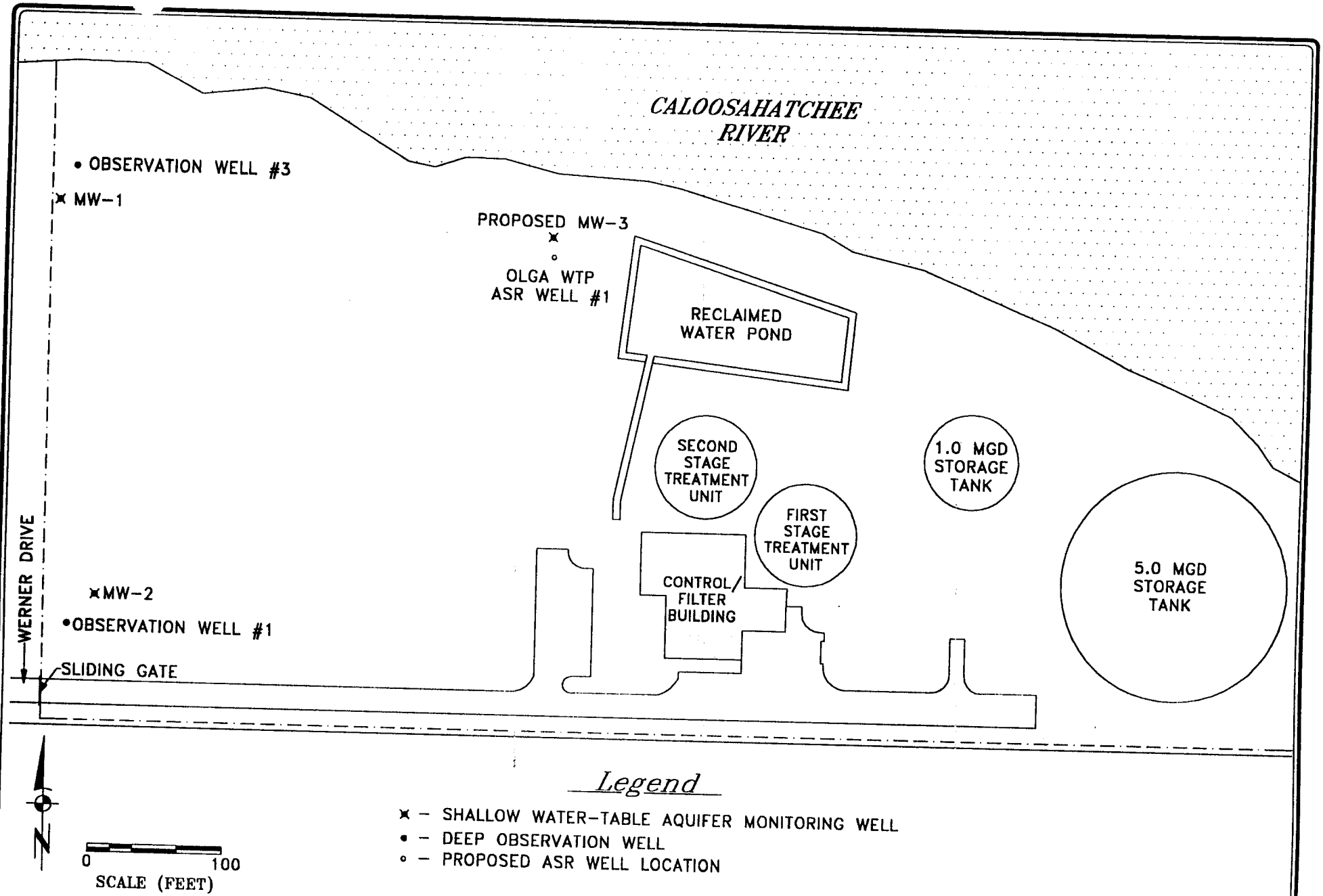
This document is intended as the subsurface completion report for the initial exploratory well at the Lee County Utilities' Olga site (Figure 2-1). The purpose of the investigation conducted at that this site was to determine the feasibility of constructing an aquifer storage and recovery (ASR) system. The Olga site is an approximate 7.10 acre property on which is located a five million gallon per day (MGD) capacity water treatment plant and 1.0 million gallon (MG) total capacity storage tanks (Figure 2-2). Since ASR has been shown to be a more cost effective means of storage of treated water than construction of above ground storage tanks or reservoirs, a successful ASR project at Olga would provide Lee County Utilities (LCU) with considerable operational flexibility for supplying the northern portion of its service area.

The scope of the investigation included the installation and testing of two exploratory wells. These wells, referred to as Observation Well #1 (LM-6209) and Observation Well #3 (LM-6615) were drilled to depths of 1200 and 945 feet respectively and several zones in the Upper Floridan aquifer were tested. Based upon the testing, described in more detail herein, a suitable zone for storage and recovery of potable water was selected. Selection criteria, which included eight hydrologic variables, were delineated in a previous report prepared for LCU (ViroGroup, 1998). Thereafter, the exploratory wells were backplugged with appropriate volumes of sand and cement and a final string of casing was set in each. The wells were completed open-hole in the selected ASR zone. These wells are to be used as monitoring wells during testing of an ASR production well which is to be installed at the site. A subsequent report will describe the installation of the initial ASR well; long-term aquifer testing, including cyclical injection, storage, and recovery operations; and plans for a fully operational ASR wellfield in the vicinity of the Olga site.



Water Resource Solutions	PROJECT NAME: OLGA PROJECT NUMBER: 01-03891.HO	DWG. NUMBER: A-013891L1-1 DATE: 5/18/99

FIGURE 2-1. GENERAL SITE LOCATION MAP.



Water Resource Solutions	PROJECT NAME: OLGA	DWG. NUMBER: A-013891SI-3
	PROJECT NUMBER: 01-03891.HO	DATE: 5/17/99

FIGURE 2-2. OLGA SITE MAP SHOWING LOCATION OF OBSERVATION WELLS, SHALLOW WATER-TABLE AQUIFER MONITORING WELLS, AND PROPOSED ASR WELL.

B. Background

The present investigation is an endeavor jointly funded by Lee County Utilities and the South Florida Water Management District (SFWMD). The Lee County Regional Water Supply Authority (LCRWSA) was the agent through which the funding application to the SFWMD was made and through which results of the work are reported to the SFWMD.

Although the selection of the Olga site for an ASR project was based solely on LCU's logistical and operational considerations, previous subsurface mapping conducted as part of another project for LCU (ViroGroup, 1998) indicated that the site had potentially favorable hydrogeological characteristics in the Suwannee portion of the Upper Floridan aquifer.

In 1977, a demonstration ASR project was constructed at Olga by the United States Geological Survey (USGS). This project utilized the basal portion of the Mid Hawthorn and the upper portion of the Lower Hawthorn aquifers as the storage zone of raw water pumped from the Caloosahatchee River. Ultimately, the project was abandoned due to progressive aquifer plugging caused by precipitation of material from the injected water.

An Area of Review (Appendix A) was performed by Water Resource Solutions (formerly ViroGroup) as part of the ASR well construction application submitted by Hazen & Sawyer to the Florida Department of Environmental Protection (FDEP). The Area of Review contains a tabulation of pertinent characteristics of wells located in a nine square mile area surrounding the site. It also contains a subsurface cross-section through the site. Prior to drilling the exploratory well at the site, a well prognosis (Appendix B), which delineates formation tops and details the data acquisition program, was prepared. This prognosis was based upon available information, including the Area of Review, and some semi-regional subsurface mapping.

III. TEST WELL DRILLING AND AQUIFER TESTING

A. Observation Well #1 (LM-6209) Installation

Observation Well #1 (LM-6209) was spudded on December 2, 1998. Eighteen inch diameter steel surface casing was set at 35 feet below the drill floor (DF) elevation, which was about 4.5 feet above land surface (ALS). All drilling to intermediate casing setting depth was performed by the mud rotary method. The top of the Lower Hawthorn aquifer was encountered at a depth of 520 feet (DF) in the eight-inch diameter pilot hole. At a depth of 530 feet (DF) pilot hole drilling was stopped and open-hole geophysical logs were run. The pilot hole was then reamed to 18-inch diameter. A caliper log and deviation surveys were run and thereafter 12-inch diameter steel intermediate casing was set at a depth of 530 feet (DF).

Subsequent to setting intermediate casing, all drilling was done by the reverse air rotary method. An eight inch diameter pilot hole was advanced to a depth of 944 feet. At that depth, the well driller requested that a string of eight-inch diameter PVC casing be set to seal off an interval in the Lower Hawthorn aquifer, between the approximate depths of 636 and 694 feet (DF) from which had flowed large volumes of sand while drilling operations proceeded through that zone. The well flow was killed with a heavy salt brine solution, plugged back with sand, and the eight inch diameter PVC casing was set.

The intended setting depth for the eight-inch diameter PVC casing was 714 feet (DF). During pressure grouting of this casing, the grout pipe was inadvertently cemented in the hole. During an attempt to retrieve the two-inch steel grout pipe, it was sheared off at a depth of 665 feet (DF). A video log was run to inspect the casing, which was found in good condition, and thereafter milling operations commenced. It was later determined, through a recount of the casing that had been delivered compared to that installed in the well, that the well had been short cased and the eight-inch diameter PVC casing was actually set at a depth of 679 feet (DF) rather than the intended 714 feet (DF). The hole

was mudded and milling operations continued for two days until all of the two-inch diameter steel tremie pipe was ground up. Thereafter, a second video survey was run to inspect the eight-inch diameter PVC casing. The casing was found to be in good condition. Reverse air drilling was then commenced to drill out the sand back plug to a depth of 944 feet (DF). A series of packer tests were then conducted as the pilot hole was drilled to a depth of 1200 feet (DF).

Six potential storage zones were encountered, five of which were evaluated by aquifer testing. A suite of geophysical logs was run at total depth. Daily drilling reports are provided in Appendix C.

Based upon an analysis of the geology and aquifer test data, Suwannee Zone II, between the approximate depths of 840 and 940 feet (DF), was considered the zone with the most ASR potential. Because the overlying confining interval was lithologically rather subtle, being comprised of mudstone and argillaceous limestone with poor porosity, the confining characteristics of this interval were not clear cut. The test data obtained from the packer testing was not completely definitive with respect to hydraulic isolation by the overlying confinement. However, a major difference in both lithology and groundwater quality is present in the two zones separated by this confining interval. The zone above the confinement is composed of very sandy calcarenitic limestone which was likely deposited in a near shore (i.e. shallow water environment), whereas the zone below the confinement is a biomicritic limestone likely deposited in a deeper water shelf setting. Groundwater quality changes significantly at the confining zone, being relatively fresh above (dissolved chlorides averaging 400 mg/l) to more brackish (averaging about 980 mg/l) below the confining zone. From a geologic perspective, the confining zone likely represents a hard ground which reflects an intraformational disconformity related to the Gulf-wide Chickasawhayan-Vicksburgian unconformity.

Considering the construction difficulties encountered with this well, it was decided that Observation Well #3 (LM-6615) would be installed to allow for further testing. Based on the results of Observation Well #3 (LM-6615), described below, Observation Well #1 (LM-6209) was then back plugged with cement to a reported depth of 919 feet and with sand to 853 feet, and a final string of four-inch diameter PVC casing, was set at a depth of 850 feet (BLS). Thereafter, the sand back plug was drilled out.

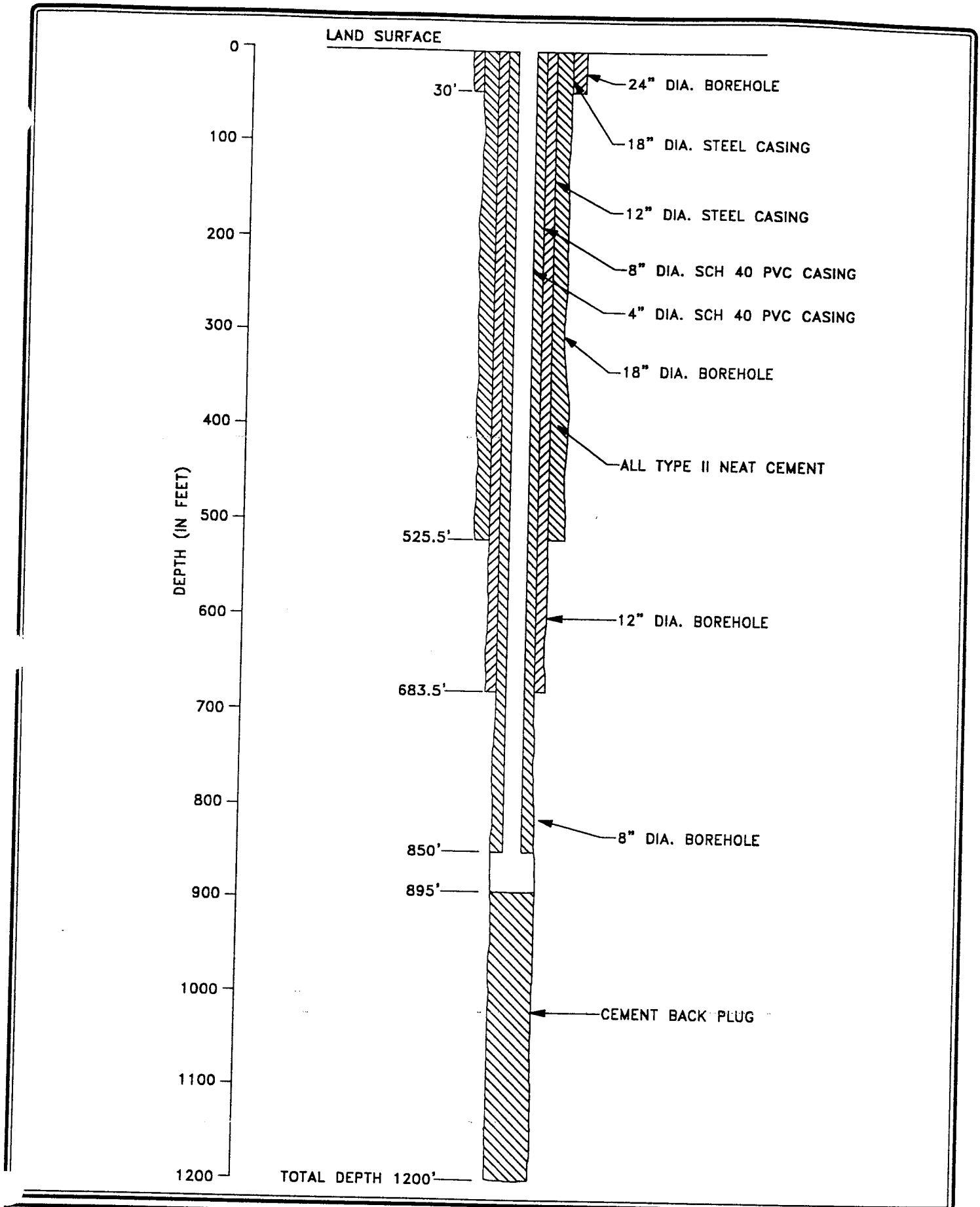
When the sand back plug was drilled out on May 27, 1999, the top of cement plug back was not encountered at the anticipated depth of 919 feet. Rather, the interval between 919 and 959 feet was comprised of barite and salt. This necessitated another back plug operation in order to isolate the ASR zone from underlying zones. On June 3, 1999 after attempting to back plug with cement to a depth of 919 feet, the top of the new cement back plug was found at a depth of 862 feet (i.e. 12 feet below the base of the four-inch diameter casing). After extensive air development of the well, the flow from the well was about 15 gpm, or about 10% of that anticipated if the entire ASR zone were open to the wellbore.

In order to correct this situation, remedial operations were commenced on August 17, 1999 and completed on August 19, 1999. These operations consisted of reentering the well and drilling out the cement back plug to a depth of 870 feet and a sidetracked hole to a depth of 895 feet, and thereafter thoroughly redeveloping the well with an air compressor. The remedial operations increased the flow from the well to 90 gpm.

A schematic illustration of well construction details for Observation Well #1 (LM-6209) is provided as Figure 3-1.

B. Observation Well #3 (LM-6615) Installation

Observation Well #3 (LM-6615) was spudded on December 15, 1998. Eighteen-inch diameter steel surface casing was set at 35 feet below land surface (BLS). After setting



Water Resource Solutions	PROJECT NAME: OLGA WTP ASR	DWG. NUMBER: A-013891F1-2
	PROJECT NUMBER: 01-03891.HO	DATE: 9/15/99

FIGURE 3-1. SCHEMATIC ILLUSTRATION OF CONSTRUCTION DETAILS FOR OLGA ASR OBSERVATION WELL #1 (LM-6209).

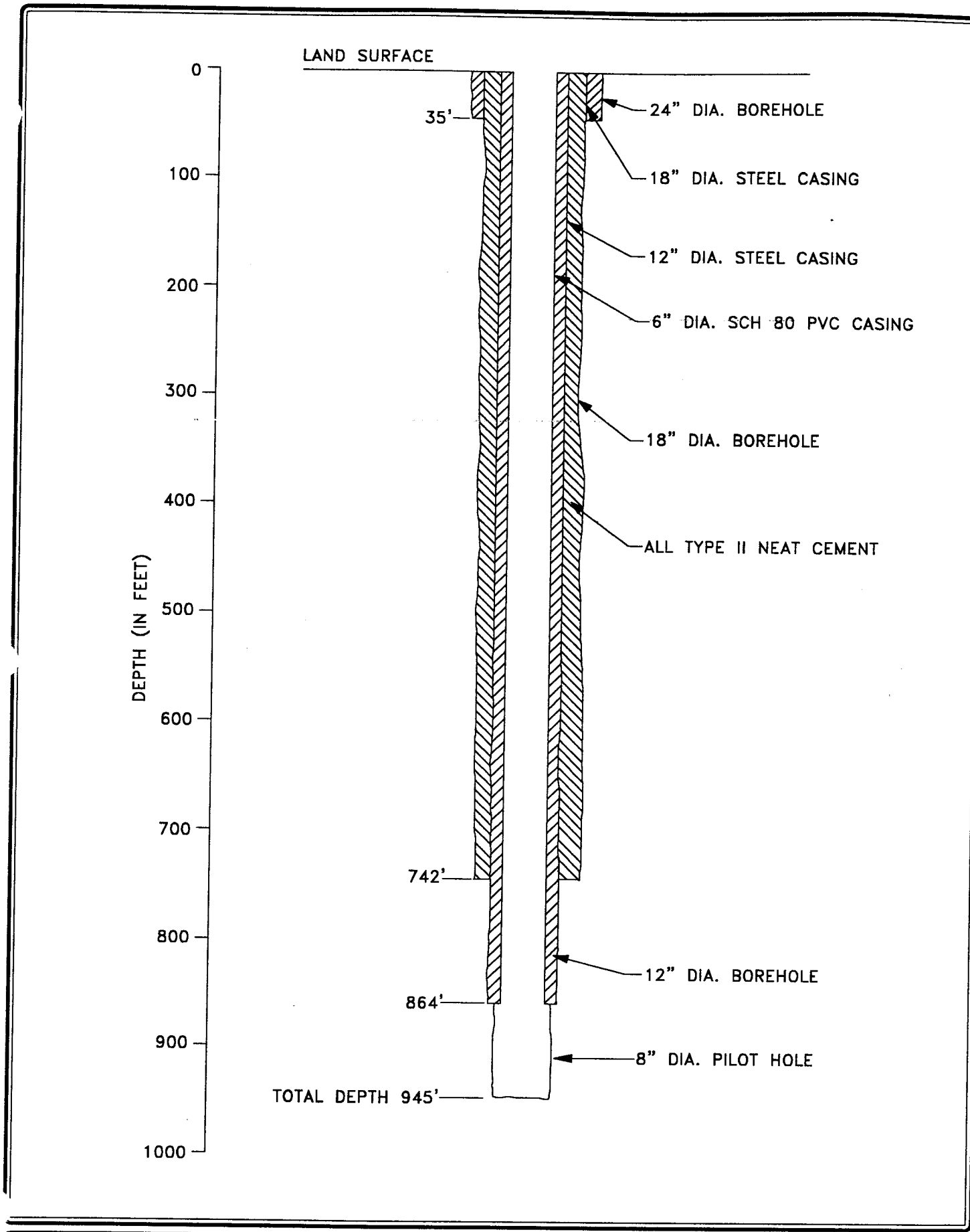
surface casing the drilling rig was moved off-site and operations on this well were suspended.

On March 2, 1999 operations were resumed using another drilling rig. All drilling to intermediate casing setting depth was performed by the mud rotary method. Because of the sand inflow problems encountered in Lower Hawthorn Zone II in Observation Well #1 (LM-6209), 12-inch diameter steel intermediate casing was set into the top of the Suwannee formation at a depth of 742 feet (BLS) in Observation Well #3 (LM-6615). Prior to setting intermediate casing, a suite of geophysical logs and deviation surveys were run.

Subsequent to setting intermediate casing, all drilling was done by the reverse air rotary method. An eight-inch diameter pilot was advanced to a depth of 945 feet (BLS). Three potential storage zones (i.e. the Suwannee Zone IA, Suwannee Zone IB, and Suwannee Zone II) were tested. The first zone tested was the open-hole interval below casing, and the latter two were tested by using a single packer set at the top of the test interval.

A suite of geophysical logs were run at total depth in the pilot hole. Thereafter, the well was killed with a heavy salt brine solution and back plugged with sand to a depth above the intended final casing setting depth. The pilot hole was then reamed to 12-inch diameter to a depth of 867 feet (BLS). A caliper log and deviation surveys were run at that depth. Six-inch diameter PVC casing was set at a depth of 864 feet (BLS). Thereafter, the sand back plug was drilled out and the well was thoroughly developed by air lift method.

A schematic illustration of the well construction details for Observation Well #3 is presented as Figure 3-2.



Water Resource Solutions	PROJECT NAME: OLGA WTP ASR	DWG. NUMBER: A-013891BS-1
	PROJECT NUMBER: 01-03891.HO	DATE: 5/19/99

FIGURE 3-2. SCHEMATIC ILLUSTRATION OF CONSTRUCTION DETAILS FOR OLGA ASR OBSERVATION WELL #3 (LM-6615).

C. Site Hydrogeology

The general hydrogeology of northern Lee County was previously described in the Area of Review (Appendix A) and other recent reports prepared for LCU (ViroGroup, 1998). A generalized hydrostratigraphic column for north Lee County is presented as Figure 3-3.

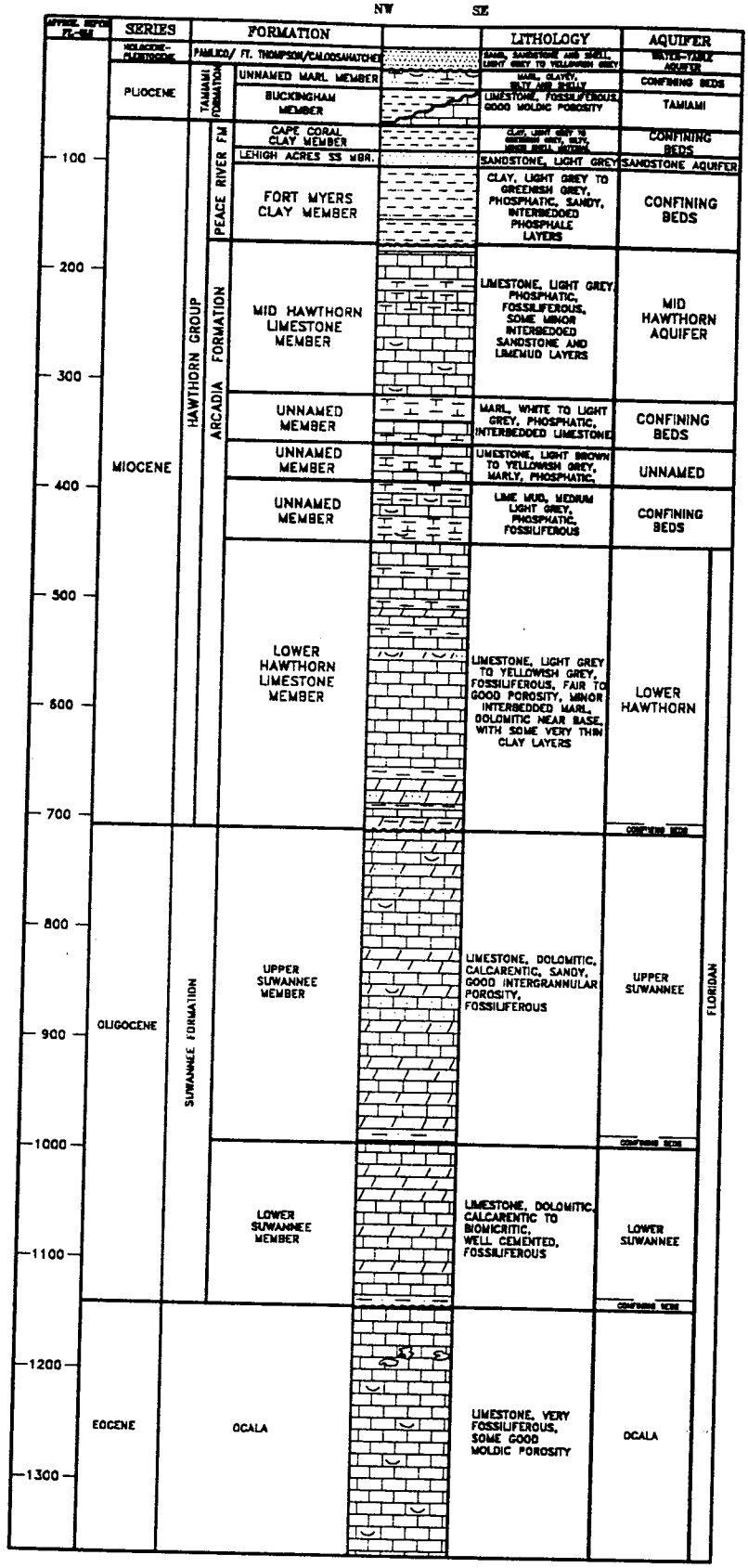
Throughout the drilling and testing of Observation Well #1 (LM-6209) a WRS geologist was present on-site to supervise drilling operations and compile a detailed log of lithology based upon analysis of the drill cuttings. A lithologic log is provided in Appendix E. The strip log for Observation Well #1 (LM-6209), compiled from the lithologic analysis and the drilling penetration rate, is provided in Appendix F.

A suite of geophysical logs was run in the open-hole section of the wells prior to setting of intermediate casing. A more comprehensive suite of geophysical logs, including both sonic and flowmeter logs, was run at total depth. Copies of the geophysical logs are provided in Appendix G.

Based on analyses of the lithology and the geophysical logs, a comparison of anticipated (i.e. from the well prognosis) to actual stratigraphic tops is provided on Table 3-1 for Observation Well #1 (LM-6209) and on Table 3-2 for Observation Well #3 (LM-6615).

As can be noted from Table 3-1, from a structural aspect Observation Well #1 (LM-6209) was approximately flat to prognosis at the top of the Mid Miocene (approximately 17 to 22 million years ago) Arcadia formation (Mid-Hawthorn Zone I), approximately flat to prognosis at the top of the Lower Miocene (23.5 to 26 mya) Lower Hawthorn Zone I, and approximately 20 feet low at the top of the Oligocene (29 to 37 mya) Suwannee formation. The structural data from Observation Well #1 tends to confirm the structure contour map prepared as part of an earlier project for LCU (see Plate 32, ViroGroup, 1998). The site-specific stratigraphic data has been utilized to construct a structure contour map on the

GENERAL HYDROSTRATIGRAPHIC COLUMN FOR OLGA AREA



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	PROJECT NUMBER: 01-03891.HO	DATE: 5/18/99

FIGURE 3-3. GENERALIZED HYDROSTRATIGRAPHIC COLUMN FOR OLGA AREA.

TABLE 3-1. COMPARISON OF PREDICTED VERSUS ACTUAL STRATIGRAPHIC TOPS FOR OBSERVATION WELL #1 (LM-6209)

Stratigraphic Top	Predicted Depth (ft-BLS)	Actual Depth (ft-BLS)
Pamlico/Ft. Thompson	Surface	Surface
Cape Coral Clay	7	7
Lehigh Acres Sandstone	60	57
Fort Myers Clay	138	130
Mid-Hawthorn Zone I	235	237
Unnamed Marl/Clay		270
Mid-Hawthorn Zone II	355	355
Unnamed Marl/Clay	410	395
Unnamed Limestone	457	445
Unnamed Marl/Clay	500	510
Lower Hawthorn Zone I	520	515
Unnamed Marl/Clay		605
Lower Hawthorn Zone II		612
Unnamed Marl/Clay	680	689
Suwannee Zone I	690	710
Unnamed Marl/Clay	830	829
Suwannee Zone II	850	835
Unnamed Marl/Clay	940	935
Suwannee Zone III	950*	NP
Unnamed Marl/Clay	1105*	NP
Ocala Zone I		945*
Unnamed Marl/Clay		1101*
Ocala Zone II		1124

NP = Not Present

*Based upon fossil content in Observation Well #1, the interval in a nearby offsetting well classified as Suwannee by the Florida Geological Survey, is now believed to be Ocala.

TABLE 3-2. COMPARISON OF PREDICTED VERSUS ACTUAL STRATIGRAPHIC TOPS FOR OBSERVATION WELL #3 (LM-6615)

Stratigraphic Top	Predicted Depth (ft-BLS)	Actual Depth (ft-BLS)
Pamlico/Ft. Thompson	Surface	Surface
Cape Coral Clay	14	14
Lehigh Acres Sandstone	61	58
Fort Myers Clay	131	117
Mid-Hawthorn Zone I	235	262
Unnamed Marl/Clay	270	300
Mid-Hawthorn Zone II	355	352
Unnamed Marl/Clay	395	394
Unnamed Limestone	470	456
Unnamed Marl/Clay	510	506
Lower Hawthorn Zone I	515	510
Unnamed Marl/Clay	605	613
Lower Hawthorn Zone II	612	624
Unnamed Marl/Clay	690	683
Suwannee Zone I	710	737
Mudstone	825	845
Suwannee Zone II	835	866
Unnamed Marl/Clay	935	NDE

NDE = Not Deep Enough

top of the Lower Hawthorn at the site (Figure 3-4) and a revised version of Cross-Section A-A' (Figure 3-5) originally prepared for the Area of Review.

D. Aquifer Testing

Five potential storage zones were encountered in Observation Well #1 (LM-6209), all of which were evaluated by aquifer testing. Specific capacity pumping tests were conducted of Lower Hawthorn Zone I, Lower Hawthorn Zone II, Suwannee Zone I, Suwannee Zone II, and Ocala Zone I. In each case, except for Suwannee Zone I, drilling was stopped when the underlying confining unit was encountered. Suwannee Zone I was tested commingled with Suwannee Zone II, after Suwannee Zone II had been tested singularly. The test of Lower Hawthorn Zone I was conducted in the open hole below intermediate casing. The tests of the four zones below Lower Hawthorn Zone I were conducted using a single packer set at the top of interval to be tested. Plots of the specific capacity test data for Observation Well #1 (LM-6209) are provided on Figures 3-6 through 3-11.

Three potential storage zones were encountered in Observation Well #3 (LM-6615), all of which were evaluated by aquifer testing. Specific capacity pumping tests were conducted of Suwannee Zone IA, Suwannee Zone IB, and Suwannee Zone II. Suwannee Zone IB was tested in conjunction with Suwannee Zone II and thereafter Suwannee Zone II was tested singularly. Suwannee Zone IA was tested in the open-hole when drilling was stopped at its basal confinement and the latter two specific capacity tests were conducted using a single packer set at the top of the test interval. Plots of the specific capacity test data for Observation Well #3 (LM-6615) are provided as Figure 3-12 through 3-14. In addition to the specific capacity pumping tests, a constant-rate pumping test of Suwannee Zone II was also conducted. A semi-logrithmic plot of recovery water levels versus time is provided as Figure 3-15. The purpose of the latter test was to eliminate friction loss effects in the drill pipe in order to obtain a more precise estimate of aquifer transmissivity than obtained by the specific capacity test data.

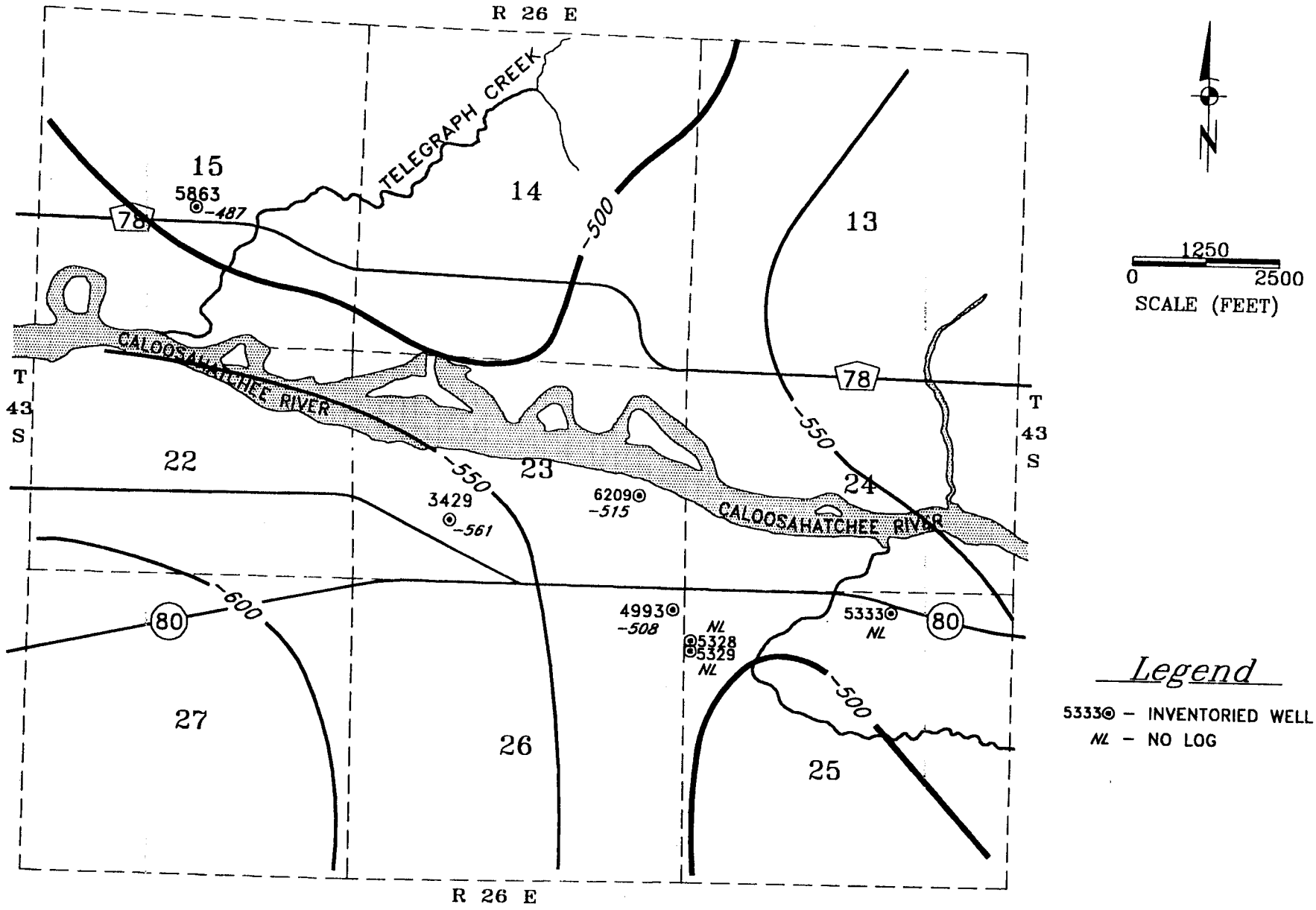

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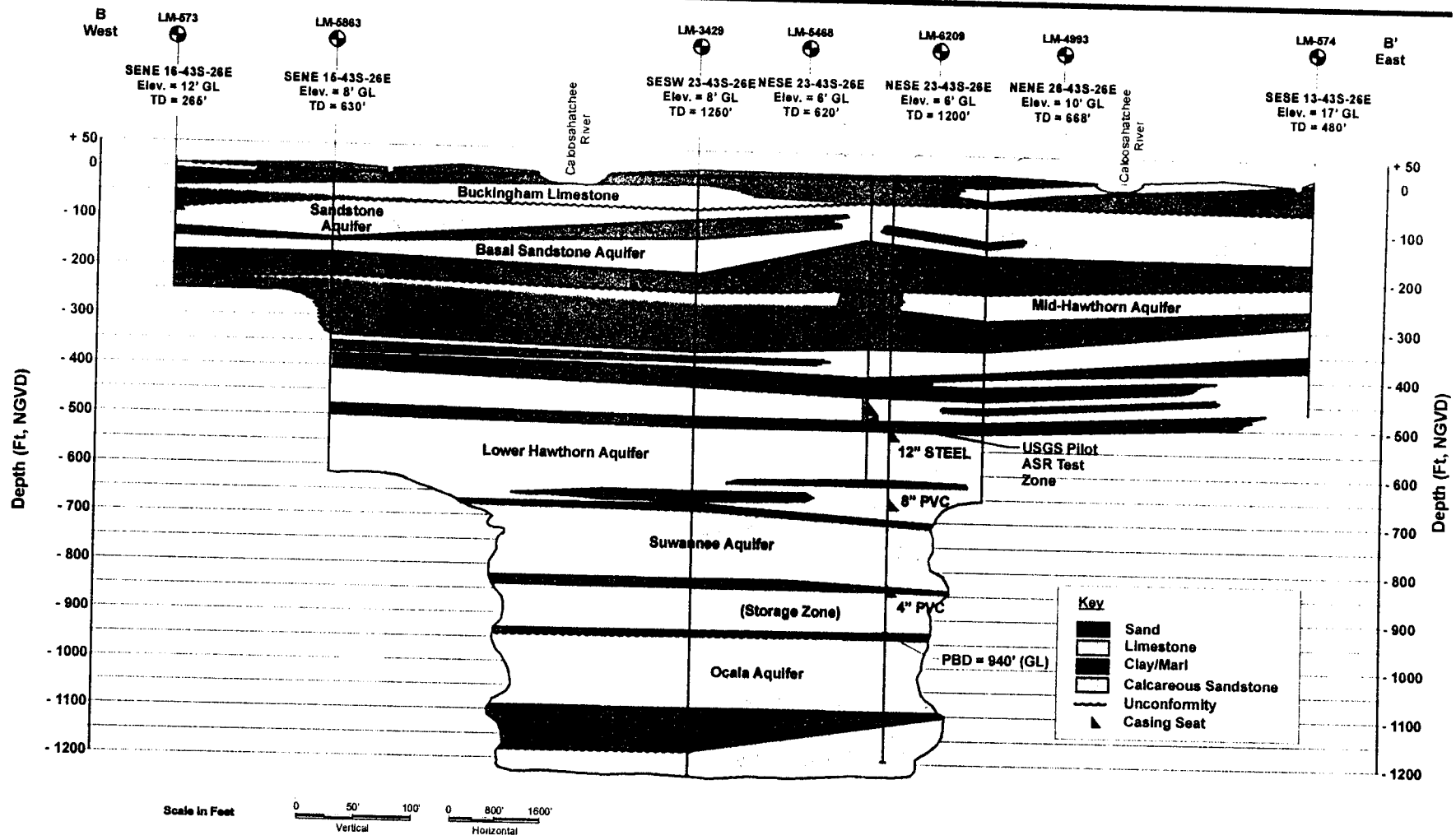
FIGURE 3-4. SUBSURFACE STRUCTURE MAP ON TOP OF LOWER HAWTHORN AQUIFER.

Olga Area, Lee County, Florida



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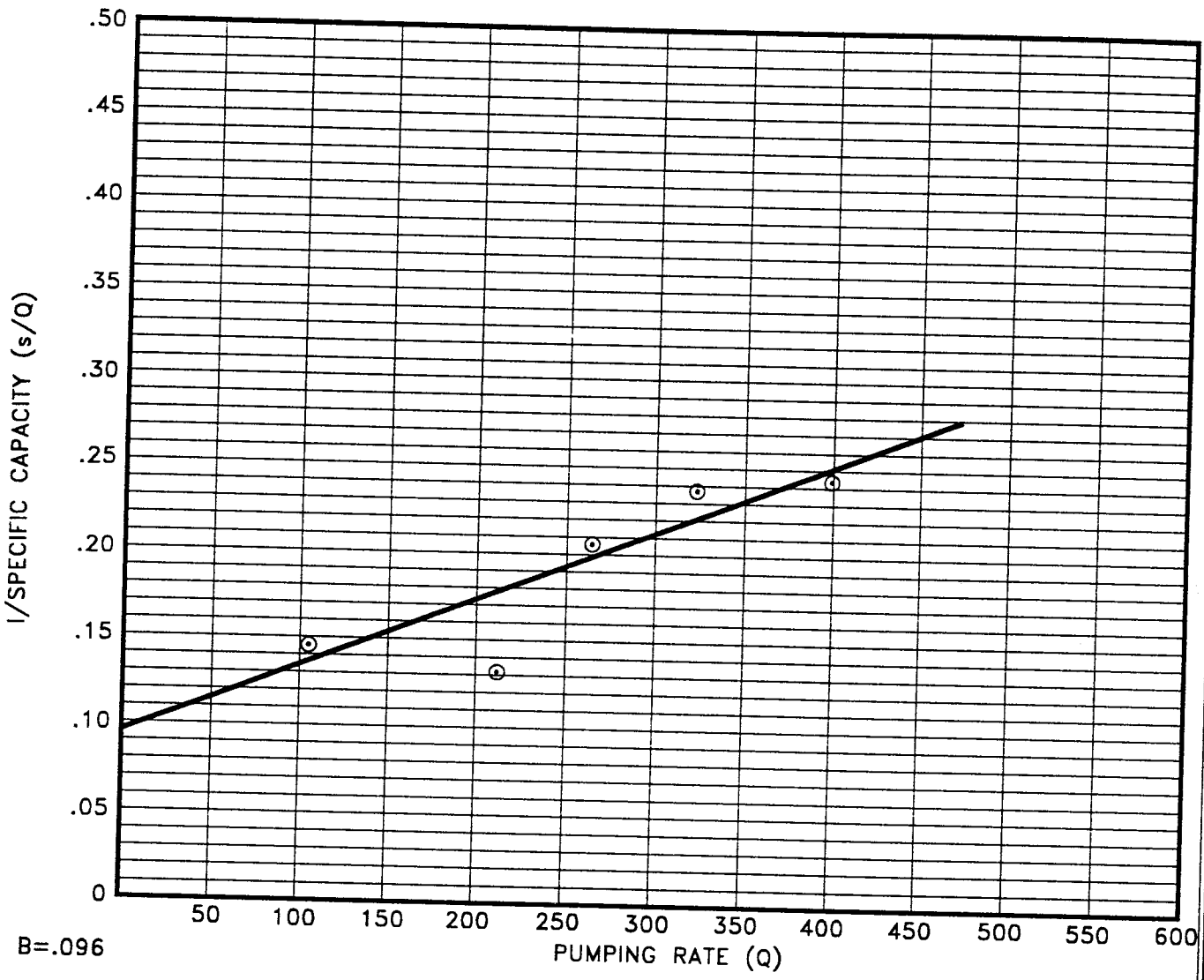
PROJECT NAME: OLGA
PROJECT NUMBER: 01-0589-110
DWG. NUMBER: A-01-0589104-1
DATE: 4/29/99

FIGURE 3-5. CROSS-SECTION B-B' SHOWING OLGA OBSERVATION WELL #1 (LM-6209).



Q (GPM)	DRAWDOWN s(FEET)	s/Q	FORMATION LOSS (FT.)	WELL LOSS (FT.)	WELL EFFICIENCY (%)	ESTIMATED TRANSMISSIVITY (gpd/ft)
110	15.94	.145	10.56	5.38	66.2	19,000
220	28.83	.131	21.12	7.71	73.3	
270	55.68	.206	25.92	29.76	46.5	
330	77.65	.235	31.68	45.97	40.8	
400	96.73	.242	38.40	58.33	39.7	

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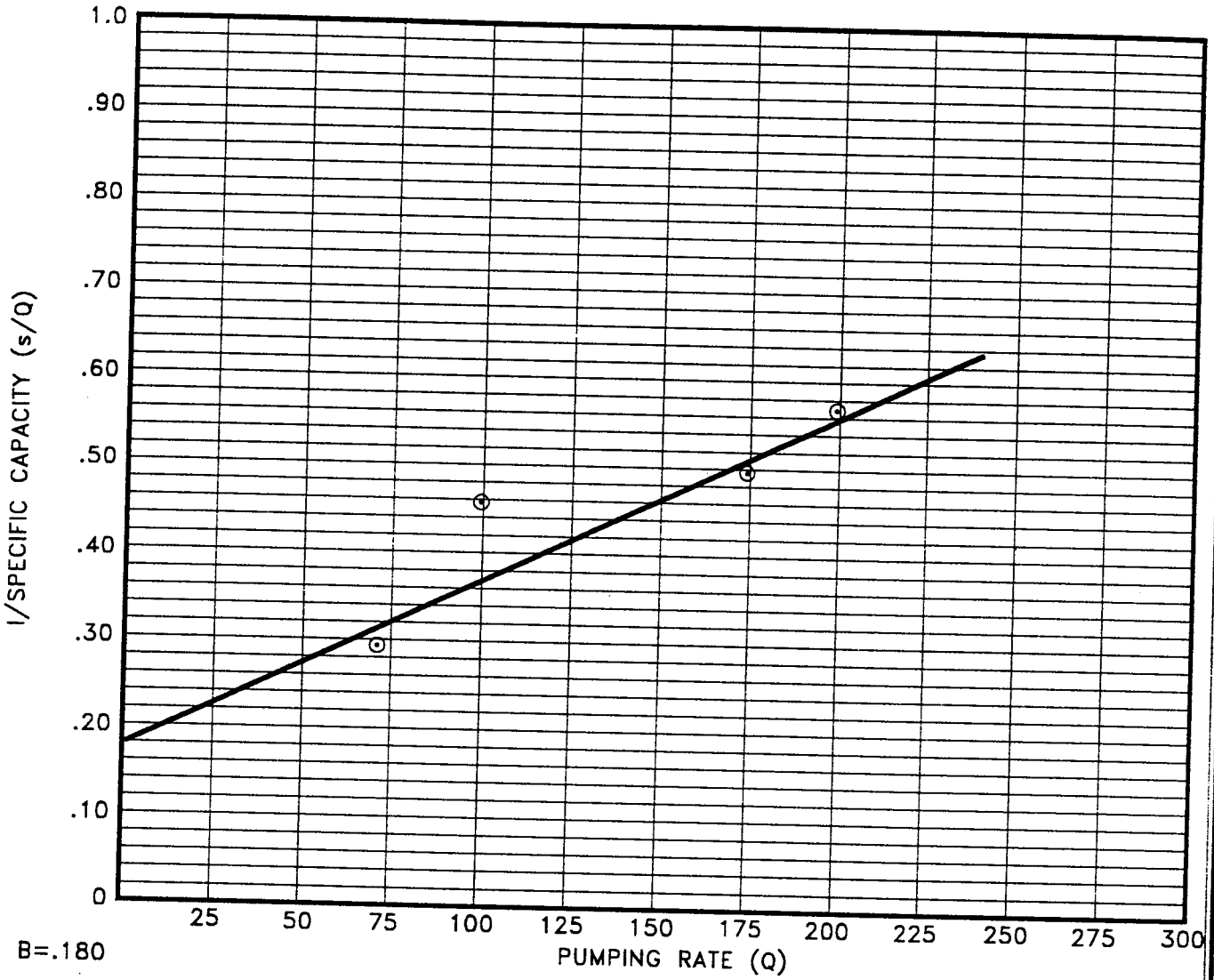
FIGURE 3-6. SUMMARY OF SPECIFIC CAPACITY DATA AND ANALYSES FOR OLGA OBSERVATION WELL #1 (LM-6209) FOR LOWER HAWTHORN AQUIFER ZONE I (515-605' BLS)

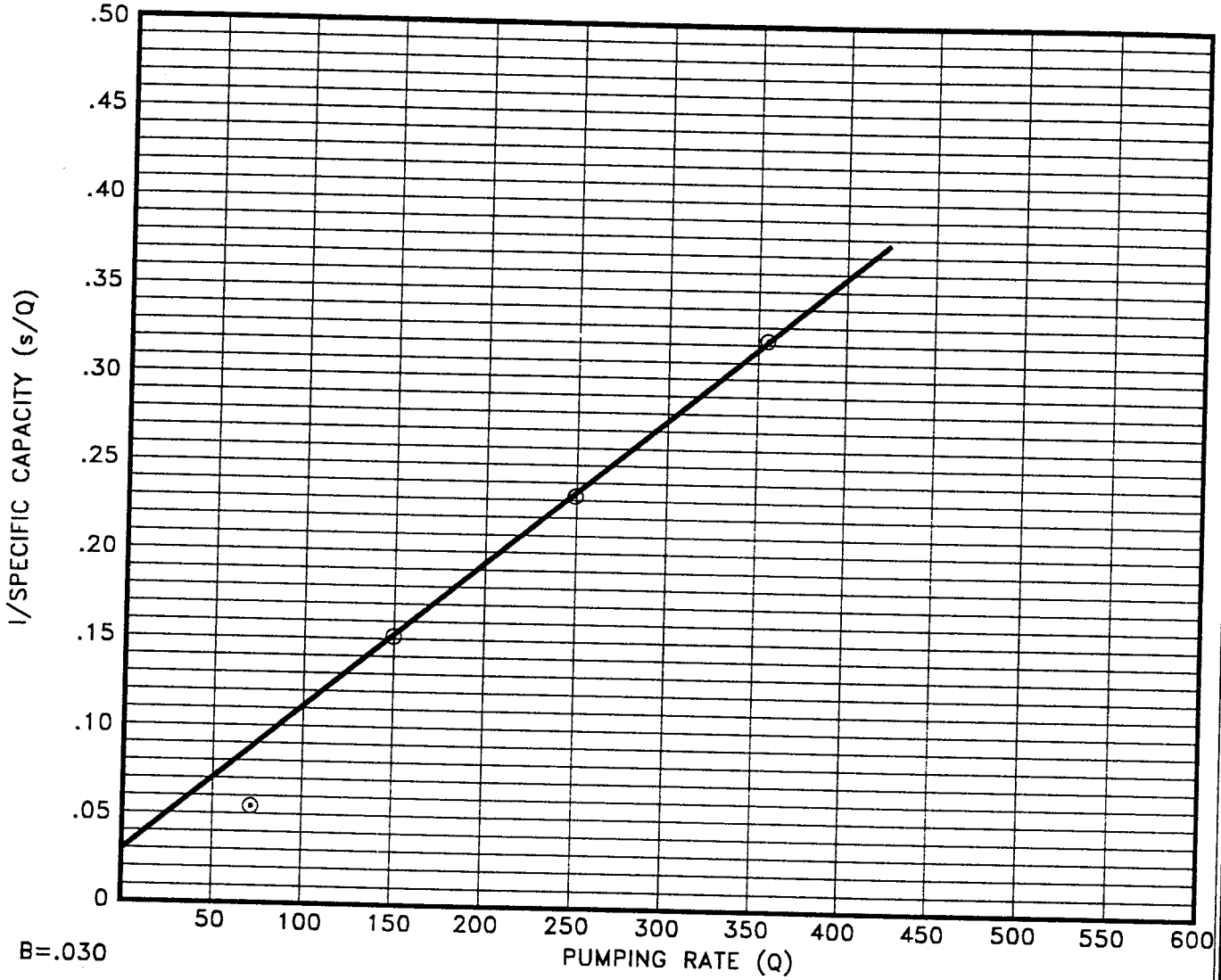


Q (GPM)	DRAWDOWN s(FEET)	s/Q	FORMATION LOSS (FT.)	WELL LOSS (FT.)	WELL EFFICIENCY (%)	ESTIMATED TRANSMISSIVITY (gpd/ft)
70	20.82	.297	1260	8.22	60.5	10,000
100	45.63	.4563				
175	86.20	.493				
200	112.70	.564				
400	96.73	.242				

Water Resource Solutions	PROJECT NAME: OLGA	DWG. NUMBER: A-013891T2-2
	PROJECT NUMBER: 01-03891.HO	DATE: 5/17/99

FIGURE 3-7. SUMMARY OF SPECIFIC CAPACITY DATA AND ANALYSES FOR OLGA OBSERVATION WELL #1 (LM-6209) FOR LOWER HAWTHORN AQUIFER ZONE II (612-689' BLS)

LCU OLGA ASR OBSERVATION WELL #1
TEST #3
WELL EFFICIENCY
$s = BQ + CQ^2$ or $s/Q = B + CQ$
WHERE s = WELL DRAWDOWN
BQ = FORMATION LOSS
CQ^2 = WELL LOSS

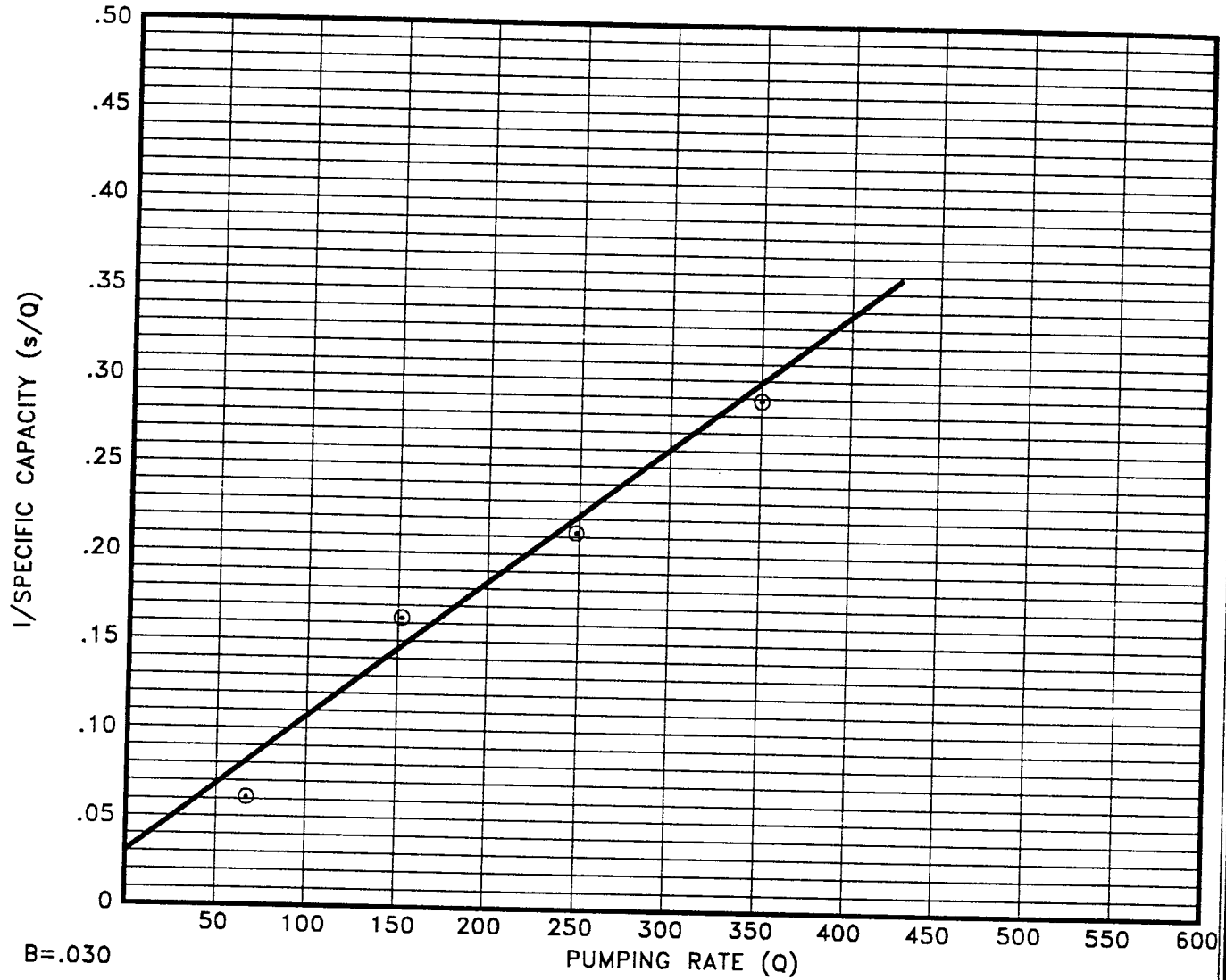


Q (GPM)	DRAWDOWN s(FEET)	s/Q	FORMATION LOSS (FT.)	WELL LOSS (FT.)	WELL EFFICIENCY (%)	ESTIMATED TRANSMISSIVITY (gpd/ft)
70	3.74	.053	2.10	1.64	56.1	57,250
150	22.36	.149	4.50	17.86	20.1	
250	57.57	.230	7.50	50.07	13.0	
355	113.19	.321	10.65	102.54	9.4	

Water Resource Solutions	PROJECT NAME: OLGA	DWG. NUMBER: A-013891T3-2
	PROJECT NUMBER: 01-03891.HO	DATE: 5/17/99

FIGURE 3-8. SUMMARY OF SPECIFIC CAPACITY DATA AND ANALYSES FOR OLGA OBSERVATION WELL #1 (LM-6209) FOR SUWANNEE ZONE II (835-935' BLS)

LCU OLGA ASR OBSERVATION WELL #1
TEST #4
WELL EFFICIENCY
$s = BQ + CQ^2$ or $s/Q = B + CQ$
WHERE s = WELL DRAWDOWN
BQ = FORMATION LOSS
CQ^2 = WELL LOSS

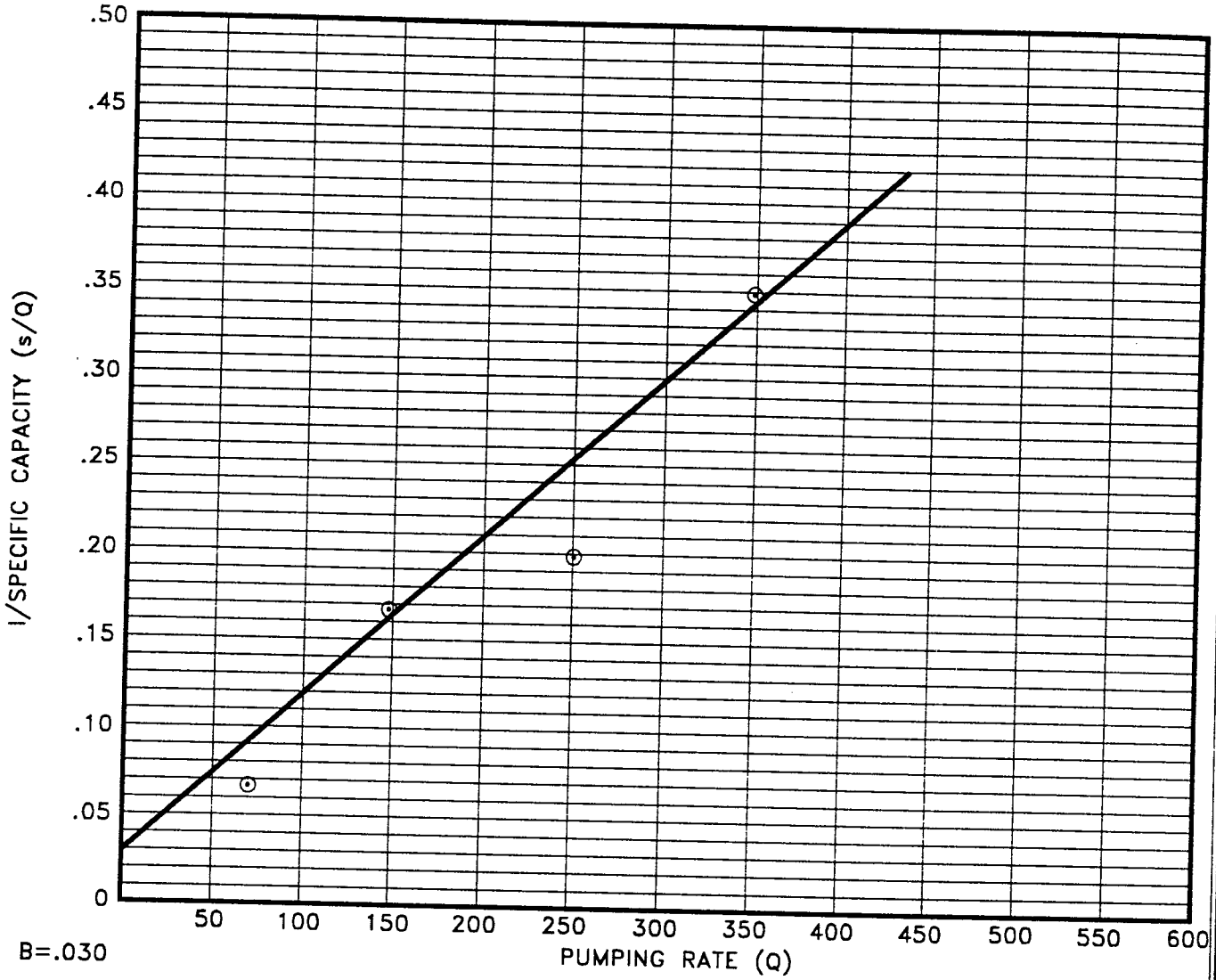


Q (GPM)	DRAWDOWN s(FEET)	s/Q	FORMATION LOSS (FT.)	WELL LOSS (FT.)	WELL EFFICIENCY (%)	ESTIMATED TRANSMISSIVITY (gpd/ft)
70	4.44	.063	2.10			57,300
150	24.95	.161	4.65			
250	52.80	.211	7.50			
350	100.05	.286	10.50			

Water Resource Solutions	PROJECT NAME: OLGA	DWG. NUMBER: A-013891T4-2
	PROJECT NUMBER: 01-03891.HO	DATE: 5/17/99

FIGURE 3-9. SUMMARY OF SPECIFIC CAPACITY DATA AND ANALYSES FOR OLGA OBSERVATION WELL #1 (LM-6209) FOR SUWANNEE ZONE I & II (710-935' BLS) COMBINED.

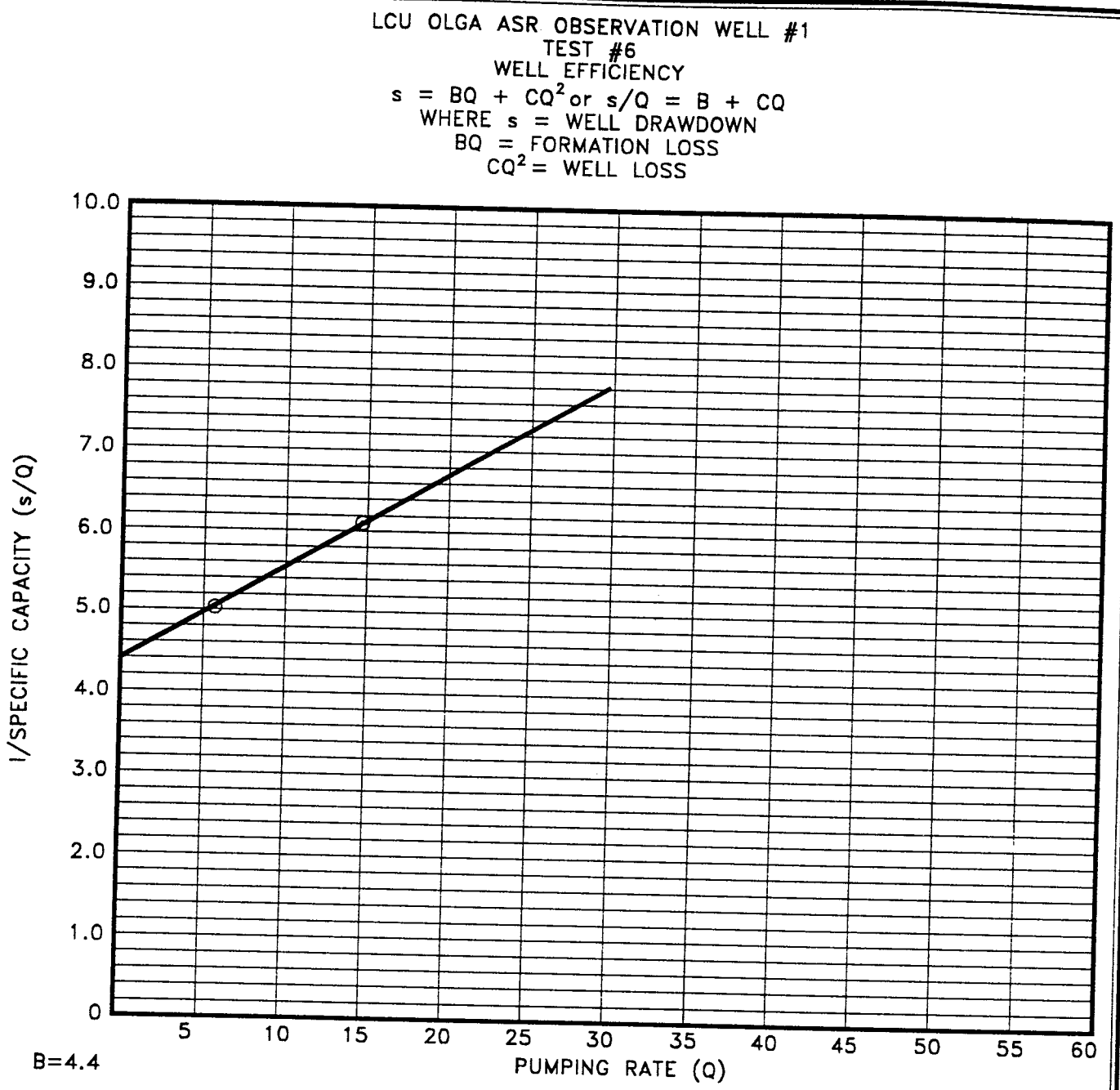
LCU OLGA ASR OBSERVATION WELL #1
TEST #5
WELL EFFICIENCY
$s = BQ + CQ^2$ or $s/Q = B + CQ$
WHERE s = WELL DRAWDOWN
BQ = FORMATION LOSS
CQ^2 = WELL LOSS



Q (GPM)	DRAWDOWN s(FEET)	s/Q	FORMATION LOSS (FT.)	WELL LOSS (FT.)	WELL EFFICIENCY (%)	ESTIMATED TRANSMISSIVITY (gpd/ft)
70	4.62	.066	2.10	2.52	45.4	57,300
150	25.41	.169	4.50	20.91	17.7	
250	49.19	.197	7.50	41.69	15.2	
350	121.09	.346	10.50	110.59	8.7	

Water Resource Solutions	PROJECT NAME: OLGA	DWG. NUMBER: A-013891T5-2
	PROJECT NUMBER: 01-03891.HO	DATE: 5/17/99

FIGURE 3-10. SUMMARY OF SPECIFIC CAPACITY DATA AND ANALYSES FOR OLGA OBSERVATION WELL #1 (LM-6209) FOR SUWANNEE ZONE II (835-935' BLS) RETEST.

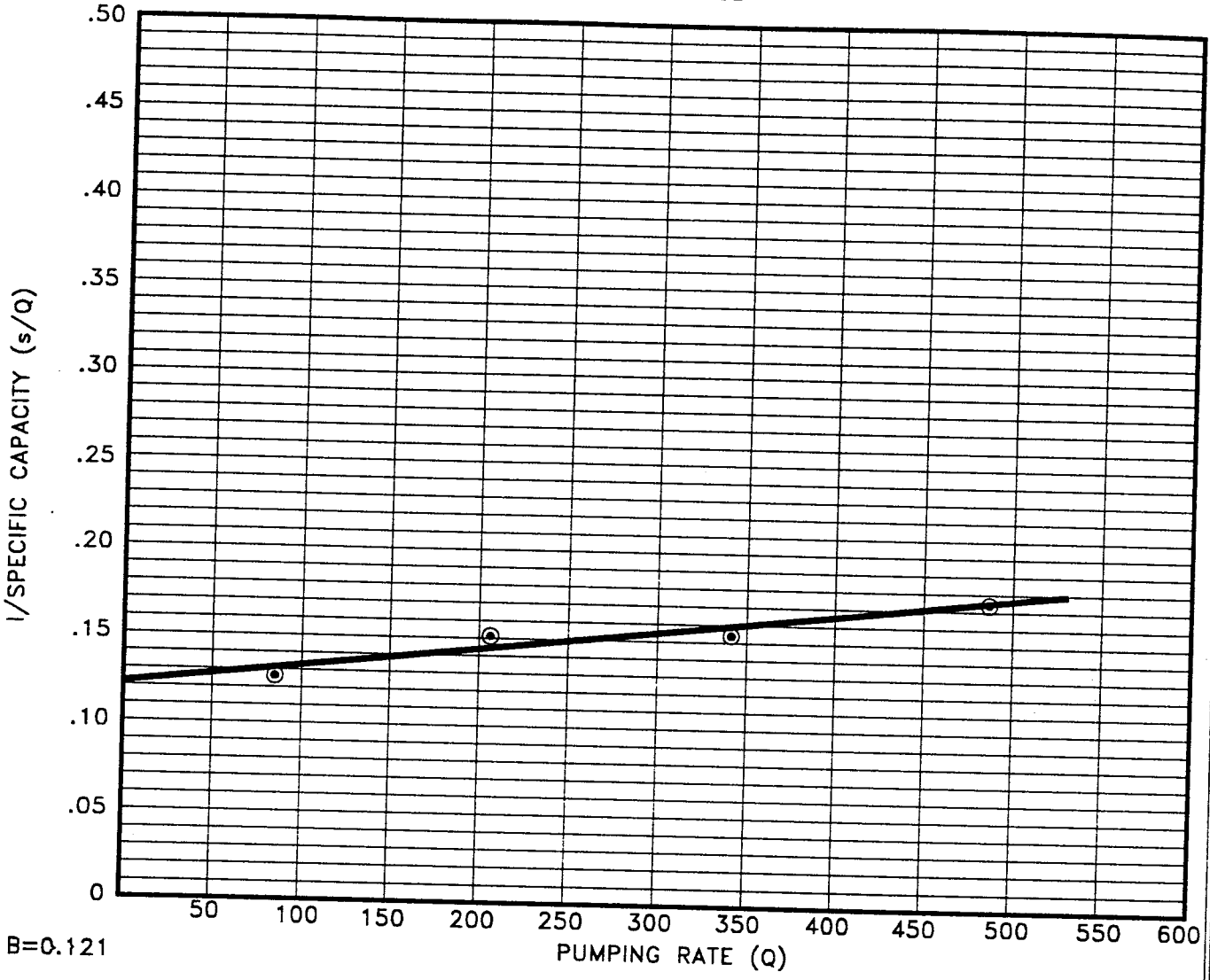


Q (GPM)	DRAWDOWN s(FEET)	s/Q	FORMATION LOSS (FT.)	WELL LOSS (FT.)	WELL EFFICIENCY (%)	ESTIMATED TRANSMISSIVITY (gpd/ft)
6	30.03	5.00	26.40	3.63	87.9	250
15	91.59	6.11	66.00	25.59	72.1	

Water Resource Solutions	PROJECT NAME: OLGA	DWG. NUMBER: A-013891T6-2
	PROJECT NUMBER: 01-03891.HO	DATE: 5/17/99

FIGURE 3-11. SUMMARY OF SPECIFIC CAPACITY DATA AND ANALYSES FOR OLGA OBSERVATION WELL #1 (LM-6209) FOR OCALA ZONE 1 (945-1101' BLS).

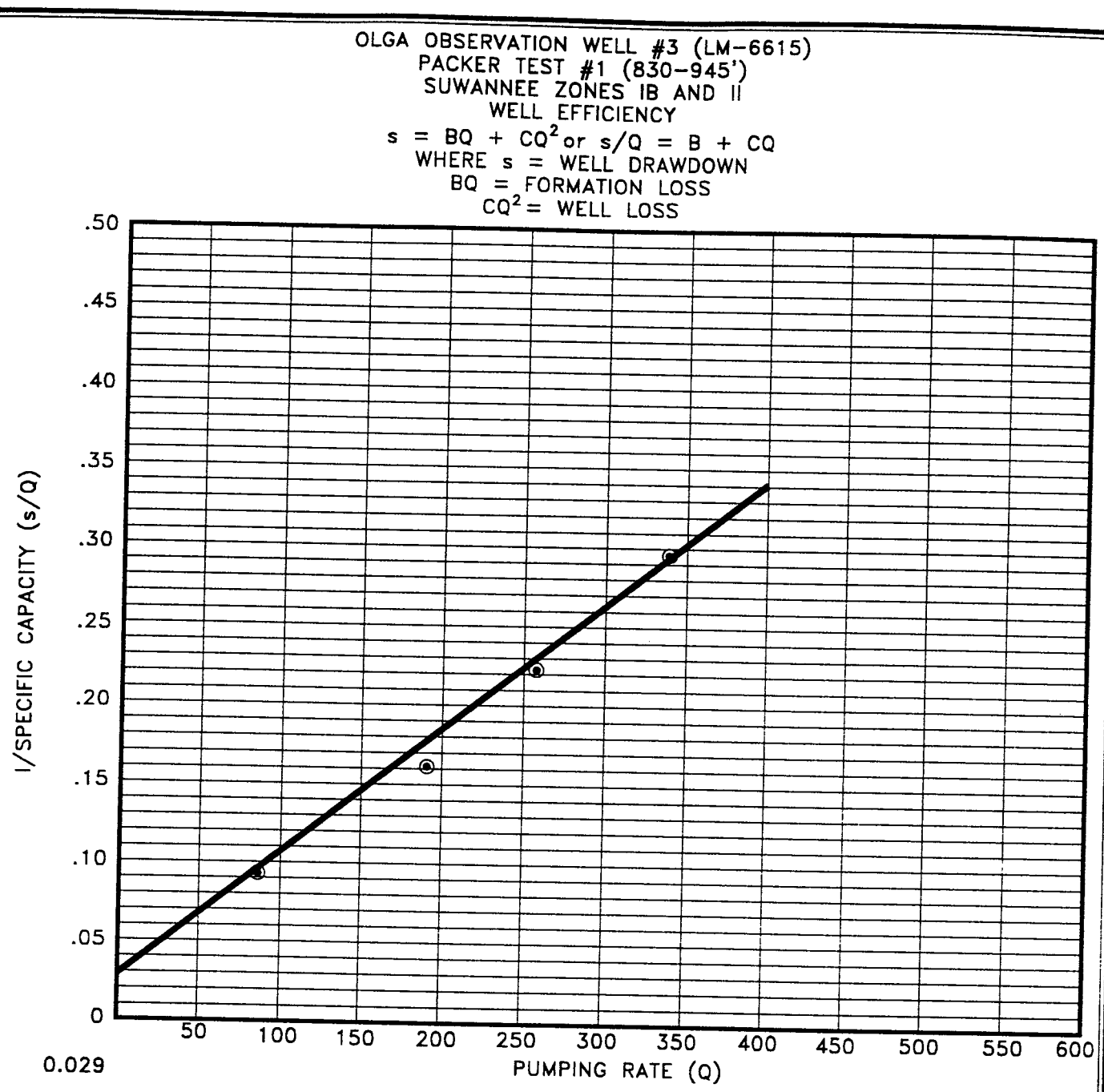
OLGA OBSERVATION WELL #3 (LM-6615)
SUWANNEE ZONE IA (740-820')
WELL EFFICIENCY
$s = BQ + CQ^2$ or $s/Q = B + CQ$
WHERE s = WELL DRAWDOWN
BQ = FORMATION LOSS
CQ^2 = WELL LOSS



Q (GPM)	DRAWDOWN s(FEET)	s/Q	FORMATION LOSS (FT.)	WELL LOSS (FT.)	WELL EFFICIENCY (%)	ESTIMATED TRANSMISSIVITY (gpd/ft)
78	9.94	.127	9.45	0.49	94.9	14,300
210	31.42	.150	25.41	6.01	80.9	
345	53.36	.155	41.75	11.61	78.2	
480	82.48	.172	58.08	24.40	70.4	

Water Resource Solutions	PROJECT NAME: OLGA	DWG. NUMBER: A-013891W1-2
	PROJECT NUMBER: 01-03891.HO	DATE: 5/17/99

FIGURE 3-12. SUMMARY OF SPECIFIC CAPACITY DATA AND ANALYSES FOR OLGA OBSERVATION WELL #3 (LM-6615), FOR SUWANNEE ZONE IA (740-820' BLS).

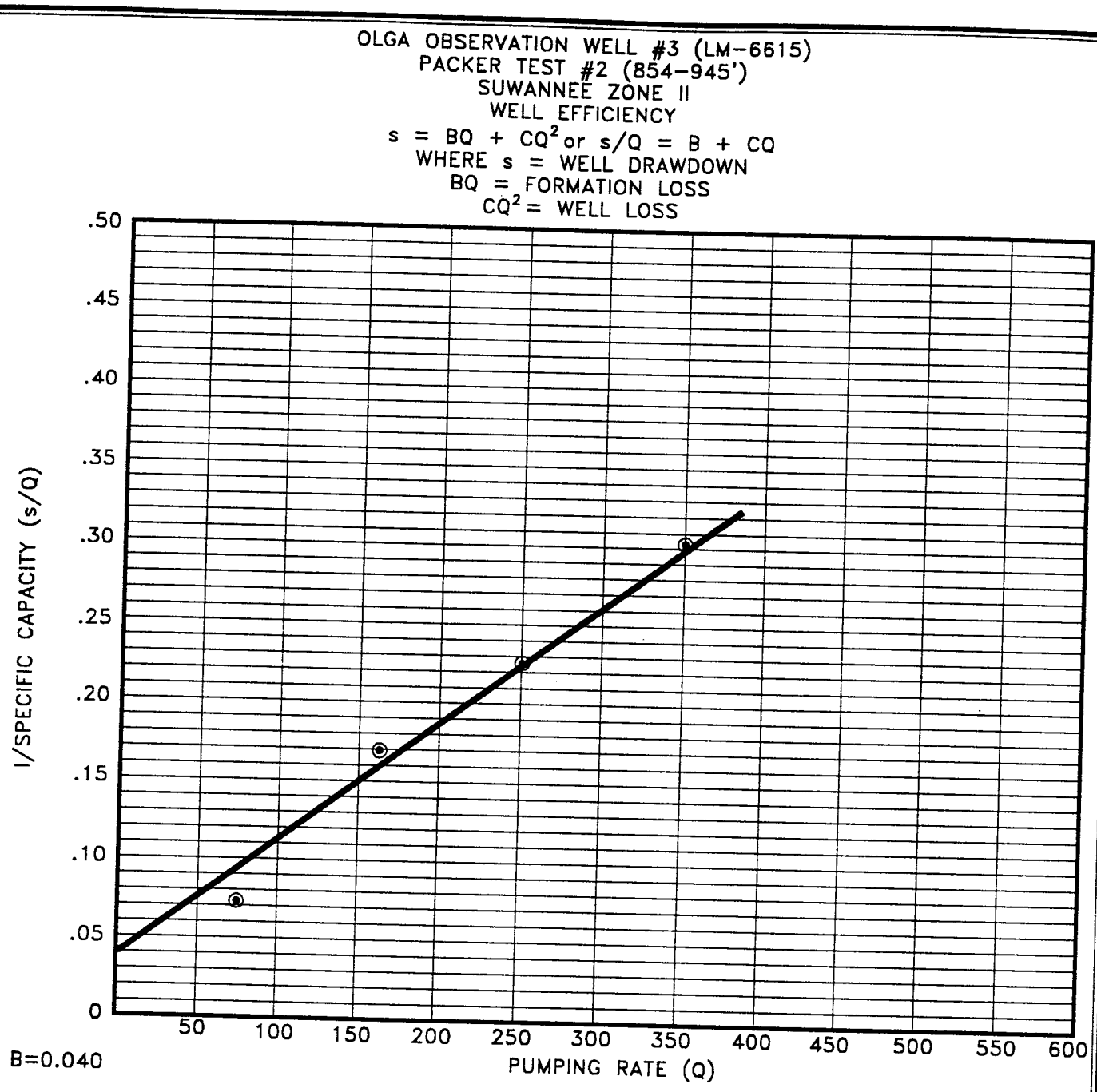


Q (GPM)	DRAWDOWN s(FEET)	s/Q	FORMATION LOSS (FT.)	WELL LOSS (FT.)	WELL EFFICIENCY (%)	ESTIMATED TRANSMISSIVITY (gpd/ft)
80	7.28	.091	2.32	4.96	31.9	67,000
180	29.45	.164	5.22	24.23	17.7	
260	57.87	.223	7.54	50.33	13.0	
340	100.42	.295	9.86	90.56	9.8	

Water Resource Solutions

PROJECT NAME: OLGA	DWG. NUMBER: A-013891W2-2
PROJECT NUMBER: 01-03891.HO	DATE: 5/17/99

FIGURE 3-13. SUMMARY OF SPECIFIC CAPACITY DATA AND ANALYSES FOR OLGA OBSERVATION WELL #3 (LM-6615) FOR SUWANNEE ZONE IB AND ZONE II (830-945' BLS).

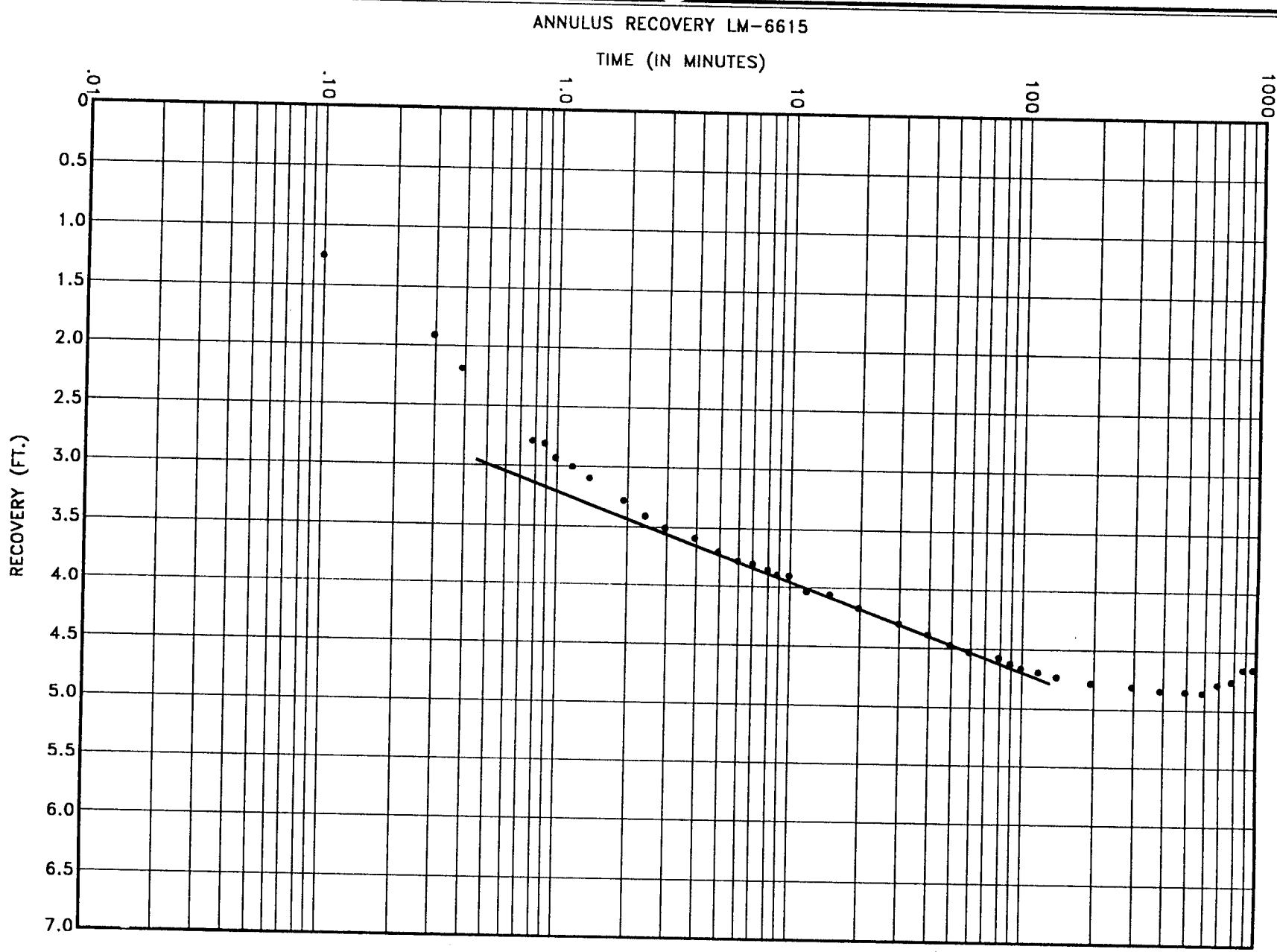


Q (GPM)	DRAWDOWN s(FEET)	s/Q	FORMATION LOSS (FT.)	WELL LOSS (FT.)	WELL EFFICIENCY (%)	ESTIMATED TRANSMISSIVITY (gpd/ft)
75	5.31	.071	3.00	2.31	56.5	48,000
170	28.88	.170	6.80	22.08	23.5	
250	57.12	.228	10.00	47.12	17.5	
350	106.75	.305	14.00	92.75	13.1	

Water Resource Solutions

PROJECT NAME: OLGA
PROJECT NUMBER: 01-03891.HO
DWG. NUMBER: A-013891W3-1
DATE: 3/30/99

FIGURE 3-14. SUMMARY OF SPECIFIC CAPACITY DATA AND ANALYSES FOR OLGA OBSERVATION WELL #3 (LM-6615) FOR SUWANNEE ZONE II (854-945' BLS).



Water Resource Solutions	PROJECT NAME: OLGA	DWG. NUMBER: A-013891L1-2
	PROJECT NUMBER: 01-03891.HO	DATE: 5/17/99

FIGURE 3-15. SEMI-LOGRITHMIC PLOT OF RECOVERY WATER LEVELS VERSUS TIME FOR CONSTANT RATE (300 GPM) PUMPING TEST OF OLGA OBSERVATION WELL #3 (LM-6615), CONDUCTED MARCH 26,1999.

The aquifer test data for both wells is provided in Appendix H. A summary of the aquifer test information for both wells is provided on Tables 3-3 and 3-4.

E. Water Quality Data

Water samples were collected at approximate 30 foot intervals throughout the reverse air drilling process. Water samples were also collected during the aquifer testing and well development processes. These samples were analyzed by WRS for dissolved chloride concentrations and conductivity. The raw water quality data is provided in Appendix I. A chloride profile for Observation Well #1 (LM-6209) is provided on Figure 3-16.

TABLE 3-3.

SUMMARY OF OLGA OBSERVATION WELL #1 (LM-6209)
TEST DATA

Test #	Zone	Static Water Level (ft ALS)	Dissolved Chlorides (mg/l)	Estimated Transmissivity (gpd/ft)	Overlying Confinement Thickness (ft)	Underlying Confinement Thickness (ft)	Comments
1	Lower Hawthorn Zone I (520 - 610')	39.15	540	19,000	5	7	One of zones used in USGS well.
2	Lower Hawthorn Zone II (617 - 694')	42.90	260	10,000	7	21	Running sand (636 - 696').
4	Suwannee Zone I (715 - 834')	42.12	400	[27,000][1]	21	6	
3/5	Suwannee Zone II (840 - 940')	41.69	1000	[30,000][1]	6	10	
6	Ocala Zone I (950 - 1106')	37.01	820	250	10	21	
	Ocala Zone II (1129 - ND)	ND	940	ND	21	ND	

ND = No Data
NB: All zone depths are from drill floor which is 4.5 feet above land surface (ALS).

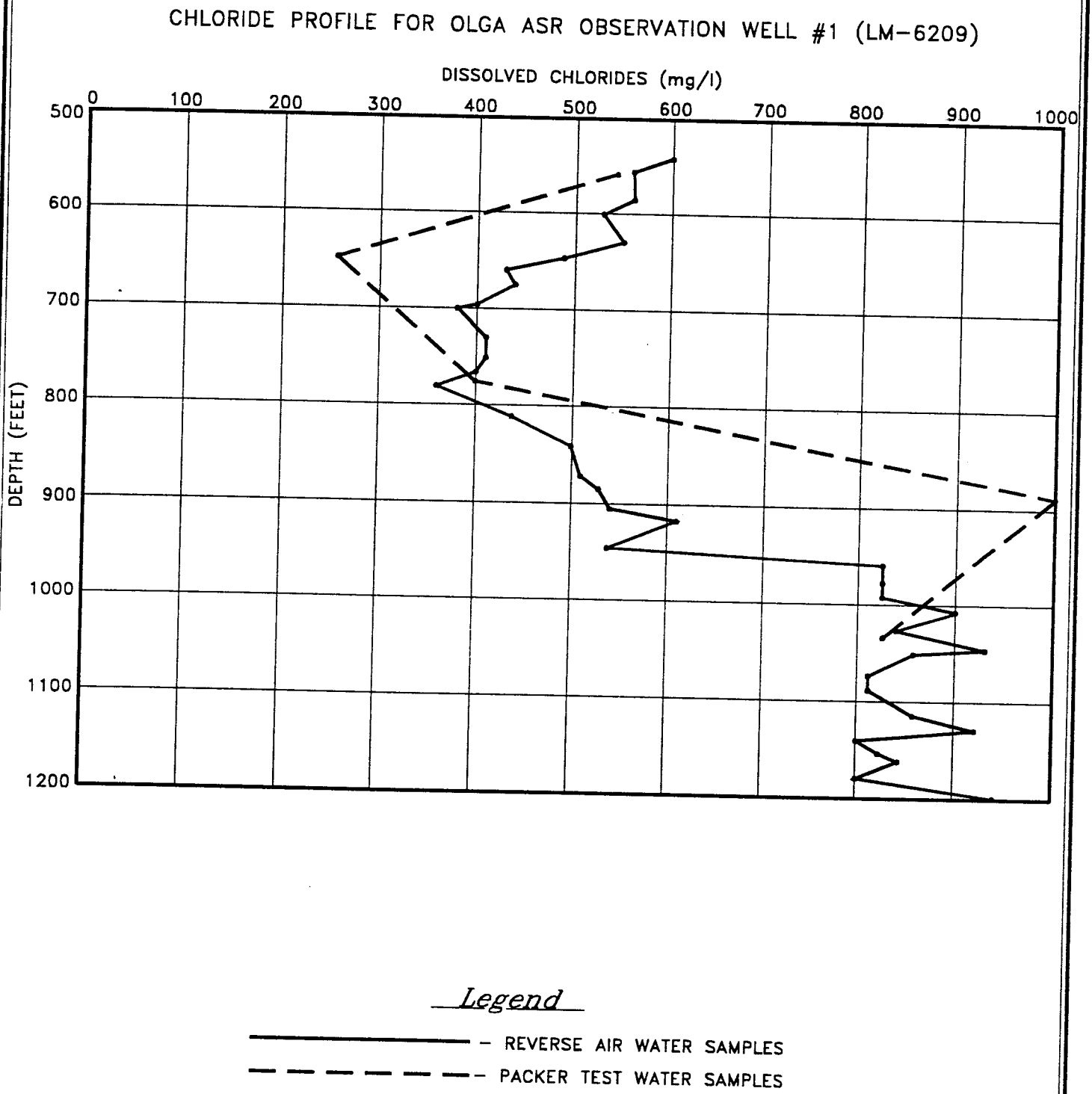
[1]Test results indicate Suwannee Zone I and Zone II may be in communication with a transmissivity of 57,000 gpd/ft for both zones combined.

TABLE 3-4.

SUMMARY OF OLGA OBSERVATION WELL #3 (LM-6615)
TEST DATA

Test #	Zone	Static Water Level (ft ALS)	Dissolved Chlorides (mg/l)	Estimated Transmissivity (gpd/ft)	Overlying Confinement Thickness (ft)	Underlying Confinement Thickness (ft)	Comments
1	Suwannee Zone IA (740 - 820')	41.85	270	14,000	34	(10)	Sandy near base.
2	Suwannee Zone IB (830 - 846')	ND	620	25,000	(10)	8	
3	Suwannee Zone II (854 - 945')	38.99	980	65,000	8	ND	

ND = No Data
NB: All zone depths are from below land surface (BLS).



Water Resource Solutions	PROJECT NAME: OLGA WTP ASR	DWG. NUMBER: A-013891F2-2
	PROJECT NUMBER: 01-03891.HO	DATE: 5/17/99

FIGURE 3-16. CHLORIDE PROFILE FOR OLGA ASR OBSERVATION WELL #1 (LM-6209).

IV. ASR ZONE SELECTION

A. Selection Criteria

Evaluation criteria utilized herein for potential ASR zones were delineated in a previous report prepared for LCU (ViroGroup, Inc., 1998). These include: (1) confinement characteristics of the storage zone, (2) areal extent of the storage zone, (3) thickness of the storage zone, (4) hydraulic conductivity (i.e. permeability) of the storage zone, (5) transmissivity of the storage zone (i.e. hydraulic conductivity times thickness), (6) background water quality of the storage zone, (7) general structural characteristics of the storage zone proximal to the injection site, and (8) other existing users of the storage zone. Each of these criteria is discussed in more detail below.

Confinement Characteristics

Good confinement, above and below a potential storage zone, is an important consideration. The thicker and the lower the permeability of the confining units, the lesser the potential for vertical intrusion of groundwater from adjacent (i.e. above and below) aquifers.

Areal Extent

The required areal extent of the storage zone is dependent not only on its hydraulic characteristics and thickness, but also on the required storage capacity. Required storage capacity is a project-specific parameter that has yet to be determined for this project.

Thickness

The optimum thickness of a storage zone, based upon previous studies in Southwest Florida, is between 40 and 100 feet. Computer simulations of ASR performance using a range of aquifer thickness values indicates that thinner zones result in better recovery efficiencies.

Hydraulic Conductivity

In order to minimize plugging of pore space and also reduce the operating pressure requirements, a bulk hydraulic conductivity in the range of 250 to 600 gallons per day per square foot (gpd/ft^2) is optimal. It is desirable that the permeability be as uniform as possible vertically across the storage interval. The presence of large solution channels or fractures can drastically reduce recovery efficiencies.

Transmissivity

Based upon the thickness and hydraulic conductivity parameters delineated above, as well as on operational testing experience, a transmissivity in the range of 20,000 to 70,000 gallons per day per foot (gpd/ft) is optimal. For large volumes and high rates of injection and recovery, higher transmissivity values may be appropriate.

Native Water Quality

Because some mixing of the injected water with the native groundwater will occur in the storage zone, a native water that is either relatively fresh or slightly brackish is preferred. An upper limit of 1200 milligrams per liter (mg/l) is preferred.

Structure

The optimum storage site from a structural standpoint is in an anticlinal feature with four way structural closure. Density segregation of the ambient groundwater, and its influence on the injected water, would tend to minimize both migration and diffusion at such a site.

Other Users

Even if the seven preceding evaluation parameters are met for a particular storage zone at a particular site, if the storage zone is being utilized nearby for water supply purposes, it may have no value for ASR purposes. In this evaluation, a minimum distance of one mile from any existing user was utilized. Computer impact modelling integrating withdrawal volumes and aquifer parameters will be necessary for more detailed evaluations of interference potential.

B. Evaluation of Zones Encountered at the Olga WTP Site

A brief description of each of the zones encountered in Observation Well #1 (LM-6209) and Observation Well #3 (LM-6615) is provided below. A decision matrix which evaluates each zone relative to the above - described selection criteria is provided on Table 4-1.

Lower Hawthorn Zone I

This zone, found between the depths of 515 and 605 feet (BLS) in Observation Well #1 (LM-6209), was judged, after testing, to have a permeability too low to be used for ASR purposes.

Lower Hawthorn II

This zone, found between the depths of 612 and 689 feet (BLS) in Observation Well #1 (LM-6208), had a high inflow of loose sand. The specific capacity pumping test of this zone yielded an estimated transmissivity too low for ASR purposes. It is likely that the sand inflow influenced the test results.

Suwannee Zone I

This zone, found between the depths of 710 and 829 feet (BLS) in Observation Well #1 (LM-6209), was packer tested and found to be too thick and hydraulically too heterogeneous, as well as having potential sand inflow problems, to be used as an ASR storage zone.

Suwannee Zone II

This zone, found between the depths of 835 and 935 feet (BLS) in Observation Well #1 (LM-6209), was found to have a transmissivity and native water quality acceptable for ASR purposes.

TABLE 4-1.

DECISION MATRIX FOR SELECTION OF AQUIFER STORAGE AND RECOVERY ZONE
FOR OLGA WTP SITE USING DATA OBTAINED FROM
OBSERVATION WELLS 1 AND 3

Potential Storage Zone	Confinement Characteristics	Areal Extent	Thickness (40 - 100 feet)	Hydraulic Conductivity (250 - 600 gpd/ft^2)	Transmissivity (20,000 - 70,000 gpd/ft)	Native Water Quality (<1200 mg/l Cl^-)	Structure (High)	Other Users (None)
Lower Hawthorn Zone I	X	X	X			X	X	
Lower Hawthorn Zone II	X	X	X			X	X	
Suwanee Zone I	(X)	X			X	X	X	X
Suwannee Zone II	(X)	X	X	X	X	X	X	X
Ocala Zone I	X	X				X	X	X
Ocala Zone II	X	X				X	X	X

ND - No Data

Ocala Zone I

This zone, found between the depths of 945 and 1101 feet (BLS) in the test well, was packer tested and found to have an estimated transmissivity which was well below the lower limit considered as useable for ASR purposes.

C. Recommended Storage Zone

Based upon the lithologic, geophysical log, and aquifer test information, it is recommended that Suwannee Zone II be utilized for aquifer storage and recovery zone at the Olga site. A decision matrix (Table 4-1) is provided to summarize the decision-making process for this site.

As part of the decision-making process an analysis of the expected long-term performance of a Suwannee Zone II ASR system at the site was made using a simplified five layer (three permeable layers and two intervening confining layers) model, simulating the Suwannee system, and incorporating representative hydraulic and water quality, and estimated transport values. Since longer duration constant-rate pumping testing, measuring water level drawdowns in the test zone in an observation well, has not yet been conducted at the site, leakance values for the two confining layers were estimated. A leakance value of .5 gallons per day per cubic foot (gpd/ft^3) was used for the zone between Suwannee Zone IA and IB, and a leakance value of .1 gpd/ft^3 was used between Suwannee Zone I and Suwannee Zone II.

The model was run simulating four injection/storage/recovery cycles, injecting 100 million gallons of potable water. Recovery efficiency increased progressively with each successive cycle from am initial 26% to an ultimate 75% in the fourth cycle.

VI. REFERENCES

Fitzpatrick, D.J., 1986, Tests for Injecting, Storing, and Recovering Freshwater in a Saline Artesian Aquifer, Lee County, Florida: United States Geological Survey Water Resources Investigations Report 85-4249, Tallahassee, FL, 53p.

ViroGroup, Inc. 1998, North Lee County Water Treatment Facilities, Task 1.2.1.9 Preliminary Source Water Evaluation Report, prepared for Montgomery Watson Americas, Inc.

APPENDIX A

AREA OF REVIEW

II. AREA OF REVIEW

A - AREA OF REVIEW

The Area of Review conducted for the proposed Lee County Olga pilot ASR well program encompasses nine square miles (Figure 2-1) with the proposed pilot ASR well at the approximate center.

B - HYDROGEOLOGIC SETTING

The geologic section which will be penetrated by the proposed pilot ASR well (Figure 2-2) ranges in age from Holocene (less than 10,000 years before present) in the near surface to Oligocene (approximately 37 million years ago) at the proposed total depth of 1110 feet. A brief description of the lithologic and hydrologic characteristics of each of the formations expected to be penetrated is presented below. In order to show schematically the subsurface geological relationships at the site, a cross-section was constructed. Figure 2-3 shows the line of cross-section, and Plate 1 presents the cross-section.

1. Undifferentiated Holocene Deposits

The undifferentiated Holocene deposits consist of unconsolidated sand, silt, shell, and clay. This stratigraphic unit is approximately 30 feet thick at the site.

2. Tamiami Formation

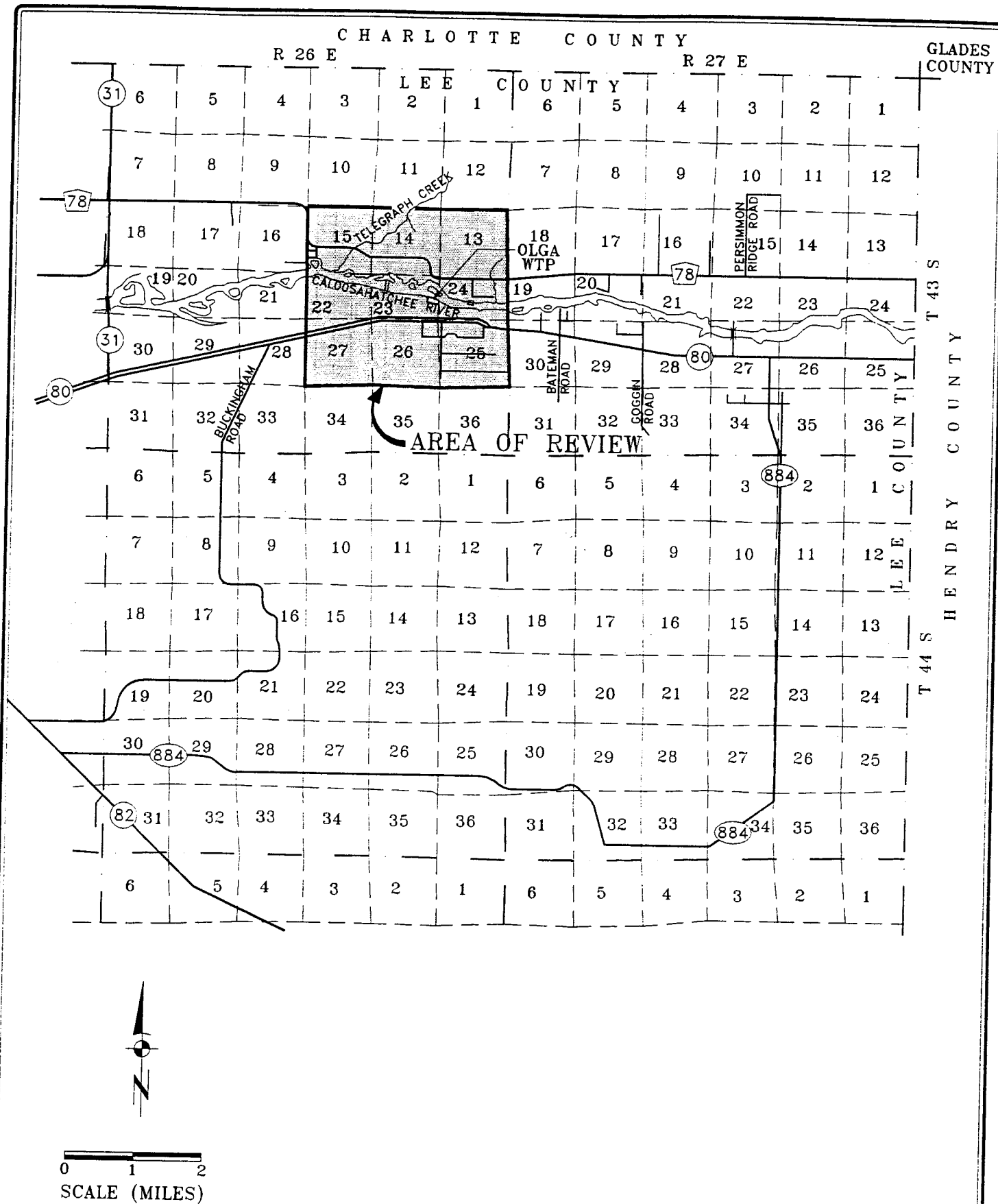
The Tamiami Formation, consists of sandy limestone and clay of Pliocene age (approximately 3.5 to 4.6 million years ago). This stratigraphic unit is about 45 feet thick at the site.

3. Peace River Formation (of Hawthorn Group)

The Peace River formation, which unconformably underlies the Tamiami formation deposits, is the uppermost formation of the Hawthorn Group. The Peace River formation consists of variably indurated phosphatic and calcareous sandstone, unconsolidated sands, silty clays, and sandy limestones. The Peace River formation is Middle Miocene in age (approximately 12 to 15 million years ago) and is about 170 feet thick at the site.

4. Arcadia Formation (of Hawthorn Group)

The Arcadia formation (of the Hawthorn Group) is, in contrast to overlying stratigraphic units, a predominantly carbonate unit. It consists of interbedded fossiliferous and phosphatic limestones,



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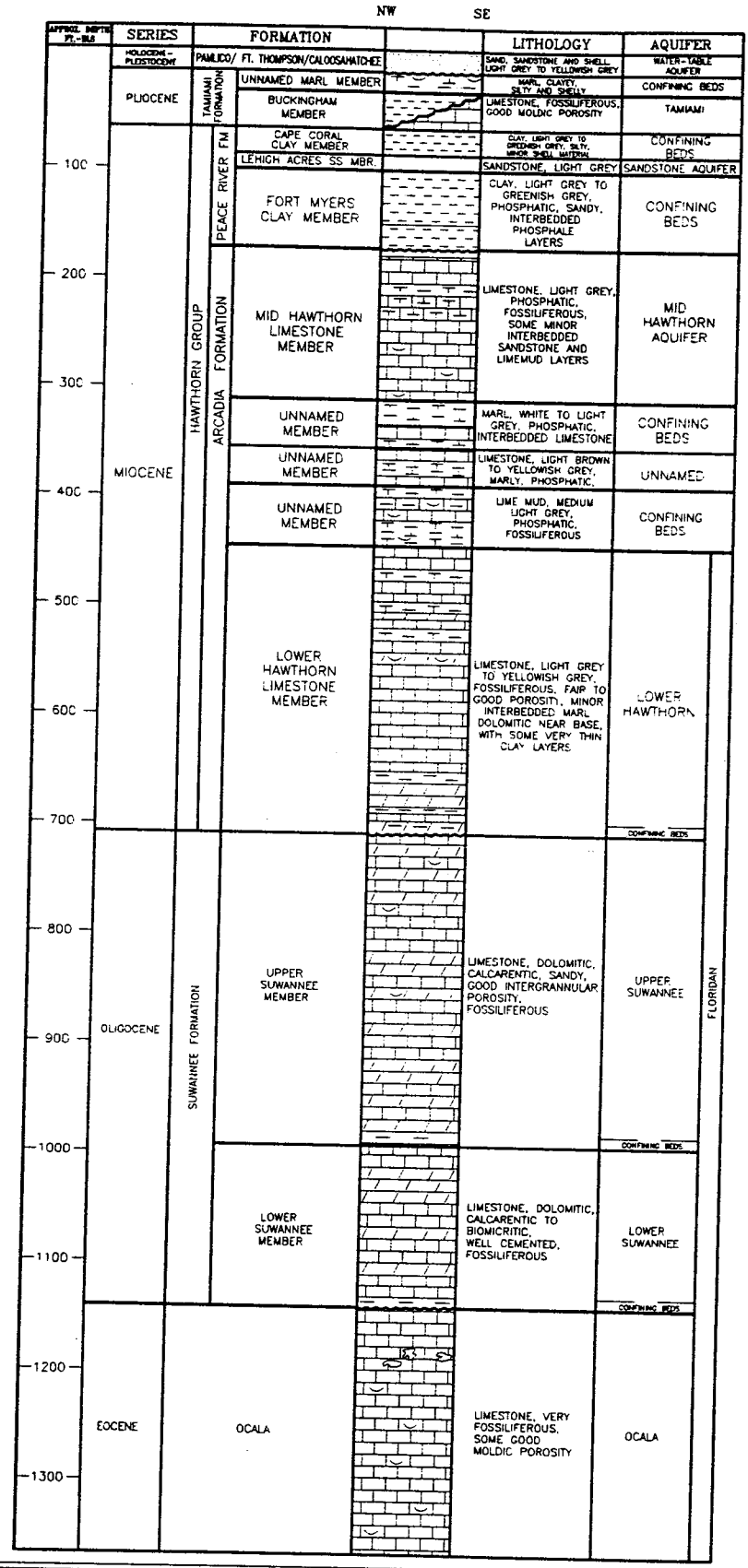
	PROJECT NAME: OLGA PILOT ASR		NUMBER: P8-10811.01

FIGURE 2-1. MAP SHOWING AREA OF REVIEW.

GENERAL HYDROSTRATIGRAPHIC COLUMN FOR OLGA AREA



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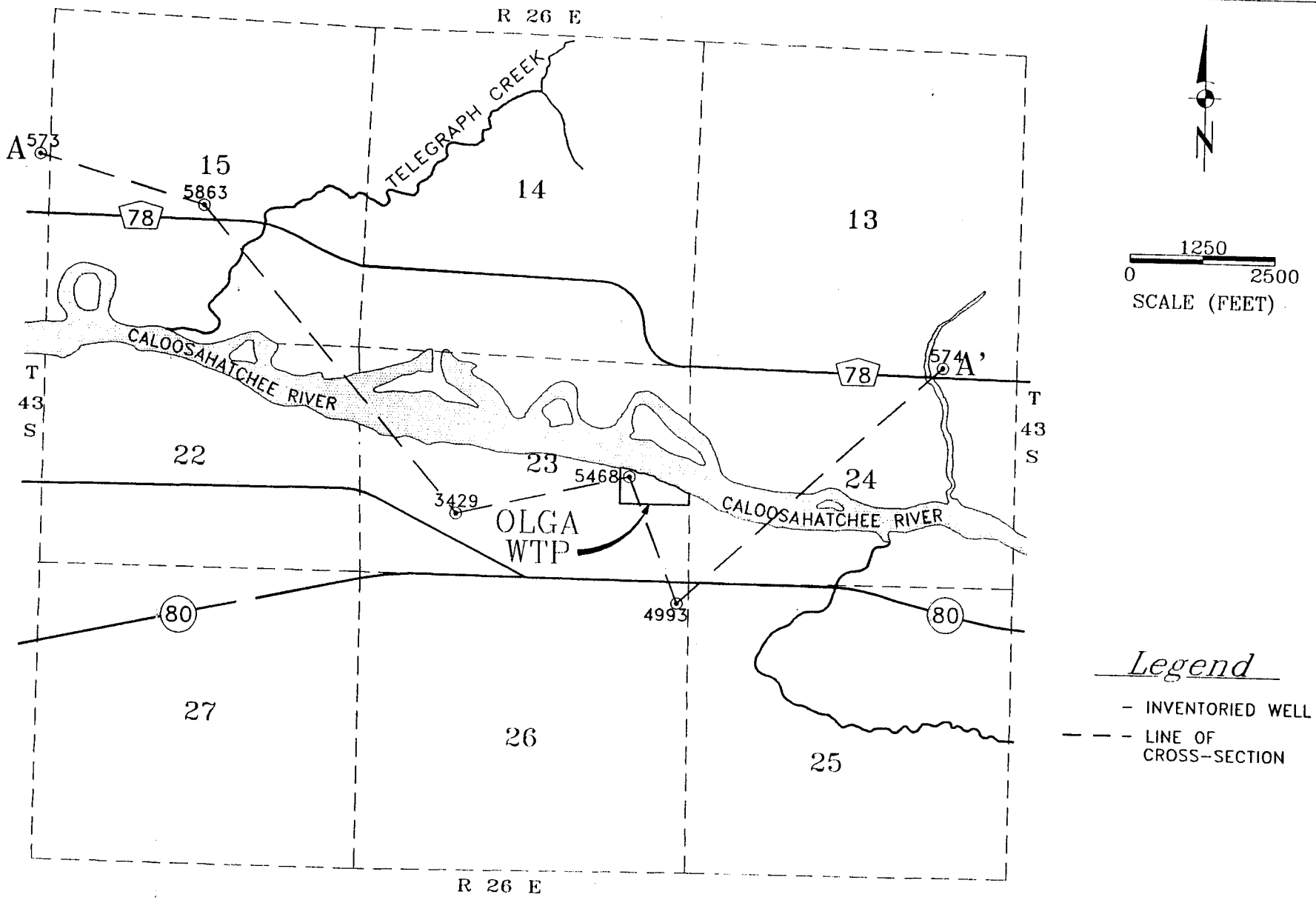
	PROJECT NAME: OLGA PILOT ASR	NUMBER: P8-10811.01

FIGURE 2-2. GENERALIZED HYDROSTRATIGRAPHIC COLUMN FOR OLGA AREA.



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PROJECT NAME: OLGA PILOT ASR PROJECT NUMBER: P8-10811.01

FIGURE 2-3. MAP SHOWING LINE OF CROSS-SECTION.

clays, and marls. The Arcadia formation is Early Miocene in age (17 to 26 million years ago) and is approximately 450 feet thick at the site. The limestones of the lower part of the Arcadia formation exhibit relatively good porosity in western Lee County and comprise the Lower Hawthorn or 'Tampa' aquifer. These limestones are thinner and less transmissive in eastern Lee County. An unconformity is present at the top of the Arcadia formation.

5. Suwannee Formation

The Suwannee formation consists of Oligocene age (29 to 37 mya) fossiliferous, sandy, calcarenitic limestones with some interbedded clays, marls, and dolomite units. The top of the Suwannee formation represents a major unconformity, with a period of approximately 3.5 million years not represented in the stratigraphic record in Southwest Florida. The Suwannee formation is about 400 feet thick at the proposed ASR site.

C - EXISTING LEGAL GROUNDWATER USERS PROXIMAL TO THE PROPOSED ASR SITE

Existing permitted users of groundwater within the area of review are shown on Figure 2-4. Pertinent information for these permits is provided on Table 2-1. All existing permitted users rely upon the water-table, Sandstone, and Mid-Hawthorn aquifers.

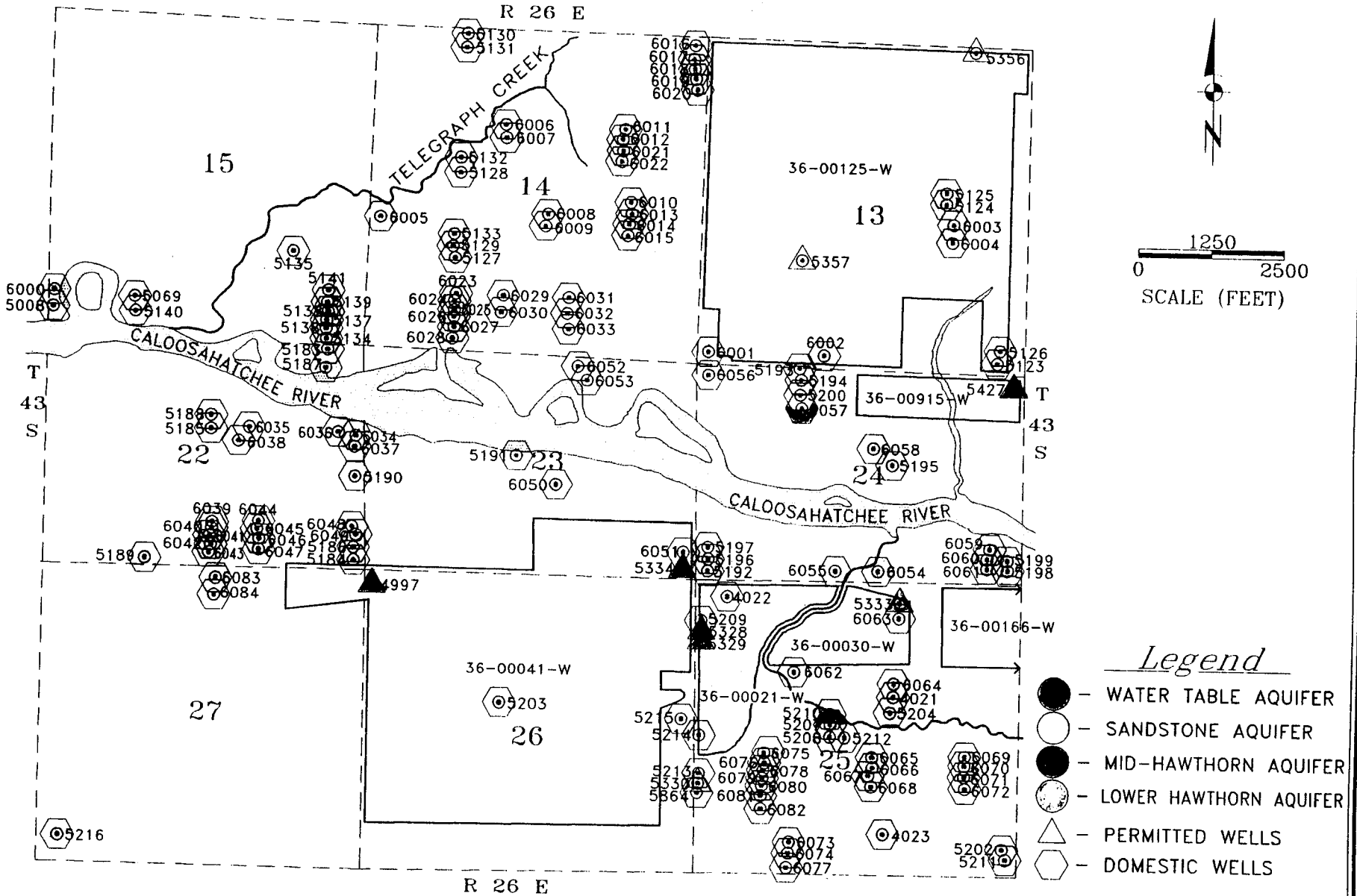
A summary of the pertinent characteristics of all of the inventoried wells is presented on Table 2-2. The location of each of these wells is shown on Figure 2-5.

D - DELINEATION OF THE USDW

The base of the underground source of drinking water (USDW), defined in applicable state and federal regulations as less than 10,000 milligram per liter (mg/l) total dissolved solids (TDS), has not been delineated in any of the deep wells drilled within the area of review (Figure 2-6), but is anticipated to occur at an approximate depth of 1800 feet in the lower part of the Avon Park formation at the proposed Lee County Olga pilot ASR well site. This depth is significantly deeper than the current water production zones at depths above 600 feet at the site. Water quality below 1800 feet at the site is anticipated to deteriorate rapidly with depth and approach seawater quality. Water quality in the prospective ASR zones is anticipated to be essentially slightly brackish, with dissolved chloride concentrations of approximately 800 mg/l and TDS concentrations of about 2000 mg/l.

E - CONFINING BEDS

The confining beds above and below the prospective ASR zones consist of low permeability clays and marls. The precise thickness of these units will be determined during the exploratory drilling program.



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PROJECT NAME: OLGA PILOT ASR PROJECT NUMBER: P8-10811.01

FIGURE 2-4. MAP SHOWING PERMITTED AND OTHER WATER USERS WITHIN THE AREA OF REVIEW.

TABLE 2-1 SUMMARY OF WATER USE PERMIT INFORMATION FOR THE AREA OF REVIEW

Permit #	Permittee	S-T-R	Avg. Day Alloc.	Max Day Alloc.	Aquifer	Water Body	# of Wells	USE
36-00021-W	W.F. DYESS	25-43-26	0.65	0.27	MH		3	AGR
36-00030-W	R.W. and K.A. WIGHTMAN	25-43-26	0.07	0.20	MH		1	AGR
36-00041-W	J.L. CARTER	23-43-26	0.11	0.25	MH		2	AGR
36-00125-W	B.E. AHERN	13-43-26	0.60	1.39	SS		2	AGR
36-00166-W	FLORIDA WATER SERVICES	43,44,45-26,27	1.31	2.74	SS		14	PWS
36-00915-W	L. HIGGINSON	24-43-26	0.06	0.25	MH		1	AGR

TABLE 2 - 2 SUMMARY OF PERTINENT CHARACTERISTICS OF WELLS WITHIN THE AREA OF REVIEW

VGI #	USGS #	SFWMD #	LOCATION	SORT	T.D. (ft.)	C.D. (ft.)	AQUIFER	LITH LOG	GEOPHY LOG	COND	CHLOR	USE	SOURCE	COMMENTS
574	L-631		SE SE 13-43-26	432613	480		MH/LH	X	X		420	TEST	USGS	PLUGGED 1968
2789	L-1222		SW SE 13-43-26	432613	80		SS					OBS	USGS	
5123			SE SE 13-43-26	432613	95		SS			1500	216	DOM	LCWR	
5124			SE NE 13-43-26	432613	93		SS			1100	177	DOM	LCWR	
5125			SE NE 13-43-26	432613	95		SS			100	164	DOM	LCWR	
5126			SE SE 13-43-26	432613	80		SS			1200	300	DOM	LCWR	
5356			NE NE 13-43-26	432613	90	50	SS					IRR	SFWMD	WUP # 36-00125-W
5357			NE SW 13-43-26	432613	110	50	SS					IRR	SFWMD	WUP # 36-00125-W
6001			SW SW 13-43-26	432613	94	74	SS				206	DOM	LCWR	
6002			SE SW 13-43-26	432613	140	73	SS				225	IRR	LCWR	
6003			NE SE 13-43-26	432613	110	90	SS				198	DOM	LCWR	
6004			NE SE 13-43-26	432613	100	60	SS					IRR	LCWR	
5127			NE SW 14-43-26	432614	129		SS			1100	170	DOM	LCWR	
5128			SE NW 14-43-26	432614	104		SS			900	125	DOM	LCWR	
5129			NE SW 14-43-26	432614	135		SS			900	124	DOM	LCWR	
5130			NE NW 14-43-26	432614	90		SS			1000	136	DOM	LCWR	
5131			NE NW 14-43-26	432614	95		SS			1000	152	DOM	LCWR	
5132			SE NW 14-43-26	432614	90		SS				182	DOM	LCWR	
5133			NE SW 14-43-26	432614	84		SS				124	DOM	LCWR	
6005			NW SW 14-43-26	432614	110	102	SS				130	DOM	LCWR	
6006			SE NW 14-43-26	432614	100	78	SS					DOM	LCWR	
6007			SE NW 14-43-26	432614	100	74	SS				132	DOM	LCWR	
6008			NW SE 14-43-26	432614	100	80	SS				146	IRR	LCWR	
6009			NW SE 14-43-26	432614	100	90	SS				170	IRR	LCWR	
6010			NE SE 14-43-26	432614	80	76	SS				550	DOM	LCWR	
6011			SE NE 14-43-26	432614	94	74	SS				500	DOM	LCWR	
6012			SE NE 14-43-26	432614	98	60	SS				79	DOM	LCWR	
6013			NE SE 14-43-26	432614	90	81	SS				235	DOM	LCWR	
6014			NE SE 14-43-26	432614	85	72	SS				275	DOM	LCWR	
6015			NE SE 14-43-26	432614	80	60	SS					DOM	LCWR	
6016			NE NE 14-43-26	432614	88	74	SS					DOM	LCWR	
6017			NE NE 14-43-26	432614	90	80	SS				132	DOM	LCWR	
6018			NE NE 14-43-26	432614	120	60	SS				140	DOM	LCWR	
6019			NE NE 14-43-26	432614	100	80	SS				132	DOM	LCWR	
6020			NE NE 14-43-26	432614	100	80	SS				124	DOM	LCWR	
6021			SE NE 14-43-26	432614	80	60	SS				500	DOM	LCWR	
6022			SE NE 14-43-26	432614	95	80	SS				390	DOM	LCWR	
6023			SE SW 14-43-26	432614	100	82	SS				180	DOM	LCWR	

TABLE 2 - 2 SUMMARY OF PERTINENT CHARACTERISTICS OF WELLS WITHIN THE AREA OF REVIEW

VGI #	USGS #	SFWMD #	LOCATION	SORT	T.D. (ft.)	C.D. (ft.)	AQUIFER	LITH LOG	GEOPHY LOG	COND	CHLOR	USE	SOURCE	COMMENTS
6024			SE SW 14-43-26	432614	120	80	SS				180	DOM	LCWR	
6025			SE SW 14-43-26	432614	95	75	SS				170	DOM	LCWR	
6026			SE SW 14-43-26	432614	100	75	SS					DOM	LCWR	
6027			SE SW 14-43-26	432614	95	75	SS					DOM	LCWR	
6028			SE SW 14-43-26	432614	85	75	SS				164	DOM	LCWR	
6029			SE SW 14-43-26	432614	100	80	SS				164	DOM	LCWR	
6030			SE SW 14-43-26	432614	115	98	SS				140	DOM	LCWR	
6031			SW SE 14-43-26	432614	90	80	SS				160	DOM	LCWR	
6032			SW SE 14-43-26	432614	100	80	SS				160	DOM	LCWR	
6033			SW SE 14-43-26	432614	95	75	SS				180	DOM	LCWR	
5134			SE SE 15-43-26	432615	90		SS			2000	394	DOM	LCWR	
5135			NE SE 15-43-26	432615	120		SS			2100	394	DOM	LCWR	
5136			SE SE 15-43-26	432615	82		SS			2500	430	DOM	LCWR	
5137			SE SE 15-43-26	432615	95		SS			2000	390	DOM	LCWR	
5138			SE SE 15-43-26	432615	85		SS			2300	420	DOM	LCWR	
5139			SE SE 15-43-26	432615	89		SS				176	DOM	LCWR	
5140			SE SW 15-43-26	432615	120		SS			900	132	IRR	LCWR	
5141			SE SE 15-43-26	432615	100		SS				418	DOM	LCWR	
5863		WA-989	15-43-26	432615	633	210	MH/LH		X			IRR	SFWMD	
5008			SW SW 15-43-26	432615	100	60	SS				268	DOM	LCWR	
5069			SE SW 15-43-26	432615	90	70	SS				275	DOM	LCWR	
5999			SW SW 15-43-26	432615	90	70	SS					DOM	LCWR	
6000			SE SE 15-43-26	432615	85	73	SS					DOM	LCWR	
6094			SE SE 15-43-26	432615	110		SS				328	DOM	LCWR	
6095			SE SE 15-43-26	432615	80	45	SS/WT					DOM	LCWR	
5183			NE NE 22-43-26	432622	85		SS			2400	345	DOM	LCWR	
5184			SE SE 22-43-26	432622	85		SS			1200	157	DOM	LCWR	
5185			SW NE 22-43-26	432622	80		SS				310	DOM	LCWR	
5186			SE SE 22-43-26	432622	88		SS			1000	216	DOM	LCWR	
5187			NE NE 22-43-26	432622	80		SS			1600	278	DOM	LCWR	
5188			SW NE 22-43-26	432622	80		SS				430	DOM	LCWR	
5189			SE SW 22-43-26	432622	80		SS				445	DOM	LCWR	
5190			NE SE 22-43-26	432622	100		SS				552	DOM	LCWR	
6034			SE NE 22-43-26	432622	100	75	SS				680	DOM	LCWR	
6035			SW NE 22-43-26	432622	91	71	SS				445	DOM	LCWR	
6036			SE NE 22-43-26	432622	95	75	SS				608	DOM	LCWR	
6037			SE NE 22-43-26	432622	97	77	SS					DOM	LCWR	
6038			SW NE 22-43-26	432622	85	75	SS				415	IRR	LCWR	

TABLE 2 - 2 SUMMARY OF PERTINENT CHARACTERISTICS OF WELLS WITHIN THE AREA OF REVIEW

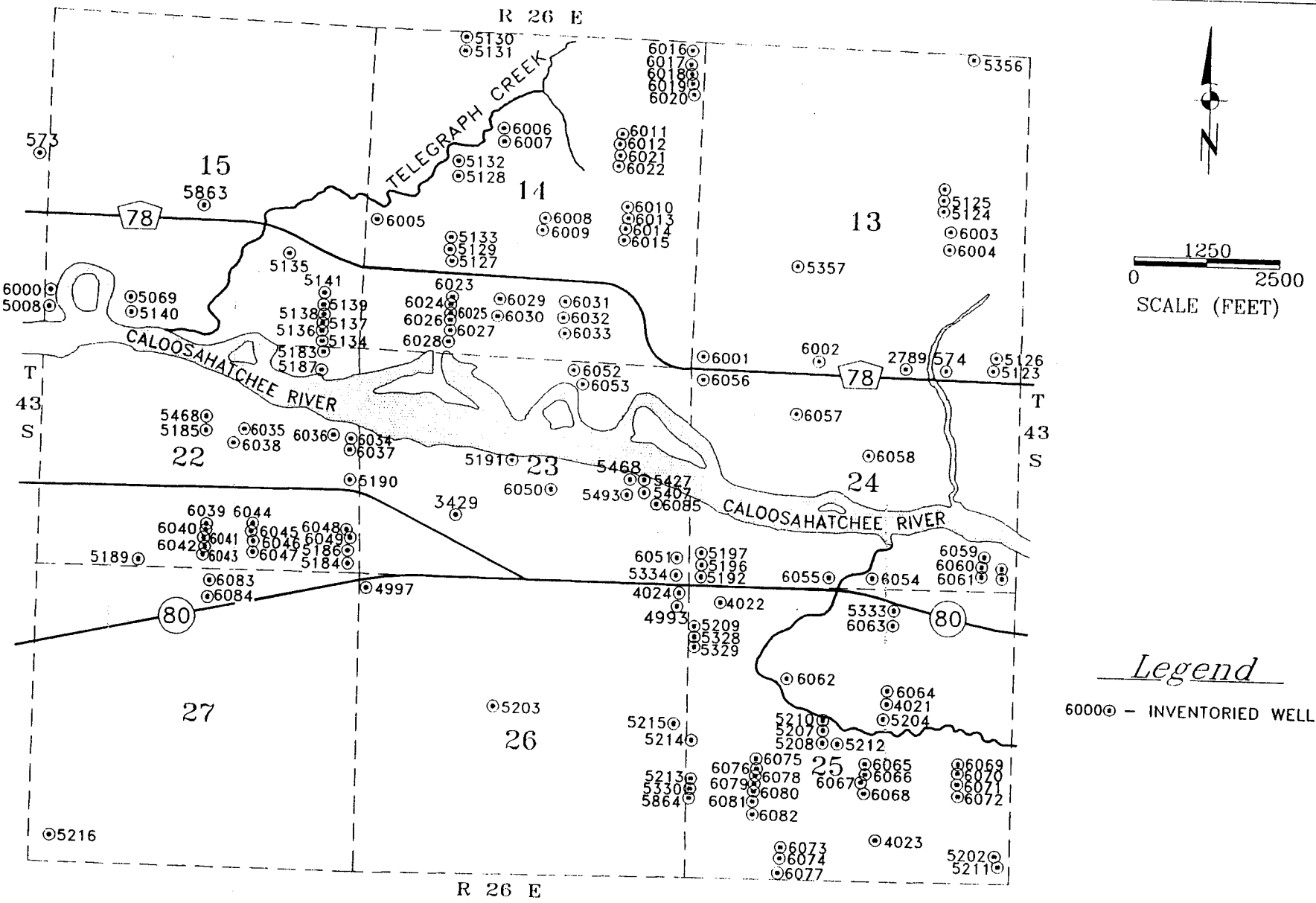
VGI #	USGS #	SFWMD #	LOCATION	SORT	T.D. (ft.)	C.D. (ft.)	AQUIFER	LITH LOG	GEOPHY LOG	COND	CHLOR	USE	SOURCE	COMMENTS
6039			SW SE 22-43-26	432622	95	76	SS				378	DOM	LCWR	
6040			SW SE 22-43-26	432622	120	78	SS				220	IRR	LCWR	
6041			SW SE 22-43-26	432622	100	70	SS					DOM	LCWR	
6042			SW SE 22-43-26	432622	95	75	SS				260	DOM	LCWR	
6043			SW SE 22-43-26	432622	95	90	SS				226	DOM	LCWR	
6044			SW SE 22-43-26	432622	100	70	SS				247	DOM	LCWR	
6045			SW SE 22-43-26	432622	88	56	SS				137	DOM	LCWR	
6046			SW SE 22-43-26	432622	113	80	SS				360	DOM	LCWR	
6047			SW SE 22-43-26	432622	120	76	SS				250	DOM	LCWR	
6048			SE SE 22-43-26	432622	80	60	SS				320	IRR	LCWR	
6049			SE SE 22-43-26	432622	120	95	SS				168	IRR	LCWR	
3429			SE SW 23-43-26	432623	1250		OC	X				OIL TEST	FGS	FGS # W-9308
5191			SE NW 23-43-26	432623	80		SS			1550	282	DOM	LCWR	
5334			SE SE 23-43-26	432623	500	200	MH/LH					IRR	SFWMD	WUP # 36-00041-W
6085	L-3224		NE SE 23-43-26	432623	620	460	LH		X			OBS	USGS	
5927	L-3225		NE SE 23-43-26	432623	600	445	LH		X			OBS	USGS	
5467	L-1907		NE SE 23-43-26	432623	57	55	SS	X		834	160	OBS	USGS	
5468	L-2530		NE SE 23-43-26	432623	614	475	LH	X		2190	460	OBS	USGS	
5493	L-2901		NE SE 23-43-26	432623	705	460	LH		X			OBS	USGS	
6050			NW SE 23-43-26	432623	90	70	SS				482	DOM	LCWR	
6051			SE SE 23-43-26	432623	100		SS				420	DOM	LCWR	
6052			NW NE 23-43-26	432623	92	70	SS				170	DOM	LCWR	
6053			NW NE 23-43-26	432623	90	72	SS				159	DOM	LCWR	
5192			SW SW 24-43-26	432624	85		SS			1500		DOM	LCWR	
5193			NE NW 24-43-26	432624	120		SS			1500	320	DOM	LCWR	
5194			NE NW 24-43-26	432624	135		SS			1200	242	DOM	LCWR	
5195			SW NE 24-43-26	432624	82		SS			1200	194	DOM	LCWR	
5196			SW SW 24-43-26	432624	70		SS				146	DOM	LCWR	
5197			SW SW 24-43-26	432624	75		SS				786	DOM	LCWR	
5198			SE SE 24-43-26	432624	95		SS				304	DOM	LCWR	
5199			SE SE 24-43-26	432624	85		SS				292	DOM	LCWR	
5200			NE NW 24-43-26	432624	130		SS				548	DOM	LCWR	
5427			NE NE 24-43-26	432624	300	110	SS/MH					IRR	SFWMD	WUP # 36-00915-W
6054			SW SE 24-43-26	432624	100	80	SS				195	DOM	LCWR	
6055			SE SW 24-43-26	432624	110	70	SS				325	DOM	LCWR	
6056			NW NW 24-43-26	432624	100	70	SS					DOM	LCWR	
6057			NE NW 24-43-26	432624	26	15	WT				71	DOM	LCWR	
6058			SW NE 24-43-26	432624	85	80	SS				208	DOM	LCWR	

TABLE 2 - 2 SUMMARY OF PERTINENT CHARACTERISTICS OF WELLS WITHIN THE AREA OF REVIEW

VGI #	USGS #	SFWMD #	LOCATION	SORT	T.D. (ft.)	C.D. (ft.)	AQUIFER	LITH LOG	GEOPHY LOG	COND	CHLOR	USE	SOURCE	COMMENTS
6059			SE SE 24-43-26	432624	80	70	SS					DOM	LCWR	
6060			SE SE 24-43-26	432624	80	70	SS					DOM	LCWR	
6061			SE SE 24-43-26	432624	100	70	SS				270	DOM	LCWR	
5214			SW NW 25-43-26	432625	75		SS				152	DOM	LCWR	
5328			NW NW 25-43-26	432625	585	350	LH					IRR	SFWMD	WUP # 36-00021-W
5329			NW NW 25-43-26	432625	675	350	LH					IRR	SFWMD	WUP # 36-00021-W
5330			NW SW 25-43-26	432625	100	60	SS					IRR	SFWMD	WUP # 36-00021-W
5333			NW NE 25-43-26	432625	710	400	MH/LH					IRR	SFWMD	WUP # 36-00030-W
5864		WA-834	NW SW 25-43-26	432625	519	210	MH/LH		X			IRR	SFWMD	
4021			SW NE 25-43-26	432625	75	63	SS				163	DOM	LCWR	
4022			NW NW 25-43-26	432625	72	57	SS				270	DOM	LCWR	
4023			SW SE 25-43-26	432625	70	63	SS				204	DOM	LCWR	
5201			SW SW 25-43-26	432625	73		SS			1200	194	IRR	LCWR	
5202			SE SE 25-43-26	432625	90		SS			1000	190	DOM	LCWR	
5204			SW NE 25-43-26	432625	100		SS			1100	260	DOM	LCWR	
5206			SE SW 25-43-26	432625	70		SS				204	DOM	LCWR	
5207			SE NW 25-43-26	432625	100		SS			1100	140	DOM	LCWR	
5208			SE NW 25-43-26	432625	85		SS				160	DOM	LCWR	
5209			NW NW 25-43-26	432625	72		SS				270	DOM	LCWR	
5210			SE NW 25-43-26	432625	32		WT				88	DOM	LCWR	
5211			SE SE 25-43-26	432625	77		SS				204	DOM	LCWR	
5212			SE NW 25-43-26	432625	75		SS				163	DOM	LCWR	
5213			NW SW 25-43-26	432625	70		SS				145	DOM	LCWR	
6062			SE NW 25-43-26	432625	90	70	SS				182	DOM	LCWR	
6063			NW NE 25-43-26	432625	95	65	SS				183	TEST	LCWR	
6064			SW NE 25-43-26	432625	80	63	SS				190	DOM	LCWR	
6065			NW SE 25-43-26	432625	100	60	SS					DOM	LCWR	
6066			NW SE 25-43-26	432625	100	60	SS				164	DOM	LCWR	
6067			NW SE 25-43-26	432625	110	70	SS				194	DOM	LCWR	
6068			NW SE 25-43-26	432625	95	68	SS				172	DOM	LCWR	
6069			NE SE 25-43-26	432625	80	60	SS				230	IRR	LCWR	
6070			NE SE 25-43-26	432625	100	65	SS					DOM	LCWR	
6071			NE SE 25-43-26	432625	82	61	SS				225	DOM	LCWR	
6072			NE SE 25-43-26	432625	100	65	SS				210	DOM	LCWR	
6073			SE SW 25-43-26	432625	78	66	SS				142	DOM	LCWR	
6074			SE SW 25-43-26	432625	95	70	SS					DOM	LCWR	
6075			NW SW 25-43-26	432625	80	60	SS				140	DOM	LCWR	
6076			NW SW 25-43-26	432625	77	66	SS				146	DOM	LCWR	

TABLE 2 - 2 SUMMARY OF PERTINENT CHARACTERISTICS OF WELLS WITHIN THE AREA OF REVIEW

VGI #	USGS #	SFWMD #	LOCATION	SORT	T.D. (ft.)	C.D. (ft.)	AQUIFER	LITH LOG	GEOPHY LOG	COND	CHLOR	USE	SOURCE	COMMENTS
6077			SE SW 25-43-26	432625	100	70	SS				144	DOM	LCWR	
6078			NW SW 25-43-26	432625	80	60	SS				130	DOM	LCWR	
6079			NW SW 25-43-26	432625	80	60	SS				124	DOM	LCWR	
6080			NW SW 25-43-26	432625	80	60	SS				148	DOM	LCWR	
6081			NW SW 25-43-26	432625	97	71	SS				170	DOM	LCWR	
6082			NW SW 25-43-26	432625	80	60	SS				135	DOM	LCWR	
4024			NE NE 26-43-26	432626	80	60	SS			1100	286	DOM	LCWR	
4993	L-1903	WA-77	NE NE 26-43-26	432626	669	190	SS/MH/LH		X	2100	413	IRR	SFWMD	
4997	L-2586	WA-81	NW NW 26-43-26	432626	450		MH/LH		X	2330	450	IRR	SFWMD	WUP # 36-00041-W
5203			SE NW 26-43-26	432626	80		SS			900	90	DOM	LCWR	
5215			SE NE 26-43-26	432626	80		SS			1100		DOM	LCWR	
5216			SW SW 27-43-26	432627	95		SS			1000	121	DOM	LCWR	
6083			NW NE 27-43-26	432627	110	88	SS				184	IRR	LCWR	
6084			NW NE 27-43-26	432627	110	70	SS				180	DOM	LCWR	



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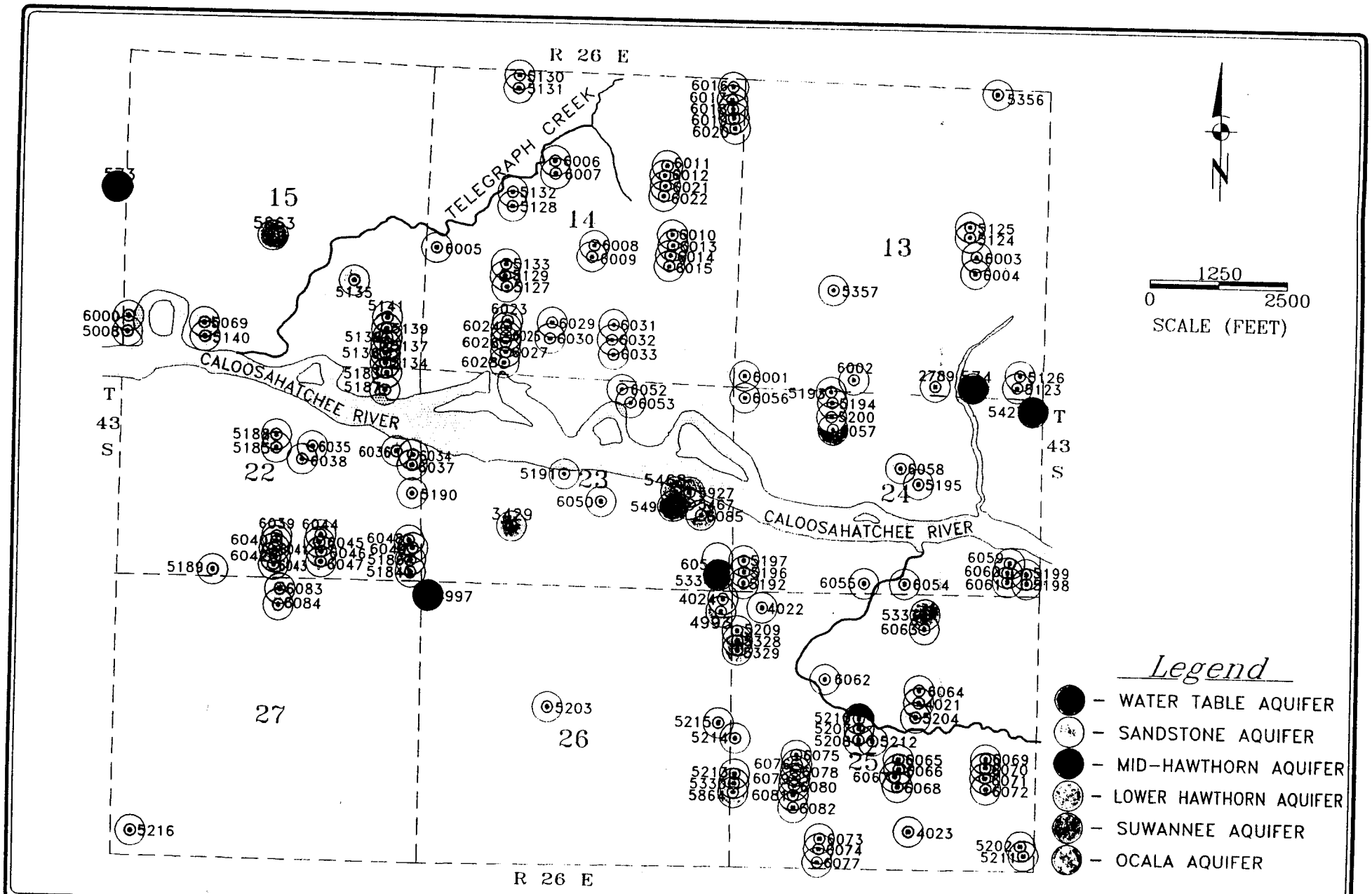
AIR • WATER • SOIL TECHNOLOGY

DRN. BY: G.C.S. DWG. NO. A-P10811KB-1 DATE: 05/04/98

PROJECT NAME: OLGA PILOT ASR PROJECT NUMBER: P8-10811.01

FIGURE 2--5. MAP SHOWING LOCATION OF INVENTORIED WELLS IN THE AREA OF REVIEW.



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DRN. BY: G.C.S. DWG. NO. A-P10811KB-1 DATE: 05/04/98

PROJECT NAME: OLGA PILOT ASR PROJECT NUMBER: P8-10811.01

FIGURE 2-6. DEPTH OF PENETRATION MAP.

F - MAPPED OR KNOWN FAULTS

Based upon a review of available published data, no known or mapped faults have been identified within the Area of Review.

G - PROPOSED ASR ZONE

The precise ASR zone will be determined by testing in the exploratory well. Intervals of porous limestones within the Lower Hawthorn and Suwannee aquifers are the most prospective. The proposed total depth of 1110 feet for the Lee County Olga pilot ASR well should provide for evaluation of enough zones to identify an interval with adequate transmissivity to store anticipated available excess treated water from the Caloosahatchee River during peak wet season flows.

H - INJECTION AND PETROLEUM TEST WELLS

There are no injection wells within the Area of Review. There are no producing petroleum wells located within the Area of Review. Petroleum test wells are located in the general vicinity of the ASR site, but outside of the Area of Review.

APPENDIX B

WELL PROGNOSES

1. Observation Well #1 (LM-6209)

2. Observation Well #3 (LM-6615)

WELL PROGNOSIS

PROJECT NAME: Lee County Olga ASR Program
PROJECT NUMBER:
WELL NAME: ASR Test Well LM-6086
LOCATION: NE SE Sec. 23, T43S, R26E
ELEVATION: Est. 6' (GL)

ANTICIPATED STRATIGRAPHIC TOPS:

Pamlico/Ft. Thompson Fm. (Holocene-Pleistocene)	Surface
Pinecrest/Ochopee Mbrs. of Tamiami Fm. (Pliocene)	NP
Cape Coral Clay Mbr. of Peace River Fm. (Miocene)	7'
Lehigh Acres Sandstone Mbr. of Peace River Fm.	60'
Fort Myers Clay Mbr. of Peace River Fm.	138'
Mid-Hawthorn Mbr. of Arcadia Fm.	235'
Mid-Hawthorn Zone II Limestone of Arcadia Fm.	355'
Unnamed Marl/Clay Mbr. of Arcadia Fm.	410'
Unnamed Limestone Zone of Arcadia Fm.	457'
Unnamed Marl/Clay Zone of Arcadia Fm.	500'
Lower Hawthorn Mbr. of Arcadia Fm.	520'
Unnamed Marl/Clay Zone of Arcadia Fm.	680'
Suwannee Zone I (Oligocene)	690'
Unnamed Marl/Clay Zone	830'
Suwannee Zone II Ls.	850'
Unnamed Marl/Clay Zone	940'
Suwannee Zone III Ls.	950'
Unnamed Marl/Clay Zone	1105'

CONTROL WELLS: LM-5468, LM-3429, LM-5493

POTENTIAL PACKER TEST ZONES:

Lower Hawthorn Ls. of Arcadia Fm.
Suwannee Zone I Ls.
Suwannee Zone II Ls.
Suwannee Zone III Ls.

A total of three zones are to be tested.

ANTICIPATED TOTAL DEPTH: 1110'

ANTICIPATED GEOPHYSICAL LOGGING PROGRAMS:

Prior to setting upper casing - Resistivity, Gamma Ray, Caliper
Prior to running tests - Gamma Ray, Caliper
Prior to setting production casing - Resistivity, Gamma Ray, Caliper, Flowmeter
After each stage of casing cementing - Temperature

ANTICIPATED CASING PROGRAM:

16" @ 10'	Surface
12" @ 525'	Upper
6" @ 855'	Production

SAMPLE COLLECTION PROGRAM:

Lithologic Samples - Every 5'
Water - Every 10' from 525' to Total Depth

CORING PROGRAM:

Up to four 10-foot long 4-inch diameter cores. See potential packer test zones for potential core intervals.

DRILLING METHOD:

Mud rotary to upper casing setting depth
Reverse air rotary below upper casing

ADDITIONAL INSTRUCTIONS:

Call in morning report every day
All casing setting depths, test zones, packer seats, and core intervals must be reviewed and approved by the Project Manager

N.B. This is an exploratory well to test several potential aquifer storage and recovery zones. Accurate depth and lithologic control is critical. All anticipated stratigraphic tops listed above were obtained from analyses of regional well control, actual depths and unit thickness may be significantly different at the site.

PROGNOSIS PREPARED BY:

Daniel J. Acquaviva, P.G. 4/21/98

WELL PROGNOSIS

PROJECT NAME: Lee County Olga ASR Program
PROJECT NUMBER: 01-03891.HO
WELL NAME: ASR Test Well #3 LM-6615
LOCATION: Sec. 23, T43S, R26E
ELEVATION: Est. 6' (GL)

ANTICIPATED STRATIGRAPHIC TOPS:

Pamlico/Ft. Thompson Fm. (Holocene-Pleistocene)	Surface
Pinecrest/Ochopee Mbrs. of Tamiami Fm. (Pliocene)	NP
Cape Coral Clay Mbr. of Peace River Fm. (Miocene)	14'
Lehigh Acres Sandstone Mbr. of Peace River Fm.	61'
Fort Myers Clay Mbr. of Peace River Fm.	131'
Mid-Hawthorn Zone I Limestone of Arcadia Fm.	235'
Unnamed Marl/Clay Mbr. of Arcadia Fm.	270'
Mid-Hawthorn Zone II Limestone of Arcadia Fm.	355'
Unnamed Marl/Clay Mbr. of Arcadia Fm.	395'
Unnamed Limestone Zone of Arcadia Fm.	470'
Unnamed Marl/Clay Zone of Arcadia Fm.	510'
Lower Hawthorn Zone I Limestone of Arcadia Fm.	515'
Unnamed Marl/Clay Zone	605'
Lower Hawthorn Zone II Limestone of Arcadia Fm.	612'
Unnamed Marl/Clay Zone	690'
Suwannee Zone I (Oligocene)	710'
Unnamed Mudstone	825'
Suwannee Zone II Ls.	835'
Unnamed Marl/Clay Zone	935'

CONTROL WELLS: LM-6208

POTENTIAL PACKER TEST ZONES:

Suwannee Zone I Ls. (Open hole)
Suwannee Zone II Ls.

A total of two zones are to be tested.

ANTICIPATED TOTAL DEPTH: 940'

ANTICIPATED GEOPHYSICAL LOGGING PROGRAMS:

Prior to setting upper casing - Resistivity, Gamma Ray, Caliper
Prior to running tests - Gamma Ray, Caliper
Prior to setting production casing - Resistivity, Gamma Ray, Caliper, Flowmeter
After each stage of casing cementing - Temperature

ANTICIPATED CASING PROGRAM:

18" @ 35'	Surface
12" @ 720'	Upper
6" @ 840'	Production

SAMPLE COLLECTION PROGRAM:

Lithologic Samples - Every 5'
Water - Every 10' from 720' to Total Depth

CORING PROGRAM:

Up to four 10-foot long 4-inch diameter cores. See potential packer test zones for potential core intervals.

DRILLING METHOD:

Mud rotary to upper casing setting depth
Reverse air rotary below upper casing

ADDITIONAL INSTRUCTIONS:

Call in morning report every day
All casing setting depths, test zones, packer seats, and core intervals must be reviewed and approved by the Project Manager

N.B. This is an exploratory well to test several potential aquifer storage and recovery zones. Accurate depth and lithologic control is critical.

PROGNOSIS PREPARED BY:

Justin Chamberlain 2/25/99

APPENDIX C

DAILY DRILLING REPORTS

1. Observation Well #1 (LM-6209)
2. Observation Well #3 (LM-6615)

DAILY DRILLING REPORT

LCU - Olga ASR
Observation Well # 1
NE SE Sec-23-T43S-R26E
Lee County, Florida

Well Water Systems Rig #2

11/16/98 Pres Ops @ 9:00 AM: MI equip. Prep to MIRT.
Ops Last 48 hrs: MI equip.

11/17/98 Pres Ops @ 9:00 AM: WORT.
Ops Last 24 hrs: MI equip.

11/18/98 Pres Ops @ 9:00 AM: WORT.
Ops Last 24 hrs: SD.

11/19/98 Pres Ops @ 9:00 AM: Prep to MIRT.
Ops Last 24 hrs: SD.

11/20/98 Pres Ops @ 9:00 AM: SD
Ops Last 24 hrs: SD.

11/23/98 Pres Ops @ 9:00 AM: WO DOT permit to move rig.
Ops Last 72 hrs: SD.

11/24/98 Pres Ops @ 9:00 AM: WO DOT permit to move rig.
Ops Last 24 hrs: WO DOT permit to move rig.

11/25/98 Pres Ops @ 9:00 AM: Prep to MIRT.
Ops Last 24 hrs: WO DOT permit to move rig.

11/30/98 Pres Ops @ 9:00 AM: RURT.
Ops Last 5 days: MIRT 11/27/98.

12/1/98 Pres Ops @ 9:00 AM: WO equipment.
Ops Last 24 hrs: RURT.

12/2/98 Pres Ops @ 9:00 AM: WO equipment.
Ops Last 24 hrs: WO equipment.

12/3/98 Pres Ops @ 9:00 AM: Prep to ream to straighten hole.
Ops Last 24 hrs: Spudded well @ 11:00 AM. Drld 24" dia hole to 36.5' by mud rotary. BHA: 8.5" lead bit + 24" bit + x-over sub, total length 4.5'. POH. WIH w/ 18" dia steel csg. Landed @ 30'. Csg out of alignment. SD for night @ 6:00 PM.
Lithology: Sd, clayey and shelly, 0-10'; ls, 10-12'; clay, lt olive gry, 12-25'; clay, grn gry, 25-35'.

Distribution:

	FAX#:
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DAILY DRILLING REPORT

LCU - Olga ASR
Observation Well # 1
NE SE Sec-23-T43S-R26E
Lee County, Florida

Well Water Systems Rig #2

12/1/98 Pres Ops @ 9:00 AM: WO equipment.
Ops Last 24 hrs: RURT.

12/2/98 Pres Ops @ 9:00 AM: WO equipment.
Ops Last 24 hrs: WO equipment.

12/3/98 Pres Ops @ 9:00 AM: Prep to ream to straighten hole.
Ops Last 24 hrs: Spudded well @ 11:00 AM. Drld 24" dia hole to 36.5' by mud rotary. BHA: 8.5" lead bit + 24" bit + x-over sub, total length 4.5'. POH. WIH w/ 18" dia steel csg. Landed @ 30'. Csg out of alignment. SD for night @ 6:00 PM.
Lithology: Sd, clayey and shelly, 0-10'; ls, 10-12'; clay, lt olive gry, 12-25'; clay, grn gry, 25-35'.

12/4/98 Pres Ops @ 9:00 AM: Prep to GIH w/ 8" dia bit.
Ops Last 24 hrs: POH w/ 18" dia steel csg. WBIH w/ RT. Reamed hole to straighten. POH. WBIH w/ 18" dia csg. Landed csg @ 35'. Cmtd w/ 68 sks neat cmt. SD for night @ 5:00 PM.

12/7/98 Pres Ops @ 9:00 AM: Installing BOP's.
Ops Last 72 hrs: WIH w/ 8" dia bit. BHA = bit + sub; total length = 4.4'. Drld 8" pilot hole to 102'. SD for weekend 6:30 PM 12/4/98.
Lithology: Clay, w/ tr shell 40-62'; ss, v fn to med, friable, poor por, 62-65'; ls, biomic, fair to good por, 65-70'; ls, calcar, fair to good por, 70-95'; clay, bl white, sticky, 95-102'.
Sample Tops: Pamlico/Ft. Thompson @ surf; Cape Coral Clay @ 12'; Lehigh Acres Sandstone member of Peace River fm @ 62'. Running 2' low to prognosis.

12/8/98 Pres Ops @ 9:00 AM: Drlg @ 242'.
Ops last 24 hrs: Drld 8" pilot hole to 225'. MW 9.0. SD for night @ 5:30 PM.
Lithology: Clay, bl-wh, 102-112'; clay & ls, 112-115'; ls, mic, good por, 115-130'; ls, sandy, fair to poor por, 130-135'; clay, shell frags, 135-145'; clay, very phos, 145-200'; clay & ls, w/ phos layers, 200-220'; ls, phos, poor por, some clay, 220-225'.
Sample Tops: Ft. Myers Clay @ 135'. Running 3' high to prognosis.

12/9/98 Pres Ops @ 9:00 AM: Drlg @ 411'.
Ops last 24 hrs: Drld 8" dia pilot hole to 381'. SD for night @ 7:00 PM.
Lithology: Marl, 225-242'; ls, mic, poor por, 242-244'; clay, minor shell, phos, 244-260'; ls, chalky, poor to fair por, 260-265'; ls & marl, 265-275'; clay, v phos, 275-290'; clay & marl, 290-300'; clay, soft, phos, 300-340'; clay, marly, 340-350'; clay, gummy, 350-360'; ls, biomic, phos, hard, good por, 360-365'; ls, mic, poor por, 365-375'; ls, phos, gd por, 375-381'.
Sample Tops: Mid-Hawthorn Zone II Ls @ @ 360'. Running 5' low to prognosis.

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DAILY DRILLING REPORT

LCU - Olga ASR
Observation Well # 1
NE SE Sec-23-T43S-R26E
Lee County, Florida

Well Water Systems Rig #2

12/8/98 Pres Ops @ 9:00 AM: Drlg @ 242'.
Ops last 24 hrs: Drld 8" pilot hole to 225'. MW 9.0. SD for night @ 5:30 PM.
Lithology: Clay, bl-wh, 102-112'; clay & ls, 112-115'; ls, mic, good por, 115-130'; ls, sandy, fair to poor por, 130-135'; clay, shell frags, 135-145'; clay, very phos, 145-200'; clay & ls, w/ phos layers, 200-220'; ls, phos, poor por, some clay, 220-225'.
Sample Tops: Ft. Myers Clay @ 135'. Running 3' high to prognosis.

12/9/98 Pres Ops @ 9:00 AM: Drlg @ 411'.
Ops last 24 hrs: Drld 8" dia pilot hole to 381'. SD for night @ 7:00 PM.
Lithology: Marl, 225-242'; ls, mic, poor por, 242-244'; clay, minor shell, phos, 244-260'; ls, chalky, poor to fair por, 260-265'; ls & marl, 265-275'; clay, v phos, 275-290'; clay & marl, 290-300'; clay, soft, phos, 300-340'; clay, marly, 340-350'; clay, gummy, 350-360'; ls, biomic, phos, hard, good por, 360-365'; ls, mic, poor por, 365-375'; ls, phos, gd por, 375-381'.
Sample Tops: Mid-Hawthorn Zone II Ls @ @ 360'. Running 5' low to prognosis.

12/10/98 Pres Ops @ 9:00 AM: POH to run geophy logs.
Ops Last 24 hrs: Drld 8" hole to 530'. C&c. MW 9.0. SD for night @ 4:00 PM.
Lithology: Ls, phos, gd por, 381-395'; lime mud & ls, 395-400'; lime mud, 400-440'; ls, mic, poor por, tr clay, 440-445'; lime mud, minor ls, 445-450'; ls, mic, poor to fair por, tr lime mud, 450-460'; lime mud, 460-475'; ls, mic, v phos, poor to fair por, 475-515'; lime mud, marly, soft, minor ls, 515-520'; ls, mic, marly, fair to gd por, 520-525'; ls, biomic, tr phos, common sh frags, gd por, 525-530'.
Sample Tops: Lower Hawthorn Zone I @ 520'. Running flat w/ prognosis.

12/11/98 Pres Ops @ 9:00 AM: RU to drill rathole.
Ops Last 24 hrs: C&c. POH. WIH w/ logging tools. Ran GR/SP/Res log. Repaired kelly. Drld mousehole. SD for night @ 5:00 PM.

12/14/98 Pres Ops @ 9:00 AM: RU to ream.
Ops Last 72 hrs: Drld rathole. SD for weekend @ 12:00 Noon 12/11/98.

12/15/98 Pres Ops @ 9:00 AM: Reaming @ 105'.
Ops Last 24 hrs: Well strtd F @ 70-100 gpm. Killed well w/ 20 sks Baroid. Reamed 18" hole to 73'. BHA = 18" bit + sub + stabilizer, total length = 12.9'. SD for night @ 5:00 PM.

12/16/98 Pres Ops @ 9:00 AM: Prep to ream.
Ops Last 24 hrs: Reamed 18" hole to 199'. MW 9.4. Repaired rotary table. SD for night @ 5:00 PM.

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DAILY DRILLING REPORT

LCU - Olga ASR
Observation Well # 1
NE SE Sec-23-T43S-R26E
Lee County, Florida

Well Water Systems Rig #2

12/16/98 Pres Ops @ 9:00 AM: Prep to ream.
Ops Last 24 hrs: Reamed 18" hole to 199'. MW 9.4. Repaired rotary table. SD for night @ 5:00 PM.

12/17/98 Pres Ops @ 9:00 AM: Repairing drive shaft.
Ops Last 24 hrs: Reamed 18" dia hole to 329'. Made wiper trip @ 300'.Broke drive shaft.
SD for night @ 7:30 PM.

12/18/98 Pres Ops @ 9:00 AM: Drlg 18" hole @ 400'.
Ops Last 24 hrs: Repaired rig. Reamed 18" hole to 382'. MW 9.4. SD for night @ 6:30 PM.

12/19/98 Pres Ops @ 9:00 AM: Drlg 18" hole @ 520'.
Ops Last 24 hrs: Reamed 18" hole to 500'. Made wiper trip @ 400'. MW 9.4. SD for night @ 6:30 PM.

12/21/98 Pres Ops @ 9:00 AM: POH.
Ops Last 48 hrs: Reamed 18" hole to 530'. Made wiper trip @ 500'. MW 12.0. SD for weekend @ 10:00 AM 12/19/98.

12/22/98 Pres Ops @ 9:00 AM: Prep to tag TOC.
Ops Last 24 hrs: WIH w/ 18" bit. Made wiper trip to 530'. POH. Ran Caliper log & dev surveys. Found hole sloughing between 90' and 282'. WBIH for wiper trip. POH. WIH w/ 12' dia steel csg. Landed csg 530'. Pressure grtd w/ 267 sks neat cmt. Chased w/ 200 gals wtr. Dev @ 90' 0 deg dev @ 180' 0 deg, dev @ 270' 0 deg, dev @ 360' 0 deg, dev @ 450' 0.5 deg. SD for night @ 11:55 PM.

12/23/98 Pres Ops @ 9:00 AM: RU for reverse air.
Ops last 24 hrs: Tagged cmt @ 120'. Tremied 45 sks neat cmt. Cleaned site. SD for night @ 3:15 PM.

12/24/98 Pres Ops @ 9:00 AM: SD for holidays.
Ops Last 24 hrs: Tagged TOC @ 6' BLS. RU for reverse air. Cleaned site. SD for night @ 5:30 PM.

1/4/99 Pres Ops @ 9:00 AM: RU reverse air rotary system.
Ops Last 11 days: SD for holidays.

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DAILY DRILLING REPORT

LCU - Olga ASR
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Well Water Systems Rig #2

1/4/99 Pres Ops @ 9:00 AM: RU reverse air rotary system.
Ops Last 11 days: SD for holidays.

1/5/99 Pres Ops @ 9:00 AM: Repairing air line.
Ops Last 24 hrs: RU reverse air rotary system. WIH w/ 8" bit. BHA: bit + sub + 4 DC's, total length = 117.2'. Dlrd 8" pilot hole to 589'. Made short trip to 530'. SD for night @ 6:00 PM.
Lithology: Ls, mic, phos, gd por, 520-45'; ls, biomic, phos, gd to xlnt por, 545-80; ls, mic, phos, gd moldic por, 580-89' (increase in flow @ 580').
Reverse Air Water Quality: Dis Cl @ 540' = 600 mg/l, Dis Cl @ 555' = 560 mg/l, Dis Cl @ 570' = 510 mg/l, Dis Cl @ 585' = 560 mg/l. Note: added fresh water for makeup to 560'.

1/6/99 Pres Ops: Drlg @ 655'.
Ops Last 24 hrs: Drld 8" dia hole to 617'. POH. WBIH w/ submer pump. Set pump @ 102' below DF (97.5' BLS). Sealed wellhead. SWL= 39.15' ALS. Performed preflow @ 450 gpm. SI for 45 min. Conducted specific capacity test @ rates of 110, 220, 270, 330, and 400 gpm. Est. Transmissivity = 19,000 gpd/ft. Dissolved Chlorides = 540 mg/l. SD for night @ 5:00 PM.
Lithology: ls, mic to biomic, phos, gd por, 589-605'; ls, sparitic, tr lime mud, gd por, 605-610'; lime mud, soft, cohesive, 610-617'.
Reverse Air Water Quality: Dis Cl @ 600' = 530 mg/l; Dis Cl @ 615' = 520 mg/l.

1/7/99 Pres Ops @ 9:00 AM: POH w/ pckr.
Ops Last 24 hrs: Drld 8" dia hole to 696'. POH. WBIH w/ packer. Set packer @ 615-619' below DF. Set submer pump @ 100' DF. Measured SWL in test zone (617-695' DF) @ 42.90' ALS and 39.27' ALS in annulus. Conducted preflow @ 190 gpm. Well producing approx 15% sd. SI for night.
Lithology: Ls, sparitic, v. hard, phos, poor to fair por, 617-620'; ls, mic to biomic, phos, fair to gd moldic por, 620-630'; ls, mic to calcar, phos, gd moldic por, 630-650'; ls, biomic to biosparitic, v. fos, phos, gd por, 655-675'; ls, calcar, v. sndy, phos, fair to gd por, 675-94'; lime mud, 694-96'.
Reverse Air Water Quality: Dis Cl @ 630' = 550 mg/l, Dis Cl @ 645' = 490 mg/l, Dis Cl @ 660' = 430 mg/l, Dis Cl @ 675' = 440 mg/l, Dis Cl @ 695' = 400 mg/l.

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DAILY DRILLING REPORT

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Observation Well # 1
NE SE Sec-23-T43S-R26E
Lee County, Florida

Well Water Systems Rig #2

1/7/99 Pres Ops @ 9:00 AM: POH w/ pckr.
Ops Last 24 hrs: Drld 8" dia hole to 696'. POH. WBIH w/ packer. Set packer @ 615-619' below DF. Set submer pump @ 100' DF. Measured SWL in test zone (617-695' DF) @ 42.90' ALS and 39.27' ALS in annulus. Conducted preflow @ 190 gpm. Well producing approx 15% sd. SI for night.
Lithology: Ls, sparitic, v. hard, phos, poor to fair por, 617-620'; ls, mic to biomic, phos, fair to gd moldic por, 620-630'; ls, mic to calcar, phos, gd moldic por, 630-650'; ls, biomic to biosparitic, v. fos, phos, gd por, 655-675'; ls, calcar, v. sndy, phos, fair to gd por, 675-94'; lime mud, 694-96'.
Reverse Air Water Quality: Dis Cl @ 630' = 550 mg/l, Dis Cl @ 645' = 490 mg/l, Dis Cl @ 660' = 430 mg/l, Dis Cl @ 675' = 440 mg/l, Dis Cl @ 695' = 400 mg/l.

1/8/99 Pres Ops @ 9:00 AM: GBIH.
Ops Last 24 hrs: Conducted specific capacity test of Lower Hawthorn Zone II (617-694' DF) @ rates of 70, 100, 175, 200 gpm. Est Transmissivity = 10000 gpd/ft. Dis Cl = 260 mg/l. POH w/ submer pump & pcker. WBIH. BHA = bit + sub + 4 DC's, total length = 119'. Found 60' sd fill up. Drld out sd. Drld 8" dia hole to 749'. Heavy sd inflow @ connections. PU to 530'. SD for night @ 5:00 PM.
Lithology: Clay, soft, cohesive, 698-708'; ls, calcar to mic, gd moldic por, 708-10; ls & clay, 710-15'; ls, calcar to mic, hard, fair to gd por, 715-20'; ls, biomic, gd por, 720-30'; clay, 730-31'; ls, calcar, fair por, 731-735'; ls & clay, 735-40; ls, biomic, gd to xlnt por, 740-49'.
Reverse Air Water Quality: Dis Cl @ 700' = 380 mg/l, Dis Cl @ 730' = 410 mg/l, Dis Cl @ 749' = 410 mg/l.
Sample Tops: Suwannee Zone I @ 715' DF. Running 20' low to prognosis.

1/11/99 Pres Ops @ 9:00 AM: WOO.
Ops Last 72 hrs: WBIH to 749'. Found no sd fill up. Drld 8" dia hole to 944'. PU to 530'. SD for weekend @ 5:45 PM on 1/8/99.
Lithology: Ls, bimic, gd to xlnt por, 749-55'; ls, mic to biomic, hard, fair to gd por, 755-65'; ls, biospar, hard, gd moldic por, 765-75'; ls, mic, poor to fair por, 775-80'; ls, v. sandy, hard, fair to gd por, 780-810'; ls, calcar, common ss layers, gd por, 810-20'; mudstone, hard, poor to fair por, 820-30'; ls, calcar, intrbd lime mud, poor to fair por, 830-40'; ls, biomic to biosparitic, gd to xlnt por, increase in flow, 840-55'; ls, calcar, gd moldic por, 855-70'; ls, mic to biomic, fair to gd por, 870-903'; ls, calcar to biomic, hard, fair to gd por, 903-915'; ls, biospar, gd por, 915-20'; ls, biospar, tr clay, fair por, 920-40'; mudstone, hard, poor por, 940-42'; clay, soft, cohesive, 942-44'.
Reverse Air Water Quality: Dis Cl @ 765' = 400 mg/l, Dis Cl @ 780' = 360 mg/l, Dis Cl @ 845' = 500 mg/l, Dis Cl @ 870' = 510 mg/l, Dis Cl @ 886' = 530 mg/l, Dis Cl @ 903' = 540 mg/l, Dis Cl @ 915' = 610 mg/l, Dis Cl @ 944' = 540 mg/l.
Sample Tops: Suwannee Zone II @ 840'. Running 15' high to prognosis.

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DAILY DRILLING REPORT

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Well Water Systems Rig #2

1/11/99 Pres Ops @ 9:00 AM: WOO.
Ops Last 72 hrs: WBIH to 749'. Found no sd fill up. Drld 8" dia hole to 944'. PU to 530'. SD for weekend @ 5:45 PM on 1/8/99.
Lithology: Ls, bimic, gd to xlnt por, 749-55'; ls, mic to biomic, hard, fair to gd por, 755-65'; ls, biospar, hard, gd moldic por, 765-75'; ls, mic, poor to fair por, 775-80'; ls, v. sandy, hard, fair to gd por, 780-810'; ls, calcar, common ss layers, gd por, 810-20'; mudstone, hard, poor to fair por, 820-30'; ls, calcar, intrbd lime mud, poor to fair por, 830-40'; ls, biomic to biosparitic, gd to xlnt por, increase in flow, 840-55'; ls, calcar, gd moldic por, 855-70'; ls, mic to biomic, fair to gd por, 870-903'; ls, calcar to biomic, hard, fair to gd por, 903-915'; ls, biospar, gd por, 915-20'; ls, biospar, tr clay, fair por, 920-40'; mudstone, hard, poor por, 940-42'; clay, soft, cohesive, 942-44'.
Reverse Air Water Quality: Dis Cl @ 765' = 400 mg/l, Dis Cl @ 780' = 360 mg/l, Dis Cl @ 845' = 500 mg/l, Dis Cl @ 870' = 510 mg/l, Dis Cl @ 886' = 530 mg/l, Dis Cl @ 903' = 540 mg/l, Dis Cl @ 915' = 610 mg/l, Dis Cl 2 944' = 540 mg/l.
Sample Tops: Suwannee Zone II @ 840'. Running 15' high to prognosis.

1/12/99 Pres Ops@ 9:00 AM: WO supplies.
Ops Last 24 hrs: WOO

1/13/99 Pres Ops @ 9:00 AM: WO supplies.
Ops Last 24 hrs: WO supplies.

1/14/99 Pres Ops @ 9:00 AM: WO supplies.
Ops Last 24 hrs: WO supplies.

1/15/99 Pres Ops @ 9:00 AM: GIH to find bottom.
Ops Last 24 hrs: WO supplies.

1/18/99 Pres Ops @ 9:00 AM: GIH w/ 12" dia bit to ream.
Ops Last 72 hrs: WIH open-ended. Hit bridge @ 540'. POH. SD for weekend @ 2:00 PM 1/15/99.

1/19/99 Pres Ops @ 9:00 AM: POH.
Ops Last 24 hrs: Reamed 12" dia hole to 717'. Killed well w/ 9000 lbs salt. SD for night @ 5:00 PM.

1/20/99 Pres Ops @ 9:00 AM: PB w/ sd.
Ops Last 24 hrs: Tagged BO hole (TO reamed cuttings) @ 910'. Spttd 66 cu ft sd through DP. Added 2000 lbs salt to annulus. SD for night @ 5:00 PM.

1/21/99 Pres Ops @ 9:00 AM: GIH w/ 8" PVC csg.
Ops Last 24 hrs: Tagged TO sd @ 818'. Added 33 cu ft sd. Tagged TO sd @ 795'. Added 33 cu ft sd. Tagged TO sd @ 755'. Added 16 cu ft sd. SD for night @ 5:00 PM.

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DAILY DRILLING REPORT

LCU - Olga ASR
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Well Water Systems Rig #2

1/21/99 Pres Ops @ 9:00 AM: GIH w/ 8" PVC csg.
Ops Last 24 hrs: Tagged TO sd @ 818'. Added 33 cu ft sd. Tagged TO sd @ 795'. Added 33 cu ft sd. Tagged TO sd @ 755'. Added 16 cu ft sd. SD for night @ 5:00 PM.

1/22/99 Pres Ops @ 9:00 AM. GIH w/ air line.
Ops Last 24 hrs: WIH w/ 8" Schedule 40 PVC csg. Landed csg @ 716'. Press grtd w/ 120 sks neat cmt. SD for night @ 4:00 PM.

1/23/99 Pres Ops @ 9:00 AM: Circulating water in csg.
Ops Last 24 hrs: Attempted to POH w/ 2" steel tremie. Found tremie cemented in hole. Tagged TOC w/ 1" PVC @ 640'. POH w/ 1" PVC. WIH w/ 6" dia reamer bit. Tagged TOC @ 658'. Attempted to tag TOC in annulus. Hit obstruction @ 240'. Set air line in csg @ 240'. Circulated air. Had possible air returns in annulus. POH w/ air line. Mudded hole. MW 16.0. Reamed to 658' by mud rotary. Sheared off 2" steel tremie. POH w/ DP & 2" dia steel tremie. Still in hole: 34' of cemented in 2" steel tremie. SD for night @ 10:00 PM.

1/25/99 Pres Ops @ 9:00 AM: GI annulus w/ 1" tremie to tag TOC.
Ops Last 48 hrs: WIH w/ 1" tremie. Pumped water for 2 hrs. Ran video. Found bottom @ 665'. Found csg in good condition. SD for weekend @ 1:30 PM 1/23/99.

1/26/99 Pres Ops @ 9:00 AM: Treming cmt in annulus.
Ops Last 24 hrs: Tagged TOC @ 620'. Tremied 40 sks cmt, 4% bentonite. WOC for 6.5 hrs. Tagged TOC @ 580'. Tremied 40 sks cmt, 4% bentonite. SD for night @ 5:30 PM.

1/27/99 Pres Ops @ 9:00 AM: WO drill crew.
Ops Last 24 hrs: Tagged TOC @ 540'. Tremied 20 sks cmt, 4% bentonite. WOC 6 hrs. Tagged TOC @ 482'. WIH to TD w/ 6" dia reamer bit. SD for night @ 4:00 PM.

1/28/99 Pres Ops @ 9:00 AM: WO drill crew.
Ops Last 24 hrs: No activity.

1/29/99 Pres Ops @ 9:00 AM: Milling on junk @ 689'.
Ops Last 24 hrs: Milled on junk from 665 to 681'. BHA = 7" dia reamer bit + 4 DC's, total length = 116.3'. Still in hole: 19' of junk. SD for night @ 7:00 PM.

1/30/99 Pres Ops @ 9:00 AM: Running video.
Ops Last 24 hrs: Milled on junk from 681 to 694'. POH for bit trip. WBIH. Drilled junk & formation (clay & ls) from 686 to 701'. POH. SD for night @ 4:30 PM.

2/1/99 Pres Ops @ 9:00 AM: Mixing mud.
Ops Last 48 hrs: Ran video. Found csg in gd cond. Found BO csg @ 679'. SD for weekend @ 11:00 AM 1/30/99.

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2/1/99 Pres Ops @ 9:00 AM: Mixing mud.
Ops Last 48 hrs: Ran video. Found csg in gd cond. Found BO csg @ 679'. SD for weekend @ 11:00 AM 1/30/99.

2/2/99 Pres Ops @ 9:00 AM: Drlg out sand back plug @ 869'.
Ops Last 24 hrs: Dlrd 8" dia hole by mud rotary to 717'. RU reverse air system. Set air line @ 180'. Dlrd 8" dia hole by reverse air to 838'. BHA = bit + 4 DC's, total length = 117'. PU to 489'. SI. SD for night @ 5:00 PM.

2/3/99 Pres Ops @ 9:00 AM: GIH w/ submer pump.
Ops Last 24 hrs: Drld 8" dia hole to 944'. POH. RU for packer test. SD for night @ 6:30 PM.

2/4/99 Pres Ops @ 9:00 AM: Prep to conduct pckr test.
Ops last 24 hrs: RU & ran pckr test of Suwannee Zone II (840-940'). Set packer @ 837-41' DF. Had gd seal. Set submer pump @ 116'. Measured SWL in test zone (840-940') @ 41.69' ALS. Measured SWL in annulus @ 42.12' ALS. Conducted preflow @ 350 gpm. SI for 30 min. Conducted specific capacity test @ rates of 70, 150, 250, 360 gpm. Estimated Transmissivity = 57,000 gpd/ft. Dissolved Chlorides = 1000 mg/l. PO pump. PU to 715'. SD for night 6:00 PM.

2/5/99 Pres Ops @ 9:00 AM: WO drill crew.
Ops Last 24 hrs: Set pckr @ 713-717'. Set submer pump @ 116'. Measured SWL in test zone (Suwannee Zones I & II combined) @ 42.15' ALS. Measured SWL in annulus @ 42.19' ALS. Conducted preflow @ 350 gpm. SI for 45 min. Conducted spec cap test @ rates of 70, 155, 250, and 350 gpm. Had 17.85' of drawdown in annulus @ 350 gpm (poor pckr seal). Estimated Transmissivity = 57,000 gpd/ft. Dissolved Chlorides = 900 mg/l.
Released pckr & MU & reset @ 711-715'. No seal. Released pckr & MU & reset @ 709-711'. No seal. Released pckr & reset @ 714-718'. No seal. Released pckr & reset @ 715-719'. Had partial seal. On preflow had 15.92' drawdown in annulus @ 380 gpm.
Released pckr & reset @ 837-841' (Suwannee Zone II). Restested Suwannee Zone II due to possible transducer malfunction on 2/3/99. Measured SWL in annulus @ 42.12' ALS & in test zone @ 41.69' ALS. SI for 50 min. Conducted spec cap test @ rates of 70, 150, 250, and 350 gpm. Had 3.95' of drawdown in annulus @ 350 gpm. Estimated Transmissivity = 57,000 gpd/ft. Dissolved Chlorides = 1140 mg/l.
SD for night @ 9:30 PM.

Distribution:

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DAILY DRILLING REPORT

LCU - Olga ASR
Observation Well # 1
NE SE Sec-23-T43S-R26E
Lee County, Florida

Well Water Systems Rig #2

2/8/99 Pres Ops @ 9:00 AM: Prep to conduct pckr test of Ocala Zone I.
Ops Last 72 hrs: POH w/ submer pump & pckr. WBIH w/ 8" bit. BHA =bit + sub + 4 DC's, total length = 117'. Drld 8" dia hole by reverse air to 1108'. SD for weekend @ 5:30 PM on 2/5/99.
Lithology: Clay & ls, 944-45'; ls, marly, 945-50'; ls, calcar, fair to gd por, 950-60'; ls, mic, fair to gd por, 960-70'; ls, mic, poor por, 970-72'; ls, biomic, fair to gd por, 972-95'; ls, abun forams, gd por, 995-1000'; ls, mic, chalky, poor to fair por, 1000-20'; ls, biomic, fair to gd por, 1020-40'; shell hash, 1040-70'; ls, mic to biomic, fair to gd por, 1070-75'; ls, mic, chalky, fair to gd por, 1075-85'; shell hash, 1085-1100', ls, mic, fair por, 1100-06'; clay, 1106-08'.
Reverse Air Water Quality: Dis Cl @ 960' = 820 mg/l; Dis Cl @ 975' = 820 mg/l; Dis Cl @ 990' = 820 mg/l; Dis Cl @ 1005' = 900 mg/l; Dis Cl @ 1020' = 830 mg/l; Dis Cl @ 1035' = 930 mg/l; Dis Cl @ 1050' = 860 mg/l; Dis Cl @ 1075' = 820 mg/l; Dis Cl @ 1090' = 820 mg/l; Dis Cl @ 1108' = 860 mg/l.
Sample Tops: Ocala Zone I @ 950'. Running 5' high to prognosis.

2/9/99 Pres Ops @ 9:00 AM: GIH w/ 8" bit.
Ops Last 24 hrs: WIH w/ pckr. Set pckr @ 941-45'. Had gd seal. Set pump @ 80'. SI well. Measured SWL in test zone (950-1106') @ 37.01' ALS. Measured SWL in annulus @ 39.00' ALS. Conducted preflow @ 20 gpm. SI for 60 min. Started test. Packer failed during second pumping rate. SD test. Reset pckr @ 941-945'. SI for 30 min. Conducted specific capacity test @ rates of 6 and 15 gpm. No drawdown in annulus. Unseated pckr. PU to 679'. SD for night @ 5:00 PM.
Estimated Transmissivity (Ocala Zone I) = 250 gpd/ft. Dissolved Chlorides = 820 mg/l.

2/10/99 Pres Ops @ 9:00 AM: WO geophy logger.
Ops Last 24 hrs: POH w/ pckr. WBIH w/ 8" dia bit. Drld 8" dia holeby reverse air to 1200'. C&c hole. PU to 679'. SD for night @ 4:00 PM.
Lithology: Lime mud, 1108-09'; ls, mic, poor to fair por, 1109-25'; ls & lime mud, abun forams, 1125-30'; ls, mic to calcar, abun forams, poor to fair por, 1130-80'; ls,mic, poor por, 1180-1200'.
Reverse Air Water Quality: Dis Cl @ 1118' = 920 mg/l, Dis Cl @ 1135' = 800 mg/l, Dis Cl @ 1150' = 820 mg/l, Dis Cl @ 1165' = 840 mg/l, Dis Cl @ 1186' = 800 mg/l, Dis Cl @ 1200' = 940 mg/l.
Sample Tops: Ocala Zone II @ 1130'.

2/11/99 Pres Ops @ 9:00 AM: WOO.
Ops Last 24 hrs: POH. RU & ran geophysical logs - GR, SP, Res (LN & SN), Fluid Res, Cal, Flowmeter, Sonic, Temp. SD for night @ 5:30 PM.

2/12/99 Pres Ops @ 9:00 AM: WOO.
Ops Last 24 hrs: WOO.

2/15/99 Pres Ops @ 9:00 AM: WOO.
Ops Last 72 hrs: WOO.

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DAILY DRILLING REPORT

LCU - Olga ASR
Observation Well # 1
NE SE Sec-23-T43S-R26E
Lee County, Florida

Well Water Systems Rig #2/#1

2/15/99 Pres Ops @ 9:00 AM: WOO.
Ops Last 72 hrs: WOO.

2/16/99 Pres Ops @ 9:00 AM: Prep to RD & MORT.
Ops Last 24 hrs: WOO.

2/17/99 Pres Ops @ 9:00 AM: Prep to RD & MORT.
Ops Last 24 hrs: Prep to RD & MORT.

2/18/99 Pres Ops @ 9:00 AM: RDRT.
Ops Last 24 hrs: RDRT.

2/19/99 Pres Ops @ 9:00 AM: RDRT.
Ops Last 24 hrs: RDRT.

2/22/99 Pres Ops @ 9:00 AM: RDRT.
Ops Last 72 hrs: RDRT. SD for weekend @ 3:00 PM 2/19/99.

2/23/99 Pres Ops @ 9:00 AM: Prep to MORT.
Ops Last 24 hrs: RDRT.

2/24/99 Pres Ops @ 9:00 AM: Prep to MORT.
Ops Last 24 hrs: RDRT.

2/25/99 Pres Ops @ 9:00 AM: MORT.
Ops Last 24 hrs: Prep to MORT.

2/26/99 Pres Ops @ 9:00 AM: SI. Ops suspended.
Ops Last 24 hrs: MORT.

4/15/99 Pres Ops @ 9:00 AM: RU to cmt.
Ops Last 47 days: SD from 2/26/99 to 4/13/99. On 4/14/99 MIRT (well Water Systems Rig #1). RURT. Killed well w/ 3000 lbs salt. SD for day @ 5:00 PM.

4/16/99 Pres Ops @ 9:00 AM: WOC.
Ops Last 24 hrs: Tagged TOC in annulus w/ 1" tremie @ 432'. Set tremie @ 420' & pumped 30 sks neat cmt. PU tremie to 231'. WOC. SD for day @ 4:45 PM.

4/17/99 Pres Ops @ 9:00 AM: SD for weekend.
Ops Last 24 hrs: Tagged TOC @ 310'. Set tremie @ 294'. Pumped 30 sks neat cmt. WOC for 12 hrs. Tagged TOC @ 206'. Set tremie @ 189'. Pumped 30 sks neat cmt. PU to 10'. SD for night @ 6:30 PM.

4/19/99 Pres Ops @ 9:00 AM: GIH w/ DP.
Ops Last 48 hrs: Tagged Toc @ 98'. Set tremie @ 84'. Pumped 23 sks neat cmt. SD for weekend @ 8:10 AM 4/17/99.

Distribution:

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DAILY DRILLING REPORT

LCU - Olga ASR
Observation Well # 1
NE SE Sec-23-T43S-R26E
Lee County, Florida

Well Water Systems Rig #1

4/19/99 Pres Ops @ 9:00 AM: GIH w/ DP.
Ops Last 48 hrs: Tagged TOC @ 98'. Set tremie @ 84'. Pumped 23 sks neat cmt. SD for weekend @ 8:10 AM 4/17/99.

4/20/99 Pres Ops @ 9:00 AM: Adding salt to kill well.
Ops Last 24 hrs: WIH open-ended w/ DP. At 1152' pumped 101 sks neat cmt. PU to 995', chased w/ 500 gals wtr. Added 1000 lbs salt to kill well. PU to 871'. SI well. SD for day @ 2:00 PM.

4/21/99 Pres Ops @ 9:00 AM: POH.
Ops Last 24 hrs: Tagged TOC @ 976'. PU to 964'. Pumped 27 sks neat cmt. PU to 933'. Chased w/ 400 gals wtr. PU to 808'. Flushed DP w/ 500 gals wtr. Added 200 lbs salt. WOC for 8 hrs. Tagged TOC @ 919'. Added 150 lbs salt. SD for day @ 5:30 PM.

4/22/99 Pres Ops @ 9:00 AM: POH w/ dev surveys.
Ops Last 24 hrs: At 902' spttd 40 cu ft sd. PU to 839'. Spttd 30 cu ft sd. Tagged TO sd @ 770'. Pumped 600 lbs salt. PU to 745'. Pumped 400 lbs salt POH. WBIH w/ 8" dia bit. BHA = bit + sub, total length = 1.75'. RU for reverse air. Set air line @ 210'. Reamed 8" dia hole to 853'. SD for day @ 5:00 PM.

4/23/99 Pres Ops @ 9:00 AM: GI annulus w/ 1" dia steel tremie.
Ops Last 24 hrs: POH w/ DP. Ran caliper & dev surveys. WIH w/ 4" dia Sched 40 PVC csg. Landed csg @ 850'. WIH w/ 2" dia steel tremie. Set tremie @ 819'. Pressure grouted w/ 40 sks neat cmt. Chased w/ 155 gals wtr. WOC 4 hrs. Released pressure & PU tremie to 462'. SD for night @ 6:45 PM.

4/24/99 Pres Ops @ 9:00 AM: PU tremie.
Ops Last 24 hrs: Held safety mtg. POH w/ 2" steel tremie. WI annulus w/ 1' steel tremie. Tagged TOC in annulus @ 787'. Set tremie @ 772'. Pumped 40 sks neat cmt. PU to 693'. Chased w/ 120 gals wtr.. PU to 630'. Chased w/ 150 gals wtr. PU to 600'. SD for day @ 2:00 PM.

4/26/99 Pres Ops @ 9:00 AM: WOC.
Ops Last 48 hrs: Tagged TOC @ 740'. Set tremie @ 708'. Pumped 40 sks neat cmt. SD for day @ 10:15 AM.

4/27/99 Pres Ops @ 9:00 AM: WOC.
Ops Last 24 hrs: Tagged TOC @ 674'. Set tremie @ 667'. Pumped 40 sks neat cmt. PU to 457'. Chased w/ 80 gals wtr. PU to 394'. Chased w/ 150 gals wtr. PU to 364'. WOC for 12 hrs. Tagged TOC @ 504'. Set tremie @ 496'. Pumped 40 sks neat cmt. PU to 286'. Chased w/ 50 gals wtr. PU to 223'. Chased w/ 140 gals wtr. PU to 193'. SD for night @ 7:00 PM.

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DAILY DRILLING REPORT

LCU - Olga ASR
Observation Well # 1
NE SE Sec-23-T43S-R26E
Lee County, Florida

Well Water Systems Rig #1

4/27/99 Pres Ops @ 9:00 AM: WOC.
Ops Last 24 hrs: Tagged TOC @ 674'. Set tremie @ 667'. Pumped 40 sks neat cmt. PU to 457'. Chased w/ 80 gals wtr. PU to 394'. Chased w/ 150 gals wtr. PU to 364'. WOC for 12 hrs. Tagged TOC @ 504'. Set tremie @ 496'. Pumped 40 sks neat cmt. PU to 286'. Chased w/ 50 gals wtr. PU to 223'. Chased w/ 140 gals wtr. PU to 193'. SD for night @ 7:00 PM.

4/28/99 Pres Ops @ 9:00 AM: WORT.
Ops Last 24 hrs: Tagged TOC @ 304'. Set 1" tremie @ 286'. Pumped 40 sks neat cmt. POO annulus w/ 1" steel tremie. WOC for 8 hrs. WBI annulus w/ 1" PVC tremie. Tagged TOC @ 50'. RD & MORT. Cleaned site. SD for day @ 4:30 PM.

4/29/99 Pres Ops @ 9:00 AM: WO drill rig to drill out sand backplug.
Ops Last 24 hrs: WBI annulus w/ 1" dia PVC tremie. Tagged TOC @ 50'. PU tremie to 40'. Pumped 11 sks neat cmt. Cleaned site. SD for day @ 11:00 AM.

4/30/99 Pres Ops @ 9:00 AM: WO drill rig to drill out sand backplug.
Ops Last 24 hrs: WO drill rig to drill out sand backplug.

5/3/99 Pres Ops @ 9:00 AM: SD. WO rig to drillout sand backplug.
Ops Last 72 hrs: SD. WO rig to drillout sand backplug.

5/4/99 Pres Ops @ 9:00 AM: SD. WO rig to drillout sand backplug.
Ops Last 24 hrs: SD. WO rig to drillout sand backplug.

5/5/99 Pres Ops @ 9:00 AM: SD. WO rig to drillout sand backplug.
Ops Last 24 hrs: SD. WO rig to drillout sand backplug.

5/6/99 Pres Ops @ 9:00 AM: SD. WO rig to drillout sand backplug.
Ops Last 24 hrs: SD. WO rig to drillout sand backplug.

5/7/99 Pres Ops @ 9:00 AM: SD. WO rig to drillout sand backplug.
Ops Last 24 hrs: SD. WO rig to drillout sand backplug.

5/10/99 Pres Ops @ 9:00 AM: SD. WO rig to drillout sand backplug.
Ops Last 72 hrs: SD. WO rig to drillout sand backplug.

5/11/99 Pres Ops @ 9:00 AM: SD. WO rig to drillout sand backplug.
Ops Last 24 hrs: SD. WO rig to drillout sand backplug.

5/12/99 Pres Ops @ 9:00 AM: SD. WO rig to drillout sand backplug.
Ops Last 24 hrs: SD. WO rig to drillout sand backplug.

5/13/99 Pres Ops @ 9:00 AM: SD. WO rig to drillout sand backplug.
Ops Last 24 hrs: SD. WO rig to drillout sand backplug.

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DAILY DRILLING REPORT

LCU - Olga ASR
Observation Well # 1
NE SE Sec-23-T43S-R26E
Lee County, Florida

West Coast Drilling Rig #1

5/13/99 Pres Ops @ 9:00 AM: SD. WO rig to drillout sand backplug.
Ops Last 24 hrs: SD. WO rig to drillout sand backplug.

5/14/99 Pres Ops @ 9:00 AM: SD. WO rig to drillout sand backplug.
Ops Last 24 hrs: SD. WO rig to drillout sand backplug.

5/17/99 Pres Ops @ 9:00 AM: SD. WO rig to drillout sand backplug.
Ops Last 72 hrs: SD. WO rig to drillout sand backplug.

5/18/99 Pres Ops @ 9:00 AM: SD. WO rig to drillout sand backplug.
Ops Last 24 hrs: SD. WO rig to drillout sand backplug.

5/19/99 Pres Ops @ 9:00 AM: SD. WO rig to drillout sand backplug.
Ops Last 24 hrs: SD. WO rig to drillout sand backplug.

5/20/99 Pres Ops @ 9:00 AM: SD. WO rig to drillout sand backplug.
Ops Last 24 hrs: SD. WO rig to drillout sand backplug.

5/21/99 Pres Ops @ 9:00 AM: SD. WO rig to drillout sand backplug.
Ops Last 24 hrs: SD. WO rig to drillout sand backplug.

5/24/99 Pres Ops @ 9:00 AM: SD. WO rig to drillout sand backplug.
Ops Last 72 hrs: SD. WO rig to drillout sand backplug.

5/25/99 Pres Ops @ 9:00 AM: SD. WO rig to drillout sand backplug.
Ops Last 24 hrs: SD. WO rig to drillout sand backplug.

5/26/99 Pres Ops @ 9:00 AM: SD. Prep to MIRT.
Ops Last 24 hrs: SD. WO rig to drillout sand backplug.

5/27/99 Pres Ops @ 9:00 AM: GIH @ 830'.
Ops Last 24 hrs: MIRT - West Coast Drlg Rig #1. RURT. WIH to 800'. BHA = 4" bit + sub, total length = 1.0'. WO parts. SD for day @ 1:30 PM.

5/28/99 Pres Ops @ 9:00 AM: SD for holiday.
Ops Last 24 hrs: Set up discharge line. Mixed mud. WIH & tagged TOC @ 847'. TO sd @ 852'. At 852' circ out mud & switched to drlg w/ wtr. Switched to reverse air @ @ 879'. Set air line @ 230'. Drld sd to 899'. Drld barite & salt to 959'. TOC not tagged. SI well. SD for night @ 9:20 PM.

6/1/99 Pres Ops @ 9:00 AM: WO tremie.
Ops Last 120 hrs: SD for holiday.

6/2/99 Pres Ops @ 9:00 AM: GIH w/ 1.25" steel tremie.
Ops Last 24 hrs: WO delivery of tremie pipe. Offloaded tremie. SD for day @ 3:00 PM.

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DAILY DRILLING REPORT

LCU - Olga ASR
Observation Well # 1
NE SE Sec-23-T43S-R26E
Lee County, Florida

West Coast Drilling Rig #1

6/2/99 Pres Ops @ 9:00 AM: GIH w/ 1.25" dia steel tremie.
Ops Last 24 hrs: WO delivery of tremie pipe. Offloaded tremie. SD for day @ 3:00 PM.

6/3/99 Pres Ops @ 9:00 AM: GIH w/ tremie.
Ops Last 24 hrs: WIH w/ 1.25" dia steel tremie. Taged TOC @ 965'. Set tremie @ 961'. Pumped 24 sks neat cmt. Chased w/ 30 gals salty wtr. PU tremie to 951'. Chased w/ 35 gals salty wtr. TOH w/ tremie. SI well. SD for day @ 3:00 PM.

6/4/99 Pres Ops @ 9:00 AM: WO contractor to air develop well.
Ops Last 24 hrs: WIH w/ 1.25" dia steel tremie. Tagged TOC @ 862'. POH. Set air line @ 80'. Air developed well with rig for 1 hour. Est F 30-40 gpm. SI well. MORT. SD for day @ 3:30 PM.

6/7/99 Pres Ops @ 9:00 AM: WO contractor to air develop well.
Ops Last 72 hrs: WO contractor to air develop well.

6/8/99 Pres Ops @ 9:00 AM: WO contractor to air develop well.
Ops Last 24 hrs: WO contractor to air develop well.

6/9/99 Pres Ops @ 9:00 AM: WO contractor to air develop well.
Ops Last 24 hrs: WO contractor to air develop well.

6/10/99 Pres Ops @ 9:00 AM: WO contractor to air develop well.
Ops Last 24 hrs: WO contractor to air develop well.

6/11/99 Pres Ops @ 9:00 AM: WO contractor to air develop well.
Ops Last 24 hrs: WO contractor to air develop well.

6/14/99 Pres Ops @ 9:00 AM: WO contractor to air develop well.
Ops Last 72 hrs: WO contractor to air develop well.

6/15/99 Pres Ops @ 9:00 AM: WO contractor to air develop well.
Ops Last 24 hrs: WO contractor to air develop well.

6/16/99 Pres Ops @ 9:00 AM: WO contractor to air develop well.
Ops Last 24 hrs: WO contractor to air develop well.

6/17/99 Pres Ops @ 9:00 AM: WO contractor to air develop well.
Ops Last 24 hrs: WO contractor to air develop well.

6/18/99 Pres Ops @ 9:00 AM: Air developing well w/ air compressor.
Ops Last 24 hrs: Est F = 15 gpm. Set air line @ 80'. Air developed w/ air compressor for 12 hrs. SD air compressor. Est F = 18 gpm. SI well. SD for night @ 7:30 PM.
Dev wtr quality @ 1 hr Dis Cl = 2260 mg/l, @ 4 hrs Dis Cl = 1860 mg/l, @ 8 hrs Dis Cl = 1590 mg/l, @ 12 hrs Dis Cl = 1660 mg/l.

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DAILY DRILLING REPORT

LCU - Olga ASR
Observation Well # 1
NE SE Sec-23-T43S-R26E
Lee County, Florida

West Coast Drilling Rig #1

6/18/99 Pres Ops @ 9:00 AM: Air developing well w/ air compressor.
Ops Last 24 hrs: Est F = 15 gpm. Set air line @ 80'. Air developed w/ air compressor for 12 hrs. SD air compressor. Est F = 18 gpm. SI well. SD for night @ 7:30 PM.
Dev wtr quality @ 1 hr Dis Cl = 2260 mg/l, @ 4 hrs Dis Cl = 1860 mg/l, @ 8 hrs Dis Cl = 1590 mg/l, @ 12 hrs Dis Cl = 1660 mg/l.

6/21/99 Pres Ops @ 9:00 AM: SI.
Ops Last 72 hrs: Air dev w/ air compressor for 7.5 hrs. SD air compressor. Est F = 20 gpm. SI well. Total dev time = 19.5 hrs.
Dev wtr quality @ 15.5 hr Dis Cl = 1540 mg/l, @ 19.5 hrs Dis Cl = 1420 mg/l.

8/18/99 Pres Ops @ 9:00 AM: GIH w/ 4" bit @ 130'.
Ops Last 57 days: SD. MI & RURT 8/17/99.

8/19/99 Pres Ops @ 9:00 AM: Prep to MORT.
Ops Last 24 hrs: WIH w/ 4" bit. Set air line @ 270'. Tagged bottom @ 861'. Drld by reverse air rotary to 895'. Drld cmt from 863-70', ls from 870-95'. POH. Measured F @ 87 gpm. RDRT. SD for day @ 3:00 PM.
Lithology: Ls, biomic to calcar, fair to gd por, 870-95'.

8/20/99 Pres Ops @ 9:00 AM: SI. WO air development.
Ops Last 24 hrs: MORT.

9/4/99 Pres Ops @ 9:00 AM: Air developing well.
Ops Last 24 hrs: RU air compressor. Set air line @ 100'. Air developed for 5 hrs. SI well. SD for night @ 5:00 PM.

9/7/99 Pres Ops @ 9:00 AM: WOO.
Ops Last 96 hrs: Air developed well for 10 hrs. SI well. SD for weekend & holiday @ 5:00 PM 9/4/99.

9/8/99 Pres Ops @ 9:00 AM: SI.
Ops Last 24 hrs: Air developed well for 5 hrs. SD air compressor. Measured F @ 90 gpm. SI well. SD for day @ 1:30 PM. Total development time = 20 hrs. Dis Cl after 17 hrs = 1200 mg/l.

N.B. This is the last report for this well.

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Contractor: Well Water Systems Rig #1
LCU - Olga ASR
Observation Well # 3
NE SE Sec-23-T43S-R26E
Lee County, Florida

Well Water Systems Rig #1

12/11/98 Pres Ops @ 9:00 AM: SD.
Ops last 24 hrs: MIRT. SD for night @ 3:30 PM.

12/14/98 Pres Ops @ 9:00 AM: RURT.
Ops Last 72 hrs: WO csg.

12/15/98 Pres Ops @ 9:00 AM: Prep to set surf csg.
Ops Last 24 hrs: MI equip. Received csg shipment. SD for night @ 11:00 AM.

12/16/98 Pres Ops @ 9:00 AM: Prep to MORT.
Ops Last 24 hrs: Drld 24" hole by mud rotary to 38'. BHA = bit + sub, total length = 5.0'. POH. WIH w. 18" steel csg. Landed @ 35'. Cmtd by tremie w/ 47 sks neat cmt. SD for night @ 12:10 PM.
Lithology: Sd, fine to med grn, 0-5'; sd, w/intrbd clay, phos, 5-11'; marl, w/ intrbd ls, poor por, 11-14'; clay, w/ interbd ls, poor por, common shell, 14-30'; clay, phos, 30-38'.
Sample Tops: Pamlico/Ft. Thompson @ surf; Cape Coral Clay @ 14'.

12/17/98 Pres Ops @ 9:00 AM: SD.
Ops Last 24 hrs: MORT - Well Water Systems Rig # 3.

2/26/99 Pres Ops @ 9:00 AM: Prep to MIRT.
Ops Last 70 days: SD.

3/1/99 Pres Ops @ 9:00 AM: RURT.
Ops Last 72 hrs: MI & RURT 2/26/99 - Well Water Systems Rig # 1.
SD for weekend @ 5:00 PM 2/26/99.

3/2/99 Pres Ops @ 9:00 AM: RURT.
Ops Last 24 hrs: RURT. SD for night @ 5:00 PM.

3/3/99 Pres Ops @ 9:00 AM: Drlg @ 140'.
Ops Last 24 hrs: WIH w/ staged 17" dia bit. BHA: 9.75" bit + 17" bit + sub + x-ver sub + DC, total length = 22.24'. Drld 17" dia hole by mud rotary to 112'. SD for night @ 3:00 PM.
Lithology: Clay, 38-45'; clay, w/ minor shell frags, 45-52'; clay, phos, w/ ls, biomic, poor to fair por, 52-58'; ls, biomic, phos, poor to fair por, 58-62'; ls & clay, 58-64'; ls, biomic, gd por, w/ shell frags, 64-82'; marl & ls, 82-86'; clay, stiff, cohesive, w/ minor ls, 86-108'; ls, biomic, abun shell, fair por, 108-112'.
Sample Tops: Lehigh Acres Ss @ 58'.

3/4/99 Pres Ops @ 9:00 AM: Drlg @ 175'.
Ops Last 24 hrs: Drld 17" dia hole to 161'. WOW. Decided to SD for day @ 11:30 AM due to localized heavy rain.
Lithology: Ls & clay, 112-17'; clay, sticky, intrbd ls, 117-144'; clay, cohesive, abun phos, minor shell frags, 144-61'.

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LCU - Olga ASR
Observation Well # 3
NE SE Sec-23-T43S-R26E
Lee County, Florida

Well Water Systems Rig #1

3/4/99 Pres Ops @ 9:00 AM: Drlg @ 175'.
Ops Last 24 hrs: Drld 17" dia hole to 161'. WOW. Decided to SD for day @ 11:30 AM due to localized heavy rain.
Lithology: Ls & clay, 112-17'; clay, sticky, intrbd ls, 117-144'; clay, cohesive, abun phos, minor shell frags, 144-61'.

3/5/99 Pres Ops @ 9:00 AM: Offloading csg.
Ops Last 24 hrs: Drld 17" dia hole to 300'. SD for night @ 5:00 PM.
Lithology: Clay, sticky, phos, w/ fine sand, 161-90'; clay, w/ occ marl, minor shell frags, 190-96'; clay, marl & ls, biomic, abun shell frags, 196-206'; marl, phos, w/intrbd ls, biomic, poor por, 206-239'; clay, phos, sticky, some ls, biomic, poor por, 239-48'; lime mud, soft, w/ some ls, biomic, fair por, 248-62'; marl, w/ abun ls, poor to fair por, minor clay, 262-300'.

3/8/99 Pres Ops @ 9:00 AM: GBIH.
Ops Last 72 hrs: Drld 17" dia hole to 352'. PU to 50'. SD for weekend @ 5:00 PM 3/5/99.
Lithology: Marl, soft, cohesive, phos, & ls, biomic, poor to fair por, 300-19'; marl, sticky, minor ls, 319-36'; marl,, soft, phos, & ls, biomic, poor por, common clay & shell frags, 336-41'; clay, stiff, & ls, biomic, poor por, 341-52'.

3/9/99 Pres Ops @ 9:00 AM: Drlg @ 488'.
Ops Last 24 hrs: WBIH to 352'. Dlrd 17" dia hole to 456'. PU to 425'. SD for night @ 5:30 PM.
Lithology: Clay,phos, sticky,, & ls, mic, phos, poor por, w/ minor dol, poor por, 352-56'; marl, soft, phos, & ls, biomic, phos, poor por, 356-84'; marl, clayey, & ls, mic, poor por, 384-94'; clay, marly, sticky, minor phos, & ls, mic, poor to fair por, 394-425'; marl, clayey, sticky, minor phos, & ls, biomic, fair por, 425-38'; marl, as above, w/ ls, biomic, fair to gd por, 438-56'.

3/10/99 Pres Ops @ 9:00 AM: Drlg @ 675'.
Ops Last 24 hrs: WBIH to 456'. Drld 17" dia hole to 645'. PU to 614'. SD for night @ 5:30 PM.
Lithology: Ls, biomic, fair to gd por, w/ some marl, 456-70'; ls, mic to biomic, fair por, tr phos, 470-506'; ls, mic, fair por, marly, 506-10'; ls, mic, fair por, 510-30'; ls, biomic, fair to gd por, 530-56'; ls, biomic, phos, poor to fair por, w/ common dol, v. hard & minor marl, 556-82'; ls, mic to biomic, phos, poor por,582-607'; ls, biomic, minor phos, tr clay, 607-13'; marl, clayey, 613-24'; ls, mic to biomic, poor por, marly, phos, 624-45'.

3/11/99 Pres Ops @ 9:00 AM: WO geophysical logger.
Ops Last 24 hrs: WBIH to 645'. Drld 17" hole to 747'. TOH. TBIH to TD. C&c hole. PU to 716'. SD for night @ 7:00 PM.
Lithology: Marl, soft, & ls, biomic,poor to fair por, 645-69'; ls, biomic, poor to fair por, 669-75'; ls, calcar, gd por, 675-83'; lime mud, soft, sticky, minor ld, 683-716'; ls, calcar, minor phos, fair por, & marl, clayey, 716-37',ls, calcar, gd por, 737-47'.

Distribution:

	FAX#:
E. Wong, LCU	479-8176
D. Giles, HMA	481-8795
A. Muniz, HS	(561) 997-8159

LCU - Olga ASR
Observation Well # 3
NE SE Sec-23-T43S-R26E
Lee County, Florida

Well Water Systems Rig #1

3/11/99 Pres Ops @ 9:00 AM: WO geophysical logger.
Ops Last 24 hrs: WBIH to 645'. Drld 17" hole to 747'. TOH. TBIH to TD. C&c hole. PU to 716'. SD for night @ 7:00 PM.
Lithology: Marl, soft, & ls, biomic, poor to fair por, 645-69'; ls, biomic, poor to fair por, 669-75'; ls, calcar, gd por, 675-83'; lime mud, soft, sticky, minor ld, 683-716'; ls, calcar, minor phos, fair por, & marl, clayey, 716-37', ls, calcar, gd por, 737-47'.

3/12/99 Pres Ops @ 9:00 AM: GI annulus to tag TOC.
Ops Last 24 hrs: WBIH to TD. C&c hole. POH. Spttd 1 sk Bariod. Ran geophysical logs - GR/SP/ Res, Caliper. Ran dev surveys. WIH w/ 12" dia steel csg (wt = .375"). Landed csg @ 742'. Pres grtd w/ 15.75 cu yds neat cmt. Chased w/ 460 gals mud. SD for night @ 8:30 PM.
Dev @ 720' = 0.75 deg, dev @ 630' = 0.75 deg, dev @ 540' = 0.50 deg, dev @ 450' = 0.75 deg, dev @ 360' = 0.75 deg, dev @ 270' = 0.50 deg, dev @ 180' = 0.50 deg, dev @ 90' = 0.50 deg.

3/15/99 Pres Ops @ 9:00 AM: POH w/ 2" dia tremie.
Ops Last 72 hrs: Tagged TOC in annulus @ 140'. Pumped 70 sks neat cmt. SD for weekend @ 1:00 PM 3/12/99.

3/16/99 Pres Ops @ 9:00 AM: Installing air line.
Ops Last 24 hrs: RU for reverse air drlg. SD for night @ 6:00 PM.

3/17/99 Pres Ops @ 9:00 AM: Drlg @ 812'.
Ops Last 24 hrs: WBIH w/ 8" dia bit. Tagged TOC inside csg @ 728'. Set air line @ 210'. BHA = bit + sub, total length = 1.75'. Drld 8" hole by reverse air to 781'. SD for night @ 6:00 PM.
Lithology: Ls, biomic, gd to xlnt por, 747-54'; ls, mic, hard, poor to fair por, 754-55'; ls, mic to biomic, gd moldic por, 755-72'; ls, mic, sndy, fair por, 772-73'; ls, biomic to calcar, fair moldic por, 773-79'; ls, mic, poor to fair por, 779-81'.
Reverse Air Water Quality: Dis Cl @ 781' = 270 mg/l.

3/18/99 Pres Ops @ 9:00 AM: RU to run core #1.
Ops Last 24 hrs: Drld 8" dia hole to 820'. POH. WIH w/ submer pump. Set pump @ 96' BLS. SI well for 50 min. SWL = 41.85' ALS. Performed pretest @ 500 gpm. SI well for 80 min. Conducted specific capacity test @ rates of 78, 210, 345, and 480 gpm. Est Transmissivity = 14,300 gpd/ft. SD for night @ 5:30 PM.
Lithology: Ls, mic to biomic, hard, poor to gd por, w/ intrbd lime mud, soft to very stiff, 781-94'; ls, biomic, sndy, abun molds & casts, poor to fair por, 794-806'; ls, biomic, fair to gd moldic por, & ls, sndy, hard, tr phos, poor por, 806-20'.
Reverse Air Water Quality: Dis Cl @ 795' = 270 mg/, Dis Cl @ 811' = 300 mg/l, Dis Cl @ 820' = 300 mg/l.
Pumping Test Water Quality: Dis Cl for Step 4 = 310 mg/l.

3/19/99 Pres Ops @ 9:00 AM: RU to run core #1.
Ops Last 24 hrs: Repaired mud pump. RU to run core #1. SD for day @ 3:00 PM.

Distribution:

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LCU - Olga ASR
Observation Well # 3
NE SE Sec-23-T43S-R26E
Lee County, Florida

Well Water Systems Rig #1

3/19/99 Pres Ops @ 9:00 AM: RU to run core #1.
Ops Last 24 hrs: Repaired mud pump. RU to run core #1. SD for day @ 3:00 PM.

3/22/99 Pres Ops @ 9:00 AM: Prep to drill ahead.
Ops Last 72 hrs: WO supplies. Cored 820-24.7'. Core barrel plugged. POH w/ core. Had 0% recovery. WBIH w/ 8" dia bit. BHA = bit + sub, total length = 1.7'. SD for weekend @ 4:30 PM 3/19/99.

3/23/99 Pres Ops @ 9:00 AM: WO geophy logger.
Ops Last 24 hrs: RU reverse air system. Drld 8" dia hole to 945'. POH. Est F 1000 gpm. SI well. SD for night @ 5:45 PM.
Lithology: Ls, sndy, calcr, suc, gd to xlnt intrgran por, intrbd w/ ls, chalky to mic, tr phos, poor to fair por, abun loose sand (820-33'), 820-45'; ls, calcar, suc, gd por, w/ intrbd ls, mic, poor por, and tr lime mud, 845-47'; ls, calcar to biomic, fair to gd moldic por, intrbd w/ ls, chalky, poor to fair por, 847-66'; ls, calcar to biomic, fair to gd por, 866-77'; ls, calcar to biomic, suc, common molds and casts, gd por, 877-928'; ls, biomic to mic, gd moldic por, 928-37'; ls, mic, hard, fair to gd moldic por, 937-45'.
Reverse Air Water Quality: Dis Cl @ 825' = 270 mg/l, Dis Cl @ 840' = 480 mg/l, Dis Cl @ 856' = 620 mg/l' Dis Cl @ 873' = 560 mg/l, Dis Cl @ 886' = 770 mg/l, Dis Cl @ 900' = 780 mg/l' Dis Cl @ 915' = 780 mg/l, Dis Cl @ 930' = 780 mg/l, Dis Cl @ 940' = 900 mg/l, Dis Cl @ 945' = 880 mg/l.

3/24/99 Pres Ops @ 9:00 AM: Repairing pump.
Ops Last 24 hrs: RU & ran geophysical logs - GR/SP/Res (L&SN), Cal/Sonic/Flowmeter/Fluid Res/Temp. Calculated F 1050 gpm. SI well. SD for night @ 5:00 PM.

3/25/99 Pres Ops @ 9:00 AM: Conducting packer test.
Ops Last 24 hrs: Changed out centrifugal pump, capacity of new pump = 2600 gpm. WIH w/ packer. Set packer @ 821-25'. Set submer pump @ 80'. Inflated packer, IP = 300 psi. SI well for 120 min. SWL in annulus = 39.43' ALS. SWL in test zone (825-945') = 39.21' ALS. Conducted pretest @ 370 gpm. Had 111.45' drawdown in test zone, 7.40' drawdown in annulus, no sand in discharge. Packer FP = 200 psi. SI well. SD for night @ 6:15 PM.

3/26/99 Pres Ops @ 9:00 AM: WOO.
Ops Last 24 hrs: Conducted specific capacity test @ rates of 80, 180, 260, 340 gpm. Had 7.68' drawdown in annulus. Packer IP = 250 psi, FP = 240 psi. Est Transmissivity of test zone (825-945') = 53,000 gpd/ft. Dis Cl = 780 mg/l. Unseated packer & MD to 853-57'. Set submer pump @ 110'. Inflated packer, IP = 250 psi. SI well for 120 min. SWL in annulus = 39.44' ALS. SWL in test zone = 38.99' ALS. Conducted pretest @ 350 gpm. Had 100.28' drawdown in test zone and 0.97' drawdown in annulus. Packer FP = 250 psi. SI well for 120 min. Conducted specific capacity test @ rates of 75, 170, 250, 350 gpm. Had 1.01' drawdown in annulus @ 350 gpm. Packer IP = 250 psi, FP = 242 psi. Est Transmissivity of test zone (Suwannee Zone II) = 36,000 gpd/ft. Dis Cl = 980 mg/l. SD for night @ 8:00 PM.

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LCU - Olga ASR
Observation Well # 3
NE SE Sec-23-T43S-R26E
Lee County, Florida

Well Water Systems Rig #1

3/26/99 Pres Ops @ 9:00 AM: WOO.
Ops Last 24 hrs: Conducted specific capacity test @ rates of 80, 180, 260, 340 gpm. Had 7.68' drawdown in annulus. Packer IP = 250 psi, FP = 240 psi. Est Transmissivity of test zone (825-945') = 53,000 gpd/ft. Dis Cl = 780 mg/l. Unseated packer & MD to 853-57'. Set submer pump @ 110'. Inflated packer, IP = 250 psi. SI well for 120 min. SWL in annulus = 39.44' ALS. SWL in test zone = 38.99' ALS. Conducted pretest @ 350 gpm. Had 100.28' drawdown in test zone and 0.97' drawdown in annulus. Packer FP = 250 psi. SI well for 120 min. Conducted specific capacity test @ rates of 75, 170, 250, 350 gpm. Had 1.01' drawdown in annulus @ 350 gpm. Packer IP = 250 psi, FP = 242 psi. Est Transmissivity of test zone (Suwannee Zone II) = 36,000 gpd/ft. Dis Cl = 980 mg/l. SD for night @ 8:00 PM.

3/29/99 Pres Ops @ 9:00 AM: WOO.
Ops Last 72 hrs: Conducted constant rate pumping test @ 300 gpm. Pumped well for 4 hrs. Packer set @ 853-57'. Test zone = Suwannee Zone II. Packer IP = 230 psi, FP = 223 psi. Had 6.39' drawdown in annulus. SD for weekend @ 5:45 PM 3/26/99.
Dis Cl = 810 mg/l.

3/30/99 Pres Ops @ 9:00 AM: WOO.
Ops Last 24 hrs: WOO. POH w/ packer. SI well. SD for day @ 5:00 PM.

3/31/99 Pres Ops @ 9:00 AM: WOO.
Ops Last 24 hrs: WOO.

4/1/99 Pres Ops @ 9:00 AM: WOO.
Ops Last 24 hrs: WOO.

4/2/99 Pres Ops @ 9:00 AM: No activity.
Ops Last 24 hrs: No activity.

4/5/99 Pres Ops @ 9:00 AM: Prep to set up to complete well.
Ops Last 72 hrs: Cleaned site. SD for weekend @ 11:30 AM 4/2/99.

4/6/99 Pres Ops @ 9:00 AM: SD - No drill crew today.
Ops Last 24 hrs: Prep to set up to complete well.

4/7/99 Pres Ops @ 9:00 AM: Attempting to kill well.
Ops Last 24 hrs: SD - No drill crew.

4/8/99 Pres Ops @ 9:00 AM: RU reverse air system.
Ops Last 24 hrs: Killed well w/ 6000 lbs salt. WIH open ended to 905'. Sptd 40 cu ft sand. Tagged TO sd @ 873'. PU to 810'. Sptd 25 cu ft sd. Tagged TO sd @ 816'. POH. WBIH w/ 12" dia bit. to 479'. BHA = bit + sub, total length = 2.1'. SD for night @ 6:45 PM.

4/9/99 Pres Ops @ 9:00 AM: Running deviation surveys.
Ops Last 24 hrs: WIH w/ 12" dia bit. Reamed 12" hole by reverse air to 867'. WO csg to arrive. SD for night @ 7:00 PM.

Distribution:

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D. Giles, HMA	481-8795
A. Muniz, HS	(561) 997-8159

LCU - Olga ASR
Observation Well # 3
NE SE Sec-23-T43S-R26E
Lee County, Florida

Well Water Systems Rig #1

4/9/99 Pres Ops @ 9:00 AM: Running deviation surveys.
Ops Last 24 hrs: WIH w/ 12" dia bit. Reamed 12" hole by reverse air to 867'. WO csg to arrive. SD for night @ 7:00 PM.

4/12/99 Pres Ops @ 9:00 AM: Prep to grout second stage.
Ops last 72 hrs: POH. Ran Caliper & dev surveys. WIH w/ 6" dia Sched 80 PVC csg. Lnded @ 864. WIH w/ 2" dia steel tremie. Set tremie @ 815'. Pressure grouted w/ 115 sks neat cmt. Chased w/ 50 gals wtr. Had press buildup in tremie. Stopped chase. Chained 6" csg. Released pressure. Pulled 42' tremie. Pumped 400 gals wtr. Had returns inside csg. POH w/ tremie. SI well. SD for weekend @ 7:45 PM 4/9/99.
Dev @ 850' = 0.5 deg, dev @ 760' = 0.5 deg.

4/13/99 Pres Ops @ 9:00 AM: Prep to grout stage 3.
Ops Last 24 hrs: Wih w/ 1" steel tremie. Tagged TOC in annulus @ 783'. Pumped 120 sks neat cmt. PU tremie to 432'. Cleaned site. SD for day @ 5:00 PM.

4/14/99 Pres Ops @ 9:00 AM: Cleaning site.
Ops Last 24 hrs: Repaired cmt mixer. Tagged TOC in annulus @ 552'. WBI annulus to 549'. Pumped 120 sks neat cmt. PU tremie to 174'. Cleaned site. SD for day @ 3:00 PM.

4/15/99 Pres Ops @ 9:00 AM: SD. WO rig to drillout sand backplug.
Ops Last 24 hrs: Tagged TOC @ 268'. WBI annulus to 252'. Pumped 106 sks neat cmt. POH w/ tremie. RDRT. MORT.

4/16/99 Pres Ops @ 9:00 AM: SD. WO rig to drillout sand backplug.
Ops Last 24 hrs: SD. WO rig to drillout sand backplug.

4/19/99 Pres Ops @ 9:00 AM: SD. WO rig to drillout sand backplug.
Ops Last 72 hrs: SD. WO rig to drillout sand backplug.

4/20/99 Pres Ops @ 9:00 AM: SD. WO rig to drillout sand backplug.
Ops Last 24 hrs: SD. WO rig to drillout sand backplug.

4/21/99 Pres Ops @ 9:00 AM: SD. WO rig to drillout sand backplug.
Ops Last 24 hrs: SD. WO rig to drillout sand backplug.

4/22/99 Pres Ops @ 9:00 AM: SD. WO rig to drillout sand backplug.
Ops Last 24 hrs: SD. WO rig to drillout sand backplug.

4/23/99 Pres Ops @ 9:00 AM: SD. WO rig to drillout sand backplug.
Ops Last 24 hrs: SD. WO rig to drillout sand backplug.

4/26/99 Pres Ops @ 9:00 AM: SD. WO rig to drillout sand backplug.
Ops Last 72 hrs: SD. WO rig to drillout sand backplug.

4/27/99 Pres Ops @ 9:00 AM: SD. WO rig to drillout sand backplug.
Ops Last 24 hrs: SD. WO rig to drillout sand backplug.

4/28/99 Pres Ops @ 9:00 AM: SD. WO rig to drillout sand backplug.
Ops Last 24 hrs: SD. WO rig to drillout sand backplug.

Distribution:

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D. Giles, HMA	481-8795
A. Muniz, HS	(561) 997-8159

LCU - Olga ASR
Observation Well # 3
NE SE Sec-23-T43S-R26E
Lee County, Florida

Well Water Systems Rig #1

4/28/99	Pres Ops @ 9:00 AM: SD. WO rig to drillout sand backplug. Ops Last 24 hrs: SD. WO rig to drillout sand backplug.
4/29/99	Pres Ops @ 9:00 AM: SD. WO rig to drillout sand backplug. Ops Last 24 hrs: SD. WO rig to drillout sand backplug.
4/30/99	Pres Ops @ 9:00 AM: SD. WO rig to drillout sand backplug. Ops Last 24 hrs: SD. WO rig to drillout sand backplug.
5/3/99	Pres Ops @ 9:00 AM: SD. WO rig to drillout sand backplug. Ops Last 72 hrs: SD. WO rig to drillout sand backplug.
5/4/99	Pres Ops @ 9:00 AM: SD. WO rig to drillout sand backplug. Ops Last 24 hrs: SD. WO rig to drillout sand backplug.
5/5/99	Pres Ops @ 9:00 AM: SD. WO rig to drillout sand backplug. Ops Last 24 hrs: SD. WO rig to drillout sand backplug.
5/6/99	Pres Ops @ 9:00 AM: SD. WO rig to drillout sand backplug. Ops Last 24 hrs: SD. WO rig to drillout sand backplug.
5/7/99	Pres Ops @ 9:00 AM: SD. WO rig to drillout sand backplug. Ops Last 24 hrs: SD. WO rig to drillout sand backplug.
5/10/99	Pres Ops @ 9:00 AM: SD. WO rig to drillout sand backplug. Ops Last 72 hrs: SD. WO rig to drillout sand backplug.
5/11/99	Pres Ops @ 9:00 AM: SD. WO rig to drillout sand backplug. Ops Last 24 hrs: SD. WO rig to drillout sand backplug.
5/12/99	Pres Ops @ 9:00 AM: SD. WO rig to drillout sand backplug. Ops Last 24 hrs: SD. WO rig to drillout sand backplug.
5/13/99	Pres Ops @ 9:00 AM: SD. WO rig to drillout sand backplug. Ops Last 24 hrs: SD. WO rig to drillout sand backplug.

Distribution:

	FAX#:
E. Wong, LCU	479-8176
D. Giles, HMA	481-8795
A. Muniz, HS	(561) 997-8159

APPENDIX D

CASING MILL SLIPS

검 사 증 명 서 (A)

MILL INSPECTION CERTIFICATE

현 대 강 관 주 식 회 사
HYUNDAI PIPE CO., LTD.
* 본사 · 공장: 울산광역시 동구 염포동 265번지
ULSAN PLANT: #265, YUMPO-DONG, DONG-KU, ULSAN METROPOLITAN, KOREA
TEL: (052)287-2101~9 FAX: (052)267-8516
TLX: HDPIPE K 53776
* 서울사무소 서울특별시 중구 무교동 77번지
SEOUL OFFICE: #77, MUKYO-DONG, JUNG KU, SEOUL, KOREA
TEL: 773-0522 FAX: 775-7095
TLX: HDPIPE K 24656, K 22956

증명서 번호 CERTIFICATE NO: E-8-04-305 페이지 PAGE: 1
발행일자 DATE OF ISSUE: APR. 28. 1998. E4908400
계약번호 CONTRACT P/O NO:
품명 COMMODITY: E.R.W. STEEL PIPE
품규격 SPECIFICATION: API 5L X42/API 5LB/ASTM A53B
수요가 CUSTOMER: BARTOW STEEL, INC.

MILL TEST REPORT
FOR SUBMITTAL INFORMATION ONLY
PENDING APPROVAL FOR PURCHASE

G : GOOD

치수 DIMENSION 외경 × 두께 × 길이 (OUTDIA × THICK × LENGTH) *2 *3 *4	수량 QUANTITY PCS	중량 WEIGHT KG	수압시험 HYDRO-STATIC TEST Mpa kg/cm² PSI	6	7	8	9	10	11	12	13	두막시험 COATING TEST 아연부착량 WEIGHT OF ZINC COAT g/m² OZ/FT²	굽힘시험 BEND TEST	제강번호 HEAT NO	인장시험 TENSILE TEST 항복강도 YIELD STRENGTH	인장강도 TENSILE STRENGTH B *14	W *15	연신율 % ELONGATION	화학성분 (%) CHEMICAL COMPOSITION C	Si	Mn	P	S	Cu	Ni	Cr	Mo	V	충격시험 IMPACT 흡수에너지 ABSORBED ENERGY J	%	비고 REMARK
															Psi	N/mm²				× 100			× 1000			× 100			
B OD 12-3/4" x .375" x21.000'	424	200.340	148	G	G	G	G	G						A20804	29.7	47.2	50.2	40	17	1	78	15	9	6	1	2	Tr	1		
(323.9㎜ x 9.53㎜ x 6.401M)			2110												42200	67100	71400												
														Y27630	36.0	52.6	55.4	36	18	2	79	18	8	6	1	2	1	Tr	
															51200	74800	78800												
														Y28911	32.9	50.3	53.2	32	18	1	75	16	7	6	1	2	1	Tr	
B OD 12-3/4" x .375" x42.000'	205	250.425	148	G	G	G	G	G							46800	71500	75700												
(323.9㎜ x 9.53㎜ x 12.802M)			2110											Y27743	36.2	52.8	55.4	31	17	2	76	15	9	6	1	2	1	Tr	
B OD 12-3/4" x .500" x42.000'	58	72.349	197	G	G	G	G	G							51500	75100	78800												
(323.9㎜ x12.70㎜ x 12.802M)			2800											Y27627	31.6	49.4	52.2	39	18	1	74	12	8	6	1	2	1	Tr	
B OD 16" x .250" x42.000'	81	64.944	79	G	G	G	G	G							44900	70300	74200												
(406.4㎜ x 6.35㎜ x 12.802M)			1120											A31120	30.4	46.9	49.5	38	15	1	69	17	8	6	1	2	1	Tr	
															43200	66700	70400												
														A31614	33.1	50.2	53.2	39	14	1	68	19	10	5	2	1	Tr	1	
															47100	71400	75700												
														A34573	29.9	45.1	48.2	41	14	1	68	17	8	6	2	1	Tr	1	
TOTAL ->	828	588.058													42500	64100	68000												

BARTOW STEEL, INC.
MILL TEST REPORT
FOR SUBMITTAL INFORMATION ONLY
PENDING APPROVAL FOR PURCHASE

NOTES *1 Type of pipe End 관종

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

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

SURVEYOR

본 제품은 귀하의 계약에 합격되었음을 보증합니다.
WE HEREBY CERTIFY THAT THE MATERIAL DESCRIBED HERE IN HAS BEEN ACCEPTED IN ACCORDANCE WITH THE PRESCRIBED SPECIFICATION AND ORDER.

INSPECTION MANAGER

B 301 - 019 - QLT

BARNES IND PLAS PIPE, TAMPA
7930 U.S.301 N.
TAMPA, FL 33637

Phone #: (813) 985-3995

N/A

Invoice #: 191979 Pg. 1

Customer ID: 123806

****
* INVOICE *
****

Bill to:

WELL WATER SYSTEMS
17174 JEAN ST.
FORT MYERS, FL 33912

Ship to:

WELL WATER SYSTEMS
SEE DIRECTIONS
FORT MYERS, FL 33912

Date	Ship Via	F.O.B.	Terms
01/14/99	BARNES TRUCK	Destination	Net 30
Order	**P.O. Number**	**Salesperson**	**FROM SALESORDER**
01/11/99	BOBBY	MIKE HALE	192772

Req	Shp	B.O.	Item No.	Description	Price	Amount
				CUSTOMER NEEDS WEDNESDAY 1/13/99		
800	800		PIPE-40-080	8" PIPE SCH40 BE		
				TAKE I-75 TO EXIT 25 GO EAST 7.2 MILES TURN LEFT ON WERNER RD GO TO WATER PLANT		
				Invoice subtotal		
				Sales tax @ 6.000%		
				Invoice total		

ORDER TAKEN BY MIKE H. PULLED BY:_____DEL BY:_____

BARNES IND LAS PIPE, TAMPA
7930 U.S.30 N.
TAMPA, FL 637

Phone #: (3) 985-3995

N/A

Invoice #: 195162 Pg. 1

Customer ID: 123806

****
* *
* I N V O I C E *
* *
****

Bill to:

WELL WATER YSTEMS
17174 JEAN T.
FORT MYERS FL 33912

Ship to:

WELL WATER SYSTEMS
SEE MAP

-Date	Ship Via	F.O.B.	Terms
04/21/99	BARNES TRUCK	Destination	Net 30
-Order	**P.O. Number**	**Salesperson**	**FROM SALESORDER#**
04/16/99	499008E 13	MIKE HALE	195726

Req	Shp	B.O.	Item No.	Description	Price	Amount
				PLEASE DELIVER BEFORE NOON ON TUESDAY 4/20 **********		
900	900		IPE-40-040	4" PIPE SCH40 BE (WELL CASING)		
1	1		54-040	4" VAN-STONE FLANGE SCH80		
1	1		R-GASKT-040	4" F.F. RED RUBBER GASKT		
2	2		E-1224	GALLON MEDIUM CLEAR CEMENT GALLON #1200		
2	2		E-7324	GALLONS CLEAR CLEANER 7300		

Invoice subtotal
Sales tax @ 6.000%
Sales tax @ 1.000%

Invoice total

ORDER AKEN BY JEFF PULLED BY:_____DEL BY:_____

검 사 증 명 서 (A)

MILL INSPECTION CERTIFICATE

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

* 본사 · 공장: 울산광역시 동구 염포동 265번지 (052) 230-0400
ULSAN PLANT: 265, YUMPO-DONG, DONG-KU, ULSAN METROPOLITAN, KOREA
TEL: (052) 287-2101~9 FAX: (052) 287-8516
TLX: HDPIPE K 53776

* 서울사무소 서울특별시 중구 무교동 77번지 (100-070)
SEOUL OFFICE: #77, MUKYO-DONG, JUNG-KU, SEOUL, KOREA
TEL: 773-0522 FAX: 775-7095
TLX: HDPIPE K 24656, K 22956

CERTIFICATE NO: E-8-04-305 페이지 PAGE 1
DATE OF ISSUE: APR. 28. 1998. E4508400
CONTRACT P/O NO
수요가 CUSTOMER: BARTOW STEEL, INC.
품명 COMMODITY: E.R.W. STEEL PIPE
품규격 SPECIFICATION: API 5L X42/API 5LB/ASTM A53B

MILL TEST REPORT
FOR SUBMITTAL INFORMATION ONLY
PENDING APPROVAL FOR PURCHASE

치수 DIMENSION 외경 × 두께 × 길이 (OUTDIA × THICK × LENGTH) *2 *3 *4	수량 QUANTITY (PCS)	중량 WEIGHT (KG)	수압시험 HYDRO-STATIC TEST Mpa kg/㎠ PSI *4 5	6 7 8 9 10 11 12 13 G GOOD	도막시험 COATING TEST 아연무게 WEIGHT OF ZINC COAT g/㎡ oz/ft²	굽힘성 BEND TEST *7 *9	제조번호 HEAT NO	인장시험 TENSILE TEST 항복강도 YIELD STRENGTH PSI kg/㎟ N/㎟ *16	인장강도 TENSILE STRENGTH B *14 W *15 PSI kg/㎟ N/㎟	연신율 EL %	화학성분 CHEMICAL COMPOSITION C × 100	Si	Mn	P	S	Cu	Ni	Cr	Mo	V × 1000	Nb × 100	충격시험 IMPACT 흡수에너지 ABSORBED ENERGY J(kgf-m)	전단면적 SHEAR AREA %	비고 REMARK
B OD 12-3/4" x .375" x21.000'	424	200,340	148	G G G G G			A20804	29.7	47.2	50.2	40	17	1	78	15	9	6	1	2	Tr	1			
(323.9㎜ x 9.53㎜ x 6.401M)			2110					42200	67100	71400														
							Y27630	36.0	52.6	55.4	36	18	2	79	18	8	6	1	2	1	Tr			
								51200	74800	78800														
							Y28911	32.9	50.3	53.2	32	18	1	75	16	7	6	1	2	1	Tr			
B OD 12-3/4" x .375" x42.000'	265	250,425	148	G G G G G				46800	71500	75700														
(323.9㎜ x 9.53㎜ x 12.802M)			2110				Y27743	36.2	52.8	55.4	31	17	2	76	15	9	6	1	2	1	Tr			
B OD 12-3/4" x .500" x42.000'	58	72,349	197	G G G G G				51500	75100	78800														
(323.9㎜ x12.70㎜ x 12.802M)			2800				Y27627	31.6	49.4	52.2	39	18	1	74	12	8	6	1	2	1	Tr			
B OD 16" x .250" x42.000'	81	64,944	79	G G G G G				44900	70300	74200														
(406.4㎜ x 6.35㎜ x 12.802M)			1120				A31120	30.4	46.9	49.5	38	15	1	69	17	8	6	1	2	1	Tr			
								43200	66700	70400														
							A31614	33.1	50.2	53.2	39	14	1	68	19	10	5	2	1	Tr	1			
								47100	71400	75700														
							A34573	29.9	45.1	48.2	41	14	1	68	17	8	6	2	1	Tr	1			
TOTAL ->	828	588,058						42500	64100	68000														

BARTOW STEEL, INC.
MILL TEST REPORT
FOR SUBMITTAL INFORMATION ONLY
PENDING APPROVAL FOR PURCHASE

NOTES *1 Type of pipe End 끝종

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

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

SURVEYOR

본 제조품 귀하의 주문에 합격하였음을 보증합니다.
WE HEREBY CERTIFY THAT THE MATERIAL DESCRIBED HEREIN HAS BEEN ACCEPTED IN ACCORDANCE WITH THE PRESCRIBED SPECIFICATION AND ORDER.

S. H. Kim
INSPECTION MANAGER

B 301 - 019 - QLT

BARNES IND PLAS PIPE, TAMPA
7930 U.S.301 N.
TAMPA, FL 33637

Phone #: (813) 985-3995

N/A

Invoice #: 192034 Pg. 1

Customer ID: 123806

INVOICE

Bill to:

WELL WATER SYSTEMS
17174 JEAN ST.
FORT MYERS, FL 33912

Ship to:

WELL WATER SYSTEMS
17174 JEAN ST.
FORT MYERS, FL 33912

Date	Ship Via	F.O.B.	Terms
01/18/99	BARNES TRUCK	Destination	Net 30

Order	P.O. Number	Salesperson	FROM SALESORDER#
01/12/99	BOBBY	MIKE HALE	192807

Req	Ship	B.O.	Item No.	Description
60	960		PIPE-80-060	6 SCH 80 PIPE BE

Invoice subtotal
Sales tax @ 6.000%

Invoice total

ORDER TAKEN BY BOB S. PULLED BY:_____DEL BY:_____

APPENDIX E

LITHOLOGIC LOGS

1. Observation Well #1 (LM-6209)
2. Observation Well #3 (LM-6615)

GEOLOGIST'S LOG OF LCU - OLGA ASR OBSERVATION WELL #1
LM- 6209
NESE 23-43-26
******NOTE: ALL DEPTHS MEASURED FROM DRILL FLOOR (4.5 FT. ABOVE LAND SURFACE)***

Depth (feet)	Lithology
4.5 - 5	Sand, yellowish grey (5Y 7/1),fine to medium grained, well to subrounded, with abundant Clay, and common Silt, traces of shell fragments.
5 - 10	Sand, as above, increasing in Clay and Silt, occasional shell fragments.
10 - 12	Limestone, yellowish grey (5Y 8/1), medium to hard, micrite to biomicrite, fair to poor porosity.
12 - 15	Clay, light olive grey (5Y 6/1), to grey(N6), soft, cohesive, shelly, abundant hash, very fine phosphate grains.
15 - 25	Clay, grey (N6), soft, cohesive, traces of shell fragments.
25 - 30	Clay, as above, traces of greenish grey (5GY 6/1), phosphate grains decreasing.
30 - 45	Clay, greenish grey (5GY 6/1), soft, cohesive, phosphatic.
45 - 50	Clay, as above, increasing light olive grey (5Y 6/1), gummy texture.
50 - 62	Clay, light olive grey (5Y 6/1), trace to common shell fragments, interbedded hard layers at 60 and 62 feet.
62 - 65	Sandstone, light grey (N7), to light olive grey (5Y 6/1), loosely indurated, common to abundant shell fragments, phosphatic, poor to fair porosity.
65 - 70	Limestone, yellowish grey (5Y 8/1), moderately hard to hard, micritic to biomicritic, abundant shell fragments, molds and casts, good porosity and apparent permeability.
70 - 80	Limestone, yellowish grey (5Y 8/1) to light olive grey (5Y 6/1), calcarenitic, moderately soft to moderately hard, molds and casts, abundant shell fragments, mollusks, worm burrows, bivalves, fair to good moldic porosity and apparent permeability.
80 - 95	Limestone, as above increasing light grey (N7) to very light grey (N8), biomicritic to micritic.
95 - 112	Clay, bluish white (5B 9/1), soft, cohesive, trace shell fragments.
112 - 115	Clay, as above, interbedded with Limestone, as below.
115 - 120	Limestone, light grey (N7), micritic to biomicritic, abundant shell fragments, moderately hard, phosphatic, good porosity and apparent permeability.
120 - 130	Limestone, as above, except increasing moderately soft to soft layers, good to fair porosity and apparent permeability.

GEOLOGIST'S LOG OF LCU - OLGA ASR OBSERVATION WELL #1
LM- 6209
NESE 23-43-26
******NOTE: ALL DEPTHS MEASURED FROM DRILL FLOOR (4.5 FT. ABOVE LAND SURFACE)***

Depth (feet)	Lithology
130 - 135	Limestone, light grey (N7) to yellowish grey (5Y 8/1), moderately soft to moderately hard, micritic to biomicritic, shell fragments, phosphatic, sandy layers, poor to fair porosity.
135 - 140	Clay, light olive grey, soft, cohesive, abundant shell fragments, slightly phosphatic.
140 - 145	Clay, as above, with increasing chalk, white (N9), layers, phosphatic, Sandy, subangular to well rounded.
145 - 165	Clay, medium grey to dark grey, soft, phosphatic, common shell fragments, sandy, subangular to well rounded, increasing shell fragments and phosphate with depth.
165 - 195	Clay, dark greenish grey (5GY 4/1) to dark grey (5G 4/1), soft, gummy texture, very phosphatic.
195 -207	Clay, as above, decreasing phosphate grains, and decreasing shell fragments.
207 - 220	Clay, light olive grey (5Y 6/1), interbedded with Limestone, micritic, moderately hard, phosphate layers, poor to fair porosity and apparent permeability.
220 - 225	Limestone, light grey (N7), micritic, moderately hard to hard, phosphatic, interbedded with Clay layers, as above, common shell fragments, increasing hardness with depth, poor to fair porosity.
225 - 242	Marl, yellowish grey(5Y 8/1) to olive grey (5Y 4/1), soft, cohesive, phosphatic, interbedded with Limestone, as above.
242 - 244	Limestone.greyish yellow (5Y 8/4), micritic, moderately soft, trace shell fragments, phosphatic, fair apparent porosity and permeability, with some Lime Mud, as below.
244 - 250 soft	Lime Mud, dark grey (N3) to dark greenish grey (5G 4/1), moderately to soft, cohesive, minor shell fragments, with Limestone, as above.
250 - 260	Lime Mud, greenish grey (5G 6/1), moderately soft to soft, cohesive, minor to occasional shells, minor to occasional phosphate.
260 - 265	Limestone, white (N9) moderately hard, phosphatic, chalky, poor to fair porosity and appparent permeability.
265 - 275	Limestone,as above, poor to fair porosity, interbedded with Marl.
275 - 280	Clay, light olive grey (5Y 6/1), with Limestone, white (N9), decreasing with depth, chalky, phosphatic, poor porosity.
280 - 290	Clay, light grey (N7), soft, cohesive, traces of shell fragments, phosphatic.

GEOLOGIST'S LOG OF LCU - OLGA ASR OBSERVATION WELL #1
LM- 6209
NESE 23-43-26
******NOTE: ALL DEPTHS MEASURED FROM DRILL FLOOR (4.5 FT. ABOVE LAND SURFACE)***

Depth (feet)	Lithology
290 - 300	Clay, as above, interbedded with Marl, trace shell fragments.
300 - 325	Clay, light olive grey (5Y 6/1) to medium dark grey (N4), soft, marly, phosphatic, common shell fragments, traces of Limestone layers, poor porosity.
325 - 340	Clay, light grey (N7), soft, cohesive, phosphatic, rare to minor shell fragments.
340 - 350	Clay, light grey (N7), marly, interbedded with Limestone, light olive grey (5Y 6/1), biomicritic, moderately hard, phosphatic, and minor to common shell fragments.
350 - 360	Clay, light grey (N7), soft, gummy texture, trace to minor shell fragments, minor interbeds of Limestone.
360 - 370	Limestone, light olive grey (5Y 6/1) to medium grey (N5), hard, micritic, fine to coarse phosphate grains, minor to common shell fragments, fossiliferrous, fair to good porosity and apparent permeability.
370 - 375	Limestone, as above, marly, poor to fair porosity and apparent permeability.
375 - 390	Limestone, white (N9), to very light grey (N8), moderately soft to moderately hard, biomicritic, common shell fragments, phosphatic, fair to good porosity and apparent permeability.
390 - 400	Limestone, white (N9), moderately soft to moderately hard, micritic to biomicritic, abundant shall fragments, good porosity and apparent permeability with Lime Mud, light olive grey (5Y 5/2), soft, gummy texture.
400 - 425	Lime Mud, light olive grey (5Y 5/2), soft, gummy texture, trace shell fragments.
425 - 440	Lime Mud, light olive grey (5Y 5/2), soft, cohesive, trace Limestone,very pale orange (10YR 8/2), poor porosity and apparent permeability.
440 - 445	Limestone, very pale orange (10YR 8/2), sparce biomicrite, with Clay, light olive grey (5Y 5/2), occasional shell fragments, trace phosphate, poor to fair porosity.
445 - 460	Lime Mud, light olive grey (5Y 5/2), with Limestone, yellowish grey (5Y8/1), micritic to biomicritic, shell fragments, trace amounts of phosphate.
460 - 475	Clay, light olive grey (5Y 5/2) , with Limestone, yellowish grey (5Y8/1), biomicritic, poorly indurated, occasional shell fragments, phosphatic, poor porosity.

GEOLOGIST'S LOG OF LCU - OLGA ASR OBSERVATION WELL #1
LM- 6209
NESE 23-43-26
******NOTE: ALL DEPTHS MEASURED FROM DRILL FLOOR (4.5 FT. ABOVE LAND SURFACE)***

Depth (feet)	Lithology
475 - 515	Limestone, yellowish grey (5Y8/1), micritic, with Clay, light grey (N7), moderately indurated, trace shell fragments, good porosity and apparent permeability.
515 - 520	Clay, light grey (N7), marly, soft, interbedded with Limestone, as above.
520 - 530	Limestone, light grey (N7) to medium grey(N5), micritic to biomicrite, moderately soft to hard, finely phosphatic, common shell fragments, good porosity and apparent permeability.
530 - 535	Limestone, light grey (N7) to medium grey (N6), micritic to biomicritic, moderately hard to hard, finely phosphatic, common shell fragments, good porosity and apparent permeability.
535 - 545	Limestone, light olive grey (5Y 6/1), micritic to biomicrite, moderately hard, common phosphate grains, molds and casts, good to excellent porosity and apparent permeability.
545 - 555	Limestone. white (N9) to light olive grey(5Y 6/1), moderately soft to moderately hard, micritic, phosphatic, molds and casts, common sharks teeth, shells and shell fragments, good to excellent porosity and apparent permeability.
555 - 580	Limestone, white (N9) to light grey (N7),moderately soft to moderately hard, micritic, phosphatic, worm burrows, molds and casts, shells and shell fragments, good to excellent porosity and apparent permeability, with rare Sand, very fine grained, quartz, angular to subangular, low sphericity.
580 - 585	Limestone, medium grey (N5),soft to moderately soft, minor shells and shell fragments, fair to good porosity and apparent permeability, rare Sand, very fine grained, quartz, angular to subangular, low sphericity.
585 - 590	Limestone, white (N9) to very light grey (N8), moderately hard to hard, calcite common shells and shell fragments, molds and casts, good to excellent porosity and permeability.
590 - 595	Limestone, white (N9), moderately soft to moderately hard, micritic and biomicritic, molds and casts, shells and shell fragments, phosphatic, good porosity and apparent permeability.
595 - 605	Limestone, white (N9) to very light grey (N8), moderately hard, micritic to biomicritic, phosphatic, casts, shells and shell fragments, good moldic porosity and good apparent permeability.
610 - 617	Lime Mud, dark grey (N3) to medium grey (N4), soft, cohesive, minor phosphate, interbedded with Limestone, as above, from 615 - 617, poor porosity and apparent permeability.
617 - 620	Limestone, light grey (N7) to light medium grey (N6), very hard, sparitic, crystalline texture, fair to poor porosity and apparent permeability.

GEOLOGIST'S LOG OF LCU - OLGA ASR OBSERVATION WELL #1
LM- 6209
NESE 23-43-26
******NOTE: ALL DEPTHS MEASURED FROM DRILL FLOOR (4.5 FT. ABOVE LAND SURFACE)***

Depth (feet)	Lithology
620 - 630	Limestone, yellowish grey (5Y 8/1) to very pale orange (10YR 8/2), moderately soft to moderately hard, biomicrite to biosparite, phosphatic,fair to good apparent moldic porosity and fair to good apparent permeability.
630 - 650	Limestone, light yellowish grey (5Y 8/1), calcarenitic to micritic, moderately soft to modertely hard, good moldic porosity and good permeability.
650 - 655	Limestone, yellowish grey (5Y 8/1), moderately hard to hard, biomicritic to biosparitic, molds and casts, shell fragments, fossiliferous, good to excellent porosity and apparent permeability.
655 - 665	Limestone, yellowish grey (5Y 8/1), moderately hard to hard, micritic, calcarenitic, with minor yellowish brown very hard Limestone layers, fair to good porosity, minor sand, angular to subangular, very fine grained.
665 - 675	Limestone, as above increasing biomicritic layer, increasing shell fragments, good porosity and apparent permeability.
675 - 685	Limestone, yellowish grey (5Y 8/1), moderately hard, calcarenitic, sucrosic texture, sandy, very fine to fine grained, well sorted, well rounded, good porosity.
685 - 695	Limestone, as above, very sandy as, above.
695 - 697	Lime Mud, white (N9) to very light grey (N8), soft, cohesive, massive, poor porosity.
695 - 708	Lime Mud, white (N9) to very light grey (N8), soft, cohesive, cakey texture, traces of sand, as above.
708 - 710	Limestone, yellowish grey, calcarenitic, micritic, molds and casts, fair to good porosity.
710 - 715	Interbedded Limestone and Clay, as above.
715 - 720	Limestone, yellowish grey, moderately hard to hard, micritic to biomicritic, shell fragments, molds and casts, fair to good porosity and apparent permeability.
730 - 731	Clay, white (N9), soft, cohesive.
731 - 735	Limestone, yellowish grey (5Y 8/1), moderately soft, calcarenitic, fair porosity and apparent permeability.
735 - 740	Limestone, as above, interbedded with Clay, greenish grey (5G 6/1), moderately soft to firm.

GEOLOGIST'S LOG OF LCU - OLGA ASR OBSERVATION WELL #1
LM- 6209
NESE 23-43-26
******NOTE: ALL DEPTHS MEASURED FROM DRILL FLOOR (4.5 FT. ABOVE LAND SURFACE)***

Depth (feet)	Lithology
740 - 750	Limestone, very light grey (N8), micritic to biomicritic, very fossiliferous, common molds and casts, interbedded crystalline pelloids, good moldic porosity and apparent permeability.
750 -755	Limestone, as above, decreasing shell fragments, fair to good porosity.
755 - 765	Limestone, yellowish grey (5Y 8/1), moderately hard to hard, micritic to biomicritic, shell fragments, fossiliferrous, fair to good porosity.
765 - 775	Limestone, very light grey (N8), hard to very hard, biosparitic, very fossiliferrous, good to excellent moldic porosity.
775 - 780	Limestone, very light grey (N8), micritic, chalky, poor to fair porosity.
775 - 810	Limestone, yellowish grey (5Y 8/1) to very light grey (N8), sandy, very hard, limey texture, sand is fine grained, consolidated in a lime matrix, poor to good porosity.
810 - 820	Limestone, very light grey (N8) to medium light grey (N6), calcarenitic, sucrosic texture, common sandstone layers, as above, poor to good porosity.
820 - 830	Mudstone, very light grey (N8) to light greenish grey (5G 8/1), chalky, micritic layers, poor to fair porosity.
830 - 840	Limestone, medium light grey (N6), chalky, poor to fair porosity, interbedded w/ Lime Mud, white (N9) to very light grey (N8), soft.
840 - 855	Limestone, light olive grey (5Y 6/1), biomicritic to biosparitic, moderately hard to hard, fossiliferrous, good to very good porosity.
855 - 865	Limestone, yellowish grey (5Y 8/1), moderately soft to moderately hard, calcarenitic, molds and casts, fossils, micritic to biomicritic layers, good moldic porosity.
865 - 870	Limestone, as above, decreasing fossil content, increase in biosparitic layers, fair to good porosity.
870 - 900	Limestone, very light grey (N8) to yellowish grey (5Y 8/1), biomicritic, moderately soft to moderately hard, trace to minor shell fragments, fair moldic porosity and fair apparent permeability.
900 - 915	Limestone, light grey (N7) to light olive grey (5Y 6/1), moderately hard to hard, calcarenitic to biomicritic, shell fragments, molds and casts, fair to good porosity.
915 - 920	Limestone, medium grey (N5), hard, biosparitic to biomicritic, crystalline texture, good porosity.
920 - 940	Limestone, as above, decreasing porosity with depth, minor Mudstone layers, traces of Clay, greenish grey (5GY 6/1).

GEOLOGIST'S LOG OF LCU - OLGA ASR OBSERVATION WELL #1
LM- 6209
NESE 23-43-26
******NOTE: ALL DEPTHS MEASURED FROM DRILL FLOOR (4.5 FT. ABOVE LAND SURFACE)***

Depth (feet)	Lithology
940 - 942	Mudstone, yellowish grey (5Y 8/1), hard, micritic.
942 - 944	Clay, greenish grey (5GY 6/1), soft, cohesive.
944 - 945	Clay, greenish grey (5GY 6/1), soft, cohesive, interbedded with Limestone, calcarenitic, poor to fair porosity.
945 - 950	Limestone, yellowish grey (5Y 8/1), moderately soft to hard, abundant fossil and shell fragments, marly, fair porosity.
950 - 960	Limestone, very light grey (N8) to light grey (N7), moderately soft to moderately hard, calcarenitic, decreasing shell fragments, fair to good porosity.
960 - 970	Limestone, yellowish grey (5Y 8/1) to very light grey (N8), moderately soft, micritic, traces of biomicrite, minor shell fragment, fair to good porosity.
970 - 972	Lime Mud, medium grey (N6), moderately hard to hard, splinty texture, poor porosity.
972 - 995	Limestone, yellowish grey (5Y 8/1), moderately soft to moderately hard, sucrosic texture, micritic, fair to good apparent porosity.
995 - 1000	Limestone, yellowish grey (5Y 8/1), moderately hard, abundant forams (*Camerina*), good porosity.
1000 - 1020	Limestone, light yellowish grey (5Y 8/1), moderately soft, micritic, earthy texture, trace forams (*Camerina*), poor to fair porosity.
1020 - 1040	Limestone, as above, except increasing shell fragments, poor to fair porosity.
1040 - 1070	Shell hash, sponge spicules, forams (*Lepidocyclina, Camerina*), shell fragments, interbedded layers of Limestone with depth, good porosity.
1070 - 1075	Limestone, yellowish grey (5Y 8/1)soft to moderately soft, micritic, decreasing shell fragments, fair to good porosity.
1075 - 1085	Limestone, yellowish grey (5Y 8/1), moderately soft, earthy texture, micritic, increasing shell layers, fair to good porosity.
1085 - 1100	Shell hash, sponge spicules, shell fragments, forams (*Lepidocyclina)*, bryozoans.
1100 - 1106	Limestone, yellowish grey (5Y 8/1), micritic to biomicritic, earthy texture, poor to fair porosity.

GEOLOGIST'S LOG OF LCU - OLGA ASR OBSERVATION WELL #1
LM- 6209
NESE 23-43-26
******NOTE: ALL DEPTHS MEASURED FROM DRILL FLOOR (4.5 FT. ABOVE LAND SURFACE)***

Depth (feet)	Lithology
1106 - 1109	Lime Mud, off-white, soft, cakey, traces of forams, poor porosity and apparent permeability.
1109 - 1115	Limestone, yellowish grey (5Y 8/1), soft to moderately soft, micritic to calcarenitic, abundant fossils in a moderately soft micritic matrix, sponge spicules, bryozoans, forams (*Lepidocyclina)*, poor to fair porosity.
1115 - 1125	Limestone, as above, increasing micritic layers, decreasing fossil content.
1125 - 1130	Limestone, as above, interbedded with layers of Lime Mud, light olive grey (5Y 6/1), abundant forams.
1130 - 1150	Limestone, yellowish grey (5Y 8/1), soft to moderately soft, calcarenitic, (micritic matrix - loosely consolidated) abundant forams (*Lepidocyclina)*.
1150 - 1170	Limestone, yellowish grey (5Y 8/1) to very light grey (N8), soft to moderately soft, calcarenitic, micritic, abundant fossils, poor to fair porosity.
1170 - 1180	Limestone, as above, increasing micritic layers, poor to fair porosity.
1180 - 1200	Limestone, yellowish grey (5Y 8/1) traces of light grey (N7), calcarenitic to micritic, soft to moderately soft, decreasing fossil content, poor porosity.

GEOLOGIST'S LOG OF LCU - OLGA ASR OBSERVATION WELL # 3
LM- 6615
NESE 23-43-26

Depth (feet)	Lithology
0 - 11	Sand, olive grey (5Y 4/1), very fine to medium grained, sub-rounded to well-rounded, silty, some organic material.
11 - 14	Clay, olive grey (5Y 4/1), soft, sticky, phosphatic, minor shell.
14 - 35	Clay, olive grey (5Y 4/1), soft, sticky, phosphatic.
35 - 40	Clay, greenish grey (5GY 6/1), soft, sticky, cohesive.
40 - 44	Clay, light olive grey (5Y 6/1), cohesive, sticky.
44 - 52	Clay, greyish olive (10Y 4/2), sticky cohesive, minor shell fragments.
52 - 56	Clay, as above, with shelly interbeds, molds and casts, minor phosphate (pebble size).
56 - 58	Clay, greyish olive (10Y 4/2), sticky, cohesive, with Limestone, light olive grey (5Y 6/1) to yellowish grey (5Y 8/1), biomicritic, moderately hard, phosphatic, abundant shell fragments, poor to fair porosity.
58 - 62	Limestone, yellowish grey (5Y 8/1) to medium grey (N5), sparse biomicrite to micrite, hard, phosphatic, common to abundant shell, poor porosity, with minor interbeds of Clay, greyish olive (10Y 4/2), sticky, cohesive.
62 - 64	Limestone, yellowish grey (5Y 8/1), with occasional clay, greyish olive (10Y 4/2), sticky, cohesive, and rare Lime Mud, white (N9), cohesive, gummy, phosphatic.
64 - 66	Limestone, light olive grey (5Y 6/1), to pale yellowish brown (10 YR 6/2), biomicritic to micritic, moderate to moderately hard, good moldic porosity and good apparent permeability.
66 - 70	Limestone, greyish orange, (10YR 7/4), biomicritic, sucrosic texture, soft to moderately hard, good to excellent porosity and good apparent permeability. with minor Clay, dark greenish grey (5GY 4/1), sticky, cohesive.
70 - 74	Limestone, greyish orange, (10YR 7/4), biomicritic, sucrosic texture, moderately soft to hard, abundant molds and casts, good moldic porosity and apparent permeability.
74 - 82	Limestone, yellowish grey (5Y 7/2) to light olive grey (5Y 5/2), biomicritic, moderately hard, abundant shell fragments, molds and casts, good moldic porosity and fair permeability.
82 - 86	Marl, light olive grey (5Y 6/1), sticky, cohesive. Interbedded with Limestone, yellowish grey (5Y 7/2) to light olive grey (5Y 5/2), biomicritic, hard, molds and casts, poor to fair porosity and apparent permeability.
86 - 108	Marl, medium light grey (N6) to light grey (N7), sticky, soft to firm, cohesive to stiff. Interbedded with occasional Limestone , greenish grey (5GY 6/1), biomicritic to micritic, hard, minor shell fragments, minor phosphate, poor porosity and apparent permeability.
108 - 112	Limestone, yellowish grey (5Y 8/1), biomicritic, hard, abundant shell, fair porosity, and poor to fair apparent permeability with Sand, fine to very fine grained, quartz, subangular to sub-rounded, low to moderate sphericity, from 110 - 112 feet.

GEOLOGIST'S LOG OF LCU - OLGA ASR OBSERVATION WELL # 3
LM- 6615
NESE 23-43-26

Depth (feet)	Lithology
112 - 117	Limestone, occasional shell fragments, poor porosity and apparent permeability. with Clay, medium light grey (N6) to light grey(N7), sticky, soft to firm, cohesive to stiff with Sand, fine to very fine grained, quartz, subangular to sub-rounded, low to moderate sphericity.
117 - 147	Clay, greenish grey (5GY 6/1), sticky, soft, phosphatic. Interbedded with Limestone, pale greenish grey (10Y 8/2), micritic, moderately hard, some shell fragments, poor porosity and apparent permeability with Sand, fine to very fine grained, quartz subangular to subrounded, low to moderate sphericity.
147 - 161	Clay, medium dark grey (N4), to greenish grey (5Y 6/1), with minor Limestone , pale greenish grey (10Y 8/2), micritic to biomicritic, hard, minor shell fragments, poor porosity, and apparent permeability with quartz Sand, fine to very fine subangular to sub-rounded, low to moderate sphericity, from 147 - 150 feet.
161 - 188	Clay, dark greenish grey (5GY 4/1), sticky, cohesive, soft to moderately stiff, phosphatic, with minor to occasional Sand, very fine to fine grained, quartz, subangular to sub-rounded, rare shell fragments.
188 - 196	Clay, dark greenish grey (5GY 4/1), sticky, cohesive, soft to moderately stiff, finely phosphatic, minor shell fragments, with occasional Marl, pale olive (10Y 6/2), soft gummy texture, phosphatic at 190 - 196 feet.
196 - 206	Clay, as above, with occasional Marl, pale olive (10Y 6/2), phosphatic and occasional Limestone, light greenish grey (5GY 8/1), sparse biomicrite, moderately soft to moderately hard, phosphatic, abundant shell fragments.
206 - 223	Marl, Pale olive(10Y 6/2), phosphatic, with occasional Limestone , light greenish grey (5GY 8/1), micritic to biomicritic, moderately soft to moderately hard, phosphatic, poor porosity and apparent permeability. Interbedded with Clay, dark greenish grey (5GY 4/1), moderately soft, sticky, cohesive, common shell fragments.
223 - 239	Marl, as above, with Limestone , light greenish grey to light olive grey (5Y 5/2), biomicritic, moderate hardness, poor porosity and apparent permeability. Interbedded with minor clay dark greenish grey(5GY 4/1), moderately soft, sticky, cohesive.
239 - 245	Clay, dark greenish grey (5GY 4/1), soft to medium stiff, sticky, phosphatic, inter bedded with Limestone , dusky yellow (5Y 6/4) to yellowish grey (5Y 7/2), micritic to biomicritic, moderately hard, poor porosity and apparent permeability. with minor Lime Mud, white (N9), moderately soft, cohesive, phosphatic.
245 - 262	Lime Mud, light olive grey (5Y 5/2) to white (N9), moderately soft to soft, cohesive, minor to common shell fragments. Interbedded with clay, as above.
262 - 303	Marl, very light grey (N8), soft, cohesive, phosphatic, with abundant Limestone, very light grey (N8), sparse biomicrite, moderately soft to moderately hard, common shell fragments, poor to fair porosity and poor apparent permeability.
303 - 336	Marl, light olive grey (5Y 6/1), very soft to soft, finely phosphatic, common shell fragments.
336 - 344	Marl, light olive grey (5Y 6/1), soft, finely phosphatic, interbedded with common to minor Clay, greenish grey (5GY 6/1), soft.

GEOLOGIST'S LOG OF LCU - OLGA ASR OBSERVATION WELL # 3
LM- 6615
NESE 23-43-26

Depth (feet)	Lithology
344 - 352	Clay, greenish grey (5GY 6/1) to dark greenish grey (5G 4/1), phosphatic, moderately soft, sticky, with interbeds of Limestone, yellowish grey (5Y 8/1), micrite to fossiliferous micrite, moderately hard, common shell fragments,phosphatic, poor porosity and apparent permeability and Marl (5Y 8/1), moderately soft, phosphatic.
352 - 365	Clay, greenish grey (5GY 6/1) to dark greenish grey (5G 4/1), slightly marly, sticky, phosphatic, minor shell fragments, with Dolomite, dusky yellow (5Y 6/4) to olive grey (5Y 4/1), very hard, phosphatic, poor porosity and apparent permeability.
365 - 384	Limestone, yellowish grey (5Y 7/2), fossiliferous micrite, hard, phosphatic, common shell fragments, poor porosity and permeability, with occasional Clay, greenish grey (5GY 6/1), soft, phosphatic.
384 - 394	Marl, light olive grey (5Y 6/1), clayey, with common to abundant Limestone interbeds, very light grey (N8), micritic, moderately soft to moderately hard, occasional shell fragments, poor interparticle porosity.
394 - 425	Lime Mud, light olive grey (5Y 6/1), sticky, minor phosphate, with common Limestone, yellowish grey (5Y 8/1), micritic, moderately soft, poor to fair porosity and poor apparent permeability. Limestone decreases with depth.
425 - 456	Marl, light olive grey (5Y 6/1), clayey, sticky, minor phosphate, with interbeds of Limestone , biomicritic, moderately soft, fair moldic porosity and poor apparent permeability, and Clay, dark greenish grey (5GY 4/1), gummy texture, abundant shell fragments from 438 to 456 feet.
456 - 470	Limestone, white (N9) to yellowish grey (5Y 8/1), biomicritic, moderately soft to moderately hard, abundant shell fragments, fair and poor apparent permeability. Interbedded with Marl, medium light greenish grey (5GY 7/1), soft, rare to minor phosphate.
470 - 506	Limestone, white (N9) to yellowish grey (5Y 8/1), as above.
506 - 530	Limestone, white (N9) to yellowish grey (5Y 8/1), micritic to biomicritic, moderately hard, fair porosity and poor to fair apparent permeability.
530 - 556	Limestone, light grey (N7), moderately hard, biomicritic, fair to good porosity and good apparent permeability.
556 - 582	Limestone, very light grey (N8) to light olive grey (5Y 6/1), sandy, micritic, moderately hard, phosphatic, poor to fair interparticle porosity, interbedded with Marl, light olive grey, gummy texture, common shell fragments.
582 - 607	Limestone, light olive grey (5Y 6/1), sandy, micritic, moderately soft to moderately hard, finely phosphatic, minor shell fragments, poor porosity and apparent permeability.
607 - 613	Limestone, very light grey (N8), sandy, micritic to biomicritic, moderately soft to moderately hard, minor phosphate, abundant shell fragments, molds and casts, interbedded with common to abundant Marl, soft, phosphatic.
613 - 624	Limestone, very light grey (N8), to yellowish grey, sandy, hard, micritic, phosphatic fair porosity and apparent permeability.

GEOLOGIST'S LOG OF LCU - OLGA ASR OBSERVATION WELL # 3
LM- 6615
NESE 23-43-26

Depth (feet)	Lithology
624 - 649	Limestone, very light grey (N8), micritic to biomicritic, sandy, moderately soft to moderately hard, poor porosity, common shells and fossils, molds and casts.
649 - 667	Limestone, pale greenish yellow (10Y 8/2) to yellow orange (10YR 7/6), sandy, biomicritic, moderately hard, poor to fair porosity.
667 - 683	Limestone, light olive grey (5Y 5/2), sandy, calcarenitic, sucrosic texture, good porosity and apparent permeability.
683 - 716	Lime Mud, white (N9) to light olive grey (5Y 6/1), soft, sticky, interbedded with Limestone, as above, fair to good porosity and apparent permeability.
716 - 737	Marl/Clay, yellowish brown (10YR 5/2), soft, sticky, interbedded with Limestone, Pale olive (10Y 6/2) to dusky yellow (5Y 6/4), sandy, moderately soft, calcarenitic, sucrosic, minor phosphate, and shell, poor interparticle porosity and apparent permeability.
737 - 747	Limestone, dusky yellow (5Y 6/4), calcarenitic to micritic, sucrosic, moderately soft to moderately hard, poor to good porosity and poor apparent permeability.
747 - 754	Limestone, yellowish grey (5Y 8/1), micritic to biomicritic, moderately hard, fossiliferous, molds and casts, good porosity and apparent permeability.
754 - 755	Limestone, medium light grey (N6), micritic, hard, poor to fair porosity and poor permeability.
755 - 772	Limestone, yellowish grey (5Y 8/1), micritic to biomicritic, moderately soft to moderately hard, common fossils, molds and casts, good moldic porosity and permeability.
772 - 773	Limestone, yellowish grey (5Y 8/1), sandy, micritic, sucrosic texture, very soft, minor fossils, fair moldic porosity and apparent permeability with Sand, fine to medium grained, quartz, subangular to subrounded, moderate sphericity.
773 - 779	Limestone, medium light grey (N6), biomicritic to calcarenitic, moderately soft to moderately hard, sucrosic texture, minor fossils, fair moldic porosity.
779 - 781	Limestone, medium light grey, moderately hard, micritic, poor to fair porosity and apparent permeability.
781 - 794	Limestone, yellowish grey (5Y 8/1) to medium grey (N5), micritic to biomicritic, sandy, hard, molds and casts, poor to good porosity and permeability, interbedded with Lime Mud, very light grey (N8) to dark grey (N3), soft to very stiff.
794 - 806	Sandstone, yellowish grey (5Y 7/2), with carbonate cement, moderate hardness, fossiliferous, abundant molds and casts, fair porosity and poor to fair permeability.
806 - 820	Sandstone, yellowish grey (5Y 8/1) to medium light grey (N6), with a carbonate cement, moderately hard, occasional to abundant fossils, molds and casts, fair to good porosity and permeability, interbedded with Limestone , yellowish grey to light olive grey (5Y 6/1), sandy, micritic, moderately hard to hard, trace phosphate, poor porosity and apparent permeability.

GEOLOGIST'S LOG OF LCU - OLGA ASR OBSERVATION WELL # 3
LM- 6615
NESE 23-43-26

Depth (feet)	Lithology
820 - 845	Sandstone, light grey (N7), with a carbonate cement, soft to moderately hard, calcarenitic, sucrosic Texture, occasional to common molds and casts, excellent porosity and apparent permeability. Interbedded with layers of Limestone , white (N9), micritic, chalky, moderately soft to moderately hard, trace phosphate, poor to fair porosity and poor permeability, with Sand, very fine grained, sub-rounded, moderate sphericity, well sorted.
845 - 847	Limestone, yellowish grey (5Y 8/1), biosparitic, moderately soft to moderately hard, good to excellent porosity and good apparent permeability, interbedded with Limestone , medium light grey (N6), hard, micritic, chalky, poor porosity and apparent permeability, with rare Lime Mud, yellowish grey soft.
847 - 866	Limestone, very light grey (N8), biosparitic, fair to good moldic porosity, and apparent permeability, interbedded with Limestone, white (N9) to light yellowish grey (5Y 8/1), chalky, fair to poor porosity and apparent permeability.
866 - 877	Limestone, yellowish grey (5Y 8/1), calcarenitic to biomicritic, soft to moderately hard, minor to occasional shell fragments, poor to fair porosity and apparent permeability.
877 - 906	Limestone, yellowish grey (5Y 8/1), calcarenitic, to biomicritic, sucrosic texture, soft to moderately hard, minor to occasional shell fragments, common molds and casts (gastropods and bivalves), good interparticle porosity.
906 - 912	Limestone, as above with decreasing shells and fossils.
912 - 928	Limestone, light olive grey (5Y 6/1), calcarenitic, to biomicritic, sucrosic texture, soft to moderately hard, occasional shell fragments, common molds, good moldic porosity and apparent permeability.
928 - 937	Limestone, very light grey (N8), biomicritic to micritic, hard, abundant fossils (molds and casts), and shell fragments, good moldic porosity and apparent permeability.
937 - 945	Limestone, white (N9), micritic to sparse biomicrite, common molds and casts, fair to good moldic porosity, fair to poor apparent permeability.

GEOLOGIST'S LOG OF LCU - OLGA ASR OBSERVATION WELL #1
LM- 6209
NESE 23-43-26
******NOTE: ALL DEPTHS MEASURED FROM DRILL FLOOR (4.5 FT. ABOVE LAND SURFACE)***

Depth (feet)	Lithology
4.5 - 5	Sand, yellowish grey (5Y 7/1),fine to medium grained, well to subrounded, with abundant Clay, and common Silt, traces of shell fragments.
5 - 10	Sand, as above, increasing in Clay and Silt, occasional shell fragments.
10 - 12	Limestone, yellowish grey (5Y 8/1), medium to hard, micrite to biomicrite, fair to poor porosity.
12 - 15	Clay, light olive grey (5Y 6/1), to grey(N6), soft, cohesive, shelly, abundant hash, very fine phosphate grains.
15 - 25	Clay, grey (N6), soft, cohesive, traces of shell fragments.
25 - 30	Clay, as above, traces of greenish grey (5GY 6/1), phosphate grains decreasing.
30 - 45	Clay, greenish grey (5GY 6/1), soft, cohesive, phosphatic.
45 - 50	Clay, as above, increasing light olive grey (5Y 6/1), gummy texture.
50 - 62	Clay, light olive grey (5Y 6/1), trace to common shell fragments, interbedded hard layers at 60 and 62 feet.
62 - 65	Sandstone, light grey (N7), to light olive grey (5Y 6/1), loosely indurated, common to abundant shell fragments, phosphatic, poor to fair porosity.
65 - 70	Limestone, yellowish grey (5Y 8/1), moderately hard to hard, micritic to biomicritic, abundant shell fragments, molds and casts, good porosity and apparent permeability.
70 - 80	Limestone, yellowish grey (5Y 8/1) to light olive grey (5Y 6/1), calcarenitic, moderately soft to moderately hard, molds and casts, abundant shell fragments, mollusks, worm burrows, bivalves, fair to good moldic porosity and apparent permeability.
80 - 95	Limestone, as above increasing light grey (N7) to very light grey (N8), biomicritic to micritic.
95 - 112	Clay, bluish white (5B 9/1), soft, cohesive, trace shell fragments.
112 - 115	Clay, as above, interbedded with Limestone, as below.
115 - 120	Limestone, light grey (N7), micritic to biomicritic, abundant shell fragments, moderately hard, phosphatic, good porosity and apparent permeability.
120 - 130	Limestone, as above, except increasing moderately soft to soft layers, good to fair porosity and apparent permeability.

APPENDIX F

STRIP LOG FOR OBSERVATION WELL #1 (LM-6209)

PLATE I

WELL NAME: OLGA WTP OBSERVATION WELL #1(LM-6209)
LOCATION: NE SE SEC. 23 - T43S - R26E, LEE COUNTY, FLORIDA

DEPTH (FEET)	DRILL TIME (MIN./FT.) 0 5 10 15 20 25	LITHOLOGY	LITHOLOGIC DESCRIPTIONS	REVERSE AIR WATER QUALITY (Dissolved Chlorides-mg/l)	PACKER TEST INFORMATION	CORE INFORMATION
0	PAMLICO/FT. THOMPSON		SAND, PALE YELLOWISH GREY (5Y 7/2), FINE TO MED. GRAINED, WELL TO SUB-ROUNDED, SHELLY, CLAYEY W/ LIMESTONE (5Y 7/2) AT BASE			
	CAPE CORAL CLAY		CLAY, LIGHT OLIVE GREY (5Y 6/1) TO GREY (N6), SOFT, COHESIVE, SHELL FRAGMENTS AND TRACE PHOPHATE			
			CLAY, GREENISH GREY (5Y 6/1), SOFT, COHESIVE, PHOSPHATIC			
50			CLAY, LIGHT OLIVE GREY (5Y 6/1) TO GREY (N6), SOFT, COHESIVE, SHELL FRAGMENTS AND TRACE PHOPHATE			
	LEHIGH ACRES MEMBER (PEACE RIVER FM.)		SANDSTONE, LT GREY(N7) TO LT OLIVE GREY(5Y 6/0), FRIABLE, ABUNDANT SHELL FRAGMENT, PHOSPHATIC, MARLY			
			LIMESTONE, YELLOWISH GREY(5Y 7/2) TO LT OLIVE GREY(5Y 6/1), BIOMICRITIC, COMMON SHELL FRAGMENTS, GOOD POROSITY AND PERMEABILITY			
			LIMESTONE, YELLOWISH GREY(5Y 7/2) TO VERY LT GREY(N8), CALCARINITIC, MED. TO HARD, SHELLY, BIOMICRITIC, GOOD POROSITY AND PERMEABILITY			
100			CLAY, BLUISH WHITE(5B 9/1), SOFT, COHESIVE, SHELL FRAGMENTS			
			INTERBEDDED CLAY AND LIMESTONE, SHELL FRAGMENTS			
			LIMESTONE, LT GREY(N7), MICRITIC TO BIOMICRITIC, ABUNDANT SHELL FRAGMENTS, MODERATELY HARD, PHOSPHATIC, GOOD POROSITY & APPARENT PERMEABILITY			
			SAND, LT GREY(N8), VERY FINE, WELL SORTED AND ROUNDED			
	FT. MYERS CLAY		CLAY, LT OLIVE GREY(5Y 6/1), SOFT, COHESIVE, PHOSPHATIC, SANDY, SAND IS LT GREY, FINE GRAINED, WELL ROUNDED AND SORTED			
150	GAMMA RAY					
			CLAY, GREENISH GREY(56Y 6/1), GUMMY TEXTURE, PHOSPHATIC			
200			LIMESTONE, LT GREY(N7), PHOSPHATIC, COMMON SHELL FRAGMENTS			
	MID-HAWTHORN ZONE I ARCADIA FM.		LIMEMUD, LT OLIVE GREY(5Y 6/1), MED. SOFT TO SOFT, COHESIVE, SHELL FRAGMENTS, LIMESTONE LAYERS AS ABOVE			
250			LIMEMUD, GREENISH GREY, MED. SOFT, SOFT, SHELL FRAGMENTS, PHOSPHATIC			
			LIMESTONE, WHITE(N9), MED HARD, PHOSPHATIC, CHALKY, POOR TO FAIR POR.			
			CLAY, LT GREY(N7), SOFT, COHESIVE, TRACE SHELL FRAGMENTS			
300			LIMESTONE LAYER, MED. HARD, MICRITIC, POOR POROSITY			
			CLAY, LT GREY(N6), MARLY, PHOSPHATIC, SHELL FRAGMENTS			
			LIMESTONE, LT GREY(N7), MED. SOFT TO MED. HARD, PHOSPHATIC, BIOMICRITIC, SHELL FRAGMENTS			
350	MID-HAWTHORN ZONE II		LIMESTONE, LT OLIVE GREY(5Y 6/1) TO MED. GREY(N5), HARD, MICRITIC, MINOR BIOMICRITIC, FINE TO COARSE PHOSPHATIC GRAINS, COMMON SHELL FRAGMENTS, FAIR TO GOOD POROSITY			
			CLAY, LT OLIVE GREY, SOFT, GUMMY TEXTURE, TRACES OF SHELL FRAGMENTS			
400						
			INTERBEDDED LIMESTONE (MICRITIC TO BIOMICRITIC) AND CLAY, AS ABOVE, FAIR TO POOR POROSITY, SHELL FRAGMENTS, PHOSPHATIC			
450						
			LIMESTONE, YELLOWISH GREY, MICRITIC, VERY PHOSPHATIC, MARLY, POOR TO FAIR POROSITY			
500						
	12" STEEL @ 530' (DF)		LIMEMUD, LT GREY(N7), MARLY, SOFT, SOME INTERBEDDED LIMESTONE			
	LOWER HAWTHORN ZONE I		LIMESTONE, LT GREY(N7) TO MED. GREY(N6), MICRITIC TO BIOMICRITIC, HARD TO MED. HARD, FINELY PHOSPHATIC, COMMON SHELL AND SHELL FRAGMENTS, GOOD POROSITY AND APPARENT PERMEABILITY			
550						
600	CONFINING BEDS		CLAY, DK GREY(N3) MED. GREY(N4) SOFT, COHESIVE, MINOR PHOSPH. GRAINS			
	LOWER HAWTHORN ZONE II		LIMESTONE, LT GREY(N7) TO YELLOWISH GREY(5Y 9/1), MED. SOFT TO MED. HARD, MICRITIC TO BIOMICRITIC, MOLDIC, FAIR TO GOOD POROSITY, INCREASING CALCARENITIC LAYERS WITH DEPTH, SAND, VERY FINE TO FINE GRAINED, WELL SORTED, WELL ROUNDED, UNCONSOLIDATED			
650	8" PVC @ 679' (DF) DRILL TIME					
			MARL, WHITE(N9) VERY LT GREY(N8), SOFT, COHESIVE			
700	CONFINING BEDS		INTERBEDDED LIMESTONE AND MARL, AS ABOVE			
	SUWANNEE ZONE I		LIMESTONE, VERY LT GREY(N8), MICRITIC TO BIOMICRITIC, FAIR TO GOOD POROSITY, TRACE LIMEMUD 728-730'			
750			LIMESTONE, LT GREY(N7) TO YELLOWISH GREY(5Y 9/1), MED. SOFT TO MED. HARD, MICRITIC TO BIOMICRITIC, SHELL FRAGMENTS, MOLDS AND CASTS, GOOD POROSITY AND APPARENT PERMEABILITY			
			MARL, WHITE, SOFT, COHESIVE			
800			LIMESTONE, YELLOWISH GREY(5Y 6/1) TO VERY LT GREY(N8), VERY HARD, SAND IS FINE GRAINED, WELL SORTED			
	CONFINING BEDS		LIMESTONE, YELLOWISH GREY, CALCILUTITE, POOR POROSITY			
			LIMESTONE AND LIMEMUD			
850	SUWANNEE ZONE II		LIMESTONE, VERY LT GREY(N8) TO YELLOWISH GREY, MOD. SOFT TO MOD. HARD, TRACES TO MINOR SHELL FRAGMENTS, FAIR TO GOOD POROSITY			
900						
	CONFINING BEDS		LIMEMUD, WHITE(N9), SOFT, COHESIVE, POOR POROSITY			
950			LIMESTONE, DARK GREY(N5) TO MED. GREY, POOR POROSITY			
	OCALA ZONE I		LIMESTONE, VERY LT GREY TO LT GREY, MED. SOFT TO MED. HARD, CLACARENTIC			
			LIMEMUD, WHITE, INTERBEDDED DK GREY, POOR POROSITY			
			LIMESTONE, YELLOWISH GREY, MICRITIC TO BIOMICRITIC, SUCROSIC TEXTURE, MED. SOFT TO MED. HARD, FAIR POROSITY			
1000			SHELL HASH, MULTICOLORED, LOOSELY CONSOLIDATED			
			LIMESTONE, LT YELLOWISH GREY, MED. SOFT, MICRITIC, EARTHY TEXTURE, POOR TO FAIR POROSITY			
			INTERBEDDED SHELL HASH AND LIMESTONE			
1050	DECREASED WEIGHT ON BIT TO 3,500 LBS.		SHELL HASH, SPONGE SPICULES, SMALL AMMONIODS AND FOARAMINIFERA, INTERBEDDED LAYERS OF LIMESTONE WITH DEPTH			
			LIMESTONE, LT YELLOWISH GREY, MED. SOFT, MICRITIC, EARTHY TEXTURE, POOR TO FAIR POROSITY			
			SHELL HASH AND LIMESTONE AS ABOVE			
1100			LIMESTONE, LT YELLOWISH GREY, EARTHY TEXTURE, FAIR POROSITY			
	CONFINING BEDS		LIMEMUD, WHITE, SOFT, COHESIVE			
			LIMESTONE, YELLOWISH GREY, MICRITIC TO CALCARENITIC, POOR TO FAIR POROSITY			
	OCALA ZONE II		LIMESTONE, YELLOWISH GREY, CALCARENITIC, MICRITIC, MED. SOFT TO SOFT, ABUNDANT FOSSIL FRAGMENTS, SPONGE SPICULES, DRYORONS, GASTROPOD FRAGMENTS, FORAMS, FAIR TO POOR POROSITY			
1150			LIMESTONE, YELLOWISH GREY, VERY LT GREY, MICRITIC, MED. SOFT, TRACES OF FOSSILS, POOR POROSITY			

(Dissolved Chlorides - mg/l)
0 500 1000 1500 2000

TEST #1 (OH)
520'-610'
EST. TRANSMIS.
19,000 GPD./FT
DIS. CL=540mg/l
SWL=39.15' ALS

TEST #2 (PT)
617'-694'
EST. TRANSMIS.
10,000 GPD./FT
DIS. CL=260mg/l
SWL=42.90' ALS

TEST #4 (PT)
717'-940'
EST. TRANSMIS.
57,000 GPD./FT
DIS. CL=900mg/l
(17.85' DD IN ANNULUS)
SWL=42.15' ALS

TEST #3/5 (PT)
840'-940'
EST. TRANSMIS.
57,000 GPD./FT
DIS. CL=1000mg/l
(3.95' DD IN ANNULUS)
SWL=41.69' ALS

TEST #6 (PT)
950'-1106'
EST. TRANSMIS.
250 GPD./FT
DIS. CL=820mg/l
SWL=37.01' ALS

APPENDIX G

GEOPHYSICAL LOGS

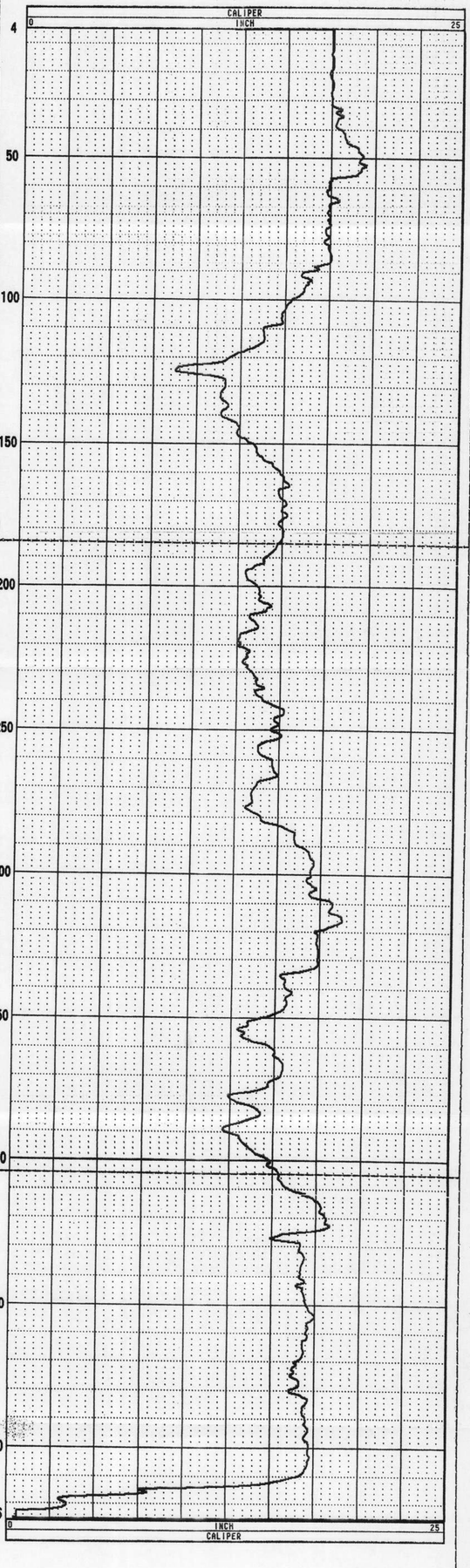
Southern Resource Exploration Inc.

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

CALIPER LOG

COMPANY	: WELL WATER SYSTEMS			OTHER SERVICES:	
WELL	: T-1				
LOCATION/FIELD	: OLGA WATER PLANT				
COUNTY	: LEE				
STATE	: FL				
SECTION	: 23	TOWNSHIP	: 43S	RANGE	: 26E
DATE	: 12/21/98	PERMANENT DATUM	:	ELEVATIONS	
DEPTH DRILLER	: 530'	ELEV. PERM. DATUM:		KB	:
LOG BOTTOM	: 525.00	LOG MEASURED FROM:	GL	DF	:
LOG TOP	: 5.00	DRL MEASURED FROM:	GL	GL	:
CASING DRILLER	: 35	LOGGING UNIT	: BMT		
CASING TYPE	: STEEL	FIELD OFFICE	: GVL		
CASING THICKNESS	: -	RECORDED BY	: MAF		
BIT SIZE	: 17.5	BOREHOLE FLUID	: MUD	FILE	: PROCESSED
MAGNETIC DECL.	:	RM	:	TYPE	: ANIMC
MATRIX DENSITY	:	RM TEMPERATURE	:	LOG	: 1
FLUID DENSITY	:	MATRIX DELTA T	:	PLOT	: CALIPER 2
NEUTRON MATRIX	:	FLUID DELTA T	: 189	THRESH	: 5000

REMARKS :
LOGGING OBSERVED BY JACK BRELAND



Southern Resource Exploration Inc.

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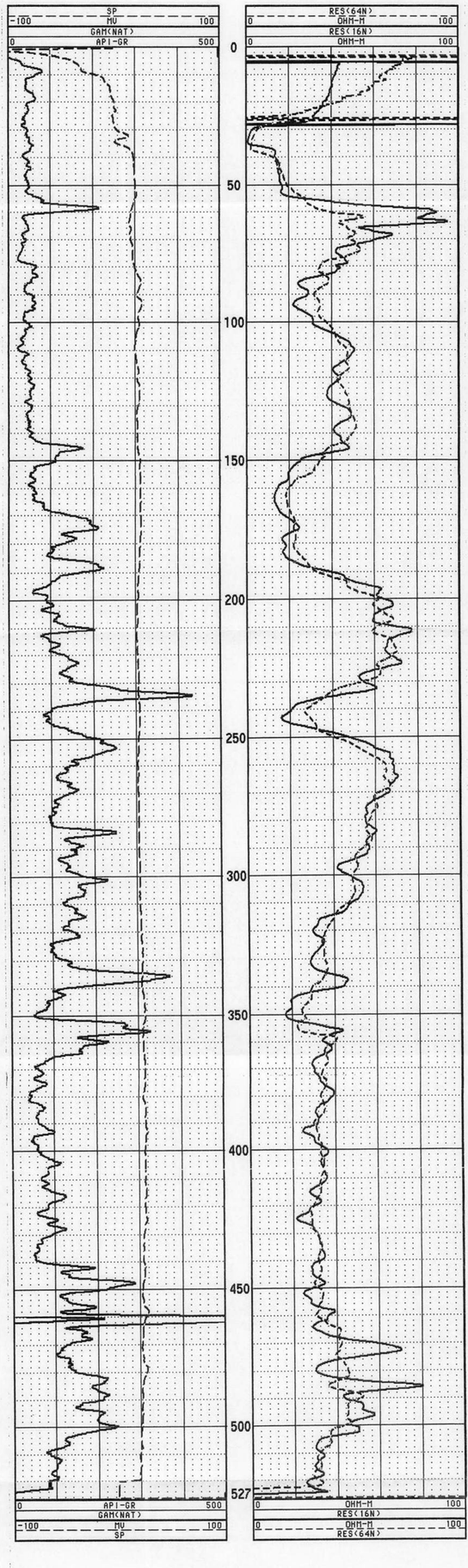
Phone 352-372-5950

GAM, RES (16-64), SP

COMPANY	: WELL WATER SYSTEMS			OTHER SERVICES:	
WELL	: T-1				
LOCATION/FIELD	: OLGA WATER PLANT				
COUNTY	: LEE				
STATE	: FL				
SECTION	: 23	TOWNSHIP	: 43S	RANGE	: 26E
DATE	: 12/18/98	PERMANENT DATUM	:	ELEVATIONS	
DEPTH DRILLER	: 525'	ELEV. PERM. DATUM:		KB	:
LOG BOTTOM	: 526.00	LOG MEASURED FROM:	GL	DF	:
LOG TOP	: 0.60	DRL MEASURED FROM:	GL	GL	:
CASING DRILLER	: 35	LOGGING UNIT	: BWT		
CASING TYPE	: STEEL	FIELD OFFICE	: GVL		
CASING THICKNESS:	-	RECORDED BY	: MAF		
BIT SIZE	: 8.75	BOREHOLE FLUID	: MUD	FILE	: ORIGINAL
MAGNETIC DECL.	:	RM	:	TYPE	: 9041A
MATRIX DENSITY	:	RM TEMPERATURE	:	LOG	: 5
FLUID DENSITY	:	MATRIX DELTA T	:	PLOT	: 9040B 0
NEUTRON MATRIX	:	FLUID DELTA T	: 189	THRESH:	5000
REMARKS	:				

LOGGING OBSERVED BY JACK BRELAND & JUSTIN CHAMBERLAND



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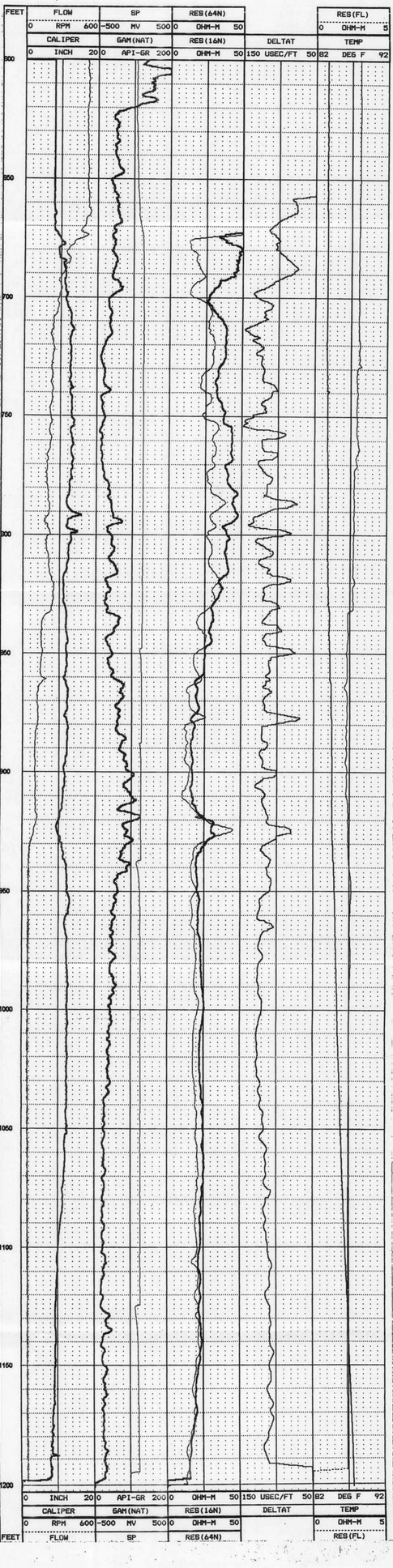
Phone 352-372-5950

OLGA ASR OBS. WELL # 1

COMPANY	: WELL WATER SYSTEMS			OTHER SERVICES:	
WELL	: OLGA ASR OBS. WELL # 1				
LOCATION/FIELD	: OLGA WATER TREATMENT PLANT				
COUNTY	: LEE				
STATE	: FL				
SECTION	: 23	TOWNSHIP	: 43S	RANGE	: 26E
DATE	: 02/10/99	PERMANENT DATUM	: .	ELEVATIONS:	
DEPTH DRILLER	: 1200	ELEV. PERM. DATUM	:	KB	:
LOG BOTTOM	: 1201.40	LOG MEASURED FROM:	ROTARY	DF	:
LOG TOP	: 600.40	DRL MEASURED FROM:	ROTARY	GL	:
CASING DRILLER	: 679	LOGGING UNIT	: BWT		
CASING TYPE	: PVC	FIELD OFFICE	: GVL		
CASING THICKNESS:	-	RECORDED BY	: MAF		
BIT SIZE	: 8	BOREHOLE FLUID	: WATER	FILE	: ORIGINAL
MAGNETIC DECL.	:	Rm	:	TYPE	: ANIMC
MATRIX DENSITY	:	Rm TEMPERATURE	:	LOG	: 1.
FLUID DENSITY	:	MATRIX DELTA T	:	PLOT	:
NEUTRON MATRIX	:	FLUID DELTA T	: 189	THRESH:	5000

REMARKS:

WELL FLOWING



MV Geophysical

Company: WELL WATER SYSTEMS
Well: OLGA ASR OBS WELL #1
Field: OLGA
County: LEE
State/Prv: FLORIDA
Location: SEC. 23 T43S R26E
Elevation: 72.00 ft
Permanent Datum: GROUND LEVEL
Log Measured From: KELLY BUSHING
Drilling Measured From: KELLY BUSHING

Company: WELL WATER SYSTEMS
Well: OLGA ASR OBS WELL #1
Field: OLGA
County: LEE
State/Prv: FLORIDA

X-Y CALIPER

All interpretations are opinions based on inferences from electrical or other measurements and we cannot and do not guarantee the accuracy or correctness of any interpretation, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, damages, or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to our general terms and conditions set out in our current Price Schedule.

Comments

WITNESSED BY: JUSTIN CHAMBERLAIN

MV Geophysical

MAIN PASS

Database File: olgasrv1.db
Dataset Pathname: pass2
Presentation Format: ext.pvs
Dataset Creation: Thu Apr 22 08:16:41 1999 by Log VER_5.3
Charted by: Depth in Feet scaled 1:240

TOTAL BOREHOLE VOLUME (ID)
GR (GAPI) 0 100
CCL -6 1

Y-CALIPER (in) 0 20
X-CALIPER (in) 0 20
BIT SIZE (in) 0 20

181 174 167 160 153 146 139 132 125 118 111 104 97 90 83 76 69 62 55 48 41 34 27 20

800 700 800

← CBG →
← TD →

Y-CALIPER
X-CALIPER
BIT SIZE

MV Geophysical

MAIN PASS

Database File: olgasrv1.db
Dataset Pathname: pass2
Presentation Format: ext.pvs
Dataset Creation: Thu Apr 22 08:16:41 1999 by Log VER_5.3
Charted by: Depth in Feet scaled 1:600

TOTAL BOREHOLE VOLUME (ID)
GR (GAPI) 0 100
CCL -6 1

Y-CALIPER (in) 0 20
X-CALIPER (in) 0 20
BIT SIZE (in) 0 20

181 174 167 160 153 146 139 132 125 118 111 104 97 90 83 76 69 62 55 48 41 34 27 20

800 700 800

← CBG →
← TD →

Y-CALIPER
X-CALIPER
BIT SIZE

MV Geophysical

MAIN PASS

Database File: olgasrv1.db
Dataset Pathname: pass2
Presentation Format: ext.pvs
Dataset Creation: Thu Apr 22 08:16:41 1999 by Log VER_5.3
Charted by: Depth in Feet scaled 1:240

TOTAL BOREHOLE VOLUME (ID)
GR (GAPI) 0 100
CCL -6 1

Y-CALIPER (in) 0 20
X-CALIPER (in) 0 20
BIT SIZE (in) 0 20

181 174 167 160 153 146 139 132 125 118 111 104 97 90 83 76 69 62 55 48 41 34 27 20

800 700 800

← CBG →
← TD →

Y-CALIPER
X-CALIPER
BIT SIZE

MV Geophysical

REPEAT SECTION

Database File: olgasrv1.db
Dataset Pathname: pass1
Presentation Format: ext.pvs
Dataset Creation: Thu Apr 22 08:04:27 1999 by Log VER_5.3
Charted by: Depth in Feet scaled 1:240

TOTAL BOREHOLE VOLUME (ID)
GR (GAPI) 0 100
CCL -6 1

Y-CALIPER (in) 0 20
X-CALIPER (in) 0 20
BIT SIZE (in) 0 20

180 173 166 159 152 145 138 131 124 117 110 103 96 89 82 75 68 61 54 47 40 33 26 19

700 800

← CBG →
← TD →

Y-CALIPER
X-CALIPER
BIT SIZE

XY Caliper Calibration Report

Serial Number/Model: 1020 /XYCI
Performed: Thu Apr 22 07:58:05 1999

Ring	X Caliper		Y Caliper	
1: 7.83 in	578.879	cpk	587.898	cpk
2: 20.26 in	987	cps	983	cps
3: in	n/a	cps	n/a	cps
4: in	n/a	cps	n/a	cps
5: in	n/a	cps	n/a	cps
6: in	n/a	cps	n/a	cps

Gamma Ray Calibration Report

Serial Number: 14
Tool Model: GROH
Performed: Mon Apr 19 11:40:13 1999

Calibrator Value: 120 GAPI

Background Reading: 80.3105 cps
Calibrator Reading: 392.237 cps

Sensitivity: 0.592314 GAPI/cps

CCL 0.85 ft — CCL 0.250/RCO, (552) 11.00 lb 3.25 in OD 1.25 ft

GR 7.60 ft — GR-GROH (14) 46.20 lb 3.50 in OD 3.75 ft

XCAL 3.50 ft
YCAL 3.50 ft — (XY-CI/XCI (1020) 67.00 lb 3.50 in OD 6.66 ft

Dataset: sort1desc2
Total Length: 10.83 ft
Total Weight: 133.00 lb
O.D.: 3.50 in

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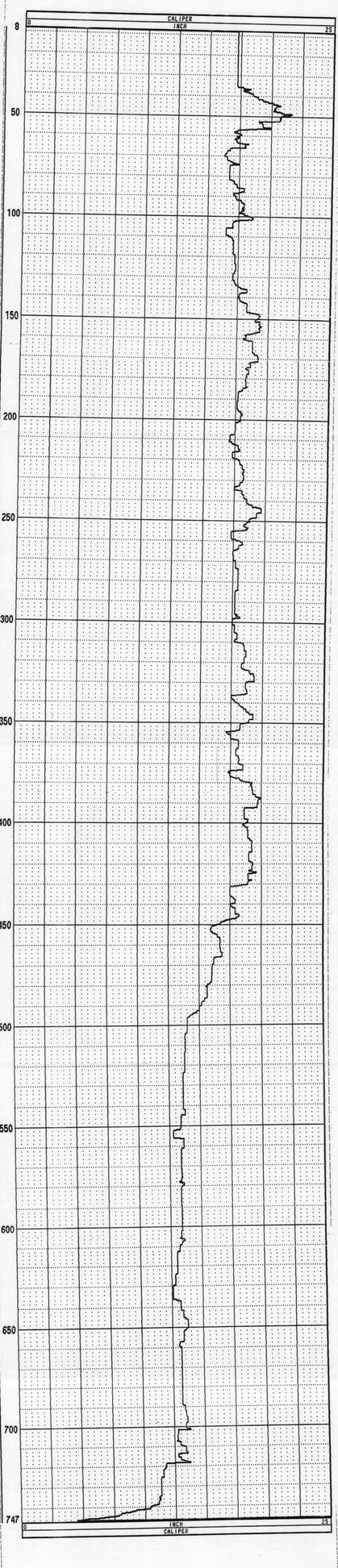
Phone 352-372-5950

CALIPER LOG

COMPANY	: WELL WATER SYSTEMS			OTHER SERVICES:	
WELL	: OLGA ASR OBS. WELL #3				
LOCATION/FIELD	: OLGA WATER TREATMENT PLANT				
COUNTY	: LEE				
STATE	: FL				
SECTION	: 23	TOWNSHIP	: 43S	RANGE	: 26E
DATE	: 03/11/99	PERMANENT DATUM	: .	ELEVATIONS	
DEPTH DRILLER	: 747'	ELEV. PERM. DATUM:		KB	:
LOG BOTTOM	: 750.28	LOG MEASURED FROM:	GL	DF	:
LOG TOP	: 8.68	DRL MEASURED FROM:	GL	GL	:
CASING DRILLER	: 35	LOGGING UNIT	: BWT		
CASING TYPE	: STEEL	FIELD OFFICE	: GWL		
CASING THICKNESS:	-	RECORDED BY	: MAF		
BIT SIZE	: 17.25	BOREHOLE FLUID	: MUD	FILE	: PROCESSED
MAGNETIC DECL.	:	RM	:	TYPE	: 9865A2
MATRIX DENSITY	:	RM TEMPERATURE	:	LOG	: 3
FLUID DENSITY	:	MATRIX DELTA T	:	PLOT	: CALIPER 2
NEUTRON MATRIX	:	FLUID DELTA T	: 189	THRESH:	5000
REMARKS	:				
-					

ALL SERVICES PROVIDED SUBJECT TO STANDARD TERMS AND CONDITIONS



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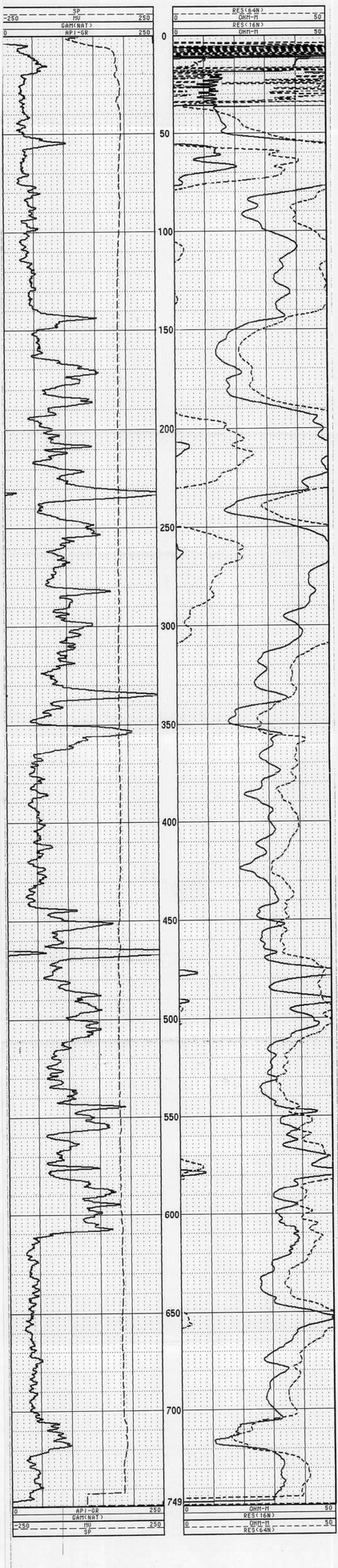
GAM, RES (16-64), SP

COMPANY	: WELL WATER SYSTEMS			OTHER SERVICES:	
WELL	: OLGA ASR OBS. WELL #3				
LOCATION/FIELD	: OLGA WATER TREATMENT PLANT				
COUNTY	: LEE				
STATE	: FL				
SECTION	: 23	TOWNSHIP	: 43S	RANGE	: 26E
DATE	: 03/11/99	PERMANENT DATUM	: .	ELEVATIONS	
DEPTH DRILLER	: 747'	ELEV. PERM. DATUM:		KB	:
LOG BOTTOM	: 749.00	LOG MEASURED FROM:	GL	DF	:
LOG TOP	: 1.20	DRL MEASURED FROM:	GL	GL	:
CASING DRILLER	: 35	LOGGING UNIT	: BWI		
CASING TYPE	: STEEL	FIELD OFFICE	: GVL		
CASING THICKNESS	: -	RECORDED BY	: MAF		
BIT SIZE	: 17.25	BOREHOLE FLUID	: MUD	FILE	: ORIGINAL
MAGNETIC DECL.	:	RM	:	TYPE	: 9041A
MATRIX DENSITY	:	RM TEMPERATURE	:	LOG	: 1
FLUID DENSITY	:	MATRIX DELTA T	:	PLOT	: 9040B 0
NEUTRON MATRIX	:	FLUID DELTA T	: 189	THRESH	: 5000
REMARKS	:				

ALL SERVICES PROVIDED SUBJECT TO STANDARD TERMS AND CONDITIONS



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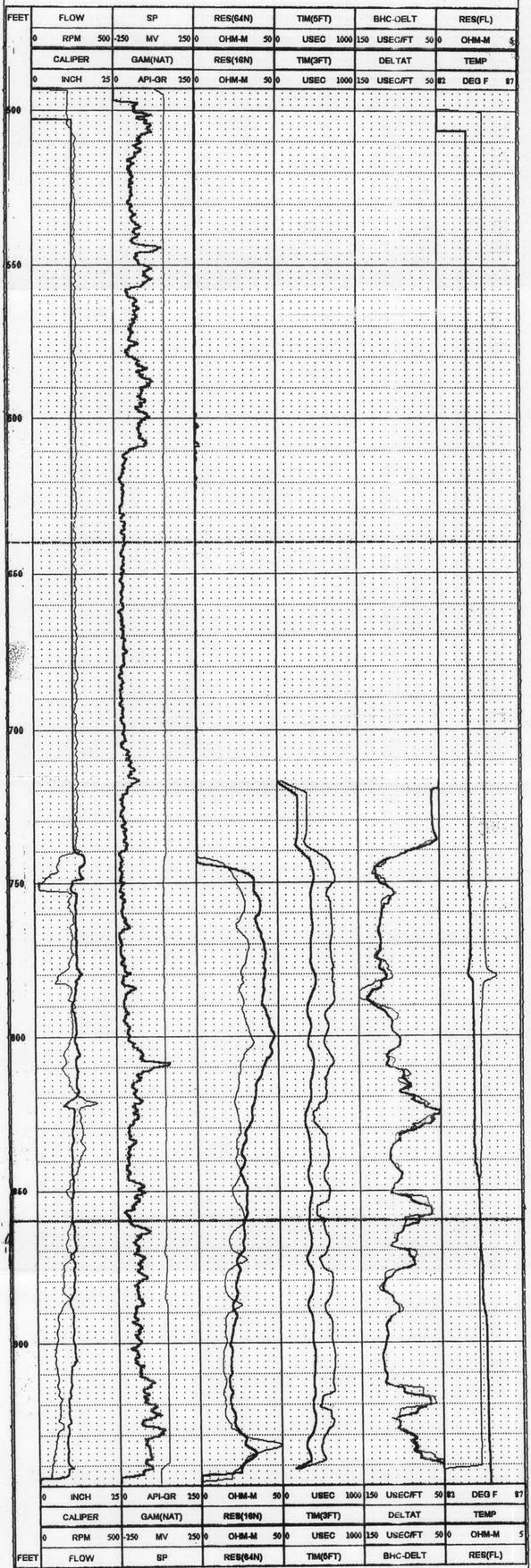
OLGA ASR OBS. WELL #3

COMPANY	: WELL WATER SYSTEMS			OTHER SERVICES:	
WELL	: OLGA ASR OBS. WELL #3				
LOCATION/FIELD	: OLGA WATER TREATMENT PLANT				
COUNTY	: LEE				
STATE	: FL				
SECTION	: 23	TOWNSHIP	: 43S	RANGE	: 26E
DATE	: 03/23/99	PERMANENT DATUM	: .	ELEVATIONS:	
DEPTH DRILLER	: 945'	ELEV. PERM. DATUM	:	KB	:
LOG BOTTOM	: 946.40	LOG MEASURED FROM:	GL	DF	:
LOG TOP	: 493.00	DRL MEASURED FROM:	GL	GL	: EST. 6'
CASING DRILLER	: 742	LOGGING UNIT	: BWT		
CASING TYPE	: STEEL	FIELD OFFICE	: GVL		
CASING THICKNESS:	.375	RECORDED BY	: MAF		
BIT SIZE	: 7.875	BOREHOLE FLUID	: WATER	FILE	: ORIGINAL
MAGNETIC DECL.	:	RM	:	TYPE	: 9041A
MATRIX DENSITY	:	RM TEMPERATURE	:	LOG	: 1.
FLUID DENSITY	:	MATRIX DELTA T	:	PLOT	:
NEUTRON MATRIX	:	FLUID DELTA T	: 189	THRESH:	5000

REMARKS:

FLOW LOG RUN AT 40'/MIN. DOWN.
LOGGING WITNESSED BY : JUSTIN CHAMBERLIN..

ALL SERVICES PROVIDED SUBJECT TO STANDARD TERMS AND CONDITIONS



MV Geophysical

Company WELL WATER SYSTEMS
Well OLGA ASR OBS WELL #3
Field OLGA
County LEE
State/Pr FLORIDA

Company WELL WATER SYSTEMS
Well OLGA ASR OBS WELL #3
Field OLGA
County LEE
State/Pr FLORIDA

X,Y CALIPER

Permanent Datum: GROUND LEVEL
Elevation: 0 ft
Log Measured From: KELLY BUSHING
Drilling Measured From: KELLY BUSHING

SEC 1 TWP 45S RGE 25E
OLGA WTP
OLGA ASR OBS WELL #3

API No.
Other Services

	Permanent Datum	Log Measured From	Drilling Measured From
Elevation	GROUND LEVEL	KELLY BUSHING	KELLY BUSHING
	0 ft	0 ft	0 ft

Date	4/20/1999		
Run No.	ONE		
Depth Driller	1100		
Depth Logger	1100		
Bottom Logged Interval	1100		
Top Logged Interval	0		
Casing Driller	8.625 @ 0		
Casing Logger	8.625 @ 0		
Bit Size	7.875		
Type Fluid in Hole	WATER		
Density / Viscosity	8.4		
pH / Fluid Loss	7		
Source of Sample	CIRC		
Rm @ Meas Temp	0.000 @ 0		
Rmf @ Meas Temp	0.000 @ 0		
Rmc @ Meas Temp	0.000 @ 0		
Source of Rmf / Rmc	CALC		
Rm @ BHT	0.000 @ 0		
Time Since Circulation	0		
Max Rec Temp	0		
Equipment / Location	2131		
Recorded By	JUSTIN CHAMBERLAIN		
Witnessed By	JUSTIN CHAMBERLAIN		

Comments

WITNESSED BY: JUSTIN CHAMBERLAIN

MV Geophysical

MAIN PASS

Database File: olga.db
Dataset Pathname: pass3
Presentation Format: run pre
Dataset Creation: Fri Apr 09 08:06:47 1999 by Log VER_5.3
Charted by: Depth in Feet scaled 1:1200

Y-CALIPER (in) 20 10
X-CALIPER (in) 20 10
BIT SIZE (in) 20 10

296 294 248 232 200 185 153 129 107 78 49 27 10

600 700 800

<-- CSG -->
TOTAL BOREHOLE VOLUME
<-- TD -->

SB Size
X-Caliper
Y-Caliper

MV Geophysical

MAIN PASS

Database File: olga.db
Dataset Pathname: pass3
Presentation Format: run pre
Dataset Creation: Fri Apr 09 08:06:47 1999 by Log VER_5.3
Charted by: Depth in Feet scaled 1:600

Y-CALIPER (in) 20 10
X-CALIPER (in) 20 10
BIT SIZE (in) 20 10

296 294 248 232 200 185 153 129 107 78 49 27 10

600 700 800

<-- CSG -->
TOTAL BOREHOLE VOLUME
<-- TD -->

SB Size
X-Caliper
Y-Caliper

MV Geophysical

MAIN PASS

Database File: olga.db
Dataset Pathname: pass3
Presentation Format: run pre
Dataset Creation: Fri Apr 09 08:06:47 1999 by Log VER_5.3
Charted by: Depth in Feet scaled 1:240

Y-CALIPER (in) 20 10
X-CALIPER (in) 20 10
BIT SIZE (in) 20 10

296 294 248 232 200 185 153 129 107 78 49 27 10

600 700 800

<-- CSG -->
TOTAL BOREHOLE VOLUME
<-- TD -->

SB Size
X-Caliper
Y-Caliper

MV Geophysical

MAIN PASS

Database File: olga.db
Dataset Pathname: pass3
Presentation Format: run pre
Dataset Creation: Fri Apr 09 08:06:47 1999 by Log VER_5.3
Charted by: Depth in Feet scaled 1:240

Y-CALIPER (in) 20 10
X-CALIPER (in) 20 10
BIT SIZE (in) 20 10

296 294 248 232 200 185 153 129 107 78 49 27 10

600 700 800

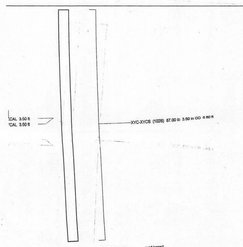
<-- CSG -->
TOTAL BOREHOLE VOLUME
<-- TD -->

SB Size
X-Caliper
Y-Caliper

XY Caliper Calibration Report

Serial Number/Model: 1059-XYCS
Performed: Thu Apr 08 21:31:12 1999

	Ring	X Caliper		Y Caliper	
1:	10.75 in	617.918	cps	641.642	cps
2:	39.25 in	977.177	cps	998.458	cps
3:	in	n/a		n/a	
4:	in	n/a		n/a	
5:	in	n/a		n/a	
6:	in	n/a		n/a	



APPENDIX H

SPECIFIC CAPACITY PUMPING TEST DATA

Observation Well #1 (LM-6209)

1. Lower Hawthorn Zone I - Open Hole Test
2. Lower Hawthorn Zone II - Single Packer Test
3. Suwannee Zone I - Single Packer Test
4. Suwannee Zone II - Single Packer Test
5. Ocala Zone I - Single Packer Test

Observation Well #3 (LM-6615)

1. Suwannee Zone I - Open Hole Test
2. Suwannee Zone II - Single Packer Test

LEE COUNTY UTILITIES - OLGA ASR PROJECT
SPECIFIC CAPACITY PUMPING TEST

WELL: LM-6209 (OBSERVATION WELL #1)
TEST DATE: JANUARY 5, 1999
HYDROGEOLOGIST: JACK BRELAND
STATIC WATER LEVEL: 34.65 ft AMP
MEASURING POINT: TOP OF FLANGE (4.5 ft ALS)
TEST INTERVAL: 530 - 615 ft BLS, LOWER HAWTHORN ZONE I, OPEN HOLE

STEP No.	RATE (gpm)	ELAPSED TIME (min)	WATER LEVEL (ft BMP)	DRAWDOWN (ft)
1	110	5	23.10*	11.55
		10	21.95*	12.70
		15	19.65*	15.00
		20	18.90*	15.75
		25	18.71*	15.94
		30	18.71*	15.94
2	220	5	5.54*	29.11
		10	5.78*	28.87
		15	5.80*	28.85
		20	5.80*	28.85
		25	5.80*	28.85
		30	5.82*	28.83
3	270	5	16.00	59.65
		10	15.60	50.25
		15	18.70	53.35
		20	20.90	55.55
		25	21.01	55.66
		30	21.03	55.68
4	330	5	32.20	66.85
		10	34.70	69.34
		15	34.90	72.55
		20	39.00	73.65
		25	39.40	74.05
		30	40.90	75.55
		35	42.60	77.25
		40	43.00	77.65
5	400	5	57.20	91.85
		10	60.20	94.85
		15	60.90	95.55
		20	62.00	96.95
		25	62.04	96.69
		30	62.08	96.73

AMP= Above Measuring Point
BMP= Below Measuring Point
* = Measurement given in feet AMP
NM= Not Measurable
ALS= Above Land Surface
BLS= Below Land Surface

LEE COUNTY UTILITIES - OLGA ASR PROJECT
SPECIFIC CAPACITY PUMPING TEST

WELL: LM-6209 (OBSERVATION WELL #1)
TEST DATE: JANUARY 6, 1999
HYDROGEOLOGIST: JACK BRELAND
STATIC WATER LEVEL: 30.30 ft AMP (TEST ZONE); 39.27 ft ALS (ANNULUS)
MEASURING POINT: TOP OF FLANGE (5.5 ft ALS) FOR TEST ZONE
TEST INTERVAL: 617 - 697 ft BLS, LOWER HAWTHORN ZONE II, SINGLE PACKER

STEP No.	RATE (gpm)	ELAPSED TIME (min)	WATER LEVEL (ft BMP)	DRAWDOWN (ft)
1	40	5	14.56*	15.74
		10	14.32*	15.98
		15	14.86*	15.44
		20	15.00*	15.30
		25	16.60*	13.70
		30	16.40*	13.90
		35	18.25	12.05
2	75	5	9.24*	20.79
		10	9.47*	20.56
		15	9.70*	20.33
		20	9.47*	20.56
		25	9.70*	20.33
		30	9.70*	20.33
3	115	5	17.40	47.70
		10	17.48	47.78

***NOTES: ELECTRIC WATER LEVEL TAPE MALFUNCTIONED
CONSIDERABLE SAND WAS PUMPED DURING THE PRE-TEST AND THE AQUIFER TEST.

AMP= Above Measuring Point
BMP= Below Measuring Point
* = Measurement given in feet AMP
NM= Not Measurable
ALS= Above Land Surface
BLS= Below Land Surface

LEE COUNTY UTILITIES - OLGA ASR PROJECT
SPECIFIC CAPACITY PUMPING TEST

WELL: LM-6209 (OBSERVATION WELL #1)
TEST DATE: JANUARY 7, 1999
HYDROGEOLOGIST: JACK BRELAND
STATIC WATER LEVEL: 37.42 ft AMP (TEST ZONE); 39.27 ft ALS (ANNULUS)
MEASURING POINT: TOP OF FLANGE (5.5 ft ALS) FOR TEST ZONE
TEST INTERVAL: 617 - 697 ft BLS, LOWER HAWTHORN ZONE II, SINGLE PACKER

STEP No.	RATE (gpm)	ELAPSED TIME (min)	WATER LEVEL (ft BMP)	DRAWDOWN (ft)	ANNULUS DRAWDOWN (ft)
1	70	5	19.06*	18.36	
		105	16.74*	20.68	
		15	15.01*	22.41	
		20	17.56*	19.86	
		25	15.01*	22.41	
		30	16.60*	20.82	
		35	16.60*	20.82	0.0
2	100	5	4.54	41.77	
		10	5.21	42.63	
		15	6.00	43.42	
		20	6.88	44.30	
		25	7.50	44.92	
		30	7.98	45.40	
		35	8.21	45.63	0.0
3	175	5	49.00	86.42	
		10	47.20	84.62	
		15	46.30	83.72	
		20	47.90	85.32	
		25	49.72	87.14	
		30	48.78	86.20	0.0
4	200	5	72.50	109.92	
		10	73.87	111.29	
		15	74.23	111.65	
		20	74.87	112.29	
		25	75.12	112.54	
		30	75.28	112.70	0.0

AMP= Above Measuring Point
BMP= Below Measuring Point
* = Measurement given in feet AMP
NM= Not Measurable
ALS= Above Land Surface
BLS= Below Land Surface

LEE COUNTY UTILITIES - OLGA ASR PROJECT
SPECIFIC CAPACITY PUMPING TEST

WELL: LM-6209 (OBSERVATION WELL #1)
TEST DATE: FEBRUARY 3, 1999
HYDROGEOLOGIST: JACK BRELAND
STATIC WATER LEVEL: 34.19 ft AMP (TEST ZONE); 41.12 ft ALS (ANNULUS)
MEASURING POINT: 7.50 ft ALS
TEST INTERVAL: 839 - 944 ft (DF), SUWANNEE ZONE II, SINGLE PACKER

STEP No.	RATE (gpm)	ELAPSED TIME (min)	WATER LEVEL (ft BMP)	DRAWDOWN (ft)	ANNULUS DRAWDOWN (ft)
1	70	5	28.64*	5.55	
		10	28.76*	5.43	
		15	30.14*	4.05	
		20	30.26*	3.93	
		25	30.30*	3.89	
		30	30.45*	3.74	0.0
2	150	5	11.55*	22.64	
		10	11.78*	22.41	
		15	11.83*	22.36	
		20	11.83*	22.36	
		25	11.80*	22.39	
		30	11.83*	22.36	0.0
3	250	5	23.10	57.29	
		10	23.18	57.37	
		15	23.29	57.48	
		20	23.38	57.57	
		25	23.38	57.57	
		30	23.38	57.57	0.0
4	355	5	79.30	113.49	
		10	78.50	112.69	
		15	78.40	112.59	
		20	79.00	113.19	
		25	78.99	113.18	
		30	79.00	113.19	0.0

AMP= Above Measuring Point
BMP= Below Measuring Point
* = Measurement given in feet AMP
NM= Not Measurable
ALS= Above Land Surface
BLS= Below Land Surface
DF= Drill Floor

LEE COUNTY UTILITIES - OLGA ASR PROJECT
SPECIFIC CAPACITY PUMPING TEST

WELL: LM-6209 (OBSERVATION WELL #1)
TEST DATE: FEBRUARY 4 , 1999
HYDROGEOLOGIST: JACK BRELAND
STATIC WATER LEVEL: 34.65 ft AMP (TEST ZONE); 342.48 ft ALS (ANNULUS)
MEASURING POINT: 7.50 ft ALS
TEST INTERVAL: 715 - 944 ft BLS, SUWANNEE ZONE I AND II, SINGLE PACKER

STEP No	RATE (gpm)	ELAPSED TIME (min)	WATER LEVEL (ft BMP)	DRAWDOWN (ft)	ANNULUS DRAWDOWN (ft)
1	70	5	30.26*	4.39	
		10	30.21*	4.44	
		15	30.15*	4.50	
		20	30.21*	4.44	
		25	30.19*	4.45	
		30	30.21*	4.44	4.44
2	155	5	9.70*	24.95	
		10	9.70*	24.95	
		15	9.81*	24.48	
		20	9.24*	25.41	
		25	9.70*	24.95	
		30	9.70*	24.95	6.09
3	250	5	16.82	51.47	
		10	17.61	52.26	
		15	18.00	52.65	
		20	18.10	52.75	
		25	18.15	52.80	
		30	18.15	52.80	11.84
4	350	5	65.80	100.45	
		10	65.70	100.35	
		15	65.50	100.15	
		20	65.40	100.05	
		25	65.40	100.05	
		30	65.40	100.05	15.34

***NOTE: NO PACKER SEAL DURING THIS TEST

AMP= Above Measuring Point
BMP= Below Measuring Point
* = Measurement given in feet AMP
NM= Not Measurable
ALS= Above Land Surface
BLS= Below Land Surface

LEE COUNTY UTILITIES - OLGA ASR PROJECT
SPECIFIC CAPACITY PUMPING TEST

WELL: LM-6209 (OBSERVATION WELL #1)
TEST DATE: FEBRUARY 4, 1999
HYDROGEOLOGIST: JACK BRELAND
STATIC WATER LEVEL: 34.19 ft AMP (TEST ZONE); 42.12 ft ALS (ANNULUS)
MEASURING POINT: 7.50 ft ALS
TEST INTERVAL: 840 - 940 ft (DF), SUWANNEE ZONE II (RETEST), SINGLE PACKER

STEP No.	RATE (gpm)	ELAPSED TIME (min)	WATER LEVEL (ft BMP)	DRAWDOWN (ft)	ANNULUS DRAWDOWN (ft)
1	70	5	29.11*	5.08	
		10	29.57*	4.62	
		15	29.34*	4.85	
		20	29.45*	4.74	
		25	29.51*	4.68	
		30	29.57*	4.62	0.08
2	150	5	5.50*	28.64	
		10	4.62*	29.57	
		15	5.08*	29.11	
		20	6.01*	28.18	
		25	8.32*	25.87	
		30	8.78*	25.41	1.19
3	250	5	29.90	64.09	
		10	21.10	55.29	
		15	15.00	49.19	
		20	15.01	49.20	
		25	14.90	48.09	
		30	15.00	49.19	1.20
4	350	5	84.00	118.19	
		10	86.70	120.89	
		15	86.90	121.09	
		20	85.88	120.07	
		25	86.12	120.31	
		30	86.90	121.09	4.05

AMP= Above Measuring Point
BMP= Below Measuring Point
* = Measurement given in feet AMP
NM= Not Measurable
ALS= Above Land Surface
BLS= Below Land Surface
DF= Drill Floor

LEE COUNTY UTILITIES - OLGA ASR PROJECT
SPECIFIC CAPACITY PUMPING TEST

WELL: LM-6209 (OBSERVATION WELL #1)
TEST DATE: FEBRUARY 8, 1999
HYDROGEOLOGIST: JACK BRELAND
STATIC WATER LEVEL: 29.01 ft AMP (TEST ZONE); 37.76 ft ALS (ANNULUS)
MEASURING POINT: 8.00 ft ALS
TEST INTERVAL: 945 - 1106 ft (DF), OCALA ZONE I, SINGLE PACKER

STEP No.	RATE (gpm)	ELAPSED TIME (min)	WATER LEVEL (ft BMP)	DRAWDOWN (ft)	ANNULUS DRAWDOWN (ft)
1	6	5	1.05*	27.96	
		10	1.05*	27.96	
		15	1.02*	27.99	
		20	1.02*	27.99	
		25	1.02*	27.99	
		30	1.02*	27.99	0.0
2	15	5	78.00	107.01	
		10	75.00	104.01	
		15	69.00	98.01	
		20	62.20	91.21	
		25	59.80	88.81	
		30	62.80	91.81	
		35	62.50	91.51	
		40	62.53	91.54	0.0

AMP= Above Measuring Point
BMP= Below Measuring Point
* = Measurement given in feet AMP
NM= Not Measurable
ALS= Above Land Surface
BLS= Below Land Surface
DF= Drill Floor

LEE COUNTY UTILITIES - PLGA ASR PROJECT
SPECIFIC CAPACITY PUMPING TEST

WELL: LM-6615 (OBSERVATION WELL #3)
TEST DATE: MARCH 17, 1999
HYDROGEOLOGIST: JUSTIN CHAMBERLAIN
STATIC WATER LEVEL: 40.43 ft AMP
MEASURING POINT: 1.42 ft ALS
TEST INTERVAL: 740 - 820 ft BLS, SUWANNEE ZONE IA, OPEN HOLE

STEP No.	RATE (gpm)	ELAPSED TIME (min)	WATER LEVEL (ft BMP)	DRAWDOWN (ft)
1	78	5	30.49*	9.94
		10	30.49*	9.94
		15	30.49*	9.94
		20	30.49*	9.94
		25	30.49*	9.94
		30	30.49*	9.94
2	210	5	8.78*	31.65
		10	9.01*	31.42
		15	9.01*	31.42
		20	9.01*	31.42
		25	9.01*	31.42
		30	9.01*	31.42
3	345	5	2.37	42.80
		10	8.91	49.34
		15	12.12	52.55
		20	12.72	53.15
		25	12.81	53.24
		30	12.92	53.35
		35	12.93	53.36
		40	12.94	53.37
4	480	5	38.67	79.10
		10	40.89	81.32
		15	41.34	81.77
		20	41.55	81.98
		25	41.70	82.13
		30	41.84	82.27
		35	41.96	82.39
		40	42.02	82.45
		45	42.05	82.48

AMP= Above Measuring Point
BMP= Below Measuring Point
* = Measurement given in feet AMP
NM= Not Measurable
ALS= Above Land Surface
BLS= Below Land Surface

LEE COUNTY UTILITIES - OLGA ASR PROJECT
SPECIFIC CAPACITY PUMPING TEST

WELL: LM-6615 (OBSERVATION WELL #3)
TEST DATE: MARCH 25, 1999
HYDROGEOLOGIST: JUSTIN CHAMBERLAIN
STATIC WATER LEVEL: 35.81 ft AMP (TEST ZONE); 37.66 ft ALS (ANNULUS)
MEASURING POINT: 6.83 ft ALS
TEST INTERVAL: 826 - 945 ft BLS, SUWANNEE ZONE I AND II, SINGLE PACKER

STEP No.	RATE (gpm)	ELAPSED TIME (min)	WATER LEVEL (ft BMP)	DRAWDOWN (ft)	ANNULUS DRAWDOWN (ft)
1	80	5	28.18*	7.63	
		10	28.18*	7.63	
		15	28.18*	7.63	
		20	28.18*	7.63	
		25	28.18*	7.63	
		30	28.18*	7.63	1.67
2	180	5	6.01*	29.80	
		10	6.01*	29.80	
		15	6.01*	29.80	
		20	6.01*	29.80	
		25	6.01*	29.80	
		30	6.01*	29.80	3.81
3	260	5	16.84	51.97	
		10	22.45	57.58	
		15	23.66	58.79	
		20	22.89	58.02	
		25	22.76	57.89	
		30	22.74	57.87	
		35	22.74	57.87	5.68
4	350	5	64.60	99.73	
		10	65.31	100.44	
		15	65.24	100.37	
		20	65.25	100.38	
		25	65.27	100.40	
		30	65.29	100.42	
		35	65.29	100.42	7.68

AMP= Above Measuring Point
BMP= Below Measuring Point
* = Measurement given in feet AMP
NM= Not Measurable
ALS= Above Land Surface
BLS= Below Land Surface

LEE COUNTY UTILITIES - OLGA ASR PROJECT
SPECIFIC CAPACITY PUMPING TEST

WELL: LM-6615 (OBSERVATION WELL #3)
TEST DATE: MARCH 25, 1999
HYDROGEOLOGIST: JUSTIN CHAMBERLAIN
STATIC WATER LEVEL: 34.88 ft AMP (TEST ZONE); 36.60 ft ALS (ANNULUS)
MEASURING POINT: 6.05 ft ALS
TEST INTERVAL: 857 - 945 ft BLS, SUWANNEE ZONE II, SINGLE PACKER

STEP No.	RATE (gpm)	ELAPSED TIME (min)	WATER LEVEL (ft BMP)	DRAWDOWN (ft)	ANNULUS DRAWDOWN (ft)
1	75	5	29.57*	5.31	
		10	29.57*	5.31	
		15	29.57*	5.31	
		20	29.57*	5.31	
		25	29.57*	5.31	
		30	29.57*	5.31	0.00
2	120	5	5.08*	29.80	
		10	6.23*	28.65	
		15	6.23*	28.65	
		20	6.01*	28.87	
		25	6.01*	28.87	
		30	6.01*	28.87	0.35
3	250	5	22.81	57.69	
		10	21.99	56.87	
		15	22.01	56.89	
		20	21.96	56.84	
		25	22.04	56.92	
		30	22.06	56.95	0.5
4	350	5	CAV	NM	
		10	71.63	106.51	
		15	71.72	106.66	
		20	71.72	106.66	
		25	71.72	106.66	
		30	71.72	106.66	1.01

AMP= Above Measuring Point
BMP= Below Measuring Point
* = Measurement given in feet AMP
NM= Not Measurable
CAV= Cavitating Pump
ALS= Above Land Surface
BLS= Below Land Surface

LEE COUNTY UTILITIES - OLGA ASR PROJECT
SPECIFIC CAPACITY PUMPING TEST

WELL: LM-6615 (OBSERVATION WELL #3)
TEST DATE: MARCH 26, 1999
HYDROGEOLOGIST: JUSTIN CHAMBERLAIN
STATIC WATER LEVEL: 34.31 ft AMP (TEST ZONE); 37.22 ft ALS (ANNULUS)
MEASURING POINT: 5.96 ft ALS
TEST INTERVAL: 857 - 945 ft BLS, SUWANNEE ZONE II, SINGLE PACKER

RATE (gpm)	ELAPSED TIME (min)	WATER LEVEL (ft BMP)	DRAWDOWN (ft)
300	1	ND	ND
	2	76.40	110.71
	3	69.53	103.84
	4	56.93	91.24
	5	45.63	79.94
	6	45.00	79.31
	7	43.69	78.00
	8	43.51	77.82
	9	43.42	77.73
	10	41.75	76.06
	12	41.68	75.99
	14	42.00	76.31
	20	41.25	75.56
	24	ND	ND
	30	41.14	75.45
	40	41.13	75.44
	50	40.53	74.84
	60	40.45	74.76
	70	40.16	74.47
	80	40.10	74.41
	90	37.29	71.60
	100	37.07	71.38
	120	37.13	71.44
	140	36.52	70.83
	200	35.08	69.39
	240	35.15	69.46

***NOTES: PACKER LOST SEAL DURING TEST.
ANNULUS DRAWDOWN= 6.39 ft

AMP= Above Measuring Point
BMP= Below Measuring Point
* = Measurement given in feet AMP
NM= Not Measurable
ALS= Above Land Surface
BLS= Below Land Surface

APPENDIX I

WATER QUALITY DATA

Observation Well #1 (LM-6209)

1. Reverse Air Water Quality
2. Water Quality Data From Specific Capacity Tests
3. Development Water Quality

Observation Well #3 (LM-6615)

1. Reverse Air Water Quality
2. Water Quality Data From Specific Capacity Tests
3. Development Water Quality

LCU - OLGA WTP ASR PROJECT
ASR OBSERVATION WELL #1 - LM-6209
CHLORIDE AND CONDUCTIVITY vs. DEPTH
FROM REVERSE AIR WATER SAMPLES

DEPTH (ft. below Land Surface)	SAMPLING DATE	DISSOLVED CHLORIDES (mg/l)	CONDUCTIVITY at 25° C (umhoc/cm)
540	1/4/99	600	2794
555	1/4/99	560	2269
570	1/4/99	510	1964
585	1/4/99	560	2318
600	1/5/99	530	1964
615	1/5/99	520	1980
630	1/6/99	550	2037
645	1/6/99	540	1988
660	1/6/99	550	2029
675	1/6/99	490	1961
696	1/6/99	430	1824
700	1/7/99	380	1569
730	1/7/99	410	1605
750	1/7/99	410	1593
765	1/7/99	400	1624
780	1/7/99	360	1600
810	1/8/99	440	1736
840	1/8/99	500	1848
870	1/8/99	510	1835
886	1/8/99	530	1835
903	1/8/99	540	1872
914	1/8/99	610	2207
944	1/8/99	540	1959
960	2/5/99	820	2746
975	2/5/99	820	2703
990	2/5/99	820	2714
1005	2/5/99	900	2856
1020	2/5/99	830	2725
1035	2/5/99	930	2856
1050	2/5/99	860	2780
1075	2/5/99	820	2714
1090	2/5/99	820	2746
1108	2/5/99	860	2769
1118	2/9/99	920	3014
1135	2/9/99	800	2909
1150	2/9/99	820	2870
1165	2/9/99	840	2861
1180	2/9/99	800	2832
1200	2/9/99	940	3062

LCU - OLGA WTP ASR PROJECT
ASR OBSERVATION WELL #1 - LM-6209
CHLORIDE AND CONDUCTIVITY RESULTS FROM PACKER TESTS

ZONE TESTED	STEP NO.	FLOW RATE (gpm)	SAMPLING DATE	DISSOLVED CHLORIDES (mg/l)	CONDUCTIVITY at 25° C (umhoc/cm)
Lower Hawthorn	1	110	1/5/99	530	2061
Zone I	2	220	1/5/99	540	2061
(520 - 610')	3	270	1/5/99	530	2050
	4	330	1/5/99	550	2037
	5	400	1/5/99	540	1988
Lower Hawthorn	1	70	1/6/99	260	1464
Zone II	2	100	1/6/99	260	1440
(617 - 694')	3	175	1/6/99	250	1452
	4	200	1/6/99	260	1427
Suwannee	1	70	2/3/99	1360	4100
Zone II	2	150	2/3/99	1060	3580
(840 - 940')	3	250	2/3/99	1000	3420
	4	360	2/3/99	1000	3420
Suwannee	1	70	2/4/99	1320	3461
Zone II	2	150	2/4/99	1160	3472
(840 - 940')	3	250	2/4/99	1140	3461
	4	350	2/4/99	ND	ND
Suwannee	1	70	2/4/99	860	2890
Zones I and II combined	2	155	2/4/99	ND	ND
(715 - 940')	3	250	2/4/99	860	2520
	4	350	2/4/99	900	2928
Ocala	1	6	2/8/99	1050	3308
Zone I	2	15	2/8/99	850	2793
(950 - 1106')					

ND= No Data

LCU - OLGA WTP ASR PROJECT
ASR OBSERVATION WELL #3 - LM-6615
CHLORIDE AND CONDUCTIVITY vs. DEPTH
FROM REVERSE AIR WATER SAMPLES

DEPTH (ft. below Land Surface)	SAMPLING DATE	DISSOLVED CHLORIDES (mg/l)	CONDUCTIVITY at 25° C (umhos/cm)
825	3/22/99	270	1609
840	3/22/99	480	2052
856	3/22/99	620	2354
873	3/22/99	560	2473
886	3/22/99	770	2700
900	3/22/99	780	2721
915	3/22/99	780	2711
930	3/22/99	780	2754
940	3/22/99	900	3013
945	3/22/99	880	2916

LCU - OLGA WTP ASR PROJECT
ASR OBSERVATION WELL #3 - LM-6615
CHLORIDE AND CONDUCTIVITY RESULTS FROM PACKER TESTS

ZONE TESTED	STEP NO.	FLOW RATE (gpm)	SAMPLING DATE	DISSOLVED CHLORIDES (mg/l)	CONDUCTIVITY at 25° C (umhos/cm)
Suwannee	1	80	3/25/99	800	2552
Zones I and II combined	2	180	3/25/99	760	2350
(826 - 945')	3	260	3/25/99	780	2350
	4	350	3/25/99	790	2350
Suwannee	1	75	3/25/99	960	2904
Zone II	2	170	3/25/99	960	2838
(857 - 945')	3	250	3/25/99	970	2882
	4	350	3/25/99	970	2948

ND= No Data