



Laramie Energy, LLC

Mesa County, CO

Sup & Shep 25-11 Pad

Sup & Shep 0993-25-07W

B-7

Design: B-7

QES Survey Report

04 December, 2018





Survey Report



Company:	Laramie Energy, LLC	Local Co-ordinate Reference:	Well Sup & Shep 0993-25-07W
Project:	Mesa County, CO	TVD Reference:	RKB @ 8108.0usft (H&P #522)
Site:	Sup & Shep 25-11 Pad	MD Reference:	RKB @ 8108.0usft (H&P #522)
Well:	Sup & Shep 0993-25-07W	North Reference:	True
Wellbore:	B-7	Survey Calculation Method:	Minimum Curvature
Design:	B-7	Database:	EDM 5000.1 Single User Db

Project	Mesa County, CO		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Central Zone		

Site	Sup & Shep 25-11 Pad				
Site Position:		Northing:	1,521,749.72 usft	Latitude:	39.244779
From:	Lat/Long	Easting:	2,370,406.93 usft	Longitude:	-107.723301
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-1.40 °

Well	Sup & Shep 0993-25-07W					
Well Position	+N/-S	0.0 usft	Northing:	1,521,771.12 usft	Latitude:	39.244836
	+E/-W	0.0 usft	Easting:	2,370,380.54 usft	Longitude:	-107.723396
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level:	8,078.0 usft

Wellbore	B-7				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	User Defined	11/24/2018	9.33	65.37	51,238.90000000

Design	B-7				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.0	0.0	0.0	347.23	

Survey Program	Date	12/4/2018			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
428.0	8,700.0	QES MWD Surveys PVA (B-7)	MWD default	MWD - Standard	

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
First MWD Survey @ 428.0' MD / 427.8' TVD									
428.0	2.70	0.90	427.8	10.1	0.2	9.8	0.63	0.63	0.00
490.0	2.90	356.10	489.8	13.1	0.1	12.8	0.50	0.32	-7.74
583.0	4.50	3.70	582.6	19.1	0.2	18.6	1.80	1.72	8.17
675.0	6.10	359.00	674.2	27.6	0.3	26.8	1.80	1.74	-5.11
768.0	7.40	351.90	766.5	38.5	-0.6	37.6	1.66	1.40	-7.63
860.0	8.50	342.20	857.6	50.8	-3.5	50.3	1.88	1.20	-10.54
953.0	10.40	341.20	949.4	65.3	-8.4	65.5	2.05	2.04	-1.08
1,048.0	12.10	347.10	1,042.6	83.1	-13.3	84.0	2.16	1.79	6.21
1,142.0	12.10	345.20	1,134.5	102.2	-18.1	103.7	0.42	0.00	-2.02



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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)
1,236.0	11.30	350.10	1,226.5	120.8	-22.2	122.7	1.36	-0.85	5.21
1,330.0	11.90	345.00	1,318.6	139.3	-26.2	141.6	1.26	0.64	-5.43
1,425.0	11.90	342.30	1,411.6	158.1	-31.8	161.2	0.59	0.00	-2.84
1,519.0	11.30	343.10	1,503.6	176.1	-37.4	180.0	0.66	-0.64	0.85
1,528.0	11.30	343.10	1,512.5	177.8	-37.9	181.8	0.00	0.00	0.00
1,611.0	11.60	342.30	1,593.8	193.5	-42.8	198.2	0.41	0.36	-0.96
1,705.0	12.50	349.60	1,685.7	212.5	-47.5	217.8	1.88	0.96	7.77
1,799.0	12.50	349.60	1,777.5	232.5	-51.2	238.1	0.00	0.00	0.00
1,894.0	12.10	349.60	1,870.3	252.5	-54.8	258.3	0.42	-0.42	0.00
1,988.0	11.60	350.10	1,962.3	271.5	-58.2	277.6	0.54	-0.53	0.53
2,082.0	13.10	346.40	2,054.2	291.1	-62.4	297.7	1.80	1.60	-3.94
2,176.0	12.70	346.00	2,145.8	311.5	-67.4	318.7	0.44	-0.43	-0.43
2,271.0	11.70	345.60	2,238.6	331.0	-72.3	338.8	1.06	-1.05	-0.42
2,365.0	11.50	345.40	2,330.7	349.3	-77.0	357.6	0.22	-0.21	-0.21
2,459.0	12.50	347.50	2,422.7	368.3	-81.6	377.2	1.16	1.06	2.23
2,553.0	11.80	346.30	2,514.6	387.5	-86.1	397.0	0.79	-0.74	-1.28
2,648.0	10.70	344.50	2,607.7	405.5	-90.7	415.5	1.22	-1.16	-1.89
2,742.0	11.80	352.50	2,699.9	423.4	-94.3	433.8	2.03	1.17	8.51
2,837.0	11.60	353.00	2,793.0	442.5	-96.7	453.0	0.24	-0.21	0.53
2,931.0	12.80	350.30	2,884.8	462.2	-99.7	472.8	1.41	1.28	-2.87
3,026.0	12.50	349.90	2,977.5	482.7	-103.2	493.5	0.33	-0.32	-0.42
3,120.0	11.70	352.10	3,069.4	502.1	-106.3	513.2	0.98	-0.85	2.34
3,214.0	12.70	346.70	3,161.3	521.6	-110.0	533.0	1.61	1.06	-5.74
3,309.0	11.80	347.40	3,254.2	541.3	-114.5	553.2	0.96	-0.95	0.74
3,403.0	11.00	348.00	3,346.3	559.4	-118.5	571.8	0.86	-0.85	0.64
3,497.0	12.10	344.00	3,438.4	577.6	-123.1	590.6	1.45	1.17	-4.26
3,591.0	12.00	341.00	3,530.3	596.4	-129.0	610.1	0.67	-0.11	-3.19
3,686.0	11.30	340.30	3,623.4	614.5	-135.3	629.2	0.75	-0.74	-0.74
3,780.0	12.50	345.50	3,715.3	633.0	-141.0	648.5	1.71	1.28	5.53
3,874.0	12.40	344.10	3,807.1	652.5	-146.3	668.7	0.34	-0.11	-1.49
3,968.0	12.00	343.70	3,899.0	671.6	-151.8	688.6	0.43	-0.43	-0.43
4,063.0	11.60	346.60	3,992.0	690.4	-156.8	708.0	0.75	-0.42	3.05
4,157.0	10.90	346.50	4,084.2	708.2	-161.0	726.3	0.74	-0.74	-0.11
4,251.0	10.50	343.40	4,176.6	725.1	-165.6	743.7	0.75	-0.43	-3.30
4,346.0	11.50	347.10	4,269.8	742.6	-170.2	761.8	1.29	1.05	3.89
4,440.0	10.80	348.30	4,362.0	760.4	-174.0	780.0	0.78	-0.74	1.28
4,534.0	12.20	347.90	4,454.2	778.7	-177.9	798.8	1.49	1.49	-0.43
4,628.0	12.30	346.20	4,546.0	798.1	-182.4	818.7	0.40	0.11	-1.81
4,723.0	12.20	349.60	4,638.9	817.8	-186.6	838.8	0.77	-0.11	3.58
4,817.0	11.30	348.00	4,730.9	836.6	-190.3	858.0	1.02	-0.96	-1.70
4,911.0	11.80	350.50	4,823.0	855.1	-193.8	876.8	0.75	0.53	2.66
5,006.0	11.30	351.00	4,916.1	873.9	-196.9	895.8	0.54	-0.53	0.53
5,100.0	11.10	349.30	5,008.3	891.9	-200.0	914.0	0.41	-0.21	-1.81



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Survey										
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5,194.0	10.50	348.60	5,100.6	909.1	-203.4	931.6	0.65	-0.64	-0.74	
5,289.0	11.70	346.70	5,193.8	927.0	-207.3	949.9	1.32	1.26	-2.00	
5,383.0	11.50	346.90	5,285.9	945.4	-211.6	968.8	0.22	-0.21	0.21	
5,477.0	10.80	346.30	5,378.1	963.1	-215.8	987.0	0.75	-0.74	-0.64	
5,571.0	11.70	348.50	5,470.3	981.0	-219.8	1,005.3	1.06	0.96	2.34	
5,666.0	11.60	347.00	5,563.4	999.7	-223.9	1,024.5	0.34	-0.11	-1.58	
5,760.0	10.50	347.10	5,655.6	1,017.3	-227.9	1,042.5	1.17	-1.17	0.11	
5,854.0	10.50	345.50	5,748.0	1,033.9	-232.0	1,059.6	0.31	0.00	-1.70	
5,948.0	10.10	343.90	5,840.5	1,050.1	-236.4	1,076.4	0.52	-0.43	-1.70	
6,043.0	10.10	348.40	5,934.1	1,066.3	-240.4	1,093.1	0.83	0.00	4.74	
6,137.0	9.00	346.80	6,026.8	1,081.5	-243.7	1,108.7	1.20	-1.17	-1.70	
6,231.0	8.30	346.50	6,119.7	1,095.3	-247.0	1,122.8	0.75	-0.74	-0.32	
6,325.0	9.40	348.10	6,212.6	1,109.4	-250.1	1,137.3	1.20	1.17	1.70	
6,420.0	9.10	348.80	6,306.3	1,124.4	-253.2	1,152.5	0.34	-0.32	0.74	
6,514.0	8.00	348.50	6,399.3	1,138.1	-255.9	1,166.5	1.17	-1.17	-0.32	
6,608.0	6.80	346.60	6,492.5	1,149.9	-258.5	1,178.6	1.30	-1.28	-2.02	
6,703.0	5.90	346.50	6,586.9	1,160.1	-261.0	1,189.1	0.95	-0.95	-0.11	
6,797.0	5.10	344.60	6,680.5	1,168.8	-263.2	1,198.1	0.87	-0.85	-2.02	
6,892.0	4.40	342.10	6,775.2	1,176.4	-265.5	1,206.0	0.77	-0.74	-2.63	
6,986.0	3.90	339.40	6,868.9	1,182.8	-267.7	1,212.7	0.57	-0.53	-2.87	
7,080.0	3.50	335.10	6,962.7	1,188.4	-270.0	1,218.7	0.52	-0.43	-4.57	
7,175.0	2.70	340.10	7,057.6	1,193.1	-272.0	1,223.7	0.89	-0.84	5.26	
7,270.0	2.60	18.70	7,152.5	1,197.3	-272.1	1,227.8	1.85	-0.11	40.63	
7,364.0	2.10	18.70	7,246.4	1,200.9	-270.8	1,231.1	0.53	-0.53	0.00	
7,458.0	1.70	21.70	7,340.3	1,203.9	-269.8	1,233.7	0.44	-0.43	3.19	
7,553.0	1.30	12.50	7,435.3	1,206.2	-269.0	1,235.8	0.49	-0.42	-9.68	
7,648.0	1.20	14.20	7,530.3	1,208.2	-268.5	1,237.7	0.11	-0.11	1.79	
7,742.0	1.50	34.80	7,624.3	1,210.2	-267.6	1,239.4	0.60	0.32	21.91	
7,836.0	1.20	23.50	7,718.2	1,212.1	-266.5	1,241.0	0.43	-0.32	-12.02	
7,931.0	1.10	16.10	7,813.2	1,213.9	-265.9	1,242.6	0.19	-0.11	-7.79	
8,025.0	1.20	0.40	7,907.2	1,215.7	-265.6	1,244.4	0.35	0.11	-16.70	
8,119.0	1.40	357.20	8,001.2	1,217.9	-265.7	1,246.5	0.23	0.21	-3.40	
8,214.0	1.20	6.60	8,096.2	1,220.0	-265.6	1,248.6	0.31	-0.21	9.89	
8,308.0	1.50	357.90	8,190.1	1,222.2	-265.5	1,250.7	0.39	0.32	-9.26	
8,403.0	1.40	353.80	8,285.1	1,224.6	-265.7	1,253.1	0.15	-0.11	-4.32	
8,497.0	1.20	348.00	8,379.1	1,226.7	-266.0	1,255.2	0.25	-0.21	-6.17	
8,591.0	1.10	355.80	8,473.1	1,228.6	-266.3	1,257.1	0.20	-0.11	8.30	
8,640.0	1.30	353.40	8,522.0	1,229.6	-266.4	1,258.1	0.42	0.41	-4.90	
Projection to TD @ 8700.0' MD / 8582.0' TVD										
8,700.0	1.30	353.40	8,582.0	1,231.0	-266.6	1,259.4	0.00	0.00	0.00	



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Wellbore:	B-7	Survey Calculation Method:	Minimum Curvature
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Design Annotations

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		+N/-S (usft)	+E/-W (usft)	
428.0	427.8	10.1	0.2	First MWD Survey @ 428.0' MD / 427.8' TVD
8,700.0	8,582.0	1,231.0	-266.6	Projection to TD @ 8700.0' MD / 8582.0' TVD