



US ROCKIES REGION PLANNING

COLORADO NORTHERN ZONE - 83

WELD_COTTONWOOD 12-33 PAD

P_COTTONWOOD 32-33

P_COTTONWOOD 32-33

Plan: PLAN #1 2-19-10 RHS

Standard Planning Report

19 February, 2010

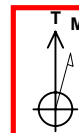




Project: COLORADO NORTHERN ZONE - 83
 Site: WELD_COTTONWOOD 12-33 PAD
 Well: P_COTTONWOOD 32-33
 Wellbore: P_COTTONWOOD 32-33
 Section: SECTION 33 T2N R66W
 SHL: 1808 FSL 889 FWL
 Design: PLAN #1 2-19-10 RHS
 Latitude: 40° 5' 32.377 N
 Longitude: 104° 47' 18.330 W
 GL: 4949.00
 KB: WELL @ 4964.00ft (Original Well Elev)



Weatherford



Azimuths to True North
 Magnetic North: 9.03°
 Magnetic Field
 Strength: 53104.7nT
 Dip Angle: 66.84°
 Date: 2/19/2010
 Model: IGRF2010

FORMATION TOP DETAILS		
TVDPath	MDPath	Formation
4174.00	4261.79	PARKMAN
4680.00	4784.62	SUSSEX
7166.00	7303.91	NIO A
7486.00	7623.91	CODELL
7576.00	7713.91	GRNHRN
7950.00	8087.91	JSAND

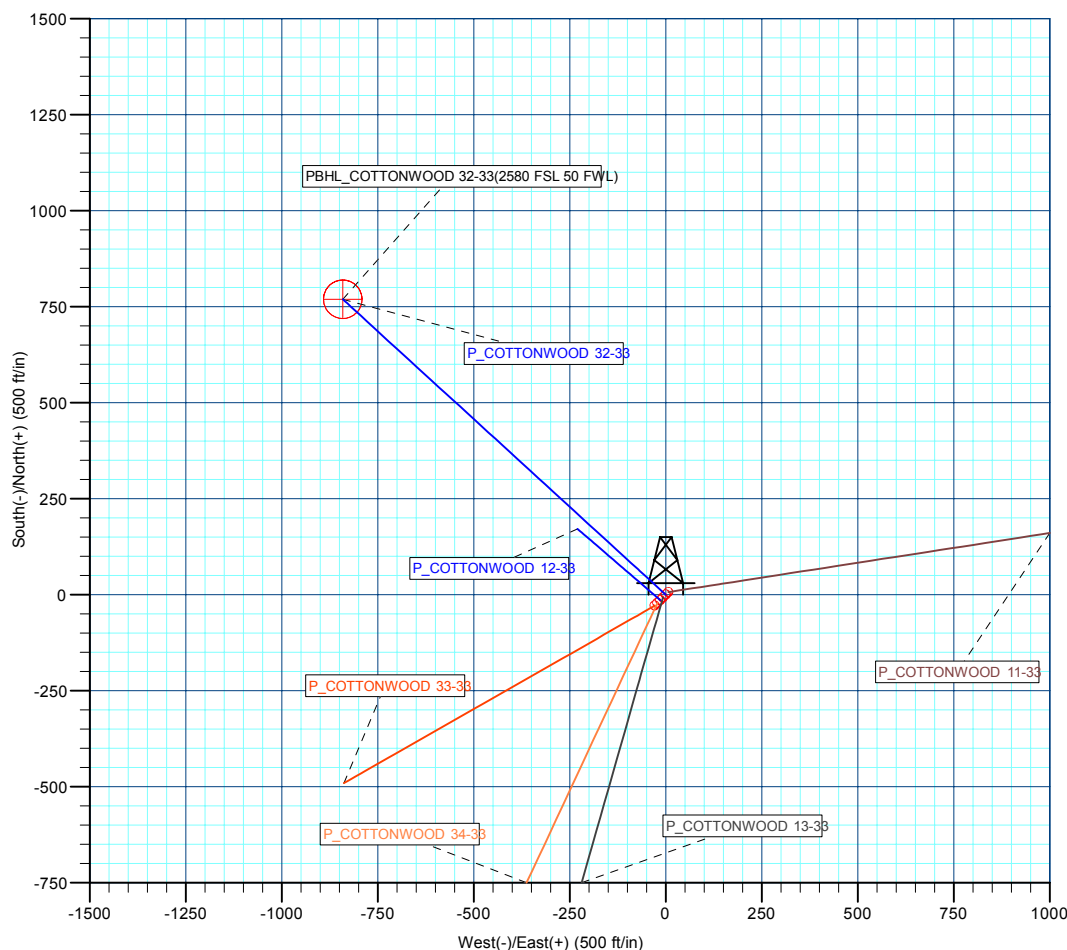
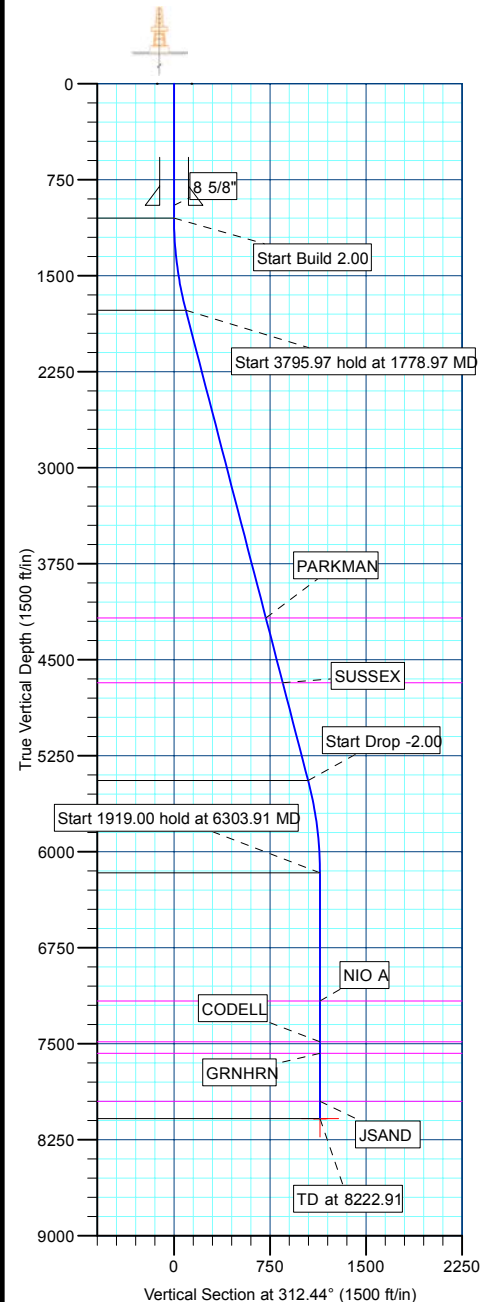
CASING DETAILS			
TVD	MD	Name	Size
950.00	950.00	8 5/8"	8.62

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	
1778.97	14.58	312.44	1771.13	62.26	-68.07	2.00	312.44	92.25	Start 3795.97 hold at 1778.97 MD	
5574.94	14.58	312.44	5444.87	707.12	-773.18	0.00	0.00	1047.78	Start Drop -2.00	
6303.91	0.00	0.00	6166.00	769.38	-841.26	2.00	180.00	1140.02	Start 1919.00 hold at 6303.91 MD	
8222.91	0.00	0.00	8085.00	769.38	-841.26	0.00	0.00	1140.02	TD at 8222.91	

WELLBORE TARGET DETAILS (MAP CO-ORDINATES AND LAT/LONG)							
Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape	
PBHL	8085.00	769.38	-841.26	40° 5' 39.980 N	104° 47' 29.155 W	Circle (Radius: 50.00)	

WELL DETAILS: P_COTTONWOOD 32-33						
+N/-S	+E/-W	Northing	Ground Level: Easting	4949.00 Latitude	Longitude	Slot
0.00	0.00	1277278.06	3199078.27	40° 5' 32.377 N	104° 47' 18.330 W	

LEGEND	
P_COTTONWOOD 11-33, P_COTTONWOOD 11-33, PLAN #1 2-19-10 RHS V0	
P_COTTONWOOD 12-33, P_COTTONWOOD 12-33, PLAN #1 2-19-10 RHS V0	
P_COTTONWOOD 13-33, P_COTTONWOOD 13-33, PLAN #1 2-19-10 RHS V0	
P_COTTONWOOD 33-33, P_COTTONWOOD 33-33, PLAN #1 2-19-10 RHS V0	
P_COTTONWOOD 34-33, P_COTTONWOOD 34-33, PLAN #1 2-19-10 RHS V0	
PLAN #1 2-19-10 RHS	



Plan: PLAN #1 2-19-10 RHS (P_COTTONWOOD 32-33/P_COTTONWOOD 32-33)		
Created By:	Robert H. Scott	Date: 10:20, February 19 2010

Database:	EDM 2003.21 Single User Db	Local Co-ordinate Reference:	Well P_COTTONWOOD 32-33
Company:	US ROCKIES REGION PLANNING	TVD Reference:	WELL @ 4964.00ft (Original Well Elev)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	WELL @ 4964.00ft (Original Well Elev)
Site:	WELD_COTTONWOOD 12-33 PAD	North Reference:	True
Well:	P_COTTONWOOD 32-33	Survey Calculation Method:	Minimum Curvature
Wellbore:	P_COTTONWOOD 32-33		
Design:	PLAN #1 2-19-10 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 12-33 PAD, SECTION 33 T2N R66W							
Site Position: From: Position Uncertainty:			Lat/Long 0.00 ft			Northing:		1,277,285.05 ft		Latitude:		40° 5' 32.446 N	
						Easting:		3,199,085.21 ft		Longitude:		104° 47' 18.240 W	
						Slot Radius:		in		Grid Convergence:		0.46 °	

Well	P_COTTONWOOD 32-33					
Well Position	+N/-S	-6.93 ft	Northing:	1,277,278.06 ft	Latitude:	40° 5' 32.377 N
	+E/-W	-6.99 ft	Easting:	3,199,078.27 ft	Longitude:	104° 47' 18.330 W
Position Uncertainty		0.00 ft	Wellhead Elevation:	ft	Ground Level:	4,949.00 ft

Wellbore	P_COTTONWOOD 32-33				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	2/19/2010	9.03	66.84	53,105

Design	PLAN #1 2-19-10 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	312.44

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	
1,778.97	14.58	312.44	1,771.13	62.26	-68.07	2.00	2.00	0.00	312.44	
5,574.94	14.58	312.44	5,444.87	707.12	-773.18	0.00	0.00	0.00	0.00	
6,303.91	0.00	0.00	6,166.00	769.38	-841.26	2.00	-2.00	0.00	180.00	
8,222.91	0.00	0.00	8,085.00	769.38	-841.26	0.00	0.00	0.00	0.00	PBHL_COTTONW

Database:	EDM 2003.21 Single User Db	Local Co-ordinate Reference:	Well P_COTTONWOOD 32-33
Company:	US ROCKIES REGION PLANNING	TVD Reference:	WELL @ 4964.00ft (Original Well Elev)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	WELL @ 4964.00ft (Original Well Elev)
Site:	WELD_COTTONWOOD 12-33 PAD	North Reference:	True
Well:	P_COTTONWOOD 32-33	Survey Calculation Method:	Minimum Curvature
Wellbore:	P_COTTONWOOD 32-33		
Design:	PLAN #1 2-19-10 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	312.44	1,100.00	0.29	-0.32	0.44	2.00	2.00	0.00
1,200.00	3.00	312.44	1,199.93	2.65	-2.90	3.93	2.00	2.00	0.00
1,300.00	5.00	312.44	1,299.68	7.36	-8.04	10.90	2.00	2.00	0.00
1,400.00	7.00	312.44	1,399.13	14.41	-15.76	21.35	2.00	2.00	0.00
1,500.00	9.00	312.44	1,498.15	23.80	-26.03	35.27	2.00	2.00	0.00
1,600.00	11.00	312.44	1,596.63	35.52	-38.84	52.63	2.00	2.00	0.00
1,700.00	13.00	312.44	1,694.44	49.55	-54.18	73.42	2.00	2.00	0.00
Start 3795.97 hold at 1778.97 MD									
1,778.97	14.58	312.44	1,771.13	62.26	-68.07	92.25	2.00	2.00	0.00
1,800.00	14.58	312.44	1,791.48	65.83	-71.98	97.54	0.00	0.00	0.00
1,900.00	14.58	312.44	1,888.26	82.82	-90.55	122.71	0.00	0.00	0.00
2,000.00	14.58	312.44	1,985.04	99.80	-109.13	147.89	0.00	0.00	0.00
2,100.00	14.58	312.44	2,081.82	116.79	-127.70	173.06	0.00	0.00	0.00
2,200.00	14.58	312.44	2,178.60	133.78	-146.28	198.23	0.00	0.00	0.00
2,300.00	14.58	312.44	2,275.38	150.77	-164.85	223.40	0.00	0.00	0.00
2,400.00	14.58	312.44	2,372.16	167.76	-183.43	248.57	0.00	0.00	0.00
2,500.00	14.58	312.44	2,468.94	184.75	-202.01	273.75	0.00	0.00	0.00
2,600.00	14.58	312.44	2,565.72	201.73	-220.58	298.92	0.00	0.00	0.00
2,700.00	14.58	312.44	2,662.50	218.72	-239.16	324.09	0.00	0.00	0.00
2,800.00	14.58	312.44	2,759.28	235.71	-257.73	349.26	0.00	0.00	0.00
2,900.00	14.58	312.44	2,856.06	252.70	-276.31	374.44	0.00	0.00	0.00
3,000.00	14.58	312.44	2,952.84	269.69	-294.88	399.61	0.00	0.00	0.00
3,100.00	14.58	312.44	3,049.62	286.67	-313.46	424.78	0.00	0.00	0.00
3,200.00	14.58	312.44	3,146.40	303.66	-332.03	449.95	0.00	0.00	0.00
3,300.00	14.58	312.44	3,243.18	320.65	-350.61	475.12	0.00	0.00	0.00
3,400.00	14.58	312.44	3,339.96	337.64	-369.18	500.30	0.00	0.00	0.00
3,500.00	14.58	312.44	3,436.74	354.63	-387.76	525.47	0.00	0.00	0.00
3,600.00	14.58	312.44	3,533.52	371.62	-406.33	550.64	0.00	0.00	0.00
3,700.00	14.58	312.44	3,630.30	388.60	-424.91	575.81	0.00	0.00	0.00
3,800.00	14.58	312.44	3,727.08	405.59	-443.48	600.98	0.00	0.00	0.00
3,900.00	14.58	312.44	3,823.86	422.58	-462.06	626.16	0.00	0.00	0.00
4,000.00	14.58	312.44	3,920.64	439.57	-480.63	651.33	0.00	0.00	0.00
4,100.00	14.58	312.44	4,017.42	456.56	-499.21	676.50	0.00	0.00	0.00
4,200.00	14.58	312.44	4,114.20	473.54	-517.79	701.67	0.00	0.00	0.00
PARKMAN									
4,261.79	14.58	312.44	4,174.00	484.04	-529.26	717.23	0.00	0.00	0.00
4,300.00	14.58	312.44	4,210.98	490.53	-536.36	726.85	0.00	0.00	0.00
4,400.00	14.58	312.44	4,307.76	507.52	-554.94	752.02	0.00	0.00	0.00
4,500.00	14.58	312.44	4,404.54	524.51	-573.51	777.19	0.00	0.00	0.00
4,600.00	14.58	312.44	4,501.32	541.50	-592.09	802.36	0.00	0.00	0.00
4,700.00	14.58	312.44	4,598.10	558.49	-610.66	827.53	0.00	0.00	0.00
SUSSEX									
4,784.62	14.58	312.44	4,680.00	572.86	-626.38	848.84	0.00	0.00	0.00
4,800.00	14.58	312.44	4,694.88	575.47	-629.24	852.71	0.00	0.00	0.00
4,900.00	14.58	312.44	4,791.66	592.46	-647.81	877.88	0.00	0.00	0.00
5,000.00	14.58	312.44	4,888.44	609.45	-666.39	903.05	0.00	0.00	0.00
5,100.00	14.58	312.44	4,985.22	626.44	-684.96	928.22	0.00	0.00	0.00
5,200.00	14.58	312.44	5,082.00	643.43	-703.54	953.40	0.00	0.00	0.00
5,300.00	14.58	312.44	5,178.78	660.41	-722.11	978.57	0.00	0.00	0.00
5,400.00	14.58	312.44	5,275.56	677.40	-740.69	1,003.74	0.00	0.00	0.00
5,500.00	14.58	312.44	5,372.34	694.39	-759.26	1,028.91	0.00	0.00	0.00

Database:	EDM 2003.21 Single User Db	Local Co-ordinate Reference:	Well P_COTTONWOOD 32-33
Company:	US ROCKIES REGION PLANNING	TVD Reference:	WELL @ 4964.00ft (Original Well Elev)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	WELL @ 4964.00ft (Original Well Elev)
Site:	WELD_COTTONWOOD 12-33 PAD	North Reference:	True
Well:	P_COTTONWOOD 32-33	Survey Calculation Method:	Minimum Curvature
Wellbore:	P_COTTONWOOD 32-33		
Design:	PLAN #1 2-19-10 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 Drop -2.00									
5,574.94	14.58	312.44	5,444.87	707.12	-773.18	1,047.78	0.00	0.00	0.00
5,600.00	14.08	312.44	5,469.15	711.31	-777.76	1,053.98	2.00	-2.00	0.00
5,700.00	12.08	312.44	5,566.55	726.58	-794.46	1,076.61	2.00	-2.00	0.00
5,800.00	10.08	312.44	5,664.68	739.55	-808.64	1,095.82	2.00	-2.00	0.00
5,900.00	8.08	312.44	5,763.42	750.19	-820.28	1,111.60	2.00	-2.00	0.00
6,000.00	6.08	312.44	5,862.66	758.51	-829.37	1,123.92	2.00	-2.00	0.00
6,100.00	4.08	312.44	5,962.26	764.48	-835.90	1,132.77	2.00	-2.00	0.00
6,200.00	2.08	312.44	6,062.11	768.11	-839.87	1,138.14	2.00	-2.00	0.00
6,300.00	0.08	312.44	6,162.09	769.38	-841.25	1,140.02	2.00	-2.00	0.00
Start 1919.00 hold at 6303.91 MD									
6,303.91	0.00	0.00	6,166.00	769.38	-841.26	1,140.02	2.00	-2.00	0.00
6,400.00	0.00	0.00	6,262.09	769.38	-841.26	1,140.02	0.00	0.00	0.00
6,500.00	0.00	0.00	6,362.09	769.38	-841.26	1,140.02	0.00	0.00	0.00
6,600.00	0.00	0.00	6,462.09	769.38	-841.26	1,140.02	0.00	0.00	0.00
6,700.00	0.00	0.00	6,562.09	769.38	-841.26	1,140.02	0.00	0.00	0.00
6,800.00	0.00	0.00	6,662.09	769.38	-841.26	1,140.02	0.00	0.00	0.00
6,900.00	0.00	0.00	6,762.09	769.38	-841.26	1,140.02	0.00	0.00	0.00
7,000.00	0.00	0.00	6,862.09	769.38	-841.26	1,140.02	0.00	0.00	0.00
7,100.00	0.00	0.00	6,962.09	769.38	-841.26	1,140.02	0.00	0.00	0.00
7,200.00	0.00	0.00	7,062.09	769.38	-841.26	1,140.02	0.00	0.00	0.00
7,300.00	0.00	0.00	7,162.09	769.38	-841.26	1,140.02	0.00	0.00	0.00
NIO A									
7,303.91	0.00	0.00	7,166.00	769.38	-841.26	1,140.02	0.00	0.00	0.00
7,400.00	0.00	0.00	7,262.09	769.38	-841.26	1,140.02	0.00	0.00	0.00
7,500.00	0.00	0.00	7,362.09	769.38	-841.26	1,140.02	0.00	0.00	0.00
7,600.00	0.00	0.00	7,462.09	769.38	-841.26	1,140.02	0.00	0.00	0.00
CODELL									
7,623.91	0.00	0.00	7,486.00	769.38	-841.26	1,140.02	0.00	0.00	0.00
7,700.00	0.00	0.00	7,562.09	769.38	-841.26	1,140.02	0.00	0.00	0.00
GRNHRN									
7,713.91	0.00	0.00	7,576.00	769.38	-841.26	1,140.02	0.00	0.00	0.00
7,800.00	0.00	0.00	7,662.09	769.38	-841.26	1,140.02	0.00	0.00	0.00
7,900.00	0.00	0.00	7,762.09	769.38	-841.26	1,140.02	0.00	0.00	0.00
8,000.00	0.00	0.00	7,862.09	769.38	-841.26	1,140.02	0.00	0.00	0.00
JSAND									
8,087.91	0.00	0.00	7,950.00	769.38	-841.26	1,140.02	0.00	0.00	0.00
8,100.00	0.00	0.00	7,962.09	769.38	-841.26	1,140.02	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	8,085.00	769.38	-841.26	1,278,040.66	3,198,230.87	40° 5' 39.980 N	104° 47' 29.155 W
- plan misses target center by 122.91ft at 8100.00ft MD (7962.09 TVD, 769.38 N, -841.26 E)									
- Circle (radius 50.00)									

Database:	EDM 2003.21 Single User Db	Local Co-ordinate Reference:	Well P_COTTONWOOD 32-33
Company:	US ROCKIES REGION PLANNING	TVD Reference:	WELL @ 4964.00ft (Original Well Elev)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	WELL @ 4964.00ft (Original Well Elev)
Site:	WELD_COTTONWOOD 12-33 PAD	North Reference:	True
Well:	P_COTTONWOOD 32-33	Survey Calculation Method:	Minimum Curvature
Wellbore:	P_COTTONWOOD 32-33		
Design:	PLAN #1 2-19-10 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 (°)	
4,261.79	4,174.00	PARKMAN				
4,784.62	4,680.00	SUSSEX				
7,303.91	7,166.00	NIO A				
7,623.91	7,486.00	CODELL				
7,713.91	7,576.00	GRNHRN				
8,087.91	7,950.00	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	
1,778.97	1,771.13	62.26	-68.07	Start 3795.97 hold at 1778.97 MD	
5,574.94	5,444.87	707.12	-773.18	Start Drop -2.00	
6,303.91	6,166.00	769.38	-841.26	Start 1919.00 hold at 6303.91 MD	
8,222.91	8,085.00	769.38	-841.26	TD at 8222.91	



US ROCKIES REGION PLANNING

**COLORADO NORTHERN ZONE - 83
WELD_COTTONWOOD 12-33 PAD
P_COTTONWOOD 32-33**

**P_COTTONWOOD 32-33
PLAN #1 2-19-10 RHS**

Anticollision Report

19 February, 2010



Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_COTTONWOOD 32-33
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	WELL @ 4964.00ft (Original Well Elev)
Reference Site:	WELD_COTTONWOOD 12-33 PAD	MD Reference:	WELL @ 4964.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_COTTONWOOD 32-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 32-33	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 2-19-10 RHS	Offset TVD Reference:	Offset Datum

Reference	PLAN #1 2-19-10 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 2/19/2010			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.00	8,222.91	PLAN #1 2-19-10 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
WELD_COTTONWOOD 12-33 PAD						
P_COTTONWOOD 11-33 - P_COTTONWOOD 11-33 - F	300.00	300.00	9.85	8.76	9.032	CC, ES
P_COTTONWOOD 11-33 - P_COTTONWOOD 11-33 - F	400.00	399.68	11.30	9.77	7.395	SF
P_COTTONWOOD 12-33 - P_COTTONWOOD 12-33 - F	1,050.00	1,050.00	20.14	15.68	4.514	CC
P_COTTONWOOD 12-33 - P_COTTONWOOD 12-33 - F	1,400.00	1,399.84	20.73	14.70	3.434	ES
P_COTTONWOOD 12-33 - P_COTTONWOOD 12-33 - F	1,500.00	1,499.68	22.01	15.47	3.368	SF
P_COTTONWOOD 13-33 - P_COTTONWOOD 13-33 - F	300.00	300.00	10.30	9.21	9.450	CC, ES
P_COTTONWOOD 13-33 - P_COTTONWOOD 13-33 - F	400.00	399.65	11.85	10.34	7.831	SF
P_COTTONWOOD 33-33 - P_COTTONWOOD 33-33 - F	1,050.00	1,050.00	40.28	35.81	9.027	CC, ES
P_COTTONWOOD 33-33 - P_COTTONWOOD 33-33 - F	1,200.00	1,197.85	43.92	38.85	8.658	SF
P_COTTONWOOD 34-33 - P_COTTONWOOD 34-33 - F	300.00	300.00	30.18	29.09	27.685	CC, ES
P_COTTONWOOD 34-33 - P_COTTONWOOD 34-33 - F	600.00	596.01	45.04	42.66	18.923	SF

Offset Design WELD_COTTONWOOD 12-33 PAD - P_COTTONWOOD 11-33 - P_COTTONWOOD 11-33 - PLAN #1											
Survey Program: 0-MWD											
Reference											
Measured Depth (ft)	Vertical Depth (ft)	Offset Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)
0.00	0.00	0.00	0.00	0.00	0.00	45.27	6.93	6.99	9.85		
100.00	100.00	100.00	100.00	0.10	0.10	45.27	6.93	6.99	9.85	9.65	0.19
200.00	200.00	200.00	200.00	0.32	0.32	45.27	6.93	6.99	9.85	9.21	0.64
300.00	300.00	300.00	300.00	0.55	0.55	45.27	6.93	6.99	9.85	8.76	1.09
400.00	400.00	399.68	399.66	0.77	0.76	50.44	7.19	8.71	11.30	9.77	1.53
500.00	500.00	499.12	498.96	0.99	0.98	59.99	7.99	13.83	16.00	14.04	1.96
600.00	600.00	598.09	597.55	1.22	1.22	67.37	9.30	22.31	24.29	21.88	2.41
700.00	700.00	696.34	695.08	1.44	1.49	71.92	11.11	34.05	36.15	33.27	2.88
800.00	800.00	793.67	791.23	1.67	1.80	74.66	13.42	48.93	51.48	48.12	3.36
900.00	900.00	889.86	885.70	1.89	2.16	76.38	16.18	66.79	70.20	66.32	3.88
1,000.00	1,000.00	984.71	978.21	2.12	2.56	77.51	19.38	87.48	92.21	87.78	4.43
1,050.00	1,050.00	1,031.59	1,023.66	2.23	2.78	77.93	21.13	98.81	104.42	99.71	4.71
1,100.00	1,100.00	1,077.99	1,068.47	2.34	3.01	125.78	22.98	110.75	117.67	113.00	4.67
1,200.00	1,199.93	1,169.00	1,155.73	2.56	3.49	126.87	26.93	136.25	148.00	142.88	5.12
1,300.00	1,299.68	1,262.24	1,244.62	2.78	4.04	128.31	31.23	164.07	182.28	176.71	5.57
1,400.00	1,399.13	1,355.06	1,333.11	3.02	4.59	129.83	35.52	191.78	218.81	212.78	6.03

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 32-33
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	WELL @ 4964.00ft (Original Well Elev)
Reference Site:	WELD_COTTONWOOD 12-33 PAD	MD Reference:	WELL @ 4964.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_COTTONWOOD 32-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 32-33	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 2-19-10 RHS	Offset TVD Reference:	Offset Datum

Offset Design WELD_COTTONWOOD 12-33 PAD - P_COTTONWOOD 11-33 - P_COTTONWOOD 11-33 - 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	
1,500.00	1,498.15	1,446.82	1,420.58	3.28	5.14	131.34	39.76	219.18	257.68	251.19	6.49	39.734	
1,600.00	1,596.63	1,537.41	1,506.94	3.57	5.69	132.78	43.94	246.23	298.96	292.01	6.95	42.999	
1,700.00	1,694.44	1,626.72	1,592.07	3.90	6.24	134.14	48.07	272.89	342.72	335.29	7.43	46.115	
1,778.97	1,771.13	1,696.27	1,658.37	4.20	6.66	135.13	51.28	293.65	379.05	371.23	7.82	48.475	
1,800.00	1,791.48	1,714.67	1,675.91	4.28	6.78	135.54	52.13	299.15	388.95	381.01	7.93	49.018	
1,900.00	1,888.26	1,802.17	1,759.32	4.70	7.32	137.21	56.17	325.27	436.17	427.68	8.49	51.349	
2,000.00	1,985.04	1,889.66	1,842.73	5.13	7.86	138.56	60.21	351.39	483.63	474.56	9.07	53.324	
2,100.00	2,081.82	1,977.16	1,926.13	5.59	8.40	139.67	64.25	377.52	531.27	521.61	9.66	55.014	
2,200.00	2,178.60	2,064.65	2,009.54	6.05	8.95	140.60	68.29	403.64	579.03	568.78	10.25	56.473	
2,300.00	2,275.38	2,152.15	2,092.95	6.53	9.49	141.39	72.34	429.76	626.90	616.04	10.86	57.744	
2,400.00	2,372.16	2,239.65	2,176.36	7.01	10.04	142.06	76.38	455.88	674.84	663.38	11.47	58.860	
2,500.00	2,468.94	2,327.14	2,259.77	7.50	10.59	142.65	80.42	482.01	722.85	710.77	12.08	59.845	
2,600.00	2,565.72	2,414.64	2,343.18	7.99	11.14	143.16	84.46	508.13	770.91	758.21	12.70	60.722	
2,700.00	2,662.50	2,502.14	2,426.58	8.49	11.68	143.62	88.50	534.25	819.01	805.69	13.32	61.507	
2,800.00	2,759.28	2,589.63	2,509.99	8.99	12.23	144.02	92.54	560.38	867.15	853.21	13.94	62.212	
2,900.00	2,856.06	2,677.13	2,593.40	9.50	12.78	144.38	96.58	586.50	915.31	900.75	14.56	62.850	
3,000.00	2,952.84	2,764.63	2,676.81	10.01	13.33	144.71	100.62	612.62	963.50	948.31	15.19	63.429	
3,100.00	3,049.62	2,852.12	2,760.22	10.52	13.88	145.00	104.67	638.75	1,011.72	995.90	15.82	63.957	
3,200.00	3,146.40	2,939.62	2,843.62	11.03	14.43	145.27	108.71	664.87	1,059.95	1,043.50	16.45	64.440	
3,300.00	3,243.18	3,027.12	2,927.03	11.54	14.98	145.52	112.75	690.99	1,108.20	1,091.12	17.08	64.884	
3,400.00	3,339.96	3,114.61	3,010.44	12.06	15.53	145.74	116.79	717.11	1,156.46	1,138.75	17.71	65.293	
3,500.00	3,436.74	3,202.11	3,093.85	12.58	16.08	145.95	120.83	743.24	1,204.74	1,186.39	18.35	65.671	
3,600.00	3,533.52	3,289.61	3,177.26	13.09	16.63	146.14	124.87	769.36	1,253.02	1,234.04	18.98	66.021	
3,700.00	3,630.30	3,377.10	3,260.66	13.61	17.18	146.31	128.91	795.48	1,301.32	1,281.70	19.61	66.347	
3,800.00	3,727.08	3,464.60	3,344.07	14.13	17.73	146.48	132.96	821.61	1,349.62	1,329.37	20.25	66.651	
3,900.00	3,823.86	3,552.10	3,427.48	14.65	18.28	146.63	137.00	847.73	1,397.93	1,377.05	20.89	66.934	
4,000.00	3,920.64	3,639.59	3,510.89	15.17	18.83	146.77	141.04	873.85	1,446.25	1,424.73	21.52	67.199	
4,100.00	4,017.42	3,727.09	3,594.30	15.69	19.38	146.91	145.08	899.98	1,494.58	1,472.42	22.16	67.448	
4,200.00	4,114.20	3,814.58	3,677.70	16.22	19.94	147.03	149.12	926.10	1,542.91	1,520.12	22.80	67.682	
4,300.00	4,210.98	3,902.08	3,761.11	16.74	20.49	147.15	153.16	952.22	1,591.25	1,567.81	23.43	67.902	
4,400.00	4,307.76	4,067.98	3,920.33	17.26	21.33	147.40	160.28	998.20	1,637.96	1,613.70	24.26	67.510	
4,500.00	4,404.54	4,266.22	4,113.70	17.78	22.07	147.84	166.92	1,041.16	1,679.17	1,654.07	25.11	66.879	
4,600.00	4,501.32	4,474.91	4,320.00	18.31	22.65	148.44	171.69	1,072.00	1,714.30	1,688.38	25.91	66.155	
4,700.00	4,598.10	4,692.53	4,536.95	18.83	23.04	149.22	174.21	1,088.26	1,742.91	1,716.25	26.66	65.377	
4,800.00	4,694.88	4,850.49	4,694.88	19.36	23.20	149.87	174.52	1,090.28	1,765.64	1,738.39	27.25	64.785	
4,900.00	4,791.66	4,947.27	4,791.66	19.88	23.29	150.28	174.52	1,090.28	1,787.63	1,759.88	27.75	64.415	
5,000.00	4,888.44	5,044.05	4,888.44	20.41	23.38	150.67	174.52	1,090.28	1,809.70	1,781.45	28.25	64.060	
5,100.00	4,985.22	5,140.83	4,985.22	20.93	23.48	151.05	174.52	1,090.28	1,831.86	1,803.11	28.75	63.723	
5,200.00	5,082.00	5,237.61	5,082.00	21.46	23.57	151.42	174.52	1,090.28	1,854.09	1,824.84	29.24	63.403	
5,300.00	5,178.78	5,334.39	5,178.78	21.98	23.67	151.79	174.52	1,090.28	1,876.39	1,846.65	29.74	63.098	
5,400.00	5,275.56	5,431.17	5,275.56	22.51	23.77	152.15	174.52	1,090.28	1,898.77	1,868.54	30.23	62.808	
5,500.00	5,372.34	5,527.95	5,372.34	23.04	23.87	152.49	174.52	1,090.28	1,921.21	1,890.49	30.72	62.533	
5,574.94	5,444.87	5,600.48	5,444.87	23.43	23.95	152.75	174.52	1,090.28	1,938.08	1,906.99	31.09	62.335	
5,600.00	5,469.15	5,624.76	5,469.15	23.55	23.98	152.88	174.52	1,090.28	1,943.63	1,912.37	31.26	62.170	
5,700.00	5,566.55	5,722.16	5,566.55	23.92	24.08	153.37	174.52	1,090.28	1,963.92	1,932.03	31.89	61.579	
5,800.00	5,664.68	5,820.29	5,664.68	24.26	24.19	153.77	174.52	1,090.28	1,981.19	1,948.72	32.47	61.007	
5,900.00	5,763.42	5,919.03	5,763.42	24.55	24.30	154.10	174.52	1,090.28	1,995.40	1,962.39	33.01	60.455	
6,000.00	5,862.66	6,018.26	5,862.66	24.80	24.41	154.35	174.52	1,090.28	2,006.51	1,973.02	33.49	59.918	
6,100.00	5,962.26	6,117.87	5,962.26	25.00	24.53	154.53	174.52	1,090.28	2,014.50	1,980.59	33.92	59.395	
6,200.00	6,062.11	6,217.72	6,062.11	25.17	24.64	154.64	174.52	1,090.28	2,019.35	1,985.06	34.29	58.883	
6,303.91	6,166.00	6,321.61	6,166.00	25.29	24.76	107.12	174.52	1,090.28	2,021.06	1,986.42	34.63	58.357	
6,400.00	6,262.09	6,417.70	6,262.09	25.39	24.88	107.12	174.52	1,090.28	2,021.06	1,986.12	34.93	57.855	

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 32-33
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	WELL @ 4964.00ft (Original Well Elev)
Reference Site:	WELD_COTTONWOOD 12-33 PAD	MD Reference:	WELL @ 4964.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_COTTONWOOD 32-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 32-33	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 2-19-10 RHS	Offset TVD Reference:	Offset Datum

Offset Design WELD_COTTONWOOD 12-33 PAD - P_COTTONWOOD 11-33 - P_COTTONWOOD 11-33 - 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		
6,500.00	6,362.09	6,517.70	6,362.09	25.51	25.00	107.12	174.52	1,090.28	2,021.06	1,985.80	35.26	57.320		
6,600.00	6,462.09	6,617.70	6,462.09	25.63	25.12	107.12	174.52	1,090.28	2,021.06	1,985.47	35.59	56.791		
6,700.00	6,562.09	6,717.70	6,562.09	25.75	25.24	107.12	174.52	1,090.28	2,021.06	1,985.14	35.92	56.267		
6,800.00	6,662.09	6,817.70	6,662.09	25.87	25.37	107.12	174.52	1,090.28	2,021.06	1,984.80	36.25	55.749		
6,900.00	6,762.09	6,917.70	6,762.09	26.00	25.49	107.12	174.52	1,090.28	2,021.06	1,984.47	36.59	55.237		
7,000.00	6,862.09	7,017.70	6,862.09	26.12	25.62	107.12	174.52	1,090.28	2,021.06	1,984.13	36.93	54.730		
7,100.00	6,962.09	7,117.70	6,962.09	26.25	25.75	107.12	174.52	1,090.28	2,021.06	1,983.79	37.27	54.230		
7,200.00	7,062.09	7,217.70	7,062.09	26.38	25.88	107.12	174.52	1,090.28	2,021.06	1,983.45	37.61	53.735		
7,300.00	7,162.09	7,317.70	7,162.09	26.51	26.01	107.12	174.52	1,090.28	2,021.06	1,983.10	37.96	53.246		
7,400.00	7,262.09	7,417.70	7,262.09	26.64	26.15	107.12	174.52	1,090.28	2,021.06	1,982.75	38.30	52.762		
7,500.00	7,362.09	7,517.70	7,362.09	26.77	26.28	107.12	174.52	1,090.28	2,021.06	1,982.40	38.65	52.285		
7,600.00	7,462.09	7,617.70	7,462.09	26.90	26.41	107.12	174.52	1,090.28	2,021.06	1,982.05	39.01	51.813		
7,700.00	7,562.09	7,717.70	7,562.09	27.04	26.55	107.12	174.52	1,090.28	2,021.06	1,981.70	39.36	51.348		
7,800.00	7,662.09	7,817.70	7,662.09	27.17	26.69	107.12	174.52	1,090.28	2,021.06	1,981.34	39.72	50.888		
7,900.00	7,762.09	7,917.70	7,762.09	27.31	26.83	107.12	174.52	1,090.28	2,021.06	1,980.98	40.07	50.434		
8,000.00	7,862.09	8,017.70	7,862.09	27.45	26.97	107.12	174.52	1,090.28	2,021.06	1,980.62	40.43	49.985		
8,100.00	7,962.09	8,117.70	7,962.09	27.59	27.11	107.12	174.52	1,090.28	2,021.06	1,980.26	40.79	49.543		
8,162.08	8,024.17	8,179.78	8,024.17	27.67	27.20	107.12	174.52	1,090.28	2,021.06	1,980.04	41.02	49.271		
8,200.00	8,062.09	8,205.61	8,050.00	27.73	27.23	107.12	174.52	1,090.28	2,021.09	1,979.96	41.14	49.133		
8,222.91	8,085.00	8,205.61	8,050.00	27.76	27.23	107.12	174.52	1,090.28	2,021.36	1,980.18	41.18	49.090		

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_COTTONWOOD 32-33
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	WELL @ 4964.00ft (Original Well Elev)
Reference Site:	WELD_COTTONWOOD 12-33 PAD	MD Reference:	WELL @ 4964.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_COTTONWOOD 32-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 32-33	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 2-19-10 RHS	Offset TVD Reference:	Offset Datum

Offset Design WELD_COTTONWOOD 12-33 PAD - P_COTTONWOOD 12-33 - P_COTTONWOOD 12-33 - 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)	Highside Tooface (")	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	-134.89	-14.22	-14.27	20.14				
100.00	100.00	100.00	100.00	0.10	0.10	-134.89	-14.22	-14.27	20.14	19.95	0.19	105.422	
200.00	200.00	200.00	200.00	0.32	0.32	-134.89	-14.22	-14.27	20.14	19.50	0.64	31.442	
300.00	300.00	300.00	300.00	0.55	0.55	-134.89	-14.22	-14.27	20.14	19.05	1.09	18.476	
400.00	400.00	400.00	400.00	0.77	0.77	-134.89	-14.22	-14.27	20.14	18.60	1.54	13.082	
500.00	500.00	500.00	500.00	0.99	0.99	-134.89	-14.22	-14.27	20.14	18.15	1.99	10.125	
600.00	600.00	600.00	600.00	1.22	1.22	-134.89	-14.22	-14.27	20.14	17.70	2.44	8.259	
700.00	700.00	700.00	700.00	1.44	1.44	-134.89	-14.22	-14.27	20.14	17.25	2.89	6.973	
800.00	800.00	800.00	800.00	1.67	1.67	-134.89	-14.22	-14.27	20.14	16.80	3.34	6.034	
900.00	900.00	900.00	900.00	1.89	1.89	-134.89	-14.22	-14.27	20.14	16.35	3.79	5.318	
1,000.00	1,000.00	1,000.00	1,000.00	2.12	2.12	-134.89	-14.22	-14.27	20.14	15.90	4.24	4.754	
1,050.00	1,050.00	1,050.00	1,050.00	2.23	2.23	-134.89	-14.22	-14.27	20.14	15.68	4.46	4.514 CC	
1,100.00	1,100.00	1,099.97	1,099.97	2.34	2.34	-87.34	-13.93	-14.60	20.15	15.47	4.68	4.305	
1,200.00	1,199.93	1,199.92	1,199.85	2.56	2.56	-87.36	-11.66	-17.24	20.26	15.14	5.12	3.960	
1,300.00	1,299.68	1,299.87	1,299.56	2.78	2.78	-87.45	-7.12	-22.51	20.47	14.90	5.56	3.679	
1,400.00	1,399.13	1,399.84	1,399.18	3.02	3.02	-93.24	-1.65	-28.86	20.73	14.70	6.04	3.434 ES	
1,500.00	1,498.15	1,499.68	1,498.66	3.28	3.25	-107.79	3.80	-35.20	22.01	15.47	6.53	3.368 SF	
1,600.00	1,596.63	1,599.27	1,597.90	3.57	3.50	-126.52	9.25	-41.53	26.44	19.43	7.01	3.773	
1,700.00	1,694.44	1,698.47	1,696.76	3.90	3.74	-142.57	14.67	-47.83	35.53	28.11	7.42	4.788	
1,778.97	1,771.13	1,776.47	1,774.48	4.20	3.94	-151.61	18.94	-52.78	46.06	38.34	7.72	5.964	
1,800.00	1,791.48	1,797.20	1,795.13	4.28	3.99	-153.53	20.07	-54.10	49.26	41.45	7.81	6.307	
1,900.00	1,888.26	1,895.75	1,893.33	4.70	4.24	-160.00	25.46	-60.36	65.02	56.77	8.24	7.887	
2,000.00	1,985.04	1,994.29	1,991.53	5.13	4.49	-163.93	30.85	-66.62	81.26	72.57	8.70	9.345	
2,100.00	2,081.82	2,092.84	2,089.74	5.59	4.75	-166.54	36.24	-72.88	97.76	88.60	9.16	10.669	
2,200.00	2,178.60	2,191.39	2,187.94	6.05	5.00	-168.39	41.63	-79.14	114.40	104.76	9.64	11.871	
2,300.00	2,275.38	2,289.94	2,286.14	6.53	5.26	-169.78	47.01	-85.40	131.13	121.01	10.12	12.962	
2,400.00	2,372.16	2,388.49	2,384.34	7.01	5.52	-170.85	52.40	-91.66	147.91	137.31	10.60	13.954	
2,500.00	2,468.94	2,487.03	2,482.54	7.50	5.77	-171.70	57.79	-97.92	164.73	153.64	11.09	14.858	
2,600.00	2,565.72	2,585.58	2,580.74	7.99	6.03	-172.40	63.18	-104.18	181.58	170.01	11.58	15.685	
2,700.00	2,662.50	2,684.13	2,678.95	8.49	6.29	-172.97	68.57	-110.44	198.46	186.39	12.07	16.444	
2,800.00	2,759.28	2,782.68	2,777.15	8.99	6.56	-173.46	73.96	-116.70	215.34	202.78	12.56	17.141	
2,900.00	2,856.06	2,881.23	2,875.35	9.50	6.82	-173.87	79.34	-122.96	232.25	219.19	13.06	17.785	
3,000.00	2,952.84	2,979.78	2,973.55	10.01	7.08	-174.23	84.73	-129.22	249.16	235.60	13.56	18.380	
3,100.00	3,049.62	3,078.32	3,071.75	10.52	7.34	-174.55	90.12	-135.48	266.08	252.03	14.06	18.931	
3,200.00	3,146.40	3,176.87	3,169.95	11.03	7.60	-174.82	95.51	-141.74	283.01	268.45	14.55	19.444	
3,300.00	3,243.18	3,275.42	3,268.15	11.54	7.87	-175.07	100.90	-148.00	299.94	284.89	15.06	19.922	
3,400.00	3,339.96	3,373.97	3,366.36	12.06	8.13	-175.28	106.29	-154.26	316.88	301.32	15.56	20.368	
3,500.00	3,436.74	3,472.52	3,464.56	12.58	8.40	-175.48	111.68	-160.52	333.82	317.76	16.06	20.786	
3,600.00	3,533.52	3,571.07	3,562.76	13.09	8.66	-175.66	117.06	-166.78	350.77	334.20	16.56	21.177	
3,700.00	3,630.30	3,669.61	3,660.96	13.61	8.92	-175.82	122.45	-173.04	367.72	350.65	17.07	21.544	
3,800.00	3,727.08	3,768.16	3,759.16	14.13	9.19	-175.97	127.84	-179.30	384.67	367.10	17.57	21.890	
3,900.00	3,823.86	3,866.71	3,857.36	14.65	9.45	-176.10	133.23	-185.56	401.62	383.54	18.08	22.216	
4,000.00	3,920.64	3,965.26	3,955.56	15.17	9.72	-176.22	138.62	-191.82	418.58	399.99	18.58	22.524	
4,100.00	4,017.42	4,063.81	4,053.77	15.69	9.98	-176.34	144.01	-198.08	435.53	416.44	19.09	22.815	
4,200.00	4,114.20	4,162.35	4,151.97	16.22	10.25	-176.44	149.39	-204.34	452.49	432.90	19.60	23.091	
4,300.00	4,210.98	4,260.90	4,250.17	16.74	10.52	-176.54	154.78	-210.60	469.45	449.35	20.10	23.352	
4,400.00	4,307.76	4,359.45	4,348.37	17.26	10.78	-176.63	160.17	-216.86	486.41	465.80	20.61	23.600	
4,500.00	4,404.54	4,455.51	4,444.09	17.78	11.04	-176.72	165.40	-222.93	503.42	482.31	21.11	23.849	
4,600.00	4,501.32	4,538.84	4,527.25	18.31	11.21	-176.80	168.90	-227.00	522.30	500.75	21.55	24.241	
4,700.00	4,598.10	4,621.19	4,609.54	18.83	11.36	-176.90	170.80	-229.21	544.00	522.03	21.97	24.764	
4,800.00	4,694.88	4,706.53	4,694.88	19.36	11.50	-177.01	171.22	-229.69	568.38	545.98	22.40	25.375	
4,900.00	4,791.66	4,803.31	4,791.66	19.88	11.69	-177.14	171.22	-229.69	593.52	570.64	22.88	25.939	

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 32-33
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	WELL @ 4964.00ft (Original Well Elev)
Reference Site:	WELD_COTTONWOOD 12-33 PAD	MD Reference:	WELL @ 4964.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_COTTONWOOD 32-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 32-33	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 2-19-10 RHS	Offset TVD Reference:	Offset Datum

Offset Design WELD_COTTONWOOD 12-33 PAD - P_COTTONWOOD 12-33 - P_COTTONWOOD 12-33 - 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	4,888.44	4,900.09	4,888.44	20.41	11.88	-177.26	171.22	-229.69	618.67	595.30	23.36	26.479	
5,100.00	4,985.22	4,996.87	4,985.22	20.93	12.08	-177.36	171.22	-229.69	643.81	619.96	23.85	26.997	
5,200.00	5,082.00	5,093.65	5,082.00	21.46	12.27	-177.46	171.22	-229.69	668.96	644.63	24.33	27.493	
5,300.00	5,178.78	5,190.43	5,178.78	21.98	12.46	-177.55	171.22	-229.69	694.11	669.29	24.82	27.969	
5,400.00	5,275.56	5,287.21	5,275.56	22.51	12.66	-177.64	171.22	-229.69	719.26	693.96	25.30	28.426	
5,500.00	5,372.34	5,383.99	5,372.34	23.04	12.85	-177.72	171.22	-229.69	744.41	718.63	25.79	28.866	
5,574.94	5,444.87	5,456.52	5,444.87	23.43	13.00	-177.78	171.22	-229.69	763.27	737.11	26.15	29.184	
5,600.00	5,469.15	5,480.80	5,469.15	23.55	13.05	-177.80	171.22	-229.69	769.46	743.17	26.29	29.264	
5,700.00	5,566.55	5,578.20	5,566.55	23.92	13.25	-177.88	171.22	-229.69	792.07	765.27	26.81	29.547	
5,800.00	5,664.68	5,676.33	5,664.68	24.26	13.45	-177.94	171.22	-229.69	811.28	783.99	27.28	29.735	
5,900.00	5,763.42	5,775.07	5,763.42	24.55	13.65	-177.99	171.22	-229.69	827.04	799.32	27.72	29.835	
6,000.00	5,862.66	5,874.31	5,862.66	24.80	13.85	-178.03	171.22	-229.69	839.36	811.24	28.12	29.852	
6,100.00	5,962.26	5,973.91	5,962.26	25.00	14.06	-178.06	171.22	-229.69	848.20	819.73	28.47	29.791	
6,200.00	6,062.11	6,073.76	6,062.11	25.17	14.26	-178.07	171.22	-229.69	853.57	824.79	28.78	29.656	
6,303.91	6,166.00	6,177.65	6,166.00	25.29	14.48	134.37	171.22	-229.69	855.45	826.39	29.06	29.437	
6,400.00	6,262.09	6,273.74	6,262.09	25.39	14.68	134.37	171.22	-229.69	855.45	826.02	29.43	29.063	
6,500.00	6,362.09	6,373.74	6,362.09	25.51	14.88	134.37	171.22	-229.69	855.45	825.62	29.84	28.668	
6,600.00	6,462.09	6,473.74	6,462.09	25.63	15.09	134.37	171.22	-229.69	855.45	825.21	30.25	28.283	
6,700.00	6,562.09	6,573.74	6,562.09	25.75	15.30	134.37	171.22	-229.69	855.45	824.80	30.65	27.908	
6,800.00	6,662.09	6,673.74	6,662.09	25.87	15.51	134.37	171.22	-229.69	855.45	824.39	31.06	27.541	
6,900.00	6,762.09	6,773.74	6,762.09	26.00	15.72	134.37	171.22	-229.69	855.45	823.98	31.47	27.182	
7,000.00	6,862.09	6,873.74	6,862.09	26.12	15.93	134.37	171.22	-229.69	855.45	823.57	31.88	26.833	
7,100.00	6,962.09	6,973.74	6,962.09	26.25	16.14	134.37	171.22	-229.69	855.45	823.16	32.29	26.491	
7,200.00	7,062.09	7,073.74	7,062.09	26.38	16.35	134.37	171.22	-229.69	855.45	822.75	32.71	26.157	
7,300.00	7,162.09	7,173.74	7,162.09	26.51	16.56	134.37	171.22	-229.69	855.45	822.34	33.12	25.830	
7,400.00	7,262.09	7,273.74	7,262.09	26.64	16.77	134.37	171.22	-229.69	855.45	821.92	33.53	25.511	
7,500.00	7,362.09	7,373.74	7,362.09	26.77	16.99	134.37	171.22	-229.69	855.45	821.51	33.95	25.199	
7,600.00	7,462.09	7,473.74	7,462.09	26.90	17.20	134.37	171.22	-229.69	855.45	821.09	34.36	24.894	
7,700.00	7,562.09	7,573.74	7,562.09	27.04	17.41	134.37	171.22	-229.69	855.45	820.67	34.78	24.596	
7,800.00	7,662.09	7,673.74	7,662.09	27.17	17.62	134.37	171.22	-229.69	855.45	820.26	35.20	24.304	
7,900.00	7,762.09	7,773.74	7,762.09	27.31	17.84	134.37	171.22	-229.69	855.45	819.84	35.62	24.019	
8,000.00	7,862.09	7,873.74	7,862.09	27.45	18.05	134.37	171.22	-229.69	855.45	819.42	36.03	23.740	
8,100.00	7,962.09	7,973.74	7,962.09	27.59	18.27	134.37	171.22	-229.69	855.45	819.00	36.45	23.467	
8,200.00	8,062.09	8,073.74	8,062.09	27.73	18.48	134.37	171.22	-229.69	855.45	818.58	36.87	23.199	
8,204.36	8,066.45	8,078.10	8,066.45	27.73	18.49	134.37	171.22	-229.69	855.45	818.56	36.89	23.188	
8,222.91	8,085.00	8,086.65	8,075.00	27.76	18.51	134.37	171.22	-229.69	855.51	818.56	36.95	23.154	

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_COTTONWOOD 32-33
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	WELL @ 4964.00ft (Original Well Elev)
Reference Site:	WELD_COTTONWOOD 12-33 PAD	MD Reference:	WELL @ 4964.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_COTTONWOOD 32-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 32-33	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 2-19-10 RHS	Offset TVD Reference:	Offset Datum

Offset Design WELD_COTTONWOOD 12-33 PAD - P_COTTONWOOD 13-33 - P_COTTONWOOD 13-33 - 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	-135.08	-7.29	-7.27	10.30				
100.00	100.00	100.00	100.00	0.10	0.10	-135.08	-7.29	-7.27	10.30	10.11	0.19	53.919	
200.00	200.00	200.00	200.00	0.32	0.32	-135.08	-7.29	-7.27	10.30	9.66	0.64	16.081	
300.00	300.00	300.00	300.00	0.55	0.55	-135.08	-7.29	-7.27	10.30	9.21	1.09	9.450 CC, ES	
400.00	400.00	399.65	399.63	0.77	0.74	-139.14	-8.96	-7.75	11.85	10.34	1.51	7.831 SF	
500.00	500.00	499.05	498.89	0.99	0.94	-146.66	-13.94	-9.17	16.72	14.79	1.93	8.648	
600.00	600.00	597.98	597.44	1.22	1.17	-152.55	-22.18	-11.52	25.13	22.75	2.38	10.557	
700.00	700.00	696.20	694.94	1.44	1.44	-156.25	-33.60	-14.78	37.05	34.20	2.85	12.988	
800.00	800.00	793.49	791.06	1.67	1.75	-158.52	-48.07	-18.91	52.42	49.07	3.35	15.634	
900.00	900.00	889.65	885.49	1.89	2.10	-159.96	-65.44	-23.87	71.15	67.27	3.88	18.325	
1,000.00	1,000.00	984.48	977.98	2.12	2.51	-160.91	-85.55	-29.61	93.17	88.73	4.44	20.970	
1,050.00	1,050.00	1,031.34	1,023.42	2.23	2.73	-161.26	-96.57	-32.75	105.38	100.65	4.74	22.252	
1,100.00	1,100.00	1,077.75	1,068.23	2.34	2.95	-113.95	-108.19	-36.07	118.56	113.96	4.60	25.752	
1,200.00	1,199.93	1,168.90	1,155.64	2.56	3.44	-115.04	-133.04	-43.16	148.30	143.25	5.05	29.341	
1,300.00	1,299.68	1,257.54	1,239.81	2.78	3.97	-116.45	-159.75	-50.78	182.58	177.07	5.51	33.146	
1,400.00	1,399.13	1,343.35	1,320.43	3.02	4.52	-117.89	-187.98	-58.84	221.39	215.42	5.97	37.087	
1,500.00	1,498.15	1,426.07	1,397.29	3.28	5.09	-119.19	-217.38	-67.23	264.65	258.21	6.44	41.091	
1,600.00	1,596.63	1,512.99	1,477.48	3.57	5.72	-120.51	-249.65	-76.44	311.34	304.39	6.95	44.793	
1,700.00	1,694.44	1,599.62	1,557.39	3.90	6.36	-121.75	-281.83	-85.63	359.98	352.49	7.49	48.075	
1,778.97	1,771.13	1,667.12	1,619.65	4.20	6.86	-122.66	-306.90	-92.78	399.79	391.86	7.93	50.396	
1,800.00	1,791.48	1,684.98	1,636.12	4.28	6.99	-123.10	-313.53	-94.68	410.57	402.51	8.06	50.926	
1,900.00	1,888.26	1,769.91	1,714.46	4.70	7.63	-124.89	-345.07	-103.68	462.03	453.34	8.69	53.145	
2,000.00	1,985.04	1,854.84	1,792.79	5.13	8.26	-126.32	-376.62	-112.68	513.76	504.41	9.35	54.966	
2,100.00	2,081.82	1,939.77	1,871.13	5.59	8.90	-127.50	-408.16	-121.68	565.69	555.67	10.02	56.479	
2,200.00	2,178.60	2,024.69	1,949.47	6.05	9.54	-128.48	-439.71	-130.69	617.76	607.07	10.70	57.751	
2,300.00	2,275.38	2,109.62	2,027.81	6.53	10.19	-129.31	-471.25	-139.69	669.95	658.56	11.39	58.831	
2,400.00	2,372.16	2,194.55	2,106.15	7.01	10.83	-130.02	-502.79	-148.69	722.23	710.14	12.09	59.757	
2,500.00	2,468.94	2,279.48	2,184.48	7.50	11.47	-130.64	-534.34	-157.69	774.57	761.78	12.79	60.558	
2,600.00	2,565.72	2,364.41	2,262.82	7.99	12.12	-131.17	-565.88	-166.70	826.97	813.47	13.50	61.258	
2,700.00	2,662.50	2,449.34	2,341.16	8.49	12.76	-131.65	-597.43	-175.70	879.42	865.21	14.21	61.873	
2,800.00	2,759.28	2,534.27	2,419.50	8.99	13.41	-132.07	-628.97	-184.70	931.91	916.98	14.93	62.418	
2,900.00	2,856.06	2,619.20	2,497.84	9.50	14.06	-132.44	-660.51	-193.71	984.43	968.78	15.65	62.903	
3,000.00	2,952.84	2,704.12	2,576.17	10.01	14.70	-132.78	-692.06	-202.71	1,036.98	1,020.61	16.37	63.338	
3,100.00	3,049.62	2,789.05	2,654.51	10.52	15.35	-133.09	-723.60	-211.71	1,089.55	1,072.45	17.10	63.729	
3,200.00	3,146.40	2,873.98	2,732.85	11.03	16.00	-133.36	-755.15	-220.71	1,142.14	1,124.32	17.82	64.083	
3,300.00	3,243.18	2,958.91	2,811.19	11.54	16.65	-133.62	-786.69	-229.72	1,194.75	1,176.20	18.55	64.404	
3,400.00	3,339.96	3,043.84	2,889.53	12.06	17.29	-133.85	-818.23	-238.72	1,247.38	1,228.10	19.28	64.698	
3,500.00	3,436.74	3,128.77	2,967.86	12.58	17.94	-134.06	-849.78	-247.72	1,300.02	1,280.01	20.01	64.967	
3,600.00	3,533.52	3,213.70	3,046.20	13.09	18.59	-134.26	-881.32	-256.72	1,352.67	1,331.93	20.74	65.214	
3,700.00	3,630.30	3,298.63	3,124.54	13.61	19.24	-134.44	-912.86	-265.73	1,405.33	1,383.86	21.47	65.442	
3,800.00	3,727.08	3,383.55	3,202.88	14.13	19.89	-134.61	-944.41	-274.73	1,458.00	1,435.79	22.21	65.652	
3,900.00	3,823.86	3,468.48	3,281.22	14.65	20.54	-134.76	-975.95	-283.73	1,510.68	1,487.74	22.94	65.848	
4,000.00	3,920.64	3,553.41	3,359.55	15.17	21.19	-134.91	-1,007.50	-292.74	1,563.37	1,539.69	23.68	66.029	
4,100.00	4,017.42	3,638.34	3,437.89	15.69	21.84	-135.05	-1,039.04	-301.74	1,616.06	1,591.65	24.41	66.198	
4,200.00	4,114.20	3,723.27	3,516.23	16.22	22.49	-135.18	-1,070.58	-310.74	1,668.76	1,643.61	25.15	66.356	
4,300.00	4,210.98	3,808.17	3,594.56	16.74	23.14	-135.30	-1,102.13	-319.74	1,720.75	1,694.71	25.88	66.506	
4,400.00	4,307.76	3,893.10	3,672.89	17.26	23.79	-135.41	-1,133.66	-328.74	1,772.84	1,744.79	26.61	66.649	
4,500.00	4,404.54	3,978.03	3,751.22	17.78	24.44	-135.51	-1,165.19	-337.74	1,824.93	1,796.87	27.34	66.787	
4,600.00	4,501.32	4,062.96	3,829.55	18.30	25.09	-135.61	-1,196.72	-346.74	1,877.02	1,848.91	28.07	66.920	
4,700.00	4,598.10	4,147.89	3,907.88	18.82	25.74	-135.71	-1,228.25	-355.74	1,929.11	1,900.95	28.80	67.049	
4,800.00	4,694.88	4,232.82	3,986.21	19.34	26.39	-135.81	-1,259.78	-364.74	1,981.20	1,952.99	29.53	67.178	
4,900.00	4,791.66	4,317.75	4,064.54	19.86	27.04	-135.91	-1,291.31	-373.74	2,033.29	2,004.97	30.26	67.302	

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 32-33
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	WELL @ 4964.00ft (Original Well Elev)
Reference Site:	WELD_COTTONWOOD 12-33 PAD	MD Reference:	WELL @ 4964.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_COTTONWOOD 32-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 32-33	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 2-19-10 RHS	Offset TVD Reference:	Offset Datum

Offset Design WELD_COTTONWOOD 12-33 PAD - P_COTTONWOOD 13-33 - P_COTTONWOOD 13-33 - 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	4,888.44	5,128.16	4,888.44	20.41	26.63	-140.17	-1,299.37	-376.04	1,930.78	1,899.05	31.73	60.859	
5,100.00	4,985.22	5,224.94	4,985.22	20.93	26.69	-140.64	-1,299.37	-376.04	1,950.43	1,918.16	32.27	60.440	
5,200.00	5,082.00	5,321.72	5,082.00	21.46	26.77	-141.10	-1,299.37	-376.04	1,970.21	1,937.39	32.81	60.044	
5,300.00	5,178.78	5,418.50	5,178.78	21.98	26.84	-141.55	-1,299.37	-376.04	1,990.11	1,956.75	33.35	59.669	
5,400.00	5,275.56	5,515.28	5,275.56	22.51	26.91	-141.99	-1,299.37	-376.04	2,010.12	1,976.24	33.89	59.315	
5,500.00	5,372.34	5,612.06	5,372.34	23.04	26.99	-142.42	-1,299.37	-376.04	2,030.26	1,995.83	34.42	58.978	
5,574.94	5,444.87	5,684.59	5,444.87	23.43	27.04	-142.74	-1,299.37	-376.04	2,045.42	2,010.60	34.82	58.738	
5,600.00	5,469.15	5,708.86	5,469.15	23.55	27.06	-142.91	-1,299.37	-376.04	2,050.42	2,015.41	35.00	58.576	
5,700.00	5,566.55	5,806.27	5,566.55	23.92	27.14	-143.50	-1,299.37	-376.04	2,068.71	2,033.05	35.65	58.028	
5,800.00	5,664.68	5,904.40	5,664.68	24.26	27.22	-144.00	-1,299.37	-376.04	2,084.30	2,048.06	36.24	57.509	
5,900.00	5,763.42	6,003.14	5,763.42	24.55	27.31	-144.40	-1,299.37	-376.04	2,097.16	2,060.38	36.78	57.019	
6,000.00	5,862.66	6,102.37	5,862.66	24.80	27.39	-144.72	-1,299.37	-376.04	2,107.22	2,069.96	37.26	56.553	
6,100.00	5,962.26	6,201.97	5,962.26	25.00	27.48	-144.94	-1,299.37	-376.04	2,114.47	2,076.78	37.69	56.109	
6,200.00	6,062.11	6,301.83	6,062.11	25.17	27.57	-145.07	-1,299.37	-376.04	2,118.87	2,080.81	38.05	55.683	
6,303.91	6,166.00	6,405.72	6,166.00	25.29	27.66	167.33	-1,299.37	-376.04	2,120.41	2,082.04	38.37	55.256	
6,400.00	6,262.09	6,501.80	6,262.09	25.39	27.75	167.33	-1,299.37	-376.04	2,120.41	2,081.78	38.64	54.881	
6,500.00	6,362.09	6,601.80	6,362.09	25.51	27.84	167.33	-1,299.37	-376.04	2,120.41	2,081.48	38.93	54.469	
6,600.00	6,462.09	6,701.80	6,462.09	25.63	27.94	167.33	-1,299.37	-376.04	2,120.41	2,081.19	39.22	54.060	
6,700.00	6,562.09	6,801.80	6,562.09	25.75	28.03	167.33	-1,299.37	-376.04	2,120.41	2,080.89	39.52	53.653	
6,800.00	6,662.09	6,901.80	6,662.09	25.87	28.13	167.33	-1,299.37	-376.04	2,120.41	2,080.59	39.82	53.248	
6,900.00	6,762.09	7,001.80	6,762.09	26.00	28.23	167.33	-1,299.37	-376.04	2,120.41	2,080.29	40.12	52.846	
7,000.00	6,862.09	7,101.80	6,862.09	26.12	28.33	167.33	-1,299.37	-376.04	2,120.41	2,079.98	40.43	52.446	
7,100.00	6,962.09	7,201.80	6,962.09	26.25	28.43	167.33	-1,299.37	-376.04	2,120.41	2,079.67	40.74	52.048	
7,200.00	7,062.09	7,301.80	7,062.09	26.38	28.53	167.33	-1,299.37	-376.04	2,120.41	2,079.36	41.05	51.654	
7,300.00	7,162.09	7,401.80	7,162.09	26.51	28.64	167.33	-1,299.37	-376.04	2,120.41	2,079.05	41.36	51.262	
7,400.00	7,262.09	7,501.80	7,262.09	26.64	28.75	167.33	-1,299.37	-376.04	2,120.41	2,078.73	41.68	50.873	
7,500.00	7,362.09	7,601.80	7,362.09	26.77	28.85	167.33	-1,299.37	-376.04	2,120.41	2,078.41	42.00	50.487	
7,600.00	7,462.09	7,701.80	7,462.09	26.90	28.96	167.33	-1,299.37	-376.04	2,120.41	2,078.09	42.32	50.104	
7,700.00	7,562.09	7,801.80	7,562.09	27.04	29.07	167.33	-1,299.37	-376.04	2,120.41	2,077.77	42.64	49.724	
7,800.00	7,662.09	7,901.80	7,662.09	27.17	29.18	167.33	-1,299.37	-376.04	2,120.41	2,077.44	42.97	49.347	
7,900.00	7,762.09	8,001.80	7,762.09	27.31	29.30	167.33	-1,299.37	-376.04	2,120.41	2,077.11	43.30	48.973	
8,000.00	7,862.09	8,101.80	7,862.09	27.45	29.41	167.33	-1,299.37	-376.04	2,120.41	2,076.78	43.63	48.603	
8,100.00	7,962.09	8,201.80	7,962.09	27.59	29.53	167.33	-1,299.37	-376.04	2,120.41	2,076.45	43.96	48.236	
8,200.00	8,062.09	8,301.80	8,062.09	27.73	29.64	167.33	-1,299.37	-376.04	2,120.41	2,076.12	44.29	47.872	
8,222.91	8,085.00	8,304.72	8,085.00	27.76	29.65	167.33	-1,299.37	-376.04	2,120.51	2,076.17	44.34	47.826	

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_COTTONWOOD 32-33
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	WELL @ 4964.00ft (Original Well Elev)
Reference Site:	WELD_COTTONWOOD 12-33 PAD	MD Reference:	WELL @ 4964.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_COTTONWOOD 32-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 32-33	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 2-19-10 RHS	Offset TVD Reference:	Offset Datum

Offset Design WELD_COTTONWOOD 12-33 PAD - P_COTTONWOOD 33-33 - P_COTTONWOOD 33-33 - 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	-134.88	-28.42	-28.54	40.28				
100.00	100.00	100.00	100.00	0.10	0.10	-134.88	-28.42	-28.54	40.28	40.09	0.19	210.814	
200.00	200.00	200.00	200.00	0.32	0.32	-134.88	-28.42	-28.54	40.28	39.64	0.64	62.874	
300.00	300.00	300.00	300.00	0.55	0.55	-134.88	-28.42	-28.54	40.28	39.19	1.09	36.947	
400.00	400.00	400.00	400.00	0.77	0.77	-134.88	-28.42	-28.54	40.28	38.74	1.54	26.159	
500.00	500.00	500.00	500.00	0.99	0.99	-134.88	-28.42	-28.54	40.28	38.29	1.99	20.248	
600.00	600.00	600.00	600.00	1.22	1.22	-134.88	-28.42	-28.54	40.28	37.84	2.44	16.515	
700.00	700.00	700.00	700.00	1.44	1.44	-134.88	-28.42	-28.54	40.28	37.39	2.89	13.945	
800.00	800.00	800.00	800.00	1.67	1.67	-134.88	-28.42	-28.54	40.28	36.94	3.34	12.067	
900.00	900.00	900.00	900.00	1.89	1.89	-134.88	-28.42	-28.54	40.28	36.49	3.79	10.635	
1,000.00	1,000.00	1,000.00	1,000.00	2.12	2.12	-134.88	-28.42	-28.54	40.28	36.04	4.24	9.506	
1,050.00	1,050.00	1,050.00	1,050.00	2.23	2.23	-134.88	-28.42	-28.54	40.28	35.81	4.46	9.027 CC, ES	
1,100.00	1,100.00	1,099.33	1,099.32	2.34	2.33	-87.77	-28.63	-28.91	40.67	36.00	4.67	8.706	
1,200.00	1,199.93	1,197.85	1,197.79	2.56	2.52	-91.00	-30.31	-31.85	43.92	38.85	5.07	8.658 SF	
1,300.00	1,299.68	1,296.02	1,295.71	2.78	2.71	-96.16	-33.66	-37.71	50.77	45.28	5.49	9.250	
1,400.00	1,399.13	1,393.58	1,392.75	3.02	2.93	-101.62	-38.62	-46.41	61.59	55.66	5.92	10.395	
1,500.00	1,498.15	1,490.30	1,488.57	3.28	3.16	-106.38	-45.16	-57.86	76.56	70.17	6.39	11.979	
1,600.00	1,596.63	1,585.98	1,582.86	3.57	3.43	-110.12	-53.21	-71.95	95.70	88.80	6.90	13.873	
1,700.00	1,694.44	1,681.86	1,676.83	3.90	3.74	-113.10	-62.62	-88.45	118.61	111.15	7.46	15.904	
1,778.97	1,771.13	1,758.13	1,751.54	4.20	4.00	-115.50	-70.26	-101.82	138.14	130.20	7.94	17.399	
1,800.00	1,791.48	1,778.39	1,771.38	4.28	4.07	-116.22	-72.29	-105.38	143.51	135.44	8.07	17.773	
1,900.00	1,888.26	1,874.73	1,865.74	4.70	4.42	-119.01	-81.94	-122.27	169.28	160.54	8.74	19.370	
2,000.00	1,985.04	1,971.08	1,960.10	5.13	4.79	-121.06	-91.58	-139.17	195.33	185.90	9.43	20.712	
2,100.00	2,081.82	2,067.42	2,054.45	5.59	5.16	-122.63	-101.23	-156.07	221.56	211.41	10.14	21.844	
2,200.00	2,178.60	2,163.76	2,148.81	6.05	5.55	-123.86	-110.88	-172.97	247.90	237.03	10.87	22.803	
2,300.00	2,275.38	2,260.11	2,243.17	6.53	5.94	-124.86	-120.52	-189.86	274.34	262.73	11.61	23.623	
2,400.00	2,372.16	2,356.45	2,337.53	7.01	6.34	-125.69	-130.17	-206.76	300.84	288.47	12.37	24.328	
2,500.00	2,468.94	2,452.79	2,431.88	7.50	6.74	-126.38	-139.81	-223.66	327.39	314.26	13.13	24.939	
2,600.00	2,565.72	2,549.13	2,526.24	7.99	7.15	-126.96	-149.46	-240.56	353.97	340.08	13.90	25.473	
2,700.00	2,662.50	2,645.48	2,620.60	8.49	7.56	-127.47	-159.11	-257.45	380.59	365.92	14.67	25.942	
2,800.00	2,759.28	2,741.82	2,714.96	8.99	7.97	-127.91	-168.75	-274.35	407.22	391.77	15.45	26.356	
2,900.00	2,856.06	2,838.16	2,809.31	9.50	8.39	-128.29	-178.40	-291.25	433.88	417.65	16.24	26.725	
3,000.00	2,952.84	2,934.50	2,903.67	10.01	8.80	-128.63	-188.05	-308.14	460.56	443.53	17.02	27.054	
3,100.00	3,049.62	3,030.85	2,998.03	10.52	9.22	-128.94	-197.69	-325.04	487.25	469.43	17.82	27.350	
3,200.00	3,146.40	3,127.19	3,092.39	11.03	9.64	-129.21	-207.34	-341.94	513.95	495.34	18.61	27.617	
3,300.00	3,243.18	3,223.53	3,186.74	11.54	10.07	-129.45	-216.99	-358.84	540.65	521.25	19.41	27.859	
3,400.00	3,339.96	3,319.87	3,281.10	12.06	10.49	-129.68	-226.63	-375.73	567.37	547.17	20.21	28.079	
3,500.00	3,436.74	3,416.22	3,375.46	12.58	10.91	-129.88	-236.28	-392.63	594.10	573.09	21.01	28.280	
3,600.00	3,533.52	3,512.56	3,469.82	13.09	11.34	-130.06	-245.93	-409.53	620.83	599.02	21.81	28.465	
3,700.00	3,630.30	3,608.90	3,564.17	13.61	11.76	-130.23	-255.57	-426.43	647.56	624.95	22.61	28.635	
3,800.00	3,727.08	3,705.25	3,658.53	14.13	12.19	-130.39	-265.22	-443.32	674.30	650.88	23.42	28.791	
3,900.00	3,823.86	3,801.59	3,752.89	14.65	12.62	-130.53	-274.87	-460.22	701.05	676.82	24.23	28.936	
4,000.00	3,920.64	3,897.93	3,847.25	15.17	13.05	-130.66	-284.51	-477.12	727.80	702.76	25.04	29.070	
4,100.00	4,017.42	3,994.27	3,941.60	15.69	13.48	-130.79	-294.16	-494.02	754.55	728.71	25.85	29.195	
4,200.00	4,114.20	4,090.62	4,035.96	16.22	13.91	-130.90	-303.80	-510.91	781.31	754.65	26.66	29.311	
4,300.00	4,210.98	4,186.96	4,130.32	16.74	14.33	-131.01	-313.45	-527.81	808.07	780.60	27.47	29.420	
4,400.00	4,307.76	4,283.30	4,224.68	17.26	14.77	-131.11	-323.10	-544.71	834.83	806.55	28.28	29.522	
4,500.00	4,404.54	4,379.64	4,319.03	17.78	15.20	-131.21	-332.74	-561.60	861.59	832.50	29.09	29.617	
4,600.00	4,501.32	4,475.99	4,413.39	18.31	15.63	-131.30	-342.39	-578.50	888.35	858.45	29.90	29.707	
4,700.00	4,598.10	4,572.33	4,507.75	18.83	16.06	-131.38	-352.04	-595.40	915.12	884.40	30.72	29.791	
4,800.00	4,694.88	4,668.67	4,602.11	19.36	16.49	-131.46	-361.68	-612.30	941.89	910.36	31.53	29.871	
4,900.00	4,791.66	4,765.01	4,696.46	19.88	16.92	-131.53	-371.33	-629.19	968.66	936.31	32.35	29.946	

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 32-33
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	WELL @ 4964.00ft (Original Well Elev)
Reference Site:	WELD_COTTONWOOD 12-33 PAD	MD Reference:	WELL @ 4964.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_COTTONWOOD 32-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 32-33	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 2-19-10 RHS	Offset TVD Reference:	Offset Datum

Offset Design WELD_COTTONWOOD 12-33 PAD - P_COTTONWOOD 33-33 - P_COTTONWOOD 33-33 - 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	4,888.44	4,861.36	4,790.82	20.41	17.35	-131.60	-380.98	-646.09	995.43	962.27	33.16	30.017	
5,100.00	4,985.22	4,957.70	4,885.18	20.93	17.78	-131.67	-390.62	-662.99	1,022.21	988.23	33.98	30.084	
5,200.00	5,082.00	5,054.04	4,979.54	21.46	18.22	-131.73	-400.27	-679.89	1,048.98	1,014.19	34.79	30.148	
5,300.00	5,178.78	5,150.39	5,073.89	21.98	18.65	-131.79	-409.92	-696.78	1,075.76	1,040.15	35.61	30.209	
5,400.00	5,275.56	5,246.73	5,168.25	22.51	19.08	-131.85	-419.56	-713.68	1,102.53	1,066.11	36.43	30.267	
5,500.00	5,372.34	5,343.07	5,262.61	23.04	19.52	-131.91	-429.21	-730.58	1,129.31	1,092.07	37.24	30.321	
5,574.94	5,444.87	5,415.27	5,333.32	23.43	19.84	-131.95	-436.44	-743.24	1,149.38	1,111.52	37.86	30.361	
5,600.00	5,469.15	5,439.43	5,356.98	23.55	19.95	-132.06	-438.86	-747.48	1,156.02	1,117.95	38.07	30.365	
5,700.00	5,566.55	5,536.23	5,451.78	23.92	20.38	-132.39	-448.55	-764.46	1,181.10	1,142.25	38.85	30.399	
5,800.00	5,664.68	5,633.53	5,547.08	24.26	20.82	-132.57	-458.29	-781.52	1,203.90	1,164.30	39.60	30.400	
5,900.00	5,763.42	5,748.76	5,660.17	24.55	21.24	-132.58	-469.23	-800.68	1,223.94	1,183.63	40.31	30.366	
6,000.00	5,862.66	5,873.69	5,783.65	24.80	21.58	-132.57	-478.61	-817.12	1,239.70	1,198.80	40.90	30.308	
6,100.00	5,962.26	5,999.98	5,909.19	25.00	21.87	-132.56	-485.38	-828.97	1,251.01	1,209.60	41.40	30.214	
6,200.00	6,062.11	6,127.20	6,036.14	25.17	22.09	-132.57	-489.42	-836.04	1,257.80	1,216.00	41.80	30.093	
6,303.91	6,166.00	6,257.09	6,166.00	25.29	22.27	179.86	-490.66	-838.22	1,260.04	1,217.94	42.10	29.929	
6,400.00	6,262.09	6,353.18	6,262.09	25.39	22.38	179.86	-490.66	-838.22	1,260.04	1,217.70	42.35	29.756	
6,500.00	6,362.09	6,453.18	6,362.09	25.51	22.50	179.86	-490.66	-838.22	1,260.04	1,217.43	42.62	29.566	
6,600.00	6,462.09	6,553.18	6,462.09	25.63	22.63	179.86	-490.66	-838.22	1,260.04	1,217.15	42.89	29.376	
6,700.00	6,562.09	6,653.18	6,562.09	25.75	22.75	179.86	-490.66	-838.22	1,260.04	1,216.87	43.17	29.186	
6,800.00	6,662.09	6,753.18	6,662.09	25.87	22.88	179.86	-490.66	-838.22	1,260.04	1,216.59	43.45	28.997	
6,900.00	6,762.09	6,853.18	6,762.09	26.00	23.00	179.86	-490.66	-838.22	1,260.04	1,216.30	43.74	28.808	
7,000.00	6,862.09	6,953.18	6,862.09	26.12	23.13	179.86	-490.66	-838.22	1,260.04	1,216.02	44.03	28.620	
7,100.00	6,962.09	7,053.18	6,962.09	26.25	23.26	179.86	-490.66	-838.22	1,260.04	1,215.73	44.32	28.433	
7,200.00	7,062.09	7,153.18	7,062.09	26.38	23.40	179.86	-490.66	-838.22	1,260.04	1,215.44	44.61	28.247	
7,300.00	7,162.09	7,253.18	7,162.09	26.51	23.53	179.86	-490.66	-838.22	1,260.04	1,215.14	44.90	28.061	
7,400.00	7,262.09	7,353.18	7,262.09	26.64	23.67	179.86	-490.66	-838.22	1,260.04	1,214.84	45.20	27.876	
7,500.00	7,362.09	7,453.18	7,362.09	26.77	23.80	179.86	-490.66	-838.22	1,260.04	1,214.54	45.50	27.693	
7,600.00	7,462.09	7,553.18	7,462.09	26.90	23.94	179.86	-490.66	-838.22	1,260.04	1,214.24	45.80	27.510	
7,700.00	7,562.09	7,653.18	7,562.09	27.04	24.08	179.86	-490.66	-838.22	1,260.04	1,213.93	46.11	27.328	
7,800.00	7,662.09	7,753.18	7,662.09	27.17	24.22	179.86	-490.66	-838.22	1,260.04	1,213.63	46.42	27.147	
7,900.00	7,762.09	7,853.18	7,762.09	27.31	24.36	179.86	-490.66	-838.22	1,260.04	1,213.32	46.73	26.967	
8,000.00	7,862.09	7,953.18	7,862.09	27.45	24.50	179.86	-490.66	-838.22	1,260.04	1,213.01	47.04	26.788	
8,100.00	7,962.09	8,053.18	7,962.09	27.59	24.65	179.86	-490.66	-838.22	1,260.04	1,212.69	47.35	26.610	
8,200.00	8,062.09	8,153.18	8,062.09	27.73	24.79	179.86	-490.66	-838.22	1,260.04	1,212.38	47.67	26.434	
8,204.36	8,066.45	8,157.54	8,066.45	27.73	24.80	179.86	-490.66	-838.22	1,260.04	1,212.36	47.68	26.426	
8,222.91	8,085.00	8,166.09	8,075.00	27.76	24.81	179.86	-490.66	-838.22	1,260.08	1,212.36	47.73	26.403	

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_COTTONWOOD 32-33
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	WELL @ 4964.00ft (Original Well Elev)
Reference Site:	WELD_COTTONWOOD 12-33 PAD	MD Reference:	WELL @ 4964.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_COTTONWOOD 32-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 32-33	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 2-19-10 RHS	Offset TVD Reference:	Offset Datum

Offset Design WELD_COTTONWOOD 12-33 PAD - P_COTTONWOOD 34-33 - P_COTTONWOOD 34-33 - 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		
0.00	0.00	0.00	0.00	0.00	0.00	-134.45	-21.14	-21.54	30.18					
100.00	100.00	100.00	100.00	0.10	0.10	-134.45	-21.14	-21.54	30.18	29.99	0.19	157.969		
200.00	200.00	200.00	200.00	0.32	0.32	-134.45	-21.14	-21.54	30.18	29.54	0.64	47.113		
300.00	300.00	300.00	300.00	0.55	0.55	-134.45	-21.14	-21.54	30.18	29.09	1.09	27.685 CC, ES		
400.00	400.00	398.98	398.96	0.77	0.74	-135.53	-22.69	-22.27	31.80	30.29	1.51	21.021		
500.00	500.00	497.73	497.57	0.99	0.94	-138.19	-27.32	-24.43	36.73	34.79	1.93	18.998		
600.00	600.00	596.01	595.48	1.22	1.17	-141.31	-34.98	-28.01	45.04	42.66	2.38	18.923 SF		
700.00	700.00	693.60	692.36	1.44	1.43	-144.12	-45.59	-32.98	56.78	53.93	2.86	19.889		
800.00	800.00	790.27	787.88	1.67	1.74	-146.37	-59.05	-39.27	71.94	68.58	3.36	21.416		
900.00	900.00	885.83	881.76	1.89	2.09	-148.09	-75.21	-46.83	90.45	86.56	3.89	23.232		
1,000.00	1,000.00	980.09	973.72	2.12	2.49	-149.39	-93.92	-55.58	112.25	107.79	4.46	25.176		
1,050.00	1,050.00	1,026.67	1,018.91	2.23	2.71	-149.91	-104.18	-60.37	124.36	119.60	4.75	26.162		
1,100.00	1,100.00	1,072.83	1,063.49	2.34	2.94	-102.72	-114.99	-65.43	137.34	132.74	4.60	29.859		
1,200.00	1,199.93	1,163.63	1,150.60	2.56	3.42	-104.00	-138.17	-76.27	166.27	161.22	5.05	32.916		
1,300.00	1,299.68	1,252.12	1,234.69	2.78	3.95	-105.61	-163.15	-87.95	199.20	193.69	5.51	36.168		
1,400.00	1,399.13	1,338.04	1,315.48	3.02	4.50	-107.27	-189.64	-100.34	236.20	230.22	5.97	39.536		
1,500.00	1,498.15	1,422.80	1,394.30	3.28	5.08	-108.85	-217.86	-113.53	277.21	270.75	6.46	42.904		
1,600.00	1,596.63	1,512.10	1,477.05	3.57	5.72	-110.51	-248.27	-127.76	320.54	313.55	6.99	45.837		
1,700.00	1,694.44	1,600.40	1,558.87	3.90	6.36	-112.07	-278.34	-141.82	365.48	357.92	7.56	48.352		
1,778.97	1,771.13	1,669.36	1,622.77	4.20	6.86	-113.24	-301.83	-152.80	402.18	394.14	8.03	50.063		
1,800.00	1,791.48	1,687.62	1,639.69	4.28	7.00	-113.74	-308.05	-155.71	412.11	403.94	8.17	50.449		
1,900.00	1,888.26	1,774.48	1,720.18	4.70	7.64	-115.82	-337.62	-169.54	459.63	450.80	8.83	52.029		
2,000.00	1,985.04	1,861.33	1,800.66	5.13	8.28	-117.51	-367.20	-183.37	507.55	498.02	9.53	53.285		
2,100.00	2,081.82	1,948.18	1,881.14	5.59	8.92	-118.92	-396.78	-197.20	555.75	545.51	10.24	54.298		
2,200.00	2,178.60	2,035.04	1,961.62	6.05	9.56	-120.11	-426.36	-211.03	604.17	593.21	10.96	55.126		
2,300.00	2,275.38	2,121.89	2,042.10	6.53	10.21	-121.12	-455.93	-224.86	652.77	641.07	11.70	55.812		
2,400.00	2,372.16	2,208.74	2,122.59	7.01	10.85	-121.99	-485.51	-238.69	701.50	689.06	12.44	56.388		
2,500.00	2,468.94	2,295.60	2,203.07	7.50	11.50	-122.75	-515.09	-252.52	750.34	737.15	13.19	56.877		
2,600.00	2,565.72	2,382.45	2,283.55	7.99	12.15	-123.42	-544.67	-266.35	799.27	785.32	13.95	57.295		
2,700.00	2,662.50	2,469.30	2,364.03	8.49	12.80	-124.01	-574.24	-280.18	848.27	833.56	14.71	57.658		
2,800.00	2,759.28	2,556.16	2,444.52	8.99	13.45	-124.54	-603.82	-294.01	897.33	881.85	15.48	57.974		
2,900.00	2,856.06	2,643.01	2,525.00	9.50	14.10	-125.01	-633.40	-307.84	946.45	930.20	16.25	58.252		
3,000.00	2,952.84	2,729.86	2,605.48	10.01	14.75	-125.43	-662.98	-321.67	995.61	978.59	17.02	58.499		
3,100.00	3,049.62	2,816.72	2,685.96	10.52	15.40	-125.82	-692.55	-335.51	1,044.81	1,027.01	17.79	58.719		
3,200.00	3,146.40	2,903.57	2,766.44	11.03	16.05	-126.17	-722.13	-349.34	1,094.04	1,075.47	18.57	58.915		
3,300.00	3,243.18	2,990.42	2,846.93	11.54	16.70	-126.49	-751.71	-363.17	1,143.30	1,123.95	19.35	59.093		
3,400.00	3,339.96	3,077.28	2,927.41	12.06	17.35	-126.79	-781.29	-377.00	1,192.58	1,172.46	20.13	59.253		
3,500.00	3,436.74	3,164.13	3,007.89	12.58	18.00	-127.06	-810.86	-390.83	1,241.89	1,220.98	20.91	59.399		
3,600.00	3,533.52	3,250.98	3,088.37	13.09	18.65	-127.31	-840.44	-404.66	1,291.22	1,269.53	21.69	59.532		
3,700.00	3,630.30	3,337.84	3,168.86	13.61	19.30	-127.54	-870.02	-418.49	1,340.56	1,318.09	22.47	59.654		
3,800.00	3,727.08	3,424.69	3,249.34	14.13	19.96	-127.76	-899.60	-432.32	1,389.92	1,366.66	23.26	59.767		
3,900.00	3,823.86	3,511.54	3,329.82	14.65	20.61	-127.96	-929.17	-446.15	1,439.29	1,415.25	24.04	59.870		
4,000.00	3,920.64	3,598.40	3,410.30	15.17	21.26	-128.15	-958.75	-459.98	1,488.68	1,463.85	24.83	59.966		
4,100.00	4,017.42	3,685.25	3,490.78	15.69	21.91	-128.33	-988.33	-473.81	1,538.08	1,512.47	25.61	60.055		
4,200.00	4,114.20	3,772.10	3,571.27	16.22	22.57	-128.49	-1,017.91	-487.64	1,587.49	1,561.09	26.40	60.137		
4,300.00	4,210.98	3,858.96	3,651.75	16.74	23.22	-128.65	-1,047.48	-501.47	1,636.90	1,609.72	27.18	60.214		
4,400.00	4,307.76	3,945.81	3,732.23	17.26	23.87	-128.79	-1,077.06	-515.31	1,686.33	1,658.36	27.97	60.286		
4,500.00	4,404.54	4,032.66	3,812.71	17.78	24.52	-128.93	-1,106.64	-529.14	1,735.76	1,707.00	28.76	60.354		
4,600.00	4,501.32	4,119.52	3,893.20	18.31	25.18	-129.06	-1,136.22	-542.97	1,785.20	1,755.66	29.55	60.417		
4,700.00	4,598.10	4,206.37	3,973.68	18.83	25.83	-129.18	-1,165.79	-556.80	1,834.65	1,804.31	30.34	60.476		
4,800.00	4,694.88	4,293.22	4,054.16	19.36	26.48	-129.30	-1,195.37	-570.63	1,884.10	1,852.98	31.13	60.532		
4,900.00	4,791.66	4,380.08	4,134.64	19.88	27.14	-129.41	-1,224.95	-584.46	1,933.56	1,901.65	31.91	60.585		

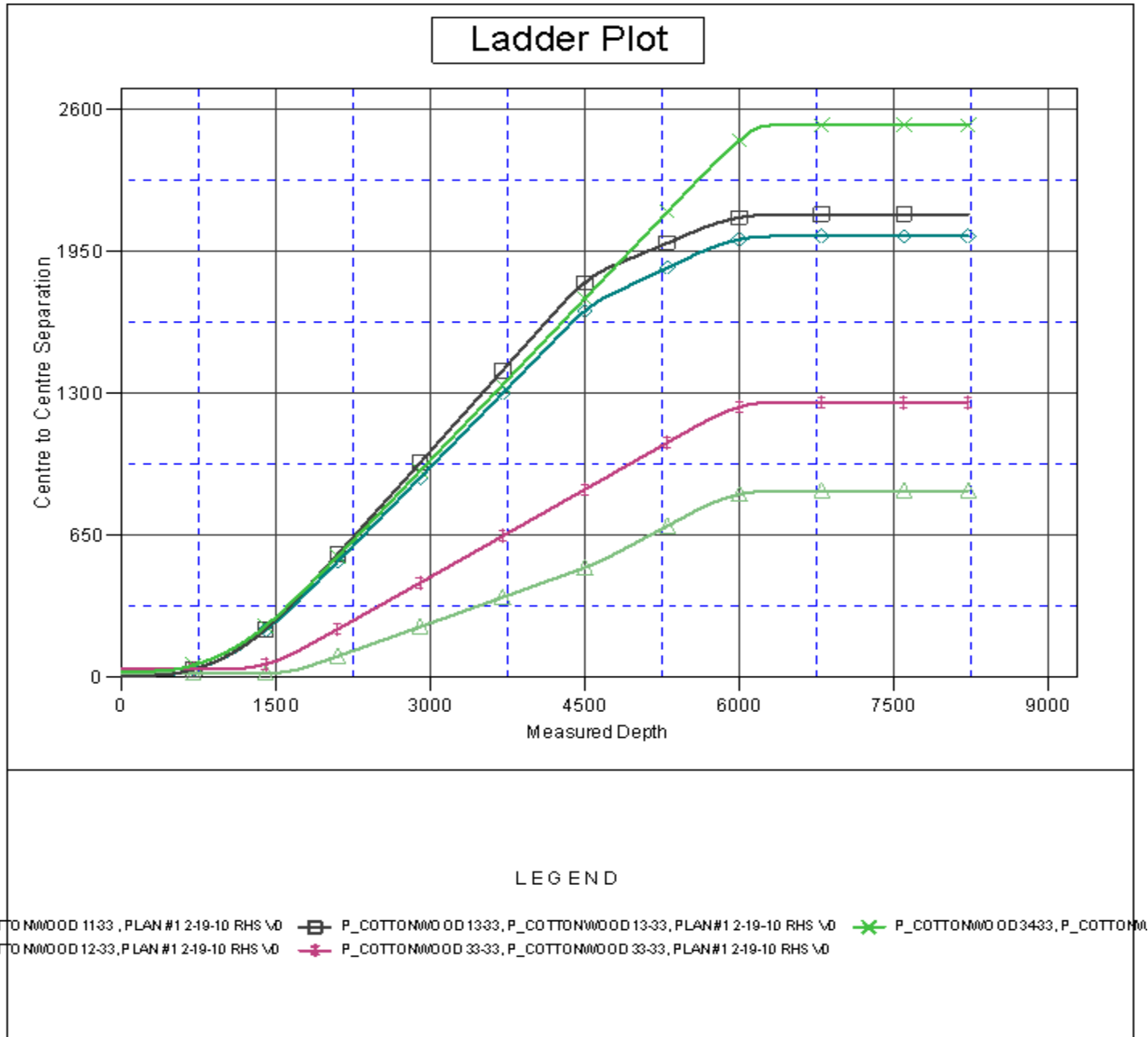
CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_COTTONWOOD 32-33
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	WELL @ 4964.00ft (Original Well Elev)
Reference Site:	WELD_COTTONWOOD 12-33 PAD	MD Reference:	WELL @ 4964.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_COTTONWOOD 32-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 32-33	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 2-19-10 RHS	Offset TVD Reference:	Offset Datum

Offset Design WELD_COTTONWOOD 12-33 PAD - P_COTTONWOOD 34-33 - P_COTTONWOOD 34-33 - 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	4,888.44	4,466.93	4,215.12	20.41	27.79	-129.52	-1,254.53	-598.29	1,983.03	1,950.32	32.70	60.635	
5,100.00	4,985.22	4,553.78	4,295.61	20.93	28.44	-129.62	-1,284.10	-612.12	2,032.50	1,999.00	33.49	60.682	
5,200.00	5,082.00	4,640.64	4,376.09	21.46	29.09	-129.71	-1,313.68	-625.95	2,081.97	2,047.69	34.28	60.727	
5,300.00	5,178.78	4,727.49	4,456.57	21.98	29.75	-129.80	-1,343.26	-639.78	2,131.45	2,096.37	35.07	60.770	
5,400.00	5,275.56	4,814.34	4,537.05	22.51	30.40	-129.89	-1,372.84	-653.61	2,180.93	2,145.07	35.86	60.810	
5,500.00	5,372.34	4,901.20	4,617.54	23.04	31.05	-129.97	-1,402.41	-667.44	2,230.42	2,193.76	36.66	60.849	
5,574.94	5,444.87	4,966.29	4,677.85	23.43	31.54	-130.03	-1,424.58	-677.81	2,267.50	2,230.25	37.25	60.876	
5,600.00	5,469.15	4,988.09	4,698.05	23.55	31.71	-130.27	-1,432.00	-681.28	2,279.84	2,242.33	37.51	60.780	
5,700.00	5,566.55	5,075.80	4,779.33	23.92	32.37	-131.12	-1,461.87	-695.25	2,327.85	2,289.37	38.48	60.500	
5,800.00	5,664.68	5,164.58	4,861.60	24.26	33.04	-131.84	-1,492.11	-709.39	2,373.83	2,334.43	39.40	60.246	
5,900.00	5,763.42	5,254.30	4,944.74	24.55	33.71	-132.44	-1,522.66	-723.67	2,417.74	2,377.46	40.28	60.025	
6,000.00	5,862.66	5,344.87	5,028.67	24.80	34.39	-132.94	-1,553.51	-738.10	2,459.53	2,418.43	41.10	59.840	
6,100.00	5,962.26	5,593.59	5,261.61	25.00	35.76	-132.96	-1,632.31	-774.94	2,497.84	2,455.56	42.28	59.074	
6,200.00	6,062.11	6,059.51	5,714.29	25.17	37.43	-132.65	-1,730.21	-820.72	2,522.48	2,478.77	43.71	57.711	
6,303.91	6,166.00	6,512.93	6,166.00	25.29	38.16	179.86	-1,760.53	-834.91	2,529.92	2,485.30	44.62	56.700	
6,400.00	6,262.09	6,609.01	6,262.09	25.39	38.22	179.86	-1,760.53	-834.91	2,529.92	2,485.08	44.84	56.423	
6,500.00	6,362.09	6,709.01	6,362.09	25.51	38.28	179.86	-1,760.53	-834.91	2,529.92	2,484.84	45.08	56.115	
6,600.00	6,462.09	6,809.01	6,462.09	25.63	38.34	179.86	-1,760.53	-834.91	2,529.92	2,484.59	45.33	55.806	
6,700.00	6,562.09	6,909.01	6,562.09	25.75	38.41	179.86	-1,760.53	-834.91	2,529.92	2,484.34	45.59	55.497	
6,800.00	6,662.09	7,009.01	6,662.09	25.87	38.47	179.86	-1,760.53	-834.91	2,529.92	2,484.08	45.84	55.188	
6,900.00	6,762.09	7,109.01	6,762.09	26.00	38.54	179.86	-1,760.53	-834.91	2,529.92	2,483.82	46.10	54.879	
7,000.00	6,862.09	7,209.01	6,862.09	26.12	38.61	179.86	-1,760.53	-834.91	2,529.92	2,483.56	46.36	54.570	
7,100.00	6,962.09	7,309.01	6,962.09	26.25	38.68	179.86	-1,760.53	-834.91	2,529.92	2,483.30	46.63	54.261	
7,200.00	7,062.09	7,409.01	7,062.09	26.38	38.75	179.86	-1,760.53	-834.91	2,529.92	2,483.03	46.89	53.952	
7,300.00	7,162.09	7,509.01	7,162.09	26.51	38.82	179.86	-1,760.53	-834.91	2,529.92	2,482.76	47.16	53.644	
7,400.00	7,262.09	7,609.01	7,262.09	26.64	38.89	179.86	-1,760.53	-834.91	2,529.92	2,482.49	47.43	53.336	
7,500.00	7,362.09	7,709.01	7,362.09	26.77	38.96	179.86	-1,760.53	-834.91	2,529.92	2,482.21	47.71	53.029	
7,600.00	7,462.09	7,809.01	7,462.09	26.90	39.04	179.86	-1,760.53	-834.91	2,529.92	2,481.94	47.99	52.722	
7,700.00	7,562.09	7,909.01	7,562.09	27.04	39.12	179.86	-1,760.53	-834.91	2,529.92	2,481.66	48.27	52.416	
7,800.00	7,662.09	8,009.01	7,662.09	27.17	39.19	179.86	-1,760.53	-834.91	2,529.92	2,481.37	48.55	52.111	
7,900.00	7,762.09	8,109.01	7,762.09	27.31	39.27	179.86	-1,760.53	-834.91	2,529.92	2,481.09	48.83	51.807	
8,000.00	7,862.09	8,209.01	7,862.09	27.45	39.35	179.86	-1,760.53	-834.91	2,529.92	2,480.80	49.12	51.504	
8,100.00	7,962.09	8,309.01	7,962.09	27.59	39.43	179.86	-1,760.53	-834.91	2,529.92	2,480.51	49.41	51.202	
8,200.00	8,062.09	8,409.01	8,062.09	27.73	39.51	179.86	-1,760.53	-834.91	2,529.92	2,480.22	49.70	50.901	
8,200.80	8,062.89	8,409.81	8,062.89	27.73	39.51	179.86	-1,760.53	-834.91	2,529.92	2,480.22	49.71	50.898	
8,222.91	8,085.00	8,416.93	8,070.00	27.76	39.52	179.86	-1,760.53	-834.91	2,529.97	2,480.22	49.75	50.853	

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_COTTONWOOD 32-33
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	WELL @ 4964.00ft (Original Well Elev)
Reference Site:	WELD_COTTONWOOD 12-33 PAD	MD Reference:	WELL @ 4964.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_COTTONWOOD 32-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 32-33	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 2-19-10 RHS	Offset TVD Reference:	Offset Datum

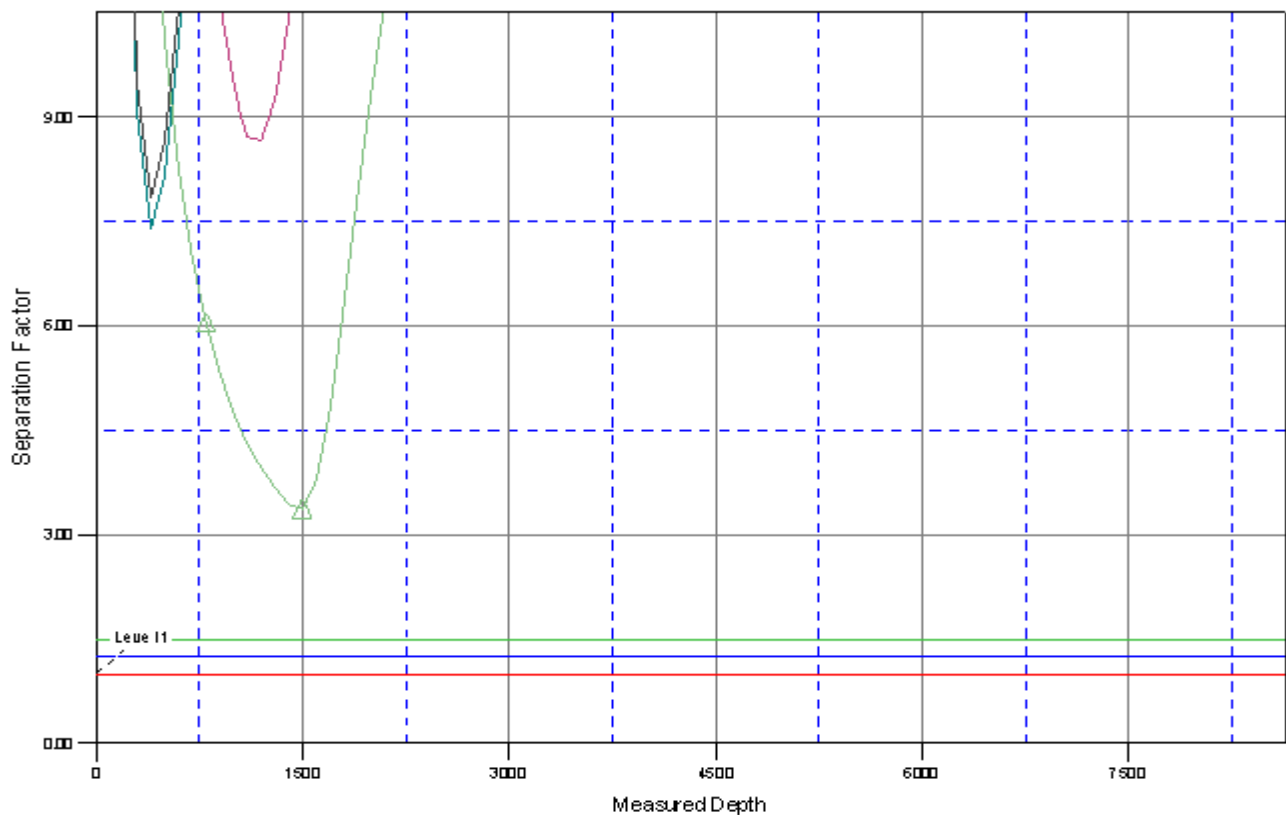
Reference Depths are relative to WELL @ 4964.00ft (Original Well Elev) Coordinates are relative to: P_COTTONWOOD 32-33
Offset Depths are relative to Offset Datum Coordinate System is US State Plane 1983, Colorado Northern Zone
Central Meridian is 105° 30' 0.000 W ° Grid Convergence at Surface is: 0.46°



Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_COTTONWOOD 32-33
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	WELL @ 4964.00ft (Original Well Elev)
Reference Site:	WELD_COTTONWOOD 12-33 PAD	MD Reference:	WELL @ 4964.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_COTTONWOOD 32-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 32-33	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 2-19-10 RHS	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 4964.00ft (Original Well Elev) Coordinates are relative to: P_COTTONWOOD 32-33
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: 0.46°

Separation Factor Plot



LEGEND

P_COTTONWOOD 11-33, PLAN #1 2-19-10 RHS \0 P_COTTONWOOD 13-33, P_COTTONWOOD 13-33, PLAN #1 2-19-10 RHS \0 P_COTTONWOOD 34-33, P_COTTONWOOD 34-33, PLAN #1 2-19-10 RHS \0
 P_COTTONWOOD 12-33, PLAN #1 2-19-10 RHS \0 P_COTTONWOOD 33-33, P_COTTONWOOD 33-33, PLAN #1 2-19-10 RHS \0