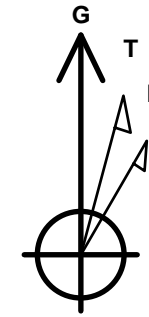


Company: NAG - MASTER
 Project: SAN JUAN NORTH - BP
 Site: SEC 10 - T33N - R08W
 Well: FORD H3
 Wellbore: OH
 Design: Plan #1 - 8/11/2015

PROJECT DETAILS: SAN JUAN NORTH - BP

Geodetic System: US State Plane 1983
 Datum: North American Datum 1983
 Ellipsoid: GRS 1980
 Zone: Colorado Southern Zone
 System Datum: Mean Sea Level
 Local North: Grid



Azimuths to Grid North
 True North: 1.35°
 Magnetic North: 10.87°

Magnetic Field
 Strength: 50423.2snT
 Dip Angle: 63.71°
 Date: 8/11/2015
 Model: BGGM2014

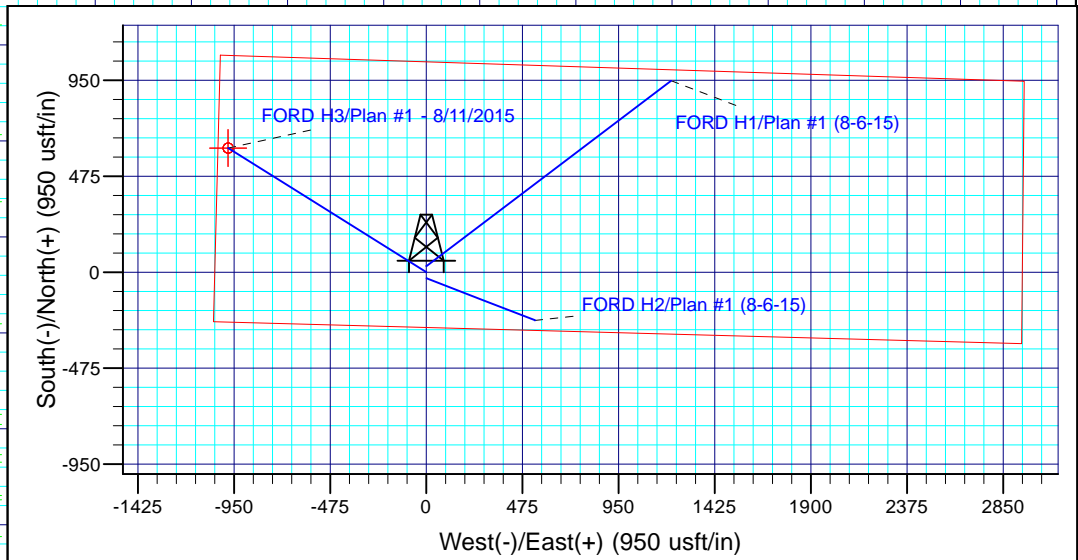
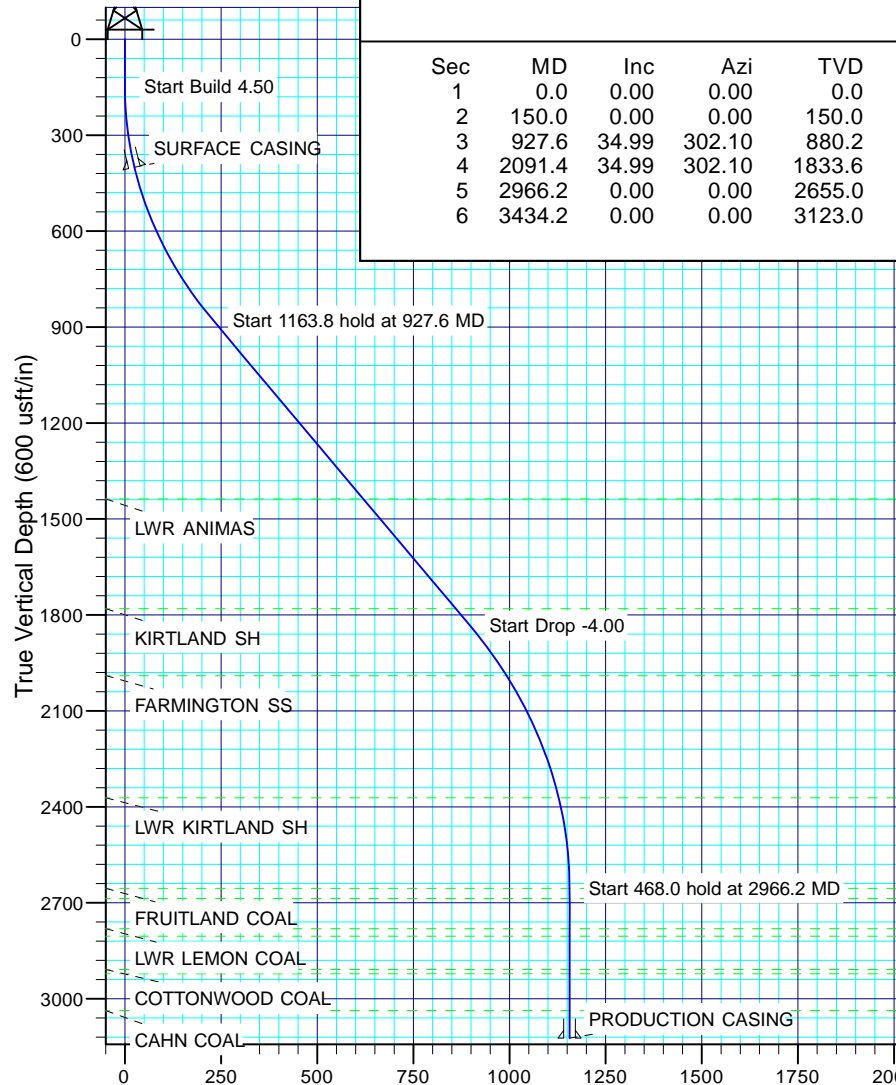
WELL DETAILS: FORD H3

Ground Level: 6701.3
 +N/-S 0.0 +E/-W 0.0 Northing 1173110.32 Easting 2356283.29 Latitude 37° 7' 16.285 N Longitude 107° 42' 28.546 W

Created By: Ashley Henderson Troutman
 Date: 12:47, August 11 2015

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	150.0	0.00	0.00	150.0	0.0	0.0	0.00	0.00	0.0	
3	927.6	34.99	302.10	880.2	122.3	-195.0	4.50	302.10	230.1	
4	2091.4	34.99	302.10	1833.6	476.9	-760.3	0.00	0.00	897.5	
5	2966.2	0.00	0.00	2655.0	614.5	-979.7	4.00	180.00	1156.4	FORD H3 - BTV
6	3434.2	0.00	0.00	3123.0	614.5	-979.7	0.00	0.00	1156.4	FORD H3 - PBHL



Vertical Section at 302.10° (500 usft/in)

NAG - MASTER

SAN JUAN NORTH - BP

SEC 10 - T33N - R08W

FORD H3

OH

Plan: Plan #1 - 8/11/2015

Survey Report - Geographic

11 August, 2015

Survey Report - Geographic

Company:	NAG - MASTER	Local Co-ordinate Reference:	Well FORD H3
Project:	SAN JUAN NORTH - BP	TVD Reference:	RIG @ 6712.3usft (RIG 507)
Site:	SEC 10 - T33N - R08W	MD Reference:	RIG @ 6712.3usft (RIG 507)
Well:	FORD H3	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Plan #1 - 8/11/2015	Database:	EDM R5K - NAG PROD - NAGP1

Project	SAN JUAN NORTH - BP, LA PLATA & ARCHULETA COUNTIES		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		Using Well Reference Point
Map Zone:	Colorado Southern Zone		

Site	SEC 10 - T33N - R08W		
Site Position:		Northing:	1,173,140.32 usft
From:	Map	Easting:	2,356,283.14 usft
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16"
		Latitude:	37° 7' 16.582 N
		Longitude:	107° 42' 28.557 W
		Grid Convergence:	-1.35 °

Well	FORD H3	API No.	
Well Position	+N/-S	0.0 usft	Northing: 1,173,110.32 usft
	+E/-W	0.0 usft	Easting: 2,356,283.29 usft
Position Uncertainty	0.0 usft	Wellhead Elevation:	usft
		Latitude:	37° 7' 16.285 N
		Longitude:	107° 42' 28.546 W
		Ground Level:	6,701.3 usft

Wellbore	OH	API no.			
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2014	8/11/2015	9.52	63.71	50,423

Design	Plan #1 - 8/11/2015				
Audit Notes:					
Version:		Phase:	PROTOTYPE	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.0	0.0	0.0	302.10	

Survey Tool Program	Date: 8/11/2015				
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
0.0	450.0	Plan #1 - 8/11/2015 (OH)	MWD	MWD - Standard	
450.0	3,434.2	Plan #1 - 8/11/2015 (OH)	MWD	MWD - Standard	

Survey Report - Geographic

Company:	NAG - MASTER	Local Co-ordinate Reference:	Well FORD H3
Project:	SAN JUAN NORTH - BP	TVD Reference:	RIG @ 6712.3usft (RIG 507)
Site:	SEC 10 - T33N - R08W	MD Reference:	RIG @ 6712.3usft (RIG 507)
Well:	FORD H3	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Plan #1 - 8/11/2015	Database:	EDM R5K - NAG PROD - NAGP1

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
0.0	0.00	0.00	0.0	0.0	0.0	1,173,110.32	2,356,283.29	37° 7' 16.285 N	107° 42' 28.546 W
100.0	0.00	0.00	100.0	0.0	0.0	1,173,110.32	2,356,283.29	37° 7' 16.285 N	107° 42' 28.546 W
150.0	0.00	0.00	150.0	0.0	0.0	1,173,110.32	2,356,283.29	37° 7' 16.285 N	107° 42' 28.546 W
200.0	2.25	302.10	200.0	0.5	-0.8	1,173,110.84	2,356,282.46	37° 7' 16.290 N	107° 42' 28.557 W
300.0	6.75	302.10	299.7	4.7	-7.5	1,173,115.01	2,356,275.82	37° 7' 16.330 N	107° 42' 28.640 W
400.0	11.25	302.10	398.4	13.0	-20.7	1,173,123.32	2,356,262.57	37° 7' 16.409 N	107° 42' 28.806 W
401.6	11.32	302.10	400.0	13.2	-21.0	1,173,123.49	2,356,262.30	37° 7' 16.411 N	107° 42' 28.809 W
SURFACE CASING									
500.0	15.75	302.10	495.6	25.4	-40.5	1,173,135.72	2,356,242.80	37° 7' 16.527 N	107° 42' 29.054 W
600.0	20.25	302.10	590.7	41.8	-66.7	1,173,152.13	2,356,216.63	37° 7' 16.683 N	107° 42' 29.381 W
700.0	24.75	302.10	683.1	62.1	-99.1	1,173,172.46	2,356,184.22	37° 7' 16.876 N	107° 42' 29.787 W
800.0	29.25	302.10	772.1	86.3	-137.5	1,173,196.57	2,356,145.77	37° 7' 17.106 N	107° 42' 30.269 W
900.0	33.75	302.10	857.4	114.0	-181.8	1,173,224.33	2,356,101.52	37° 7' 17.370 N	107° 42' 30.823 W
927.6	34.99	302.10	880.2	122.3	-195.0	1,173,232.60	2,356,088.33	37° 7' 17.448 N	107° 42' 30.989 W
1,000.0	34.99	302.10	939.5	144.3	-230.1	1,173,254.67	2,356,053.15	37° 7' 17.658 N	107° 42' 31.429 W
1,100.0	34.99	302.10	1,021.4	174.8	-278.7	1,173,285.13	2,356,004.57	37° 7' 17.948 N	107° 42' 32.038 W
1,200.0	34.99	302.10	1,103.3	205.3	-327.3	1,173,315.60	2,355,955.99	37° 7' 18.238 N	107° 42' 32.646 W
1,300.0	34.99	302.10	1,185.2	235.8	-375.9	1,173,346.07	2,355,907.41	37° 7' 18.528 N	107° 42' 33.255 W
1,400.0	34.99	302.10	1,267.2	266.2	-424.5	1,173,376.54	2,355,858.84	37° 7' 18.818 N	107° 42' 33.863 W
1,500.0	34.99	302.10	1,349.1	296.7	-473.0	1,173,407.01	2,355,810.26	37° 7' 19.107 N	107° 42' 34.472 W
1,600.0	34.99	302.10	1,431.0	327.2	-521.6	1,173,437.48	2,355,761.68	37° 7' 19.397 N	107° 42' 35.080 W
1,607.3	34.99	302.10	1,437.0	329.4	-525.2	1,173,439.70	2,355,758.13	37° 7' 19.418 N	107° 42' 35.125 W
LWR ANIMAS									
1,700.0	34.99	302.10	1,512.9	357.6	-570.2	1,173,467.95	2,355,713.10	37° 7' 19.687 N	107° 42' 35.689 W
1,800.0	34.99	302.10	1,594.9	388.1	-618.8	1,173,498.42	2,355,664.52	37° 7' 19.977 N	107° 42' 36.298 W
1,900.0	34.99	302.10	1,676.8	418.6	-667.4	1,173,528.89	2,355,615.94	37° 7' 20.267 N	107° 42' 36.906 W
2,000.0	34.99	302.10	1,758.7	449.0	-715.9	1,173,559.36	2,355,567.36	37° 7' 20.556 N	107° 42' 37.515 W
2,026.0	34.99	302.10	1,780.0	457.0	-728.5	1,173,567.27	2,355,554.74	37° 7' 20.632 N	107° 42' 37.673 W
KIRTLAND SH									
2,091.4	34.99	302.10	1,833.6	476.9	-760.3	1,173,587.21	2,355,522.95	37° 7' 20.821 N	107° 42' 38.071 W
2,100.0	34.65	302.10	1,840.7	479.5	-764.5	1,173,589.82	2,355,518.80	37° 7' 20.846 N	107° 42' 38.123 W
2,200.0	30.65	302.10	1,924.8	508.2	-810.2	1,173,618.48	2,355,473.11	37° 7' 21.119 N	107° 42' 38.695 W
2,274.6	27.66	302.10	1,990.0	527.5	-841.0	1,173,637.79	2,355,442.32	37° 7' 21.302 N	107° 42' 39.081 W
FARMINGTON SS									
2,300.0	26.65	302.10	2,012.6	533.6	-850.8	1,173,643.94	2,355,432.50	37° 7' 21.361 N	107° 42' 39.204 W
2,400.0	22.65	302.10	2,103.5	555.8	-886.1	1,173,666.10	2,355,397.18	37° 7' 21.572 N	107° 42' 39.646 W
2,500.0	18.65	302.10	2,197.0	574.5	-916.0	1,173,684.83	2,355,367.32	37° 7' 21.750 N	107° 42' 40.020 W
2,600.0	14.65	302.10	2,292.8	589.7	-940.2	1,173,700.05	2,355,343.05	37° 7' 21.894 N	107° 42' 40.324 W
2,681.3	11.39	302.10	2,372.0	599.5	-955.8	1,173,709.78	2,355,327.54	37° 7' 21.987 N	107° 42' 40.519 W
LWR KIRTLAND SH									
2,700.0	10.65	302.10	2,390.4	601.4	-958.8	1,173,711.68	2,355,324.51	37° 7' 22.005 N	107° 42' 40.557 W
2,800.0	6.65	302.10	2,489.2	609.3	-971.5	1,173,719.66	2,355,311.78	37° 7' 22.081 N	107° 42' 40.716 W
2,900.0	2.65	302.10	2,588.9	613.6	-978.4	1,173,723.97	2,355,304.91	37° 7' 22.122 N	107° 42' 40.802 W
2,966.2	0.00	0.00	2,655.0	614.5	-979.7	1,173,724.78	2,355,303.62	37° 7' 22.130 N	107° 42' 40.818 W
FRUITLAND COAL									
2,997.2	0.00	0.00	2,686.0	614.5	-979.7	1,173,724.78	2,355,303.62	37° 7' 22.130 N	107° 42' 40.818 W
LEMON COAL									
3,000.0	0.00	0.00	2,688.8	614.5	-979.7	1,173,724.78	2,355,303.62	37° 7' 22.130 N	107° 42' 40.818 W
3,092.2	0.00	0.00	2,781.0	614.5	-979.7	1,173,724.78	2,355,303.62	37° 7' 22.130 N	107° 42' 40.818 W
LWR LEMON COAL									
3,100.0	0.00	0.00	2,788.8	614.5	-979.7	1,173,724.78	2,355,303.62	37° 7' 22.130 N	107° 42' 40.818 W
3,115.2	0.00	0.00	2,804.0	614.5	-979.7	1,173,724.78	2,355,303.62	37° 7' 22.130 N	107° 42' 40.818 W
IGNACIO COAL									
3,200.0	0.00	0.00	2,888.8	614.5	-979.7	1,173,724.78	2,355,303.62	37° 7' 22.130 N	107° 42' 40.818 W

Survey Report - Geographic

Company:	NAG - MASTER	Local Co-ordinate Reference:	Well FORD H3
Project:	SAN JUAN NORTH - BP	TVD Reference:	RIG @ 6712.3usft (RIG 507)
Site:	SEC 10 - T33N - R08W	MD Reference:	RIG @ 6712.3usft (RIG 507)
Well:	FORD H3	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Plan #1 - 8/11/2015	Database:	EDM R5K - NAG PROD - NAGP1

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
3,219.2	0.00	0.00	2,908.0	614.5	-979.7	1,173,724.78	2,355,303.62	37° 7' 22.130 N	107° 42' 40.818 W	
COTTONWOOD COAL										
3,233.2	0.00	0.00	2,922.0	614.5	-979.7	1,173,724.78	2,355,303.62	37° 7' 22.130 N	107° 42' 40.818 W	
PICTURED CLIFFS										
3,300.0	0.00	0.00	2,988.8	614.5	-979.7	1,173,724.78	2,355,303.62	37° 7' 22.130 N	107° 42' 40.818 W	
3,348.2	0.00	0.00	3,037.0	614.5	-979.7	1,173,724.78	2,355,303.62	37° 7' 22.130 N	107° 42' 40.818 W	
CAHN COAL										
3,400.0	0.00	0.00	3,088.8	614.5	-979.7	1,173,724.78	2,355,303.62	37° 7' 22.130 N	107° 42' 40.818 W	
3,434.2	0.00	0.00	3,123.0	614.5	-979.7	1,173,724.78	2,355,303.62	37° 7' 22.130 N	107° 42' 40.818 W	
PRODUCTION CASING										

Targets										
Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude	
FORD H3 - BTV - plan hits target center - Circle (radius 25.0)	0.00	360.00	2,655.0	614.5	-979.7	1,173,724.78	2,355,303.62	37° 7' 22.130 N	107° 42' 40.818 W	
FORD H3 - PBHL - plan hits target center - Circle (radius 25.0)	0.00	360.00	3,123.0	614.5	-979.7	1,173,724.78	2,355,303.62	37° 7' 22.130 N	107° 42' 40.818 W	

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")	
401.6	400.0	SURFACE CASING	8-5/8	12-1/4	
3,434.2	3,123.0	PRODUCTION CASING	5-1/2	7-7/8	

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
1,607.3	1,437.0	LWR ANIMAS				
2,026.0	1,780.0	KIRTLAND SH				
2,274.6	1,990.0	FARMINGTON SS				
2,681.3	2,372.0	LWR KIRTLAND SH				
2,966.2	2,655.0	FRUITLAND COAL				
2,997.2	2,686.0	LEMON COAL				
3,092.2	2,781.0	LWR LEMON COAL				
3,115.2	2,804.0	IGNACIO COAL				
3,219.2	2,908.0	COTTONWOOD COAL		0.00		
3,233.2	2,922.0	PICTURED CLIFFS		0.00		
3,348.2	3,037.0	CAHN COAL		0.00		

Checked By: _____	Approved By: _____	Date: _____
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