

COG OPERATING

Gatuna Canyon

Eddy County, NM

Marauder Federal #1

VH - Job #32K1110886

30-015-38244

Survey: Actual

SDI Standard Survey Report

21 November, 2010

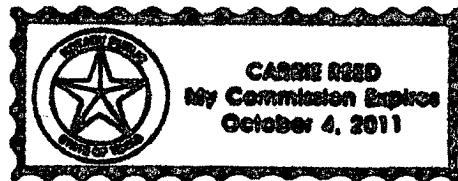
This survey is correct to the best of my knowledge and is supported by actual field data.

[Signature]

Notorized this date 22nd of November, 2010.

[Signature]

Notary Signature
County of Midland
State of Texas



Scientific Drilling International, Inc.
SDI Standard Survey Report

Company:	COG OPERATING	Local Co-ordinate Reference:	Well Marauder Federal #1
Project:	Gatuna Canyon	TVD Reference:	WELL @ 0.0usft (Original Well Elev)
Site:	Eddy County, NM	MD Reference:	WELL @ 0.0usft (Original Well Elev)
Well:	Marauder Federal #1	North Reference:	Grid
Wellbore:	VH - Job #32K1110886	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #32K1110886	Database:	EDM-Regulatory

Project:	Gatuna Canyon		
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:	590,631.31 usft
From:	Lat/Long	Easting:	629,005.79 usft
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16"
		Latitude:	32° 37' 22.980 N
		Longitude:	103° 54' 51.559 W
		Grid Convergence:	0.23 °

Well:	Marauder Federal #1, Directional (Pathfinder)		
Well Position	+N/-S	0.0 usft	Northing: 590,631.31 usft
	+E/-W	0.0 usft	Easting: 629,005.79 usft
Position Uncertainty	0.0 usft	Wellhead Elevation:	usft
		Latitude:	32° 37' 22.980 N
		Longitude:	103° 54' 51.559 W
		Ground Level:	0.0 usft

Wellbore	VH - Job #32K1110886				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2010	11/12/2010	7.91	60.52	48,940

Design:	VH - Job #32K1110886				
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	179.83	

Survey Program	Date	11/21/2010		
From	To	Survey (Wellbore)	Tool Name	Description
(usft)	(usft)			
100.0	10,000.0	Actual (VH - Job #32K1110886)	Keeper	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	0.32	18.37	100.0	0.3	0.1	18.37	0.3	
200.0	0.39	32.70	200.0	0.8	0.4	23.79	0.9	
300.0	0.80	4.95	300.0	1.8	0.6	18.56	1.9	
400.0	1.02	297.90	400.0	2.9	-0.1	357.59	2.9	
500.0	1.00	281.47	500.0	3.5	-1.8	333.25	3.9	
600.0	0.75	310.17	600.0	4.1	-3.1	322.71	5.1	
700.0	0.65	294.41	699.9	4.8	-4.1	318.97	6.3	
800.0	0.41	294.54	799.9	5.1	-5.0	315.89	7.2	
900.0	0.26	356.90	899.9	5.5	-5.3	316.03	7.7	
1,000.0	0.34	75.73	999.9	5.8	-5.0	319.06	7.7	
1,100.0	0.46	64.47	1,099.9	6.1	-4.4	324.06	7.5	

Scientific Drilling International, Inc.
SDI Standard Survey Report

Company:	COG OPERATING	Local Co-ordinate Reference:	Well Marauder Federal #1
Project:	Gatuna Canyon	TVD Reference:	WELL @ 0.0usft (Original Well Elev)
Site:	Eddy County, NM	MD Reference:	WELL @ 0.0usft (Original Well Elev)
Well:	Marauder Federal #1	North Reference:	Grid
Wellbore:	VH - Job #32K1110886	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #32K1110886	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	0.65	69.73	1,199.9	6.4	-3.5	331.45	7.3	
1,300.0	1.04	73.44	1,299.9	6.9	-2.1	343.07	7.2	
1,400.0	1.67	65.29	1,399.9	7.7	0.1	0.73	7.7	
1,500.0	2.29	60.70	1,499.8	9.3	3.2	18.73	9.9	
1,600.0	2.40	59.89	1,599.8	11.4	6.7	30.59	13.2	
1,700.0	2.42	63.95	1,699.7	13.3	10.4	38.01	16.9	
1,800.0	1.52	75.10	1,799.6	14.6	13.6	42.96	20.0	
1,900.0	0.95	106.43	1,899.6	14.7	15.7	46.82	21.5	
2,000.0	1.02	126.81	1,999.6	13.9	17.2	50.94	22.1	
2,100.0	1.11	143.62	2,099.5	12.6	18.5	55.63	22.4	
2,200.0	1.19	147.03	2,199.5	11.0	19.6	60.75	22.5	
2,300.0	1.05	157.98	2,299.5	9.3	20.5	65.71	22.5	
2,400.0	0.69	175.65	2,399.5	7.8	20.9	69.51	22.3	
2,500.0	0.66	155.53	2,499.5	6.7	21.2	72.49	22.2	
2,600.0	0.48	147.87	2,599.5	5.8	21.7	74.98	22.4	
2,700.0	0.51	127.77	2,699.5	5.2	22.2	76.88	22.8	
2,800.0	0.41	135.42	2,799.5	4.7	22.8	78.48	23.3	
2,900.0	0.36	121.12	2,899.5	4.2	23.4	79.71	23.7	
3,000.0	0.25	131.74	2,999.5	3.9	23.8	80.62	24.1	
3,100.0	0.26	136.16	3,099.5	3.6	24.1	81.46	24.4	
3,200.0	0.37	100.64	3,199.5	3.4	24.6	82.13	24.8	
3,300.0	0.34	58.15	3,299.5	3.5	25.2	82.09	25.4	
3,400.0	0.45	33.83	3,399.5	4.0	25.6	81.17	25.9	
3,500.0	1.01	5.76	3,499.5	5.2	25.9	78.70	26.4	
3,600.0	1.07	351.25	3,599.4	7.0	25.9	74.90	26.8	
3,700.0	1.07	10.30	3,699.4	8.8	25.9	71.19	27.4	
3,800.0	0.99	11.64	3,799.4	10.6	26.2	68.03	28.3	
3,900.0	0.82	27.52	3,899.4	12.1	26.7	65.72	29.3	
4,000.0	0.87	25.63	3,999.4	13.4	27.4	63.97	30.5	
4,100.0	0.84	23.74	4,099.4	14.7	28.0	62.26	31.7	
4,200.0	0.84	26.95	4,199.4	16.1	28.7	60.72	32.9	
4,300.0	0.85	27.91	4,299.4	17.4	29.3	59.36	34.1	
4,400.0	0.89	31.77	4,399.3	18.7	30.1	58.15	35.4	
4,500.0	1.48	36.14	4,499.3	20.4	31.3	56.88	37.3	
4,600.0	1.24	42.40	4,599.3	22.2	32.8	55.83	39.6	
4,700.0	1.00	26.75	4,699.3	23.8	33.9	54.89	41.4	
4,800.0	1.09	25.45	4,799.3	25.5	34.7	53.72	43.0	
4,900.0	1.11	24.98	4,899.2	27.2	35.5	52.55	44.7	
5,000.0	1.12	36.15	4,999.2	28.9	36.5	51.66	46.5	
5,100.0	1.10	35.59	5,099.2	30.4	37.6	51.03	48.4	
5,200.0	1.04	20.49	5,199.2	32.1	38.5	50.21	50.1	
5,300.0	1.13	21.57	5,299.2	33.8	39.2	49.19	51.8	
5,400.0	1.03	14.87	5,399.1	35.6	39.8	48.16	53.4	
5,500.0	1.02	17.16	5,499.1	37.3	40.3	47.16	54.9	

Scientific Drilling International, Inc.
SDI Standard Survey Report

Company:	COG OPERATING	Local Co-ordinate Reference:	Well Marauder Federal #1
Project:	Gatuna Canyon	TVD Reference:	WELL @ 0.0usft (Original Well Elev)
Site:	Eddy County, NM	MD Reference:	WELL @ 0.0usft (Original Well Elev)
Well:	Marauder Federal #1	North Reference:	Grid
Wellbore:	VH - Job #32K1110886	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #32K1110886	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	1.11	15.32	5,599.1	39.1	40.8	46.19	56.5	
5,700.0	1.08	16.77	5,699.1	41.0	41.3	45.25	58.2	
5,800.0	1.06	19.85	5,799.1	42.7	41.9	44.44	59.8	
5,900.0	1.24	22.38	5,899.1	44.6	42.6	43.70	61.7	
6,000.0	1.28	23.58	5,999.0	46.6	43.5	43.00	63.7	
6,100.0	1.21	24.06	6,099.0	48.6	44.4	42.38	65.8	
6,200.0	1.20	20.99	6,199.0	50.5	45.2	41.78	67.8	
6,300.0	1.28	28.37	6,299.0	52.5	46.1	41.26	69.9	
6,400.0	1.29	25.05	6,398.9	54.5	47.1	40.81	72.0	
6,500.0	1.27	22.67	6,498.9	56.6	48.0	40.31	74.2	
6,600.0	0.84	29.08	6,598.9	58.2	48.8	39.95	75.9	
6,700.0	0.53	28.81	6,698.9	59.3	49.3	39.78	77.1	
6,800.0	0.31	301.48	6,798.9	59.8	49.3	39.52	77.5	
6,900.0	0.38	278.34	6,898.9	60.0	48.8	39.11	77.3	
7,000.0	0.28	252.65	6,998.9	60.0	48.2	38.80	76.9	
7,100.0	0.14	352.52	7,098.9	60.0	48.0	38.63	76.8	
7,200.0	0.39	28.68	7,198.9	60.4	48.1	38.52	77.3	
7,300.0	0.51	53.98	7,298.9	61.0	48.6	38.56	78.0	
7,400.0	0.65	60.69	7,398.9	61.5	49.5	38.80	79.0	
7,500.0	1.10	59.65	7,498.9	62.3	50.8	39.20	80.4	
7,600.0	1.16	67.57	7,598.8	63.2	52.6	39.77	82.2	
7,700.0	1.05	71.64	7,698.8	63.8	54.4	40.42	83.9	
7,800.0	1.10	83.38	7,798.8	64.2	56.2	41.18	85.4	
7,900.0	1.50	96.85	7,898.8	64.2	58.5	42.32	86.8	
8,000.0	1.53	99.75	7,998.7	63.8	61.1	43.74	88.3	
8,100.0	1.33	109.51	8,098.7	63.2	63.5	45.12	89.6	
8,200.0	1.74	129.09	8,198.7	61.9	65.8	46.75	90.3	
8,300.0	1.07	150.81	8,298.7	60.1	67.4	48.28	90.3	
8,400.0	1.14	145.77	8,398.6	58.5	68.4	49.48	90.0	
8,500.0	0.83	154.82	8,498.6	57.0	69.3	50.56	89.7	
8,600.0	0.98	153.09	8,598.6	55.6	70.0	51.55	89.3	
8,700.0	1.20	158.39	8,698.6	53.8	70.7	52.73	88.9	
8,800.0	1.38	167.77	8,798.6	51.7	71.4	54.10	88.1	
8,900.0	1.47	184.11	8,898.5	49.2	71.5	55.48	86.8	
9,000.0	1.52	189.99	8,998.5	46.6	71.2	56.79	85.1	
9,100.0	1.39	191.59	9,098.5	44.1	70.7	58.04	83.4	
9,200.0	1.78	187.49	9,198.4	41.4	70.3	59.50	81.6	
9,300.0	2.22	190.70	9,298.4	38.0	69.7	61.44	79.4	
9,400.0	1.82	227.17	9,398.3	35.0	68.2	62.85	76.7	
9,500.0	1.76	243.37	9,498.3	33.2	65.7	63.17	73.6	
9,600.0	1.75	238.74	9,598.2	31.7	63.0	63.27	70.5	
9,700.0	1.72	231.76	9,698.2	30.0	60.5	63.62	67.5	
9,800.0	1.60	230.60	9,798.1	28.2	58.3	64.17	64.7	
9,900.0	1.34	217.53	9,898.1	26.4	56.5	64.96	62.3	

Scientific Drilling International, Inc.

SDI Standard Survey Report

Company:	COG OPERATING	Local Co-ordinate Reference:	Well Marauder Federal #1
Project:	Gatuna Canyon	TVD Reference:	WELL @ 0.0usft (Original Well Elev)
Site:	Eddy County, NM	MD Reference:	WELL @ 0.0usft (Original Well Elev)
Well:	Marauder Federal #1	North Reference:	Grid
Wellbore:	VH - Job #32K1110886	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #32K1110886	Database:	EDM-Regulatory

Survey							
Measured Depth (usft)	Inclination (°)	Azimuth (°)	True Vertical Depth	North/South (usft)	East/West (usft)	Closure Azimuth (°)	Closure Distance (usft)
10,000.0	1.27	198.86	9,998.1	24.4	55.4	66.22	60.5



Project: Gatuna Canyon
Eddy County, NM
Well: Marauder Federal #1
Wellbore: VH - Job #32K1110886
Design: VH - Job #32K1110886

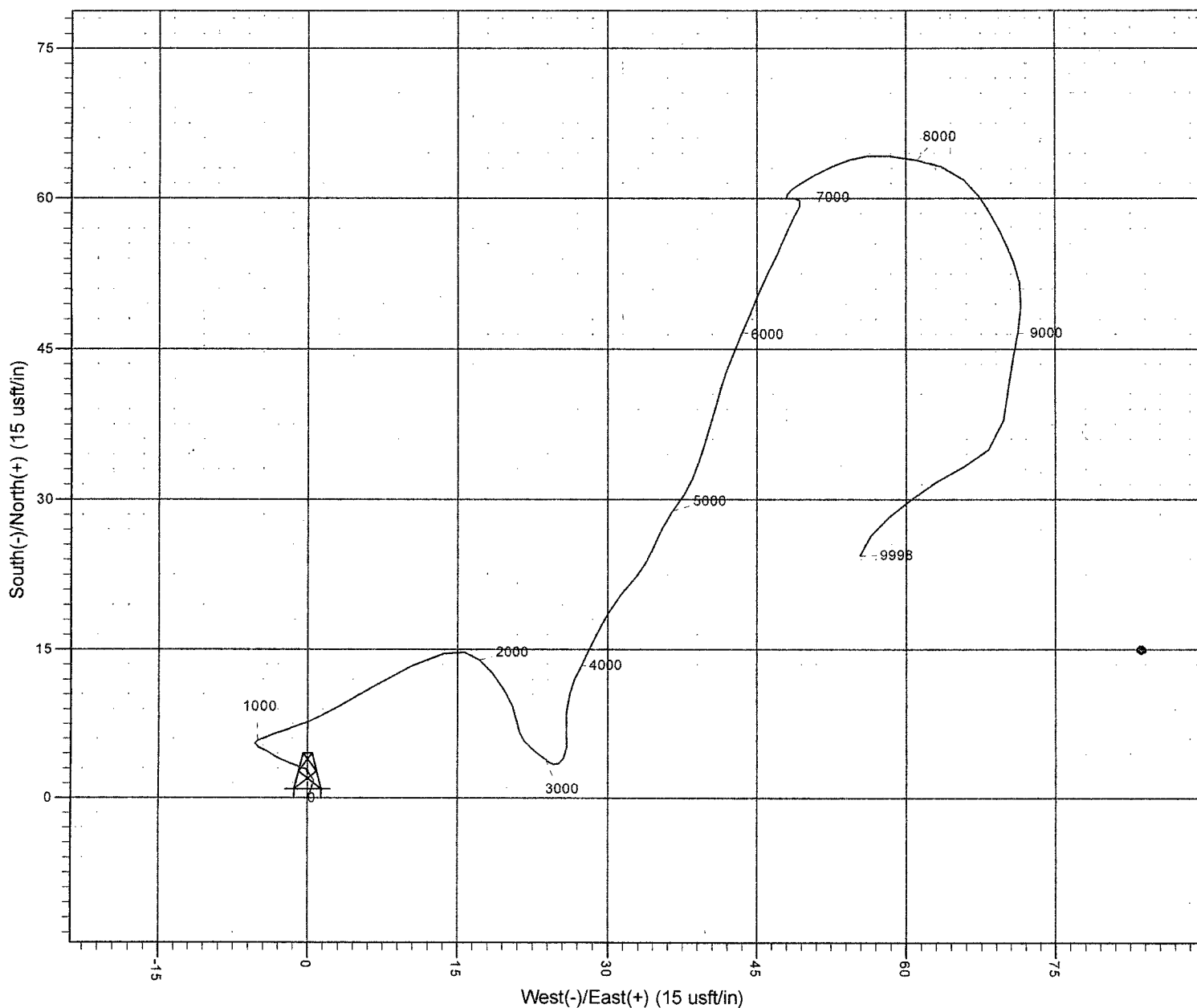


Azimuths to Grid North
True North: -0.23°
Magnetic North: 7.68°

Magnetic Field
Strength: 48940.0snT
Dip Angle: 60.52°
Date: 11/12/2010
Model: BGGM2010

WELL DETAILS: Marauder Federal #1
WELL @ 0.0usft (Original Well Elev)
Ground Level: 0.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	590631.31	629005.79	32° 37' 22.980 N	103° 54' 51.559 W	



PROJECT DETAILS: Gatuna Canyon
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° 37' 22.980 N
Longitude: 103° 54' 51.559 W
Positional Uncertainty: 0.0
Convergence: 0.23
Local North: Grid