

Pathfinder Energy Survey Report

Company: XTO Energy Field: San Juan Co. NM NAD-27 Site: Basin Fruitland Coal (2) Well: OH Randel #14S Wellpath: OH	Date: 12/14/2006 Time: 10:30:27 Page: 1 Co-ordinate(NE) Reference: Well: OH Randel #14S, Grid North Vertical (TVD) Reference: SITE 6316.0 Section (VS) Reference: Well (0.00N,0.00E,294.14Azi) Survey Calculation Method: Minimum Curvature Db: Sybase
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30-045-32948

Field: San Juan Co. NM NAD-27 Map System: US State Plane Coordinate System 1927 Geo Datum: NAD27 (Clarke 1866) Sys Datum: Mean Sea Level	Map Zone: New Mexico, Western Zone Coordinate System: Well Centre Geomagnetic Model: igrf2005
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Site: Basin Fruitland Coal (2)

Site Position: From: Map Position Uncertainty: 0.00 ft Ground Level: 6304.00 ft	Northing: 2000684.24 ft Easting: 450278.12 ft	Latitude: 36 29 54.000 N Longitude: 108 0 9.000 W North Reference: Grid Grid Convergence: -0.10 deg
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Well: OH Randel #14S Well Position: +N/-S 0.00 ft Northing: 2000684.24 ft Position Uncertainty: 0.00 ft Easting: 450278.12 ft	Slot Name: Latitude: 36 29 54.000 N Longitude: 108 0 9.000 W
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Wellpath: OH Current Datum: SITE Magnetic Data: 11/30/2006 Field Strength: 51079 nT Vertical Section: Depth From (TVD) ft	Height: 6316.00 ft +N/-S ft	Drilled From: Surface Tie-on Depth: 0.00 ft Above System Datum: Mean Sea Level Declination: 10.50 deg Mag Dip Angle: 63.32 deg +E/-W ft	Direction deg 294.14
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Surface 1185/S 885/E
 BHL 1454/S 1465/E
 BHL 21940/S 2584/E

Survey: Pathfinder MWD Surveys Company: Pathfinder Energy Tool:	Start Date: 12/4/2006 Engineer: Midwellplan Tied-to: From Surface
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1 md 1900 + TVD 1631
 2 md 3121 TVD 21651

MD ft	Incl deg	Azim deg	TVD ft	+N/-S ft	+E/-W ft	VS ft	DLS deg/100ft	Build deg/100ft	Turn deg/100ft	Tool/Comment
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
390.00	2.50	171.10	389.88	-8.40	1.32	-4.64	0.64	0.64	0.00	
398.00	2.55	171.10	397.87	-8.75	1.37	-4.83	0.64	0.64	0.00	
417.00	2.37	175.40	416.85	-9.56	1.47	-5.25	1.36	-0.95	22.63	
447.00	1.85	190.79	446.83	-10.65	1.43	-5.66	2.55	-1.73	51.30	
479.00	1.49	227.70	478.82	-11.44	1.02	-5.61	3.47	-1.12	115.34	
510.00	1.49	265.32	509.81	-11.74	0.32	-5.10	3.10	0.00	121.35	
542.00	2.11	281.31	541.79	-11.66	-0.67	-4.16	2.48	1.94	49.97	
573.00	3.17	290.98	572.76	-11.24	-2.03	-2.75	3.70	3.42	31.19	
604.00	4.66	294.58	603.69	-10.41	-3.98	-0.63	4.87	4.81	11.61	
635.00	6.07	297.66	634.55	-9.13	-6.57	2.27	4.64	4.55	9.94	
666.00	7.47	300.30	665.33	-7.35	-9.76	5.90	4.63	4.52	8.52	
695.00	8.62	301.70	694.05	-5.26	-13.24	9.93	4.02	3.97	4.83	
725.00	9.67	302.32	723.67	-2.73	-17.28	14.66	3.52	3.50	2.07	
757.00	10.82	301.62	755.15	0.28	-22.11	20.29	3.61	3.59	-2.19	
788.00	11.87	300.47	785.55	3.43	-27.34	26.35	3.46	3.39	-3.71	
819.00	13.10	299.59	815.81	6.78	-33.14	33.02	4.01	3.97	-2.84	
851.00	14.16	300.56	846.91	10.56	-39.67	40.51	3.39	3.31	3.03	
883.00	15.48	300.83	877.85	14.74	-46.70	48.65	4.13	4.12	0.84	
914.00	16.80	299.95	907.63	19.09	-54.14	57.21	4.33	4.26	-2.84	
946.00	17.94	299.77	938.17	23.85	-62.42	66.72	3.57	3.56	-0.56	
976.00	19.26	298.98	966.60	28.54	-70.76	76.25	4.48	4.40	-2.63	
1006.00	20.75	298.45	994.79	33.47	-79.76	86.48	5.00	4.97	-1.77	
1037.00	21.72	298.36	1023.68	38.81	-89.64	97.67	3.13	3.13	-0.29	

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Pathfinder Energy

Survey Report

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Survey: Pathfinder MWD Surveys

MD ft	Incl deg	Azim deg	TVD ft	+N/-S ft	+E/-W ft	VS ft	DLS deg/100ft	Build deg/100ft	Turn deg/100ft	Tool/Comment
1068.00	22.77	298.71	1052.37	44.42	-99.95	109.37	3.41	3.39	1.13	
1099.00	23.83	298.54	1080.85	50.29	-110.71	121.60	3.43	3.42	-0.55	
1129.00	24.71	298.63	1108.19	56.19	-121.54	133.89	2.94	2.93	0.30	
1160.00	26.12	298.71	1136.19	62.58	-133.21	147.15	4.55	4.55	0.26	
1192.00	26.82	298.36	1164.84	69.39	-145.74	161.38	2.24	2.19	-1.09	
1223.00	26.47	297.48	1192.55	75.90	-158.03	175.25	1.70	-1.13	-2.84	
1254.00	27.26	297.05	1220.20	82.32	-170.48	189.24	2.62	2.55	-1.39	
1285.00	27.35	297.22	1247.75	88.80	-183.14	203.44	0.38	0.29	0.55	
1316.00	27.08	296.96	1275.31	95.26	-195.76	217.60	0.95	-0.87	-0.84	
1348.00	27.44	296.08	1303.76	101.80	-208.87	232.24	1.69	1.12	-2.75	
1379.00	28.49	294.67	1331.14	108.03	-222.01	246.77	4.00	3.39	-4.55	
1409.00	29.72	294.14	1357.35	114.06	-235.29	261.36	4.19	4.10	-1.77	
1439.00	30.78	294.32	1383.27	120.26	-249.08	276.48	3.55	3.53	0.60	
1471.00	32.01	293.62	1410.58	127.03	-264.31	293.15	4.01	3.84	-2.19	
1503.00	32.62	292.92	1437.63	133.79	-280.02	310.25	2.24	1.91	-2.19	
1536.00	36.76	294.00	1464.75	141.27	-297.24	329.02	12.68	12.55	3.27	
1555.00	39.79	290.55	1479.67	145.72	-308.14	340.78	19.51	15.95	-18.15	
1597.00	46.78	284.30	1510.24	154.23	-335.60	369.32	19.51	16.64	-14.88	
1629.00	50.74	291.60	1531.35	161.68	-358.44	393.21	21.14	12.37	22.81	
1661.00	53.99	294.23	1550.89	171.56	-381.77	418.54	12.06	10.16	8.22	
1691.00	58.48	295.73	1567.56	182.09	-404.36	443.47	15.53	14.97	5.00	
1720.00	63.31	295.99	1581.66	193.14	-427.16	468.79	16.67	16.66	0.90	
1749.00	66.13	295.73	1594.04	204.58	-450.75	495.00	9.76	9.72	-0.90	
1780.00	69.73	296.26	1605.69	217.17	-476.57	523.71	11.72	11.61	1.71	
1810.00	73.78	297.05	1615.08	229.95	-502.03	552.17	13.73	13.50	2.63	
1841.00	78.00	297.84	1622.63	243.80	-528.70	582.17	13.84	13.61	2.55	
1872.00	82.57	297.75	1627.86	258.05	-555.72	612.66	14.74	14.74	-0.29	
1900.00	86.31	297.15	1630.58	270.89	-580.45	640.48	13.51	13.34	-2.14	
1901.00	86.44	297.13	1630.64	271.35	-581.34	641.47	13.51	13.35	-2.13	
1932.00	89.16	296.69	1631.83	285.37	-608.96	672.41	8.89	8.77	-1.42	
1961.00	88.90	296.34	1632.32	298.31	-634.90	701.38	1.50	-0.90	-1.21	
1992.00	88.81	296.43	1632.94	312.09	-662.67	732.35	0.41	-0.29	0.29	
2023.00	87.67	295.29	1633.89	325.60	-690.55	763.32	5.20	-3.68	-3.68	
2054.00	85.30	295.38	1635.79	338.84	-718.52	794.25	7.65	-7.65	0.29	
2085.00	85.82	296.08	1638.19	352.26	-746.36	825.15	2.81	1.68	2.26	
2115.00	89.78	298.71	1639.34	366.05	-772.97	855.07	15.84	13.20	8.77	
2146.00	91.36	298.19	1639.04	380.81	-800.22	885.98	5.37	5.10	-1.68	
2176.00	90.84	297.48	1638.46	394.82	-826.74	915.91	2.93	-1.73	-2.37	
2237.00	88.99	295.99	1638.55	422.26	-881.22	976.84	3.89	-3.03	-2.44	
2267.00	89.34	296.17	1638.99	435.45	-908.16	1006.82	1.31	1.17	0.60	
2327.00	85.91	294.76	1641.47	461.22	-962.28	1066.75	6.18	-5.72	-2.35	
2358.00	85.71	294.32	1643.74	474.06	-990.40	1097.66	1.56	-0.65	-1.42	
2388.00	86.17	293.79	1645.86	486.26	-1017.73	1127.59	2.34	1.53	-1.77	
2417.00	87.76	291.68	1647.40	497.45	-1044.43	1156.54	9.10	5.48	-7.28	
2446.00	88.90	290.01	1648.24	507.76	-1071.52	1185.47	6.97	3.93	-5.76	
2475.00	90.04	289.40	1648.51	517.54	-1098.82	1214.38	4.46	3.93	-2.10	
2506.00	89.96	288.08	1648.51	527.50	-1128.18	1245.25	4.27	-0.26	-4.26	
2537.00	90.57	287.29	1648.37	536.91	-1157.71	1276.05	3.22	1.97	-2.55	
2568.00	91.80	287.64	1647.73	546.22	-1187.28	1306.83	4.13	3.97	1.13	
2598.00	91.98	287.20	1646.74	555.19	-1215.88	1336.61	1.58	0.60	-1.47	
2629.00	90.40	287.03	1646.09	564.31	-1245.50	1367.37	5.13	-5.10	-0.55	
2661.00	89.50	287.29	1646.12	573.75	-1276.08	1399.13	2.93	-2.81	0.81	
2693.00	89.52	286.76	1646.40	583.12	-1306.68	1430.88	1.66	0.06	-1.66	

Pathfinder Energy Survey Report

Company: XTO Energy
Field: San Juan Co. NM NAD-27
Site: Basin Fruitland Coal (2)
Well: OH Randel #14S
Wellpath: OH

Date: 12/14/2006 **Time:** 10:30:27 **Page:** 3
Co-ordinate(NE) Reference: Well: OH Randel #14S, Grid North
Vertical (TVD) Reference: SITE 6316.0
Section (VS) Reference: Well (0.00N,0.00E,294.14Azi)
Survey Calculation Method: Minimum Curvature **Db:** Sybase

Survey: Pathfinder MWD Surveys

MD ft	Incl deg	Azim deg	TVD ft	+N/-S ft	+E/-W ft	VS ft	DLS deg/100ft	Build deg/100ft	Turn deg/100ft	Tool/Comment
2724.00	89.16	290.10	1646.75	592.92	-1336.08	1461.72	10.84	-1.16	10.77	
2756.00	89.25	292.48	1647.20	604.54	-1365.89	1493.68	7.44	0.28	7.44	
2788.00	89.60	292.74	1647.52	616.84	-1395.43	1525.67	1.36	1.09	0.81	
2819.00	89.43	294.14	1647.78	629.17	-1423.87	1556.66	4.55	-0.55	4.52	
2850.00	89.60	294.06	1648.04	641.83	-1452.17	1587.66	0.61	0.55	-0.26	
2881.00	89.08	294.76	1648.40	654.64	-1480.39	1618.66	2.81	-1.68	2.26	
2913.00	88.64	294.67	1649.04	668.02	-1509.46	1650.65	1.40	-1.37	-0.28	
2945.00	89.08	294.76	1649.67	681.39	-1538.52	1682.64	1.40	1.37	0.28	
2976.00	89.52	294.23	1650.05	694.24	-1566.73	1713.64	2.22	1.42	-1.71	
3008.00	89.87	294.76	1650.22	707.51	-1595.85	1745.64	1.98	1.09	1.66	
3040.00	89.25	294.58	1650.47	720.87	-1624.92	1777.63	2.02	-1.94	-0.56	
3071.00	89.34	294.58	1650.85	733.76	-1653.11	1808.63	0.29	0.29	0.00	
3103.00	90.13	294.85	1651.00	747.14	-1682.18	1840.63	2.61	2.47	0.84	
3121.00	90.40	294.94	1650.91	754.72	-1698.51	1858.63	1.58	1.50	0.50	

Annotation

MD ft	TVD ft



Field: San Juan Co. NM NAD-27
Site: Basin Fruitland Coal (2)
Well: OH Randel #14S
Wellpath: OH
Survey: Pathfinder MWD Surveys

PATHFINDER

SITE DETAILS

Basin Fruitland Coal (2)

Site Centre Northing: 2000684.24

Easting: 430278.12

Ground Level: 6304.00

Positional Uncertainty: 0.00

Convergence: -0.10

WELLPATH DETAILS

OH

Rig:

Ref Datum:

V/Section

Angle

SITE

Origin

+N/-S

0.00

Origin

+E/-W

0.00

Starting

From TVD

0.00

TARGET DETAILS

Name

PBHL

TVD

1635.00

+N/-S

768.01

+E/-W

-1713.66

Shape

Point

Survey: Pathfinder MWD Surveys OH Randel #14S(OH)

No	MD	Inc	Av	TVD	+N/-S	+E/-W	DLeg	TFace	VSec
83	2976.00	89.52	294.23	1650.05	694.24	-1566.73	2.22	-50.30	1713.64
84	3008.00	89.87	294.76	1650.22	707.51	-1595.85	1.98	56.56	1745.64
85	3040.00	89.25	294.58	1650.47	720.87	-1624.92	2.02	-163.81	1777.63
86	3071.00	89.34	294.58	1650.85	733.76	-1653.11	0.29	0.00	1808.63
87	3103.00	90.13	294.85	1651.00	747.14	-1682.18	1.87	18.87	1840.63
88	3121.00	90.40	294.94	1650.91	754.72	-1698.51	1.58	18.43	1858.63

ANNOTATIONS

No.	TVD	MD	Annotation
1	389.88	390.00	KOP @ 390' MD / TVD Build 3°/100'
2	1479.67	1555.00	SIDE TRACK @ 1555' MD
3	1479.67	1555.00	BEGIN 16° / 100' BUILD RATES
4	1630.58	1900.00	EOC @ 1900' MD / 1635' TVD

