



Occidental Petroleum

Weld County, CO (UTM-NAD83)

4N-68W-11 (S&B 5-11HZ Pad)

Bake 11-16HZ

OH

Design: OH

Standard Survey Report

06 July, 2021





Total Directional Services

Survey Report



Company:	Occidental Petroleum	Local Co-ordinate Reference:	Well Bake 11-16HZ
Project:	Weld County, CO (UTM-NAD83)	TVD Reference:	4993' GE + 20' KB @ 5013.00usft
Site:	4N-68W-11 (S&B 5-11HZ Pad)	MD Reference:	4993' GE + 20' KB @ 5013.00usft
Well:	Bake 11-16HZ	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.15 Single User Db

Project	Weld County, CO (UTM-NAD83)		
Map System:	Universal Transverse Mercator (US Survey Feet)	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Zone 13N (108 W to 102 W)		

Site	4N-68W-11 (S&B 5-11HZ Pad)				
Site Position:		Northing:	14,647,020.58 usft	Latitude:	40.330320
From:	Lat/Long	Easting:	1,646,741.13 usft	Longitude:	-104.977307
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.01 °

Well	Bake 11-16HZ					
Well Position	+N/-S	0.00 usft	Northing:	14,646,860.72 usft	Latitude:	40.329881
	+E/-W	0.00 usft	Easting:	1,646,755.39 usft	Longitude:	-104.977256
Position Uncertainty		3.28 usft	Wellhead Elevation:	usft	Ground Level:	4,993.00 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2020	3/8/2021	7.98	66.58	51,922.32978260

Design	OH				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00	89.58	

Survey Program	Date	7/6/2021			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
96.00	1,847.00	Survey #1 - Surface MWD+IFR (OH)	APC_ISCWSA REV 2 MWD+	Fixed:v2:crustal field declination	
1,912.00	17,838.00	Survey #2 - MWD+IFR+MS (OH)	APC_ISCWSA REV 2 MWD+	Fixed:v2:Rockies, crustal dec + 3-axis correction	
17,894.00	17,894.00	Survey #3 - Proj to TD (OH)	APC_BLIND	OWSG BLIND	

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
SHL: 2054' FNL, 702' FWL Sec 11 T4N R68W - SHL (Bake 11-16HZ) - Bake 11-16HZ - Hardline Box									
96.00	0.38	237.21	96.00	-0.17	-0.27	-0.27	0.40	0.40	0.00
180.00	0.40	215.95	180.00	-0.56	-0.67	-0.68	0.17	0.02	-25.31
264.00	1.40	234.00	263.99	-1.40	-1.68	-1.69	1.22	1.19	21.49
354.00	1.63	225.34	353.95	-2.95	-3.48	-3.50	0.36	0.26	-9.62
443.00	2.95	234.21	442.88	-5.18	-6.23	-6.27	1.53	1.48	9.97
533.00	3.23	233.34	532.75	-8.04	-10.15	-10.21	0.32	0.31	-0.97
623.00	4.28	236.01	622.56	-11.44	-14.97	-15.05	1.18	1.17	2.97



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Well:	Bake 11-16HZ	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.15 Single User Db

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)
713.00	5.97	230.79	712.19	-16.27	-21.38	-21.50	1.95	1.88	-5.80
803.00	9.47	226.59	801.37	-24.32	-30.39	-30.56	3.94	3.89	-4.67
893.00	10.05	224.88	890.06	-34.97	-41.30	-41.56	0.72	0.64	-1.90
983.00	10.52	226.50	978.62	-46.19	-52.81	-53.14	0.61	0.52	1.80
1,073.00	10.88	223.46	1,067.05	-58.02	-64.61	-65.03	0.74	0.40	-3.38
1,163.00	13.31	225.69	1,155.05	-71.42	-77.87	-78.39	2.75	2.70	2.48
1,253.00	15.48	225.61	1,242.22	-87.06	-93.86	-94.50	2.41	2.41	-0.09
1,343.00	15.93	224.61	1,328.86	-104.25	-111.12	-111.88	0.58	0.50	-1.11
1,432.00	17.39	226.01	1,414.12	-122.19	-129.27	-130.16	1.70	1.64	1.57
1,522.00	16.50	226.37	1,500.21	-140.35	-148.20	-149.22	1.00	-0.99	0.40
1,612.00	21.00	222.79	1,585.42	-161.01	-168.41	-169.59	5.16	5.00	-3.98
1,702.00	22.32	222.79	1,669.06	-185.39	-190.98	-192.33	1.47	1.47	0.00
1,792.00	22.91	224.29	1,752.14	-210.47	-214.82	-216.36	0.92	0.66	1.67
1,847.00	23.20	226.13	1,802.75	-225.64	-230.11	-231.75	1.41	0.53	3.35
1,912.00	21.38	224.87	1,862.88	-242.91	-247.69	-249.47	2.90	-2.81	-1.93
Surface TD: 2297' FNL, 453' FWL (40.329213, -104.978148) - Surface TD: 1912.00' MD 2297' FNL, 453' FWL									
1,924.00	21.04	224.62	1,874.08	-245.99	-250.75	-252.55	2.90	-2.80	-2.12
2,016.00	22.44	224.35	1,959.53	-270.31	-274.63	-276.60	1.53	1.52	-0.29
2,110.00	22.56	226.79	2,046.38	-295.48	-300.31	-302.47	1.00	0.13	2.60
2,204.00	26.51	227.41	2,131.87	-322.04	-328.91	-331.26	4.21	4.20	0.66
2,297.00	29.30	225.92	2,214.05	-351.92	-360.54	-363.11	3.09	3.00	-1.60
2,390.00	29.34	224.71	2,295.14	-383.94	-392.92	-395.72	0.64	0.04	-1.30
2,482.00	29.35	223.95	2,375.33	-416.19	-424.43	-427.47	0.40	0.01	-0.83
2,576.00	28.62	222.87	2,457.56	-449.28	-455.73	-459.01	0.96	-0.78	-1.15
2,670.00	26.02	221.64	2,541.07	-481.19	-484.75	-488.27	2.83	-2.77	-1.31
2,763.00	26.77	226.80	2,624.38	-510.78	-513.58	-517.31	2.59	0.81	5.55
2,856.00	27.17	229.30	2,707.27	-538.96	-544.94	-548.88	1.29	0.43	2.69
2,948.00	25.73	232.44	2,789.64	-564.84	-576.70	-580.83	2.18	-1.57	3.41
3,042.00	26.14	232.78	2,874.18	-589.80	-609.37	-613.67	0.46	0.44	0.36
3,134.00	27.34	230.82	2,956.34	-615.41	-641.88	-646.38	1.62	1.30	-2.13
3,227.00	26.14	233.03	3,039.39	-641.22	-674.81	-679.49	1.68	-1.29	2.38
3,320.00	25.87	234.82	3,122.98	-665.23	-707.76	-712.62	0.89	-0.29	1.92
3,414.00	26.81	228.25	3,207.24	-691.17	-740.34	-745.39	3.26	1.00	-6.99
3,507.00	28.00	234.02	3,289.81	-717.97	-773.66	-778.91	3.13	1.28	6.20
3,600.00	28.25	231.01	3,371.84	-744.64	-808.44	-813.87	1.55	0.27	-3.24
3,693.00	30.63	231.78	3,452.82	-773.15	-844.16	-849.81	2.59	2.56	0.83
3,785.00	30.09	231.46	3,532.21	-802.02	-880.62	-886.47	0.61	-0.59	-0.35
3,878.00	29.53	229.03	3,612.90	-831.57	-916.16	-922.23	1.43	-0.60	-2.61
3,971.00	28.78	227.53	3,694.12	-861.72	-949.98	-956.27	1.13	-0.81	-1.61
4,065.00	26.11	226.33	3,777.53	-891.28	-981.64	-988.14	2.90	-2.84	-1.28
4,158.00	23.42	231.47	3,861.98	-916.94	-1,010.90	-1,017.60	3.70	-2.89	5.53
4,250.00	23.20	231.68	3,946.47	-939.56	-1,039.43	-1,046.28	0.26	-0.24	0.23
4,342.00	21.62	236.20	4,031.53	-960.23	-1,067.73	-1,074.74	2.54	-1.72	4.91



Total Directional Services

Survey Report



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Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.15 Single User Db

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)
4,437.00	21.85	233.26	4,119.78	-980.54	-1,096.44	-1,103.60	1.17	0.24	-3.09
4,530.00	22.37	234.06	4,205.94	-1,001.28	-1,124.64	-1,131.95	0.65	0.56	0.86
4,622.00	18.59	233.15	4,292.11	-1,020.36	-1,150.56	-1,158.01	4.12	-4.11	-0.99
4,718.00	19.27	232.61	4,382.92	-1,039.15	-1,175.39	-1,182.97	0.73	0.71	-0.56
4,810.00	19.50	231.47	4,469.70	-1,057.94	-1,199.46	-1,207.18	0.48	0.25	-1.24
4,902.00	17.86	229.98	4,556.85	-1,076.58	-1,222.28	-1,230.14	1.86	-1.78	-1.62
4,926.78	17.23	229.56	4,580.48	-1,081.40	-1,227.98	-1,235.88	2.61	-2.56	-1.69
Enter Land Box - Enter Land Box: 4926.78' MD & 4580.48' TVD									
5,020.00	14.85	227.67	4,670.07	-1,098.40	-1,247.32	-1,255.34	2.61	-2.55	-2.03
5,113.00	11.82	224.89	4,760.55	-1,113.18	-1,262.86	-1,270.98	3.33	-3.26	-2.99
5,206.00	11.29	229.62	4,851.67	-1,125.82	-1,276.52	-1,284.73	1.17	-0.57	5.09
5,298.00	9.46	227.76	4,942.16	-1,136.74	-1,288.97	-1,297.27	2.02	-1.99	-2.02
5,391.00	8.61	239.16	5,034.01	-1,145.45	-1,300.61	-1,308.97	2.13	-0.91	12.26
5,484.00	7.17	236.06	5,126.13	-1,152.26	-1,311.40	-1,319.81	1.61	-1.55	-3.33
5,578.00	5.68	250.54	5,219.54	-1,157.08	-1,320.66	-1,329.10	2.33	-1.59	15.40
5,672.00	4.07	263.85	5,313.20	-1,158.99	-1,328.36	-1,336.82	2.08	-1.71	14.16
5,764.00	1.38	283.69	5,405.09	-1,159.08	-1,332.68	-1,341.14	3.06	-2.92	21.57
5,858.00	1.34	265.31	5,499.06	-1,158.90	-1,334.88	-1,343.34	0.46	-0.04	-19.55
5,950.00	1.18	245.68	5,591.04	-1,159.38	-1,336.81	-1,345.28	0.50	-0.17	-21.34
6,043.00	1.24	237.42	5,684.02	-1,160.31	-1,338.53	-1,347.00	0.20	0.06	-8.88
6,135.00	1.48	245.05	5,776.00	-1,161.35	-1,340.45	-1,348.93	0.33	0.26	8.29
6,228.00	1.26	241.15	5,868.97	-1,162.35	-1,342.44	-1,350.92	0.26	-0.24	-4.19
6,321.00	1.09	331.55	5,961.96	-1,162.07	-1,343.75	-1,352.23	1.80	-0.18	97.20
6,414.00	0.92	310.86	6,054.94	-1,160.80	-1,344.74	-1,353.21	0.43	-0.18	-22.25
6,508.00	1.12	312.54	6,148.93	-1,159.69	-1,345.99	-1,354.45	0.22	0.21	1.79
6,600.00	0.95	317.71	6,240.91	-1,158.51	-1,347.16	-1,355.62	0.21	-0.18	5.62
6,694.00	1.14	330.81	6,334.90	-1,157.12	-1,348.14	-1,356.59	0.32	0.20	13.94
6,717.00	2.04	63.57	6,357.89	-1,156.74	-1,347.89	-1,356.33	10.36	3.90	403.29
KOP - Curve KOP (Bake 11-16HZ)									
6,786.00	8.99	85.94	6,426.53	-1,155.81	-1,341.40	-1,349.84	10.36	10.08	32.43
6,878.00	13.14	82.44	6,516.80	-1,153.92	-1,323.86	-1,332.28	4.57	4.51	-3.80
6,971.00	21.32	89.41	6,605.56	-1,152.36	-1,296.42	-1,304.84	9.06	8.80	7.49
7,064.00	27.44	91.46	6,690.23	-1,152.73	-1,258.06	-1,266.48	6.64	6.58	2.20
7,157.00	36.20	91.47	6,769.18	-1,153.98	-1,209.09	-1,217.52	9.42	9.42	0.01
7,250.00	40.80	94.16	6,841.95	-1,156.89	-1,151.30	-1,159.75	5.26	4.95	2.89
7,344.00	49.92	91.43	6,907.93	-1,160.02	-1,084.57	-1,093.04	9.92	9.70	-2.90
7,436.00	58.07	89.60	6,961.97	-1,160.63	-1,010.21	-1,018.70	9.00	8.86	-1.99
7,529.00	63.28	89.75	7,007.51	-1,160.17	-929.16	-937.64	5.60	5.60	0.16
7,623.00	70.63	88.73	7,044.28	-1,159.01	-842.73	-851.20	7.88	7.82	-1.09
7,715.00	77.97	89.66	7,069.16	-1,157.78	-754.23	-762.70	8.04	7.98	1.01
7,808.00	84.45	90.42	7,083.36	-1,157.85	-662.38	-670.85	7.01	6.97	0.82
7,844.86	85.80	90.44	7,086.49	-1,158.12	-625.65	-634.12	3.66	3.66	0.04
LP (Bake 11-16HZ)									
7,901.00	87.85	90.46	7,089.60	-1,158.56	-569.60	-578.08	3.66	3.66	0.04



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Survey Report



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Well:	Bake 11-16HZ	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.15 Single User Db

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LP: 2124' FSL, 132' FWL (40.326700, -104.979300) - LP: 2124' FSL, 132' FWL Sec 11 T4N R68W									
7,993.00	88.84	89.15	7,092.26	-1,158.24	-477.64	-486.12	1.78	1.08	-1.42
8,085.00	88.16	88.02	7,094.67	-1,155.97	-385.71	-394.17	1.43	-0.74	-1.23
8,178.00	88.98	89.56	7,096.99	-1,154.01	-292.76	-301.21	1.88	0.88	1.66
8,229.24	88.92	89.64	7,097.93	-1,153.65	-241.53	-249.98	0.20	-0.12	0.16
Exit Heel Box - Exit Heel Box: 8229.24' MD 2126' FSL 460' FWL									
8,270.00	88.87	89.71	7,098.72	-1,153.42	-200.78	-209.23	0.20	-0.12	0.16
8,364.00	89.22	89.79	7,100.28	-1,153.01	-106.79	-115.24	0.38	0.37	0.09
8,457.00	88.93	89.04	7,101.78	-1,152.07	-13.81	-22.25	0.86	-0.31	-0.81
8,550.00	88.84	87.94	7,103.59	-1,149.62	79.14	70.71	1.19	-0.10	-1.18
8,643.00	90.94	87.52	7,103.77	-1,145.93	172.06	163.66	2.30	2.26	-0.45
8,737.00	89.58	85.56	7,103.35	-1,140.26	265.88	257.52	2.54	-1.45	-2.09
8,831.00	87.79	85.42	7,105.50	-1,132.87	359.56	351.25	1.91	-1.90	-0.15
8,923.00	88.83	85.79	7,108.22	-1,125.82	451.25	442.99	1.20	1.13	0.40
9,016.00	89.82	89.32	7,109.31	-1,121.86	544.14	535.91	3.94	1.06	3.80
9,109.00	89.05	91.29	7,110.23	-1,122.35	637.13	628.89	2.27	-0.83	2.12
9,202.00	88.56	91.17	7,112.17	-1,124.35	730.09	721.83	0.54	-0.53	-0.13
9,295.00	89.87	90.95	7,113.44	-1,126.07	823.06	814.79	1.43	1.41	-0.24
9,389.00	90.04	90.85	7,113.52	-1,127.54	917.05	908.76	0.21	0.18	-0.11
9,484.00	89.74	90.18	7,113.70	-1,128.40	1,012.05	1,003.75	0.77	-0.32	-0.71
9,577.00	89.35	90.02	7,114.44	-1,128.56	1,105.04	1,096.74	0.45	-0.42	-0.17
9,670.00	88.91	89.10	7,115.85	-1,127.85	1,198.03	1,189.73	1.10	-0.47	-0.99
9,764.00	91.10	93.96	7,115.84	-1,130.36	1,291.96	1,283.64	5.67	2.33	5.17
9,857.00	89.17	93.86	7,115.62	-1,136.70	1,384.74	1,376.37	2.08	-2.08	-0.11
9,951.00	89.13	93.50	7,117.02	-1,142.73	1,478.54	1,470.12	0.39	-0.04	-0.38
10,043.00	89.40	93.23	7,118.20	-1,148.13	1,570.37	1,561.91	0.42	0.29	-0.29
10,137.00	89.20	90.86	7,119.35	-1,151.48	1,664.30	1,655.81	2.53	-0.21	-2.52
10,231.00	89.64	90.42	7,120.30	-1,152.53	1,758.29	1,749.79	0.66	0.47	-0.47
10,324.00	90.12	90.05	7,120.49	-1,152.91	1,851.28	1,842.78	0.65	0.52	-0.40
10,417.00	88.91	87.46	7,121.28	-1,150.89	1,944.25	1,935.76	3.07	-1.30	-2.78
10,509.00	88.90	86.93	7,123.04	-1,146.39	2,036.12	2,027.66	0.58	-0.01	-0.58
10,602.00	90.55	89.48	7,123.48	-1,143.48	2,129.06	2,120.62	3.27	1.77	2.74
10,695.00	90.80	91.11	7,122.39	-1,143.96	2,222.05	2,213.61	1.77	0.27	1.75
10,788.00	91.34	90.75	7,120.65	-1,145.47	2,315.02	2,306.57	0.70	0.58	-0.39
10,880.00	91.26	90.80	7,118.56	-1,146.71	2,406.99	2,398.52	0.10	-0.09	0.05
10,974.00	91.00	91.29	7,116.71	-1,148.43	2,500.96	2,492.47	0.59	-0.28	0.52
11,066.00	90.11	89.05	7,115.82	-1,148.70	2,592.95	2,584.46	2.62	-0.97	-2.43
11,159.00	89.97	88.44	7,115.75	-1,146.66	2,685.92	2,677.45	0.67	-0.15	-0.66
11,251.00	89.96	88.38	7,115.81	-1,144.11	2,777.89	2,769.43	0.07	-0.01	-0.07
11,344.00	88.99	87.37	7,116.66	-1,140.66	2,870.82	2,862.38	1.51	-1.04	-1.09
11,436.00	89.05	87.42	7,118.24	-1,136.48	2,962.71	2,954.30	0.08	0.07	0.05
11,529.00	89.23	86.17	7,119.63	-1,131.28	3,055.55	3,047.18	1.36	0.19	-1.34
11,623.00	89.11	88.30	7,120.99	-1,126.75	3,149.43	3,141.08	2.27	-0.13	2.27
11,717.00	88.21	86.14	7,123.19	-1,122.19	3,243.28	3,234.97	2.49	-0.96	-2.30



Total Directional Services

Survey Report



Company:	Occidental Petroleum	Local Co-ordinate Reference:	Well Bake 11-16HZ
Project:	Weld County, CO (UTM-NAD83)	TVD Reference:	4993' GE + 20' KB @ 5013.00usft
Site:	4N-68W-11 (S&B 5-11HZ Pad)	MD Reference:	4993' GE + 20' KB @ 5013.00usft
Well:	Bake 11-16HZ	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.15 Single User Db

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)
11,809.00	89.37	87.51	7,125.14	-1,117.10	3,335.12	3,326.84	1.95	1.26	1.49
11,902.00	89.16	90.58	7,126.33	-1,115.55	3,428.09	3,419.82	3.31	-0.23	3.30
11,996.00	89.10	90.98	7,127.76	-1,116.83	3,522.07	3,513.79	0.43	-0.06	0.43
12,088.00	89.40	90.42	7,128.96	-1,117.95	3,614.05	3,605.76	0.69	0.33	-0.61
12,180.00	90.27	89.81	7,129.23	-1,118.13	3,706.05	3,697.75	1.15	0.95	-0.66
12,272.00	88.99	91.02	7,129.82	-1,118.80	3,798.04	3,789.74	1.91	-1.39	1.32
12,366.00	89.82	90.02	7,130.80	-1,119.65	3,892.03	3,883.72	1.38	0.88	-1.06
12,459.00	90.34	90.37	7,130.67	-1,119.97	3,985.03	3,976.71	0.67	0.56	0.38
12,552.00	89.19	89.18	7,131.05	-1,119.61	4,078.03	4,069.71	1.78	-1.24	-1.28
12,644.00	90.40	89.06	7,131.38	-1,118.19	4,170.01	4,161.70	1.32	1.32	-0.13
12,738.00	89.93	90.64	7,131.11	-1,117.95	4,264.01	4,255.70	1.75	-0.50	1.68
12,830.00	89.10	91.37	7,131.88	-1,119.56	4,355.99	4,347.67	1.20	-0.90	0.79
12,922.00	89.46	90.93	7,133.04	-1,121.41	4,447.96	4,439.62	0.62	0.39	-0.48
13,016.00	90.40	90.31	7,133.16	-1,122.42	4,541.96	4,533.61	1.20	1.00	-0.66
13,111.00	88.47	88.96	7,134.09	-1,121.82	4,636.94	4,628.60	2.48	-2.03	-1.42
13,203.00	89.30	88.60	7,135.88	-1,119.86	4,728.90	4,720.57	0.98	0.90	-0.39
13,297.00	89.71	87.84	7,136.69	-1,116.94	4,822.85	4,814.54	0.92	0.44	-0.81
13,389.00	89.83	90.41	7,137.06	-1,115.54	4,914.83	4,906.53	2.80	0.13	2.79
13,481.00	91.70	91.36	7,135.84	-1,116.96	5,006.81	4,998.49	2.28	2.03	1.03
13,575.00	89.03	90.21	7,135.24	-1,118.24	5,100.79	5,092.46	3.09	-2.84	-1.22
13,667.00	90.02	90.22	7,136.00	-1,118.59	5,192.78	5,184.45	1.08	1.08	0.01
13,760.00	88.64	89.65	7,137.09	-1,118.48	5,285.78	5,277.43	1.61	-1.48	-0.61
13,853.00	89.34	89.73	7,138.73	-1,117.98	5,378.76	5,370.42	0.76	0.75	0.09
13,946.00	89.61	88.86	7,139.58	-1,116.84	5,471.75	5,463.41	0.98	0.29	-0.94
14,039.00	89.71	88.80	7,140.13	-1,114.94	5,564.73	5,556.40	0.13	0.11	-0.06
14,132.00	89.67	88.01	7,140.63	-1,112.35	5,657.69	5,649.38	0.85	-0.04	-0.85
14,224.00	89.82	87.73	7,141.04	-1,108.93	5,749.62	5,741.34	0.35	0.16	-0.30
14,317.00	90.25	87.00	7,140.99	-1,104.65	5,842.52	5,834.27	0.91	0.46	-0.78
14,410.00	89.56	90.11	7,141.14	-1,102.31	5,935.48	5,927.24	3.43	-0.74	3.34
14,504.00	90.49	90.14	7,141.10	-1,102.51	6,029.48	6,021.24	0.99	0.99	0.03
14,597.00	89.03	90.58	7,141.49	-1,103.10	6,122.48	6,114.23	1.64	-1.57	0.47
14,690.00	89.04	90.22	7,143.06	-1,103.75	6,215.46	6,207.20	0.39	0.01	-0.39
14,782.00	88.52	88.48	7,145.01	-1,102.70	6,307.43	6,299.18	1.97	-0.57	-1.89
14,877.00	90.99	88.41	7,145.42	-1,100.13	6,402.39	6,394.15	2.60	2.60	-0.07
14,970.00	90.60	87.48	7,144.13	-1,096.79	6,495.32	6,487.10	1.08	-0.42	-1.00
15,062.00	91.20	89.10	7,142.68	-1,094.05	6,587.26	6,579.06	1.88	0.65	1.76
15,155.00	89.29	89.48	7,142.29	-1,092.89	6,680.25	6,672.06	2.09	-2.05	0.41
15,249.00	90.50	88.86	7,142.46	-1,091.53	6,774.24	6,766.05	1.45	1.29	-0.66
15,343.00	90.48	88.30	7,141.66	-1,089.20	6,868.20	6,860.03	0.60	-0.02	-0.60
15,435.00	90.54	87.61	7,140.84	-1,085.92	6,960.14	6,951.99	0.75	0.07	-0.75
15,528.00	90.57	88.94	7,139.94	-1,083.12	7,053.09	7,044.96	1.43	0.03	1.43
15,620.00	90.08	89.15	7,139.41	-1,081.59	7,145.08	7,136.96	0.58	-0.53	0.23
15,712.00	89.84	87.99	7,139.48	-1,079.29	7,237.05	7,228.94	1.29	-0.26	-1.26



Total Directional Services

Survey Report



Company:	Occidental Petroleum	Local Co-ordinate Reference:	Well Bake 11-16HZ
Project:	Weld County, CO (UTM-NAD83)	TVD Reference:	4993' GE + 20' KB @ 5013.00usft
Site:	4N-68W-11 (S&B 5-11HZ Pad)	MD Reference:	4993' GE + 20' KB @ 5013.00usft
Well:	Bake 11-16HZ	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.15 Single User Db

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)	
15,805.00	89.47	88.85	7,140.04	-1,076.73	7,330.01	7,321.92	1.01	-0.40	0.92	
15,897.00	88.84	88.95	7,141.39	-1,074.96	7,421.98	7,413.90	0.69	-0.68	0.11	
15,990.00	90.15	89.29	7,142.21	-1,073.53	7,514.96	7,506.89	1.46	1.41	0.37	
16,082.00	90.00	88.84	7,142.09	-1,072.03	7,606.95	7,598.89	0.52	-0.16	-0.49	
16,174.00	89.79	89.94	7,142.26	-1,071.05	7,698.95	7,690.89	1.22	-0.23	1.20	
16,267.00	90.01	89.28	7,142.42	-1,070.42	7,791.94	7,783.89	0.75	0.24	-0.71	
16,362.00	88.25	87.11	7,143.87	-1,067.43	7,886.88	7,878.84	2.94	-1.85	-2.28	
16,454.00	90.80	87.81	7,144.63	-1,063.35	7,978.77	7,970.76	2.87	2.77	0.76	
16,546.00	91.43	88.60	7,142.84	-1,060.47	8,070.71	8,062.72	1.10	0.68	0.86	
16,584.44	90.89	88.77	7,142.06	-1,059.59	8,109.13	8,101.15	1.47	-1.41	0.43	
Enter Toe Box - Enter Toe Box: 16584.44' MD 2140' FSL 1784' FEL										
16,639.00	90.12	89.00	7,141.58	-1,058.52	8,163.68	8,155.70	1.47	-1.41	0.43	
16,733.00	89.39	89.71	7,141.98	-1,057.47	8,257.67	8,249.70	1.08	-0.78	0.76	
16,827.00	88.20	88.80	7,143.96	-1,056.24	8,351.64	8,343.67	1.59	-1.27	-0.97	
16,919.00	90.22	89.21	7,145.23	-1,054.65	8,443.61	8,435.65	2.24	2.20	0.45	
17,012.00	91.42	91.05	7,143.90	-1,054.86	8,536.60	8,528.63	2.36	1.29	1.98	
17,104.00	92.47	91.04	7,140.78	-1,056.53	8,628.53	8,620.55	1.14	1.14	-0.01	
17,196.00	92.94	90.78	7,136.43	-1,057.99	8,720.41	8,712.42	0.58	0.51	-0.28	
17,289.00	91.06	91.71	7,133.19	-1,060.01	8,813.33	8,805.32	2.26	-2.02	1.00	
17,384.00	89.69	91.10	7,132.57	-1,062.34	8,908.29	8,900.27	1.58	-1.44	-0.64	
17,476.00	89.92	91.24	7,132.88	-1,064.22	9,000.28	8,992.23	0.29	0.25	0.15	
17,570.00	87.85	90.74	7,134.71	-1,065.84	9,094.24	9,086.18	2.27	-2.20	-0.53	
17,663.00	88.32	89.38	7,137.82	-1,065.94	9,187.18	9,179.12	1.55	0.51	-1.46	
17,756.00	87.22	88.37	7,141.44	-1,064.12	9,280.09	9,272.04	1.61	-1.18	-1.09	
17,838.00	87.38	87.92	7,145.30	-1,061.47	9,361.96	9,353.93	0.58	0.20	-0.55	
17,894.00	87.38	87.92	7,147.86	-1,059.44	9,417.86	9,409.84	0.00	0.00	0.00	
BHL: 2141' FSL, 477' FEL (40.326967, -104.943465) - PBHL (Bake 11-16HZ) - BHL: 2141' FSL, 477' FEL Sec 12 T4N R68W										



Total Directional Services

Survey Report



Company:	Occidental Petroleum	Local Co-ordinate Reference:	Well Bake 11-16HZ
Project:	Weld County, CO (UTM-NAD83)	TVD Reference:	4993' GE + 20' KB @ 5013.00usft
Site:	4N-68W-11 (S&B 5-11HZ Pad)	MD Reference:	4993' GE + 20' KB @ 5013.00usft
Well:	Bake 11-16HZ	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.15 Single User Db

Design Targets									
Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
SHL: 2054' FNL, 702' FV - actual wellpath hits target center - Point	0.00	0.00	0.00	0.00	0.00	14,646,860.72	1,646,755.39	40.329881	-104.977256
Surface TD: 1912.00' MI - actual wellpath misses target center by 1.07usft at 1912.00usft MD (1862.88 TVD, -242.91 N, -247.69 E) - Point	0.00	0.00	1,862.49	-243.39	-248.57	14,646,617.27	1,646,506.88	40.329213	-104.978148
Enter Land Box: 4926.78' - actual wellpath hits target center - Point	0.00	0.00	4,580.48	-1,081.40	-1,227.98	14,645,779.00	1,645,527.68	40.326911	-104.981662
Curve KOP (Bake 11-16) - actual wellpath hits target center - Point	0.00	0.00	6,357.89	-1,156.74	-1,347.89	14,645,703.63	1,645,407.79	40.326705	-104.982092
LP: 2124' FSL, 132' FWL - actual wellpath hits target center - Point	0.00	0.00	7,089.60	-1,158.56	-569.60	14,645,702.01	1,646,186.08	40.326700	-104.979300
Exit Heel Box: 8229.24' I - actual wellpath hits target center - Point	0.00	0.00	7,097.93	-1,153.65	-241.53	14,645,707.01	1,646,514.15	40.326713	-104.978123
Enter Toe Box: 16584.44' - actual wellpath hits target center - Point	0.00	0.00	7,142.06	-1,059.59	8,109.13	14,645,803.21	1,654,864.79	40.326968	-104.948161
BHL: 2141' FSL, 477' FE - actual wellpath hits target center - Point	0.00	0.00	7,147.86	-1,059.44	9,417.86	14,645,803.70	1,656,173.52	40.326967	-104.943465

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
1,912.00	1,862.89	-242.91	-247.69	Surface TD: 2297' FNL, 453' FWL (40.329213, -104.978148)	
4,926.78	4,580.48	-1,081.40	-1,227.98	Enter Land Box	
6,717.00	6,357.89	-1,156.74	-1,347.89	KOP	
7,901.00	7,089.60	-1,158.56	-569.60	LP: 2124' FSL, 132' FWL (40.326700, -104.979300)	
8,229.24	7,097.93	-1,153.65	-241.53	Exit Heel Box	
16,584.44	7,142.06	-1,059.59	8,109.13	Enter Toe Box	
17,894.00	7,147.86	-1,059.44	9,417.86	BHL: 2141' FSL, 477' FEL (40.326967, -104.943465)	

Checked By: _____	Approved By: _____	Date: _____
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