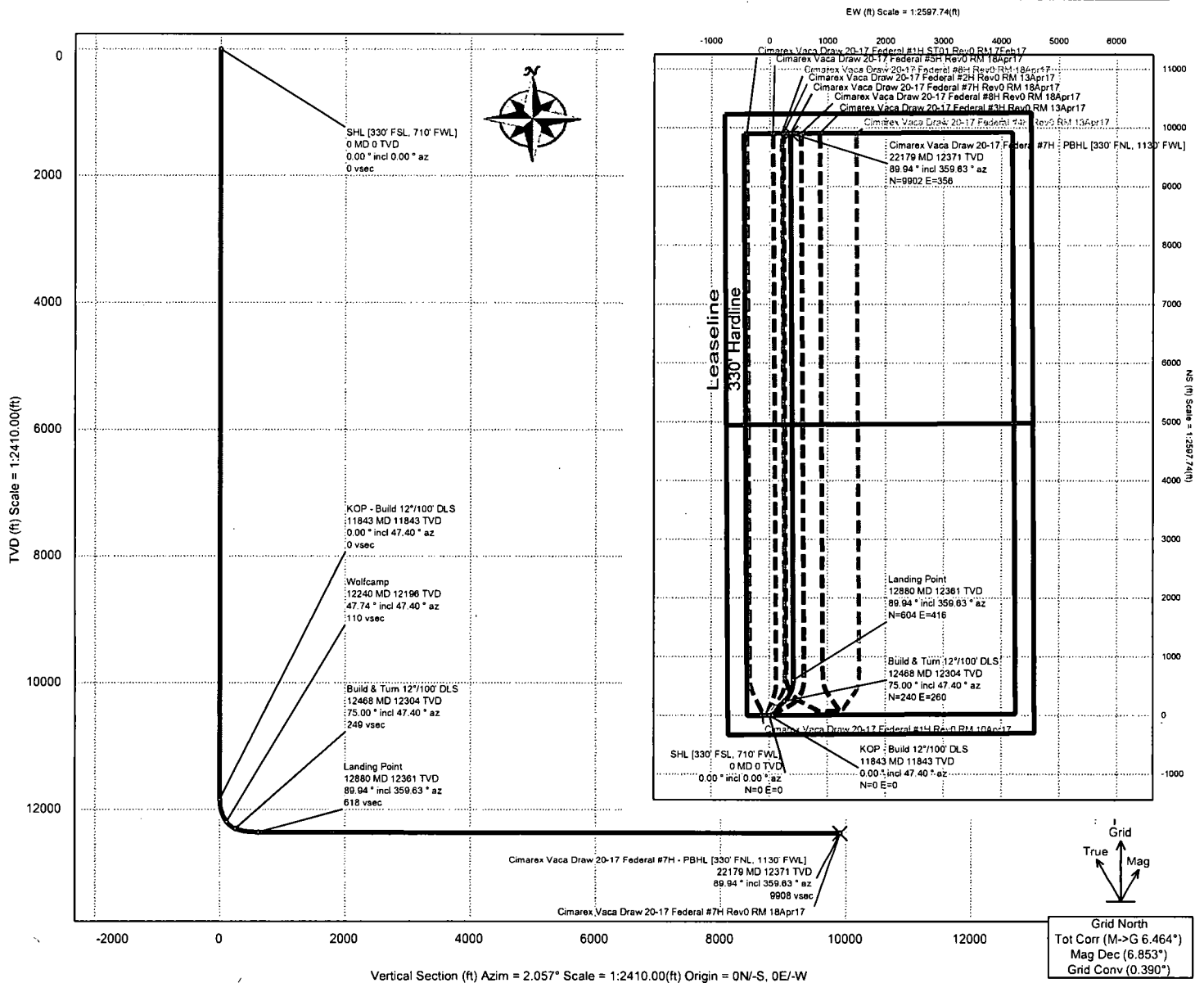


Borehole:	Well:	Field:	Structure:
Original Borehole	Cimarex Vaca Draw 20-17 Federal #7H	NM Lea County (NAD 83)	Cimarex Vaca Draw 20-17 Federal #7H

Gravity & Magnetic Parameters	Surface Location	NAD83 New Mexico State Plane, Eastern Zone, US Feet	Miscellaneous
Model: HDGM 2016 Dip: 59.837° Date: 18-Apr-2017	Lat: N 32 8 35.06 Northings: 404430.67NUS Grid Conv: 0.3895°	Slot: Cimarex Vaca Draw 20-17 TVD Ref: RKB(3445.8H above MSL)	Plan: Cimarex Vaca Draw 20-17 Federal #7H Rev0 RM 18Apr17
MagDec: 6.853° FS: 48915.69nT Gravity FS: 998.423mgm (9.80665 Based)	Lon: W 103.36 2.00 Eastings: 786221.66RUS Scale Fact: 0.98988605		



Critical Points

Critical Point	MD	INCL	AZIM	TVD	VSEC	N(+)/S(-)	E(+)/W(-)	DLS
SHL [330' FSL, 710' FWL]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
KOP - Build 12°/100' DLS	11842.60	0.00	47.40	11842.60	0.00	0.00	0.00	0.00
Wolfcamp	12240.47	47.74	47.40	12196.00	109.93	105.87	115.13	12.00
Build & Turn 12°/100' DLS	12467.60	75.00	47.40	12303.80	248.73	239.54	260.50	12.00
Landing Point	12880.07	89.94	359.63	12361.00	618.06	603.53	415.57	12.00
Cimarex Vaca Draw 20-17 Federal #7H - PBHL [330' FNL, 1130' FWL]	22178.74	89.94	359.63	12371.00	9908.39	9902.01	355.59	0.00

Cimarex Vaca Draw 20-17 Federal #7H Rev0 RM 18Apr17 Proposal

Geodetic Report

(Non-Def Plan)



Report Date:	April 18, 2017 - 03:56 PM	Survey / DLS Computation:	Minimum Curvature / Lubinski
Client:	Cimarex	Vertical Section Azimuth:	2.057 ° (Grid North)
Field:	NM Lea County (NAD 83)	Vertical Section Origin:	0.000 ft, 0.000 ft
Structure / Slot:	Cimarex Vaca Draw 20-17 Federal #7H / Cimarex Vaca Draw 20-17 Federal #7H	TVD Reference Datum:	RKB
Well:	Cimarex Vaca Draw 20-17 Federal #7H	TVD Reference Elevation:	3446.900 ft above MSL
Borehole:	Original Borehole	Seabed / Ground Elevation:	3422.900 ft above MSL
UWI / API#:	Unknown / Unknown	Magnetic Declination:	6.853 °
Survey Name:	Cimarex Vaca Draw 20-17 Federal #7H Rev0 RM 18Apr17	Total Gravity Field Strength:	998.4294mgn (9.80665 Based)
Survey Date:	April 18, 2017	Gravity Model:	GARM
Tort / AHD / DDI / ERD Ratio:	124.497 ° / 10059.830 ft / 6.351 / 0.813	Total Magnetic Field Strength:	48015.690 nT
Coordinate Reference System:	NAD83 New Mexico State Plane, Eastern Zone, US Feet	Magnetic Dip Angle:	59.837 °
Location Lat / Long:	N 32° 6' 35.06070", W 103° 36' 1.99689"	Declination Date:	April 18, 2017
Location Grid N/E Y/X:	N 404430.670 ftUS, E 768221.880 ftUS	Magnetic Declination Model:	HDGM 2016
CRS Grid Convergence Angle:	0.3895 °	North Reference:	Grid North
Grid Scale Factor:	0.99996805	Grid Convergence Used:	0.3895 °
Version / Patch:	2.10.254.0	Total Corr Mag North->Grid North:	6.4638 °
		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 [330' FSL, 710' FWL]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	404430.67	768221.88	N 32 6 35.06 W 103 36 2.00	
	100.00	0.00	47.40	100.00	0.00	0.00	0.00	0.00	404430.67	768221.88	N 32 6 35.06 W 103 36 2.00	
	200.00	0.00	47.40	200.00	0.00	0.00	0.00	0.00	404430.67	768221.88	N 32 6 35.06 W 103 36 2.00	
	300.00	0.00	47.40	300.00	0.00	0.00	0.00	0.00	404430.67	768221.88	N 32 6 35.06 W 103 36 2.00	
	400.00	0.00	47.40	400.00	0.00	0.00	0.00	0.00	404430.67	768221.88	N 32 6 35.06 W 103 36 2.00	
	500.00	0.00	47.40	500.00	0.00	0.00	0.00	0.00	404430.67	768221.88	N 32 6 35.06 W 103 36 2.00	
	600.00	0.00	47.40	600.00	0.00	0.00	0.00	0.00	404430.67	768221.88	N 32 6 35.06 W 103 36 2.00	
	700.00	0.00	47.40	700.00	0.00	0.00	0.00	0.00	404430.67	768221.88	N 32 6 35.06 W 103 36 2.00	
	800.00	0.00	47.40	800.00	0.00	0.00	0.00	0.00	404430.67	768221.88	N 32 6 35.06 W 103 36 2.00	
	900.00	0.00	47.40	900.00	0.00	0.00	0.00	0.00	404430.67	768221.88	N 32 6 35.06 W 103 36 2.00	
	1000.00	0.00	47.40	1000.00	0.00	0.00	0.00	0.00	404430.67	768221.88	N 32 6 35.06 W 103 36 2.00	
	1100.00	0.00	47.40	1100.00	0.00	0.00	0.00	0.00	404430.67	768221.88	N 32 6 35.06 W 103 36 2.00	
	1200.00	0.00	47.40	1200.00	0.00	0.00	0.00	0.00	404430.67	768221.88	N 32 6 35.06 W 103 36 2.00	
	1300.00	0.00	47.40	1300.00	0.00	0.00	0.00	0.00	404430.67	768221.88	N 32 6 35.06 W 103 36 2.00	
	1400.00	0.00	47.40	1400.00	0.00	0.00	0.00	0.00	404430.67	768221.88	N 32 6 35.06 W 103 36 2.00	
	1500.00	0.00	47.40	1500.00	0.00	0.00	0.00	0.00	404430.67	768221.88	N 32 6 35.06 W 103 36 2.00	
	1600.00	0.00	47.40	1600.00	0.00	0.00	0.00	0.00	404430.67	768221.88	N 32 6 35.06 W 103 36 2.00	
	1700.00	0.00	47.40	1700.00	0.00	0.00	0.00	0.00	404430.67	768221.88	N 32 6 35.06 W 103 36 2.00	
	1800.00	0.00	47.40	1800.00	0.00	0.00	0.00	0.00	404430.67	768221.88	N 32 6 35.06 W 103 36 2.00	
	1900.00	0.00	47.40	1900.00	0.00	0.00	0.00	0.00	404430.67	768221.88	N 32 6 35.06 W 103 36 2.00	
	2000.00	0.00	47.40	2000.00	0.00	0.00	0.00	0.00	404430.67	768221.88	N 32 6 35.06 W 103 36 2.00	
	2100.00	0.00	47.40	2100.00	0.00	0.00	0.00	0.00	404430.67	768221.88	N 32 6 35.06 W 103 36 2.00	
	2200.00	0.00	47.40	2200.00	0.00	0.00	0.00	0.00	404430.67	768221.88	N 32 6 35.06 W 103 36 2.00	
	2300.00	0.00	47.40	2300.00	0.00	0.00	0.00	0.00	404430.67	768221.88	N 32 6 35.06 W 103 36 2.00	
	2400.00	0.00	47.40	2400.00	0.00	0.00	0.00	0.00	404430.67	768221.88	N 32 6 35.06 W 103 36 2.00	
	2500.00	0.00	47.40	2500.00	0.00	0.00	0.00	0.00	404430.67	768221.88	N 32 6 35.06 W 103 36 2.00	

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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 ° ' ")
	8500.00	0.00	47.40	8500.00	0.00	0.00	0.00	0.00	404430.67	768221.88	N 32 6 35.06 W 103 36	2.00
	8600.00	0.00	47.40	8600.00	0.00	0.00	0.00	0.00	404430.67	768221.88	N 32 6 35.06 W 103 36	2.00
	8700.00	0.00	47.40	8700.00	0.00	0.00	0.00	0.00	404430.67	768221.88	N 32 6 35.06 W 103 36	2.00
	8800.00	0.00	47.40	8800.00	0.00	0.00	0.00	0.00	404430.67	768221.88	N 32 6 35.06 W 103 36	2.00
	8900.00	0.00	47.40	8900.00	0.00	0.00	0.00	0.00	404430.67	768221.88	N 32 6 35.06 W 103 36	2.00
	9000.00	0.00	47.40	9000.00	0.00	0.00	0.00	0.00	404430.67	768221.88	N 32 6 35.06 W 103 36	2.00
	9100.00	0.00	47.40	9100.00	0.00	0.00	0.00	0.00	404430.67	768221.88	N 32 6 35.06 W 103 36	2.00
	9200.00	0.00	47.40	9200.00	0.00	0.00	0.00	0.00	404430.67	768221.88	N 32 6 35.06 W 103 36	2.00
	9300.00	0.00	47.40	9300.00	0.00	0.00	0.00	0.00	404430.67	768221.88	N 32 6 35.06 W 103 36	2.00
	9400.00	0.00	47.40	9400.00	0.00	0.00	0.00	0.00	404430.67	768221.88	N 32 6 35.06 W 103 36	2.00
	9500.00	0.00	47.40	9500.00	0.00	0.00	0.00	0.00	404430.67	768221.88	N 32 6 35.06 W 103 36	2.00
	9600.00	0.00	47.40	9600.00	0.00	0.00	0.00	0.00	404430.67	768221.88	N 32 6 35.06 W 103 36	2.00
	9700.00	0.00	47.40	9700.00	0.00	0.00	0.00	0.00	404430.67	768221.88	N 32 6 35.06 W 103 36	2.00
	9800.00	0.00	47.40	9800.00	0.00	0.00	0.00	0.00	404430.67	768221.88	N 32 6 35.06 W 103 36	2.00
	9900.00	0.00	47.40	9900.00	0.00	0.00	0.00	0.00	404430.67	768221.88	N 32 6 35.06 W 103 36	2.00
	10000.00	0.00	47.40	10000.00	0.00	0.00	0.00	0.00	404430.67	768221.88	N 32 6 35.06 W 103 36	2.00
	10100.00	0.00	47.40	10100.00	0.00	0.00	0.00	0.00	404430.67	768221.88	N 32 6 35.06 W 103 36	2.00
	10200.00	0.00	47.40	10200.00	0.00	0.00	0.00	0.00	404430.67	768221.88	N 32 6 35.06 W 103 36	2.00
	10300.00	0.00	47.40	10300.00	0.00	0.00	0.00	0.00	404430.67	768221.88	N 32 6 35.06 W 103 36	2.00
	10400.00	0.00	47.40	10400.00	0.00	0.00	0.00	0.00	404430.67	768221.88	N 32 6 35.06 W 103 36	2.00
	10500.00	0.00	47.40	10500.00	0.00	0.00	0.00	0.00	404430.67	768221.88	N 32 6 35.06 W 103 36	2.00
	10600.00	0.00	47.40	10600.00	0.00	0.00	0.00	0.00	404430.67	768221.88	N 32 6 35.06 W 103 36	2.00
	10700.00	0.00	47.40	10700.00	0.00	0.00	0.00	0.00	404430.67	768221.88	N 32 6 35.06 W 103 36	2.00
	10800.00	0.00	47.40	10800.00	0.00	0.00	0.00	0.00	404430.67	768221.88	N 32 6 35.06 W 103 36	2.00
	10900.00	0.00	47.40	10900.00	0.00	0.00	0.00	0.00	404430.67	768221.88	N 32 6 35.06 W 103 36	2.00
	11000.00	0.00	47.40	11000.00	0.00	0.00	0.00	0.00	404430.67	768221.88	N 32 6 35.06 W 103 36	2.00
	11100.00	0.00	47.40	11100.00	0.00	0.00	0.00	0.00	404430.67	768221.88	N 32 6 35.06 W 103 36	2.00
	11200.00	0.00	47.40	11200.00	0.00	0.00	0.00	0.00	404430.67	768221.88	N 32 6 35.06 W 103 36	2.00
	11300.00	0.00	47.40	11300.00	0.00	0.00	0.00	0.00	404430.67	768221.88	N 32 6 35.06 W 103 36	2.00
	11400.00	0.00	47.40	11400.00	0.00	0.00	0.00	0.00	404430.67	768221.88	N 32 6 35.06 W 103 36	2.00
	11500.00	0.00	47.40	11500.00	0.00	0.00	0.00	0.00	404430.67	768221.88	N 32 6 35.06 W 103 36	2.00
	11600.00	0.00	47.40	11600.00	0.00	0.00	0.00	0.00	404430.67	768221.88	N 32 6 35.06 W 103 36	2.00
	11700.00	0.00	47.40	11700.00	0.00	0.00	0.00	0.00	404430.67	768221.88	N 32 6 35.06 W 103 36	2.00
	11800.00	0.00	47.40	11800.00	0.00	0.00	0.00	0.00	404430.67	768221.88	N 32 6 35.06 W 103 36	2.00
KOP - Build 12°/100' DLS	11842.60	0.00	47.40	11842.60	0.00	0.00	0.00	0.00	404430.67	768221.88	N 32 6 35.06 W 103 36	2.00
	11900.00	6.89	47.40	11899.86	2.42	2.33	2.54	12.00	404433.00	768224.42	N 32 6 35.08 W 103 36	1.97
	12000.00	18.89	47.40	11997.16	18.07	17.40	18.93	12.00	404448.07	768240.80	N 32 6 35.23 W 103 36	1.78
	12100.00	30.89	47.40	12087.71	47.60	45.84	49.85	12.00	404476.50	768271.73	N 32 6 35.51 W 103 36	1.41
	12200.00	42.89	47.40	12167.55	89.71	86.39	93.95	12.00	404517.06	768315.83	N 32 6 35.91 W 103 36	0.90
Wolfcamp	12240.47	47.74	47.40	12196.00	109.93	105.87	115.13	12.00	404536.53	768337.00	N 32 6 36.10 W 103 36	0.65
	12300.00	54.89	47.40	12233.18	142.57	137.30	149.31	12.00	404567.96	768371.18	N 32 6 36.41 W 103 36	0.25
	12400.00	66.89	47.40	12281.74	203.86	196.32	213.50	12.00	404626.99	768435.37	N 32 6 36.99 W 103 35	59.50
Build & Turn 12°/100' DLS	12467.60	75.00	47.40	12303.80	248.73	239.54	260.50	12.00	404670.20	768482.37	N 32 6 37.41 W 103 35	58.95
	12500.00	75.92	43.50	12311.93	271.52	261.54	282.84	12.00	404692.20	768504.71	N 32 6 37.63 W 103 35	58.69
	12600.00	79.12	31.65	12333.62	350.86	338.80	342.20	12.00	404769.46	768564.07	N 32 6 38.39 W 103 35	57.99
	12700.00	82.76	20.07	12349.42	441.06	427.51	385.14	12.00	404858.17	768607.01	N 32 6 39.27 W 103 35	57.49
	12800.00	86.69	8.68	12358.64	538.17	523.80	409.78	12.00	404954.45	768631.65	N 32 6 40.22 W 103 35	57.19
Landing Point	12880.07	89.94	359.63	12361.00	618.06	603.53	415.57	12.00	405034.18	768637.44	N 32 6 41.00 W 103 35	57.12
	12900.00	89.94	359.63	12361.02	637.97	623.46	415.44	0.00	405054.11	768637.31	N 32 6 41.20 W 103 35	57.12
	13000.00	89.94	359.63	12361.13	737.88	723.46	414.80	0.00	405154.10	768636.66	N 32 6 42.19 W 103 35	57.12
	13100.00	89.94	359.63	12361.23	837.79	823.46	414.15	0.00	405254.10	768636.02	N 32 6 43.18 W 103 35	57.12
	13200.00	89.94	359.63	12361.34	937.70	923.45	413.51	0.00	405354.09	768635.37	N 32 6 44.17 W 103 35	57.12
	13300.00	89.94	359.63	12361.45	1037.61	1023.45	412.86	0.00	405454.09	768634.73	N 32 6 45.16 W 103 35	57.12
	13400.00	89.94	359.63	12361.56	1137.52	1123.45	412.22	0.00	405554.08	768634.08	N 32 6 46.15 W 103 35	57.12
	13500.00	89.94	359.63	12361.66	1237.43	1223.45	411.57	0.00	405654.08	768633.44	N 32 6 47.14 W 103 35	57.12
	13600.00	89.94	359.63	12361.77	1337.34	1323.45	410.93	0.00	405754.07	768632.79	N 32 6 48.13 W 103 35	57.11
	13700.00	89.94	359.63	12361.88	1437.25	1423.44	410.28	0.00	405854.07	768632.15	N 32 6 49.12 W 103 35	57.11

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 ° ' '')
	13800.00	89.94	359.63	12361.99	1537.16	1523.44	409.64	0.00	405954.06	768631.50	N 32 6 50.11	W 103 35 57.11
	13900.00	89.94	359.63	12362.10	1637.07	1623.44	408.99	0.00	406054.05	768630.86	N 32 6 51.10	W 103 35 57.11
	14000.00	89.94	359.63	12362.20	1736.98	1723.44	408.35	0.00	406154.05	768630.21	N 32 6 52.09	W 103 35 57.11
	14100.00	89.94	359.63	12362.31	1836.89	1823.43	407.70	0.00	406254.04	768629.57	N 32 6 53.08	W 103 35 57.11
	14200.00	89.94	359.63	12362.42	1936.80	1923.43	407.06	0.00	406354.04	768628.92	N 32 6 54.07	W 103 35 57.11
	14300.00	89.94	359.63	12362.53	2036.71	2023.43	406.41	0.00	406454.03	768628.28	N 32 6 55.06	W 103 35 57.11
	14400.00	89.94	359.63	12362.63	2136.62	2123.43	405.77	0.00	406554.03	768627.63	N 32 6 56.04	W 103 35 57.11
	14500.00	89.94	359.63	12362.74	2236.53	2223.43	405.12	0.00	406654.02	768626.99	N 32 6 57.03	W 103 35 57.11
	14600.00	89.94	359.63	12362.85	2336.44	2323.42	404.48	0.00	406754.02	768626.34	N 32 6 58.02	W 103 35 57.11
	14700.00	89.94	359.63	12362.96	2436.35	2423.42	403.83	0.00	406854.01	768625.70	N 32 6 59.01	W 103 35 57.11
	14800.00	89.94	359.63	12363.06	2536.26	2523.42	403.19	0.00	406954.00	768625.05	N 32 7 0.00	W 103 35 57.11
	14900.00	89.94	359.63	12363.17	2636.17	2623.42	402.54	0.00	407054.00	768624.41	N 32 7 0.99	W 103 35 57.11
	15000.00	89.94	359.63	12363.28	2736.08	2723.42	401.90	0.00	407153.99	768623.76	N 32 7 1.98	W 103 35 57.11
	15100.00	89.94	359.63	12363.39	2835.99	2823.41	401.25	0.00	407253.99	768623.12	N 32 7 2.97	W 103 35 57.11
	15200.00	89.94	359.63	12363.49	2935.91	2923.41	400.61	0.00	407353.98	768622.47	N 32 7 3.96	W 103 35 57.11
	15300.00	89.94	359.63	12363.60	3035.82	3023.41	399.96	0.00	407453.98	768621.83	N 32 7 4.95	W 103 35 57.11
	15400.00	89.94	359.63	12363.71	3135.73	3123.41	399.32	0.00	407553.97	768621.18	N 32 7 5.94	W 103 35 57.11
	15500.00	89.94	359.63	12363.82	3235.64	3223.41	398.67	0.00	407653.97	768620.54	N 32 7 6.93	W 103 35 57.11
	15600.00	89.94	359.63	12363.92	3335.55	3323.40	398.03	0.00	407753.96	768619.89	N 32 7 7.92	W 103 35 57.11
	15700.00	89.94	359.63	12364.03	3435.46	3423.40	397.38	0.00	407853.95	768619.25	N 32 7 8.91	W 103 35 57.11
	15800.00	89.94	359.63	12364.14	3535.37	3523.40	396.74	0.00	407953.95	768618.60	N 32 7 9.90	W 103 35 57.11
	15900.00	89.94	359.63	12364.25	3635.28	3623.40	396.09	0.00	408053.94	768617.96	N 32 7 10.89	W 103 35 57.11
	16000.00	89.94	359.63	12364.35	3735.19	3723.39	395.45	0.00	408153.94	768617.31	N 32 7 11.88	W 103 35 57.10
	16100.00	89.94	359.63	12364.46	3835.10	3823.39	394.80	0.00	408253.93	768616.67	N 32 7 12.87	W 103 35 57.10
	16200.00	89.94	359.63	12364.57	3935.01	3923.39	394.16	0.00	408353.93	768616.02	N 32 7 13.86	W 103 35 57.10
	16300.00	89.94	359.63	12364.68	4034.92	4023.39	393.51	0.00	408453.92	768615.38	N 32 7 14.85	W 103 35 57.10
	16400.00	89.94	359.63	12364.78	4134.83	4123.39	392.87	0.00	408553.92	768614.73	N 32 7 15.84	W 103 35 57.10
	16500.00	89.94	359.63	12364.89	4234.74	4223.38	392.22	0.00	408653.91	768614.09	N 32 7 16.83	W 103 35 57.10
	16600.00	89.94	359.63	12365.00	4334.65	4323.38	391.58	0.00	408753.90	768613.44	N 32 7 17.81	W 103 35 57.10
	16700.00	89.94	359.63	12365.11	4434.56	4423.38	390.93	0.00	408853.90	768612.80	N 32 7 18.80	W 103 35 57.10
	16800.00	89.94	359.63	12365.21	4534.47	4523.38	390.29	0.00	408953.89	768612.15	N 32 7 19.79	W 103 35 57.10
	16900.00	89.94	359.63	12365.32	4634.38	4623.38	389.64	0.00	409053.89	768611.51	N 32 7 20.78	W 103 35 57.10
	17000.00	89.94	359.63	12365.43	4734.29	4723.37	389.00	0.00	409153.88	768610.86	N 32 7 21.77	W 103 35 57.10
	17100.00	89.94	359.63	12365.54	4834.20	4823.37	388.35	0.00	409253.88	768610.22	N 32 7 22.76	W 103 35 57.10
	17200.00	89.94	359.63	12365.64	4934.11	4923.37	387.71	0.00	409353.87	768609.57	N 32 7 23.75	W 103 35 57.10
	17300.00	89.94	359.63	12365.75	5034.02	5023.37	387.06	0.00	409453.87	768608.93	N 32 7 24.74	W 103 35 57.10
	17400.00	89.94	359.63	12365.86	5133.93	5123.36	386.42	0.00	409553.86	768608.28	N 32 7 25.73	W 103 35 57.10
	17500.00	89.94	359.63	12365.97	5233.84	5223.36	385.77	0.00	409653.85	768607.64	N 32 7 26.72	W 103 35 57.10
	17600.00	89.94	359.63	12366.07	5333.75	5323.36	385.13	0.00	409753.85	768606.99	N 32 7 27.71	W 103 35 57.10
	17700.00	89.94	359.63	12366.18	5433.66	5423.36	384.48	0.00	409853.84	768606.35	N 32 7 28.70	W 103 35 57.10
	17800.00	89.94	359.63	12366.29	5533.57	5523.36	383.84	0.00	409953.84	768605.70	N 32 7 29.69	W 103 35 57.10
	17900.00	89.94	359.63	12366.40	5633.48	5623.35	383.19	0.00	410053.83	768605.06	N 32 7 30.68	W 103 35 57.10
	18000.00	89.94	359.63	12366.51	5733.39	5723.35	382.55	0.00	410153.83	768604.41	N 32 7 31.67	W 103 35 57.10
	18100.00	89.94	359.63	12366.61	5833.30	5823.35	381.90	0.00	410253.82	768603.77	N 32 7 32.66	W 103 35 57.10
	18200.00	89.94	359.63	12366.72	5933.21	5923.35	381.26	0.00	410353.82	768603.12	N 32 7 33.65	W 103 35 57.10
	18300.00	89.94	359.63	12366.83	6033.12	6023.35	380.61	0.00	410453.81	768602.48	N 32 7 34.64	W 103 35 57.09
	18400.00	89.94	359.63	12366.94	6133.03	6123.34	379.97	0.00	410553.81	768601.83	N 32 7 35.63	W 103 35 57.09
	18500.00	89.94	359.63	12367.04	6232.94	6223.34	379.32	0.00	410653.80	768601.19	N 32 7 36.62	W 103 35 57.09
	18600.00	89.94	359.63	12367.15	6332.86	6323.34	378.68	0.00	410753.79	768600.54	N 32 7 37.61	W 103 35 57.09
	18700.00	89.94	359.63	12367.26	6432.77	6423.34	378.03	0.00	410853.79	768599.90	N 32 7 38.59	W 103 35 57.09
	18800.00	89.94	359.63	12367.37	6532.68	6523.33	377.39	0.00	410953.78	768599.25	N 32 7 39.58	W 103 35 57.09
	18900.00	89.94	359.63	12367.47	6632.59	6623.33	376.74	0.00	411053.78	768598.61	N 32 7 40.57	W 103 35 57.09
	19000.00	89.94	359.63	12367.58	6732.50	6723.33	376.10	0.00	411153.77	768597.96	N 32 7 41.56	W 103 35 57.09
	19100.00	89.94	359.63	12367.69	6832.41	6823.33	375.45	0.00	411253.77	768597.32	N 32 7 42.55	W 103 35 57.09
	19200.00	89.94	359.63	12367.80	6932.32	6923.33	374.81	0.00	411353.76	768596.67	N 32 7 43.54	W 103 35 57.09
	19300.00	89.94	359.63	12367.90	7032.23	7023.32	374.16	0.00	411453.76	768596.03	N 32 7 44.53	W 103 35 57.09
	19400.00	89.94	359.63	12368.01	7132.14	7123.32	373.52	0.00	411553.75	768595.38	N 32 7 45.52	W 103 35 57.09
	19500.00	89.94	359.63	12368.12	7232.05	7223.32	372.87	0.00	411653.74	768594.74	N 32 7 46.51	W 103 35 57.09
	19600.00	89.94	359.63	12368.23	7331.96	7323.32	372.23	0.00	411753.74	768594.09	N 32 7 47.50	W 103 35 57.09

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 ° ' '')
	19700.00	89.94	359.63	12368.33	7431.87	7423.32	371.58	0.00	411853.73	768593.45	N 32° 7' 48.49"	W 103° 35' 57.09"
	19800.00	89.94	359.63	12368.44	7531.78	7523.31	370.94	0.00	411953.73	768592.80	N 32° 7' 49.48"	W 103° 35' 57.09"
	19900.00	89.94	359.63	12368.55	7631.69	7623.31	370.29	0.00	412053.72	768592.16	N 32° 7' 50.47"	W 103° 35' 57.09"
	20000.00	89.94	359.63	12368.66	7731.60	7723.31	369.65	0.00	412153.72	768591.51	N 32° 7' 51.46"	W 103° 35' 57.09"
	20100.00	89.94	359.63	12368.76	7831.51	7823.31	369.00	0.00	412253.71	768590.87	N 32° 7' 52.45"	W 103° 35' 57.09"
	20200.00	89.94	359.63	12368.87	7931.42	7923.30	368.36	0.00	412353.71	768590.22	N 32° 7' 53.44"	W 103° 35' 57.09"
	20300.00	89.94	359.63	12368.98	8031.33	8023.30	367.71	0.00	412453.70	768589.58	N 32° 7' 54.43"	W 103° 35' 57.09"
	20400.00	89.94	359.63	12369.09	8131.24	8123.30	367.07	0.00	412553.69	768588.93	N 32° 7' 55.42"	W 103° 35' 57.09"
	20500.00	89.94	359.63	12369.19	8231.15	8223.30	366.42	0.00	412653.69	768588.29	N 32° 7' 56.41"	W 103° 35' 57.09"
	20600.00	89.94	359.63	12369.30	8331.06	8323.30	365.78	0.00	412753.68	768587.64	N 32° 7' 57.40"	W 103° 35' 57.09"
	20700.00	89.94	359.63	12369.41	8430.97	8423.29	365.13	0.00	412853.68	768587.00	N 32° 7' 58.39"	W 103° 35' 57.08"
	20800.00	89.94	359.63	12369.52	8530.88	8523.29	364.49	0.00	412953.67	768586.35	N 32° 7' 59.37"	W 103° 35' 57.08"
	20900.00	89.94	359.63	12369.62	8630.79	8623.29	363.84	0.00	413053.67	768585.71	N 32° 8' 0.36"	W 103° 35' 57.08"
	21000.00	89.94	359.63	12369.73	8730.70	8723.29	363.20	0.00	413153.66	768585.06	N 32° 8' 1.35"	W 103° 35' 57.08"
	21100.00	89.94	359.63	12369.84	8830.61	8823.29	362.55	0.00	413253.66	768584.42	N 32° 8' 2.34"	W 103° 35' 57.08"
	21200.00	89.94	359.63	12369.95	8930.52	8923.28	361.91	0.00	413353.65	768583.77	N 32° 8' 3.33"	W 103° 35' 57.08"
	21300.00	89.94	359.63	12370.05	9030.43	9023.28	361.26	0.00	413453.64	768583.13	N 32° 8' 4.32"	W 103° 35' 57.08"
	21400.00	89.94	359.63	12370.16	9130.34	9123.28	360.62	0.00	413553.64	768582.48	N 32° 8' 5.31"	W 103° 35' 57.08"
	21500.00	89.94	359.63	12370.27	9230.25	9223.28	359.97	0.00	413653.63	768581.84	N 32° 8' 6.30"	W 103° 35' 57.08"
	21600.00	89.94	359.63	12370.38	9330.16	9323.27	359.33	0.00	413753.63	768581.19	N 32° 8' 7.29"	W 103° 35' 57.08"
	21700.00	89.94	359.63	12370.49	9430.07	9423.27	358.68	0.00	413853.62	768580.55	N 32° 8' 8.28"	W 103° 35' 57.08"
	21800.00	89.94	359.63	12370.59	9529.98	9523.27	358.04	0.00	413953.62	768579.90	N 32° 8' 9.27"	W 103° 35' 57.08"
	21900.00	89.94	359.63	12370.70	9629.90	9623.27	357.39	0.00	414053.61	768579.26	N 32° 8' 10.26"	W 103° 35' 57.08"
	22000.00	89.94	359.63	12370.81	9729.81	9723.27	356.74	0.00	414153.61	768578.61	N 32° 8' 11.25"	W 103° 35' 57.08"
	22100.00	89.94	359.63	12370.92	9829.72	9823.26	356.10	0.00	414253.60	768577.97	N 32° 8' 12.24"	W 103° 35' 57.08"
Cimarex Vaca Draw 20-17 Federal #7H - PBHL [330' FNL, 1130' FWL]	22178.74	89.94	359.63	12371.00	9908.39	9902.01	355.59	0.00	414332.34	768577.46	N 32° 8' 13.02"	W 103° 35' 57.08"

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	24.000	1/100.000	30.000	30.000		NAL_MWD_PLUS_0.5_DEG- Depth Only	Original Borehole / Cimarex Vaca Draw 20-17 Federal #7H Rev0 RM 18Apr17
	1	24.000	22178.744	1/100.000	30.000	30.000		NAL_MWD_PLUS_0.5_DEG	Original Borehole / Cimarex Vaca Draw 20-17 Federal #7H Rev0