



COG OPERATING, LLC

Eddy /Lea County, NM (NAD27) NMEZ

Burkett 16 State 12H

#12H - Slot 1520'FNL, 330'FWL Sec16

PP: 990'FNL, 330'FWL Sec16

Lateral

PLANNED BHL:990'FNL, 1330'FEL Sec16

NM OIL CONSERVATION
ARTESIA DISTRICT

JUN 15 2017

RECEIVED



DIRECTIONAL SERVICES, LLC.



Planning Report



Database: VON_EDM
Company: COG OPERATING, LLC
Project: Eddy /Lea County, NM (NAD27) NMEZ
Site: Burkett 16 State 12H
Well: #12H
Wellbore: Lateral
Design: Plan #1

Local Co-ordinate Reference: Well #12H - Slot Burkett12H
TVD Reference: 3767+18 @ 3785.00ft (Planning)
MD Reference: 3767+18 @ 3785.00ft (Planning)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Project	Eddy /Lea County, NM (NAD27) NMEZ		
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		

Site	Burkett 16 State 12H				
Site Position:		Northing:	668,692.40 ft	Latitude:	32° 50' 15.009 N
From:	Map	Easting:	638,719.40 ft	Longitude:	103° 52' 54.108 W
Position Uncertainty:	0.00 ft	Slot Radius:	13.20 in	Grid Convergence:	0.24 °

Well	#12H - Slot Burkett12H					
Well Position	+N/-S	0.00 ft	Northing:	668,692.40 ft	Latitude:	32° 50' 15.009 N
	+E/-W	0.00 ft	Easting:	638,719.40 ft	Longitude:	103° 52' 54.108 W
Position Uncertainty		0.00 ft	Wellhead Elevation:		Ground Level:	3,767.00 ft

Wellbore Lateral

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	06/10/17	7.15	60.57	48.268

Design Plan #1

Audit Notes:

Version:	Phase:	PROTOTYPE	Tie On Depth:	0.00
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Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.00	0.00	0.00	89.74

Plan Sections

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.00	0.00	0.00	0.00	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	
1,715.03	10.73	359.67	1,710.86	66.73	-0.38	1.50	1.50	0.00	359.67	
3,860.01	10.73	359.67	3,818.37	465.91	-2.66	0.00	0.00	0.00	0.00	
4,575.04	0.00	0.00	4,529.23	532.64	-3.04	1.50	-1.50	0.00	180.00	
4,775.04	0.00	0.00	4,729.23	532.64	-3.04	0.00	0.00	0.00	0.00	
5,603.33	91.11	89.74	5,250.00	535.02	527.93	11.00	11.00	10.83	89.74	
8,694.82	91.11	89.74	5,190.00	548.90	3,618.80	0.00	0.00	0.00	0.00	Burkett 16 State 12H



Planning Report

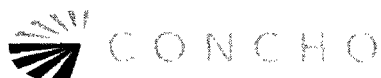


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Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Burkett 16 State 12H SL									
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
370.00	0.00	0.00	370.00	0.00	0.00	0.00	0.00	0.00	0.00
Rustler									
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
580.00	0.00	0.00	580.00	0.00	0.00	0.00	0.00	0.00	0.00
Top of Salt									
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	1.50	359.67	1,099.99	1.31	-0.01	0.00	1.50	1.50	0.00
1,200.00	3.00	359.67	1,199.91	5.23	-0.03	-0.01	1.50	1.50	0.00
1,300.00	4.50	359.67	1,299.69	11.77	-0.07	-0.01	1.50	1.50	0.00
1,400.00	6.00	359.67	1,399.27	20.92	-0.12	-0.02	1.50	1.50	0.00
1,500.00	7.50	359.67	1,498.57	32.68	-0.19	-0.04	1.50	1.50	0.00
1,506.48	7.60	359.67	1,505.00	33.53	-0.19	-0.04	1.50	1.50	0.00
Tansill									
1,600.00	9.00	359.67	1,597.54	47.03	-0.27	-0.06	1.50	1.50	0.00
1,602.50	9.04	359.67	1,600.00	47.42	-0.27	-0.06	1.50	1.50	0.00
Yates									
1,700.00	10.50	359.67	1,696.09	63.96	-0.37	-0.08	1.50	1.50	0.00
1,715.03	10.73	359.67	1,710.86	66.73	-0.38	-0.08	1.50	1.50	0.00
1,800.00	10.73	359.67	1,794.35	82.54	-0.47	-0.10	0.00	0.00	0.00
1,900.00	10.73	359.67	1,892.60	101.15	-0.58	-0.12	0.00	0.00	0.00
1,922.80	10.73	359.67	1,915.00	105.39	-0.60	-0.12	0.00	0.00	0.00
Seven Rivers									
2,000.00	10.73	359.67	1,990.85	119.76	-0.68	-0.14	0.00	0.00	0.00
2,100.00	10.73	359.67	2,089.11	138.37	-0.79	-0.16	0.00	0.00	0.00
2,200.00	10.73	359.67	2,187.36	156.98	-0.90	-0.18	0.00	0.00	0.00
2,300.00	10.73	359.67	2,285.61	175.59	-1.00	-0.21	0.00	0.00	0.00
2,400.00	10.73	359.67	2,383.87	194.20	-1.11	-0.23	0.00	0.00	0.00
2,500.00	10.73	359.67	2,482.12	212.81	-1.22	-0.25	0.00	0.00	0.00
2,548.73	10.73	359.67	2,530.00	221.88	-1.27	-0.26	0.00	0.00	0.00
Queen									
2,600.00	10.73	359.67	2,580.37	231.42	-1.32	-0.27	0.00	0.00	0.00
2,700.00	10.73	359.67	2,678.62	250.03	-1.43	-0.29	0.00	0.00	0.00
2,800.00	10.73	359.67	2,776.88	268.64	-1.54	-0.32	0.00	0.00	0.00
2,900.00	10.73	359.67	2,875.13	287.25	-1.64	-0.34	0.00	0.00	0.00
2,966.02	10.73	359.67	2,940.00	299.54	-1.71	-0.35	0.00	0.00	0.00
Grayburg									
3,000.00	10.73	359.67	2,973.38	305.86	-1.75	-0.36	0.00	0.00	0.00
3,100.00	10.73	359.67	3,071.64	324.47	-1.85	-0.38	0.00	0.00	0.00
3,200.00	10.73	359.67	3,169.89	343.08	-1.96	-0.40	0.00	0.00	0.00
3,281.54	10.73	359.67	3,250.00	358.26	-2.05	-0.42	0.00	0.00	0.00
San Andres									
3,300.00	10.73	359.67	3,268.14	361.69	-2.07	-0.43	0.00	0.00	0.00
3,400.00	10.73	359.67	3,366.40	380.30	-2.17	-0.45	0.00	0.00	0.00



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3,500.00	10.73	359.67	3,464.65	398.91	-2.28	-0.47	0.00	0.00	0.00
3,600.00	10.73	359.67	3,562.90	417.52	-2.39	-0.49	0.00	0.00	0.00
3,700.00	10.73	359.67	3,661.15	436.13	-2.49	-0.51	0.00	0.00	0.00
3,800.00	10.73	359.67	3,759.41	454.74	-2.60	-0.54	0.00	0.00	0.00
3,860.01	10.73	359.67	3,818.37	465.91	-2.66	-0.55	0.00	0.00	0.00
3,900.00	10.13	359.67	3,857.70	473.15	-2.70	-0.56	1.50	-1.50	0.00
4,000.00	8.63	359.67	3,956.36	489.44	-2.80	-0.58	1.50	-1.50	0.00
4,049.15	7.89	359.67	4,005.00	496.50	-2.84	-0.58	1.50	-1.50	0.00
Burkett 16 State 12H Tgt									
4,100.00	7.13	359.67	4,055.41	503.14	-2.88	-0.59	1.50	-1.50	0.00
4,200.00	5.63	359.67	4,154.79	514.24	-2.94	-0.61	1.50	-1.50	0.00
4,300.00	4.13	359.67	4,254.43	522.74	-2.99	-0.62	1.50	-1.50	0.00
4,400.00	2.63	359.67	4,354.25	528.63	-3.02	-0.62	1.50	-1.50	0.00
4,500.00	1.13	359.67	4,454.19	531.90	-3.04	-0.63	1.50	-1.50	0.00
4,575.04	0.00	0.00	4,529.23	532.64	-3.04	-0.63	1.50	-1.50	0.00
4,600.00	0.00	0.00	4,554.19	532.64	-3.04	-0.63	0.00	0.00	0.00
4,700.00	0.00	0.00	4,654.19	532.64	-3.04	-0.63	0.00	0.00	0.00
4,775.04	0.00	0.00	4,729.23	532.64	-3.04	-0.63	0.00	0.00	0.00
4,800.00	2.75	89.74	4,754.18	532.64	-2.45	-0.03	11.00	11.00	0.00
4,800.82	2.84	89.74	4,755.00	532.64	-2.41	0.01	11.00	11.00	0.00
Glorieta									
4,850.00	8.25	89.74	4,803.93	532.66	2.34	4.76	11.00	11.00	0.00
4,900.00	13.75	89.74	4,852.99	532.71	11.87	14.29	11.00	11.00	0.00
4,907.22	14.54	89.74	4,860.00	532.71	13.64	16.06	11.00	11.00	0.00
Paddock									
4,950.00	19.25	89.74	4,900.92	532.77	26.06	28.48	11.00	11.00	0.00
5,000.00	24.75	89.74	4,947.26	532.85	44.78	47.20	11.00	11.00	0.00
5,050.00	30.25	89.74	4,991.60	532.96	67.86	70.28	11.00	11.00	0.00
5,100.00	35.75	89.74	5,033.52	533.08	95.08	97.49	11.00	11.00	0.00
5,150.00	41.25	89.74	5,072.63	533.22	126.19	128.61	11.00	11.00	0.00
5,200.00	46.75	89.74	5,108.59	533.38	160.90	163.32	11.00	11.00	0.00
5,250.00	52.25	89.74	5,141.05	533.55	198.91	201.33	11.00	11.00	0.00
5,300.00	57.75	89.74	5,169.72	533.73	239.85	242.27	11.00	11.00	0.00
5,350.00	63.25	89.74	5,194.34	533.93	283.34	285.76	11.00	11.00	0.00
5,400.00	68.75	89.74	5,214.67	534.13	329.00	331.42	11.00	11.00	0.00
5,450.00	74.25	89.74	5,230.53	534.34	376.40	378.82	11.00	11.00	0.00
5,500.00	79.75	89.74	5,241.78	534.56	425.10	427.52	11.00	11.00	0.00
5,550.00	85.25	89.74	5,248.31	534.78	474.65	477.07	11.00	11.00	0.00
5,603.33	91.11	89.74	5,250.00	535.02	527.93	530.35	11.00	11.00	0.00
5,700.00	91.11	89.74	5,248.13	535.46	624.58	627.00	0.00	0.00	0.00
5,800.00	91.11	89.74	5,246.19	535.91	724.56	726.98	0.00	0.00	0.00
5,900.00	91.11	89.74	5,244.24	536.35	824.54	826.97	0.00	0.00	0.00
6,000.00	91.11	89.74	5,242.30	536.80	924.52	926.95	0.00	0.00	0.00
6,100.00	91.11	89.74	5,240.36	537.25	1,024.50	1,026.93	0.00	0.00	0.00
6,200.00	91.11	89.74	5,238.42	537.70	1,124.48	1,126.91	0.00	0.00	0.00
6,300.00	91.11	89.74	5,236.48	538.15	1,224.46	1,226.89	0.00	0.00	0.00
6,400.00	91.11	89.74	5,234.54	538.60	1,324.44	1,326.87	0.00	0.00	0.00
6,500.00	91.11	89.74	5,232.60	539.05	1,424.42	1,426.85	0.00	0.00	0.00
6,600.00	91.11	89.74	5,230.66	539.50	1,524.40	1,526.83	0.00	0.00	0.00
6,700.00	91.11	89.74	5,228.72	539.95	1,624.38	1,626.81	0.00	0.00	0.00
6,800.00	91.11	89.74	5,226.78	540.39	1,724.36	1,726.80	0.00	0.00	0.00
6,900.00	91.11	89.74	5,224.84	540.84	1,824.34	1,826.78	0.00	0.00	0.00
7,000.00	91.11	89.74	5,222.89	541.29	1,924.32	1,926.76	0.00	0.00	0.00



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Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
7,100.00	91.11	89.74	5,220.95	541.74	2,024.30	2,026.74	0.00	0.00	0.00
7,200.00	91.11	89.74	5,219.01	542.19	2,124.28	2,126.72	0.00	0.00	0.00
7,300.00	91.11	89.74	5,217.07	542.64	2,224.26	2,226.70	0.00	0.00	0.00
7,400.00	91.11	89.74	5,215.13	543.09	2,324.24	2,326.68	0.00	0.00	0.00
7,500.00	91.11	89.74	5,213.19	543.54	2,424.22	2,426.66	0.00	0.00	0.00
7,600.00	91.11	89.74	5,211.25	543.99	2,524.20	2,526.64	0.00	0.00	0.00
7,700.00	91.11	89.74	5,209.31	544.43	2,624.18	2,626.63	0.00	0.00	0.00
7,800.00	91.11	89.74	5,207.37	544.88	2,724.16	2,726.61	0.00	0.00	0.00
7,900.00	91.11	89.74	5,205.43	545.33	2,824.14	2,826.59	0.00	0.00	0.00
8,000.00	91.11	89.74	5,203.49	545.78	2,924.12	2,926.57	0.00	0.00	0.00
8,100.00	91.11	89.74	5,201.54	546.23	3,024.10	3,026.55	0.00	0.00	0.00
8,200.00	91.11	89.74	5,199.60	546.68	3,124.08	3,126.53	0.00	0.00	0.00
8,300.00	91.11	89.74	5,197.66	547.13	3,224.06	3,226.51	0.00	0.00	0.00
8,400.00	91.11	89.74	5,195.72	547.58	3,324.04	3,326.49	0.00	0.00	0.00
8,500.00	91.11	89.74	5,193.78	548.03	3,424.02	3,426.48	0.00	0.00	0.00
8,600.00	91.11	89.74	5,191.84	548.47	3,524.00	3,526.46	0.00	0.00	0.00
8,694.82	91.11	89.74	5,190.00	548.90	3,618.80	3,621.25	0.00	0.00	0.00

Burkett 16 State 12H PBHL

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
Burkett 16 State 12H SL	0.00	0.00	0.00	0.00	0.00	668,692.40	638,719.40	32° 50' 15.009 N	103° 52' 54.108 W
Burkett 16 State 12H Tg	0.00	0.00	4,000.00	532.64	-3.04	669,225.04	638,716.36	32° 50' 20.280 N	103° 52' 54.117 W
Burkett 16 State 12H PB - plan hits target center - Point	0.00	0.00	5,190.00	548.90	3,618.80	669,241.30	642,338.20	32° 50' 20.286 N	103° 52' 11.665 W

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
370.00	370.00	Rustler			
580.00	580.00	Top of Salt			
1,506.48	1,505.00	Tansill			
1,602.50	1,600.00	Yates			
1,922.80	1,915.00	Seven Rivers			
2,548.73	2,530.00	Queen			
2,966.02	2,940.00	Grayburg			
3,281.54	3,250.00	San Andres			
4,800.82	4,755.00	Glorieta			
4,907.22	4,860.00	Paddock			



Planning Report

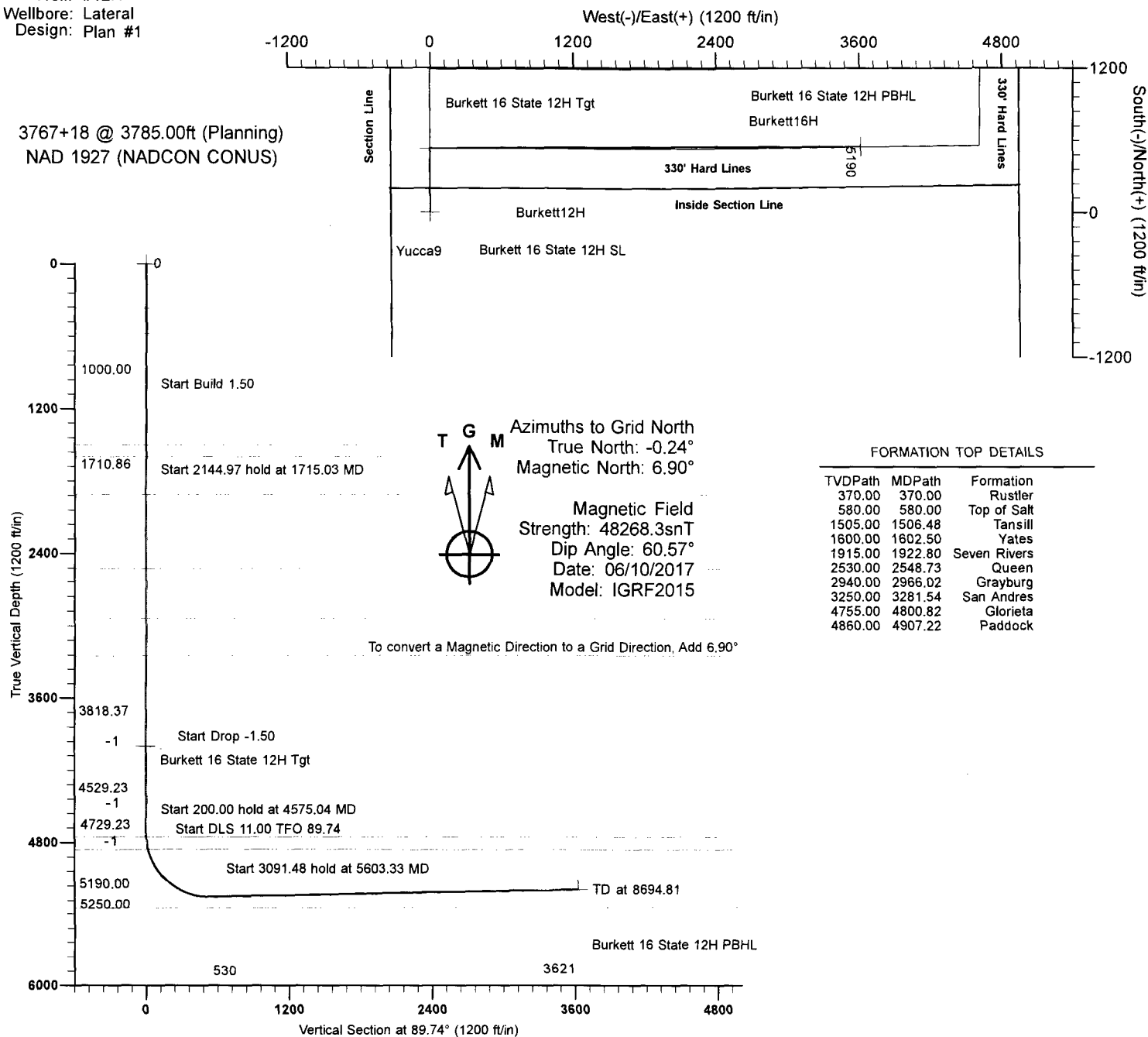


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FORMATION TOP DETAILS

TVDPPath	MDPath	Formation
370.00	370.00	Rustler
580.00	580.00	Top of Salt
1505.00	1506.48	Tansill
1600.00	1602.50	Yates
1915.00	1922.80	Seven Rivers
2530.00	2548.73	Queen
2940.00	2966.02	Grayburg
3250.00	3281.54	San Andres
4755.00	4800.82	Glorieta
4860.00	4907.22	Paddock

TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Shape
Burkett 16 State 12H SL	0.00	0.00	0.00	668692.40	638719.40	Point
Burkett 16 State 12H Tgt	4000.00	532.64	-3.04	669225.04	638716.36	Point
Burkett 16 State 12H PBHL	5190.00	548.90	3618.80	669241.30	642338.20	Point

SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1000.00	0.00	0.00	1000.00	0.00	0.00	0.00	0.00	0.00	
1715.03	10.73	359.67	1710.86	66.73	-0.38	1.50	359.67	-0.08	
3860.01	10.73	359.67	3818.37	465.91	-2.66	0.00	0.00	-0.55	
4575.04	0.00	0.00	4529.23	532.64	-3.04	1.50	180.00	-0.63	
4775.04	0.00	0.00	4729.23	532.64	-3.04	0.00	0.00	-0.63	
5603.33	91.11	89.74	5250.00	535.02	527.93	11.00	89.74	530.35	
8694.81	91.11	89.74	5190.00	548.90	3618.80	0.00	0.00	3621.25	Burkett 16 State 12H PBHL

Plan: Plan #1 (#12H/Lateral)
 Created By: Mekka Williams
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 23:48, June 11 2017

VON DIRECTIONAL
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