BW - 4

CAVERN CHARACTERIZATION

Wasserhund Inc.
P.O. Box 2140
575-396-0522
FAX 575-396-0797
Lovington, New Mexico 88260

ANNUAL CLASS III WELL REPORT FOR 2017

Wasserhund Inc.

Buckeye Brine Station

OCD Permit BW-04

Expiration Date: November 08, 2018

API No. 30-025-26883 Eidson #1

Unit Letter M-Section 31-Ts 16s – R35e

May 01, 2018

Submitted By: Price LLC on behalf of Wasserhund Inc Principals Mr. Larry and Jon Gandy.

Wayne Price-LLC _____

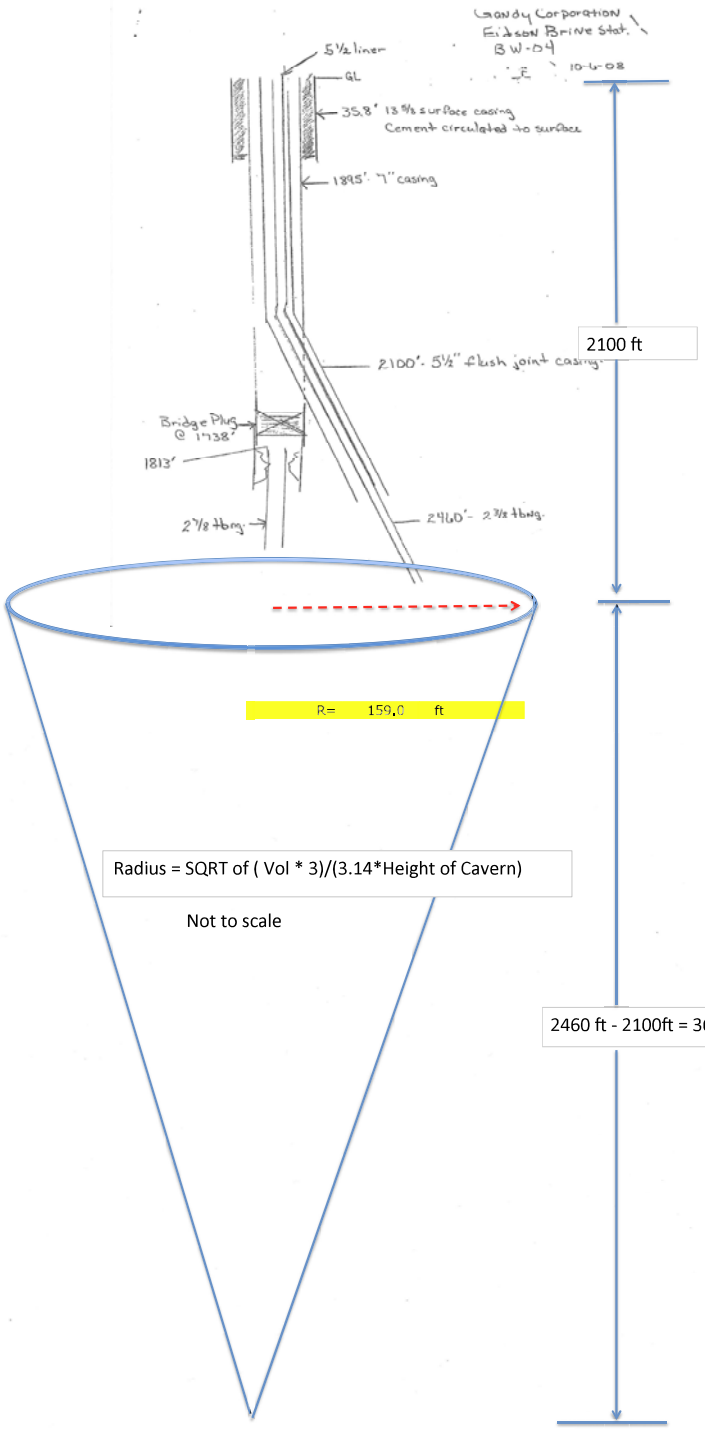
Larry Gandy _____

Jon Gandy _____

Appendix “F”

- Wellbore Sketch, Brine Cavity Calculations with new 2017 Radius and D/H calculations.

** **Cavern Characterization using New OCD Example applied to BW-04**
  * **OCD Email**
  * **Example of OCD Well Log + Cavern Layout**
  * **BW-04 Cavern Superimposed on Nearby well log**
  * **BW-04 Well Bore Schematic**
  * **Mass Balance**



2017 Calculations

r=SqRtV(V*3/π*D)

V	Volume	=		9,528,093 bbls
D	Depth	=		360 ft
H	Height	=		2100 ft
Kf	ft3 salt/bbl		159.0	1 est
	r	=		159.0 ft
	Diameter			318.04 ft
	D/H=			0.151

From: "Chavez, Carl J, EMNRD" <CarlJ.Chavez@state.nm.us>
Subject: RE: Key Eunice BW-28 Compliance letter response.
Date: April 6, 2018 at 10:59:51 AM MDT
To: Wayne Price <wayneprice@q.com>

E-mail for documentation by Price LLC April 7, 2018- Per C. Chavex- OCD can apply to Wasserhund wells BW-04 & BW-22 also.

Wayne:

Good morning. Please see attachment.

Thank you.

-----Original Message-----
From: Wayne Price <wayneprice@q.com>
Sent: Thursday, April 5, 2018 7:40 PM
To: Chavez, Carl J, EMNRD <CarlJ.Chavez@state.nm.us>
Cc: Wayne Price <wayneprice@q.com>
Subject: Re: Key Eunice BW-28 Compliance letter response.

Hi Carl,

What type of well Log?

On Apr 3, 2018, at 1:43 PM, Chavez, Carl J, EMNRD <CarlJ.Chavez@state.nm.us> wrote:

Mr. Price, et al.:

Good afternoon. The New Mexico Oil Conservation Division (OCD) is in receipt of the Key Energy Services letter (letter) dated March 30, 2018.

The letter was recently added to the above subject well administrative record.

OCD will consider the letter for the upcoming discharge permit renewal.

Regarding the workgroup for the cavern characterization, etc., OCD

is accepting the "cone" calculation with additional well log characterization supporting the calculation. Upon request, OCD can send you an example. Therefore, OCD does not believe a "study group" is necessary at this time; however, it will remain an option as OCD reviews the submittals, receives any new proposals, and seeks out any new scientific information on the subject.

Thank you.

Mr. Carl J. Chavez, CHMM (#13099)
New Mexico Oil Conservation Division
Energy Minerals and Natural Resources Department
1220 South St Francis Drive
Santa Fe, New Mexico 87505
Ph. (505) 476-3490
E-mail: CarlJ.Chavez@state.nm.us
"Why not prevent pollution, minimize waste to reduce operating costs, reuse or recycle, and move forward with the rest of the Nation?" (To see how, go to: http://www.emnrd.state.nm.us/OCD and see "Publications")

-----Original Message-----
From: Wayne Price <wayneprice@q.com>
Sent: Monday, April 2, 2018 12:26 PM
To: Griswold, Jim, EMNRD <Jim.Griswold@state.nm.us>; Chavez, Carl J, EMNRD <CarlJ.Chavez@state.nm.us>
Cc: Wayne Price <wayneprice@q.com>; Rick Graham <rgraham01@keyenergy.com>
Subject: Key Eunice BW-28 Compliance letter response.

Dear Mr. Griswold and Mr. Chavez:

Please find attached a response letter to your February 16, 2018 letter requesting record information and a response by May 04, 2018. Price LLC, a consultant for Key Energy has already supplied the Annual Reports for the 2011-2016 years .

Please note this response has some Minor Modification requests.

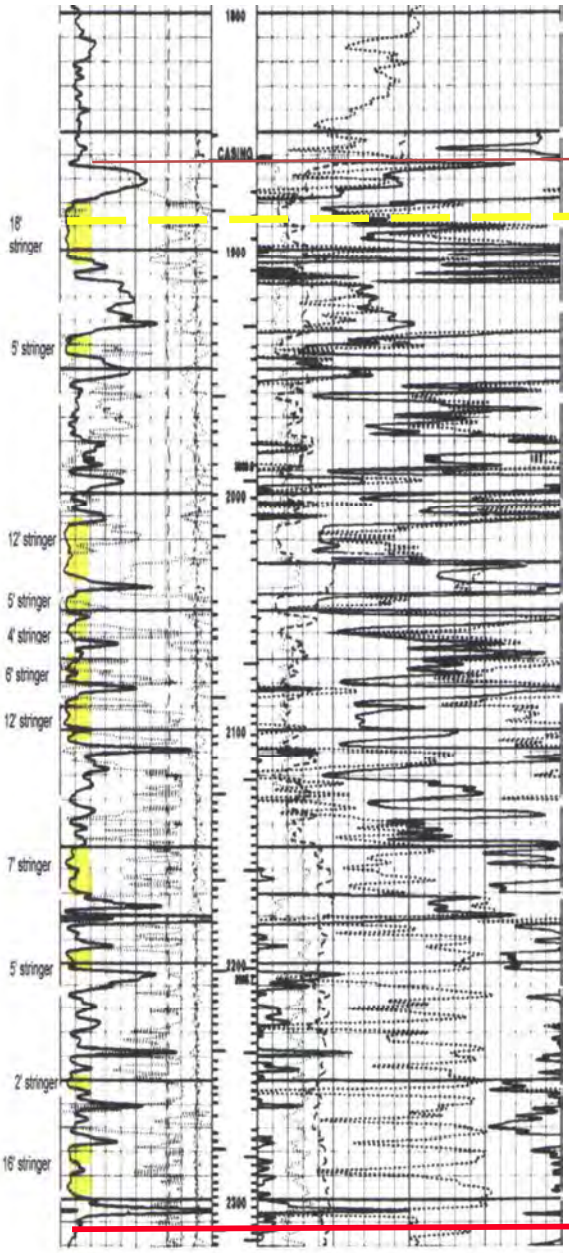
Please note, you can evaluate them now, or you can wait until we submit the renewal permit application which is due 120 days before expiration of November 08, 2018 of this year.

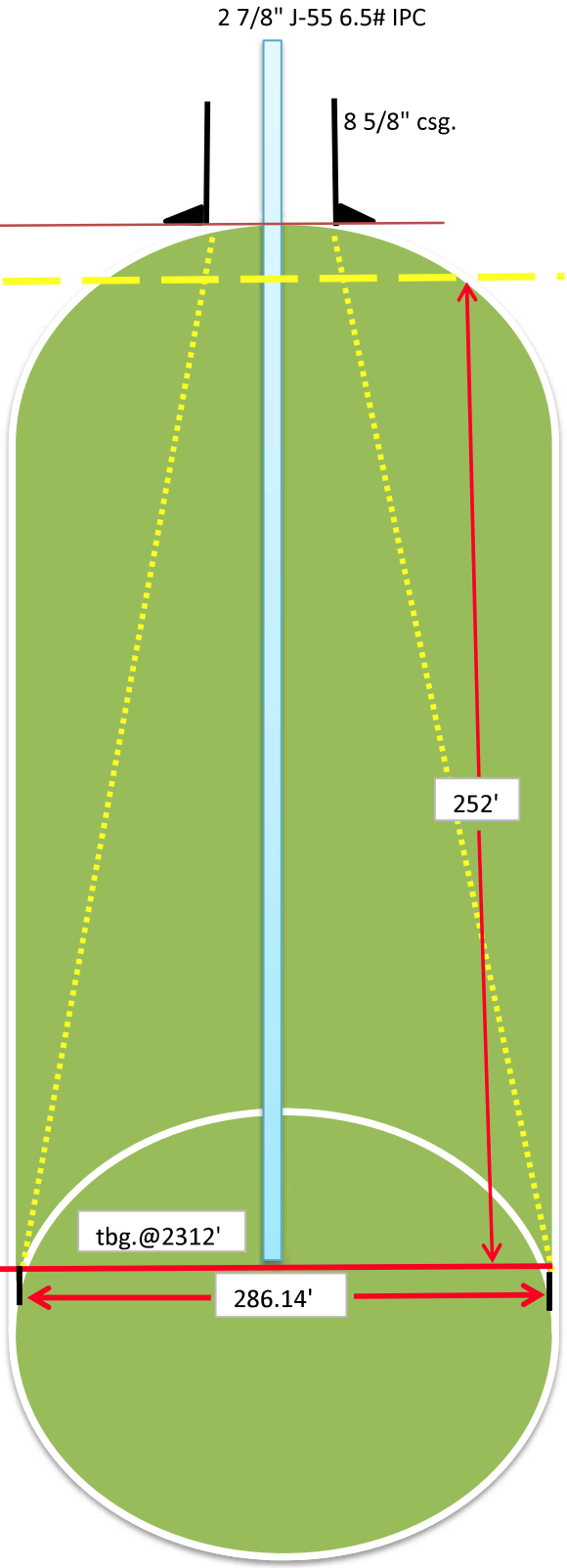
Please file in the Key OCD BW-28 file. Please let us know if you received this correspondence.

Wayne Price-Price LLC
312 Encantado Ridge CT NE
Rio Rancho, NM 87124
wayneprice@q.com
505-715-2809

EXAMPLE SALT CAVERN CHARACTERIZATION

John Doe Well No6
API 30-015-#####
SEC36 T18S R38E LAT: 32.##### LONG:-103.#####





PPG 9.97 brine
PPG 8.34 fresh
SG 1.1951
2006 to 2017 Total Brine bbl. 3,538,154
122.136 LBS / BBL = 432,135,977 LBS HALITE
(432,135,977 LBS) / (80BLS per ft^3) = 5,401,700 ft^3

$V = \prod R^2 h / 3$
$V = (3.14159 * 143.07^2) * (252') / 3$
$V = 5,401,648.6\ ft.^3$

Est. hight is 252'
Est. cavern floor diameter is 286.14'

mberger

SIDEWALL NEUTRON POROSITY LOG

P-36-T16S-R34E 460FS 660FE
SAGE ENERGY CO
NORTH VACUUM ABO NORTH UNIT # 1
30-025-25146

COMPANY K. K. AMINI

WELL EXXON A STATE #1

FIELD BUCKEYE

COUNTY LEA STATE NEW MEXICO

Location API Serial No.

460' FSL & 660' FEL

Sec. 36 Twp. 16-S Rge. 34-E

Other Services:

NONE

Permanent Datum: G.L. ; Elev.: 4036

Log Measured From K.B. , 12 Ft. Above Perm. Datum

Drilling Measured From K.B.

Elev.: K.B. 4048

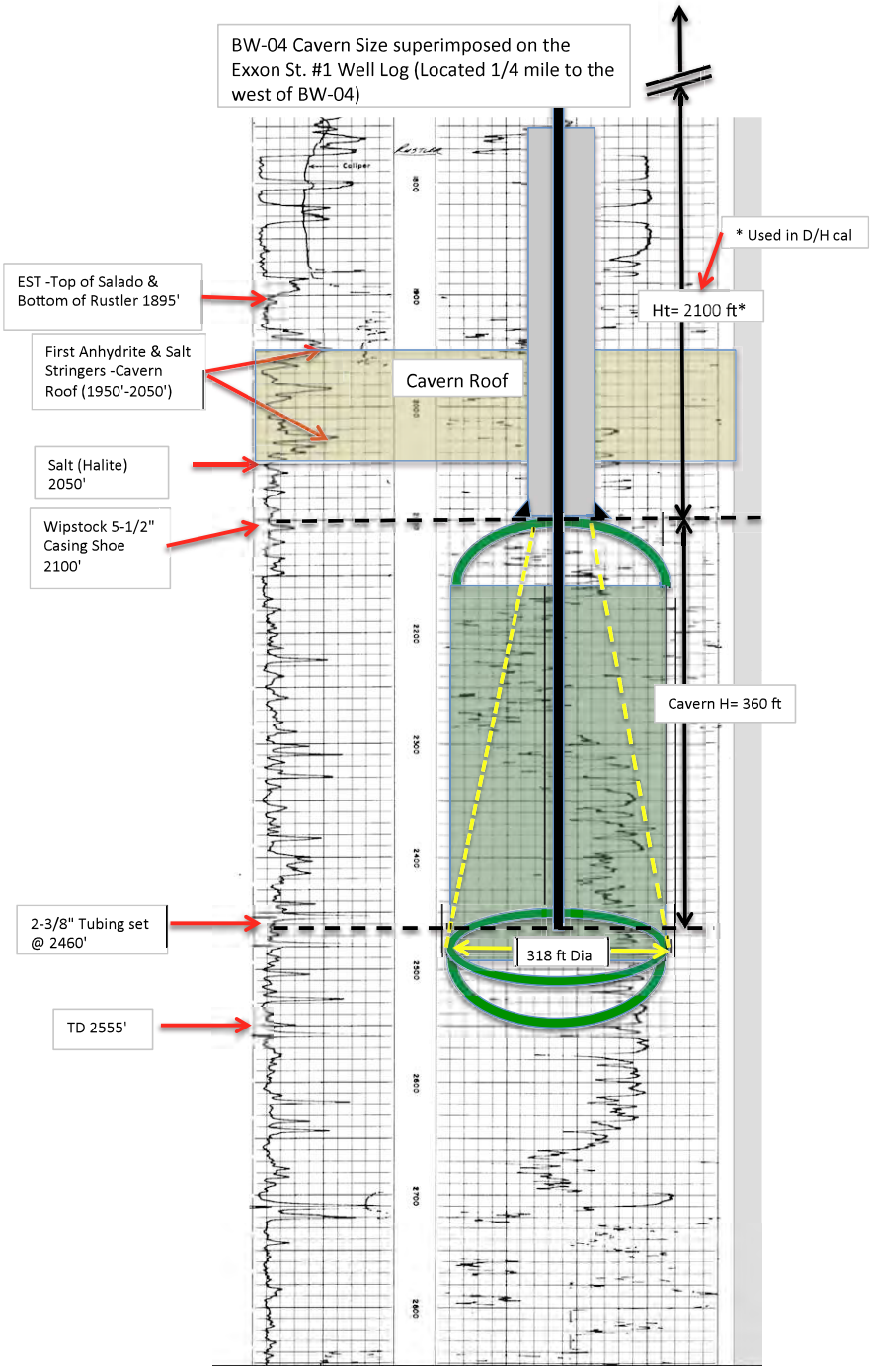
D.F.

G.L. 4036

Date	11-12-75			
Run No.	ONE			
Depth—Driller	8980			
Depth—Logger	8984			
Btm. Log Interval	8983			
Top Log Interval	SURFACE			
Casing—Driller	8 5/8 @ 1680	@	@	@
Casing—Logger	1678			
Bit Size	7 7/8			
Type Fluid in Hole	SALT GEL-STARCH			
Dens. / Visc.	10 / 40	/	/	/
pH / Fluid Loss	6 / 45.8ml	/ ml	/ ml	/ ml
Source of Sample	CIRCULATED			
R_m @ Meas. Temp.	.065 @ 62 °F	@ °F	@ °F	@ °F
R_{mf} @ Meas. Temp.	.049 @ 62 °F	@ °F	@ °F	@ °F
R_{mc} @ Meas. Temp.	.096 @ 62 °F	@ °F	@ °F	@ °F
Source: R_{mf} / R_{mc}	M / C	/	/	/
R_m @ BHT	.034 @ 128 °F	@ °F	@ °F	@ °F
TIME Circulation Stopped	0615			
TIME Logger on Bottom	1100			
Max. Rec. Temp.	128 °F	°F	°F	°F
Equip. / Location	7645 / HOBBS	/	/	/
Recorded By	KITTS			
Witnessed By	AMINI			

The well name, location and borehole reference data were furnished by the customer.

FOLD HERE


BW-04 Cavern Size superimposed on the Exxon St. #1 Well Log (Located 1/4 mile to the west of BW-04)
* Used in D/H cal
EST -Top of Salado & Bottom of Rustler 1895'
Ht= 2100 ft*
First Anhydrite & Salt Stringers -Cavern Roof (1950'-2050')
Cavern Roof
Salt (Halite) 2050'
Wipstock 5-1/2" Casing Shoe 2100'
Cavern H= 360 ft
2-3/8" Tubing set @ 2460'
318 ft Dia
TD 2555'

SOCON Sonar Well Services, Inc.

ECHO – LOG

Gandy Corporation

Brine Well No: 04

Eidson Brine Station, New Mexico

First SOCON Sonar Well Services Survey

10/21/2008 083069

SOCON Sonar Well Services, Inc.

11133 I-45 South, Ste. E Conroe, Texas 77302
Phone (936) 441-5801 Fax (936) 539-6847

e-mail: soconusa@socon.com

Results of the Cavern Survey

By means of Echo-Sounding

In the cavern

Brine Well No: 04

Date: 10/21/2008

083069

Customer:

Gandy Corporation

Lovington, New Mexico

Responsible for the survey:

Surveyor:	HL Van Metre
Leadership:	Mr. Dale Gandy
Interpreter:	HL Van Metre
Control:	Mr. Richard Lawrence

Contents

Summary of results

Well details

All depths are given as:	**MD**
Datum level for all depths:	**BHF**
Shoe of the 4-/2" - tubing:	1909.0 ft
Reference depth for ECHO-LOG:	**1909.0 ft**
Depth correction:	0.0 ft

Details of survey equipment

Measuring vehicle used:	Grey WireLine
Tools used:	XN02 – R185

General details

Number of runs:	1
Measured horizontal sections:	13
Measured tilted sections:	0
Lowest survey depth:	1944.0 ft

Maximum and minimum dimensions with ref. to the measuring axis

Reference direction: **magnetic north**

Determination out of 12 vertical sections derived from horizontally and tilted measured data at1 5 degree intervals:

Minimum radius:	0.0 ft
Depth:	1945.1 ft
Direction:	0°
Maximum radius:	1.8 ft
Depth:	1911.0 ft
Direction:	180°
Highest point of cavern:	1910.0 ft
Horizontal distance:	1.1 ft
Direction:	0°
Lowest point of cavern:	1945.1 ft
Horizontal distance:	0.0 ft
Direction:	0°
Lowest point in the measuring axis:	1945.1 ft

Determination out of 13 horizontal sections in the depths between 1910 feet and 1944 feet at 5 degree intervals:

Maximum radius:	1.8 ft
Depth:	1911.0 ft
Direction:	100°
Maximum diameter:	3.3 ft
Depth:	1911.0 ft
Direction:	295 - 115°

Volume

Volume:	10.7 Bbls
Depth range:	1910.0 ft <--> 1945.0 ft

Interpretation

Supposing a rectilinear propagation of ultrasonic waves all recorded echo travel times were converted into distances by using the subsequent speeds of sound:

5902 feet/second in brine (measured)

In the case of recording several echoes along one trace of echo signals, the representative echo signal was selected according to the level of amplitude, transmission time, and density of measured points and the shape of the cavern.

Horizontal sections

13 horizontal sections at following measured depths are included as graphical plots in this report:

1910.0 ft	1911.0 ft	1912.0 ft	1914.0 ft	1916.0 ft	1918.0 ft	1920.0 ft
1925.0 ft	1930.0 ft	1935.0 ft	1940.0 ft	1942.0 ft	1944.0 ft	

The following 1 sections are constructed:

1945.0 ft

Tilted sections

0 sections recorded with tilted echo-transducer at following measured depths are presented in the vertical sections:

Vertical sections

The shape of the cavern was determined by interpretation of all horizontally and tilted measured data and is presented by 36 vertical sections in this report.

Maximum plots (top view)

The maximum plot presents the largest extension of the cavern in a top view. The first picture shows the areas of all horizontal sections and the area resulting out of the vertical sections (hatched). The resulting total area is shown in the second picture (cross hatching) together with the largest single area.

In both pictures the total centre of gravity of the cavern is shown with its distance and its direction referring to the measuring axis.
The total centre of gravity is derived out of the envelope, which is the connection line of the largest cavern extension in every direction

Perspective views

Several perspective drawings are included in this report to give a quick review of detailed relations.

LEGEND

□	Measured point recorded with horizontal adjusted ultrasonic transducer
○	Measured point recorded with tilted or vertical orientated ultrasonic transducer
△	Interpolated point derived from the vertical sections
——	Connection line between two measured points in order to calculate the volume
- -	Assumed connection line (in areas which are not sufficiently covered by measured points)
N	Magnetic north determined with compass inside the tool (Magnetic compass in areas without tubing) (Fibre gyro compass in areas with tubing)
(N)	Assumed north direction (for sections in magnetic disturbed surroundings without fibre gyro compass)
a	Longest extension in section (Without considering of hidden leached pockets)
b	Longest extension in section perpendicular to a (Without considering of hidden leached pockets)
a/b	Ratio of longest extensions in section which are perpendicular to each other
(xx m²)	Area in actual section resulting from hidden leached pockets
r~	Average radius
🗀 021835 29.04.2002	Job number and survey date

SOCON Sonar Well Services, Inc.

Brine Well No: 04 083069 10/21/2008

Brine Well No: 04 --> 0° <--

SOCON Sonar Well Services, Inc.

Brine Well No: 04 083069 10/21/2008

Brine Well No: 04 --> 60° <--

SOCON Sonar Well Services, Inc.

Brine Well No: 04 083069 10/21/2008

Brine Well No: 04 --> 120° <--

SOCON Sonar Well Services, Inc.

Brine Well No: 04 083069 10/21/2008

Brine Well No: 04 --> 180° <--

SOCON Sonar Well Services, Inc.

Brine Well No: 04 083069 10/21/2008

Brine Well No: 04 --> 240° <--

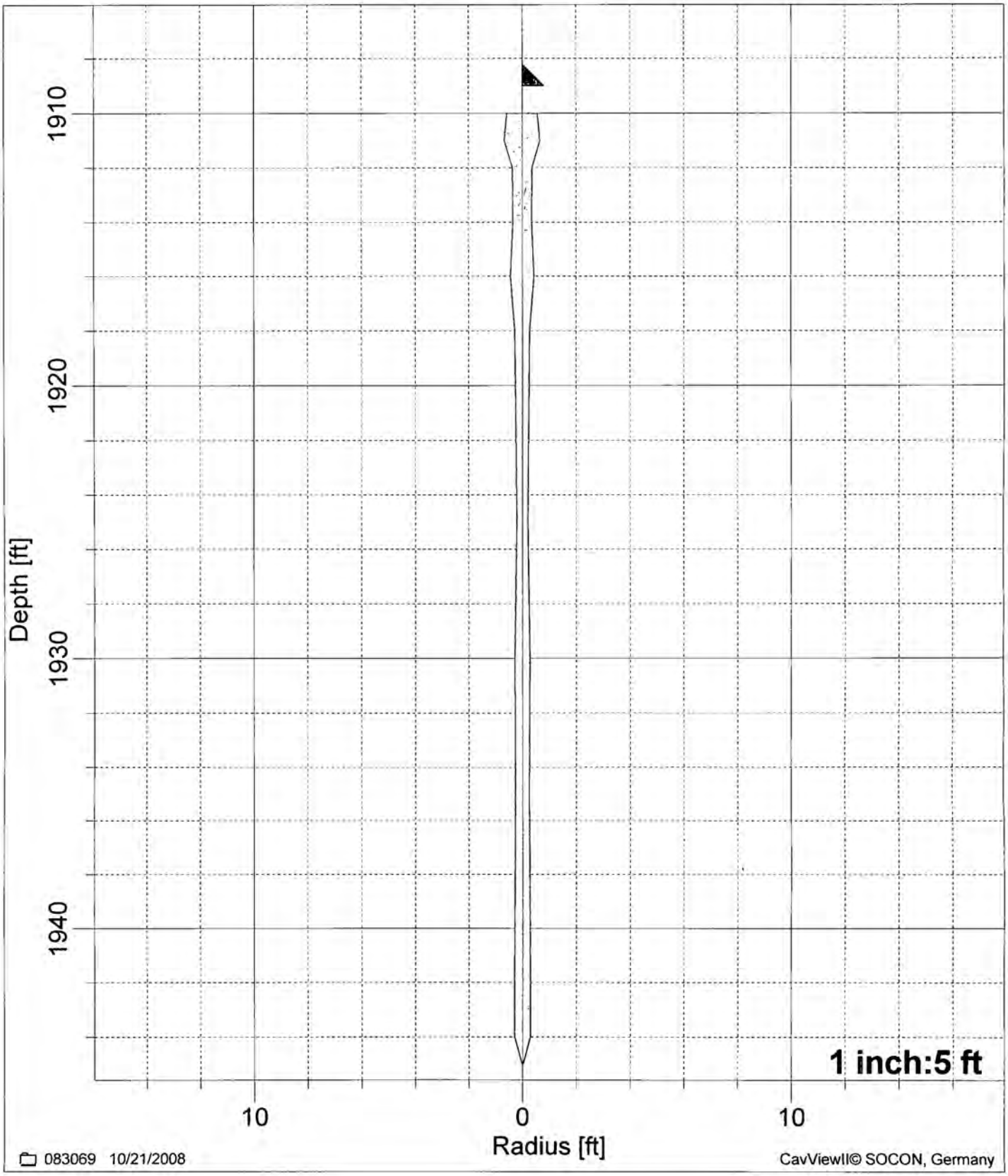
SOCON Sonar Well Services, Inc.

Brine Well No: 04 083069 10/21/2008

Brine Well No: 04 --> 300° <--

SOCON Sonar Well Services, Inc.

Brine Well No: 04 **AVERAGE RADIUS** **10/21/2008**

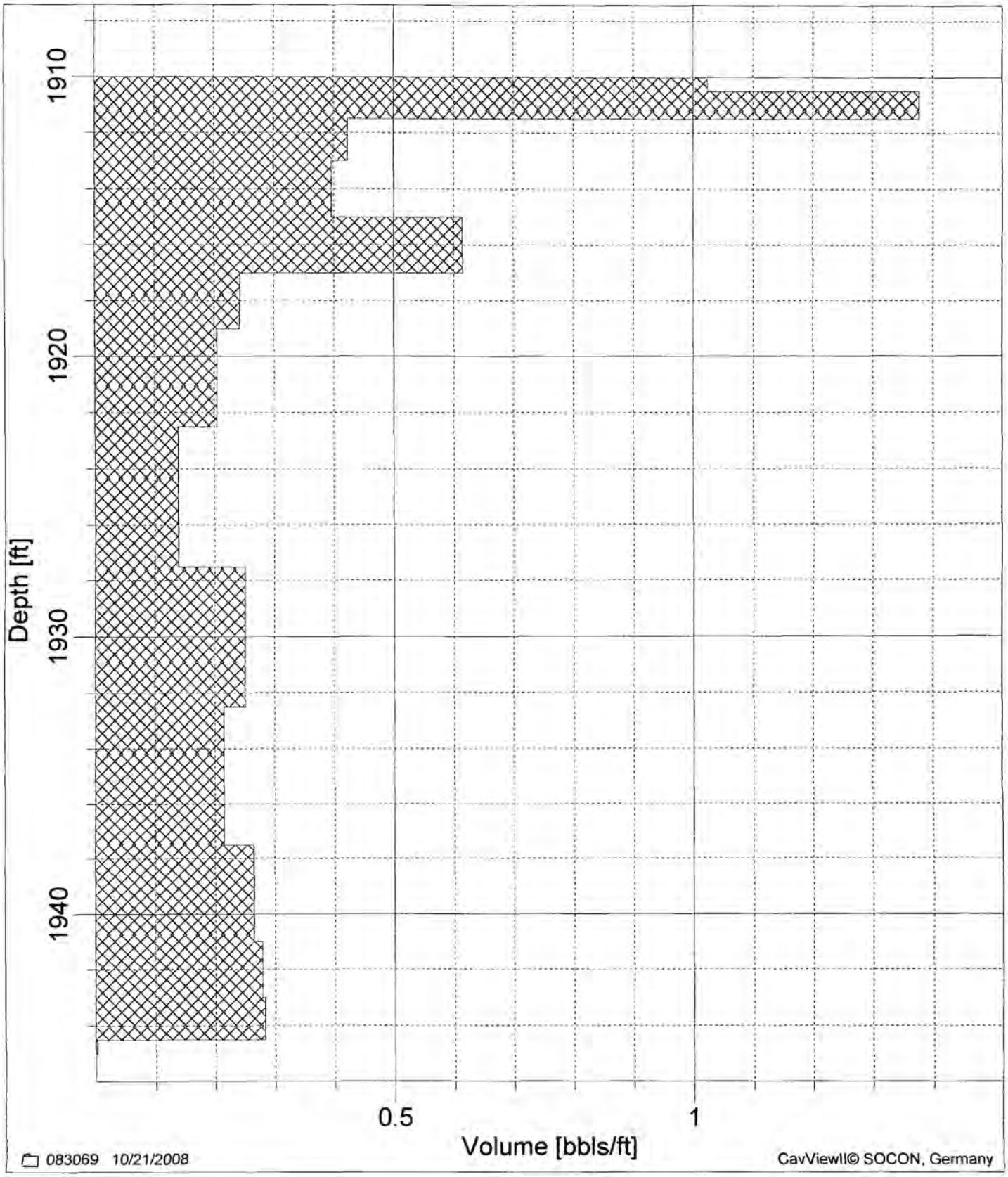


4-1/2" : 1909.0 ft

Average radius (10/21/2008)

SOCON Sonar Well Services, Inc.

Brine Well No: 04 **PARTIAL VOLUME** **10/21/2008**



SOCON Sonar Well Services, Inc.

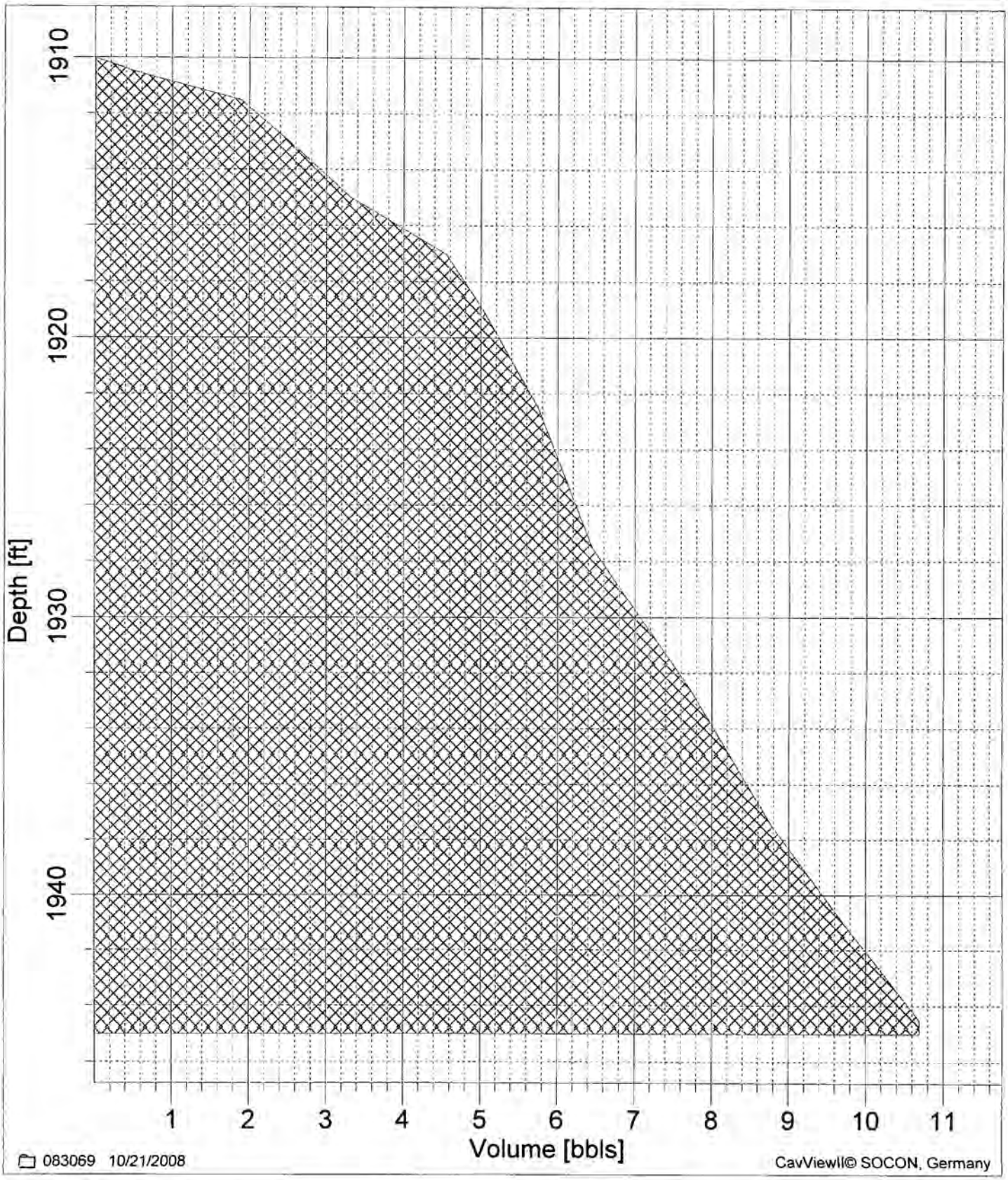
Volume list

Brine Well No: 04 083069 10/21/2008

Depth [ft]	Radius [ft]	Area [ft²]	Depth range [ft]		Volume [bbls]	
			from	to	partial	total
1910.0	1.4	6	1910.0	1910.5	1	1
1911.0	1.6	8	1910.5	1911.5	1	2
1912.0	0.9	2	1911.5	1913.0	1	3
1914.0	0.8	2	1913.0	1915.0	1	3
1916.0	1.0	3	1915.0	1917.0	1	5
1918.0	0.7	1	1917.0	1919.0	0	5
1920.0	0.6	1	1919.0	1922.5	1	6
1925.0	0.5	1	1922.5	1927.5	1	6
1930.0	0.7	1	1927.5	1932.5	1	8
1935.0	0.6	1	1932.5	1937.5	1	9
1940.0	0.7	1	1937.5	1941.0	1	10
1942.0	0.7	2	1941.0	1943.0	1	10
1944.0	0.7	2	1943.0	1944.5	0	11
1945.0	0.1	0	1944.5	1945.0	0	11

SOCON Sonar Well Services, Inc.

Brine Well No: 04 **TOTAL VOLUME** **10/21/2008**



Total volume = 10.7 bbls

SOCON Sonar Well Services, Inc.

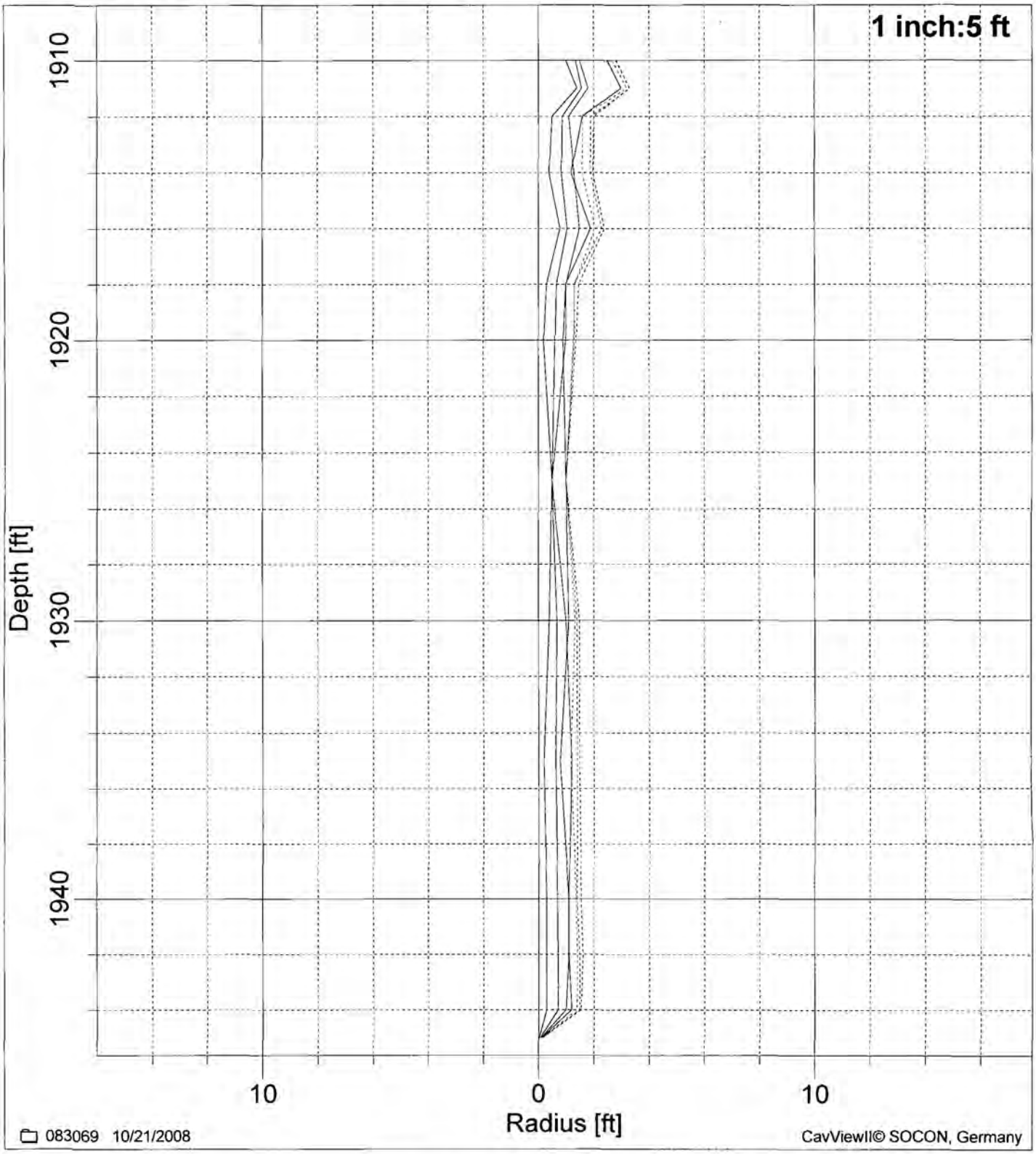
Table of volumes (foot by foot)

Job-No.: 083069, Name: Brine Well No: 04, Date: 10/21/2008

depth [ft]	volume [bbls]	depth [ft]	volume [bbls]	depth [ft]	volume [bbls]	depth [ft]	volume [bbls]	depth [ft]	volume [bbls]
1910	0	1911	1	1912	2	1913	3	1914	3
1915	3	1916	4	1917	5	1918	5	1919	5
1920	5	1921	5	1922	6	1923	6	1924	6
1925	6	1926	6	1927	6	1928	7	1929	7
1930	7	1931	7	1932	8	1933	8	1934	8
1935	8	1936	8	1937	9	1938	9	1939	9
1940	9	1941	10	1942	10	1943	10	1944	11
1945	11								

SOCON Sonar Well Services, Inc.

Brine Well No: 04 **RADII / DIAMETERS** **10/21/2008**



Average radius
Minimum radius
Maximum radius
Minimum diameter
Maximum diameter
Largest extension
Largest perpendicular extension

SOCON Sonar Well Services, Inc.

Table of radii and diameters

Brine Well No: 04 083069 10/21/2008 10/21/2008

Depth	Radius [MIN]		Radius [MAX]		Diameter [MIN]		[MAX]	
[ft]	[ft]	[°]	[ft]	[°]	[ft]	[°]	[ft]	[°]
1910.0	1.0	332	1.5	85	2.5	152 <-> 332	2.8	60 <-> 240
1911.0	1.4	2	1.8	100	3.0	37 <-> 217	3.3	115 <-> 295
1912.0	0.5	261	1.1	75	1.6	69 <-> 249	1.9	10 <-> 190
1914.0	0.4	236	1.3	110	1.2	57 <-> 237	1.9	165 <-> 345
1916.0	0.8	242	1.5	155	1.9	17 <-> 197	2.3	160 <-> 340
1918.0	0.3	166	1.0	25	1.0	143 <-> 323	1.3	25 <-> 205
1920.0	0.2	221	1.0	35	0.9	131 <-> 311	1.3	35 <-> 215
1925.0	0.5	1	0.5	0	1.0	1 <-> 181	1.0	0 <-> 180
1930.0	0.4	196	1.0	80	1.1	17 <-> 197	1.4	130 <-> 310
1935.0	0.2	251	1.2	140	0.8	38 <-> 218	1.4	140 <-> 320
1940.0	0.3	236	1.1	120	1.1	15 <-> 195	1.4	120 <-> 300
1942.0	0.3	246	1.1	130	1.1	30 <-> 210	1.5	130 <-> 310
1944.0	0.3	251	1.0	65	1.2	5 <-> 185	1.5	140 <-> 320
1945.0	0.0	250	0.1	75	0.1	68 <-> 248	0.1	150 <-> 330

SOCON Sonar Well Services, Inc.

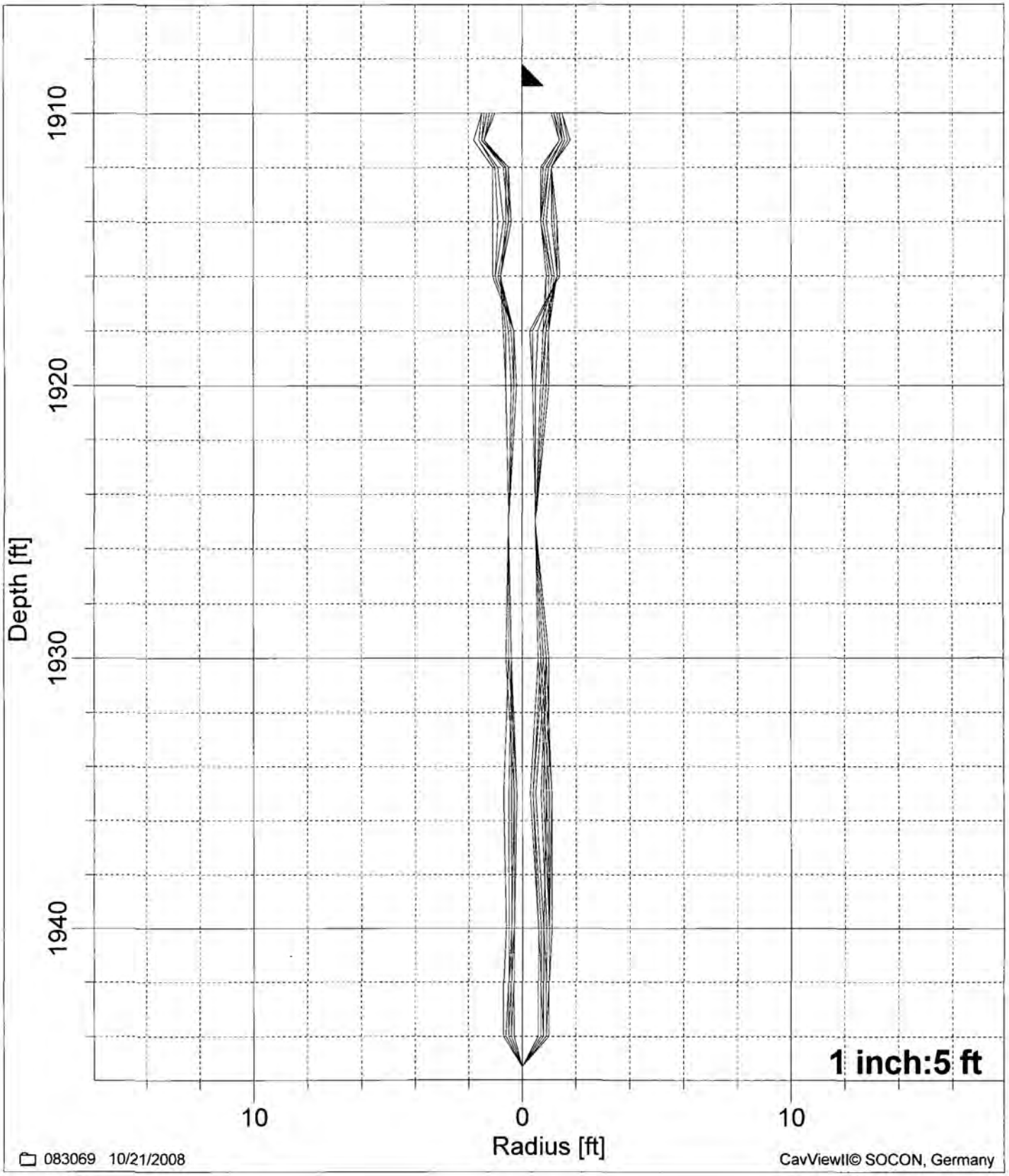
Table of radii in N-E-S-W-NE-SE-SW-NW presentation

Brine Well No: 04 083069 10/21/2008

Depth [ft]	<R> [ft]	N [ft]	E [ft]	S [ft]	W [ft]	NE [ft]	SE [ft]	SW [ft]	NW [ft]
1910.0	1.4	1.1	1.5	1.5	1.3	1.3	1.5	1.4	1.1
1911.0	1.6	1.4	1.7	1.8	1.5	1.5	1.8	1.5	1.4
1912.0	0.9	0.7	1.1	1.1	0.5	1.0	1.1	0.7	0.5
1914.0	0.8	0.7	1.1	1.1	0.4	0.7	1.3	0.5	0.4
1916.0	1.0	0.9	1.3	1.1	0.8	1.1	1.3	0.9	0.8
1918.0	0.7	0.8	1.0	0.3	0.3	1.0	0.6	0.3	0.5
1920.0	0.6	0.7	0.9	0.3	0.2	1.0	0.5	0.2	0.4
1925.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
1930.0	0.7	0.6	1.0	0.5	0.4	0.9	0.8	0.4	0.5
1935.0	0.6	0.3	0.9	0.7	0.2	0.5	1.1	0.3	0.2
1940.0	0.7	0.6	1.0	0.6	0.3	0.8	1.0	0.4	0.3
1942.0	0.7	0.6	1.0	0.7	0.3	0.9	1.0	0.4	0.4
1944.0	0.7	0.6	1.0	0.7	0.4	0.9	1.0	0.4	0.4
1945.0	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.0

SOCON Sonar Well Services, Inc.

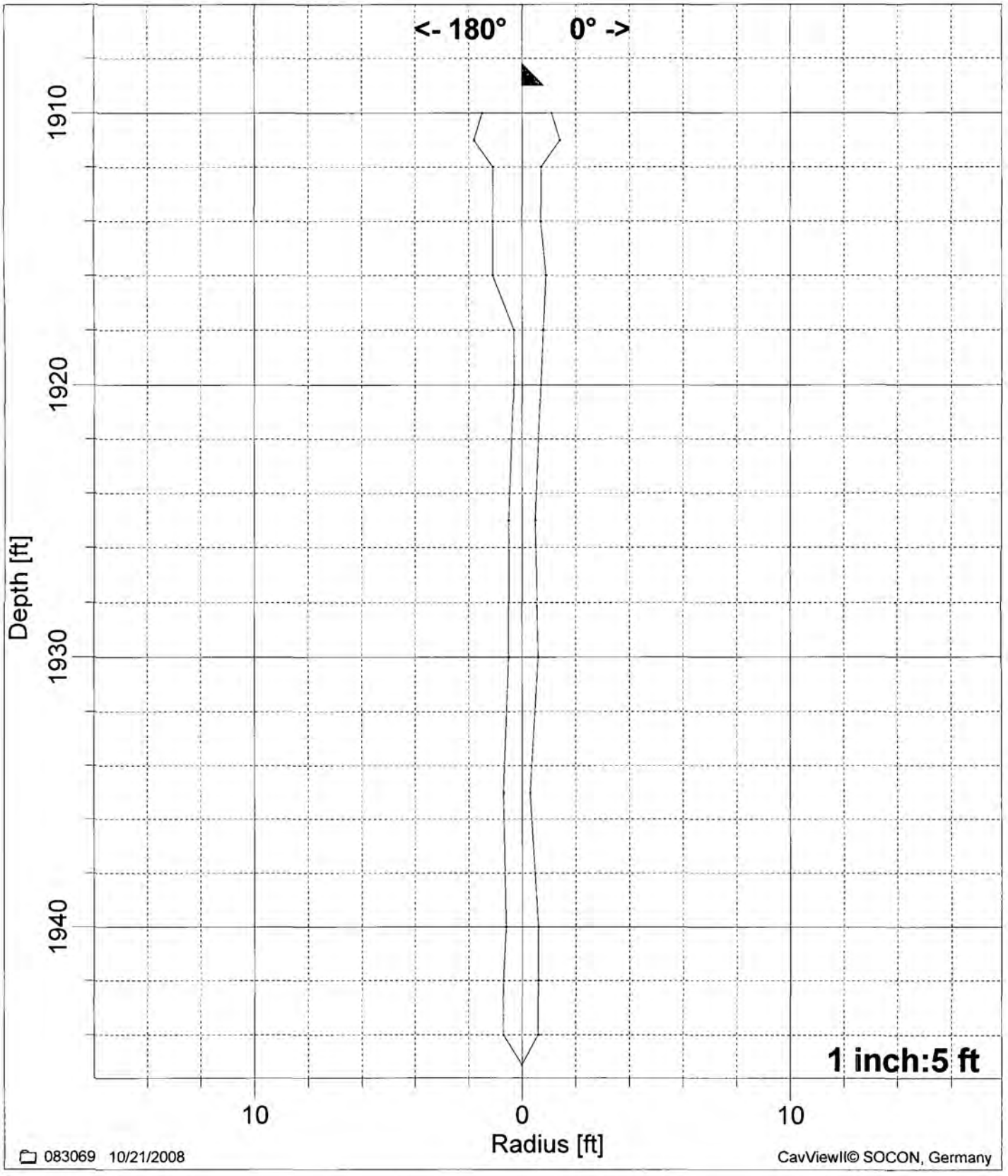
Brine Well No: 04 **MAXPLOT** **10/21/2008**



4-1/2" : 1909.0 ft

SOCON Sonar Well Services, Inc.

Brine Well No: 04 **10/21/2008**

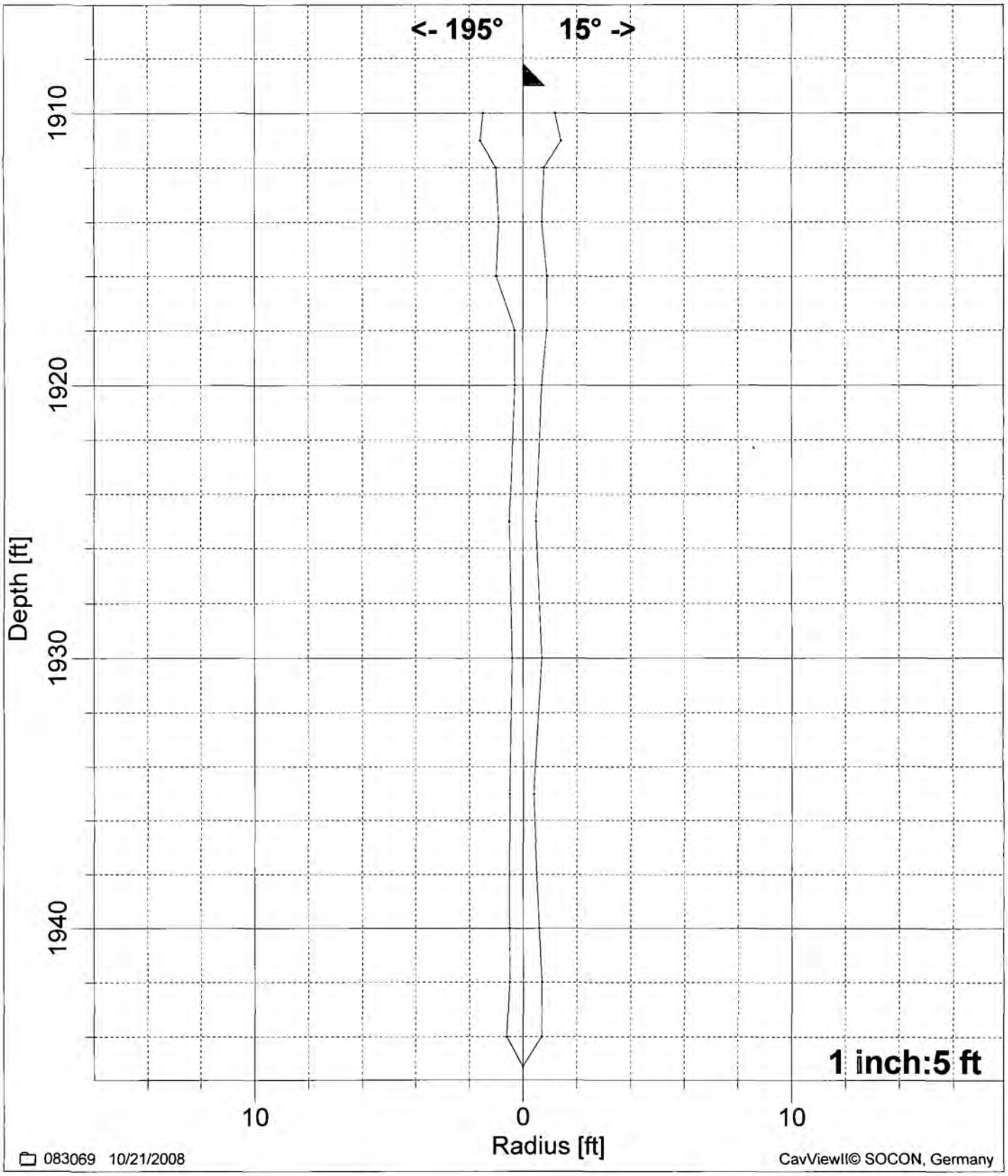


(10/21/2008) 4-1/2" : 1909.0 ft

SOCON Sonar Well Services, Inc.

Brine Well No: 04

10/21/2008



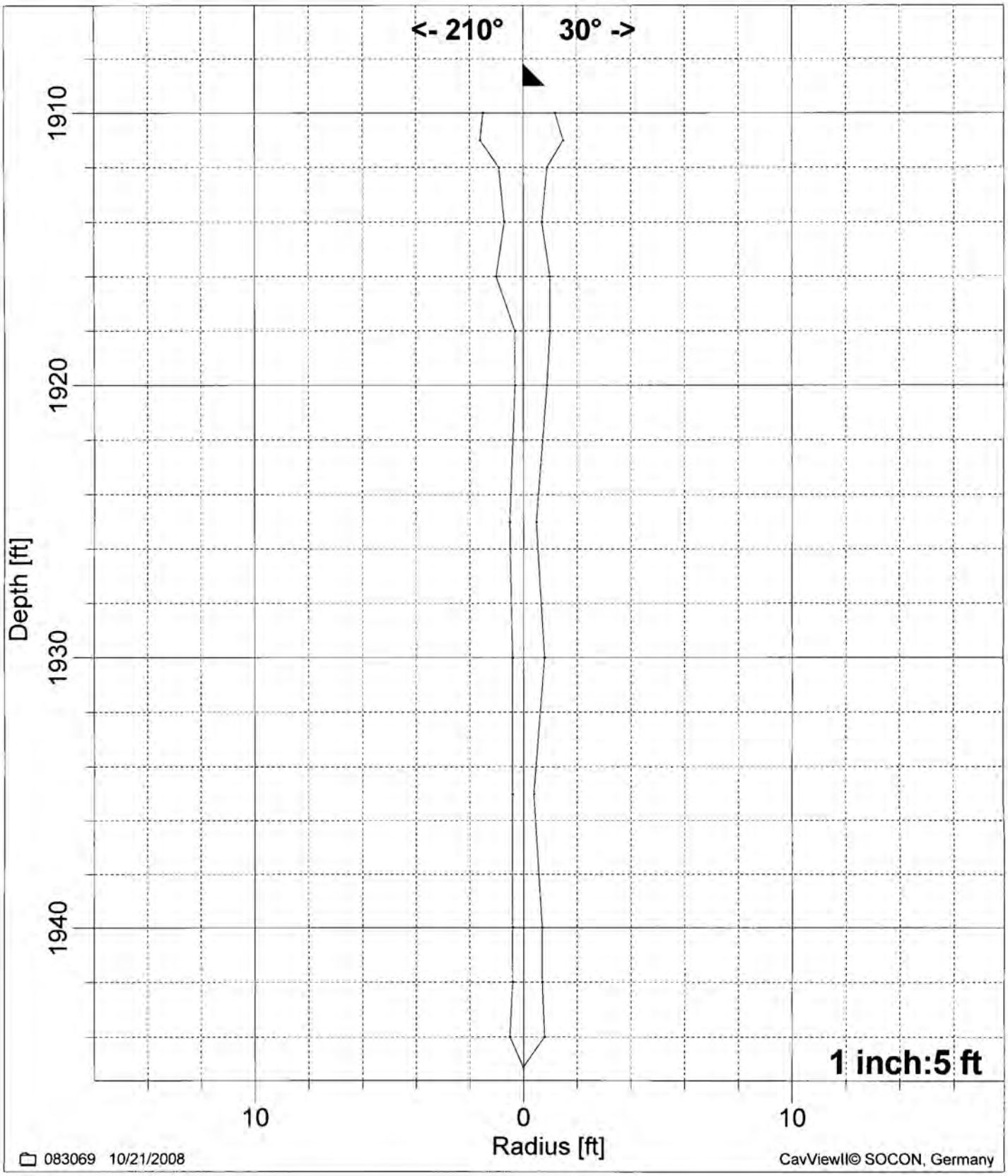
(10/21/2008)

4-1/2" : 1909.0 ft

SOCON Sonar Well Services, Inc.

Brine Well No: 04

10/21/2008



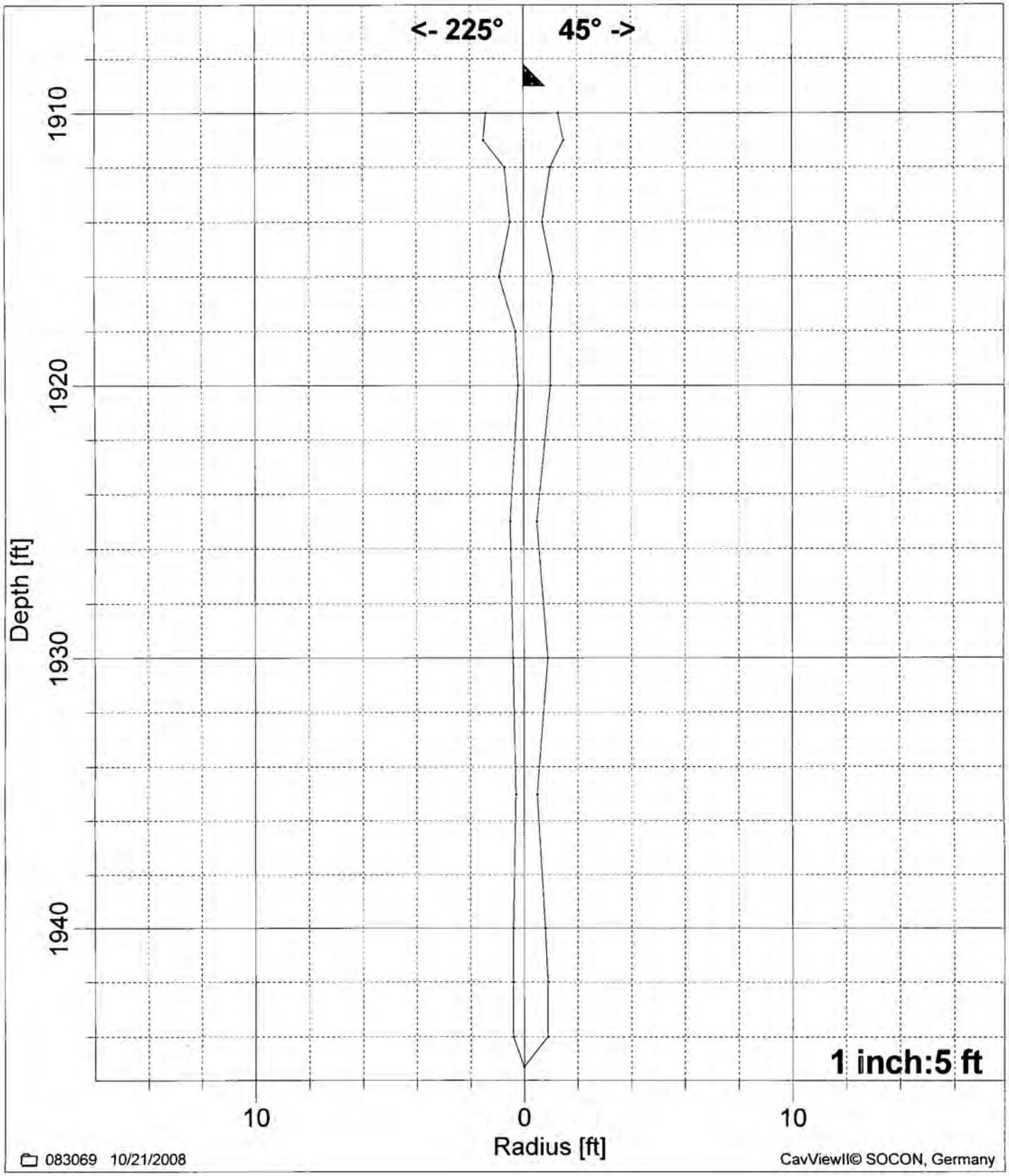
(10/21/2008)

4-1/2" : 1909.0 ft

SOCON Sonar Well Services, Inc.

Brine Well No: 04

10/21/2008



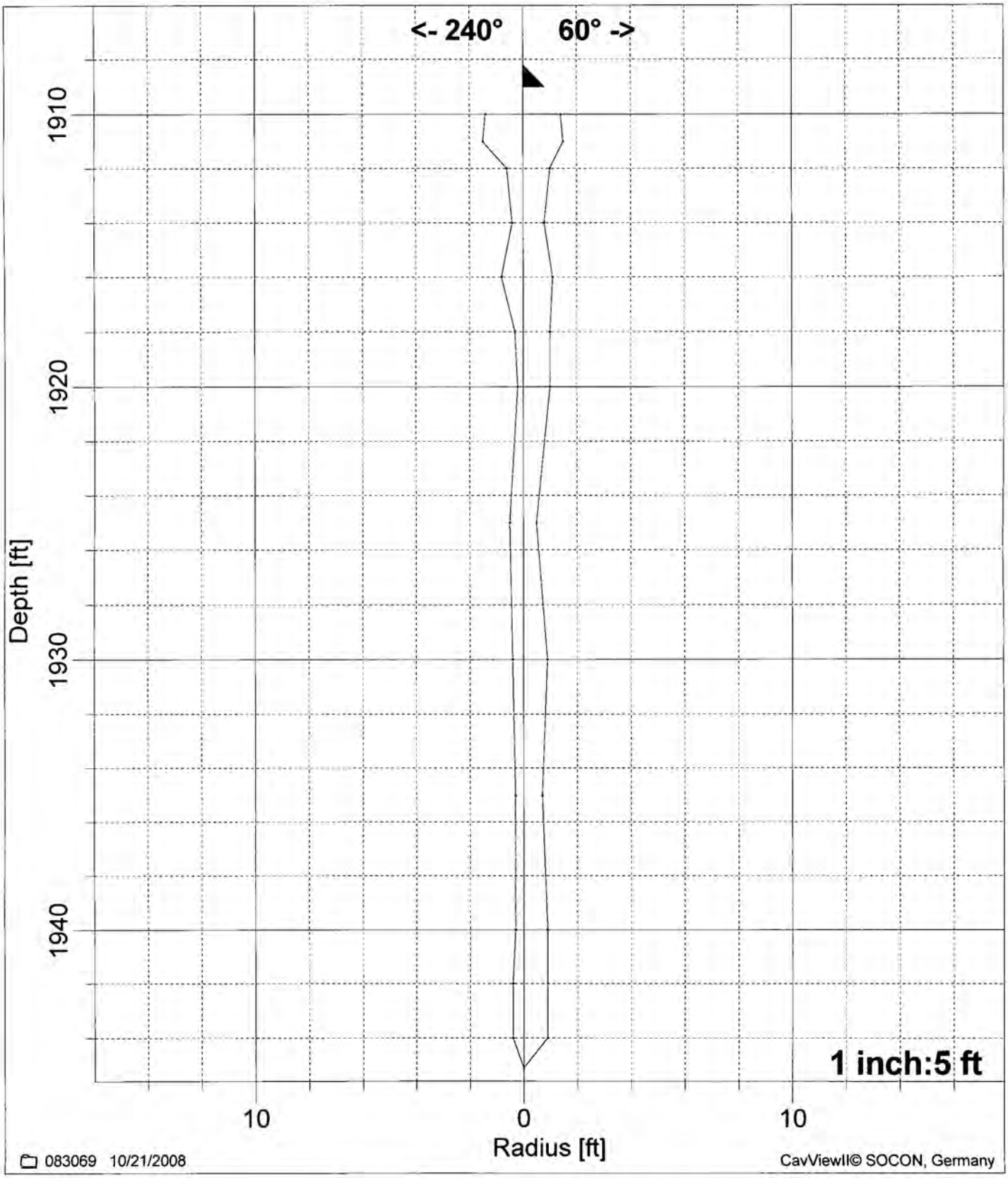
(10/21/2008)

4-1/2" : 1909.0 ft

SOCON Sonar Well Services, Inc.

Brine Well No: 04

10/21/2008



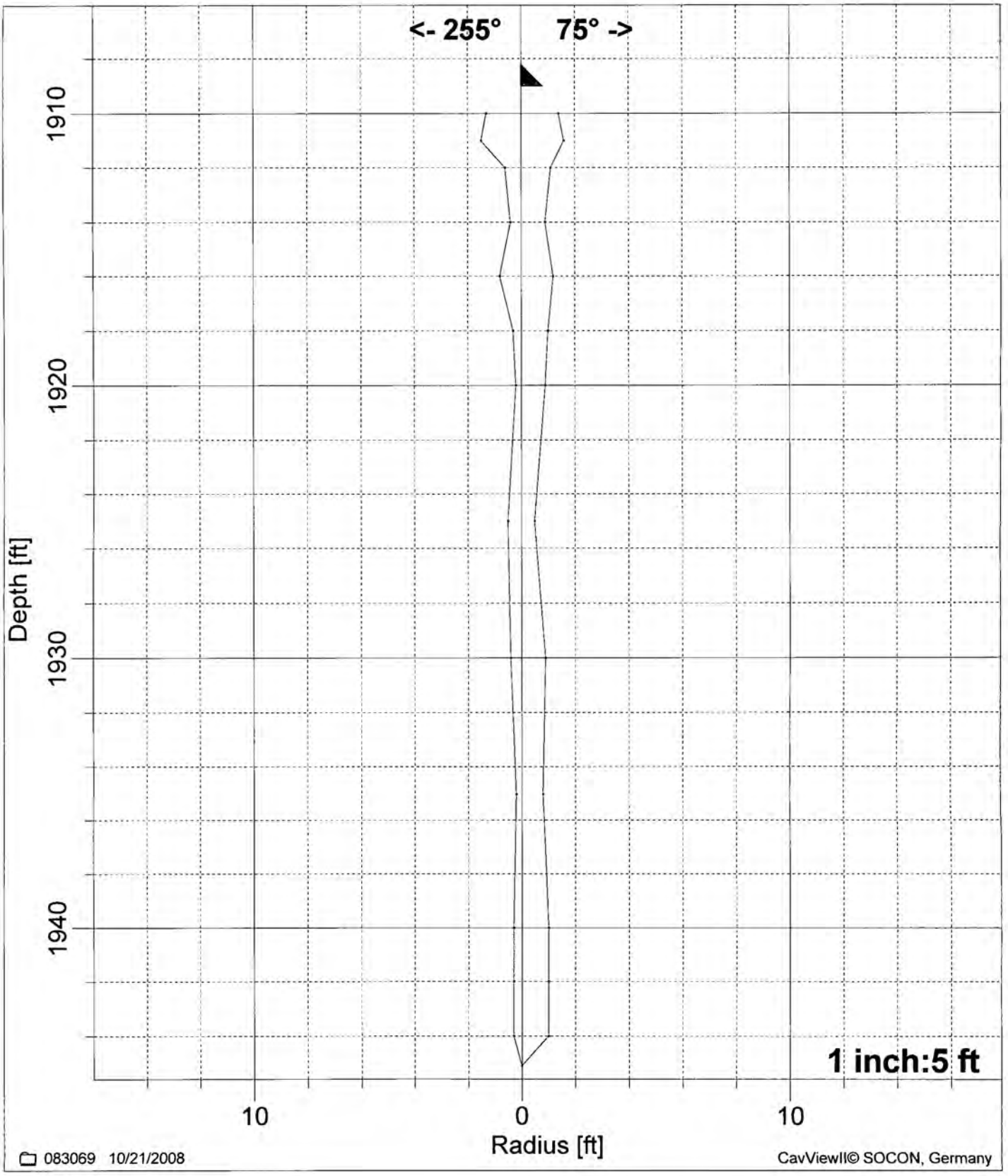
(10/21/2008)

4-1/2" : 1909.0 ft

SOCON Sonar Well Services, Inc.

Brine Well No: 04

10/21/2008



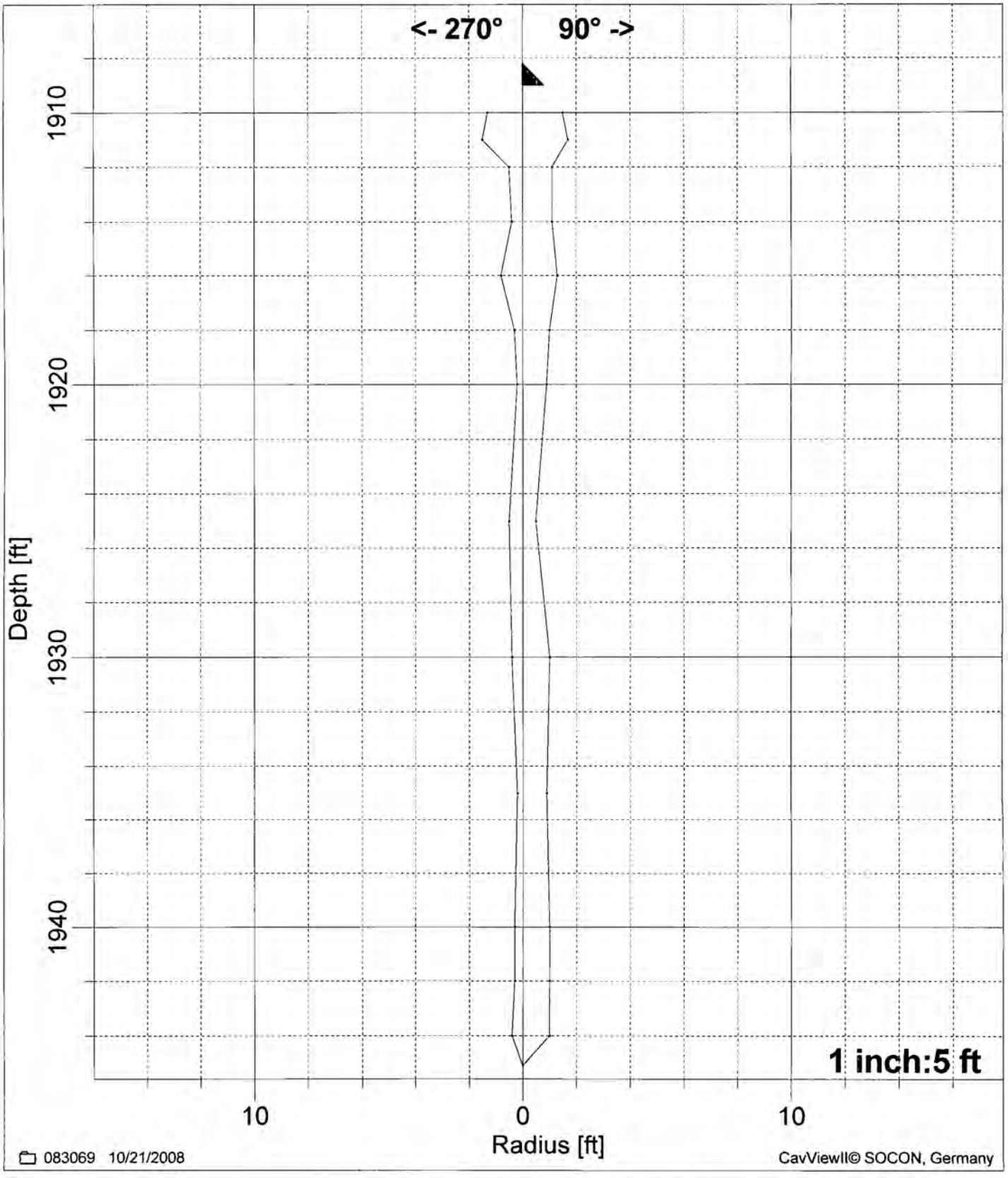
(10/21/2008)

4-1/2" : 1909.0 ft

SOCON Sonar Well Services, Inc.

Brine Well No: 04

10/21/2008

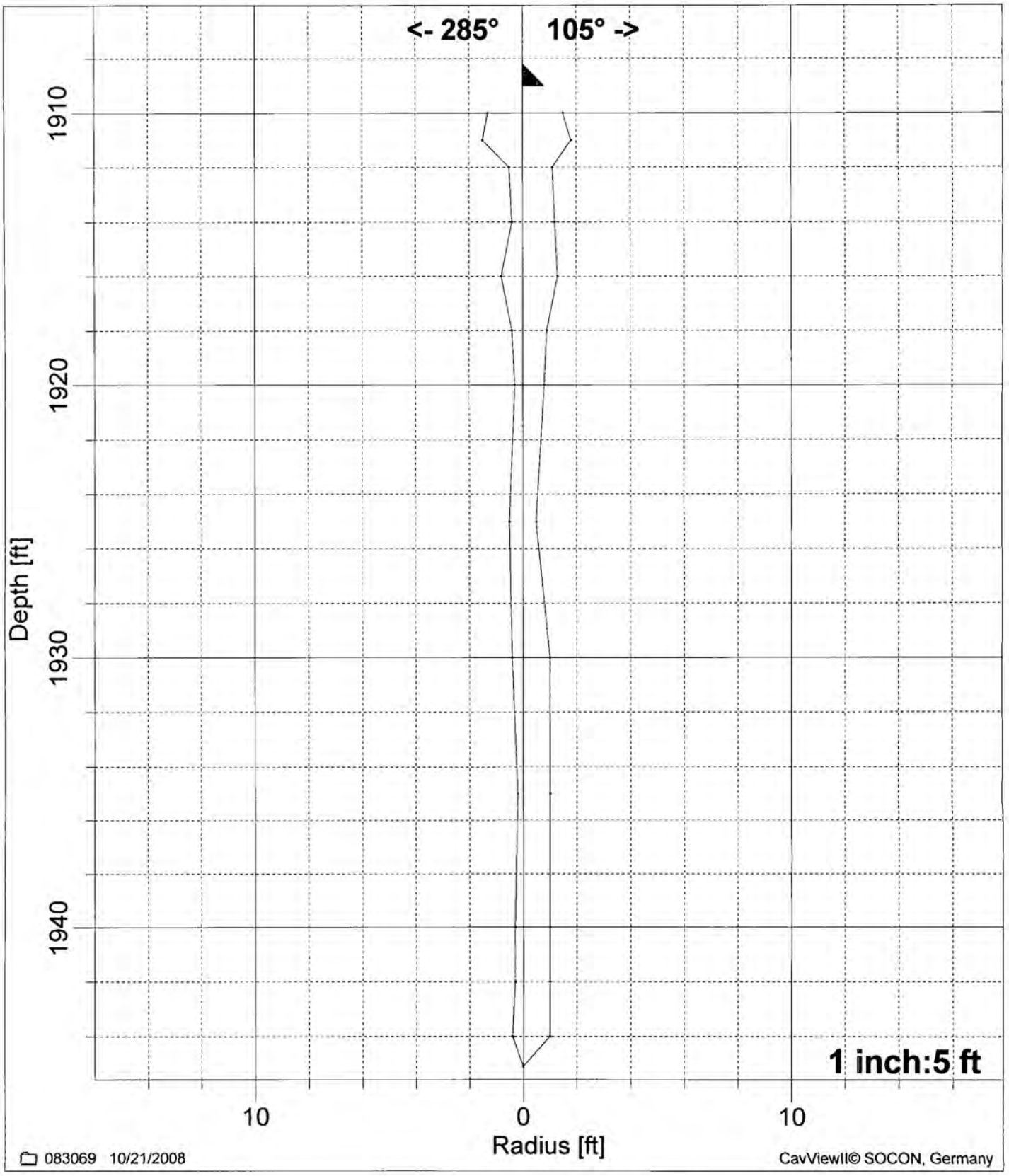


(10/21/2008)

4-1/2" : 1909.0 ft

SOCON Sonar Well Services, Inc.

Brine Well No: 04 **10/21/2008**

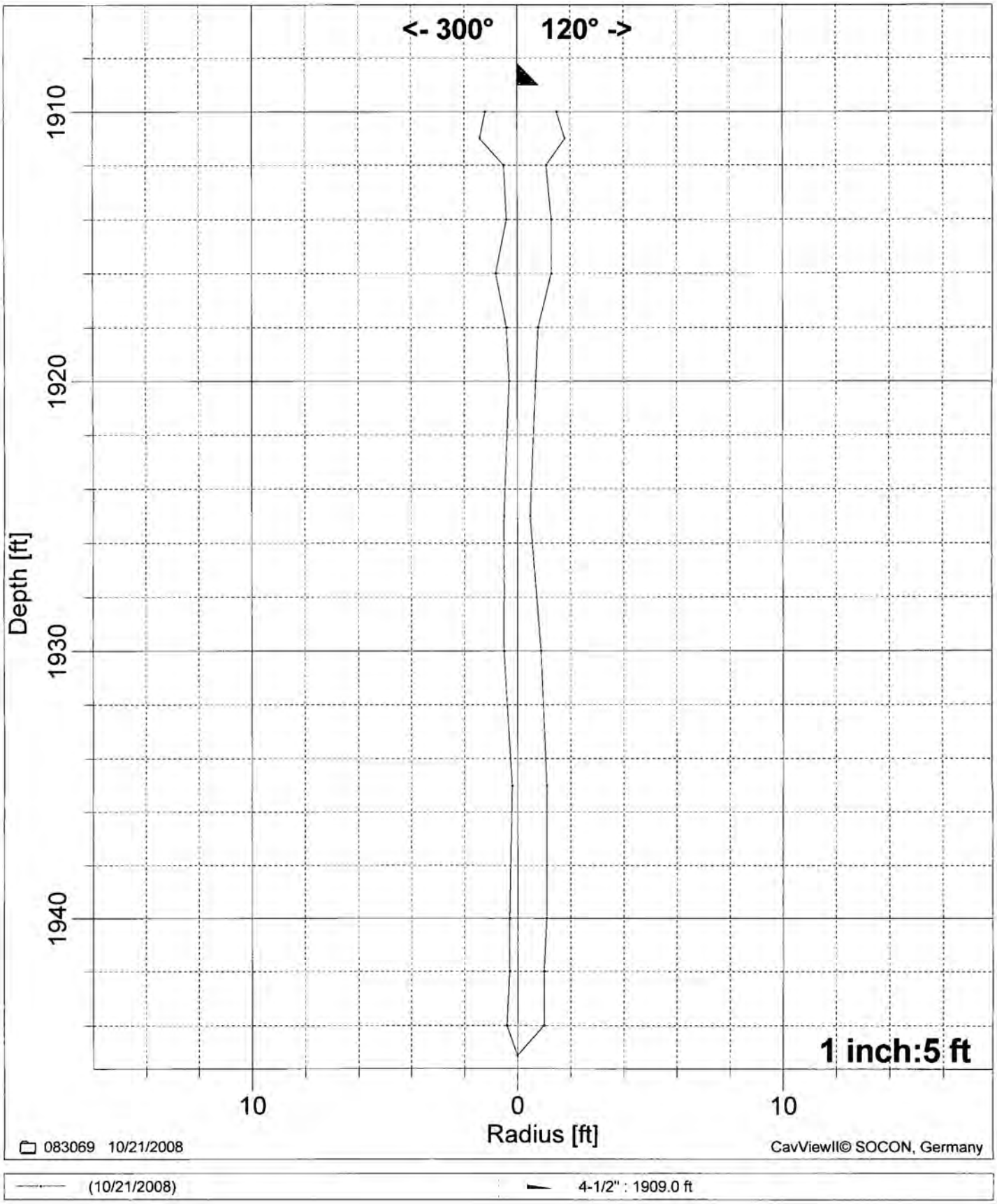


(10/21/2008) 4-1/2" : 1909.0 ft

SOCON Sonar Well Services, Inc.

Brine Well No: 04

10/21/2008



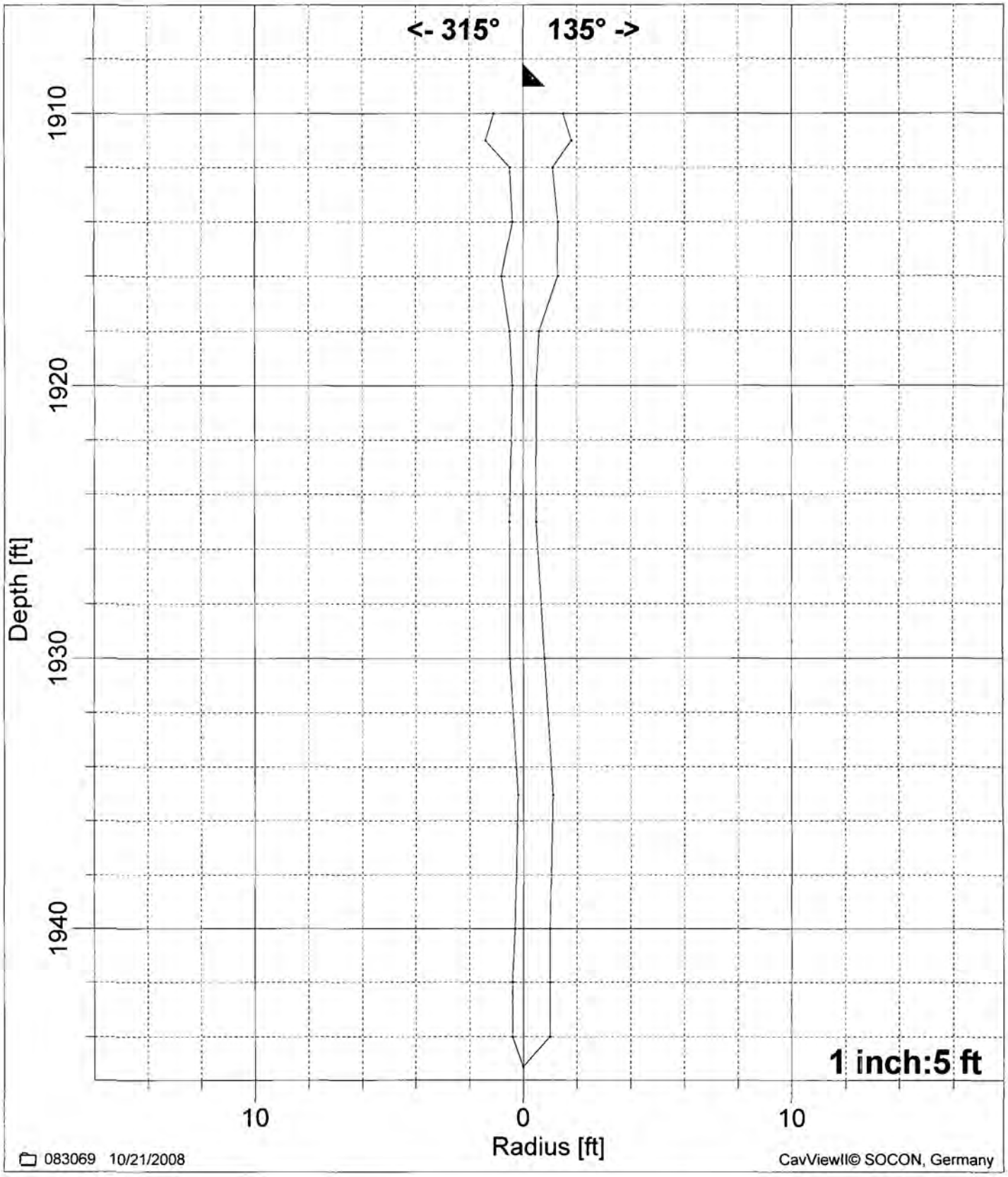
(10/21/2008)

4-1/2" : 1909.0 ft

SOCON Sonar Well Services, Inc.

Brine Well No: 04

10/21/2008



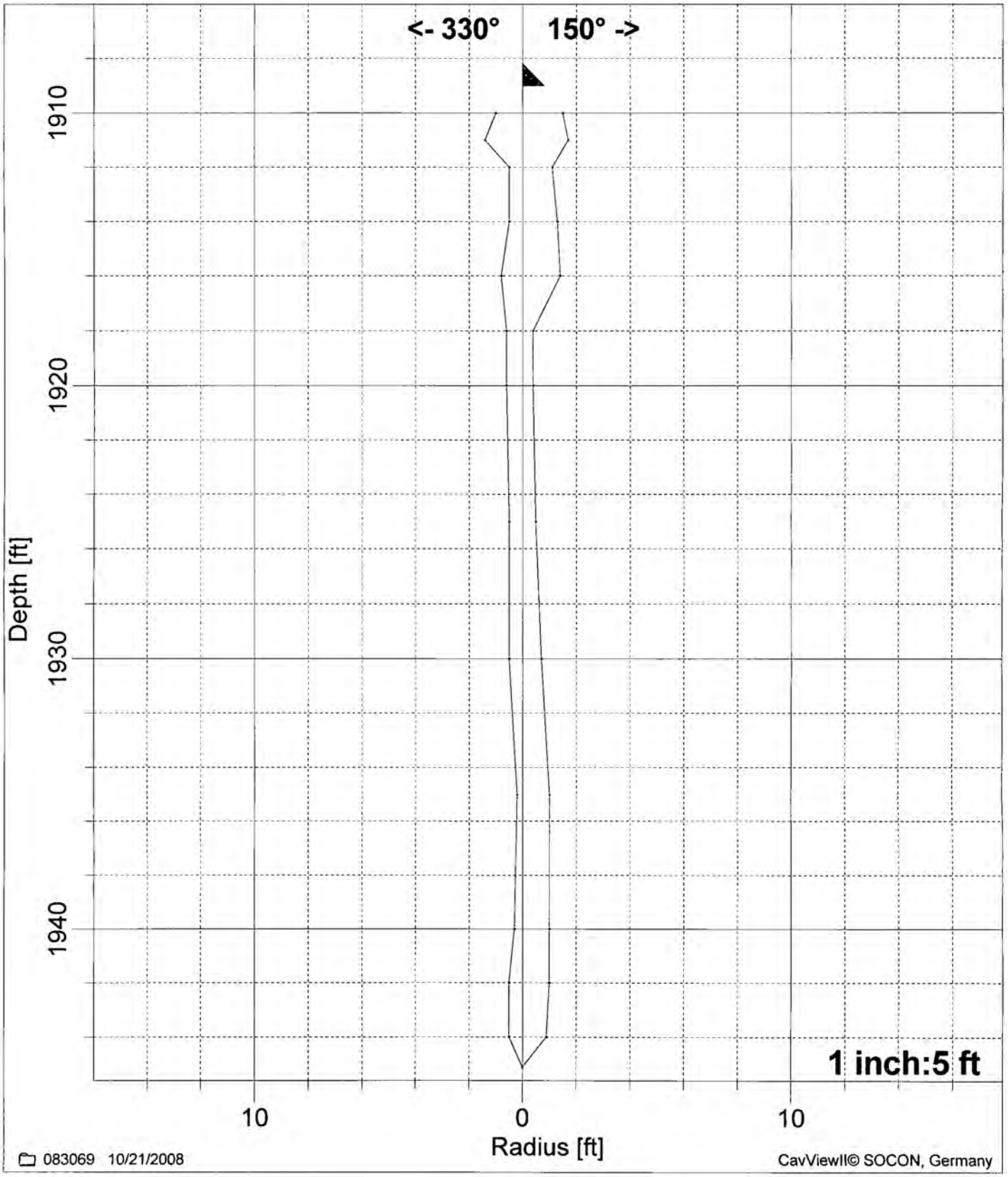
(10/21/2008)

4-1/2" : 1909.0 ft

SOCON Sonar Well Services, Inc.

Brine Well No: 04

10/21/2008



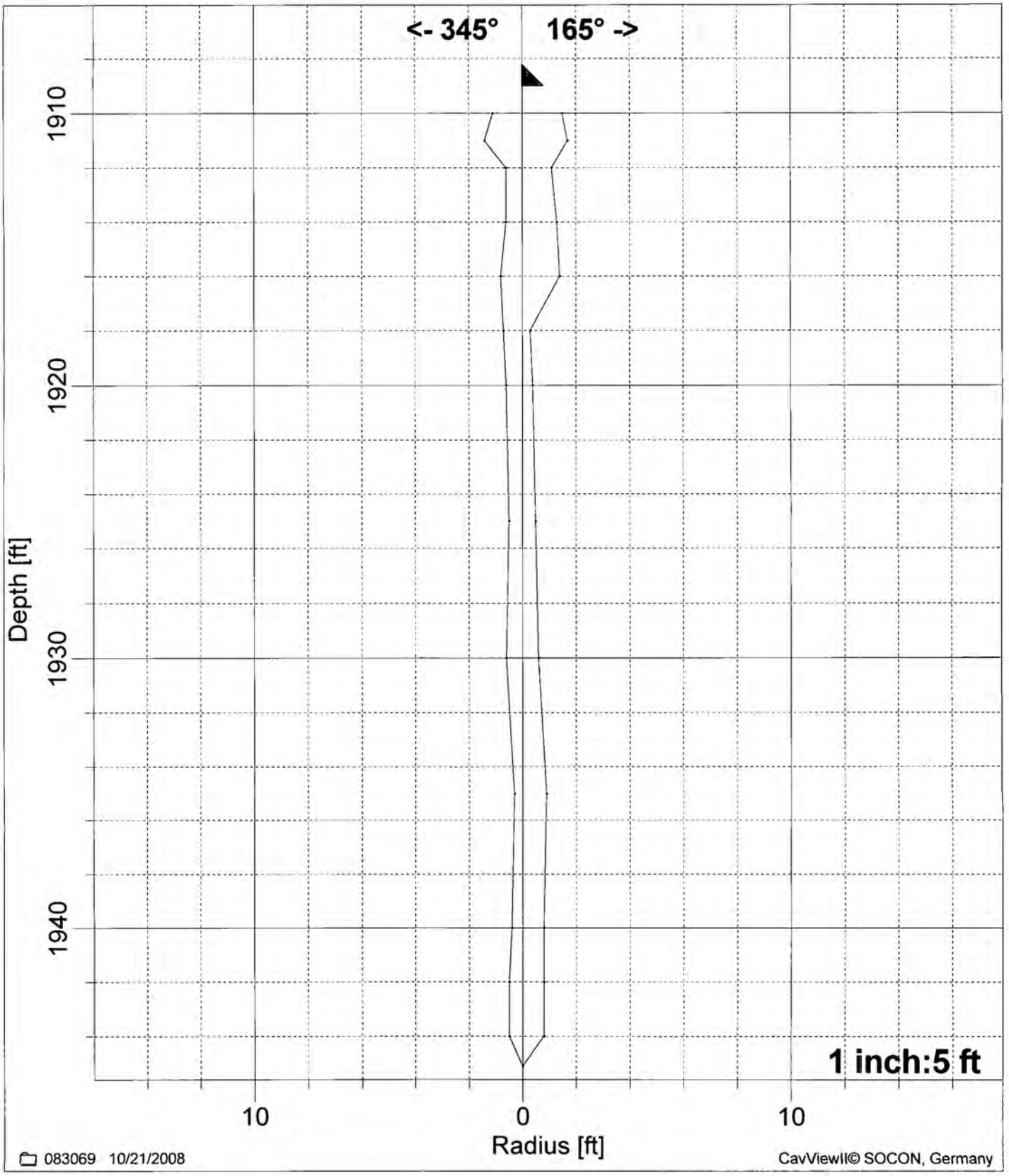
(10/21/2008)

4-1/2" : 1909.0 ft

SOCON Sonar Well Services, Inc.

Brine Well No: 04

10/21/2008



(10/21/2008)

4-1/2" : 1909.0 ft

HORIZONTAL SECTIONS

Brine Well No: 04 Report No.: 083069

Utilized speed of sound: 5902 feet/second

Measuring date: 10/21/2008 Scale: 1: 50

Horizontal sections measured at following depths:

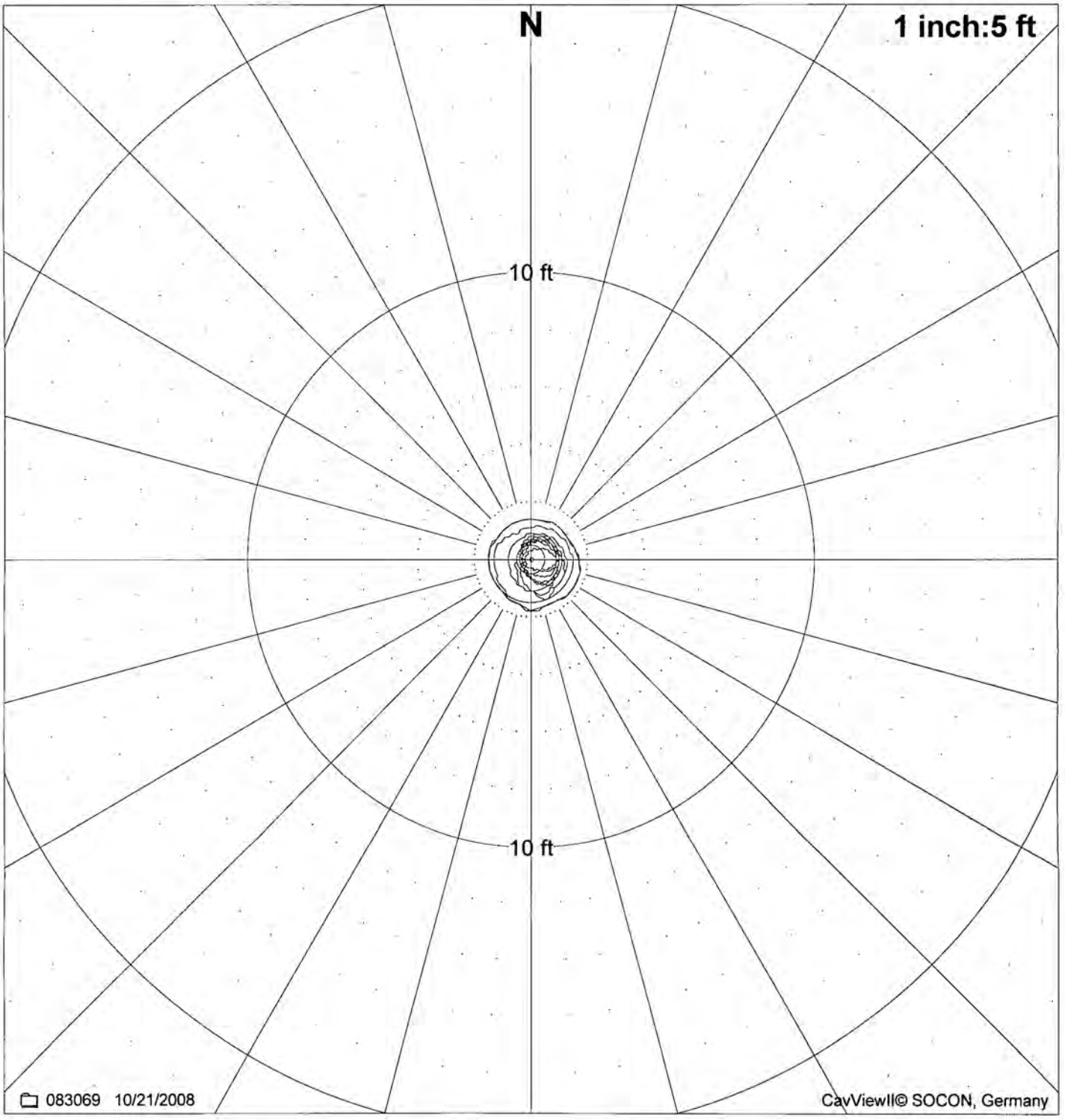
1910.0 ft	1911.0 ft	1912.0 ft	1914.0 ft	1916.0 ft	1918.0 ft	1920.0 ft
1925.0 ft	1930.0 ft	1935.0 ft	1940.0 ft	1942.0 ft	1944.0 ft	

The following 1 section is constructed:

1945.0 ft

SOCON Sonar Well Services, Inc.

Brine Well No: 04 — MAXPLOT — 10/21/2008



Vertical maximum plot — Horizontal sections — a/b

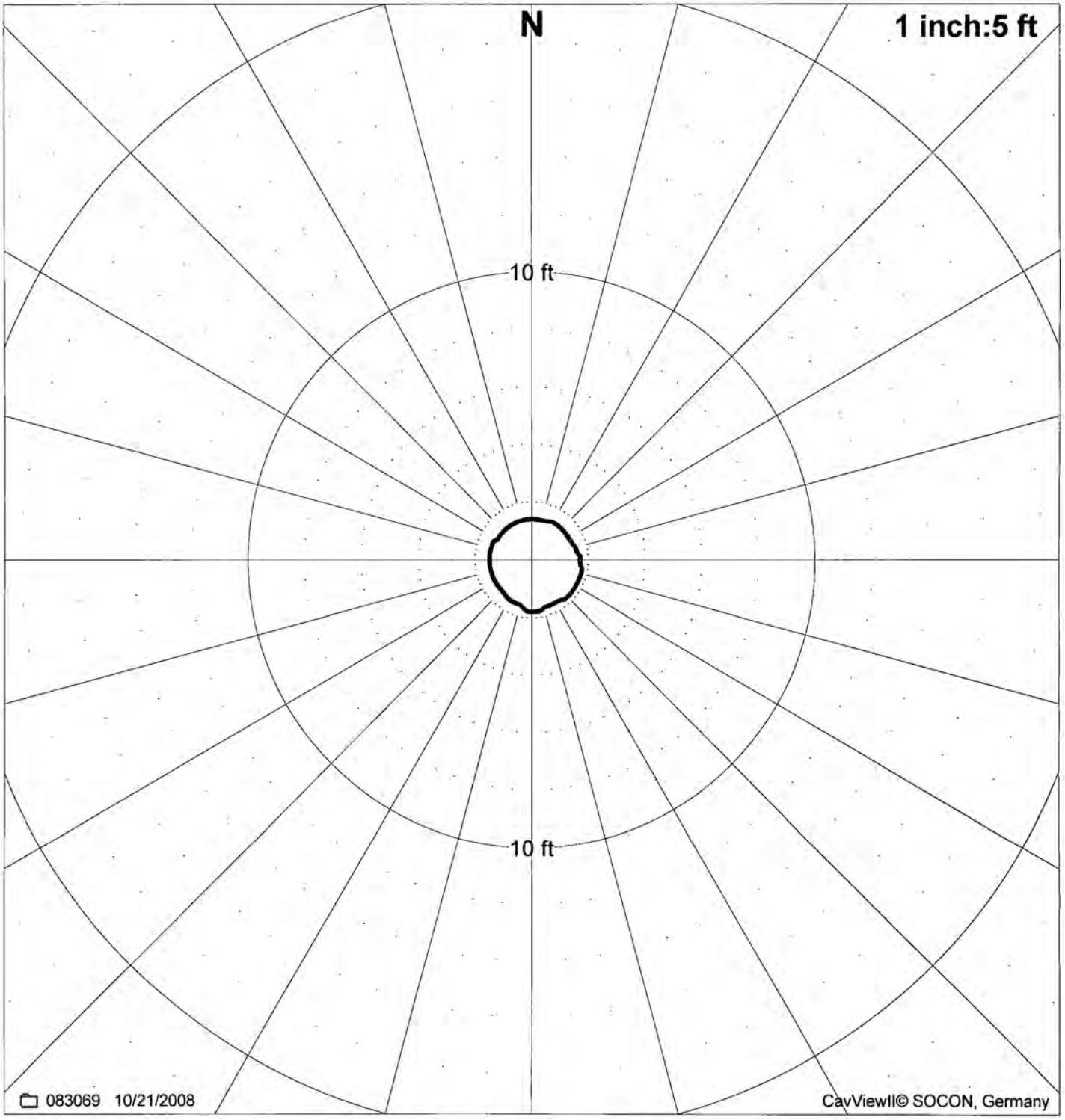
d_{max}: 3.3 ft 295° <--> 115° r_{min}: 1.4 ft -> 2° r~: 1.6 ft r_{max}: 1.8 ft -> 100°

a/b = 1.044 a = 3.3 ft (109°-290°) b = 3.2 ft (38°-185°)

Area from vertical sections: 8 ft², Area from horizontal and vertical sections: 8 ft²

SOCON Sonar Well Services, Inc.

Brine Well No: 04 **MAXPLOT** **10/21/2008**



a/b — Horizontal/vertical maximum plot — Largest single area

d_{max}: 3.3 ft 295° <--> 115° r_{min}: 1.4 ft -> 2° r~: 1.6 ft r_{max}: 1.8 ft -> 100°

a/b = 1.044 a = 3.3 ft (109°-290°) b = 3.2 ft (38°-185°)

Largest single area: 8 ft² in depth: 1911.0 ft, Area from horizontal and vertical sections: 8 ft²

SOCON Sonar Well Services, Inc.

Table of radii

Brine Well No: 04 083069 10/21/2008

Depth: 1910.0 ft

[°]	Radii in [ft]									
0	1.1	1.1	1.2	1.2	1.2	1.2	1.2	1.3	1.3	1.3
50	1.3	1.3	1.4	1.4	1.4	1.4	1.4	1.5	1.5	1.5
100	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
150	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
200	1.5	1.5	1.5	1.5	1.4	1.4	1.4	1.4	1.4	1.3
250	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
300	1.2	1.2	1.2	1.1	1.1	1.1	1.0	1.0	1.1	1.1
350	1.1	1.1								

Depth: 1911.0 ft

[°]	Radii in [ft]									
0	1.4	1.4	1.4	1.4	1.4	1.4	1.5	1.5	1.5	1.5
50	1.5	1.5	1.5	1.5	1.5	1.6	1.6	1.7	1.7	1.7
100	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.7
150	1.7	1.7	1.7	1.7	1.8	1.8	1.8	1.8	1.7	1.6
200	1.6	1.6	1.6	1.5	1.5	1.5	1.5	1.5	1.5	1.5
250	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
300	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
350	1.4	1.4								

Depth: 1912.0 ft

[°]	Radii in [ft]									
0	0.7	0.7	0.8	0.8	0.8	0.9	0.9	0.9	0.9	1.0
50	1.0	1.0	1.0	1.0	1.0	1.1	1.1	1.1	1.1	1.1
100	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
150	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.0
200	1.0	1.0	0.9	0.8	0.7	0.7	0.6	0.6	0.6	0.6
250	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
300	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6
350	0.6	0.7								

Depth: 1914.0 ft

[°]	Radii in [ft]									
0	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
50	0.8	0.8	0.8	0.8	0.9	0.9	1.0	1.1	1.1	1.2
100	1.2	1.2	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.2
150	1.3	1.3	1.3	1.3	1.2	1.1	1.1	1.0	0.9	0.9
200	0.8	0.7	0.7	0.6	0.6	0.5	0.5	0.4	0.4	0.4
250	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
300	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.6
350	0.6	0.6								

SOCON Sonar Well Services, Inc.

Table of radii

Brine Well No: 04 083069 10/21/2008

Depth: 1916.0 ft

[°]	Radii in [ft]									
0	0.9	0.9	0.9	0.9	0.9	1.0	1.0	1.0	1.0	1.1
50	1.1	1.1	1.1	1.1	1.2	1.2	1.2	1.2	1.3	1.3
100	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.4
150	1.4	1.5	1.5	1.4	1.3	1.1	1.1	1.1	1.1	1.0
200	1.0	1.0	1.0	0.9	0.9	0.9	0.9	0.9	0.8	0.8
250	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
300	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
350	0.9	0.9								

Depth: 1918.0 ft

[°]	Radii in [ft]									
0	0.8	0.8	0.9	0.9	0.9	1.0	1.0	1.0	1.0	1.0
50	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9
100	0.9	0.9	0.9	0.8	0.8	0.7	0.6	0.6	0.5	0.4
150	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3
200	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
250	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4
300	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.6	0.7	0.7
350	0.7	0.8								

Depth: 1920.0 ft

[°]	Radii in [ft]									
0	0.7	0.7	0.7	0.7	0.8	0.9	0.9	1.0	1.0	1.0
50	1.0	1.0	1.0	1.0	1.0	0.9	0.9	0.9	0.9	0.9
100	0.9	0.8	0.8	0.7	0.7	0.6	0.5	0.5	0.5	0.4
150	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3
200	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2
250	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3
300	0.3	0.4	0.4	0.4	0.5	0.5	0.6	0.6	0.6	0.6
350	0.6	0.7								

Depth: 1925.0 ft

[°]	Radii in [ft]									
0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
50	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
100	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
150	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
200	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
250	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
300	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
350	0.5	0.5								

SOCON Sonar Well Services, Inc.

Table of radii

Brine Well No: 04 083069 10/21/2008

Depth: 1930.0 ft

[°]	Radii in [ft]									
0	0.6	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.9	0.9
50	0.9	0.9	0.9	0.9	0.9	0.9	1.0	1.0	1.0	1.0
100	1.0	1.0	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.7
150	0.7	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.4
200	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
250	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5
300	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6
350	0.6	0.6								

Depth: 1935.0 ft

[°]	Radii in [ft]									
0	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.5	0.5
50	0.6	0.6	0.7	0.7	0.7	0.8	0.8	0.9	0.9	1.0
100	1.0	1.0	1.0	1.1	1.1	1.1	1.1	1.1	1.2	1.1
150	1.0	1.0	0.9	0.9	0.8	0.7	0.7	0.6	0.5	0.5
200	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3
250	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
300	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3
350	0.3	0.3								

Depth: 1940.0 ft

[°]	Radii in [ft]									
0	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.8	0.8	0.8
50	0.9	0.9	0.9	0.9	0.9	1.0	1.0	1.0	1.0	1.0
100	1.0	1.0	1.0	1.0	1.1	1.1	1.0	1.0	1.0	1.0
150	1.0	0.9	0.9	0.8	0.8	0.7	0.6	0.6	0.6	0.5
200	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3
250	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
300	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4
350	0.5	0.5								

Depth: 1942.0 ft

[°]	Radii in [ft]									
0	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.8	0.8	0.9
50	0.9	0.9	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0
100	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.0	1.0	1.0
150	1.0	1.0	0.9	0.8	0.8	0.7	0.7	0.6	0.6	0.5
200	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3
250	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
300	0.3	0.3	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5
350	0.6	0.6								

SOCON Sonar Well Services, Inc.

Table of radii

Brine Well No: 04 083069 10/21/2008

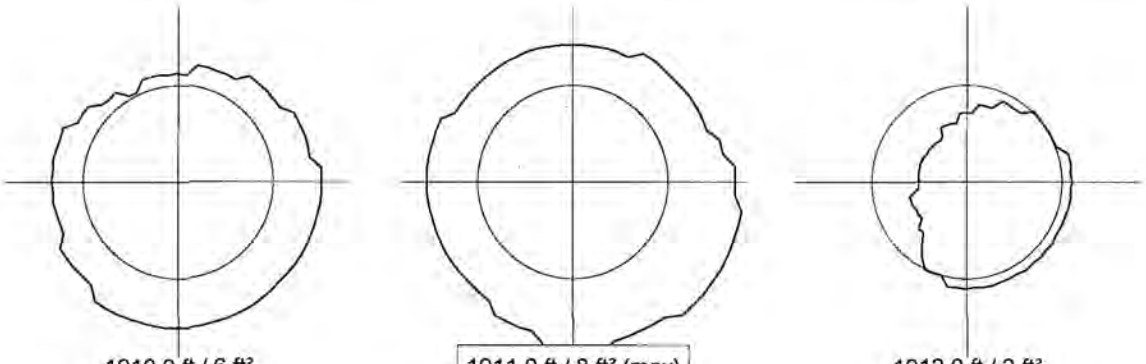
Depth: 1944.0 ft

[°]	Radii in [ft]									
0	0.6	0.6	0.7	0.7	0.7	0.8	0.8	0.8	0.9	0.9
50	0.9	0.9	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0
100	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9
150	0.9	0.9	0.8	0.8	0.7	0.7	0.7	0.6	0.6	0.6
200	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4
250	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4
300	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5
350	0.6	0.6								

SOCON Sonar Well Services, Inc.

Horizontal slices 1 - 12

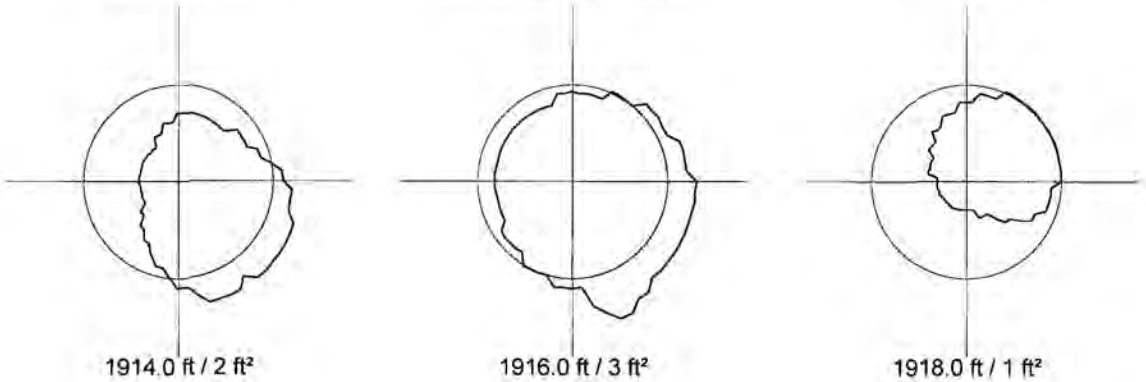
Cavity: Brine Well No: 04 Report number: 083069 Date: 10/21/2008



1910.0 ft / 6 ft²

1911.0 ft / 8 ft² (max)

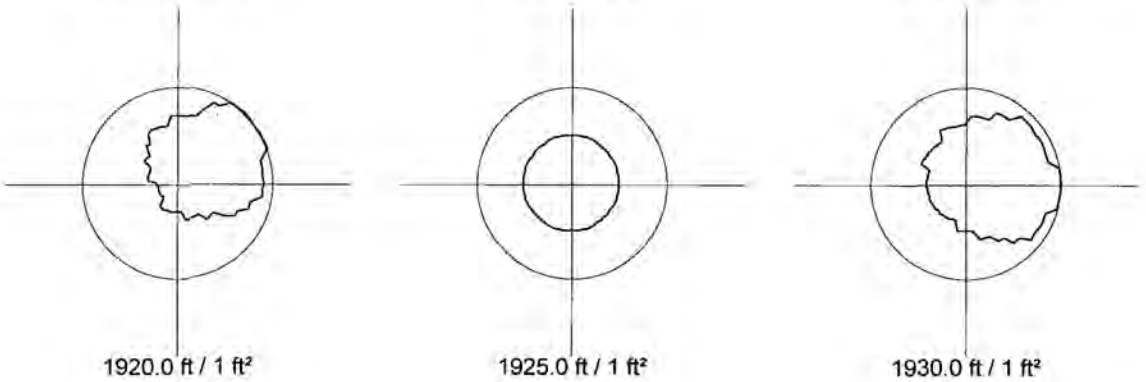
1912.0 ft / 2 ft²



1914.0 ft / 2 ft²

1916.0 ft / 3 ft²

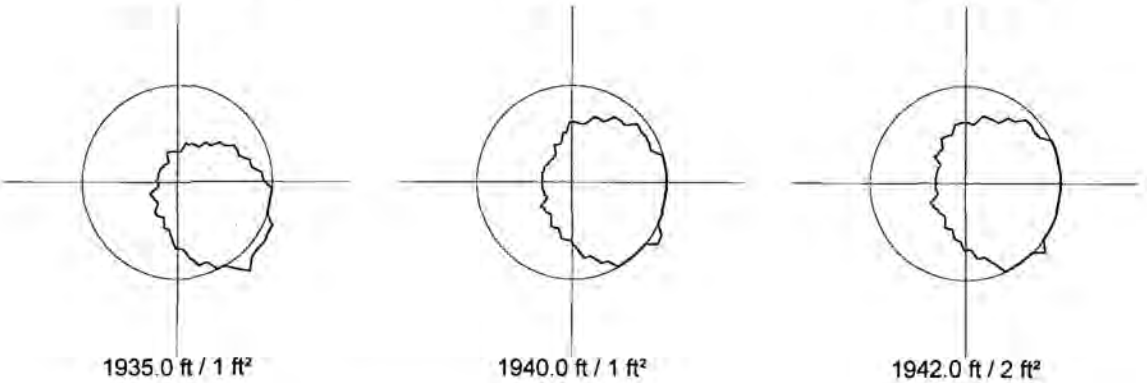
1918.0 ft / 1 ft²



1920.0 ft / 1 ft²

1925.0 ft / 1 ft²

1930.0 ft / 1 ft²



1935.0 ft / 1 ft²

1940.0 ft / 1 ft²

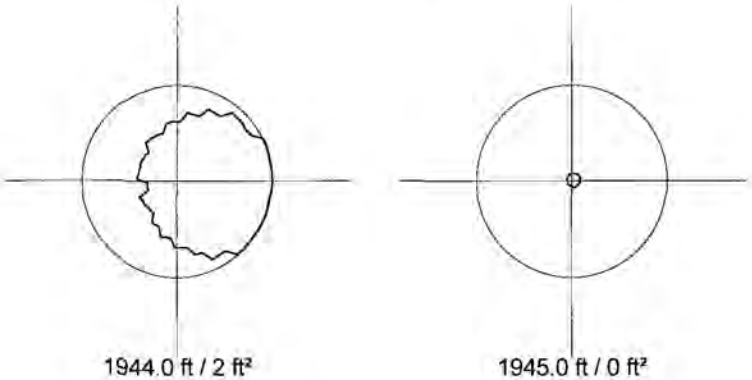
1942.0 ft / 2 ft²

The distance between 2 circles equals 1 ft

SOCON Sonar Well Services, Inc.

Horizontal slices 13 - 14

Cavity: Brine Well No: 04 Report number: 083069 Date: 10/21/2008



1944.0 ft / 2 ft²

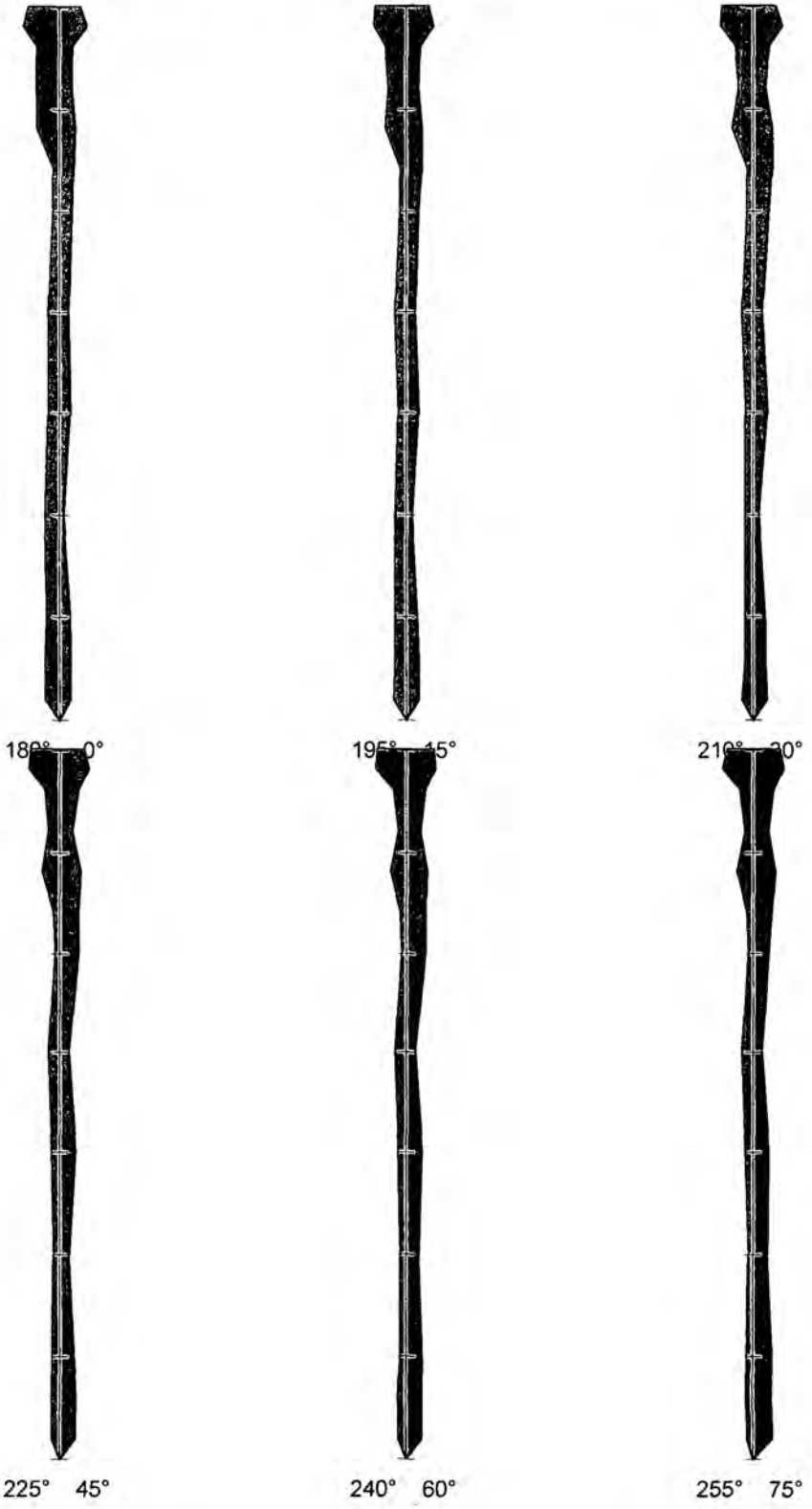
1945.0 ft / 0 ft²

The distance between 2 circles equals 1 ft

SOCON Sonar Well Services, Inc.

Vertical slices 1 - 6

[redacted] Cavity: Brine Well No: 04 Report number: 083069 Date: 10/21/2008



Range from 1910 ft to 1945 ft, step 5 ft

SOCON Sonar Well Services, Inc.

Vertical slices 7 - 12

[redacted] Cavity: Brine Well No: 04 Report number: 083069 Date: 10/21/2008

270° 90°

285° 105°

300° 120°

315° 135°

330° 150°

345° 165°

Range from 1910 ft to 1945 ft, step 5 ft

Chavez, Carl J, EMNRD

From: Chavez, Carl J, EMNRD

Sent: Wednesday, November 12, 2008 11:50 AM

To: 'ziatransports@gmail.com'; 'jrmillett@gmail.com'; 'Patterson, Bob'; Phillber, Mark; 'rharrisnm@aim.com'; 'gandy2@leaco.net'; 'David Pyeatt'; 'garymschubert@aol.com'

Cc: Price, Wayne, EMNRD; Sanchez, Daniel J., EMNRD; Hill, Larry, EMNRD; Gum, Tim, EMNRD

Subject: Brine Well Sonar Testing Requirement with this season's upcoming MIT Schedule 2009

Gentlemen:

Re: MITs and OCD Sonar Test Requirement

Good morning. It is that time of season when the OCD requests your proposed MIT schedule. The OCD is requiring a sonar test in addition to the MIT this season. The OCD objective is to complete the MITs on or before July 31, 2009. If circumstances require it, the deadline for MITs may be extended to on or before October 31, 2009. Please contact me within 30 days to schedule your MIT and sonar test with date and time that you prefer. Note that brine well operators scheduled for the annual OCD 4-hr. formation MIT may conduct the EPA 5-Yr. 30 minute MIT (+/- 10% to pass) at 300 – 500 psig on casing in lieu of the OCD annual formation MIT this season.

After reviewing the site files and your responses to the recent OCD questionnaire following the Jims Water Service (BW-5) brine well collapse SE of Artesia in Eddy County on 7/16/2008, and the more recent collapse at Loco Hills (BW-21) in Eddy County on 11/3/2008, the OCD is requiring Sonar Testing along with your MIT this season to assess the configuration of your brine well cavern and any threats to public health and safety in your areas. The OCD is focused on the maturity of brine wells and the "Calculation" from the recent questionnaire attempts to assess brine well maturity by comparing the total brine production relative to the depth of the brine well casing shoe. This is one of the reasons why fresh water and brine well production record reporting to the OCD is so critical. Any operators that are planning to plug and abandon their brine wells are required by the OCD to conduct a sonar test of the well in advance of plugging and abandonment. Also, the OCD requires that the brine cavern be filled with brine fluid as this adds structural stability to the cavern and well. This will be required in a C-103 approved with conditions by the OCD. Currently, 3 brine well operators have been required by the OCD to conduct sonar testing within 30 days due to the maturity issue mentioned above. The OCD is continuing to assess its EPA Class III Brine Well program and will keep you updated on improvements and/or changes as needed.

If you feel that your brine well is too new to require sonar testing or a sonar was recently completed at your brine well, please provide the basis for requesting an exemption to this OCD sonar test requirement ASAP for OCD approval.

Please contact me if you have questions. Thanks in advance for your cooperation in this matter.

Carl J. Chavez, CHMM
New Mexico Energy, Minerals & Natural Resources Dept.
Oil Conservation Division, Environmental Bureau
1220 South St. Francis Dr., Santa Fe, New Mexico 87505
Office: (505) 476-3491
Fax: (505) 476-3462
E-mail: CarlJ.Chavez@state.nm.us
Website: http://www.emnrd.state.nm.us/ocd/index.htm
(Pollution Prevention Guidance is under "Publications")

New Mexico Energy, Minerals and Natural Resources Department

Bill Richardson
Governor

Joanna Prukop
Cabinet Secretary
Reese Fullerton
Deputy Cabinet Secretary

Mark Fesmire
Division Director
Oil Conservation Division

OIL CONSERVATION DIVISION
BRINE WELL INFORMATION REQUEST

GENERAL INFORMATION:

Operator Name Gandy Corp Well Name(s) Eidson St. #1
API Number 30-025-26883 Brine Well Permit # BW-04
Date Permit Expires? 2011

Location: Section 31 Ts 16 Rg 35
FNL ____ FSL 567 FEL ____ FWL 162
GPS of well(s): Lat: 32° 52' 23" Long: 103° 30' 16"
Unit M

Have you reviewed and understand all of your permit conditions? Yes ☒ No ☐
Are you presently deficient of any condition in your permit? Yes ☐ No ☐ Don't know ☒
Do you operate below grade tanks or pits at the site? Yes ☒ No ☐
Do all tanks, including fresh water tanks, have secondary containment? Yes ☒ No ☐
Do you think you have the expertise, knowledge and general understanding of what causes a brine well to collapse? Yes ☒ No ☐
Do you think OCD should provide guidelines on subsidence and collapse issues? Yes ☒ No ☐

SITING INFORMATION: *Please provide the following information and depict on 7.5 minute (1": 2000') USGS Quad Map. Limit search to one mile radius.*

Is the brine well located within a municipality or city limits? Yes ☐ No ☒

Distance and direction to nearest permanent structure, house, school, *etc. if less than one mile:*
Attached

Distance and direction to nearest water well *if less than one mile:*
Attached

Distance to nearest watercourse(s), floodplain, playa lake(s), or man-made canal(s) or pond(s) *if less than one mile:* Attached

Distance and direction to nearest known karst features or mines *if less than one mile:*
Attached

Distance and direction to nearest producing oil or gas well(s) *if less than one mile:* Provide API Number: Attached
Distance and direction to nearest tank battery(ies) *if less than one mile:* Attached
Distance and direction to nearest pipeline(s), including fresh water pipelines *if less than one mile:* Attached
Distance and direction to nearest paved or maintained road or railroad *if less than one mile:* Attached
Depth to ground water found above the Salado (salt section), regardless of yield: Attached
Name of aquifer(s): Attached
WELL CONSTRUCTION: ***Please provide the following information and attach a diagram depicting the brine well. Check box if attached:*** *Copy of a current well diagram:* *Attached* ☒ *Copy of formation record with tops:* *Attached* ☒ *Copy of geophysical well logs if available:* *Attached* ☐ *If not, well logs within one mile* ☐
Depth of the top of the salt below ground surface (feet): Attached
Depth to the bottom of the salt below ground surface (feet): Attached
Depth(s) to and thickness(es) of any anhydrite section(s) (located above the salt): Attached
Depth of casing(s) shoe below ground surface (feet): 1895 Is the casing shoe set in the anhydrite or other layer above the salt? Yes ☒ No ☐ Is the casing shoe set into the salt? Yes ☒ No ☐ If yes, how far into the salt? Top
Depth of tubing(s): 2461
Do you suspect that your cavern has partially caved in? Yes ☐ No ☐ Don't know ☒
OPERATIONS: *Please provide the following information.*
Start date of brine well operation: 1980
Total volume of fresh water injected into the brine well to date (bbls) and how determined: total bls brine X 7 36977360 . fresh water calculated

Total volume of brine water produced (bbls) to date and how determined: Average 188660 per yr for 28 yrs = 5,282,480 bbls brine
Have you ever lost casing or tubing? If yes, please provide details. Document attached ☒ Recently tryingto run sonar log.
Do you maintain a surface pressure on your well during idle times? Yes☒ No☐
Have you noticed large amounts of air built up during cavity pressurization? Yes☐ No☒
Have you ever noticed fluids or air/gas bubbling up around the casing during testing or normal operations? Yes☐ No☒
MONITORING: *Please provide the following information.*
Are you currently monitoring ground water contamination from your brine well or system? Yes ☒ No☐ The supply well is tested.
Have you ever run a sonar log? Yes☒ No☐ Tried to. *If yes,* please provide last date: 8/2008 No log
Provide cavern configuration (dimensions and volume) and method(s) used to estimate: If sonar report please attach ☐ *If other, please specify and provide a sketch of cavern:* ☐
Do you have a subsidence monitoring program in place? Yes ☐ No☒
Do you have any geophysical monitoring devices, such as a seismic device positioned near your brine well? Yes ☐ No☒
Have you submitted all of your monthly, quarterly, or annual reports to the OCD? Yes ☒ No☐
Have you failed a brine well mechanical integrity test (MIT)? If yes, please attach details and results. Attached ☐ No
Have you ever had a casing leak? Yes ☐ No☐ Have you ever had a cavern leak? Yes ☐ No☐ Don't know ☒ Have you ever exceeded the cavern fracture pressure? Yes ☐ No☒ Don't know ☐ Do you know how to calculate your maximum pressure? Yes ☐ No☒ Don't know ☐ stop Rate test
Have you routinely looked for cracks or fissures in the ground surface around your brine well? Yes ☒ No☐ Gandy inspects location daily for all problems
Do you have any minor or major cracks, fissures, tank settlement, line breakage from settlement or any minor subsidence. Yes ☐ No☒
During operations have you experienced any ground vibration, ground movement, or well movement after opening or shunting valves, pump start-up, shut-down, etc.? Yes☐ No☒

Have you ever experienced unexpected pressure gain or loss in the cavern? Yes☐ No☒ If Yes, was there a difference in your normal flow rate? Yes☐ No☐
Anytime during the past 5 years, have you experienced a noticeable difference between fresh water volume pumped into the well verses brine water produced? Yes ☐ No☒
Are you concerned about pulling the tubing due to the fact it may be difficult to re-enter the hole? Yes☒ No☐
Are you concerned about running a sonar tool in fear of losing tool because of debris in hole? Yes☒ No☐ Fear of loosing hole
Have you ever conducted a fly over of your well site? No☒ *Yes☐ if yes, please provide photo.* ☐ *Photo(s) attached*
Calculation: Please divide your estimated total volume of produced brine by 180,000 and multiply by 50. ***Example:*** If you have produced a total of 18,000,000 bbls of brine in the life time of the well then your calculation would be 18,000,000/180,000 = 100 x 50 = 5000. 1. Provide the calculated number above here: 1467.3. 2. Now provide the depth (ft) from the surface to your casing shoe: 1895. Is the calculated number found in #1 above greater than #2? Yes☐ No☒
Comments or recommendations for OCD:

"I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment."

Gandy Corp.
Company Name-print name above

Eddie W Seay
Company Representative- print name

Eddie W Seay
Company Representative- Signature

Title Agent

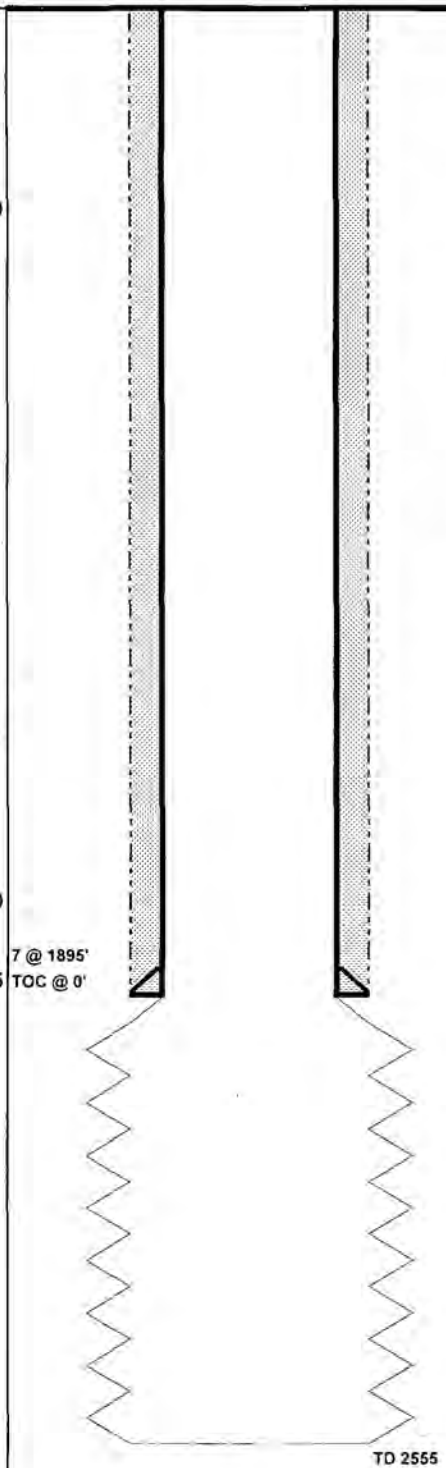
Date: 8/30/2008

API NUMBER	30-025-26883
OPERATOR	GANDY CORP
PROPERTY NAME	EIDSON STATE # 1
LOCATION	M-31-T16S-R35E 567 FSL 162 FWL
DEPTH TOP SALT BELOW G.L.	1895 FEET
DEPTH BASE SALT BELOW G.L.	2900 FEET
THICKNESS ANHYDRITE ABOVE SALT	95 FEET
LOGS WITHIN 1 MILE	All AVAILABLE ON OCD ONLINE 30-025-27837
County Road 238	0.06 miles SE
Water Well	
Water Well (Chevron CVU)	0.14 miles SE
Supply Well	0.03 miles W
Structures & Buildings	
None	
Tank Batteries	
Chesapeake Bat	0.27 miles SW
BTA Bat	0.26 miles NE
Pipe Lines	
Gas Pipeline (E-W)	0.16 miles NW
Duke Pipeline (E-W)	0.21 miles S
Navajo Pipeline (E-W)	0.35 miles S
DEPTH TO GROUND WATER **OGALLALA** **SANTA ROSA**	 60-220 FEET 1400-1895 FEET
Playa	0.25 miles SE

WELLBORE SCHEMATIC AND HISTORY

COMPLETION SCHEMATIC

FORM	DEPTH
Base Ogallala	220
Top Red Beds	
t. Santa Rosa	1400
b Santa Rosa	1570
Rustler	1800
Top Salt	1895
Base Salt	2900



APINUM:	30-025-26883				
OPERATOR:	GANDY CORP				
LEASENAME:	EIDSON STATE			WELL NO.	1
LOCATION:	UL: M	SEC: 31	TWN: 16S	RNG:	35E
	567 FSL		162 FWL		
TD	PBD	KB	DF		
		GL 4032			
POOL		Open Hole 1895-2555			
BSW;SALADO					
POOL		PERFS			
POOL		PERFS			

CASING RECORD

	SIZE	DEPTH	CMT	HOLE SIZE	TOC
PROD.	7	1895	na	9 7/8	0' CIRC

PREPARED BY:	Eddie Seay	UPDATED	08/23/08

BRINE WELL

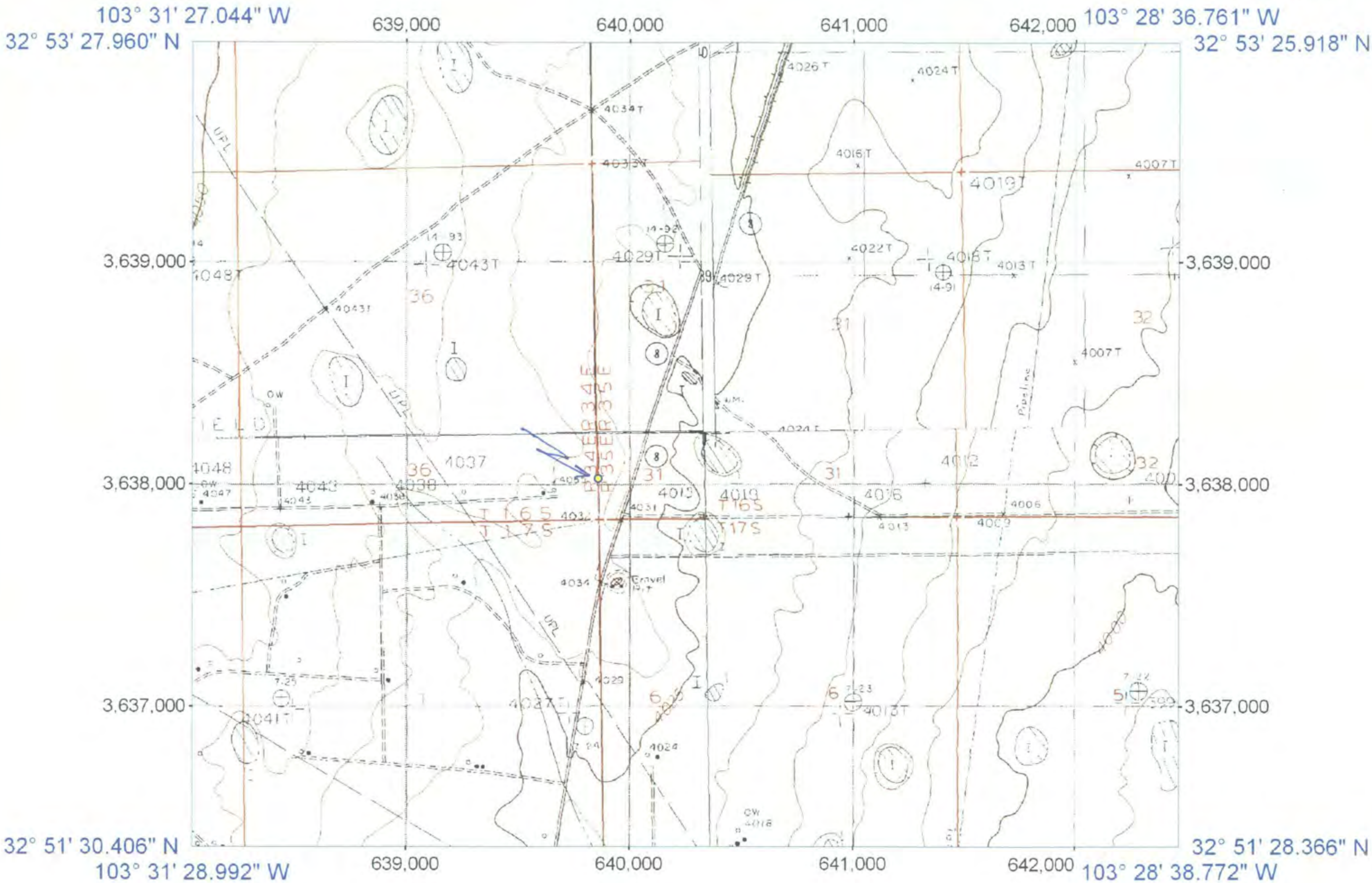
30-025-26883	EIDSON STATE	1	GANDY CORP		BSW	A	Lea		M	31	16	S	35	E	567	S	162	W	

Wells within 1 mile of Gandy Corp, Eidson State # 1 brine well

															5280		5280		
API #	**PROPERTY NAME**	**#**	**OPERATOR**	**TD**	**TYPE**	**STAT**	**CO**	**L**	**U/L**	**SEC**	**TWN**		**RNG**		**N/S**		**E/W**		**Distance**	**Dir**
3002524594	NORTH VACUUM ABO NORTH UNIT	1	SAGE ENERGY CO	8940	I	A	Lea	S	N	36	16	S	34	E	460	S	1980	W	**3463**	W
3002524648	NORTH VACUUM ABO NORTH UNIT	2	SAGE ENERGY CO	8925	O	A	Lea	S	L	36	16	S	34	E	1780	S	460	W	**5127**	W
3002525146	NORTH VACUUM ABO NORTH UNIT	1	SAGE ENERGY CO	8980	O	A	Lea	S	P	36	16	S	34	E	460	S	660	E	**828**	W
3002525170	NORTH VACUUM ABO NORTH UNIT	2	SAGE ENERGY CO	8950	O	A	Lea	S	O	36	16	S	34	E	460	S	1980	E	**2144**	WSW
3002533184	EUREKA 36 STATE	1	CIMAREX ENERGY CO OF COLORADO	12962	G	A	Lea	S	F	36	16	S	34	E	1980	N	1650	W	**4674**	WNW
3002534356	NORTH VACUUM ABO NORTH UNIT	163	SAGE ENERGY CO	8808	O	A	Lea	S	M	36	16	S	34	E	660	S	660	W	**4782**	W
3002536389	EUREKA 36 STATE	2	CIMAREX ENERGY CO OF COLORADO	12820	G	A	Lea	S	N	36	16	S	34	E	810	S	1860	W	**3590**	W
3002537018	NORTH VACUUM ABO NORTH UNIT	123	SAGE ENERGY CO	8883	O	A	Lea	S	O	36	16	S	34	E	608	S	1777	E	**1939**	WSW
3002537993	ENCORE 36 STATE	1	ENCORE OPERATING LP	13030	G	A	Lea	S	J	36	16	S	34	E	1330	S	1750	E	**2058**	W
3002531621	VACUUM 9205 JV-P	1	BTA OIL PRODUCERS	12900	O	A	Lea	S	L	31	16	S	35	E	1980	S	660	W	**1498**	N
3002532958	VACUUM 31	1	PETROHAWK OPERATING COMPANY	12750	G	A	Lea	S	O	31	16	S	35	E	660	S	1980	E	**3139**	E
3002524176	NORTH VACUUM ABO NORTH UNIT	1	SAGE ENERGY CO	8850	I	A	Lea	S	J	1	17	S	34	E	1780	S	2000	E	**4605**	SE
3002524341	NORTH VACUUM ABO NORTH UNIT	1	SAGE ENERGY CO	8830	I	A	Lea	S	P	1	17	S	34	E	660	S	860	E	**5286**	SE
3002524487	NORTH VACUUM ABO NORTH UNIT	1	SAGE ENERGY CO	8830	I	A	Lea	S	F	1	17	S	34	E	2180	N	1980	W	**4419**	WSW
3002524631	NORTH VACUUM ABO NORTH UNIT	1	SAGE ENERGY CO	8910	I	A	Lea	S	B	1	17	S	34	E	800	N	2120	E	**2660**	SW
3002524645	NORTH VACUUM ABO NORTH UNIT	2	SAGE ENERGY CO	8940	I	A	Lea	S	H	1	17	S	34	E	1980	N	860	E	**2744**	S
3002525059	NORTH VACUUM ABO NORTH UNIT	1	SAGE ENERGY CO	8845	I	A	Lea	S	D	1	17	S	34	E	860	N	660	W	**4990**	WSW
3002525206	NORTH VACUUM ABO NORTH UNIT	2	SAGE ENERGY CO	8830	O	A	Lea	S	E	1	17	S	34	E	1980	N	860	W	**5242**	WSW
3002527953	STATE VI	1	CHESAPEAKE OPERATING, INC.	12250	G	TA	Lea	S	P	1	17	S	34	E	990	S	990	E	**4991**	S
3002532243	NORTH VACUUM ABO NORTH UNIT	2	SAGE ENERGY CO	8800	O	A	Lea	S	K	1	17	S	34	E	1980	S	1980	W	**5190**	SW
3002532244	NORTH VACUUM ABO NORTH UNIT	2	SAGE ENERGY CO	8844	O	A	Lea	S	I	1	17	S	34	E	1980	S	660	E	**3953**	SSW
3002532721	NORTH VACUUM ABO NORTH UNIT	73	SAGE ENERGY CO	8860	O	A	Lea	S	G	1	17	S	34	E	1980	N	1980	E	**3327**	SW
3002535678	STATE VII	7	CHESAPEAKE OPERATING, INC.	12750	G	A	Lea	P	A	1	17	S	34	E	660	N	660	E	**1476**	SSW
3002536333	BUCKEYE 1 STATE	1	FASKEN OIL & RANCH LTD	12600	O	A	Lea	S	D	1	17	S	34	E	820	N	1310	W	**4358**	WSW
3002502814	STATE A	1	WARREN & BRADSHAW E	87	O	P&A	Lea	S	L	6	17	S	35	E	1650	S	330	W	**4200**	S
3002525282	STATE K 6119 COM	1	SOUTHWEST ROYALTIES INC	8925	O	A	Lea	S	L	6	17	S	35	E	1980	S	660	W	**3898**	S
3002536166	SAGEBRUSH	1	SAGE ENERGY CO	8884	O	A	Lea	S	E	6	17	S	35	E	2286	N	660	W	**2896**	S
3002538000	ENCORE 6 STATE COM	1	ENCORE OPERATING LP	12850	G	A	Lea	S	F	6	17	S	35	E	1650	N	1650	W	**2670**	SSE
3002538368	ENCORE 6 STATE COM	2	ENCORE OPERATING LP	12820	G	A	Lea	S	A	6	17	S	35	E	1190	N	790	E	**4671**	ESE


32.8731623 -103.5050261
©2008 Google
Image © 2008 DigitalGlobe

BigTopo



0 ¼ ½ Mile

0 1000 2000 Feet

0 0[illegible]lometer

1927 North American Datum; UTM grid zone 13
Generated by BigTopo7 (www.igage.com)
Map compiled from USGS Quads: Buckeye NE; NM Lovi[illegible]n NW; NM Buckeye; NM
'BigTopo.it5' Scale: [illegible] = 0.379Mi 610Mt 2,000Ft, 1 Mi = 2.640", 1 cm = 240Mt

UTM Grid and 2008 Magnetic North Declination at Center of Sheet

BigTo[illegible] Map

RECEIVED
2008 SEP 9 PM 2 55

August 30, 2008

NMOCD Environmental
ATTN: Wayne Price
1220 S. St. Francis Dr.
Santa Fe, NM 87505

RE: Gandy Corp.
BW-04
BW-022

Mr. Price:

Find within the information requested on the two brine wells that Gandy Corp. operates. Information was obtained from operator personnel, well files and physical observation.

Should you need anything further, please call.

Sincerely,

Eddie W. Seay

Eddie W. Seay, Agent
Eddie Seay Consulting
601 W. Illinois
Hobbs, NM 88242
(575)392-2236
seay04@leaco.net

cc: Gandy Corp.

New Mexico Office of the State Engineer
POD Reports and Downloads

Township: 16S Range: 35E Sections: 31

NAD27 X: Y: Zone: Search Radius:

County: LE Basin: Number: Suffix:

Owner Name: (First) (Last) ○Non-Domestic ○Domestic ◉All

POD / Surface Data Report | Avg Depth to Water Report | Water Column Report

Clear Form | iWATERS Menu | Help

WATER COLUMN REPORT 10/08/2008

(quarters are 1=NW 2=NE 3=SW 4=SE)
(quarters are biggest to smallest)

POD Number	Tws	Rng	Sec	q	q	q	Zone	X	Y	Depth Well	Depth Water	Water Column (in feet)
L 10270	16S	35E	31	3	1	4				180	70	110
L 10482 2	16S	35E	31	4	3					165		
L 10482	16S	35E	31	4	3	3				190	75	115

Record Count: 3

New Mexico Office of the State Engineer
POD Reports and Downloads

Township: 16S Range: 35E Sections: 31

NAD27 X: Y: Zone: Search Radius:

County: LE Basin: Number: Suffix:

Owner Name: (First) (Last) ○ Non-Domestic ○ Domestic
◉ All

POD / Surface Data Report | Avg Depth to Water Report | Water Column Report

Clear Form | iWATERS Menu | Help

AVERAGE DEPTH OF WATER REPORT 10/08/2008

Bsn	Tws	Rng	Sec	Zone	X	Y	Wells	(Depth Water in Feet) Min	Max	Avg
L	16S	35E	31				2	70	75	73

Record Count: 2

Chavez, Carl J, EMNRD

From: Chavez, Carl J, EMNRD
Sent: Friday, October 03, 2008 9:06 AM
To: 'Larry Gandy'
Cc: Gum, Tim, EMNRD; Price, Wayne, EMNRD; Leking, Geoffrey R, EMNRD
Subject: BW-4 (C-103) & BW-22 (C-103) w/ recent Sonar Testing & MITs Info.
Attachments: BW-4.tif; BW-22.tif

Larry:

Please find attached signed OCD C-103 Forms for the above discharge permitted facilities. The OCD is awaiting receipt of the final C-103's for each facility with Gandy's final actions. The OCD would appreciate receipt of the final C-103 Forms within 30 days to determine the status of the work.

Recent Sonar Activities and MITs

BW-4:

MIT: A packer was set at 1738 ft. (casing shoe set at 1895 ft.) A 30 min. EPA casing test was run on 8/27/08 and passed. The packer was set ~157 feet above the casing shoe. In the future, the packer should be set near (within at least 20 ft.) the casing shoe depth.

Sonar: The tubing got stuck in the hole while trying to run the sonar test. Consequently, Gandy cut the tubing and discarded pipe into the cavern w/ OCD approval in the field. A sonar could not be performed.

BW-22:

MIT: The packer was set at 2139 ft. (casing shoe set at 2905 ft.). A 30 min. EPA casing test was run on 8/28/2008 and passed. The packer was set !~766 feet above the casing shoe. In the future, the packer should be set near (within at least 20 ft.) the casing shoe depth.

Sonar: The sonar was run; however, the centralizer on the sonde got hung up about 28 ft. below the bottom of the casing shoe. The OCD approved in the field the sonar shooting upward at the roof of the cavern in order to complete a limited sonar test of the roof of the cavern. The OCD is awaiting the final report.

The above attachments will be scanned into the OCD Online soon. Please contact me if you have questions. Thank you.

Carl J. Chavez, CHMM
New Mexico Energy, Minerals & Natural Resources Dept.
Oil Conservation Division, Environmental Bureau
1220 South St. Francis Dr., Santa Fe, New Mexico 87505
Office: (505) 476-3491
Fax: (505) 476-3462
E-mail: CarlJ.Chavez@state.nm.us
Website: http://www.emnrd.state.nm.us/ocd/index.htm
(Pollution Prevention Guidance is under "Publications")

Submit 3 Copies To Appropriate District Office
District I
1625 N. French Dr., Hobbs, NM 88240
District II
1301 W. Grand Ave., Artesia, NM 88210
District III
1000 Rio Brazos Rd., Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy, Minerals and Natural Resources

OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-103
June 19, 2008

WELL API NO. 30-025-26883
5. Indicate Type of Lease STATE [X] FEE [ ]
6. State Oil & Gas Lease No.

SUNDRY NOTICES AND REPORTS ON WELLS
(DO NOT USE THIS FORM FOR PROPOSALS TO DRILL OR TO DEEPEN OR PLUG BACK TO A DIFFERENT RESERVOIR. USE "APPLICATION FOR PERMIT" (FORM C-101) FOR SUCH PROPOSALS.)

7. Lease Name or Unit Agreement Name: Eidson Brine Station BW-004
1. Type of Well: Oil Well [ ] Gas Well [ ] Other Brine Well
8. Well Number 1
2. Name of Operator: Gandy Corporation
9. OGRID Number
3. Address of Operator: P.O. Box 2140, Lovington, NM 88260
10. Pool name or Wildcat
4. Well Location
Unit Letter M : 567.4 feet from the South line and 161.7 feet from the West line
Section 31 Township 16 Range 35 NMPM County Lea
11. Elevation *(Show whether DR, RKB, RT, GR, etc.)*

12. Check Appropriate Box to Indicate Nature of Notice, Report or Other Data

NOTICE OF INTENTION TO:		SUBSEQUENT REPORT OF:	
PERFORM REMEDIAL WORK [X]	PLUG AND ABANDON [ ]	REMEDIAL WORK [ ]	ALTERING CASING [ ]
TEMPORARILY ABANDON [ ]	CHANGE PLANS [ ]	COMMENCE DRILLING OPNS. [ ]	P AND A [ ]
PULL OR ALTER CASING [ ]	MULTIPLE COMPL [ ]	CASING/CEMENT JOB [ ]	
DOWNHOLE COMMINGLE [ ]			
OTHER: [ ]		OTHER: [ ]	

13. Describe proposed or completed operations. (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work). SEE RULE 1103. For Multiple Completions: Attach wellbore diagram of proposed completion or recompletion.

08/20/08 Pull tubing.

08/21/08 Run wire line & sonar tools for capacity/cavity configuration and subsidence survey.
Run casing scraper.
Run in hole and set packer.
Pressure test casing for MIT.

08/22/08 Run 2 7/8 tubing to approximately 2450' - put back in operation.

RECEIVED
AUG 2008
HOBBS OCD

Spud Date: Rig Release Date:

I hereby certify that the information above is true and complete to the best of my knowledge and belief.

SIGNATURE Larry Gandy TITLE Sec/Treas. DATE 8-20-08

Type or print name Larry Gandy E-mail address: PHONE: 575-398-4960

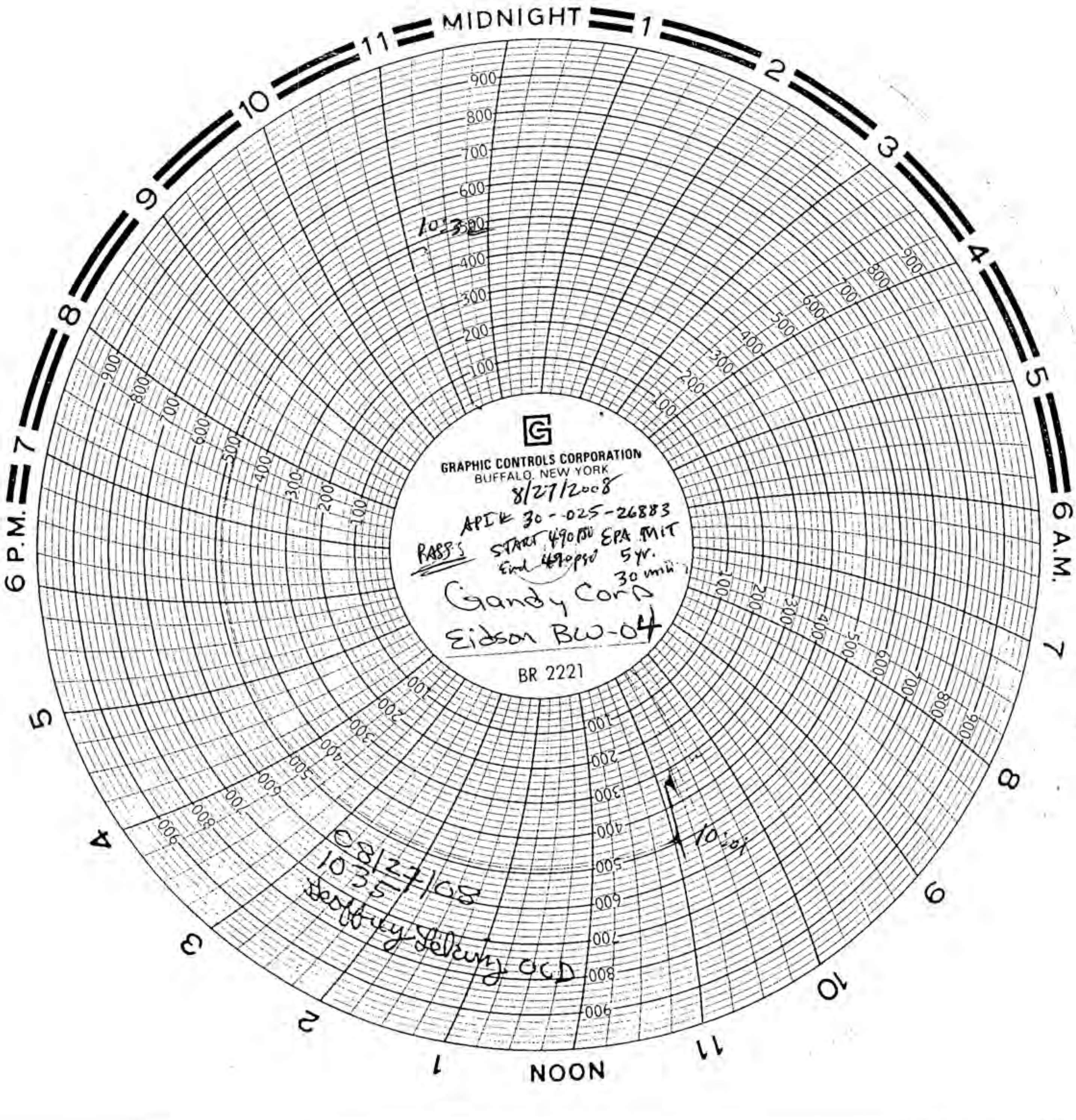
For State Use Only

APPROVED BY: TITLE Geologist DATE

Conditions of Approval (if any):

BBC 9/3/08

packer set @ 1738' (tubing blocking bot of casing.)
casing shoe ~ ~~2000~~ ft 1895 csg



New Mexico Energy, Minerals and Natural Resources Department

Bill Richardson
Governor

Joanna Prukop
Cabinet Secretary
Reese Fullerton
Deputy Cabinet Secretary

Mark Fesmire
Division Director
Oil Conservation Division

Certified Receipt/Return Requested:

August 01, 2008

Attention Brine Well Operator(s):

One of the permitted brine wells has experienced a total collapse and created an enormous sinkhole. The well was located approximately 17 miles SE of Artesia, NM. on State Trust Land. The operator was Jim's Water Service and the brine well permit is BW-005. OCD has enclosed a press release with photos of the event.

The magnitude of this event warrants an immediate investigation of all brine wells in the state. Therefore, please find enclosed a "BRINE WELL INFORMATION REQUEST" form to be filled out and returned to this office no later than September 05, 2008. Failure to properly fill out and return the form in a timely manner may result in OCD requesting you shut down your operations until further notice. If you have any questions please do not hesitate to call me at 505-476-3490 or E-mail wayne.price@state.nm.us.

Sincerely,

Wayne Price
Environmental Bureau Chief
Oil Conservation Division

Attachments: (2)

Cc: EMNRD Cabinet Secretary-Joanna Prukop
OCD Director-Mark Fesmire
NMSLO- Brian Henington SF, Jim Carr-Carlsbad
BLM-Carlsbad Office- Dave Herrell
Eddy Co. Emergency Management-Joel Arnwine
NM State Police –Roswell Sgt. Les Clements
National Cave and Karst Research Institute- Dr. George Veni
NMOSE-John Stewart
Solution Mining Research Institute-John Voigt