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Case No. 10725

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BECFIELD SURVEY AND TARGET TRACKING PROGRAM

>

OPERATOR TEXACO, INC.**START:** 11/2/95**WELL:** C.W. ROBERTS NO. 4**FINISH:** 11/26/95**LOCATION:** RIO ARRIBA COUNTY, NEW MEXICO

BECFIELD DIR.COORD.

STEVE BLOUNT

Survey number 0 is a Tie-In to a

ALAN PEDERSON

GYRO survey run by SCIENTIFIC DRILLING

11.2 degs applied = TRUE

<

MINIMUM CURVATURE CALCULATIONS(SPE-3362)

PROPOSED DIR.

>

85.00

SUR NUM	MD	INC	TRUE AZM	TVD	N-S	E-W	SECT	DLS/ 100
0	6820	0.50	222.90	6819.80	-0.20	15.13	15.05	0.00
1	6872	2.10	131.90	6871.79	-1.00	15.68	15.54	4.17
2	6874	2.80	128.60	6873.79	-1.06	15.75	15.60	35.69
3	6876	3.60	117.50	6875.78	-1.12	15.84	15.69	50.42
4	6878	4.40	113.90	6877.78	-1.18	15.97	15.81	41.91
5	6880	5.50	110.00	6879.77	-1.24	16.13	15.96	57.48
6	6882	6.70	106.30	6881.76	-1.31	16.33	16.16	63.11
7	6884	8.10	104.50	6883.74	-1.37	16.58	16.40	70.94
8	6886	9.50	103.20	6885.72	-1.45	16.88	16.69	70.70
9	6888	11.00	101.40	6887.69	-1.52	17.23	17.03	76.68
10	6890	12.70	99.70	6889.64	-1.60	17.63	17.42	86.76
11	6892	13.90	98.70	6891.59	-1.67	18.08	17.87	61.09
12	6894	15.40	97.70	6893.53	-1.74	18.58	18.36	76.06
13	6896	16.70	97.20	6895.45	-1.81	19.13	18.90	65.37
14	6898	18.10	97.10	6897.36	-1.89	19.73	19.49	70.02
15	6900	19.40	97.60	6899.25	-1.97	20.36	20.11	65.49
16	6902	20.70	99.10	6901.13	-2.07	21.04	20.78	69.90
17	6904	21.90	100.40	6902.99	-2.19	21.76	21.48	64.48
18	6906	23.10	100.90	6904.84	-2.34	22.51	22.22	60.76
19	6908	24.40	99.50	6906.67	-2.48	23.30	23.00	70.85
20	6910	25.70	96.80	6908.48	-2.60	24.14	23.82	86.54
21	6912	27.00	94.20	6910.27	-2.68	25.02	24.69	86.90
22	6914	28.30	91.80	6912.05	-2.73	25.95	25.61	85.58
23	6916	29.50	90.40	6913.80	-2.75	26.92	26.58	68.88
24	6918	30.80	89.20	6915.53	-2.75	27.92	27.58	71.64
25	6920	32.00	88.20	6917.23	-2.72	28.96	28.62	65.41
26	6922	33.20	87.70	6918.92	-2.68	30.04	29.69	61.49
27	6924	34.50	87.40	6920.58	-2.64	31.15	30.80	65.53
28	6926	35.70	87.30	6922.22	-2.58	32.30	31.95	60.07
29	6928	37.00	87.30	6923.83	-2.53	33.49	33.14	65.00
30	6930	38.20	87.50	6925.41	-2.47	34.70	34.36	60.31

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MINIMUM CURVATURE CALCULATIONS(SPE-3362)

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31	6932	39.60	87.80	6926.97	-2.42	35.96	35.61	70.63
32	6934	40.90	88.10	6928.49	-2.37	37.25	36.90	65.72
33	6936	42.20	88.20	6929.99	-2.33	38.58	38.23	65.08
34	6938	43.40	88.50	6931.46	-2.29	39.94	39.58	60.86
35	6940	44.50	88.90	6932.90	-2.26	41.32	40.97	56.72
36	6942	45.70	89.30	6934.31	-2.24	42.74	42.38	61.65
37	6944	46.90	89.60	6935.69	-2.22	44.19	43.82	60.97
38	6946	47.80	89.70	6937.05	-2.21	45.66	45.29	45.15
39	6948	48.90	89.80	6938.38	-2.21	47.15	46.78	55.13
40	6950	50.00	89.70	6939.68	-2.20	48.67	48.29	55.13
41	6952	51.10	89.80	6940.95	-2.19	50.21	49.83	55.14
42	6954	52.00	89.60	6942.19	-2.19	51.78	51.39	45.68
43	6956	53.00	89.40	6943.41	-2.17	53.37	52.97	50.63
44	6958	53.90	89.10	6944.60	-2.15	54.97	54.58	46.59
45	6960	54.80	88.80	6945.76	-2.12	56.60	56.20	46.62
46	6962	55.80	88.50	6946.90	-2.08	58.24	57.84	51.50
47	6964	56.80	88.40	6948.01	-2.04	59.91	59.50	50.17
48	6966	57.80	88.10	6949.09	-1.99	61.59	61.18	51.57
49	6968	58.70	88.20	6950.15	-1.93	63.29	62.88	45.20
50	6970	59.70	87.70	6951.17	-1.87	65.00	64.59	54.42
51	6972	60.70	87.40	6952.16	-1.80	66.74	66.33	51.67
52	6974	61.70	87.30	6953.13	-1.72	68.49	68.08	50.19
53	6976	62.70	87.10	6954.06	-1.63	70.26	69.85	50.78
54	6978	63.70	86.90	6954.96	-1.54	72.04	71.63	50.79
55	6980	64.70	86.80	6955.83	-1.44	73.84	73.43	50.20
56	6982	65.90	86.70	6956.67	-1.33	75.65	75.25	60.17
57	6984	66.90	86.70	6957.47	-1.23	77.48	77.08	50.00
58	6986	68.00	86.70	6958.23	-1.12	79.32	78.93	55.00
59	6988	69.00	86.60	6958.97	-1.01	81.18	80.79	50.22
60	6990	70.10	86.60	6959.67	-0.90	83.05	82.66	55.00
61	6992	71.20	86.60	6960.33	-0.79	84.94	84.54	55.00

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NUM	MD	INC	AZM	TVD	N-S	E-W	SECT	100
62	6994	72.30	86.70	6960.96	-0.68	86.83	86.44	55.20
63	6996	73.50	86.70	6961.54	-0.57	88.74	88.35	60.00
64	6998	74.60	86.90	6962.09	-0.46	90.66	90.28	55.83
65	7000	75.80	87.80	6962.60	-0.37	92.59	92.21	74.11
66	7002	76.90	87.90	6963.08	-0.30	94.53	94.15	55.21
67	7004	78.20	88.00	6963.51	-0.23	96.49	96.10	65.18
68	7006	79.50	88.20	6963.89	-0.16	98.45	98.06	65.74
69	7008	80.50	88.30	6964.24	-0.10	100.42	100.03	50.24
70	7010	81.50	88.30	6964.55	-0.05	102.39	102.00	50.00
71	7012	82.50	88.20	6964.83	0.02	104.37	103.97	50.24
72	7014	83.50	88.00	6965.08	0.08	106.35	105.96	50.98
73	7016	84.20	88.00	6965.29	0.15	108.34	107.94	35.00
74	7018	85.00	88.20	6965.48	0.22	110.33	109.93	41.22
75	7020	85.40	88.10	6965.65	0.28	112.32	111.92	20.61
76	7022	85.70	88.10	6965.80	0.35	114.32	113.91	15.00
77	7024	86.10	88.00	6965.94	0.41	116.31	115.90	20.61
78	7026	86.70	88.20	6966.07	0.48	118.30	117.90	31.62
79	7028	86.80	88.20	6966.18	0.54	120.30	119.89	5.00
80	7030	86.80	88.50	6966.30	0.60	122.30	121.88	14.98
81	7032	86.80	88.50	6966.41	0.65	124.29	123.88	0.00
82	7034	86.80	88.50	6966.52	0.71	126.29	125.87	0.00
83	7036	86.70	88.60	6966.63	0.76	128.29	127.86	7.07
84	7041	86.70	89.00	6966.92	0.86	133.28	132.84	7.99
85	7046	86.70	89.20	6967.21	0.94	138.27	137.82	3.99
86	7051	87.00	89.20	6967.48	1.01	143.26	142.80	6.00
87	7056	87.50	89.10	6967.72	1.08	148.25	147.78	10.20
88	7061	88.00	89.20	6967.92	1.16	153.25	152.77	10.20
89	7066	88.40	89.00	6968.08	1.24	158.25	157.75	8.94
90	7071	89.00	88.90	6968.19	1.33	163.24	162.74	12.17
91	7076	89.50	88.90	6968.25	1.42	168.24	167.73	10.00
92	7081	89.80	88.70	6968.28	1.53	173.24	172.71	7.21

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93	7086	89.80	88.70	6968.30	1.64	178.24	177.70	0.00
94	7091	89.30	87.90	6968.34	1.79	183.24	182.70	18.87
95	7096	88.80	87.50	6968.42	1.99	188.23	187.69	12.81
96	7101	87.90	87.20	6968.57	2.22	193.22	192.68	18.97
97	7106	87.60	87.10	6968.76	2.47	198.21	197.68	6.32
98	7111	87.40	87.00	6968.98	2.73	203.20	202.67	4.47
99	7116	87.30	87.00	6969.21	2.99	208.19	207.66	2.00
100	7126	87.40	87.10	6969.68	3.50	218.17	217.64	1.41
101	7136	87.70	87.20	6970.10	4.00	228.15	227.63	3.16
102	7146	88.30	87.30	6970.45	4.48	238.13	237.61	6.08
103	7156	88.80	87.20	6970.71	4.96	248.11	247.60	5.10
104	7166	89.20	86.80	6970.88	5.48	258.10	257.59	5.66
105	7176	88.80	86.10	6971.05	6.10	268.08	267.59	8.06
106	7181	88.00	85.90	6971.19	6.45	273.06	272.59	16.49
107	7186	87.60	85.70	6971.39	6.82	278.05	277.58	8.94
108	7191	87.40	85.60	6971.60	7.19	283.03	282.58	4.47
109	7196	87.20	85.50	6971.84	7.58	288.01	287.57	4.47
110	7201	87.00	85.60	6972.09	7.97	292.98	292.56	4.47
111	7206	86.60	85.10	6972.37	8.37	297.96	297.56	12.79
112	7211	86.40	84.80	6972.68	8.81	302.93	302.55	7.20
113	7216	86.30	85.00	6973.00	9.26	307.90	307.54	4.46
114	7221	86.10	84.90	6973.33	9.70	312.87	312.53	4.47
115	7226	85.90	84.90	6973.68	10.14	317.84	317.51	4.00
116	7231	85.60	84.80	6974.05	10.59	322.81	322.50	6.32
117	7236	85.20	84.70	6974.45	11.04	327.77	327.48	8.24
118	7241	84.70	84.40	6974.89	11.52	332.73	332.46	11.65
119	7246	84.30	84.20	6975.37	12.01	337.68	337.44	8.94
120	7251	83.90	84.00	6975.88	12.52	342.63	342.41	8.93
121	7256	83.50	83.80	6976.43	13.05	347.57	347.38	8.93
122	7261	83.30	83.90	6977.00	13.58	352.51	352.35	4.47
123	7266	83.20	83.70	6977.59	14.12	357.44	357.31	4.45

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124	7271	83.30	83.50	6978.18	14.67	362.38	362.28	4.45
125	7276	83.20	83.30	6978.77	15.24	367.31	367.24	4.45
126	7281	83.00	83.20	6979.37	15.83	372.24	372.20	4.47
127	7286	82.90	82.80	6979.98	16.43	377.16	377.16	8.19
128	7291	82.80	82.60	6980.60	17.06	382.08	382.12	4.44
129	7296	82.70	82.30	6981.23	17.71	387.00	387.07	6.28
130	7301	82.70	81.80	6981.87	18.40	391.91	392.03	9.92
131	7306	82.90	81.70	6982.50	19.11	396.82	396.98	4.47
132	7311	82.80	81.50	6983.12	19.83	401.73	401.93	4.44
133	7316	82.80	81.20	6983.75	20.58	406.63	406.88	5.95
134	7321	82.80	81.10	6984.37	21.34	411.54	411.83	1.98
135	7326	82.70	80.70	6985.00	22.13	416.43	416.78	8.18
136	7331	82.70	80.60	6985.64	22.93	421.33	421.72	1.98
137	7336	82.60	80.80	6986.28	23.74	426.22	426.67	4.44
138	7341	82.60	80.70	6986.92	24.53	431.11	431.61	1.98
139	7346	82.70	81.00	6987.56	25.32	436.01	436.56	6.28
140	7351	83.00	81.00	6988.18	26.10	440.91	441.51	6.00
141	7356	83.20	81.40	6988.79	26.86	445.82	446.46	8.89
142	7361	83.40	81.80	6989.37	27.58	450.73	451.42	8.90
143	7366	83.70	82.20	6989.93	28.27	455.65	456.38	9.96
144	7371	84.30	82.60	6990.45	28.93	460.58	461.35	14.40
145	7376	84.90	82.90	6990.92	29.56	465.52	466.32	13.40
146	7381	85.50	83.30	6991.34	30.16	470.46	471.30	14.41
147	7386	86.10	83.50	6991.71	30.73	475.42	476.28	12.65
148	7391	86.90	82.20	6992.01	31.35	480.37	481.27	30.49
149	7396	87.20	82.30	6992.27	32.03	485.31	486.26	6.32
150	7411	88.10	82.40	6992.89	34.02	500.17	501.23	6.04
151	7421	88.30	82.50	6993.20	35.33	510.08	511.22	2.24
152	7431	88.50	82.40	6993.48	36.65	519.99	521.20	2.24
153	7462	89.10	82.30	6994.13	40.77	550.70	552.16	1.96
154	7472	89.40	82.20	6994.26	42.12	560.61	562.15	3.16

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155	7494	89.50	82.50	6994.47	45.05	582.41	584.12	1.44
156	7504	88.20	82.50	6994.67	46.35	592.33	594.11	13.00
157	7514	88.70	83.00	6994.94	47.62	602.24	604.10	7.07
158	7524	88.80	82.90	6995.16	48.84	612.17	614.09	1.41
159	7539	88.90	82.70	6995.46	50.72	627.04	629.08	1.49
160	7554	89.20	82.60	6995.71	52.64	641.92	644.06	2.11
161	7569	89.40	82.60	6995.89	54.57	656.79	659.05	1.33
162	7584	89.60	82.30	6996.02	56.54	671.66	674.03	2.40
163	7619	89.10	82.50	6996.42	61.17	706.35	709.00	1.54
164	7634	89.20	82.70	6996.64	63.10	721.23	723.98	1.49
165	7649	89.50	82.50	6996.81	65.04	736.10	738.97	2.40
166	7679	89.30	83.00	6997.13	68.82	765.86	768.94	1.79
167	7711	89.10	83.80	6997.57	72.50	797.64	800.93	2.58
168	7741	88.60	84.30	6998.18	75.61	827.47	830.92	2.36
169	7771	87.80	84.80	6999.12	78.46	857.32	860.90	3.14
170	7803	87.50	84.80	7000.43	81.35	889.17	892.87	0.94
171	7835	87.30	84.60	7001.88	84.31	921.00	924.84	0.88
172	7866	86.50	84.10	7003.56	87.36	951.80	955.79	3.04
173	7897	85.90	83.80	7005.61	90.62	982.56	986.72	2.16
174	7929	86.20	85.40	7007.82	93.62	1014.34	1018.64	5.08
175	7959	87.70	85.50	7009.41	96.00	1044.20	1048.60	5.01
176	7991	88.70	85.30	7010.42	98.56	1076.08	1080.58	3.19
177	8023	88.70	84.70	7011.14	101.35	1107.95	1112.57	1.87
178	8056	88.40	85.10	7011.98	104.28	1140.81	1145.56	1.51
179	8085	88.60	85.10	7012.74	106.76	1169.70	1174.55	0.69
180	8114	88.00	84.60	7013.60	109.36	1198.57	1203.54	2.69
181	8149	87.20	85.30	7015.07	112.44	1233.40	1238.51	3.04
182	8183	86.20	85.70	7017.02	115.10	1267.24	1272.45	3.17
183	8214	85.80	85.70	7019.18	117.42	1298.08	1303.37	1.29
184	8246	86.60	85.10	7021.31	119.98	1329.90	1335.30	3.12
185	8276	87.70	85.30	7022.80	122.49	1359.76	1365.26	3.73

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NUM	MD	INC	AZM	TVD	N-S	E-W	SECT	100
186	8308	87.90	85.50	7024.03	125.05	1391.63	1397.24	0.88
187	8338	88.20	85.60	7025.05	127.38	1421.52	1427.22	1.05
188	8370	88.60	85.60	7025.94	129.83	1453.42	1459.20	1.25
189	8402	88.50	85.60	7026.75	132.29	1485.31	1491.19	0.31
190	8434	88.80	85.40	7027.50	134.80	1517.21	1523.18	1.13
191	8466	88.20	85.70	7028.34	137.28	1549.10	1555.17	2.10
192	8499	88.50	86.00	7029.29	139.67	1582.00	1588.15	1.29
193	8530	88.80	85.90	7030.02	141.85	1612.91	1619.14	1.02
194	8561	88.60	86.00	7030.72	144.04	1643.83	1650.13	0.72
195	8593	88.10	86.30	7031.65	146.19	1675.74	1682.11	1.82
196	8624	88.20	86.40	7032.65	148.16	1706.66	1713.08	0.46
197	8656	88.40	86.40	7033.60	150.17	1738.58	1745.06	0.63
198	8688	88.20	86.40	7034.55	152.18	1770.51	1777.03	0.63
199	8720	87.90	86.50	7035.63	154.16	1802.43	1809.00	0.99
200	8751	87.60	87.20	7036.85	155.86	1833.36	1839.96	2.46
201	8781	89.30	87.00	7037.66	157.38	1863.31	1869.93	5.71
202	8813	89.00	85.70	7038.14	159.42	1895.24	1901.92	4.17
203	8843	89.20	85.10	7038.61	161.82	1925.14	1931.91	2.11
204	8872	89.30	85.40	7038.99	164.22	1954.03	1960.91	1.09
205	8902	90.50	85.90	7039.04	166.50	1983.95	1990.91	4.33
206	8935	89.80	84.90	7038.95	169.15	2016.84	2023.91	3.70
207	8967	90.40	85.70	7038.90	171.77	2048.73	2055.91	3.12
208	8998	88.40	86.70	7039.22	173.82	2079.66	2086.90	7.21
209	9030	87.70	86.00	7040.31	175.86	2111.58	2118.87	3.09
210	9061	88.60	86.10	7041.31	177.99	2142.49	2149.85	2.92
211	9092	88.50	86.00	7042.10	180.13	2173.40	2180.83	0.46
212	9123	90.10	86.00	7042.48	182.29	2204.32	2211.82	5.16
213	9153	90.50	86.10	7042.32	184.36	2234.25	2241.82	1.37
214	9182	89.40	86.00	7042.34	186.35	2263.18	2270.81	3.81
215	9212	89.10	84.80	7042.74	188.76	2293.08	2300.81	4.12
216	9242	88.50	84.50	7043.37	191.56	2322.95	2330.80	2.24

<
BECFIELD SURVEY AND TARGET TRACKING PROGRAM
>

OPERATOR TEXACO, INC.

WELL: C.W. ROBERTS NO. 4

LOCATION: RIO ARriba COUNTY, NEW MEXICO

Survey number 0 is a Tie-In to a
GYRO survey run by SCIENTIFIC DRILLING

START: 11/2/95

FINISH: 11/26/95

BECFIELD DIR.COORD.
STEVE BLOUNT
ALAN PEDERSON
11.2 degs applied = TRUE

<

MINIMUM CURVATURE CALCULATIONS(SPE-3362)

PROPOSED DIR.

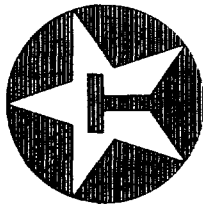
>

SUR			TRUE					DLS/
NUM	MD	INC	AZM	TVD	N-S	E-W	SECT	100
217	9273	88.00	85.10	7044.31	194.36	2353.80	2361.79	2.52
218	9308	87.90	83.30	7045.56	197.90	2388.60	2396.76	5.15
219	9339	88.20	81.90	7046.62	201.89	2419.32	2427.71	4.62
220	9370	88.90	81.60	7047.40	206.34	2449.99	2458.65	2.46
221	9402	88.80	81.40	7048.05	211.06	2481.63	2490.59	0.70
222	9432	88.80	83.10	7048.67	215.11	2511.35	2520.54	5.67
223	9462	87.80	82.90	7049.56	218.76	2541.12	2550.51	3.40
224	9490	87.40	83.90	7050.74	221.98	2568.91	2578.48	3.84
225	9522	87.60	83.60	7052.13	225.46	2600.69	2610.44	1.13
226	9555	87.90	84.10	7053.43	228.99	2633.47	2643.41	1.77
227	9578	87.70	84.20	7054.31	231.33	2656.33	2666.39	0.97
228	9611	87.60	83.50	7055.66	234.87	2689.12	2699.35	2.14
229	9644	87.20	83.30	7057.16	238.66	2721.86	2732.31	1.35
230	9673	87.20	83.30	7058.58	242.04	2750.63	2761.26	0.00

Survey No. 0 is a gyro run by Scientific Drilling
 1 thru 229 is an all angle tensor steering tool
 Steering tool surveys ran by Becfield Drlg. Services
 Survey No. 230 is a projection to total depth.
 Bottom Hole location from Surface Location.
 Horizontal Displacement = 2761.26 FEET
 Displacement Bearing = True azimuth of 84.97 degrees

BECHFIELD

DRILLING SERVICES



TEXACO INC.
C.W. ROBERTS NO. 4
RIO ARriba COUNTY, NM

Drawn By: JEP	Checked By: DMS
Date: 10/08/75	
HORIZONTAL PROJECTION	
The Surface Location on the drawing is represented by the coordinates 88	
Easting 1000 and 1000 feet are shown in relation to the Surface Location	
Magnetic Dec. 112° E	



1100
1000
900
800
700
600
500
400
300
200
100
0

100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000 2100 2200 2300 2400 2500 2600 2700 2800 2900 3000

6500

6600

6700

6800

7100

0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000 2100 2200 2300 2400 2500 2600 2700 2800 2900 3000

Actual Bottom Hole Location
From Surface Location
Measured From 88 Deg. Azimuth
Measured Depth 2673 feet
True Vertical Depth 2699 feet
Total Measured Depth 2673 feet