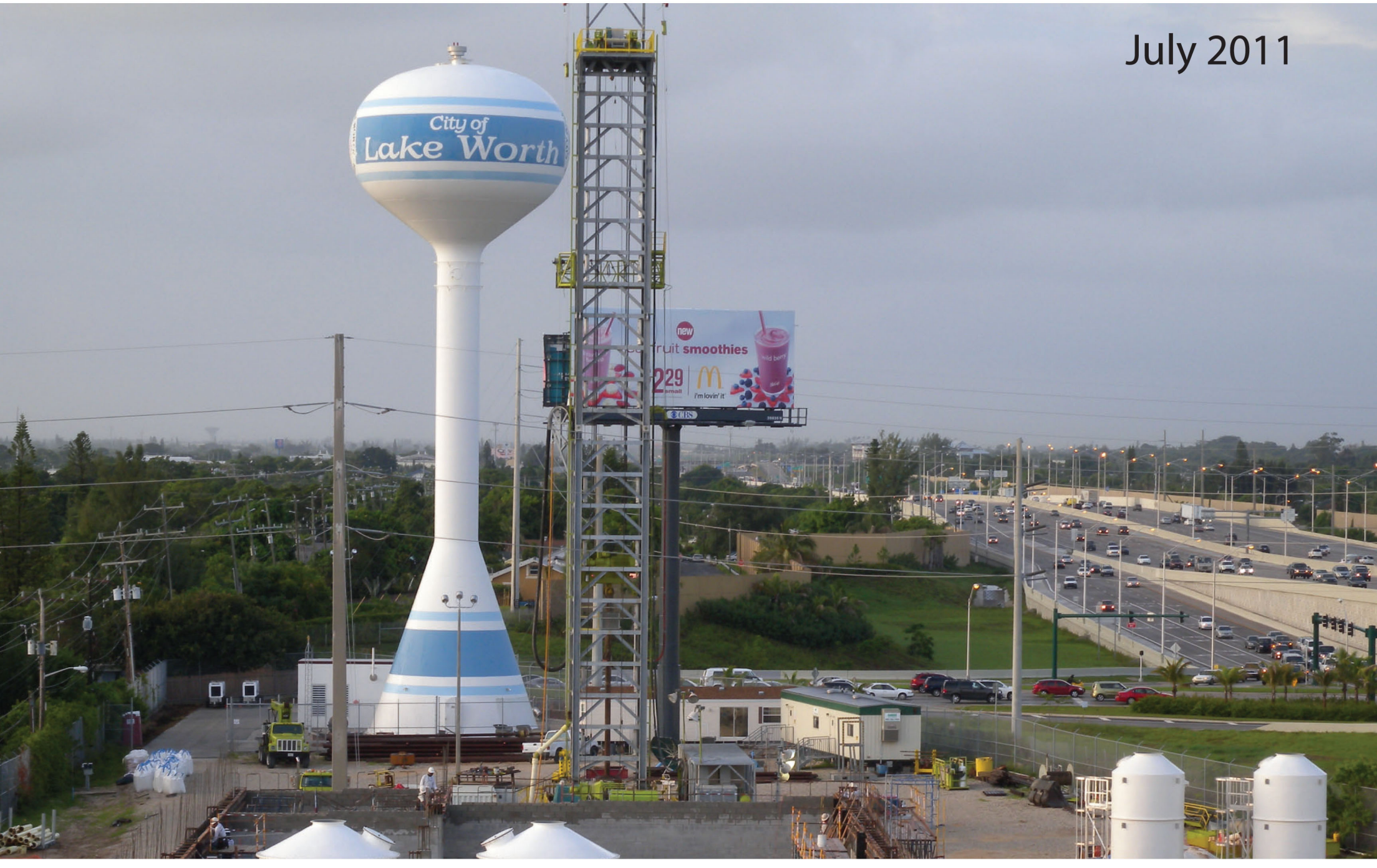
Report on the Construction and Testing of the Class I Deep Injection Well System

at the City of Lake Worth
Reverse Osmosis Water Treatment Plant

Volume 3

July 2011



Prepared for the City of Lake Worth

MOCK • ROOS
ENGINEERS • SURVEYORS • PLANNERS

MHC McNabb Hydrogeologic Consulting, Inc.

COMPANY	CONOCO-OIL CO. OF LONE MOUNTAIN
WELL	1
FIELD	WILDCAT
COUNTY	LONE MOUNTAIN
STATE	ALASKA
LOCATION	1980' FSL & 1980' FEL
SEC	34
TWP	17 N
RGE	14 E
PERMANENT DATUM	GROUND LEVEL
ELEV.	0
LOG MEASURED FROM	KB 10 FT. ABOVE PERM. DATUM
DRILLING MEASURED FROM	KB
API SERIAL NO.	50-000-00000
API WELL CODE	00
DATE	1-1-1
RUN NO.	ONE
DEPTH-DRILLER	1000
DEPTH-LOGGER	1000
BTM. LOG INTERVAL	1000
TOP LOG INTERVAL	0
CASING-DRILLER	0 @ 0
CASING-LOGGER	0 @ 0
BIT SIZE	0
TYPE FLUID IN HOLE	NONE
DENS. / VISC.	0 / 0
PH / FLUID LOSS	0 / 0
SOURCE OF SAMPLE	NONE
RM @ MEAS. TEMP.	0 @ 0
RMF @ MEAS. TEMP.	0 @ 0
RMC @ MEAS. TEMP.	0 @ 0
SOURCE RMF / RMC	NONE / NONE
RM @ BHT	0 @ 0
TIME SINCE CIRC.	0
TIME SINCE STOP	0
MAX. REC. TEMP.	0
EQUIP. LOCATION	0
RECORDED BY	0
WITNESSED BY	0

THE CONFIDENTIAL DATA SUBMITTED HEREWITH IS THE PROPERTY OF THE STATE OF ALASKA. IT IS TO BE KEPT CONFIDENTIAL FOR A PERIOD OF TWO YEARS AFTER THE WELL IS PERMANENTLY ABANDONED. THE RECEIVING OFFICE WILL NOTIFY THE SENDER WHEN THE WELL IS ABANDONED.

CONOCO

DIFFERENTIAL TEMPERATURE LOG

MAIN PASS

DIFFERENTIAL TEMPERATURE LOG

CONOCO-OIL CO. OF LONE MOUNTAIN
1 WILDCAT
LONE MOUNTAIN
ALASKA
1980' FSL & 1980' FEL
SEC 34 TWP 17 N RGE 14 E
PERM. DATUM: GROUND LEVEL
ELEV. 0
LOG MEASURED FROM: KB 10 FT. ABOVE PERM. DATUM
DRILLING MEASURED FROM: KB
API SERIAL NO. 50-000-00000
API WELL CODE 00
DATE 1-1-1
RUN NO. ONE
DEPTH-DRILLER 1000
DEPTH-LOGGER 1000
BTM. LOG INTERVAL 1000
TOP LOG INTERVAL 0
CASING-DRILLER 0 @ 0
CASING-LOGGER 0 @ 0
BIT SIZE 0
TYPE FLUID IN HOLE NONE
DENS. / VISC. 0 / 0
PH / FLUID LOSS 0 / 0
SOURCE OF SAMPLE NONE
RM @ MEAS. TEMP. 0 @ 0
RMF @ MEAS. TEMP. 0 @ 0
RMC @ MEAS. TEMP. 0 @ 0
SOURCE RMF / RMC NONE / NONE
RM @ BHT 0 @ 0
TIME SINCE CIRC. 0
TIME SINCE STOP 0
MAX. REC. TEMP. 0
EQUIP. LOCATION 0
RECORDED BY 0
WITNESSED BY 0

CN 0	CN (cpm) 1000	DEPTH (FEET)	DIFF. TEMP.	Variable Density
		0		
		50		
		100		
		150		
		200		
		250		
		300		
		350		
		400		
		450		
		500		
		550		
		600		
		650		
		700		
		750		
		800		
		850		
		900		
		950		
		1000		

REPEAT PASS

DIFFERENTIAL TEMPERATURE LOG

CONOCO-OIL CO. OF LONE MOUNTAIN
1 WILDCAT
LONE MOUNTAIN
ALASKA
1980' FSL & 1980' FEL
SEC 34 TWP 17 N RGE 14 E
PERM. DATUM: GROUND LEVEL
ELEV. 0
LOG MEASURED FROM: KB 10 FT. ABOVE PERM. DATUM
DRILLING MEASURED FROM: KB
API SERIAL NO. 50-000-00000
API WELL CODE 00
DATE 1-1-1
RUN NO. ONE
DEPTH-DRILLER 1000
DEPTH-LOGGER 1000
BTM. LOG INTERVAL 1000
TOP LOG INTERVAL 0
CASING-DRILLER 0 @ 0
CASING-LOGGER 0 @ 0
BIT SIZE 0
TYPE FLUID IN HOLE NONE
DENS. / VISC. 0 / 0
PH / FLUID LOSS 0 / 0
SOURCE OF SAMPLE NONE
RM @ MEAS. TEMP. 0 @ 0
RMF @ MEAS. TEMP. 0 @ 0
RMC @ MEAS. TEMP. 0 @ 0
SOURCE RMF / RMC NONE / NONE
RM @ BHT 0 @ 0
TIME SINCE CIRC. 0
TIME SINCE STOP 0
MAX. REC. TEMP. 0
EQUIP. LOCATION 0
RECORDED BY 0
WITNESSED BY 0

CN 0	CN (cpm) 1000	DEPTH (FEET)	DIFF. TEMP.	Variable Density
		0		
		50		
		100		
		150		
		200		
		250		
		300		
		350		
		400		
		450		
		500		
		550		
		600		
		650		
		700		
		750		
		800		
		850		
		900		
		950		
		1000		

Log Measured From	KB 10 FT. ABOVE PERM. DATUM
Drilling Measured From	KB
Permanent Datum	GROUND LEVEL
Elevation	0
Run Number	ONE
Date	1-1-1
Depth-Driller	1000
Depth-Logger	1000
Bottom Log Interval	1000
Top Log Interval	0
Casing-Driller	0 @ 0
Casing-Logger	0 @ 0
Bit Size	0
Type Fluid in Hole	NONE
Dens. / Visc.	0 / 0
PH / Fluid Loss	0 / 0
Source of Sample	NONE
Rm @ Meas. Temp.	0 @ 0
Rmf @ Meas. Temp.	0 @ 0
Rmc @ Meas. Temp.	0 @ 0
Source Rmf / Rmc	NONE / NONE
Rm @ BHT	0 @ 0
Time Since Circ.	0
Time Since Stop	0
Max. Rec. Temp.	0
Equip. Location	0
Recorded By	0
Witnessed By	0

COMPANY	CHEVRON U.S.A. INC.
WELL	MAIN PASS 265 BLOCK 265 OCS-G 14141
FIELD	WILDCAT
COUNTY	
STATE	LOUISIANA
LOCATION	
OTHER SERVICES	
PERMANENT DATUM	MSL
LOG MEASURED FROM	RKB 0 FT ABOVE PERM. DATUM
DRILLING MEASURED FROM	RKB
API SERIAL NO.	
SECTION	
TOWNSHIP	
RANGE	
DATE	1-Jun-2006
RUN NUMBER	ONE
DEPTH-DRILLER	18000 FT
DEPTH-LOGGER	17996 FT
BOTTOM LOG INTERVAL	17996 FT
TOP LOG INTERVAL	16000 FT
CASING-DRILLER	16000 FT @ 16000 FT
CASING-LOGGER	16000 FT
BIT SIZE	12.250 IN
TYPE FLUID IN HOLE	SALT WATER
DENSITY	12.0 LB/G
VISCOSITY	60 S
PH	10.0
FLUID LOSS	4.0 C3
SOURCE OF SAMPLE	FLOWLINE
RM @ MEASURED TEMP	0.100 @ 70 DEGF
RMF @ MEASURED TEMP	0.080 @ 70 DEGF
RMC @ MEASURED TEMP	0.110 @ 70 DEGF
RM @ BHT	0.060 @ 180 DEGF
MATRIX	SANDSTONE
TOOL TYPE (EPITHERMAL OR THERMAL)	EPITHERMAL
TOOL NO.	3506XA
TOOL STANDOFF (IN)	0.0
EKB	
EDF	
EGL	
CASING	16000 FT @ 16000 FT
BIT	
TD	18000 FT
TD	17996 FT
TOP LOG INTERVAL	16000 FT
BOTTOM LOG INTERVAL	17996 FT
LOGGING SPEED	30 FT/MIN
LOGGING SPEED	30 FT/MIN
LOGGING SPEED	30 FT/MIN

YOUNGQUIST BROTHERS, Inc

GEOPHYSICAL LOGGING DIVISION

HIGH RESOLUTION TEMPERATURE LOG

Company CITY OF LAKE WORTH R.O.W.T.P.
Well IW-1
Field LAKE WORTH
County PALM BEACH
State FL

Company CITY OF LAKE WORTH R.O.W.T.P.

Well IW-1

Field LAKE WORTH

County PALM BEACH State FL

Location: API # :

SEC TWP RGE

Other Services

RTS

Permanent Datum Elevation

Log Measured From

Drilling Measured From

Elevation

K.B.
D.F.
G.L.

Date	29-MAR-2011		
Run Number	MIT 2011		
Depth Driller	3305'		
Depth Logger	3305'		
Bottom Logged Interval	3305'		
Top Log Interval	SURFACE		
Open Hole Size	18.5"		
Type Fluid	WATER		
Density / Viscosity	NA		
Max. Recorded Temp.	82.9		
Estimated Cement Top	NA		
Time Well Ready	0700		
Time Logger on Bottom	0835		
Equipment Number	103		
Location	FT MYERS		
Recorded By	MOREY		
Witnessed By	DURALL, S		

Borehole Record				Borehole Record			
Run Number	Bit	From	To	Run Number	Bit	From	To
ONE	58.5"	SURFACE	258'	FIVE	38.5"	CASING	1733'
TWO	12.25"	CASING	1000'	SIX	12.25"	CASING	3302'
THREE	48.5"	CASING	958'	SEVEN	28.5"	CASING	2856'
FOUR	12.25"	CASING	1753'	EIGHT	18.5"	CASING	3303'

Casing Record	Size	Wgt/Ft	Top	Bottom
Surface String	50	.375 W.T.	SURFACE	249'
Prot. String	40"	.375 W.T.	SURFACE	954'
Production String	30"	.375 W.T.	SURFACE	1730'
Liner	20"	.500 W.T.	SURFACE	2860'
	11.75"	FRP	SURFACE	2842'

<< Fold Here >>

All interpretations are opinions based on inferences from electrical or other measurements and we cannot and do not guarantee the accuracy or correctness of any interpretation, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, damages, or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to our general terms and conditions set out in our current Price Schedule.

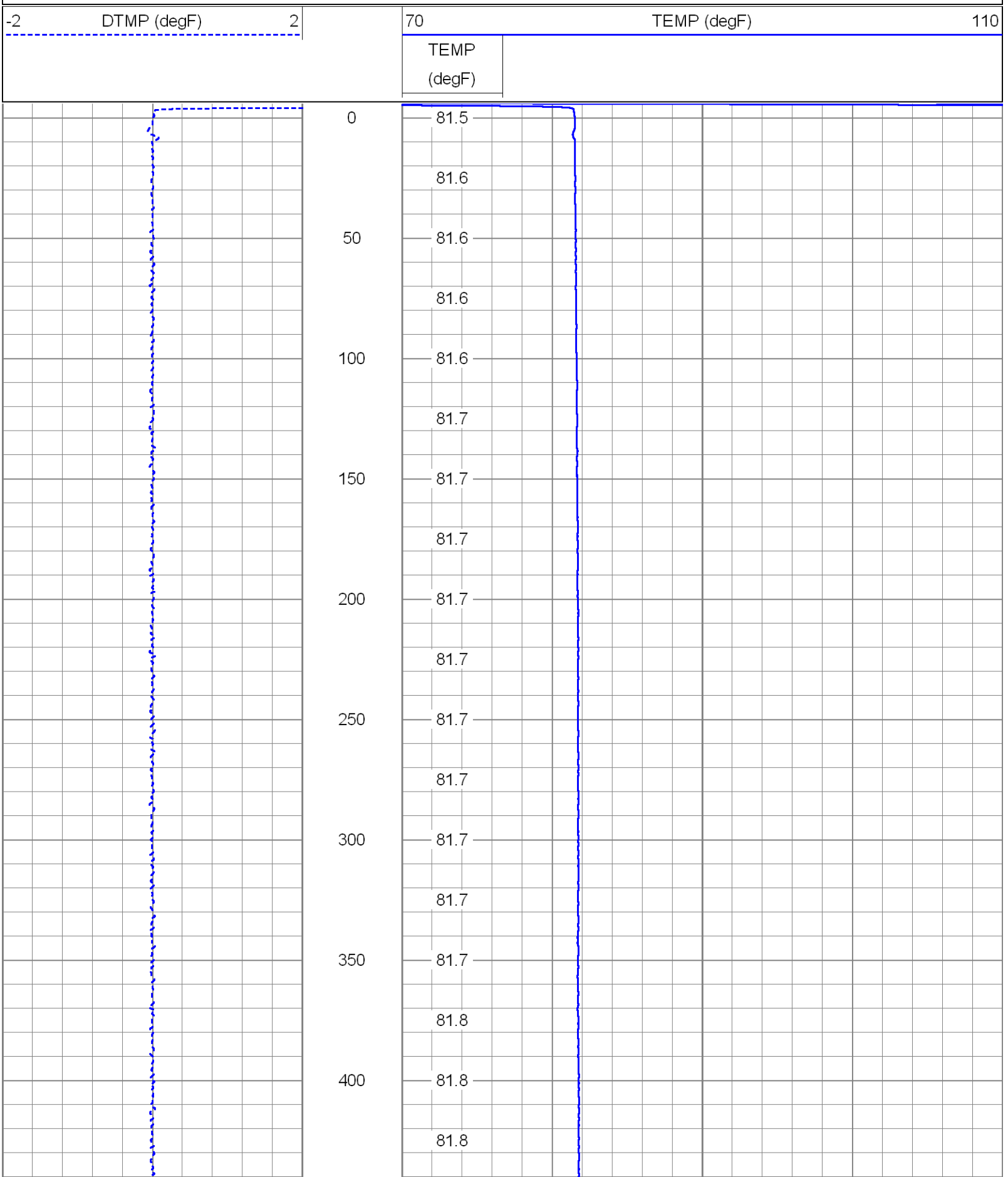
Comments

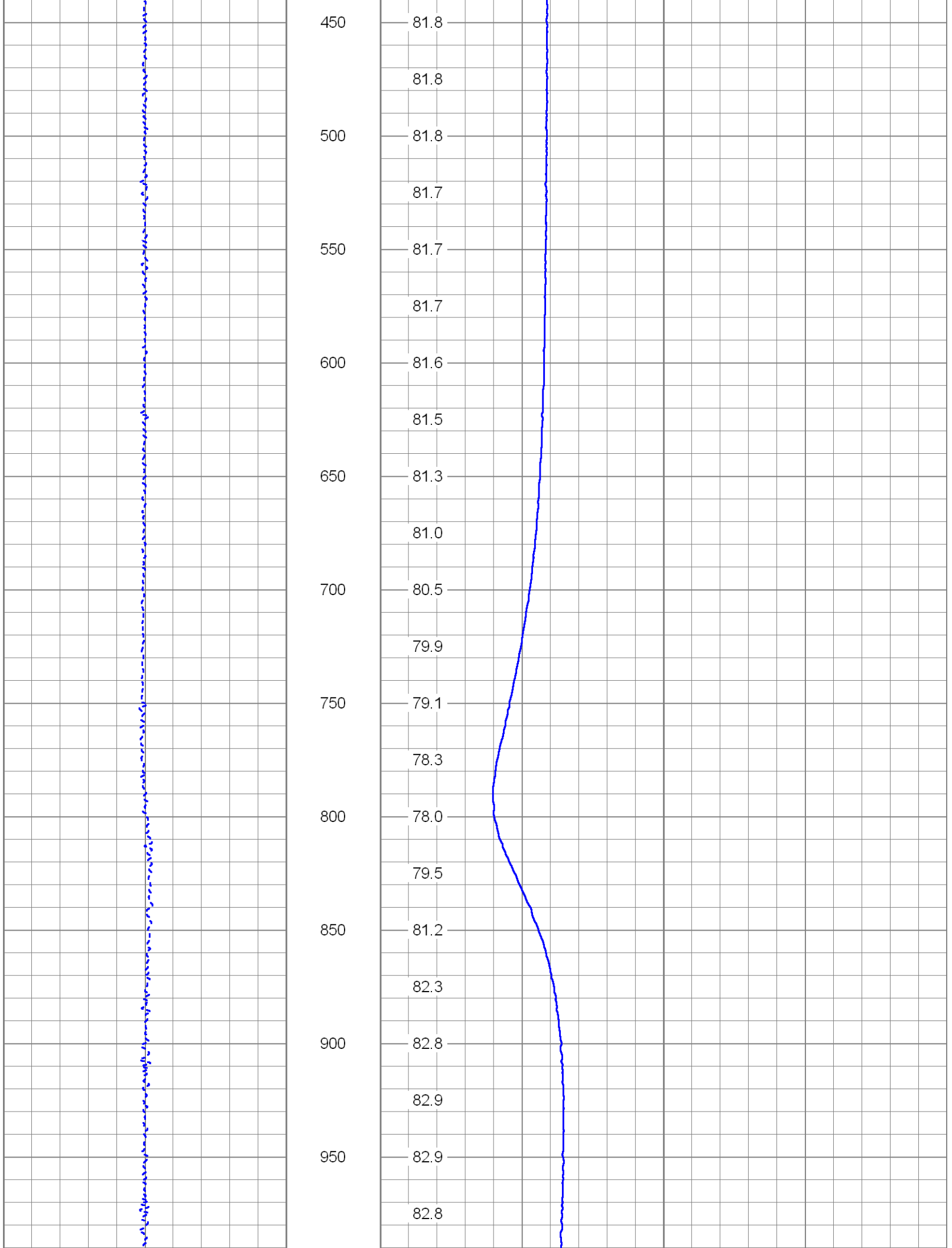
TEMPERATURE

YOUNGQUIST BROTHERS, Inc

GEOPHYSICAL LOGGING DIVISION

Database File:	lakeiw1rts.db
Dataset Pathname:	pass4
Presentation Format:	temp
Dataset Creation:	Tue Mar 29 08:12:43 2011 by Log Open-Cased 100827
Charted by:	Depth in Feet scaled 1:600

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500
550
600
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850
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950
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81.6
81.5
81.3
81.0
80.5
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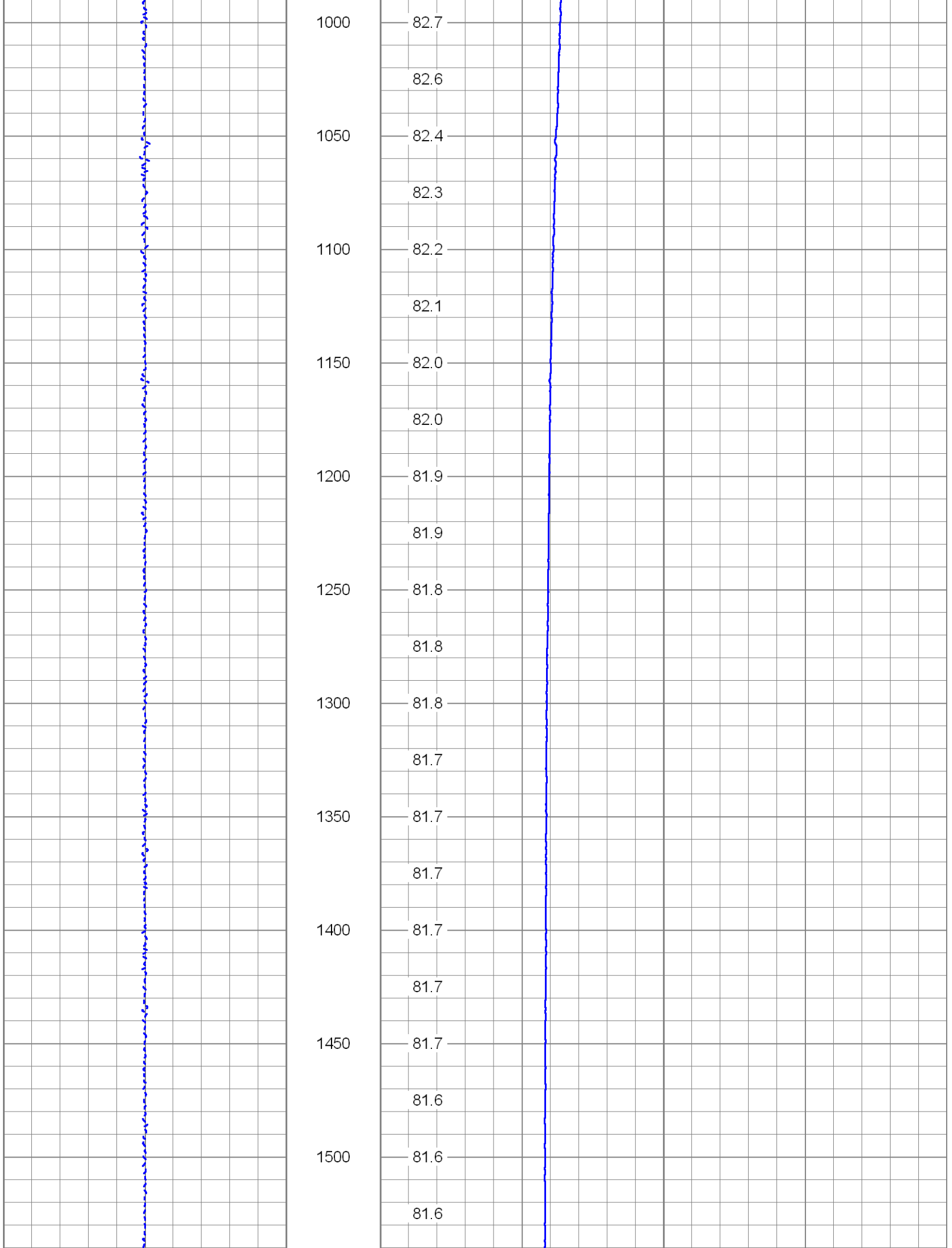
79.1
78.3
78.0
79.5
81.2
82.3
82.8
82.9
82.9
82.8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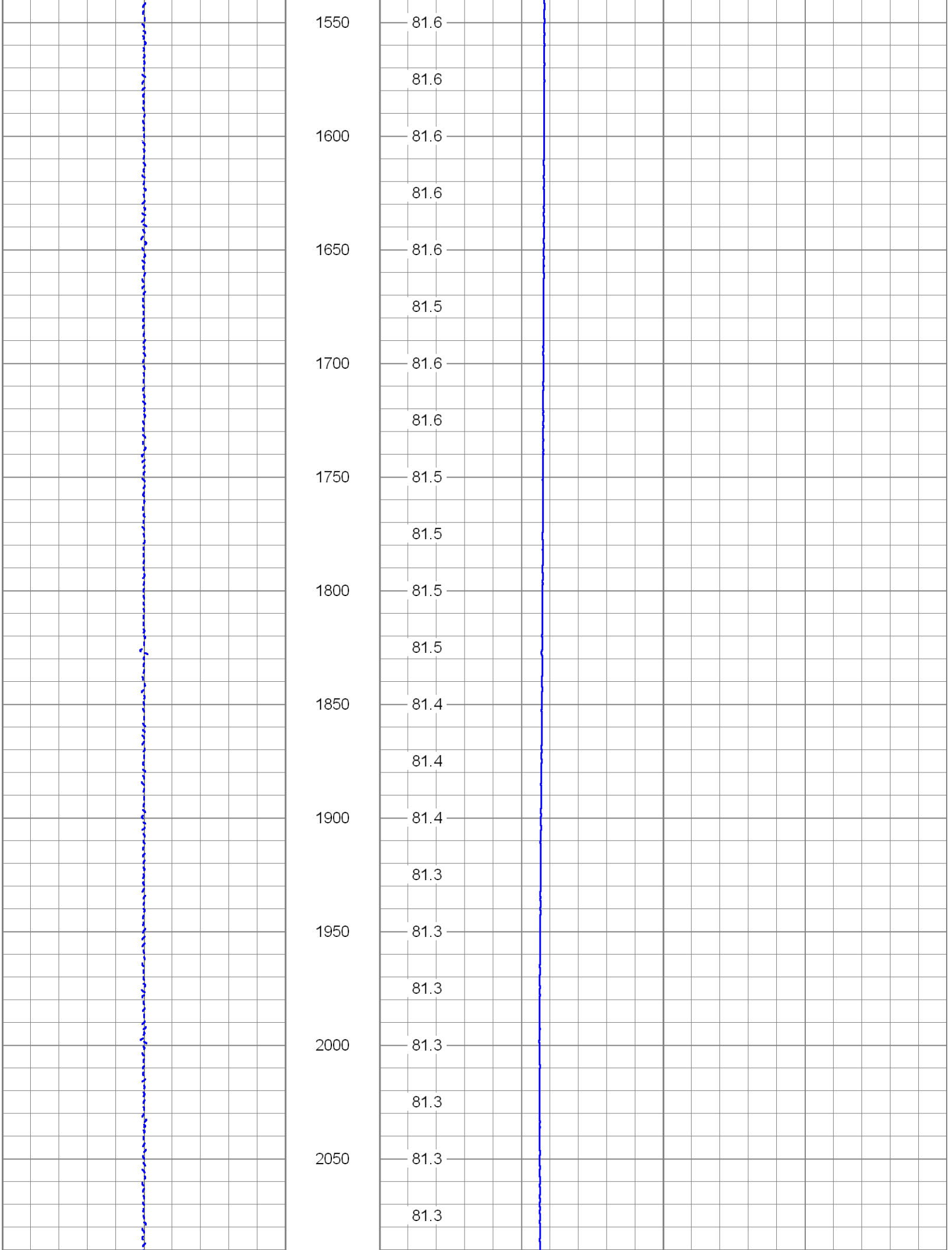
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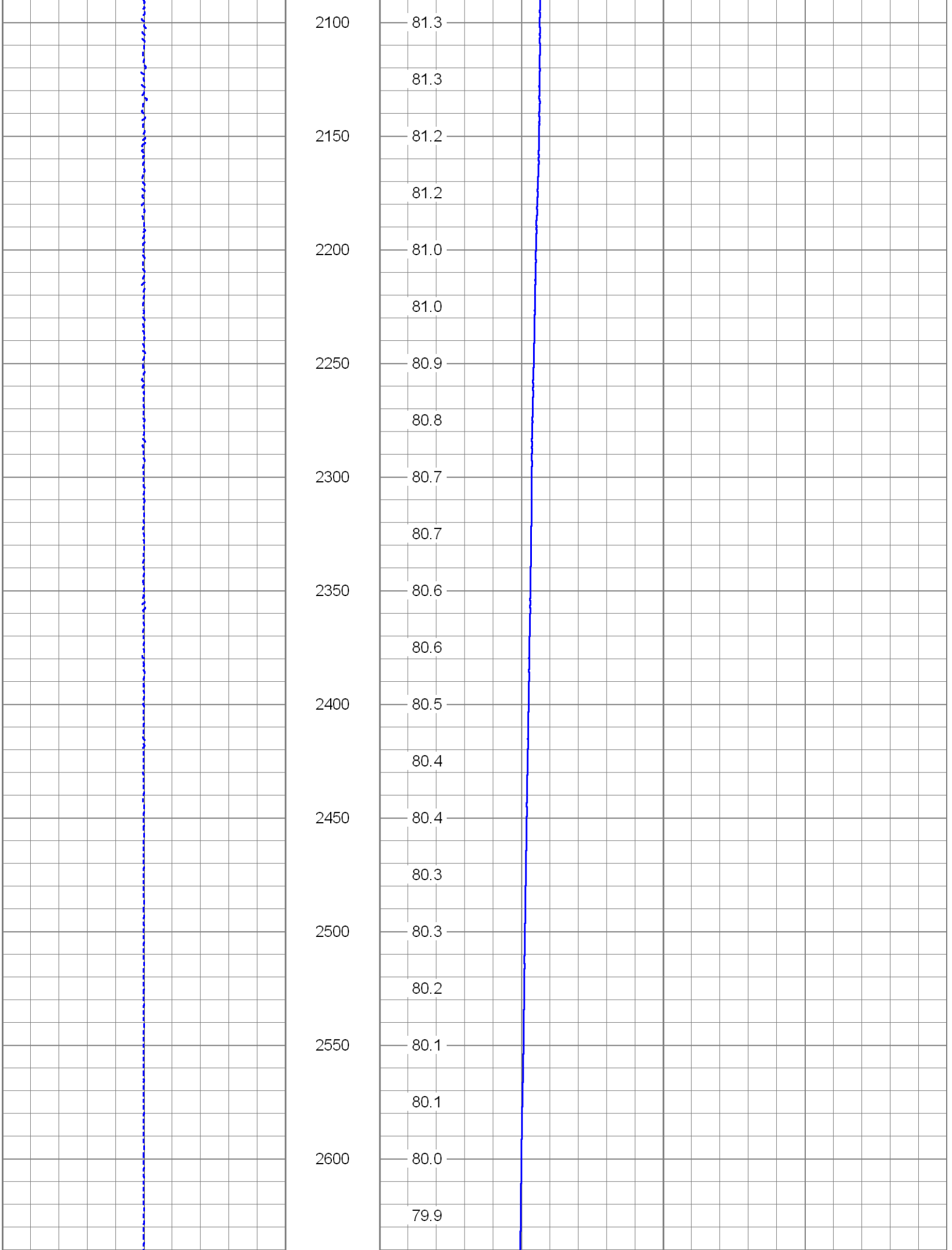
81.3


2100
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2200
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2400
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2600
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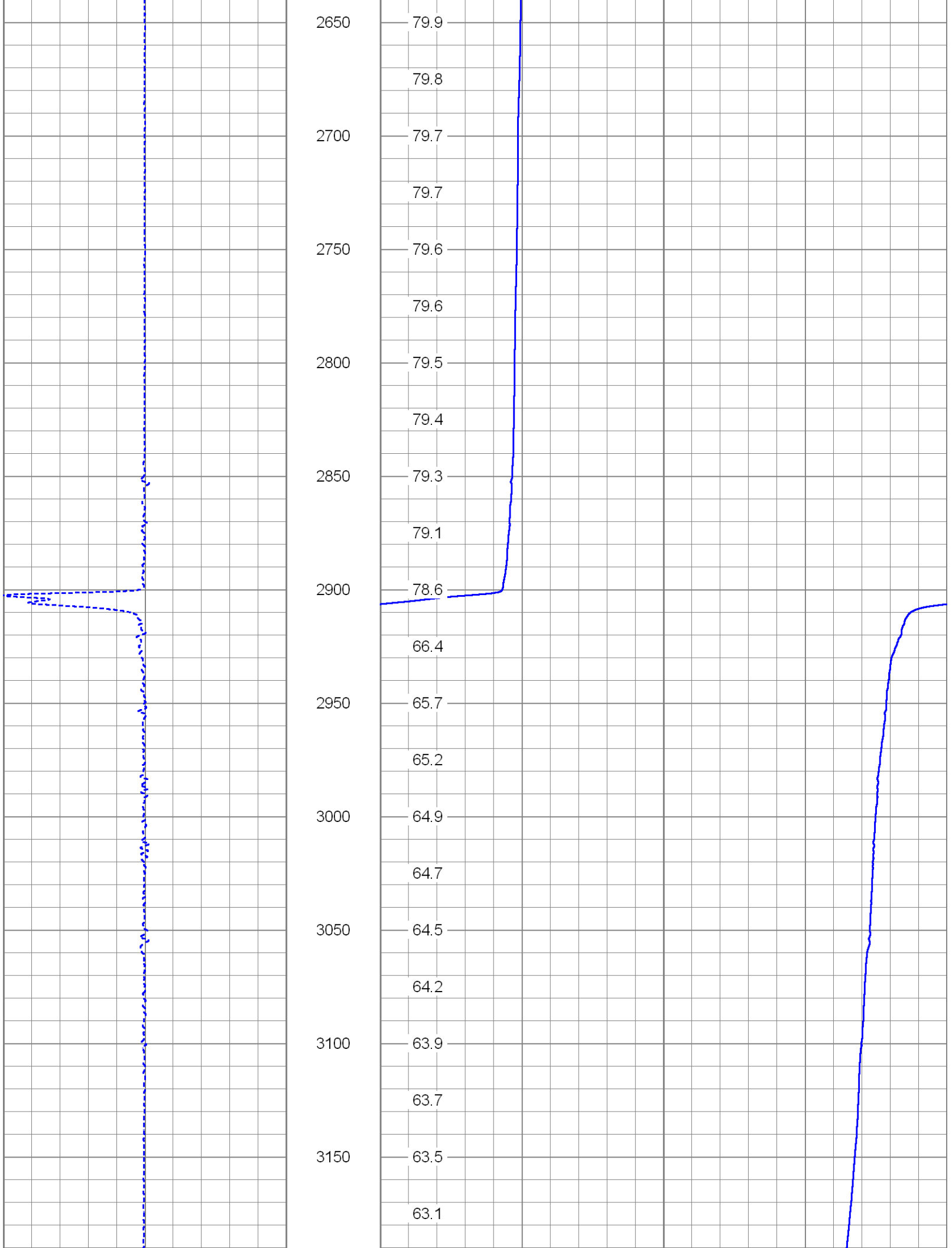
79.9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79.3
79.1
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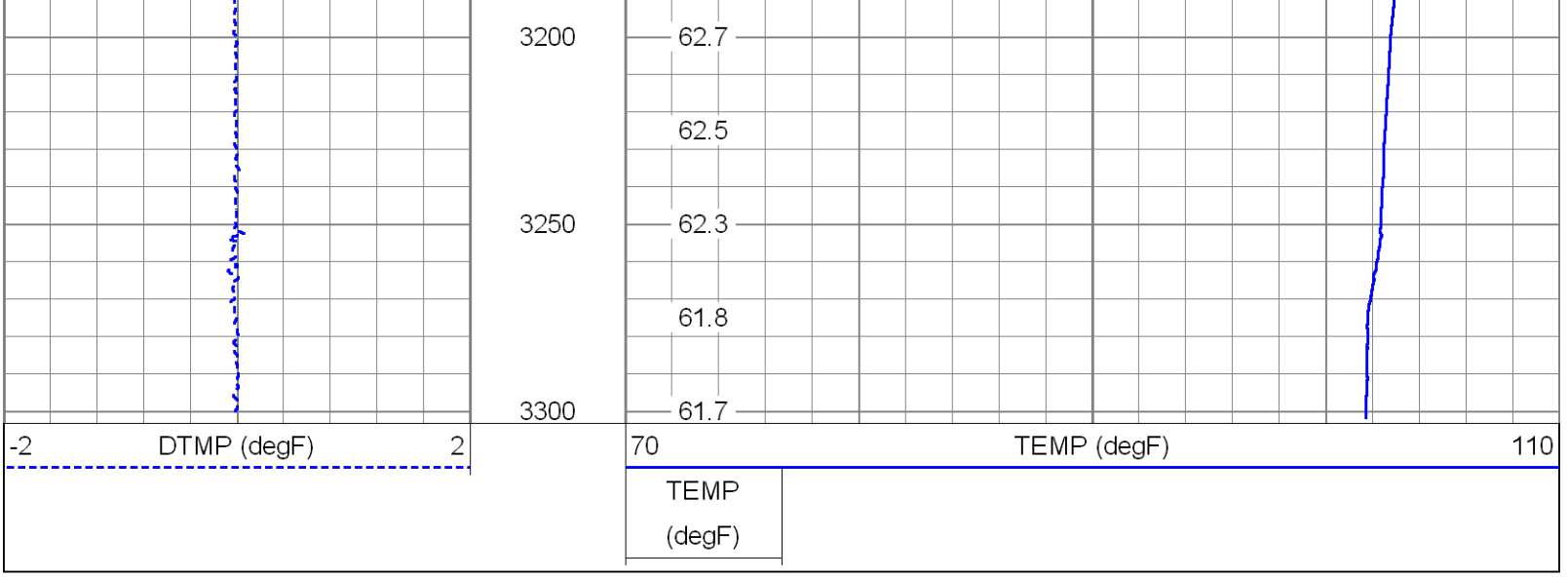
63.5
63.1



Sensor	Offset (ft)	Schematic	Description	Len (ft)	OD (in)	Wt (lb)
			TEMP-RTS (952)	25.50	1.69	70.00

TEMP	0.10	

Dataset:	lakeiw1rts.db: field/well/run1/pass4
Total Length:	25.50 ft
Total Weight:	70.00 lb
O.D.	1.69 in

Calibration Report

Database File:	lakeiw1rts.db
Dataset Pathname:	pass4
Dataset Creation:	Tue Mar 29 08:12:43 2011 by Log Open-Cased 100827

Temperature Calibration Report

Serial Number:	952
Tool Model:	RTS
Performed:	Thu Feb 25 07:16:45 2010

Point #	Reading		Reference	
1	420.00	cps	40.00	degF
2	830.30	cps	83.00	degF
3	1470.50	cps	147.00	degF
4		cps		degF
5		cps		degF
6		cps		degF
7		cps		degF
8		cps		degF
9		cps		degF
10		cps		degF

Company:	Chesapeake Operating, Inc.	Date:	07-JAN-2014
Well:	Hoover 1-29-5H	Time:	08:00
Field:	Wildcat	Depth:	0 - 10,000 ft
County:	Grady	Operator:	Jeff Bennett
State:	Oklahoma	Recorder:	8
Lat:	34.9	Operator Rig:	Nabors
Long:	-97.9	Rig Type:	Land
Elevation:	1,000 ft	Rig Phone:	405-840-7294
Datum:	Rotary Table	Rig Manager:	Jeff Bennett

Comments:

Tool Zero Depth: 0 ft
Tool Zero Date: 07-JAN-2014
Tool Zero Time: 08:00
Tool Zero Pressure: 0 psi
Tool Zero Temperature: 0 °F

Tool	Tool Id	Description	Serial	Top	Bottom
GR	1	GR/CCL	1	0 ft	10,000 ft
CCL	1				
PRESS	1	PRESSURE	1	0 ft	10,000 ft
TEMP	1	TEMPERATURE	1	0 ft	10,000 ft
SPIN	1	SPINNER	1	0 ft	10,000 ft

Tool Zero Depth: 0 ft
Tool Zero Date: 07-JAN-2014
Tool Zero Time: 08:00
Tool Zero Pressure: 0 psi
Tool Zero Temperature: 0 °F

Tool Zero Depth: 0 ft
Tool Zero Date: 07-JAN-2014
Tool Zero Time: 08:00
Tool Zero Pressure: 0 psi
Tool Zero Temperature: 0 °F

Tool Zero Depth: 0 ft
Tool Zero Date: 07-JAN-2014
Tool Zero Time: 08:00
Tool Zero Pressure: 0 psi
Tool Zero Temperature: 0 °F

Tool Zero Depth: 0 ft
Tool Zero Date: 07-JAN-2014
Tool Zero Time: 08:00
Tool Zero Pressure: 0 psi
Tool Zero Temperature: 0 °F

FINAL GAMMA RAY

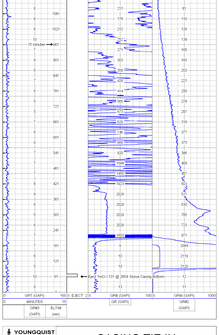
LOP #2

DYNAMIC TEST #2 (57 GPM)

LAF #1 (5000 GALS)

LOP #1

DYNAMIC TEST #1 (57 GPM)



YOUNGQUIST BROTHERS, Inc.
GEOPHYSICAL LOGGING DIVISION

CASING TIE IN

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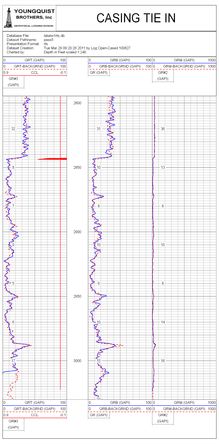
Dataset Pathname: pass5
Presentation Format: tie line
Dataset Creation: Tue Mar 29 08:20:28 2011
Charted by: Depth in Feet scaled 1:200



YOUNGQUIST BROTHERS, Inc.
GEOPHYSICAL LOGGING DIVISION

BACKGROUND GAMMA RAY

Database File: tstone hfu.db
Dataset Pathname: BGGR
Presentation Format: log
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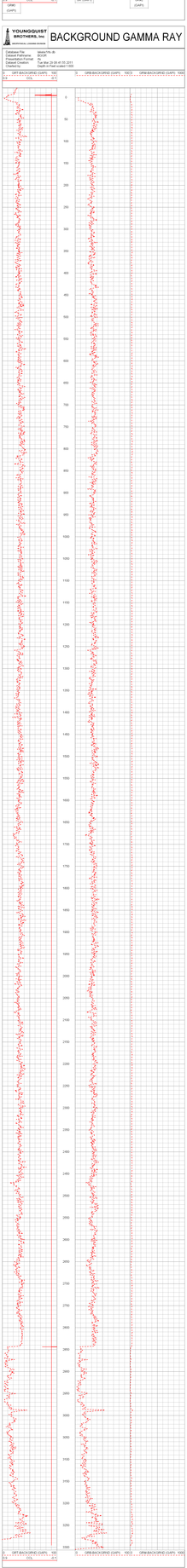
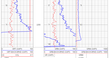
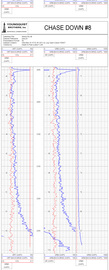
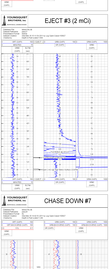
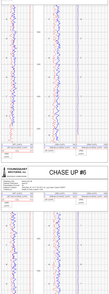
Charted by: Depth in Feet scaled 1:600

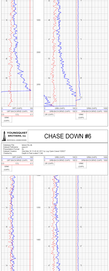


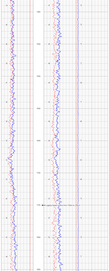

HYDROSOFT
SOFTWARE, INC.
CHASE DOWN #8
Cable Length (m)
Cable Speed (m/min)
Temperature (°C)
Conductivity (mS/cm)
Pressure (psia)
Depth (m)
Salinity (PSU)
Density (kg/m³)
Sound Velocity (m/s)
Time (min)

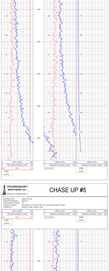

HYDROSOFT
SOFTWARE, INC.
EJECT #3 (2 mCi)
Cable Length (m)
Cable Speed (m/min)
Temperature (°C)
Conductivity (mS/cm)
Pressure (psia)
Depth (m)
Salinity (PSU)
Density (kg/m³)
Sound Velocity (m/s)
Time (min)

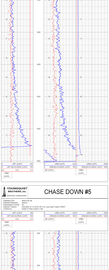

HYDROSOFT
SOFTWARE, INC.
CHASE DOWN #7
Cable Length (m)
Cable Speed (m/min)
Temperature (°C)
Conductivity (mS/cm)
Pressure (psia)
Depth (m)
Salinity (PSU)
Density (kg/m³)
Sound Velocity (m/s)
Time (min)

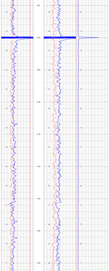

HYDROSOFT
SOFTWARE, INC.
CHASE UP #6
Cable Length (m)
Cable Speed (m/min)
Temperature (°C)
Conductivity (mS/cm)
Pressure (psia)
Depth (m)
Salinity (PSU)
Density (kg/m³)
Sound Velocity (m/s)
Time (min)


HYDROSOFT
SOFTWARE, INC.
CHASE DOWN #6
Cable Length (m)
Cable Speed (m/min)
Temperature (°C)
Conductivity (mS/cm)
Pressure (psia)
Depth (m)
Salinity (PSU)
Density (kg/m³)
Sound Velocity (m/s)
Time (min)


HYDROSOFT
SOFTWARE, INC.
CHASE UP #5
Cable Length (m)
Cable Speed (m/min)
Temperature (°C)
Conductivity (mS/cm)
Pressure (psia)
Depth (m)
Salinity (PSU)
Density (kg/m³)
Sound Velocity (m/s)
Time (min)


HYDROSOFT
SOFTWARE, INC.
CHASE DOWN #5
Cable Length (m)
Cable Speed (m/min)
Temperature (°C)
Conductivity (mS/cm)
Pressure (psia)
Depth (m)
Salinity (PSU)
Density (kg/m³)
Sound Velocity (m/s)
Time (min)

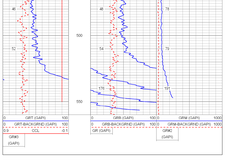

HYDROSOFT
SOFTWARE, INC.
CHASE UP #4
Cable Length (m)
Cable Speed (m/min)
Temperature (°C)
Conductivity (mS/cm)
Pressure (psia)
Depth (m)
Salinity (PSU)
Density (kg/m³)
Sound Velocity (m/s)
Time (min)


HYDROSOFT
SOFTWARE, INC.
CHASE DOWN #4
Cable Length (m)
Cable Speed (m/min)
Temperature (°C)
Conductivity (mS/cm)
Pressure (psia)
Depth (m)
Salinity (PSU)
Density (kg/m³)
Sound Velocity (m/s)
Time (min)

CHASE DOWN #4

HYDROSONDE
Well Name: 1-1

Company: Pan Am Petroleum
Company Rep.: Jim Hall
Operator: Jim Hall
Date: 1-Jan-1900
Time: 00:00:00
Depth Reference: Kelly Bushing
Elevation: 0.00 m
Depth Offset: 0.00 m
Tool Type: Hydrosonde
Tool Serial Number: 0
Tool Version: 0.0
Tool Length: 0.00 m
Tool Offset: 0.00 m
Tool Diameter: 0.00 m
Tool Weight: 0.00 kg
Tool Calibration Date: 1-Jan-1900 00:00:00
Tool Calibration Factor: 0.000
Tool Calibration Offset: 0.000
Tool Calibration Temperature: 0.00 °C
Tool Calibration Pressure: 0.00 kPa
Tool Calibration Humidity: 0.00 %
Tool Calibration Voltage: 0.00 V
Tool Calibration Current: 0.00 mA
Tool Calibration Resistance: 0.00 Ω
Tool Calibration Capacitance: 0.00 pF
Tool Calibration Inductance: 0.00 mH
Tool Calibration Frequency: 0.00 Hz
Tool Calibration Phase: 0.00 °
Tool Calibration Amplitude: 0.00 V
Tool Calibration Offset: 0.00 V

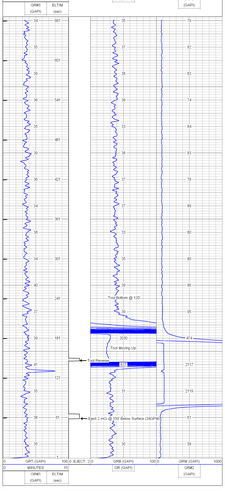


YOUNGQUIST BROTHERS, Inc

www.youngquist.com, Lexington, Kentucky

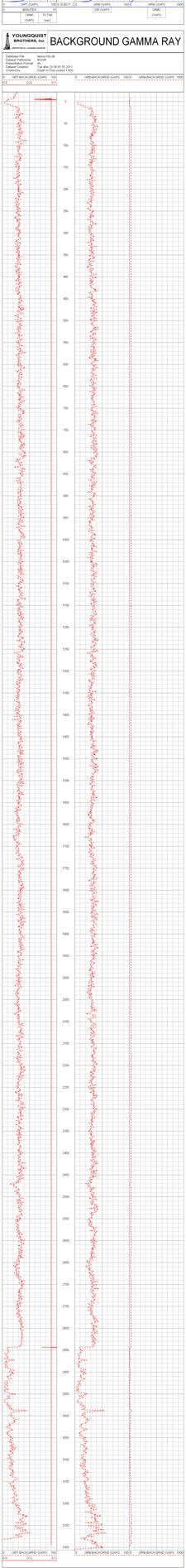
EJECT #1 (2 mCi)

Database File: latest1hrs.db
Dataset Pathname: eject1
Presentation Format: ejecttest
Dataset Creation: Wed Mar 30 08:23:29 2011 by Log Comm Cased 100627
Charted by: Depth in Feet scaled 240



YOUNGQUIST BROTHERS, Inc

www.youngquist.com, Lexington, Kentucky

BACKGROUND GAMMA RAY

Database File: latest1hrs.db
Dataset Pathname: BGGR
Presentation Format: ta
Dataset Creation: Tue Apr 26 08:40:55 2011
Charted by: Depth in Feet scaled 1:500