

ANADARKO PETROLEUM CORP

Project: Weld County, CO (UTM-NAD83)
 Site: MAE J 14-8HZ
 Well: MAE J 8-12HZ
 Wellbore: OH
 Design: OH

20' KB + 5083' GE @ 5103.00usft



Azimuths to True North
 Magnetic North: 8.08°

Magnetic Field
 Strength: 51928.6nT
 Dip Angle: 66.49°
 Date: 9/19/2019
 Model: IGRF2015

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

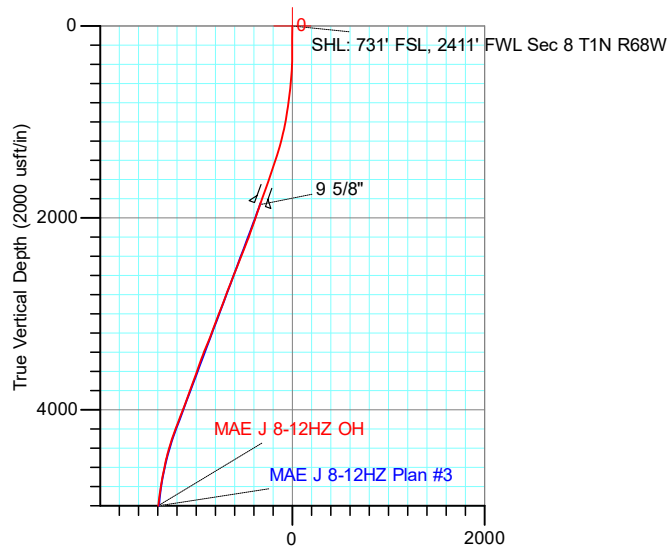
Geodetic System: Universal Transverse Mercator (US Survey Feet)
 Datum: North American Datum 1983
 Ellipsoid: GRS 1980
 Zone: Zone 13N (108 W to 102 W)



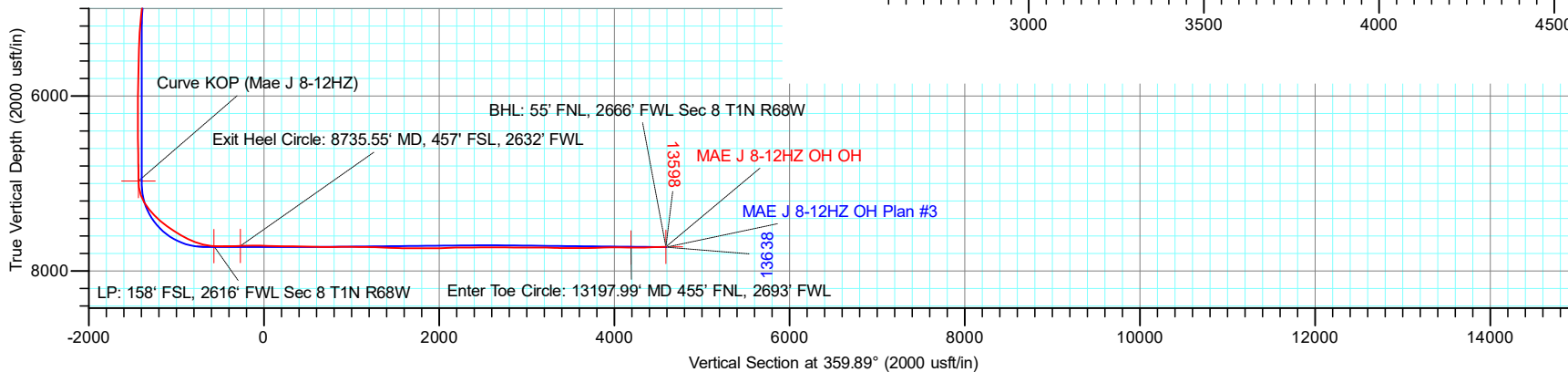
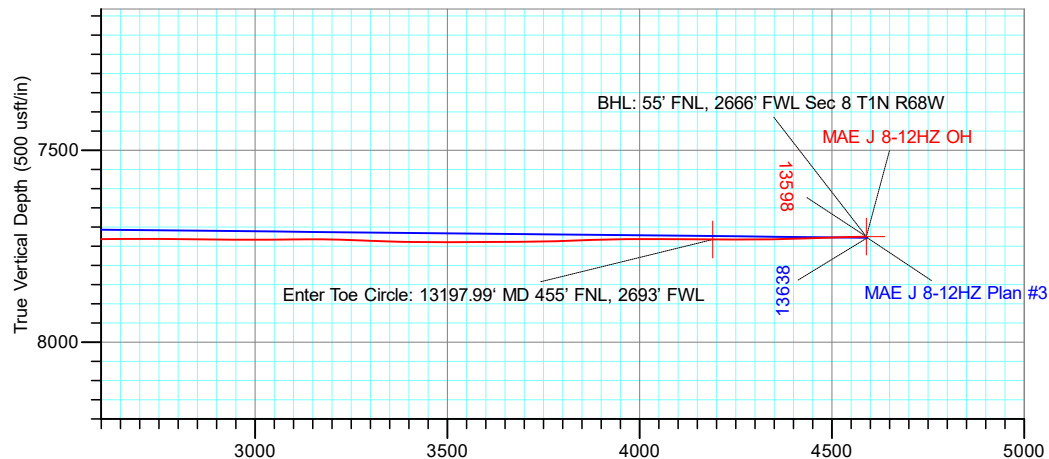
1N-68W-8

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
BHL: 55' FNL, 2666' FWL Sec 8 T1N R68W	7725.10	4590.42	216.29	40.072864	-105.027830
Curve KOP (Mae J 8-12HZ)	6973.41	-1432.80	237.68	40.056323	-105.027754
Enter Toe Circle: 13197.99' MD 455' FNL, 2693' FWL	7732.61	4190.86	231.42	40.071767	-105.027776
Exit Heel Circle: 8735.55' MD, 457' FSL, 2632' FWL	7714.56	-269.16	231.99	40.059519	-105.027774
LP: 158' FSL, 2616' FWL Sec 8 T1N R68W	7717.12	-570.56	231.83	40.058691	-105.027774
SHL: 731' FSL, 2411' FWL Sec 8 T1N R68W	0.00	0.00	0.00	40.060258	-105.028603



ACTUAL LINE CALLS
SHL: 731' FSL, 2411' FWL Sec 8 T1N R68W
HEEL: 158' FSL, 2616' FWL Sec 8 T1N R68W
BHL: 55' FNL, 2666' FWL Sec 8 T1N R68W



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

Design: OH (MAE J 8-12HZ/OH)
 MAE J 14-8HZ
 Created By: Dustin Ault Date: 9/23, April 29 2020
 Date: _____
 Approved: _____ Date: _____

ANADARKO PETROLEUM CORP

Project: Weld County, CO (UTM-NAD83)
 Site: MAE J 14-8HZ
 Well: MAE J 8-12HZ
 Wellbore: OH
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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: 51928.6nT
 Dip Angle: 66.49°
 Date: 9/19/2019
 Model: IGRF2015



DESIGN TARGET DETAILS

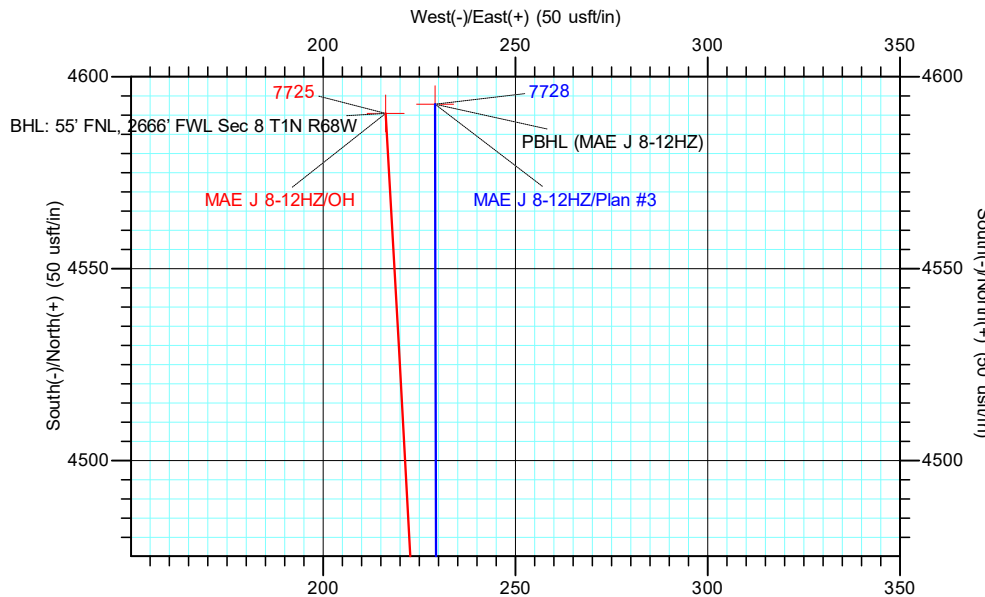
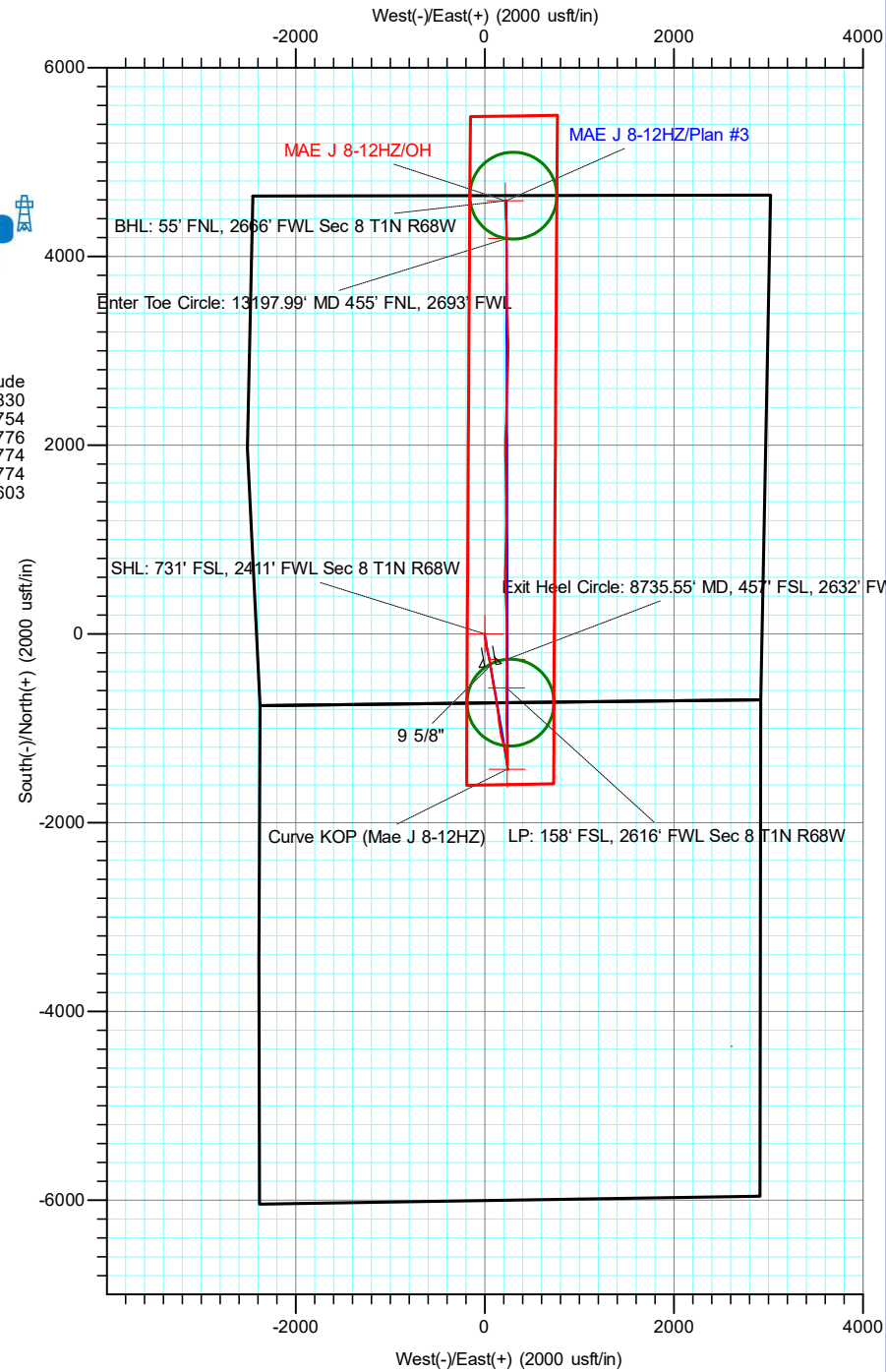
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
BHL: 55' FNL, 2666' FWL Sec 8 T1N R68W	7725.10	4590.42	216.29	14553267.59	1632631.17	40.072864	-105.027830
Curve KOP (Mae J 8-12HZ)	6973.41	-1432.80	237.68	14547244.36	1632650.63	40.056323	-105.027754
Enter Toe Circle: 13197.99' MD 455' FNL, 2693' FWL	7732.61	4190.86	231.42	14552868.03	1632646.18	40.071767	-105.027776
Exit Heel Circle: 8735.55' MD, 457' FSL, 2632' FWL	7714.56	-269.16	231.99	14548408.01	1632645.31	40.059519	-105.027774
LP: 158' FSL, 2616' FWL Sec 8 T1N R68W	7717.12	-570.56	231.83	14548106.61	1632645.06	40.058691	-105.027774
SHL: 731' FSL, 2411' FWL Sec 8 T1N R68W	0.00	0.00	0.00	14548677.24	1632413.41	40.060258	-105.028603

ACTUAL LINE CALLS

SHL: 731' FSL, 2411' FWL Sec 8 T1N R68W

HEEL: 158' FSL, 2616' FWL Sec 8 T1N R68W

BHL: 55' FNL, 2666' FWL Sec 8 T1N R68W



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

Design: OH (MAE J 8-12HZ/OH)
 MAE J 14-8HZ
 Created By: Dustin Ault Date: 9:25, April 29 2020
 Approved: _____ Date: _____



ANADARKO PETROLEUM CORP

Weld County, CO (UTM-NAD83)

MAE J 14-8HZ

MAE J 8-12HZ

OH

Design: OH

Standard Survey Report

29 April, 2020



Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well MAE J 8-12HZ
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 8-12HZ	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 8-12HZ					
Well Position	+N/-S	0.00 usft	Northing:	14,548,677.24 usft	Latitude:	40.060258
	+E/-W	0.00 usft	Easting:	1,632,413.41 usft	Longitude:	-105.028603
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	51,928.56197878

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	359.89	

Survey Program	Date	4/29/2020			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
131.00	1,890.00	Survey #1 - Surface MWD (OH)	APC_ISCWSA REV 2 MWD	Fixed:v2:standard declination	
1,890.00	13,537.00	Survey #2 - MWD+IFR (OH)	APC_ISCWSA REV 2 MWD+	Fixed:v2:crustal field declination	
13,598.00	13,598.00	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 (MAE J 8-12HZ) - SHL: 731' FSL, 2411' FWL Sec 8 T1N R68W										
131.00	0.79	256.11	131.00	-0.22	-0.88	-0.22	0.60	0.60	0.00	
226.00	0.26	342.06	225.99	-0.17	-1.58	-0.17	0.86	-0.56	90.47	
321.00	0.62	184.04	320.99	-0.48	-1.68	-0.47	0.91	0.38	-166.34	
416.00	2.50	174.46	415.95	-3.05	-1.52	-3.05	1.99	1.98	-10.08	
511.00	4.39	173.75	510.78	-8.73	-0.92	-8.73	1.99	1.99	-0.75	
606.00	5.36	170.41	605.43	-16.72	0.21	-16.72	1.06	1.02	-3.52	
701.00	6.55	169.54	699.92	-26.42	1.94	-26.43	1.26	1.25	-0.92	

Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well MAE J 8-12HZ
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 8-12HZ	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	7.91	166.81	794.16	-38.12	4.41	-38.12	1.48	1.43	-2.87	
892.00	9.32	167.95	889.07	-52.15	7.54	-52.16	1.48	1.47	1.19	
986.00	10.06	170.33	981.73	-67.69	10.51	-67.71	0.90	0.79	2.53	
1,081.00	12.39	171.91	1,074.91	-85.96	13.34	-85.98	2.47	2.45	1.66	
1,176.00	13.49	173.31	1,167.50	-107.06	16.06	-107.09	1.20	1.16	1.47	
1,271.00	16.30	169.27	1,259.30	-131.16	19.84	-131.20	3.15	2.96	-4.25	
1,367.00	17.84	168.57	1,351.06	-158.82	25.26	-158.86	1.62	1.60	-0.73	
1,462.00	18.63	168.57	1,441.29	-187.95	31.15	-188.01	0.83	0.83	0.00	
1,557.00	19.42	166.72	1,531.10	-218.20	37.79	-218.27	1.05	0.83	-1.95	
1,653.00	19.64	169.27	1,621.58	-249.58	44.46	-249.67	0.92	0.23	2.66	
1,747.00	19.82	169.62	1,710.06	-280.78	50.27	-280.88	0.23	0.19	0.37	
1,842.00	20.08	170.33	1,799.36	-312.70	55.91	-312.81	0.37	0.27	0.75	
1,890.00	20.08	170.06	1,844.45	-328.94	58.72	-329.05	0.19	0.00	-0.56	
1,910.00	19.88	170.20	1,863.24	-335.67	59.89	-335.78	1.02	-0.99	0.70	
9 5/8"										
2,027.00	18.72	171.07	1,973.66	-373.82	66.19	-373.95	1.02	-0.99	0.74	
2,119.00	18.91	171.45	2,060.75	-403.15	70.70	-403.28	0.25	0.21	0.41	
2,213.00	19.84	169.37	2,149.43	-433.89	75.90	-434.04	1.23	0.99	-2.21	
2,307.00	21.73	171.28	2,237.30	-466.77	81.49	-466.93	2.14	2.01	2.03	
2,401.00	22.02	172.53	2,324.54	-501.44	86.41	-501.61	0.58	0.31	1.33	
2,494.00	21.61	169.59	2,410.88	-535.58	91.78	-535.75	1.25	-0.44	-3.16	
2,587.00	21.37	168.94	2,497.41	-569.05	98.12	-569.24	0.36	-0.26	-0.70	
2,680.00	21.49	166.10	2,583.99	-602.21	105.46	-602.42	1.12	0.13	-3.05	
2,773.00	21.93	172.12	2,670.40	-635.96	111.94	-636.17	2.44	0.47	6.47	
2,867.00	21.32	170.36	2,757.79	-670.19	117.21	-670.42	0.95	-0.65	-1.87	
2,960.00	21.13	172.13	2,844.48	-703.47	122.33	-703.70	0.72	-0.20	1.90	
3,056.00	21.08	171.87	2,934.04	-737.70	127.14	-737.94	0.11	-0.05	-0.27	
3,150.00	20.62	172.71	3,021.88	-770.85	131.63	-771.10	0.58	-0.49	0.89	
3,246.00	20.88	172.03	3,111.66	-804.56	136.15	-804.82	0.37	0.27	-0.71	
3,338.00	20.91	171.03	3,197.61	-837.01	140.98	-837.28	0.39	0.03	-1.09	
3,431.00	22.39	174.63	3,284.05	-871.04	145.23	-871.32	2.14	1.59	3.87	
3,524.00	22.31	175.53	3,370.06	-906.28	148.26	-906.56	0.38	-0.09	0.97	
3,619.00	20.17	170.58	3,458.61	-940.42	152.35	-940.71	2.94	-2.25	-5.21	
3,713.00	19.80	169.60	3,546.95	-972.06	157.88	-972.37	0.53	-0.39	-1.04	
3,806.00	20.41	173.52	3,634.29	-1,003.67	162.55	-1,003.98	1.59	0.66	4.22	
3,899.00	19.69	171.71	3,721.65	-1,035.29	166.64	-1,035.61	1.02	-0.77	-1.95	
3,993.00	20.35	168.54	3,809.97	-1,066.98	172.17	-1,067.31	1.35	0.70	-3.37	
4,088.00	20.21	163.93	3,899.09	-1,098.94	179.99	-1,099.28	1.69	-0.15	-4.85	
4,180.00	21.69	165.11	3,985.00	-1,130.64	188.76	-1,131.00	1.67	1.61	1.28	
4,273.00	21.80	165.29	4,071.39	-1,163.95	197.56	-1,164.33	0.14	0.12	0.19	
4,366.00	21.83	165.34	4,157.73	-1,197.38	206.32	-1,197.78	0.04	0.03	0.05	
4,458.00	20.17	170.14	4,243.62	-1,229.56	213.37	-1,229.97	2.60	-1.80	5.22	
4,551.00	17.11	171.16	4,331.73	-1,258.88	218.22	-1,259.30	3.31	-3.29	1.10	

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Well:	MAE J 8-12HZ	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)	
4,644.00	16.90	173.39	4,420.67	-1,285.83	221.88	-1,286.25	0.74	-0.23	2.40	
4,738.00	12.87	173.27	4,511.49	-1,309.81	224.68	-1,310.24	4.29	-4.29	-0.13	
4,832.00	11.57	169.04	4,603.36	-1,329.46	227.70	-1,329.90	1.68	-1.38	-4.50	
4,926.00	10.99	171.19	4,695.55	-1,347.57	230.86	-1,348.01	0.76	-0.62	2.29	
5,019.00	9.45	171.10	4,787.07	-1,363.87	233.40	-1,364.32	1.66	-1.66	-0.10	
5,113.00	8.05	172.28	4,879.97	-1,378.02	235.48	-1,378.47	1.50	-1.49	1.26	
5,232.00	6.26	171.32	4,998.04	-1,392.69	237.58	-1,393.15	1.51	-1.50	-0.81	
5,324.00	5.64	171.52	5,089.54	-1,402.12	239.00	-1,402.58	0.67	-0.67	0.22	
5,418.00	5.23	167.92	5,183.12	-1,410.88	240.58	-1,411.34	0.57	-0.44	-3.83	
5,511.00	4.01	167.13	5,275.82	-1,418.20	242.19	-1,418.66	1.31	-1.31	-0.85	
5,603.00	2.43	160.50	5,367.67	-1,423.17	243.56	-1,423.64	1.76	-1.72	-7.21	
5,697.00	1.76	169.34	5,461.61	-1,426.47	244.49	-1,426.93	0.79	-0.71	9.40	
5,791.00	1.51	176.90	5,555.57	-1,429.12	244.83	-1,429.59	0.35	-0.27	8.04	
5,884.00	1.22	181.98	5,648.54	-1,431.34	244.86	-1,431.80	0.34	-0.31	5.46	
5,976.00	0.98	202.69	5,740.53	-1,433.04	244.52	-1,433.51	0.50	-0.26	22.51	
6,068.00	1.31	188.17	5,832.51	-1,434.81	244.07	-1,435.27	0.47	0.36	-15.78	
6,162.00	0.84	195.39	5,926.49	-1,436.54	243.73	-1,437.00	0.52	-0.50	7.68	
6,255.00	1.20	212.67	6,019.48	-1,438.01	243.03	-1,438.48	0.51	0.39	18.58	
6,348.00	0.53	289.15	6,112.47	-1,438.69	242.09	-1,439.15	1.28	-0.72	82.24	
6,441.00	0.83	254.32	6,205.46	-1,438.73	241.04	-1,439.19	0.54	0.32	-37.45	
6,535.00	0.61	272.31	6,299.45	-1,438.90	239.88	-1,439.35	0.33	-0.23	19.14	
6,628.00	0.50	324.42	6,392.45	-1,438.55	239.15	-1,439.00	0.53	-0.12	56.03	
6,721.00	0.76	352.09	6,485.44	-1,437.60	238.83	-1,438.06	0.42	0.28	29.75	
6,814.00	0.79	354.27	6,578.44	-1,436.36	238.68	-1,436.81	0.05	0.03	2.34	
6,907.00	0.76	358.01	6,671.43	-1,435.10	238.60	-1,435.56	0.06	-0.03	4.02	
7,000.00	0.88	347.56	6,764.42	-1,433.79	238.42	-1,434.24	0.21	0.13	-11.24	
7,093.00	0.19	261.77	6,857.41	-1,433.11	238.12	-1,433.57	0.95	-0.74	-92.25	
7,186.00	0.29	256.37	6,950.41	-1,433.19	237.73	-1,433.64	0.11	0.11	-5.81	
7,208.98	2.01	0.93	6,973.39	-1,432.80	237.68	-1,433.25	9.17	7.50	454.92	
Curve KOP (Mae J 8-12HZ)										
7,280.00	8.51	6.79	7,044.07	-1,426.33	238.33	-1,426.78	9.17	9.15	8.25	
7,374.00	19.00	359.00	7,135.26	-1,404.06	238.88	-1,404.51	11.31	11.16	-8.29	
7,469.00	31.05	1.51	7,221.18	-1,363.95	239.26	-1,364.41	12.73	12.68	2.64	
7,562.00	39.66	359.39	7,296.96	-1,310.20	239.58	-1,310.66	9.35	9.26	-2.28	
7,655.00	43.24	357.56	7,366.66	-1,248.67	237.90	-1,249.13	4.06	3.85	-1.97	
7,749.00	50.45	359.31	7,430.91	-1,180.18	236.09	-1,180.63	7.79	7.67	1.86	
7,843.00	54.22	359.48	7,488.34	-1,105.78	235.31	-1,106.23	4.01	4.01	0.18	
7,936.00	55.31	357.58	7,542.00	-1,029.85	233.35	-1,030.30	2.04	1.17	-2.04	
8,029.00	59.97	356.77	7,591.76	-951.42	229.47	-951.85	5.06	5.01	-0.87	
8,122.00	63.92	1.83	7,635.52	-869.40	228.53	-869.84	6.41	4.25	5.44	
8,215.00	70.50	0.78	7,671.52	-783.73	230.47	-784.17	7.15	7.08	-1.13	
8,309.00	74.91	359.42	7,699.46	-694.01	230.61	-694.45	4.89	4.69	-1.45	
8,330.05	77.31	359.84	7,704.51	-673.58	230.48	-674.02	11.55	11.39	1.98	
Heel (MAE J 8-12HZ)										

Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well MAE J 8-12HZ
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 8-12HZ	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)	
8,402.00	85.51	1.21	7,715.25	-602.50	231.14	-602.94	11.55	11.40	1.91	
8,434.00	87.80	1.27	7,717.12	-570.56	231.83	-571.00	7.16	7.16	0.19	
LP: 158' FSL, 2616' FWL Sec 8 T1N R68W										
8,495.00	89.31	1.22	7,718.66	-509.60	233.15	-510.05	2.48	2.48	-0.08	
8,588.00	90.26	0.06	7,719.01	-416.61	234.19	-417.06	1.61	1.02	-1.25	
8,681.00	92.39	358.55	7,716.86	-323.65	233.06	-324.09	2.81	2.29	-1.62	
8,735.55	92.44	359.19	7,714.56	-269.16	231.99	-269.60	1.17	0.10	1.17	
Exit Heel Circle: 8735.55' MD, 457' FSL, 2632' FWL										
8,774.00	92.48	359.64	7,712.90	-230.74	231.60	-231.19	1.17	0.10	1.17	
8,868.00	90.12	359.96	7,710.77	-136.78	231.27	-137.22	2.53	-2.51	0.34	
8,962.00	88.52	0.67	7,711.89	-42.79	231.79	-43.23	1.86	-1.70	0.76	
9,054.00	88.39	359.63	7,714.37	49.18	232.03	48.73	1.14	-0.14	-1.13	
9,148.00	89.08	358.86	7,716.44	143.14	230.79	142.70	1.10	0.73	-0.82	
9,241.00	88.90	358.30	7,718.08	236.10	228.48	235.66	0.63	-0.19	-0.60	
9,335.00	88.88	356.84	7,719.90	330.00	224.50	329.57	1.55	-0.02	-1.55	
9,431.00	89.52	358.14	7,721.24	425.89	220.30	425.47	1.51	0.67	1.35	
9,504.90	88.95	357.37	7,722.23	499.73	217.40	499.31	1.30	-0.77	-1.04	
Interm TGT1 (MAE J 8-12HZ)										
9,524.00	88.80	357.17	7,722.61	518.80	216.49	518.39	1.30	-0.77	-1.04	
9,618.00	87.92	0.32	7,725.30	612.73	214.43	612.32	3.48	-0.94	3.35	
9,710.00	89.72	2.50	7,727.19	704.67	216.70	704.26	3.07	1.96	2.37	
9,804.00	90.59	1.36	7,726.94	798.62	219.86	798.19	1.53	0.93	-1.21	
9,898.00	91.17	1.05	7,725.50	892.58	221.84	892.16	0.70	0.62	-0.33	
9,992.00	89.04	1.35	7,725.32	986.56	223.81	986.13	2.29	-2.27	0.32	
10,086.00	89.22	0.79	7,726.75	1,080.53	225.56	1,080.10	0.63	0.19	-0.60	
10,180.00	89.41	359.88	7,727.87	1,174.52	226.11	1,174.08	0.99	0.20	-0.97	
10,272.00	88.01	358.82	7,729.95	1,266.49	225.07	1,266.05	1.91	-1.52	-1.15	
10,364.00	88.20	0.29	7,732.99	1,358.43	224.35	1,358.00	1.61	0.21	1.60	
10,458.00	88.10	359.76	7,736.02	1,452.38	224.40	1,451.95	0.57	-0.11	-0.56	
10,550.00	87.91	358.94	7,739.23	1,544.32	223.35	1,543.89	0.91	-0.21	-0.89	
10,644.00	90.31	359.67	7,740.69	1,638.29	222.21	1,637.87	2.67	2.55	0.78	
10,736.00	90.11	358.71	7,740.35	1,730.28	220.91	1,729.86	1.07	-0.22	-1.04	
10,828.00	89.99	359.58	7,740.27	1,822.27	219.54	1,821.85	0.95	-0.13	0.95	
10,921.00	89.24	357.92	7,740.89	1,915.24	217.51	1,914.82	1.96	-0.81	-1.78	
11,014.00	91.66	1.85	7,740.16	2,008.22	217.32	2,007.80	4.96	2.60	4.23	
11,107.00	93.30	1.02	7,736.14	2,101.10	219.65	2,100.67	1.98	1.76	-0.89	
11,201.00	90.91	3.85	7,732.68	2,194.93	223.64	2,194.50	3.94	-2.54	3.01	
11,294.00	89.90	0.94	7,732.03	2,287.84	227.53	2,287.40	3.31	-1.09	-3.13	
11,386.00	89.74	1.14	7,732.32	2,379.82	229.20	2,379.38	0.28	-0.17	0.22	
11,481.00	90.78	0.29	7,731.89	2,474.81	230.38	2,474.36	1.41	1.09	-0.89	
11,575.00	89.56	2.78	7,731.61	2,568.77	232.90	2,568.32	2.95	-1.30	2.65	
11,669.00	90.80	2.19	7,731.31	2,662.68	236.98	2,662.22	1.46	1.32	-0.63	
11,763.00	89.26	2.59	7,731.26	2,756.59	240.90	2,756.12	1.69	-1.64	0.43	
11,856.00	89.23	2.07	7,732.49	2,849.51	244.68	2,849.03	0.56	-0.03	-0.56	

Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well MAE J 8-12HZ
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 8-12HZ	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)	
11,949.00	89.89	1.21	7,733.20	2,942.46	247.34	2,941.98	1.17	0.71	-0.92	
12,043.00	90.21	0.22	7,733.12	3,036.45	248.51	3,035.97	1.11	0.34	-1.05	
12,137.00	90.79	358.51	7,732.30	3,130.44	247.47	3,129.96	1.92	0.62	-1.82	
12,231.00	88.00	357.04	7,733.29	3,224.35	243.82	3,223.88	3.35	-2.97	-1.56	
12,324.00	87.62	356.64	7,736.85	3,317.14	238.70	3,316.68	0.59	-0.41	-0.43	
12,416.00	89.48	358.32	7,739.17	3,409.02	234.66	3,408.56	2.72	2.02	1.83	
12,509.00	90.11	0.44	7,739.51	3,502.01	233.65	3,501.55	2.38	0.68	2.28	
12,604.00	90.33	359.27	7,739.14	3,597.00	233.41	3,596.55	1.25	0.23	-1.23	
12,697.00	89.93	359.10	7,738.93	3,689.99	232.09	3,689.54	0.47	-0.43	-0.18	
12,791.00	91.99	0.41	7,737.36	3,783.97	231.68	3,783.52	2.60	2.19	1.39	
12,884.00	92.41	359.95	7,733.79	3,876.90	231.98	3,876.45	0.67	0.45	-0.49	
12,976.00	90.24	0.06	7,731.66	3,968.87	231.98	3,968.42	2.36	-2.36	0.12	
13,070.00	89.48	359.84	7,731.89	4,062.87	231.90	4,062.42	0.84	-0.81	-0.23	
13,164.00	89.78	359.80	7,732.49	4,156.87	231.61	4,156.42	0.32	0.32	-0.04	
13,197.99	89.82	359.55	7,732.61	4,190.86	231.42	4,190.41	0.73	0.11	-0.72	
Enter Toe Circle: 13197.99' MD 455' FNL, 2693' FWL										
13,258.00	89.88	359.12	7,732.77	4,250.86	230.72	4,250.41	0.73	0.11	-0.72	
13,352.00	90.76	358.19	7,732.25	4,344.84	228.52	4,344.39	1.36	0.94	-0.99	
13,445.00	92.23	357.07	7,729.82	4,437.72	224.67	4,437.28	1.99	1.58	-1.20	
13,537.00	91.57	356.77	7,726.77	4,529.54	219.73	4,529.11	0.79	-0.72	-0.33	
13,598.00	91.57	356.77	7,725.10	4,590.42	216.29	4,589.99	0.00	0.00	0.00	
PBHL (MAE J 8-12HZ) - BHL: 55' FNL, 2666' FWL Sec 8 T1N R68W										

Design Targets										
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude	
SHL: 731' FSL, 2411' FV - hit/miss target - Shape - Point	0.00	0.00	0.00	0.00	0.00	14,548,677.24	1,632,413.41	40.060258	-105.028603	
Curve KOP (Mae J 8-12) - actual wellpath hits target center - Point	0.00	0.00	6,973.41	-1,432.80	237.68	14,547,244.36	1,632,650.63	40.056323	-105.027754	
Exit Heel Circle: 8735.5' - actual wellpath hits target center - Point	0.00	0.00	7,714.56	-269.16	231.99	14,548,408.00	1,632,645.31	40.059519	-105.027774	
LP: 158' FSL, 2616' FWI - actual wellpath hits target center - Point	0.00	0.00	7,717.12	-570.56	231.83	14,548,106.60	1,632,645.05	40.058691	-105.027775	
BHL: 55' FNL, 2666' FW - actual wellpath misses target center by 0.01usft at 13598.00usft MD (7725.10 TVD, 4590.42 N, 216.29 E) - Point	0.00	0.00	7,725.10	4,590.42	216.29	14,553,267.59	1,632,631.17	40.072864	-105.027830	
Enter Toe Circle: 13197. - actual wellpath misses target center by 0.01usft at 13197.99usft MD (7732.61 TVD, 4190.86 N, 231.42 E) - Point	0.00	0.00	7,732.61	4,190.86	231.42	14,552,868.02	1,632,646.17	40.071767	-105.027776	

Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well MAE J 8-12HZ
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 8-12HZ	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.15 Single User Db

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)		Name	Casing Diameter (")	Hole Diameter (")
1,910.00	1,863.24	9 5/8"		9-5/8	13-1/2

Checked By: _____ Approved By: _____ Date: _____