

30-015-37925

BOPCO

Quahada Ridge
Eddy County, NM
James Ranch Unit #114H
VH - Job #32K1110894



Survey: Actual

SDI Standard Survey Report

16 December, 2010

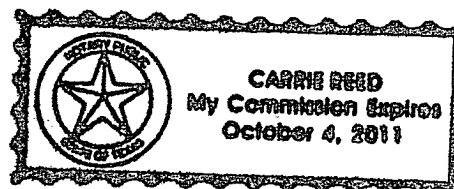
This survey is correct to the best of my knowledge and is supported by actual field data.

R. W. Barton

Notorized this date 17th of December, 2010.

Carrie Reed

Notary Signature
County of Midland
State of Texas



13

Scientific Drilling International, Inc.

SDI Standard Survey Report

Company:	BOPCO	Local Co-ordinate Reference:	Well James Ranch Unit #114H
Project:	Quahada Ridge	TVD Reference:	WELL @ 0.0usft (Original Well Elev)
Site:	Eddy County, NM	MD Reference:	WELL @ 0.0usft (Original Well Elev)
Well:	James Ranch Unit #114H	North Reference:	Grid
Wellbore:	VH - Job #32K1110894	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #32K1110894	Database:	EDM-Regulatory

Project	Quahada Ridge		
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	Eddy County, NM				
Site Position:		Northing:	487,803.60 usft	Latitude:	32° 20' 24.020 N
From:	Lat/Long	Easting:	661,394.96 usft	Longitude:	103° 48' 38.740 W
Position Uncertainty:	0.0 usft	Slot Radius:	0"	Grid Convergence:	0.28 °

Well	James Ranch Unit #114H, Directional (Baker)					
Well Position	+N/-S	0.0 usft	Northing:	487,803.60 usft	Latitude:	32° 20' 24.020 N
	+E/-W	0.0 usft	Easting:	661,394.96 usft	Longitude:	103° 48' 38.740 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level:	0.0 usft

Wellbore	VH - Job #32K1110894				
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
	BGGM2010	11/17/2010	(°)	(°)	(nT)
			7.83	60.27	48,779

Design	VH - Job #32K1110894				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction	
	(usft)	(usft)	(usft)	(°)	
	0.0	0.0	0.0	177.67	

Survey Program	Date 12/16/2010				
From	To	Survey (Wellbore)	Tool Name	Description	
(usft)	(usft)				
100.0	7,126.0	Actual (VH - Job #32K1110894)	KSRG	Keeper Gyro	

Survey								
Measured Depth	Inclination	Azimuth	True Vertical	North/South	East/West	Closure Azimuth	Closure Distance	
(usft)	(°)	(°)	Depth	(usft)	(usft)	(°)	(usft)	
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.0	
100.0	0.09	9.36	100.0	0.1	0.0	9.36	0.1	
200.0	0.41	283.83	200.0	0.2	-0.3	306.77	0.4	
300.0	0.65	265.69	300.0	0.3	-1.2	282.93	1.3	
400.0	0.56	253.32	400.0	0.1	-2.3	272.54	2.3	
500.0	0.46	261.11	500.0	-0.1	-3.1	268.14	3.1	
600.0	0.63	267.27	600.0	-0.2	-4.1	267.33	4.1	
700.0	0.73	261.63	700.0	-0.3	-5.3	266.64	5.3	
800.0	0.69	267.18	800.0	-0.4	-6.5	266.20	6.5	
900.0	0.68	273.42	900.0	-0.4	-7.7	266.83	7.7	
1,000.0	0.65	271.18	1,000.0	-0.4	-8.8	267.55	8.9	
1,100.0	0.60	282.40	1,099.9	-0.3	-9.9	268.53	9.9	

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Project: Quahada Ridge
Site: Eddy County, NM
Well: James Ranch Unit #114H
Wellbore: VH - Job #32K1110894
Design: VH - Job #32K1110894

Local Co-ordinate Reference: Well James Ranch Unit #114H
TVD Reference: WELL @ 0.0usft (Original Well Elev)
MD Reference: WELL @ 0.0usft (Original Well Elev)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM-Regulatory

Survey							
Measured Depth (usft)	Inclination (°)	Azimuth (°)	True Vertical Depth	North/South (usft)	East/West (usft)	Closure Azimuth (°)	Closure Distance (usft)
1,200.0	0.59	275.46	1,199.9	-0.1	-10.9	269.51	10.9
1,300.0	0.62	281.57	1,299.9	0.1	-12.0	270.31	12.0
1,400.0	0.49	273.58	1,399.9	0.2	-12.9	270.88	12.9
1,500.0	0.47	277.13	1,499.9	0.3	-13.8	271.15	13.8
1,600.0	0.48	252.08	1,599.9	0.2	-14.6	270.78	14.6
1,700.0	0.41	261.34	1,699.9	0.0	-15.3	270.06	15.3
1,800.0	0.32	225.04	1,799.9	-0.2	-15.9	269.15	15.9
1,900.0	0.28	219.56	1,899.9	-0.6	-16.2	267.81	16.3
2,000.0	0.27	225.32	1,999.9	-1.0	-16.6	266.63	16.6
2,100.0	0.28	209.08	2,099.9	-1.4	-16.9	265.41	16.9
2,200.0	0.30	219.48	2,199.9	-1.8	-17.1	264.11	17.2
2,300.0	0.32	212.18	2,299.9	-2.2	-17.5	262.79	17.6
2,400.0	0.50	187.15	2,399.9	-2.9	-17.7	260.74	17.9
2,500.0	0.38	193.83	2,499.9	-3.6	-17.8	258.46	18.2
2,600.0	0.45	186.85	2,599.9	-4.3	-17.9	256.37	18.4
2,700.0	0.41	191.29	2,699.9	-5.1	-18.0	254.25	18.7
2,800.0	0.29	199.35	2,799.9	-5.7	-18.2	252.67	19.0
2,900.0	0.27	209.54	2,899.9	-6.1	-18.4	251.59	19.4
3,000.0	0.27	206.06	2,999.9	-6.5	-18.6	250.65	19.7
3,100.0	0.24	204.06	3,099.9	-6.9	-18.8	249.74	20.0
3,200.0	0.43	124.18	3,199.9	-7.3	-18.6	248.43	20.0
3,300.0	0.69	121.99	3,299.9	-7.9	-17.7	246.09	19.4
3,400.0	0.10	270.19	3,399.9	-8.2	-17.3	244.70	19.2
3,500.0	0.19	275.99	3,499.9	-8.2	-17.6	245.07	19.4
3,600.0	0.27	170.31	3,599.9	-8.4	-17.7	244.65	19.6
3,700.0	0.61	151.53	3,699.9	-9.1	-17.4	242.44	19.6
3,800.0	0.56	147.29	3,799.9	-10.0	-16.9	239.46	19.6
3,900.0	0.54	154.29	3,899.9	-10.8	-16.4	236.67	19.7
4,000.0	0.46	146.66	3,999.9	-11.6	-16.0	234.14	19.7
4,100.0	0.48	142.70	4,099.9	-12.2	-15.5	231.77	19.8
4,200.0	0.47	133.07	4,199.9	-12.8	-15.0	229.37	19.7
4,300.0	0.46	130.60	4,299.9	-13.4	-14.4	227.02	19.6
4,400.0	0.45	136.17	4,399.9	-13.9	-13.8	224.71	19.6
4,500.0	0.47	153.40	4,499.9	-14.6	-13.3	222.44	19.8
4,600.0	0.45	164.54	4,599.9	-15.3	-13.0	220.40	20.1
4,700.0	0.55	166.70	4,699.8	-16.2	-12.8	218.43	20.6
4,800.0	0.58	172.08	4,799.8	-17.1	-12.6	216.43	21.3
4,900.0	0.55	174.47	4,899.8	-18.1	-12.5	214.67	22.0
5,000.0	0.54	184.16	4,999.8	-19.1	-12.5	213.29	22.8
5,100.0	0.48	197.34	5,099.8	-19.9	-12.7	212.46	23.6
5,200.0	0.42	184.61	5,199.8	-20.7	-12.8	211.80	24.4
5,300.0	0.45	197.40	5,299.8	-21.4	-13.0	211.19	25.1
5,400.0	0.45	203.43	5,399.8	-22.2	-13.3	210.87	25.8
5,500.0	0.50	207.48	5,499.8	-22.9	-13.6	210.70	26.7

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 Project: Quahada Ridge
 Site: Eddy County, NM
 Well: James Ranch Unit #114H
 Wellbore: VH - Job #32K1110894
 Design: VH - Job #32K1110894

Local Co-ordinate Reference: Well James Ranch Unit #114H
 TVD Reference: WELL @ 0.0usft (Original Well Elev)
 MD Reference: WELL @ 0.0usft (Original Well Elev)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Database: EDM-Regulatory

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	True Vertical Depth	North/South (usft)	East/West (usft)	Closure Azimuth (°)	Closure Distance (usft)
5,600.0	0.43	222.59	5,599.8	-23.6	-14.1	210.81	27.5
5,700.0	0.52	222.87	5,699.8	-24.2	-14.6	211.16	28.3
5,800.0	0.50	222.12	5,799.8	-24.8	-15.2	211.50	29.1
5,900.0	0.55	233.40	5,899.8	-25.5	-15.9	212.00	30.0
6,000.0	0.50	227.46	5,999.8	-26.0	-16.6	212.54	30.9
6,100.0	0.61	229.38	6,099.8	-26.7	-17.3	213.02	31.8
6,200.0	0.70	237.82	6,199.8	-27.4	-18.3	213.73	32.9
6,300.0	1.10	259.75	6,299.8	-27.9	-19.7	215.31	34.1
6,400.0	1.28	256.67	6,399.8	-28.3	-21.8	217.57	35.7
6,500.0	1.29	258.02	6,499.7	-28.8	-23.9	219.77	37.4
6,600.0	1.34	257.13	6,599.7	-29.3	-26.2	221.82	39.3
6,700.0	1.31	254.66	6,699.7	-29.8	-28.4	223.62	41.2
6,800.0	1.22	248.38	6,799.6	-30.5	-30.5	225.00	43.2
6,900.0	1.21	246.41	6,899.6	-31.3	-32.5	226.02	45.1
7,000.0	1.07	233.63	6,999.6	-32.3	-34.2	226.62	47.0
7,100.0	1.15	237.06	7,099.6	-33.4	-35.8	226.97	49.0
7,126.0	1.14	228.01	7,125.6	-33.7	-36.2	227.03	49.5



Scientific Drilling
Directional Drilling Operations

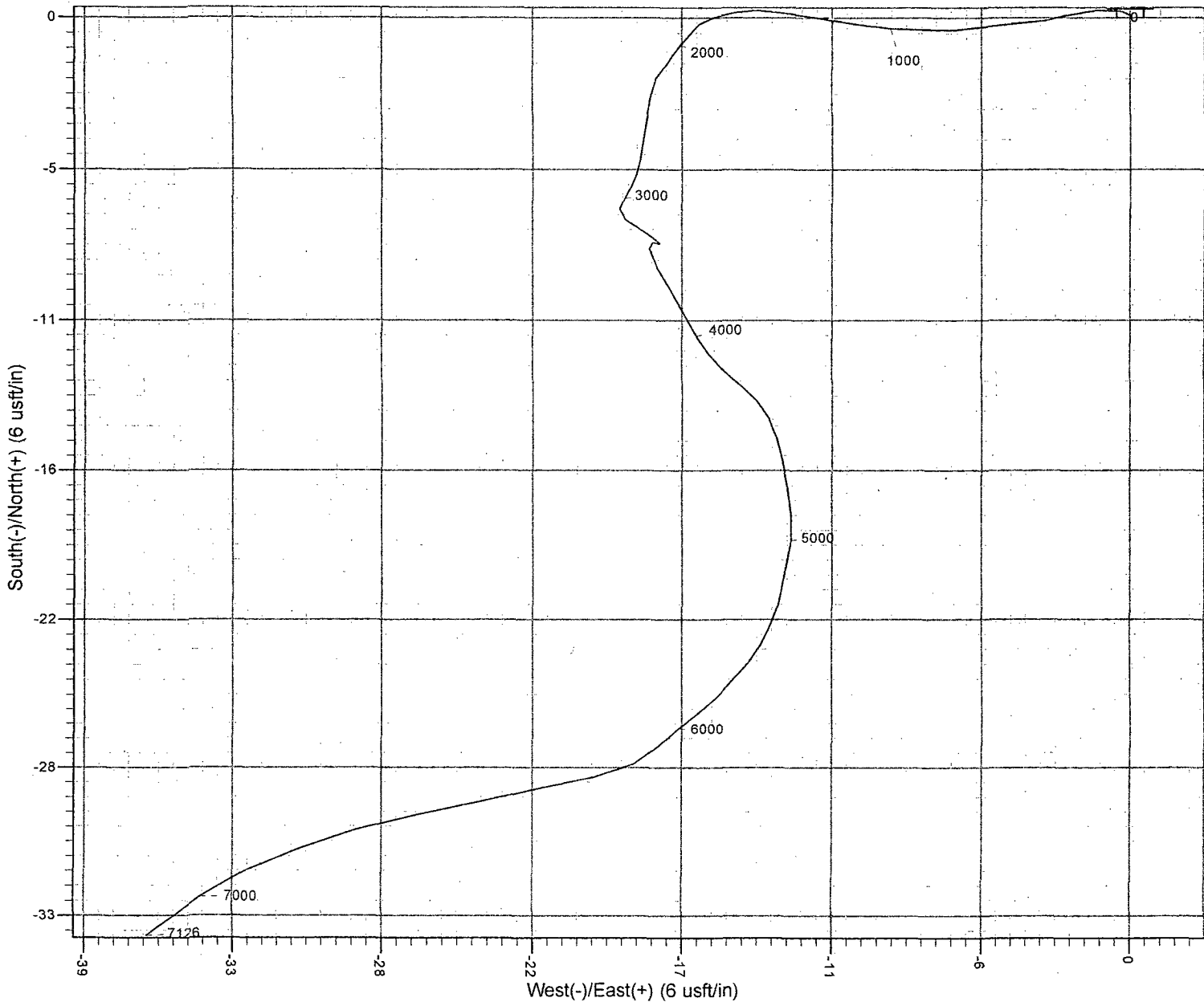
Project: Quahada Ridge
Eddy County, NM
Well: James Ranch Unit #114H
Wellbore: VH - Job #32K1110894
Design: VH - Job #32K1110894



Azimuths to Grid North
True North: -0.28°
Magnetic North: 7.55°
Magnetic Field
Strength: 48779.3nT
Dip Angle: 60.27°
Date: 11/17/2010
Model: BGGM2010

WELL DETAILS: James Ranch Unit #114H
WELL @ 0.0usft (Original Well Elev)
Ground Level: 0.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	487803.60	661394.96	32° 20' 24.020 N	103° 48' 38.740 W	



PROJECT DETAILS: Quahada Ridge
Geodetic System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone: New Mexico East 3001
System Datum: Mean Sea Level

SITE DETAILS: Eddy County, NM
Site Centre Latitude: 32° 20' 24.020 N
Longitude: 103° 48' 38.740 W
Positional Uncertainty: 0.0
Convergence: 0.28
Local North: Grid