30-015-37452

CIMAREX ENERGY

Undesignated Bone Spring
Eddy County, NM
Crescent Hale "1" Federal Com #1
VH - Job #32K0810655

Survey: Actual

SDI Standard Survey Report

08 September, 2010

This survey is correct to the best of my knowledge and is supported by actual field data.

Notorized this date 5th of October, 2010.

Notary Signature
County of Midland
State of Texas

NOTARY PUBLIC STATE OF TEXAS

CARRIE REED
My Commission Expires
October 4, 2011

Scientific Drilling International, Inc.

SDI Standard Survey Report

Company:	CIMAREX ENERGY	Local Co-ordinate Reference:	Well Crescent Hale "1" Federal Com #1
Project:	Undesignated Bone Spring	TVD Reference:	WELL @ 0.0usft (Original Well Elev)
Site:	Eddy County, NM	MD Reference:	WELL @ 0.0usft (Original Well Elev)
Well:	Crescent Hale "1" Federal Com #1	North Reference:	Grid
Wellbore:	VH - Job #32K0810655	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #32K0810655	Database:	EDM Regulatory

Project	Undesignated Bone Spring		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Well	Crescent Hale "1" Federal Com #1, Directional (Baker Inteq)					
Well Position	+N/-S	0.0 usft	Northing:	617,056.29 usft	Latitude:	32° 41' 44.690 N
	+E/-W	0.0 usft	Easting:	623,159.69 usft	Longitude:	103° 55' 58.750 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level:	0.0 usft

Wellbore VH - Job #32K0810655

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2010	9/3/2010	7.95	60.59	49,003

Design VH - Job #32K0810655

Audit Notes:

Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	175.76

Survey Program Date 9/8/2010

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
72.2	8,920.3	Actual (VH - Job #32K0810655)	Keeper	Keeper Gyro

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	True Vertical Depth	North/South (usft)	East/West (usft)	Closure Azimuth (°)	Closure Distance (usft)
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.0
72.2	0.75	267.01	72.2	0.0	-0.5	267.01	0.5
163.1	1.04	257.53	163.1	-0.2	-1.9	262.88	1.9
252.3	1.26	251.04	252.3	-0.7	-3.6	258.55	3.7
341.5	1.12	252.24	341.4	-1.3	-5.3	256.22	5.5
434.8	1.00	256.23	434.7	-1.8	-7.0	255.72	7.2
528.1	1.04	256.92	528.0	-2.2	-8.6	255.88	8.9
621.4	0.93	259.03	621.3	-2.5	-10.2	256.19	10.5
712.1	0.67	258.06	712.0	-2.8	-11.4	256.45	11.8
806.4	0.63	261.75	806.3	-2.9	-12.5	256.73	12.8
897.6	0.54	265.39	897.5	-3.0	-13.4	257.19	13.8
988.7	0.37	259.71	988.6	-3.1	-14.1	257.48	14.5
1,079.9	0.24	258.77	1,079.8	-3.2	-14.6	257.54	15.0
1,171.7	0.09	288.50	1,171.6	-3.2	-14.9	257.70	15.2
1,265.5	0.00	36.26	1,265.4	-3.2	-14.9	257.84	15.3
1,360.4	0.01	290.91	1,360.3	-3.2	-14.9	257.85	15.3
1,455.7	0.05	91.67	1,455.6	-3.2	-14.9	257.83	15.2

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SDI Standard Survey Report

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Project:	Undesignated Bone Spring	TVD Reference:	WELL @ 0.0usft (Original Well Elev)
Site:	Eddy County, NM	MD Reference:	WELL @ 0.0usft (Original Well Elev)
Well:	Crescent Hale "1" Federal Com #1	North Reference:	Grid
Wellbore:	VH - Job #32K0810655	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #32K0810655	Database:	EDM-Regulatory

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	True Vertical Depth	North/South (usft)	East/West (usft)	Closure Azimuth (°)	Closure Distance (usft)
1,551.0	0.07	147.61	1,550.9	-3.3	-14.8	257.59	15.2
1,646.2	0.05	195.68	1,646.1	-3.4	-14.8	257.25	15.2
1,741.5	0.09	110.76	1,741.4	-3.4	-14.8	256.95	15.1
1,836.8	0.76	67.85	1,836.7	-3.2	-14.1	257.18	14.5
1,932.0	1.19	64.16	1,931.9	-2.5	-12.6	258.63	12.9
2,027.3	1.25	55.87	2,027.1	-1.5	-10.9	262.02	11.0
2,122.6	1.11	30.80	2,122.4	-0.1	-9.5	269.11	9.5
2,217.8	0.99	8.07	2,217.6	1.5	-9.0	279.26	9.1
2,313.1	0.95	4.14	2,312.9	3.1	-8.8	289.23	9.3
2,408.4	0.83	4.72	2,408.2	4.5	-8.7	297.64	9.8
2,503.6	0.43	2.06	2,503.4	5.6	-8.6	303.00	10.2
2,598.9	0.85	122.40	2,598.7	5.6	-8.0	304.85	9.7
2,694.2	1.65	122.21	2,693.9	4.5	-6.2	305.55	7.7
2,789.5	1.91	114.38	2,789.2	3.1	-3.6	310.24	4.7
2,884.7	2.00	107.14	2,884.3	1.9	-0.6	342.99	2.0
2,980.0	1.91	108.91	2,979.6	0.9	2.5	69.94	2.7
3,075.3	1.77	113.21	3,074.8	-0.2	5.4	91.93	5.4
3,170.5	1.30	118.23	3,170.0	-1.3	7.7	99.42	7.8
3,265.8	1.05	122.42	3,265.3	-2.3	9.4	103.53	9.6
3,361.1	0.85	120.07	3,360.6	-3.1	10.7	106.02	11.1
3,456.3	0.88	117.19	3,455.8	-3.8	12.0	107.45	12.5
3,551.6	0.83	117.22	3,551.1	-4.4	13.2	108.44	13.9
3,646.9	0.73	116.99	3,646.3	-5.0	14.4	109.18	15.2
3,742.2	0.78	119.80	3,741.6	-5.6	15.5	109.88	16.5
3,837.4	0.85	127.67	3,836.8	-6.4	16.6	110.94	17.8
3,932.7	0.75	119.24	3,932.1	-7.1	17.7	111.82	19.1
4,028.0	0.80	104.08	4,027.4	-7.6	18.9	111.79	20.4
4,123.2	0.75	99.49	4,122.6	-7.8	20.2	111.20	21.6
4,218.5	0.75	103.90	4,217.9	-8.1	21.4	110.69	22.9
4,313.8	0.73	108.67	4,313.2	-8.4	22.6	110.46	24.1
4,409.1	0.55	94.95	4,408.5	-8.7	23.6	110.14	25.1
4,504.3	0.41	70.47	4,503.7	-8.6	24.4	109.39	25.8
4,599.6	0.54	24.45	4,599.0	-8.1	24.9	107.94	26.1
4,694.9	1.02	7.04	4,694.3	-6.8	25.2	105.13	26.1
4,790.1	1.24	347.93	4,789.4	-5.0	25.1	101.19	25.5
4,885.4	1.29	334.14	4,884.7	-3.0	24.4	96.98	24.6
4,980.7	1.04	289.53	4,980.0	-1.7	23.1	94.28	23.2
5,075.9	0.93	309.39	5,075.2	-0.9	21.7	92.50	21.7
5,171.2	0.39	321.60	5,170.5	-0.2	20.9	90.56	20.9
5,269.5	0.21	2.08	5,268.8	0.2	20.7	89.34	20.7
5,364.8	0.60	63.36	5,364.1	0.6	21.1	88.27	21.1
5,460.1	0.58	65.82	5,459.4	1.1	22.0	87.25	22.0
5,555.3	0.36	67.82	5,554.6	1.4	22.7	86.55	22.8
5,650.6	0.23	45.78	5,649.9	1.6	23.1	86.01	23.2

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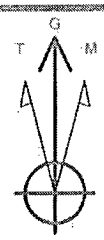
Site:	Eddy County, NM	**MD Reference:**	WELL @ 0.0usft (Original Well Elev)
Well:	Crescent Hale "1" Federal Com #1	**North Reference:**	Grid
Wellbore:	VH - Job #32K0810655	**Survey Calculation Method:**	Minimum Curvature
Design:	VH - Job #32K0810655	**Database:**	EDM-Regulatory

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	True Vertical Depth	North/South (usft)	East/West (usft)	Closure Azimuth (°)	Closure Distance (usft)
5,745.9	0.25	335.57	5,745.2	1.9	23.2	85.22	23.3
5,841.2	0.55	314.53	5,840.5	2.4	22.8	83.87	22.9
5,936.4	0.82	293.38	5,935.7	3.0	21.8	82.08	22.0
6,031.7	1.42	311.02	6,030.9	4.1	20.3	78.63	20.7
6,127.0	1.47	273.41	6,126.2	4.9	18.2	74.84	18.9
6,222.2	1.81	249.41	6,221.4	4.5	15.6	73.97	16.2
6,317.5	1.40	231.92	6,316.6	3.2	13.3	76.31	13.6
6,412.8	1.35	230.32	6,411.9	1.8	11.5	81.11	11.6
6,508.1	1.04	239.78	6,507.2	0.6	9.9	86.27	9.9
6,603.3	1.09	245.24	6,602.4	-0.2	8.3	91.19	8.3
6,698.6	0.77	255.17	6,697.7	-0.7	6.8	95.96	6.9
6,793.9	0.82	285.78	6,793.0	-0.7	5.6	97.10	5.6
6,889.1	0.79	324.53	6,888.1	0.0	4.5	89.68	4.5
6,984.4	0.57	222.34	6,983.4	0.2	3.8	86.86	3.8
7,079.7	0.69	208.98	7,078.7	-0.6	3.2	101.21	3.3
7,174.9	0.77	230.51	7,173.9	-1.6	2.5	122.13	2.9
7,270.2	1.22	249.89	7,269.2	-2.3	1.0	156.11	2.5
7,365.5	1.89	244.23	7,364.5	-3.3	-1.3	201.96	3.6
7,460.7	1.94	235.98	7,459.6	-4.9	-4.1	219.76	6.4
7,556.0	1.90	232.99	7,554.9	-6.8	-6.7	224.65	9.5
7,651.3	1.83	235.33	7,650.1	-8.6	-9.2	226.98	12.6
7,746.6	6.56	196.00	7,745.2	-14.7	-12.0	219.14	18.9
7,841.8	9.07	188.94	7,839.5	-27.3	-14.6	208.15	31.0
7,937.1	7.95	160.81	7,933.8	-41.0	-13.6	198.39	43.2
8,032.4	7.70	146.32	8,028.2	-52.5	-7.9	188.57	53.1
8,127.6	4.23	157.75	8,122.8	-61.1	-3.1	182.86	61.2
8,222.9	1.89	167.25	8,218.0	-65.9	-1.4	181.19	65.9
8,318.2	1.66	161.66	8,313.3	-68.7	-0.6	180.49	68.7
8,413.5	1.28	160.12	8,408.5	-71.0	0.2	179.84	71.0
8,445.1	1.13	167.99	8,440.1	-71.7	0.4	179.69	71.7
8,540.4	0.62	209.89	8,535.4	-73.0	0.3	179.74	73.0
8,635.6	0.84	204.40	8,630.6	-74.1	-0.2	180.17	74.1
8,730.9	1.25	212.07	8,725.9	-75.6	-1.1	180.80	75.6
8,825.6	1.18	201.70	8,820.6	-77.4	-2.0	181.46	77.4
8,920.3	1.31	217.67	8,915.2	-79.2	-3.0	182.16	79.2

Scientific Drilling
Directional Drilling Operations

Project: Undesignated Bone Spring
Eddy County, NM
Well: Crescent Hale "1" Federal Com #1
Wellbore: VH - Job #32K0810655
Design: VH - Job #32K0810655

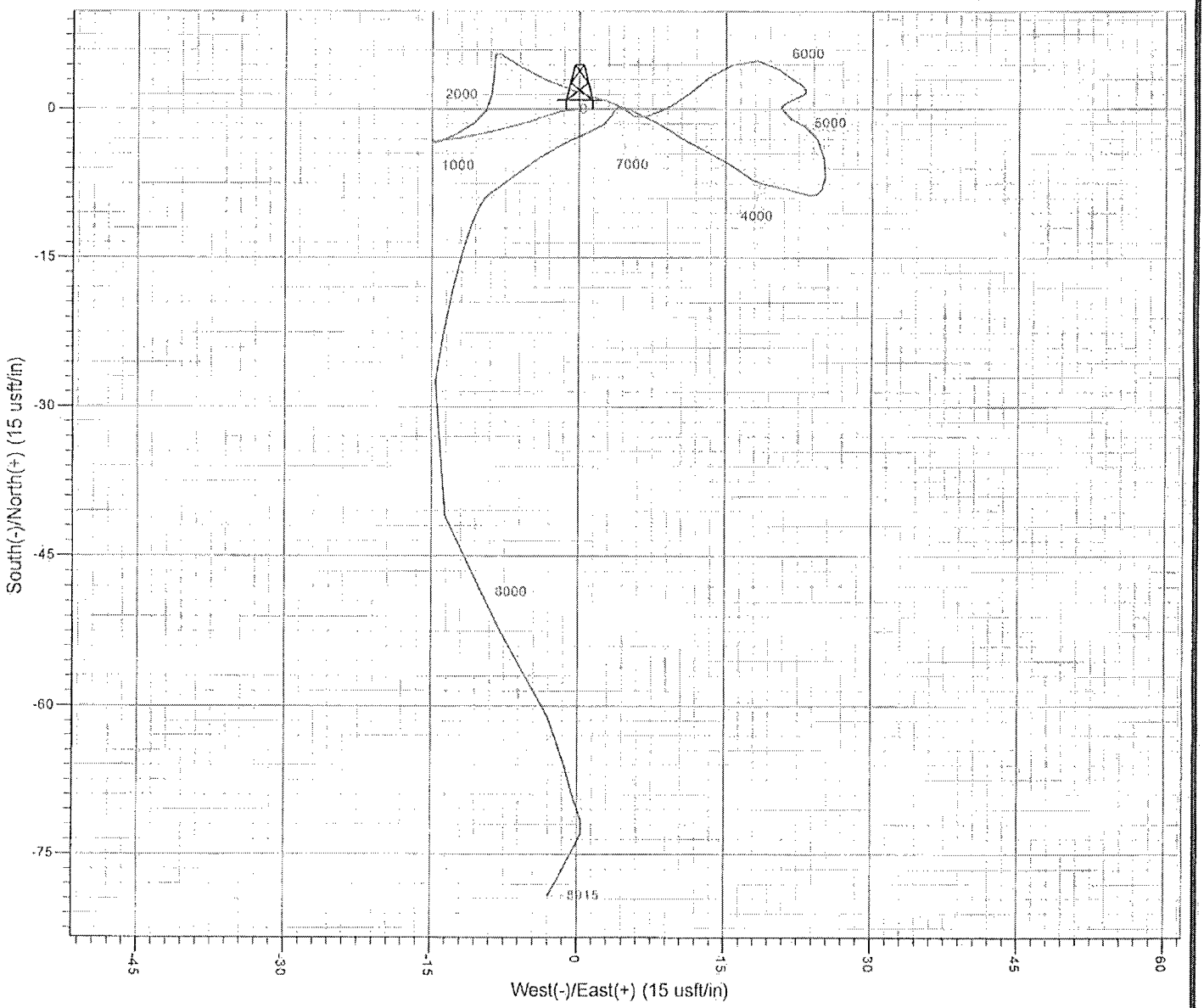


Azimuths to Grid North
True North: -0.22°
Magnetic North: 7.73°

Magnetic Field
Strength: 49002.5nT
Dip Angle: 60.59°
Date: 9/3/2010
Model: BGGM2010

WELL DETAILS: Crescent Hale "1" Federal Com #1
WELL @ 0.0usft (Original Well Elev)
Ground Level: 0.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	617056.29	623159.69	32° 41' 44.690 N	103° 55' 58.750 W	



PROJECT DETAILS: Undesignated Bone Spring
Geodetic System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone: New Mexico East 3001
System Datum: Mean Sea Level

SITE DETAILS: Eddy County, NM
Site Centre Latitude: 32° 41' 44.690 N
Longitude: 103° 55' 58.750 W
Positional Uncertainty: 0.0
Convergence: 0.22
Local North: Grid