

ANADARKO PETROLEUM CORP

Project: Weld County, CO (UTM-NAD83)
 Site: MAE J 14-8HZ
 Well: MAE J 8-7HZ
 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)

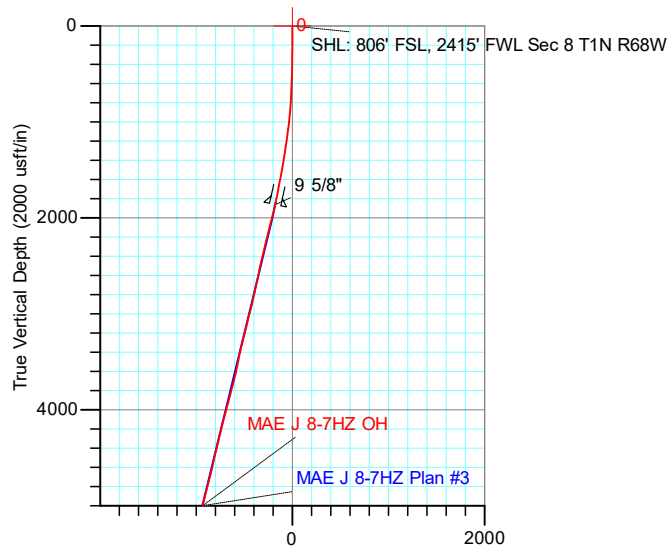
Geodetic System: Universal Transverse Mercator (US Survey Feet)
 Datum: North American Datum 1983
 Ellipsoid: GRS 1980
 Zone: Zone 13N (108 W to 102 W)



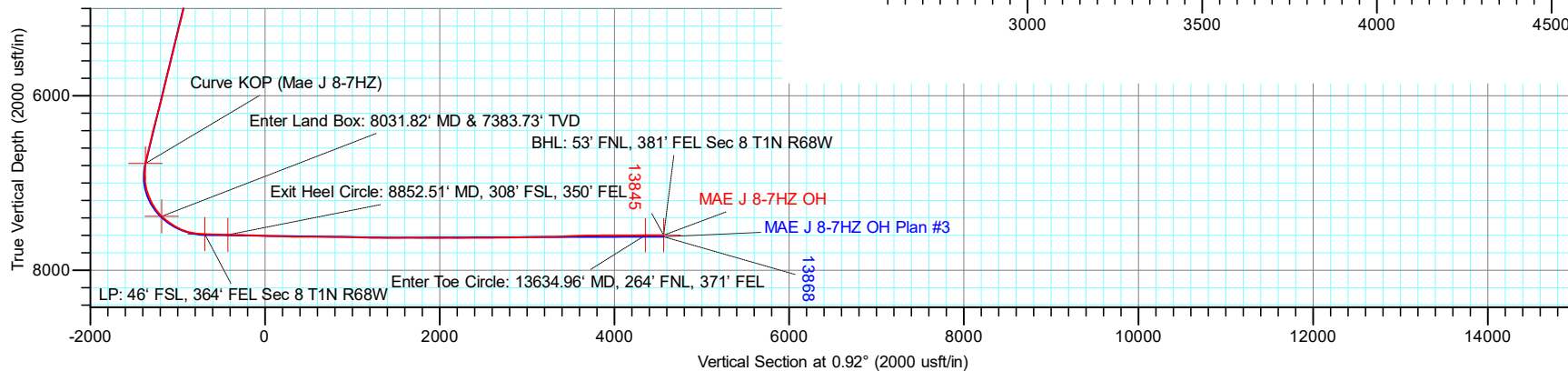
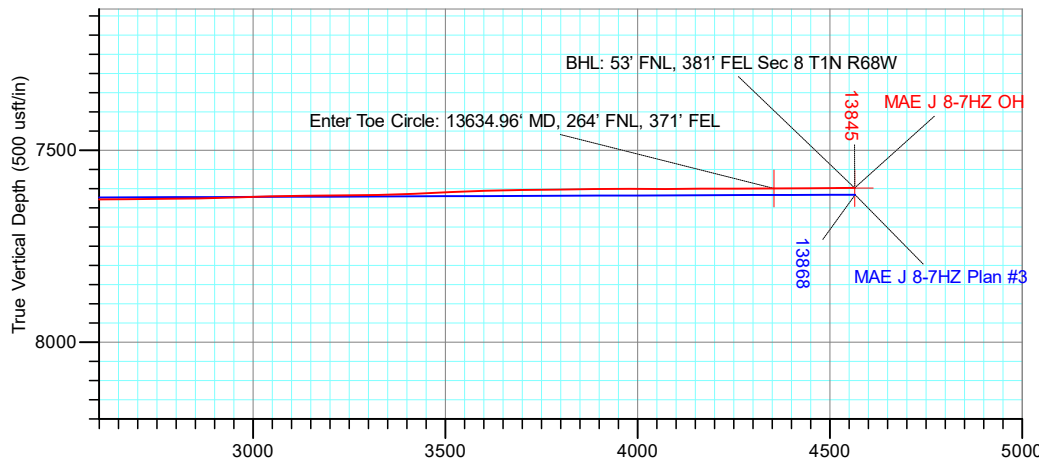
1N-68W-8

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
BHL: 53' FNL, 381' FEL Sec 8 T1N R68W	7598.50	4522.70	2639.88	40.072884	-105.019165
Curve KOP (Mae J 8-7HZ)	6776.90	-1404.81	2227.41	40.056606	-105.020641
Enter Land Box: 8031.82' MD & 7383.73' TVD	7383.73	-1223.09	2457.00	40.057105	-105.019820
Enter Toe Circle: 13634.96' MD, 264' FNL, 371' FEL	7599.85	4312.74	2645.52	40.072307	-105.019144
Exit Heel Circle: 8852.51' MD, 308' FSL, 350' FEL	7595.22	-467.29	2573.00	40.059180	-105.019405
LP: 46' FSL, 364' FEL Sec 8 T1N R68W	7586.65	-729.99	2554.84	40.058459	-105.019470
SHL: 806' FSL, 2415' FWL Sec 8 T1N R68W	0.00	0.00	0.00	40.060464	-105.028601



ACTUAL LINE CALLS
SHL: 806' FSL, 2415' FWL Sec 8 T1N R68W
HEEL: 46' FSL, 364' FEL Sec 8 T1N R68W
BHL: 53' FNL, 381' FEL Sec 8 T1N R68W



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

Design: OH (MAE J 8-7HZ/OH)
 MAE J 14-8HZ
 Created By: Dustin Ault
 Date: 0:15, March 24 2020
 Approved: _____
 Date: _____

ANADARKO PETROLEUM CORP

Project: Weld County, CO (UTM-NAD83)
 Site: MAE J 14-8HZ
 Well: MAE J 8-7HZ
 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

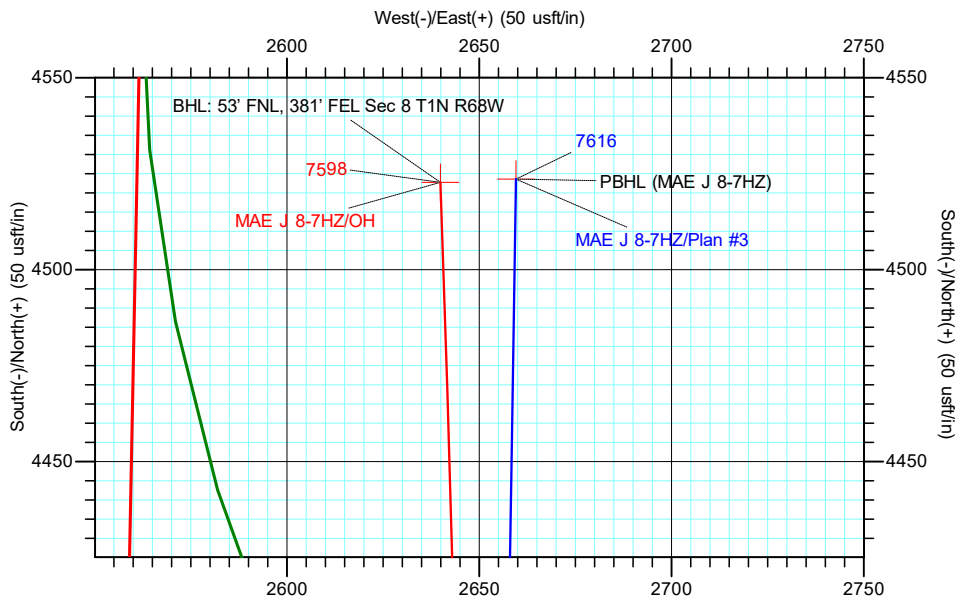
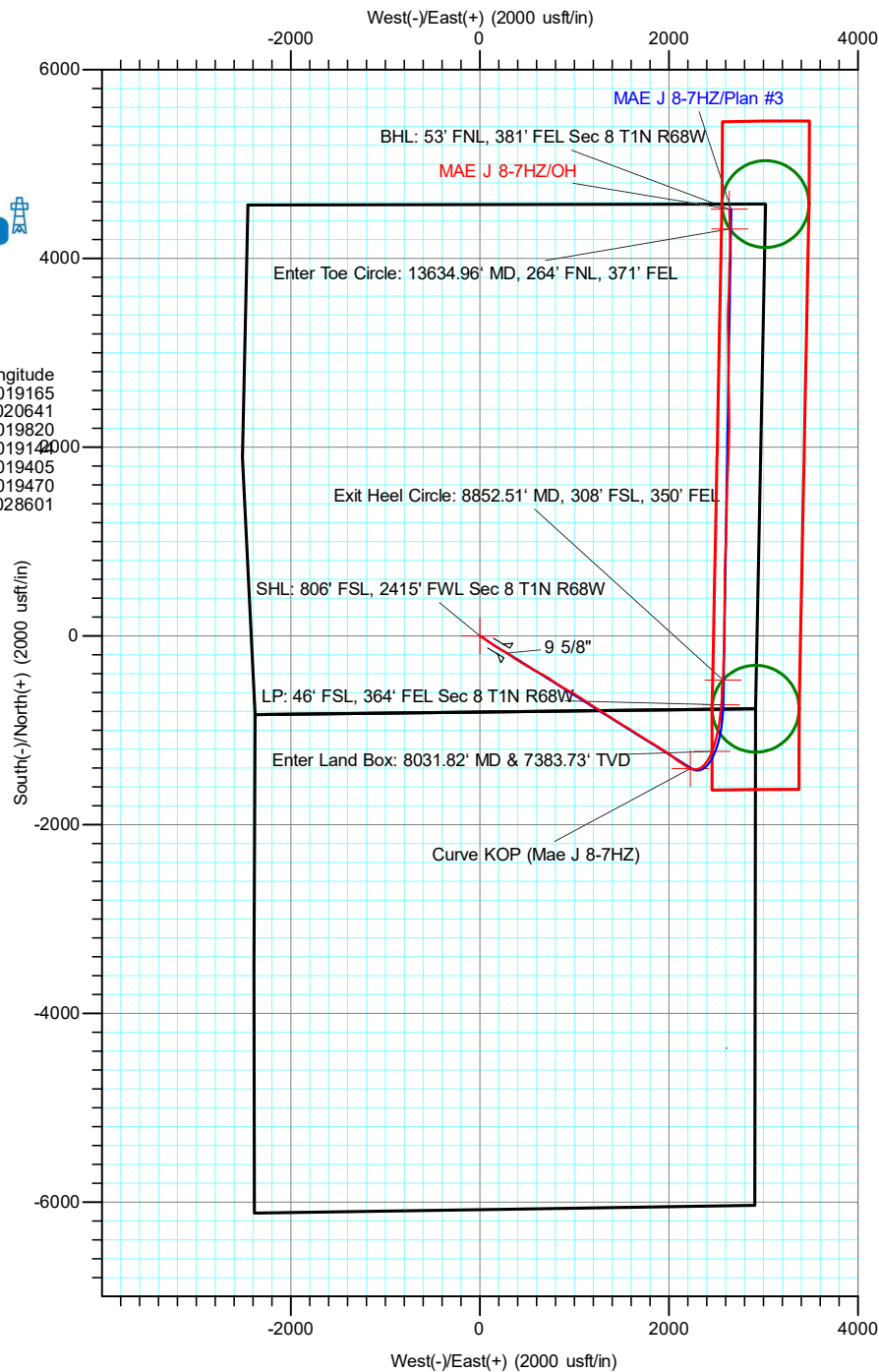
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
BHL: 53' FNL, 381' FEL Sec 8 T1N R68W	7598.50	4522.70	2639.88	14553274.11	1635055.33	40.072884	-105.019165
Curve KOP (Mae J 8-7HZ)	6776.90	-1404.81	2227.41	14547346.73	1634640.96	40.056606	-105.020641
Enter Land Box: 8031.82' MD & 7383.73' TVD	7383.73	-1223.09	2457.00	14547528.38	1634870.61	40.057105	-105.019820
Enter Toe Circle: 13634.96' MD, 264' FNL, 371' FEL	7599.85	4312.74	2645.52	14553064.15	1635060.91	40.072307	-105.019142
Exit Heel Circle: 8852.51' MD, 308' FSL, 350' FEL	7595.22	-467.29	2573.00	14548284.14	1634986.85	40.059180	-105.019405
LP: 46' FSL, 364' FEL Sec 8 T1N R68W	7586.65	-729.99	2554.84	14548021.45	1634968.61	40.058459	-105.019470
SHL: 806' FSL, 2415' FWL Sec 8 T1N R68W	0.00	0.00	0.00	14548752.26	1632414.00	40.060464	-105.028601

ACTUAL LINE CALLS

SHL: 806' FSL, 2415' FWL Sec 8 T1N R68W

HEEL: 46' FSL, 364' FEL Sec 8 T1N R68W

BHL: 53' FNL, 381' FEL Sec 8 T1N R68W



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

Design: OH (MAE J 8-7HZ/OH)
 MAE J 14-8HZ
 Created By: Dustin Ault
 Date: 0:15, March 24 2020
 Approved: _____ Date: _____

ANADARKO PETROLEUM CORP

Weld County, CO (UTM-NAD83)

MAE J 14-8HZ

MAE J 8-7HZ

OH

Design: OH

Standard Survey Report

24 March, 2020

Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well MAE J 8-7HZ
Project:	Weld County, CO (UTM-NAD83)	TVD Reference:	20' KB + 5083' GE @ 5103.00usft
Site:	MAE J 14-8HZ	MD Reference:	20' KB + 5083' GE @ 5103.00usft
Well:	MAE J 8-7HZ	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.15 Single User Db

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

Site	MAE J 14-8HZ				
Site Position:		Northing:	14,548,842.20 usft	Latitude:	40.060711
From:	Map	Easting:	1,632,414.30 usft	Longitude:	-105.028600
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-0.02 °

Well	MAE J 8-7HZ					
Well Position	+N/-S	0.00 usft	Northing:	14,548,752.26 usft	Latitude:	40.060464
	+E/-W	0.00 usft	Easting:	1,632,414.00 usft	Longitude:	-105.028601
Position Uncertainty		3.28 usft	Wellhead Elevation:	usft	Ground Level:	5,083.00 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	9/19/2019	8.08	66.49	51,928.66963406

Design	OH				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00	0.92	

Survey Program	Date	3/24/2020			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
130.00	1,885.00	Survey #1 - Surface MWD (OH)	APC_ISCWSA REV 2 MWD	Fixed:v2:standard declination	
1,934.00	13,791.00	Survey #2 - MWD+IFR (OH)	APC_ISCWSA REV 2 MWD+	Fixed:v2:crustal field declination	
13,845.00	13,845.00	Survey #3 - Proj to TD (OH)	BLIND	OWSG BLIND	

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SHL: 806' FSL, 2415' FWL Sec 8 T1N R68W - SHL (MAE J 8-7HZ)										
130.00	1.63	335.38	129.98	1.68	-0.77	1.67	1.25	1.25	0.00	
225.00	2.24	141.85	224.96	1.45	-0.19	1.45	4.05	0.64	175.23	
320.00	1.54	117.50	319.91	-0.60	2.09	-0.57	1.11	-0.74	-25.63	
415.00	2.24	112.67	414.86	-1.91	4.94	-1.83	0.76	0.74	-5.08	
510.00	3.16	115.31	509.75	-3.74	9.02	-3.60	0.98	0.97	2.78	
606.00	4.31	117.59	605.55	-6.54	14.61	-6.31	1.21	1.20	2.38	
701.00	5.45	121.20	700.20	-10.53	21.63	-10.18	1.24	1.20	3.80	

Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well MAE J 8-7HZ
Project:	Weld County, CO (UTM-NAD83)	TVD Reference:	20' KB + 5083' GE @ 5103.00usft
Site:	MAE J 14-8HZ	MD Reference:	20' KB + 5083' GE @ 5103.00usft
Well:	MAE J 8-7HZ	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.15 Single User Db

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
796.00	6.68	122.43	794.67	-15.83	30.15	-15.35	1.30	1.29	1.29	
891.00	8.35	126.91	888.85	-22.94	40.33	-22.29	1.86	1.76	4.72	
986.00	10.37	125.94	982.58	-32.10	52.77	-31.25	2.13	2.13	-1.02	
1,081.00	13.40	125.77	1,075.53	-43.56	68.63	-42.45	3.19	3.19	-0.18	
1,176.00	14.06	124.45	1,167.82	-56.52	87.08	-55.11	0.77	0.69	-1.39	
1,271.00	15.12	123.22	1,259.75	-69.84	106.96	-68.11	1.16	1.12	-1.29	
1,366.00	17.62	122.87	1,350.90	-84.43	129.41	-82.34	2.63	2.63	-0.37	
1,462.00	18.28	121.99	1,442.22	-100.29	154.38	-97.80	0.74	0.69	-0.92	
1,557.00	18.72	123.22	1,532.31	-116.54	179.77	-113.64	0.62	0.46	1.29	
1,652.00	19.95	122.43	1,621.95	-133.58	206.20	-130.25	1.32	1.29	-0.83	
1,746.00	20.83	120.49	1,710.06	-150.66	234.14	-146.88	1.18	0.94	-2.06	
1,842.00	21.93	120.40	1,799.46	-168.39	264.31	-164.13	1.15	1.15	-0.09	
1,885.00	23.51	120.58	1,839.12	-176.82	278.62	-172.32	3.68	3.67	0.42	
1,910.00	23.46	121.16	1,862.05	-181.93	287.17	-177.30	0.94	-0.19	2.30	
9 5/8"										
1,934.00	23.42	121.71	1,884.07	-186.91	295.32	-182.15	0.94	-0.18	2.31	
2,027.00	24.90	124.54	1,968.92	-207.73	327.17	-202.45	2.02	1.59	3.04	
2,119.00	25.96	124.19	2,052.01	-230.03	359.78	-224.22	1.16	1.15	-0.38	
2,213.00	24.49	123.29	2,137.04	-252.28	393.09	-245.94	1.62	-1.56	-0.96	
2,307.00	25.05	121.97	2,222.39	-273.51	426.26	-266.63	0.84	0.60	-1.40	
2,401.00	26.16	120.89	2,307.16	-294.69	460.92	-287.25	1.28	1.18	-1.15	
2,494.00	24.63	120.73	2,391.17	-315.12	495.18	-307.13	1.65	-1.65	-0.17	
2,587.00	25.39	120.66	2,475.45	-335.19	528.99	-326.65	0.82	0.82	-0.08	
2,680.00	23.68	118.38	2,560.05	-354.23	562.57	-345.15	2.10	-1.84	-2.45	
2,773.00	25.90	119.67	2,644.48	-373.17	596.66	-363.54	2.46	2.39	1.39	
2,867.00	24.09	118.00	2,729.67	-392.34	631.44	-382.15	2.07	-1.93	-1.78	
2,960.00	26.12	117.96	2,813.88	-410.85	666.28	-400.10	2.18	2.18	-0.04	
3,055.00	26.58	120.18	2,899.01	-431.34	703.13	-419.99	1.14	0.48	2.34	
3,150.00	25.61	124.20	2,984.33	-453.57	738.48	-441.65	2.12	-1.02	4.23	
3,246.00	23.44	123.09	3,071.67	-475.65	771.64	-463.20	2.31	-2.26	-1.16	
3,338.00	23.67	124.75	3,156.00	-496.17	802.15	-483.23	0.76	0.25	1.80	
3,431.00	26.04	122.99	3,240.38	-517.93	834.62	-504.46	2.67	2.55	-1.89	
3,524.00	24.07	123.02	3,324.63	-539.38	867.64	-525.38	2.12	-2.12	0.03	
3,619.00	26.10	118.80	3,410.67	-560.01	902.20	-545.45	2.85	2.14	-4.44	
3,713.00	22.81	117.38	3,496.23	-578.36	936.51	-563.24	3.56	-3.50	-1.51	
3,806.00	24.14	120.04	3,581.53	-596.17	968.99	-580.53	1.83	1.43	2.86	
3,899.00	25.34	120.83	3,665.99	-615.89	1,002.54	-599.71	1.34	1.29	0.85	
3,993.00	27.15	122.82	3,750.30	-637.82	1,037.84	-621.08	2.14	1.93	2.12	
4,087.00	25.96	123.29	3,834.38	-660.74	1,073.06	-643.43	1.29	-1.27	0.50	
4,180.00	26.28	124.50	3,917.89	-683.58	1,107.05	-665.71	0.67	0.34	1.30	
4,273.00	26.35	121.32	4,001.25	-705.97	1,141.65	-687.54	1.52	0.08	-3.42	
4,365.00	26.31	124.25	4,083.71	-728.06	1,175.94	-709.08	1.41	-0.04	3.18	
4,458.00	25.38	122.88	4,167.41	-750.48	1,209.72	-730.96	1.19	-1.00	-1.47	

Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well MAE J 8-7HZ
Project:	Weld County, CO (UTM-NAD83)	TVD Reference:	20' KB + 5083' GE @ 5103.00usft
Site:	MAE J 14-8HZ	MD Reference:	20' KB + 5083' GE @ 5103.00usft
Well:	MAE J 8-7HZ	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.15 Single User Db

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
4,551.00	25.47	122.35	4,251.40	-772.00	1,243.35	-751.93	0.26	0.10	-0.57	
4,644.00	22.93	122.93	4,336.22	-792.55	1,275.45	-771.97	2.74	-2.73	0.62	
4,738.00	24.94	122.18	4,422.13	-813.06	1,307.60	-791.96	2.16	2.14	-0.80	
4,832.00	23.46	123.81	4,507.87	-834.03	1,339.92	-812.41	1.73	-1.57	1.73	
4,925.00	23.11	120.54	4,593.30	-853.60	1,371.02	-831.48	1.44	-0.38	-3.52	
5,019.00	24.98	123.99	4,679.15	-874.08	1,403.37	-851.43	2.49	1.99	3.67	
5,113.00	26.32	123.26	4,763.88	-896.60	1,437.26	-873.41	1.46	1.43	-0.78	
5,233.00	25.96	122.18	4,871.61	-925.18	1,481.73	-901.27	0.50	-0.30	-0.90	
5,325.00	25.61	121.24	4,954.45	-946.22	1,515.78	-921.76	0.59	-0.38	-1.02	
5,419.00	25.89	119.01	5,039.11	-966.71	1,551.10	-941.68	1.07	0.30	-2.37	
5,512.00	24.91	122.30	5,123.13	-987.02	1,585.41	-961.44	1.85	-1.05	3.54	
5,604.00	24.97	124.41	5,206.55	-1,008.35	1,617.81	-982.24	0.97	0.07	2.29	
5,698.00	25.09	121.37	5,291.73	-1,029.93	1,651.19	-1,003.29	1.37	0.13	-3.23	
5,792.00	25.36	123.78	5,376.76	-1,051.50	1,684.94	-1,024.31	1.13	0.29	2.56	
5,885.00	24.99	122.07	5,460.93	-1,073.01	1,718.14	-1,045.28	0.88	-0.40	-1.84	
5,977.00	25.61	120.64	5,544.11	-1,093.46	1,751.72	-1,065.19	0.95	0.67	-1.55	
6,069.00	26.16	121.50	5,626.88	-1,114.19	1,786.12	-1,085.37	0.72	0.60	0.93	
6,163.00	25.87	119.94	5,711.35	-1,135.25	1,821.56	-1,105.86	0.79	-0.31	-1.66	
6,255.00	25.27	122.97	5,794.35	-1,155.96	1,855.43	-1,126.02	1.56	-0.65	3.29	
6,349.00	23.86	121.33	5,879.84	-1,176.76	1,888.50	-1,146.29	1.67	-1.50	-1.74	
6,442.00	25.28	122.36	5,964.42	-1,197.17	1,921.34	-1,166.17	1.59	1.53	1.11	
6,536.00	25.11	120.99	6,049.47	-1,218.18	1,955.40	-1,186.63	0.65	-0.18	-1.46	
6,629.00	26.50	126.75	6,133.21	-1,240.76	1,988.94	-1,208.67	3.08	1.49	6.19	
6,721.00	23.93	125.92	6,216.44	-1,263.99	2,020.51	-1,231.39	2.82	-2.79	-0.90	
6,815.00	24.03	128.86	6,302.33	-1,287.19	2,050.85	-1,254.09	1.28	0.11	3.13	
6,908.00	22.78	129.15	6,387.67	-1,310.43	2,079.56	-1,276.88	1.35	-1.34	0.31	
7,001.00	24.71	121.68	6,472.82	-1,332.02	2,110.07	-1,297.97	3.84	2.08	-8.03	
7,094.00	23.59	122.77	6,557.68	-1,352.30	2,142.26	-1,317.73	1.30	-1.20	1.17	
7,187.00	24.67	122.23	6,642.55	-1,372.72	2,174.33	-1,337.63	1.19	1.16	-0.58	
7,281.00	25.44	122.74	6,727.70	-1,394.10	2,207.90	-1,358.47	0.85	0.82	0.54	
7,335.01	23.34	114.42	6,776.90	-1,404.81	2,227.41	-1,368.86	7.44	-3.89	-15.40	
Curve KOP (Mae J 8-7HZ)										
7,375.00	22.11	107.40	6,813.80	-1,410.33	2,241.81	-1,374.16	7.44	-3.08	-17.56	
7,470.00	22.30	88.22	6,901.87	-1,415.13	2,276.93	-1,378.39	7.60	0.20	-20.19	
7,563.00	19.52	72.10	6,988.81	-1,409.80	2,309.39	-1,372.54	6.84	-2.99	-17.33	
7,655.00	24.86	56.08	7,074.04	-1,394.26	2,340.11	-1,356.50	8.72	5.80	-17.41	
7,749.00	29.18	44.23	7,157.82	-1,366.78	2,372.53	-1,328.51	7.32	4.60	-12.61	
7,844.00	32.61	35.99	7,239.37	-1,329.44	2,403.75	-1,290.68	5.73	3.61	-8.67	
7,937.00	38.95	26.08	7,314.84	-1,282.82	2,431.38	-1,243.62	9.22	6.82	-10.66	
8,030.00	47.61	20.87	7,382.50	-1,224.35	2,456.52	-1,184.75	10.07	9.31	-5.60	
8,031.82	47.75	20.81	7,383.73	-1,223.09	2,457.00	-1,183.48	8.25	7.83	-3.52	
Enter Land Box: 8031.82' MD & 7383.73' TVD										
8,123.00	54.93	17.92	7,440.66	-1,155.94	2,480.50	-1,115.97	8.25	7.87	-3.17	
8,216.00	58.63	14.03	7,491.61	-1,081.17	2,501.85	-1,040.86	5.30	3.98	-4.18	

Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well MAE J 8-7HZ
Project:	Weld County, CO (UTM-NAD83)	TVD Reference:	20' KB + 5083' GE @ 5103.00usft
Site:	MAE J 14-8HZ	MD Reference:	20' KB + 5083' GE @ 5103.00usft
Well:	MAE J 8-7HZ	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.15 Single User Db

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
8,310.00	65.90	10.83	7,535.34	-999.97	2,519.67	-959.39	8.30	7.73	-3.40	
8,403.00	76.56	8.35	7,565.22	-913.27	2,534.26	-872.46	11.74	11.46	-2.67	
8,496.00	84.65	6.13	7,580.39	-822.33	2,545.79	-781.35	9.01	8.70	-2.39	
8,589.00	87.63	5.07	7,586.65	-729.99	2,554.84	-688.87	3.40	3.20	-1.14	
LP: 46' FSL, 364' FEL Sec 8 T1N R68W										
8,598.79	87.67	5.05	7,587.05	-720.25	2,555.70	-679.13	0.49	0.43	-0.22	
Heel (MAE J 8-7HZ)										
8,681.00	88.03	4.87	7,590.14	-638.41	2,562.80	-597.17	0.49	0.43	-0.22	
8,774.00	88.35	3.13	7,593.07	-545.68	2,569.29	-504.36	1.90	0.34	-1.87	
8,852.51	88.52	2.30	7,595.22	-467.29	2,573.00	-425.92	1.08	0.21	-1.06	
Exit Heel Circle: 8852.51' MD, 308' FSL, 350' FEL										
8,869.00	88.55	2.12	7,595.64	-450.82	2,573.64	-409.44	1.08	0.21	-1.06	
8,963.00	89.18	1.97	7,597.51	-356.90	2,576.99	-315.47	0.69	0.67	-0.16	
9,055.00	88.57	1.53	7,599.31	-264.96	2,579.80	-223.50	0.82	-0.66	-0.48	
9,149.00	88.24	1.42	7,601.93	-171.03	2,582.22	-129.54	0.37	-0.35	-0.12	
9,242.00	88.20	1.38	7,604.82	-78.10	2,584.49	-36.59	0.06	-0.04	-0.04	
9,336.00	87.80	0.91	7,608.10	15.83	2,586.37	57.35	0.66	-0.43	-0.50	
9,431.00	88.21	0.45	7,611.41	110.76	2,587.49	152.29	0.65	0.43	-0.48	
9,525.00	87.89	0.28	7,614.60	204.70	2,588.09	246.23	0.39	-0.34	-0.18	
9,618.00	90.21	1.13	7,616.15	297.68	2,589.24	339.21	2.66	2.49	0.91	
9,711.00	89.53	359.84	7,616.36	390.67	2,590.02	432.21	1.57	-0.73	-1.39	
9,805.00	90.18	0.40	7,616.59	484.67	2,590.22	526.20	0.91	0.69	0.60	
9,899.00	90.25	0.02	7,616.24	578.67	2,590.56	620.19	0.41	0.07	-0.40	
9,993.00	89.92	1.68	7,616.10	672.65	2,591.96	714.18	1.80	-0.35	1.77	
10,087.00	89.36	1.69	7,616.69	766.61	2,594.72	808.17	0.60	-0.60	0.01	
10,181.00	88.31	2.16	7,618.60	860.54	2,597.88	902.14	1.22	-1.12	0.50	
10,273.00	87.56	2.27	7,621.92	952.41	2,601.43	994.05	0.82	-0.82	0.12	
10,365.00	88.44	1.79	7,625.13	1,044.29	2,604.69	1,085.98	1.09	0.96	-0.52	
10,459.00	88.46	1.99	7,627.67	1,138.21	2,607.79	1,179.93	0.21	0.02	0.21	
10,551.00	89.51	0.74	7,629.30	1,230.16	2,609.98	1,271.91	1.77	1.14	-1.36	
10,645.00	90.08	0.84	7,629.64	1,324.15	2,611.28	1,365.91	0.62	0.61	0.11	
10,679.11	90.32	0.83	7,629.52	1,358.26	2,611.77	1,400.02	0.71	0.71	-0.03	
Interm TGT#1 (MAE J 8-7HZ)										
10,737.00	90.73	0.81	7,628.99	1,416.14	2,612.60	1,457.91	0.71	0.71	-0.03	
10,829.00	89.97	1.62	7,628.43	1,508.12	2,614.55	1,549.90	1.21	-0.83	0.88	
10,922.00	90.75	1.33	7,627.84	1,601.08	2,616.95	1,642.90	0.89	0.84	-0.31	
11,015.00	88.86	2.51	7,628.16	1,694.03	2,620.06	1,735.88	2.40	-2.03	1.27	
11,107.00	89.30	2.67	7,629.64	1,785.92	2,624.22	1,827.82	0.51	0.48	0.17	
11,201.00	89.65	3.07	7,630.50	1,879.80	2,628.92	1,921.77	0.57	0.37	0.43	
11,294.00	90.46	1.70	7,630.41	1,972.71	2,632.79	2,014.73	1.71	0.87	-1.47	
11,387.00	90.14	1.25	7,629.92	2,065.68	2,635.19	2,107.73	0.59	-0.34	-0.48	
11,482.00	89.75	1.29	7,630.01	2,160.66	2,637.29	2,202.72	0.41	-0.41	0.04	
11,576.00	90.37	359.84	7,629.91	2,254.65	2,638.22	2,296.72	1.68	0.66	-1.54	
11,669.00	90.37	359.61	7,629.31	2,347.65	2,637.77	2,389.70	0.25	0.00	-0.25	

Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well MAE J 8-7HZ
Project:	Weld County, CO (UTM-NAD83)	TVD Reference:	20' KB + 5083' GE @ 5103.00usft
Site:	MAE J 14-8HZ	MD Reference:	20' KB + 5083' GE @ 5103.00usft
Well:	MAE J 8-7HZ	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.15 Single User Db

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
11,764.00	90.21	359.20	7,628.83	2,442.64	2,636.79	2,484.66	0.46	-0.17	-0.43	
11,856.00	90.60	359.20	7,628.18	2,534.63	2,635.50	2,576.62	0.42	0.42	0.00	
11,950.00	90.17	358.25	7,627.55	2,628.60	2,633.41	2,670.55	1.11	-0.46	-1.01	
12,044.00	90.76	359.41	7,626.79	2,722.58	2,631.49	2,764.48	1.38	0.63	1.23	
12,138.00	90.41	358.85	7,625.83	2,816.56	2,630.07	2,858.43	0.70	-0.37	-0.60	
12,232.00	92.66	0.48	7,623.31	2,910.52	2,629.52	2,952.36	2.96	2.39	1.73	
12,324.00	91.13	359.42	7,620.27	3,002.46	2,629.43	3,044.29	2.02	-1.66	-1.15	
12,416.00	90.78	358.94	7,618.73	3,094.44	2,628.12	3,136.24	0.65	-0.38	-0.52	
12,510.00	90.34	358.52	7,617.81	3,188.41	2,626.03	3,230.17	0.65	-0.47	-0.45	
12,604.00	90.98	359.83	7,616.73	3,282.39	2,624.68	3,324.11	1.55	0.68	1.39	
12,698.00	92.74	1.20	7,613.68	3,376.33	2,625.53	3,418.06	2.37	1.87	1.46	
12,792.00	92.41	1.42	7,609.46	3,470.21	2,627.67	3,511.96	0.42	-0.35	0.23	
12,885.00	92.02	2.33	7,605.86	3,563.09	2,630.71	3,604.87	1.06	-0.42	0.98	
12,977.00	90.70	1.86	7,603.68	3,655.00	2,634.07	3,696.83	1.52	-1.43	-0.51	
13,071.00	90.60	1.52	7,602.61	3,748.96	2,636.85	3,790.81	0.38	-0.11	-0.36	
13,165.00	91.04	1.10	7,601.27	3,842.92	2,639.00	3,884.80	0.65	0.47	-0.45	
13,259.00	89.39	1.87	7,600.92	3,936.89	2,641.43	3,978.79	1.94	-1.76	0.82	
13,353.00	90.35	1.85	7,601.13	4,030.84	2,644.48	4,072.78	1.02	1.02	-0.02	
13,446.00	90.51	1.03	7,600.43	4,123.80	2,646.82	4,165.77	0.90	0.17	-0.88	
13,538.00	89.85	359.28	7,600.14	4,215.80	2,647.07	4,257.76	2.03	-0.72	-1.90	
13,632.00	90.47	358.90	7,599.88	4,309.79	2,645.58	4,351.71	0.77	0.66	-0.40	
13,634.96	90.47	358.89	7,599.86	4,312.74	2,645.52	4,354.66	0.32	0.02	-0.32	
Enter Toe Circle: 13634.96' MD, 264' FNL, 371' FEL										
13,726.00	90.49	358.60	7,599.09	4,403.76	2,643.53	4,445.64	0.32	0.02	-0.32	
13,791.00	90.21	358.11	7,598.69	4,468.73	2,641.66	4,510.57	0.87	-0.43	-0.75	
13,845.00	90.21	358.11	7,598.50	4,522.70	2,639.88	4,564.50	0.00	0.00	0.00	
BHL: 53' FNL, 381' FEL Sec 8 T1N R68W - PBHL (MAE J 8-7HZ)										

Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well MAE J 8-7HZ
Project:	Weld County, CO (UTM-NAD83)	TVD Reference:	20' KB + 5083' GE @ 5103.00usft
Site:	MAE J 14-8HZ	MD Reference:	20' KB + 5083' GE @ 5103.00usft
Well:	MAE J 8-7HZ	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.15 Single User Db

Design Targets										
Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude	
SHL: 806' FSL, 2415' FV - actual wellpath hits target center - Point	0.00	0.00	0.00	0.00	0.00	14,548,752.26	1,632,414.00	40.060464	-105.028601	
Curve KOP (Mae J 8-7H - actual wellpath hits target center - Point	0.00	0.00	6,776.90	-1,404.81	2,227.41	14,547,346.73	1,634,640.96	40.056606	-105.020641	
Enter Land Box: 8031.82 - actual wellpath hits target center - Point	0.00	0.00	7,383.73	-1,223.09	2,457.00	14,547,528.38	1,634,870.60	40.057105	-105.019821	
LP: 46' FSL, 364' FEL S - actual wellpath hits target center - Point	0.00	0.00	7,586.65	-729.99	2,554.84	14,548,021.44	1,634,968.60	40.058459	-105.019471	
Exit Heel Circle: 8852.51 - actual wellpath hits target center - Point	0.00	0.00	7,595.22	-467.29	2,573.00	14,548,284.14	1,634,986.85	40.059180	-105.019406	
BHL: 53' FNL, 381' FEL - actual wellpath hits target center - Point	0.00	0.00	7,598.50	4,522.70	2,639.88	14,553,274.11	1,635,055.33	40.072884	-105.019165	
Enter Toe Circle: 13634. - actual wellpath misses target center by 0.01usft at 13634.96usft MD (7599.85 TVD, 4312.74 N, 2645.52 E) - Point	0.00	0.00	7,599.85	4,312.74	2,645.52	14,553,064.15	1,635,060.90	40.072307	-105.019145	

Casing Points						
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")		
1,910.00	1,862.05	9 5/8"	9-5/8	13-1/2		

Checked By: _____ Approved By: _____ Date: _____