

VOLUME III APPENDIXES

DRILLING AND TESTING OF THE DEEP INJECTION WELL SYSTEM AT NORTH PORT, FLORIDA

**Prepared for
GENERAL DEVELOPMENT UTILITIES, INC.
Miami, Florida**



Prepared by



VOLUME III. APPENDIXES

DRILLING AND TESTING OF THE
DEEP INJECTION WELL SYSTEM AT
NORTH PORT, FLORIDA

Prepared for

GENERAL DEVELOPMENT UTILITIES, INC.
Miami, Florida

GDU Work Release No. 1538

Prepared by

CH2M HILL
800 Fairway Drive, Suite 305
Deerfield Beach, Florida 33441



September 1988
FC15920.C2

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Appendix Q

Geophysical Logs, OMW

CLIENT GDU-North Port Date July 16, 1987
 Well No. OMW Project No. FC 15920.C2

Location: State FL County Sarasota
1/4 1/4 1/4 Sec. 12 T. 40 N R. 20 E
 Logged by B. Cocke Observer Dave Snyder

Owner: GDU-North Port
 Well: On Site Monitor Well
 Driller: Alsay Inc. Date Drilled: July 1987
 Surface Elevation: 8 ft. Estimated Above MSL
 Measured
 T.D. Logged 560' T.D. Driller 560'
 Hole Dia. 22" 26' to 560'
 Casing Dia. 32" to 26'
 Finish: Open hole Screen Gravel Other
 Water Level: _____ ft. Above MP, AT Above Land Surface
 Below Below Pad Surface
 Yield: Flow N/A gpm Pump _____ gpm
 Drawdown: N/A ft. after _____ hours pumping @ _____ gpm
 Use: Dom. Stock PS Ind. Irr. Test
 Heating or cooling Drainage Disposal Obs.

Water Quality: N/A Drilling Mud
 Temp. _____ °F, Sp Cond. _____; Iron _____ mg/L
 Cl⁻ _____ mg/L; SO₄²⁻ _____ mg/L; Total Hardness _____ mg/L
 Color _____ Odor _____ Taste _____

Remarks: _____

CH2M HILL **GEOPHYSICAL WELL SURVEY**

Electric 18" Normal 64" Normal Single Point S.P.
 Caliper Fluid Resistivity Fluid Velocity Gamma Ray Temperature

Log Scales

Electric Log Fluid Resistivity
 SP 20 millivolts/inch _____ ohm meters/inch
 Res. 20 ohm-meters/inch
 Res. _____ ohms/inch @ _____ °F

Gamma Ray Log Fluid Velocity
10 Counts/sec/inch _____ Counts/min/inch
 Time Constant 4 sec. _____ FPM (Continuous)
 Logging speed 20 FPM Q = _____ gpm

Temperature _____ °F to _____ °F
 Logging speed _____ FPM Caliper 12 inches to 30 inches
 Logging speed _____ FPM Logging speed 20 FPM

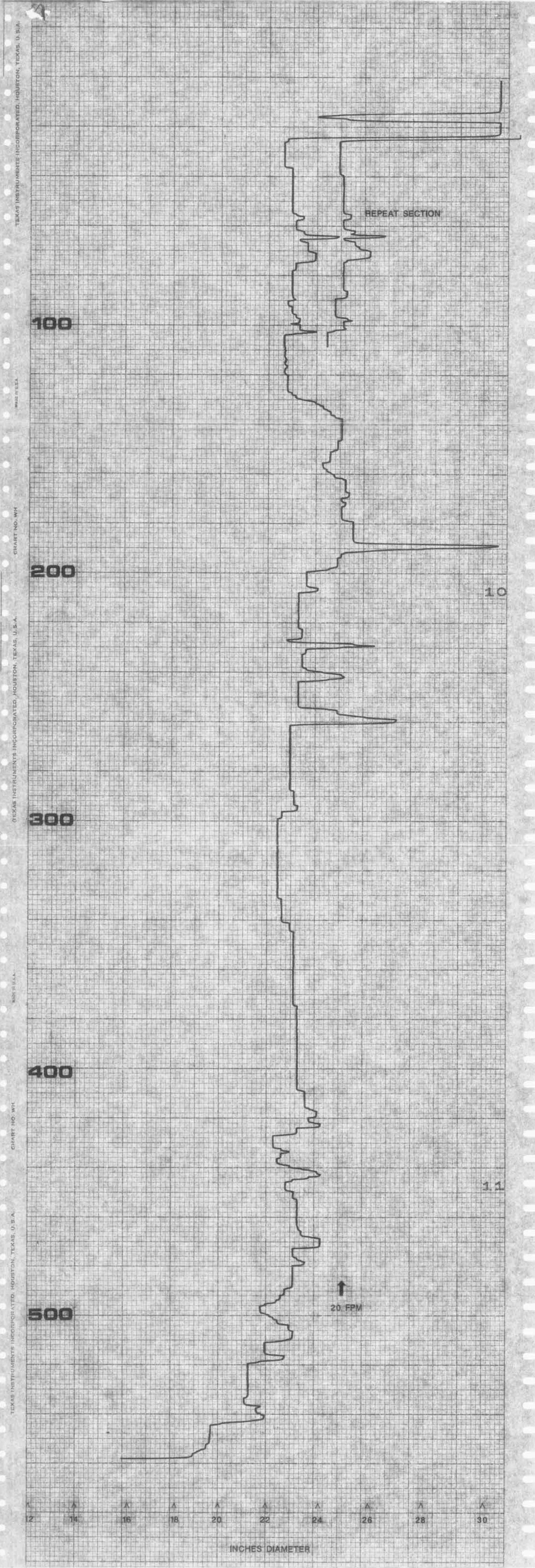
Water Samples
 Depths sampled: _____

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 Palm Beach County—305/395-3800
 Broward County—305/426-4008



CLIENT GDU-North Port **Date** July 16, 1987
Well No. OMW **Project No.** FC 15920.C2

Location: State FL County Sarasota
1/4 1/4 1/4 Sec. 12 T. 40 1/4 1/4 R. 20 1/4 1/4
 N S E W

Logged by B. Cocke Observer Dave Snyder

Owner: GDU-North Port
Well: On Site Monitor Well
Driller: Alsay Inc. **Date Drilled:** July 1987
Surface Elevation: 8 ft. Estimated Measured Above MSL
T.D. Logged: 560' T.D. Driller 560'

Hole Dia. 22" 26' to 560'
 Casing Dia. 32" to 26'

Finish: Open hole Screen Gravel Other

Water Level: ft. Above MP AT Above Land Surface
 Below Below Pad Surface

Yield: Flow N/A gpm Pump gpm

Drawdown: N/A ft. after hours pumping @ gpm

Use: Dom Stock PS Ind. Irr Test
 Heating or cooling Drainage Disposal Obs.

Water Quality: N/A Drilling Mud
 Temp. °F. Sp. Cond. ; Iron mg/L
 Cl⁻ mg/L. SO₄⁻² mg/L; Total Hardness mg/L
 Color Odor Taste

Remarks:



GEOPHYSICAL WELL SURVEY

- Electric
 16" Normal
 64" Normal
 Single Point
 S.P.
- Calliper
 Fluid Resistivity
 Fluid Velocity
 Gamma Ray
 Temperature

Log Scales

Electric Log Fluid Resistivity
 SP 20 millivolts/inch ohm meters/inch
 Res. 20 ohm-meters/inch
 Res. ohms/inch @ °F

Gamma Ray Log Fluid Velocity
10 Counts/sec/inch Counts/min/inch
 Time Constant 4 sec FPM (Continuous)
 Logging speed 20 FPM Q = gpm

Temperature °F to °F Calliper 12 inches to 30 inches
 Logging speed FPM Logging speed 20 FPM

Water Samples
 Depths sampled:

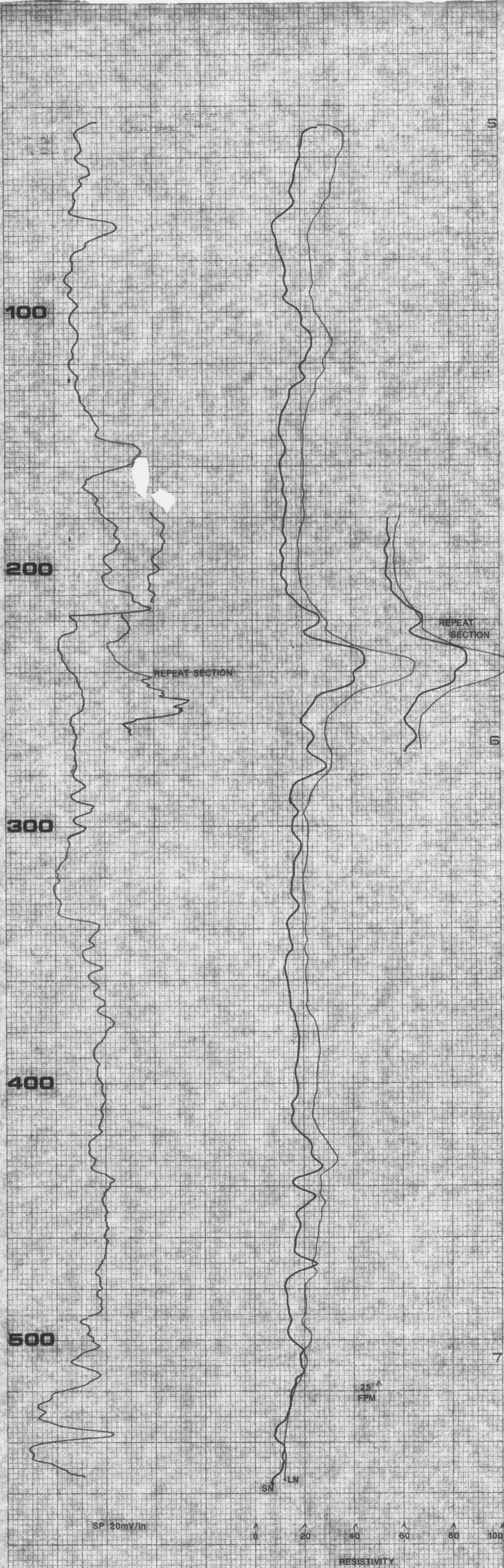
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CLIENT GDU-North Port **Date** July 16, 1987
Well No. OMW **Project No.** FC 15920.C2

Location: State FL County Sarasota
 1/4 W 1/4 Sec. 12 T. 40 N. R. 20 E
 Logged by B. Cocke Observer Dave Snyder

Owner: GDU-North Port
 Well: On Site Monitor Well
 Driller: Alsay Inc. Date Drilled: July 1987
 Surface Elevation: 8 ft. Estimated Measured Above MSL
 T.D. Logged 560' T.D. Driller 560'
 Hole Dia. 22" 26' to 560'
 Casing Dia. 32" to 26'

Finish: Open hole Screen Gravel Other
 Water Level: ft. Above MP, AT Above Land Surface
 Below Below Pad Surface
 Yield: Flow N/A gpm Pump gpm
 Drawdown: N/A ft. after hours pumping @ gpm

Use: Dom Stock PS Ind Irr Test
 Heating or cooling Drainage Disposal Obs.

Water Quality: N/A Drilling Mud
 Temp °F Sp. Cond. Iron mg/L
 Cl⁻ mg/L SO₄⁻² mg/L Total Hardness mg/L
 Color Odor Taste

Remarks:

CH2M HILL **GEOPHYSICAL WELL SURVEY**

- Electric
- 16" Normal
- 64" Normal
- Single Point
- S.P.
- Caliper
- Fluid Resistivity
- Fluid Velocity
- Gamma Ray
- Temperature

Log Scales

Electric Log Fluid Resistivity
 SP 20 millivolts/inch _____ ohm meters/inch
 Res. 20 ohm-meters/inch
 Res. _____ ohms/inch @ _____ °F

Gamma Ray Log Fluid Velocity
10 Counts/sec/inch _____ Counts/min/inch
 Time Constant 4 sec. _____ FPM (Continuous)
 Logging speed 20 FPM Q = _____ gpm

Temperature Caliper
 _____ °F to _____ °F 12 inches to 30 inches
 Logging speed _____ FPM Logging speed 20 FPM

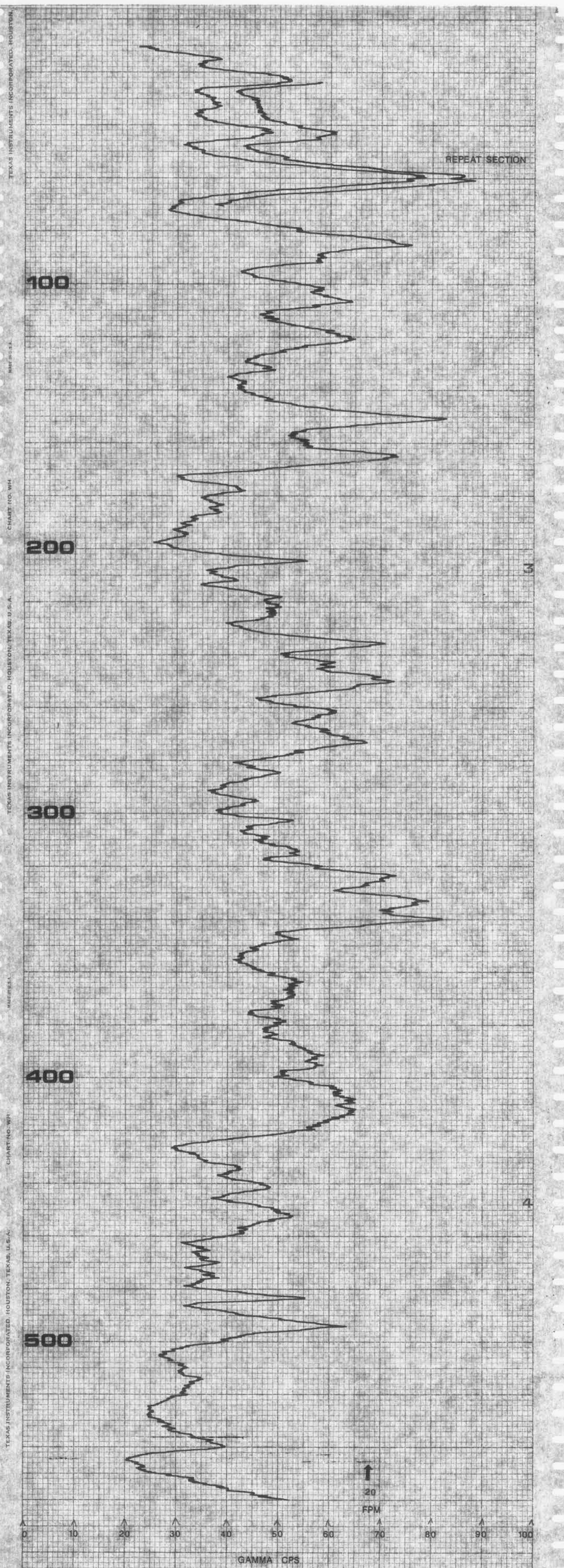
Water Samples
 Depths sampled _____

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GEOPHYSICAL WELL SURVEY

- | | |
|---------------------------------------|---|
| Electric | <input checked="" type="checkbox"/> Caliper |
| <input type="checkbox"/> 16" Normal | <input type="checkbox"/> Fluid Resistivity |
| <input type="checkbox"/> 64" Normal | <input type="checkbox"/> Fluid Velocity |
| <input type="checkbox"/> Single Point | <input type="checkbox"/> Gamma Ray |
| <input type="checkbox"/> S.P. | <input type="checkbox"/> Temperature |

CLIENT GDJ - North Port Date Aug 24, 1987
 Well No. OMW Project No. PC15920.C2

Location: State FL County Sarasota
1/4 1/4 1/4 Sec. 12 T. 40 N S E W
 Logged by B. Cocke Observer David Snyder

Owner: GDJ
 Well: On Site Monitor Well
 Driller: Alsay Inc. Date Drilled: Aug 1987
 Surface Elevation: 8 ft. Estimated Above MSL
 Measured T.D. Driller 735'
 T.D. Logged 733'
 Hole Dia. 12" 560' to 730'
 Casing Dia. 20" to 560'

Finish: Open hole Screen Gravel Other
 Water Level: Flowing ft. Above MP, AT Above Land Surface
 Below Below Pad Surface
 Yield: Flow 500 gpm Pump _____ gpm
 Drawdown: N/A ft. after _____ hours pumping @ _____ gpm

Use: Dom. Stock PS Ind. Irr. Test
 Heating or cooling Drainage Disposal Obs ASR

Water Quality:
 Temp. 84 °F; Sp. Cond. 14,000; Iron _____ mg/L
 Cl⁻ _____ mg/L; SO₄⁻² _____ mg/L; Total Hardness _____ mg/L
 Color _____ Odor _____ Taste _____

Remarks: _____

Log Scales

Electric Log	Fluid Resistivity
SP <u>20</u> millivolts/inch	<u>See Log</u> ohm meters/inch
Res. <u>10</u> ohm-meters/inch	
Res. _____ ohms/inch	@ <u>84</u> °F

Gamma Ray Log	Fluid Velocity
<u>10</u> Counts/sec/inch	_____ Counts/min/inch
Time Constant <u>4</u> sec.	_____ FPM (Continuous)
Logging speed <u>20</u> FPM	Q = _____ gpm

Temperature	Caliper
<u>80</u> °F to <u>90</u> °F	<u>8</u> inches to <u>28</u> inches
Logging speed <u>35</u> FPM	Logging speed <u>35</u> FPM

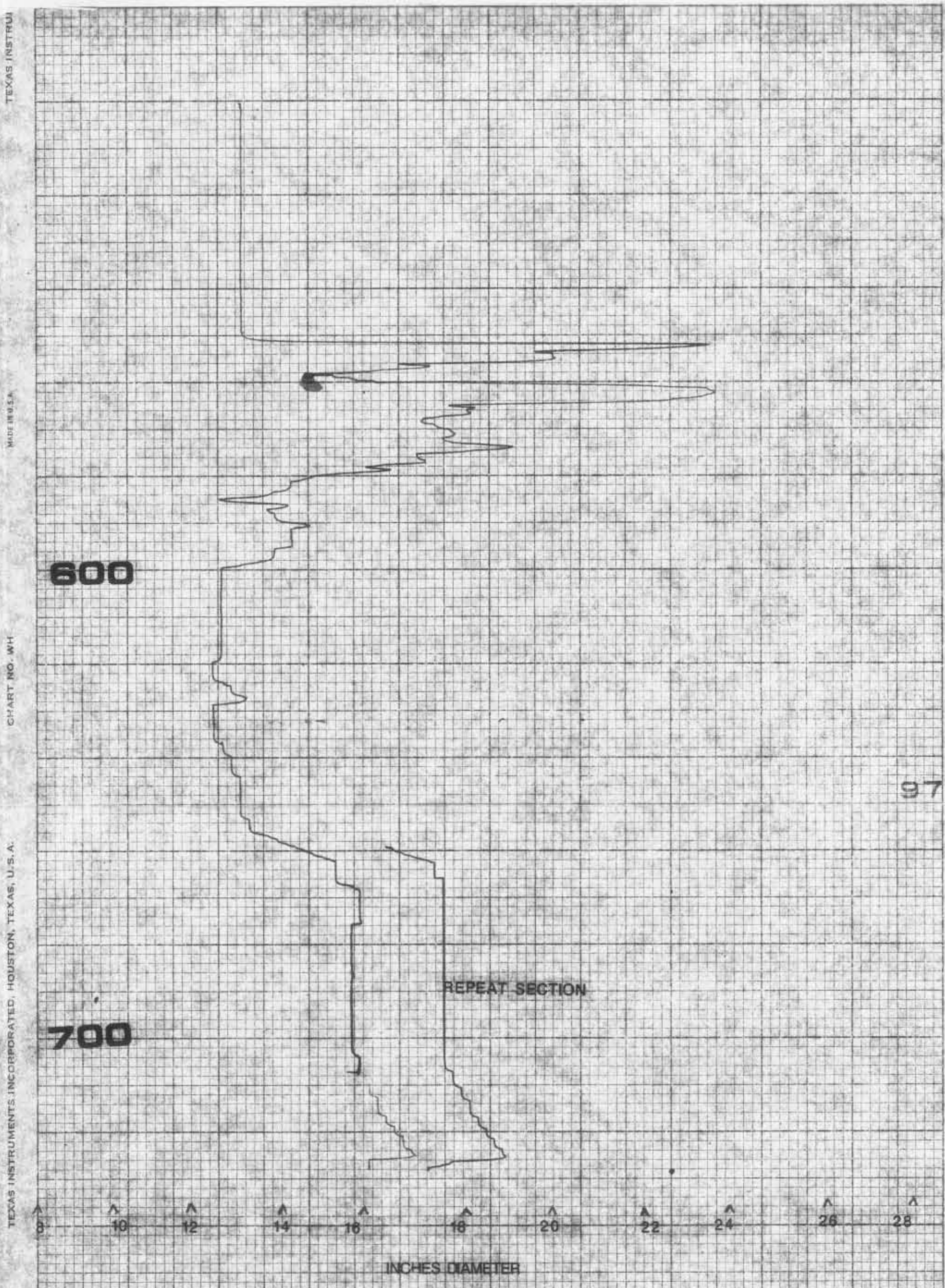
Water Samples
 Depths sampled: 560', 600', 730', _____, _____

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GEOPHYSICAL WELL SURVEY

- Electric
 - 16" Normal
 - 64" Normal
 - Single Point
 - S.P.
- Caliper
- Fluid Resistivity
- Fluid Velocity
- Gamma Ray
- Temperature

CLIENT GDU - North Port Date Aug 24, 1987
 Well No. OMW Project No. FC15920.C2

Location: State FL County Sarasota
1/4 1/4 1/4 Sec 12 T 40 N S E W R 20
 Logged by B. Cocke Observer David Snyder

Owner: GDU
 Well: On Site Monitor Well
 Driller: Alsay Inc. Date Drilled: Aug 1987
 Surface Elevation: 8 ft. Estimated Above MSL
 Measured
 T.D. Logged 733' T.D. Driller 735'
 Hole Dia. 12" 560' to 730'
 Casing Dia. 20" to 560'
 Finish: Open hole Screen Gravel Other
 Water Level: Flowing ft. Above MP: AT Above Land Surface
 Below Below Pad Surface
 Yield: Flow 500 gpm Pump _____ gpm
 Drawdown: N/A ft. after _____ hours pumping @ _____ gpm
 Use Dom. Stock PS Ind Irr. Test Heating or cooling Drainage Disposal Obs. ASR

Water Quality:
 Temp. 84 °F; Sp Cond. 14,000 Iron _____ mg/L
 Cl⁻ _____ mg/L; SO₄ _____ mg/L; Total Hardness _____ mg/L
 Color _____ Odor _____ Taste _____

Remarks _____

Log Scales

Electric Log	Fluid Resistivity
SP <u>20</u> millivolts/inch	See Log _____ ohm meters/inch
Res. <u>10</u> ohm-meters/inch	
Res. _____ ohms/inch	@ <u>84</u> °F
Gamma Ray Log	Fluid Velocity
<u>10</u> Counts/sec/inch	_____ Counts/min/inch
Time Constant <u>4</u> sec.	_____ FPM (Continuous)
Logging speed <u>20</u> FPM	Q = _____ gpm
Temperature	Caliper
<u>80</u> °F to <u>90</u> °F	<u>8</u> inches to <u>28</u> inches
Logging speed <u>35</u> FPM	Logging speed <u>35</u> FPM
Water Samples	
Depths sampled: <u>560'</u> , <u>600'</u> , <u>730'</u>	

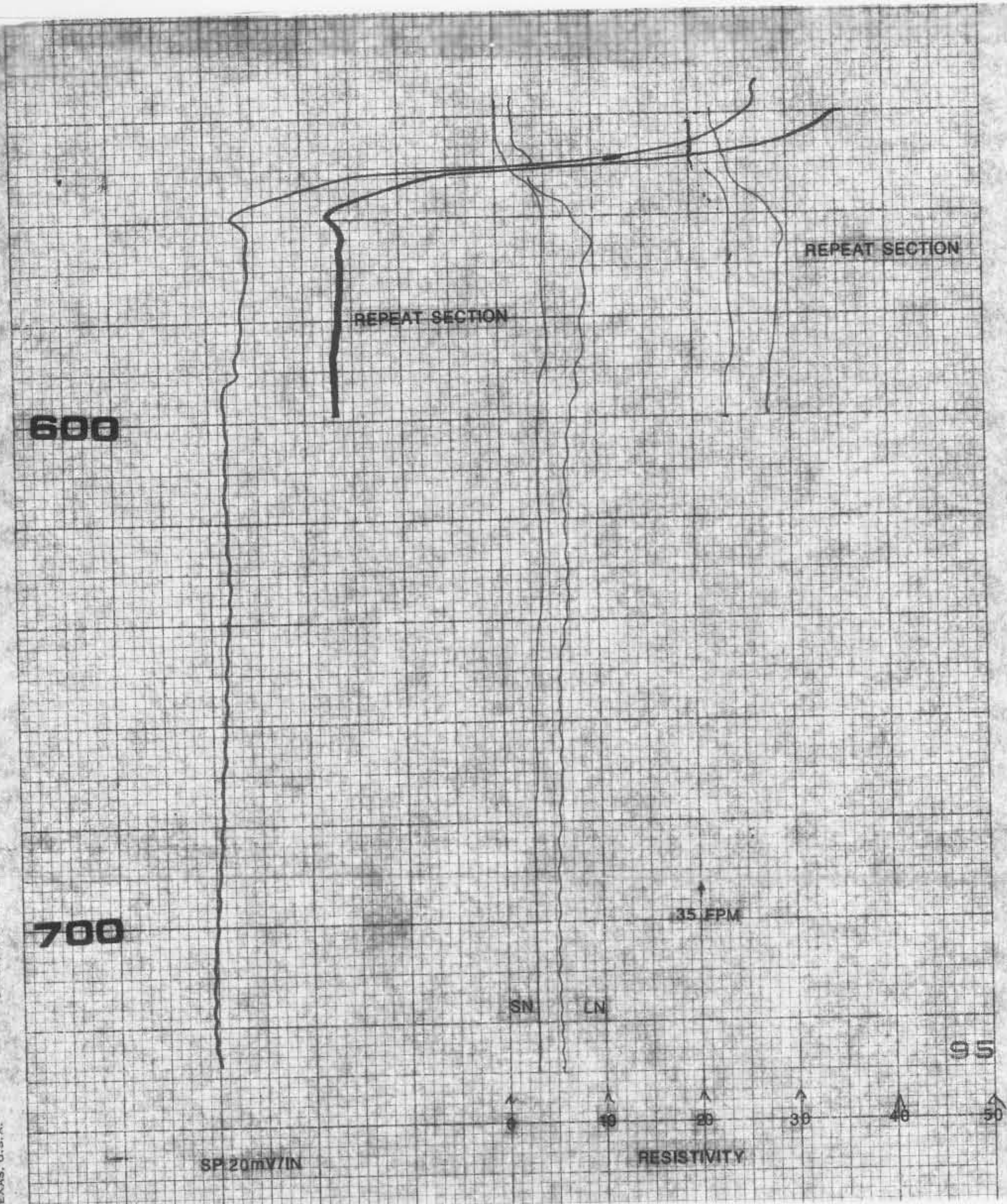
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Well No. <u>QMW</u>	Project No. <u>FC15920.C2</u>
Location: State <u>FL</u> County <u>Sarasota</u>	
1/4 <u> </u> 1/4 <u> </u> 1/4 Sec. <u>12</u> T. <u>40</u> R. <u>20</u> <input type="checkbox"/> E <input type="checkbox"/> W <input type="checkbox"/> N <input checked="" type="checkbox"/> S	
Logged by <u>B. Cocke</u> Observer <u>David Snyder</u>	
Owner: <u>GDU</u>	
Well: <u>On Site Monitor Well</u>	
Driller: <u>Alsay Inc.</u> Date Drilled: <u>Aug 1987</u>	
Surface Elevation: <u>8</u> ft. <input checked="" type="checkbox"/> Estimated Above MSL <input type="checkbox"/> Measured	
T.D. Logged <u>733'</u> T.D. Driller <u>735'</u>	
Hole Dia. <u>12" 560' to 730'</u>	
Casing Dia. <u>20" to 560'</u>	
Finish: <input checked="" type="checkbox"/> Open hole <input type="checkbox"/> Screen <input type="checkbox"/> Gravel <input type="checkbox"/> Other	
Water Level: <u>Flowing</u> ft. <input type="checkbox"/> Above MP. <u>AT</u> <input type="checkbox"/> Above Land Surface <input type="checkbox"/> Below <input type="checkbox"/> Pad Surface	
Yield: Flow <u>500</u> gpm Pump <u> </u> gpm	
Drawdown: <u>N/A</u> ft. after <u> </u> hours pumping @ <u> </u> gpm	
Use: <input type="checkbox"/> Dom. <input type="checkbox"/> Stock <input type="checkbox"/> PS <input type="checkbox"/> Ind. <input type="checkbox"/> Irr. <input type="checkbox"/> Test <input type="checkbox"/> Heating or cooling <input type="checkbox"/> Drainage <input type="checkbox"/> Disposal <input type="checkbox"/> Obs. <input checked="" type="checkbox"/> ASR	
Water Quality:	
Temp. <u>84</u> °F, Sp. Cond. <u>14,000</u> ; Iron <u> </u> mg/L	
Cl ⁻ <u> </u> mg/L, SO ₄ ²⁻ <u> </u> mg/L, Total Hardness <u> </u> mg/L	
Color <u> </u> Odor <u> </u> Taste <u> </u>	
Remarks: <u> </u>	

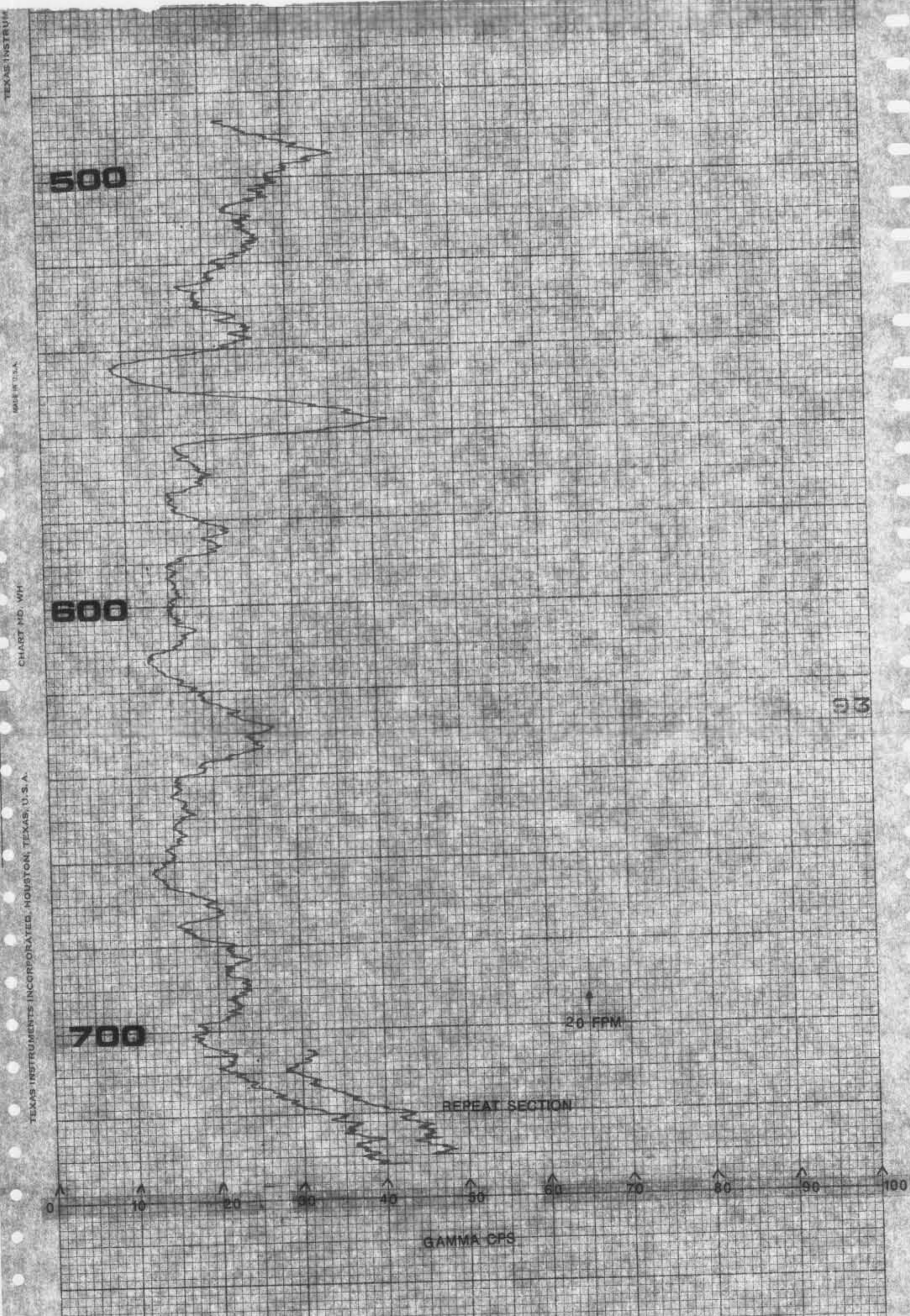


GEOPHYSICAL WELL SURVEY

- | | |
|---------------------------------------|---|
| <input type="checkbox"/> Electric | <input type="checkbox"/> Caliper |
| <input type="checkbox"/> 16" Normal | <input type="checkbox"/> Fluid Resistivity |
| <input type="checkbox"/> 64" Normal | <input type="checkbox"/> Fluid Velocity |
| <input type="checkbox"/> Single Point | <input checked="" type="checkbox"/> Gamma Ray |
| <input type="checkbox"/> S.P. | <input type="checkbox"/> Temperature |

Log Scales	
Electric Log	Fluid Resistivity
SP <u>20</u> millivolts/inch	<u>See Log</u> ohm meters/inch
Res. <u>10</u> ohm-meters/inch	
Res. <u> </u> ohms/inch	@ <u>84</u> °F
Gamma Ray Log	Fluid Velocity
<u>10</u> Counts/sec/inch	<u> </u> Counts/min/inch
Time Constant <u>4</u> sec.	<u> </u> FPM (Continuous)
Logging speed <u>20</u> FPM	Q = <u> </u> gpm
Temperature	Caliper
<u>80</u> °F to <u>90</u> °F	<u>8</u> inches to <u>28</u> inches
Logging speed <u>35</u> FPM	Logging speed <u>35</u> FPM
Water Samples	
Depths sampled <u>560'</u> , <u>600'</u> , <u>730'</u> , <u> </u> , <u> </u>	

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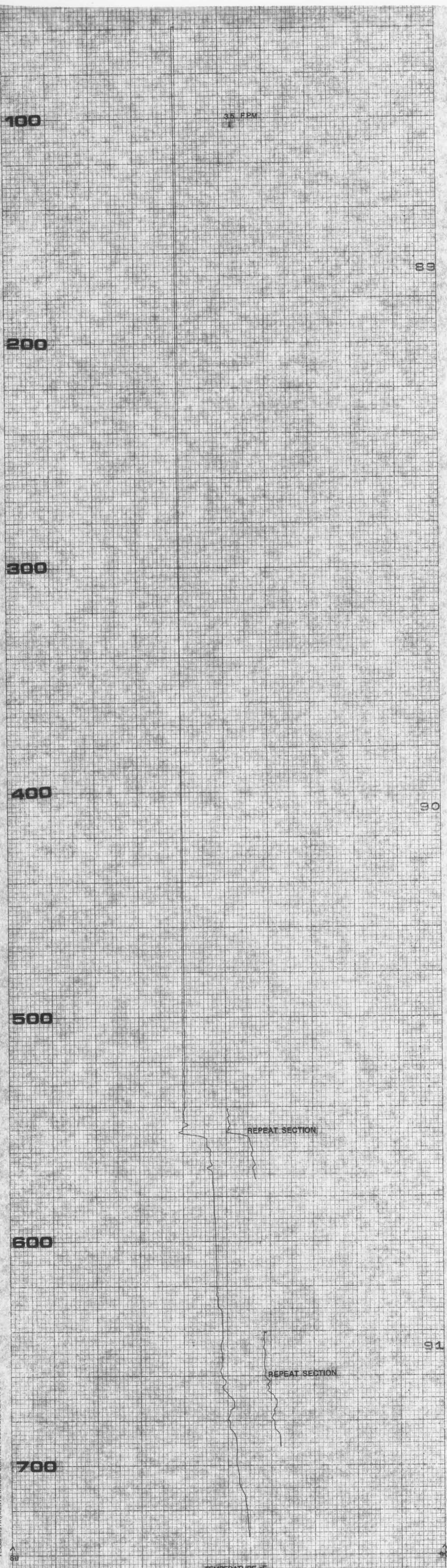


GEOPHYSICAL WELL SURVEY

- Electric
 - 16" Normal
 - 64" Normal
 - Single Point
 - S.P.
- Caliper
 - Fluid Resistivity
 - Fluid Velocity
 - Gamma Ray
 - Temperature

CLIENT <u>GDU - North Port</u> Date <u>Aug 24, 1987</u>	
Well No. <u>CMW</u> Project No. <u>FC15920.C2</u>	
Location: State <u>FL</u> County <u>Sarasota</u>	
1/4 <u> </u> 1/4 <u> </u> Sec. <u>12</u> T. <u>40</u> N <u> </u> R <u>20</u> E <input type="checkbox"/> S <input type="checkbox"/> W	
Logged by <u>B. Cocke</u> Observer <u>David Snyder</u>	
Owner: <u>GDU</u>	
Well: <u>On Site Monitor Well</u>	
Driller: <u>Alsay Inc.</u> Date Drilled: <u>Aug 1987</u>	
Surface Elevation: <u>8</u> ft. <input type="checkbox"/> Estimated Above MSL <input type="checkbox"/> Measured T.D. Driller <u>735'</u>	
T.D. Logged <u>733'</u>	
Hole Dia. <u>12" 560' to 730'</u>	
Casing Dia. <u>20" to 560'</u>	
Finish: <input checked="" type="checkbox"/> Open hole <input type="checkbox"/> Screen <input type="checkbox"/> Gravel <input type="checkbox"/> Other	
Water Level: <u>Flowing</u> ft. <input type="checkbox"/> Above MP. <u>AT</u> <input type="checkbox"/> Above <input checked="" type="checkbox"/> Land Surface <input type="checkbox"/> Below gpm <input type="checkbox"/> Below <input type="checkbox"/> Pad Surface gpm	
Yield: Flow <u>500</u> gpm Pump <u> </u> gpm	
Drawdown: <u>N/A</u> ft. after <u> </u> hours pumping @ <u> </u> gpm	
Use: <input type="checkbox"/> Dom. <input type="checkbox"/> Stock <input type="checkbox"/> PS <input type="checkbox"/> Ind. <input type="checkbox"/> Irr. <input type="checkbox"/> Test <input type="checkbox"/> Heating or cooling <input type="checkbox"/> Drainage <input type="checkbox"/> Disposal <input type="checkbox"/> Obs. <input checked="" type="checkbox"/> ASR	
Water Quality: Temp. <u>84</u> °F. Sp Cond. <u>14,000</u> Iron <u> </u> mg/L Cl ⁻ <u> </u> mg/L. SO ₄ ⁻² <u> </u> mg/L. Total Hardness <u> </u> mg/L Color <u> </u> Odor <u> </u> Taste <u> </u>	
Remarks: <u> </u>	

Log Scales	
Electric Log	Fluid Resistivity
SP <u>20</u> millivolts/inch	See Log <u> </u> ohm meters/inch
Res. <u>10</u> ohm-meters/inch	
Res. <u> </u> ohms/inch	@ <u>84</u> °F
Gamma Ray Log	Fluid Velocity
<u>10</u> Counts/sec/inch	<u> </u> Counts/min/inch
Time Constant <u>4</u> sec.	<u> </u> FPM (Continuous)
Logging speed <u>20</u> FPM	Q = <u> </u> gpm
Temperature <u>80</u> °F to <u>90</u> °F	Caliper <u>8</u> inches to <u>28</u> inches
Logging speed <u>35</u> FPM	Logging speed <u>35</u> FPM
Water Samples	
Depths sampled: <u>560'</u> , <u>600'</u> , <u>730'</u> , <u> </u> , <u> </u>	
CH2M HILL Water Resources Division P.O. Box 1647 Gainesville, Florida 32620 904/377-2442	Fort Myers Office The Financial Center 1550 College Parkway, Suite 307 Fort Myers, Florida 33907 813/275-3121
Deerfield Beach Office Hillsboro Executive Center North 350 Fairway Drive, Suite 210 Deerfield Beach, Florida 33441 Palm Beach County—305/395-3800 Broward County—305/426-4008	Tampa Office Rocky Point Centre 3030 North Rocky Point Drive, West Suite 350 Tampa, Florida 33607 Hillsborough County—813/888-6777 Pinellas County—813/536-9454



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TEMPERATURE °F

CLIENT GDU - North Port Date Aug 24, 1987
 Well No. QMW Project No. PC15920.C2



GEOPHYSICAL WELL SURVEY

Location: State FL County Sarasota
 T. 40 N. 20 E. W
 Logged by B. Cocke Observer David Snyder

- Electric
 16" Normal
 64" Normal
 Single Point
 S.P.
- Caliper
 Fluid Resistivity
 Fluid Velocity
 Gamma Ray
 Temperature

Owner: GDU
 Well: On Site Monitor Well
 Driller: Alsay Inc. Date Drilled: Aug 1987
 Surface Elevation: 8 ft. Estimated Above MSL
 T.D. Logged: 733' Measured T.D. Driller: 735'
 Hole Dia: 12" 560' to 730'
 Casing Dia: 20" tr) 560'
 Finish: Open hole Screen Gravel Other
 Water Level: Flowing ft. Above MP, AT Above Land Surface
 Yield: Flow 500 gpm Below Pump Pad Surface gpm
 Drawdown: N/A ft. after _____ hours pumping @ _____ gpm
 Use: Dom. Stock PS Ind. Irr. Test
 Heating or cooling Drainage Disposal Obs. ASR

Log Scales

Electric Log	Fluid Resistivity
SP <u>20</u> millivolts/inch	See Log _____ ohm meters/inch
Res. <u>10</u> ohm-meters/inch	
Res. _____ ohms/inch	@ <u>84</u> °F
Gamma Ray Log	Fluid Velocity
<u>10</u> Counts/sec/inch	_____ Counts/min/inch
Time Constant <u>4</u> sec.	_____ FPM (Continuous)
Logging speed <u>20</u> FPM	Q = _____ gpm
Temperature <u>80</u> °F to <u>90</u> °F	Caliper <u>8</u> inches to <u>28</u> inches
Logging speed <u>35</u> FPM	Logging speed <u>35</u> FPM

Water Quality:
 Temp. 84 °F, Sp Cond 14,000; Iron _____ mg/L
 Cl⁻ _____ mg/L, SO₄⁻² _____ mg/L; Total Hardness _____ mg/L
 Color _____ Odor _____ Taste _____

Water Samples
 Depths sampled: 560', 600', 730', _____, _____

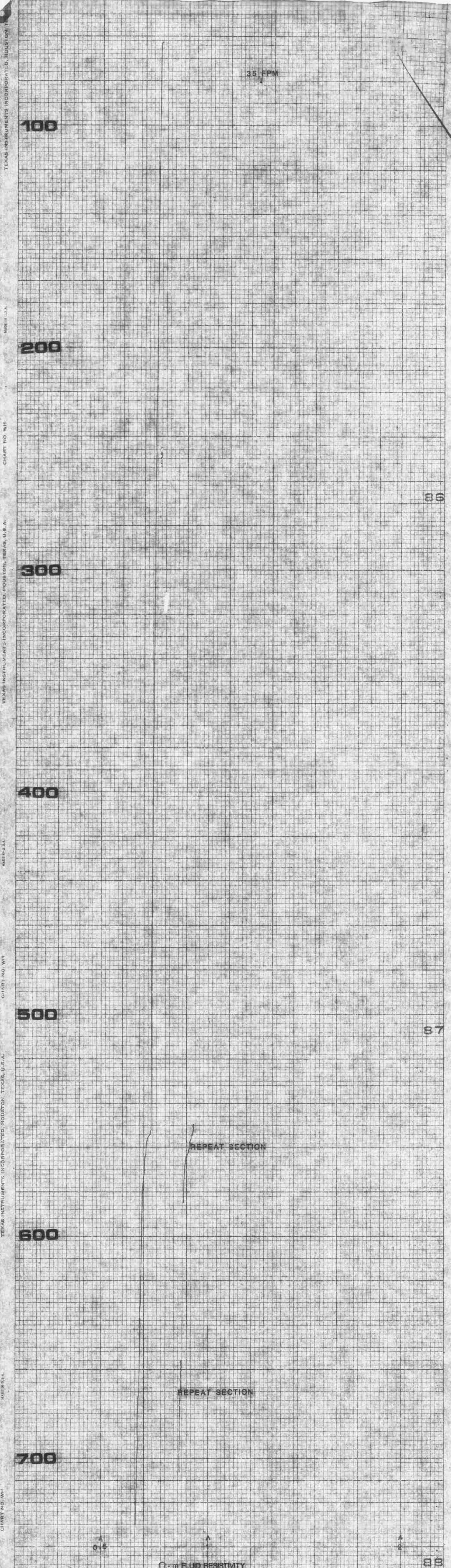
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Remarks: _____



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GEOPHYSICAL WELL SURVEY

CLIENT North Port Date August 27, 1987
 Well No. OMW Project No. PC15920.C2

Location: State FL County Sarasota
 1/4 1/4 1/4 Sec. 12 T. 40 N R 20 E
 W
 Logged by B. Cocke Observer Dave Snyder

Owner: GDU - North Port
 Well: On Site Monitor Well
 Driller: Alsay Inc. Date Drilled: Aug 1987
 Surface Elevation: 8 ft. Estimated Above MSL
 Measured
 T.D. Logged 720' T.D. Driller 730'
 Hole Dia. _____
 Casing Dia. 2 1/2" ID FRP to 730'
 Finish: Open hole Screen Gravel Other
 Water Level: _____ ft. Above MP, Above Land Surface
 Below Below Pad Surface
 Yield: Flow _____ gpm Pump _____ gpm
 Drawdown: _____ ft. after _____ hours pumping @ _____ gpm
 Use: Dom. Stock PS Ind. Irr. Test
 Heating or cooling Drainage Disposal Obs.

Water Quality:
 Temp. 8.1 °F; Sp. Cond. _____; Iron _____ mg/L
 Cl⁻ _____ mg/L; SO₄²⁻ _____ mg/L; Total Hardness _____ mg/L
 Color _____ Odor _____ Taste _____

Remarks: Log run 12 hours after 1st stage of cementing.

- Electric 16" Normal Fluid Resistivity
 64" Normal Fluid Velocity
 Single Point Gamma Ray
 S.P. Temperature

Log Scales

Electric Log Fluid Resistivity
 SP _____ millivolts/inch _____ ohm meters/inch
 Res. _____ ohm-meters/inch
 Res. _____ ohms/inch @ _____ °F

Gamma Ray Log Fluid Velocity
 _____ Counts/sec/inch _____ Counts/min/inch
 Time Constant _____ sec. _____ FPM (Continuous)
 Logging speed _____ FPM Q = _____ gpm

Temperature _____ °F to _____ °F/5"
 Logging speed 40 FPM Caliper _____ inches to _____ inches
 Logging speed _____ FPM

Water Samples
 Depths sampled: _____

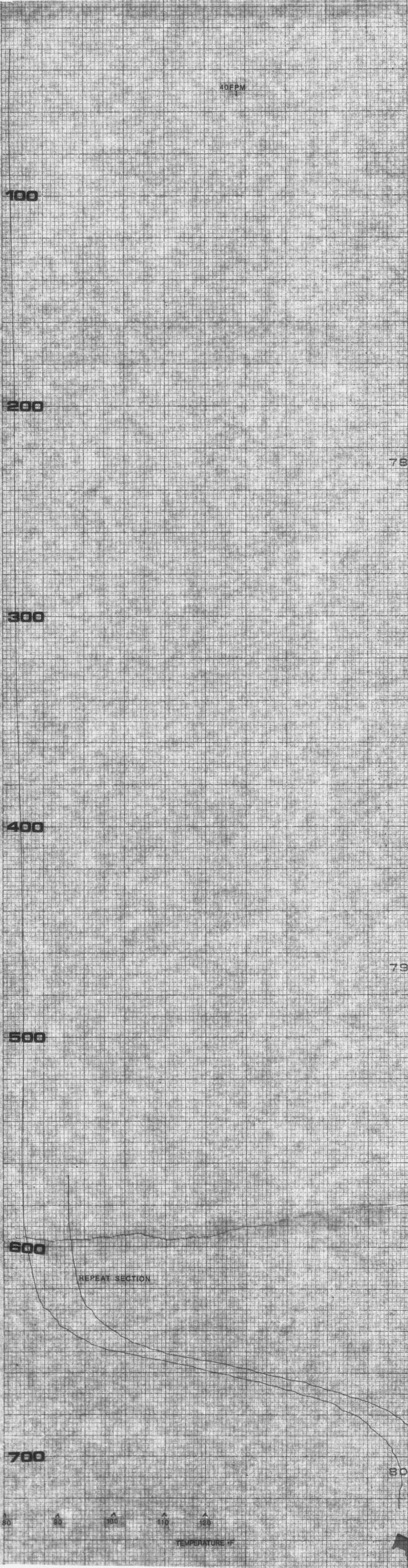
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78

79

80

CLIENT GDU-North Port Date Sept. 9, 1987
 Well No. OMW Project No. FC 15920.C2

Location: State FL County Sarasota
 1/4 1/4 1/4 Sec. 12 T. 40 N S R 20 E W
 Logged by B. Cocke Observer _____

Owner: GDU-North Port
 Well: Onsite Monitor Well
 Driller: Alsay, Inc. Date Drilled: Sept 1987
 Surface Elevation: 8 ft. Estimated Above MSL
 T.D. Logged: 753' Measured T.D. Driller 755'
 Hole Dia. 5"
 Casing Dia. 6" FRP to 730' 5 1/2" I.D.
 Finish: Open hole Screen Gravel Other
 Water Level: Flowing ft. Above MP, AT Above Land Surface
 Below Below Pad Surface
 Yield: Flow _____ gpm Pump _____ gpm
 Drawdown: _____ ft. after _____ hours pumping @ _____ gpm
 Use: Dom. Stock PS Ind. Irr. Test
 Heating or cooling Drainage Disposal Obs.

Water Quality:
 Temp. 84 °F, Sp. Cond. 1150 ; Iron _____ mg/L
 Cl⁻ _____ mg/L, SO₄⁻² _____ mg/L; Total Hardness _____ mg/L
 Color _____ Odor _____ Taste _____

Remarks: _____

CH2M HILL **GEOPHYSICAL WELL SURVEY**

Electric 16" Normal 64" Normal Single Point S.P.
 Caliper Fluid Resistivity Fluid Velocity Gamma Ray Temperature

Log Scales

Electric Log Fluid Resistivity
 SP 20 millivolts/inch _____ ohm meters/inch
 Res. 10 ohm-meters/inch _____
 Res. _____ ohms/inch @ 84 °F

Gamma Ray Log Fluid Velocity
 _____ Counts/sec/inch _____ Counts/min/inch
 Time Constant 4 sec. _____ FPM (Continuous)
 Logging speed 20 FPM Q = _____ gpm

Temperature _____ °F Caliper _____ inches to _____ inches
 Logging speed 30 FPM Logging speed 35 FPM

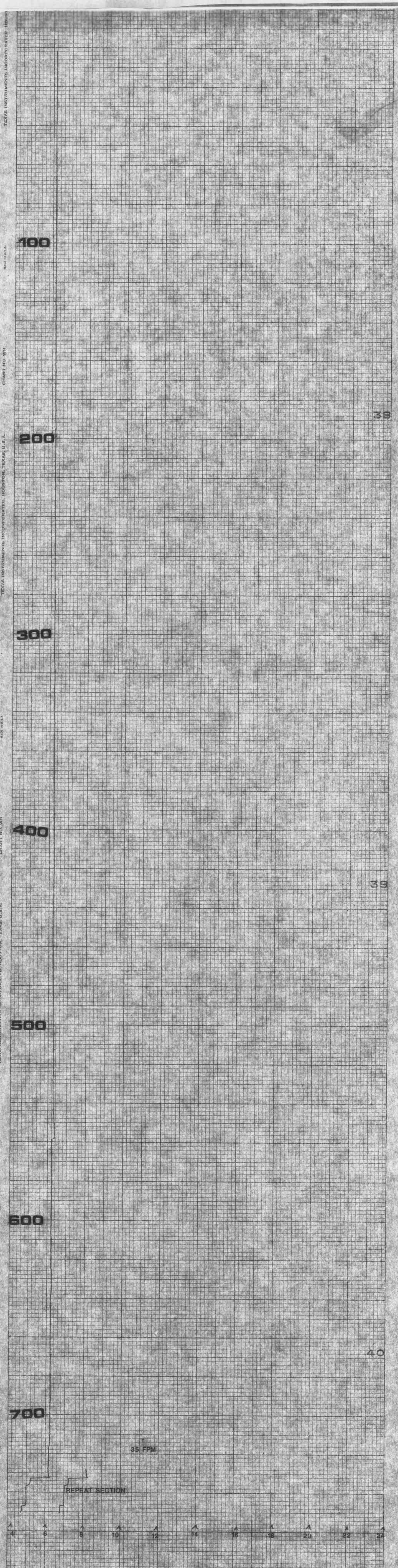
Water Samples
 Depths sampled: 752', 730', _____, _____, _____

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CLIENT GDU-North Port Date Sept. 9, 1987
 Well No. OMW Project No. PC 15029.02

Location: State FL County SEASATA
 W. 4 Sec. 12 T. 40 R. 20
 Logged by B. Cocke Observer _____

Owner: GDU-North Port
 Well: Onsite Monitor Well
 Driller: Alsay, Inc. Date Drilled: Sept 1987
 Surface Elevation: 6 ft. Estimated Measured Above MSL
 T.D. Logged: 753' T.D. Driller: 755
 Hole Dia. 5"
 Casing Dia. 6" FRP to 730' 55" I.D.
 Finish: Open hole Screen Gravel Other
 Water Level: Flowing ft. Above MP, AT Above Land Surface
 Yield: Flow _____ gpm Below Pad Surface
 Drawdown: _____ ft. after _____ hours pumping @ _____ gpm
 Use: Dom. Stock PS Ind Irr. Test
 Heating or cooling Drainage Disposal Obs.

Water Quality:
 Temp. 84 °F. Sp Cond. 1150 Iron _____ mg/L
 Cl⁻ _____ mg/L. SO₄²⁻ _____ mg/L. Total Hardness _____ mg/L
 Color _____ Odor _____ Taste _____

Remarks: _____

CH2M HILL GEOPHYSICAL WELL SURVEY

Electric 16" Normal Caliper
 64" Normal Fluid Resistivity
 Single Point Fluid Velocity
 S.P. Gamma Ray Temperature

Log Scales

Electric Log Fluid Resistivity
 SP 20 millivolts/inch 0-3 ohm meters/inch
 Res. 10 ohm-meters/inch
 Res. _____ ohms/inch @ 84 °F

Gamma Ray Log Fluid Velocity
10 Counts/sec/inch _____ Counts/min/inch
 Time Constant 4 sec. _____ FPM (Continuous)
 Logging speed 20 FPM Q = _____ gpm

Temperature Caliper
80 °F to 90 °F _____ inches to 24 inches
 Logging speed 30 FPM Logging speed 35 FPM

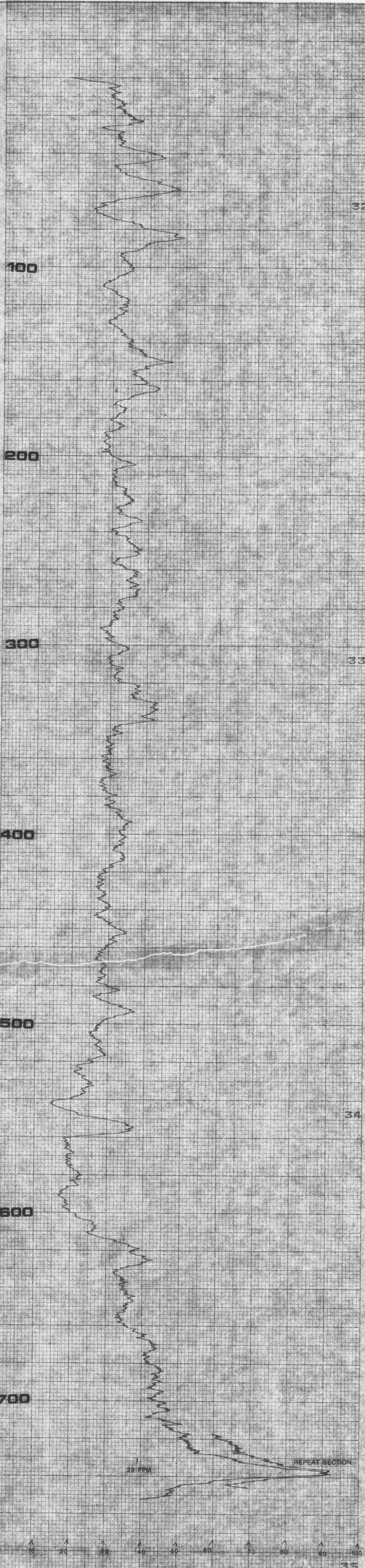
Water Samples
 Depths sampled: 752', 730'

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GEOPHYSICAL WELL SURVEY

CLIENT GDU-North Port Date Sept. 9, 1987
 Well No. OMW Project No. FC 15920.C2

Location: State FL County Sarasota
 T. 40 R. 20 S. 2
 Logged by B. Cocke Observer _____

Owner: GDU-North Port
 Well: Onsite Monitor Well
 Driller: Alsay, Inc. Date Drilled: Sept 1987
 Surface Elevation: 8 ft. Estimated Measured Above MSL
 T.D. Logged 753' T.D. Driller 755'
 Hole Dia. 5"
 Casing Dia. 6" FRP to 730' 5 1/2" I.D.

Finish: Open hole Screen Gravel Other
 Water Level: Flowing Above MP, AT Above Land Surface
 Below Below Pad Surface
 Yield: _____ gpm Pump _____ gpm
 Drawdown: _____ ft. after _____ hours pumping @ _____ gpm

Use: Dom. Stock PS Ind. Irr. Test Obs.
 Heating or cooling Drainage Disposal

Water Quality:
 Temp. 84 °F; Sp. Cond. 1150 ; Iron _____ mg/L
 Cl⁻ _____ mg/L; SO₄ _____ mg/L; Total Hardness _____ mg/L
 Color _____ Odor _____ Taste _____

Remarks: _____

- Electric
- 16" Normal
- 64" Normal
- Single Point
- S.P.
- Caliper
- Fluid Resistivity
- Fluid Velocity
- Gamma Ray
- Temperature

Log Scales

Electric Log Fluid Resistivity
 SP 20 millivolts/inch 0-3 ohm meters/inch
 Res. 10 ohm-meters/inch
 Res. _____ ohms/inch @ 84 °F

Gamma Ray Log Fluid Velocity
10 Counts/sec/inch _____ Counts/min/inch
 Time Constant 4 sec. _____ FPM (Continuous)
 Logging speed 20 FPM Q = _____ gpm

Temperature Caliper
80 °F to 90 °F 4 inches to 24 inches
 Logging speed 30 FPM Logging speed 35 FPM

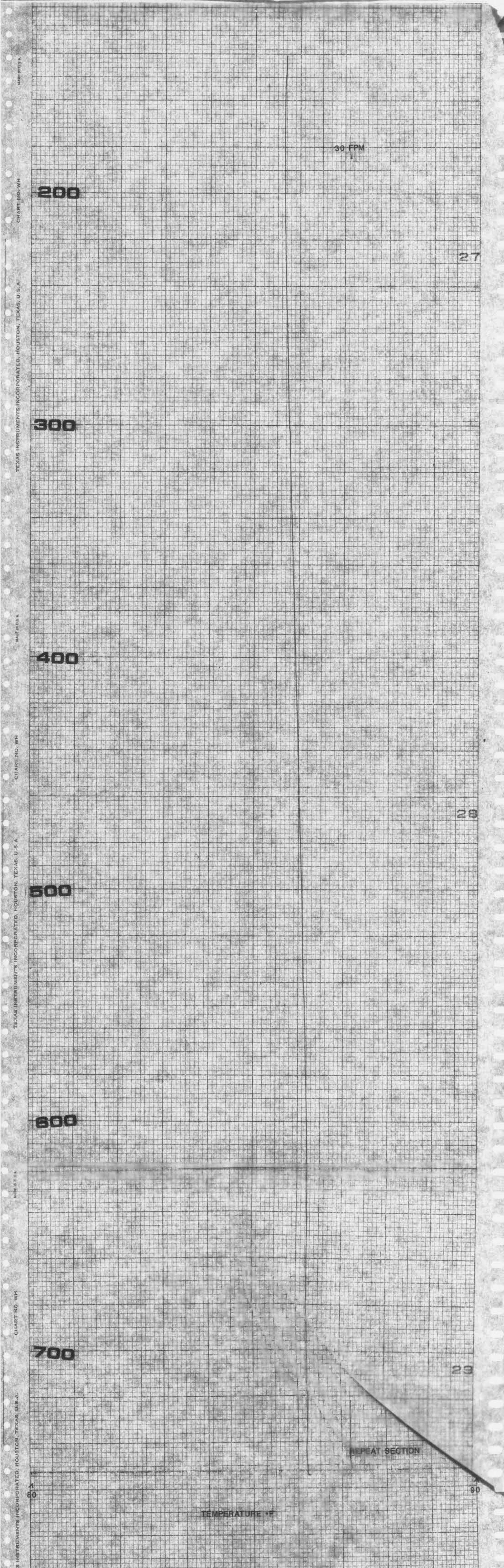
Water Samples
 Depths sampled: 752', 730', _____, _____, _____

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Appendix R

Geophysical Logs, RMW

CH2M HILL **GEOPHYSICAL WELL SURVEY**

CLIENT GDU North Port Date Oct 28, 1987
 Well No. R897 Project No. FC15920.C2

Location: State FL County Sarasota
 T. 12 N. 40 R. 20 E
 Logged by B. Cocke Observer David Snyder

Owner GDU North Port
 Well Regional (Off-site) Monitor Well
 Driller Alsay, Inc. Date Drilled Oct 1987
 Surface Elevation 8 ft. Estimated Measured Above MSL
 T.D. Logged 563' T.D. Driller 565'
 Hole Dia. 20" 42' to 565'
 Casing Dia. 24" Pit Casing to 42'
 Finish: Open hole Screen Gravel Other
 Water Level: N/A ft. Above MP AT Above Land Surface
 Below Below Pad Surface
 Yield: Flow _____ gpm Pump _____ gpm
 Drawdown: _____ ft. after _____ hours pumping @ _____ gpm
 Use: Dom. Stock PS Ind. Irr. Test
 Heating or cooling Drainage Disposal Obs.

Water Quality: N/A Drilling Mud
 Temp. _____ °F Sp. Cond. _____ Iron _____ mg/L
 Cl⁻ _____ mg/L SO₄ _____ mg/L Total Hardness _____ mg/L
 Color _____ Odor _____ Taste _____

Remarks: _____

- Electric
 16" Normal
 64" Normal
 Single Point
 S.P.
- Caliper
 Fluid Resistivity
 Fluid Velocity
 Gamma Ray
 Temperature

Log Scales

Electric Log Fluid Resistivity
 SP 40 millivolts/inch _____ ohm meters/inch
 Res 40 ohm-meters/inch
 Res _____ ohms/inch @ _____ °F

Gamma Ray Log Fluid Velocity
 _____ 10 Counts/sec/inch _____ Counts/min/inch
 Time Constant 4 sec. _____ FPM (Continuous)
 Logging speed 20 FPM Q = _____ gpm

Temperature _____ °F to _____ °F Caliper _____ 14 inches to _____ 32 inches
 Logging speed _____ FPM Logging speed 20 FPM

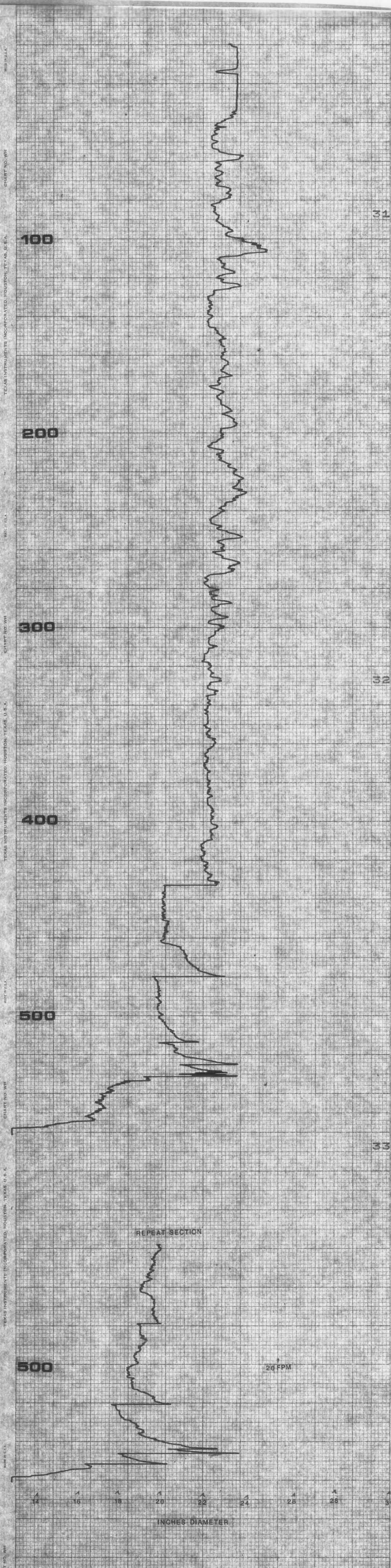
Water Samples
 Depths sampled: _____

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 CHART NO. WH
 MADE IN U.S.A.

CLIENT GDU North Port **Date** Oct 28, 1987
Well No. RMW **Project No.** FC15920.02

Location: State FL County Sarasott
 1/4 1/4 Sec. 12 T. 40 R. 20 E S W

Logged by B. Cocks Observer David Snyder

Owner GDU North Port
Well Regional (Off-Site) Monitor Well
Driller Alsay, Inc. **Date Drilled** Oct 1987
Surface Elevation 8 ft Estimated Measured Above MSL
T.D. Logged 563' T.D. Driller 565'
Hole Dia. 20" 42' to 565'
Casing Dia. 24" Pit Casing to 42'

Finish: Open hole Screen Gravel Other
Water Level N/A ft Above MP, AT Above Land Surface
 Below Below Pad Surface
Yield: Flow gpm Pump gpm
Drawdown: ft after hours pumping @ gpm

Use: Dom Stock PS Ind Irr Test Heating or cooling Drainage Disposal Obs

Water Quality N/A Drilling Muc.
 Temp. °F, Sp Cond. Iron mg/L
 Cl⁻ mg/L, SO₄ mg/L, Total Hardness mg/L
 Color Ortor Taste

Remarks:

CH2M HILL **GEOPHYSICAL WELL SURVEY**

Electric 16" Normal Caliper
 64" Normal Fluid Resistivity
 Single Point Fluid Velocity
 S.P. Gamma Ray Temperature

Log Scales

Electric Log **Fluid Resistivity**
 SP 40 millivolts/inch ohm meters/inch
 Res. 40 ohm-meters/inch
 Res. ohms/inch @ °F

Gamma Ray Log **Fluid Velocity**
10 Counts/sec/inch Counts/min/inch
 Time Constant 4 sec FPM (Continuous)
 Logging speed 20 FPM Q gpm

Temperature °F to °F Caliper 14 inches to 3 1/2 inches
 Logging speed FPM Logging speed 20 FPM

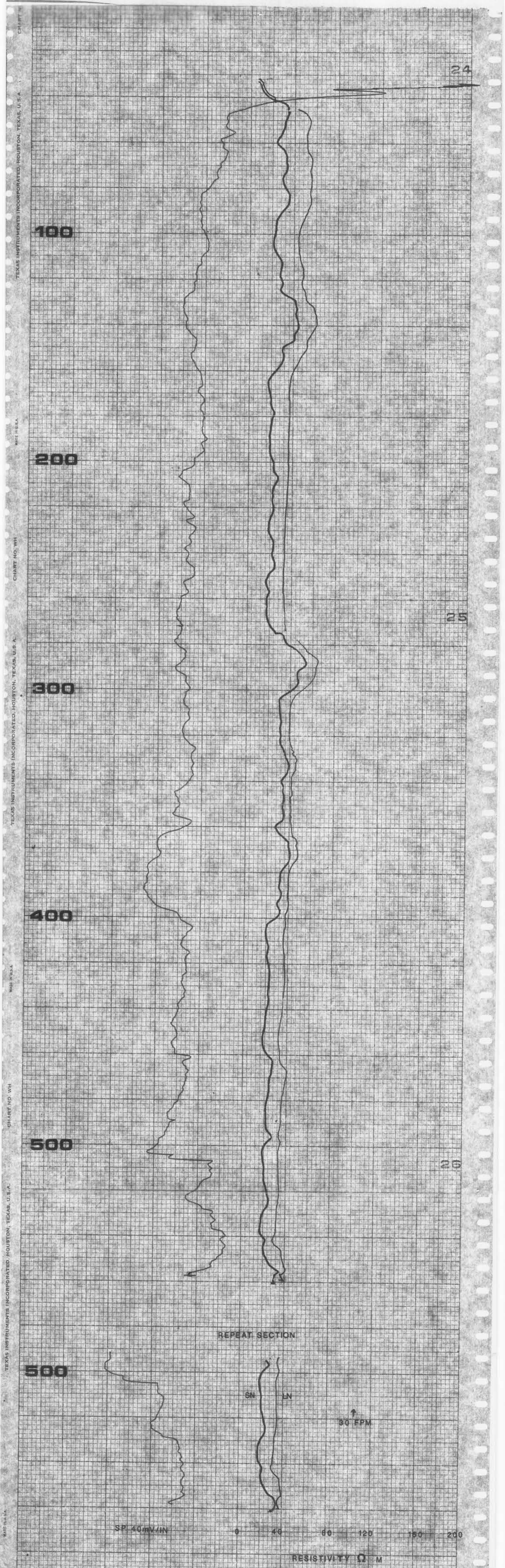
Water Samples
 Depths sampled:

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CLIENT GDU North Port **Date** Oct 28, 1987
Well No RMW **Project No** FC1522C.C2

Location: State FL County Sarasota
 1/4 1/4 Sec. 12 T. 40 R. 20 N S E W
Logged by B. Crooke **Observer** David Snyder

Owner: GDU North Port
Well: Regional (Off-Site) Monitor Well
Driller: AIsay, Inc. **Date Drilled:** Oct 1987
Surface Elevation: 8 ft. Estimated Measured Above MSL
T.D. Logged: 563' **T.D. Driller:** 565'
Hole Dia.: 20" 42' to 565'
Casing Dia.: 24" Pit Casing to 42'

Finish: Open hole Screen Cased Other
Water Level: N/A ft. Above MP, AT Above Land Surface
 Below Below Pad Surface
Yield: Flow _____ gpm Pump _____ gpm
Drawdown: _____ ft. after _____ hours pumping @ _____ gpm

Use: Dom. Stock PS Ind Irr Test Heating or cooling Drainage Disposal Obs.

Water Quality: N/A Drilling Mud
 Temp _____ °F. Sp Cond. _____ Iron _____ mg/L
 Cl _____ mg/L SO₄ _____ mg/L. Total Hardness _____ mg/L
 Color _____ Odor _____ Taste _____

Remarks:

CH2M HILL **GEOPHYSICAL WELL SURVEY**

Electric Log **Fluid Resistivity**
 SP 40 millivolts/inch _____ ohm meters/inch
 Res. 40 ohm-meters/inch _____
 Res. _____ ohms/inch @ _____ °F

Gamma Ray Log **Fluid Velocity**
 10 Counts/sec/inch _____ Counts/min/inch
 Time Constant 4 sec _____ FPM (Continuous)
 Logging speed 20 FPM Q = _____ gpm

Temperature _____ °F to _____ °F Caliper 14 inches to 32 inches
 Logging speed _____ FPM Logging speed 20 FPM

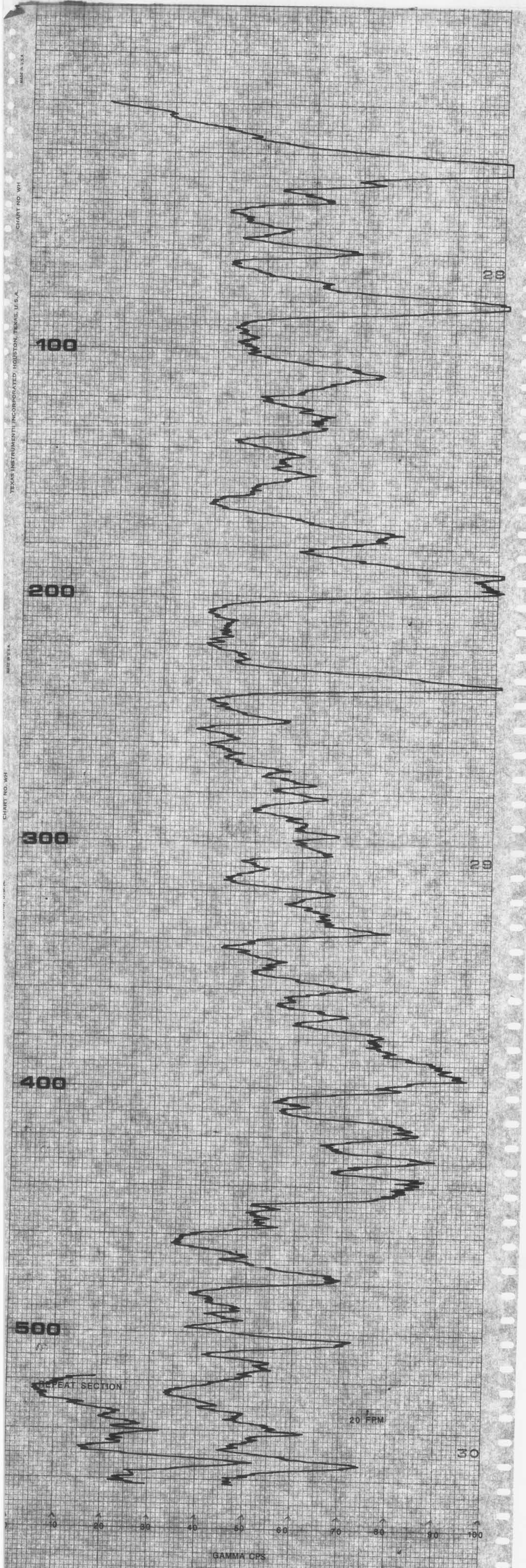
Water Samples
 Depths sampled _____

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CLIENT CDU North Port **Date** Nov 5, 1987
Well No. R03W **Project No.** PC15920.C2

Location: State FL County Sarasota
 Sec. 12 T. 40 N. R. 20 E
 Logged by B. Cocke Observer David Snyder

Owner CDU North Port
Well Regional (Off-Site) Monitor Well
Driller Alsay, Inc. **Date Drilled** Nov 1987
Surface Elevation 8 ft Estimated Measured Above MSL
T.D. Logged 1094' J.D. Driller 1093'
Hole Dia. 14 3/4" 560' to 1093'
Casing Dia. 16" O.D. (15" I.D.) to 560'
Finish: Open hole Screen Gravel Other
Water Level ft Above MP AT Above Land Surface
 Below Below Pad Surface
Yield Flow N/A gpm Pump gpm
Drawdown ft. after hours pumping @ gpm
Use: Dom Heating or cooling PS Irr. Test Disposal
 Heating or cooling Drainage Disposal Obs

Water Quality Drilling Mud
 Temp. 81 °F. Sp Cond. 1500 Iron mg/L
 Cl mg/L. SO₄ mg/L. Total Hardness mg/L
 Color Odor Taste

Remarks: _____

CH2M HILL **GEOPHYSICAL WELL SURVEY**

Electric
 16" Normal
 64" Normal
 Single Point
 S.P.

Log Scales

Fluid Resistivity
 SP 20 millivolts/inch 6-9 ohm meters/inch
 Res. 20 ohm-meters/inch
 Res. ohms/inch @ 81 °F

Gamma Ray Log **Fluid Velocity**
10 Counts/sec/inch Counts/min/inch
 Time Constant 4 sec. FPM (Continuous)
 Logging speed 20 FPM Q = gpm

Temperature **Caliper**
80 °F to 90 °F 8 inches to 28 inches
 Logging speed 15 FPM Logging speed 25 FPM

Water Samples
 Depths sampled: _____

CH2M HILL
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 Tampa Florida 33607
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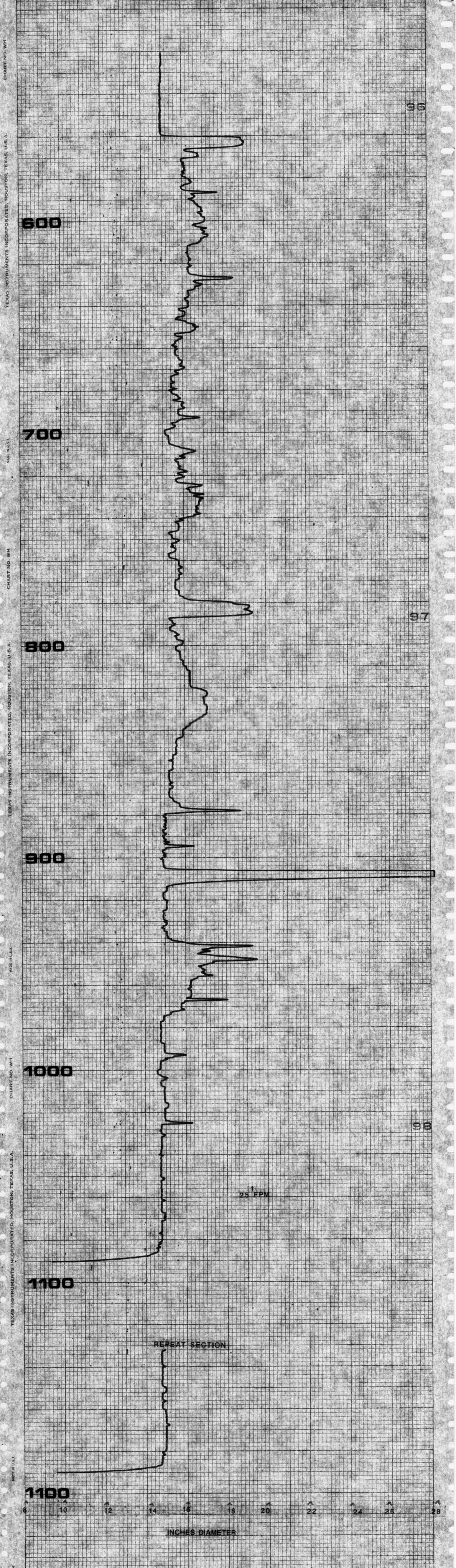


CHART NO. WH
 TEXAS INSTRUMENTS INCORPORATED, HOUSTON, TEXAS, U.S.A.
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 CHART NO. WH
 TEXAS INSTRUMENTS INCORPORATED, HOUSTON, TEXAS, U.S.A.

CLIENT: GDU North Port Date: 10/5/1987
 Well No: RMN Project No: 2015520 GZ
 Location: State FL County: Sarasota
 Logged by: B. Cocke Observer: David Snyder
 Owner: GDU North Port
 Well: Regional-(Off-Site) KNOX-1 Well
 Driller: Alsay, Inc. Date Drilled: Nov. 1987
 Surface Elevation: 5 ft. Estimated Above MSL
 T.D. Logged: 1094' T.D. Driller: 1093'
 Hole Dia: 4 3/4" 56 1/2" to 1093'
 Casing Dia: 16" O.D. 15" I.D. to 56 1/2"
 Finish: Open hole Screen Gravel Other
 Water Level: ft. Above M.P. Above Land Surface
 Yield: Flow N/A gpm Pump Pad Surface gpm
 Drawdown: ft. after _____ hours pumping @ _____ gpm
 Use: Dom. Stock PS Ind. Irr. Test
 Heating or cooling Drainage Disposal Cus.
 Water Quality: Seawater
 Temp: 81 °F Sp. Cond: 5.1 mg/L
 Cl: _____ mg/L SO₄: _____ mg/L Total Hardness: _____ mg/L
 Color: _____ Odor: _____ Taste: _____
 Remarks:

CRAMER GEOPHYSICAL WELL LOG

Electric 16" Normal 34" Normal Single Point S.P.
 Cables Fluid Resistivity Fluid Velocity Gamma Ray Temperature

Log Scales

Electric Log
 SP: 10 millivolts/inch
 Res: 20 ohm-meters/inch
 Fas: _____ ohms/inch

Fluid Resistivity
 6-9 ohm-meters/inch
 @ #1 of

Gamma Ray Log
 _____ Counts/sec/inch
 Time Constant: 4 sec
 Logging speed: 20 FPM

Fluid Velocity
 _____ Counts/min/inch
 PRA (Continuous)
 Q: _____ gpm

Temperature
 8 °F to 90 °F
 Logging speed: 35 FPM

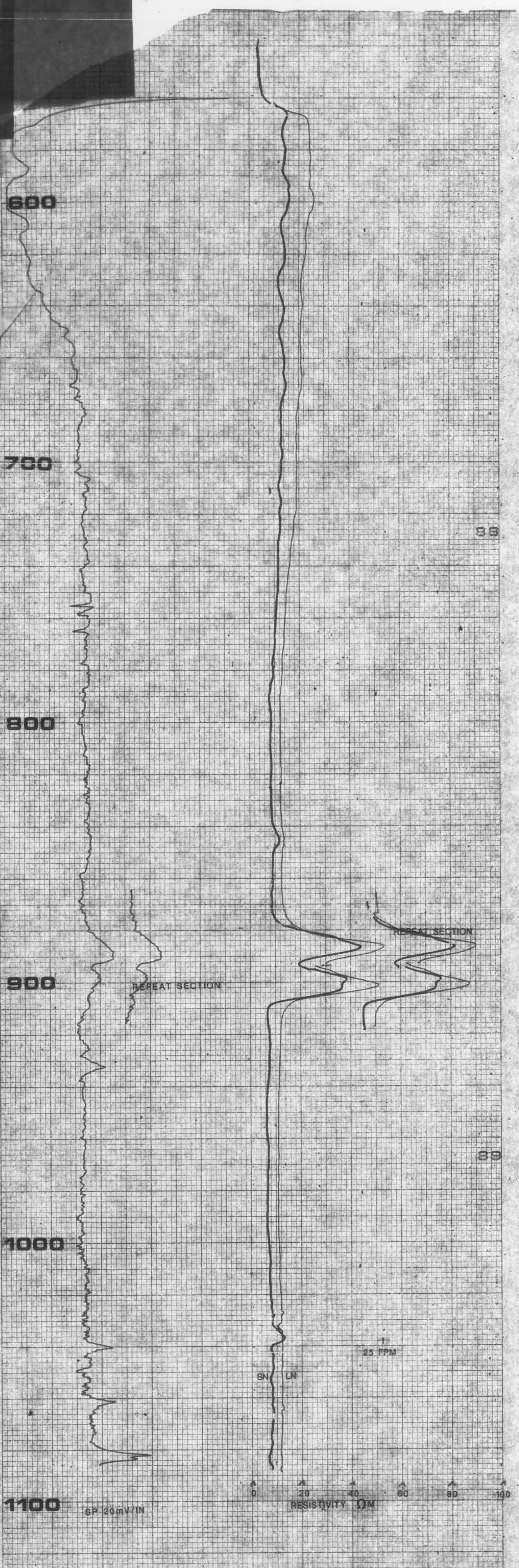
Water Samples
 Depths sampled: _____

CRAMER
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 Gainesville, Florida 32620
 904/577-2442

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 One First Street East
 2550 College Parkway, Suite 307
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 813-275-0121

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 Broward County - 305/428-4048

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 Rocky Point Centre
 2020 North Rocky Point Drive, West
 Suite 350
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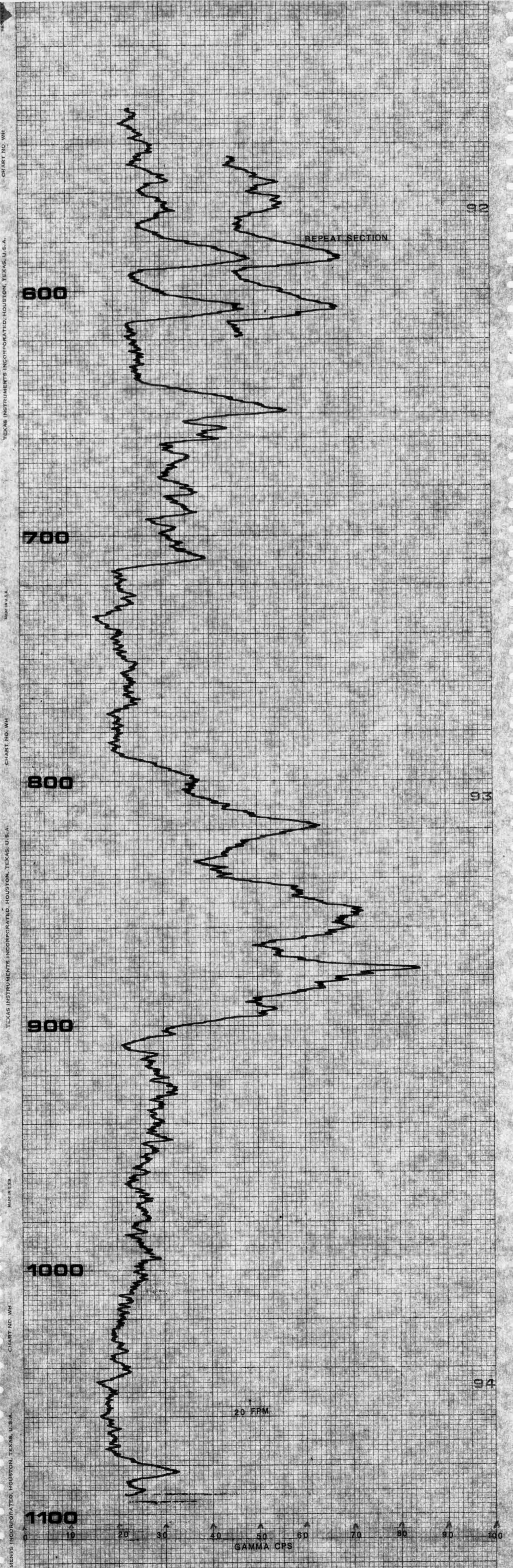
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 CHART NO. WH
 MADE IN U.S.A.
 CHART NO. WH
 TEXAS INSTRUMENTS INCORPORATED, HOUSTON, TEXAS, U.S.A.

CLIENT <u>GDU North Port</u>	Date <u>Nov 5, 1987</u>
Well No. <u>RMW</u>	Project No. <u>FC15920.C2</u>
Location: State <u>FL</u> County <u>Sarasota</u>	
<u>1/4</u> <u>1/4</u> <u>1/4</u> Sec. <u>12</u> T. <u>40</u> <input type="checkbox"/> N <input type="checkbox"/> R <u>20</u> <input checked="" type="checkbox"/> E	<input type="checkbox"/> S <input type="checkbox"/> W
Logged by <u>B. Cocke</u>	Observer <u>David Snyder</u>
Owner: <u>GDU North Port</u>	
Well: <u>Regional (Off-Site) Monitor Well</u>	
Driller: <u>Alsay, Inc.</u>	Date Drilled: <u>Nov 1987</u>
Surface Elevation: <u>8</u> ft	<input checked="" type="checkbox"/> Estimated Above MSL
T.D. Logged: <u>1094'</u>	<input type="checkbox"/> Measured T.D. Driller <u>1093'</u>
Hole Dia. <u>14 3/4" 560'</u> to <u>1093'</u>	
Casing Dia. <u>16" O.D. (15" I.D.)</u> to <u>560'</u>	
Finish: <input checked="" type="checkbox"/> Open hole <input type="checkbox"/> Screen <input type="checkbox"/> Gravel <input type="checkbox"/> Other	
Water Level: <u> </u> ft <input type="checkbox"/> Above MP <u>AT</u> <input type="checkbox"/> Above <input type="checkbox"/> Land Surface	<input type="checkbox"/> Below <input type="checkbox"/> Below <input checked="" type="checkbox"/> Pad Surface
Yield: Flow <u>N/A</u> gpm	Pump <u> </u> gpm
Drawdown: <u> </u> ft after <u> </u> hours pumping @ <u> </u> gpm	
Use: <input type="checkbox"/> Dom <input type="checkbox"/> Stock <input type="checkbox"/> PS <input type="checkbox"/> Ind <input type="checkbox"/> Irr <input type="checkbox"/> Test	<input type="checkbox"/> Heating or cooling <input type="checkbox"/> Drainage <input type="checkbox"/> Disposal <input checked="" type="checkbox"/> Obs
Water Quality: <u>Drilling Mud</u>	
Temp. <u>81</u> °F, Sp Cond. <u>1500</u> Iron <u> </u> mg/L	
Cl ⁻ <u> </u> mg/L, SO ₄ <u> </u> mg/L, Total Hardness <u> </u> mg/L	
Color <u> </u> Odor <u> </u> Taste <u> </u>	
Remarks:	

CH2M HILL GEOPHYSICAL WELL SURVEY

- | | |
|---------------------------------------|---|
| Electric | <input type="checkbox"/> Caliper |
| <input type="checkbox"/> 13" Normal | <input type="checkbox"/> Fluid Resistivity |
| <input type="checkbox"/> 64" Normal | <input type="checkbox"/> Fluid Velocity |
| <input type="checkbox"/> Single Point | <input checked="" type="checkbox"/> Gamma Ray |
| <input type="checkbox"/> S.P. | <input type="checkbox"/> Temperature |

Log Scales	
Electric Log	Fluid Resistivity
SP <u>20</u> millivolts/inch	<u>6-9</u> ohm meters/inch
Res <u>20</u> ohm-meters/inch	
Res <u> </u> ohms/inch	@ <u>81</u> °F
Gamma Ray Log	Fluid Velocity
<u>10</u> Counts/sec/inch	<u> </u> Counts/min/inch
Time Constant <u>4</u> sec	<u> </u> FPM (Continuous)
Logging speed <u>20</u> FPM	Q = <u> </u> gpm
Temperature	Caliper
<u>80</u> °F to <u>90</u> °F	<u>8</u> inches to <u>28</u> inches
Logging speed <u>35</u> FPM	Logging speed <u>25</u> FPM
Water Samples	
Depths sampled: <u> </u>	
CH2M HILL Water Resources Division P.O. Box 1647 Gainesville, Florida 32620 904/377-2442	Fort Myers Office The Financial Center 1550 College Parkway, Suite 307 Fort Myers, Florida 33907 813/275-3121
Deerfield Beach Office Hillsboro Executive Center North 350 Fairway Drive, Suite 210 Deerfield Beach, Florida 33441 Palm Beach County - 305/395-3800 Broward County - 305/426-4008	Tampa Office Rocky Point Centre 3030 North Rocky Point Drive, West Suite 350 Tampa, Florida 33607 Hillsborough County - 813/888-6777 Pinellas County - 813/536-9454



CLIENT GDU North Port **Date** Nov 5, 1997
Well No. RMW **Project No.** FC15920.C2

Location: State FL County Sarasota
 Sec 12 T 40 N R 20 E
 S

Logged by: B. Cocke **Observer:** David Snyder

Owner: GDU North Port
Well: Regional (Off-Size) Monitor Well
Driller: Aisay, Inc. **Date Drilled:** 11/1/97

Surface Elevation: 3 ft Estimated Above MSL
T.D. Logger: 1094' Measured T.D. Driller: 1093'

Hole Dia: 14 3/4" 560' to 1093'
Casing Dia: 16" O.D. 115' I.D. 590'

Finish: Open hole Screen Gravel Other

Water Level: ft Above MP Below MP Land Surface
Yield: Flow N/A gpm Pump Below Pad Surface gpm

Drawdown: ft after _____ hours pumping @ _____ gpm

Use: Dam Stock PS Ind Irr Test
 Heating or cooling Drainage D.S. Obs

Water Quality: Drilling fluid
 Temp 81 °F Sp Cond 1570 Iron _____ mg/L
 Cl _____ mg/L SO₄ _____ mg/L Total Hardness _____ mg/L
 Color _____ Odor _____ Taste _____

Remarks:

CH2M HILL GEOPHYSICAL WELL SURVEY

Electric Log Scales:
 Electric Log: SP 20 millivolts/inch
 Res 20 ohm-meters/inch
 Res _____ ohms/inch

Fluid Resistivity:
 6-9 ohm meters/inch
 @ 81 °F

Gamma Ray Log Scales:
 Gamma Ray Log: 10 Counts/sec/inch
 Time Constant 4 sec
 Logging speed 20 FPM

Fluid Velocity:
 Counts/min/inch
 FPM (Continuous)
 Q _____ gpm

Temperature:
 80 °F to 90 °F
 Logging speed 35 FPM

Caliper:
 8 inches to 20 inches
 Logging speed 25 FPM

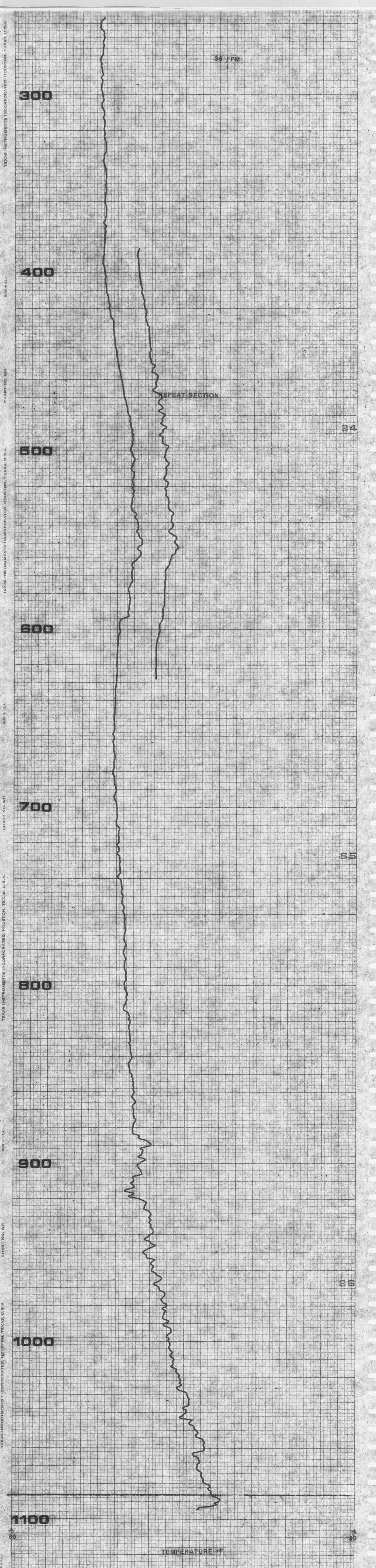
Water Samples:
 Depths sampled _____

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 Pinellas County - 813-538-9454

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 Hibborn Executive Center North
 350 Fairway Drive, Suite 210
 Deerfield Beach, Florida 33441
 Palm Beach County - 305-395-3800
 Broward County - 305-426-4908



CLIENT GDU North Port Date Nov 5, 1987
 Well No. RMW Project No. FC15920.C2

Location: State FL County Sarasota
 T. 40 R. 20 S. 20 E. W
 Logged by B. Cocke Observer David Snyder

Owner: GDU North Port
 Well: Regional (Off-Site) Monitor Well
 Driller: Alsay, Inc. Date Drilled: Nov 1987
 Surface Elevation 8 ft. Estimated Above MSL
 T.D. Logged 1094' Measured T.D. Driller 1093'
 Hole Dia. 14 3/4" 560' to 1093'
 Casing Dia. 16" O.D. (15" I.D.) to 560'
 Finish: Open hole Screen Gravel Other
 Water Level: 8 ft. Above MP. AT Above Land Surface
 Below Below Pad Surface
 Yield: Flow N/A gpm Pump gpm
 Drawdown: ft. after hours pumping @ gpm
 Use: Dom Stock PS Ind Irr Test
 Heating or cooling Drainage Disposal Obs

Water Quality: Drilling Mud
 Temp 81 °F. Sp Cond 1500 Iron _____ mg/L
 Cl⁻ _____ mg/L. SO₄⁻² _____ mg/L. Total Hardness _____ mg/L
 Color _____ Odor _____ Taste _____

Remarks: _____



GEOPHYSICAL WELL SURVEY

- Electric
 - 16" Normal
 - 64" Normal
 - Single Point
 - S.P.
- Caliper
 - Fluid Resistivity
 - Fluid Velocity
 - Gamma Ray
 - Temperature

Log Scales

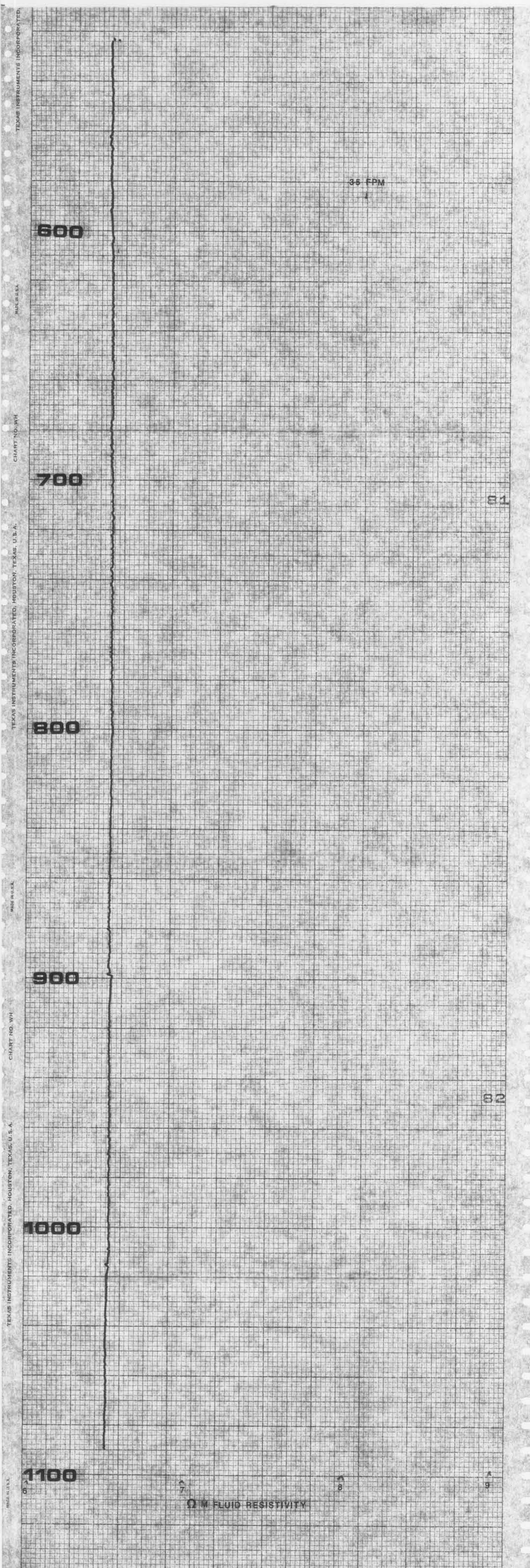
Electric Log	Fluid Resistivity
SP <u>20</u> millivolts/inch	<u>6-9</u> ohm meters/inch
Res. <u>20</u> ohm-meters/inch	
Res. _____ ohms/inch	@ <u>81</u> °F
Gamma Ray Log	Fluid Velocity
<u>10</u> Counts/sec/inch	_____ Counts/min/inch
Time Constant <u>4</u> sec.	_____ FPM (Continuous)
Logging speed <u>20</u> FPM	Q = _____ gpm
Temperature	Caliper
<u>80</u> °F to <u>90</u> °F	<u>8</u> inches to <u>28</u> inches
Logging speed <u>35</u> FPM	Logging speed <u>25</u> FPM
Water Samples	
Depths sampled: _____	

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 Pinellas County - 813/536-9454

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 350 Fairway Drive, Suite 210
 Deerfield Beach, Florida 33441
 Palm Beach County - 305/395-3800
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 CHART NO. WH

600
700
800
900
1000
1100

Ω M FLUID RESISTIVITY

CLIENT	GDJ North Port	Date	Nov 9, 1987
Well No.	R5W	Project No.	FC15920.C2
Location: State	FL	County	Sarasota
W	W	1/4 Sec.	12 T. 40 N. R. 20
Logged by	B. Cooke	Observer	David Snyder
Owner	GDJ North Port		
Well	Regional (Off-Site) Monitor Well		
Driller	Aisay, Inc.	Date Drilled	Nov 1987
Surface Elevation	8 ft.	Estimated	Above MSL
T.D. Logged	1035'	Measured	T.D. Driller
Hole Dia.	N/A		
Casing Dia.	6" FRP to 1100'		
Finish	<input checked="" type="checkbox"/> Open hole <input type="checkbox"/> Screen <input type="checkbox"/> Gravel <input type="checkbox"/> Other <input type="checkbox"/> Above MP <input type="checkbox"/> Above Land Surface <input type="checkbox"/> Below MP <input type="checkbox"/> Below Pad Surface Yield Flow _____ gpm Pump _____ gpm		
Drawdown	_____ ft. after _____ hours pumping @ _____ gpm		
Use	<input type="checkbox"/> Dom. <input type="checkbox"/> Stock <input type="checkbox"/> PS <input type="checkbox"/> Ind. <input type="checkbox"/> Irr. <input type="checkbox"/> Test <input type="checkbox"/> Heating or cooling <input type="checkbox"/> Drainage <input type="checkbox"/> Disposal <input type="checkbox"/> Obs.		
Water Quality	N/A		
Temp	_____ °F	Sp Cond.	_____ Iron _____ mg/L
Cl	_____ mg/L	SO ₄	_____ mg/L
Color	_____	Odor	_____ Taste _____
Remarks	Log run 14 hrs after first stage of cementing. Drillers tagged cement at 843'.		

GEOPHYSICAL WELL SURVEY

Electric
 16" Normal
 64" Normal
 Single Point
 S.P.

Caliper
 Fluid Resistivity
 Fluid Velocity
 Gamma Ray
 Temperature

Log Scales

Electric Log	Fluid Resistivity
SP _____ millivolts/inch	_____ ohm meters/inch
Res. _____ ohm-meters/inch	
Res. _____ ohms/inch	@ _____ °F

Gamma Ray Log	Fluid Velocity
Counts/sec/inch	Counts/min/inch
Time Constant _____ sec.	FPM (Continuous)
Logging speed _____ FPM	Q = _____ gpm

Temperature	Caliper
70 °F to 120 °F / 5'	_____ inches to _____ inches
Logging speed _____ FPM	Logging speed _____ FPM

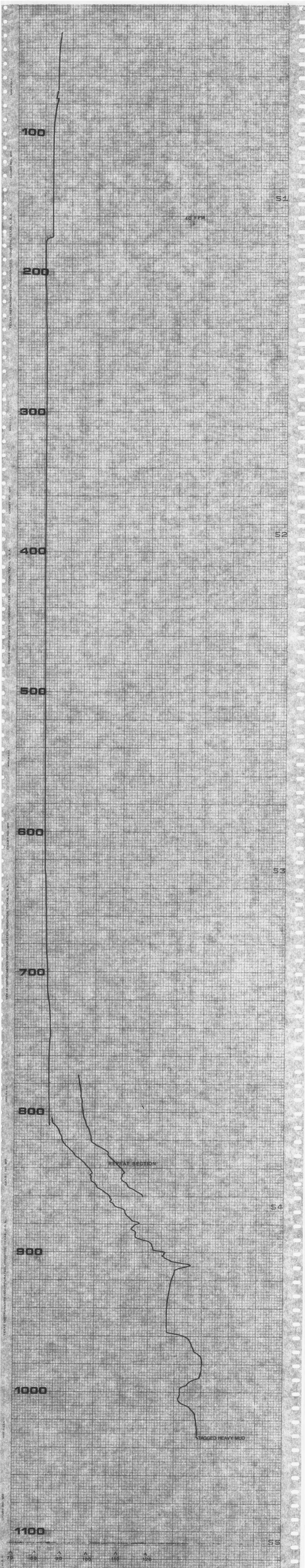
Water Samples
 Depths sampled: _____

CH2M HILL
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TEXAS INSTRUMENTS INCORPORATED, HOUSTON, TEXAS, U.S.A.
 CHART NO. WH
 MADE IN U.S.A.

CLIENT GDU - North Port **Date** Nov. 12, 1987

Well No. RMW **Project No.** PC15920.62

Location: State FL County Sarasota

1/4 1/4 1/4 1/4 **Sec.** 17 **T.** 40 **R.** 20 **E.** 1

Logged by Bill Cocks Observer David Snyder

Owner: GDU - North Port

Well: Regional (Offsite) Monitor Well

Driller: Alsay, Inc. **Date Drilled:** NOV 1987

Surface Elevation: 6 **ft** Estimated Measured **Above MSL**

T.D. Logged: 1151' **T.D. Driller:** 1150'

Hole Dia: 6" 1100' to 1150'

Casing Dia: 6" FRP to 1100'

Finish: Open hole Screen Gravel Other

Water Level: Flowing Above MP, at Above Land Surface

Yield: Flow Below Pump Below Pad Surface

Drawdown: 105 **gpm**

Use: Dam Stock PS Ind Irr Test Heating or cooling Drainage Disposal Obs

Water Quality:

Temp: 91 °F **Sp. Cond:** 27000 **Iron:** _____ **mg/L**

Cl: _____ **mg/L** **SO₄:** _____ **mg/L** **Total Hardness:** _____ **mg/L**

Color: _____ **Odor:** _____ **Taste:** _____

Remarks:

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 Pinellas County - 813/536-9454

Deerfield Beach Office
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 Palm Beach County - 305/395-3800
 Broward County - 305/426-4008

Log Scales

Electric
 16" Normal
 64" Normal
 Single Point
 S.P.

Fluid Resistivity
 Caliper
 Fluid Resistivity
 Fluid Velocity
 Gamma Ray
 Temperature

Electric Log
 SP 20 millivolts/inch **Fluid Resistivity**
0.5-2 ohm-meters/inch

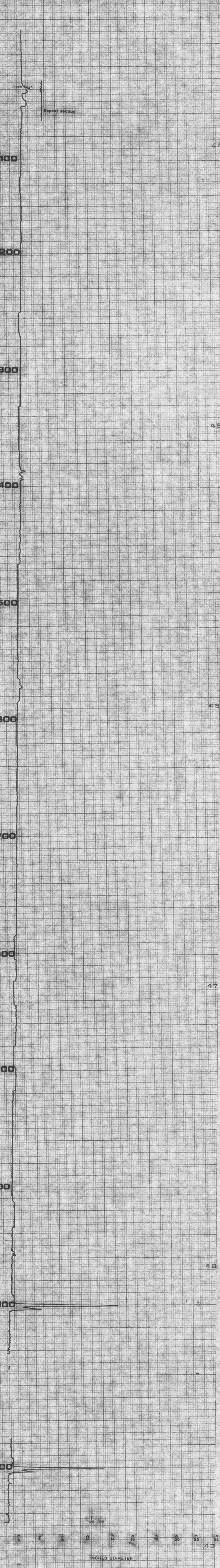
Gamma Ray Log
 Res 10 ohm-inches
 @ 91 °F

Gamma Ray Log
 Time Constant 4 sec
 Logging speed 20 FPM

Fluid Velocity
10 Counts/sec/inch **Counts/min/inch**
40 FPM (Continuous)
 Q 105 gpm

Temperature
85 °F to 95 °F **Caliper**
7 inches to 2.4 inches
 Logging speed 35 FPM **Logging speed** 7.5 FPM

Water Samples
 Depths sampled: 1110', 1140'





GEOPHYSICAL WELL SURVEY

CLIENT GDU - North Port Date Nov. 12, 1987
 Well No. RMW Project No. FC15920.C2

Location: State FL. County Sarasota
1/4 1/4 1/4 Sec. 12 T. 40 N S R. 20 E W
 Logged by Bill Cocks Observer David Snyder

Owner: GDU - North Port
 Well: Regional (Offsite) Monitor Well
 Driller: Alsay, Inc. Date Drilled: NOV 1987
 Surface Elevation: 6 ft. Estimated Above MSL Measured
 T.D. Logged 1151' T.D. Driller 1150'
 Hole Dia. 6" 1100' to 1150'
 Casing Dia. 6" FRP to 1100'
 Finish: Open hole Screen Gravel Other
 Water Level: flowing Above MP. at Above Land Surface
 Below Below Pad Surface
 Yield: Flow 105 gpm Pump gpm
 Drawdown: ft. after hours pumping @ gpm
 Use: Dom. Stock PS Ind. Irr. Test
 Heating or cooling Drainage Disposal Obs.

Water Quality:
 Temp. 91 °F. Sp Cond. 27000; Iron mg/L
 Cl⁻ mg/L; SO₄²⁻ mg/L; Total Hardness mg/L
 Color Odor Taste

Remarks:

- Electric
 16" Normal
 64" Normal
 Single Point
 S.P.
- Caliper
 Fluid Resistivity
 Fluid Velocity
 Gamma Ray
 Temperature

Log Scales	
Electric Log	Fluid Resistivity
SP <u>20</u> millivolts/inch	<u>0.5-2</u> ohm meters/inch
Res. <u>10</u> ohm-meters/inch	
Res. <u> </u> ohms/inch	@ <u>91</u> °F
Gamma Ray Log	Fluid Velocity
<u>10</u> Counts/sec/inch	<u>40</u> Counts/min/inch
Time Constant <u>4</u> sec.	<u>20</u> FPM (Continuous)
Logging speed <u>20</u> FPM	Q = <u>9.05</u> gpm
Temperature	Caliper
<u>85</u> °F to <u>95</u> °F	<u>4</u> inches to <u>24</u> inches
Logging speed <u>35</u> FPM	Logging speed <u>25</u> FPM
Water Samples	
Depths sampled: <u>1110', 1140'</u>	

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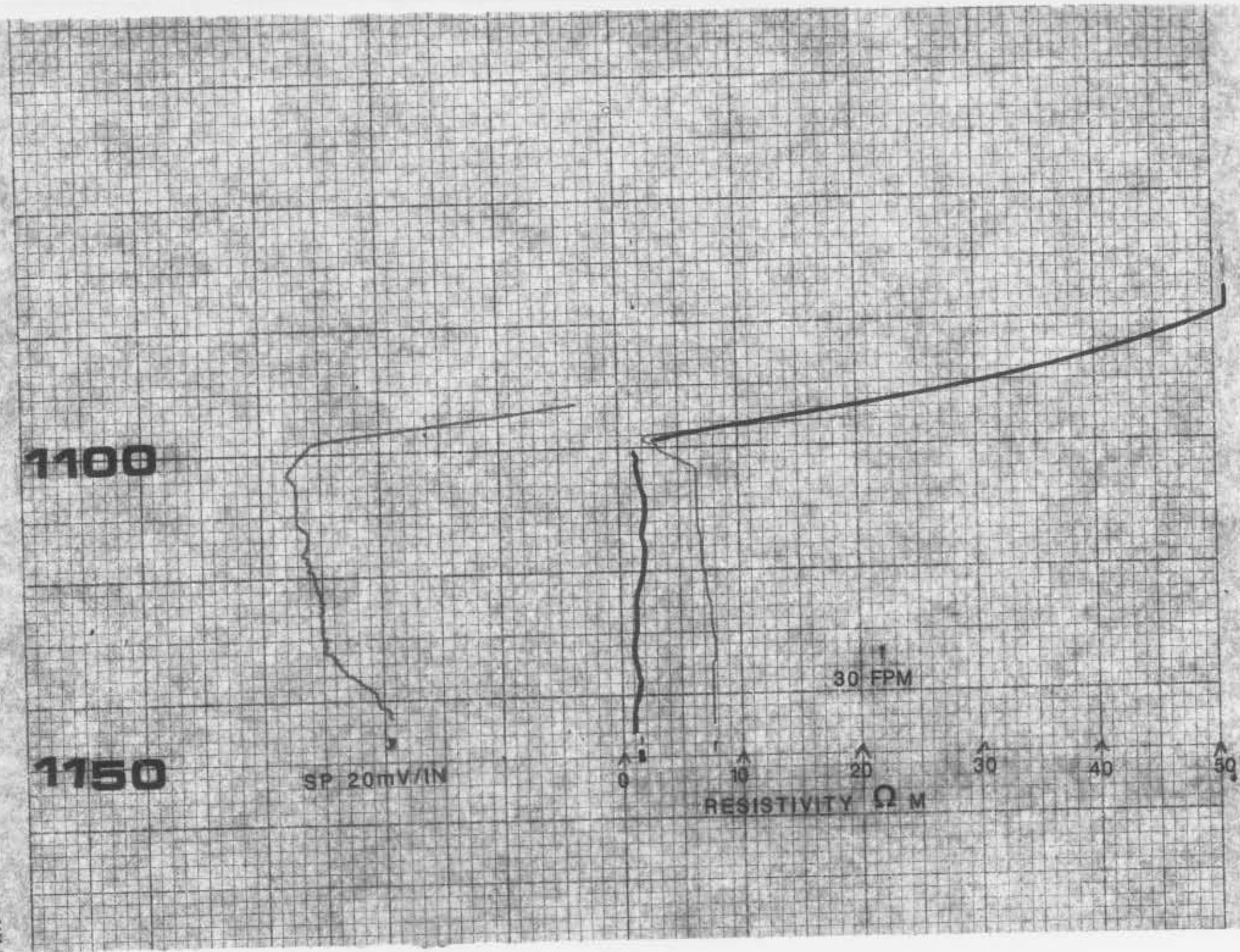
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TEXAS INSTRUMENTS

MADE IN U.S.A.





GEOPHYSICAL WELL SURVEY

CLIENT GDU - North Port Date Nov. 12, 1987
 Well No. RMW Project No. FC15920.C2

Location: State FL. County Sarasota
1/4 1/4 1/4 Sec 12 T. 40 N S E W R 20
 Logged by Bill Cocks Observer David Snyder

Owner: GDU - North Port
 Well: Regional (Offsite) Monitor Well
 Driller: Alsay, Inc. Date Drilled: NOV 1987
 Surface Elevation: 6 ft. Estimated Above MSL
 Measured
 T.D. Logged 1151' T.D. Driller: 1150'
 Hole Dia 6" 1100' to 1150'
 Casing Dia: 6" FRP to 1100'
 Finish: Open hole Screen Gravel Other
 Water Level: Flowing Above MP, at Above Land Surface
 Below Below Pad Surface
 Yield: Flow 105 gpm Pump gpm
 Drawdown: ft. after hours pumping @ gpm
 Use: Dom. Stock PS Ind Irr. Test
 Heating or cooling Drainage Disposal Obs

Water Quality:
 Temp 91 °F, Sp Cond. 27000 Iron mg/L
 Cl⁻ mg/L, SO₄²⁻ mg/L, Total Hardness mg/L
 Color Odor Taste

Remarks:

- Electric 16" Normal Caliper
 64" Normal Fluid Resistivity
 Single Point Fluid Velocity
 S.P. Gamma Ray
 Temperature

Log Scales

Electric Log Fluid Resistivity
 SP 20 millivolts/inch 0.5-2 ohm meters/inch
 Res 10 ohm-meters/inch
 Res ohms/inch @ 91 °F

Gamma Ray Log Fluid Velocity
10 Counts/sec/inch 40 Counts/min/inch
 Time Constant 4 sec 20 FPM (Continuous)
 Logging speed 20 FPM Q - 105 gpm

Temperature Caliper
85 °F to 95 °F 4 inches to 24 inches
 Logging speed 35 FPM Logging speed 25 FPM

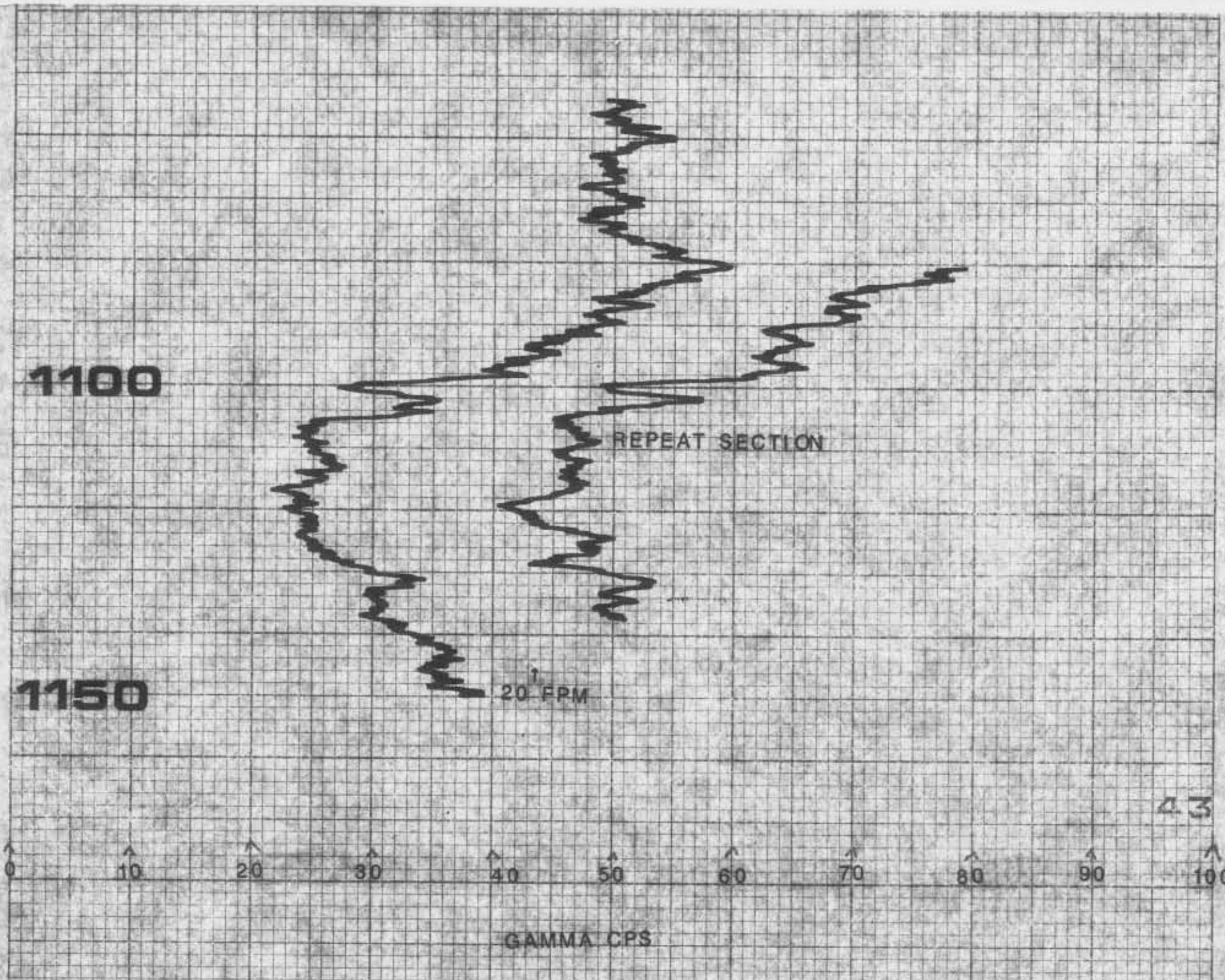
Water Samples
 Depths sampled: 1110' 1140'

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 Pinellas County—813/536-9454



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CHART NO. WH

TEXAS, U.S.A.

CLIENT GDU - North Port **Date** Nov. 12, 1987
Well No. RMN **Project No.** FC15920.C2

Location: State FL County Sarasota
 T. 40 N. 20 E. W
 Sec. 12
 Logged by Bill Cocke Observer David Snyder

Owner: GDU - North Port
Well: Regional (Offsite) Monitor Well
Driller: Alsay, Inc. **Date Drilled:** NOV 1987
 Surface Elevation: 6 ft. Estimated Measured Above MSL
 T.D. Logged 1151' T.D. Driller 1150'
 Hole Dia. 6" FRP to 1100'
 Casing Dia. 6" FRP to 1100'
 Finish: Open hole Screen Gravel Other
 Water Level: Flowing Above MP at Above Below Land Surface
 Yield: Flow 105 gpm Pump Pad Surface gpm
 Drawdown: _____ ft. after _____ hours pumping @ _____ gpm
 Use: Dorn Stock PS Ind. Irr. Test Heating or cooling Drainage Disposal Obs

Water Quality:
 Temp. 91 °F, Sp Cond. 27000 Iron _____ mg/L
 Cr _____ mg/L, SO₄ _____ mg/L, Total Hardness _____ mg/L
 Color _____ Odor _____ Taste _____

Remarks

CH2M HILL GEOPHYSICAL WELL SURVEY

Electric 16" Normal Caliper
 64" Normal Fluid Resistivity
 Single Point Fluid Velocity
 S.P. Gamma Ray Temperature

Log Scales

Electric Log **Fluid Resistivity**
 SP 20 millivolts/inch 0.5-2 ohm meters/inch
 Res. 10 ohm-meters/inch
 Res. _____ ohms/inch @ 91 °F

Gamma Ray Log **Fluid Velocity**
10 Counts/sec/inch 40 Counts/min/inch
 Time Constant 4 sec 20 FPM (Continuous)
 Logging speed 20 FPM Q = 105 gpm

Temperature 85 °F to 95 °F Caliper _____ inches to 24 inches
 Logging speed 35 FPM Logging speed 25 FPM

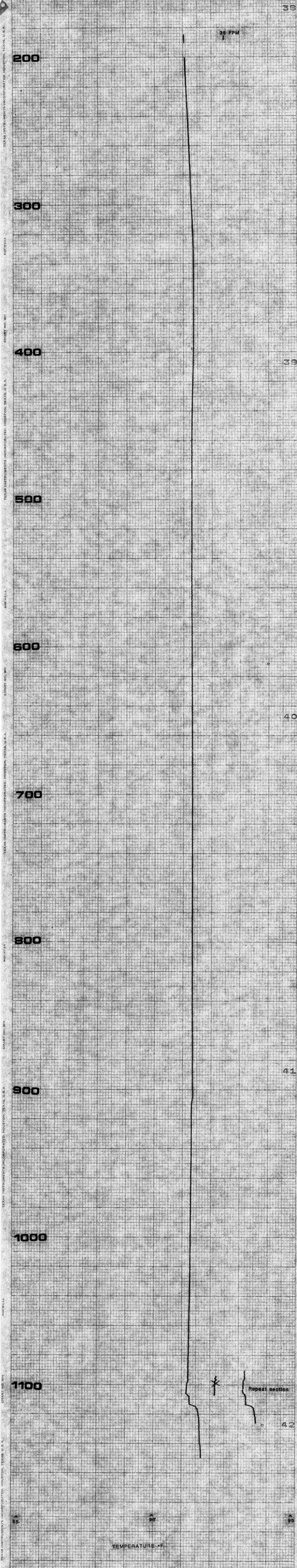
Water Samples
 Depths sampled 1110', 1140'

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TEXAS INSTRUMENTS INCORPORATED, HOUSTON, TEXAS, U.S.A. CHART NO. WH



GEOPHYSICAL WELL SURVEY

CLIENT GDU - North Port Date Nov. 12, 1987
 Well No. RMW Project No. FC15920.G2

Location: State FL. County Sarasota
 1/4 1/4 1/4 Sec. 12 T. 40 N R 20 E
 S W
 Logged by Bill Cocks Observer David Snyder

Owner: GDU - North Port
 Well: Regional (Offsite) Monitor Well
 Driller: Alsay, Inc. Date Drilled: NOV 1987
 Surface Elevation: 6 ft. Estimated Above MSL
 Measured
 T.D. Logged 1151' T.D. Driller 1150'
 Hole Dia. 6" 1100' to 1150'
 Casing Dia. 6" FRP to 1100'
 Finish: Open hole Screen Gravel Other
 Water Level: flowing Above MP. at Above Land Surface
 Below Below Pad Surface
 Yield: Flow 105 gpm Pump _____ gpm
 Drawdown: _____ ft. after _____ hours pumping @ _____ gpm.
 Use: Dom Stock PS Ind Irr Test
 Heating or cooling Drainage Disposal Obs

Water Quality
 Temp 91 °F, Sp. Cond. 27000, Iron _____ mg/L
 Cl⁻ _____ mg/L, SO₄ _____ mg/L, Total Hardness _____ mg/L
 Color _____ Odor _____ Taste _____

Remarks _____

- Electric
 16" Normal
 64" Normal
 Single Point
 S,P
- Caliper
 Fluid Resistivity
 Fluid Velocity
 Gamma Ray
 Temperature

Log Scales

Electric Log Fluid Resistivity
 SP 20 millivolts/inch 0.5-2 ohm meters/inch
 Res. 10 ohm-meters/inch
 Res. _____ ohms/inch @ 91 °F

Gamma Ray Log Fluid Velocity
 _____ Counts/sec/inch 40 Counts/min/inch
 Time Constant 4 sec 20 FPM (Continuous)
 Logging speed 20 FPM Q- 105 gpm

Temperature Caliper
85 °F to 95 °F 4 inches to 24 inches
 Logging speed 35 FPM Logging speed 25 FPM

Water Samples
 Depths sampled 1110'-1140'

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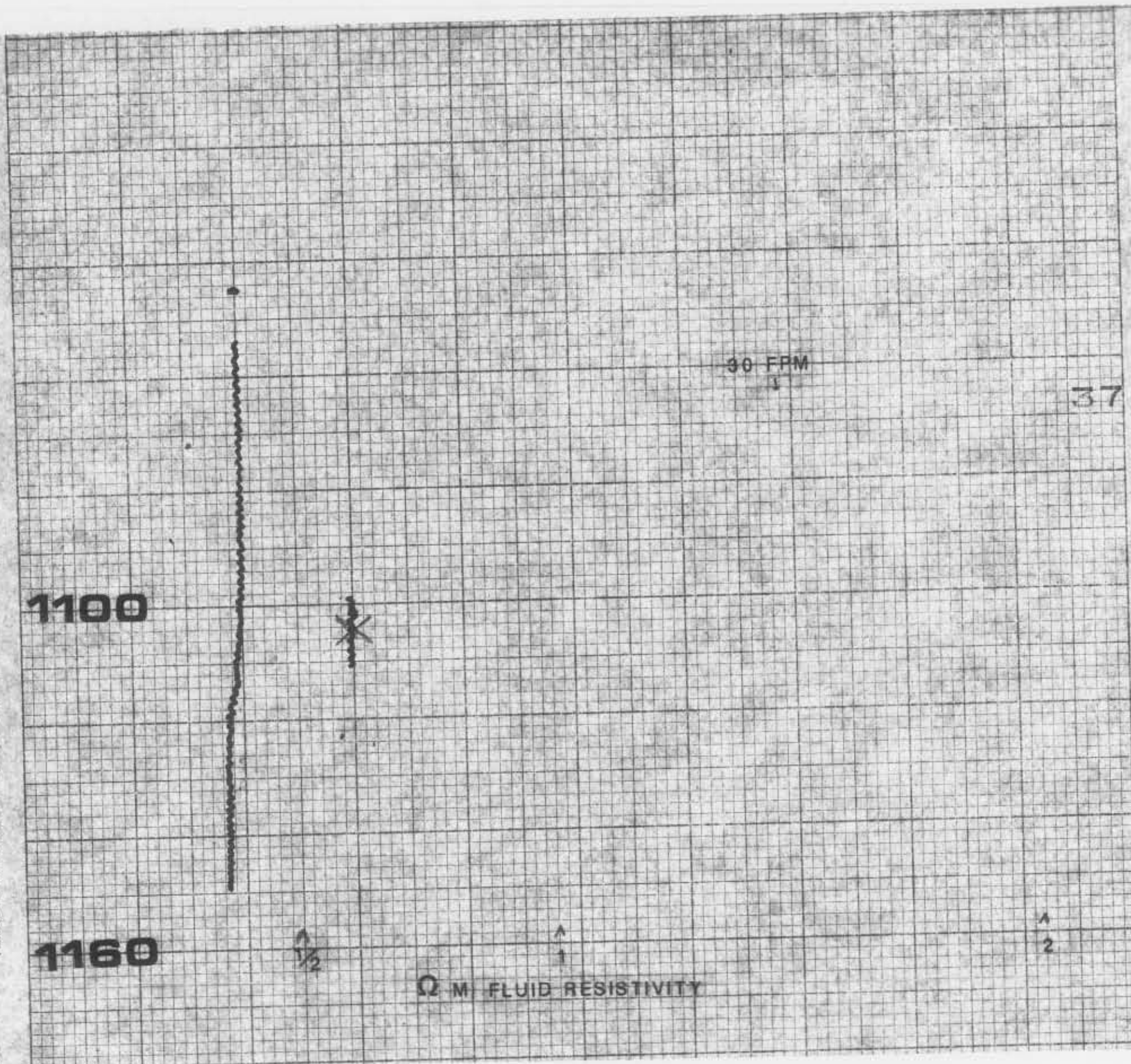
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CHART NO. WH

TEXAS INSTRUMENTS INCORPORATED, HOUSTON, TEXAS, U.S.A.





GEOPHYSICAL WELL SURVEY

CLIENT GDU - North Port Date Nov. 12, 1987
 Well No. RNW Project No. FC15920.G2

Location: State FL. County Sarasota
1/4 1/4 1/4 Sec. 12 T. 40 N S R. 20 E W
 Logged by Bill Coker Observer David Snyder

Owner GDU - North Port
 Well: Regional (Offsite) Monitor Well
 Driller: Alsay, Inc. Date Drilled: NOV 1987
 Surface Elevation: 6 ft. Estimated Above MSL
 Measured T.D. Driller 1150'
 T.D. Logged 1151'
 Hole Dia. 6" - 1100' to 1150'
 Casing Dia. 6" FRP to 1100'
 Finish: Open hole Screen Gravel Other
 Water Level flowing Above MP. at Above Land Surface
 Below Below Pad Surface
 Yield: Flow 105 gpm Pump gpm
 Drawdown _____ ft. after _____ hours pumping @ _____ gpm
 Use: Dom Stock PS Ind Irr. Test
 Heating or cooling Drainage Disposal Obs

Water Quality:
 Temp 91 °F; Sp Cond 27000; Iron _____ mg/L
 Cl⁻ _____ mg/L; SO₄²⁻ _____ mg/L; Total Hardness _____ mg/L
 Color _____ Odor _____ Taste _____

Remarks: _____

- Electric
- 16" Normal
 - 64" Normal
 - Single Point
 - S.P.
- Caliper
 Fluid Resistivity
 Fluid Velocity
 Gamma Ray
 Temperature

Log Scales

Electric Log	Fluid Resistivity
SP <u>20</u> millivolts/inch	<u>0.5-2</u> ohm meters/inch
Res <u>10</u> ohm-meters/inch	
Res _____ ohms/inch	@ <u>91</u> °F
Gamma Ray Log	Fluid Velocity
<u>10</u> Counts/sec/inch	<u>40</u> Counts/min/inch
Time Constant <u>4</u> sec	<u>20</u> FPM (Continuous)
Logging speed <u>20</u> FPM	Q = <u>105</u> gpm
Temperature	Caliper
<u>85</u> °F to <u>95</u> °F	<u>4</u> inches to <u>24</u> inches
Logging speed <u>35</u> FPM	Logging speed <u>25</u> FPM
Water Samples	
Depths sampled <u>1110', 1140'</u>	

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