

sperry-sun



P.O. Box 2133, Odessa, Texas 79760 (915) 563-1106

November 30, 1981

Arco Oil and Gas Co.
P.O. Box 1710
Hobbs, New Mexico 88240

RE: BOSS-6950; BOSS-6813

Custer Well No. 1
North Jal Field
Lea County, N.M.

*Directionally
Drilled Hole
Section*

Gentlemen:

Enclosed please find four (4) copies of our Job Number, BOSS-6950, a Gyroscopic Multishot Survey of the above well run November 25, 1981, from a depth of 6,200 feet to a depth of 12,500 feet. This survey was tied on to our survey Job Number, BOSS-6813, run May 28, 1981, at a depth of 6,200 feet. The survey copies show the concactination of both jobs mentioned above.

It has been a pleasure performing these services for you. If we can be of further assistance to you, please contact us.

Sincerely,

G. Steve Hall
District Manager

GSH/tdb

SPERRY-SUN INCORPORATED
NORTH JAL FIELD, LEA COUNTY, NEW MEXICO

PAGE 1

ARCO OIL AND GAS CO.
CUSTER WELL NO. 1

BOSS-6950
NOVEMBER 25, 1981

TOTAL DEPTH	DIRECTION DEG MIN		ANGLE DEG MIN		VERTICAL DEPTH	LATITUDE FEET	DEPARTURE FEET	VERTICAL SECTION	DOG LEG
0	N	0	O	E	0 0	0.00 N	0.00 E	0.00	0.00
100	N	52	O	W	0 8	0.07 N	0.10 W	0.09	0.13
200	S	87	O	W	0 28	0.12 N	0.60 W	0.59	0.38
300	N	81	O	W	0 11	0.13 N	1.16 W	1.16	0.29
400	N	71	O	W	0 34	0.31 N	1.79 W	1.79	0.39
500	N	77	O	W	0 34	0.58 N	2.74 W	2.74	0.06
600	N	52	O	W	0 35	1.01 N	3.62 W	3.63	0.25
700	N	55	O	W	0 48	1.72 N	4.60 W	4.61	0.22
800	N	45	O	W	0 25	2.38 N	5.42 W	5.45	0.40
900	N	25	O	W	0 45	3.23 N	5.96 W	6.00	0.39
1000	N	50	O	W	0 22	4.03 N	6.48 W	6.53	0.45
1100	N	11	O	W	0 50	4.95 N	6.86 W	6.93	0.59
1200	N	18	O	W	0 37	6.17 N	7.17 W	7.26	0.23
1300	N	38	O	W	0 31	7.04 N	7.61 W	7.72	0.22
1400	N	76	O	W	0 7	7.42 N	7.99 W	8.10	0.43
1500	S	52	O	W	0 17	7.29 N	8.28 W	8.39	0.23
1600	S	81	O	W	0 25	7.08 N	8.84 W	8.94	0.22
1700	N	87	O	W	0 23	7.05 N	9.53 W	9.63	0.09
1800	N	16	O	W	0 15	7.27 N	9.92 W	10.03	0.38
1900	N	48	O	W	0 13	7.61 N	10.13 W	10.24	0.13
2000	N	13	O	W	0 15	7.95 N	10.31 W	10.43	0.14
2100	S	19	O	E	0 10	8.02 N	10.32 W	10.44	0.42
2200	S	45	O	E	0 37	7.50 N	9.89 W	10.00	0.47
2300	S	41	O	E	0 52	6.55 N	9.01 W	9.11	0.26
2400	S	46	O	E	1 8	5.30 N	7.80 W	7.88	0.28
2500	S	35	O	E	1 13	3.74 N	6.48 W	6.53	0.24
2600	S	37	O	E	1 17	1.97 N	5.20 W	5.22	0.08
2700	S	38	O	E	1 8	0.30 N	3.92 W	3.91	0.15
2800	S	58	O	E	0 47	0.85 S	2.73 W	2.71	0.48
2900	S	49	O	E	0 40	1.59 S	1.71 W	1.67	0.16
3000	S	45	O	E	0 29	2.27 S	0.97 W	0.93	0.19
3100	S	57	O	E	0 34	2.84 S	0.26 W	0.20	0.14
3200	S	65	O	E	0 36	3.33 S	0.64 E	-0.69	0.09
3300	S	86	O	E	0 40	3.59 S	1.69 E	-1.75	0.24
3400	N	65	O	E	0 43	3.37 S	2.84 E	-2.89	0.35
3500	S	84	O	E	0 39	3.17 S	3.97 E	-4.02	0.37
3600	N	90	O	E	0 44	3.22 S	5.18 E	-5.23	0.11
3700	S	71	O	E	0 56	3.49 S	6.59 E	-6.64	0.34
3800	S	79	O	E	0 50	3.89 S	8.07 E	-8.13	0.16
3900	S	74	O	E	0 43	4.20 S	9.38 E	-9.45	0.13

SPERRY-SUN INCORPORATED
NORTH JAL FIELD, LEA COUNTY, NEW MEXICO

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ARCO OIL AND GAS CO.
CUSTER WELL NO. 1

BOSS-6950
NOVEMBER 25, 1981

TOTAL DEPTH	DIRECTION		ANGLE	VERTICAL	LATITUDE	DEPARTURE	VERTICAL	DOG	
	DEG	MIN	DEG	DEPTH	FEET	FEET	SECTION	LEG	
4000	S	57	0 E	0 52	3999.73	4.79 S	10.62 E	-10.70	0.28
4100	S	82	0 E	0 48	4099.72	5.30 S	11.95 E	-12.03	0.37
4200	S	82	0 E	0 40	4199.70	5.48 S	13.21 E	-13.30	0.13
4300	S	85	0 E	0 44	4299.70	5.61 S	14.43 E	-14.52	0.08
4400	S	80	0 E	1 1	4399.68	5.82 S	15.94 E	-16.03	0.29
4500	N	84	0 E	0 50	4499.66	5.90 S	17.53 E	-17.63	0.32
4600	N	68	0 E	0 44	4599.65	5.59 S	18.85 E	-18.94	0.24
4700	N	58	0 E	0 47	4699.64	4.98 S	20.02 E	-20.10	0.14
4800	N	77	0 E	0 41	4799.63	4.49 S	21.18 E	-21.25	0.26
4900	N	52	0 E	0 47	4899.62	3.93 S	22.30 E	-22.37	0.33
5000	S	86	0 E	0 32	4999.61	3.54 S	23.31 E	-23.36	0.53
5100	S	64	0 E	0 14	5099.61	3.67 S	23.95 E	-24.01	0.33
5200	S	9	0 E	0 22	5199.60	4.07 S	24.19 E	-24.25	0.30
5300	S	14	0 W	0 45	5299.59	5.02 S	24.08 E	-24.16	0.44
5400	S	13	0 W	0 41	5399.58	6.24 S	23.79 E	-23.88	0.07
5500	S	9	0 E	0 43	5499.57	7.44 S	23.75 E	-23.87	0.27
5600	S	19	0 E	0 16	5599.57	8.27 S	23.92 E	-24.06	0.46
5700	S	39	0 W	0 28	5699.56	8.81 S	23.74 E	-23.88	0.40
5800	S	49	0 W	0 32	5799.56	9.43 S	23.14 E	-23.29	0.11
5900	S	51	0 W	0 25	5899.55	9.97 S	22.50 E	-22.66	0.12
6000	S	26	0 W	0 23	5999.55	10.50 S	22.07 E	-22.24	0.18
6100	S	32	0 W	0 29	6099.55	11.15 S	21.70 E	-21.88	0.11
6200	S	18	0 W	0 19	6199.54	11.78 S	21.39 E	-21.58	0.19
6300	N	60	48 E	0 28	6299.54	11.84 S	21.66 E	-21.85	0.73
6400	N	33	18 E	0 27	6399.54	11.31 S	22.24 E	-22.42	0.22
6500	S	87	42 W	1 50	6499.52	11.05 S	20.86 E	-21.03	2.12
6600	S	87	6 W	6 10	6599.25	11.38 S	13.89 E	-14.07	4.34
6700	S	87	0 W	7 23	6698.54	11.99 S	2.11 E	-2.30	1.21
6800	S	84	36 W	8 53	6797.53	13.06 S	12.01 W	11.79	1.55
6900	S	79	18 W	10 13	6896.14	15.43 S	28.41 W	28.15	1.58
7000	S	78	0 W	11 41	6994.32	19.18 S	47.02 W	46.69	1.49
7100	S	76	36 W	11 59	7092.20	23.69 S	67.02 W	66.62	0.42
7200	S	73	54 W	11 56	7190.02	28.96 S	87.05 W	86.55	0.56
7300	S	72	48 W	12 45	7287.71	35.09 S	107.52 W	106.92	0.85
7400	S	71	48 W	13 5	7385.18	41.89 S	128.82 W	128.11	0.41
7500	S	71	30 W	13 22	7482.52	49.09 S	150.54 W	149.71	0.29
7600	S	73	6 W	13 7	7579.86	56.06 S	172.36 W	171.42	0.44
7700	S	72	36 W	12 31	7677.36	62.60 S	193.57 W	192.51	0.61
7800	S	70	30 W	10 56	7775.27	69.01 S	212.85 W	211.69	1.65
7900	S	89	24 W	9 5	7873.77	72.26 S	229.69 W	228.47	3.74

SPERRY-SUN INCORPORATED
NORTH JAL FIELD, LEA COUNTY, NEW MEXICO

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ARCO OIL AND GAS CO.
CUSTER WELL NO. 1

BOSS-6950
NOVEMBER 25, 1981

TOTAL DEPTH	DIRECTION DEG MIN	ANGLE DEG MIN	VERTICAL DEPTH	LATITUDE FEET	DEPARTURE FEET	VERTICAL SECTION	DOG LEG
8000	N 78 30 W	11 56	7972.09	70.28 S	247.72 W	246.54	3.58
8100	N 72 54 W	13 41	8069.60	64.74 S	269.15 W	268.06	2.14
8200	N 76 18 W	14 17	8166.64	58.34 S	292.45 W	291.45	1.02
8300	N 75 48 W	14 42	8263.45	52.31 S	316.74 W	315.83	0.43
8400	N 74 42 W	14 28	8360.23	45.90 S	341.09 W	340.29	0.36
8500	N 73 6 W	14 29	8457.05	38.97 S	365.10 W	364.41	0.40
8600	N 73 54 W	14 5	8553.96	31.96 S	388.75 W	388.17	0.45
8700	N 73 30 W	14 10	8650.94	25.11 S	412.16 W	411.69	0.13
8800	N 77 12 W	13 48	8747.98	19.00 S	435.52 W	435.15	0.96
8900	N 82 36 W	15 29	8844.73	14.63 S	460.39 W	460.08	2.16
9000	N 87 18 W	18 30	8940.36	12.17 S	489.48 W	489.21	3.32
9100	N 86 48 W	20 34	9034.59	10.44 S	522.86 W	522.61	2.07
9200	S 89 0 W	21 46	9127.85	9.78 S	558.94 W	558.70	1.94
9300	S 88 12 W	22 16	9220.56	10.70 S	596.41 W	596.15	0.57
9400	S 89 6 W	22 50	9312.91	11.60 S	634.75 W	634.47	0.67
9500	S 87 42 W	21 22	9405.56	12.64 S	672.35 W	672.05	1.57
9600	N 90 0 W	19 47	9499.18	13.37 S	707.47 W	707.15	1.77
9700	N 87 30 W	19 22	9593.40	12.64 S	740.97 W	740.65	0.93
9800	N 89 12 W	21 2	9687.24	11.67 S	775.48 W	775.18	1.76
9900	N 88 12 W	22 20	9780.16	10.82 S	812.41 W	812.12	1.36
10000	N 87 48 W	22 53	9872.47	9.48 S	850.84 W	850.56	0.56
10100	N 88 0 W	19 35	9965.67	8.15 S	887.02 W	886.76	3.30
10150	N 88 18 W	16 31	10013.21	7.65 S	902.50 W	902.25	6.12
10200	N 86 24 W	14 16	10061.41	7.05 S	915.75 W	915.51	4.63
10300	N 86 36 W	12 56	10158.61	5.61 S	939.22 W	938.99	1.33
10400	N 87 42 W	12 1	10256.24	4.53 S	960.78 W	960.57	0.95
10500	N 89 48 W	11 29	10354.14	4.08 S	981.13 W	980.93	0.67
10600	N 88 30 W	11 39	10452.11	3.78 S	1001.19 W	1000.98	0.31
10700	N 88 12 W	12 42	10549.86	3.17 S	1022.27 W	1022.07	1.05
10800	N 86 24 W	13 20	10647.28	2.10 S	1044.77 W	1044.59	0.76
10900	N 86 36 W	13 13	10744.60	0.70 S	1067.70 W	1067.53	0.13
11000	N 84 54 W	12 52	10842.02	0.98 N	1090.20 W	1090.07	0.52
11100	N 87 24 W	11 50	10939.71	2.44 N	1111.54 W	1111.42	1.17
11200	N 86 0 W	11 11	11037.70	3.58 N	1131.45 W	1131.35	0.71
11300	N 85 18 W	10 14	11135.95	4.98 N	1149.98 W	1149.90	0.95
11400	N 85 6 W	9 26	11234.48	6.41 N	1167.01 W	1166.95	0.80
11500	N 85 42 W	9 11	11333.16	7.71 N	1183.14 W	1183.10	0.27
11600	N 85 30 W	9 22	11431.84	8.95 N	1199.21 W	1199.19	0.17
11700	N 86 48 W	9 50	11530.45	10.06 N	1215.84 W	1215.84	0.52
11800	N 89 6 W	10 55	11628.81	10.69 N	1233.83 W	1233.83	1.16

SPERRY-SUN INCORPORATED
NORTH JAL FIELD, LEA COUNTY, NEW MEXICO

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ARCO OIL AND GAS CO.
CUSTER WELL NO. 1

BOSS-6950
NOVEMBER 25, 1981

TOTAL DEPTH	DIRECTION DEG MIN	ANGLE DEG MIN	VERTICAL DEPTH	LATITUDE FEET	DEPARTURE FEET	VERTICAL SECTION	DOG LEG
11900	N 88 36 W	12 4	11726.80	11.09 N	1253.74 W	1253.75	1.16
12000	N 87 36 W	11 39	11824.66	11.77 N	1274.28 W	1274.29	0.47
12100	N 87 0 W	10 35	11922.78	12.67 N	1293.54 W	1293.56	1.08
12200	N 83 12 W	10 37	12021.08	14.24 N	1311.85 W	1311.90	0.70
12300	N 80 54 W	9 16	12119.57	16.61 N	1328.95 W	1329.03	1.42
12400	N 80 12 W	8 4	12218.43	19.07 N	1343.81 W	1343.93	1.19
12500	N 74 0 W	7 32	12317.50	22.08 N	1357.03 W	1357.21	0.99

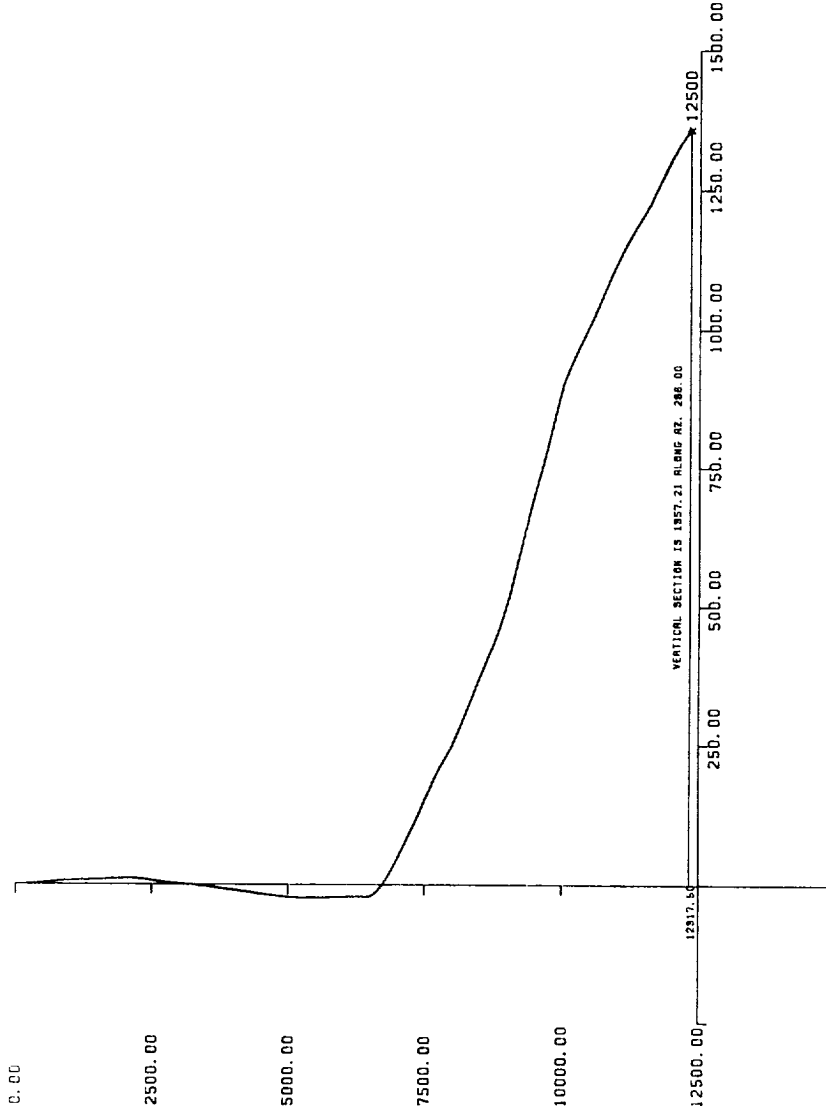
THE DOGLEG SEVERITY IS IN DEGREES PER ONE HUNDRED FEET.
THE VERTICAL SECTION WAS COMPUTED ALONG N 89 4 W

BASED UPON MINIMUM CURVATURE TYPE CALCULATIONS. THE BOTTOM HOLE
DISPLACEMENT IS 1357.21 FEET, IN THE DIRECTION OF N 89 4 W
BOTTOM HOLE DISPLACEMENT IS RELATIVE TO WELLHEAD.
VERTICAL SECTION IS RELATIVE TO WELLHEAD.
0 TO 6200 FEET-JOB NO. BOSS6813 6200 TO 12500 FEET-JOB NO. BOSS6950.

SPERRY-SUN INTERNATIONAL INC.

SCALE 1" = 1 INCH TO 2500.00 / 250.0

ARCC OIL AND GAS CO. CUSTER WELL NO. 1
 NOVEMBER 25, 1981 ROSS-6950
 N 89 4 W N 89 4 W



VERTICAL PROJECTION

SPERRY-SUN INTERNATIONAL INC.

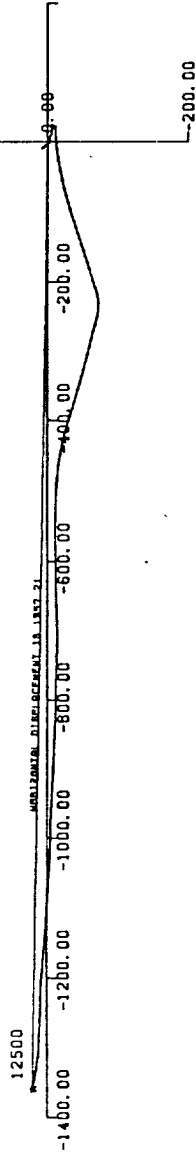
SCALE :- 1 INCH TO 200.00 / 200.0

ARCO OIL AND GAS CO. CUSTER WELL NO. 1

NOVEMBER 25, 1981 8055-6950

N 89 4 W N 89 4 W

TRUE NORTH



HORIZONTAL PROJECTION

ARCO NORTH JAL FIELD NORTH JAL FIELD
 LEA-COUNTY, NEW MEXICO
 GYROSCOPIC MULTISHOT

PAGE. 1
 MAY 28, 1981
 CLOSURE
 BOSS-6813

SPERRY-SUN, INC. RECORD OF SURVEY									
DATE OF SURVEY MAY 28, 1981 VERTICAL SECTION DIRECTION									
MEASURED DEPTH	TRUE VERTICAL DEPTH	SUB SEA TVD	COURSE INCLINATION DEG MIN	COURSE DIRECTION DEG	DOG-LEG DEG/100	RECTANGULAR NORTH/SOUTH	COORDINATES EAST/WEST	TOTAL	VERTICAL SECTION
0	0.	0.	ORIGIN AT SURFACE			0.	0.	0.	0.
100	100.00	100.00	0 8	N 52	W 0.14	0.08 N	0.10 W	0.08	0.08
200	200.00	200.00	0 28	S 87	W 0.38	0.13 N	0.60 W	0.13	0.40
300	300.00	300.00	0 11	N 81	W 0.29	0.13 N	1.18 W	0.13	0.97
400	399.99	399.99	0 34	N 71	W 0.37	0.32 N	1.80 W	0.32	1.43
500	499.99	499.99	0 34	N 77	W 0.06	0.58 N	2.75 W	0.58	2.13
600	599.98	599.98	0 35	N 52	W 0.25	1.01 N	3.63 W	1.01	2.70
700	699.98	699.98	0 48	N 55	W 0.22	1.72 N	4.60 W	1.72	3.20
800	799.97	799.97	0 25	N 45	W 0.39	2.39 N	5.43 W	2.39	3.60
900	899.97	899.97	0 45	N 25	W 0.39	3.24 N	5.96 W	3.24	3.66
1000	999.96	999.96	0 22	N 50	W 0.45	4.03 N	6.48 W	4.03	3.73
1100	1099.96	1099.96	0 50	N 11	W 0.61	4.95 N	6.86 W	4.95	3.62
1200	1199.95	1199.95	0 37	N 18	W 0.24	6.19 N	7.18 W	6.19	3.30
1300	1299.94	1299.94	0 31	N 38	W 0.22	7.05 N	7.62 W	7.05	3.27
1400	1399.94	1399.94	0 7	N 76	W 0.43	7.43 N	7.99 W	7.43	3.41
1500	1499.94	1499.94	0 17	S 52	W 0.24	7.29 N	8.28 W	7.29	3.7
1600	1599.94	1599.94	0 25	S 81	W 0.21	7.08 N	8.83 W	7.08	4.32
1700	1699.94	1699.94	0 23	N 87	W 0.09	7.04 N	9.52 W	7.04	4.94
1800	1799.93	1799.93	0 15	N 16	W 0.38	7.27 N	9.91 W	7.27	5.17
1900	1899.93	1899.93	0 13	N 48	W 0.13	7.60 N	10.10 W	7.60	5.18
2000	1999.93	1999.93	0 15	N 13	W 0.14	7.94 N	10.29 W	7.94	5.18
2100	2099.93	2099.93	0 10	S 19	E 0.41	8.02 N	10.29 W	8.02	5.15
2200	2199.93	2199.93	0 37	S 45	E 0.47	7.51 N	9.87 W	7.51	5.02
2300	2299.92	2299.92	0 52	S 41	E 0.26	6.57 N	9.00 W	6.57	4.72
2400	2399.91	2399.91	1 8	S 46	E 0.28	5.31 N	7.81 W	5.31	4.28
2500	2499.89	2499.89	1 13	S 35	E 0.24	3.75 N	6.50 W	3.75	3.88
2600	2599.86	2599.86	1 17	S 37	E 0.09	2.00 N	5.22 W	2.00	3.61
2700	2699.84	2699.84	1 8	S 38	E 0.15	0.34 N	3.94 W	0.34	3.29
2800	2799.83	2799.83	0 47	S 58	E 0.47	0.80 S	2.75 W	0.80	2.79
2900	2899.82	2899.82	0 40	S 49	E 0.16	1.54 S	1.73 W	1.54	2.26

ARCO

NORTH JAL

NORTH JAL FIELD

LEA COUNTY, NEW MEXICO

GYROSCOPIC MULTISHOT

DATE OF SURVEY MAY 28, 1981

VERTICAL SECTION DIRECTION

CLOSURE

BOSS-6813

SPERRY-SUN, INC.

RECORD OF SURVEY

MEASURED DEPTH	TRUE VERTICAL DEPTH	SUB SEA TVD	COURSE		COURSE DIRECTION	DOG-LEG		RECTANGULAR NORTH/SOUTH	COORDINATES		VERTICAL SECTION
			INCLINATION DEG MIN	DEG		SEV DEG/100	TOTAL		EAST/WEST		
3000	2999.81	2999.81	0 29	S	45 E	0.19	2.22 S	0.99 W		1.94	
3100	3099.81	3099.81	0 34	S	57 E	0.14	2.78 S	0.28 W		1.50	
3200	3199.80	3199.80	0 36	S	65 E	0.09	3.27 S	0.60 E		1.0	
3300	3299.80	3299.80	0 40	S	86 E	0.24	3.54 S	1.66 E		0.25	
3400	3399.79	3399.79	0 43	N	65 E	0.36	3.32 S	2.81 E		-0.86	
3500	3499.78	3499.78	0 39	S	84 E	0.37	3.11 S	3.95 E		-1.96	
3600	3599.78	3599.78	0 44	S	90 E	0.11	3.17 S	5.16 E		-2.99	
3700	3699.77	3699.77	0 56	S	71 E	0.33	3.45 S	6.57 E		-4.09	
3800	3799.75	3799.75	0 50	S	79 E	0.17	3.85 S	8.04 E		-5.19	
3900	3899.74	3899.74	0 43	S	74 E	0.13	4.16 S	9.36 E		-6.19	
4000	3999.74	3999.74	0 52	S	57 E	0.28	4.74 S	10.60 E		-7.00	
4100	4099.73	4099.73	0 48	S	82 E	0.37	5.25 S	11.93 E		-7.91	
4200	4199.72	4199.72	0 40	S	82 E	0.13	5.44 S	13.20 E		-8.94	
4300	4299.71	4299.71	0 44	S	85 E	0.07	5.58 S	14.41 E		-9.93	
4400	4399.70	4399.70	1 1	S	80 E	0.30	5.79 S	15.92 E		-11.15	
4500	4499.68	4499.68	0 50	N	84 E	0.32	5.87 S	17.53 E		-12.	
4600	4599.68	4599.68	0 44	N	68 E	0.24	5.55 S	18.85 E		-13.84	
4700	4699.67	4699.67	0 47	N	58 E	0.14	4.95 S	20.03 E		-15.16	
4800	4799.66	4799.66	0 41	N	77 E	0.25	4.44 S	21.19 E		-16.42	
4900	4899.65	4899.65	0 47	N	52 E	0.33	3.88 S	22.32 E		-17.68	
5000	4999.64	4999.64	0 32	S	86 E	0.53	3.48 S	23.34 E		-18.76	
5100	5099.64	5099.64	0 14	S	64 E	0.33	3.61 S	23.99 E		-19.28	
5200	5199.64	5199.64	0 22	S	9 E	0.30	4.01 S	24.23 E		-19.29	
5300	5299.64	5299.64	0 45	S	14 W	0.44	4.95 S	24.12 E		-18.74	
5400	5399.63	5399.63	0 41	S	13 W	0.06	6.18 S	23.82 E		-17.89	
5500	5499.62	5499.62	0 43	S	9 E	0.27	7.38 S	23.79 E		-17.28	
5600	5599.62	5599.62	0 16	S	19 E	0.46	8.22 S	23.97 E		-17.03	
5700	5699.61	5699.61	0 28	S	39 W	0.40	8.77 S	23.79 E		-16.61	
5800	5799.61	5799.61	0 32	S	49 W	0.11	9.39 S	23.18 E		-15.77	
5900	5899.61	5899.61	0 25	S	51 W	0.13	9.92 S	22.54 E		-14.0	

SPERRY-SUN, INC. RECORD OF SURVEY										
MEASURED DEPTH	TRUE VERTICAL DEPTH	SUB SEA TVD	COURSE		COURSE DIRECTION	DOG-LEG		RECTANGULAR NORTH/SOUTH	COORDINATES EAST/WEST	VERTICAL SECTION
			INCLINATION DEG MIN	DEG		SEV DEG/100	TOTAL			
6000	5999.60	5999.60	0 23	S	26 W	0.17	10.45 S	22.11 E	-14.33	
6100	6099.60	6099.60	0 29	S	32 W	0.11	11.10 S	21.75 E	-13.69	
6200	6199.60	6199.60	0 19	S	18 W	0.19	11.71 S	21.44 E	-13.13	
6300	6299.60	6299.60	0 19	S	47 E	0.34	12.16 S	21.56 E	-13.02	
6400	6399.60	6399.60	0 22	S	57 E	0.08	12.53 S	22.04 E	-13.26	
6500	6499.59	6499.59	0 19	S	70 E	0.09	12.80 S	22.57 E	-13.60	
6600	6599.59	6599.59	0 23	S	73 E	0.06	12.99 S	23.15 E	-14.02	
6700	6699.59	6699.59	0 22	S	70 E	0.02	13.19 S	23.78 E	-14.46	
6800	6799.59	6799.59	0 27	S	51 E	0.15	13.55 S	24.39 E	-14.82	
6900	6899.58	6899.58	0 29	S	33 E	0.15	14.14 S	24.92 E	-15.01	
7000	6999.58	6999.58	0 43	S	49 E	0.28	14.90 S	25.62 E	-15.25	
7100	7099.57	7099.57	0 57	S	60 E	0.28	15.72 S	26.80 E	-15.89	
7200	7199.55	7199.55	1 11	S	54 E	0.26	16.75 S	28.36 E	-16.76	
7300	7299.52	7299.52	1 29	S	48 E	0.32	18.23 S	30.15 E	-17.62	
7400	7399.48	7399.48	1 43	S	38 E	0.37	20.29 S	32.02 E	-18.26	
7500	7499.42	7499.42	2 23	S	24 E	0.81	23.38 S	33.79 E	-18.32	
7600	7599.35	7599.35	1 53	S	29 E	0.52	26.73 S	35.44 E	-18.15	
7700	7699.29	7699.29	2 7	S	9 E	0.73	30.01 S	36.51 E	-17.50	
7800	7799.21	7799.21	2 29	S	7 W	0.72	33.98 S	36.53 E	-15.60	
7900	7899.11	7899.11	2 46	S	13 W	0.39	38.48 S	35.73 E	-12.73	
8000	7998.97	7998.97	3 15	S	22 W	0.69	43.45 S	34.12 E	-8.93	
8100	8098.77	8098.77	3 53	S	21 W	0.65	49.25 S	31.85 E	-4.14	
8200	8198.53	8198.53	4 3	S	19 W	0.19	55.75 S	29.47 E	1.08	
8300	8298.30	8298.30	3 47	S	20 W	0.27	62.18 S	27.14 E	6.22	
8400	8398.10	8398.10	3 31	S	26 W	0.43	68.03 S	24.67 E	11.21	
8500	8497.92	8497.92	3 21	S	28 W	0.22	73.37 S	21.97 E	16.16	
8600	8597.83	8597.83	1 14	S	32 W	2.12	76.86 S	20.02 E	19.54	
8700	8697.82	8697.82	0 35	S	79 W	0.94	77.87 S	18.96 E	20.96	
8800	8797.81	8797.81	1 23	N	3 E	1.63	76.75 S	18.53 E	20.80	
8900	8897.75	8897.75	2 25	N	22 E	1.20	73.59 S	19.40 E	-18.51	

SPERRY-SUN, INC.											
RECORD OF SURVEY											
MEASURED DEPTH	TRUE VERTICAL DEPTH	SUB SEA TVD	COURSE		INCLINATION DEG MIN	COURSE		DOG-LEG SEV DEG/100	TOTAL RECTANGULAR NORTH/SOUTH	COORDINATES EAST/WEST	VERTICAL SECTION
			DEG	DIRECTION		DEG	DIRECTION				
9000	8997.60	8997.60	4	8	N	18	W	2.78	68.22 S	19.09 E	16.19
9100	9097.07	9097.07	7	32	N	30	W	3.61	59.12 S	14.67 E	15.67
9200	9195.86	9195.86	10	15	N	27	W	2.76	45.50 S	7.36 E	15.51
9300	9293.82	9293.82	12	56	N	20	W	3.01	27.04 S	0.46 W	13.45
9400	9390.92	9390.92	14	41	N	17	W	1.87	4.41 S	8.00 W	9.13

** THE CALCULATIONS ARE BASED ON THE MINIMUM RADIUS OF CURVATURE METHOD **

HORIZONTAL DISPLACEMENT = 9.13 FEET AT SOUTH 61 DEG. 9 MIN. WEST (TRUE)

ARCO

NORTH JAL, CUSTER NO. 1
NORTH JAL FIELD
EA COUNTY, NEW MEXICO
HYDROSCOPIC MULTISHOT

DATE OF SURVEY JUNE 12, 1981
VERTICAL SECTION DIRECTION CLOSURE

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SPERRY-SUN, INC.

RECORD OF SURVEY

MEASURED DEPTH	TRUE VERTICAL DEPTH	SUB SEA TVD	RECORD OF SURVEY			RECTANGULAR NORTH/SOUTH	COORDINATES EAST/WEST	TOTAL	VERTICAL SECTION
			COURSE INCLINATION DEG MIN	COURSE DIRECTION DEG	DOG-LEG SEV DEG/100				
9200	9195.86	9195.86	TIE ON AT 9200 FEET			45.50 S	7.36 E	-44.89	
9300	9294.31	9294.31	10 56	N 17 W	7.84	28.46 S	8.71 E	-27.79	
9400	9391.96	9391.96	13 55	N 12 W	3.14	7.60 S	3.54 E	-7.34	
9450	9440.38	9440.38	14 57	N 8 W	2.88	4.67 N	1.41 E	4.76	
9500	9488.65	9488.65	15 20	N 6 W	1.35	17.64 N	0.14 W	17.59	
9550	9536.78	9536.78	16 4	N 4 W	1.90	31.12 N	1.23 W	30.96	
9600	9584.76	9584.76	16 40	N 1 W	1.77	45.19 N	1.81 W	44.96	
9650	9632.56	9632.56	17 24	N 0 E	1.64	59.83 N	1.96 W	59.56	
9700	9680.17	9680.17	18 11	N 2 E	1.93	75.11 N	1.71 W	74.82	
9750	9727.68	9727.68	18 8	N 2 E	0.33	90.69 N	1.15 W	90.39	
9800	9775.29	9775.29	17 25	N 3 E	1.52	105.93 N	0.45 W	105.65	
9850	9823.04	9823.04	17 6	N 4 E	0.99	120.74 N	0.49 E	120.48	
9900	9870.89	9870.89	16 40	N 5 E	1.01	135.21 N	1.69 E	135.01	
9950	9918.74	9918.74	17 4	N 5 E	0.82	149.66 N	2.97 E	149.51	
0000	9966.58	9966.58	16 43	N 4 E	0.96	164.15 N	4.07 E	164.04	
0050	10014.51	10014.51	16 23	N 7 E	2.04	178.32 N	5.43 E	178.27	
0100	10062.34	10062.34	17 28	N 7 E	2.17	192.77 N	7.22 E	192.81	
0150	10109.91	10109.91	18 25	N 8 E	2.00	208.04 N	9.22 E	208.18	
0200	10157.24	10157.24	19 12	N 8 E	1.59	224.00 N	11.42 E	224.26	
0250	10204.31	10204.31	20 14	N 11 E	2.94	240.64 N	14.14 E	241.05	
0300	10250.94	10250.94	22 3	N 8 E	4.16	258.43 N	17.07 E	258.99	
0336	10284.07	10284.07	24 4	N 6 E	6.12	272.43 N	18.74 E	273.07	

THE CALCULATIONS ARE BASED ON THE

** THE CALCULATIONS ARE BASED ON THE MINIMUM RADIUS OF CURVATURE METHOD **

HORIZONTAL DISPLACEMENT = 273.07 FEET AT NORTH 3 DEG. 56 MIN. EAST (TRUE)