



SURVEY CALCULATION PROGRAM

ctrl-shift-I = Insert Survey
ctrl-shift-D = Delete Survey

Minimum Curvature

File:

OIL & GAS CO.:		Tug Hill		Target Information			VS Referenced to Offset from Surface				
WELL:		Edmonston 1-28H		TARGET TVD:	5096.85		NORTH/SOUTH:	0.00			
COUNTY / STATE:		Comanche/KS		TARGET INCL:	91.00		EAST/WEST:	0.00			
RIG:		Patterson #421		TARGET AZM:	1.40		(Enter 0' N and 0' E for Surface)				
MS Guidance Job #:		DDOK-120298	MS Directional Job #:	DDOK-120298							
SURVEY COMPANY:			DIRECTIONAL COMPANY:			PROPOSED DIRECTION:		1.40		MAG-DEC. / TOTAL CORR.(+/-):	6.15
MS Guidance			MS Directional					REFERENCED TO:	Grid North		
MWD SPECIALIST(S):			DIRECTIONAL DRILLER(S):			COMMENTS:					
J. Kernan			C. Pullin			Final Survey PBHL					
S. Smith			W. Crowell								

SVY	MD	INC	TRUE AZM	TEMP °F	Course Length	TVD	N-S	E-W	Surface Vert Sect	CLOSURE		DLS/100	BUR/100'	Target Calculations			
										DIST	DIR			TVD AT 0' V. SEC.	RIGHT(+) LEFT(-)	ABOVE(+) BELOW (-)	
Tie In	0	0.00	0.00	0.0		0.00	0.00	0.00									
1	700	1.10	207.70	0.0	700	699.96	-5.95	-3.12	-6.02	6.72	207.70	0.16	0.16	699.85	-2.98	4397.00	
2	799	0.20	213.10	0.0	99	798.95	-6.94	-3.66	-7.02	7.84	207.82	0.91	-0.91	798.83	-3.49	4298.02	
3	1271	0.40	282.40	0.0	472	1270.94	-7.27	-5.72	-7.41	9.25	218.18	0.08	0.04	1270.81	-5.54	3826.04	
4	1745	0.70	293.60	0.0	474	1744.92	-5.76	-9.99	-6.00	11.53	240.04	0.07	0.06	1744.82	-9.84	3352.03	
5	2216	0.70	286.00	0.0	471	2215.89	-3.81	-15.39	-4.19	15.86	256.09	0.02	0.00	2215.81	-15.29	2881.04	
6	2689	0.60	346.20	0.0	473	2688.86	-0.61	-18.76	-1.07	18.77	268.14	0.14	-0.02	2688.84	-18.74	2408.01	
7	2973	0.50	4.40	78.3	284	2972.85	2.07	-19.02	1.60	19.13	276.21	0.07	-0.04	2972.88	-19.06	2123.97	
8	3068	0.60	359.80	87.2	95	3067.84	2.98	-18.99	2.51	19.22	278.92	0.11	0.11	3067.89	-19.05	2028.96	
9	3162	0.60	37.00	95.3	94	3161.84	3.86	-18.69	3.41	19.09	281.68	0.41	0.00	3161.90	-18.78	1934.95	
10	3257	0.70	26.10	98.9	95	3256.83	4.78	-18.14	4.34	18.76	284.77	0.17	0.11	3256.91	-18.25	1839.94	
11	3351	0.40	358.50	98.9	94	3350.83	5.63	-17.89	5.19	18.76	287.46	0.42	-0.32	3350.92	-18.03	1745.93	
12	3446	0.90	16.30	98.9	95	3445.82	6.67	-17.69	6.24	18.91	290.67	0.56	0.53	3445.93	-17.85	1650.92	
13	3541	0.50	40.00	99.8	95	3540.82	7.71	-17.22	7.29	18.86	294.12	0.51	-0.42	3540.94	-17.40	1555.91	
14	3635	0.50	37.70	99.8	94	3634.81	8.35	-16.70	7.94	18.67	296.55	0.02	0.00	3634.95	-16.90	1461.90	
15	3730	0.80	32.50	99.8	95	3729.81	9.23	-16.09	8.84	18.55	299.85	0.32	0.32	3729.96	-16.31	1366.89	
16	3826	0.80	32.90	101.6	96	3825.80	10.36	-15.37	9.98	18.54	303.99	0.01	0.00	3825.97	-15.62	1270.88	
17	3920	0.50	43.00	104.3	94	3919.79	11.21	-14.73	10.85	18.51	307.27	0.34	-0.32	3919.98	-15.00	1176.87	
18	4016	0.90	41.60	106.1	96	4015.78	12.08	-13.95	11.74	18.45	310.90	0.42	0.42	4015.99	-14.24	1080.86	
19	4110	0.70	33.40	107.0	94	4109.77	13.11	-13.14	12.79	18.57	314.94	0.24	-0.21	4110.00	-13.46	986.85	
20	4205	1.10	20.40	109.6	95	4204.76	14.45	-12.50	14.14	19.11	319.14	0.47	0.42	4205.01	-12.85	891.84	
21	4300	0.80	41.40	108.7	95	4299.75	15.81	-11.75	15.51	19.69	323.38	0.48	-0.32	4300.02	-12.13	796.83	

													Target Calculations			
SVY	MD	INC	TRUE	TEMP	Course				Surface	CLOSURE		DLS/	BUR/	TVD AT 0'	RIGHT(+)	ABOVE (+)
			AZM	°F	Length	TVD	N-S	E-W	Vert Sect	DIST	DIR	100	100'	V. SEC.	LEFT(-)	BELOW (-)
22	4395	0.50	150.00	108.7	95	4394.75	15.94	-11.10	15.67	19.43	325.15	1.13	-0.32	4395.02	-11.49	701.83
23	4489	0.70	205.20	111.4	94	4488.74	15.07	-11.14	14.79	18.74	323.53	0.62	0.21	4489.00	-11.51	607.85
24	4597	2.20	6.90	98.9	108	4596.72	16.53	-11.17	16.25	19.95	325.95	2.66	1.39	4597.00	-11.57	499.85
25	4629	5.90	11.50	100.7	32	4628.63	18.75	-10.77	18.48	21.63	330.13	11.60	11.56	4628.96	-11.23	467.89
26	4661	8.40	10.20	100.7	32	4660.38	22.67	-10.03	22.41	24.79	336.13	7.83	7.81	4660.77	-10.58	436.08
27	4693	11.20	7.30	100.7	32	4691.91	28.05	-9.22	27.82	29.53	341.80	8.88	8.75	4692.40	-9.90	404.45
28	4725	14.30	7.30	100.7	32	4723.12	35.05	-8.32	34.84	36.03	346.64	9.69	9.69	4723.73	-9.18	373.12
29	4756	17.60	6.90	105.2	31	4752.92	43.51	-7.27	43.32	44.11	350.51	10.65	10.65	4753.68	-8.33	343.17
30	4788	21.00	5.80	104.3	32	4783.12	54.02	-6.11	53.85	54.36	353.54	10.69	10.63	4784.06	-7.43	312.79
31	4819	24.80	5.20	107.0	31	4811.67	66.02	-4.96	65.88	66.21	355.70	12.28	12.26	4812.82	-6.57	284.03
32	4851	28.70	3.50	107.0	32	4840.24	80.38	-3.88	80.26	80.47	357.23	12.42	12.19	4841.64	-5.85	255.21
33	4883	32.60	1.60	107.8	32	4867.77	96.67	-3.17	96.57	96.73	358.12	12.56	12.19	4869.45	-5.53	227.40
34	4914	36.40	0.80	107.8	31	4893.31	114.23	-2.81	114.12	114.26	358.59	12.34	12.26	4895.30	-5.60	201.55
35	4946	40.60	1.10	107.8	32	4918.35	134.14	-2.48	134.04	134.16	358.94	13.14	13.13	4920.69	-5.76	176.16
36	4977	44.50	1.90	109.6	31	4941.18	155.09	-1.92	155.00	155.10	359.29	12.70	12.58	4943.89	-5.71	152.96
37	5009	49.00	2.50	107.8	32	4963.10	178.37	-1.03	178.30	178.38	359.67	14.13	14.06	4966.21	-5.38	130.64
38	5041	53.40	2.90	109.6	32	4983.15	203.28	0.15	203.22	203.28	0.04	13.78	13.75	4986.69	-4.81	110.16
39	5073	57.20	3.30	109.6	32	5001.36	229.54	1.58	229.51	229.55	0.39	11.92	11.88	5005.37	-4.03	91.48
40	5105	59.10	3.10	111.4	32	5018.25	256.68	3.09	256.68	256.70	0.69	5.96	5.94	5022.73	-3.18	74.12
41	5136	59.40	2.90	112.3	31	5034.10	283.29	4.49	283.31	283.32	0.91	1.12	0.97	5039.04	-2.44	57.81
42	5168	59.20	2.90	112.3	32	5050.43	310.77	5.88	310.82	310.82	1.08	0.63	-0.62	5055.86	-1.72	40.99
43	5199	58.80	2.80	113.2	31	5066.40	337.31	7.20	337.38	337.38	1.22	1.32	-1.29	5072.29	-1.04	24.56
44	5231	59.40	2.40	115.0	32	5082.83	364.74	8.45	364.83	364.83	1.33	2.16	1.88	5089.20	-0.47	7.65
45	5263	62.50	1.50	115.9	32	5098.37	392.69	9.39	392.80	392.80	1.37	9.99	9.69	5105.23	-0.20	-8.38
46	5294	66.90	0.80	115.9	31	5111.62	420.70	9.95	420.82	420.82	1.36	14.34	14.19	5118.96	-0.33	-22.11
47	5326	70.90	1.40	117.7	32	5123.13	450.55	10.53	450.67	450.67	1.34	12.62	12.50	5131.00	-0.48	-34.15
48	5357	74.30	2.40	117.7	31	5132.40	480.11	11.51	480.25	480.25	1.37	11.39	10.97	5140.78	-0.22	-43.93
49	5389	77.20	2.90	120.4	32	5140.28	511.09	12.95	511.25	511.25	1.45	9.19	9.06	5149.20	0.46	-52.35
50	5421	79.80	2.80	120.4	32	5146.66	542.40	14.51	542.60	542.60	1.53	8.13	8.12	5156.13	1.25	-59.28
51	5453	82.90	2.40	123.1	32	5151.47	574.00	15.94	574.22	574.22	1.59	9.77	9.69	5161.49	1.91	-64.64
52	5485	85.90	2.40	124.9	32	5154.59	605.82	17.27	606.06	606.06	1.63	9.38	9.38	5165.17	2.47	-68.32
53	5516	88.90	2.20	125.8	31	5156.00	636.76	18.52	637.02	637.03	1.67	9.70	9.68	5167.12	2.95	-70.27
54	5602	91.30	1.50	109.6	86	5155.85	722.71	21.29	723.01	723.02	1.69	2.91	2.79	5168.47	3.63	-71.62
55	5696	91.90	0.90	109.6	94	5153.22	816.65	23.26	816.97	816.98	1.63	0.90	0.64	5167.48	3.30	-70.63
56	5791	91.20	0.80	110.5	95	5150.65	911.60	24.67	911.93	911.94	1.55	0.74	-0.74	5166.57	2.39	-69.72
57	5885	91.10	1.00	113.2	94	5148.77	1005.57	26.14	1005.91	1005.91	1.49	0.24	-0.11	5166.33	1.57	-69.48

															Target Calculations		
SVY	MD	INC	TRUE	TEMP	Course			Surface	CLOSURE		DLS/	BUR/	TVD AT 0'	RIGHT(+)	ABOVE (+)		
			AZM	°F	Length	TVD	N-S	E-W	Vert Sect	DIST	DIR	100	100'	V. SEC.	LEFT(-)	BELOW (-)	
58	5980	91.10	0.80	114.1	95	5146.94	1100.54	27.64	1100.89	1100.89	1.44	0.21	0.00	5166.16	0.74	-69.31	
59	6075	91.70	0.10	115.0	95	5144.62	1195.51	28.38	1195.85	1195.85	1.36	0.97	0.63	5165.50	-0.83	-68.65	
60	6170	90.80	0.50	113.2	95	5142.55	1290.48	28.88	1290.80	1290.81	1.28	1.04	-0.95	5165.08	-2.66	-68.23	
61	6265	91.60	0.90	112.3	95	5140.56	1385.46	30.04	1385.78	1385.78	1.24	0.94	0.84	5164.75	-3.82	-67.90	
62	6360	91.10	359.80	111.4	95	5138.32	1480.43	30.62	1480.73	1480.74	1.18	1.27	-0.53	5164.17	-5.56	-67.32	
63	6456	92.00	0.80	112.3	96	5135.73	1576.39	31.12	1576.68	1576.69	1.13	1.40	0.94	5163.25	-7.40	-66.40	
64	6550	91.30	1.40	113.2	94	5133.02	1670.33	32.93	1670.64	1670.65	1.13	0.98	-0.74	5162.18	-7.89	-65.33	
65	6645	90.00	2.30	113.5	95	5131.94	1765.27	35.99	1765.62	1765.64	1.17	1.66	-1.37	5162.76	-7.15	-65.91	
66	6740	90.80	2.70	115.9	95	5131.28	1860.18	40.14	1860.60	1860.61	1.24	0.94	0.84	5163.75	-5.32	-66.90	
67	6835	89.90	0.80	115.9	95	5130.70	1955.13	43.04	1955.59	1955.60	1.26	2.21	-0.95	5164.83	-4.74	-67.98	
68	6931	90.50	0.80	114.5	96	5130.36	2051.12	44.38	2051.59	2051.60	1.24	0.63	0.62	5166.17	-5.75	-69.32	
69	7026	90.70	1.20	113.6	95	5129.37	2146.10	46.04	2146.58	2146.59	1.23	0.47	0.21	5166.84	-6.41	-69.99	
70	7120	91.10	0.40	111.8	94	5127.89	2240.07	47.35	2240.56	2240.57	1.21	0.95	0.43	5167.00	-7.40	-70.15	
71	7216	92.10	0.40	110.9	96	5125.21	2336.03	48.02	2336.51	2336.53	1.18	1.04	1.04	5165.99	-9.07	-69.14	
72	7311	92.30	359.80	92.3	95	5121.56	2430.96	48.18	2431.41	2431.44	1.14	0.67	0.21	5164.00	-11.22	-67.15	
73	7406	91.70	0.40	98.3	95	5118.25	2525.90	48.35	2526.33	2526.37	1.10	0.89	-0.63	5162.35	-13.38	-65.50	
74	7501	89.80	1.10	96.8	95	5117.00	2620.88	49.59	2621.31	2621.35	1.08	2.13	-2.00	5162.76	-14.46	-65.91	
75	7596	90.20	1.10	98.6	95	5117.00	2715.86	51.42	2716.31	2716.35	1.08	0.42	0.42	5164.42	-14.95	-67.57	
76	7691	88.80	2.70	100.4	95	5117.83	2810.80	54.57	2811.30	2811.33	1.11	2.24	-1.47	5166.91	-14.12	-70.06	
77	7787	89.60	2.30	101.0	96	5119.17	2906.70	58.75	2907.27	2907.30	1.16	0.93	0.83	5169.92	-12.28	-73.07	
78	7883	91.10	1.40	101.9	96	5118.59	3002.65	61.85	3003.26	3003.28	1.18	1.82	1.56	5171.01	-11.53	-74.16	
79	7977	90.30	2.80	101.9	94	5117.44	3096.57	65.30	3097.24	3097.26	1.21	1.72	-0.85	5171.50	-10.38	-74.65	
80	8072	91.10	1.80	102.8	95	5116.28	3191.49	69.11	3192.22	3192.24	1.24	1.35	0.84	5172.00	-8.89	-75.15	
81	8168	92.20	1.70	103.7	96	5113.51	3287.40	72.04	3288.18	3288.19	1.26	1.15	1.15	5170.91	-8.30	-74.06	
82	8264	91.80	3.30	103.7	96	5110.16	3383.25	76.22	3384.10	3384.11	1.29	1.72	-0.42	5169.23	-6.46	-72.38	
83	8359	92.80	3.20	104.6	95	5106.35	3478.02	81.61	3478.97	3478.97	1.34	1.06	1.05	5167.08	-3.39	-70.23	
84	8371	93.20	3.00	110.9	12	5105.72	3489.98	82.25	3490.95	3490.95	1.35	3.73	3.33	5166.66	-3.04	-69.81	
85	8466	91.80	3.20	110.0	95	5101.58	3584.75	87.39	3585.82	3585.82	1.40	1.49	-1.47	5164.17	-0.22	-67.32	
86	8561	92.40	3.10	111.8	95	5098.10	3679.54	92.60	3680.71	3680.71	1.44	0.64	0.63	5162.35	2.68	-65.50	
87	8656	92.40	2.90	110.9	95	5094.12	3774.33	97.57	3775.59	3775.59	1.48	0.21	0.00	5160.02	5.33	-63.17	
88	8752	89.50	2.20	113.6	96	5092.53	3870.21	101.84	3871.54	3871.55	1.51	3.11	-3.02	5160.11	7.25	-63.26	
89	8848	89.50	2.30	115.4	96	5093.37	3966.13	105.61	3967.53	3967.54	1.53	0.10	0.00	5162.62	8.68	-65.77	
90	8943	89.50	0.30	115.4	95	5094.20	4061.10	107.76	4062.52	4062.53	1.52	2.11	0.00	5165.11	8.51	-68.26	
91	9037	90.20	359.80	117.2	94	5094.44	4155.10	107.85	4156.49	4156.50	1.49	0.92	0.74	5166.99	6.30	-70.14	
92	9133	92.60	359.40	110.9	96	5092.10	4251.06	107.18	4252.41	4252.41	1.44	2.53	2.50	5166.32	3.28	-69.47	

														Target Calculations		
SVY	MD	INC	TRUE	TEMP	Course	TVD	N-S	E-W	Surface	CLOSURE		DLS/	BUR/	TVD AT 0'	RIGHT(+)	ABOVE (+)
			AZM	°F					Length	Vert Sect	DIST	DIR	100	100'	V. SEC.	LEFT(-)
93	9228	93.50	359.50	116.6	95	5087.04	4345.92	106.27	4347.22	4347.22	1.40	0.95	0.95	5162.92	0.05	-66.07
94	9323	91.70	0.10	115.4	95	5082.73	4440.82	105.93	4442.08	4442.08	1.37	2.00	-1.89	5160.27	-2.60	-63.42
95	9394	90.90	1.20	112.7	71	5081.12	4511.79	106.74	4513.06	4513.06	1.36	1.92	-1.13	5159.90	-3.52	-63.05
96	9490	92.20	359.80	113.6	96	5078.52	4607.75	107.58	4609.00	4609.01	1.34	1.99	1.35	5158.98	-5.03	-62.13
97	9585	93.80	359.00	113.6	95	5073.55	4702.61	106.59	4703.81	4703.82	1.30	1.88	1.68	5155.66	-8.34	-58.81
98	9633	94.70	359.20	115.4	48	5070.00	4750.47	105.83	4751.64	4751.65	1.28	1.92	1.88	5152.94	-10.26	-56.09
99	9685	94.70	359.20	115.4	52	5065.73	4802.29	105.11	4803.43	4803.44	1.25	0.00	0.00	5149.58	-12.25	-52.73