

OXY

PRD NM DIRECTIONAL PLANS (NAD 1983)

Mesa Verde 18-7 Fed Com

Mesa Verde 18-7 Fed Com 4H

WB00

Plan: Permitting Plan

Standard Planning Report

14 November, 2016

HOBBS OCD

NOV 06 2017

RECEIVED

Oxy Planning Report

Database:	HOPSP	Local Co-ordinate Reference:	Well Mesa Verde 18-7 Fed Com 4H
Company:	OXY	TVD Reference:	WELL @ 3598 00ft (Original Well Elev)
Project:	PRD NM DIRECTIONAL PLANS (NAD 1983)	MD Reference:	WELL @ 3598 00ft (Original Well Elev)
Site:	Mesa Verde 18-7 Fed Com	North Reference:	Grid
Well:	Mesa Verde 18-7 Fed Com 4H	Survey Calculation Method:	Minimum Curvature
Wellbore:	WB00		
Design:	Permitting Plan		

Project:	PRD NM DIRECTIONAL PLANS (NAD 1983)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		Using geodetic scale factor

Site:	Mesa Verde 18-7 Fed Com		
Site Position:	Northings:	441,014.48 usft	Latitude: 32° 12' 39.283315 N
From: Map	Easting:	732,669.96 usft	Longitude: 103° 42' 52.894713 W
Position Uncertainty:	0.00 ft	Slot Radius: 13 200 in	Grid Convergence: 0.33°

Well:	Mesa Verde 18-7 Fed Com 4H		
Well Position	+N-S	0.00 ft	Northings: 441,014.48 usft
	+E-W	0.00 ft	Easting: 732,669.96 usft
Position Uncertainty	0.00 ft	Wellhead Elevation: 3,571.50 ft	Ground Level: 3,571.50 ft

Wellbore:	WB00		
Magnetics	Model Name	Sample Date	Declination
	HDGM	11/9/2016	6.92
			Dip Angle
			60.00
			Field Strength
			48,195

Design:	Permitting Plan		
Audit Notes:			
Version:	Phase:	PROTOTYPE	Tie On Depth: 0.00
Vertical Section:	Depth From (TVD)	+N-S	+E-W
	(ft)	(ft)	(ft)
	0.00	0.00	0.00
			Direction
			(°)
			4.55

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	
5.507.00	0.00	0.01	5.507.00	0.00	0.00	0.00	0.00	0.00	0.01	
6.006.85	10.00	109.05	6.004.32	-14.20	41.11	2.00	2.00	0.00	109.05	
9.454.60	10.00	109.05	9.399.73	-209.58	606.84	0.00	0.00	0.00	0.00	
9.954.45	0.00	359.60	9.897.04	-223.78	647.95	2.00	-2.00	0.00	180.00	MV18-7_4H_KOP
10.854.45	90.00	359.60	10.470.00	349.16	643.92	10.00	10.00	0.00	-0.40	
17.968.62	90.00	359.60	10.470.00	7,463.15	593.83	0.00	0.00	0.00	0.00	MV18-7_4H_BHL

Oxy Planning Report

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Company:	OPY	TVD Reference:	WELL @ 3598 00ft (Original Well Elev)
Project:	PRD NM DIRECTIONAL PLANS (NAD 1983)	MD Reference:	WELL @ 3598 00ft (Original Well Elev)
Site:	Mesa Verde 18-7 Fed Com	North Reference:	Grid
Well:	Mesa Verde 18-7 Fed Com 4H	Survey Calculation Method:	Minimum Curvature
Wellbore:	WB00		
Design:	Permitting Plan		

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
920.00	0.00	0.00	920.00	0.00	0.00	0.00	0.00	0.00	0.00
Rustler									
1,030.00	0.00	0.00	1,030.00	0.00	0.00	0.00	0.00	0.00	0.00
Salado									
3,310.00	0.00	0.00	3,310.00	0.00	0.00	0.00	0.00	0.00	0.00
Castilla									
4,632.00	0.00	0.00	4,632.00	0.00	0.00	0.00	0.00	0.00	0.00
Delaware									
4,647.00	0.00	0.00	4,647.00	0.00	0.00	0.00	0.00	0.00	0.00
Bell Canyon									
5,507.00	0.00	0.00	5,507.00	0.00	0.00	0.00	0.00	0.00	0.00
Step out DLS 2.00									
5,554.00	0.94	109.05	5,554.00	-0.13	0.36	-0.10	2.00	2.00	0.00
Charry Canyon									
5,600.00	1.86	109.05	5,599.99	-0.49	1.43	-0.38	2.00	2.00	0.00
5,700.00	3.66	109.05	5,699.85	-2.12	6.14	-1.63	2.00	2.00	0.00
5,800.00	5.86	109.05	5,799.49	-4.89	14.15	-3.75	2.00	2.00	0.00
5,900.00	7.86	109.05	5,898.77	-8.79	25.44	-6.74	2.00	2.00	0.00
6,000.00	9.86	109.05	5,997.57	-13.81	40.00	-10.60	2.00	2.00	0.00
6,006.85	10.00	109.05	6,004.32	-14.20	41.11	-10.89	2.00	2.00	0.00
Hold 10° Inclination									
6,100.00	10.00	109.05	6,096.05	-19.48	56.40	-14.94	0.00	0.00	0.00
6,200.00	10.00	109.05	6,194.54	-25.15	72.81	-19.29	0.00	0.00	0.00
6,300.00	10.00	109.05	6,293.02	-30.81	89.22	-23.64	0.00	0.00	0.00
6,400.00	10.00	109.05	6,391.50	-36.48	105.62	-27.99	0.00	0.00	0.00
6,500.00	10.00	109.05	6,489.98	-42.15	122.03	-32.33	0.00	0.00	0.00
6,600.00	10.00	109.05	6,588.46	-47.81	138.44	-36.68	0.00	0.00	0.00
6,700.00	10.00	109.05	6,686.94	-53.48	154.85	-41.03	0.00	0.00	0.00
6,800.00	10.00	109.05	6,785.43	-59.15	171.26	-45.38	0.00	0.00	0.00
6,842.22	10.00	109.05	6,827.00	-61.54	178.18	-47.21	0.00	0.00	0.00
Brushy Canyon									
6,900.00	10.00	109.05	6,883.91	-64.81	187.67	-49.72	0.00	0.00	0.00
7,000.00	10.00	109.05	6,982.39	-70.48	204.08	-54.07	0.00	0.00	0.00
7,100.00	10.00	109.05	7,080.87	-76.15	220.48	-58.42	0.00	0.00	0.00
7,200.00	10.00	109.05	7,179.35	-81.81	236.89	-62.77	0.00	0.00	0.00
7,300.00	10.00	109.05	7,277.83	-87.48	253.30	-67.11	0.00	0.00	0.00
7,400.00	10.00	109.05	7,376.32	-93.15	269.71	-71.46	0.00	0.00	0.00
7,500.00	10.00	109.05	7,474.80	-98.82	286.12	-75.81	0.00	0.00	0.00
7,600.00	10.00	109.05	7,573.28	-104.48	302.53	-80.16	0.00	0.00	0.00
7,700.00	10.00	109.05	7,671.76	-110.15	318.93	-84.51	0.00	0.00	0.00
7,800.00	10.00	109.05	7,770.24	-115.82	335.34	-88.85	0.00	0.00	0.00
7,900.00	10.00	109.05	7,868.72	-121.48	351.75	-93.20	0.00	0.00	0.00
8,000.00	10.00	109.05	7,967.21	-127.15	368.16	-97.55	0.00	0.00	0.00
8,100.00	10.00	109.05	8,065.69	-132.82	384.57	-101.90	0.00	0.00	0.00
8,200.00	10.00	109.05	8,164.17	-138.48	400.98	-106.24	0.00	0.00	0.00
8,300.00	10.00	109.05	8,262.65	-144.15	417.39	-110.59	0.00	0.00	0.00
8,400.00	10.00	109.05	8,361.13	-149.82	433.79	-114.94	0.00	0.00	0.00
8,500.00	10.00	109.05	8,459.61	-155.49	450.20	-119.29	0.00	0.00	0.00
8,517.65	10.00	109.05	8,477.00	-156.49	453.10	-120.05	0.00	0.00	0.00
Bone Spring									
8,600.00	10.00	109.05	8,558.10	-161.15	466.61	-123.63	0.00	0.00	0.00
8,700.00	10.00	109.05	8,656.58	-166.82	483.02	-127.98	0.00	0.00	0.00

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Project:	PRD NM DIRECTIONAL PLANS (NAD 1983)	MD Reference:	WELL @ 3598 00ft (Original Well Elev)
Site:	Mesa Verde 18-7 Fed Com	North Reference:	Grid
Well:	Mesa Verde 18-7 Fed Com 4H	Survey Calculation Method:	Minimum Curvature
Wellbore:	WB00		
Design:	Permitting Plan		

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)
8,800.00	10.00	109.05	8,755.06	-172.49	499.43	-132.33	0.00	0.00	0.00
8,900.00	10.00	109.05	8,853.54	-178.15	515.84	-136.68	0.00	0.00	0.00
9,000.00	10.00	109.05	8,952.02	-183.82	532.25	-141.02	0.00	0.00	0.00
9,100.00	10.00	109.05	9,050.50	-189.49	548.65	-145.37	0.00	0.00	0.00
9,200.00	10.00	109.05	9,148.99	-195.15	565.06	-149.72	0.00	0.00	0.00
9,300.00	10.00	109.05	9,247.47	-200.82	581.47	-154.07	0.00	0.00	0.00
9,400.00	10.00	109.05	9,345.95	-206.49	597.88	-158.41	0.00	0.00	0.00
9,454.60	10.00	109.05	9,399.73	-209.58	606.84	-160.79	0.00	0.00	0.00
Drop back to vertical DLS 2.00									
9,500.00	9.09	109.05	9,444.49	-212.04	613.95	-162.67	2.00	-2.00	0.00
9,600.00	7.09	109.05	9,543.49	-216.63	627.25	-166.20	2.00	-2.00	0.00
9,700.00	5.09	109.05	9,642.92	-220.09	637.28	-168.85	2.00	-2.00	0.00
9,800.00	3.09	109.05	9,742.66	-222.42	644.02	-170.64	2.00	-2.00	0.00
9,900.00	1.09	109.05	9,842.59	-223.61	647.46	-171.55	2.00	-2.00	0.00
9,954.45	0.00	0.00	9,897.04	-223.78	647.95	-171.68	2.00	-2.00	-200.27
Build curve 10°/100' - MV18-7_4H_KOP									
10,000.00	4.55	359.60	9,942.54	-221.97	647.94	-169.88	10.00	10.00	-0.89
10,100.00	14.55	359.60	10,041.03	-205.39	647.82	-153.36	10.00	10.00	0.00
10,200.00	24.55	359.60	10,135.14	-171.97	647.59	-120.06	10.00	10.00	0.00
10,300.00	34.55	359.60	10,222.02	-122.70	647.24	-70.98	10.00	10.00	0.00
10,400.00	44.55	359.60	10,299.02	-59.11	646.79	-7.62	10.00	10.00	0.00
10,500.00	54.55	359.60	10,363.81	16.90	646.26	68.10	10.00	10.00	0.00
10,600.00	64.55	359.60	10,414.42	103.00	645.65	153.89	10.00	10.00	0.00
10,700.00	74.55	359.60	10,449.31	195.58	644.99	247.12	10.00	10.00	0.00
10,800.00	84.55	359.60	10,467.41	294.79	644.30	344.97	10.00	10.00	0.00
10,854.45	90.00	359.60	10,470.00	349.16	643.92	399.14	10.00	10.00	0.00
Landing Point									
10,900.00	90.00	359.60	10,470.00	394.71	643.60	444.51	0.00	0.00	0.00
11,000.00	90.00	359.60	10,470.00	494.71	642.89	544.14	0.00	0.00	0.00
11,100.00	90.00	359.60	10,470.00	594.70	642.19	643.77	0.00	0.00	0.00
11,200.00	90.00	359.60	10,470.00	694.70	641.49	743.39	0.00	0.00	0.00
11,300.00	90.00	359.60	10,470.00	794.70	640.78	843.02	0.00	0.00	0.00
11,400.00	90.00	359.60	10,470.00	894.70	640.08	942.65	0.00	0.00	0.00
11,500.00	90.00	359.60	10,470.00	994.69	639.37	1,042.27	0.00	0.00	0.00
11,600.00	90.00	359.60	10,470.00	1,094.69	638.67	1,141.90	0.00	0.00	0.00
11,700.00	90.00	359.60	10,470.00	1,194.69	637.97	1,241.53	0.00	0.00	0.00
11,800.00	90.00	359.60	10,470.00	1,294.69	637.26	1,341.15	0.00	0.00	0.00
11,900.00	90.00	359.60	10,470.00	1,394.68	636.56	1,440.78	0.00	0.00	0.00
12,000.00	90.00	359.60	10,470.00	1,494.68	635.85	1,540.41	0.00	0.00	0.00
12,100.00	90.00	359.60	10,470.00	1,594.68	635.15	1,640.03	0.00	0.00	0.00
12,200.00	90.00	359.60	10,470.00	1,694.68	634.45	1,739.66	0.00	0.00	0.00
12,300.00	90.00	359.60	10,470.00	1,794.67	633.74	1,839.29	0.00	0.00	0.00
12,400.00	90.00	359.60	10,470.00	1,894.67	633.04	1,938.91	0.00	0.00	0.00
12,500.00	90.00	359.60	10,470.00	1,994.67	632.33	2,038.54	0.00	0.00	0.00
12,600.00	90.00	359.60	10,470.00	2,094.67	631.63	2,138.17	0.00	0.00	0.00
12,700.00	90.00	359.60	10,470.00	2,194.66	630.93	2,237.79	0.00	0.00	0.00
12,800.00	90.00	359.60	10,470.00	2,294.66	630.22	2,337.42	0.00	0.00	0.00
12,900.00	90.00	359.60	10,470.00	2,394.66	629.52	2,437.05	0.00	0.00	0.00
13,000.00	90.00	359.60	10,470.00	2,494.66	628.81	2,536.67	0.00	0.00	0.00
13,100.00	90.00	359.60	10,470.00	2,594.65	628.11	2,636.30	0.00	0.00	0.00
13,200.00	90.00	359.60	10,470.00	2,694.65	627.40	2,735.93	0.00	0.00	0.00
13,300.00	90.00	359.60	10,470.00	2,794.65	626.70	2,835.55	0.00	0.00	0.00
13,400.00	90.00	359.60	10,470.00	2,894.65	626.00	2,935.18	0.00	0.00	0.00

Oxy Planning Report

Database: HOPSPP
Company: OXY
Project: PRD NM DIRECTIONAL PLANS (NAD 1983)
Site: Mesa Verde 18-7 Fed Com
Well: Mesa Verde 18-7 Fed Com 4H
Wellbore: WB00
Design: Permitting Plan

Local Co-ordinate Reference: Well Mesa Verde 18-7 Fed Com 4H
TVD Reference: WELL @ 3598.00ft (Original Well Elev)
MD Reference: WELL @ 3598.00ft (Original Well Elev)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

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)
13,500.00	90.00	359.60	10,470.00	2,994.64	625.29	3,034.81	0.00	0.00	0.00
13,600.00	90.00	359.60	10,470.00	3,094.64	624.59	3,134.43	0.00	0.00	0.00
13,700.00	90.00	359.60	10,470.00	3,194.64	623.89	3,234.06	0.00	0.00	0.00
13,800.00	90.00	359.60	10,470.00	3,294.64	623.18	3,333.69	0.00	0.00	0.00
13,900.00	90.00	359.60	10,470.00	3,394.63	622.48	3,433.31	0.00	0.00	0.00
14,000.00	90.00	359.60	10,470.00	3,494.63	621.77	3,532.94	0.00	0.00	0.00
14,100.00	90.00	359.60	10,470.00	3,594.63	621.07	3,632.57	0.00	0.00	0.00
14,200.00	90.00	359.60	10,470.00	3,694.63	620.36	3,732.19	0.00	0.00	0.00
14,300.00	90.00	359.60	10,470.00	3,794.62	619.66	3,831.82	0.00	0.00	0.00
14,400.00	90.00	359.60	10,470.00	3,894.62	618.96	3,931.45	0.00	0.00	0.00
14,500.00	90.00	359.60	10,470.00	3,994.62	618.25	4,031.07	0.00	0.00	0.00
14,600.00	90.00	359.60	10,470.00	4,094.62	617.55	4,130.70	0.00	0.00	0.00
14,700.00	90.00	359.60	10,470.00	4,194.62	616.84	4,230.33	0.00	0.00	0.00
14,800.00	90.00	359.60	10,470.00	4,294.61	616.14	4,329.95	0.00	0.00	0.00
14,900.00	90.00	359.60	10,470.00	4,394.61	615.44	4,429.58	0.00	0.00	0.00
15,000.00	90.00	359.60	10,470.00	4,494.61	614.73	4,529.21	0.00	0.00	0.00
15,100.00	90.00	359.60	10,470.00	4,594.61	614.03	4,628.83	0.00	0.00	0.00
15,200.00	90.00	359.60	10,470.00	4,694.60	613.32	4,728.46	0.00	0.00	0.00
15,300.00	90.00	359.60	10,470.00	4,794.60	612.62	4,828.09	0.00	0.00	0.00
15,400.00	90.00	359.60	10,470.00	4,894.60	611.92	4,927.71	0.00	0.00	0.00
15,500.00	90.00	359.60	10,470.00	4,994.60	611.21	5,027.34	0.00	0.00	0.00
15,600.00	90.00	359.60	10,470.00	5,094.59	610.51	5,126.97	0.00	0.00	0.00
15,700.00	90.00	359.60	10,470.00	5,194.59	609.80	5,226.59	0.00	0.00	0.00
15,800.00	90.00	359.60	10,470.00	5,294.59	609.10	5,326.22	0.00	0.00	0.00
15,900.00	90.00	359.60	10,470.00	5,394.59	608.39	5,425.85	0.00	0.00	0.00
16,000.00	90.00	359.60	10,470.00	5,494.58	607.69	5,525.47	0.00	0.00	0.00
16,100.00	90.00	359.60	10,470.00	5,594.58	606.99	5,625.10	0.00	0.00	0.00
16,200.00	90.00	359.60	10,470.00	5,694.58	606.28	5,724.73	0.00	0.00	0.00
16,300.00	90.00	359.60	10,470.00	5,794.58	605.58	5,824.35	0.00	0.00	0.00
16,400.00	90.00	359.60	10,470.00	5,894.57	604.87	5,923.98	0.00	0.00	0.00
16,500.00	90.00	359.60	10,470.00	5,994.57	604.17	6,023.61	0.00	0.00	0.00
16,600.00	90.00	359.60	10,470.00	6,094.57	603.47	6,123.23	0.00	0.00	0.00
16,700.00	90.00	359.60	10,470.00	6,194.57	602.76	6,222.86	0.00	0.00	0.00
16,800.00	90.00	359.60	10,470.00	6,294.56	602.06	6,322.49	0.00	0.00	0.00
16,900.00	90.00	359.60	10,470.00	6,394.56	601.35	6,422.11	0.00	0.00	0.00
17,000.00	90.00	359.60	10,470.00	6,494.56	600.65	6,521.74	0.00	0.00	0.00
17,100.00	90.00	359.60	10,470.00	6,594.55	599.95	6,621.37	0.00	0.00	0.00
17,200.00	90.00	359.60	10,470.00	6,694.55	599.24	6,720.99	0.00	0.00	0.00
17,300.00	90.00	359.60	10,470.00	6,794.55	598.54	6,820.62	0.00	0.00	0.00
17,400.00	90.00	359.60	10,470.00	6,894.55	597.83	6,920.24	0.00	0.00	0.00
17,500.00	90.00	359.60	10,470.00	6,994.55	597.13	7,019.87	0.00	0.00	0.00
17,600.00	90.00	359.60	10,470.00	7,094.54	596.43	7,119.50	0.00	0.00	0.00
17,700.00	90.00	359.60	10,470.00	7,194.54	595.72	7,219.12	0.00	0.00	0.00
17,800.00	90.00	359.60	10,470.00	7,294.54	595.02	7,318.75	0.00	0.00	0.00
17,900.00	90.00	359.60	10,470.00	7,394.54	594.31	7,418.38	0.00	0.00	0.00
17,968.62	90.00	359.60	10,470.00	7,463.15	593.83	7,486.74	0.00	0.00	0.00

TD at 17968.62 - MV18-7_4H_BHL

Oxy Planning Report

Database:	HOPSP	Local Co-ordinate Reference:	Well Mesa Verde 18-7 Fed Com 4H
Company:	OXY	TVD Reference:	WELL @ 3598.00ft (Original Well Elev)
Project:	PRD NM DIRECTIONAL PLANS (NAD 1983)	MD Reference:	WELL @ 3598.00ft (Original Well Elev)
Site:	Mesa Verde 18-7 Fed Com	North Reference:	Grid
Well:	Mesa Verde 18-7 Fed Com 4H	Survey Calculation Method:	Minimum Curvature
Wellbore:	WB00		
Design:	Permitting Plan		

Design Targets									
Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(ft)	(ft)	(ft)	(usft)	(usft)		
- Shape									
MV18-7_4H_KOP	0.00	0.00	9,897.04	-223.78	647.95	440,790.71	733,317.88	32° 12' 37.032034 N	103° 42' 45.368360
- plan hits target center									
- Point									
MV18-7_4H_BHL	0.00	0.01	10,470.00	7,463.15	593.83	446,477.25	733,263.76	32° 13' 53.097187 N	103° 42' 45.481493
- plan hits target center									
- Point									

Formations				
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip Direction (°)
5,507.00	5,507.00			
6,006.85	6,004.32			
9,454.60	9,399.73			
9,954.45	9,897.04			
10,854.45	10,470.00			
17,968.62	10,470.00			

Plan Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
5,507.00	5,507.00	0.00	0.00	Step out DLS 2.00
6,006.85	6,004.32	-14.20	41.11	Hold 10° inclination
9,454.60	9,399.73	-209.58	606.84	Drop back to vertical DLS 2.00
9,954.45	9,897.04	-223.78	647.95	Build curve 10°/100'
10,854.45	10,470.00	349.16	643.92	Landing Point
17,968.62	10,470.00	7,463.15	593.83	TD at 17968.62