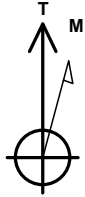


ANADARKO PETROLEUM CORP

Project: WELD COUNTY (NAD 83)  
Site: SW SW SEC 21 T3N R66W 6th P.M.  
Well: SARCHET 21-4HZ  
Wellbore: ORIGINAL WELLBORE  
Design: ORIGINAL WELLBORE

KB 21' @ 5003.00usft (PD 464)

Ground Level: 4982.00



Azimuths to True North  
Magnetic North: 7.98°

Magnetic Field  
Strength: 52045.9nT  
Dip Angle: 66.64°  
Date: 7/29/2019  
Model: IGRF2015

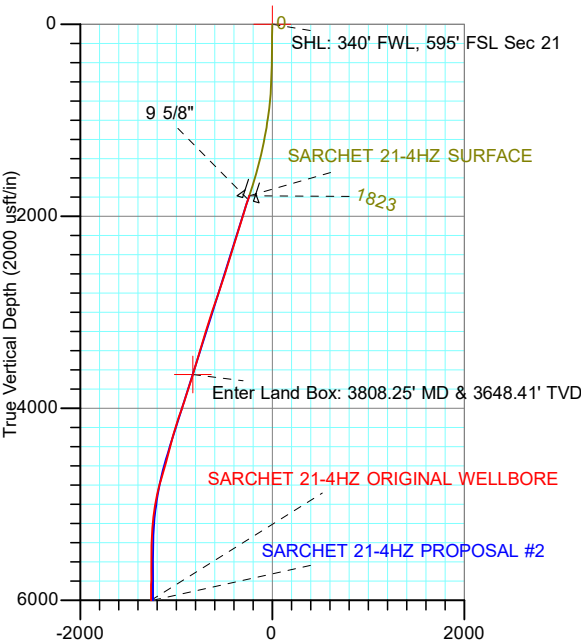
PROJECT DETAILS: WELD COUNTY (NAD 83)

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

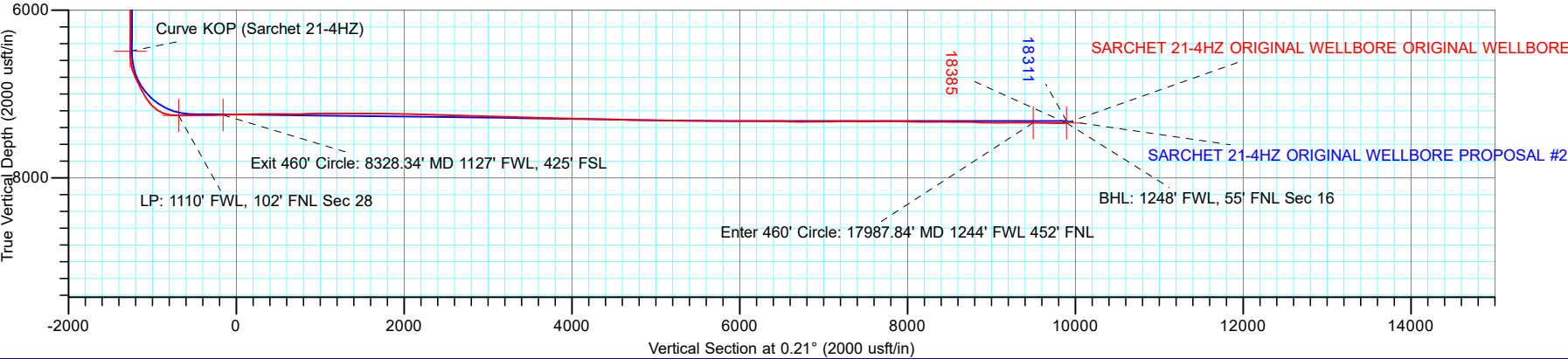
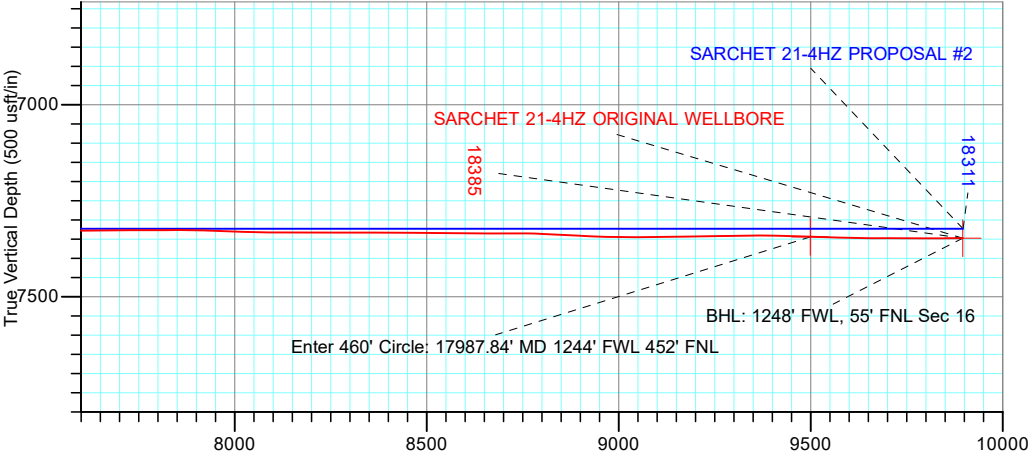


DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
BHL: 1248' FWL, 55' FNL Sec 16	7347.75	9892.73	818.28	40.231941	-104.787462
Curve KOP (Sarchet 21-4HZ)	6490.09	-1265.12	781.35	40.201312	-104.787596
Enter 460' Circle: 17987.84' MD 1244' FWL 452' FNL	7344.24	9495.61	818.17	40.230851	-104.787463
Enter Land Box: 3808.25' MD & 3648.41' TVD	3648.41	-828.23	505.73	40.202512	-104.788583
Exit 460' Circle: 8328.34' MD 1127' FWL, 425' FSL	7250.15	-159.65	788.64	40.204347	-104.787570
LP: 1110' FWL, 102' FNL Sec 28	7257.99	-689.68	774.70	40.202892	-104.787620
SHL: 340' FWL, 595' FSL Sec 21	0.00	0.00	0.00	40.204785	-104.790393



**Actual Line Calls**  
**SHL: 340' FWL, 595' FSL Sec 21 T3N R66W**  
**Heel: 1110' FWL, 102' FNL Sec 28 T3N R66W**  
**BHL: 1248' FWL, 55' FNL Sec 16 T3N R66W**



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

Design: ORIGINAL WELLBORE (SARCHET 21-4HZ/ORIGINAL WELLBORE)  
SW SW SEC 21 T3N R66W 6th P.M.  
Created By: Micah Ault Date: 14:47, November 07 2019  
Approved: \_\_\_\_\_ Date: \_\_\_\_\_

# ANADARKO PETROLEUM CORP

Project: WELD COUNTY (NAD 83)  
Site: SW SW SEC 21 T3N R66W 6th P.M.  
Well: SARCHET 21-4HZ  
Wellbore: ORIGINAL WELLBORE  
Design: ORIGINAL WELLBORE



Azimuths to True North  
Magnetic North: 7.98°

Magnetic Field  
Strength: 52045.9nT  
Dip Angle: 66.64°  
Date: 7/29/2019  
Model: IGRF2015

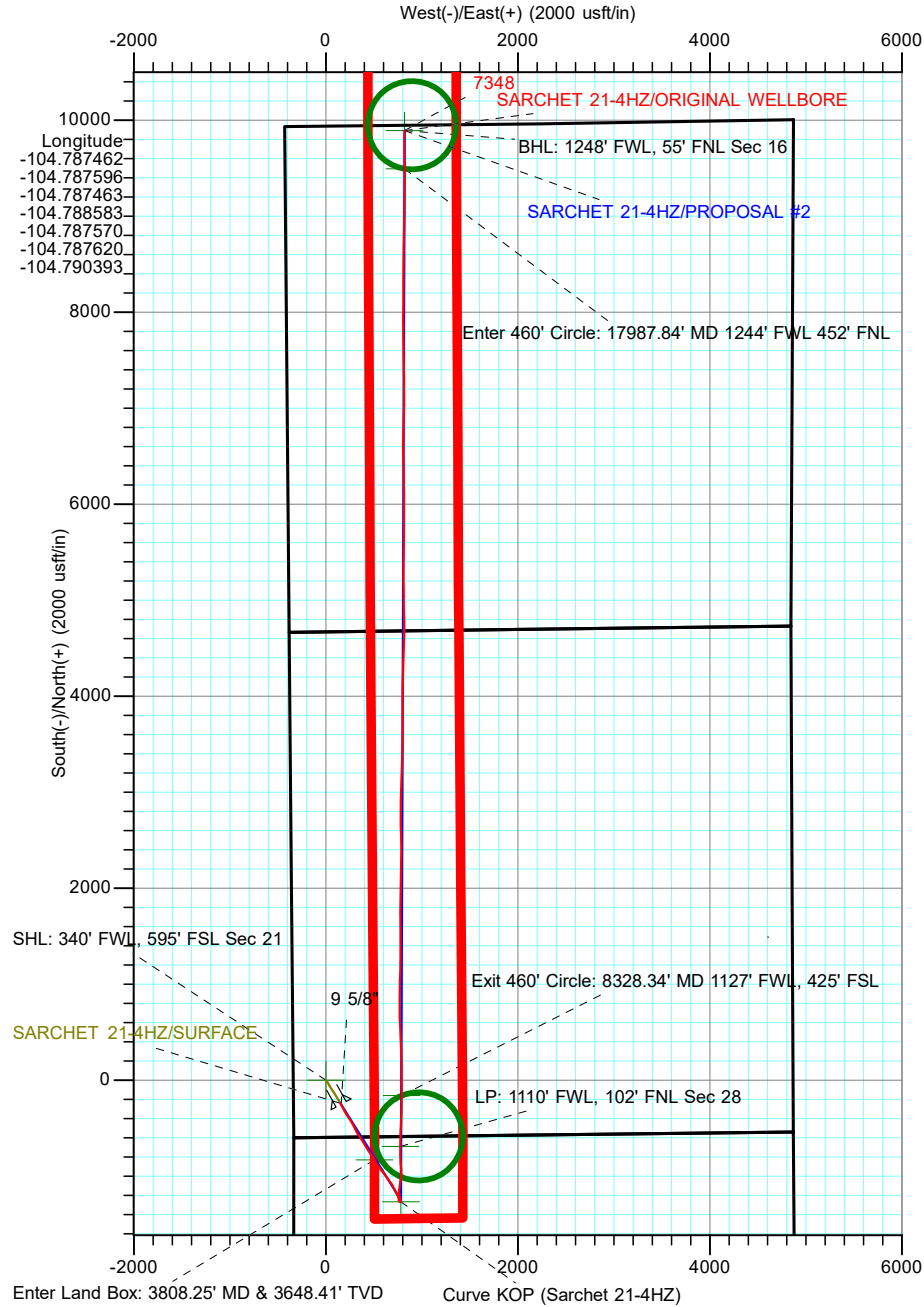
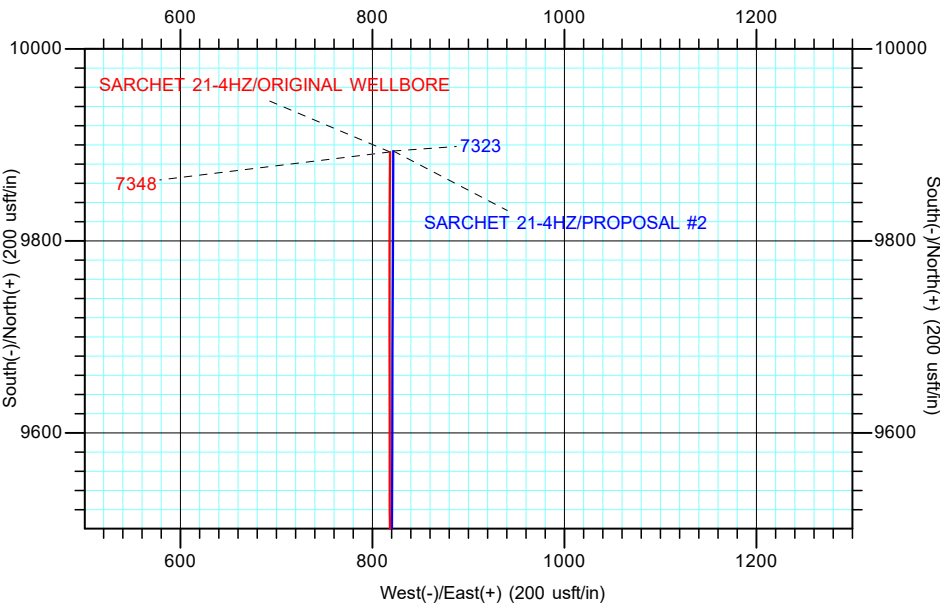
PROJECT DETAILS: WELD COUNTY (NAD 83)  
Geodetic System: Universal Transverse Mercator (US Survey Feet)  
Datum: North American Datum 1983  
Ellipsoid: GRS 1980  
Zone: Zone 13N (108 W to 102 W)



## DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude
BHL: 1248' FWL, 55' FNL Sec 16	7347.75	9892.73	818.28	14611265.21	1699736.18	40.231941
Curve KOP (Sarchet 21-4HZ)	6490.09	-1265.12	781.35	14600111.73	1699725.61	40.201312
Enter 460' Circle: 17987.84' MD 1244' FWL 452' FNL	7344.24	9495.61	818.17	14610868.25	1699737.01	40.230851
Enter Land Box: 3808.25' MD & 3648.41' TVD	3648.41	-828.23	505.73	14600547.79	1699449.06	40.202512
Exit 460' Circle: 8328.34' MD 1127' FWL, 425' FSL	7250.15	-159.65	788.64	14601216.77	1699730.28	40.204347
LP: 1110' FWL, 102' FNL Sec 28	7257.99	-689.68	774.70	14600686.92	1699717.60	40.202892
SHL: 340' FWL, 595' FSL Sec 21	0.00	0.00	0.00	14601374.50	1698941.58	40.204785

**Actual Line Calls**  
**SHL: 340' FWL, 595' FSL Sec 21 T3N R66W**  
**Heel: 1110' FWL, 102' FNL Sec 28 T3N R66W**  
**BHL: 1248' FWL, 55' FNL Sec 16 T3N R66W**



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

Design: ORIGINAL WELLBORE (SARCHET 21-4HZ/ORIGINAL WELLBORE)  
SW SW SEC 21 T3N R66W 6th P.M.  
Created By: Micah Ault Date: 14:48, November 07 2019  
Date: \_\_\_\_\_  
Approved: \_\_\_\_\_ Date: \_\_\_\_\_

# **ANADARKO PETROLEUM CORP**

**WELD COUNTY (NAD 83)  
SW SW SEC 21 T3N R66W 6th P.M.  
SARCHET 21-4HZ**

**ORIGINAL WELLBORE**

**Design: ORIGINAL WELLBORE**

## **Standard Survey Report**

**07 November, 2019**

<b>Company:</b>	ANADARKO PETROLEUM CORP	<b>Local Co-ordinate Reference:</b>	Well SARCHET 21-4HZ
<b>Project:</b>	WELD COUNTY (NAD 83)	<b>TVD Reference:</b>	KB 21' @ 5003.00usft (PD 464)
<b>Site:</b>	SW SW SEC 21 T3N R66W 6th P.M.	<b>MD Reference:</b>	KB 21' @ 5003.00usft (PD 464)
<b>Well:</b>	SARCHET 21-4HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	ORIGINAL WELLBORE	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	ORIGINAL WELLBORE	<b>Database:</b>	EDM 5000.15 Single User Db

<b>Project</b>	WELD COUNTY (NAD 83)		
<b>Map System:</b>	Universal Transverse Mercator (US Survey Feet)	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	Zone 13N (108 W to 102 W)		Using geodetic scale factor

<b>Site</b>	SW SW SEC 21 T3N R66W 6th P.M.		
<b>Site Position:</b>		<b>Northing:</b>	14,601,419.51 usft
<b>From:</b>	Lat/Long	<b>Easting:</b>	1,698,941.78 usft
<b>Position Uncertainty:</b>	0.00 usft	<b>Slot Radius:</b>	13-3/16 "
		<b>Latitude:</b>	40.204909
		<b>Longitude:</b>	-104.790392
		<b>Grid Convergence:</b>	0.14 °

<b>Well</b>	SARCHET 21-4HZ		
<b>Well Position</b>	<b>+N/-S</b>	0.00 usft	<b>Northing:</b> 14,601,374.49 usft
	<b>+E/-W</b>	0.00 usft	<b>Easting:</b> 1,698,941.58 usft
<b>Position Uncertainty</b>	0.00 usft	<b>Wellhead Elevation:</b>	usft
		<b>Latitude:</b>	40.204785
		<b>Longitude:</b>	-104.790393
		<b>Ground Level:</b>	4,982.00 usft

<b>Wellbore</b>	ORIGINAL WELLBORE				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2015	7/29/2019	7.98	66.64	52,045.93921149

<b>Design</b>	ORIGINAL WELLBORE				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	1,823.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>	
	0.00	0.00	0.00	0.21	

<b>Survey Program</b>	<b>Date</b>	11/7/2019			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
128.00	1,823.00	FINAL SURVEYS - SURFACE (JOB # 201	APC_ISCWSA REV 2 MWD+	Fixed:v2:crustal field declination	
1,933.00	18,330.00	Survey #1 (ORIGINAL WELLBORE)	APC_ISCWSA REV 2 MWD+	Fixed:v2:crustal field declination	
18,385.00	18,385.00	Survey #2 (ORIGINAL WELLBORE)	BLIND	OWSG BLIND	

<b>Survey</b>										
<b>Measured Depth (usft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Vertical Section (usft)</b>	<b>Dogleg Rate (°/100usft)</b>	<b>Build Rate (°/100usft)</b>	<b>Turn Rate (°/100usft)</b>	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
<b>SHL: 340' FWL, 595' FSL Sec 21</b>										
128.00	0.31	192.22	128.00	-0.34	-0.07	-0.34	0.24	0.24	0.00	
223.00	0.70	206.81	223.00	-1.11	-0.39	-1.11	0.43	0.41	15.36	
318.00	1.32	123.14	317.98	-2.22	0.27	-2.22	1.50	0.65	-88.07	
412.00	2.07	137.64	411.94	-4.07	2.32	-4.06	0.91	0.80	15.43	
508.00	2.46	128.76	507.87	-6.64	5.09	-6.62	0.55	0.41	-9.25	
603.00	3.21	125.51	602.75	-9.46	8.85	-9.43	0.81	0.79	-3.42	
699.00	4.26	148.54	698.55	-14.07	12.89	-14.02	1.89	1.09	23.99	

<b>Company:</b>	ANADARKO PETROLEUM CORP	<b>Local Co-ordinate Reference:</b>	Well SARCHET 21-4HZ
<b>Project:</b>	WELD COUNTY (NAD 83)	<b>TVD Reference:</b>	KB 21' @ 5003.00usft (PD 464)
<b>Site:</b>	SW SW SEC 21 T3N R66W 6th P.M.	<b>MD Reference:</b>	KB 21' @ 5003.00usft (PD 464)
<b>Well:</b>	SARCHET 21-4HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	ORIGINAL WELLBORE	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	ORIGINAL WELLBORE	<b>Database:</b>	EDM 5000.15 Single User Db

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
793.00	6.72	147.57	792.11	-21.69	17.67	-21.62	2.62	2.62	-1.03
889.00	8.48	149.94	887.27	-32.55	24.22	-32.47	1.86	1.83	2.47
984.00	9.27	151.00	981.13	-45.31	31.44	-45.19	0.85	0.83	1.12
1,079.00	11.16	149.50	1,074.62	-59.92	39.82	-59.78	2.01	1.99	-1.58
1,174.00	11.87	149.06	1,167.71	-76.23	49.51	-76.04	0.75	0.75	-0.46
1,269.00	13.27	148.63	1,260.43	-93.92	60.21	-93.70	1.48	1.47	-0.45
1,364.00	15.91	146.25	1,352.36	-114.06	73.12	-113.79	2.85	2.78	-2.51
1,460.00	16.96	147.22	1,444.43	-136.77	88.01	-136.45	1.13	1.09	1.01
1,554.00	19.07	148.27	1,533.82	-161.36	103.51	-160.98	2.27	2.24	1.12
1,649.00	18.98	146.43	1,623.63	-187.43	120.22	-186.99	0.64	-0.09	-1.94
1,744.00	21.05	149.86	1,712.89	-215.06	137.33	-214.56	2.50	2.18	3.61
1,823.00	20.52	149.94	1,786.75	-239.32	151.39	-238.76	0.67	-0.67	0.10
LAST SURVEY JULY 4, 2019									
1,863.00	20.25	151.13	1,824.24	-251.45	158.24	-250.87	1.23	-0.66	2.98
9 5/8"									
1,933.00	19.81	153.29	1,890.01	-272.66	169.43	-272.03	1.23	-0.64	3.08
2,022.00	18.67	153.22	1,974.04	-298.85	182.62	-298.17	1.28	-1.28	-0.08
2,112.00	19.42	153.09	2,059.11	-325.05	195.88	-324.33	0.83	0.83	-0.14
2,201.00	21.04	145.70	2,142.63	-351.45	211.59	-350.67	3.40	1.82	-8.30
2,291.00	19.28	144.93	2,227.11	-376.96	229.23	-376.11	1.98	-1.96	-0.86
2,381.00	21.02	147.17	2,311.60	-402.68	246.52	-401.78	2.11	1.93	2.49
2,470.00	19.50	146.60	2,395.09	-428.50	263.35	-427.53	1.72	-1.71	-0.64
2,560.00	19.44	153.55	2,479.96	-454.45	278.29	-453.43	2.57	-0.07	7.72
2,739.00	21.17	154.05	2,647.83	-510.19	305.71	-509.06	0.97	0.97	0.28
2,829.00	19.04	152.81	2,732.34	-537.86	319.53	-536.69	2.41	-2.37	-1.38
2,918.00	22.65	147.39	2,815.51	-565.22	335.40	-563.99	4.59	4.06	-6.09
3,008.00	22.62	147.01	2,898.58	-594.34	354.17	-593.03	0.17	-0.03	-0.42
3,098.00	22.16	146.77	2,981.79	-623.05	372.89	-621.68	0.52	-0.51	-0.27
3,188.00	21.31	146.50	3,065.39	-650.89	391.22	-649.45	0.95	-0.94	-0.30
3,277.00	19.22	143.31	3,148.88	-676.12	408.90	-674.62	2.66	-2.35	-3.58
3,367.00	21.78	151.08	3,233.19	-702.63	425.83	-701.06	4.15	2.84	8.63
3,456.00	19.14	152.86	3,316.57	-730.07	440.48	-728.45	3.05	-2.97	2.00
3,546.00	18.26	143.22	3,401.84	-754.50	455.65	-752.82	3.57	-0.98	-10.71
3,636.00	19.66	143.22	3,486.95	-777.92	473.16	-776.18	1.56	1.56	0.00
3,725.00	20.83	145.95	3,570.46	-803.02	490.99	-801.22	1.69	1.31	3.07
3,808.25	20.33	153.50	3,648.41	-828.23	505.73	-826.37	3.24	-0.61	9.07
Enter Land Box: 3808.25' MD & 3648.41' TVD									
3,815.00	20.30	154.13	3,654.74	-830.33	506.76	-828.47	3.24	-0.39	9.28
3,904.00	19.88	149.27	3,738.33	-857.23	521.23	-855.32	1.93	-0.47	-5.46
3,994.00	21.01	144.88	3,822.66	-883.59	538.33	-881.61	2.12	1.26	-4.88
4,083.00	22.96	142.54	3,905.19	-910.42	558.07	-908.37	2.40	2.19	-2.63
4,172.00	20.46	143.24	3,987.87	-936.66	577.94	-934.54	2.82	-2.81	0.79
4,262.00	23.70	142.05	4,071.26	-963.54	598.49	-961.34	3.63	3.60	-1.32
4,352.00	24.30	143.60	4,153.48	-992.70	620.60	-990.42	0.97	0.67	1.72

<b>Company:</b>	ANADARKO PETROLEUM CORP	<b>Local Co-ordinate Reference:</b>	Well SARCHET 21-4HZ
<b>Project:</b>	WELD COUNTY (NAD 83)	<b>TVD Reference:</b>	KB 21' @ 5003.00usft (PD 464)
<b>Site:</b>	SW SW SEC 21 T3N R66W 6th P.M.	<b>MD Reference:</b>	KB 21' @ 5003.00usft (PD 464)
<b>Well:</b>	SARCHET 21-4HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	ORIGINAL WELLBORE	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	ORIGINAL WELLBORE	<b>Database:</b>	EDM 5000.15 Single User Db

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
4,441.00	22.22	143.71	4,235.24	-1,021.01	641.43	-1,018.65	2.34	-2.34	0.12	
4,531.00	18.32	143.77	4,319.65	-1,046.15	659.87	-1,043.72	4.33	-4.33	0.07	
4,620.00	14.99	149.79	4,404.91	-1,067.38	673.93	-1,064.91	4.21	-3.74	6.76	
4,710.00	17.41	146.70	4,491.33	-1,088.70	687.18	-1,086.17	2.85	2.69	-3.43	
4,799.00	18.42	150.74	4,576.02	-1,112.10	701.37	-1,109.52	1.80	1.13	4.54	
4,889.00	18.66	152.09	4,661.35	-1,137.23	715.06	-1,134.60	0.55	0.27	1.50	
4,979.00	17.64	153.45	4,746.87	-1,162.15	727.89	-1,159.47	1.23	-1.13	1.51	
5,068.00	15.88	153.61	4,832.09	-1,185.12	739.33	-1,182.40	1.98	-1.98	0.18	
5,158.00	12.68	156.47	4,919.29	-1,205.21	748.75	-1,202.46	3.64	-3.56	3.18	
5,248.00	10.02	163.06	5,007.53	-1,221.76	754.98	-1,218.99	3.28	-2.96	7.32	
5,338.00	7.89	171.08	5,096.43	-1,235.36	758.22	-1,232.57	2.74	-2.37	8.91	
5,427.00	6.14	170.12	5,184.76	-1,246.08	759.98	-1,243.29	1.97	-1.97	-1.08	
5,517.00	2.67	184.92	5,274.49	-1,252.91	760.63	-1,250.12	4.03	-3.86	16.44	
5,606.00	2.40	181.17	5,363.40	-1,256.84	760.41	-1,254.05	0.36	-0.30	-4.21	
5,696.00	2.14	130.56	5,453.34	-1,259.82	761.65	-1,257.02	2.17	-0.29	-56.23	
5,786.00	1.44	101.99	5,543.29	-1,261.15	764.03	-1,258.34	1.24	-0.78	-31.74	
5,875.00	1.31	72.17	5,632.27	-1,261.07	766.09	-1,258.25	0.81	-0.15	-33.51	
5,990.00	2.31	115.68	5,747.21	-1,261.67	769.43	-1,258.84	1.42	0.87	37.83	
6,080.00	0.80	133.00	5,837.18	-1,262.88	771.53	-1,260.05	1.74	-1.68	19.24	
6,170.00	0.82	115.28	5,927.17	-1,263.59	772.57	-1,260.75	0.28	0.02	-19.69	
6,259.00	0.62	114.53	6,016.16	-1,264.06	773.58	-1,261.22	0.22	-0.22	-0.84	
6,349.00	0.70	86.87	6,106.16	-1,264.23	774.58	-1,261.38	0.36	0.09	-30.73	
6,438.00	1.01	83.05	6,195.15	-1,264.11	775.90	-1,261.25	0.35	0.35	-4.29	
6,528.00	1.13	96.63	6,285.13	-1,264.11	777.57	-1,261.25	0.31	0.13	15.09	
6,618.00	1.10	106.75	6,375.11	-1,264.46	779.28	-1,261.60	0.22	-0.03	11.24	
6,708.00	1.23	113.83	6,465.10	-1,265.10	780.99	-1,262.23	0.22	0.14	7.87	
6,733.00	0.70	51.04	6,490.09	-1,265.12	781.35	-1,262.24	4.41	-2.13	-251.18	
Curve KOP (Sarchet 21-4HZ)										
6,766.99	1.73	351.75	6,524.08	-1,264.48	781.44	-1,261.61	4.41	3.03	-174.43	
KOP - SARCHET 21-4HZ (P2)										
6,770.06	1.86	350.07	6,527.15	-1,264.38	781.42	-1,261.51	4.41	4.07	-54.60	
KOP - SARCHET 21-4HZ										
6,797.00	2.99	341.53	6,554.06	-1,263.29	781.12	-1,260.42	4.41	4.21	-31.71	
6,887.00	9.98	348.77	6,643.43	-1,253.40	778.86	-1,250.54	7.80	7.77	8.04	
6,976.00	17.29	344.31	6,729.87	-1,233.07	773.77	-1,230.23	8.29	8.21	-5.01	
7,066.00	24.36	350.04	6,813.94	-1,201.87	766.94	-1,199.05	8.17	7.86	6.37	
7,156.00	27.99	355.11	6,894.71	-1,162.53	761.92	-1,159.73	4.73	4.03	5.63	
7,245.00	27.93	8.91	6,973.40	-1,121.09	763.37	-1,118.28	7.26	-0.07	15.51	
7,335.00	33.65	13.36	7,050.70	-1,075.96	772.41	-1,073.12	6.84	6.36	4.94	
7,437.00	41.77	5.27	7,131.37	-1,014.49	782.08	-1,011.62	9.31	7.96	-7.93	
7,526.00	55.03	358.12	7,190.37	-948.19	783.62	-945.31	16.05	14.90	-8.03	
7,616.00	69.58	356.17	7,232.09	-868.82	779.57	-865.96	16.28	16.17	-2.17	
7,708.00	84.76	358.39	7,252.46	-779.48	775.38	-776.64	16.67	16.50	2.41	
7,798.00	88.20	0.75	7,257.99	-689.68	774.70	-686.84	4.63	3.82	2.62	

<b>Company:</b>	ANADARKO PETROLEUM CORP	<b>Local Co-ordinate Reference:</b>	Well SARCHET 21-4HZ
<b>Project:</b>	WELD COUNTY (NAD 83)	<b>TVD Reference:</b>	KB 21' @ 5003.00usft (PD 464)
<b>Site:</b>	SW SW SEC 21 T3N R66W 6th P.M.	<b>MD Reference:</b>	KB 21' @ 5003.00usft (PD 464)
<b>Well:</b>	SARCHET 21-4HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	ORIGINAL WELLBORE	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	ORIGINAL WELLBORE	<b>Database:</b>	EDM 5000.15 Single User Db

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
LP: 1110' FWL, 102' FNL Sec 28									
7,887.00	91.84	1.59	7,257.96	-600.71	776.52	-597.86	4.20	4.09	0.94
7,951.57	90.90	1.79	7,256.41	-536.18	778.43	-533.33	1.49	-1.46	0.31
HEEL - SARCHET 21-4HZ									
7,951.60	90.90	1.79	7,256.41	-536.16	778.43	-533.30	1.49	-1.46	0.31
HEEL - SARCHET 21-4HZ (P2)									
7,977.00	90.53	1.87	7,256.10	-510.77	779.24	-507.91	1.49	-1.46	0.31
8,067.00	89.96	2.06	7,255.71	-420.83	782.32	-417.96	0.67	-0.63	0.21
8,156.00	91.01	1.60	7,254.96	-331.88	785.17	-329.00	1.29	1.18	-0.52
8,246.00	91.61	1.31	7,252.90	-241.93	787.45	-239.04	0.74	0.67	-0.32
8,328.34	92.22	0.34	7,250.15	-159.65	788.64	-156.76	1.39	0.74	-1.18
Exit 460' Circle: 8328.34' MD 1127' FWL, 425' FSL									
8,336.00	92.28	0.25	7,249.85	-151.99	788.68	-149.10	1.39	0.74	-1.18
8,425.00	91.31	0.17	7,247.06	-63.04	789.00	-60.15	1.09	-1.09	-0.09
8,515.00	90.82	0.18	7,245.39	26.95	789.28	29.84	0.54	-0.54	0.01
8,604.00	91.08	359.63	7,243.91	115.93	789.13	118.83	0.68	0.29	-0.62
8,694.00	91.81	358.87	7,241.64	205.90	787.95	208.78	1.17	0.81	-0.84
8,784.00	91.37	358.22	7,239.14	295.83	785.67	298.71	0.87	-0.49	-0.72
8,874.00	89.34	356.96	7,238.59	385.74	781.88	388.61	2.65	-2.26	-1.40
8,963.00	90.52	357.63	7,238.69	474.64	777.68	477.49	1.52	1.33	0.75
9,053.00	88.97	356.54	7,239.10	564.52	773.11	567.35	2.11	-1.72	-1.21
9,142.00	89.21	358.45	7,240.51	653.42	769.22	656.24	2.16	0.27	2.15
9,232.00	91.16	0.37	7,240.22	743.41	768.29	746.22	3.04	2.17	2.13
9,322.00	92.13	0.02	7,237.63	833.37	768.60	836.18	1.15	1.08	-0.39
9,411.00	91.66	0.42	7,234.69	922.32	768.94	925.13	0.69	-0.53	0.45
9,501.00	89.74	1.38	7,233.59	1,012.30	770.35	1,015.11	2.39	-2.13	1.07
9,591.00	91.05	2.08	7,232.97	1,102.25	773.07	1,105.08	1.65	1.46	0.78
9,680.00	90.16	1.06	7,232.03	1,191.21	775.51	1,194.04	1.52	-1.00	-1.15
9,770.00	88.71	0.79	7,232.92	1,281.19	776.96	1,284.03	1.64	-1.61	-0.30
9,860.00	90.17	0.28	7,233.80	1,371.18	777.80	1,374.02	1.72	1.62	-0.57
9,949.00	89.28	359.83	7,234.23	1,460.18	777.88	1,463.02	1.12	-1.00	-0.51
10,039.00	90.66	359.53	7,234.27	1,550.17	777.38	1,553.01	1.57	1.53	-0.33
10,129.00	89.37	0.05	7,234.25	1,640.17	777.05	1,643.01	1.55	-1.43	0.58
10,218.00	90.32	359.41	7,234.49	1,729.17	776.63	1,732.00	1.29	1.07	-0.72
10,308.00	87.27	359.94	7,236.38	1,819.14	776.12	1,821.97	3.44	-3.39	0.59
10,397.00	88.97	0.88	7,239.30	1,908.08	776.76	1,910.92	2.18	1.91	1.06
10,487.00	90.46	0.58	7,239.75	1,998.07	777.91	2,000.91	1.69	1.66	-0.33
10,577.00	88.87	1.87	7,240.28	2,088.04	779.83	2,090.89	2.27	-1.77	1.43
10,667.00	88.33	2.09	7,242.48	2,177.96	782.94	2,180.82	0.65	-0.60	0.24
10,756.00	88.15	359.81	7,245.21	2,266.90	784.41	2,269.76	2.57	-0.20	-2.56
10,846.00	86.67	0.24	7,249.28	2,356.81	784.45	2,359.67	1.71	-1.64	0.48
10,936.00	87.94	359.82	7,253.51	2,446.71	784.50	2,449.56	1.49	1.41	-0.47
11,025.00	89.90	359.20	7,255.19	2,535.68	783.74	2,538.54	2.31	2.20	-0.70
11,115.00	88.73	358.58	7,256.26	2,625.66	781.99	2,628.51	1.47	-1.30	-0.69

<b>Company:</b>	ANADARKO PETROLEUM CORP	<b>Local Co-ordinate Reference:</b>	Well SARCHET 21-4HZ
<b>Project:</b>	WELD COUNTY (NAD 83)	<b>TVD Reference:</b>	KB 21' @ 5003.00usft (PD 464)
<b>Site:</b>	SW SW SEC 21 T3N R66W 6th P.M.	<b>MD Reference:</b>	KB 21' @ 5003.00usft (PD 464)
<b>Well:</b>	SARCHET 21-4HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	ORIGINAL WELLBORE	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	ORIGINAL WELLBORE	<b>Database:</b>	EDM 5000.15 Single User Db

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
11,205.00	87.67	359.38	7,259.09	2,715.60	780.39	2,718.44	1.48	-1.18	0.89
11,294.00	88.31	359.10	7,262.21	2,804.53	779.21	2,807.37	0.78	0.72	-0.31
11,384.00	89.05	2.04	7,264.28	2,894.49	780.11	2,897.33	3.37	0.82	3.27
11,474.00	87.44	1.21	7,267.04	2,984.41	782.66	2,987.26	2.01	-1.79	-0.92
11,487.61	87.50	1.26	7,267.64	2,998.00	782.95	3,000.85	0.56	0.44	0.35
INT PT 1 - SARCHET 21-4HZ									
11,563.00	87.83	1.52	7,270.71	3,073.31	784.78	3,076.17	0.56	0.44	0.35
11,653.00	88.14	1.86	7,273.88	3,163.22	787.43	3,166.08	0.51	0.34	0.38
11,742.00	88.59	1.89	7,276.42	3,252.13	790.34	3,255.01	0.51	0.51	0.03
11,832.00	89.59	2.04	7,277.85	3,342.07	793.43	3,344.95	1.12	1.11	0.17
11,921.00	88.98	1.44	7,278.96	3,431.02	796.13	3,433.91	0.96	-0.69	-0.67
12,011.00	89.78	1.35	7,279.93	3,520.98	798.32	3,523.89	0.89	0.89	-0.10
12,101.00	87.80	359.98	7,281.83	3,610.95	799.37	3,613.86	2.68	-2.20	-1.52
12,190.00	87.42	359.70	7,285.54	3,699.87	799.12	3,702.78	0.53	-0.43	-0.31
12,279.00	87.51	359.60	7,289.48	3,788.79	798.57	3,791.69	0.15	0.10	-0.11
12,369.00	88.03	359.97	7,292.98	3,878.72	798.24	3,881.62	0.71	0.58	0.41
12,459.00	88.60	0.49	7,295.63	3,968.68	798.60	3,971.58	0.86	0.63	0.58
12,548.00	88.94	0.78	7,297.54	4,057.65	799.58	4,060.55	0.50	0.38	0.33
12,638.00	88.96	0.97	7,299.19	4,147.62	800.96	4,150.53	0.21	0.02	0.21
12,727.00	89.12	1.38	7,300.68	4,236.59	802.78	4,239.51	0.49	0.18	0.46
12,817.00	89.69	1.44	7,301.61	4,326.56	805.00	4,329.48	0.64	0.63	0.07
12,907.00	88.65	1.84	7,302.92	4,416.51	807.57	4,419.44	1.24	-1.16	0.44
12,996.00	88.54	2.35	7,305.10	4,505.43	810.82	4,508.37	0.59	-0.12	0.57
13,086.00	88.07	1.53	7,307.76	4,595.33	813.87	4,598.29	1.05	-0.52	-0.91
13,176.00	87.99	359.72	7,310.85	4,685.27	814.85	4,688.23	2.01	-0.09	-2.01
13,265.00	88.88	359.50	7,313.29	4,774.24	814.25	4,777.19	1.03	1.00	-0.25
13,355.00	90.26	359.28	7,313.96	4,864.23	813.29	4,867.17	1.55	1.53	-0.24
13,444.00	88.81	358.98	7,314.68	4,953.21	811.94	4,956.15	1.66	-1.63	-0.34
13,534.00	90.29	359.59	7,315.39	5,043.20	810.81	5,046.13	1.78	1.64	0.68
13,624.00	88.54	358.94	7,316.31	5,133.18	809.66	5,136.11	2.07	-1.94	-0.72
13,713.00	89.03	358.79	7,318.20	5,222.14	807.90	5,225.07	0.58	0.55	-0.17
13,803.00	89.82	359.53	7,319.10	5,312.13	806.58	5,315.05	1.20	0.88	0.82
13,893.00	90.45	0.09	7,318.89	5,402.13	806.28	5,405.04	0.94	0.70	0.62
13,982.00	88.49	1.03	7,319.71	5,491.11	807.15	5,494.03	2.44	-2.20	1.06
13,988.00	88.51	1.08	7,319.87	5,497.11	807.26	5,500.03	0.93	0.41	0.83
INT PT 2 - SARCHET 21-4HZ									
14,072.00	88.86	1.78	7,321.79	5,581.06	809.35	5,583.99	0.93	0.41	0.83
14,251.00	90.18	0.89	7,323.29	5,760.00	813.52	5,762.94	0.89	0.74	-0.50
14,341.00	90.94	0.94	7,322.41	5,849.98	814.96	5,852.93	0.85	0.84	0.06
14,430.00	89.41	359.63	7,322.14	5,938.98	815.40	5,941.93	2.26	-1.72	-1.47
14,520.00	90.24	358.84	7,322.41	6,028.97	814.20	6,031.91	1.27	0.92	-0.88
14,609.00	88.22	358.66	7,323.61	6,117.93	812.26	6,120.87	2.28	-2.27	-0.20
14,698.00	88.83	359.01	7,325.90	6,206.89	810.45	6,209.81	0.79	0.69	0.39



<b>Company:</b>	ANADARKO PETROLEUM CORP	<b>Local Co-ordinate Reference:</b>	Well SARCHET 21-4HZ
<b>Project:</b>	WELD COUNTY (NAD 83)	<b>TVD Reference:</b>	KB 21' @ 5003.00usft (PD 464)
<b>Site:</b>	SW SW SEC 21 T3N R66W 6th P.M.	<b>MD Reference:</b>	KB 21' @ 5003.00usft (PD 464)
<b>Well:</b>	SARCHET 21-4HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	ORIGINAL WELLBORE	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	ORIGINAL WELLBORE	<b>Database:</b>	EDM 5000.15 Single User Db

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
14,788.00	90.14	359.16	7,326.71	6,296.87	809.02	6,299.79	1.47	1.46	0.17	
14,877.00	91.17	359.24	7,325.69	6,385.85	807.77	6,388.77	1.16	1.16	0.09	
14,967.00	88.59	358.57	7,325.88	6,475.83	806.05	6,478.74	2.96	-2.87	-0.74	
15,056.00	88.67	358.43	7,328.01	6,564.77	803.72	6,567.67	0.18	0.09	-0.16	
15,146.00	87.94	1.12	7,330.67	6,654.72	803.37	6,657.62	3.10	-0.81	2.99	
15,235.00	89.00	2.27	7,333.05	6,743.65	806.00	6,746.56	1.76	1.19	1.29	
15,325.00	91.70	1.64	7,332.50	6,833.59	809.07	6,836.51	3.08	3.00	-0.70	
15,414.00	91.00	0.82	7,330.40	6,922.54	810.98	6,925.47	1.21	-0.79	-0.92	
15,503.00	90.17	0.63	7,329.49	7,011.53	812.11	7,014.46	0.96	-0.93	-0.21	
15,592.00	91.56	0.64	7,328.15	7,100.51	813.09	7,103.44	1.56	1.56	0.01	
15,682.00	89.94	0.30	7,326.97	7,190.50	813.83	7,193.43	1.84	-1.80	-0.38	
15,771.00	91.06	0.35	7,326.19	7,279.49	814.34	7,282.43	1.26	1.26	0.06	
15,861.00	88.40	358.95	7,326.62	7,369.48	813.79	7,372.41	3.34	-2.96	-1.56	
15,950.00	89.10	358.67	7,328.56	7,458.44	811.94	7,461.36	0.85	0.79	-0.31	
16,040.00	90.45	358.53	7,328.91	7,548.41	809.74	7,551.32	1.51	1.50	-0.16	
16,130.00	91.26	358.41	7,327.57	7,638.36	807.34	7,641.27	0.91	0.90	-0.13	
16,219.00	89.48	359.96	7,327.00	7,727.35	806.07	7,730.25	2.65	-2.00	1.74	
16,309.00	90.99	359.83	7,326.63	7,817.34	805.91	7,820.24	1.68	1.68	-0.14	
16,398.00	88.04	359.84	7,327.38	7,906.33	805.65	7,909.23	3.31	-3.31	0.01	
16,488.00	88.26	0.32	7,330.29	7,996.28	805.78	7,999.18	0.59	0.24	0.53	
16,577.00	88.79	0.23	7,332.58	8,085.25	806.20	8,088.15	0.60	0.60	-0.10	
16,756.00	90.76	0.07	7,333.28	8,264.24	806.67	8,267.14	1.10	1.10	-0.09	
16,846.00	89.25	0.33	7,333.27	8,354.24	806.99	8,357.14	1.70	-1.68	0.29	
16,936.00	90.01	0.18	7,333.85	8,444.23	807.39	8,447.14	0.86	0.84	-0.17	
17,025.00	89.38	0.85	7,334.33	8,533.23	808.19	8,536.13	1.03	-0.71	0.75	
17,115.00	89.51	0.99	7,335.20	8,623.21	809.63	8,626.12	0.21	0.14	0.16	
17,205.00	90.51	0.89	7,335.18	8,713.20	811.11	8,716.11	1.12	1.11	-0.11	
17,294.00	87.45	0.98	7,336.77	8,802.16	812.56	8,805.08	3.44	-3.44	0.10	
17,384.00	86.87	0.87	7,341.23	8,892.04	814.01	8,894.96	0.66	-0.64	-0.12	
17,473.00	88.97	1.35	7,344.46	8,980.96	815.73	8,983.89	2.42	2.36	0.54	
17,563.00	90.29	1.53	7,345.04	9,070.93	818.00	9,073.86	1.48	1.47	0.20	
17,653.00	91.52	1.48	7,343.62	9,160.88	820.36	9,163.83	1.37	1.37	-0.06	
17,742.00	90.36	359.58	7,342.16	9,249.86	821.18	9,252.81	2.50	-1.30	-2.13	
17,832.00	91.11	358.99	7,341.00	9,339.85	820.06	9,342.79	1.06	0.83	-0.66	
17,921.00	87.70	359.27	7,341.92	9,428.82	818.71	9,431.75	3.84	-3.83	0.31	
17,987.84	88.32	359.80	7,344.24	9,495.61	818.17	9,498.55	1.22	0.93	0.79	
Enter 460' Circle: 17987.84' MD 1244' FWL 452' FNL										
18,011.00	88.54	359.98	7,344.88	9,518.77	818.12	9,521.70	1.22	0.93	0.79	
18,101.00	89.12	359.90	7,346.72	9,608.75	818.03	9,611.68	0.65	0.64	-0.09	
18,190.00	89.34	359.88	7,347.91	9,697.74	817.86	9,700.67	0.25	0.25	-0.02	
18,280.00	90.12	0.13	7,348.34	9,787.74	817.86	9,790.67	0.91	0.87	0.28	
18,330.00	90.38	0.26	7,348.12	9,837.74	818.03	9,840.67	0.58	0.52	0.26	
18,385.00	90.38	0.26	7,347.75	9,892.73	818.28	9,895.66	0.00	0.00	0.00	
BHL - SARCHET 21-4HZ (P2) - BHL - SARCHET 21-4HZ - BHL: 1248' FWL, 55' FNL Sec 16										

<b>Company:</b>	ANADARKO PETROLEUM CORP	<b>Local Co-ordinate Reference:</b>	Well SARCHET 21-4HZ
<b>Project:</b>	WELD COUNTY (NAD 83)	<b>TVD Reference:</b>	KB 21' @ 5003.00usft (PD 464)
<b>Site:</b>	SW SW SEC 21 T3N R66W 6th P.M.	<b>MD Reference:</b>	KB 21' @ 5003.00usft (PD 464)
<b>Well:</b>	SARCHET 21-4HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	ORIGINAL WELLBORE	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	ORIGINAL WELLBORE	<b>Database:</b>	EDM 5000.15 Single User Db

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)

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: 340' FWL, 595' FS - actual wellpath hits target center - Point	0.00	0.00	0.00	0.00	0.00	14,601,374.49	1,698,941.58	40.204785	-104.790393
Enter Land Box: 3808.2' - actual wellpath hits target center - Point	0.00	0.00	3,648.41	-828.23	505.73	14,600,547.79	1,699,449.06	40.202512	-104.788583
Curve KOP (Sarchet 21- - actual wellpath hits target center - Point	0.00	0.00	6,490.09	-1,265.12	781.35	14,600,111.72	1,699,725.60	40.201313	-104.787596
Exit 460' Circle: 8328.34 - actual wellpath hits target center - Point	0.00	0.00	7,250.15	-159.65	788.64	14,601,216.77	1,699,730.28	40.204347	-104.787570
LP: 1110' FWL, 102' FNL - actual wellpath hits target center - Point	0.00	0.00	7,257.99	-689.68	774.70	14,600,686.92	1,699,717.60	40.202892	-104.787620
Enter 460' Circle: 17987 - actual wellpath misses target center by 0.01usft at 17987.84usft MD (7344.24 TVD, 9495.61 N, 818.17 E) - Point	0.00	0.00	7,344.24	9,495.61	818.17	14,610,868.25	1,699,737.01	40.230851	-104.787463
BHL: 1248' FWL, 55' FN - actual wellpath hits target center - Point	0.00	0.00	7,347.75	9,892.73	818.28	14,611,265.21	1,699,736.18	40.231941	-104.787463

Casing Points				
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,863.00	1,824.24	9 5/8"	9-5/8	12-1/4

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,823.00	1,786.75	-239.32	151.39	LAST SURVEY JULY 4, 2019

Checked By: _____	Approved By: _____	Date: _____
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