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DISTRICT II-ARTESIA O.C.D.

NORTHERN DELAWARE BASIN

EDDY COUNTY, NM

ATLAS

LITTLEFIELD 33 FED COM #805H

ST01

Design: ACTUAL WELLPATH

Standard Survey Report

15 January, 2019

Survey Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well: LITTLEFIELD 33 FED COM #805H
Project:	EDDY COUNTY, NM	TVD Reference:	RKB=2858.7+26 @ 2884.7usft (PRECISION 106)
Site:	ATLAS	MD Reference:	RKB=2858.7+26 @ 2884.7usft (PRECISION 106)
Well:	LITTLEFIELD 33 FED COM #805H	North Reference:	Grid
Wellbore:	ST01	Survey Calculation Method:	Minimum Curvature
Design:	ACTUAL WELLPATH	Database:	EDM Users

Project: EDDY COUNTY, NM			
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site		ATLAS			
Site Position:		Northing:	371,480.80 usft	Latitude:	32° 1' 15.933 N
From:	Map	Easting:	573,599.60 usft	Longitude:	104° 5' 45.086 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.13 °

Well	LITTLEFIELD 33 FED COM #805H					
Well Position	+N/-S	0.0 usft	Northing:	364,192.20 usft	Latitude:	32° 0' 2.926 N
	+E/-W	0.0 usft	Easting:	606,505.30 usft	Longitude:	103° 59' 23.135 W
Position Uncertainty		3.0 usft	Wellhead Elevation:	usft	Ground Level:	2,858.7 usft

Wellbore		ST01			
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	WMM2015	12/13/2018	7.00	59.75	47,596.18858901

Design: ACTUAL WELLPATH				
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	1.17

Survey Program		Date	1/15/2019	
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100.0	10,203.0	GYRO (ST01)	Standard Keeper 104	Standard Wireline Keeper ver 1.0.4
10,269.0	17,966.0	MWD-CURVE/LATERAL (ST01)	MWD+IFR1+MS	OWSG MWD + IFR1 + Multi-Station Correction

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	0.46	263.59	100.0	0.0	-0.4	-0.1	0.46	0.46	0.00
125.0	0.72	244.90	125.0	-0.1	-0.6	-0.1	1.28	1.04	-74.76
150.0	0.90	234.46	150.0	-0.3	-0.9	-0.3	0.93	0.72	-41.76
175.0	0.88	234.14	175.0	-0.5	-1.3	-0.6	0.08	-0.08	-1.28
200.0	0.74	237.17	200.0	-0.7	-1.5	-0.8	0.59	-0.56	12.12
225.0	0.78	237.91	225.0	-0.9	-1.8	-0.9	0.16	0.16	2.96
250.0	0.83	242.02	250.0	-1.1	-2.1	-1.1	0.31	0.20	16.44

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Well:	LITTLEFIELD 33 FED COM #805H	North Reference:	Grid
Wellbore:	ST01	Survey Calculation Method:	Minimum Curvature
Design:	ACTUAL WELLPATH	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)
275.0	0.87	241.96	275.0	-1.3	-2.5	-1.3	0.16	0.16	-0.24
300.0	0.92	241.82	300.0	-1.4	-2.8	-1.5	0.20	0.20	-0.56
325.0	0.92	240.66	325.0	-1.6	-3.2	-1.7	0.07	0.00	-4.64
350.0	0.97	248.95	350.0	-1.8	-3.5	-1.9	0.58	0.20	33.16
375.0	1.11	256.54	375.0	-1.9	-4.0	-2.0	0.78	0.56	30.36
400.0	1.11	255.44	400.0	-2.1	-4.4	-2.1	0.09	0.00	-4.40
425.0	1.14	253.39	425.0	-2.2	-4.9	-2.3	0.20	0.12	-8.20
450.0	0.98	260.33	450.0	-2.3	-5.4	-2.4	0.82	-0.64	27.76
475.0	0.63	294.01	475.0	-2.3	-5.7	-2.4	2.30	-1.40	134.72
500.0	0.78	355.32	500.0	-2.1	-5.8	-2.2	2.92	0.60	245.24
525.0	1.05	15.96	524.9	-1.7	-5.8	-1.8	1.69	1.08	82.56
550.0	1.35	33.30	549.9	-1.2	-5.6	-1.3	1.87	1.20	69.36
575.0	1.58	51.88	574.9	-0.7	-5.1	-0.8	2.10	0.92	74.32
600.0	1.76	58.40	599.9	-0.3	-4.5	-0.4	1.05	0.72	26.08
625.0	1.74	58.41	624.9	0.1	-3.9	0.0	0.08	-0.08	0.04
650.0	1.76	56.87	649.9	0.5	-3.2	0.4	0.20	0.08	-6.16
675.0	1.79	54.31	674.9	0.9	-2.6	0.9	0.34	0.12	-10.24
700.0	1.70	57.72	699.9	1.3	-2.0	1.3	0.55	-0.36	13.64
725.0	1.74	57.44	724.9	1.8	-1.3	1.7	0.16	0.16	-1.12
750.0	1.78	58.64	749.9	2.2	-0.7	2.1	0.22	0.16	4.80
775.0	1.66	58.15	774.8	2.6	0.0	2.5	0.48	-0.48	-1.96
800.0	1.52	59.17	799.8	2.9	0.6	2.9	0.57	-0.56	4.08
825.0	1.46	63.31	824.8	3.2	1.1	3.2	0.49	-0.24	16.56
850.0	1.38	68.67	849.8	3.5	1.7	3.5	0.62	-0.32	21.44
875.0	1.24	78.73	874.8	3.6	2.2	3.7	1.07	-0.56	40.24
900.0	1.17	76.25	899.8	3.8	2.7	3.8	0.35	-0.28	-9.92
925.0	1.13	82.81	924.8	3.8	3.2	3.9	0.55	-0.16	26.24
950.0	1.14	82.37	949.8	3.9	3.7	4.0	0.05	0.04	-1.76
975.0	1.20	90.72	974.8	3.9	4.2	4.0	0.72	0.24	33.40
1,000.0	1.24	86.55	999.8	4.0	4.8	4.0	0.39	0.16	-16.68
1,025.0	1.18	83.48	1,024.8	4.0	5.3	4.1	0.35	-0.24	-12.28
1,050.0	1.12	85.89	1,049.8	4.0	5.8	4.2	0.31	-0.24	9.64
1,075.0	1.07	93.21	1,074.8	4.0	6.3	4.2	0.59	-0.20	29.28
1,100.0	1.09	91.77	1,099.8	4.0	6.7	4.2	0.13	0.08	-5.76
1,125.0	1.04	85.78	1,124.8	4.0	7.2	4.2	0.49	-0.20	-23.96
1,150.0	1.01	91.91	1,149.8	4.0	7.7	4.2	0.45	-0.12	24.52
1,175.0	1.00	95.20	1,174.8	4.0	8.1	4.2	0.23	-0.04	13.16
1,200.0	1.09	95.90	1,199.7	4.0	8.5	4.1	0.36	0.36	2.80
1,225.0	1.00	88.93	1,224.7	4.0	9.0	4.1	0.62	-0.36	-27.88
1,250.0	0.92	101.40	1,249.7	3.9	9.4	4.1	0.89	-0.32	49.88
1,275.0	0.94	109.29	1,274.7	3.8	9.8	4.0	0.52	0.08	31.56
1,300.0	0.87	110.39	1,299.7	3.7	10.2	3.9	0.29	-0.28	4.40

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Well:	LITTLEFIELD 33, FED COM #805H	North Reference:	Grid
Wellbore:	ST01	Survey Calculation Method:	Minimum Curvature
Design:	ACTUAL WELLPATH	Database:	EDM Users

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)
1,325.0	0.83	111.11	1,324.7	3.5	10.5	3.8	0.17	-0.16	2.88
1,350.0	0.85	120.85	1,349.7	3.4	10.9	3.6	0.58	0.08	38.96
1,375.0	0.62	100.30	1,374.7	3.3	11.1	3.5	1.39	-0.92	-82.20
1,400.0	0.66	139.68	1,399.7	3.1	11.4	3.4	1.73	0.16	157.52
1,425.0	0.75	145.87	1,424.7	2.9	11.6	3.1	0.47	0.36	24.76
1,450.0	0.71	152.69	1,449.7	2.6	11.7	2.9	0.38	-0.16	27.28
1,475.0	1.04	164.21	1,474.7	2.3	11.9	2.5	1.49	1.32	46.08
1,500.0	2.29	179.60	1,499.7	1.5	11.9	1.8	5.27	5.00	61.56
1,525.0	2.96	183.38	1,524.7	0.4	11.9	0.6	2.77	2.68	15.12
1,550.0	3.18	183.63	1,549.6	-0.9	11.8	-0.7	0.88	0.88	1.00
1,575.0	3.15	183.55	1,574.6	-2.3	11.7	-2.1	0.12	-0.12	-0.32
1,600.0	3.25	182.94	1,599.6	-3.7	11.6	-3.5	0.42	0.40	-2.44
1,625.0	3.23	182.16	1,624.5	-5.1	11.6	-4.9	0.19	-0.08	-3.12
1,650.0	3.16	182.68	1,649.5	-6.5	11.5	-6.3	0.30	-0.28	2.08
1,675.0	3.18	183.28	1,674.5	-7.9	11.4	-7.7	0.15	0.08	2.40
1,700.0	3.14	183.83	1,699.4	-9.3	11.4	-9.0	0.20	-0.16	2.20
1,725.0	3.11	182.69	1,724.4	-10.6	11.3	-10.4	0.28	-0.12	-4.56
1,750.0	3.05	180.78	1,749.3	-12.0	11.2	-11.7	0.48	-0.24	-7.64
1,775.0	2.92	177.38	1,774.3	-13.3	11.3	-13.0	0.88	-0.52	-13.60
1,800.0	2.82	176.65	1,799.3	-14.5	11.3	-14.3	0.43	-0.40	-2.92
1,825.0	2.92	175.55	1,824.2	-15.8	11.4	-15.5	0.46	0.40	-4.40
1,850.0	2.82	173.06	1,849.2	-17.0	11.5	-16.8	0.64	-0.40	-9.96
1,875.0	2.74	173.33	1,874.2	-18.2	11.7	-18.0	0.32	-0.32	1.08
1,900.0	2.84	171.67	1,899.2	-19.4	11.8	-19.2	0.51	0.40	-6.64
1,925.0	2.86	170.01	1,924.1	-20.7	12.0	-20.4	0.34	0.08	-6.64
1,950.0	2.83	166.18	1,949.1	-21.9	12.3	-21.6	0.77	-0.12	-15.32
1,975.0	2.76	166.23	1,974.1	-23.1	12.6	-22.8	0.28	-0.28	0.20
2,000.0	2.81	166.61	1,999.0	-24.2	12.9	-24.0	0.21	0.20	1.52
2,025.0	2.91	163.43	2,024.0	-25.4	13.2	-25.2	0.75	0.40	-12.72
2,050.0	2.94	157.08	2,049.0	-26.6	13.6	-26.4	1.30	0.12	-25.40
2,075.0	3.08	155.02	2,073.9	-27.8	14.2	-27.5	0.71	0.56	-8.24
2,100.0	3.17	153.41	2,098.9	-29.1	14.7	-28.8	0.50	0.36	-6.44
2,125.0	3.35	151.29	2,123.9	-30.3	15.4	-30.0	0.87	0.72	-8.48
2,150.0	3.49	149.37	2,148.8	-31.6	16.1	-31.3	0.72	0.56	-7.68
2,175.0	3.61	148.94	2,173.8	-32.9	16.9	-32.6	0.49	0.48	-1.72
2,200.0	3.61	148.50	2,198.7	-34.3	17.8	-33.9	0.11	0.00	-1.76
2,225.0	3.97	156.60	2,223.7	-35.8	18.5	-35.4	2.58	1.44	32.40
2,250.0	4.57	167.12	2,248.6	-37.5	19.1	-37.1	3.94	2.40	42.08
2,275.0	4.85	170.26	2,273.5	-39.5	19.5	-39.1	1.52	1.12	12.56
2,300.0	4.94	163.79	2,298.4	-41.6	20.0	-41.2	2.24	0.36	-25.88
2,325.0	5.08	160.65	2,323.3	-43.7	20.6	-43.3	1.23	0.56	-12.56
2,350.0	5.10	159.94	2,348.2	-45.8	21.4	-45.3	0.26	0.08	-2.84

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Wellbore:	ST01	Survey Calculation Method:	Minimum Curvature
Design:	ACTUAL WELLPATH	Database:	EDM Users

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)
2,375.0	5.12	160.13	2,373.1	-47.9	22.1	-47.4	0.10	-0.08	0.76
2,400.0	5.19	159.98	2,398.0	-50.0	22.9	-49.5	0.29	0.28	-0.60
2,425.0	5.17	160.11	2,422.9	-52.1	23.7	-51.6	0.09	-0.08	0.52
2,450.0	5.18	159.09	2,447.8	-54.2	24.5	-53.7	0.37	0.04	-4.08
2,475.0	5.21	159.43	2,472.7	-56.3	25.3	-55.8	0.17	0.12	1.36
2,500.0	5.24	158.72	2,497.6	-58.5	26.1	-57.9	0.29	0.12	-2.84
2,525.0	5.29	158.90	2,522.5	-60.6	26.9	-60.0	0.21	0.20	0.72
2,550.0	5.05	159.17	2,547.4	-62.7	27.7	-62.1	0.96	-0.96	1.08
2,575.0	3.93	160.41	2,572.3	-64.5	28.4	-63.9	4.50	-4.48	4.96
2,600.0	3.13	165.74	2,597.3	-66.0	28.8	-65.4	3.46	-3.20	21.32
2,625.0	3.04	173.59	2,622.2	-67.3	29.1	-66.7	1.73	-0.36	31.40
2,650.0	2.99	188.93	2,647.2	-68.6	29.1	-68.0	3.22	-0.20	61.36
2,675.0	3.23	211.44	2,672.2	-69.9	28.6	-69.3	4.94	0.96	90.04
2,700.0	3.27	213.00	2,697.1	-71.1	27.8	-70.5	0.39	0.16	6.24
2,725.0	3.14	215.46	2,722.1	-72.2	27.0	-71.7	0.76	-0.52	9.84
2,750.0	2.99	216.77	2,747.1	-73.3	26.3	-72.8	0.66	-0.60	5.24
2,775.0	2.89	217.47	2,772.0	-74.3	25.5	-73.8	0.42	-0.40	2.80
2,800.0	2.83	219.23	2,797.0	-75.3	24.7	-74.8	0.43	-0.24	7.04
2,825.0	2.79	218.32	2,822.0	-76.3	23.9	-75.8	0.24	-0.16	-3.64
2,850.0	2.90	217.81	2,846.9	-77.2	23.2	-76.8	0.45	0.44	-2.04
2,875.0	2.87	217.64	2,871.9	-78.2	22.4	-77.8	0.12	-0.12	-0.68
2,900.0	2.88	219.59	2,896.9	-79.2	21.6	-78.8	0.39	0.04	7.80
2,925.0	2.82	215.48	2,921.8	-80.2	20.9	-79.8	0.85	-0.24	-16.44
2,950.0	2.86	218.75	2,946.8	-81.2	20.1	-80.8	0.67	0.16	13.08
2,975.0	2.92	208.08	2,971.8	-82.2	19.4	-81.8	2.16	0.24	-42.68
3,000.0	3.67	188.93	2,996.7	-83.6	19.0	-83.2	5.29	3.00	-76.60
3,025.0	4.40	177.50	3,021.7	-85.3	18.9	-84.9	4.33	2.92	-45.72
3,050.0	4.80	172.06	3,046.6	-87.3	19.1	-86.9	2.37	1.60	-21.76
3,075.0	4.82	171.79	3,071.5	-89.4	19.4	-89.0	0.12	0.08	-1.08
3,100.0	4.77	171.76	3,096.4	-91.5	19.7	-91.1	0.20	-0.20	-0.12
3,125.0	4.77	171.98	3,121.3	-93.5	20.0	-93.1	0.07	0.00	0.88
3,150.0	4.85	172.03	3,146.2	-95.6	20.3	-95.2	0.32	0.32	0.20
3,175.0	4.91	171.27	3,171.2	-97.7	20.6	-97.3	0.35	0.24	-3.04
3,200.0	4.93	170.53	3,196.1	-99.8	20.9	-99.4	0.27	0.08	-2.96
3,225.0	4.93	170.99	3,221.0	-102.0	21.3	-101.5	0.16	0.00	1.84
3,250.0	4.93	170.65	3,245.9	-104.1	21.6	-103.6	0.12	0.00	-1.36
3,275.0	4.91	170.75	3,270.8	-106.2	22.0	-105.7	0.09	-0.08	0.40
3,300.0	4.88	171.30	3,295.7	-108.3	22.3	-107.8	0.22	-0.12	2.20
3,325.0	4.74	171.22	3,320.6	-110.4	22.6	-109.9	0.56	-0.56	-0.32
3,350.0	4.60	171.59	3,345.5	-112.4	22.9	-111.9	0.57	-0.56	1.48
3,375.0	4.51	171.89	3,370.4	-114.3	23.2	-113.8	0.37	-0.36	1.20
3,400.0	4.55	171.60	3,395.4	-116.3	23.5	-115.8	0.18	0.16	-1.16

Survey Report

Company:	NORTHERN-DELAWARE BASIN	Local Co-ordinate Reference:	Well: LITTLEFIELD 33 FED COM #805H
Project:	EDDY COUNTY, NM	TVD Reference:	RKB=2858.7+26 @ 2884.7usft (PRECISION 106)
Site:	ATLAS	MD Reference:	RKB=2858.7+26 @ 2884.7usft (PRECISION 106)
Well:	LITTLEFIELD 33 FED COM #805H	North Reference:	Grid
Wellbore:	ST01	Survey Calculation Method:	Minimum Curvature
Design:	ACTUAL WELLPATH	Database:	EDM Users

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)
3,425.0	4.50	171.02	3,420.3	-118.2	23.8	-117.7	0.27	-0.20	-2.32
3,450.0	4.34	171.44	3,445.2	-120.2	24.1	-119.6	0.65	-0.64	1.68
3,475.0	4.34	171.37	3,470.1	-122.0	24.4	-121.5	0.02	0.00	-0.28
3,500.0	4.42	171.32	3,495.1	-123.9	24.7	-123.4	0.32	0.32	-0.20
3,525.0	4.35	172.38	3,520.0	-125.8	24.9	-125.3	0.43	-0.28	4.24
3,550.0	4.33	171.67	3,544.9	-127.7	25.2	-127.1	0.23	-0.08	-2.84
3,575.0	4.17	171.34	3,569.9	-129.5	25.5	-129.0	0.65	-0.64	-1.32
3,600.0	4.06	170.62	3,594.8	-131.3	25.7	-130.7	0.49	-0.44	-2.88
3,625.0	3.97	170.11	3,619.7	-133.0	26.0	-132.4	0.39	-0.36	-2.04
3,650.0	3.80	169.47	3,644.7	-134.7	26.3	-134.1	0.70	-0.68	-2.56
3,675.0	3.69	169.36	3,669.6	-136.3	26.6	-135.7	0.44	-0.44	-0.44
3,700.0	3.61	169.02	3,694.6	-137.8	26.9	-137.3	0.33	-0.32	-1.36
3,725.0	3.38	167.86	3,719.5	-139.3	27.2	-138.7	0.96	-0.92	-4.64
3,750.0	3.41	169.49	3,744.5	-140.8	27.5	-140.2	0.40	0.12	6.52
3,775.0	3.39	168.78	3,769.4	-142.2	27.8	-141.6	0.19	-0.08	-2.84
3,800.0	3.42	168.36	3,794.4	-143.7	28.1	-143.1	0.16	0.12	-1.68
3,825.0	3.37	166.77	3,819.3	-145.1	28.4	-144.5	0.43	-0.20	-6.36
3,850.0	3.22	168.28	3,844.3	-146.5	28.7	-145.9	0.69	-0.60	6.04
3,875.0	3.27	167.93	3,869.3	-147.9	29.0	-147.3	0.22	0.20	-1.40
3,900.0	3.18	167.68	3,894.2	-149.3	29.3	-148.7	0.36	-0.36	-1.00
3,925.0	3.16	167.61	3,919.2	-150.7	29.6	-150.0	0.08	-0.08	-0.28
3,950.0	3.16	165.05	3,944.1	-152.0	29.9	-151.4	0.56	0.00	-10.24
3,975.0	3.14	167.55	3,969.1	-153.3	30.3	-152.7	0.56	-0.08	10.00
4,000.0	3.19	166.51	3,994.1	-154.7	30.6	-154.0	0.30	0.20	-4.16
4,025.0	3.13	165.02	4,019.0	-156.0	30.9	-155.3	0.41	-0.24	-5.96
4,050.0	3.04	165.83	4,044.0	-157.3	31.3	-156.6	0.40	-0.36	3.24
4,075.0	3.08	165.40	4,069.0	-158.6	31.6	-157.9	0.18	0.16	-1.72
4,100.0	3.02	165.70	4,093.9	-159.9	31.9	-159.2	0.25	-0.24	1.20
4,125.0	3.13	165.82	4,118.9	-161.2	32.2	-160.5	0.44	0.44	0.48
4,150.0	3.02	165.62	4,143.9	-162.5	32.6	-161.8	0.44	-0.44	-0.80
4,175.0	3.07	165.90	4,168.8	-163.8	32.9	-163.1	0.21	0.20	1.12
4,200.0	3.04	175.29	4,193.8	-165.1	33.1	-164.4	2.00	-0.12	37.56
4,225.0	3.16	181.97	4,218.7	-166.4	33.2	-165.7	1.52	0.48	26.72
4,250.0	3.08	187.24	4,243.7	-167.8	33.0	-167.1	1.19	-0.32	21.08
4,275.0	3.16	188.74	4,268.7	-169.1	32.9	-168.4	0.46	0.32	6.00
4,300.0	3.23	188.29	4,293.6	-170.5	32.7	-169.8	0.30	0.28	-1.80
4,325.0	3.23	188.74	4,318.6	-171.9	32.4	-171.2	0.10	0.00	1.80
4,350.0	3.22	190.04	4,343.6	-173.3	32.2	-172.6	0.30	-0.04	5.20
4,375.0	3.25	187.87	4,368.5	-174.7	32.0	-174.0	0.50	0.12	-8.68
4,400.0	3.24	188.91	4,393.5	-176.1	31.8	-175.4	0.24	-0.04	4.16
4,425.0	3.33	188.84	4,418.4	-177.5	31.6	-176.8	0.36	0.36	-0.28
4,450.0	3.23	191.26	4,443.4	-178.9	31.3	-178.2	0.68	-0.40	9.68

Survey Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well LITTLEFIELD 33 FED COM #805H
Project:	EDDY COUNTY, NM	TVD Reference:	RKB=2858.7+26 @ 2884.7usft (PRECISION 106)
Site:	ATLAS	MD Reference:	RKB=2858.7+26 @ 2884.7usft (PRECISION 106)
Well:	LITTLEFIELD 33 FED COM #805H	North Reference:	Grid
Wellbore:	ST01	Survey Calculation Method:	Minimum Curvature
Design:	ACTUAL WELLPATH	Database:	EDM Users

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)
4,475.0	3.29	192.21	4,468.3	-180.3	31.0	-179.6	0.32	0.24	3.80
4,500.0	3.31	191.83	4,493.3	-181.7	30.7	-181.1	0.12	0.08	-1.52
4,525.0	3.23	191.81	4,518.3	-183.1	30.4	-182.5	0.32	-0.32	-0.08
4,550.0	3.32	192.53	4,543.2	-184.5	30.1	-183.9	0.40	0.36	2.88
4,575.0	3.35	191.72	4,568.2	-185.9	29.8	-185.3	0.22	0.12	-3.24
4,600.0	3.39	191.80	4,593.1	-187.4	29.5	-186.7	0.16	0.16	0.32
4,625.0	3.32	193.58	4,618.1	-188.8	29.2	-188.2	0.50	-0.28	7.12
4,650.0	2.76	197.21	4,643.1	-190.1	28.9	-189.4	2.37	-2.24	14.52
4,675.0	1.40	203.22	4,668.0	-190.9	28.6	-190.3	5.50	-5.44	24.04
4,700.0	0.90	212.14	4,693.0	-191.4	28.3	-190.8	2.12	-2.00	35.68
4,725.0	0.83	209.06	4,718.0	-191.7	28.1	-191.1	0.34	-0.28	-12.32
4,750.0	0.93	212.84	4,743.0	-192.0	27.9	-191.4	0.46	0.40	15.12
4,775.0	0.83	211.45	4,768.0	-192.4	27.7	-191.7	0.41	-0.40	-5.56
4,800.0	0.91	215.23	4,793.0	-192.7	27.5	-192.1	0.39	0.32	15.12
4,825.0	0.92	215.88	4,818.0	-193.0	27.3	-192.4	0.06	0.04	2.60
4,850.0	0.96	213.15	4,843.0	-193.3	27.1	-192.7	0.24	0.16	-10.92
4,875.0	0.96	210.29	4,868.0	-193.7	26.8	-193.1	0.19	0.00	-11.44
4,900.0	0.99	211.05	4,893.0	-194.1	26.6	-193.5	0.13	0.12	3.04
4,925.0	0.99	207.26	4,918.0	-194.4	26.4	-193.9	0.26	0.00	-15.16
4,950.0	1.00	207.15	4,943.0	-194.8	26.2	-194.2	0.04	0.04	-0.44
4,975.0	1.01	206.09	4,968.0	-195.2	26.0	-194.6	0.08	0.04	-4.24
5,000.0	0.90	208.40	4,993.0	-195.6	25.8	-195.0	0.47	-0.44	9.24
5,025.0	0.96	207.89	5,018.0	-195.9	25.6	-195.4	0.24	0.24	-2.04
5,050.0	1.03	204.40	5,043.0	-196.3	25.5	-195.8	0.37	0.28	-13.96
5,075.0	0.97	204.66	5,068.0	-196.7	25.3	-196.2	0.24	-0.24	1.04
5,100.0	1.03	209.28	5,093.0	-197.1	25.1	-196.6	0.40	0.24	18.48
5,125.0	1.04	200.70	5,118.0	-197.5	24.9	-197.0	0.62	0.04	-34.32
5,150.0	1.06	193.43	5,143.0	-198.0	24.8	-197.4	0.54	0.08	-29.08
5,175.0	1.04	196.04	5,168.0	-198.4	24.6	-197.9	0.21	-0.08	10.44
5,200.0	1.04	200.19	5,193.0	-198.8	24.5	-198.3	0.30	0.00	16.60
5,225.0	1.15	197.12	5,218.0	-199.3	24.3	-198.7	0.50	0.44	-12.28
5,250.0	1.08	193.82	5,243.0	-199.8	24.2	-199.2	0.38	-0.28	-13.20
5,275.0	0.99	201.61	5,268.0	-200.2	24.1	-199.7	0.67	-0.36	31.16
5,300.0	1.14	197.15	5,293.0	-200.6	23.9	-200.1	0.69	0.60	-17.84
5,325.0	1.11	192.87	5,317.9	-201.1	23.8	-200.6	0.36	-0.12	-17.12
5,350.0	1.07	197.47	5,342.9	-201.6	23.7	-201.0	0.38	-0.16	18.40
5,375.0	1.19	201.13	5,367.9	-202.0	23.5	-201.5	0.56	0.48	14.64
5,400.0	1.19	202.53	5,392.9	-202.5	23.3	-202.0	0.12	0.00	5.60
5,425.0	1.14	202.87	5,417.9	-203.0	23.1	-202.5	0.20	-0.20	1.36
5,450.0	1.25	204.69	5,442.9	-203.4	22.9	-202.9	0.47	0.44	7.28
5,475.0	1.22	201.44	5,467.9	-203.9	22.7	-203.4	0.30	-0.12	-13.00
5,500.0	1.19	201.21	5,492.9	-204.4	22.5	-203.9	0.12	-0.12	-0.92

Survey Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well: LITTLEFIELD 33-FED.COM #805H
Project:	EDDY COUNTY, NM	TVD Reference:	RKB=2858.7+26 @ 2884.7usft (PRECISION 106)
Site:	ATLAS	MD Reference:	RKB=2858.7+26 @ 2884.7usft (PRECISION 106)
Well:	LITTLEFIELD 33-FED.COM #805H	North Reference:	Grid
Wellbore:	ST01	Survey Calculation Method:	Minimum Curvature
Design:	ACTUAL WELLPATH	Database:	EDM: Users

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)
5,525.0	1.20	205.11	5,517.9	-204.9	22.3	-204.4	0.33	0.04	15.60
5,550.0	1.26	199.28	5,542.9	-205.4	22.1	-204.9	0.55	0.24	-23.32
5,575.0	1.26	197.48	5,567.9	-205.9	21.9	-205.4	0.16	0.00	-7.20
5,600.0	1.20	205.09	5,592.9	-206.4	21.7	-205.9	0.70	-0.24	30.44
5,625.0	1.22	204.59	5,617.9	-206.9	21.5	-206.4	0.09	0.08	-2.00
5,650.0	1.23	202.63	5,642.9	-207.4	21.3	-206.9	0.17	0.04	-7.84
5,675.0	1.18	196.66	5,667.9	-207.9	21.1	-207.4	0.54	-0.20	-23.88
5,700.0	1.15	198.03	5,692.9	-208.4	21.0	-207.9	0.16	-0.12	5.48
5,725.0	1.15	201.34	5,717.9	-208.8	20.8	-208.4	0.27	0.00	13.24
5,750.0	1.08	204.81	5,742.9	-209.3	20.6	-208.8	0.39	-0.28	13.88
5,775.0	0.73	204.55	5,767.9	-209.7	20.4	-209.2	1.40	-1.40	-1.04
5,800.0	0.27	75.76	5,792.9	-209.8	20.4	-209.3	3.69	-1.84	-515.16
5,825.0	0.98	47.31	5,817.9	-209.6	20.6	-209.2	3.01	2.84	-113.80
5,850.0	1.25	45.19	5,842.8	-209.3	21.0	-208.8	1.09	1.08	-8.48
5,875.0	1.29	42.41	5,867.8	-208.9	21.4	-208.4	0.29	0.16	-11.12
5,900.0	1.22	40.35	5,892.8	-208.5	21.7	-208.0	0.33	-0.28	-8.24
5,925.0	1.23	44.13	5,917.8	-208.1	22.1	-207.6	0.33	0.04	15.12
5,950.0	1.27	46.89	5,942.8	-207.7	22.5	-207.2	0.29	0.16	11.04
5,975.0	1.24	43.05	5,967.8	-207.3	22.9	-206.8	0.36	-0.12	-15.36
6,000.0	1.09	42.43	5,992.8	-206.9	23.2	-206.4	0.60	-0.60	-2.48
6,025.0	0.96	49.51	6,017.8	-206.6	23.5	-206.1	0.73	-0.52	28.32
6,050.0	1.04	52.02	6,042.8	-206.4	23.9	-205.8	0.36	0.32	10.04
6,075.0	1.03	52.19	6,067.8	-206.1	24.2	-205.5	0.04	-0.04	0.68
6,100.0	0.79	45.40	6,092.8	-205.8	24.5	-205.3	1.05	-0.96	-27.16
6,125.0	0.60	55.94	6,117.8	-205.6	24.8	-205.1	0.91	-0.76	42.16
6,150.0	0.58	69.05	6,142.8	-205.5	25.0	-205.0	0.54	-0.08	52.44
6,175.0	0.54	72.38	6,167.8	-205.4	25.2	-204.9	0.21	-0.16	13.32
6,200.0	0.55	73.65	6,192.8	-205.4	25.5	-204.8	0.06	0.04	5.08
6,225.0	0.51	72.07	6,217.8	-205.3	25.7	-204.7	0.17	-0.16	-6.32
6,250.0	0.35	80.63	6,242.8	-205.2	25.9	-204.7	0.69	-0.64	34.24
6,275.0	0.42	97.70	6,267.8	-205.2	26.0	-204.7	0.53	0.28	68.28
6,300.0	0.44	91.03	6,292.8	-205.3	26.2	-204.7	0.22	0.08	-26.68
6,325.0	0.29	90.02	6,317.8	-205.3	26.4	-204.7	0.60	-0.60	-4.04
6,350.0	0.31	151.96	6,342.8	-205.3	26.5	-204.7	1.24	0.08	247.76
6,375.0	0.36	150.05	6,367.8	-205.4	26.5	-204.9	0.20	0.20	-7.64
6,400.0	0.20	155.56	6,392.8	-205.6	26.6	-205.0	0.65	-0.64	22.04
6,425.0	0.33	183.66	6,417.8	-205.7	26.6	-205.1	0.72	0.52	112.40
6,450.0	0.38	173.97	6,442.8	-205.8	26.6	-205.2	0.31	0.20	-38.76
6,475.0	0.33	194.70	6,467.8	-206.0	26.6	-205.4	0.55	-0.20	82.92
6,500.0	0.40	186.52	6,492.8	-206.1	26.6	-205.5	0.35	0.28	-32.72
6,525.0	0.34	195.43	6,517.8	-206.3	26.5	-205.7	0.33	-0.24	35.64
6,550.0	0.43	198.27	6,542.8	-206.4	26.5	-205.9	0.37	0.36	11.36

Survey Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well LITTLEFIELD 33 FED COM #805H
Project:	EDDY COUNTY NM	TVD Reference:	RKB=2858.7+26 @ 2884.7usft (PRECISION 106)
Site:	ATLAS	MD Reference:	RKB=2858.7+26 @ 2884.7usft (PRECISION 106)
Well:	LITTLEFIELD 33 FED COM #805H	North Reference:	Grid
Wellbore:	ST01	Survey Calculation Method:	Minimum Curvature
Design:	ACTUAL WELLPATH	Database:	EDM-Users

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)
6,575.0	0.35	220.39	6,567.8	-206.6	26.4	-206.0	0.68	-0.32	88.48
6,600.0	0.47	223.12	6,592.8	-206.7	26.3	-206.1	0.49	0.48	10.92
6,625.0	0.47	240.05	6,617.8	-206.9	26.1	-206.3	0.55	0.00	67.72
6,650.0	0.59	246.90	6,642.8	-207.0	25.9	-206.4	0.54	0.48	27.40
6,675.0	0.81	271.66	6,667.8	-207.0	25.6	-206.4	1.48	0.88	99.04
6,700.0	0.95	272.19	6,692.8	-207.0	25.3	-206.4	0.56	0.56	2.12
6,725.0	1.11	278.82	6,717.8	-206.9	24.8	-206.4	0.80	0.64	26.52
6,750.0	1.47	276.31	6,742.8	-206.9	24.2	-206.3	1.46	1.44	-10.04
6,775.0	1.62	280.45	6,767.8	-206.8	23.6	-206.2	0.75	0.60	16.56
6,800.0	1.85	279.87	6,792.7	-206.6	22.8	-206.1	0.92	0.92	-2.32
6,825.0	1.97	283.14	6,817.7	-206.5	22.0	-206.0	0.65	0.48	13.08
6,850.0	2.13	284.73	6,842.7	-206.3	21.2	-205.8	0.68	0.64	6.36
6,875.0	2.14	284.31	6,867.7	-206.0	20.2	-205.6	0.07	0.04	-1.68
6,900.0	2.13	286.67	6,892.7	-205.8	19.4	-205.3	0.35	-0.04	9.44
6,925.0	1.97	285.83	6,917.7	-205.5	18.5	-205.1	0.65	-0.64	-3.36
6,950.0	2.21	294.22	6,942.6	-205.2	17.6	-204.8	1.55	0.96	33.56
6,975.0	2.20	294.85	6,967.6	-204.8	16.8	-204.4	0.10	-0.04	2.52
7,000.0	2.02	295.10	6,992.6	-204.4	15.9	-204.0	0.72	-0.72	1.00
7,025.0	1.79	294.34	7,017.6	-204.1	15.2	-203.7	0.93	-0.92	-3.04
7,050.0	1.60	292.79	7,042.6	-203.8	14.5	-203.4	0.78	-0.76	-6.20
7,075.0	1.52	289.59	7,067.6	-203.5	13.9	-203.2	0.47	-0.32	-12.80
7,100.0	1.49	291.74	7,092.6	-203.3	13.3	-203.0	0.26	-0.12	8.60
7,125.0	1.55	290.30	7,117.6	-203.1	12.6	-202.8	0.28	0.24	-5.76
7,150.0	1.58	291.22	7,142.6	-202.8	12.0	-202.5	0.16	0.12	3.68
7,175.0	1.56	291.69	7,167.5	-202.6	11.4	-202.3	0.10	-0.08	1.88
7,200.0	1.27	294.79	7,192.5	-202.3	10.8	-202.1	1.20	-1.16	12.40
7,225.0	0.77	6.67	7,217.5	-202.0	10.6	-201.8	5.06	-2.00	287.52
7,250.0	0.85	15.88	7,242.5	-201.7	10.6	-201.4	0.61	0.32	36.84
7,275.0	0.81	21.10	7,267.5	-201.4	10.7	-201.1	0.34	-0.16	20.88
7,300.0	0.85	21.58	7,292.5	-201.0	10.9	-200.8	0.16	0.16	1.92
7,325.0	0.89	16.07	7,317.5	-200.7	11.0	-200.4	0.37	0.16	-22.04
7,350.0	0.87	11.36	7,342.5	-200.3	11.1	-200.0	0.30	-0.08	-18.84
7,375.0	0.92	5.07	7,367.5	-199.9	11.1	-199.6	0.44	0.20	-25.16
7,400.0	0.86	2.18	7,392.5	-199.5	11.2	-199.2	0.30	-0.24	-11.56
7,425.0	0.82	9.37	7,417.5	-199.1	11.2	-198.9	0.45	-0.16	28.76
7,450.0	0.90	18.88	7,442.5	-198.8	11.3	-198.5	0.65	0.32	38.04
7,475.0	1.22	67.14	7,467.5	-198.5	11.6	-198.2	3.66	1.28	193.04
7,500.0	2.00	87.07	7,492.5	-198.4	12.3	-198.1	3.80	3.12	79.72
7,525.0	2.22	91.09	7,517.5	-198.4	13.2	-198.0	1.06	0.88	16.08
7,550.0	2.07	94.17	7,542.5	-198.4	14.1	-198.1	0.76	-0.60	12.32
7,575.0	1.94	100.34	7,567.4	-198.5	15.0	-198.2	1.01	-0.52	24.68
7,600.0	1.83	103.19	7,592.4	-198.7	15.8	-198.3	0.58	-0.44	11.40

Survey Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well: LITTLEFIELD 33 FED.COM #805H
Project:	EDDY COUNTY, NM	TVD Reference:	RKB=2858.7+26 @ 2884.7usft (PRECISION 106)
Site:	ATLAS	MD Reference:	RKB=2858.7+26 @ 2884.7usft (PRECISION 106)
Well:	LITTLEFIELD 33 FED.COM #805H	North Reference:	Grid
Wellbore:	ST01	Survey Calculation Method:	Minimum Curvature
Design:	ACTUAL WELLPATH	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)
7,625.0	1.80	104.87	7,617.4	-198.9	16.6	-198.5	0.24	-0.12	6.72
7,650.0	1.76	105.92	7,642.4	-199.1	17.3	-198.7	0.21	-0.16	4.20
7,675.0	1.46	107.80	7,667.4	-199.3	18.0	-198.9	1.22	-1.20	7.52
7,700.0	1.40	111.90	7,692.4	-199.5	18.6	-199.1	0.47	-0.24	16.40
7,725.0	1.22	114.05	7,717.4	-199.7	19.1	-199.3	0.75	-0.72	8.60
7,750.0	1.05	111.93	7,742.4	-199.9	19.6	-199.5	0.70	-0.68	-8.48
7,775.0	0.99	119.74	7,767.4	-200.1	20.0	-199.6	0.61	-0.24	31.24
7,800.0	1.04	119.47	7,792.4	-200.3	20.4	-199.9	0.20	0.20	-1.08
7,825.0	0.73	124.11	7,817.4	-200.5	20.7	-200.0	1.27	-1.24	18.56
7,850.0	0.66	140.40	7,842.4	-200.7	20.9	-200.2	0.84	-0.28	65.16
7,875.0	0.65	146.33	7,867.4	-200.9	21.1	-200.5	0.27	-0.04	23.72
7,900.0	0.55	147.45	7,892.4	-201.2	21.2	-200.7	0.40	-0.40	4.48
7,925.0	0.60	161.12	7,917.4	-201.4	21.3	-200.9	0.58	0.20	54.68
7,950.0	0.81	185.54	7,942.4	-201.7	21.4	-201.2	1.45	0.84	97.68
7,975.0	0.86	188.76	7,967.4	-202.0	21.3	-201.6	0.27	0.20	12.88
8,000.0	0.89	188.70	7,992.3	-202.4	21.2	-201.9	0.12	0.12	-0.24
8,025.0	0.70	183.15	8,017.3	-202.8	21.2	-202.3	0.82	-0.76	-22.20
8,050.0	0.34	118.32	8,042.3	-203.0	21.3	-202.5	2.54	-1.44	-259.32
8,075.0	0.92	61.37	8,067.3	-202.9	21.5	-202.4	3.15	2.32	-227.80
8,100.0	1.03	60.84	8,092.3	-202.7	21.9	-202.2	0.44	0.44	-2.12
8,125.0	0.97	57.10	8,117.3	-202.5	22.3	-202.0	0.35	-0.24	-14.96
8,150.0	0.90	60.35	8,142.3	-202.3	22.6	-201.8	0.35	-0.28	13.00
8,175.0	0.70	61.10	8,167.3	-202.1	22.9	-201.6	0.80	-0.80	3.00
8,200.0	0.45	76.91	8,192.3	-202.0	23.1	-201.5	1.18	-1.00	63.24
8,225.0	0.43	79.61	8,217.3	-201.9	23.3	-201.4	0.12	-0.08	10.80
8,250.0	0.18	116.61	8,242.3	-201.9	23.5	-201.4	1.22	-1.00	148.00
8,275.0	0.38	162.29	8,267.3	-202.0	23.5	-201.5	1.14	0.80	182.72
8,300.0	0.37	188.51	8,292.3	-202.2	23.5	-201.7	0.68	-0.04	104.88
8,325.0	0.48	187.87	8,317.3	-202.4	23.5	-201.9	0.44	0.44	-2.56
8,350.0	0.47	196.63	8,342.3	-202.6	23.5	-202.1	0.29	-0.04	35.04
8,375.0	0.54	196.06	8,367.3	-202.8	23.4	-202.3	0.28	0.28	-2.28
8,400.0	0.61	209.93	8,392.3	-203.0	23.3	-202.5	0.62	0.28	55.48
8,425.0	0.75	206.37	8,417.3	-203.3	23.2	-202.8	0.58	0.56	-14.24
8,450.0	0.75	217.76	8,442.3	-203.6	23.0	-203.1	0.60	0.00	45.56
8,475.0	0.82	207.58	8,467.3	-203.9	22.8	-203.3	0.62	0.28	-40.72
8,500.0	0.74	215.99	8,492.3	-204.1	22.6	-203.6	0.56	-0.32	33.64
8,525.0	0.85	207.79	8,517.3	-204.4	22.4	-203.9	0.63	0.44	-32.80
8,550.0	0.78	207.16	8,542.3	-204.8	22.3	-204.3	0.28	-0.28	-2.52
8,575.0	0.88	200.30	8,567.3	-205.1	22.1	-204.6	0.56	0.40	-27.44
8,600.0	0.89	183.04	8,592.3	-205.5	22.1	-205.0	1.06	0.04	-69.04
8,625.0	1.14	168.90	8,617.3	-205.9	22.1	-205.4	1.41	1.00	-56.56
8,650.0	1.41	152.51	8,642.3	-206.4	22.3	-205.9	1.80	1.08	-65.56

Survey Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well: LITTLEFIELD 33 FED COM #805H
Project:	EDDY COUNTY, NM	TVD Reference:	RKB=2858'7+26 @ 2884.7usft (PRECISION 106)
Site:	ATLAS	MD Reference:	RKB=2858'7+26 @ 2884.7usft (PRECISION 106)
Well:	LITTLEFIELD 33 FED COM #805H	North Reference:	Grid
Wellbore:	ST01	Survey Calculation Method:	Minimum Curvature
Design:	ACTUAL WELLPATH	Database:	EDM Users

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)
8,675.0	1.47	150.80	8,667.3	-207.0	22.6	-206.5	0.30	0.24	-6.84
8,700.0	1.58	149.69	8,692.3	-207.5	22.9	-207.0	0.46	0.44	-4.44
8,725.0	1.70	149.22	8,717.3	-208.2	23.3	-207.6	0.48	0.48	-1.88
8,750.0	1.65	149.56	8,742.3	-208.8	23.6	-208.3	0.20	-0.20	1.36
8,775.0	1.61	155.77	8,767.2	-209.4	24.0	-208.9	0.72	-0.16	24.84
8,800.0	1.70	158.80	8,792.2	-210.1	24.3	-209.5	0.50	0.36	12.12
8,825.0	1.72	160.98	8,817.2	-210.8	24.5	-210.2	0.27	0.08	8.72
8,850.0	1.77	164.88	8,842.2	-211.5	24.7	-211.0	0.52	0.20	15.60
8,875.0	1.80	165.81	8,867.2	-212.3	24.9	-211.7	0.17	0.12	3.72
8,900.0	1.81	166.96	8,892.2	-213.0	25.1	-212.5	0.15	0.04	4.60
8,925.0	1.91	165.50	8,917.2	-213.8	25.3	-213.3	0.44	0.40	-5.84
8,950.0	1.88	166.07	8,942.2	-214.6	25.5	-214.1	0.14	-0.12	2.28
8,975.0	1.83	165.68	8,967.2	-215.4	25.7	-214.8	0.21	-0.20	-1.56
9,000.0	1.92	167.82	8,992.1	-216.2	25.9	-215.6	0.46	0.36	8.56
9,025.0	1.86	164.55	9,017.1	-217.0	26.1	-216.4	0.49	-0.24	-13.08
9,050.0	1.80	165.37	9,042.1	-217.8	26.3	-217.2	0.26	-0.24	3.28
9,075.0	1.69	164.37	9,067.1	-218.5	26.5	-217.9	0.46	-0.44	-4.00
9,100.0	1.42	160.70	9,092.1	-219.2	26.7	-218.6	1.15	-1.08	-14.68
9,125.0	1.44	160.49	9,117.1	-219.7	26.9	-219.2	0.08	0.08	-0.84
9,150.0	1.25	158.19	9,142.1	-220.3	27.1	-219.7	0.79	-0.76	-9.20
9,175.0	1.21	163.90	9,167.1	-220.8	27.3	-220.2	0.52	-0.16	22.84
9,200.0	0.96	170.67	9,192.1	-221.3	27.4	-220.7	1.12	-1.00	27.08
9,225.0	0.90	178.08	9,217.1	-221.7	27.4	-221.1	0.54	-0.24	29.64
9,250.0	0.87	178.89	9,242.1	-222.1	27.4	-221.4	0.13	-0.12	3.24
9,275.0	0.71	178.74	9,267.1	-222.4	27.5	-221.8	0.64	-0.64	-0.60
9,300.0	0.56	172.22	9,292.1	-222.7	27.5	-222.1	0.67	-0.60	-26.08
9,325.0	0.40	144.85	9,317.1	-222.9	27.5	-222.3	1.10	-0.64	-109.48
9,350.0	0.50	147.67	9,342.1	-223.0	27.6	-222.4	0.41	0.40	11.28
9,375.0	0.40	149.50	9,367.1	-223.2	27.7	-222.6	0.40	-0.40	7.32
9,400.0	0.35	146.32	9,392.1	-223.3	27.8	-222.7	0.22	-0.20	-12.72
9,425.0	0.32	152.86	9,417.1	-223.5	27.9	-222.8	0.19	-0.12	26.16
9,450.0	0.25	135.68	9,442.1	-223.6	28.0	-222.9	0.44	-0.28	-68.72
9,475.0	0.07	103.36	9,467.1	-223.6	28.0	-223.0	0.78	-0.72	-129.28
9,500.0	0.51	336.49	9,492.1	-223.5	28.0	-222.9	2.22	1.76	-507.48
9,525.0	0.84	330.89	9,517.0	-223.2	27.9	-222.6	1.34	1.32	-22.40
9,550.0	0.93	328.52	9,542.0	-222.9	27.7	-222.3	0.39	0.36	-9.48
9,575.0	1.04	330.93	9,567.0	-222.5	27.5	-221.9	0.47	0.44	9.64
9,600.0	1.16	334.06	9,592.0	-222.1	27.2	-221.5	0.54	0.48	12.52
9,625.0	1.41	347.51	9,617.0	-221.6	27.1	-221.0	1.56	1.00	53.80
9,650.0	1.91	4.67	9,642.0	-220.9	27.0	-220.3	2.80	2.00	68.64
9,675.0	2.21	11.32	9,667.0	-220.0	27.2	-219.4	1.53	1.20	26.60
9,700.0	2.20	13.45	9,692.0	-219.0	27.4	-218.4	0.33	-0.04	8.52

Survey Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well: LITTLEFIELD 33 FED.COM #805H
Project:	EDDY COUNTY, NM	TVD Reference:	RKB=2858.7+26 @ 2884.7usft (PRECISION 106)
Site:	ATLAS	MD Reference:	RKB=2858.7+26 @ 2884.7usft (PRECISION 106)
Well:	LITTLEFIELD 33 FED.COM #805H	North Reference:	Grid
Wellbore:	ST01	Survey Calculation Method:	Minimum Curvature
Design:	ACTUAL WELLPATH	Database:	EDM Users

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)
9,725.0	2.13	15.07	9,717.0	-218.1	27.6	-217.5	0.37	-0.28	6.48
9,750.0	2.06	17.96	9,742.0	-217.2	27.9	-216.6	0.51	-0.28	11.56
9,775.0	1.89	19.11	9,766.9	-216.4	28.1	-215.8	0.70	-0.68	4.60
9,800.0	1.73	21.54	9,791.9	-215.7	28.4	-215.1	0.71	-0.64	9.72
9,825.0	1.53	20.85	9,816.9	-215.0	28.7	-214.4	0.80	-0.80	-2.76
9,850.0	1.43	22.52	9,841.9	-214.4	28.9	-213.8	0.44	-0.40	6.68
9,875.0	1.47	21.52	9,866.9	-213.8	29.1	-213.2	0.19	0.16	-4.00
9,900.0	1.49	21.86	9,891.9	-213.2	29.4	-212.6	0.09	0.08	1.36
9,925.0	1.50	20.49	9,916.9	-212.6	29.6	-212.0	0.15	0.04	-5.48
9,950.0	1.43	20.25	9,941.9	-212.0	29.8	-211.4	0.28	-0.28	-0.96
9,975.0	1.48	17.39	9,966.9	-211.4	30.0	-210.8	0.35	0.20	-11.44
10,000.0	1.46	16.83	9,991.9	-210.8	30.2	-210.2	0.10	-0.08	-2.24
10,025.0	1.43	15.33	10,016.8	-210.2	30.4	-209.6	0.19	-0.12	-6.00
10,050.0	1.32	18.29	10,041.8	-209.6	30.6	-209.0	0.52	-0.44	11.84
10,075.0	1.41	19.32	10,066.8	-209.1	30.8	-208.4	0.37	0.36	4.12
10,100.0	1.37	22.02	10,091.8	-208.5	31.0	-207.8	0.31	-0.16	10.80
10,125.0	1.27	23.00	10,116.8	-208.0	31.2	-207.3	0.41	-0.40	3.92
10,150.0	1.11	27.82	10,141.8	-207.5	31.4	-206.8	0.75	-0.64	19.28
10,175.0	0.95	30.04	10,166.8	-207.1	31.6	-206.4	0.66	-0.64	8.88
10,200.0	0.80	29.11	10,191.8	-206.8	31.8	-206.1	0.60	-0.60	-3.72
10,203.0	0.82	21.07	10,194.8	-206.7	31.8	-206.1	3.84	0.67	-268.00
10,269.0	0.49	358.92	10,260.8	-206.0	32.0	-205.3	0.62	-0.50	-33.56
10,363.0	4.44	13.66	10,354.7	-202.1	32.9	-201.4	4.22	4.20	15.68
10,410.0	7.84	13.38	10,401.4	-197.2	34.0	-196.5	7.23	7.23	-0.60
10,457.0	14.98	354.13	10,447.5	-188.0	34.2	-187.3	17.02	15.19	-40.96
10,504.0	22.15	348.78	10,492.0	-173.3	31.8	-172.6	15.66	15.26	-11.38
10,551.0	29.67	348.48	10,534.3	-153.1	27.8	-152.6	16.00	16.00	-0.64
10,598.0	35.97	350.26	10,573.7	-128.1	23.1	-127.6	13.56	13.40	3.79
10,644.0	40.00	353.32	10,610.0	-100.1	19.1	-99.7	9.67	8.76	6.65
10,691.0	43.97	1.14	10,644.9	-68.8	17.6	-68.4	13.96	8.45	16.64
10,738.0	49.04	7.36	10,677.3	-34.8	20.2	-34.4	14.43	10.79	13.23
10,777.8	52.16	6.98	10,702.5	-4.3	24.1	-3.8	7.88	7.85	-0.94
FTP @ 10777.8' MD									
10,785.0	52.73	6.92	10,706.9	1.4	24.8	1.9	7.88	7.85	-0.90
10,833.0	54.02	2.21	10,735.6	39.8	27.8	40.3	8.32	2.69	-9.81
10,880.0	57.65	358.47	10,762.0	78.6	28.0	79.2	10.15	7.72	-7.96
10,927.0	61.38	0.50	10,785.8	119.1	27.7	119.7	8.77	7.94	4.32
10,974.0	67.29	1.29	10,806.2	161.5	28.3	162.0	12.67	12.57	1.68
11,020.0	74.42	2.53	10,821.2	204.9	29.8	205.4	15.71	15.50	2.70
11,067.0	77.79	2.88	10,832.5	250.4	32.0	251.0	7.21	7.17	0.74
11,113.0	86.03	1.90	10,839.0	295.9	33.9	296.5	18.04	17.91	-2.13
11,160.0	90.10	0.47	10,840.6	342.8	34.8	343.5	9.18	8.66	-3.04

Survey Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well LITTLEFIELD 33 FED COM #805H
Project:	EDDY COUNTY NM	TVD Reference:	RKB-2858.7+26 @ 2884.7usft (PRECISION 106)
Site:	ATLAS	MD Reference:	RKB-2858.7+26 @ 2884.7usft (PRECISION 106)
Well:	LITTLEFIELD 33 FED COM #805H	North Reference:	Grid
Wellbore:	ST01	Survey Calculation Method:	Minimum Curvature
Design:	ACTUAL WELLPATH	Database:	EDM Users

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)
11,207.0	90.69	1.22	10,840.3	389.8	35.5	390.5	2.03	1.26	1.60
11,230.0	91.16	1.21	10,839.9	412.8	36.0	413.5	2.04	2.04	-0.04
11,325.0	91.16	0.68	10,838.0	507.8	37.6	508.5	0.56	0.00	-0.56
11,418.0	93.43	3.19	10,834.2	600.7	40.7	601.4	3.64	2.44	2.70
11,465.0	90.15	4.11	10,832.8	647.5	43.7	648.3	7.25	-6.98	1.96
11,512.0	89.15	3.17	10,833.1	694.4	46.7	695.2	2.92	-2.13	-2.00
11,559.0	87.44	1.80	10,834.5	741.4	48.7	742.2	4.66	-3.64	-2.91
11,606.0	87.18	0.38	10,836.7	788.3	49.6	789.1	3.07	-0.55	-3.02
11,653.0	86.65	359.15	10,839.2	835.2	49.4	836.1	2.85	-1.13	-2.62
11,699.0	88.22	359.96	10,841.3	881.2	49.1	882.0	3.84	3.41	1.76
11,746.0	90.10	359.32	10,841.9	928.2	48.8	929.0	4.23	4.00	-1.36
11,793.0	87.07	357.68	10,843.1	975.1	47.5	975.9	7.33	-6.45	-3.49
11,840.0	83.67	356.30	10,846.9	1,021.9	45.1	1,022.6	7.80	-7.23	-2.94
11,887.0	83.39	356.07	10,852.2	1,068.5	42.0	1,069.1	0.77	-0.60	-0.49
11,934.0	85.50	356.10	10,856.7	1,115.2	38.8	1,115.7	4.49	4.49	0.06
11,981.0	86.34	355.94	10,860.1	1,161.9	35.5	1,162.4	1.82	1.79	-0.34
12,028.0	88.11	355.24	10,862.4	1,208.7	31.9	1,209.1	4.05	3.77	-1.49
12,076.0	91.02	358.80	10,862.7	1,256.7	29.4	1,257.0	9.58	6.06	7.42
12,123.0	90.88	358.33	10,861.9	1,303.6	28.2	1,303.9	1.04	-0.30	-1.00
12,169.0	91.98	1.86	10,860.8	1,349.6	28.3	1,349.9	8.04	2.39	7.67
12,264.0	87.35	0.23	10,861.4	1,444.6	30.1	1,444.9	5.17	-4.87	-1.72
12,357.0	91.83	2.22	10,862.0	1,537.5	32.0	1,537.9	5.27	4.82	2.14
12,451.0	88.95	0.75	10,861.4	1,631.5	34.5	1,631.8	3.44	-3.06	-1.56
12,545.0	91.05	2.90	10,861.4	1,725.4	37.5	1,725.8	3.20	2.23	2.29
12,638.0	88.50	1.62	10,861.7	1,818.3	41.1	1,818.8	3.07	-2.74	-1.38
12,732.0	87.24	0.28	10,865.2	1,912.3	42.7	1,912.7	1.96	-1.34	-1.43
12,826.0	87.38	358.37	10,869.7	2,006.1	41.6	2,006.6	2.04	0.15	-2.03
12,919.0	87.97	357.01	10,873.4	2,099.0	37.8	2,099.3	1.59	0.63	-1.46
13,014.0	89.54	358.25	10,875.5	2,193.9	33.9	2,194.1	2.11	1.65	1.31
13,108.0	86.90	358.72	10,878.4	2,287.8	31.4	2,288.0	2.85	-2.81	0.50
13,201.0	88.16	358.46	10,882.4	2,380.7	29.1	2,380.8	1.38	1.35	-0.28
13,296.0	90.10	359.13	10,883.9	2,475.6	27.1	2,475.7	2.16	2.04	0.71
13,390.0	92.70	1.83	10,881.6	2,569.6	27.9	2,569.6	3.99	2.77	2.87
13,483.0	91.86	0.17	10,877.9	2,662.5	29.6	2,662.5	2.00	-0.90	-1.78
13,577.0	96.67	2.32	10,870.9	2,756.2	31.6	2,756.3	5.60	5.12	2.29
13,671.0	96.75	3.17	10,859.9	2,849.4	36.1	2,849.6	0.90	0.09	0.90
13,765.0	93.97	2.86	10,851.1	2,942.9	41.0	2,943.1	2.98	-2.96	-0.33
13,859.0	90.74	3.15	10,847.2	3,036.7	45.9	3,037.0	3.45	-3.44	0.31
13,953.0	90.35	1.74	10,846.4	3,130.6	49.9	3,130.9	1.56	-0.41	-1.50
14,047.0	84.63	1.72	10,850.5	3,224.4	52.7	3,224.8	6.09	-6.09	-0.02
14,141.0	87.60	359.19	10,856.8	3,318.2	53.5	3,318.6	4.15	3.16	-2.69
14,235.0	89.29	358.93	10,859.4	3,412.1	51.9	3,412.5	1.82	1.80	-0.28

Survey Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well: LITTLEFIELD 33 FED COM #805H
Project:	EDDY COUNTY, NM	TVD Reference:	RKB=2858.7+26 @ 2884.7usft (PRECISION 106)
Site:	ATLAS	MD Reference:	RKB=2858.7+26 @ 2884.7usft (PRECISION 106)
Well:	LITTLEFIELD 33 FED COM #805H	North Reference:	Grid:
Wellbore:	ST01	Survey Calculation Method:	Minimum Curvature
Design:	ACTUAL WELLPATH	Database:	EDM Users

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)
14,328.0	89.40	0.33	10,860.4	3,505.1	51.3	3,505.4	1.51	0.12	1.51
14,423.0	88.19	358.88	10,862.4	3,600.1	50.7	3,600.4	1.99	-1.27	-1.53
14,517.0	93.91	359.66	10,860.7	3,694.0	49.5	3,694.2	6.14	6.09	0.83
14,611.0	91.19	1.41	10,856.5	3,787.9	50.4	3,788.1	3.44	-2.89	1.86
14,710.0	92.20	4.71	10,853.6	3,886.7	55.6	3,887.0	3.48	1.02	3.33
14,806.0	89.23	4.71	10,852.4	3,982.4	63.5	3,982.8	3.09	-3.09	0.00
14,899.0	88.08	3.07	10,854.6	4,075.1	69.8	4,075.7	2.15	-1.24	-1.76
14,993.0	86.01	358.78	10,859.4	4,168.9	71.4	4,169.5	5.06	-2.20	-4.56
15,088.0	86.88	358.25	10,865.3	4,263.7	68.9	4,264.2	1.07	0.92	-0.56
15,181.0	89.06	357.22	10,868.6	4,356.6	65.2	4,357.0	2.59	2.34	-1.11
15,276.0	90.13	358.50	10,869.3	4,451.5	61.7	4,451.8	1.76	1.13	1.35
15,370.0	89.40	358.71	10,869.7	4,545.5	59.4	4,545.8	0.81	-0.78	0.22
15,464.0	89.59	359.94	10,870.5	4,639.5	58.3	4,639.7	1.32	0.20	1.31
15,558.0	90.80	1.13	10,870.2	4,733.5	59.2	4,733.7	1.81	1.29	1.27
15,652.0	88.95	3.34	10,870.4	4,827.4	62.8	4,827.7	3.07	-1.97	2.35
15,746.0	90.80	4.43	10,870.6	4,921.2	69.2	4,921.6	2.28	1.97	1.16
15,840.0	85.36	0.51	10,873.8	5,015.0	73.2	5,015.4	7.13	-5.79	-4.17
15,934.0	85.98	0.38	10,880.9	5,108.7	74.0	5,109.1	0.67	0.66	-0.14
16,028.0	88.59	0.68	10,885.3	5,202.6	74.8	5,203.0	2.79	2.78	0.32
16,122.0	91.84	0.89	10,885.0	5,296.6	76.1	5,297.0	3.46	3.46	0.22
16,216.0	91.83	359.46	10,881.9	5,390.5	76.4	5,390.9	1.52	-0.01	-1.52
16,310.0	91.25	358.00	10,879.4	5,484.4	74.3	5,484.8	1.67	-0.62	-1.55
16,404.0	88.08	356.53	10,880.0	5,578.3	69.8	5,578.6	3.72	-3.37	-1.56
16,498.0	90.07	0.92	10,881.5	5,672.3	67.8	5,672.5	5.13	2.12	4.67
16,592.0	90.88	0.96	10,880.7	5,766.2	69.3	5,766.5	0.86	0.86	0.04
16,686.0	88.45	357.41	10,881.3	5,860.2	68.0	5,860.4	4.58	-2.59	-3.78
16,779.0	88.22	355.82	10,884.0	5,953.0	62.5	5,953.0	1.73	-0.25	-1.71
16,873.0	90.69	359.65	10,884.9	6,046.9	58.8	6,046.8	4.85	2.63	4.07
16,967.0	92.37	2.27	10,882.3	6,140.8	60.3	6,140.8	3.31	1.79	2.79
17,026.0	90.24	5.90	10,881.0	6,199.7	64.5	6,199.7	7.13	-3.61	6.15
17,062.0	89.90	7.35	10,881.0	6,235.4	68.7	6,235.5	4.14	-0.94	4.03
17,156.0	89.29	5.10	10,881.6	6,328.9	78.9	6,329.2	2.48	-0.65	-2.39
17,250.0	91.33	6.90	10,881.1	6,422.3	88.7	6,422.8	2.89	2.17	1.91
17,344.0	89.59	4.91	10,880.4	6,515.8	98.4	6,516.5	2.81	-1.85	-2.12
17,438.0	87.63	6.24	10,882.6	6,609.4	107.5	6,610.2	2.52	-2.09	1.41
17,532.0	86.57	2.98	10,887.4	6,702.9	115.1	6,703.9	3.64	-1.13	-3.47
17,626.0	85.89	1.91	10,893.6	6,796.6	119.1	6,797.6	1.35	-0.72	-1.14
17,720.0	87.77	3.32	10,898.8	6,890.4	123.3	6,891.5	2.50	2.00	1.50
17,814.0	88.81	4.70	10,901.6	6,984.1	129.9	6,985.3	1.84	1.11	1.47
17,907.0	89.90	6.45	10,902.6	7,076.6	138.9	7,078.0	2.22	1.17	1.88
17,935.7	89.90	6.45	10,902.7	7,105.2	142.2	7,106.6	0.00	0.00	0.00

LTP @ 17935.7

Survey Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well LITTLEFIELD 33 FED COM #805H
Project:	EDDY COUNTY- NM	TVD Reference:	RKB=2858.7+26 @ 2884.7usft (PRECISION 106)
Site:	ATLAS	MD Reference:	RKB=2858.7+26 @ 2884.7usft (PRECISION 106)
Well:	LITTLEFIELD 33 FED COM #805H	North Reference:	Grid
Wellbore:	ST01	Survey Calculation Method:	Minimum Curvature
Design:	ACTUAL WELLPATH	Database:	EDM Users

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)
17,966.0	89.90	6.45	10,902.7	7,135.3	145.6	7,136.8	0.00	0.00	0.00

Target Name	hit/miss target	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
**FTP		0.00	0.00	0.0	-4.3	54.8	364,187.86	606,560.15	32° 0' 2.881 N	103° 59' 22.499 W
- actual wellpath misses target center by 55.0usft at 0.0usft MD (0.0 TVD, 0.0 N, 0.0 E)										
- Point										

Measured Depth (usft)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Comment
10,777.8	10,702.5	-4.3	24.1	FTP @ 10777.8' MD
17,935.7	10,902.7	7,105.2	142.2	LTP @ 17935.7

Checked By: _____ Approved By: _____ Date: _____

Littlefield 33 Federal Com #805H

<u>Perfs</u>	<u>7 1/2% Acid (Gal)</u>	<u>Sand (#)</u>	<u>Fluid (Gal)</u>
1	2998	361220	884970
2	3192	350133	504798
3	3012	337238	618270
4	4482	362835	556992
5	3024	362258	381528
6	3192	360020	414708
7	3012	298513	424482
8	3024	363231	597912
9	3012	361020	446070
10	3024	351950	389424
11	3012	360012	427296
12	3000	354260	461556
13	3012	359426	461022
14	3012	360122	735324
15	3012	360361	366480
16	3000	358627	462732
17	3024	360055	371616
18	3024	360595	449190
19	3024	359176	425964
20	3012	360399	384036
21	3024	360010	355908
22	3012	360147	314064
23	3000	360004	347988
24	3024	360120	379218
25	3012	359495	463752
26	3024	360148	293202
27	3012	360204	335652
28	3000	360651	317118
29	3024	352941	368088
30	3024	360515	295092
31	3012	362593	338046
32	3012	360186	303144
33	3024	360671	299880
34	3024	360894	289086
35	3012	359945	290124
36	3000	360570	327912
37	3024	360336	307398
38	3024	360216	284970
39	3822	377501	313488
Totals	117,216	13,958,598	15,988,499

	Stage 1	Distance Between Perfs	Shots	Stage 2	Distance Between Perfs	Shots	Stage 3	Distance Between Perfs	Shots	Stage 4	Distance Between Perfs	Shots	Stage 5	Distance Between Perfs	Shots
From Bottom to Top	17,875	22	5	17,658	62	5	17,491	52	5	17,330	37	5	17,146	44	5
	17,853	22	5	17,648	10	5	17,478	11	5	17,320	20	5	17,133	10	5
	17,831	22	5	17,638	10	5	17,467	15	5	17,300	22	5	17,123	22	5
	17,809	22	5	17,628	13	5	17,452	19	5	17,278	18	5	17,101	22	5
	17,787	23	5	17,615	27	4	17,433		4	17,260	26	4	17,079	22	4
	17,764	22	5	17,588	25	4	17,411	22	4	17,234	25	4	17,057	22	4
	17,742	22	5	17,563	20	4	17,389	22	4	17,209	19	4	17,035	22	4
	17,720		5	17,543		4	17,367		4	17,190		4	17,013		4
	Plug to Plug	81	40	Plug to Plug	42	36	Plug to Plug	57	36	Plug to Plug	69	36	Plug to Plug	59	36
	Frac Plug	17,890	Total Shots	Frac Plug	17,670	Total Shots	Frac Plug	17,509	Total Shots	Frac Plug	17,347	Total Shots	Frac Plug	17,160	Total Shots

	Stage 6	Distance Between Perfs	Shots	Stage 7	Distance Between Perfs	Shots	Stage 8	Distance Between Perfs	Shots	Stage 9	Distance Between Perfs	Shots	Stage 10	Distance Between Perfs	Shots
From Bottom to Top	16,980	33	5	16,800	32	5	16,621	38	5	16,439	43	5	16,270	35	5
	16,969	22	5	16,788	18	5	16,610	17	5	16,429	17	5	16,260	21	5
	16,947	23	5	16,770	17	5	16,593	22	5	16,412	18	5	16,239	22	5
	16,924	22	5	16,753	28	5	16,571	22	5	16,394	25	5	16,217	22	5
	16,902	22	4	16,725	24	4	16,549	22	4	16,369	19	4	16,195	21	4
	16,880	22	4	16,701	20	4	16,527	22	4	16,350	25	4	16,174	23	4
	16,858	26	4	16,681	22	4	16,505	23	4	16,325	20	4	16,151	22	4
	16,832		4	16,659		4	16,482		4	16,305		4	16,129		4
	Plug to Plug	67	36	Plug to Plug	61	36	Plug to Plug	69	36	Plug to Plug	55	36	Plug to Plug	65	36
	Frac Plug	16,991	Total Shots	Frac Plug	16,814	Total Shots	Frac Plug	16,640	Total Shots	Frac Plug	16,449	Total Shots	Frac Plug	16,282	Total Shots

	Stage 11	Distance Between Perfs	Shots	Stage 12	Distance Between Perfs	Shots	Stage 13	Distance Between Perfs	Shots	Stage 14	Distance Between Perfs	Shots	Stage 15	Distance Between Perfs	Shots
From Bottom to Top	16,096	33	5	15,920	32	5	15,732	43	5	15,566	32	5	15,385	37	5
	16,078	16	5	15,908	23	5	15,722	16	5	15,549	17	5	15,370	15	5
	16,062	16	5	15,885	22	5	15,706	19	5	15,532	22	5	15,355	16	5
	16,046	28	5	15,863	22	5	15,687	23	5	15,510	22	5	15,339	28	5
	16,018	28	4	15,841	22	4	15,664	22	4	15,488	23	4	15,311	26	4
	15,990	16	4	15,819	19	4	15,642	22	4	15,465	22	4	15,285	19	4
	15,974	22	4	15,800	25	4	15,620	22	4	15,443	21	4	15,266	23	4
	15,952		4	15,775		4	15,598		4	15,422		4	15,243		4
	Plug to Plug	61	36	Plug to Plug	67	36	Plug to Plug	58	36	Plug to Plug	66	36	Plug to Plug	61	36
	Frac Plug	16,107	Total Shots	Frac Plug	15,930	Total Shots	Frac Plug	15,745	Total Shots	Frac Plug	15,576	Total Shots	Frac Plug	15,400	Total Shots

	Stage 16	Distance Between Perfs	Shots	Stage 17	Distance Between Perfs	Shots	Stage 18	Distance Between Perfs	Shots	Stage 19	Distance Between Perfs	Shots	Stage 20	Distance Between Perfs	Shots
From Bottom to Top	15,211	32	5	15,033	35	5	14,850	41	5	14,681	33	5	14,499	38	5
	15,200	22	5	15,023	21	5	14,839	15	5	14,671	23	5	14,486	15	5
	15,178	22	5	15,002	23	5	14,824	22	5	14,648	27	5	14,471	22	5
	15,156	22	5	14,979	17	5	14,802	22	5	14,621	18	5	14,449	23	5
	15,134	22	4	14,962	27	4	14,780	22	4	14,603	22	4	14,426	22	4
	15,112	22	4	14,935	22	4	14,758	22	4	14,581	22	4	14,404	21	4
	15,090	22	4	14,913	22	4	14,736	22	4	14,559	22	4	14,383	11	4
	15,068		4	14,891		4	14,714		4	14,537		4	14,372		4
	Plug to Plug	66	36	Plug to Plug	71	36	Plug to Plug	64	36	Plug to Plug	71	36	Plug to Plug	66	36
	Frac Plug	15,222	Total Shots	Frac Plug	15,050	Total Shots	Frac Plug	14,866	Total Shots	Frac Plug	14,692	Total Shots	Frac Plug	14,515	Total Shots

	Stage 21	Distance Between Perfs	Shots	Stage 22	Distance Between Perfs	Shots	Stage 23	Distance Between Perfs	Shots	Stage 24	Distance Between Perfs	Shots	Stage 25	Distance Between Perfs	Shots
From Bottom to Top	14,333	39	5	14,147	36	5	13,970	36	5	13,798	31	3	13,622	31	3
	14,316	26	5	14,133	16	5	13,962	22	5	13,785	22	3	13,609	20	3
	14,290	18	5	14,117	22	5	13,940	26	5	13,763	22	3	13,589	25	3
	14,272	23	5	14,095	22	5	13,914	18	5	13,741	22	3	13,564	26	3
	14,249	21	4	14,073	22	4	13,896	24	4	13,719	22	3	13,538	18	3
	14,228	23	4	14,051	22	4	13,872	20	4	13,697	22	3	13,520	25	3
	14,205	22	4	14,029	23	4	13,852	23	4	13,675	22	3	13,495	19	3
	14,183		4	14,006		4	13,829		4	13,653		3	13,476		3
	Plug to Plug	77	36	Plug to Plug	65	36	Plug to Plug	70	36	Plug to Plug	69	24	Plug to Plug	71	24
	Frac Plug	14,349	Total Shots	Frac Plug	14,160	Total Shots	Frac Plug	13,984	Total Shots	Frac Plug	13,810	Total Shots	Frac Plug	13,635	Total Shots

	Stage 26	Distance Between Perfs	Shots	Stage 27	Distance Between Perfs	Shots	Stage 28	Distance Between Perfs	Shots	Stage 29	Distance Between Perfs	Shots	Stage 30	Distance Between Perfs	Shots
From Bottom to Top	13,436	40	5	13,266	33	5	13,097	32	5	12,910	35	5	12,728	41	5
	13,422	16	5	13,254	21	5	13,077	21	5	12,898	19	5	12,718	17	5
	13,406	19	5	13,233	21	5	13,056	22	5	12,879	22	5	12,701	21	5
	13,387	22	5	13,212	23	5	13,034	22	5	12,857	21	5	12,680	22	5
	13,365	22	4	13,189	20	4	13,012	22	4	12,836	23	4	12,658	22	4
	13,343	22	4	13,169	25	4	12,990	23	4	12,813	18	4	12,636	22	4
	13,321	22	4	13,144	15	4	12,967	22	4	12,795	26	4	12,614	22	4
	13,299		4	13,129		4	12,945		4	12,769		4	12,592		4
	Plug to Plug	63	36	Plug to Plug	65	36	Plug to Plug	75	36	Plug to Plug	67	36	Plug to Plug	58	36
	Frac Plug	13,450	Total Shots	Frac Plug	13,277	Total Shots	Frac Plug	13,109	Total Shots	Frac Plug	12,924	Total Shots	Frac Plug	12,738	Total Shots

From Bottom to Top	Stage 31	Distance Between Perfs	Shots	Stage 32	Distance Between Perfs	Shots	Stage 33	Distance Between Perfs	Shots	Stage 34	Distance Between Perfs	Shots	Stage 35	Distance Between Perfs	Shots
	12,560	32	5	12,380	41	5	12,204	34	5	12,020	41	5	11,850	34	5
	12,545	20	5	12,370	21	5	12,194	20	5	12,008	13	5	11,836	18	5
	12,525	22	5	12,349	23	5	12,174	24	5	11,995	22	5	11,818	19	5
	12,503	22	5	12,326	22	5	12,150	28	5	11,973	22	5	11,799	25	5
	12,481	18	4	12,304	22	4	12,122	17	4	11,951	23	4	11,774	17	4
	12,463	26	4	12,282	22	4	12,105	23	4	11,928	22	4	11,757	27	4
	12,437	16	4	12,260	22	4	12,082	21	4	11,906	22	4	11,730	15	4
	12,421		4	12,238		4	12,061		4	11,884		4	11,715		4
	Plug to Plug	67	36	Plug to Plug	67	36	Plug to Plug	70	36	Plug to Plug	61	36	Plug to Plug	63	36
	Frac Plug	12,570	Total Shots	Frac Plug	12,393	Total Shots	Frac Plug	12,220	Total Shots	Frac Plug	12,034	Total Shots	Frac Plug	11,862	Total Shots

From Bottom to Top	Stage 36	Distance Between Perfs	Shots	Stage 37	Distance Between Perfs	Shots	Stage 38	Distance Between Perfs	Shots	Stage 39	Distance Between Perfs	Shots	Stage 40	Distance Between Perfs	Shots
	11,674	41	5	11,496	35	5	11,320	34	5	11,142	38	5	11,000		3
	11,663	22	5	11,484	18	5	11,308	21	5	11,133	22	5			3
	11,641	22	5	11,466	24	5	11,287	22	5	11,111	26	5			3
	11,619	22	5	11,442	26	5	11,265	22	5	11,085	19	5			3
	11,597	22	4	11,416	18	4	11,243	19	4	11,066	23	4			3
	11,575	22	4	11,398	22	4	11,224	25	4	11,043	21	4			3
	11,553	22	4	11,376	22	4	11,199	19	4	11,022	22	4			3
	11,531		4	11,354		4	11,180		4	11,000		4			3
	Plug to Plug	66	36	Plug to Plug	70	36	Plug to Plug	67	36	Plug to Plug	70	36	Plug to Plug	0	24
	Frac Plug	11,685	Total Shots	Frac Plug	11,512	Total Shots	Frac Plug	11,332	Total Shots	Frac Plug	11,155	Total Shots	Frac Plug		Total Shots