

UL Loveland 1920-17 7H MWD 0' to update Survey Report

(Non-Def Survey)

Report Date: October 07, 2018 - 12:51 AM	Survey / DLS Computation: Minimum Curvature / Lubinski
Client: Felix Energy	Vertical Section Azimuth: 161.808 ° (Grid North)
Field: TX Ward County (NAD 27)	Vertical Section Origin: 0.000 ft, 0.000 ft
Structure / Slot: Felix Energy (UL Loveland 1920-17 Pad) / UL Loveland 1920-17 7H	TVD Reference Datum: KB 25ft
Well: UL Loveland 1920-17 7H - Cactus 138	TVD Reference Elevation: 2670.000 ft above MSL
Borehole: Original Hole	Seabed / Ground Elevation: 2645.000 ft above MSL
UWI / API#: Unknown / Unknown	Magnetic Declination: 7.130 °
Survey Name: UL Loveland 1920-17 7H MWD 0' to update	Total Gravity Field Strength: 998.4900mgn (9.80665 Based)
Survey Date: July 05, 2018	Gravity Model: GARM
Tort / AHD / DDI / ERD Ratio: 275.080 ° / 11582.211 ft / 6.804 / 1.068	Total Magnetic Field Strength: 47513.157 nT
Coordinate Reference System: NAD27 Texas State Plane, Central Zone, US Feet	Magnetic Dip Angle: 59.492 °
Location Lat / Long: N 31° 33' 14.42162", W 103° 9' 42.55636"	Declination Date: August 10, 2018
Location Grid N/E Y/X: N 697609.720 ftUS, E 1119044.550 ftUS	Magnetic Declination Model: HDGM 2018
CRS Grid Convergence Angle: -1.4568 °	North Reference: Grid North
Grid Scale Factor: 0.99992812	Grid Convergence Used: -1.4568 °
Version / Patch: 2.10.254.0	Total Corr Mag North->Grid North: 8.5866 °
	Local Coord Referenced To: Well Head

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (NS ft)	EW (EW ft)	Closure (ft)	Closure Azimuth (°)	DLS (°/100ft)	TF (°)
Surface	0.00	0.00	0.00	0.00	0.00	N 0.00	E 0.00	0.00	0.00	N/A	0M
KB Adjustment	12.00	0.00	0.00	12.00	0.00	N 0.00	E 0.00	0.00	0.00	0.00	60.64M
Begin MWD Survey	142.00	0.70	60.64	142.00	-0.15	N 0.39	E 0.69	0.79	60.64	0.54	103.07M
	230.00	0.45	103.07	229.99	-0.08	N 0.57	E 1.50	1.60	69.00	0.54	69.11M
	317.00	0.25	69.11	316.99	0.09	N 0.57	E 2.01	2.09	74.28	0.32	119.27M
	401.00	0.73	119.27	400.99	0.48	N 0.37	E 2.65	2.67	82.06	0.72	145.43M
	486.00	0.78	145.43	485.98	1.43	S 0.37	E 3.45	3.47	96.17	0.41	186.64M
	577.00	1.05	186.64	576.97	2.78	S 1.71	E 3.70	4.08	114.80	0.76	159.74M
	692.00	2.21	159.74	691.92	5.95	S 4.84	E 4.35	6.50	138.06	1.18	159.11M
	777.00	2.43	159.11	776.85	9.39	S 8.06	E 5.56	9.79	145.41	0.26	170.5M
	869.00	2.30	170.50	868.78	13.16	S 11.70	E 6.56	13.41	150.73	0.53	168.52M
	948.00	1.59	168.52	947.73	15.82	S 14.34	E 7.04	15.97	153.86	0.90	156.73M
	1033.00	1.10	156.73	1032.71	17.80	S 16.24	E 7.59	17.93	154.94	0.66	128.13M
	1118.00	1.48	128.13	1117.69	19.53	S 17.67	E 8.78	19.73	153.58	0.87	116.67M
	1181.00	1.88	116.67	1180.66	20.94	S 18.64	E 10.34	21.32	150.97	0.83	120.18M
	1292.00	1.99	120.18	1291.59	23.66	S 20.42	E 13.64	24.56	146.27	0.15	106.92M
	1377.00	2.35	106.92	1376.53	25.77	S 21.67	E 16.58	27.29	142.58	0.72	102.47M
	1462.00	2.57	102.47	1461.46	27.74	S 22.59	E 20.11	30.24	138.33	0.34	94.56M
	1547.00	2.52	94.56	1546.37	29.43	S 23.15	E 23.83	33.23	134.17	0.42	91.92M
	1633.00	2.50	91.92	1632.29	30.81	S 23.36	E 27.59	36.15	130.26	0.14	88.41M
	1718.00	2.35	88.41	1717.21	31.95	S 23.38	E 31.18	38.97	126.86	0.25	94.35M
	1761.00	2.36	94.35	1760.18	32.54	S 23.42	E 32.95	40.42	125.41	0.57	96.99M
	1888.00	3.58	96.99	1887.00	35.23	S 24.10	E 39.49	46.27	121.40	0.97	93.42M
	1973.00	4.65	93.42	1971.78	37.62	S 24.63	E 45.57	51.80	118.39	1.29	91.82M
	2058.00	5.07	91.82	2056.48	40.18	S 24.96	E 52.76	58.36	115.31	0.52	93.83M
	2143.00	5.10	93.83	2141.14	42.88	S 25.33	E 60.28	65.39	112.79	0.21	90.26M
	2228.00	5.32	90.26	2225.79	45.55	S 25.60	E 67.99	72.65	110.63	0.46	90.23M
	2313.00	5.19	90.23	2310.44	48.01	S 25.63	E 75.78	79.99	108.69	0.15	90.36M
	2399.00	5.13	90.36	2396.09	50.46	S 25.67	E 83.51	87.37	107.09	0.07	92.77M
	2484.00	5.29	92.77	2480.74	53.07	S 25.88	E 91.23	94.83	105.84	0.32	93.57M
	2570.00	5.24	93.57	2566.37	55.94	S 26.32	E 99.11	102.54	104.87	0.10	94.79M
	2655.00	4.92	94.79	2651.04	58.81	S 26.87	E 106.61	109.94	104.14	0.40	95.48M
	2741.00	4.92	95.48	2736.72	61.73	S 27.53	E 113.96	117.23	103.58	0.07	94.33M
	2826.00	4.77	94.33	2821.42	64.54	S 28.14	E 121.11	124.34	103.08	0.21	94.77M
	2912.00	4.51	94.77	2907.14	67.23	S 28.69	E 128.04	131.22	102.63	0.31	93.49M
	2998.00	4.49	93.49	2992.87	69.80	S 29.18	E 134.77	137.90	102.22	0.12	93.72M
	3083.00	4.83	93.72	3077.59	72.36	S 29.61	E 141.67	144.73	101.81	0.40	93M
	3169.00	4.80	93.00	3163.29	75.01	S 30.04	E 148.87	151.87	101.41	0.08	93.75M
	3254.00	4.70	93.75	3248.00	77.60	S 30.45	E 155.90	158.84	101.05	0.14	94.56M
	3339.00	4.70	94.56	3332.71	80.25	S 30.95	E 162.84	165.76	100.76	0.08	90.95M
	3424.00	4.56	90.95	3417.43	82.70	S 31.29	E 169.69	172.55	100.45	0.38	89.77M
	3510.00	4.26	89.77	3503.18	84.81	S 31.33	E 176.31	179.07	100.08	0.36	92.64M
	3596.00	4.16	92.64	3588.95	86.90	S 31.46	E 182.62	185.31	99.78	0.27	92.92M
	3681.00	4.18	92.92	3673.72	89.11	S 31.76	E 188.79	191.44	99.55	0.03	93.96M
	3766.00	4.87	93.96	3758.46	91.59	S 32.17	E 195.48	198.11	99.34	0.82	92.57M
	3852.00	4.97	92.57	3844.14	94.29	S 32.59	E 202.85	205.45	99.13	0.18	92.05M
	3940.00	4.74	92.05	3931.82	96.90	S 32.89	E 210.29	212.85	98.89	0.27	89.27M
	4025.00	4.85	89.27	4016.53	99.19	S 32.97	E 217.39	219.88	98.62	0.30	84.09M
	4113.00	4.78	84.09	4104.22	101.09	S 32.54	E 224.76	227.10	98.24	0.50	89.6M
	4198.00	5.41	89.60	4188.88	103.06	S 32.15	E 232.29	234.50	97.88	0.94	87.78M
	4283.00	5.82	87.78	4273.47	105.47	S 31.96	E 240.60	242.71	97.57	0.53	94.62M
	4369.00	5.57	94.62	4359.05	108.29	S 32.12	E 249.12	251.18	97.35	0.84	94.26M
	4453.00	5.60	94.26	4442.65	111.44	S 32.76	E 257.27	259.35	97.26	0.05	97.63M
	4539.00	6.22	97.63	4528.19	115.07	S 33.69	E 266.07	268.20	97.22	0.83	99.99M
	4624.00	5.98	99.99	4612.71	119.17	S 35.07	E 275.00	277.22	97.27	0.41	99.94M
	4709.00	5.66	99.94	4697.27	123.23	S 36.56	E 283.49	285.83	97.35	0.38	100.51M
	4794.00	5.47									

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (N/S ft)	EW (E/W ft)	Closure (ft)	Closure Azimuth (°)	DLS (°/100ft)	TF (°)
	5873.00	4.41	100.08	5856.99	172.92	S 56.89	E 380.78	385.00	98.50	0.50	95.81M
	5968.00	4.25	95.61	5951.72	176.07	S 57.87	E 387.88	392.17	98.49	0.39	93.58M
	6064.00	4.00	93.58	6047.47	178.75	S 58.43	E 394.76	399.06	98.42	0.30	95.72M
	6159.00	2.98	95.72	6142.29	180.98	S 58.88	E 400.52	404.83	98.36	1.08	92.2M
	6253.00	2.25	92.20	6236.19	182.62	S 59.20	E 404.80	409.10	98.32	0.79	66.33M
	6348.00	0.41	66.33	6331.17	183.23	S 59.13	E 406.97	411.25	98.27	1.99	354.35M
	6442.00	0.39	354.35	6425.16	182.89	S 58.68	E 407.25	411.46	98.20	0.50	338.52M
	6536.00	0.52	338.52	6519.16	182.15	S 57.96	E 407.06	411.17	98.10	0.19	334.5M
	6631.00	0.58	334.50	6614.16	181.24	S 57.13	E 406.70	410.69	98.00	0.08	328.92M
	6725.00	0.66	328.92	6708.15	180.24	S 56.23	E 406.21	410.09	97.88	0.11	328.76M
	6820.00	0.53	328.76	6803.15	179.28	S 55.39	E 405.70	409.47	97.77	0.14	335.21M
	6915.00	0.53	335.21	6898.14	178.42	S 54.62	E 405.29	408.95	97.67	0.06	330.82M
	7010.00	0.63	330.82	6993.14	177.47	S 53.76	E 404.85	408.41	97.56	0.12	326.47M
	7106.00	0.56	326.47	7089.13	176.50	S 52.91	E 404.34	407.78	97.45	0.09	334.03M
	7200.00	0.75	334.03	7183.13	175.45	S 51.97	E 403.81	407.14	97.33	0.22	356.53M
	7295.00	0.91	356.53	7278.12	174.10	S 50.66	E 403.49	406.66	97.16	0.38	57.21M
	7389.00	0.68	57.21	7372.11	173.24	S 49.61	E 403.92	406.95	97.00	0.88	91.69M
	7484.00	0.75	91.69	7467.10	173.31	S 49.33	E 405.01	408.01	96.94	0.45	61.21M
	7580.00	1.13	61.21	7563.09	173.35	S 48.89	E 406.47	409.40	96.86	0.64	60.85M
	7674.00	1.44	60.85	7657.06	172.95	S 47.87	E 408.32	411.11	96.69	0.33	97.61M
	7769.00	0.68	97.61	7752.05	172.97	S 47.36	E 409.92	412.64	96.59	1.04	127.5M
	7864.00	0.56	127.50	7847.04	173.60	S 47.72	E 410.84	413.61	96.62	0.36	124.66M
	7959.00	0.29	124.66	7942.04	174.17	S 48.14	E 411.41	414.22	96.67	0.28	65.34M
	8054.00	0.50	65.34	8037.04	174.32	S 48.10	E 411.98	414.78	96.66	0.45	40.74M
	8149.00	0.80	40.74	8132.03	173.93	S 47.43	E 412.79	415.51	96.55	0.42	232.6M
	8243.00	0.68	232.60	8226.03	173.77	S 47.27	E 412.78	415.48	96.53	1.57	204.73M
	8338.00	1.47	204.73	8321.01	174.85	S 48.72	E 411.82	414.69	96.75	0.97	213.77M
	8433.00	1.94	213.77	8415.97	176.74	S 51.16	E 410.42	413.59	97.11	0.57	226.21M
	8527.00	2.47	226.21	8509.90	178.59	S 53.88	E 408.07	411.61	97.52	0.76	180.82M
	8622.00	1.47	180.82	8604.85	180.63	S 56.52	E 406.58	410.49	97.91	1.87	114.53M
	8717.00	2.31	114.53	8699.81	183.08	S 58.53	E 408.30	412.47	98.16	2.30	95.78M
	8812.00	1.99	95.78	8794.74	185.05	S 59.49	E 411.68	415.96	98.22	0.81	83.42M
	8907.00	2.11	83.42	8889.68	186.07	S 59.46	E 415.06	419.30	98.15	0.48	80.42M
	9002.00	1.56	80.42	8984.63	186.62	S 59.04	E 418.07	422.22	98.04	0.59	72.18M
	9097.00	2.73	72.18	9079.56	186.82	S 58.14	E 421.50	425.49	97.85	1.27	33.81M
	9192.00	1.24	33.81	9174.51	186.21	S 56.59	E 424.23	427.99	97.60	2.02	224.46M
	9286.00	0.40	224.46	9268.50	185.73	S 55.98	E 424.57	428.24	97.51	1.74	217M
	9381.00	0.85	217.00	9363.50	186.29	S 56.78	E 423.91	427.69	97.63	0.48	197.04M
	9476.00	1.14	197.04	9458.48	187.46	S 58.24	E 423.21	427.20	97.84	0.47	190.76M
	9572.00	1.80	190.76	9554.45	189.56	S 60.64	E 422.65	426.97	98.16	0.71	194.31M
	9667.00	2.30	194.31	9649.39	192.47	S 63.95	E 421.90	426.72	98.62	0.54	189.25M
	9762.00	2.41	189.25	9744.31	195.85	S 67.77	E 421.10	426.52	99.14	0.25	166.59M
	9858.00	1.91	166.59	9840.24	199.24	S 71.32	E 421.15	427.15	99.61	1.02	177.85M
	9953.00	2.82	177.85	9935.16	203.06	S 75.19	E 421.61	428.26	100.11	1.07	167.91M
	10048.00	2.99	167.91	10030.04	207.77	S 79.95	E 422.21	429.72	100.72	0.56	195.04M
	10143.00	2.40	195.04	10124.94	211.90	S 84.30	E 422.22	430.55	101.29	1.46	220.46M
	10212.00	2.64	220.46	10193.87	213.93	S 86.90	E 420.81	429.69	101.67	1.64	226.72M
	10300.00	2.97	226.72	10281.77	215.95	S 90.01	E 417.83	427.42	102.16	0.51	192.93M
	10396.00	6.98	192.93	10377.40	222.01	S 97.40	E 414.72	426.00	103.22	5.00	172.34M
	10443.00	11.65	172.34	10423.78	229.12	S 104.89	E 414.71	427.77	104.19	12.06	27.52L
	10490.00	17.76	162.32	10469.23	240.97	S 116.44	E 417.52	433.46	105.58	14.04	11.08L
	10538.00	23.31	159.59	10514.16	257.79	S 132.33	E 423.06	443.27	107.37	11.73	12.07L
	10585.00	26.80	157.94	10556.73	277.66	S 150.87	E 430.29	455.97	109.32	7.57	19.41R
	10633.00	34.46	162.64	10598.01	302.08	S 173.90	E 438.42	471.65	111.64	16.71	4.47R
	10680.00	40.83	163.40	10635.21	330.76	S 201.34	E 446.78	490.05	114.26	13.59	13.43R
	10728.00	46.88	165.37	10669.81	363.96	S 233.36	E 455.70	511.97	117.12	12.92	8.15L
	10776.00	52.61	164.34	10700.81	400.53	S 268.70	E 465.28	537.29	120.01	12.05	42.05L
	10824.00	55.26	161.47	10729.07	439.31	S 305.77	E 476.70	566.34	122.68	7.34	6.03R
	10872.00	62.05	162.28	10754.02	480.28	S 344.71	E 489.43	598.64	125.16	14.22	11.23R
	10920.00	68.64	163.68	10774.04	523.87	S 386.40	E 502.18	633.64	127.58	13.98	9.81L
	10967.00	72.90	162.91	10789.51	568.22	S 428.90	E 514.94	670.16	129.79	9.19	14.66L
	11015.00	76.89	161.84	10802.02	614.55	S 473.05	E 528.97	709.64	131.81	8.59	1.42R
	11062.00	82.10	161.97	10810.59	660.75	S 516.97	E 543.32	749.96	133.58	11.09	3.1R
	11110.00	87.45	162.26	10814.96	708.53	S 562.44	E 557.99	792.27	135.23	11.16	13.1R
	11157.00	91.62	163.23	10815.34	755.51	S 607.31	E 571.93	834.23	136.72	9.11	1.9L
	11185.00	94.33	163.14	10813.88	783.46	S 634.08	E 580.02	859.34	137.55	9.68	119.02L
	11231.00	93.27	161.23	10810.83	829.36	S 677.77	E 594.06	901.27	138.77	4.74	170.06L
	11327.00	89.96	160.65	10808.13	925.30	S 768.46	E 625.39	990.78	140.86	3.50	101.01R
	11423.00	89.34	163.84	10808.72	1021.28	S 859.87	E 654.66	1080.72	142.72	3.39	54.47R
	11518.00	90.14	164.96	10809.15	1116.18	S 951.37	E 680.21	1169.53	144.44	1.45	154.51L
	11610.00	89.28	164.55	10809.61	1208.06	S 1040.13	E 704.40	1256.21	145.89	1.04	6.65R
	11702.00	90.31	164.67	10809.94	1299.94	S 1128.83	E 728.82	1343.66	147.15	1.13	7.35R
	11794.00	91.24	164.79	10808.70	1391.81	S 1217.57	E 753.04	1431.63	148.26	1.02	127.78L
	11885.00	90.93	164.39	10806.97	1482.69	S 1305.29	E 777.22	1519.16	149.23	0.56	38.88R
	11977.00	91.24	164.64	10805.23	1574.57	S 1393.93	E 801.78	1608.07	150.09	0.43	96.01L
	12069.00	91.20	164.26	10803.27	1666.45	S 1482.54	E 826.44	1697.33	150.86	0.42	174.96L
	12161.00	90.86	164.23	10801.62	1758.35	S 1571.07	E 851.41	1786.94	151.55	0.37	159.15R
	12252.00	90.44	164.39	10800.59	1849.26	S 1658.67	E 876.02	1875.80	152.16	0.49	132.27L
	12344.00	90.24	164.17	10800.04	1941.17	S 1747.23	E 900.94	1965.84	152.72	0.32	32.9R
	12436.00	90.75	164.50	10799.25	2033.08	S 1835.81	E 925.78	2056.03	153.24	0.66	125.39L
	12529.00	90.48	164.12	10798.25	2125.99	S 1925.34	E 950.93	2147.37	153.72	0.50	79.37L
	12620.00	90.72	162.84	10797.30	2216.94	S 2012.58	E 976.81	2237.10	154.11	1.43	127.43L
	12804.00	89.48	161.22	10796.97	2400.93	S 2187.59	E 1033.57	2419.47	154.71	1.11	LS
	12896.00	89.03	161.22	10798.17	2492.92	S 2274.69	E 1063.19	2510.89	154.95	0.49	28.83R
	12988.00	90.72	162.15	10798.37	2584.91	S 2362.02	E 1092.10	2602.27	155.19	2.10	90R
	13080.00	90.72	162.25	10797.22	2676.90	S 2449.61	E 1120.22	2693.60	155.43	0.11	154.54R
	13175.00	90.51	162.35	10796.20	2771.89	S 2540.11	E 1149.10	2787.93	155.66	0.24	4.51R
	13270.00	90.89	162.38	10795.03	2866.88	S 2630.64	E 1177.88	2882.30	155.88	0.40	55R
	13366.00	90.96	162.48	10793.49	2962.86	S 2722.15	E 1206.85	2977.68	156.09	0.13	156.3L
	13461.00	90.14	162.12	10792.57	3057.85	S 2812.64	E 1235.73	3072.13	156.28	0.94	124.51R
	13557.00	90.03	162.28	10792.43	3153.85	S 2904.05	E 1265.08	3167.64	156.46	0.20	139.48R
	13652.00	89.41	162.81	10792.89	3248.84	S 2994.67	E 1293.58	3262.12	156.64	0.86	139.4R
	13748.00	89.27	162.93	10794.00	3344.82	S 3086.41	E 1321.85	335			

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (N/S ft)	EW (E/W ft)	Closure (ft)	Closure Azimuth (°)	DLS (°/100ft)	TF (°)
	14511.00	89.10	164.21	10803.17	4106.96	S 3820.39	E 1529.54	4115.20	158.18	0.66	63.44R
	14606.00	89.41	164.83	10804.41	4201.84	S 3911.94	E 1554.89	4209.62	158.32	0.73	145.34L
	14702.00	87.69	163.64	10806.84	4297.72	S 4004.29	E 1580.96	4305.09	158.46	2.18	28.82R
	14798.00	89.69	164.74	10809.03	4393.60	S 4096.63	E 1607.11	4400.59	158.58	2.38	124.99L
	14894.00	89.34	164.24	10809.84	4489.49	S 4189.13	E 1632.78	4496.08	158.71	0.64	22.99R
	14989.00	90.00	164.52	10810.39	4584.40	S 4280.62	E 1658.36	4590.63	158.82	0.75	178.64L
	15085.00	89.58	164.51	10810.74	4680.29	S 4373.13	E 1683.99	4686.16	158.94	0.44	95.36L
	15180.00	89.52	163.87	10811.49	4775.20	S 4464.54	E 1709.87	4780.77	159.04	0.68	125.3L
	15276.00	87.11	160.46	10814.31	4871.14	S 4555.86	E 1739.25	4876.56	159.11	4.35	61.04R
	15371.00	89.14	164.12	10817.42	4966.06	S 4646.29	E 1768.13	4971.35	159.17	4.40	HS
	15467.00	90.65	164.12	10817.60	5061.98	S 4738.63	E 1794.39	5066.99	159.26	1.57	135R
	15562.00	90.48	164.29	10816.66	5156.89	S 4830.03	E 1820.25	5161.64	159.35	0.25	166.15R
	15658.00	89.75	164.47	10816.47	5252.80	S 4922.49	E 1846.10	5257.28	159.44	0.78	42.56L
	15754.00	90.24	164.02	10816.48	5348.71	S 5014.88	E 1872.17	5352.95	159.53	0.69	158.48L
	15849.00	89.20	163.61	10816.94	5443.65	S 5106.11	E 1898.65	5447.68	159.60	1.18	53.31R
	15945.00	89.58	164.12	10817.96	5539.58	S 5198.33	E 1925.32	5543.42	159.68	0.66	96.63R
	16041.00	89.45	165.24	10818.78	5635.46	S 5290.91	E 1950.68	5639.05	159.76	1.17	136.48L
	16136.00	88.45	164.29	10820.52	5730.31	S 5382.55	E 1975.64	5733.68	159.84	1.45	132.52R
	16232.00	88.34	164.41	10823.20	5826.18	S 5474.96	E 2001.53	5829.35	159.92	0.17	7.59R
	16328.00	88.79	164.47	10825.61	5922.05	S 5567.41	E 2027.27	5925.02	159.99	0.47	153.44R
	16424.00	88.41	164.66	10827.95	6017.91	S 5659.92	E 2052.82	6020.69	160.06	0.44	20.16L
	16520.00	89.20	164.37	10829.96	6113.78	S 5752.41	E 2078.44	6116.39	160.13	0.88	172.22L
	16615.00	88.03	164.21	10832.25	6208.66	S 5843.84	E 2104.16	6211.11	160.20	1.24	16.18R
	16711.00	88.34	164.30	10835.29	6304.52	S 5936.19	E 2130.19	6306.83	160.26	0.34	17.32L
	16807.00	89.27	164.01	10837.30	6400.42	S 6028.52	E 2156.40	6402.59	160.32	1.01	116.57R
	16902.00	89.13	164.29	10838.62	6495.33	S 6119.90	E 2182.34	6497.37	160.37	0.33	3.27R
	16998.00	89.48	164.31	10839.79	6591.23	S 6212.31	E 2208.32	6593.14	160.43	0.37	162.15L
	17093.00	88.89	164.12	10841.14	6686.14	S 6303.72	E 2234.16	6687.92	160.48	0.65	30.07R
	17189.00	89.27	164.34	10842.68	6782.04	S 6396.09	E 2260.25	6783.71	160.54	0.46	144.75L
	17284.00	88.69	163.93	10844.37	6876.95	S 6487.46	E 2286.21	6878.51	160.59	0.75	5.27R
	17379.00	89.34	163.99	10846.00	6971.87	S 6578.75	E 2312.46	6973.33	160.63	0.69	159.15R
	17475.00	89.13	164.07	10847.28	7067.79	S 6671.03	E 2338.87	7069.16	160.68	0.23	126.39L
	17570.00	88.99	163.88	10848.84	7162.71	S 6762.33	E 2365.09	7163.99	160.72	0.25	24.02R
	17665.00	90.92	164.74	10848.92	7257.61	S 6853.78	E 2390.78	7258.80	160.77	2.22	69.81L
	17744.00	91.17	164.06	10847.48	7336.51	S 6929.86	E 2412.02	7337.63	160.81	0.92	162.55L
	17823.00	90.82	163.95	10846.11	7415.44	S 7005.79	E 2433.79	7416.50	160.84	0.46	14.19R
	17919.00	91.65	164.16	10844.04	7511.35	S 7098.08	E 2460.15	7512.32	160.88	0.89	101.49R
	18014.00	91.03	167.20	10841.81	7606.09	S 7190.09	E 2483.64	7606.96	160.94	3.27	111.88R
	18109.00	90.58	168.32	10840.48	7700.57	S 7282.92	E 2503.78	7701.28	161.03	1.27	77.17L
	18205.00	90.86	167.09	10839.27	7796.05	S 7376.71	E 2524.22	7796.63	161.11	1.31	110.23L
	18300.00	90.79	166.90	10837.91	7890.65	S 7469.29	E 2545.59	7891.13	161.18	0.21	90L
	18396.00	90.79	163.36	10836.58	7986.47	S 7562.02	E 2570.22	7986.88	161.23	3.69	88.16L
	18492.00	90.89	160.20	10835.17	8082.45	S 7653.19	E 2600.23	8082.85	161.23	3.29	102.19L
	18587.00	90.65	159.09	10833.90	8177.37	S 7742.24	E 2633.27	8177.80	161.22	1.20	158.2L
	18682.00	90.45	159.01	10832.98	8272.25	S 7830.96	E 2667.24	8272.73	161.19	0.23	43.09R
	18777.00	90.76	159.30	10831.98	8367.15	S 7919.74	E 2701.04	8367.67	161.17	0.45	92.7R
	18873.00	90.65	161.62	10830.80	8463.11	S 8010.20	E 2733.15	8463.65	161.16	2.42	LS
	18968.00	90.51	161.62	10829.84	8558.10	S 8100.34	E 2763.10	8558.64	161.17	0.15	97.44R
	19064.00	90.17	164.22	10829.27	8654.07	S 8192.10	E 2791.29	8654.58	161.18	2.73	60.25L
	19159.00	90.93	162.89	10828.36	8749.02	S 8283.21	E 2818.18	8749.50	161.21	1.61	104.03R
	19255.00	90.72	163.73	10826.97	8844.98	S 8375.15	E 2845.75	8845.42	161.23	0.90	69.77R
	19350.00	90.79	163.92	10825.72	8939.91	S 8466.38	E 2872.21	8940.32	161.26	0.21	79.28L
	19445.00	90.93	163.18	10824.30	9034.85	S 8557.49	E 2899.11	9035.23	161.28	0.79	106.69R
	19541.00	90.69	163.98	10822.94	9130.80	S 8649.56	E 2926.25	9131.14	161.31	0.87	75.96L
	19636.00	90.82	163.46	10821.69	9225.74	S 8740.74	E 2952.88	9226.05	161.33	0.56	114.68L
	19732.00	90.65	163.09	10820.46	9321.70	S 8832.67	E 2980.50	9321.99	161.35	0.42	112.04R
	19828.00	90.48	163.51	10819.51	9417.66	S 8924.62	E 3008.09	9417.93	161.37	0.47	54.72L
	19923.00	91.06	162.69	10818.23	9512.63	S 9015.51	E 3035.70	9512.88	161.39	1.06	120.34R
	20018.00	90.82	163.10	10816.67	9607.60	S 9106.29	E 3063.64	9607.83	161.41	0.50	16.46R
	20113.00	92.41	163.57	10814.00	9702.52	S 9197.26	E 3090.87	9702.74	161.42	1.75	60.23L
	20209.00	94.48	159.93	10808.23	9798.33	S 9288.25	E 3120.87	9798.54	161.43	4.36	176.22L
	20304.00	92.21	159.78	10802.68	9893.10	S 9377.28	E 3153.53	9893.34	161.41	2.39	44.68L
	20400.00	93.31	158.69	10798.06	9988.89	S 9466.94	E 3187.52	9989.16	161.39	1.61	158.45R
	20494.00	91.03	159.59	10794.50	10082.72	S 9554.71	E 3220.97	10083.01	161.37	2.61	152.88R
	20589.00	89.80	160.22	10793.81	10177.66	S 9643.92	E 3253.61	10177.97	161.36	1.45	59.89R
	20685.00	91.51	163.17	10792.95	10253.64	S 9716.06	E 3277.47	10253.96	161.36	4.49	102.13R
	20715.00	91.17	164.75	10791.78	10303.59	S 9764.10	E 3291.28	10303.89	161.37	3.23	135R
	20810.00	88.65	167.27	10791.93	10398.32	S 9856.26	E 3314.25	10398.57	161.41	3.75	28.17L
	20906.00	88.93	167.12	10793.95	10493.87	S 9949.86	E 3335.52	10494.06	161.47	0.33	105.26R
	21001.00	88.90	167.23	10795.75	10588.44	S 10042.47	E 3356.60	10588.58	161.52	0.12	3.37L
	21096.00	89.07	167.22	10797.43	10683.00	S 10135.10	E 3377.60	10683.10	161.57	0.18	143.68L
	21192.00	88.73	166.97	10799.28	10778.58	S 10228.66	E 3399.04	10778.64	161.62	0.44	170L
	21287.00	88.56	166.94	10801.52	10873.17	S 10321.18	E 3420.48	10873.20	161.66	0.18	4.65R
	21382.00	89.79	167.04	10802.89	10967.77	S 10413.73	E 3441.86	10967.78	161.71	1.30	14.28L
	21478.00	90.34	166.90	10802.78	11063.38	S 10507.26	E 3463.51	11063.38	161.76	0.59	6.34L
	21574.00	90.79	166.85	10801.84	11159.00	S 10600.75	E 3485.30	11159.00	161.80	0.47	157.11L
	21632.00	90.34	166.66	10801.26	11216.78	S 10657.20	E 3498.59	11216.78	161.83	0.84	HS
Projection To Bit	21685.00	90.34	166.66	10800.95	11269.59	S 10708.77	E 3510.82	11269.59	161.85	0.00	

Survey Type: Non-Def Survey

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)	Survey Tool Type	Borehole / Survey
	1	0.000	12.000	1/98.425	17.500	13.375	NAL_MWD_PLUS_0.5_DEG-Depth Only	Original Hole / UL Loveland 1920-17 7H MWD 0' to update
	1	12.000	25.000	Act Stns	17.500	13.375	NAL_MWD_PLUS_0.5_DEG-Depth Only	Original Hole / UL Loveland 1920-17 7H MWD 0' to update
	1	25.000	1235.000	Act Stns	17.500	13.375	NAL_MWD_PLUS_0.5_DEG	Original Hole / UL Loveland 1920-17 7H MWD 0' to update

...UL Loveland 1920-17 7H - Cactus 138/Original Hole/UL Loveland 1920-17 7H MWD 0' to update

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (N/S ft)	EW (E/W ft)	Closure (ft)	Closure Azimuth (°)	DLS (°/100ft)	TF (°)
		1	1235.000	5101.000	Act Stns	12.250	10.750	NAL_MWD_PLUS_0.5_DEG		Original Hole / UL Loveland 1920-17 7H MWD 0' to update	
		1	5101.000	21685.000	Act Stns	9.875	7.625	NAL_MWD_PLUS_0.5_DEG			Original Hole / UL Loveland 1920-17 7H MWD 0' to update