



Breitburn Operating

Lea County, New Mexico (NAD 83)

Encore M 21 Fee

Encore M 21 Fee 002

Wellbore #1

Design: Surveys

Standard Survey Report

11 October, 2018

HOBBS OCD

OCT 16 2018

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MS Directional Survey Report



Company: Breitburn Operating
Project: Lea County, New Mexico (NAD 83)
Site: Encore M 21 Fee
Well: Encore M 21 Fee 002
Wellbore: Wellbore #1
Design: Surveys

Local Co-ordinate Reference: Well Encore M 21 Fee 002
TVD Reference: Well @ 3383.00usft (Nabors M10)
MD Reference: Well @ 3383.00usft (Nabors M10)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.14 Conroe Db

Project Lea County, New Mexico (NAD 83)

Map System: US State Plane 1983
Geo Datum: North American Datum 1983
Map Zone: New Mexico Eastern Zone
System Datum: Mean Sea Level

Well Encore M 21 Fee 002

Well Position +N/-S 0.00 usft **Northing:** 502,457.10 usft **Latitude:** 32° 22' 33.470 N
+E/-W 0.00 usft **Easting:** 900,235.80 usft **Longitude:** 103° 10' 14.944 W
Position Uncertainty 0.00 usft **Wellhead Elevation:** usft **Ground Level:** 3,361.00 usft
Grid Convergence: 0.623 °

Wellbore Wellbore #1

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2018	9/27/2018	6.693	60.223	47,974.54

Design Surveys

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 10/11/2018

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
1,205.00	7,634.00	MS MWD (Wellbore #1)	MWD	OWSG 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)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,205.00	0.56	196.51	1,204.98	-5.65	-1.67	-5.65	0.05	0.05	0.00
1,260.00	0.20	19.70	1,259.98	-5.81	-1.72	-5.81	1.38	-0.65	-321.47
1,448.00	0.50	20.50	1,447.98	-4.74	-1.32	-4.74	0.16	0.16	0.43
1,637.00	0.50	352.40	1,636.97	-3.15	-1.14	-3.15	0.13	0.00	-14.87
1,825.00	0.30	38.80	1,824.97	-1.95	-0.94	-1.95	0.19	-0.11	24.68
2,014.00	0.60	18.60	2,013.96	-0.63	-0.31	-0.63	0.18	0.16	-10.69
2,201.00	0.50	41.50	2,200.95	0.91	0.54	0.91	0.13	-0.05	12.25
2,390.00	0.70	36.10	2,389.94	2.46	1.77	2.46	0.11	0.11	-2.86
2,578.00	0.90	35.70	2,577.92	4.59	3.30	4.59	0.11	0.11	-0.21
2,766.00	0.90	42.00	2,765.90	6.89	5.15	6.89	0.05	0.00	3.35
2,954.00	1.10	32.30	2,953.87	9.51	7.11	9.51	0.14	0.11	-5.16
3,143.00	1.20	35.80	3,142.83	12.65	9.23	12.65	0.06	0.05	1.85
3,331.00	1.30	33.10	3,330.79	16.03	11.55	16.03	0.06	0.05	-1.44
3,519.00	1.40	31.20	3,518.74	19.78	13.90	19.78	0.06	0.05	-1.01



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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)
3,708.00	1.50	26.30	3,707.67	23.97	16.20	23.97	0.08	0.05	-2.59
3,896.00	0.70	191.20	3,895.66	25.05	17.06	25.05	1.16	-0.43	87.71
4,084.00	1.30	189.90	4,083.63	21.83	16.47	21.83	0.32	0.32	-0.69
4,272.00	1.40	187.00	4,271.58	17.45	15.83	17.45	0.06	0.05	-1.54
4,460.00	1.50	193.80	4,459.52	12.78	14.96	12.78	0.11	0.05	3.62
4,480.00	1.60	186.00	4,479.51	12.25	14.87	12.25	1.17	0.50	-39.00
4,558.00	1.60	187.10	4,557.48	10.08	14.62	10.08	0.04	0.00	1.41
4,746.00	0.40	282.40	4,745.45	7.62	13.65	7.62	0.90	-0.64	50.69
4,935.00	0.40	280.60	4,934.45	7.88	12.36	7.88	0.01	0.00	-0.95
5,122.00	0.60	272.40	5,121.44	8.04	10.74	8.04	0.11	0.11	-4.39
5,310.00	0.60	275.80	5,309.43	8.18	8.78	8.18	0.02	0.00	1.81
5,499.00	0.40	298.40	5,498.42	8.60	7.21	8.60	0.15	-0.11	11.96
5,686.00	0.30	277.70	5,685.42	8.97	6.15	8.97	0.09	-0.05	-11.07
5,875.00	0.50	272.00	5,874.42	9.07	4.84	9.07	0.11	0.11	-3.02
6,062.00	0.60	283.70	6,061.41	9.33	3.07	9.33	0.08	0.05	6.26
6,250.00	0.50	250.60	6,249.40	9.29	1.34	9.29	0.17	-0.05	-17.61
6,439.00	0.60	247.60	6,438.39	8.64	-0.35	8.64	0.06	0.05	-1.59
6,627.00	0.60	278.10	6,626.38	8.40	-2.23	8.40	0.17	0.00	16.22
6,815.00	0.50	247.40	6,814.37	8.22	-3.97	8.22	0.16	-0.05	-16.33
7,003.00	0.50	277.90	7,002.37	8.02	-5.54	8.02	0.14	0.00	16.22
7,192.00	0.40	260.40	7,191.36	8.03	-7.00	8.03	0.09	-0.05	-9.26
7,380.00	0.70	140.10	7,379.36	7.04	-6.91	7.04	0.51	0.16	-63.99
7,568.00	0.50	49.60	7,567.35	6.69	-5.55	6.69	0.46	-0.11	-48.14
7,634.00	0.50	49.60	7,633.35	7.06	-5.11	7.06	0.00	0.00	0.00

Projection to TD-7634.00' MD

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates	+N/-S (usft)	+E/-W (usft)	Comment
7,634.00	7,633.35	7.06	-5.11		Projection to TD-7634.00' MD