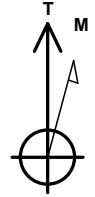


ANADARKO PETROLEUM CORP

Project: WELD COUNTY (NAD 83)
Site: Cleland 11-15HZ
Well: Cleland 15-4HZ
Wellbore: OH
Design: OH



Azimuths to True North
Magnetic North: 8.06°

Magnetic Field
Strength: 51920.7nT
Dip Angle: 66.48°
Date: 10/6/2019
Model: IGRF2015

PROJECT DETAILS: WELD COUNTY (NAD 83)

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



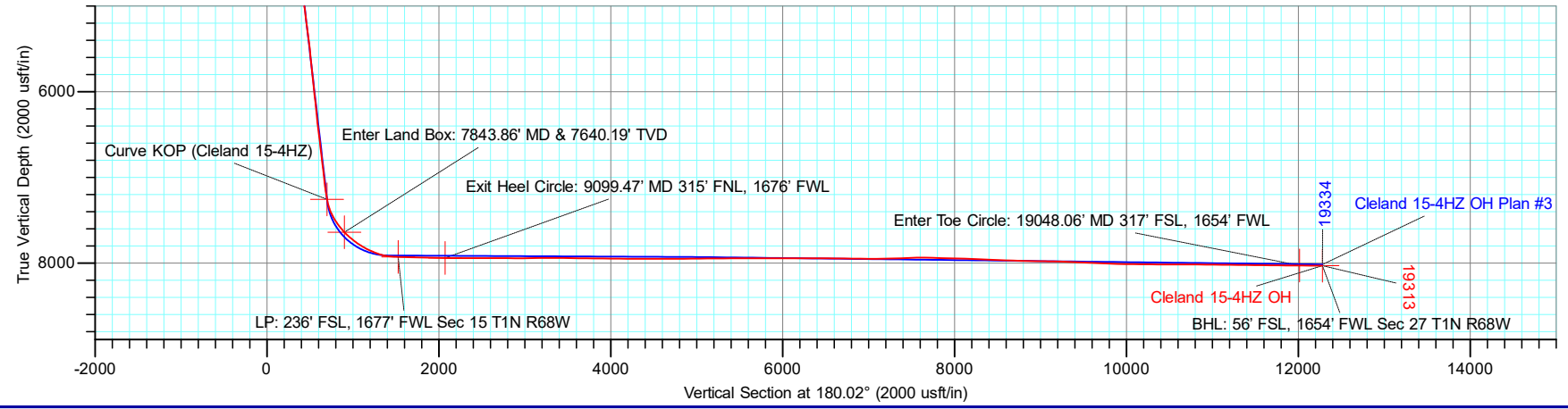
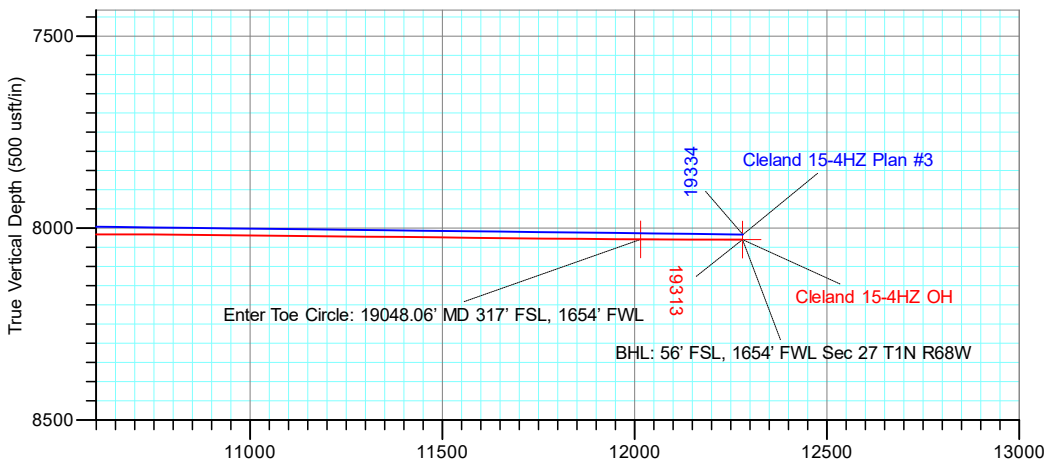
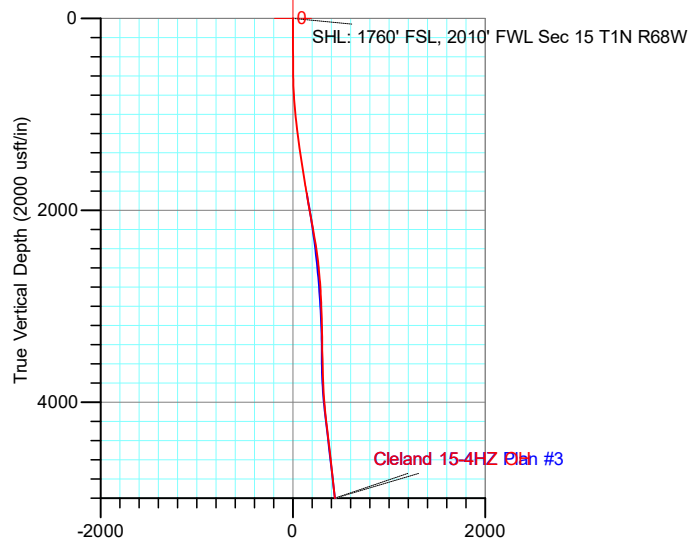
1N-68W-15

20' KB + 5152' GE @ 5172.00usft

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
BHL: 56' FSL, 1654' FWL Sec 27 T1N R68W	8030.23	-12280.74	-318.19	40.015044	-104.993148
Curve KOP (Cleland 15-4HZ)	7257.31	-699.13	-379.08	40.046837	-104.993366
Enter Land Box: 7843.86' MD & 7640.19' TVD	7640.19	-900.57	-338.57	40.046284	-104.993221
Enter Toe Circle: 19048.06' MD 317' FSL, 1654' FWL	8029.74	-12015.80	-319.61	40.015772	-104.993153
Exit Heel Circle: 9099.47' MD 315' FNL, 1676' FWL	7941.37	-2073.54	-330.38	40.043064	-104.993192
LP: 236' FSL, 1677' FWL Sec 15 T1N R68W	7928.12	-1526.25	-332.83	40.044566	-104.993201
SHL: 1760' FSL, 2010' FWL Sec 15 T1N R68W	0.00	0.00	0.00	40.048756	-104.992012

ACTUAL LINE CALLS
SHL: 1760' FSL, 2010' FWL Sec 15 T1N R68W
HEEL: 236' FSL, 1677' FWL Sec 15 T1N R68W
BHL: 56' FSL, 1654' FWL Sec 27 T1N R68W



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

Design: OH (Cleland 15-4HZ/OH)
Created By: Micah Ault
Date: 11:11, January 08 2020
Approved: _____

ANADARKO PETROLEUM CORP

Project: WELD COUNTY (NAD 83)
 Site: Cleland 11-15HZ
 Well: Cleland 15-4HZ
 Wellbore: OH
 Design: OH



Azimuths to True North
 Magnetic North: 8.06°

Magnetic Field
 Strength: 51920.7nT
 Dip Angle: 66.48°
 Date: 10/6/2019
 Model: IGRF2015

PROJECT DETAILS: WELD COUNTY (NAD 83)
 Geodetic System: Universal Transverse Mercator (US Survey Feet)
 Datum: North American Datum 1983
 Ellipsoid: GRS 1980
 Zone: Zone 13N (108 W to 102 W)

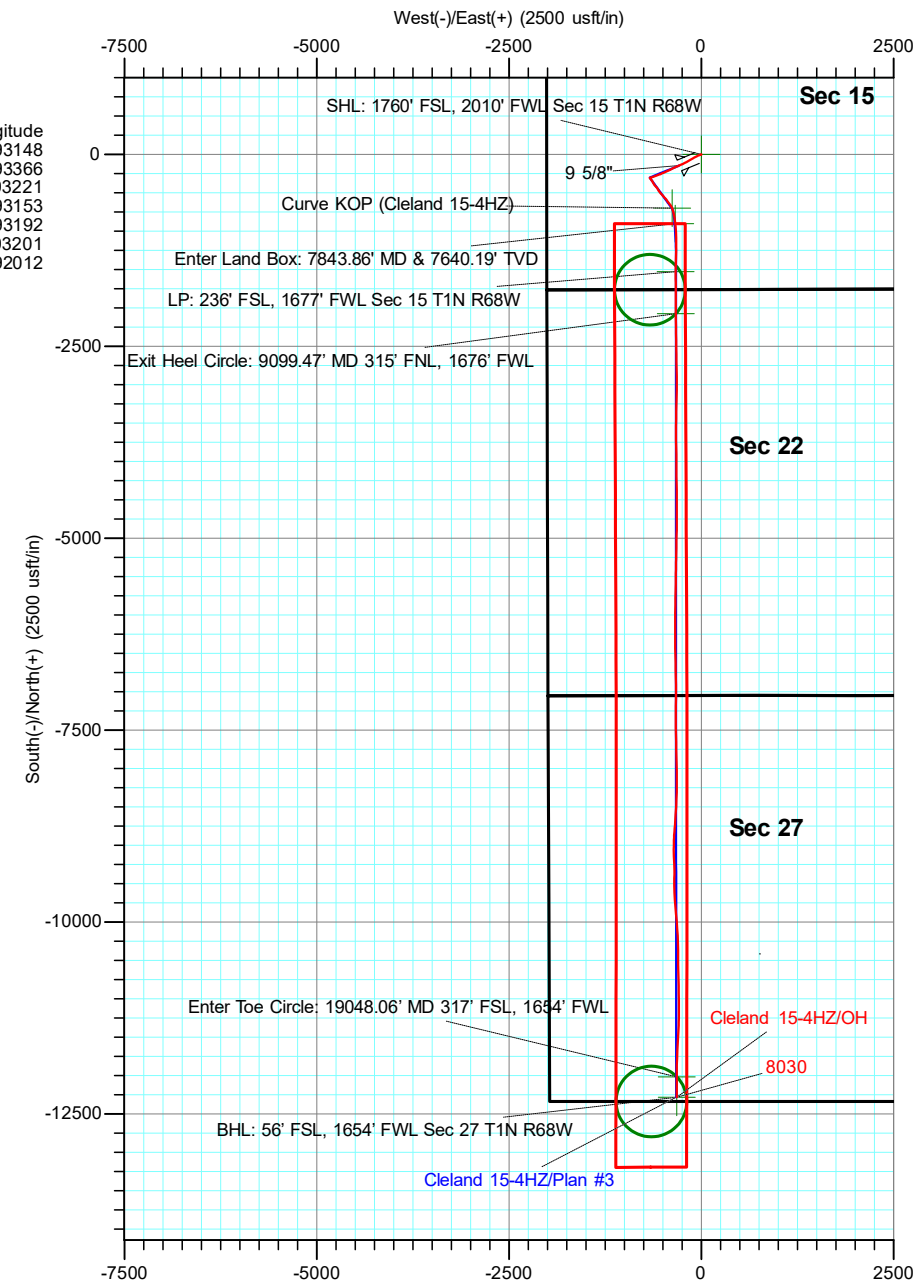
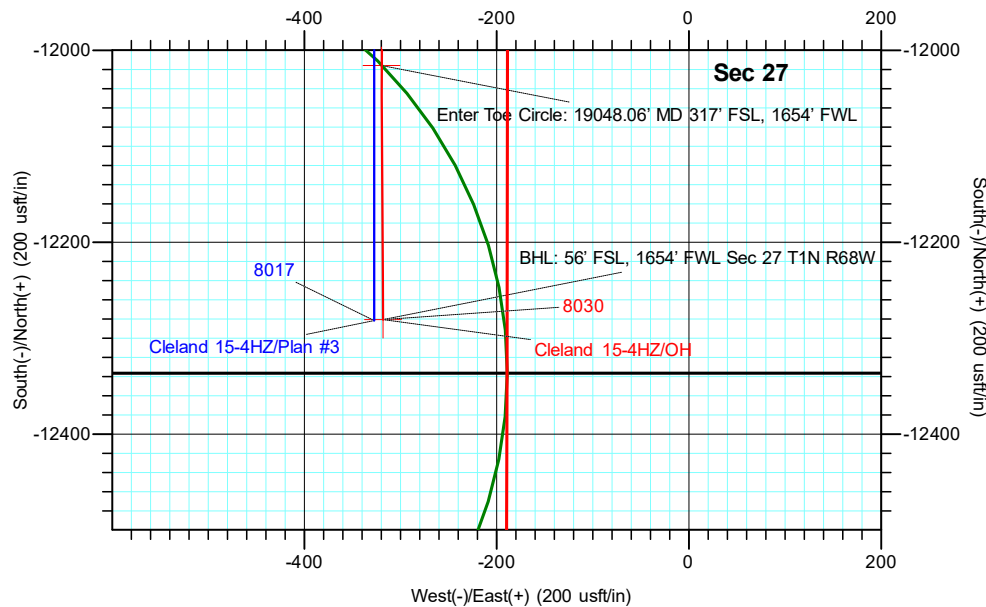


DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
BHL: 56' FSL, 1654' FWL Sec 27 T1N R68W	8030.23	-12280.74	-318.19	14532211.81	1642335.16	40.015044	-104.993148
Curve KOP (Cleland 15-4HZ)	7257.31	-699.13	-379.08	14543788.79	1642273.25	40.046837	-104.993366
Enter Land Box: 7843.86' MD & 7640.19' TVD	7640.19	-900.57	-338.57	14543587.43	1642313.77	40.046284	-104.993221
Enter Toe Circle: 19048.06' MD 317' FSL, 1654' FWL	8029.74	-12015.80	-319.61	14532476.65	1642333.72	40.015772	-104.993153
Exit Heel Circle: 9099.47' MD 315' FNL, 1676' FWL	7941.37	-2073.54	-330.38	14542414.93	1642322.06	40.043064	-104.993192
LP: 236' FSL, 1677' FWL Sec 15 T1N R68W	7928.12	-1526.25	-332.83	14542962.00	1642319.56	40.044566	-104.993201
SHL: 1760' FSL, 2010' FWL Sec 15 T1N R68W	0.00	0.00	0.00	14544487.67	1642652.12	40.048756	-104.992012

ACTUAL LINE CALLS

SHL: 1760' FSL, 2010' FWL Sec 15 T1N R68W
HEEL: 236' FSL, 1677' FWL Sec 15 T1N R68W
BHL: 56' FSL, 1654' FWL Sec 27 T1N R68W



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

Design: OH (Cleland 15-4HZ/OH)
 Cleland 11-15HZ
 Created By: Micah Ault
 Date: 11/13, January 08 2020
 Approved: _____
 Date: _____



ANADARKO PETROLEUM CORP

WELD COUNTY (NAD 83)

Cleland 11-15HZ

Cleland 15-4HZ

OH

Design: OH

Standard Survey Report

08 January, 2020



Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well Cleland 15-4HZ
Project:	WELD COUNTY (NAD 83)	TVD Reference:	20' KB + 5152' GE @ 5172.00usft
Site:	Cleland 11-15HZ	MD Reference:	20' KB + 5152' GE @ 5172.00usft
Well:	Cleland 15-4HZ	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.15 Single User Db

Project	WELD COUNTY (NAD 83)		
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)		Using geodetic scale factor

Site	Cleland 11-15HZ		
Site Position:		Northing:	14,544,455.99 usft
From:	Map	Easting:	1,642,620.22 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	40.048669
		Longitude:	-104.992126
		Grid Convergence:	0.01 °

Well	Cleland 15-4HZ		
Well Position	+N/-S	0.00 usft	Northing: 14,544,487.67 usft
	+E/-W	0.00 usft	Easting: 1,642,652.12 usft
Position Uncertainty	3.28 usft	Wellhead Elevation:	usft
		Latitude:	40.048756
		Longitude:	-104.992012
		Ground Level:	5,152.00 usft

Wellbore	OH		
Magnetics	Model Name	Sample Date	Declination (°)
	IGRF2015	10/6/2019	8.06
			Dip Angle (°) 66.48
			Field Strength (nT) 51,920.72665366

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)
	0.00	0.00	0.00
			Direction (°) 180.02

Survey Program	Date	1/8/2020	
From (usft)	To (usft)	Survey (Wellbore)	Tool Name
131.00	1,869.00	Survey #1 - Surface (OH)	APC_ISCWSA REV 2 MWD+ Fixed:v2:crustal field declination
1,982.00	19,269.00	Survey #2 (OH)	APC_ISCWSA REV 2 MWD+ Fixed:v2:crustal field declination
19,313.00	19,313.00	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
SHL: 1760' FSL, 2010' FWL Sec 15 T1N R68W - SHL (Cleland 15-4HZ)									
131.00	0.35	129.88	131.00	-0.26	0.31	0.26	0.27	0.27	0.00
226.00	0.35	212.58	226.00	-0.69	0.37	0.69	0.49	0.00	87.05
321.00	0.92	242.46	320.99	-1.28	-0.46	1.28	0.67	0.60	31.45
416.00	1.19	243.96	415.98	-2.07	-2.02	2.07	0.29	0.28	1.58
511.00	2.59	254.68	510.92	-3.07	-4.98	3.07	1.51	1.47	11.28
606.00	4.35	267.86	605.75	-3.77	-10.65	3.78	2.02	1.85	13.87
701.00	6.64	251.60	700.31	-5.64	-19.46	5.65	2.89	2.41	-17.12

Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well Cleland 15-4HZ
Project:	WELD COUNTY (NAD 83)	TVD Reference:	20' KB + 5152' GE @ 5172.00usft
Site:	Cleland 11-15HZ	MD Reference:	20' KB + 5152' GE @ 5172.00usft
Well:	Cleland 15-4HZ	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)
797.00	8.79	245.72	795.44	-10.41	-31.42	10.42	2.38	2.24	-6.13
892.00	10.33	241.94	889.11	-17.40	-45.55	17.42	1.75	1.62	-3.98
986.00	11.38	243.17	981.43	-25.55	-61.26	25.57	1.14	1.12	1.31
1,081.00	12.70	242.11	1,074.34	-34.67	-78.86	34.69	1.41	1.39	-1.12
1,176.00	13.36	241.41	1,166.89	-44.80	-97.73	44.84	0.71	0.69	-0.74
1,271.00	15.07	239.65	1,258.98	-56.30	-118.02	56.34	1.86	1.80	-1.85
1,367.00	16.79	239.83	1,351.29	-69.57	-140.78	69.62	1.79	1.79	0.19
1,463.00	17.49	240.18	1,443.03	-83.72	-165.28	83.77	0.74	0.73	0.36
1,558.00	18.37	242.02	1,533.41	-97.84	-190.89	97.90	1.10	0.93	1.94
1,653.00	18.41	243.26	1,623.56	-111.61	-217.51	111.69	0.41	0.04	1.31
1,747.00	19.29	244.22	1,712.52	-125.04	-244.75	125.13	0.99	0.94	1.02
1,842.00	24.87	246.68	1,800.52	-139.79	-277.25	139.88	5.95	5.87	2.59
1,859.00	24.79	247.29	1,815.95	-142.58	-283.82	142.68	1.58	-0.49	3.59
9 5/8"									
1,869.00	24.74	247.65	1,825.03	-144.18	-287.69	144.28	1.58	-0.47	3.60
1,982.00	21.76	246.01	1,928.84	-161.69	-328.70	161.81	2.70	-2.64	-1.45
2,076.00	22.11	244.91	2,016.04	-176.28	-360.64	176.41	0.57	0.37	-1.17
2,171.00	23.04	240.35	2,103.76	-193.06	-392.99	193.20	2.09	0.98	-4.80
2,265.00	22.96	246.54	2,190.30	-209.46	-425.80	209.61	2.57	-0.09	6.59
2,359.00	22.16	246.50	2,277.11	-223.83	-458.88	223.99	0.85	-0.85	-0.04
2,452.00	21.06	245.17	2,363.57	-237.84	-490.13	238.01	1.29	-1.18	-1.43
2,546.00	19.80	246.48	2,451.66	-251.29	-520.06	251.47	1.43	-1.34	1.39
2,638.00	18.04	249.76	2,538.69	-262.43	-547.71	262.63	2.23	-1.91	3.57
2,731.00	15.23	249.95	2,627.79	-271.61	-572.70	271.81	3.02	-3.02	0.20
2,825.00	13.24	250.31	2,718.89	-279.47	-594.44	279.67	2.12	-2.12	0.38
2,918.00	11.09	250.34	2,809.80	-286.06	-612.89	286.28	2.31	-2.31	0.03
3,011.00	8.94	252.56	2,901.38	-291.24	-628.21	291.46	2.35	-2.31	2.39
3,105.00	6.57	251.86	2,994.51	-295.10	-640.29	295.33	2.52	-2.52	-0.74
3,197.00	6.16	251.07	3,085.95	-298.34	-649.96	298.57	0.46	-0.45	-0.86
3,290.00	4.24	249.07	3,178.56	-301.19	-657.89	301.42	2.07	-2.06	-2.15
3,383.00	2.89	250.16	3,271.38	-303.21	-663.31	303.45	1.45	-1.45	1.17
3,478.00	1.27	263.59	3,366.31	-304.15	-666.61	304.38	1.77	-1.71	14.14
3,570.00	1.73	212.14	3,458.28	-305.44	-668.36	305.67	1.49	0.50	-55.92
3,662.00	2.24	165.37	3,550.23	-308.35	-668.64	308.58	1.79	0.55	-50.84
3,757.00	1.67	125.78	3,645.18	-310.96	-667.05	311.19	1.50	-0.60	-41.67
3,849.00	2.43	122.15	3,737.12	-312.78	-664.31	313.01	0.84	0.83	-3.95
3,942.00	3.38	147.43	3,830.01	-316.14	-661.17	316.37	1.69	1.02	27.18
4,036.00	4.80	142.76	3,923.76	-321.60	-657.30	321.83	1.55	1.51	-4.97
4,130.00	6.03	138.74	4,017.34	-328.45	-651.66	328.67	1.37	1.31	-4.28
4,223.00	7.58	146.20	4,109.69	-337.22	-645.03	337.44	1.92	1.67	8.02
4,317.00	6.92	150.27	4,202.94	-347.29	-638.77	347.51	0.89	-0.70	4.33
4,411.00	8.39	148.78	4,296.09	-358.07	-632.41	358.29	1.58	1.56	-1.59
4,504.00	8.05	148.75	4,388.14	-369.44	-625.51	369.66	0.37	-0.37	-0.03

Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well Cleland 15-4HZ
Project:	WELD COUNTY (NAD 83)	TVD Reference:	20' KB + 5152' GE @ 5172.00usft
Site:	Cleland 11-15HZ	MD Reference:	20' KB + 5152' GE @ 5172.00usft
Well:	Cleland 15-4HZ	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)
4,599.00	7.28	150.88	4,482.29	-380.38	-619.13	380.60	0.86	-0.81	2.24
4,691.00	7.53	145.80	4,573.52	-390.46	-612.91	390.68	0.76	0.27	-5.52
4,785.00	7.81	137.32	4,666.69	-400.25	-605.11	400.46	1.24	0.30	-9.02
4,879.00	8.77	140.77	4,759.70	-410.50	-596.25	410.71	1.15	1.02	3.67
4,973.00	8.03	141.69	4,852.69	-421.20	-587.65	421.41	0.80	-0.79	0.98
5,067.00	7.25	141.35	4,945.86	-430.98	-579.87	431.19	0.83	-0.83	-0.36
5,162.00	7.80	142.37	5,040.04	-440.77	-572.19	440.97	0.60	0.58	1.07
5,255.00	8.48	150.69	5,132.11	-451.75	-564.98	451.95	1.46	0.73	8.95
5,348.00	7.54	153.80	5,224.20	-463.20	-558.93	463.40	1.11	-1.01	3.34
5,442.00	8.73	148.95	5,317.25	-474.85	-552.53	475.04	1.46	1.27	-5.16
5,534.00	9.49	140.83	5,408.09	-486.71	-544.14	486.90	1.62	0.83	-8.83
5,630.00	8.58	137.90	5,502.90	-498.16	-534.34	498.35	1.06	-0.95	-3.05
5,724.00	7.39	135.03	5,595.99	-507.64	-525.37	507.82	1.33	-1.27	-3.05
5,818.00	7.74	136.36	5,689.17	-516.50	-516.72	516.68	0.42	0.37	1.41
5,936.00	7.89	140.64	5,806.08	-528.51	-506.10	528.69	0.51	0.13	3.63
6,029.00	7.89	139.54	5,898.20	-538.30	-497.91	538.48	0.16	0.00	-1.18
6,123.00	7.98	139.67	5,991.30	-548.19	-489.50	548.36	0.10	0.10	0.14
6,217.00	9.48	138.35	6,084.20	-558.94	-480.14	559.11	1.61	1.60	-1.40
6,311.00	7.54	133.41	6,177.17	-568.97	-470.51	569.13	2.20	-2.06	-5.26
6,404.00	7.65	139.76	6,269.35	-577.89	-462.08	578.05	0.91	0.12	6.83
6,497.00	7.66	145.53	6,361.53	-587.72	-454.57	587.88	0.83	0.01	6.20
6,592.00	8.04	147.54	6,455.63	-598.55	-447.42	598.70	0.49	0.40	2.12
6,686.00	9.40	143.99	6,548.55	-610.30	-439.38	610.46	1.56	1.45	-3.78
6,779.00	7.77	142.02	6,640.50	-621.40	-431.05	621.55	1.78	-1.75	-2.12
6,873.00	8.40	142.67	6,733.57	-631.87	-422.97	632.02	0.68	0.67	0.69
6,966.00	9.30	147.07	6,825.46	-643.58	-414.77	643.73	1.21	0.97	4.73
7,059.00	7.53	140.26	6,917.46	-654.58	-406.79	654.72	2.18	-1.90	-7.32
7,152.00	7.99	139.57	7,009.61	-664.18	-398.70	664.32	0.50	0.49	-0.74
7,246.00	8.79	145.96	7,102.60	-675.11	-390.44	675.24	1.31	0.85	6.80
7,339.00	9.64	156.85	7,194.41	-688.16	-383.40	688.29	2.08	0.91	11.71
7,403.01	11.62	159.88	7,257.31	-699.13	-379.08	699.27	3.21	3.09	4.73
Curve KOP (Cleland 15-4HZ)									
7,433.00	12.55	160.97	7,286.64	-705.05	-376.98	705.18	3.21	3.11	3.64
7,528.00	21.34	166.53	7,377.43	-731.67	-369.57	731.80	9.40	9.25	5.85
7,622.00	29.55	165.31	7,462.24	-770.79	-359.69	770.92	8.75	8.73	-1.30
7,715.00	35.36	171.07	7,540.70	-819.61	-349.69	819.74	7.07	6.25	6.19
7,807.00	41.02	172.60	7,612.98	-875.90	-341.66	876.02	6.24	6.15	1.66
7,843.85	43.83	173.12	7,640.19	-900.57	-338.57	900.69	7.70	7.64	1.42
Enter Land Box: 7843.86' MD & 7640.19' TVD									
7,899.00	48.05	173.81	7,678.52	-939.93	-334.07	940.05	7.70	7.64	1.25
7,992.00	51.64	176.77	7,738.49	-1,010.75	-328.29	1,010.86	4.56	3.86	3.18
8,086.00	57.46	179.16	7,792.99	-1,087.24	-325.63	1,087.35	6.53	6.19	2.54
8,178.00	63.69	180.46	7,838.17	-1,167.33	-325.39	1,167.44	6.88	6.77	1.41
8,271.00	67.71	181.46	7,876.44	-1,252.06	-326.82	1,252.17	4.43	4.32	1.08

Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well Cleland 15-4HZ
Project:	WELD COUNTY (NAD 83)	TVD Reference:	20' KB + 5152' GE @ 5172.00usft
Site:	Cleland 11-15HZ	MD Reference:	20' KB + 5152' GE @ 5172.00usft
Well:	Cleland 15-4HZ	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)
8,365.00	74.92	181.82	7,906.53	-1,341.01	-329.37	1,341.12	7.68	7.67	0.38
8,433.72	82.28	181.16	7,920.10	-1,408.30	-331.12	1,408.42	10.75	10.71	-0.95
Heel (Cleland 15-4HZ)									
8,459.00	84.99	180.93	7,922.91	-1,433.42	-331.58	1,433.53	10.75	10.71	-0.93
8,552.00	88.58	180.61	7,928.12	-1,526.25	-332.83	1,526.37	3.88	3.86	-0.34
LP: 236' FSL, 1677' FWL Sec 15 T1N R68W									
8,645.00	88.24	179.50	7,930.70	-1,619.21	-332.92	1,619.33	1.25	-0.37	-1.19
8,698.00	88.65	179.49	7,932.14	-1,672.19	-332.45	1,672.30	0.77	0.77	-0.02
8,792.00	88.28	179.45	7,934.66	-1,766.15	-331.58	1,766.27	0.40	-0.39	-0.04
8,886.00	88.59	179.51	7,937.22	-1,860.11	-330.73	1,860.23	0.34	0.33	0.06
8,979.00	89.07	179.89	7,939.12	-1,953.09	-330.24	1,953.21	0.66	0.52	0.41
9,073.00	88.82	180.19	7,940.85	-2,047.07	-330.31	2,047.19	0.42	-0.27	0.32
9,099.47	88.94	180.11	7,941.37	-2,073.54	-330.38	2,073.66	0.53	0.44	-0.30
Exit Heel Circle: 9099.47' MD 315' FNL, 1676' FWL									
9,166.00	89.23	179.91	7,942.44	-2,140.06	-330.39	2,140.18	0.53	0.44	-0.30
9,260.00	89.74	179.31	7,943.28	-2,234.05	-329.75	2,234.17	0.84	0.54	-0.64
9,355.00	90.20	179.10	7,943.33	-2,329.04	-328.43	2,329.16	0.53	0.48	-0.22
9,447.00	90.12	179.13	7,943.07	-2,421.03	-327.01	2,421.15	0.09	-0.09	0.03
9,540.00	90.02	179.44	7,942.96	-2,514.03	-325.85	2,514.14	0.35	-0.11	0.33
9,633.00	90.04	179.26	7,942.91	-2,607.02	-324.79	2,607.13	0.19	0.02	-0.19
9,726.00	90.19	179.37	7,942.73	-2,700.01	-323.68	2,700.13	0.20	0.16	0.12
9,819.00	89.27	178.72	7,943.16	-2,793.00	-322.13	2,793.11	1.21	-0.99	-0.70
9,912.00	89.50	178.53	7,944.16	-2,885.97	-319.90	2,886.08	0.32	0.25	-0.20
10,005.00	90.49	179.70	7,944.17	-2,978.95	-318.46	2,979.06	1.65	1.06	1.26
10,097.00	91.43	181.06	7,942.63	-3,070.93	-319.07	3,071.04	1.80	1.02	1.48
10,191.00	90.78	181.34	7,940.82	-3,164.89	-321.04	3,165.01	0.75	-0.69	0.30
10,284.00	89.73	181.18	7,940.40	-3,257.87	-323.09	3,257.98	1.14	-1.13	-0.17
10,377.00	89.47	181.30	7,941.05	-3,350.85	-325.10	3,350.96	0.31	-0.28	0.13
10,470.00	89.45	181.05	7,941.93	-3,443.82	-327.01	3,443.94	0.27	-0.02	-0.27
10,564.00	89.30	180.74	7,942.95	-3,537.80	-328.47	3,537.92	0.37	-0.16	-0.33
10,656.00	89.37	179.96	7,944.02	-3,629.80	-329.04	3,629.91	0.85	0.08	-0.85
10,750.00	89.19	179.19	7,945.20	-3,723.79	-328.34	3,723.90	0.84	-0.19	-0.82
10,842.00	89.38	178.64	7,946.35	-3,815.76	-326.60	3,815.87	0.63	0.21	-0.60
10,936.00	89.44	179.21	7,947.32	-3,909.74	-324.83	3,909.85	0.61	0.06	0.61
11,029.00	89.46	179.25	7,948.21	-4,002.73	-323.58	4,002.84	0.05	0.02	0.04
11,123.00	89.35	180.25	7,949.19	-4,096.72	-323.17	4,096.83	1.07	-0.12	1.06
11,217.00	89.46	179.51	7,950.16	-4,190.71	-322.98	4,190.83	0.80	0.12	-0.79
11,311.00	89.50	178.69	7,951.02	-4,284.70	-321.50	4,284.81	0.87	0.04	-0.87
11,404.00	89.92	179.36	7,951.49	-4,377.68	-319.92	4,377.79	0.85	0.45	0.72
11,497.00	90.00	180.01	7,951.55	-4,470.68	-319.41	4,470.79	0.70	0.09	0.70
11,592.00	89.96	180.16	7,951.58	-4,565.68	-319.55	4,565.79	0.16	-0.04	0.16
11,687.00	90.04	179.07	7,951.58	-4,660.68	-318.91	4,660.79	1.15	0.08	-1.15
11,781.00	90.47	180.00	7,951.17	-4,754.67	-318.15	4,754.78	1.09	0.46	0.99
11,875.00	90.47	180.46	7,950.40	-4,848.67	-318.52	4,848.78	0.49	0.00	0.49

Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well Cleland 15-4HZ
Project:	WELD COUNTY (NAD 83)	TVD Reference:	20' KB + 5152' GE @ 5172.00usft
Site:	Cleland 11-15HZ	MD Reference:	20' KB + 5152' GE @ 5172.00usft
Well:	Cleland 15-4HZ	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)
11,968.00	90.63	181.47	7,949.50	-4,941.65	-320.09	4,941.76	1.10	0.17	1.09
12,026.78	90.52	181.52	7,948.91	-5,000.40	-321.62	5,000.52	0.21	-0.19	0.09
5000' VS TGT (Cleland 15-4HZ)									
12,061.00	90.45	181.55	7,948.63	-5,034.61	-322.54	5,034.72	0.21	-0.19	0.09
12,154.00	90.44	180.81	7,947.90	-5,127.59	-324.46	5,127.70	0.80	-0.01	-0.80
12,248.00	90.53	181.59	7,947.11	-5,221.56	-326.42	5,221.68	0.84	0.10	0.83
12,341.00	90.45	180.01	7,946.31	-5,314.55	-327.72	5,314.66	1.70	-0.09	-1.70
12,435.00	90.47	181.80	7,945.56	-5,408.53	-329.21	5,408.64	1.90	0.02	1.90
12,528.00	90.20	180.71	7,945.01	-5,501.50	-331.24	5,501.62	1.21	-0.29	-1.17
12,620.00	90.30	180.24	7,944.61	-5,593.50	-332.01	5,593.62	0.52	0.11	-0.51
12,712.00	89.96	181.12	7,944.40	-5,685.49	-333.10	5,685.61	1.03	-0.37	0.96
12,805.00	89.98	181.35	7,944.45	-5,778.47	-335.10	5,778.59	0.25	0.02	0.25
12,898.00	89.96	181.03	7,944.50	-5,871.45	-337.03	5,871.57	0.34	-0.02	-0.34
12,993.00	89.94	180.29	7,944.58	-5,966.44	-338.13	5,966.56	0.78	-0.02	-0.78
13,087.00	89.82	180.38	7,944.78	-6,060.44	-338.68	6,060.56	0.16	-0.13	0.10
13,181.00	89.97	179.73	7,944.95	-6,154.44	-338.77	6,154.56	0.71	0.16	-0.69
13,274.00	90.02	179.92	7,944.96	-6,247.44	-338.48	6,247.56	0.21	0.05	0.20
13,367.00	89.84	180.06	7,945.08	-6,340.44	-338.47	6,340.56	0.25	-0.19	0.15
13,461.00	89.93	179.50	7,945.26	-6,434.44	-338.11	6,434.56	0.60	0.10	-0.60
13,555.00	89.68	178.94	7,945.58	-6,528.43	-336.83	6,528.55	0.65	-0.27	-0.60
13,649.00	89.46	178.69	7,946.29	-6,622.41	-334.88	6,622.52	0.35	-0.23	-0.27
13,744.00	89.27	179.25	7,947.34	-6,717.38	-333.18	6,717.50	0.62	-0.20	0.59
13,839.00	89.33	178.93	7,948.50	-6,812.37	-331.67	6,812.48	0.34	0.06	-0.34
13,932.00	89.45	178.97	7,949.49	-6,905.34	-329.96	6,905.46	0.14	0.13	0.04
14,026.00	89.76	179.73	7,950.14	-6,999.34	-328.90	6,999.45	0.87	0.33	0.81
14,120.00	90.03	180.61	7,950.31	-7,093.33	-329.18	7,093.45	0.98	0.29	0.94
14,214.00	90.94	180.77	7,949.52	-7,187.32	-330.31	7,187.44	0.98	0.97	0.17
14,307.00	91.40	179.95	7,947.62	-7,280.30	-330.89	7,280.42	1.01	0.49	-0.88
14,399.00	92.41	180.03	7,944.56	-7,372.25	-330.88	7,372.36	1.10	1.10	0.09
14,493.00	92.77	179.22	7,940.31	-7,466.15	-330.26	7,466.26	0.94	0.38	-0.86
14,587.00	90.40	179.08	7,937.71	-7,560.10	-328.87	7,560.21	2.53	-2.52	-0.15
14,680.00	89.45	179.01	7,937.83	-7,653.08	-327.32	7,653.20	1.02	-1.02	-0.08
14,775.00	88.63	178.70	7,939.43	-7,748.05	-325.42	7,748.16	0.92	-0.86	-0.33
14,869.00	88.17	178.23	7,942.05	-7,841.98	-322.90	7,842.09	0.70	-0.49	-0.50
14,962.00	88.38	178.46	7,944.85	-7,934.90	-320.22	7,935.01	0.33	0.23	0.25
15,055.00	88.66	179.13	7,947.25	-8,027.85	-318.26	8,027.96	0.78	0.30	0.72
15,149.00	88.12	180.22	7,949.89	-8,121.80	-317.73	8,121.92	1.29	-0.57	1.16
15,242.00	88.17	180.26	7,952.90	-8,214.76	-318.12	8,214.87	0.07	0.05	0.04
15,335.00	87.56	181.89	7,956.37	-8,307.67	-319.86	8,307.78	1.87	-0.66	1.75
15,430.00	87.50	182.31	7,960.46	-8,402.52	-323.34	8,402.63	0.45	-0.06	0.44
15,524.00	87.48	182.71	7,964.58	-8,496.34	-327.45	8,496.45	0.43	-0.02	0.43
15,618.00	87.67	183.51	7,968.56	-8,590.11	-332.55	8,590.23	0.87	0.20	0.85
15,712.00	88.16	183.93	7,971.98	-8,683.85	-338.64	8,683.97	0.69	0.52	0.45

Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well Cleland 15-4HZ
Project:	WELD COUNTY (NAD 83)	TVD Reference:	20' KB + 5152' GE @ 5172.00usft
Site:	Cleland 11-15HZ	MD Reference:	20' KB + 5152' GE @ 5172.00usft
Well:	Cleland 15-4HZ	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)	
15,805.00	88.10	185.08	7,975.01	-8,776.52	-345.94	8,776.64	1.24	-0.06	1.24	
15,898.00	88.52	183.35	7,977.75	-8,869.22	-352.78	8,869.34	1.91	0.45	-1.86	
15,991.00	89.42	181.40	7,979.43	-8,962.12	-356.63	8,962.24	2.31	0.97	-2.10	
16,083.00	89.87	179.69	7,980.00	-9,054.11	-357.50	9,054.23	1.92	0.49	-1.86	
16,176.00	88.81	177.86	7,981.07	-9,147.08	-355.52	9,147.20	2.27	-1.14	-1.97	
16,271.00	88.33	177.68	7,983.44	-9,241.98	-351.82	9,242.10	0.54	-0.51	-0.19	
16,364.00	87.84	179.62	7,986.55	-9,334.89	-349.63	9,335.01	2.15	-0.53	2.09	
16,457.00	87.36	181.14	7,990.44	-9,427.81	-350.25	9,427.93	1.71	-0.52	1.63	
16,551.00	87.63	179.57	7,994.55	-9,521.71	-350.83	9,521.83	1.69	0.29	-1.67	
16,645.00	87.51	178.28	7,998.54	-9,615.61	-349.07	9,615.73	1.38	-0.13	-1.37	
16,739.00	87.06	176.03	8,002.99	-9,709.38	-344.41	9,709.50	2.44	-0.48	-2.39	
16,832.00	87.38	174.19	8,007.50	-9,801.93	-336.49	9,802.05	2.01	0.34	-1.98	
16,926.00	88.78	174.87	8,010.65	-9,895.45	-327.53	9,895.56	1.66	1.49	0.72	
17,021.00	89.16	175.93	8,012.36	-9,990.12	-319.92	9,990.23	1.19	0.40	1.12	
17,114.00	89.30	175.77	8,013.61	-10,082.87	-313.19	10,082.98	0.23	0.15	-0.17	
17,208.00	89.37	176.76	8,014.70	-10,176.66	-307.06	10,176.77	1.06	0.07	1.05	
17,303.00	89.65	178.33	8,015.51	-10,271.57	-302.99	10,271.68	1.68	0.29	1.65	
17,395.00	89.63	180.27	8,016.09	-10,363.56	-301.87	10,363.66	2.11	-0.02	2.11	
17,489.00	89.71	180.09	8,016.63	-10,457.56	-302.17	10,457.66	0.21	0.09	-0.19	
17,582.00	89.97	179.00	8,016.89	-10,550.55	-301.43	10,550.65	1.20	0.28	-1.17	
17,677.00	90.31	177.14	8,016.66	-10,645.49	-298.23	10,645.60	1.99	0.36	-1.96	
17,771.00	89.39	179.14	8,016.90	-10,739.44	-295.18	10,739.54	2.34	-0.98	2.13	
17,865.00	89.43	179.59	8,017.87	-10,833.43	-294.14	10,833.53	0.48	0.04	0.48	
17,958.00	89.41	179.19	8,018.81	-10,926.42	-293.15	10,926.52	0.43	-0.02	-0.43	
18,052.00	89.49	179.86	8,019.71	-11,020.41	-292.37	11,020.51	0.72	0.09	0.71	
18,145.00	89.32	179.95	8,020.68	-11,113.40	-292.21	11,113.50	0.21	-0.18	0.10	
18,239.00	89.35	179.78	8,021.77	-11,207.40	-291.99	11,207.50	0.18	0.03	-0.18	
18,332.00	89.59	181.01	8,022.63	-11,300.39	-292.63	11,300.49	1.35	0.26	1.32	
18,426.00	89.56	182.84	8,023.33	-11,394.33	-295.79	11,394.43	1.95	-0.03	1.95	
18,520.00	89.27	183.27	8,024.29	-11,488.19	-300.80	11,488.29	0.55	-0.31	0.46	
18,613.00	89.18	183.23	8,025.55	-11,581.03	-306.07	11,581.14	0.11	-0.10	-0.04	
18,707.00	89.42	182.67	8,026.70	-11,674.90	-310.91	11,675.01	0.65	0.26	-0.60	
18,799.00	89.39	182.08	8,027.65	-11,766.81	-314.72	11,766.92	0.64	-0.03	-0.64	
18,893.00	89.58	181.39	8,028.50	-11,860.77	-317.57	11,860.88	0.76	0.20	-0.73	
18,986.00	89.47	180.68	8,029.27	-11,953.75	-319.25	11,953.86	0.77	-0.12	-0.76	
19,048.06	89.65	179.99	8,029.74	-12,015.80	-319.61	12,015.91	1.14	0.29	-1.11	
Enter Toe Circle: 19048.06' MD 317' FSL, 1654' FWL										
19,079.00	89.74	179.65	8,029.91	-12,046.74	-319.51	12,046.85	1.14	0.29	-1.11	
19,173.00	89.84	179.52	8,030.25	-12,140.74	-318.83	12,140.85	0.17	0.11	-0.14	
19,269.00	90.10	179.85	8,030.30	-12,236.74	-318.31	12,236.85	0.44	0.27	0.34	
19,313.00	90.10	179.85	8,030.23	-12,280.74	-318.19	12,280.85	0.00	0.00	0.00	
BHL: 56' FSL, 1654' FWL Sec 27 T1N R68W - PBHL (Cleland 15-4HZ)										

Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well Cleland 15-4HZ
Project:	WELD COUNTY (NAD 83)	TVD Reference:	20' KB + 5152' GE @ 5172.00usft
Site:	Cleland 11-15HZ	MD Reference:	20' KB + 5152' GE @ 5172.00usft
Well:	Cleland 15-4HZ	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: 1760' FSL, 2010' F - actual wellpath hits target center - Point	0.00	0.00	0.00	0.00	0.00	14,544,487.67	1,642,652.12	40.048756	-104.992012	
Curve KOP (Cleland 15- - actual wellpath hits target center - Point	0.00	0.00	7,257.31	-699.13	-379.08	14,543,788.78	1,642,273.25	40.046837	-104.993366	
Enter Land Box: 7843.86 - actual wellpath hits target center - Point	0.00	0.00	7,640.19	-900.57	-338.57	14,543,587.42	1,642,313.76	40.046284	-104.993222	
LP: 236' FSL, 1677' FWI - actual wellpath hits target center - Point	0.00	0.00	7,928.12	-1,526.25	-332.83	14,542,962.00	1,642,319.56	40.044566	-104.993201	
Exit Heel Circle: 9099.47 - actual wellpath hits target center - Point	0.00	0.00	7,941.37	-2,073.54	-330.38	14,542,414.92	1,642,322.05	40.043064	-104.993192	
Enter Toe Circle: 19048.1 - actual wellpath hits target center - Point	0.00	0.00	8,029.74	-12,015.80	-319.61	14,532,476.65	1,642,333.71	40.015772	-104.993153	
BHL: 56' FSL, 1654' FW - actual wellpath hits target center - Point	0.00	0.00	8,030.23	-12,280.74	-318.19	14,532,211.82	1,642,335.16	40.015044	-104.993148	

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")	
1,859.00	1,815.95	9 5/8"	9-5/8	12-1/4	

Checked By: _____	Approved By: _____	Date: _____
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