

RAMAS Inc. and
Terra Services



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Colorado State Bank Building
1600 Broadway, Suite. 2060
Denver, Colorado 80202

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CONOCO, INC.

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South McCallum Unit No. 50
Section 8-T9N-R78W
Jackson County, Colorado

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CONOCO, INC.
South McCallum Unit No. 50
Section 8-T9N-R78W
Jackson County, Colorado

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CONOCO, INC.
South McCallum Unit No. 50
Section 8-T9N-R78W
Jackson County, Colorado

WELL DATA SHEET

OPERATOR: Conoco, Inc.

WELL NAME: South McCallum Unit No. 50

LOCATION: Section 8 - T9N - R78W
185' FSL and 205' FWL
Jackson County, Colorado

ELEVATION: 8151' GR
8168.5' KB

SPUD DATE: August 28, 1991 at 7:00 p.m.

DATE COMPLETED DRILLING: Completed vertical drilling on September 7, 1991.
Completed Horizontal #1 on September 18, 1991.
Completed Horizontal #2 on October 1, 1991.

STATUS: Set 5½" - drilled liner and tested well.

HOLE SIZES: Vertical: 20" surface from 0' to 80'.
17½" from 80' to 530'.
12½" from 529' to 4360'.
Horizontal: 8½" from 4087' to 6586'.

CASING: Surface: 13-3/8" to 529'.
Intermediate: 9-5/8" to 4087'.
Production: 5½"

TOTAL DEPTH: Vertical Driller Total Depth: 4360'.
Vertical Schlumberger Total Depth: 4342'.
Horizontal #1 Schlumberger Total Depth: 4593'.
Horizontal #2 Schlumberger Total Depth: 6586'.

CONTRACTOR: SST - Casper, Wyoming
Rig No. 57
Toolpusher: Morris Terry

COMPANY SUPERVISOR: Butch McMann/Manual Trevino/Bob Williams
Conoco, Inc. - Casper, Wyoming

GEOLOGIST: TERRA SERVICES, INC. - Denver, Colorado
Wellsite Geologist: James M. Ray
Client Geologist: Craig Wolffing

CONOCO, INC.
South McCallum Unit No. 50
Section 8-T9N-R78W
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WELL DATA SHEET - CONTINUED

MUD LOGGING: Terra Services, Inc. - Denver, Colorado
Type Unit: 2 man FID with Varian Equipment.
Loggers: John McClelland and Jim Terwilliger

MUD: Summit Drilling Fluids - Denver, Colorado
Engineer: Dan Jackson
Type mud used: KCL/Polymer

DST'S: None

CORES: None

ELECTRIC LOGS: Schlumberger - Fort Morgan, Colorado
Engineer: J. Cutler and R. Moore

DIL/SFL - GR	529' - 4336'
FMS-GR	2900' - 4334'

SAMPLES: Vertical: 10' samples from 530' to 4360'.
Horizontal #1: 10' samples from 3660'-4593'.
Horizontal #2: 10' samples from 4095'-6586'.

Samples deposited with Conoco, Inc. in Ponca City, Oklahoma (1 set dry), and another dry set to Conoco, Inc. in Casper, Wyoming.

CONOCO, INC.
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FORMATION TOPS:	<u>NAME</u>	<u>DEPTH</u>	<u>DATUM</u>
Vertical Well:	Pierre	Surface	
	Pierre "A" Sand	1573'	(+6595')
	Pierre "B" Sand	2315'	(+5853')
	Niobrara "A1"	4055'	(+4113')
	Niobrara "A2"	4096'	(+4072')
	Niobrara "B1"	4180'	(+3988')
	Niobrara "B2"	4260'	(+3908')
	Niobrara "B3"	4280'	(+3888')
	Niobrara "B4"	4302'	(+3866')
	Niobrara "C"	4312'	(+3856')

BIT RECORD

<u>NUMBER</u>	<u>SIZE</u>	<u>TYPE</u>	<u>MAKE</u>	<u>DEPTH</u>	<u>OUT</u>	<u>FEET</u>	<u>HOURS</u>
1	17½"	3AS	HTC	530'		450'	6½
2	12¼"	ATJ-IS	HTC	636'		106'	1½
3	12¼"	DS40	HYC	4360'		3724'	97½
Plug Back							
4	12¼"	ATJ-15	HTC	3660'		100'	½
5	12¼"	ATJCO5	HTC	4114'		454'	28½
6	8½"	ATJ1	HTC	4115'		75'	1¼
7	8½"	DS49HV	HYC	4593'		476'	16
7rr	8½"	DS49HV	HYC	6586'		2491'	106
Plug Back							

CONOCO, INC.
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WELL CHRONOLOGY

<u>DATE</u>	<u>6:00 a.m. DEPTH - OPERATION - REMARKS</u>
8/28/91	Spud well at 19:00 - Drilling surface.
8/29/91	Drilling surface to 530' - run surface casing (13-3/8" to 530'). Cement and nipple up.
8/30/91	Nipple up - try to fit stack under sub. Waiting on parts.
8/31/91	Test BOP's - waiting on Blind ram rubbers.
9/1/91	Test BOP's - pick up BHA, drill cement and formation.
9/2/91	738' - trip for bit and mud motor at 636'. Drilling ahead.
9/3/91	2213' - cut 1473' in 19-3/4 hours drilling. Work stuck pipe for 1-3/4 hours. Drilling ahead.
9/4/91	2653' - cut 440' in 23 hours - drilling ahead.
9/5/91	3371' - cut 718' in 21 hours - drilling ahead.
9/6/91	4149' - cut 778' in 19½ hours - drilling ahead.
9/7/91	4360' - cut 211' in 10½ hours. work stuck pipe at 4255'. Trip out of hole with Multi-Shot survey.
9/8/91	4360' - run E-Logs with Schlumberger: GR/DIL from 530' to 4343'. FMS, Caliper, GR, Dipmeter (2600'-4340'). FMS Processing from 3850' to 4340'. Dipmeter Processing from 2950'-3460'. Set plugs from 4110'-4360' and 3556'-3906'.
9/9/91	3605' - tag cement at 3560'. Drill cement to 3605' - wait on cement to finish drying.

CONOCO, INC.
 South McCallum Unit No. 50
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WELL CHRONOLOGY - CONTINUED

<u>DATE</u>	<u>6:00 a.m. DEPTH - OPERATION - REMARKS</u>
9/10/91	3660' - drill cement to 3660' - wait on cement.
9/11/91	3802' - cut 142' in 20 hours - side track with Great Land Directional and Teloco with a 2½° Bent Motor. Time drilling from 3660'-3708' for 17 hours. Drilling ahead.
9/12/91	4114' - cut 312'... Work stuck pipe at 4044'. Trip out of hole to run intermediate casing.
9/13/91	4114' - run 9-5/8", 40#, K55 casing to 4087'. Cement and nipple down.
9/14/91	4114' - Nipple down and nipple up. Install rotating head. Drilling cement, shoe and 3' formation to 4117'. Run leak off test 200 psi - 10 ppg.
9/15/91	4117' - trying to get good MWD readings. Tripped twice to change out MWD tools.
9/16/91	4168' - cut 51' in 1½ hours drilling. Orientate tools and drilling ahead. Trip for mud motor at 4279'.
9/17/91	4353' - cut 185' in 6 hours drilling. Trip for MWD at 4353'. Building angle for B-3 target.
9/18/91	4550' - cut 197' in 6½ hours drilling. Cut 35' normal fault, drilled to 4593' into "C" zone of the Niobrara, prepare to plug back.
9/19/91	Plug back to 4020' - wait on cement.
9/20/91	Tag cement at 4020' - drilled to 4039' - waiting on cement - drill to 4095' - pick up BHA to kickoff well.
9/21/91	4116' - cut 21' in 5 hours drilling, using a 1-3/4° Bent Motor to kick off. Drill to 4120' - trip out and put on 2° Bent Motor.

CONOCO, INC.
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WELL CHRONOLOGY - CONTINUED

9/22/91	4138' - cut 22' in 10 hours. Time drill to 4134' (9½ hours).
9/23/91	4328' - cut 190' in 7½ hours drilling. Trip at 4310' to change out BHA to 1-3/4° Bent Bent Motor and MWD. Trip at 4328' to change out MWD.
9/24/91	4608' - cut 280' in 9-3/4 hours. Drilling ahead.
9/25/91	4924' - cut 316' in 9½ hours drilling. Trip for mud motor at 4924'.
9/26/91	5395' - cut 471' in 16½ hours drilling. Drilling ahead.
9/27/91	5595' - cut 200' in 7½ hours drilling. Trip at 5423' in pick up more push pipe.
9/28/91	5940' - cut 345' in 11½ hours drilling. Drilling ahead.
9/29/91	6213' - cut 273' in 6 hours drilling. Trip for more push pipe, check BOP's and pick up new mud motor at 6213'.
9/30/91	6417' - cut 204' in 8 hours drilling. Trip for MWD at 6250'.
10/1/91	6586' - cut 169' in 7½ hours drilling. Total depth well at 05:00. Short trip, then pulled out of well and prepare to run 5½" liner to total depth.
10/2/91	6586' TOTAL DEPTH. Run 5½" pre-drilled liner to 6565'. Rig down casing tools and prepare to move drilling rig. I was released at this point of the well.

[illegible]

CONOCO, INC.
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MUD RECORD (CONTINUED)

<u>DAY</u>	<u>DATE</u>	<u>DEPTH</u>	<u>WT</u>	<u>VIS</u>	<u>FIL</u>	<u>PV</u>	<u>YP</u>	<u>PH</u>	<u>CL</u>	<u>SOLIDS</u>
23	9/21	4116'	8.8	34	10.4	7	6	11.0	21,000	2.2
24	9/22	4138'	8.8	33	9.2	7	6	10.0	21,000	2.2
25	9/23	4329'	8.8	33	9.5	7	6	9.5	23,000	2
26	9/24	4612'	8.8	34	8.4	9	7	9.0	23,000	2
27	9/25	4924'	8.8+	35	8.8	9	6	9.0	23,000	2
28	9/26	5395'	8.9+	35	8.0	11	7	9.0	23,000	2.9
29	9/27	5595'	8.9+	36	8.0	11	7	9.0	25,000	2.7
30	9/28	5915'	8.9	35	8.4	10	6	9.0	23,000	2.8
31	9/29	6213'	9.0	35	8.0	10	6	9.0	25,000	3.2
32	9/30	6396'	8.4	35	8.4	7	5	9.0	22,000	2.2
33	10/1	6586'	8.0	32	8.0	8	5	9.0	26,000	2.2

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SURVEY RECORD

<u>DATE</u>	<u>SURVEY DEPTH</u>	<u>SURVEY TYPE</u>	<u>DEVIATION</u>
8/28/91	246'	Wireline	½°
8/28/91	367'	Wireline	½°
8/29/91	515'	Wireline	¾°
9/2/91	808'	Wireline	3°
9/2/91	1083'	Wireline	2° N78E
9/2/91	1393'	Wireline	2½° S84E
9/3/91	1706'	Wireline	5¼° N81E
9/3/91	2027'	Wireline	5° N84E
9/3/91	2329'	Wireline	5-¾° N73E
9/4/91	2668'	Wireline	5-¾° N74E
9/4/91	2978'	Wireline	6-¾° N69E
9/5/91	3165'	Wireline	6½° N71E
9/5/91	3477'	Wireline	6-¾° N70E
9/5/91	3789'	Wireline	5-¾° N64E
9/6/91	4067'	Wireline	9° N76E

A Multi Shot Survey was run after drilling Vertical (following pages)

09/07/91

GREAT LAND DIRECTIONAL DRILLING, INC.

Client.....: CONOCO
 Field.....: NORTH PARK BASIN
 Well.....: McCALLUM UNIT #50
 Section at: S,30.00,E
 Engineer...: WICK & WEST

Computation....: RADIUS OF CURVATURE
 Survey Date....: 09/07/91
 RKB Elevation.: 0.00 ft
 Reference.....: RMC89113
 Magnetic Decl.: 12.00 E

RECORD OF SURVEY

S	MEAS DEPTH	INCLN ANGLE	VERT-DEPTHS BKB SUB-S	SECT DIST	DIRECTION BEARING	REL-COORDINATES FROM-WELLHEAD	CLOSURE DIST BEARING	DL/ 100
2	636	2.75	636 636	11	S 75.00 E	4 S 15 E	15 S 75.00 E	0.4
2	730	2.25	730 730	14	S 74.00 E	5 S 19 E	19 S 74.89 E	0.5
2	823	2.25	823 823	16	S 76.00 E	6 S 22 E	23 S 74.91 E	0.0
2	917	2.75	917 917	19	S 71.00 E	7 S 26 E	27 S 74.70 E	0.5
2	1010	2.50	1009 1009	22	S 73.00 E	8 S 30 E	31 S 74.33 E	0.3
2	1103	2.50	1102 1102	25	S 75.00 E	10 S 34 E	35 S 74.29 E	0.0
2	1197	2.25	1196 1196	28	S 77.00 E	11 S 38 E	39 S 74.46 E	0.3
2	1290	2.50	1289 1289	31	S 79.00 E	11 S 42 E	43 S 74.78 E	0.3
2	1384	3.25	1383 1383	34	S 85.00 E	12 S 46 E	48 S 75.49 E	0.8
2	1477	4.00	1476 1476	37	S 86.00 E	12 S 52 E	54 S 76.58 E	0.8
2	1570	4.25	1569 1569	40	N 89.00 E	13 S 59 E	60 S 77.89 E	0.3
2	1664	4.75	1662 1662	44	N 88.00 E	12 S 66 E	67 S 79.37 E	0.5
2	1757	4.75	1755 1755	48	N 89.00 E	12 S 74 E	75 S 80.61 E	0.0
2	1851	4.75	1849 1849	51	N 89.00 E	12 S 82 E	83 S 81.58 E	0.0
2	1944	4.75	1941 1941	55	N 88.00 E	12 S 89 E	90 S 82.42 E	0.0
2	2037	5.25	2034 2034	59	N 85.00 E	11 S 98 E	98 S 83.33 E	0.5
2	2131	5.75	2128 2128	62	N 79.00 E	10 S 106 E	107 S 84.55 E	0.5
2	2224	5.75	2220 2220	65	N 78.00 E	8 S 116 E	116 S 85.90 E	0.0
2	2318	5.75	2314 2314	68	N 76.00 E	6 S 125 E	125 S 87.17 E	0.0
2	2411	5.75	2406 2406	70	N 74.00 E	4 S 134 E	134 S 88.39 E	0.0
2	2504	5.50	2499 2499	72	N 74.00 E	1 S 142 E	142 S 89.50 E	0.3
2	2598	5.75	2592 2592	75	N 75.00 E	1 N 151 E	151 N 89.54 E	0.3
2	2691	5.75	2685 2685	77	N 73.00 E	4 N 160 E	160 N 88.65 E	0.0
2	2785	6.25	2778 2778	79	N 73.00 E	7 N 170 E	170 N 87.75 E	0.5
2	2878	6.25	2871 2871	81	N 71.00 E	10 N 179 E	180 N 86.88 E	0.0
2	2971	6.25	2963 2963	83	N 71.00 E	13 N 189 E	189 N 86.04 E	0.0
2	3065	6.25	3057 3057	85	N 70.00 E	16 N 199 E	199 N 85.25 E	0.0
2	3158	6.25	3149 3149	87	N 69.00 E	20 N 208 E	209 N 84.50 E	0.0
2	3252	6.25	3243 3243	88	N 69.00 E	24 N 218 E	219 N 83.78 E	0.0
2	3345	6.75	3335 3335	90	N 70.00 E	27 N 227 E	229 N 83.13 E	0.5
2	3438	6.75	3427 3427	92	N 71.00 E	31 N 238 E	240 N 82.56 E	0.0
2	3532	7.00	3521 3521	94	N 68.00 E	35 N 248 E	251 N 81.98 E	0.3
2	3625	7.00	3613 3613	95	N 65.00 E	40 N 259 E	262 N 81.2 E	0.0

Survey Codes: 2/MULTI SHOT

(MCCALLUM B1.23)

McCALLUM UNIT #50

Page 2

09/07/91

RECORD OF SURVEY

MEAS	INCLN	VERT-DEPTHS		SECT	DIRECTION	REL-COORDINATES		CLOSURE		DL/
DEPTH	ANGLE	BKB	SUB-S	DIST	BEARING	FROM-WELLHEAD		DIST	BEARING	100
2 3719	6.25	3706	3706	96	N 65.00 E	44 N	269 E	272 N	80.68 E	0.8
2 3812	6.50	3799	3799	97	N 70.00 E	48 N	278 E	282 N	80.20 E	0.3
2 3905	8.50	3891	3891	100	N 77.00 E	51 N	290 E	294 N	79.92 E	2.2
2 3999	9.00	3984	3984	104	N 77.00 E	55 N	304 E	309 N	79.79 E	0.5
2 4092	9.50	4076	4076	108	N 74.00 E	58 N	318 E	323 N	79.59 E	0.5
2 4186	10.25	4168	4168	112	N 72.00 E	63 N	334 E	339 N	79.28 E	0.8
2 4279	10.25	4260	4260	115	N 70.00 E	69 N	349 E	356 N	78.89 E	0.1

Survey Codes: 2/MULTI SHOT

1st Horizontal Well

09/18/91

GREAT LAND DIRECTIONAL DRILLING, INC.

Client.....: CONOCO
 Field.....: NORTH PARK BASIN
 Well.....: McALLUM NO. 50
 Section at: 8,60.00,E

Computation....: RADIUS OF CURVATURE
 Survey Date....: 09/18/91
 EKB Elevation.: 0.00 ft
 Reference.....: RMC89113
 Magnetic Decl.: 12.00 E

RECORD OF SURVEY
 (Calculated from a tie-in station at 3825 MD)

MEAS	INCLN	VERT-DEPTH	SECT	DIRECTION	REL-COORDINATES	CLOSURE	DL/
DEPTH	ANGLE	EKB	SUB-S	DIST	BEARING	FROM-WELLHEAD	DIST BEARING 100
3 3825	7.00	3813	3813	204 N 65.00 E	40 N 259 E	282 N 81.22 E	<TIE
3 3854	7.60	3842	3842	207 N 69.00 E	41 N 262 E	286 N 81.03 E	2.1
3 3885	8.10	3872	3872	209 N 77.40 E	43 N 266 E	270 N 80.90 E	1.7
3 3716	9.00	3703	3703	215 S 69.60 E	43 N 271 E	274 N 80.95 E	3.1
3 3747	11.50	3734	3734	218 S 85.40 E	43 N 277 E	280 N 81.18 E	8.1
3 3778	13.80	3764	3764	224 S 78.00 E	42 N 283 E	286 N 81.58 E	7.5
3 3810	15.20	3795	3795	232 S 64.00 E	39 N 291 E	293 N 82.30 E	5.3
3 3841	17.60	3825	3825	241 S 62.00 E	35 N 299 E	301 N 83.25 E	7.8
3 3872	18.50	3854	3854	251 S 55.10 E	30 N 307 E	308 N 84.35 E	3.7
3 3904	21.40	3884	3884	261 S 52.00 E	24 N 316 E	316 N 85.68 E	9.2
3 3935	26.10	3913	3913	274 S 52.30 E	16 N 325 E	326 N 87.15 E	15.2
3 3965	29.30	3939	3939	288 S 55.50 E	3 N 337 E	337 N 88.84 E	11.0
3 3996	32.60	3966	3966	303 S 53.00 E	1 S 350 E	350 S 89.78 E	10.9
3 4023	36.90	3988	3988	319 S 56.00 E	10 S 362 E	362 S 88.38 E	16.4
3 4058	40.50	4016	4016	341 S 57.30 E	23 S 361 E	362 S 86.60 E	10.1
3 4115	41.70	4058	4058	378 S 58.30 E	42 S 413 E	414 S 84.15 E	2.3
3 4141	41.40	4078	4078	395 S 58.70 E	51 S 427 E	430 S 83.15 E	1.3
3 4172	46.50	4100	4100	417 S 61.30 E	62 S 445 E	450 S 82.09 E	17.3
3 4202	53.40	4119	4119	440 S 60.10 E	73 S 466 E	471 S 81.08 E	23.3
3 4229	57.00	4135	4135	462 S 59.40 E	84 S 485 E	492 S 80.14 E	13.5
3 4240	58.40	4140	4140	471 S 61.80 E	89 S 493 E	501 S 79.78 E	20.3
3 4270	56.30	4157	4157	496 S 59.00 E	101 S 515 E	525 S 78.87 E	8.2
3 4300	57.70	4173	4173	522 S 64.30 E	113 S 537 E	549 S 78.09 E	12.9
3 4332	62.00	4189	4189	549 S 58.30 E	127 S 561 E	575 S 77.29 E	19.9
3 4363	66.80	4202	4202	577 S 61.10 E	141 S 585 E	602 S 76.49 E	17.3
3 4394	71.00	4213	4213	606 S 61.80 E	155 S 611 E	630 S 75.60 E	13.7
3 4425	73.20	4223	4223	626 S 63.20 E	168 S 637 E	658 S 75.21 E	8.2
3 4456	71.70	4232	4232	665 S 58.70 E	182 S 663 E	687 S 74.61 E	14.0
3 4487	75.60	4241	4241	695 S 62.50 E	197 S 689 E	716 S 74.03 E	17.0

Survey Codes: 3/MWD 8/TIE-IN

(CONOCO B1.23)

2nd Horizontal Well

10/01/91 CONOCO

Case ID: CONOCO

Drilling data by RADIUS OF CURVATURE from tie-in station at MD: 3625.00

T	MD	Incln	TVD	Sub-S	Sectn	Direction	From-Well-Head	Dogleg
8	3625	7.00	3613	-4555	204	N,65.00,E	40 N 259 E	<TIE>
3	3654	7.60	3642	-4526	207	N,69.00,E	41 N 262 E	2.08
3	3685	8.10	3672	-4496	209	N,77.40,E	43 N 266 E	1.70
3	3716	9.00	3703	-4465	213	S,89.60,E	43 N 271 E	3.08
3	3747	11.50	3734	-4434	218	S,85.40,E	43 N 277 E	8.08
3	3778	13.80	3764	-4404	224	S,78.00,E	42 N 283 E	7.54
3	3810	15.20	3795	-4373	232	S,64.00,E	39 N 291 E	5.31
3	3841	17.60	3825	-4343	241	S,62.00,E	35 N 299 E	7.76
3	3872	18.50	3854	-4314	251	S,55.10,E	30 N 307 E	3.67
3	3904	21.40	3884	-4284	261	S,52.00,E	24 N 316 E	9.15
3	3935	26.10	3913	-4255	274	S,52.30,E	16 N 325 E	15.16
3	3965	29.30	3939	-4229	288	S,55.50,E	8 N 337 E	10.97
3	3996	32.60	3966	-4202	303	S,53.00,E	1 S 350 E	10.90
3	4023	36.90	3988	-4180	319	S,56.00,E	10 S 362 E	16.42

showing)

(c) 1990 GLDD, Inc.

SrvOut Release B1.23

10/01/91 CONOCO

Case ID: CONOCO

Drilling data by RADIUS OF CURVATURE from tie-in station at MD: 3625.00

T	MD	Incln	TVD	Sub-S	Sectn	Direction	From-Well-Head	Dogleg
3	4059	40.50	4016	-4152	341	S,57.30,E	23 S 381 E	10.12
3	4116	44.00	4058	-4110	380	S,62.50,E	42 S 414 E	7.56
3	4148	47.10	4081	-4087	402	S,65.70,E	52 S 435 E	11.07
3	4179	50.10	4101	-4067	425	S,67.50,E	61 S 456 E	10.26
3	4210	54.40	4120	-4048	450	S,68.50,E	70 S 479 E	14.03
3	4242	59.10	4139	-4030	476	S,68.50,E	80 S 504 E	14.69
3	4273	63.20	4152	-4016	503	S,68.20,E	90 S 529 E	13.25
3	4305	67.50	4166	-4002	532	S,67.50,E	101 S 556 E	13.57
3	4336	71.50	4177	-3991	581	S,67.50,E	112 S 583 E	12.90
3	4367	75.50	4185	-3983	590	S,67.50,E	123 S 610 E	12.90
3	4399	79.70	4192	-3976	621	S,67.80,E	135 S 639 E	13.16
3	4430	83.70	4197	-3971	651	S,67.80,E	147 S 667 E	12.90
3	4461	87.90	4199	-3969	682	S,67.10,E	159 S 696 E	13.73
3	4492	92.10	4199	-3969	713	S,66.40,E	171 S 724 E	13.73

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SrvOut Release B1.23

10/01/91 CONOCO

Case ID: CONOCO

Drilling data by RADIUS OF CURVATURE from tie-in station at MD: 3625.00

T	MD	Inclin	TVD	Sub-S	Sectn	Direction	From-Well-Head	Dogleg
3	4523	95.90	4197	-3971	744	8,65.00,E	184 S 753 E	13.05
3	4555	99.20	4193	-3975	775	8,62.90,E	198 S 781 E	12.13
3	4586	102.70	4187	-3981	806	8,60.40,E	212 S 808 E	13.65
3	4617	104.50	4180	-3988	836	8,59.40,E	227 S 834 E	6.55
3	4648	105.00	4172	-3996	866	8,59.00,E	243 S 860 E	2.01
3	4679	105.40	4164	-4004	896	8,59.40,E	258 S 885 E	1.76
3	4710	105.60	4155	-4013	926	8,59.00,E	273 S 911 E	1.36
3	4741	106.10	4147	-4021	955	8,59.40,E	288 S 937 E	2.01
3	4804	106.10	4128	-4040	1015	8,55.50,E	321 S 987 E	6.43
3	4835	109.50	4118	-4050	1045	8,52.70,E	338 S 1011 E	9.21
3	4866	110.10	4108	-4060	1074	8,51.30,E	356 S 1034 E	4.43
3	4898	110.40	4097	-4071	1103	8,50.60,E	375 S 1057 E	2.14
3	4930	110.80	4085	-4083	1133	8,50.60,E	394 S 1081 E	1.25
3	4961	111.30	4074	-4094	1161	8,50.60,E	412 S 1103 E	1.61

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10/01/91 CONOCO

Case ID: CONOCO

Drilling data by RADIUS OF CURVATURE from tie-in station at MD: 3625.00

T	MD	Inclin	TVD	Sub-S	Sectn	Direction	From-Well-Head	Dogleg
3	4993	111.20	4063	-4105	1191	8,49.20,E	432 S 1126 E	3.82
3	5023	112.50	4052	-4116	1218	8,52.00,E	449 S 1147 E	9.07
3	5055	111.70	4039	-4129	1248	8,54.40,E	467 S 1171 E	6.94
3	5087	109.90	4028	-4140	1277	8,55.90,E	484 S 1195 E	6.99
3	5118	110.00	4018	-4150	1306	8,56.20,E	500 S 1220 E	0.91
3	5150	109.60	4007	-4161	1337	8,58.70,E	517 S 1245 E	7.05
3	5182	106.70	3997	-4171	1367	8,61.10,E	532 S 1271 E	11.36
3	5213	104.70	3988	-4180	1397	8,62.90,E	546 S 1298 E	8.43
3	5244	102.20	3981	-4187	1427	8,65.70,E	559 S 1325 E	11.81
3	5274	99.30	3976	-4192	1456	8,68.20,E	570 S 1352 E	12.62
3	5306	97.40	3971	-4197	1487	8,69.60,E	582 S 1382 E	7.33
3	5338	96.40	3967	-4201	1519	8,69.90,E	593 S 1411 E	3.26
3	5370	96.20	3964	-4204	1550	8,69.90,E	604 S 1441 E	0.63
3	5401	96.60	3960	-4208	1580	8,69.60,E	614 S 1470 E	1.61

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10/01/91 CONOCO

Case ID: CONOCO

Drilling data by RADIUS OF CURVATURE from tie-in station at MD: 3625.00

T	MD	Inclin	TVD	Sub-S	Sectn	Direction	From-Well-Head	Dogleg
3	5432	95.90	3957	-4211	1611	8,69.20,E	625 S 1499 E	2.59
3	5463	95.00	3954	-4214	1641	8,69.20,E	636 S 1528 E	2.90
3	5494	93.90	3951	-4217	1672	8,69.20,E	647 S 1557 E	3.55
3	5526	93.80	3949	-4219	1703	8,69.20,E	659 S 1587 E	0.31
3	5557	94.10	3947	-4221	1734	8,68.90,E	670 S 1615 E	1.37
3	5588	94.50	3945	-4223	1764	8,68.90,E	681 S 1644 E	1.29
3	5620	94.90	3942	-4226	1796	8,68.90,E	692 S 1674 E	1.25
3	5651	94.30	3940	-4228	1826	8,68.90,E	703 S 1703 E	1.94
3	5682	93.50	3938	-4230	1857	8,68.50,E	715 S 1732 E	2.88
3	5713	92.80	3936	-4232	1888	8,68.20,E	726 S 1760 E	2.46
3	5744	94.00	3934	-4234	1918	8,66.40,E	738 S 1789 E	6.95
3	5776	97.30	3931	-4237	1950	8,64.30,E	751 S 1818 E	12.17
3	5804	100.50	3927	-4241	1978	8,63.60,E	763 S 1843 E	11.68
3	5836	105.20	3919	-4249	2009	8,64.30,E	777 S 1871 E	14.83

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10/01/91 CONOCO

Case ID: CONOCO

Drilling data by RADIUS OF CURVATURE from tie-in station at MD: 3625.00

T	MD	Inclin	TVD	Sub-S	Sectn	Direction	From-Well-Head	Dogleg
3	5867	107.40	3911	-4257	2038	8,65.00,E	790 S 1898 E	7.39
3	5898	107.80	3901	-4267	2068	8,65.00,E	802 S 1924 E	1.29
3	5930	109.50	3891	-4277	2098	8,64.60,E	815 S 1952 E	5.43
3	5961	113.00	3880	-4288	2127	8,63.20,E	828 S 1978 E	11.92
3	5990	115.50	3868	-4300	2153	8,62.90,E	840 S 2001 E	8.66
3	6022	118.10	3854	-4314	2182	8,62.90,E	853 S 2027 E	1.87
3	6053	116.80	3840	-4328	2210	8,63.50,E	865 S 2052 E	2.73
3	6085	117.20	3826	-4342	2238	8,63.60,E	878 S 2077 E	1.27
3	6115	118.90	3812	-4356	2265	8,62.90,E	890 S 2101 E	5.94
3	6146	121.10	3796	-4372	2291	8,62.20,E	902 S 2125 E	7.29
3	6161	121.90	3788	-4380	2304	8,62.20,E	908 S 2136 E	5.33
3	6176	122.40	3780	-4388	2317	8,63.20,E	914 S 2147 E	5.81
3	6207	123.80	3763	-4405	2343	8,62.20,E	926 S 2170 E	5.04
3	6239	123.70	3746	-4422	2369	8,59.70,E	939 S 2194 E	5.42

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10/01/91 CONOCO

Case ID: CONOCO

Drilling data by RADIUS OF CURVATURE from tie-in station at MD: 3625.00

T	MD	Incln	TVD	Sub-S	Sectn	Direction	From-Well-Head	Dogleg
3	8270	123.30	3728	-4440	2395	8,57.30,E	953 S 2216 E	5.36
3	8301	124.10	3711	-4457	2421	8,54.10,E	967 S 2237 E	7.14
3	8333	124.50	3693	-4475	2447	8,51.30,E	983 S 2258 E	6.07
3	8364	124.60	3675	-4493	2472	8,48.50,E	1000 S 2277 E	6.13
3	8396	124.40	3657	-4511	2498	8,45.30,E	1018 S 2297 E	6.84
3	8438	125.00	3639	-4529	2523	8,42.60,E	1036 S 2315 E	5.57
3	8458	123.30	3622	-4546	2547	8,41.10,E	1055 S 2332 E	5.60
3	8460	122.30	3605	-4563	2572	8,40.70,E	1075 S 2349 E	4.77
3	8522	120.50	3588	-4580	2598	8,40.70,E	1096 S 2367 E	5.63
3	8533	120.00	3582	-4586	2607	8,40.70,E	1103 S 2373 E	4.55

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CONOCO, INC.
South McCallum Unit No. 50
Section 8-T9N-R78W
Jackson County, Colorado

SAMPLE DESCRIPTIONS

VERTICAL WELL

<u>530'-650'</u>	VERY POOR SAMPLES - due to cement. SHALE: medium grey, blocky, moderately firm, silty in part, trace SANDSTONE.
<u>650'-680'</u>	SHALE: light to medium grey, blocky, moderately soft to moderately firm, silty in part, trace small carbonaceous inclusions. SANDSTONE: white to light grey, very fine to fine grained, subrounded to subangular, moderately to poorly sorted, salt and peppered, trace clay filled, calcareous, no stain fluorescence odor or cut.
<u>680'-710'</u>	SANDSTONE: light grey, very fine grained to silty, well sorted, slightly salt and peppered, calcareous.
<u>710'-830'</u>	VERY POOR SAMPLES - 95% cement contamination. SHALE: light to medium grey, blocky, moderately soft, slightly calcareous.
<u>830'-860'</u>	SANDSTONE: light grey, very fine grained, well sorted, slightly salt and peppered, calcareous, tight. SHALE: as above.
<u>860'-920'</u>	SANDSTONE: as above, trace glauconitic, silty in part, trace SHALE stringers.
<u>920'-950'</u>	VERY POOR SAMPLES.
<u>950'-1100'</u>	SILTSTONE: light grey, moderately soft to moderately firm, occasional salt and pepper, slightly calcareous, slightly sandy, to shaley in part.
<u>1100'-1150'</u>	SHALE: light grey, blocky, moderately soft to moderately firm, silty, occasionally sandy in part.
<u>1150'-1230'</u>	SANDSTONE: white to light grey, very fine grained, moderately sorted, slightly salt and peppered, calcareous, clay filled, tight, increase in SILTSTONE with depth.

CONOCO, INC.
South McCallum Unit No. 50
Section 8-T9N-R78W
Jackson County, Colorado

SAMPLE DESCRIPTIONS - CONTINUED

<u>1230'-1260'</u>	SANDSTONE: white to light grey, very fine grained, moderately to well sorted, slightly salt and peppered, calcareous, silty in part, trace SHALE stringers.
<u>1260'-1310'</u>	SHALE: light grey, blocky, moderately firm, silty to sandy in part, occasional trace carbonaceous inclusions.
<u>1310'-1320'</u>	SANDSTONE: light grey, very fine grained, silty in part, moderately sorted, <u>trace calcite filled fractures</u> , <u>trace black dead oil stained fractures</u> , with PYRITE inclusions.
<u>1320'-1330'</u>	SHALE: as above, silty in part, trace fossil fragments (inoceramus).
<u>1330'-1380'</u>	SHALE: light to medium grey, blocky, moderately firm, silty in part, sandy in part, occasional trace carbonaceous inclusions.
<u>1380'-1390'</u>	SHALE: as above, trace calcite filled fractures, trace free Calcite crystals.
<u>1390'-1430'</u>	SHALE: as above, silty to sandy in part.
<u>1430'-1460'</u>	SANDSTONE: white to light grey, very fine to fine grained, subrounded to subangular, moderately sorted, salt and peppered, calcareous, trace glauconite, trace clay filled.
<u>1460'-1520'</u>	SHALE: medium grey, blocky, moderately firm, silty in part, sandy in part, trace glauconite, trace brown marlstone stringers, trace free Calcite crystals.
<u>1520'-1670'</u>	SHALE: as above. SANDSTONE: white, light grey in part, very fine to fine grained, subrounded, well sorted, salt and peppered, calcitic, trace glauconite, trace clay filling, becoming silty in part.
<u>1573'</u>	<u>SAMPLE TOP PIERRE "A" AT 1573'</u>

CONOCO, INC.
South McCallum Unit No. 50
Section 8-T9N-R78W
Jackson County, Colorado

SAMPLE DESCRIPTIONS - CONTINUED

<u>1670'-1700'</u>	SHALE: medium grey, blocky, moderately firm, silty in part, trace carbonaceous inclusions.
<u>1700'-1760'</u>	SHALE: as above. SANDSTONE: white, very fine grained, well sorted, salt and peppered, calcareous, tight, increasing with depth.
<u>1760'-1790'</u>	SANDSTONE: white, light grey in part, very fine to fine grained, moderately to poorly sorted, subrounded, salt and peppered, calcareous, clay filled in part, predominantly tight, trace light yellow mineral fluorescence, no visible cut. SHALE: as above.
<u>1790'-1820'</u>	SANDSTONE: white, very fine to fine grained, subrounded, subangular in part, predominantly well sorted, salt and peppered, calcareous, trace glauconite, slight trace clay filling.
<u>1820'-1860'</u>	SANDSTONE: as above, increase in clay filling.
<u>1860'-1970'</u>	SHALE: medium grey, dark grey in part, blocky, moderately firm, silty in part, trace SANDSTONE.
<u>1970'-2150'</u>	SHALE: as above, increasingly dark grey.
<u>2150'-2220'</u>	SANDSTONE: light grey to white, very fine grained to silty, moderately to well sorted, salt and peppered, calcareous, glauconitic, trace Calcite filled fractures, becoming silty with depth.
<u>2220'-2330'</u>	SHALE: light to medium grey, grey brown, dark grey in part, blocky, moderately soft to moderately firm, silty in part, slightly calcareous.
<u>2315'</u>	<u>SAMPLE TOP PIERRE "B" AT 2315'</u>
<u>2330'-2410'</u>	SHALE: medium to dark grey, black in part, blocky, moderately firm to firm, trace SILT-STONE stringers, becoming silty to sandy with depth.

CONOCO, INC.
South McCallum Unit No. 50
Section 8-T9N-R78W
Jackson County, Colorado

SAMPLE DESCRIPTIONS - CONTINUED

2410'-2520'

SHALE: medium grey, grey brown in part, blocky, moderately firm to moderately soft, silty in part, occasional trace carbonaceous inclusions.

2520'-2540'

SHALE: dark grey, black, blocky, firm, carbonaceous in part, silty in part.

2540'-2580'

SHALE: medium grey, grey brown, moderately soft, moderately firm, blocky, slightly bentonitic, occasional trace SILTSTONE.

2580'-2700'

SHALE: grey brown, medium grey, blocky, soft to moderately firm in part, bentonitic, occasional trace SILTSTONE.

2700'-2790'

SHALE: dark grey, medium grey, grey brown, blocky, moderately firm to moderately soft, silty in part, occasional trace fine SANDSTONE, bentonitic in part, slightly calcareous.

2790'-2880'

SHALE: grey-brown, medium grey, blocky, subplaty, moderately firm to firm, slightly silty, trace white, very fine grained, salt and peppered, clay filled SANDSTONE.

2880'-3020'

SHALE: medium to dark grey, occasionally grey brown, blocky, platy in part, firm to moderately firm, slightly calcareous, trace thin SILTSTONE stringers, trace thin BENTONITE stringers.

3020'-3030'

SHALE: as above, trace free CALCITE crystals.

3030'-3050'

SHALE: dark grey, medium grey, grey brown, blocky, platy in part, firm to moderately firm, occasional trace SILTSTONE to thin SANDSTONE stringers.

3050'-3110'

SHALE: grey brown, medium to to dark grey, blocky, moderately soft to moderately firm, slightly calcareous, bentonitic in part, trace SILTSTONE stringers, trace free Calcite with depth.

CONOCO, INC.
South McCallum Unit No. 50
Section 8-T9N-R78W
Jackson County, Colorado

SAMPLE DESCRIPTIONS - CONTINUED

<u>3110'-3120'</u>	SHALE: as above, trace BENTONITE.
<u>3120'-3300'</u>	SHALE: as above.
<u>3300'-3320'</u>	SHALE: medium grey, grey brown, blocky, moderately firm, firm, slightly calcareous, slight increase in SILTSTONE, trace fossil fragments.
<u>3320'-3350'</u>	SHALE: black, dark grey, blocky, firm, slightly carbonaceous in part, slight trace SILTSTONE.
<u>3350'-3380'</u>	SHALE: grey brown, dark grey, blocky, moderately firm to firm, occasionally soft, silty in part.
<u>3380'-3520'</u>	SHALE: dark grey, black, blocky, firm, slightly silty, slightly calcareous, trace BENTONITE, becoming slightly grey brown with depth.
<u>3520'-3570'</u>	SHALE: black, dark grey, blocky, platy in part, firm, occasional trace SILTSTONE: slightly calcareous.
<u>3570'-3600'</u>	SHALE: as above. SANDSTONE: light grey, very fine grained, moderately to poorly sorted, subangular to subrounded, salt and peppered, calcareous, slightly glauconitic, clay filled, tight, trace calcite filled fractures.
<u>3600'-3670'</u>	SHALE: as above, trace free Calcite and Calcite filled fractures through interval.
<u>3670'-3700'</u>	SHALE: medium to dark grey, slightly grey brown in part, blocky, firm, silty in part, trace bentonitic, slight increase in calcareous SHALE, slight trace Calcite filled fractures.
<u>3700'-3740'</u>	SHALE: black, dark grey, blocky, firm, slightly carbonaceous in part.

CONOCO, INC.
South McCallum Unit No. 50
Section 8-T9N-R78W
Jackson County, Colorado

SAMPLE DESCRIPTIONS - CONTINUED

<u>3740'-3750'</u>	SHALE: as above, trace fossil fragments (inoceramus).
<u>3750'-3780'</u>	SHALE: dark grey, medium grey in part, blocky, firm, occasional trace free Calcite.
<u>3780'-3800'</u>	SHALE: as above, numerous calcite filled fractures, trace free calcite crystals, trace BENTONITE.
<u>3800'-3880'</u>	SHALE: black to dark grey, blocky, platy in part, firm, slight trace Calcite filled fractures, slightly to moderately calcareous.
<u>3880'-3910'</u>	SHALE: dark grey, blocky, firm, moderately calcareous, trace white specks.
<u>3910'-3950'</u>	SHALE: as above, decrease in white specks (very slight trace to none).
<u>3950'-3980'</u>	SHALE: dark grey, black in part, blocky, firm, calcareous, trace scattered cream colored flakes.
<u>3980'-4000'</u>	SHALE: dark grey, medium grey in part, blocky, moderately firm to firm, slight trace SILTSTONE: trace free Calcite, moderately calcareous, slight trace tan specks.
<u>4000'-4035'</u>	SHALE: black, dark grey, blocky, firm, calcareous, trace carbonaceous inclusions, slight trace disseminated PYRITE, occasional trace tan specks.
<u>4035'-4080'</u>	SHALE: dark grey, black, blocky, subplaty, firm, calcareous, trace tan specks, trace free calcite.
<u>4055'</u>	<u>SAMPLE TOP NIOBRARA.</u>
<u>4080'-4120'</u>	SHALE: dark grey, increasing in grey-brown with depth, blocky, subplaty in part, moderately soft to moderately firm, extremely calcareous, abundant tan specks, trace fossil fragments (inoceramus), trace bright yellow mineral fluorescence, no visible cut.

CONOCO, INC.
South McCallum Unit No. 50
Section 8-T9N-R78W
Jackson County, Colorado

SAMPLE DESCRIPTIONS - CONTINUED

4096'

SAMPLE TOP NIOBRARA "A2" AT 4096'

4120'-4180'

SHALE: black, dark grey, blocky, platy in part, hard, fissile, extremely calcareous, fair amount tan specks.

4180'-4220'

SHALE: medium to dark grey, blocky, subplaty in part, moderately firm to firm, extremely calcareous, numerous tan specks, trace acid cut.

4180'

SAMPLE TOP NIOBRARA "B-1" AT 4180'

4220'-4250'

SHALE: as above, grey brown in part, moderately soft to moderately firm, trace bentonite, chalky in part, trace acid cut.

4250'-4290'

SHALE: grey brown, blocky, subplaty, chalky in part, soft to moderately firm, slight trace chalky calcite, trace free calcite, trace calcite filled fractures, slight stream of oil over shaker, trace acid cut, trace dull gold fluorescence, fair residual cut.

4260'

SAMPLE TOP NIOBRARA "B2" AT 4260'.

4280'

SAMPLE TOP NIOBRARA "B3" AT 4280'.

4290'-4310'

SHALE: light to medium grey, grey brown, chalky, slightly blocky, soft to moderately firm, abundant tan specks, extremely calcareous, trace free calcite dull yellow to yellow-gold fluorescence, slight residual cut. Trace acid cut.

4310'-4320'

SHALE: grey brown, medium to dark grey, blocky, chalky, soft to firm, abundant tan specks, trace free calcite, trace calcite filled fractures, trace black dead oil stained horse-hair fractures, abundant dull yellow gold fluorescence, slight trace streaming cut, fair residual cut.

4312'

SAMPLE TOP NIOBRARA "C" AT 4312'.

CONOCO, INC.
South McCallum Unit No. 50
Section 8-T9N-R78W
Jackson County, Colorado

SAMPLE DESCRIPTIONS - CONTINUED

4320'-4350'

SHALE: dark grey to grey brown, blocky, firm to moderately soft, chalky in part, extremely calcareous, fair amount of tan specks, trace thin black dead oil stain fractures, trace free calcite, trace Bentonite in part, scattered dull yellow gold fluorescence, trace weak residual cut.

4350'-4360'

SHALE: predominantly dark grey to grey brown, blocky to subplaty, moderately firm to firm, calcareous, trace tan specks, trace very fine disseminated pyrite, trace free calcite with dead oil stained face, slight trace calcite filled fractures, trace fossil fragments (inoceramus), trace dull yellow-gold fluorescence, no visible cut.

RUN ELECTRIC LOGS WITH SCHLUMBERGER -
FORT MORGAN, COLORADO.

DIL-SFL-GR
FMS/Dipmeter

PLUG BACK TO 3550' - kick off horizontal
well at 3660'.

CONOCO, INC.
South McCallum Unit No. 50
Section 8-T9N-R78W
Jackson County, Colorado

SAMPLE DESCRIPTIONS

HORIZONTAL HOLE NO. 1

<u>3660'-3700'</u>	POOR SAMPLES. Samples going from 90% cement to 50% cement. SHALE: medium to dark grey, blocky, moderately firm, occasional trace SILTSTONE, slightly calcareous.
<u>3700'-3720'</u>	SHALE: medium to dark grey, black in part, blocky, moderately firm to firm, slightly silty in part, slightly calcareous, trace BENTONITE.
<u>3720'-3860'</u>	SHALE: black to dark grey, blocky to sub-platy, moderately firm to firm, trace SILTSTONE: slightly calcareous, trace fossil fragments (inoceramus), trace Calcite filled fractures; slight trace BENTONITE.
<u>3860'-3900'</u>	SHALE: dark grey to black, blocky to platy, fissile in part, hard to medium firm, slightly calcareous, trace free calcite, trace SILTSTONE, trace grey brown SHALE with depth.
<u>3900'-3920'</u>	SHALE: medium to dark grey, blocky, moderately firm, silty in part, trace free calcite crystals, trace very fine disseminated PYRITE, slightly calcareous.
<u>3920'-3950'</u>	SHALE: dark grey to black, blocky to platy, firm to hard, carbonaceous in part, slightly calcareous, trace free Calcite.
<u>3950'-3980'</u>	SHALE: as above, becoming moderately calcareous, trace inoceramus; grading into a grey brown SHALE.
<u>3980'-4010'</u>	SHALE: dark grey, blocky, moderately firm to firm, slight trace siltstone, trace large free Calcite filled fractures, moderately calcareous.
<u>4010'-4020'</u>	SHALE: dark grey, blocky, firm, moderately calcareous, very slight trace brown specks, trace inoceramus.

CONOCO, INC.
South McCallum Unit No. 50
Section 8-T9N-R78W
Jackson County, Colorado

SAMPLE DESCRIPTIONS CONT.*HORIZONTAL HOLE 1

<u>4020'-4030'</u>	SHALE: dark grey, black, blocky, moderately firm to firm, moderately calcareous, trace Inoceramus.
<u>4030'-4040'</u>	SHALE: as above, grey brown in part, silty in part, moderately soft to firm.
<u>4040'-4060'</u>	SHALE: black, dark grey, blocky to platy, firm, carbonaceous in part, trace tan specks, which increase with depth, extremely calcareous.
<u>4060'-4070'</u>	SHALE: as above, numerous tan specks.
<u>4070'-4090'</u>	SHALE: dark grey, grey brown, blocky, moderately firm to firm, extremely calcareous, abundant tan specks, trace Calcite filled fractures, trace inoceramus.
<u>4090'-4114'</u>	SHALE: dark grey, blocky, moderately firm to firm, extremely calcareous, abundant tan specks, no visible fluorescence, no visible cut.
	Run 9-5/8" Intermediate casing to 4087' - K-55 - 40#.
	Drilling cement and shoe plus 3' of formation to 4017'. Run leak off test - 200 psi * 10 ppg.
<u>4117'-4170'</u>	SHALE: dark grey, blocky to platy, firm, extremely calcareous, numerous tan specks, decreasing with depth.
<u>4170'-4200'</u>	SHALE: dark grey, black in part, blocky to platy, firm, extremely calcareous, numerous tan specks, increasing with depth, occasional trace Calcite filled fractures.
<u>4200'-4250'</u>	SHALE: dark grey, grey brown, blocky, platy in part, moderately firm to firm, slightly chalky in part, abundant tan specks, very slight trace BENTONITE.

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SAMPLE DESCRIPTIONS CONT.*HORIZONTAL HOLE 1

4250'-4260'

SHALE: as above, trace Calcite filled fractures, slight trace bentonite, moderately soft in part.

4260'-4280'

SHALE: dark grey, occasionally grey brown, blocky, subplaty in part, moderately soft to moderately firm, firm in part, very calcareous, abundant tan specks, trace Calcite filled fractures, trace free Calcite crystals, trace inoceramus, slight trace disseminated PYRITE, slight trace acid cut, no fluorescence odor or cut.

4280'-4350'

SHALE: grey brown, blocky to platy, moderately firm, very calcareous, abundant tan specks, trace disseminated PYRITE in inoceramus fossils, trace calcite filled fractures, very slight trace BENTONITE, no visible fluorescence, very slight residual cut.

4350'-4370'

SHALE: grey brown, light grey in part, blocky, moderately soft to moderately firm, very calcareous, trace tan specks, trace bentonite, trace calcite filled fractures, dull yellow gold fluorescence, very slight residual cut.

4370'-4380'

SHALE: light grey brown, light grey in part, chalky, soft to moderately soft, very calcareous, slight trace tan specks, moderate trace of free Calcite crystals, slight trace bentonite, dull yellow gold fluorescence, trace residual cut.

4380'-4400'

SHALE: grey brown, blocky, moderately soft to soft, very calcareous, trace BENTONITE inclusions, trace inoceramus; slight trace Calcite, occasional trace white specks, trace acid cut.

4400'-4420'

SHALE: grey brown, dark grey (increasing with depth), blocky, platy in part, moderately soft to moderately firm, abundant tan specks, trace BENTONITE, trace carbonaceous inclusions, trace acid cut.

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SAMPLE DESCRIPTIONS CONT.*HORIZONTAL HOLE 1

4420'-4430'

SHALE: light grey brown, tan, soft, chalky, trace tan specks, trace horsehair fractures, trace large calcite filled fractures, trace PYRITE along fracture face, good acid cut, very slight trace residual cut.

4430'-4500'

SHALE: black, dark grey, blocky to platy, firm, trace tan specks, slight trace Calcite filled fractures, slight trace BENTONITE.

4500'-4580'

SHALE: black, dark grey, blocky to platy, calcareous, carbonaceous in part, firm to hard, occasional trace BENTONITE, occasional trace tan specks, occasional trace Calcite filled fractures, becoming slightly grey brown with depth.

4580'-4593'

NO SAMPLE - not circulated out.

PLUG BACK to 4020' because of a 35' normal fault. Unable to stay in B-3 target zone, because of deviation angle - kickoff at 4115',

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SAMPLE DESCRIPTIONS

HORIZONTAL HOLE NO. 2

<u>4120'-4200'</u>	SHALE: dark grey, blocky to subplaty, moderately firm, calcareous, slight trace BENTONITE, slight trace tan specks, increasing with depth.
<u>4200'-4240'</u>	SHALE: dark grey, grey brown in part, blocky, subplaty, very calcareous, numerous tan specks.
<u>4240'-4280'</u>	SHALE: as above, slight trace BENTONITE inclusions, slight increase in grey brown shales.
<u>4280'-4330'</u>	SHALE: dark grey, black, blocky to platy, moderately firm, very calcareous, numerous tan specks, trace BENTONITE with PYRITE inclusions.
<u>4330'-4340'</u>	SHALE: grey brown, dark grey in part, blocky to subplaty, very calcareous, numerous tan specks, trace BENTONITE stringers, slight trace free Calcite crystals.
<u>4340'-4350'</u>	SHALE: grey brown, blocky, moderately firm, very calcareous, numerous tan specks, trace calcite filled fractures, trace free calcite crystals.
<u>4350'-4360'</u>	SHALE: grey brown, light grey, chalky, blocky, moderately soft to moderately firm, very calcareous, numerous tan specks, moderate trace Bentonite, trace free Calcite.
<u>4360'-4370'</u>	SHALE: light grey brown, chalky, soft, extremely calcareous, trace tan specks, abundant Calcite (chalky to firm) trace horsehair fractures filled with dead oil stain, trace yellow/gold mineral fluorescence.

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SAMPLE DESCRIPTIONS*HORIZONTAL HOLE #2

4370'-4380'

SHALE: light grey, light grey brown, chalky, soft, extremely calcareous, trace Calcite filled fractures, trace horsehair fractures, dull gold fluorescence, trace hydrocarbon sheen on shaker, no visible cut.

4380'-4400'

SHALE: light grey, light to medium grey brown, soft to moderately soft, chalky, trace black dead oil stained fractures, trace free Calcite, with dead oil stain; slight increase in tan specks, slight trace carbonaceous inclusions, dull gold fluorescence.

4400'-4410'

SHALE: as above, increase in dark grey
SHALE - increase in moderately firm SHALE, trace Calcite.

4410'-4420'

SHALE: grey brown, dark grey to black in part, increaseing with depth, blocky, moderately soft to firm, increasing with depth, slight trace tan specks, trace Calcite.

4420'-4460'

SHALE: black, dark grey, blocky to subplaty, calcareous, occasional trace tan specks, trace Calcite crystals, trace calcite filled fractures, decrease in Calcite after 4450'.

4460'-4530'

SHALE: dark grey, black in part, blocky, firm, calcareous, carbonaceous in part, occasibnal trace Calcite filled fractures.

4530'-4540'

SHALE: as above, trace inoceramus.

4540'-4600'

SHALE: black, dark grey, blocky to platy, firm, calcareous, carbonaceous in part, scattered trace Calcite.

4600'-4610'

SHALE: dark grey, grey brown, blocky to platy, moderately firm, trace tan specks.

4610'-4628'

SHALE: dark grey, grey brown in part, black in part, blocky to platy, moderately firm, slight increase in tan specks, trace free Calcite crystals, trace Calcite filled fractures with disseminated PYRITE.

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SAMPLE DESCRIPTIONS*HORIZONTAL HOLE #2

<u>4628'-4650'</u>	SHALE: as above - increase in dark grey to black SHALE. Possible cavings from the "C" zone due to rotating the Drill String.
<u>4650'-4660'</u>	SHALE: as above, trace Calcite filled fractures. 1200 units.
<u>4660'-4670'</u>	SHALE: as above, trace Calcite filled fractures and free Calcite crystals. 2000 units.
<u>4670'-4690'</u>	SHALE: dark grey, black, blocky to platy, moderately firm to firm, calcareous, slight trace tan specks.
<u>4690'-4710'</u>	SHALE: as above, trace calcite filled fractures. 1600 units.
<u>4710'-4730'</u>	SHALE: dark grey, grey brown in part, black in part, blocky to platy, moderately firm to firm, calcareous, slight trace tan specks, trace Calcite filled fractures, with PYRITE inclusions, trace inoceramus.
<u>4730'-4842'</u>	SHALE: black, dark grey, blocky, firm, calcareous, trace inoceramus, very slight trace tan specks, occasional trace Calcite filled fractures, occasional trace free Calcite, scattered trace BENTONITE.
<u>4842'-4844'</u>	SHALE: black to dark grey, blocky to platy, firm, calcareous, slightly carbonaceous in part, very slight trace tan specks, trace BENTONITE, trace Calcite filled fractures, trace BENTONIE, trace Inoceramus.
<u>4844'-4924'</u>	SHALE: as above, trace free Calcite crystals. Trip for mud motor.
<u>4924'-4960'</u>	SHALE: dark grey, slightly grey brown, blocky, subplaty, moderately firm to firm, calcareous, slight trace tan specks, trace inoceramus.
<u>4960'-4980'</u>	SHALE: dark grey, blocky to platy, moderately firm, calcareous, slight trace tan specks, trace calcite filled fractures.

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SAMPLE DESCRIPTIONS*HORIZONTAL HOLE #2

<u>4980'-4990'</u>	SHALE: grey brown, dark grey in part, blocky to platy, slightly chalky, moderately soft to moderately firm, very calcareous, numerous tan specks, trace free Calcite crystals, trace Calcite filled fractures.
<u>4990'-5000'</u>	SHALE: grey brown, tan, light grey, chalky, soft, abundant specks, trace Calcite, trace Calcite filled fractures, oil breaking out of mud.
<u>5000'-5012'</u>	SHALE: tan, grey brown, chalky; soft, very calcareous, trace Calcite filled fractures, trace dead oil stained hairline fractures, oil breaking out of mud, dull yellow gold fluorescence, good residual cut.
<u>5012'-5020'</u>	SHALE: light grey brown to dark grey brown, dark grey in part, blocky to chalky, soft to moderately firm, numerous tan specks, trace free calcite crystals, dull yellow fluorescence, good residual cut, good streaming cut.
<u>5020'-5030'</u>	SHALE: tan to light grey brown, chalky, soft to moderately soft, occasional trace tan specks, slight trace calcite filled fractures, trace dead oil stained fractures, yellow gold fluorescence, good streaming cut.
<u>5030'-5040'</u>	SHALE: grey brown-dark grey, blocky, chalky, moderately soft to moderately firm, fair amount of tan specks, trace black dead oil stained fractures, slight trace Calcite filled fractures.
<u>5040'-5050'</u>	SHALE: light grey brown to dark grey, chalky to slightly blocky, moderately soft to soft, moderately firm in part, very calcareous, trace black oil stain, slight trace Calcite crystals.
<u>5060'-5080'</u>	SHALE: grey brown to dark grey, blocky to slightly chalky, moderately soft to moderately firm, abundant tan specks, slight trace calcite filled fractures.

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SAMPLE DESCRIPTIONS*HORIZONTAL HOLE. #2

5080'-5130'

SHALE: dark grey to grey brown, blocky to subplaty, moderately firm, numerous tan specks, trace free calcite crystals, trace calcite filled fractures.

5130'-5170'

SHALE: dark grey, blocky, moderately firm to firm, calcareous, numerous tan specks, trace calcite filled fractures.

5170'-5230'

SHALE: dark grey, black in part, grey brown in part, blocky to platy, moderate trace tan specks, slight trace calcite filled fractures.

5230'-5260'

SHALE: dark grey, blocky, moderately firm, calcareous, slight trace tan specks.

5260'-5320'

SHALE: dark grey, grey brown in part, blocky to subplaty, moderately firm, calcareous, increasing tan specks with depth, slight trace inoceramus at 5310'.

5320'-5360'

SHALE: grey brown to dark grey, blocky to subplaty, moderately firm to occasionally moderately soft, very calcareous, slightly chalky in part, numerous tan specks.

5360'-5420'

SHALE: grey brown, blocky to slightly chalky, moderately firm, to moderately soft, very calcareous, abundant tan specks, slight trace calcareous.

5420'-5450'

SHALE: dark grey to grey brown in part, blocky to platy, moderately firm, very calcareous, numerous tan specks, occasional trace calcite filled fractures.

5450'-5530'

SHALE: grey brown, dark grey in part, blocky to platy, occasionally slightly chalky, moderately firm to moderately soft in part, very calcareous, numerous tan specks, slight trace free calcite crystals with PYRITE inclusions, occasional trace dark grey to black SHALE stringers.

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SAMPLE DESCRIPTIONS*HORIZONTAL HOLE #2

5530'-5590'

SHALE: grey-brown, blocky to subplaty, chalky in part, moderately firm to moderately soft, very calcareous, numerous tan specks, very slight trace calcite crystals.

5590'-5610'

SHALE: as above, abundant tan specks, trace Calcite crystals.

5610'-5650'

SHALE: dark grey, grey brown, blocky to platy, moderately firm, very calcareous, abundant tan specks, occasional trace calcite filled fractures.

5650'-5700'

SHALE: grey brown, light grey in part, blocky to platy, chalky in part, moderately firm to moderately soft, very calcareous, abundant tan specks, trace inoceramus.

5700'-5770'

SHALE: light grey, grey brown, chalky, blocky in part, moderately soft to moderately firm in part, moderate trace tan specks, trace Calcite crystals, dull yellow gold fluorescence, good residual cut, fair diffuse cut, trace streaming cut, increasing with depth.

5770'-5800'

SHALE: dark grey brown, grey brown, dark grey in part, blocky to chalky, moderately soft to moderately firm, very calcareous, trace Calcite filled fractures, trace tan specks, increasing with depth. Dull yellow fluorescence, good diffuse cut.

5800'-5890'

SHALE: dark grey, grey brown, blocky to subplaty, chalky in part, moderately firm to moderately soft, very calcareous, trace tan specks, increasing with depth, dull yellow gold fluorescence, moderate residual cut in part.

5890'-5960'

SHALE: dark grey, black in part, grey brown in part, blocky to platy, calcareous, trace to moderate trace of tan specks, trace Calcite filled fractures and free calcite crystals.

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SAMPLE DESCRIPTIONS*HORIZONTAL HOLE #2

5960'-6000'

SHALE: dark grey, grey brown in part, blocky, moderately firm, calcareous, numerous tan specks, slight trace free calcite, becoming a light or grey brown with abundant tan specks, with depth.

6000'-6040'

SHALE: dark grey to black, grey brown in part, blocky, moderately firm to moderately soft in part, carbonaceous in part, calcareous, moderate amount of tan specks, slight trace Calcite filled fractures.

6040'-6060'

SHALE: as above, predominantly grey brown, abundant free calcite crystals.

6060'-6110'

SHALE: grey brown, dark grey, black in part, blocky, moderately firm, moderately soft in part, calcareous, numerous tan specks, slight trace free Calcite crystals.

6110'-6150'

SHALE: dark grey, black to grey brown in part, blocky, platy in part, moderately firm, calcareous, trace tan specks, trace calcite filled fractures.

6150'-6250'

SHALE: black, dark grey, blocky to platy, firm, moderate trace tan specks, carbonaceous in part, calcareous, trace calcite filled fractures, trace free calcite with depth, slightly grey brown with depth.

6250'-6400'

SHALE: dark grey, grey brown in part, black in part, blocky to platy, moderately firm, calcareous, trace calcite filled fractures, trace free calcite, occasional trace inoceramus, with PYRITE inclusions, trace tan specks with depth.

6400'-6410'

SHALE: dark grey, grey brown, blocky to platy, slightly chalky, moderately firm to moderately soft in part, calcareous, moderate trace tan specks, slight trace calcareous crystals.

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SAMPLE DESCRIPTIONS*HORIZONTAL HOLE #2

6410'-6440'

SHALE: tan, light grey-brown to grey brown, chalky to blocky, soft to moderately firm, very calcareous, numerous to round, sparry calcitic growths, trace black oil stain, dull yellow fluorescence, fair streaming cut, good diffuse cut.

6440'-6450'

SHALE: as above, trace dark grey, blocky shale stringers.

6450'-6480'

SHALE: tan, light grey brown to grey brown, chalky, blocky in part, moderately soft to moderately firm in part, very calcareous, trace tan specks, trace free calcite crystals, dull yellow gold fluorescence, good diffuse cut.

6480'-6530'

SHALE: light grey brown, grey brown, tan in part, chalky to blocky, moderately soft to moderately firm, very calcareous, trace tan specks, which increase with depth, trace free Calcite crystals, trace Calcite filled fractures, dull yellow fluorescence, moderate diffuse cut.

6530'-6560'

SHALE: as above, increase in dark grey brown, increase in tan specks with depth. Fluorescence and cut, as above, decreasing with depth.

6560'-6586'

SHALE: grey brown, blocky to platy, moderately firm, very calcareous, numerous tan specks, occasionally slightly chalky, dull yellow gold fluorescence.

REACHED TOTAL DEPTH ON OCTOBER 1, 1991 @ 05:00.

PREPARE TO RUN PIPE TO TEST WELL.