



COG Operating L L C
Project: Lea County, NM (NAD27 NME)
Site: Sec. 17, T 26 S., R 33 E
Well: Vast State 26H
Wellbore: Wellbore #1
Plan: Plan #1 (Vast State 26H/Wellbore #1)

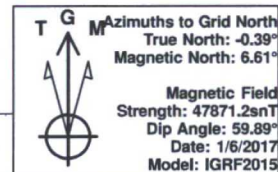
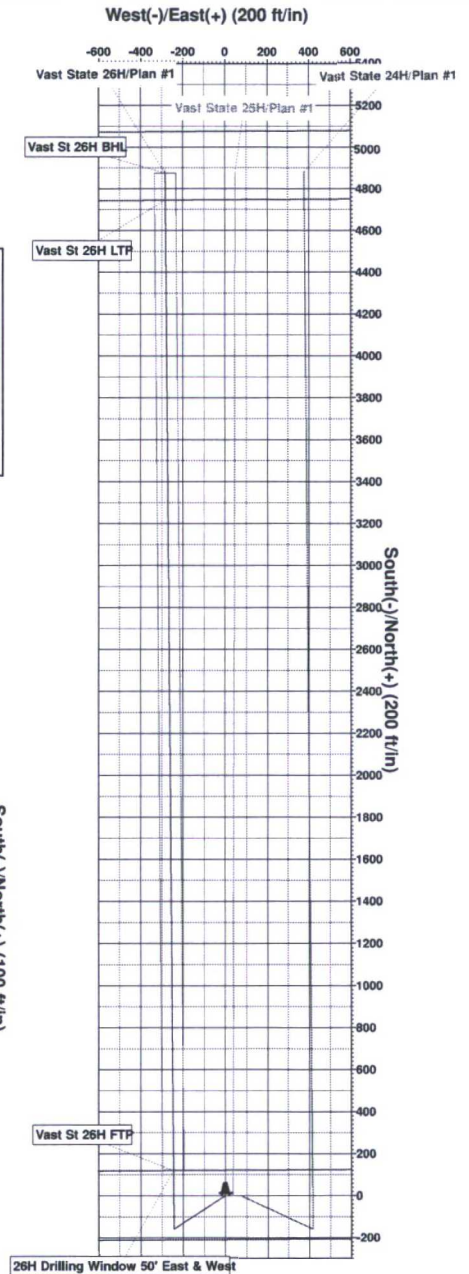
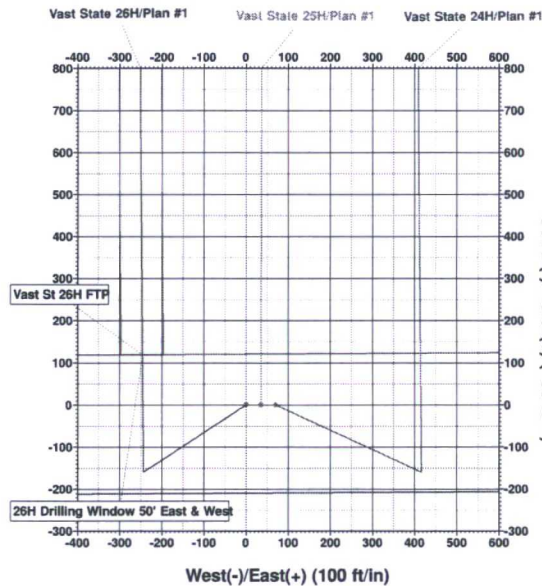
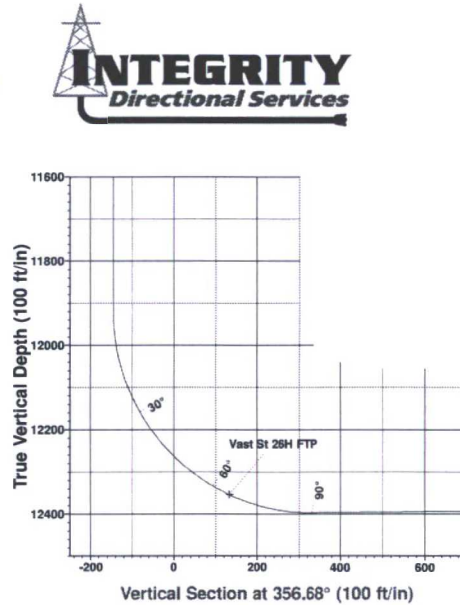
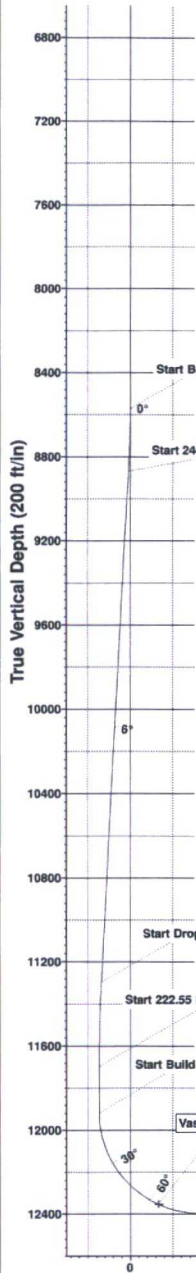
WELL DETAILS: Vast State 26H

Ground Elevation:: 3262.00
RKB Elevation: KB=28' @ 3290.00ft
Rig Name:

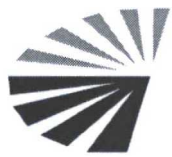
Northing 377869.6000 Easting 729736.5000 Latitude 32° 2' 12.158 N Longitude 103° 35' 31.015 W

Section Details

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	8570.57	0.00	0.00	8570.57	0.00	0.00	0.00	0.00	0.00	Start Build 2.00
3	8870.57	6.00	236.75	8870.02	-8.61	-13.12	2.00	236.75	-7.83	Start 2441.08 hold at 8870.57 MD
4	11311.65	6.00	236.75	11297.73	-148.53	-226.50	0.00	0.00	-135.15	Start Drop -1.50
5	11711.65	0.00	0.00	11697.00	-160.00	-244.00	1.50	180.00	-145.59	Start 222.55 hold at 11711.65 MD
6	11934.20	0.00	0.00	11919.55	-160.00	-244.00	0.00	0.00	-145.59	Start Build 12.00
7	12688.50	90.52	359.56	12397.00	321.75	-247.73	12.00	359.56	335.57	Start 4552.18 hold at 12688.50 MD
8	17240.68	90.52	359.56	12356.00	4873.61	-283.00	0.00	0.00	4881.82	TD at 17240.68



PROJECT DETAILS: Lea County, NM (NAD27 NME)
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
Local North: Grid



CONCHO

COG Operating L L C

Lea County, NM (NAD27 NME)

Sec. 17, T 26 S. , R 33 E

Vast State 26H

Wellbore #1

Plan: Plan #1

Standard Survey Report

06 January, 2017





Integrity Directional Services, LLC

Survey Report



Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Vast State 26H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=28' @ 3290.00ft
Site:	Sec. 17, T 26 S. , R 33 E	MD Reference:	KB=28' @ 3290.00ft
Well:	Vast State 26H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Plan #1	Database:	EDM 5000.1 Multi User Db

Project	Lea County, NM (NAD27 NME)		
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	Sec. 17, T 26 S. , R 33 E		
Site Position:		Northing:	377,872.3000 usft
From:	Map	Easting:	730,181.4000 usft
Position Uncertainty:	5.00 ft	Slot Radius:	13-3/16 "
		Latitude:	32° 2' 12.155 N
		Longitude:	103° 35' 25.847 W
		Grid Convergence:	0.39 °

Well	Vast State 26H		
Well Position	+N/-S	0.00 ft	Northing:
	+E/-W	0.00 ft	Easting:
Position Uncertainty	0.00 ft	Wellhead Elevation:	0.00 ft
		Latitude:	32° 2' 12.158 N
		Longitude:	103° 35' 31.015 W
		Ground Level:	3,262.00 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	1/6/2017	7.00	59.89	47,871

Design	Plan #1			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.00	0.00	0.00	356.68

Survey Tool Program	Date 1/6/2017			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.00	17,240.27	Plan #1 (Wellbore #1)	MWD	MWD - Standard

Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00	
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00	
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00	
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00	
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00	
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00	
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00	
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00	



Integrity Directional Services, LLC
Survey Report



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Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=28' @ 3290.00ft
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Well:	Vast State 26H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Plan #1	Database:	EDM 5000.1 Multi User Db

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	0.00	0.00
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	0.00	0.00
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00
2,100.00	0.00	0.00	2,100.00	0.00	0.00	0.00	0.00	0.00	0.00
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	0.00	0.00
2,300.00	0.00	0.00	2,300.00	0.00	0.00	0.00	0.00	0.00	0.00
2,400.00	0.00	0.00	2,400.00	0.00	0.00	0.00	0.00	0.00	0.00
2,500.00	0.00	0.00	2,500.00	0.00	0.00	0.00	0.00	0.00	0.00
2,600.00	0.00	0.00	2,600.00	0.00	0.00	0.00	0.00	0.00	0.00
2,700.00	0.00	0.00	2,700.00	0.00	0.00	0.00	0.00	0.00	0.00
2,800.00	0.00	0.00	2,800.00	0.00	0.00	0.00	0.00	0.00	0.00
2,900.00	0.00	0.00	2,900.00	0.00	0.00	0.00	0.00	0.00	0.00
3,000.00	0.00	0.00	3,000.00	0.00	0.00	0.00	0.00	0.00	0.00
3,100.00	0.00	0.00	3,100.00	0.00	0.00	0.00	0.00	0.00	0.00
3,200.00	0.00	0.00	3,200.00	0.00	0.00	0.00	0.00	0.00	0.00
3,300.00	0.00	0.00	3,300.00	0.00	0.00	0.00	0.00	0.00	0.00
3,400.00	0.00	0.00	3,400.00	0.00	0.00	0.00	0.00	0.00	0.00
3,500.00	0.00	0.00	3,500.00	0.00	0.00	0.00	0.00	0.00	0.00
3,600.00	0.00	0.00	3,600.00	0.00	0.00	0.00	0.00	0.00	0.00
3,700.00	0.00	0.00	3,700.00	0.00	0.00	0.00	0.00	0.00	0.00
3,800.00	0.00	0.00	3,800.00	0.00	0.00	0.00	0.00	0.00	0.00
3,900.00	0.00	0.00	3,900.00	0.00	0.00	0.00	0.00	0.00	0.00
4,000.00	0.00	0.00	4,000.00	0.00	0.00	0.00	0.00	0.00	0.00
4,100.00	0.00	0.00	4,100.00	0.00	0.00	0.00	0.00	0.00	0.00
4,200.00	0.00	0.00	4,200.00	0.00	0.00	0.00	0.00	0.00	0.00
4,300.00	0.00	0.00	4,300.00	0.00	0.00	0.00	0.00	0.00	0.00
4,400.00	0.00	0.00	4,400.00	0.00	0.00	0.00	0.00	0.00	0.00
4,500.00	0.00	0.00	4,500.00	0.00	0.00	0.00	0.00	0.00	0.00
4,600.00	0.00	0.00	4,600.00	0.00	0.00	0.00	0.00	0.00	0.00
4,700.00	0.00	0.00	4,700.00	0.00	0.00	0.00	0.00	0.00	0.00
4,800.00	0.00	0.00	4,800.00	0.00	0.00	0.00	0.00	0.00	0.00
4,900.00	0.00	0.00	4,900.00	0.00	0.00	0.00	0.00	0.00	0.00
5,000.00	0.00	0.00	5,000.00	0.00	0.00	0.00	0.00	0.00	0.00
5,100.00	0.00	0.00	5,100.00	0.00	0.00	0.00	0.00	0.00	0.00
5,200.00	0.00	0.00	5,200.00	0.00	0.00	0.00	0.00	0.00	0.00
5,300.00	0.00	0.00	5,300.00	0.00	0.00	0.00	0.00	0.00	0.00



Integrity Directional Services, LLC

Survey Report



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Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
5,400.00	0.00	0.00	5,400.00	0.00	0.00	0.00	0.00	0.00	0.00
5,500.00	0.00	0.00	5,500.00	0.00	0.00	0.00	0.00	0.00	0.00
5,600.00	0.00	0.00	5,600.00	0.00	0.00	0.00	0.00	0.00	0.00
5,700.00	0.00	0.00	5,700.00	0.00	0.00	0.00	0.00	0.00	0.00
5,800.00	0.00	0.00	5,800.00	0.00	0.00	0.00	0.00	0.00	0.00
5,900.00	0.00	0.00	5,900.00	0.00	0.00	0.00	0.00	0.00	0.00
6,000.00	0.00	0.00	6,000.00	0.00	0.00	0.00	0.00	0.00	0.00
6,100.00	0.00	0.00	6,100.00	0.00	0.00	0.00	0.00	0.00	0.00
6,200.00	0.00	0.00	6,200.00	0.00	0.00	0.00	0.00	0.00	0.00
6,300.00	0.00	0.00	6,300.00	0.00	0.00	0.00	0.00	0.00	0.00
6,400.00	0.00	0.00	6,400.00	0.00	0.00	0.00	0.00	0.00	0.00
6,500.00	0.00	0.00	6,500.00	0.00	0.00	0.00	0.00	0.00	0.00
6,600.00	0.00	0.00	6,600.00	0.00	0.00	0.00	0.00	0.00	0.00
6,700.00	0.00	0.00	6,700.00	0.00	0.00	0.00	0.00	0.00	0.00
6,800.00	0.00	0.00	6,800.00	0.00	0.00	0.00	0.00	0.00	0.00
6,900.00	0.00	0.00	6,900.00	0.00	0.00	0.00	0.00	0.00	0.00
7,000.00	0.00	0.00	7,000.00	0.00	0.00	0.00	0.00	0.00	0.00
7,100.00	0.00	0.00	7,100.00	0.00	0.00	0.00	0.00	0.00	0.00
7,200.00	0.00	0.00	7,200.00	0.00	0.00	0.00	0.00	0.00	0.00
7,300.00	0.00	0.00	7,300.00	0.00	0.00	0.00	0.00	0.00	0.00
7,400.00	0.00	0.00	7,400.00	0.00	0.00	0.00	0.00	0.00	0.00
7,500.00	0.00	0.00	7,500.00	0.00	0.00	0.00	0.00	0.00	0.00
7,600.00	0.00	0.00	7,600.00	0.00	0.00	0.00	0.00	0.00	0.00
7,700.00	0.00	0.00	7,700.00	0.00	0.00	0.00	0.00	0.00	0.00
7,800.00	0.00	0.00	7,800.00	0.00	0.00	0.00	0.00	0.00	0.00
7,900.00	0.00	0.00	7,900.00	0.00	0.00	0.00	0.00	0.00	0.00
8,000.00	0.00	0.00	8,000.00	0.00	0.00	0.00	0.00	0.00	0.00
8,100.00	0.00	0.00	8,100.00	0.00	0.00	0.00	0.00	0.00	0.00
8,200.00	0.00	0.00	8,200.00	0.00	0.00	0.00	0.00	0.00	0.00
8,300.00	0.00	0.00	8,300.00	0.00	0.00	0.00	0.00	0.00	0.00
8,400.00	0.00	0.00	8,400.00	0.00	0.00	0.00	0.00	0.00	0.00
8,500.00	0.00	0.00	8,500.00	0.00	0.00	0.00	0.00	0.00	0.00
8,570.57	0.00	0.00	8,570.57	0.00	0.00	0.00	0.00	0.00	0.00
Start Build 2.00									
8,600.00	0.59	236.75	8,600.00	-0.08	-0.13	-0.08	2.00	2.00	0.00
8,700.00	2.59	236.75	8,699.96	-1.60	-2.44	-1.46	2.00	2.00	0.00
8,800.00	4.59	236.75	8,799.76	-5.04	-7.68	-4.58	2.00	2.00	0.00
8,870.57	6.00	236.75	8,870.02	-8.61	-13.12	-7.83	2.00	2.00	0.00
Start 2441.08 hold at 8870.57 MD									
8,900.00	6.00	236.75	8,899.29	-10.29	-15.70	-9.37	0.00	0.00	0.00
9,000.00	6.00	236.75	8,998.74	-16.02	-24.44	-14.58	0.00	0.00	0.00
9,100.00	6.00	236.75	9,098.20	-21.76	-33.18	-19.80	0.00	0.00	0.00
9,200.00	6.00	236.75	9,197.65	-27.49	-41.92	-25.01	0.00	0.00	0.00



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9,300.00	6.00	236.75	9,297.10	-33.22	-50.66	-30.23	0.00	0.00	0.00
9,400.00	6.00	236.75	9,396.55	-38.95	-59.40	-35.44	0.00	0.00	0.00
9,500.00	6.00	236.75	9,496.00	-44.68	-68.14	-40.66	0.00	0.00	0.00
9,600.00	6.00	236.75	9,595.46	-50.42	-76.88	-45.87	0.00	0.00	0.00
9,700.00	6.00	236.75	9,694.91	-56.15	-85.63	-51.09	0.00	0.00	0.00
9,800.00	6.00	236.75	9,794.36	-61.88	-94.37	-56.31	0.00	0.00	0.00
9,900.00	6.00	236.75	9,893.81	-67.61	-103.11	-61.52	0.00	0.00	0.00
10,000.00	6.00	236.75	9,993.27	-73.34	-111.85	-66.74	0.00	0.00	0.00
10,100.00	6.00	236.75	10,092.72	-79.08	-120.59	-71.95	0.00	0.00	0.00
10,200.00	6.00	236.75	10,192.17	-84.81	-129.33	-77.17	0.00	0.00	0.00
10,300.00	6.00	236.75	10,291.62	-90.54	-138.07	-82.38	0.00	0.00	0.00
10,400.00	6.00	236.75	10,391.07	-96.27	-146.81	-87.60	0.00	0.00	0.00
10,500.00	6.00	236.75	10,490.53	-102.00	-155.55	-92.81	0.00	0.00	0.00
10,600.00	6.00	236.75	10,589.98	-107.73	-164.30	-98.03	0.00	0.00	0.00
10,700.00	6.00	236.75	10,689.43	-113.47	-173.04	-103.24	0.00	0.00	0.00
10,800.00	6.00	236.75	10,788.88	-119.20	-181.78	-108.46	0.00	0.00	0.00
10,900.00	6.00	236.75	10,888.33	-124.93	-190.52	-113.68	0.00	0.00	0.00
11,000.00	6.00	236.75	10,987.79	-130.66	-199.26	-118.89	0.00	0.00	0.00
11,100.00	6.00	236.75	11,087.24	-136.39	-208.00	-124.11	0.00	0.00	0.00
11,200.00	6.00	236.75	11,186.69	-142.13	-216.74	-129.32	0.00	0.00	0.00
11,300.00	6.00	236.75	11,286.14	-147.86	-225.48	-134.54	0.00	0.00	0.00
11,311.65	6.00	236.75	11,297.73	-148.53	-226.50	-135.15	0.00	0.00	0.00
Start Drop -1.50									
11,400.00	4.67	236.75	11,385.69	-153.03	-233.37	-139.25	1.50	-1.50	0.00
11,500.00	3.17	236.75	11,485.46	-156.79	-239.10	-142.66	1.50	-1.50	0.00
11,600.00	1.67	236.75	11,585.36	-159.11	-242.64	-144.77	1.50	-1.50	0.00
11,700.00	0.17	236.75	11,685.35	-159.99	-243.99	-145.58	1.50	-1.50	0.00
11,711.65	0.00	0.00	11,697.00	-160.00	-244.00	-145.59	1.50	-1.50	0.00
Start 222.55 hold at 11711.65 MD									
11,800.00	0.00	0.00	11,785.35	-160.00	-244.00	-145.59	0.00	0.00	0.00
11,900.00	0.00	0.00	11,885.35	-160.00	-244.00	-145.59	0.00	0.00	0.00
11,934.20	0.00	0.00	11,919.55	-160.00	-244.00	-145.59	0.00	0.00	0.00
Start Build 12.00									
12,000.00	7.90	359.56	11,985.14	-155.47	-244.04	-141.07	12.00	12.00	0.00
12,100.00	19.90	359.56	12,082.04	-131.50	-244.22	-117.12	12.00	12.00	0.00
12,200.00	31.90	359.56	12,171.83	-87.91	-244.56	-73.58	12.00	12.00	0.00
12,300.00	43.90	359.56	12,250.60	-26.60	-245.03	-12.35	12.00	12.00	0.00
12,400.00	55.90	359.56	12,314.90	49.74	-245.63	63.90	12.00	12.00	0.00
12,500.00	67.90	359.56	12,361.92	137.79	-246.31	151.84	12.00	12.00	0.00
12,600.00	79.90	359.56	12,389.61	233.69	-247.05	247.62	12.00	12.00	0.00
12,688.50	90.52	359.56	12,397.00	321.75	-247.73	335.57	12.00	12.00	0.00
Start 4552.18 hold at 12688.50 MD									
12,700.00	90.52	359.56	12,396.89	333.25	-247.82	347.05	0.00	0.00	0.00
12,800.00	90.52	359.56	12,395.99	433.24	-248.60	446.92	0.00	0.00	0.00



Integrity Directional Services, LLC
Survey Report



Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Vast State 26H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=28' @ 3290.00ft
Site:	Sec. 17, T 26 S. , R 33 E	MD Reference:	KB=28' @ 3290.00ft
Well:	Vast State 26H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Plan #1	Database:	EDM 5000.1 Multi User Db

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
12,900.00	90.52	359.56	12,395.09	533.23	-249.37	546.79	0.00	0.00	0.00
13,000.00	90.52	359.56	12,394.19	633.23	-250.15	646.66	0.00	0.00	0.00
13,100.00	90.52	359.56	12,393.29	733.22	-250.92	746.53	0.00	0.00	0.00
13,200.00	90.52	359.56	12,392.39	833.21	-251.70	846.40	0.00	0.00	0.00
13,300.00	90.52	359.56	12,391.49	933.21	-252.47	946.27	0.00	0.00	0.00
13,400.00	90.52	359.56	12,390.59	1,033.20	-253.24	1,046.14	0.00	0.00	0.00
13,500.00	90.52	359.56	12,389.69	1,133.19	-254.02	1,146.01	0.00	0.00	0.00
13,600.00	90.52	359.56	12,388.79	1,233.18	-254.79	1,245.88	0.00	0.00	0.00
13,700.00	90.52	359.56	12,387.89	1,333.18	-255.57	1,345.75	0.00	0.00	0.00
13,800.00	90.52	359.56	12,386.99	1,433.17	-256.34	1,445.62	0.00	0.00	0.00
13,900.00	90.52	359.56	12,386.09	1,533.16	-257.12	1,545.49	0.00	0.00	0.00
14,000.00	90.52	359.56	12,385.19	1,633.16	-257.89	1,645.36	0.00	0.00	0.00
14,100.00	90.52	359.56	12,384.28	1,733.15	-258.67	1,745.23	0.00	0.00	0.00
14,200.00	90.52	359.56	12,383.38	1,833.14	-259.44	1,845.10	0.00	0.00	0.00
14,300.00	90.52	359.56	12,382.48	1,933.14	-260.22	1,944.97	0.00	0.00	0.00
14,400.00	90.52	359.56	12,381.58	2,033.13	-260.99	2,044.84	0.00	0.00	0.00
14,500.00	90.52	359.56	12,380.68	2,133.12	-261.77	2,144.71	0.00	0.00	0.00
14,600.00	90.52	359.56	12,379.78	2,233.11	-262.54	2,244.58	0.00	0.00	0.00
14,700.00	90.52	359.56	12,378.88	2,333.11	-263.32	2,344.45	0.00	0.00	0.00
14,800.00	90.52	359.56	12,377.98	2,433.10	-264.09	2,444.32	0.00	0.00	0.00
14,900.00	90.52	359.56	12,377.08	2,533.09	-264.87	2,544.19	0.00	0.00	0.00
15,000.00	90.52	359.56	12,376.18	2,633.09	-265.64	2,644.06	0.00	0.00	0.00
15,100.00	90.52	359.56	12,375.28	2,733.08	-266.42	2,743.93	0.00	0.00	0.00
15,200.00	90.52	359.56	12,374.38	2,833.07	-267.19	2,843.80	0.00	0.00	0.00
15,300.00	90.52	359.56	12,373.48	2,933.06	-267.97	2,943.67	0.00	0.00	0.00
15,400.00	90.52	359.56	12,372.58	3,033.06	-268.74	3,043.54	0.00	0.00	0.00
15,500.00	90.52	359.56	12,371.68	3,133.05	-269.51	3,143.41	0.00	0.00	0.00
15,600.00	90.52	359.56	12,370.78	3,233.04	-270.29	3,243.28	0.00	0.00	0.00
15,700.00	90.52	359.56	12,369.88	3,333.04	-271.06	3,343.15	0.00	0.00	0.00
15,800.00	90.52	359.56	12,368.97	3,433.03	-271.84	3,443.01	0.00	0.00	0.00
15,900.00	90.52	359.56	12,368.07	3,533.02	-272.61	3,542.88	0.00	0.00	0.00
16,000.00	90.52	359.56	12,367.17	3,633.02	-273.39	3,642.75	0.00	0.00	0.00
16,100.00	90.52	359.56	12,366.27	3,733.01	-274.16	3,742.62	0.00	0.00	0.00
16,200.00	90.52	359.56	12,365.37	3,833.00	-274.94	3,842.49	0.00	0.00	0.00
16,300.00	90.52	359.56	12,364.47	3,932.99	-275.71	3,942.36	0.00	0.00	0.00
16,400.00	90.52	359.56	12,363.57	4,032.99	-276.49	4,042.23	0.00	0.00	0.00
16,500.00	90.52	359.56	12,362.67	4,132.98	-277.26	4,142.10	0.00	0.00	0.00
16,600.00	90.52	359.56	12,361.77	4,232.97	-278.04	4,241.97	0.00	0.00	0.00
16,700.00	90.52	359.56	12,360.87	4,332.97	-278.81	4,341.84	0.00	0.00	0.00
16,800.00	90.52	359.56	12,359.97	4,432.96	-279.59	4,441.71	0.00	0.00	0.00
16,900.00	90.52	359.56	12,359.07	4,532.95	-280.36	4,541.58	0.00	0.00	0.00
17,000.00	90.52	359.56	12,358.17	4,632.94	-281.14	4,641.45	0.00	0.00	0.00
17,100.00	90.52	359.56	12,357.27	4,732.94	-281.91	4,741.32	0.00	0.00	0.00
17,200.00	90.52	359.56	12,356.37	4,832.93	-282.69	4,841.19	0.00	0.00	0.00



Integrity Directional Services, LLC

Survey Report



Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Vast State 26H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=28' @ 3290.00ft
Site:	Sec. 17, T 26 S. , R 33 E	MD Reference:	KB=28' @ 3290.00ft
Well:	Vast State 26H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Plan #1	Database:	EDM 5000.1 Multi User Db

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
17,240.68	90.52	359.56	12,356.00	4,873.61	-283.00	4,881.82	0.00	0.00	0.00
TD at 17240.68									

Design Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
26H Drilling Window	0.00	0.00	0.00	118.80	-246.20	377,988.3998	729,490.3005	32° 2' 13.350 N	103° 35' 33.866 W
- plan misses target center by 273.36ft at 0.00ft MD (0.00 TVD, 0.00 N, 0.00 E)									
- Rectangle (sides W100.00 H4,754.81 D0.00)									
Vast St 26H FTP	0.00	0.00	12,353.7	118.80	-246.20	377,988.4000	729,490.3000	32° 2' 13.350 N	103° 35' 33.866 W
- plan misses target center by 0.05ft at 12479.35ft MD (12353.74 TVD, 118.83 N, -246.16 E)									
- Point									
Vast St 26H BHL	0.00	0.00	12,356.0	4,873.61	-283.00	382,743.2000	729,453.5000	32° 3' 0.406 N	103° 35' 33.915 W
- plan hits target center									
- Point									
Vast St 26H LTP	0.00	0.00	12,357.1	4,743.61	-282.00	382,613.2000	729,454.5000	32° 2' 59.119 N	103° 35' 33.913 W
- plan misses target center by 0.01ft at 17110.67ft MD (12357.17 TVD, 4743.61 N, -281.99 E)									
- Point									

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
8571	8571	0	0	Start Build 2.00
8871	8870	-9	-13	Start 2441.08 hold at 8870.57 MD
11,312	11,298	-149	-227	Start Drop -1.50
11,712	11,697	-160	-244	Start 222.55 hold at 11711.65 MD
11,934	11,920	-160	-244	Start Build 12.00
12,689	12,397	322	-248	Start 4552.18 hold at 12688.50 MD
17,241	12,356	4874	-283	TD at 17240.68

Checked By: _____ Approved By: _____ Date: _____