



US ROCKIES REGION PLANNING

COLORADO NORTHERN ZONE - 83

WELD_COTTONWOOD 15-33 PAD

P_COTTONWOOD 23-33

P_COTTONWOOD 23-33

Plan: PLAN #1 2-18-10 RHS

Standard Planning Report

18 February, 2010





Project: COLORADO NORTHERN ZONE - 83
 Site: WELD_COTTONWOOD 15-33 PAD
 Well: P_COTTONWOOD 23-33
 Wellbore: P_COTTONWOOD 23-33
 Section: SECTION 33 T2N R66W
 SHL: 753 FSL 1865 FEL
 Design: PLAN #1 2-18-10 RHS
 Latitude: 40° 5' 21.944 N
 Longitude: 104° 46' 45.700 W
 GL: 4982.00
 KB: WELL @ 4997.00ft (Original Well Elev)



Weatherford®



Azimuths to True North
 Magnetic North: 9.02°
 Magnetic Field
 Strength: 53104.2snT
 Dip Angle: 66.84°
 Date: 2/18/2010
 Model: IGRF2010

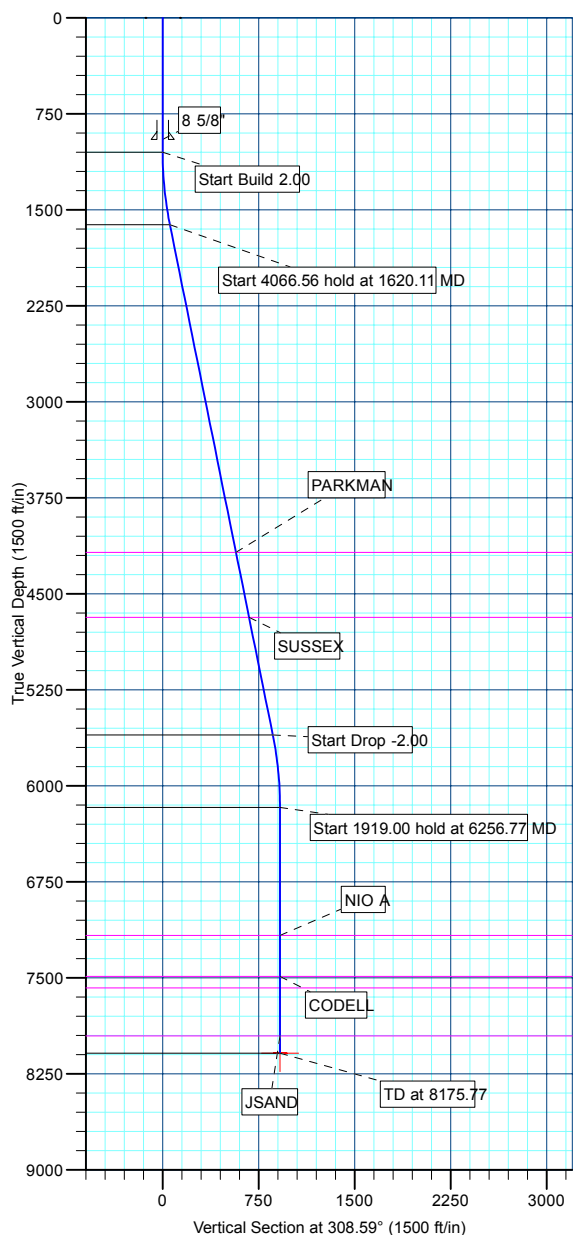
FORMATION TOP DETAILS		
TVDPath	MDPath	Formation
4177.00	4232.31	PARKMAN
4683.00	4748.50	SUSSEX
7169.00	7256.77	NIO A
7489.00	7576.77	CODELL
7579.00	7666.77	GRNHRN
7953.00	8040.77	JSAND

CASING DETAILS			
TVD	MD	Name	Size
950.00	950.00	8 5/8"	8.62

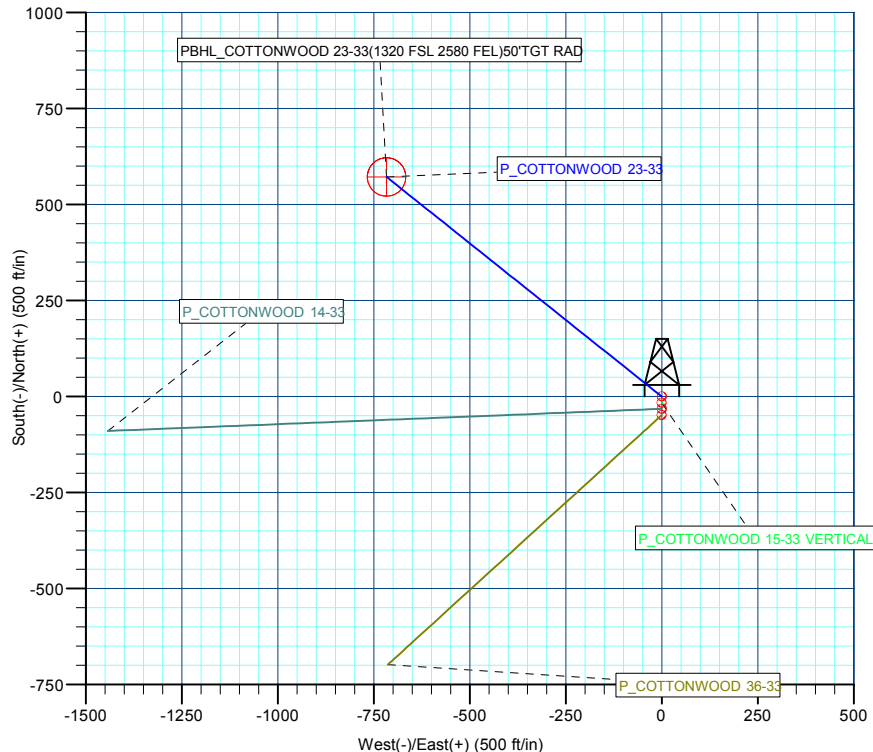
SECTION DETAILS									
MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	Annotation
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1050.00	0.00	0.00	1050.00	0.00	0.00	0.00	0.00	0.00	Start Build 2.00
1620.11	11.40	308.59	1616.35	35.26	-44.20	2.00	308.59	56.54	Start 4066.56 hold at 1620.11 MD
5686.66	11.40	308.59	5602.65	536.68	-672.60	0.00	0.00	860.47	Start Drop -2.00
6256.77	0.00	0.00	6169.00	571.94	-716.80	2.00	180.00	917.01	Start 1919.00 hold at 6256.77 MD
8175.77	0.00	0.00	8088.00	571.94	-716.80	0.00	0.00	917.01	TD at 8175.77

WELLBORE TARGET DETAILS (MAP CO-ORDINATES AND LAT/LONG)						
Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
PBHL	8088.00	571.94	-716.80	40° 5' 27.596 N	104° 46' 54.923 W	Circle (Radius: 50.00)

WELL DETAILS: P_COTTONWOOD 23-33						
+N/-S	+E/-W	Northing	Ground Level: Easting	4982.00 Latitude	Longitude	Slot
0.00	0.00	1276242.89	3201622.64	40° 5' 21.944 N	104° 46' 45.700 W	



LEGEND	
P_COTTONWOOD 14-33, P_COTTONWOOD 14-33, PLAN #1 2-18-10 RHS V0	
P_COTTONWOOD 15-33 VERTICAL, P_COTTONWOOD 15-33 VERTICAL, PLAN #1 2-18-10 RHS V0	
P_COTTONWOOD 36-33, P_COTTONWOOD 36-33, PLAN #1 2-18-10 RHS V0	
PLAN #1 2-18-10 RHS	



Plan: PLAN #1 2-18-10 RHS (P_COTTONWOOD 23-33/P_COTTONWOOD 23-33)	
Created By: Robert H. Scott	Date: 11:40, February 18 2010

Database:	EDM 2003.21 Single User Db	Local Co-ordinate Reference:	Well P_COTTONWOOD 23-33
Company:	US ROCKIES REGION PLANNING	TVD Reference:	WELL @ 4997.00ft (Original Well Elev)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	WELL @ 4997.00ft (Original Well Elev)
Site:	WELD_COTTONWOOD 15-33 PAD	North Reference:	True
Well:	P_COTTONWOOD 23-33	Survey Calculation Method:	Minimum Curvature
Wellbore:	P_COTTONWOOD 23-33		
Design:	PLAN #1 2-18-10 RHS		

Project	COLORADO NORTHERN ZONE - 83, KERR MCGEE OIL & GAS ONSHORE LP		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Site						WELD_COTTONWOOD 15-33 PAD, SECTION 33 T2N R66W											
Site Position:			Northing:			1,276,210.85 ft			Latitude:			40° 5' 21.628 N					
From:			Lat/Long			Easting:			3,201,622.90 ft			Longitude:			104° 46' 45.700 W		
Position Uncertainty:			0.00 ft			Slot Radius:			in			Grid Convergence:			0.47 °		

Well	P_COTTONWOOD 23-33,					
Well Position	+N/-S	32.04 ft	Northing:	1,276,242.89 ft	Latitude:	40° 5' 21.944 N
	+E/-W	0.00 ft	Easting:	3,201,622.64 ft	Longitude:	104° 46' 45.700 W
Position Uncertainty		0.00 ft	Wellhead Elevation:	ft	Ground Level:	4,982.00 ft

Wellbore	P_COTTONWOOD 23-33				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	2/18/2010	9.02	66.84	53,104

Design	PLAN #1 2-18-10 RHS			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.00	0.00	0.00	308.59

Plan Sections										
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
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,050.00	0.00	0.00	1,050.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,620.11	11.40	308.59	1,616.35	35.26	-44.20	2.00	2.00	0.00	308.59	
5,686.66	11.40	308.59	5,602.65	536.68	-672.60	0.00	0.00	0.00	0.00	
6,256.77	0.00	0.00	6,169.00	571.94	-716.80	2.00	-2.00	0.00	180.00	
8,175.77	0.00	0.00	8,088.00	571.94	-716.80	0.00	0.00	0.00	0.00	PBHL_COTTONW

Database:	EDM 2003.21 Single User Db	Local Co-ordinate Reference:	Well P_COTTONWOOD 23-33
Company:	US ROCKIES REGION PLANNING	TVD Reference:	WELL @ 4997.00ft (Original Well Elev)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	WELL @ 4997.00ft (Original Well Elev)
Site:	WELD_COTTONWOOD 15-33 PAD	North Reference:	True
Well:	P_COTTONWOOD 23-33	Survey Calculation Method:	Minimum Curvature
Wellbore:	P_COTTONWOOD 23-33		
Design:	PLAN #1 2-18-10 RHS		

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)
Start Build 2.00									
1,050.00	0.00	0.00	1,050.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	1.00	308.59	1,100.00	0.27	-0.34	0.44	2.00	2.00	0.00
1,200.00	3.00	308.59	1,199.93	2.45	-3.07	3.93	2.00	2.00	0.00
1,300.00	5.00	308.59	1,299.68	6.80	-8.52	10.90	2.00	2.00	0.00
1,400.00	7.00	308.59	1,399.13	13.32	-16.69	21.35	2.00	2.00	0.00
1,500.00	9.00	308.59	1,498.15	22.00	-27.57	35.27	2.00	2.00	0.00
1,600.00	11.00	308.59	1,596.63	32.83	-41.14	52.63	2.00	2.00	0.00
Start 4066.56 hold at 1620.11 MD									
1,620.11	11.40	308.59	1,616.35	35.26	-44.20	56.54	2.00	2.00	0.00
1,700.00	11.40	308.59	1,694.67	45.11	-56.54	72.33	0.00	0.00	0.00
1,800.00	11.40	308.59	1,792.69	57.45	-71.99	92.10	0.00	0.00	0.00
1,900.00	11.40	308.59	1,890.72	69.78	-87.45	111.87	0.00	0.00	0.00
2,000.00	11.40	308.59	1,988.75	82.11	-102.90	131.64	0.00	0.00	0.00
2,100.00	11.40	308.59	2,086.77	94.44	-118.35	151.41	0.00	0.00	0.00
2,200.00	11.40	308.59	2,184.80	106.77	-133.81	171.18	0.00	0.00	0.00
2,300.00	11.40	308.59	2,282.83	119.10	-149.26	190.95	0.00	0.00	0.00
2,400.00	11.40	308.59	2,380.85	131.43	-164.71	210.72	0.00	0.00	0.00
2,500.00	11.40	308.59	2,478.88	143.76	-180.17	230.49	0.00	0.00	0.00
2,600.00	11.40	308.59	2,576.91	156.09	-195.62	250.26	0.00	0.00	0.00
2,700.00	11.40	308.59	2,674.93	168.42	-211.07	270.03	0.00	0.00	0.00
2,800.00	11.40	308.59	2,772.96	180.75	-226.52	289.80	0.00	0.00	0.00
2,900.00	11.40	308.59	2,870.98	193.08	-241.98	309.57	0.00	0.00	0.00
3,000.00	11.40	308.59	2,969.01	205.41	-257.43	329.34	0.00	0.00	0.00
3,100.00	11.40	308.59	3,067.04	217.74	-272.88	349.11	0.00	0.00	0.00
3,200.00	11.40	308.59	3,165.06	230.07	-288.34	368.88	0.00	0.00	0.00
3,300.00	11.40	308.59	3,263.09	242.40	-303.79	388.64	0.00	0.00	0.00
3,400.00	11.40	308.59	3,361.12	254.73	-319.24	408.41	0.00	0.00	0.00
3,500.00	11.40	308.59	3,459.14	267.06	-334.70	428.18	0.00	0.00	0.00
3,600.00	11.40	308.59	3,557.17	279.39	-350.15	447.95	0.00	0.00	0.00
3,700.00	11.40	308.59	3,655.20	291.72	-365.60	467.72	0.00	0.00	0.00
3,800.00	11.40	308.59	3,753.22	304.05	-381.06	487.49	0.00	0.00	0.00
3,900.00	11.40	308.59	3,851.25	316.38	-396.51	507.26	0.00	0.00	0.00
4,000.00	11.40	308.59	3,949.27	328.71	-411.96	527.03	0.00	0.00	0.00
4,100.00	11.40	308.59	4,047.30	341.04	-427.41	546.80	0.00	0.00	0.00
4,200.00	11.40	308.59	4,145.33	353.37	-442.87	566.57	0.00	0.00	0.00
PARKMAN									
4,232.31	11.40	308.59	4,177.00	357.35	-447.86	572.96	0.00	0.00	0.00
4,300.00	11.40	308.59	4,243.35	365.70	-458.32	586.34	0.00	0.00	0.00
4,400.00	11.40	308.59	4,341.38	378.03	-473.77	606.11	0.00	0.00	0.00
4,500.00	11.40	308.59	4,439.41	390.36	-489.23	625.88	0.00	0.00	0.00
4,600.00	11.40	308.59	4,537.43	402.69	-504.68	645.65	0.00	0.00	0.00
4,700.00	11.40	308.59	4,635.46	415.02	-520.13	665.42	0.00	0.00	0.00
SUSSEX									
4,748.50	11.40	308.59	4,683.00	421.00	-527.63	675.00	0.00	0.00	0.00
4,800.00	11.40	308.59	4,733.49	427.35	-535.59	685.19	0.00	0.00	0.00
4,900.00	11.40	308.59	4,831.51	439.68	-551.04	704.95	0.00	0.00	0.00
5,000.00	11.40	308.59	4,929.54	452.01	-566.49	724.72	0.00	0.00	0.00
5,100.00	11.40	308.59	5,027.56	464.34	-581.94	744.49	0.00	0.00	0.00
5,200.00	11.40	308.59	5,125.59	476.67	-597.40	764.26	0.00	0.00	0.00
5,300.00	11.40	308.59	5,223.62	489.00	-612.85	784.03	0.00	0.00	0.00
5,400.00	11.40	308.59	5,321.64	501.33	-628.30	803.80	0.00	0.00	0.00
5,500.00	11.40	308.59	5,419.67	513.66	-643.76	823.57	0.00	0.00	0.00

Database:	EDM 2003.21 Single User Db	Local Co-ordinate Reference:	Well P_COTTONWOOD 23-33
Company:	US ROCKIES REGION PLANNING	TVD Reference:	WELL @ 4997.00ft (Original Well Elev)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	WELL @ 4997.00ft (Original Well Elev)
Site:	WELD_COTTONWOOD 15-33 PAD	North Reference:	True
Well:	P_COTTONWOOD 23-33	Survey Calculation Method:	Minimum Curvature
Wellbore:	P_COTTONWOOD 23-33		
Design:	PLAN #1 2-18-10 RHS		

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)
5,600.00	11.40	308.59	5,517.70	525.99	-659.21	843.34	0.00	0.00	0.00
Start Drop -2.00									
5,686.66	11.40	308.59	5,602.65	536.68	-672.60	860.47	0.00	0.00	0.00
5,700.00	11.14	308.59	5,615.73	538.30	-674.64	863.08	2.00	-2.00	0.00
5,800.00	9.14	308.59	5,714.16	549.28	-688.39	880.68	2.00	-2.00	0.00
5,900.00	7.14	308.59	5,813.15	558.10	-699.45	894.83	2.00	-2.00	0.00
6,000.00	5.14	308.59	5,912.57	564.77	-707.81	905.51	2.00	-2.00	0.00
6,100.00	3.14	308.59	6,012.31	569.27	-713.45	912.72	2.00	-2.00	0.00
6,200.00	1.14	308.59	6,112.23	571.59	-716.36	916.45	2.00	-2.00	0.00
Start 1919.00 hold at 6256.77 MD									
6,256.77	0.00	0.00	6,169.00	571.94	-716.80	917.01	2.00	-2.00	90.57
6,300.00	0.00	0.00	6,212.23	571.94	-716.80	917.01	0.00	0.00	0.00
6,400.00	0.00	0.00	6,312.23	571.94	-716.80	917.01	0.00	0.00	0.00
6,500.00	0.00	0.00	6,412.23	571.94	-716.80	917.01	0.00	0.00	0.00
6,600.00	0.00	0.00	6,512.23	571.94	-716.80	917.01	0.00	0.00	0.00
6,700.00	0.00	0.00	6,612.23	571.94	-716.80	917.01	0.00	0.00	0.00
6,800.00	0.00	0.00	6,712.23	571.94	-716.80	917.01	0.00	0.00	0.00
6,900.00	0.00	0.00	6,812.23	571.94	-716.80	917.01	0.00	0.00	0.00
7,000.00	0.00	0.00	6,912.23	571.94	-716.80	917.01	0.00	0.00	0.00
7,100.00	0.00	0.00	7,012.23	571.94	-716.80	917.01	0.00	0.00	0.00
7,200.00	0.00	0.00	7,112.23	571.94	-716.80	917.01	0.00	0.00	0.00
NIO A									
7,256.77	0.00	0.00	7,169.00	571.94	-716.80	917.01	0.00	0.00	0.00
7,300.00	0.00	0.00	7,212.23	571.94	-716.80	917.01	0.00	0.00	0.00
7,400.00	0.00	0.00	7,312.23	571.94	-716.80	917.01	0.00	0.00	0.00
7,500.00	0.00	0.00	7,412.23	571.94	-716.80	917.01	0.00	0.00	0.00
CODELL									
7,576.77	0.00	0.00	7,489.00	571.94	-716.80	917.01	0.00	0.00	0.00
7,600.00	0.00	0.00	7,512.23	571.94	-716.80	917.01	0.00	0.00	0.00
GRNHRN									
7,666.77	0.00	0.00	7,579.00	571.94	-716.80	917.01	0.00	0.00	0.00
7,700.00	0.00	0.00	7,612.23	571.94	-716.80	917.01	0.00	0.00	0.00
7,800.00	0.00	0.00	7,712.23	571.94	-716.80	917.01	0.00	0.00	0.00
7,900.00	0.00	0.00	7,812.23	571.94	-716.80	917.01	0.00	0.00	0.00
8,000.00	0.00	0.00	7,912.23	571.94	-716.80	917.01	0.00	0.00	0.00
JSAND									
8,040.77	0.00	0.00	7,953.00	571.94	-716.80	917.01	0.00	0.00	0.00
8,100.00	0.00	0.00	8,012.23	571.94	-716.80	917.01	0.00	0.00	0.00

Design Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
- hit/miss target									
- Shape									
PBHL_COTTONWOC	0.00	0.00	8,088.00	571.94	-716.80	1,276,808.99	3,200,901.22	40° 5' 27.596 N	104° 46' 54.923 W
- plan misses target center by 75.77ft at 8100.00ft MD (8012.23 TVD, 571.94 N, -716.80 E)									
- Circle (radius 50.00)									

Database:	EDM 2003.21 Single User Db	Local Co-ordinate Reference:	Well P_COTTONWOOD 23-33
Company:	US ROCKIES REGION PLANNING	TVD Reference:	WELL @ 4997.00ft (Original Well Elev)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	WELL @ 4997.00ft (Original Well Elev)
Site:	WELD_COTTONWOOD 15-33 PAD	North Reference:	True
Well:	P_COTTONWOOD 23-33	Survey Calculation Method:	Minimum Curvature
Wellbore:	P_COTTONWOOD 23-33		
Design:	PLAN #1 2-18-10 RHS		

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)	
950.00	950.00	8 5/8"	8.62	11.00	

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
4,232.31	4,177.00	PARKMAN				
4,748.50	4,683.00	SUSSEX				
7,256.77	7,169.00	NIO A				
7,576.77	7,489.00	CODELL				
7,666.77	7,579.00	GRNHRN				
8,040.77	7,953.00	JSAND				

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
1,050.00	1,050.00	0.00	0.00	Start Build 2.00	
1,620.11	1,616.35	35.26	-44.20	Start 4066.56 hold at 1620.11 MD	
5,686.66	5,602.65	536.68	-672.60	Start Drop -2.00	
6,256.77	6,169.00	571.94	-716.80	Start 1919.00 hold at 6256.77 MD	
8,175.77	8,088.00	571.94	-716.80	TD at 8175.77	



US ROCKIES REGION PLANNING

**COLORADO NORTHERN ZONE - 83
WELD_COTTONWOOD 15-33 PAD
P_COTTONWOOD 23-33**

**P_COTTONWOOD 23-33
PLAN #1 2-18-10 RHS**

Anticollision Report

18 February, 2010



Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_COTTONWOOD 23-33
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	WELL @ 4997.00ft (Original Well Elev)
Reference Site:	WELD_COTTONWOOD 15-33 PAD	MD Reference:	WELL @ 4997.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_COTTONWOOD 23-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 23-33	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 2-18-10 RHS	Offset TVD Reference:	Offset Datum

Reference	PLAN #1 2-18-10 RHS		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	Stations	Error Model:	ISCWSA
Depth Range:	0.00 to 20,000.00ft	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 10,000.00ft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma		

Survey Tool Program	Date 2/18/2010			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.00	8,175.77	PLAN #1 2-18-10 RHS (P_COTTONWOO	MWD	MWD - Standard

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
WELD_COTTONWOOD 15-33 PAD						
P_COTTONWOOD 14-33 - P_COTTONWOOD 14-33 - F	1,050.00	1,050.00	32.04	27.58	7.182	CC, ES
P_COTTONWOOD 14-33 - P_COTTONWOOD 14-33 - F	1,200.00	1,199.88	34.66	29.57	6.807	SF
P_COTTONWOOD 15-33 VERTICAL - P_COTTONWOC	1,050.00	1,050.00	16.04	11.58	3.595	CC, ES
P_COTTONWOOD 15-33 VERTICAL - P_COTTONWOC	1,100.00	1,100.00	16.32	11.63	3.484	SF
P_COTTONWOOD 36-33 - P_COTTONWOOD 36-33 - F	1,050.00	1,050.00	48.08	43.61	10.776	CC, ES
P_COTTONWOOD 36-33 - P_COTTONWOOD 36-33 - F	1,100.00	1,099.43	48.64	43.97	10.414	SF

Offset Design WELD_COTTONWOOD 15-33 PAD - P_COTTONWOOD 14-33 - P_COTTONWOOD 14-33 - PLAN #1													Offset Site Error:	0.00 ft
Survey Program: 0-MWD													Offset Well Error:	0.00 ft
Reference	Offset	Semi Major Axis	Distance											
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
0.00	0.00	0.00	0.00	0.00	0.00	180.00	-32.04	0.00	32.04					
100.00	100.00	100.00	100.00	0.10	0.10	180.00	-32.04	0.00	32.04	31.85	0.19	167.724		
200.00	200.00	200.00	200.00	0.32	0.32	180.00	-32.04	0.00	32.04	31.40	0.64	50.023		
300.00	300.00	300.00	300.00	0.55	0.55	180.00	-32.04	0.00	32.04	30.95	1.09	29.395		
400.00	400.00	400.00	400.00	0.77	0.77	180.00	-32.04	0.00	32.04	30.50	1.54	20.812		
500.00	500.00	500.00	500.00	0.99	0.99	180.00	-32.04	0.00	32.04	30.05	1.99	16.109		
600.00	600.00	600.00	600.00	1.22	1.22	180.00	-32.04	0.00	32.04	29.61	2.44	13.140		
700.00	700.00	700.00	700.00	1.44	1.44	180.00	-32.04	0.00	32.04	29.16	2.89	11.095		
800.00	800.00	800.00	800.00	1.67	1.67	180.00	-32.04	0.00	32.04	28.71	3.34	9.600		
900.00	900.00	900.00	900.00	1.89	1.89	180.00	-32.04	0.00	32.04	28.26	3.79	8.461		
1,000.00	1,000.00	1,000.00	1,000.00	2.12	2.12	180.00	-32.04	0.00	32.04	27.81	4.24	7.563		
1,050.00	1,050.00	1,050.00	1,050.00	2.23	2.23	180.00	-32.04	0.00	32.04	27.58	4.46	7.182	CC, ES	
1,100.00	1,100.00	1,099.98	1,099.97	2.34	2.34	-128.41	-32.06	-0.44	32.33	27.66	4.68	6.914		
1,200.00	1,199.93	1,199.88	1,199.81	2.56	2.54	-127.14	-32.20	-3.92	34.66	29.57	5.09	6.807	SF	
1,300.00	1,299.68	1,299.66	1,299.34	2.78	2.75	-125.04	-32.48	-10.86	39.35	33.82	5.52	7.124		
1,400.00	1,399.13	1,399.21	1,398.35	3.02	2.98	-122.67	-32.89	-21.24	46.44	40.46	5.98	7.764		
1,500.00	1,498.15	1,498.46	1,496.63	3.28	3.23	-120.43	-33.44	-35.00	55.95	49.47	6.48	8.635		
1,600.00	1,596.63	1,597.32	1,594.00	3.57	3.52	-118.48	-34.12	-52.08	67.89	60.85	7.04	9.648		
1,620.11	1,616.35	1,617.14	1,613.45	3.63	3.58	-118.13	-34.27	-55.91	70.58	63.42	7.16	9.858		
1,700.00	1,694.67	1,695.75	1,690.30	3.89	3.85	-116.36	-34.93	-72.41	81.72	74.05	7.67	10.656		
1,800.00	1,792.69	1,793.68	1,785.36	4.24	4.22	-112.99	-35.87	-95.91	96.61	88.24	8.37	11.547		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_COTTONWOOD 23-33
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	WELL @ 4997.00ft (Original Well Elev)
Reference Site:	WELD_COTTONWOOD 15-33 PAD	MD Reference:	WELL @ 4997.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_COTTONWOOD 23-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 23-33	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 2-18-10 RHS	Offset TVD Reference:	Offset Datum

Offset Design WELD_COTTONWOOD 15-33 PAD - P_COTTONWOOD 14-33 - P_COTTONWOOD 14-33 - PLAN #1												Offset Site Error:	0.00 ft
Survey Program: 0-MWD												Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	
1,900.00	1,890.72	1,890.89	1,878.87	4.60	4.66	-108.93	-36.93	-122.43	112.91	103.79	9.12	12.382	
2,000.00	1,988.75	1,987.17	1,970.54	4.97	5.15	-104.60	-38.10	-151.81	131.04	121.13	9.91	13.217	
2,100.00	2,086.77	2,084.27	2,062.29	5.35	5.70	-100.53	-39.36	-183.57	150.84	140.11	10.73	14.057	
2,200.00	2,184.80	2,181.78	2,154.40	5.74	6.27	-97.37	-40.64	-215.53	171.26	159.70	11.56	14.817	
2,300.00	2,282.83	2,279.28	2,246.51	6.14	6.87	-94.88	-41.91	-247.49	192.07	179.68	12.39	15.501	
2,400.00	2,380.85	2,376.79	2,338.62	6.54	7.48	-92.89	-43.19	-279.45	213.16	199.93	13.23	16.116	
2,500.00	2,478.88	2,474.29	2,430.73	6.95	8.10	-91.25	-44.46	-311.41	234.45	220.39	14.07	16.667	
2,600.00	2,576.91	2,571.80	2,522.84	7.36	8.72	-89.88	-45.73	-343.37	255.90	240.99	14.91	17.163	
2,700.00	2,674.93	2,669.31	2,614.96	7.77	9.36	-88.73	-47.01	-375.33	277.46	261.71	15.76	17.610	
2,800.00	2,772.96	2,766.81	2,707.07	8.18	10.00	-87.74	-48.28	-407.29	299.12	282.52	16.60	18.014	
2,900.00	2,870.98	2,864.32	2,799.18	8.60	10.64	-86.89	-49.56	-439.25	320.85	303.39	17.46	18.381	
3,000.00	2,969.01	2,961.82	2,891.29	9.02	11.29	-86.14	-50.83	-471.22	342.64	324.33	18.31	18.714	
3,100.00	3,067.04	3,059.33	2,983.40	9.44	11.94	-85.48	-52.10	-503.18	364.48	345.31	19.16	19.018	
3,200.00	3,165.06	3,156.84	3,075.51	9.86	12.59	-84.90	-53.38	-535.14	386.36	366.34	20.02	19.297	
3,300.00	3,263.09	3,254.34	3,167.62	10.28	13.25	-84.38	-54.65	-567.10	408.27	387.39	20.88	19.553	
3,400.00	3,361.12	3,351.85	3,259.73	10.70	13.91	-83.91	-55.93	-599.06	430.21	408.47	21.74	19.789	
3,500.00	3,459.14	3,449.35	3,351.84	11.13	14.57	-83.49	-57.20	-631.02	452.18	429.58	22.60	20.007	
3,600.00	3,557.17	3,546.86	3,443.95	11.55	15.23	-83.11	-58.48	-662.98	474.17	450.70	23.46	20.209	
3,700.00	3,655.20	3,644.37	3,536.06	11.98	15.89	-82.76	-59.75	-694.94	496.17	471.85	24.33	20.397	
3,800.00	3,753.22	3,741.87	3,628.17	12.41	16.55	-82.44	-61.02	-726.90	518.20	493.01	25.19	20.571	
3,900.00	3,851.25	3,839.38	3,720.28	12.84	17.22	-82.14	-62.30	-758.86	540.23	514.18	26.06	20.734	
4,000.00	3,949.27	3,936.88	3,812.39	13.26	17.88	-81.87	-63.57	-790.82	562.28	535.36	26.92	20.886	
4,100.00	4,047.30	4,034.39	3,904.50	13.69	18.55	-81.62	-64.85	-822.79	584.34	556.55	27.79	21.029	
4,200.00	4,145.33	4,131.89	3,996.61	14.12	19.21	-81.39	-66.12	-854.75	606.41	577.76	28.65	21.163	
4,300.00	4,243.35	4,229.40	4,088.72	14.55	19.88	-81.18	-67.40	-886.71	628.49	598.97	29.52	21.289	
4,400.00	4,341.38	4,326.91	4,180.83	14.98	20.55	-80.98	-68.67	-918.67	650.58	620.18	30.39	21.407	
4,500.00	4,439.41	4,424.41	4,272.94	15.41	21.22	-80.79	-69.94	-950.63	672.67	641.41	31.26	21.519	
4,600.00	4,537.43	4,521.92	4,365.05	15.84	21.89	-80.61	-71.22	-982.59	694.77	662.64	32.13	21.625	
4,700.00	4,635.46	4,619.42	4,457.16	16.27	22.55	-80.45	-72.49	-1,014.55	716.87	683.88	33.00	21.725	
4,800.00	4,733.49	4,716.93	4,549.27	16.70	23.22	-80.29	-73.77	-1,046.51	738.99	705.12	33.87	21.820	
4,900.00	4,831.51	4,814.44	4,641.38	17.13	23.89	-80.15	-75.04	-1,078.47	761.10	726.36	34.74	21.910	
5,000.00	4,929.54	4,911.94	4,733.49	17.57	24.56	-80.01	-76.32	-1,110.43	783.22	747.61	35.61	21.995	
5,100.00	5,027.56	5,009.45	4,825.60	18.00	25.23	-79.88	-77.59	-1,142.39	805.35	768.87	36.48	22.076	
5,200.00	5,125.59	5,106.95	4,917.71	18.43	25.91	-79.75	-78.86	-1,174.36	827.47	790.12	37.35	22.154	
5,300.00	5,223.62	5,204.46	5,009.82	18.86	26.58	-79.64	-80.14	-1,206.32	849.61	811.38	38.22	22.228	
5,400.00	5,321.64	5,301.97	5,101.93	19.29	27.25	-79.53	-81.41	-1,238.28	871.74	832.65	39.09	22.298	
5,500.00	5,419.67	5,399.47	5,194.04	19.73	27.92	-79.42	-82.69	-1,270.24	893.88	853.91	39.97	22.365	
5,600.00	5,517.70	5,514.93	5,303.41	20.16	28.63	-79.34	-84.16	-1,307.21	915.48	874.59	40.89	22.391	
5,686.66	5,602.65	5,628.16	5,411.94	20.54	29.16	-79.43	-85.45	-1,339.45	931.72	890.02	41.69	22.348	
5,700.00	5,615.73	5,645.69	5,428.85	20.59	29.23	-79.51	-85.63	-1,344.06	933.99	892.17	41.82	22.334	
5,800.00	5,714.16	5,777.87	5,557.22	20.89	29.76	-79.99	-86.88	-1,375.46	949.41	906.75	42.67	22.252	
5,900.00	5,813.15	5,911.20	5,688.05	21.17	30.21	-80.37	-87.90	-1,401.10	961.92	918.52	43.40	22.164	
6,000.00	5,912.57	6,045.46	5,820.85	21.40	30.57	-80.65	-88.69	-1,420.75	971.45	927.44	44.01	22.073	
6,100.00	6,012.31	6,180.41	5,955.11	21.59	30.85	-80.83	-89.22	-1,434.22	977.95	933.45	44.50	21.975	
6,200.00	6,112.23	6,315.79	6,090.29	21.74	31.05	-80.92	-89.51	-1,441.36	981.41	936.53	44.88	21.870	
6,256.77	6,169.00	6,392.74	6,167.22	21.81	31.13	-132.35	-89.56	-1,442.58	982.01	936.97	45.03	21.806	
6,300.00	6,212.23	6,437.74	6,212.23	21.86	31.17	-132.35	-89.56	-1,442.59	982.01	936.87	45.14	21.755	
6,400.00	6,312.23	6,537.74	6,312.23	22.00	31.26	-132.35	-89.56	-1,442.59	982.01	936.62	45.39	21.634	
6,500.00	6,412.23	6,637.74	6,412.23	22.14	31.35	-132.35	-89.56	-1,442.59	982.01	936.36	45.65	21.511	
6,600.00	6,512.23	6,737.74	6,512.23	22.28	31.45	-132.35	-89.56	-1,442.59	982.01	936.10	45.91	21.388	
6,700.00	6,612.23	6,837.74	6,612.23	22.42	31.55	-132.35	-89.56	-1,442.59	982.01	935.83	46.18	21.265	
6,800.00	6,712.23	6,937.74	6,712.23	22.56	31.65	-132.35	-89.56	-1,442.59	982.01	935.56	46.45	21.142	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_COTTONWOOD 23-33
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	WELL @ 4997.00ft (Original Well Elev)
Reference Site:	WELD_COTTONWOOD 15-33 PAD	MD Reference:	WELL @ 4997.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_COTTONWOOD 23-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 23-33	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 2-18-10 RHS	Offset TVD Reference:	Offset Datum

Offset Design WELD_COTTONWOOD 15-33 PAD - P_COTTONWOOD 14-33 - P_COTTONWOOD 14-33 - PLAN #1												Offset Site Error:	0.00 ft
Survey Program: 0-MWD												Offset Well Error:	0.00 ft
Reference	Offset	Semi Major Axis		Distance									
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
6,900.00	6,812.23	7,037.74	6,812.23	22.71	31.75	-132.35	-89.56	-1,442.59	982.01	935.29	46.72	21.019	
7,000.00	6,912.23	7,137.74	6,912.23	22.85	31.85	-132.35	-89.56	-1,442.59	982.01	935.02	46.99	20.897	
7,100.00	7,012.23	7,237.74	7,012.23	23.00	31.95	-132.35	-89.56	-1,442.59	982.01	934.74	47.27	20.774	
7,200.00	7,112.23	7,337.74	7,112.23	23.15	32.06	-132.35	-89.56	-1,442.59	982.01	934.46	47.55	20.652	
7,300.00	7,212.23	7,437.74	7,212.23	23.30	32.16	-132.35	-89.56	-1,442.59	982.01	934.18	47.83	20.531	
7,400.00	7,312.23	7,537.74	7,312.23	23.45	32.27	-132.35	-89.56	-1,442.59	982.01	933.90	48.12	20.409	
7,500.00	7,412.23	7,637.74	7,412.23	23.60	32.38	-132.35	-89.56	-1,442.59	982.01	933.61	48.40	20.288	
7,600.00	7,512.23	7,737.74	7,512.23	23.75	32.49	-132.35	-89.56	-1,442.59	982.01	933.32	48.69	20.168	
7,700.00	7,612.23	7,837.74	7,612.23	23.90	32.60	-132.35	-89.56	-1,442.59	982.01	933.03	48.98	20.048	
7,800.00	7,712.23	7,937.74	7,712.23	24.06	32.71	-132.35	-89.56	-1,442.59	982.01	932.73	49.28	19.928	
7,900.00	7,812.23	8,037.74	7,812.23	24.21	32.82	-132.35	-89.56	-1,442.59	982.01	932.44	49.57	19.809	
8,000.00	7,912.23	8,137.74	7,912.23	24.37	32.93	-132.35	-89.56	-1,442.59	982.01	932.14	49.87	19.690	
8,100.00	8,012.23	8,237.74	8,012.23	24.53	33.05	-132.35	-89.56	-1,442.59	982.01	931.84	50.17	19.572	
8,175.77	8,088.00	8,313.51	8,088.00	24.65	33.14	-132.35	-89.56	-1,442.59	982.01	931.61	50.40	19.483	

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_COTTONWOOD 23-33
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	WELL @ 4997.00ft (Original Well Elev)
Reference Site:	WELD_COTTONWOOD 15-33 PAD	MD Reference:	WELL @ 4997.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_COTTONWOOD 23-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 23-33	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 2-18-10 RHS	Offset TVD Reference:	Offset Datum

Offset Design WELD_COTTONWOOD 15-33 PAD - P_COTTONWOOD 15-33 VERTICAL - P_COTTONWOOD 15-33												Offset Site Error:	0.00 ft
Survey Program: 0-MWD												Offset Well Error:	0.00 ft
Reference	Offset	Semi Major Axis		Distance									
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.00	0.00	0.00	0.00	0.00	0.00	-180.00	-16.04	0.00	16.04				
100.00	100.00	100.00	100.00	0.10	0.10	-180.00	-16.04	0.00	16.04	15.85	0.19	83.961	
200.00	200.00	200.00	200.00	0.32	0.32	-180.00	-16.04	0.00	16.04	15.40	0.64	25.041	
300.00	300.00	300.00	300.00	0.55	0.55	-180.00	-16.04	0.00	16.04	14.95	1.09	14.715	
400.00	400.00	400.00	400.00	0.77	0.77	-180.00	-16.04	0.00	16.04	14.50	1.54	10.418	
500.00	500.00	500.00	500.00	0.99	0.99	-180.00	-16.04	0.00	16.04	14.05	1.99	8.064	
600.00	600.00	600.00	600.00	1.22	1.22	-180.00	-16.04	0.00	16.04	13.60	2.44	6.578	
700.00	700.00	700.00	700.00	1.44	1.44	-180.00	-16.04	0.00	16.04	13.15	2.89	5.554	
800.00	800.00	800.00	800.00	1.67	1.67	-180.00	-16.04	0.00	16.04	12.70	3.34	4.806	
900.00	900.00	900.00	900.00	1.89	1.89	-180.00	-16.04	0.00	16.04	12.25	3.79	4.235	
1,000.00	1,000.00	1,000.00	1,000.00	2.12	2.12	-180.00	-16.04	0.00	16.04	11.80	4.24	3.786	
1,050.00	1,050.00	1,050.00	1,050.00	2.23	2.23	-180.00	-16.04	0.00	16.04	11.58	4.46	3.595 CC, ES	
1,100.00	1,100.00	1,100.00	1,100.00	2.34	2.34	-129.78	-16.04	0.00	16.32	11.63	4.68	3.484 SF	
1,200.00	1,199.93	1,199.93	1,199.93	2.56	2.57	-137.97	-16.04	0.00	18.74	13.62	5.12	3.659	
1,300.00	1,299.68	1,299.68	1,299.68	2.78	2.79	-148.95	-16.04	0.00	24.38	18.82	5.56	4.388	
1,400.00	1,399.13	1,399.13	1,399.13	3.02	3.02	-158.06	-16.04	0.00	33.77	27.79	5.98	5.645	
1,500.00	1,498.15	1,498.15	1,498.15	3.28	3.24	-164.34	-16.04	0.00	46.98	40.58	6.40	7.339	
1,600.00	1,596.63	1,596.63	1,596.63	3.57	3.46	-168.47	-16.04	0.00	63.88	57.07	6.81	9.377	
1,620.11	1,616.35	1,616.35	1,616.35	3.63	3.50	-169.12	-16.04	0.00	67.72	60.82	6.89	9.822	
1,700.00	1,694.67	1,694.67	1,694.67	3.89	3.68	-171.17	-16.04	0.00	83.29	76.04	7.25	11.483	
1,800.00	1,792.69	1,792.69	1,792.69	4.24	3.90	-172.86	-16.04	0.00	102.88	95.17	7.71	13.350	
1,900.00	1,890.72	1,890.72	1,890.72	4.60	4.12	-174.01	-16.04	0.00	122.52	114.36	8.16	15.011	
2,000.00	1,988.75	1,988.75	1,988.75	4.97	4.34	-174.84	-16.04	0.00	142.20	133.58	8.62	16.493	
2,100.00	2,086.77	2,086.77	2,086.77	5.35	4.56	-175.47	-16.04	0.00	161.90	152.82	9.08	17.824	
2,200.00	2,184.80	2,184.80	2,184.80	5.74	4.78	-175.96	-16.04	0.00	181.62	172.07	9.55	19.022	
2,300.00	2,282.83	2,282.83	2,282.83	6.14	5.00	-176.36	-16.04	0.00	201.35	191.33	10.01	20.108	
2,400.00	2,380.85	2,380.85	2,380.85	6.54	5.22	-176.68	-16.04	0.00	221.08	210.60	10.48	21.094	
2,500.00	2,478.88	2,478.88	2,478.88	6.95	5.44	-176.96	-16.04	0.00	240.82	229.87	10.95	21.995	
2,600.00	2,576.91	2,576.91	2,576.91	7.36	5.66	-177.19	-16.04	0.00	260.57	249.15	11.42	22.819	
2,700.00	2,674.93	2,674.93	2,674.93	7.77	5.88	-177.38	-16.04	0.00	280.31	268.42	11.89	23.577	
2,800.00	2,772.96	2,772.96	2,772.96	8.18	6.10	-177.56	-16.04	0.00	300.06	287.70	12.36	24.275	
2,900.00	2,870.98	2,870.98	2,870.98	8.60	6.32	-177.71	-16.04	0.00	319.82	306.98	12.83	24.921	
3,000.00	2,969.01	2,969.01	2,969.01	9.02	6.54	-177.84	-16.04	0.00	339.57	326.27	13.31	25.520	
3,100.00	3,067.04	3,067.04	3,067.04	9.44	6.76	-177.96	-16.04	0.00	359.33	345.55	13.78	26.077	
3,200.00	3,165.06	3,165.06	3,165.06	9.86	6.98	-178.07	-16.04	0.00	379.09	364.83	14.25	26.595	
3,300.00	3,263.09	3,263.09	3,263.09	10.28	7.21	-178.16	-16.04	0.00	398.85	384.12	14.73	27.080	
3,400.00	3,361.12	3,361.12	3,361.12	10.70	7.43	-178.25	-16.04	0.00	418.61	403.40	15.20	27.533	
3,500.00	3,459.14	3,459.14	3,459.14	11.13	7.65	-178.33	-16.04	0.00	438.37	422.69	15.68	27.959	
3,600.00	3,557.17	3,557.17	3,557.17	11.55	7.87	-178.40	-16.04	0.00	458.13	441.97	16.15	28.358	
3,700.00	3,655.20	3,655.20	3,655.20	11.98	8.09	-178.47	-16.04	0.00	477.89	461.26	16.63	28.735	
3,800.00	3,753.22	3,753.22	3,753.22	12.41	8.31	-178.53	-16.04	0.00	497.65	480.55	17.11	29.090	
3,900.00	3,851.25	3,851.25	3,851.25	12.84	8.53	-178.58	-16.04	0.00	517.42	499.83	17.58	29.425	
4,000.00	3,949.27	3,949.27	3,949.27	13.26	8.75	-178.64	-16.04	0.00	537.18	519.12	18.06	29.742	
4,100.00	4,047.30	4,047.30	4,047.30	13.69	8.97	-178.68	-16.04	0.00	556.95	538.41	18.54	30.042	
4,200.00	4,145.33	4,145.33	4,145.33	14.12	9.19	-178.73	-16.04	0.00	576.71	557.69	19.02	30.327	
4,300.00	4,243.35	4,243.35	4,243.35	14.55	9.41	-178.77	-16.04	0.00	596.47	576.98	19.49	30.598	
4,400.00	4,341.38	4,341.38	4,341.38	14.98	9.63	-178.81	-16.04	0.00	616.24	596.27	19.97	30.856	
4,500.00	4,439.41	4,439.41	4,439.41	15.41	9.85	-178.85	-16.04	0.00	636.01	615.56	20.45	31.101	
4,600.00	4,537.43	4,537.43	4,537.43	15.84	10.07	-178.88	-16.04	0.00	655.77	634.84	20.93	31.335	
4,700.00	4,635.46	4,635.46	4,635.46	16.27	10.29	-178.92	-16.04	0.00	675.54	654.13	21.41	31.558	
4,800.00	4,733.49	4,733.49	4,733.49	16.70	10.51	-178.95	-16.04	0.00	695.30	673.42	21.88	31.771	
4,900.00	4,831.51	4,831.51	4,831.51	17.13	10.73	-178.98	-16.04	0.00	715.07	692.71	22.36	31.975	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_COTTONWOOD 23-33
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	WELL @ 4997.00ft (Original Well Elev)
Reference Site:	WELD_COTTONWOOD 15-33 PAD	MD Reference:	WELL @ 4997.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_COTTONWOOD 23-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 23-33	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 2-18-10 RHS	Offset TVD Reference:	Offset Datum

Offset Design WELD_COTTONWOOD 15-33 PAD - P_COTTONWOOD 15-33 VERTICAL - P_COTTONWOOD 15-33												Offset Site Error:	0.00 ft
Survey Program: 0-MWD												Offset Well Error:	0.00 ft
Reference	Offset	Semi Major Axis		Distance									
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
5,000.00	4,929.54	4,929.54	4,929.54	17.57	10.95	-179.00	-16.04	0.00	734.84	711.99	22.84	32.170	
5,100.00	5,027.56	5,027.56	5,027.56	18.00	11.17	-179.03	-16.04	0.00	754.60	731.28	23.32	32.358	
5,200.00	5,125.59	5,125.59	5,125.59	18.43	11.39	-179.05	-16.04	0.00	774.37	750.57	23.80	32.537	
5,300.00	5,223.62	5,223.62	5,223.62	18.86	11.61	-179.08	-16.04	0.00	794.14	769.86	24.28	32.709	
5,400.00	5,321.64	5,321.64	5,321.64	19.29	11.83	-179.10	-16.04	0.00	813.90	789.15	24.76	32.875	
5,500.00	5,419.67	5,419.67	5,419.67	19.73	12.05	-179.12	-16.04	0.00	833.67	808.43	25.24	33.034	
5,600.00	5,517.70	5,517.70	5,517.70	20.16	12.27	-179.14	-16.04	0.00	853.44	827.72	25.72	33.187	
5,686.66	5,602.65	5,602.65	5,602.65	20.54	12.46	-179.16	-16.04	0.00	870.57	844.44	26.13	33.314	
5,700.00	5,615.73	5,615.73	5,615.73	20.59	12.49	-179.16	-16.04	0.00	873.17	846.97	26.21	33.320	
5,800.00	5,714.16	5,714.16	5,714.16	20.89	12.71	-179.18	-16.04	0.00	890.77	864.06	26.71	33.348	
5,900.00	5,813.15	5,813.15	5,813.15	21.17	12.94	-179.20	-16.04	0.00	904.92	877.74	27.18	33.292	
6,000.00	5,912.57	5,912.57	5,912.57	21.40	13.16	-179.21	-16.04	0.00	915.60	887.99	27.61	33.160	
6,100.00	6,012.31	6,012.31	6,012.31	21.59	13.38	-179.22	-16.04	0.00	922.81	894.81	28.00	32.955	
6,200.00	6,112.23	6,112.23	6,112.23	21.74	13.61	-179.22	-16.04	0.00	926.54	898.19	28.35	32.681	
6,256.77	6,169.00	6,169.00	6,169.00	21.81	13.74	-129.36	-16.04	0.00	927.10	898.57	28.53	32.494	
6,300.00	6,212.23	6,212.23	6,212.23	21.86	13.83	-129.36	-16.04	0.00	927.10	898.40	28.71	32.296	
6,400.00	6,312.23	6,312.23	6,312.23	22.00	14.06	-129.36	-16.04	0.00	927.10	897.98	29.13	31.831	
6,500.00	6,412.23	6,412.23	6,412.23	22.14	14.28	-129.36	-16.04	0.00	927.10	897.56	29.55	31.378	
6,600.00	6,512.23	6,512.23	6,512.23	22.28	14.51	-129.36	-16.04	0.00	927.10	897.14	29.97	30.937	
6,700.00	6,612.23	6,612.23	6,612.23	22.42	14.73	-129.36	-16.04	0.00	927.10	896.71	30.39	30.507	
6,800.00	6,712.23	6,712.23	6,712.23	22.56	14.96	-129.36	-16.04	0.00	927.10	896.29	30.81	30.089	
6,900.00	6,812.23	6,812.23	6,812.23	22.71	15.18	-129.36	-16.04	0.00	927.10	895.87	31.24	29.681	
7,000.00	6,912.23	6,912.23	6,912.23	22.85	15.41	-129.36	-16.04	0.00	927.10	895.44	31.66	29.283	
7,100.00	7,012.23	7,012.23	7,012.23	23.00	15.63	-129.36	-16.04	0.00	927.10	895.02	32.08	28.895	
7,200.00	7,112.23	7,112.23	7,112.23	23.15	15.86	-129.36	-16.04	0.00	927.10	894.59	32.51	28.517	
7,300.00	7,212.23	7,212.23	7,212.23	23.30	16.08	-129.36	-16.04	0.00	927.10	894.17	32.94	28.148	
7,400.00	7,312.23	7,312.23	7,312.23	23.45	16.31	-129.36	-16.04	0.00	927.10	893.74	33.36	27.788	
7,500.00	7,412.23	7,412.23	7,412.23	23.60	16.53	-129.36	-16.04	0.00	927.10	893.31	33.79	27.437	
7,600.00	7,512.23	7,512.23	7,512.23	23.75	16.76	-129.36	-16.04	0.00	927.10	892.88	34.22	27.094	
7,700.00	7,612.23	7,612.23	7,612.23	23.90	16.98	-129.36	-16.04	0.00	927.10	892.46	34.65	26.759	
7,800.00	7,712.23	7,712.23	7,712.23	24.06	17.21	-129.36	-16.04	0.00	927.10	892.03	35.07	26.432	
7,900.00	7,812.23	7,812.23	7,812.23	24.21	17.43	-129.36	-16.04	0.00	927.10	891.60	35.50	26.113	
8,000.00	7,912.23	7,912.23	7,912.23	24.37	17.65	-129.36	-16.04	0.00	927.10	891.17	35.93	25.800	
8,100.00	8,012.23	8,012.23	8,012.23	24.53	17.88	-129.36	-16.04	0.00	927.10	890.74	36.36	25.495	
8,175.77	8,088.00	8,088.00	8,088.00	24.65	18.05	-129.36	-16.04	0.00	927.10	890.41	36.69	25.268	

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_COTTONWOOD 23-33
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	WELL @ 4997.00ft (Original Well Elev)
Reference Site:	WELD_COTTONWOOD 15-33 PAD	MD Reference:	WELL @ 4997.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_COTTONWOOD 23-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 23-33	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 2-18-10 RHS	Offset TVD Reference:	Offset Datum

Offset Design WELD_COTTONWOOD 15-33 PAD - P_COTTONWOOD 36-33 - P_COTTONWOOD 36-33 - PLAN #1												Offset Site Error:	0.00 ft
Survey Program: 0-MWD												Offset Well Error:	0.00 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Semi Major Axis Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.00	0.00	0.00	0.00	0.00	0.00	-180.00	-48.08	0.00	48.08				
100.00	100.00	100.00	100.00	0.10	0.10	-180.00	-48.08	0.00	48.08	47.89	0.19	251.641	
200.00	200.00	200.00	200.00	0.32	0.32	-180.00	-48.08	0.00	48.08	47.44	0.64	75.051	
300.00	300.00	300.00	300.00	0.55	0.55	-180.00	-48.08	0.00	48.08	46.99	1.09	44.102	
400.00	400.00	400.00	400.00	0.77	0.77	-180.00	-48.08	0.00	48.08	46.54	1.54	31.226	
500.00	500.00	500.00	500.00	0.99	0.99	-180.00	-48.08	0.00	48.08	46.09	1.99	24.169	
600.00	600.00	600.00	600.00	1.22	1.22	-180.00	-48.08	0.00	48.08	45.64	2.44	19.714	
700.00	700.00	700.00	700.00	1.44	1.44	-180.00	-48.08	0.00	48.08	45.19	2.89	16.646	
800.00	800.00	800.00	800.00	1.67	1.67	-180.00	-48.08	0.00	48.08	44.74	3.34	14.404	
900.00	900.00	900.00	900.00	1.89	1.89	-180.00	-48.08	0.00	48.08	44.29	3.79	12.694	
1,000.00	1,000.00	1,000.00	1,000.00	2.12	2.12	-180.00	-48.08	0.00	48.08	43.84	4.24	11.347	
1,050.00	1,050.00	1,050.00	1,050.00	2.23	2.23	-180.00	-48.08	0.00	48.08	43.61	4.46	10.776 CC, ES	
1,100.00	1,100.00	1,099.43	1,099.43	2.34	2.33	-128.60	-48.36	-0.32	48.64	43.97	4.67	10.414 SF	
1,200.00	1,199.93	1,198.16	1,198.09	2.56	2.51	-128.72	-50.66	-2.83	53.14	48.07	5.07	10.490	
1,300.00	1,299.68	1,296.43	1,296.13	2.78	2.70	-128.89	-55.21	-7.83	62.11	56.64	5.47	11.349	
1,400.00	1,399.13	1,393.97	1,393.14	3.02	2.91	-129.04	-61.97	-15.25	75.54	69.64	5.90	12.805	
1,500.00	1,498.15	1,490.49	1,488.76	3.28	3.14	-129.12	-70.84	-24.99	93.35	86.99	6.35	14.697	
1,600.00	1,596.63	1,585.74	1,582.62	3.57	3.40	-129.13	-81.71	-36.92	115.47	108.63	6.84	16.885	
1,620.11	1,616.35	1,604.71	1,601.25	3.63	3.46	-129.12	-84.13	-39.58	120.43	113.49	6.94	17.352	
1,700.00	1,694.67	1,680.55	1,675.50	3.89	3.70	-129.08	-94.52	-50.99	141.06	133.67	7.38	19.107	
1,800.00	1,792.69	1,777.07	1,769.90	4.24	4.04	-128.92	-108.07	-65.86	167.19	159.22	7.97	20.979	
1,900.00	1,890.72	1,873.60	1,864.31	4.60	4.39	-128.80	-121.62	-80.73	193.33	184.75	8.58	22.533	
2,000.00	1,988.75	1,970.12	1,958.71	4.97	4.76	-128.71	-135.17	-95.61	219.47	210.26	9.21	23.829	
2,100.00	2,086.77	2,066.64	2,053.11	5.35	5.15	-128.64	-148.72	-110.48	245.60	235.75	9.86	24.919	
2,200.00	2,184.80	2,163.17	2,147.52	5.74	5.54	-128.59	-162.27	-125.35	271.74	261.22	10.52	25.842	
2,300.00	2,282.83	2,259.69	2,241.92	6.14	5.94	-128.54	-175.82	-140.23	297.88	286.69	11.19	26.631	
2,400.00	2,380.85	2,356.21	2,336.32	6.54	6.34	-128.50	-189.37	-155.10	324.02	312.15	11.86	27.311	
2,500.00	2,478.88	2,452.74	2,430.73	6.95	6.76	-128.47	-202.92	-169.97	350.15	337.60	12.55	27.900	
2,600.00	2,576.91	2,549.26	2,525.13	7.36	7.17	-128.44	-216.47	-184.85	376.29	363.05	13.24	28.415	
2,700.00	2,674.93	2,645.78	2,619.53	7.77	7.59	-128.41	-230.02	-199.72	402.43	388.49	13.94	28.867	
2,800.00	2,772.96	2,742.31	2,713.94	8.18	8.01	-128.39	-243.57	-214.60	428.57	413.92	14.64	29.268	
2,900.00	2,870.98	2,838.83	2,808.34	8.60	8.44	-128.37	-257.12	-229.47	454.71	439.36	15.35	29.623	
3,000.00	2,969.01	2,935.35	2,902.74	9.02	8.87	-128.35	-270.67	-244.34	480.84	464.79	16.06	29.941	
3,100.00	3,067.04	3,031.88	2,997.14	9.44	9.30	-128.34	-284.22	-259.22	506.98	490.21	16.77	30.227	
3,200.00	3,165.06	3,128.40	3,091.55	9.86	9.73	-128.32	-297.77	-274.09	533.12	515.63	17.49	30.485	
3,300.00	3,263.09	3,224.92	3,185.95	10.28	10.16	-128.31	-311.32	-288.96	559.26	541.05	18.21	30.719	
3,400.00	3,361.12	3,321.45	3,280.35	10.70	10.59	-128.30	-324.87	-303.84	585.40	566.47	18.93	30.931	
3,500.00	3,459.14	3,417.97	3,374.76	11.13	11.03	-128.29	-338.42	-318.71	611.54	591.89	19.65	31.125	
3,600.00	3,557.17	3,514.49	3,469.16	11.55	11.46	-128.28	-351.97	-333.59	637.68	617.30	20.37	31.303	
3,700.00	3,655.20	3,611.02	3,563.56	11.98	11.90	-128.27	-365.52	-348.46	663.81	642.72	21.10	31.467	
3,800.00	3,753.22	3,707.54	3,657.97	12.41	12.34	-128.26	-379.07	-363.33	689.95	668.13	21.82	31.617	
3,900.00	3,851.25	3,804.06	3,752.37	12.84	12.77	-128.25	-392.62	-378.21	716.09	693.54	22.55	31.756	
4,000.00	3,949.27	3,900.59	3,846.77	13.26	13.21	-128.25	-406.17	-393.08	742.23	718.95	23.28	31.886	
4,100.00	4,047.30	3,997.11	3,941.18	13.69	13.65	-128.24	-419.72	-407.95	768.37	744.36	24.01	32.005	
4,200.00	4,145.33	4,093.63	4,035.58	14.12	14.09	-128.23	-433.27	-422.83	794.51	769.77	24.74	32.117	
4,300.00	4,243.35	4,190.16	4,129.98	14.55	14.53	-128.23	-446.82	-437.70	820.64	795.18	25.47	32.221	
4,400.00	4,341.38	4,286.68	4,224.38	14.98	14.97	-128.22	-460.37	-452.57	846.78	820.58	26.20	32.319	
4,500.00	4,439.41	4,383.20	4,318.79	15.41	15.41	-128.22	-473.92	-467.45	872.92	845.99	26.93	32.410	
4,600.00	4,537.43	4,479.73	4,413.19	15.84	15.85	-128.21	-487.46	-482.32	899.06	871.39	27.67	32.496	
4,700.00	4,635.46	4,576.25	4,507.59	16.27	16.29	-128.21	-501.01	-497.20	925.20	896.80	28.40	32.577	
4,800.00	4,733.49	4,672.77	4,602.00	16.70	16.74	-128.20	-514.56	-512.07	951.34	922.20	29.14	32.653	
4,900.00	4,831.51	4,769.30	4,696.40	17.13	17.18	-128.20	-528.11	-526.94	977.48	947.61	29.87	32.724	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_COTTONWOOD 23-33
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	WELL @ 4997.00ft (Original Well Elev)
Reference Site:	WELD_COTTONWOOD 15-33 PAD	MD Reference:	WELL @ 4997.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_COTTONWOOD 23-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 23-33	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 2-18-10 RHS	Offset TVD Reference:	Offset Datum

Offset Design WELD_COTTONWOOD 15-33 PAD - P_COTTONWOOD 36-33 - P_COTTONWOOD 36-33 - PLAN #1												Offset Site Error:	0.00 ft
Survey Program: 0-MWD												Offset Well Error:	0.00 ft
Reference	Offset	Semi Major Axis		Distance									
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
5,000.00	4,929.54	4,865.82	4,790.80	17.57	17.62	-128.20	-541.66	-541.82	1,003.61	973.01	30.61	32.792	
5,100.00	5,027.56	4,962.34	4,885.21	18.00	18.06	-128.19	-555.21	-556.69	1,029.75	998.41	31.34	32.856	
5,200.00	5,125.59	5,058.87	4,979.61	18.43	18.51	-128.19	-568.76	-571.56	1,055.89	1,023.81	32.08	32.917	
5,300.00	5,223.62	5,155.39	5,074.01	18.86	18.95	-128.18	-582.31	-586.44	1,082.03	1,049.22	32.81	32.975	
5,400.00	5,321.64	5,251.91	5,168.42	19.29	19.39	-128.18	-595.86	-601.31	1,108.17	1,074.62	33.55	33.029	
5,500.00	5,419.67	5,348.44	5,262.82	19.73	19.84	-128.18	-609.41	-616.18	1,134.31	1,100.02	34.29	33.082	
5,600.00	5,517.70	5,444.96	5,357.22	20.16	20.28	-128.18	-622.96	-631.06	1,160.45	1,125.42	35.03	33.131	
5,686.66	5,602.65	5,528.61	5,439.03	20.54	20.66	-128.17	-634.70	-643.95	1,183.10	1,147.43	35.67	33.172	
5,700.00	5,615.73	5,541.49	5,451.63	20.59	20.72	-128.23	-636.51	-645.93	1,186.57	1,150.80	35.77	33.171	
5,800.00	5,714.16	5,638.34	5,546.35	20.89	21.17	-128.54	-650.11	-660.86	1,211.38	1,174.89	36.49	33.196	
5,900.00	5,813.15	5,758.15	5,663.74	21.17	21.62	-128.67	-666.22	-678.54	1,233.58	1,196.40	37.18	33.175	
6,000.00	5,912.57	5,896.74	5,800.59	21.40	22.01	-128.72	-680.94	-694.70	1,250.80	1,213.00	37.80	33.088	
6,100.00	6,012.31	6,037.31	5,940.29	21.59	22.32	-128.74	-691.30	-706.08	1,262.65	1,224.33	38.32	32.951	
6,200.00	6,112.23	6,179.14	6,081.86	21.74	22.56	-128.74	-697.07	-712.41	1,269.03	1,230.29	38.74	32.758	
6,256.77	6,169.00	6,259.95	6,162.64	21.81	22.67	-179.86	-698.24	-713.70	1,270.20	1,231.27	38.94	32.623	
6,300.00	6,212.23	6,309.54	6,212.23	21.86	22.73	179.86	-698.30	-713.76	1,270.24	1,231.18	39.06	32.517	
6,400.00	6,312.23	6,409.54	6,312.23	22.00	22.85	179.86	-698.30	-713.76	1,270.24	1,230.89	39.35	32.278	
6,500.00	6,412.23	6,509.54	6,412.23	22.14	22.96	179.86	-698.30	-713.76	1,270.24	1,230.60	39.65	32.039	
6,600.00	6,512.23	6,609.54	6,512.23	22.28	23.08	179.86	-698.30	-713.76	1,270.24	1,230.30	39.94	31.802	
6,700.00	6,612.23	6,709.54	6,612.23	22.42	23.20	179.86	-698.30	-713.76	1,270.24	1,230.00	40.24	31.567	
6,800.00	6,712.23	6,809.54	6,712.23	22.56	23.32	179.86	-698.30	-713.76	1,270.24	1,229.70	40.54	31.332	
6,900.00	6,812.23	6,909.54	6,812.23	22.71	23.44	179.86	-698.30	-713.76	1,270.24	1,229.40	40.85	31.099	
7,000.00	6,912.23	7,009.54	6,912.23	22.85	23.57	179.86	-698.30	-713.76	1,270.24	1,229.09	41.15	30.867	
7,100.00	7,012.23	7,109.54	7,012.23	23.00	23.69	179.86	-698.30	-713.76	1,270.24	1,228.78	41.46	30.637	
7,200.00	7,112.23	7,209.54	7,112.23	23.15	23.82	179.86	-698.30	-713.76	1,270.24	1,228.47	41.77	30.409	
7,300.00	7,212.23	7,309.54	7,212.23	23.30	23.95	179.86	-698.30	-713.76	1,270.24	1,228.16	42.09	30.182	
7,400.00	7,312.23	7,409.54	7,312.23	23.45	24.08	179.86	-698.30	-713.76	1,270.24	1,227.84	42.40	29.956	
7,500.00	7,412.23	7,509.54	7,412.23	23.60	24.21	179.86	-698.30	-713.76	1,270.24	1,227.52	42.72	29.733	
7,600.00	7,512.23	7,609.54	7,512.23	23.75	24.34	179.86	-698.30	-713.76	1,270.24	1,227.20	43.04	29.511	
7,700.00	7,612.23	7,709.54	7,612.23	23.90	24.47	179.86	-698.30	-713.76	1,270.24	1,226.87	43.37	29.290	
7,800.00	7,712.23	7,809.54	7,712.23	24.06	24.61	179.86	-698.30	-713.76	1,270.24	1,226.55	43.69	29.072	
7,900.00	7,812.23	7,909.54	7,812.23	24.21	24.74	179.86	-698.30	-713.76	1,270.24	1,226.22	44.02	28.855	
8,000.00	7,912.23	8,009.54	7,912.23	24.37	24.88	179.86	-698.30	-713.76	1,270.24	1,225.89	44.35	28.641	
8,100.00	8,012.23	8,109.54	8,012.23	24.53	25.02	179.86	-698.30	-713.76	1,270.24	1,225.56	44.68	28.428	
8,175.77	8,088.00	8,185.31	8,088.00	24.65	25.12	179.86	-698.30	-713.76	1,270.24	1,225.31	44.94	28.268	

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_COTTONWOOD 23-33
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Reference Site:	WELD_COTTONWOOD 15-33 PAD	MD Reference:	WELL @ 4997.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_COTTONWOOD 23-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 23-33	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 2-18-10 RHS	Offset TVD Reference:	Offset Datum

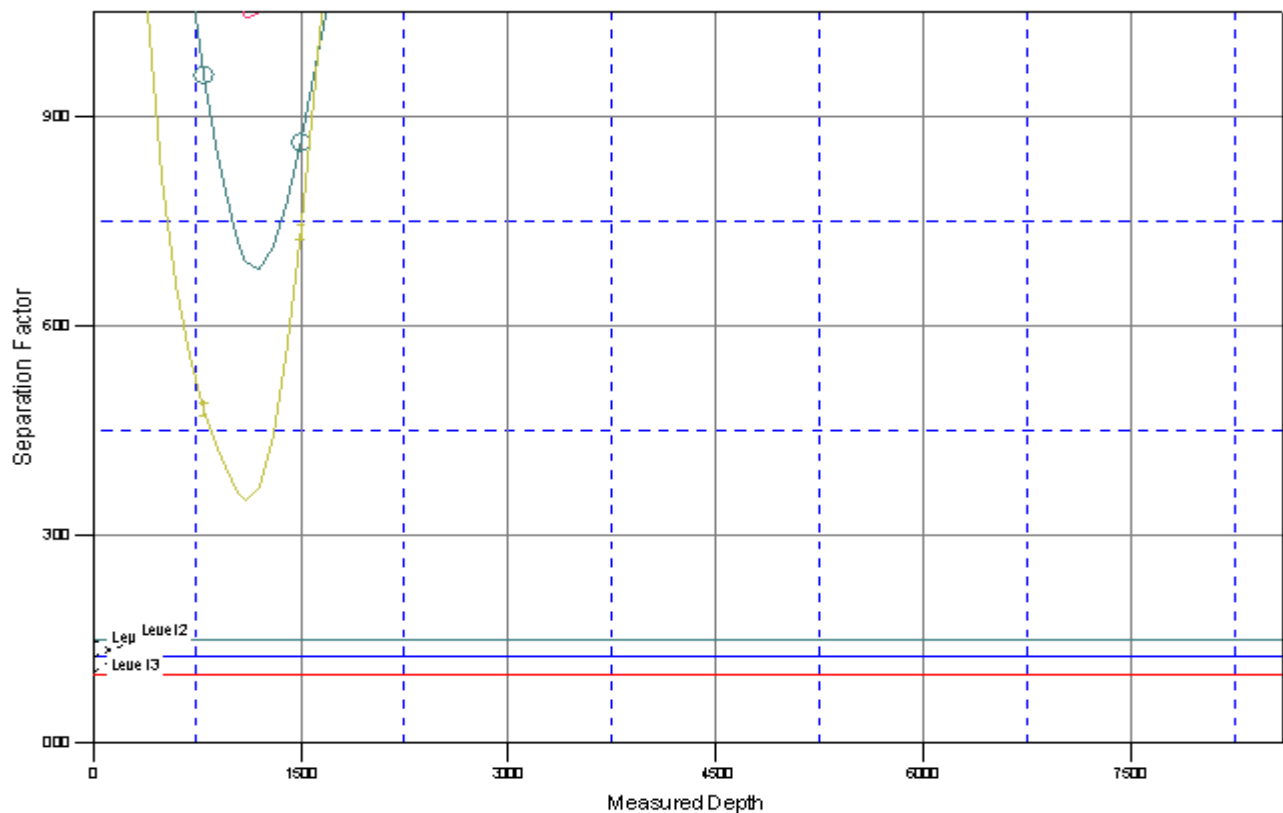
Reference Depths are relative to WELL @ 4997.00ft (Original Well Elev) Coordinates are relative to: P_COTTONWOOD 23-33
Offset Depths are relative to Offset Datum Coordinate System is US State Plane 1983, Colorado Northern Zone
Central Meridian is 105° 30' 0.000 W ° Grid Convergence at Surface is: 0.47°





Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_COTTONWOOD 23-33
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	WELL @ 4997.00ft (Original Well Elev)
Reference Site:	WELD_COTTONWOOD 15-33 PAD	MD Reference:	WELL @ 4997.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_COTTONWOOD 23-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 23-33	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 2-18-10 RHS	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 4997.00ft (Original Well Elev) Coordinates are relative to: P_COTTONWOOD 23-33
Offset Depths are relative to Offset Datum Coordinate System is US State Plane 1983, Colorado Northern Zone
Central Meridian is 105° 30' 0.000 W ° Grid Convergence at Surface is: 0.47°

Separation Factor Plot



LEGEND

 P_COTTONWOOD 15-33 VERTICAL, P_COTTONWOOD 15-33 VERTICAL, PLAN #1 2-18-10 RHS VD
  P_COTTONWOOD