



Directional Survey

DELAWARE BASIN EAST UNRESTRICTED

HOBBS OCD

JAN 28 2016

Well Name: BLACK MAMBA 15 STATE COM 8H

Sub-Division DELAWARE BASIN EAST	Region BASIN EAST	Field Name JOHNSON RANCH	County LEA	State/Province NM		
Surface Legal Location SEC10 T23S R33E	API/UWI 3002542630	Latitude (") 32° 18' 47.734" N	Longitude (") 103° 33' 14.918" W	Orig KB Elevation (ft) 3,678.30	Ground Elev MSL (ft) 3,651.30	KB - GL (ft) 27.00

Wellbores	Parent Wellbore	SAP Well ID	Vertical Section Direction (")
OH		38791	179.26

Kick Offs & Key Depths			
Date 9/5/2015	Type CURVE	Top Depth (ftKB) 10,338.0	
Actual Deviation Survey EXTREME, Proposed? No	Definitive? No	Proposed? No	Proposed Deviation Survey

Deviation Survey					
Date 8/24/2015		Description EXTREME			
MD Tie In (ftKB)	TVD Tie In (ftKB)	Inclination Tie In (°)	Azimuth Tie In (°)	NSTie In (ft)	EWTTie In (ft)

Survey Data										
Date	MD (ftKB)	Incl (")	Azm (")	TVD (ftKB)	VS (ft)	N/S (ft)	E/W (ft)	DLS ("/100ft)	Survey Tool	Survey Company
8/24/2015	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	MWD	PATHFINDER ENERGY SE...
8/24/2015	242.00	0.88	301.32	241.99	-0.99	0.97	-1.59	0.36	MWD	EXTREME
8/24/2015	331.00	1.19	309.19	330.98	-1.94	1.91	-2.89	0.38	MWD	EXTREME
8/24/2015	424.00	1.19	316.88	423.96	-3.28	3.22	-4.30	0.17	MWD	EXTREME
8/24/2015	520.00	1.41	308.00	519.93	-4.75	4.68	-5.91	0.31	MWD	EXTREME
8/24/2015	607.00	1.32	312.70	606.91	-6.11	6.01	-7.49	0.17	MWD	EXTREME
8/24/2015	669.00	1.32	309.19	668.89	-7.06	6.95	-8.57	0.13	MWD	EXTREME
8/24/2015	731.00	1.19	308.22	730.88	-7.92	7.80	-9.63	0.21	MWD	EXTREME
8/24/2015	792.00	1.32	304.40	791.86	-8.73	8.59	-10.70	0.25	MWD	EXTREME
8/24/2015	855.00	1.19	315.78	854.85	-9.62	9.47	-11.76	0.45	MWD	EXTREME
8/24/2015	918.00	1.01	312.48	917.83	-10.47	10.31	-12.62	0.30	MWD	EXTREME
8/24/2015	980.00	1.10	312.88	979.82	-11.26	11.08	-13.46	0.15	MWD	EXTREME
8/24/2015	1,041.00	1.01	316.88	1,040.81	-12.06	11.88	-14.26	0.19	MWD	EXTREME
8/24/2015	1,106.00	1.01	302.90	1,105.80	-12.80	12.60	-15.13	0.38	MWD	EXTREME
8/24/2015	1,167.00	0.88	311.38	1,166.79	-13.41	13.21	-15.94	0.31	MWD	EXTREME
8/24/2015	1,230.00	0.88	316.22	1,229.79	-14.09	13.88	-16.63	0.12	MWD	EXTREME
8/24/2015	1,299.00	1.01	327.51	1,298.78	-14.99	14.77	-17.33	0.33	MWD	EXTREME
8/24/2015	1,367.00	1.01	334.98	1,366.77	-16.05	15.82	-17.90	0.19	MWD	EXTREME
8/29/2015	1,468.00	0.79	353.22	1,467.76	-17.55	17.32	-18.36	0.36	MWD	EXTREME
8/29/2015	1,550.00	0.79	2.84	1,549.75	-18.68	18.44	-18.40	0.16	MWD	EXTREME
8/29/2015	1,644.00	0.48	51.14	1,643.74	-19.57	19.34	-18.06	0.63	MWD	EXTREME
8/29/2015	1,738.00	0.70	110.42	1,737.74	-19.61	19.38	-17.22	0.65	MWD	EXTREME
8/29/2015	1,832.00	0.88	120.70	1,831.73	-19.02	18.82	-16.06	0.24	MWD	EXTREME
8/29/2015	1,926.00	0.62	116.53	1,925.72	-18.41	18.22	-14.98	0.28	MWD	EXTREME
8/29/2015	2,021.00	1.01	132.30	2,020.71	-17.60	17.43	-13.90	0.47	MWD	EXTREME
8/29/2015	2,116.00	1.80	156.83	2,115.68	-15.65	15.49	-12.70	1.03	MWD	EXTREME
8/29/2015	2,211.00	2.42	159.20	2,210.62	-12.39	12.24	-11.40	0.66	MWD	EXTREME
8/29/2015	2,306.00	2.59	152.74	2,305.53	-8.59	8.46	-9.70	0.35	MWD	EXTREME
8/29/2015	2,402.00	3.12	154.63	2,401.41	-4.27	4.17	-7.59	0.56	MWD	EXTREME
8/29/2015	2,497.00	3.30	156.91	2,496.26	0.61	-0.68	-5.41	0.23	MWD	EXTREME
8/29/2015	2,592.00	3.12	152.83	2,591.11	5.45	-5.49	-3.16	0.31	MWD	EXTREME
8/29/2015	2,689.00	2.90	153.70	2,687.98	10.03	-10.04	-0.86	0.23	MWD	EXTREME
8/29/2015	2,781.00	2.50	153.70	2,779.87	13.94	-13.93	1.06	0.43	MWD	EXTREME
8/29/2015	2,876.00	2.29	144.21	2,874.79	17.36	-17.32	3.09	0.47	MWD	EXTREME
8/29/2015	2,971.00	2.42	143.42	2,969.71	20.54	-20.47	5.39	0.14	MWD	EXTREME
8/29/2015	3,067.00	1.80	155.73	3,065.65	23.57	-23.48	7.22	0.80	MWD	EXTREME
8/30/2015	3,258.00	1.19	158.93	3,256.58	28.18	-28.06	9.16	0.32	MWD	EXTREME
8/30/2015	3,447.00	1.01	139.20	3,445.55	31.29	-31.15	10.96	0.22	MWD	EXTREME
8/30/2015	3,638.00	0.79	101.01	3,636.52	32.85	-32.68	13.35	0.33	MWD	EXTREME
8/30/2015	3,827.00	1.01	80.14	3,825.50	32.85	-32.64	16.27	0.21	MWD	EXTREME
8/31/2015	4,018.00	0.79	25.34	4,016.48	31.40	-31.16	18.49	0.45	MWD	EXTREME
8/31/2015	4,208.00	1.32	75.92	4,206.45	29.72	-29.45	21.18	0.54	MWD	EXTREME
8/31/2015	4,400.00	1.49	82.12	4,398.39	28.90	-28.57	25.79	0.12	MWD	EXTREME
8/31/2015	4,588.00	1.80	89.50	4,586.32	28.61	-28.21	31.17	0.20	MWD	EXTREME
8/31/2015	4,778.00	1.80	82.61	4,776.22	28.27	-27.80	37.11	0.11	MWD	EXTREME
8/31/2015	4,967.00	1.89	88.53	4,965.12	27.89	-27.34	43.17	0.11	MWD	EXTREME
8/31/2015	5,048.00	1.80	84.03	5,046.08	27.76	-27.17	45.77	0.21	MWD	EXTREME
8/31/2015	5,156.00	1.32	93.78	5,154.04	27.70	-27.07	48.70	0.51	MWD	PATHFINDER ENERGY SE...
8/31/2015	5,346.00	0.26	45.20	5,344.02	27.57	-26.92	51.19	0.61	MWD	PATHFINDER ENERGY SE...
8/31/2015	5,536.00	0.53	302.63	5,534.02	26.79	-26.14	50.75	0.34	MWD	PATHFINDER ENERGY SE...
8/31/2015	5,726.00	0.70	319.50	5,724.01	25.42	-24.78	49.26	0.13	MWD	PATHFINDER ENERGY SE...
8/31/2015	5,916.00	1.06	272.84	5,913.99	24.41	-23.81	46.75	0.41	MWD	PATHFINDER ENERGY SE...
9/3/2015	6,106.00	1.58	273.62	6,103.94	24.10	-23.56	42.38	0.27	MWD	PATHFINDER ENERGY SE...
9/3/2015	6,296.00	1.32	273.66	6,293.88	23.74	-23.25	37.58	0.14	MWD	PATHFINDER ENERGY SE...
9/3/2015	6,485.00	1.32	269.15	6,482.83	23.57	-23.15	33.23	0.05	MWD	PATHFINDER ENERGY SE...
9/3/2015	6,675.00	1.41	274.25	6,672.77	23.38	-23.01	28.72	0.08	MWD	PATHFINDER ENERGY SE...
9/3/2015	6,865.00	1.58	273.31	6,862.71	22.99	-22.68	23.77	0.09	MWD	PATHFINDER ENERGY SE...
9/3/2015	7,055.00	1.76	284.05	7,052.63	22.06	-21.82	18.32	0.19	MWD	PATHFINDER ENERGY SE...
9/3/2015	7,244.00	0.62	300.32	7,241.58	20.79	-20.60	14.63	0.62	MWD	PATHFINDER ENERGY SE...
9/3/2015	7,434.00	0.62	291.50	7,431.57	19.87	-19.71	12.78	0.05	MWD	PATHFINDER ENERGY SE...
9/3/2015	7,624.00	0.62	306.28	7,621.56	18.86	-18.72	11.00	0.08	MWD	PATHFINDER ENERGY SE...
9/3/2015	7,814.00	0.53	271.02	7,811.55	18.22	-18.10	9.29	0.19	MWD	PATHFINDER ENERGY SE...
9/3/2015	8,004.00	0.62	246.25	8,001.54	18.59	-18.50	7.47	0.14	MWD	PATHFINDER ENERGY SE...
9/3/2015	8,194.00	0.79	234.98	8,191.53	19.73	-19.66	5.46	0.12	MWD	PATHFINDER ENERGY SE...
9/3/2015	8,384.00	0.79	234.21	8,381.51	21.22	-21.18	3.32	0.01	MWD	PATHFINDER ENERGY SE...

FEB 15 2016



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Surface Legal Location		API/UWI		Latitude (°)		Longitude (°)		Orig KB Elevation (ft)		Ground Elev MSL (ft)	
SEC10 T23S R33E		3002542630		32° 18' 47.734" N		103° 33' 14.918" W		3,678.30		3,651.30	
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