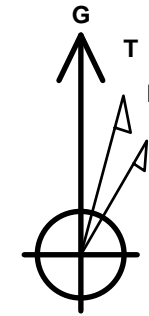


Company: NAG - MASTER
 Project: SAN JUAN NORTH - BP
 Site: SEC 09 - T32N - R06W
 Well: TUBBS 32-6-9 B 4
 Wellbore: 00
 Design: PL-vA.2 AHT-2/3/2015

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: 1.23°
 Magnetic North: 10.70°

Magnetic Field
 Strength: 50472.6snT
 Dip Angle: 63.69°
 Date: 1/25/2015
 Model: BGGM2014

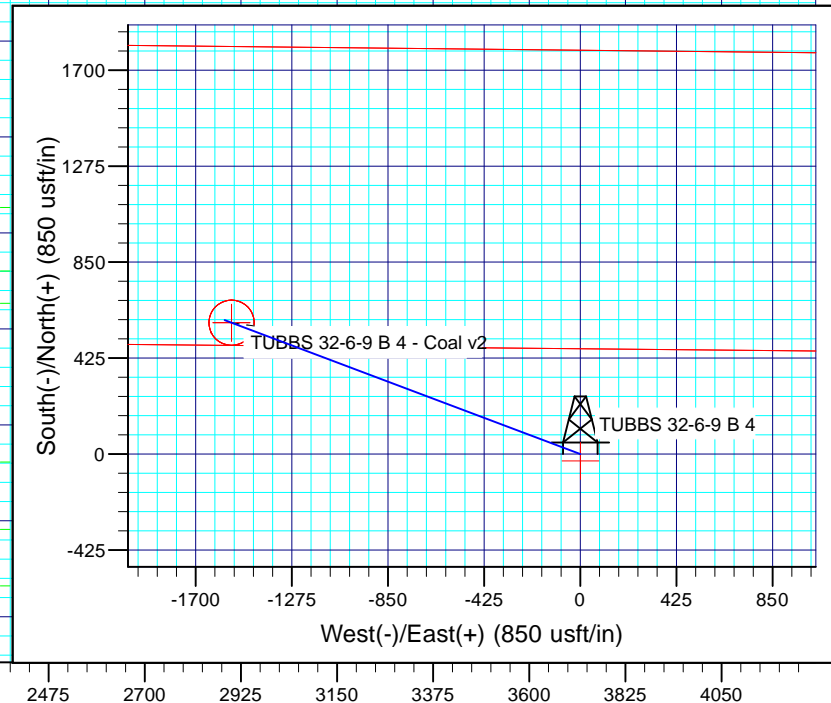
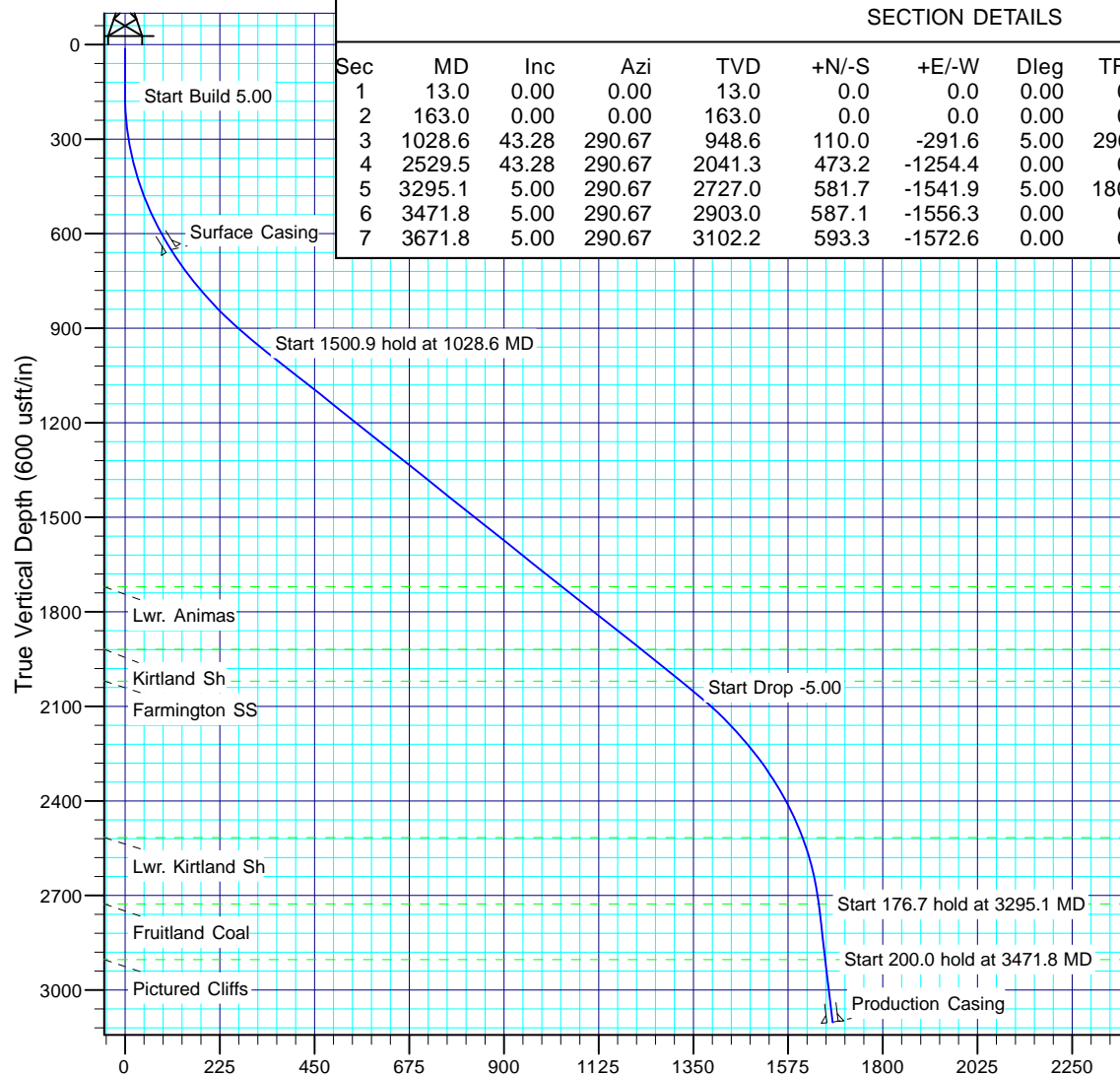
WELL DETAILS: TUBBS 32-6-9 B 4

Ground Level: 6349.9
 +N/-S 0.0 +E/-W 0.0 Northing 1139438.90 Easting 2414944.84 Latitude 37° 1' 56.537 N Longitude 107° 30' 15.514 W

Created By: Ashley Henderson Troutman
 Date: 14:51, February 03 2015

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Target
1	13.0	0.00	0.00	13.0	0.0	0.0	0.00	0.00	0.0	
2	163.0	0.00	0.00	163.0	0.0	0.0	0.00	0.00	0.0	
3	1028.6	43.28	290.67	948.6	110.0	-291.6	5.00	290.67	311.7	
4	2529.5	43.28	290.67	2041.3	473.2	-1254.4	0.00	0.00	1340.7	
5	3295.1	5.00	290.67	2727.0	581.7	-1541.9	5.00	180.00	1648.0	TUBBS 32-6-9 B 4 - Coal v2
6	3471.8	5.00	290.67	2903.0	587.1	-1556.3	0.00	0.00	1663.4	TUBBS 32-6-9 B 4 - PC v2
7	3671.8	5.00	290.67	3102.2	593.3	-1572.6	0.00	0.00	1680.8	



Vertical Section at 290.67° (450 usft/in)

NAG - MASTER

SAN JUAN NORTH - BP

SEC 09 - T32N - R06W

TUBBS 32-6-9 B 4

00

Plan: PL-vA.2 AHT-2/3/2015

Survey Report - Geographic

03 February, 2015

Survey Report - Geographic

Company:	NAG - MASTER	Local Co-ordinate Reference:	Well TUBBS 32-6-9 B 4
Project:	SAN JUAN NORTH - BP	TVD Reference:	RKB @ 6362.9usft (RIG 507)
Site:	SEC 09 - T32N - R06W	MD Reference:	RKB @ 6362.9usft (RIG 507)
Well:	TUBBS 32-6-9 B 4	North Reference:	Grid
Wellbore:	00	Survey Calculation Method:	Minimum Curvature
Design:	PL-vA.2 AHT-2/3/2015	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 09 - T32N - R06W		
Site Position:		Northing:	1,139,408.90 usft
From:	Map	Easting:	2,414,944.99 usft
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16"
		Latitude:	37° 1' 56.241 N
		Longitude:	107° 30' 15.504 W
		Grid Convergence:	-1.23 °

Well	TUBBS 32-6-9 B 4			API No.
Well Position	+N/-S	0.0 usft	Northing:	1,139,438.90 usft
	+E/-W	0.0 usft	Easting:	2,414,944.84 usft
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft
			Latitude:	37° 1' 56.537 N
			Longitude:	107° 30' 15.514 W
			Ground Level:	6,349.9 usft

Wellbore	00					API no.
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)	
	BGGM2014	1/25/2015	9.47	63.69	50,473	

Design	PL-vA.2 AHT-2/3/2015			
Audit Notes:				
Version:		Phase:	PROTOTYPE	Tie On Depth: 13.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	13.0	0.0	0.0	290.67

Survey Tool Program	Date: 2/3/2015			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
13.0	3,671.8	PL-vA.2 AHT-2/3/2015 (00)	MWD	MWD - Standard

Survey Report - Geographic

Company:	NAG - MASTER	Local Co-ordinate Reference:	Well TUBBS 32-6-9 B 4
Project:	SAN JUAN NORTH - BP	TVD Reference:	RKB @ 6362.9usft (RIG 507)
Site:	SEC 09 - T32N - R06W	MD Reference:	RKB @ 6362.9usft (RIG 507)
Well:	TUBBS 32-6-9 B 4	North Reference:	Grid
Wellbore:	00	Survey Calculation Method:	Minimum Curvature
Design:	PL-VA.2 AHT-2/3/2015	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	
13.0	0.00	0.00	13.0	0.0	0.0	1,139,438.90	2,414,944.84	37° 1' 56.537 N	107° 30' 15.514 W	
100.0	0.00	0.00	100.0	0.0	0.0	1,139,438.90	2,414,944.84	37° 1' 56.537 N	107° 30' 15.514 W	
163.0	0.00	0.00	163.0	0.0	0.0	1,139,438.90	2,414,944.84	37° 1' 56.537 N	107° 30' 15.514 W	
200.0	1.85	290.67	200.0	0.2	-0.6	1,139,439.11	2,414,944.28	37° 1' 56.539 N	107° 30' 15.521 W	
300.0	6.85	290.67	299.7	2.9	-7.7	1,139,441.79	2,414,937.19	37° 1' 56.564 N	107° 30' 15.609 W	
400.0	11.85	290.67	398.3	8.6	-22.8	1,139,447.52	2,414,921.99	37° 1' 56.618 N	107° 30' 15.798 W	
500.0	16.85	290.67	495.2	17.4	-46.0	1,139,456.27	2,414,898.81	37° 1' 56.699 N	107° 30' 16.086 W	
600.0	21.85	290.67	589.5	29.1	-77.0	1,139,467.96	2,414,867.82	37° 1' 56.808 N	107° 30' 16.471 W	
667.1	25.21	290.67	651.0	38.5	-102.1	1,139,477.41	2,414,842.76	37° 1' 56.896 N	107° 30' 16.782 W	
Surface Casing										
700.0	26.85	290.67	680.6	43.6	-115.6	1,139,482.51	2,414,829.25	37° 1' 56.944 N	107° 30' 16.950 W	
800.0	31.85	290.67	767.7	60.9	-161.4	1,139,499.80	2,414,783.41	37° 1' 57.105 N	107° 30' 17.520 W	
900.0	36.85	290.67	850.2	80.8	-214.2	1,139,519.71	2,414,730.63	37° 1' 57.291 N	107° 30' 18.176 W	
1,000.0	41.85	290.67	927.5	103.2	-273.5	1,139,542.09	2,414,671.33	37° 1' 57.499 N	107° 30' 18.913 W	
1,028.6	43.28	290.67	948.6	110.0	-291.6	1,139,548.92	2,414,653.22	37° 1' 57.563 N	107° 30' 19.138 W	
1,100.0	43.28	290.67	1,000.6	127.3	-337.4	1,139,566.19	2,414,607.43	37° 1' 57.724 N	107° 30' 19.707 W	
1,200.0	43.28	290.67	1,073.4	151.5	-401.6	1,139,590.39	2,414,543.28	37° 1' 57.949 N	107° 30' 20.505 W	
1,300.0	43.28	290.67	1,146.2	175.7	-465.7	1,139,614.59	2,414,479.14	37° 1' 58.175 N	107° 30' 21.302 W	
1,400.0	43.28	290.67	1,219.0	199.9	-529.8	1,139,638.79	2,414,414.99	37° 1' 58.401 N	107° 30' 22.099 W	
1,500.0	43.28	290.67	1,291.8	224.1	-594.0	1,139,662.99	2,414,350.85	37° 1' 58.626 N	107° 30' 22.896 W	
1,600.0	43.28	290.67	1,364.6	248.3	-658.1	1,139,687.19	2,414,286.71	37° 1' 58.852 N	107° 30' 23.694 W	
1,700.0	43.28	290.67	1,437.4	272.5	-722.3	1,139,711.39	2,414,222.56	37° 1' 59.077 N	107° 30' 24.491 W	
1,800.0	43.28	290.67	1,510.2	296.7	-786.4	1,139,735.59	2,414,158.42	37° 1' 59.303 N	107° 30' 25.288 W	
1,900.0	43.28	290.67	1,583.0	320.9	-850.6	1,139,759.79	2,414,094.27	37° 1' 59.529 N	107° 30' 26.086 W	
2,000.0	43.28	290.67	1,655.8	345.1	-914.7	1,139,783.99	2,414,030.13	37° 1' 59.754 N	107° 30' 26.883 W	
2,088.2	43.28	290.67	1,720.0	366.4	-971.3	1,139,805.33	2,413,973.55	37° 1' 59.953 N	107° 30' 27.586 W	
Lwr. Animas										
2,100.0	43.28	290.67	1,728.6	369.3	-978.9	1,139,808.18	2,413,965.98	37° 1' 59.980 N	107° 30' 27.680 W	
2,200.0	43.28	290.67	1,801.4	393.5	-1,043.0	1,139,832.38	2,413,901.84	37° 2' 0.205 N	107° 30' 28.477 W	
2,300.0	43.28	290.67	1,874.2	417.7	-1,107.1	1,139,856.58	2,413,837.70	37° 2' 0.431 N	107° 30' 29.275 W	
2,361.6	43.28	290.67	1,919.0	432.6	-1,146.6	1,139,871.48	2,413,798.21	37° 2' 0.570 N	107° 30' 29.765 W	
Kirtland Sh										
2,400.0	43.28	290.67	1,947.0	441.9	-1,171.3	1,139,880.78	2,413,773.55	37° 2' 0.656 N	107° 30' 30.072 W	
2,500.0	43.28	290.67	2,019.8	466.1	-1,235.4	1,139,904.98	2,413,709.41	37° 2' 0.882 N	107° 30' 30.869 W	
2,500.3	43.28	290.67	2,020.0	466.2	-1,235.6	1,139,905.05	2,413,709.22	37° 2' 0.883 N	107° 30' 30.872 W	
Farmington SS										
2,529.5	43.28	290.67	2,041.3	473.2	-1,254.4	1,139,912.12	2,413,690.48	37° 2' 0.949 N	107° 30' 31.104 W	
2,600.0	39.76	290.67	2,094.0	489.7	-1,298.1	1,139,928.61	2,413,646.77	37° 2' 1.102 N	107° 30' 31.648 W	
2,700.0	34.76	290.67	2,173.6	511.1	-1,354.7	1,139,949.97	2,413,590.15	37° 2' 1.301 N	107° 30' 32.352 W	
2,800.0	29.76	290.67	2,258.1	529.9	-1,404.6	1,139,968.81	2,413,540.23	37° 2' 1.477 N	107° 30' 32.972 W	
2,900.0	24.76	290.67	2,347.0	546.1	-1,447.4	1,139,984.97	2,413,497.39	37° 2' 1.628 N	107° 30' 33.504 W	
3,000.0	19.76	290.67	2,439.5	559.4	-1,482.9	1,139,998.33	2,413,461.97	37° 2' 1.752 N	107° 30' 33.945 W	
3,080.3	15.74	290.67	2,516.0	568.1	-1,505.8	1,140,006.97	2,413,439.07	37° 2' 1.833 N	107° 30' 34.229 W	
Lwr. Kirtland Sh										
3,100.0	14.76	290.67	2,535.0	569.9	-1,510.6	1,140,008.80	2,413,434.22	37° 2' 1.850 N	107° 30' 34.290 W	
3,200.0	9.76	290.67	2,632.7	577.4	-1,530.5	1,140,016.29	2,413,414.37	37° 2' 1.919 N	107° 30' 34.536 W	
3,295.1	5.00	290.67	2,727.0	581.7	-1,541.9	1,140,020.60	2,413,402.94	37° 2' 1.960 N	107° 30' 34.678 W	
Fruitland Coal										
3,300.0	5.00	290.67	2,731.9	581.9	-1,542.3	1,140,020.75	2,413,402.54	37° 2' 1.961 N	107° 30' 34.683 W	
3,400.0	5.00	290.67	2,831.5	584.9	-1,550.5	1,140,023.83	2,413,394.39	37° 2' 1.990 N	107° 30' 34.785 W	
3,471.8	5.00	290.67	2,903.0	587.1	-1,556.3	1,140,026.04	2,413,388.53	37° 2' 2.010 N	107° 30' 34.858 W	
Pictured Cliffs										
3,500.0	5.00	290.67	2,931.1	588.0	-1,558.6	1,140,026.90	2,413,386.23	37° 2' 2.018 N	107° 30' 34.886 W	
3,600.0	5.00	290.67	3,030.7	591.1	-1,566.8	1,140,029.98	2,413,378.08	37° 2' 2.047 N	107° 30' 34.987 W	

Survey Report - Geographic

Company:	NAG - MASTER	Local Co-ordinate Reference:	Well TUBBS 32-6-9 B 4
Project:	SAN JUAN NORTH - BP	TVD Reference:	RKB @ 6362.9usft (RIG 507)
Site:	SEC 09 - T32N - R06W	MD Reference:	RKB @ 6362.9usft (RIG 507)
Well:	TUBBS 32-6-9 B 4	North Reference:	Grid
Wellbore:	00	Survey Calculation Method:	Minimum Curvature
Design:	PL-VA.2 AHT-2/3/2015	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
3,671.6	5.00	290.67	3,102.0	593.3	-1,572.6	1,140,032.18	2,413,372.24	37° 2' 2.068 N	107° 30' 35.060 W
Production Casing									
3,671.8	5.00	290.67	3,102.2	593.3	-1,572.6	1,140,032.19	2,413,372.22	37° 2' 2.068 N	107° 30' 35.060 W

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
TUBBS 32-6-9 B 4 - PC - plan misses target center by 186.8usft at 3486.1usft MD (2917.3 TVD, 587.6 N, -1557.5 E) - Circle (radius 100.0)	0.00	360.00	2,903.0	561.6	-1,741.9	1,140,000.54	2,413,202.94	37° 2' 1.719 N	107° 30' 37.139 W
TUBBS 32-6-9 B 4 - PC - plan misses target center by 15.3usft at 3470.4usft MD (2901.7 TVD, 587.1 N, -1556.2 E) - Circle (radius 100.0)	0.00	360.00	2,903.0	581.7	-1,541.9	1,140,020.60	2,413,402.94	37° 2' 1.960 N	107° 30' 34.678 W
TUBBS 32-6-9 B 4 - Drill - plan misses target center by 32.7usft at 13.0usft MD (13.0 TVD, 0.0 N, 0.0 E) - Polygon	0.00	360.00	0.0	-30.0	0.2	1,139,408.90	2,414,944.99	37° 1' 56.241 N	107° 30' 15.504 W
NW Corner Drilling W			0.0	1,843.2	-2,353.1	1,141,252.10	2,412,591.89		
NE Corner Drilling W			0.0	1,801.5	1,607.4	1,141,210.40	2,416,552.39		
SE Corner Drilling W			0.0	482.4	1,587.2	1,139,891.30	2,416,532.19		
SW Corner Drilling W			0.0	519.0	-2,383.2	1,139,927.90	2,412,561.79		
TUBBS 32-6-9 B 4 - Coe - plan misses target center by 200.4usft at 3310.8usft MD (2742.6 TVD, 582.2 N, -1543.2 E) - Circle (radius 100.0)	0.00	360.00	2,727.0	561.6	-1,741.9	1,140,000.54	2,413,202.94	37° 2' 1.719 N	107° 30' 37.139 W
TUBBS 32-6-9 B 4 - Coe - plan hits target center - Circle (radius 100.0)	0.00	360.00	2,727.0	581.7	-1,541.9	1,140,020.60	2,413,402.94	37° 2' 1.960 N	107° 30' 34.678 W

Casing Points				
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
667.1	651.0	Surface Casing	8-5/8	12-1/4
3,671.6	3,102.0	Production Casing	5-1/2	7-7/8

Formations					
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,088.2	1,720.0	Lwr. Animas		0.00	
2,361.6	1,919.0	Kirtland Sh		0.00	
2,500.3	2,020.0	Farmington SS		0.00	
3,080.3	2,516.0	Lwr. Kirtland Sh		0.00	
3,295.1	2,727.0	Fruitland Coal		0.00	
3,471.8	2,903.0	Pictured Cliffs		0.00	

Checked By: _____	Approved By: _____	Date: _____
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