



Catena Resources Operating, LLC
Project: Lea County NM N83-NM-EZ
Site: Belcher Cable
Well: Cable 19S35E16 2H
Wellbore: 2H
Plan: Plan #2 (Cable 19S35E16 2H/2H)

WELL DETAILS: Cable 19S35E16 2H

Northing 607582.97 Easting 810546.07 Latitude 32.667241722 Longitude -103.458504742 Slot



Azimuths to Grid North
True North: -0.47°
Magnetic North: 6.28°
Magnetic Field
Strength: 48035.6snT
Dip Angle: 60.46°
Date: 2/22/2019
Model: IGRF2015

PROJECT DETAILS: Lea County NM N83-NM-EZ
Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: New Mexico Eastern Zone
System Datum: Mean Sea Level
Local North: Grid
Grid Convergence: 0.47° West
KB Elevation: 3793+25 @ 3818.00usft (KB=25)
Elevation: 3793.00

Section Details

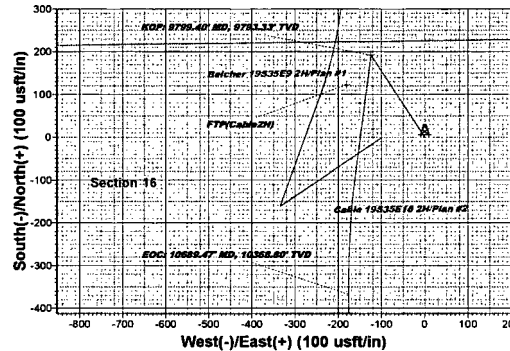
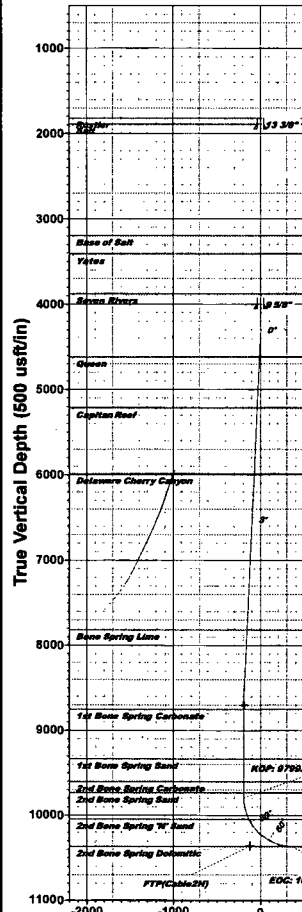
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	4300.00	0.00	0.00	4300.00	0.00	0.00	0.00	0.00	0.00
3	4454.07	3.08	327.14	4453.99	3.48	-2.25	2.00	327.14	-3.50
4	8552.01	3.08	327.14	8546.01	188.52	-121.75	0.00	0.00	-189.70
5	8706.07	0.00	0.00	8700.00	192.00	-124.00	2.00	180.00	-193.20
6	9799.40	0.00	0.00	9793.33	192.00	-124.00	0.00	0.00	-193.20
7	10399.40	60.00	187.42	10289.53	-92.08	-161.00	10.00	187.42	90.50
8	10689.47	88.00	179.44	10368.80	-367.47	-176.12	10.00	-16.63	365.73
9	12880.07	88.00	179.44	10445.25	-2556.63	-154.73	0.00	0.00	2555.00
10	12980.07	90.00	179.44	10447.00	-2656.61	-153.75	2.00	-0.07	2654.98
11	17325.08	90.00	179.44	10447.00	-7001.41	-111.10	0.00	0.00	6999.99
12	17342.42	89.65	179.44	10447.05	-7018.75	-110.93	2.00	179.18	7017.33
13	18325.10	89.65	179.44	10453.00	-8001.37	-101.37	0.00	0.00	8000.00
14	18354.62	89.06	179.44	10453.33	-8030.88	-101.08	2.00	-179.65	8029.51
15	20596.68	89.06	179.44	10490.00	-10272.54	-79.13	0.00	0.00	10271.28

DESIGN TARGET DETAILS

Name	+N/-S	+E/-W	Northing	Easting
EON(Cable2H)	192.00	-124.00	607774.97	810422.07
FTP(Cable2H)	122.72	-181.25	607705.69	810364.82
PBHL(Cable2H)	-10272.54	-79.13	597310.43	810466.94
T07(Cable2H)@7000VS	-7001.42	-111.16	600581.55	810434.91
T08(Cable2H)@8000VS	-8001.37	-101.37	599581.60	810444.70

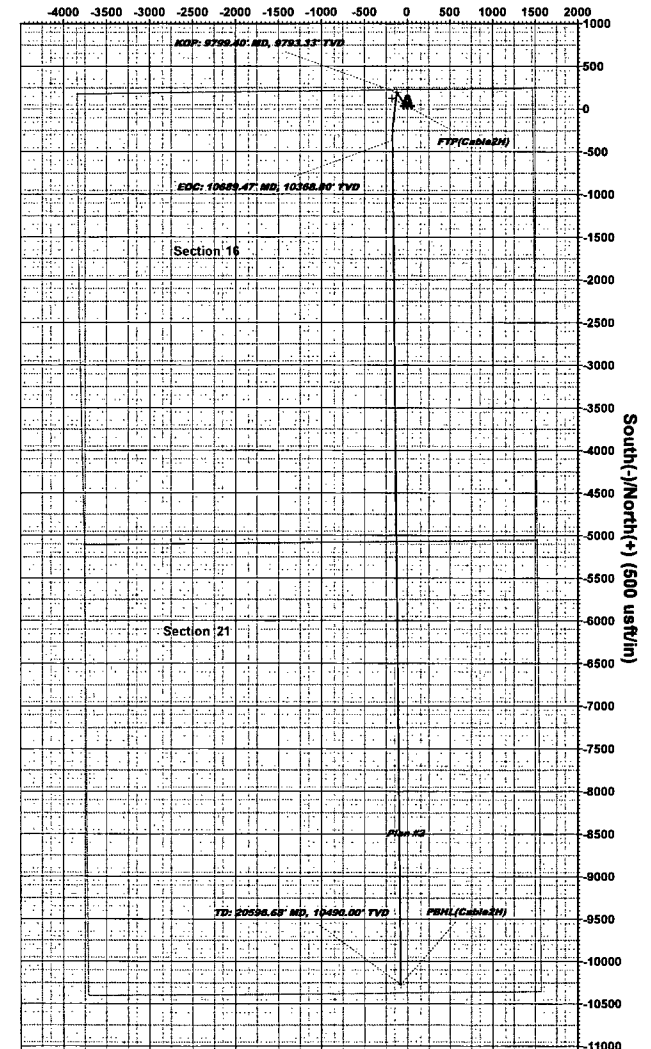
FORMATION TOP DETAILS

TVDPath	MDPath	Formation
1821.00	1821.00	Rustler
1889.00	1889.00	Salt
3197.00	3197.00	Base of Salt
3412.00	3412.00	Yates
3879.00	3879.00	Seven Rivers
4621.00	4621.00	Queen
5217.00	5218.18	Capitan Reef
5989.00	5991.30	Delaware Cherry Canyon
7817.00	7821.94	Bone Spring Lime
8751.00	8757.07	1st Bone Spring Carbonate
9335.00	9341.07	1st Bone Spring Sand
9603.00	9609.07	2nd Bone Spring Carbonate
9734.00	9740.07	2nd Bone Spring Sand
10046.00	10061.08	2nd Bone Spring 'N' Sand
10367.00	10659.50	2nd Bone Spring Dolomitic



Vertical Section at 179.44° (500 usft/in)

West(-)/East(+) (500 usft/in)





Catena Resources Operating, LLC

Lea County NM N83-NM-EZ

Belcher Cable

Cable 19S35E16 2H

2H

Plan: Plan #2

Standard Planning Report

26 February, 2019

Database:	EDM 5000.14 Single User Db	Local Co-ordinate Reference:	Well Cable 19S35E16 2H
Company:	Catena Resources Operating, LLC	TVD Reference:	3793+25 @ 3818.00usft (KB=25)
Project:	Lea County NM N83-NM-EZ	MD Reference:	3793+25 @ 3818.00usft (KB=25)
Site:	Belcher Cable	North Reference:	Grid
Well:	Cable 19S35E16 2H	Survey Calculation Method:	Minimum Curvature
Wellbore:	2H		
Design:	Plan #2		

Project	Lea County NM N83-NM-EZ		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site	Belcher Cable			
Site Position:		Northing:	607,587.91 usft	Latitude: 32.667309413
From:	Map	Easting:	808,146.45 usft	Longitude: -103.466301717
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence: 0.47 °

Well	Cable 19S35E16 2H			
Well Position	+N/-S	-4.94 usft	Northing:	607,582.97 usft
	+E/-W	2,399.62 usft	Easting:	810,546.07 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:		Ground Level: 3,793.00 usft

Wellbore	2H			
Magnetics	Model Name	Sample Date	Declination	Dip Angle
			(°)	(°)
	IGRF2015	2/22/2019	6.75	60.46
				Field Strength
				(nT)
				48,035.60294525

Design	Plan #2			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction
	(usft)	(usft)	(usft)	(°)
	0.00	0.00	0.00	179.44

Plan Survey Tool Program	Date 2/26/2019			
Depth From	Depth To	Survey (Wellbore)	Tool Name	Remarks
(usft)	(usft)			
1	0.00	20,596.54 Plan #2 (2H)	MWD	
			MWD - Standard	



Planning Report

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Site:	Belcher Cable	North Reference:	Grid
Well:	Cable 19S35E16 2H	Survey Calculation Method:	Minimum Curvature
Wellbore:	2H		
Design:	Plan #2		

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
4,300.00	0.00	0.00	4,300.00	0.00	0.00	0.00	0.00	0.00	0.00	
4,454.07	3.08	327.14	4,453.99	3.48	-2.25	2.00	2.00	0.00	327.14	
8,552.01	3.08	327.14	8,546.01	188.52	-121.75	0.00	0.00	0.00	0.00	
8,706.07	0.00	0.00	8,700.00	192.00	-124.00	2.00	-2.00	0.00	180.00	EON(Cable2H)
9,799.40	0.00	0.00	9,793.33	192.00	-124.00	0.00	0.00	0.00	0.00	
10,399.40	60.00	187.42	10,289.53	-92.08	-161.00	10.00	10.00	0.00	187.42	
10,689.47	88.00	179.44	10,368.80	-367.47	-176.12	10.00	9.65	-2.75	-16.63	
12,880.07	88.00	179.44	10,445.25	-2,556.63	-154.73	0.00	0.00	0.00	0.00	
12,980.07	90.00	179.44	10,447.00	-2,656.61	-153.75	2.00	2.00	0.00	-0.07	
17,325.08	90.00	179.44	10,447.00	-7,001.41	-111.10	0.00	0.00	0.00	0.00	
17,342.42	89.65	179.44	10,447.05	-7,018.75	-110.93	2.00	-2.00	0.03	179.18	
18,325.10	89.65	179.44	10,453.00	-8,001.37	-101.37	0.00	0.00	0.00	0.00	T08(Cable2H)@8000'
18,354.62	89.06	179.44	10,453.33	-8,030.88	-101.08	2.00	-2.00	-0.01	-179.65	
20,596.68	89.06	179.44	10,490.00	-10,272.54	-79.13	0.00	0.00	0.00	0.00	PBHL(Cable2H)

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Site:	Belcher Cable	North Reference:	Grid
Well:	Cable 19S35E16 2H	Survey Calculation Method:	Minimum Curvature
Wellbore:	2H		
Design:	Plan #2		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	0.00	0.00
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00
1,821.00	0.00	0.00	1,821.00	0.00	0.00	0.00	0.00	0.00	0.00
Rustler									
1,889.00	0.00	0.00	1,889.00	0.00	0.00	0.00	0.00	0.00	0.00
Salt									
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	0.00	0.00
1,946.00	0.00	0.00	1,946.00	0.00	0.00	0.00	0.00	0.00	0.00
13 3/8"									
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00
2,100.00	0.00	0.00	2,100.00	0.00	0.00	0.00	0.00	0.00	0.00
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	0.00	0.00
2,300.00	0.00	0.00	2,300.00	0.00	0.00	0.00	0.00	0.00	0.00
2,400.00	0.00	0.00	2,400.00	0.00	0.00	0.00	0.00	0.00	0.00
2,500.00	0.00	0.00	2,500.00	0.00	0.00	0.00	0.00	0.00	0.00
2,600.00	0.00	0.00	2,600.00	0.00	0.00	0.00	0.00	0.00	0.00
2,700.00	0.00	0.00	2,700.00	0.00	0.00	0.00	0.00	0.00	0.00
2,800.00	0.00	0.00	2,800.00	0.00	0.00	0.00	0.00	0.00	0.00
2,900.00	0.00	0.00	2,900.00	0.00	0.00	0.00	0.00	0.00	0.00
3,000.00	0.00	0.00	3,000.00	0.00	0.00	0.00	0.00	0.00	0.00
3,100.00	0.00	0.00	3,100.00	0.00	0.00	0.00	0.00	0.00	0.00
3,197.00	0.00	0.00	3,197.00	0.00	0.00	0.00	0.00	0.00	0.00
Base of Salt									
3,200.00	0.00	0.00	3,200.00	0.00	0.00	0.00	0.00	0.00	0.00
3,300.00	0.00	0.00	3,300.00	0.00	0.00	0.00	0.00	0.00	0.00
3,400.00	0.00	0.00	3,400.00	0.00	0.00	0.00	0.00	0.00	0.00
3,412.00	0.00	0.00	3,412.00	0.00	0.00	0.00	0.00	0.00	0.00
Yates									
3,500.00	0.00	0.00	3,500.00	0.00	0.00	0.00	0.00	0.00	0.00
3,600.00	0.00	0.00	3,600.00	0.00	0.00	0.00	0.00	0.00	0.00
3,700.00	0.00	0.00	3,700.00	0.00	0.00	0.00	0.00	0.00	0.00
3,800.00	0.00	0.00	3,800.00	0.00	0.00	0.00	0.00	0.00	0.00
3,879.00	0.00	0.00	3,879.00	0.00	0.00	0.00	0.00	0.00	0.00
Seven Rivers									
3,900.00	0.00	0.00	3,900.00	0.00	0.00	0.00	0.00	0.00	0.00
4,000.00	0.00	0.00	4,000.00	0.00	0.00	0.00	0.00	0.00	0.00

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Wellbore:	2H		
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Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,050.00	0.00	0.00	4,050.00	0.00	0.00	0.00	0.00	0.00	0.00
9 5/8"									
4,100.00	0.00	0.00	4,100.00	0.00	0.00	0.00	0.00	0.00	0.00
4,200.00	0.00	0.00	4,200.00	0.00	0.00	0.00	0.00	0.00	0.00
4,300.00	0.00	0.00	4,300.00	0.00	0.00	0.00	0.00	0.00	0.00
4,400.00	2.00	327.14	4,399.98	1.47	-0.95	-1.48	2.00	2.00	0.00
4,454.07	3.08	327.14	4,453.99	3.48	-2.25	-3.50	2.00	2.00	0.00
4,500.00	3.08	327.14	4,499.86	5.55	-3.59	-5.59	0.00	0.00	0.00
4,600.00	3.08	327.14	4,599.71	10.07	-6.50	-10.13	0.00	0.00	0.00
4,621.32	3.08	327.14	4,621.00	11.03	-7.12	-11.10	0.00	0.00	0.00
Queen									
4,700.00	3.08	327.14	4,699.57	14.58	-9.42	-14.68	0.00	0.00	0.00
4,800.00	3.08	327.14	4,799.43	19.10	-12.34	-19.22	0.00	0.00	0.00
4,900.00	3.08	327.14	4,899.28	23.62	-15.25	-23.76	0.00	0.00	0.00
5,000.00	3.08	327.14	4,999.14	28.13	-18.17	-28.31	0.00	0.00	0.00
5,100.00	3.08	327.14	5,098.99	32.65	-21.08	-32.85	0.00	0.00	0.00
5,200.00	3.08	327.14	5,198.85	37.16	-24.00	-37.39	0.00	0.00	0.00
5,218.18	3.08	327.14	5,217.00	37.98	-24.53	-38.22	0.00	0.00	0.00
Capitan Reef									
5,300.00	3.08	327.14	5,298.70	41.68	-26.92	-41.94	0.00	0.00	0.00
5,400.00	3.08	327.14	5,398.56	46.19	-29.83	-46.48	0.00	0.00	0.00
5,500.00	3.08	327.14	5,498.41	50.71	-32.75	-51.03	0.00	0.00	0.00
5,600.00	3.08	327.14	5,598.27	55.22	-35.67	-55.57	0.00	0.00	0.00
5,700.00	3.08	327.14	5,698.12	59.74	-38.58	-60.11	0.00	0.00	0.00
5,800.00	3.08	327.14	5,797.98	64.25	-41.50	-64.66	0.00	0.00	0.00
5,900.00	3.08	327.14	5,897.84	68.77	-44.41	-69.20	0.00	0.00	0.00
5,991.30	3.08	327.14	5,989.00	72.89	-47.08	-73.35	0.00	0.00	0.00
Delaware Cherry Canyon									
6,000.00	3.08	327.14	5,997.69	73.29	-47.33	-73.74	0.00	0.00	0.00
6,100.00	3.08	327.14	6,097.55	77.80	-50.25	-78.29	0.00	0.00	0.00
6,200.00	3.08	327.14	6,197.40	82.32	-53.16	-82.83	0.00	0.00	0.00
6,300.00	3.08	327.14	6,297.26	86.83	-56.08	-87.38	0.00	0.00	0.00
6,400.00	3.08	327.14	6,397.11	91.35	-59.00	-91.92	0.00	0.00	0.00
6,500.00	3.08	327.14	6,496.97	95.86	-61.91	-96.46	0.00	0.00	0.00
6,600.00	3.08	327.14	6,596.82	100.38	-64.83	-101.01	0.00	0.00	0.00
6,700.00	3.08	327.14	6,696.68	104.89	-67.74	-105.55	0.00	0.00	0.00
6,800.00	3.08	327.14	6,796.53	109.41	-70.66	-110.09	0.00	0.00	0.00
6,900.00	3.08	327.14	6,896.39	113.92	-73.58	-114.64	0.00	0.00	0.00
7,000.00	3.08	327.14	6,996.25	118.44	-76.49	-119.18	0.00	0.00	0.00
7,100.00	3.08	327.14	7,096.10	122.96	-79.41	-123.73	0.00	0.00	0.00
7,200.00	3.08	327.14	7,195.96	127.47	-82.33	-128.27	0.00	0.00	0.00
7,300.00	3.08	327.14	7,295.81	131.99	-85.24	-132.81	0.00	0.00	0.00
7,400.00	3.08	327.14	7,395.67	136.50	-88.16	-137.36	0.00	0.00	0.00
7,500.00	3.08	327.14	7,495.52	141.02	-91.07	-141.90	0.00	0.00	0.00
7,600.00	3.08	327.14	7,595.38	145.53	-93.99	-146.44	0.00	0.00	0.00
7,700.00	3.08	327.14	7,695.23	150.05	-96.91	-150.99	0.00	0.00	0.00
7,800.00	3.08	327.14	7,795.09	154.56	-99.82	-155.53	0.00	0.00	0.00
7,821.94	3.08	327.14	7,817.00	155.55	-100.46	-156.53	0.00	0.00	0.00
Bone Spring Lime									
7,900.00	3.08	327.14	7,894.94	159.08	-102.74	-160.08	0.00	0.00	0.00
8,000.00	3.08	327.14	7,994.80	163.60	-105.66	-164.62	0.00	0.00	0.00
8,100.00	3.08	327.14	8,094.65	168.11	-108.57	-169.16	0.00	0.00	0.00
8,200.00	3.08	327.14	8,194.51	172.63	-111.49	-173.71	0.00	0.00	0.00

Database:	EDM 5000.14 Single User Db	Local Co-ordinate Reference:	Well Cable 19S35E16 2H
Company:	Catena Resources Operating, LLC	TVD Reference:	3793+25 @ 3818.00usft (KB=25)
Project:	Lea County NM N83-NM-EZ	MD Reference:	3793+25 @ 3818.00usft (KB=25)
Site:	Belcher Cable	North Reference:	Grid
Well:	Cable 19S35E16 2H	Survey Calculation Method:	Minimum Curvature
Wellbore:	2H		
Design:	Plan #2		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
8,300.00	3.08	327.14	8,294.37	177.14	-114.40	-178.25	0.00	0.00	0.00
8,400.00	3.08	327.14	8,394.22	181.66	-117.32	-182.79	0.00	0.00	0.00
8,500.00	3.08	327.14	8,494.08	186.17	-120.24	-187.34	0.00	0.00	0.00
8,552.01	3.08	327.14	8,546.01	188.52	-121.75	-189.70	0.00	0.00	0.00
8,600.00	2.12	327.14	8,593.95	190.35	-122.93	-191.54	2.00	-2.00	0.00
8,706.07	0.00	0.00	8,700.00	192.00	-124.00	-193.20	2.00	-2.00	0.00
EON(Cable2H)									
8,757.07	0.00	0.00	8,751.00	192.00	-124.00	-193.20	0.00	0.00	0.00
1st Bone Spring Carbonate									
8,800.00	0.00	0.00	8,793.93	192.00	-124.00	-193.20	0.00	0.00	0.00
8,900.00	0.00	0.00	8,893.93	192.00	-124.00	-193.20	0.00	0.00	0.00
9,000.00	0.00	0.00	8,993.93	192.00	-124.00	-193.20	0.00	0.00	0.00
9,100.00	0.00	0.00	9,093.93	192.00	-124.00	-193.20	0.00	0.00	0.00
9,200.00	0.00	0.00	9,193.93	192.00	-124.00	-193.20	0.00	0.00	0.00
9,300.00	0.00	0.00	9,293.93	192.00	-124.00	-193.20	0.00	0.00	0.00
9,341.07	0.00	0.00	9,335.00	192.00	-124.00	-193.20	0.00	0.00	0.00
1st Bone Spring Sand									
9,400.00	0.00	0.00	9,393.93	192.00	-124.00	-193.20	0.00	0.00	0.00
9,500.00	0.00	0.00	9,493.93	192.00	-124.00	-193.20	0.00	0.00	0.00
9,600.00	0.00	0.00	9,593.93	192.00	-124.00	-193.20	0.00	0.00	0.00
9,609.07	0.00	0.00	9,603.00	192.00	-124.00	-193.20	0.00	0.00	0.00
2nd Bone Spring Carbonate									
9,700.00	0.00	0.00	9,693.93	192.00	-124.00	-193.20	0.00	0.00	0.00
9,740.07	0.00	0.00	9,734.00	192.00	-124.00	-193.20	0.00	0.00	0.00
2nd Bone Spring Sand									
9,799.40	0.00	0.00	9,793.33	192.00	-124.00	-193.20	0.00	0.00	0.00
KOP: 9799.40' MD, 9793.33' TVD									
9,850.00	5.06	187.42	9,843.86	189.79	-124.29	-190.99	10.00	10.00	0.00
9,900.00	10.06	187.42	9,893.41	183.27	-125.14	-184.48	10.00	10.00	0.00
9,950.00	15.06	187.42	9,942.20	172.49	-126.54	-173.72	10.00	10.00	0.00
10,000.00	20.06	187.42	9,989.85	157.53	-128.49	-158.78	10.00	10.00	0.00
10,050.00	25.06	187.42	10,036.01	138.52	-130.97	-139.79	10.00	10.00	0.00
10,061.08	26.17	187.42	10,046.00	133.77	-131.58	-135.05	10.00	10.00	0.00
2nd Bone Spring 'N' Sand									
10,100.00	30.06	187.42	10,080.33	115.58	-133.95	-116.89	10.00	10.00	0.00
10,150.00	35.06	187.42	10,122.45	88.91	-137.43	-90.25	10.00	10.00	0.00
10,200.00	40.06	187.42	10,162.08	58.70	-141.36	-60.07	10.00	10.00	0.00
10,250.00	45.06	187.42	10,198.89	25.17	-145.73	-26.59	10.00	10.00	0.00
10,290.73	49.13	187.42	10,226.62	-4.41	-149.58	2.95	10.00	10.00	0.00
FTP(Cable2H)									
10,300.00	50.06	187.42	10,232.62	-11.41	-150.49	9.94	10.00	10.00	0.00
10,350.00	55.06	187.42	10,263.01	-50.76	-155.62	49.24	10.00	10.00	0.00
10,399.40	60.00	187.42	10,289.53	-92.08	-161.00	90.50	10.00	10.00	0.00
10,450.00	64.86	185.82	10,312.94	-136.62	-166.15	134.99	10.00	9.60	-3.16
10,500.00	69.67	184.36	10,332.26	-182.54	-170.24	180.86	10.00	9.63	-2.92
10,550.00	74.50	183.00	10,347.63	-230.00	-173.28	228.30	10.00	9.65	-2.74
10,600.00	79.34	181.69	10,358.95	-278.65	-175.26	276.92	10.00	9.67	-2.61
10,650.00	84.18	180.42	10,366.11	-328.11	-176.17	326.37	10.00	9.68	-2.53
10,659.50	85.10	180.19	10,367.00	-337.57	-176.22	335.83	10.00	9.69	-2.50
2nd Bone Spring Dolomitic									
10,689.47	88.00	179.44	10,368.80	-367.48	-176.12	365.74	10.00	9.69	-2.49
EOC: 10689.47' MD, 10368.80' TVD									
10,700.00	88.00	179.44	10,369.17	-378.00	-176.02	376.26	0.00	0.00	0.00

Database:	EDM 5000.14 Single User Db	Local Co-ordinate Reference:	Well Cable 19S35E16 2H
Company:	Catena Resources Operating, LLC	TVD Reference:	3793+25 @ 3818.00usft (KB=25)
Project:	Lea County NM N83-NM-EZ	MD Reference:	3793+25 @ 3818.00usft (KB=25)
Site:	Belcher Cable	North Reference:	Grid
Well:	Cable 19S35E16 2H	Survey Calculation Method:	Minimum Curvature
Wellbore:	2H		
Design:	Plan #2		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
10,800.00	88.00	179.44	10,372.66	-477.93	-175.04	476.20	0.00	0.00	0.00
10,896.54	88.00	179.44	10,376.03	-574.41	-174.10	572.69	0.00	0.00	0.00
T00(Cable2H)@573VS									
10,900.00	88.00	179.44	10,376.15	-577.87	-174.07	576.14	0.00	0.00	0.00
11,000.00	88.00	179.44	10,379.64	-677.80	-173.09	676.08	0.00	0.00	0.00
11,100.00	88.00	179.44	10,383.13	-777.74	-172.11	776.02	0.00	0.00	0.00
11,200.00	88.00	179.44	10,386.62	-877.67	-171.14	875.96	0.00	0.00	0.00
11,300.00	88.00	179.44	10,390.11	-977.61	-170.16	975.90	0.00	0.00	0.00
11,323.91	88.00	179.44	10,390.95	-1,001.50	-169.93	999.79	0.00	0.00	0.00
T01(Cable2H)@1000VS									
11,400.00	88.00	179.44	10,393.60	-1,077.54	-169.18	1,075.83	0.00	0.00	0.00
11,500.00	88.00	179.44	10,397.09	-1,177.47	-168.21	1,175.77	0.00	0.00	0.00
11,600.00	88.00	179.44	10,400.58	-1,277.41	-167.23	1,275.71	0.00	0.00	0.00
11,700.00	88.00	179.44	10,404.07	-1,377.34	-166.25	1,375.65	0.00	0.00	0.00
11,800.00	88.00	179.44	10,407.56	-1,477.28	-165.28	1,475.59	0.00	0.00	0.00
11,900.00	88.00	179.44	10,411.05	-1,577.21	-164.30	1,575.53	0.00	0.00	0.00
12,000.00	88.00	179.44	10,414.54	-1,677.15	-163.32	1,675.47	0.00	0.00	0.00
12,100.00	88.00	179.44	10,418.03	-1,777.08	-162.35	1,775.41	0.00	0.00	0.00
12,200.00	88.00	179.44	10,421.52	-1,877.01	-161.37	1,875.35	0.00	0.00	0.00
12,300.00	88.00	179.44	10,425.01	-1,976.95	-160.39	1,975.29	0.00	0.00	0.00
12,324.80	88.00	179.44	10,425.88	-2,001.73	-160.15	2,000.07	0.00	0.00	0.00
T02(Cable2H)@2000VS									
12,400.00	88.00	179.44	10,428.50	-2,076.88	-159.42	2,075.23	0.00	0.00	0.00
12,500.00	88.00	179.44	10,431.99	-2,176.82	-158.44	2,175.16	0.00	0.00	0.00
12,600.00	88.00	179.44	10,435.48	-2,276.75	-157.46	2,275.10	0.00	0.00	0.00
12,700.00	88.00	179.44	10,438.97	-2,376.69	-156.49	2,375.04	0.00	0.00	0.00
12,800.00	88.00	179.44	10,442.46	-2,476.62	-155.51	2,474.98	0.00	0.00	0.00
12,880.07	88.00	179.44	10,445.25	-2,556.63	-154.73	2,555.00	0.00	0.00	0.00
12,900.00	88.40	179.44	10,445.88	-2,576.56	-154.53	2,574.92	2.00	2.00	0.00
12,980.07	90.00	179.44	10,447.00	-2,656.61	-153.75	2,654.98	2.00	2.00	0.00
13,000.00	90.00	179.44	10,447.00	-2,676.54	-153.55	2,674.91	0.00	0.00	0.00
13,100.00	90.00	179.44	10,447.00	-2,776.54	-152.57	2,774.91	0.00	0.00	0.00
13,200.00	90.00	179.44	10,447.00	-2,876.53	-151.59	2,874.91	0.00	0.00	0.00
13,300.00	90.00	179.44	10,447.00	-2,976.53	-150.61	2,974.91	0.00	0.00	0.00
13,325.09	90.00	179.44	10,447.00	-3,001.61	-150.36	3,000.00	0.00	0.00	0.00
T03(Cable2H)@3000VS									
13,400.00	90.00	179.44	10,447.00	-3,076.52	-149.63	3,074.91	0.00	0.00	0.00
13,500.00	90.00	179.44	10,447.00	-3,176.52	-148.64	3,174.91	0.00	0.00	0.00
13,600.00	90.00	179.44	10,447.00	-3,276.51	-147.66	3,274.91	0.00	0.00	0.00
13,700.00	90.00	179.44	10,447.00	-3,376.51	-146.68	3,374.91	0.00	0.00	0.00
13,800.00	90.00	179.44	10,447.00	-3,476.50	-145.70	3,474.91	0.00	0.00	0.00
13,900.00	90.00	179.44	10,447.00	-3,576.50	-144.72	3,574.91	0.00	0.00	0.00
14,000.00	90.00	179.44	10,447.00	-3,676.49	-143.74	3,674.91	0.00	0.00	0.00
14,100.00	90.00	179.44	10,447.00	-3,776.49	-142.76	3,774.91	0.00	0.00	0.00
14,200.00	90.00	179.44	10,447.00	-3,876.48	-141.77	3,874.91	0.00	0.00	0.00
14,300.00	90.00	179.44	10,447.00	-3,976.48	-140.79	3,974.91	0.00	0.00	0.00
14,325.09	90.00	179.44	10,447.00	-4,001.57	-140.55	4,000.01	0.00	0.00	0.00
T04(Cable2H)@4000VS									
14,400.00	90.00	179.44	10,447.00	-4,076.47	-139.81	4,074.91	0.00	0.00	0.00
14,500.00	90.00	179.44	10,447.00	-4,176.47	-138.83	4,174.91	0.00	0.00	0.00
14,600.00	90.00	179.44	10,447.00	-4,276.46	-137.85	4,274.91	0.00	0.00	0.00
14,700.00	90.00	179.44	10,447.00	-4,376.46	-136.87	4,374.91	0.00	0.00	0.00
14,800.00	90.00	179.44	10,447.00	-4,476.45	-135.88	4,474.91	0.00	0.00	0.00



Planning Report

Database:	EDM 5000.14 Single User Db	Local Co-ordinate Reference:	Well Cable 19S35E16 2H
Company:	Catena Resources Operating, LLC	TVD Reference:	3793+25 @ 3818.00usft (KB=25)
Project:	Lea County NM N83-NM-EZ	MD Reference:	3793+25 @ 3818.00usft (KB=25)
Site:	Belcher Cable	North Reference:	Grid
Well:	Cable 19S35E16 2H	Survey Calculation Method:	Minimum Curvature
Wellbore:	2H		
Design:	Plan #2		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
14,900.00	90.00	179.44	10,447.00	-4,576.45	-134.90	4,574.91	0.00	0.00	0.00
15,000.00	90.00	179.44	10,447.00	-4,676.45	-133.92	4,674.91	0.00	0.00	0.00
15,100.00	90.00	179.44	10,447.00	-4,776.44	-132.94	4,774.91	0.00	0.00	0.00
15,200.00	90.00	179.44	10,447.00	-4,876.44	-131.96	4,874.91	0.00	0.00	0.00
15,300.00	90.00	179.44	10,447.00	-4,976.43	-130.98	4,974.91	0.00	0.00	0.00
15,325.08	90.00	179.44	10,447.00	-5,001.51	-130.73	4,999.99	0.00	0.00	0.00
T05(Cable2H)@5000VS									
15,400.00	90.00	179.44	10,447.00	-5,076.43	-130.00	5,074.91	0.00	0.00	0.00
15,500.00	90.00	179.44	10,447.00	-5,176.42	-129.01	5,174.91	0.00	0.00	0.00
15,600.00	90.00	179.44	10,447.00	-5,276.42	-128.03	5,274.91	0.00	0.00	0.00
15,700.00	90.00	179.44	10,447.00	-5,376.41	-127.05	5,374.91	0.00	0.00	0.00
15,800.00	90.00	179.44	10,447.00	-5,476.41	-126.07	5,474.91	0.00	0.00	0.00
15,900.00	90.00	179.44	10,447.00	-5,576.40	-125.09	5,574.91	0.00	0.00	0.00
16,000.00	90.00	179.44	10,447.00	-5,676.40	-124.11	5,674.91	0.00	0.00	0.00
16,100.00	90.00	179.44	10,447.00	-5,776.39	-123.12	5,774.91	0.00	0.00	0.00
16,200.00	90.00	179.44	10,447.00	-5,876.39	-122.14	5,874.91	0.00	0.00	0.00
16,300.00	90.00	179.44	10,447.00	-5,976.38	-121.16	5,974.91	0.00	0.00	0.00
16,325.09	90.00	179.44	10,447.00	-6,001.47	-120.92	6,000.00	0.00	0.00	0.00
T06(Cable2H)@6000VS									
16,400.00	90.00	179.44	10,447.00	-6,076.38	-120.18	6,074.91	0.00	0.00	0.00
16,500.00	90.00	179.44	10,447.00	-6,176.37	-119.20	6,174.91	0.00	0.00	0.00
16,600.00	90.00	179.44	10,447.00	-6,276.37	-118.22	6,274.91	0.00	0.00	0.00
16,700.00	90.00	179.44	10,447.00	-6,376.36	-117.24	6,374.91	0.00	0.00	0.00
16,800.00	90.00	179.44	10,447.00	-6,476.36	-116.25	6,474.91	0.00	0.00	0.00
16,900.00	90.00	179.44	10,447.00	-6,576.35	-115.27	6,574.91	0.00	0.00	0.00
17,000.00	90.00	179.44	10,447.00	-6,676.35	-114.29	6,674.91	0.00	0.00	0.00
17,100.00	90.00	179.44	10,447.00	-6,776.34	-113.31	6,774.91	0.00	0.00	0.00
17,200.00	90.00	179.44	10,447.00	-6,876.34	-112.33	6,874.91	0.00	0.00	0.00
17,300.00	90.00	179.44	10,447.00	-6,976.33	-111.35	6,974.91	0.00	0.00	0.00
17,325.08	90.00	179.44	10,447.00	-7,001.41	-111.10	6,999.99	0.00	0.00	0.00
17,325.08	90.00	179.44	10,447.00	-7,001.42	-111.10	7,000.00	0.01	0.00	0.00
T07(Cable2H)@7000VS									
17,342.42	89.65	179.44	10,447.05	-7,018.75	-110.93	7,017.33	2.00	-2.00	0.03
17,400.00	89.65	179.44	10,447.40	-7,076.33	-110.37	7,074.91	0.00	0.00	0.00
17,500.00	89.65	179.44	10,448.01	-7,176.32	-109.40	7,174.91	0.00	0.00	0.00
17,600.00	89.65	179.44	10,448.61	-7,276.32	-108.42	7,274.91	0.00	0.00	0.00
17,700.00	89.65	179.44	10,449.22	-7,376.31	-107.45	7,374.91	0.00	0.00	0.00
17,800.00	89.65	179.44	10,449.82	-7,476.30	-106.48	7,474.90	0.00	0.00	0.00
17,900.00	89.65	179.44	10,450.43	-7,576.30	-105.51	7,574.90	0.00	0.00	0.00
18,000.00	89.65	179.44	10,451.03	-7,676.29	-104.53	7,674.90	0.00	0.00	0.00
18,100.00	89.65	179.44	10,451.64	-7,776.28	-103.56	7,774.90	0.00	0.00	0.00
18,200.00	89.65	179.44	10,452.24	-7,876.28	-102.59	7,874.90	0.00	0.00	0.00
18,300.00	89.65	179.44	10,452.85	-7,976.27	-101.61	7,974.90	0.00	0.00	0.00
18,325.10	89.65	179.44	10,453.00	-8,001.37	-101.37	8,000.00	0.00	0.00	0.00
T08(Cable2H)@8000VS									
18,354.62	89.06	179.44	10,453.33	-8,030.88	-101.08	8,029.51	2.00	-2.00	-0.01
18,400.00	89.06	179.44	10,454.07	-8,076.26	-100.64	8,074.89	0.00	0.00	0.00
18,500.00	89.06	179.44	10,455.71	-8,176.24	-99.66	8,174.87	0.00	0.00	0.00
18,600.00	89.06	179.44	10,457.34	-8,276.22	-98.68	8,274.86	0.00	0.00	0.00
18,700.00	89.06	179.44	10,458.98	-8,376.20	-97.70	8,374.85	0.00	0.00	0.00
18,800.00	89.06	179.44	10,460.62	-8,476.18	-96.72	8,474.83	0.00	0.00	0.00
18,900.00	89.06	179.44	10,462.25	-8,576.17	-95.74	8,574.82	0.00	0.00	0.00
19,000.00	89.06	179.44	10,463.89	-8,676.15	-94.76	8,674.81	0.00	0.00	0.00

Database:	EDM 5000.14 Single User Db	Local Co-ordinate Reference:	Well Cable 19S35E16 2H
Company:	Catena Resources Operating, LLC	TVD Reference:	3793+25 @ 3818.00usft (KB=25)
Project:	Lea County NM N83-NM-EZ	MD Reference:	3793+25 @ 3818.00usft (KB=25)
Site:	Belcher Cable	North Reference:	Grid
Well:	Cable 19S35E16 2H	Survey Calculation Method:	Minimum Curvature
Wellbore:	2H		
Design:	Plan #2		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
19,100.00	89.06	179.44	10,465.52	-8,776.13	-93.78	8,774.79	0.00	0.00	0.00
19,200.00	89.06	179.44	10,467.16	-8,876.11	-92.80	8,874.78	0.00	0.00	0.00
19,300.00	89.06	179.44	10,468.79	-8,976.09	-91.83	8,974.77	0.00	0.00	0.00
19,325.21	89.06	179.44	10,469.21	-9,001.29	-91.58	8,999.97	0.00	0.00	0.00
T09(Cable2H)@9000VS									
19,400.00	89.06	179.44	10,470.43	-9,076.07	-90.85	9,074.75	0.00	0.00	0.00
19,500.00	89.06	179.44	10,472.06	-9,176.06	-89.87	9,174.74	0.00	0.00	0.00
19,600.00	89.06	179.44	10,473.70	-9,276.04	-88.89	9,274.73	0.00	0.00	0.00
19,700.00	89.06	179.44	10,475.33	-9,376.02	-87.91	9,374.71	0.00	0.00	0.00
19,800.00	89.06	179.44	10,476.97	-9,476.00	-86.93	9,474.70	0.00	0.00	0.00
19,900.00	89.06	179.44	10,478.61	-9,575.98	-85.95	9,574.69	0.00	0.00	0.00
20,000.00	89.06	179.44	10,480.24	-9,675.97	-84.97	9,674.67	0.00	0.00	0.00
20,100.00	89.06	179.44	10,481.88	-9,775.95	-83.99	9,774.66	0.00	0.00	0.00
20,200.00	89.06	179.44	10,483.51	-9,875.93	-83.01	9,874.65	0.00	0.00	0.00
20,300.00	89.06	179.44	10,485.15	-9,975.91	-82.03	9,974.63	0.00	0.00	0.00
20,325.35	89.06	179.44	10,485.56	-10,001.25	-81.79	9,999.98	0.00	0.00	0.00
T10(Cable2H)@10000VS									
20,400.00	89.06	179.44	10,486.78	-10,075.89	-81.06	10,074.62	0.00	0.00	0.00
20,500.00	89.06	179.44	10,488.42	-10,175.87	-80.08	10,174.61	0.00	0.00	0.00
20,596.68	89.06	179.44	10,490.00	-10,272.54	-79.13	10,271.27	0.00	0.00	0.00
TD: 20596.68' MD, 10490.00' TVD - T11(Cable2H)@10275VS - PBHL(Cable2H)									

Design Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
EON(Cable2H)	0.00	0.00	8,700.00	192.00	-124.00	607,774.97	810,422.07	32.667772221	-103.458902516
- plan hits target center									
- Point									
FTP(Cable2H)	0.00	0.00	10,360.00	122.72	-181.25	607,705.69	810,364.82	32.667583100	-103.459090400
- plan misses target center by 186.96usft at 10290.73usft MD (10226.62 TVD, -4.41 N, -149.58 E)									
- Point									
T07(Cable2H)@7000VS	0.00	0.00	10,446.00	-7,001.42	-111.16	600,581.55	810,434.91	32.648001562	-103.459053272
- plan misses target center by 1.00usft at 17325.08usft MD (10447.00 TVD, -7001.42 N, -111.10 E)									
- Point									
T08(Cable2H)@8000VS	0.00	0.00	10,453.00	-8,001.37	-101.37	599,581.60	810,444.70	32.645253077	-103.459048210
- plan hits target center									
- Point									
PBHL(Cable2H)	0.00	0.00	10,490.00	-10,272.54	-79.13	597,310.43	810,466.94	32.639010483	-103.459036694
- plan hits target center									
- Point									

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,946.00	1,946.00	13 3/8"	13-3/8	17-1/2
4,050.00	4,050.00	9 5/8"	9-5/8	12-1/4

Database:	EDM 5000.14 Single User Db	Local Co-ordinate Reference:	Well Cable 19S35E16 2H
Company:	Catena Resources Operating, LLC	TVD Reference:	3793+25 @ 3818.00usft (KB=25)
Project:	Lea County NM N83-NM-EZ	MD Reference:	3793+25 @ 3818.00usft (KB=25)
Site:	Belcher Cable	North Reference:	Grid
Well:	Cable 19S35E16 2H	Survey Calculation Method:	Minimum Curvature
Wellbore:	2H		
Design:	Plan #2		

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,821.00	1,821.00	Rustler			
1,889.00	1,889.00	Salt			
3,197.00	3,197.00	Base of Salt			
3,412.00	3,412.00	Yates			
3,879.00	3,879.00	Seven Rivers			
4,621.32	4,621.00	Queen			
5,218.18	5,217.00	Capitan Reef			
5,991.30	5,989.00	Delaware Cherry Canyon			
7,821.94	7,817.00	Bone Spring Lime			
8,757.07	8,751.00	1st Bone Spring Carbonate			
9,341.07	9,335.00	1st Bone Spring Sand			
9,609.07	9,603.00	2nd Bone Spring Carbonate			
9,740.07	9,734.00	2nd Bone Spring Sand			
10,061.08	10,046.00	2nd Bone Spring 'N' Sand			
10,659.50	10,367.00	2nd Bone Spring Dolomitic			

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
9,799.40	9,793.33	0.00	0.00	KOP: 9799.40' MD, 9793.33' TVD
10,689.47	10,368.80	3.48	-2.25	EOC: 10689.47' MD, 10368.80' TVD
20,596.68	10,490.00	188.52	-121.75	TD: 20596.68' MD, 10490.00' TVD