

REPORT OF
SUB-SURFACE
DIRECTIONAL
SURVEY

**REPORT
of
SUB-SURFACE
DIRECTIONAL
SURVEY**

MERIDIAN OIL INCORPORATED
COMPANY

HOWELL E NO. 2R
WELL NAME

B-14-30 N-8W

SAN JUAN COUNTY, NEW MEXICO
LOCATION

JOB NUMBER
413-523

TYPE OF SURVEY
SEEKER I GYRO SURVEY

DATE
20-JUN-90

SURVEY BY
MR. D. COY

OFFICE
RM/410 CASPER, WY.

EC DISTRICT : ROCKY MOUNTAIN DIST.

MERIDIAN OIL INCORPORATED
M.O.I. WELLS

DATE PRINTED : 26-JUN-90
OUR REF. NO. : S03264.8MZ
JOB NUMBER :

PAGE NO. 2

PBHL : N 0 0 E

MEASURED DEPTH	DRIFT ANGLE D M	DRIFT DIRECTION D M	COURSE LENGTH	TRUE VERTICAL DEPTH	VERTICAL SECTION	R E C T A N G U L A R C O O R D I N A T E S	C L O S U R E DISTANCE	DIRECTION D M	DOBLEG SEVERITY
3344.00	3 0 S	3 0 W	0.00	3343.00	-5.60	5.60 S	32.50 E	32.98 S 80 13 E	0.00
3421.00	3 46 S	13 0 W	77.00	3419.87	-10.09	10.09 S	31.87 E	33.43 S 72 25 E	1.25
3451.00	6 43 S	12 0 W	30.00	3449.74	-12.77	12.77 S	31.28 E	33.78 S 67 47 E	9.84
3481.00	9 39 S	9 0 W	30.00	3479.43	-16.97	16.97 S	30.50 E	34.90 S 60 55 E	9.88
3511.00	12 42 S	8 0 W	30.00	3508.86	-22.72	22.72 S	29.64 E	37.34 S 52 32 E	10.19
3541.00	15 36 S	5 0 W	30.00	3537.94	-30.00	30.00 S	28.81 E	41.59 S 43 50 E	9.97
3571.00	18 31 S	3 0 W	30.00	3566.62	-38.78	38.78 S	28.19 E	47.95 S 36 1 E	9.92
3601.00	21 48 S	6 0 W	30.00	3594.78	-49.08	49.08 S	27.38 E	56.21 S 29 9 E	11.47
3631.00	25 15 S	7 0 W	30.00	3622.28	-60.98	60.98 S	26.03 E	66.30 S 23 7 E	11.58
3661.00	28 57 S	7 0 W	30.00	3648.98	-74.54	74.54 S	24.36 E	78.42 S 18 6 E	12.33
3691.00	31 6 S	8 0 W	30.00	3674.95	-89.42	89.42 S	22.40 E	92.19 S 14 4 E	7.36
3721.00	32 18 S	8 0 W	30.00	3700.48	-105.03	105.03 S	20.21 E	106.96 S 10 53 E	4.00
3751.00	33 13 S	7 0 W	30.00	3725.71	-121.13	121.13 S	18.09 E	122.47 S 8 30 E	3.55
3781.00	34 45 S	6 0 W	30.00	3750.58	-137.79	137.79 S	16.19 E	138.74 S 6 42 E	5.44
3811.00	36 23 S	6 0 W	30.00	3774.98	-155.14	155.14 S	14.37 E	155.80 S 5 17 E	5.44
3841.00	39 9 S	6 0 W	30.00	3798.70	-173.41	173.41 S	12.45 E	173.86 S 4 6 E	9.22
3871.00	40 21 S	5 0 W	30.00	3821.76	-192.51	192.51 S	10.61 E	192.80 S 3 9 E	4.53
3901.00	41 4 S	4 0 W	30.00	3844.50	-212.01	212.01 S	9.07 E	212.21 S 2 27 E	3.23
3931.00	42 10 S	4 0 W	30.00	3866.93	-231.89	231.89 S	7.68 E	232.01 S 1 54 E	3.67
3961.00	42 27 S	3 0 W	30.00	3889.12	-252.04	252.04 S	6.45 E	252.13 S 1 28 E	2.43
3991.00	43 0 S	3 0 W	30.00	3911.16	-272.37	272.37 S	5.39 E	272.42 S 1 8 E	1.83
4021.00	44 26 S	4 0 W	30.00	3932.84	-293.06	293.06 S	4.12 E	293.09 S 0 48 E	5.30
4051.00	45 17 S	3 0 W	30.00	3954.10	-314.18	314.18 S	2.83 E	314.20 S 0 31 E	3.68
4081.00	46 28 S	3 0 W	30.00	3974.99	-335.69	335.69 S	1.70 E	335.69 S 0 17 E	3.94
4111.00	47 24 S	3 0 W	30.00	3995.48	-357.57	357.57 S	0.56 E	357.57 S 0 5 E	3.11
4141.00	49 48 S	2 0 W	30.00	4015.31	-380.05	380.05 S	0.43 W	380.05 S 0 4 W	8.38
4171.00	51 57 S	0 0 W	30.00	4034.24	-403.32	403.32 S	0.83 W	403.32 S 0 7 W	8.84
4201.00	53 52 S	0 0 W	30.00	4052.33	-427.25	427.25 S	0.83 W	427.25 S 0 7 W	6.39
4231.00	56 48 S	0 0 W	30.00	4069.40	-451.92	451.92 S	0.83 W	451.92 S 0 6 W	9.78
4261.00	58 57 S	0 0 W	30.00	4085.35	-477.33	477.33 S	0.83 W	477.33 S 0 6 W	7.17

CONTINUED ON NEXT PAGE ...

MERIDIAN OIL INCORPORATED
M.O.I. WELLS

DATE PRINTED : 26-JUN-90
OUR REF. NO. : S03264.8MZ
JOB NUMBER :
PBHL : N O O E

PAGE NO. 3

MEASURED DEPTH	DRIFT ANGLE D M	DRIFT DIRECTION D M	COURSE LENGTH	TRUE VERTICAL DEPTH	VERTICAL SECTION	R E C T A N G U L A R C O O R D I N A T E S	C L O S U R E DISTANCE	DIRECTION D M	DOGLEG SEVERITY
4291.00	61	2 S	0 0 W	30.00	4100.35	-503.30	503.30 S	0.83 W	503.31 S 0 6 W 6.94
4321.00	63	47 S	0 0 W	30.00	4114.25	-529.89	529.89 S	0.83 W	529.89 S 0 5 W 9.17
4351.00	66	9 S	0 0 W	30.00	4126.94	-557.07	557.07 S	0.83 W	557.07 S 0 5 W 7.89
4381.00	66	46 S	0 0 W	30.00	4138.92	-584.57	584.57 S	0.83 W	584.57 S 0 5 W 2.06
4411.00	66	57 S	1 0 W	30.00	4150.71	-612.16	612.16 S	1.07 W	612.16 S 0 6 W 3.13
4441.00	66	9 S	0 0 W	30.00	4162.65	-639.68	639.68 S	1.31 W	639.68 S 0 7 W 4.06
4471.00	63	21 S	2 0 W	30.00	4175.45	-666.80	666.80 S	1.79 W	666.81 S 0 9 W 11.11
4501.00	62	33 S	3 0 W	30.00	4189.09	-693.50	693.50 S	2.95 W	693.50 S 0 15 W 3.99
4531.00	63	58 S	3 0 W	30.00	4202.59	-720.25	720.25 S	4.35 W	720.26 S 0 21 W 4.72
4561.00	64	13 S	2 0 W	30.00	4215.70	-747.21	747.21 S	5.53 W	747.23 S 0 25 W 3.11
4591.00	65	58 S	2 0 W	30.00	4228.33	-774.40	774.40 S	6.48 W	774.43 S 0 29 W 5.83
4621.00	66	18 S	2 0 W	30.00	4240.47	-801.82	801.82 S	7.44 W	801.85 S 0 32 W 1.11
4651.00	66	47 S	1 0 W	30.00	4252.41	-829.33	829.33 S	8.16 W	829.37 S 0 34 W 3.46
4681.00	67	38 S	1 0 W	30.00	4264.03	-856.98	856.98 S	8.64 W	857.02 S 0 35 W 2.83
4711.00	68	34 S	1 0 W	30.00	4275.22	-884.81	884.81 S	9.13 W	884.86 S 0 35 W 3.11
4741.00	69	14 S	1 0 W	30.00	4286.02	-912.80	912.80 S	9.62 W	912.85 S 0 36 W 2.22
4771.00	69	29 S	1 0 W	30.00	4296.60	-940.87	940.87 S	10.11 W	940.92 S 0 37 W 0.83
4801.00	70	36 S	1 0 W	30.00	4306.84	-969.06	969.06 S	10.60 W	969.12 S 0 38 W 3.72
4831.00	71	5 S	1 0 W	30.00	4316.68	-997.39	997.39 S	11.09 W	997.46 S 0 38 W 1.61
4861.00	71	37 S	1 0 W	30.00	4326.28	-1025.81	1025.81 S	11.59 W	1025.88 S 0 39 W 1.76
4891.00	72	42 S	0 0 W	30.00	4335.47	-1054.37	1054.37 S	11.84 W	1054.44 S 0 39 W 4.81
4921.00	73	30 S	0 0 W	30.00	4344.19	-1083.07	1083.07 S	11.84 W	1083.14 S 0 38 W 2.67
4951.00	73	36 S	0 0 W	30.00	4352.68	-1111.84	1111.84 S	11.84 W	1111.91 S 0 37 W 0.33
4981.00	75	2 S	1 0 W	30.00	4360.79	-1140.72	1140.72 S	12.09 W	1140.79 S 0 36 W 5.76
5011.00	73	48 S	1 0 W	30.00	4368.85	-1169.62	1169.62 S	12.59 W	1169.68 S 0 37 W 4.11
5041.00	73	47 S	0 0 W	30.00	4377.22	-1198.43	1198.43 S	12.85 W	1198.49 S 0 37 W 3.20
5071.00	73	51 S	1 0 W	30.00	4385.58	-1227.24	1227.24 S	13.10 W	1227.31 S 0 37 W 3.21
5101.00	73	43 S	1 0 W	30.00	4393.96	-1256.04	1256.04 S	13.60 W	1256.11 S 0 37 W 0.44
5131.00	74	28 S	0 0 W	30.00	4402.18	-1284.89	1284.89 S	13.85 W	1284.96 S 0 37 W 4.07
5161.00	72	24 S	0 0 W	30.00	4410.74	-1313.64	1313.64 S	13.85 W	1313.71 S 0 36 W 6.89

CONTINUED ON NEXT PAGE ...

MERIDIAN OIL INCORPORATED
M.O.I. WELLS

DATE PRINTED : 26-JUN-90
OUR REF. NO. : S03264.8MZ
JOB NUMBER :

PAGE NO. 4

PBHL : N O O E

MEASURED DEPTH	DRIFT ANGLE D M	DRIFT DIRECTION D M	COURSE LENGTH	TRUE VERTICAL DEPTH	VERTICAL SECTION	R E C T A N G U L A R C O O R D I N A T E S	C L O S U R E DISTANCE	DIRECTION D M	DOGLEG SEVERITY
5191.00	73 14	S 0	0 W	30.00	4419.60	-1342.30	1342.30 S	13.85 W	1342.37 S 0 35 W 2.78
5221.00	73 14	S 0	0 W	30.00	4428.25	-1371.03	1371.03 S	13.85 W	1371.10 S 0 35 W 0.00
5251.00	71 59	S 1	0 E	30.00	4437.22	-1399.65	1399.65 S	13.60 W	1399.72 S 0 33 W 5.24
5281.00	72 23	S 1	0 E	30.00	4446.40	-1428.21	1428.21 S	13.10 W	1428.27 S 0 32 W 1.33
5311.00	72 29	S 1	0 E	30.00	4455.45	-1456.81	1456.81 S	12.60 W	1456.86 S 0 30 W 0.33
5341.00	70 46	S 1	0 E	30.00	4464.91	-1485.27	1485.27 S	12.11 W	1485.32 S 0 28 W 5.72
5371.00	71 59	S 1	0 E	30.00	4474.49	-1513.69	1513.69 S	11.61 W	1513.74 S 0 26 W 4.06
5401.00	70 38	S 0	0 W	30.00	4484.11	-1542.11	1542.11 S	11.36 W	1542.15 S 0 25 W 5.90
5431.00	69 29	S 1	0 W	30.00	4494.34	-1570.31	1570.31 S	11.61 W	1570.35 S 0 25 W 4.95
5461.00	69 43	S 1	0 W	30.00	4504.79	-1598.42	1598.42 S	12.10 W	1598.47 S 0 26 W 0.78
5491.00	68 30	S 1	0 W	30.00	4515.49	-1626.45	1626.45 S	12.59 W	1626.50 S 0 27 W 4.06
5521.00	67 23	S 1	0 W	30.00	4526.76	-1654.25	1654.25 S	13.07 W	1654.30 S 0 27 W 3.72
5551.00	67 15	S 2	0 W	30.00	4538.38	-1681.89	1681.89 S	13.80 W	1681.95 S 0 28 W 3.31
5581.00	66 36	S 2	0 W	30.00	4550.20	-1709.45	1709.45 S	14.76 W	1709.51 S 0 30 W 1.39
5611.00	66 20	S 2	0 W	30.00	4562.18	-1736.94	1736.94 S	15.72 W	1737.01 S 0 31 W 0.89
5641.00	66 6	S 2	0 W	30.00	4574.27	-1764.38	1764.38 S	16.68 W	1764.45 S 0 32 W 0.78
5671.00	65 3	S 2	0 W	30.00	4586.68	-1791.67	1791.67 S	17.63 W	1791.76 S 0 34 W 3.50
5701.00	63 18	S 1	0 W	30.00	4599.75	-1818.67	1818.67 S	18.34 W	1818.76 S 0 35 W 6.56
5731.00	63 17	S 0	0 W	30.00	4613.23	-1845.47	1845.47 S	18.57 W	1845.57 S 0 35 W 2.98
5761.00	63 48	S 0	0 W	30.00	4626.60	-1872.33	1872.33 S	18.57 W	1872.42 S 0 34 W 1.72
5791.00	63 30	S 1	0 W	30.00	4639.91	-1899.21	1899.21 S	18.81 W	1899.31 S 0 34 W 3.15
5821.00	63 26	S 2	0 W	30.00	4653.31	-1926.04	1926.04 S	19.51 W	1926.14 S 0 35 W 2.99
5851.00	63 50	S 1	0 W	30.00	4666.64	-1952.91	1952.91 S	20.21 W	1953.02 S 0 36 W 3.27
5881.00	64 3	S 1	0 W	30.00	4679.81	-1979.86	1979.86 S	20.68 W	1979.97 S 0 36 W 0.72
5911.00	63 40	S 1	0 W	30.00	4693.03	-2006.79	2006.79 S	21.15 W	2006.90 S 0 36 W 1.28
5941.00	63 35	S 1	0 W	30.00	4706.36	-2033.66	2033.66 S	21.62 W	2033.77 S 0 37 W 0.28
5971.00	63 42	S 0	0 W	30.00	4719.68	-2060.54	2060.54 S	21.86 W	2060.65 S 0 36 W 3.01
6001.00	63 44	S 1	0 W	30.00	4732.96	-2087.43	2087.43 S	22.09 W	2087.55 S 0 36 W 2.99
6031.00	62 26	S 0	0 W	30.00	4746.54	-2114.18	2114.18 S	22.33 W	2114.30 S 0 36 W 5.25
6061.00	62 45	S 1	0 W	30.00	4760.35	-2140.81	2140.81 S	22.56 W	2140.93 S 0 36 W 3.14

CONTINUED ON NEXT PAGE ...

MERIDIAN OIL INCORPORATED
M.O.I. WELLS

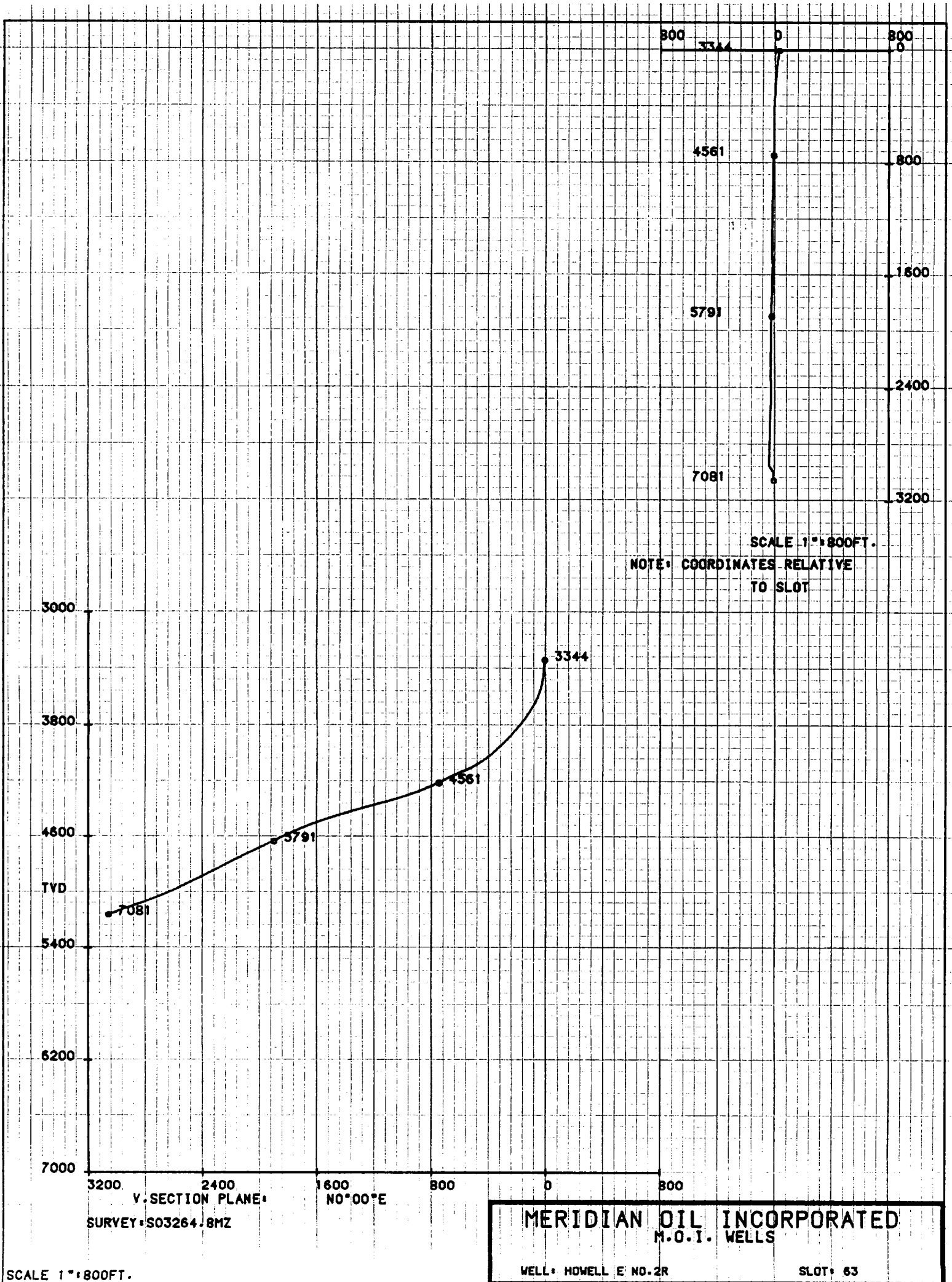
DATE PRINTED : 26-JUN-90
OUR REF. NO. : S03264.8MZ
JOB NUMBER :

PAGE NO. 5

PBHL : N 0 0 E

MEASURED DEPTH	DRIFT ANGLE D M	DRIFT DIRECTION D M	COURSE LENGTH	TRUE VERTICAL DEPTH	VERTICAL SECTION	R E C T A N G U L A R C O R D I N A T E S	C L O S U R E DISTANCE	D I R E C T I O N D M	DOGLEG SEVERITY
6091.00	63 13	S 1	0 W	30.00	4773.98	-2167.53	2167.53	S 0 37 W	1.36
6121.00	62 11	S 1	0 W	30.00	4787.74	-2194.19	2194.31	S 0 37 W	3.44
6151.00	62 29	S 1	0 E	30.00	4801.67	-2220.76	2220.88	S 0 36 W	5.99
6181.00	61 44	S 0	0 W	30.00	4815.70	-2247.27	2247.39	S 0 36 W	3.86
6211.00	61 29	S 1	0 W	30.00	4829.97	-2273.66	2273.78	S 0 36 W	3.05
6241.00	61 58	S 1	0 W	30.00	4844.18	-2300.08	2300.20	S 0 36 W	1.61
6271.00	64 6	S 1	0 W	30.00	4857.78	-2326.81	2326.94	S 0 36 W	7.11
6301.00	63 25	S 11	0 E	30.00	4871.05	-2353.57	2353.67	S 0 32 W	35.94
6331.00	62 57	S 1	0 W	30.00	4884.58	-2380.19	2380.27	S 0 29 W	35.72
6361.00	63 31	S 0	0 W	30.00	4898.09	-2406.97	2407.06	S 0 29 W	3.52
6391.00	63 42	S 2	0 W	30.00	4911.43	-2433.84	2433.93	S 0 29 W	6.00
6421.00	63 32	S 2	0 W	30.00	4924.76	-2460.70	2460.79	S 0 30 W	0.56
6451.00	63 48	S 1	0 W	30.00	4938.07	-2487.58	2487.68	S 0 31 W	3.12
6481.00	63 52	S 2	0 W	30.00	4951.30	-2514.49	2514.60	S 0 31 W	3.00
6511.00	64 17	S 2	0 W	30.00	4964.41	-2541.46	2541.57	S 0 32 W	1.39
6541.00	64 6	S 2	0 W	30.00	4977.47	-2568.45	2568.57	S 0 33 W	0.61
6571.00	64 31	S 3	0 W	30.00	4990.48	-2595.46	2595.59	S 0 34 W	3.31
6601.00	64 57	S 2	0 W	30.00	5003.28	-2622.56	2622.70	S 0 35 W	3.34
6631.00	65 56	S 2	0 W	30.00	5015.75	-2649.83	2649.98	S 0 36 W	3.28
6661.00	66 16	S 1	0 W	30.00	5027.91	-2677.25	2677.40	S 0 37 W	3.24
6691.00	67 3	S 2	0 W	30.00	5039.79	-2704.78	2704.94	S 0 37 W	4.02
6721.00	67 16	S 2	0 W	30.00	5051.44	-2732.41	2732.58	S 0 38 W	0.72
6751.00	67 47	S 1	0 W	30.00	5062.91	-2760.13	2760.30	S 0 39 W	3.53
6781.00	68 29	S 1	0 W	30.00	5074.08	-2787.96	2788.14	S 0 39 W	2.33
6811.00	68 56	S 2	0 W	30.00	5084.97	-2815.91	2816.09	S 0 39 W	3.45
6841.00	69 31	S 1	0 W	30.00	5095.61	-2843.94	2844.14	S 0 40 W	3.67
6871.00	70 4	S 2	0 W	30.00	5105.98	-2872.09	2872.29	S 0 40 W	3.63
6901.00	70 49	S 1	0 W	30.00	5116.02	-2900.35	2900.55	S 0 41 W	4.01
6931.00	71 0	S 1	0 W	30.00	5125.83	-2928.69	2928.90	S 0 41 W	0.61
6961.00	71 33	S 0	0 W	30.00	5135.46	-2957.10	2957.31	S 0 41 W	3.65

CONTINUED ON NEXT PAGE ...



MERIDIAN OIL INCORPORATED
M.O.I. WELLS

DATE PRINTED : 26-JUN-90
OUR REF. NO. : S03264.8MZ
JOB NUMBER :
PAGE NO. 6

PBHL : N 0 0 E

MEASURED DEPTH	DRIFT ANGLE D M	DRIFT DIRECTION D M	COURSE LENGTH	TRUE VERTICAL DEPTH	VERTICAL SECTION	RECTAN GULAR C O R D I N A T E S	C L O S U R E DISTANCE	DIRECTION D M	DOGLEG SEVERITY
6991.00	71 42	S 71 0 E	30.00	5144.92	-2978.82	2978.82 S	19.80 W	S 0 23 W	222.95
7021.00	72 24	S 1 0 W	30.00	5154.17	-3000.70	3000.69 S	4.49 W	S 0 5 W	226.67
7051.00	72 54	S 2 0 W	30.00	5163.11	-3029.32	3029.32 S	5.24 W	S 0 6 W	3.59
7081.00	73 4	S 2 0 W	30.00	5171.89	-3057.99	3057.99 S	6.24 W	S 0 7 W	0.56

CLOSURE - DISTANCE : 3058.00
DIRECTION : S 0 7 W
REPORT UNITS : Feet
SURVEY CALCULATION METHOD : Radius of curvature

Accepted by :
Checked by :

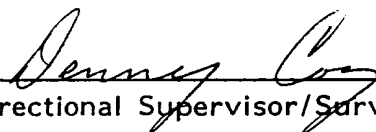
SURVEY RUN INFORMATION
=====

SEEKER I GYRO SURVEY
SURVEYOR: MR. D. COY
413-523
(3421-7081)

SURVEY CERTIFICATION SHEET

Company MERIDIAN OIL INC. Job # 413-523 Date 20-JUN-90
Lease HOWELL E Well # 2R State NEW MEXICO
Surveyed from a depth of 3344 feet to a depth of 7081 feet.
Type of Survey SEEKER I GYRO SURVEY
Directional Supervisor/Surveyor MR. D. COY

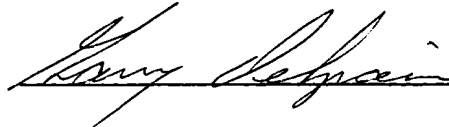
The data for this survey and the calculations for this survey were obtained and performed by me according to the standards and procedures as set forth by Eastman Christensen Company and are true and correct to the best of my knowledge.



Directional Supervisor/Surveyor

The data and calculations for this survey have been checked by me and conform to the standards and procedures as set forth by Eastman Christensen Company. This report represents a true and correct Directional Survey of this well based on the original data obtained at the well site:

Checked by:



Original Copy - District Office File
One copy to Houston Office
FORM D-1121