

30-025-44505



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OCT 12 2018

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NORTHERN DELAWARE BASIN

LEA COUNTY, NM

BULLDOG

USHANKA FED COM #23H

OWB - ST01

Design: ACTUAL WELLPATH - ST01

Survey Report - Geographic

31 May, 2018

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well USHANKA FED COM #23H
Project:	LEA COUNTY, NM	TVD Reference:	RKB=26+3036 @ 3062.0usft (MCVAY 8)
Site:	BULLDOG	MD Reference:	RKB=26+3036 @ 3062.0usft (MCVAY 8)
Well:	USHANKA FED COM #23H	North Reference:	Grid
Wellbore:	OWB - ST01	Survey Calculation Method:	Minimum Curvature
Design:	ACTUAL WELLPATH - ST01	Database:	EDM_Users

Project	LEA 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		BULLDOG			
Site Position:		Northing:	398,637.10 usft	Latitude:	32° 5' 36.820 N
From:	Map	Easting:	741,887.40 usft	Longitude:	103° 33' 8.116 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.42 °

Well		USHANKA FED COM #23H				
Well Position	+N/-S	0.0 usft	Northing:	393,897.90 usft	Latitude:	32° 4' 43.929 N
	+E/-W	0.0 usft	Easting:	814,612.90 usft	Longitude:	103° 19' 3.319 W
Position Uncertainty		3.0 usft	Wellhead Elevation:	usft	Ground Level:	3,036.0 usft

Wellbore	OWB - ST01				
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
			(°)	(°)	(nT)
	WMM2015	4/24/2018	6.76	59.94	47,779.74776207

Design	ACTUAL WELLPATH - ST01				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	11,452.0
Vertical Section:	Depth From (TVD)	+N-S	+E-W	Direction	
	(usft)	(usft)	(usft)	(°)	
	0.0	0.0	0.0	179.78	

Survey Program:	Date 5/16/2018			
From	To	Survey (Wellbore)	Tool Name	Description
(usft)	(usft)			
100.0	11,452.0	GYRO (OWB (PH))	Standard Keeper 104	Standard Wireline Keeper ver 1.0.4
11,608.0	19,335.0	MWD-CURVE / LATERAL (OWB - ST01)	MWD+IFR1+MS	OWSG MWD + IFR1 + Multi-Station Correction

Survey									
Measured	Inclination	Azimuth	Vertical	+N-S	+E-W	Map	Map	Latitude	Longitude
Depth	(°)	(°)	Depth	(usft)	(usft)	Northing	Easting		
(usft)			(usft)			(usft)	(usft)		
0.0	0.00	0.00	0.0	0.0	0.0	393,897.90	814,612.90	32° 4' 43.929 N	103° 19' 3.319 W
100.0	0.72	340.50	100.0	0.6	-0.2	393,898.49	814,612.69	32° 4' 43.935 N	103° 19' 3.321 W
125.0	0.89	340.71	125.0	0.9	-0.3	393,898.82	814,612.57	32° 4' 43.939 N	103° 19' 3.322 W
150.0	0.93	351.90	150.0	1.3	-0.4	393,899.21	814,612.48	32° 4' 43.942 N	103° 19' 3.324 W
175.0	1.04	350.18	175.0	1.7	-0.5	393,899.63	814,612.41	32° 4' 43.947 N	103° 19' 3.324 W
200.0	1.08	353.53	200.0	2.2	-0.6	393,900.09	814,612.35	32° 4' 43.951 N	103° 19' 3.325 W
225.0	1.12	355.12	225.0	2.7	-0.6	393,900.57	814,612.30	32° 4' 43.956 N	103° 19' 3.325 W
250.0	1.14	354.70	250.0	3.2	-0.6	393,901.06	814,612.26	32° 4' 43.961 N	103° 19' 3.326 W
275.0	1.11	359.09	275.0	3.6	-0.7	393,901.55	814,612.23	32° 4' 43.966 N	103° 19' 3.326 W
300.0	1.19	0.37	300.0	4.1	-0.7	393,902.05	814,612.23	32° 4' 43.970 N	103° 19' 3.326 W
325.0	1.26	0.67	325.0	4.7	-0.7	393,902.58	814,612.23	32° 4' 43.976 N	103° 19' 3.326 W

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Project:	LEA COUNTY, NM	TVD Reference:	RKB=26+3036 @ 3062.0usft (MCVAY 8)
Site:	BULLDOG	MD Reference:	RKB=26+3036 @ 3062.0usft (MCVAY 8)
Well:	USHANKA FED COM #23H	North Reference:	Grid
Wellbore:	OWB - ST01	Survey Calculation Method:	Minimum Curvature
Design:	ACTUAL WELLPATH - ST01	Database:	EDM_Users

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
350.0	1.24	1.41	350.0	5.2	-0.7	393,903.13	814,612.24	32° 4' 43.981 N	103° 19' 3.326 W
375.0	1.30	0.57	374.9	5.8	-0.6	393,903.68	814,612.25	32° 4' 43.987 N	103° 19' 3.326 W
400.0	1.29	0.54	399.9	6.3	-0.6	393,904.25	814,612.26	32° 4' 43.992 N	103° 19' 3.326 W
425.0	1.27	2.56	424.9	6.9	-0.6	393,904.81	814,612.27	32° 4' 43.998 N	103° 19' 3.325 W
450.0	1.24	359.56	449.9	7.5	-0.6	393,905.35	814,612.28	32° 4' 44.003 N	103° 19' 3.325 W
475.0	1.22	2.34	474.9	8.0	-0.6	393,905.89	814,612.29	32° 4' 44.008 N	103° 19' 3.325 W
500.0	1.16	3.30	499.9	8.5	-0.6	393,906.41	814,612.32	32° 4' 44.014 N	103° 19' 3.325 W
525.0	1.09	3.79	524.9	9.0	-0.6	393,906.90	814,612.35	32° 4' 44.018 N	103° 19' 3.324 W
550.0	1.02	8.78	549.9	9.5	-0.5	393,907.35	814,612.40	32° 4' 44.023 N	103° 19' 3.324 W
575.0	1.00	8.54	574.9	9.9	-0.4	393,907.79	814,612.46	32° 4' 44.027 N	103° 19' 3.323 W
600.0	1.00	8.30	599.9	10.3	-0.4	393,908.22	814,612.53	32° 4' 44.032 N	103° 19' 3.322 W
625.0	1.06	8.55	624.9	10.8	-0.3	393,908.67	814,612.59	32° 4' 44.036 N	103° 19' 3.321 W
650.0	1.00	2.84	649.9	11.2	-0.3	393,909.11	814,612.64	32° 4' 44.040 N	103° 19' 3.321 W
675.0	0.91	3.39	674.9	11.6	-0.2	393,909.53	814,612.66	32° 4' 44.044 N	103° 19' 3.320 W
700.0	0.79	4.17	699.9	12.0	-0.2	393,909.90	814,612.68	32° 4' 44.048 N	103° 19' 3.320 W
725.0	0.73	359.59	724.9	12.3	-0.2	393,910.23	814,612.70	32° 4' 44.051 N	103° 19' 3.320 W
750.0	0.71	3.55	749.9	12.6	-0.2	393,910.54	814,612.70	32° 4' 44.055 N	103° 19' 3.320 W
775.0	0.71	5.61	774.9	13.0	-0.2	393,910.85	814,612.73	32° 4' 44.058 N	103° 19' 3.319 W
800.0	0.67	2.94	799.9	13.3	-0.1	393,911.15	814,612.75	32° 4' 44.061 N	103° 19' 3.319 W
825.0	0.63	7.13	824.9	13.5	-0.1	393,911.44	814,612.78	32° 4' 44.063 N	103° 19' 3.319 W
850.0	0.60	10.05	849.9	13.8	-0.1	393,911.70	814,612.82	32° 4' 44.066 N	103° 19' 3.318 W
875.0	0.60	6.15	874.9	14.1	0.0	393,911.96	814,612.85	32° 4' 44.069 N	103° 19' 3.318 W
900.0	0.63	1.16	899.9	14.3	0.0	393,912.23	814,612.87	32° 4' 44.071 N	103° 19' 3.318 W
925.0	0.60	12.58	924.9	14.6	0.0	393,912.49	814,612.90	32° 4' 44.074 N	103° 19' 3.317 W
950.0	0.60	9.06	949.9	14.9	0.1	393,912.75	814,612.95	32° 4' 44.076 N	103° 19' 3.317 W
975.0	0.57	12.54	974.9	15.1	0.1	393,913.00	814,613.00	32° 4' 44.079 N	103° 19' 3.316 W
1,000.0	0.61	11.55	999.9	15.4	0.2	393,913.25	814,613.05	32° 4' 44.081 N	103° 19' 3.315 W
1,025.0	0.63	8.75	1,024.9	15.6	0.2	393,913.52	814,613.10	32° 4' 44.084 N	103° 19' 3.315 W
1,050.0	0.63	10.23	1,049.9	15.9	0.2	393,913.79	814,613.14	32° 4' 44.087 N	103° 19' 3.314 W
1,075.0	0.67	15.75	1,074.9	16.2	0.3	393,914.07	814,613.21	32° 4' 44.089 N	103° 19' 3.313 W
1,100.0	0.68	24.12	1,099.9	16.4	0.4	393,914.34	814,613.31	32° 4' 44.092 N	103° 19' 3.312 W
1,125.0	0.68	19.82	1,124.9	16.7	0.5	393,914.62	814,613.42	32° 4' 44.095 N	103° 19' 3.311 W
1,150.0	0.66	21.29	1,149.9	17.0	0.6	393,914.89	814,613.52	32° 4' 44.097 N	103° 19' 3.310 W
1,175.0	0.65	17.01	1,174.9	17.3	0.7	393,915.16	814,613.62	32° 4' 44.100 N	103° 19' 3.309 W
1,200.0	0.63	13.22	1,199.9	17.5	0.8	393,915.43	814,613.69	32° 4' 44.103 N	103° 19' 3.308 W
1,225.0	0.73	10.32	1,224.9	17.8	0.9	393,915.72	814,613.75	32° 4' 44.106 N	103° 19' 3.307 W
1,250.0	0.77	7.58	1,249.8	18.1	0.9	393,916.04	814,613.80	32° 4' 44.109 N	103° 19' 3.306 W
1,275.0	0.80	7.20	1,274.8	18.5	0.9	393,916.38	814,613.84	32° 4' 44.112 N	103° 19' 3.306 W
1,300.0	0.80	7.27	1,299.8	18.8	1.0	393,916.73	814,613.89	32° 4' 44.116 N	103° 19' 3.305 W
1,325.0	0.84	5.30	1,324.8	19.2	1.0	393,917.08	814,613.93	32° 4' 44.119 N	103° 19' 3.305 W
1,350.0	0.87	5.01	1,349.8	19.6	1.1	393,917.46	814,613.96	32° 4' 44.123 N	103° 19' 3.304 W
1,375.0	0.92	4.95	1,374.8	19.9	1.1	393,917.85	814,613.99	32° 4' 44.127 N	103° 19' 3.304 W
1,400.0	0.92	4.65	1,399.8	20.3	1.1	393,918.25	814,614.03	32° 4' 44.131 N	103° 19' 3.303 W
1,425.0	0.95	2.47	1,424.8	20.8	1.2	393,918.65	814,614.05	32° 4' 44.135 N	103° 19' 3.303 W
1,450.0	0.99	358.16	1,449.8	21.2	1.2	393,919.08	814,614.05	32° 4' 44.139 N	103° 19' 3.303 W
1,475.0	0.94	5.13	1,474.8	21.6	1.2	393,919.50	814,614.07	32° 4' 44.143 N	103° 19' 3.303 W
1,500.0	0.97	6.43	1,499.8	22.0	1.2	393,919.91	814,614.11	32° 4' 44.147 N	103° 19' 3.302 W
1,525.0	0.97	6.35	1,524.8	22.4	1.3	393,920.33	814,614.15	32° 4' 44.151 N	103° 19' 3.302 W
1,550.0	0.95	7.43	1,549.8	22.8	1.3	393,920.75	814,614.20	32° 4' 44.155 N	103° 19' 3.301 W
1,575.0	0.98	7.32	1,574.8	23.3	1.4	393,921.16	814,614.26	32° 4' 44.159 N	103° 19' 3.300 W
1,600.0	0.95	13.23	1,599.8	23.7	1.4	393,921.58	814,614.33	32° 4' 44.164 N	103° 19' 3.300 W
1,625.0	1.02	6.51	1,624.8	24.1	1.5	393,922.00	814,614.41	32° 4' 44.168 N	103° 19' 3.299 W
1,650.0	1.00	11.82	1,649.8	24.5	1.6	393,922.43	814,614.48	32° 4' 44.172 N	103° 19' 3.298 W
1,675.0	0.99	18.04	1,674.8	25.0	1.7	393,922.85	814,614.59	32° 4' 44.176 N	103° 19' 3.296 W
1,700.0	1.02	16.73	1,699.8	25.4	1.8	393,923.27	814,614.72	32° 4' 44.180 N	103° 19' 3.295 W

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Design:	ACTUAL WELLPATH - ST01	Database:	EDM_Users

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
1,725.0	0.98	17.95	1,724.8	25.8	2.0	393,923.69	814,614.85	32° 4' 44.184 N	103° 19' 3.293 W
1,750.0	0.97	20.45	1,749.8	26.2	2.1	393,924.09	814,614.99	32° 4' 44.188 N	103° 19' 3.292 W
1,775.0	0.97	21.45	1,774.8	26.6	2.2	393,924.49	814,615.14	32° 4' 44.192 N	103° 19' 3.290 W
1,800.0	1.00	21.89	1,799.8	27.0	2.4	393,924.88	814,615.30	32° 4' 44.196 N	103° 19' 3.288 W
1,825.0	0.98	26.89	1,824.8	27.4	2.6	393,925.28	814,615.48	32° 4' 44.200 N	103° 19' 3.286 W
1,850.0	0.98	27.31	1,849.8	27.8	2.8	393,925.66	814,615.67	32° 4' 44.204 N	103° 19' 3.284 W
1,875.0	1.00	34.86	1,874.8	28.1	3.0	393,926.03	814,615.89	32° 4' 44.207 N	103° 19' 3.281 W
1,900.0	1.06	37.75	1,899.8	28.5	3.3	393,926.39	814,616.16	32° 4' 44.211 N	103° 19' 3.278 W
1,925.0	1.12	40.47	1,924.8	28.9	3.6	393,926.76	814,616.46	32° 4' 44.215 N	103° 19' 3.274 W
1,950.0	1.14	43.10	1,949.8	29.2	3.9	393,927.13	814,616.79	32° 4' 44.218 N	103° 19' 3.270 W
1,975.0	1.17	40.62	1,974.7	29.6	4.2	393,927.50	814,617.13	32° 4' 44.222 N	103° 19' 3.266 W
2,000.0	1.23	48.49	1,999.7	30.0	4.6	393,927.87	814,617.49	32° 4' 44.226 N	103° 19' 3.262 W
2,025.0	1.18	48.84	2,024.7	30.3	5.0	393,928.22	814,617.89	32° 4' 44.229 N	103° 19' 3.257 W
2,050.0	1.18	49.12	2,049.7	30.7	5.4	393,928.56	814,618.28	32° 4' 44.232 N	103° 19' 3.253 W
2,075.0	1.11	47.27	2,074.7	31.0	5.7	393,928.89	814,618.65	32° 4' 44.235 N	103° 19' 3.249 W
2,100.0	1.15	49.37	2,099.7	31.3	6.1	393,929.22	814,619.02	32° 4' 44.239 N	103° 19' 3.244 W
2,125.0	1.10	47.84	2,124.7	31.6	6.5	393,929.54	814,619.38	32° 4' 44.242 N	103° 19' 3.240 W
2,150.0	1.05	45.53	2,149.7	32.0	6.8	393,929.86	814,619.73	32° 4' 44.245 N	103° 19' 3.236 W
2,175.0	0.88	41.83	2,174.7	32.3	7.1	393,930.17	814,620.02	32° 4' 44.248 N	103° 19' 3.233 W
2,200.0	0.94	41.76	2,199.7	32.6	7.4	393,930.46	814,620.28	32° 4' 44.251 N	103° 19' 3.229 W
2,225.0	0.91	45.19	2,224.7	32.9	7.7	393,930.76	814,620.56	32° 4' 44.254 N	103° 19' 3.226 W
2,250.0	0.92	42.34	2,249.7	33.1	7.9	393,931.04	814,620.84	32° 4' 44.257 N	103° 19' 3.223 W
2,275.0	0.97	41.03	2,274.7	33.5	8.2	393,931.35	814,621.11	32° 4' 44.260 N	103° 19' 3.220 W
2,300.0	1.09	49.56	2,299.7	33.8	8.5	393,931.67	814,621.43	32° 4' 44.263 N	103° 19' 3.216 W
2,325.0	1.07	48.92	2,324.7	34.1	8.9	393,931.97	814,621.79	32° 4' 44.266 N	103° 19' 3.212 W
2,350.0	1.16	54.74	2,349.7	34.4	9.3	393,932.27	814,622.17	32° 4' 44.269 N	103° 19' 3.207 W
2,375.0	1.23	55.71	2,374.7	34.7	9.7	393,932.57	814,622.60	32° 4' 44.272 N	103° 19' 3.202 W
2,400.0	1.26	54.15	2,399.7	35.0	10.1	393,932.88	814,623.04	32° 4' 44.275 N	103° 19' 3.197 W
2,425.0	1.33	56.85	2,424.7	35.3	10.6	393,933.20	814,623.51	32° 4' 44.278 N	103° 19' 3.192 W
2,450.0	1.44	61.34	2,449.7	35.6	11.1	393,933.51	814,624.03	32° 4' 44.281 N	103° 19' 3.186 W
2,475.0	1.56	62.49	2,474.6	35.9	11.7	393,933.82	814,624.60	32° 4' 44.284 N	103° 19' 3.179 W
2,500.0	1.58	63.03	2,499.6	36.2	12.3	393,934.13	814,625.21	32° 4' 44.287 N	103° 19' 3.172 W
2,525.0	1.47	71.70	2,524.6	36.5	12.9	393,934.39	814,625.82	32° 4' 44.289 N	103° 19' 3.165 W
2,550.0	1.26	93.24	2,549.6	36.6	13.5	393,934.48	814,626.40	32° 4' 44.290 N	103° 19' 3.158 W
2,575.0	1.31	101.96	2,574.6	36.5	14.1	393,934.40	814,626.96	32° 4' 44.289 N	103° 19' 3.151 W
2,600.0	1.25	100.35	2,599.6	36.4	14.6	393,934.29	814,627.50	32° 4' 44.288 N	103° 19' 3.145 W
2,625.0	1.33	101.65	2,624.6	36.3	15.2	393,934.19	814,628.06	32° 4' 44.287 N	103° 19' 3.139 W
2,650.0	1.73	96.43	2,649.6	36.2	15.8	393,934.08	814,628.72	32° 4' 44.286 N	103° 19' 3.131 W
2,675.0	1.88	94.77	2,674.6	36.1	16.6	393,934.01	814,629.50	32° 4' 44.285 N	103° 19' 3.122 W
2,700.0	1.92	93.17	2,699.6	36.1	17.4	393,933.95	814,630.33	32° 4' 44.284 N	103° 19' 3.112 W
2,725.0	1.95	93.85	2,724.6	36.0	18.3	393,933.90	814,631.17	32° 4' 44.284 N	103° 19' 3.103 W
2,750.0	1.60	95.17	2,749.5	35.9	19.0	393,933.84	814,631.94	32° 4' 44.283 N	103° 19' 3.094 W
2,775.0	1.44	95.62	2,774.5	35.9	19.7	393,933.78	814,632.60	32° 4' 44.283 N	103° 19' 3.086 W
2,800.0	1.17	93.55	2,799.5	35.8	20.3	393,933.73	814,633.17	32° 4' 44.282 N	103° 19' 3.079 W
2,825.0	0.69	91.14	2,824.5	35.8	20.7	393,933.71	814,633.57	32° 4' 44.282 N	103° 19' 3.075 W
2,850.0	0.15	318.16	2,849.5	35.8	20.8	393,933.73	814,633.70	32° 4' 44.282 N	103° 19' 3.073 W
2,875.0	0.15	311.47	2,874.5	35.9	20.8	393,933.78	814,633.66	32° 4' 44.282 N	103° 19' 3.074 W
2,900.0	0.18	325.84	2,899.5	35.9	20.7	393,933.83	814,633.61	32° 4' 44.283 N	103° 19' 3.074 W
2,925.0	0.28	4.12	2,924.5	36.0	20.7	393,933.93	814,633.59	32° 4' 44.284 N	103° 19' 3.074 W
2,950.0	0.59	34.33	2,949.5	36.2	20.8	393,934.09	814,633.67	32° 4' 44.286 N	103° 19' 3.073 W
2,975.0	0.77	39.70	2,974.5	36.4	21.0	393,934.33	814,633.85	32° 4' 44.288 N	103° 19' 3.071 W
3,000.0	0.82	39.83	2,999.5	36.7	21.2	393,934.60	814,634.07	32° 4' 44.291 N	103° 19' 3.069 W
3,025.0	0.83	41.30	3,024.5	37.0	21.4	393,934.87	814,634.31	32° 4' 44.293 N	103° 19' 3.066 W
3,050.0	0.86	53.18	3,049.5	37.2	21.7	393,935.12	814,634.57	32° 4' 44.296 N	103° 19' 3.063 W
3,075.0	0.82	51.66	3,074.5	37.4	22.0	393,935.34	814,634.87	32° 4' 44.298 N	103° 19' 3.059 W

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well USHANKA FED COM #23H
Project:	LEA COUNTY, NM	TVD Reference:	RKB=26+3036 @ 3062.0usft (MCVAY 8)
Site:	BULLDOG	MD Reference:	RKB=26+3036 @ 3062.0usft (MCVAY 8)
Well:	USHANKA FED COM #23H	North Reference:	Grid
Wellbore:	OWB - ST01	Survey Calculation Method:	Minimum Curvature
Design:	ACTUAL WELLPATH - ST01	Database:	EDM_Users

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N-S (usft)	+E-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
3,100.0	0.77	42.02	3,099.5	37.7	22.2	393,935.58	814,635.12	32° 4' 44.300 N	103° 19' 3.056 W	
3,125.0	0.49	12.99	3,124.5	37.9	22.4	393,935.81	814,635.25	32° 4' 44.302 N	103° 19' 3.055 W	
3,150.0	0.41	345.51	3,149.5	38.1	22.4	393,936.00	814,635.26	32° 4' 44.304 N	103° 19' 3.055 W	
3,175.0	0.33	1.38	3,174.5	38.3	22.3	393,936.16	814,635.24	32° 4' 44.306 N	103° 19' 3.055 W	
3,200.0	0.21	43.07	3,199.5	38.4	22.4	393,936.26	814,635.27	32° 4' 44.307 N	103° 19' 3.055 W	
3,225.0	0.36	131.24	3,224.5	38.3	22.5	393,936.24	814,635.36	32° 4' 44.307 N	103° 19' 3.054 W	
3,250.0	0.44	136.99	3,249.5	38.2	22.6	393,936.12	814,635.48	32° 4' 44.305 N	103° 19' 3.052 W	
3,275.0	0.54	137.46	3,274.5	38.1	22.7	393,935.96	814,635.63	32° 4' 44.304 N	103° 19' 3.050 W	
3,300.0	1.18	175.98	3,299.5	37.7	22.8	393,935.62	814,635.73	32° 4' 44.300 N	103° 19' 3.049 W	
3,325.0	1.97	185.84	3,324.5	37.0	22.8	393,934.94	814,635.70	32° 4' 44.294 N	103° 19' 3.050 W	
3,350.0	2.10	185.55	3,349.5	36.2	22.7	393,934.05	814,635.61	32° 4' 44.285 N	103° 19' 3.051 W	
3,375.0	2.11	186.11	3,374.5	35.2	22.6	393,933.14	814,635.52	32° 4' 44.276 N	103° 19' 3.052 W	
3,400.0	2.13	185.52	3,399.4	34.3	22.5	393,932.22	814,635.43	32° 4' 44.267 N	103° 19' 3.053 W	
3,425.0	2.13	179.74	3,424.4	33.4	22.5	393,931.29	814,635.38	32° 4' 44.258 N	103° 19' 3.054 W	
3,450.0	2.07	173.59	3,449.4	32.5	22.5	393,930.38	814,635.44	32° 4' 44.249 N	103° 19' 3.053 W	
3,475.0	1.95	170.31	3,474.4	31.6	22.7	393,929.51	814,635.56	32° 4' 44.240 N	103° 19' 3.052 W	
3,500.0	1.88	166.90	3,499.4	30.8	22.8	393,928.69	814,635.72	32° 4' 44.232 N	103° 19' 3.050 W	
3,525.0	1.82	164.05	3,524.4	30.0	23.0	393,927.91	814,635.92	32° 4' 44.224 N	103° 19' 3.048 W	
3,550.0	1.71	157.80	3,549.4	29.3	23.3	393,927.18	814,636.17	32° 4' 44.217 N	103° 19' 3.045 W	
3,575.0	1.67	158.57	3,574.3	28.6	23.5	393,926.50	814,636.45	32° 4' 44.210 N	103° 19' 3.042 W	
3,600.0	1.70	155.37	3,599.3	27.9	23.8	393,925.82	814,636.74	32° 4' 44.203 N	103° 19' 3.039 W	
3,625.0	1.62	156.09	3,624.3	27.3	24.1	393,925.16	814,637.03	32° 4' 44.197 N	103° 19' 3.035 W	
3,650.0	1.64	158.23	3,649.3	26.6	24.4	393,924.51	814,637.31	32° 4' 44.190 N	103° 19' 3.032 W	
3,675.0	1.40	187.64	3,674.3	26.0	24.5	393,923.87	814,637.40	32° 4' 44.184 N	103° 19' 3.031 W	
3,700.0	1.40	213.23	3,699.3	25.4	24.3	393,923.31	814,637.19	32° 4' 44.179 N	103° 19' 3.034 W	
3,725.0	1.65	222.59	3,724.3	24.9	23.9	393,922.79	814,636.78	32° 4' 44.173 N	103° 19' 3.038 W	
3,750.0	1.54	224.73	3,749.3	24.4	23.4	393,922.29	814,636.30	32° 4' 44.169 N	103° 19' 3.044 W	
3,775.0	1.32	224.58	3,774.3	23.9	23.0	393,921.85	814,635.86	32° 4' 44.164 N	103° 19' 3.049 W	
3,800.0	1.30	226.30	3,799.3	23.5	22.6	393,921.45	814,635.46	32° 4' 44.160 N	103° 19' 3.054 W	
3,825.0	1.30	224.18	3,824.3	23.1	22.2	393,921.05	814,635.05	32° 4' 44.156 N	103° 19' 3.059 W	
3,850.0	1.27	221.74	3,849.2	22.7	21.8	393,920.64	814,634.67	32° 4' 44.152 N	103° 19' 3.063 W	
3,875.0	1.25	222.88	3,874.2	22.3	21.4	393,920.23	814,634.30	32° 4' 44.148 N	103° 19' 3.068 W	
3,900.0	1.38	223.36	3,899.2	21.9	21.0	393,919.81	814,633.91	32° 4' 44.144 N	103° 19' 3.072 W	
3,925.0	1.32	226.26	3,924.2	21.5	20.6	393,919.39	814,633.50	32° 4' 44.140 N	103° 19' 3.077 W	
3,950.0	1.35	223.38	3,949.2	21.1	20.2	393,918.98	814,633.08	32° 4' 44.136 N	103° 19' 3.082 W	
3,975.0	1.27	225.04	3,974.2	20.7	19.8	393,918.57	814,632.69	32° 4' 44.132 N	103° 19' 3.087 W	
4,000.0	1.19	217.11	3,999.2	20.3	19.4	393,918.17	814,632.33	32° 4' 44.128 N	103° 19' 3.091 W	
4,025.0	1.29	217.08	4,024.2	19.8	19.1	393,917.74	814,632.01	32° 4' 44.124 N	103° 19' 3.095 W	
4,050.0	1.20	222.31	4,049.2	19.4	18.8	393,917.32	814,631.66	32° 4' 44.120 N	103° 19' 3.099 W	
4,075.0	0.97	224.08	4,074.2	19.1	18.4	393,916.97	814,631.34	32° 4' 44.116 N	103° 19' 3.102 W	
4,100.0	0.54	231.15	4,099.2	18.8	18.2	393,916.75	814,631.10	32° 4' 44.114 N	103° 19' 3.105 W	
4,125.0	0.20	305.66	4,124.2	18.8	18.1	393,916.70	814,630.97	32° 4' 44.114 N	103° 19' 3.107 W	
4,150.0	0.65	0.18	4,149.2	19.0	18.0	393,916.86	814,630.94	32° 4' 44.115 N	103° 19' 3.107 W	
4,175.0	1.06	12.91	4,174.2	19.3	18.1	393,917.23	814,630.99	32° 4' 44.119 N	103° 19' 3.106 W	
4,200.0	1.68	6.63	4,199.2	19.9	18.2	393,917.82	814,631.08	32° 4' 44.125 N	103° 19' 3.105 W	
4,225.0	1.79	10.47	4,224.2	20.7	18.3	393,918.57	814,631.20	32° 4' 44.132 N	103° 19' 3.104 W	
4,250.0	1.65	10.55	4,249.2	21.4	18.4	393,919.31	814,631.33	32° 4' 44.139 N	103° 19' 3.102 W	
4,275.0	1.44	351.20	4,274.1	22.1	18.5	393,919.97	814,631.35	32° 4' 44.146 N	103° 19' 3.102 W	
4,300.0	1.27	341.36	4,299.1	22.6	18.3	393,920.54	814,631.21	32° 4' 44.152 N	103° 19' 3.103 W	
4,325.0	1.36	343.99	4,324.1	23.2	18.1	393,921.09	814,631.04	32° 4' 44.157 N	103° 19' 3.105 W	
4,350.0	1.41	342.14	4,349.1	23.8	18.0	393,921.67	814,630.87	32° 4' 44.163 N	103° 19' 3.107 W	
4,375.0	1.87	346.21	4,374.1	24.5	17.8	393,922.36	814,630.68	32° 4' 44.170 N	103° 19' 3.110 W	
4,400.0	2.16	348.85	4,399.1	25.3	17.6	393,923.22	814,630.49	32° 4' 44.178 N	103° 19' 3.112 W	
4,425.0	2.36	352.51	4,424.1	26.3	17.4	393,924.19	814,630.33	32° 4' 44.188 N	103° 19' 3.113 W	
4,450.0	2.57	350.34	4,449.1	27.4	17.3	393,925.25	814,630.17	32° 4' 44.198 N	103° 19' 3.115 W	

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well USHANKA FED COM #23H
Project:	LEA COUNTY, NM	TVD Reference:	RKB=26+3036 @ 3062.0usft (MCVAY 8)
Site:	BULLDOG	MD Reference:	RKB=26+3036 @ 3062.0usft (MCVAY 8)
Well:	USHANKA FED COM #23H	North Reference:	Grid
Wellbore:	OWB - ST01	Survey Calculation Method:	Minimum Curvature
Design:	ACTUAL WELLPATH - ST01	Database:	EDM_Users

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
4,475.0	2.88	349.59	4,474.0	28.5	17.1	393,926.42	814,629.96	32° 4' 44.210 N	103° 19' 3.117 W
4,500.0	3.09	349.06	4,499.0	29.8	16.8	393,927.70	814,629.72	32° 4' 44.223 N	103° 19' 3.120 W
4,525.0	3.37	347.75	4,524.0	31.2	16.5	393,929.08	814,629.44	32° 4' 44.236 N	103° 19' 3.123 W
4,550.0	3.59	346.79	4,548.9	32.7	16.2	393,930.56	814,629.10	32° 4' 44.251 N	103° 19' 3.127 W
4,575.0	3.68	343.53	4,573.9	34.2	15.8	393,932.09	814,628.70	32° 4' 44.266 N	103° 19' 3.131 W
4,600.0	3.71	343.35	4,598.8	35.7	15.3	393,933.64	814,628.24	32° 4' 44.282 N	103° 19' 3.137 W
4,625.0	3.65	338.92	4,623.8	37.3	14.8	393,935.15	814,627.72	32° 4' 44.297 N	103° 19' 3.142 W
4,650.0	3.56	328.50	4,648.7	38.7	14.1	393,936.56	814,627.03	32° 4' 44.311 N	103° 19' 3.150 W
4,675.0	3.50	320.13	4,673.7	39.9	13.2	393,937.81	814,626.13	32° 4' 44.323 N	103° 19' 3.161 W
4,700.0	3.62	318.10	4,698.6	41.1	12.2	393,938.98	814,625.12	32° 4' 44.335 N	103° 19' 3.172 W
4,725.0	3.73	316.28	4,723.6	42.3	11.1	393,940.16	814,624.03	32° 4' 44.346 N	103° 19' 3.185 W
4,750.0	3.74	315.22	4,748.5	43.4	10.0	393,941.32	814,622.89	32° 4' 44.358 N	103° 19' 3.198 W
4,775.0	3.82	314.80	4,773.5	44.6	8.8	393,942.49	814,621.72	32° 4' 44.370 N	103° 19' 3.211 W
4,800.0	3.86	313.87	4,798.4	45.8	7.6	393,943.66	814,620.53	32° 4' 44.381 N	103° 19' 3.225 W
4,825.0	3.60	308.34	4,823.3	46.8	6.4	393,944.73	814,619.30	32° 4' 44.392 N	103° 19' 3.239 W
4,850.0	3.18	298.61	4,848.3	47.6	5.2	393,945.55	814,618.08	32° 4' 44.400 N	103° 19' 3.253 W
4,875.0	2.82	288.47	4,873.3	48.2	4.0	393,946.07	814,616.89	32° 4' 44.406 N	103° 19' 3.267 W
4,900.0	2.58	281.88	4,898.2	48.5	2.9	393,946.38	814,615.75	32° 4' 44.409 N	103° 19' 3.280 W
4,925.0	2.08	266.18	4,923.2	48.6	1.9	393,946.47	814,614.75	32° 4' 44.410 N	103° 19' 3.292 W
4,950.0	1.66	216.90	4,948.2	48.3	1.2	393,946.15	814,614.08	32° 4' 44.407 N	103° 19' 3.300 W
4,975.0	1.85	200.84	4,973.2	47.6	0.8	393,945.48	814,613.72	32° 4' 44.400 N	103° 19' 3.304 W
5,000.0	1.86	199.65	4,998.2	46.8	0.5	393,944.72	814,613.44	32° 4' 44.393 N	103° 19' 3.307 W
5,025.0	1.94	199.50	5,023.2	46.0	0.3	393,943.94	814,613.16	32° 4' 44.385 N	103° 19' 3.311 W
5,050.0	1.96	201.09	5,048.2	45.2	0.0	393,943.14	814,612.87	32° 4' 44.377 N	103° 19' 3.314 W
5,075.0	1.93	203.64	5,073.1	44.5	-0.4	393,942.36	814,612.54	32° 4' 44.369 N	103° 19' 3.318 W
5,100.0	1.90	200.75	5,098.1	43.7	-0.7	393,941.59	814,612.23	32° 4' 44.362 N	103° 19' 3.322 W
5,125.0	1.93	198.05	5,123.1	42.9	-0.9	393,940.80	814,611.95	32° 4' 44.354 N	103° 19' 3.325 W
5,150.0	1.97	201.21	5,148.1	42.1	-1.2	393,940.00	814,611.67	32° 4' 44.346 N	103° 19' 3.329 W
5,175.0	1.92	199.16	5,173.1	41.3	-1.5	393,939.20	814,611.37	32° 4' 44.338 N	103° 19' 3.332 W
5,200.0	1.93	197.89	5,198.1	40.5	-1.8	393,938.41	814,611.11	32° 4' 44.330 N	103° 19' 3.335 W
5,225.0	1.95	201.50	5,223.1	39.7	-2.1	393,937.61	814,610.82	32° 4' 44.323 N	103° 19' 3.339 W
5,250.0	1.87	201.74	5,248.0	38.9	-2.4	393,936.83	814,610.51	32° 4' 44.315 N	103° 19' 3.342 W
5,275.0	1.96	199.26	5,273.0	38.2	-2.7	393,936.05	814,610.22	32° 4' 44.307 N	103° 19' 3.346 W
5,300.0	1.92	200.76	5,298.0	37.4	-3.0	393,935.26	814,609.93	32° 4' 44.299 N	103° 19' 3.349 W
5,325.0	1.93	196.87	5,323.0	36.6	-3.2	393,934.46	814,609.66	32° 4' 44.291 N	103° 19' 3.352 W
5,350.0	1.89	200.95	5,348.0	35.8	-3.5	393,933.67	814,609.39	32° 4' 44.284 N	103° 19' 3.356 W
5,375.0	1.93	197.52	5,373.0	35.0	-3.8	393,932.89	814,609.12	32° 4' 44.276 N	103° 19' 3.359 W
5,400.0	1.86	200.05	5,398.0	34.2	-4.0	393,932.11	814,608.85	32° 4' 44.268 N	103° 19' 3.362 W
5,425.0	1.73	198.33	5,422.9	33.5	-4.3	393,931.37	814,608.59	32° 4' 44.261 N	103° 19' 3.365 W
5,450.0	1.74	197.64	5,447.9	32.7	-4.5	393,930.65	814,608.36	32° 4' 44.254 N	103° 19' 3.368 W
5,475.0	1.76	195.26	5,472.9	32.0	-4.8	393,929.91	814,608.14	32° 4' 44.247 N	103° 19' 3.371 W
5,500.0	1.79	198.68	5,497.9	31.3	-5.0	393,929.17	814,607.92	32° 4' 44.239 N	103° 19' 3.373 W
5,525.0	1.72	197.82	5,522.9	30.5	-5.2	393,928.45	814,607.68	32° 4' 44.232 N	103° 19' 3.376 W
5,550.0	1.78	192.52	5,547.9	29.8	-5.4	393,927.71	814,607.48	32° 4' 44.225 N	103° 19' 3.378 W
5,575.0	1.77	200.29	5,572.9	29.1	-5.6	393,926.97	814,607.26	32° 4' 44.218 N	103° 19' 3.381 W
5,600.0	1.76	193.13	5,597.9	28.3	-5.9	393,926.23	814,607.04	32° 4' 44.210 N	103° 19' 3.384 W
5,625.0	1.83	195.55	5,622.8	27.6	-6.1	393,925.48	814,606.85	32° 4' 44.203 N	103° 19' 3.386 W
5,650.0	1.73	199.00	5,647.8	26.8	-6.3	393,924.73	814,606.62	32° 4' 44.195 N	103° 19' 3.389 W
5,675.0	1.72	196.23	5,672.8	26.1	-6.5	393,924.02	814,606.39	32° 4' 44.188 N	103° 19' 3.392 W
5,700.0	1.56	196.23	5,697.8	25.4	-6.7	393,923.33	814,606.19	32° 4' 44.182 N	103° 19' 3.394 W
5,725.0	1.60	194.03	5,722.8	24.8	-6.9	393,922.66	814,606.01	32° 4' 44.175 N	103° 19' 3.396 W
5,750.0	1.63	199.16	5,747.8	24.1	-7.1	393,921.99	814,605.81	32° 4' 44.168 N	103° 19' 3.399 W
5,775.0	1.61	192.39	5,772.8	23.4	-7.3	393,921.31	814,605.62	32° 4' 44.162 N	103° 19' 3.401 W
5,800.0	1.61	196.38	5,797.8	22.7	-7.5	393,920.63	814,605.44	32° 4' 44.155 N	103° 19' 3.403 W
5,825.0	1.52	195.66	5,822.8	22.1	-7.6	393,919.97	814,605.25	32° 4' 44.149 N	103° 19' 3.405 W

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well USHANKA FED COM #23H
Project:	LEA COUNTY, NM	TVD Reference:	RKB=26+3036 @ 3062.0usft (MCVAY 8)
Site:	BULLDOG	MD Reference:	RKB=26+3036 @ 3062.0usft (MCVAY 8)
Well:	USHANKA FED COM #23H	North Reference:	Grid
Wellbore:	OWB - ST01	Survey Calculation Method:	Minimum Curvature
Design:	ACTUAL WELLPATH - ST01	Database:	EDM_Users

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
5,850.0	1.61	191.94	5,847.8	21.4	-7.8	393,919.31	814,605.09	32° 4' 44.142 N	103° 19' 3.407 W	
5,875.0	1.55	195.78	5,872.7	20.7	-8.0	393,918.64	814,604.93	32° 4' 44.135 N	103° 19' 3.409 W	
5,900.0	1.52	190.29	5,897.7	20.1	-8.1	393,917.99	814,604.77	32° 4' 44.129 N	103° 19' 3.411 W	
5,925.0	1.58	192.29	5,922.7	19.4	-8.3	393,917.33	814,604.64	32° 4' 44.122 N	103° 19' 3.413 W	
5,950.0	1.58	195.93	5,947.7	18.8	-8.4	393,916.66	814,604.47	32° 4' 44.116 N	103° 19' 3.415 W	
5,975.0	1.48	189.06	5,972.7	18.1	-8.6	393,916.01	814,604.33	32° 4' 44.109 N	103° 19' 3.416 W	
6,000.0	1.62	190.39	5,997.7	17.4	-8.7	393,915.34	814,604.21	32° 4' 44.103 N	103° 19' 3.418 W	
6,025.0	1.59	190.85	6,022.7	16.8	-8.8	393,914.66	814,604.08	32° 4' 44.096 N	103° 19' 3.419 W	
6,050.0	1.66	189.34	6,047.7	16.1	-8.9	393,913.96	814,603.96	32° 4' 44.089 N	103° 19' 3.421 W	
6,075.0	1.60	190.88	6,072.7	15.4	-9.1	393,913.26	814,603.84	32° 4' 44.082 N	103° 19' 3.422 W	
6,100.0	1.62	188.30	6,097.7	14.7	-9.2	393,912.56	814,603.72	32° 4' 44.075 N	103° 19' 3.424 W	
6,125.0	1.53	186.86	6,122.7	14.0	-9.3	393,911.88	814,603.63	32° 4' 44.069 N	103° 19' 3.425 W	
6,150.0	1.50	183.10	6,147.6	13.3	-9.3	393,911.23	814,603.57	32° 4' 44.062 N	103° 19' 3.426 W	
6,175.0	1.57	184.50	6,172.6	12.7	-9.4	393,910.56	814,603.53	32° 4' 44.056 N	103° 19' 3.426 W	
6,200.0	1.51	186.77	6,197.6	12.0	-9.4	393,909.89	814,603.46	32° 4' 44.049 N	103° 19' 3.427 W	
6,225.0	1.46	183.02	6,222.6	11.3	-9.5	393,909.24	814,603.41	32° 4' 44.043 N	103° 19' 3.428 W	
6,250.0	1.44	182.26	6,247.6	10.7	-9.5	393,908.61	814,603.38	32° 4' 44.036 N	103° 19' 3.428 W	
6,275.0	1.54	182.27	6,272.6	10.1	-9.5	393,907.96	814,603.35	32° 4' 44.030 N	103° 19' 3.429 W	
6,300.0	1.51	184.77	6,297.6	9.4	-9.6	393,907.30	814,603.31	32° 4' 44.023 N	103° 19' 3.429 W	
6,325.0	1.48	183.90	6,322.6	8.7	-9.6	393,906.65	814,603.26	32° 4' 44.017 N	103° 19' 3.430 W	
6,350.0	1.60	183.88	6,347.6	8.1	-9.7	393,905.98	814,603.21	32° 4' 44.010 N	103° 19' 3.430 W	
6,375.0	1.53	182.81	6,372.6	7.4	-9.7	393,905.30	814,603.17	32° 4' 44.003 N	103° 19' 3.431 W	
6,400.0	1.49	180.57	6,397.6	6.7	-9.7	393,904.64	814,603.15	32° 4' 43.997 N	103° 19' 3.431 W	
6,425.0	1.52	182.91	6,422.5	6.1	-9.8	393,903.98	814,603.13	32° 4' 43.990 N	103° 19' 3.432 W	
6,450.0	1.46	182.10	6,447.5	5.4	-9.8	393,903.33	814,603.11	32° 4' 43.984 N	103° 19' 3.432 W	
6,475.0	1.60	177.20	6,472.5	4.8	-9.8	393,902.67	814,603.11	32° 4' 43.977 N	103° 19' 3.432 W	
6,500.0	1.46	180.92	6,497.5	4.1	-9.8	393,902.00	814,603.12	32° 4' 43.971 N	103° 19' 3.432 W	
6,525.0	1.55	175.82	6,522.5	3.4	-9.8	393,901.34	814,603.14	32° 4' 43.964 N	103° 19' 3.432 W	
6,550.0	1.53	177.79	6,547.5	2.8	-9.7	393,900.67	814,603.18	32° 4' 43.958 N	103° 19' 3.431 W	
6,575.0	1.59	173.87	6,572.5	2.1	-9.7	393,899.99	814,603.23	32° 4' 43.951 N	103° 19' 3.431 W	
6,600.0	1.56	176.49	6,597.5	1.4	-9.6	393,899.31	814,603.29	32° 4' 43.944 N	103° 19' 3.430 W	
6,625.0	1.60	174.39	6,622.5	0.7	-9.6	393,898.62	814,603.34	32° 4' 43.937 N	103° 19' 3.430 W	
6,650.0	1.57	174.23	6,647.5	0.0	-9.5	393,897.93	814,603.41	32° 4' 43.931 N	103° 19' 3.429 W	
6,675.0	1.59	175.75	6,672.5	-0.7	-9.4	393,897.25	814,603.47	32° 4' 43.924 N	103° 19' 3.428 W	
6,700.0	1.56	174.60	6,697.4	-1.3	-9.4	393,896.56	814,603.53	32° 4' 43.917 N	103° 19' 3.428 W	
6,725.0	1.53	174.42	6,722.4	-2.0	-9.3	393,895.89	814,603.59	32° 4' 43.910 N	103° 19' 3.427 W	
6,750.0	1.58	176.86	6,747.4	-2.7	-9.3	393,895.22	814,603.65	32° 4' 43.904 N	103° 19' 3.427 W	
6,775.0	1.53	172.84	6,772.4	-3.4	-9.2	393,894.54	814,603.71	32° 4' 43.897 N	103° 19' 3.426 W	
6,800.0	1.54	173.30	6,797.4	-4.0	-9.1	393,893.88	814,603.79	32° 4' 43.890 N	103° 19' 3.425 W	
6,825.0	1.52	175.25	6,822.4	-4.7	-9.0	393,893.21	814,603.85	32° 4' 43.884 N	103° 19' 3.424 W	
6,850.0	1.42	170.43	6,847.4	-5.3	-9.0	393,892.58	814,603.93	32° 4' 43.878 N	103° 19' 3.424 W	
6,875.0	1.39	170.64	6,872.4	-5.9	-8.9	393,891.97	814,604.03	32° 4' 43.872 N	103° 19' 3.422 W	
6,900.0	1.31	172.60	6,897.4	-6.5	-8.8	393,891.39	814,604.12	32° 4' 43.866 N	103° 19' 3.422 W	
6,925.0	1.20	172.13	6,922.4	-7.1	-8.7	393,890.85	814,604.19	32° 4' 43.860 N	103° 19' 3.421 W	
6,950.0	1.10	166.33	6,947.4	-7.5	-8.6	393,890.35	814,604.28	32° 4' 43.856 N	103° 19' 3.420 W	
6,975.0	0.99	165.53	6,972.4	-8.0	-8.5	393,889.91	814,604.40	32° 4' 43.851 N	103° 19' 3.418 W	
7,000.0	0.98	158.55	6,997.4	-8.4	-8.4	393,889.50	814,604.53	32° 4' 43.847 N	103° 19' 3.417 W	
7,025.0	0.97	162.31	7,022.4	-8.8	-8.2	393,889.10	814,604.67	32° 4' 43.843 N	103° 19' 3.415 W	
7,050.0	0.89	164.45	7,047.4	-9.2	-8.1	393,888.71	814,604.79	32° 4' 43.839 N	103° 19' 3.414 W	
7,075.0	0.96	158.76	7,072.4	-9.6	-8.0	393,888.33	814,604.91	32° 4' 43.835 N	103° 19' 3.413 W	
7,100.0	0.91	152.24	7,097.3	-9.9	-7.8	393,887.96	814,605.08	32° 4' 43.832 N	103° 19' 3.411 W	
7,125.0	0.98	151.17	7,122.3	-10.3	-7.6	393,887.60	814,605.28	32° 4' 43.828 N	103° 19' 3.408 W	
7,150.0	0.94	153.59	7,147.3	-10.7	-7.4	393,887.23	814,605.47	32° 4' 43.824 N	103° 19' 3.406 W	
7,175.0	0.98	148.06	7,172.3	-11.0	-7.2	393,886.86	814,605.68	32° 4' 43.821 N	103° 19' 3.404 W	
7,200.0	0.86	149.52	7,197.3	-11.4	-7.0	393,886.52	814,605.89	32° 4' 43.817 N	103° 19' 3.402 W	

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well USHANKA FED COM #23H
Project:	LEA COUNTY, NM	TVD Reference:	RKB=26+3036 @ 3062.0usft (MCVAY 8)
Site:	BULLDOG	MD Reference:	RKB=26+3036 @ 3062.0usft (MCVAY 8)
Well:	USHANKA FED COM #23H	North Reference:	Grid
Wellbore:	OWB - ST01	Survey Calculation Method:	Minimum Curvature
Design:	ACTUAL WELLPATH - ST01	Database:	EDM_Users

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
7,225.0	0.97	148.00	7,222.3	-11.7	-6.8	393,886.18	814,606.09	32° 4' 43.814 N	103° 19' 3.399 W
7,250.0	1.00	143.08	7,247.3	-12.1	-6.6	393,885.82	814,606.34	32° 4' 43.810 N	103° 19' 3.396 W
7,275.0	0.90	141.96	7,272.3	-12.4	-6.3	393,885.49	814,606.59	32° 4' 43.807 N	103° 19' 3.393 W
7,300.0	0.94	143.93	7,297.3	-12.7	-6.1	393,885.17	814,606.83	32° 4' 43.804 N	103° 19' 3.391 W
7,325.0	0.91	137.49	7,322.3	-13.0	-5.8	393,884.86	814,607.08	32° 4' 43.801 N	103° 19' 3.388 W
7,350.0	0.88	134.73	7,347.3	-13.3	-5.5	393,884.58	814,607.35	32° 4' 43.798 N	103° 19' 3.385 W
7,375.0	1.00	127.66	7,372.3	-13.6	-5.2	393,884.31	814,607.66	32° 4' 43.795 N	103° 19' 3.381 W
7,400.0	1.06	127.78	7,397.3	-13.9	-4.9	393,884.04	814,608.02	32° 4' 43.793 N	103° 19' 3.377 W
7,425.0	1.01	127.06	7,422.3	-14.1	-4.5	393,883.76	814,608.38	32° 4' 43.790 N	103° 19' 3.373 W
7,450.0	1.01	127.74	7,447.3	-14.4	-4.2	393,883.49	814,608.73	32° 4' 43.787 N	103° 19' 3.369 W
7,475.0	1.12	124.38	7,472.3	-14.7	-3.8	393,883.22	814,609.10	32° 4' 43.784 N	103° 19' 3.364 W
7,500.0	1.19	124.82	7,497.3	-15.0	-3.4	393,882.94	814,609.52	32° 4' 43.782 N	103° 19' 3.360 W
7,525.0	1.26	119.39	7,522.3	-15.2	-2.9	393,882.65	814,609.97	32° 4' 43.779 N	103° 19' 3.354 W
7,550.0	1.33	120.62	7,547.3	-15.5	-2.4	393,882.37	814,610.46	32° 4' 43.776 N	103° 19' 3.349 W
7,575.0	1.41	122.02	7,572.3	-15.8	-1.9	393,882.06	814,610.97	32° 4' 43.773 N	103° 19' 3.343 W
7,600.0	1.32	119.63	7,597.3	-16.1	-1.4	393,881.75	814,611.48	32° 4' 43.770 N	103° 19' 3.337 W
7,625.0	1.48	117.12	7,622.3	-16.4	-0.9	393,881.46	814,612.02	32° 4' 43.767 N	103° 19' 3.331 W
7,650.0	1.65	110.84	7,647.2	-16.7	-0.3	393,881.19	814,612.64	32° 4' 43.764 N	103° 19' 3.324 W
7,675.0	1.71	111.52	7,672.2	-17.0	0.4	393,880.92	814,613.33	32° 4' 43.761 N	103° 19' 3.316 W
7,700.0	1.66	113.61	7,697.2	-17.3	1.1	393,880.64	814,614.01	32° 4' 43.759 N	103° 19' 3.308 W
7,725.0	1.78	109.52	7,722.2	-17.5	1.8	393,880.37	814,614.70	32° 4' 43.756 N	103° 19' 3.300 W
7,750.0	1.78	109.12	7,747.2	-17.8	2.5	393,880.11	814,615.44	32° 4' 43.753 N	103° 19' 3.291 W
7,775.0	1.70	112.64	7,772.2	-18.1	3.2	393,879.84	814,616.15	32° 4' 43.750 N	103° 19' 3.283 W
7,800.0	1.71	107.97	7,797.2	-18.3	3.9	393,879.58	814,616.84	32° 4' 43.748 N	103° 19' 3.275 W
7,825.0	1.82	107.80	7,822.2	-18.6	4.7	393,879.35	814,617.58	32° 4' 43.745 N	103° 19' 3.266 W
7,850.0	1.93	108.55	7,847.2	-18.8	5.5	393,879.09	814,618.35	32° 4' 43.743 N	103° 19' 3.257 W
7,875.0	1.75	109.68	7,872.1	-19.1	6.2	393,878.83	814,619.11	32° 4' 43.740 N	103° 19' 3.249 W
7,900.0	1.47	98.50	7,897.1	-19.2	6.9	393,878.65	814,619.79	32° 4' 43.738 N	103° 19' 3.241 W
7,925.0	1.42	93.14	7,922.1	-19.3	7.5	393,878.59	814,620.41	32° 4' 43.738 N	103° 19' 3.234 W
7,950.0	1.29	94.16	7,947.1	-19.3	8.1	393,878.55	814,621.00	32° 4' 43.737 N	103° 19' 3.227 W
7,975.0	1.31	91.25	7,972.1	-19.4	8.7	393,878.52	814,621.57	32° 4' 43.737 N	103° 19' 3.220 W
8,000.0	1.37	93.31	7,997.1	-19.4	9.3	393,878.50	814,622.15	32° 4' 43.737 N	103° 19' 3.213 W
8,025.0	1.33	93.81	8,022.1	-19.4	9.8	393,878.46	814,622.74	32° 4' 43.736 N	103° 19' 3.207 W
8,050.0	1.38	91.91	8,047.1	-19.5	10.4	393,878.43	814,623.33	32° 4' 43.736 N	103° 19' 3.200 W
8,075.0	1.36	94.47	8,072.1	-19.5	11.0	393,878.40	814,623.93	32° 4' 43.735 N	103° 19' 3.193 W
8,100.0	1.29	92.02	8,097.1	-19.5	11.6	393,878.37	814,624.51	32° 4' 43.735 N	103° 19' 3.186 W
8,125.0	1.38	91.25	8,122.1	-19.5	12.2	393,878.35	814,625.09	32° 4' 43.735 N	103° 19' 3.179 W
8,150.0	1.40	95.31	8,147.1	-19.6	12.8	393,878.32	814,625.69	32° 4' 43.734 N	103° 19' 3.172 W
8,175.0	1.34	96.92	8,172.1	-19.6	13.4	393,878.25	814,626.29	32° 4' 43.734 N	103° 19' 3.165 W
8,200.0	1.35	95.23	8,197.0	-19.7	14.0	393,878.19	814,626.87	32° 4' 43.733 N	103° 19' 3.159 W
8,225.0	1.30	94.45	8,222.0	-19.8	14.5	393,878.14	814,627.45	32° 4' 43.733 N	103° 19' 3.152 W
8,250.0	1.27	95.15	8,247.0	-19.8	15.1	393,878.10	814,628.01	32° 4' 43.732 N	103° 19' 3.145 W
8,275.0	1.05	100.63	8,272.0	-19.9	15.6	393,878.03	814,628.51	32° 4' 43.731 N	103° 19' 3.140 W
8,300.0	0.70	129.19	8,297.0	-20.0	16.0	393,877.89	814,628.85	32° 4' 43.730 N	103° 19' 3.136 W
8,325.0	0.69	155.38	8,322.0	-20.2	16.1	393,877.66	814,629.03	32° 4' 43.728 N	103° 19' 3.134 W
8,350.0	0.62	149.27	8,347.0	-20.5	16.3	393,877.40	814,629.16	32° 4' 43.725 N	103° 19' 3.132 W
8,375.0	0.66	158.10	8,372.0	-20.7	16.4	393,877.15	814,629.29	32° 4' 43.723 N	103° 19' 3.131 W
8,400.0	0.59	156.38	8,397.0	-21.0	16.5	393,876.90	814,629.39	32° 4' 43.720 N	103° 19' 3.129 W
8,425.0	0.67	147.32	8,422.0	-21.2	16.6	393,876.66	814,629.52	32° 4' 43.718 N	103° 19' 3.128 W
8,450.0	0.67	159.47	8,447.0	-21.5	16.8	393,876.40	814,629.65	32° 4' 43.715 N	103° 19' 3.126 W
8,475.0	0.61	175.18	8,472.0	-21.8	16.8	393,876.13	814,629.71	32° 4' 43.712 N	103° 19' 3.126 W
8,500.0	0.71	187.69	8,497.0	-22.1	16.8	393,875.85	814,629.70	32° 4' 43.710 N	103° 19' 3.126 W
8,525.0	0.73	203.70	8,522.0	-22.4	16.7	393,875.55	814,629.62	32° 4' 43.707 N	103° 19' 3.127 W
8,550.0	0.66	202.30	8,547.0	-22.6	16.6	393,875.27	814,629.50	32° 4' 43.704 N	103° 19' 3.128 W
8,575.0	0.61	199.32	8,572.0	-22.9	16.5	393,875.01	814,629.40	32° 4' 43.701 N	103° 19' 3.129 W



Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well USHANKA FED COM #23H
Project:	LEA COUNTY, NM	TVD Reference:	RKB=26+3036 @ 3062.0usft (MCVAY 8)
Site:	BULLDOG	MD Reference:	RKB=26+3036 @ 3062.0usft (MCVAY 8)
Well:	USHANKA FED COM #23H	North Reference:	Grid
Wellbore:	OWB - ST01	Survey Calculation Method:	Minimum Curvature
Design:	ACTUAL WELLPATH - ST01	Database:	EDM_Users

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
8,600.0	0.63	192.93	8,597.0	-23.1	16.4	393,874.75	814,629.33	32° 4' 43.699 N	103° 19' 3.130 W	
8,625.0	0.67	189.70	8,622.0	-23.4	16.4	393,874.47	814,629.27	32° 4' 43.696 N	103° 19' 3.131 W	
8,650.0	0.60	190.68	8,647.0	-23.7	16.3	393,874.20	814,629.22	32° 4' 43.693 N	103° 19' 3.132 W	
8,675.0	0.68	180.34	8,672.0	-24.0	16.3	393,873.92	814,629.20	32° 4' 43.691 N	103° 19' 3.132 W	
8,700.0	0.66	193.04	8,697.0	-24.3	16.3	393,873.63	814,629.17	32° 4' 43.688 N	103° 19' 3.132 W	
8,725.0	0.64	179.79	8,722.0	-24.5	16.2	393,873.35	814,629.13	32° 4' 43.685 N	103° 19' 3.133 W	
8,750.0	0.68	181.91	8,747.0	-24.8	16.2	393,873.06	814,629.13	32° 4' 43.682 N	103° 19' 3.133 W	
8,775.0	0.69	190.12	8,772.0	-25.1	16.2	393,872.77	814,629.10	32° 4' 43.679 N	103° 19' 3.133 W	
8,800.0	0.62	182.95	8,797.0	-25.4	16.2	393,872.49	814,629.06	32° 4' 43.676 N	103° 19' 3.134 W	
8,825.0	0.68	185.83	8,822.0	-25.7	16.1	393,872.20	814,629.04	32° 4' 43.674 N	103° 19' 3.134 W	
8,850.0	0.70	199.80	8,847.0	-26.0	16.1	393,871.91	814,628.98	32° 4' 43.671 N	103° 19' 3.135 W	
8,875.0	0.63	194.63	8,872.0	-26.3	16.0	393,871.63	814,628.89	32° 4' 43.668 N	103° 19' 3.136 W	
8,900.0	0.74	189.40	8,897.0	-26.6	15.9	393,871.34	814,628.83	32° 4' 43.665 N	103° 19' 3.137 W	
8,925.0	0.77	197.34	8,922.0	-26.9	15.9	393,871.02	814,628.75	32° 4' 43.662 N	103° 19' 3.137 W	
8,950.0	0.66	199.26	8,947.0	-27.2	15.8	393,870.73	814,628.65	32° 4' 43.659 N	103° 19' 3.139 W	
8,975.0	0.66	193.15	8,972.0	-27.4	15.7	393,870.45	814,628.57	32° 4' 43.656 N	103° 19' 3.140 W	
9,000.0	0.68	194.74	8,997.0	-27.7	15.6	393,870.17	814,628.50	32° 4' 43.654 N	103° 19' 3.140 W	
9,025.0	0.70	185.27	9,022.0	-28.0	15.6	393,869.87	814,628.45	32° 4' 43.651 N	103° 19' 3.141 W	
9,050.0	0.85	184.73	9,047.0	-28.4	15.5	393,869.53	814,628.42	32° 4' 43.647 N	103° 19' 3.141 W	
9,075.0	0.78	191.67	9,072.0	-28.7	15.5	393,869.18	814,628.37	32° 4' 43.644 N	103° 19' 3.142 W	
9,100.0	0.77	182.21	9,097.0	-29.1	15.4	393,868.85	814,628.33	32° 4' 43.640 N	103° 19' 3.143 W	
9,125.0	0.87	180.65	9,122.0	-29.4	15.4	393,868.49	814,628.32	32° 4' 43.637 N	103° 19' 3.143 W	
9,150.0	0.78	177.70	9,147.0	-29.8	15.4	393,868.13	814,628.33	32° 4' 43.633 N	103° 19' 3.143 W	
9,175.0	0.88	167.13	9,172.0	-30.1	15.5	393,867.77	814,628.38	32° 4' 43.630 N	103° 19' 3.142 W	
9,200.0	0.92	168.67	9,197.0	-30.5	15.6	393,867.39	814,628.46	32° 4' 43.626 N	103° 19' 3.141 W	
9,225.0	0.88	167.14	9,222.0	-30.9	15.6	393,867.01	814,628.54	32° 4' 43.622 N	103° 19' 3.140 W	
9,250.0	0.95	164.52	9,247.0	-31.3	15.7	393,866.62	814,628.64	32° 4' 43.618 N	103° 19' 3.139 W	
9,275.0	0.95	171.67	9,271.9	-31.7	15.8	393,866.21	814,628.72	32° 4' 43.614 N	103° 19' 3.138 W	
9,300.0	0.91	173.68	9,296.9	-32.1	15.9	393,865.81	814,628.78	32° 4' 43.610 N	103° 19' 3.138 W	
9,325.0	0.89	169.93	9,321.9	-32.5	15.9	393,865.42	814,628.83	32° 4' 43.607 N	103° 19' 3.137 W	
9,350.0	0.96	168.69	9,346.9	-32.9	16.0	393,865.03	814,628.91	32° 4' 43.603 N	103° 19' 3.136 W	
9,375.0	0.90	171.76	9,371.9	-33.3	16.1	393,864.63	814,628.98	32° 4' 43.599 N	103° 19' 3.136 W	
9,400.0	0.91	167.28	9,396.9	-33.7	16.2	393,864.24	814,629.05	32° 4' 43.595 N	103° 19' 3.135 W	
9,425.0	0.96	172.09	9,421.9	-34.1	16.2	393,863.84	814,629.12	32° 4' 43.591 N	103° 19' 3.134 W	
9,450.0	0.96	163.56	9,446.9	-34.5	16.3	393,863.43	814,629.21	32° 4' 43.587 N	103° 19' 3.133 W	
9,475.0	0.96	172.36	9,471.9	-34.9	16.4	393,863.02	814,629.30	32° 4' 43.583 N	103° 19' 3.132 W	
9,500.0	0.99	164.62	9,496.9	-35.3	16.5	393,862.61	814,629.38	32° 4' 43.579 N	103° 19' 3.131 W	
9,525.0	0.96	167.82	9,521.9	-35.7	16.6	393,862.19	814,629.48	32° 4' 43.575 N	103° 19' 3.130 W	
9,550.0	1.01	168.86	9,546.9	-36.1	16.7	393,861.77	814,629.57	32° 4' 43.570 N	103° 19' 3.129 W	
9,575.0	0.96	163.87	9,571.9	-36.5	16.8	393,861.35	814,629.67	32° 4' 43.566 N	103° 19' 3.128 W	
9,600.0	0.99	175.39	9,596.9	-37.0	16.8	393,860.94	814,629.75	32° 4' 43.562 N	103° 19' 3.127 W	
9,625.0	0.90	179.08	9,621.9	-37.4	16.9	393,860.53	814,629.77	32° 4' 43.558 N	103° 19' 3.127 W	
9,650.0	0.48	198.95	9,646.9	-37.7	16.8	393,860.23	814,629.74	32° 4' 43.555 N	103° 19' 3.127 W	
9,675.0	0.43	228.24	9,671.9	-37.8	16.7	393,860.07	814,629.63	32° 4' 43.553 N	103° 19' 3.128 W	
9,700.0	0.50	220.40	9,696.9	-38.0	16.6	393,859.92	814,629.49	32° 4' 43.552 N	103° 19' 3.130 W	
9,725.0	0.46	229.73	9,721.9	-38.1	16.4	393,859.78	814,629.34	32° 4' 43.551 N	103° 19' 3.132 W	
9,750.0	0.47	216.29	9,746.9	-38.3	16.3	393,859.63	814,629.21	32° 4' 43.549 N	103° 19' 3.133 W	
9,775.0	0.38	210.33	9,771.9	-38.4	16.2	393,859.47	814,629.10	32° 4' 43.548 N	103° 19' 3.135 W	
9,800.0	0.42	217.03	9,796.9	-38.6	16.1	393,859.33	814,629.01	32° 4' 43.546 N	103° 19' 3.136 W	
9,825.0	0.42	192.53	9,821.9	-38.7	16.0	393,859.17	814,628.93	32° 4' 43.545 N	103° 19' 3.137 W	
9,850.0	0.39	195.82	9,846.9	-38.9	16.0	393,859.00	814,628.89	32° 4' 43.543 N	103° 19' 3.137 W	
9,875.0	0.32	197.97	9,871.9	-39.1	15.9	393,858.85	814,628.84	32° 4' 43.541 N	103° 19' 3.138 W	
9,900.0	0.29	171.67	9,896.9	-39.2	15.9	393,858.72	814,628.83	32° 4' 43.540 N	103° 19' 3.138 W	
9,925.0	0.38	151.13	9,921.9	-39.3	16.0	393,858.58	814,628.88	32° 4' 43.539 N	103° 19' 3.137 W	
9,950.0	0.50	157.46	9,946.9	-39.5	16.1	393,858.41	814,628.96	32° 4' 43.537 N	103° 19' 3.136 W	

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well USHANKA FED COM #23H
Project:	LEA COUNTY, NM	TVD Reference:	RKB=26+3036 @ 3062.0usft (MCVAY 8)
Site:	BULLDOG	MD Reference:	RKB=26+3036 @ 3062.0usft (MCVAY 8)
Well:	USHANKA FED COM #23H	North Reference:	Grid
Wellbore:	OWB - ST01	Survey Calculation Method:	Minimum Curvature
Design:	ACTUAL WELLPATH - ST01	Database:	EDM_Users

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
9,975.0	0.74	155.62	9,971.9	-39.7	16.2	393,858.16	814,629.07	32° 4' 43.535 N	103° 19' 3.135 W
10,000.0	0.89	155.44	9,996.9	-40.1	16.3	393,857.84	814,629.22	32° 4' 43.531 N	103° 19' 3.134 W
10,025.0	1.11	166.41	10,021.9	-40.5	16.5	393,857.43	814,629.36	32° 4' 43.527 N	103° 19' 3.132 W
10,050.0	1.23	175.84	10,046.9	-41.0	16.5	393,856.92	814,629.43	32° 4' 43.522 N	103° 19' 3.131 W
10,075.0	1.23	177.39	10,071.9	-41.5	16.6	393,856.39	814,629.46	32° 4' 43.517 N	103° 19' 3.131 W
10,100.0	1.25	171.45	10,096.9	-42.0	16.6	393,855.85	814,629.52	32° 4' 43.512 N	103° 19' 3.130 W
10,125.0	1.31	174.14	10,121.9	-42.6	16.7	393,855.30	814,629.59	32° 4' 43.506 N	103° 19' 3.130 W
10,150.0	1.28	179.32	10,146.9	-43.2	16.7	393,854.73	814,629.62	32° 4' 43.501 N	103° 19' 3.129 W
10,175.0	1.25	175.91	10,171.8	-43.7	16.7	393,854.18	814,629.64	32° 4' 43.495 N	103° 19' 3.129 W
10,200.0	1.20	174.92	10,196.8	-44.3	16.8	393,853.65	814,629.68	32° 4' 43.490 N	103° 19' 3.129 W
10,225.0	1.13	177.97	10,221.8	-44.8	16.8	393,853.14	814,629.72	32° 4' 43.485 N	103° 19' 3.128 W
10,250.0	1.05	179.08	10,246.8	-45.2	16.8	393,852.67	814,629.73	32° 4' 43.480 N	103° 19' 3.128 W
10,275.0	1.01	176.94	10,271.8	-45.7	16.8	393,852.22	814,629.74	32° 4' 43.476 N	103° 19' 3.128 W
10,300.0	0.96	178.16	10,296.8	-46.1	16.9	393,851.79	814,629.76	32° 4' 43.472 N	103° 19' 3.128 W
10,325.0	0.88	171.51	10,321.8	-46.5	16.9	393,851.39	814,629.80	32° 4' 43.468 N	103° 19' 3.127 W
10,350.0	0.79	171.19	10,346.8	-46.9	17.0	393,851.03	814,629.85	32° 4' 43.464 N	103° 19' 3.127 W
10,375.0	0.75	174.59	10,371.8	-47.2	17.0	393,850.69	814,629.89	32° 4' 43.461 N	103° 19' 3.126 W
10,400.0	0.70	166.61	10,396.8	-47.5	17.0	393,850.38	814,629.94	32° 4' 43.458 N	103° 19' 3.126 W
10,425.0	0.24	259.91	10,421.8	-47.7	17.0	393,850.23	814,629.93	32° 4' 43.456 N	103° 19' 3.126 W
10,450.0	0.73	320.79	10,446.8	-47.6	16.9	393,850.34	814,629.78	32° 4' 43.457 N	103° 19' 3.128 W
10,475.0	0.70	322.65	10,471.8	-47.3	16.7	393,850.58	814,629.58	32° 4' 43.460 N	103° 19' 3.130 W
10,500.0	0.72	315.88	10,496.8	-47.1	16.5	393,850.82	814,629.38	32° 4' 43.462 N	103° 19' 3.132 W
10,525.0	0.70	314.15	10,521.8	-46.9	16.3	393,851.04	814,629.16	32° 4' 43.464 N	103° 19' 3.135 W
10,550.0	0.76	318.50	10,546.8	-46.6	16.0	393,851.27	814,628.94	32° 4' 43.466 N	103° 19' 3.137 W
10,575.0	0.69	311.00	10,571.8	-46.4	15.8	393,851.49	814,628.72	32° 4' 43.469 N	103° 19' 3.140 W
10,600.0	0.58	328.17	10,596.8	-46.2	15.6	393,851.70	814,628.54	32° 4' 43.471 N	103° 19' 3.142 W
10,625.0	0.62	321.92	10,621.8	-46.0	15.5	393,851.91	814,628.39	32° 4' 43.473 N	103° 19' 3.144 W
10,650.0	0.50	323.83	10,646.8	-45.8	15.3	393,852.11	814,628.24	32° 4' 43.475 N	103° 19' 3.145 W
10,675.0	0.36	323.25	10,671.8	-45.6	15.2	393,852.26	814,628.13	32° 4' 43.476 N	103° 19' 3.147 W
10,700.0	0.25	345.47	10,696.8	-45.5	15.2	393,852.37	814,628.07	32° 4' 43.477 N	103° 19' 3.147 W
10,725.0	0.28	334.93	10,721.8	-45.4	15.1	393,852.48	814,628.03	32° 4' 43.479 N	103° 19' 3.148 W
10,750.0	0.29	345.02	10,746.8	-45.3	15.1	393,852.60	814,627.99	32° 4' 43.480 N	103° 19' 3.148 W
10,775.0	0.51	325.38	10,771.8	-45.1	15.0	393,852.75	814,627.91	32° 4' 43.481 N	103° 19' 3.149 W
10,800.0	1.18	313.40	10,796.8	-44.9	14.8	393,853.02	814,627.66	32° 4' 43.484 N	103° 19' 3.152 W
10,825.0	1.81	308.85	10,821.8	-44.5	14.3	393,853.44	814,627.16	32° 4' 43.488 N	103° 19' 3.158 W
10,850.0	1.99	309.43	10,846.8	-43.9	13.6	393,853.97	814,626.52	32° 4' 43.493 N	103° 19' 3.165 W
10,875.0	1.98	309.90	10,871.8	-43.4	13.0	393,854.52	814,625.85	32° 4' 43.499 N	103° 19' 3.173 W
10,900.0	1.95	308.06	10,896.7	-42.8	12.3	393,855.06	814,625.19	32° 4' 43.504 N	103° 19' 3.181 W
10,925.0	1.98	312.77	10,921.7	-42.3	11.6	393,855.61	814,624.54	32° 4' 43.510 N	103° 19' 3.188 W
10,950.0	1.79	311.77	10,946.7	-41.7	11.0	393,856.17	814,623.93	32° 4' 43.515 N	103° 19' 3.195 W
10,975.0	1.73	312.12	10,971.7	-41.2	10.5	393,856.68	814,623.36	32° 4' 43.521 N	103° 19' 3.202 W
11,000.0	1.74	312.91	10,996.7	-40.7	9.9	393,857.19	814,622.80	32° 4' 43.526 N	103° 19' 3.208 W
11,025.0	1.66	313.62	11,021.7	-40.2	9.4	393,857.70	814,622.26	32° 4' 43.531 N	103° 19' 3.214 W
11,050.0	1.67	313.76	11,046.7	-39.7	8.8	393,858.20	814,621.73	32° 4' 43.536 N	103° 19' 3.220 W
11,075.0	1.57	311.11	11,071.7	-39.2	8.3	393,858.68	814,621.21	32° 4' 43.541 N	103° 19' 3.226 W
11,100.0	1.55	312.35	11,096.7	-38.8	7.8	393,859.13	814,620.70	32° 4' 43.545 N	103° 19' 3.232 W
11,125.0	1.42	313.07	11,121.6	-38.3	7.3	393,859.57	814,620.23	32° 4' 43.549 N	103° 19' 3.238 W
11,150.0	1.32	312.29	11,146.6	-37.9	6.9	393,859.98	814,619.79	32° 4' 43.553 N	103° 19' 3.243 W
11,175.0	1.27	312.16	11,171.6	-37.5	6.5	393,860.36	814,619.37	32° 4' 43.557 N	103° 19' 3.248 W
11,200.0	1.21	312.96	11,196.6	-37.2	6.1	393,860.72	814,618.97	32° 4' 43.561 N	103° 19' 3.252 W
11,225.0	1.15	312.15	11,221.6	-36.8	5.7	393,861.07	814,618.59	32° 4' 43.564 N	103° 19' 3.257 W
11,250.0	1.15	311.77	11,246.6	-36.5	5.3	393,861.41	814,618.22	32° 4' 43.568 N	103° 19' 3.261 W
11,275.0	1.09	312.95	11,271.6	-36.2	5.0	393,861.74	814,617.86	32° 4' 43.571 N	103° 19' 3.265 W
11,300.0	0.96	316.66	11,296.6	-35.8	4.6	393,862.05	814,617.54	32° 4' 43.574 N	103° 19' 3.269 W
11,325.0	0.87	318.46	11,321.6	-35.6	4.4	393,862.34	814,617.27	32° 4' 43.577 N	103° 19' 3.272 W

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well USHANKA FED COM #23H
Project:	LEA COUNTY, NM	TVD Reference:	RKB=26+3036 @ 3062.0usft (MCVAY.8)
Site:	BULLDOG	MD Reference:	RKB=26+3036 @ 3062.0usft (MCVAY.8)
Well:	USHANKA FED COM #23H	North Reference:	Grid
Wellbore:	OWB - ST01	Survey Calculation Method:	Minimum Curvature
Design:	ACTUAL WELLPATH - ST01	Database:	EDM_Users

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude Longitude		
11,350.0	0.86	325.36	11,346.6	-35.3	4.1	393,862.64	814,617.04	32° 4' 43.580 N	103° 19' 3.275 W	
11,375.0	0.84	330.35	11,371.6	-34.9	3.9	393,862.95	814,616.84	32° 4' 43.583 N	103° 19' 3.277 W	
11,400.0	0.89	336.25	11,396.6	-34.6	3.8	393,863.29	814,616.67	32° 4' 43.587 N	103° 19' 3.279 W	
11,425.0	0.96	342.38	11,421.6	-34.2	3.6	393,863.67	814,616.53	32° 4' 43.590 N	103° 19' 3.280 W	
11,450.0	0.95	352.22	11,446.6	-33.8	3.5	393,864.07	814,616.44	32° 4' 43.594 N	103° 19' 3.281 W	
11,452.0	0.96	353.00	11,448.6	-33.8	3.5	393,864.11	814,616.43	32° 4' 43.595 N	103° 19' 3.281 W	
11,608.0	0.38	227.50	11,604.6	-32.8	3.0	393,865.05	814,615.89	32° 4' 43.604 N	103° 19' 3.288 W	
11,618.0	1.11	198.68	11,614.6	-33.0	2.9	393,864.94	814,615.84	32° 4' 43.603 N	103° 19' 3.288 W	
11,639.0	3.08	186.95	11,635.6	-33.7	2.8	393,864.19	814,615.70	32° 4' 43.596 N	103° 19' 3.290 W	
11,671.0	8.30	182.54	11,667.4	-36.9	2.6	393,861.02	814,615.50	32° 4' 43.584 N	103° 19' 3.293 W	
11,703.0	12.64	181.84	11,698.9	-42.7	2.4	393,855.21	814,615.28	32° 4' 43.507 N	103° 19' 3.296 W	
11,735.0	16.87	180.59	11,729.8	-50.8	2.2	393,847.07	814,615.12	32° 4' 43.426 N	103° 19' 3.298 W	
11,767.0	20.65	182.94	11,760.1	-61.1	1.9	393,836.79	814,614.79	32° 4' 43.324 N	103° 19' 3.304 W	
11,799.0	25.56	183.13	11,789.5	-73.6	1.2	393,824.25	814,614.12	32° 4' 43.201 N	103° 19' 3.313 W	
11,831.0	31.33	182.86	11,817.6	-88.9	0.4	393,809.04	814,613.33	32° 4' 43.050 N	103° 19' 3.324 W	
11,863.0	36.28	183.61	11,844.2	-106.6	-0.6	393,791.27	814,612.31	32° 4' 42.874 N	103° 19' 3.337 W	
11,894.0	41.25	182.87	11,868.4	-126.0	-1.7	393,771.89	814,611.22	32° 4' 42.683 N	103° 19' 3.352 W	
11,926.0	44.50	180.77	11,891.8	-147.8	-2.4	393,750.14	814,610.55	32° 4' 42.467 N	103° 19' 3.362 W	
11,958.0	48.42	179.45	11,913.9	-171.0	-2.4	393,726.95	814,610.51	32° 4' 42.238 N	103° 19' 3.365 W	
11,990.0	52.12	179.48	11,934.3	-195.6	-2.2	393,702.34	814,610.74	32° 4' 41.995 N	103° 19' 3.365 W	
12,022.0	56.56	180.14	11,953.0	-221.6	-2.1	393,676.35	814,610.82	32° 4' 41.737 N	103° 19' 3.367 W	
12,054.0	60.91	180.46	11,969.6	-248.9	-2.2	393,649.00	814,610.68	32° 4' 41.467 N	103° 19' 3.372 W	
12,086.0	64.13	181.44	11,984.3	-277.3	-2.7	393,620.62	814,610.20	32° 4' 41.186 N	103° 19' 3.380 W	
12,118.0	67.87	180.61	11,997.4	-306.5	-3.2	393,591.40	814,609.68	32° 4' 40.897 N	103° 19' 3.390 W	
12,150.0	72.40	180.19	12,008.2	-336.6	-3.4	393,561.31	814,609.47	32° 4' 40.599 N	103° 19' 3.395 W	
12,182.0	76.25	179.82	12,016.9	-367.4	-3.4	393,530.51	814,609.47	32° 4' 40.294 N	103° 19' 3.399 W	
12,246.0	82.06	179.46	12,028.9	-430.2	-3.0	393,467.68	814,609.87	32° 4' 39.673 N	103° 19' 3.401 W	
12,278.0	84.63	179.75	12,032.6	-462.0	-2.8	393,435.90	814,610.09	32° 4' 39.358 N	103° 19' 3.402 W	
12,372.0	86.94	181.04	12,039.5	-555.7	-3.5	393,342.16	814,609.44	32° 4' 38.431 N	103° 19' 3.420 W	
12,468.0	89.51	180.68	12,042.5	-651.7	-4.9	393,246.23	814,608.00	32° 4' 37.481 N	103° 19' 3.447 W	
12,564.0	88.67	180.81	12,044.0	-747.7	-6.1	393,150.25	814,606.75	32° 4' 36.532 N	103° 19' 3.472 W	
12,660.0	87.94	181.80	12,046.9	-843.6	-8.3	393,054.32	814,604.57	32° 4' 35.583 N	103° 19' 3.508 W	
12,756.0	90.36	183.42	12,048.3	-939.5	-12.7	392,958.44	814,600.20	32° 4' 34.635 N	103° 19' 3.569 W	
12,851.0	92.16	181.01	12,046.2	-1,034.4	-16.4	392,863.54	814,596.52	32° 4' 33.696 N	103° 19' 3.622 W	
12,947.0	92.21	178.73	12,042.5	-1,130.3	-16.2	392,787.62	814,596.74	32° 4' 32.747 N	103° 19' 3.630 W	
13,043.0	88.45	178.00	12,042.0	-1,226.2	-13.4	392,671.68	814,599.48	32° 4' 31.797 N	103° 19' 3.609 W	
13,139.0	87.03	177.64	12,045.8	-1,322.1	-9.8	392,575.82	814,603.13	32° 4' 30.848 N	103° 19' 3.577 W	
13,234.0	87.85	178.58	12,050.0	-1,416.9	-6.6	392,480.97	814,606.26	32° 4' 29.909 N	103° 19' 3.551 W	
13,330.0	89.22	178.31	12,052.5	-1,512.9	-4.0	392,385.04	814,608.86	32° 4' 28.960 N	103° 19' 3.531 W	
13,425.0	93.40	178.55	12,050.3	-1,607.8	-1.4	392,290.12	814,611.47	32° 4' 28.020 N	103° 19' 3.511 W	
13,521.0	90.76	176.29	12,046.8	-1,703.6	2.9	392,194.30	814,615.78	32° 4' 27.072 N	103° 19' 3.472 W	
13,617.0	90.79	175.91	12,045.5	-1,799.4	9.4	392,098.53	814,622.31	32° 4' 26.124 N	103° 19' 3.406 W	
13,713.0	87.27	177.28	12,047.1	-1,895.2	15.1	392,002.73	814,628.01	32° 4' 25.175 N	103° 19' 3.350 W	
13,809.0	86.37	176.28	12,052.5	-1,990.9	20.5	391,907.03	814,633.40	32° 4' 24.228 N	103° 19' 3.298 W	
13,904.0	85.32	177.65	12,059.3	-2,085.5	25.5	391,812.42	814,638.41	32° 4' 23.291 N	103° 19' 3.250 W	
14,000.0	89.59	178.43	12,063.6	-2,181.3	28.8	391,716.59	814,641.69	32° 4' 22.343 N	103° 19' 3.223 W	
14,095.0	91.75	178.56	12,062.5	-2,276.3	31.3	391,621.64	814,644.19	32° 4' 21.403 N	103° 19' 3.204 W	
14,191.0	91.95	179.90	12,059.4	-2,372.2	32.6	391,525.70	814,645.48	32° 4' 20.453 N	103° 19' 3.200 W	
14,286.0	88.96	180.95	12,058.6	-2,467.2	31.9	391,430.71	814,644.77	32° 4' 19.513 N	103° 19' 3.218 W	
14,382.0	89.53	181.16	12,059.9	-2,563.2	30.1	391,334.74	814,643.01	32° 4' 18.564 N	103° 19' 3.249 W	
14,477.0	87.97	181.12	12,062.0	-2,658.1	28.2	391,239.78	814,641.12	32° 4' 17.625 N	103° 19' 3.282 W	
14,573.0	89.99	182.14	12,063.7	-2,754.1	25.5	391,143.84	814,638.39	32° 4' 16.675 N	103° 19' 3.324 W	
14,669.0	86.99	181.57	12,066.2	-2,850.0	22.4	391,047.94	814,635.28	32° 4' 15.727 N	103° 19' 3.371 W	
14,764.0	85.97	180.43	12,072.0	-2,944.8	20.7	390,953.14	814,633.62	32° 4' 14.789 N	103° 19' 3.400 W	
14,860.0	85.94	180.20	12,078.8	-3,040.5	20.2	390,857.38	814,633.10	32° 4' 13.841 N	103° 19' 3.417 W	

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well USHANKA FED COM #23H
Project:	LEA COUNTY, NM	TVD Reference:	RKB=26+3036 @ 3062.0usft (MCVAY 8)
Site:	BULLDOG	MD Reference:	RKB=26+3036 @ 3062.0usft (MCVAY 8)
Well:	USHANKA FED COM #23H	North Reference:	Grid
Wellbore:	OWB - ST01	Survey Calculation Method:	Minimum Curvature
Design:	ACTUAL WELLPATH - ST01	Database:	EDM_Users

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
14,955.0	86.57	179.21	12,085.0	-3,135.3	20.7	390,762.58	814,633.59	32° 4' 12.903 N	103° 19' 3.421 W
15,051.0	86.69	177.89	12,090.7	-3,231.1	23.1	390,666.78	814,636.01	32° 4' 11.955 N	103° 19' 3.404 W
15,147.0	86.32	176.84	12,096.5	-3,326.8	27.5	390,571.06	814,640.42	32° 4' 11.008 N	103° 19' 3.363 W
15,242.0	87.65	177.38	12,101.5	-3,421.6	32.3	390,476.32	814,645.20	32° 4' 10.070 N	103° 19' 3.318 W
15,338.0	87.34	176.33	12,105.7	-3,517.3	37.6	390,380.55	814,650.46	32° 4' 9.122 N	103° 19' 3.267 W
15,435.0	87.85	176.99	12,109.8	-3,614.1	43.2	390,283.81	814,656.11	32° 4' 8.164 N	103° 19' 3.212 W
15,531.0	90.52	179.81	12,111.2	-3,710.0	45.9	390,187.87	814,658.78	32° 4' 7.214 N	103° 19' 3.191 W
15,626.0	90.47	179.37	12,110.3	-3,805.0	46.6	390,092.88	814,659.46	32° 4' 6.274 N	103° 19' 3.194 W
15,721.0	91.10	179.59	12,109.0	-3,900.0	47.4	389,997.89	814,660.33	32° 4' 5.334 N	103° 19' 3.194 W
15,817.0	91.52	180.03	12,106.8	-3,996.0	47.7	389,901.92	814,660.65	32° 4' 4.384 N	103° 19' 3.201 W
15,913.0	90.44	180.48	12,105.2	-4,092.0	47.3	389,805.93	814,660.22	32° 4' 3.435 N	103° 19' 3.217 W
16,009.0	87.33	179.25	12,107.1	-4,187.9	47.5	389,709.97	814,660.44	32° 4' 2.485 N	103° 19' 3.224 W
16,104.0	86.82	178.15	12,111.9	-4,282.8	49.7	389,615.12	814,662.60	32° 4' 1.546 N	103° 19' 3.210 W
16,200.0	88.04	178.33	12,116.2	-4,378.6	52.6	389,519.26	814,665.54	32° 4' 0.598 N	103° 19' 3.186 W
16,296.0	89.55	179.42	12,118.2	-4,474.6	54.5	389,423.30	814,667.43	32° 3' 59.648 N	103° 19' 3.175 W
16,392.0	89.39	178.90	12,119.1	-4,570.6	55.9	389,327.32	814,668.83	32° 3' 58.698 N	103° 19' 3.169 W
16,488.0	89.45	178.79	12,120.1	-4,666.6	57.9	389,231.34	814,670.77	32° 3' 57.748 N	103° 19' 3.157 W
16,583.0	89.92	180.48	12,120.6	-4,761.5	58.5	389,136.35	814,671.37	32° 3' 56.808 N	103° 19' 3.160 W
16,679.0	90.45	179.86	12,120.3	-4,857.5	58.2	389,040.35	814,671.09	32° 3' 55.858 N	103° 19' 3.174 W
16,775.0	90.50	179.47	12,119.5	-4,953.5	58.8	388,944.36	814,671.65	32° 3' 54.908 N	103° 19' 3.178 W
16,871.0	89.67	180.32	12,119.4	-5,049.5	58.9	388,848.36	814,671.82	32° 3' 53.958 N	103° 19' 3.186 W
16,967.0	90.44	181.01	12,119.3	-5,145.5	57.8	388,752.37	814,670.71	32° 3' 53.009 N	103° 19' 3.210 W
17,062.0	88.68	181.96	12,120.0	-5,240.5	55.4	388,657.41	814,668.25	32° 3' 52.069 N	103° 19' 3.249 W
17,158.0	90.12	183.39	12,121.0	-5,336.4	50.9	388,561.52	814,663.77	32° 3' 51.121 N	103° 19' 3.311 W
17,252.0	86.23	183.81	12,124.0	-5,430.1	45.0	388,467.77	814,657.87	32° 3' 50.194 N	103° 19' 3.390 W
17,347.0	86.25	184.56	12,130.2	-5,524.7	38.1	388,373.23	814,650.95	32° 3' 49.259 N	103° 19' 3.481 W
17,441.0	88.05	183.46	12,134.9	-5,618.3	31.5	388,279.58	814,644.39	32° 3' 48.333 N	103° 19' 3.567 W
17,536.0	89.21	183.77	12,137.2	-5,713.1	25.5	388,184.80	814,638.40	32° 3' 47.395 N	103° 19' 3.647 W
17,631.0	88.70	180.84	12,138.9	-5,808.0	21.7	388,089.90	814,634.58	32° 3' 46.457 N	103° 19' 3.702 W
17,726.0	90.64	180.06	12,139.5	-5,903.0	20.9	387,994.91	814,633.83	32° 3' 45.517 N	103° 19' 3.721 W
17,820.0	92.00	178.43	12,137.3	-5,996.9	22.2	387,900.95	814,635.07	32° 3' 44.587 N	103° 19' 3.717 W
17,914.0	89.18	178.73	12,136.3	-6,090.9	24.5	387,806.99	814,637.40	32° 3' 43.657 N	103° 19' 3.700 W
18,009.0	91.16	181.12	12,136.0	-6,185.9	24.6	387,712.01	814,637.53	32° 3' 42.717 N	103° 19' 3.709 W
18,103.0	89.28	179.75	12,135.7	-6,279.9	23.9	387,618.02	814,636.81	32° 3' 41.787 N	103° 19' 3.728 W
18,197.0	87.70	176.34	12,138.2	-6,373.8	27.1	387,524.12	814,640.02	32° 3' 40.858 N	103° 19' 3.701 W
18,291.0	87.85	176.67	12,141.8	-6,467.5	32.8	387,430.37	814,645.74	32° 3' 39.930 N	103° 19' 3.645 W
18,387.0	88.39	178.00	12,145.0	-6,563.4	37.3	387,334.52	814,650.20	32° 3' 38.981 N	103° 19' 3.603 W
18,481.0	86.56	177.04	12,149.1	-6,657.2	41.4	387,240.71	814,654.27	32° 3' 38.052 N	103° 19' 3.566 W
18,576.0	88.62	178.55	12,153.1	-6,752.0	45.0	387,145.87	814,657.92	32° 3' 37.113 N	103° 19' 3.534 W
18,671.0	90.64	179.74	12,153.7	-6,847.0	46.4	387,050.89	814,659.33	32° 3' 36.173 N	103° 19' 3.528 W
18,766.0	88.76	178.05	12,154.2	-6,942.0	48.3	386,955.92	814,661.17	32° 3' 35.233 N	103° 19' 3.517 W
18,861.0	86.97	179.30	12,157.7	-7,036.9	50.5	386,861.01	814,663.36	32° 3' 34.294 N	103° 19' 3.502 W
18,956.0	88.65	181.98	12,161.4	-7,131.8	49.4	386,766.10	814,662.30	32° 3' 33.355 N	103° 19' 3.525 W
19,052.0	88.73	183.44	12,163.6	-7,227.7	44.9	386,670.24	814,657.76	32° 3' 32.407 N	103° 19' 3.588 W
19,148.0	88.84	182.98	12,165.6	-7,323.5	39.5	386,574.41	814,652.39	32° 3' 31.459 N	103° 19' 3.661 W
19,243.0	88.48	183.00	12,167.8	-7,418.3	34.5	386,479.56	814,647.43	32° 3' 30.521 N	103° 19' 3.729 W
19,285.0	89.41	183.96	12,168.6	-7,460.2	32.0	386,437.65	814,644.89	32° 3' 30.107 N	103° 19' 3.763 W
19,335.0	89.41	183.96	12,169.1	-7,510.1	28.5	386,387.77	814,641.43	32° 3' 29.613 N	103° 19' 3.809 W

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well USHANKA FED COM #23H
Project:	LEA COUNTY, NM	TVD Reference:	RKB=26+3036 @ 3062.0usft (MCVAY 8)
Site:	BULLDOG	MD Reference:	RKB=26+3036 @ 3062.0usft (MCVAY 8)
Well:	USHANKA FED COM #23H	North Reference:	Grid
Wellbore:	OWB - ST01	Survey Calculation Method:	Minimum Curvature
Design:	ACTUAL WELLPATH - ST01	Database:	EDM_Users

Checked By: _____ Approved By: _____ Date: _____