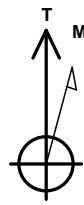


# ANADARKO PETROLEUM CORP

Project: Weld County, CO (UTM-NAD83)  
 Site: MAE J 14-8HZ  
 Well: MAE J 8-4HZ  
 Wellbore: OH  
 Design: OH

20' KB + 5083' GE @ 5103.00usft



Azimuths to True North  
 Magnetic North: 8.08°

Magnetic Field  
 Strength: 51928.7nT  
 Dip Angle: 66.49°  
 Date: 9/19/2019  
 Model: IGRF2015

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

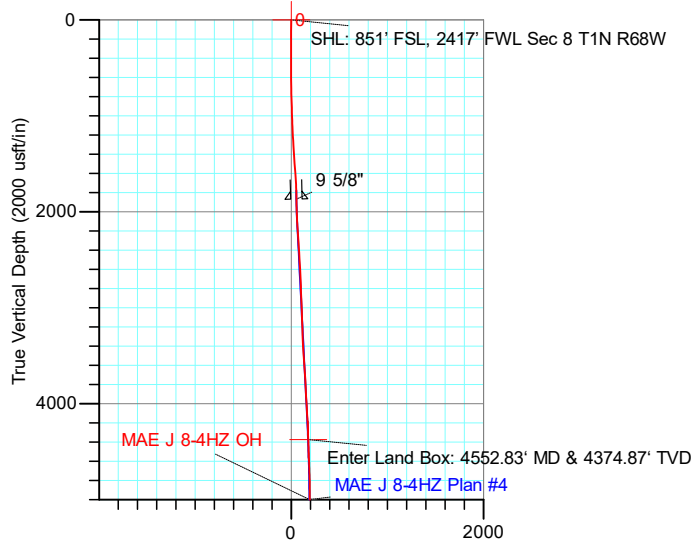
Geodetic System: Universal Transverse Mercator (US Survey Feet)  
 Datum: North American Datum 1983  
 Ellipsoid: GRS 1980  
 Zone: Zone 13N (108 W to 102 W)



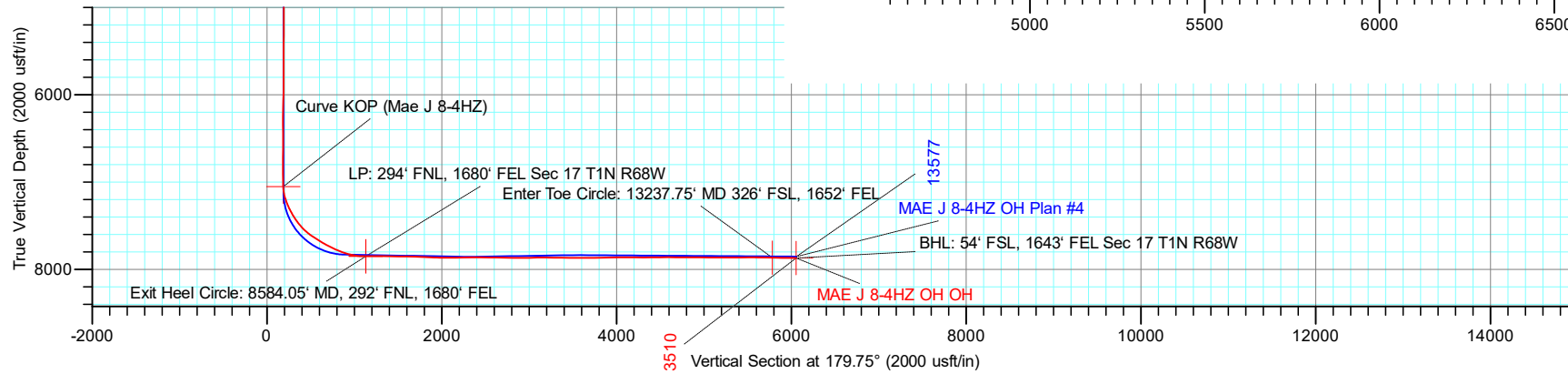
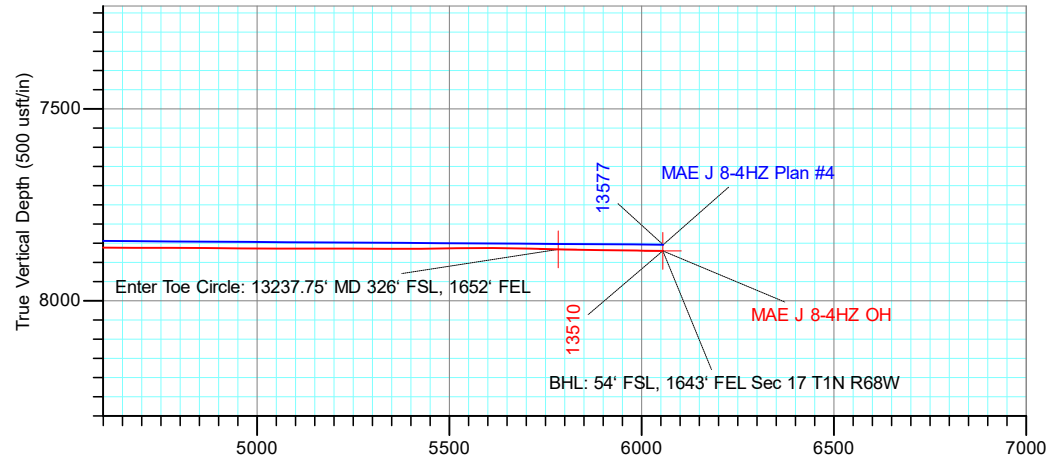
## DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
BHL: 54' FSL, 1643' FEL Sec 17 T1N R68W	7870.02	-6049.67	1266.73	40.043973	-105.024074
Curve KOP (Mae J 8-4HZ)	7052.96	-181.00	1225.40	40.060090	-105.024221
Enter Land Box: 4552.83' MD & 4374.87' TVD	4374.87	-172.57	1142.02	40.060113	-105.024519
Enter Toe Circle: 13237.75' MD 326' FSL, 1652' FEL	7866.08	-5777.65	1256.41	40.044721	-105.024111
Exit Heel Circle: 8584.05' MD, 292' FNL, 1680' FEL	7850.03	-1125.22	1239.69	40.057497	-105.024170
LP: 294' FNL, 1680' FEL Sec 17 T1N R68W	7849.96	-1127.17	1239.72	40.057492	-105.024170
SHL: 851' FSL, 2417' FWL Sec 8 T1N R68W	0.00	0.00	0.00	40.060587	-105.028600

## 1N-68W-17



**ACTUAL LINE CALLS**  
**SHL: 851' FSL, 2417' FWL Sec 8 T1N R68W**  
**HEEL: 294' FNL, 1680' FEL Sec 17 T1N R68W**  
**BHL: 54' FSL, 1643' FEL Sec 17 T1N R68W**



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

Design: OH (MAE J 8-4HZ/OH)  
 MAE J 14-8HZ  
 Created By: Dustin Ault Date: 14:35, March 10 2020  
 Date: \_\_\_\_\_  
 Approved: \_\_\_\_\_ Date: \_\_\_\_\_

# ANADARKO PETROLEUM CORP

Project: Weld County, CO (UTM-NAD83)  
 Site: MAE J 14-8HZ  
 Well: MAE J 8-4HZ  
 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°

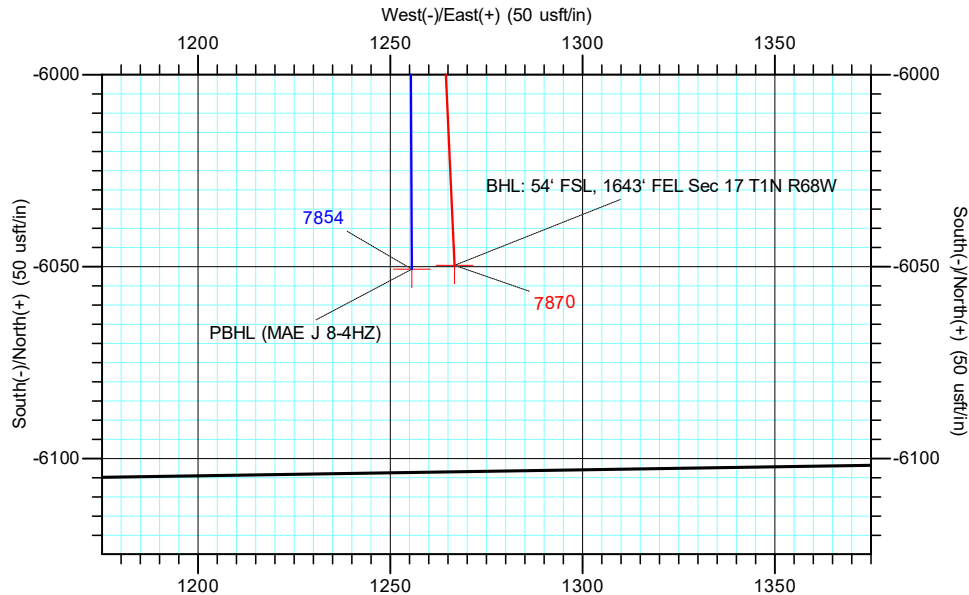
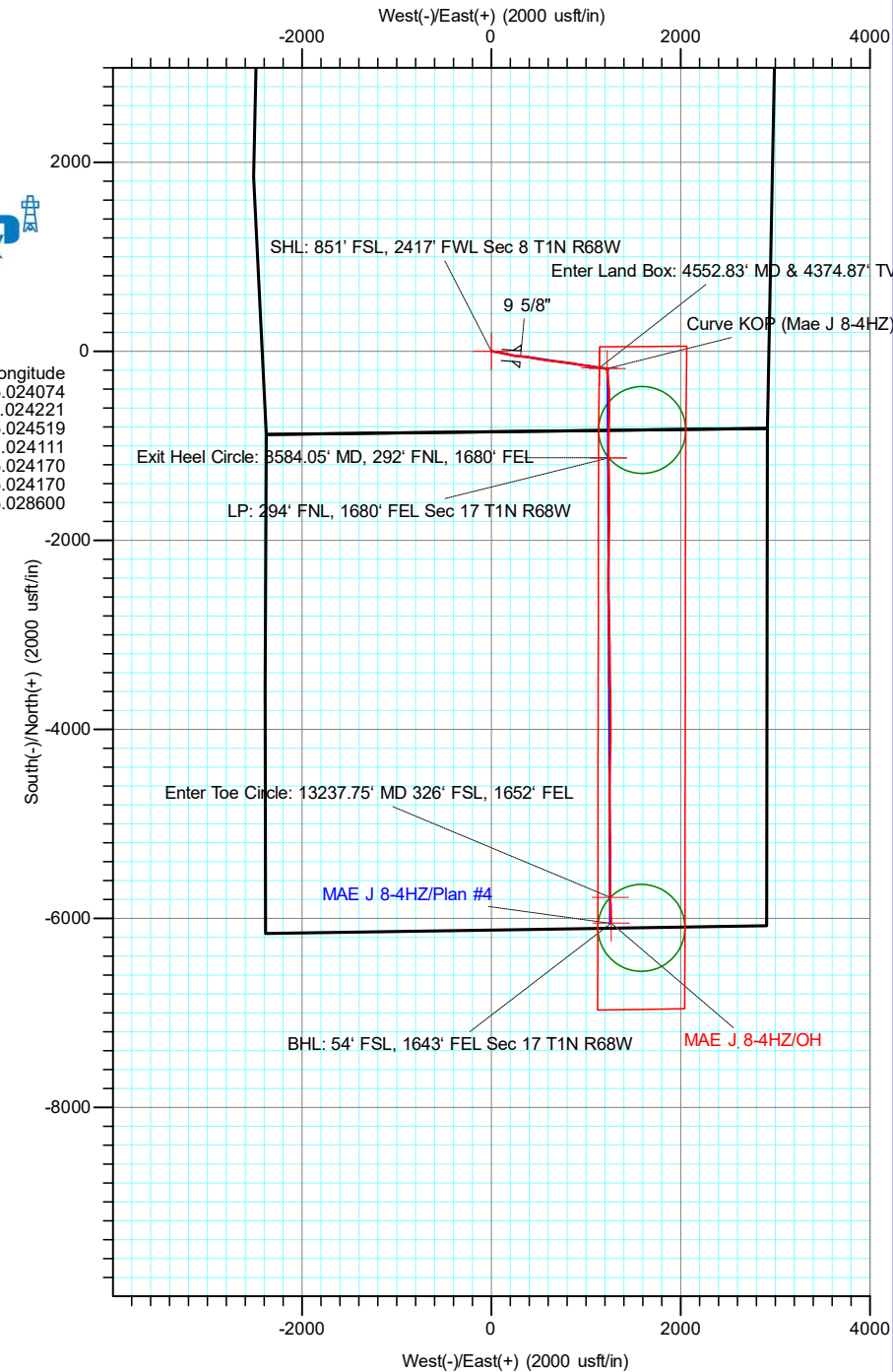
Magnetic Field  
 Strength: 51928.7nT  
 Dip Angle: 66.49°  
 Date: 9/19/2019  
 Model: IGRF2015



### DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
BHL: 54' FSL, 1643' FEL Sec 17 T1N R68W	7870.02	-6049.67	1266.73	14542746.97	1633679.08	40.043973	-105.024074
Curve KOP (Mae J 8-4HZ)	7052.96	-181.00	1225.40	14548615.66	1633639.63	40.060090	-105.024221
Enter Land Box: 4552.83' MD & 4374.87' TVD	4374.87	-172.57	1142.02	14548624.11	1633556.25	40.060113	-105.024519
Enter Toe Circle: 13237.75' MD 326' FSL, 1652' FEL	7866.08	-5777.65	1256.41	14543019.00	1633668.84	40.044721	-105.024111
Exit Heel Circle: 8584.05' MD, 292' FNL, 1680' FEL	7850.03	-1125.22	1239.69	14547671.43	1633653.62	40.057497	-105.024170
LP: 294' FNL, 1680' FEL Sec 17 T1N R68W	7849.96	-1127.17	1239.72	14547669.48	1633653.65	40.057492	-105.024170
SHL: 851' FSL, 2417' FWL Sec 8 T1N R68W	0.00	0.00	0.00	14548797.05	1632414.29	40.060587	-105.028600

**ACTUAL LINE CALLS**  
**SHL: 851' FSL, 2417' FWL Sec 8 T1N R68W**  
**HEEL: 294' FNL, 1680' FEL Sec 17 T1N R68W**  
**BHL: 54' FSL, 1643' FEL Sec 17 T1N R68W**



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

Design: OH (MAE J 8-4HZ/OH)  
 MAE J 14-8HZ  
 Created By: Dustin Ault  
 Date: \_\_\_\_\_  
 Approved: \_\_\_\_\_  
 Date: 14:36, March 10 2020



# **ANADARKO PETROLEUM CORP**

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

**MAE J 14-8HZ**

**MAE J 8-4HZ**

**OH**

**Design: OH**

## **Standard Survey Report**

**10 March, 2020**



<b>Company:</b>	ANADARKO PETROLEUM CORP	<b>Local Co-ordinate Reference:</b>	Well MAE J 8-4HZ
<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 8-4HZ	<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 8-4HZ					
<b>Well Position</b>	<b>+N/-S</b>	0.00 usft	<b>Northing:</b>	14,548,797.05 usft	<b>Latitude:</b>	40.060587
	<b>+E/-W</b>	0.00 usft	<b>Easting:</b>	1,632,414.29 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	51,928.73388463

<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	179.75	

<b>Survey Program</b>	<b>Date</b>	3/10/2020			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
120.00	1,814.27	Survey #2 - Surface Gyro (OH)	APC_NS-GYRO-MS	North sensing gyrocompassing m/s	
1,814.27	13,456.00	Survey #3 - MWD+IFR (OH)	APC_ISCWSA REV 2 MWD+	Fixed:v2:crustal field declination	
13,510.00	13,510.00	Survey #4 - 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: 851' FSL, 2417' FWL Sec 8 T1N R68W - SHL (MAE J 8-4HZ)</b>										
120.00	0.23	271.21	120.00	0.01	-0.24	-0.01	0.19	0.19	0.00	
220.00	0.33	341.02	220.00	0.28	-0.54	-0.29	0.33	0.10	69.81	
320.00	0.51	283.66	320.00	0.66	-1.07	-0.67	0.44	0.18	-57.36	
420.00	2.13	72.93	419.98	1.31	0.27	-1.31	2.58	1.61	149.27	
520.00	3.93	87.69	519.83	2.00	5.47	-1.97	1.95	1.80	14.76	
620.00	5.01	99.70	619.53	1.40	13.20	-1.34	1.43	1.08	12.01	
720.00	6.55	102.30	719.02	-0.55	23.08	0.66	1.56	1.54	2.60	

<b>Company:</b>	ANADARKO PETROLEUM CORP	<b>Local Co-ordinate Reference:</b>	Well MAE J 8-4HZ
<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 8-4HZ	<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)	
820.00	7.74	101.44	818.24	-3.11	35.26	3.26	1.19	1.19	-0.86	
920.00	9.22	99.70	917.15	-5.79	49.75	6.01	1.50	1.48	-1.74	
1,020.00	10.38	100.90	1,015.69	-8.84	66.49	9.13	1.18	1.16	1.20	
1,120.00	12.55	100.76	1,113.69	-12.57	86.01	12.95	2.17	2.17	-0.14	
1,220.00	14.15	101.32	1,210.98	-17.00	108.67	17.48	1.61	1.60	0.56	
1,320.00	15.92	101.35	1,307.55	-22.10	134.10	22.68	1.77	1.77	0.03	
1,420.00	18.13	101.62	1,403.16	-27.93	162.80	28.64	2.21	2.21	0.27	
1,520.00	18.10	102.24	1,498.21	-34.36	193.22	35.20	0.20	-0.03	0.62	
1,620.00	18.78	102.91	1,593.07	-41.24	224.08	42.22	0.71	0.68	0.68	
1,720.00	18.17	99.54	1,687.92	-47.42	255.15	48.54	1.23	-0.61	-3.37	
1,814.27	15.93	94.17	1,778.05	-50.80	282.55	52.03	2.90	-2.37	-5.70	
1,910.00	16.54	94.02	1,869.96	-52.71	309.25	54.06	0.64	0.64	-0.16	
<b>9 5/8"</b>										
1,933.00	16.69	93.98	1,892.00	-53.17	315.81	54.55	0.64	0.64	-0.15	
2,026.00	18.39	95.70	1,980.68	-55.55	343.73	57.05	1.91	1.83	1.85	
2,118.00	17.85	96.27	2,068.11	-58.54	372.19	60.16	0.62	-0.59	0.62	
2,212.00	19.60	101.11	2,157.14	-63.15	401.98	64.90	2.49	1.86	5.15	
2,306.00	18.96	100.68	2,245.87	-69.02	432.46	70.90	0.70	-0.68	-0.46	
2,400.00	18.19	101.93	2,334.97	-74.88	461.82	76.89	0.92	-0.82	1.33	
2,493.00	19.20	99.37	2,423.06	-80.37	491.11	82.51	1.40	1.09	-2.75	
2,586.00	18.60	98.72	2,511.05	-85.11	520.86	87.38	0.68	-0.65	-0.70	
2,679.00	19.13	98.57	2,599.05	-89.63	550.59	92.03	0.57	0.57	-0.16	
2,772.00	18.34	98.27	2,687.12	-94.00	580.14	96.53	0.86	-0.85	-0.32	
2,866.00	19.07	95.66	2,776.16	-97.64	610.05	100.31	1.18	0.78	-2.78	
2,959.00	17.99	96.73	2,864.34	-100.83	639.44	103.62	1.22	-1.16	1.15	
3,054.00	19.44	96.08	2,954.31	-104.22	669.73	107.14	1.54	1.53	-0.68	
3,149.00	17.80	96.14	3,044.34	-107.45	699.89	110.50	1.73	-1.73	0.06	
3,245.00	18.53	94.74	3,135.55	-110.28	729.68	113.46	0.89	0.76	-1.46	
3,337.00	18.53	95.09	3,222.78	-112.78	758.81	116.09	0.12	0.00	0.38	
3,430.00	19.52	97.51	3,310.70	-116.12	788.93	119.57	1.36	1.06	2.60	
3,523.00	19.28	97.54	3,398.42	-120.17	819.56	123.74	0.26	-0.26	0.03	
3,618.00	18.98	99.68	3,488.18	-124.83	850.34	128.53	0.80	-0.32	2.25	
3,712.00	18.97	100.49	3,577.07	-130.18	880.43	134.02	0.28	-0.01	0.86	
3,805.00	18.42	103.49	3,665.17	-136.36	909.58	140.32	1.19	-0.59	3.23	
3,898.00	18.91	99.85	3,753.28	-142.36	938.72	146.46	1.36	0.53	-3.91	
3,992.00	19.09	96.32	3,842.16	-146.66	969.00	150.89	1.24	0.19	-3.76	
4,086.00	19.30	98.24	3,930.93	-150.58	999.65	154.94	0.71	0.22	2.04	
4,179.00	19.86	100.04	4,018.56	-155.54	1,030.42	160.03	0.88	0.60	1.94	
4,272.00	17.93	100.02	4,106.54	-160.78	1,060.08	165.41	2.08	-2.08	-0.02	
4,364.00	17.14	99.25	4,194.27	-165.42	1,087.40	170.17	0.89	-0.86	-0.84	
4,457.00	17.33	97.00	4,283.09	-169.32	1,114.68	174.18	0.75	0.20	-2.42	
4,550.00	16.11	96.59	4,372.16	-172.48	1,141.24	177.46	1.32	-1.31	-0.44	
4,552.82	16.05	96.58	4,374.87	-172.57	1,142.02	177.56	2.28	-2.28	-0.45	
<b>Enter Land Box: 4552.83' MD &amp; 4374.87' TVD</b>										

<b>Company:</b>	ANADARKO PETROLEUM CORP	<b>Local Co-ordinate Reference:</b>	Well MAE J 8-4HZ
<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 8-4HZ	<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)	
4,643.00	13.99	96.11	4,461.96	-175.16	1,165.24	180.24	2.28	-2.28	-0.52	
4,737.00	11.47	102.52	4,553.65	-178.40	1,185.67	183.57	3.07	-2.68	6.82	
4,831.00	9.38	104.18	4,646.09	-182.30	1,202.22	187.55	2.25	-2.22	1.77	
4,924.00	7.37	104.44	4,738.10	-185.65	1,215.34	190.95	2.16	-2.16	0.28	
5,018.00	5.31	96.40	4,831.52	-187.63	1,225.51	192.98	2.38	-2.19	-8.55	
5,112.00	2.58	76.33	4,925.29	-187.62	1,231.89	192.99	3.21	-2.90	-21.35	
5,230.00	0.25	115.53	5,043.25	-187.10	1,234.70	192.49	2.03	-1.97	33.22	
5,323.00	0.19	322.35	5,136.25	-187.07	1,234.79	192.45	0.46	-0.06	-164.71	
5,416.00	0.14	274.07	5,229.25	-186.94	1,234.58	192.32	0.15	-0.05	-51.91	
5,509.00	0.56	285.43	5,322.24	-186.81	1,234.03	192.19	0.46	0.45	12.22	
5,602.00	0.93	281.85	5,415.24	-186.53	1,232.85	191.91	0.40	0.40	-3.85	
5,695.00	0.93	273.52	5,508.22	-186.33	1,231.36	191.70	0.15	0.00	-8.96	
5,789.00	1.29	270.62	5,602.21	-186.27	1,229.54	191.64	0.39	0.38	-3.09	
5,882.00	0.67	263.99	5,695.19	-186.32	1,227.95	191.67	0.68	-0.67	-7.13	
5,974.00	0.61	279.66	5,787.19	-186.29	1,226.94	191.64	0.20	-0.07	17.03	
6,066.00	0.86	277.04	5,879.18	-186.13	1,225.77	191.47	0.27	0.27	-2.85	
6,160.00	1.56	336.89	5,973.16	-184.86	1,224.57	190.20	1.44	0.74	63.67	
6,253.00	1.66	349.44	6,066.12	-182.37	1,223.82	187.71	0.39	0.11	13.49	
6,346.00	1.48	345.67	6,159.09	-179.89	1,223.28	185.22	0.22	-0.19	-4.05	
6,439.00	0.35	283.29	6,252.08	-178.66	1,222.70	183.99	1.46	-1.22	-67.08	
6,533.00	0.43	84.93	6,346.08	-178.56	1,222.78	183.89	0.82	0.09	171.96	
6,626.00	0.74	253.46	6,439.07	-178.70	1,222.55	184.03	1.25	0.33	181.22	
6,719.00	1.03	235.92	6,532.06	-179.34	1,221.28	184.67	0.42	0.31	-18.86	
6,812.00	0.92	58.49	6,625.06	-179.42	1,221.22	184.74	2.10	-0.12	-190.78	
6,905.00	1.44	68.57	6,718.04	-178.60	1,222.95	183.93	0.60	0.56	10.84	
6,998.00	1.02	76.73	6,811.02	-177.98	1,224.84	183.33	0.49	-0.45	8.77	
7,091.00	0.44	144.20	6,904.01	-178.08	1,225.86	183.43	1.01	-0.62	72.55	
7,184.00	0.79	213.78	6,997.01	-178.91	1,225.71	184.25	0.82	0.38	74.82	
7,240.00	3.63	183.06	7,052.96	-181.00	1,225.40	186.34	5.32	5.07	-54.86	
<b>Curve KOP (Mae J 8-4HZ)</b>										
7,278.00	5.64	180.27	7,090.83	-184.07	1,225.33	189.41	5.32	5.29	-7.34	
7,372.00	17.10	178.68	7,182.84	-202.56	1,225.62	207.91	12.19	12.19	-1.69	
7,467.00	23.66	175.89	7,271.84	-235.58	1,227.31	240.93	6.98	6.91	-2.94	
7,560.00	29.03	175.66	7,355.15	-276.72	1,230.36	282.09	5.78	5.77	-0.25	
7,653.00	35.05	173.43	7,433.95	-325.80	1,235.13	331.18	6.60	6.47	-2.40	
7,747.00	41.19	174.02	7,507.87	-383.45	1,241.45	388.86	6.54	6.53	0.63	
7,841.00	49.61	179.00	7,573.83	-450.17	1,245.31	455.60	9.71	8.96	5.30	
7,934.00	57.11	180.04	7,629.30	-524.73	1,245.90	530.16	8.11	8.06	1.12	
8,027.00	57.92	180.30	7,679.24	-603.18	1,245.66	608.61	0.90	0.87	0.28	
8,120.00	62.56	180.50	7,725.39	-683.89	1,245.10	689.32	4.99	4.99	0.22	
8,213.00	65.04	181.17	7,766.45	-767.32	1,243.88	772.74	2.74	2.67	0.72	
8,307.00	69.89	181.80	7,802.47	-854.09	1,241.62	859.50	5.20	5.16	0.67	
8,347.56	72.52	181.38	7,815.53	-892.46	1,240.55	897.87	6.56	6.48	-1.03	

<b>Company:</b>	ANADARKO PETROLEUM CORP	<b>Local Co-ordinate Reference:</b>	Well MAE J 8-4HZ
<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 8-4HZ	<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)
<b>Heel (MAE J 8-4HZ)</b>									
8,400.00	75.92	180.86	7,829.79	-942.91	1,239.57	948.31	6.56	6.48	-1.00
8,493.00	83.37	179.84	7,846.50	-1,034.33	1,239.02	1,039.73	8.08	8.01	-1.10
8,584.06	92.17	179.31	7,850.03	-1,125.22	1,239.69	1,130.62	9.68	9.67	-0.58
<b>Exit Heel Circle: 8584.05' MD, 292' FNL, 1680' FEL</b>									
8,586.00	92.36	179.30	7,849.96	-1,127.17	1,239.72	1,132.57	9.67	9.65	-0.58
<b>LP: 294' FNL, 1680' FEL Sec 17 T1N R68W</b>									
8,679.00	89.85	178.71	7,848.16	-1,220.13	1,241.33	1,225.53	2.77	-2.70	-0.63
8,772.00	88.87	179.43	7,849.20	-1,313.11	1,242.84	1,318.52	1.31	-1.05	0.77
8,866.00	88.85	179.07	7,851.07	-1,407.08	1,244.07	1,412.50	0.38	-0.02	-0.38
8,960.00	89.40	179.04	7,852.51	-1,501.06	1,245.62	1,506.48	0.59	0.59	-0.03
9,052.00	88.94	180.49	7,853.84	-1,593.04	1,246.00	1,598.47	1.65	-0.50	1.58
9,146.00	88.92	180.38	7,855.60	-1,687.02	1,245.29	1,692.44	0.12	-0.02	-0.12
9,239.00	87.10	180.30	7,858.83	-1,779.96	1,244.73	1,785.38	1.96	-1.96	-0.09
9,333.00	87.31	179.76	7,863.41	-1,873.85	1,244.68	1,879.26	0.62	0.22	-0.57
9,429.00	89.11	181.28	7,866.41	-1,969.79	1,243.81	1,975.20	2.45	1.88	1.58
9,523.00	89.15	181.06	7,867.84	-2,063.76	1,241.89	2,069.16	0.24	0.04	-0.23
9,616.00	91.14	181.70	7,867.60	-2,156.73	1,239.65	2,162.12	2.25	2.14	0.69
9,704.14	91.63	181.67	7,865.47	-2,244.81	1,237.06	2,250.19	0.56	0.55	-0.03
<b>Interm TGT#1 (MAE J 8-4HZ)</b>									
9,708.00	91.65	181.67	7,865.36	-2,248.66	1,236.95	2,254.04	0.56	0.55	-0.03
9,802.00	90.58	179.98	7,863.53	-2,342.63	1,235.60	2,348.00	2.13	-1.14	-1.80
9,896.00	89.70	180.14	7,863.30	-2,436.63	1,235.50	2,442.00	0.95	-0.94	0.17
9,990.00	89.36	179.56	7,864.07	-2,530.63	1,235.74	2,535.99	0.72	-0.36	-0.62
10,084.00	89.14	178.41	7,865.30	-2,624.60	1,237.41	2,629.98	1.25	-0.23	-1.22
10,178.00	88.58	177.65	7,867.17	-2,718.53	1,240.64	2,723.91	1.00	-0.60	-0.81
10,270.00	89.49	179.10	7,868.72	-2,810.47	1,243.25	2,815.87	1.86	0.99	1.58
10,362.00	89.80	178.88	7,869.29	-2,902.46	1,244.87	2,907.86	0.41	0.34	-0.24
10,456.00	91.57	178.66	7,868.17	-2,996.42	1,246.89	3,001.84	1.90	1.88	-0.23
10,549.00	91.29	178.87	7,865.85	-3,089.37	1,248.89	3,094.79	0.38	-0.30	0.23
10,642.00	89.40	179.15	7,865.29	-3,182.35	1,250.50	3,187.78	2.05	-2.03	0.30
10,734.00	89.29	179.38	7,866.34	-3,274.34	1,251.68	3,279.77	0.28	-0.12	0.25
10,826.00	89.03	179.58	7,867.69	-3,366.33	1,252.51	3,371.76	0.36	-0.28	0.22
10,919.00	89.24	178.96	7,869.09	-3,459.31	1,253.70	3,464.74	0.70	0.23	-0.67
10,954.03	89.63	179.12	7,869.44	-3,494.33	1,254.28	3,499.77	1.20	1.11	0.46
<b>Interm TGT#2 (MAE J 8-4HZ)</b>									
11,013.00	90.28	179.39	7,869.49	-3,553.30	1,255.05	3,558.74	1.20	1.11	0.46
11,105.00	89.92	178.60	7,869.33	-3,645.28	1,256.67	3,650.73	0.94	-0.39	-0.86
11,199.00	91.33	179.98	7,868.30	-3,739.26	1,257.83	3,744.72	2.10	1.50	1.47
11,292.00	91.45	179.39	7,866.04	-3,832.23	1,258.34	3,837.69	0.65	0.13	-0.63
11,384.00	90.66	180.76	7,864.35	-3,924.21	1,258.22	3,929.67	1.72	-0.86	1.49
11,479.00	89.98	178.99	7,863.82	-4,019.21	1,258.43	4,024.66	2.00	-0.72	-1.86
11,573.00	90.21	181.26	7,863.66	-4,113.20	1,258.22	4,118.65	2.43	0.24	2.41
11,667.00	89.57	180.25	7,863.84	-4,207.19	1,256.98	4,212.64	1.27	-0.68	-1.07

<b>Company:</b>	ANADARKO PETROLEUM CORP	<b>Local Co-ordinate Reference:</b>	Well MAE J 8-4HZ
<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 8-4HZ	<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)
11,761.00	90.24	181.86	7,864.00	-4,301.17	1,255.25	4,306.61	1.86	0.71	1.71
11,854.00	90.55	181.43	7,863.36	-4,394.13	1,252.58	4,399.56	0.57	0.33	-0.46
11,947.00	90.76	180.78	7,862.30	-4,487.11	1,250.79	4,492.52	0.73	0.23	-0.70
12,041.00	89.86	180.99	7,861.79	-4,581.09	1,249.34	4,586.50	0.98	-0.96	0.22
12,135.00	89.87	180.34	7,862.01	-4,675.09	1,248.25	4,680.49	0.69	0.01	-0.69
12,230.00	89.74	179.83	7,862.33	-4,770.09	1,248.11	4,775.49	0.55	-0.14	-0.54
12,322.00	89.44	179.14	7,862.99	-4,862.08	1,248.93	4,867.48	0.82	-0.33	-0.75
12,414.00	89.55	179.36	7,863.80	-4,954.07	1,250.14	4,959.48	0.27	0.12	0.24
12,507.00	90.03	178.66	7,864.14	-5,047.05	1,251.74	5,052.47	0.91	0.52	-0.75
12,602.00	90.07	178.24	7,864.06	-5,142.02	1,254.31	5,147.44	0.44	0.04	-0.44
12,695.00	89.54	180.08	7,864.38	-5,235.00	1,255.68	5,240.43	2.06	-0.57	1.98
12,789.00	89.74	178.95	7,864.97	-5,329.00	1,256.47	5,334.43	1.22	0.21	-1.20
12,882.00	90.82	181.46	7,864.51	-5,421.99	1,256.14	5,427.41	2.94	1.16	2.70
12,974.00	90.95	180.37	7,863.09	-5,513.96	1,254.67	5,519.38	1.19	0.14	-1.18
13,068.00	89.27	180.35	7,862.91	-5,607.96	1,254.08	5,613.37	1.79	-1.79	-0.02
13,162.00	88.85	178.92	7,864.45	-5,701.94	1,254.68	5,707.36	1.59	-0.45	-1.52
13,237.75	88.69	178.47	7,866.08	-5,777.65	1,256.41	5,783.08	0.63	-0.21	-0.60
<b>Enter Toe Circle: 13237.75' MD 326' FSL, 1652' FEL</b>									
13,256.00	88.65	178.36	7,866.50	-5,795.89	1,256.91	5,801.32	0.63	-0.21	-0.60
13,350.00	89.16	177.73	7,868.30	-5,889.82	1,260.12	5,895.26	0.86	0.54	-0.67
13,443.00	89.37	177.73	7,869.49	-5,982.74	1,263.80	5,988.19	0.23	0.23	0.00
13,456.00	89.57	177.47	7,869.61	-5,995.72	1,264.34	6,001.18	2.52	1.54	-2.00
13,510.00	89.57	177.47	7,870.02	-6,049.67	1,266.73	6,055.14	0.00	0.00	0.00
<b>PBHL (MAE J 8-4HZ) - BHL: 54' FSL, 1643' FEL Sec 17 T1N R68W</b>									

<b>Company:</b>	ANADARKO PETROLEUM CORP	<b>Local Co-ordinate Reference:</b>	Well MAE J 8-4HZ
<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 8-4HZ	<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: 851' FSL, 2417' FV - actual wellpath hits target center - Point	0.00	0.00	0.00	0.00	0.00	14,548,797.05	1,632,414.29	40.060587	-105.028600	
Enter Land Box: 4552.8' - actual wellpath hits target center - Point	0.00	0.00	4,374.87	-172.57	1,142.02	14,548,624.11	1,633,556.25	40.060113	-105.024519	
Curve KOP (Mae J 8-4H) - actual wellpath hits target center - Point	0.00	0.00	7,052.96	-181.00	1,225.40	14,548,615.65	1,633,639.63	40.060090	-105.024221	
LP: 294' FNL, 1680' FEL - actual wellpath hits target center - Point	0.00	0.00	7,849.96	-1,127.17	1,239.72	14,547,669.48	1,633,653.64	40.057492	-105.024170	
Exit Heel Circle: 8584.0' - actual wellpath misses target center by 0.01usft at 8584.05usft MD (7850.03 TVD, -1125.22 N, 1239.69 E) - Point	0.00	0.00	7,850.03	-1,125.22	1,239.69	14,547,671.43	1,633,653.61	40.057497	-105.024170	
Enter Toe Circle: 13237. - actual wellpath hits target center - Point	0.00	0.00	7,866.08	-5,777.65	1,256.41	14,543,018.99	1,633,668.84	40.044721	-105.024111	
BHL: 54' FSL, 1643' FEL - actual wellpath hits target center - Point	0.00	0.00	7,870.02	-6,049.67	1,266.73	14,542,746.97	1,633,679.07	40.043974	-105.024074	

Casing Points						
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")		
1,910.00	1,869.96	9 5/8"	9-5/8	13-1/2		

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