

VOLUME 2
EVALUATION OF OFF-SITE
BEDROCK HYDROGEOLOGY
FOR THE
CIBA-GEIGY GLENS FALLS FACILITY
GLENS FALLS, NEW YORK

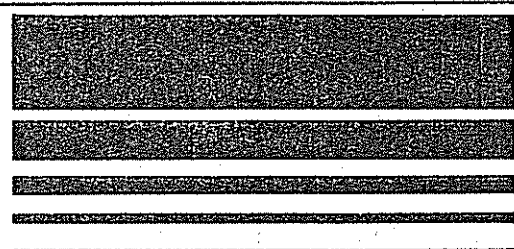
Prepared for:

Ciba-Geigy Corporation
Lower Warren Street
Glens Falls, New York

AWARE Incorporated
1200 MacArthur Boulevard
Mahwah, New Jersey 07430

January 1989

ATTACHMENT A
GEOPHYSICAL LOGS



AWARE
INCORPORATED

consultants in environmental management

227 French Landing Drive
Nashville, Tennessee 37228
(615) 255-2288

80 Airport Road
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(201) 728-1940

GAMMA LOG

Rec. Output: 625
CPS: 500
Time Constant: 4 SEC.
Logging Speed: 25 ft./min.
Ratio: 10 in./100 ft

Client: CIBA-GEIGY
Project: REGIONAL BEDROCK EVALUATION
Well: AW-1
Location: GLENS FALLS, NEW YORK
Job #: 6966 Elevation: Top Outer CSG: N.A.
Date: 7/28/88 Top Inner CSG: 282.78
Ground: 280.81
Log Measured From GROUND
Recorded By: J.Q.R.
Witnessed By: ED COLE

WELL PARAMETERS

OPEN HOLE CASED HOLE
Hole Diameter: 3" Casing Diameter: _____
Driller TD: 220 Casing TD: _____
Logger TD: 220 Logger TD: _____
Type Of Fluid In Hole GROUNDWATER

REMARKS:

AW-1

GAMMA

CPS = 500
Rec = 300

0 0 CPS 500

10

20

30

40

50

60

70

80

90

100

110

120

130

140

150

160

170

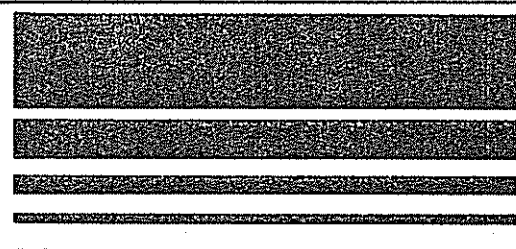
180

190

200

210

220



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SPONTANEOUS POTENTIAL SINGLE-POINT RESISTIVITY LOG

S.P. Scale Selector: 100 mV/div.
Res. Scale Selector: 800 ohm/div.
Logging Speed: 30 ft./min.
Ratio: 10 in./100 ft

REMARKS:

Client: CIBA-GEIGY

Project: REGIONAL BEDROCK EVALUATION

Well: AW-1

Location: GLENS FALLS, NEW YORK

Job #: 6966 Elevation: Top Outer CSG: N.A.

Date: 7/28/88 Top Inner CSG: 282.98

Ground: 280.81

Log Measured From GROUND

Recorded By: J.Q.R.

Witnessed By: ED COLE

WELL PARAMETERS

OPEN HOLE

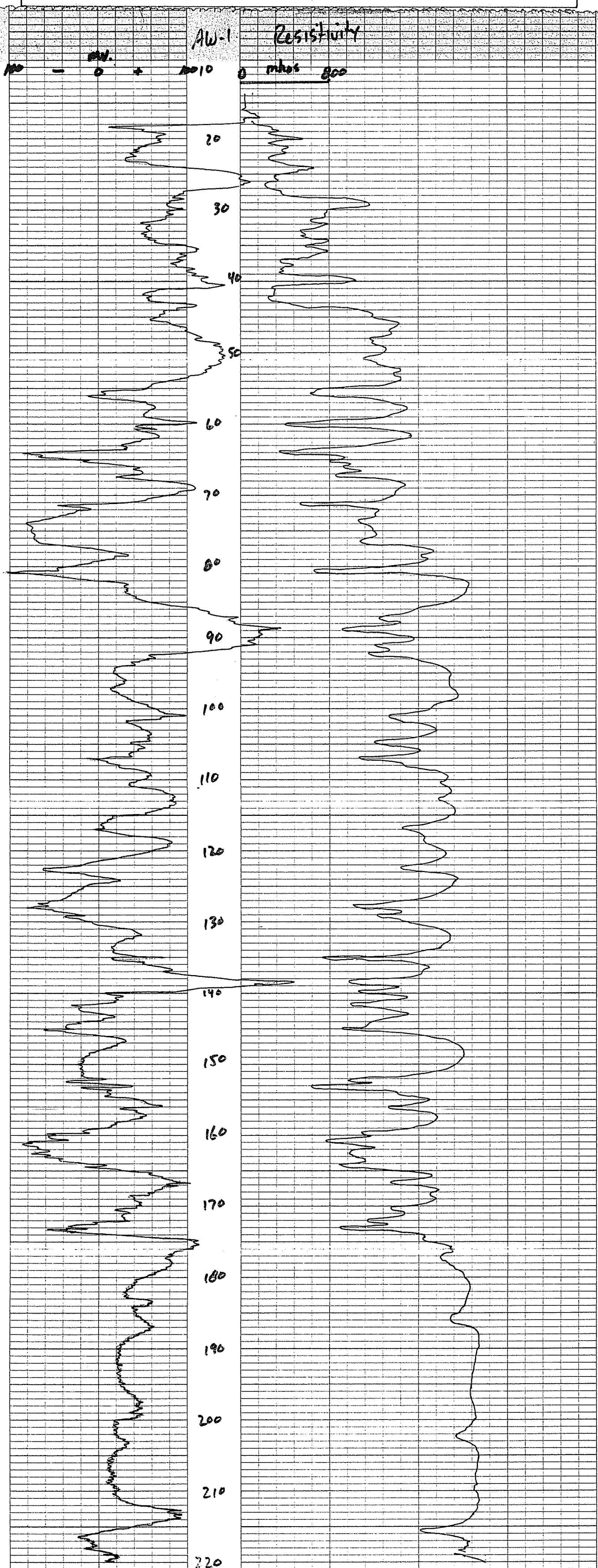
CASED HOLE

Hole Diameter: 3" Casing Diameter:

Driller TD: 220 Casing TD:

Logger TD: 220 Logger TD:

Type Of Fluid In Hole GROUNDWATER



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CALIPER LOG

Logging Speed: 30 ft./min.
Ratio 10 in./100 ft

Client: CIBA-GEIGY

Project: REGIONAL BEDROCK EVALUATION

Well: AW-1

Location: GLENS FALLS, NEW YORK

Job #: 6966 Elevation: Top Outer CSG: N.A.

Date: 7/28/88 Top Inner CSG: 282.78

Ground: 280.81

Log Measured From GROUND

Recorded By: J.Q.R.

Witnessed By: ED COLE

WELL PARAMETERS

OPEN HOLE

CASED HOLE

Hole Diameter: 3" Casing Diameter: _____

Driller TD: 220 Casing TD: _____

Logger TD: 220 Logger TD: _____

Type Of Fluid In Hole GROUNDWATER

REMARKS:

AW-1
10

CALIPER

20

30

40

50

60

70

80

90

100

110

120

130

140

150

160

170

180

190

200

210

220

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TEMPERATURE LOG

Rec. Output: 625
CPS: 200
Delta Spacing: 3
Logging Speed: 30 ft./min.
Ratio: 10 in./100 ft

Client: CIBA-GEIGY

Project: REGIONAL BEDROCK EVALUATION

Well: AW-1

Location: GLENS FALLS, NEW YORK

Job #: 6966 Elevation: Top Outer CSG: N.A.

Date: 7/21/88 Top Inner CSG: 282.81

Ground: 280.81

Log Measured From GROUND

Recorded By: J.Q.R.

Witnessed By: ED COLE

WELL PARAMETERS

OPEN HOLE

CASED HOLE

Hole Diameter: 3" Casing Diameter: _____

Driller TD: 220 Casing TD: _____

Logger TD: 220 Logger TD: _____

Type Of Fluid In Hole GROUNDWATER

REMARKS:

GRADIENT

DIFFERENTIAL

AW-1
Temp

CPS-200
Rec-625

25

30

40

50

60

70

80

90

100

110

120

130

140

150

160

170

180

190

200

210

210

220

50°

60°

70°

GRADIENT

Differential

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GAMMA LOG

Rec. Output: 625
CPS: 500
Time Constant: 4 SEC.
Logging Speed: 25 ft./min.
Ratio: 10 in./100 ft

Project: REGIONAL BEDROCK EVALUATION

Well: AW-2

Location: GLENS FALLS, NEW YORK

Job #: 6966 Elevation: Top Outer CSG: N.A.

Date: 8/9/88 Top Inner CSG: 237.97

Ground: 235.78

Log Measured From GROUND

Recorded By: J.Q.R.

Witnessed By: ED COLE

WELL PARAMETERS

OPEN HOLE

CASED HOLE

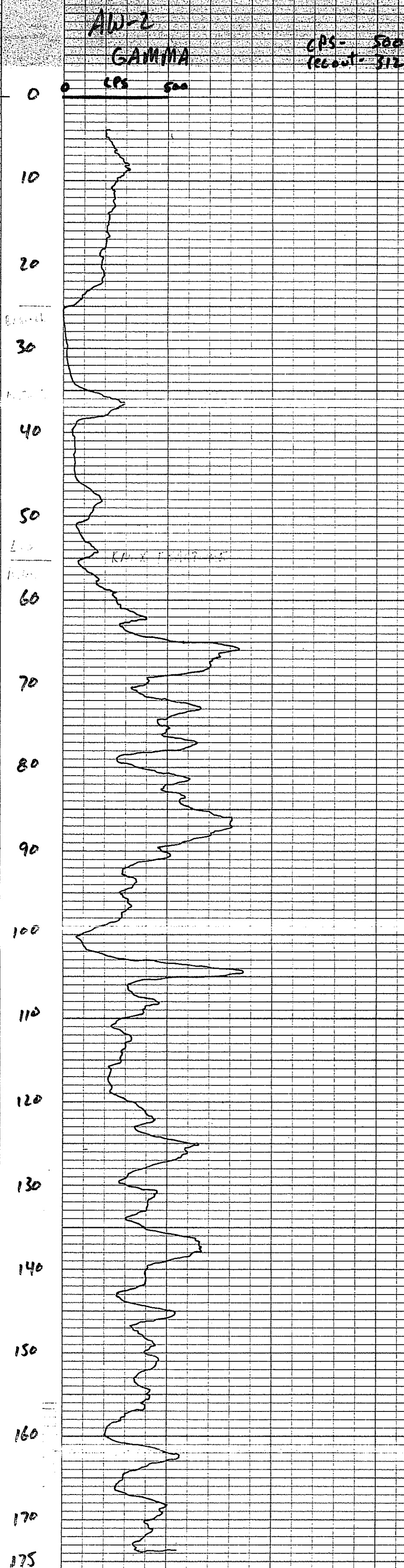
Hole Diameter: 3" Casing Diameter: _____

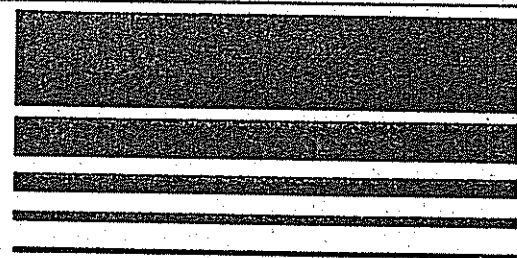
Driller TD: 175 Casing TD: _____

Logger TD: 174 Logger TD: _____

Type Of Fluid In Hole GROUNDWATER

REMARKS:





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SPONTANEOUS POTENTIAL SINGLE-POINT RESISTIVITY LOG

S.P. Scale Selector: 100 mV/div.
Res. Scale Selector: 800 ohm/div.
Logging Speed: 30 ft./min.
Ratio: 10 in./100 ft

Client: CIBA-GEIGY

Project: REGIONAL BEDROCK EVALUATION

Well: AW-2

Location: GLENS FALLS, NEW YORK

Job #: 6966 Elevation: Top Outer CSG: N.A.

Date: 8/9/88 Top Inner CSG: 237.97

Ground: 235.78

Log Measured From GROUND

Recorded By: J.Q.R.

Witnessed By: ED COLE

WELL PARAMETERS

OPEN HOLE

CASED HOLE

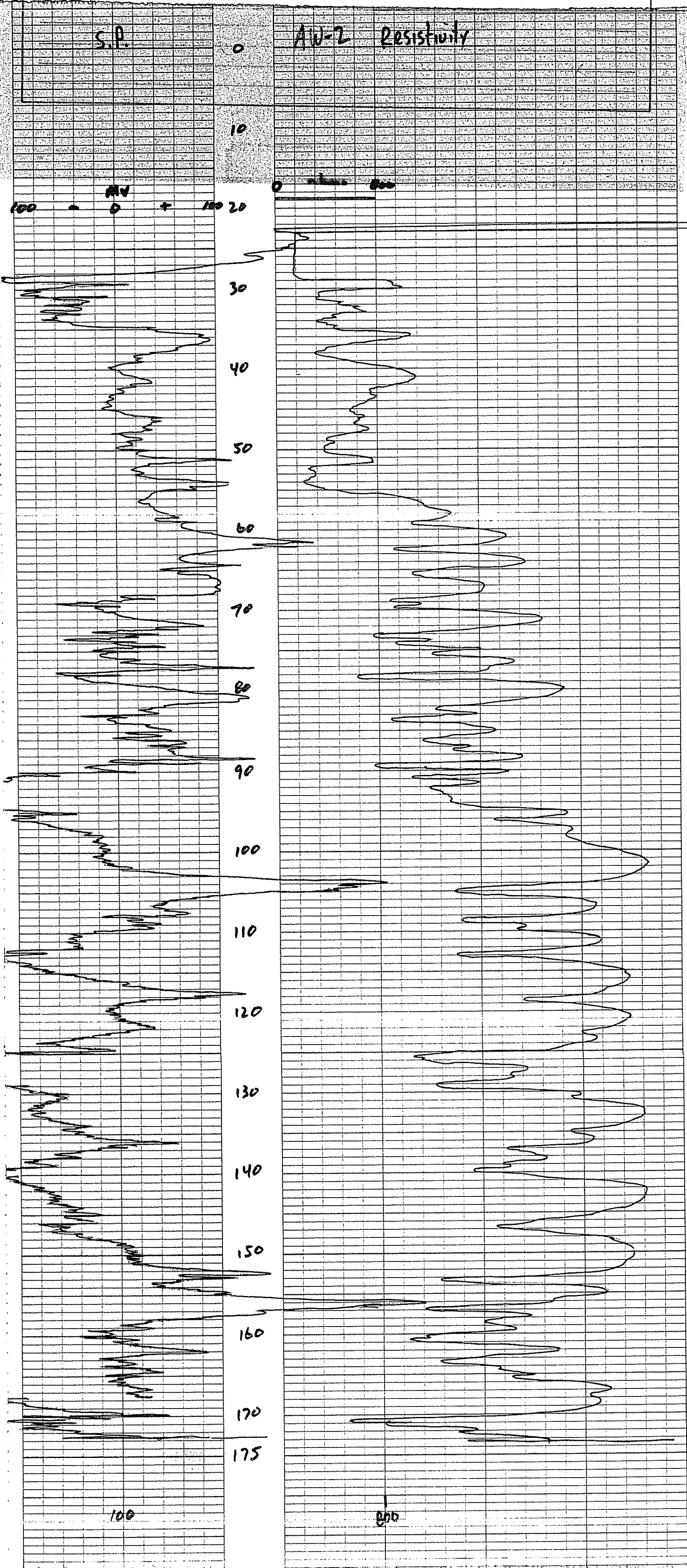
Hole Diameter: 3" Casing Diameter:

Driller TD: 175 Casing TD:

Logger TD: 174 Logger TD:

Type Of Fluid In Hole GROUNDWATER

REMARKS:



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CALIPER LOG

Logging Speed: 30 ft./min.
Ratio 10 in./100 ft

Client: CIBA-GEIGY

Project: REGIONAL BEDROCK EVALUATION

Well: AW-2

Location: GLENS FALLS, NEW YORK

Job #: 6966 Elevation: Top Outer CSG: N.A.

Date: 8/9/88 Top Inner CSG: 237.97

Ground: 235.78

Log Measured From GROUND

Recorded By: J.Q.R.

Witnessed By: ED COLE

WELL PARAMETERS

OPEN HOLE

CASED HOLE

Hole Diameter: 3" Casing Diameter: _____

Driller TD: 175 Casing TD: _____

Logger TD: 174 Logger TD: _____

Type Of Fluid In Hole GROUNDWATER

REMARKS: _____

AW-2 CALIPER

0

10

20

30

40

50

60

70

80

90

100

110

120

130

140

150

160

170

175

Casing @ 27'

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Client: CIBA-GEIGY

Project: REGIONAL BEDROCK EVALUATION

Well: AW-2

Location: GLENS FALLS, NEW YORK

Job #: 6966 Elevation: Top Outer CSG: N.A.

Date: 8/9/88 Top Inner CSG: 237.97

Ground: 235.78

Log Measured From GROUND

Recorded By: J.Q.R.

Witnessed By: ED COLE

WELL PARAMETERS

OPEN HOLE

CASED HOLE

Hole Diameter: 3" Casing Diameter:

Driller TD: 175 Casing TD:

Logger TD: 174 Logger TD:

Type Of Fluid In Hole GROUNDWATER

TEMPERATURE LOG

Rec. Output 625

CPS: 200

Delta Spacing: 3

Logging Speed: 30 ft./min.

Ratio: 10 in./100 ft

REMARKS:

GRADIENT

AW-2

TEMPERATURE

DIFFERENTIAL

RUN-2

50°

60°

70°

50°

60°

70°

CPS -
10000

Gradient

Differential

TD 206'

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GAMMA LOG

Rec. Output: 625
CPS: 500
Time Constant: 4 SEC.
Logging Speed: 25 ft./min.
Ratio: 10 in./100 ft

REMARKS:

Well: AW-3
Location: GLENS FALLS, NEW YORK

Job #: 6966 Elevation: Top Outer CSG: N.A.
Date: 9/10/88 Top Inner CSG: 131.03
Ground: 116.72

Log Measured From GROUND

Recorded By: J.Q.R.

Witnessed By: _____

WELL PARAMETERS

OPEN HOLE

CASED HOLE

Hole Diameter: 3" Casing Diameter: _____
Driller TD: 152 Casing TD: _____
Logger TD: 151 Logger TD: _____
Type Of Fluid In Hole GROUNDWATER

AW-3

0

10

20

30

40

50

60

70

80

90

100

110

120

130

140

150

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**SPONTANEOUS POTENTIAL
SINGLE-POINT
RESISTIVITY LOG**

S.P. Scale Selector: 100 mV/div.
Res. Scale Selector: 800 ohm/div.
Logging Speed: 30 ft./min.
Ratio: 10 in./100 ft

REMARKS:

Project: REGIONAL BEDROCK EVALUATION

Well: AW-3

Location: GLENS FALLS, NEW YORK

Job #: 6966 Elevation: Top Outer CSG: N.A

Date: 9/10/88 Top Inner CSG: 131.03

Ground: 116.72

Log Measured From GROUND

Recorded By: J.Q.R.

Witnessed By: _____

WELL PARAMETERS

OPEN HOLE

CASED HOLE

Hole Diameter: 3"

Casing Diameter: _____

Driller TD: 152

Casing TD: _____

Logger TD: 151

Logger TD: _____

Type Of Fluid In Hole GROUNDWATER

S.P. 200

AW-3

Resistivity

FW-1

800

1

800

10

20

30

40

50

60

70

80

90

100

110

120

130

140

150

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CALIPER LOG

Logging Speed: 30 ft./min.
Ratio 10 in./100 ft

Well: AW-3

Location: GLENS FALLS, NEW YORK

Job #: 6966 Elevation: Top Outer CSG: N. A.

Date: 9/10/88 Top Inner CSG: 131.03

Ground: 116.72

Log Measured From GROUND

Recorded By: J.Q.R.

Witnessed By: _____

WELL PARAMETERS

OPEN HOLE

CASED HOLE

Hole Diameter: 3" Casing Diameter: _____

Driller TD: 152 Casing TD: _____

Logger TD: 151 Logger TD: _____

Type Of Fluid In Hole GROUNDWATER

REMARKS: _____

AW-3

CALIPER

0

10

20

30

40

50

60

70

80

90

100

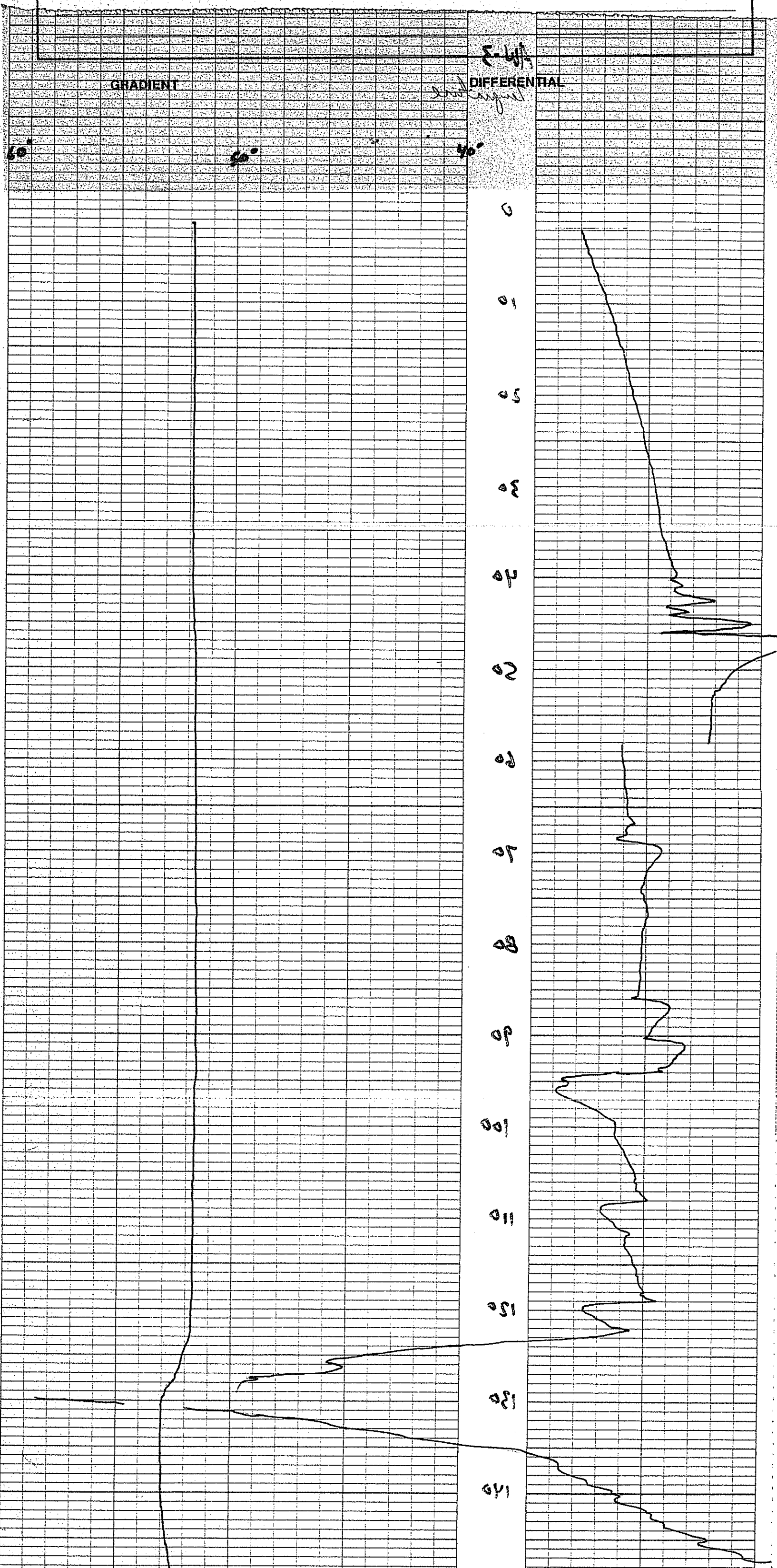
110

120

130

140

150



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GAMMA LOG

Rec. Output: 625
CPS: 500
Time Constant: 4 SEC.
Logging Speed: 25 ft./min.
Ratio: 10 in./100 ft

Client: CIBA-GEIGY

Project: REGIONAL BEDROCK EVALUATION

Well: AW-4

Location: GLENS FALLS, NEW YORK

Job #: 6966 Elevation: Top Outer CSG: _____

Date: 8/9/88 Top Inner CSG: 160.11

Ground: 158.87

Log Measured From GROUND

Recorded By: J.Q.R.

Witnessed By: ED COLE

WELL PARAMETERS

OPEN HOLE

CASED HOLE

Hole Diameter: 3" Casing Diameter: _____

Driller TD: 206 Casing TD: _____

Logger TD: 206 Logger TD: _____

Type Of Fluid In Hole GROUNDWATER

REMARKS: GAMMA RUN INSIDE CORING RODS

AW-4

GAMMA

CPS - 500
Rec'd - 312
Run - 3

0

10

20

30

40

50

60

70

80

90

100

110

120

130

140

150

160

170

180

190

200

205

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SPONTANEOUS POTENTIAL SINGLE-POINT RESISTIVITY LOG

S.P. Scale Selector: 100 mV/div.
Res. Scale Selector: 800 ohm/div.
Logging Speed: 30 ft./min.
Ratio: 10 in./100 ft

REMARKS:

Client: CIBA-GEIGY

Project: REGIONAL BEDROCK EVALUATION

Well: AW-4

Location: GLENS FALLS, NEW YORK

Job #: 6966 Elevation: Top Outer CSG: N.A.

Date: 8/9/88 Top Inner CSG: 160.11

Ground: 158.87

Log Measured From GROUND

Recorded By: J.Q.R.

Witnessed By: ED COLE

WELL PARAMETERS

OPEN HOLE

CASED HOLE

Hole Diameter: 3"

Casing Diameter:

Driller TD: 206

Casing TD:

Logger TD: 206

Logger TD:

Type Of Fluid In Hole GROUNDWATER

S.P. 105 mV AW-4

RESISTIVITY

800

Casing @ 5.0'

Resistivity

SP

T.D. 206'

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CALIPER LOG

Logging Speed: 30 ft./min.
Ratio 10 in./100 ft

REMARKS:

Project: **REGIONAL BEDROCK EVALUATION**

Well: AW-4

Location: GLENS FALLS, NEW YORK

Job #: 6966 Elevation: Top Outer CSG: _____

Date: 8/9/88 Top Inner CSG: 160.11

Ground: 158.57

Log Measured From GROUND

Recorded By: J.Q.R.

Witnessed By: ED COLE

WELL PARAMETERS

OPEN HOLE

CASED HOLE

Hole Diameter: 3" Casing Diameter: _____

Driller TD: 200 Casing TD: _____

Logger TD: 200 Logger TD: _____

Type Of Fluid In Hole GROUNDWATER

AW-4

CALIPER

Casing - 3.0"

0

2"

10

20

30

40

50

60

70

80

90

100

110

120

130

140

150

160

170

180

190

200

205

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TEMPERATURE LOG

Rec. Output: 625
CPS: 200
Delta Spacing: 3
Logging Speed: 30 ft./min.
Ratio: 10 in./100 ft

REMARKS:

Client: CIBA-GEIGY

Project: REGIONAL BEDROCK EVALUATION

Well: AW-4

Location: GLENS FALLS, NEW YORK

Job #: 6966 Elevation: Top Outer CSG: N.A.

Date: 8/9/88 Top Inner CSG: 160.11

Ground: 158.87

Log Measured From GROUND

Recorded By: J.Q.R.

Witnessed By: ED COLE

WELL PARAMETERS

OPEN HOLE

CASED HOLE

Hole Diameter: 3" Casing Diameter: _____

Driller TD: 206 Casing TD: _____

Logger TD: 206 Logger TD: _____

Type Of Fluid In Hole GROUNDWATER

GRADIENT

DIFFERENTIAL

AW-4

TEMPERATURE RUN-1

0

10

20

30

40

50

60

70

80

90

100

110

120

130

140

150

160

170

180

190

200

210

T.D. 206



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GAMMA LOG

Rec. Output: 625

CPS: 500

Time Constant: 4 SEC.

Logging Speed: 25 ft./min.

Ratio: 10 in./100 ft

REMARKS: GAMMA RUN INSIDE REAMING RODS

Client: CIBA-GEIGY

Project: REGIONAL BEDROCK EVALUATION

Well: AW-5

Location: GLENS FALLS, NEW YORK

Job #: 6966 Elevation: Top Outer CSG: NA

Date: 10/3/88 Top Inner CSG: 315.72

Ground: 313.84

Log Measured From GROUND

Recorded By: J.Q.R.

Witnessed By: ED COLE

WELL PARAMETERS

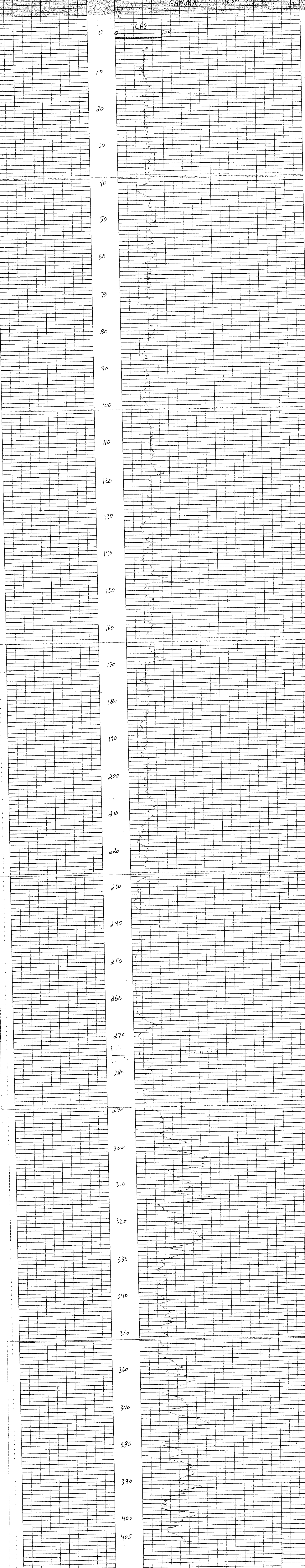
OPEN HOLE Cased Hole

Hole Diameter: 6" Casing Diameter:

Driller TD: 407 Casing TD:

Logger TD: 407 Logger TD:

Type Of Fluid In Hole GROUNDWATER



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CALIPER LOG

Logging Speed: 30 ft./min.

Ratio 10 in./100 ft

Client: CIBA-GEIGY

Project: REGIONAL BEDROCK EVALUATION

Well: AW-5

Location: GLENS FALLS, NEW YORK

Job #: 6966 Elevation: Top Outer CSG: N.A.

Date: 10/3/88 Top Inner CSG: 315.72

Ground: 313.84

Log Measured From GROUND

Recorded By: J.Q.R.

Witnessed By: ED COLE

WELL PARAMETERS

OPEN HOLE

CASED HOLE

Hole Diameter: 6" Casing Diameter: _____

Driller TD: 407 Casing TD: _____

Logger TD: 407 Logger TD: _____

Type Of Fluid In Hole GROUNDWATER

REMARKS: _____

AW-5
CALIPER

50

60

70

80

90

100

110

120

130

140

150

160

170

180

190

200

210

220

230

240

250

260

270

280

290

300

310

320

330

340

350

360

370

380

390

400

410

420

430

440

450

460

470

480

490

500

510

520

530

540

550

560

570

580

590

600

610

620

630

640

650

660

670

680

690

700

710

720

730

740

750

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850

860

870

880

890

900

910

920

930

940

950

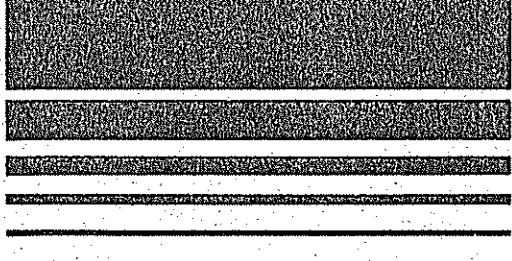
960

970

980

990

1000



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**SPONTANEOUS POTENTIAL
SINGLE-POINT
RESISTIVITY LOG**

S.P. Scale Selector: 100 mV/div.
Res. Scale Selector: 800 ohm/div.
Logging Speed: 30 ft./min.
Ratio: 10 in./100 ft

Client: CIBA-GEIGY

Project: REGIONAL BEDROCK EVALUATION

Well: AW-5

Location: GLENS FALLS, NEW YORK

Job #: 6966 Elevation: Top Outer CSG: N.A.

Date: 10/3/88 Top Inner CSG: 315.72

Ground: 313.84

Log Measured From GROUND

Recorded By: J.Q.R.

Witnessed By: ED COLE

WELL PARAMETERS

OPEN HOLE

CASED HOLE

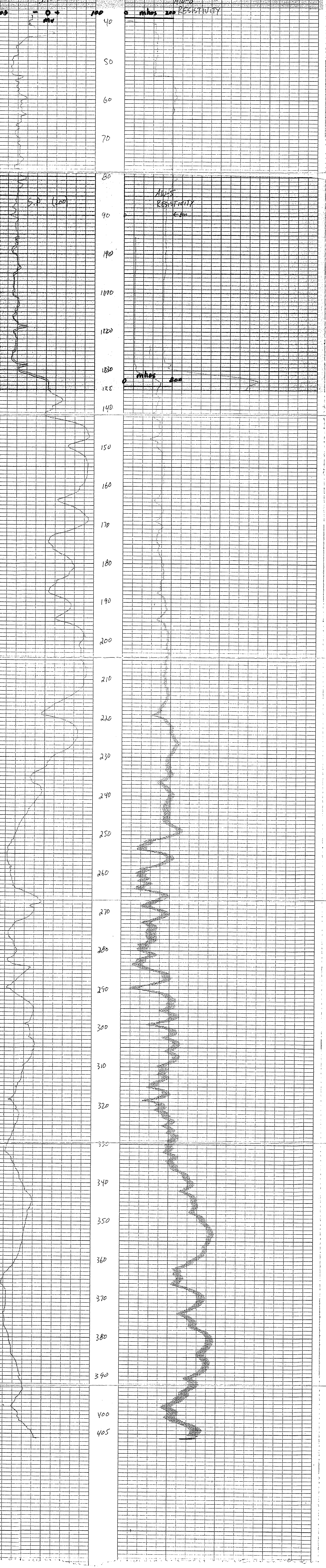
Hole Diameter: 6" Casing Diameter: _____

Driller TD: 407 Casing TD: _____

Logger TD: 407 Logger TD: _____

Type Of Fluid In Hole GROUNDWATER

REMARKS: Resistivity Scale Change at 135'





consultants in environmental management

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TEMPERATURE LOG

Rec. Output: 625
CPS: 200
Delta Spacing: 3
Logging Speed: 30 ft./min.
Ratio: 10 in./100 ft

Client: CIBA-GEIGY

Project: REGIONAL BEDROCK EVALUATION

Well: AW-5

Location: GLENS FALLS, NEW YORK

Job #: 6966 Elevation: Top Outer CSG: N.A.

Date: Top Inner CSG: 315.72

Ground: 313.84

Log Measured From GROUND

Recorded By: J.Q.R.

Witnessed By: ED COLE

WELL PARAMETERS

OPEN HOLE CASED HOLE

Hole Diameter: 6" Casing Diameter:

Driller TD: 407 Casing TD:

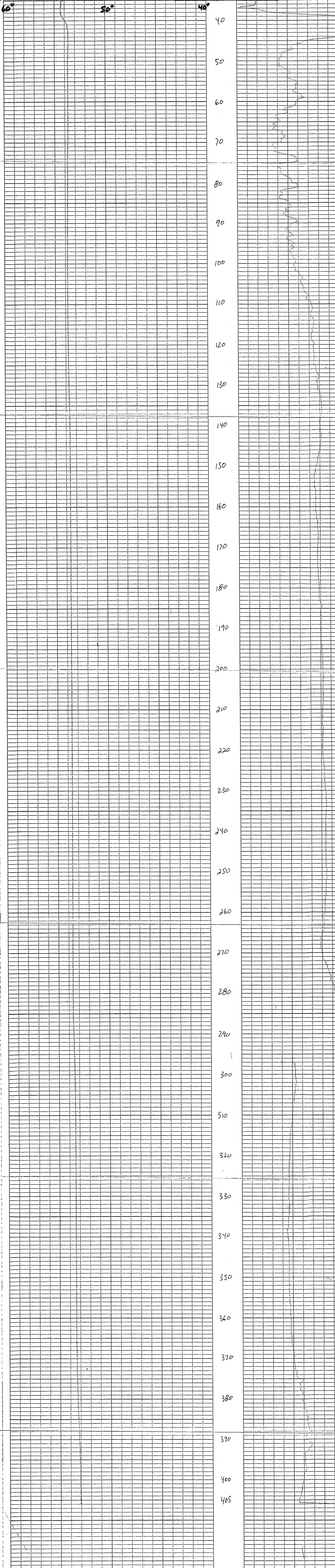
Logger TD: 407 Logger TD:

Type Of Fluid In Hole GROUNDWATER

REMARKS:

GRADIENT

DIFFERENTIAL



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Location: GLENS FALLS, NEW YORK

Job #: 6966 Elevation: Top Outer CSG: _____

Date: 8/88 Top Inner CSG: _____

Ground: _____

Log Measured From GROUND

Recorded By: J.Q.R.

Witnessed By: _____

WELL PARAMETERS

OPEN HOLE

CASED HOLE

Hole Diameter: 8" Casing Diameter: 8"

Driller TD: 163 Casing TD: _____

Logger TD: 152 Logger TD: _____

Type Of Fluid In Hole GROUNDWATER

GAMMA LOG

Rec. Output: 625

CPS: 500

Time Constant: 4 SEC.

Logging Speed: 25 ft./min.

Ratio: 10 in./100 ft

REMARKS: _____

PRODUCTION WELL No. 1

GAMMA

CPS-

REC. OUT-

CPS

500

0

10

20

30

40

50

60

70

80

90

100

110

120

130

140

150

T.D. 152

AWARE INCORPORATED

CONSULTANTS IN ENVIRONMENTAL MANAGEMENT

227 French Landing Drive
Nashville, Tennessee 37228
(615) 255-2288

80 Airport Road
West Milford, New Jersey 07480
(201) 728-1940

SPONTANEOUS POTENTIAL SINGLE-POINT RESISTIVITY LOG

S.P. Scale Selector: 100 mV/div.
Res. Scale Selector: 800 ohm/div.
Logging Speed: 30 ft./min.
Ratio: 10 in./100 ft

REMARKS:

Project: REGIONAL BEDROCK EVALUATION

Well: PRODUCTION WELL # 1 (PW-1)

Location: GLENS FALLS, NEW YORK

Job #: 6966 Elevation: Top Outer CSG: _____

Date: 8/88 Top Inner CSG: _____

Ground: _____

Log Measured From GROUND

Recorded By: J.Q.R.

Witnessed By: _____

WELL PARAMETERS

OPEN HOLE

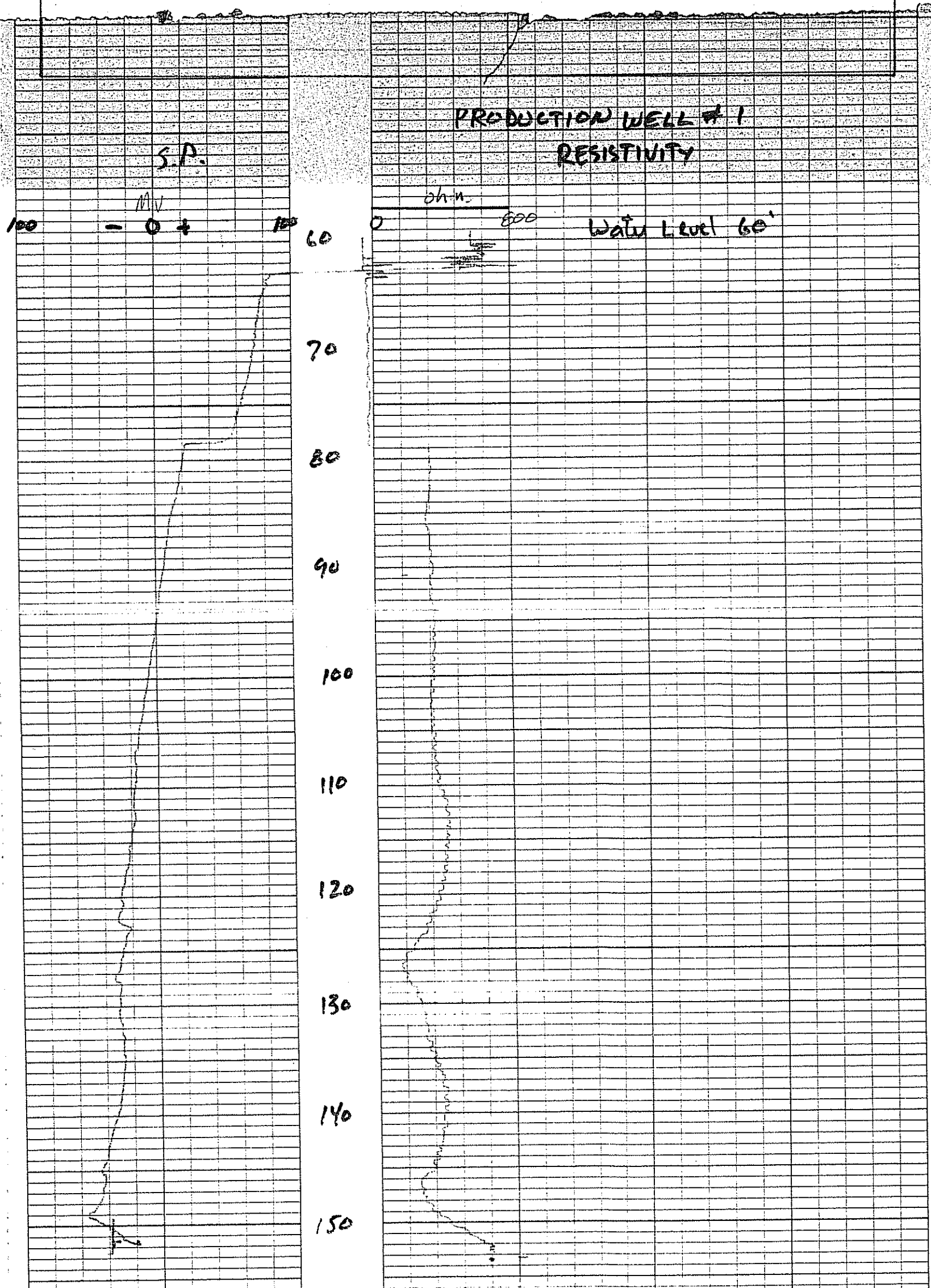
CASED HOLE

Hole Diameter: 8" Casing Diameter: 8"

Driller TD: 163 Casing TD: _____

Logger TD: 152 Logger TD: _____

Type Of Fluid In Hole GROUNDWATER



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CALIPER LOG

Logging Speed: 30 ft./min.
Ratio 10 in./100 ft

Well: PRODUCTION WELL #1 (PW-1)

Location: GLENS FALLS, NEW YORK

Job #: 6966 Elevation: Top Outer CSG: _____

Date: 8/88 Top Inner CSG: _____

Ground: _____

Log Measured From GROUND

Recorded By: J.Q.R.

Witnessed By: _____

WELL PARAMETERS

OPEN HOLE

CASED HOLE

Hole Diameter: 8" Casing Diameter: 8"

Driller TD: 163 Casing TD: _____

Logger TD: 152 Logger TD: _____

Type Of Fluid In Hole GROUNDWATER

REMARKS: _____

PRODUCTION WELL #1
CALIPER

0

10

20

30

40

50

60

70

80

90

100

110

120

130

140

150

TD = 152.5

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TEMPERATURE LOG

Rec. Output: 625
CPS: 200
Delta Spacing: 3
Logging Speed: 30 ft./min.
Ratio: 10 in./100 ft

REMARKS:

Location: GLENS FALLS, NEW YORK

Job #: 6966 Elevation: Top Outer CSG: _____

Date: 8/88 Top Inner CSG: _____

Ground: _____

Log Measured From GROUND

Recorded By: J.Q.R.

Witnessed By: ED COLE

WELL PARAMETERS

OPEN HOLE

CASED HOLE

Hole Diameter: 8" Casing Diameter: 8"

Driller TD: 163 Casing TD: _____

Logger TD: 152 Logger TD: _____

Type Of Fluid In Hole GROUNDWATER

GRADIENT

DIFFERENTIAL

PRODUCTION WELL #1
TEMPERATURE

RUN #2

60

50°

60°

70°

70

80

90

100

110

120

130

140

150

Differential

Gradient

TD 152.5

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GAMMA LOG

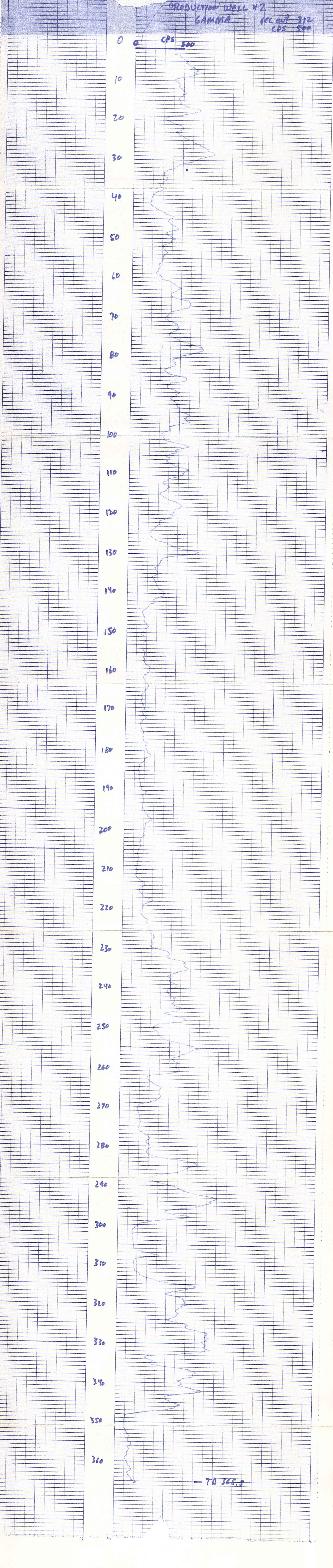
Rec. Output: **625**
CPS: **500**
Time Constant: **4 SEC.**
Logging Speed: **25** ft./min.
Ratio: **10** in./100 ft

Client: **CIBA-GEIGY**
Project: **REGIONAL BEDROCK EVALUATION**
Well: **PRODUCTION WELL #2 (PW-2)**
Location: **GLENS FALLS, NEW YORK**
Job #: **6966** Elevation: Top Outer CSG: _____
Date: **8/88** Top Inner CSG: _____
Ground: _____
Log Measured From **GROUND**
Recorded By: **J.Q.R.**
Witnessed By: _____

WELL PARAMETERS

OPEN HOLE	CASED HOLE
Hole Diameter: 8"	Casing Diameter: 8"
Driller TD: 265	Casing TD: _____
Logger TD: 265	Logger TD: _____
Type Of Fluid In Hole GROUNDWATER	

REMARKS: **COREHOLE TD 1012 (2 3/8" DIA.)**



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**SPONTANEOUS POTENTIAL
SINGLE-POINT
RESISTIVITY LOG**

S.P. Scale Selector: 100 mV/div.
Res. Scale Selector: 800 ohm/div.
Logging Speed: 30 ft./min.
Ratio: 10 in./100 ft

Client: CIBA-GEIGY

Project: REGIONAL BEDROCK EVALUATION

Well: PRODUCTION WELL #2 (PW-2)

Location: GLENS FALLS, NEW YORK

Job #: 6966 Elevation: Top Outer CSG:

Date: 8/88 Top Inner CSG:

Ground:

Log Measured From GROUND

Recorded By: J.Q.R.

Witnessed By:

WELL PARAMETERS

OPEN HOLE

CASED HOLE

Hole Diameter: 8" Casing Diameter: 8"

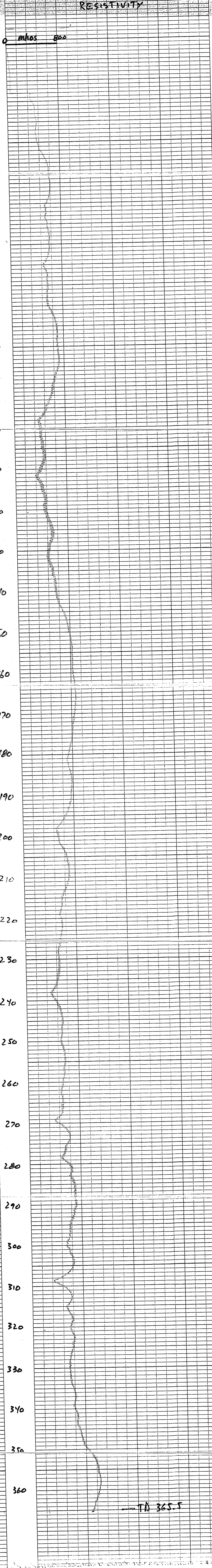
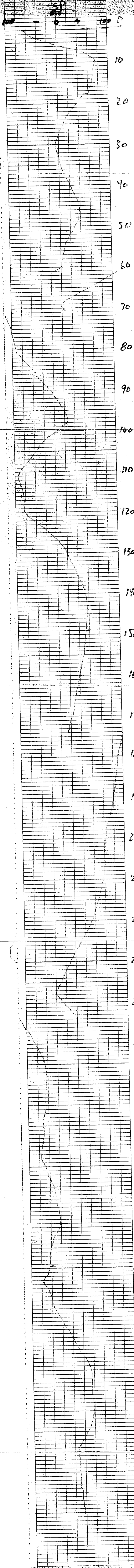
Driller TD: 265 Casing TD:

Logger TD: 265 Logger TD:

Type Of Fluid In Hole GROUNDWATER

REMARKS: COREHOLE TD 1012 (2 3/8" DIA.)

**PRODUCTION WELL #2
RESISTIVITY**



TA 365.5

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CALIPER LOG

Logging Speed: 30 ft./min.

Ratio 10 in./100 ft

Client: CIBA-GEIGY

Project: REGIONAL BEDROCK EVALUATION

Well: PRODUCTION WELL #2 (PW-2)

Location: GLENS FALLS, NEW YORK

Job #: 6966 Elevation: Top Outer CSG: _____

Date: 8/88 Top Inner CSG: _____

Ground: _____

Log Measured From GROUND

Recorded By: J.Q.R.

Witnessed By: _____

WELL PARAMETERS

OPEN HOLE

CASED HOLE

Hole Diameter: 8" Casing Diameter: 8"

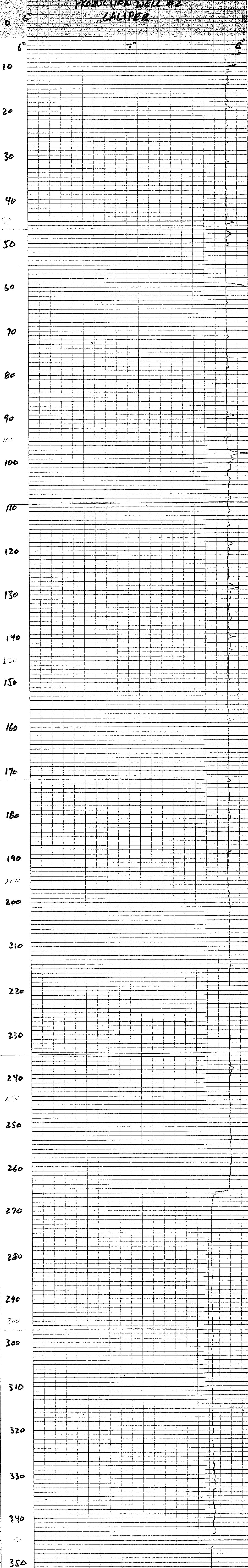
Driller TD: 265 Casing TD: _____

Logger TD: 265 Logger TD: _____

Type Of Fluid In Hole GROUNDWATER

REMARKS: COREHOLE TD 1012 (2 3/8" DIA.)

PRODUCTION WELL #2
CALIPER



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80 Airport Road
West Milford, New Jersey 07480
(201) 728-1940

TEMPERATURE LOG

Rec. Output: 625
CPS: 200
Delta Spacing: 3
Logging Speed: 30 ft./min.
Ratio: 10 in./100 ft

Client: CIBA-GEIGY

Project: REGIONAL BEDROCK EVALUATION

Well: PRODUCTION WELL #2 (PW-2)

Location: GLENS FALLS, NEW YORK

Job #: 6966 Elevation: Top Outer CSG:

Date: 8/88 Top Inner CSG:

Ground:

Log Measured From: GROUND

Recorded By: J.Q.R.

Witnessed By:

WELL PARAMETERS

OPEN HOLE

CASED HOLE

Hole Diameter: .8" Casing Diameter: 8"

Driller TD: 265 Casing TD:

Logger TD: 265 Logger TD:

Type Of Fluid In Hole: GROUNDWATER

REMARKS: COREHOLE TD 1012 (2 3/8" DIA.)

Production Well #2

GRADIENT

DIFFERENTIAL

0

10

20

30

40

50

60

70

80

90

100

110

120

130

140

150

160

170

180

190

200

210

220

230

240

250

260

270

280

290

300

310

320

330

340

350

360

TD 365

ATTACHMENT B

WATER SAMPLING PROTOCOL

SITE-SPECIFIC
STANDARD OPERATING PROCEDURES

CG Bedrock
Aquatec Project No. 88117

Site: Ciba-Geigy
Location: Glens Falls, New York

Prepared By:
Aquatec, Inc.
75 Green Mountain Drive
South Burlington, Vermont 05403
(802)658-1074

August 1988

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Figure 2 - Chain-of-Custody Record

1. Introduction

This document is Aquatec's Site-Specific Standard Operating Procedures (SOP) for field sampling at Ciba-Geigy Corporation in Glens Falls, New York. This plan outlines the procedures and equipment that will be used for sample collection, sample preservation and handling, chain-of-custody, and field Quality Assurance/Quality Control (QA/QC) for project CG Bedrock, No. 88117.

2. Water Sample Collection

2.1 Ground Water

2.1.1 Measurement of Static Water Levels

Depth to the static water level and the adjusted depth (depth to the bottom of the well) will be measured at each well. These measurements and the inside casing diameter will be used to calculate the volume of stagnant water in the well. A calibrated electronic water level indicator will be used to make the measurements. The measurements will be recorded to the nearest 0.01 foot. A reference point identified on the well will be used. If no reference point is identified, the highest point on the PVC riser pipe is assumed to be the reference point. The measuring device will be cleaned between each well. Cleaning procedures are explained in Section 4.

2.1.2 Well Evacuation

The preferred equipment to use to evacuate stagnant water from two and four inch diameter monitoring wells are dedicated PVC bladder pumps. In cases where bladder pumps are not suitable, dedicated bailers may be used. These bladder pumps will be activated by an oilless air compressor.

The amount of water evacuated from each well will ultimately depend on the yield characteristics of each well. A minimum of three well volumes will be evacuated from each well or until the well is purged dry. Samples will then be collected as described below. All stagnant water pumped from the well will be contained in 55-gallon drums supplied by Ciba-Geigy.

2.1.3 Sample Withdrawal

Samples will be collected via the bladder pump. Specific conductance, pH and temperature measurements will be recorded just prior to and following sample collection. The preferred order in which the parameters will be sampled is as follows:

1. Volatile Organics
2. Semivolatile Organics (BNA)
3. HCO_3
4. TOX, TOC
5. Metals (Dissolved and Total)
6. Hexavalent Chromium
7. Phenols
8. Cyanide
9. Fluoride, Chloride, Turbidity, TDS
10. Nitrate/Nitrite-N

Samples collected for dissolved metals will be field filtered by placing an in-line disposable 0.45 micron filter on the end of the pump discharge line.

2.1.4 Sample Containers

All sample containers will be certified clean I-Chem bottles.

2.1.5 Sample Preservation

Listed below are the number, size, and type of bottle used for each analytical parameter. Bottles will be preserved prior to sample collection.

<u>Parameter</u>	<u>Bottle Size, Material</u>	<u>Preservative</u>
Temperature	field determined	-
pH	field determined	-
Specific Conductance	field determined	-
HCO_3	1-250 ml glass w/TFE cap	4°C
VOC	2-40 ml glass w/TFE cap	4°C HCl
Semi-VOC (BNA)	1-4 liter glass w/TFE cap	4°C
TOX	1-250 ml glass w/TFE cap	1 ml 1.1M NaSO_3 , 4°C
Dissolved Metals	1-500 ml plastic	HNO_3 to pH <2
Hexavalent Chromium	1-500 ml plastic	4°C
Phenols	1-500 ml	H_2SO_4 to pH <2, 4°C
Cyanide	1-500 ml plastic	NaOH to pH <12, 4°C
Chloride, Fluoride, Turbidity, TDS	1-1/2 gallon plastic	4°C
Nitrate/Nitrite-N	1-500 ml plastic	H_2SO_4 to pH <2, 4°C
TOC	1-250 ml glass w/TFE cap	4°C

2.2 Surface Water

Generally, samples of surface water, i.e., seepage, streams, outfalls or discharge systems, are grab samples. In most cases, samples will be collected and placed directly into the sample containers. In cases where samples cannot be collected directly, sampling devices will be used. These devices will consist of bailers, pumps, syringes, or Kemmerer bottles. For seepage sample collection Teflon tubes will be driven into seepage faces.

The sample order, containers, and preservation are the same as Section 2.1.3, 2.1.4, and 2.1.5, respectively.

3. Chain-of-Custody Program

The chain-of-custody program will include:

- Sample Labels
- Sample Seals
- Personal Field Log Book
- Chain-of-custody Record
- Sample Analysis Request Sheet
- Dissection Log (fish only)

3.1 Sample Labels

Sample labels are gummed labels affixed to each chemical sample container. The labels will be filled out entirely and covered with clean Mylar tape prior to filling the container. A copy of the label can be found in Figure 1.

I-Chem bottles are pre-labeled. These labels are to be used when possible.

3.2 Sample Seals

Sample seals will be placed over the top of each chemical sample container cap immediately following collection. A seal will also be placed on the shipping cooler by the person relinquishing or transporting the cooler to Aquatec's laboratory. A copy of the label can be found in Figure 1.

3.3 Personal Field Log Book

The designated field director will be responsible for maintaining a field log book. The log book will include documenting the following where applicable:

- o Identification of well
- o Well depth
- o Static water level depth and measurement technique
- o Well yield - high or low estimate
- o Purge volume and pumping rate
- o Time well purged
- o Well evacuation procedure/equipment
- o Sample withdrawal procedure/equipment
- o Date and time of collection
- o Well sampling sequence
- o Types of sample containers used and sample ID numbers
- o Preservative(s) used
- o Parameters requested for analysis
- o Field analysis data and method(s)
- o Sample distribution and transporter
- o Field observation on sampling event
- o Name of collector
- o Climatic conditions including air temperature

3.4 Chain-of-Custody Record

Chain-of-custody records will be filled out entirely for each sample station. More than one sample may be recorded on a single chain-of-custody record if the sample destination is the same. A chain-of-custody record is shown in Figure 2.

4. Field Quality Assurance/Quality Control

4.1 Equipment Cleaning

All nondedicated equipment used to measure, pump, sample, or the like will be cleaned between each station. The equipment will be washed with a soap solution consisting of Liquinox and deionized water, followed by three successive rinses with deionized water. All the equipment will be wiped dry with paper towels following the final rinse. Clean disposable gloves will be worn when cleaning equipment. The wash water and rinse water will be disposed of in the 55-gallon drums supplied by Ciba-Geigy.

4.2 Duplicates and Trip Blanks

Duplicate water samples for laboratory matrix spikes and matrix spike duplicates will be collected. The number of duplicate samples depend on program requirements. In general, for groups of ten samples or less, one duplicate will be collected. Trip blanks for each sampling trip will be included and analyzed.

5. Data Entry

All paperwork will be reviewed by the field and laboratory personnel conducting the work for completeness and accuracy. The paperwork will then be submitted to the project quality control officer. The officer will review the data for completeness and submit data for entry into the computer. After entry, the original data forms will be used to check the computer file for accuracy. Corrections will be made until no known errors exist. Original forms will be retained on file.

88117D10JAN89

Figure 1 - Labels

CHEM		I-CHEM RESEARCH	
(800) 443-1689		(800) 553-3696	
SITE NAME		DATE	
ANALYSIS		TIME	
		PRESERVATIVE	
SPECIALTY CLEANED CONTAINER			

	<i>aquatec inc.</i> ENVIRONMENTAL SERVICES 75 Green Mountain Drive, So. Burlington, VT 05403 TEL. 802/658-1074	SEALED BY
		DATE _____ TIME _____
CUSTODY SEAL		

CHAIN OF CUSTODY RECORD

Aquatec, Inc.
75 Green Mountain Drive'
South Burlington, VT 05403
(802) 658-1074

Figure 2 - Chain-of-Custody Record

[illegible]

ATTACHMENT C

WATER QUALITY DATA

(Available upon request - refer to Summary Tables)