



Scientific Drilling
Directional Drilling Operations

Field: EDDY COUNTY, NM
Site: SEC 9-T18-R27E
Well: HorseTAIL Federal 9 #1
Wellpath: OH
Plan: Plan #1



SECTION DETAILS

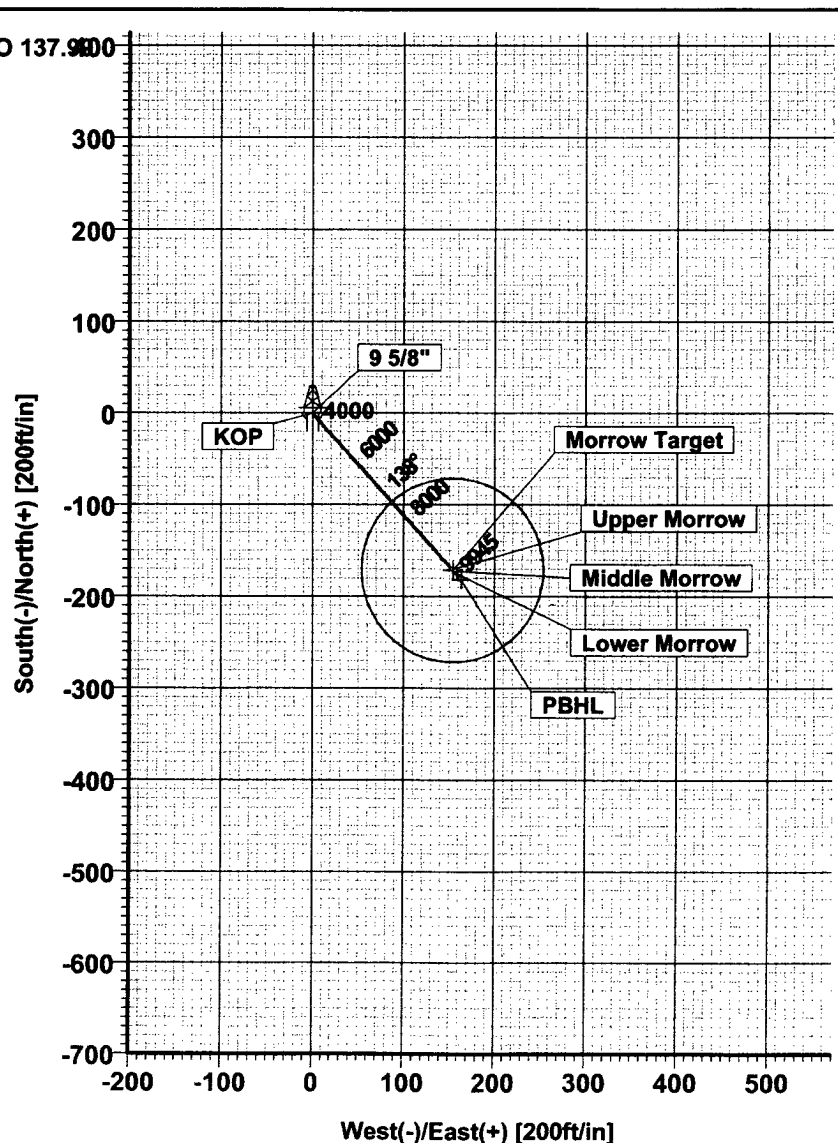
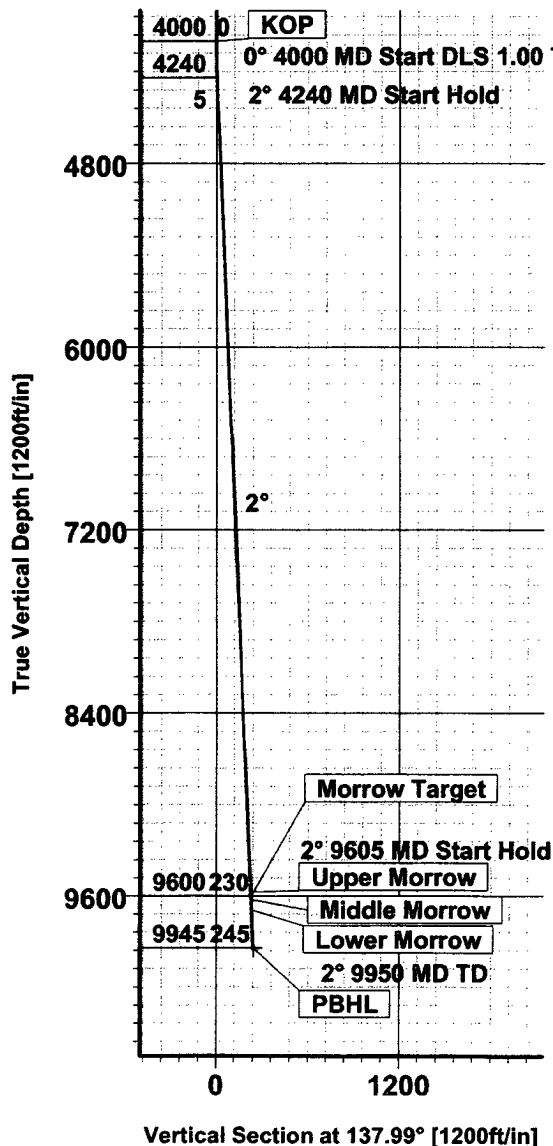
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	4000.00	0.00	0.00	4000.00	0.00	0.00	0.00	0.00	0.00	
3	4240.45	2.40	137.99	4240.38	-3.75	3.38	1.00	137.99	5.05	
4	9604.79	2.40	137.99	9600.00	-171.00	154.00	0.00	0.00	230.12	Morrow Target
5	9950.00	2.40	137.99	9944.90	-181.76	163.69	0.00	0.00	244.61	PBHL

WELL DETAILS

Name	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
HorseTAIL Federal 9 #1	0.00	0.00	639639.469	516960.819	32°45'30.420N	104°16'41.380W	N/A

TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Shape
Morrow Target	9600.00	-171.00	154.00	639468.484	517114.805	Circle (Radius: 100)
PBHL	9944.90	-181.76	163.69	639457.725	517124.495	Point



[illegible]

Scientific Drilling Planning Report

Company: BP
Field: EDDY COUNTY, NM
Site: SEC 9-T18-R27E
Well: HorseTAIL Federal 9 #1
Wellpath: OH

Date: 2005/07/22 **Time:** 14:08:46 **Page:** 2
Co-ordinate(NE) Reference: Well: HorseTAIL Federal 9 #1, Grid North
Vertical (TVD) Reference: SITE 3520.0
Section (VS) Reference: Well (0.00N,0.00E,137.99Azi)
Plan: Plan #1

Section 1 : Start Hold

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	TFO deg
1900.00	0.00	0.00	1900.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2000.00	0.00	0.00	2000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2100.00	0.00	0.00	2100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2200.00	0.00	0.00	2200.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2300.00	0.00	0.00	2300.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2400.00	0.00	0.00	2400.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2500.00	0.00	0.00	2500.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2600.00	0.00	0.00	2600.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2700.00	0.00	0.00	2700.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2800.00	0.00	0.00	2800.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2900.00	0.00	0.00	2900.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3000.00	0.00	0.00	3000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3100.00	0.00	0.00	3100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3200.00	0.00	0.00	3200.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3300.00	0.00	0.00	3300.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3400.00	0.00	0.00	3400.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3500.00	0.00	0.00	3500.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3600.00	0.00	0.00	3600.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3700.00	0.00	0.00	3700.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3800.00	0.00	0.00	3800.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3900.00	0.00	0.00	3900.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4000.00	0.00	0.00	4000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Section 2 : Start DLS 1.00 TFO 137.99

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	TFO deg
4100.00	1.00	137.99	4099.99	-0.65	0.58	0.87	1.00	1.00	0.00	0.00
4200.00	2.00	137.99	4199.96	-2.59	2.34	3.49	1.00	1.00	0.00	0.00
4240.45	2.40	137.99	4240.38	-3.75	3.38	5.05	1.00	1.00	0.00	0.00

Section 3 : Start Hold

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	TFO deg
4300.00	2.40	137.99	4299.88	-5.61	5.05	7.54	0.00	0.00	0.00	0.00
4400.00	2.40	137.99	4399.79	-8.72	7.86	11.74	0.00	0.00	0.00	0.00
4500.00	2.40	137.99	4499.70	-11.84	10.66	15.94	0.00	0.00	0.00	0.00
4600.00	2.40	137.99	4599.61	-14.96	13.47	20.13	0.00	0.00	0.00	0.00
4700.00	2.40	137.99	4699.52	-18.08	16.28	24.33	0.00	0.00	0.00	0.00
4800.00	2.40	137.99	4799.44	-21.19	19.09	28.52	0.00	0.00	0.00	0.00
4900.00	2.40	137.99	4899.35	-24.31	21.90	32.72	0.00	0.00	0.00	0.00
5000.00	2.40	137.99	4999.26	-27.43	24.70	36.91	0.00	0.00	0.00	0.00
5100.00	2.40	137.99	5099.17	-30.55	27.51	41.11	0.00	0.00	0.00	0.00
5200.00	2.40	137.99	5199.08	-33.67	30.32	45.31	0.00	0.00	0.00	0.00
5300.00	2.40	137.99	5299.00	-36.78	33.13	49.50	0.00	0.00	0.00	0.00
5400.00	2.40	137.99	5398.91	-39.90	35.93	53.70	0.00	0.00	0.00	0.00
5500.00	2.40	137.99	5498.82	-43.02	38.74	57.89	0.00	0.00	0.00	0.00
5600.00	2.40	137.99	5598.73	-46.14	41.55	62.09	0.00	0.00	0.00	0.00
5700.00	2.40	137.99	5698.64	-49.26	44.36	66.29	0.00	0.00	0.00	0.00
5800.00	2.40	137.99	5798.56	-52.37	47.17	70.48	0.00	0.00	0.00	0.00
5900.00	2.40	137.99	5898.47	-55.49	49.97	74.68	0.00	0.00	0.00	0.00
6000.00	2.40	137.99	5998.38	-58.61	52.78	78.87	0.00	0.00	0.00	0.00
6100.00	2.40	137.99	6098.29	-61.73	55.59	83.07	0.00	0.00	0.00	0.00
6200.00	2.40	137.99	6198.20	-64.84	58.40	87.26	0.00	0.00	0.00	0.00
6300.00	2.40	137.99	6298.12	-67.96	61.21	91.46	0.00	0.00	0.00	0.00
6400.00	2.40	137.99	6398.03	-71.08	64.01	95.66	0.00	0.00	0.00	0.00
6500.00	2.40	137.99	6497.94	-74.20	66.82	99.85	0.00	0.00	0.00	0.00
6600.00	2.40	137.99	6597.85	-77.32	69.63	104.05	0.00	0.00	0.00	0.00
6700.00	2.40	137.99	6697.76	-80.43	72.44	108.24	0.00	0.00	0.00	0.00
6800.00	2.40	137.99	6797.68	-83.55	75.25	112.44	0.00	0.00	0.00	0.00
6900.00	2.40	137.99	6897.59	-86.67	78.05	116.64	0.00	0.00	0.00	0.00
7000.00	2.40	137.99	6997.50	-89.79	80.86	120.83	0.00	0.00	0.00	0.00
7100.00	2.40	137.99	7097.41	-92.90	83.67	125.03	0.00	0.00	0.00	0.00



Scientific Drilling Planning Report



Company: BP	Date: 2005/07/22	Time: 14:08:46	Page: 4
Field: EDDY COUNTY, NM	Co-ordinate(NE) Reference: Well: HorseTAIL Federal 9 #1, Grid North		
Site: SEC 9-T18-R27E	Vertical (TVD) Reference: SITE 3520.0		
Well: HorseTAIL Federal 9 #1	Section (VS) Reference: Well (0.00N,0.00E,137.99Azi)		
Wellpath: OH	Plan: Plan #1		

Survey

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
1900.00	0.00	0.00	1900.00	0.00	0.00	0.00	0.00	0.00	0.00	MWD ISCWSA
2000.00	0.00	0.00	2000.00	0.00	0.00	0.00	0.00	0.00	0.00	MWD ISCWSA
2100.00	0.00	0.00	2100.00	0.00	0.00	0.00	0.00	0.00	0.00	MWD ISCWSA
2200.00	0.00	0.00	2200.00	0.00	0.00	0.00	0.00	0.00	0.00	MWD ISCWSA
2300.00	0.00	0.00	2300.00	0.00	0.00	0.00	0.00	0.00	0.00	MWD ISCWSA
2400.00	0.00	0.00	2400.00	0.00	0.00	0.00	0.00	0.00	0.00	MWD ISCWSA
2500.00	0.00	0.00	2500.00	0.00	0.00	0.00	0.00	0.00	0.00	MWD ISCWSA
2600.00	0.00	0.00	2600.00	0.00	0.00	0.00	0.00	0.00	0.00	MWD ISCWSA
2700.00	0.00	0.00	2700.00	0.00	0.00	0.00	0.00	0.00	0.00	MWD ISCWSA
2800.00	0.00	0.00	2800.00	0.00	0.00	0.00	0.00	0.00	0.00	MWD ISCWSA
2900.00	0.00	0.00	2900.00	0.00	0.00	0.00	0.00	0.00	0.00	MWD ISCWSA
3000.00	0.00	0.00	3000.00	0.00	0.00	0.00	0.00	0.00	0.00	9 5/8"
3100.00	0.00	0.00	3100.00	0.00	0.00	0.00	0.00	0.00	0.00	MWD ISCWSA
3200.00	0.00	0.00	3200.00	0.00	0.00	0.00	0.00	0.00	0.00	MWD ISCWSA
3300.00	0.00	0.00	3300.00	0.00	0.00	0.00	0.00	0.00	0.00	MWD ISCWSA
3400.00	0.00	0.00	3400.00	0.00	0.00	0.00	0.00	0.00	0.00	MWD ISCWSA
3500.00	0.00	0.00	3500.00	0.00	0.00	0.00	0.00	0.00	0.00	MWD ISCWSA
3600.00	0.00	0.00	3600.00	0.00	0.00	0.00	0.00	0.00	0.00	MWD ISCWSA
3700.00	0.00	0.00	3700.00	0.00	0.00	0.00	0.00	0.00	0.00	MWD ISCWSA
3800.00	0.00	0.00	3800.00	0.00	0.00	0.00	0.00	0.00	0.00	MWD ISCWSA
3900.00	0.00	0.00	3900.00	0.00	0.00	0.00	0.00	0.00	0.00	MWD ISCWSA
4000.00	0.00	0.00	4000.00	0.00	0.00	0.00	0.00	0.00	0.00	KOP
4100.00	1.00	137.99	4099.99	-0.65	0.58	0.87	1.00	1.00	0.00	MWD ISCWSA
4200.00	2.00	137.99	4199.96	-2.59	2.34	3.49	1.00	1.00	0.00	MWD ISCWSA
4240.45	2.40	137.99	4240.38	-3.75	3.38	5.05	1.00	1.00	0.00	MWD ISCWSA
4300.00	2.40	137.99	4299.88	-5.61	5.05	7.54	0.00	0.00	0.00	MWD ISCWSA
4400.00	2.40	137.99	4399.79	-8.72	7.86	11.74	0.00	0.00	0.00	MWD ISCWSA
4500.00	2.40	137.99	4499.70	-11.84	10.66	15.94	0.00	0.00	0.00	MWD ISCWSA
4600.00	2.40	137.99	4599.61	-14.96	13.47	20.13	0.00	0.00	0.00	MWD ISCWSA
4700.00	2.40	137.99	4699.52	-18.08	16.28	24.33	0.00	0.00	0.00	MWD ISCWSA
4800.00	2.40	137.99	4799.44	-21.19	19.09	28.52	0.00	0.00	0.00	MWD ISCWSA
4900.00	2.40	137.99	4899.35	-24.31	21.90	32.72	0.00	0.00	0.00	MWD ISCWSA
5000.00	2.40	137.99	4999.26	-27.43	24.70	36.91	0.00	0.00	0.00	MWD ISCWSA
5100.00	2.40	137.99	5099.17	-30.55	27.51	41.11	0.00	0.00	0.00	MWD ISCWSA
5200.00	2.40	137.99	5199.08	-33.67	30.32	45.31	0.00	0.00	0.00	MWD ISCWSA
5300.00	2.40	137.99	5299.00	-36.78	33.13	49.50	0.00	0.00	0.00	MWD ISCWSA
5400.00	2.40	137.99	5398.91	-39.90	35.93	53.70	0.00	0.00	0.00	MWD ISCWSA
5500.00	2.40	137.99	5498.82	-43.02	38.74	57.89	0.00	0.00	0.00	MWD ISCWSA
5600.00	2.40	137.99	5598.73	-46.14	41.55	62.09	0.00	0.00	0.00	MWD ISCWSA
5700.00	2.40	137.99	5698.64	-49.26	44.36	66.29	0.00	0.00	0.00	MWD ISCWSA
5800.00	2.40	137.99	5798.56	-52.37	47.17	70.48	0.00	0.00	0.00	MWD ISCWSA
5900.00	2.40	137.99	5898.47	-55.49	49.97	74.68	0.00	0.00	0.00	MWD ISCWSA
6000.00	2.40	137.99	5998.38	-58.61	52.78	78.87	0.00	0.00	0.00	MWD ISCWSA
6100.00	2.40	137.99	6098.29	-61.73	55.59	83.07	0.00	0.00	0.00	MWD ISCWSA
6200.00	2.40	137.99	6198.20	-64.84	58.40	87.26	0.00	0.00	0.00	MWD ISCWSA
6300.00	2.40	137.99	6298.12	-67.96	61.21	91.46	0.00	0.00	0.00	MWD ISCWSA
6400.00	2.40	137.99	6398.03	-71.08	64.01	95.66	0.00	0.00	0.00	MWD ISCWSA
6500.00	2.40	137.99	6497.94	-74.20	66.82	99.85	0.00	0.00	0.00	MWD ISCWSA
6600.00	2.40	137.99	6597.85	-77.32	69.63	104.05	0.00	0.00	0.00	MWD ISCWSA
6700.00	2.40	137.99	6697.76	-80.43	72.44	108.24	0.00	0.00	0.00	MWD ISCWSA
6800.00	2.40	137.99	6797.68	-83.55	75.25	112.44	0.00	0.00	0.00	MWD ISCWSA
6900.00	2.40	137.99	6897.59	-86.67	78.05	116.64	0.00	0.00	0.00	MWD ISCWSA
7000.00	2.40	137.99	6997.50	-89.79	80.86	120.83	0.00	0.00	0.00	MWD ISCWSA

Company: BP
Field: EDDY COUNTY, NM
Site: SEC 9-T18-R27E
Well: HorseTAIL Federal 9 #1
Wellpath: OH

Date: 2005/07/22
Co-ordinate(NE) Reference: Well: HorseTAIL Federal 9 #1, Grid North
Vertical (TVD) Reference: SITE 3520.0
Section (VS) Reference: Well (0.00N,0.00E,137.99Azi)
Plan: Plan #1

Page: 5

Survey

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
7100.00	2.40	137.99	7097.41	-92.90	83.67	125.03	0.00	0.00	0.00	MWD ISCWSA
7200.00	2.40	137.99	7197.32	-96.02	86.48	129.22	0.00	0.00	0.00	MWD ISCWSA
7300.00	2.40	137.99	7297.24	-99.14	89.28	133.42	0.00	0.00	0.00	MWD ISCWSA
7400.00	2.40	137.99	7397.15	-102.26	92.09	137.61	0.00	0.00	0.00	MWD ISCWSA
7500.00	2.40	137.99	7497.06	-105.38	94.90	141.81	0.00	0.00	0.00	MWD ISCWSA
7600.00	2.40	137.99	7596.97	-108.49	97.71	146.01	0.00	0.00	0.00	MWD ISCWSA
7700.00	2.40	137.99	7696.88	-111.61	100.52	150.20	0.00	0.00	0.00	MWD ISCWSA
7800.00	2.40	137.99	7796.79	-114.73	103.32	154.40	0.00	0.00	0.00	MWD ISCWSA
7900.00	2.40	137.99	7896.71	-117.85	106.13	158.59	0.00	0.00	0.00	MWD ISCWSA
8000.00	2.40	137.99	7996.62	-120.97	108.94	162.79	0.00	0.00	0.00	MWD ISCWSA
8100.00	2.40	137.99	8096.53	-124.08	111.75	166.99	0.00	0.00	0.00	MWD ISCWSA
8200.00	2.40	137.99	8196.44	-127.20	114.56	171.18	0.00	0.00	0.00	MWD ISCWSA
8300.00	2.40	137.99	8296.35	-130.32	117.36	175.38	0.00	0.00	0.00	MWD ISCWSA
8400.00	2.40	137.99	8396.27	-133.44	120.17	179.57	0.00	0.00	0.00	MWD ISCWSA
8500.00	2.40	137.99	8496.18	-136.55	122.98	183.77	0.00	0.00	0.00	MWD ISCWSA
8600.00	2.40	137.99	8596.09	-139.67	125.79	187.96	0.00	0.00	0.00	MWD ISCWSA
8700.00	2.40	137.99	8696.00	-142.79	128.59	192.16	0.00	0.00	0.00	MWD ISCWSA
8800.00	2.40	137.99	8795.91	-145.91	131.40	196.36	0.00	0.00	0.00	MWD ISCWSA
8900.00	2.40	137.99	8895.83	-149.03	134.21	200.55	0.00	0.00	0.00	MWD ISCWSA
9000.00	2.40	137.99	8995.74	-152.14	137.02	204.75	0.00	0.00	0.00	MWD ISCWSA
9100.00	2.40	137.99	9095.65	-155.26	139.83	208.94	0.00	0.00	0.00	MWD ISCWSA
9200.00	2.40	137.99	9195.56	-158.38	142.63	213.14	0.00	0.00	0.00	MWD ISCWSA
9300.00	2.40	137.99	9295.47	-161.50	145.44	217.34	0.00	0.00	0.00	MWD ISCWSA
9400.00	2.40	137.99	9395.39	-164.61	148.25	221.53	0.00	0.00	0.00	MWD ISCWSA
9500.00	2.40	137.99	9495.30	-167.73	151.06	225.73	0.00	0.00	0.00	MWD ISCWSA
9580.00	2.40	137.99	9575.23	-170.23	153.30	229.08	0.00	0.00	0.00	Upper Morrow
9600.00	2.40	137.99	9595.21	-170.85	153.87	229.92	0.00	0.00	0.00	MWD ISCWSA
9604.79	2.40	137.99	9600.00	-171.00	154.00	230.12	0.00	0.00	0.00	Morrow Target
9630.00	2.40	137.99	9625.18	-171.79	154.71	231.18	0.00	0.00	0.00	Middle Morrow
9700.00	2.40	137.99	9695.12	-173.97	156.67	234.12	0.00	0.00	0.00	Lower Morrow
9800.00	2.40	137.99	9795.03	-177.09	159.48	238.31	0.00	0.00	0.00	MWD ISCWSA
9900.00	2.40	137.99	9894.95	-180.20	162.29	242.51	0.00	0.00	0.00	MWD ISCWSA
9950.00	2.40	137.99	9944.90	-181.76	163.69	244.61	0.00	0.00	0.00	PBHL

Targets

Name	Description Dip. Dir.	TVD ft	+N/-S ft	+E/-W ft	Map Northing ft	Map Easting ft	Latitude Deg Min Sec	Longitude Deg Min Sec
Morrow Target		9600.00	-171.00	154.00	639468.484	517114.805	32 45 28.727 N	104 16 39.578 W
-Circle (Radius: 100)								
-Plan hit target								
PBHL		9944.90	-181.76	163.69	639457.725	517124.495	32 45 28.621 N	104 16 39.464 W
-Plan hit target								

Casing Points

MD ft	TVD ft	Diameter in	Hole Size in	Name
3000.00	3000.00	9.625	12.250	9 5/8"

Formations

MD ft	TVD ft	Formations	Lithology	Dip Angle deg	Dip Direction deg
9580.00	9575.23	Upper Morrow		0.00	0.00
9630.00	9625.18	Middle Morrow		0.00	0.00
9700.00	9695.12	Lower Morrow		0.00	0.00



Scientific Drilling Planning Report



Company: BP
Field: EDDY COUNTY, NM
Site: SEC 9-T18-R27E
Well: HorseTAIL Federal 9 #1
Wellpath: OH

Date: 2005/07/22
Co-ordinate(NE) Reference: Well: HorseTAIL Federal 9 #1, Grid North
Vertical (TVD) Reference: SITE 3520.0
Section (VS) Reference: Well (0.00N,0.00E,137.99Azi)
Plan: Plan #1

Page: 6

Annotation

MD ft	TVD ft	
4000.00	4000.00	KOP