

# NINE POINT DRILLING PLAN

## UNION PACIFIC 151X16

### *Rangely Weber Sand Unit*

#### Directional Well

Surface: 2058' FSL & 161' FWL, Section 16, T2N, R103W  
Bottomhole: 1500' FSL & 1721' FWL, Section 16, T2N, R103W

Rio Blanco County, CO

a. NAMES & ESTIMATED TOPS OF GEOLOGIC GROUPS:

Name	Estimated Tops
Mancos group	Surface

b. NAMES, ESTIMATED TOPS & THICKNESS OF FORMATIONS:  
(based upon est. surface elev. of 5,417')

Name	Estimated Tops	Thickness
Mancos	Surface	3,446'
Frontier	3,446' TVD/ 3,541' MD	365'
Dakota	3,811' TVD/ 3,923' MD	99'
Morrison	3,910' TVD/ 4,026' MD	679'
Curtis	4,589' TVD/ 4,737' MD	129'
Entrada	4,718' TVD/ 4,872' MD	92'
Carmel	4,810' TVD/ 4,968' MD	76'
Navajo	4,886' TVD/ 5,048' MD	625'
Chinle	5,511' TVD/ 5,702' MD	117'
Shinarump	5,628' TVD/ 5,824' MD	87'
Moenkopi	5,715' TVD/ 5,915' MD	730'
Weber	6,445' TVD/ 6,679' MD	130'
TD	6,575' TVD/ 6,815' MD	

c. PRESSURE CONTROL EQUIPMENT:

**For drilling surface hole to 2000':**

No BOP equipment required. A diverter will be utilized if a Surface Hole Drilling Rig equipped to drill with air/air mist is used to preset surface casing.

**For drilling through 9 5/8" surface casing to TD:**

Maximum anticipated surface pressure is <3000 psi.

Pressure control equipment shall be in accordance with BLM minimum standards.

A casing head with an 11", 3000 psi flange will be welded onto the 9 5/8" surface casing.

BOP stack will consist of either 2 single gate or a double gate and annular preventer. The gate preventers will be equipped with pipe rams on bottom and blind rams on top. The choke and kill lines will be connected to outlets below the bottom rams, utilizing either the ram body outlet or a drilling spool with side outlets. Co-flex hose will be utilized from the BOP to the choke manifold. The BOP stack will be 11" or 13.625" bore, 3000 psi working pressure or greater. The choke and kill lines will be 3" bore, 3000 psi working pressure or greater. Please refer to attached schematic.

Test procedure and frequency shall be in accordance with BLM minimum standards for 3000 psi equipment, per BLM Oil & Gas Order #2.

**d. PROPOSED CASING PROGRAM, DRILLED HOLE SIZE:**

**Casing Information:** All casing will be new pipe and tested to 1500 psi.

Casing	Weight	Grade	Conn.	Stage	Centralizers
9 5/8"	36.0#/ft	K-55	LTC	No	*
7"	23.0#/ft	J-55	LTC	No	As Needed

\*Centralizers will be placed on the bottom three joints and every fourth joint thereafter.

**Casing Design Information (9 5/8" casing @ 2000'):**

Collapse value for new pipe: 2020 psi	Actual Load: 915 psi	S.F.: 2.2
Burst value for new pipe: 3520 psi	Actual Load: 731 psi*	S.F.: 4.8
Tension value for new pipe: 489,000#	Actual Load: 72,000#	S.F.: 6.8

\*Surface casing burst load based on a formation fracture gradient of 1.0 psi/ft.

**(7" casing @ top of Weber at 6445' TVD):**

Collapse value for new pipe: 3270 psi	Actual Load: 3062 psi	S.F.: 1.1
Burst value for new pipe: 4360 psi	Actual Load: 3000psi	S.F.: 1.5
Tension value for new pipe: 313,000#	Actual Load: 153,617#	S.F.: 2.0

### **Surface Hole (0'-2000')**

Drilling of the surface hole will be with a Surface Hole drilling rig equipped to drill with air/air mist if the rig is available. Hole size will be in the 12 ¼" - 11" range at the discretion of the drilling contractor.

Variance to Onshore Oil and Gas Order No. 2 III -E. Special Drilling Operations which addresses additional drilling equipment required for drilling with air/gas is requested for the Surface Hole drilling rig which may be used to preset surface casing. To our knowledge, it is possible (but not probable) that minor amounts of shallow gas (<2000') could be encountered while drilling in this area. The Mancos formation was oil productive in the 1920's but has been mostly depleted and there are no productive Mancos wells with ¼ mile of the proposed well. Consequently, the majority of the equipment specified in the Special Drilling Operations is not necessary to drill surface holes (<2000') in this area. Auxiliary Equipment to be used is outlined in Section 8. Air/gas will not be used to drill below surface casing.

If the Surface Hole drilling rig is not available to preset the surface casing a conventional rotary drilling rig will be used to drill the surface hole. A 12 ¼" hole will be drilled utilizing fresh water mud.

### **Production Hole (2000' - 6445' TVD)**

Drilling below surface casing will be with conventional rotary equipment utilizing fresh water mud. Hole size will be 8 ¾".

### **Open Hole (6445' TVD - TD)**

The Weber Payzone will be drilled and completed open hole utilizing NaCl brine. Hole size will be 6-1/8".

#### **e. AMOUNT AND TYPES OF CEMENT TO BE USED SETTING CASING STRING:**

<b>Casing</b>	<b>Cement</b>
9 5/8"	Two slurry system with oilfield type cement circulated in place. Lead: 35:65 Poz: Class "G" cement mixed at 12.7 ppg with an yield of 1.9 cf/sx. Theoretical volume of lead cement is 499 sacks including 80% excess in the open hole. Tail: Class "G" cement mixed at 15.8 ppg with an yield of 1.15 cf/sx. Theoretical volume of tail cement is 290 sacks. Volumes based on calculated plus 100% excess. Tail plug used. Allowed to set under pressure. Theoretical open hole annular volume is 598 cu ft.
7"	Two slurry system with oilfield "light weight" cement with additives ahead of oilfield premium cement with additives circulated in place. Lead: Class G cement mixed at 11.0 ppg with a yield of 3.49 cf/sx. Theoretical volume of lead cement is 303 sacks including 80% excess in the open hole. Tail: CemCRETE Blend 54/46 mixed at 12.5 ppg with a yield of 1.63 cf/sx. Theoretical volume of tail cement is 395 sacks including 80% excess in the open hole. If cement does not

reach the surface in cementing the production string, a bond log will be run to determine the top of cement (TOC) to ensure isolation between the Frontier formation and the surface casing shoe.

**f. TYPES AND CHARACTERISTICS OF PROPOSED CIRCULATING MEDIUM:**

**Surface Hole (0'-2000')**

Surface hole will be drilled with air/air mist if a Surface Hole drilling rig is utilized to preset surface casing prior to moving in and rigging up a conventional rotary drilling rig.

Mud circulating equipment and materials as specified in Onshore Order #2, III - E will not be kept on location due to the fact that the Surface Hole drilling rig equipped to drill with air/air mist is not equipped to circulate mud.

If a Surface Hole drilling rig is not utilized to preset the surface casing a conventional rotary rig will be used to drill the surface hole. Water based drilling fluids consisting primarily of fresh water, bentonite, lignite, caustic, lime, soda ash, and polymers will be used. No chromate's will be used. It is not intended to use oil in the mud, however, in the event it is used, oil concentration will be less than 4% by volume. Maximum anticipated mud weight is  $\pm 9.0$  ppg.

A minimum quantity of weighting material will be kept on location

**Production Hole (2000'-6445' TVD')**

Drilling below surface casing will be with water based drilling fluids consisting primarily of fresh water, bentonite, lignite, caustic, lime, soda ash, and polymers. No chromate's will be used. It is not intended to use oil in the mud, however, in the event it is used, oil concentration will be less than 4% by volume. Maximum anticipated mud weight is  $\pm 10.0$  ppg.

A minimum quantity of weighting material will be kept on location.

H2S and CO2 detector will be used at all times during drilling operation.

**Open Hole (6445' TVD'-TD)**

The Weber Payzone will be drilled and completed open hole utilizing NaCl brine.

**g. TESTING, LOGGING AND CORING PROCEDURES:**

**Logging:**

Electric Logging: Cased Hole logs / gamma ray and porosity  
Open Hole logs (possible)

**Coring:** None planned.

**Testing:** None planned.

**h. EXPECTED BOTTOM HOLE PRESSURES, ABNORMAL PRESSURES, TEMPERATURES OR POTENTIAL HAZARDS:**

Normal pressure gradient to top of Weber. Offset pressure history indicates that the pressure gradient in the Weber should be between a minimum of 0.32 psi/ft to a maximum of 0.50 psi/ft.

Maximum expected BHP @ TD: ~ 2700 psi

Maximum expected BHT @ TD: ~ 160° F

**Hydrogen Sulfide:**

Hydrogen sulfide (H<sub>2</sub>S) gas exists in the Weber Formation within the Rangely Field. Concentrations vary across the Field (+/- 100-700 ppm) due to a long history of production in conjunction with water and CO<sub>2</sub> injection.

Chevron's "H<sub>2</sub>S Contingency Plan" will be adhered to minimize any potential hazard.

**Possible Aquifers:** None

**Oil:** Probable in Weber @ 6445' – 6575' TVD

**Gas:** Probable minor gas in Weber @ 6445' TVD decreasing to TD.

**Protection of oil, gas, water, or other mineral bearing formations:**

Protection shall be accomplished by cementing surface casing back to the surface. Production casing will be cemented with a sufficient cement volume to attempt to bring cement back to surface. If cement does not reach the surface in cementing the production string, a bond log will be run to determine the top of cement (TOC) to ensure isolation between the Frontier formation and the surface casing shoe.

**i. OTHER INFORMATION:**

**Auxiliary Equipment**

Conventional Rotary Drilling Rig

Geograph

PVT-Flowmeter

Desilter

Desander

Full Opening Safety Valve

Upper Kelly Valve

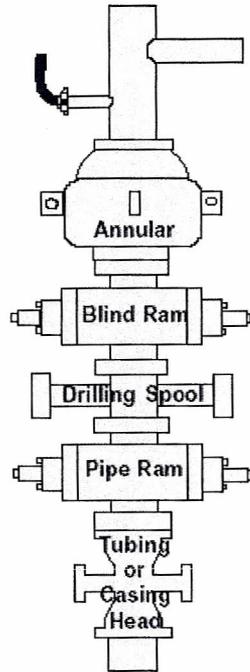
Lower Kelly Valve

Surface Hole Rig Equipped to Drill with Air/Air Mist

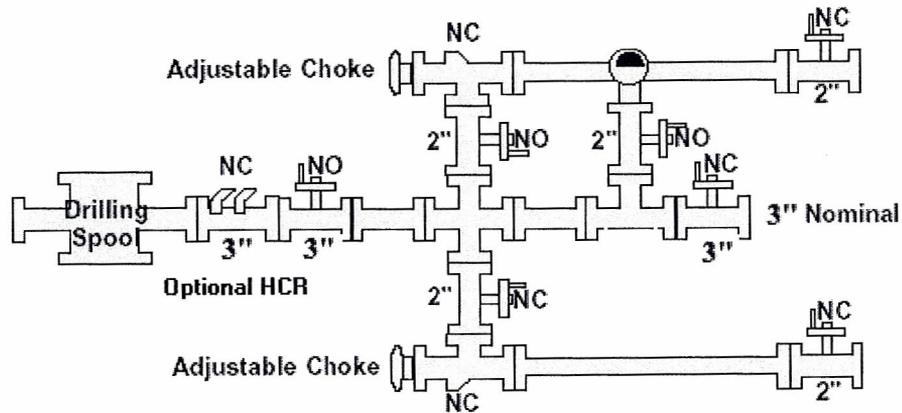
Diverter; 100' Discharge Line

# BOP Schematic

Class III BOP Stack



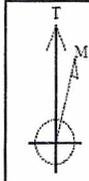
Class III Choke Manifold



NO	Normally Open
NC	Normally Closed



**CHEVRON**  
**UP151X16**  
**RIO BLANCO COUNTY, COLORADO**  
**SHL: LAT 40°8'28.372"N LON 108°51'26.492"W**



Azimuths to True North  
 Magnetic North: 11.20°  
 Magnetic Field  
 Strength: 52795nT  
 Dip Angle: 66.18°  
 Date: 9/30/2008  
 Model: bggm2007

**TOTAL CORRECTION TO TRUE NORTH: 11.20°**

**FIELD DETAILS**

Rio Blanco, Colorado  
 Colorado, Northern Zone  
 Geodetic System: US State Plane Coordinate System 1983  
 Ellipsoid: GRS 1980  
 Zone: Colorado, Northern Zone  
 Magnetic Model: bggm2007  
 System Datum: Mean Sea Level  
 Local North: True North

**SECTION DETAILS**

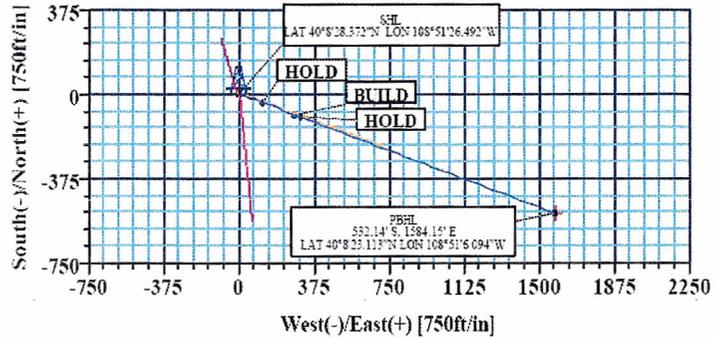
Sec	MD	Inc	Azi	TVD	+N-S	-E-W	DLeg	IFace	VSec	Target
1	0.00	0.00	108.57	0.00	0.00	0.00	0.00	0.00	0.00	
2	500.00	0.00	108.57	500.00	0.00	0.00	0.00	108.57	0.00	
3	1500.00	15.00	108.57	1488.62	-41.45	123.38	1.50	108.57	130.15	
4	2132.95	15.00	108.57	2100.00	-93.61	178.67	0.00	0.00	293.97	
5	2239.44	17.13	108.57	2202.33	-102.99	306.60	2.00	0.00	323.44	
6	6815.09	17.13	108.57	6575.00	-532.14	1584.15	0.00	0.00	1671.14	PBHL-151

**WELL DETAILS**

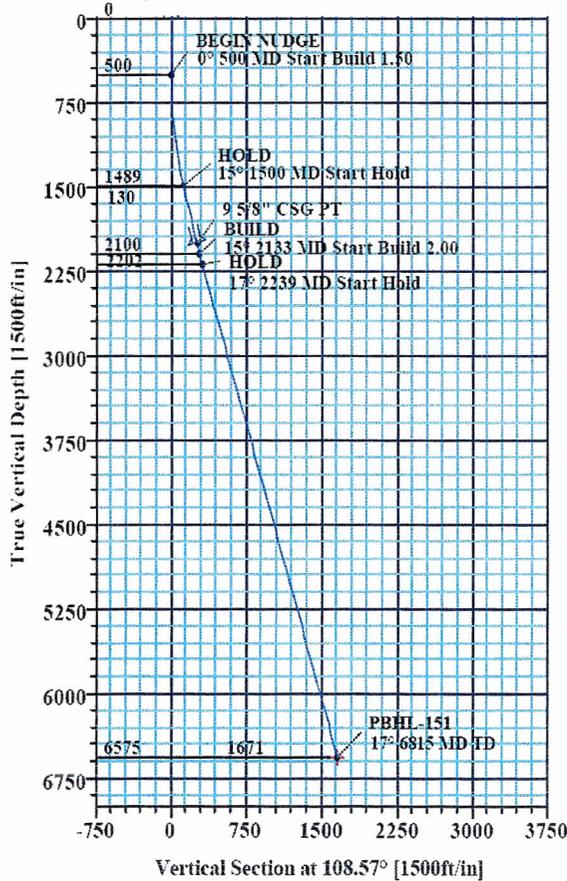
Name	+N-S	-E-W	Northing	Easting	Latitude	Longitude	Slor
UP151X16	5.50	-5.50	1312057.43	2061599.83	40°08'28.372"N	108°51'26.492"W	N/A

**TARGET DETAILS**

Name	TVD	-N-S	+E-W	Latitude	Longitude	Shape
PBHL-151	6575.00	-532.14	1584.15	40°08'23.115"N	108°51'06.094"W	Point



KB ELEV: 5403' EST  
 GRELEV: 5385'



**SITE DETAILS**

UP150X16 PAD  
 Site Centre Latitude: 40°08'28.320"N  
 Longitude: 108°51'26.424"W  
 Ground Level: 5385.00  
 Positional Uncertainty: 0.00  
 Convergence: -2.17

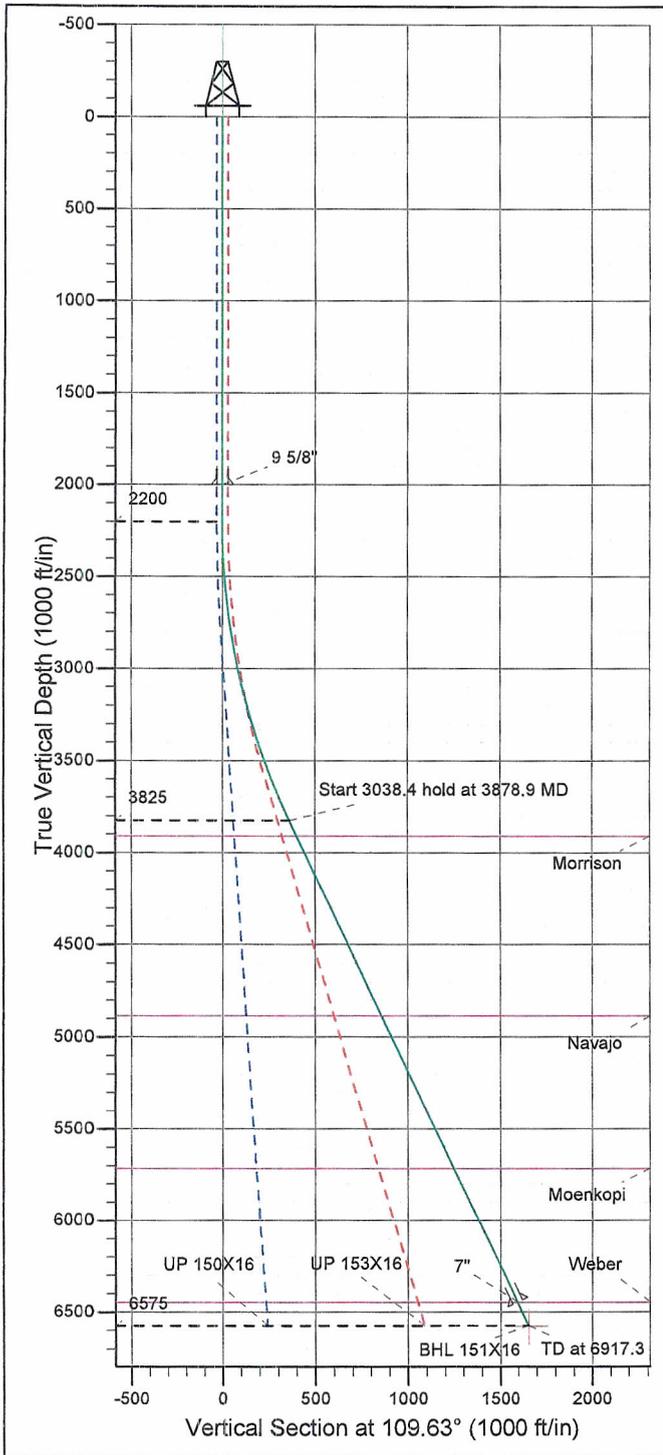
**LEGEND**

- UP150X16 (1)
- UP152X16 (1)
- UP153X16 (1)
- Plan #1

Plan: Plan #1 (UP151X16-1)

Created By: L. Winchell

Date: 9/30/2008



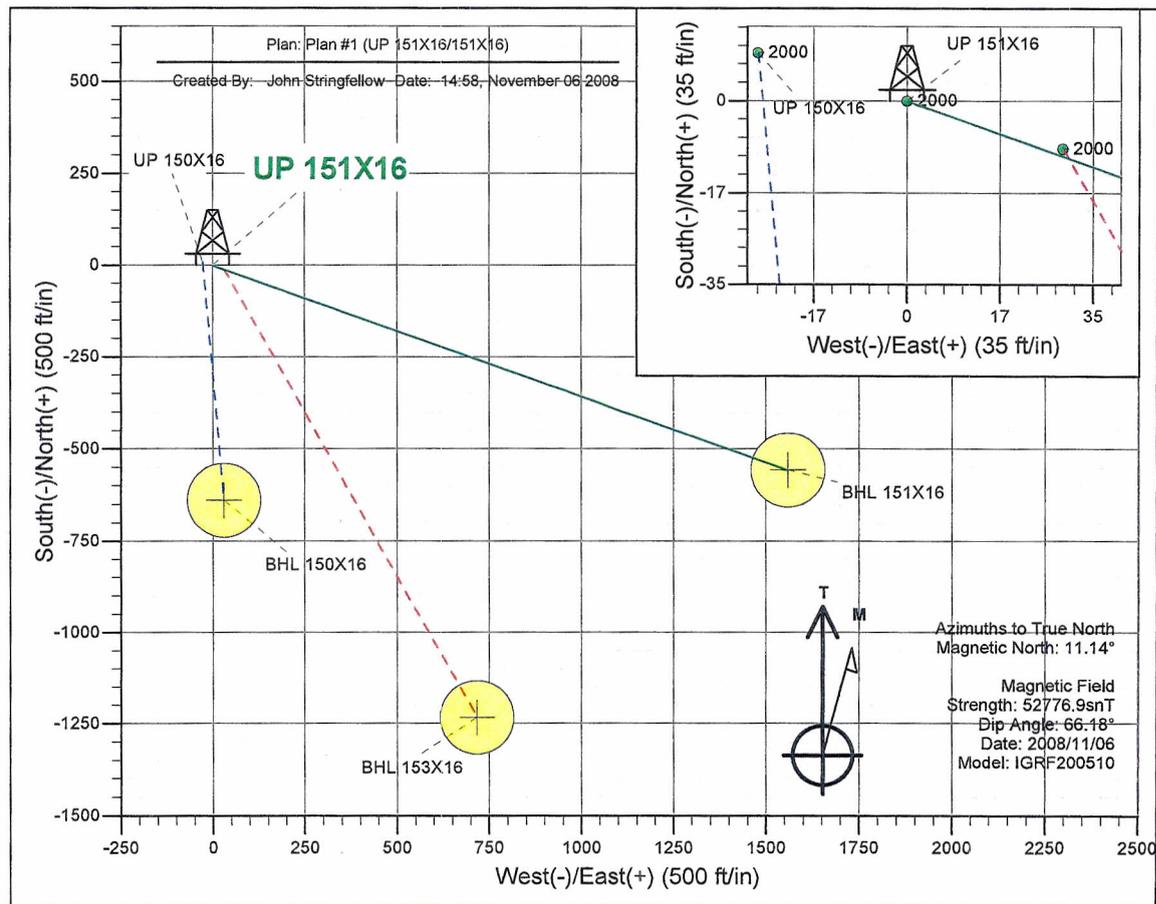
**Chevron N.America  
Union Pacific  
Rio Blanco Co., Colorado  
UP 151X16**

Geodetic System: US State Plane 1983  
Zone: Colorado Northern Zone  
WELL @ 5385.0ft (KB Elevation)  
Ground Level: 5363.0  
Latitude: 40° 8' 29.249 N  
Longitude: 108° 51' 26.129 W  
Magnetic North is 11.14° East of True North (Magnetic Declination)



**SECTION DETAILS**

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	2200.0	0.00	0.00	2200.0	0.0	0.0	0.00	0.00	0.0	
3	33878.9	25.18	109.63	3825.4	-121.9	342.0	1.50	109.63	363.1	
4	6917.3	25.18	109.63	6575.0	-556.2	1559.8	0.00	0.00	1656.0	BHL 151X16





# **ChevronTexaco**

**Rio Blanco Co., Colorado**

**Union Pacific**

**UP 151X16**

**151X16**

**Plan: Plan #1**

## **Standard Planning Report**

**06 November, 2008**





# Crescent Directional Drilling Planning Report



<b>Database:</b> EDM 2003.16 Single User Db	<b>Local Co-ordinate Reference:</b> Well UP 151X16
<b>Company:</b> ChevronTexaco	<b>TVD Reference:</b> WELL @ 5385.0ft (KB Elevation)
<b>Project:</b> Rio Blanco Co., Colorado	<b>MD Reference:</b> WELL @ 5385.0ft (KB Elevation)
<b>Site:</b> Union Pacific	<b>North Reference:</b> True
<b>Well:</b> UP 151X16	<b>Survey Calculation Method:</b> Minimum Curvature
<b>Wellbore:</b> 151X16	
<b>Design:</b> Plan #1	

<b>Project</b> Rio Blanco Co., Colorado
<b>Map System:</b> US State Plane 1983 <b>System Datum:</b> Mean Sea Level
<b>Geo Datum:</b> North American Datum 1983
<b>Map Zone:</b> Colorado Northern Zone

<b>Site</b> Union Pacific					
<b>Site Position:</b>		<b>Northing:</b>	1,312,142.36 ft	<b>Latitude:</b>	40° 8' 29.249 N
<b>From:</b>	Lat/Long	<b>Easting:</b>	2,061,627.27 ft	<b>Longitude:</b>	108° 51' 26.129 W
<b>Position Uncertainty:</b>	0.0 ft	<b>Slot Radius:</b>	"	<b>Grid Convergence:</b>	-2.17 °

<b>Well</b> UP 151X16						
<b>Well Position</b>	+N/-S	0.0 ft	<b>Northing:</b>	1,312,132.19 ft	<b>Latitude:</b>	40° 8' 29.159 N
	+E/-W	0.0 ft	<b>Easting:</b>	2,061,654.86 ft	<b>Longitude:</b>	108° 51' 25.769 W
<b>Position Uncertainty</b>		0.0 ft	<b>Wellhead Elevation:</b>	ft	<b>Ground Level:</b>	5,363.0 ft

<b>Wellbore</b> 151X16					
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	2008/11/06	11.14	66.19	52,777

<b>Design</b> Plan #1				
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PROTOTYPE	<b>Tie On Depth:</b>	0.0
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.0	0.0	0.0	109.63

<b>Plan Sections</b>										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
2,200.0	0.00	0.00	2,200.0	0.0	0.0	0.00	0.00	0.00	0.00	
3,878.9	25.18	109.63	3,825.4	-121.9	342.0	1.50	1.50	0.00	109.63	
6,917.3	25.18	109.63	6,575.0	-556.2	1,559.8	0.00	0.00	0.00	0.00	BHL 151X16



# Crescent Directional Drilling Planning Report



<b>Database:</b> EDM 2003.16 Single User Db	<b>Local Co-ordinate Reference:</b> Well UP 151X16
<b>Company:</b> ChevronTexaco	<b>TVD Reference:</b> WELL @ 5385.0ft (KB Elevation)
<b>Project:</b> Rio Blanco Co., Colorado	<b>MD Reference:</b> WELL @ 5385.0ft (KB Elevation)
<b>Site:</b> Union Pacific	<b>North Reference:</b> True
<b>Well:</b> UP 151X16	<b>Survey Calculation Method:</b> Minimum Curvature
<b>Wellbore:</b> 151X16	
<b>Design:</b> Plan #1	

### Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	0.00
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	0.00
<b>9 5/8"</b>									
2,200.0	0.00	0.00	2,200.0	0.0	0.0	0.0	0.00	0.00	0.00
<b>KOP 1.5</b>									
2,500.0	4.50	109.63	2,499.7	-4.0	11.1	11.8	1.50	1.50	0.00
3,000.0	12.00	109.63	2,994.2	-28.0	78.6	83.5	1.50	1.50	0.00
3,500.0	19.50	109.63	3,475.0	-73.6	206.4	219.1	1.50	1.50	0.00
3,878.9	25.18	109.63	3,825.4	-121.9	342.0	363.1	1.50	1.50	0.00
<b>Hold at 3878' MD</b>									
3,972.4	25.18	109.63	3,910.0	-135.3	379.5	402.9	0.00	0.00	0.00
<b>Morrison</b>									
4,000.0	25.18	109.63	3,935.0	-139.3	390.5	414.6	0.00	0.00	0.00
4,500.0	25.18	109.63	4,387.4	-210.7	590.9	627.4	0.00	0.00	0.00
5,000.0	25.18	109.63	4,839.9	-282.2	791.3	840.1	0.00	0.00	0.00
5,050.9	25.18	109.63	4,886.0	-289.5	811.7	861.8	0.00	0.00	0.00
<b>Navajo</b>									
5,500.0	25.18	109.63	5,292.4	-353.6	991.7	1,052.9	0.00	0.00	0.00
5,967.0	25.18	109.63	5,715.0	-420.4	1,178.9	1,251.6	0.00	0.00	0.00
<b>Moenkopi</b>									
6,000.0	25.18	109.63	5,744.9	-425.1	1,192.1	1,265.6	0.00	0.00	0.00
6,500.0	25.18	109.63	6,197.3	-496.6	1,392.5	1,478.4	0.00	0.00	0.00
6,773.7	25.18	109.63	6,445.0	-535.7	1,502.2	1,594.8	0.00	0.00	0.00
<b>Weber - 7"</b>									
6,917.3	25.18	109.63	6,575.0	-556.2	1,559.8	1,656.0	0.00	0.00	0.00
<b>BHL 151X16</b>									

### Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
BHL 151X16	0.00	0.00	6,575.0	-556.2	1,559.8	1,311,517.36	2,063,192.46	40° 8' 23.662 N	108° 51' 5.684 W
- hit/miss target									
- plan hits target									
- Circle (radius 100.0)									

### Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
2,000.0	2,000.0	9 5/8"	9-5/8	12-1/4
6,773.7	6,445.0	7"	7	8-3/4



# Crescent Directional Drilling Planning Report



<b>Database:</b> EDM 2003.16 Single User Db	<b>Local Co-ordinate Reference:</b> Well UP 151X16	
<b>Company:</b> ChevronTexaco	<b>TVD Reference:</b> WELL @ 5385.0ft (KB Elevation)	
<b>Project:</b> Rio Blanco Co., Colorado	<b>MD Reference:</b> WELL @ 5385.0ft (KB Elevation)	
<b>Site:</b> Union Pacific	<b>North Reference:</b> True	
<b>Well:</b> UP 151X16	<b>Survey Calculation Method:</b> Minimum Curvature	
<b>Wellbore:</b> 151X16		
<b>Design:</b> Plan #1		

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
5,967.0	5,715.0	Moenkopi		0.00		
6,773.7	6,445.0	Weber		0.00		
5,050.9	4,886.0	Navajo		0.00		
3,972.4	3,910.0	Morrison		0.00		

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment	
		+N/-S (ft)	+E/-W (ft)		
2,200.0	2,200.0	0.0	0.0	KOP 1.5	
3,878.9	3,825.4	-121.9	342.0	Hold at 3878' MD	
6,917.3	6,575.0	-556.2	1,559.8	TD at 6917' MD	