

RECEIVED

OCT 29 1990

OIL CON. DIV.
DIST. 3

SMITH INTERNATIONAL INC

DIRECTIONAL SURVEY DATA

E-34-31M-7w

RECEIVED

OCT 24 1990

OIL CON. DIV.
DIST. 3

OIL COMPANY: BLACKWOOD & NICHOLS
 FIELD: N.E. BLANCO UNIT
 WELL NAME: #404-R
 CALCULATION: RADIUS OF CURVATURE
 OBJECTIVE: 1404S-538E-2800TVD
 SUPERVISOR: NICK FREDRICK

PAGE: 1
 DATE: 10-20-1990
 JOB#: 1156-900231
 DECLINATION: 12.50DEG.

SECTION CALCULATIONS BASED ON TARGET DIRECTION OF S20.96E OF SURFACE LOCATION

STA	TMD	ANG	DIR	CLG	TVD	SEC	COORDINATES		DLS
1	353	1.00	S69E	353	352.98	2.06	1.10S	2.88E	0.28
2	376	0.40	S74.3E	23	375.98	2.24	1.19S	3.15E	2.62
3	406	0.40	S29.7E	30	405.98	2.41	1.31S	3.31E	1.01
4	436	1.50	S10E	30	435.97	2.91	1.78S	3.48E	3.77
5	465	3.10	S10E	29	464.95	4.05	2.93S	3.68E	5.52
6	496	5.20	S12.8E	31	495.87	6.26	5.12S	4.12E	6.80
7	527	7.10	S14.6E	31	526.69	9.55	8.35S	4.91E	6.16
8	556	9.00	S16.3E	29	555.40	13.60	12.26S	5.99E	6.60
9	585	10.20	S18.1E	29	583.99	18.42	16.88S	7.42E	4.27
10	616	12.40	S18.1E	31	614.39	24.49	22.66S	9.31E	7.10
11	646	14.20	S17.4E	30	643.58	31.38	29.23S	11.41E	6.02
12	676	16.10	S17E	30	672.54	39.20	36.72S	13.73E	6.34
13	706	17.90	S17E	30	701.23	47.95	45.11S	16.29E	6.00
14	736	19.20	S17E	30	729.67	57.47	54.23S	19.08E	4.33
15	765	20.30	S16.7E	29	756.96	67.25	63.61S	21.92E	3.81
16	795	21.70	S17E	30	784.97	77.97	73.90S	25.04E	4.68
17	825	23.10	S17.4E	30	812.70	89.38	84.82S	28.42E	4.70
18	855	24.60	S17E	30	840.14	101.48	96.41S	32.01E	5.03
19	885	26.20	S17E	30	867.24	114.32	108.72S	35.77E	5.33
20	914	27.70	S17.4E	29	893.09	127.43	121.27S	39.66E	5.21
21	944	29.20	S18.1E	30	919.47	141.70	134.88S	44.01E	5.13
22	974	30.10	S19.8E	30	945.54	156.53	148.92S	48.83E	4.19
23	1005	32.10	S19.8E	31	972.08	172.54	163.98S	54.26E	6.45
24	1035	33.80	S20.5E	30	997.26	188.86	179.30S	59.88E	5.82
25	1063	35.60	S21.2E	28	1020.27	204.79	194.20S	65.55E	6.60
26	1093	36.80	S22.3E	30	1044.48	222.51	210.65S	72.12E	4.62
27	1123	37.30	S22E	30	1068.43	240.58	227.39S	78.93E	1.79
28	1153	37.40	S22.3E	30	1092.27	258.78	244.25S	85.79E	0.73
29	1183	38.00	S21.2E	30	1116.01	277.12	261.29S	92.59E	3.13
30	1213	38.50	S20.9E	30	1139.57	295.69	278.62S	99.26E	1.80
31	1243	39.20	S20.9E	30	1162.93	314.51	296.20S	105.97E	2.33
32	1272	39.80	S21.2E	29	1185.31	332.96	313.42S	112.60E	2.19
33	1301	40.40	S21.2E	29	1207.49	351.64	330.83S	119.36E	2.07
34	1330	41.50	S21.6E	29	1229.40	370.64	348.53S	126.29E	3.92
35	1360	42.80	S22E	30	1251.64	390.77	367.22S	133.77E	4.44

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SECTION CALCULATIONS BASED ON TARGET DIRECTION OF S20.96E OF SURFACE LOCATION

STA	TMD	ANG	DIR	CLG	TVD	SEC	COORDINATES		DLS
36	1391	44.50	S22.3E	31	1274.07	412.17	387.04S	141.83E	5.53
37	1420	46.10	S22.7E	29	1294.46	432.77	406.08S	149.72E	5.62
38	1452	47.30	S22E	32	1316.41	456.05	427.62S	158.58E	4.15
39	1482	47.20	S22E	30	1336.77	478.08	448.05S	166.83E	0.33
40	1513	46.20	S21.2E	31	1358.03	500.64	469.02S	175.13E	3.85
41	1543	45.80	S20.9E	30	1378.87	522.22	489.16S	182.89E	1.56
42	1574	45.20	S21.2E	31	1400.60	544.33	509.80S	190.83E	2.08
43	1605	46.60	S22E	31	1422.18	566.59	530.50S	199.02E	4.97
44	1637	46.50	S21.6E	32	1444.18	589.82	552.07S	207.65E	1.06
45	1668	46.80	S21.6E	31	1465.46	612.36	573.03S	215.95E	0.97
46	1699	46.90	S22E	31	1486.66	634.97	594.03S	224.35E	1.10
47	1731	47.50	S21.2E	32	1508.41	658.45	615.86S	232.99E	2.79
48	1762	48.10	S21.6E	31	1529.23	681.41	637.24S	241.37E	2.21
49	1825	49.10	S21.6E	63	1570.89	728.67	681.17S	258.77E	1.59
50	1855	49.00	S21.2E	30	1590.55	751.32	702.27S	267.03E	1.19
51	1886	49.40	S21.2E	31	1610.81	774.79	724.15S	275.52E	1.29
52	1918	50.10	S21.6E	32	1631.48	799.21	746.89S	284.43E	2.44
53	1949	50.80	S21.6E	31	1651.22	823.12	769.11S	293.23E	2.26
54	1981	51.10	S21.6E	32	1671.38	847.96	792.22S	302.38E	0.94
55	2010	51.30	S22.7E	29	1689.56	870.56	813.15S	310.90E	3.46
56	2042	51.30	S22.7E	32	1709.56	895.52	836.19S	320.54E	0.00
57	2072	51.90	S23.4E	30	1728.20	919.02	857.82S	329.74E	2.90
58	2104	51.80	S23E	32	1747.96	944.16	880.95S	339.66E	1.17
59	2136	51.50	S22.7E	32	1767.82	969.24	904.08S	349.40E	1.26
60	2164	51.20	S23.4E	28	1785.31	991.10	924.20S	357.96E	2.48
61	2196	50.80	S23E	32	1805.45	1015.95	947.06S	367.76E	1.67
62	2227	49.30	S22.7E	31	1825.35	1039.70	968.96S	376.99E	4.91
63	2257	47.70	S22.3E	30	1845.23	1062.16	989.72S	385.59E	5.45
64	2288	46.80	S20.9E	31	1866.27	1084.92	1010.88S	393.97E	4.72
65	2320	45.60	S20.9E	32	1888.42	1108.02	1032.46S	402.20E	3.75
66	2351	44.80	S21.2E	31	1910.26	1130.01	1052.99S	410.11E	2.69
67	2383	44.60	S21.2E	32	1933.01	1152.52	1073.97S	418.25E	0.62
68	2414	43.70	S21.2E	31	1955.25	1174.11	1094.10S	426.05E	2.90
69	2444	43.10	S20.5E	30	1977.05	1194.72	1113.37S	433.39E	2.67
70	2475	42.50	S20.2E	31	1999.79	1215.79	1133.11S	440.71E	2.07

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STA	TMD	ANG	DIR	CLG	TVD	SEC	COORDINATES		DLS
71	2507	41.00	S19.5E	32	2023.67	1237.09	1153.15S	447.95E	4.95
72	2541	39.60	S18.4E	34	2049.60	1259.07	1173.95S	455.09E	4.70
73	2571	38.20	S17.7E	30	2072.94	1277.88	1191.86S	460.93E	4.93
74	2602	37.00	S18.1E	31	2097.50	1296.77	1209.86S	466.74E	3.96
75	2633	36.10	S18.4E	31	2122.41	1315.21	1227.40S	472.52E	2.97
76	2665	35.40	S18.8E	32	2148.38	1333.89	1245.11S	478.49E	2.32
77	2696	34.10	S19.5E	31	2173.85	1351.55	1261.81S	484.28E	4.41
78	2728	33.10	S19.5E	32	2200.50	1369.25	1278.50S	490.19E	3.12
79	2759	31.80	S19.5E	31	2226.66	1385.88	1294.18S	495.75E	4.19
80	2789	30.60	S20.2E	30	2252.32	1401.42	1308.79S	501.02E	4.20
81	2821	28.70	S21.2E	32	2280.13	1417.25	1323.60S	506.62E	6.15
82	2850	27.20	S22E	29	2305.75	1430.84	1336.24S	511.62E	5.34
83	2882	25.60	S22.7E	32	2334.41	1445.06	1349.40S	517.03E	5.10
84	2912	24.30	S22.7E	30	2361.61	1457.71	1361.07S	521.91E	4.33
85	2942	22.80	S23E	30	2389.11	1469.69	1372.12S	526.57E	5.02
86	2973	21.30	S22.7E	31	2417.84	1481.32	1382.84S	531.09E	4.85
87	3003	19.70	S22.3E	30	2445.94	1491.82	1392.55S	535.11E	5.35
88	3035	18.00	S21.2E	32	2476.22	1502.16	1402.15S	538.94E	5.43
89	3066	16.40	S21.2E	31	2505.83	1511.33	1410.70S	542.25E	5.16
90	3097	15.20	S20.9E	31	2535.66	1519.77	1418.57S	545.29E	3.88
91	3128	13.70	S21.6E	31	2565.68	1527.50	1425.78S	548.09E	4.87
92	3159	12.30	S21.2E	31	2595.89	1534.47	1432.28S	550.63E	4.53
93	3188	11.00	S20.5E	29	2624.29	1540.33	1437.75S	552.72E	4.51
94	3218	9.60	S20.2E	30	2653.80	1545.69	1442.78S	554.58E	4.67
95	3249	8.30	S19.1E	31	2684.43	1550.52	1447.32S	556.21E	4.23
96	3280	7.20	S19.1E	31	2715.14	1554.69	1451.27S	557.57E	3.55
97	3311	6.20	S17.4E	31	2745.93	1558.31	1454.70S	558.71E	3.29
98	3341	4.90	S15.6E	30	2775.79	1561.20	1457.49S	559.53E	4.37
99	3365	3.80	S15.6E	24	2799.72	1563.01	1459.24S	560.02E	4.58
100	3435	0.60	S15.6E	70	2869.66	1565.69	1461.83S	560.74E	4.57

* CLOSURE IS 1565.69 FEET SOUTH 20 DEG 59 MIN EAST OF SURFACE LOCATION *
 * STATION #100 PROJECTED.

County of: La Plata
State of: Colorado

Signature Elizabeth Boyd
Elizabeth Boyd
Notary Public
Commission Expires 3-10-91

10-25-90
Date
484 Turner Drive
Durango, Colorado 81301