

**McVAY DRILLING COMPANY**

P.O. Box 2450
Hobbs, New Mexico 88241
(575) 397-3311
FAX: 39-DRILL

Well Name and Num: Windward Federal #10H
Location: Sec 30, T24S, R32E
Operator: COG
Drilling Contractor: McVay Drilling Company

The undersigned certifies that he is an authorized representative of the drilling contractor who drilled the above described well and that he has conducted deviation tests and obtained the following results:

<u>Degrees @</u>	<u>Depth</u>	<u>Degrees @</u>	<u>Depth</u>	<u>Degrees @</u>	<u>Depth</u>	<u>Degrees @</u>	<u>Depth</u>
0.30	198	1.20	6406	90.63	13243		
0.40	385	0.10	6783	92.37	13718		
0.10	756	0.50	7161	91.16	14190		
0.20	1310	0.40	7540	91.75	14473		
0.40	1687	0.40	7918	91.90	14759		
1.90	2065	0.40	8244	90.41	15220		
1.10	2442	0.60	8488	88.50	15597		
1.90	2821	9.70	8683	87.32	16068		
0.70	3199	22.00	8776	86.76	16445		
0.20	3587	62.53	9246	87.80	16822		
2.10	3769	68.50	9309	87.97	17295		
1.60	4147	93.72	10504	89.79	17580		
1.10	4574	89.45	10882	88.50	18054		
1.50	4896	90.35	11354	87.74	18527		
1.00	5122	89.57	11825	86.87	18811		
1.40	5651	90.71	12296	86.11	18905		
1.60	6028	90.70	12769				

By: Mario A. Camacho S.

Subscribed and sworn to before me this 17th day of April, 2017

Tina Flemens
Notary Public, Lea County, New Mexico





CONCHO

COG Operating L L C

Lea County, NM (NAD27 NME)

Sec. 30, T 24 S. , R 32 E

Windward Federal 10H

Wellbore #1

Design: Wellbore #1

Survey Report - Geographic

10 April, 2017

HOBBS OCD

AUG 25 2017

RECEIVED



Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Windward Federal 10H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3576.80ft (McVay #8)
Site:	Sec. 30, T 24 S. , R 32 E	MD Reference:	KB=26' @ 3576.80ft (McVay #8)
Well:	Windward Federal 10H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #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. 30, T 24 S. , R 32 E		
Site Position:		Northing:	435,165.5000 usft
From:	Map	Easting:	689,517.6000 usft
Position Uncertainty:	0.00 ft	Slot Radius:	13-3/16 "
		Latitude:	32° 11' 41.651 N
		Longitude:	103° 43' 14.453 W
		Grid Convergence:	0.33 °

Well	Windward Federal 10H, ACTIVE		
Well Position	+N/-S	0.00 ft	Northing: 435,188.9000 usft
	+E/-W	0.00 ft	Easting: 692,494.4000 usft
Position Uncertainty	0.00 ft	Wellhead Elevation:	0.00 ft
		Latitude:	32° 11' 41.713 N
		Longitude:	103° 42' 39.810 W
		Ground Level:	3,550.80 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	3/20/2017	7.04	60.02	47,930

Design	Wellbore #1				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.00	0.00	0.00	178.28	

Survey Program	Date 4/10/2017				
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
100.00	8,514.00	Keeper Surveys (Wellbore #1)	Keeper	Standard Wireline Keeper ver 1.0.2	
8,683.00	19,025.00	IDS MWD Surveys (Wellbore #1)	MWD	MWD - Standard	

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
0.00	0.00	0.00	0.00	0.00	0.00	435,188.9000	692,494.4000	32° 11' 41.713 N	103° 42' 39.810 W	
100.00	0.14	0.19	100.00	0.12	0.00	435,189.0222	692,494.4004	32° 11' 41.714 N	103° 42' 39.810 W	
125.00	0.16	337.29	125.00	0.18	-0.01	435,189.0849	692,494.3870	32° 11' 41.715 N	103° 42' 39.810 W	
150.00	0.18	330.13	150.00	0.25	-0.05	435,189.1512	692,494.3540	32° 11' 41.715 N	103° 42' 39.811 W	
175.00	0.14	335.60	175.00	0.31	-0.08	435,189.2130	692,494.3218	32° 11' 41.716 N	103° 42' 39.811 W	
200.00	0.21	330.89	200.00	0.38	-0.11	435,189.2809	692,494.2869	32° 11' 41.717 N	103° 42' 39.811 W	
225.00	0.23	339.73	225.00	0.47	-0.15	435,189.3680	692,494.2472	32° 11' 41.718 N	103° 42' 39.812 W	
250.00	0.16	7.26	250.00	0.55	-0.17	435,189.4497	692,494.2343	32° 11' 41.718 N	103° 42' 39.812 W	
275.00	0.18	333.30	275.00	0.62	-0.18	435,189.5194	692,494.2210	32° 11' 41.719 N	103° 42' 39.812 W	
300.00	0.20	355.70	300.00	0.70	-0.20	435,189.5980	692,494.2001	32° 11' 41.720 N	103° 42' 39.812 W	
325.00	0.17	4.68	325.00	0.78	-0.20	435,189.6784	692,494.1999	32° 11' 41.721 N	103° 42' 39.812 W	

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Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3576.80ft (McVay #8)
Site:	Sec. 30, T 24 S. , R 32 E	MD Reference:	KB=26' @ 3576.80ft (McVay #8)
Well:	Windward Federal 10H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Multi User Db

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
350.00	0.21	342.77	350.00	0.86	-0.21	435,189.7592	692,494.1893	32° 11' 41.721 N	103° 42' 39.812 W
375.00	0.20	325.21	375.00	0.94	-0.25	435,189.8388	692,494.1509	32° 11' 41.722 N	103° 42' 39.813 W
400.00	0.23	352.24	400.00	1.02	-0.28	435,189.9243	692,494.1192	32° 11' 41.723 N	103° 42' 39.813 W
425.00	0.18	316.84	425.00	1.10	-0.31	435,190.0027	692,494.0855	32° 11' 41.724 N	103° 42' 39.814 W
450.00	0.14	322.28	450.00	1.16	-0.36	435,190.0555	692,494.0400	32° 11' 41.724 N	103° 42' 39.814 W
475.00	0.23	318.13	475.00	1.22	-0.41	435,190.1170	692,493.9878	32° 11' 41.725 N	103° 42' 39.815 W
500.00	0.18	315.33	500.00	1.28	-0.47	435,190.1823	692,493.9267	32° 11' 41.726 N	103° 42' 39.815 W
525.00	0.23	303.31	525.00	1.34	-0.54	435,190.2378	692,493.8572	32° 11' 41.726 N	103° 42' 39.816 W
550.00	0.27	312.90	550.00	1.41	-0.63	435,190.3054	692,493.7721	32° 11' 41.727 N	103° 42' 39.817 W
575.00	0.29	317.46	575.00	1.49	-0.71	435,190.3922	692,493.6862	32° 11' 41.728 N	103° 42' 39.818 W
600.00	0.25	319.53	600.00	1.58	-0.79	435,190.4803	692,493.6080	32° 11' 41.729 N	103° 42' 39.819 W
625.00	0.29	327.51	625.00	1.68	-0.86	435,190.5751	692,493.5386	32° 11' 41.730 N	103° 42' 39.820 W
650.00	0.18	313.18	650.00	1.76	-0.92	435,190.6554	692,493.4760	32° 11' 41.730 N	103° 42' 39.821 W
675.00	0.13	294.46	675.00	1.79	-0.98	435,190.6940	692,493.4215	32° 11' 41.731 N	103° 42' 39.821 W
700.00	0.10	253.60	700.00	1.80	-1.03	435,190.6996	692,493.3748	32° 11' 41.731 N	103° 42' 39.822 W
725.00	0.11	178.07	725.00	1.77	-1.05	435,190.6694	692,493.3547	32° 11' 41.731 N	103° 42' 39.822 W
750.00	0.26	163.83	750.00	1.69	-1.03	435,190.5909	692,493.3713	32° 11' 41.730 N	103° 42' 39.822 W
775.00	0.31	170.18	775.00	1.57	-1.00	435,190.4698	692,493.3986	32° 11' 41.729 N	103° 42' 39.822 W
800.00	0.34	169.23	800.00	1.43	-0.98	435,190.3303	692,493.4240	32° 11' 41.727 N	103° 42' 39.821 W
825.00	0.33	181.08	824.99	1.29	-0.96	435,190.1855	692,493.4365	32° 11' 41.726 N	103° 42' 39.821 W
850.00	0.36	164.42	849.99	1.14	-0.94	435,190.0378	692,493.4562	32° 11' 41.724 N	103° 42' 39.821 W
875.00	0.33	193.63	874.99	0.99	-0.94	435,189.8922	692,493.4604	32° 11' 41.723 N	103° 42' 39.821 W
900.00	0.31	171.98	899.99	0.86	-0.95	435,189.7553	692,493.4528	32° 11' 41.722 N	103° 42' 39.821 W
925.00	0.44	203.36	924.99	0.70	-0.98	435,189.6002	692,493.4242	32° 11' 41.720 N	103° 42' 39.821 W
950.00	0.32	200.00	949.99	0.55	-1.04	435,189.4465	692,493.3623	32° 11' 41.718 N	103° 42' 39.822 W
975.00	0.28	199.98	974.99	0.42	-1.08	435,189.3234	692,493.3175	32° 11' 41.717 N	103° 42' 39.823 W
1,000.00	0.40	217.30	999.99	0.30	-1.16	435,189.1966	692,493.2438	32° 11' 41.716 N	103° 42' 39.823 W
1,025.00	0.31	211.37	1,024.99	0.17	-1.24	435,189.0695	692,493.1557	32° 11' 41.715 N	103° 42' 39.824 W
1,050.00	0.27	200.91	1,049.99	0.06	-1.30	435,188.9567	692,493.0995	32° 11' 41.714 N	103° 42' 39.825 W
1,075.00	0.39	205.37	1,074.99	-0.08	-1.36	435,188.8248	692,493.0420	32° 11' 41.712 N	103° 42' 39.826 W
1,100.00	0.45	218.51	1,099.99	-0.23	-1.46	435,188.6711	692,492.9444	32° 11' 41.711 N	103° 42' 39.827 W
1,125.00	0.32	219.59	1,124.99	-0.36	-1.56	435,188.5405	692,492.8388	32° 11' 41.710 N	103° 42' 39.828 W
1,150.00	0.27	212.25	1,149.99	-0.46	-1.64	435,188.4368	692,492.7629	32° 11' 41.708 N	103° 42' 39.829 W
1,175.00	0.28	213.73	1,174.99	-0.56	-1.70	435,188.3362	692,492.6975	32° 11' 41.708 N	103° 42' 39.830 W
1,200.00	0.19	205.18	1,199.99	-0.65	-1.75	435,188.2479	692,492.6459	32° 11' 41.707 N	103° 42' 39.830 W
1,225.00	0.20	201.58	1,224.99	-0.73	-1.79	435,188.1698	692,492.6123	32° 11' 41.706 N	103° 42' 39.831 W
1,250.00	0.20	207.41	1,249.99	-0.81	-1.82	435,188.0905	692,492.5761	32° 11' 41.705 N	103° 42' 39.831 W
1,275.00	0.36	243.07	1,274.99	-0.88	-1.91	435,188.0162	692,492.4860	32° 11' 41.704 N	103° 42' 39.832 W
1,300.00	0.21	220.39	1,299.99	-0.95	-2.01	435,187.9457	692,492.3863	32° 11' 41.704 N	103° 42' 39.833 W
1,325.00	0.30	232.17	1,324.99	-1.03	-2.10	435,187.8707	692,492.3049	32° 11' 41.703 N	103° 42' 39.834 W
1,350.00	0.39	231.95	1,349.99	-1.12	-2.21	435,187.7781	692,492.1862	32° 11' 41.702 N	103° 42' 39.836 W
1,375.00	0.30	221.53	1,374.99	-1.22	-2.32	435,187.6767	692,492.0758	32° 11' 41.701 N	103° 42' 39.837 W
1,400.00	0.29	239.21	1,399.99	-1.30	-2.42	435,187.5953	692,491.9781	32° 11' 41.700 N	103° 42' 39.838 W
1,425.00	0.29	236.83	1,424.99	-1.37	-2.53	435,187.5283	692,491.8708	32° 11' 41.700 N	103° 42' 39.840 W
1,450.00	0.14	250.77	1,449.99	-1.42	-2.61	435,187.4836	692,491.7890	32° 11' 41.699 N	103° 42' 39.840 W
1,475.00	0.30	264.80	1,474.99	-1.43	-2.71	435,187.4676	692,491.6950	32° 11' 41.699 N	103° 42' 39.842 W
1,500.00	0.25	255.72	1,499.99	-1.45	-2.82	435,187.4482	692,491.5769	32° 11' 41.699 N	103° 42' 39.843 W
1,525.00	0.23	298.39	1,524.98	-1.44	-2.92	435,187.4587	692,491.4799	32° 11' 41.699 N	103° 42' 39.844 W
1,550.00	0.32	303.60	1,549.98	-1.38	-3.02	435,187.5211	692,491.3776	32° 11' 41.700 N	103° 42' 39.845 W
1,575.00	0.30	295.00	1,574.98	-1.31	-3.14	435,187.5874	692,491.2602	32° 11' 41.700 N	103° 42' 39.847 W
1,600.00	0.28	322.27	1,599.98	-1.24	-3.24	435,187.6634	692,491.1635	32° 11' 41.701 N	103° 42' 39.848 W
1,625.00	0.36	324.34	1,624.98	-1.12	-3.32	435,187.7755	692,491.0803	32° 11' 41.702 N	103° 42' 39.849 W
1,650.00	0.43	338.55	1,649.98	-0.97	-3.40	435,187.9267	692,491.0002	32° 11' 41.704 N	103° 42' 39.850 W
1,675.00	0.36	350.56	1,674.98	-0.81	-3.45	435,188.0915	692,490.9530	32° 11' 41.705 N	103° 42' 39.850 W
1,700.00	0.47	359.48	1,699.98	-0.63	-3.46	435,188.2715	692,490.9392	32° 11' 41.707 N	103° 42' 39.850 W

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Well:	Windward Federal 10H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Multi User Db

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
1,725.00	0.54	351.59	1,724.98	-0.41	-3.48	435,188.4905	692,490.9211	32° 11' 41.709 N	103° 42' 39.850 W
1,750.00	0.62	357.77	1,749.98	-0.16	-3.50	435,188.7422	692,490.8986	32° 11' 41.712 N	103° 42' 39.851 W
1,775.00	0.70	2.65	1,774.98	0.13	-3.50	435,189.0299	692,490.9004	32° 11' 41.714 N	103° 42' 39.851 W
1,800.00	0.74	1.55	1,799.98	0.44	-3.49	435,189.3439	692,490.9118	32° 11' 41.718 N	103° 42' 39.851 W
1,825.00	0.78	1.44	1,824.97	0.78	-3.48	435,189.6754	692,490.9204	32° 11' 41.721 N	103° 42' 39.850 W
1,850.00	0.90	16.97	1,849.97	1.13	-3.42	435,190.0333	692,490.9820	32° 11' 41.724 N	103° 42' 39.850 W
1,875.00	0.97	8.90	1,874.97	1.53	-3.33	435,190.4301	692,491.0721	32° 11' 41.728 N	103° 42' 39.849 W
1,900.00	1.15	14.19	1,899.96	1.98	-3.23	435,190.8824	692,491.1663	32° 11' 41.733 N	103° 42' 39.847 W
1,925.00	1.09	18.43	1,924.96	2.45	-3.10	435,191.3512	692,491.3030	32° 11' 41.737 N	103° 42' 39.846 W
1,950.00	1.24	16.27	1,949.95	2.94	-2.95	435,191.8365	692,491.4539	32° 11' 41.742 N	103° 42' 39.844 W
1,975.00	1.36	23.62	1,974.95	3.47	-2.75	435,192.3680	692,491.6486	32° 11' 41.747 N	103° 42' 39.842 W
2,000.00	1.40	21.76	1,999.94	4.02	-2.52	435,192.9234	692,491.8807	32° 11' 41.753 N	103° 42' 39.839 W
2,025.00	1.43	20.67	2,024.93	4.60	-2.30	435,193.4989	692,492.1040	32° 11' 41.759 N	103° 42' 39.836 W
2,050.00	1.63	22.77	2,049.92	5.22	-2.05	435,194.1186	692,492.3517	32° 11' 41.765 N	103° 42' 39.833 W
2,075.00	1.50	23.08	2,074.91	5.85	-1.78	435,194.7475	692,492.6176	32° 11' 41.771 N	103° 42' 39.830 W
2,100.00	1.57	20.99	2,099.90	6.47	-1.53	435,195.3683	692,492.8686	32° 11' 41.777 N	103° 42' 39.827 W
2,125.00	1.02	16.72	2,124.90	7.00	-1.34	435,195.9012	692,493.0553	32° 11' 41.782 N	103° 42' 39.825 W
2,150.00	0.31	23.11	2,149.90	7.28	-1.25	435,196.1765	692,493.1458	32° 11' 41.785 N	103° 42' 39.824 W
2,175.00	0.25	191.51	2,174.90	7.29	-1.24	435,196.1852	692,493.1615	32° 11' 41.785 N	103° 42' 39.824 W
2,200.00	0.30	176.03	2,199.90	7.17	-1.24	435,196.0665	692,493.1551	32° 11' 41.784 N	103° 42' 39.824 W
2,225.00	0.35	190.33	2,224.90	7.03	-1.25	435,195.9261	692,493.1460	32° 11' 41.783 N	103° 42' 39.824 W
2,250.00	0.27	156.16	2,249.90	6.90	-1.24	435,195.7971	692,493.1561	32° 11' 41.781 N	103° 42' 39.824 W
2,275.00	0.35	115.35	2,274.90	6.81	-1.15	435,195.7105	692,493.2489	32° 11' 41.780 N	103° 42' 39.823 W
2,300.00	0.43	96.29	2,299.89	6.77	-0.99	435,195.6675	692,493.4112	32° 11' 41.780 N	103° 42' 39.821 W
2,325.00	0.58	83.44	2,324.89	6.77	-0.77	435,195.6717	692,493.6301	32° 11' 41.780 N	103° 42' 39.818 W
2,350.00	0.71	76.93	2,349.89	6.82	-0.49	435,195.7212	692,493.9067	32° 11' 41.781 N	103° 42' 39.815 W
2,375.00	0.69	79.09	2,374.89	6.88	-0.19	435,195.7847	692,494.2054	32° 11' 41.781 N	103° 42' 39.812 W
2,400.00	0.81	80.42	2,399.89	6.94	0.13	435,195.8426	692,494.5274	32° 11' 41.782 N	103° 42' 39.808 W
2,425.00	0.97	78.71	2,424.89	7.01	0.51	435,195.9135	692,494.9092	32° 11' 41.782 N	103° 42' 39.804 W
2,450.00	0.81	67.93	2,449.88	7.12	0.88	435,196.0213	692,495.2805	32° 11' 41.783 N	103° 42' 39.799 W
2,475.00	1.02	69.85	2,474.88	7.26	1.25	435,196.1643	692,495.6531	32° 11' 41.785 N	103° 42' 39.795 W
2,500.00	1.09	65.13	2,499.87	7.44	1.68	435,196.3410	692,496.0778	32° 11' 41.787 N	103° 42' 39.790 W
2,525.00	1.10	66.17	2,524.87	7.64	2.11	435,196.5379	692,496.5130	32° 11' 41.788 N	103° 42' 39.785 W
2,550.00	1.16	67.61	2,549.87	7.83	2.57	435,196.7313	692,496.9665	32° 11' 41.790 N	103° 42' 39.780 W
2,575.00	1.36	60.74	2,574.86	8.07	3.06	435,196.9727	692,497.4593	32° 11' 41.793 N	103° 42' 39.774 W
2,600.00	1.46	58.63	2,599.85	8.38	3.59	435,197.2835	692,497.9901	32° 11' 41.796 N	103° 42' 39.768 W
2,625.00	1.64	62.25	2,624.84	8.72	4.18	435,197.6159	692,498.5786	32° 11' 41.799 N	103° 42' 39.761 W
2,650.00	1.61	61.00	2,649.83	9.05	4.80	435,197.9527	692,499.2024	32° 11' 41.802 N	103° 42' 39.753 W
2,675.00	1.79	60.53	2,674.82	9.42	5.45	435,198.3150	692,499.8495	32° 11' 41.806 N	103° 42' 39.746 W
2,700.00	1.74	56.70	2,699.81	9.82	6.11	435,198.7155	692,500.5066	32° 11' 41.810 N	103° 42' 39.738 W
2,725.00	1.82	57.63	2,724.80	10.24	6.76	435,199.1364	692,501.1592	32° 11' 41.814 N	103° 42' 39.731 W
2,750.00	1.88	57.50	2,749.78	10.67	7.44	435,199.5693	692,501.8403	32° 11' 41.818 N	103° 42' 39.723 W
2,775.00	1.87	55.37	2,774.77	11.12	8.12	435,200.0215	692,502.5218	32° 11' 41.823 N	103° 42' 39.715 W
2,800.00	1.87	58.44	2,799.76	11.57	8.81	435,200.4667	692,503.2050	32° 11' 41.827 N	103° 42' 39.707 W
2,825.00	1.90	58.22	2,824.74	12.00	9.50	435,200.8985	692,503.9049	32° 11' 41.831 N	103° 42' 39.699 W
2,850.00	1.83	57.54	2,849.73	12.43	10.19	435,201.3310	692,504.5940	32° 11' 41.835 N	103° 42' 39.691 W
2,875.00	1.54	55.93	2,874.72	12.83	10.81	435,201.7334	692,505.2091	32° 11' 41.839 N	103° 42' 39.683 W
2,900.00	1.06	68.19	2,899.71	13.11	11.30	435,202.0076	692,505.7021	32° 11' 41.842 N	103° 42' 39.678 W
2,925.00	0.76	78.93	2,924.71	13.23	11.68	435,202.1253	692,506.0795	32° 11' 41.843 N	103° 42' 39.673 W
2,950.00	0.65	88.58	2,949.71	13.26	11.98	435,202.1607	692,506.3839	32° 11' 41.844 N	103° 42' 39.670 W
2,975.00	0.50	89.82	2,974.71	13.26	12.23	435,202.1645	692,506.6348	32° 11' 41.844 N	103° 42' 39.667 W
3,000.00	0.61	90.74	2,999.71	13.26	12.48	435,202.1631	692,506.8769	32° 11' 41.844 N	103° 42' 39.664 W
3,025.00	0.52	84.94	3,024.70	13.27	12.72	435,202.1714	692,507.1230	32° 11' 41.844 N	103° 42' 39.661 W
3,050.00	0.61	73.29	3,049.70	13.32	12.96	435,202.2197	692,507.3635	32° 11' 41.844 N	103° 42' 39.658 W
3,075.00	0.64	73.89	3,074.70	13.40	13.23	435,202.2967	692,507.6251	32° 11' 41.845 N	103° 42' 39.655 W

Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Windward Federal 10H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3576.80ft (McVay #8)
Site:	Sec. 30, T 24 S. , R 32 E	MD Reference:	KB=26' @ 3576.80ft (McVay #8)
Well:	Windward Federal 10H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Multi User Db

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
3,100.00	0.62	73.38	3,099.70	13.47	13.49	435,202.3741	692,507.8888	32° 11' 41.846 N	103° 42' 39.652 W
3,125.00	0.59	72.88	3,124.70	13.55	13.74	435,202.4507	692,508.1414	32° 11' 41.846 N	103° 42' 39.649 W
3,150.00	0.58	74.31	3,149.70	13.62	13.99	435,202.5228	692,508.3863	32° 11' 41.847 N	103° 42' 39.646 W
3,175.00	0.65	74.19	3,174.70	13.70	14.24	435,202.5957	692,508.6445	32° 11' 41.848 N	103° 42' 39.643 W
3,200.00	0.72	75.87	3,199.69	13.77	14.53	435,202.6726	692,508.9333	32° 11' 41.848 N	103° 42' 39.640 W
3,225.00	0.89	67.43	3,224.69	13.89	14.86	435,202.7855	692,509.2649	32° 11' 41.850 N	103° 42' 39.636 W
3,250.00	0.96	67.84	3,249.69	14.04	15.24	435,202.9390	692,509.6381	32° 11' 41.851 N	103° 42' 39.632 W
3,275.00	1.12	51.85	3,274.68	14.27	15.62	435,203.1690	692,510.0242	32° 11' 41.853 N	103° 42' 39.627 W
3,300.00	1.25	53.09	3,299.68	14.58	16.03	435,203.4836	692,510.4344	32° 11' 41.856 N	103° 42' 39.622 W
3,325.00	1.33	45.43	3,324.67	14.95	16.46	435,203.8510	692,510.8591	32° 11' 41.860 N	103° 42' 39.617 W
3,350.00	1.28	40.80	3,349.67	15.37	16.85	435,204.2660	692,511.2483	32° 11' 41.864 N	103° 42' 39.613 W
3,375.00	1.66	37.24	3,374.66	15.87	17.25	435,204.7657	692,511.6499	32° 11' 41.869 N	103° 42' 39.608 W
3,400.00	1.60	39.46	3,399.65	16.42	17.69	435,205.3234	692,512.0908	32° 11' 41.874 N	103° 42' 39.603 W
3,425.00	1.55	35.94	3,424.64	16.97	18.11	435,205.8666	692,512.5111	32° 11' 41.880 N	103° 42' 39.598 W
3,450.00	1.21	41.26	3,449.63	17.44	18.48	435,206.3388	692,512.8836	32° 11' 41.884 N	103° 42' 39.594 W
3,475.00	0.57	42.72	3,474.63	17.73	18.74	435,206.6286	692,513.1421	32° 11' 41.887 N	103° 42' 39.591 W
3,500.00	0.05	2.96	3,499.63	17.83	18.83	435,206.7308	692,513.2270	32° 11' 41.888 N	103° 42' 39.590 W
3,525.00	0.15	147.39	3,524.63	17.81	18.85	435,206.7142	692,513.2452	32° 11' 41.888 N	103° 42' 39.589 W
3,550.00	0.10	188.54	3,549.63	17.77	18.86	435,206.6650	692,513.2596	32° 11' 41.888 N	103° 42' 39.589 W
3,575.00	0.17	156.24	3,574.63	17.71	18.87	435,206.6095	692,513.2713	32° 11' 41.887 N	103° 42' 39.589 W
3,600.00	0.17	108.48	3,599.63	17.66	18.92	435,206.5638	692,513.3214	32° 11' 41.887 N	103° 42' 39.589 W
3,625.00	0.27	85.14	3,624.63	17.66	19.02	435,206.5570	692,513.4153	32° 11' 41.887 N	103° 42' 39.588 W
3,650.00	0.58	74.43	3,649.63	17.70	19.20	435,206.5960	692,513.5959	32° 11' 41.887 N	103° 42' 39.585 W
3,675.00	0.67	72.91	3,674.63	17.77	19.46	435,206.6729	692,513.8575	32° 11' 41.888 N	103° 42' 39.582 W
3,700.00	0.79	76.14	3,699.62	17.86	19.76	435,206.7572	692,514.1645	32° 11' 41.889 N	103° 42' 39.579 W
3,725.00	1.13	73.55	3,724.62	17.97	20.17	435,206.8682	692,514.5682	32° 11' 41.890 N	103° 42' 39.574 W
3,750.00	1.74	71.97	3,749.61	18.16	20.77	435,207.0555	692,515.1656	32° 11' 41.891 N	103° 42' 39.567 W
3,775.00	1.78	73.09	3,774.60	18.39	21.50	435,207.2859	692,515.8980	32° 11' 41.894 N	103° 42' 39.559 W
3,800.00	1.79	74.18	3,799.59	18.61	22.25	435,207.5053	692,516.6451	32° 11' 41.896 N	103° 42' 39.550 W
3,825.00	1.58	73.91	3,824.58	18.81	22.95	435,207.7073	692,517.3520	32° 11' 41.898 N	103° 42' 39.542 W
3,850.00	0.81	67.23	3,849.57	18.97	23.45	435,207.8712	692,517.8461	32° 11' 41.899 N	103° 42' 39.536 W
3,875.00	0.54	53.52	3,874.57	19.11	23.70	435,208.0096	692,518.1037	32° 11' 41.901 N	103° 42' 39.533 W
3,900.00	0.48	49.08	3,899.57	19.25	23.88	435,208.1483	692,518.2776	32° 11' 41.902 N	103° 42' 39.531 W
3,925.00	0.62	52.41	3,924.57	19.40	24.06	435,208.2994	692,518.4639	32° 11' 41.904 N	103° 42' 39.529 W
3,950.00	0.87	46.35	3,949.57	19.61	24.31	435,208.5129	692,518.7084	32° 11' 41.906 N	103° 42' 39.526 W
3,975.00	1.10	50.05	3,974.56	19.90	24.63	435,208.7980	692,519.0297	32° 11' 41.908 N	103° 42' 39.522 W
4,000.00	1.18	52.41	3,999.56	20.21	25.02	435,209.1091	692,519.4176	32° 11' 41.912 N	103° 42' 39.517 W
4,025.00	1.15	51.43	4,024.55	20.52	25.42	435,209.4225	692,519.8177	32° 11' 41.915 N	103° 42' 39.513 W
4,050.00	1.36	48.08	4,049.55	20.88	25.83	435,209.7772	692,520.2346	32° 11' 41.918 N	103° 42' 39.508 W
4,075.00	1.33	49.95	4,074.54	21.26	26.28	435,210.1621	692,520.6775	32° 11' 41.922 N	103° 42' 39.503 W
4,100.00	1.45	54.38	4,099.53	21.63	26.76	435,210.5330	692,521.1567	32° 11' 41.926 N	103° 42' 39.497 W
4,125.00	1.57	54.49	4,124.52	22.02	27.29	435,210.9161	692,521.6926	32° 11' 41.929 N	103° 42' 39.491 W
4,150.00	1.73	64.76	4,149.51	22.38	27.91	435,211.2759	692,522.3127	32° 11' 41.933 N	103° 42' 39.484 W
4,175.00	1.88	71.41	4,174.50	22.67	28.64	435,211.5676	692,523.0428	32° 11' 41.936 N	103° 42' 39.475 W
4,200.00	1.93	77.06	4,199.49	22.89	29.44	435,211.7926	692,523.8417	32° 11' 41.938 N	103° 42' 39.466 W
4,225.00	2.04	90.94	4,224.47	22.98	30.30	435,211.8796	692,524.6969	32° 11' 41.939 N	103° 42' 39.456 W
4,250.00	2.08	88.49	4,249.46	22.98	31.20	435,211.8842	692,525.5954	32° 11' 41.939 N	103° 42' 39.445 W
4,275.00	2.02	95.37	4,274.44	22.95	32.09	435,211.8549	692,526.4876	32° 11' 41.938 N	103° 42' 39.435 W
4,300.00	1.95	109.17	4,299.42	22.77	32.93	435,211.6740	692,527.3280	32° 11' 41.936 N	103° 42' 39.425 W
4,325.00	1.49	136.26	4,324.41	22.40	33.55	435,211.2995	692,527.9545	32° 11' 41.933 N	103° 42' 39.418 W
4,350.00	1.54	181.46	4,349.41	21.83	33.77	435,210.7289	692,528.1706	32° 11' 41.927 N	103° 42' 39.416 W
4,375.00	1.55	187.03	4,374.40	21.16	33.72	435,210.0575	692,528.1207	32° 11' 41.920 N	103° 42' 39.416 W
4,400.00	1.68	186.55	4,399.39	20.46	33.64	435,209.3578	692,528.0375	32° 11' 41.914 N	103° 42' 39.417 W
4,425.00	1.61	188.18	4,424.38	19.75	33.55	435,208.6461	692,527.9457	32° 11' 41.906 N	103° 42' 39.418 W
4,450.00	1.52	182.95	4,449.37	19.07	33.48	435,207.9673	692,527.8787	32° 11' 41.900 N	103° 42' 39.419 W

Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Windward Federal 10H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3576.80ft (McVay #8)
Site:	Sec. 30, T 24 S. , R 32 E	MD Reference:	KB=26' @ 3576.80ft (McVay #8)
Well:	Windward Federal 10H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Multi User Db

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
4,475.00	1.31	178.96	4,474.36	18.45	33.47	435,207.3505	692,527.8668	32° 11' 41.894 N	103° 42' 39.419 W
4,500.00	1.26	177.06	4,499.35	17.89	33.49	435,206.7903	692,527.8861	32° 11' 41.888 N	103° 42' 39.419 W
4,525.00	1.31	178.39	4,524.35	17.33	33.51	435,206.2301	692,527.9082	32° 11' 41.883 N	103° 42' 39.419 W
4,550.00	1.33	183.70	4,549.34	16.75	33.50	435,205.6549	692,527.8976	32° 11' 41.877 N	103° 42' 39.419 W
4,575.00	1.23	184.19	4,574.33	16.20	33.46	435,205.0978	692,527.8592	32° 11' 41.871 N	103° 42' 39.420 W
4,600.00	1.10	195.16	4,599.33	15.70	33.38	435,204.5985	692,527.7769	32° 11' 41.866 N	103° 42' 39.421 W
4,625.00	1.21	194.11	4,624.32	15.21	33.25	435,204.1109	692,527.6498	32° 11' 41.862 N	103° 42' 39.422 W
4,650.00	1.08	195.04	4,649.32	14.73	33.12	435,203.6274	692,527.5243	32° 11' 41.857 N	103° 42' 39.424 W
4,675.00	1.19	194.29	4,674.31	14.25	33.00	435,203.1483	692,527.3991	32° 11' 41.852 N	103° 42' 39.425 W
4,700.00	1.15	195.49	4,699.31	13.75	32.87	435,202.6550	692,527.2680	32° 11' 41.847 N	103° 42' 39.427 W
4,725.00	1.16	195.62	4,724.30	13.27	32.73	435,202.1695	692,527.1328	32° 11' 41.842 N	103° 42' 39.428 W
4,750.00	1.25	195.68	4,749.30	12.76	32.59	435,201.6632	692,526.9910	32° 11' 41.837 N	103° 42' 39.430 W
4,775.00	1.10	197.43	4,774.29	12.27	32.45	435,201.1718	692,526.8454	32° 11' 41.833 N	103° 42' 39.432 W
4,800.00	1.36	196.21	4,799.29	11.76	32.29	435,200.6579	692,526.6907	32° 11' 41.827 N	103° 42' 39.433 W
4,825.00	1.39	195.11	4,824.28	11.18	32.13	435,200.0803	692,526.5289	32° 11' 41.822 N	103° 42' 39.435 W
4,850.00	1.32	199.19	4,849.27	10.62	31.96	435,199.5156	692,526.3552	32° 11' 41.816 N	103° 42' 39.437 W
4,875.00	1.46	195.67	4,874.27	10.04	31.77	435,198.9370	692,526.1745	32° 11' 41.810 N	103° 42' 39.440 W
4,900.00	1.46	195.85	4,899.26	9.42	31.60	435,198.3240	692,526.0015	32° 11' 41.804 N	103° 42' 39.442 W
4,925.00	1.40	197.22	4,924.25	8.83	31.42	435,197.7259	692,525.8241	32° 11' 41.799 N	103° 42' 39.444 W
4,950.00	1.47	196.61	4,949.24	8.23	31.24	435,197.1269	692,525.6420	32° 11' 41.793 N	103° 42' 39.446 W
4,975.00	1.47	195.88	4,974.23	7.61	31.06	435,196.5112	692,525.4626	32° 11' 41.787 N	103° 42' 39.448 W
5,000.00	1.44	195.19	4,999.23	7.00	30.89	435,195.8996	692,525.2926	32° 11' 41.780 N	103° 42' 39.450 W
5,025.00	1.29	196.61	5,024.22	6.43	30.73	435,195.3268	692,525.1298	32° 11' 41.775 N	103° 42' 39.452 W
5,050.00	1.38	192.50	5,049.21	5.86	30.58	435,194.7632	692,524.9842	32° 11' 41.769 N	103° 42' 39.454 W
5,075.00	1.45	194.70	5,074.20	5.26	30.44	435,194.1633	692,524.8388	32° 11' 41.763 N	103° 42' 39.455 W
5,100.00	1.36	198.20	5,099.20	4.68	30.27	435,193.5756	692,524.6659	32° 11' 41.758 N	103° 42' 39.457 W
5,125.00	1.41	199.00	5,124.19	4.10	30.07	435,193.0029	692,524.4731	32° 11' 41.752 N	103° 42' 39.460 W
5,150.00	1.40	199.55	5,149.18	3.52	29.87	435,192.4243	692,524.2707	32° 11' 41.746 N	103° 42' 39.462 W
5,175.00	1.45	200.27	5,174.17	2.94	29.66	435,191.8398	692,524.0590	32° 11' 41.740 N	103° 42' 39.465 W
5,200.00	1.42	199.03	5,199.17	2.35	29.45	435,191.2502	692,523.8484	32° 11' 41.735 N	103° 42' 39.467 W
5,225.00	1.41	201.86	5,224.16	1.77	29.23	435,190.6719	692,523.6328	32° 11' 41.729 N	103° 42' 39.470 W
5,250.00	1.54	198.05	5,249.15	1.17	29.01	435,190.0670	692,523.4142	32° 11' 41.723 N	103° 42' 39.472 W
5,275.00	1.35	198.80	5,274.14	0.57	28.82	435,189.4689	692,523.2152	32° 11' 41.717 N	103° 42' 39.475 W
5,300.00	1.39	201.43	5,299.14	0.01	28.61	435,188.9078	692,523.0095	32° 11' 41.711 N	103° 42' 39.477 W
5,325.00	1.42	202.15	5,324.13	-0.56	28.38	435,188.3387	692,522.7820	32° 11' 41.706 N	103° 42' 39.480 W
5,350.00	1.40	201.17	5,349.12	-1.13	28.15	435,187.7670	692,522.5549	32° 11' 41.700 N	103° 42' 39.482 W
5,375.00	1.43	202.88	5,374.11	-1.71	27.92	435,187.1948	692,522.3233	32° 11' 41.695 N	103° 42' 39.485 W
5,400.00	1.42	201.69	5,399.10	-2.28	27.69	435,186.6195	692,522.0875	32° 11' 41.689 N	103° 42' 39.488 W
5,425.00	1.36	203.14	5,424.10	-2.84	27.46	435,186.0589	692,521.8565	32° 11' 41.683 N	103° 42' 39.491 W
5,450.00	1.48	197.69	5,449.09	-3.42	27.24	435,185.4785	692,521.6418	32° 11' 41.678 N	103° 42' 39.493 W
5,475.00	1.37	199.21	5,474.08	-4.01	27.05	435,184.8887	692,521.4453	32° 11' 41.672 N	103° 42' 39.496 W
5,500.00	1.42	198.64	5,499.07	-4.59	26.85	435,184.3130	692,521.2480	32° 11' 41.666 N	103° 42' 39.498 W
5,525.00	1.54	200.85	5,524.07	-5.19	26.63	435,183.7055	692,521.0294	32° 11' 41.660 N	103° 42' 39.500 W
5,550.00	1.29	197.18	5,549.06	-5.78	26.43	435,183.1227	692,520.8267	32° 11' 41.654 N	103° 42' 39.503 W
5,575.00	1.46	199.76	5,574.05	-6.35	26.24	435,182.5541	692,520.6359	32° 11' 41.649 N	103° 42' 39.505 W
5,600.00	1.43	198.65	5,599.04	-6.94	26.03	435,181.9588	692,520.4285	32° 11' 41.643 N	103° 42' 39.508 W
5,625.00	1.44	197.99	5,624.04	-7.54	25.83	435,181.3645	692,520.2317	32° 11' 41.637 N	103° 42' 39.510 W
5,650.00	1.33	199.79	5,649.03	-8.11	25.64	435,180.7927	692,520.0365	32° 11' 41.631 N	103° 42' 39.512 W
5,675.00	1.45	201.42	5,674.02	-8.67	25.42	435,180.2253	692,519.8227	32° 11' 41.626 N	103° 42' 39.515 W
5,700.00	1.45	199.59	5,699.01	-9.27	25.20	435,179.6328	692,519.6012	32° 11' 41.620 N	103° 42' 39.517 W
5,725.00	1.40	199.38	5,724.01	-9.85	24.99	435,179.0467	692,519.3938	32° 11' 41.614 N	103° 42' 39.520 W
5,750.00	1.40	201.65	5,749.00	-10.43	24.78	435,178.4748	692,519.1798	32° 11' 41.608 N	103° 42' 39.522 W
5,775.00	1.35	202.00	5,773.99	-10.98	24.56	435,177.9179	692,518.9568	32° 11' 41.603 N	103° 42' 39.525 W
5,800.00	1.46	203.36	5,798.98	-11.55	24.32	435,177.3524	692,518.7202	32° 11' 41.597 N	103° 42' 39.528 W
5,825.00	1.36	202.44	5,823.98	-12.11	24.08	435,176.7858	692,518.4806	32° 11' 41.592 N	103° 42' 39.531 W

Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Windward Federal 10H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3576.80ft (McVay #8)
Site:	Sec. 30, T 24 S. , R 32 E	MD Reference:	KB=26' @ 3576.80ft (McVay #8)
Well:	Windward Federal 10H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Multi User Db

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
5,850.00	1.46	204.42	5,848.97	-12.68	23.84	435,176.2216	692,518.2357	32° 11' 41.586 N	103° 42' 39.533 W
5,875.00	1.40	202.51	5,873.96	-13.25	23.59	435,175.6495	692,517.9871	32° 11' 41.581 N	103° 42' 39.536 W
5,900.00	1.37	208.40	5,898.95	-13.80	23.33	435,175.1045	692,517.7281	32° 11' 41.575 N	103° 42' 39.539 W
5,925.00	1.47	204.37	5,923.94	-14.35	23.05	435,174.5495	692,517.4536	32° 11' 41.570 N	103° 42' 39.543 W
5,950.00	1.35	208.26	5,948.94	-14.90	22.78	435,173.9980	692,517.1818	32° 11' 41.564 N	103° 42' 39.546 W
5,975.00	1.39	205.73	5,973.93	-15.43	22.51	435,173.4654	692,516.9108	32° 11' 41.559 N	103° 42' 39.549 W
6,000.00	1.51	206.62	5,998.92	-16.00	22.23	435,172.8978	692,516.6315	32° 11' 41.553 N	103° 42' 39.552 W
6,025.00	1.41	206.90	6,023.91	-16.57	21.94	435,172.3290	692,516.3448	32° 11' 41.548 N	103° 42' 39.556 W
6,050.00	1.41	207.63	6,048.91	-17.12	21.66	435,171.7822	692,516.0630	32° 11' 41.542 N	103° 42' 39.559 W
6,075.00	1.48	208.90	6,073.90	-17.67	21.36	435,171.2271	692,515.7643	32° 11' 41.537 N	103° 42' 39.563 W
6,100.00	1.40	210.84	6,098.89	-18.22	21.05	435,170.6822	692,515.4517	32° 11' 41.531 N	103° 42' 39.566 W
6,125.00	1.49	208.22	6,123.88	-18.77	20.74	435,170.1336	692,515.1415	32° 11' 41.526 N	103° 42' 39.570 W
6,150.00	1.38	214.48	6,148.87	-19.30	20.42	435,169.5990	692,514.8173	32° 11' 41.521 N	103° 42' 39.574 W
6,175.00	1.33	212.70	6,173.87	-19.79	20.09	435,169.1067	692,514.4902	32° 11' 41.516 N	103° 42' 39.578 W
6,200.00	1.44	213.70	6,198.86	-20.30	19.76	435,168.6012	692,514.1591	32° 11' 41.511 N	103° 42' 39.581 W
6,225.00	1.37	217.52	6,223.85	-20.80	19.40	435,168.1029	692,513.8028	32° 11' 41.506 N	103° 42' 39.586 W
6,250.00	1.40	214.86	6,248.85	-21.28	19.05	435,167.6152	692,513.4463	32° 11' 41.501 N	103° 42' 39.590 W
6,275.00	1.37	216.13	6,273.84	-21.78	18.70	435,167.1233	692,513.0955	32° 11' 41.496 N	103° 42' 39.594 W
6,300.00	1.54	214.17	6,298.83	-22.30	18.33	435,166.6039	692,512.7306	32° 11' 41.491 N	103° 42' 39.598 W
6,325.00	1.49	214.02	6,323.82	-22.84	17.96	435,166.0566	692,512.3601	32° 11' 41.486 N	103° 42' 39.603 W
6,350.00	1.38	217.05	6,348.81	-23.35	17.60	435,165.5469	692,511.9968	32° 11' 41.481 N	103° 42' 39.607 W
6,375.00	1.48	217.47	6,373.81	-23.85	17.22	435,165.0504	692,511.6191	32° 11' 41.476 N	103° 42' 39.611 W
6,400.00	1.40	214.64	6,398.80	-24.36	16.85	435,164.5429	692,511.2491	32° 11' 41.471 N	103° 42' 39.616 W
6,425.00	1.44	218.77	6,423.79	-24.85	16.48	435,164.0467	692,510.8788	32° 11' 41.466 N	103° 42' 39.620 W
6,450.00	1.50	215.20	6,448.78	-25.37	16.09	435,163.5345	692,510.4934	32° 11' 41.461 N	103° 42' 39.624 W
6,475.00	1.36	222.44	6,473.77	-25.85	15.70	435,163.0481	692,510.1046	32° 11' 41.456 N	103° 42' 39.629 W
6,500.00	1.35	222.03	6,498.77	-26.29	15.31	435,162.6104	692,509.7072	32° 11' 41.452 N	103° 42' 39.634 W
6,525.00	1.43	218.34	6,523.76	-26.75	14.92	435,162.1470	692,509.3166	32° 11' 41.447 N	103° 42' 39.638 W
6,550.00	1.39	219.82	6,548.75	-27.23	14.53	435,161.6695	692,508.9289	32° 11' 41.443 N	103° 42' 39.643 W
6,575.00	1.47	221.68	6,573.74	-27.70	14.12	435,161.1971	692,508.5215	32° 11' 41.438 N	103° 42' 39.648 W
6,600.00	1.44	222.43	6,598.74	-28.17	13.70	435,160.7257	692,508.0963	32° 11' 41.433 N	103° 42' 39.652 W
6,625.00	1.41	221.28	6,623.73	-28.64	13.28	435,160.2627	692,507.6814	32° 11' 41.429 N	103° 42' 39.657 W
6,650.00	1.58	219.84	6,648.72	-29.13	12.86	435,159.7669	692,507.2577	32° 11' 41.424 N	103° 42' 39.662 W
6,675.00	1.48	220.20	6,673.71	-29.64	12.43	435,159.2557	692,506.8285	32° 11' 41.419 N	103° 42' 39.667 W
6,700.00	1.40	219.28	6,698.70	-30.13	12.03	435,158.7727	692,506.4268	32° 11' 41.414 N	103° 42' 39.672 W
6,725.00	1.30	217.03	6,723.70	-30.59	11.66	435,158.3099	692,506.0626	32° 11' 41.410 N	103° 42' 39.676 W
6,750.00	1.26	219.81	6,748.69	-31.03	11.32	435,157.8724	692,505.7159	32° 11' 41.405 N	103° 42' 39.680 W
6,775.00	0.98	211.83	6,773.69	-31.42	11.03	435,157.4796	692,505.4271	32° 11' 41.401 N	103° 42' 39.684 W
6,800.00	0.06	126.61	6,798.68	-31.61	10.92	435,157.2901	692,505.3249	32° 11' 41.400 N	103° 42' 39.685 W
6,825.00	0.37	29.96	6,823.68	-31.55	10.98	435,157.3522	692,505.3757	32° 11' 41.400 N	103° 42' 39.684 W
6,850.00	0.40	25.59	6,848.68	-31.40	11.05	435,157.5009	692,505.4537	32° 11' 41.402 N	103° 42' 39.683 W
6,875.00	0.63	26.32	6,873.68	-31.20	11.15	435,157.7028	692,505.5523	32° 11' 41.404 N	103° 42' 39.682 W
6,900.00	0.64	24.02	6,898.68	-30.95	11.27	435,157.9535	692,505.6701	32° 11' 41.406 N	103° 42' 39.681 W
6,925.00	0.56	25.09	6,923.68	-30.71	11.38	435,158.1917	692,505.7788	32° 11' 41.408 N	103° 42' 39.680 W
6,950.00	0.54	20.04	6,948.68	-30.49	11.47	435,158.4130	692,505.8709	32° 11' 41.411 N	103° 42' 39.679 W
6,975.00	0.50	25.67	6,973.68	-30.28	11.56	435,158.6220	692,505.9586	32° 11' 41.413 N	103° 42' 39.678 W
7,000.00	0.61	22.17	6,998.68	-30.06	11.66	435,158.8435	692,506.0560	32° 11' 41.415 N	103° 42' 39.676 W
7,025.00	0.58	25.82	7,023.68	-29.82	11.76	435,159.0807	692,506.1614	32° 11' 41.417 N	103° 42' 39.675 W
7,050.00	0.51	22.60	7,048.67	-29.60	11.86	435,159.2973	692,506.2592	32° 11' 41.419 N	103° 42' 39.674 W
7,075.00	0.54	36.31	7,073.67	-29.41	11.97	435,159.4950	692,506.3717	32° 11' 41.421 N	103° 42' 39.673 W
7,100.00	0.45	32.71	7,098.67	-29.23	12.09	435,159.6725	692,506.4946	32° 11' 41.423 N	103° 42' 39.671 W
7,125.00	0.40	14.92	7,123.67	-29.06	12.17	435,159.8394	692,506.5701	32° 11' 41.425 N	103° 42' 39.670 W
7,150.00	0.47	25.58	7,148.67	-28.88	12.24	435,160.0162	692,506.6368	32° 11' 41.426 N	103° 42' 39.670 W
7,175.00	0.46	23.47	7,173.67	-28.70	12.32	435,160.2008	692,506.7211	32° 11' 41.428 N	103° 42' 39.669 W
7,200.00	0.31	37.61	7,198.67	-28.55	12.40	435,160.3464	692,506.8023	32° 11' 41.430 N	103° 42' 39.668 W

Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Windward Federal 10H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3576.80ft (McVay #8)
Site:	Sec. 30, T 24 S., R 32 E	MD Reference:	KB=26' @ 3576.80ft (McVay #8)
Well:	Windward Federal 10H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Multi User Db

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
7,225.00	0.36	31.03	7,223.67	-28.43	12.48	435,160.4673	692,506.8841	32° 11' 41.431 N	103° 42' 39.667 W
7,250.00	0.41	28.97	7,248.67	-28.29	12.57	435,160.6128	692,506.9679	32° 11' 41.432 N	103° 42' 39.666 W
7,275.00	0.42	30.06	7,273.67	-28.13	12.66	435,160.7704	692,507.0571	32° 11' 41.434 N	103° 42' 39.665 W
7,300.00	0.35	35.58	7,298.67	-27.99	12.75	435,160.9118	692,507.1474	32° 11' 41.435 N	103° 42' 39.664 W
7,325.00	0.31	48.52	7,323.67	-27.88	12.84	435,161.0187	692,507.2425	32° 11' 41.436 N	103° 42' 39.662 W
7,350.00	0.38	46.45	7,348.67	-27.78	12.95	435,161.1206	692,507.3533	32° 11' 41.437 N	103° 42' 39.661 W
7,375.00	0.34	44.96	7,373.67	-27.67	13.07	435,161.2302	692,507.4658	32° 11' 41.438 N	103° 42' 39.660 W
7,400.00	0.29	63.83	7,398.67	-27.59	13.17	435,161.3106	692,507.5750	32° 11' 41.439 N	103° 42' 39.659 W
7,425.00	0.32	61.88	7,423.66	-27.53	13.29	435,161.3714	692,507.6933	32° 11' 41.440 N	103° 42' 39.657 W
7,450.00	0.32	59.68	7,448.66	-27.46	13.42	435,161.4396	692,507.8151	32° 11' 41.440 N	103° 42' 39.656 W
7,475.00	0.30	69.26	7,473.66	-27.40	13.54	435,161.4980	692,507.9366	32° 11' 41.441 N	103° 42' 39.654 W
7,500.00	0.29	54.94	7,498.66	-27.34	13.65	435,161.5575	692,508.0496	32° 11' 41.442 N	103° 42' 39.653 W
7,525.00	0.29	79.11	7,523.66	-27.29	13.76	435,161.6058	692,508.1635	32° 11' 41.442 N	103° 42' 39.652 W
7,550.00	0.36	81.85	7,548.66	-27.27	13.90	435,161.6289	692,508.3034	32° 11' 41.442 N	103° 42' 39.650 W
7,575.00	0.36	69.86	7,573.66	-27.23	14.05	435,161.6671	692,508.4549	32° 11' 41.443 N	103° 42' 39.648 W
7,600.00	0.44	63.98	7,598.66	-27.16	14.21	435,161.7362	692,508.6149	32° 11' 41.443 N	103° 42' 39.646 W
7,625.00	0.40	91.41	7,623.66	-27.12	14.39	435,161.7762	692,508.7884	32° 11' 41.444 N	103° 42' 39.644 W
7,650.00	0.39	77.74	7,648.66	-27.11	14.56	435,161.7921	692,508.9588	32° 11' 41.444 N	103° 42' 39.642 W
7,675.00	0.47	81.63	7,673.66	-27.07	14.74	435,161.8251	692,509.1434	32° 11' 41.444 N	103° 42' 39.640 W
7,700.00	0.46	83.28	7,698.66	-27.05	14.94	435,161.8518	692,509.3445	32° 11' 41.444 N	103° 42' 39.638 W
7,725.00	0.47	94.27	7,723.66	-27.04	15.15	435,161.8559	692,509.5464	32° 11' 41.444 N	103° 42' 39.636 W
7,750.00	0.46	91.40	7,748.66	-27.05	15.35	435,161.8458	692,509.7490	32° 11' 41.444 N	103° 42' 39.633 W
7,775.00	0.47	92.73	7,773.66	-27.06	15.55	435,161.8385	692,509.9517	32° 11' 41.444 N	103° 42' 39.631 W
7,800.00	0.53	93.99	7,798.66	-27.07	15.77	435,161.8255	692,510.1695	32° 11' 41.444 N	103° 42' 39.628 W
7,825.00	0.43	104.86	7,823.66	-27.11	15.98	435,161.7934	692,510.3755	32° 11' 41.444 N	103° 42' 39.626 W
7,850.00	0.49	109.85	7,848.65	-27.17	16.17	435,161.7331	692,510.5667	32° 11' 41.443 N	103° 42' 39.624 W
7,875.00	0.58	106.27	7,873.65	-27.24	16.39	435,161.6613	692,510.7887	32° 11' 41.442 N	103° 42' 39.621 W
7,900.00	0.57	116.60	7,898.65	-27.33	16.62	435,161.5702	692,511.0214	32° 11' 41.442 N	103° 42' 39.618 W
7,925.00	0.55	106.57	7,923.65	-27.42	16.85	435,161.4803	692,511.2476	32° 11' 41.441 N	103° 42' 39.616 W
7,950.00	0.60	115.51	7,948.65	-27.51	17.08	435,161.3897	692,511.4807	32° 11' 41.440 N	103° 42' 39.613 W
7,975.00	0.58	115.60	7,973.65	-27.62	17.31	435,161.2786	692,511.7130	32° 11' 41.439 N	103° 42' 39.610 W
8,000.00	0.53	115.32	7,998.65	-27.73	17.53	435,161.1745	692,511.9316	32° 11' 41.438 N	103° 42' 39.608 W
8,025.00	0.55	110.61	8,023.65	-27.82	17.75	435,161.0828	692,512.1484	32° 11' 41.437 N	103° 42' 39.605 W
8,050.00	0.56	112.80	8,048.64	-27.91	17.97	435,160.9933	692,512.3734	32° 11' 41.436 N	103° 42' 39.603 W
8,075.00	0.60	119.62	8,073.64	-28.02	18.20	435,160.8812	692,512.5998	32° 11' 41.435 N	103° 42' 39.600 W
8,100.00	0.58	118.58	8,098.64	-28.14	18.42	435,160.7560	692,512.8247	32° 11' 41.433 N	103° 42' 39.597 W
8,125.00	0.56	116.32	8,123.64	-28.26	18.65	435,160.6413	692,513.0453	32° 11' 41.432 N	103° 42' 39.595 W
8,150.00	0.50	124.18	8,148.64	-28.37	18.85	435,160.5258	692,513.2451	32° 11' 41.431 N	103° 42' 39.593 W
8,175.00	0.54	123.21	8,173.64	-28.50	19.03	435,160.4000	692,513.4339	32° 11' 41.430 N	103° 42' 39.590 W
8,200.00	0.52	138.07	8,198.64	-28.65	19.21	435,160.2511	692,513.6082	32° 11' 41.428 N	103° 42' 39.588 W
8,225.00	0.45	139.18	8,223.64	-28.81	19.35	435,160.0924	692,513.7482	32° 11' 41.427 N	103° 42' 39.587 W
8,250.00	0.48	140.53	8,248.64	-28.96	19.48	435,159.9373	692,513.8790	32° 11' 41.425 N	103° 42' 39.585 W
8,275.00	0.47	147.60	8,273.64	-29.13	19.60	435,159.7699	692,514.0005	32° 11' 41.424 N	103° 42' 39.584 W
8,300.00	0.52	154.29	8,298.63	-29.32	19.70	435,159.5811	692,514.1046	32° 11' 41.422 N	103° 42' 39.583 W
8,325.00	0.48	158.21	8,323.63	-29.52	19.79	435,159.3816	692,514.1927	32° 11' 41.420 N	103° 42' 39.582 W
8,350.00	0.50	137.54	8,348.63	-29.70	19.91	435,159.2039	692,514.3052	32° 11' 41.418 N	103° 42' 39.580 W
8,375.00	0.58	170.87	8,373.63	-29.90	20.00	435,158.9985	692,514.3989	32° 11' 41.416 N	103° 42' 39.579 W
8,400.00	0.56	159.74	8,398.63	-30.14	20.06	435,158.7590	692,514.4613	32° 11' 41.414 N	103° 42' 39.579 W
8,425.00	0.58	159.23	8,423.63	-30.37	20.15	435,158.5260	692,514.5485	32° 11' 41.411 N	103° 42' 39.578 W
8,450.00	0.59	160.48	8,448.63	-30.61	20.24	435,158.2864	692,514.6364	32° 11' 41.409 N	103° 42' 39.577 W
8,475.00	0.61	161.22	8,473.63	-30.86	20.32	435,158.0391	692,514.7222	32° 11' 41.406 N	103° 42' 39.576 W
8,500.00	0.63	158.08	8,498.62	-31.11	20.42	435,157.7856	692,514.8164	32° 11' 41.404 N	103° 42' 39.574 W
8,514.00	0.57	152.44	8,512.62	-31.25	20.48	435,157.6525	692,514.8773	32° 11' 41.403 N	103° 42' 39.574 W
8,683.00	9.70	171.90	8,680.77	-46.12	22.88	435,142.7802	692,517.2774	32° 11' 41.255 N	103° 42' 39.547 W

First IDS MWD Survey

Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Windward Federal 10H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3576.80ft (McVay #8)
Site:	Sec. 30, T 24 S. , R 32 E	MD Reference:	KB=26' @ 3576.80ft (McVay #8)
Well:	Windward Federal 10H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Multi User Db

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
8,730.00	17.20	173.50	8,726.45	-56.96	24.22	435,131.9403	692,518.6239	32° 11' 41.148 N	103° 42' 39.532 W
8,777.00	22.00	174.10	8,770.71	-72.63	25.92	435,116.2700	692,520.3165	32° 11' 40.993 N	103° 42' 39.513 W
8,824.00	26.20	175.20	8,813.61	-91.73	27.69	435,097.1658	692,522.0904	32° 11' 40.804 N	103° 42' 39.494 W
8,871.00	29.70	172.20	8,855.12	-113.62	30.14	435,075.2834	692,524.5396	32° 11' 40.587 N	103° 42' 39.467 W
8,918.00	33.00	171.70	8,895.25	-137.82	33.57	435,051.0762	692,527.9684	32° 11' 40.347 N	103° 42' 39.429 W
8,965.00	36.40	174.10	8,933.89	-164.37	36.85	435,024.5308	692,531.2506	32° 11' 40.084 N	103° 42' 39.392 W
9,012.00	41.30	174.10	8,970.48	-193.69	39.88	434,995.2136	692,534.2802	32° 11' 39.794 N	103° 42' 39.359 W
9,060.00	48.00	170.30	9,004.62	-227.07	44.52	434,961.8330	692,538.9197	32° 11' 39.463 N	103° 42' 39.307 W
9,107.00	53.70	170.50	9,034.28	-262.99	50.59	434,925.9096	692,544.9930	32° 11' 39.108 N	103° 42' 39.239 W
9,149.00	56.94	168.69	9,058.17	-296.95	56.84	434,891.9480	692,551.2401	32° 11' 38.771 N	103° 42' 39.169 W
9,182.00	58.76	165.93	9,075.74	-324.20	62.98	434,864.6976	692,557.3831	32° 11' 38.501 N	103° 42' 39.099 W
9,215.00	59.80	164.16	9,092.59	-351.61	70.31	434,837.2919	692,564.7058	32° 11' 38.230 N	103° 42' 39.016 W
9,246.00	62.53	164.42	9,107.54	-377.75	77.66	434,811.1523	692,572.0574	32° 11' 37.970 N	103° 42' 38.932 W
9,277.00	65.49	165.08	9,121.13	-404.63	84.98	434,784.2713	692,579.3839	32° 11' 37.704 N	103° 42' 38.848 W
9,309.00	68.50	165.66	9,133.63	-433.13	92.42	434,755.7743	692,586.8210	32° 11' 37.422 N	103° 42' 38.764 W
9,340.00	71.88	165.24	9,144.14	-461.35	99.75	434,727.5487	692,594.1481	32° 11' 37.142 N	103° 42' 38.680 W
9,371.00	75.47	165.24	9,152.85	-490.12	107.33	434,698.7850	692,601.7264	32° 11' 36.857 N	103° 42' 38.594 W
9,404.00	79.14	165.32	9,160.10	-521.25	115.51	434,667.6537	692,609.9050	32° 11' 36.548 N	103° 42' 38.501 W
9,435.00	81.03	166.05	9,165.44	-550.83	123.05	434,638.0663	692,617.4544	32° 11' 36.255 N	103° 42' 38.415 W
9,467.00	82.53	166.88	9,170.01	-581.63	130.47	434,607.2758	692,624.8660	32° 11' 35.950 N	103° 42' 38.331 W
9,498.00	84.00	167.64	9,173.65	-611.65	137.25	434,577.2487	692,631.6546	32° 11' 35.652 N	103° 42' 38.254 W
9,561.00	87.35	168.19	9,178.40	-673.07	150.40	434,515.8293	692,644.8042	32° 11' 35.044 N	103° 42' 38.105 W
9,655.00	89.14	168.94	9,181.28	-765.16	169.03	434,423.7429	692,663.4304	32° 11' 34.131 N	103° 42' 37.895 W
9,749.00	90.18	172.00	9,181.83	-857.85	184.59	434,331.0543	692,678.9909	32° 11' 33.213 N	103° 42' 37.720 W
9,844.00	90.91	172.30	9,180.93	-951.95	197.57	434,236.9497	692,691.9653	32° 11' 32.281 N	103° 42' 37.575 W
9,938.00	90.94	172.41	9,179.41	-1,045.10	210.07	434,143.7976	692,704.4689	32° 11' 31.359 N	103° 42' 37.436 W
10,033.00	90.32	174.65	9,178.37	-1,139.49	220.77	434,049.4150	692,715.1723	32° 11' 30.424 N	103° 42' 37.318 W
10,127.00	89.26	177.44	9,178.71	-1,233.25	227.26	433,955.6503	692,721.6550	32° 11' 29.496 N	103° 42' 37.249 W
10,221.00	88.75	178.34	9,180.35	-1,327.17	230.72	433,861.7296	692,725.1154	32° 11' 28.566 N	103° 42' 37.215 W
10,316.00	89.90	178.10	9,181.46	-1,422.12	233.67	433,766.7839	692,728.0660	32° 11' 27.627 N	103° 42' 37.187 W
10,410.00	90.38	178.51	9,181.24	-1,516.08	236.45	433,672.8260	692,730.8465	32° 11' 26.697 N	103° 42' 37.161 W
10,504.00	93.27	179.10	9,178.24	-1,610.00	238.41	433,578.9047	692,732.8060	32° 11' 25.767 N	103° 42' 37.144 W
10,599.00	93.32	178.23	9,172.78	-1,704.81	240.62	433,484.0886	692,735.0156	32° 11' 24.829 N	103° 42' 37.125 W
10,693.00	89.65	178.53	9,170.35	-1,798.73	243.27	433,390.1741	692,737.6715	32° 11' 23.899 N	103° 42' 37.100 W
10,787.00	88.81	178.81	9,171.61	-1,892.69	245.45	433,296.2091	692,739.8531	32° 11' 22.969 N	103° 42' 37.081 W
10,882.00	89.45	178.39	9,173.05	-1,987.65	247.77	433,201.2493	692,742.1739	32° 11' 22.029 N	103° 42' 37.061 W
10,976.00	89.12	179.74	9,174.22	-2,081.63	249.31	433,107.2716	692,743.7077	32° 11' 21.099 N	103° 42' 37.049 W
11,070.00	89.37	179.94	9,175.46	-2,175.62	249.57	433,013.2804	692,743.9702	32° 11' 20.169 N	103° 42' 37.052 W
11,165.00	90.21	180.97	9,175.81	-2,270.62	248.82	432,918.2864	692,743.2157	32° 11' 19.229 N	103° 42' 37.068 W
11,259.00	90.46	181.38	9,175.26	-2,364.60	246.89	432,824.3082	692,741.2882	32° 11' 18.299 N	103° 42' 37.096 W
11,354.00	90.35	179.98	9,174.59	-2,459.59	245.76	432,729.3199	692,740.1608	32° 11' 17.359 N	103° 42' 37.116 W
11,448.00	90.69	180.29	9,173.74	-2,553.58	245.54	432,635.3244	692,739.9394	32° 11' 16.429 N	103° 42' 37.125 W
11,542.00	91.25	180.25	9,172.15	-2,647.57	245.10	432,541.3395	692,739.4965	32° 11' 15.499 N	103° 42' 37.136 W
11,637.00	89.23	179.53	9,171.75	-2,742.56	245.28	432,446.3462	692,739.6789	32° 11' 14.559 N	103° 42' 37.141 W
11,731.00	89.40	180.04	9,172.87	-2,836.55	245.63	432,352.3541	692,740.0316	32° 11' 13.629 N	103° 42' 37.143 W
11,825.00	89.57	180.67	9,173.72	-2,930.55	245.05	432,258.3604	692,739.4492	32° 11' 12.699 N	103° 42' 37.156 W
11,919.00	89.26	180.65	9,174.68	-3,024.53	243.97	432,164.3719	692,738.3665	32° 11' 11.769 N	103° 42' 37.175 W
12,013.00	89.01	181.10	9,176.10	-3,118.51	242.53	432,070.3941	692,736.9312	32° 11' 10.839 N	103° 42' 37.198 W
12,108.00	88.84	182.25	9,177.88	-3,213.45	239.76	431,975.4532	692,734.1549	32° 11' 9.899 N	103° 42' 37.237 W
12,202.00	89.93	179.69	9,178.89	-3,307.43	238.16	431,881.4815	692,732.5640	32° 11' 8.970 N	103° 42' 37.261 W
12,296.00	90.71	179.97	9,178.36	-3,401.42	238.44	431,787.4844	692,732.8429	32° 11' 8.039 N	103° 42' 37.264 W
12,390.00	91.19	179.88	9,176.80	-3,495.41	238.57	431,693.4978	692,732.9660	32° 11' 7.109 N	103° 42' 37.269 W
12,485.00	87.49	178.95	9,177.90	-3,590.38	239.54	431,598.5268	692,733.9354	32° 11' 6.169 N	103° 42' 37.265 W
12,580.00	85.89	179.22	9,183.38	-3,685.21	241.05	431,503.7008	692,735.4500	32° 11' 5.231 N	103° 42' 37.253 W
12,675.00	89.29	179.63	9,187.38	-3,780.10	242.00	431,408.8039	692,736.4020	32° 11' 4.292 N	103° 42' 37.249 W

Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Windward Federal 10H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3576.80ft (McVay #8)
Site:	Sec. 30, T 24 S. , R 32 E	MD Reference:	KB=26' @ 3576.80ft (McVay #8)
Well:	Windward Federal 10H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Multi User Db

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
12,769.00	90.07	180.26	9,187.90	-3,874.10	242.09	431,314.8068	692,736.4922	32° 11' 3.362 N	103° 42' 37.254 W
12,864.00	88.89	180.10	9,188.76	-3,969.09	241.79	431,219.8130	692,736.1938	32° 11' 2.422 N	103° 42' 37.264 W
12,959.00	92.03	178.47	9,188.00	-4,064.07	242.98	431,124.8388	692,737.3787	32° 11' 1.482 N	103° 42' 37.256 W
13,054.00	92.93	178.26	9,183.89	-4,158.94	245.69	431,029.9676	692,740.0866	32° 11' 0.543 N	103° 42' 37.231 W
13,148.00	93.55	178.32	9,178.58	-4,252.75	248.49	430,936.1603	692,742.8872	32° 10' 59.614 N	103° 42' 37.205 W
13,243.00	90.63	177.95	9,175.11	-4,347.62	251.58	430,841.2844	692,745.9768	32° 10' 58.675 N	103° 42' 37.175 W
13,338.00	90.32	177.57	9,174.33	-4,442.55	255.29	430,746.3608	692,749.6898	32° 10' 57.736 N	103° 42' 37.139 W
13,433.00	91.39	177.84	9,172.91	-4,537.46	259.09	430,651.4492	692,753.4936	32° 10' 56.796 N	103° 42' 37.101 W
13,527.00	90.21	178.50	9,171.60	-4,631.40	262.10	430,557.5086	692,756.4949	32° 10' 55.866 N	103° 42' 37.072 W
13,623.00	89.62	178.88	9,171.74	-4,727.37	264.29	430,461.5346	692,758.6896	32° 10' 54.917 N	103° 42' 37.053 W
13,718.00	92.37	179.93	9,170.09	-4,822.35	265.28	430,366.5647	692,759.6763	32° 10' 53.977 N	103° 42' 37.048 W
13,813.00	92.54	179.99	9,166.02	-4,917.26	265.34	430,271.6522	692,759.7425	32° 10' 53.037 N	103° 42' 37.054 W
13,907.00	92.40	179.39	9,161.97	-5,011.17	265.85	430,177.7415	692,760.2507	32° 10' 52.108 N	103° 42' 37.054 W
14,001.00	94.08	179.26	9,156.66	-5,105.01	266.96	430,083.9018	692,761.3562	32° 10' 51.179 N	103° 42' 37.048 W
14,096.00	91.75	179.07	9,151.83	-5,199.87	268.34	429,989.0416	692,762.7389	32° 10' 50.241 N	103° 42' 37.038 W
14,190.00	91.16	179.57	9,149.44	-5,293.83	269.45	429,895.0794	692,763.8540	32° 10' 49.311 N	103° 42' 37.031 W
14,284.00	91.84	178.56	9,146.98	-5,387.78	270.99	429,801.1261	692,765.3872	32° 10' 48.381 N	103° 42' 37.020 W
14,378.00	94.47	178.39	9,141.80	-5,481.60	273.49	429,707.3103	692,767.8847	32° 10' 47.452 N	103° 42' 36.997 W
14,473.00	91.75	178.48	9,136.65	-5,576.42	276.08	429,612.4947	692,770.4751	32° 10' 46.514 N	103° 42' 36.973 W
14,558.00	90.10	179.14	9,135.28	-5,661.38	277.84	429,527.5277	692,772.2399	32° 10' 45.673 N	103° 42' 36.958 W
14,653.00	90.18	178.21	9,135.05	-5,756.36	280.04	429,432.5547	692,774.4366	32° 10' 44.733 N	103° 42' 36.939 W
14,748.00	91.89	179.33	9,133.33	-5,851.31	282.08	429,337.5973	692,776.4757	32° 10' 43.793 N	103° 42' 36.922 W
14,842.00	91.50	179.58	9,130.55	-5,945.27	282.97	429,243.6431	692,777.3694	32° 10' 42.863 N	103° 42' 36.918 W
14,937.00	90.46	178.94	9,128.93	-6,040.25	284.20	429,148.6669	692,778.5962	32° 10' 41.923 N	103° 42' 36.910 W
15,031.00	92.87	180.01	9,126.19	-6,134.19	285.06	429,054.7190	692,779.4576	32° 10' 40.994 N	103° 42' 36.906 W
15,125.00	91.81	179.73	9,122.36	-6,228.11	285.27	428,960.7993	692,779.6708	32° 10' 40.064 N	103° 42' 36.910 W
15,220.00	90.41	178.80	9,120.52	-6,323.08	286.49	428,865.8285	692,780.8893	32° 10' 39.124 N	103° 42' 36.902 W
15,314.00	92.37	180.09	9,118.24	-6,417.05	287.40	428,771.8673	692,781.8000	32° 10' 38.194 N	103° 42' 36.898 W
15,409.00	93.12	180.52	9,113.69	-6,511.93	286.90	428,676.9788	692,781.2950	32° 10' 37.256 N	103° 42' 36.910 W
15,503.00	89.71	179.88	9,111.37	-6,605.89	286.57	428,583.0226	692,780.9674	32° 10' 36.326 N	103° 42' 36.920 W
15,597.00	88.50	181.59	9,112.83	-6,699.87	285.36	428,489.0472	692,779.7620	32° 10' 35.396 N	103° 42' 36.941 W
15,692.00	87.88	179.48	9,115.83	-6,794.81	284.48	428,394.1048	692,778.8752	32° 10' 34.456 N	103° 42' 36.958 W
15,786.00	89.37	180.21	9,118.09	-6,888.78	284.73	428,300.1356	692,779.1292	32° 10' 33.526 N	103° 42' 36.961 W
15,879.00	89.15	181.60	9,119.29	-6,981.76	283.26	428,207.1575	692,777.6605	32° 10' 32.606 N	103° 42' 36.984 W
15,974.00	89.15	182.13	9,120.70	-7,076.70	280.17	428,112.2188	692,774.5691	32° 10' 31.667 N	103° 42' 37.027 W
16,068.00	89.31	182.75	9,121.96	-7,170.60	276.17	428,018.3132	692,770.5676	32° 10' 30.738 N	103° 42' 37.080 W
16,162.00	88.00	180.46	9,124.17	-7,264.53	273.54	427,924.3845	692,767.9352	32° 10' 29.809 N	103° 42' 37.116 W
16,257.00	87.32	178.19	9,128.05	-7,359.44	274.65	427,829.4772	692,769.0529	32° 10' 28.869 N	103° 42' 37.110 W
16,351.00	86.76	178.74	9,132.90	-7,453.28	277.17	427,735.6373	692,771.5677	32° 10' 27.941 N	103° 42' 37.087 W
16,445.00	86.76	178.99	9,138.22	-7,547.11	279.03	427,641.8062	692,773.4267	32° 10' 27.012 N	103° 42' 37.072 W
16,540.00	88.39	178.44	9,142.24	-7,642.00	281.16	427,546.9189	692,775.5554	32° 10' 26.073 N	103° 42' 37.053 W
16,634.00	88.64	178.08	9,144.67	-7,735.92	284.01	427,452.9942	692,778.4086	32° 10' 25.143 N	103° 42' 37.026 W
16,728.00	88.08	178.59	9,147.36	-7,829.84	286.74	427,359.0732	692,781.1388	32° 10' 24.214 N	103° 42' 37.001 W
16,822.00	87.80	178.62	9,150.74	-7,923.75	289.03	427,265.1621	692,783.4257	32° 10' 23.284 N	103° 42' 36.981 W
16,917.00	87.80	178.85	9,154.39	-8,018.66	291.12	427,170.2555	692,785.5215	32° 10' 22.345 N	103° 42' 36.963 W
17,012.00	87.88	178.75	9,157.97	-8,113.57	293.11	427,075.3441	692,787.5096	32° 10' 21.406 N	103° 42' 36.946 W
17,106.00	87.74	178.37	9,161.56	-8,207.47	295.47	426,981.4428	692,789.8701	32° 10' 20.476 N	103° 42' 36.925 W
17,201.00	88.39	179.89	9,164.77	-8,302.41	296.91	426,886.5114	692,791.3114	32° 10' 19.537 N	103° 42' 36.914 W
17,295.00	87.97	179.87	9,167.75	-8,396.36	297.11	426,792.5594	692,791.5082	32° 10' 18.607 N	103° 42' 36.918 W
17,390.00	89.37	180.03	9,169.96	-8,491.33	297.19	426,697.5876	692,791.5910	32° 10' 17.667 N	103° 42' 36.924 W
17,485.00	89.54	180.25	9,170.86	-8,586.32	296.96	426,602.5925	692,791.3589	32° 10' 16.727 N	103° 42' 36.933 W
17,580.00	89.79	179.97	9,171.42	-8,681.32	296.78	426,507.5946	692,791.1765	32° 10' 15.787 N	103° 42' 36.942 W
17,674.00	90.21	180.22	9,171.42	-8,775.32	296.62	426,413.5952	692,791.0207	32° 10' 14.857 N	103° 42' 36.950 W
17,769.00	90.32	180.15	9,170.98	-8,870.32	296.31	426,318.5969	692,790.7139	32° 10' 13.917 N	103° 42' 36.960 W
17,863.00	88.61	179.79	9,171.86	-8,964.31	296.36	426,224.6049	692,790.7631	32° 10' 12.987 N	103° 42' 36.965 W

Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Windward Federal 10H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=26' @ 3576.80ft (McVay #8)
Site:	Sec. 30, T 24 S. , R 32 E	MD Reference:	KB=26' @ 3576.80ft (McVay #8)
Well:	Windward Federal 10H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Multi User Db

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
17,959.00	88.56	180.05	9,174.23	-9,060.28	296.50	426,128.6345	692,790.8971	32° 10' 12.037 N	103° 42' 36.970 W
18,054.00	88.50	180.28	9,176.66	-9,155.25	296.22	426,033.6664	692,790.6236	32° 10' 11.097 N	103° 42' 36.980 W
18,149.00	87.88	179.85	9,179.66	-9,250.20	296.12	425,938.7148	692,790.5158	32° 10' 10.157 N	103° 42' 36.988 W
18,244.00	87.60	179.66	9,183.41	-9,345.13	296.52	425,843.7898	692,790.9217	32° 10' 9.218 N	103° 42' 36.989 W
18,338.00	86.99	179.79	9,187.85	-9,439.02	296.97	425,749.8963	692,791.3724	32° 10' 8.289 N	103° 42' 36.990 W
18,433.00	87.01	179.93	9,192.82	-9,533.89	297.20	425,655.0270	692,791.6042	32° 10' 7.350 N	103° 42' 36.994 W
18,527.00	87.74	180.26	9,197.12	-9,627.79	297.05	425,561.1267	692,791.4484	32° 10' 6.421 N	103° 42' 37.002 W
18,622.00	88.70	180.32	9,200.07	-9,722.74	296.57	425,466.1752	692,790.9678	32° 10' 5.481 N	103° 42' 37.014 W
18,716.00	87.94	179.71	9,202.83	-9,816.70	296.54	425,372.2169	692,790.9431	32° 10' 4.551 N	103° 42' 37.021 W
18,811.00	86.87	179.18	9,207.13	-9,911.60	297.46	425,277.3207	692,791.8622	32° 10' 3.612 N	103° 42' 37.016 W
18,905.00	86.43	179.45	9,212.62	-10,005.43	298.58	425,183.4885	692,792.9841	32° 10' 2.684 N	103° 42' 37.010 W
Final IDS MWD Survey									
19,025.00	86.43	179.45	9,220.10	-10,125.19	299.73	425,063.7271	692,794.1338	32° 10' 1.498 N	103° 42' 37.004 W
Projection to TD									

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
8,683.00	8,680.77	-46.12	22.88	First IDS MWD Survey
18,905.00	9,212.62	-10,005.43	298.58	Final IDS MWD Survey
19,025.00	9,220.10	-10,125.19	299.73	Projection to TD

Checked By: _____ Approved By: _____ Date: _____