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DISTRICT 7 - ARTESIA O.C.D.

NORTHERN DELAWARE BASIN

EDDY COUNTY, NM

ATLAS

HAMBONE FEDERAL COM 26H

ST01 - LATERAL

Design: ST01 - LATERAL

Standard Survey Report

07 May, 2019

Survey Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well HAMBONE FEDERAL COM 26H
Project:	EDDY COUNTY, NM	TVD Reference:	RKB = 2894.5' + 30 @ 2924.5usft (Original Well Elev)
Site:	ATLAS	MD Reference:	RKB = 2894.5' + 30 @ 2924.5usft (Original Well Elev)
Well:	HAMBONE FEDERAL COM 26H	North Reference:	Grid
Wellbore:	ST01 - LATERAL	Survey Calculation Method:	Minimum Curvature
Design:	ST01 - LATERAL	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
From:	Map	Easting:	573,599.60 usft
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 1' 15.933 N
		Longitude:	104° 5' 45.086 W
		Grid Convergence:	0.13 °

Well	HAMBONE FEDERAL COM 26H		
Well Position	+N/-S	0.0 usft	Northing: 382,231.57 usft
	+E/-W	0.0 usft	Easting: 601,241.54 usft
Position Uncertainty	3.0 usft	Wellhead Elevation:	usft
		Latitude:	32° 3' 1.614 N
		Longitude:	104° 0' 23.630 W
		Ground Level:	2,894.5 usft

Wellbore	ST01 - LATERAL				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	WMM2015	4/1/2019	6.98	59.79	47,592.18205509

Design	ST01 - LATERAL				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	11,028.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.0	0.0	0.0	2.97	

Survey Program	Date	5/6/2019			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100.0	10,050.0	GYRO (OWB (PILOT))	Standard Keeper 104	Standard Wireline Keeper ver 1.0.4	
10,249.0	11,028.0	MWD-CURVE/LATERAL (OWB (LATERAL	MWD+IFR1+MS	OWSG MWD + IFR1 + Multi-Station Correction	
11,064.0	20,989.0	MWD-ST01 CURVE/ LATERAL (ST01 - L	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	0.13	5.97	100.0	0.1	0.0	0.1	0.13	0.13	0.00	
125.0	0.07	32.80	125.0	0.2	0.0	0.2	0.30	-0.24	107.32	
150.0	0.06	294.14	150.0	0.2	0.0	0.2	0.40	-0.04	-394.64	
175.0	0.14	13.52	175.0	0.2	0.0	0.2	0.57	0.32	317.52	
200.0	0.18	6.74	200.0	0.3	0.0	0.3	0.18	0.16	-27.12	
225.0	0.22	8.11	225.0	0.4	0.0	0.4	0.16	0.16	5.48	

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Well:	HAMBONE FEDERAL COM 26H	North Reference:	Grid
Wellbore:	ST01 - LATERAL	Survey Calculation Method:	Minimum Curvature
Design:	ST01 - LATERAL	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)	
250.0	0.21	19.09	250.0	0.5	0.1	0.5	0.17	-0.04	43.92	
275.0	0.17	31.92	275.0	0.5	0.1	0.5	0.23	-0.16	51.32	
300.0	0.19	20.03	300.0	0.6	0.1	0.6	0.17	0.08	-47.56	
325.0	0.17	346.61	325.0	0.7	0.1	0.7	0.42	-0.08	-133.68	
350.0	0.30	353.00	350.0	0.8	0.1	0.8	0.53	0.52	25.56	
375.0	0.34	355.96	375.0	0.9	0.1	0.9	0.17	0.16	11.84	
400.0	0.23	358.37	400.0	1.0	0.1	1.0	0.44	-0.44	9.64	
425.0	0.28	1.54	425.0	1.1	0.1	1.2	0.21	0.20	12.68	
450.0	0.35	10.33	450.0	1.3	0.1	1.3	0.34	0.28	35.16	
475.0	0.39	8.98	475.0	1.4	0.1	1.4	0.16	0.16	-5.40	
500.0	0.31	1.23	500.0	1.6	0.2	1.6	0.37	-0.32	-31.00	
525.0	0.27	345.60	525.0	1.7	0.1	1.7	0.35	-0.16	-62.52	
550.0	0.29	343.25	550.0	1.8	0.1	1.8	0.09	0.08	-9.40	
575.0	0.30	347.66	575.0	2.0	0.1	2.0	0.10	0.04	17.64	
600.0	0.19	355.12	600.0	2.1	0.1	2.1	0.46	-0.44	29.84	
625.0	0.24	348.00	625.0	2.2	0.0	2.2	0.23	0.20	-28.48	
650.0	0.23	326.34	650.0	2.3	0.0	2.3	0.36	-0.04	-86.64	
675.0	0.29	333.86	675.0	2.4	-0.1	2.3	0.28	0.24	30.08	
700.0	0.17	314.27	700.0	2.4	-0.1	2.4	0.57	-0.48	-78.36	
725.0	0.15	299.48	725.0	2.5	-0.2	2.5	0.18	-0.08	-59.16	
750.0	0.14	303.52	750.0	2.5	-0.2	2.5	0.06	-0.04	16.16	
775.0	0.19	326.69	775.0	2.6	-0.3	2.5	0.33	0.20	92.68	
800.0	0.26	305.65	800.0	2.6	-0.3	2.6	0.43	0.28	-84.16	
825.0	0.11	260.01	825.0	2.7	-0.4	2.6	0.80	-0.60	-182.56	
850.0	0.08	253.32	850.0	2.6	-0.4	2.6	0.13	-0.12	-26.76	
875.0	0.10	243.88	875.0	2.6	-0.5	2.6	0.10	0.08	-37.76	
900.0	0.11	228.65	900.0	2.6	-0.5	2.6	0.12	0.04	-60.92	
925.0	0.21	238.54	925.0	2.6	-0.6	2.5	0.41	0.40	39.56	
950.0	0.16	247.38	950.0	2.5	-0.6	2.5	0.23	-0.20	35.36	
975.0	0.18	258.04	975.0	2.5	-0.7	2.5	0.15	0.08	42.64	
1,000.0	0.22	237.18	1,000.0	2.5	-0.8	2.4	0.33	0.16	-83.44	
1,025.0	0.15	260.02	1,025.0	2.4	-0.9	2.4	0.40	-0.28	91.36	
1,050.0	0.21	239.02	1,050.0	2.4	-0.9	2.4	0.35	0.24	-84.00	
1,075.0	0.06	212.03	1,075.0	2.4	-1.0	2.3	0.64	-0.60	-107.96	
1,100.0	0.06	217.50	1,100.0	2.4	-1.0	2.3	0.02	0.00	21.88	
1,125.0	0.13	214.95	1,125.0	2.3	-1.0	2.3	0.28	0.28	-10.20	
1,150.0	0.14	215.56	1,150.0	2.3	-1.1	2.2	0.04	0.04	2.44	
1,175.0	0.08	218.79	1,175.0	2.2	-1.1	2.2	0.24	-0.24	12.92	
1,200.0	0.11	265.72	1,200.0	2.2	-1.1	2.2	0.32	0.12	187.72	
1,225.0	0.06	213.84	1,225.0	2.2	-1.2	2.1	0.35	-0.20	-207.52	
1,250.0	0.14	218.78	1,250.0	2.2	-1.2	2.1	0.32	0.32	19.76	
1,275.0	0.17	209.90	1,275.0	2.1	-1.2	2.1	0.15	0.12	-35.52	

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Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
1,300.0	0.15	241.45	1,300.0	2.1	-1.3	2.0	0.36	-0.08	126.20	
1,325.0	0.05	298.49	1,325.0	2.1	-1.3	2.0	0.52	-0.40	228.16	
1,350.0	0.13	224.71	1,350.0	2.0	-1.3	2.0	0.50	0.32	-295.12	
1,375.0	0.17	232.71	1,375.0	2.0	-1.4	1.9	0.18	0.16	32.00	
1,400.0	0.21	218.77	1,400.0	1.9	-1.4	1.9	0.24	0.16	-55.76	
1,425.0	0.07	238.42	1,425.0	1.9	-1.5	1.8	0.58	-0.56	78.60	
1,450.0	0.07	214.24	1,450.0	1.9	-1.5	1.8	0.12	0.00	-96.72	
1,475.0	0.05	213.84	1,475.0	1.9	-1.5	1.8	0.08	-0.08	-1.60	
1,500.0	0.16	218.58	1,500.0	1.8	-1.5	1.7	0.44	0.44	18.96	
1,525.0	0.11	210.07	1,525.0	1.8	-1.6	1.7	0.21	-0.20	-34.04	
1,550.0	0.09	233.59	1,550.0	1.7	-1.6	1.7	0.18	-0.08	94.08	
1,575.0	0.08	176.04	1,575.0	1.7	-1.6	1.6	0.33	-0.04	-230.20	
1,600.0	0.15	208.17	1,600.0	1.7	-1.6	1.6	0.37	0.28	128.52	
1,625.0	0.13	239.76	1,625.0	1.6	-1.7	1.5	0.31	-0.08	126.36	
1,650.0	0.07	232.25	1,650.0	1.6	-1.7	1.5	0.25	-0.24	-30.04	
1,675.0	0.16	214.68	1,675.0	1.6	-1.7	1.5	0.38	0.36	-70.28	
1,700.0	0.14	209.19	1,700.0	1.5	-1.8	1.4	0.10	-0.08	-21.96	
1,725.0	0.22	225.54	1,725.0	1.4	-1.8	1.4	0.38	0.32	65.40	
1,750.0	0.22	238.43	1,750.0	1.4	-1.9	1.3	0.20	0.00	51.56	
1,775.0	0.20	197.86	1,775.0	1.3	-2.0	1.2	0.59	-0.08	-162.28	
1,800.0	0.05	239.53	1,800.0	1.3	-2.0	1.2	0.66	-0.60	166.68	
1,825.0	0.16	216.20	1,825.0	1.2	-2.0	1.1	0.46	0.44	-93.32	
1,850.0	0.16	204.13	1,850.0	1.2	-2.0	1.1	0.13	0.00	-48.28	
1,875.0	0.13	227.31	1,875.0	1.1	-2.1	1.0	0.26	-0.12	92.72	
1,900.0	0.12	236.02	1,900.0	1.1	-2.1	1.0	0.09	-0.04	34.84	
1,925.0	0.03	174.46	1,925.0	1.1	-2.1	1.0	0.44	-0.36	-246.24	
1,950.0	0.16	230.16	1,950.0	1.0	-2.2	0.9	0.58	0.52	222.80	
1,975.0	0.18	210.75	1,975.0	1.0	-2.2	0.9	0.24	0.08	-77.64	
2,000.0	0.08	226.82	2,000.0	0.9	-2.2	0.8	0.42	-0.40	64.28	
2,025.0	0.06	153.76	2,025.0	0.9	-2.3	0.8	0.34	-0.08	-292.24	
2,050.0	0.08	124.51	2,050.0	0.9	-2.2	0.8	0.16	0.08	-117.00	
2,075.0	0.14	130.13	2,075.0	0.9	-2.2	0.8	0.24	0.24	22.48	
2,100.0	0.15	80.61	2,100.0	0.9	-2.1	0.7	0.49	0.04	-198.08	
2,125.0	0.39	87.13	2,125.0	0.9	-2.0	0.8	0.97	0.96	26.08	
2,150.0	0.41	93.23	2,150.0	0.9	-1.8	0.8	0.19	0.08	24.40	
2,175.0	0.47	103.20	2,175.0	0.8	-1.7	0.7	0.39	0.24	39.88	
2,200.0	0.46	89.90	2,200.0	0.8	-1.5	0.7	0.43	-0.04	-53.20	
2,225.0	0.54	93.32	2,225.0	0.8	-1.2	0.7	0.34	0.32	13.68	
2,250.0	0.57	87.72	2,250.0	0.8	-1.0	0.8	0.25	0.12	-22.40	
2,275.0	0.58	96.75	2,275.0	0.8	-0.8	0.8	0.36	0.04	36.12	
2,300.0	0.64	96.54	2,300.0	0.8	-0.5	0.7	0.24	0.24	-0.84	
2,325.0	0.57	99.59	2,325.0	0.7	-0.2	0.7	0.31	-0.28	12.20	

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Site:	ATLAS	MD Reference:	RKB = 2894.5' + 30 @ 2924.5usft (Original Well Elev)
Well:	HAMBONE FEDERAL COM 26H	North Reference:	Grid
Wellbore:	ST01 - LATERAL	Survey Calculation Method:	Minimum Curvature
Design:	ST01 - LATERAL	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)
2,350.0	0.56	103.22	2,350.0	0.7	0.0	0.7	0.15	-0.04	14.52
2,375.0	0.53	95.26	2,375.0	0.6	0.3	0.7	0.33	-0.12	-31.84
2,400.0	0.58	95.09	2,400.0	0.6	0.5	0.6	0.20	0.20	-0.68
2,425.0	0.67	99.86	2,425.0	0.6	0.8	0.6	0.42	0.36	19.08
2,450.0	0.79	99.90	2,450.0	0.5	1.1	0.6	0.48	0.48	0.16
2,475.0	0.79	99.28	2,475.0	0.5	1.4	0.5	0.03	0.00	-2.48
2,500.0	0.75	104.63	2,500.0	0.4	1.7	0.5	0.33	-0.16	21.40
2,525.0	0.82	95.44	2,525.0	0.3	2.1	0.4	0.58	0.28	-36.76
2,550.0	0.73	106.46	2,550.0	0.3	2.4	0.4	0.69	-0.36	44.08
2,575.0	0.81	104.97	2,575.0	0.2	2.7	0.3	0.33	0.32	-5.96
2,600.0	0.75	105.14	2,600.0	0.1	3.1	0.3	0.24	-0.24	0.68
2,625.0	0.79	95.86	2,625.0	0.0	3.4	0.2	0.52	0.16	-37.12
2,650.0	0.67	105.98	2,650.0	0.0	3.7	0.2	0.70	-0.48	40.48
2,675.0	0.54	93.83	2,675.0	-0.1	4.0	0.1	0.73	-0.52	-48.60
2,700.0	0.31	99.24	2,700.0	-0.1	4.1	0.1	0.93	-0.92	21.64
2,725.0	0.38	80.24	2,725.0	-0.1	4.3	0.1	0.53	0.28	-76.00
2,750.0	0.35	97.26	2,750.0	-0.1	4.5	0.2	0.45	-0.12	68.08
2,775.0	0.21	98.96	2,775.0	-0.1	4.6	0.1	0.56	-0.56	6.80
2,800.0	0.18	115.86	2,800.0	-0.1	4.7	0.1	0.26	-0.12	67.60
2,825.0	0.19	98.60	2,825.0	-0.1	4.7	0.1	0.23	0.04	-69.04
2,850.0	0.38	62.67	2,850.0	-0.1	4.8	0.1	1.01	0.76	-143.72
2,875.0	0.34	67.00	2,875.0	0.0	5.0	0.2	0.19	-0.16	17.32
2,900.0	0.20	81.84	2,900.0	0.0	5.1	0.3	0.62	-0.56	59.36
2,925.0	0.18	103.12	2,925.0	0.0	5.2	0.3	0.29	-0.08	85.12
2,950.0	0.25	64.07	2,950.0	0.0	5.3	0.3	0.63	0.28	-156.20
2,975.0	0.22	92.87	2,975.0	0.0	5.4	0.3	0.48	-0.12	115.20
3,000.0	0.26	88.74	3,000.0	0.0	5.5	0.3	0.17	0.16	-16.52
3,025.0	0.14	90.88	3,025.0	0.0	5.6	0.3	0.48	-0.48	8.56
3,050.0	0.22	90.79	3,050.0	0.0	5.6	0.3	0.32	0.32	-0.36
3,075.0	0.19	104.70	3,075.0	0.0	5.7	0.3	0.23	-0.12	55.64
3,100.0	0.20	87.90	3,100.0	0.0	5.8	0.3	0.23	0.04	-67.20
3,125.0	0.23	77.49	3,125.0	0.0	5.9	0.3	0.20	0.12	-41.64
3,150.0	0.24	80.28	3,150.0	0.0	6.0	0.3	0.06	0.04	11.16
3,175.0	0.21	100.53	3,175.0	0.0	6.1	0.4	0.34	-0.12	81.00
3,200.0	0.25	79.01	3,199.9	0.0	6.2	0.4	0.38	0.16	-86.08
3,225.0	0.15	101.30	3,224.9	0.0	6.3	0.4	0.50	-0.40	89.16
3,250.0	0.22	94.00	3,249.9	0.0	6.4	0.4	0.29	0.28	-29.20
3,275.0	0.18	106.96	3,274.9	0.0	6.4	0.4	0.24	-0.16	51.84
3,300.0	0.19	68.05	3,299.9	0.0	6.5	0.4	0.49	0.04	-155.64
3,325.0	0.25	89.36	3,324.9	0.0	6.6	0.4	0.40	0.24	85.24
3,350.0	0.23	74.32	3,349.9	0.1	6.7	0.4	0.26	-0.08	-60.16
3,375.0	0.21	95.54	3,374.9	0.1	6.8	0.4	0.33	-0.08	84.88

Survey Report

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Project:	EDDY COUNTY, NM	TVD Reference:	RKB = 2894.5' + 30 @ 2924.5usft (Original Well Elev)
Site:	ATLAS	MD Reference:	RKB = 2894.5' + 30 @ 2924.5usft (Original Well Elev)
Well:	HAMBONE FEDERAL COM 26H	North Reference:	Grid
Wellbore:	ST01 - LATERAL	Survey Calculation Method:	Minimum Curvature
Design:	ST01 - LATERAL	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)	
3,400.0	0.21	68.98	3,399.9	0.1	6.9	0.4	0.39	0.00	-106.24	
3,425.0	0.25	77.92	3,424.9	0.1	7.0	0.5	0.21	0.16	35.76	
3,450.0	0.20	95.82	3,449.9	0.1	7.1	0.5	0.34	-0.20	71.60	
3,475.0	0.21	120.50	3,474.9	0.1	7.2	0.5	0.35	0.04	98.72	
3,500.0	0.18	84.78	3,499.9	0.1	7.3	0.4	0.49	-0.12	-142.88	
3,525.0	0.14	99.69	3,524.9	0.1	7.3	0.4	0.23	-0.16	59.64	
3,550.0	0.15	94.46	3,549.9	0.1	7.4	0.4	0.07	0.04	-20.92	
3,575.0	0.20	64.89	3,574.9	0.1	7.5	0.5	0.41	0.20	-118.28	
3,600.0	0.13	66.58	3,599.9	0.1	7.5	0.5	0.28	-0.28	6.76	
3,625.0	0.13	91.11	3,624.9	0.1	7.6	0.5	0.22	0.00	98.12	
3,650.0	0.15	70.08	3,649.9	0.1	7.6	0.5	0.22	0.08	-84.12	
3,675.0	0.04	10.34	3,674.9	0.1	7.7	0.5	0.54	-0.44	-238.96	
3,700.0	0.16	359.43	3,699.9	0.2	7.7	0.6	0.48	0.48	-43.64	
3,725.0	0.14	62.83	3,724.9	0.2	7.7	0.6	0.63	-0.08	253.60	
3,750.0	0.06	83.79	3,749.9	0.2	7.7	0.6	0.35	-0.32	83.84	
3,775.0	0.11	27.77	3,774.9	0.3	7.8	0.7	0.36	0.20	-224.08	
3,800.0	0.15	3.37	3,799.9	0.3	7.8	0.7	0.27	0.16	-97.60	
3,825.0	0.10	41.47	3,824.9	0.4	7.8	0.8	0.38	-0.20	152.40	
3,850.0	0.07	38.96	3,849.9	0.4	7.8	0.8	0.12	-0.12	-10.04	
3,875.0	0.14	8.47	3,874.9	0.4	7.8	0.8	0.35	0.28	-121.96	
3,900.0	0.03	118.76	3,899.9	0.5	7.8	0.9	0.61	-0.44	441.16	
3,925.0	0.10	18.13	3,924.9	0.5	7.9	0.9	0.44	0.28	-402.52	
3,950.0	0.13	347.77	3,949.9	0.5	7.9	0.9	0.27	0.12	-121.44	
3,975.0	0.07	89.24	3,974.9	0.6	7.9	1.0	0.64	-0.24	405.88	
4,000.0	0.13	65.31	3,999.9	0.6	7.9	1.0	0.29	0.24	-95.72	
4,025.0	0.10	63.42	4,024.9	0.6	7.9	1.0	0.12	-0.12	-7.56	
4,050.0	0.18	10.45	4,049.9	0.6	8.0	1.1	0.58	0.32	-211.88	
4,075.0	0.10	19.37	4,074.9	0.7	8.0	1.1	0.33	-0.32	35.68	
4,100.0	0.13	56.59	4,099.9	0.7	8.0	1.2	0.31	0.12	148.88	
4,125.0	0.08	29.91	4,124.9	0.8	8.1	1.2	0.27	-0.20	-106.72	
4,150.0	0.07	42.66	4,149.9	0.8	8.1	1.2	0.08	-0.04	51.00	
4,175.0	0.14	43.04	4,174.9	0.8	8.1	1.3	0.28	0.28	1.52	
4,200.0	0.08	68.42	4,199.9	0.9	8.1	1.3	0.30	-0.24	101.52	
4,225.0	0.27	55.74	4,224.9	0.9	8.2	1.3	0.77	0.76	-50.72	
4,250.0	0.24	45.80	4,249.9	1.0	8.3	1.4	0.21	-0.12	-39.76	
4,275.0	0.25	34.87	4,274.9	1.1	8.4	1.5	0.19	0.04	-43.72	
4,300.0	0.19	31.24	4,299.9	1.1	8.4	1.6	0.25	-0.24	-14.52	
4,325.0	0.45	44.82	4,324.9	1.2	8.5	1.7	1.08	1.04	54.32	
4,350.0	0.14	35.71	4,349.9	1.3	8.6	1.8	1.25	-1.24	-36.44	
4,375.0	0.01	137.74	4,374.9	1.4	8.6	1.8	0.57	-0.52	408.12	
4,400.0	0.12	184.33	4,399.9	1.3	8.6	1.8	0.45	0.44	186.36	
4,425.0	0.06	129.76	4,424.9	1.3	8.6	1.7	0.39	-0.24	-218.28	

Survey Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well HAMBONE FEDERAL COM 26H
Project:	EDDY COUNTY, NM	TVD Reference:	RKB = 2894.5' + 30 @ 2924.5usft (Original Well Elev)
Site:	ATLAS	MD Reference:	RKB = 2894.5' + 30 @ 2924.5usft (Original Well Elev)
Well:	HAMBONE FEDERAL COM 26H	North Reference:	Grid
Wellbore:	ST01 - LATERAL	Survey Calculation Method:	Minimum Curvature
Design:	ST01 - LATERAL	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)
4,450.0	0.19	179.66	4,449.9	1.2	8.6	1.7	0.63	0.52	199.60
4,475.0	0.13	164.25	4,474.9	1.2	8.6	1.6	0.29	-0.24	-61.64
4,500.0	0.06	38.78	4,499.9	1.2	8.7	1.6	0.69	-0.28	-501.88
4,525.0	0.31	184.84	4,524.9	1.1	8.7	1.5	1.45	1.00	584.24
4,550.0	0.15	185.31	4,549.9	1.0	8.6	1.4	0.64	-0.64	1.88
4,575.0	0.13	160.67	4,574.9	0.9	8.7	1.4	0.25	-0.08	-98.56
4,600.0	0.27	170.26	4,599.9	0.9	8.7	1.3	0.57	0.56	38.36
4,625.0	0.34	184.29	4,624.9	0.7	8.7	1.2	0.41	0.28	56.12
4,650.0	0.17	180.65	4,649.9	0.6	8.7	1.1	0.68	-0.68	-14.56
4,675.0	0.18	156.41	4,674.9	0.5	8.7	1.0	0.30	0.04	-96.96
4,700.0	0.31	186.28	4,699.9	0.4	8.7	0.9	0.71	0.52	119.48
4,725.0	0.37	182.44	4,724.9	0.3	8.7	0.7	0.26	0.24	-15.36
4,750.0	0.23	175.41	4,749.9	0.2	8.7	0.6	0.58	-0.56	-28.12
4,775.0	0.25	179.22	4,774.9	0.1	8.7	0.5	0.10	0.08	15.24
4,800.0	0.32	183.28	4,799.9	-0.1	8.7	0.4	0.29	0.28	16.24
4,825.0	0.37	178.16	4,824.9	-0.2	8.7	0.2	0.23	0.20	-20.48
4,850.0	0.44	186.54	4,849.9	-0.4	8.7	0.1	0.37	0.28	33.52
4,875.0	0.41	179.82	4,874.9	-0.6	8.7	-0.1	0.23	-0.12	-26.88
4,900.0	0.39	164.60	4,899.9	-0.8	8.7	-0.3	0.43	-0.08	-60.88
4,925.0	0.41	188.20	4,924.9	-0.9	8.7	-0.5	0.66	0.08	94.40
4,950.0	0.48	182.25	4,949.9	-1.1	8.7	-0.7	0.34	0.28	-23.80
4,975.0	0.39	180.13	4,974.9	-1.3	8.7	-0.9	0.37	-0.36	-8.48
5,000.0	0.36	173.28	4,999.9	-1.5	8.7	-1.0	0.22	-0.12	-27.40
5,025.0	0.47	178.62	5,024.9	-1.7	8.7	-1.2	0.47	0.44	21.36
5,050.0	0.34	178.29	5,049.9	-1.8	8.7	-1.4	0.52	-0.52	-1.32
5,075.0	0.40	180.67	5,074.9	-2.0	8.7	-1.5	0.25	0.24	9.52
5,100.0	0.50	173.00	5,099.9	-2.2	8.7	-1.7	0.47	0.40	-30.68
5,125.0	0.40	171.66	5,124.9	-2.4	8.7	-1.9	0.40	-0.40	-5.36
5,150.0	0.49	189.41	5,149.9	-2.6	8.7	-2.1	0.65	0.36	71.00
5,175.0	0.45	174.29	5,174.9	-2.8	8.7	-2.3	0.52	-0.16	-60.48
5,200.0	0.35	177.56	5,199.9	-2.9	8.7	-2.5	0.41	-0.40	13.08
5,225.0	0.42	184.98	5,224.9	-3.1	8.7	-2.7	0.34	0.28	29.68
5,250.0	0.42	175.36	5,249.9	-3.3	8.7	-2.8	0.28	0.00	-38.48
5,275.0	0.44	170.57	5,274.9	-3.5	8.8	-3.0	0.16	0.08	-19.16
5,300.0	0.45	177.89	5,299.9	-3.7	8.8	-3.2	0.23	0.04	29.28
5,325.0	0.43	183.13	5,324.9	-3.9	8.8	-3.4	0.18	-0.08	20.96
5,350.0	0.37	172.81	5,349.9	-4.0	8.8	-3.6	0.37	-0.24	-41.28
5,375.0	0.38	175.69	5,374.9	-4.2	8.8	-3.7	0.09	0.04	11.52
5,400.0	0.43	168.32	5,399.9	-4.4	8.8	-3.9	0.29	0.20	-29.48
5,425.0	0.39	169.39	5,424.9	-4.6	8.9	-4.1	0.16	-0.16	4.28
5,450.0	0.52	181.01	5,449.9	-4.8	8.9	-4.3	0.64	0.52	46.48
5,475.0	0.47	183.57	5,474.9	-5.0	8.9	-4.5	0.22	-0.20	10.24

Survey Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well HAMBONE FEDERAL COM 26H
Project:	EDDY COUNTY, NM	TVD Reference:	RKB = 2894.5' + 30 @ 2924.5usft (Original Well Elev)
Site:	ATLAS	MD Reference:	RKB = 2894.5' + 30 @ 2924.5usft (Original Well Elev)
Well:	HAMBONE FEDERAL COM 26H	North Reference:	Grid
Wellbore:	ST01 - LATERAL	Survey Calculation Method:	Minimum Curvature
Design:	ST01 - LATERAL	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	0.38	180.04	5,499.9	-5.2	8.9	-4.7	0.37	-0.36	-14.12	
5,525.0	0.49	182.28	5,524.9	-5.3	8.9	-4.9	0.45	0.44	8.96	
5,550.0	0.40	160.61	5,549.9	-5.5	8.9	-5.1	0.76	-0.36	-86.68	
5,575.0	0.43	161.81	5,574.9	-5.7	8.9	-5.2	0.12	0.12	4.80	
5,600.0	0.47	152.05	5,599.9	-5.9	9.0	-5.4	0.35	0.16	-39.04	
5,625.0	0.55	139.77	5,624.9	-6.1	9.1	-5.6	0.54	0.32	-49.12	
5,650.0	0.51	152.01	5,649.9	-6.3	9.3	-5.8	0.48	-0.16	48.96	
5,675.0	0.47	154.02	5,674.9	-6.4	9.4	-6.0	0.17	-0.16	8.04	
5,700.0	0.49	156.21	5,699.9	-6.6	9.5	-6.1	0.11	0.08	8.76	
5,725.0	0.51	152.72	5,724.9	-6.8	9.5	-6.3	0.15	0.08	-13.96	
5,750.0	0.55	157.29	5,749.9	-7.0	9.6	-6.5	0.23	0.16	18.28	
5,775.0	0.52	146.12	5,774.9	-7.2	9.8	-6.7	0.43	-0.12	-44.68	
5,800.0	0.60	152.76	5,799.9	-7.5	9.9	-6.9	0.41	0.32	26.56	
5,825.0	0.55	151.40	5,824.9	-7.7	10.0	-7.2	0.21	-0.20	-5.44	
5,850.0	0.50	161.15	5,849.9	-7.9	10.1	-7.4	0.41	-0.20	39.00	
5,875.0	0.57	150.97	5,874.9	-8.1	10.2	-7.6	0.47	0.28	-40.72	
5,900.0	0.59	148.72	5,899.9	-8.3	10.3	-7.8	0.12	0.08	-9.00	
5,925.0	0.53	144.01	5,924.9	-8.5	10.4	-8.0	0.30	-0.24	-18.84	
5,950.0	0.49	147.19	5,949.9	-8.7	10.6	-8.1	0.20	-0.16	12.72	
5,975.0	0.56	141.77	5,974.9	-8.9	10.7	-8.3	0.34	0.28	-21.68	
6,000.0	0.61	156.33	5,999.9	-9.1	10.8	-8.5	0.63	0.20	58.24	
6,025.0	0.50	158.63	6,024.9	-9.3	10.9	-8.8	0.45	-0.44	9.20	
6,050.0	0.53	158.12	6,049.9	-9.5	11.0	-9.0	0.12	0.12	-2.04	
6,075.0	0.56	152.74	6,074.9	-9.8	11.1	-9.2	0.24	0.12	-21.52	
6,100.0	0.44	179.47	6,099.9	-10.0	11.2	-9.4	1.04	-0.48	106.92	
6,125.0	0.35	236.03	6,124.9	-10.1	11.1	-9.5	1.53	-0.36	226.24	
6,150.0	0.41	249.38	6,149.9	-10.2	11.0	-9.6	0.43	0.24	53.40	
6,175.0	0.41	250.53	6,174.9	-10.2	10.8	-9.7	0.03	0.00	4.60	
6,200.0	0.43	256.02	6,199.9	-10.3	10.6	-9.7	0.18	0.08	21.96	
6,225.0	0.35	258.83	6,224.9	-10.3	10.4	-9.8	0.33	-0.32	11.24	
6,250.0	0.43	252.35	6,249.9	-10.4	10.3	-9.8	0.36	0.32	-25.92	
6,275.0	0.46	237.65	6,274.9	-10.5	10.1	-9.9	0.47	0.12	-58.80	
6,300.0	0.57	245.10	6,299.9	-10.6	9.9	-10.0	0.51	0.44	29.80	
6,325.0	0.54	241.90	6,324.9	-10.7	9.7	-10.1	0.17	-0.12	-12.80	
6,350.0	0.61	232.87	6,349.9	-10.8	9.5	-10.3	0.46	0.28	-36.12	
6,375.0	0.77	231.22	6,374.9	-11.0	9.2	-10.5	0.64	0.64	-6.60	
6,400.0	0.60	243.64	6,399.9	-11.2	9.0	-10.7	0.90	-0.68	49.68	
6,425.0	0.75	237.60	6,424.9	-11.3	8.7	-10.8	0.66	0.60	-24.16	
6,450.0	0.88	227.54	6,449.9	-11.5	8.5	-11.1	0.77	0.52	-40.24	
6,475.0	0.92	229.21	6,474.9	-11.8	8.2	-11.3	0.19	0.16	6.68	
6,500.0	0.94	229.46	6,499.9	-12.0	7.9	-11.6	0.08	0.08	1.00	
6,525.0	0.88	225.16	6,524.9	-12.3	7.6	-11.9	0.36	-0.24	-17.20	

Survey Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well HAMBONE FEDERAL COM 26H
Project:	EDDY COUNTY, NM	TVD Reference:	RKB = 2894.5' + 30 @ 2924.5usft (Original Well Elev)
Site:	ATLAS	MD Reference:	RKB = 2894.5' + 30 @ 2924.5usft (Original Well Elev)
Well:	HAMBONE FEDERAL COM 26H	North Reference:	Grid
Wellbore:	ST01 - LATERAL	Survey Calculation Method:	Minimum Curvature
Design:	ST01 - LATERAL	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)	
6,550.0	0.93	229.39	6,549.9	-12.6	7.3	-12.2	0.33	0.20	16.92	
6,575.0	0.91	222.26	6,574.9	-12.9	7.0	-12.5	0.46	-0.08	-28.52	
6,600.0	0.93	223.41	6,599.9	-13.1	6.7	-12.8	0.11	0.08	4.60	
6,625.0	0.98	222.22	6,624.9	-13.5	6.4	-13.1	0.22	0.20	-4.76	
6,650.0	1.00	227.66	6,649.9	-13.8	6.1	-13.4	0.38	0.08	21.76	
6,675.0	0.64	218.65	6,674.9	-14.0	5.9	-13.7	1.53	-1.44	-36.04	
6,700.0	0.48	200.06	6,699.9	-14.2	5.8	-13.9	0.96	-0.64	-74.36	
6,725.0	0.55	209.86	6,724.9	-14.4	5.7	-14.1	0.45	0.28	39.20	
6,750.0	0.42	210.53	6,749.9	-14.6	5.6	-14.3	0.52	-0.52	2.68	
6,775.0	0.32	204.43	6,774.9	-14.8	5.5	-14.4	0.43	-0.40	-24.40	
6,800.0	0.32	208.32	6,799.9	-14.9	5.4	-14.6	0.09	0.00	15.56	
6,825.0	0.26	196.59	6,824.8	-15.0	5.4	-14.7	0.34	-0.24	-46.92	
6,850.0	0.32	206.28	6,849.8	-15.1	5.3	-14.8	0.31	0.24	38.76	
6,875.0	0.20	222.09	6,874.8	-15.2	5.3	-14.9	0.55	-0.48	63.24	
6,900.0	0.11	293.24	6,899.8	-15.2	5.2	-14.9	0.78	-0.36	284.60	
6,925.0	0.06	27.31	6,924.8	-15.2	5.2	-14.9	0.52	-0.20	376.28	
6,950.0	0.23	53.45	6,949.8	-15.2	5.2	-14.9	0.71	0.68	104.56	
6,975.0	0.70	96.16	6,974.8	-15.2	5.4	-14.8	2.21	1.88	170.84	
7,000.0	1.36	97.43	6,999.8	-15.2	5.9	-14.9	2.64	2.64	5.08	
7,025.0	1.59	101.42	7,024.8	-15.3	6.5	-15.0	1.01	0.92	15.96	
7,050.0	2.30	112.85	7,049.8	-15.6	7.3	-15.2	3.22	2.84	45.72	
7,075.0	3.55	118.15	7,074.8	-16.1	8.5	-15.7	5.11	5.00	21.20	
7,100.0	3.87	120.37	7,099.7	-16.9	9.9	-16.4	1.40	1.28	8.88	
7,125.0	4.18	119.68	7,124.7	-17.8	11.4	-17.2	1.26	1.24	-2.76	
7,150.0	4.65	120.48	7,149.6	-18.8	13.1	-18.1	1.90	1.88	3.20	
7,175.0	4.99	121.42	7,174.5	-19.9	14.9	-19.1	1.40	1.36	3.76	
7,200.0	4.96	121.35	7,199.4	-21.0	16.7	-20.1	0.12	-0.12	-0.28	
7,225.0	4.88	122.02	7,224.3	-22.1	18.5	-21.1	0.39	-0.32	2.68	
7,250.0	4.83	118.70	7,249.2	-23.2	20.4	-22.1	1.14	-0.20	-13.28	
7,275.0	4.70	118.42	7,274.1	-24.2	22.2	-23.0	0.53	-0.52	-1.12	
7,300.0	4.68	118.95	7,299.1	-25.1	24.0	-23.9	0.19	-0.08	2.12	
7,325.0	4.74	119.27	7,324.0	-26.1	25.8	-24.8	0.26	0.24	1.28	
7,350.0	5.56	114.34	7,348.9	-27.2	27.8	-25.7	3.72	3.28	-19.72	
7,375.0	5.76	116.51	7,373.8	-28.2	30.0	-26.6	1.17	0.80	8.68	
7,400.0	5.69	115.44	7,398.6	-29.3	32.2	-27.6	0.51	-0.28	-4.28	
7,425.0	5.61	114.66	7,423.5	-30.3	34.5	-28.5	0.44	-0.32	-3.12	
7,450.0	5.63	114.33	7,448.4	-31.4	36.7	-29.4	0.15	0.08	-1.32	
7,475.0	5.51	113.38	7,473.3	-32.3	38.9	-30.3	0.61	-0.48	-3.80	
7,500.0	5.37	112.95	7,498.2	-33.3	41.1	-31.1	0.58	-0.56	-1.72	
7,525.0	5.30	113.00	7,523.1	-34.2	43.2	-31.9	0.28	-0.28	0.20	
7,550.0	5.27	111.99	7,547.9	-35.1	45.4	-32.7	0.39	-0.12	-4.04	
7,575.0	5.33	112.59	7,572.8	-35.9	47.5	-33.4	0.33	0.24	2.40	

Survey Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well HAMBONE FEDERAL COM 26H
Project:	EDDY COUNTY, NM	TVD Reference:	RKB = 2894.5' + 30 @ 2924.5usft (Original Well Elev)
Site:	ATLAS	MD Reference:	RKB = 2894.5' + 30 @ 2924.5usft (Original Well Elev)
Well:	HAMBONE FEDERAL COM 26H	North Reference:	Grid
Wellbore:	ST01 - LATERAL	Survey Calculation Method:	Minimum Curvature
Design:	ST01 - LATERAL	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	5.35	112.68	7,597.7	-36.8	49.6	-34.2	0.09	0.08	0.36
7,625.0	5.44	111.32	7,622.6	-37.7	51.8	-35.0	0.63	0.36	-5.44
7,650.0	5.60	111.65	7,647.5	-38.6	54.1	-35.7	0.65	0.64	1.32
7,675.0	5.62	112.79	7,672.4	-39.5	56.3	-36.5	0.45	0.08	4.56
7,700.0	5.59	112.30	7,697.3	-40.5	58.6	-37.4	0.23	-0.12	-1.96
7,725.0	5.38	112.54	7,722.2	-41.4	60.8	-38.2	0.84	-0.84	0.96
7,750.0	5.19	111.47	7,747.0	-42.2	62.9	-38.9	0.86	-0.76	-4.28
7,775.0	5.01	111.46	7,771.9	-43.0	65.0	-39.6	0.72	-0.72	-0.04
7,800.0	4.78	111.21	7,796.9	-43.8	67.0	-40.3	0.92	-0.92	-1.00
7,825.0	4.55	109.45	7,821.8	-44.5	68.9	-40.9	1.08	-0.92	-7.04
7,850.0	4.63	110.51	7,846.7	-45.2	70.8	-41.5	0.47	0.32	4.24
7,875.0	4.58	109.03	7,871.6	-45.9	72.7	-42.1	0.52	-0.20	-5.92
7,900.0	4.62	109.03	7,896.5	-46.5	74.6	-42.6	0.16	0.16	0.00
7,925.0	4.84	108.22	7,921.4	-47.2	76.5	-43.2	0.92	0.88	-3.24
7,950.0	4.83	108.86	7,946.4	-47.9	78.5	-43.7	0.22	-0.04	2.56
7,975.0	4.92	107.60	7,971.3	-48.5	80.5	-44.3	0.56	0.36	-5.04
8,000.0	5.26	109.54	7,996.2	-49.2	82.6	-44.9	1.52	1.36	7.76
8,025.0	5.55	109.59	8,021.1	-50.0	84.8	-45.6	1.16	1.16	0.20
8,050.0	5.48	108.61	8,045.9	-50.8	87.1	-46.2	0.47	-0.28	-3.92
8,075.0	5.63	109.67	8,070.8	-51.6	89.4	-46.9	0.73	0.60	4.24
8,100.0	5.60	108.90	8,095.7	-52.4	91.7	-47.6	0.32	-0.12	-3.08
8,125.0	5.59	109.06	8,120.6	-53.2	94.0	-48.3	0.07	-0.04	0.64
8,150.0	5.49	108.00	8,145.5	-54.0	96.3	-48.9	0.57	-0.40	-4.24
8,175.0	5.49	107.29	8,170.4	-54.7	98.6	-49.5	0.27	0.00	-2.84
8,200.0	5.59	107.93	8,195.2	-55.4	100.9	-50.1	0.47	0.40	2.56
8,225.0	5.65	108.71	8,220.1	-56.2	103.2	-50.8	0.39	0.24	3.12
8,250.0	5.60	109.01	8,245.0	-57.0	105.5	-51.5	0.23	-0.20	1.20
8,275.0	5.54	110.03	8,269.9	-57.8	107.8	-52.1	0.46	-0.24	4.08
8,300.0	5.57	111.77	8,294.8	-58.7	110.1	-52.9	0.68	0.12	6.96
8,325.0	5.59	113.33	8,319.6	-59.6	112.3	-53.7	0.61	0.08	6.24
8,350.0	5.66	113.14	8,344.5	-60.6	114.6	-54.5	0.29	0.28	-0.76
8,375.0	5.43	113.77	8,369.4	-61.5	116.8	-55.4	0.95	-0.92	2.52
8,400.0	5.24	113.36	8,394.3	-62.5	118.9	-56.2	0.78	-0.76	-1.64
8,425.0	5.23	114.71	8,419.2	-63.4	121.0	-57.0	0.49	-0.04	5.40
8,450.0	5.17	115.72	8,444.1	-64.4	123.0	-57.9	0.44	-0.24	4.04
8,475.0	5.04	116.92	8,469.0	-65.3	125.0	-58.8	0.67	-0.52	4.80
8,500.0	4.81	117.50	8,493.9	-66.3	126.9	-59.7	0.94	-0.92	2.32
8,525.0	4.78	119.09	8,518.8	-67.3	128.8	-60.5	0.54	-0.12	6.36
8,550.0	4.75	118.82	8,543.7	-68.3	130.6	-61.5	0.15	-0.12	-1.08
8,575.0	4.73	118.13	8,568.6	-69.3	132.4	-62.3	0.24	-0.08	-2.76
8,600.0	4.86	119.15	8,593.5	-70.3	134.3	-63.2	0.62	0.52	4.08
8,625.0	4.78	118.79	8,618.5	-71.3	136.1	-64.2	0.34	-0.32	-1.44

Survey Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well HAMBONE FEDERAL COM 26H
Project:	EDDY COUNTY, NM	TVD Reference:	RKB = 2894.5' + 30 @ 2924.5usft (Original Well Elev)
Site:	ATLAS	MD Reference:	RKB = 2894.5' + 30 @ 2924.5usft (Original Well Elev)
Well:	HAMBONE FEDERAL COM 26H	North Reference:	Grid
Wellbore:	ST01 - LATERAL	Survey Calculation Method:	Minimum Curvature
Design:	ST01 - LATERAL	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	4.79	118.66	8,643.4	-72.3	137.9	-65.1	0.06	0.04	-0.52	
8,675.0	4.78	118.93	8,668.3	-73.3	139.8	-66.0	0.10	-0.04	1.08	
8,700.0	4.63	118.84	8,693.2	-74.3	141.5	-66.9	0.60	-0.60	-0.36	
8,725.0	4.54	118.82	8,718.1	-75.3	143.3	-67.8	0.36	-0.36	-0.08	
8,750.0	4.44	119.13	8,743.0	-76.2	145.0	-68.6	0.41	-0.40	1.24	
8,775.0	4.42	118.64	8,768.0	-77.2	146.7	-69.5	0.17	-0.08	-1.96	
8,800.0	4.45	118.65	8,792.9	-78.1	148.4	-70.3	0.12	0.12	0.04	
8,825.0	4.46	119.02	8,817.8	-79.0	150.1	-71.1	0.12	0.04	1.48	
8,850.0	4.51	119.41	8,842.7	-80.0	151.8	-72.0	0.23	0.20	1.56	
8,875.0	4.58	118.76	8,867.7	-80.9	153.5	-72.9	0.35	0.28	-2.60	
8,900.0	4.58	119.44	8,892.6	-81.9	155.3	-73.8	0.22	0.00	2.72	
8,925.0	4.71	119.47	8,917.5	-82.9	157.0	-74.7	0.52	0.52	0.12	
8,950.0	4.70	118.53	8,942.4	-83.9	158.8	-75.6	0.31	-0.04	-3.76	
8,975.0	4.71	118.71	8,967.3	-84.9	160.6	-76.4	0.07	0.04	0.72	
9,000.0	4.62	119.93	8,992.3	-85.9	162.4	-77.3	0.54	-0.36	4.88	
9,025.0	4.71	117.78	9,017.2	-86.9	164.2	-78.2	0.79	0.36	-8.60	
9,050.0	4.61	117.32	9,042.1	-87.8	166.0	-79.1	0.43	-0.40	-1.84	
9,075.0	4.64	116.16	9,067.0	-88.7	167.8	-79.9	0.39	0.12	-4.64	
9,100.0	4.63	116.23	9,091.9	-89.6	169.6	-80.7	0.05	-0.04	0.28	
9,125.0	4.70	115.98	9,116.8	-90.5	171.4	-81.5	0.29	0.28	-1.00	
9,150.0	4.79	116.52	9,141.8	-91.4	173.3	-82.3	0.40	0.36	2.16	
9,175.0	4.85	115.96	9,166.7	-92.3	175.2	-83.1	0.30	0.24	-2.24	
9,200.0	4.94	115.27	9,191.6	-93.3	177.1	-84.0	0.43	0.36	-2.76	
9,225.0	4.99	114.37	9,216.5	-94.2	179.1	-84.8	0.37	0.20	-3.60	
9,250.0	5.11	114.52	9,241.4	-95.1	181.1	-85.6	0.48	0.48	0.60	
9,275.0	5.10	115.17	9,266.3	-96.0	183.1	-86.4	0.23	-0.04	2.60	
9,300.0	5.21	114.98	9,291.2	-97.0	185.1	-87.2	0.45	0.44	-0.76	
9,325.0	5.38	114.80	9,316.1	-97.9	187.2	-88.1	0.68	0.68	-0.72	
9,350.0	5.50	114.53	9,341.0	-98.9	189.4	-89.0	0.49	0.48	-1.08	
9,375.0	5.57	114.34	9,365.8	-99.9	191.6	-89.9	0.29	0.28	-0.76	
9,400.0	5.52	115.45	9,390.7	-100.9	193.7	-90.8	0.47	-0.20	4.44	
9,425.0	5.46	116.14	9,415.6	-102.0	195.9	-91.7	0.36	-0.24	2.76	
9,450.0	5.32	116.33	9,440.5	-103.0	198.0	-92.6	0.56	-0.56	0.76	
9,475.0	5.31	116.89	9,465.4	-104.1	200.1	-93.5	0.21	-0.04	2.24	
9,500.0	5.46	117.07	9,490.3	-105.1	202.2	-94.5	0.60	0.60	0.72	
9,525.0	5.59	117.27	9,515.2	-106.2	204.3	-95.5	0.53	0.52	0.80	
9,550.0	5.63	118.22	9,540.1	-107.4	206.5	-96.5	0.40	0.16	3.80	
9,575.0	5.57	119.20	9,564.9	-108.5	208.6	-97.6	0.45	-0.24	3.92	
9,600.0	5.63	120.66	9,589.8	-109.7	210.7	-98.7	0.62	0.24	5.84	
9,625.0	5.43	119.57	9,614.7	-111.0	212.8	-99.8	0.90	-0.80	-4.36	
9,650.0	5.43	120.50	9,639.6	-112.1	214.9	-100.9	0.35	0.00	3.72	
9,675.0	5.40	120.16	9,664.5	-113.3	216.9	-101.9	0.18	-0.12	-1.36	

Survey Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well HAMBONE FEDERAL COM 26H
Project:	EDDY COUNTY, NM	TVD Reference:	RKB = 2894.5' + 30 @ 2924.5usft (Original Well Elev)
Site:	ATLAS	MD Reference:	RKB = 2894.5' + 30 @ 2924.5usft (Original Well Elev)
Well:	HAMBONE FEDERAL COM 26H	North Reference:	Grid
Wellbore:	ST01 - LATERAL	Survey Calculation Method:	Minimum Curvature
Design:	ST01 - LATERAL	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	5.40	120.76	9,689.4	-114.5	218.9	-103.0	0.23	0.00	2.40
9,725.0	5.25	120.65	9,714.3	-115.7	220.9	-104.1	0.60	-0.60	-0.44
9,750.0	5.38	121.40	9,739.1	-116.9	222.9	-105.2	0.59	0.52	3.00
9,775.0	5.49	121.66	9,764.0	-118.1	224.9	-106.3	0.45	0.44	1.04
9,800.0	5.71	121.13	9,788.9	-119.4	227.0	-107.5	0.90	0.88	-2.12
9,825.0	5.89	120.91	9,813.8	-120.7	229.2	-108.7	0.73	0.72	-0.88
9,850.0	5.98	120.46	9,838.7	-122.0	231.4	-109.9	0.41	0.36	-1.80
9,875.0	5.83	119.66	9,863.5	-123.3	233.6	-111.0	0.68	-0.60	-3.20
9,900.0	5.65	118.71	9,888.4	-124.5	235.8	-112.1	0.81	-0.72	-3.80
9,925.0	5.52	118.19	9,913.3	-125.7	237.9	-113.2	0.56	-0.52	-2.08
9,950.0	5.30	117.73	9,938.2	-126.8	240.0	-114.2	0.90	-0.88	-1.84
9,975.0	5.14	118.04	9,963.1	-127.9	242.0	-115.2	0.65	-0.64	1.24
10,000.0	4.99	118.92	9,988.0	-128.9	244.0	-116.1	0.68	-0.60	3.52
10,025.0	4.81	121.38	10,012.9	-130.0	245.8	-117.1	1.11	-0.72	9.84
10,050.0	4.39	121.36	10,037.8	-131.0	247.5	-118.0	1.68	-1.68	-0.08
10,249.0	3.15	115.83	10,236.4	-137.4	259.0	-123.8	0.65	-0.62	-2.78
10,371.0	9.12	37.82	10,357.7	-131.2	267.9	-117.1	7.38	4.89	-63.94
10,402.0	12.73	23.49	10,388.2	-126.1	270.8	-111.9	14.49	11.65	-46.23
10,433.0	17.25	18.97	10,418.1	-118.6	273.6	-104.3	15.05	14.58	-14.58
10,464.0	21.15	18.21	10,447.4	-109.0	276.9	-94.5	12.61	12.58	-2.45
10,495.0	24.51	18.90	10,476.0	-97.6	280.7	-82.9	10.87	10.84	2.23
10,526.0	25.24	26.03	10,504.1	-85.5	285.7	-70.6	9.95	2.35	23.00
10,558.0	27.15	27.60	10,532.8	-72.9	292.1	-57.7	6.35	5.97	4.91
10,652.0	38.64	27.49	10,611.6	-27.8	315.6	-11.4	12.22	12.22	-0.12
10,745.0	52.19	24.80	10,676.7	31.6	344.6	49.5	14.71	14.57	-2.89
10,840.0	57.68	22.62	10,731.3	102.8	375.8	122.2	6.08	5.78	-2.29
10,871.0	61.81	21.85	10,746.9	127.6	385.9	147.4	13.49	13.32	-2.48
10,903.0	62.75	21.89	10,761.8	153.9	396.5	174.2	2.94	2.94	0.13
10,934.0	62.17	23.11	10,776.1	179.3	407.0	200.1	3.96	-1.87	3.94
11,028.0	67.54	26.67	10,816.1	256.4	442.8	279.0	6.66	5.71	3.79
11,064.0	66.94	33.75	10,830.0	285.1	459.5	308.5	18.21	-1.67	19.67
11,085.0	67.83	36.58	10,838.1	300.9	470.7	324.9	13.14	4.24	13.48
11,117.0	70.64	37.90	10,849.4	324.7	488.8	349.6	9.59	8.78	4.13
11,149.0	75.88	37.63	10,858.6	348.9	507.6	374.8	16.39	16.38	-0.84
11,179.0	79.89	35.50	10,864.9	372.5	525.0	399.2	15.06	13.37	-7.10
11,241.0	86.30	33.28	10,872.4	423.3	559.8	451.7	10.93	10.34	-3.58
11,334.0	88.04	27.92	10,877.0	503.2	607.0	534.0	6.05	1.87	-5.76
11,428.0	89.92	19.17	10,878.7	589.3	644.5	621.9	9.52	2.00	-9.31
11,522.0	89.58	14.99	10,879.1	679.1	672.1	713.0	4.46	-0.36	-4.45
11,617.0	91.71	15.68	10,878.0	770.7	697.2	805.8	2.36	2.24	0.73
11,711.0	92.21	12.71	10,874.8	861.8	720.3	897.9	3.20	0.53	-3.16
11,806.0	90.53	5.55	10,872.5	955.5	735.3	992.3	7.74	-1.77	-7.54

Survey Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well HAMBONE FEDERAL COM 26H
Project:	EDDY COUNTY, NM	TVD Reference:	RKB = 2894.5' + 30 @ 2924.5usft (Original Well Elev)
Site:	ATLAS	MD Reference:	RKB = 2894.5' + 30 @ 2924.5usft (Original Well Elev)
Well:	HAMBONE FEDERAL COM 26H	North Reference:	Grid
Wellbore:	ST01 - LATERAL	Survey Calculation Method:	Minimum Curvature
Design:	ST01 - LATERAL	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)
11,899.0	90.45	359.13	10,871.7	1,048.3	739.1	1,085.2	6.90	-0.09	-6.90
11,993.0	90.90	355.69	10,870.6	1,142.2	734.9	1,178.8	3.69	0.48	-3.66
12,088.0	91.60	358.15	10,868.5	1,237.1	729.8	1,273.2	2.69	0.74	2.59
12,181.0	93.05	351.81	10,864.8	1,329.6	721.7	1,365.2	6.99	1.56	-6.82
12,276.0	93.98	350.52	10,858.9	1,423.3	707.1	1,458.0	1.67	0.98	-1.36
12,370.0	93.53	349.92	10,852.8	1,515.7	691.2	1,549.5	0.80	-0.48	-0.64
12,464.0	93.87	351.71	10,846.7	1,608.3	676.2	1,641.2	1.93	0.36	1.90
12,557.0	88.88	350.11	10,844.5	1,700.1	661.5	1,732.1	5.63	-5.37	-1.72
12,651.0	88.07	349.92	10,847.0	1,792.6	645.2	1,823.7	0.89	-0.86	-0.20
12,745.0	86.58	350.54	10,851.4	1,885.1	629.3	1,915.2	1.72	-1.59	0.66
12,839.0	89.64	352.09	10,854.5	1,978.0	615.1	2,007.2	3.65	3.26	1.65
12,932.0	92.04	355.09	10,853.1	2,070.4	604.7	2,099.0	4.13	2.58	3.23
13,026.0	92.27	359.49	10,849.6	2,164.2	600.3	2,192.4	4.68	0.24	4.68
13,120.0	90.70	357.63	10,847.1	2,258.1	597.9	2,286.1	2.59	-1.67	-1.98
13,214.0	90.62	357.13	10,846.1	2,352.0	593.6	2,379.6	0.54	-0.09	-0.53
13,305.0	90.00	356.62	10,845.6	2,442.9	588.7	2,470.1	0.88	-0.68	-0.56
13,400.0	90.78	357.37	10,844.9	2,537.8	583.7	2,564.6	1.14	0.82	0.79
13,495.0	90.81	358.82	10,843.6	2,632.7	580.5	2,659.2	1.53	0.03	1.53
13,589.0	91.32	359.94	10,841.8	2,726.7	579.5	2,753.0	1.31	0.54	1.19
13,683.0	90.48	359.03	10,840.4	2,820.7	578.7	2,846.9	1.32	-0.89	-0.97
13,778.0	90.36	359.89	10,839.7	2,915.6	577.8	2,941.7	0.91	-0.13	0.91
13,872.0	91.04	359.83	10,838.5	3,009.6	577.5	3,035.5	0.73	0.72	-0.06
13,967.0	91.76	1.13	10,836.2	3,104.6	578.3	3,130.4	1.56	0.76	1.37
14,062.0	91.51	1.22	10,833.5	3,199.5	580.3	3,225.3	0.28	-0.26	0.09
14,157.0	91.74	1.51	10,830.8	3,294.5	582.5	3,320.2	0.39	0.24	0.31
14,251.0	90.73	0.91	10,828.8	3,388.4	584.5	3,414.2	1.25	-1.07	-0.64
14,346.0	89.38	359.63	10,828.7	3,483.4	585.0	3,509.1	1.96	-1.42	-1.35
14,440.0	88.77	358.40	10,830.2	3,577.4	583.4	3,602.8	1.46	-0.65	-1.31
14,534.0	89.08	358.72	10,832.0	3,671.4	581.0	3,696.5	0.47	0.33	0.34
14,628.0	89.97	359.18	10,832.7	3,765.3	579.3	3,790.3	1.07	0.95	0.49
14,722.0	89.27	358.48	10,833.4	3,859.3	577.4	3,884.1	1.05	-0.74	-0.74
14,817.0	90.48	359.78	10,833.6	3,954.3	575.9	3,978.8	1.87	1.27	1.37
14,911.0	87.17	359.21	10,835.5	4,048.3	575.1	4,072.6	3.57	-3.52	-0.61
15,005.0	87.17	359.10	10,840.1	4,142.1	573.7	4,166.3	0.12	0.00	-0.12
15,099.0	90.03	359.82	10,842.4	4,236.1	572.8	4,260.1	3.14	3.04	0.77
15,192.0	90.14	359.32	10,842.3	4,329.1	572.1	4,352.9	0.55	0.12	-0.54
15,287.0	89.58	357.76	10,842.5	4,424.1	569.7	4,447.6	1.74	-0.59	-1.64
15,381.0	93.28	357.63	10,840.2	4,517.9	565.9	4,541.2	3.94	3.94	-0.14
15,476.0	93.90	358.55	10,834.2	4,612.7	562.8	4,635.7	1.17	0.65	0.97
15,570.0	93.92	359.37	10,827.8	4,706.5	561.1	4,729.2	0.87	0.02	0.87
15,664.0	90.84	0.27	10,823.9	4,800.4	560.8	4,823.0	3.41	-3.28	0.96
15,759.0	90.39	359.57	10,822.9	4,895.4	560.6	4,917.8	0.88	-0.47	-0.74

Survey Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well HAMBONE FEDERAL COM 26H
Project:	EDDY COUNTY, NM	TVD Reference:	RKB = 2894.5' + 30 @ 2924.5usft (Original Well Elev)
Site:	ATLAS	MD Reference:	RKB = 2894.5' + 30 @ 2924.5usft (Original Well Elev)
Well:	HAMBONE FEDERAL COM 26H	North Reference:	Grid
Wellbore:	ST01 - LATERAL	Survey Calculation Method:	Minimum Curvature
Design:	ST01 - LATERAL	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)
15,853.0	90.00	358.81	10,822.6	4,989.3	559.3	5,011.6	0.91	-0.41	-0.81
15,947.0	89.97	358.80	10,822.6	5,083.3	557.3	5,105.4	0.03	-0.03	-0.01
16,041.0	89.44	358.05	10,823.1	5,177.3	554.8	5,199.1	0.98	-0.56	-0.80
16,136.0	89.10	357.92	10,824.3	5,272.2	551.4	5,293.7	0.38	-0.36	-0.14
16,230.0	89.10	356.68	10,825.8	5,366.1	547.0	5,387.2	1.32	0.00	-1.32
16,323.0	88.12	359.16	10,828.0	5,459.0	543.6	5,479.8	2.87	-1.05	2.67
16,418.0	90.62	1.99	10,829.1	5,554.0	544.6	5,574.7	3.97	2.63	2.98
16,512.0	91.43	2.43	10,827.4	5,647.9	548.2	5,668.7	0.98	0.86	0.47
16,604.0	91.32	2.64	10,825.2	5,739.8	552.3	5,760.7	0.26	-0.12	0.23
16,698.0	90.76	2.15	10,823.5	5,833.7	556.2	5,854.7	0.79	-0.60	-0.52
16,792.0	90.92	2.32	10,822.1	5,927.6	559.9	5,948.6	0.25	0.17	0.18
16,886.0	87.79	358.14	10,823.2	6,021.6	560.2	6,042.5	5.55	-3.33	-4.45
16,979.0	86.78	357.74	10,827.6	6,114.4	556.9	6,135.0	1.17	-1.09	-0.43
17,074.0	89.13	357.83	10,831.0	6,209.3	553.2	6,229.6	2.48	2.47	0.09
17,168.0	90.39	358.01	10,831.4	6,303.2	549.8	6,323.2	1.35	1.34	0.19
17,263.0	90.53	357.94	10,830.6	6,398.1	546.5	6,417.9	0.16	0.15	-0.07
17,356.0	90.70	358.12	10,829.6	6,491.1	543.3	6,510.5	0.27	0.18	0.19
17,448.0	90.53	357.92	10,828.6	6,583.0	540.1	6,602.2	0.29	-0.18	-0.22
17,541.0	90.76	357.34	10,827.6	6,675.9	536.2	6,694.7	0.67	0.25	-0.62
17,634.0	90.92	357.20	10,826.2	6,768.8	531.8	6,787.3	0.23	0.17	-0.15
17,729.0	90.25	356.72	10,825.2	6,863.7	526.8	6,881.7	0.87	-0.71	-0.51
17,821.0	90.90	356.48	10,824.3	6,955.5	521.3	6,973.2	0.75	0.71	-0.26
17,914.0	90.98	356.21	10,822.8	7,048.3	515.4	7,065.5	0.30	0.09	-0.29
18,009.0	88.82	356.91	10,822.9	7,143.1	509.7	7,159.9	2.39	-2.27	0.74
18,104.0	88.94	357.83	10,824.8	7,238.0	505.3	7,254.5	0.98	0.13	0.97
18,198.0	85.15	358.04	10,829.6	7,331.8	501.9	7,348.0	4.04	-4.03	0.22
18,292.0	87.03	358.27	10,836.1	7,425.5	498.9	7,441.4	2.01	2.00	0.24
18,387.0	91.18	1.07	10,837.5	7,520.5	498.4	7,536.2	5.27	4.37	2.95
18,481.0	91.96	1.91	10,835.0	7,614.4	500.8	7,630.1	1.22	0.83	0.89
18,576.0	92.02	1.01	10,831.7	7,709.3	503.2	7,725.0	0.95	0.06	-0.95
18,670.0	91.65	0.51	10,828.7	7,803.3	504.5	7,818.9	0.66	-0.39	-0.53
18,764.0	91.34	0.44	10,826.2	7,897.2	505.3	7,912.8	0.34	-0.33	-0.07
18,859.0	91.01	359.90	10,824.3	7,992.2	505.5	8,007.7	0.67	-0.35	-0.57
18,952.0	90.14	359.46	10,823.3	8,085.2	505.0	8,100.5	1.05	-0.94	-0.47
19,046.0	89.24	359.54	10,823.8	8,179.2	504.2	8,194.3	0.96	-0.96	0.09
19,139.0	89.55	359.26	10,824.8	8,272.2	503.2	8,287.2	0.45	0.33	-0.30
19,233.0	89.44	359.28	10,825.6	8,366.2	502.0	8,381.0	0.12	-0.12	0.02
19,328.0	89.38	358.45	10,826.6	8,461.2	500.2	8,475.7	0.88	-0.06	-0.87
19,422.0	87.93	358.91	10,828.8	8,555.1	498.0	8,569.4	1.62	-1.54	0.49
19,515.0	89.86	0.83	10,830.6	8,648.1	497.8	8,662.2	2.93	2.08	2.06
19,609.0	90.22	1.11	10,830.6	8,742.1	499.4	8,756.2	0.49	0.38	0.30
19,703.0	90.00	0.88	10,830.4	8,836.0	501.0	8,850.1	0.34	-0.23	-0.24

Survey Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well HAMBONE FEDERAL COM 26H
Project:	EDDY COUNTY, NM	TVD Reference:	RKB = 2894.5' + 30 @ 2924.5usft (Original Well Elev)
Site:	ATLAS	MD Reference:	RKB = 2894.5' + 30 @ 2924.5usft (Original Well Elev)
Well:	HAMBONE FEDERAL COM 26H	North Reference:	Grid
Wellbore:	ST01 - LATERAL	Survey Calculation Method:	Minimum Curvature
Design:	ST01 - LATERAL	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)
19,797.0	88.99	1.26	10,831.2	8,930.0	502.8	8,944.1	1.15	-1.07	0.40
19,890.0	92.63	1.28	10,829.9	9,023.0	504.8	9,037.0	3.91	3.91	0.02
19,985.0	93.67	0.94	10,824.7	9,117.8	506.7	9,131.8	1.15	1.09	-0.36
20,077.0	93.87	0.14	10,818.6	9,209.6	507.5	9,223.5	0.89	0.22	-0.87
20,172.0	93.95	0.26	10,812.1	9,304.4	507.8	9,318.2	0.15	0.08	0.13
20,266.0	94.18	0.74	10,805.5	9,398.1	508.7	9,411.9	0.57	0.24	0.51
20,360.0	95.41	0.33	10,797.6	9,491.8	509.5	9,505.5	1.38	1.31	-0.44
20,453.0	90.98	359.85	10,792.4	9,584.6	509.7	9,598.2	4.79	-4.76	-0.52
20,549.0	91.04	0.80	10,790.7	9,680.6	510.2	9,694.1	0.99	0.06	0.99
20,642.0	89.86	0.52	10,790.0	9,773.6	511.3	9,787.0	1.30	-1.27	-0.30
20,735.0	90.36	1.75	10,789.8	9,866.6	513.1	9,879.9	1.43	0.54	1.32
20,829.0	89.55	1.99	10,789.9	9,960.5	516.2	9,973.9	0.90	-0.86	0.26
20,923.0	89.58	3.75	10,790.6	10,054.4	520.9	10,067.9	1.87	0.03	1.87
20,932.0	89.47	3.85	10,790.7	10,063.4	521.5	10,076.9	1.65	-1.22	1.11
Last MWD Svy									
20,989.0	89.47	3.85	10,791.2	10,120.3	525.3	10,133.9	0.00	0.00	0.00
PTD									

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
20,932.0	10,790.7	10,063.4	521.5	Last MWD Svy
20,989.0	10,791.2	10,120.3	525.3	PTD

Checked By: _____ Approved By: _____ Date: _____