

Occidental Petroleum

Project: Weld County, CO (UTM-NAD83)
 Site: 4N-68W-13 SBJ 22-13HZ PAD
 Well: SBJ 13-1HZ
 Wellbore: OH
 Design: Surveys

PROJECT DETAILS: Weld County, CO (UTM-NAD83)
 Geodetic System: Universal Transverse Mercator (US Survey Feet)
 Datum: North American Datum 1983
 Ellipsoid: GRS 1980
 Zone: Zone 13N (108 W to 102 W)

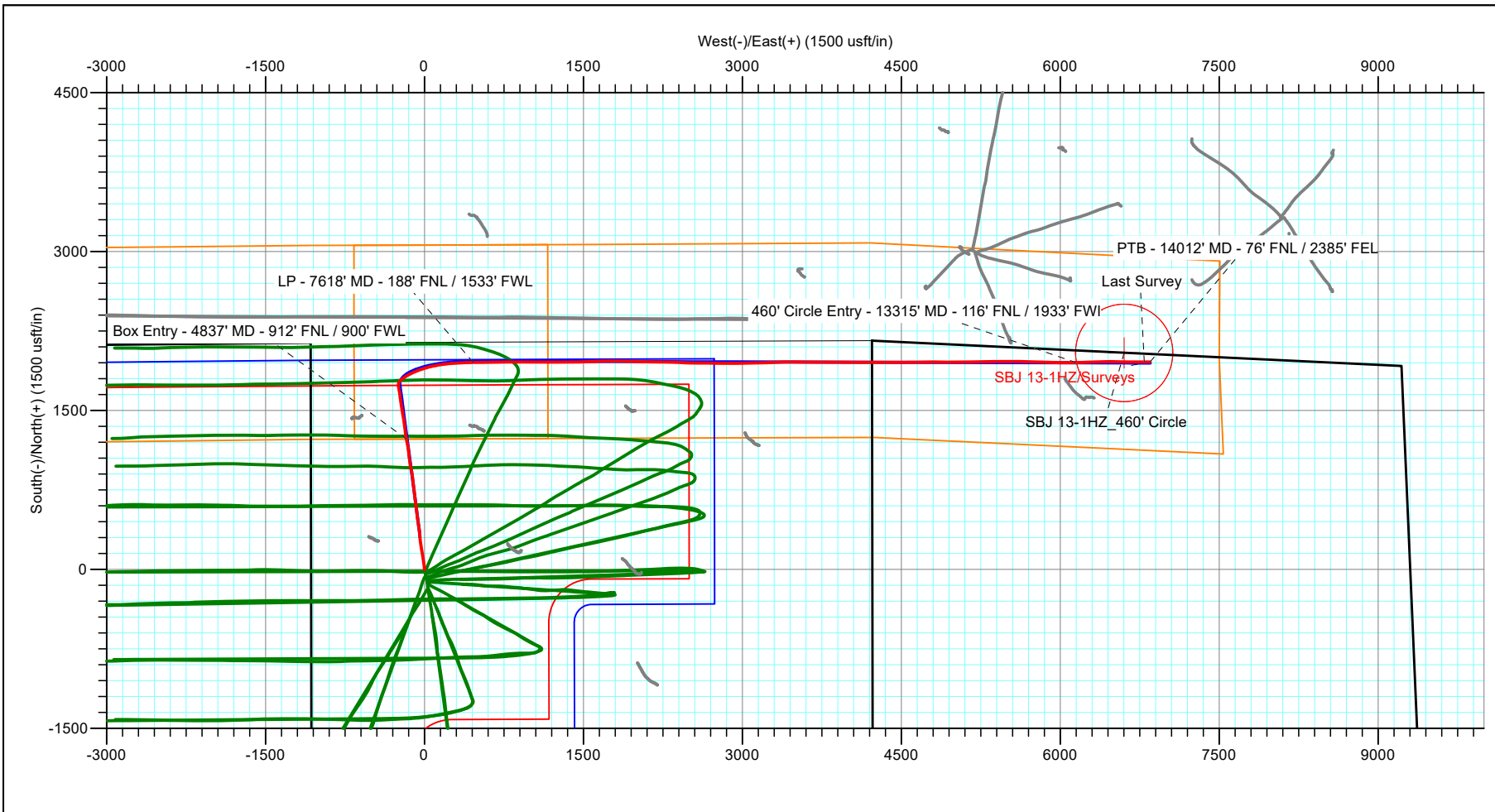


ACTUAL LINE CALLS
SHL: 2144' FNL, 1065' FWL
HEEL: 188' FNL, 1533' FWL
TOE: 76' FNL, 2385' FEL

SHL: T4N, R68W, Sec13
HEEL: T4N, R68W, Sec13
TOE: T4N, R67W, Sec18

ANNOTATIONS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Vsect	Departure	Annotation
4837.69	17.18	350.46	4647.49	1232.85	-170.95	-174.39	1245.74	Box Entry - 4837' MD - 912' FNL / 900' FWL
7618.87	85.35	88.90	6933.36	1953.51	460.00	454.55	2531.33	LP - 7618' MD - 188' FNL / 1533' FWL
13315.62	86.99	89.25	7101.55	1952.31	6152.60	6147.13	8224.88	460' Circle Entry - 13315' MD - 116' FNL / 1933' FWL
13956.00	88.71	89.99	7127.78	1958.54	6792.20	6786.70	8864.64	Last Survey
14012.00	88.71	89.99	7129.04	1958.55	6848.19	6842.69	8920.63	PTB - 14012' MD - 76' FNL / 2385' FEL



TOTAL DIRECTIONAL SERVICES LLC

Design: Surveys (SBJ 13-1HZ/OH)
 4N-68W-13 SBJ 22-13HZ PAD
 Created By: RDW Date: 17:40, March 09 2022
 Approved: _____ Date: _____

Occidental Petroleum

Project: Weld County, CO (UTM-NAD83)
 Site: 4N-68W-13 SBJ 22-13HZ PAD
 Well: SBJ 13-1HZ
 Wellbore: OH
 Design: Surveys

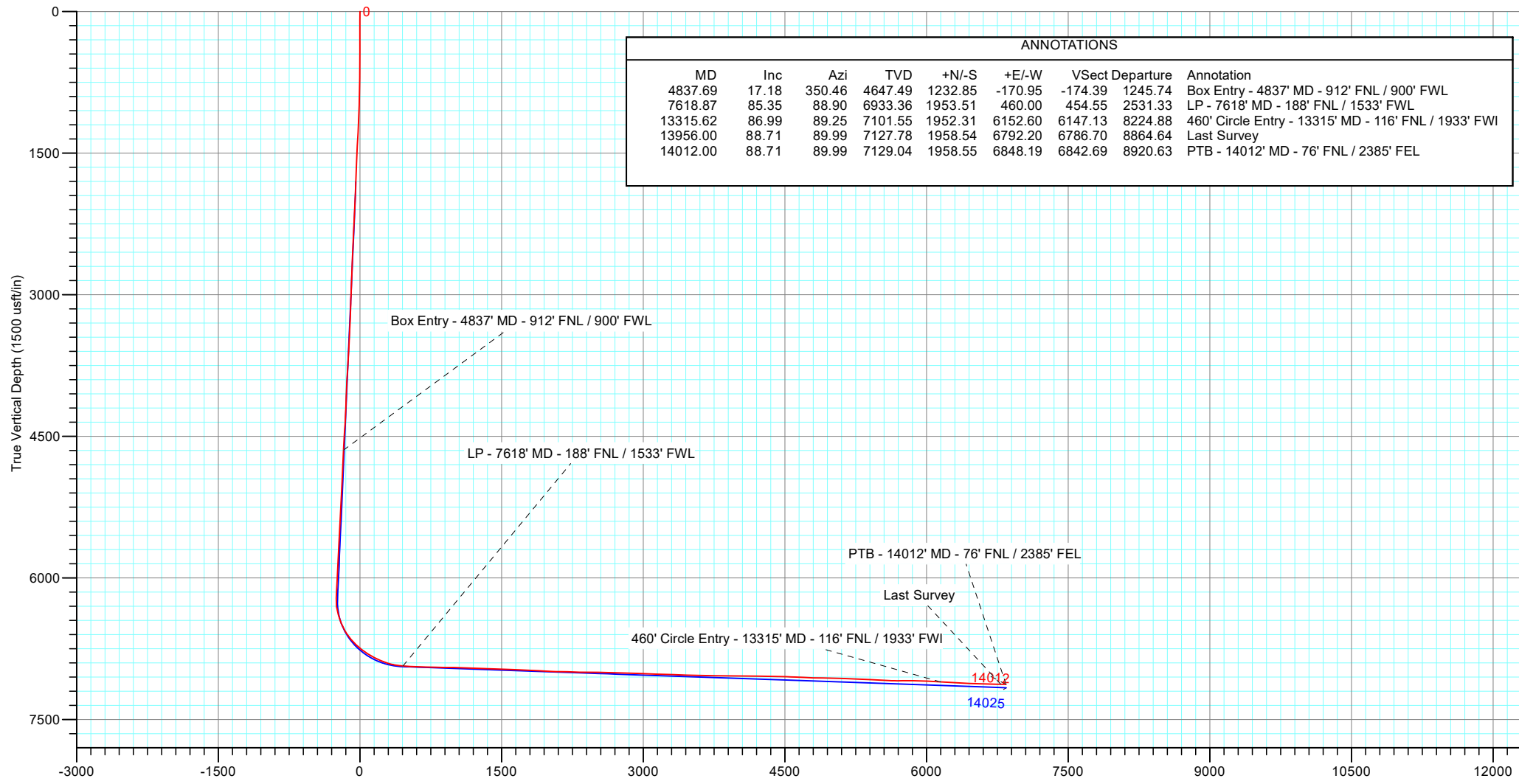
PROJECT DETAILS: Weld County, CO (UTM-NAD83)

Geodetic System: Universal Transverse Mercator (US Survey Feet)
 Datum: North American Datum 1983
 Ellipsoid: GRS 1980
 Zone: Zone 13N (108 W to 102 W)



Ground Level

ACTUAL LINE CALLS
SHL: 2144' FNL, 1065' FWL
HEEL: 188' FNL, 1533' FWL
TOE: 76' FNL, 2385' FEL



ANNOTATIONS								
MD	Inc	Azi	TVD	+N/-S	+E/-W	Vsect	Departure	Annotation
4837.69	17.18	350.46	4647.49	1232.85	-170.95	-174.39	1245.74	Box Entry - 4837' MD - 912' FNL / 900' FWL
7618.87	85.35	88.90	6933.36	1953.51	460.00	454.55	2531.33	LP - 7618' MD - 188' FNL / 1533' FWL
13315.62	86.99	89.25	7101.55	1952.31	6152.60	6147.13	8224.88	460' Circle Entry - 13315' MD - 116' FNL / 1933' FWL
13956.00	88.71	89.99	7127.78	1958.54	6792.20	6786.70	8864.64	Last Survey
14012.00	88.71	89.99	7129.04	1958.55	6848.19	6842.69	8920.63	PTB - 14012' MD - 76' FNL / 2385' FEL

TOTAL DIRECTIONAL SERVICES LLC

Design: Surveys (SBJ 13-1HZ/OH)
 4N-68W-13 SBJ 22-13HZ PAD
 Created By: RDW Date: 17:35, March 09 2022
 Approved: _____ Date: _____



Occidental Petroleum

Weld County, CO (UTM-NAD83)

4N-68W-13 SBJ 22-13HZ PAD

SBJ 13-1HZ

OH

Design: Surveys

Standard Survey Report

03 December, 2021





Survey Report



Company:	Occidental Petroleum	Local Co-ordinate Reference:	Well SBJ 13-1HZ
Project:	Weld County, CO (UTM-NAD83)	TVD Reference:	RKB = 20' @ 4879.00usft (PD 461)
Site:	4N-68W-13 SBJ 22-13HZ PAD	MD Reference:	RKB = 20' @ 4879.00usft (PD 461)
Well:	SBJ 13-1HZ	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM 5000.16 Single User Db

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

Site	4N-68W-13 SBJ 22-13HZ PAD				
Site Position:		Northing:	14,641,145.55 usft	Latitude:	40.314181
From:	Lat/Long	Easting:	1,652,517.50 usft	Longitude:	-104.956591
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "		

Well	SBJ 13-1HZ					
Well Position	+N/-S	0.00 usft	Northing:	14,641,504.57 usft	Latitude:	40.315167
	+E/-W	0.00 usft	Easting:	1,652,429.79 usft	Longitude:	-104.956905
Position Uncertainty	3.28 usft		Wellhead Elevation:	usft	Ground Level:	4,859.00 usft
Grid Convergence:	0.03 °					

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IFR	10/6/2021	7.86	66.48	51,859.70

Design	Surveys				
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	90.16	

Survey Program	Date	12/3/2021			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
99.00	1,845.00	Survey #1 (OH)	APC_ISCWSA REV 2 MM Fixed:v2:crustal field declination		
2,003.00	14,012.00	Survey #2 (OH)	APC_ISCWSA REV 2 MM Fixed:v2:Rockies, crustal dec + 3-axis correction		

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	
99.00	0.29	254.14	99.00	-0.07	-0.24	-0.24	0.29	0.29	0.00	
186.00	0.34	335.05	186.00	0.11	-0.56	-0.56	0.47	0.06	93.00	
275.00	0.83	3.40	274.99	0.99	-0.63	-0.64	0.62	0.55	31.85	
366.00	1.95	354.87	365.97	3.19	-0.73	-0.74	1.25	1.23	-9.37	
456.00	2.82	355.90	455.89	6.92	-1.03	-1.05	0.97	0.97	1.14	
546.00	4.41	355.81	545.70	12.58	-1.44	-1.48	1.77	1.77	-0.10	
636.00	4.33	355.27	635.44	19.42	-1.97	-2.03	0.10	-0.09	-0.60	
726.00	5.57	354.83	725.11	27.15	-2.65	-2.72	1.38	1.38	-0.49	



Survey Report



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Site:	4N-68W-13 SBJ 22-13HZ PAD	MD Reference:	RKB = 20' @ 4879.00usft (PD 461)
Well:	SBJ 13-1HZ	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM 5000.16 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)	
816.00	7.51	352.24	814.52	37.33	-3.84	-3.94	2.18	2.16	-2.88	
906.00	9.17	353.69	903.56	50.29	-5.42	-5.56	1.86	1.84	1.61	
995.00	12.16	352.79	991.01	66.64	-7.37	-7.56	3.36	3.36	-1.01	
1,085.00	14.51	350.41	1,078.58	87.17	-10.44	-10.69	2.68	2.61	-2.64	
1,175.00	15.11	350.09	1,165.59	109.84	-14.34	-14.65	0.67	0.67	-0.36	
1,265.00	15.85	351.12	1,252.33	133.54	-18.26	-18.63	0.88	0.82	1.14	
1,355.00	17.03	350.24	1,338.65	158.67	-22.39	-22.83	1.34	1.31	-0.98	
1,445.00	17.11	350.46	1,424.68	184.71	-26.82	-27.33	0.11	0.09	0.24	
1,535.00	17.32	351.79	1,510.65	211.03	-30.92	-31.51	0.50	0.23	1.48	
1,625.00	16.45	350.20	1,596.77	236.85	-35.01	-35.67	1.09	-0.97	-1.77	
1,715.00	17.60	352.01	1,682.82	262.88	-39.07	-39.80	1.41	1.28	2.01	
1,805.00	20.03	356.14	1,768.01	291.74	-42.00	-42.81	3.08	2.70	4.59	
1,845.00	19.62	356.38	1,805.64	305.28	-42.88	-43.73	1.05	-1.03	0.60	
Tie-on Survey										
2,003.00	18.59	352.19	1,954.94	356.70	-47.98	-48.97	1.09	-0.65	-2.65	
2,065.00	17.98	350.85	2,013.81	375.94	-50.84	-51.89	1.19	-0.98	-2.16	
2,190.00	19.13	352.39	2,132.31	415.29	-56.62	-57.78	1.00	0.92	1.23	
2,283.00	18.45	351.76	2,220.36	444.96	-60.75	-61.99	0.76	-0.73	-0.68	
2,376.00	19.90	353.75	2,308.20	475.26	-64.58	-65.91	1.71	1.56	2.14	
2,469.00	19.41	352.75	2,395.78	506.33	-68.26	-69.67	0.64	-0.53	-1.08	
2,561.00	17.89	351.42	2,482.94	535.46	-72.29	-73.79	1.72	-1.65	-1.45	
2,653.00	17.77	351.98	2,570.53	563.34	-76.36	-77.93	0.23	-0.13	0.61	
2,745.00	17.77	354.91	2,658.14	591.23	-79.56	-81.22	0.97	0.00	3.18	
2,838.00	16.01	352.26	2,747.12	618.07	-82.55	-84.28	2.07	-1.89	-2.85	
2,956.00	16.67	351.66	2,860.36	650.94	-87.20	-89.02	0.58	0.56	-0.51	
3,049.00	18.44	354.59	2,949.03	678.79	-90.52	-92.41	2.13	1.90	3.15	
3,142.00	15.62	353.48	3,037.94	705.87	-93.33	-95.30	3.05	-3.03	-1.19	
3,234.00	17.72	354.35	3,126.07	732.11	-96.11	-98.16	2.30	2.28	0.95	
3,328.00	17.38	351.40	3,215.69	760.23	-99.62	-101.74	1.01	-0.36	-3.14	
3,421.00	18.14	353.67	3,304.26	788.36	-103.30	-105.50	1.11	0.82	2.44	
3,514.00	19.58	352.73	3,392.27	818.20	-106.86	-109.15	1.58	1.55	-1.01	
3,607.00	19.70	352.17	3,479.86	849.19	-110.97	-113.34	0.24	0.13	-0.60	
3,701.00	19.62	352.77	3,568.38	880.54	-115.12	-117.57	0.23	-0.09	0.64	
3,794.00	19.43	350.51	3,656.03	911.29	-119.63	-122.18	0.84	-0.20	-2.43	
3,887.00	17.34	348.82	3,744.28	940.15	-124.87	-127.49	2.32	-2.25	-1.82	
3,981.00	17.43	348.97	3,833.98	967.71	-130.28	-132.98	0.11	0.10	0.16	
4,075.00	18.42	349.48	3,923.42	996.13	-135.68	-138.46	1.07	1.05	0.54	
4,169.00	17.42	352.70	4,012.86	1,024.69	-140.18	-143.04	1.50	-1.06	3.43	
4,262.00	18.52	353.68	4,101.32	1,053.18	-143.58	-146.52	1.23	1.18	1.05	
4,355.00	18.14	353.59	4,189.61	1,082.24	-146.82	-149.84	0.41	-0.41	-0.10	
4,447.00	18.03	355.48	4,277.06	1,110.67	-149.54	-152.64	0.65	-0.12	2.05	
4,541.00	18.76	349.63	4,366.26	1,140.04	-153.41	-156.59	2.11	0.78	-6.22	
4,633.00	19.84	349.60	4,453.09	1,169.95	-158.89	-162.16	1.17	1.17	-0.03	



Survey Report



Company:	Occidental Petroleum	Local Co-ordinate Reference:	Well SBJ 13-1HZ
Project:	Weld County, CO (UTM-NAD83)	TVD Reference:	RKB = 20' @ 4879.00usft (PD 461)
Site:	4N-68W-13 SBJ 22-13HZ PAD	MD Reference:	RKB = 20' @ 4879.00usft (PD 461)
Well:	SBJ 13-1HZ	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM 5000.16 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)
4,725.00	17.97	347.82	4,540.13	1,199.18	-164.70	-168.05	2.13	-2.03	-1.93
4,818.00	17.56	350.73	4,628.69	1,227.05	-169.99	-173.42	1.05	-0.44	3.13
4,837.69	17.18	350.46	4,647.49	1,232.85	-170.95	-174.39	1.98	-1.94	-1.36
Box Entry - 4837' MD - 912' FNL / 900' FWL									
4,910.00	15.78	349.37	4,716.82	1,253.05	-174.53	-178.03	1.98	-1.93	-1.51
5,002.00	18.46	353.98	4,804.74	1,279.83	-178.37	-181.94	3.26	2.91	5.01
5,095.00	17.90	353.51	4,893.10	1,308.68	-181.53	-185.18	0.62	-0.60	-0.51
5,187.00	17.97	352.15	4,980.63	1,336.78	-185.07	-188.80	0.46	0.08	-1.48
5,279.00	17.76	351.61	5,068.20	1,364.72	-189.05	-192.86	0.29	-0.23	-0.59
5,371.00	17.24	354.04	5,155.94	1,392.16	-192.51	-196.40	0.97	-0.57	2.64
5,465.00	17.98	349.92	5,245.54	1,420.30	-196.50	-200.47	1.54	0.79	-4.38
5,558.00	17.99	349.22	5,333.99	1,448.54	-201.70	-205.74	0.23	0.01	-0.75
5,652.00	19.03	349.28	5,423.13	1,477.86	-207.26	-211.39	1.11	1.11	0.06
5,745.00	18.59	352.63	5,511.16	1,507.46	-211.99	-216.20	1.25	-0.47	3.60
5,837.00	19.24	350.77	5,598.20	1,536.97	-216.30	-220.59	0.96	0.71	-2.02
5,930.00	17.97	350.85	5,686.33	1,566.26	-221.04	-225.41	1.37	-1.37	0.09
6,023.00	17.67	353.53	5,774.87	1,594.45	-224.91	-229.36	0.94	-0.32	2.88
6,117.00	18.80	351.36	5,864.15	1,623.60	-228.79	-233.33	1.40	1.20	-2.31
6,209.00	18.97	351.76	5,951.20	1,653.05	-233.16	-237.78	0.23	0.18	0.43
6,302.00	17.14	349.87	6,039.62	1,681.51	-237.74	-242.44	2.07	-1.97	-2.03
6,394.00	16.91	349.96	6,127.59	1,708.03	-242.46	-247.23	0.25	-0.25	0.10
6,486.00	15.94	350.85	6,215.83	1,733.67	-246.80	-251.64	1.09	-1.05	0.97
6,579.00	19.32	21.85	6,304.64	1,760.63	-243.10	-248.01	10.58	3.63	33.33
6,673.00	21.71	47.71	6,392.86	1,786.82	-224.41	-229.39	9.89	2.54	27.51
6,765.00	26.20	54.58	6,476.93	1,810.05	-195.25	-200.30	5.74	4.88	7.47
6,858.00	33.44	61.59	6,557.58	1,834.18	-155.91	-161.04	8.63	7.78	7.54
6,951.00	41.01	65.16	6,631.59	1,859.23	-105.61	-110.80	8.46	8.14	3.84
7,042.00	46.67	70.01	6,697.22	1,883.11	-47.34	-52.60	7.23	6.22	5.33
7,134.00	53.43	74.18	6,756.27	1,904.65	19.74	14.42	8.13	7.35	4.53
7,227.00	58.74	78.88	6,808.17	1,922.52	94.76	89.39	7.08	5.71	5.05
7,321.00	62.75	82.05	6,854.10	1,936.06	175.61	170.20	5.18	4.27	3.37
7,413.00	70.52	85.65	6,890.57	1,945.02	259.51	254.07	9.18	8.45	3.91
7,506.00	76.73	87.69	6,916.78	1,950.17	348.53	343.09	7.00	6.68	2.19
7,599.00	84.84	88.66	6,931.66	1,953.09	440.21	434.75	8.78	8.72	1.04
7,618.87	85.35	88.90	6,933.36	1,953.51	460.00	454.55	2.85	2.57	1.23
LP - 7618' MD - 188' FNL / 1533' FWL									
7,693.00	87.26	89.81	6,938.14	1,954.34	533.97	528.51	2.85	2.57	1.22
7,785.00	87.62	89.50	6,942.25	1,954.89	625.88	620.41	0.52	0.39	-0.34
7,879.00	88.14	89.04	6,945.72	1,956.09	719.80	714.34	0.74	0.55	-0.49
7,973.00	89.09	89.60	6,947.99	1,957.20	813.77	808.30	1.17	1.01	0.60
8,066.00	89.00	89.46	6,949.54	1,957.96	906.75	901.28	0.18	-0.10	-0.15
8,159.00	89.80	90.90	6,950.52	1,957.67	999.74	994.27	1.77	0.86	1.55
8,251.00	87.81	90.39	6,952.44	1,956.64	1,091.71	1,086.24	2.23	-2.16	-0.55
8,345.00	87.68	89.85	6,956.14	1,956.44	1,185.64	1,180.17	0.59	-0.14	-0.57



Survey Report



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Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM 5000.16 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)	
8,437.00	88.03	90.37	6,959.58	1,956.26	1,277.57	1,272.11	0.68	0.38	0.57	
8,530.00	87.78	88.93	6,962.98	1,956.83	1,370.51	1,365.04	1.57	-0.27	-1.55	
8,623.00	88.13	88.79	6,966.30	1,958.68	1,463.43	1,457.95	0.41	0.38	-0.15	
8,717.00	88.21	88.47	6,969.30	1,960.93	1,557.36	1,551.87	0.35	0.09	-0.34	
8,809.00	87.22	86.49	6,972.97	1,964.97	1,649.19	1,643.69	2.40	-1.08	-2.15	
8,901.00	88.20	90.61	6,976.65	1,967.29	1,741.06	1,735.56	4.60	1.07	4.48	
8,995.00	86.63	90.92	6,980.89	1,966.04	1,834.96	1,829.46	1.70	-1.67	0.33	
9,089.00	87.09	91.49	6,986.03	1,964.06	1,928.79	1,923.30	0.78	0.49	0.61	
9,181.00	87.05	90.87	6,990.74	1,962.17	2,020.65	2,015.17	0.67	-0.04	-0.67	
9,273.00	89.17	91.51	6,993.77	1,960.26	2,112.58	2,107.10	2.41	2.30	0.70	
9,365.00	88.56	91.46	6,995.59	1,957.88	2,204.53	2,199.05	0.67	-0.66	-0.05	
9,458.00	88.20	90.48	6,998.22	1,956.31	2,297.48	2,292.01	1.12	-0.39	-1.05	
9,551.00	89.53	92.59	7,000.07	1,953.81	2,390.42	2,384.95	2.68	1.43	2.27	
9,645.00	89.70	92.21	7,000.70	1,949.88	2,484.33	2,478.88	0.44	0.18	-0.40	
9,737.00	88.27	90.35	7,002.33	1,947.82	2,576.29	2,570.84	2.55	-1.55	-2.02	
9,830.00	88.49	90.43	7,004.96	1,947.19	2,669.25	2,663.80	0.25	0.24	0.09	
9,922.00	89.02	91.05	7,006.95	1,946.00	2,761.22	2,755.77	0.89	0.58	0.67	
10,015.00	87.91	89.85	7,009.45	1,945.27	2,854.18	2,848.74	1.76	-1.19	-1.29	
10,107.00	87.92	89.80	7,012.79	1,945.55	2,946.12	2,940.67	0.06	0.01	-0.05	
10,200.00	88.32	89.72	7,015.84	1,945.94	3,039.07	3,033.62	0.44	0.43	-0.09	
10,292.00	88.20	88.18	7,018.64	1,947.63	3,131.01	3,125.56	1.68	-0.13	-1.67	
10,385.00	87.82	87.24	7,021.87	1,951.34	3,223.88	3,218.41	1.09	-0.41	-1.01	
10,478.00	87.61	88.27	7,025.58	1,954.98	3,316.73	3,311.26	1.13	-0.23	1.11	
10,570.00	87.64	88.19	7,029.39	1,957.82	3,408.61	3,403.13	0.09	0.03	-0.09	
10,663.00	88.18	90.92	7,032.78	1,958.54	3,501.53	3,496.05	2.99	0.58	2.94	
10,755.00	89.55	90.70	7,034.60	1,957.24	3,593.50	3,588.02	1.51	1.49	-0.24	
10,847.00	89.67	90.59	7,035.23	1,956.21	3,685.50	3,680.02	0.18	0.13	-0.12	
10,940.00	89.37	90.39	7,036.01	1,955.41	3,778.49	3,773.01	0.39	-0.32	-0.22	
11,033.00	89.58	90.05	7,036.86	1,955.05	3,871.48	3,866.01	0.43	0.23	-0.37	
11,127.00	89.08	89.79	7,037.96	1,955.18	3,965.48	3,960.00	0.60	-0.53	-0.28	
11,220.00	88.93	90.74	7,039.57	1,954.75	4,058.46	4,052.99	1.03	-0.16	1.02	
11,316.00	88.65	89.94	7,041.60	1,954.18	4,154.44	4,148.96	0.88	-0.29	-0.83	
11,408.00	89.24	90.82	7,043.30	1,953.57	4,246.42	4,240.95	1.15	0.64	0.96	
11,501.00	89.06	89.61	7,044.67	1,953.23	4,339.40	4,333.93	1.32	-0.19	-1.30	
11,594.00	89.21	89.53	7,046.08	1,953.92	4,432.39	4,426.92	0.18	0.16	-0.09	
11,687.00	88.62	89.87	7,047.84	1,954.41	4,525.37	4,519.90	0.73	-0.63	0.37	
11,779.00	87.39	88.82	7,051.04	1,955.46	4,617.31	4,611.83	1.76	-1.34	-1.14	
11,871.00	87.57	89.54	7,055.09	1,956.78	4,709.21	4,703.73	0.81	0.20	0.78	
11,965.00	87.12	89.48	7,059.44	1,957.58	4,803.10	4,797.62	0.48	-0.48	-0.06	
12,057.00	89.63	90.48	7,062.05	1,957.61	4,895.06	4,889.57	2.94	2.73	1.09	
12,149.00	89.56	90.53	7,062.70	1,956.80	4,987.05	4,981.57	0.09	-0.08	0.05	
12,241.00	89.30	89.26	7,063.62	1,956.97	5,079.05	5,073.56	1.41	-0.28	-1.38	
12,334.00	87.00	89.14	7,066.62	1,958.27	5,171.98	5,166.49	2.48	-2.47	-0.13	



Survey Report



Company:	Occidental Petroleum	Local Co-ordinate Reference:	Well SBJ 13-1HZ
Project:	Weld County, CO (UTM-NAD83)	TVD Reference:	RKB = 20' @ 4879.00usft (PD 461)
Site:	4N-68W-13 SBJ 22-13HZ PAD	MD Reference:	RKB = 20' @ 4879.00usft (PD 461)
Well:	SBJ 13-1HZ	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM 5000.16 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)	
12,428.00	87.03	89.49	7,071.51	1,959.39	5,265.85	5,260.36	0.37	0.03	0.37	
12,520.00	87.07	88.82	7,076.25	1,960.74	5,357.72	5,352.22	0.73	0.04	-0.73	
12,614.00	86.96	89.18	7,081.14	1,962.38	5,451.57	5,446.07	0.40	-0.12	0.38	
12,706.00	87.54	91.23	7,085.56	1,962.05	5,543.46	5,537.96	2.31	0.63	2.23	
12,798.00	87.65	90.13	7,089.42	1,960.96	5,635.37	5,629.88	1.20	0.12	-1.20	
12,890.00	89.96	91.97	7,091.34	1,959.28	5,727.33	5,721.83	3.21	2.51	2.00	
12,984.00	89.84	91.70	7,091.50	1,956.27	5,821.28	5,815.79	0.31	-0.13	-0.29	
13,076.00	89.96	91.97	7,091.66	1,953.32	5,913.23	5,907.75	0.32	0.13	0.29	
13,168.00	86.80	89.83	7,094.26	1,951.87	6,005.17	5,999.69	4.15	-3.43	-2.33	
13,261.00	87.47	90.05	7,098.91	1,951.97	6,098.05	6,092.58	0.76	0.72	0.24	
13,315.62	86.99	89.25	7,101.55	1,952.31	6,152.60	6,147.13	1.71	-0.88	-1.47	
460' Circle Entry - 13315' MD - 116' FNL / 1933' FWI										
13,353.00	86.66	88.70	7,103.62	1,952.97	6,189.92	6,184.44	1.71	-0.88	-1.47	
13,448.00	86.03	87.24	7,109.68	1,956.33	6,284.66	6,279.18	1.67	-0.66	-1.54	
13,540.00	87.19	88.62	7,115.12	1,959.65	6,376.44	6,370.94	1.96	1.26	1.50	
13,634.00	87.67	89.95	7,119.33	1,960.82	6,470.34	6,464.84	1.50	0.51	1.41	
13,727.00	88.32	90.70	7,122.59	1,960.29	6,563.28	6,557.78	1.07	0.70	0.81	
13,821.00	88.88	91.11	7,124.88	1,958.81	6,657.24	6,651.74	0.74	0.60	0.44	
13,913.00	88.72	89.47	7,126.81	1,958.34	6,749.21	6,743.72	1.79	-0.17	-1.78	
13,956.00	88.71	89.99	7,127.78	1,958.54	6,792.20	6,786.70	1.21	-0.02	1.21	
Last Survey										
14,012.00	88.71	89.99	7,129.04	1,958.55	6,848.19	6,842.69	0.00	0.00	0.00	
PTB - 14012' MD - 76' FNL / 2385' FEL										

Design Targets										
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude	
SBJ 13-1HZ_460' Circ	0.00	0.00	6.00	2,139.15	-1,074.75	14,643,643.20	1,651,354.00	40.321041	-104.960761	
- hit/miss target										
- Shape										
- actual wellpath misses target center by 2393.97usft at 7.14usft MD (7.14 TVD, 0.00 N, 0.00 E)										
- Circle (radius 460.00)										

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")	
14,012.00	7,129.04	20" Casing	20	24	



Survey Report



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Site:	4N-68W-13 SBJ 22-13HZ PAD	MD Reference:	RKB = 20' @ 4879.00usft (PD 461)
Well:	SBJ 13-1HZ	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM 5000.16 Single User Db

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,845.00	1,805.64	305.28	-42.88	Tie-on Survey
4,837.69	4,647.49	1,232.85	-170.95	Box Entry - 4837' MD - 912' FNL / 900' FWL
7,618.87	6,933.36	1,953.51	460.00	LP - 7618' MD - 188' FNL / 1533' FWL
13,315.62	7,101.55	1,952.31	6,152.60	460' Circle Entry - 13315' MD - 116' FNL / 1933' FWI
13,956.00	7,127.78	1,958.54	6,792.20	Last Survey
14,012.00	7,129.04	1,958.55	6,848.19	PTB - 14012' MD - 76' FNL / 2385' FEL

Checked By: _____	Approved By: _____	Date: _____
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