ADDENDUM TO REPORT
PHASE I - DEEP AQUIFER HYDROGEOLOGIC STUDY, COLLIER COUNTY, FLORIDA
PRELIMINARY REPORT

prepared for

Collier County Utilities Division
Water and Wastewater Services
2800 North Horseshoe Drive
Naples, Florida 33942

February, 1991

by

Missimer & Associates, Inc.
428 Pine Island Road, S.W.
Cape Coral, Florida 33991

Project Number
H89-342

Charles W. Walker, Ph.D
Senior Hydrogeologist

W. Kirk Martin, P.G.
Professional Geologist #079

TABLE OF CONTENTS

LIST OF FIGURES

INTRODUCTION

This addendum to the report titled "Phase I - Deep Aquifer Hydrogeologic Study, Collier County, Florida Preliminary Report" is intended to clarify or answer items discussed during the February 5, 1991 Technical Advisory Committee meeting at Fort Myers, Florida. The initial report describes the hydrogeology of the Manatee Road project site, construction plans for 1 ASR test-production well and 2 monitor wells, and the testing and sampling program. Questions regarding some aspects of the report are answered below.

MANATEE ROAD ASR TESTING PROGRAM

1. Well Inventory

A well inventory and water use assessment are presented in the original report (pages 6-9). A question was raised about the one mile radius "area of review", specifically the area south of the project site. There is no record of any well having been drilled or utilized in an area at least 2 miles to the south of the project site.

2. Supervision of Well Construction

A hydrogeologist or hydrologist will be on-site during the entire well construction operation. Drill cuttings will be collected and construction records will be maintained for the well. The construction of additional observation wells at the site will also be supervised.

3. ASR Well and Monitor Well Locations and Construction

Two additional monitor wells were added to the ASR construction plans at the request of the TAC. This includes a well to monitor water quality and static water level of the Lower Tamiami Aquifer (Surficial Aquifer System) above the injection zone. Also included is a very shallow monitor well located next to the drill pad to enable the monitoring of shallow water quality during the drilling and testing periods.

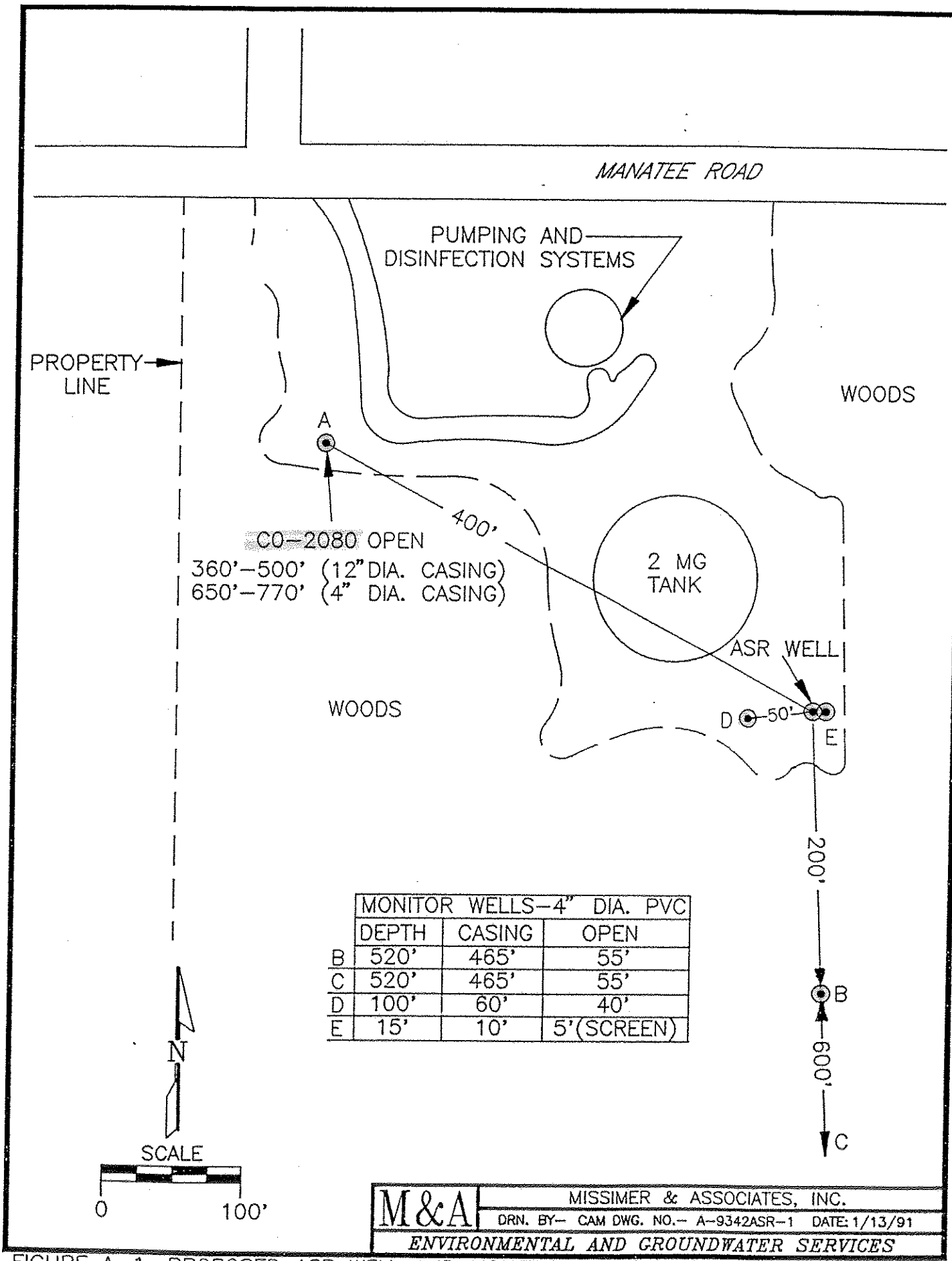
The location and construction details of 4 proposed monitor wells, the existing monitor well (CO-2080) and the proposed ASR test-production well are shown in Figure A-1. Also displayed in this figure are the locations of the 2 MG storage tank and the pumping and disinfection station which will be utilized in the ASR project.

4. Geophysical Logging

Geophysical logs will be obtained from the ASR well through all depth intervals except the upper 40 to 50 feet. The following logs will be run: fluid resistivity, spontaneous potential, single point resistance, gamma ray, temperature, caliper, and flow meter. A Widco model 1200 geophysical logging unit will be used.

5. Aquifer Performance Testing/Injection and Recovery Testing

An aquifer performance and/or injection test shall be first conducted at the site. This involves the continuous pumping of the test-production well or injection into a well for a period of up to 72 hours. The pumping or injection rate is maintained at a constant rate and would be continuously monitored. Water level recorders and/or pressure transducers will be utilized to measure the decline or increase in pressure in the test-production well and the observation wells. All measurement equipment will be provided by Missimer & Associates, Inc. Subsequently, the ASR well will be tested on several occasions with periodic



	MONITOR WELLS-4" DIA. PVC		
	DEPTH	CASING	OPEN
B	520'	465'	55'
C	520'	465'	55'
D	100'	60'	40'
E	15'	10'	5'(SCREEN)

M&A MISSIMER & ASSOCIATES, INC.
DRN. BY- CAM DWG. NO.- A-9342ASR-1 DATE: 1/13/91
ENVIRONMENTAL AND GROUNDWATER SERVICES

FIGURE A-1. PROPOSED ASR WELL AND MONITORING WELL LOCATIONS.

injection and recovery of water to model the capacities of the wells and to assess movement of the injected water and potential recovery efficiencies.

Additionally, the three monitor wells open to the injection zone will be periodically geophysically logged during the long term injection/recovery cycles with the fluid resistivity tool. This logging will provide information as to the vertical distribution of water quality within the ASR zone. Water samples will be collected from the ASR well during its construction while drilling by the reverse-air rotary methods. Also during drilling, water samples will be taken on a weekly basis from the shallow monitor well located next to the drill rig. Following completion of the ASR well and all monitoring wells, water samples will be taken by use of the geophysical logging unit (grab samples), well flows, and by pumping when necessary. Chloride ion concentration and conductivity analyses will be performed on the samples. These data will provide baseline water quality in the ASR zone, water-table aquifer at depth, and the shallow ground water.

During the aquifer performance testing/injection and recovery testing, water samples will be taken periodically from all 5 wells. All samples will be analyzed for chloride ion and conductivity. Prior to introducing the recovered water into the utilities distribution system, a complete analysis for the primary and secondary drinking water standards will be conducted. The analysis results will be submitted to the DER. Two subsequent complete analyses of the standards for the recovered water will be performed prior to applying for the Class V well operation permit.

6. Confining Beds Above and Below Injection Zone

There is some concern regarding the amount and efficiency of confinement below and above the Hawthorn Zone II ASR zone. In this project it is important to have sufficient confinement so as not to lose the injected potable water. Any loss can only improve the quality of the native water, but will result in less recoverable potable water. The original report discusses the confining horizons qualitatively (pages 29-35). Only after we conduct the aquifer performance test (APT) on the

ASR can a quantitative approach be undertaken to characterize the nature of the confining beds.

7. Data Compilation and Analysis

All hydrogeologic data collected during construction of the test production and observation wells will be compiled and analyzed by a qualified hydrogeologist. Detailed geologist's logs will be prepared for each well and the relationship of the nature of the production/injection zone would be described.

The aquifer test data will be analyzed to calculate aquifer hydraulic coefficients of the production/injection aquifer. This will include a calculation of transmissivity, storage coefficient, and leakance.

8. Recovered Water Quality Safeguards

(Refer to 2-19-91 letter to Charles W. Walker from Michael R. Newman).

COLLIER COUNTY GOVERNMENT

UTILITIES DIVISION
WATER AND WASTEWATER SERVICES

2800 NORTH HORSESHOE DRIVE
NAPLES, FL 33942
(813) 643-8480

A CERTIFIED BLUE CHIP COMMUNITY

February 19, 1991

Mr. Charles W. Walker, Ph. D., PG
Senior Hydrologist
Missimer & Associates, Inc.
428 Pine Island Road, S.W.
Cape Coral, FL 33991

RE: Deep Aquifer Hydrogeological Study
Utilities Division File No. 228.05

Dear Buzz:

After reviewing your attached facsimile of February 7, 1991 outlining Dr. Ahmadi's desire for assurances that water quality safequards be provided for this project, I would offer the following comments. As it is assumed by this writer that primary and secondary water quality analysis parameters and testing intervals will be established by the Department of Environmental Regulation, indicator parameters including disinfection monitoring and chloride concentrations will be the only parameters addressed in these comments.

Chloride contamination of the proposed ASR system is most possible under two cases; upconing, which is unlikely due to the relative thinness of the aquifer being utilized, and if the transition zone between the source water and the injected water begins to interfere with the cone of influence created by the ASR system itself. To offset concerns related to this indicator parameter, I would suggest that a continuous on-line conductivity meter be incorporated into the ASR discharge piping design. The information generated by this device could then be telemetered by the existing equipment back to the Regional Water Treatment Plant offering 24-hour continuous monitoring. In addition, this device could be designed to automatically discontinue operation of the ASR system, should water quality parameters related to conductivity be violated.

As for bacterial disinfection residual monitoring, should this be demonstrated to be of concern after completion of the upcoming pilot study, the discharge piping design from the ASR well could be modified to circulate all water withdrawn from the ASR system throughout the existing 2 MGD ground storage tank after chlorination. Based on the Manatee Road facility's existing pumping capability of 1,600 gpm, this scenario would provide a theoretical disinfection contact time of 20.8 hours. The effluent withdrawn from this storage tank would then be

monitored by the existing automatic residual monitoring equipment to ensure adequate bacterial disinfection. This system could also be modified to automatically shutdown this facility's pumping equipment, should disinfection residual parameters be violated.

Other continuous monitoring may be possible, however, the two indicator parameters discussed, in combination with the normal Department of Environmental Regulation required testing, should be sufficient to ensure water quality entering the County's water distribution system.

If I can be of any further assistance to you, please let me know.

Sincerely,

Michael R. Newman
Water Director

MRN/jo

APPENDICES

APPENDIX A

WATER QUALITY ANALYSIS RESULTS AND CORRESPONDENCE FROM COLLIER COUNTY UTILITIES

COLLIER COUNTY GOVERNMENT

UTILITIES DIVISION
WATER AND WASTEWATER SERVICES

2800 NORTH HORSESHOE DRIVE
NAPLES, FL 33942
(813) 643-8480

A CERTIFIED BLUE CHIP COMMUNITY

January 18, 1991

Mr. Buzz Walker
Missimer and Associates, Inc.
Rt. 8, Box 625-D
Cape Coral, Florida 33909

RE: Tac Committee Requirements

Dear Buzz:

Enclosed please find seven (7) copies of the aerial photographs of the Manatee Road site as 24" x 36" prints. Also included is a copy of the finished water analysis for our system (also comparison to the Golden Gate system but that should be deleted) and the THM analysis. As for the present facilities on the Manatee Road site, we have a 2 MG Crom concrete storage tank and a smaller Crom tank that has been converted into a finished water pumping station. Our intent, should an ASR project prove feasible at this site, is to add a chloramine disinfection system to this station so that we can maintain turn-over of water in the tanks and disinfection throughout the system. Disinfection could also be done on the ASR water should it prove necessary. Previously there were seven (7) surface water wells on the site, but I believe all have been plugged. The previous water plant owned by Capri Water Works, was dismantled when the pump station was built. The post-recovery treatment we hope would not extend beyond disinfection, although as you are aware Mike Newman suspects there may be some need for filtering this water should the TDS be too high. I think we should shoot for a maximum acceptable recovery TDS and chlorides would be a value that is 75% of the Safe Drinking Water Act requirements (all the Safe Drinking Water Act requirements are shown on the enclosed water analysis). Most other items we would not want to have exceed about 75% so that should some odd-ball water sample come up in the ASR well, we would not create a problem throughout our system..

During the summer months of June, July, August and September, we would have at least 1.5 MG each day to pump into the ASR well and probably have up to 1 MGD through mid-November. We would hope to be able to recover at least the 1.5 MGD during the March, April and May time period and perhaps more. You indicated that we might perhaps be able to get 2 or 2.5 MGD out of a well that we are pumping 1.5 MGD into. This would significantly help us. As to a monthly and yearly basis, approximately 45 MG during the summer, and a total in the summer and fall exceeding 200 MG should be available. Should you have any further questions, please let us know.

Very truly yours,

Fred Bloetscher, P.E.
Assistant Utilities Administrator

FB:smc

Attachments

cc: Michael K. Arnold, Utilities Administrator
C. W. Temby, Utilities Engineering Director
Michael R. Newman, Water Department Director

APPENDIX

FINISHED WATER ANALYSIS
AS COMPARED TO SAFE DRINKING WATER ACT
(expressed as mg\l)

SUBSTANCE	COLLIER CO.	GOLDEN GATE (Not Applicable)	SDWA-EPA REQ
Endrin	ND	NA	0.0002
Lindane	ND	NA	0.004
Methoxychlor	ND	NA	0.1
Tozaphene	ND	NA	0.005
2,4-D	ND	NA	0.1
2,4,5-TP (Silvex)	ND	NA	0.01
Arsenic	ND	ND	0.05
Barium	ND	0.1	1.0
Cadmium	ND	ND	0.01
Chromium	ND	0.02	0.05
Flouride	0.97	1.3	4.0
Lead	ND	ND	0.05
Mercury	ND	ND	0.002
Nitrate (as N)	ND	0.24	10.0
Selenium	ND	ND	0.01
Silver	ND	ND	0.05
Sodium	45	65	160.0
Calcium (as CaCO3)	34	166	no standard
Chloride	50	103	250.0
Copper	ND	ND	1.0
Total Hardness	75	NA	no standard
Iron	ND	ND	0.3
Manganese	0.018	ND	0.05
Sulfate	17	88	250.0
Zinc	ND	ND	5.0
Carbon Dioxide	ND	NA	no standard
Color	10 parts	7 parts**	15 parts
Odor	ND	ND	3 TON
pH (min.)	8.6	8.5	6.5
Total alkalinity	78	20	no standard
Total Dissolved Solids	210	488	500.0
Langlier Index	8.51	.06	no standard
Foaming Agents	ND	.02	0.5
Corrosivity	0.2	NA	+\- 0.2
Turbidity	ND	.63 NTU**	1.0 NTU
Ethylene Dibromide	ND	ND	0.00002

NOTES: * Sample does not meet SDWA requirementsas per EPA regulations
** Sample meets SDWA requirements, but other samples on monthly reports have failed this parameter
NA Data Not Available for this parameter
ND Substance was Not Detected in analysis

APPENDIX
(continued)

SUBSTANCE	COLLIER CO.	GOLDEN GATE	SDWA-EPA REQ
p-Dichlorobenzene	ND	ND	0.075
Vinyl Chloride	ND	ND	0.001
1,1-Dichloroethene	ND	ND	0.003
1,2-Dichloroethane	ND	ND	0.003
1,1,1-Trichloroethane	ND	ND	0.2
Carbon Tetrachloride	ND	ND	0.003
Trichloroethene	ND	ND	0.003
Tetrachloroethene	ND	ND	0.003
Benzene	ND	ND	0.001
Chloromethane	ND	ND	detection
Dichlorodiflouromethane	ND	ND	detection
Bromomethane	ND	ND	detection
Chloroethane	ND	ND	detection
Trichloroflouromethane	ND	ND	detection
trans-1,3-dichloropropene	ND	NA	detection
cis-1,3-dichloropropene	ND	ND	detection
Methyl-tert-butyl-ether	ND	ND	detection
cis-1,2-dichloroethene	ND	ND	detection
Dibromomethane	ND	ND	detection
1,1-dichloropropene	ND	ND	detection
1,3-dichloropropane	ND	ND	detection
1,2,3-trichloropropane	ND	ND	detection
Chloroform	ND	ND	detection
Bromoform	ND	ND	detection
Bromochloromethane	ND	ND	detection
Dibromochloromethane	ND	ND	detection
p-xylene	ND	ND	detection
Methylene Chloride	ND	ND	detection
o-chlorotoluene	ND	ND	detection
p-chlorotoluene	ND	ND	detection
m-dichlorobenzene	ND	ND	detection
o-dichlorobenzene	ND	ND	detection
1,1-dichloroethane	ND	ND	detection
trans-1,2-dichloroethylene	ND	ND	detection
1,2-dichloropropane	ND	ND	detection
1,1,2-trichloroethane	ND	ND	detection
1,1,1,2-tetrachloroethane	ND	ND	detection
1,1,2,2-tetrachloroethane	ND	ND	detection
Chlorobenzene	ND	ND	detection
Toluene	ND	ND	detection

NOTES: * Sample does not meet SDWA requirementsas per EPA regulations
** Sample meets SDWA requirements, but other samples on monthly reports have failed this parameter
NA Data Not Available for this parameter
ND Substance was Not Detected in analysis

APPENDIX
(Continued)

SUBSTANCE	COLLIER CO.	GOLDEN GATE	SDWA-EPA REQ.
Ethylbenzene	ND	ND	detection
Bromobenzene	ND	ND	detection
m-xylene	ND	ND	detection
Styrene	ND	ND	detection
o-xylene	ND	ND	detection
Dalapon	ND	ND	detection
Oxyamyl	ND	ND	detection
Simazine	ND	ND	detection
Pinchloram	ND	ND	detection
Dinoseb	ND	ND	detection
Aldicarb Sulfoxide	ND	ND	detection
Aldicarb Sulfone	ND	ND	detection
Metolachlor	ND	ND	detection
Carbofuran	ND	ND	detection
Aldicarb	ND	ND	detection
Atrazine	ND	ND	detection
Alachlor (lasso)	ND	ND	detection
Heptachlor	ND	ND	detection
Aldrin	ND	ND	detection
Dieldrin	ND	ND	detection
Dicamba	ND	ND	detection
Chlordane	ND	ND	detection
Pentachlorophenol	ND	ND	detection
Hexachlorocyclopentadiene	ND	ND	detection
Dioxin	ND	ND	detection
Isophorone	ND	ND	detection
2,4-dinitrotoluene	ND	ND	detection
Dimethylphthalate	ND	ND	detection
Diethylphthalate	ND	ND	detection
Di-n-butylphthalate	ND	ND	detection
Butyl-benzyl-phthalate	ND	ND	detection
Bis(2-ethyexly)-phthalate	ND	ND	detection
1,2,4-trichlorobenzene	ND	ND	detection
PCB-1016	ND	ND	detection
PCB-1221	ND	ND	detection
PCB-1232	ND	ND	detection
PCB-1248	ND	ND	detection
PCB-1254	ND	ND	detection
PCB-1260	ND	ND	detection

NOTES: * Sample does not meet SDWA requirementsas per EPA regulations
** Sample meets SDWA requirements, but other samples on monthly reports have failed this parameter
NA Data Not Available for this parameter
ND Substance was Not Detected in analysis

APPENDIX
(Continued)

SUBSTANCE	COLLIER CO.	GOLDEN GATE	SDWA-EPA REQ.
Dioctylphthalate	ND	ND	detection
2-chlorophenol	ND	ND	detection
2 methyl-4,6-dinitrophenol	ND	ND	detection
Phenol	ND	ND	detection
2,4,6-trichlorophenol	ND	ND	detection
Gross Alpha(Radionucleide)	ND	6.5 pCi*	5.0 pCi

NOTES: * Sample does not meet SDWA requirementsas per EPA regulations
** Sample meets SDWA requirements, but other samples on monthly reports have failed this parameter
NA Data Not Available for this parameter
ND Substance was Not Detected in analysis

Envirolab, Inc.
1042 U.S. Highway 1 • P.O. Box 607
Ormond Beach, Florida 32174 • (904) 672-5668

Drinking Water Certification
HRS #83160

Environmental Certification
HRS #E83079

COLLIER COUNTY UTILITIES

2800 N. HORSESH OE DR.
NAPLES FL 33942
ATTN: JOHN AUGUSTINE

escription: 4 Samples Received on 10/18/90

Sampled By: CLIENT Client Job/PO Number: 100348

eference Number: 917934 Reported Date : 10/31/90
Invoice Number: 91-7934

mple	Description	Client Id
0001		LELY SALES CENTER
0002		810 GULF PAVILLION
0003		THE HAMMOCKS
0004		CAPRI FIRE DEPT.

PARAMETER		SAMPLE NUMBER 0001	0002	0003	0004
FILE: TRIHALOMETHANES					
BROMODICHLOROMETHANE	UG/L	2.6	2.4	2.6	3.5
BROMOFORM	UG/L	< 1	< 1	< 1	< 1
LOROFORM	UG/L	13.2	12.0	12.8	12.4
BROMOCHLOROMETHANE	UG/L	< 1	< 1	< 1	< 1
TOTAL TRIHALOMETHANE	UG/L	15.8	14.4	15.4	15.9

APPROVED BY:

Michael C. Price
Laboratory Manager

APPENDIX B

GEOLOGIST'S LOGS OF WELLS CO-2080 AND CO-2081

GEOLOGIST'S LOG OF WELL CO-2080

Depth (feet)	Description
0 - 5	Sandy soil, tan and brown, silty, common organics, occasional limestone fragments.
5 - 10	Sand, moderate brown 5YR 4/4, fine to medium grain, clayey, minor limestone fragments and organic material.
10 - 15	Sand, tan to light gray, fine, clayey, low to moderate permeability, common limestone fragments.
15 - 25	Limestone, light gray N-7, minor shell (bivalves), medium hard, moderate to high permeability.
25 - 30	Limestone, light gray N-7, medium hard, common shell, high permeability.
30 - 37	Limestone, light gray N-7, medium hard, abundant shell, moderate to high permeability.
37 - 43	Limestone, medium gray N-5, hard with a few soft lenses, abundant shell, moderate permeability.
43 - 60	Limestone, light gray N-7, medium hard, abundant shell-gastropods and bivalves, moderate permeability.
60 - 74	Limestone, pinkish gray 5YR 8/1, medium hard, common shell and fossil, moldic, vuggy.
74 - 84	Limestone, white N-9 to light gray N-7, sandy, soft to medium hard, common shell and fossil, moldic, vuggy.
84 - 94	Limestone, very pale orange 10YR 8/2, soft to medium hard, very sandy, casts and molds, occasional shell.
94 - 104	Limestone, very pale orange 10YR 8/2, soft to medium hard, sandy, casts and molds, common shell, finely phosphatic.

GEOLOGIST'S LOG OF WELL CO-2080
Continued:

Depth (feet)	Description
104 - 114	Limestone, very pale orange 10YR 8/2, soft, very sandy, occasional shell, finely phosphatic.
114 - 125	Limestone, very pale orange 10YR 8/2, medium hard, sandy, moldic, friable, occasional shell, finely phosphatic.
125 - 135	Limestone, very pale orange 10YR 8/2, soft to medium hard, sandy, occasional shell, finely phosphatic.
135 - 145	Limestone, yellowish gray 5Y 8/1, medium hard, sandy, common shell and fossil, casts and molds.
145 - 155	Limestone, medium dark gray N-4, hard, common shell, minor clay interbedding.
155 - 165	Limestone, medium gray N-5, medium hard, vuggy, common shell fragments, minor clay, minor coarse quartz sand.
165 - 175	Sandy limestone, pinkish gray 5YR 8/1, medium hard, common shell fragments, vuggy, casts and molds, common coarse quartz sand.
175 - 185	Sandy limestone, as above with abundant coarse quartz sand.
185 - 195	Limestone as above.
195 - 205	Limestone, medium gray N-5, medium hard, common shell and sand, common green clay.
205 - 215	Clay, grayish olive green 5GY 3/2, soft, minor shell and rock material.
215 - 225	Clay, as above.
225 - 235	Clay, grayish olives green 5GY 3/2, soft, minor shell and rock fragments.
235 - 249	Clay, grayish olive green 5GY 3/2, soft, fine phosphate interbedding, minor shell and rock fragments.

GEOLOGIST'S LOG OF WELL CO-2080
Continued:

Depth (feet)	Description
249 - 255	Clay, grayish olive green 5GY 3/2, soft, phosphatic, minor white phosphatic marl interbedded.
255 - 260	Clay, as above.
260 - 270	Clay, grayish blue green 5BG 5/2, finely phosphatic, common shell fragments, common coarse phosphate nodules.
270 - 280	Clay, pale blue 5B 6/2, soft, finely phosphatic, minor shell and coarse phosphate fragments.
280 - 290	Clay, pale blue 5B 6/2, soft, sticky, finely phosphatic, trace shell and coarse phosphate.
290 - 300	Clay, as above.
300 - 310	Limestone, white N-9 to light gray N-7, hard, well indurated, common shell fragments, casts and molds, finely phosphatic.
310 - 320	Limestone, as above but interbedded with minor soft clay.
320 - 330	Limestone, white N-9 to very pale orange 10YR 8/2, medium hard, phosphatic, moldic, occasional shell and fossil, minor clay.
330 - 340	Limestone, white N-9 to light gray N-7, medium hard, common shell and fossil, moldic, vuggy, finely phosphatic.
340 - 350	Limestone, white N-9 to very pale orange 10YR 8/2, soft to medium hard, sandy, phosphatic, occasional shell.
350 - 360	Limestone, white N-9 to very pale orange 10YR 8/2, soft to medium, sandy, finely phosphatic, occasional shell, moldic, vuggy, friable.

GEOLOGIST'S LOG OF WELL CO-2080
Continued:

Depth (feet)	Description
360 - 370	Limestone, very pale orange 10YR 8/2, medium hard, casts and molds, common shell and fossil, trace clay.
370 - 380	Limestone, as above.
380 - 390	Limestone, very pale orange 10YR 8/2, medium hard, moldic, vuggy, finely phosphatic, occasional shell and fossil, trace clay.
390 - 400	Limestone, very pale orange 10YR 8/2, medium hard, common shell and fossil, casts and molds, vuggy, finely phosphatic.
400 - 410	Limestone, very pale orange 10YR 8/2, soft to medium hard, friable, occasional shell and fossil, finely phosphatic, minor clay.
410 - 421	Limestone, very pale orange 10YR 8/2, soft to medium hard, occasional shell and fossil, finely phosphatic, trace clay.
421 - 432	Limestone, very pale orange 10YR 8/2, soft to medium hard, friable, sandy, occasional shell and fossil, moldic, finely phosphatic.
432 - 442	Limestone, as above with minor clay.
442 - 452	Limestone, very pale orange 10YR 8/2, medium hard, common shell, minor phosphate, common clay interbedded from 447-452.
452 - 462	Limestone, very pale orange 10YR 8/2, medium hard, common shell and fossil, marl and clay interbedded.
462 - 465	Limestone, very pale orange 10YR 8/2, medium hard, sandy, casts and molds, abundant shell.
465 - 475	Limestone, very pale orange, 10YR 8/2, medium hard to hard, moldic, common shell and fossil, minor well rounded elliptical quartz disks.

GEOLOGIST'S LOG OF WELL CO-2080
Continued:

Depth (feet)	Description
475 - 480	Limestone, very pale orange, 10YR 8/2, medium hard, well indurated, moldic, common shell and brachiopod, occasional conchoidal fracture.
480 - 490	Limestone, very pale orange, 10YR 8/2, medium hard, moldic, minor shell.
490 - 510	Limestone, very pale orange, 10YR 8/2, medium hard, moldic, vuggy, common shell, and fossil including coral and gastropods.
510 - 520	Limestone, as above.
520 - 530	Limestone, very pale orange, 10YR 8/2, medium hard to hard, occasional shell, minor gray phosphatic lime mud.
530 - 540	Limestone, as above.
540 - 545	Limestone, yellowish-gray, 5Y 7/2, soft, minor shell, common gray phosphatic lime mud.
545 - 550	Lime mud, very light gray, N-8, minor limestone interbedded.
550 - 555	Lime mud, light olive-gray, 5Y 6/1, partially lithified, finely phosphatic.
555 - 557	Lime mud, as above.
557 - 560	Limestone, white N-9, soft, finely phosphatic, minor calcitic shell, common lime mud interbedded.
560 - 565	Limestone and lime mud, as above, except with increasing phosphate.
565 - 580	Limestone, white N-9 to very pale orange, 10YR 8/2, medium hard to soft, occasional shell, minor phosphatic lime mud interbedded.
580 - 595	Limestone, very pale orange, 10YR 8/2, medium hard, finely phosphatic, minor shell and fossil.

GEOLOGIST'S LOG OF WELL CO-2080
Continued:

Depth (feet)	Description
595 - 617	Limestone, pinkish-gray, 5YR 8/1, soft to medium hard, minor shell.
617 - 620	Limestone, as above, except with minor amounts of phosphate nodules.
620 - 625	Lime mud, yellowish-gray, 5Y 8/1, phosphatic, partially lithified.
625 - 630	Lime mud, yellowish-gray, 5Y 8/1, phosphatic, minor limestone interbedded.
630 - 645	Lime mud, light olive-gray, 5Y 6/1, phosphatic, minor limestone interbedded.
645 - 650	Dolomite, light olive-gray, 5Y 5/2, hard, low apparent permeability, minor phosphate nodules.
650 - 655	Clay, light olive-gray, 5Y 6/1, soft, sticky, phosphatic, abundant limestone fragments.
655 - 660	Clay and limestone fragments, as above.
660 - 665	Limestone, very pale orange, 10YR 8/2, medium hard, casts and molds, fossiliferous, phosphatic.
665 - 670	Limestone, very pale orange, 10YR 8/2, medium hard, moldic, phosphatic, interbedded with common hard gray sucrosic dolomite.
670 - 675	Limestone, as above.
675 - 680	Limestone, very pale orange, 10YR 8/2, medium hard, moldic, finely phosphatic, minor shell fragments, common dolomite (hard, gray, crystalline).
680 - 685	Dolomite, pale yellowish-brown, 10YR 6/2, very hard, well indurated, crystalline, finely phosphatic, common limestone and shell fragments.

GEOLOGIST'S LOG OF WELL CO-2080
Continued:

Depth (feet)	Description
685 - 690	Dolomite, pale yellowish-brown, 10YR 6/2, hard, well indurated, common limestone and shell fragments.
690 - 695	Limestone, white N-9, hard, well indurated, moldic, common shell and fossil, minor dolomitization.
695 - 700	Limestone, as above.
700 - 705	Limestone, very pale orange, 10YR 8/2, medium hard, finely phosphatic, common dolomite interbedded.
705 - 711	Limestone and dolomite, as above.
711 - 716	Limestone, white N-9, soft to medium hard, slightly marly, interbedded with hard tan dolomite.
716 - 721	Limestone, very pale orange, 10YR 8/2, soft to medium hard, silty, finely phosphatic, minor dolomite.
721 - 726	Limestone, very pale orange, 10YR 8/2 to white N-9, medium hard, silty, moldic, vuggy, common shell and fossil, minor dolomite.
726 - 731	Limestone, very pale orange, 10YR 8/2, medium hard, phosphatic, sandy, casts and molds, minor shell and dolomite.
731 - 736	Limestone, as above.
736 - 743	Limestone, very pale orange, 10YR 8/2 to light gray N-7, medium hard, common white marl.
743 - 748	Limestone, very pale orange, 10YR 8/2, soft, sandy, friable, trace shell fragments.
748 - 753	Limestone, as above.

GEOLOGIST'S LOG OF WELL CO-2080
Continued:

Depth (feet)	Description
753 - 758	Limestone, very pale orange, 10YR 8/2 to light gray N-7, soft to medium hard, moldic, common shell, trace hard green dolomite.
758 - 763	Limestone, as above.
763 - 768	Limestone, very pale orange, 10YR 8/2, soft, sandy, moldic, occasional shell fragments.
768 - 774	Limestone, as above.
774 - 779	Limestone, very pale orange, 10YR 8/2, soft to medium hard, silty, moldic, minor shell and fossil.
779 - 784	Limestone, very pale orange, 10YR 8/2, soft, very silty, friable.
784 - 789	Limestone, as above.
789 - 794	Limestone, very pale orange, 10YR 8/2, soft to medium hard, very silty, friable, trace shell.
794 - 806	Limestone, as above.
806 - 811	Limestone, very pale orange, 10YR 8/2, soft, friable, silty, minor marl.
811 - 816	Limestone, as above, except no marl.
816 - 821	Limestone, very pale orange, 10YR 8/2, medium hard, well indurated, moldic, vuggy, silty, occasional shell and fossil.
821 - 837	Limestone, very pale orange, 10YR 8/2, soft to medium hard, silty, vuggy.
837 - 842	Limestone, very pale orange, 10YR 8/2, soft to medium hard, friable, very sandy/silty.
842 - 847	Limestone, as above.

GEOLOGIST'S LOG OF WELL CO-2080
Continued:

Depth (feet)	Description
847 - 852	Limestone, very pale orange, 10YR 8/2, medium hard to hard, well indurated, moldic, vuggy, occasional shell and fossil.
852 - 857	Limestone, pinkish-gray, 5YR 8/1, soft to medium hard, friable, sandy.
857 - 868	Limestone, as above.
868 - 873	Limestone, very pale orange, 10YR 8/2, soft to medium hard, sandy, casts and molds, minor shell.
873 - 883	Limestone, as above.
883 - 888	Limestone, pinkish-gray, 5YR 8/1, medium hard, moderately well indurated, sandy, casts and molds, minor shell.
888 - 893	Limestone, very pale orange, 10YR 8/2, soft, silty, friable.
893 - 900	Limestone, pinkish-gray, 5YR 8/1, soft to medium hard, sandy, moldic, occasional shell.
900 - 905	Limestone, pinkish-gray, 5YR 8/1, hard, well indurated, micritic matrix, minor shell fragments, trace clay.
905 - 910	Limestone, medium gray, N-5, medium hard, moderately well indurated, casts and molds, minor shell.
910 - 915	Limestone, very pale orange, 10YR 8/2, medium hard, silty, vuggy, minor shell and fossil.
915 - 920	Lime mud, very pale orange, 10YR 8/2, soft, common limestone, interbedded.
920 - 925	Limestone, pinkish-gray, 5YR 8/1, soft to medium hard, casts and molds, silty, minor shell and fossil.

GEOLOGIST'S LOG OF WELL CO-2080
Continued:

Depth (feet)	Description
925 - 932	Limestone, yellowish-gray, 5Y 8/1, medium hard, casts of molds, occasional shell.
932 - 937	Limestone, very pale orange, 10YR 8/2, soft, silty, friable, interbedded with occasional tan dolosilt.
937 - 942	Limestone, as above with only minor dolosilt.
942 - 947	Limestone, pinkish-gray, 5YR 8/1, medium hard, moldic, minor shell fragments, silty.
947 - 952	Limestone, very pale orange, 10YR 8/2, sandy, medium hard to soft, minor dolosilt.
952 - 957	Limestone, very pale orange, 10YR 8/2, sandy, medium hard, casts and molds, common shell and fossil.
957 - 963	Limestone, pinkish-gray, 5YR 8/1, sandy-silty, medium hard, casts and molds, vuggy, common shell and fossil.
963 - 968	Limestone, yellowish-gray, 5Y 8/1, soft to medium hard, moldic, vuggy, occasional shell and fossil, minor white phosphatic clay.
968 - 973	Limestone, pinkish-gray, 5YR 8/1, soft to medium hard, moldic, vuggy, occasional shell and fossil, minor white phosphatic clay.
973 - 978	Limestone, as above, with common shell and fossil and no clay.
978 - 980	Lime mud, pinkish-gray, 5YR 8/1, soft, common limestone fragments.
980 - 983	Dolomite, dusky yellow-green, 5GY 5/2, very hard, finely phosphatic, common limestone fragments.

GEOLOGIST'S LOG OF WELL CO-2080
Continued:

Depth (feet)	Description
983 - 988	Limestone, yellowish-gray, 5Y 8/1, medium hard, casts and molds, occasional shell and fossil, minor marl.
988 - 993	Limestone, light gray N-7 to medium gray, N-5, medium hard, moldic, vuggy, common shell and fossil.
993 - 998	Limestone, pinkish-gray, 5YR 8/1, medium hard, sandy, casts and molds, vuggy, common shell and fossil.
998 - 1003	Limestone, pinkish-gray, 5YR 8/1, medium hard, sandy, moldic, common shell and fossil, occasional white and gray clay.
1003 - 1008	Limestone, very pale orange 10YR 8/2, soft to medium hard, sandy, casts and molds, vuggy.
1008 - 1013	Limestone, pinkish-gray, 5YR 8/1, hard, well indurated, moldic, vuggy, common shell and fossil.
1013 - 1018	Limestone, as above.
1018 - 1024	Limestone, very pale orange, 10YR 8/2, sandy, soft to medium hard, casts and molds, minor shell fragments.
1024 - 1029	Limestone, as above.
1029 - 1034	Limestone, as above.
1034 - 1039	Limestone, medium gray, N-5, hard, well indurated, casts and molds, vuggy, common shell and fossil.
1039 - 1044	Limestone, multicolored, soft to medium hard, finely phosphatic, silty, minor clay, minor shell and fossil.
1044 - 1049	Limestone, very pale orange, soft to medium hard, sandy, silty, minor white clay, minor shell.

GEOLOGIST'S LOG OF WELL CO-2080
Continued:

Depth (feet)	Description
1049 - 1055	Limestone, medium gray, N-5, sandy, soft to medium hard, finely phosphatic, occasional shell.
1055 - 1060	Limestone, pinkish-gray, 5YR 8/1, soft to medium hard, very silty, finely phosphatic, occasional shell.
1060 - 1065	Limestone, light gray, N-7, soft to medium hard, silty, occasional shell, minor white phosphatic clay.
1065 - 1070	Limestone, as above, with occasional gray clay.
1070 - 1075	Limestone, multicolored, medium hard, minor fine phosphate, common shell and fossil.
1075 - 1080	Limestone, yellowish-gray, 5Y 8/1, medium hard, well indurated, casts and molds, vuggy, common shell and fossil.
1080 - 1087	Limestone, very pale orange, 10YR 8/2, medium hard to hard, moderately well indurated, sandy, moldic.
1087 - 1092	Limestone, very pale orange, 10YR 8/2, medium hard, very sandy (fine grained), finely phosphatic, minor shell.
1092 - 1097	Limestone, very pale orange, 10YR 8/2, soft to medium hard, sandy, moldic, vuggy, common shell and fossil.
1097 - 1102	Limestone, pinkish-gray, 5YR 8/1, medium hard, well indurated, moldic, abundant shell and fossil.
1102 - 1107	Limestone, as above.
1107 - 1112	Limestone, very pale orange, 10YR 8/2, medium hard, sandy, casts and molds, occasional shell and fossil.

GEOLOGIST'S LOG OF WELL CO-2080
Continued:

Depth (feet)	Description
1112 - 1118	Limestone, very pale orange, 10YR 8/2, soft to medium hard, sandy, moldic, occasional shell and fossil.
1118 - 1123	Limestone, pinkish-gray, 5YR 8/1, soft, sandy, friable, casts, occasional shell and fossil, minor fine phosphate.
1123 - 1128	Limestone, pinkish-gray, 5YR 8/1, soft, sandy, friable, slightly moldic, occasional shell and fossil, finely phosphatic.
1128 - 1133	Limestone, as above.
1133 - 1138	Limestone, very pale orange, 10RY 8/2, soft to medium hard, sandy, slightly moldic, occasional shell and fossil.
1138 - 1143	Limestone, as above.
1143 - 1148	Limestone, very pale orange, 10YR 8/2, medium hard, moderately well indurated, moldic, common shell and fossil, trace white clay.
1148 - 1153	Limestone, pinkish-gray, 5YR 8/1, medium hard, casts and molds, common shell and fossil.
1153 - 1158	Limestone, white, N-9, soft to medium hard, sandy, minor gray clay, minor shell fragments.
1158 - 1163	Limestone, as above.
1163 - 1168	Limestone, pinkish-gray, 5YR 8/1, soft to medium hard, sandy, minor shell, trace clay.
1168 - 1175	Limestone, very pale orange, 10YR 8/2, medium hard, casts and molds, vuggy, sandy, common shell and fossil.
1175 - 1180	Limestone, as above.

GEOLOGIST'S LOG OF WELL CO-2080
Continued:

Depth (feet)	Description
1180 - 1193	Limestone, very pale orange, 10YR 8/2, sandy, medium hard, slightly moldic, minor shell and gastropods, trace clay.
1193 - 1197	Limestone, pinkish-gray, 5YR 8/1, biomicritic, medium hard.
1197 - 1200	Limestone, as above, with dolomite lense.
1200 - 1210	Limestone, very pale orange, 10YR 8/2, soft to medium hard, casts and molds, minor gastropods.
1210 - 1218	Limestone, as above.
1218 - 1228	Limestone, very pale orange, 10YR 8/2, soft to medium hard, moldic, minor shell.
1228 - 1230	Limestone, very pale orange, 10YR 8/2, soft to medium hard, moldic, minor shell and fossil, minor white lime mud.
1230 - 1232	Limestone, very pale orange, 10YR 8/2, soft, minor shell and fossil, minor white lime mud.
1232 - 1238	Limestone, pinkish-gray, 5YR 8/1, soft to medium hard, moldic, finely phosphatic.
1238 - 1243	Limestone, very pale orange, 10YR 8/2, soft to medium hard, friable, casts and molds, minor crystalline shell.
1243 - 1252	Limestone, very pale orange, 10YR 8/2, medium hard, moderately well indurated, slightly moldic, minor fossil, minor white lime mud.
1252 - 1258	Limestone, very pale orange, 10YR 8/2, medium hard, moldic, minor crystalline shell and gastropods.
1258 - 1262	Limestone, as above.
1262 - 1270	Lime mud, light gray, N-7, partially lithified.

GEOLOGIST'S LOG OF WELL CO-2080
Continued:

Depth (feet)	Description
1270 - 1274	Limestone, very pale orange, 10YR 8/2, soft to medium hard, minor fossil, minor lime mud.
1274 - 1288	Limestone, very pale orange, 10YR 8/2, soft, silty, low apparent permeability.
1288 - 1290	Limestone, pinkish-gray, 5YR 8/1, soft, silty, slightly moldic.
1290 - 1298	Limestone, very pale orange, 10YR 8/2, soft, silty, casts and molds, minor gastropods.
1298 - 1305	Limestone, pinkish-gray, 5YR 8/1, soft, silty, low apparent permeability.
1305 - 1309	Lime mud, pinkish-gray, 5YR 8/1, partially lithified, low apparent permeability.
1309 - 1320	Limestone, very pale orange, 10YR 8/2, soft to medium hard, vuggy, minor shell and fossil.
1320 - 1332	Limestone, as above.
1332 - 1335	Dolomite, pale yellowish-brown, 10YR 6/2, very hard, well indurated, sucrosic texture.
1335 - 1342	Dolomite, pale yellowish-brown, 10YR 6/2, very hard, well indurated, interbedded with hard brown limestone.
1342 - 1345	Limestone, pale yellowish-brown, 10YR 6/2, medium hard, interbedded dolomite.
1345 - 1353	Dolomite, yellowish-gray, 5Y 7/2, hard, conchoidal fracture.
1353 - 1355	Dolomite, as above.
1355 - 1358	Dolomite, yellowish-gray, 5Y 7/2, hard, well indurated, occasional lime mud, minor fossil.

GEOLOGIST'S LOG OF WELL CO-2080
Continued:

Depth (feet)	Description
1358 - 1364	Dolomite, pale yellowish-brown, 10YR 6/2, hard, well indurated, minor limestone and lime mud.
1364 - 1368	Dolomite, dark yellowish-brown, 10YR 4/2, hard, sucrosic texture.
1368 - 1375	Dolomite, medium dark gray, N-4, hard, sucrosic texture, vuggy.
1375 - 1380	Dolomite, medium dark gray, N-4, very hard, well indurated, occasional limestone interbedded, minor echinoderm spines.
1380 - 1385	Limestone, white, N-9, medium hard, moldic, vuggy, occasional shell and fossil.
1385 - 1399	Limestone, light gray N-8 to white N-9, medium hard, moldic, vuggy, biomicritic, minor gray dolomite.
1399 - 1405	Limestone, pinkish-gray, 5YR 8/1, medium hard to hard, well indurated, casts and molds, occasional shell and fossil, trace hard gray dolomite.
1405 - 1410	Limestone, as above.
1410 - 1415	Limestone, very pale orange, 10YR 8/2, soft to medium hard, friable, silty, minor casts and shell molds, minor gray dolomite.
1415 - 1420	Limestone, very pale orange, 10YR 8/2, medium hard, moderately well indurated, moldic, vuggy, common shell and fossil.
1420 - 1425	Limestone, as above, with minor sucrosic dolomite.
1425 - 1430	Limestone, pinkish-gray, 5YR 8/1, medium hard, casts and molds, common shell and fossil, occasional gray sucrosic dolomite, interbedded.
1430 - 1435	Limestone, pinkish-gray, 5YR 8/1, hard, well indurated, casts and molds, common shell and fossil, minor dolomite.

GEOLOGIST'S LOG OF WELL CO-2080
Continued:

Depth (feet)	Description
1435 - 1440	Limestone, very pale orange, 10YR 8/2, soft to medium hard, friable, silty, common dolomite.
1440 - 1445	Limestone, as above.
1445 - 1450	Limestone, very pale orange, 10YR 8/2, medium hard, sandy, casts and shell molds, minor dolomite.
1450 - 1455	Limestone, pinkish-gray, 5YR 8/1, hard, moldic, occasional shell, minor dolomite.
1455 - 1462	Limestone, very pale orange, 10YR 8/2, soft to medium hard, friable, silty, minor shell, minor dolomite.
1462 - 1467	Limestone, as above.
1467 - 1472	Limestone, as above.
1472 - 1477	Limestone, very pale orange, 10YR 8/2, soft to medium hard, friable, silty, minor shell fragments, trace dolomite.
1477 - 1482	Limestone, as above.
1482 - 1487	Limestone, as above.
1487 - 1493	Limestone, very pale orange, 10YR 8/2, soft to medium hard, silty, friable, casts and shell molds, occasional gray sucrosic dolomite.
1493 - 1498	Limestone, as above.
1498 - 1503	Limestone, very pale orange, 10YR 8/2, soft to medium hard, friable, silty, minor shell fragments, minor gray dolomite.
1503 - 1508	Limestone, as above.
1508 - 1513	Limestone, as above.
1513 - 1518	Limestone, pinkish-gray, 5YR 8/1, soft to medium hard, friable, silty, minor shell, minor gray dolomite.

GEOLOGIST'S LOG OF WELL CO-2080
Continued:

Depth (feet)	Description
1518 - 1525	Limestone, as above.
1525 - 1530	Limestone, very pale orange, 10YR 8/2, soft to medium hard, friable, silty, occasional gray dolomite, minor shell.
1530 - 1535	Limestone, as above.
1535 - 1540	Limestone, very pale orange, 10YR 8/2, soft to medium hard, silty, common stiff white clay, trace dolomite fragments.
1540 - 1545	Limestone, very pale orange, 10YR 8/2, soft to medium hard, silty, friable, slightly moldic, minor shell and dolomite.
1545 - 1550	Limestone, as above.
1550 - 1556	Limestone, very pale orange, 10YR 8/2, soft to medium hard, friable, silty, minor shell fragments, trace dolomite.
1556 - 1561	Limestone, as above.
1561 - 1566	Limestone, very pale orange, 10YR 8/2, soft to medium hard, friable, silty, minor shell fragments, trace dolomite.
1566 - 1571	Limestone, as above.
1571 - 1576	Limestone, very pale orange, 10YR 8/2, soft to medium hard, friable, silty, casts and molds, common shell and fossil, trace dolomite.
1576 - 1581	Limestone, very pale orange, 10YR 8/2, soft to medium hard, friable, silty, minor shell fragments.
1581 - 1586	Limestone, as above.
1586 - 1591	Limestone, very pale orange, 10YR 8/2, soft to medium hard, friable, silty, minor shell, occasional gray sucrosic dolomite.
1591 - 1608	Limestone, as above.

GEOLOGIST'S LOG OF WELL CO-2081

Depth (feet)	Description
0 - 5	Limestone, grayish orange (10YR 7/4), very hard, well indurated, minor sand and organics, trace shell fragments.
5 - 9	Limestone, very pale orange (10YR 8/2), very hard, well indurated, minor shell fragments.
9 - 15	Limestone, pinkish gray (5YR 8/1), soft to medium hard, moldic, vuggy, common shell.
15 - 30	Marl, yellowish gray (5Y 8/1), soft, abundant shell.
30 - 40	Limestone, multicolored, medium hard, casts and molds, vuggy, common shell and fossil.
40 - 50	Limestone, yellowish gray (5Y 8/1), medium hard, vuggy, moldic, common shell and fossil.
50 - 60	Limestone, as above.
60 - 70	Limestone, very pale orange (10YR 8/2), hard, moderately well indurated, moldic common shell.
70 - 80	Limestone, very pale orange (10YR 8/2), hard, well indurated, minor shell.
80 - 90	Limestone, very pale orange (10YR 8/2), medium hard, moderately well indurated, slightly moldic, occasional shell fragments.
90 - 100	Limestone, as above.
100 - 110	Limestone, yellowish gray (5Y 7/2), medium hard, sandy, finely phosphatic, minor shell.
110 - 120	Limestone, as above.
120 - 130	Limestone, yellowish gray (5Y 8/1), soft to medium hard, friable, sandy, finely phosphatic, minor shell fragments.

GEOLOGIST'S LOG OF WELL CO-2081
Continued:

Depth (feet)	Description
130 - 140	Limestone, pinkish gray (5YR 8/1) to medium light gray (N-6), soft to medium hard, friable, finely phosphatic, sandy, occasional shell.
140 - 150	Limestone, multicolored, medium hard, sandy, occasional shell fragments.
150 - 155	Limestone, very pale orange (10YR 8/2), soft to medium hard, friable, silty, minor shell.
155 - 160	Limestone, very pale orange (10YR 8/2), soft to medium hard, friable, moldic, vuggy, occasional shell.
160 - 165	Limestone, as above.
165 - 170	Limestone, very pale orange (10YR 8/2) to pale brown (5YR 5/2), medium hard, casts and molds, common shell and fossil, minor clay.
170 - 175	Clay, pinkish-gray (5YR 8/1), soft, abundant coarse quartz sand, phosphatic, minor limestone fragments.
175 - 180	Clay, light olive-gray (5Y 6/1), soft, sticky, occasional shell and limestone fragments, minor phosphate grains.
180 - 190	Clay, as above.
190 - 200	Clay, olive-gray (5Y 4/2), soft, sticky, common shell and limestone, minor sand and phosphate.
200 - 205	Limestone, light olive-gray (5Y 6/1), medium hard, occasional quartz sand (coarse to pebble sizes), abundant green clay.
205 - 210	Clay, dark greenish-gray (5GY 4/1), soft, sticky, common shell and limestone fragments, occasional coarse quartz sand.
210 - 220	Clay, as above.

GEOLOGIST'S LOG OF WELL CO-2081
Continued:

Depth (feet)	Description
220 - 228	Clay, as above.
228 - 235	Limestone, yellowish-gray (5Y 7/2), medium hard, highly phosphatic, occasional clay, minor coarse quartz sand.
235 - 240	Clay, dark greenish-gray (5GY 4/1), soft, sticky, occasional limestone and shell fragments, phosphatic.
240 - 250	Clay, as above.
250 - 260	Clay, dark greenish-gray (5GY 4/1), soft, sticky, common fine phosphate, minor shell and rock fragments.
260 - 273	Clay, as above.
273 - 285	Clay, as above.
285 - 304	Limestone, yellowish-gray (5Y 8/1), medium hard, finely phosphatic, moldic, common shell and fossil (gastropods).
304 - 319	Limestone, as above.
319 - 334	Limestone, as above.
334 - 340	Limestone, yellowish-gray (5Y 8/1), hard, casts and molds, finely phosphatic, common shell and fossil.
340 - 350	Limestone, yellowish-gray (5Y 8/1), medium hard, occasional shell and fossil, minor clay.
350 - 366	Limestone, yellowish-gray (5Y 8/1), soft to medium hard, common shell fragments, trace clay.
366 - 382	Limestone, very pale orange (10YR 8/2), medium hard, casts and molds, common shell fragments.
382 - 398	Limestone, yellowish-gray (5Y 7/2), soft to medium hard, friable, finely phosphatic, occasional shell.

GEOLOGIST'S LOG OF WELL CO-2081
Continued:

Depth (feet)	Description
398 - 403	Limestone, as above.
403 - 408	Limestone, yellowish-gray (5Y 7/2), medium hard, finely phosphatic, occasional shell, minor marl.
408 - 414	Limestone, pinkish-gray (5YR 8/1), medium hard, moldic, common shell and fossil, finely phosphatic.
414 - 420	Limestone, pinkish-gray (5YR 8/1), medium hard, casts and molds, abundant shell, minor white phosphatic marl.
420 - 425	Lime mud, yellowish-gray (5Y 8/1), soft, finely phosphatic, occasional phosphate nodules, minor shell.
425 - 428	Dolomite, light olive-gray (5Y 6/1), hard, well indurated, occasional shell, minor phosphate, minor clay.
428 - 430	Clay, light olive-gray (5Y 5/2), soft, sticky, common limestone and shell fragments.
430 - 435	Limestone, yellowish-gray (5Y 7/2), hard, well indurated, moldic, common shell and fossil.
435 - 440	Limestone, very pale orange (10YR 8/2), medium hard, finely phosphatic, occasional shell and fossil.
440 - 445	Limestone, pinkish-gray (5YR 8/1), medium hard, casts and molds, common shell and fossil.
445 - 450	Limestone, yellowish-gray (5Y 7/2) to light olive-gray (5Y 5/2), hard, well indurated, moldic, vuggy, occasional shell.
450 - 460	Limestone, pinkish-gray (5YR 8/1), hard, well indurated, moldic, vuggy, common shell and fossil.

GEOLOGIST'S LOG OF WELL CO-2081
Continued:

Depth (feet)	Description
460 - 465	Limestone, as above.
465 - 470	Limestone, yellowish-gray (5Y 8/1), medium hard, casts and molds, common shell and fossil, finely phosphatic.
470 - 475	Limestone, as above.
475 - 480	Limestone, pinkish-gray (5YR 8/1), medium hard, casts and molds, common shell and fossil, trace fine phosphate.
480 - 485	Limestone, as above with minor lime mud.
485 - 492	Limestone, yellowish-gray (5Y 8/1), hard, well indurated, casts and molds, vuggy, common shell and fossil.
492 - 498	Limestone, pinkish-gray (5YR 8/1), medium hard, moldic, common shell and fossil, trace marl.
498 - 503	Limestone, very pale orange (10YR 8/2), medium hard, common shell, minor marl.
503 - 508	Limestone, pinkish-gray (5YR 8/1), soft to medium hard, slightly moldic, occasional white lime mud.
508 - 513	Limestone, yellowish-gray (5Y 8/1), medium hard, abundant phosphatic lime mud, minor shell.
513 - 518	Limestone, as above.
518 - 523	Clay, light olive-gray (5Y 5/2), stiff, finely phosphatic, common limestone and shell fragments.
523 - 528	Clay, as above with common phosphate nodules.
528 - 533	Limestone, white (N-9), medium hard, abundant white phosphatic lime mud, common shell, minor phosphate nodules.

GEOLOGIST'S LOG OF WELL CO-2081
Continued:

Depth (feet)	Description
533 - 538	Limestone, very pale orange (10YR 8/2) to dark gray (N-3), hard, well indurated, moldic, vuggy, phosphatic, common shell and fossil.
538 - 543	Limestone, yellowish-gray (5Y 8/1), medium hard, vuggy, phosphatic, common shell.
543 - 548	Limestone, very pale orange (10YR 8/2), soft to medium hard, casts, finely phosphatic, common shell.
548 - 555	Lime mud, yellowish-gray (5Y 8/1), soft, phosphatic, common limestone and shell fragments.
555 - 560	Limestone, yellowish-gray (5Y 8/1), medium hard, silty, minor shell.
560 - 565	Limestone, as above with common shell.
565 - 570	Limestone, very pale orange (10YR 8/2), hard, well indurated, moldic, vuggy, common shell and fossil.
570 - 575	Lime mud, yellowish-gray (5Y 7/2), soft, phosphatic, minor shell and limestone fragments.
575 - 580	Limestone, yellowish-gray (5Y 7/2), soft to medium hard, abundant phosphatic lime mud, common shell.
580 - 587	Clay, yellowish-gray (5Y 7/2), soft, sticky, common shell and limestone fragments.
587 - 592	Clay, as above.
592 - 597	Lime mud, white (N-9), soft, sticky, common shell and limestone fragments.
597 - 603	Clay, light olive-gray (5Y 6/1), soft, sticky, common shell and limestone fragments.

GEOLOGIST'S LOG OF WELL CO-2081
Continued:

Depth (feet)	Description
603 - 608	Clay, light olive-gray (5Y 5/2), soft, common phosphate nodules, occasional shell and limestone fragments.
608 - 613	Clay, as above.
613 - 618	Clay, dark greenish-gray (5GY 4/1), soft, sticky, minor shell and limestone fragments.
618 - 623	Limestone, pinkish-gray (5YR 8/1), medium hard, casts and molds, common shell and fossil.
623 - 628	Limestone, very pale orange (10YR 8/2), medium hard, moldic, vuggy, occasional shell, minor marl.
628 - 633	Limestone, yellowish-gray (5Y 8/1), medium hard, occasional shell, minor marl.
633 - 638	Clay, yellowish-gray (5Y 7/2), sticky, common shell and limestone fragments, minor fine phosphate.
638 - 643	Limestone, pinkish-gray (5YR 8/1), medium hard, casts and molds, finely phosphatic, minor shell.
643 - 648	Limestone, as above.
648 - 655	Limestone, yellowish-gray (5Y 7/2), hard, well indurated, micritic, trace shell fragments.
655 - 658	Limestone, pinkish-gray (5YR 8/1), hard, well indurated, casts and molds, common shell and fossil.
658 - 663	Limestone, as above.
663 - 668	Limestone, pinkish-gray (5YR 8/1), medium hard, slightly moldic, occasional shell and fossil.
668 - 673	Limestone, as above.

GEOLOGIST'S LOG OF WELL CO-2081
Continued:

Depth (feet)	Description
673 - 680	Limestone, yellowish-gray (5Y 8/1), medium hard, moldic, finely phosphatic, occasional recrystallized shell fragments.
680 - 685	Dolomite, light olive-gray (5Y 6/1), hard, well indurated, common shell and limestone fragments.
685 - 690	Limestone, white (N-9), medium hard, moldic, minor shell.
690 - 695	Dolomite, pale yellowish-brown (10YR 6/2), hard, well indurated, common shell and limestone fragments.
695 - 700	Dolomite, as above.
700 - 705	Dolomite, dark yellowish-brown (10YR 4/2), hard, well indurated, occasional shell and limestone fragments.
705 - 711	Limestone, very pale orange (10YR 8/2), medium hard, casts and molds, occasional shell.
711 - 716	Limestone, very pale orange (10YR 8/2), medium hard, moldic, occasional shell and fossil.
716 - 721	Limestone, very pale orange (10YR 8/2), medium hard, silty, casts and molds, minor shell.
721 - 726	Limestone, as above with occasional white lime mud.
726 - 731	Lime mud, white (N-9), soft, sticky, common shell and limestone fragments.
731 - 752	Lime mud, as above.
752 - 757	Dolomite, light olive-gray (5Y 5/2), hard, well indurated, common limestone and shell fragments.
757 - 761	Dolomite, as above.

GEOLOGIST'S LOG OF WELL CO-2081
Continued:

Depth (feet)	Description
761 - 763	Dolomite, dark yellowish-brown (10YR 4/2), hard, well indurated, casts, minor shell fragments.
763 - 765	Clay, white (N-9), soft, sticky, minor shell.
765 - 769	Limestone, very pale orange (10YR 8/2), soft to medium hard, friable, silty, vuggy, trace marl.
769 - 773	Clay, dark yellowish-brown (10YR 4/2), soft, minor shell and limestone fragments.
773 - 778	Limestone, very pale orange (10YR 8/2), soft to medium hard, friable, moldic, vuggy, sandy, minor shell.
778 - 783	Limestone, as above.
783 - 788	Clay, yellowish-gray (5Y 8/1), soft, sticky, minor limestone fragments, minor phosphate nodules.
788 - 805	Limestone, very pale orange (10YR 8/2), soft to medium hard, slightly moldic.
805 - 810	Limestone, very pale orange (10YR 8/2), soft to medium hard, moldic, vuggy, minor shell.
810 - 815	Lime mud, yellowish-gray (5Y 8/1), soft, interbedded with limestone.
815 - 820	Limestone, pinkish-gray (5YR 8/1), soft to medium hard, friable, sandy.
820 - 827	Limestone, white (N-9), hard, well indurated, silty.
827 - 830	Limestone, very pale orange (10YR 8/2), medium hard, sandy.
830 - 835	Limestone, pale yellowish-brown (10YR 6/2), medium hard, casts and molds, vuggy, very fossiliferous, occasional shell.

GEOLOGIST'S LOG OF WELL CO-2081
Continued:

Depth (feet)	Description
835 - 840	Limestone, very pale orange (10YR 8/2), soft to medium hard, friable, vuggy, casts.
840 - 845	Limestone, as above.
845 - 850	Limestone, very pale orange (10YR 8/2), soft to medium hard, friable, moldic, minor shell.
850 - 853	Lime mud, very pale orange (10YR 8/2), soft, sticky.
853 - 856	Lime mud, as above.
856 - 860	Clay, pale yellowish-brown (10YR 6/2), soft, sticky.
860 - 862	Clay, as above.
862 - 866	Limestone, very pale orange (10YR 8/2), medium hard, moldic, vuggy.
866 - 870	Limestone, yellowish-gray (5Y 8/1), soft, friable, minor shell.
870 - 873	Clay, light olive-gray (5Y 6/1), soft, sticky.
873 - 885	Clay, light olive-gray (5Y 6/1), soft, sticky, minor shell and limestone fragments.
885 - 888	Clay, light olive-gray (5Y 5/2), as above.
888 - 891	Limestone, very pale orange (10YR 8/2), medium hard, moldic, vuggy.
891 - 895	Clay, multicolored, soft, sticky, common shell and limestone fragments.
895 - 900	Limestone, very pale orange (10YR 8/2), soft to medium hard, friable, vuggy, sandy.
900 - 905	Limestone, very pale orange (10YR 8/2), medium hard, vuggy, common clay.

GEOLOGIST'S LOG OF WELL CO-2081
Continued:

Depth (feet)	Description
905 - 910	Limestone, very pale orange (10YR 8/2), soft to medium hard, friable, slightly, moldic, vuggy, sandy.
910 - 915	Limestone, very pale orange (10YR 8/2), soft to medium hard, friable, occasional white clay.
915 - 920	Limestone, very pale orange (10YR 8/2), medium hard, silty, casts, minor shell.
920 - 925	Limestone, yellowish-gray (5Y 8/1), soft to medium hard, vuggy, sandy.
925 - 931	Limestone, as above with minor white clay.
931 - 936	Clay, white (N-9), stiff.
936 - 941	Clay, as above.
941 - 946	Limestone, very pale orange (10YR 8/2), medium hard to hard, well indurated, moldic, vuggy, conchoidal fracture.
946 - 951	Limestone, very pale orange (10YR 8/2), soft to medium hard, friable, sandy, trace shell.
951 - 956	Limestone, as above.
956 - 961	Limestone, very pale orange (10YR 8/2), medium hard, casts and molds, vuggy.
961 - 966	Limestone, yellowish-gray (5Y 8/1), medium hard to hard, well indurated, casts and molds, minor shell.
966 - 971	Limestone, very pale orange (10YR 8/2), soft to medium hard, friable, silty, casts, vuggy.
971 - 976	Limestone, yellowish-gray (5Y 8/1), soft to medium hard, friable, casts and molds.
976 - 981	Limestone, very pale orange (10YR 8/2), medium hard to hard, well indurated, micritic, minor clay.

GEOLOGIST'S LOG OF WELL CO-2081
Continued:

Depth (feet)	Description
981 - 986	Limestone, very pale orange (10YR 8/2), soft to medium hard, friable, slightly moldic, trace shell.
986 - 993	Limestone, as above.
993 - 998	Limestone, very pale orange (10YR 8/2), soft to medium, silty, common clay.
998 - 1003	Limestone, very pale orange (10YR 8/2), soft to medium hard, friable, trace shell.
1003 - 1008	Limestone, as above.
1008 - 1013	Limestone, very pale orange (10YR 8/2), soft to medium hard, friable, casts and molds, silty.
1013 - 1018	Limestone, very pale orange (10YR 8/2), hard, well indurated, silty, minor shell.
1018 - 1025	Limestone, very pale orange (10YR 8/2), medium hard, casts and molds, silty, minor clay.
1025 - 1030	Limestone, very pale orange (10YR 8/2), hard well indurated, silty, minor shell, minor clay.
1030 - 1035	Limestone, very pale orange (10YR 8/2), medium hard, casts, occasional clay.
1035 - 1040	Limestone, very pale orange (10YR 8/2), soft to medium hard, friable, moldic, silty.
1040 - 1045	Limestone, very pale orange (10YR 8/2), soft to medium hard, friable, silty, casts, minor clay.
1045 - 1050	Limestone, very pale orange (10YR 8/2), medium hard, moderately well indurated, minor shell fragments, minor clay.
1050 - 1055	Limestone, very pale orange (10YR 8/2), medium hard, moldic, vuggy, common shell, minor clay.

GEOLOGIST'S LOG OF WELL CO-2081
Continued:

Depth (feet)	Description
1055 - 1060	Limestone, very pale orange (10YR 8/2), soft to medium hard, friable, sandy, minor shell.
1060 - 1065	Limestone, as above.
1065 - 1070	Limestone, very pale orange (10YR 8/2), hard, well indurated, casts and molds, minor shell.
1070 - 1075	Limestone, very pale orange (10YR 8/2), medium hard, silty, minor shell.
1075 - 1080	Limestone, very pale orange (10YR 8/2), soft to medium hard, friable, moldic, silty, common clay.
1080 - 1085	Limestone, very pale orange (10YR 8/2), soft to medium hard, friable, moldic, vuggy, sandy.
1085 - 1090	Limestone, yellowish-gray (5Y 8/1), medium hard, casts and molds, vuggy, minor shell.
1090 - 1095	Limestone, very pale orange (10YR 8/2), medium hard, casts and molds, minor shell.
1095 - 1100	Limestone, as above.
1100 - 1105	Limestone, very pale orange (10YR 8/2), medium hard, casts and molds, fossiliferous (forams).
1105 - 1110	Limestone, very pale orange (10YR 8/2), soft, silty, common clay.
1110 - 1117	Limestone, very pale orange (10YR 8/2), medium hard, casts and molds.
1117 - 1122	Limestone, very pale orange (10YR 8/2), soft to medium hard, friable, moldic, vuggy, sandy, minor shell fragments.
1122 - 1127	Limestone, very pale orange (10YR 8/2), medium hard, casts and molds, vuggy.
1127 - 1132	Limestone, very pale orange (10YR 8/2), soft to medium hard, friable, silty.

GEOLOGIST'S LOG OF WELL CO-2081
Continued:

Depth (feet)	Description
1132 - 1137	Limestone, pinkish-gray (5YR 8/1), soft to medium hard, friable, casts and molds, minor shell.
1137 - 1142	Limestone, as above.
1142 - 1148	Limestone, yellowish-gray (5Y 8/1), medium hard, slightly moldic, vuggy, occasional shell.
1148 - 1153	Limestone, yellowish-gray (5Y 8/1), medium hard, common white clay, minor shell.
1153 - 1160	Limestone, very pale orange (10YR 8/2), medium hard, casts and molds, common shell fragments.
1160 - 1163	Clay, very pale orange (10YR 8/2), firm, common limestone fragments.
1163 - 1168	Limestone, very pale orange (10YR 8/2), hard, well indurated, casts and molds, vuggy, common shell and fossil.
1168 - 1173	Limestone, as above.
1173 - 1178	Limestone, yellowish-gray (5Y 8/1) to black (N-1), hard, well indurated, moldic, vuggy, common shell and fossil.
1178 - 1188	Clay, yellowish-gray (5Y 8/1), soft, sticky, minor shell and limestone fragments.
1188 - 1193	Clay, as above, with large shell fragments.
1193 - 1208	Limestone, very pale orange (10YR 8/2), medium hard, sandy.
1208 - 1212	Sand, yellowish-gray (5Y 8/1), very fine to fine, well sorted, subangular.
1212 - 1216	Limestone, pale yellowish-brown (10YR 6/2), hard, well indurated, sandy, casts and molds, vuggy.

GEOLOGIST'S LOG OF WELL CO-2081
Continued:

Depth (feet)	Description
1216 - 1224	Sand, yellowish-gray (5Y 8/1), very fine to fine, well sorted, subangular.
1224 - 1228	Limestone, pale yellowish-brown (10YR 6/2), hard, well indurated, casts and molds, vuggy.
1228 - 1238	Limestone, as above, with trace black dolomite.
1238 - 1242	Limestone, very pale orange (10YR 8/2), soft to medium hard, friable, moldic, common white clay.
1242 - 1247	Limestone, very pale orange (10YR 8/2), hard, well indurated, sandy, minor shell.
1247 - 1252	Limestone, as above.
1252 - 1257	Limestone, light olive-gray (5Y 6/1), to very pale orange (10YR 8/2), hard, well indurated, moldic, vuggy, abundant shell and fossil.
1257 - 1262	Limestone, light olive-gray (5Y 6/1), medium hard, casts and molds, minor shell.
1262 - 1267	Limestone, very pale orange (10YR 8/2), hard, well indurated, moldic, occasional shell.
1267 - 1272	Limestone, very pale orange (10YR 8/2), hard, well indurated, casts and molds, vuggy, common shell and fossil.

GEOLOGIST'S LOG OF WELL CO-2081
Continued:

Depth (feet)	Description
1272 - 1277	Limestone, yellowish brown (10YR 5/2), hard, well indurated, casts and molds, vuggy.
1277 - 1282	Limestone, yellowish gray (5Y 8/1), hard, well indurated, moldic, vuggy.
1282 - 1287	Limestone, very pale orange (10YR 8/2), hard, well indurated, sandy, casts and molds.
1287 - 1292	Limestone, as above.
1292 - 1297	Limestone, very pale orange (10YR 8/2), medium hard, casts, sandy.
1297 - 1303	Limestone, very pale orange (10YR 8/2), soft to medium hard, friable, sandy.
1303 - 1308	Limestone, as above.
1308 - 1313	Limestone, as above.
1313 - 1318	Limestone, very pale orange (10YR 8/2), soft to medium hard, friable, sandy, minor shell fragments.
1318 - 1323	Limestone, as above.
1323 - 1328	Limestone, as above.
1328 - 1335	Limestone, very pale orange (10YR 8/2), medium hard, casts and molds, sandy, minor shell fragments.
1335 - 1340	Limestone, as above.
1340 - 1345	Limestone, very pale orange (10YR 8/2), soft to medium hard, friable, minor shell fragments.
1345 - 1351	Limestone, very pale orange (10YR 8/2), medium hard, minor casts and molds.
1351 - 1356	Limestone, as above except softer.
1356 - 1361	Limestone, as above.

GEOLOGIST'S LOG OF WELL CO-2081
Continued:

Depth (feet)	Description
1361 - 1366	Limestone, very pale orange (10YR 8/2), medium hard, sandy, trace shell.
1366 - 1371	Limestone, as above.
1371 - 1376	Limestone, very pale orange (10YR 8/2), soft to medium hard, friable, minor casts and molds.
1376 - 1381	Limestone, very pale orange (10YR 8/2), medium hard, slightly moldic, vuggy, trace shell.
1381 - 1387	Limestone, very pale orange (10YR 8/2), soft to medium hard, friable, minor shell casts.
1387 - 1393	Limestone, as above.
1393 - 1398	Limestone, very pale orange (10YR 8/2), soft, friable, minor shell fragments.
1398 - 1403	Limestone, very pale orange (10YR 8/2), hard, well indurated, casts and molds, vuggy.
1403 - 1408	Limestone, as above.
1408 - 1413	Limestone, as above.
1413 - 1418	Limestone, very pale orange (10YR 8/2), medium hard, silty, slightly moldic.
1418 - 1423	Limestone, as above.
1423 - 1429	Limestone, yellowish gray (5Y 8/1), medium hard, silty.
1429 - 1435	Limestone, yellowish gray (5Y 8/1), hard, vuggy, minor casts and molds.
1435 - 1440	Limestone, yellowish gray (5Y 8/1), hard, well indurated, vuggy, slightly moldic.
1440 - 1445	Limestone, as above.

GEOLOGIST'S LOG OF WELL CO-2081
Continued:

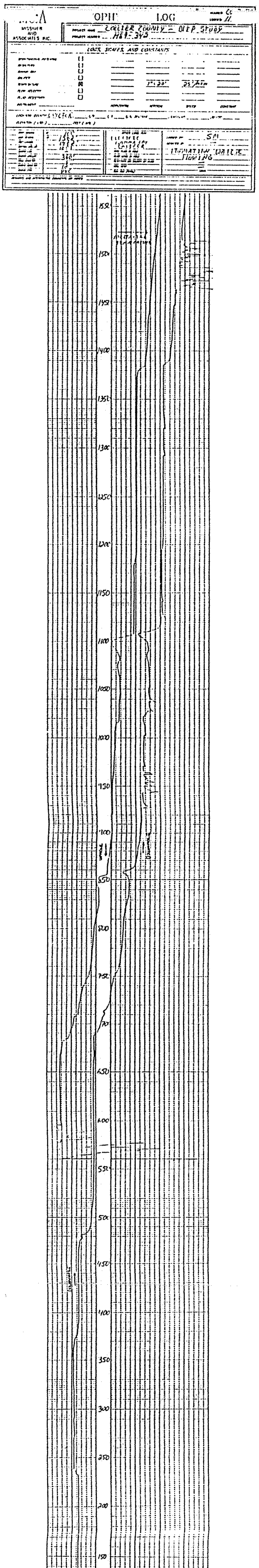
Depth (feet)	Description
1445 - 1450	Limestone, very pale orange (10YR 8/2), medium hard, silty, vuggy, slightly moldic.
1450 - 1455	Limestone, as above.
1455 - 1460	Limestone, as above.
1460 - 1465	Limestone, yellowish gray (5Y 8/1), medium hard, vuggy, casts and molds.
1465 - 1470	Limestone, very pale orange (10YR 8/2), medium hard, vuggy, casts and molds.
1470 - 1475	Limestone, as above.
1475 - 1480	Limestone, yellowish gray (5Y 8/1), soft to medium hard, friable, silty.
1480 - 1485	Limestone, very pale orange (10YR 8/2), soft to medium hard, friable, silty.
1485 - 1491	Limestone, as above.
1491 - 1496	Limestone, very pale orange, (10YR 8/2), medium hard, casts and molds, silty.
1496 - 1501	Limestone, as above.
1501 - 1506	Limestone, very pale orange (10YR 8/2), soft to medium hard, friable, silty.
1506 - 1511	Limestone, as above.
1511 - 1516	Limestone, as above.
1516 - 1521	Limestone, as above.
1521 - 1526	Limestone, very pale orange (10Yr 8/2), soft to medium hard, friable, silty, trace shell fragments.
1526 - 1531	Limestone, very pale orange (10YR 8/2), medium hard, moderately well indurated, casts and molds, vuggy.
1531 - 1536	Limestone, as above.

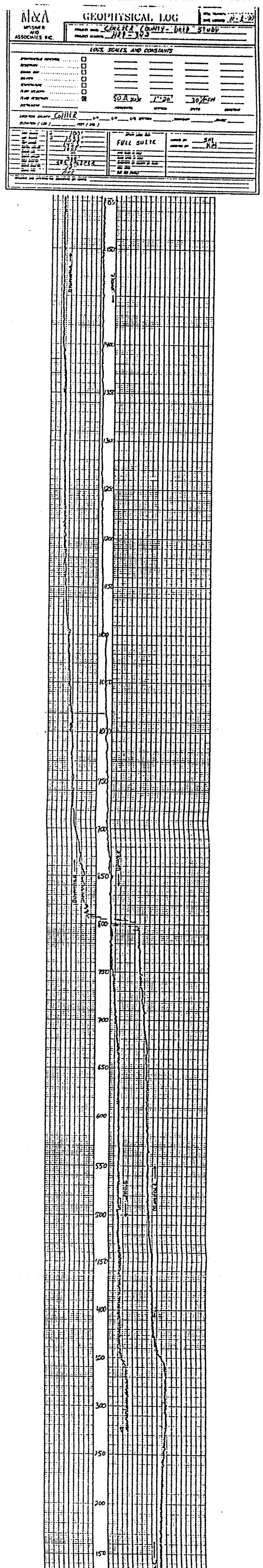
GEOLOGIST'S LOG OF WELL CO-2081
Continued:

Depth (feet)	Description
1536 - 1542	Limestone, very pale orange (10YR 8/2), soft to medium hard, friable, silty.
1542 - 1547	Limestone, as above.
1547 - 1553	Limestone, very pale orange (10YR 8/2), soft to medium hard, friable, silty, minor shell fragments.
1553 - 1558	Limestone, pale yellowish brown (10YR 7/2), soft to medium, friable, silty, common white forams.
1558 - 1563	Limestone, very pale orange (10YR 5/2), soft, poorly indurated, sandy, common shell fragments.
1563 - 1568	Limestone, as above.
1568 - 1573	Limestone, very pale orange (10YR 8/2), soft to medium hard, silty, common shell fragments.
1573 - 1578	Limestone, as above.
1578 - 1583	Limestone, as above.
1583 - 1588	Limestone, very pale orange (10YR 8/2), soft to medium hard, very silty, minor shell fragments.
1588 - 1593	Limestone, as above.
1593 - 1598	Limestone, very pale orange (10YR 8/2), medium hard, silty.
1598 - 1604	Limestone, as above.
1604 - 1610	Limestone, very pale orange (10YR 8/2), soft to medium hard, friable, silty, minor shell fragments.
1610 - 1616	Limestone, as above.

APPENDIX C

GEOPHYSICAL LOGS OF WELL CO-2080


MISSIMER AND ASSOCIATES INC.
LOG
COLLIER COUNTY - DEEP STUDY
LOGS, SCALES, AND CONSTANTS
1"=20'
25'/MIN
COLLIER
SM
FLOWING
PVC
1550
1500
1450
1400
1350
1300
1250
1200
1150
1100
1050
1000
950
900
850
800
750
700
650
600
550
500
450
400
350
300
250
200
150
100


M&A
GEOPHYSICAL LOG
MISSIMER AND ASSOCIATES INC.
COLLIER COUNTY - DEEP STUDY
LOGS, SCALES, AND CONSTANTS
1"=20'
30'/MIN
Collier
FULL SUITE
SM
KM
1500
1400
1350
1300
1250
1200
1150
1100
1000
950
900
850
800
750
700
650
600
550
500
450
400
350
300
250
200
150
100

M&A
MISSIMER AND ASSOCIATES INC.

GEOPHYSICAL LOG

PROJECT NAME COLLIER COUNTY - DEEP STUDY
PROJECT NUMBER 1189 - 343

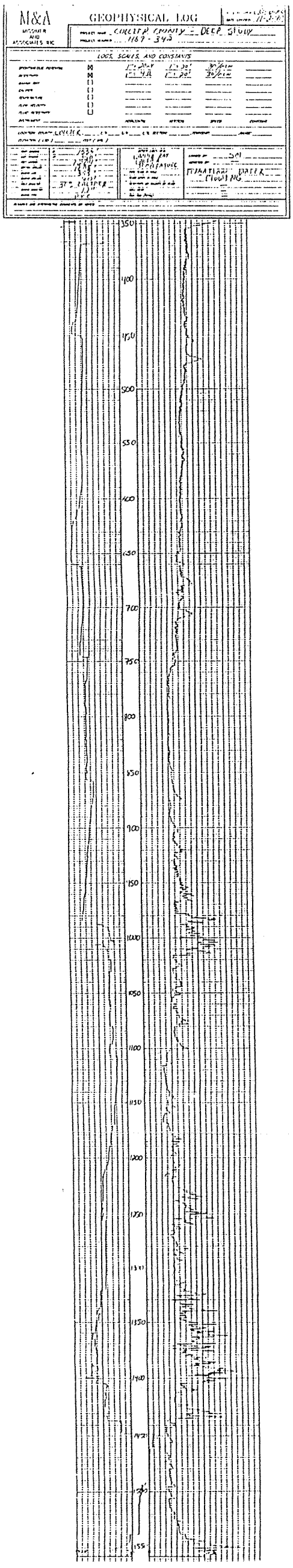
LOGS, SCALES AND CONSTANTS

SPONTANEOUS POTENTIAL	☐				
RESISTIVITY	☐				
GAMMA RAY	☐				
CALIPER	☐	SEE LOG	1"=50'	30/min	
TEMPERATURE	☐				
FLUID VELOCITY	☐				
FLUID RESISTIVITY	☐				
DATE RUN					

LOCATION: COUNTY COLLIER, ST, LAT, LONG, SECTION, TOWNSHIP, RANGE
ELEVATION (GL) PERMANENT DATUM

DEPTH DRILLER	1535 ft	ELECTRIC LOG MEASURED FROM	CASING
DEPTH LOGGER	1538 ft	DRILLING MEASURED FROM	CASING
BTM. LOG INTERVAL	1535 ft	CASING DRILLER	501
TOP LOG INTERVAL	SURFACE	CASING LOGGER	501
CASING DRILLER	30" @ 501	BOTTOM LOG INTERVAL	WATER
BIT SIZE	24"	TYPE FLUID IN HOLE	FLOWING
TYPE FLUID IN HOLE	SALT WATER	DENSITY	
DENSITY	10.1	VISCOSITY	
VISCOSITY	28	PH	
PH	7.0	FLUID LOSS	
FLUID LOSS	3.8 cc/30	SOURCE OF SAMPLE	
SOURCE OF SAMPLE	FLOWING	RM @ MEAS. TEMP.	
RM @ MEAS. TEMP.	.27 @ 72°	RMF @ MEAS. TEMP.	
RMF @ MEAS. TEMP.		RMC @ MEAS. TEMP.	
RMC @ MEAS. TEMP.		SOURCE RMF / RMC	
SOURCE RMF / RMC		RM @ BHT	
RM @ BHT		TIME SINCE CIRC.	
TIME SINCE CIRC.		MAX. REC. TEMP.	
MAX. REC. TEMP.		EQUIP. LOCATION	
EQUIP. LOCATION		RECORDED BY	
RECORDED BY		WITNESSED BY	
WITNESSED BY			

REMARKS OR OPERATING ENGINEER'S OPINION



M&A
MISSIMER AND ASSOCIATES INC.

GEOPHYSICAL LOG

PROJECT NAME COLLIER COUNTY - DEEP STUDY
PROJECT NUMBER 1189 - 343

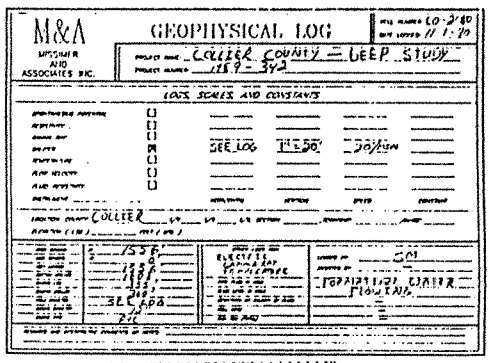
LOGS, SCALES AND CONSTANTS

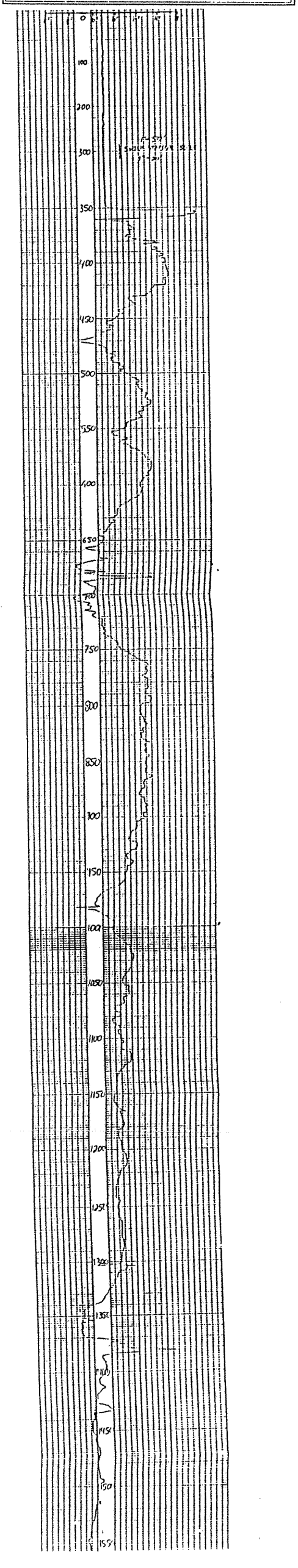
SPONTANEOUS POTENTIAL	☐				
RESISTIVITY	☐				
GAMMA RAY	☐				
CALIPER	☐	SEE LOG	1"=50'	30/min	
TEMPERATURE	☐				
FLUID VELOCITY	☐				
FLUID RESISTIVITY	☐				
DATE RUN					

LOCATION: COUNTY COLLIER, ST, LAT, LONG, SECTION, TOWNSHIP, RANGE
ELEVATION (GL) PERMANENT DATUM

DEPTH DRILLER	1535 ft	ELECTRIC LOG MEASURED FROM	CASING
DEPTH LOGGER	1538 ft	DRILLING MEASURED FROM	CASING
BTM. LOG INTERVAL	1535 ft	CASING DRILLER	501
TOP LOG INTERVAL	SURFACE	CASING LOGGER	501
CASING DRILLER	30" @ 501	BOTTOM LOG INTERVAL	WATER
BIT SIZE	24"	TYPE FLUID IN HOLE	FLOWING
TYPE FLUID IN HOLE	SALT WATER	DENSITY	
DENSITY	10.1	VISCOSITY	
VISCOSITY	28	PH	
PH	7.0	FLUID LOSS	
FLUID LOSS	3.8 cc/30	SOURCE OF SAMPLE	
SOURCE OF SAMPLE	FLOWING	RM @ MEAS. TEMP.	
RM @ MEAS. TEMP.	.27 @ 72°	RMF @ MEAS. TEMP.	
RMF @ MEAS. TEMP.		RMC @ MEAS. TEMP.	
RMC @ MEAS. TEMP.		SOURCE RMF / RMC	
SOURCE RMF / RMC		RM @ BHT	
RM @ BHT		TIME SINCE CIRC.	
TIME SINCE CIRC.		MAX. REC. TEMP.	
MAX. REC. TEMP.		EQUIP. LOCATION	
EQUIP. LOCATION		RECORDED BY	
RECORDED BY		WITNESSED BY	
WITNESSED BY			

REMARKS OR OPERATING ENGINEER'S OPINION





M&A
MISSIMER AND ASSOCIATES INC.

GEOPHYSICAL LOG

PROJECT NAME COLLIER COUNTY - DEEP STUDY
PROJECT NUMBER 1189 - 343

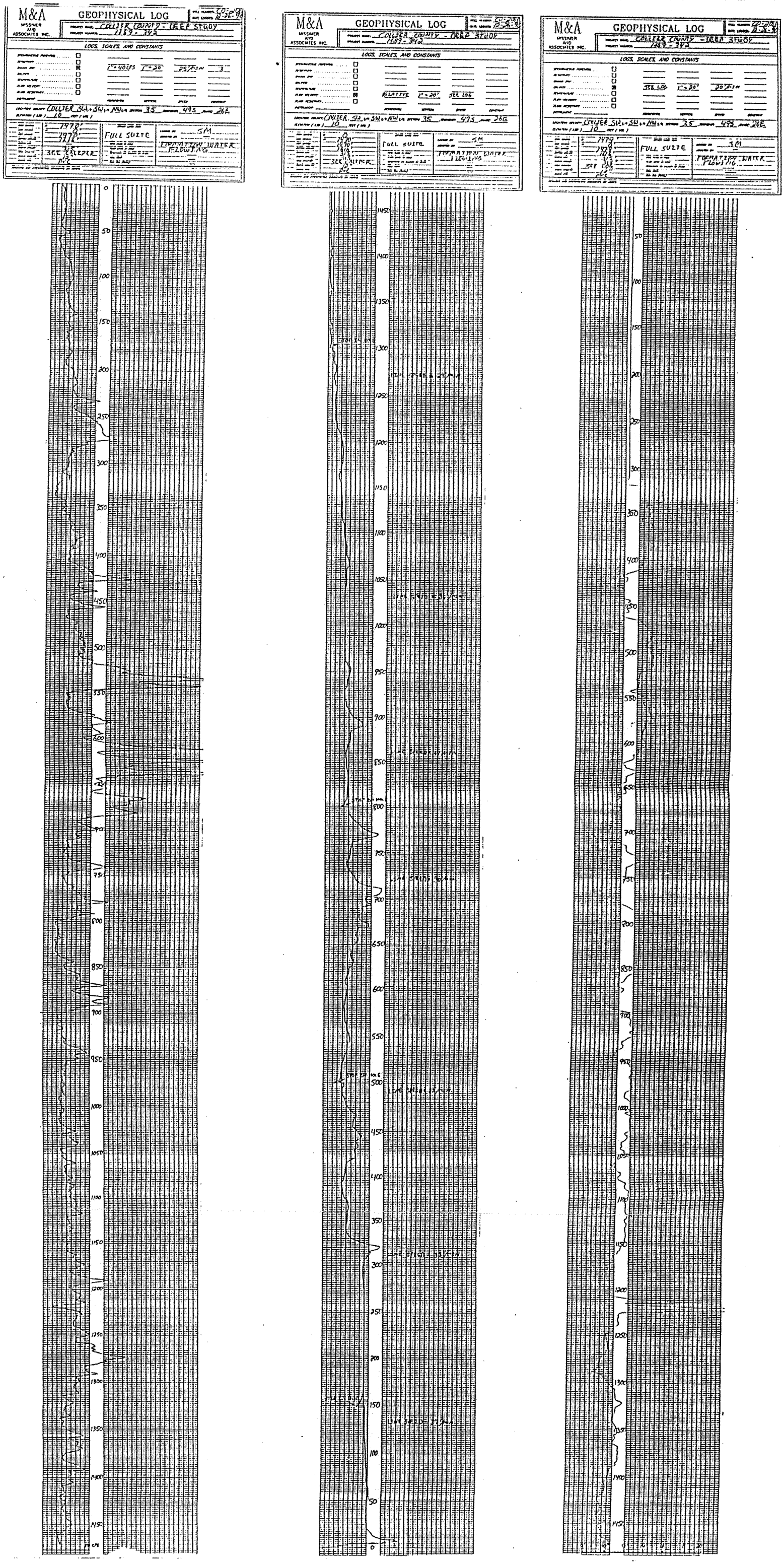
LOGS, SCALES AND CONSTANTS

SPONTANEOUS POTENTIAL	☐				
RESISTIVITY	☐				
GAMMA RAY	☐				
CALIPER	☐	SEE LOG	1"=50'	30/min	
TEMPERATURE	☐				
FLUID VELOCITY	☐				
FLUID RESISTIVITY	☐				
DATE RUN					

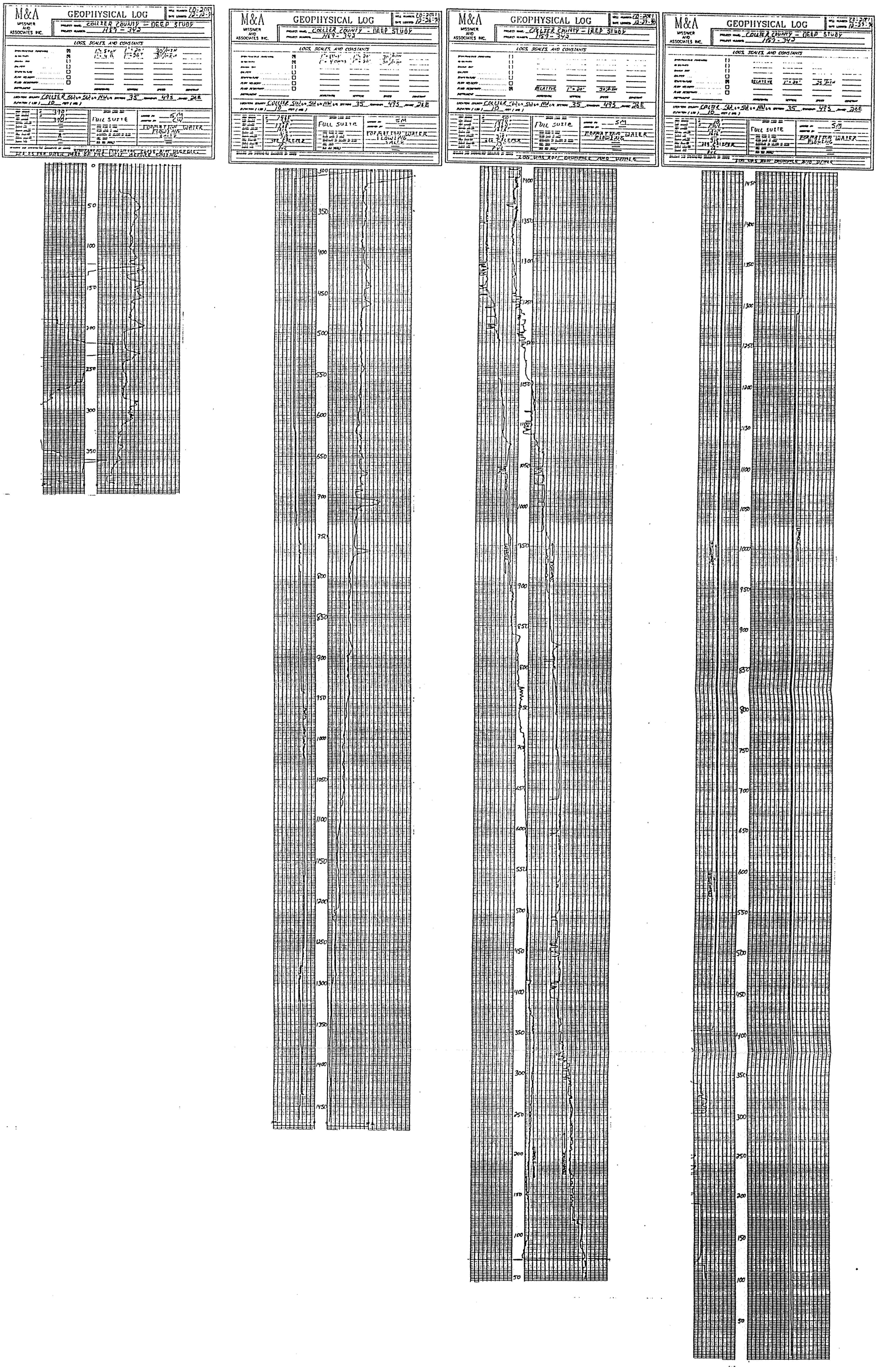
LOCATION: COUNTY COLLIER, ST, LAT, LONG, SECTION, TOWNSHIP, RANGE
ELEVATION (GL) PERMANENT DATUM

DEPTH DRILLER	1535 ft	ELECTRIC LOG MEASURED FROM	CASING
DEPTH LOGGER	1538 ft	DRILLING MEASURED FROM	CASING
BTM. LOG INTERVAL	1535 ft	CASING DRILLER	501
TOP LOG INTERVAL	SURFACE	CASING LOGGER	501
CASING DRILLER	30" @ 501	BOTTOM LOG INTERVAL	WATER
BIT SIZE	24"	TYPE FLUID IN HOLE	FLOWING
TYPE FLUID IN HOLE	SALT WATER	DENSITY	
DENSITY	10.1	VISCOSITY	
VISCOSITY	28	PH	
PH	7.0	FLUID LOSS	
FLUID LOSS	3.8 cc/30	SOURCE OF SAMPLE	
SOURCE OF SAMPLE	FLOWING	RM @ MEAS. TEMP.	
RM @ MEAS. TEMP.	.27 @ 72°	RMF @ MEAS. TEMP.	
RMF @ MEAS. TEMP.		RMC @ MEAS. TEMP.	
RMC @ MEAS. TEMP.		SOURCE RMF / RMC	
SOURCE RMF / RMC		RM @ BHT	
RM @ BHT		TIME SINCE CIRC.	
TIME SINCE CIRC.		MAX. REC. TEMP.	
MAX. REC. TEMP.		EQUIP. LOCATION	
EQUIP. LOCATION		RECORDED BY	
RECORDED BY		WITNESSED BY	
WITNESSED BY			

REMARKS OR OPERATING ENGINEER'S OPINION



GAMMA RAY, FLOW VELOCITY, AND CALIPER LOGS OF WELL CO-2081



ELECTRIC, TEMPERATURE, AND FLUID RESISTIVITY LOGS FOR WELL CO-2081

APPENDIX D

WATER QUALITY VS. DEPTH FOR WELLS CO-2080 AND CO-2081

REVERSE AIR SAMPLES
WATER QUALITY VARIATION WITH DEPTH
COLLIER COUNTY UTILITIES ASR TEST WELL CO-2080

Depth (feet)	Dissolved Chloride Concentration (mg/l)	Conductivity (umhos/cm)
460	2300	7090
470	2350	8000
480	2400	8010
490	2450	8010
500	2400	8010
310	2400	8010
520	2400	8010
530	2450	8010
540	2300	7800
550	2250	7090
560	2400	8010
570	2500	8030
580	2600	8050
590	2350	8010
600	2300	8000
610	2300	7090
620	2300	7090
630	2250	7090
640	2300	7080
650	2350	7080
660	2200	8000
670	2250	8000
680	2350	8100
690	2700	9700
700	2900	9900
710	3550	11100
720	3400	11000
730	3350	11000
740	3200	11000
750	4100	13500
760	3750	12500
770	3700	12000
780	3800	13500
790	4500	14100
800	4250	13100
810	3950	14000
820	4050	14000
830	4350	13900
840	4000	13500
850	4100	13100
860	4000	13500
870	4050	13800
880	4250	14100
890	4550	14200
900	4300	14100

TABLE

REVERSE AIR SAMPLES
WATER QUALITY VARIATION WITH DEPTH
COLLIER COUNTY UTILITIES ASR TEST WELL CO-2080
Continued:

Depth (feet)	Dissolved Chloride Concentration (mg/l)	Conductivity (umhos/cm)
910	4500	14100
920	4600	14000
930	4400	13900
940	4300	13900
950	4400	13500
960	4100	13500
970	3900	12900
980	4100	12800
990	3800	12000
1000	4300	13000
1010	4400	13500
1020	4700	14000
1030	4800	14900
1040	4400	14500
1050	4800	14000
1060	4500	14000
1070	5200	14000
1080	4700	14500
1090	4900	14500
1100	6500	20000
1110	6500	19100
1120	6900	18000
1130	6900	18000
1140	6300	19000
1150	5900	17900
1160	6200	19100
1170	6300	19000
1180	7000	20900
1190	6900	20300
1200	7000	20900
1210	6900	20300
1220	6700	20100
1230	6400	20100
1240	6300	19700
1250	6200	19100
1260	6000	18800
1270	6900	20900
1280	6100	19000
1290	5800	18000
1300	5700	17800
1310	5200	16400
1320	5100	16100
1330	5300	16900
1340	5800	17500
1350	4000	13100

TABLE

REVERSE AIR SAMPLES
WATER QUALITY VARIATION WITH DEPTH
COLLIER COUNTY UTILITIES ASR TEST WELL CO-2080
Continued:

Depth (feet)	Dissolved Chloride Concentration (mg/l)	Conductivity (umhos/cm)
1360	4200	13900
1370	8300	25000
1380	14500	40100
1390	13000	36200
1400	12200	34800
1410	13100	38900
1420	14400	43800
1430	16800	47800
1440	10100	29700
1450	10900	31000
1460	13200	39000
1470	14000	42200
1480	17400	52000
1490	15600	50000
1500	11700	32000
1510	15400	47600
1520	11300	36500
1530	9500	29100
1540	16600	49800
1550	13100	34800
1560	15200	41200
1570	15000	42000
1580	14400	42000
1590	14400	41800
1600	15200	41000
1610	16800	48000

REVERSE AIR SAMPLES
WATER QUALITY VARIATION WITH DEPTH
COLLIER COUNTY UTILITIES ASR TEST WELL CO-2081

Depth (feet)	Dissolved Chloride Concentration (mg/l)	Conductivity (umhos/cm)
335	2700	7500
345	2550	7200
355	2650	7200
366	2450	7100
376	2350	7000
386	2450	7200
398	2600	7400
408	2350	7200
420	2300	7100
430	2350	7000
440	2500	7200
450	2250	7000
460	2400	7200
470	2300	7100
480	2450	7100
492	2350	7000
503	2400	7000
513	2450	7100
523	2400	7000
533	2450	7000
543	2350	7100
555	2350	7200
565	2100	7100
575	2550	7100
587	2500	7200
597	2400	7200
608	2300	7000
618	2500	7200
628	2350	7000
638	2250	7200
648	2050	7000
658	2450	7000
663	2400	7100
668	2400	7000
680	2350	7000
690	2300	7000
695	2250	7200
711	2100	7000
721	2050	6500
731	2250	7000
742	2200	7100
752	2050	6500
773	2300	7200
783	2350	7000
788	2350	7200

REVERSE AIR SAMPLES
WATER QUALITY VARIATION WITH DEPTH
COLLIER COUNTY UTILITIES ASR TEST WELL CO-2081
Continued:

Depth (feet)	Dissolved Chloride Concentration (mg/l)	Conductivity (umhos/cm)
805	2375	7000
820	2250	7000
835	2100	7590
845	2200	7590
866	2100	7180
873	2050	6860
891	1900	6860
900	2050	6340
915	2000	6940
931	2000	6730
941	2050	6940
961	2000	6730
971	1900	6730
993	2050	6970
1003	2000	6430
1013	2000	7040
1025	2050	7380
1035	2150	7280
1045	2000	6970
1055	2100	7070
1065	2150	7180
1085	2300	7040
1095	2400	8110
1117	2450	8060
1132	2750	9080
1148	3350	10000
1160	3950	12060
1173	3600	11440
1178	4350	13000
1188	4200	13000
1208	5000	14280
1223	5250	15290
1242	4950	14870
1257	6100	17580
1272	6300	17680
1287	4800	15160
1303	5700	16430
1318	5100	15550
1335	5200	16020
1350	5700	16730
1366	5500	16730
1381	6650	19790
1396	5250	16520
1413	5200	16160
1428	4600	14380

REVERSE AIR SAMPLES
WATER QUALITY VARIATION WITH DEPTH
COLLIER COUNTY UTILITIES ASR TEST WELL CO-2081
Continued:

Depth (feet)	Dissolved Chloride Concentration (mg/l)	Conductivity (umhos/cm)
1453	5700	17280
1468	6500	19500
1483	7050	20400
1498	5950	18560
1513	6200	18380
1528	6850	20600
1543	6200	18970
1558	6650	19480
1573	8300	23460
1583	6500	19760
1598	7550	21940
1616	9100	26360

APPENDIX E

TIME AND HEAD DATA FOR WELL CO-2080 PACKER TESTS

WELL CO-2080
SINGLE PACKER TEST
ZONE TESTED: 360' TO 489'
FLOW THROUGH 2" METER

Q = 8 gpm thru 2"

2008
Environmental Logger
11/08 12:37
Q?
Unit# 00913 Test# 2

INPUT 2: Level (F) TOC

Reference	0.00
Scale factor	10.01
Offset	- 0.03

Step# 0 11/07 11:34

Elapsed Time	Value
0.0000	0.23
0.0033	0.22
0.0066	0.22
0.0099	0.23
0.0133	0.28
0.0166	0.88
0.0200	0.97
0.0233	0.96
0.0266	0.94
0.0300	0.92
0.0333	0.93
0.0500	5.61
0.0666	4.24
0.0833	3.66
0.1000	4.69
0.1166	4.81
0.1333	3.96
0.1500	4.38
0.1666	4.20
0.1833	4.13
0.2000	4.12
0.2166	4.41
0.2333	4.52
0.2500	4.73
0.2666	4.60
0.2833	4.65
0.3000	4.47
0.3166	4.98
0.3333	4.17
0.4167	4.83
0.5000	4.69
0.5833	5.04
0.6667	4.59
0.7500	4.27
0.8333	4.45
0.9167	4.30
1.0000	4.41
1.0833	4.33
1.1667	4.29
1.2500	4.66
1.3333	4.43
1.4166	4.34
1.5000	4.58
1.5833	4.35
1.6667	3.95
1.7500	4.10
1.8333	4.43
1.9167	4.39
2.0000	4.69
2.5000	4.24
3.0000	4.32
3.5000	4.46
4.0000	4.50
4.5000	4.20
5.0000	4.43
5.5000	4.15
6.0000	4.04
6.5000	4.59
7.0000	4.44
7.5000	4.50
8.0000	4.59
8.5000	4.78
9.0000	4.75
9.5000	4.19
10.0000	4.15
12.0000	4.67
14.0000	4.22
16.0000	4.19
18.0000	4.86
20.0000	4.47
22.0000	4.43
24.0000	4.00
26.0000	2.82
28.0000	2.90
30.0000	3.36
32.0000	3.38
34.0000	3.12
36.0000	3.16
38.0000	3.10
40.0000	3.50
42.0000	3.01
44.0000	3.25
46.0000	3.10
48.0000	3.09
50.0000	3.06
52.0000	3.07

END

Environmental Logger
11/08 12:40

Unit# 00913 Test# 2

Q = 6 gpm thru 2"

INPUT 2: Level (F) TOC

Reference	0.00
Scale factor	10.01
Offset	- 0.03

Step# 1 11/07 10:27

Elapsed Time	Value
0.0000	2.86
0.0033	2.17
0.0066	2.15
0.0099	2.09
0.0133	2.09
0.0166	2.07
0.0200	2.60
0.0233	2.21
0.0266	2.06
0.0300	2.12
0.0333	2.30
0.0500	2.96
0.0666	2.31
0.0833	2.06
0.1000	2.20
0.1166	2.22
0.1333	2.12
0.1500	2.09
0.1666	2.05
0.1833	2.12
0.2000	2.08
0.2166	2.40
0.2333	2.12
0.2500	2.23
0.2666	2.17
0.2833	2.30
0.3000	2.27
0.3166	2.30
0.3333	2.12
0.4167	2.08
0.5000	2.27
0.5833	2.24
0.6667	2.31
0.7500	2.33
0.8333	2.19
0.9167	2.17
1.0000	2.86
1.0833	2.66
1.1667	2.68
1.2500	2.21
1.3333	2.72
1.4166	2.30
1.5000	2.91
1.5833	2.76
1.6667	2.76
1.7500	2.85
1.8333	3.24
1.9167	2.57
2.0000	2.77
2.5000	2.82
3.0000	1.40
3.5000	1.18
4.0000	1.13
4.5000	1.38
5.0000	1.25
5.5000	0.99
6.0000	1.25
6.5000	1.21
7.0000	0.95
7.5000	1.34
8.0000	1.30
8.5000	1.32
9.0000	1.28
9.5000	1.14
10.0000	1.09
12.0000	1.20

END

WELL CO-2080
SINGLE PACKER TEST
ZONE TESTED: 360' TO 489'
FLOW THROUGH 6" ORIFICE

SE1000B
Environmental Logger
11/07 15:32

Unit# 00913 Test# 3

INPUT 2: Level (F) TOC

Reference	0.00
Scale factor	10.01
Offset	- 0.03

Step# 0 11/07 14:14

Elapsed Time	Value
0.0000	- 0.02
1.0000	0.52
2.0000	0.50
3.0000	0.47
4.0000	0.50
5.0000	0.48
6.0000	0.48
7.0000	0.53

END

SE1000B
Environmental Logger
11/07 15:33

Unit# 00913 Test# 3

INPUT 2: Level (F) TOC

Reference	0.00
Scale factor	10.01
Offset	- 0.03

Step# 1 11/07 14:21

Elapsed Time	Value
0.0000	0.51
1.0000	1.08
2.0000	1.16
3.0000	1.19
4.0000	1.27
5.0000	1.30
6.0000	1.37
7.0000	1.36
8.0000	1.39
9.0000	1.34
10.0000	1.39

END

SE1000B
Environmental Logger
11/07 15:34

Unit# 00913 Test# 3

INPUT 2: Level (F) TOC

Reference	0.00
Scale factor	10.01
Offset	- 0.03

Step# 2 11/07 14:32

Elapsed Time	Value
0.0000	1.36
1.0000	1.99
2.0000	2.13
3.0000	2.14
4.0000	2.20
5.0000	2.26
6.0000	2.30
7.0000	2.29
8.0000	2.22
9.0000	2.24
10.0000	2.24
11.0000	2.23
12.0000	2.18

END

SE1000B
Environmental Logger
11/07 15:35

Unit# 00913 Test# 3

INPUT 2: Level (F) TOC

Reference	0.00
Scale factor	10.01
Offset	- 0.03

Step# 3 11/07 14:44

Elapsed Time	Value
0.0000	2.21
1.0000	2.87
2.0000	3.01
3.0000	3.04
4.0000	3.15
5.0000	3.22
6.0000	3.19
7.0000	3.16
8.0000	3.14
9.0000	3.22
10.0000	3.17
11.0000	3.15
12.0000	3.24

END

SE1000B
Environmental Logger
11/07 15:36

Unit# 00913 Test# 3

INPUT 2: Level (F) TOC

Reference	0.00
Scale factor	10.01
Offset	- 0.03

Step# 4 11/07 14:56

Elapsed Time	Value
0.0000	3.20
1.0000	4.63
2.0000	4.65
3.0000	4.75
4.0000	4.77
5.0000	4.82
6.0000	4.82
7.0000	4.86
8.0000	4.88
9.0000	4.93
10.0000	4.91
11.0000	4.90
12.0000	4.87
13.0000	4.84
14.0000	4.88
15.0000	4.89

END

WELL CO-2080
DOUBLE PACKER TEST
ZONE TESTED: 670' TO 717'
PUMP THROUGH 2" METER

Environmental Logger
11/09 15:31

Unit# 00613 Test# 2

INPUT 2: Level (F) TOC

Reference	0.00
Scale factor	10.01
Offset	- 0.03

Step# 0 11/09 12:42

Elapsed Time	Value
0.0000	0.00
1.0000	1.52
2.0000	1.74
3.0000	1.74
4.0000	1.77
5.0000	1.81
6.0000	1.91
7.0000	1.86
8.0000	1.58
9.0000	1.69
10.0000	1.43
11.0000	1.36
12.0000	1.32
13.0000	1.20
14.0000	1.13
15.0000	1.09
16.0000	1.20
17.0000	1.19
18.0000	1.10
19.0000	1.09
20.0000	1.00
21.0000	0.98
22.0000	1.02
23.0000	0.96
24.0000	0.91
25.0000	0.87
26.0000	0.84
27.0000	0.75
28.0000	0.75
29.0000	0.77
30.0000	0.74
31.0000	0.66
32.0000	0.66
33.0000	0.65
34.0000	0.58
35.0000	0.56
36.0000	0.42
37.0000	0.47
38.0000	0.52
39.0000	0.48
40.0000	0.31

END

Q=43gpm

SE1000B
Environmental Logger
11/09 15:33

Unit# 00613 Test# 2

INPUT 2: Level (F) TOC

Reference	0.00
Scale factor	10.01
Offset	- 0.03

Step# 1 11/09 13:22

Elapsed Time	Value
0.0000	0.46
1.0000	2.37
2.0000	2.34
3.0000	2.36
4.0000	2.34
5.0000	2.38
6.0000	2.39
7.0000	2.34
8.0000	2.34
9.0000	2.37
10.0000	2.39
11.0000	2.36
12.0000	2.36
13.0000	2.40
14.0000	2.39
15.0000	2.36
16.0000	2.39
17.0000	2.34
18.0000	2.27
19.0000	2.34
20.0000	2.36
21.0000	2.38
22.0000	2.34
23.0000	2.30
24.0000	2.32
25.0000	2.29
26.0000	2.28
27.0000	2.27
28.0000	2.22
29.0000	2.25
30.0000	2.28

END

Q=64gpm

SE1000B
Environmental Logger
11/09 15:35

Unit# 00613 Test# 2

INPUT 2: Level (F) TOC

Reference	0.00
Scale factor	10.01
Offset	- 0.03

Step# 2 11/09 13:53

Elapsed Time	Value
0.0000	1.30
1.0000	4.13
2.0000	4.13
3.0000	4.06
4.0000	4.12
5.0000	4.13
6.0000	4.09
7.0000	4.14
8.0000	4.21
9.0000	4.20
10.0000	4.23
11.0000	4.19
12.0000	4.25
13.0000	4.17
14.0000	4.26
15.0000	4.24
16.0000	4.23
17.0000	4.22
18.0000	4.17
19.0000	4.28
20.0000	4.23
21.0000	4.24
22.0000	4.26
23.0000	4.22
24.0000	4.22
25.0000	4.27
26.0000	4.26
27.0000	4.20
28.0000	4.25
29.0000	4.21

END

80gpm

CONTINUATION OF 670' TO 717'
DOUBLE PACKER TEST

SE10008
Environmental Logger
11/09 15:07

Unit# 00810 Test# 2

INPUT 3: Level (F) TOC

Reference 0.00
Scale factor 10.81
Offset - 3.80

Step# 3 11/09 14:23

Elapsed Time	Value
0.0000	6.49
1.0000	6.11
2.0000	6.01
3.0000	6.06
4.0000	5.96
5.0000	6.00
6.0000	6.05
7.0000	6.12
8.0000	6.00
9.0000	6.01
10.0000	6.07
11.0000	6.09
12.0000	6.15
13.0000	6.07
14.0000	6.16
15.0000	6.08
16.0000	6.12
17.0000	6.12
18.0000	6.12
19.0000	6.15
20.0000	6.15
21.0000	6.08
22.0000	6.16
23.0000	6.17
24.0000	6.14
25.0000	6.13
26.0000	6.10
27.0000	6.10
28.0000	6.11
29.0000	6.10
30.0000	6.10

END

92 psi x 2.6

SE10008
Environmental Logger
11/09 15:38

Unit# 00810 Test# 2

INPUT 3: Level (F) TOC

Reference 0.00
Scale factor 10.81
Offset - 3.80

Step# 4 11/09 14:53

Elapsed Time	Value
0.0000	10.11
1.0000	10.19
2.0000	10.17
3.0000	10.16
4.0000	10.13
5.0000	10.19
6.0000	10.20
7.0000	10.24
8.0000	10.26
9.0000	10.30
10.0000	10.33
11.0000	10.29
12.0000	10.20
13.0000	10.25
14.0000	10.17
15.0000	10.17
16.0000	10.22
17.0000	10.28
18.0000	10.21
19.0000	10.28
20.0000	10.24
21.0000	10.16
22.0000	10.17
23.0000	10.23
24.0000	10.28
25.0000	10.22
26.0000	10.13
27.0000	10.20
28.0000	10.16
29.0000	10.22
30.0000	10.18

END

119 psi x 2.6

WELL CO-2080
DOUBLE PACKER TEST
ZONE TESTED: 975' TO 1023'
FLOW THROUGH 2" METER

SE10008
Environmental Logger
11/12 16:56

Unit# 0091J Test# 4

INPUT 2: Level (F) TOC

Reference actual 0.00
Scale factor 10.01
Offset - 0.03

Step# 3 11/12 17:07

Elapsed Time	Value
0.0000	- 0.04
1.0000	- 0.11
2.0000	- 0.07
3.0000	- 0.04
4.0000	- 0.24
5.0000	- 0.36
6.0000	- 0.35
7.0000	- 0.17
8.0000	- 0.44
9.0000	- 0.21
10.0000	- 0.05
11.0000	- 0.04
12.0000	- 0.05
13.0000	- 0.41
14.0000	- 0.40
15.0000	- 0.16
16.0000	- 0.34
17.0000	- 0.49

END

Flow 55 gpm

SE10008
Environmental Logger
11/12 16:57

Unit# 0091J Test# 4

INPUT 2: Level (F) TOC

Reference 0.00
Scale factor 10.01
Offset - 0.03

Step# 4 11/12 18:25

Elapsed Time	Value
0.0000	3.59
1.0000	4.05
2.0000	4.09
3.0000	4.15
4.0000	4.29
5.0000	4.11
6.0000	3.98
7.0000	3.98
8.0000	3.97
9.0000	4.08
10.0000	4.16
11.0000	4.07

END

59 gpm

SE10008
Environmental Logger
11/12 16:58

Unit# 0091J Test# 4

INPUT 2: Level (F) TOC

Reference 0.00
Scale factor 10.01
Offset - 0.03

Step# 5 11/12 18:38

Elapsed Time	Value
0.0000	4.39
1.0000	4.40
2.0000	4.42
3.0000	4.12
4.0000	4.79
5.0000	4.44
6.0000	4.42
7.0000	4.43
8.0000	4.37
9.0000	4.70
10.0000	4.38

END

Q=62 gpm

SE10008
Environmental Logger
11/12 17:09

Unit# 0091J Test# 4

INPUT 2: Level (F) TOC

Reference 0.00
Scale factor 10.01
Offset - 0.03

Step# 6 11/12 18:47

Elapsed Time	Value
0.0000	4.71
1.0000	5.24
2.0000	5.54
3.0000	5.39
4.0000	5.05
5.0000	5.29
6.0000	4.84
7.0000	5.50
8.0000	5.43
9.0000	5.26
10.0000	5.27
11.0000	5.86
12.0000	6.34
13.0000	6.01
14.0000	6.31
15.0000	5.90
16.0000	6.14
17.0000	6.24
18.0000	6.23
19.0000	6.11
20.0000	6.64
21.0000	6.16
22.0000	6.24
23.0000	6.99

END

70 gpm

WELL CO-2080
DOUBLE PACKER TEST
ZONE TESTED: 975' TO 1023'
PUMP THROUGH 2" METER

Environmental Logger
11/12 16:52

Unit# 00913 Test# 3

INPUT 2: Level (F) TOC

Reference 0.00
Scale factor 10.01
Offset - 0.03

Step# 0 11/12 17:19

Elapsed Time	Value
0.0000	0.01
1.0000	0.03
2.0000	0.09
3.0000	0.09
4.0000	0.02
5.0000	0.15
6.0000	- 0.16
7.0000	- 0.07
8.0000	- 0.15
9.0000	0.00
10.0000	- 0.06
11.0000	0.01
12.0000	- 0.06
13.0000	- 0.02
14.0000	- 0.06
15.0000	- 0.07
16.0000	- 0.07
17.0000	- 0.12

END

Pump 93 gpm

+9.02

SE10008
Environmental Logger
11/12 16:54

Unit# 00913 Test# 3

INPUT 2: Level (F) TOC

Reference 0.00
Scale factor 10.01
Offset - 0.03

Step# 1 11/12 17:37

Elapsed Time	Value
0.0000	- 0.11
1.0000	4.97
2.0000	5.00
3.0000	5.05
4.0000	5.10
5.0000	5.07
6.0000	5.04
7.0000	5.09
8.0000	4.99
9.0000	5.17
10.0000	5.34
11.0000	5.45
12.0000	5.73
13.0000	5.92
14.0000	6.06
15.0000	6.16
16.0000	6.09
17.0000	6.00
18.0000	6.01
19.0000	6.04
20.0000	6.10
21.0000	6.09
22.0000	6.02
23.0000	6.07
24.0000	6.09
25.0000	6.00
26.0000	6.02
27.0000	5.97
28.0000	6.06

END

119 gpm

SE10008
Environmental Logger
11/12 18:05

Unit# 00913 Test# 3

INPUT 2: Level (F) TOC

Reference 0.00
Scale factor 10.01
Offset - 0.03

Step# 2 11/12 18:05

Elapsed Time	Value
0.0000	3.90
1.0000	3.93
2.0000	3.85
3.0000	3.87
4.0000	3.81
5.0000	3.79
6.0000	3.81
7.0000	3.76
8.0000	3.72
9.0000	3.67
10.0000	3.66
11.0000	3.63
12.0000	3.66
13.0000	3.61
14.0000	3.54

END

+9.02

107 gpm

WELL CO-2080
DOUBLE PACKER TEST
ZONE TESTED: 1224' TO 1271'
PUMP THROUGH 2" METER

Environmental Logger
11/08 18:36

Unit# 00913 Test# 1

INPUT 2: Level (F) TOC

Reference	0.00
Scale factor	10.01
Offset	- 0.03

Step# 0 11/08 18:33

Elapsed Time	Value
0.0000	0.00
1.0000	2.66
2.0000	3.43
3.0000	3.50
4.0000	3.48
5.0000	3.47
6.0000	3.46
7.0000	3.36
8.0000	3.48
9.0000	3.28
10.0000	3.29
11.0000	3.19
12.0000	3.09
13.0000	3.08
14.0000	2.97
15.0000	2.97
16.0000	2.91
17.0000	2.87
18.0000	2.74
19.0000	2.69
20.0000	2.75
21.0000	2.79
22.0000	2.79
23.0000	2.79
24.0000	2.87
25.0000	2.88
26.0000	2.96
27.0000	3.17
28.0000	3.30
29.0000	3.15

END

Q=52

SE10008
Environmental Logger
11/08 18:38

Unit# 00913 Test# 1

INPUT 2: Level (F) TOC

Reference	0.00
Scale factor	10.01
Offset	- 0.03

Step# 1 11/08 17:02

Elapsed Time	Value
0.0000	3.06
1.0000	3.97
2.0000	3.93
3.0000	3.92
4.0000	4.91
5.0000	4.00
6.0000	4.01
7.0000	3.98
8.0000	3.97
9.0000	3.92
10.0000	3.94
11.0000	3.93
12.0000	3.86
13.0000	3.87
14.0000	3.82
15.0000	3.92
16.0000	3.91
17.0000	3.94
18.0000	3.90
19.0000	3.90
20.0000	3.93

END

Q=62

SE10008
Environmental Logger
11/08 18:39

Unit# 00913 Test# 1

INPUT 2: Level (F) TOC

Reference	0.00
Scale factor	10.01
Offset	- 0.03

Step# 2 11/08 17:22

Elapsed Time	Value
0.0000	3.97
1.0000	5.83
2.0000	5.71
3.0000	5.77
4.0000	6.12
5.0000	6.10
6.0000	5.98
7.0000	5.91
8.0000	5.92
9.0000	5.86
10.0000	5.84
11.0000	5.74
12.0000	5.74
13.0000	5.86
14.0000	5.88
15.0000	5.94
16.0000	5.89
17.0000	5.94
18.0000	5.96
19.0000	5.95
20.0000	6.05
21.0000	6.03
22.0000	6.02
23.0000	6.07
24.0000	6.05
25.0000	6.03

END

Q=77

SE10008
Environmental Logger
11/08 18:40

Unit# 00913 Test# 1

INPUT 2: Level (F) TOC

Reference	0.00
Scale factor	10.01
Offset	- 0.03

Step# 3 11/08 17:46

Elapsed Time	Value
Ready	
0.0000	6.19
1.0000	11.89
2.0000	11.79
3.0000	11.91
4.0000	11.80
5.0000	12.06
6.0000	12.48
7.0000	12.41
8.0000	12.38
9.0000	12.48
10.0000	12.50
11.0000	12.55
12.0000	12.64
13.0000	12.58
14.0000	12.62
15.0000	12.68
16.0000	12.77
17.0000	12.75
18.0000	12.84
19.0000	12.85
20.0000	12.90
21.0000	12.91
22.0000	12.95
23.0000	12.96
24.0000	12.95
25.0000	12.93
26.0000	13.09
27.0000	13.12
28.0000	13.12
29.0000	13.19
30.0000	13.16
31.0000	13.13
32.0000	13.11
33.0000	13.13
34.0000	13.08
35.0000	13.14
36.0000	13.12
37.0000	13.10
38.0000	13.05
39.0000	- 2.21
40.0000	- 0.42

END

Q=115

WELL CO-2080
SINGLE PACKER TEST
ZONE TESTED: 1345' TO 1608'
PUMP THROUGH 2" METER

Environmental Logger
11/06 11:15

Unit# 00913 Test# 1

INPUT 1: Level (F) TOC

Reference	0.00
Scale factor	10.01
Offset	- 0.03

Step# 0 11/06 10:23

Q = 110

Elapsed Time	Value
0.0000	[illegible]
0.0033	5.56
0.0066	6.31
0.0099	5.09
0.0133	6.63
0.0166	7.65
0.0200	6.87
0.0233	7.84
0.0266	8.94
0.0300	9.90
0.0333	9.97
0.0500	11.50
0.0666	13.17
0.0833	14.49
0.1000	16.08
0.1166	16.82
0.1333	17.43
0.1500	17.83
0.1666	18.03
0.1833	18.06
0.2000	17.69
0.2166	17.40
0.2333	16.99
0.2500	16.55
0.2666	16.14
0.2833	15.80
0.3000	15.43
0.3166	15.00
0.3333	14.78
0.4167	13.29
0.5000	13.07
0.5833	12.88
0.6667	13.14
0.7500	13.13
0.8333	13.13
0.9167	13.28
1.0000	13.20
1.0833	13.13
1.1667	13.37
1.2500	13.38
1.3333	13.06
1.4166	13.17
1.5000	13.21
1.5833	13.24
1.6667	13.16
1.7500	13.23
1.8333	13.20
1.9167	13.14
2.0000	13.08
2.5000	13.14
3.0000	13.25
3.5000	13.10
4.0000	12.76
4.5000	12.85
5.0000	12.23
5.5000	11.02
6.0000	19.60
6.5000	10.96
7.0000	[illegible]
7.5000	11.26
8.0000	10.43
8.5000	11.38
9.0000	12.08
9.5000	12.32
10.0000	12.70
12.0000	12.73
14.0000	12.70
16.0000	12.65
18.0000	12.79
20.0000	12.27
22.0000	12.25
24.0000	12.29
26.0000	12.15
28.0000	12.20
30.0000	6.88
32.0000	- 0.15
34.0000	0.08

END

Environmental Logger
11/06 15:07

Unit# 00913 Test# 0

Q = 113

INPUT 1: Level (F) TOC

Reference	0.00
Scale factor	10.01
Offset	- 0.03

Step# 0 11/06 13:24

Elapsed Time	Value
0.0000	- 0.00
0.0033	9.00
0.0066	- 0.00
0.0099	- 0.00
0.0133	12.33
0.0166	13.21
0.0200	- 0.61
0.0233	- 0.61
0.0266	9.78
0.0300	6.45
0.0333	- 0.61
0.0500	8.67
0.0666	9.86
0.0833	11.52
0.1000	13.72
0.1166	14.99
0.1333	16.03
0.1500	16.93
0.1666	17.47
0.1833	17.65
0.2000	17.76
0.2166	17.64
0.2333	17.50
0.2500	17.13
0.2666	16.82
0.2833	16.43
0.3000	16.03
0.3166	15.65
0.3333	15.26
0.4167	13.79
0.5000	13.06
0.5833	13.00
0.6667	13.21
0.7500	13.35
0.8333	13.46
0.9167	[illegible]
1.0000	13.66
1.0833	13.70
1.1667	13.72
1.2500	13.76
1.3333	13.73
1.4166	13.79
1.5000	13.80
1.5833	13.81
1.6667	13.84
1.7500	13.71
1.8333	13.77
1.9167	13.73
2.0000	13.76
2.5000	13.73
3.0000	13.74
3.5000	13.79
4.0000	13.73
4.5000	13.74
5.0000	13.60
5.5000	13.59
6.0000	13.54
6.5000	13.61
7.0000	13.49
7.5000	13.45
8.0000	13.39
8.5000	13.45
9.0000	13.59
9.5000	13.54
10.0000	13.47
12.0000	13.41
14.0000	13.35
16.0000	13.43
18.0000	13.38
20.0000	13.40
22.0000	13.38
24.0000	13.45
26.0000	13.42
28.0000	13.38
30.0000	13.41
32.0000	13.36
34.0000	13.38
36.0000	13.46
38.0000	13.43
40.0000	13.35
42.0000	13.34
44.0000	13.32
46.0000	13.38
48.0000	13.32
50.0000	13.38
52.0000	13.29
54.0000	13.26
56.0000	13.26
58.0000	13.24
60.0000	13.29
62.0000	13.30
64.0000	13.16
66.0000	13.28
68.0000	13.16
70.0000	13.22
72.0000	13.19
74.0000	13.19
76.0000	13.14
78.0000	13.17
80.0000	13.20
82.0000	13.20
84.0000	13.21
86.0000	13.12
88.0000	13.17
90.0000	13.15

END

WELL CO-2081
SINGLE PACKER TEST
ZONE TESTED: 315' TO 460'
FLOW THROUGH 2" METER

SE10008
Environmental Logger
12/28 14:38

Unit# 00913 Test# 0

INPUT 1: Level (F)

Reference	0.00
Scale factor	10.01
Offset	- 0.03

Step# 0 12/28 13:01

Elapsed Time	Value
0.0000	0.00
1.0000	- 0.24
2.0000	- 0.24
3.0000	- 0.24
4.0000	- 0.24
5.0000	- 0.24
6.0000	- 0.24
7.0000	- 0.24
8.0000	- 0.24

Q= 24 gpm

END

SE10008
Environmental Logger
12/28 14:27

Unit# 00913 Test# 0

INPUT 1: Level (F)

Reference	0.00
Scale factor	10.01
Offset	- 0.03

Step# 2 12/28 13:21

Elapsed Time	Value
0.0000	- 0.39
1.0000	- 0.54
2.0000	- 0.54
3.0000	- 0.54
4.0000	- 0.55
5.0000	- 0.54
6.0000	- 0.55
7.0000	- 0.55
8.0000	- 0.55
9.0000	- 0.54
10.0000	- 0.55
11.0000	- 0.55

Q= 57 gpm

END

SE10008
Environmental Logger
12/28 13:09

Unit# 00913 Test# 0

INPUT 1: Level (F)

Reference	0.00
Scale factor	10.01
Offset	- 0.03

Step# 1 12/28 13:09

Elapsed Time	Value
0.0000	- 0.24
1.0000	- 0.41
2.0000	- 0.41
3.0000	- 0.42
4.0000	- 0.42
5.0000	- 0.41
6.0000	- 0.42
7.0000	- 0.42
8.0000	- 0.41
9.0000	- 0.41
10.0000	- 0.40
11.0000	- 0.39

Q=42 gpm

END

SE10008
Environmental Logger
12/28 13:25

Unit# 00913 Test# 0

INPUT 1: Level (F)

Reference	0.00
Scale factor	10.01
Offset	- 0.03

Step# 3 12/28 13:33

Elapsed Time	Value
0.0000	- 0.56
1.0000	- 0.85
2.0000	- 0.86
3.0000	- 0.87
4.0000	- 0.88
5.0000	- 0.90
6.0000	- 0.91
7.0000	- 0.92
8.0000	- 0.94
9.0000	- 0.94
10.0000	- 0.96
11.0000	- 0.96
12.0000	- 0.97
13.0000	- 0.97
14.0000	- 0.97
15.0000	- 0.96
16.0000	- 0.97

Q=77 gpm

END

SE10008
Environmental Logger
12/28 14:24

Unit# 00913 Test# 0

INPUT 1: Level (F)

Reference	0.00
Scale factor	10.01
Offset	- 0.03

Step# 4 12/28 13:49

Elapsed Time	Value
0.0000	- 0.96
1.0000	- 1.66
2.0000	- 1.87
3.0000	- 1.89
4.0000	- 1.91
5.0000	- 1.93
6.0000	- 1.94
7.0000	- 1.95
8.0000	- 1.97
9.0000	- 1.98
10.0000	- 1.97
11.0000	- 1.96
12.0000	- 2.00
13.0000	- 2.00
14.0000	- 2.01
15.0000	- 2.01
16.0000	- 2.01
17.0000	- 2.02
18.0000	- 2.01
19.0000	- 2.04
20.0000	- 2.04
21.0000	- 2.05
22.0000	- 2.05
23.0000	- 2.07
24.0000	- 2.07
25.0000	- 2.07
26.0000	- 2.08
27.0000	- 2.15

Q=128 gpm

END

WELL CO-2081
SINGLE PACKER TEST
ZONE TESTED: 315' TO 665'
FLOW THROUGH 2" METER

SE'0008
Environmental Logger
01/02 11:43

Unit# 00810 Test# 0

INPUT 1: Level (Ft) TOC

Reference	0.00
Scale factor	10.01
Offset	- 0.03

Step# 0 01/02 11:29

Elapsed Time	Value
0.2300	0.48
1.2000	0.58
2.2000	0.59
3.2000	0.60
4.2000	0.61
5.2000	0.60
6.2000	0.61
7.2000	0.61
8.2000	0.60
9.2000	0.60
10.2000	0.60
11.2000	0.60
12.2000	0.57
13.2000	0.58
14.2000	0.58
15.2000	0.58
16.2000	0.58
17.2000	0.60

END

Q=45 gpm

SE'0008
Environmental Logger
01/02 15:43

Unit# 00810 Test# 0

INPUT 1: Level (Ft) TOC

Reference	0.00
Scale factor	10.01
Offset	- 0.03

Step# 1 01/02 11:47

Elapsed Time	Value
0.0000	0.96
1.2000	1.46
2.2000	1.50
3.2000	1.50
4.2000	1.52
5.2000	1.52
6.2000	1.56
7.2000	1.58
8.2000	1.61
9.2000	1.62
10.2000	1.63
11.2000	1.63
12.2000	1.65
13.2000	1.66
14.2000	1.70
15.2000	1.73
16.2000	1.74
17.2000	1.76
18.2000	1.77
19.2000	1.79
20.2000	1.80
21.2000	1.84
22.2000	1.86
23.2000	1.86
24.2000	1.87
25.2000	1.88
26.2000	1.87
27.2000	1.89
28.2000	1.88
29.2000	1.89
30.2000	1.92
31.2000	1.91
32.2000	1.92

END

Q=84 gpm

CONTINUATION OF 315' TO 665'
SINGLE PACKER TEST
FLOW THROUGH 6" X 4" ORIFICE WEIR

SE1000B
Environmental Logger
31/02 16:40

Unit# 03913 Test# 0

INPUT 1: Level (F) TOC

Reference 0.00
Scale factor 13.01
Offset - 3.82

Step# 3 31/02 12:20

Elapsed Time	Value
0.0000	5.26
1.0000	5.29
2.0000	5.31
3.0000	5.32
4.0000	5.37
5.0000	5.39
6.0000	5.41
7.0000	5.43
8.0000	5.42
9.0000	5.44
10.0000	5.39
11.0000	5.46
12.0000	5.44
13.0000	5.45
14.0000	5.41
15.0000	5.41
16.0000	5.44
17.0000	5.46
18.0000	5.42
19.0000	5.44
20.0000	5.45
21.0000	5.46
22.0000	5.46
23.0000	5.46
24.0000	5.47
25.0000	5.44
26.0000	5.47
27.0000	5.46
28.0000	5.48
29.0000	5.51

END

Q=180 gpm

SE1000B
Environmental Logger
31/02 16:39

Unit# 03913 Test# 0

INPUT 1: Level (F) TOC

Reference 0.00
Scale factor 13.01
Offset - 3.82

Step# 3 31/02 12:49

Elapsed Time	Value
0.0000	7.99
1.0000	8.07
2.0000	8.29
3.0000	8.30
4.0000	8.31
5.0000	8.39
6.0000	8.39
7.0000	8.46
8.0000	8.44
9.0000	8.45
10.0000	8.48
11.0000	8.48
12.0000	8.47
13.0000	8.46
14.0000	8.46
15.0000	8.45
16.0000	8.46
17.0000	8.44
18.0000	8.46
19.0000	8.29
20.0000	8.22
21.0000	8.23
22.0000	8.28
23.0000	8.27
24.0000	8.25
25.0000	8.26
26.0000	8.25
27.0000	8.29
28.0000	8.28
29.0000	8.29
30.0000	8.27
31.0000	8.30
32.0000	8.34
33.0000	8.34
34.0000	8.31
35.0000	8.30
36.0000	8.33
37.0000	8.35
38.0000	8.33
39.0000	8.36
40.0000	8.32
41.0000	8.17

END

Q=257 gpm

Step# 4 31/02 13:31

Elapsed Time	Value
0.0000	11.25
1.0000	13.68
2.0000	13.70
3.0000	13.70
4.0000	13.76
5.0000	13.76
6.0000	13.78
7.0000	13.77
8.0000	13.80
9.0000	13.82
10.0000	13.85
11.0000	13.84
12.0000	13.84
13.0000	13.85
14.0000	13.89
15.0000	13.90
16.0000	13.91
17.0000	13.93
18.0000	13.94
19.0000	13.96
20.0000	13.98
21.0000	13.99
22.0000	14.01
23.0000	14.03
24.0000	14.04
25.0000	14.06
26.0000	14.09
27.0000	14.12
28.0000	14.13
29.0000	14.16
30.0000	14.18
31.0000	14.19
32.0000	14.23
33.0000	14.25
34.0000	14.25
35.0000	14.27
36.0000	14.30
37.0000	14.33
38.0000	14.32
39.0000	14.35
40.0000	14.38
41.0000	14.40
42.0000	14.44
43.0000	14.43
44.0000	14.46
45.0000	14.47
46.0000	14.49
47.0000	14.50
48.0000	14.52
49.0000	14.52
50.0000	14.53
51.0000	14.53
52.0000	14.56
53.0000	14.54
54.0000	14.55
55.0000	14.57
56.0000	14.56
57.0000	14.56

END

Q=318 gpm

WELL CO-2081
SINGLE PACKER TEST
ZONE TESTED: 940' TO 1033'
PUMP THROUGH 2" METER

SE1000B
Environmental Logger
01/09 16:17

Unit# 00913 Test# 2

INPUT 1: Level (F) TOC

Reference	0.00
Scale factor	10.01
Offset	- 0.03

Step# 0 01/09 13:00

Elapsed Time	Value
0.0000	-0.00
2.0000	3.57
4.0000	3.56
6.0000	3.55
8.0000	3.48
10.0000	3.60

Q=46gpm flow
actual d.d.

SE1000B
Environmental Logger
01/09 16:18

Unit# 00913 Test# 2

INPUT 1: Level (F) TOC

Reference	0.00
Scale factor	10.01
Offset	- 0.03

Step# 1 01/09 13:11

Elapsed Time	Value
0.0000	3.44
2.0000	3.69
4.0000	3.77
6.0000	3.73
8.0000	3.80
10.0000	3.63

Q=55gpm flow
actual d.d.

SE1000B
Environmental Logger
01/09 16:19

Unit# 00913 Test# 3

INPUT 1: Level (F) TOC

Reference	0.00
Scale factor	10.01
Offset	- 0.03

Step# 1 01/09 14:02

Elapsed Time	Value
0.0000	6.46
2.0000	1.12
4.0000	1.14
6.0000	0.91
8.0000	0.96
10.0000	1.00
12.0000	0.95

Q=86gpm pump
d.d. + 11.9

SE1000B
Environmental Logger
01/09 16:19

Unit# 00913 Test# 3

INPUT 1: Level (F) TOC

Reference	0.00
Scale factor	10.01
Offset	- 0.03

Step# 0 01/09 13:48

Elapsed Time	Value	
0.0000	2.48	Q=109gpm pump
2.0000	6.82	
4.0000	6.63	
6.0000	6.61	
8.0000	6.51	
10.0000	6.50	
12.0000	6.53	
14.0000	6.55	+ 11.9

SE1000B
Environmental Logger
01/09 16:20

Unit# 00913 Test# 3

INPUT 1: Level (F) TOC

Reference	0.00
Scale factor	10.01
Offset	- 0.03

Step# 2 01/09 14:14

Elapsed Time	Value	
0.0000	0.96	Q=112gpm pump
2.0000	7.65	
4.0000	7.59	
6.0000	7.73	
8.0000	7.65	
10.0000	7.64	
12.0000	7.61	+ 11.9

WELL CO-2081
SINGLE PACKER TEST
ZONE TESTED: 1288' TO 1616'
PUMP THROUGH 2" METER
6" FLOW LINE OPEN - 825 GPM FLOW

SE10008
Environmental Logger
01/03 13:12

Unit# 00513 Test# 3

INPUT 1: Level (F) TOC

Reference 0.00
Scale factor 10.01
Offset - 0.03

Step# 3 01/03 13:26

Elapsed Time	Value
0.0000	4.06
1.0000	3.62
2.0000	4.03
3.0000	4.45
4.0000	4.95
5.0000	5.35
6.0000	5.90
7.0000	6.38
8.0000	6.74
9.0000	7.21
10.0000	7.65
11.0000	8.13
12.0000	8.51
13.0000	9.03
14.0000	9.36
15.0000	9.85
16.0000	10.26
17.0000	10.74
18.0000	11.13
19.0000	11.34
20.0000	11.17
21.0000	11.19
22.0000	11.17
23.0000	11.22
24.0000	11.26
25.0000	11.26
26.0000	11.29
27.0000	11.24
28.0000	11.23
29.0000	11.25
30.0000	11.28
31.0000	11.22
32.0000	11.24

END

Q=41 gpm

SE10009
Environmental Logger
01/03 14:13

Unit# 00513 Test# 3

INPUT 1: Level (F) TOC

Reference 0.00
Scale factor 10.01
Offset - 0.03

Step# 1 01/03 12:59

Elapsed Time	Value
0.0000	13.20
1.0000	16.28
2.0000	16.08
3.0000	15.95
4.0000	15.74
5.0000	15.61
6.0000	15.41
7.0000	15.25
8.0000	15.05
9.0000	14.91
10.0000	14.69
11.0000	14.50
12.0000	14.33
13.0000	14.18
14.0000	14.04
15.0000	14.00
16.0000	13.97
17.0000	13.92
18.0000	13.93
19.0000	13.93
20.0000	13.91
21.0000	13.92
22.0000	13.90
23.0000	13.92
24.0000	13.93
25.0000	13.96
26.0000	13.92
27.0000	13.92
28.0000	13.92
29.0000	13.96
30.0000	13.95
31.0000	13.99
32.0000	13.94

END

Q=72 gpm

SE10008
Environmental Logger
01/03 14:12

Unit# 00513 Test# 3

INPUT 1: Level (F) TOC

Reference 0.00
Scale factor 10.01
Offset - 0.03

Step# 2 01/03 13:32

Elapsed Time	Value
0.0000	14.32
1.0000	16.84
2.0000	16.79
3.0000	16.73
4.0000	16.69
5.0000	16.61
6.0000	16.55
7.0000	16.49
8.0000	16.50
9.0000	16.42
10.0000	16.38
11.0000	16.31
12.0000	16.35
13.0000	16.34
14.0000	16.32
15.0000	16.32
16.0000	16.32

END

Q=87 gpm

Step# 3 01/03 13:48

Elapsed Time	Value
0.0000	16.31
1.0000	19.13
2.0000	19.14
3.0000	19.15
4.0000	19.15
5.0000	19.14
6.0000	19.14
7.0000	19.14
8.0000	19.15
9.0000	19.16
10.0000	19.14
11.0000	19.14
12.0000	19.14
13.0000	19.15
14.0000	19.15
15.0000	19.15
16.0000	19.15

END

Q=104 gpm