



Directional Survey
Well Name: GMR 21-8D (H21)

API # 045-09285
Doc# 1310050

API/UWI 05045092850000	Related POD H21	User Text 5 L.D. Vance	State CO	County GARFIELD
Permit Number	Original Spud Date 9/8/2003 00:00	Total Depth (ftKB) 9,190.0	Original KB Elevation (ft) 6,299.21	Ground Elevation (ft) 6,286.09

Wellbore Name Original Hole - Initial Migration	Actual Deviation Survey Original Migration, Proposed? No	Vertical Section Direction (°)	Lat/Long Datum NAD 83	Latitude (°)	Longitude (°)
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Deviation Surveys

Date 9/8/2003	Description Original Migration	Declination (°)			
MD Tie In (ftKB)	Inclination Tie In (°)	Azimuth Tie In (°)	TVD Tie In (ftKB)	NSTie In (ft)	EW Tie In (ft)

Survey Data

Date	Survey Company	MD (ftKB)	Incl (°)	Azm (°)	Bad Data?	TVD (ftKB)	VS (ft)	NS (ft)	EW (ft)	DLS (°/100ft)
	WLVERINE	1,245.00	2.00	76.00	No	1,244.75	0.00	5.26	21.08	0.16
	WLVERINE	1,617.00	2.30	97.80	No	1,616.49	4.87	5.81	34.78	0.23
	WLVERINE	1,989.00	1.90	111.50	No	1,988.24	13.05	2.54	47.91	0.17
	WLVERINE	2,361.00	4.00	129.50	No	2,359.74	28.91	-7.97	63.66	0.61
	WLVERINE	2,733.00	6.00	124.30	No	2,730.30	56.83	-27.19	89.74	0.55
	WLVERINE	2,826.00	5.90	125.50	No	2,822.80	65.01	-32.70	97.64	0.17
	WLVERINE	2,870.00	5.71	125.50	No	2,866.58	68.81	-35.28	101.27	0.43
	WLVERINE	2,901.00	5.80	126.00	No	2,897.42	71.47	-37.10	103.79	0.33
	WLVERINE	2,933.00	5.20	126.70	No	2,929.27	74.11	-38.92	106.26	1.89
	WLVERINE	2,963.00	4.80	128.60	No	2,959.16	76.39	-40.51	108.33	1.44
	WLVERINE	2,995.00	4.50	126.50	No	2,991.05	78.65	-42.10	110.39	1.08
	WLVERINE	3,026.00	4.30	127.90	No	3,021.96	80.72	-43.53	112.28	0.73
	WLVERINE	3,058.00	4.00	131.90	No	3,053.88	82.78	-45.01	114.06	1.30
	WLVERINE	3,058.00	4.00	131.90	No	3,053.88	82.78	-45.01	114.06	1.30
	WLVERINE	3,089.00	3.90	133.30	No	3,084.80	84.73	-46.46	115.63	0.45
	WLVERINE	3,121.00	3.50	127.80	No	3,116.74	86.58	-47.80	117.19	1.67
	WLVERINE	3,215.00	2.90	130.30	No	3,210.59	91.22	-51.10	121.27	0.66
	WLVERINE	3,369.00	1.60	127.40	No	3,364.47	96.57	-54.93	125.95	0.85
	WLVERINE	3,524.00	0.30	175.40	No	3,519.45	98.84	-56.65	127.71	0.91
	WLVERINE	3,771.00	2.10	300.80	No	3,766.39	95.80	-54.97	123.87	0.93
	WLVERINE	4,207.00	2.90	288.90	No	4,201.98	81.95	-47.31	106.57	0.22
	WLVERINE	4,585.00	2.60	278.00	No	4,579.55	71.11	-43.02	89.04	0.16
	WLVERINE	4,770.00	1.90	277.90	No	4,764.40	67.36	-42.01	81.84	0.38
	WLVERINE	4,864.00	1.80	276.20	No	4,858.35	65.83	-41.64	78.83	0.12
	WLVERINE	4,958.00	1.60	271.90	No	4,952.31	64.55	-41.44	76.05	0.25
	WLVERINE	5,052.00	1.20	269.00	No	5,046.28	63.62	-41.41	73.76	0.43
	WLVERINE	5,363.00	0.50	206.60	No	5,357.25	63.27	-42.68	69.89	0.34
	WLVERINE	5,675.00	0.90	181.40	No	5,669.23	66.38	-46.35	69.22	0.16
	WLVERINE	5,985.00	2.40	279.50	No	5,979.13	65.09	-47.71	62.76	0.86
	WLVERINE	6,298.00	1.70	266.30	No	6,291.93	60.01	-46.93	51.66	0.27
	WLVERINE	6,485.00	2.40	279.40	No	6,478.81	56.98	-46.47	45.03	0.45
	WLVERINE	6,610.00	2.10	281.80	No	6,603.71	54.26	-45.57	40.21	0.25
	WLVERINE	6,703.00	2.60	293.50	No	6,696.64	51.75	-44.38	36.61	0.74
	WLVERINE	7,106.00	1.60	303.60	No	7,099.36	40.39	-37.62	23.54	0.26
	WLVERINE	8,100.00	3.00	142.00	No	8,093.01	53.94	-50.45	28.00	0.46
	WLVERINE	9,100.00	3.50	140.00	No	9,091.40	108.45	-94.45	63.73	0.05