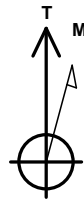


# ANADARKO PETROLEUM CORP

Project: Weld County, CO (UTM-NAD83)  
 Site: MAE J 14-8HZ  
 Well: MAE J 8-1HZ  
 Wellbore: OH  
 Design: OH

20' KB + 5083' GE @ 5103.00usft



Azimuths to True North  
 Magnetic North: 8.08°

Magnetic Field  
 Strength: 51928.8nT  
 Dip Angle: 66.49°  
 Date: 9/19/2019  
 Model: IGRF2015

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

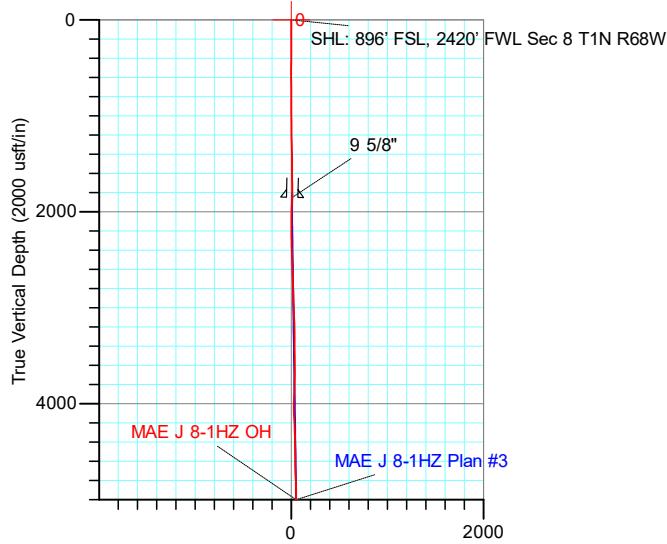
Geodetic System: Universal Transverse Mercator (US Survey Feet)  
 Datum: North American Datum 1983  
 Ellipsoid: GRS 1980  
 Zone: Zone 13N (108 W to 102 W)



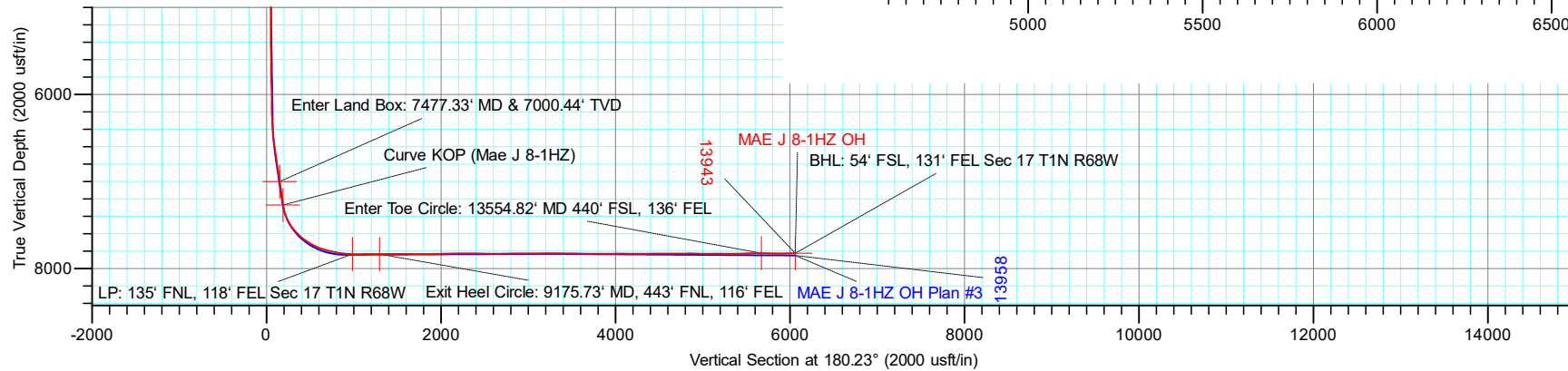
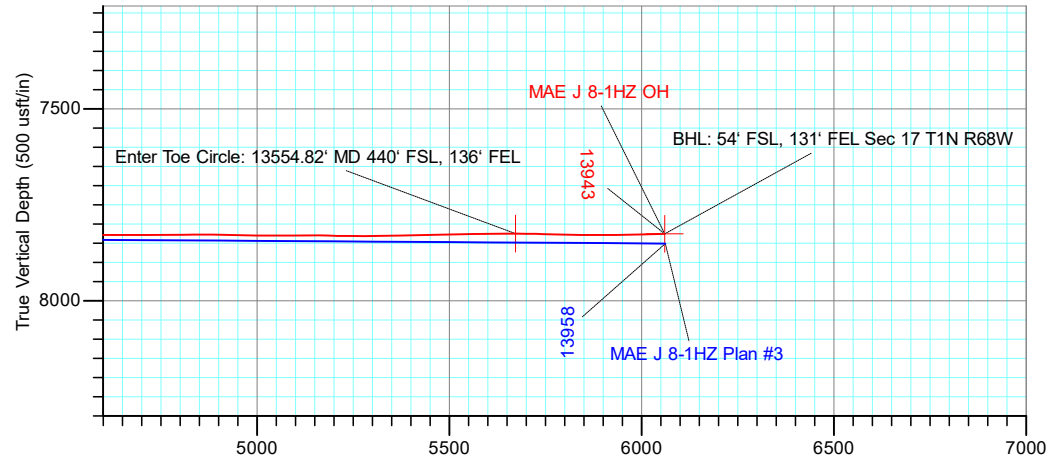
## DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
BHL: 54' FSL, 131' FEL Sec 17 T1N R68W	7825.89	-6071.23	2778.49	40.044038	-105.018672
Curve KOP (Mae J 8-1HZ)	7271.07	-199.77	2575.52	40.060162	-105.019395
Enter Land Box: 7477.33' MD & 7000.44' TVD	7000.44	-161.41	2471.09	40.060267	-105.019769
Enter Toe Circle: 13554.82' MD 440' FSL, 136' FEL	7825.39	-5683.27	2773.66	40.045103	-105.018689
Exit Heel Circle: 9175.73' MD, 443' FNL, 116' FEL	7835.42	-1305.54	2800.63	40.057125	-105.018591
LP: 135' FNL, 118' FEL Sec 17 T1N R68W	7835.70	-996.92	2799.74	40.057973	-105.018594
SHL: 896' FSL, 2420' FWL Sec 8 T1N R68W	0.00	0.00	0.00	40.060711	-105.028600

## 1N-68W-17



**ACTUAL LINE CALLS**  
**SHL: 896' FSL, 2420' FWL Sec 8 T1N R68W**  
**HEEL: 135' FNL, 118' FEL Sec 17 T1N R68W**  
**BHL: 54' FSL, 131' FEL Sec 17 T1N R68W**



TOTAL DIRECTIONAL SERVICES LLC  
 671 Academy Ct, Windsor, CO 80550  
 Phone: (970) 460-9402

Design: OH (MAE J 8-1HZ/OH)  
 MAE J 14-8HZ  
 Created By: Dustin Ault  
 Date: \_\_\_\_\_  
 Approved: \_\_\_\_\_  
 Date: 22:52, February 27 2020  
 Date: \_\_\_\_\_

# ANADARKO PETROLEUM CORP

Project: Weld County, CO (UTM-NAD83)  
 Site: MAE J 14-8HZ  
 Well: MAE J 8-1HZ  
 Wellbore: OH  
 Design: OH

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)



Azimuths to True North  
 Magnetic North: 8.08°

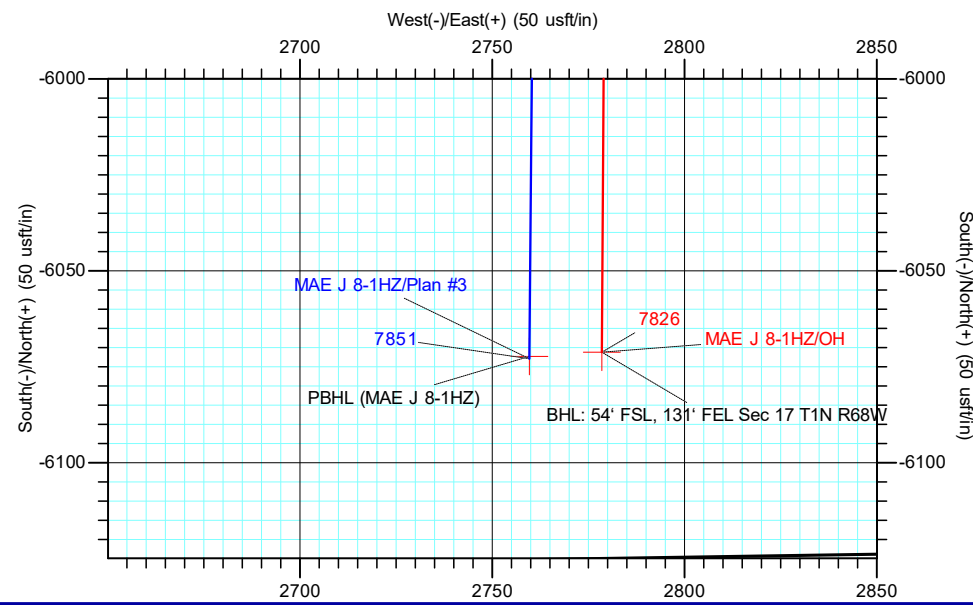
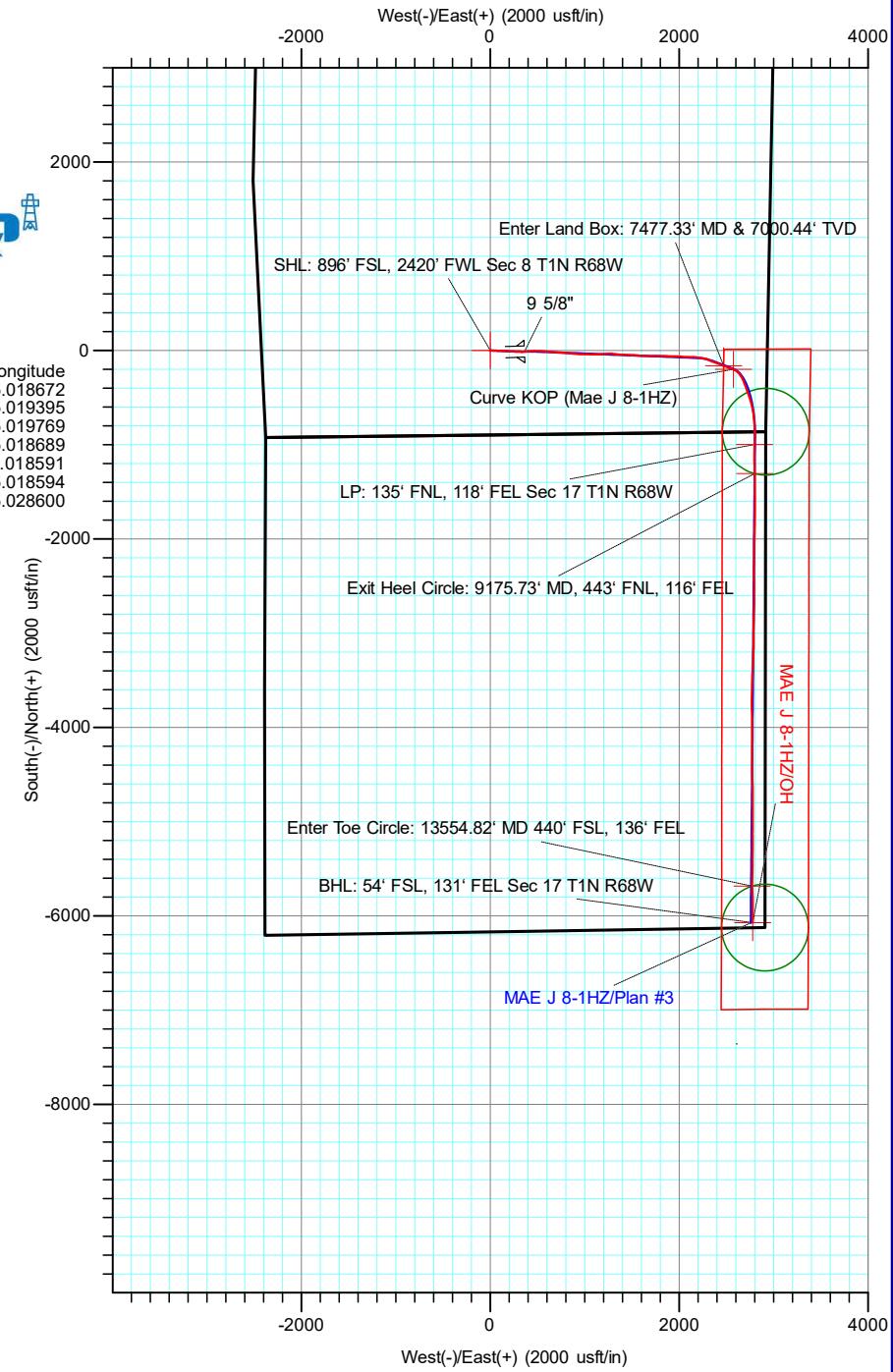
Magnetic Field  
 Strength: 51928.8nT  
 Dip Angle: 66.49°  
 Date: 9/19/2019  
 Model: IGRF2015



### DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
BHL: 54' FSL, 131' FEL Sec 17 T1N R68W	7825.89	-6071.23	2778.49	14542770.08	1635190.84	40.044038	-105.018672
Curve KOP (Mae J 8-1HZ)	7271.07	-199.77	2575.52	14548641.61	1634989.76	40.060162	-105.019395
Enter Land Box: 7477.33' MD & 7000.44' TVD	7000.44	-161.41	2471.09	14548680.00	1634885.34	40.060267	-105.019769
Enter Toe Circle: 13554.82' MD 440' FSL, 136' FEL	7825.39	-5683.27	2773.66	14543158.04	1635186.13	40.045103	-105.018689
Exit Heel Circle: 9175.73' MD, 443' FNL, 116' FEL	7835.42	-1305.54	2800.63	14547535.77	1635214.51	40.057125	-105.018591
LP: 135' FNL, 118' FEL Sec 17 T1N R68W	7835.70	-996.92	2799.74	14547844.39	1635213.72	40.057973	-105.018594
SHL: 896' FSL, 2420' FWL Sec 8 T1N R68W	0.00	0.00	0.00	14548842.20	1632414.30	40.060711	-105.028600

**ACTUAL LINE CALLS**  
**SHL: 896' FSL, 2420' FWL Sec 8 T1N R68W**  
**HEEL: 135' FNL, 118' FEL Sec 17 T1N R68W**  
**BHL: 54' FSL, 131' FEL Sec 17 T1N R68W**



**TOTAL DIRECTIONAL SERVICES LLC**  
 671 Academy Ct, Windsor, CO 80550  
 Phone: (970) 460-9402

Design: OH (MAE J 8-1HZ/OH)  
 MAE J 14-8HZ  
 Created By: Dustin Ault  
 Date: 22:55, February 27 2020  
 Approved: \_\_\_\_\_ Date: \_\_\_\_\_



# **ANADARKO PETROLEUM CORP**

**Weld County, CO (UTM-NAD83)**

**MAE J 14-8HZ**

**MAE J 8-1HZ**

**OH**

**Design: OH**

## **Standard Survey Report**

**27 February, 2020**



<b>Company:</b>	ANADARKO PETROLEUM CORP	<b>Local Co-ordinate Reference:</b>	Well MAE J 8-1HZ
<b>Project:</b>	Weld County, CO (UTM-NAD83)	<b>TVD Reference:</b>	20' KB + 5083' GE @ 5103.00usft
<b>Site:</b>	MAE J 14-8HZ	<b>MD Reference:</b>	20' KB + 5083' GE @ 5103.00usft
<b>Well:</b>	MAE J 8-1HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	EDM 5000.15 Single User Db

<b>Project</b>	Weld County, CO (UTM-NAD83)		
<b>Map System:</b>	Universal Transverse Mercator (US Survey Feet)	<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>	MAE J 14-8HZ				
<b>Site Position:</b>		<b>Northing:</b>	14,548,842.20 usft	<b>Latitude:</b>	40.060711
<b>From:</b>	Map	<b>Easting:</b>	1,632,414.30 usft	<b>Longitude:</b>	-105.028600
<b>Position Uncertainty:</b>	0.00 usft	<b>Slot Radius:</b>	13-3/16 "	<b>Grid Convergence:</b>	-0.02 °

<b>Well</b>	MAE J 8-1HZ					
<b>Well Position</b>	<b>+N/-S</b>	0.00 usft	<b>Northing:</b>	14,548,842.20 usft	<b>Latitude:</b>	40.060711
	<b>+E/-W</b>	0.00 usft	<b>Easting:</b>	1,632,414.30 usft	<b>Longitude:</b>	-105.028600
<b>Position Uncertainty</b>		3.28 usft	<b>Wellhead Elevation:</b>	usft	<b>Ground Level:</b>	5,083.00 usft

<b>Wellbore</b>	OH				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2015	9/19/2019	8.08	66.49	51,928.79855055

<b>Design</b>	OH				
<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	180.23	

<b>Survey Program</b>	<b>Date</b>	2/27/2020			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
130.00	1,861.00	Survey #1 - Surface MWD (OH)	APC_ISCWSA REV 2 MWD	Fixed:v2:standard declination	
1,861.00	13,889.00	Survey #2 - MWD+IFR (OH)	APC_ISCWSA REV 2 MWD+	Fixed:v2:crustal field declination	
13,943.00	13,943.00	Survey #3 - Proj to TD (OH)	BLIND	OWSG BLIND	

<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
<b>SHL: 896' FSL, 2420' FWL Sec 8 T1N R68W - SHL (MAE J 8-1HZ)</b>										
130.00	0.44	185.27	130.00	-0.50	-0.05	0.50	0.34	0.34	0.00	
225.00	0.57	282.04	225.00	-0.76	-0.54	0.76	0.80	0.14	101.86	
320.00	0.18	350.77	319.99	-0.52	-1.03	0.52	0.56	-0.41	72.35	
415.00	1.41	83.31	414.98	-0.23	0.11	0.23	1.50	1.29	97.41	
510.00	4.48	87.97	509.85	0.04	4.98	-0.06	3.24	3.23	4.91	
606.00	6.99	90.96	605.36	0.07	14.57	-0.13	2.63	2.61	3.11	
701.00	9.05	91.66	699.43	-0.24	27.82	0.13	2.17	2.17	0.74	

<b>Company:</b>	ANADARKO PETROLEUM CORP	<b>Local Co-ordinate Reference:</b>	Well MAE J 8-1HZ
<b>Project:</b>	Weld County, CO (UTM-NAD83)	<b>TVD Reference:</b>	20' KB + 5083' GE @ 5103.00usft
<b>Site:</b>	MAE J 14-8HZ	<b>MD Reference:</b>	20' KB + 5083' GE @ 5103.00usft
<b>Well:</b>	MAE J 8-1HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	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)	
796.00	9.67	91.93	793.16	-0.73	43.26	0.55	0.65	0.65	0.28	
891.00	11.38	92.19	886.56	-1.36	60.60	1.11	1.80	1.80	0.27	
986.00	11.56	92.89	979.66	-2.19	79.47	1.87	0.24	0.19	0.74	
1,081.00	12.17	92.28	1,072.63	-3.07	98.99	2.67	0.66	0.64	-0.64	
1,176.00	15.07	91.49	1,164.95	-3.79	121.34	3.30	3.06	3.05	-0.83	
1,271.00	16.92	94.12	1,256.27	-5.11	147.48	4.51	2.09	1.95	2.77	
1,366.00	17.49	94.12	1,347.02	-7.12	175.51	6.42	0.60	0.60	0.00	
1,462.00	17.62	92.89	1,438.55	-8.89	204.41	8.07	0.41	0.14	-1.28	
1,557.00	18.50	90.17	1,528.87	-9.66	233.84	8.72	1.28	0.93	-2.86	
1,652.00	20.17	91.40	1,618.51	-10.11	265.29	9.04	1.81	1.76	1.29	
1,746.00	21.18	92.63	1,706.45	-11.28	298.45	10.09	1.17	1.07	1.31	
1,842.00	24.87	89.99	1,794.79	-12.08	335.98	10.73	3.99	3.84	-2.75	
1,861.00	25.49	89.20	1,811.99	-12.02	344.06	10.64	3.71	3.26	-4.16	
1,904.00	25.81	87.85	1,850.75	-11.54	362.67	10.08	1.56	0.75	-3.15	
<b>9 5/8"</b>										
1,932.00	26.03	86.98	1,875.93	-10.98	374.90	9.48	1.56	0.77	-3.09	
2,026.00	24.41	83.39	1,960.97	-7.66	414.79	6.00	2.37	-1.72	-3.82	
2,118.00	23.41	90.34	2,045.09	-5.58	451.96	3.77	3.25	-1.09	7.55	
2,211.00	22.04	87.68	2,130.88	-4.98	487.87	3.03	1.84	-1.47	-2.86	
2,306.00	22.11	92.94	2,218.92	-5.18	523.54	3.08	2.08	0.07	5.54	
2,400.00	20.79	91.82	2,306.41	-6.62	557.88	4.38	1.47	-1.40	-1.19	
2,493.00	23.32	96.14	2,392.60	-9.11	592.69	6.73	3.23	2.72	4.65	
2,585.00	20.91	94.92	2,477.83	-12.47	627.16	9.95	2.67	-2.62	-1.33	
2,679.00	22.64	93.64	2,565.12	-15.05	661.93	12.40	1.91	1.84	-1.36	
2,772.00	24.12	95.32	2,650.48	-17.95	698.71	15.15	1.75	1.59	1.81	
2,865.00	21.36	93.78	2,736.24	-20.83	734.54	17.88	3.04	-2.97	-1.66	
2,959.00	22.64	95.08	2,823.40	-23.56	769.65	20.47	1.46	1.36	1.38	
3,054.00	23.58	94.62	2,910.77	-26.71	806.80	23.47	1.01	0.99	-0.48	
3,149.00	23.56	94.52	2,997.85	-29.74	844.67	26.35	0.05	-0.02	-0.11	
3,244.00	23.68	94.91	3,084.89	-32.87	882.60	29.32	0.21	0.13	0.41	
3,337.00	23.80	96.21	3,170.02	-36.50	919.86	32.80	0.58	0.13	1.40	
3,429.00	23.10	89.22	3,254.44	-38.26	956.37	34.42	3.12	-0.76	-7.60	
3,523.00	23.50	91.95	3,340.77	-38.65	993.54	34.66	1.22	0.43	2.90	
3,617.00	19.43	91.06	3,428.23	-39.57	1,027.92	35.45	4.34	-4.33	-0.95	
3,711.00	19.11	92.64	3,516.97	-40.57	1,058.92	36.32	0.65	-0.34	1.68	
3,804.00	21.06	91.01	3,604.31	-41.57	1,090.84	37.19	2.18	2.10	-1.75	
3,898.00	22.19	89.00	3,691.69	-41.55	1,125.47	37.04	1.44	1.20	-2.14	
3,992.00	20.72	85.44	3,779.18	-39.92	1,159.80	35.27	2.09	-1.56	-3.79	
4,086.00	20.39	85.97	3,867.20	-37.45	1,192.71	32.66	0.40	-0.35	0.56	
4,178.00	22.53	84.21	3,952.81	-34.54	1,226.24	29.62	2.43	2.33	-1.91	
4,272.00	23.50	88.77	4,039.34	-32.33	1,262.90	27.26	2.16	1.03	4.85	
4,364.00	23.74	98.27	4,123.66	-34.60	1,299.58	29.38	4.14	0.26	10.33	
4,457.00	23.37	96.58	4,208.91	-39.40	1,336.43	34.04	0.83	-0.40	-1.82	

<b>Company:</b>	ANADARKO PETROLEUM CORP	<b>Local Co-ordinate Reference:</b>	Well MAE J 8-1HZ
<b>Project:</b>	Weld County, CO (UTM-NAD83)	<b>TVD Reference:</b>	20' KB + 5083' GE @ 5103.00usft
<b>Site:</b>	MAE J 14-8HZ	<b>MD Reference:</b>	20' KB + 5083' GE @ 5103.00usft
<b>Well:</b>	MAE J 8-1HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	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)	
4,550.00	23.30	94.15	4,294.31	-42.85	1,373.09	37.34	1.04	-0.08	-2.61	
4,643.00	24.43	90.71	4,379.36	-44.42	1,410.67	38.75	1.93	1.22	-3.70	
4,736.00	23.36	94.46	4,464.39	-46.09	1,448.29	40.27	2.00	-1.15	4.03	
4,830.00	21.18	91.86	4,551.38	-48.09	1,483.84	42.13	2.54	-2.32	-2.77	
4,924.00	22.19	93.60	4,638.72	-49.76	1,518.53	43.66	1.27	1.07	1.85	
5,018.00	21.60	93.35	4,725.94	-51.88	1,553.52	45.64	0.64	-0.63	-0.27	
5,111.00	23.21	95.69	4,811.92	-54.70	1,588.85	48.32	1.98	1.73	2.52	
5,230.00	20.96	90.76	4,922.19	-57.31	1,633.47	50.75	2.45	-1.89	-4.14	
5,323.00	20.26	93.49	5,009.24	-58.51	1,666.18	51.82	1.28	-0.75	2.94	
5,416.00	19.82	86.30	5,096.63	-58.47	1,697.99	51.65	2.69	-0.47	-7.73	
5,509.00	22.63	88.25	5,183.31	-56.91	1,731.62	49.95	3.12	3.02	2.10	
5,602.00	22.71	90.35	5,269.13	-56.47	1,767.45	49.37	0.87	0.09	2.26	
5,696.00	22.93	89.08	5,355.77	-56.29	1,803.91	49.04	0.57	0.23	-1.35	
5,789.00	23.08	92.71	5,441.38	-56.86	1,840.23	49.47	1.53	0.16	3.90	
5,882.00	21.10	93.20	5,527.55	-58.65	1,875.16	51.13	2.14	-2.13	0.53	
5,974.00	20.40	91.87	5,613.58	-60.10	1,907.72	52.44	0.92	-0.76	-1.45	
6,067.00	20.73	91.34	5,700.65	-61.01	1,940.37	53.23	0.41	0.35	-0.57	
6,161.00	20.09	91.05	5,788.75	-61.70	1,973.15	53.78	0.69	-0.68	-0.31	
6,253.00	20.02	95.77	5,875.18	-63.57	2,004.61	55.53	1.76	-0.08	5.13	
6,347.00	24.46	96.70	5,962.16	-67.46	2,039.97	59.27	4.74	4.72	0.99	
6,440.00	24.47	88.93	6,046.83	-69.35	2,078.36	61.01	3.46	0.01	-8.35	
6,533.00	24.23	88.31	6,131.56	-68.43	2,116.69	59.93	0.38	-0.26	-0.67	
6,627.00	23.46	94.46	6,217.55	-69.31	2,154.63	60.66	2.77	-0.82	6.54	
6,719.00	24.64	97.56	6,301.57	-73.26	2,191.90	64.46	1.88	1.28	3.37	
6,812.00	24.12	97.35	6,386.27	-78.24	2,229.97	69.29	0.57	-0.56	-0.23	
6,906.00	21.80	103.99	6,472.84	-84.92	2,265.97	75.82	3.70	-2.47	7.06	
6,999.00	21.59	110.28	6,559.26	-95.03	2,298.78	85.80	2.51	-0.23	6.76	
7,092.00	21.60	112.92	6,645.73	-107.63	2,330.59	98.27	1.04	0.01	2.84	
7,185.00	23.95	110.34	6,731.48	-120.86	2,364.06	111.36	2.75	2.53	-2.77	
7,278.00	23.18	107.70	6,816.73	-132.98	2,399.20	123.35	1.40	-0.83	-2.84	
7,372.00	22.48	113.68	6,903.37	-145.83	2,433.29	136.06	2.58	-0.74	6.36	
7,468.00	23.15	111.37	6,991.86	-160.07	2,467.67	150.17	1.17	0.70	-2.41	
7,477.33	23.21	111.40	7,000.44	-161.41	2,471.09	151.49	0.64	0.62	0.34	
<b>Enter Land Box: 7477.33' MD &amp; 7000.44' TVD</b>										
7,561.00	23.73	111.68	7,077.19	-173.65	2,502.08	163.60	0.64	0.62	0.33	
7,653.00	21.91	108.83	7,161.99	-186.03	2,535.54	175.85	2.31	-1.98	-3.10	
7,747.00	20.54	108.37	7,249.61	-196.89	2,567.79	186.58	1.47	-1.46	-0.49	
7,769.98	21.55	112.48	7,271.06	-199.77	2,575.52	189.43	7.77	4.39	17.87	
<b>Curve KOP (Mae J 8-1HZ)</b>										
7,841.00	25.19	122.97	7,336.27	-212.99	2,600.26	202.55	7.77	5.13	14.78	
7,934.00	29.93	138.81	7,418.80	-241.28	2,632.21	230.71	9.35	5.10	17.03	
8,028.00	35.67	149.46	7,497.85	-282.60	2,661.63	271.91	8.64	6.11	11.33	
8,121.00	43.89	159.60	7,569.33	-336.31	2,686.71	325.53	11.24	8.84	10.90	
8,214.00	51.29	159.70	7,632.01	-400.65	2,710.57	389.77	7.96	7.96	0.11	

<b>Company:</b>	ANADARKO PETROLEUM CORP	<b>Local Co-ordinate Reference:</b>	Well MAE J 8-1HZ
<b>Project:</b>	Weld County, CO (UTM-NAD83)	<b>TVD Reference:</b>	20' KB + 5083' GE @ 5103.00usft
<b>Site:</b>	MAE J 14-8HZ	<b>MD Reference:</b>	20' KB + 5083' GE @ 5103.00usft
<b>Well:</b>	MAE J 8-1HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	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)	
8,308.00	57.27	160.40	7,686.87	-472.36	2,736.58	461.37	6.39	6.36	0.74	
8,401.00	62.84	164.44	7,733.29	-549.15	2,760.83	538.06	7.07	5.99	4.34	
8,494.00	71.03	169.45	7,769.71	-632.43	2,780.02	621.26	10.10	8.81	5.39	
8,586.00	76.05	173.77	7,795.78	-719.67	2,792.85	708.45	7.07	5.46	4.70	
8,679.00	79.51	177.34	7,815.47	-810.26	2,799.87	799.01	5.28	3.72	3.84	
8,772.00	83.99	179.79	7,828.81	-902.24	2,802.16	890.98	5.48	4.82	2.63	
8,782.07	84.38	180.15	7,829.83	-912.26	2,802.17	901.00	5.24	3.89	3.53	
<b>Heel (MAE J 8-1HZ)</b>										
8,867.00	87.69	183.13	7,835.70	-996.92	2,799.74	985.67	5.24	3.90	3.51	
<b>LP: 135' FNL, 118' FEL Sec 17 T1N R68W</b>										
8,960.00	90.81	180.00	7,836.92	-1,089.86	2,797.20	1,078.62	4.75	3.35	-3.37	
9,052.00	90.54	179.48	7,835.84	-1,181.85	2,797.62	1,170.61	0.64	-0.29	-0.57	
9,146.00	89.90	177.94	7,835.48	-1,275.82	2,799.74	1,264.57	1.77	-0.68	-1.64	
9,175.73	90.31	178.63	7,835.42	-1,305.54	2,800.63	1,294.29	2.70	1.37	2.33	
<b>Exit Heel Circle: 9175.73' MD, 443' FNL, 116' FEL</b>										
9,240.00	91.19	180.13	7,834.58	-1,369.80	2,801.32	1,358.54	2.70	1.37	2.33	
9,334.00	90.61	179.71	7,833.11	-1,463.79	2,801.45	1,452.53	0.76	-0.62	-0.45	
9,429.00	90.08	178.56	7,832.53	-1,558.77	2,802.89	1,547.51	1.33	-0.56	-1.21	
9,523.00	89.19	180.94	7,833.13	-1,652.76	2,803.30	1,641.49	2.70	-0.95	2.53	
9,616.00	89.51	180.29	7,834.19	-1,745.75	2,802.30	1,734.48	0.78	0.34	-0.70	
9,708.00	89.76	180.43	7,834.77	-1,837.74	2,801.72	1,826.48	0.31	0.27	0.15	
9,803.00	91.08	181.69	7,834.08	-1,932.72	2,799.96	1,921.47	1.92	1.39	1.33	
9,897.00	91.71	181.97	7,831.79	-2,026.65	2,796.96	2,015.40	0.73	0.67	0.30	
9,991.00	92.12	179.72	7,828.65	-2,120.58	2,795.58	2,109.34	2.43	0.44	-2.39	
10,085.00	90.99	181.68	7,826.10	-2,214.53	2,794.43	2,203.29	2.41	-1.20	2.09	
10,179.00	89.08	180.34	7,826.04	-2,308.51	2,792.77	2,297.28	2.48	-2.03	-1.43	
10,270.00	89.30	178.58	7,827.33	-2,399.49	2,793.63	2,388.26	1.95	0.24	-1.93	
10,363.00	88.83	180.10	7,828.84	-2,492.47	2,794.70	2,481.23	1.71	-0.51	1.63	
10,457.00	89.14	179.52	7,830.51	-2,586.45	2,795.01	2,575.21	0.70	0.33	-0.62	
10,549.00	90.14	181.32	7,831.09	-2,678.44	2,794.34	2,667.21	2.24	1.09	1.96	
10,642.00	91.43	180.46	7,829.81	-2,771.42	2,792.89	2,760.19	1.67	1.39	-0.92	
10,734.00	91.11	181.67	7,827.77	-2,863.38	2,791.18	2,852.15	1.36	-0.35	1.32	
10,827.00	89.55	180.61	7,827.24	-2,956.36	2,789.33	2,945.14	2.03	-1.68	-1.14	
10,920.00	90.04	179.06	7,827.57	-3,049.35	2,789.60	3,038.13	1.75	0.53	-1.67	
11,013.00	91.38	182.34	7,826.42	-3,142.32	2,788.47	3,131.10	3.81	1.44	3.53	
11,105.00	91.46	182.65	7,824.14	-3,234.21	2,784.46	3,223.00	0.35	0.09	0.34	
11,199.00	88.61	182.24	7,824.08	-3,328.11	2,780.45	3,316.92	3.06	-3.03	-0.44	
11,292.00	88.84	182.51	7,826.15	-3,421.01	2,776.60	3,409.84	0.38	0.25	0.29	
11,385.00	89.04	182.01	7,827.87	-3,513.92	2,772.93	3,502.76	0.58	0.22	-0.54	
11,480.00	89.36	181.39	7,829.20	-3,608.87	2,770.11	3,597.72	0.73	0.34	-0.65	
11,574.00	89.30	180.06	7,830.30	-3,702.85	2,768.92	3,691.71	1.42	-0.06	-1.41	
11,667.00	90.12	179.13	7,830.77	-3,795.85	2,769.58	3,784.70	1.33	0.88	-1.00	
11,761.00	90.14	177.73	7,830.55	-3,889.81	2,772.16	3,878.65	1.49	0.02	-1.49	
11,854.00	90.43	181.06	7,830.09	-3,982.79	2,773.14	3,971.63	3.59	0.31	3.58	

<b>Company:</b>	ANADARKO PETROLEUM CORP	<b>Local Co-ordinate Reference:</b>	Well MAE J 8-1HZ
<b>Project:</b>	Weld County, CO (UTM-NAD83)	<b>TVD Reference:</b>	20' KB + 5083' GE @ 5103.00usft
<b>Site:</b>	MAE J 14-8HZ	<b>MD Reference:</b>	20' KB + 5083' GE @ 5103.00usft
<b>Well:</b>	MAE J 8-1HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	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)	
11,947.00	89.98	180.13	7,829.76	-4,075.78	2,772.17	4,064.62	1.11	-0.48	-1.00	
12,042.00	89.34	178.80	7,830.32	-4,170.78	2,773.06	4,159.61	1.55	-0.67	-1.40	
12,135.00	89.90	180.63	7,830.94	-4,263.77	2,773.52	4,252.60	2.06	0.60	1.97	
12,230.00	90.64	179.89	7,830.49	-4,358.76	2,773.09	4,347.60	1.10	0.78	-0.78	
12,322.00	90.32	179.26	7,829.72	-4,450.76	2,773.77	4,439.59	0.77	-0.35	-0.68	
12,414.00	90.69	178.45	7,828.91	-4,542.74	2,775.61	4,531.56	0.97	0.40	-0.88	
12,508.00	89.71	178.23	7,828.58	-4,636.69	2,778.34	4,625.50	1.07	-1.04	-0.23	
12,602.00	90.18	179.95	7,828.67	-4,730.68	2,779.83	4,719.48	1.90	0.50	1.83	
12,695.00	90.62	181.37	7,828.02	-4,823.67	2,778.76	4,812.47	1.60	0.47	1.53	
12,789.00	89.08	178.21	7,828.27	-4,917.65	2,779.10	4,906.46	3.74	-1.64	-3.36	
12,882.00	88.58	181.31	7,830.17	-5,010.62	2,779.49	4,999.42	3.38	-0.54	3.33	
12,975.00	91.38	180.45	7,830.20	-5,103.60	2,778.06	5,092.41	3.15	3.01	-0.92	
13,068.00	88.27	178.71	7,830.49	-5,196.58	2,778.74	5,185.38	3.83	-3.34	-1.87	
13,162.00	90.43	181.12	7,831.55	-5,290.56	2,778.88	5,279.36	3.44	2.30	2.56	
13,256.00	91.02	180.86	7,830.36	-5,384.54	2,777.26	5,373.35	0.69	0.63	-0.28	
13,350.00	91.80	180.39	7,828.05	-5,478.51	2,776.23	5,467.32	0.97	0.83	-0.50	
13,444.00	90.61	181.71	7,826.07	-5,572.46	2,774.51	5,561.28	1.89	-1.27	1.40	
13,536.00	90.22	179.64	7,825.41	-5,664.45	2,773.43	5,653.27	2.29	-0.42	-2.25	
13,554.82	89.86	178.96	7,825.39	-5,683.27	2,773.66	5,672.09	4.08	-1.94	-3.59	
<b>Enter Toe Circle: 13554.82' MD 440' FSL, 136' FEL</b>										
13,630.00	88.40	176.26	7,826.54	-5,758.37	2,776.79	5,747.17	4.08	-1.94	-3.60	
13,724.00	88.70	180.28	7,828.92	-5,852.27	2,779.63	5,841.07	4.29	0.32	4.28	
13,817.00	91.22	180.25	7,828.98	-5,945.27	2,779.20	5,934.06	2.71	2.71	-0.03	
13,889.00	91.48	180.35	7,827.29	-6,017.24	2,778.82	6,006.04	0.39	0.36	0.14	
13,943.00	91.48	180.35	7,825.89	-6,071.23	2,778.49	6,060.02	0.00	0.00	0.00	
<b>PBHL (MAE J 8-1HZ) - BHL: 54' FSL, 131' FEL Sec 17 T1N R68W</b>										

<b>Company:</b>	ANADARKO PETROLEUM CORP	<b>Local Co-ordinate Reference:</b>	Well MAE J 8-1HZ
<b>Project:</b>	Weld County, CO (UTM-NAD83)	<b>TVD Reference:</b>	20' KB + 5083' GE @ 5103.00usft
<b>Site:</b>	MAE J 14-8HZ	<b>MD Reference:</b>	20' KB + 5083' GE @ 5103.00usft
<b>Well:</b>	MAE J 8-1HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	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: 896' FSL, 2420' FV - actual wellpath hits target center - Point	0.00	0.00	0.00	0.00	0.00	14,548,842.20	1,632,414.30	40.060711	-105.028600	
Enter Land Box: 7477.3' - actual wellpath hits target center - Point	0.00	0.00	7,000.44	-161.41	2,471.09	14,548,680.00	1,634,885.33	40.060268	-105.019769	
Curve KOP (Mae J 8-1H) - actual wellpath hits target center - Point	0.00	0.00	7,271.07	-199.77	2,575.52	14,548,641.60	1,634,989.75	40.060162	-105.019396	
Enter Toe Circle: 13554. - actual wellpath hits target center - Point	0.00	0.00	7,825.39	-5,683.27	2,773.66	14,543,158.04	1,635,186.13	40.045103	-105.018690	
BHL: 54' FSL, 131' FEL - actual wellpath misses target center by 0.01usft at 13943.00usft MD (7825.89 TVD, -6071.23 N, 2778.49 E) - Point	0.00	0.00	7,825.89	-6,071.23	2,778.49	14,542,770.08	1,635,190.84	40.044038	-105.018673	
Exit Heel Circle: 9175.7' - actual wellpath misses target center by 0.01usft at 9175.73usft MD (7835.42 TVD, -1305.54 N, 2800.63 E) - Point	0.00	0.00	7,835.42	-1,305.54	2,800.63	14,547,535.76	1,635,214.51	40.057125	-105.018592	
LP: 135' FNL, 118' FEL - actual wellpath misses target center by 0.01usft at 8867.00usft MD (7835.70 TVD, -996.92 N, 2799.74 E) - Point	0.00	0.00	7,835.70	-996.92	2,799.74	14,547,844.38	1,635,213.72	40.057973	-105.018595	

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")	
1,904.00	1,850.75	9 5/8"	9-5/8	13-1/2	

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_