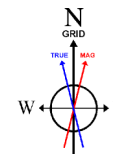
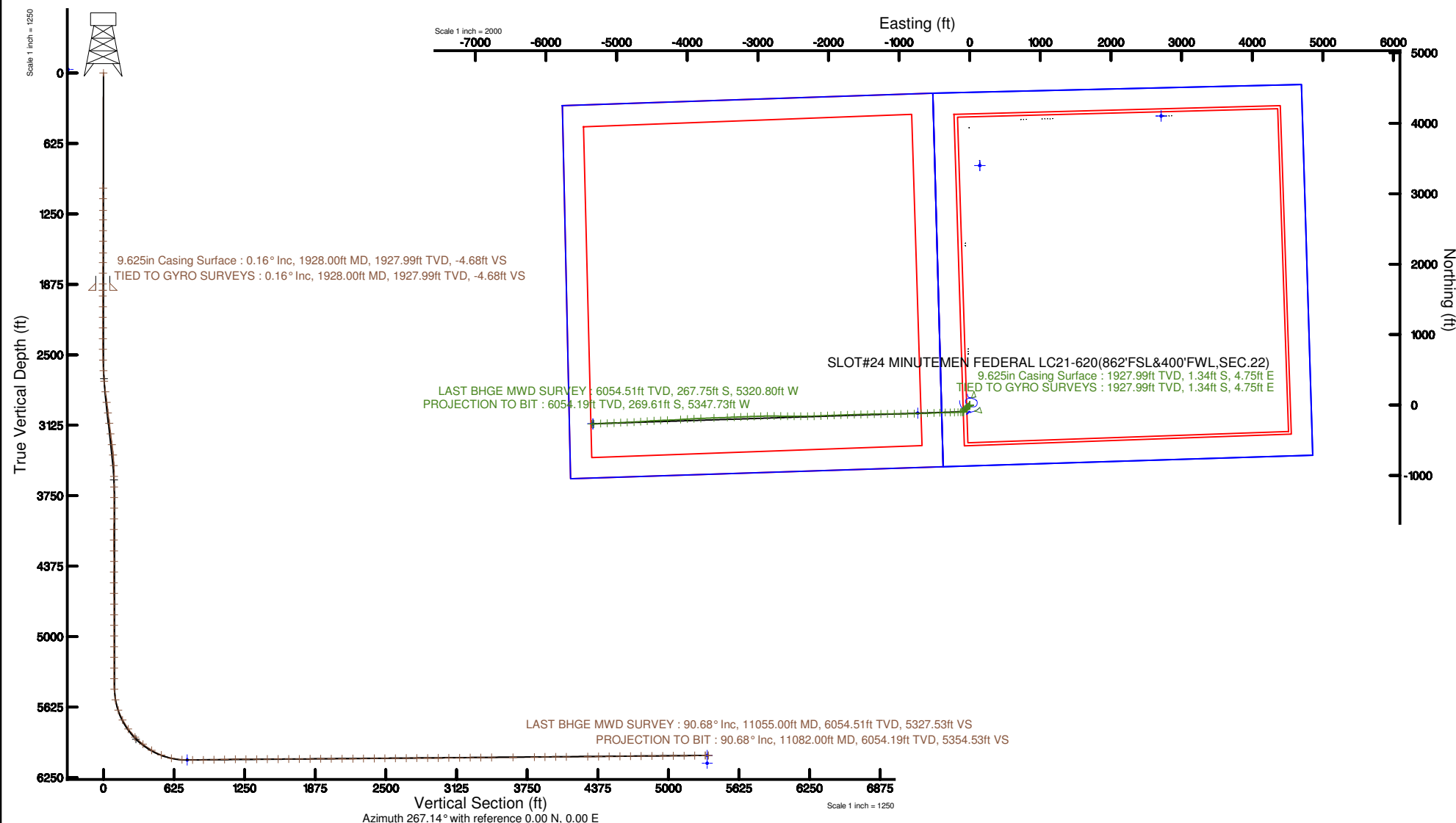


Location:	COLORADO	Slot:	SLOT#24 MINUTEMEN FEDERAL LC21-620(862'FSL&400'FWL,SEC.22)
Field:	WELD COUNTY (NOBLE NAD 83 GRID)	Well:	MINUTEMEN FEDERAL LC21-620
Facility:	SEC.22-T09N-R59W	Wellbore:	MINUTEMEN FEDERAL LC21-620 PWB



BGGM (1900.0 to 2019.0) Dip: 67.26° Field: 52666.9 nT  
Magnetic North is 7.94 degrees East of True North (at 6/28/2017)  
Grid North is 0.99 degrees East of True North  
To correct azimuth from True to Grid subtract 0.99 degrees  
To correct azimuth from Magnetic to Grid add 6.95 degrees

For reference values see MINIMUM FEDERAL LCL1-450 (REV 03) & Part 2		Dist System (MSD): Lambert Colorado 97, Northern Zone (2011), US web	
True vertical depths are referenced to NAP FGS (2016) (FWS)		1 = Wadsworth was transformed from a different geoidic datum	
Measured depths are referenced to NAP FGS (2016) (FWS)		North Reference: MAG north	
NAP FGS (2016) (FWS) is Mean Sea Level: 4007 feet		Scale: True distance	
Mean Sea Level is Ground level (At Sea) SLUTZMAN MINUTEMEN FEDERAL LCL1-450 (REV 03) & PART 2 (SEC 05)		Depth are in feet	
Coordinates are in feet referenced to Slat		Created by: copyright on 2017-09-20	
		Database: Glimmer	
Location Information			
Facility Name			
SEC 05 Transmitter			
Box	Local # (ft)	Local # (ft)	Local # (ft)
SLUTZMAN MINUTEMEN FEDERAL LCL1-450 (REV 03) & PART 2 (SEC 05)	4106-07	4706-08	360455.020
Dist East (US ft)	Dist North (US ft)	Latitude	Longitude
360455.020	110388.48	41°02'02.44"N	107°17'04.25"W
NAP FGS (2016) (FWS) is Ground level in Sea SLUTZMAN MINUTEMEN FEDERAL LCL1-450 (REV 03) & PART 2 (SEC 05)			
Mean Sea Level is Ground level in Sea SLUTZMAN MINUTEMEN FEDERAL LCL1-450 (REV 03) & PART 2 (SEC 05)			
MSL SEC 05 (FWS) is Mean Sea level			



## REFERENCE WELLPATH IDENTIFICATION

Operator	NOBLE ENERGY, INC	Slot	SLOT#24 MINUTEMEN FEDERAL LC21-620(862'FSL&400'FWL,SEC.22)
Area	COLORADO	Well	MINUTEMEN FEDERAL LC21-620
Field	WELD COUNTY (NOBLE NAD 83 GRID)	Wellbore	MINUTEMEN FEDERAL LC21-620 AWP
Facility	SEC.22-T09N-R59W		

## REPORT SETUP INFORMATION

Projection System	NAD83 / Lambert Colorado SP, Northern Zone (501), US feet	Software System	WellArchitect® 5.0
North Reference	Grid	User	Cantryat
Scale	0.999992	Report Generated	9/20/2017 at 10:18:59 AM
Convergence at slot	0.99° East	Database/Source file	Denver/MINUTEMEN_FEDERAL_LC21-620_AWP.xml

## WELLPATH LOCATION

	Local coordinates		Grid coordinates		Geographic coordinates	
	North[ft]	East[ft]	Easting[US ft]	Northing[US ft]	Latitude	Longitude
Slot Location	-4102.47	-2709.09	3423452.38	1512883.49	40°43'52.464"N	103°58'19.344"W
Facility Reference Pt			3426161.44	1516985.93	40°44'32.532"N	103°57'43.236"W
Field Reference Pt			3000000.00	4454105.15	48°46'34.315"N	105°30'00.000"W

## WELLPATH DATUM

Calculation method	Minimum curvature	H&P RIG (30'KB) (RKB) to Facility Vertical Datum	4907.00ft
Horizontal Reference Pt	Slot	H&P RIG (30'KB) (RKB) to Mean Sea Level	4907.00ft
Vertical Reference Pt	H&P RIG (30'KB) (RKB)	H&P RIG (30'KB) (RKB) to Ground Level at Slot (SLOT#24 MINUTEMEN FEDERAL LC21-620 (862'FSL&400'FWL,SEC.22))	4907.00ft
MD Reference Pt	H&P RIG (30'KB) (RKB)	Section Origin	N 0.00, E 0.00 ft
Field Vertical Reference	Mean Sea Level	Section Azimuth	267.14°

### REFERENCE WELLPATH IDENTIFICATION

Operator	NOBLE ENERGY, INC	Slot	SLOT#24 MINUTEMEN FEDERAL LC21-620(862'FSL&400'FWL,SEC.22)
Area	COLORADO	Well	MINUTEMEN FEDERAL LC21-620
Field	WELD COUNTY (NOBLE NAD 83 GRID)	Wellbore	MINUTEMEN FEDERAL LC21-620 AWB
Facility	SEC.22-T09N-R59W		

### WELLPATH DATA (107 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	DLS [°/100ft]	Comments
0.00	0.000	95.600	0.00	0.00	0.00	0.00	0.00	
1021.00	0.270	95.600	1021.00	-2.38	-0.23	2.39	0.03	
1115.00	0.330	105.810	1114.99	-2.86	-0.33	2.88	0.09	
1218.00	0.330	132.710	1217.99	-3.34	-0.61	3.38	0.15	
1303.00	0.350	197.240	1302.99	-3.43	-1.03	3.48	0.43	
1398.00	0.020	63.180	1397.99	-3.34	-1.30	3.41	0.38	
1492.00	0.140	135.950	1491.99	-3.43	-1.37	3.50	0.14	
1597.00	0.180	82.410	1596.99	-3.68	-1.44	3.76	0.14	
1681.00	0.410	107.240	1680.99	-4.09	-1.51	4.18	0.31	
1776.00	0.150	19.580	1775.99	-4.46	-1.50	4.54	0.45	
1871.00	0.070	67.980	1870.99	-4.56	-1.36	4.64	0.12	
1928.00	0.160	87.980	1927.99	-4.68	-1.34	4.75	0.17	TIED TO GYRO SURVEYS
1978.00	0.190	286.410	1977.99	-4.67	-1.32	4.74	0.69	
2073.00	0.070	352.000	2072.99	-4.51	-1.21	4.58	0.18	
2167.00	0.330	155.190	2166.99	-4.61	-1.40	4.69	0.42	
2262.00	0.410	312.320	2261.99	-4.47	-1.42	4.55	0.76	
2356.00	0.230	125.790	2355.99	-4.38	-1.31	4.45	0.68	
2451.00	0.180	232.290	2450.99	-4.41	-1.51	4.49	0.35	
2546.00	2.010	219.560	2545.96	-3.16	-2.88	3.31	1.93	
2640.00	4.220	226.820	2639.82	0.59	-6.52	-0.26	2.38	
2734.00	5.870	232.810	2733.45	7.19	-11.80	-6.61	1.84	
2829.00	8.200	239.770	2827.73	17.22	-18.14	-16.34	2.61	
2924.00	8.220	237.490	2921.76	29.14	-25.20	-27.92	0.34	
3018.00	8.170	234.510	3014.80	40.61	-32.69	-39.02	0.45	
3112.00	8.170	236.120	3107.85	51.95	-40.29	-50.01	0.24	
3207.00	8.100	235.250	3201.89	63.42	-47.87	-61.11	0.15	
3302.00	8.260	235.130	3295.92	74.89	-55.59	-72.21	0.17	
3396.00	8.450	220.910	3388.94	85.39	-64.67	-82.27	2.20	
3491.00	6.980	196.160	3483.10	92.10	-75.49	-88.45	3.79	
3586.00	5.040	185.250	3577.58	94.57	-85.19	-90.44	2.36	

REFERENCE WELLPATH IDENTIFICATION			
Operator	NOBLE ENERGY, INC	Slot	SLOT#24 MINUTEMEN FEDERAL LC21-620(862'FSL&400'FWL,SEC.22)
Area	COLORADO	Well	MINUTEMEN FEDERAL LC21-620
Field	WELD COUNTY (NOBLE NAD 83 GRID)	Wellbore	MINUTEMEN FEDERAL LC21-620 AWB
Facility	SEC.22-T09N-R59W		

WELLPATH DATA (107 stations)								
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	DLS [°/100ft]	Comments
3680.00	3.120	178.940	3671.33	95.24	-91.86	-90.77	2.09	
3774.00	2.740	173.530	3765.21	95.18	-96.65	-90.47	0.50	
3869.00	0.760	95.720	3860.17	94.41	-98.97	-89.59	2.83	
3964.00	0.480	159.870	3955.17	93.67	-99.41	-88.82	0.74	
4058.00	0.520	97.740	4049.16	93.13	-99.84	-88.27	0.55	
4153.00	0.000	96.740	4144.16	92.71	-99.89	-87.84	0.55	
4248.00	0.780	262.590	4239.16	93.35	-99.98	-88.48	0.82	
4342.00	0.040	46.980	4333.16	93.97	-100.04	-89.09	0.86	
4436.00	0.720	66.670	4427.15	93.39	-99.78	-88.52	0.73	
4531.00	0.170	322.350	4522.15	92.91	-99.43	-88.06	0.82	
4626.00	0.580	230.150	4617.15	93.37	-99.63	-88.52	0.64	
4720.00	0.260	253.950	4711.15	93.96	-99.99	-89.09	0.38	
4814.00	0.040	224.770	4805.15	94.19	-100.08	-89.32	0.24	
4909.00	0.110	162.230	4900.15	94.19	-100.19	-89.31	0.10	
5003.00	0.090	185.110	4994.15	94.18	-100.35	-89.29	0.05	
5098.00	0.100	199.480	5089.15	94.22	-100.50	-89.32	0.03	
5193.00	0.000	96.740	5184.15	94.25	-100.58	-89.35	0.11	
5287.00	0.060	65.290	5278.15	94.21	-100.56	-89.31	0.06	
5382.00	0.550	30.000	5373.14	93.91	-100.14	-89.03	0.53	
5476.00	3.110	262.030	5467.10	96.21	-100.10	-91.33	3.70	
5571.00	10.720	270.220	5561.34	107.62	-100.43	-102.74	8.06	
5666.00	19.280	267.930	5653.02	132.17	-100.96	-127.29	9.03	
5760.00	27.680	267.630	5739.16	169.58	-102.43	-164.68	8.94	
5855.00	36.170	268.800	5819.72	219.76	-103.93	-214.85	8.96	
5949.00	44.650	269.050	5891.23	280.61	-105.06	-275.72	9.02	
6044.00	51.150	268.860	5954.88	351.03	-106.35	-346.16	6.84	
6138.00	59.150	267.670	6008.56	428.09	-108.72	-423.20	8.57	
6232.00	67.720	267.070	6050.55	512.09	-112.59	-507.11	9.13	
6327.00	76.960	267.660	6079.34	602.51	-116.74	-597.44	9.74	
6421.00	86.980	268.230	6092.46	695.46	-120.07	-690.34	10.68	

REFERENCE WELLPATH IDENTIFICATION			
Operator	NOBLE ENERGY, INC	Slot	SLOT#24 MINUTEMEN FEDERAL LC21-620(862'FSL&400'FWL,SEC.22)
Area	COLORADO	Well	MINUTEMEN FEDERAL LC21-620
Field	WELD COUNTY (NOBLE NAD 83 GRID)	Wellbore	MINUTEMEN FEDERAL LC21-620 AWB
Facility	SEC.22-T09N-R59W		

WELLPATH DATA (107 stations)								
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	DLS [°/100ft]	Comments
6516.00	90.520	269.110	6094.53	790.39	-122.27	-785.27	3.84	
6610.00	90.800	269.210	6093.45	884.32	-123.65	-879.25	0.32	
6705.00	91.320	269.650	6091.69	979.23	-124.59	-974.23	0.72	
6799.00	90.830	269.290	6089.93	1073.14	-125.46	-1068.21	0.65	
6894.00	91.170	269.780	6088.27	1168.04	-126.23	-1163.19	0.63	
6988.00	89.910	269.040	6087.38	1261.96	-127.20	-1257.18	1.55	
7083.00	90.250	268.540	6087.25	1356.92	-129.21	-1352.16	0.64	
7177.00	90.310	268.930	6086.79	1450.88	-131.28	-1446.14	0.42	
7272.00	90.120	268.340	6086.43	1545.85	-133.55	-1541.11	0.65	
7366.00	90.550	268.010	6085.88	1639.83	-136.54	-1635.06	0.58	
7461.00	90.180	267.940	6085.28	1734.82	-139.90	-1730.00	0.40	
7556.00	90.370	268.220	6084.82	1829.81	-143.08	-1824.94	0.36	
7650.00	90.370	268.220	6084.22	1923.79	-146.00	-1918.90	0.00	
7744.00	89.820	267.370	6084.06	2017.78	-149.62	-2012.82	1.08	
7839.00	90.580	267.620	6083.73	2112.78	-153.77	-2107.73	0.84	
7934.00	90.800	268.300	6082.58	2207.76	-157.15	-2202.66	0.75	
8028.00	90.890	269.310	6081.20	2301.71	-159.11	-2296.63	1.08	
8123.00	90.310	269.690	6080.20	2396.62	-159.94	-2391.62	0.73	
8217.00	90.430	270.060	6079.60	2490.51	-160.14	-2485.62	0.41	
8312.00	90.310	270.730	6078.98	2585.36	-159.49	-2580.62	0.72	
8407.00	90.340	271.290	6078.44	2680.14	-157.81	-2675.60	0.59	
8501.00	90.400	270.550	6077.84	2773.93	-156.30	-2769.58	0.79	
8596.00	90.400	269.190	6077.17	2868.82	-156.52	-2864.58	1.43	
8690.00	90.400	268.080	6076.52	2962.78	-158.76	-2958.55	1.18	
8785.00	90.580	267.960	6075.70	3057.77	-162.04	-3053.49	0.23	
8879.00	90.580	268.190	6074.75	3151.75	-165.20	-3147.43	0.24	
8974.00	90.620	267.790	6073.76	3246.74	-168.53	-3242.37	0.42	
9068.00	90.430	267.590	6072.90	3340.73	-172.32	-3336.29	0.29	
9163.00	90.490	267.740	6072.13	3435.72	-176.19	-3431.20	0.17	
9352.00	90.620	268.200	6070.30	3624.69	-182.88	-3620.08	0.25	

## REFERENCE WELLPATH IDENTIFICATION

Operator	NOBLE ENERGY, INC	Slot	SLOT#24 MINUTEMEN FEDERAL LC21-620(862'FSL&400'FWL,SEC.22)
Area	COLORADO	Well	MINUTEMEN FEDERAL LC21-620
Field	WELD COUNTY (NOBLE NAD 83 GRID)	Wellbore	MINUTEMEN FEDERAL LC21-620 AWB
Facility	SEC.22-T09N-R59W		

## WELLPATH DATA (107 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	DLS [°/100ft]	Comments
9541.00	90.550	267.330	6068.37	3813.67	-190.25	-3808.92	0.46	
9636.00	90.150	267.350	6067.79	3908.67	-194.66	-3903.82	0.42	
9730.00	90.520	266.610	6067.24	4002.66	-199.62	-3997.68	0.88	
9825.00	90.580	266.030	6066.33	4097.65	-205.71	-4092.48	0.61	
10014.00	90.580	268.390	6064.42	4286.63	-214.91	-4281.24	1.25	
10109.00	90.520	267.010	6063.51	4381.62	-218.72	-4376.15	1.45	
10203.00	90.650	266.670	6062.55	4475.61	-223.91	-4470.01	0.39	
10298.00	90.580	266.350	6061.53	4570.60	-229.69	-4564.82	0.34	
10392.00	90.520	266.380	6060.62	4664.58	-235.65	-4658.63	0.07	
10487.00	90.620	266.760	6059.68	4759.58	-241.33	-4753.45	0.41	
10582.00	90.430	267.530	6058.81	4854.57	-246.06	-4848.33	0.83	
10677.00	90.460	267.450	6058.07	4949.57	-250.22	-4943.24	0.09	
10771.00	90.550	267.670	6057.24	5043.56	-254.22	-5037.15	0.25	
10866.00	90.490	267.850	6056.38	5138.55	-257.94	-5132.07	0.20	
10960.00	90.550	267.110	6055.53	5232.54	-262.07	-5225.98	0.79	
11055.00	90.680	266.040	6054.51	5327.53	-267.75	-5320.80	1.13	LAST BHGE MWD SURVEY
11082.00	90.680	266.040	6054.19	5354.53	-269.61	-5347.73	0.00	PROJECTION TO BIT

## HOLE & CASING SECTIONS - Ref Wellbore: MINUTEMEN FEDERAL LC21-620 AWB

## Ref Wellpath: MINUTEMEN FEDERAL LC21-620 AWP

String/Diameter	Start MD [ft]	End MD [ft]	Interval [ft]	Start TVD [ft]	End TVD [ft]	Start N/S [ft]	Start E/W [ft]	End N/S [ft]	End E/W [ft]
13.5in Open Hole	30.00	1928.00	1898.00	30.00	1927.99	0.00	0.00	-1.34	4.75
9.625in Casing Surface	30.00	1928.00	1898.00	30.00	1927.99	0.00	0.00	-1.34	4.75
8.5in Open Hole	1928.00	11082.00	9154.00	1927.99	6054.19	-1.34	4.75	-269.61	-5347.73

REFERENCE WELLPATH IDENTIFICATION			
Operator	NOBLE ENERGY, INC	Slot	SLOT#24 MINUTEMEN FEDERAL LC21-620(862'FSL&400'FWL,SEC.22)
Area	COLORADO	Well	MINUTEMEN FEDERAL LC21-620
Field	WELD COUNTY (NOBLE NAD 83 GRID)	Wellbore	MINUTEMEN FEDERAL LC21-620 AWB
Facility	SEC.22-T09N-R59W		

TARGETS								
Name	TVD [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Shape
MAGPUL FEDERAL LC21-670 SECTION 21	-31.00	3398.57	143.76	3423596.13	1516282.03	40°44'26.016"N	103°58'16.716"W	polygon
DUKES FEDERAL LC10-745 SECTION 22	-17.00	4102.48	2709.09	3426161.44	1516985.93	40°44'32.532"N	103°57'43.236"W	polygon
MINUTEMEN FEDERAL LC21-620 REV-2 BHL (770'FSL&330'FWL,SEC.21)	6053.80	-266.30	-5336.97	3418115.46	1512617.20	40°43'50.736"N	103°59'28.716"W	point
MINUTEMEN FEDERAL LC21-620 LANDING POINT (770'FSL&330'FEL,SEC.21)	6094.00	-115.80	-736.30	3422716.08	1512767.69	40°43'51.445"N	103°58'28.932"W	point
MINUTEMEN FEDERAL LC21-620 REV-1 BHL (770'FSL&330'FWL,SEC.21)	6123.00	-266.30	-5336.97	3418115.46	1512617.20	40°43'50.736"N	103°59'28.716"W	point
MAGPUL FEDERAL LC21-670 SECTION 21 HARDLINE (300'SETBACK)	6369.00	3398.57	143.76	3423596.13	1516282.03	40°44'26.016"N	103°58'16.716"W	polygon
DUKES FEDERAL LC10-745 SECTION 22 300' SETBACK	6483.00	4102.48	2709.09	3426161.44	1516985.93	40°44'32.532"N	103°57'43.236"W	polygon

WELLPATH COMPOSITION - Ref Wellbore: MINUTEMEN FEDERAL LC21-620 AWB					Ref Wellpath: MINUTEMEN FEDERAL LC21-620 AWP	
Start MD [ft]	End MD [ft]	Positional Uncertainty Model	Log Name/Comment		Wellbore	
0.00	1928.00	Gyrodata standard - Drop gyro or Multi-shot	3rd PARTY Surface Gyros <1021'-1928'>		MINUTEMEN FEDERAL LC21-620 AWB	
1928.00	11055.00	OWSG MWD rev2 + IFR1 + Sag + Multi-Station Correction	BHI/ATC OWSG MWD rev2+IFR1+MSA 8.5" Hole<1978'-11055'>		MINUTEMEN FEDERAL LC21-620 AWB	
11055.00	11082.00	Blind Drilling (std)	Projection to bit		MINUTEMEN FEDERAL LC21-620 AWB	

REFERENCE WELLPATH IDENTIFICATION			
Operator	NOBLE ENERGY, INC	Slot	SLOT#24 MINUTEMEN FEDERAL LC21-620(862'FSL&400'FWL,SEC.22)
Area	COLORADO	Well	MINUTEMEN FEDERAL LC21-620
Field	WELD COUNTY (NOBLE NAD 83 GRID)	Wellbore	MINUTEMEN FEDERAL LC21-620 AWB
Facility	SEC.22-T09N-R59W		

WELLPATH COMMENTS				
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Comment
1928.00	0.160	87.980	1927.99	TIED TO GYRO SURVEYS
11055.00	90.680	266.040	6054.51	LAST BHGE MWD SURVEY
11082.00	90.680	266.040	6054.19	PROJECTION TO BIT

COMMENTS	
<b>Wellpath general comments</b> SURFACE LOCATION: SWSW 40.7312N 103.97204W API #: 05-123-42789	