

ANADARKO PETROLEUM CORP

Project: Weld County, CO (UTM-NAD83)
 Site: MAE J 14-8HZ
 Well: MAE J 8-2HZ
 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)

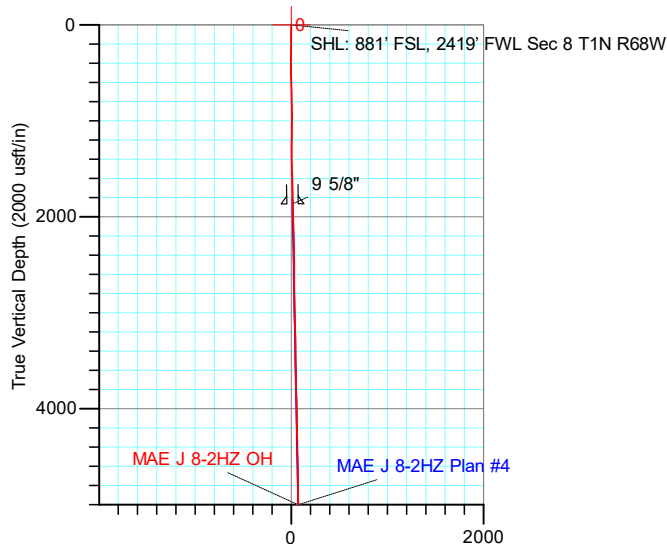
Geodetic System: Universal Transverse Mercator (US Survey Feet)
 Datum: North American Datum 1983
 Ellipsoid: GRS 1980
 Zone: Zone 13N (108 W to 102 W)



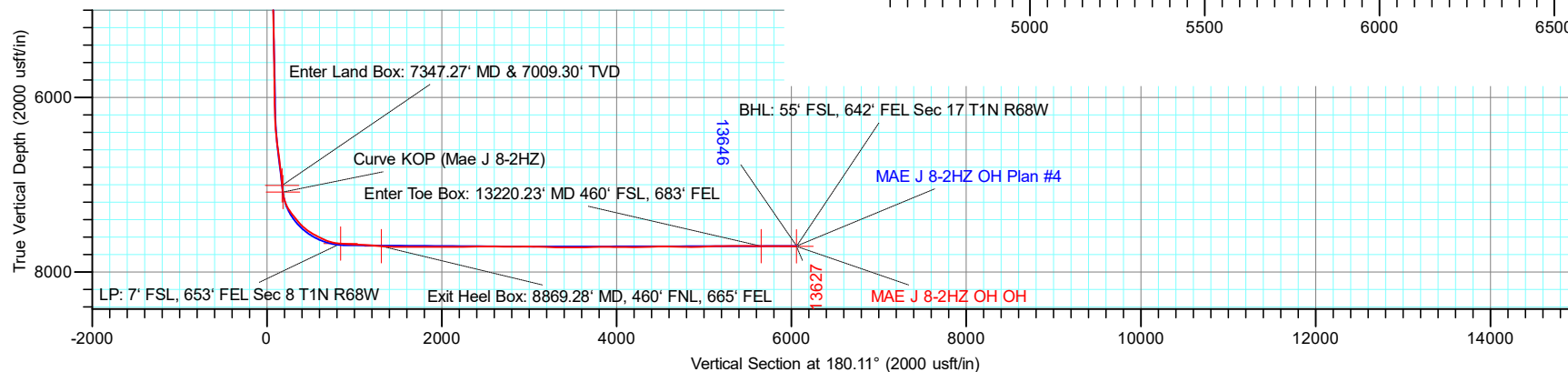
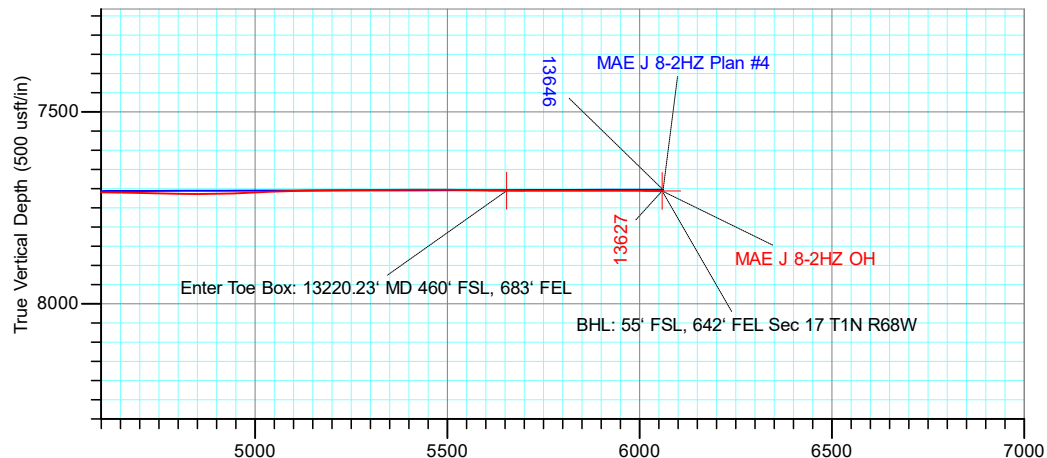
DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
BHL: 55' FSL, 642' FEL Sec 17 T1N R68W	7706.13	-6062.95	2268.40	40.044020	-105.020495
Curve KOP (Mae J 8-2HZ)	7084.10	-187.21	2085.47	40.060156	-105.021147
Enter Land Box: 7347.27' MD & 7009.30' TVD	7009.30	-177.86	2062.78	40.060181	-105.021228
Enter Toe Box: 13220.23' MD 460' FSL, 683' FEL	7705.59	-5658.33	2227.89	40.045131	-105.020639
Exit Heel Box: 8869.28' MD, 460' FNL, 665' FEL	7704.75	-1314.21	2252.04	40.057061	-105.020552
LP: 7' FSL, 653' FEL Sec 8 T1N R68W	7675.86	-847.21	2264.32	40.058343	-105.020508
SHL: 881' FSL, 2419' FWL Sec 8 T1N R68W	0.00	0.00	0.00	40.060670	-105.028600

1N-68W-17



ACTUAL LINE CALLS
SHL: 881' FSL, 2419' FWL Sec 8 T1N R68W
HEEL: 7' FSL, 653' FEL Sec 8 T1N R68W
BHL: 55' FSL, 642' FEL Sec 17 T1N R68W



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

Design: OH (MAE J 8-2HZ/OH)
 MAE J 14-8HZ
 Created By: Dustin Ault Date: 11:29, March 02 2020
 Date: _____
 Approved: _____ Date: _____

ANADARKO PETROLEUM CORP

Project: Weld County, CO (UTM-NAD83)
 Site: MAE J 14-8HZ
 Well: MAE J 8-2HZ
 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°

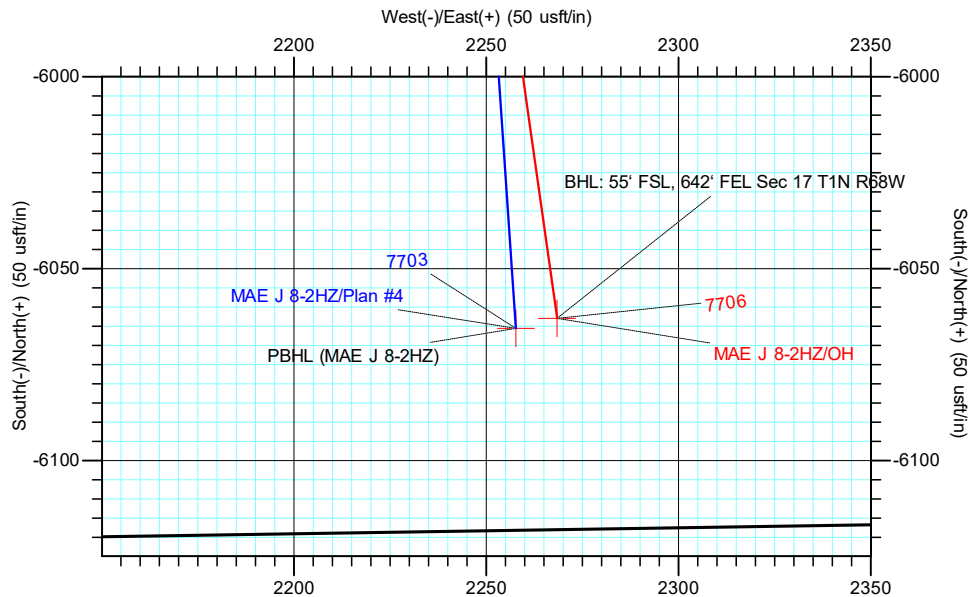
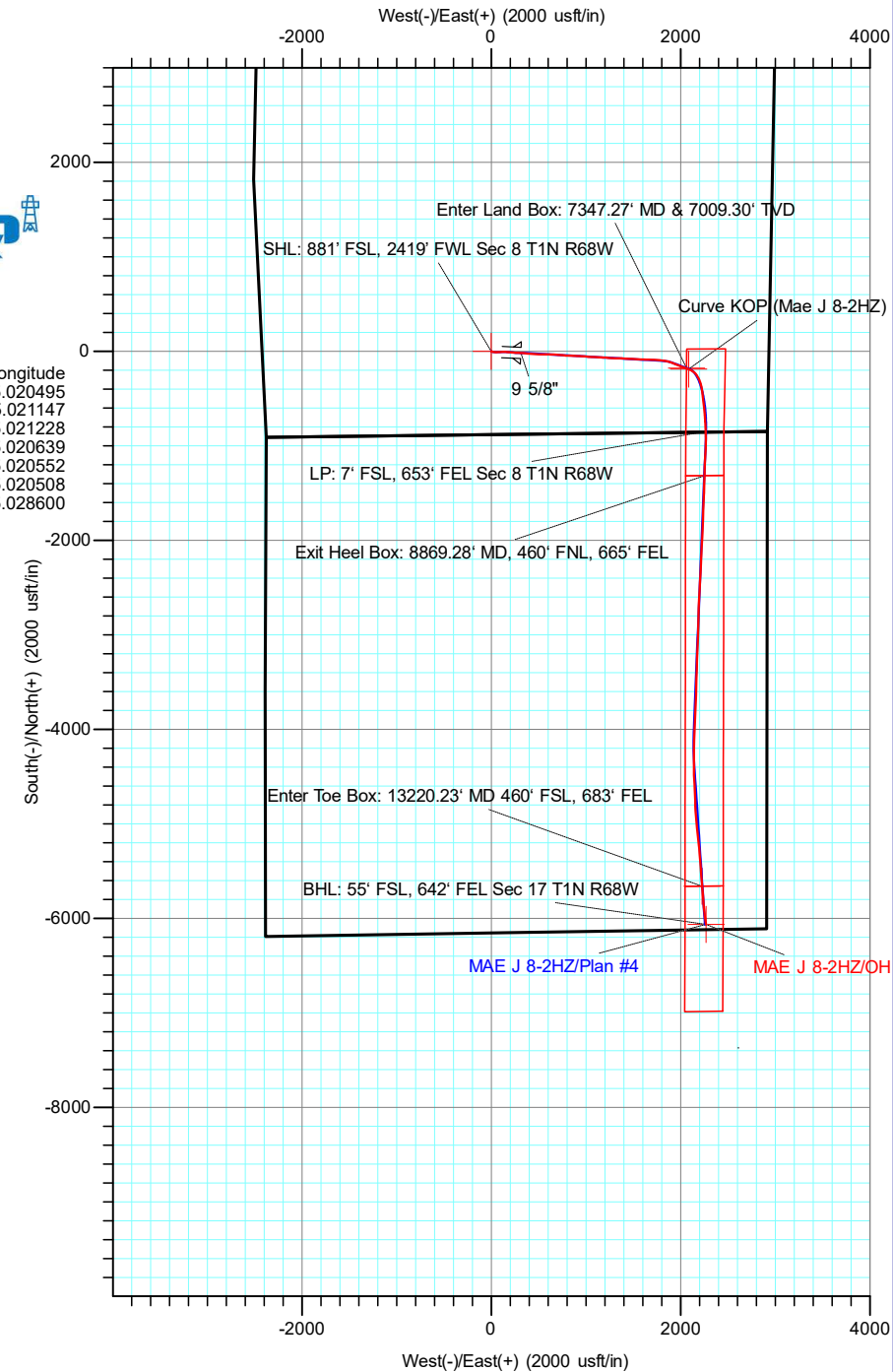
Magnetic Field
 Strength: 51928.8nT
 Dip Angle: 66.49°
 Date: 9/19/2019
 Model: IGRF2015



DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
BHL: 55' FSL, 642' FEL Sec 17 T1N R68W	7706.13	-6062.95	2268.40	14542763.59	1634680.75	40.044020	-105.020495
Curve KOP (Mae J 8-2HZ)	7084.10	-187.21	2085.47	14548639.39	1634499.71	40.060156	-105.021147
Enter Land Box: 7347.27' MD & 7009.30' TVD	7009.30	-177.86	2062.78	14548648.75	1634477.02	40.060181	-105.021228
Enter Toe Box: 13220.23' MD 460' FSL, 683' FEL	7705.59	-5658.33	2227.89	14543168.22	1634640.37	40.045131	-105.020639
Exit Heel Box: 8869.28' MD, 460' FNL, 665' FEL	7704.75	-1314.21	2252.04	14547512.34	1634665.92	40.057061	-105.020552
LP: 7' FSL, 653' FEL Sec 8 T1N R68W	7675.86	-847.21	2264.32	14547979.33	1634678.35	40.058343	-105.020508
SHL: 881' FSL, 2419' FWL Sec 8 T1N R68W	0.00	0.00	0.00	14548827.27	1632414.30	40.060670	-105.028600

ACTUAL LINE CALLS
SHL: 881' FSL, 2419' FWL Sec 8 T1N R68W
HEEL: 7' FSL, 653' FEL Sec 8 T1N R68W
BHL: 55' FSL, 642' FEL Sec 17 T1N R68W



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

Design: OH (MAE J 8-2HZ/OH)
 MAE J 14-8HZ
 Created By: Dustin Ault
 Date: 11:33, March 02 2020
 Approved: _____ Date: _____

ANADARKO PETROLEUM CORP

Weld County, CO (UTM-NAD83)

MAE J 14-8HZ

MAE J 8-2HZ

OH

Design: OH

Standard Survey Report

02 March, 2020

Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well MAE J 8-2HZ
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 8-2HZ	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 8-2HZ					
Well Position	+N/-S	0.00 usft	Northing:	14,548,827.27 usft	Latitude:	40.060670
	+E/-W	0.00 usft	Easting:	1,632,414.30 usft	Longitude:	-105.028600
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	51,928.77716385

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	180.11	

Survey Program	Date	3/2/2020			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
130.00	1,860.00	Survey #1 - Surface MWD (OH)	APC_ISCWSA REV 2 MWD	Fixed:v2:standard declination	
1,932.00	13,571.00	Survey #2 - MWD+IFR (OH)	APC_ISCWSA REV 2 MWD+	Fixed:v2:crustal field declination	
13,627.00	13,627.00	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 8-2HZ)										
130.00	0.48	313.76	130.00	0.38	-0.39	-0.38	0.37	0.37	0.00	
225.00	1.41	4.12	224.99	1.82	-0.60	-1.82	1.23	0.98	53.01	
320.00	0.92	55.63	319.97	3.41	0.12	-3.41	1.16	-0.52	54.22	
415.00	0.40	98.08	414.96	3.80	1.07	-3.80	0.72	-0.55	44.68	
510.00	1.58	154.33	509.95	2.57	1.97	-2.57	1.47	1.24	59.21	
606.00	3.25	129.37	605.86	-0.35	4.65	0.34	2.02	1.74	-26.00	
701.00	5.32	105.73	700.60	-3.25	10.97	3.23	2.82	2.18	-24.88	

Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well MAE J 8-2HZ
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 8-2HZ	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	8.04	101.77	794.94	-5.80	21.71	5.76	2.90	2.86	-4.17	
891.00	9.71	95.27	888.81	-7.89	36.20	7.82	2.05	1.76	-6.84	
986.00	11.21	88.94	982.23	-8.46	53.41	8.35	1.99	1.58	-6.66	
1,081.00	12.66	86.57	1,075.17	-7.66	73.04	7.52	1.61	1.53	-2.49	
1,176.00	12.88	85.69	1,167.82	-6.24	93.99	6.06	0.31	0.23	-0.93	
1,271.00	12.88	87.45	1,260.43	-4.98	115.12	4.76	0.41	0.00	1.85	
1,366.00	14.77	92.10	1,352.68	-4.95	137.80	4.69	2.31	1.99	4.89	
1,462.00	17.45	94.65	1,444.90	-6.57	164.38	6.25	2.89	2.79	2.66	
1,557.00	19.56	94.56	1,534.98	-8.99	194.44	8.61	2.22	2.22	-0.09	
1,652.00	19.78	94.65	1,624.44	-11.55	226.31	11.12	0.23	0.23	0.09	
1,746.00	19.95	94.74	1,712.85	-14.17	258.15	13.67	0.18	0.18	0.10	
1,842.00	18.85	91.31	1,803.40	-15.88	289.97	15.32	1.65	-1.15	-3.57	
1,860.00	19.25	90.70	1,820.41	-15.98	295.85	15.41	2.48	2.22	-3.39	
1,910.00	18.70	92.38	1,867.70	-16.41	312.10	15.81	1.55	-1.10	3.36	
9 5/8"										
1,932.00	18.46	93.15	1,888.55	-16.75	319.10	16.14	1.55	-1.08	3.50	
2,026.00	20.12	96.00	1,977.27	-19.26	350.04	18.59	2.03	1.77	3.03	
2,118.00	19.67	95.55	2,063.78	-22.41	381.19	21.68	0.52	-0.49	-0.49	
2,211.00	20.35	94.63	2,151.17	-25.23	412.88	24.44	0.81	0.73	-0.99	
2,306.00	19.96	93.41	2,240.35	-27.53	445.53	26.67	0.60	-0.41	-1.28	
2,400.00	19.53	93.24	2,328.82	-29.37	477.24	28.45	0.46	-0.46	-0.18	
2,492.00	18.85	92.78	2,415.71	-30.96	507.44	29.98	0.76	-0.74	-0.50	
2,585.00	19.27	90.13	2,503.61	-31.72	537.79	30.69	1.03	0.45	-2.85	
2,679.00	18.41	89.88	2,592.58	-31.73	568.14	30.64	0.92	-0.91	-0.27	
2,772.00	18.56	89.59	2,680.78	-31.59	597.63	30.44	0.19	0.16	-0.31	
2,865.00	19.96	92.63	2,768.57	-32.21	628.29	31.01	1.85	1.51	3.27	
2,959.00	18.90	92.10	2,857.22	-33.51	659.53	32.24	1.14	-1.13	-0.56	
3,054.00	19.36	94.00	2,946.97	-35.17	690.61	33.84	0.81	0.48	2.00	
3,149.00	17.85	92.96	3,037.01	-37.02	720.87	35.63	1.63	-1.59	-1.09	
3,244.00	18.34	97.13	3,127.31	-39.63	750.24	38.19	1.46	0.52	4.39	
3,336.00	19.20	96.93	3,214.42	-43.25	779.62	41.75	0.94	0.93	-0.22	
3,429.00	20.42	89.97	3,301.92	-45.08	811.03	43.53	2.85	1.31	-7.48	
3,523.00	18.42	90.30	3,390.57	-45.15	842.28	43.54	2.13	-2.13	0.35	
3,617.00	18.66	93.13	3,479.69	-46.05	872.15	44.38	0.99	0.26	3.01	
3,711.00	19.77	94.31	3,568.46	-48.07	903.02	46.33	1.25	1.18	1.26	
3,804.00	19.32	92.39	3,656.10	-49.89	934.07	48.10	0.84	-0.48	-2.06	
3,898.00	18.27	93.67	3,745.09	-51.48	964.31	49.63	1.20	-1.12	1.36	
3,992.00	18.78	94.34	3,834.21	-53.57	994.10	51.66	0.59	0.54	0.71	
4,086.00	19.23	95.21	3,923.09	-56.12	1,024.61	54.16	0.57	0.48	0.93	
4,178.00	19.52	92.62	4,009.88	-58.20	1,055.05	56.18	0.99	0.32	-2.82	
4,272.00	19.92	92.93	4,098.37	-59.74	1,086.73	57.65	0.44	0.43	0.33	
4,364.00	19.71	92.58	4,184.92	-61.24	1,117.88	59.09	0.26	-0.23	-0.38	
4,456.00	19.19	94.23	4,271.67	-63.05	1,148.46	60.85	0.82	-0.57	1.79	

Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well MAE J 8-2HZ
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 8-2HZ	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)	
4,550.00	18.70	91.20	4,360.58	-64.51	1,178.93	62.24	1.17	-0.52	-3.22	
4,643.00	18.08	94.58	4,448.84	-65.97	1,208.22	63.65	1.33	-0.67	3.63	
4,736.00	19.65	95.15	4,536.84	-68.53	1,238.18	66.15	1.70	1.69	0.61	
4,830.00	19.67	93.36	4,625.36	-70.87	1,269.72	68.43	0.64	0.02	-1.90	
4,924.00	18.02	91.29	4,714.32	-72.13	1,300.05	69.63	1.89	-1.76	-2.20	
5,018.00	18.63	91.22	4,803.55	-72.77	1,329.60	70.22	0.65	0.65	-0.07	
5,111.00	17.50	90.19	4,891.96	-73.14	1,358.43	70.53	1.26	-1.22	-1.11	
5,230.00	17.25	94.26	5,005.54	-74.51	1,393.92	71.83	1.04	-0.21	3.42	
5,323.00	19.04	94.20	5,093.91	-76.64	1,422.80	73.91	1.92	1.92	-0.06	
5,416.00	19.12	92.66	5,181.80	-78.46	1,453.15	75.67	0.55	0.09	-1.66	
5,509.00	19.98	92.39	5,269.44	-79.83	1,484.24	76.98	0.93	0.92	-0.29	
5,602.00	18.73	93.04	5,357.18	-81.28	1,515.02	78.38	1.36	-1.34	0.70	
5,696.00	18.57	91.88	5,446.25	-82.58	1,545.05	79.61	0.43	-0.17	-1.23	
5,789.00	19.29	93.55	5,534.22	-84.01	1,575.19	80.99	0.97	0.77	1.80	
5,882.00	18.61	91.16	5,622.18	-85.26	1,605.36	82.18	1.11	-0.73	-2.57	
5,974.00	18.99	93.07	5,709.27	-86.36	1,634.98	83.22	0.79	0.41	2.08	
6,067.00	17.96	91.64	5,797.48	-87.58	1,664.42	84.39	1.21	-1.11	-1.54	
6,161.00	17.58	93.21	5,886.99	-88.79	1,693.08	85.54	0.65	-0.40	1.67	
6,253.00	18.29	91.18	5,974.52	-89.87	1,721.39	86.56	1.03	0.77	-2.21	
6,347.00	18.40	93.91	6,063.74	-91.18	1,750.94	87.82	0.92	0.12	2.90	
6,440.00	18.22	94.97	6,152.04	-93.44	1,780.07	90.03	0.41	-0.19	1.14	
6,533.00	18.50	97.55	6,240.30	-96.64	1,809.18	93.17	0.92	0.30	2.77	
6,627.00	17.84	99.34	6,329.62	-100.94	1,838.17	97.41	0.92	-0.70	1.90	
6,719.00	22.32	104.73	6,416.01	-107.67	1,868.99	104.08	5.26	4.87	5.86	
6,812.00	19.91	109.48	6,502.77	-117.45	1,901.00	113.80	3.18	-2.59	5.11	
6,906.00	19.31	112.99	6,591.32	-128.85	1,930.40	125.15	1.41	-0.64	3.73	
6,999.00	19.56	111.93	6,679.02	-140.67	1,959.00	136.91	0.46	0.27	-1.14	
7,092.00	18.26	111.20	6,767.00	-151.76	1,987.03	147.94	1.42	-1.40	-0.78	
7,184.00	20.23	110.43	6,853.85	-162.52	2,015.37	158.65	2.16	2.14	-0.84	
7,278.00	16.59	105.08	6,943.03	-171.69	2,043.57	167.77	4.27	-3.87	-5.69	
7,347.28	17.31	110.42	7,009.30	-177.86	2,062.78	173.90	2.48	1.04	7.71	
Enter Land Box: 7347.27' MD & 7009.30' TVD										
7,372.00	17.60	112.22	7,032.89	-180.56	2,069.69	176.58	2.48	1.17	7.27	
7,426.00	19.38	113.44	7,084.10	-187.21	2,085.47	183.21	3.37	3.30	2.26	
Curve KOP (Mae J 8-2HZ)										
7,468.00	20.77	114.25	7,123.55	-193.04	2,098.65	189.01	3.37	3.31	1.93	
7,561.00	32.33	125.36	7,206.65	-214.29	2,134.11	210.19	13.48	12.43	11.95	
7,653.00	37.86	146.16	7,282.16	-252.14	2,170.05	247.97	14.25	6.01	22.61	
7,747.00	40.76	156.53	7,354.97	-304.31	2,198.37	300.09	7.63	3.09	11.03	
7,841.00	41.08	167.20	7,426.08	-362.65	2,217.46	358.39	7.44	0.34	11.35	
7,934.00	48.91	172.85	7,491.82	-427.35	2,228.61	423.07	9.45	8.42	6.08	
8,028.00	58.39	173.89	7,547.48	-502.47	2,237.30	498.17	10.12	10.09	1.11	
8,120.00	63.08	172.99	7,592.44	-582.17	2,246.48	577.86	5.17	5.10	-0.98	
8,214.00	65.50	175.51	7,633.22	-666.43	2,254.95	662.10	3.53	2.57	2.68	

Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well MAE J 8-2HZ
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 8-2HZ	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)	
8,307.00	77.62	177.69	7,662.59	-754.33	2,260.11	749.99	13.22	13.03	2.34	
8,401.00	86.13	177.13	7,675.86	-847.21	2,264.32	842.86	9.07	9.05	-0.60	
LP: 7' FSL, 653' FEL Sec 8 T1N R68W										
8,456.47	86.19	178.73	7,679.57	-902.52	2,266.32	898.16	2.88	0.12	2.88	
Heel (MAE J 8-2HZ)										
8,494.00	86.24	179.81	7,682.05	-939.96	2,266.79	935.61	2.88	0.12	2.88	
8,586.00	87.68	183.08	7,686.93	-1,031.79	2,264.48	1,027.44	3.88	1.57	3.55	
8,679.00	86.58	182.53	7,691.58	-1,124.56	2,259.93	1,120.22	1.32	-1.18	-0.59	
8,772.00	86.31	182.53	7,697.35	-1,217.29	2,255.83	1,212.95	0.29	-0.29	0.00	
8,867.00	84.99	181.96	7,704.56	-1,311.94	2,252.12	1,307.61	1.51	-1.39	-0.60	
8,869.28	85.05	181.95	7,704.75	-1,314.21	2,252.04	1,309.88	2.56	2.51	-0.54	
Exit Heel Box: 8869.28' MD, 460' FNL, 665' FEL										
8,960.00	87.32	181.46	7,710.79	-1,404.68	2,249.35	1,400.36	2.56	2.51	-0.54	
9,052.00	90.12	182.56	7,712.85	-1,496.59	2,246.13	1,492.28	3.27	3.04	1.20	
9,146.00	89.69	182.23	7,713.00	-1,590.51	2,242.20	1,586.20	0.58	-0.46	-0.35	
9,240.00	90.29	181.80	7,713.02	-1,684.45	2,238.89	1,680.15	0.79	0.64	-0.46	
9,334.00	89.86	181.57	7,712.90	-1,778.41	2,236.13	1,774.11	0.52	-0.46	-0.24	
9,429.00	89.72	181.23	7,713.25	-1,873.38	2,233.81	1,869.09	0.39	-0.15	-0.36	
9,523.00	90.11	183.50	7,713.38	-1,967.29	2,229.93	1,963.01	2.45	0.41	2.41	
9,616.00	90.05	184.09	7,713.25	-2,060.09	2,223.77	2,055.81	0.64	-0.06	0.63	
9,708.00	89.57	182.50	7,713.56	-2,151.93	2,218.49	2,147.67	1.81	-0.52	-1.73	
9,803.00	91.40	182.23	7,712.76	-2,246.84	2,214.57	2,242.59	1.95	1.93	-0.28	
9,897.00	90.45	183.24	7,711.24	-2,340.72	2,210.08	2,336.47	1.47	-1.01	1.07	
9,991.00	91.44	182.67	7,709.69	-2,434.58	2,205.24	2,430.34	1.22	1.05	-0.61	
10,084.00	89.76	183.28	7,708.71	-2,527.45	2,200.41	2,523.22	1.92	-1.81	0.66	
10,179.00	89.17	182.85	7,709.60	-2,622.31	2,195.33	2,618.09	0.77	-0.62	-0.45	
10,270.00	89.44	181.88	7,710.70	-2,713.22	2,191.58	2,709.01	1.11	0.30	-1.07	
10,363.00	90.01	181.32	7,711.15	-2,806.18	2,188.98	2,801.98	0.86	0.61	-0.60	
10,457.00	90.72	180.59	7,710.55	-2,900.17	2,187.41	2,895.96	1.08	0.76	-0.78	
10,549.00	90.45	182.62	7,709.61	-2,992.12	2,184.84	2,987.92	2.23	-0.29	2.21	
10,561.23	90.12	182.57	7,709.55	-3,004.34	2,184.28	3,000.14	2.70	-2.67	-0.40	
Interm TGT#1 (MAE J 8-2HZ)										
10,642.00	87.97	182.25	7,710.90	-3,085.02	2,180.89	3,080.83	2.70	-2.67	-0.40	
10,734.00	88.32	182.85	7,713.87	-3,176.88	2,176.80	3,172.70	0.75	0.38	0.65	
10,827.00	87.50	181.40	7,717.27	-3,269.75	2,173.35	3,265.57	1.79	-0.88	-1.56	
10,920.00	89.17	181.25	7,719.97	-3,362.69	2,171.20	3,358.51	1.80	1.80	-0.16	
11,013.00	91.01	183.09	7,719.82	-3,455.61	2,167.68	3,451.44	2.80	1.98	1.98	
11,105.00	89.58	180.81	7,719.35	-3,547.55	2,164.55	3,543.39	2.93	-1.55	-2.48	
11,199.00	91.51	181.96	7,718.45	-3,641.51	2,162.28	3,637.35	2.39	2.05	1.22	
11,292.00	91.63	182.02	7,715.91	-3,734.42	2,159.05	3,730.27	0.14	0.13	0.06	
11,385.00	91.09	182.70	7,713.70	-3,827.31	2,155.22	3,823.17	0.93	-0.58	0.73	
11,480.00	88.63	182.84	7,713.93	-3,922.19	2,150.63	3,918.06	2.59	-2.59	0.15	
11,574.00	89.99	182.75	7,715.06	-4,016.07	2,146.05	4,011.95	1.45	1.45	-0.10	
11,667.00	89.16	180.93	7,715.75	-4,109.02	2,143.06	4,104.90	2.15	-0.89	-1.96	

Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well MAE J 8-2HZ
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 8-2HZ	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)	
11,761.00	89.55	180.93	7,716.81	-4,203.00	2,141.53	4,198.88	0.41	0.41	0.00	
11,854.00	91.85	180.15	7,715.67	-4,295.98	2,140.66	4,291.86	2.61	2.47	-0.84	
11,947.00	92.55	179.93	7,712.10	-4,388.91	2,140.59	4,384.80	0.79	0.75	-0.24	
12,042.00	90.66	178.48	7,709.44	-4,483.86	2,141.91	4,479.74	2.51	-1.99	-1.53	
12,135.00	89.25	176.28	7,709.52	-4,576.75	2,146.16	4,572.63	2.81	-1.52	-2.37	
12,230.00	89.13	177.34	7,710.86	-4,671.60	2,151.45	4,667.46	1.12	-0.13	1.12	
12,322.00	88.61	178.73	7,712.67	-4,763.52	2,154.60	4,759.38	1.61	-0.57	1.51	
12,414.00	89.61	177.18	7,714.10	-4,855.45	2,157.88	4,851.30	2.00	1.09	-1.68	
12,507.00	92.14	174.67	7,712.68	-4,948.19	2,164.49	4,944.02	3.83	2.72	-2.70	
12,602.00	93.03	174.54	7,708.40	-5,042.67	2,173.41	5,038.49	0.95	0.94	-0.14	
12,695.00	90.75	173.60	7,705.33	-5,135.11	2,183.02	5,130.91	2.65	-2.45	-1.01	
12,789.00	90.61	173.59	7,704.21	-5,228.52	2,193.50	5,224.30	0.15	-0.15	-0.01	
12,882.00	89.94	176.15	7,703.77	-5,321.14	2,201.82	5,316.90	2.85	-0.72	2.75	
12,974.00	90.75	175.61	7,703.21	-5,412.90	2,208.43	5,408.65	1.06	0.88	-0.59	
13,068.00	89.51	175.77	7,703.00	-5,506.63	2,215.49	5,502.37	1.33	-1.32	0.17	
13,162.00	88.61	175.10	7,704.54	-5,600.32	2,222.97	5,596.04	1.19	-0.96	-0.71	
13,220.23	89.33	175.21	7,705.59	-5,658.33	2,227.89	5,654.04	1.25	1.23	0.19	
Enter Toe Box: 13220.23' MD 460' FSL, 683' FEL										
13,256.00	89.77	175.28	7,705.87	-5,693.98	2,230.85	5,689.68	1.25	1.23	0.19	
13,350.00	90.35	175.79	7,705.77	-5,787.69	2,238.17	5,783.38	0.82	0.62	0.54	
13,443.00	89.80	174.89	7,705.65	-5,880.38	2,245.72	5,876.06	1.13	-0.59	-0.97	
13,536.00	89.90	172.58	7,705.90	-5,972.82	2,255.87	5,968.48	2.49	0.11	-2.48	
13,571.00	89.84	171.97	7,705.97	-6,007.50	2,260.58	6,003.15	1.75	-0.17	-1.74	
13,627.00	89.84	171.97	7,706.13	-6,062.95	2,268.40	6,058.58	0.00	0.00	0.00	
BHL: 55' FSL, 642' FEL Sec 17 T1N R68W - PBHL (MAE J 8-2HZ)										

Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well MAE J 8-2HZ
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 8-2HZ	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: 881' FSL, 2419' FV - actual wellpath hits target center - Point	0.00	0.00	0.00	0.00	0.00	14,548,827.27	1,632,414.29	40.060670	-105.028600	
Enter Land Box: 7347.2' - actual wellpath hits target center - Point	0.00	0.00	7,009.30	-177.86	2,062.78	14,548,648.74	1,634,477.02	40.060181	-105.021228	
Curve KOP (Mae J 8-2H) - actual wellpath hits target center - Point	0.00	0.00	7,084.10	-187.21	2,085.47	14,548,639.39	1,634,499.71	40.060156	-105.021147	
LP: 7' FSL, 653' FEL Se - actual wellpath hits target center - Point	0.00	0.00	7,675.86	-847.21	2,264.32	14,547,979.33	1,634,678.34	40.058343	-105.020508	
Exit Heel Box: 8869.28' - actual wellpath misses target center by 0.01usft at 8869.28usft MD (7704.75 TVD, -1314.21 N, 2252.04 E) - Point	0.00	0.00	7,704.75	-1,314.21	2,252.04	14,547,512.33	1,634,665.91	40.057061	-105.020552	
Enter Toe Box: 13220.2' - actual wellpath hits target center - Point	0.00	0.00	7,705.59	-5,658.33	2,227.89	14,543,168.22	1,634,640.37	40.045131	-105.020640	
BHL: 55' FSL, 642' FEL - actual wellpath hits target center - Point	0.00	0.00	7,706.13	-6,062.95	2,268.40	14,542,763.59	1,634,680.75	40.044020	-105.020495	

Casing Points						
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")		
1,910.00	1,867.70	9 5/8"	9-5/8	13-1/2		

Checked By: _____ Approved By: _____ Date: _____