

NORTHERN DELAWARE BASIN

LEA COUNTY, NM

ZEUS

LITTLE BEAR FED COM #1H

ST01

Design: AWP-ST01

Standard Survey Report

18 January, 2019

HOBBS OCD
AUG 01 2019
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Survey Report

Company: NORTHERN DELAWARE BASIN
Project: LEA COUNTY, NM
Site: ZEUS
Well: LITTLE BEAR FED COM #1H
Wellbore: ST01
Design: AWP-ST01

Local Co-ordinate Reference: Well LITTLE BEAR FED COM #1H
TVD Reference: RKB=3791+26 @ 3817.0usft (INDEPENDENCE 205)
MD Reference: RKB=3791+26 @ 3817.0usft (INDEPENDENCE 205)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM_Users

Project LEA COUNTY, NM

Map System: US State Plane 1927 (Exact solution)
Geo Datum: NAD 1927 (NADCON CONUS)
Map Zone: New Mexico East 3001

System Datum: Mean Sea Level

Site ZEUS

Site Position: **Map** **Northing:** 597,166.40 usft **Latitude:** 32° 38' 24.583 N
From: **Easting:** 692,087.80 usft **Longitude:** 103° 42' 33.536 W
Position Uncertainty: 0.0 usft **Slot Radius:** 13-3/16 " **Grid Convergence:** 0.34 °

Well LITTLE BEAR FED COM #1H

Well Position **+N/-S** 0.0 usft **Northing:** 554,956.30 usft **Latitude:** 32° 31' 23.769 N
+E/-W 0.0 usft **Easting:** 740,237.10 usft **Longitude:** 103° 33' 14.087 W
Position Uncertainty 3.0 usft **Wellhead Elevation:** usft **Ground Level:** 3,791.0 usft

Wellbore ST01

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	WMM2015	11/17/2018	6.84	60.30	47,953.22064292

Design AWP-ST01

Audit Notes:

Version: 1.0 **Phase:** ACTUAL **Tie On Depth:** 10,834.0

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	358.70

Survey Program **Date** 12/13/2018

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100.0	10,128.2	GYRO (OWB)	Standard Keeper 104	Standard Wireline Keeper ver 1.0.4
10,215.0	10,834.0	MWD-CURVE/LAT (OWB)	MWD+IFR1+MS	OWSG MWD + IFR1 + Multi-Station Correction
10,867.0	16,062.0	MWD (ST01)	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)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.27	65.96	100.0	0.1	0.2	0.1	0.27	0.27	0.00
125.0	0.33	52.66	125.0	0.2	0.3	0.2	0.37	0.24	-53.20
150.0	0.39	52.48	150.0	0.3	0.5	0.2	0.24	0.24	-0.72
175.0	0.50	50.96	175.0	0.4	0.6	0.4	0.44	0.44	-6.08
200.0	0.51	62.55	200.0	0.5	0.8	0.5	0.41	0.04	46.36
225.0	0.54	57.12	225.0	0.6	1.0	0.6	0.23	0.12	-21.72

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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)
250.0	0.53	60.29	250.0	0.7	1.2	0.7	0.12	-0.04	12.68
275.0	0.59	70.99	275.0	0.8	1.4	0.8	0.48	0.24	42.80
300.0	0.54	68.37	300.0	0.9	1.6	0.9	0.23	-0.20	-10.48
325.0	0.50	66.44	325.0	1.0	1.8	1.0	0.17	-0.16	-7.72
350.0	0.56	43.21	350.0	1.1	2.0	1.1	0.89	0.24	-92.92
375.0	0.56	41.42	375.0	1.3	2.2	1.3	0.07	0.00	-7.16
400.0	0.51	52.99	400.0	1.5	2.4	1.4	0.48	-0.20	46.28
425.0	0.53	58.09	425.0	1.6	2.6	1.5	0.20	0.08	20.40
450.0	0.47	71.20	450.0	1.7	2.7	1.6	0.52	-0.24	52.44
475.0	0.46	65.25	475.0	1.8	2.9	1.7	0.20	-0.04	-23.80
500.0	0.43	53.73	500.0	1.9	3.1	1.8	0.38	-0.12	-46.08
525.0	0.45	63.54	525.0	2.0	3.3	1.9	0.31	0.08	39.24
550.0	0.43	53.66	550.0	2.1	3.4	2.0	0.31	-0.08	-39.52
575.0	0.39	78.96	575.0	2.1	3.6	2.1	0.74	-0.16	101.20
600.0	0.41	74.12	600.0	2.2	3.8	2.1	0.16	0.08	-19.36
625.0	0.46	68.46	625.0	2.2	3.9	2.2	0.26	0.20	-22.64
650.0	0.43	76.79	650.0	2.3	4.1	2.2	0.28	-0.12	33.32
675.0	0.48	69.61	675.0	2.4	4.3	2.3	0.30	0.20	-28.72
700.0	0.45	74.38	700.0	2.4	4.5	2.3	0.20	-0.12	19.08
725.0	0.46	71.13	725.0	2.5	4.7	2.4	0.11	0.04	-13.00
750.0	0.49	72.18	750.0	2.6	4.9	2.4	0.12	0.12	4.20
775.0	0.43	86.70	775.0	2.6	5.1	2.5	0.52	-0.24	58.08
800.0	0.37	84.91	800.0	2.6	5.3	2.5	0.25	-0.24	-7.16
825.0	0.38	79.56	825.0	2.6	5.4	2.5	0.15	0.04	-21.40
850.0	0.44	77.45	850.0	2.7	5.6	2.5	0.25	0.24	-8.44
875.0	0.47	84.54	875.0	2.7	5.8	2.6	0.25	0.12	28.36
900.0	0.44	76.88	900.0	2.7	6.0	2.6	0.27	-0.12	-30.64
925.0	0.45	76.97	925.0	2.8	6.2	2.6	0.04	0.04	0.36
950.0	0.41	84.48	950.0	2.8	6.4	2.7	0.28	-0.16	30.04
975.0	0.39	85.88	975.0	2.8	6.5	2.7	0.09	-0.08	5.60
1,000.0	0.42	78.83	1,000.0	2.8	6.7	2.7	0.23	0.12	-28.20
1,025.0	0.43	87.38	1,025.0	2.9	6.9	2.7	0.26	0.04	34.20
1,050.0	0.46	97.65	1,050.0	2.8	7.1	2.7	0.34	0.12	41.08
1,075.0	0.37	80.75	1,075.0	2.8	7.3	2.7	0.60	-0.36	-67.60
1,100.0	0.41	85.24	1,100.0	2.9	7.4	2.7	0.20	0.16	17.96
1,125.0	0.42	97.94	1,125.0	2.9	7.6	2.7	0.37	0.04	50.80
1,150.0	0.40	94.76	1,150.0	2.8	7.8	2.7	0.12	-0.08	-12.72
1,175.0	0.41	83.53	1,175.0	2.8	8.0	2.7	0.32	0.04	-44.92
1,200.0	0.41	90.51	1,200.0	2.9	8.1	2.7	0.20	0.00	27.92
1,225.0	0.52	107.90	1,225.0	2.8	8.3	2.6	0.71	0.44	69.56
1,250.0	0.40	93.19	1,250.0	2.8	8.5	2.6	0.67	-0.48	-58.84
1,275.0	0.39	86.55	1,275.0	2.8	8.7	2.6	0.19	-0.04	-26.56

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RKB=3791+26 @ 3817.0usft (INDEPENDENCE 205)

Grid

Minimum Curvature

EDM_Users

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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)
1,300.0	0.32	91.48	1,300.0	2.8	8.9	2.6	0.31	-0.28	19.72
1,325.0	0.39	95.21	1,325.0	2.8	9.0	2.6	0.29	0.28	14.92
1,350.0	0.42	81.90	1,350.0	2.8	9.2	2.6	0.39	0.12	-53.24
1,375.0	0.39	81.50	1,375.0	2.8	9.4	2.6	0.12	-0.12	-1.60
1,400.0	0.35	89.09	1,400.0	2.8	9.5	2.6	0.25	-0.16	30.36
1,425.0	0.32	81.62	1,425.0	2.8	9.7	2.6	0.21	-0.12	-29.88
1,450.0	0.32	91.74	1,450.0	2.8	9.8	2.6	0.23	0.00	40.48
1,475.0	0.38	91.52	1,475.0	2.8	10.0	2.6	0.24	0.24	-0.88
1,500.0	0.35	73.78	1,500.0	2.9	10.1	2.6	0.47	-0.12	-70.96
1,525.0	0.36	90.74	1,525.0	2.9	10.3	2.6	0.42	0.04	67.84
1,550.0	0.36	71.72	1,550.0	2.9	10.4	2.7	0.48	0.00	-76.08
1,575.0	0.32	90.46	1,575.0	2.9	10.6	2.7	0.47	-0.16	74.96
1,600.0	0.31	91.46	1,600.0	2.9	10.7	2.7	0.05	-0.04	4.00
1,625.0	0.27	82.07	1,625.0	2.9	10.8	2.7	0.25	-0.16	-37.56
1,650.0	0.32	104.85	1,650.0	2.9	11.0	2.7	0.51	0.20	91.12
1,675.0	0.20	69.55	1,675.0	2.9	11.1	2.7	0.78	-0.48	-141.20
1,700.0	0.22	70.86	1,700.0	2.9	11.2	2.7	0.08	0.08	5.24
1,725.0	0.22	85.83	1,725.0	3.0	11.3	2.7	0.23	0.00	59.88
1,750.0	0.22	70.47	1,750.0	3.0	11.3	2.7	0.24	0.00	-61.44
1,775.0	0.24	79.23	1,775.0	3.0	11.4	2.7	0.16	0.08	35.04
1,800.0	0.27	105.13	1,800.0	3.0	11.5	2.7	0.47	0.12	103.60
1,825.0	0.27	96.78	1,825.0	3.0	11.7	2.7	0.16	0.00	-33.40
1,850.0	0.36	93.18	1,850.0	3.0	11.8	2.7	0.37	0.36	-14.40
1,875.0	0.46	87.10	1,875.0	3.0	12.0	2.7	0.44	0.40	-24.32
1,900.0	0.57	87.21	1,900.0	3.0	12.2	2.7	0.44	0.44	0.44
1,925.0	0.72	92.98	1,925.0	3.0	12.5	2.7	0.65	0.60	23.08
1,950.0	0.82	82.44	1,949.9	3.0	12.8	2.7	0.69	0.40	-42.16
1,975.0	0.99	101.08	1,974.9	3.0	13.2	2.7	1.35	0.68	74.56
2,000.0	0.92	93.24	1,999.9	2.9	13.6	2.6	0.59	-0.28	-31.36
2,025.0	0.87	84.39	2,024.9	2.9	14.0	2.6	0.59	-0.20	-35.40
2,050.0	0.93	74.38	2,049.9	3.0	14.4	2.7	0.67	0.24	-40.04
2,075.0	1.00	96.82	2,074.9	3.0	14.8	2.7	1.53	0.28	89.76
2,100.0	0.94	87.28	2,099.9	3.0	15.2	2.7	0.69	-0.24	-38.16
2,125.0	0.95	86.31	2,124.9	3.0	15.6	2.7	0.08	0.04	-3.88
2,150.0	0.97	91.43	2,149.9	3.0	16.1	2.7	0.35	0.08	20.48
2,175.0	0.98	94.12	2,174.9	3.0	16.5	2.7	0.19	0.04	10.76
2,200.0	0.94	92.43	2,199.9	3.0	16.9	2.6	0.20	-0.16	-6.76
2,225.0	1.00	90.81	2,224.9	3.0	17.3	2.6	0.26	0.24	-6.48
2,250.0	0.96	90.82	2,249.9	3.0	17.8	2.6	0.16	-0.16	0.04
2,275.0	0.98	88.84	2,274.9	3.0	18.2	2.6	0.16	0.08	-7.92
2,300.0	0.95	95.23	2,299.9	3.0	18.6	2.5	0.45	-0.12	25.56
2,325.0	0.97	93.48	2,324.9	2.9	19.0	2.5	0.14	0.08	-7.00

Survey Report

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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)
2,350.0	1.03	92.30	2,349.9	2.9	19.4	2.5	0.25	0.24	-4.72
2,375.0	0.95	87.16	2,374.9	2.9	19.9	2.5	0.48	-0.32	-20.56
2,400.0	0.88	87.81	2,399.9	2.9	20.3	2.5	0.28	-0.28	2.60
2,425.0	0.57	106.32	2,424.9	2.9	20.6	2.4	1.54	-1.24	74.04
2,450.0	0.33	151.74	2,449.9	2.8	20.7	2.3	1.65	-0.96	181.68
2,475.0	0.33	188.22	2,474.9	2.7	20.8	2.2	0.83	0.00	145.92
2,500.0	0.37	211.60	2,499.9	2.5	20.7	2.1	0.59	0.16	93.52
2,525.0	0.45	220.89	2,524.9	2.4	20.6	1.9	0.42	0.32	37.16
2,550.0	0.48	219.07	2,549.9	2.2	20.5	1.8	0.13	0.12	-7.28
2,575.0	0.59	217.73	2,574.9	2.1	20.3	1.6	0.44	0.44	-5.36
2,600.0	0.58	225.42	2,599.9	1.9	20.2	1.4	0.32	-0.04	30.76
2,625.0	0.59	218.72	2,624.9	1.7	20.0	1.2	0.28	0.04	-26.80
2,650.0	0.58	211.62	2,649.9	1.5	19.8	1.0	0.29	-0.04	-28.40
2,675.0	0.53	217.12	2,674.9	1.3	19.7	0.8	0.29	-0.20	22.00
2,700.0	0.63	220.40	2,699.9	1.1	19.6	0.6	0.42	0.40	13.12
2,725.0	0.66	224.27	2,724.9	0.9	19.4	0.4	0.21	0.12	15.48
2,750.0	0.74	225.79	2,749.9	0.6	19.1	0.2	0.33	0.32	6.08
2,775.0	0.74	225.25	2,774.9	0.4	18.9	0.0	0.03	0.00	-2.16
2,800.0	0.75	229.87	2,799.9	0.2	18.7	-0.2	0.24	0.04	18.48
2,825.0	0.69	228.32	2,824.9	0.0	18.4	-0.4	0.25	-0.24	-6.20
2,850.0	0.73	231.09	2,849.9	-0.2	18.2	-0.6	0.21	0.16	11.08
2,875.0	0.79	231.11	2,874.9	-0.4	17.9	-0.8	0.24	0.24	0.08
2,900.0	0.75	224.68	2,899.9	-0.6	17.7	-1.0	0.38	-0.16	-25.72
2,925.0	0.77	221.56	2,924.9	-0.9	17.5	-1.3	0.18	0.08	-12.48
2,950.0	0.76	229.18	2,949.9	-1.1	17.2	-1.5	0.41	-0.04	30.48
2,975.0	0.66	228.54	2,974.9	-1.3	17.0	-1.7	0.40	-0.40	-2.56
3,000.0	0.51	215.50	2,999.9	-1.5	16.8	-1.9	0.80	-0.60	-52.16
3,025.0	0.53	211.46	3,024.8	-1.7	16.7	-2.1	0.17	0.08	-16.16
3,050.0	0.30	199.26	3,049.8	-1.9	16.6	-2.2	0.98	-0.92	-48.80
3,075.0	0.40	157.31	3,074.8	-2.0	16.6	-2.4	1.07	0.40	-167.80
3,100.0	0.65	137.93	3,099.8	-2.2	16.8	-2.6	1.21	1.00	-77.52
3,125.0	0.93	121.06	3,124.8	-2.4	17.0	-2.8	1.44	1.12	-67.48
3,150.0	1.09	116.62	3,149.8	-2.6	17.4	-3.0	0.71	0.64	-17.76
3,175.0	1.08	113.66	3,174.8	-2.8	17.8	-3.2	0.23	-0.04	-11.84
3,200.0	1.31	121.08	3,199.8	-3.0	18.3	-3.5	1.11	0.92	29.68
3,225.0	1.22	125.81	3,224.8	-3.3	18.8	-3.8	0.55	-0.36	18.92
3,250.0	1.42	131.62	3,249.8	-3.7	19.2	-4.1	0.96	0.80	23.24
3,275.0	1.44	127.89	3,274.8	-4.1	19.7	-4.6	0.38	0.08	-14.92
3,300.0	1.47	133.16	3,299.8	-4.5	20.2	-5.0	0.55	0.12	21.08
3,325.0	1.52	141.99	3,324.8	-5.0	20.6	-5.5	0.94	0.20	35.32
3,350.0	1.60	145.53	3,349.8	-5.6	21.0	-6.0	0.50	0.32	14.16
3,375.0	1.58	147.75	3,374.8	-6.1	21.4	-6.6	0.26	-0.08	8.88

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3,400.0	1.71	145.39	3,399.8	-6.7	21.8	-7.2	0.59	0.52	-9.44
3,425.0	1.75	147.65	3,424.8	-7.4	22.2	-7.9	0.32	0.16	9.04
3,450.0	1.58	146.82	3,449.7	-8.0	22.6	-8.5	0.69	-0.68	-3.32
3,475.0	1.63	148.01	3,474.7	-8.6	23.0	-9.1	0.24	0.20	4.76
3,500.0	1.33	152.28	3,499.7	-9.1	23.3	-9.6	1.28	-1.20	17.08
3,525.0	1.21	161.69	3,524.7	-9.6	23.5	-10.2	0.96	-0.48	37.64
3,550.0	1.04	168.36	3,549.7	-10.1	23.6	-10.6	0.86	-0.68	26.68
3,575.0	0.73	185.52	3,574.7	-10.5	23.7	-11.0	1.62	-1.24	68.64
3,600.0	0.33	248.58	3,599.7	-10.7	23.6	-11.2	2.60	-1.60	252.24
3,625.0	0.39	293.23	3,624.7	-10.7	23.4	-11.2	1.12	0.24	178.60
3,650.0	0.55	311.22	3,649.7	-10.5	23.3	-11.1	0.86	0.64	71.96
3,675.0	0.48	314.83	3,674.7	-10.4	23.1	-10.9	0.31	-0.28	14.44
3,700.0	0.54	313.37	3,699.7	-10.2	23.0	-10.8	0.25	0.24	-5.84
3,725.0	0.56	325.91	3,724.7	-10.1	22.8	-10.6	0.49	0.08	50.16
3,750.0	0.46	330.41	3,749.7	-9.9	22.7	-10.4	0.43	-0.40	18.00
3,775.0	0.52	329.46	3,774.7	-9.7	22.6	-10.2	0.24	0.24	-3.80
3,800.0	0.34	351.98	3,799.7	-9.5	22.5	-10.0	0.97	-0.72	90.08
3,825.0	0.46	354.79	3,824.7	-9.3	22.5	-9.8	0.49	0.48	11.24
3,850.0	0.48	347.93	3,849.7	-9.1	22.5	-9.6	0.24	0.08	-27.44
3,875.0	0.60	323.33	3,874.7	-8.9	22.4	-9.4	1.03	0.48	-98.40
3,900.0	0.97	302.31	3,899.7	-8.7	22.1	-9.2	1.85	1.48	-84.08
3,925.0	1.13	295.35	3,924.7	-8.5	21.7	-9.0	0.82	0.64	-27.84
3,950.0	1.21	296.39	3,949.7	-8.3	21.2	-8.7	0.33	0.32	4.16
3,975.0	1.25	293.65	3,974.7	-8.0	20.8	-8.5	0.28	0.16	-10.96
4,000.0	1.22	302.88	3,999.7	-7.8	20.3	-8.2	0.80	-0.12	36.92
4,025.0	1.21	307.72	4,024.7	-7.5	19.8	-7.9	0.41	-0.04	19.36
4,050.0	1.09	317.11	4,049.7	-7.1	19.5	-7.6	0.89	-0.48	37.56
4,075.0	1.21	318.82	4,074.7	-6.8	19.1	-7.2	0.50	0.48	6.84
4,100.0	1.19	322.20	4,099.7	-6.4	18.8	-6.8	0.29	-0.08	13.52
4,125.0	1.00	325.86	4,124.7	-6.0	18.5	-6.4	0.81	-0.76	14.64
4,150.0	1.20	325.52	4,149.6	-5.6	18.3	-6.0	0.80	0.80	-1.36
4,175.0	1.03	322.56	4,174.6	-5.2	18.0	-5.6	0.72	-0.68	-11.84
4,200.0	1.10	326.54	4,199.6	-4.8	17.7	-5.2	0.41	0.28	15.92
4,225.0	1.00	325.59	4,224.6	-4.4	17.4	-4.8	0.41	-0.40	-3.80
4,250.0	1.03	327.78	4,249.6	-4.1	17.2	-4.5	0.20	0.12	8.76
4,275.0	1.12	328.63	4,274.6	-3.7	17.0	-4.0	0.37	0.36	3.40
4,300.0	1.08	328.40	4,299.6	-3.3	16.7	-3.6	0.16	-0.16	-0.92
4,325.0	0.99	327.42	4,324.6	-2.9	16.5	-3.2	0.37	-0.36	-3.92
4,350.0	1.18	328.20	4,349.6	-2.5	16.2	-2.8	0.76	0.76	3.12
4,375.0	1.14	329.56	4,374.6	-2.0	16.0	-2.4	0.19	-0.16	5.44
4,400.0	1.16	322.49	4,399.6	-1.6	15.7	-2.0	0.57	0.08	-28.28
4,425.0	1.24	320.60	4,424.6	-1.2	15.3	-1.6	0.36	0.32	-7.56

Survey Report

Company: NORTHERN DELAWARE BASIN
Project: LEA COUNTY, NM

Site: ZEUS

Well: LITTLE BEAR FED COM #1H

Wellbore: ST01

Design: AWP-ST01

Local Co-ordinate Reference:

TVD Reference:

MD Reference:

North Reference:

Survey Calculation Method:

Database:

Well LITTLE BEAR FED COM #1H

RKB=3791+26 @ 3817.0usft (INDEPENDENCE 205)

RKB=3791+26 @ 3817.0usft (INDEPENDENCE 205)

Grid

Minimum Curvature

EDM_Users

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)
4,450.0	1.27	319.87	4,449.6	-0.8	15.0	-1.1	0.14	0.12	-2.92
4,475.0	1.23	317.20	4,474.6	-0.4	14.6	-0.7	0.28	-0.16	-10.68
4,500.0	1.28	320.09	4,499.6	0.0	14.3	-0.3	0.32	0.20	11.56
4,525.0	1.18	320.29	4,524.6	0.4	13.9	0.1	0.40	-0.40	0.80
4,550.0	1.32	320.51	4,549.6	0.9	13.6	0.6	0.56	0.56	0.88
4,575.0	1.24	323.50	4,574.6	1.3	13.2	1.0	0.42	-0.32	11.96
4,600.0	1.15	319.87	4,599.6	1.7	12.9	1.4	0.47	-0.36	-14.52
4,625.0	1.15	322.44	4,624.5	2.1	12.6	1.8	0.21	0.00	10.28
4,650.0	1.11	322.80	4,649.5	2.5	12.3	2.2	0.16	-0.16	1.44
4,675.0	1.00	321.05	4,674.5	2.9	12.0	2.6	0.46	-0.44	-7.00
4,700.0	1.07	321.84	4,699.5	3.2	11.7	2.9	0.29	0.28	3.16
4,725.0	1.05	316.14	4,724.5	3.6	11.4	3.3	0.43	-0.08	-22.80
4,750.0	0.96	314.75	4,749.5	3.9	11.1	3.6	0.37	-0.36	-5.56
4,775.0	0.91	317.35	4,774.5	4.2	10.8	3.9	0.26	-0.20	10.40
4,800.0	0.94	314.91	4,799.5	4.5	10.6	4.2	0.20	0.12	-9.76
4,825.0	0.98	317.25	4,824.5	4.8	10.3	4.5	0.22	0.16	9.36
4,850.0	1.07	319.46	4,849.5	5.1	10.0	4.9	0.39	0.36	8.84
4,875.0	0.99	317.57	4,874.5	5.4	9.7	5.2	0.35	-0.32	-7.56
4,900.0	0.97	315.03	4,899.5	5.7	9.4	5.5	0.19	-0.08	-10.16
4,925.0	1.04	314.41	4,924.5	6.0	9.1	5.8	0.28	0.28	-2.48
4,950.0	0.92	314.80	4,949.5	6.3	8.8	6.1	0.48	-0.48	1.56
4,975.0	1.01	322.66	4,974.5	6.7	8.5	6.5	0.64	0.36	31.44
5,000.0	0.95	319.71	4,999.5	7.0	8.2	6.8	0.31	-0.24	-11.80
5,025.0	0.88	323.36	5,024.5	7.3	8.0	7.1	0.36	-0.28	14.60
5,050.0	1.02	321.70	5,049.5	7.6	7.7	7.5	0.57	0.56	-8.64
5,075.0	0.99	321.06	5,074.5	8.0	7.4	7.8	0.13	-0.12	-2.56
5,100.0	0.95	321.21	5,099.5	8.3	7.2	8.1	0.16	-0.16	0.60
5,125.0	1.01	321.36	5,124.5	8.6	6.9	8.5	0.24	0.24	0.60
5,150.0	0.99	317.31	5,149.5	9.0	6.6	8.8	0.29	-0.08	-16.20
5,175.0	1.06	317.76	5,174.5	9.3	6.3	9.2	0.28	0.28	1.80
5,200.0	1.05	317.14	5,199.5	9.6	6.0	9.5	0.06	-0.04	-2.48
5,225.0	1.02	320.37	5,224.5	10.0	5.7	9.8	0.26	-0.12	12.92
5,250.0	1.06	319.38	5,249.5	10.3	5.4	10.2	0.18	0.16	-3.96
5,275.0	1.04	313.55	5,274.4	10.7	5.1	10.5	0.43	-0.08	-23.32
5,300.0	1.08	314.34	5,299.4	11.0	4.8	10.9	0.17	0.16	3.16
5,325.0	1.11	318.93	5,324.4	11.3	4.5	11.2	0.37	0.12	18.36
5,350.0	0.95	318.79	5,349.4	11.7	4.2	11.6	0.64	-0.64	-0.56
5,375.0	1.05	318.33	5,374.4	12.0	3.9	11.9	0.40	0.40	-1.84
5,400.0	1.13	321.38	5,399.4	12.4	3.6	12.3	0.40	0.32	12.20
5,425.0	1.02	314.48	5,424.4	12.7	3.3	12.6	0.68	-0.44	-27.60
5,450.0	0.93	310.10	5,449.4	13.0	2.9	12.9	0.47	-0.36	-17.52
5,475.0	1.12	310.36	5,474.4	13.3	2.6	13.2	0.76	0.76	1.04

Survey Report

Company: NORTHERN DELAWARE BASIN
Project: LEA COUNTY, NM
Site: ZEUS
Well: LITTLE BEAR FED COM #1H
Wellbore: ST01
Design: AWP-ST01

Local Co-ordinate Reference: Well LITTLE BEAR FED COM #1H
TVD Reference: RKB=3791+26 @ 3817.0usft (INDEPENDENCE 205)
MD Reference: RKB=3791+26 @ 3817.0usft (INDEPENDENCE 205)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM_Users

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)
5,500.0	1.05	315.70	5,499.4	13.6	2.2	13.5	0.49	-0.28	21.36
5,525.0	1.07	312.52	5,524.4	13.9	1.9	13.9	0.25	0.08	-12.72
5,550.0	1.08	312.63	5,549.4	14.2	1.6	14.2	0.04	0.04	0.44
5,575.0	1.03	310.93	5,574.4	14.5	1.2	14.5	0.24	-0.20	-6.80
5,600.0	1.07	312.03	5,599.4	14.9	0.9	14.8	0.18	0.16	4.40
5,625.0	1.15	312.90	5,624.4	15.2	0.5	15.2	0.33	0.32	3.48
5,650.0	1.16	313.81	5,649.4	15.5	0.2	15.5	0.08	0.04	3.64
5,675.0	1.19	315.20	5,674.4	15.9	-0.2	15.9	0.17	0.12	5.56
5,700.0	1.08	309.15	5,699.4	16.2	-0.6	16.2	0.65	-0.44	-24.20
5,725.0	1.16	309.67	5,724.4	16.5	-0.9	16.5	0.32	0.32	2.08
5,750.0	1.09	309.99	5,749.4	16.8	-1.3	16.9	0.28	-0.28	1.28
5,775.0	1.09	310.61	5,774.4	17.1	-1.7	17.2	0.05	0.00	2.48
5,800.0	1.02	309.41	5,799.4	17.4	-2.0	17.5	0.29	-0.28	-4.80
5,825.0	1.08	311.18	5,824.4	17.7	-2.4	17.8	0.27	0.24	7.08
5,850.0	1.10	314.23	5,849.3	18.1	-2.7	18.1	0.25	0.08	12.20
5,875.0	0.78	290.31	5,874.3	18.3	-3.1	18.4	2.00	-1.28	-95.68
5,900.0	0.91	234.91	5,899.3	18.2	-3.4	18.3	3.18	0.52	-221.60
5,925.0	1.47	209.83	5,924.3	17.8	-3.7	17.9	3.01	2.24	-100.32
5,950.0	1.92	194.77	5,949.3	17.2	-4.0	17.2	2.52	1.80	-60.24
5,975.0	2.34	183.34	5,974.3	16.2	-4.1	16.3	2.38	1.68	-45.72
6,000.0	2.68	176.75	5,999.3	15.2	-4.1	15.2	1.78	1.36	-26.36
6,025.0	3.55	172.19	6,024.2	13.8	-4.0	13.9	3.62	3.48	-18.24
6,050.0	3.83	172.14	6,049.2	12.2	-3.8	12.3	1.12	1.12	-0.20
6,075.0	3.94	172.15	6,074.1	10.5	-3.5	10.6	0.44	0.44	0.04
6,100.0	4.02	171.24	6,099.1	8.8	-3.3	8.9	0.41	0.32	-3.64
6,125.0	4.34	169.63	6,124.0	7.0	-3.0	7.1	1.36	1.28	-6.44
6,150.0	4.38	169.33	6,148.9	5.1	-2.6	5.2	0.18	0.16	-1.20
6,175.0	4.75	171.44	6,173.9	3.2	-2.3	3.2	1.63	1.48	8.44
6,200.0	5.25	171.95	6,198.8	1.0	-2.0	1.1	2.01	2.00	2.04
6,225.0	5.70	170.84	6,223.7	-1.3	-1.6	-1.3	1.85	1.80	-4.44
6,250.0	5.67	171.78	6,248.5	-3.8	-1.2	-3.7	0.39	-0.12	3.76
6,275.0	5.75	171.49	6,273.4	-6.2	-0.9	-6.2	0.34	0.32	-1.16
6,300.0	5.87	170.62	6,298.3	-8.7	-0.5	-8.7	0.60	0.48	-3.48
6,325.0	5.85	172.73	6,323.1	-11.3	-0.1	-11.3	0.87	-0.08	8.44
6,350.0	5.84	174.39	6,348.0	-13.8	0.2	-13.8	0.68	-0.04	6.64
6,375.0	5.87	178.77	6,372.9	-16.3	0.3	-16.3	1.79	0.12	17.52
6,400.0	6.03	181.56	6,397.7	-18.9	0.3	-18.9	1.32	0.64	11.16
6,425.0	6.08	183.42	6,422.6	-21.6	0.2	-21.6	0.81	0.20	7.44
6,450.0	6.19	183.65	6,447.5	-24.2	0.0	-24.2	0.45	0.44	0.92
6,475.0	6.12	185.03	6,472.3	-26.9	-0.2	-26.9	0.65	-0.28	5.52
6,500.0	6.17	184.76	6,497.2	-29.6	-0.4	-29.6	0.23	0.20	-1.08
6,525.0	6.17	184.44	6,522.0	-32.2	-0.6	-32.2	0.14	0.00	-1.28

Survey Report

Company: NORTHERN DELAWARE BASIN
Project: LEA COUNTY, NM

Site: ZEUS

Well: LITTLE BEAR FED COM #1H

Wellbore: ST01

Design: AWP-ST01

Local Co-ordinate Reference:

TVD Reference:

MD Reference:

North Reference:

Survey Calculation Method:

Database:

Well LITTLE BEAR FED COM #1H

RKB=3791+26 @ 3817.0usft (INDEPENDENCE 205)

RKB=3791+26 @ 3817.0usft (INDEPENDENCE 205)

Grid

Minimum Curvature

EDM_Users

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)
6,550.0	6.33	183.51	6,546.9	-35.0	-0.8	-34.9	0.76	0.64	-3.72
6,575.0	6.20	184.25	6,571.7	-37.7	-1.0	-37.7	0.61	-0.52	2.96
6,600.0	6.30	183.46	6,596.6	-40.4	-1.2	-40.4	0.53	0.40	-3.16
6,625.0	6.34	185.29	6,621.4	-43.1	-1.4	-43.1	0.82	0.16	7.32
6,650.0	6.38	185.29	6,646.3	-45.9	-1.6	-45.9	0.16	0.16	0.00
6,675.0	6.25	185.17	6,671.1	-48.6	-1.9	-48.6	0.52	-0.52	-0.48
6,700.0	6.28	184.83	6,696.0	-51.4	-2.1	-51.3	0.19	0.12	-1.36
6,725.0	6.32	185.21	6,720.8	-54.1	-2.4	-54.0	0.23	0.16	1.52
6,750.0	6.21	185.68	6,745.7	-56.8	-2.6	-56.7	0.49	-0.44	1.88
6,775.0	6.24	185.72	6,770.5	-59.5	-2.9	-59.4	0.12	0.12	0.16
6,800.0	6.23	184.93	6,795.4	-62.2	-3.1	-62.1	0.35	-0.04	-3.16
6,825.0	6.06	186.97	6,820.2	-64.9	-3.4	-64.8	1.11	-0.68	8.16
6,850.0	6.21	186.91	6,845.1	-67.5	-3.7	-67.4	0.60	0.60	-0.24
6,875.0	6.14	186.19	6,870.0	-70.2	-4.1	-70.1	0.42	-0.28	-2.88
6,900.0	6.20	186.39	6,894.8	-72.9	-4.3	-72.7	0.25	0.24	0.80
6,925.0	6.10	186.28	6,919.7	-75.5	-4.6	-75.4	0.40	-0.40	-0.44
6,950.0	6.17	187.18	6,944.5	-78.2	-5.0	-78.0	0.48	0.28	3.60
6,975.0	6.15	187.24	6,969.4	-80.8	-5.3	-80.7	0.08	-0.08	0.24
7,000.0	6.21	187.11	6,994.2	-83.5	-5.6	-83.4	0.25	0.24	-0.52
7,025.0	6.15	185.96	7,019.1	-86.2	-5.9	-86.0	0.55	-0.24	-4.60
7,050.0	6.13	188.16	7,043.9	-88.8	-6.3	-88.7	0.94	-0.08	8.80
7,075.0	6.17	186.96	7,068.8	-91.5	-6.6	-91.3	0.54	0.16	-4.80
7,100.0	6.13	188.04	7,093.7	-94.1	-7.0	-94.0	0.49	-0.16	4.32
7,125.0	6.22	188.61	7,118.5	-96.8	-7.4	-96.6	0.44	0.36	2.28
7,150.0	6.15	189.01	7,143.4	-99.5	-7.8	-99.3	0.33	-0.28	1.60
7,175.0	6.13	189.37	7,168.2	-102.1	-8.2	-101.9	0.17	-0.08	1.44
7,200.0	6.13	188.46	7,193.1	-104.7	-8.6	-104.5	0.39	0.00	-3.64
7,225.0	6.12	188.85	7,217.9	-107.4	-9.0	-107.1	0.17	-0.04	1.56
7,250.0	6.10	189.34	7,242.8	-110.0	-9.4	-109.8	0.22	-0.08	1.96
7,275.0	5.99	190.54	7,267.7	-112.6	-9.9	-112.3	0.67	-0.44	4.80
7,300.0	6.07	187.99	7,292.5	-115.2	-10.3	-114.9	1.12	0.32	-10.20
7,325.0	5.97	189.53	7,317.4	-117.8	-10.7	-117.5	0.76	-0.40	6.16
7,350.0	5.91	189.10	7,342.2	-120.3	-11.1	-120.1	0.30	-0.24	-1.72
7,375.0	5.74	190.32	7,367.1	-122.8	-11.6	-122.5	0.84	-0.68	4.88
7,400.0	5.85	190.58	7,392.0	-125.3	-12.0	-125.0	0.45	0.44	1.04
7,425.0	5.68	190.99	7,416.9	-127.8	-12.5	-127.5	0.70	-0.68	1.64
7,450.0	5.72	190.94	7,441.7	-130.2	-13.0	-129.9	0.16	0.16	-0.20
7,475.0	5.77	190.79	7,466.6	-132.7	-13.4	-132.3	0.21	0.20	-0.60
7,500.0	5.89	190.41	7,491.5	-135.2	-13.9	-134.8	0.50	0.48	-1.52
7,525.0	5.83	191.24	7,516.4	-137.7	-14.4	-137.3	0.42	-0.24	3.32
7,550.0	5.78	190.53	7,541.2	-140.2	-14.8	-139.8	0.35	-0.20	-2.84
7,575.0	5.73	191.30	7,566.1	-142.6	-15.3	-142.2	0.37	-0.20	3.08

Survey Report

Company: NORTHERN DELAWARE BASIN
Project: LEA COUNTY, NM
Site: ZEUS
Well: LITTLE BEAR FED COM #1H
Wellbore: ST01
Design: AWP-ST01

Local Co-ordinate Reference: Well LITTLE BEAR FED COM #1H
TVD Reference: RKB=3791+26 @ 3817.0usft (INDEPENDENCE 205)
MD Reference: RKB=3791+26 @ 3817.0usft (INDEPENDENCE 205)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM_Users

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)
7,600.0	5.53	190.02	7,591.0	-145.0	-15.8	-144.6	0.94	-0.80	-5.12
7,625.0	5.47	191.04	7,615.9	-147.4	-16.2	-147.0	0.46	-0.24	4.08
7,650.0	5.39	189.91	7,640.8	-149.7	-16.6	-149.3	0.53	-0.32	-4.52
7,675.0	5.30	191.06	7,665.6	-152.0	-17.1	-151.6	0.56	-0.36	4.60
7,700.0	5.31	191.12	7,690.5	-154.3	-17.5	-153.8	0.05	0.04	0.24
7,725.0	5.20	191.59	7,715.4	-156.5	-18.0	-156.1	0.47	-0.44	1.88
7,750.0	5.02	191.99	7,740.3	-158.7	-18.4	-158.2	0.73	-0.72	1.60
7,775.0	4.89	191.70	7,765.2	-160.8	-18.9	-160.3	0.53	-0.52	-1.16
7,800.0	4.77	192.59	7,790.1	-162.9	-19.3	-162.4	0.57	-0.48	3.56
7,825.0	4.66	191.34	7,815.1	-164.9	-19.7	-164.4	0.60	-0.44	-5.00
7,850.0	4.64	190.97	7,840.0	-166.9	-20.1	-166.4	0.14	-0.08	-1.48
7,875.0	4.70	191.79	7,864.9	-168.9	-20.5	-168.4	0.36	0.24	3.28
7,900.0	4.30	191.39	7,889.8	-170.8	-20.9	-170.3	1.60	-1.60	-1.60
7,925.0	4.50	190.33	7,914.7	-172.7	-21.3	-172.1	0.86	0.80	-4.24
7,950.0	4.21	192.75	7,939.7	-174.5	-21.7	-174.0	1.37	-1.16	9.68
7,975.0	4.12	190.71	7,964.6	-176.3	-22.0	-175.8	0.69	-0.36	-8.16
8,000.0	3.99	191.51	7,989.5	-178.0	-22.4	-177.5	0.57	-0.52	3.20
8,025.0	3.71	192.34	8,014.5	-179.7	-22.7	-179.1	1.14	-1.12	3.32
8,050.0	3.76	192.98	8,039.4	-181.3	-23.1	-180.7	0.26	0.20	2.56
8,075.0	3.59	193.29	8,064.4	-182.8	-23.4	-182.3	0.68	-0.68	1.24
8,100.0	3.37	197.49	8,089.3	-184.3	-23.8	-183.7	1.35	-0.88	16.80
8,125.0	3.31	198.82	8,114.3	-185.7	-24.3	-185.1	0.39	-0.24	5.32
8,150.0	3.11	200.25	8,139.3	-187.0	-24.8	-186.4	0.86	-0.80	5.72
8,175.0	2.66	204.08	8,164.2	-188.2	-25.2	-187.5	1.96	-1.80	15.32
8,200.0	2.21	212.23	8,189.2	-189.1	-25.7	-188.5	2.27	-1.80	32.60
8,225.0	2.15	215.19	8,214.2	-189.9	-26.2	-189.3	0.51	-0.24	11.84
8,250.0	2.05	218.58	8,239.2	-190.6	-26.8	-190.0	0.64	-0.40	13.56
8,275.0	1.81	228.02	8,264.2	-191.2	-27.4	-190.6	1.59	-0.96	37.76
8,300.0	1.45	241.22	8,289.1	-191.7	-27.9	-191.0	2.07	-1.44	52.80
8,325.0	1.47	252.21	8,314.1	-191.9	-28.5	-191.2	1.12	0.08	43.96
8,350.0	1.28	255.80	8,339.1	-192.1	-29.1	-191.4	0.83	-0.76	14.36
8,375.0	1.02	269.25	8,364.1	-192.1	-29.6	-191.4	1.49	-1.04	53.80
8,400.0	0.77	283.52	8,389.1	-192.1	-30.0	-191.4	1.33	-1.00	57.08
8,425.0	0.70	294.95	8,414.1	-192.0	-30.3	-191.3	0.65	-0.28	45.72
8,450.0	0.64	298.32	8,439.1	-191.9	-30.5	-191.1	0.29	-0.24	13.48
8,475.0	0.63	295.88	8,464.1	-191.8	-30.8	-191.0	0.12	-0.04	-9.76
8,500.0	0.62	295.45	8,489.1	-191.6	-31.0	-190.9	0.04	-0.04	-1.72
8,525.0	0.62	299.98	8,514.1	-191.5	-31.3	-190.7	0.20	0.00	18.12
8,550.0	0.62	297.78	8,539.1	-191.4	-31.5	-190.6	0.10	0.00	-8.80
8,575.0	0.55	298.50	8,564.1	-191.3	-31.7	-190.5	0.28	-0.28	2.88
8,600.0	0.66	299.77	8,589.1	-191.1	-32.0	-190.4	0.44	0.44	5.08
8,625.0	0.62	292.54	8,614.1	-191.0	-32.2	-190.2	0.36	-0.16	-28.92

Survey Report

Company: NORTHERN DELAWARE BASIN
Project: LEA COUNTY, NM
Site: ZEUS
Well: LITTLE BEAR FED COM #1H
Wellbore: ST01
Design: AWP-ST01

Local Co-ordinate Reference: Well LITTLE BEAR FED COM #1H
TVD Reference: RKB=3791+26 @ 3817.0usft (INDEPENDENCE 205)
MD Reference: RKB=3791+26 @ 3817.0usft (INDEPENDENCE 205)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM_Users

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)
8,650.0	0.67	300.37	8,639.1	-190.9	-32.5	-190.1	0.40	0.20	31.32
8,675.0	0.64	296.40	8,664.1	-190.7	-32.7	-190.0	0.22	-0.12	-15.88
8,700.0	0.71	296.49	8,689.1	-190.6	-33.0	-189.8	0.28	0.28	0.36
8,725.0	0.78	299.42	8,714.1	-190.5	-33.3	-189.7	0.32	0.28	11.72
8,750.0	0.79	299.49	8,739.1	-190.3	-33.6	-189.5	0.04	0.04	0.28
8,775.0	0.91	292.28	8,764.1	-190.1	-33.9	-189.3	0.64	0.48	-28.84
8,800.0	0.83	297.43	8,789.1	-190.0	-34.2	-189.1	0.45	-0.32	20.60
8,825.0	0.76	295.18	8,814.1	-189.8	-34.6	-189.0	0.31	-0.28	-9.00
8,850.0	0.70	293.53	8,839.1	-189.7	-34.8	-188.8	0.25	-0.24	-6.60
8,875.0	0.72	297.44	8,864.1	-189.6	-35.1	-188.7	0.21	0.08	15.64
8,900.0	0.54	288.36	8,889.1	-189.4	-35.4	-188.6	0.82	-0.72	-36.32
8,925.0	0.40	283.47	8,914.1	-189.4	-35.6	-188.5	0.58	-0.56	-19.56
8,950.0	0.20	330.88	8,939.1	-189.3	-35.7	-188.5	1.21	-0.80	189.64
8,975.0	0.24	77.43	8,964.1	-189.3	-35.6	-188.4	1.41	0.16	426.20
9,000.0	0.23	91.23	8,989.1	-189.3	-35.5	-188.4	0.23	-0.04	55.20
9,025.0	0.20	102.29	9,014.1	-189.3	-35.5	-188.4	0.20	-0.12	44.24
9,050.0	0.23	66.99	9,039.1	-189.3	-35.4	-188.4	0.53	0.12	-141.20
9,075.0	0.13	109.94	9,064.1	-189.3	-35.3	-188.4	0.65	-0.40	171.80
9,100.0	0.16	134.97	9,089.1	-189.3	-35.2	-188.4	0.28	0.12	100.12
9,125.0	0.31	173.71	9,114.1	-189.4	-35.2	-188.5	0.84	0.60	154.96
9,150.0	0.39	188.01	9,139.1	-189.5	-35.2	-188.7	0.47	0.32	57.20
9,175.0	0.52	193.40	9,164.1	-189.7	-35.3	-188.9	0.55	0.52	21.56
9,200.0	0.62	178.41	9,189.1	-190.0	-35.3	-189.1	0.71	0.40	-59.96
9,225.0	0.56	204.74	9,214.1	-190.2	-35.3	-189.4	1.10	-0.24	105.32
9,250.0	0.52	197.26	9,239.1	-190.4	-35.4	-189.6	0.32	-0.16	-29.92
9,275.0	0.64	200.94	9,264.1	-190.7	-35.5	-189.8	0.50	0.48	14.72
9,300.0	0.64	193.87	9,289.1	-190.9	-35.6	-190.1	0.32	0.00	-28.28
9,325.0	0.63	211.44	9,314.1	-191.2	-35.7	-190.3	0.78	-0.04	70.28
9,350.0	0.66	214.81	9,339.1	-191.4	-35.8	-190.6	0.19	0.12	13.48
9,375.0	0.59	220.67	9,364.1	-191.7	-36.0	-190.8	0.38	-0.28	23.44
9,400.0	0.85	214.57	9,389.1	-191.9	-36.2	-191.0	1.08	1.04	-24.40
9,425.0	0.77	217.66	9,414.1	-192.2	-36.4	-191.3	0.36	-0.32	12.36
9,450.0	0.96	216.67	9,439.1	-192.5	-36.6	-191.6	0.76	0.76	-3.96
9,475.0	1.06	217.42	9,464.1	-192.8	-36.9	-192.0	0.40	0.40	3.00
9,500.0	1.16	216.93	9,489.1	-193.2	-37.2	-192.3	0.40	0.40	-1.96
9,525.0	1.24	220.83	9,514.0	-193.6	-37.5	-192.7	0.46	0.32	15.60
9,550.0	1.36	226.66	9,539.0	-194.0	-37.9	-193.1	0.71	0.48	23.32
9,575.0	1.34	226.74	9,564.0	-194.4	-38.3	-193.5	0.08	-0.08	0.32
9,600.0	1.45	225.28	9,589.0	-194.9	-38.8	-193.9	0.46	0.44	-5.84
9,625.0	0.98	228.96	9,614.0	-195.2	-39.2	-194.3	1.90	-1.88	14.72
9,650.0	0.92	249.20	9,639.0	-195.4	-39.5	-194.5	1.36	-0.24	80.96
9,675.0	0.85	257.63	9,664.0	-195.6	-39.9	-194.6	0.59	-0.28	33.72

Survey Report

Company: NORTHERN DELAWARE BASIN
Project: LEA COUNTY, NM
Site: ZEUS
Well: LITTLE BEAR FED COM #1H
Wellbore: ST01
Design: AWP-ST01

Local Co-ordinate Reference: Well LITTLE BEAR FED COM #1H
TVD Reference: RKB=3791+26 @ 3817.0usft (INDEPENDENCE 205)
MD Reference: RKB=3791+26 @ 3817.0usft (INDEPENDENCE 205)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM_Users

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)
9,700.0	0.72	273.93	9,689.0	-195.6	-40.2	-194.6	1.03	-0.52	65.20
9,725.0	0.74	330.97	9,714.0	-195.4	-40.4	-194.5	2.79	0.08	228.16
9,750.0	0.86	351.69	9,739.0	-195.1	-40.6	-194.1	1.24	0.48	82.88
9,775.0	0.88	354.57	9,764.0	-194.7	-40.6	-193.8	0.19	0.08	11.52
9,800.0	0.69	332.87	9,789.0	-194.4	-40.7	-193.4	1.40	-0.76	-86.80
9,825.0	0.44	329.73	9,814.0	-194.2	-40.8	-193.2	1.01	-1.00	-12.56
9,850.0	0.45	320.16	9,839.0	-194.0	-40.9	-193.0	0.30	0.04	-38.28
9,875.0	0.44	289.86	9,864.0	-193.9	-41.1	-192.9	0.93	-0.04	-121.20
9,900.0	0.51	292.48	9,889.0	-193.8	-41.3	-192.9	0.29	0.28	10.48
9,925.0	0.49	285.73	9,914.0	-193.8	-41.5	-192.8	0.25	-0.08	-27.00
9,950.0	0.52	277.90	9,939.0	-193.7	-41.7	-192.7	0.30	0.12	-31.32
9,975.0	0.35	253.67	9,964.0	-193.7	-41.9	-192.7	0.99	-0.68	-96.92
10,000.0	0.55	259.46	9,989.0	-193.8	-42.1	-192.8	0.82	0.80	23.16
10,025.0	0.48	268.64	10,014.0	-193.8	-42.3	-192.8	0.43	-0.28	36.72
10,050.0	0.49	272.44	10,039.0	-193.8	-42.5	-192.8	0.13	0.04	15.20
10,075.0	0.42	260.26	10,064.0	-193.8	-42.7	-192.8	0.48	-0.28	-48.72
10,100.0	0.41	238.97	10,089.0	-193.9	-42.9	-192.8	0.61	-0.04	-85.16
10,125.0	0.47	260.33	10,114.0	-193.9	-43.0	-192.9	0.69	0.24	85.44
10,128.2	0.48	263.19	10,117.2	-193.9	-43.1	-192.9	0.81	0.31	89.94
10,215.0	1.06	205.99	10,204.0	-194.7	-43.8	-193.7	1.03	0.67	-65.88
10,265.0	0.70	221.81	10,254.0	-195.3	-44.2	-194.3	0.86	-0.72	31.24
10,360.0	0.16	245.74	10,349.0	-195.8	-44.7	-194.8	0.59	-0.57	25.40
10,455.0	0.45	194.21	10,444.0	-196.3	-44.9	-195.2	0.39	0.31	-54.24
10,550.0	0.24	242.70	10,539.0	-196.7	-45.2	-195.6	0.36	-0.22	51.04
10,645.0	0.40	221.11	10,634.0	-197.0	-45.6	-196.0	0.21	0.17	-22.73
10,739.0	0.99	217.81	10,728.0	-197.9	-46.3	-196.8	0.63	0.63	-3.51
10,834.0	1.65	202.47	10,822.9	-199.8	-47.3	-198.7	0.78	0.69	-16.15
10,867.0	1.66	211.75	10,855.9	-200.7	-47.7	-199.6	0.81	0.03	28.14
10,898.0	3.64	226.28	10,886.9	-201.8	-48.7	-200.6	6.69	6.39	46.87
10,929.0	5.89	275.50	10,917.8	-202.3	-51.0	-201.1	14.39	7.26	158.77
10,960.0	7.43	326.47	10,948.6	-200.5	-53.7	-199.2	18.99	4.97	164.42
10,992.0	12.26	352.97	10,980.1	-195.4	-55.2	-194.1	20.33	15.09	82.81
11,026.0	18.39	353.21	11,012.9	-186.4	-56.3	-185.1	18.03	18.03	0.71
11,058.0	24.17	353.79	11,042.7	-174.9	-57.6	-173.6	18.07	18.06	1.81
11,089.0	29.76	354.84	11,070.3	-160.9	-59.0	-159.5	18.10	18.03	3.39
11,121.0	34.95	356.50	11,097.3	-143.9	-60.3	-142.4	16.45	16.22	5.19
11,152.0	38.52	358.78	11,122.2	-125.3	-61.0	-123.9	12.33	11.52	7.35
11,184.0	40.96	0.43	11,146.8	-104.9	-61.1	-103.5	8.31	7.63	5.16
11,216.0	42.39	0.57	11,170.7	-83.6	-61.0	-82.2	4.48	4.47	0.44
11,248.0	44.14	0.30	11,194.0	-61.7	-60.8	-60.3	5.50	5.47	-0.84
11,279.0	48.59	1.00	11,215.4	-39.2	-60.5	-37.9	14.45	14.35	2.26
11,311.0	52.07	1.69	11,235.8	-14.6	-60.0	-13.3	11.00	10.88	2.16

Survey Report

Company: NORTHERN DELAWARE BASIN
Project: LEA COUNTY, NM

Site: ZEUS

Well: LITTLE BEAR FED COM #1H

Wellbore: ST01

Design: AWP-ST01

Local Co-ordinate Reference:

TVD Reference:

MD Reference:

North Reference:

Survey Calculation Method:

Database:

Well LITTLE BEAR FED COM #1H

RKB=3791+26 @ 3817.0usft (INDEPENDENCE 205)

RKB=3791+26 @ 3817.0usft (INDEPENDENCE 205)

Grid

Minimum Curvature

EDM_Users

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)
11,342.0	55.50	2.31	11,254.1	10.4	-59.1	11.7	11.18	11.06	2.00
11,374.0	58.14	3.18	11,271.6	37.1	-57.8	38.4	8.56	8.25	2.72
11,406.0	61.00	3.59	11,287.8	64.7	-56.2	65.9	9.01	8.94	1.28
11,437.0	64.27	4.07	11,302.1	92.1	-54.3	93.3	10.64	10.55	1.55
11,469.0	67.19	4.62	11,315.2	121.2	-52.1	122.4	9.26	9.13	1.72
11,501.0	69.69	4.36	11,327.0	150.9	-49.8	152.0	7.85	7.81	-0.81
11,533.0	73.29	4.10	11,337.1	181.1	-47.5	182.2	11.28	11.25	-0.81
11,564.0	76.39	3.17	11,345.3	211.0	-45.6	212.0	10.41	10.00	-3.00
11,596.0	78.51	3.03	11,352.2	242.2	-44.0	243.1	6.64	6.63	-0.44
11,618.0	80.70	2.84	11,356.2	263.8	-42.9	264.7	9.99	9.95	-0.86
11,669.0	87.23	1.82	11,361.5	314.4	-40.8	315.3	12.96	12.80	-2.00
11,722.0	87.96	2.11	11,363.8	367.4	-39.0	368.1	1.48	1.38	0.55
11,817.0	89.38	1.66	11,366.0	462.3	-35.9	463.0	1.57	1.49	-0.47
11,912.0	90.31	1.48	11,366.2	557.2	-33.3	557.9	1.00	0.98	-0.19
12,007.0	91.04	1.46	11,365.1	652.2	-30.8	652.7	0.77	0.77	-0.02
12,102.0	91.68	1.26	11,362.8	747.1	-28.6	747.6	0.71	0.67	-0.21
12,197.0	92.49	1.37	11,359.4	842.1	-26.4	842.4	0.86	0.85	0.12
12,291.0	94.23	1.09	11,353.9	935.9	-24.4	936.2	1.87	1.85	-0.30
12,387.0	94.01	0.11	11,347.0	1,031.6	-23.4	1,031.9	1.04	-0.23	-1.02
12,481.0	91.99	0.31	11,342.1	1,125.5	-23.0	1,125.7	2.16	-2.15	0.21
12,576.0	91.23	0.25	11,339.4	1,220.4	-22.6	1,220.6	0.80	-0.80	-0.06
12,671.0	90.36	0.80	11,338.1	1,315.4	-21.7	1,315.6	1.08	-0.92	0.58
12,766.0	91.09	0.83	11,336.9	1,410.4	-20.3	1,410.5	0.77	0.77	0.03
12,861.0	89.97	359.66	11,336.0	1,505.4	-19.9	1,505.5	1.70	-1.18	-1.23
12,955.0	90.56	0.01	11,335.6	1,599.4	-20.2	1,599.4	0.73	0.63	0.37
13,050.0	89.52	358.52	11,335.5	1,694.4	-21.4	1,694.4	1.91	-1.09	-1.57
13,145.0	90.22	358.46	11,335.7	1,789.4	-23.9	1,789.4	0.74	0.74	-0.06
13,240.0	91.88	359.20	11,334.0	1,884.3	-25.9	1,884.4	1.91	1.75	0.78
13,334.0	91.57	358.36	11,331.1	1,978.2	-27.9	1,978.4	0.95	-0.33	-0.89
13,430.0	92.32	358.56	11,327.9	2,074.2	-30.4	2,074.3	0.81	0.78	0.21
13,524.0	91.85	358.41	11,324.5	2,168.1	-32.9	2,168.3	0.52	-0.50	-0.16
13,619.0	89.97	357.74	11,323.0	2,263.0	-36.1	2,263.2	2.10	-1.98	-0.71
13,713.0	89.50	357.61	11,323.4	2,356.9	-39.9	2,357.2	0.52	-0.50	-0.14
13,809.0	89.75	357.75	11,324.0	2,452.8	-43.8	2,453.2	0.30	0.26	0.15
13,904.0	92.21	357.57	11,322.4	2,547.7	-47.7	2,548.2	2.60	2.59	-0.19
13,999.0	92.13	357.30	11,318.8	2,642.6	-51.9	2,643.1	0.30	-0.08	-0.28
14,093.0	92.97	357.14	11,314.6	2,736.4	-56.5	2,736.9	0.91	0.89	-0.17
14,188.0	93.47	357.06	11,309.3	2,831.1	-61.3	2,831.8	0.53	0.53	-0.08
14,283.0	92.80	358.27	11,304.1	2,925.9	-65.2	2,926.6	1.45	-0.71	1.27
14,377.0	92.60	358.04	11,299.7	3,019.7	-68.2	3,020.5	0.32	-0.21	-0.24
14,472.0	93.05	358.04	11,295.0	3,114.6	-71.4	3,115.4	0.47	0.47	0.00
14,567.0	90.34	355.97	11,292.2	3,209.4	-76.4	3,210.3	3.59	-2.85	-2.18

Survey Report

Company: NORTHERN DELAWARE BASIN
Project: LEA COUNTY, NM

Site: ZEUS

Well: LITTLE BEAR FED COM #1H

Wellbore: ST01

Design: AWP-ST01

Local Co-ordinate Reference:

TVD Reference:

MD Reference:

North Reference:

Survey Calculation Method:

Database:

Well LITTLE BEAR FED COM #1H

RKB=3791+26 @ 3817.0usft (INDEPENDENCE 205)

RKB=3791+26 @ 3817.0usft (INDEPENDENCE 205)

Grid

Minimum Curvature

EDM_Users

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)
14,662.0	88.18	359.09	11,293.4	3,304.3	-80.5	3,305.2	3.99	-2.27	3.28
14,756.0	87.73	0.02	11,296.7	3,398.2	-81.2	3,399.2	1.10	-0.48	0.99
14,851.0	87.37	359.68	11,300.8	3,493.1	-81.5	3,494.1	0.52	-0.38	-0.36
14,946.0	87.56	359.48	11,305.0	3,588.0	-82.2	3,589.0	0.29	0.20	-0.21
15,041.0	88.29	0.76	11,308.4	3,683.0	-82.0	3,683.9	1.55	0.77	1.35
15,135.0	88.60	1.72	11,311.0	3,776.9	-79.9	3,777.7	1.07	0.33	1.02
15,230.0	89.33	1.69	11,312.7	3,871.8	-77.1	3,872.6	0.77	0.77	-0.03
15,325.0	94.12	1.22	11,309.9	3,966.7	-74.7	3,967.4	5.07	5.04	-0.49
15,420.0	92.16	0.90	11,304.7	4,061.6	-72.9	4,062.2	2.09	-2.06	-0.34
15,515.0	90.62	0.01	11,302.3	4,156.5	-72.2	4,157.1	1.87	-1.62	-0.94
15,610.0	89.44	0.10	11,302.3	4,251.5	-72.1	4,252.1	1.25	-1.24	0.09
15,704.0	90.70	1.33	11,302.2	4,345.5	-70.9	4,346.0	1.87	1.34	1.31
15,799.0	87.93	0.55	11,303.3	4,440.5	-69.4	4,440.9	3.03	-2.92	-0.82
15,894.0	86.72	0.51	11,307.8	4,535.4	-68.5	4,535.8	1.27	-1.27	-0.04
15,986.0	85.85	0.90	11,313.7	4,627.2	-67.3	4,627.5	1.04	-0.95	0.42
16,062.0	85.85	0.90	11,319.2	4,703.0	-66.2	4,703.3	0.00	0.00	0.00

Checked By: _____ Approved By: _____ Date: _____

Little Bear Federal Com #1H

<u>Perfs</u>	<u>7 1/2% Acid (Gal)</u>	<u>Sand (#)</u>	<u>Fluid (Gal)</u>
1	1512	396359	317478
2	1512	397763	345156
3	1512	399640	333648
4	1512	398443	331632
5	1638	398852	328860
6	1512	399192	327768
7	1512	403180	330036
8	1512	401435	333480
9	1512	400548	347298
10	1512	405579	335916
11	3024	400934	348138
12	1512	401211	331464
13	1512	398352	331674
14	1512	402750	334866
15	1512	400241	330498
16	1512	400443	331254
17	1512	404040	328608
18	1554	400798	329910
19	1512	400487	328020
20	1512	401671	329490
21	1512	400974	330876
22	1512	400620	329448
23	1512	400963	325752
Totals	36,456	9,214,475	7,641,270

From Bottom to Top		Distance Between Perfs	Shots		Distance Between Perfs	Shots	Stage 1	Distance Between Perfs	Shots		Distance Between Perfs	Shots		Distance Between Perfs	Shots
	15,976	22	5	15,768	52	5	15,590	35	5	15,398	32	5	15,201	34	5
	15,954	23	5	15,758	11	5	15,576	24	5	15,384	27	5	15,187	20	5
	15,931	22	4	15,747	24	4	15,552	24	4	15,357	21	4	15,167	29	4
	15,909	22	4	15,723	25	4	15,528	23	4	15,336	28	4	15,138	24	4
	15,887	23	3	15,698	24	3	15,505		3	15,308	26	3	15,114	25	3
	15,864	22	3	15,674	25	3	15,479	24	3	15,282	22	3	15,089	24	3
	15,842	22	3	15,649	24	3	15,455	25	3	15,260	25	3	15,065	25	3
	15,820		3	15,625		3	15,430		3	15,235		3	15,040		3
	Plug to Plug	92	30	Plug to Plug	55	30	Plug to Plug	72	30	Plug to Plug	72	30	Plug to Plug	78	30
	Frac Plug	16,001	Total Shots	Frac Plug	15,778	Total Shots	Frac Plug	15,600	Total Shots	Frac Plug	15,408	Total Shots	Frac Plug	15,216	Total Shots

From Bottom to Top		Distance Between Perfs	Shots		Distance Between Perfs	Shots	Stage 1	Distance Between Perfs	Shots		Distance Between Perfs	Shots		Distance Between Perfs	Shots
	15,008	32	5	14,815	31	5	14,617	34	5	14,424	38	5	14,216	45	5
	14,995	28	5	14,797	24	5	14,600	16	5	14,407	24	5	14,200	14	5
	14,967	25	4	14,773	25	4	14,584	31	4	14,383	25	4	14,186	22	4
	14,942	23	4	14,748	24	4	14,553	24	4	14,358	24	4	14,164	25	4
	14,919	25	3	14,724	27	3	14,529	24	3	14,334	24	3	14,139	24	3
	14,894	24	3	14,697	22	3	14,505	25	3	14,310	25	3	14,115	25	3
	14,870	24	3	14,675	24	3	14,480	18	3	14,285	24	3	14,090	24	3
	14,846		3	14,651		3	14,462		3	14,261		3	14,066		3
	Plug to Plug	76	30	Plug to Plug	80	30	Plug to Plug	79	30	Plug to Plug	76	30	Plug to Plug	62	30
	Frac Plug	15,018	Total Shots	Frac Plug	14,828	Total Shots	Frac Plug	14,632	Total Shots	Frac Plug	14,434	Total Shots	Frac Plug	14,226	Total Shots

From Bottom to Top		Distance Between Perfs	Shots		Distance Between Perfs	Shots	Stage 1	Distance Between Perfs	Shots		Distance Between Perfs	Shots		Distance Between Perfs	Shots
	14,034	32	5	13,823	48	5	13,652	30	5	13,448	33	5	13,242	45	5
	14,019	26	5	13,810	14	5	13,628	25	5	13,433	25	5	13,226	13	5
	13,993	28	4	13,796	22	4	13,603	24	4	13,408	27	4	13,213	24	4
	13,965	21	4	13,774	25	4	13,579	20	4	13,381	21	4	13,189	24	4
	13,944	24	3	13,749	24	3	13,559	29	3	13,360	25	3	13,165	25	3
	13,920	24	3	13,725	24	3	13,530	24	3	13,335	24	3	13,140	24	3
	13,896	25	3	13,701	19	3	13,506	25	3	13,311	24	3	13,116	19	3
	13,871		3	13,682		3	13,481		3	13,287		3	13,097		3
	Plug to Plug	79	30	Plug to Plug	59	30	Plug to Plug	83	30	Plug to Plug	77	30	Plug to Plug	63	30
	Frac Plug	14,044	Total Shots	Frac Plug	13,833	Total Shots	Frac Plug	13,662	Total Shots	Frac Plug	13,458	Total Shots	Frac Plug	13,252	Total Shots

From Bottom to Top		Distance Between Perfs	Shots		Distance Between Perfs	Shots	Stage 1	Distance Between Perfs	Shots		Distance Between Perfs	Shots		Distance Between Perfs	Shots
	13,067	30	5	12,862	35	5	12,667	35	5	12,478	31	5	12,278	34	5
	13,043	24	5	12,848	24	5	12,653	29	5	12,458	24	5	12,263	24	5
	13,019	25	4	12,824	30	4	12,624	20	4	12,434	24	4	12,239	20	4
	12,994	22	4	12,794	19	4	12,604	24	4	12,410	25	4	12,219	29	4
	12,972	26	3	12,775	24	3	12,580	24	3	12,385	24	3	12,190	24	3
	12,946	25	3	12,751	25	3	12,556	25	3	12,361	27	3	12,166	24	3
	12,921	24	3	12,726	24	3	12,531	22	3	12,334	22	3	12,142	25	3
	12,897		3	12,702		3	12,509		3	12,312		3	12,117		3
	Plug to Plug	83	30	Plug to Plug	78	30	Plug to Plug	78	30	Plug to Plug	78	30	Plug to Plug	69	30
	Frac Plug	13,077	Total Shots	Frac Plug	12,872	Total Shots	Frac Plug	12,682	Total Shots	Frac Plug	12,488	Total Shots	Frac Plug	12,288	Total Shots

From Bottom to Top		Distance Between Perfs	Shots		Distance Between Perfs	Shots	Stage 24	Distance Between Perfs	Shots	Stage 25	Distance Between Perfs	Shots
	12,081	36	5	11,896	30	5	11,688	40	5		11,542	
	12,068	31	5	11,873	24	5	11,678	24	5			
	12,038	18	4	11,849	24	4	11,654	24	4			
	12,020	25	4	11,825	24	4	11,630	24	4			
	11,995	24	3	11,801	25	3	11,606	21	3			
	11,971	24	3	11,776	20	3	11,585	28	3			
	11,947	21	3	11,756	28	3	11,557	15	3			
	11,926		3	11,728		3	11,542		3			
	Plug to Plug	76	30	Plug to Plug	81	30	Plug to Plug	68	30	Plug to Plug	0	0
	Frac Plug	12,096	Total Shots	Frac Plug	11,906	Total Shots	Frac Plug	11,698	Total Shots	Frac Plug		Total Shots