



US ROCKIES REGION PLANNING

COLORADO NORTHERN ZONE - 83

WELD_COTTONWOOD 16-33 PAD

P_COTTONWOOD 9-33

P_COTTONWOOD 9-33

Plan: PLAN #1 2-18-10 RHS

Standard Planning Report

18 February, 2010





Project: COLORADO NORTHERN ZONE - 83
 Site: WELD_COTTONWOOD 16-33 PAD
 Well: P_COTTONWOOD 9-33
 Wellbore: P_COTTONWOOD 9-33
 Section: SECTION 33 T2N R66W
 SHL: 800 FSL 725 FEL
 Design: PLAN #1 2-18-10 RHS
 Latitude: 40° 5' 22.340 N
 Longitude: 104° 46' 31.033 W
 GL: 4987.00
 KB: WELL @ 5002.00ft (Original Well Elev)



Weatherford®



Azimuths to True North
 Magnetic North: 9.02°
 Magnetic Field
 Strength: 53104.6snT
 Dip Angle: 66.84°
 Date: 2/18/2010
 Model: IGRF2010

FORMATION TOP DETAILS		
TVDPath	MDPath	Formation
4172.00	4289.63	PARKMAN
4678.00	4818.94	SUSSEX
7164.00	7347.22	NIO A
7484.00	7667.22	CODELL
7574.00	7757.22	GRNHRN
7948.00	8131.22	JSAND

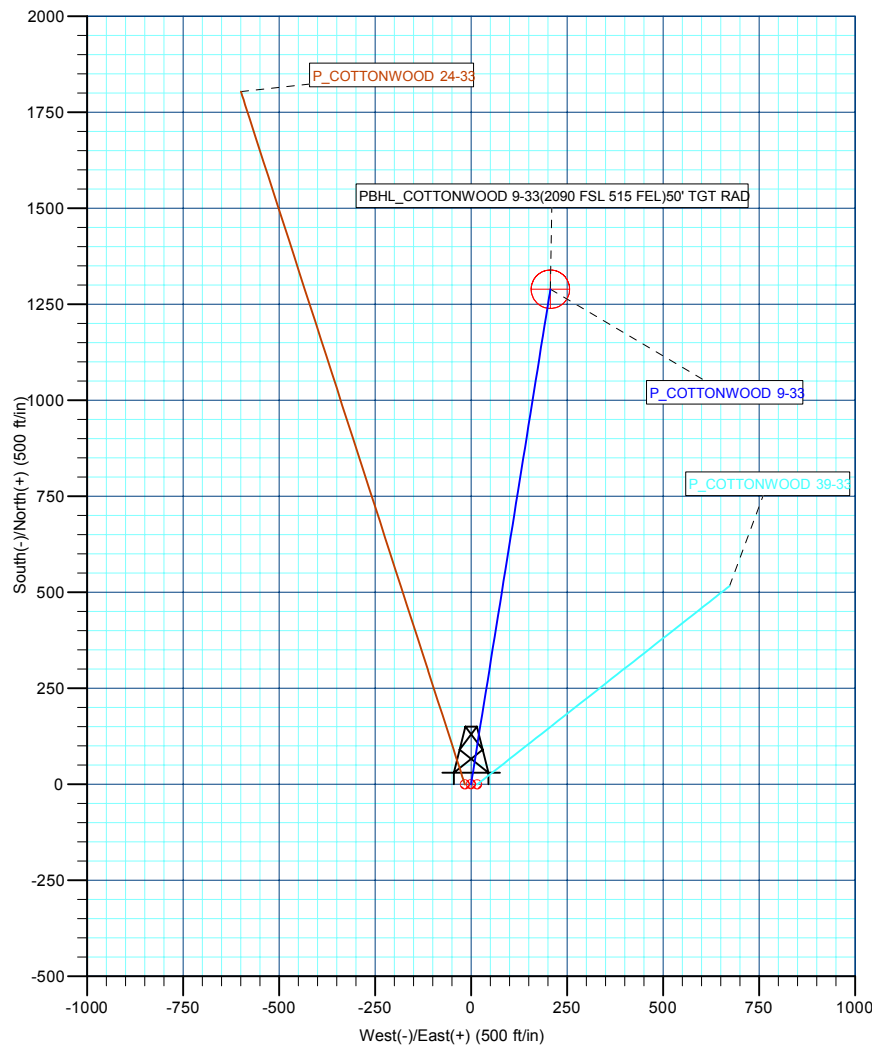
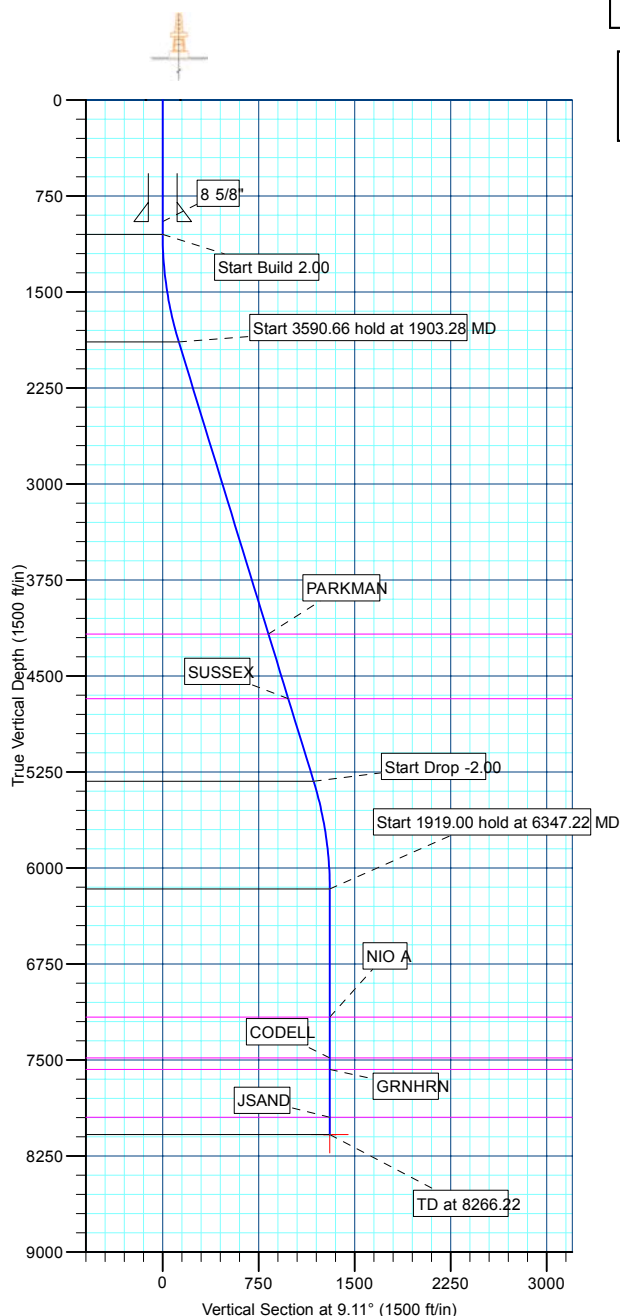
CASING DETAILS			
TVD	MD	Name	Size
950.00	950.00	8 5/8"	8.62

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
1903.28	17.07	9.11	1890.72	124.55	19.97	2.00	9.11	126.14	Start 3590.66 hold at 1903.28 MD
5493.94	17.07	9.11	5323.28	1165.00	186.78	0.00	0.00	1179.88	Start Drop -2.00
6347.22	0.00	0.00	6164.00	1289.55	206.75	2.00	180.00	1306.01	Start 1919.00 hold at 6347.22 MD
8266.22	0.00	0.00	8083.00	1289.55	206.75	0.00	0.00	1306.01	TD at 8266.22

WELLBORE TARGET DETAILS (MAP CO-ORDINATES AND LAT/LONG)						
Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
PBHL	8083.00	1289.55	206.75	40° 5' 35.084 N	104° 46' 28.373 W	Circle (Radius: 50.00)

WELL DETAILS: P_COTTONWOOD 9-33						
+N/-S	+E/-W	Northing	Ground Level: Easting	4987.00 Latitude	Longitude	Slot
0.00	0.00	1276292.27	3202762.12	40° 5' 22.340 N	104° 46' 31.033 W	

LEGEND	
P_COTTONWOOD 24-33, P_COTTONWOOD 24-33, PLAN #1 2-18-10 RHS V0	
P_COTTONWOOD 39-33, P_COTTONWOOD 39-33, PLAN #1 2-18-10 RHS V0	
PLAN #1 2-18-10 RHS	



Plan: PLAN #1 2-18-10 RHS (P_COTTONWOOD 9-33/P_COTTONWOOD 9-33)

Created By: Robert H. Scott Date: 12:24, February 18 2010

Database:	EDM 2003.21 Single User Db	Local Co-ordinate Reference:	Well P_COTTONWOOD 9-33
Company:	US ROCKIES REGION PLANNING	TVD Reference:	WELL @ 5002.00ft (Original Well Elev)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	WELL @ 5002.00ft (Original Well Elev)
Site:	WELD_COTTONWOOD 16-33 PAD	North Reference:	True
Well:	P_COTTONWOOD 9-33	Survey Calculation Method:	Minimum Curvature
Wellbore:	P_COTTONWOOD 9-33		
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 16-33 PAD, SECTION 33 T2N R66W											
Site Position:						Northing:			1,276,292.27 ft			Latitude:			40° 5' 22.340 N		
From:			Lat/Long			Easting:			3,202,762.12 ft			Longitude:			104° 46' 31.033 W		
Position Uncertainty:			0.00 ft			Slot Radius:			in			Grid Convergence:			0.47 °		

Well	P_COTTONWOOD 9-33					
Well Position	+N/-S	0.00 ft	Northing:	1,276,292.27 ft	Latitude:	40° 5' 22.340 N
	+E/-W	0.00 ft	Easting:	3,202,762.12 ft	Longitude:	104° 46' 31.033 W
Position Uncertainty		0.00 ft	Wellhead Elevation:	ft	Ground Level:	4,987.00 ft

Wellbore	P_COTTONWOOD 9-33				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	2/18/2010	9.02	66.84	53,105

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	9.11

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	
1,903.28	17.07	9.11	1,890.72	124.55	19.97	2.00	2.00	0.00	9.11	
5,493.94	17.07	9.11	5,323.28	1,165.00	186.78	0.00	0.00	0.00	0.00	
6,347.22	0.00	0.00	6,164.00	1,289.55	206.75	2.00	-2.00	0.00	180.00	
8,266.22	0.00	0.00	8,083.00	1,289.55	206.75	0.00	0.00	0.00	0.00	PBHL_COTTONW

Database:	EDM 2003.21 Single User Db	Local Co-ordinate Reference:	Well P_COTTONWOOD 9-33
Company:	US ROCKIES REGION PLANNING	TVD Reference:	WELL @ 5002.00ft (Original Well Elev)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	WELL @ 5002.00ft (Original Well Elev)
Site:	WELD_COTTONWOOD 16-33 PAD	North Reference:	True
Well:	P_COTTONWOOD 9-33	Survey Calculation Method:	Minimum Curvature
Wellbore:	P_COTTONWOOD 9-33		
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	9.11	1,100.00	0.43	0.07	0.44	2.00	2.00	0.00
1,200.00	3.00	9.11	1,199.93	3.88	0.62	3.93	2.00	2.00	0.00
1,300.00	5.00	9.11	1,299.68	10.76	1.73	10.90	2.00	2.00	0.00
1,400.00	7.00	9.11	1,399.13	21.08	3.38	21.35	2.00	2.00	0.00
1,500.00	9.00	9.11	1,498.15	34.83	5.58	35.27	2.00	2.00	0.00
1,600.00	11.00	9.11	1,596.63	51.97	8.33	52.63	2.00	2.00	0.00
1,700.00	13.00	9.11	1,694.44	72.50	11.62	73.42	2.00	2.00	0.00
1,800.00	15.00	9.11	1,791.46	96.38	15.45	97.62	2.00	2.00	0.00
1,900.00	17.00	9.11	1,887.58	123.60	19.82	125.18	2.00	2.00	0.00
Start 3590.66 hold at 1903.28 MD									
1,903.28	17.07	9.11	1,890.72	124.55	19.97	126.14	2.00	2.00	0.00
2,000.00	17.07	9.11	1,983.18	152.57	24.46	154.52	0.00	0.00	0.00
2,100.00	17.07	9.11	2,078.78	181.55	29.11	183.87	0.00	0.00	0.00
2,200.00	17.07	9.11	2,174.37	210.53	33.75	213.22	0.00	0.00	0.00
2,300.00	17.07	9.11	2,269.97	239.50	38.40	242.56	0.00	0.00	0.00
2,400.00	17.07	9.11	2,365.57	268.48	43.05	271.91	0.00	0.00	0.00
2,500.00	17.07	9.11	2,461.17	297.46	47.69	301.26	0.00	0.00	0.00
2,600.00	17.07	9.11	2,556.76	326.43	52.34	330.60	0.00	0.00	0.00
2,700.00	17.07	9.11	2,652.36	355.41	56.98	359.95	0.00	0.00	0.00
2,800.00	17.07	9.11	2,747.96	384.39	61.63	389.30	0.00	0.00	0.00
2,900.00	17.07	9.11	2,843.55	413.36	66.27	418.64	0.00	0.00	0.00
3,000.00	17.07	9.11	2,939.15	442.34	70.92	447.99	0.00	0.00	0.00
3,100.00	17.07	9.11	3,034.75	471.32	75.57	477.34	0.00	0.00	0.00
3,200.00	17.07	9.11	3,130.34	500.29	80.21	506.68	0.00	0.00	0.00
3,300.00	17.07	9.11	3,225.94	529.27	84.86	536.03	0.00	0.00	0.00
3,400.00	17.07	9.11	3,321.54	558.25	89.50	565.38	0.00	0.00	0.00
3,500.00	17.07	9.11	3,417.13	587.22	94.15	594.72	0.00	0.00	0.00
3,600.00	17.07	9.11	3,512.73	616.20	98.79	624.07	0.00	0.00	0.00
3,700.00	17.07	9.11	3,608.33	645.18	103.44	653.42	0.00	0.00	0.00
3,800.00	17.07	9.11	3,703.93	674.15	108.09	682.76	0.00	0.00	0.00
3,900.00	17.07	9.11	3,799.52	703.13	112.73	712.11	0.00	0.00	0.00
4,000.00	17.07	9.11	3,895.12	732.11	117.38	741.46	0.00	0.00	0.00
4,100.00	17.07	9.11	3,990.72	761.08	122.02	770.80	0.00	0.00	0.00
4,200.00	17.07	9.11	4,086.31	790.06	126.67	800.15	0.00	0.00	0.00
PARKMAN									
4,289.63	17.07	9.11	4,172.00	816.03	130.83	826.45	0.00	0.00	0.00
4,300.00	17.07	9.11	4,181.91	819.04	131.31	829.50	0.00	0.00	0.00
4,400.00	17.07	9.11	4,277.51	848.01	135.96	858.84	0.00	0.00	0.00
4,500.00	17.07	9.11	4,373.10	876.99	140.61	888.19	0.00	0.00	0.00
4,600.00	17.07	9.11	4,468.70	905.96	145.25	917.54	0.00	0.00	0.00
4,700.00	17.07	9.11	4,564.30	934.94	149.90	946.88	0.00	0.00	0.00
4,800.00	17.07	9.11	4,659.90	963.92	154.54	976.23	0.00	0.00	0.00
SUSSEX									
4,818.94	17.07	9.11	4,678.00	969.41	155.42	981.79	0.00	0.00	0.00
4,900.00	17.07	9.11	4,755.49	992.89	159.19	1,005.58	0.00	0.00	0.00
5,000.00	17.07	9.11	4,851.09	1,021.87	163.84	1,034.92	0.00	0.00	0.00
5,100.00	17.07	9.11	4,946.69	1,050.85	168.48	1,064.27	0.00	0.00	0.00
5,200.00	17.07	9.11	5,042.28	1,079.82	173.13	1,093.61	0.00	0.00	0.00
5,300.00	17.07	9.11	5,137.88	1,108.80	177.77	1,122.96	0.00	0.00	0.00
5,400.00	17.07	9.11	5,233.48	1,137.78	182.42	1,152.31	0.00	0.00	0.00
Start Drop -2.00									

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Company:	US ROCKIES REGION PLANNING	TVD Reference:	WELL @ 5002.00ft (Original Well Elev)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	WELL @ 5002.00ft (Original Well Elev)
Site:	WELD_COTTONWOOD 16-33 PAD	North Reference:	True
Well:	P_COTTONWOOD 9-33	Survey Calculation Method:	Minimum Curvature
Wellbore:	P_COTTONWOOD 9-33		
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)
5,493.94	17.07	9.11	5,323.28	1,165.00	186.78	1,179.88	0.00	0.00	0.00
5,500.00	16.94	9.11	5,329.08	1,166.75	187.06	1,181.65	2.00	-2.00	0.00
5,600.00	14.94	9.11	5,425.22	1,193.87	191.41	1,209.12	2.00	-2.00	0.00
5,700.00	12.94	9.11	5,522.27	1,217.66	195.23	1,233.21	2.00	-2.00	0.00
5,800.00	10.94	9.11	5,620.10	1,238.10	198.50	1,253.91	2.00	-2.00	0.00
5,900.00	8.94	9.11	5,718.59	1,255.15	201.24	1,271.18	2.00	-2.00	0.00
6,000.00	6.94	9.11	5,817.63	1,268.79	203.42	1,285.00	2.00	-2.00	0.00
6,100.00	4.94	9.11	5,917.09	1,279.02	205.06	1,295.35	2.00	-2.00	0.00
6,200.00	2.94	9.11	6,016.84	1,285.81	206.15	1,302.23	2.00	-2.00	0.00
6,300.00	0.94	9.11	6,116.78	1,289.16	206.69	1,305.63	2.00	-2.00	0.00
Start 1919.00 hold at 6347.22 MD									
6,347.22	0.00	0.00	6,164.00	1,289.55	206.75	1,306.01	2.00	-2.00	0.00
6,400.00	0.00	0.00	6,216.78	1,289.55	206.75	1,306.01	0.00	0.00	0.00
6,500.00	0.00	0.00	6,316.78	1,289.55	206.75	1,306.01	0.00	0.00	0.00
6,600.00	0.00	0.00	6,416.78	1,289.55	206.75	1,306.01	0.00	0.00	0.00
6,700.00	0.00	0.00	6,516.78	1,289.55	206.75	1,306.01	0.00	0.00	0.00
6,800.00	0.00	0.00	6,616.78	1,289.55	206.75	1,306.01	0.00	0.00	0.00
6,900.00	0.00	0.00	6,716.78	1,289.55	206.75	1,306.01	0.00	0.00	0.00
7,000.00	0.00	0.00	6,816.78	1,289.55	206.75	1,306.01	0.00	0.00	0.00
7,100.00	0.00	0.00	6,916.78	1,289.55	206.75	1,306.01	0.00	0.00	0.00
7,200.00	0.00	0.00	7,016.78	1,289.55	206.75	1,306.01	0.00	0.00	0.00
7,300.00	0.00	0.00	7,116.78	1,289.55	206.75	1,306.01	0.00	0.00	0.00
NIO A									
7,347.22	0.00	0.00	7,164.00	1,289.55	206.75	1,306.01	0.00	0.00	0.00
7,400.00	0.00	0.00	7,216.78	1,289.55	206.75	1,306.01	0.00	0.00	0.00
7,500.00	0.00	0.00	7,316.78	1,289.55	206.75	1,306.01	0.00	0.00	0.00
7,600.00	0.00	0.00	7,416.78	1,289.55	206.75	1,306.01	0.00	0.00	0.00
CODELL									
7,667.22	0.00	0.00	7,484.00	1,289.55	206.75	1,306.01	0.00	0.00	0.00
7,700.00	0.00	0.00	7,516.78	1,289.55	206.75	1,306.01	0.00	0.00	0.00
GRNHRN									
7,757.22	0.00	0.00	7,574.00	1,289.55	206.75	1,306.01	0.00	0.00	0.00
7,800.00	0.00	0.00	7,616.78	1,289.55	206.75	1,306.01	0.00	0.00	0.00
7,900.00	0.00	0.00	7,716.78	1,289.55	206.75	1,306.01	0.00	0.00	0.00
8,000.00	0.00	0.00	7,816.78	1,289.55	206.75	1,306.01	0.00	0.00	0.00
8,100.00	0.00	0.00	7,916.78	1,289.55	206.75	1,306.01	0.00	0.00	0.00

Design Targets

Target Name

- hit/miss target	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
- Shape									
PBHL_COTTONWOC	0.00	0.00	8,083.00	1,289.55	206.75	1,277,583.46	3,202,958.33	40° 5' 35.084 N	104° 46' 28.373 W
- plan misses target center by 166.22ft at 8100.00ft MD (7916.78 TVD, 1289.55 N, 206.75 E)									
- Circle (radius 50.00)									

Database:	EDM 2003.21 Single User Db	Local Co-ordinate Reference:	Well P_COTTONWOOD 9-33
Company:	US ROCKIES REGION PLANNING	TVD Reference:	WELL @ 5002.00ft (Original Well Elev)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	WELL @ 5002.00ft (Original Well Elev)
Site:	WELD_COTTONWOOD 16-33 PAD	North Reference:	True
Well:	P_COTTONWOOD 9-33	Survey Calculation Method:	Minimum Curvature
Wellbore:	P_COTTONWOOD 9-33		
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 (°)	
4,289.63	4,172.00	PARKMAN				
4,818.94	4,678.00	SUSSEX				
7,347.22	7,164.00	NIO A				
7,667.22	7,484.00	CODELL				
7,757.22	7,574.00	GRNHRN				
8,131.22	7,948.00	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	
1,903.28	1,890.72	124.55	19.97	Start 3590.66 hold at 1903.28 MD	
5,493.94	5,323.28	1,165.00	186.78	Start Drop -2.00	
6,347.22	6,164.00	1,289.55	206.75	Start 1919.00 hold at 6347.22 MD	
8,266.22	8,083.00	1,289.55	206.75	TD at 8266.22	



US ROCKIES REGION PLANNING

**COLORADO NORTHERN ZONE - 83
WELD_COTTONWOOD 16-33 PAD
P_COTTONWOOD 9-33**

**P_COTTONWOOD 9-33
PLAN #1 2-18-10 RHS**

Anticollision Report

18 February, 2010



Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_COTTONWOOD 9-33
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	WELL @ 5002.00ft (Original Well Elev)
Reference Site:	WELD_COTTONWOOD 16-33 PAD	MD Reference:	WELL @ 5002.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_COTTONWOOD 9-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 9-33	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	8,266.22	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 16-33 PAD						
P_COTTONWOOD 24-33 - P_COTTONWOOD 24-33 - F	1,050.00	1,050.00	15.95	11.49	3.574	CC
P_COTTONWOOD 24-33 - P_COTTONWOOD 24-33 - F	1,100.00	1,099.91	16.15	11.47	3.447	ES, SF
P_COTTONWOOD 39-33 - P_COTTONWOOD 39-33 - F	1,050.00	1,050.00	16.23	11.77	3.637	CC, ES
P_COTTONWOOD 39-33 - P_COTTONWOOD 39-33 - F	1,100.00	1,099.78	16.50	11.82	3.524	SF

Offset Design WELD_COTTONWOOD 16-33 PAD - P_COTTONWOOD 24-33 - P_COTTONWOOD 24-33 - PLAN #1												
Survey Program: 0-MWD												
Reference		Offset		Semi Major Axis		Distance		Offset Wellbore Centre		Minimum Separation		Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	+N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Separation Factor	
0.00	0.00	0.00	0.00	0.00	0.00	-90.03	-0.01	-15.95	15.95			
100.00	100.00	100.00	100.00	0.10	0.10	-90.03	-0.01	-15.95	15.95	15.76	0.19	83.474
200.00	200.00	200.00	200.00	0.32	0.32	-90.03	-0.01	-15.95	15.95	15.31	0.64	24.896
300.00	300.00	300.00	300.00	0.55	0.55	-90.03	-0.01	-15.95	15.95	14.86	1.09	14.629
400.00	400.00	400.00	400.00	0.77	0.77	-90.03	-0.01	-15.95	15.95	14.41	1.54	10.358
500.00	500.00	500.00	500.00	0.99	0.99	-90.03	-0.01	-15.95	15.95	13.96	1.99	8.017
600.00	600.00	600.00	600.00	1.22	1.22	-90.03	-0.01	-15.95	15.95	13.51	2.44	6.539
700.00	700.00	700.00	700.00	1.44	1.44	-90.03	-0.01	-15.95	15.95	13.06	2.89	5.522
800.00	800.00	800.00	800.00	1.67	1.67	-90.03	-0.01	-15.95	15.95	12.61	3.34	4.778
900.00	900.00	900.00	900.00	1.89	1.89	-90.03	-0.01	-15.95	15.95	12.16	3.79	4.211
1,000.00	1,000.00	1,000.00	1,000.00	2.12	2.12	-90.03	-0.01	-15.95	15.95	11.71	4.24	3.764
1,050.00	1,050.00	1,050.00	1,050.00	2.23	2.23	-90.03	-0.01	-15.95	15.95	11.49	4.46	3.574 CC
1,100.00	1,100.00	1,099.91	1,099.91	2.34	2.34	-99.19	0.41	-16.08	16.15	11.47	4.69	3.447 ES, SF
1,200.00	1,199.93	1,199.72	1,199.65	2.57	2.57	-99.58	3.71	-17.15	17.78	12.65	5.13	3.465
1,300.00	1,299.68	1,299.47	1,299.16	2.79	2.79	-100.16	10.32	-19.29	21.02	15.44	5.58	3.768
1,400.00	1,399.13	1,399.12	1,398.26	3.03	3.03	-100.74	20.21	-22.48	25.89	19.85	6.05	4.282
1,500.00	1,498.15	1,498.64	1,496.80	3.28	3.28	-101.22	33.35	-26.73	32.38	25.83	6.55	4.944
1,600.00	1,596.63	1,597.98	1,594.64	3.56	3.56	-101.57	49.71	-32.02	40.47	33.36	7.10	5.696
1,700.00	1,694.44	1,697.11	1,691.62	3.88	3.88	-101.81	69.24	-38.33	50.14	42.41	7.73	6.488
1,800.00	1,791.46	1,795.99	1,787.59	4.25	4.25	-101.96	91.89	-45.66	61.40	52.96	8.44	7.275
1,903.28	1,890.72	1,897.83	1,885.51	4.68	4.68	-102.03	118.50	-54.26	74.66	65.38	9.28	8.047
2,000.00	1,983.18	1,992.93	1,976.00	5.13	5.14	-101.28	146.32	-63.25	88.23	78.07	10.16	8.686
2,100.00	2,078.78	2,090.84	2,068.09	5.62	5.67	-98.92	177.93	-73.47	103.20	92.06	11.14	9.264

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 9-33
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	WELL @ 5002.00ft (Original Well Elev)
Reference Site:	WELD_COTTONWOOD 16-33 PAD	MD Reference:	WELL @ 5002.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_COTTONWOOD 9-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 9-33	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 2-18-10 RHS	Offset TVD Reference:	Offset Datum

Offset Design WELD_COTTONWOOD 16-33 PAD - P_COTTONWOOD 24-33 - P_COTTONWOOD 24-33 - 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 Tooface (")	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
2,200.00	2,174.37	2,188.10	2,158.40	6.12	6.26	-95.64	212.28	-84.58	119.42	107.25	12.17	9.810	
2,300.00	2,269.97	2,284.51	2,246.65	6.64	6.91	-91.88	249.19	-96.51	137.25	124.02	13.23	10.373	
2,400.00	2,365.57	2,379.85	2,332.60	7.16	7.62	-87.95	288.45	-109.20	157.05	142.76	14.29	10.988	
2,500.00	2,461.17	2,476.47	2,418.76	7.70	8.37	-84.25	330.07	-122.66	178.55	163.20	15.35	11.632	
2,600.00	2,556.76	2,573.54	2,505.28	8.24	9.16	-81.32	371.92	-136.19	200.65	184.25	16.40	12.232	
2,700.00	2,652.36	2,670.60	2,591.81	8.79	9.96	-78.97	413.77	-149.72	223.15	205.70	17.45	12.786	
2,800.00	2,747.96	2,767.67	2,678.34	9.35	10.76	-77.05	455.62	-163.25	245.95	227.45	18.50	13.294	
2,900.00	2,843.55	2,864.73	2,764.87	9.91	11.58	-75.46	497.47	-176.78	268.96	249.41	19.55	13.758	
3,000.00	2,939.15	2,961.80	2,851.39	10.47	12.40	-74.12	539.32	-190.31	292.14	271.54	20.60	14.182	
3,100.00	3,034.75	3,058.86	2,937.92	11.03	13.23	-72.97	581.17	-203.84	315.45	293.80	21.65	14.571	
3,200.00	3,130.34	3,155.93	3,024.45	11.60	14.07	-71.98	623.03	-217.37	338.87	316.17	22.70	14.926	
3,300.00	3,225.94	3,252.99	3,110.98	12.16	14.90	-71.12	664.88	-230.90	362.37	338.61	23.76	15.253	
3,400.00	3,321.54	3,350.05	3,197.50	12.73	15.75	-70.37	706.73	-244.43	385.93	361.12	24.81	15.554	
3,500.00	3,417.13	3,447.12	3,284.03	13.30	16.59	-69.70	748.58	-257.96	409.55	383.68	25.87	15.831	
3,600.00	3,512.73	3,544.18	3,370.56	13.88	17.43	-69.10	790.43	-271.49	433.22	406.29	26.93	16.087	
3,700.00	3,608.33	3,641.25	3,457.08	14.45	18.28	-68.57	832.28	-285.02	456.93	428.94	27.99	16.325	
3,800.00	3,703.93	3,738.31	3,543.61	15.03	19.13	-68.08	874.14	-298.55	480.67	451.62	29.05	16.545	
3,900.00	3,799.52	3,835.38	3,630.14	15.60	19.98	-67.65	915.99	-312.08	504.45	474.33	30.12	16.751	
4,000.00	3,895.12	3,932.44	3,716.67	16.18	20.84	-67.25	957.84	-325.61	528.24	497.06	31.18	16.942	
4,100.00	3,990.72	4,029.51	3,803.19	16.75	21.69	-66.89	999.69	-339.14	552.06	519.82	32.24	17.121	
4,200.00	4,086.31	4,126.57	3,889.72	17.33	22.54	-66.55	1,041.54	-352.67	575.90	542.59	33.31	17.289	
4,300.00	4,181.91	4,223.64	3,976.25	17.91	23.40	-66.25	1,083.39	-366.20	599.76	565.38	34.38	17.446	
4,400.00	4,277.51	4,320.70	4,062.78	18.49	24.26	-65.96	1,125.24	-379.73	623.62	588.18	35.45	17.594	
4,500.00	4,373.10	4,417.77	4,149.30	19.07	25.11	-65.70	1,167.10	-393.26	647.51	610.99	36.52	17.733	
4,600.00	4,468.70	4,514.83	4,235.83	19.65	25.97	-65.46	1,208.95	-406.79	671.40	633.82	37.58	17.864	
4,700.00	4,564.30	4,611.90	4,322.36	20.23	26.83	-65.23	1,250.80	-420.32	695.31	656.65	38.65	17.988	
4,800.00	4,659.90	4,708.96	4,408.89	20.81	27.69	-65.02	1,292.65	-433.85	719.22	679.50	39.73	18.105	
4,900.00	4,755.49	4,806.03	4,495.41	21.39	28.55	-64.82	1,334.50	-447.39	743.15	702.35	40.80	18.216	
5,000.00	4,851.09	4,903.09	4,581.94	21.97	29.41	-64.64	1,376.35	-460.92	767.08	725.21	41.87	18.321	
5,100.00	4,946.69	5,000.16	4,668.47	22.56	30.27	-64.46	1,418.21	-474.45	791.02	748.08	42.94	18.421	
5,200.00	5,042.28	5,097.22	4,755.00	23.14	31.13	-64.30	1,460.06	-487.98	814.97	770.95	44.01	18.516	
5,300.00	5,137.88	5,194.29	4,841.52	23.72	31.99	-64.14	1,501.91	-501.51	838.92	793.83	45.09	18.606	
5,400.00	5,233.48	5,291.57	4,931.42	24.30	32.82	-64.04	1,552.92	-518.00	861.67	815.42	46.25	18.630	
5,493.94	5,323.28	5,437.34	5,062.08	24.85	33.68	-64.16	1,598.90	-532.86	879.99	832.63	47.36	18.580	
5,500.00	5,329.08	5,445.17	5,069.33	24.88	33.72	-64.20	1,601.73	-533.78	881.07	833.64	47.44	18.574	
5,600.00	5,425.22	5,575.14	5,190.72	25.31	34.46	-64.72	1,645.90	-548.06	897.85	849.31	48.54	18.495	
5,700.00	5,522.27	5,706.20	5,315.12	25.71	35.13	-65.17	1,685.08	-560.73	912.61	863.06	49.55	18.418	
5,800.00	5,620.10	5,838.22	5,442.21	26.06	35.72	-65.56	1,719.04	-571.70	925.30	874.85	50.44	18.344	
5,900.00	5,718.59	5,971.06	5,571.63	26.38	36.24	-65.87	1,747.56	-580.92	935.86	884.64	51.22	18.271	
6,000.00	5,817.63	6,104.60	5,702.96	26.65	36.68	-66.13	1,770.43	-588.32	944.27	892.39	51.88	18.200	
6,100.00	5,917.09	6,238.66	5,835.80	26.87	37.02	-66.32	1,787.52	-593.84	950.49	898.07	52.42	18.133	
6,200.00	6,016.84	6,373.09	5,969.71	27.05	37.28	-66.46	1,798.69	-597.45	954.49	901.66	52.83	18.067	
6,300.00	6,116.78	6,507.72	6,104.22	27.19	37.45	-66.53	1,803.88	-599.13	956.27	903.15	53.12	18.002	
6,347.22	6,164.00	6,567.51	6,164.00	27.24	37.50	-67.44	1,804.28	-599.26	956.35	903.14	53.21	17.974	
6,400.00	6,216.78	6,620.29	6,216.78	27.29	37.54	-67.44	1,804.28	-599.26	956.35	903.04	53.31	17.938	
6,500.00	6,316.78	6,720.29	6,316.78	27.40	37.61	-67.44	1,804.28	-599.26	956.35	902.83	53.52	17.868	
6,600.00	6,416.78	6,820.29	6,416.78	27.50	37.69	-67.44	1,804.28	-599.26	956.35	902.61	53.74	17.797	
6,700.00	6,516.78	6,920.29	6,516.78	27.61	37.76	-67.44	1,804.28	-599.26	956.35	902.40	53.95	17.726	
6,800.00	6,616.78	7,020.29	6,616.78	27.72	37.84	-67.44	1,804.28	-599.26	956.35	902.18	54.17	17.654	
6,900.00	6,716.78	7,120.29	6,716.78	27.83	37.92	-67.44	1,804.28	-599.26	956.35	901.95	54.39	17.582	
7,000.00	6,816.78	7,220.29	6,816.78	27.94	38.00	-67.44	1,804.28	-599.26	956.35	901.73	54.62	17.510	
7,100.00	6,916.78	7,320.29	6,916.78	28.05	38.09	-67.44	1,804.28	-599.26	956.35	901.50	54.85	17.437	

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 9-33
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	WELL @ 5002.00ft (Original Well Elev)
Reference Site:	WELD_COTTONWOOD 16-33 PAD	MD Reference:	WELL @ 5002.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_COTTONWOOD 9-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 9-33	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 2-18-10 RHS	Offset TVD Reference:	Offset Datum

Offset Design WELD_COTTONWOOD 16-33 PAD - P_COTTONWOOD 24-33 - P_COTTONWOOD 24-33 - 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
7,200.00	7,016.78	7,420.29	7,016.78	28.17	38.17	-57.44	1,804.28	-599.26	956.35	901.27	55.08	17.364	
7,300.00	7,116.78	7,520.29	7,116.78	28.28	38.25	-57.44	1,804.28	-599.26	956.35	901.04	55.31	17.291	
7,400.00	7,216.78	7,620.29	7,216.78	28.40	38.34	-57.44	1,804.28	-599.26	956.35	900.80	55.54	17.218	
7,500.00	7,316.78	7,720.29	7,316.78	28.52	38.42	-57.44	1,804.28	-599.26	956.35	900.57	55.78	17.144	
7,600.00	7,416.78	7,820.29	7,416.78	28.64	38.51	-57.44	1,804.28	-599.26	956.35	900.33	56.02	17.071	
7,700.00	7,516.78	7,920.29	7,516.78	28.76	38.60	-57.44	1,804.28	-599.26	956.35	900.08	56.27	16.997	
7,800.00	7,616.78	8,020.29	7,616.78	28.88	38.69	-57.44	1,804.28	-599.26	956.35	899.84	56.51	16.923	
7,900.00	7,716.78	8,120.29	7,716.78	29.00	38.78	-57.44	1,804.28	-599.26	956.35	899.59	56.76	16.849	
8,000.00	7,816.78	8,220.29	7,816.78	29.13	38.87	-57.44	1,804.28	-599.26	956.35	899.34	57.01	16.775	
8,100.00	7,916.78	8,320.29	7,916.78	29.25	38.97	-57.44	1,804.28	-599.26	956.35	899.08	57.26	16.701	
8,200.00	8,016.78	8,420.29	8,016.78	29.38	39.06	-57.44	1,804.28	-599.26	956.35	898.83	57.52	16.627	
8,239.75	8,056.53	8,460.03	8,056.53	29.43	39.10	-57.44	1,804.28	-599.26	956.35	898.73	57.62	16.597	
8,266.22	8,083.00	8,475.51	8,072.00	29.46	39.11	-57.44	1,804.28	-599.26	956.41	898.74	57.68	16.582	

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_COTTONWOOD 9-33
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	WELL @ 5002.00ft (Original Well Elev)
Reference Site:	WELD_COTTONWOOD 16-33 PAD	MD Reference:	WELL @ 5002.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_COTTONWOOD 9-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 9-33	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 2-18-10 RHS	Offset TVD Reference:	Offset Datum

Offset Design WELD_COTTONWOOD 16-33 PAD - P_COTTONWOOD 39-33 - P_COTTONWOOD 39-33 - 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	90.03	-0.01	16.23	16.23				
100.00	100.00	100.00	100.00	0.10	0.10	90.03	-0.01	16.23	16.23	16.04	0.19	84.938	
200.00	200.00	200.00	200.00	0.32	0.32	90.03	-0.01	16.23	16.23	15.59	0.64	25.333	
300.00	300.00	300.00	300.00	0.55	0.55	90.03	-0.01	16.23	16.23	15.14	1.09	14.886	
400.00	400.00	400.00	400.00	0.77	0.77	90.03	-0.01	16.23	16.23	14.69	1.54	10.540	
500.00	500.00	500.00	500.00	0.99	0.99	90.03	-0.01	16.23	16.23	14.24	1.99	8.158	
600.00	600.00	600.00	600.00	1.22	1.22	90.03	-0.01	16.23	16.23	13.79	2.44	6.654	
700.00	700.00	700.00	700.00	1.44	1.44	90.03	-0.01	16.23	16.23	13.34	2.89	5.619	
800.00	800.00	800.00	800.00	1.67	1.67	90.03	-0.01	16.23	16.23	12.89	3.34	4.862	
900.00	900.00	900.00	900.00	1.89	1.89	90.03	-0.01	16.23	16.23	12.44	3.79	4.285	
1,000.00	1,000.00	1,000.00	1,000.00	2.12	2.12	90.03	-0.01	16.23	16.23	11.99	4.24	3.830	
1,050.00	1,050.00	1,050.00	1,050.00	2.23	2.23	90.03	-0.01	16.23	16.23	11.77	4.46	3.637 CC, ES	
1,100.00	1,100.00	1,099.78	1,099.77	2.34	2.34	81.48	0.26	16.57	16.50	11.82	4.68	3.524 SF	
1,200.00	1,199.93	1,199.28	1,199.21	2.57	2.56	85.32	2.39	19.28	18.74	13.62	5.12	3.660	
1,300.00	1,299.68	1,298.64	1,298.33	2.79	2.78	90.74	6.66	24.71	23.38	17.82	5.56	4.205	
1,400.00	1,399.13	1,397.77	1,396.92	3.03	3.01	95.67	13.02	32.80	30.59	24.57	6.02	5.081	
1,500.00	1,498.15	1,496.57	1,494.76	3.28	3.26	99.43	21.46	43.54	40.38	33.87	6.51	6.202	
1,600.00	1,596.63	1,595.22	1,591.96	3.56	3.54	102.25	31.86	56.77	52.66	45.61	7.05	7.467	
1,700.00	1,694.44	1,694.18	1,689.33	3.88	3.85	106.20	42.80	70.69	66.31	58.66	7.65	8.671	
1,800.00	1,791.46	1,792.82	1,786.38	4.25	4.17	111.02	53.71	84.57	81.39	73.10	8.29	9.816	
1,903.28	1,890.72	1,894.23	1,886.15	4.68	4.51	116.23	64.92	98.83	98.97	89.98	8.99	11.005	
2,000.00	1,983.18	1,988.93	1,979.32	5.13	4.84	120.61	75.38	112.15	116.88	107.20	9.68	12.069	
2,100.00	2,078.78	2,086.84	2,075.65	5.62	5.19	123.92	86.21	125.92	135.91	125.50	10.41	13.052	
2,200.00	2,174.37	2,184.75	2,171.98	6.12	5.54	126.41	97.03	139.69	155.27	144.12	11.15	13.922	
2,300.00	2,269.97	2,282.66	2,268.32	6.64	5.90	128.35	107.86	153.46	174.85	162.95	11.90	14.691	
2,400.00	2,365.57	2,380.57	2,364.65	7.16	6.26	129.90	118.68	167.23	194.58	181.93	12.66	15.372	
2,500.00	2,461.17	2,478.48	2,460.98	7.70	6.63	131.16	129.51	181.00	214.43	201.01	13.42	15.977	
2,600.00	2,556.76	2,576.40	2,557.31	8.24	7.00	132.21	140.33	194.77	234.36	220.17	14.19	16.517	
2,700.00	2,652.36	2,674.31	2,653.64	8.79	7.37	133.09	151.15	208.54	254.35	239.39	14.96	17.001	
2,800.00	2,747.96	2,772.22	2,749.98	9.35	7.74	133.85	161.98	222.32	274.39	258.65	15.74	17.436	
2,900.00	2,843.55	2,870.13	2,846.31	9.91	8.12	134.50	172.80	236.09	294.47	277.96	16.52	17.829	
3,000.00	2,939.15	2,968.04	2,942.64	10.47	8.49	135.07	183.63	249.86	314.59	297.29	17.30	18.186	
3,100.00	3,034.75	3,065.95	3,038.97	11.03	8.87	135.57	194.45	263.63	334.73	316.64	18.08	18.511	
3,200.00	3,130.34	3,163.87	3,135.30	11.60	9.25	136.01	205.27	277.40	354.89	336.02	18.87	18.807	
3,300.00	3,225.94	3,261.78	3,231.64	12.16	9.63	136.41	216.10	291.17	375.07	355.41	19.66	19.080	
3,400.00	3,321.54	3,359.69	3,327.97	12.73	10.02	136.76	226.92	304.94	395.26	374.81	20.45	19.330	
3,500.00	3,417.13	3,457.60	3,424.30	13.30	10.40	137.09	237.75	318.71	415.47	394.23	21.24	19.561	
3,600.00	3,512.73	3,555.51	3,520.63	13.88	10.78	137.38	248.57	332.48	435.69	413.66	22.03	19.774	
3,700.00	3,608.33	3,653.42	3,616.96	14.45	11.17	137.64	259.39	346.25	455.92	433.09	22.83	19.972	
3,800.00	3,703.93	3,751.33	3,713.30	15.03	11.55	137.89	270.22	360.03	476.16	452.53	23.62	20.156	
3,900.00	3,799.52	3,849.25	3,809.63	15.60	11.94	138.11	281.04	373.80	496.40	471.98	24.42	20.328	
4,000.00	3,895.12	3,947.16	3,905.96	16.18	12.33	138.31	291.87	387.57	516.65	491.44	25.22	20.489	
4,100.00	3,990.72	4,045.07	4,002.29	16.75	12.71	138.50	302.69	401.34	536.91	510.90	26.01	20.639	
4,200.00	4,086.31	4,142.98	4,098.63	17.33	13.10	138.68	313.51	415.11	557.18	530.36	26.81	20.780	
4,300.00	4,181.91	4,240.89	4,194.96	17.91	13.49	138.84	324.34	428.88	577.44	549.83	27.61	20.912	
4,400.00	4,277.51	4,338.80	4,291.29	18.49	13.88	139.00	335.16	442.65	597.72	569.30	28.41	21.037	
4,500.00	4,373.10	4,436.72	4,387.62	19.07	14.26	139.14	345.99	456.42	617.99	588.78	29.21	21.154	
4,600.00	4,468.70	4,534.63	4,483.95	19.65	14.65	139.27	356.81	470.19	638.27	608.26	30.02	21.265	
4,700.00	4,564.30	4,632.54	4,580.29	20.23	15.04	139.40	367.63	483.96	658.55	627.74	30.82	21.370	
4,800.00	4,659.90	4,730.45	4,676.62	20.81	15.43	139.52	378.46	497.74	678.84	647.22	31.62	21.470	
4,900.00	4,755.49	4,828.36	4,772.95	21.39	15.82	139.63	389.28	511.51	699.13	666.71	32.42	21.564	
5,000.00	4,851.09	4,926.27	4,869.28	21.97	16.21	139.73	400.11	525.28	719.42	686.20	33.22	21.653	

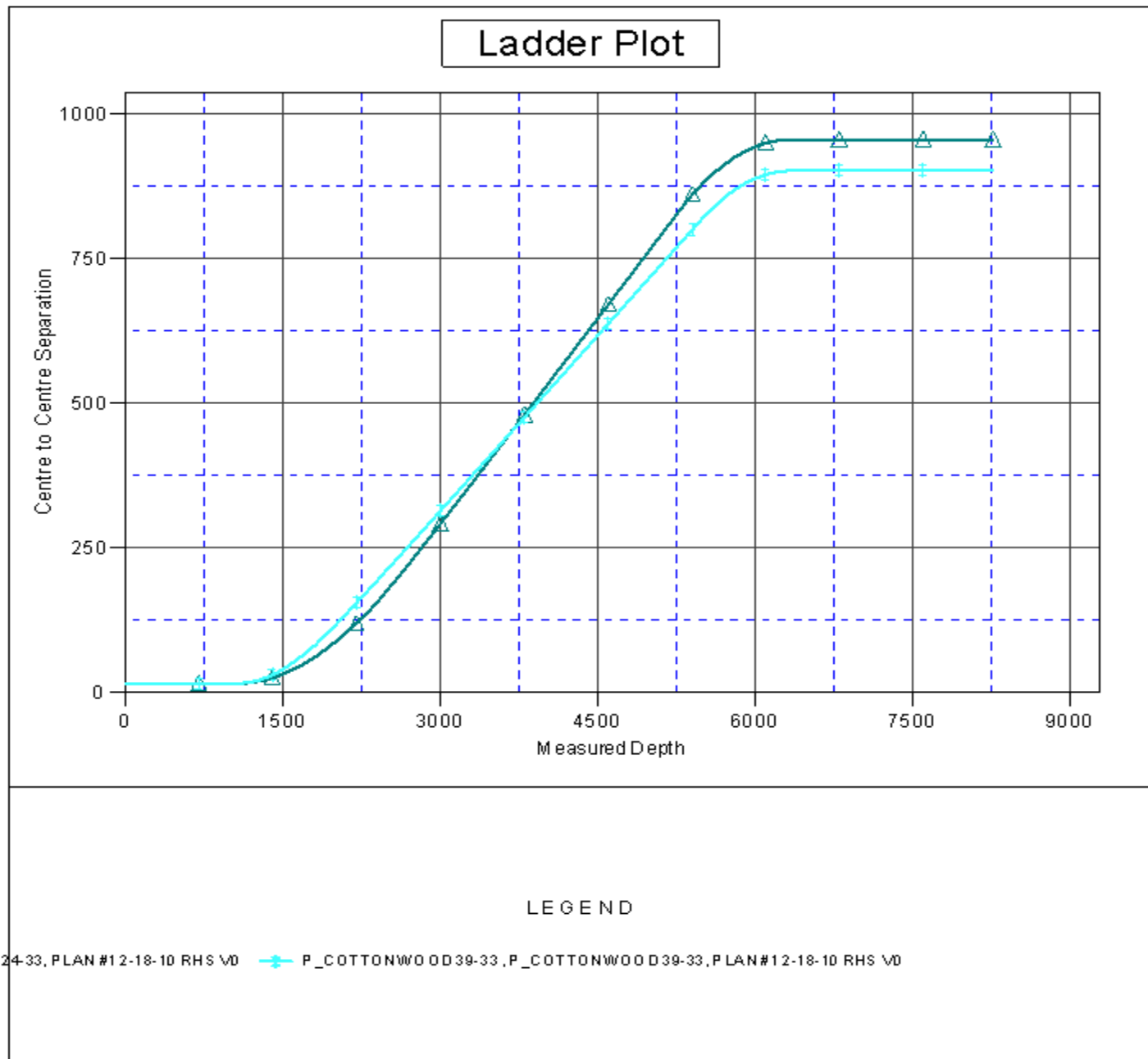
CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_COTTONWOOD 9-33
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	WELL @ 5002.00ft (Original Well Elev)
Reference Site:	WELD_COTTONWOOD 16-33 PAD	MD Reference:	WELL @ 5002.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_COTTONWOOD 9-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 9-33	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 2-18-10 RHS	Offset TVD Reference:	Offset Datum

Offset Design												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	
5,100.00	4,946.69	5,024.19	4,965.61	22.56	16.60	139.83	410.93	539.05	739.71	705.68	34.03	21.739	
5,200.00	5,042.28	5,122.10	5,061.95	23.14	16.99	139.93	421.75	552.82	760.01	725.18	34.83	21.820	
5,300.00	5,137.88	5,220.01	5,158.28	23.72	17.38	140.02	432.58	566.59	780.30	744.67	35.63	21.897	
5,400.00	5,233.48	5,317.92	5,254.61	24.30	17.77	140.10	443.40	580.36	800.60	764.16	36.44	21.971	
5,493.94	5,323.28	5,409.90	5,345.11	24.85	18.14	140.18	453.57	593.30	819.67	782.48	37.19	22.037	
5,500.00	5,329.08	5,415.83	5,350.94	24.88	18.16	140.20	454.23	594.13	820.90	783.65	37.24	22.041	
5,600.00	5,425.22	5,514.04	5,447.57	25.31	18.55	140.43	465.08	607.94	839.72	801.70	38.02	22.088	
5,700.00	5,522.27	5,612.69	5,544.62	25.71	18.95	140.48	475.99	621.82	855.90	817.11	38.79	22.067	
5,800.00	5,620.10	5,711.66	5,642.00	26.06	19.34	140.35	486.93	635.74	869.43	829.88	39.55	21.984	
5,900.00	5,718.59	5,807.29	5,736.30	26.38	19.67	140.15	496.71	648.19	880.51	840.30	40.21	21.897	
6,000.00	5,817.63	5,902.89	5,831.06	26.65	19.92	140.00	504.56	658.17	889.40	848.66	40.74	21.830	
6,100.00	5,917.09	6,000.00	5,927.68	26.87	20.14	139.88	510.52	665.76	896.07	854.88	41.19	21.756	
6,200.00	6,016.84	6,094.90	6,022.36	27.05	20.32	139.81	514.39	670.68	900.50	858.97	41.53	21.682	
6,300.00	6,116.78	6,191.13	6,118.54	27.19	20.47	139.77	516.33	673.15	902.69	860.91	41.79	21.603	
6,347.22	6,164.00	6,236.59	6,164.00	27.24	20.53	148.88	516.56	673.43	902.94	861.07	41.88	21.562	
6,400.00	6,216.78	6,289.37	6,216.78	27.29	20.60	148.88	516.56	673.43	902.94	860.93	42.01	21.493	
6,500.00	6,316.78	6,389.37	6,316.78	27.40	20.74	148.88	516.56	673.43	902.94	860.65	42.29	21.352	
6,600.00	6,416.78	6,489.37	6,416.78	27.50	20.88	148.88	516.56	673.43	902.94	860.37	42.57	21.210	
6,700.00	6,516.78	6,589.37	6,516.78	27.61	21.03	148.88	516.56	673.43	902.94	860.08	42.86	21.068	
6,800.00	6,616.78	6,689.37	6,616.78	27.72	21.18	148.88	516.56	673.43	902.94	859.80	43.15	20.927	
6,900.00	6,716.78	6,789.37	6,716.78	27.83	21.33	148.88	516.56	673.43	902.94	859.50	43.44	20.787	
7,000.00	6,816.78	6,889.37	6,816.78	27.94	21.48	148.88	516.56	673.43	902.94	859.21	43.73	20.647	
7,100.00	6,916.78	6,989.37	6,916.78	28.05	21.63	148.88	516.56	673.43	902.94	858.91	44.03	20.508	
7,200.00	7,016.78	7,089.37	7,016.78	28.17	21.78	148.88	516.56	673.43	902.94	858.61	44.33	20.370	
7,300.00	7,116.78	7,189.37	7,116.78	28.28	21.94	148.88	516.56	673.43	902.94	858.31	44.63	20.232	
7,400.00	7,216.78	7,289.37	7,216.78	28.40	22.09	148.88	516.56	673.43	902.94	858.01	44.93	20.095	
7,500.00	7,316.78	7,389.37	7,316.78	28.52	22.25	148.88	516.56	673.43	902.94	857.70	45.24	19.959	
7,600.00	7,416.78	7,489.37	7,416.78	28.64	22.41	148.88	516.56	673.43	902.94	857.39	45.55	19.823	
7,700.00	7,516.78	7,589.37	7,516.78	28.76	22.57	148.88	516.56	673.43	902.94	857.08	45.86	19.689	
7,800.00	7,616.78	7,689.37	7,616.78	28.88	22.73	148.88	516.56	673.43	902.94	856.77	46.17	19.555	
7,900.00	7,716.78	7,789.37	7,716.78	29.00	22.89	148.88	516.56	673.43	902.94	856.45	46.49	19.422	
8,000.00	7,816.78	7,889.37	7,816.78	29.13	23.05	148.88	516.56	673.43	902.94	856.13	46.81	19.290	
8,100.00	7,916.78	7,989.37	7,916.78	29.25	23.22	148.88	516.56	673.43	902.94	855.81	47.13	19.159	
8,200.00	8,016.78	8,089.37	8,016.78	29.38	23.38	148.88	516.56	673.43	902.94	855.49	47.45	19.029	
8,266.22	8,083.00	8,155.59	8,083.00	29.46	23.49	148.88	516.56	673.43	902.94	855.28	47.66	18.944	

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_COTTONWOOD 9-33
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	WELL @ 5002.00ft (Original Well Elev)
Reference Site:	WELD_COTTONWOOD 16-33 PAD	MD Reference:	WELL @ 5002.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_COTTONWOOD 9-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 9-33	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 2-18-10 RHS	Offset TVD Reference:	Offset Datum

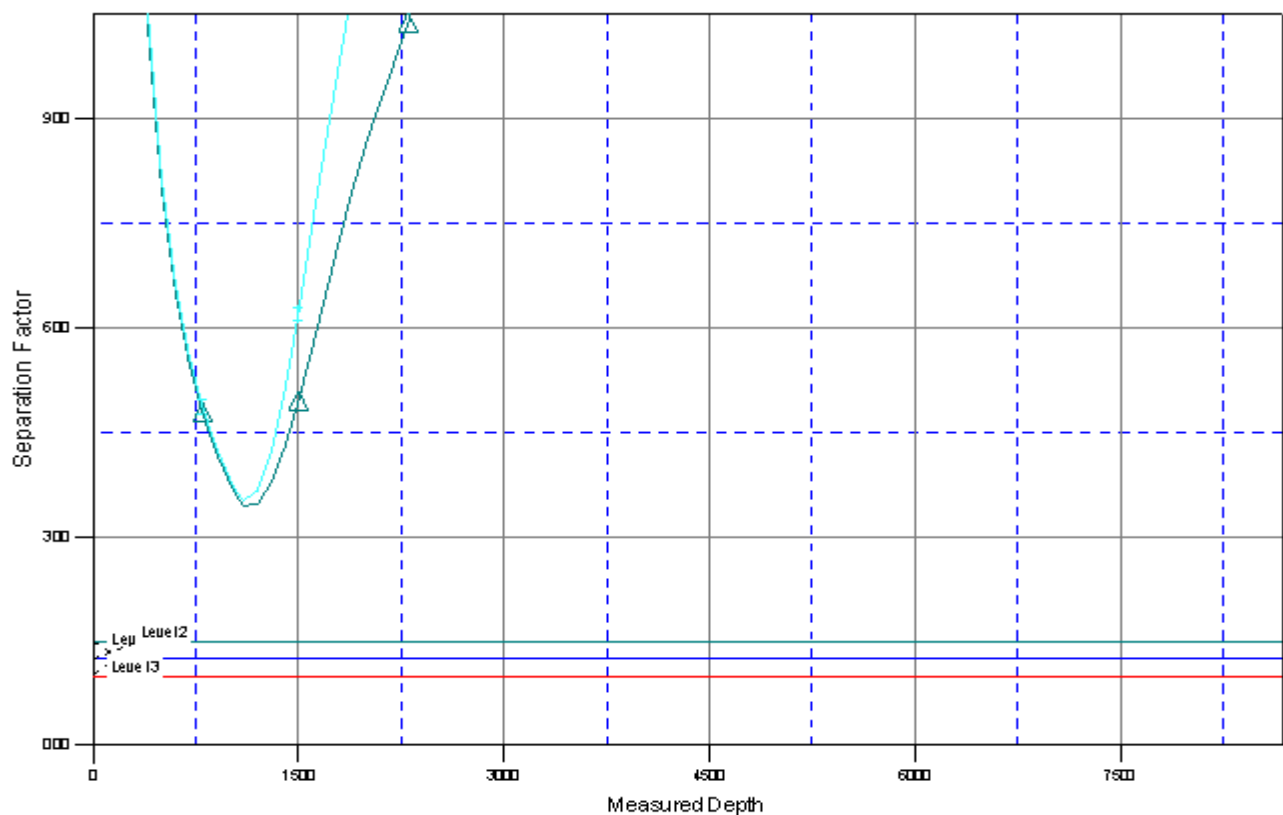
Reference Depths are relative to WELL @ 5002.00ft (Original Well Elev) Coordinates are relative to: P_COTTONWOOD 9-33
Offset Depths are relative to Offset Datum Coordinate System is US State Plane 1983, Colorado Northern Zone
Central Meridian is 105° 30' 0.000 W ° Grid Convergence at Surface is: 0.47°



Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_COTTONWOOD 9-33
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	WELL @ 5002.00ft (Original Well Elev)
Reference Site:	WELD_COTTONWOOD 16-33 PAD	MD Reference:	WELL @ 5002.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_COTTONWOOD 9-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 9-33	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 @ 5002.00ft (Original Well Elev) Coordinates are relative to: P_COTTONWOOD 9-33
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

24-33, PLAN #12-18-10 RHS \0 — P_COTTONWOOD 39-33, P_COTTONWOOD 39-33, PLAN #12-18-10 RHS \0