

# Occidental Petroleum

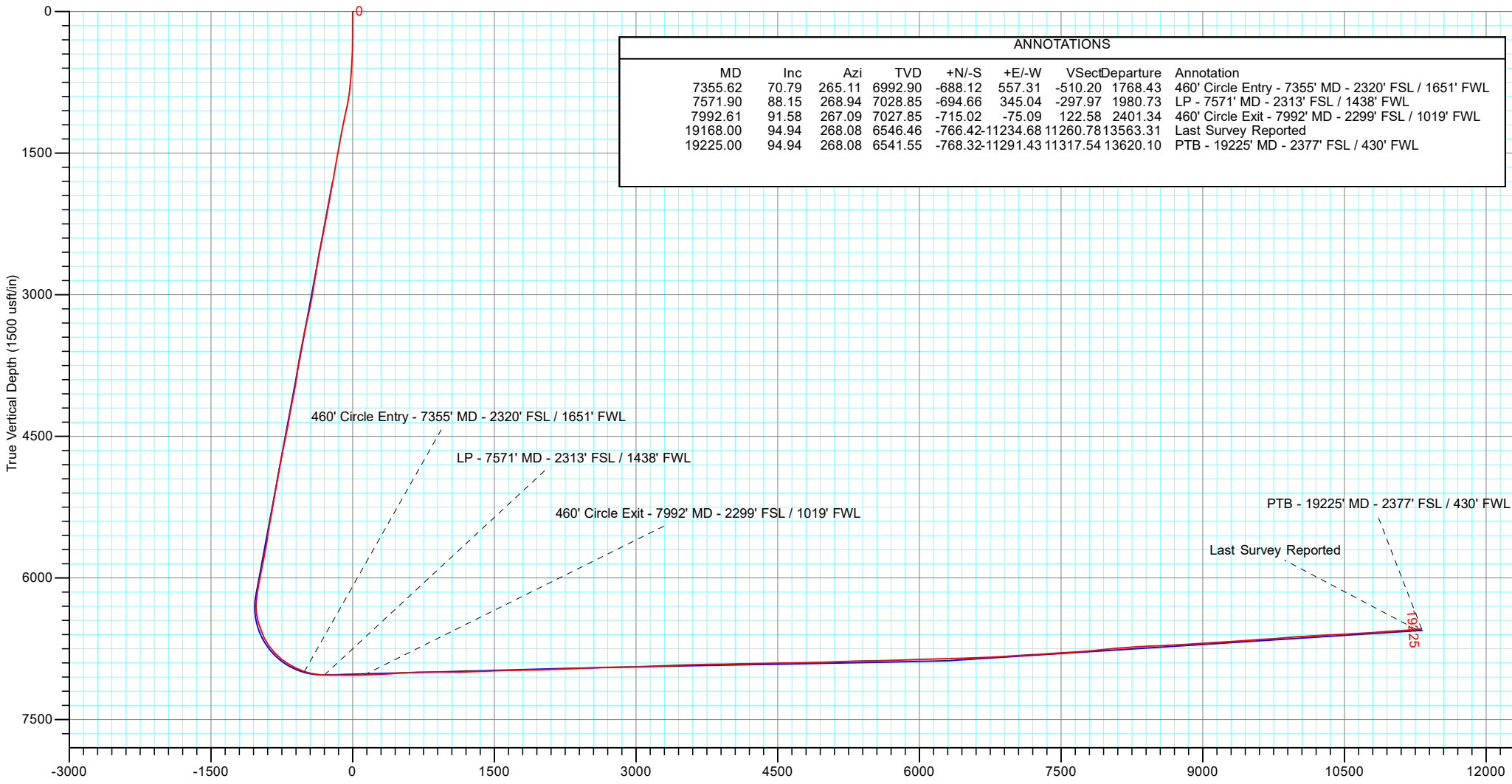
Project: Weld County, CO (UTM-NAD83)  
 Site: 4N-68W-13 SBJ 22-13HZ PAD  
 Well: SBJ 13-10HZ  
 Wellbore: Plan C  
 Design: Surveys

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: 2276' FNL, 1091' FWL**  
**LP: 2313' FSL, 1438' FWL**  
**TOE: 2377' FSL, 430' FWL**



**TOTAL DIRECTIONAL SERVICES LLC**

Design: Surveys (SBJ 13-10HZ/Plan C)  
 4N-68W-13 SBJ 22-13HZ PAD  
 Created By: RDW Date: 22:38, January 02 2022  
 Approved: \_\_\_\_\_ Date: \_\_\_\_\_

# Occidental Petroleum

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 Site: 4N-68W-13 SBJ 22-13HZ PAD  
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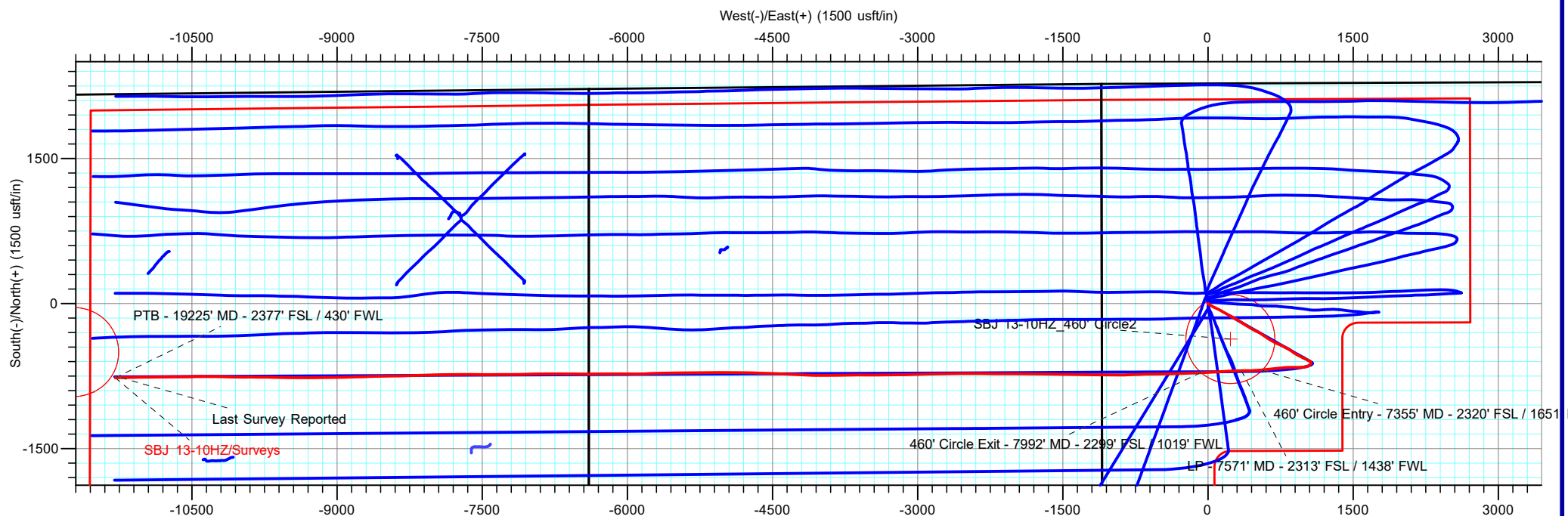
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**SHL: Sec 13-T4N-R68W**  
**LP: Sec 13-T4N-R68W**  
**BHL: Sec 15-T4N-R68W**

ANNOTATIONS									
MD	Inc	Azi	TVD	+N/-S	+E/-W	VSect	Departure	Annotation	
7355.62	70.79	265.11	6992.90	-688.12	557.31	-510.20	1768.43	460' Circle Entry - 7355' MD - 2320' FSL / 1651' FWL	
7571.90	88.15	268.94	7028.85	-694.66	345.04	-297.97	1980.73	LP - 7571' MD - 2313' FSL / 1438' FWL	
7992.61	91.58	267.09	7027.85	-715.02	-75.09	122.58	2401.34	460' Circle Exit - 7992' MD - 2299' FSL / 1019' FWL	
19168.00	94.94	268.08	6546.46	-766.42	-11234.68	11260.78	13563.31	Last Survey Reported	
19225.00	94.94	268.08	6541.55	-768.32	-11291.43	11317.54	13620.10	PTB - 19225' MD - 2377' FSL / 430' FWL	



**TOTAL DIRECTIONAL SERVICES LLC**

Design: Surveys (SBJ 13-10HZ/Plan C)  
 4N-68W-13 SBJ 22-13HZ PAD  
 Created By: RDW Date: 22:39, January 02 2022  
 Approved: \_\_\_\_\_ Date: \_\_\_\_\_



# Occidental Petroleum

Weld County, CO (UTM-NAD83)

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

SBJ 13-10HZ

Plan C

Design: Surveys

## Standard Survey Report

02 January, 2022





# Survey Report



<b>Company:</b>	Occidental Petroleum	<b>Local Co-ordinate Reference:</b>	Well SBJ 13-10HZ
<b>Project:</b>	Weld County, CO (UTM-NAD83)	<b>TVD Reference:</b>	RKB +20' @ 4879.00usft (PD 461)
<b>Site:</b>	4N-68W-13 SBJ 22-13HZ PAD	<b>MD Reference:</b>	RKB +20' @ 4879.00usft (PD 461)
<b>Well:</b>	SBJ 13-10HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	Plan C	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys	<b>Database:</b>	EDM 5000.16 Single User Db

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

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

<b>Well</b>	SBJ 13-10HZ					
<b>Well Position</b>	<b>+N/-S</b>	0.00 usft	<b>Northing:</b>	14,641,372.39 usft	<b>Latitude:</b>	40.314804
	<b>+E/-W</b>	0.00 usft	<b>Easting:</b>	1,652,456.62 usft	<b>Longitude:</b>	-104.956809
<b>Position Uncertainty</b>	3.28 usft		<b>Wellhead Elevation:</b>	usft	<b>Ground Level:</b>	4,859.00 usft
<b>Grid Convergence:</b>	0.03 °					

<b>Wellbore</b>	Plan C				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IFR	10/6/2021	7.86	66.48	51,857.90

<b>Design</b>	Surveys				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>	
	0.00	0.00	0.00	266.18	

<b>Survey Program</b>	<b>Date</b>	1/2/2022			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
99.00	1,835.00	Survey #1 (Plan C)	APC_ISCWSA REV 2 MM Fixed:v2:crustal field declination		
1,925.00	19,225.00	Survey #2 (Plan C)	APC_ISCWSA REV 2 MM Fixed:v2:Rockies, crustal dec + 3-axis correction		

<b>Survey</b>										
<b>Measured Depth (usft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Vertical Section (usft)</b>	<b>Dogleg Rate (°/100usft)</b>	<b>Build Rate (°/100usft)</b>	<b>Turn Rate (°/100usft)</b>	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
99.00	0.03	21.59	99.00	0.02	0.01	-0.01	0.03	0.03	0.00	
185.00	0.17	125.11	185.00	-0.03	0.12	-0.12	0.21	0.16	120.37	
274.00	0.60	131.54	274.00	-0.41	0.58	-0.55	0.48	0.48	7.22	
366.00	1.30	135.68	365.98	-1.48	1.67	-1.57	0.76	0.76	4.50	
456.00	2.70	115.85	455.93	-3.13	4.29	-4.07	1.71	1.56	-22.03	
546.00	4.00	121.49	545.77	-5.70	8.87	-8.47	1.49	1.44	6.27	
636.00	4.81	125.52	635.51	-9.53	14.62	-13.95	0.96	0.90	4.48	
726.00	6.45	123.58	725.07	-14.52	21.91	-20.89	1.83	1.82	-2.16	



# Survey Report



<b>Company:</b>	Occidental Petroleum	<b>Local Co-ordinate Reference:</b>	Well SBJ 13-10HZ
<b>Project:</b>	Weld County, CO (UTM-NAD83)	<b>TVD Reference:</b>	RKB +20' @ 4879.00usft (PD 461)
<b>Site:</b>	4N-68W-13 SBJ 22-13HZ PAD	<b>MD Reference:</b>	RKB +20' @ 4879.00usft (PD 461)
<b>Well:</b>	SBJ 13-10HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	Plan C	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys	<b>Database:</b>	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)	
815.00	7.65	124.45	813.39	-20.64	30.96	-29.51	1.35	1.35	0.98	
905.00	10.34	118.26	902.28	-27.85	43.01	-41.06	3.17	2.99	-6.88	
995.00	12.06	116.32	990.56	-35.84	58.56	-56.04	1.96	1.91	-2.16	
1,085.00	14.93	116.21	1,078.07	-45.13	77.39	-74.21	3.19	3.19	-0.12	
1,175.00	14.03	116.97	1,165.21	-55.20	97.51	-93.62	1.02	-1.00	0.84	
1,265.00	13.08	115.59	1,252.70	-64.55	116.42	-111.86	1.11	-1.06	-1.53	
1,355.00	12.04	119.76	1,340.55	-73.61	133.76	-128.55	1.53	-1.16	4.63	
1,445.00	12.27	120.28	1,428.53	-83.09	150.16	-144.29	0.28	0.26	0.58	
1,535.00	12.10	119.46	1,516.51	-92.55	166.64	-160.10	0.27	-0.19	-0.91	
1,624.00	11.39	117.06	1,603.64	-101.14	182.58	-175.44	0.97	-0.80	-2.70	
1,714.00	11.75	122.56	1,691.82	-110.11	198.22	-190.44	1.29	0.40	6.11	
1,804.00	13.26	121.62	1,779.68	-120.46	214.74	-206.23	1.69	1.68	-1.04	
1,835.00	13.63	120.03	1,809.83	-124.15	220.93	-212.16	1.69	1.19	-5.13	
1,925.00	11.06	113.25	1,897.74	-132.86	238.04	-228.66	3.27	-2.86	-7.53	
2,018.00	11.92	119.85	1,988.88	-141.17	254.57	-244.59	1.69	0.92	7.10	
2,110.00	12.92	120.37	2,078.73	-151.10	271.68	-261.01	1.09	1.09	0.57	
2,204.00	11.80	117.57	2,170.55	-160.86	289.27	-277.91	1.35	-1.19	-2.98	
2,296.00	14.17	122.44	2,260.19	-171.25	307.12	-295.02	2.84	2.58	5.29	
2,388.00	14.19	121.67	2,349.39	-183.21	326.22	-313.28	0.21	0.02	-0.84	
2,491.00	13.65	122.80	2,449.37	-196.43	347.18	-333.31	0.59	-0.52	1.10	
2,583.00	11.83	121.93	2,539.10	-207.30	364.31	-349.68	1.99	-1.98	-0.95	
2,675.00	12.45	122.26	2,629.04	-217.58	380.70	-365.35	0.68	0.67	0.36	
2,768.00	10.80	121.29	2,720.13	-227.45	396.62	-380.58	1.79	-1.77	-1.04	
2,860.00	11.20	120.53	2,810.44	-236.47	411.68	-395.01	0.46	0.43	-0.83	
2,953.00	12.17	127.02	2,901.51	-246.96	427.29	-409.88	1.75	1.04	6.98	
3,045.00	12.07	117.53	2,991.47	-257.25	443.57	-425.43	2.17	-0.11	-10.32	
3,137.00	12.36	117.48	3,081.39	-266.23	460.83	-442.06	0.32	0.32	-0.05	
3,229.00	14.40	115.26	3,170.89	-275.66	479.91	-460.47	2.29	2.22	-2.41	
3,322.00	14.12	115.77	3,261.02	-285.53	500.59	-480.44	0.33	-0.30	0.55	
3,414.00	13.50	114.55	3,350.36	-294.87	520.46	-499.65	0.74	-0.67	-1.33	
3,507.00	14.32	122.81	3,440.64	-305.61	540.00	-518.43	2.31	0.88	8.88	
3,599.00	14.14	124.56	3,529.82	-318.15	558.82	-536.37	0.51	-0.20	1.90	
3,691.00	13.55	126.54	3,619.15	-330.94	576.74	-553.39	0.82	-0.64	2.15	
3,784.00	12.52	128.09	3,709.75	-343.65	593.42	-569.20	1.17	-1.11	1.67	
3,876.00	9.67	127.19	3,800.02	-354.47	607.43	-582.45	3.10	-3.10	-0.98	
3,969.00	9.67	118.90	3,891.71	-362.97	620.49	-594.92	1.50	0.00	-8.91	
4,062.00	13.19	117.98	3,982.85	-371.72	636.70	-610.51	3.79	3.78	-0.99	
4,155.00	12.97	120.67	4,073.44	-382.03	655.05	-628.13	0.70	-0.24	2.89	
4,248.00	13.87	118.65	4,163.90	-392.69	673.81	-646.14	1.09	0.97	-2.17	
4,341.00	10.69	118.02	4,254.76	-402.09	691.21	-662.87	3.42	-3.42	-0.68	
4,435.00	11.64	115.95	4,346.98	-410.34	707.43	-678.51	1.10	1.01	-2.20	
4,527.00	11.93	112.46	4,437.04	-418.03	724.57	-695.09	0.84	0.32	-3.79	
4,620.00	13.68	115.77	4,527.72	-426.49	743.36	-713.28	2.04	1.88	3.56	



# Survey Report



<b>Company:</b>	Occidental Petroleum	<b>Local Co-ordinate Reference:</b>	Well SBJ 13-10HZ
<b>Project:</b>	Weld County, CO (UTM-NAD83)	<b>TVD Reference:</b>	RKB +20' @ 4879.00usft (PD 461)
<b>Site:</b>	4N-68W-13 SBJ 22-13HZ PAD	<b>MD Reference:</b>	RKB +20' @ 4879.00usft (PD 461)
<b>Well:</b>	SBJ 13-10HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	Plan C	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys	<b>Database:</b>	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)
4,713.00	13.35	116.52	4,618.15	-436.06	762.87	-732.11	0.40	-0.35	0.81
4,806.00	12.58	115.52	4,708.78	-445.22	781.61	-750.20	0.86	-0.83	-1.08
4,898.00	12.13	116.40	4,798.65	-453.83	799.31	-767.29	0.53	-0.49	0.96
4,991.00	12.74	117.23	4,889.46	-462.87	817.18	-784.51	0.68	0.66	0.89
5,083.00	11.49	115.31	4,979.41	-471.43	834.49	-801.21	1.43	-1.36	-2.09
5,175.00	11.68	124.28	5,069.55	-480.59	850.47	-816.54	1.97	0.21	9.75
5,268.00	11.81	126.62	5,160.60	-491.57	865.88	-831.19	0.53	0.14	2.52
5,361.00	12.61	128.42	5,251.49	-503.56	881.48	-845.95	0.95	0.86	1.94
5,454.00	12.80	121.78	5,342.22	-515.29	898.19	-861.85	1.58	0.20	-7.14
5,548.00	13.24	119.75	5,433.81	-526.12	916.39	-879.28	0.68	0.47	-2.16
5,640.00	9.29	117.20	5,524.02	-534.75	932.14	-894.43	4.33	-4.29	-2.77
5,733.00	11.28	120.30	5,615.52	-542.77	946.68	-908.39	2.22	2.14	3.33
5,827.00	11.95	117.21	5,707.59	-551.85	963.27	-924.34	0.97	0.71	-3.29
5,920.00	13.09	114.45	5,798.38	-560.62	981.42	-941.87	1.38	1.23	-2.97
6,014.00	13.58	117.17	5,889.85	-570.06	1,000.93	-960.70	0.85	0.52	2.89
6,107.00	11.73	114.93	5,980.59	-579.03	1,019.21	-978.35	2.06	-1.99	-2.41
6,234.00	11.43	117.13	6,105.00	-590.21	1,042.12	-1,000.46	0.42	-0.24	1.73
6,328.00	8.66	114.60	6,197.55	-597.41	1,056.85	-1,014.68	2.98	-2.95	-2.69
6,421.00	8.97	157.66	6,289.55	-607.04	1,065.98	-1,023.15	6.94	0.33	46.30
6,515.00	15.75	212.92	6,381.60	-624.60	1,061.81	-1,017.82	13.71	7.21	58.79
6,609.00	17.64	237.79	6,471.75	-642.93	1,042.80	-997.63	7.80	2.01	26.46
6,701.00	21.11	257.59	6,558.62	-653.93	1,014.79	-968.95	8.02	3.77	21.52
6,794.00	25.93	265.66	6,643.89	-659.07	978.13	-932.02	6.22	5.18	8.68
6,886.00	36.51	271.69	6,722.47	-659.79	930.57	-884.52	11.98	11.50	6.55
6,978.00	42.18	269.68	6,793.59	-659.16	872.28	-826.40	6.32	6.16	-2.18
7,071.00	51.41	266.03	6,857.21	-661.85	804.64	-758.73	10.33	9.92	-3.92
7,163.00	58.49	263.63	6,910.01	-668.70	729.69	-683.49	7.99	7.70	-2.61
7,256.00	64.21	262.79	6,954.58	-678.36	648.68	-602.03	6.20	6.15	-0.90
7,348.00	70.03	264.80	6,990.34	-687.49	564.46	-517.38	6.64	6.33	2.18
7,355.62	70.79	265.11	6,992.90	-688.12	557.31	-510.20	10.62	9.93	4.01
<b>460' Circle Entry - 7355' MD - 2320' FSL / 1651' FWL</b>									
7,440.00	79.19	268.33	7,014.74	-692.74	476.02	-428.79	10.62	9.96	3.82
7,533.00	85.87	269.80	7,026.82	-694.23	383.88	-336.75	7.35	7.18	1.58
7,571.90	88.15	268.94	7,028.85	-694.66	345.04	-297.97	6.26	5.86	-2.22
<b>LP - 7571' MD - 2313' FSL / 1438' FWL</b>									
7,625.00	91.26	267.76	7,029.13	-696.19	291.97	-244.91	6.26	5.86	-2.21
7,719.00	88.79	266.57	7,029.08	-700.84	198.09	-150.94	2.92	-2.63	-1.27
7,812.00	89.01	267.18	7,030.87	-705.91	105.25	-57.96	0.70	0.24	0.66
7,905.00	91.66	267.08	7,030.33	-710.56	12.37	35.02	2.85	2.85	-0.11
7,992.61	91.58	267.09	7,027.85	-715.02	-75.09	122.58	0.10	-0.10	0.01
<b>460' Circle Exit - 7992' MD - 2299' FSL / 1019' FWL</b>									
7,998.00	91.57	267.09	7,027.70	-715.29	-80.47	127.97	0.10	-0.10	0.01
8,091.00	92.39	268.03	7,024.49	-719.25	-173.33	220.88	1.34	0.88	1.01
8,184.00	92.38	266.82	7,020.62	-723.42	-266.15	313.78	1.30	-0.01	-1.30



# Survey Report



<b>Company:</b>	Occidental Petroleum	<b>Local Co-ordinate Reference:</b>	Well SBJ 13-10HZ
<b>Project:</b>	Weld County, CO (UTM-NAD83)	<b>TVD Reference:</b>	RKB +20' @ 4879.00usft (PD 461)
<b>Site:</b>	4N-68W-13 SBJ 22-13HZ PAD	<b>MD Reference:</b>	RKB +20' @ 4879.00usft (PD 461)
<b>Well:</b>	SBJ 13-10HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	Plan C	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys	<b>Database:</b>	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)	
8,276.00	93.41	269.41	7,015.97	-726.45	-357.97	405.60	3.03	1.12	2.82	
8,370.00	93.55	268.63	7,010.27	-728.05	-451.79	499.31	0.84	0.15	-0.83	
8,463.00	93.56	269.89	7,004.50	-729.25	-544.60	591.99	1.35	0.01	1.35	
8,555.00	92.31	268.03	6,999.79	-730.92	-636.46	683.76	2.43	-1.36	-2.02	
8,647.00	90.82	269.00	6,997.28	-733.30	-728.39	775.65	1.93	-1.62	1.05	
8,740.00	88.86	266.55	6,997.54	-736.91	-821.31	868.60	3.37	-2.11	-2.63	
8,833.00	88.80	269.77	6,999.44	-739.90	-914.23	961.51	3.46	-0.06	3.46	
8,926.00	89.85	271.02	7,000.53	-739.26	-1,007.21	1,054.25	1.76	1.13	1.34	
9,018.00	91.55	270.91	6,999.41	-737.71	-1,099.19	1,145.92	1.85	1.85	-0.12	
9,111.00	92.69	270.54	6,995.97	-736.53	-1,192.12	1,238.56	1.29	1.23	-0.40	
9,204.00	93.12	271.35	6,991.26	-735.00	-1,284.98	1,331.12	0.99	0.46	0.87	
9,297.00	91.98	271.40	6,987.12	-732.77	-1,377.86	1,423.64	1.23	-1.23	0.05	
9,387.00	91.22	269.96	6,984.60	-731.70	-1,467.82	1,513.33	1.81	-0.84	-1.60	
9,480.00	91.53	270.30	6,982.37	-731.49	-1,560.79	1,606.08	0.49	0.33	0.37	
9,574.00	91.80	271.13	6,979.64	-730.32	-1,654.74	1,699.74	0.93	0.29	0.88	
9,666.00	90.85	270.93	6,977.51	-728.66	-1,746.70	1,791.39	1.06	-1.03	-0.22	
9,760.00	90.86	270.09	6,976.11	-727.83	-1,840.69	1,885.11	0.89	0.01	-0.89	
9,853.00	91.98	270.79	6,973.81	-727.11	-1,933.66	1,977.82	1.42	1.20	0.75	
9,946.00	91.69	270.75	6,970.83	-725.87	-2,026.60	2,070.47	0.31	-0.31	-0.04	
10,039.00	91.44	270.13	6,968.29	-725.15	-2,119.56	2,163.18	0.72	-0.27	-0.67	
10,131.00	92.22	269.45	6,965.35	-725.49	-2,211.51	2,254.95	1.12	0.85	-0.74	
10,226.00	92.36	270.77	6,961.55	-725.31	-2,306.43	2,349.65	1.40	0.15	1.39	
10,320.00	92.29	270.47	6,957.74	-724.29	-2,400.35	2,443.29	0.33	-0.07	-0.32	
10,412.00	92.20	270.21	6,954.14	-723.74	-2,492.28	2,534.98	0.30	-0.10	-0.28	
10,505.00	91.85	269.29	6,950.85	-724.15	-2,585.22	2,627.74	1.06	-0.38	-0.99	
10,598.00	91.70	269.72	6,947.97	-724.95	-2,678.17	2,720.54	0.49	-0.16	0.46	
10,690.00	91.56	269.26	6,945.35	-725.77	-2,770.13	2,812.35	0.52	-0.15	-0.50	
10,783.00	90.26	267.09	6,943.88	-728.73	-2,863.06	2,905.27	2.72	-1.40	-2.33	
10,876.00	91.90	268.43	6,942.12	-732.37	-2,955.97	2,998.21	2.28	1.76	1.44	
10,970.00	92.24	269.34	6,938.73	-734.20	-3,049.89	3,092.04	1.03	0.36	0.97	
11,062.00	92.32	268.94	6,935.07	-735.58	-3,141.81	3,183.85	0.44	0.09	-0.43	
11,154.00	92.33	269.66	6,931.34	-736.70	-3,233.72	3,275.64	0.78	0.01	0.78	
11,247.00	91.73	268.20	6,928.04	-738.43	-3,326.65	3,368.47	1.70	-0.65	-1.57	
11,342.00	92.10	271.01	6,924.87	-739.09	-3,421.58	3,463.24	2.98	0.39	2.96	
11,434.00	91.84	269.24	6,921.70	-738.89	-3,513.52	3,554.96	1.94	-0.28	-1.92	
11,526.00	91.10	270.01	6,919.34	-739.49	-3,605.49	3,646.76	1.16	-0.80	0.84	
11,619.00	90.85	269.56	6,917.76	-739.84	-3,698.47	3,739.56	0.55	-0.27	-0.48	
11,712.00	90.93	269.25	6,916.32	-740.80	-3,791.46	3,832.40	0.34	0.09	-0.33	
11,806.00	90.87	269.04	6,914.84	-742.21	-3,885.44	3,926.27	0.23	-0.06	-0.22	
11,898.00	91.53	270.15	6,912.91	-742.86	-3,977.41	4,018.08	1.40	0.72	1.21	
11,990.00	92.23	271.02	6,909.89	-741.92	-4,069.36	4,109.76	1.21	0.76	0.95	
12,083.00	90.78	273.11	6,907.45	-738.57	-4,162.26	4,202.23	2.73	-1.56	2.25	
12,176.00	91.37	273.16	6,905.71	-733.48	-4,255.10	4,294.53	0.64	0.63	0.05	



# Survey Report



<b>Company:</b>	Occidental Petroleum	<b>Local Co-ordinate Reference:</b>	Well SBJ 13-10HZ
<b>Project:</b>	Weld County, CO (UTM-NAD83)	<b>TVD Reference:</b>	RKB +20' @ 4879.00usft (PD 461)
<b>Site:</b>	4N-68W-13 SBJ 22-13HZ PAD	<b>MD Reference:</b>	RKB +20' @ 4879.00usft (PD 461)
<b>Well:</b>	SBJ 13-10HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	Plan C	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys	<b>Database:</b>	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)	
12,269.00	89.97	271.69	6,904.62	-729.55	-4,348.01	4,386.96	2.18	-1.51	-1.58	
12,362.00	90.34	271.83	6,904.37	-726.69	-4,440.96	4,479.52	0.43	0.40	0.15	
12,454.00	90.61	272.49	6,903.61	-723.23	-4,532.89	4,571.02	0.78	0.29	0.72	
12,546.00	90.41	271.91	6,902.79	-719.69	-4,624.82	4,662.51	0.67	-0.22	-0.63	
12,638.00	92.20	271.19	6,900.69	-717.21	-4,716.76	4,754.07	2.10	1.95	-0.78	
12,731.00	91.99	270.60	6,897.29	-715.75	-4,809.68	4,846.70	0.67	-0.23	-0.63	
12,824.00	92.16	270.59	6,893.92	-714.79	-4,902.62	4,939.36	0.18	0.18	-0.01	
12,916.00	92.13	270.19	6,890.48	-714.16	-4,994.55	5,031.05	0.44	-0.03	-0.43	
13,008.00	91.34	269.44	6,887.70	-714.46	-5,086.51	5,122.82	1.18	-0.86	-0.82	
13,100.00	91.42	269.73	6,885.48	-715.13	-5,178.48	5,214.63	0.33	0.09	0.32	
13,194.00	91.67	270.50	6,882.95	-714.94	-5,272.44	5,308.37	0.86	0.27	0.82	
13,287.00	91.36	268.92	6,880.49	-715.41	-5,365.41	5,401.16	1.73	-0.33	-1.70	
13,380.00	91.40	269.26	6,878.25	-716.89	-5,458.37	5,494.01	0.37	0.04	0.37	
13,475.00	90.53	268.20	6,876.65	-718.99	-5,553.33	5,588.90	1.44	-0.92	-1.12	
13,569.00	92.04	269.29	6,874.54	-721.05	-5,647.28	5,682.78	1.98	1.61	1.16	
13,663.00	91.61	268.19	6,871.54	-723.12	-5,741.21	5,776.64	1.26	-0.46	-1.17	
13,755.00	91.01	267.57	6,869.44	-726.52	-5,833.12	5,868.57	0.94	-0.65	-0.67	
13,848.00	92.39	270.17	6,866.68	-728.35	-5,926.05	5,961.42	3.16	1.48	2.80	
13,940.00	91.98	270.51	6,863.17	-727.81	-6,017.98	6,053.11	0.58	-0.45	0.37	
14,032.00	91.42	270.25	6,860.45	-727.20	-6,109.94	6,144.82	0.67	-0.61	-0.28	
14,125.00	91.89	269.90	6,857.76	-727.07	-6,202.90	6,237.57	0.63	0.51	-0.38	
14,218.00	91.98	269.21	6,854.62	-727.80	-6,295.84	6,330.35	0.75	0.10	-0.74	
14,310.00	91.28	269.57	6,852.00	-728.78	-6,387.80	6,422.17	0.86	-0.76	0.39	
14,402.00	91.86	270.69	6,849.48	-728.57	-6,479.76	6,513.91	1.37	0.63	1.22	
14,495.00	92.26	270.00	6,846.14	-728.01	-6,572.70	6,606.61	0.86	0.43	-0.74	
14,589.00	92.03	271.04	6,842.62	-727.15	-6,666.63	6,700.27	1.13	-0.24	1.11	
14,682.00	92.41	269.76	6,839.02	-726.51	-6,759.55	6,792.95	1.43	0.41	-1.38	
14,775.00	94.37	269.26	6,833.52	-727.30	-6,852.38	6,885.62	2.17	2.11	-0.54	
14,867.00	93.98	268.66	6,826.82	-728.96	-6,944.12	6,977.27	0.78	-0.42	-0.65	
14,959.00	93.47	268.98	6,820.84	-730.85	-7,035.91	7,068.98	0.65	-0.55	0.35	
15,052.00	92.78	268.75	6,815.77	-732.69	-7,128.75	7,161.74	0.78	-0.74	-0.25	
15,145.00	93.80	269.85	6,810.44	-733.83	-7,221.59	7,254.44	1.61	1.10	1.18	
15,237.00	93.29	269.98	6,804.75	-733.97	-7,313.41	7,346.07	0.57	-0.55	0.14	
15,329.00	94.01	269.05	6,798.89	-734.74	-7,405.22	7,437.73	1.28	0.78	-1.01	
15,422.00	93.88	270.57	6,792.49	-735.05	-7,498.00	7,530.32	1.64	-0.14	1.63	
15,514.00	94.05	271.03	6,786.13	-733.77	-7,589.77	7,621.80	0.53	0.18	0.50	
15,609.00	93.09	269.33	6,780.21	-733.47	-7,684.58	7,716.38	2.05	-1.01	-1.79	
15,701.00	95.85	270.10	6,773.04	-733.93	-7,776.29	7,807.91	3.11	3.00	0.84	
15,794.00	95.49	269.45	6,763.86	-734.29	-7,868.83	7,900.28	0.80	-0.39	-0.70	
15,888.00	95.33	268.51	6,754.99	-735.96	-7,962.40	7,993.74	1.01	-0.17	-1.00	
15,982.00	94.51	267.84	6,746.93	-738.94	-8,056.00	8,087.34	1.12	-0.87	-0.71	
16,074.00	93.75	267.46	6,740.31	-742.70	-8,147.68	8,179.07	0.92	-0.83	-0.41	
16,166.00	94.87	269.18	6,733.39	-745.39	-8,239.38	8,270.74	2.23	1.22	1.87	
16,258.00	93.20	268.73	6,726.92	-747.07	-8,331.13	8,362.40	1.88	-1.82	-0.49	



# Survey Report



<b>Company:</b>	Occidental Petroleum	<b>Local Co-ordinate Reference:</b>	Well SBJ 13-10HZ
<b>Project:</b>	Weld County, CO (UTM-NAD83)	<b>TVD Reference:</b>	RKB +20' @ 4879.00usft (PD 461)
<b>Site:</b>	4N-68W-13 SBJ 22-13HZ PAD	<b>MD Reference:</b>	RKB +20' @ 4879.00usft (PD 461)
<b>Well:</b>	SBJ 13-10HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	Plan C	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys	<b>Database:</b>	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)
16,351.00	91.66	268.46	6,722.98	-749.35	-8,424.02	8,455.23	1.68	-1.66	-0.29
16,445.00	92.30	268.81	6,719.73	-751.58	-8,517.94	8,549.09	0.78	0.68	0.37
16,539.00	92.92	268.98	6,715.45	-753.40	-8,611.82	8,642.89	0.68	0.66	0.18
16,632.00	93.65	267.64	6,710.12	-756.13	-8,704.62	8,735.67	1.64	0.78	-1.44
16,725.00	94.67	269.83	6,703.37	-758.18	-8,797.35	8,828.32	2.59	1.10	2.35
16,817.00	92.32	268.10	6,697.76	-759.84	-8,889.15	8,920.03	3.17	-2.55	-1.88
16,910.00	93.00	268.10	6,693.45	-762.92	-8,982.00	9,012.88	0.73	0.73	0.00
17,003.00	93.82	269.30	6,687.91	-765.03	-9,074.81	9,105.62	1.56	0.88	1.29
17,095.00	94.67	269.60	6,681.10	-765.91	-9,166.55	9,197.22	0.98	0.92	0.33
17,189.00	93.31	269.88	6,674.56	-766.33	-9,260.32	9,290.81	1.48	-1.45	0.30
17,281.00	93.94	270.19	6,668.75	-766.28	-9,352.14	9,382.42	0.76	0.68	0.34
17,373.00	93.75	268.64	6,662.58	-767.22	-9,443.92	9,474.06	1.69	-0.21	-1.68
17,465.00	93.46	272.03	6,656.79	-766.68	-9,535.73	9,565.62	3.69	-0.32	3.68
17,558.00	94.19	271.55	6,650.59	-763.78	-9,628.47	9,657.97	0.94	0.78	-0.52
17,650.00	94.36	270.79	6,643.73	-761.91	-9,720.20	9,749.36	0.84	0.18	-0.83
17,742.00	93.73	270.16	6,637.24	-761.15	-9,811.96	9,840.88	0.97	-0.68	-0.68
17,834.00	94.19	270.09	6,630.89	-760.95	-9,903.74	9,932.44	0.51	0.50	-0.08
17,927.00	94.85	269.93	6,623.56	-760.93	-9,996.45	10,024.94	0.73	0.71	-0.17
18,020.00	94.08	271.54	6,616.32	-759.74	-10,089.16	10,117.36	1.91	-0.83	1.73
18,114.00	92.87	272.08	6,610.62	-756.78	-10,182.94	10,210.73	1.41	-1.29	0.57
18,207.00	93.18	270.80	6,605.71	-754.44	-10,275.78	10,303.21	1.41	0.33	-1.38
18,300.00	92.22	269.81	6,601.33	-753.95	-10,368.67	10,395.87	1.48	-1.03	-1.06
18,392.00	91.42	268.90	6,598.41	-754.98	-10,460.62	10,487.68	1.32	-0.87	-0.99
18,487.00	92.68	268.76	6,595.01	-756.92	-10,555.53	10,582.51	1.33	1.33	-0.15
18,580.00	94.48	270.40	6,589.20	-757.60	-10,648.34	10,675.16	2.62	1.94	1.76
18,673.00	94.98	268.89	6,581.53	-758.18	-10,741.02	10,767.67	1.71	0.54	-1.62
18,767.00	93.97	268.91	6,574.20	-759.98	-10,834.72	10,861.28	1.07	-1.07	0.02
18,861.00	93.33	269.22	6,568.21	-761.51	-10,928.51	10,954.97	0.76	-0.68	0.33
18,953.00	93.80	269.82	6,562.49	-762.28	-11,020.33	11,046.63	0.83	0.51	0.65
19,046.00	94.02	268.93	6,556.15	-763.29	-11,113.11	11,139.27	0.98	0.24	-0.96
19,138.00	94.87	268.33	6,549.02	-765.48	-11,204.80	11,230.91	1.13	0.92	-0.65
19,168.00	94.94	268.08	6,546.46	-766.42	-11,234.68	11,260.78	0.86	0.23	-0.83
<b>Last Survey Reported</b>									
19,225.00	94.94	268.08	6,541.55	-768.32	-11,291.43	11,317.54	0.00	0.00	0.00
<b>PTB - 19225' MD - 2377' FSL / 430' FWL</b>									



# Survey Report



<b>Company:</b>	Occidental Petroleum	<b>Local Co-ordinate Reference:</b>	Well SBJ 13-10HZ
<b>Project:</b>	Weld County, CO (UTM-NAD83)	<b>TVD Reference:</b>	RKB +20' @ 4879.00usft (PD 461)
<b>Site:</b>	4N-68W-13 SBJ 22-13HZ PAD	<b>MD Reference:</b>	RKB +20' @ 4879.00usft (PD 461)
<b>Well:</b>	SBJ 13-10HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	Plan C	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys	<b>Database:</b>	EDM 5000.16 Single User Db

Design Targets									
Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
- Shape									
SBJ 13-10HZ_460' Ci	0.00	0.00	0.00	-501.18	-11,716.26	14,640,865.50	1,640,740.60	40.313420	-104.998838
- actual wellpath misses target center by 6560.77usft at 19225.00usft MD (6541.55 TVD, -768.32 N, -11291.43 E)									
- Circle (radius 460.00)									
SBJ 13-10HZ_460' Ci	0.00	0.00	0.00	-367.61	231.90	14,641,004.90	1,652,688.70	40.313795	-104.955977
- actual wellpath misses target center by 434.64usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E)									
- Circle (radius 460.00)									

Design Annotations					
Measured Depth	Vertical Depth	Local Coordinates		Comment	
(usft)	(usft)	+N/-S	+E/-W		
		(usft)	(usft)		
7,355.62	6,992.90	-688.12	557.31	460' Circle Entry - 7355' MD - 2320' FSL / 1651' FWL	
7,571.90	7,028.85	-694.66	345.04	LP - 7571' MD - 2313' FSL / 1438' FWL	
7,992.61	7,027.85	-715.02	-75.09	460' Circle Exit - 7992' MD - 2299' FSL / 1019' FWL	
19,168.00	6,546.46	-766.42	-11,234.68	Last Survey Reported	
19,225.00	6,541.55	-768.32	-11,291.43	PTB - 19225' MD - 2377' FSL / 430' FWL	

Checked By: _____	Approved By: _____	Date: _____
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