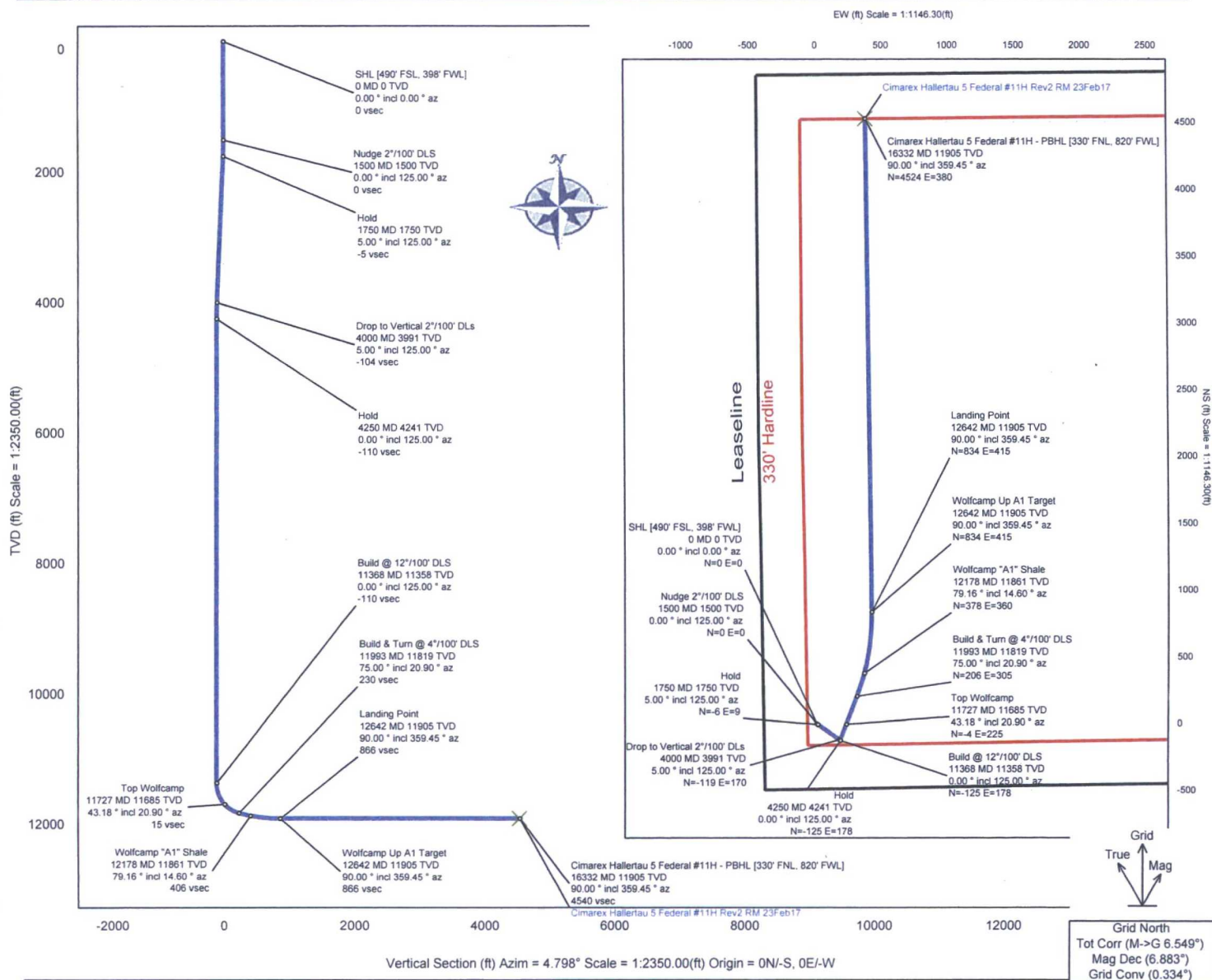


Borehole: Original Borehole			Well: Cimarex Hallertau 5 Federal #11H			Field: NM Lea County (NAD 83)			Structure: Cimarex Hallertau 5 Federal #11H		
Gravity & Magnetic Parameters						Surface Location NAD83 New Mexico State Plane, Eastern Zone, US Feet			Miscellaneous		
Model: HDGM 2016		Dip: 59.781°		Date: 23-Feb-2017		Lat: N 32 3 58.50		Northing: 388406.47RUS		Grid Conv: 0.3338°	
MagDec: 6.883°		FS: 47996.877nT		Gravity FS: 998.426mgm (9.80665 Based)		Lon: W 103 42 16.36		Easting: 736116.02RUS		Scale Fact: 0.99995264	
									Slot: Hallertau 5 Cimarex Hallertau 5 Federal #11H TVD Ref: RKB(3291.5ft above MSL)		
									Plan: Cimarex Hallertau 5 Federal #11H Rev2 RM 23Feb17		



Critical Points

Critical Point	MD	INCL	AZIM	TVD	VSEC	N(+)/S(-)	E(+)/W(-)	DLS
SHL [490' FSL, 398' FWL]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Nudge 2°/100' DLS	1500.00	0.00	125.00	1500.00	0.00	0.00	0.00	0.00
Hold	1750.00	5.00	125.00	1749.68	-5.48	-6.25	8.93	2.00
Drop to Vertical 2°/100' DLS	4000.00	5.00	125.00	3991.12	-104.13	-118.73	169.57	0.00
Hold	4250.00	0.00	125.00	4240.80	-109.62	-124.98	178.50	2.00
Build @ 12°/100' DLS	11367.50	0.00	125.00	11358.30	-109.62	-124.98	178.50	0.00
Top Wolfcamp	11727.29	43.18	20.90	11685.00	14.58	-4.22	224.61	12.00
Build & Turn @ 4°/100' DLS	11992.50	75.00	20.90	11819.50	230.39	205.62	304.74	12.00
Wolfcamp "A1" Shale	12177.98	79.16	14.60	11861.00	406.46	377.69	359.73	4.00
Wolfcamp Up A1 Target	12641.82	90.00	359.45	11905.00	865.85	834.03	415.38	4.00
Landing Point	12641.82	90.00	359.45	11905.00	865.85	834.03	415.38	4.00
Cimarex Hallertau 5 Federal #11H - PBHL [330' FNL, 820' FWL]	16331.84	90.00	359.45	11905.00	4539.79	4523.88	379.73	0.00

Cimarex Hallertau 5 Federal #11H Rev2 RM 23Feb17 Proposal Geodetic Report (Non-Def Plan)



Report Date:	February 23, 2017 - 09:53 AM	Survey / DLS Computation:	Minimum Curvature / Lubinski
Client:	Cimarex	Vertical Section Azimuth:	4.798 ° (Grid North)
Field:	NM Lea County (NAD 83)	Vertical Section Origin:	0.000 ft, 0.000 ft
Structure / Slot:	Cimarex Hallertau 5 Federal #11H / Cimarex Hallertau 5 Federal #11H	TVD Reference Datum:	RKB
Well:	Cimarex Hallertau 5 Federal #11H	TVD Reference Elevation:	3291.500 ft above MSL
Borehole:	Original Borehole	Seabed / Ground Elevation:	3271.700 ft above MSL
UWI / API#:	Unknown / Unknown	Magnetic Declination:	6.883 °
Survey Name:	Cimarex Hallertau 5 Federal #11H Rev2 RM 23Feb17	Total Gravity Field Strength:	998.4259mgn (9.80665 Based)
Survey Date:	January 13, 2017	Gravity Model:	GARM
Tort / AHD / DDI / ERD Ratio:	110.973 ° / 4903.602 ft / 5.873 / 0.412	Total Magnetic Field Strength:	47996.877 nT
Coordinate Reference System:	NAD83 New Mexico State Plane, Eastern Zone, US Feet	Magnetic Dip Angle:	59.781 °
Location Lat / Long:	N 32° 3' 58.49745", W 103° 42' 16.35964"	Declination Date:	February 23, 2017
Location Grid N/E Y/X:	N 388406.470 ftUS, E 736116.020 ftUS	Magnetic Declination Model:	HDGM 2016
CRS Grid Convergence Angle:	0.3338 °	North Reference:	Grid North
Grid Scale Factor:	0.99995254	Grid Convergence Used:	0.3338 °
Version / Patch:	2.10.254.0	Total Corr Mag North->Grid North:	6.5488 °
		Local Coord Referenced To:	Structure Reference Point

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
SHL [490' FSL, 398' FWL]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	388406.47	736116.02	N 32 3 58.50 W 103 42 16.36	
	100.00	0.00	125.00	100.00	0.00	0.00	0.00	0.00	388406.47	736116.02	N 32 3 58.50 W 103 42 16.36	
	200.00	0.00	125.00	200.00	0.00	0.00	0.00	0.00	388406.47	736116.02	N 32 3 58.50 W 103 42 16.36	
	300.00	0.00	125.00	300.00	0.00	0.00	0.00	0.00	388406.47	736116.02	N 32 3 58.50 W 103 42 16.36	
	400.00	0.00	125.00	400.00	0.00	0.00	0.00	0.00	388406.47	736116.02	N 32 3 58.50 W 103 42 16.36	
	500.00	0.00	125.00	500.00	0.00	0.00	0.00	0.00	388406.47	736116.02	N 32 3 58.50 W 103 42 16.36	
	600.00	0.00	125.00	600.00	0.00	0.00	0.00	0.00	388406.47	736116.02	N 32 3 58.50 W 103 42 16.36	
	700.00	0.00	125.00	700.00	0.00	0.00	0.00	0.00	388406.47	736116.02	N 32 3 58.50 W 103 42 16.36	
	800.00	0.00	125.00	800.00	0.00	0.00	0.00	0.00	388406.47	736116.02	N 32 3 58.50 W 103 42 16.36	
	900.00	0.00	125.00	900.00	0.00	0.00	0.00	0.00	388406.47	736116.02	N 32 3 58.50 W 103 42 16.36	
	1000.00	0.00	125.00	1000.00	0.00	0.00	0.00	0.00	388406.47	736116.02	N 32 3 58.50 W 103 42 16.36	
	1100.00	0.00	125.00	1100.00	0.00	0.00	0.00	0.00	388406.47	736116.02	N 32 3 58.50 W 103 42 16.36	
	1200.00	0.00	125.00	1200.00	0.00	0.00	0.00	0.00	388406.47	736116.02	N 32 3 58.50 W 103 42 16.36	
	1300.00	0.00	125.00	1300.00	0.00	0.00	0.00	0.00	388406.47	736116.02	N 32 3 58.50 W 103 42 16.36	
	1400.00	0.00	125.00	1400.00	0.00	0.00	0.00	0.00	388406.47	736116.02	N 32 3 58.50 W 103 42 16.36	
Nudge 2°/100'	1500.00	0.00	125.00	1500.00	0.00	0.00	0.00	0.00	388406.47	736116.02	N 32 3 58.50 W 103 42 16.36	
DLS	1600.00	2.00	125.00	1599.98	-0.88	-1.00	1.43	2.00	388405.47	736117.45	N 32 3 58.49 W 103 42 16.34	
	1700.00	4.00	125.00	1699.84	-3.51	-4.00	5.72	2.00	388402.47	736121.74	N 32 3 58.46 W 103 42 16.29	
Hold	1750.00	5.00	125.00	1749.68	-5.48	-6.25	8.93	2.00	388400.22	736124.95	N 32 3 58.44 W 103 42 16.26	
	1800.00	5.00	125.00	1799.49	-7.68	-8.75	12.50	0.00	388397.72	736128.52	N 32 3 58.41 W 103 42 16.21	
	1900.00	5.00	125.00	1899.11	-12.06	-13.75	19.64	0.00	388392.72	736135.66	N 32 3 58.36 W 103 42 16.13	
	2000.00	5.00	125.00	1998.73	-16.44	-18.75	26.78	0.00	388387.72	736142.80	N 32 3 58.31 W 103 42 16.05	
	2100.00	5.00	125.00	2098.35	-20.83	-23.75	33.92	0.00	388382.72	736149.94	N 32 3 58.26 W 103 42 15.97	
	2200.00	5.00	125.00	2197.97	-25.21	-28.75	41.06	0.00	388377.72	736157.08	N 32 3 58.21 W 103 42 15.88	
	2300.00	5.00	125.00	2297.59	-29.60	-33.75	48.20	0.00	388372.72	736164.21	N 32 3 58.16 W 103 42 15.80	

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
	2400.00	5.00	125.00	2397.21	-33.98	-38.75	55.34	0.00	388367.73	736171.35	N 32 3 58.11 W	103 42 15.72
	2500.00	5.00	125.00	2496.83	-38.37	-43.75	62.48	0.00	388362.73	736178.49	N 32 3 58.06 W	103 42 15.64
	2600.00	5.00	125.00	2596.45	-42.75	-48.74	69.61	0.00	388357.73	736185.63	N 32 3 58.01 W	103 42 15.55
	2700.00	5.00	125.00	2696.07	-47.14	-53.74	76.75	0.00	388352.73	736192.77	N 32 3 57.96 W	103 42 15.47
	2800.00	5.00	125.00	2795.69	-51.52	-58.74	83.89	0.00	388347.73	736199.91	N 32 3 57.91 W	103 42 15.39
	2900.00	5.00	125.00	2895.31	-55.90	-63.74	91.03	0.00	388342.73	736207.05	N 32 3 57.86 W	103 42 15.31
	3000.00	5.00	125.00	2994.93	-60.29	-68.74	98.17	0.00	388337.73	736214.19	N 32 3 57.81 W	103 42 15.22
	3100.00	5.00	125.00	3094.55	-64.67	-73.74	105.31	0.00	388332.73	736221.33	N 32 3 57.76 W	103 42 15.14
	3200.00	5.00	125.00	3194.17	-69.06	-78.74	112.45	0.00	388327.73	736228.47	N 32 3 57.71 W	103 42 15.06
	3300.00	5.00	125.00	3293.78	-73.44	-83.74	119.59	0.00	388322.74	736235.60	N 32 3 57.66 W	103 42 14.98
	3400.00	5.00	125.00	3393.40	-77.83	-88.74	126.73	0.00	388317.74	736242.74	N 32 3 57.61 W	103 42 14.89
	3500.00	5.00	125.00	3493.02	-82.21	-93.74	133.87	0.00	388312.74	736249.88	N 32 3 57.56 W	103 42 14.81
	3600.00	5.00	125.00	3592.64	-86.59	-98.74	141.01	0.00	388307.74	736257.02	N 32 3 57.51 W	103 42 14.73
	3700.00	5.00	125.00	3692.26	-90.98	-103.73	148.15	0.00	388302.74	736264.16	N 32 3 57.46 W	103 42 14.65
	3800.00	5.00	125.00	3791.88	-95.36	-108.73	155.29	0.00	388297.74	736271.30	N 32 3 57.41 W	103 42 14.56
	3900.00	5.00	125.00	3891.50	-99.75	-113.73	162.43	0.00	388292.74	736278.44	N 32 3 57.36 W	103 42 14.48
Drop to Vertical 2°/100' DLs	4000.00	5.00	125.00	3991.12	-104.13	-118.73	169.57	0.00	388287.74	736285.58	N 32 3 57.31 W	103 42 14.40
	4100.00	3.00	125.00	4090.87	-107.64	-122.73	175.28	2.00	388283.74	736291.29	N 32 3 57.27 W	103 42 14.33
	4200.00	1.00	125.00	4190.81	-109.40	-124.73	178.14	2.00	388281.74	736294.15	N 32 3 57.25 W	103 42 14.30
Hold	4250.00	0.00	125.00	4240.80	-109.62	-124.98	178.50	2.00	388281.49	736294.51	N 32 3 57.25 W	103 42 14.29
	4300.00	0.00	125.00	4290.80	-109.62	-124.98	178.50	0.00	388281.49	736294.51	N 32 3 57.25 W	103 42 14.29
	4400.00	0.00	125.00	4390.80	-109.62	-124.98	178.50	0.00	388281.49	736294.51	N 32 3 57.25 W	103 42 14.29
	4500.00	0.00	125.00	4490.80	-109.62	-124.98	178.50	0.00	388281.49	736294.51	N 32 3 57.25 W	103 42 14.29
	4600.00	0.00	125.00	4590.80	-109.62	-124.98	178.50	0.00	388281.49	736294.51	N 32 3 57.25 W	103 42 14.29
	4700.00	0.00	125.00	4690.80	-109.62	-124.98	178.50	0.00	388281.49	736294.51	N 32 3 57.25 W	103 42 14.29
	4800.00	0.00	125.00	4790.80	-109.62	-124.98	178.50	0.00	388281.49	736294.51	N 32 3 57.25 W	103 42 14.29
	4900.00	0.00	125.00	4890.80	-109.62	-124.98	178.50	0.00	388281.49	736294.51	N 32 3 57.25 W	103 42 14.29
	5000.00	0.00	125.00	4990.80	-109.62	-124.98	178.50	0.00	388281.49	736294.51	N 32 3 57.25 W	103 42 14.29
	5100.00	0.00	125.00	5090.80	-109.62	-124.98	178.50	0.00	388281.49	736294.51	N 32 3 57.25 W	103 42 14.29
	5200.00	0.00	125.00	5190.80	-109.62	-124.98	178.50	0.00	388281.49	736294.51	N 32 3 57.25 W	103 42 14.29
	5300.00	0.00	125.00	5290.80	-109.62	-124.98	178.50	0.00	388281.49	736294.51	N 32 3 57.25 W	103 42 14.29
	5400.00	0.00	125.00	5390.80	-109.62	-124.98	178.50	0.00	388281.49	736294.51	N 32 3 57.25 W	103 42 14.29
	5500.00	0.00	125.00	5490.80	-109.62	-124.98	178.50	0.00	388281.49	736294.51	N 32 3 57.25 W	103 42 14.29
	5600.00	0.00	125.00	5590.80	-109.62	-124.98	178.50	0.00	388281.49	736294.51	N 32 3 57.25 W	103 42 14.29
	5700.00	0.00	125.00	5690.80	-109.62	-124.98	178.50	0.00	388281.49	736294.51	N 32 3 57.25 W	103 42 14.29
	5800.00	0.00	125.00	5790.80	-109.62	-124.98	178.50	0.00	388281.49	736294.51	N 32 3 57.25 W	103 42 14.29
	5900.00	0.00	125.00	5890.80	-109.62	-124.98	178.50	0.00	388281.49	736294.51	N 32 3 57.25 W	103 42 14.29
	6000.00	0.00	125.00	5990.80	-109.62	-124.98	178.50	0.00	388281.49	736294.51	N 32 3 57.25 W	103 42 14.29
	6100.00	0.00	125.00	6090.80	-109.62	-124.98	178.50	0.00	388281.49	736294.51	N 32 3 57.25 W	103 42 14.29
	6200.00	0.00	125.00	6190.80	-109.62	-124.98	178.50	0.00	388281.49	736294.51	N 32 3 57.25 W	103 42 14.29
	6300.00	0.00	125.00	6290.80	-109.62	-124.98	178.50	0.00	388281.49	736294.51	N 32 3 57.25 W	103 42 14.29
	6400.00	0.00	125.00	6390.80	-109.62	-124.98	178.50	0.00	388281.49	736294.51	N 32 3 57.25 W	103 42 14.29
	6500.00	0.00	125.00	6490.80	-109.62	-124.98	178.50	0.00	388281.49	736294.51	N 32 3 57.25 W	103 42 14.29
	6600.00	0.00	125.00	6590.80	-109.62	-124.98	178.50	0.00	388281.49	736294.51	N 32 3 57.25 W	103 42 14.29
	6700.00	0.00	125.00	6690.80	-109.62	-124.98	178.50	0.00	388281.49	736294.51	N 32 3 57.25 W	103 42 14.29
	6800.00	0.00	125.00	6790.80	-109.62	-124.98	178.50	0.00	388281.49	736294.51	N 32 3 57.25 W	103 42 14.29
	6900.00	0.00	125.00	6890.80	-109.62	-124.98	178.50	0.00	388281.49	736294.51	N 32 3 57.25 W	103 42 14.29
	7000.00	0.00	125.00	6990.80	-109.62	-124.98	178.50	0.00	388281.49	736294.51	N 32 3 57.25 W	103 42 14.29
	7100.00	0.00	125.00	7090.80	-109.62	-124.98	178.50	0.00	388281.49	736294.51	N 32 3 57.25 W	103 42 14.29
	7200.00	0.00	125.00	7190.80	-109.62	-124.98	178.50	0.00	388281.49	736294.51	N 32 3 57.25 W	103 42 14.29
	7300.00	0.00	125.00	7290.80	-109.62	-124.98	178.50	0.00	388281.49	736294.51	N 32 3 57.25 W	103 42 14.29
	7400.00	0.00	125.00	7390.80	-109.62	-124.98	178.50	0.00	388281.49	736294.51	N 32 3 57.25 W	103 42 14.29
	7500.00	0.00	125.00	7490.80	-109.62	-124.98	178.50	0.00	388281.49	736294.51	N 32 3 57.25 W	103 42 14.29
	7600.00	0.00	125.00	7590.80	-109.62	-124.98	178.50	0.00	388281.49	736294.51	N 32 3 57.25 W	103 42 14.29
	7700.00	0.00	125.00	7690.80	-109.62	-124.98	178.50	0.00	388281.49	736294.51	N 32 3 57.25 W	103 42 14.29
	7800.00	0.00	125.00	7790.80	-109.62	-124.98	178.50	0.00	388281.49	736294.51	N 32 3 57.25 W	103 42 14.29
	7900.00	0.00	125.00	7890.80	-109.62	-124.98	178.50	0.00	388281.49	736294.51	N 32 3 57.25 W	103 42 14.29
	8000.00	0.00	125.00	7990.80	-109.62	-124.98	178.50	0.00	388281.49	736294.51	N 32 3 57.25 W	103 42 14.29

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' '')	Longitude (E/W ° ' '')
	8100.00	0.00	125.00	8090.80	-109.62	-124.98	178.50	0.00	388281.49	736294.51	N 32	3 57.25 W 103 42 14.29
	8200.00	0.00	125.00	8190.80	-109.62	-124.98	178.50	0.00	388281.49	736294.51	N 32	3 57.25 W 103 42 14.29
	8300.00	0.00	125.00	8290.80	-109.62	-124.98	178.50	0.00	388281.49	736294.51	N 32	3 57.25 W 103 42 14.29
	8400.00	0.00	125.00	8390.80	-109.62	-124.98	178.50	0.00	388281.49	736294.51	N 32	3 57.25 W 103 42 14.29
	8500.00	0.00	125.00	8490.80	-109.62	-124.98	178.50	0.00	388281.49	736294.51	N 32	3 57.25 W 103 42 14.29
	8600.00	0.00	125.00	8590.80	-109.62	-124.98	178.50	0.00	388281.49	736294.51	N 32	3 57.25 W 103 42 14.29
	8700.00	0.00	125.00	8690.80	-109.62	-124.98	178.50	0.00	388281.49	736294.51	N 32	3 57.25 W 103 42 14.29
	8800.00	0.00	125.00	8790.80	-109.62	-124.98	178.50	0.00	388281.49	736294.51	N 32	3 57.25 W 103 42 14.29
	8900.00	0.00	125.00	8890.80	-109.62	-124.98	178.50	0.00	388281.49	736294.51	N 32	3 57.25 W 103 42 14.29
	9000.00	0.00	125.00	8990.80	-109.62	-124.98	178.50	0.00	388281.49	736294.51	N 32	3 57.25 W 103 42 14.29
	9100.00	0.00	125.00	9090.80	-109.62	-124.98	178.50	0.00	388281.49	736294.51	N 32	3 57.25 W 103 42 14.29
	9200.00	0.00	125.00	9190.80	-109.62	-124.98	178.50	0.00	388281.49	736294.51	N 32	3 57.25 W 103 42 14.29
	9300.00	0.00	125.00	9290.80	-109.62	-124.98	178.50	0.00	388281.49	736294.51	N 32	3 57.25 W 103 42 14.29
	9400.00	0.00	125.00	9390.80	-109.62	-124.98	178.50	0.00	388281.49	736294.51	N 32	3 57.25 W 103 42 14.29
	9500.00	0.00	125.00	9490.80	-109.62	-124.98	178.50	0.00	388281.49	736294.51	N 32	3 57.25 W 103 42 14.29
	9600.00	0.00	125.00	9590.80	-109.62	-124.98	178.50	0.00	388281.49	736294.51	N 32	3 57.25 W 103 42 14.29
	9700.00	0.00	125.00	9690.80	-109.62	-124.98	178.50	0.00	388281.49	736294.51	N 32	3 57.25 W 103 42 14.29
	9800.00	0.00	125.00	9790.80	-109.62	-124.98	178.50	0.00	388281.49	736294.51	N 32	3 57.25 W 103 42 14.29
	9900.00	0.00	125.00	9890.80	-109.62	-124.98	178.50	0.00	388281.49	736294.51	N 32	3 57.25 W 103 42 14.29
	10000.00	0.00	125.00	9990.80	-109.62	-124.98	178.50	0.00	388281.49	736294.51	N 32	3 57.25 W 103 42 14.29
	10100.00	0.00	125.00	10090.80	-109.62	-124.98	178.50	0.00	388281.49	736294.51	N 32	3 57.25 W 103 42 14.29
	10200.00	0.00	125.00	10190.80	-109.62	-124.98	178.50	0.00	388281.49	736294.51	N 32	3 57.25 W 103 42 14.29
	10300.00	0.00	125.00	10290.80	-109.62	-124.98	178.50	0.00	388281.49	736294.51	N 32	3 57.25 W 103 42 14.29
	10400.00	0.00	125.00	10390.80	-109.62	-124.98	178.50	0.00	388281.49	736294.51	N 32	3 57.25 W 103 42 14.29
	10500.00	0.00	125.00	10490.80	-109.62	-124.98	178.50	0.00	388281.49	736294.51	N 32	3 57.25 W 103 42 14.29
	10600.00	0.00	125.00	10590.80	-109.62	-124.98	178.50	0.00	388281.49	736294.51	N 32	3 57.25 W 103 42 14.29
	10700.00	0.00	125.00	10690.80	-109.62	-124.98	178.50	0.00	388281.49	736294.51	N 32	3 57.25 W 103 42 14.29
	10800.00	0.00	125.00	10790.80	-109.62	-124.98	178.50	0.00	388281.49	736294.51	N 32	3 57.25 W 103 42 14.29
	10900.00	0.00	125.00	10890.80	-109.62	-124.98	178.50	0.00	388281.49	736294.51	N 32	3 57.25 W 103 42 14.29
	11000.00	0.00	125.00	10990.80	-109.62	-124.98	178.50	0.00	388281.49	736294.51	N 32	3 57.25 W 103 42 14.29
	11100.00	0.00	125.00	11090.80	-109.62	-124.98	178.50	0.00	388281.49	736294.51	N 32	3 57.25 W 103 42 14.29
	11200.00	0.00	125.00	11190.80	-109.62	-124.98	178.50	0.00	388281.49	736294.51	N 32	3 57.25 W 103 42 14.29
	11300.00	0.00	125.00	11290.80	-109.62	-124.98	178.50	0.00	388281.49	736294.51	N 32	3 57.25 W 103 42 14.29
Build @ 12°/100' DLS	11367.50	0.00	125.00	11358.30	-109.62	-124.98	178.50	0.00	388281.49	736294.51	N 32	3 57.25 W 103 42 14.29
	11400.00	3.90	20.90	11390.78	-108.55	-123.95	178.89	12.00	388282.52	736294.90	N 32	3 57.26 W 103 42 14.29
	11500.00	15.90	20.90	11489.11	-92.07	-107.92	185.01	12.00	388298.56	736301.02	N 32	3 57.42 W 103 42 14.22
	11600.00	27.90	20.90	11581.72	-56.30	-73.14	198.29	12.00	388333.34	736314.30	N 32	3 57.76 W 103 42 14.06
	11700.00	39.90	20.90	11664.57	-2.81	-21.13	218.15	12.00	388385.34	736334.16	N 32	3 58.28 W 103 42 13.83
Top Wolfcamp	11727.29	43.18	20.90	11685.00	14.58	-4.22	224.61	12.00	388402.25	736340.62	N 32	3 58.44 W 103 42 13.75
	11800.00	51.90	20.90	11734.04	66.06	45.84	243.73	12.00	388452.30	736359.73	N 32	3 58.94 W 103 42 13.52
	11900.00	63.90	20.90	11787.08	147.30	124.83	273.89	12.00	388531.29	736389.90	N 32	3 59.72 W 103 42 13.17
Build & Turn @ 4°/100' DLS	11992.50	75.00	20.90	11819.50	230.39	205.62	304.74	12.00	388612.08	736420.75	N 32	4 0.51 W 103 42 12.80
	12000.00	75.17	20.64	11821.43	237.36	212.40	307.31	4.00	388618.86	736423.32	N 32	4 0.58 W 103 42 12.77
	12100.00	77.39	17.22	11845.15	331.54	304.27	338.81	4.00	388710.73	736454.81	N 32	4 1.49 W 103 42 12.40
Wolfcamp "A1" Shale	12177.98	79.16	14.60	11861.00	406.46	377.69	359.73	4.00	388784.14	736475.73	N 32	4 2.21 W 103 42 12.15
	12200.00	79.66	13.86	11865.05	427.81	398.67	365.05	4.00	388805.12	736481.05	N 32	4 2.42 W 103 42 12.09
	12300.00	81.97	10.55	11881.01	525.69	495.14	385.91	4.00	388901.59	736501.91	N 32	4 3.37 W 103 42 11.84
	12400.00	84.30	7.28	11892.96	624.69	593.21	401.28	4.00	388999.65	736517.28	N 32	4 4.34 W 103 42 11.66
	12500.00	86.65	4.03	11900.85	724.35	692.39	411.09	4.00	389098.83	736527.09	N 32	4 5.33 W 103 42 11.54
	12600.00	89.01	0.80	11904.64	824.17	792.21	415.29	4.00	389198.64	736531.29	N 32	4 6.31 W 103 42 11.48
Wolfcamp Up A1 Target Landing Point	12641.82	90.00	359.45	11905.00	865.85	834.03	415.38	4.00	389240.46	736531.38	N 32	4 6.73 W 103 42 11.48
	12700.00	90.00	359.45	11905.00	923.77	892.20	414.82	0.00	389298.63	736530.82	N 32	4 7.30 W 103 42 11.48
	12800.00	90.00	359.45	11905.00	1023.34	992.20	413.85	0.00	389398.62	736529.85	N 32	4 8.29 W 103 42 11.48
	12900.00	90.00	359.45	11905.00	1122.90	1092.19	412.88	0.00	389498.61	736528.88	N 32	4 9.28 W 103 42 11.49

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
	13000.00	90.00	359.45	11905.00	1222.47	1192.19	411.92	0.00	389598.60	736527.92	N 32 4 10.27 W	103 42 11.49
	13100.00	90.00	359.45	11905.00	1322.03	1292.19	410.95	0.00	389698.59	736526.95	N 32 4 11.26 W	103 42 11.50
	13200.00	90.00	359.45	11905.00	1421.60	1392.18	409.99	0.00	389798.58	736525.99	N 32 4 12.25 W	103 42 11.50
	13300.00	90.00	359.45	11905.00	1521.16	1492.18	409.02	0.00	389898.57	736525.02	N 32 4 13.24 W	103 42 11.51
	13400.00	90.00	359.45	11905.00	1620.72	1592.17	408.05	0.00	389998.56	736524.05	N 32 4 14.23 W	103 42 11.51
	13500.00	90.00	359.45	11905.00	1720.29	1692.17	407.09	0.00	390098.55	736523.09	N 32 4 15.22 W	103 42 11.51
	13600.00	90.00	359.45	11905.00	1819.85	1792.16	406.12	0.00	390198.54	736522.12	N 32 4 16.21 W	103 42 11.52
	13700.00	90.00	359.45	11905.00	1919.42	1892.16	405.16	0.00	390298.53	736521.16	N 32 4 17.20 W	103 42 11.52
	13800.00	90.00	359.45	11905.00	2018.98	1992.15	404.19	0.00	390398.52	736520.19	N 32 4 18.19 W	103 42 11.53
	13900.00	90.00	359.45	11905.00	2118.54	2092.15	403.22	0.00	390498.51	736519.22	N 32 4 19.18 W	103 42 11.53
	14000.00	90.00	359.45	11905.00	2218.11	2192.14	402.26	0.00	390598.50	736518.26	N 32 4 20.17 W	103 42 11.54
	14100.00	90.00	359.45	11905.00	2317.67	2292.14	401.29	0.00	390698.50	736517.29	N 32 4 21.16 W	103 42 11.54
	14200.00	90.00	359.45	11905.00	2417.24	2392.13	400.33	0.00	390798.49	736516.33	N 32 4 22.15 W	103 42 11.55
	14300.00	90.00	359.45	11905.00	2516.80	2492.13	399.36	0.00	390898.48	736515.36	N 32 4 23.13 W	103 42 11.55
	14400.00	90.00	359.45	11905.00	2616.36	2592.12	398.39	0.00	390998.47	736514.39	N 32 4 24.12 W	103 42 11.55
	14500.00	90.00	359.45	11905.00	2715.93	2692.12	397.43	0.00	391098.46	736513.43	N 32 4 25.11 W	103 42 11.56
	14600.00	90.00	359.45	11905.00	2815.49	2792.12	396.46	0.00	391198.45	736512.46	N 32 4 26.10 W	103 42 11.56
	14700.00	90.00	359.45	11905.00	2915.06	2892.11	395.50	0.00	391298.44	736511.50	N 32 4 27.09 W	103 42 11.57
	14800.00	90.00	359.45	11905.00	3014.62	2992.11	394.53	0.00	391398.43	736510.53	N 32 4 28.08 W	103 42 11.57
	14900.00	90.00	359.45	11905.00	3114.18	3092.10	393.56	0.00	391498.42	736509.56	N 32 4 29.07 W	103 42 11.58
	15000.00	90.00	359.45	11905.00	3213.75	3192.10	392.60	0.00	391598.41	736508.60	N 32 4 30.06 W	103 42 11.58
	15100.00	90.00	359.45	11905.00	3313.31	3292.09	391.63	0.00	391698.40	736507.63	N 32 4 31.05 W	103 42 11.59
	15200.00	90.00	359.45	11905.00	3412.88	3392.09	390.67	0.00	391798.39	736506.67	N 32 4 32.04 W	103 42 11.59
	15300.00	90.00	359.45	11905.00	3512.44	3492.08	389.70	0.00	391898.38	736505.70	N 32 4 33.03 W	103 42 11.59
	15400.00	90.00	359.45	11905.00	3612.01	3592.08	388.73	0.00	391998.37	736504.73	N 32 4 34.02 W	103 42 11.60
	15500.00	90.00	359.45	11905.00	3711.57	3692.07	387.77	0.00	392098.36	736503.77	N 32 4 35.01 W	103 42 11.60
	15600.00	90.00	359.45	11905.00	3811.13	3792.07	386.80	0.00	392198.35	736502.80	N 32 4 36.00 W	103 42 11.61
	15700.00	90.00	359.45	11905.00	3910.70	3892.06	385.84	0.00	392298.34	736501.84	N 32 4 36.99 W	103 42 11.61
	15800.00	90.00	359.45	11905.00	4010.26	3992.06	384.87	0.00	392398.33	736500.87	N 32 4 37.98 W	103 42 11.62
	15900.00	90.00	359.45	11905.00	4109.83	4092.05	383.90	0.00	392498.32	736499.90	N 32 4 38.97 W	103 42 11.62
	16000.00	90.00	359.45	11905.00	4209.39	4192.05	382.94	0.00	392598.31	736498.94	N 32 4 39.96 W	103 42 11.63
	16100.00	90.00	359.45	11905.00	4308.95	4292.05	381.97	0.00	392698.30	736497.97	N 32 4 40.95 W	103 42 11.63
	16200.00	90.00	359.45	11905.00	4408.52	4392.04	381.01	0.00	392798.29	736497.01	N 32 4 41.94 W	103 42 11.63
	16300.00	90.00	359.45	11905.00	4508.08	4492.04	380.04	0.00	392898.28	736496.04	N 32 4 42.93 W	103 42 11.64
Cimarex Hallertau 5 Federal #11H - PBHL [330' FNL, 820' FWL]	16331.84	90.00	359.45	11905.00	4539.79	4523.88	379.73	0.00	392930.12	736495.73	N 32 4 43.24 W	103 42 11.64

Survey Type: Non-Def Plan

Survey Error Model: ISCWSA Rev 0 *** 3-D 95.000% Confidence 2.7955 sigma
Survey Program:

Description	Part	MD From (ft)	MD To (ft)	EOU Freq (ft)	Hole Size (in)	Casing Diameter (in)	Expected Max Inclination (deg)	Survey Tool Type	Borehole / Survey
	1	0.000	19.800	1/100.000	30.000	30.000		NAL_MWD_PLUS_0.5_DEG- Depth Only	Original Borehole / Cimarex Hallertau 5 Federal #11H Rev2 RM 23Feb17
	1	19.800	16331.842	1/100.000	30.000	30.000		NAL_MWD_PLUS_0.5_DEG	Original Borehole / Cimarex Hallertau 5 Federal #11H Rev2