BW - 22

SUBSIDENCE MONITORING REPORTS

DATE:

Chavez, Carl J, EMNRD

From: Chavez, Carl J, EMNRD

Sent: Friday, November 14, 2008 4:38 PM

To: 'ziatransports@gmail.com'; 'jrmillett@gmail.com'; 'rharrisnm@aim.com'; 'gandy2@leaco.net'; 'seay04@leaco.net'; 'iwcarlsbad@plateautel.net'; 'Patterson, Bob'; 'Dimas Herrera'; 'gil@mull.us'; 'David Pyeatt'; 'Wayne E Roberts'; Dennis L Shearer; 'garymschubert@aol.com'; 'dgibson@keyenergy.com'; 'Clay Wilson'; 'Prather, Steve'; Ronnie D Devore

Cc: Hill, Larry, EMNRD; Gum, Tim, EMNRD; Price, Wayne, EMNRD

Subject: Brine Well Moratorium Press Release Today

Attachments: PR-OCD Brine Well Moratorium.pdf

FYI, please see the attached NM OCD Press Release issued today. 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
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Website: http://www.emnrd.state.nm.us/ocd/index.htm
(Pollution Prevention Guidance is under "Publications")

New Mexico Energy, Minerals and Natural Resources Department

November 14, 2008

NEWS RELEASE

Contact: Jodi McGinnis Porter,
Public Information Officer 505.476.3226

Energy, Minerals and Natural Resources Cabinet Secretary Prukop Orders a Six Month Moratorium on New Brine Wells

Oil Conservation Division to Investigate Brine Well Collapses and Provide Recommendations

SANTA FE, NM – Secretary Joanna Prukop today ordered the Oil Conservation Division to place a six month moratorium on any new brine well applications located in geologically sensitive areas. Secretary Prukop's action comes following the second brine well collapse in less than four months in southeastern New Mexico. The Secretary has also directed the Oil Conservation Division to work with the Environmental Protection Agency, other states, technical experts and oil and gas industry representatives to examine the causes of recent collapses, and provide a report with recommendations to the Oil Conservation Commission for a safe path forward. The report should be completed by May 1, 2009.

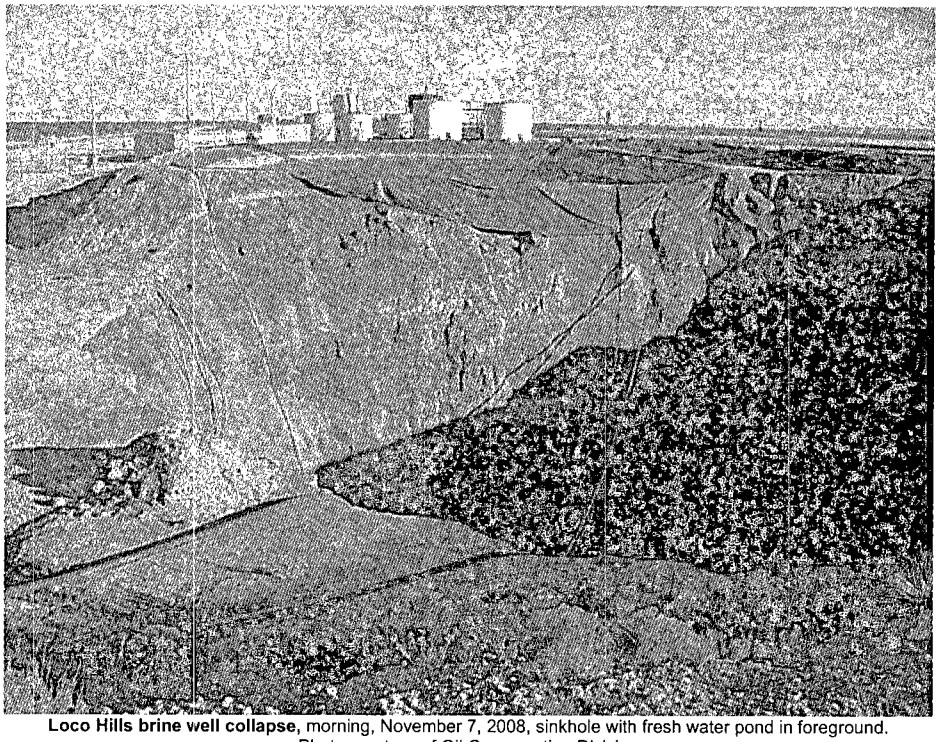
"I am deeply concerned by these two serious incidents and we are taking action to ensure the safety of our citizens and to protect the environment," stated Secretary Prukop.

Brine wells are an essential part of the oil and gas drilling industry, particularly in the southeastern part of the state. Oil and gas operators use brine water in the drilling process. Brine is saturated salt water which can be more salty than sea water. Brine is created by injecting fresh water into salt formations, allowing the water to absorb the salt and then pumping it out of the well. This method creates an underground cavity.

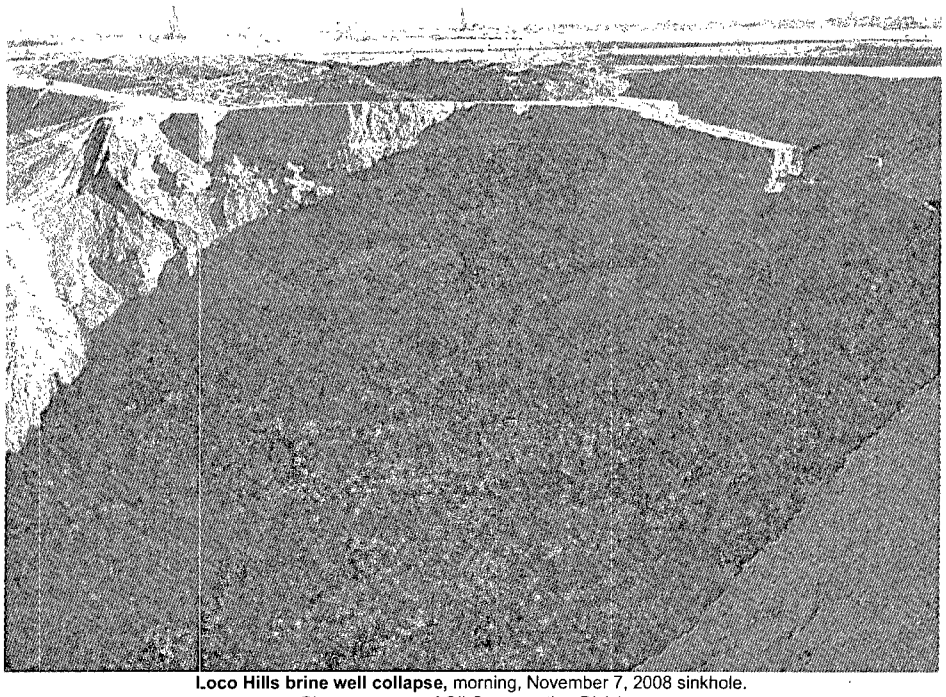
"The moratorium will provide time to properly evaluate the causes of the recent collapses and to discuss the development of new rules or guidelines to ensure the safety and stability of brine well systems," added Secretary Prukop.

The moratorium will only affect new wells and will not impact existing wells and facilities.

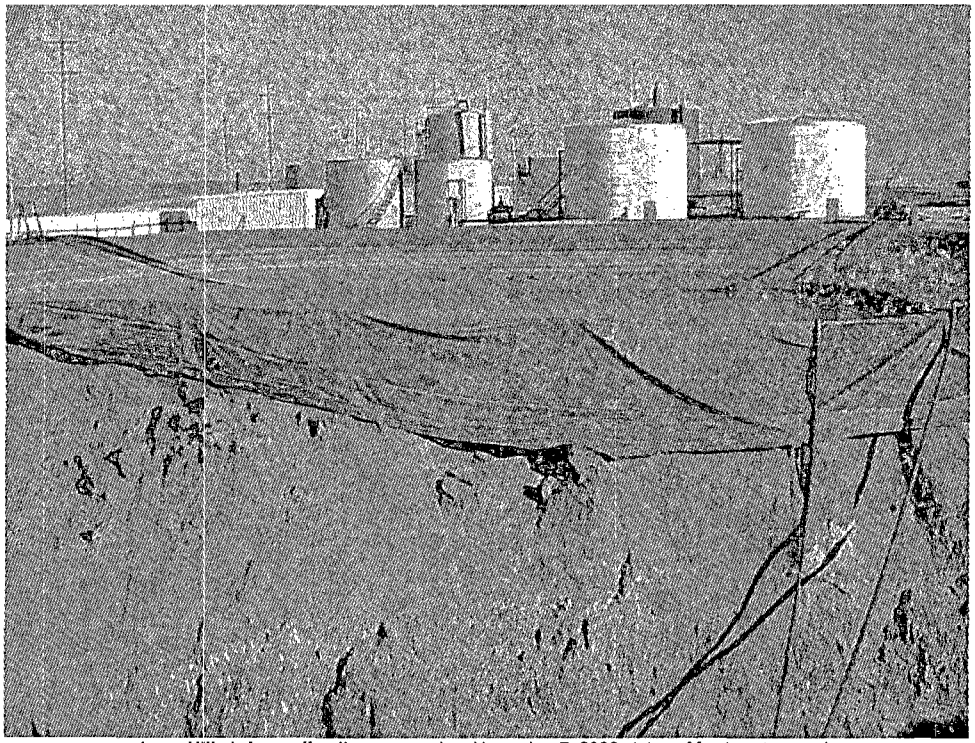
Below are photographs of the two recent collapses:



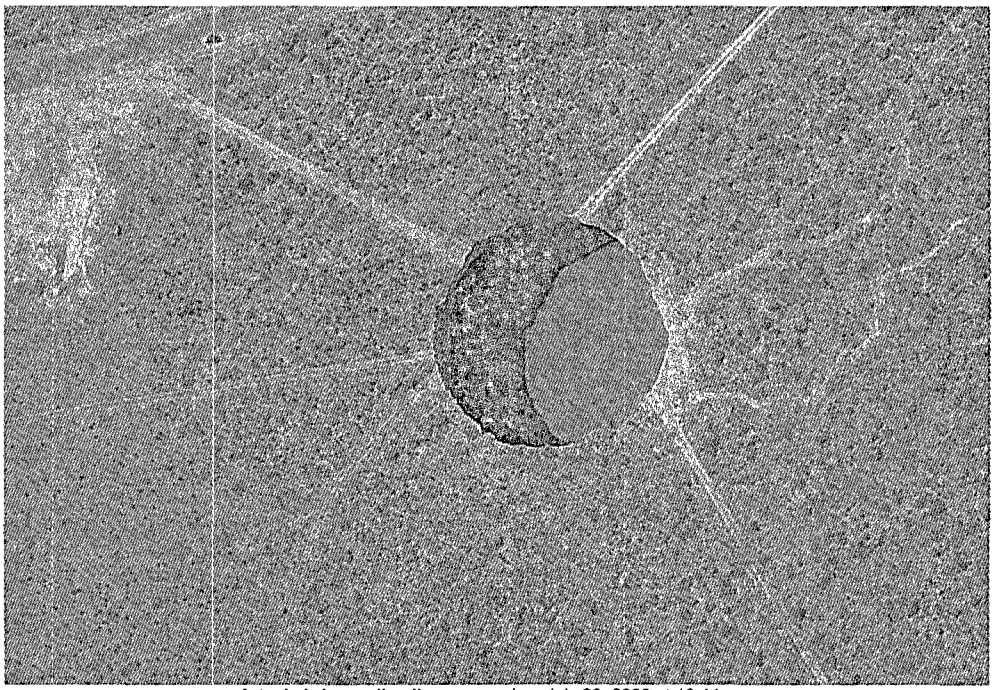
Loco Hills brine well collapse, morning, November 7, 2008, sinkhole with fresh water pond in foreground.
Photo courtesy of Oil Conservation Division



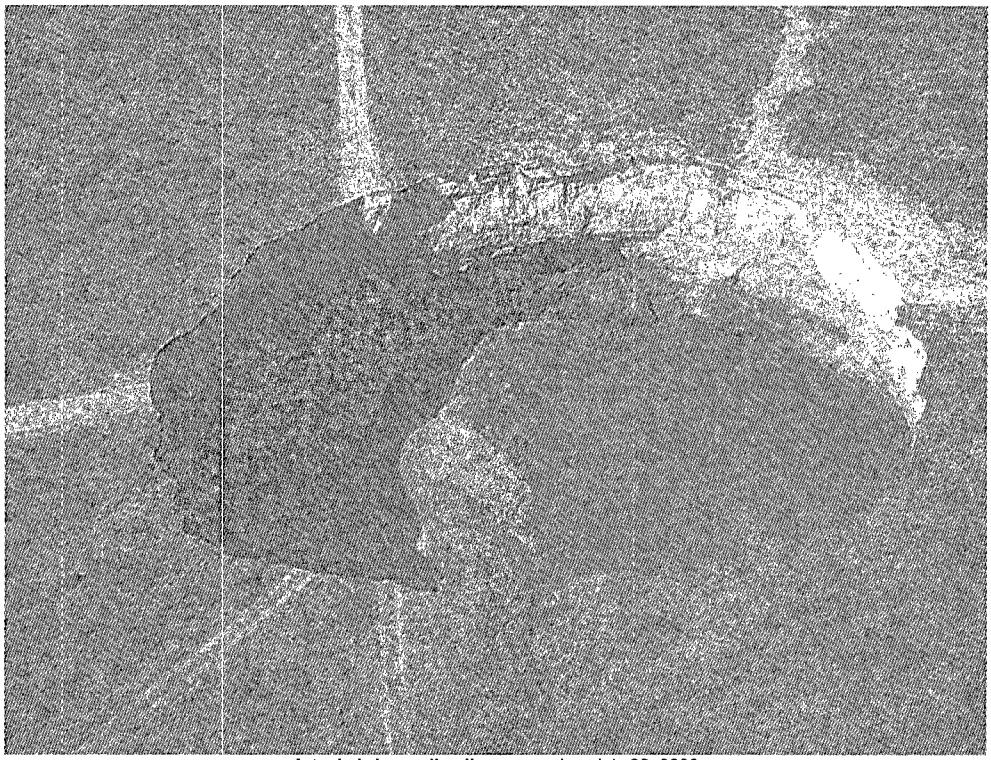
Loco Hills brine well collapse, morning, November 7, 2008 sinkhole.
Photo courtesy of Oil Conservation Division



Loco Hills brine well collapse, morning, November 7, 2008 status of fresh water pond.
Photo courtesy of Oil Conservation Division



Artesia brine well collapse, morning, July 20, 2008 at 10:44 am.
Photo courtesy of National Cave and Karst Research Institute



Artesia brine well collapse morning, July 22, 2008
Photo courtesy of National Cave and Karst Research Institute

#30#

The Energy, Minerals and Natural Resources Department provides resource protection and renewable energy resource development services to the public and other state agencies.

Oil Conservation Division
1220 South St. Francis Drive • Santa Fe, New Mexico 87505
Phone (505) 476-3440 • Fax (505) 476-3462 • www.emnrd.state.nm.us/OCD

SOCON Sonar Well Services, Inc.

ECHO - LOG

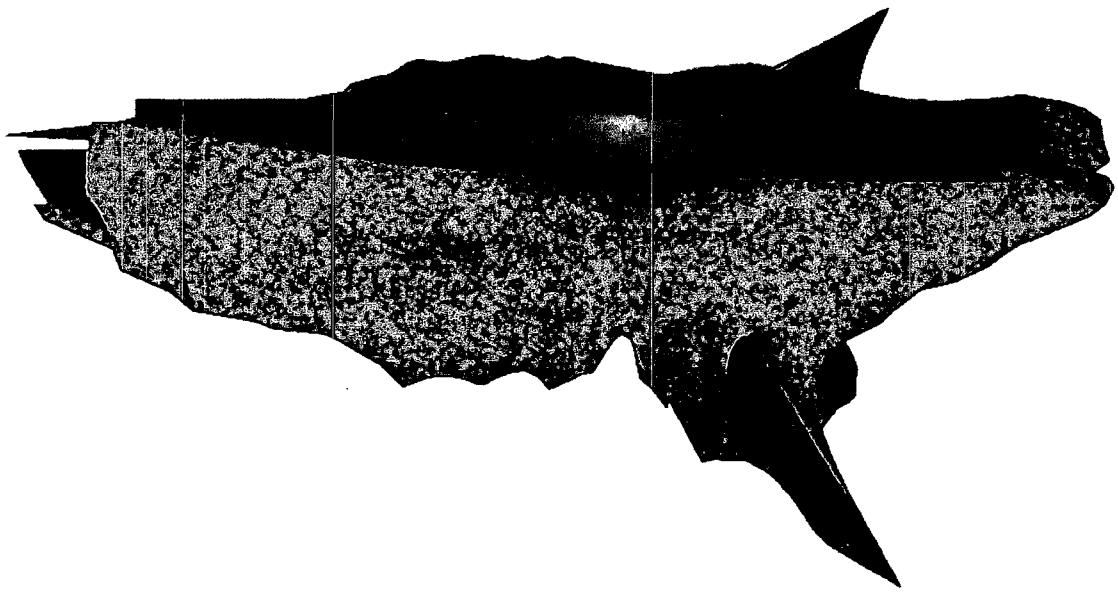
Gandy Corporation

Tatum Brine BW-22

Tatum, New Mexico

1st. Survey

08/21/2008 083053



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

Tatum Brine BW-2

Date: 08/21/2008

083053

Customer: Gandy Corporation

Tatum, New Mexico

Responsible for the survey:

Surveyor:	Richard Lawrence
Leadership:	Larry Gandy
Interpreter:	Richard Lawrence
Control:	Jason McCartney

Contents

Summary of results

Well details

All depths are given as:	**MD**
Datum level for all depths:	**BHF**
Shoe of the cemented 7"-casing:	2200 ft
Shoe of the 4 1/2"- casing during the surveying:	2165 ft
Reference depth for ECHO-LOG:	**2200 ft**
Depth correction:	-29 ft
Pressure at the well head:	0 psi

Details of survey equipment

Measuring vehicle used:	Portable
Tools used:	Echo tool BSF 39, BSF 39

General details

Number of runs:	1
Measured horizontal sections:	13
Measured tilted sections:	41
Lowest survey depth:	2220 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 at 5/15 degree intervals:

Minimum radius:	0.0 ft
Depth:	2220.3 ft
Direction:	0°
Maximum radius:	58.9 ft
Depth:	2205.0 ft
Direction:	330°
Highest point of cavern:	2190.7 ft
Horizontal distance:	24.4 ft
Direction:	195°
Lowest point of cavern:	2242.1 ft
Horizontal distance:	23.5 ft
Direction:	225°
Lowest point in the measuring axis:	2220.3 ft

Determination out of 29 horizontal sections in the depths between 2201 ft and 2241 ft at 5/15 degree intervals:

Maximum radius:	59.4 ft
Depth:	2205.0 ft
Direction:	331°
Maximum diameter:	83.8 ft
Depth:	2206.0 ft
Direction:	45 - 225°

Volume

Volume:	11,289 bbls
Depth range:	2191 ft <--> 2241 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:

1810.0 m/s (5938.3 ft/s) 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:

2201.0 ft	2202.0 ft	2204.0 ft	2205.0 ft	2206.0 ft	2208.0 ft	2210.0 ft
2212.0 ft	2214.0 ft	2215.0 ft	2216.0 ft	2218.0 ft	2220.0 ft	

The following 16 sections are constructed:

2191.0 ft	2193.0 ft	2195.0 ft	2197.0 ft	2199.0 ft	2221.0 ft	2223.0 ft
2225.0 ft	2227.0 ft	2229.0 ft	2231.0 ft	2233.0 ft	2235.0 ft	2237.0 ft
2239.0 ft	2241.0 ft					

Tilted sections

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

20 sections of these with upwards-tilted echo-transducer:

Depth / Tilting Angle

2215.0 / 6	2215.0 / 9	2215.0 / 12	2215.0 / 15	2215.0 / 18	2215.0 / 21
2215.0 / 24	2215.0 / 27	2215.0 / 30	2215.0 / 33	2215.0 / 39	2215.0 / 45
2215.0 / 51	2215.0 / 57	2215.0 / 63	2215.0 / 69	2215.0 / 74	2215.0 / 81
2215.0 / 84	2215.0 / 87				

21 sections of these with downwards-tilted echo-transducer:

Depth / Tilting Angle

2210.0 / 6	2210.0 / 12	2210.0 / 18	2210.0 / 24	2210.0 / 30	2210.0 / 36
2210.0 / 42	2210.0 / 48	2210.0 / 51	2210.0 / 54	2210.0 / 57	2210.0 / 60
2210.0 / 63	2210.0 / 66	2210.0 / 69	2210.0 / 72	2210.0 / 75	2210.0 / 78
2210.0 / 81	2210.0 / 84	2210.0 / 88			

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.

Pockets in the cavern wall

Pockets in the cavern wall, which have been identified by the tilted echo-transducer, were transferred from the vertical sections to the respective horizontal sections.
The resulting additional areas have been added to the calculated areas.

SOCON Sonar Well Services, Inc.

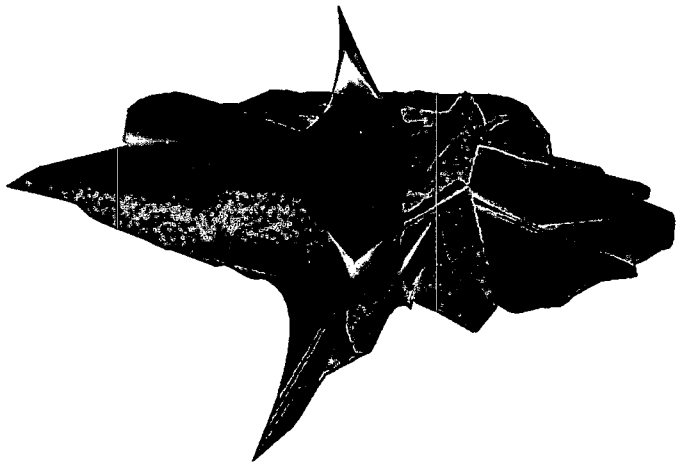
Tatum Brine BW-2 083053 08/21/2008

LEGEND

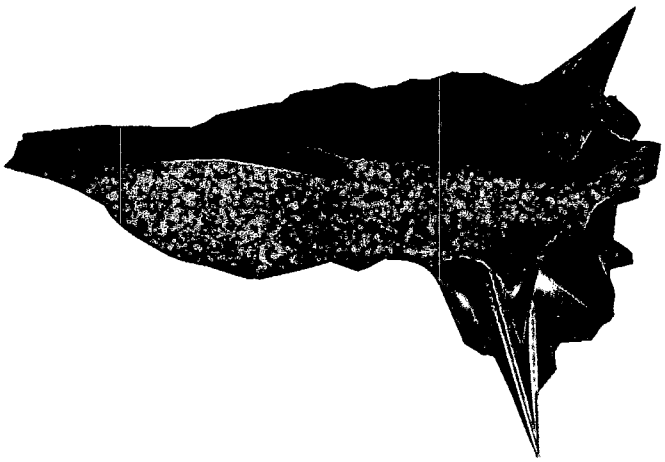
□	Measured point recorded with horizontal adjusted ultrasonic transducer
○	Measured point recorded with tilted or vertical orientated ultrasonic transducer
△	Interpolated point derived from the vertical sections
——	Connection line between two measured points in order to calculate the volume
- -	Assumed 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.

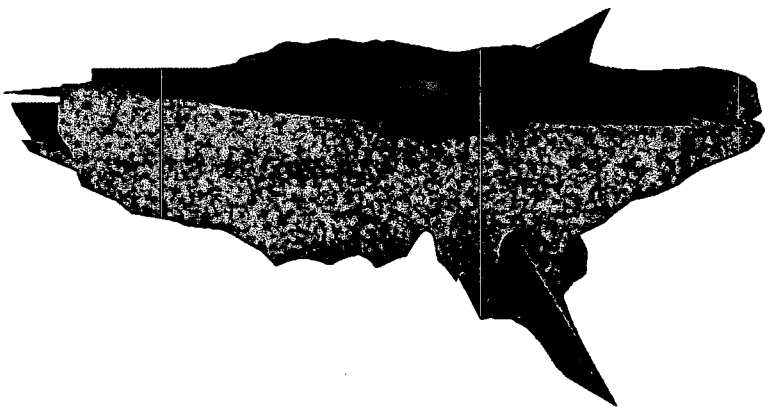
Tatum Brine BW-2 083053 08/21/2008



Tatum Brine BW-2 --> 0° <--



Tatum Brine BW-2 --> 60° <--



Tatum Brine BW-2 --> 120° <--

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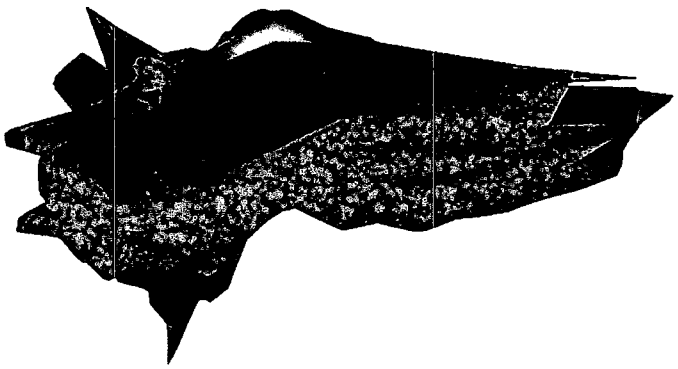
Tatum Brine BW-2 083053 08/21/2008

Tatum Brine BW-2 --> 180° <--

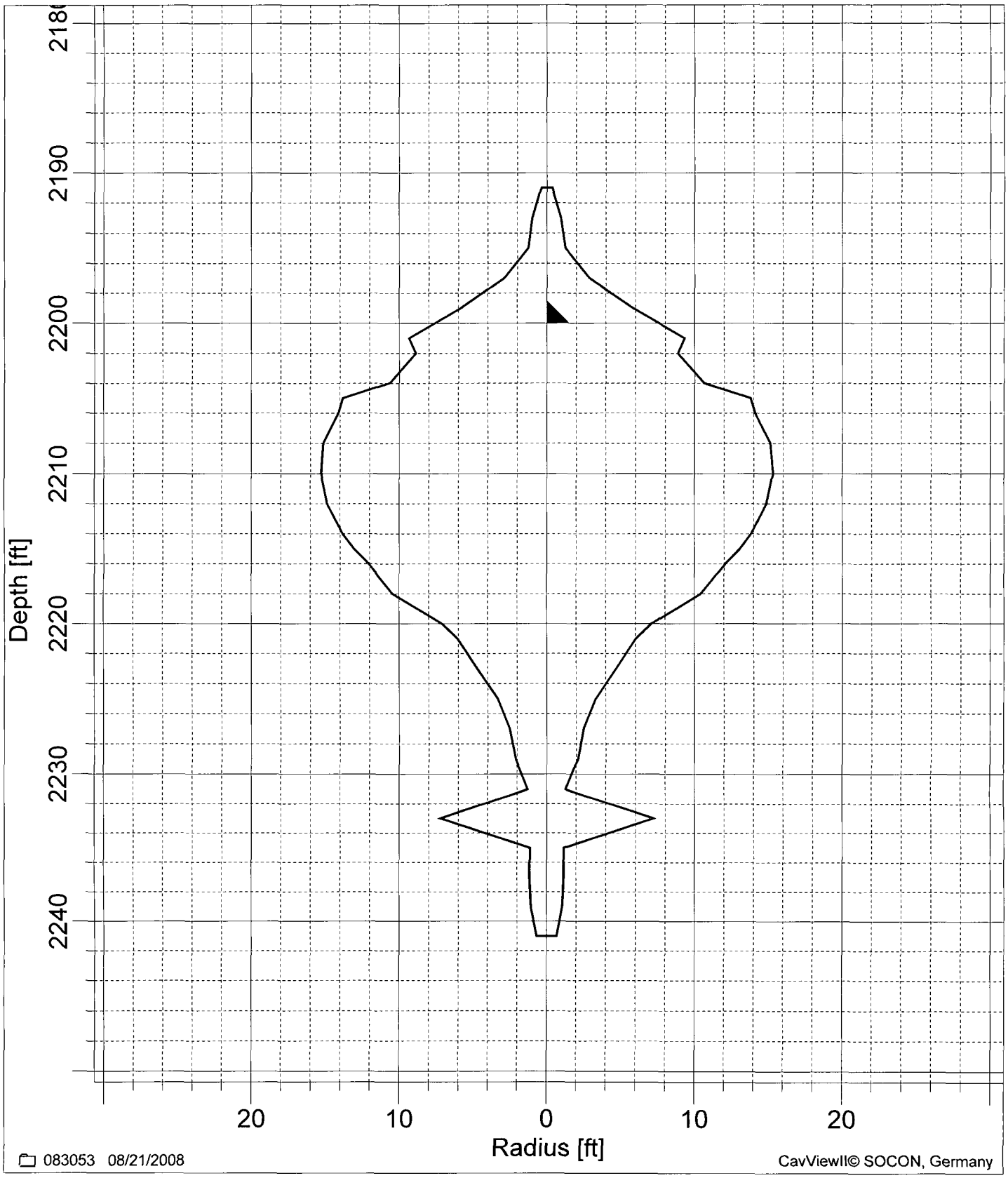


Tatum Brine BW-2 --> 240° <--

Tatum Brine BW-2 --> 300° <--

SOCON Sonar Well Services, Inc.

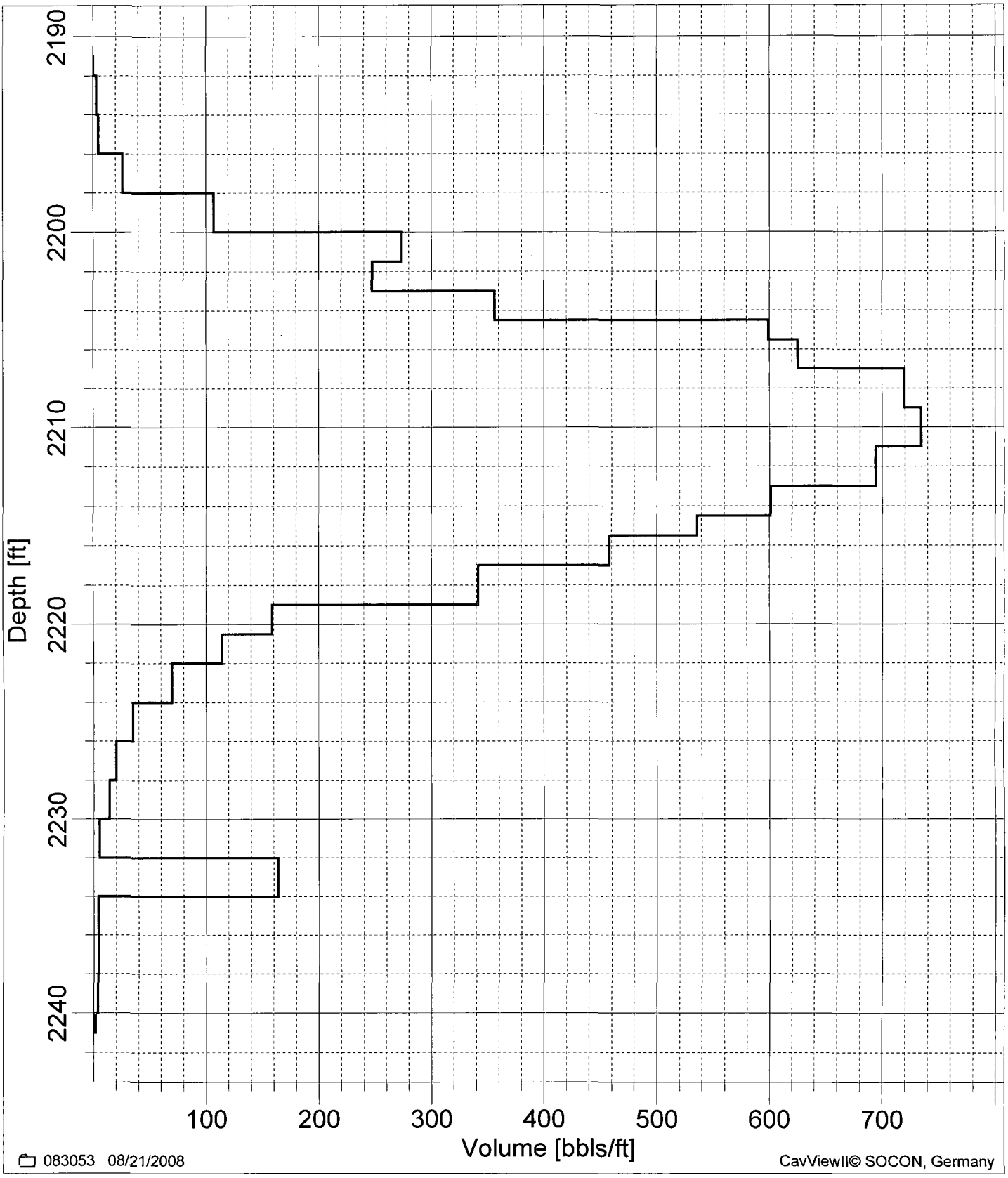
Tatum Brine BW-2 AVERAGE RADIUS 08/21/2008



7" : 2200.0 ft 4 1/2" : 2165.0 ft Average radius (08/21/2008)

SOCON Sonar Well Services, Inc.

Tatum Brine BW-2 PARTIAL VOLUME 08/21/2008



Partial volume

SOCON Sonar Well Services, Inc.

Volume list

Cavern: Tatum Brine BW-2 083053 08/21/2008

Depth [ft]	Radius [ft]	Area [ft²]	Depth range [ft] from	to	Volume [bbls] partial	total
2191.0	0.9	2	2191.0	2192.0	0	0
2193.0	2.3	17	2192.0	2194.0	6	6
2195.0	3.0	28	2194.0	2196.0	10	16
2197.0	6.8	147	2196.0	2198.0	52	69
2199.0	13.8	600	2198.0	2200.0	214	283
2201.0	22.1	1537	2200.0	2201.5	411	693
2202.0	21.0	1389	2201.5	2203.0	371	1064
2204.0	25.2	2002	2203.0	2204.5	535	1599
2205.0	32.7	3363	2204.5	2205.5	599	2198
2206.0	33.4	3510	2205.5	2207.0	938	3136
2208.0	35.9	4041	2207.0	2209.0	1440	4575
2210.0	36.2	4124	2209.0	2211.0	1469	6044
2212.0	35.2	3898	2211.0	2213.0	1388	7432
2214.0	32.8	3374	2213.0	2214.5	901	8334
2215.0	31.0	3010	2214.5	2215.5	536	8870
2216.0	28.6	2573	2215.5	2217.0	687	9557
2218.0	24.7	1918	2217.0	2219.0	683	10240
2220.0	16.8	891	2219.0	2220.5	238	10479
2221.0	14.3	642	2220.5	2222.0	172	10650
2223.0	11.2	391	2222.0	2224.0	139	10789
2225.0	7.9	195	2224.0	2226.0	69	10859
2227.0	5.9	111	2226.0	2228.0	39	10898
2229.0	5.0	78	2228.0	2230.0	28	10926
2231.0	3.0	29	2230.0	2232.0	10	10937
2233.0	17.1	919	2232.0	2234.0	327	11264
2235.0	2.7	23	2234.0	2236.0	8	11272
2237.0	2.7	24	2236.0	2238.0	8	11281
2239.0	2.5	20	2238.0	2240.0	7	11288
2241.0	1.6	8	2240.0	2241.0	1	11289

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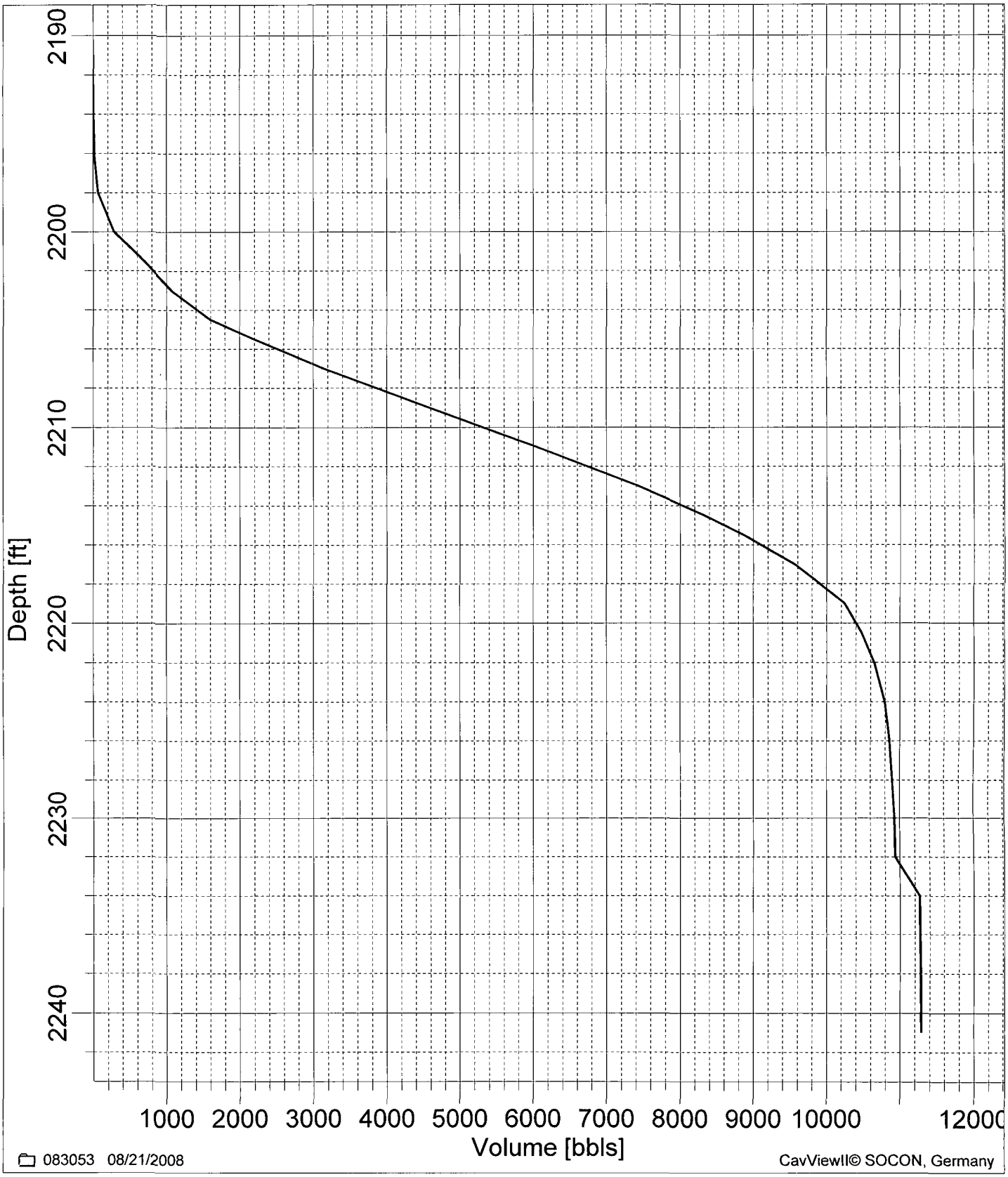
Tatum Brine BW-2 TOTAL VOLUME 08/21/2008



Total volume = 11289.1 bbls

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Table of volumes (foot by foot)

Job-No.: 083053, Name: Tatum Brine BW-2, Date: 08/21/2008

depth [ft]	volume [bbls]	depth [ft]	volume [bbls]	depth [ft]	volume [bbls]	depth [ft]	volume [bbls]	depth [ft]	volume [bbls]
		2191	0	2192	0	2193	3	2194	6
2195	11	2196	16	2197	43	2198	69	2199	176
2200	283	2201	556	2202	817	2203	1064	2204	1421
2205	1899	2206	2511	2207	3136	2208	3856	2209	4575
2210	5310	2211	6044	2212	6738	2213	7432	2214	8033
2215	8602	2216	9099	2217	9557	2218	9899	2219	10240
2220	10399	2221	10536	2222	10650	2223	10720	2224	10789
2225	10824	2226	10859	2227	10879	2228	10898	2229	10912
2230	10926	2231	10931	2232	10937	2233	11100	2234	11264
2235	11268	2236	11272	2237	11276	2238	11281	2239	11284
2240	11288	2241	11289						

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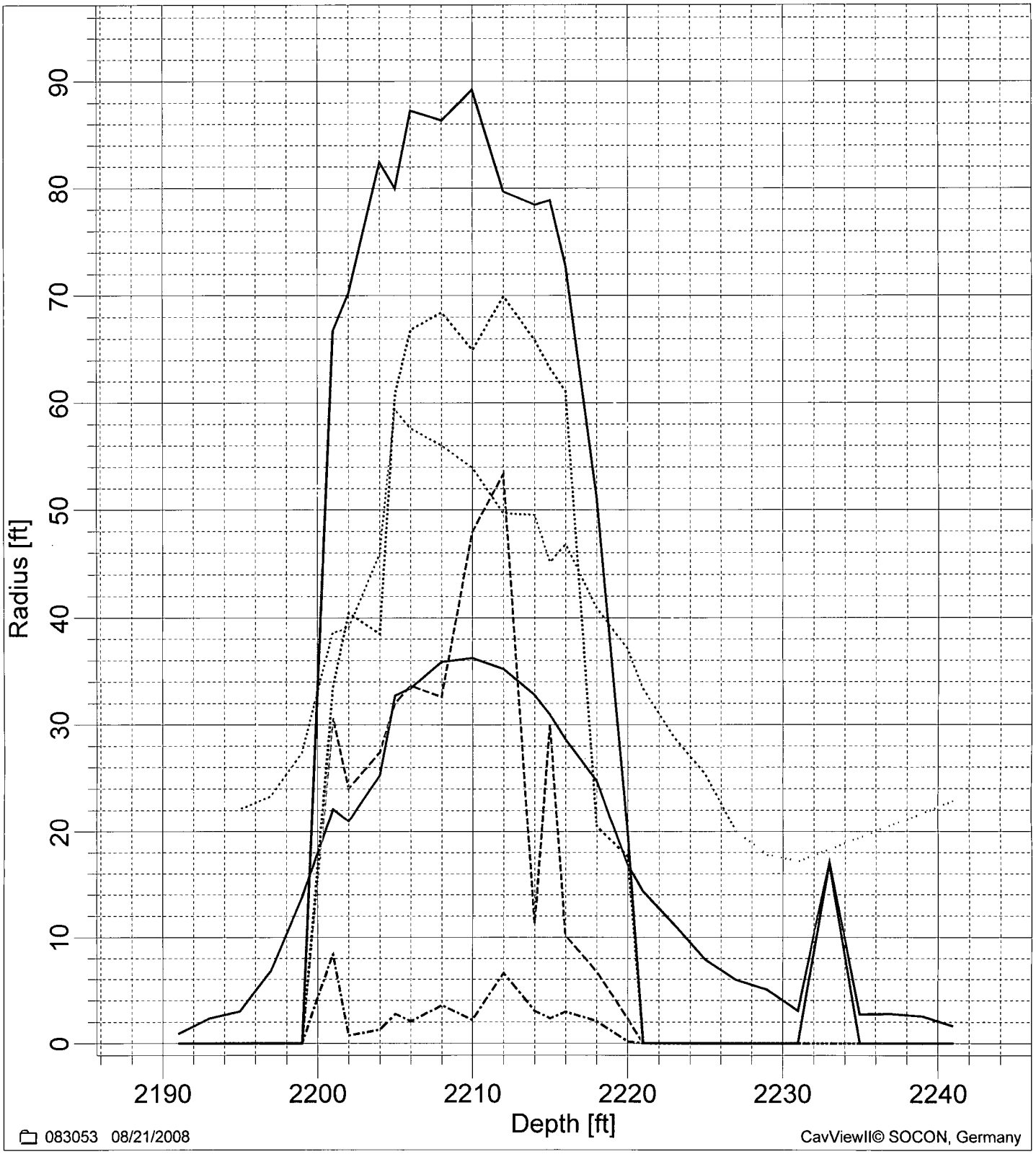
Tatum Brine BW-2 RADII / DIAMETERS 08/21/2008



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

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Table of radii and diameters

Cavern: Tatum Brine BW-2 083053 08/21/2008

Depth	Radius [MIN]		Radius [MAX]		Diameter [MIN]		[MAX]	
[ft]	[ft]	[°]	[ft]	[°]	[ft]	[°]	[ft]	[°]
2191.0	0.0	0	24.2	195	0.0	0 <-> 180	24.2	15 <-> 195
2193.0	0.0	0	23.2	195	0.0	0 <-> 180	23.2	15 <-> 195
2195.0	0.0	0	22.1	195	0.0	0 <-> 180	22.1	15 <-> 195
2197.0	0.0	1	23.3	45	0.0	1 <-> 181	36.3	15 <-> 195
2199.0	0.0	1	27.3	45	0.0	1 <-> 181	41.2	15 <-> 195
2201.0	8.4	144	38.6	259	30.6	144 <-> 324	62.3	79 <-> 259
2202.0	0.8	61	39.0	225	24.0	79 <-> 259	68.4	45 <-> 225
2204.0	1.3	62	45.9	0	27.4	151 <-> 331	69.8	45 <-> 225
2205.0	2.7	121	59.4	331	32.0	81 <-> 261	76.7	150 <-> 330
2206.0	2.1	149	57.6	330	33.6	0 <-> 180	83.8	45 <-> 225
2208.0	3.5	120	56.0	315	32.6	0 <-> 180	82.1	45 <-> 225
2210.0	2.1	130	53.9	325	48.0	25 <-> 205	80.9	105 <-> 285
2212.0	6.6	120	49.7	345	53.4	130 <-> 310	74.1	45 <-> 225
2214.0	3.0	329	49.5	345	11.3	155 <-> 335	74.7	60 <-> 240
2215.0	2.3	154	45.1	81	30.0	151 <-> 331	78.0	71 <-> 251
2216.0	2.9	59	46.8	345	10.2	156 <-> 336	70.5	60 <-> 240
2218.0	2.0	59	40.9	315	6.7	164 <-> 344	62.8	60 <-> 240
2220.0	0.2	301	37.1	315	2.3	72 <-> 252	58.0	60 <-> 240
2221.0	0.0	0	33.3	60	0.0	1 <-> 181	48.5	135 <-> 315
2223.0	0.0	0	28.8	60	0.0	1 <-> 181	39.3	60 <-> 240
2225.0	0.0	0	25.4	60	0.0	0 <-> 180	37.0	60 <-> 240
2227.0	0.0	0	20.0	195	0.0	0 <-> 180	20.0	15 <-> 195
2229.0	0.0	0	17.8	195	0.0	0 <-> 180	17.8	15 <-> 195
2231.0	0.0	0	17.2	225	0.0	0 <-> 180	17.2	45 <-> 225
2233.0	0.0	0	18.3	225	0.0	0 <-> 180	18.3	45 <-> 225
2235.0	0.0	0	19.5	225	0.0	0 <-> 180	19.5	45 <-> 225
2237.0	0.0	0	20.6	225	0.0	0 <-> 180	20.6	45 <-> 225
2239.0	0.0	0	21.7	225	0.0	0 <-> 180	21.7	45 <-> 225
2241.0	0.0	0	22.9	225	0.0	0 <-> 180	22.9	45 <-> 225

SOCON Sonar Well Services, Inc.

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

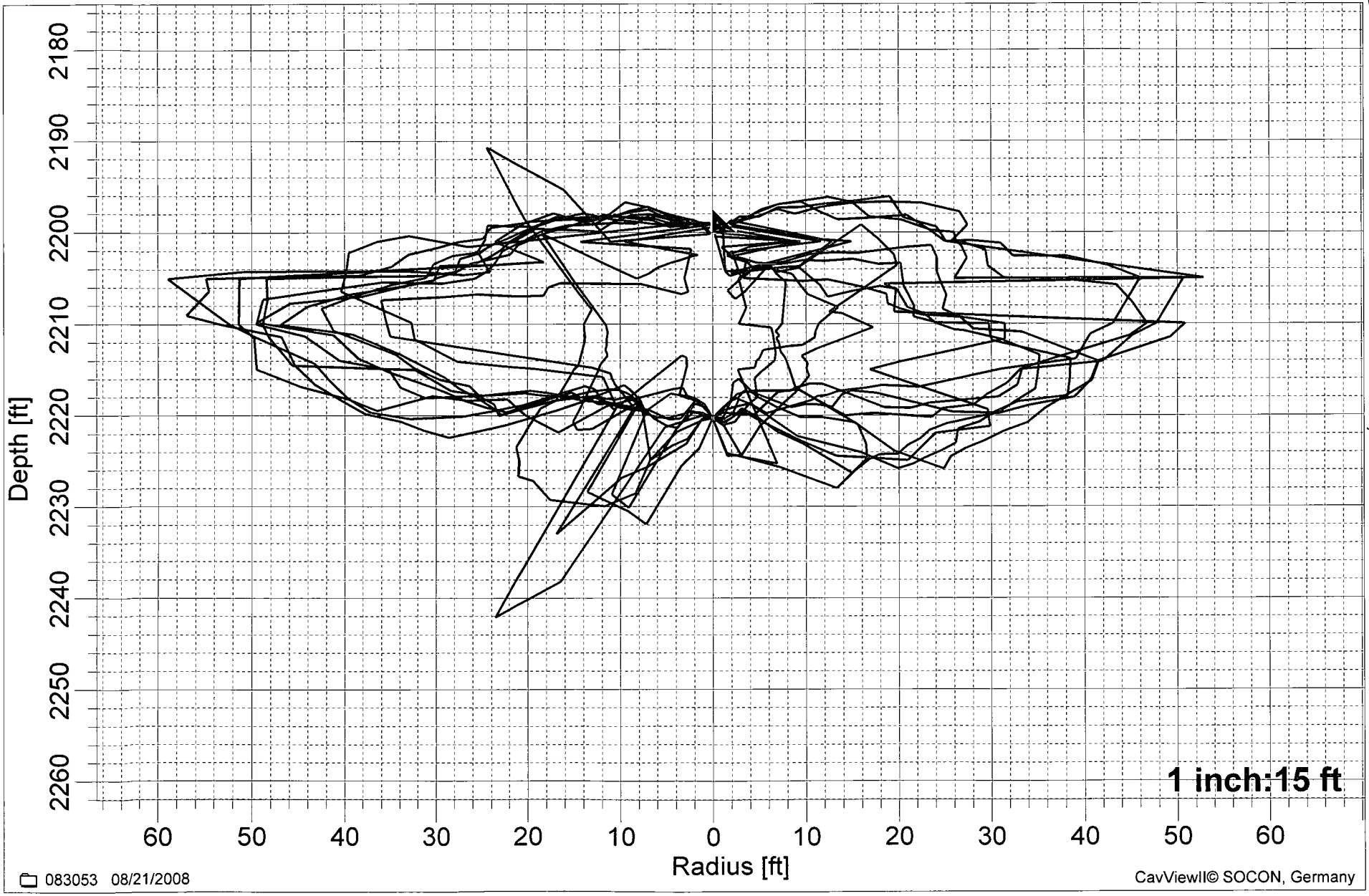
Cavern: Tatum Brine BW-2 083053 08/21/2008

Depth [ft]	<R> [ft]	N [ft]	E [ft]	S [ft]	W [ft]	NE [ft]	SE [ft]	SW [ft]	NW [ft]
2191.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2193.0	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2195.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2197.0	6.8	10.1	0.0	0.0	0.0	23.3	0.0	0.0	0.0
2199.0	13.8	22.2	0.0	0.0	14.5	27.3	0.0	2.7	20.6
2201.0	22.1	25.0	14.9	17.8	25.0	25.7	9.4	36.5	22.5
2202.0	21.0	31.9	11.1	17.2	21.5	29.4	4.9	39.0	31.2
2204.0	25.2	45.9	9.5	15.9	27.2	30.1	6.5	39.7	35.9
2205.0	32.7	52.8	3.3	15.2	30.0	31.4	4.7	9.6	54.8
2206.0	33.4	19.2	18.6	14.5	34.1	43.6	7.8	40.2	54.6
2208.0	35.9	19.5	20.8	13.1	46.3	45.3	7.6	36.8	56.0
2210.0	36.2	50.8	27.5	2.4	49.8	46.7	7.4	21.8	53.3
2212.0	35.2	47.6	31.8	11.4	40.3	42.6	7.1	31.6	46.5
2214.0	32.8	41.7	35.1	11.8	37.9	36.1	7.9	27.8	45.6
2215.0	31.0	28.3	42.5	3.8	31.8	33.1	8.2	35.6	31.6
2216.0	28.6	40.7	34.9	12.8	32.9	32.2	8.6	11.8	43.8
2218.0	24.7	38.9	33.3	13.7	27.7	29.2	10.6	10.9	40.9
2220.0	16.8	0.3	29.4	14.7	6.6	23.8	13.9	10.9	37.1
2221.0	14.3	0.0	24.9	14.9	0.0	0.0	15.5	11.5	33.0
2223.0	11.2	0.0	21.5	7.0	0.0	0.0	16.4	12.6	0.0
2225.0	7.9	0.0	16.6	0.0	0.0	0.0	16.3	13.8	0.0
2227.0	5.9	0.0	0.0	0.0	0.0	0.0	14.3	14.9	0.0
2229.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	16.0	0.0
2231.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	17.2	0.0
2233.0	17.1	0.0	0.0	0.0	0.0	0.0	0.0	18.3	0.0
2235.0	2.7	0.0	0.0	0.0	0.0	0.0	0.0	19.5	0.0
2237.0	2.7	0.0	0.0	0.0	0.0	0.0	0.0	20.6	0.0
2239.0	2.5	0.0	0.0	0.0	0.0	0.0	0.0	21.7	0.0
2241.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	22.9	0.0

Tatum Brine BW-2

MAXPLOT

08/21/2008



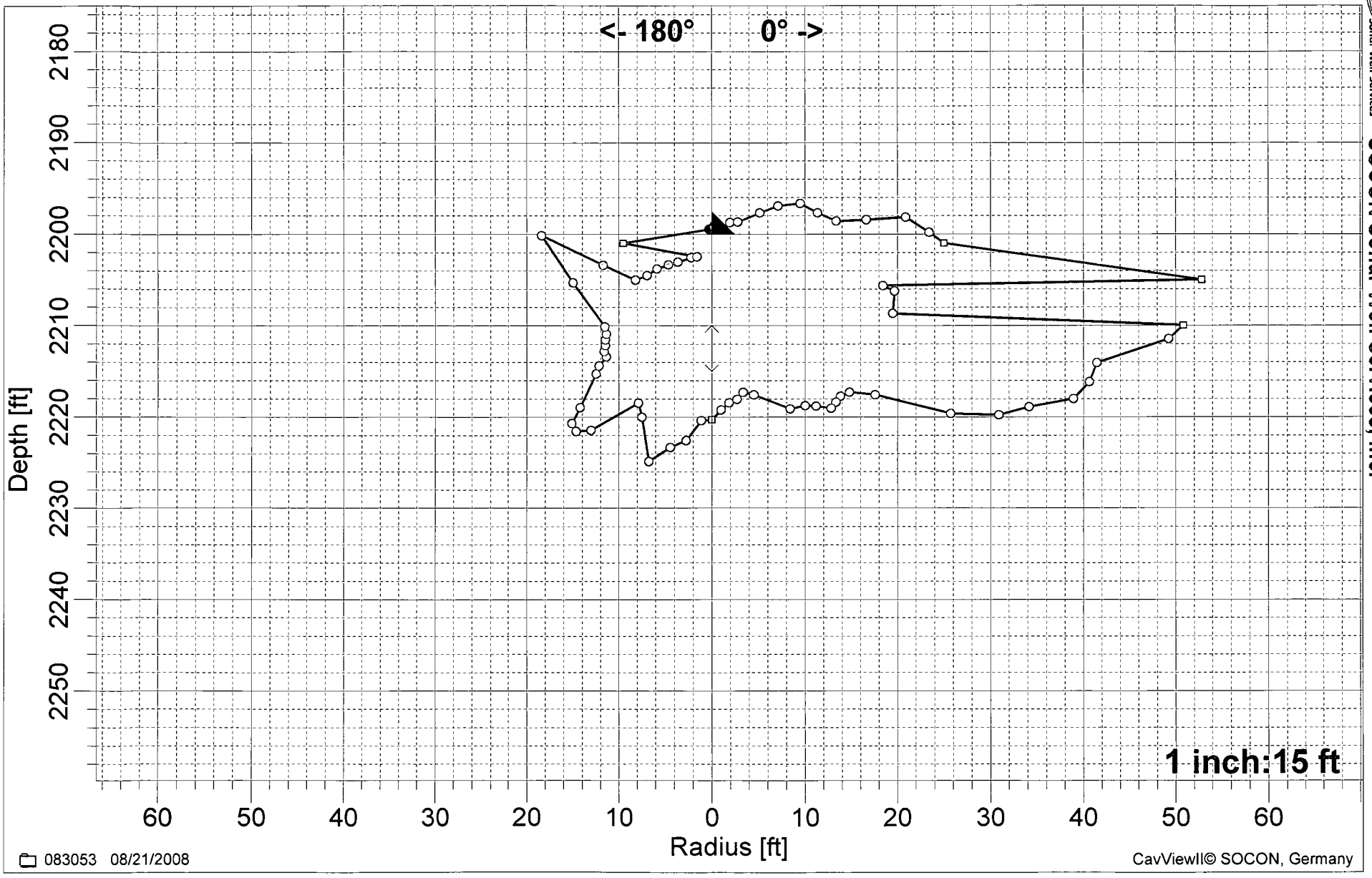
SOCON Sonar Well Services, Inc.

7" : 2200.0 ft

4 1/2" : 2165.0 ft

Tatum Brine BW-2

08/21/2008

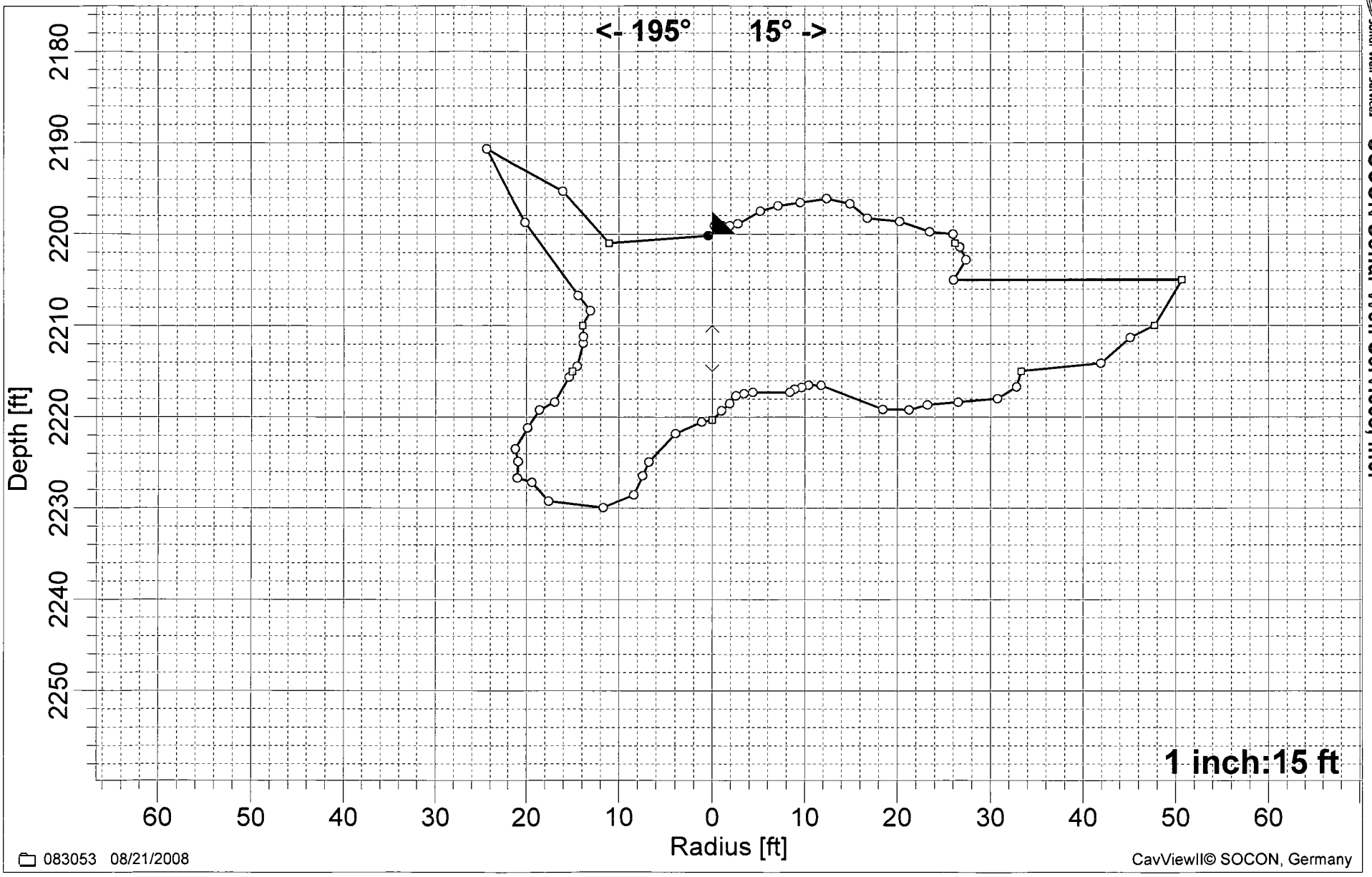


SOCON Sonar Well Services, Inc.

(08/21/2008)
Tilting position
7" : 2200.0 ft
4 1/2" : 2165.0 ft

Tatum Brine BW-2

08/21/2008

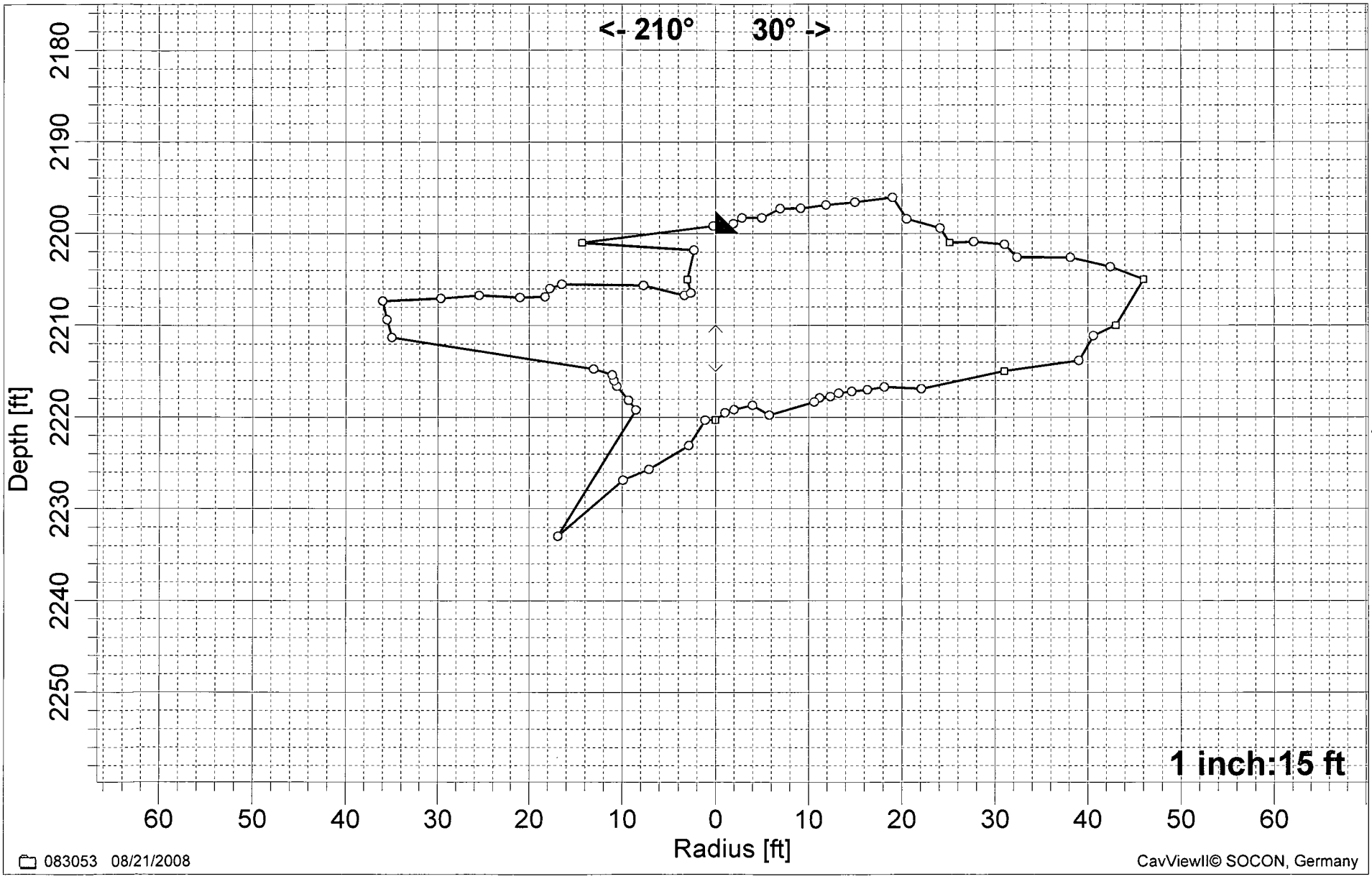


SOCON Sonar Well Services, Inc.

(08/21/2008)
Tilting position
7" : 2200.0 ft
4 1/2" : 2165.0 ft

Tatum Brine BW-2

08/21/2008



SOCON Sonar Well Services, Inc.

(08/21/2008)
Tilting position
7" : 2200.0 ft
4 1/2" : 2165.0 ft

Tatum Brine BW-2

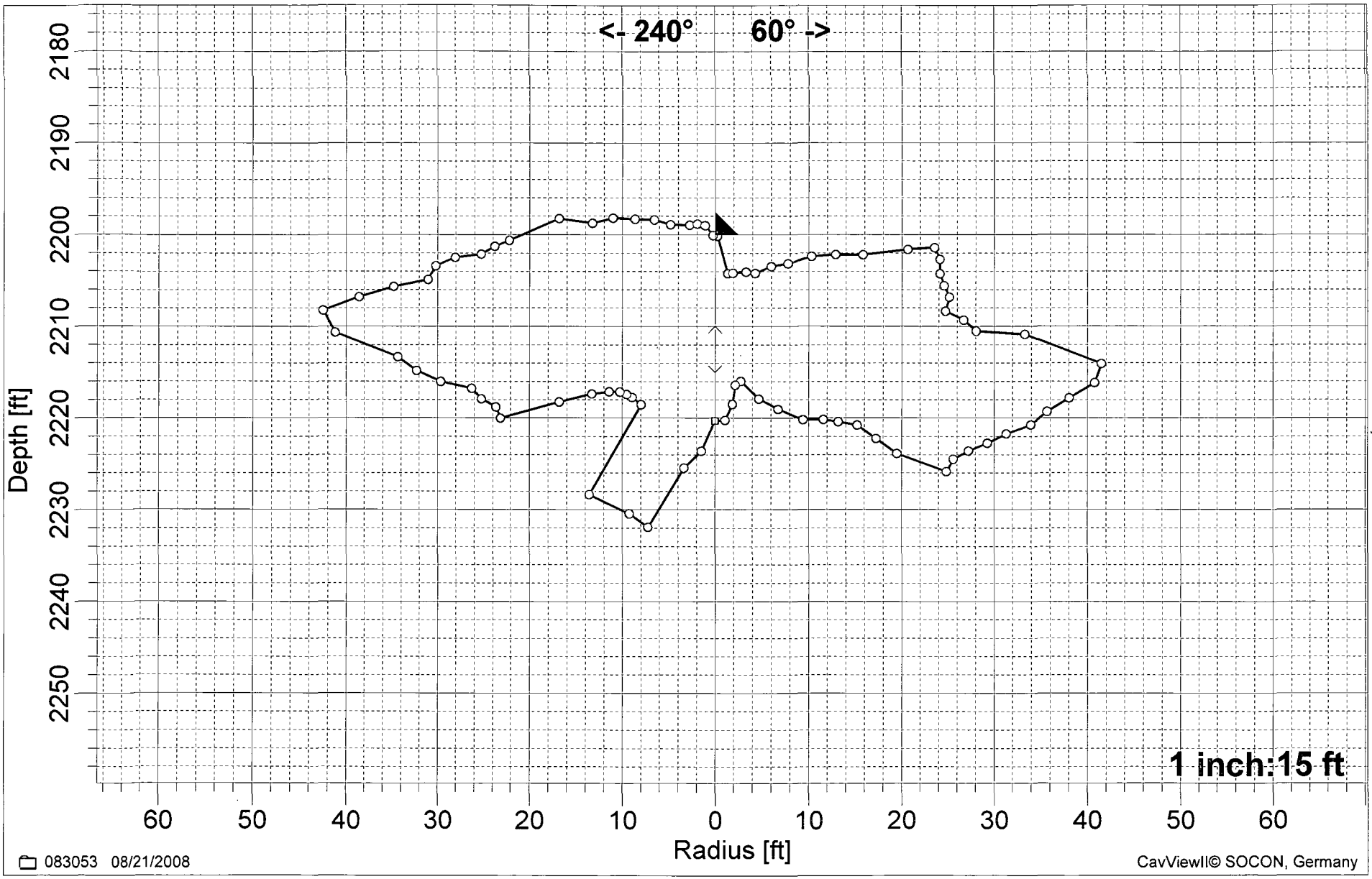
08/21/2008

SOCON Sonar Well Services, Inc.

(08/21/2008)
Tilting position
7" : 2200.0 ft
4 1/2" : 2165.0 ft

Tatum Brine BW-2

08/21/2008



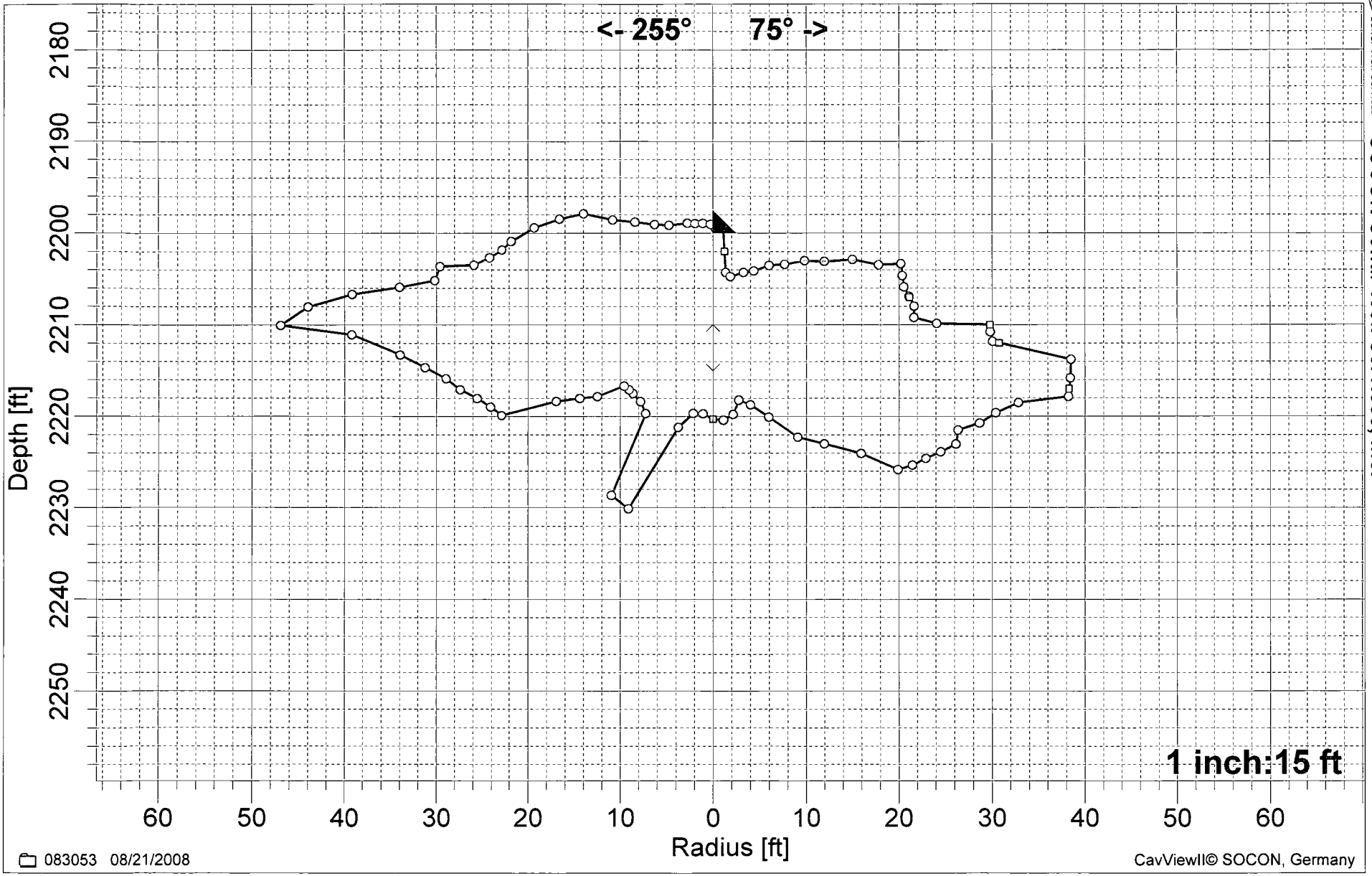
SOCON Sonar Well Services, Inc.

(08/21/2008) — 7" : 2200.0 ft — 4 1/2" : 2165.0 ft

Tilting position

Tatum Brine BW-2

08/21/2008

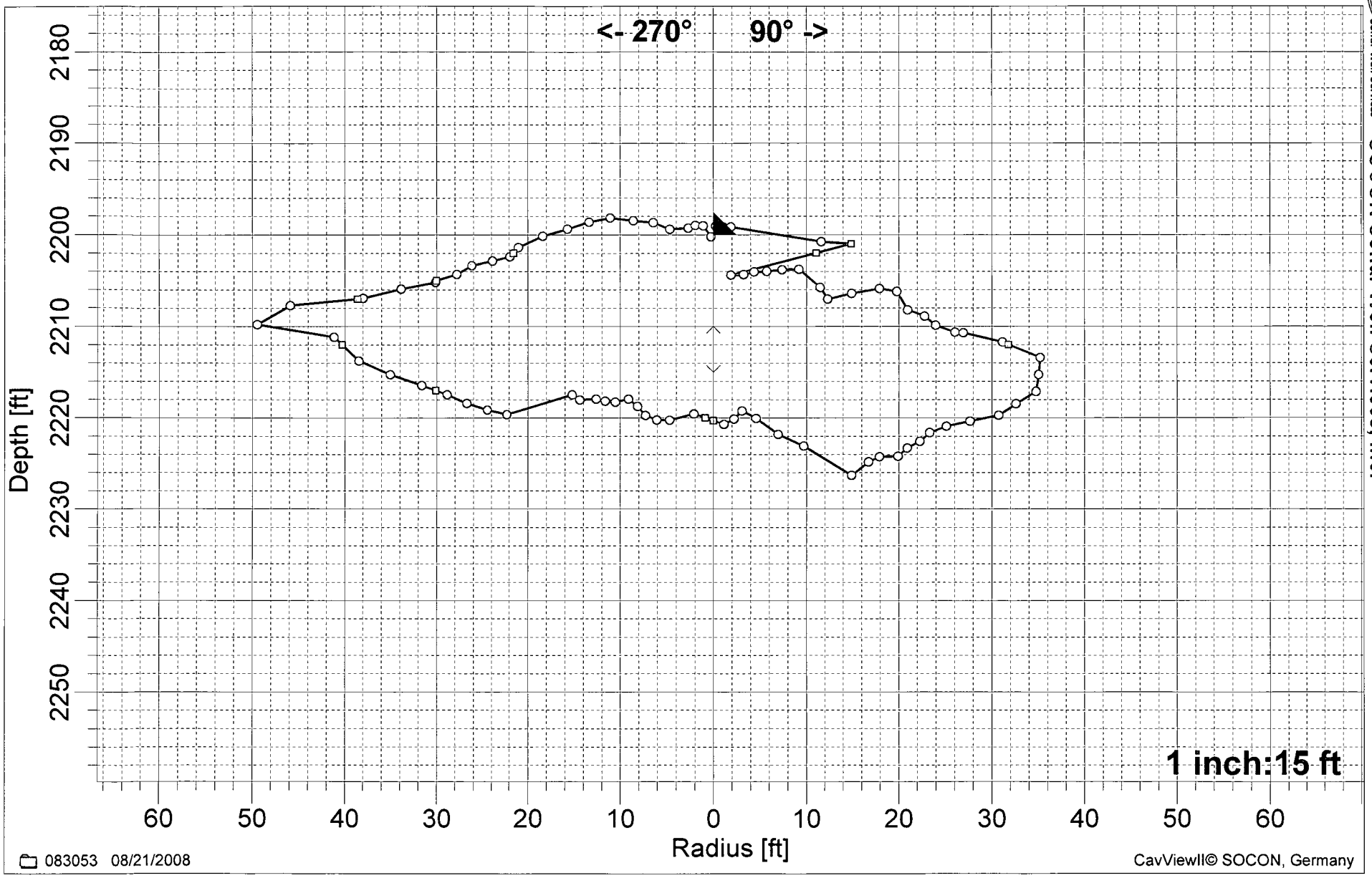


SOCON Sonar Well Services, Inc.

(08/21/2008)
Tilting position
7" : 2200.0 ft
4 1/2" : 2165.0 ft

Tatum Brine BW-2

08/21/2008

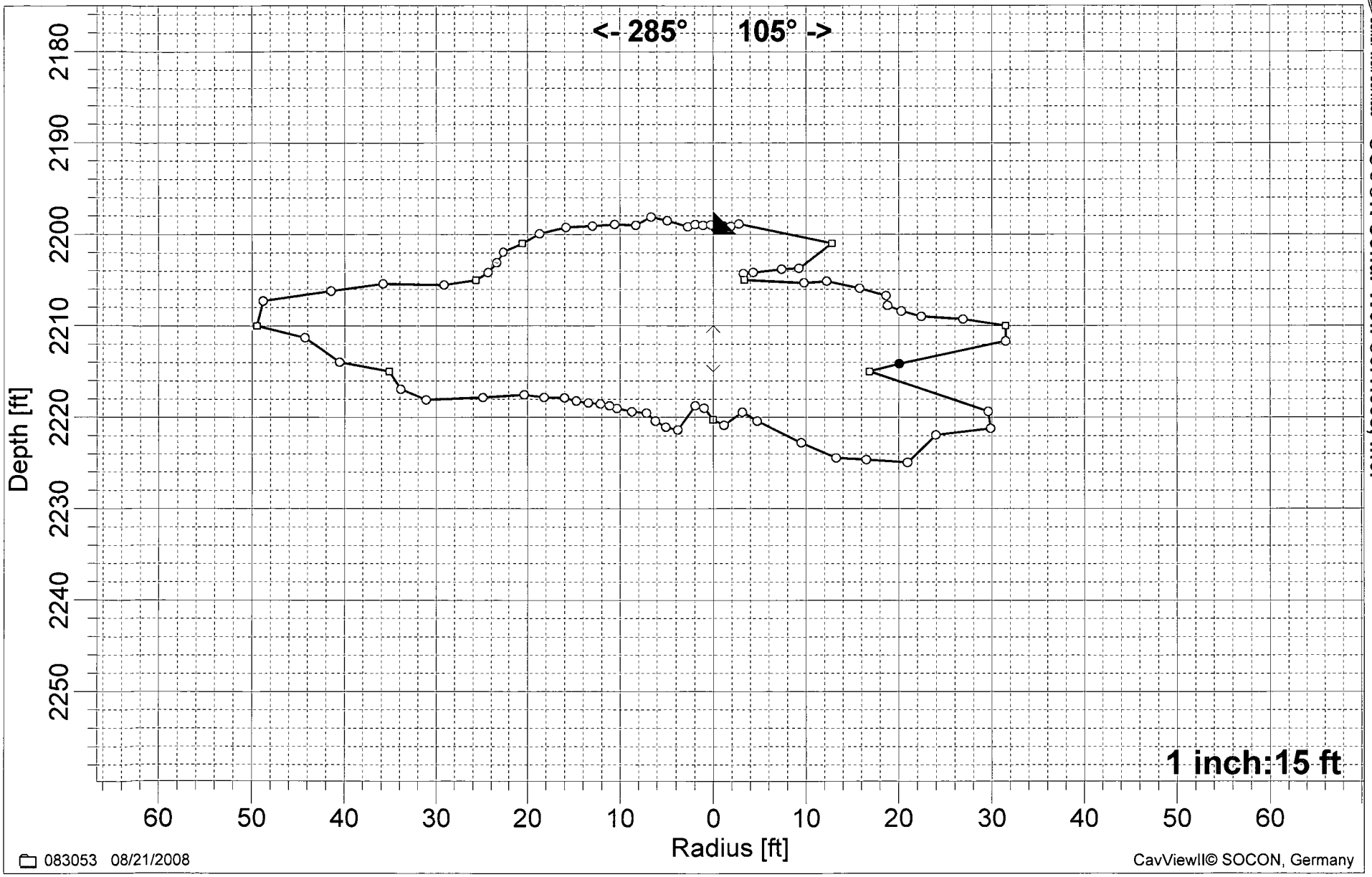


SOCON Sonar Well Services, Inc.

(08/21/2008)
Tilting position
7" : 2200.0 ft
4 1/2" : 2165.0 ft

Tatum Brine BW-2

08/21/2008

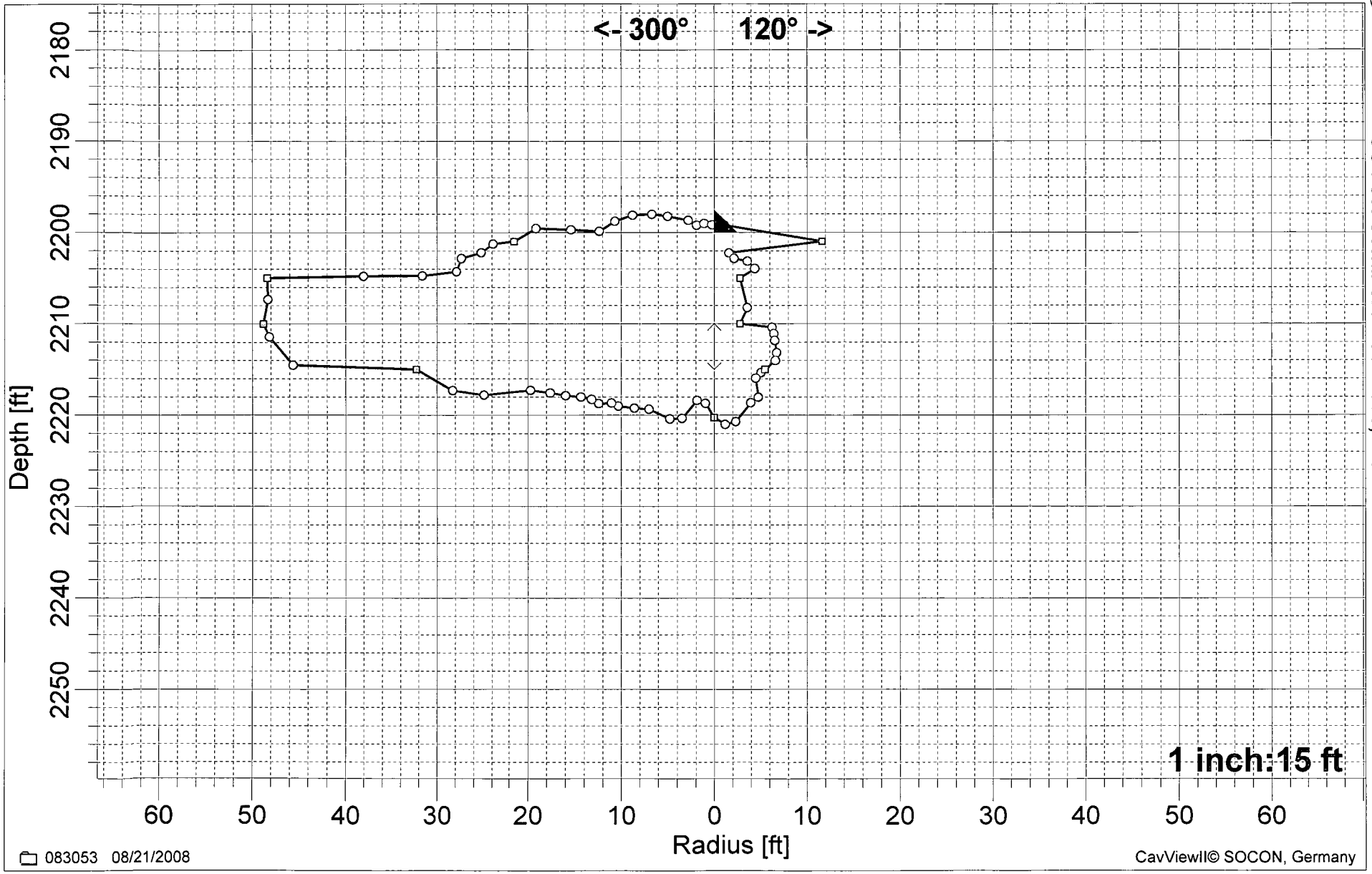


SOCON Sonar Well Services, Inc.

(08/21/2008)
Tilting position
7" : 2200.0 ft
4 1/2" : 2165.0 ft

Tatum Brine BW-2

08/21/2008

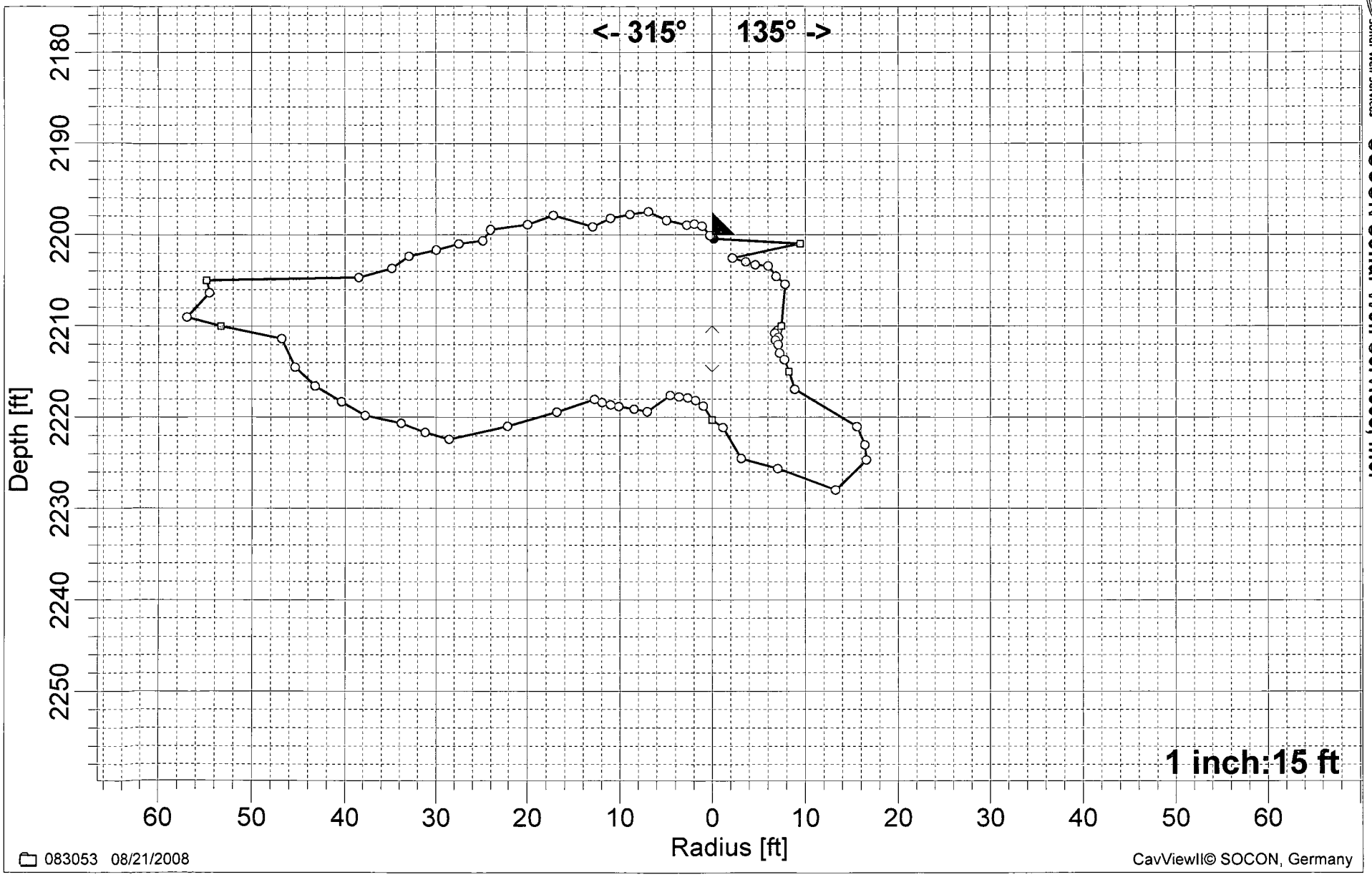


SOCON Sonar Well Services, Inc.

(08/21/2008)
Tilting position
7" : 2200.0 ft
4 1/2" : 2165.0 ft

Tatum Brine BW-2

08/21/2008

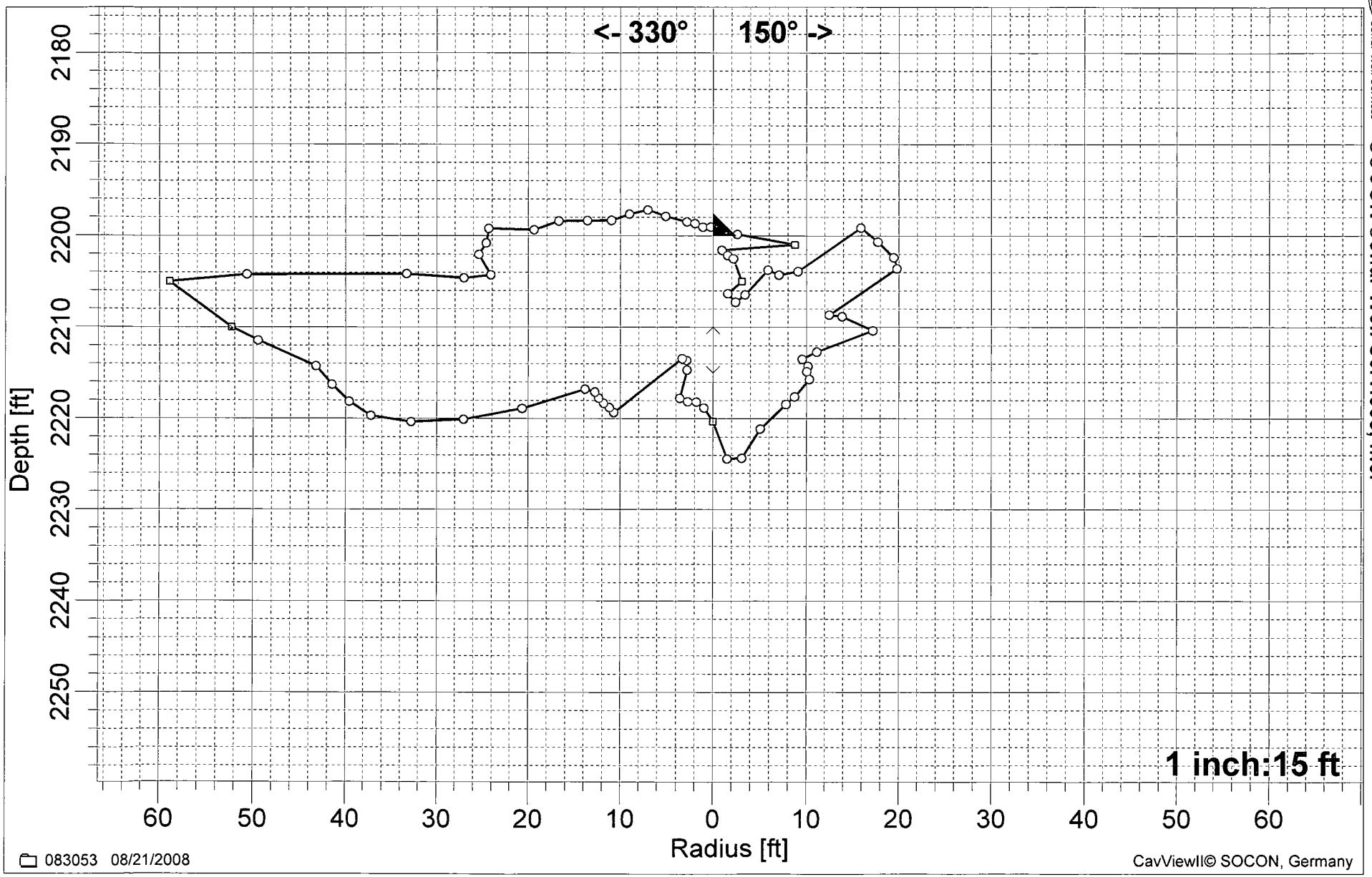


SOCON Sonar Well Services, Inc.

(08/21/2008)
Tilting position
7" : 2200.0 ft
4 1/2" : 2165.0 ft

Tatum Brine BW-2

08/21/2008



SOCON Sonar Well Services, Inc.

(08/21/2008)
Tilting position
7" : 2200.0 ft
4 1/2" : 2165.0 ft

Tatum Brine BW-2

08/21/2008

SOCON Sonar Well Services, Inc.

(08/21/2008)
Tilting position
7" : 2200.0 ft
4 1/2" : 2165.0 ft

HORIZONTAL SECTIONS

Cavern: Tatum Brine BW-2 Report No.: 083053

Utilized speed of sound: 1810.0 m/s (5938.3 ft/s)

Measuring date: 08/21/2008 Scale: 1: 20

Horizontal sections measured at following depths:

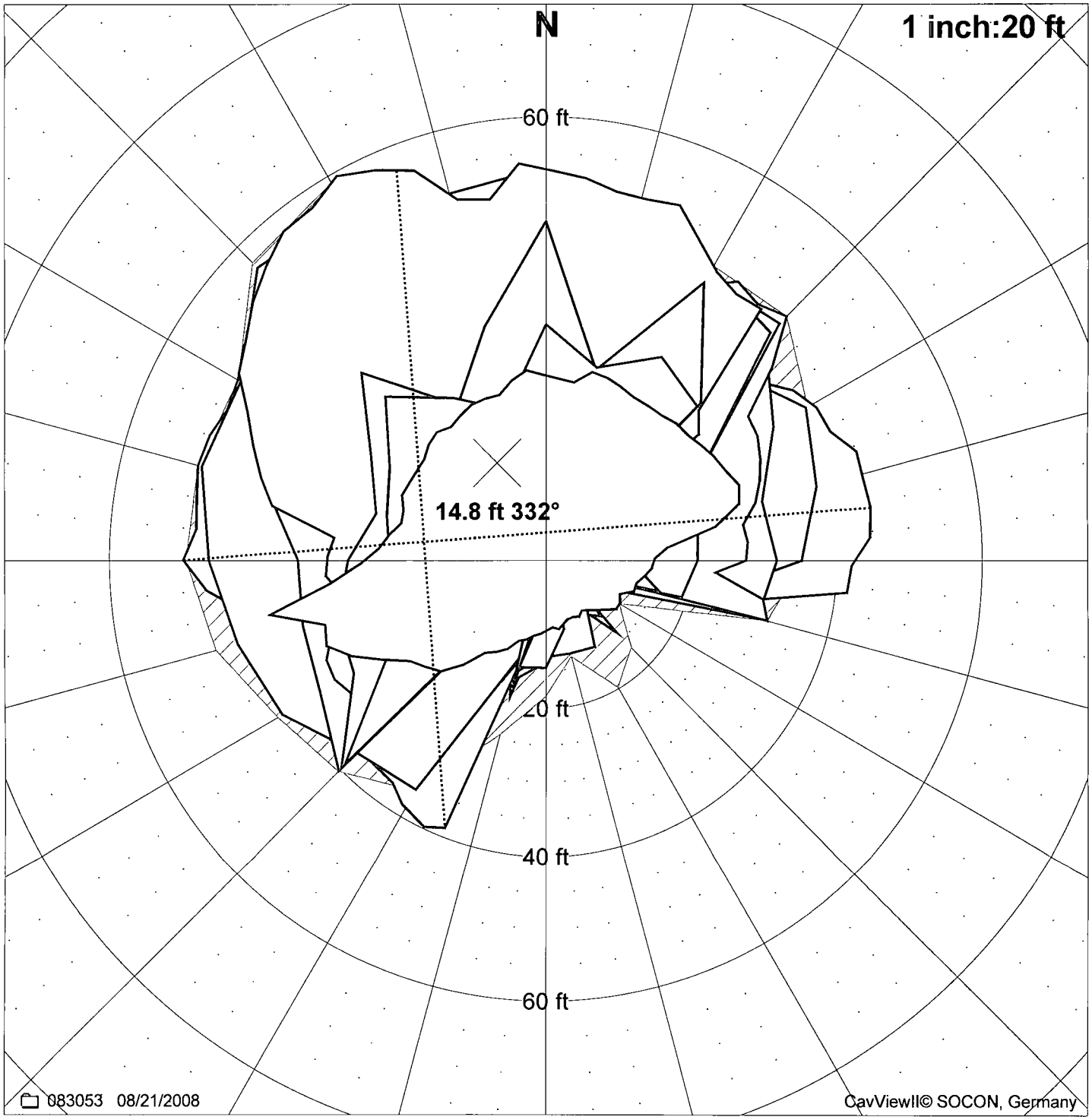
2201.0 ft	2202.0 ft	2204.0 ft	2205.0 ft	2206.0 ft	2208.0 ft	2210.0 ft
2212.0 ft	2214.0 ft	2215.0 ft	2216.0 ft	2218.0 ft	2220.0 ft	

The following 16 sections are constructed:

2191.0 ft	2193.0 ft	2195.0 ft	2197.0 ft	2199.0 ft	2221.0 ft	2223.0 ft
2225.0 ft	2227.0 ft	2229.0 ft	2231.0 ft	2233.0 ft	2235.0 ft	2237.0 ft
2239.0 ft	2241.0 ft					

SOCON Sonar Well Services, Inc.

Tatum Brine BW-2 MAXPLOT 08/21/2008



Vertical maximum plot Horizontal sections a/b
Center of gravity

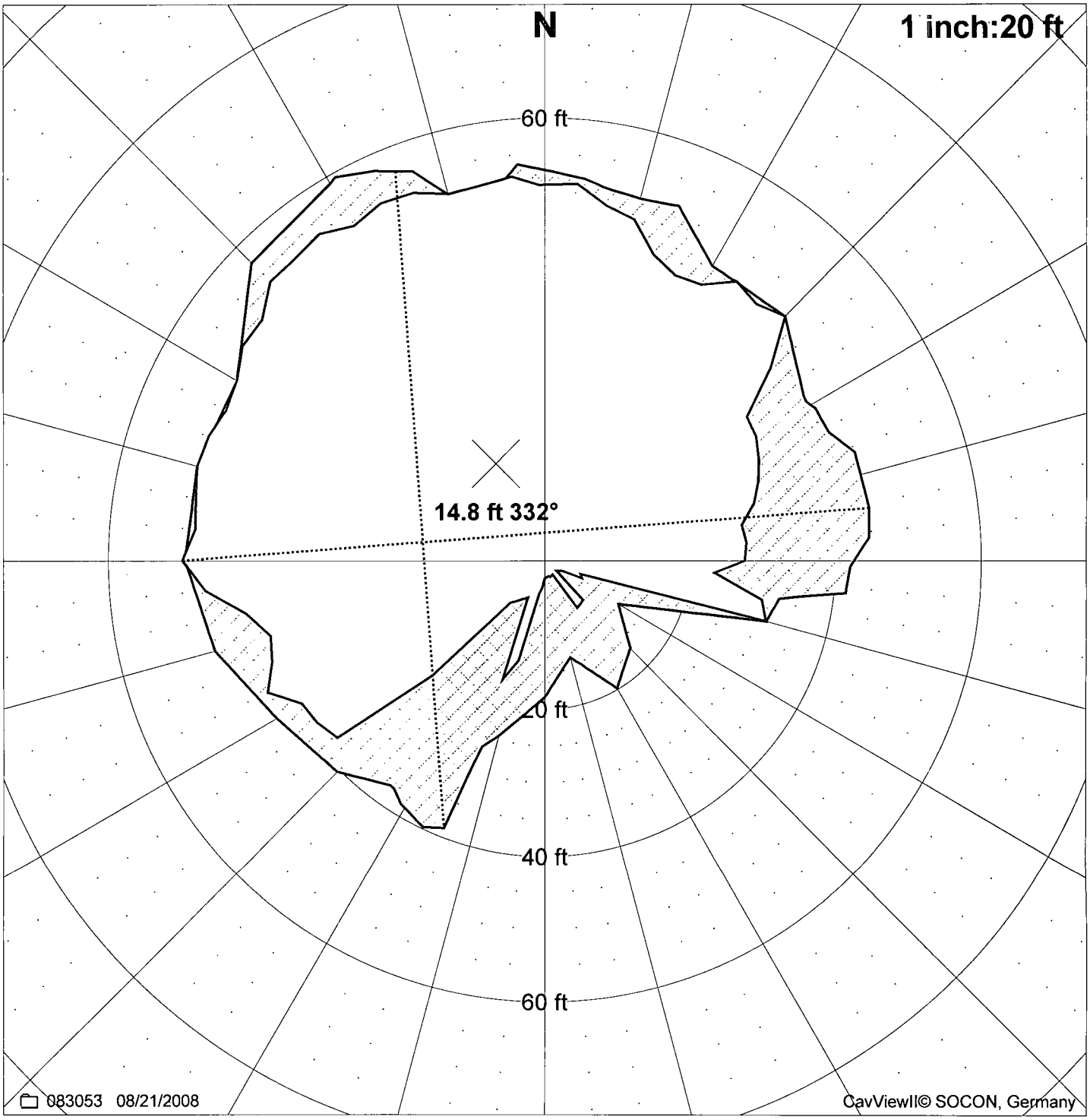
d_{max}: 93.1 ft 86° <--> 266° r_{min}: 11.6 ft -> 120° r~: 41.7 ft r_{max}: 59.4 ft -> 331°

a/b = 1.063 a = 94.7 ft (80°-270°) b = 89.1 ft (201°-338°)

Area from vertical sections: 5192 ft², Area from horizontal and vertical sections: 5463 ft²

SOCON Sonar Well Services, Inc.

Tatum Brine BW-2 — MAXPLOT — 08/21/2008



a/b Center of gravity Horizontal/vertical maximum plot

Largest single area

d_{max}: 93.1 ft 86° <--> 266° r_{min}: 11.6 ft -> 120° r~: 41.7 ft r_{max}: 59.4 ft -> 331°

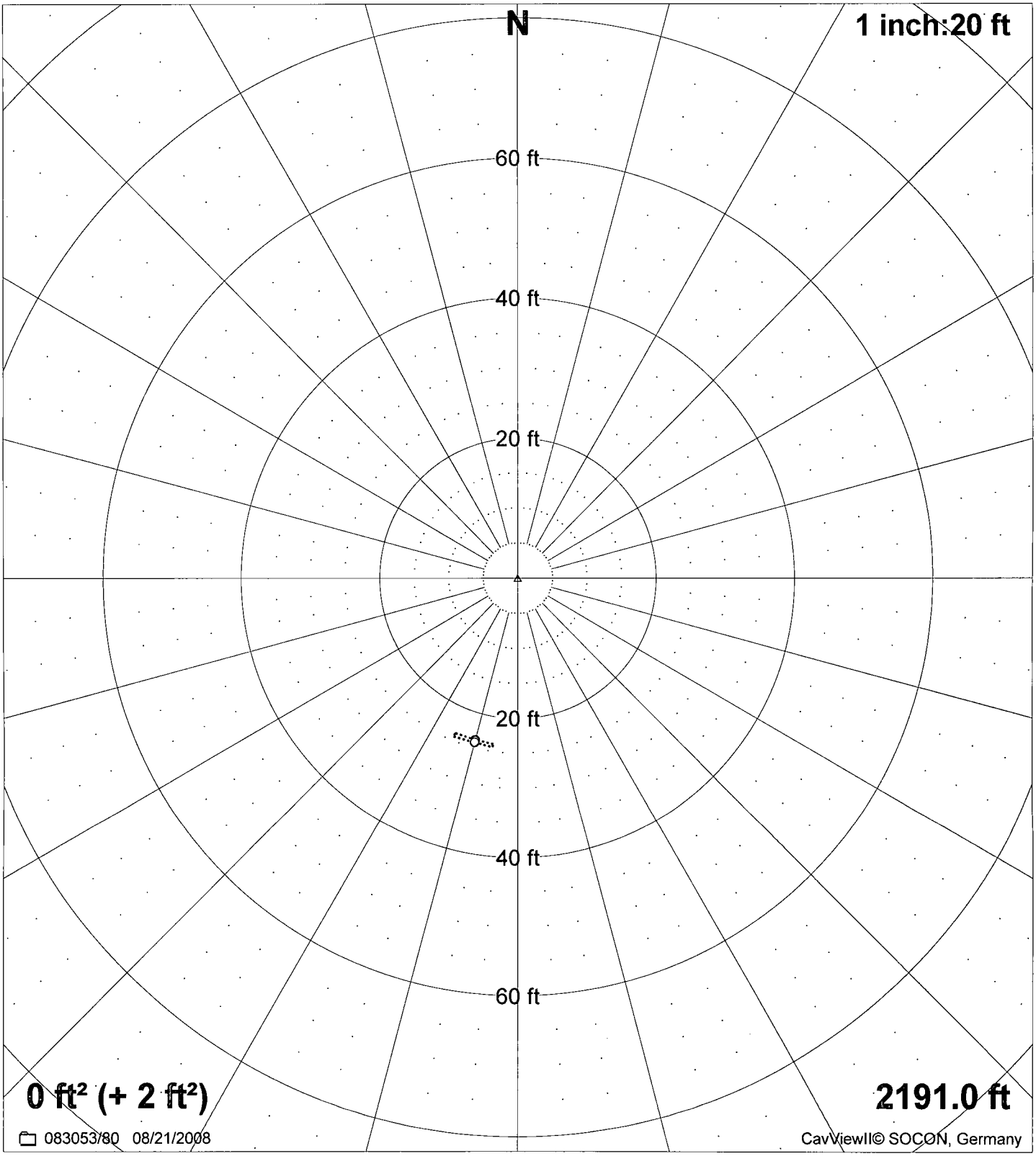
a/b = 1.063 a = 94.7 ft (80°-270°) b = 89.1 ft (201°-338°)

Largest single area: 4124 ft² in depth: 2210.0 ft, Area from horizontal and vertical sections: 5463 ft²

SOCON Sonar Well Services, Inc.

Tatum Brine BW-2

08/21/2008



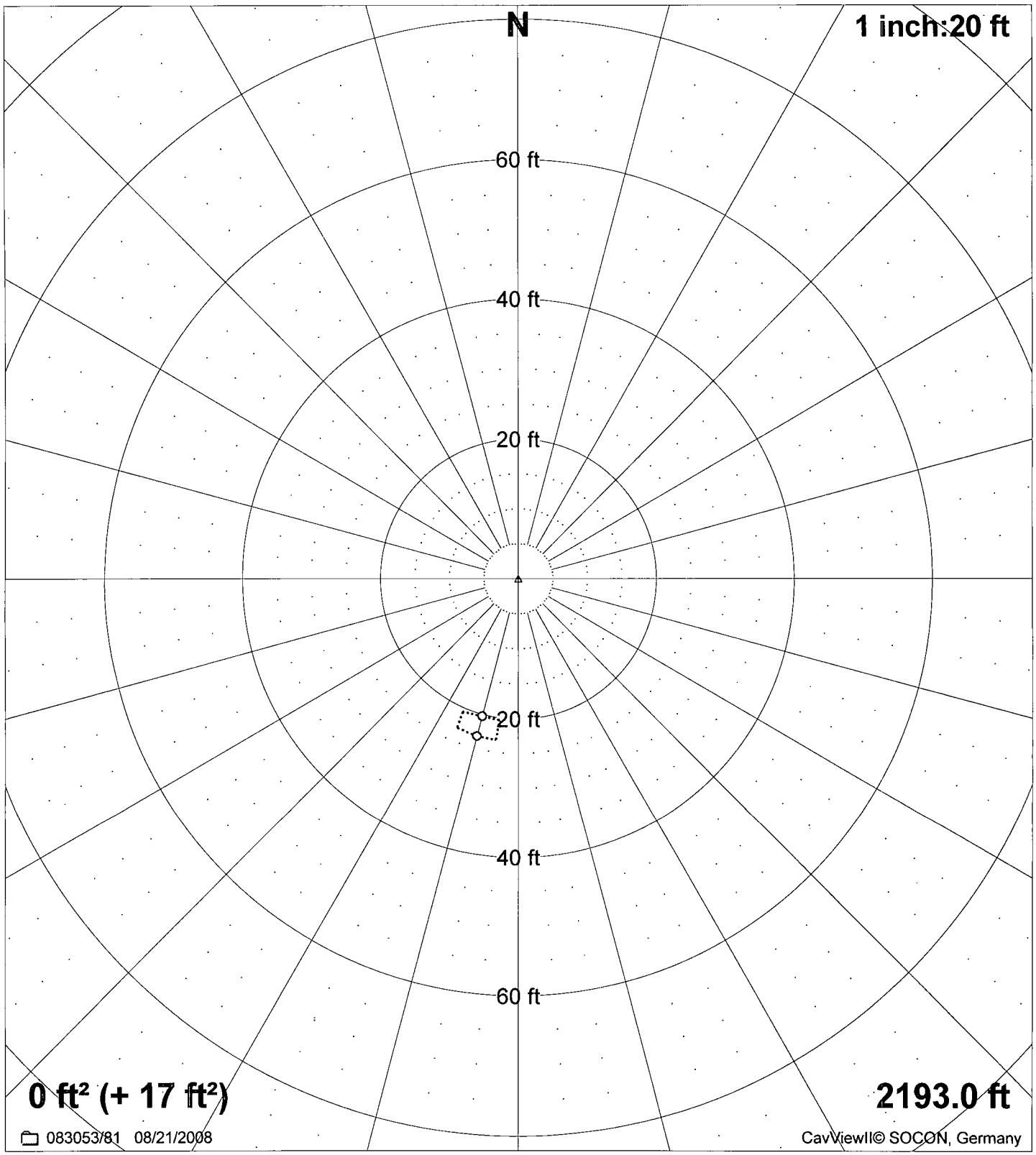
(08/21/2008) Leached pocket (08/21/2008)

d_{max}: 24.2 ft 195° <--> 15° r_{min}: 0.0 ft -> 0° r~: 0.9 ft r_{max}: 24.2 ft -> 195°

SOCON Sonar Well Services, Inc.

Tatum Brine BW-2

08/21/2008



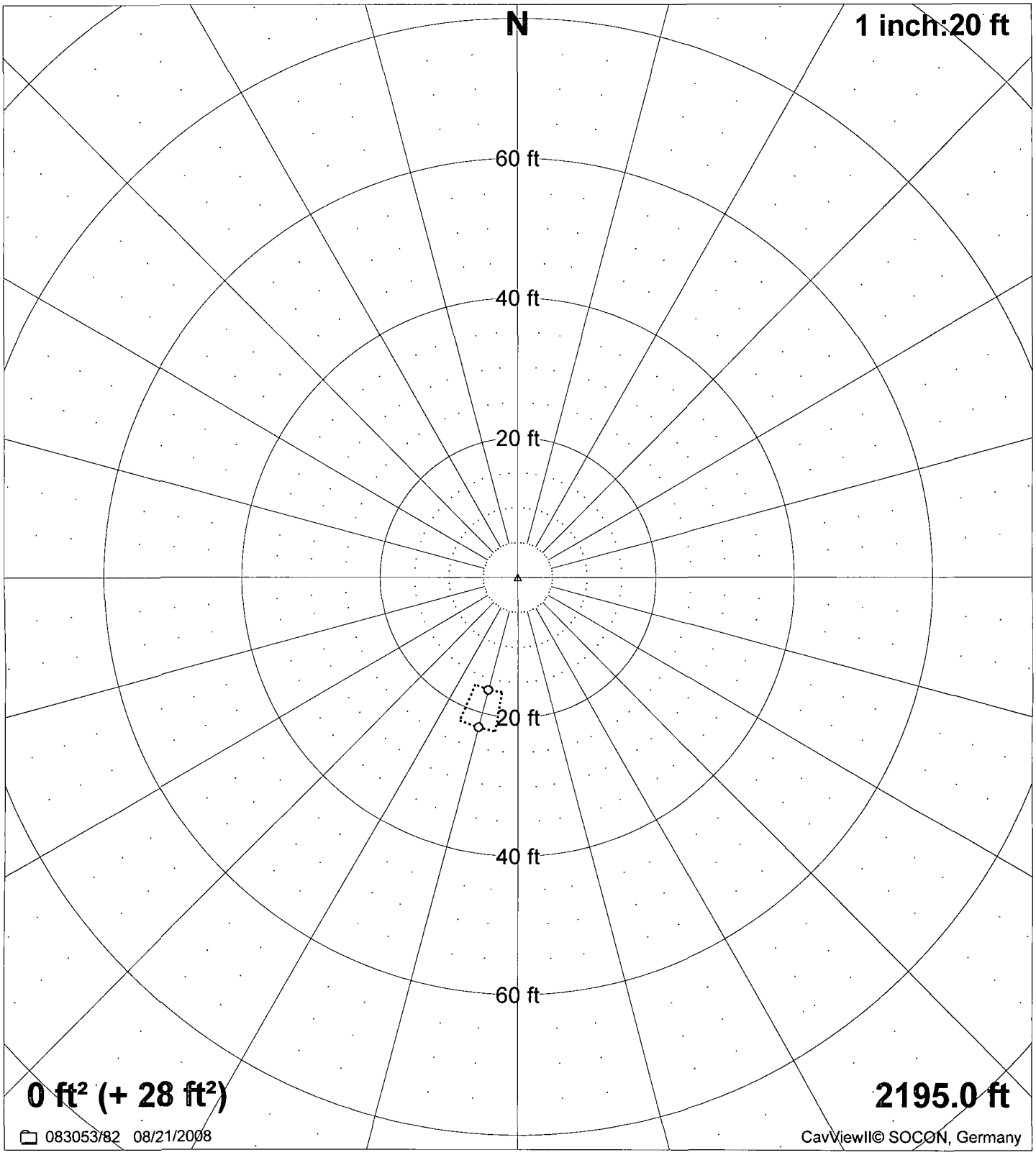
(08/21/2008) Leached pocket (08/21/2008)

d_{max}: 23.2 ft 195° <--> 15° r_{min}: 0.0 ft -> 0° r~: 2.3 ft r_{max}: 23.2 ft -> 195°

SOCON Sonar Well Services, Inc.

Tatum Brine BW-2

08/21/2008



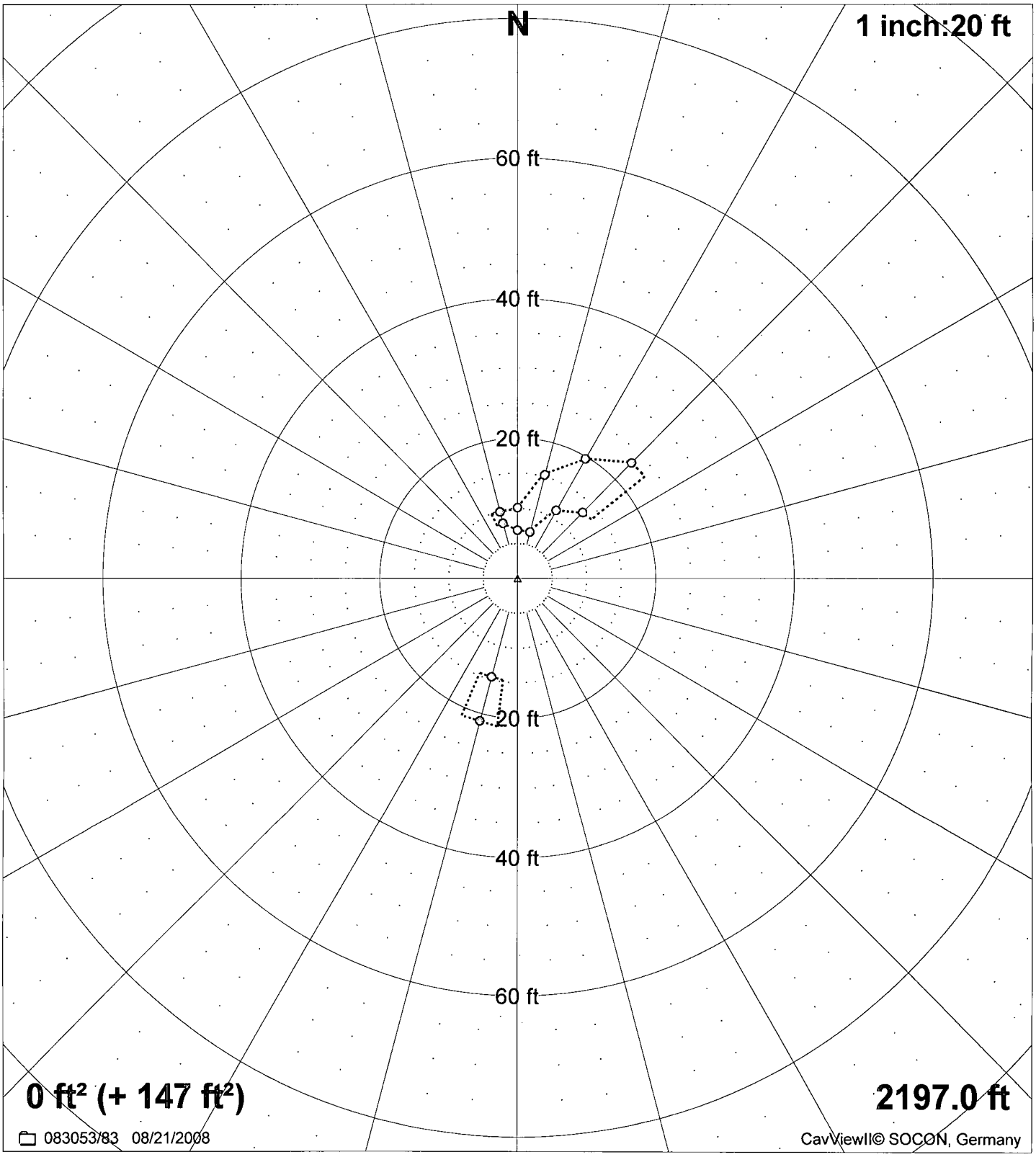
(08/21/2008) Leached pocket (08/21/2008)

d_{max}: 22.1 ft 195° <--> 15° r_{min}: 0.0 ft -> 0° r~: 3.0 ft r_{max}: 22.1 ft -> 195°

SOCON Sonar Well Services, Inc.

Tatum Brine BW-2

08/21/2008



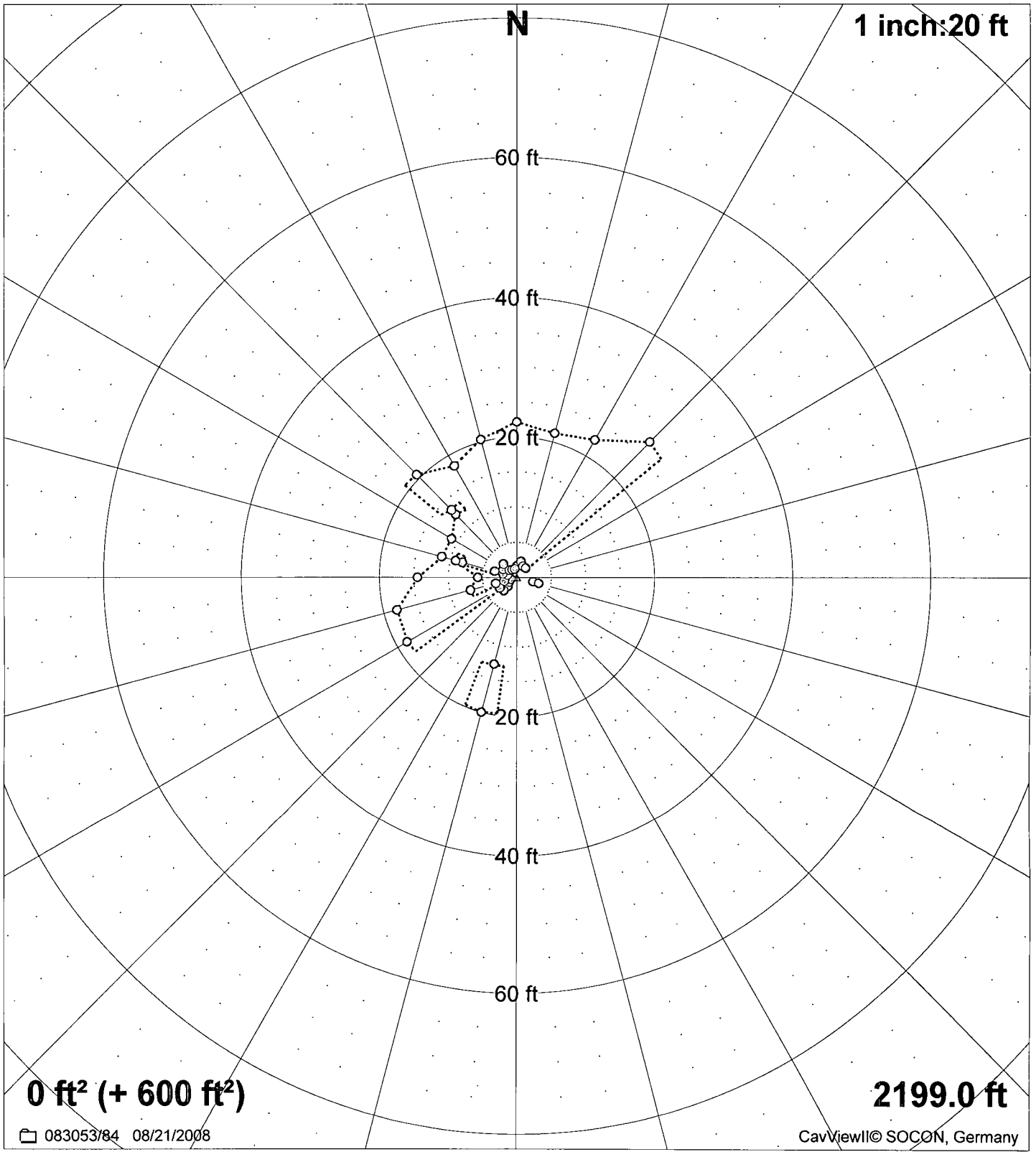
(08/21/2008) Leached pocket (08/21/2008)

d_{max}: 36.3 ft 15° <--> 195° r_{min}: 0.0 ft -> 1° r~: 6.8 ft r_{max}: 23.3 ft -> 45°

SOCON Sonar Well Services, Inc.

Tatum Brine BW-2

08/21/2008



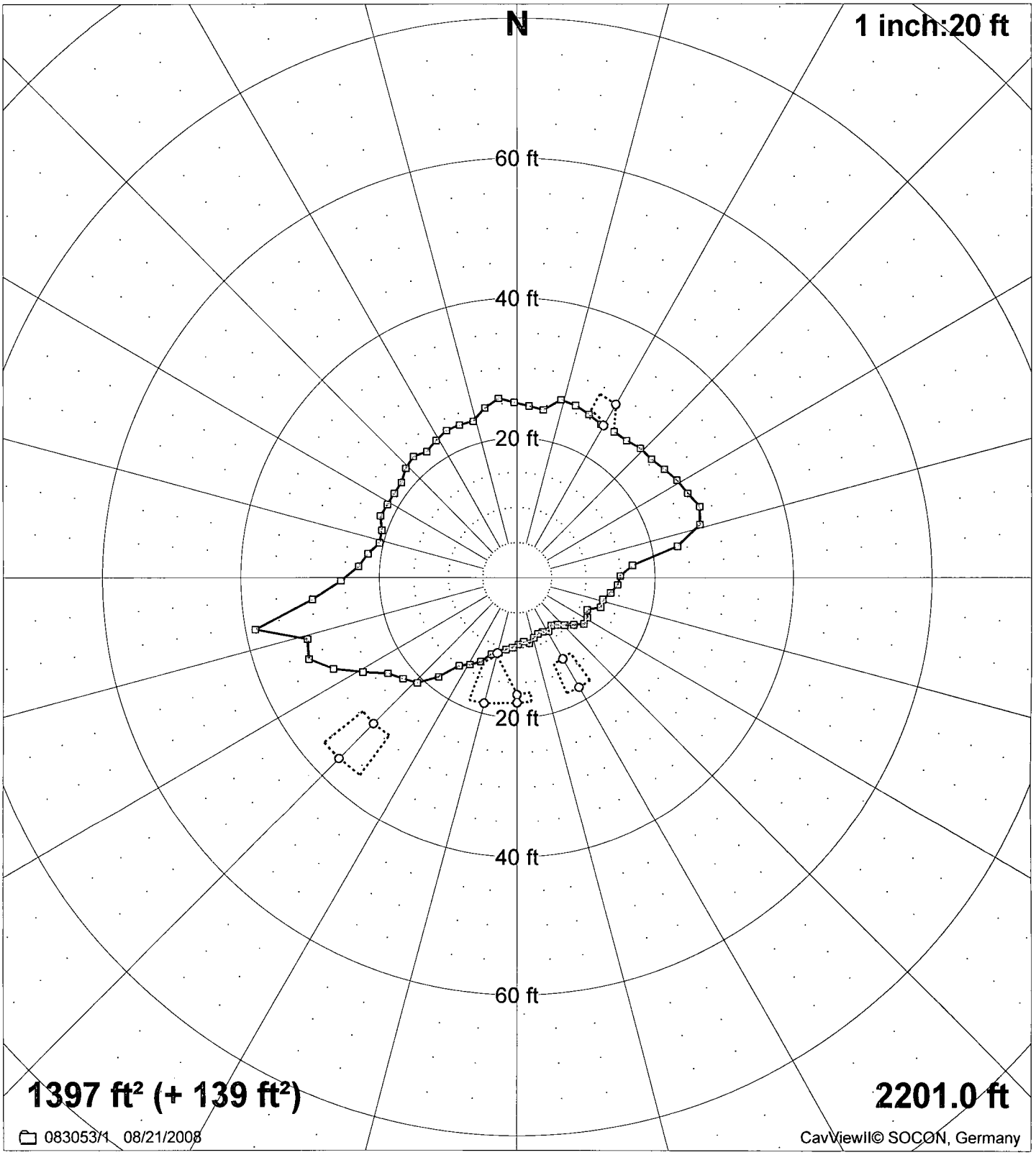
(08/21/2008) Leached pocket (08/21/2008)

d_{max}: 41.2 ft 15° <--> 195° r_{min}: 0.0 ft -> 1° r~: 13.8 ft r_{max}: 27.3 ft -> 45°

SOCON Sonar Well Services, Inc.

Tatum Brine BW-2

08/21/2008



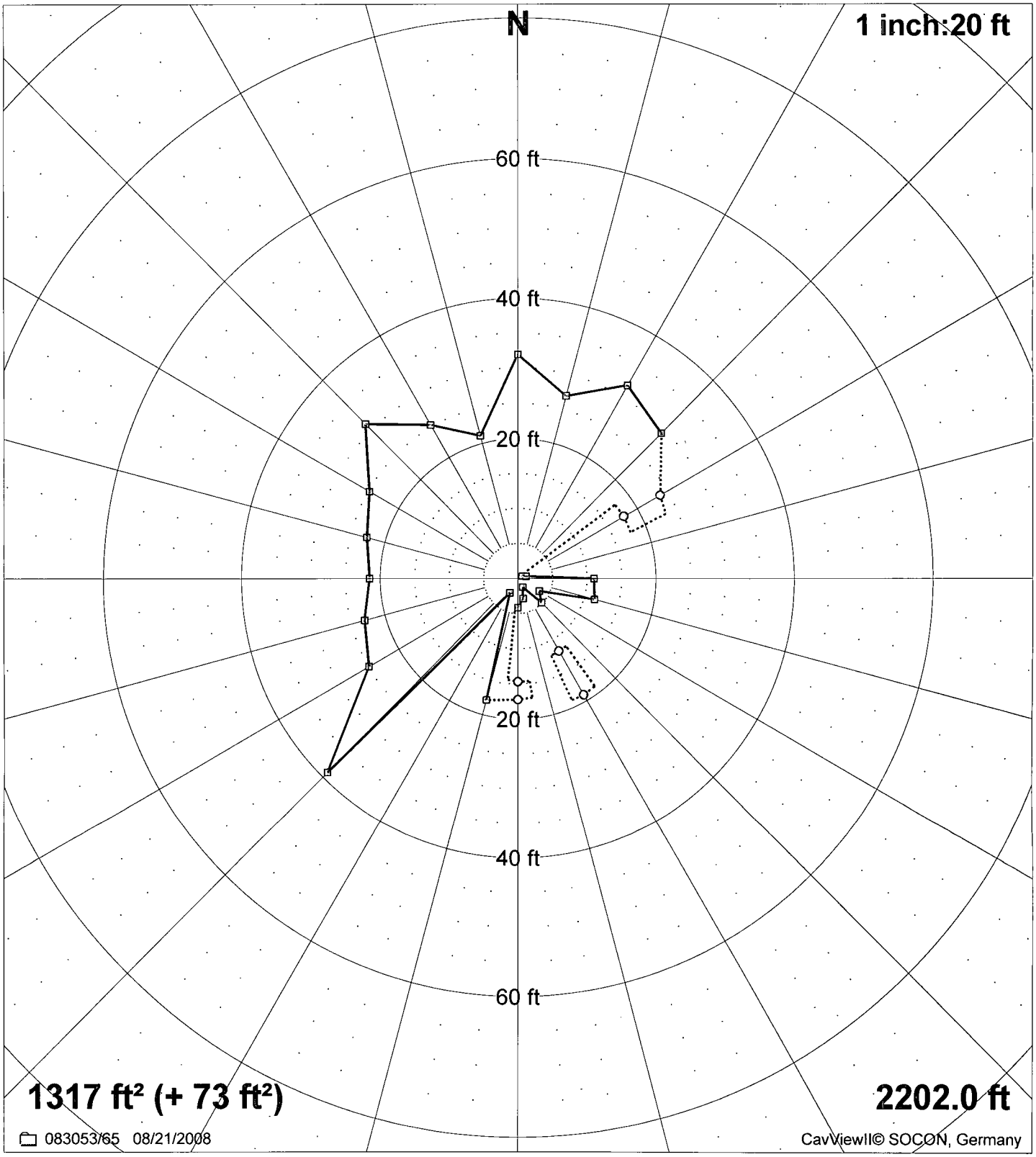
(08/21/2008) Leached pocket (08/21/2008)

d_{max}: 62.3 ft 259° <--> 79° r_{min}: 8.4 ft -> 144° r~: 22.1 ft r_{max}: 38.6 ft -> 259°

SOCON Sonar Well Services, Inc.

Tatum Brine BW-2

08/21/2008



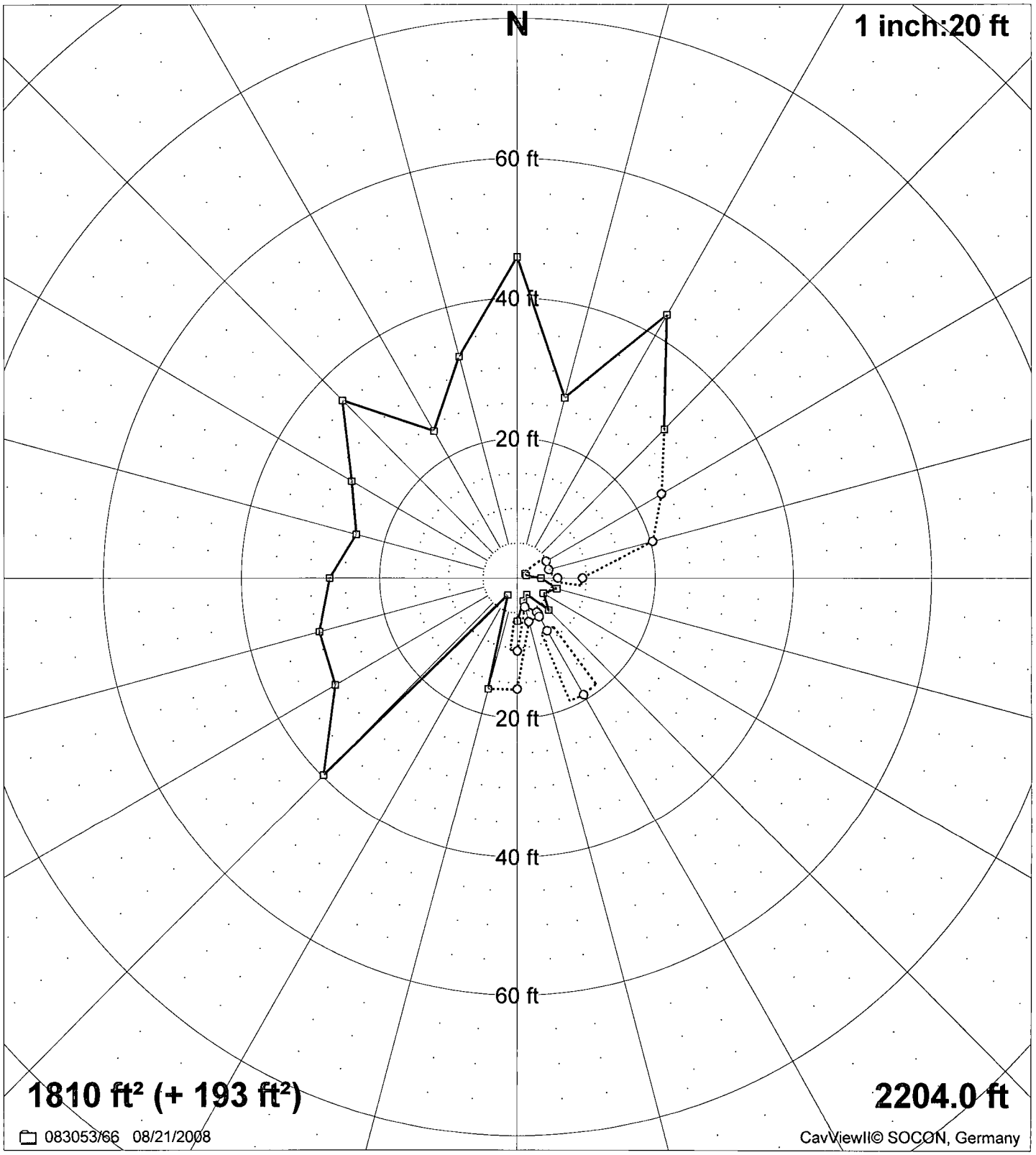
(08/21/2008) Leached pocket (08/21/2008)

d_{max}: 68.4 ft 225° <--> 45° r_{min}: 0.8 ft -> 61° r~: 21.0 ft r_{max}: 39.0 ft -> 225°

SOCON Sonar Well Services, Inc.

Tatum Brine BW-2

08/21/2008



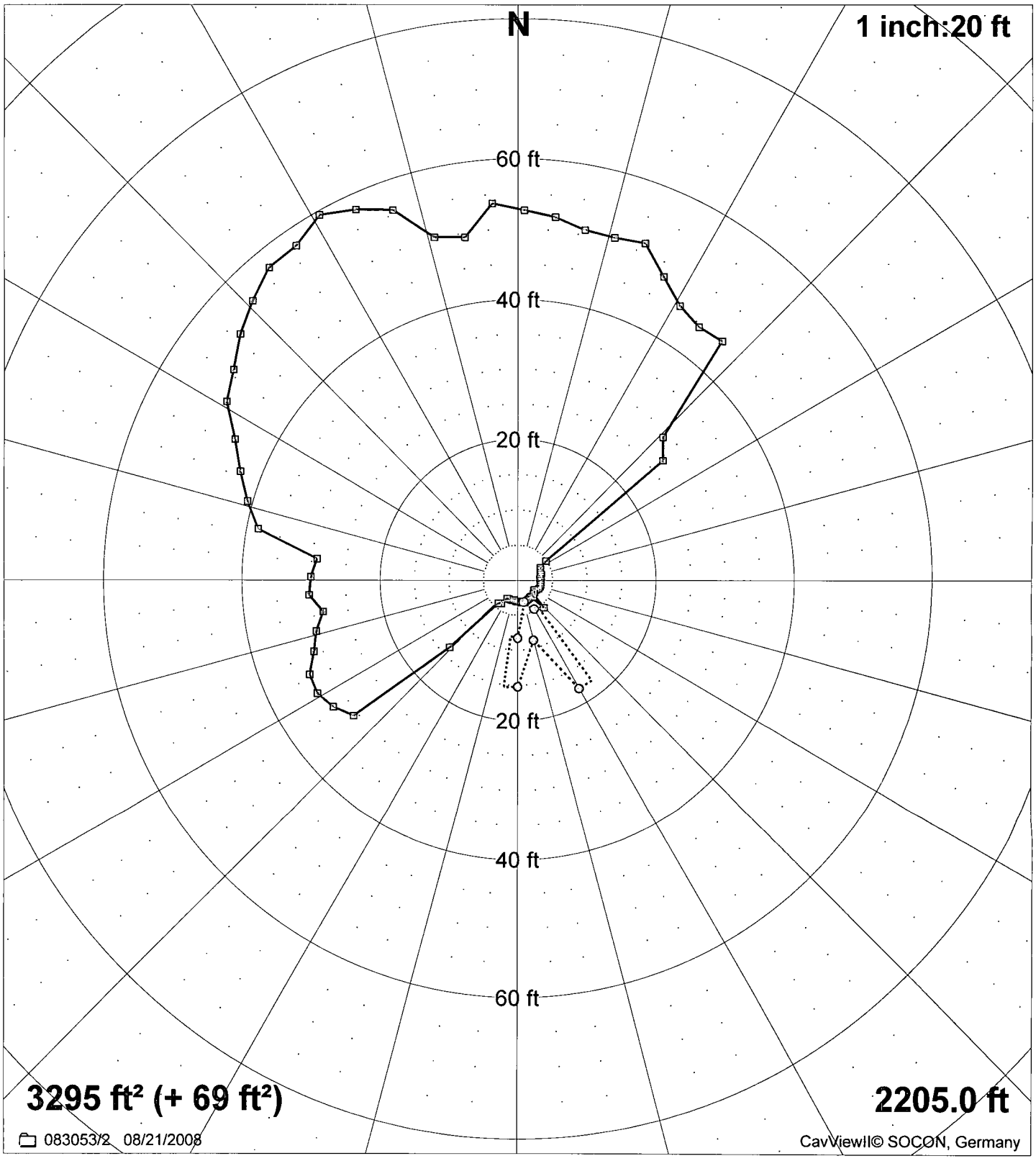
(08/21/2008) Leached pocket (08/21/2008)

d_{max}: 69.8 ft 45° <--> 225° r_{min}: 1.3 ft -> 62° r~: 25.2 ft r_{max}: 45.9 ft -> 360°

SOCON Sonar Well Services, Inc.

Tatum Brine BW-2

08/21/2008



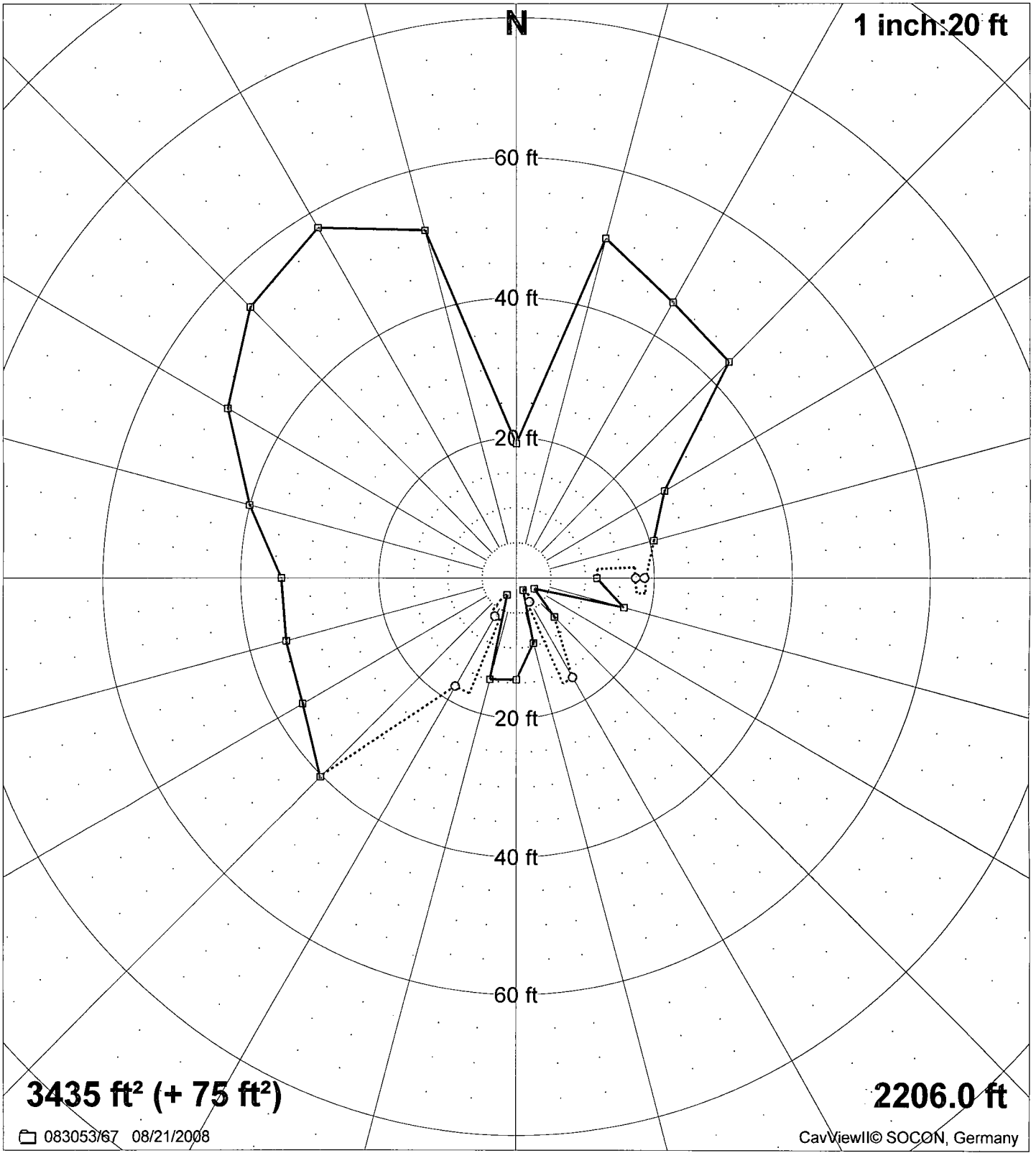
(08/21/2008) Leached pocket (08/21/2008)

d_{max}: 76.7 ft 330° <--> 150° r_{min}: 2.7 ft -> 121° r~: 32.7 ft r_{max}: 59.4 ft -> 331°

SOCON Sonar Well Services, Inc.

Tatum Brine BW-2

08/21/2008



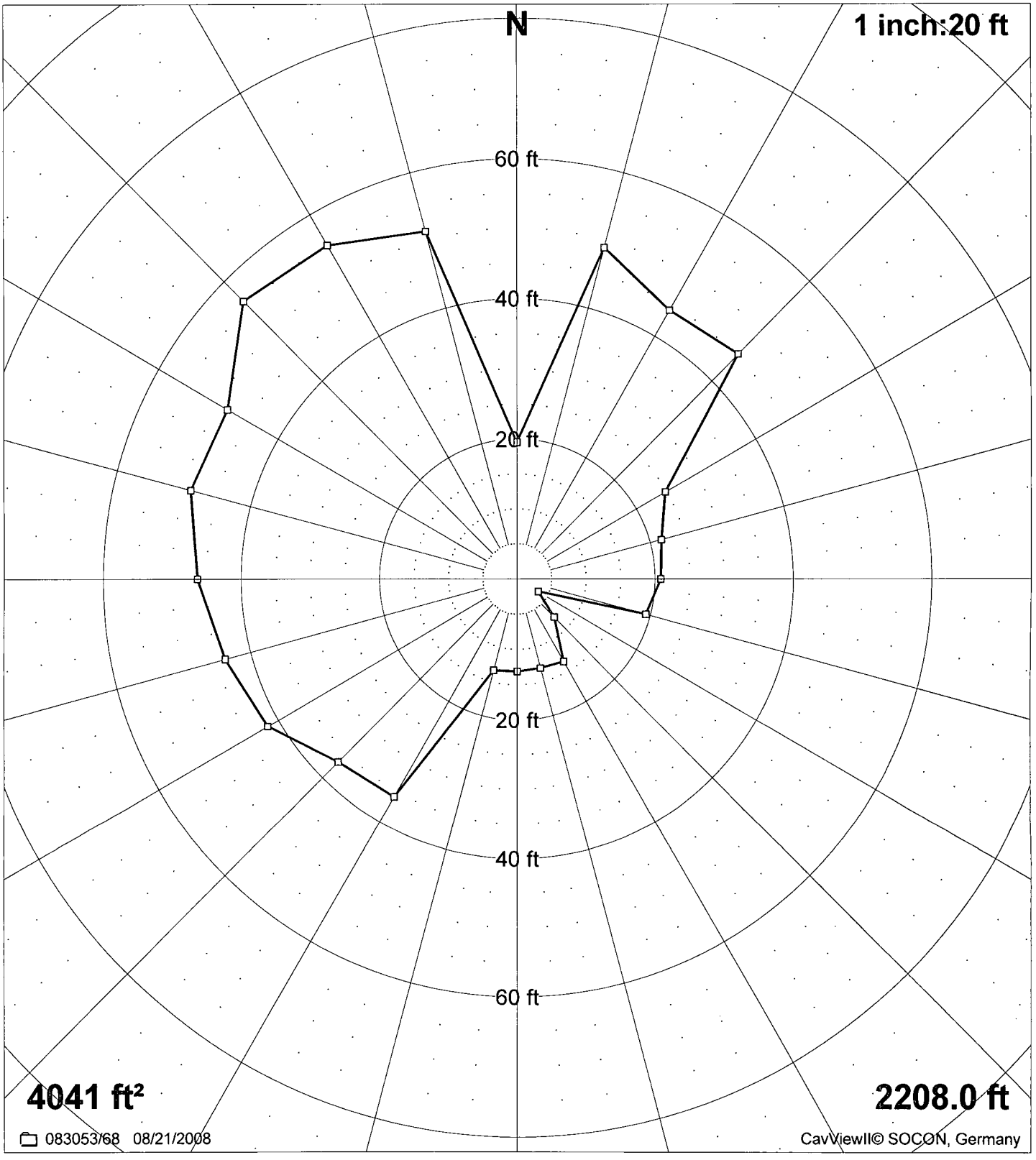
(08/21/2008) Leached pocket (08/21/2008)

d_{max}: 83.8 ft 45° <--> 225° r_{min}: 2.1 ft -> 149° r~: 33.4 ft r_{max}: 57.6 ft -> 330°

SOCON Sonar Well Services, Inc.

Tatum Brine BW-2

08/21/2008



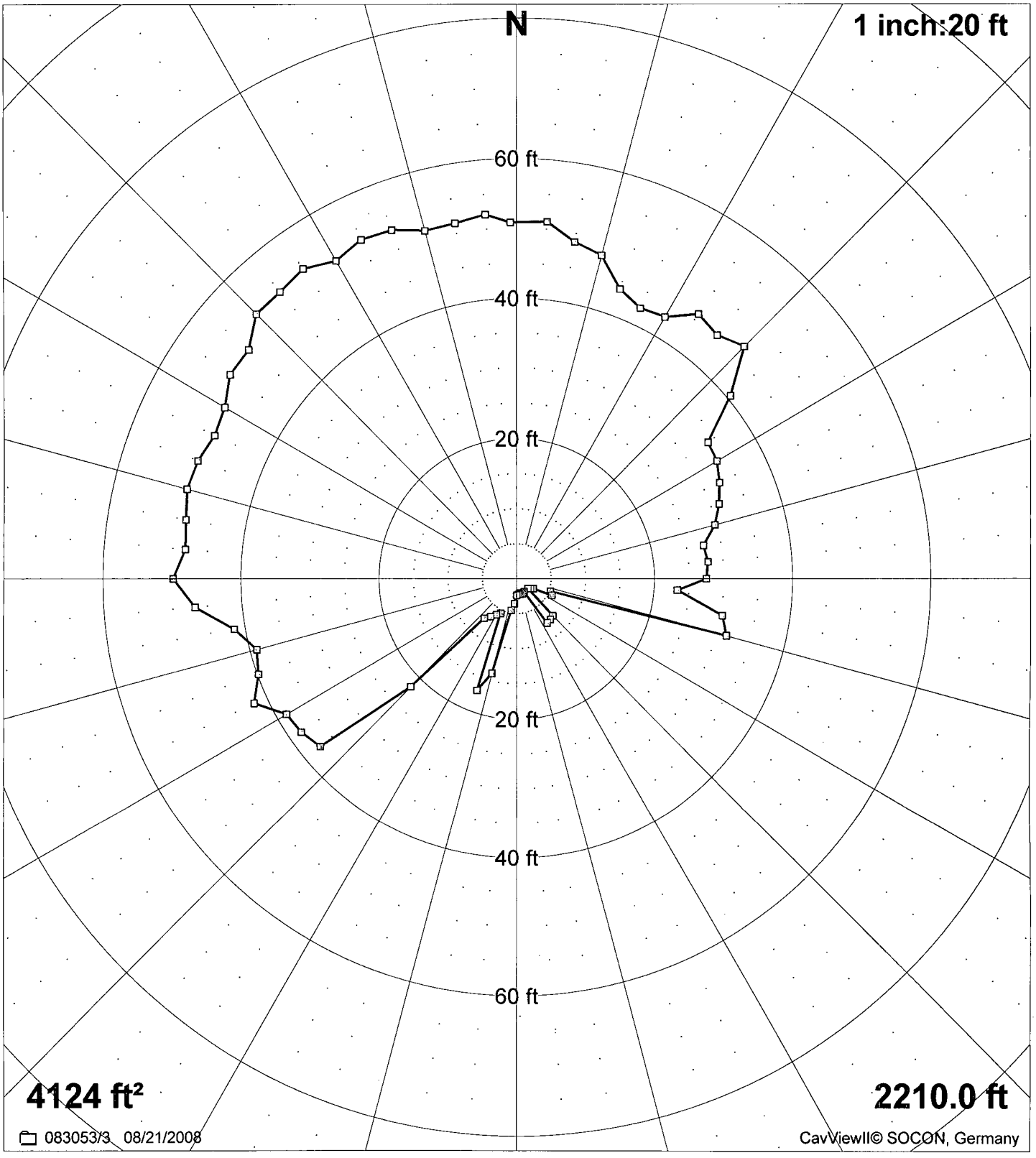
(08/21/2008)

d_{max}: 82.1 ft 45° <--> 225° r_{min}: 3.5 ft -> 120° r~: 35.9 ft r_{max}: 56.0 ft -> 315°

SOCON Sonar Well Services, Inc.

Tatum Brine BW-2

08/21/2008



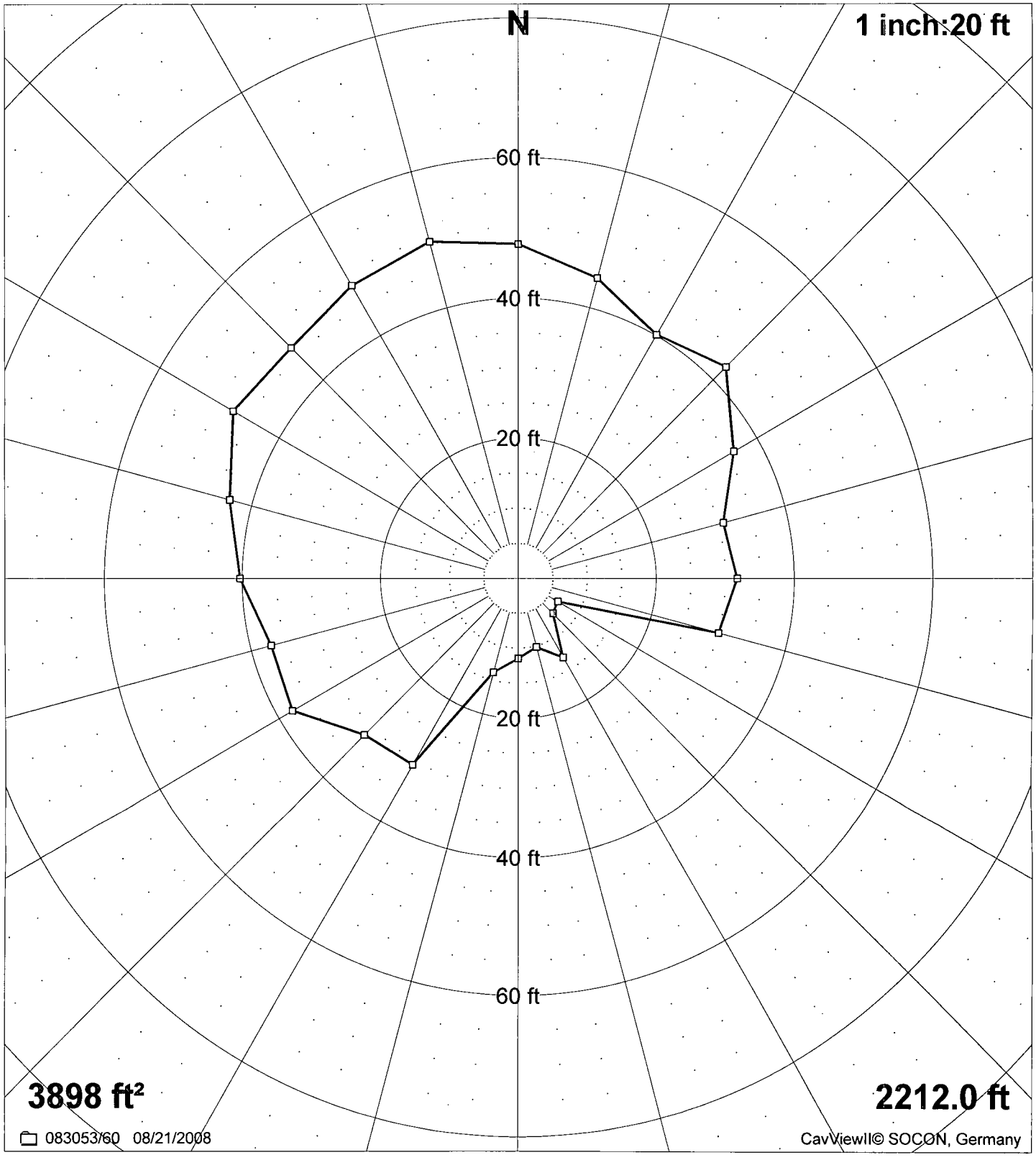
(08/21/2008)

d_{max}: 80.9 ft 105° <--> 285° r_{min}: 2.1 ft -> 130° r~: 36.2 ft r_{max}: 53.9 ft -> 325°

SOCON Sonar Well Services, Inc.

Tatum Brine BW-2

08/21/2008



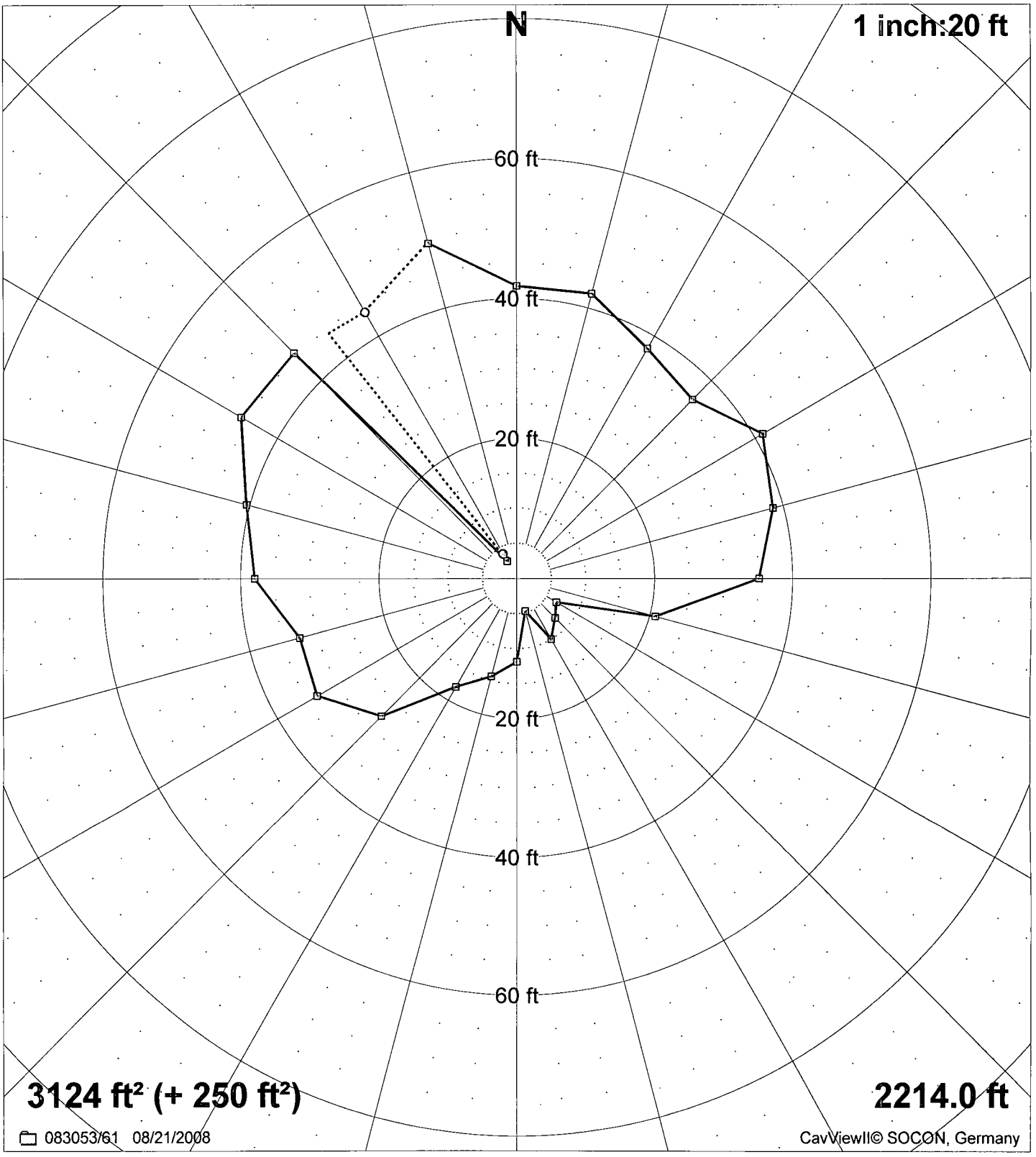
(08/21/2008)

d_{max}: 74.1 ft 45° <--> 225° r_{min}: 6.6 ft -> 120° r~: 35.2 ft r_{max}: 49.7 ft -> 345°

SOCON Sonar Well Services, Inc.

Tatum Brine BW-2

08/21/2008



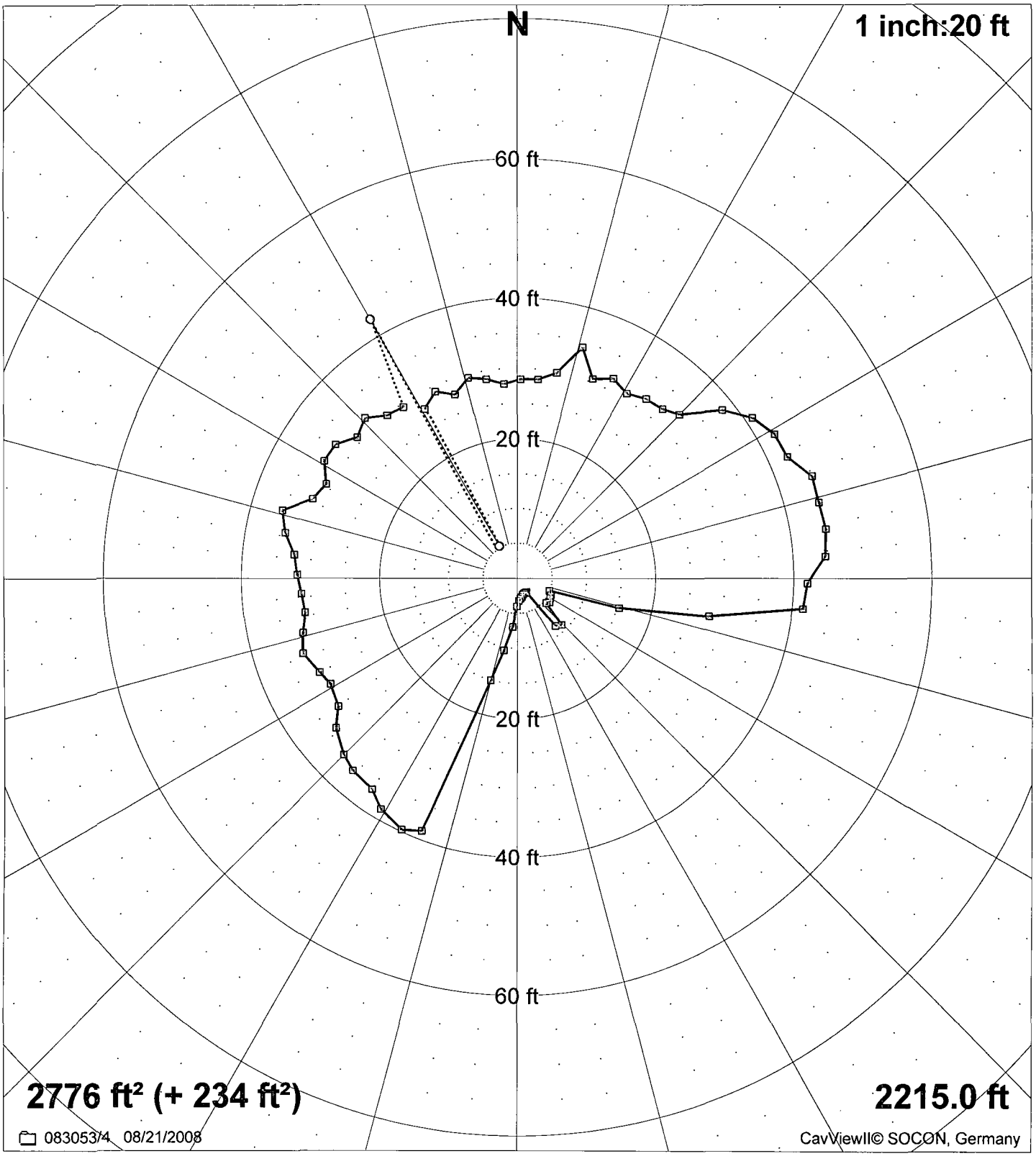
(08/21/2008) Leached pocket (08/21/2008)

d_{max}: 74.7 ft 240° <--> 60° r_{min}: 3.0 ft -> 329° r~: 32.8 ft r_{max}: 49.5 ft -> 345°

SOCON Sonar Well Services, Inc.

Tatum Brine BW-2

08/21/2008



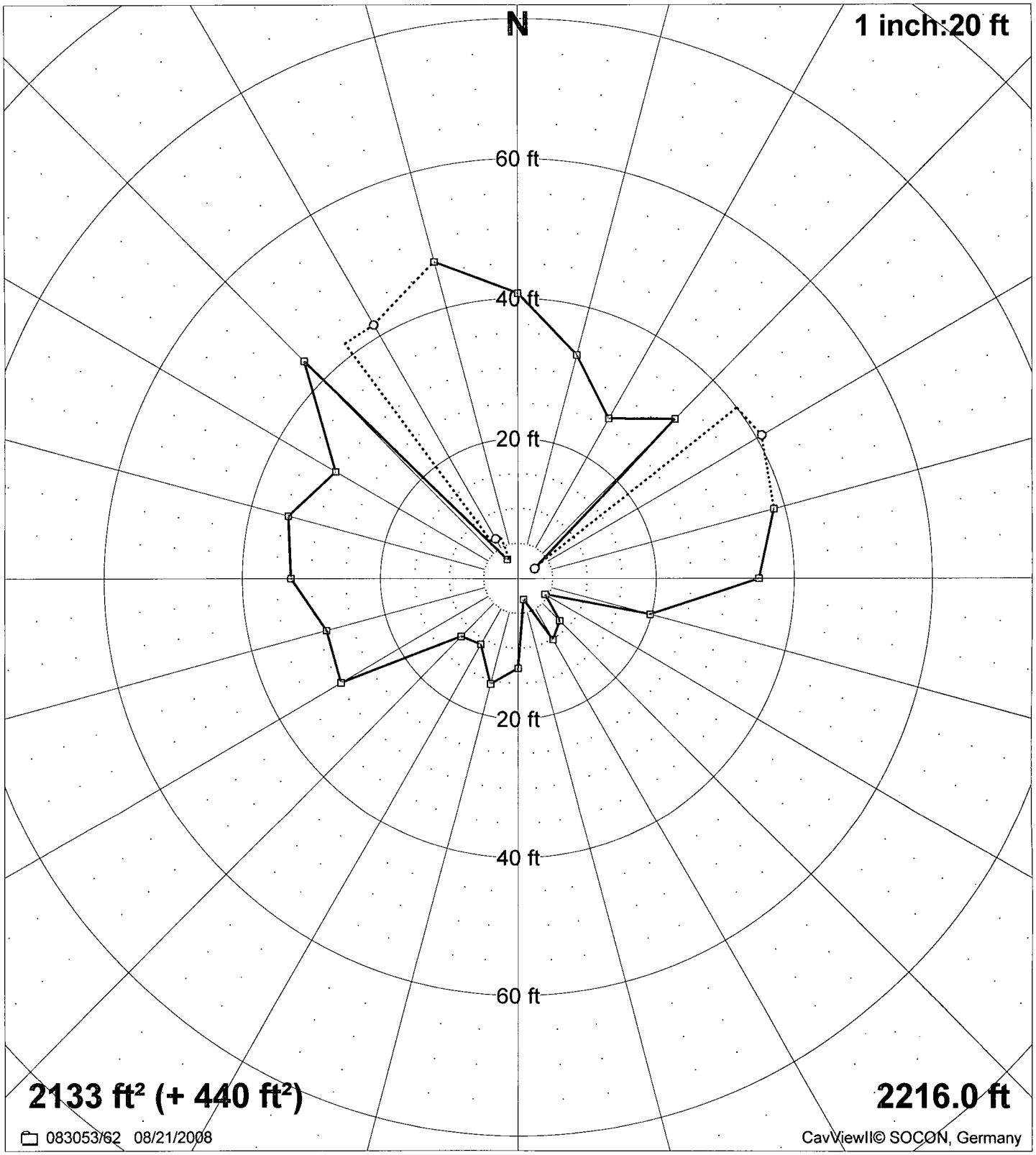
(08/21/2008) Leached pocket (08/21/2008)

d_{max}: 78.0 ft 251° <--> 71° r_{min}: 2.3 ft -> 154° r~: 31.0 ft r_{max}: 45.1 ft -> 81°

SOCON Sonar Well Services, Inc.

Tatum Brine BW-2

08/21/2008



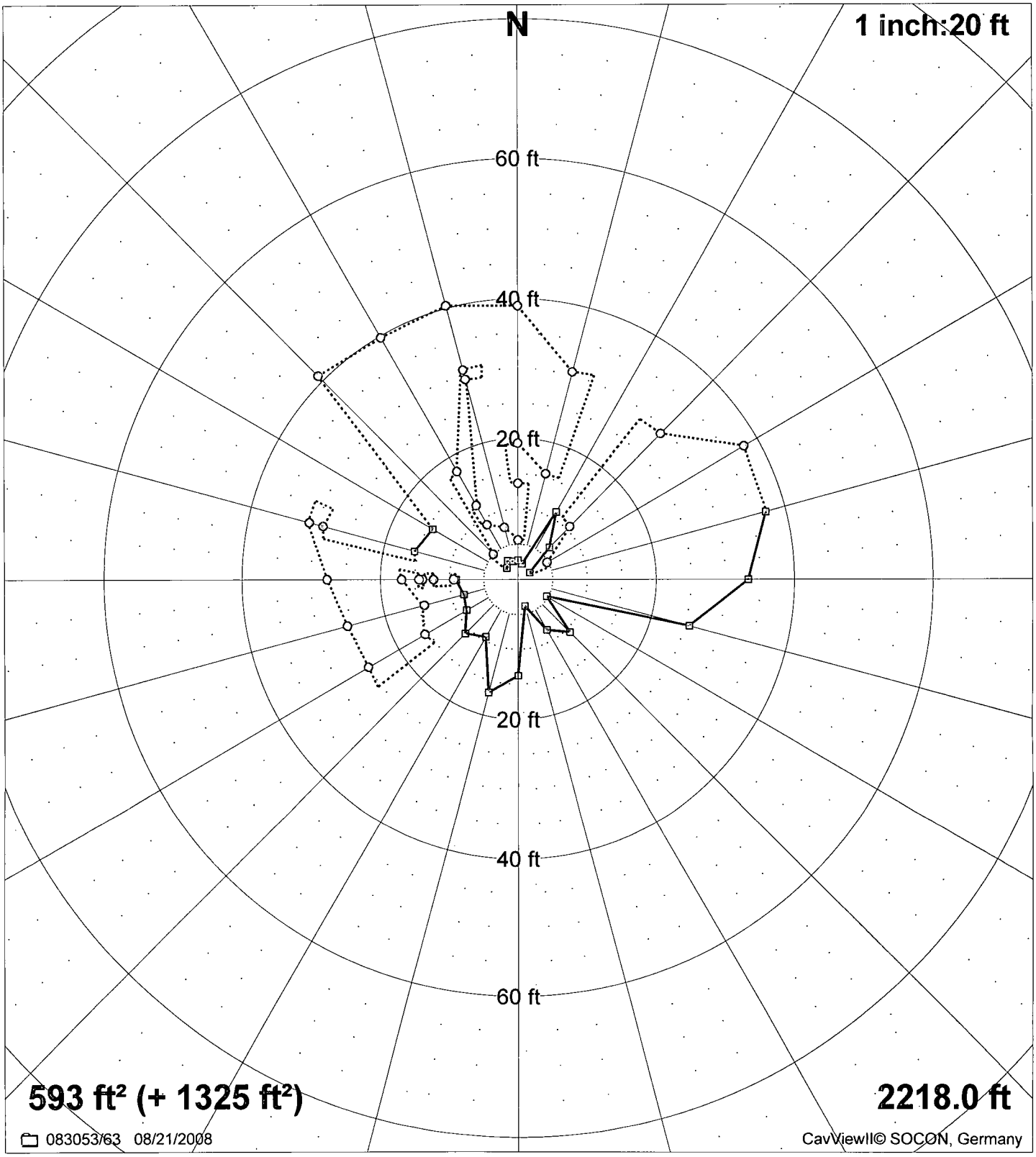
(08/21/2008) Leached pocket (08/21/2008)

d_{max}: 70.5 ft 240° <--> 60° r_{min}: 2.9 ft -> 59° r~: 28.6 ft r_{max}: 46.8 ft -> 345°

SOCON Sonar Well Services, Inc.

Tatum Brine BW-2

08/21/2008



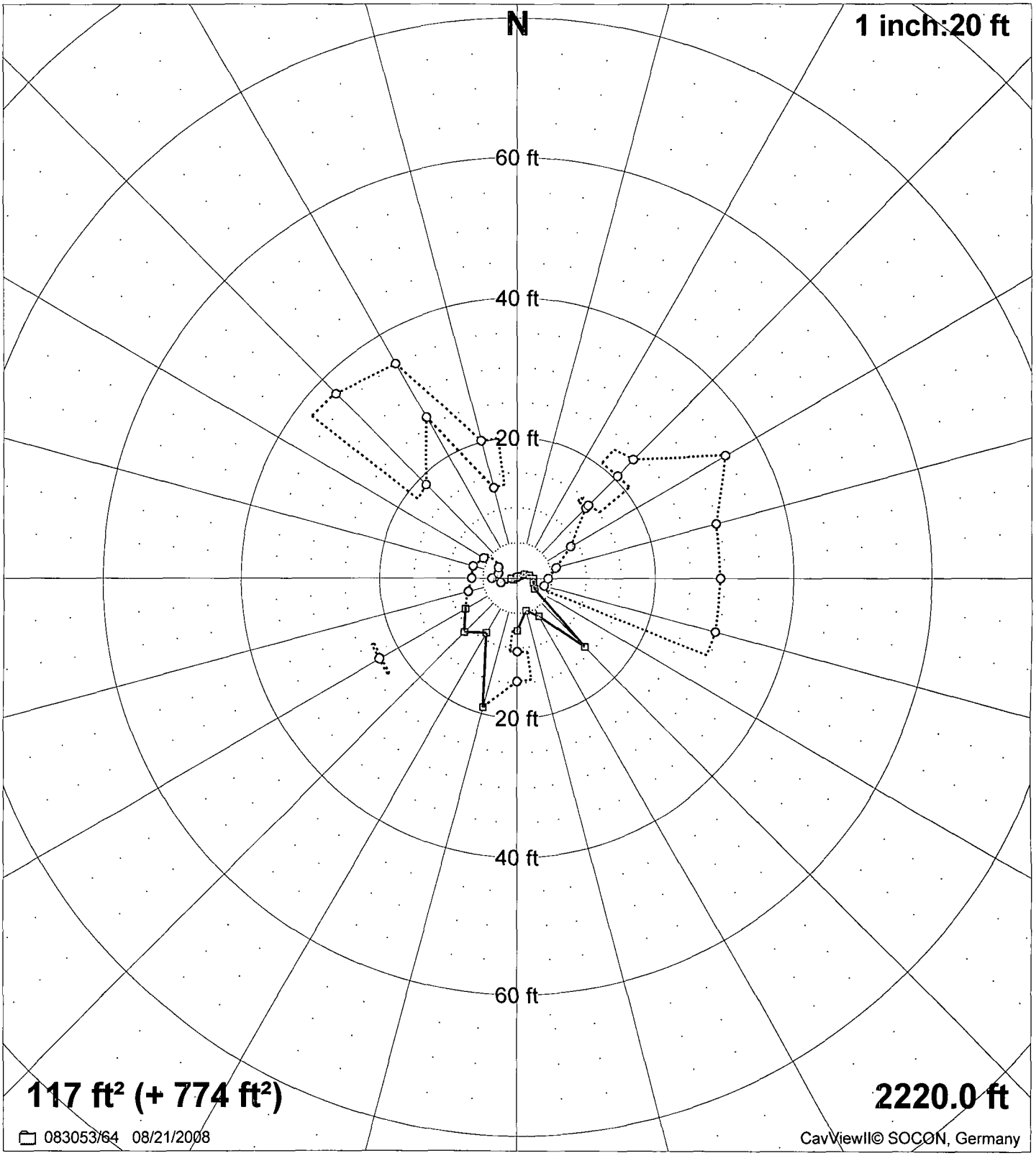
(08/21/2008) Leached pocket (08/21/2008)

d_{max}: 62.8 ft 240° <--> 60° r_{min}: 2.0 ft -> 59° r~: 24.7 ft r_{max}: 40.9 ft -> 315°

SOCON Sonar Well Services, Inc.

Tatum Brine BW-2

08/21/2008



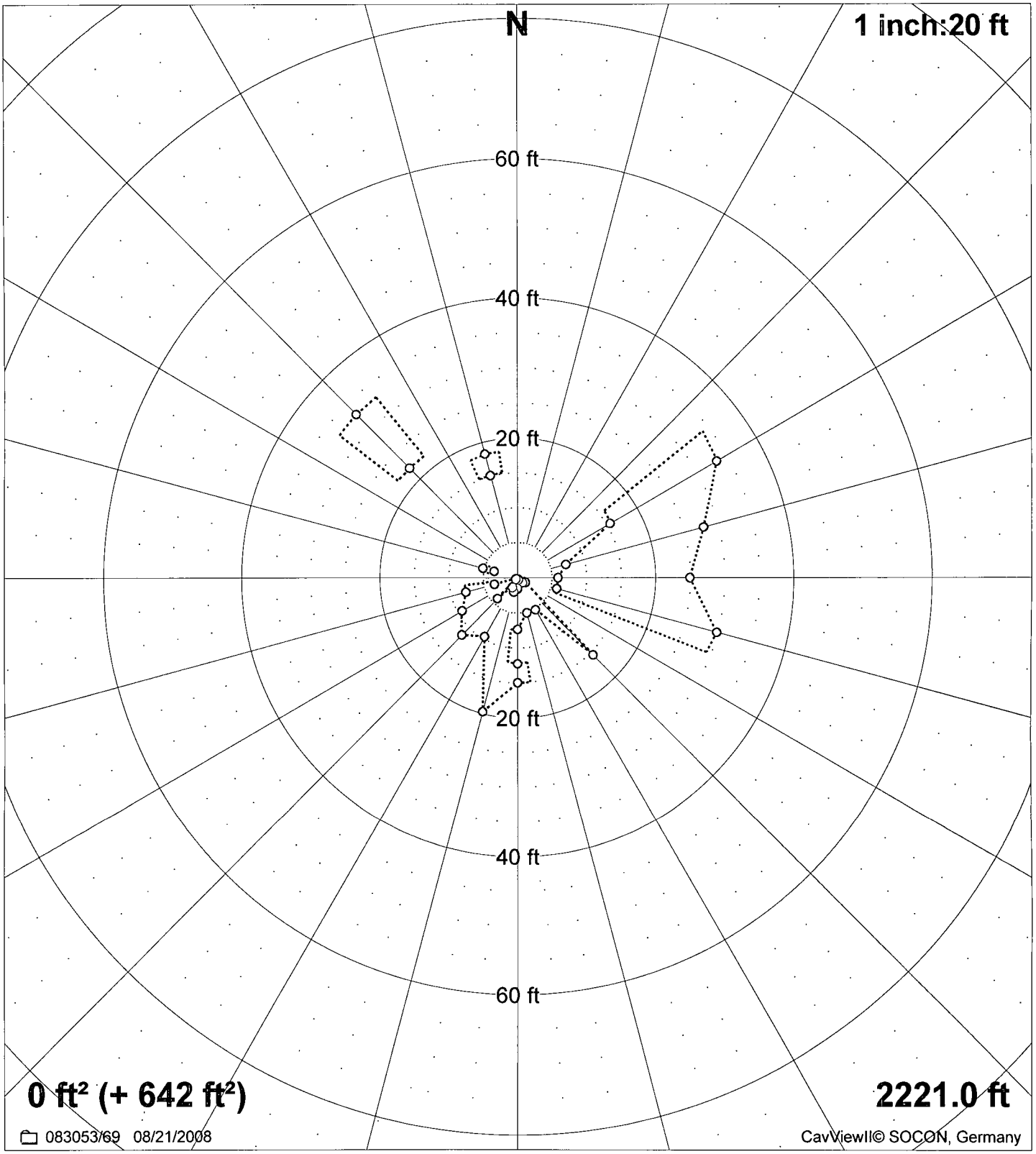
(08/21/2008) Leached pocket (08/21/2008)

d_{max}: 58.0 ft 60° <--> 240° r_{min}: 0.2 ft -> 301° r~: 16.8 ft r_{max}: 37.1 ft -> 315°

SOCON Sonar Well Services, Inc.

Tatum Brine BW-2

08/21/2008



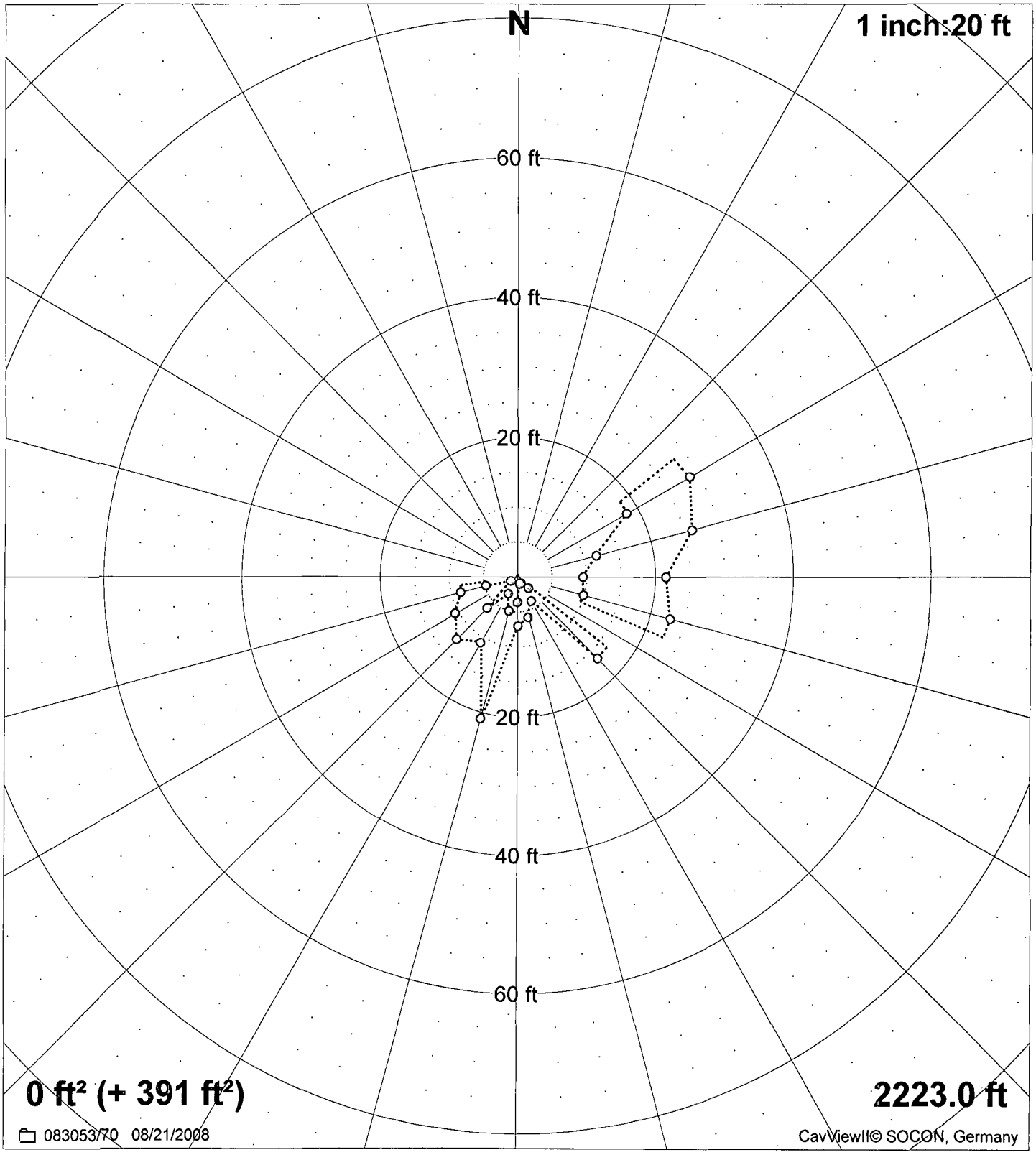
(08/21/2008) Leached pocket (08/21/2008)

d_{max}: 48.5 ft 315° <--> 135° r_{min}: 0.0 ft -> 0° r~: 14.3 ft r_{max}: 33.3 ft -> 60°

SOCON Sonar Well Services, Inc.

Tatum Brine BW-2

08/21/2008



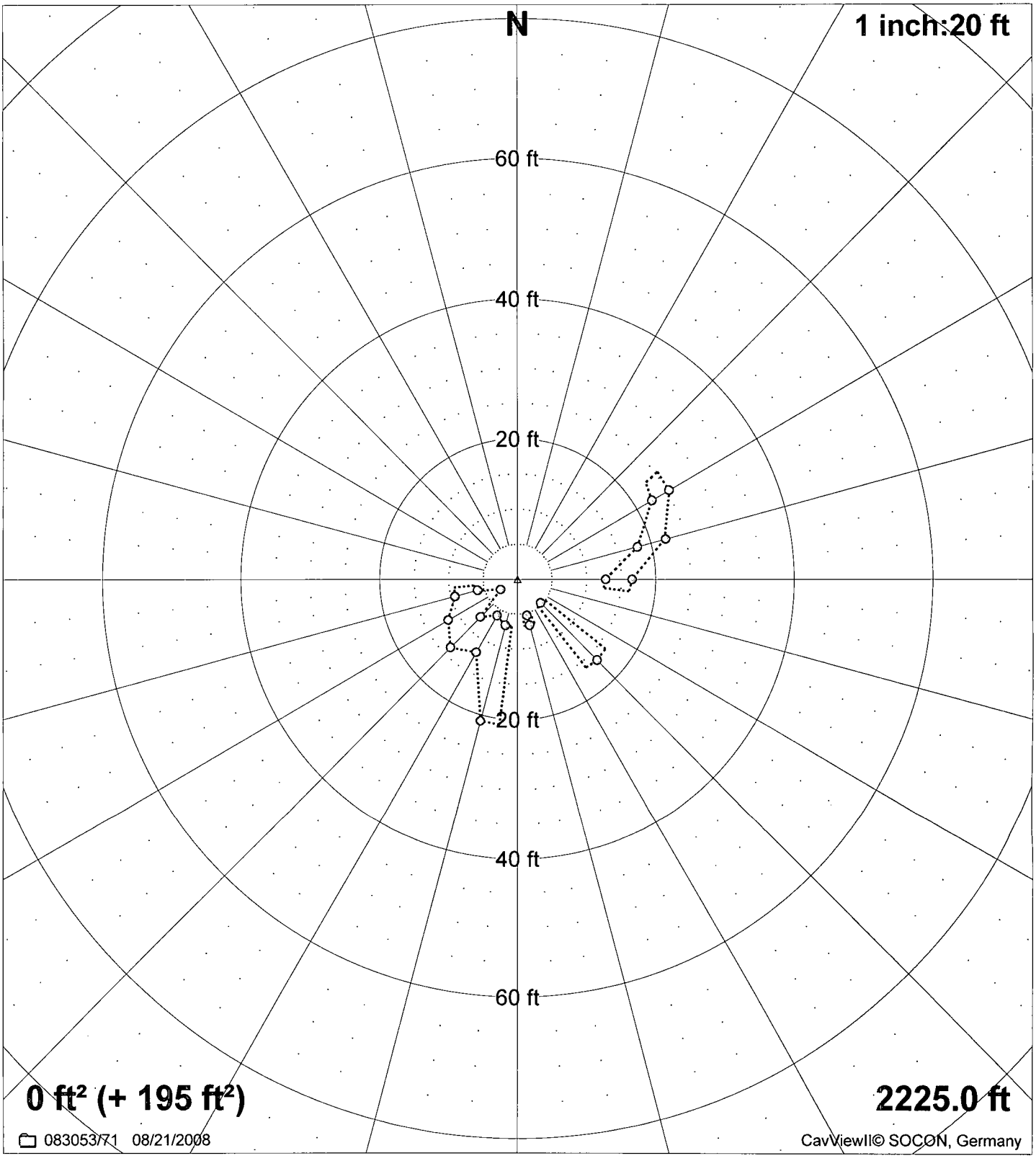
(08/21/2008) Leached pocket (08/21/2008)

d_{max}: 39.3 ft 60° <--> 240° r_{min}: 0.0 ft -> 0° r~: 11.2 ft r_{max}: 28.8 ft -> 60°

SOCON Sonar Well Services, Inc.

Tatum Brine BW-2

08/21/2008



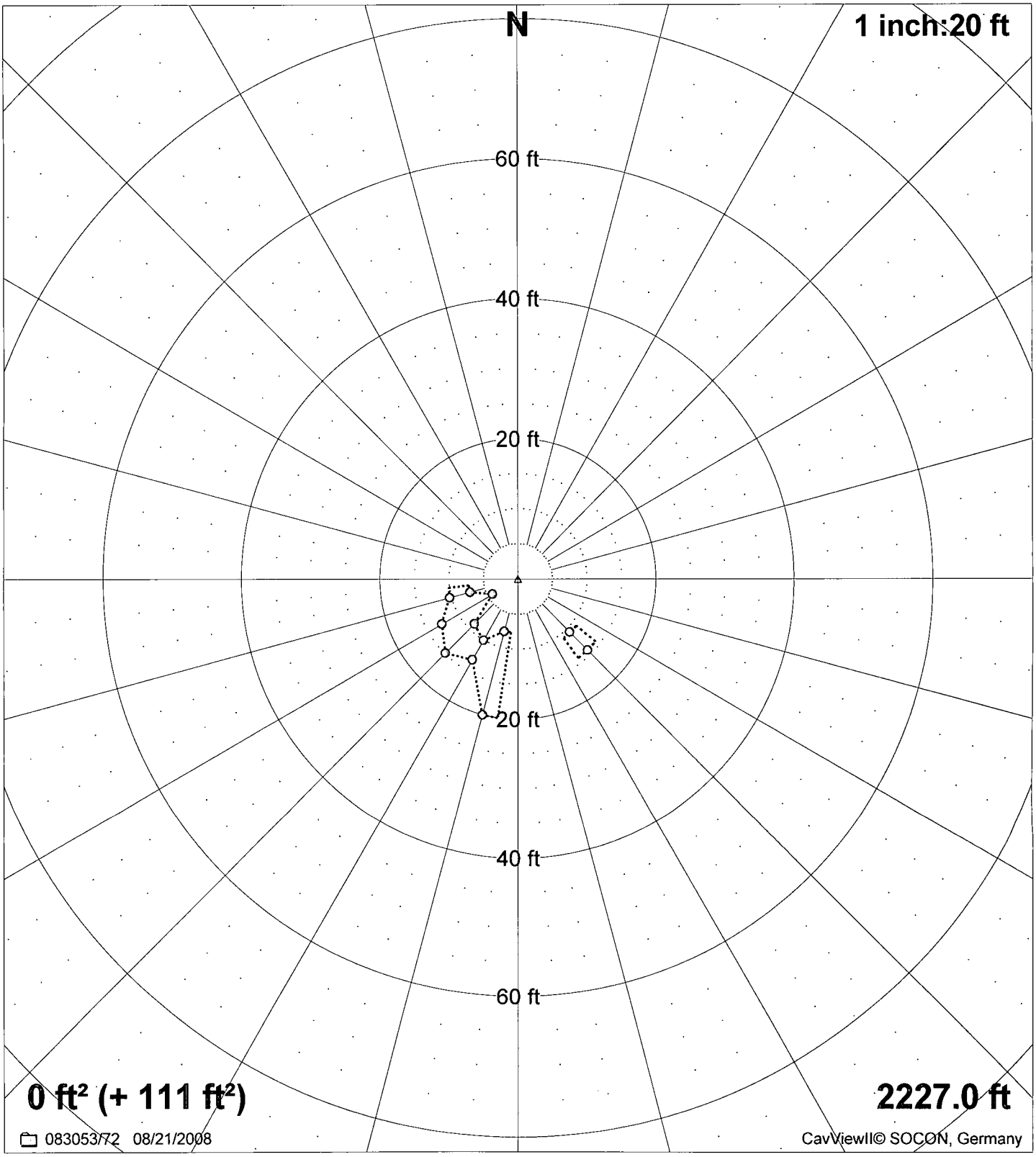
(08/21/2008) Leached pocket (08/21/2008)

d_{max}: 37.0 ft 240° <--> 60° r_{min}: 0.0 ft -> 0° r~: 7.9 ft r_{max}: 25.4 ft -> 60°

SOCON Sonar Well Services, Inc.

Tatum Brine BW-2

08/21/2008



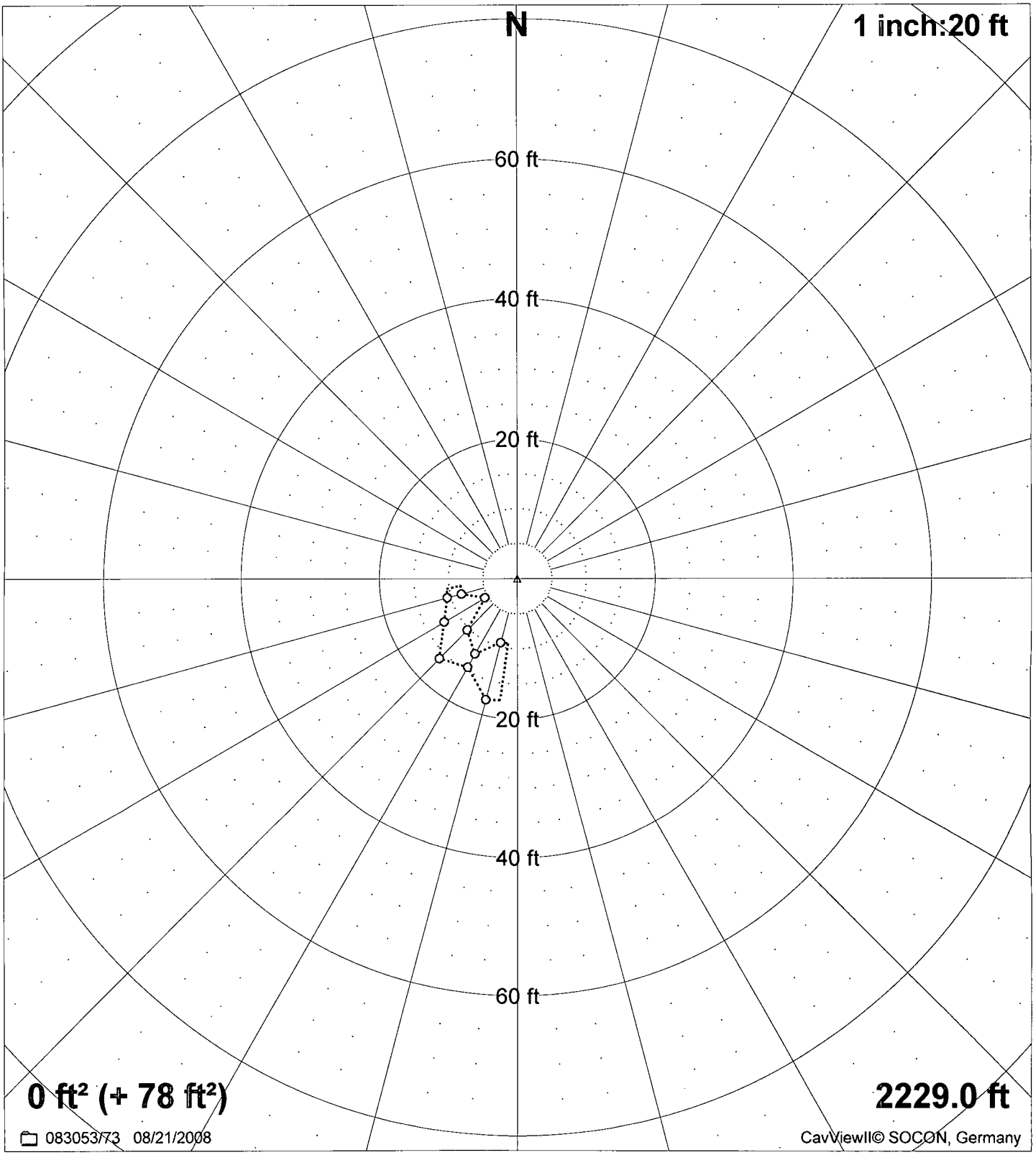
(08/21/2008) Leached pocket (08/21/2008)

d_{max}: 20.0 ft 15° <--> 195° r_{min}: 0.0 ft -> 0° r~: 5.9 ft r_{max}: 20.0 ft -> 195°

SOCON Sonar Well Services, Inc.

Tatum Brine BW-2

08/21/2008



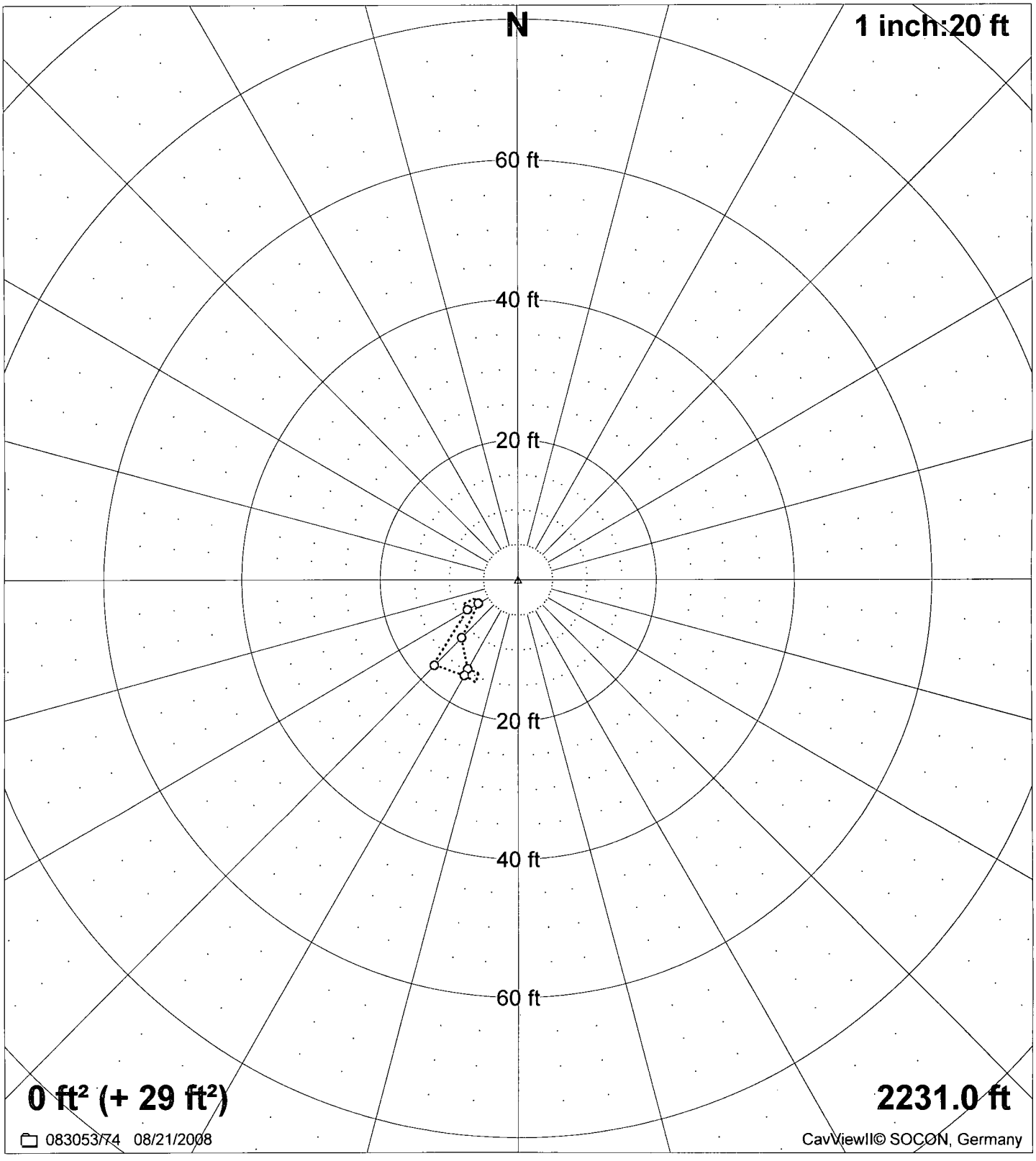
(08/21/2008) Leached pocket (08/21/2008)

d_{max}: 17.8 ft 15° <--> 195° r_{min}: 0.0 ft -> 0° r~: 5.0 ft r_{max}: 17.8 ft -> 195°

SOCON Sonar Well Services, Inc.

Tatum Brine BW-2

08/21/2008



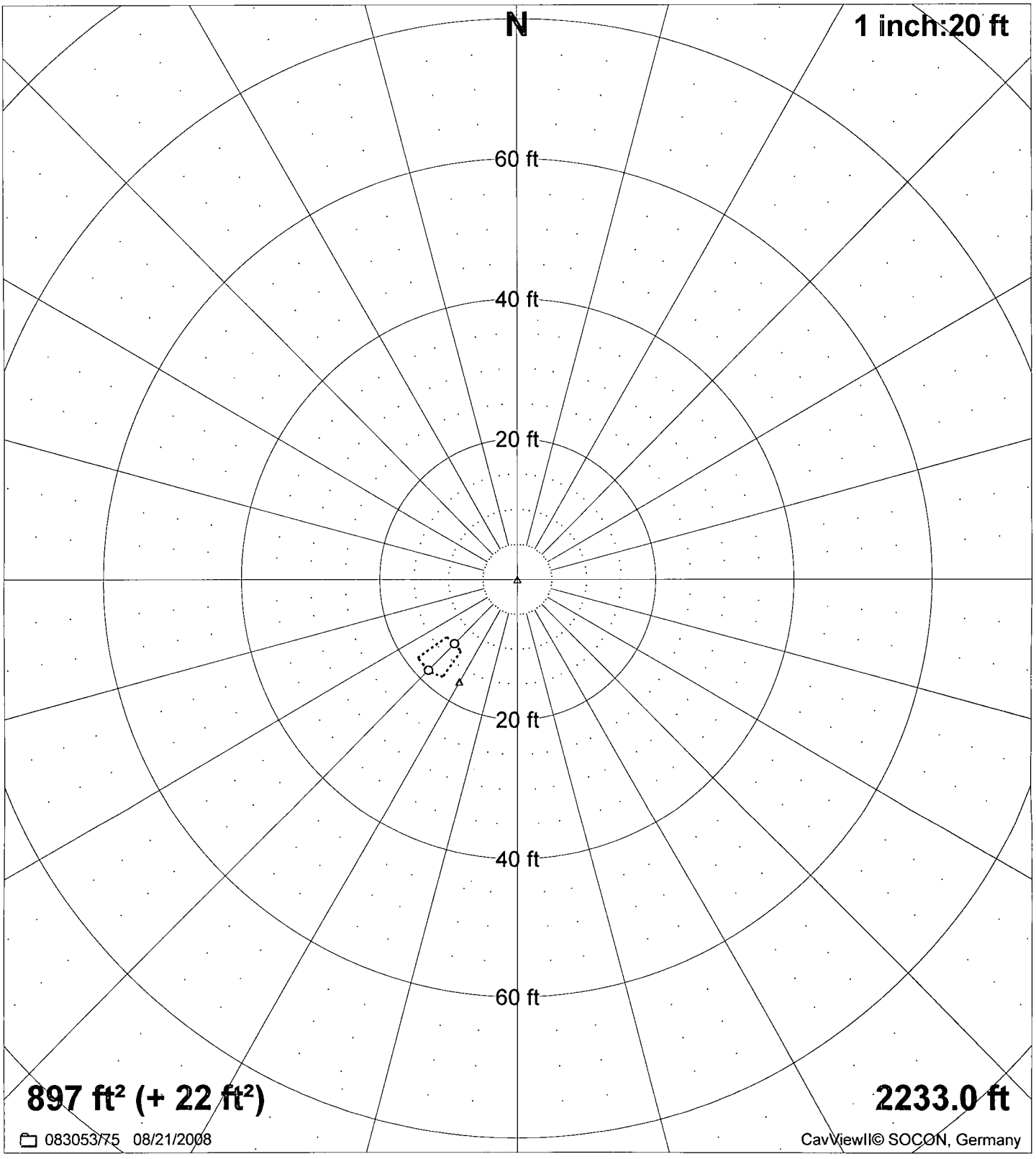
(08/21/2008) Leached pocket (08/21/2008)

d_{max}: 17.2 ft 225° <--> 45° r_{min}: 0.0 ft -> 0° r~: 3.0 ft r_{max}: 17.2 ft -> 225°

SOCON Sonar Well Services, Inc.

Tatum Brine BW-2

08/21/2008



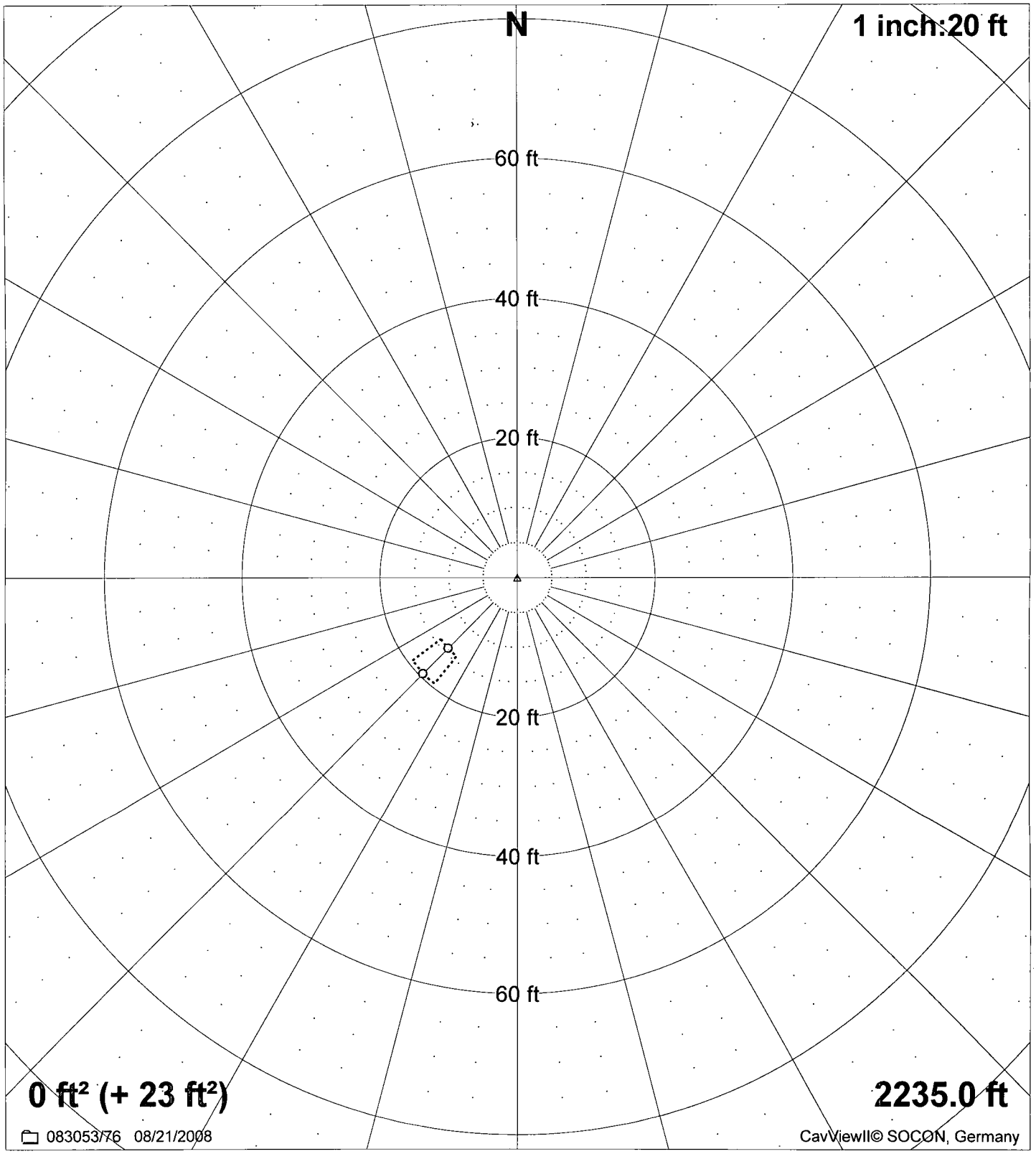
(08/21/2008) Leached pocket (08/21/2008)

d_{max}: 18.3 ft 45° <--> 225° r_{min}: 0.0 ft -> 0° r~: 17.1 ft r_{max}: 18.3 ft -> 225°

SOCON Sonar Well Services, Inc.

Tatum Brine BW-2

08/21/2008



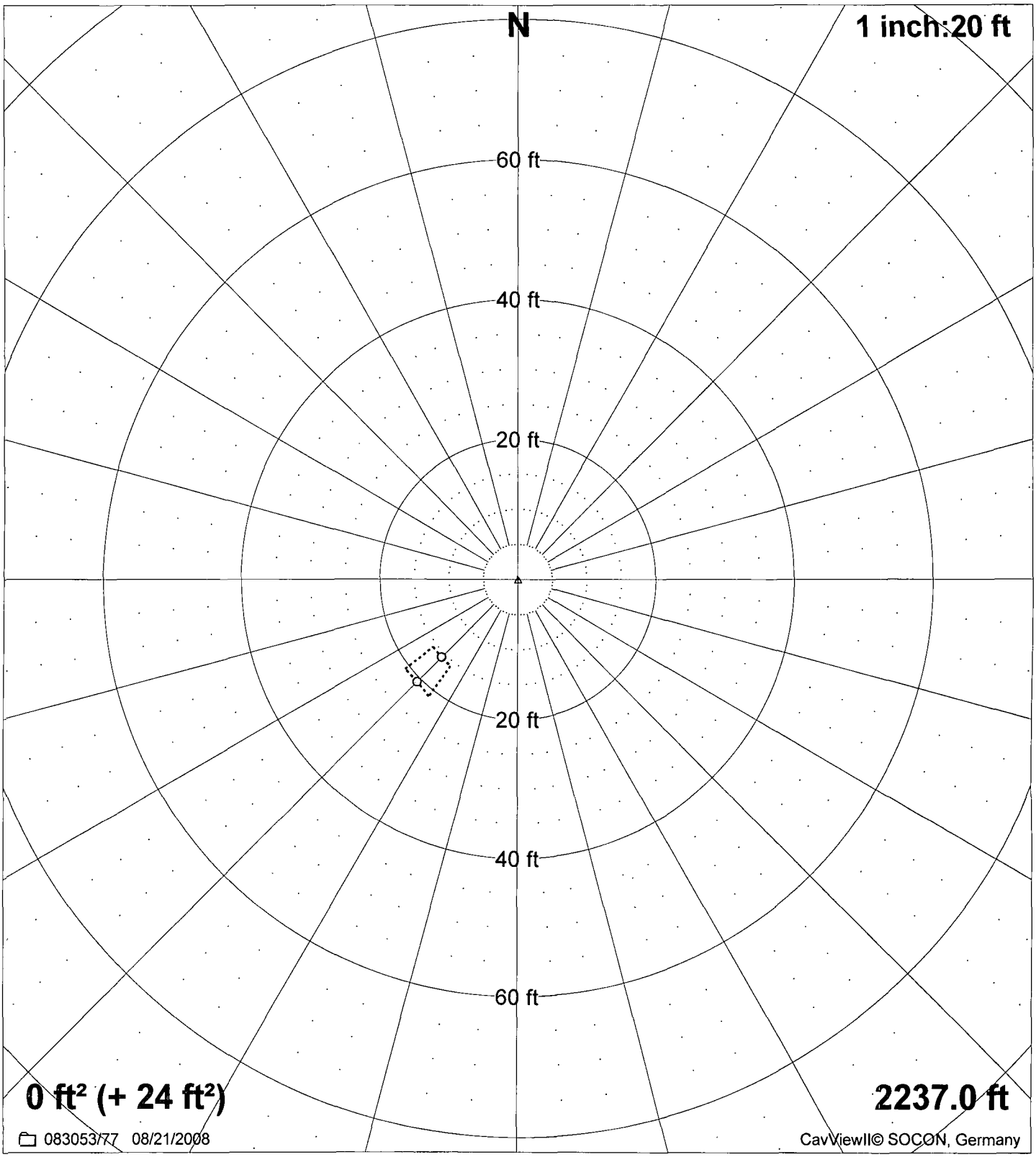
(08/21/2008) Leached pocket (08/21/2008)

d_{max}: 19.5 ft 225° <--> 45° r_{min}: 0.0 ft -> 0° r~: 2.7 ft r_{max}: 19.5 ft -> 225°

SOCON Sonar Well Services, Inc.

Tatum Brine BW-2

08/21/2008



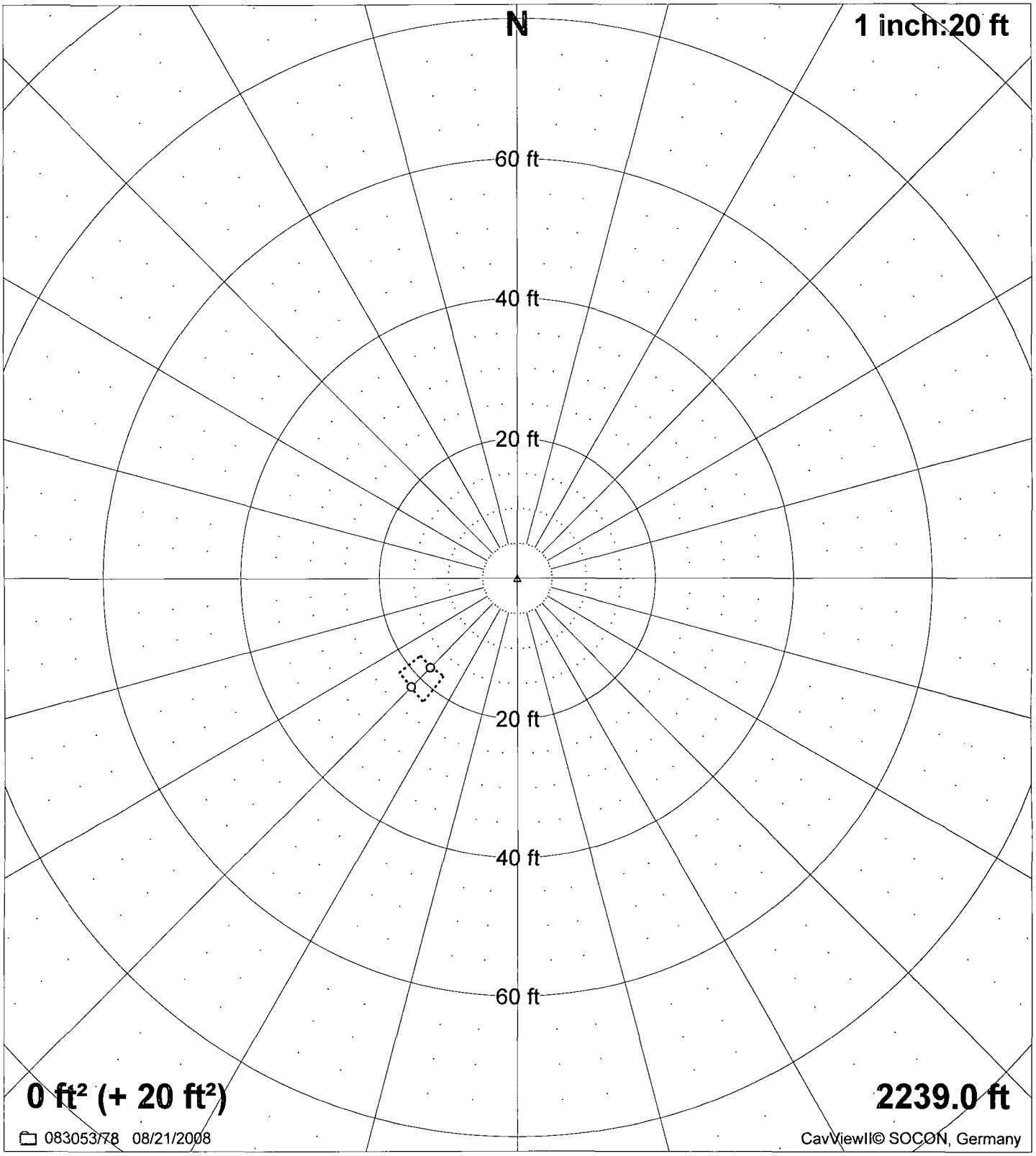
(08/21/2008) Leached pocket (08/21/2008)

d_{max}: 20.6 ft 45° <--> 225° r_{min}: 0.0 ft -> 0° r~: 2.7 ft r_{max}: 20.6 ft -> 225°

SOCON Sonar Well Services, Inc.

Tatum Brine BW-2

08/21/2008



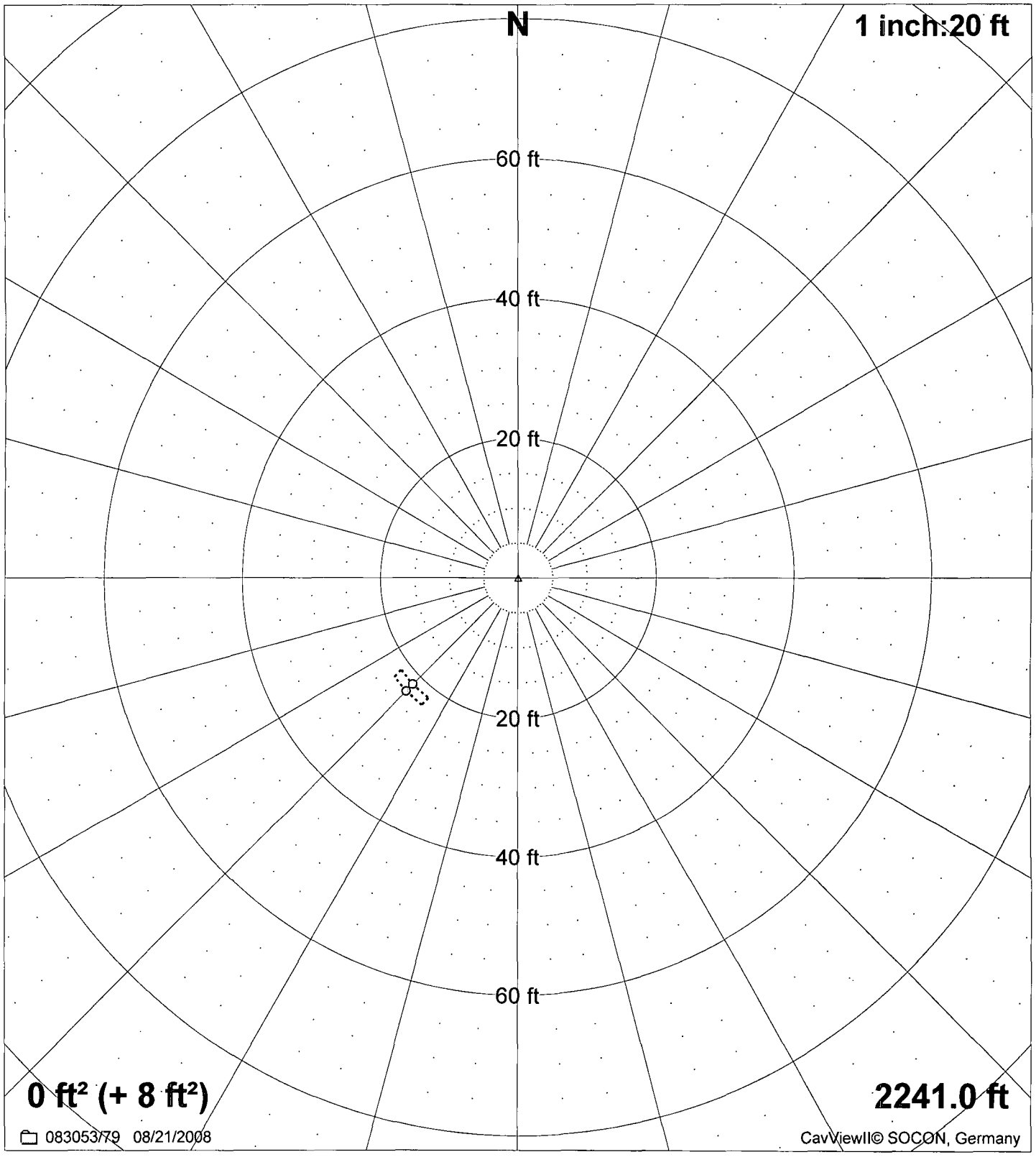
(08/21/2008) Leached pocket (08/21/2008)

d_{max}: 21.7 ft 45° <--> 225° r_{min}: 0.0 ft -> 0° r~: 2.5 ft r_{max}: 21.7 ft -> 225°

SOCON Sonar Well Services, Inc.

Tatum Brine BW-2

08/21/2008



(08/21/2008) Leached pocket (08/21/2008)

d_{max}: 22.9 ft 45° <--> 225° r_{min}: 0.0 ft -> 0° r~: 1.6 ft r_{max}: 22.9 ft -> 225°

SOCON Sonar Well Services, Inc.

Table of radii

Cavern: Tatum Brine BW-2 83053 8/21/2008

Depth: 2201.0 ft

[°]	Radii in [ft]									
0	25.0	24.6	24.7	26.2	26.0	25.5	25.1	25.2	25.3	25.7
50	25.9	26.5	27.1	27.6	28.2	26.7	21.9	16.4	14.9	14.4
100	13.5	12.8	12.4	11.2	11.6	11.4	10.4	9.4	8.7	8.5
150	8.8	8.5	8.6	9.0	9.4	9.1	9.5	10.0	10.4	11.1
200	11.7	13.3	14.3	15.6	18.6	21.0	22.1	23.7	26.7	30.1
250	32.1	32.8	36.4	28.8	25.0	22.8	21.6	20.6	20.9	21.6
300	21.5	21.5	21.7	22.5	22.8	22.4	23.0	23.4	23.4	23.5
350	25.0	25.7								

Depth: 2202.0 ft

[°]	Radii in [ft]									
0	31.9	29.9	28.2	27.0	28.2	29.8	31.8	30.7	29.9	29.4
50	27.0	25.2	23.8	3.3	1.8	1.2	1.7	3.0	11.1	11.1
100	11.3	11.5	6.6	4.6	3.6	3.9	4.3	4.9	6.4	9.6
150	19.0	6.7	4.1	2.9	4.0	6.5	17.2	17.3	17.5	17.8
200	5.5	3.3	2.3	3.4	6.2	39.0	32.6	28.1	24.9	24.1
250	23.4	23.0	22.3	21.8	21.5	21.7	22.1	22.7	23.2	23.9
300	24.8	26.4	28.5	31.2	28.8	26.8	25.3	23.6	22.2	21.1
350	23.6	27.1								

Depth: 2204.0 ft

[°]	Radii in [ft]									
0	45.9	36.7	30.8	26.7	30.4	35.6	43.4	37.5	33.3	30.1
50	27.6	25.6	24.1	22.5	21.3	20.3	14.6	11.4	9.5	7.8
100	6.7	5.9	5.3	4.7	4.4	4.9	5.5	6.5	8.3	11.5
150	19.2	11.5	8.2	6.5	8.0	10.6	15.9	15.9	16.1	16.4
200	6.2	3.8	2.8	4.0	7.3	39.7	35.8	32.8	30.5	30.0
250	29.7	29.7	28.6	27.8	27.2	25.9	24.9	24.2	25.1	26.2
300	27.7	29.8	32.4	35.9	30.7	27.0	24.3	26.3	29.1	32.7
350	35.9	40.1								

Depth: 2205.0 ft

[°]	Radii in [ft]									
0	52.8	52.1	51.0	50.7	51.2	48.7	46.0	44.7	44.9	31.4
50	27.4	5.9	3.9	3.6	3.5	3.5	3.5	3.2	3.3	3.3
100	3.4	3.4	3.3	3.1	2.8	2.9	3.0	4.7	3.3	3.0
150	3.1	3.1	3.3	3.2	3.2	3.1	3.0	3.0	2.9	2.9
200	3.0	3.0	3.0	3.8	4.3	9.6	24.6	31.9	33.0	33.0
250	31.6	30.3	28.8	29.9	30.0	29.4	36.1	40.2	42.5	45.0
300	48.4	50.5	52.8	54.8	56.8	57.3	58.9	58.0	56.1	51.3
350	49.5	52.8								

SOCON Sonar Well Services, Inc.

Table of radii

Cavern: Tatum Brine BW-2 83053 8/21/2008

Depth: 2206.0 ft

[°]	Radii in [ft]									
0	19.2	24.0	32.3	50.1	48.0	46.5	45.4	44.4	43.9	43.6
50	34.5	28.7	24.8	23.0	21.7	20.6	19.7	19.1	18.6	17.5
100	16.7	16.1	6.5	4.1	3.0	3.8	5.1	7.8	9.4	11.9
150	16.3	13.1	11.0	9.6	10.7	12.3	14.5	14.5	14.7	14.9
200	15.6	16.6	17.8	21.7	28.1	40.2	38.3	36.9	35.8	35.1
250	34.7	34.6	34.1	34.0	34.1	35.6	37.5	40.0	42.2	44.9
300	48.3	49.9	51.9	54.6	55.1	56.1	57.6	54.9	52.8	51.3
350	32.6	24.0								

Depth: 2208.0 ft

[°]	Radii in [ft]									
0	19.5	24.3	32.3	48.9	46.9	45.3	44.2	44.2	44.6	45.3
50	35.3	29.0	24.8	23.5	22.4	21.6	21.2	20.9	20.8	20.2
100	19.6	19.3	7.7	4.8	3.5	4.3	5.5	7.6	8.8	10.6
150	13.4	13.2	13.0	13.0	12.9	12.9	13.1	13.1	13.2	13.4
200	16.8	22.8	35.8	35.9	36.2	36.8	38.0	39.6	41.7	42.1
250	42.8	43.8	44.3	45.1	46.3	46.8	47.7	48.9	48.4	48.2
300	48.4	50.3	52.8	56.0	55.2	54.9	54.9	53.3	52.1	51.3
350	33.0	24.5								

Depth: 2210.0 ft

[°]	Radii in [ft]									
0	50.8	51.1	48.8	47.7	43.9	42.5	43.1	46.0	45.2	46.7
50	40.5	33.9	33.5	32.5	31.2	29.7	27.5	27.8	27.5	24.2
100	30.3	31.5	5.2	5.6	2.8	2.4	2.1	7.4	7.6	7.7
150	2.1	2.3	2.3	2.1	2.3	2.3	2.4	3.6	4.6	13.9
200	16.9	5.5	5.9	6.6	7.4	21.8	37.2	38.1	38.5	42.0
250	39.8	39.0	41.6	46.8	49.8	48.2	48.7	49.5	49.2	48.3
300	48.8	50.7	50.7	53.3	53.3	53.9	52.3	53.3	52.9	51.4
350	51.5	52.1								

Depth: 2212.0 ft

[°]	Radii in [ft]									
0	47.6	46.1	45.0	44.3	42.5	41.1	40.1	40.6	41.4	42.6
50	39.9	37.7	36.1	33.9	32.1	30.7	30.8	31.2	31.8	30.9
100	30.4	30.1	13.6	8.8	6.6	6.7	6.9	7.1	8.3	10.1
150	13.0	11.8	10.9	10.2	10.5	10.9	11.4	12.1	12.8	13.9
200	16.8	21.6	30.6	30.7	31.0	31.6	33.1	35.2	37.8	37.2
250	37.0	37.0	37.8	38.8	40.3	40.9	41.9	43.3	44.3	45.7
300	47.6	46.9	46.5	46.5	46.7	47.3	48.2	48.3	48.8	49.7
350	48.6	47.9								

SOCON Sonar Well Services, Inc.

Table of radii

Cavern: Tatum Brine BW-2 83053 8/21/2008

Depth: 2214.0 ft

[°]	Radii in [ft]									
0	41.7	41.5	41.6	42.1	40.3	38.9	37.9	37.0	36.4	36.1
50	37.4	39.1	41.2	40.0	39.1	38.5	37.0	35.9	35.1	28.3
100	23.9	20.8	12.0	8.5	6.6	7.0	7.4	7.9	8.4	9.1
150	10.0	7.2	5.7	4.7	5.9	7.8	11.8	12.5	13.3	14.4
200	15.3	16.4	17.8	20.1	23.2	27.8	29.2	31.0	33.4	32.9
250	32.6	32.5	33.9	35.7	37.9	38.5	39.3	40.5	41.9	43.7
300	46.0	45.5	45.4	45.6	44.6	44.1	43.9	45.2	47.1	49.5
350	46.2	43.7								

Depth: 2215.0 ft

[°]	Radii in [ft]									
0	28.3	28.5	29.6	33.3	31.2	31.5	31.0	31.5	32.0	33.1
50	37.2	40.4	42.2	42.7	44.6	44.9	45.1	44.7	42.5	41.6
100	30.1	16.9	5.7	5.3	5.5	5.7	5.5	8.2	8.8	2.7
150	2.3	2.3	2.4	2.7	2.9	3.1	3.8	6.0	9.5	15.0
200	30.6	39.7	38.6	36.8	36.4	35.6	34.1	31.7	31.1	31.7
250	32.7	32.2	31.3	31.3	31.8	32.3	33.9	35.1	32.4	31.0
300	32.3	32.6	31.1	31.6	30.3	29.6	28.0	28.9	28.0	29.1
350	28.9	28.0								

Depth: 2216.0 ft

[°]	Radii in [ft]									
0	40.7	37.5	35.0	33.0	30.2	28.0	26.3	27.8	29.7	32.2
50	34.4	37.2	40.8	39.7	38.9	38.4	36.9	35.7	34.9	27.6
100	22.9	19.8	9.2	6.0	4.5	5.3	6.5	8.6	8.9	9.5
150	10.1	5.7	4.0	3.1	4.1	6.2	12.8	13.5	14.4	15.6
200	13.5	12.0	10.9	11.1	11.4	11.8	14.6	19.5	29.7	29.2
250	28.9	28.8	29.8	31.2	32.9	33.2	33.7	34.5	32.8	31.5
300	30.5	33.7	38.0	43.8	42.8	42.1	41.7	43.0	44.6	46.8
350	44.2	42.2								

Depth: 2218.0 ft

[°]	Radii in [ft]									
0	38.9	35.4	32.7	30.5	19.1	13.9	11.0	13.8	18.7	29.2
50	31.3	34.1	37.8	37.3	37.1	37.1	35.5	34.2	33.3	30.1
100	27.6	25.6	10.3	6.5	4.8	5.8	7.5	10.6	9.6	8.9
150	8.3	6.0	4.7	3.9	5.1	7.4	13.7	14.5	15.5	16.7
200	13.2	10.9	9.4	9.8	10.3	10.9	13.3	17.3	25.1	25.1
250	25.2	25.6	26.1	26.7	27.7	28.6	29.7	31.3	22.2	17.3
300	14.3	18.1	25.0	40.9	40.2	39.8	39.7	39.6	39.8	40.3
350	39.6	39.1								

SOCON Sonar Well Services, Inc.

Table of radii

Cavern: Tatum Brine BW-2 83053 8/21/2008

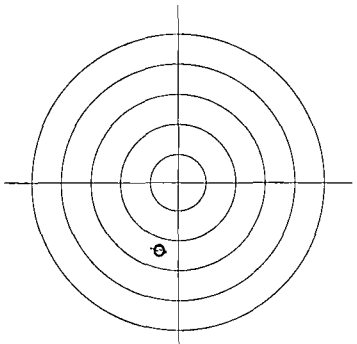
Depth: 2220.0 ft

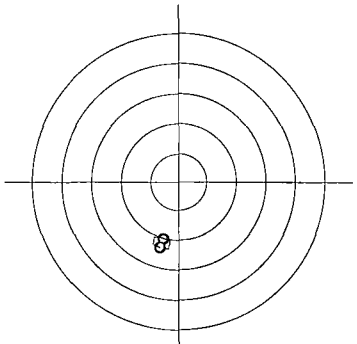
[°]	Radii in [ft]									
0	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.6	1.1	23.8
50	26.4	30.0	34.9	32.7	31.1	29.8	29.4	29.3	29.4	29.3
100	29.4	29.7	7.2	4.1	2.9	3.9	6.1	13.9	9.8	7.6
150	6.2	5.6	5.1	4.7	6.1	8.6	14.7	15.8	17.2	19.1
200	13.8	10.8	9.0	9.5	10.1	10.9	13.1	16.7	23.1	13.4
250	9.5	7.4	7.0	6.8	6.6	6.6	6.6	6.7	6.2	5.9
300	5.7	7.8	12.9	37.1	36.2	35.6	35.3	28.0	23.4	20.2
350	0.8	0.4								

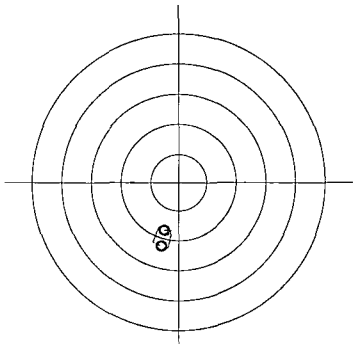
SOCON Sonar Well Services, Inc.

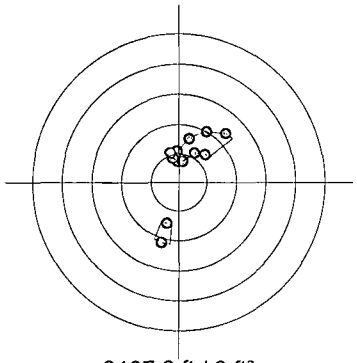
Horizontal slices 1 - 12

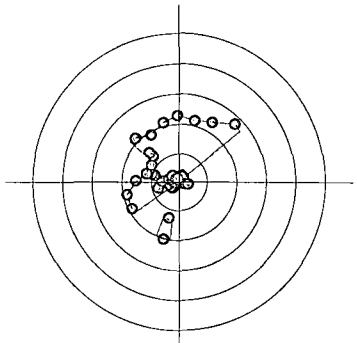
Cavity: Tatum Brine BW-2 Report number: 083053 Date: 08/21/2008

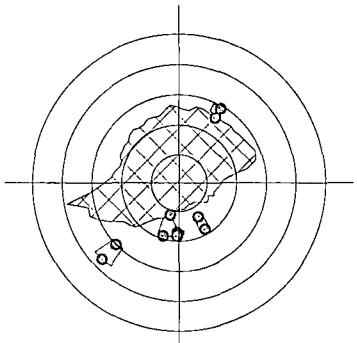

2191.0 ft / 0 ft²

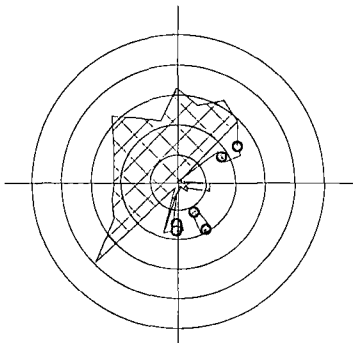

2193.0 ft / 0 ft²

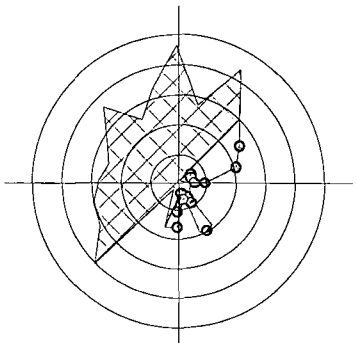

2195.0 ft / 0 ft²

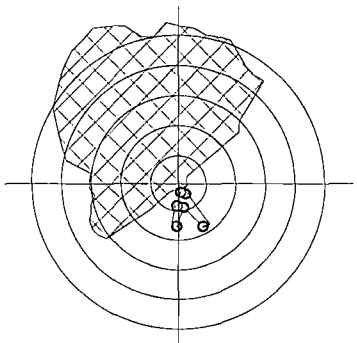

2197.0 ft / 0 ft²

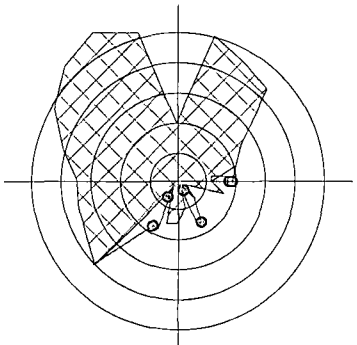

2199.0 ft / 0 ft²

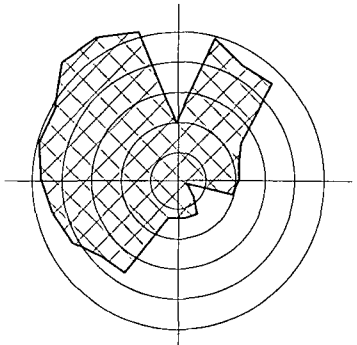

2201.0 ft / 1397 ft²

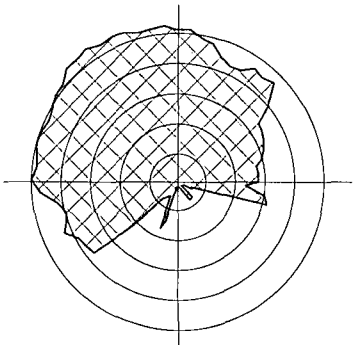

2202.0 ft / 1317 ft²


2204.0 ft / 1810 ft²


2205.0 ft / 3295 ft²


2206.0 ft / 3435 ft²


2208.0 ft / 4041 ft²

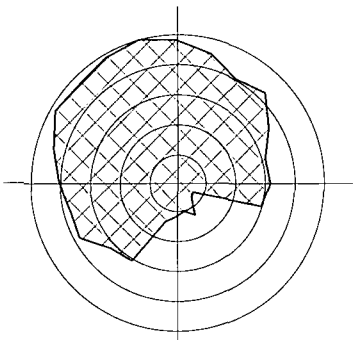

2210.0 ft / 4124 ft² (max)

The distance between 2 circles equals 10 ft

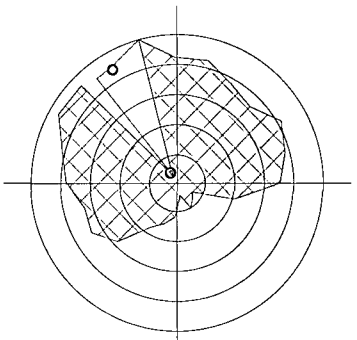
SOCON Sonar Well Services, Inc.

Horizontal slices 13 - 24

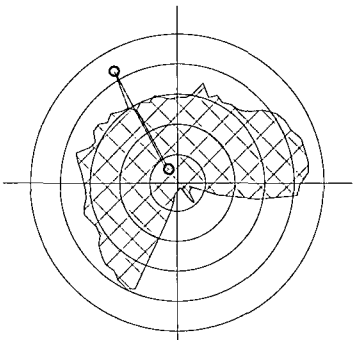
Cavity: Tatum Brine BW-2 Report number: 083053 Date: 08/21/2008



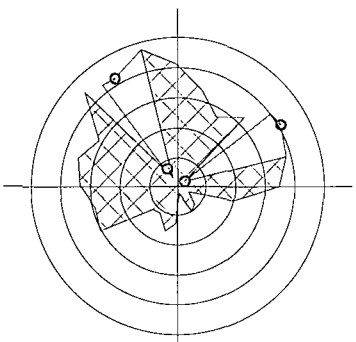
2212.0 ft / 3898 ft²



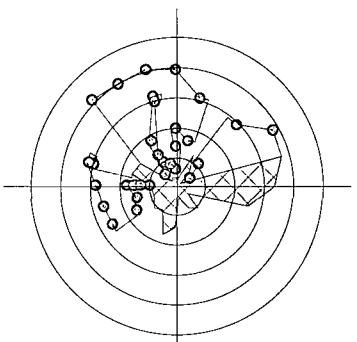
2214.0 ft / 3124 ft²



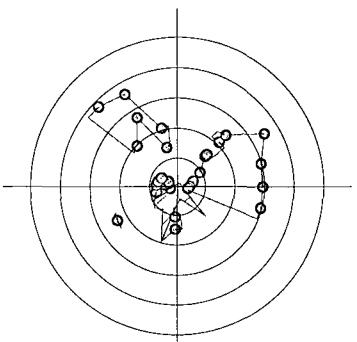
2215.0 ft / 2776 ft²



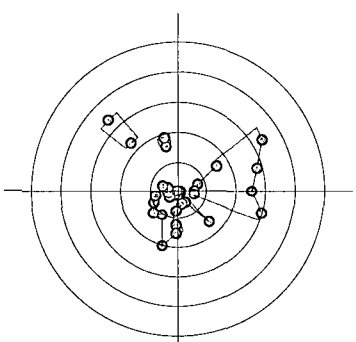
2216.0 ft / 2133 ft²



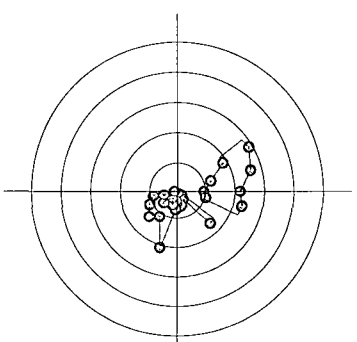
2218.0 ft / 593 ft²



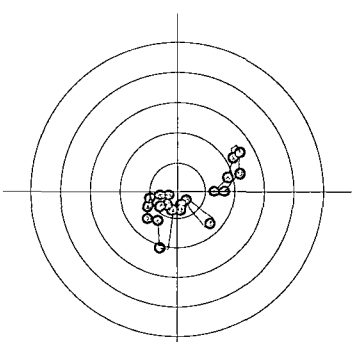
2220.0 ft / 117 ft²



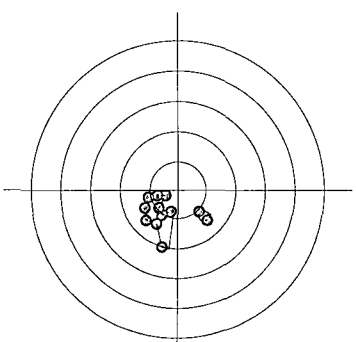
2221.0 ft / 0 ft²



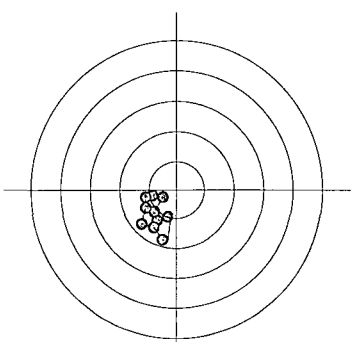
2223.0 ft / 0 ft²



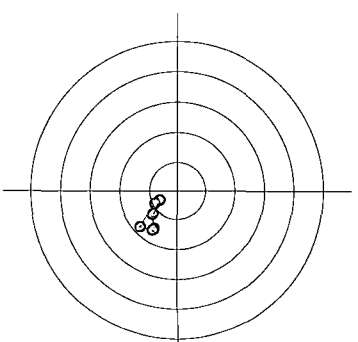
2225.0 ft / 0 ft²



2227.0 ft / 0 ft²



2229.0 ft / 0 ft²



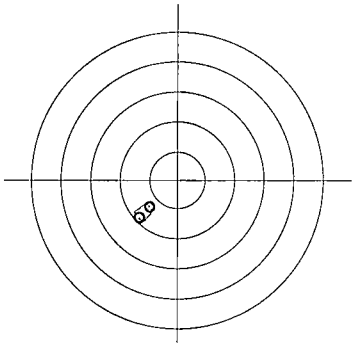
2231.0 ft / 0 ft²

The distance between 2 circles equals 10 ft

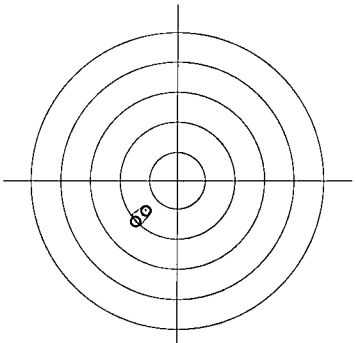
SOCON Sonar Well Services, Inc.

Horizontal slices 25 - 29

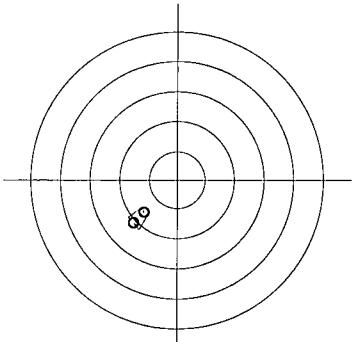
Cavity: Tatum Brine BW-2 Report number: 083053 Date: 08/21/2008



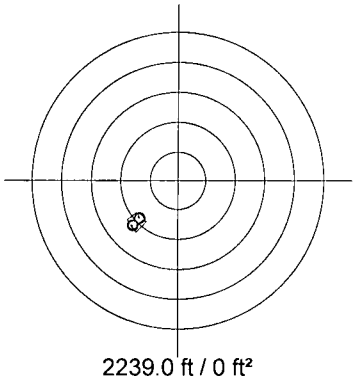
2233.0 ft / 897 ft²



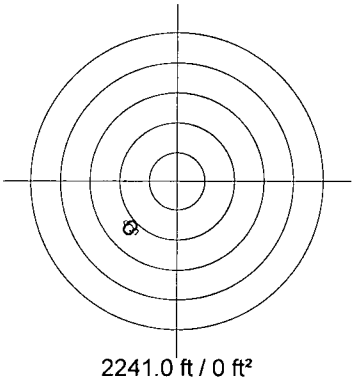
2235.0 ft / 0 ft²



2237.0 ft / 0 ft²



2239.0 ft / 0 ft²



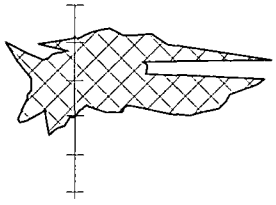
2241.0 ft / 0 ft²

The distance between 2 circles equals 10 ft

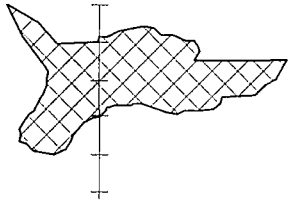
SOCON Sonar Well Services, Inc.

Vertical slices 1 - 12

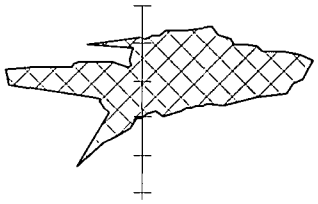
Cavity: Tatum Brine BW-2 Report number: 083053 Date: 08/21/2008



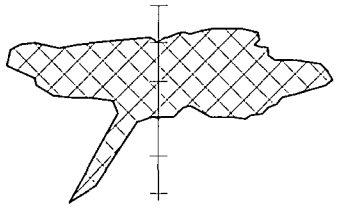
180° 0°



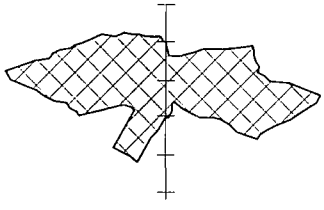
195° 15°



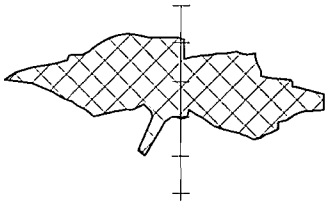
210° 30°



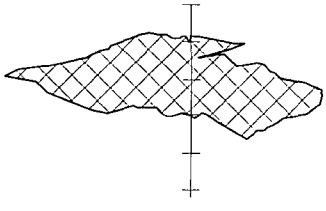
225° 45°



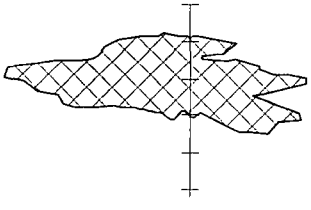
240° 60°



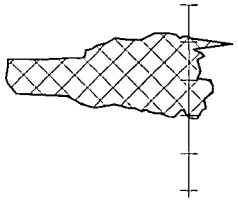
255° 75°



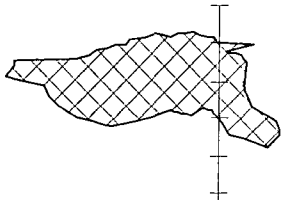
270° 90°



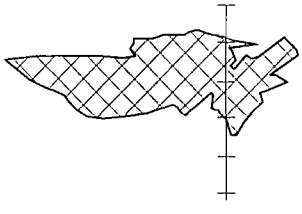
285° 105°



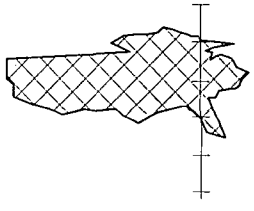
300° 120°



315° 135°



330° 150°



345° 165°

Range from 2190 ft to 2242 ft, step 10 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'; Phillliber, 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.

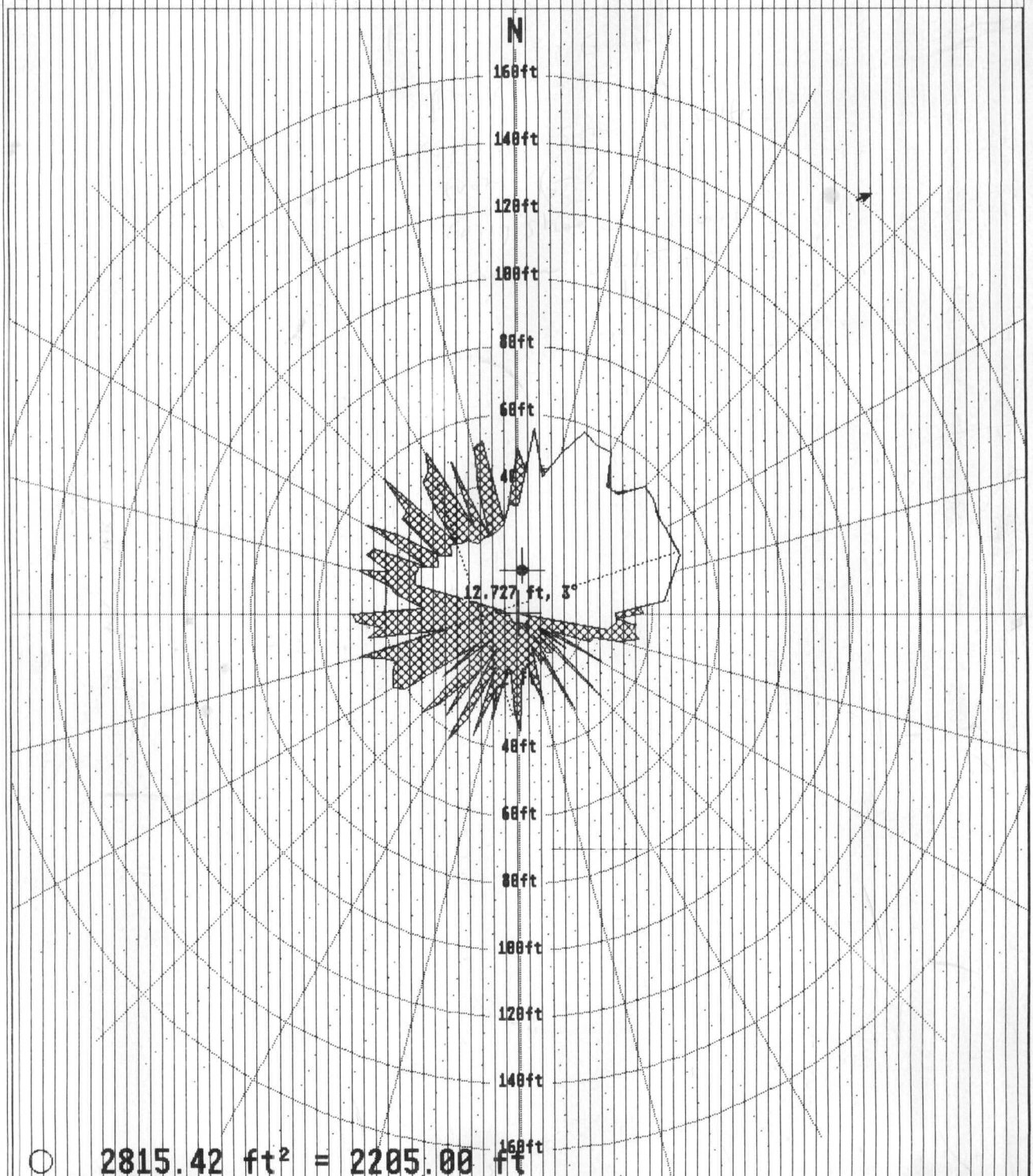
If you feel that your brine well is too new to require sonar testing or a sonar was recently completed at your brine well, please provide the basis for requesting an exemption to this OCD sonar test requirement ASAP for OCD approval.

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")

TATUM QUALITY BRINE
BW-22

MAXIMUM PLOT



○ 2815.42 ft² = 2205.00 ft

⊗ Σ 4666.51 ft² 0.00 ft

1 inch : 50 ft

Φ 98.18 ft 30° <--> 210°

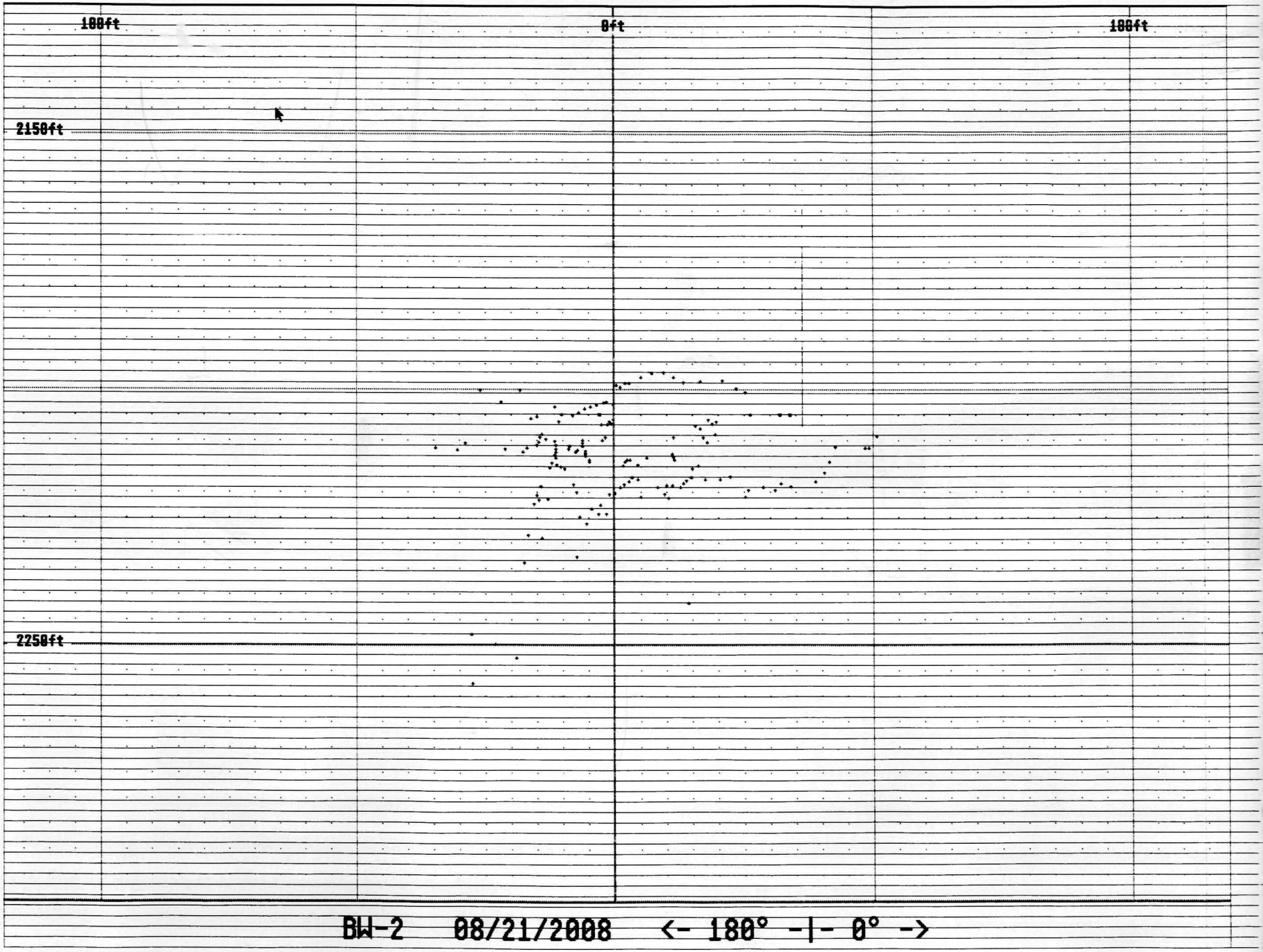
< 4.79 ft -> 119° ~ 38.54 ft > 57.66 ft -> 20°

b/a = 0.722 b = 72.64ft (184°-328°) 161°-341° a = 100.58ft (69°-255°) 72°-252°

BW-2 Report No.: 083053/0 Date: 08/21/2008

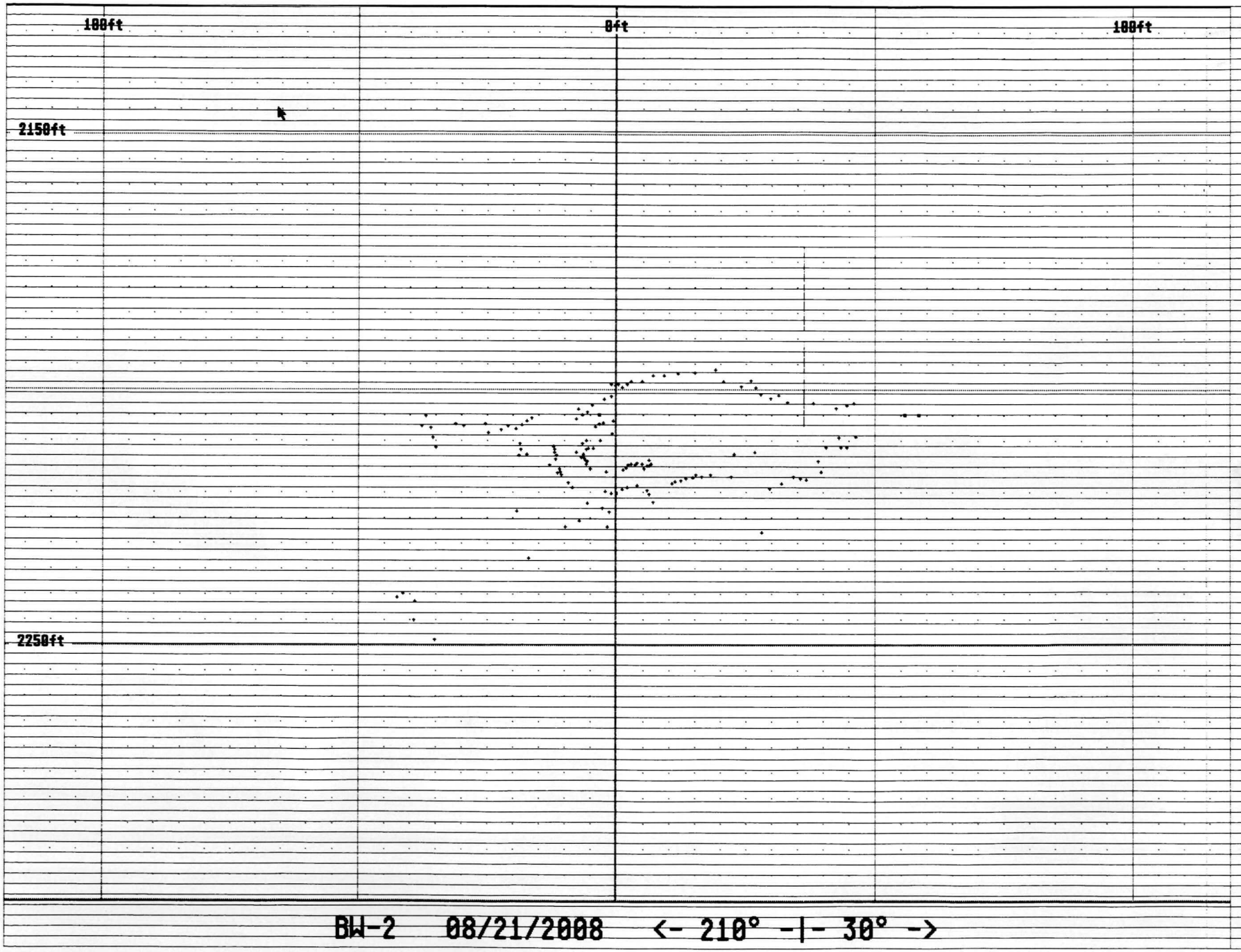
Casing shoe ~ 2200 ft bgl
Sonar shots from ~ 2215 ft. bgl

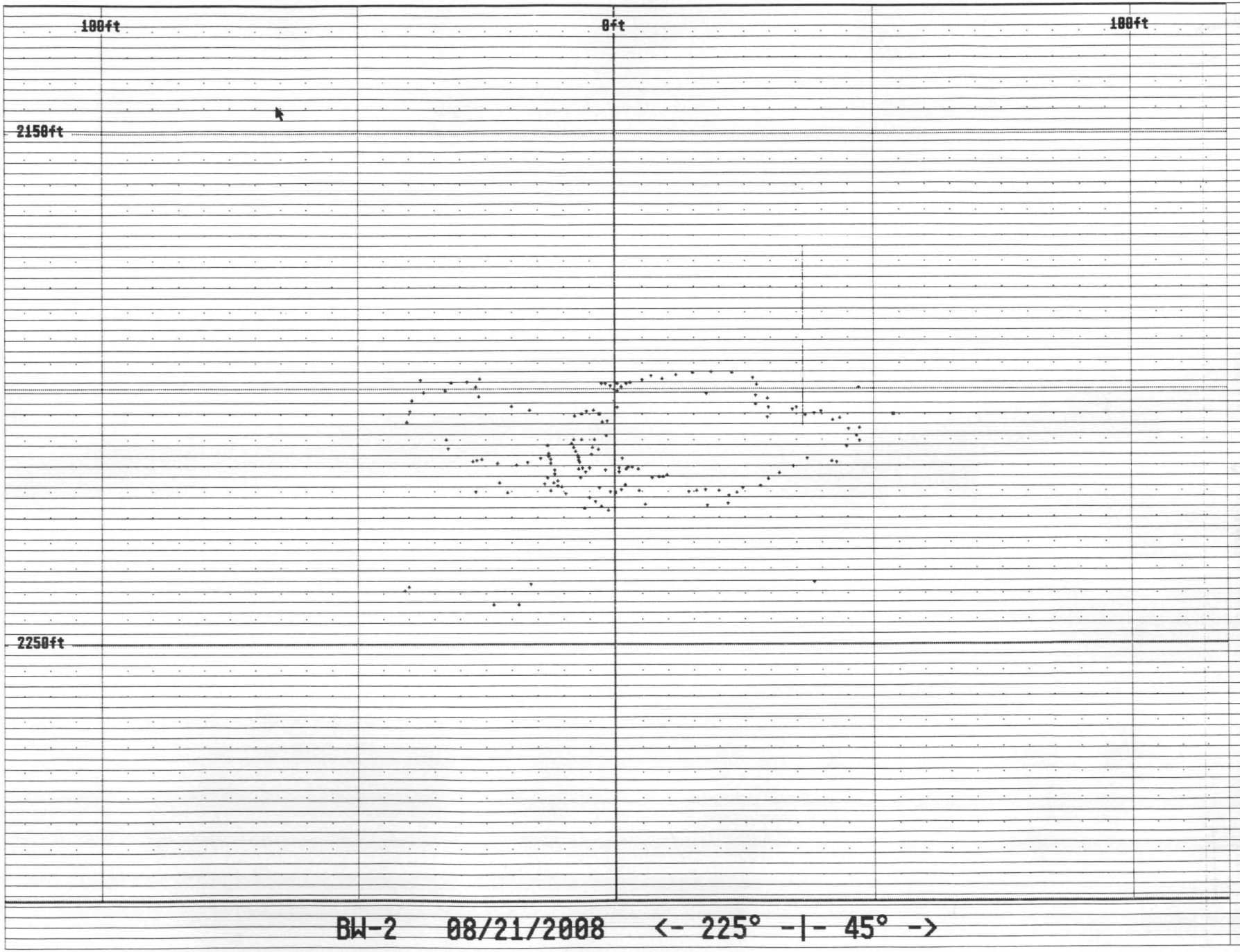
916

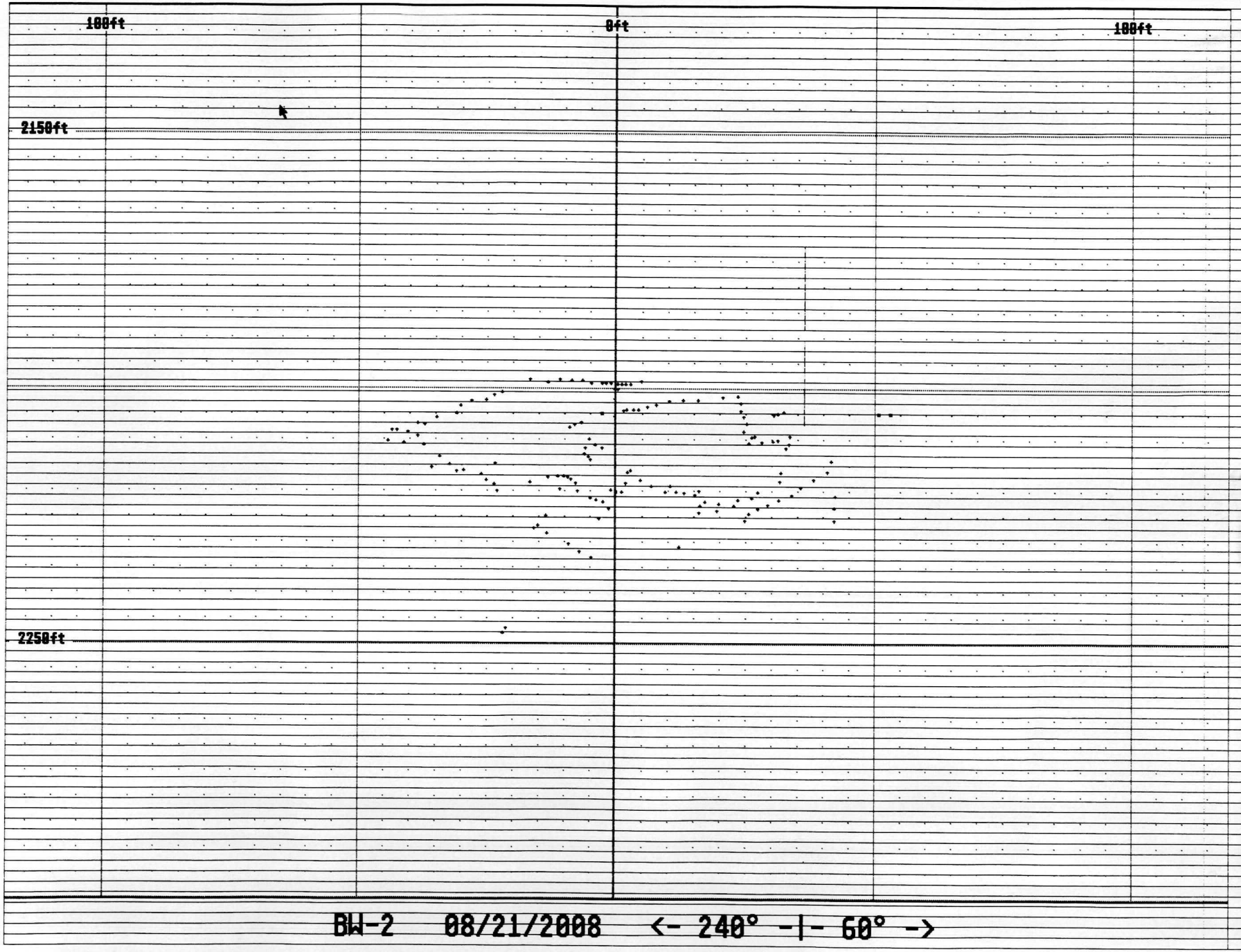

-100ft
0ft
100ft
-2150ft
-2250ft
BW-2 08/21/2008 <- 180° -|- 0° ->

887

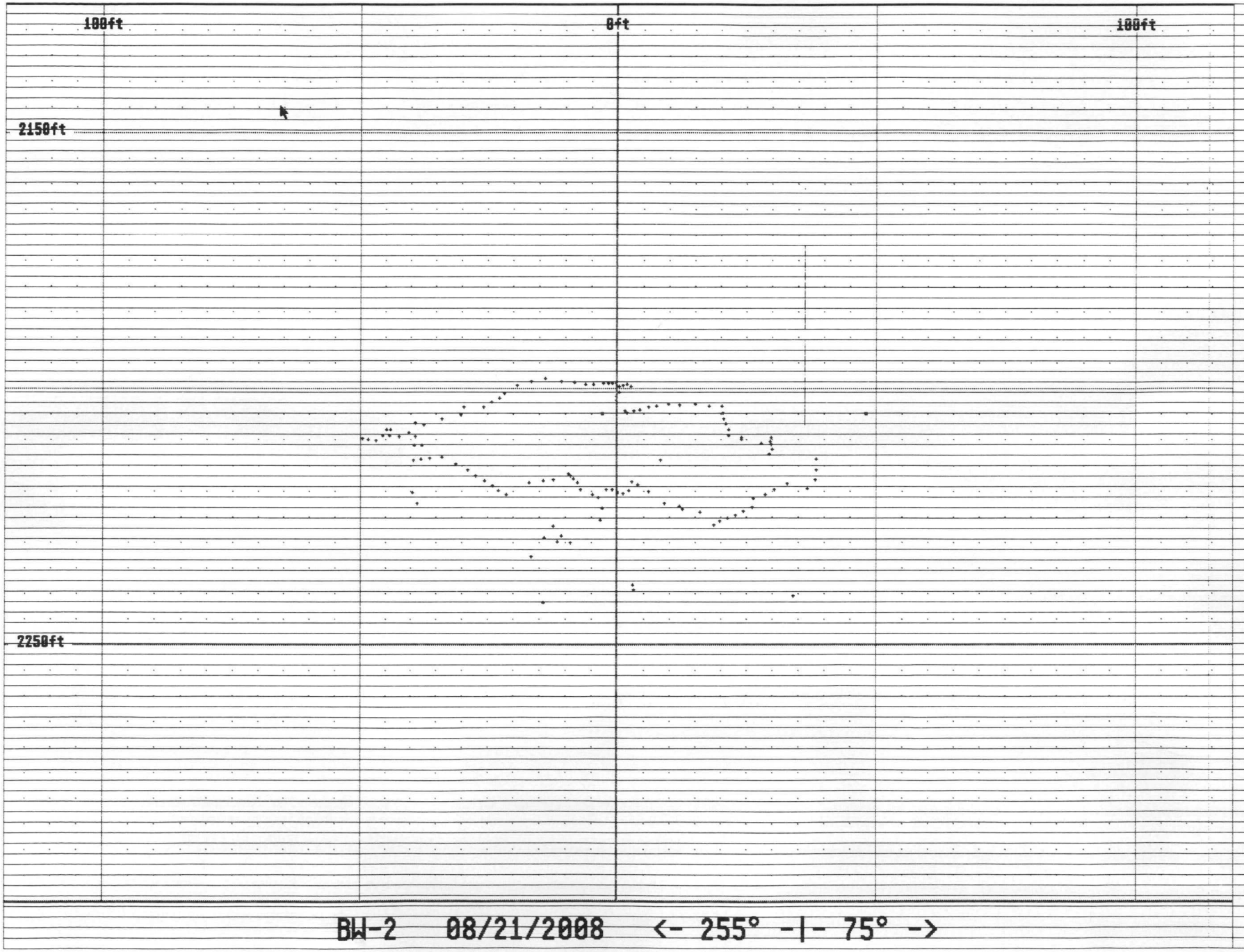
888

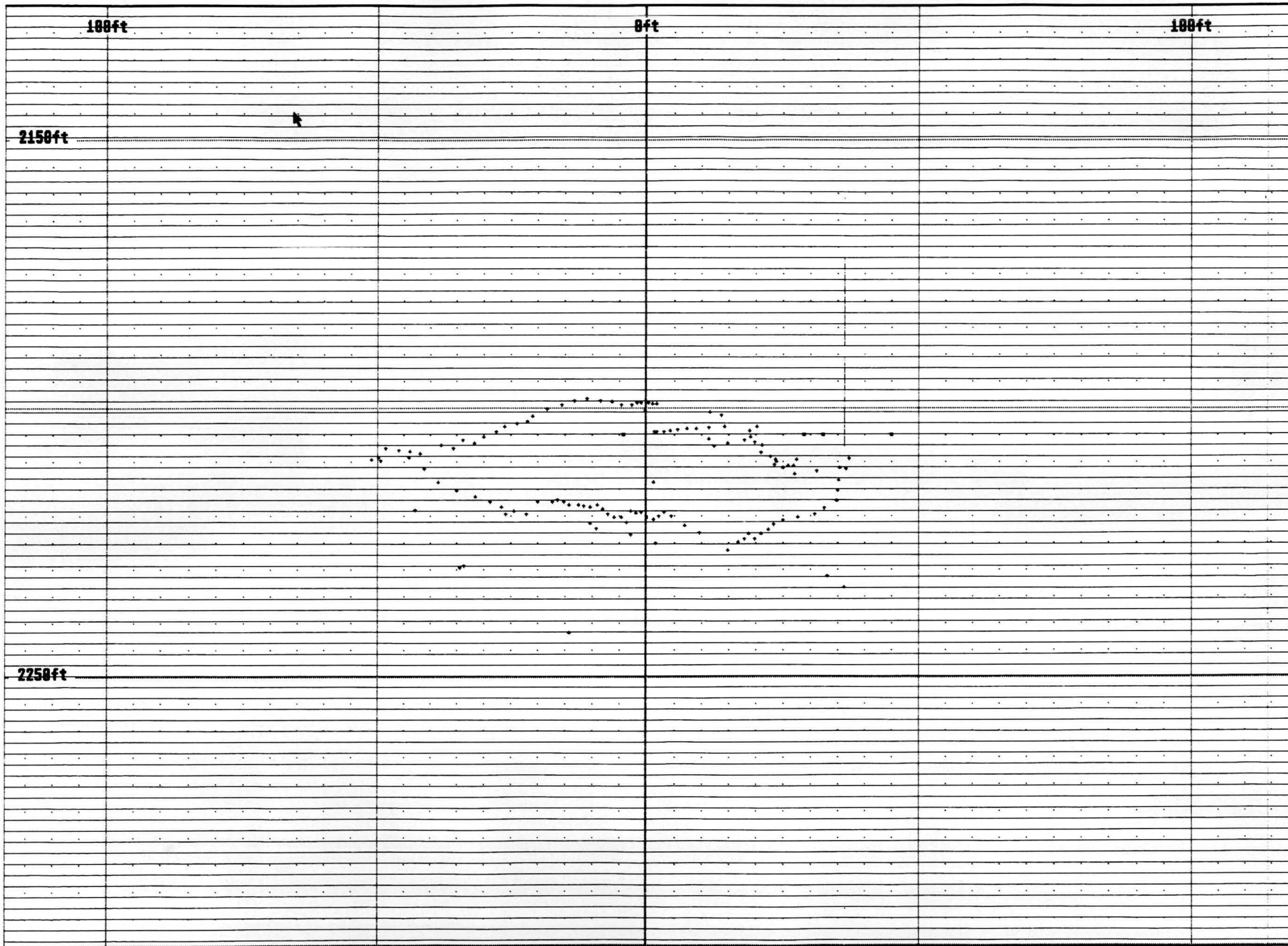



-100ft
0ft
100ft
2150ft
2250ft
BW-2 08/21/2008 <- 225° -|- 45° ->

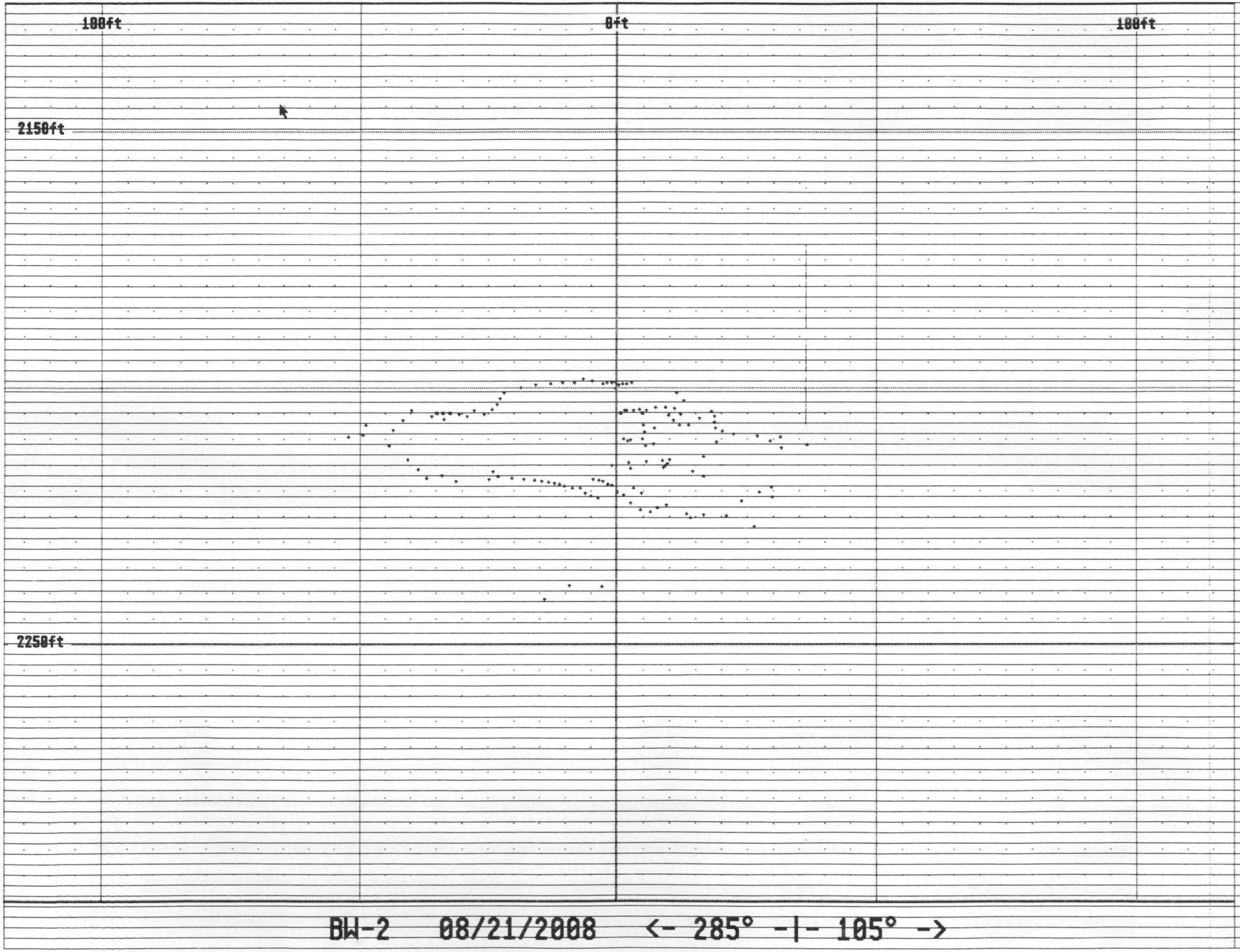

100ft
0ft
100ft
2150ft
2250ft
BW-2 08/21/2008 <- 240° -|- 60° ->

T68

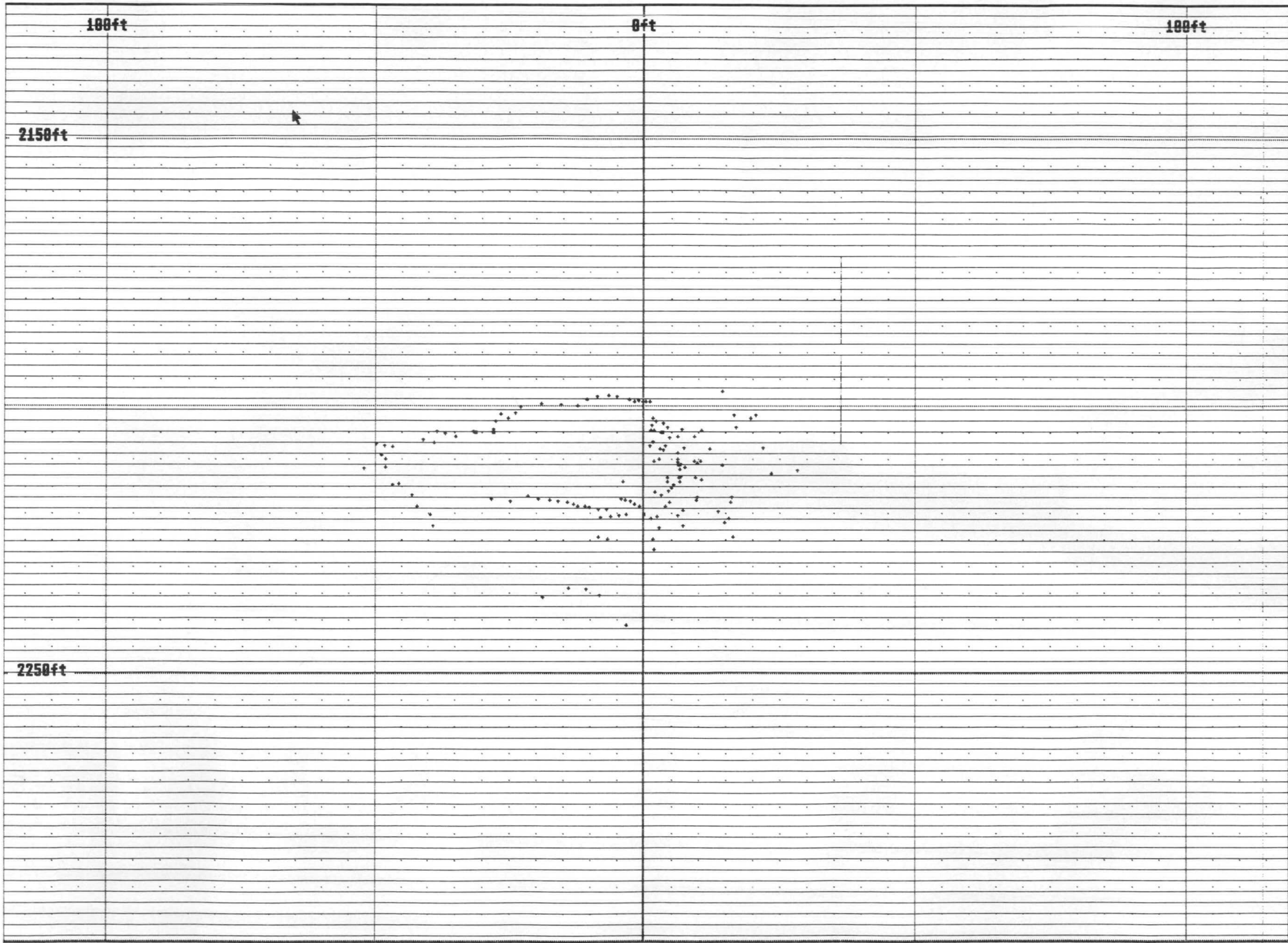




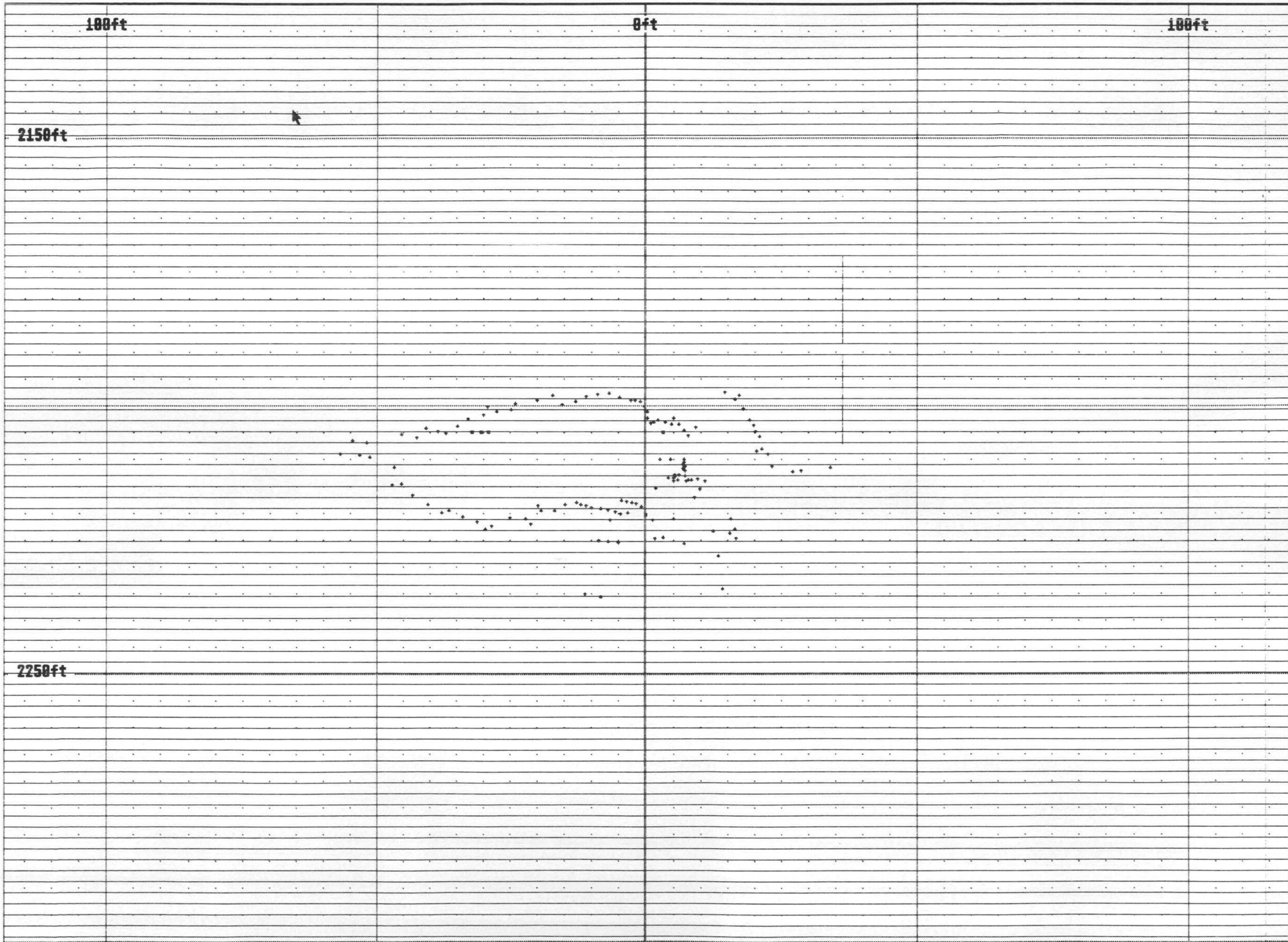
BW-2 08/21/2008 <- 270° -|- 90° ->


100ft
0ft
100ft
2150ft
2250ft
BW-2 08/21/2008 <- 285° -|- 105° ->

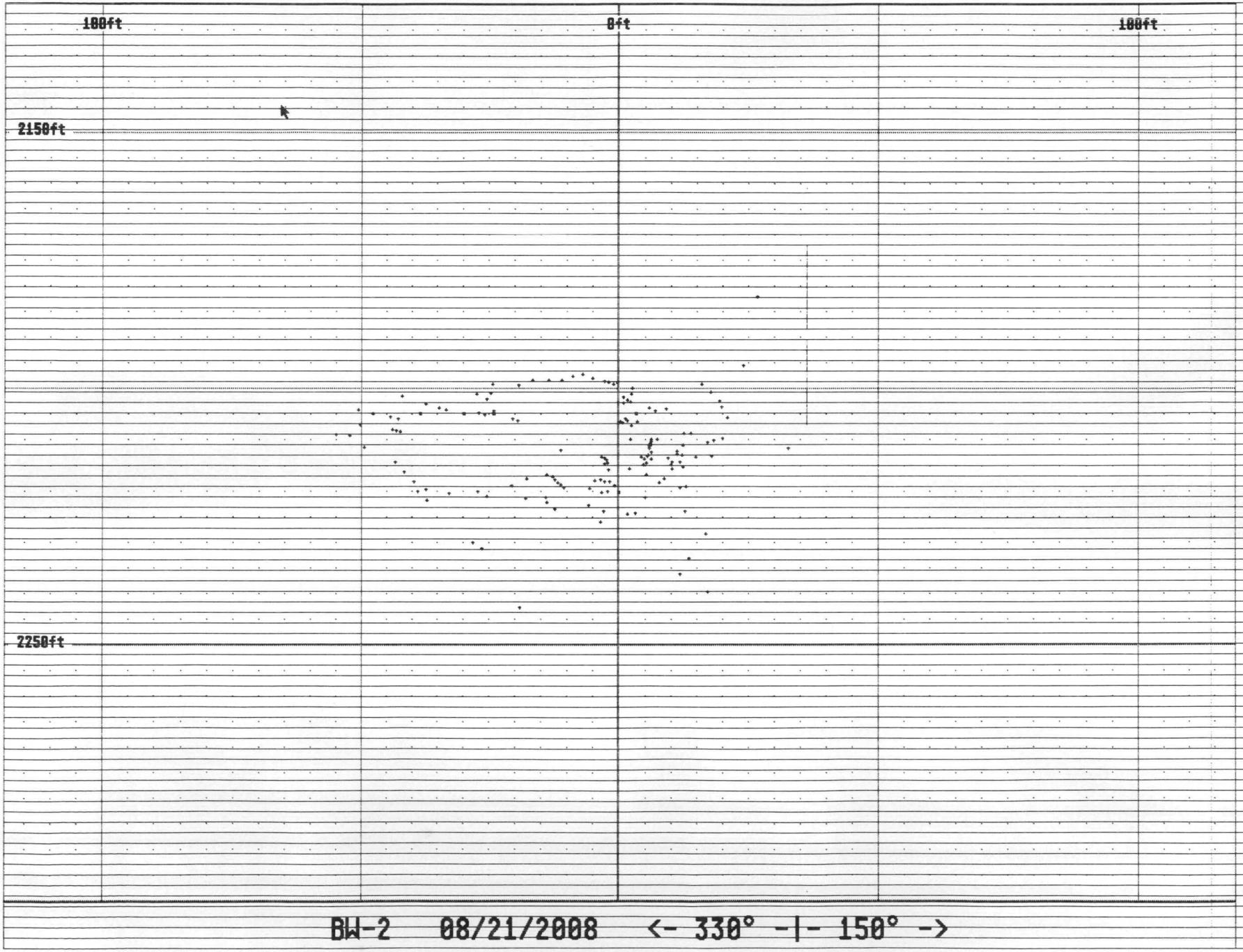
894

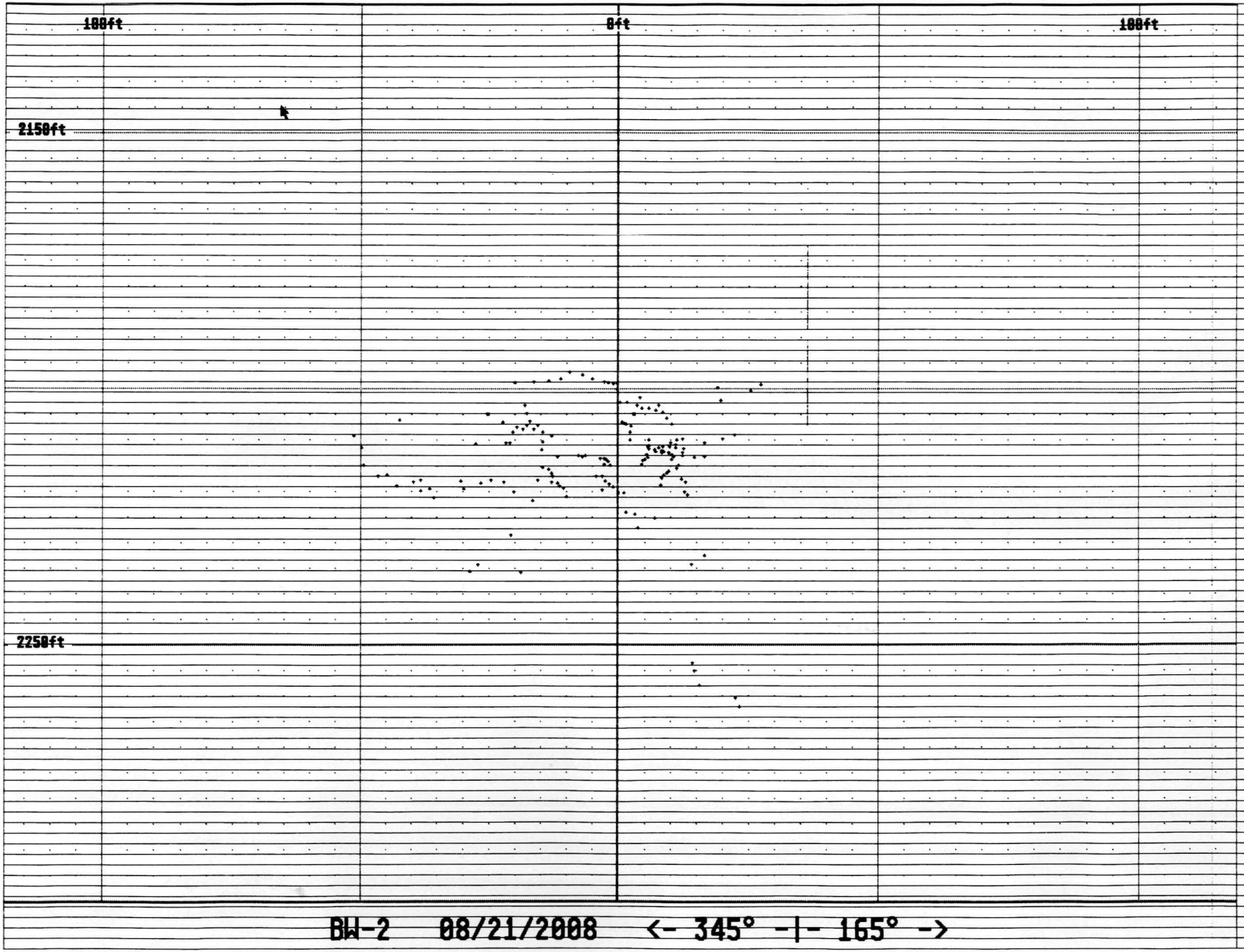


BW-2 08/21/2008 <- 300° -|- 120° ->



BW-2 08/21/2008 <- 315° -|- 135° ->


100ft
0ft
100ft
2150ft
2250ft
BW-2 08/21/2008 <- 330° -|- 150° ->


100ft
0ft
100ft
2150ft
2250ft
BW-2 08/21/2008 <- 345° -|- 165° ->

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) Quality Brines #2
API Number 30-025-28162 Brine Well Permit # BW-022
Date Permit Expires? 2012

Location: Section 20 Ts 12 Rg 36
FNL 593 FSL _____ FEL 639 FWL _____
GPS of well(s): Lat: 33° 15' 30" Long: 103° 19' 57"
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 - NONE

Distance and direction to nearest known karst features or mines *if less than one mile:*
None

Distance and direction to nearest producing oil or gas well(s) *if less than one mile:* Provide API Number: None
Distance and direction to nearest tank battery(ies) *if less than one mile:* None
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:* None
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): 2250 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): 2800
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: 1983
Total volume of fresh water injected into the brine well to date (bbls) and how determined: Total brine 256,250 X 7 = 17,928,750 calculated

Total volume of brine water produced (bbls) to date and how determined: 2561250 bbl average per yr.
Have you ever lost casing or tubing? If yes, please provide details. Document attached ☐
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☐ only testing fresh water from supply well
Have you ever run a sonar log? Yes☐ No☒ Trying to *If yes,* please provide last date: 8/09
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 ☐ step Rate test
Have you routinely looked for cracks or fissures in the ground surface around your brine well? Yes☒ No☐ Inspect the facility 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☐ only getting tubing in & out
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: 711.4. 2. Now provide the depth (ft) from the surface to your casing shoe: 2250. 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."

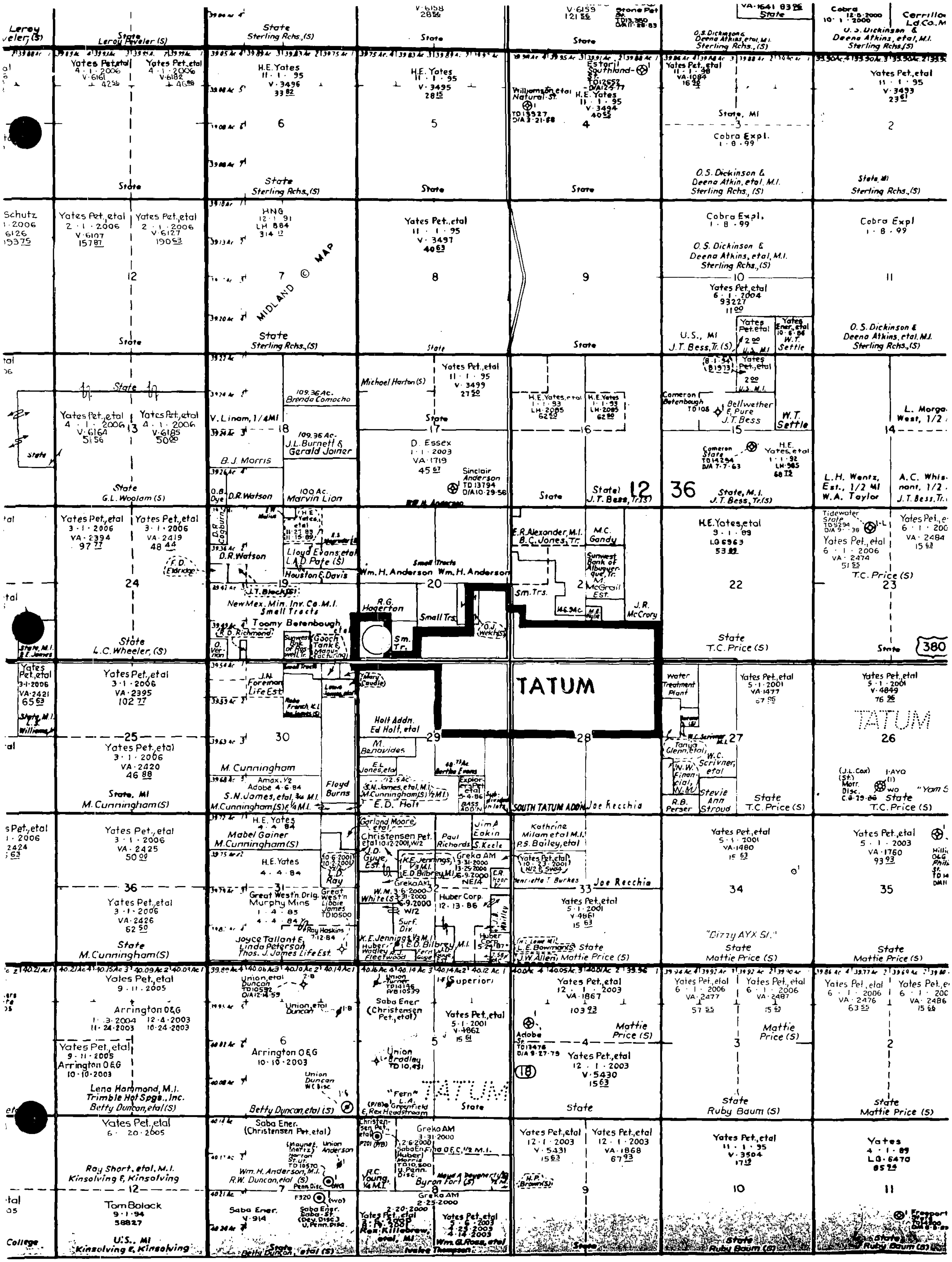
Gandy Corp
Company Name-print name above

Eddie W Seay
Company Representative- print name

Eddie W Seay
Company Representative- Signature

Title Agent

Date: 8/30/2008



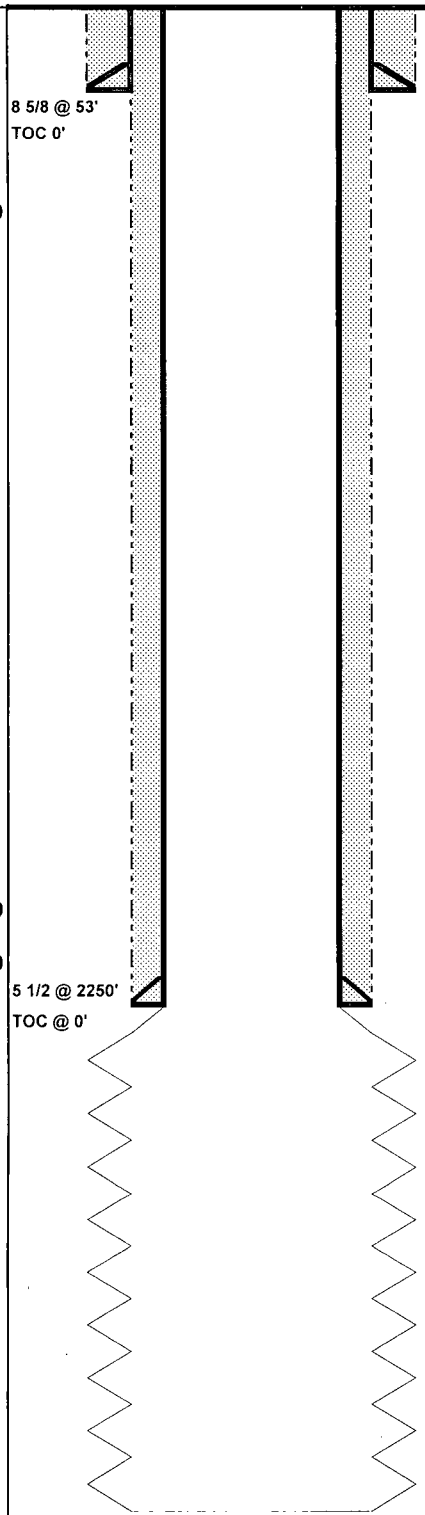
State
Sterling Rchs.,(S)
Leroy Feveler (S)
Yates Pet.,etal
H.E. Yates
11 · 1 · 95
V·3496
V·3495
Estoril
Southland
Williamson,etal
Natural St.
V·3494
O.S. Dickinson &
Deena Atkins, etal, M.I.
Sterling Rchs.,(S)
Cobra Expl.
1 · 8 · 99
V·3493
State, MI
6
5
4
3
2
Schutz
Yates Pet.,etal
2 · 1 · 2006
HNG
V·3497
Cobra Expl
O.S. Dickinson &
Deena Atkins, etal, M.I.
Sterling Rchs.,(S)
12
7
8
9
10
11
MIDLAND © MAP
Yates Pet.,etal
6 · 1 · 2004
U.S., MI
J.T. Bess,Tr.(S)
W.T. Settle
O.S. Dickinson &
Deena Atkins, etal, M.I.
Sterling Rchs.,(S)
Michael Horton (S)
109.36 Ac.
Brenda Comocho
Yates Pet.,etal
4 · 1 · 2006
V. Linam, 1/4 MI
J.L. Burnett &
Gerald Joiner
D. Essex
1 · 1 · 2003
VA·1719
Sinclair
Anderson
H.E. Yates,etal
Cameron
Betenbough
Bellwether
E. Pure
J.T. Bess
W.T. Settle
L. Morgan
West, 1/2
13
18
17
16
15
14
B.J. Morris
G.L. Woolam (S)
D.R. Watson
100 Ac.
Marvin Lion
State
State
J.T. Bess,Tr.(S)
12
36
State, M.I.
J.T. Bess,Tr.(S)
L.H. Wentz, Est., 1/2 MI
W.A. Taylor
A.C. Whisnant, 1/2
J.T. Bess,Tr.
Yates Pet.,etal
3 · 1 · 2006
VA·2394
VA·2419
D.R. Coburn
D.R. Watson
F.D. Eldridge
Lloyd Evans,etal
L.A.D. Pate (S)
Houston & Davis
Wm. H. Anderson
Wm. H. Anderson
Small Tracts
E.R. Alexander, M.I.
B.C. Jones, Tr.
M.C. Gandy
Sunwest Bank of Albuquerque, Tr.
M. McGrail Est.
H.E. Yates,etal
9 · 1 · 89
LG 6963
Tidewater
Yates Pet.,etal
6 · 1 · 2006
VA·2474
VA·2484
T.C. Price (S)
24
19
20
21
22
23
J.T. Block (S)
New Mex. Min. Inv. Co. M.I.
Small Tracts
Toomy Betenbough
R.G. Hogerton
Small Trs.
Sm. Trs.
O.J. Welch (S)
J.R. McCrory
State
L.C. Wheeler, (S)
State
T.C. Price (S)
380
Yates Pet.,etal
3 · 1 · 2006
VA·2395
TATUM
J.N. Foreman Life Est.
Holt Addn.
Ed Holt, etal
Water Treatment Plant
Yates Pet.,etal
5 · 1 · 2001
VA·1477
V·4849
TATUM
25
30
29
28
27
26
Yates Pet.,etal
3 · 1 · 2006
VA·2420
M. Cunningham
M. Benavides
Amax, 1/2
Adobe 4 · 6 · 84
S.N. James, etal, 3/4 MI
M. Cunningham (S), 1/4 MI
Floyd Burns
E.D. Holt
SOUTH TATUM ADDN
Joe Recchia
Tanya Glenn, etal
W.C. Scrivner, etal
Stevie Ann Stroud
R.B. Perser
State
T.C. Price (S)
State, MI
M. Cunningham (S)
Yates Pet.,etal
3 · 1 · 2006
VA·2425
H.E. Yates
Mabel Gainer
M. Cunningham (S)
Garland Moore, etal
Christensen Pet., etal
Paul Richards
Jim A Eakin
S. Keele
Greko AM
Kathrine Milam etal M.I.
P.S. Bailey, etal
Yates Pet.,etal
5 · 1 · 2001
VA·1480
Yates Pet.,etal
5 · 1 · 2003
VA·1760
36
31
32
33
34
35
Great West'n Drlg.
Murphy Mins
Huber Corp.
12 · 13 · 86
Joe Recchia
Yates Pet.,etal
5 · 1 · 2001
V·4861
Yates Pet.,etal
3 · 1 · 2006
VA·2426
Joyce Tallant &
Linda Peterson
Thos. J. James Life Est.
K.E. Jennings 1/3 M.I.
E.D. Bilbrey M.I.
State
M. Cunningham (S)
"Dizzy AYX St."
State
Mattie Price (S)
State
Mattie Price (S)
J.W. Allen, Mattie Price (S)
Yates Pet.,etal
9 · 11 · 2005
Arrington O&G
Union, etal
Duncan
Saba Ener.
(Christensen Pet., etal)
Superior
Yates Pet.,etal
5 · 1 · 2001
V·4862
Yates Pet.,etal
12 · 1 · 2003
VA·1867
Adobe
Mattie Price (S)
Yates Pet.,etal
6 · 1 · 2006
VA·2477
VA·2487
VA·2476
VA·2486
12
6
5
4
3
2
Yates Pet.,etal
9 · 11 · 2005
Arrington O&G
10 · 10 · 2003
Union
Bradley
Yates Pet.,etal
12 · 1 · 2003
V·5430
Lena Hammond, M.I.
Trimble Hot Spgs., Inc.
Betty Duncan, etal (S)
Union Duncan
E. Rex Headstream
TATUM
State
State
State
Ruby Baum (S)
State
Mattie Price (S)
Yates Pet.,etal
6 · 20 · 2005
Saba Ener.
(Christensen Pet., etal)
Greko AM
3 · 31 · 2000
Yates Pet.,etal
12 · 1 · 2003
V·5431
VA·1868
Yates Pet.,etal
11 · 1 · 95
V·3504
Yates
4 · 1 · 89
LG·6470
Ray Short, etal, M.I.
Kinsolving & Kinsolving
Wm. H. Anderson, M.I.
R.W. Duncan, etal (S)
R.C. Young, 1/4 M.I.
Byron Fort (S)
H.P. Brown (S)
12
7
8
9
10
11
Tom Bolack
9 · 1 · 94
58827
Saba Ener.
V·914
Greko AM
2 · 25 · 2000
Yates Pet.,etal
Rex Killebrew, etal, MI
Yates Pet.,etal
Wm. G. Ross, etal
U.S., MI
Kinsolving & Kinsolving
College
State
Betty Duncan, etal (S)
State
State
Ruby Baum (S)
State
Ruby Baum (S)
Freeport

API NUMBER	30-025-28162
OPERATOR	GANDY CORP
PROPERTY NAME	QUALITY BRINE # 2
LOCATION	M-20-T12S-R36E 593 FSL 639 FWL
DEPTH TOP SALT BELOW G.L.	2250 FEET
DEPTH BASE SALT BELOW G.L.	2950 FEET
THICKNESS ANHYDRITE ABOVE SALT	80 FEET
LOGS WITHIN 1 MILE	There are no miles within 1 mile
US HWY 380	0.11 miles S
Water Well	
Water Well	0.10 miles WNW
Supply Well	0.15 miles NNW
Structures & Buildings	
Building	0.08 miles W
Bar & Package	0.08 miles SSE
Tank Batteries	
None within 1 mile	
Pipe Lines	
None	
Water Line	
City Tatum Water Line	0.10 miles SSW
DEPTH TO GROUND WATER	
OGALLALA	60-250 FEET
SANTA ROSA	1500-1800 FEET

WELLBORE SCHEMATIC AND HISTORY

COMPLETION SCHEMATIC

FORM	DEPTH
Base Ogallala	250
t. Santa Rosa	1500
b Santa Rosa	1800
Rustler	2170
Top Salt	2250
Base Salt	2950

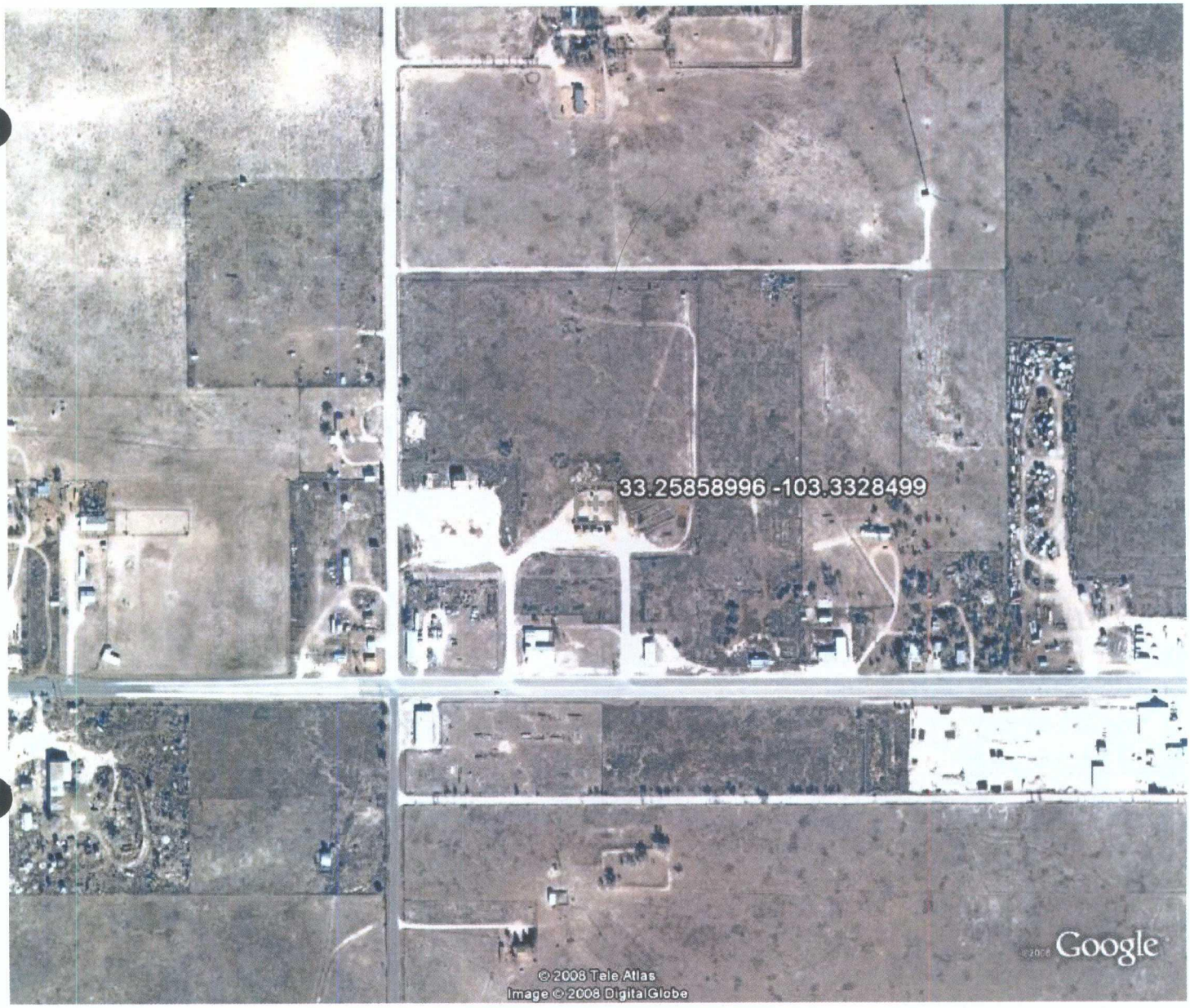


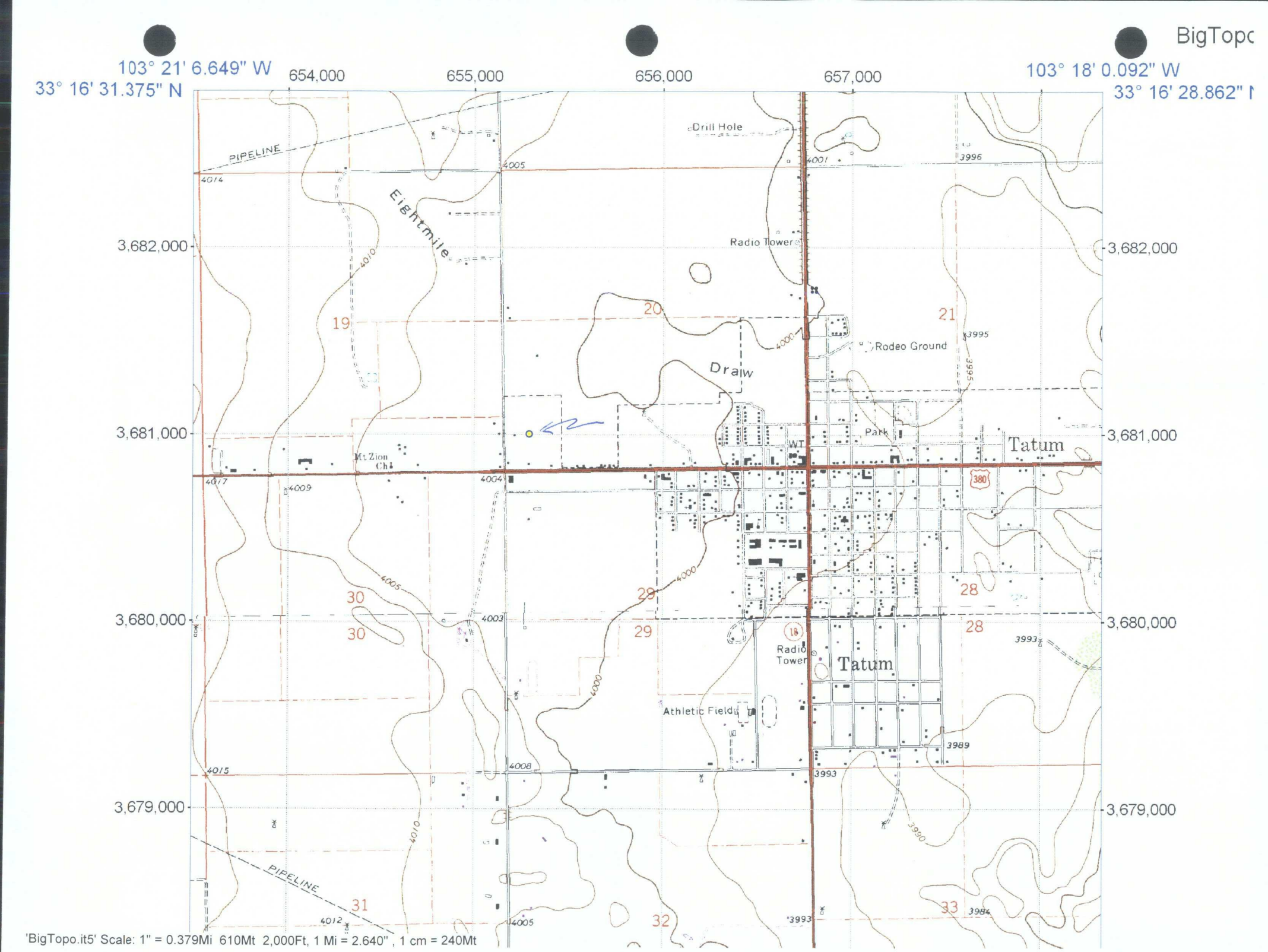
APINUM:	30-025-28162				
OPERATOR:	GANDY CORP				
LEASENAME:	QUALITY BRINE			WELL NO.	1
LOCATION:	UL: M	SEC: 20	TWN: 12S	RNG:	36E
	593 FSL		639 FWL		
TD	PBD	KB	DF		
		GL 3995			
POOL		Open Hole	2250-2932		
BSW;SALADO					
POOL		PERFS			
POOL		PERFS			

CASING RECORD

	SIZE	DEPTH	CMT	HOLE SIZE	TOC
SURF.	8 5/8	53	56 sxs	12	0' CIRC
PROD.	5 1/2	2250	250 sxs	7 7/8	0' CIRC

PREPARED BY:	Eddie Seay	UPDATED	08/23/08


33.25858996 -103.3328499
© 2008 Tele Atlas
Image © 2008 DigitalGlobe
Google


BigTopo
103° 21' 6.649" W
33° 16' 31.375" N
103° 18' 0.092" W
33° 16' 28.862" N
654,000
655,000
656,000
657,000
3,682,000
3,681,000
3,680,000
3,679,000
Drill Hole
PIPELINE
Eightmile
Draw
Radio Tower
Rodeo Ground
Park
WT
Mt Zion Ch
Tatum
Athletic Field
19
20
21
28
29
30
31
32
33
380
'BigTopo.it5' Scale: 1" = 0.379Mi 610Mt 2,000Ft, 1 Mi = 2.640" , 1 cm = 240Mt

New Mexico Office of the State Engineer
POD Reports and Downloads

Township: 12S Range: 36E Sections: 20

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 06819	12S	36E	20	2	2					70	30	40
L 03682	12S	36E	20	2	4	2				190	27	163
L 03682 APPRO	12S	36E	20	2	4	2				190	27	163
L 01467 APPRO	12S	36E	20	2	4	2				62	12	50
L 02821 S7	12S	36E	20	3	2	2				94		
L 02049	12S	36E	20	3	3	3				60		
L 02049 APPRO	12S	36E	20	3	3	3				60		
L 10125	12S	36E	20	3	3	3				60	30	30
L 02610 APPRO	12S	36E	20	3	3	3				75	27	48
L 02610	12S	36E	20	3	3	3				75	27	48
L 01504 APPRO	12S	36E	20	3	4					55	30	25
L 01504	12S	36E	20	3	4					55	30	25
L 10739	12S	36E	20	3	4	4				100		
L 02821 S6	12S	36E	20	4	1	1				87		
L 02821 S5	12S	36E	20	4	1	3				85		
L 07248	12S	36E	20	4	4	1				36	26	10
L 07991	12S	36E	20	4	4	4				50	24	26
L 02821	12S	36E	20	4	4	4				75		

Record Count: 18

New Mexico Office of the State Engineer
POD Reports and Downloads

Township: 12S Range: 36E Sections: 20

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

(Depth Water in Feet)

Bsn	Tws	Rng	Sec	Zone	X	Y	Wells	Min	Max	Avg
L	12S	36E	20				11	12	30	26

Record Count: 11

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. 30-025-28162
5. Indicate Type of Lease STATE ☐ 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: Quality Brine
1. Type of Well: Oil Well ☐ Gas Well ☐ Other Brine Well
8. Well Number
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 : 593 feet from the South line and 639 feet from the West line
Section 20 Township 12s Range 36e 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 ☒	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.

08/15/08 Pull tubing.

08/19/08 Run wire-line & sonar tools for capacity/cavity configuration and subsidence survey.

08/25/08 Run packer and set perform MIT.

08/26/08 Run 2 3/8 tubing to approximately 2800' and retu to Brine.

RECEIVED
AUG 1 2 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 Secretary/Treasurer DATE 8-13-08

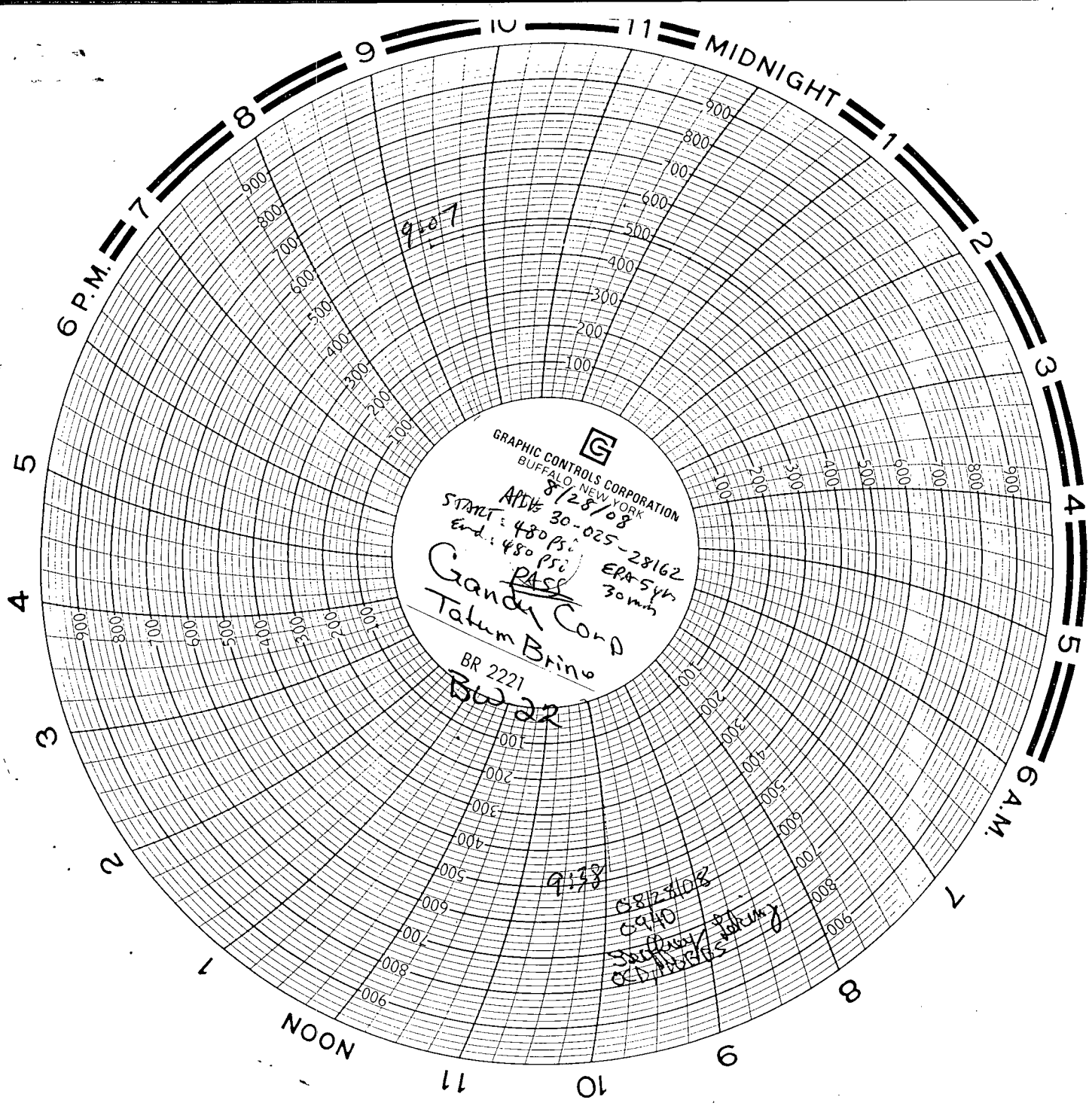
Type or print name Larry Gandy E-mail address: gandy2@leaconet PHONE: 575-398-4960

For State Use Only

APPROVED BY: TITLE Geologist DATE

Conditions of Approval (if any):

FB c 9/30/88



packer set @ 2139.40

Casing shoe ~ 2905 ft.

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

Price, Wayne, EMNRD

From: Porter, Jodi, EMNRD
Sent: Wednesday, July 23, 2008 5:00 PM
Subject: PR-Secretary Prukop Proposes Stricter Conditions on Brine Wells State-wide
Attachments: PR-OCD.Brine.Wells07.23.08.pdf

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

July 23, 2008

NEWS RELEASE

Contact: Jodi McGinnis Porter,
Public Information Officer 505.476.3226

Energy, Minerals and Natural Resources Cabinet Secretary Joanna Prukop Proposes Stricter Conditions on Brine Wells State-wide

Artesia brine well collapse prompts statewide review

SANTA FE, NM – Secretary Joanna Prukop has directed the Oil Conservation Division (OCD) to conduct a complete evaluation of the rules and regulations concerning brine wells, a method of creating saturated salt water used in oil and gas production. The OCD evaluation will include an internal audit and inspection of all existing brine wells in New Mexico. Secretary Prukop is considering strengthening oversight of brine wells to protect against well failures such as the recent collapse in Artesia that created a huge sinkhole and forced the closure of an Eddy County road.

"There are several brine wells in New Mexico and we must ensure that they are all properly monitored to ensure safety and stability," stated Cabinet Secretary Joanna Prukop. "We have now seen that these wells can collapse and the extensive damage such a collapse can generate."

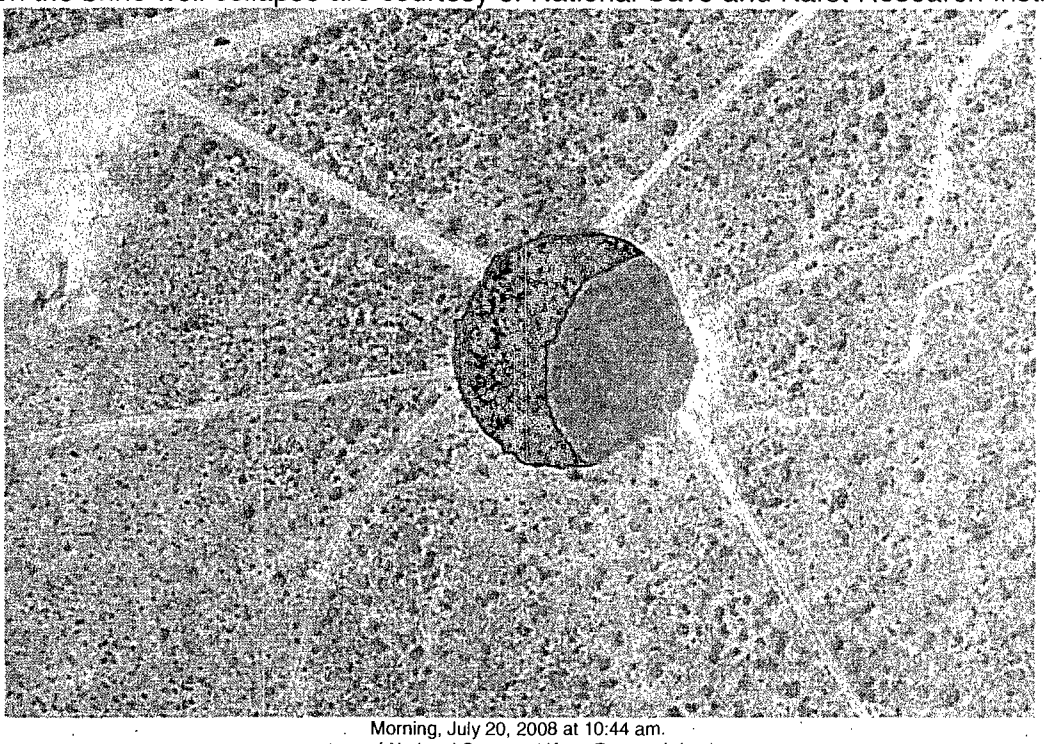
The Oil Conservation Division is continuing to monitor and investigate the collapse of the brine well, located on state trust land 17.3 miles southeast of Artesia, which is still active. The well is owned by Jim's Water Service. County Road 217 remains closed as a safety precaution, and a command center is on site. Division engineers estimate that the well is approximately 300 to 400 feet in diameter, 70 feet to the water level, and the actual depth to the bottom is unknown.

Scientists from the Oil Conservation Division, the Bureau of Land Management, State Land Office, the New Mexico

Bureau of Geology and Mineral Resources, and the National Cave & Karst Research Institute are all working together to assess horizontal and vertical movements to project any future subsidence. Work on a protective fence and keep-out signage began yesterday with completion expected on Friday.

In a related issue, the Oil Conservation Division has also been closely monitoring a brine well operated by I & W, Inc located in Carlsbad, NM. Yesterday, following ongoing inquiries from OCD the operator decided voluntarily to stop operation of the well The division will work with I & W, Inc. to ensure that the well is properly plugged, permanently abandoned, and monitored for the long term.

Images provided on the brine well collapse are courtesy of National Cave and Karst Research Institute:



Morning, July 20, 2008 at 10:44 am.
courtesy of National Cave and Karst Research Institute

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_____ Well Name(s)_____ API Number _____ Brine Well Permit # _____ Date Permit Expires? _____ Location: Section _____Ts _____ Rg _____ FNL_____FSL_____FEL_____FWL_____ GPS of well(s): Lat: Long:
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:*
Distance and direction to nearest water well *if less than one mile:*
Distance to nearest watercourse(s), floodplain, playa lake(s), or man-made canal(s) or pond(s) *if less than one mile:*
Distance and direction to nearest known karst features or mines *if less than one mile:*

Distance and direction to nearest producing oil or gas well(s) *if less than one mile:* Provide API Number:
Distance and direction to nearest tank battery(ies) *if less than one mile:*
Distance and direction to nearest pipeline(s), including fresh water pipelines *if less than one mile:*
Distance and direction to nearest paved or maintained road or railroad *if less than one mile:*
Depth to ground water found above the Salado (salt section), regardless of yield:
Name of aquifer(s):
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):
Depth to the bottom of the salt below ground surface (feet):
Depth(s) to and thickness(es) of any anhydrite section(s) (located above the salt):
Depth of casing(s) shoe below ground surface (feet):_____ 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?_____
Depth of tubing(s):
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:
Total volume of fresh water injected into the brine well to date (bbls) and how determined:

Total volume of brine water produced (bbls) to date and how determined:
Have you ever lost casing or tubing? If yes, please provide details. Document attached ☐
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☐
Have you ever run a sonar log? Yes☐ No☐ *If yes,* please provide last date:_____
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 ☐
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 ☐
Have you routinely looked for cracks or fissures in the ground surface around your brine well? Yes ☐ No☐
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☐
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:_____. 2. Now provide the depth (ft) from the surface to your casing shoe:_____ . 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."

_____
Company Name-print name above

_____
Company Representative- print name

_____
Company Representative- Signature

Title_____

Date:_____

Chavez, Carl J, EMNRD

From: Chavez, Carl J, EMNRD
Sent: Friday, July 25, 2008 4:21 PM
To: Hansen, Edward J., EMNRD; Price, Wayne, EMNRD
Cc: Sanchez, Daniel J., EMNRD
Subject: RE: PR-Secretary Prukop Proposes Stricter Conditions on Brine Wells State-wide
Attachments: image001.jpg; image007.jpg

Ed, Wayne, et. al:

Based on my records and knowledge of current activities at NMOCD BWs, my tally is as follows:

There are a total of 15 active UIC Class III Brine Well Permits (excluding BW-5 JWS & BW-6 I&W)

There are currently 13 active UIC Class III Brine Wells in operation (BW-2; BW-4; BW-8; BW-9; BW-12; BW-13; BW-22; BW-25; BW-27 Wells 1 & 2; BW-28; BW-30; and BW-31)

There are currently 6 brine wells that have actually been PA'd including: BW-5 JWS Collapse w/ Site Closure; BW-6 Eugenie #2; BW-21 Loco Hills Well #1 recently PA'd; BW-26 Salado Brine Sales; BW-29 Marbob; & William Brininstool.

There are currently 3 pending PAs of BWs including: BW-6 Eugenie #1 w/ Site Closure; BW-18 Key w/ redrill; and BW-19 Key w/ redrill.

There are currently 5 inactive brine wells (BW-5 Collapse w/ Site Closure; BW-6 needs PA Eugenie #1 w/ Site Closure; BW-18 needs PA w/ redrill; BW-19 needs PA w/ redrill; and BW21 needs redrill)

Let me know how we need to straighten RBDMS out. Please contact me if you have questions. Thanks.

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")

From: Hansen, Edward J., EMNRD
Sent: Wednesday, July 23, 2008 5:56 PM
To: Price, Wayne, EMNRD
Cc: Chavez, Carl J, EMNRD
Subject: FW: PR-Secretary Prukop Proposes Stricter Conditions on Brine Wells State-wide

Wayne,
Jane and I tallied these numbers off of RBDMS (you may want to double check).

From: Hansen, Edward J., EMNRD
Sent: Wednesday, July 23, 2008 5:54 PM
To: Porter, Jodi, EMNRD
Subject: RE: PR-Secretary Prukop Proposes Stricter Conditions on Brine Wells State-wide

Jodi,

We counted (from our database: RBDMS):

16 Active Brine Wells

11 Plugged and Abandoned Brine Wells

2 Inactive Brine Wells

From: Porter, Jodi, EMNRD
Sent: Wednesday, July 23, 2008 5:00 PM
Subject: PR-Secretary Prukop Proposes Stricter Conditions on Brine Wells State-wide

New Mexico Energy, Minerals and Natural Resources Department

July 23, 2008

NEWS RELEASE

Contact: Jodi McGinnis Porter,
Public Information Officer 505.476.3226

Energy, Minerals and Natural Resources Cabinet Secretary Joanna Prukop Proposes Stricter Conditions on Brine Wells State-wide

Artesia brine well collapse prompts statewide review

SANTA FE, NM – Secretary Joanna Prukop has directed the Oil Conservation Division (OCD) to conduct a complete evaluation of the rules and regulations concerning brine wells, a method of creating saturated salt water used in oil and gas production. The OCD evaluation will include an internal audit and inspection of all existing brine wells in New Mexico. Secretary Prukop is considering strengthening oversight of brine wells to protect against well failures such as the recent collapse in Artesia that created a huge sinkhole and forced the closure of an Eddy County road.

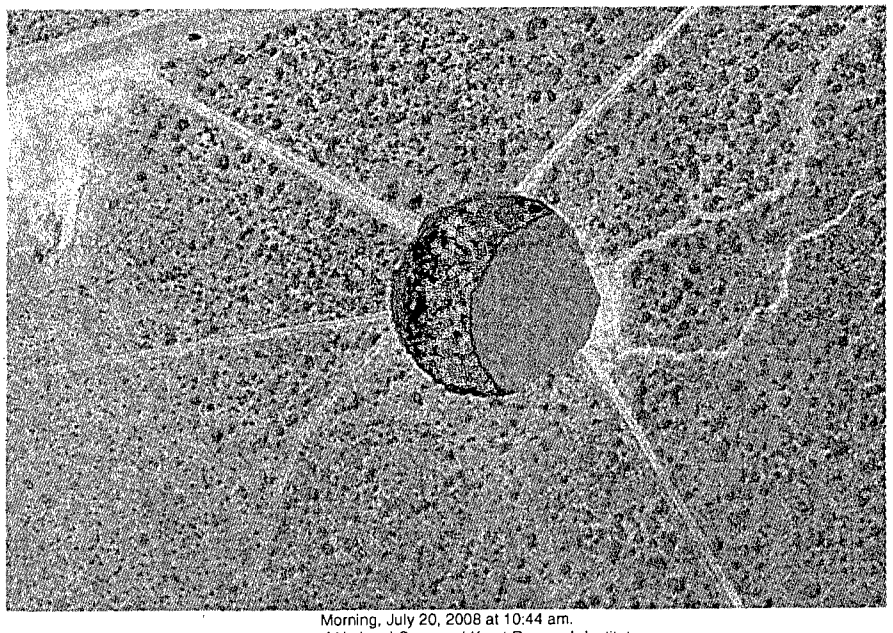
"There are several brine wells in New Mexico and we must ensure that they are all properly monitored to ensure safety and stability," stated Cabinet Secretary Joanna Prukop. "We have now seen that these wells can collapse and the extensive damage such a collapse can generate."

The Oil Conservation Division is continuing to monitor and investigate the collapse of the brine well, located on state trust land 17.3 miles southeast of Artesia, which is still active. The well is owned by Jim's Water Service. County Road 217 remains closed as a safety precaution, and a command center is on site. Division engineers estimate that the well is approximately 300 to 400 feet in diameter, 70 feet to the water level, and the actual depth to the bottom is unknown.

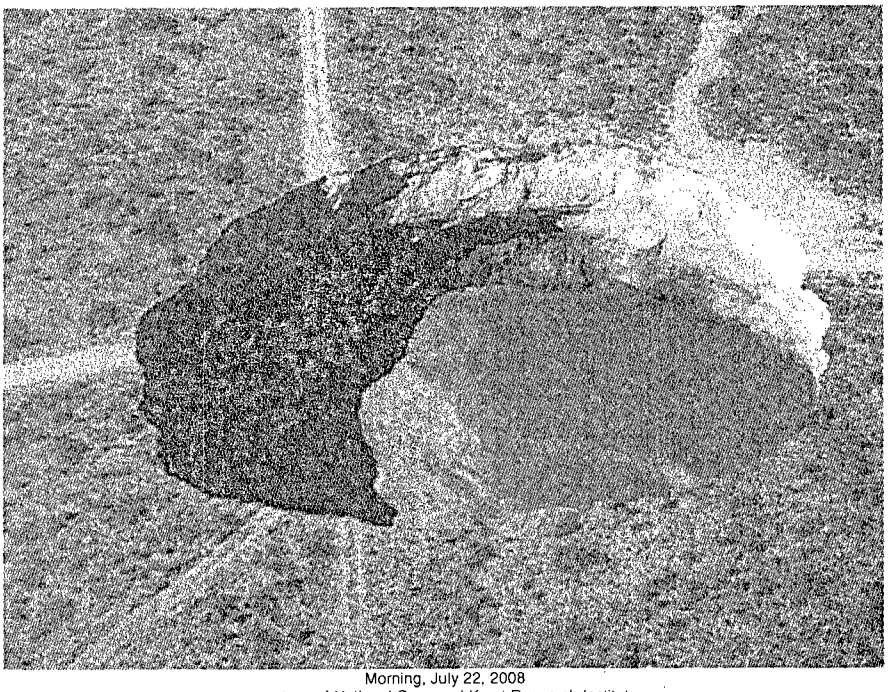
Scientists from the Oil Conservation Division, the Bureau of Land Management, State Land Office, the New Mexico Bureau of Geology and Mineral Resources, and the National Cave & Karst Research Institute are all working together to assess horizontal and vertical movements to project any future subsidence. Work on a protective fence and keep-out signage began yesterday with completion expected on Friday.

In a related issue, the Oil Conservation Division has also been closely monitoring a brine well operated by I & W, Inc located in Carlsbad, NM. Yesterday, following ongoing inquiries from OCD the operator decided voluntarily to stop operation of the well The division will work with I & W, Inc. to ensure that the well is properly plugged, permanently abandoned, and monitored for the long term.

Images provided on the brine well collapse are courtesy of National Cave and Karst Research Institute:



Morning, July 20, 2008 at 10:44 am.
courtesy of National Cave and Karst Research Institute



Morning, July 22, 2008
courtesy of National Cave and Karst Research Institute

#30#

The Energy, Minerals and Natural Resources Department provides resource protection and renewable energy resource development services to the public and other state agencies.

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Phone (505) 476-3440 • Fax (505) 476-3462 • www.emnrd.state.nm.us/OCD

Jodi

Jodi McGinnis Porter
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7/29/2008

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