

**CORE ANALYSIS REPORT**  
**FOR**  
**SOUTH FLORIDA WATER MANAGEMENT**  
**I75-PW**



**CORE LABORATORIES**

*n.w. B's copy*

**CORE ANALYSIS REPORT**  
**FOR**  
**SOUTH FLORIDA WATER MANAGEMENT**  
**I75-PW**

These analyses, opinions or interpretations are based on observations and materials supplied by the client to whom; and for whose exclusive and confidential use; this report is made. The interpretations or opinions expressed represent the best judgment of Core Laboratories (all errors and omissions excepted); but Core Laboratories and its officers and employees, assume no responsibility and make no warranty or representations, as to the productivity, proper operations, or profitableness of any oil, gas or other mineral well or formation in connection with which such report is used or relied upon.



South Florida Water Management

I-75-PW

910-913

CORELAB  
CORING PHOTO™

TOP OF CORE

910.0

Lithofacies #1

33.2% ● 2205.7md

912

910

33.5% ● 3.236md

913.0

BASE OF CORE

911

911

911

Lithofacies #2

KEY

Lithofacies #1: Foram-peloidal packstone

Lithofacies #2: Pelecypod coquina

Core Plug Location

Porosity (%) → 39.7% ● 380.22md

Permeability (K90) ↑



South Florida Water Management

I-75-PW

945-955



TOP OF CORE

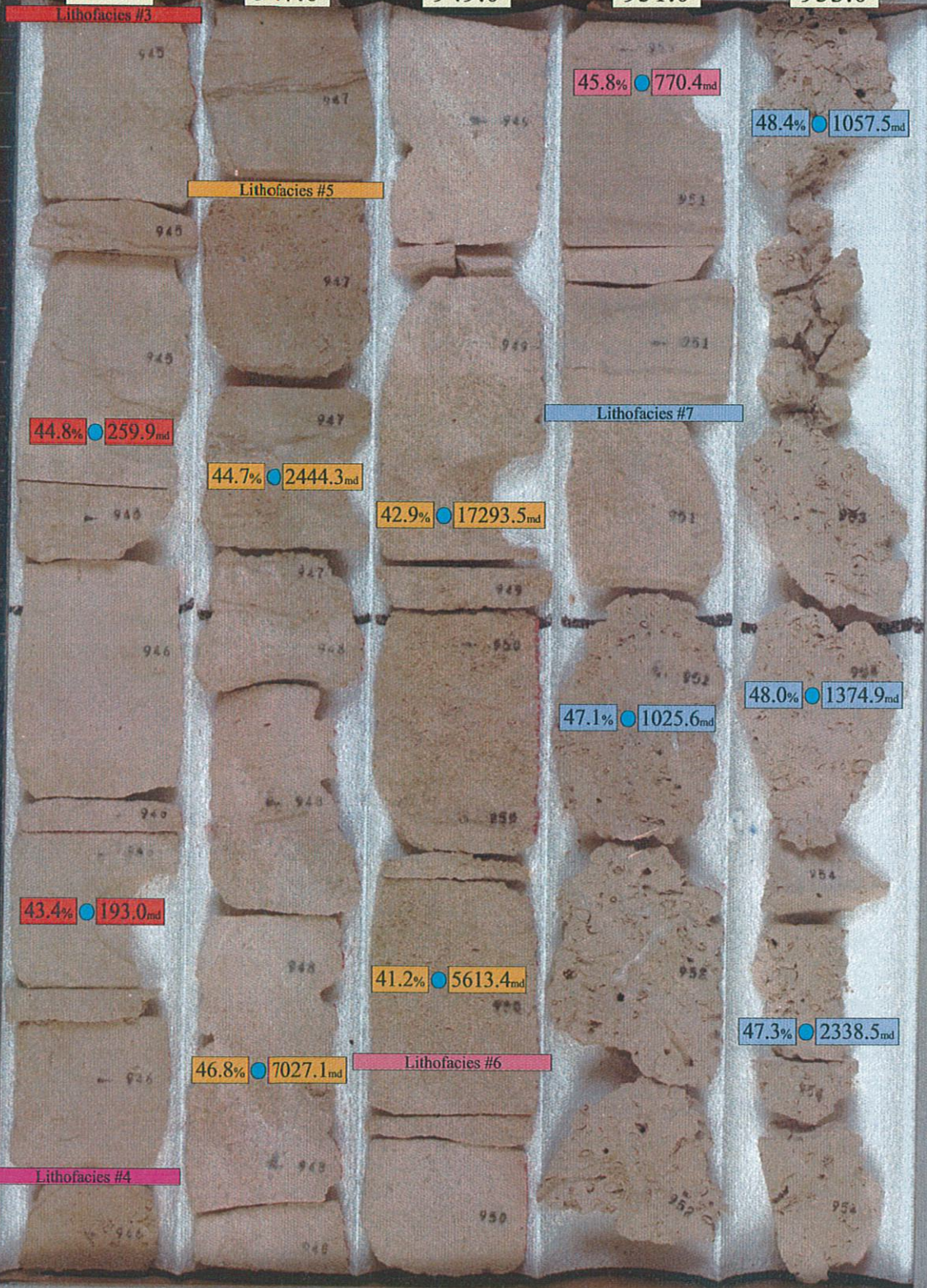
945.0

947.0

949.0

951.0

953.0



KEY

- Lithofacies #3: Ostracod-foram-peloidal packstone
- Lithofacies #4: Foram-peloidal packstone
- Lithofacies #5: Intra-algal-foram peloid packstone
- Lithofacies #6: Foram-pellet packstone
- Lithofacies #7: Bryzoan-pelecypod-wackstone-grainstone

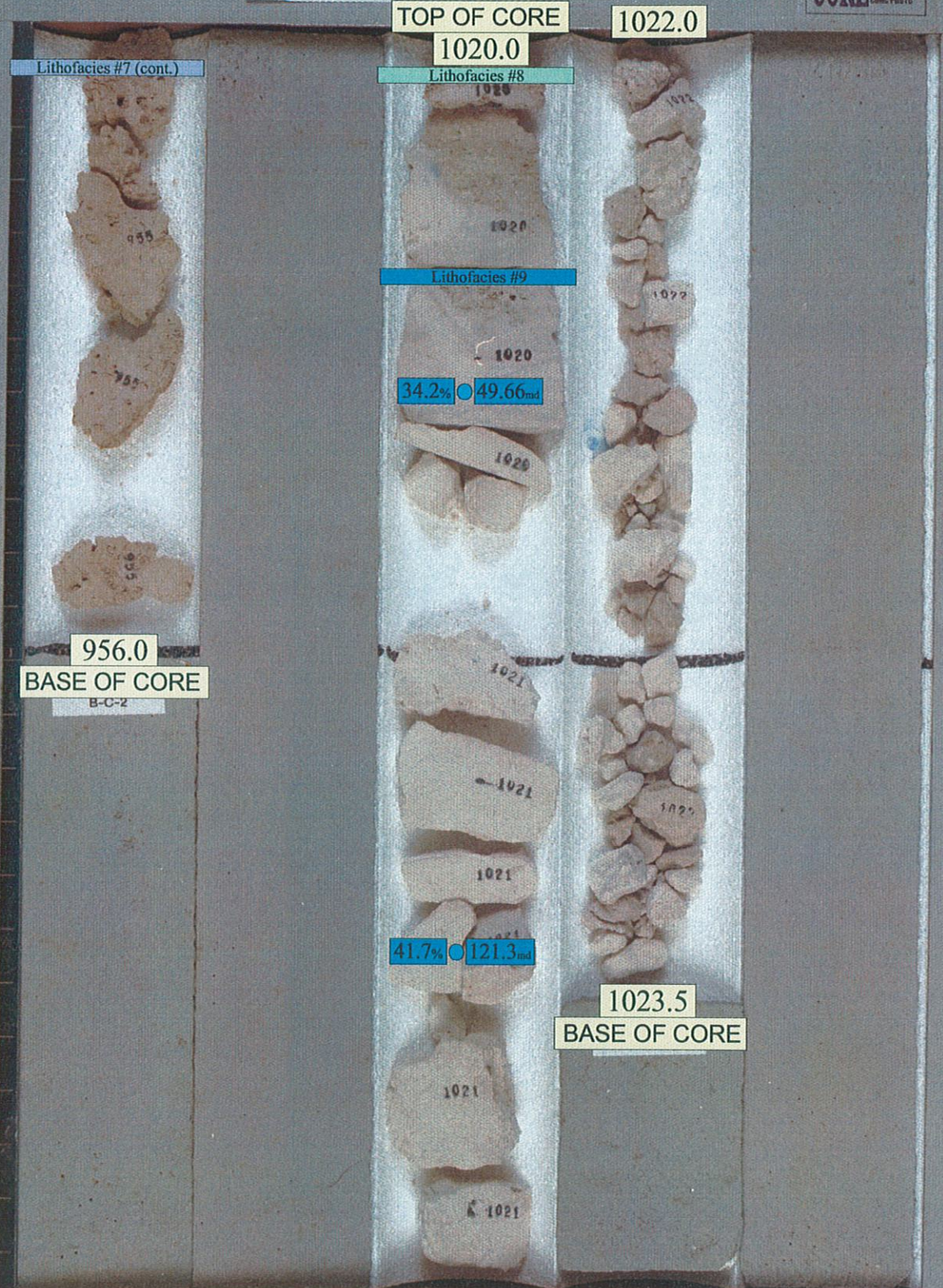
Core Plug Location

Porosity (%) → 39.7% ● 380.22<sub>md</sub>

Permeability (K90) ↑



South Florida Water Management  
 I-75-PW  
 955-1023.5



Lithofacies #7 (cont.)

TOP OF CORE

1022.0

1020.0

Lithofacies #8

Lithofacies #9

34.2% ● 49.66md

956.0  
 BASE OF CORE  
 B-C-2

41.7% ● 121.3md

1023.5  
 BASE OF CORE

**KEY**

|   |                                 |
|---|---------------------------------|
| Lithofacies #7 (cont.): Bryzoan-pelecypod-wackstone-grainstone      | Core Plug Location              |
| Lithofacies #8: Gastropod-pelecypod-skeletal peloidal wackpackstone | Porosity (%) → 39.7% ● 380.22md |
| Lithofacies #9: Peloidal skeletal packstone                         | Permeability (K90) ↑            |



# I-75-TW

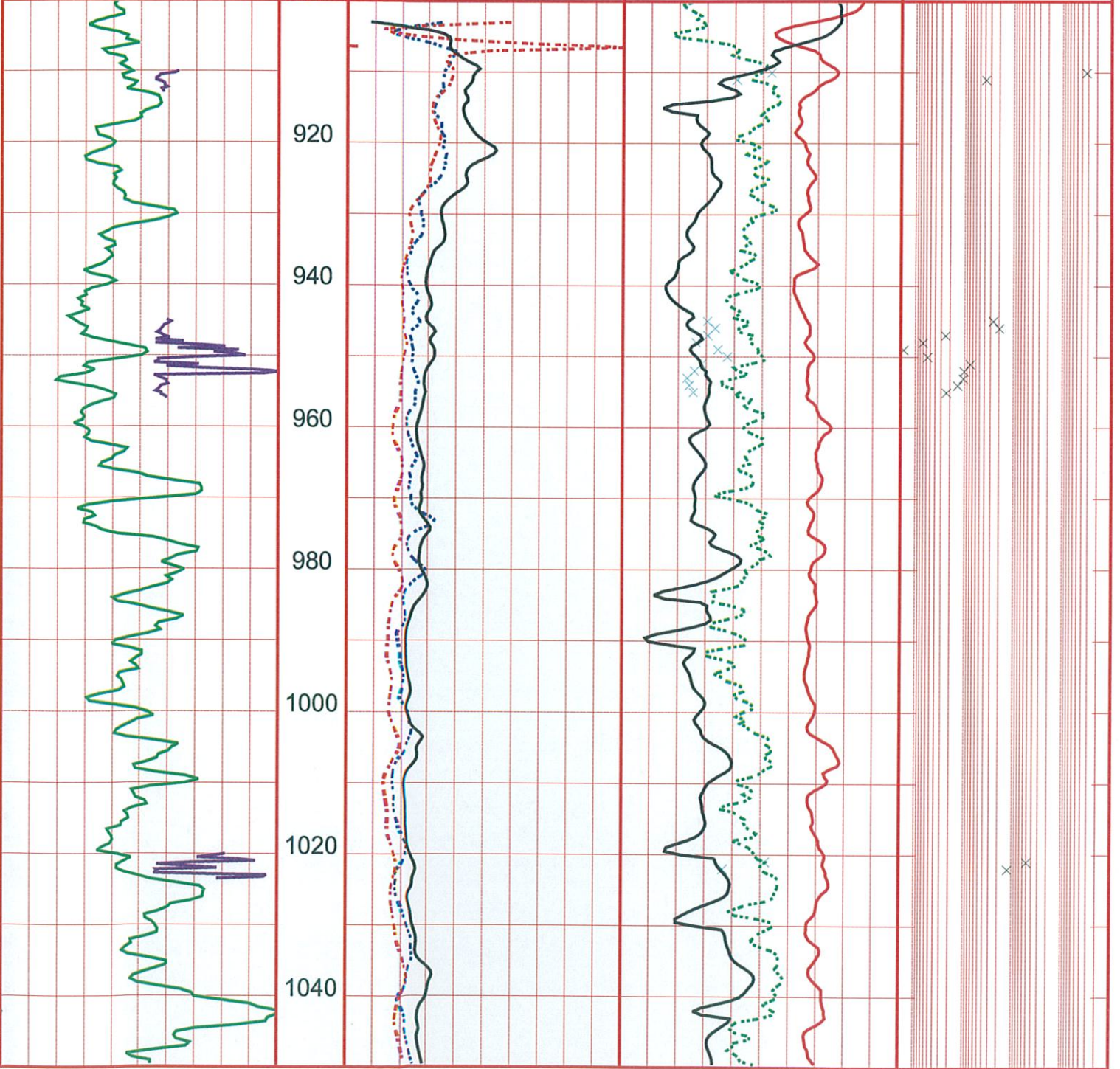
-10 SGR-CORE (cps) 10  
 0 GR (API) 100

M\_DEPTH (#)

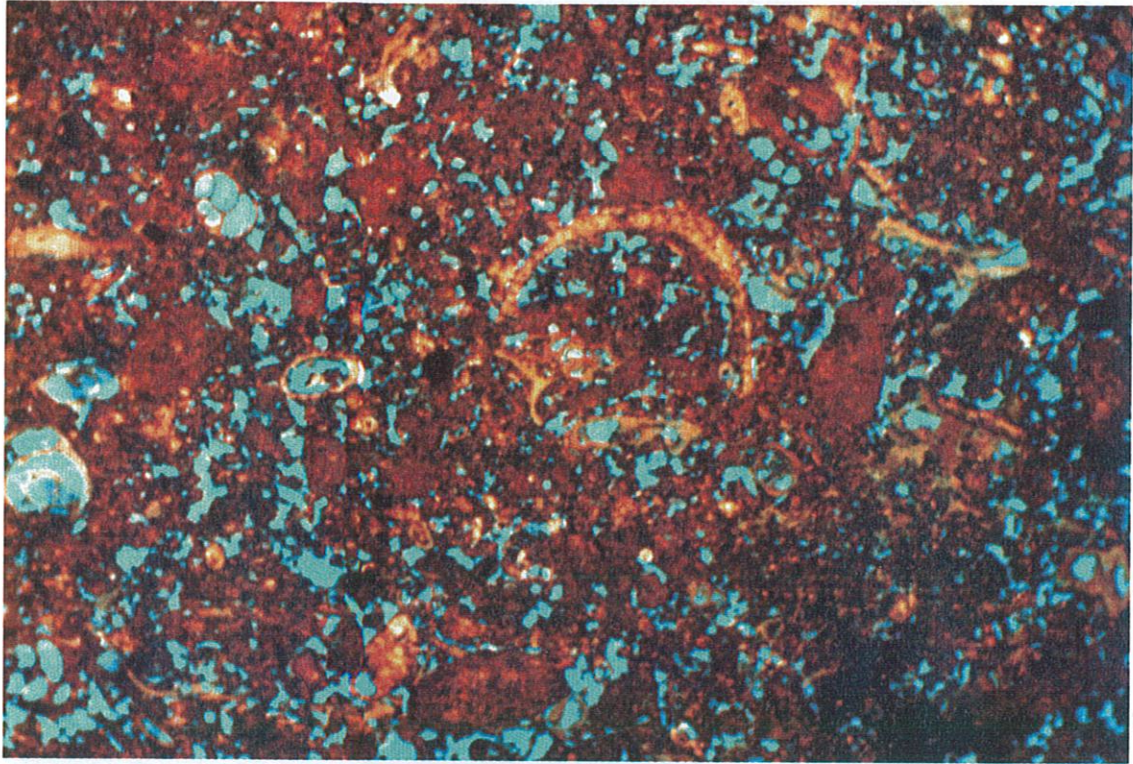
900  
920  
940  
960  
980  
1000  
1020  
1040

|   |            |    |        |          |        |
|---|------------|----|--------|----------|--------|
| 0 | LL3 (ohmm) | 20 | 0.6000 | SonicPor | 0.1000 |
| 0 | ILD (ohmm) | 20 | 0.6000 | POR-CORE | 0.1000 |
| 0 | ILM (ohmm) | 20 | 0.6000 | NPHI     | 0.1000 |
| 0 |            |    | 0.6000 | DPHI     | 0.1000 |

20000 PERM90 1



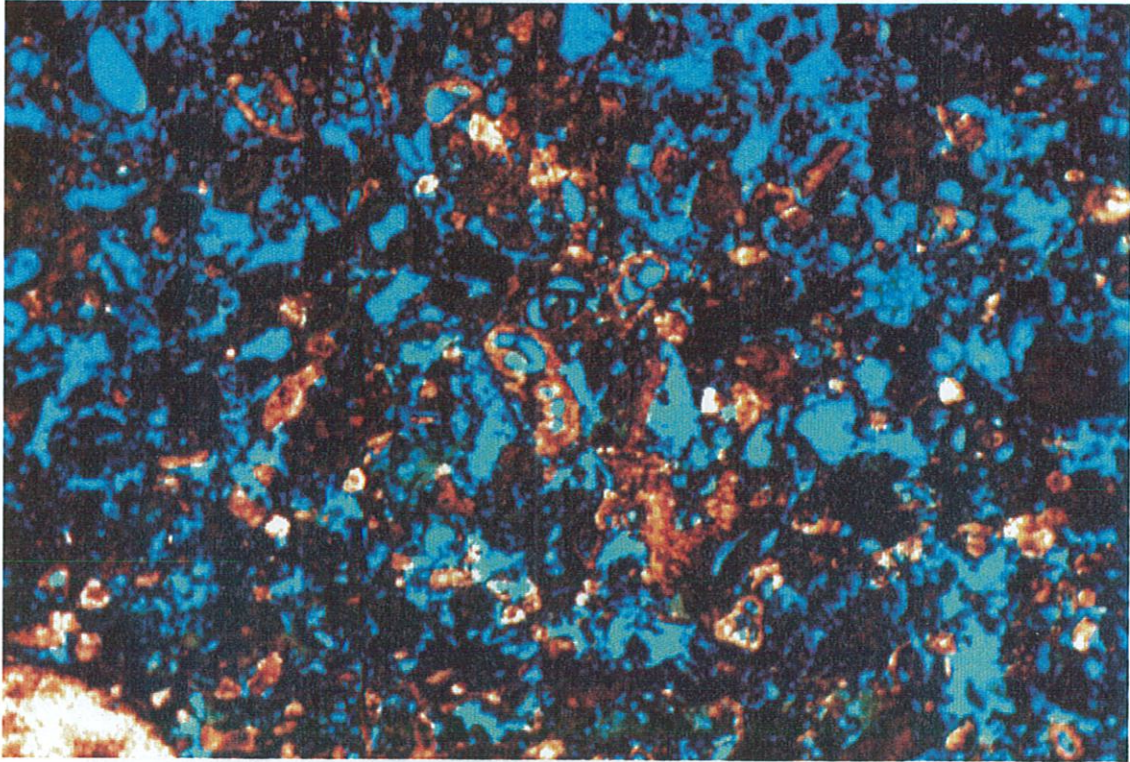




**WELL:** I-75-PW  
**DEPTH:** 910.5  
**MAGNIFICATION:** X40

**LITHOFACIES:** FORAM-PELOIDAL PACKSTONE WITH GOOD VERY FINE-FINE INTERPARTICLE AND FAIR VUGGY MOLDIC INTRAPARTICLE POROSITY

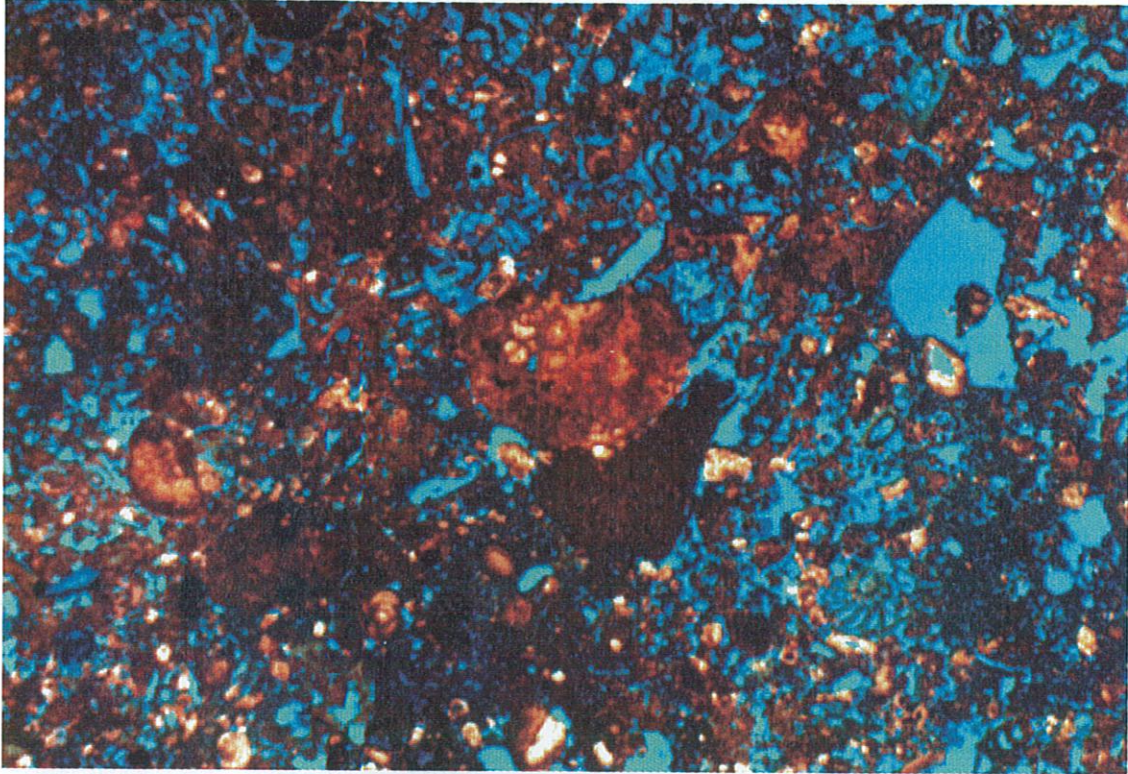




**WELL:** I-75-PW  
**DEPTH:** 947.2  
**MAGNIFICATION:** X40

**LITHOFACIES:** SLIGHTLY GLAUCONITIC FORAM-PELOIDAL PACKSTONE  
WITH GOOD INTERPARTICLE VUGGY POROSITY

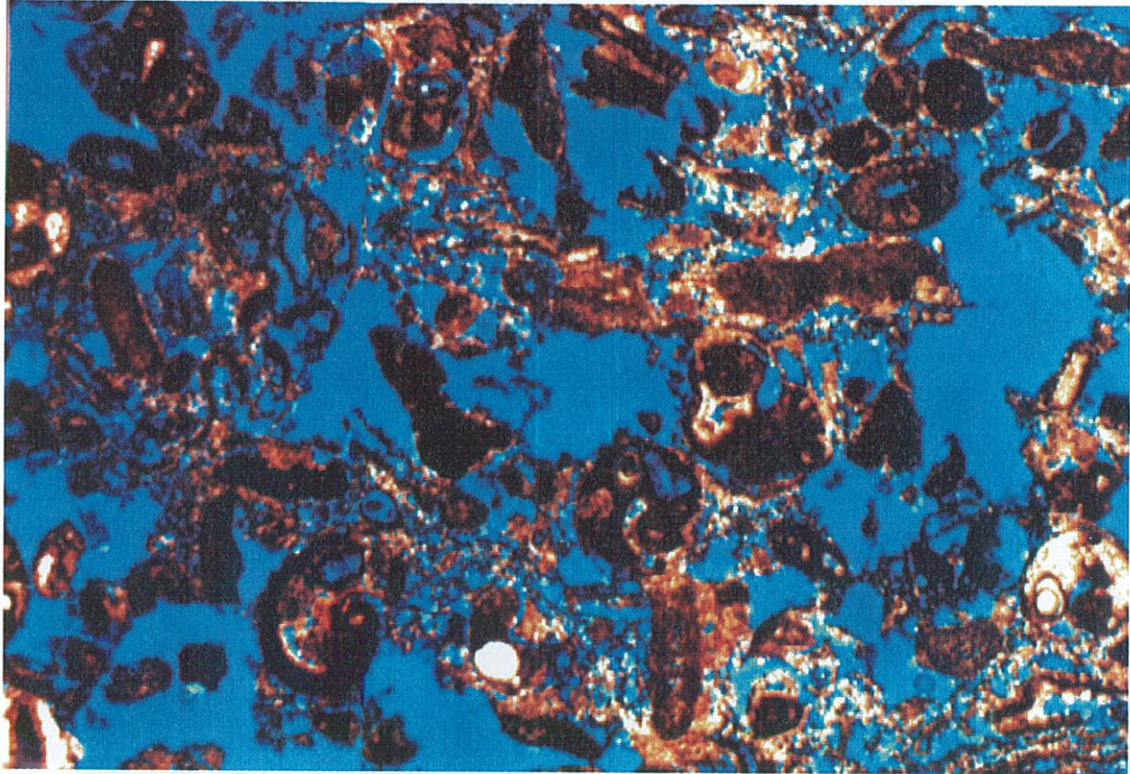




**WELL:** I-75-PW  
**DEPTH:** 947.3  
**MAGNIFICATION:** X20

**LITHOFACIES:** ALGAL-INTERCLASTIC-FORAM-PELOIDAL PACKSTONE WITH GOOD INTERPARTICLE, VUG, AND MOLDIC POROSITY

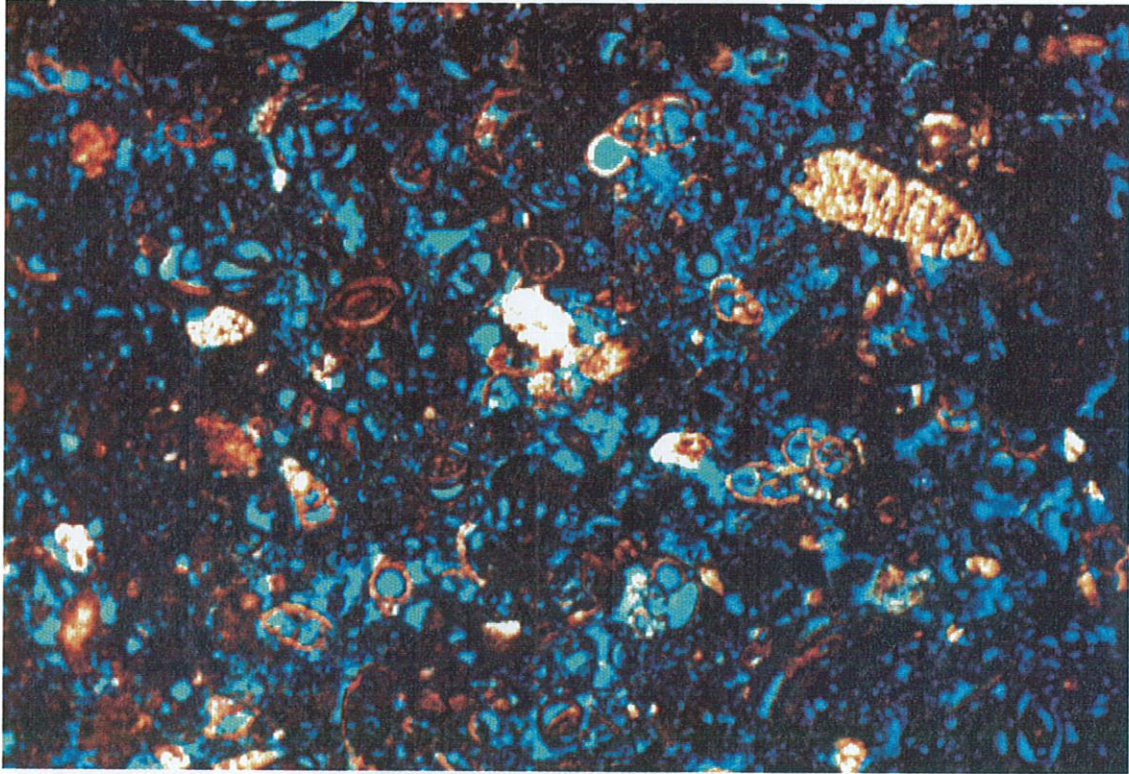




**WELL:** I-75-PW  
**DEPTH:** 950  
**MAGNIFICATION:** X20

**LITHOFACIES:** FORAM-PELOIDAL PACKSTONE-GRAINSTONE WITH VERY GOOD VUGGY INTERPARTICLE, LARGE SECONDARY VUGS, AND "FLOATING GRAINS"

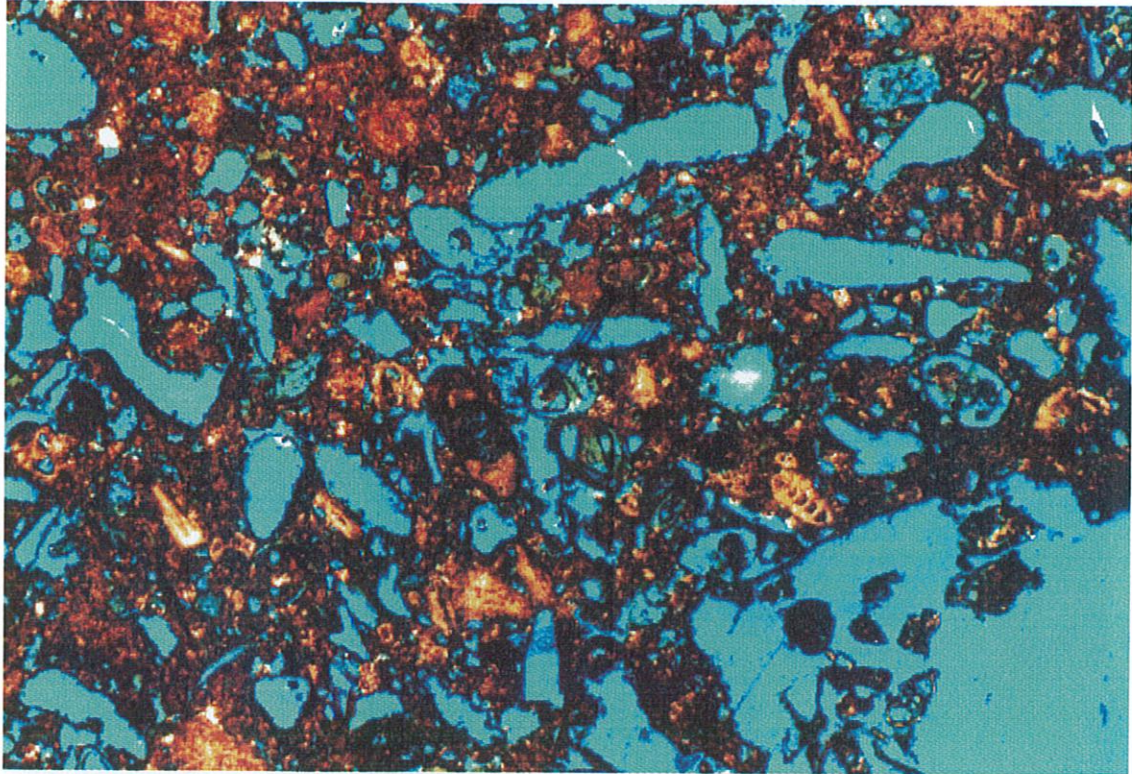




**WELL:** I-75-PW  
**DEPTH:** 951.4  
**MAGNIFICATION:** X20

**LITHOFACIES:** PELOIDAL-FORAM PACKSTONE WITH FAIR VUGGY  
INTRAPARTICLE AND MOLDIC POROSITY





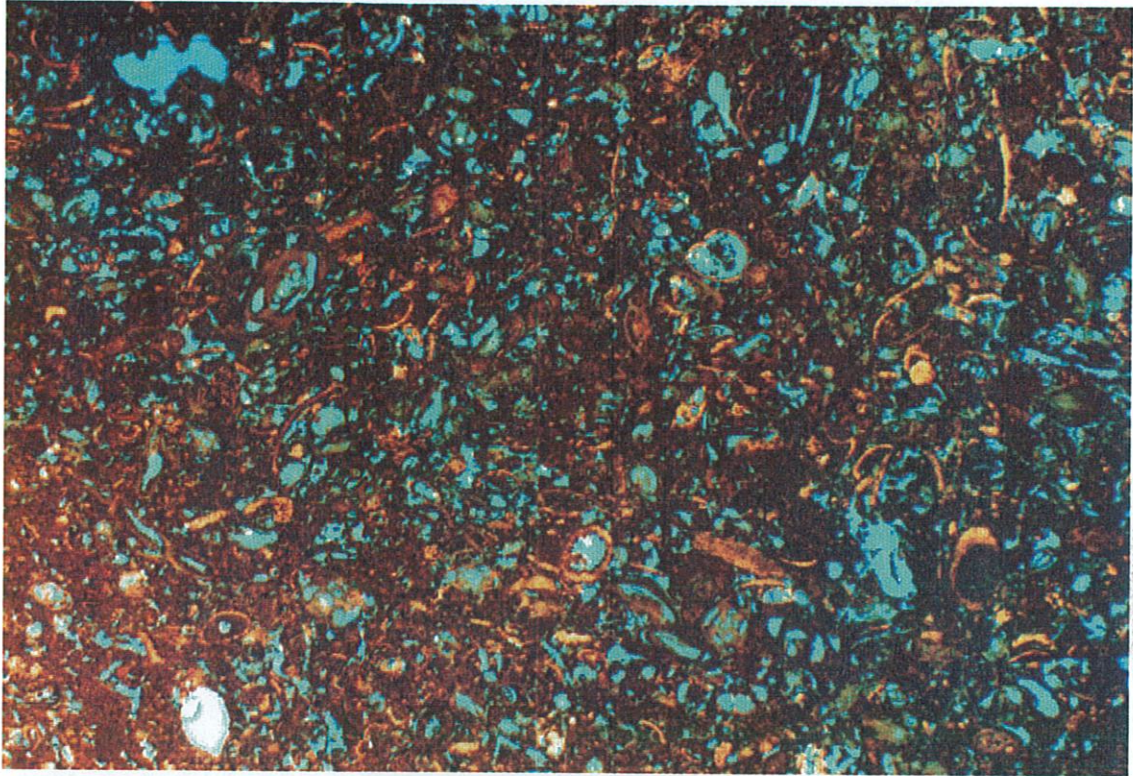
**WELL:** I-75-PW

**DEPTH:** 952.2

**MAGNIFICATION:** X20

**LITHOFACIES:** BRYOZOAN PELECYPOD COATED GRAIN PELOIDAL WACKESTONE-GRAINSTONE WITH GOOD VUGGY-MOLDIC POROSITY. NOTE: "FLOATING" COATINGS ARE INDICATIVE OF SECONDARY LEACHING.

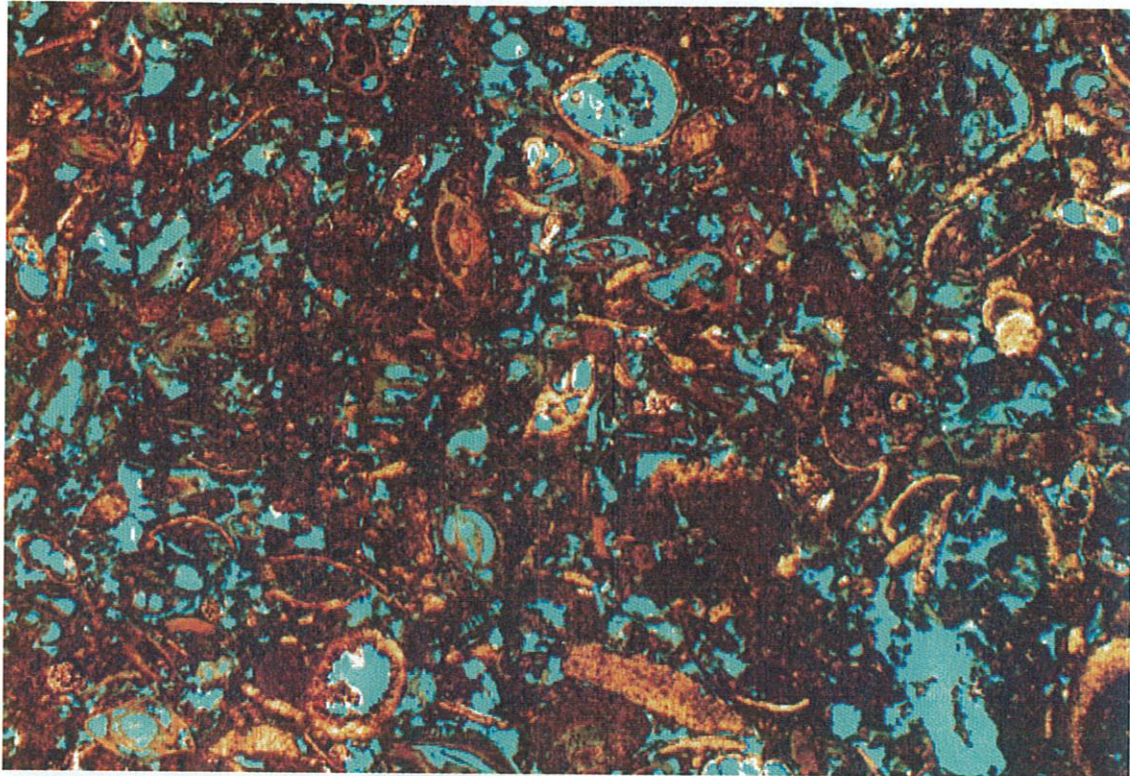




**WELL:** I-75-PW  
**DEPTH:** 1020.3  
**MAGNIFICATION:** X20

**LITHOFACIES:** SKELETAL PELOIDAL PACKSTONE





**WELL:** I-75-PW  
**DEPTH:** 1021  
**MAGNIFICATION:** X40

**LITHOFACIES:** PELOIDAL SKELETAL PACKSTONE, GLAUCONITIC WITH GOOD VUGGY, MOLDIC, AND INTRAPARTICLE POROSITY



Core Photo Index

| <b>WELL</b>    | <b>DEPTH</b> | <b>INTERVAL</b> | <b>IMAGE NUMBER</b> |
|----------------|--------------|-----------------|---------------------|
| <b>IWSD-PW</b> | 882          | 889             | Core18.cdr          |
|                | 955          | 962.1           | Core19.cdr          |
|                | 1040         | 1049.7          | Core20.cdr          |
|                | 1060         | 1062.2          | Core21.cdr          |
|                | 1080         | 1089.1          | Core22.cdr          |
|                | 1090         | 1098            | Core23.cdr          |
|                |              |                 |                     |
| <b>L2-PW</b>   | 830          | 839.5           | Core24.cdr          |
|                | 1020         | 1029.8          | Core25.cdr          |
|                | 1190         | 1199.1          | Core26.cdr          |
|                | 1330         | 1339            | Core27.cdr          |
|                | 1480         | 1583.3          | Core28.cdr          |
|                | 1630         | 1711.3          | Core29.cdr          |
|                |              |                 |                     |
| <b>I75-PW</b>  | 910          | 913             | Core30.cdr          |
|                | 945          | 955             | Core16.cdr          |
|                | 955          | 1023.5          | Core17.cdr          |



South Florida Water Management  
I-75-PW  
910-913



TOP OF CORE

910.0

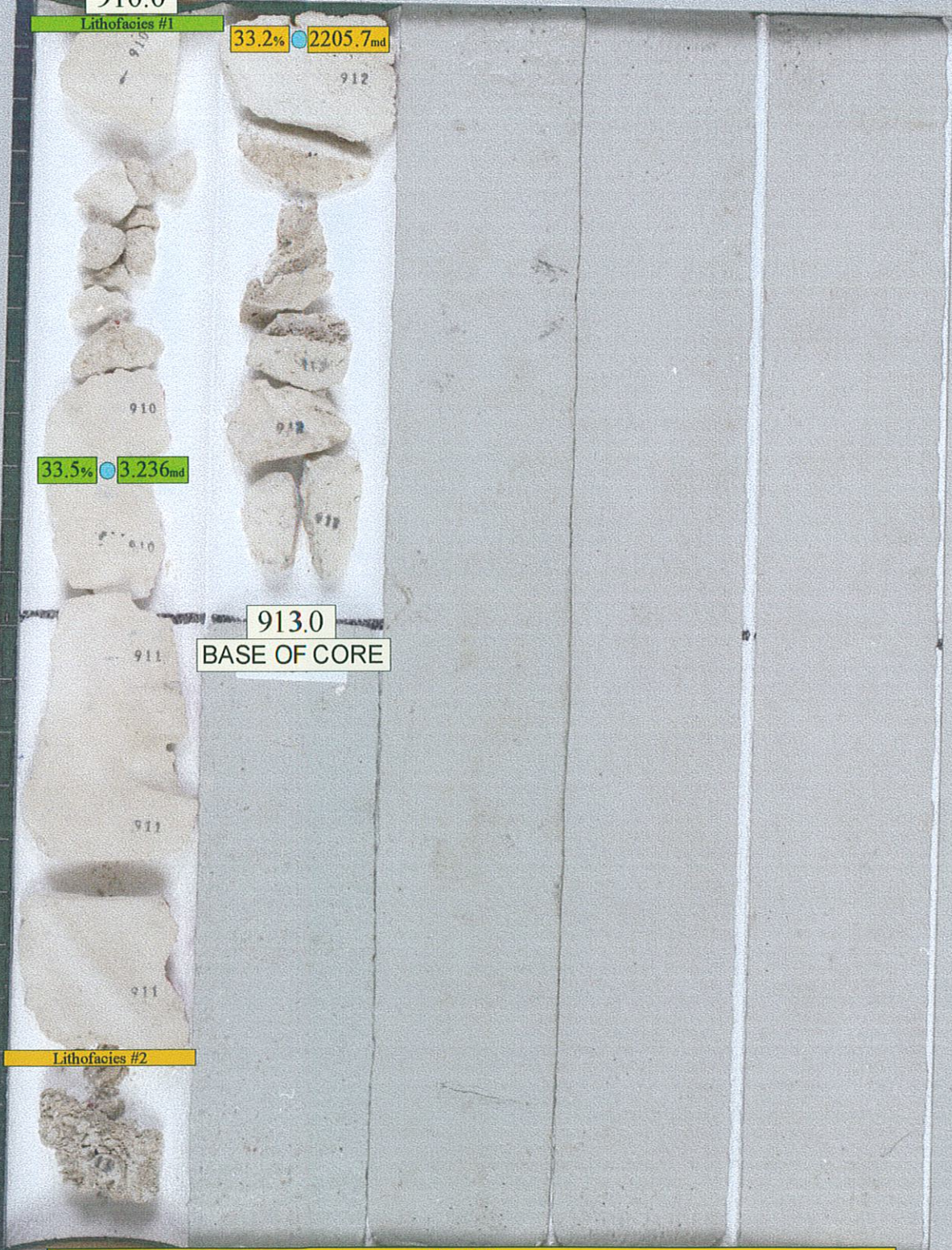
Lithofacies #1

33.2% ● 2205.7md

33.5% ● 3.236md

913.0

BASE OF CORE



KEY

|  |
|--|
| Lithofacies #1: Foram-peloidal packstone |
| Lithofacies #2: Pelecypod coquina        |
|  |
|  |
|  |

|                                 |
|---------------------------------|
| Core Plug Location              |
| Porosity (%) → 39.7% ● 380.22md |
| Permeability (K90) →            |



South Florida Water Management  
I-75-PW  
945-955



TOP OF CORE

945.0

947.0

949.0

951.0

953.0



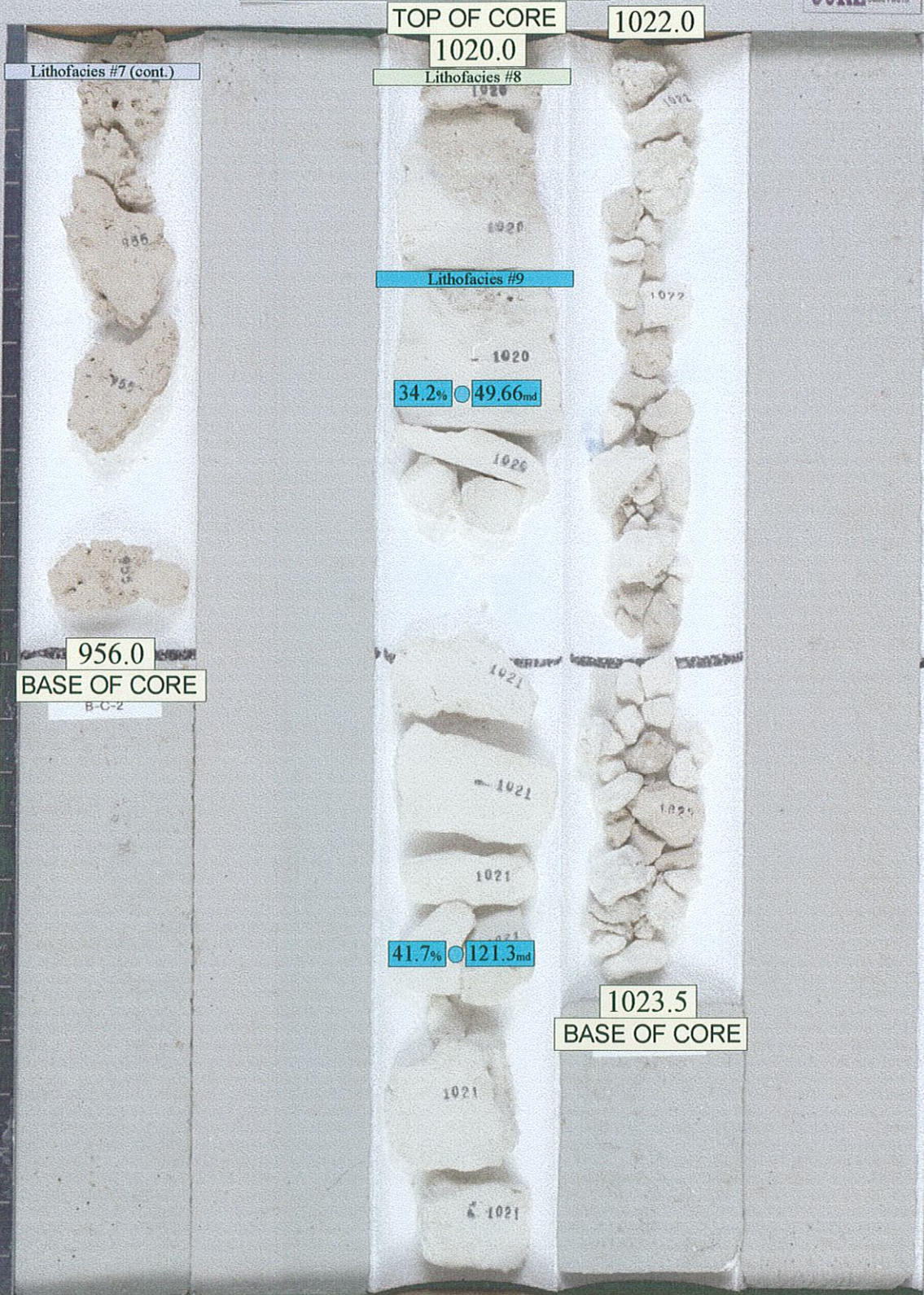
KEY

- Lithofacies #3: Ostracod-foram-peloidal packstone
- Lithofacies #4: Foram-peloidal packstone
- Lithofacies #5: Intra-algal-foram peloid packstone
- Lithofacies #6: Foram-pellet packstone
- Lithofacies #7: Bryzoan-pelecypod-wackstone-grainstone

Core Plug Location  
Porosity (%) → 39.7% ● 380.22md  
Permeability (K90) →



South Florida Water Management  
 I-75-PW  
 955-1023.5



**KEY**

|   |   |
|---|---|
| Lithofacies #7 (cont.): Bryozan-pelecypod-wackstone-grainstone      | Core Plug Location<br>Porosity (%) → 39.7% ● 380.22md<br>Permeability (K90) → |
| Lithofacies #8: Gastropod-pelecypod-skeletal peloidal wackpackstone |   |
| Lithofacies #9: Peloidal skeletal packstone                         |   |





PETROLEUM SERVICES

September 8, 1997

SOUTH FLORIDA WATER MANAGEMENT  
3301 Gun Club Road  
West Palm Beach, Florida 33416

File No.: 57181-17712  
Subject: Core Analysis  
I75-PW

Gentleman:

The subject well was cored using diamond coring equipment and water to obtain 4 inch diameter cores from 910 to 1022 feet from an unknown formation.

Core analysis data is presented in tabular and graphical form for your convenience. A porosity vs. permeability plot was prepared for statistical evaluation.

We trust these data will be useful in the evaluation of your property and thank you for the opportunity of serving you.

Very truly yours,

CORE LABORATORIES, INC.

John Sebian  
Laboratory Supervisor

JS/ym



SOUTH FLORIDA WATER MANAGEMENT  
I75-PW  
File No. 57181-17712  
Procedural Page

The cores were transported to Midland by Motor Freight.

A Core Spectral Gamma Log was recorded for downhole E-log correlation.

Core analysis was made from selected intervals requested on full diameter samples and plug samples when core condition necessitated.

Fluid removal was achieved by convection oven drying.

Full diameter porosity was determined by direct pore volume measurement using Boyle's law helium expansion. Bulk volume was measured by Archimedes Principle. Grain density was calculated from dry weight, bulk volume and pore volume measurements.

$$\text{Grain Density} = \frac{\text{Dry Weight}}{\text{Bulk Vol.} - \text{Pore Vol.}}$$

One inch diameter plugs had direct grain volume measurement using Boyle's law helium expansion. Bulk volume was measured by Archimedes Principle on samples after cleaning. Porosity was calculated using bulk volume and grain volume measurements.

$$\text{Porosity} = \frac{\text{Bulk Vol.} - \text{Grain Vol.}}{\text{Bulk Vol.}} \times 100$$

Two samples, number one and number two, were selected for stress pore volume measurement at 400 PSI net confining pressure. Stress pore volume data indicates minimal to null pore volume reduction.

Steady State Air Permeability on full diameter samples was measured in two horizontal directions and vertically while the core was confined in a Hassler rubber sleeve at 400 net confining stress. Plug permeability was measured in the horizontal direction and confined at 400 net stress.

The core was double slabbed and boxed after analysis.

The slabs were photographed under natural light and ultraviolet light. Negatives were scanned and written to compact discs.

The core will remain at our Midland facility (thirty days free of charge) as we await further disposition instructions.





# PETROLEUM SERVICES

## Hydrostatic Core Holder - 400 Net Overburden Pressure

COMPANY: South Florida Water Management  
WELL: 175-PW

| SAMPLE NO | PLUG DEPTH (feet) | DATA SOURCE               | K(air) (md) | POR (%) | GD (gm/cc) | Description    |
|-----------|-------------------|---------------------------|-------------|---------|------------|----------------|
| 1         | 910.8             | Original Ambient Porosity |             | 33.5    | 2.69       | Lim. vug, foss |
| 1         | 910.8             | Second Ambient Porosity   |             | 33.7    | 2.69       |                |
| 1         | 910.8             | 400 N.O.B. Porosity       | 3.24        | 33.8    | 2.69       |                |
| 2         | 911.3             | Original Ambient Porosity |             | 39.7    | 2.70       | Lim. vug, foss |
| 2         | 911.3             | Second Ambient Porosity   |             | 39.7    | 2.70       |                |
| 2         | 911.3             | 400 N.O.B. Porosity       | 380         | 39.5    | 2.70       |                |



## CORE LABORATORIES

Company : SOUTH FLORIDA WATER MANAGEMENT  
 Well : I75-PW  
 Location :  
 Co,State :

Field :  
 Formation :  
 Coring Fluid :  
 Elevation :

File No.: 57181-17712  
 Date : 8-6-97  
 API No. :  
 Analysts: FULLINWIDER

### CORE ANALYSIS RESULTS

| SAMPLE NUMBER                                | DEPTH<br>ft  | PERMEABILITY            |                        |                          | POROSITY<br>(HELIUM)<br>% | GRAIN<br>DENSITY<br>gm/cc | DESCRIPTION  |
|--|--------------|-------------------------|------------------------|--------------------------|---------------------------|---------------------------|--------------|
|  |              | (MAXIMUM)<br>Kair<br>md | (90 DEG)<br>Kair<br>md | (VERTICAL)<br>Kair<br>md |                           |                           |              |
| <del>CORE NO. 1 910.0-913.0 REC 3'</del>     |              |                         |                        |                          |                           |                           |              |
| * 1  | 910.8        |                         | 3.24                   |                          | 33.5                      | 2.69                      | Lim vug foss |
| * 2  | 911.3        |                         | 380.                   |                          | 39.7                      | 2.70                      | Lim vug foss |
| 3  | 912.5- 12.7  |                         | 2206.                  |                          | 33.2                      | 2.71                      | Lim vug foss |
| <del>CORE NO. 2 945.0-956.0 REC 11'</del>    |              |                         |                        |                          |                           |                           |              |
| 4  | 945.0- 45.4  |                         | 260.                   |                          | 44.8                      | 2.71                      | Lim pp       |
| 5  | 946.3- 46.6  |                         | 193.                   |                          | 43.4                      | 2.70                      | Lim pp       |
| 6  | 947.3- 47.6  |                         | 2444.                  |                          | 44.7                      | 2.71                      | Lim sli/vug  |
| * 7  | 948.7        |                         | 7027.                  |                          | 46.8                      | 2.71                      | Lim sli/vug  |
| 8  | 949.4- 49.8  |                         | 17294.                 |                          | 42.9                      | 2.71                      | Lim sli/vug  |
| 9  | 950.3- 50.7  | 6662.                   | 5613.                  | 5759.                    | 41.2                      | 2.72                      | Lim sli/vug  |
| 10   | 951.0- 51.4  |                         | 770.                   |                          | 45.8                      | 2.71                      | Lim sli/vug  |
| * 11   | 952.1        |                         | 1026.                  |                          | 47.1                      | 2.71                      | Lim vug foss |
| * 12   | 953.1        |                         | 1057.                  |                          | 48.4                      | 2.71                      | Lim vug foss |
| * 13   | 954.3        |                         | 1375.                  |                          | 48.0                      | 2.70                      | Lim vug foss |
| 14   | 954.7- 54.9  |                         | 2339.                  |                          | 47.3                      | 2.71                      | Lim vug foss |
| <del>CORE NO. 3 1020.0-1023.5 REC 3.5'</del> |              |                         |                        |                          |                           |                           |              |
| 15   | 1020.7- 20.9 | 1697.                   | 49.7                   | 1.81                     | 34.2                      | 2.72                      | Lim vug foss |
| * 16   | 1021.5       |                         | 121.                   |                          | 41.7                      | 2.71                      | Lim vug foss |



## CORE LABORATORIES

Company : SOUTH FLORIDA WATER MANAGEMENT  
 Well : I75-PW

Field :  
 Formation :

File No.: 57181-17712  
 Date : 8-6-97

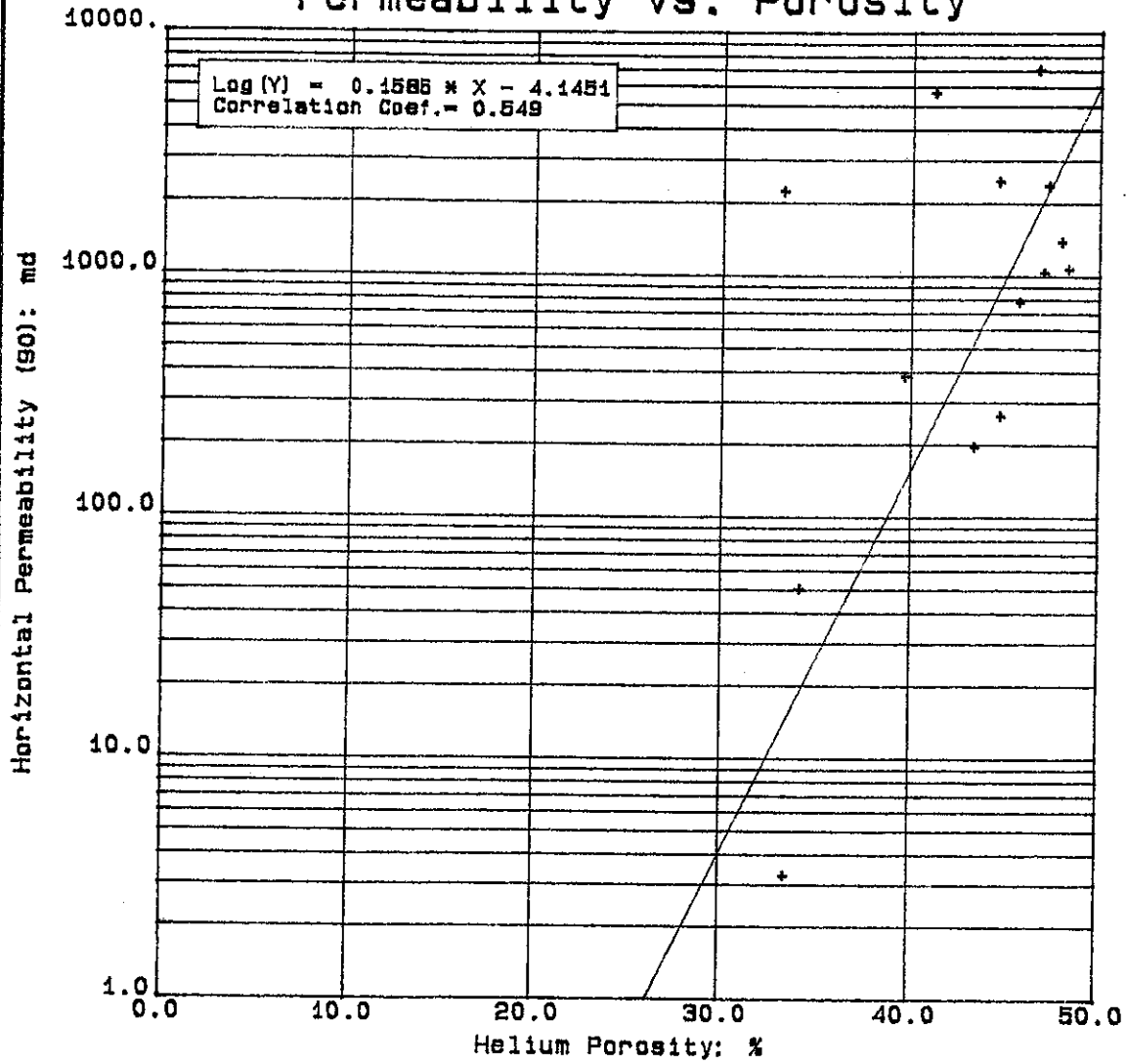
### CORE ANALYSIS RESULTS

| SAMPLE NUMBER | DEPTH<br>ft | PERMEABILITY                        |                                    |                                      | POROSITY<br>(HELIUM)<br>% | GRAIN DENSITY<br>gm/cc | DESCRIPTION |
|---------------|-------------|-------------------------------------|------------------------------------|--------------------------------------|---------------------------|------------------------|-------------|
|               |             | (MAXIMUM)<br>K <sub>air</sub><br>md | (90 DEG)<br>K <sub>air</sub><br>md | (VERTICAL)<br>K <sub>air</sub><br>md |                           |                        |             |

\* INDICATES PLUG ANALYSIS



# Permeability vs. Porosity



|   |   |
|---|---|
| <p><b>SOUTH FLORIDA WATER MANAGEMENT</b><br/>I75-PW</p> <p>(910.8-1021.5 feet)</p> <p>Core Laboratories</p> | <p>- LEGEND -<br/>Not Specified</p> <p>8-6-97</p> |
|---|---|



# CORE LABORATORIES

Company : SOUTH FLORIDA WATER MANAGEMENT  
 Well : I75-PW

Field :  
 Formation : NOT SPECIFIED

File No.: 57181-17712  
 Date : 8-6-97

TABLE I

## SUMMARY OF CORE DATA

| ZONE AND CUTOFF DATA                  | CHARACTERISTICS REMAINING AFTER CUTOFFS  |   |
|---------------------------------------|--|---|
| <b>ZONE:</b>                          | <b>ZONE:</b>                             | <b>PERMEABILITY:</b>                                |
| Identification ----- Not Specified    | Number of Samples ----- 14               | Flow Capacity ----- 15236.1 md-ft                   |
| Top Depth ----- 910.8 ft              | Thickness Represented - 8.4 ft           | Arithmetic Average ---- 1814. md                    |
| Bottom Depth ----- 1021.5 ft          |  | Geometric Average ----- 565. md                     |
| Number of Samples ----- 15            | <b>POROSITY:</b>                         | Harmonic Average ----- 26.1 md                      |
|                                       | Storage Capacity ----- 365.6 $\phi$ -ft  | Minimum ----- 3.24 md                               |
| <b>DATA TYPE:</b>                     | Arithmetic Average ---- 43.5 %           | Maximum ----- 7027. md                              |
| Porosity ----- (HELIUM)               | Minimum ----- 33.2 %                     | Median ----- 1042. md                               |
| Permeability ----- (90 DEG) Kair      | Maximum ----- 48.4 %                     | Standard Dev. (Geom) -- $K \cdot 10^{\pm 0.883}$ md |
|                                       | Median ----- 44.7 %                      |   |
| <b>CUTOFFS:</b>                       | Standard Deviation ---- $\pm 5.6$ %      | <b>HETEROGENEITY (Permeability):</b>                |
| Porosity (Minimum) ----- 0.0 %        | <b>GRAIN DENSITY:</b>                    | Dykstra-Parsons Var. -- 0.773                       |
| Porosity (Maximum) ----- 100.0 %      | Arithmetic Average ---- 2.71 gm/cc       | Lorenz Coefficient ---- 0.586                       |
| Permeability (Minimum) --- 0.0100 md  | Minimum ----- 2.69 gm/cc                 |   |
| Permeability (Maximum) --- 10000. md  | Maximum ----- 2.72 gm/cc                 | <b>AVERAGE SATURATIONS (Pore Volume):</b>           |
| Water Saturation (Maximum)            | Median ----- 2.71 gm/cc                  | Oil -----   |
| Oil Saturation (Minimum) -            | Standard Deviation ---- $\pm 0.01$ gm/cc | Water -----   |
| Grain Density (Minimum) -- 2.00 gm/cc |  |   |
| Grain Density (Maximum) -- 3.00 gm/cc |  |   |
| Lithology Excluded ----- NONE         |  |   |



## LITHOLOGICAL ABBREVIATIONS

|              |                                      |              |                                    |
|--------------|--------------------------------------|--------------|------------------------------------|
| Anhy, anhy   | anhydrite (-ic)                      | Lim, lim     | limestone                          |
| Ark, ark     | arkose (-ic)                         | med gr       | medium grain                       |
| brd          | band (-ed)                           | Mtrx         | matrix                             |
| Brec, brec   | breccia                              | NA           | interval not analyzed              |
| Calc, calctc | calcite (-ic)                        | Nod, nod     | nodules (-ar)                      |
| carb         | carbonaceous                         | Ool, ool     | oolite (-itic)                     |
| crs gr       | course grained                       | Pisol, pisol | pisolite, pisolitic                |
| Chk, chky    | chalk (-y)                           | p.p.         | pin-point (porosity)               |
| cht, cht     | chert (-y)                           | Ptg          | parting                            |
| Ogl, ogl     | conglomerate (-ic)                   | Pyr, pyr     | pyrite (-itized, -itic)            |
| crs xln      | coursely crystalline                 | Sd, sdy      | sand (-y)                          |
| dns          | dense                                | Sh, shy      | shale (-ly)                        |
| Dol, dol     | dolomite (-ic)                       | SHR          | solid hydrocarbon residue          |
| F            | randomly oriented fractures          | sli          | slightly                           |
| f            | slightly fractured                   | Slt, slty    | silt (-y)                          |
| f gr         | fine grained                         | styl         | stylolite (-itic)                  |
| foss         | fossil (-iferous)                    | suc          | sucrosic                           |
| f xln        | finely crystalline                   | Su, su       | sulphur, sulphurous                |
| Gil          | gilsonite                            | TEFA         | TOO BROKEN FOR ANALYSIS            |
| Glauc, glauc | glauconite (-itic)                   | Trip, trip   | tripoli (-itic)                    |
| Grt          | granite                              | v            | very                               |
| GYP, gyp     | gypsum (-iferous)                    | vf           | predominantly vertically fractured |
| hor frac     | predominantly horizontally fractured | vug          | vug (-gy)                          |
| incl         | inclusion (-ded)                     | xbd          | crossbedded                        |
| intbd        | interbedded                          | xln          | medium crystalline                 |
| lam          | lamina (-tions, -ated)               | xtl          | crystal                            |

THE FIRST WORD IN THE DESCRIPTION COLUMN OF THE CORE ANALYSIS REPORT DESCRIBES THE ROCK TYPE. FOLLOWING ARE ROCK MODIFIERS IN DECREASING ABUNDANCE AND MISCELLANEOUS DESCRIPTIVE TERMS.

DISTRIBUTION OF FINAL REPORTS

3 COPIES  
1 CD DISC

SOUTH FLORIDA WATER MANAGEMENT  
ATTN: MICHAEL BENNETT  
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WEST PALM BEACH FL 33416

2 COPIES  
1 SET OF PHOTOS  
1 CD DISC

COLLIER CONSULTING  
ATTN: HUGHERT COLLIER  
741 WEST COLLEGE STREET  
STEPHENVILLE TX 76401



# COMPLETION COREGRAPH

SOUTH FLORIDA WATER MANAGEMENT  
I75-PW

(910.8-1021.5 feet)

Core Laboratories

8-6-97

Vertical Scale  
5.00 in = 100.0 ft



# SPECTRAL CORE GAMMA LOG

SOUTH FLORIDA WATER MANAGEMENT  
I75-PW

(910.8-1021.5 feet)

Core Laboratories

8-6-97

Vertical Scale  
5.00 in = 100.0 ft

