

Solaris MidStream

Eddy County, New Mexico (NAD 83)

Trove Energy SWD

1

OH / 64135

Survey: Phoenix MWD Surveys

Standard Survey Report

08 March, 2019

Survey Report

Company:	Solaris MidStream	Local Co-ordinate Reference:	Well 1
Project:	Eddy County, New Mexico (NAD 83)	TVD Reference:	RKB @ 2998.00usft (Latshaw 21)
Site:	Trove Energy SWD	MD Reference:	RKB @ 2998.00usft (Latshaw 21)
Well:	1	North Reference:	Grid
Wellbore:	OH / 64135	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Latshaw 21)	Database:	USA Compass

Project:	Eddy County, New Mexico (NAD 83)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site:	Trove Energy SWD
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Site Position:		Northing:	441,361.90 usft	Latitude:	32° 12' 46.95523 N
From:	Map	Easting:	631,685.10 usft	Longitude:	104° 2' 28.32465 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.16 °

Well:	1					
Well Position	+N/-S	0.00 usft	Northing:	441,361.90 usft	Latitude:	32° 12' 46.95523 N
	+E/-W	0.00 usft	Easting:	631,685.10 usft	Longitude:	104° 2' 28.32465 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	2,966.00 usft

Wellbore:	OH / 64135
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Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	MVHD	1/31/2019	7.05	59.96	47,932.63559249

Design:	Surveys (Latshaw 21)
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Audit Notes:				
Version:	1.0	Phase:	ACTUAL	Tie On Depth: 0.00

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	0.00

Survey Program		Date: 3/8/2019		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
601.00	15,335.00	Phoenix MWD Surveys (OH / 64135)	MWD+HDGM	OWSG Rev.2 MWD + HDGM

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)
	540.00	1.50	140.00	539.92	-6.07	4.75	-6.07	0.00	0.00	0.00
Tie On	601.00	1.20	124.00	600.90	-7.04	5.79	-7.04	0.79	-0.49	-26.23
First Phoenix MWD Survey	696.00	1.40	134.50	695.88	-8.41	7.45	-8.41	0.33	0.21	11.05
	791.00	1.40	133.10	790.85	-10.01	9.12	-10.01	0.04	0.00	-1.47
	885.00	1.55	117.58	884.82	-11.39	11.09	-11.39	0.45	0.16	-16.51
	980.00	0.24	214.51	979.81	-12.15	12.11	-12.15	1.68	-1.38	102.03
	1,074.00	0.15	259.18	1,073.81	-12.33	11.88	-12.33	0.18	-0.10	47.52
	1,169.00	0.37	256.63	1,168.81	-12.43	11.46	-12.43	0.23	0.23	-2.68

Survey Report

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Site:	Trove Energy SWD	MD Reference:	RKB @ 2998.00usft (Latshaw 21)
Well:	1	North Reference:	Grid
Wellbore:	OH / 64135	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Latshaw 21)	Database:	USA Compass

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)
1,263.00	0.26	241.22	1,262.81	-12.60	10.98	-12.60	0.15	-0.12	-16.39
1,358.00	0.63	246.03	1,357.80	-12.92	10.31	-12.92	0.39	0.39	5.06
1,454.00	0.51	241.82	1,453.80	-13.33	9.45	-13.33	0.13	-0.13	-4.39
1,549.00	0.30	326.10	1,548.80	-13.32	8.94	-13.32	0.60	-0.22	88.72
1,644.00	0.30	14.80	1,643.79	-12.88	8.87	-12.88	0.26	0.00	51.26
1,738.00	0.37	61.38	1,737.79	-12.49	9.19	-12.49	0.29	0.07	49.55
1,832.00	0.46	15.78	1,831.79	-11.99	9.56	-11.99	0.35	0.10	-48.51
1,927.00	0.37	41.31	1,926.79	-11.39	9.87	-11.39	0.21	-0.09	26.87
2,022.00	0.59	79.20	2,021.79	-11.07	10.55	-11.07	0.39	0.23	39.88
2,116.00	1.42	95.50	2,115.77	-11.09	12.19	-11.09	0.93	0.88	17.34
2,209.00	0.64	69.63	2,208.75	-11.02	13.82	-11.02	0.96	-0.84	-27.82
2,304.00	1.25	102.51	2,303.74	-11.06	15.33	-11.06	0.83	0.64	34.61
2,399.00	1.91	107.91	2,398.71	-11.77	17.85	-11.77	0.71	0.69	5.68
2,493.00	2.39	101.42	2,492.64	-12.64	21.26	-12.64	0.57	0.51	-6.90
2,586.00	1.81	83.74	2,585.58	-12.86	24.62	-12.86	0.93	-0.62	-19.01
2,765.00	1.47	72.23	2,764.50	-11.85	29.62	-11.85	0.26	-0.19	-6.43
2,859.00	0.79	37.15	2,858.49	-10.97	31.16	-10.97	1.00	-0.72	-37.32
2,952.00	0.76	13.94	2,951.48	-9.86	31.69	-9.86	0.34	-0.03	-24.96
3,046.00	0.98	334.34	3,045.47	-8.53	31.49	-8.53	0.66	0.23	-42.13
3,141.00	1.23	324.70	3,140.45	-6.96	30.55	-6.96	0.33	0.26	-10.15
3,237.00	1.09	304.77	3,236.43	-5.60	29.21	-5.60	0.44	-0.15	-20.76
3,332.00	0.92	301.25	3,331.42	-4.69	27.81	-4.69	0.19	-0.18	-3.71
3,427.00	0.90	302.73	3,426.40	-3.89	26.53	-3.89	0.03	-0.02	1.56
3,521.00	0.94	299.20	3,520.39	-3.12	25.24	-3.12	0.07	0.04	-3.76
3,615.00	0.79	297.52	3,614.38	-2.44	23.99	-2.44	0.16	-0.16	-1.79
3,711.00	0.77	296.12	3,710.37	-1.85	22.83	-1.85	0.03	-0.02	-1.46
3,806.00	0.82	298.25	3,805.36	-1.25	21.65	-1.25	0.06	0.05	2.24
3,901.00	0.83	301.81	3,900.35	-0.57	20.47	-0.57	0.05	0.01	3.75
3,995.00	0.76	303.69	3,994.34	0.14	19.37	0.14	0.08	-0.07	2.00
4,090.00	0.75	302.97	4,089.34	0.83	18.33	0.83	0.01	-0.01	-0.76
4,185.00	0.71	302.90	4,184.33	1.49	17.31	1.49	0.04	-0.04	-0.07
4,279.00	0.71	305.05	4,278.32	2.14	16.35	2.14	0.03	0.00	2.29
4,373.00	0.72	298.67	4,372.31	2.75	15.35	2.75	0.09	0.01	-6.79
4,468.00	0.68	294.64	4,467.31	3.28	14.32	3.28	0.07	-0.04	-4.24
4,563.00	0.67	290.14	4,562.30	3.70	13.28	3.70	0.06	-0.01	-4.74
4,658.00	0.75	296.89	4,657.29	4.17	12.21	4.17	0.12	0.08	7.11
4,753.00	0.73	285.57	4,752.29	4.62	11.07	4.62	0.16	-0.02	-11.92
4,847.00	0.78	283.66	4,846.28	4.93	9.87	4.93	0.06	0.05	-2.03
4,942.00	0.85	279.34	4,941.27	5.20	8.55	5.20	0.10	0.07	-4.55
5,037.00	0.90	272.82	5,036.26	5.35	7.10	5.35	0.12	0.05	-6.86
5,131.00	0.98	259.06	5,130.24	5.23	5.58	5.23	0.25	0.09	-14.64
5,226.00	1.07	263.39	5,225.23	4.98	3.90	4.98	0.12	0.09	4.56
5,321.00	0.98	260.82	5,320.21	4.74	2.22	4.74	0.11	-0.09	-2.71

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5,415.00	1.01	254.97	5,414.20	4.40	0.62	4.40	0.11	0.03	-6.22
5,511.00	1.05	248.49	5,510.18	3.86	-1.01	3.86	0.13	0.04	-6.75
5,605.00	1.08	247.92	5,604.17	3.21	-2.63	3.21	0.03	0.03	-0.61
5,701.00	1.05	241.84	5,700.15	2.45	-4.25	2.45	0.12	-0.03	-6.33
5,795.00	1.08	242.77	5,794.13	1.64	-5.80	1.64	0.04	0.03	0.99
5,885.00	1.08	241.59	5,884.12	0.85	-7.30	0.85	0.02	0.00	-1.31
5,948.00	1.12	237.03	5,947.11	0.23	-8.33	0.23	0.15	0.06	-7.24
6,044.00	1.15	234.12	6,043.09	-0.84	-9.90	-0.84	0.07	0.03	-3.03
6,139.00	1.26	228.42	6,138.07	-2.09	-11.46	-2.09	0.17	0.12	-6.00
6,234.00	1.24	234.19	6,233.04	-3.39	-13.07	-3.39	0.13	-0.02	6.07
6,330.00	1.26	236.41	6,329.02	-4.58	-14.79	-4.58	0.05	0.02	2.31
6,424.00	1.08	263.78	6,423.00	-5.25	-16.53	-5.25	0.62	-0.19	29.12
6,518.00	1.45	307.51	6,516.98	-4.62	-18.36	-4.62	1.07	0.39	46.52
6,614.00	1.78	302.89	6,612.94	-3.07	-20.57	-3.07	0.37	0.34	-4.81
6,709.00	2.10	307.10	6,707.89	-1.22	-23.20	-1.22	0.37	0.34	4.43
6,804.00	3.30	310.60	6,802.78	1.61	-26.67	1.61	1.27	1.26	3.68
6,898.00	4.85	309.21	6,896.54	5.88	-31.80	5.88	1.65	1.65	-1.48
6,991.00	4.57	324.24	6,989.23	11.38	-37.01	11.38	1.36	-0.30	16.16
7,086.00	4.54	332.24	7,083.93	17.77	-40.97	17.77	0.67	-0.03	8.42
7,180.00	4.71	336.29	7,177.63	24.60	-44.26	24.60	0.39	0.18	4.31
7,276.00	4.56	337.43	7,273.31	31.73	-47.31	31.73	0.18	-0.16	1.19
7,371.00	4.49	338.21	7,368.02	38.67	-50.14	38.67	0.10	-0.07	0.82
7,466.00	4.11	337.24	7,462.75	45.26	-52.84	45.26	0.41	-0.40	-1.02
7,560.00	2.77	339.68	7,556.58	50.50	-54.93	50.50	1.43	-1.43	2.60
7,653.00	3.03	340.46	7,649.46	54.92	-56.53	54.92	0.28	0.28	0.84
7,748.00	1.89	353.01	7,744.37	58.85	-57.56	58.85	1.32	-1.20	13.21
7,844.00	1.04	5.49	7,840.34	61.28	-57.67	61.28	0.94	-0.89	13.00
7,939.00	0.52	58.15	7,935.33	62.37	-57.22	62.37	0.88	-0.55	55.43
8,034.00	0.60	69.84	8,030.32	62.77	-56.39	62.77	0.15	0.08	12.31
8,129.00	0.63	76.94	8,125.32	63.06	-55.41	63.06	0.09	0.03	7.47
8,223.00	0.56	77.81	8,219.31	63.27	-54.46	63.27	0.08	-0.07	0.93
8,318.00	0.40	46.62	8,314.31	63.60	-53.76	63.60	0.32	-0.17	-32.83
8,413.00	0.41	20.84	8,409.31	64.14	-53.40	64.14	0.19	0.01	-27.14
8,508.00	0.40	7.88	8,504.31	64.79	-53.24	64.79	0.10	-0.01	-13.64
8,603.00	0.51	355.40	8,599.30	65.54	-53.22	65.54	0.16	0.12	-13.14
8,698.00	0.26	340.56	8,694.30	66.16	-53.33	66.16	0.28	-0.26	-15.62
8,792.00	0.34	254.69	8,788.30	66.29	-53.67	66.29	0.44	0.09	-91.35
8,885.00	0.48	196.99	8,881.30	65.85	-54.05	65.85	0.45	0.15	-62.04
8,977.00	0.59	197.38	8,973.29	65.03	-54.30	65.03	0.12	0.12	0.42
9,072.00	0.68	214.97	9,068.29	64.10	-54.77	64.10	0.22	0.09	18.52
9,165.00	0.74	210.92	9,161.28	63.13	-55.40	63.13	0.08	0.06	-4.35
9,260.00	0.72	197.79	9,256.27	62.03	-55.90	62.03	0.18	-0.02	-13.82
9,352.00	0.75	207.73	9,348.27	60.95	-56.35	60.95	0.14	0.03	10.80
9,447.00	0.83	202.84	9,443.26	59.77	-56.91	59.77	0.11	0.08	-5.15

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Site:	Trove Energy-SWD	MD Reference:	RKB @ 2998.00usft (Latshaw 21)
Well:	1	North Reference:	Grid
Wellbore:	OH / 64135	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Latshaw 21)	Database:	USA Compass

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)
9,542.00	1.00	200.59	9,538.25	58.36	-57.47	58.36	0.18	0.18	-2.37
9,637.00	1.05	196.69	9,633.23	56.75	-58.01	56.75	0.09	0.05	-4.11
9,733.00	1.18	187.33	9,729.21	54.92	-58.39	54.92	0.23	0.14	-9.75
9,829.00	1.31	188.34	9,825.19	52.86	-58.67	52.86	0.14	0.14	1.05
9,924.00	1.43	174.10	9,920.16	50.60	-58.71	50.60	0.38	0.13	-14.99
10,036.00	1.86	154.51	10,032.12	47.57	-57.78	47.57	0.63	0.38	-17.49
10,130.00	1.96	151.45	10,126.06	44.78	-56.36	44.78	0.15	0.11	-3.26
10,225.00	1.47	195.91	10,221.03	42.19	-55.92	42.19	1.45	-0.52	46.80
10,319.00	0.94	209.91	10,315.00	40.36	-56.63	40.36	0.64	-0.56	14.89
10,415.00	0.81	231.38	10,410.99	39.25	-57.55	39.25	0.36	-0.14	22.36
10,508.00	1.15	215.00	10,503.98	38.08	-58.60	38.08	0.47	0.37	-17.61
10,603.00	1.09	206.50	10,598.96	36.49	-59.55	36.49	0.19	-0.06	-8.95
10,697.00	1.21	213.26	10,692.94	34.86	-60.50	34.86	0.19	0.13	7.19
10,791.00	1.18	199.49	10,786.92	33.11	-61.36	33.11	0.31	-0.03	-14.65
10,885.00	1.06	201.13	10,880.91	31.39	-62.00	31.39	0.13	-0.13	1.74
10,980.00	0.94	214.30	10,975.89	29.93	-62.76	29.93	0.27	-0.13	13.86
11,076.00	1.03	224.00	11,071.88	28.66	-63.80	28.66	0.20	0.09	10.10
11,169.00	1.07	237.23	11,164.86	27.59	-65.11	27.59	0.26	0.04	14.23
11,263.00	1.16	242.62	11,258.84	26.67	-66.69	26.67	0.15	0.10	5.73
11,358.00	1.12	248.62	11,353.82	25.89	-68.41	25.89	0.13	-0.04	6.32
11,451.00	0.88	255.57	11,446.81	25.38	-69.95	25.38	0.29	-0.26	7.47
11,545.00	0.60	270.78	11,540.80	25.21	-71.14	25.21	0.36	-0.30	16.18
11,640.00	0.75	342.64	11,635.80	25.81	-71.82	25.81	0.84	0.16	75.64
11,736.00	0.70	327.46	11,731.79	26.90	-72.33	26.90	0.21	-0.05	-15.81
11,831.00	0.66	329.89	11,826.78	27.87	-72.91	27.87	0.05	-0.04	2.56
11,925.00	0.83	322.71	11,920.78	28.88	-73.60	28.88	0.21	0.18	-7.64
12,021.00	0.85	330.97	12,016.76	30.05	-74.36	30.05	0.13	0.02	8.60
12,115.00	0.83	328.38	12,110.75	31.24	-75.06	31.24	0.05	-0.02	-2.76
12,208.00	0.90	331.10	12,203.74	32.45	-75.76	32.45	0.09	0.08	2.92
12,303.00	0.99	324.78	12,298.73	33.78	-76.60	33.78	0.14	0.09	-6.65
12,398.00	1.11	330.98	12,393.72	35.25	-77.52	35.25	0.17	0.13	6.53
12,492.00	1.18	333.19	12,487.70	36.91	-78.40	36.91	0.09	0.07	2.35
12,588.00	1.12	325.09	12,583.68	38.56	-79.38	38.56	0.18	-0.06	-8.44
12,682.00	1.04	308.67	12,677.66	39.65	-80.57	39.65	0.34	-0.09	-17.47
12,770.00	1.00	303.39	12,765.65	40.77	-81.84	40.77	0.12	-0.05	-6.00
12,864.00	0.99	309.99	12,859.63	41.75	-83.14	41.75	0.12	-0.01	7.02
12,960.00	1.00	306.99	12,955.62	42.78	-84.45	42.78	0.06	0.01	-3.13
13,056.00	1.19	303.33	13,051.60	43.83	-85.95	43.83	0.21	0.20	-3.81
13,151.00	1.28	306.32	13,146.58	45.01	-87.63	45.01	0.12	0.09	3.15
13,246.00	1.40	307.46	13,241.55	46.34	-89.40	46.34	0.13	0.13	1.20
13,340.00	1.55	309.09	13,335.52	47.84	-91.30	47.84	0.17	0.16	1.73
13,435.00	1.68	310.58	13,430.48	49.56	-93.36	49.56	0.14	0.14	1.57
13,530.00	1.99	313.30	13,525.43	51.59	-95.62	51.59	0.34	0.33	2.86

Survey Report

Company:	Solaris MidStream	Local Co-ordinate Reference:	Well 1
Project:	Eddy County, New Mexico (NAD 83)	TVD Reference:	RKB @ 2998.00usft (Latshaw 21)
Site:	Trove Energy SWD	MD Reference:	RKB @ 2998.00usft (Latshaw 21)
Well:	1	North Reference:	Grid
Wellbore:	OH / 64135	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Latshaw 21)	Database:	USA Compass

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)
13,625.00	2.49	317.20	13,620.36	54.24	-98.22	54.24	0.55	0.53	4.11
13,720.00	3.16	317.39	13,715.25	57.68	-101.39	57.68	0.71	0.71	0.20
13,814.00	2.35	329.60	13,809.14	61.25	-104.12	61.25	1.06	-0.86	12.99
13,909.00	2.88	328.13	13,904.04	64.96	-106.37	64.96	0.56	0.56	-1.55
14,003.00	3.28	328.93	13,997.90	69.26	-109.00	69.26	0.43	0.43	0.85
14,097.00	3.53	327.19	14,091.74	74.00	-111.96	74.00	0.29	0.27	-1.85
14,192.00	3.72	331.63	14,186.55	79.17	-115.01	79.17	0.36	0.20	4.67
14,314.00	4.72	335.35	14,308.21	87.21	-118.98	87.21	0.85	0.82	3.05
14,409.00	4.73	322.83	14,402.89	93.89	-122.98	93.89	1.08	0.01	-13.18
14,504.00	5.53	325.30	14,497.51	100.77	-127.95	100.77	0.87	0.84	2.60
14,599.00	6.65	332.68	14,591.98	109.42	-133.08	109.42	1.44	1.18	7.77
14,693.00	5.58	342.95	14,685.44	118.63	-136.92	118.63	1.62	-1.14	10.93
14,788.00	4.54	354.25	14,780.07	126.79	-138.65	126.79	1.51	-1.09	11.89
14,882.00	4.82	1.61	14,873.76	134.44	-138.91	134.44	0.70	0.30	7.83
14,977.00	4.89	4.15	14,968.42	142.46	-138.51	142.46	0.24	0.07	2.67
15,072.00	5.22	6.46	15,063.05	150.80	-137.73	150.80	0.41	0.35	2.43
15,167.00	5.12	10.18	15,157.66	159.26	-136.49	159.26	0.37	-0.11	3.92
15,262.00	5.87	8.65	15,252.23	168.24	-135.01	168.24	0.80	0.79	-1.61
15,281.00	5.99	8.90	15,271.13	170.18	-134.71	170.18	0.65	0.63	1.32
Final Phoenix MWD Survey									
15,335.00	5.99	8.90	15,324.83	175.74	-133.84	175.74	0.00	0.00	0.00
Projection to TD									

Survey Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/S (usft)	+E/W (usft)	
540.00	539.92	-6.07	4.75	Tie On
601.00	600.90	-7.04	5.79	First Phoenix MWD Survey
15,281.00	15,271.13	170.18	-134.71	Final Phoenix MWD Survey
15,335.00	15,324.83	175.74	-133.84	Projection to TD