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ENGINEERING REPORT

RESULTS OF DRILLING AND TESTING FLORIDAN AQUIFER WATER SUPPLY WELLS FOR THE CITY OF CAPE CORAL, FLORIDA

Project No. 212-7504-5

April, 1976

BLACK, CROW AND EIDSNESS, INC.

Engineers

Gainesville, Florida

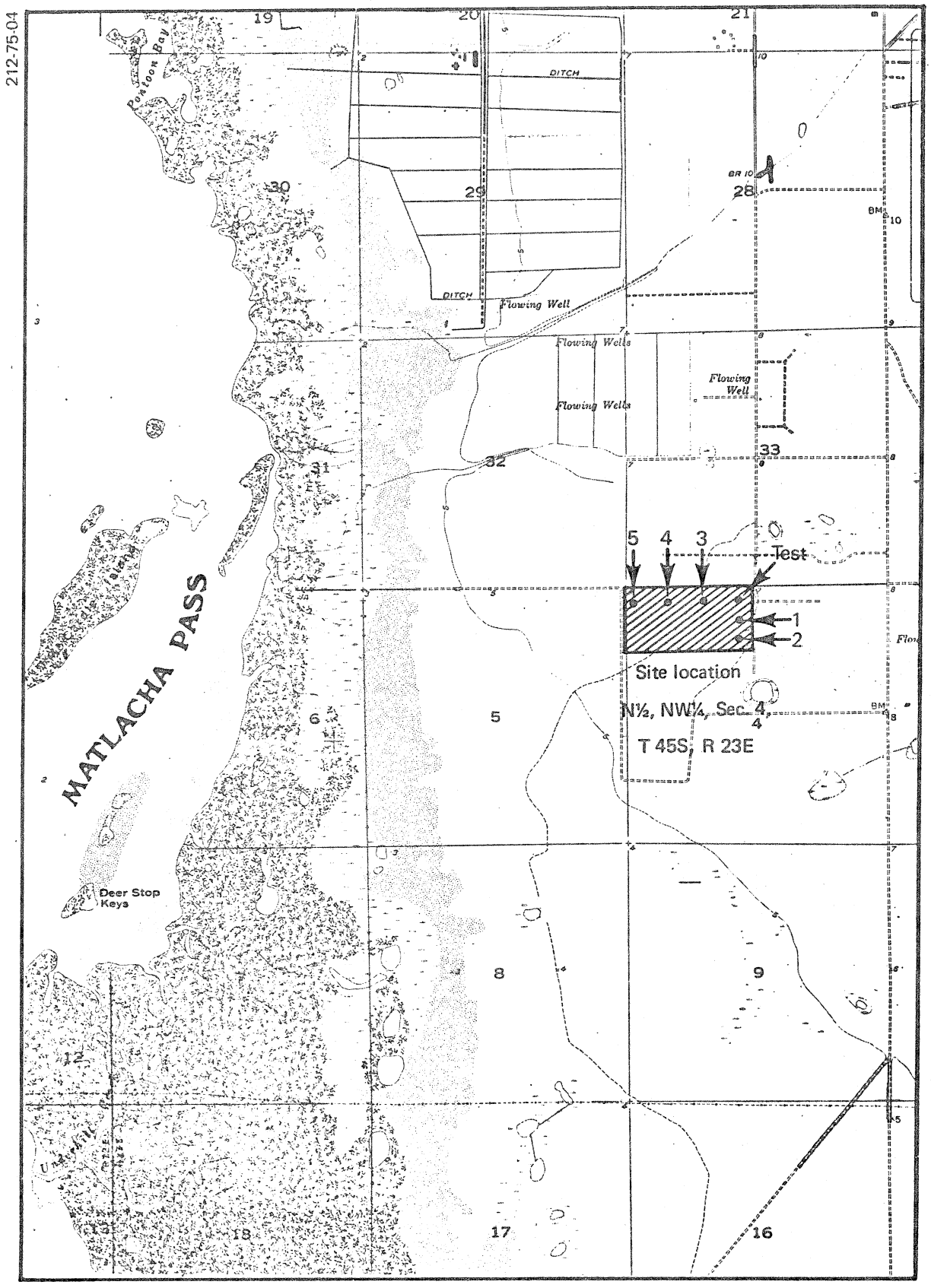


FIGURE 1. Location map.

TABLE 1-1

DESCRIPTION OF AQUIFERS

Aquifer	Approximate Depth	Description	Water Bearing Properties
Water Table	0-30 feet	Sand and shell with some limestone layers.	Furnishes water for private irrigation wells. Yields generally low. Aquifer is susceptible to saltwater intrusion near salty surface water bodies.
Upper Hawthorn	150 to 250 feet	Sandy and shelly phosphatic limestone in the upper 100 feet or so of the Hawthorn formation. Overlain by sandy clay and marl beds which separate it from the water table aquifer.	Source of present supply. The water is under artesian conditions, but pumping has lowered artesian pressure well below land surface, and in some places below sea level. Water in the aquifer is generally potable except where faulty well construction has allowed salt water to enter.
Lower Hawthorn	350 to 650 feet	Sandy limestone in the lower part of the Hawthorn Formation and upper part of the Tampa Limestone.	Formerly source of supply, along with deeper aquifers, for many irrigation wells in the area. The water is under artesian pressure sufficient to produce free flowing wells in the area. Water in the aquifer is not potable, due to high salt and total solids content. Water quality appears to have improved following plugging of many old wells in the area.
Suwannee Aquifer	750 to 900+ feet	Limestone and dolomite in the upper part of the Suwannee Limestone. Separated from the overlying lower Hawthorn aquifer by 100 feet or so of dense limestone. May extend as deep as 1,100 feet.	Formerly the source of supply for many irrigation wells in the area. The water is under artesian pressure sufficient to produce free-flowing wells in the area. Water in the aquifer is not potable, and is normally more mineralized than water in the overlying lower Hawthorn aquifer.

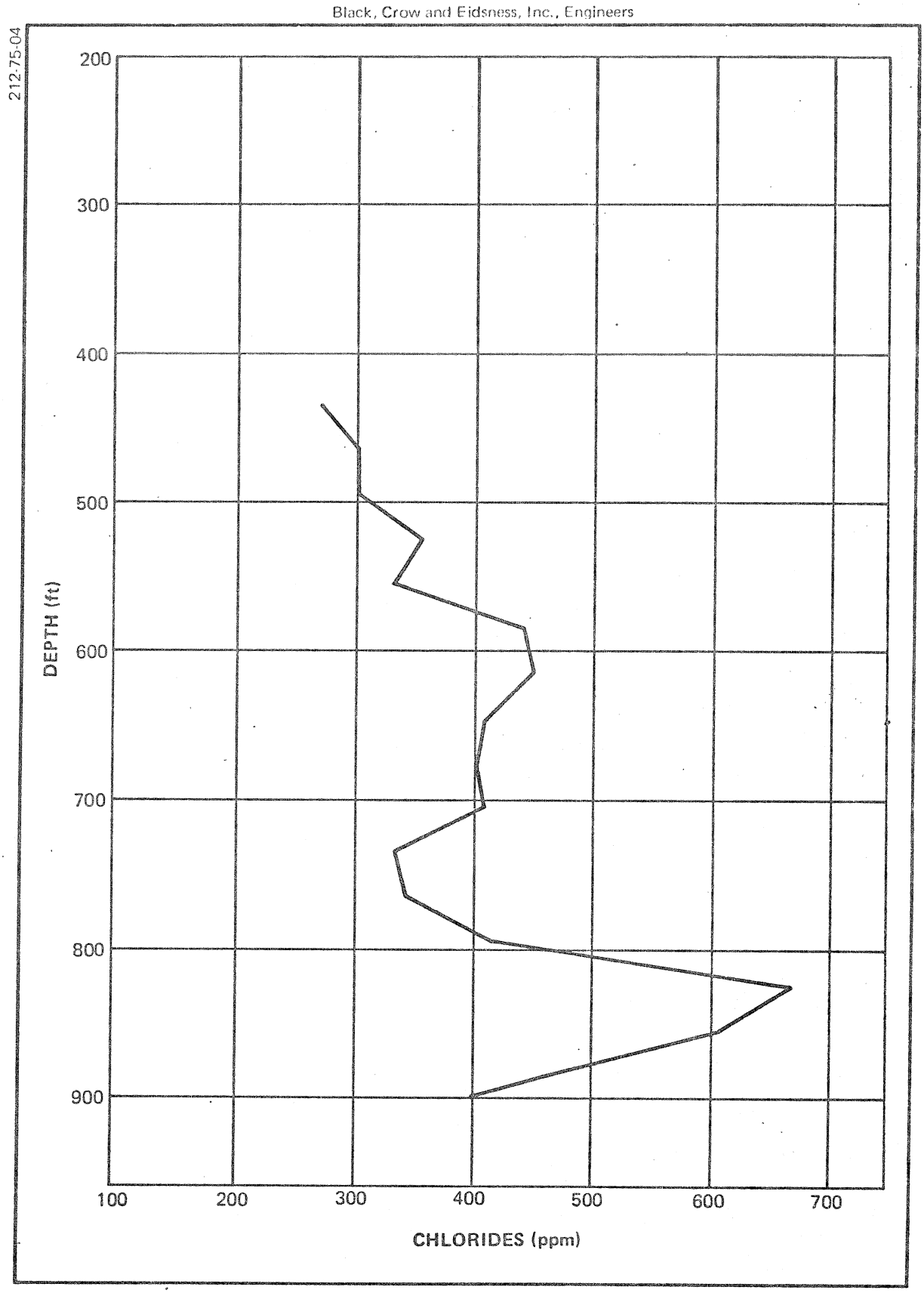


FIGURE 2. Cape Coral test well chlorides vs. depth.

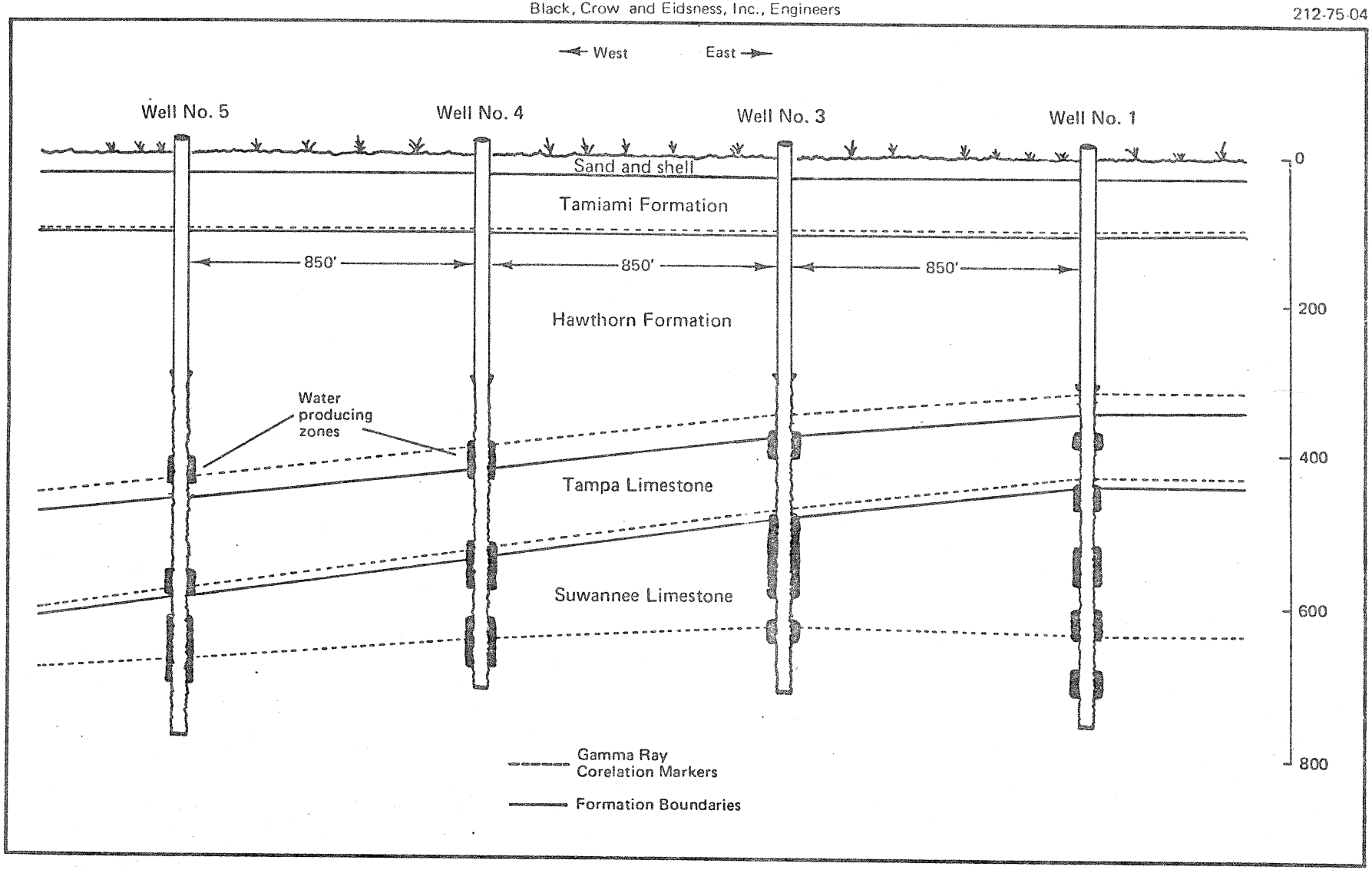


FIGURE 3. Geologic cross section.

TABLE 4-1

WELL INVENTORY DATA

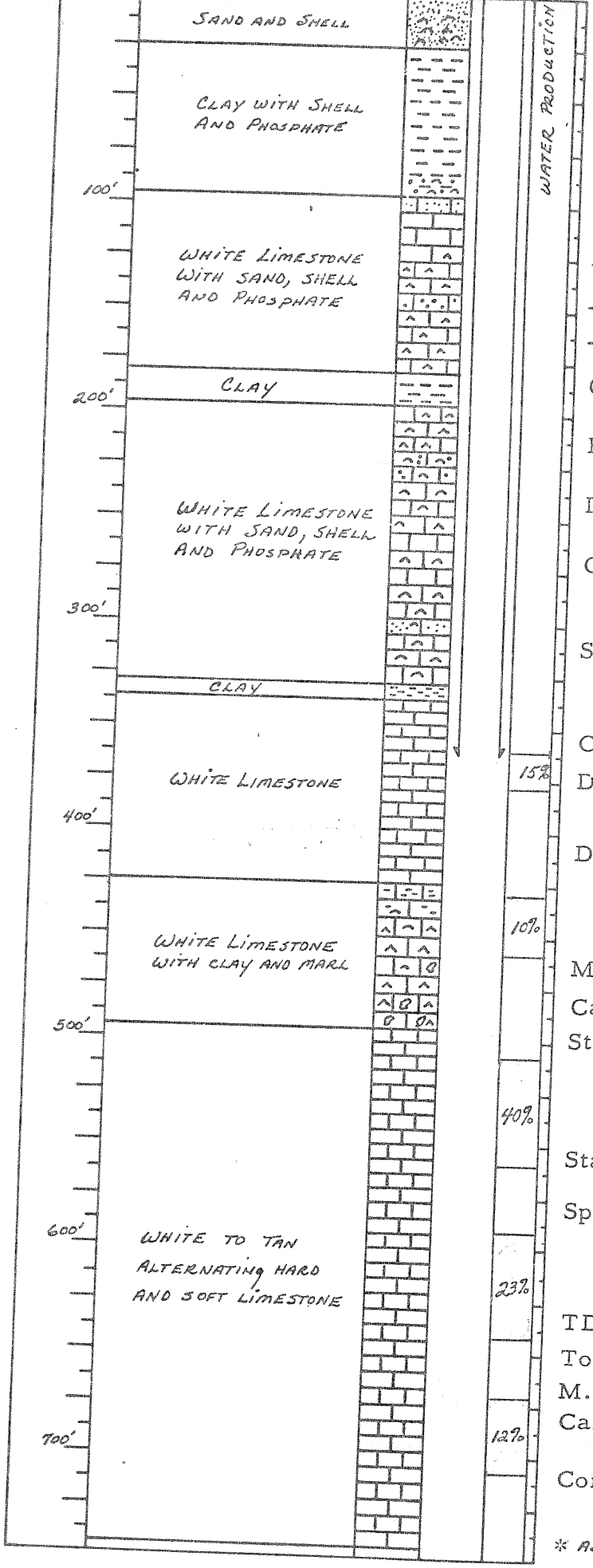
Well No.	Location ¼	¼	Sec.	Twp.	Rge.	Depth of Well, ft	Depth of Casing, ft	Chloride mg/l	Date of Data
1	SE	SE	31	43S	23E	818	131	1,200	2/69
2	SE	SE	31	43S	23E	553	132	--	12/69
3	NE	SE	32	43S	23E	--	--	1,260	2/69
4	NE	NW	36	43S	23E	731	132	--	8/69
5	SE	SW	36	43S	23E	--	--	1,940	2/69
6	SE	SW	31	43S	23E	977	--	--	12/69
7	SW	SW	31	43S	24E	425	--	740	2/69
8	NW	NE	32	43S	24E	1,155	--	480	10/56
9	SE	NE	32	43S	24E	700	--	--	9/57
10	NE	SE	32	43S	24E	830	--	580	10/56
11	SE	SE	1	44S	23E	619	133	1,000	2/69
12	NE	SE	1	44S	23E	1,001	157	--	8/69
13	SE	SE	2	44S	23E	706	143	655	6/58
14	SE	SE	3	44S	23E	511	155	--	8/69
15	NE	NE	3	44S	23E	1,045	159	880	2/69
16	SW	NE	3	44S	23E	919	137	980	2/69
17	SE	NE	3	44S	23E	642	157	640	2/69
18	SE	NE	3	44S	23E	510	155	900	2/69
19	NE	NW	6	44S	23E	--	--	900	2/69
20	SW	NE	6	44S	23E	--	--	900	2/69
21	NE	SE	6	44S	23E	--	--	840	2/69
22	NW	NE	6	44S	23E	832	122	--	12/69
23	SE	NE	7	44S	23E	468	128	960	2/69
24	SW	SE	8	44S	23E	601	156	940	2/69
25	NE	SE	9	44S	23E				
26	NE	SE	10	44S	23E	800	--	--	10/56
27	NW	NE	11	44S	23E	--	--	820	9/57
28	NW	NE	11	44S	23E	515	164	670	6/58
29	SE	NE	11	44S	23E	835	162	2,380	3/69
30	NE	NE	11	44S	23E	857	170	--	8/66
31	NE	SW	12	44S	23E	--	--	670	6/58
32	NE	SW	12	44S	23E	512	117	740	2/69
33	NE	NW	13	44S	23E	585	151	--	1/65
34	NE	NW	13	44S	23E	--	--	720	10/56
35	NW	SE	13	44S	23E	300	--	240	10/56
36	NW	NE	13	44S	23E	700	156	--	1/65
37	SE	NE	13	44S	23E	815	132	--	1/65
38	SW	SW	14	44S	23E	--	--	--	9/57
39	NW	NW	15	44S	23E	--	--	540	3/69
40	SE	NW	15	44S	23E	225	--	84	10/56
41	SW	NE	15	44S	23E	--	--	660	2/69
42	SE	SW	15	44S	23E	--	--	--	9/57
43	SW	SE	15	44S	23E	683	159	--	1/65
44	SW	SE	15	44S	23E	800	--	600	10/56

TABLE 4-1 - (continued)

Well No.	Location ¼	¼	Sec.	Twp.	Rge.	Depth of Well, ft	Depth of Casing, ft	Chloride mg/l	Date of Data
45	SE	SE	15	44S	23E	790	--	640	10/56
46	NE	SE	15	44S	23E	796	163	--	10/56
47	SW	NW	17	44S	23E	468	126	1,200	2/69
48	SW	NW	17	44S	23E	--	--	620	2/69
49	SW	SW	17	44S	23E	390	117	--	10/64
50	SW	SE	17	44S	23E	978	--	--	10/71
51	NW	SE	18	44S	23E	--	--	--	9/57
52	NW	NW	19	44S	23E	--	--	780	10/56
53	SE	NE	19	44S	23E	1,000	--	640	10/56
54	NE	SW	19	44S	23E	--	--	640	10/56
55	NE	SE	20	44S	23E	--	--	360	10/56
56	NE	NE	21	44S	23E	700	--	480	10/56
57	NE	SW	21	44S	23E	700	--	600	10/56
58	SE	SW	21	44S	23E	--	--	220	10/56
59	NE	NW	22	44S	23E	660	70	800	10/56
60	SE	NE	22	44S	23E	--	--	520	10/56
61	NW	NE	23	44S	23E	808	133	--	1/65
62	NW	SE	24	44S	23E	590	177	--	5/60
63	NW	NE	25	44S	23E	1,000	--	880	10/56
64	SW	SW	25	44S	23E	1,000	--	560	10/56
65	NE	NW	27	44S	23E	157	42	--	9/57
66	NW	NW	27	44S	23E	444	112	--	3/65
67	SW	NW	27	44S	23E	630	--	560	10/56
68	NE	NW	28	44S	23E	--	--	240	10/56
69	SE	NW	28	44S	23E	--	--	620	10/56
70	SW	SE	32	44S	23E	--	--	600	10/56
71	SE	SE	32	44S	23E	--	--	600	10/56
72	NE	SW	33	44S	23E	--	--	560	10/56
73	SW	SW	33	44S	23E	--	--	600	10/56
74	SE	SE	36	44S	23E	1,000	--	1,000	10/56
75	NE	NW	6	44S	24E	660	--	660	2/69
76	SW	SE	6	44S	24E	--	--	1,040	2/69
77	SE	SW	8	44S	24E	728	206	--	2/65
78	SW	SE	8	44S	24E	1,071	156	--	2/65
79	NE	NE	17	44S	24E	436	194	--	2/65
80	NW	NE	18	44S	24E	610	--	--	5/60
81	SW	NW	20	44S	24E	676	136	--	1/65
82	NW	NW	30	44S	24E	946	150	--	1/60
83	NW	SE	30	44S	24E	1,081	157	--	1/60
84	SW	SE	31	44S	24E	1,140	--	--	1/60
85	SE	SE	31	44S	24E	1,110	137	--	1/60
86	SW	NW	2	45S	23E	730	46	--	1/65
87	NW	NW	2	45S	23E	403	--	--	5/60
88	NW	NE	2	45S	23E	628	--	--	5/60
89	NW	SW	2	45S	23E	636	143	--	1/65

TABLE 4-1 - (continued)

Well No.	Location ¼	¼	Sec.	Twp.	Rge.	Depth of Well, ft	Depth of Casing, ft	Chloride mg/l	Date of Data
90	NW	NW	2	45S	23E	728	--	--	5/60
91	SW	NW	2	45S	23E	818	48	--	1/65
92	NW	NW	3	45S	23E	545	105	--	5/60
93	C	NE	3	45S	23E	662	94	--	1/65
94	NE	NE	6	45S	24E	964	112	--	1/60
95	SE	SE	7	45S	24E	642	172	--	1/60



Engineers
Gainesville, Florida

WELL DRILLING REPORT

Well CAPE CORAL R.O. WATER SUPPLY WELL No. 1

Location N. ½, N.W. ¼, SECT. 4, T45S, R23E

County LEE State FLORIDA

Elevation ≈ 6'

Diameter 11 in. Total Depth 745 ft.

Casing 12" SCHED. 40 PVC TO 362'

Screen NONE

Construction ROTARY

Driller McGREGOR PUMP CO. INC.
FT. MYERS, FLA.

Date Finished 9-11-75

PERMANENT PUMP

Mfg. _____ Motor _____ HP

Capacity _____ gpm TDH _____ ft.

Strainer Setting _____ ft.

PUMPING TEST

Static water level 21.2 ft. Date 7 APR. 76

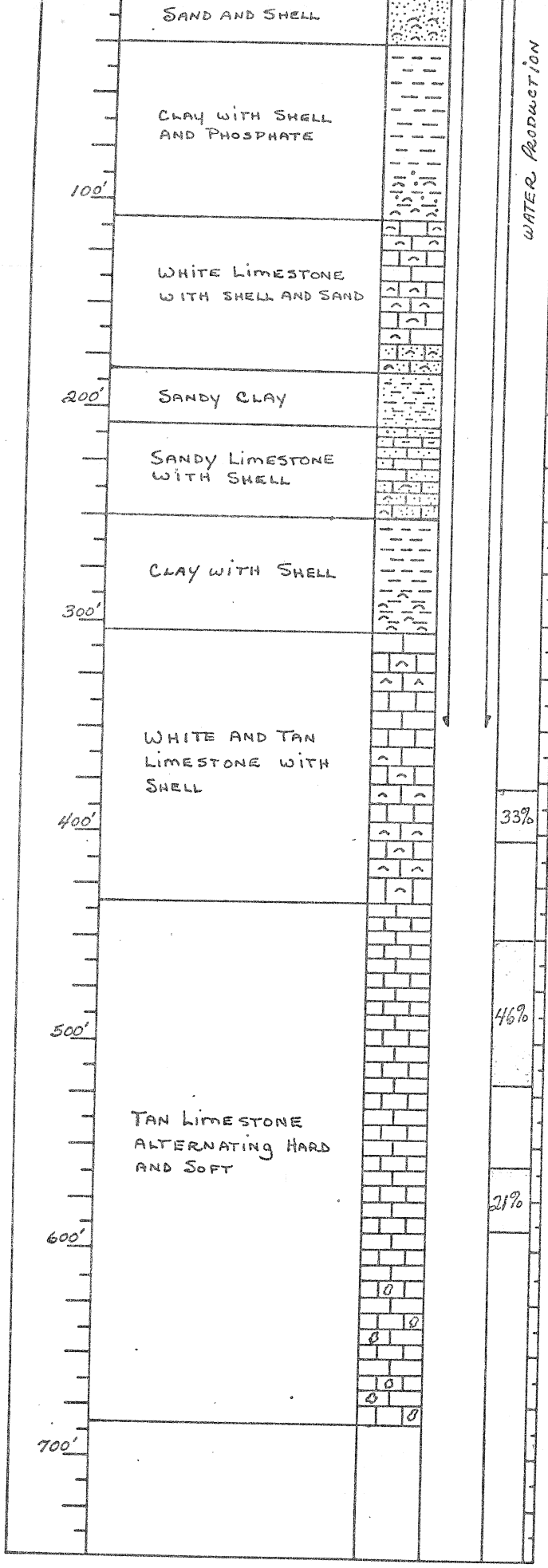
Specific capacity 50.4 gpm/ft @ 1070 gpm

WATER ANALYSIS (ppm)

TDS	1180	Chloride, Cl	440
Total Hard. *	427.5	Iron, Fe	.03
M.O. Alkal. *	209	Sulfate, SO_4	144
Calcium*	135	Color (APHA)	5

Compiled by J.C.P. Date 10 APR. 76

* AS $CaCO_3$



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WELL DRILLING REPORT

Well CAPE CORAL R.O. WATER SUPPLY WELL NO. 2

Location N. 1/2, N.W. 1/4, SECT. 4, T45S, R23E

County LEE State FLORIDA

Elevation ≈ 6'

Diameter 11 in. Total Depth 685 ft.

Casing 12" SCHED. 40 PVC TO 347

Screen NONE

Construction ROTARY

Driller McGREGOR PUMP CO INC
FT. MYERS

Date Finished 10-21-75

PERMANENT PUMP

Mfg. _____ Motor _____ HP

Capacity _____ gpm TDH _____ ft.

Strainer Setting _____ ft.

PUMPING TEST

Static water level 20.73 ft. Date 11-25-76

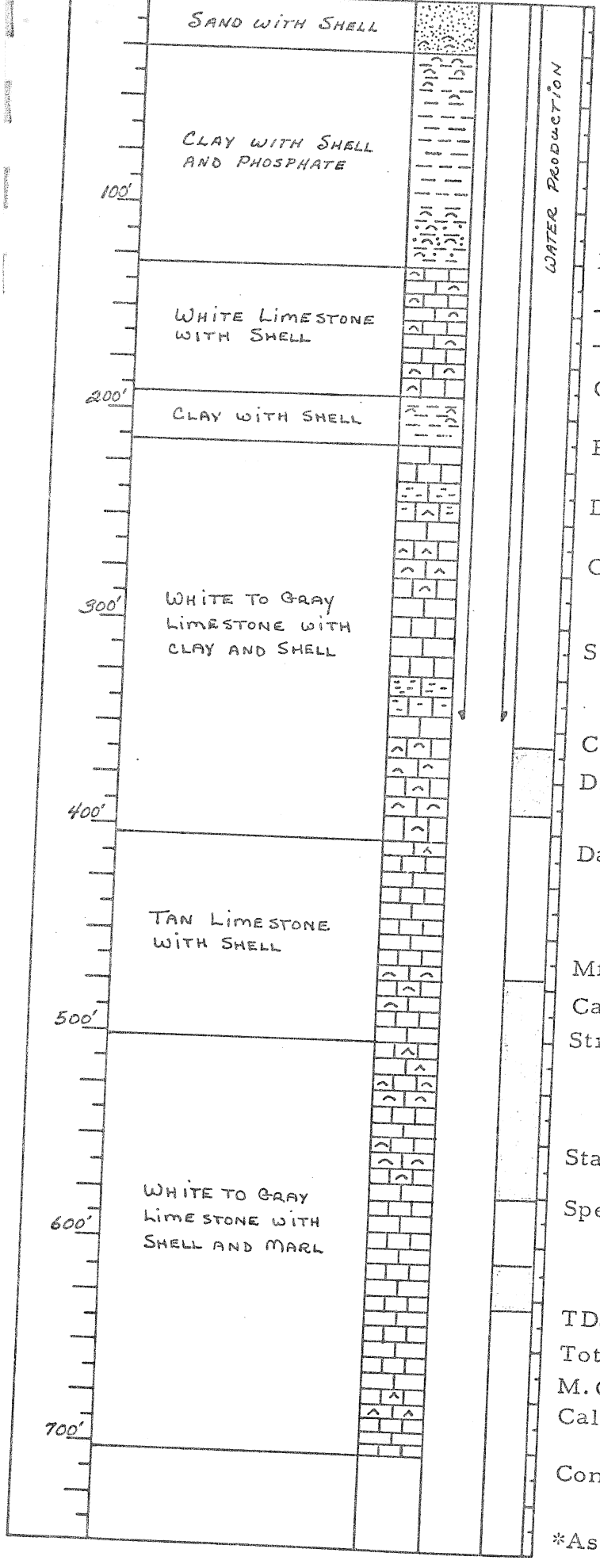
Specific capacity 102 gpm/ft @ 1500 gpm

WATER ANALYSIS (ppm)

TDS	1500	Chloride, Cl	502
Total Hard. *	482	Iron, Fe	.06
M.O. Alkal. *	202	Sulfate, SO_4	162
Calcium*	150	Color (APHA)	20

Compiled by J.C.P. Date 10 APR. 76

*As $CaCO_3$



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WELL DRILLING REPORT

Well CAPE CORAL R.O. WATER SUPPLY WELL No. 3

Location N. 1/2, N.W. 1/4, SECT. 4, T45S, R23E

County LEE State FLORIDA

Elevation ≈ 6'

Diameter 11 in. Total Depth 705 ft.

Casing 12" SCHED. 40 PVC TO 345'

Screen NONE

Construction ROTARY

Driller Mc GREGOR PUMP CO. INC.

Date Finished 10-31-75

PERMANENT PUMP

Mfg. _____ Motor _____ HP

Capacity _____ gpm TDH _____ ft.

Strainer Setting _____ ft.

PUMPING TEST

Static water level 22.0 ft. Date 11-27-76

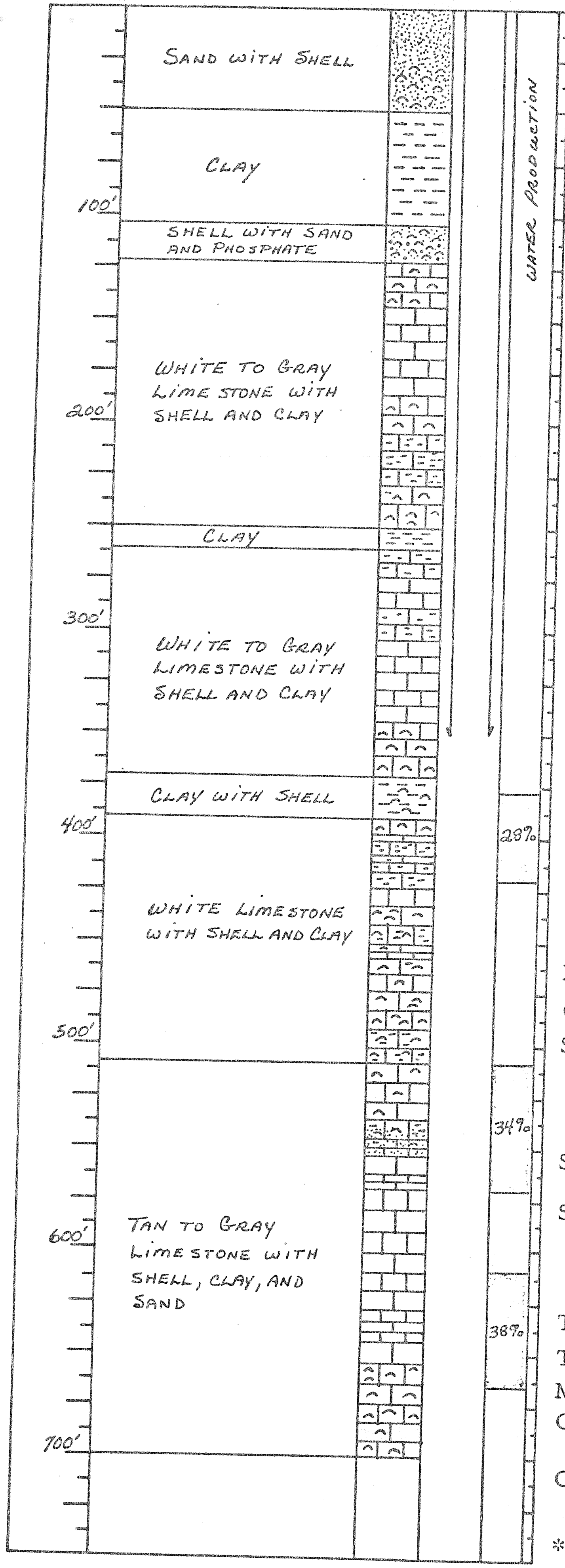
Specific capacity 34.4 gpm/ft @ 1350 gpm

WATER ANALYSIS (ppm)

TDS	1166	Chloride, Cl	350
Total Hard. *	421	Iron, Fe	.02
M. O. Alkal. *	216	Sulfate, SO_4	133
Calcium*	122	Color (APHA)	5

Compiled by J.C.P. Date 10 APR. 76

*As $CaCO_3$



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WELL DRILLING REPORT

Well: CAPE CORAL R.O. WATER SUPPLY WELL NO. 4

Location: N. 1/2, N.W. 1/4, SECT. 4, T45S, R23E

County: LEE State: FLORIDA

Elevation: ≈ 6'

Diameter: 11 in. Total Depth: 700 ft.

Casing: 12" SCHED. 40 PVC TO 350'

Screen: NONE

Construction: ROTARY

Driller: McGREGOR PUMP CO. INC.

Date Finished: 12-13-75

PERMANENT PUMP

Mfg. ______ Motor ______ HP

Capacity ______ gpm TDH ______ ft.

Strainer Setting ______ ft.

PUMPING TEST

Static water level 21.3 ft. Date 7 APR. 76

Specific capacity 28.2 gpm/ft @ 508 gpm

WATER ANALYSIS (ppm)

TDS		Chloride, Cl	
Total Hard. *		Iron, Fe	
M. O. Alkal. *		Sulfate, SO_4	
Calcium*		Color (APHA)	

Compiled by J.C.P. Date 10 APR. 76

*As $CaCO_3$

Engineers
Gainesville, Florida

WELL DRILLING REPORT

Well CAPE CORAL R.O. WATER SUPPLY WELL No. 5

Location N. 1/2, N.W. 1/4, SECT. 4, T45S, R23

County LEE State FLORIDA

Elevation ≈ 6'

Diameter 11 in. Total Depth 765

Casing 12" SCHED. 40 PVC TO 345'

Screen NONE

Construction ROTARY

Driller MC GREGOR PUMP CO. INC.

Date Finished 1-21-76

PERMANENT PUMP

Mfg. _____ Motor _____ H

Capacity _____ gpm TDH _____ f

Strainer Setting _____ f

PUMPING TEST

Static water level 21.5 ft. Date 2-11-76

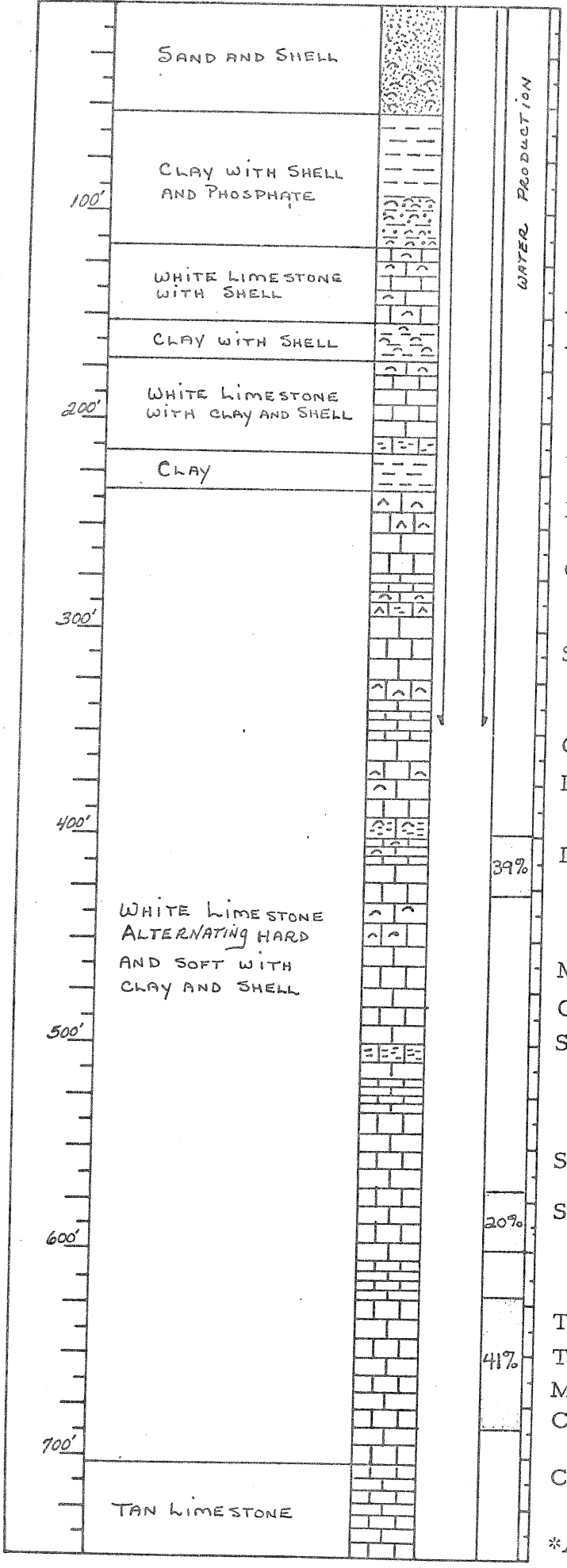
Specific capacity 17.2 gpm/ft @ 370 gp

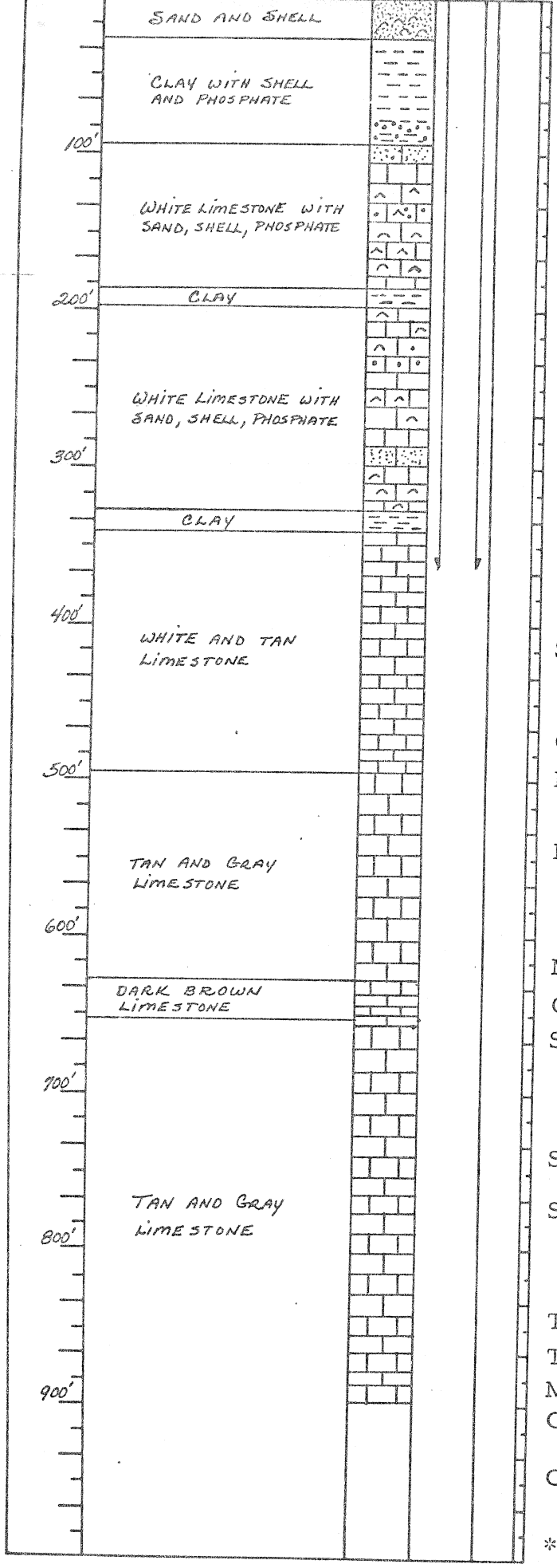
WATER ANALYSIS (ppm)

TDS	904	Chloride, Cl	242
Total Hard. *	370	Iron, Fe	.01
M. O. Alkal. *	224	Sulfate, SO_4	102
Calcium*	100	Color (APHA)	5

Compiled by J.C.P Date 10 APR. 7

*As $CaCO_3$





Engineers
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WELL DRILLING REPORT

Well CAPE CORAL TEST WELL

Location N½, NW¼, SECT. 4, T45S, R23E

County LEE State FLORIDA

Elevation ≈ 6'

Diameter 10 in. Total Depth 900 ft.

Casing 10" SCHED. 40 PVC TO 362'

Screen NONE

Construction ROTARY

Driller Mc GREGOR PUMP CO. INC.

Date Finished MAY 1975

PERMANENT PUMP

Mfg. _____ Motor _____ HP

Capacity _____ gpm TDH _____ ft.

Strainer Setting _____ ft.

PUMPING TEST

Static water level 20.2 ft. Date 2-11-76

Specific capacity 86 gpm/ft @ 818 gpm

WATER ANALYSIS (ppm)

TDS	1340	Chloride, Cl	401
Total Hard. *	437	Iron, Fe	.024
M.O. Alkal. *	198	Sulfate, SO_4	170
Calcium*	135	Color (APHA)	5

Compiled by J.C.P Date 10 APR. 76

*As $CaCO_3$