US ROCKIES REGION PLANNING

COLORADO NORTHERN ZONE - 83
WELD_COTTONWOOD 16-33 PAD
P_COTTONWOOD 24-33

P_COTTONWOOD 24-33

Plan: PLAN #1 2-18-10 RHS

Standard Planning Report

18 February, 2010

KerrMcGee

Weatherford

Project:	COLORADO NORTHERN ZONE - 83
Site:	WELD_COTTONWOOD 16-33 PAD
Well:	P_COTTONWOOD 24-33
Wellbore:	P_COTTONWOOD 24-33
Section:	SECTION 33 T2N R66W
SHL:	799' FSL 741 FEL
Design:	PLAN #1 2-18-10 RHS
Latitude:	40° 5' 22.340 N
Longitude:	104° 46' 31.238 W
GL:	4987.00
KB:	WELL @ 5002.00ft (Original Well Elev)

T M

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
4161.00	4430.89	PARKMAN
4667.00	4998.51	SUSSEX
7153.00	7556.51	NIO A
7473.00	7876.51	CODELL
7563.00	7966.51	GRNHRN
7937.00	8340.51	JSAND

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
2397.28	26.95	342.08	2348.16	295.93	-95.67	2.00	342.08	311.01	Start 2811.95 hold at 2397.28 MD
5209.23	26.95	342.08	4854.84	1508.36	-487.64	0.00	0.00	1585.23	Start Drop -2.00
6556.51	0.00	0.00	6153.00	1804.29	-583.31	2.00	180.00	1896.23	Start 1919.00 hold at 6556.51 MD
8475.51	0.00	0.00	8072.00	1804.29	-583.31	0.00	0.00	1896.23	TD at 8475.51

CASING DETAILS

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

WELLBORE TARGET DETAILS (MAP CO-ORDINATES AND LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
PBHL	8072.00	1804.29	-583.31	40° 5' 40.171 N	104° 46' 38.744 W	Circle (Radius: 50.00)

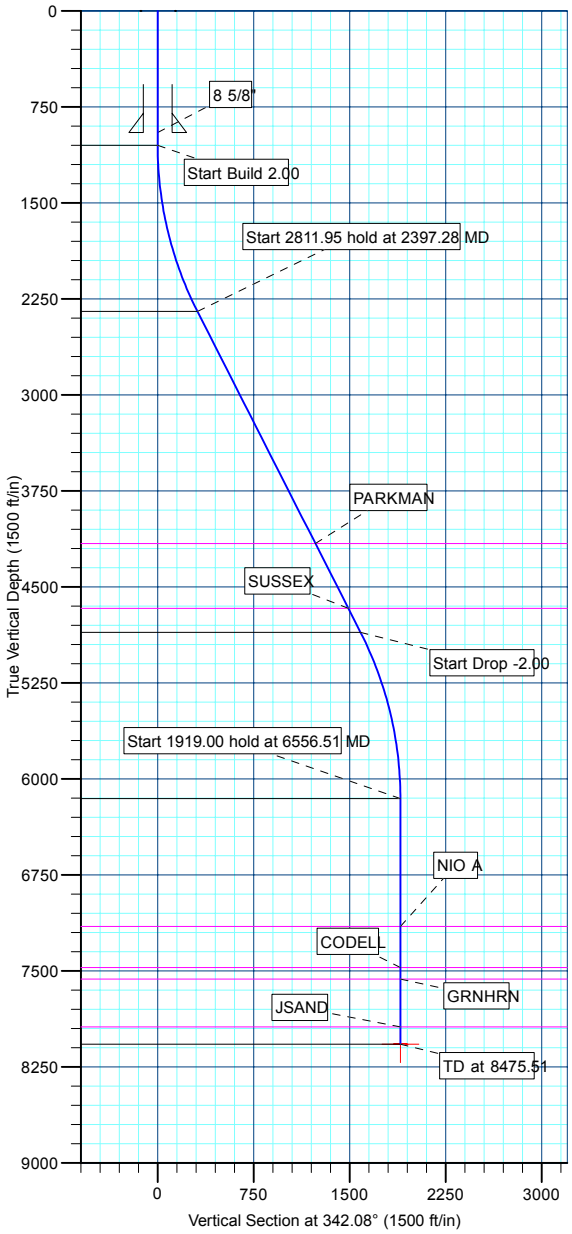
WELL DETAILS: P_COTTONWOOD 24-33

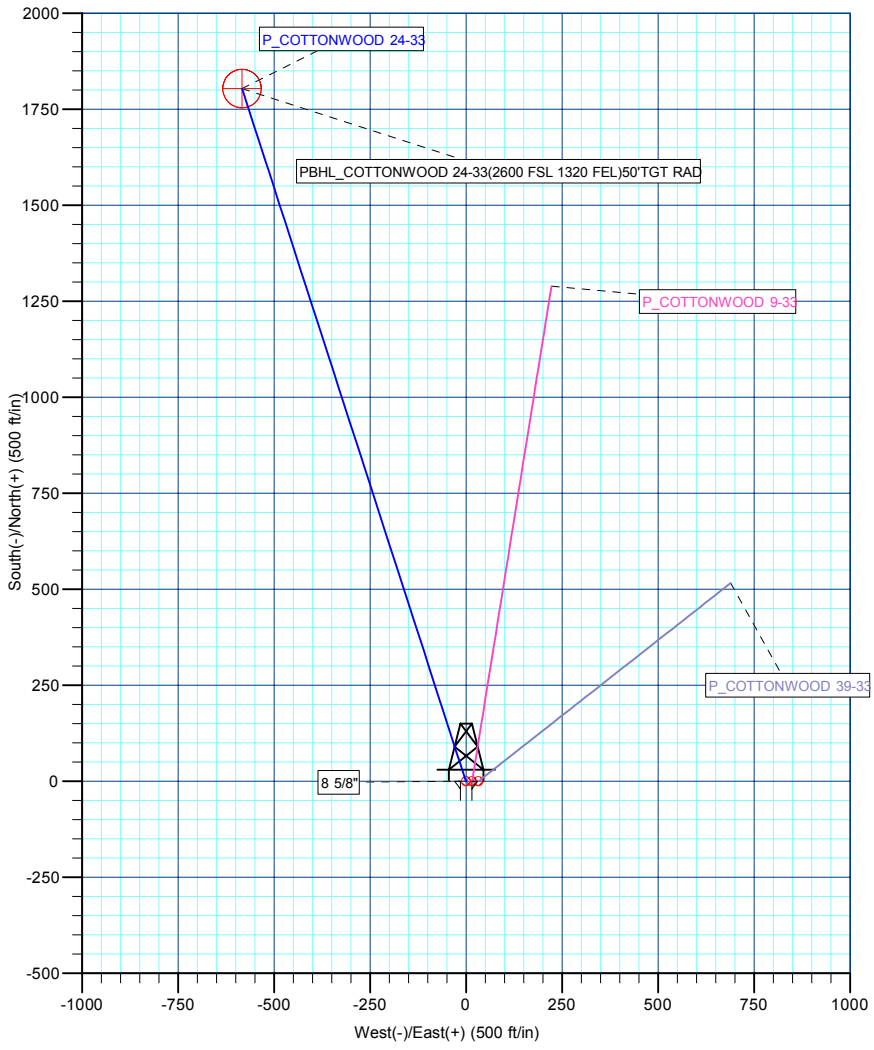
Ground Level: 4987.00

+N/-S	+E/-W	Northing	Easting	Latittude	Longitude	Slot
0.00	0.00	1276292.13	3202746.18	40° 5' 22.340 N	104° 46' 31.238 W	

LEGEND

P_COTTONWOOD 39-33 , P_COTTONWOOD 39-33, PLAN #1 2-18-10 RHS V0
P_COTTONWOOD 9-33, P_COTTONWOOD 9-33, PLAN #1 2-18-10 RHS V0
PLAN #1 2-18-10 RHS





Plan: PLAN #1 2-18-10 RHS (P_COTTONWOOD 24-33/P_COTTONWOOD 24-33)

Created By: Robert H. Scott Date: 12:17, February 18 2010

Database:	EDM 2003.21 Single User Db	**Local Co-ordinate Reference:**	Well P_COTTONWOOD 24-33
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 24-33	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	P_COTTONWOOD 24-33		
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 24-33

Well Position	**+N/-S**	-0.01 ft	**Northing:**	1,276,292.13 ft	**Latitude:**	40° 5' 22.340 N
	+E/-W	-15.95 ft	**Easting:**	3,202,746.18 ft	**Longitude:**	104° 46' 31.238 W
Position Uncertainty		0.00 ft	**Wellhead Elevation:**	ft	**Ground Level:**	4,987.00 ft

Wellbore P_COTTONWOOD 24-33

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	342.08

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	
2,397.28	26.95	342.08	2,348.16	295.93	-95.67	2.00	2.00	0.00	342.08	
5,209.23	26.95	342.08	4,854.84	1,508.36	-487.64	0.00	0.00	0.00	0.00	
6,556.51	0.00	0.00	6,153.00	1,804.29	-583.31	2.00	-2.00	0.00	180.00	
8,475.51	0.00	0.00	8,072.00	1,804.29	-583.31	0.00	0.00	0.00	0.00	PBHL_COTTONW(

Database:	EDM 2003.21 Single User Db	**Local Co-ordinate Reference:**	Well P_COTTONWOOD 24-33
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 24-33	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	P_COTTONWOOD 24-33		
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	342.08	1,100.00	0.42	-0.13	0.44	2.00	2.00	0.00
1,200.00	3.00	342.08	1,199.93	3.74	-1.21	3.93	2.00	2.00	0.00
1,300.00	5.00	342.08	1,299.68	10.37	-3.35	10.90	2.00	2.00	0.00
1,400.00	7.00	342.08	1,399.13	20.32	-6.57	21.35	2.00	2.00	0.00
1,500.00	9.00	342.08	1,498.15	33.56	-10.85	35.27	2.00	2.00	0.00
1,600.00	11.00	342.08	1,596.63	50.08	-16.19	52.63	2.00	2.00	0.00
1,700.00	13.00	342.08	1,694.44	69.86	-22.59	73.42	2.00	2.00	0.00
1,800.00	15.00	342.08	1,791.46	92.88	-30.03	97.62	2.00	2.00	0.00
1,900.00	17.00	342.08	1,887.58	119.11	-38.51	125.18	2.00	2.00	0.00
2,000.00	19.00	342.08	1,982.68	148.51	-48.01	156.08	2.00	2.00	0.00
2,100.00	21.00	342.08	2,076.65	181.05	-58.53	190.28	2.00	2.00	0.00
2,200.00	23.00	342.08	2,169.36	216.69	-70.06	227.74	2.00	2.00	0.00
2,300.00	25.00	342.08	2,260.71	255.39	-82.57	268.41	2.00	2.00	0.00
Start 2811.95 hold at 2397.28 MD									
2,397.28	26.95	342.08	2,348.16	295.93	-95.67	311.01	2.00	2.00	0.00
2,400.00	26.95	342.08	2,350.59	297.10	-96.05	312.24	0.00	0.00	0.00
2,500.00	26.95	342.08	2,439.73	340.22	-109.99	357.56	0.00	0.00	0.00
2,600.00	26.95	342.08	2,528.88	383.34	-123.93	402.87	0.00	0.00	0.00
2,700.00	26.95	342.08	2,618.02	426.45	-137.87	448.19	0.00	0.00	0.00
2,800.00	26.95	342.08	2,707.16	469.57	-151.81	493.50	0.00	0.00	0.00
2,900.00	26.95	342.08	2,796.31	512.69	-165.75	538.81	0.00	0.00	0.00
3,000.00	26.95	342.08	2,885.45	555.80	-179.69	584.13	0.00	0.00	0.00
3,100.00	26.95	342.08	2,974.59	598.92	-193.63	629.44	0.00	0.00	0.00
3,200.00	26.95	342.08	3,063.74	642.04	-207.57	674.76	0.00	0.00	0.00
3,300.00	26.95	342.08	3,152.88	685.16	-221.51	720.07	0.00	0.00	0.00
3,400.00	26.95	342.08	3,242.03	728.27	-235.44	765.39	0.00	0.00	0.00
3,500.00	26.95	342.08	3,331.17	771.39	-249.38	810.70	0.00	0.00	0.00
3,600.00	26.95	342.08	3,420.31	814.51	-263.32	856.01	0.00	0.00	0.00
3,700.00	26.95	342.08	3,509.46	857.62	-277.26	901.33	0.00	0.00	0.00
3,800.00	26.95	342.08	3,598.60	900.74	-291.20	946.64	0.00	0.00	0.00
3,900.00	26.95	342.08	3,687.74	943.86	-305.14	991.96	0.00	0.00	0.00
4,000.00	26.95	342.08	3,776.89	986.97	-319.08	1,037.27	0.00	0.00	0.00
4,100.00	26.95	342.08	3,866.03	1,030.09	-333.02	1,082.59	0.00	0.00	0.00
4,200.00	26.95	342.08	3,955.18	1,073.21	-346.96	1,127.90	0.00	0.00	0.00
4,300.00	26.95	342.08	4,044.32	1,116.33	-360.90	1,173.21	0.00	0.00	0.00
4,400.00	26.95	342.08	4,133.46	1,159.44	-374.84	1,218.53	0.00	0.00	0.00
PARKMAN									
4,430.89	26.95	342.08	4,161.00	1,172.76	-379.15	1,232.53	0.00	0.00	0.00
4,500.00	26.95	342.08	4,222.61	1,202.56	-388.78	1,263.84	0.00	0.00	0.00
4,600.00	26.95	342.08	4,311.75	1,245.68	-402.72	1,309.16	0.00	0.00	0.00
4,700.00	26.95	342.08	4,400.89	1,288.79	-416.66	1,354.47	0.00	0.00	0.00
4,800.00	26.95	342.08	4,490.04	1,331.91	-430.60	1,399.79	0.00	0.00	0.00
4,900.00	26.95	342.08	4,579.18	1,375.03	-444.54	1,445.10	0.00	0.00	0.00
SUSSEX									
4,998.51	26.95	342.08	4,667.00	1,417.50	-458.27	1,489.74	0.00	0.00	0.00
5,000.00	26.95	342.08	4,668.33	1,418.15	-458.48	1,490.41	0.00	0.00	0.00
5,100.00	26.95	342.08	4,757.47	1,461.26	-472.42	1,535.73	0.00	0.00	0.00
5,200.00	26.95	342.08	4,846.61	1,504.38	-486.35	1,581.04	0.00	0.00	0.00
Start Drop -2.00									
5,209.23	26.95	342.08	4,854.84	1,508.36	-487.64	1,585.23	0.00	0.00	0.00
5,300.00	25.13	342.08	4,936.40	1,546.27	-499.90	1,625.07	2.00	-2.00	0.00

Database:	EDM 2003.21 Single User Db	**Local Co-ordinate Reference:**	Well P_COTTONWOOD 24-33
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 24-33	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	P_COTTONWOOD 24-33		
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)
5,400.00	23.13	342.08	5,027.65	1,585.17	-512.47	1,665.95	2.00	-2.00	0.00
5,500.00	21.13	342.08	5,120.28	1,621.01	-524.06	1,703.62	2.00	-2.00	0.00
5,600.00	19.13	342.08	5,214.17	1,653.75	-534.65	1,738.03	2.00	-2.00	0.00
5,700.00	17.13	342.08	5,309.20	1,683.36	-544.22	1,769.15	2.00	-2.00	0.00
5,800.00	15.13	342.08	5,405.26	1,709.79	-552.76	1,796.93	2.00	-2.00	0.00
5,900.00	13.13	342.08	5,502.23	1,733.02	-560.27	1,821.34	2.00	-2.00	0.00
6,000.00	11.13	342.08	5,599.99	1,753.02	-566.74	1,842.35	2.00	-2.00	0.00
6,100.00	9.13	342.08	5,698.42	1,769.75	-572.15	1,859.94	2.00	-2.00	0.00
6,200.00	7.13	342.08	5,797.41	1,783.21	-576.50	1,874.08	2.00	-2.00	0.00
6,300.00	5.13	342.08	5,896.84	1,793.37	-579.78	1,884.76	2.00	-2.00	0.00
6,400.00	3.13	342.08	5,996.57	1,800.22	-582.00	1,891.96	2.00	-2.00	0.00
6,500.00	1.13	342.08	6,096.50	1,803.76	-583.14	1,895.68	2.00	-2.00	0.00
Start 1919.00 hold at 6556.51 MD									
6,556.51	0.00	0.00	6,153.00	1,804.29	-583.31	1,896.23	2.00	-2.00	31.71
6,600.00	0.00	0.00	6,196.49	1,804.29	-583.31	1,896.23	0.00	0.00	0.00
6,700.00	0.00	0.00	6,296.49	1,804.29	-583.31	1,896.23	0.00	0.00	0.00
6,800.00	0.00	0.00	6,396.49	1,804.29	-583.31	1,896.23	0.00	0.00	0.00
6,900.00	0.00	0.00	6,496.49	1,804.29	-583.31	1,896.23	0.00	0.00	0.00
7,000.00	0.00	0.00	6,596.49	1,804.29	-583.31	1,896.23	0.00	0.00	0.00
7,100.00	0.00	0.00	6,696.49	1,804.29	-583.31	1,896.23	0.00	0.00	0.00
7,200.00	0.00	0.00	6,796.49	1,804.29	-583.31	1,896.23	0.00	0.00	0.00
7,300.00	0.00	0.00	6,896.49	1,804.29	-583.31	1,896.23	0.00	0.00	0.00
7,400.00	0.00	0.00	6,996.49	1,804.29	-583.31	1,896.23	0.00	0.00	0.00
7,500.00	0.00	0.00	7,096.49	1,804.29	-583.31	1,896.23	0.00	0.00	0.00
NIO A									
7,556.51	0.00	0.00	7,153.00	1,804.29	-583.31	1,896.23	0.00	0.00	0.00
7,600.00	0.00	0.00	7,196.49	1,804.29	-583.31	1,896.23	0.00	0.00	0.00
7,700.00	0.00	0.00	7,296.49	1,804.29	-583.31	1,896.23	0.00	0.00	0.00
7,800.00	0.00	0.00	7,396.49	1,804.29	-583.31	1,896.23	0.00	0.00	0.00
CODELL									
7,876.51	0.00	0.00	7,473.00	1,804.29	-583.31	1,896.23	0.00	0.00	0.00
7,900.00	0.00	0.00	7,496.49	1,804.29	-583.31	1,896.23	0.00	0.00	0.00
GRNHRN									
7,966.51	0.00	0.00	7,563.00	1,804.29	-583.31	1,896.23	0.00	0.00	0.00
8,000.00	0.00	0.00	7,596.49	1,804.29	-583.31	1,896.23	0.00	0.00	0.00
8,100.00	0.00	0.00	7,696.49	1,804.29	-583.31	1,896.23	0.00	0.00	0.00

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
PBHL_COTTONWOC	0.00	0.00	8,072.00	1,804.29	-583.31	1,278,091.58	3,202,148.14	40° 5' 40.171 N	104° 46' 38.744 W
- plan misses target center by 375.51ft at 8100.00ft MD (7696.49 TVD, 1804.29 N, -583.31 E)									
- Circle (radius 50.00)									

Database:	EDM 2003.21 Single User Db	**Local Co-ordinate Reference:**	Well P_COTTONWOOD 24-33
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 24-33	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	P_COTTONWOOD 24-33		
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 (°)
4,430.89	4,161.00	PARKMAN			
4,998.51	4,667.00	SUSSEX			
7,556.51	7,153.00	NIO A			
7,876.51	7,473.00	CODELL			
7,966.51	7,563.00	GRNHRN			
8,340.51	7,937.00	JSAND			

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	Local Coordinates +E/-W (ft)	Comment
1,050.00	1,050.00	0.00	0.00	Start Build 2.00
2,397.28	2,348.16	295.93	-95.67	Start 2811.95 hold at 2397.28 MD
5,209.23	4,854.84	1,508.36	-487.64	Start Drop -2.00
6,556.51	6,153.00	1,804.29	-583.31	Start 1919.00 hold at 6556.51 MD
8,475.51	8,072.00	1,804.29	-583.31	TD at 8475.51

KerrMcGee

US ROCKIES REGION PLANNING

COLORADO NORTHERN ZONE - 83
WELD_COTTONWOOD 16-33 PAD
P_COTTONWOOD 24-33

P_COTTONWOOD 24-33
PLAN #1 2-18-10 RHS

Anticollision Report

18 February, 2010

Weatherford®

Company:	US ROCKIES REGION PLANNING	**Local Co-ordinate Reference:**	Well P_COTTONWOOD 24-33
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 24-33	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00ft	**Output errors are at**	2.00 sigma
Reference Wellbore	P_COTTONWOOD 24-33	**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	8,475.51	PLAN #1 2-18-10 RHS (P_COTTONWOO	MWD	MWD - Standard

Summary

Site Name / Offset Well - Wellbore - Design	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
WELD_COTTONWOOD 16-33 PAD						
P_COTTONWOOD 39-33 - P_COTTONWOOD 39-33 - F	1,050.00	1,050.00	32.18	27.71	7.212	CC, ES
P_COTTONWOOD 39-33 - P_COTTONWOOD 39-33 - F	1,100.00	1,099.56	32.65	27.97	6.974	SF
P_COTTONWOOD 9-33 - P_COTTONWOOD 9-33 - PLA	1,050.00	1,050.00	15.95	11.49	3.574	CC
P_COTTONWOOD 9-33 - P_COTTONWOOD 9-33 - PLA	1,100.00	1,099.96	16.15	11.47	3.447	ES, SF

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

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.00	0.00	0.00	0.00	0.00	0.00	90.00	0.00	32.18	32.18				
100.00	100.00	100.00	100.00	0.10	0.10	90.00	0.00	32.18	32.18	31.98	0.19	168.412	
200.00	200.00	200.00	200.00	0.32	0.32	90.00	0.00	32.18	32.18	31.53	0.64	50.228	
300.00	300.00	300.00	300.00	0.55	0.55	90.00	0.00	32.18	32.18	31.09	1.09	29.516	
400.00	400.00	400.00	400.00	0.77	0.77	90.00	0.00	32.18	32.18	30.64	1.54	20.898	
500.00	500.00	500.00	500.00	0.99	0.99	90.00	0.00	32.18	32.18	30.19	1.99	16.175	
600.00	600.00	600.00	600.00	1.22	1.22	90.00	0.00	32.18	32.18	29.74	2.44	13.194	
700.00	700.00	700.00	700.00	1.44	1.44	90.00	0.00	32.18	32.18	29.29	2.89	11.140	
800.00	800.00	800.00	800.00	1.67	1.67	90.00	0.00	32.18	32.18	28.84	3.34	9.640	
900.00	900.00	900.00	900.00	1.89	1.89	90.00	0.00	32.18	32.18	28.39	3.79	8.496	
1,000.00	1,000.00	1,000.00	1,000.00	2.12	2.12	90.00	0.00	32.18	32.18	27.94	4.24	7.594	
1,050.00	1,050.00	1,050.00	1,050.00	2.23	2.23	90.00	0.00	32.18	32.18	27.71	4.46	7.212	CC, ES
1,100.00	1,100.00	1,099.56	1,099.56	2.34	2.34	108.16	0.26	32.51	32.65	27.97	4.68	6.974	SF
1,200.00	1,199.93	1,198.56	1,198.49	2.57	2.55	109.91	2.38	35.20	36.46	31.35	5.12	7.129	
1,300.00	1,299.68	1,297.21	1,296.90	2.79	2.77	112.47	6.59	40.56	44.16	38.61	5.55	7.955	
1,400.00	1,399.13	1,395.28	1,394.44	3.03	3.00	114.94	12.84	48.51	55.79	49.79	6.00	9.300	
1,500.00	1,498.15	1,492.56	1,490.80	3.29	3.25	116.92	21.08	59.00	71.33	64.87	6.47	11.031	
1,600.00	1,596.63	1,589.32	1,586.16	3.57	3.53	118.42	31.22	71.89	90.69	83.72	6.97	13.014	
1,700.00	1,694.44	1,686.84	1,682.10	3.89	3.83	120.45	42.00	85.61	112.40	104.89	7.51	14.963	
1,800.00	1,791.46	1,783.79	1,777.50	4.26	4.14	122.95	52.72	99.24	136.09	128.00	8.09	16.819	
1,900.00	1,887.58	1,880.07	1,872.22	4.69	4.46	125.59	63.36	112.79	161.97	153.26	8.70	18.610	
2,000.00	1,982.68	1,975.55	1,966.16	5.17	4.79	128.20	73.91	126.21	190.24	180.90	9.34	20.362	
2,100.00	2,076.65	2,070.12	2,059.20	5.72	5.13	130.70	84.37	139.51	221.08	211.07	10.01	22.096	

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

Company:	US ROCKIES REGION PLANNING	**Local Co-ordinate Reference:**	Well P_COTTONWOOD 24-33
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 24-33	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00ft	**Output errors are at**	2.00 sigma
Reference Wellbore	P_COTTONWOOD 24-33	**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

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
2,200.00	2,169.36	2,163.66	2,151.23	6.34	5.46	133.03	94.71	152.67	254.59	243.91	10.68	23.828	
2,300.00	2,260.71	2,256.05	2,242.13	7.02	5.80	135.18	104.92	165.67	290.87	279.49	11.38	25.568	
2,397.28	2,348.16	2,344.73	2,329.38	7.75	6.13	137.09	114.73	178.14	328.87	316.82	12.06	27.276	
2,400.00	2,350.59	2,347.19	2,331.80	7.77	6.14	137.15	115.00	178.48	329.98	317.90	12.08	27.321	
2,500.00	2,439.73	2,437.70	2,420.85	8.56	6.47	139.34	125.00	191.21	370.67	357.83	12.84	28.863	
2,600.00	2,528.88	2,528.21	2,509.91	9.37	6.81	141.10	135.01	203.94	411.74	398.12	13.62	30.241	
2,700.00	2,618.02	2,618.73	2,598.96	10.20	7.16	142.54	145.02	216.67	453.07	438.67	14.39	31.475	
2,800.00	2,707.16	2,709.24	2,688.01	11.03	7.50	143.74	155.02	229.41	494.60	479.42	15.18	32.584	
2,900.00	2,796.31	2,799.75	2,777.06	11.88	7.85	144.76	165.03	242.14	536.29	520.32	15.97	33.583	
3,000.00	2,885.45	2,890.26	2,866.11	12.73	8.19	145.63	175.03	254.87	578.10	561.33	16.76	34.488	
3,100.00	2,974.59	2,980.77	2,955.16	13.59	8.54	146.39	185.04	267.60	620.00	602.44	17.56	35.309	
3,200.00	3,063.74	3,071.28	3,044.22	14.45	8.89	147.05	195.05	280.33	661.98	643.62	18.36	36.057	
3,300.00	3,152.88	3,161.80	3,133.27	15.31	9.25	147.63	205.05	293.06	704.03	684.87	19.16	36.741	
3,400.00	3,242.03	3,252.31	3,222.32	16.18	9.60	148.15	215.06	305.79	746.13	726.16	19.97	37.368	
3,500.00	3,331.17	3,342.82	3,311.37	17.05	9.95	148.61	225.06	318.52	788.27	767.50	20.77	37.946	
3,600.00	3,420.31	3,433.33	3,400.42	17.92	10.31	149.02	235.07	331.25	830.46	808.87	21.58	38.478	
3,700.00	3,509.46	3,523.84	3,489.47	18.80	10.66	149.40	245.08	343.98	872.67	850.28	22.39	38.971	
3,800.00	3,598.60	3,614.36	3,578.53	19.67	11.02	149.74	255.08	356.71	914.91	891.71	23.20	39.429	
3,900.00	3,687.74	3,704.87	3,667.58	20.55	11.37	150.05	265.09	369.44	957.18	933.16	24.02	39.854	
4,000.00	3,776.89	3,795.38	3,756.63	21.43	11.73	150.33	275.09	382.17	999.47	974.64	24.83	40.250	
4,100.00	3,866.03	3,885.89	3,845.68	22.31	12.08	150.59	285.10	394.90	1,041.77	1,016.13	25.65	40.620	
4,200.00	3,955.18	3,976.40	3,934.73	23.19	12.44	150.83	295.11	407.63	1,084.10	1,057.63	26.46	40.967	
4,300.00	4,044.32	4,066.91	4,023.79	24.07	12.80	151.06	305.11	420.36	1,126.43	1,099.15	27.28	41.292	
4,400.00	4,133.46	4,157.43	4,112.84	24.96	13.16	151.26	315.12	433.09	1,168.78	1,140.69	28.10	41.597	
4,500.00	4,222.61	4,247.94	4,201.89	25.84	13.52	151.46	325.12	445.82	1,211.15	1,182.23	28.92	41.885	
4,600.00	4,311.75	4,338.45	4,290.94	26.72	13.87	151.64	335.13	458.55	1,253.52	1,223.78	29.74	42.156	
4,700.00	4,400.89	4,428.96	4,379.99	27.61	14.23	151.80	345.14	471.28	1,295.90	1,265.35	30.56	42.412	
4,800.00	4,490.04	4,519.47	4,469.04	28.49	14.59	151.96	355.14	484.01	1,338.29	1,306.92	31.38	42.654	
4,900.00	4,579.18	4,609.98	4,558.10	29.38	14.95	152.11	365.15	496.74	1,380.69	1,348.49	32.20	42.883	
5,000.00	4,668.33	4,700.50	4,647.15	30.27	15.31	152.25	375.15	509.47	1,423.09	1,390.08	33.02	43.100	
5,100.00	4,757.47	4,791.01	4,736.20	31.15	15.67	152.38	385.16	522.20	1,465.51	1,431.67	33.84	43.307	
5,209.23	4,854.84	4,889.87	4,833.47	32.12	16.06	152.51	396.09	536.11	1,511.84	1,477.10	34.74	43.521	
5,300.00	4,936.40	4,972.58	4,914.84	32.82	16.39	152.96	405.23	547.74	1,549.18	1,513.63	35.55	43.573	
5,400.00	5,027.65	5,064.90	5,005.67	33.45	16.76	153.36	415.44	560.72	1,587.61	1,551.20	36.41	43.609	
5,500.00	5,120.28	5,158.36	5,097.63	34.05	17.13	153.66	425.77	573.87	1,623.13	1,585.89	37.24	43.581	
5,600.00	5,214.17	5,252.87	5,190.61	34.60	17.51	153.88	436.22	587.16	1,655.72	1,617.65	38.07	43.495	
5,700.00	5,309.20	5,348.29	5,284.49	35.11	17.89	154.00	446.77	600.58	1,685.33	1,646.46	38.87	43.360	
5,800.00	5,405.26	5,444.52	5,379.17	35.57	18.27	154.05	457.40	614.11	1,711.95	1,672.30	39.65	43.181	
5,900.00	5,502.23	5,541.44	5,474.52	35.98	18.66	154.03	468.12	627.75	1,735.55	1,695.15	40.40	42.963	
6,000.00	5,599.99	5,638.92	5,570.43	36.35	19.05	153.93	478.90	641.46	1,756.13	1,715.01	41.12	42.709	
6,100.00	5,698.42	5,737.88	5,667.81	36.66	19.44	153.76	489.81	655.34	1,773.67	1,731.87	41.81	42.427	
6,200.00	5,797.41	5,843.13	5,771.77	36.93	19.76	153.57	499.89	668.17	1,787.94	1,745.56	42.38	42.184	
6,300.00	5,896.84	5,949.39	5,877.28	37.15	20.02	153.43	507.67	678.07	1,798.77	1,755.94	42.83	41.993	
6,400.00	5,996.57	6,056.41	5,983.94	37.32	20.25	153.33	513.06	684.93	1,806.11	1,762.93	43.17	41.833	
6,500.00	6,096.50	6,163.90	6,091.32	37.44	20.43	153.27	515.99	688.65	1,809.92	1,766.52	43.40	41.701	
6,556.51	6,153.00	6,224.74	6,152.15	37.49	20.51	135.34	516.55	689.36	1,810.51	1,767.03	43.48	41.636	
6,600.00	6,196.49	6,269.09	6,196.49	37.52	20.57	135.34	516.56	689.38	1,810.52	1,766.93	43.59	41.534	
6,700.00	6,296.49	6,369.09	6,296.49	37.60	20.71	135.34	516.56	689.38	1,810.52	1,766.67	43.85	41.290	
6,800.00	6,396.49	6,469.09	6,396.49	37.67	20.85	135.34	516.56	689.38	1,810.52	1,766.40	44.11	41.043	
6,900.00	6,496.49	6,569.09	6,496.49	37.75	21.00	135.34	516.56	689.38	1,810.52	1,766.14	44.38	40.796	
7,000.00	6,596.49	6,669.09	6,596.49	37.83	21.15	135.34	516.56	689.38	1,810.52	1,765.87	44.65	40.549	
7,100.00	6,696.49	6,769.09	6,696.49	37.91	21.30	135.34	516.56	689.38	1,810.52	1,765.59	44.92	40.303	

Company:	US ROCKIES REGION PLANNING	**Local Co-ordinate Reference:**	Well P_COTTONWOOD 24-33
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 24-33	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00ft	**Output errors are at**	2.00 sigma
Reference Wellbore	P_COTTONWOOD 24-33	**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

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
7,200.00	6,796.49	6,869.09	6,796.49	37.99	21.45	135.34	516.56	689.38	1,810.52	1,765.32	45.20	40.057	
7,300.00	6,896.49	6,969.09	6,896.49	38.07	21.60	135.34	516.56	689.38	1,810.52	1,765.04	45.48	39.812	
7,400.00	6,996.49	7,069.09	6,996.49	38.15	21.75	135.34	516.56	689.38	1,810.52	1,764.76	45.76	39.568	
7,500.00	7,096.49	7,169.09	7,096.49	38.24	21.91	135.34	516.56	689.38	1,810.52	1,764.48	46.04	39.324	
7,600.00	7,196.49	7,269.09	7,196.49	38.32	22.06	135.34	516.56	689.38	1,810.52	1,764.19	46.33	39.081	
7,700.00	7,296.49	7,369.09	7,296.49	38.41	22.22	135.34	516.56	689.38	1,810.52	1,763.90	46.62	38.838	
7,800.00	7,396.49	7,469.09	7,396.49	38.49	22.38	135.34	516.56	689.38	1,810.52	1,763.61	46.91	38.597	
7,900.00	7,496.49	7,569.09	7,496.49	38.58	22.54	135.34	516.56	689.38	1,810.52	1,763.32	47.20	38.357	
8,000.00	7,596.49	7,669.09	7,596.49	38.67	22.70	135.34	516.56	689.38	1,810.52	1,763.02	47.50	38.118	
8,100.00	7,696.49	7,769.09	7,696.49	38.76	22.86	135.34	516.56	689.38	1,810.52	1,762.72	47.80	37.879	
8,200.00	7,796.49	7,869.09	7,796.49	38.85	23.02	135.34	516.56	689.38	1,810.52	1,762.42	48.10	37.642	
8,300.00	7,896.49	7,969.09	7,896.49	38.95	23.18	135.34	516.56	689.38	1,810.52	1,762.12	48.40	37.407	
8,400.00	7,996.49	8,069.09	7,996.49	39.04	23.35	135.34	516.56	689.38	1,810.52	1,761.81	48.71	37.172	
8,475.51	8,072.00	8,144.59	8,072.00	39.11	23.47	135.34	516.56	689.38	1,810.52	1,761.58	48.94	36.996	

Company:	US ROCKIES REGION PLANNING	**Local Co-ordinate Reference:**	Well P_COTTONWOOD 24-33
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 24-33	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00ft	**Output errors are at**	2.00 sigma
Reference Wellbore	P_COTTONWOOD 24-33	**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 9-33 - P_COTTONWOOD 9-33 - PLAN #1 2- **Offset Site Error:** 0.00 ft

Survey Program: 0-MWD **Offset Well Error:** 0.00 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.00	0.00	0.00	0.00	0.00	0.00	89.97	0.01	15.95	15.95				
100.00	100.00	100.00	100.00	0.10	0.10	89.97	0.01	15.95	15.95	15.76	0.19	83.474	
200.00	200.00	200.00	200.00	0.32	0.32	89.97	0.01	15.95	15.95	15.31	0.64	24.896	
300.00	300.00	300.00	300.00	0.55	0.55	89.97	0.01	15.95	15.95	14.86	1.09	14.629	
400.00	400.00	400.00	400.00	0.77	0.77	89.97	0.01	15.95	15.95	14.41	1.54	10.358	
500.00	500.00	500.00	500.00	0.99	0.99	89.97	0.01	15.95	15.95	13.96	1.99	8.017	
600.00	600.00	600.00	600.00	1.22	1.22	89.97	0.01	15.95	15.95	13.51	2.44	6.539	
700.00	700.00	700.00	700.00	1.44	1.44	89.97	0.01	15.95	15.95	13.06	2.89	5.522	
800.00	800.00	800.00	800.00	1.67	1.67	89.97	0.01	15.95	15.95	12.61	3.34	4.778	
900.00	900.00	900.00	900.00	1.89	1.89	89.97	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	89.97	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	89.97	0.01	15.95	15.95	11.49	4.46	3.574	CC
1,100.00	1,100.00	1,099.96	1,099.95	2.34	2.34	107.83	0.44	16.02	16.15	11.47	4.69	3.447	ES, SF
1,200.00	1,199.93	1,199.85	1,199.78	2.57	2.57	107.41	3.88	16.57	17.78	12.65	5.13	3.466	
1,300.00	1,299.68	1,299.68	1,299.36	2.79	2.79	106.77	10.74	17.67	21.03	15.45	5.58	3.769	
1,400.00	1,399.13	1,399.41	1,398.54	3.03	3.03	106.09	21.02	19.32	25.90	19.86	6.05	4.284	
1,500.00	1,498.15	1,499.00	1,497.17	3.29	3.28	105.48	34.68	21.51	32.39	25.84	6.55	4.947	
1,600.00	1,596.63	1,598.42	1,595.08	3.57	3.56	104.97	51.68	24.23	40.49	33.38	7.10	5.700	
1,700.00	1,694.44	1,697.64	1,692.13	3.89	3.88	104.54	71.98	27.49	50.17	42.44	7.73	6.492	
1,800.00	1,791.46	1,796.60	1,788.18	4.26	4.24	104.17	95.53	31.26	61.43	53.00	8.44	7.279	
1,900.00	1,887.58	1,895.29	1,883.08	4.69	4.65	103.85	122.25	35.55	74.26	65.01	9.25	8.027	
2,000.00	1,982.68	1,994.24	1,977.67	5.17	5.10	104.48	150.91	40.14	88.33	78.17	10.16	8.698	
2,100.00	2,076.65	2,093.01	2,072.09	5.72	5.58	106.72	179.53	44.73	103.37	92.25	11.13	9.290	
2,200.00	2,169.36	2,191.43	2,166.18	6.34	6.08	109.89	208.05	49.30	119.71	107.57	12.15	9.857	
2,300.00	2,260.71	2,289.39	2,259.83	7.02	6.58	113.54	236.44	53.85	137.73	124.55	13.18	10.447	
2,397.28	2,348.16	2,384.12	2,350.39	7.75	7.08	117.26	263.89	58.26	157.24	143.05	14.19	11.079	
2,400.00	2,350.59	2,386.77	2,352.92	7.77	7.09	117.38	264.65	58.38	157.82	143.60	14.22	11.098	
2,500.00	2,439.73	2,483.83	2,445.71	8.56	7.61	121.08	292.78	62.89	179.37	164.11	15.26	11.753	
2,600.00	2,528.88	2,580.90	2,538.50	9.37	8.14	123.99	320.91	67.40	201.48	185.18	16.30	12.361	
2,700.00	2,618.02	2,677.96	2,631.29	10.20	8.67	126.32	349.03	71.91	224.00	206.66	17.34	12.918	
2,800.00	2,707.16	2,775.03	2,724.08	11.03	9.21	128.22	377.16	76.42	246.80	228.42	18.38	13.427	
2,900.00	2,796.31	2,872.09	2,816.87	11.88	9.75	129.81	405.28	80.93	269.83	250.40	19.43	13.890	
3,000.00	2,885.45	2,969.16	2,909.66	12.73	10.29	131.14	433.41	85.43	293.01	272.54	20.47	14.312	
3,100.00	2,974.59	3,066.22	3,002.46	13.59	10.84	132.28	461.54	89.94	316.33	294.80	21.52	14.697	
3,200.00	3,063.74	3,163.29	3,095.25	14.45	11.39	133.26	489.66	94.45	339.75	317.17	22.58	15.049	
3,300.00	3,152.88	3,260.35	3,188.04	15.31	11.94	134.12	517.79	98.96	363.25	339.61	23.63	15.371	
3,400.00	3,242.03	3,357.42	3,280.83	16.18	12.49	134.87	545.92	103.47	386.81	362.12	24.69	15.667	
3,500.00	3,331.17	3,454.48	3,373.62	17.05	13.04	135.54	574.04	107.98	410.44	384.69	25.75	15.940	
3,600.00	3,420.31	3,551.55	3,466.41	17.92	13.60	136.13	602.17	112.49	434.11	407.30	26.81	16.192	
3,700.00	3,509.46	3,648.61	3,559.20	18.80	14.16	136.66	630.29	117.00	457.82	429.94	27.87	16.425	
3,800.00	3,598.60	3,745.68	3,651.99	19.67	14.71	137.14	658.42	121.51	481.56	452.62	28.94	16.641	
3,900.00	3,687.74	3,842.74	3,744.79	20.55	15.27	137.58	686.55	126.02	505.33	475.33	30.00	16.842	
4,000.00	3,776.89	3,939.81	3,837.58	21.43	15.83	137.97	714.67	130.53	529.13	498.06	31.07	17.029	
4,100.00	3,866.03	4,036.87	3,930.37	22.31	16.39	138.34	742.80	135.04	552.95	520.81	32.14	17.204	
4,200.00	3,955.18	4,133.94	4,023.16	23.19	16.95	138.67	770.92	139.55	576.79	543.58	33.21	17.368	
4,300.00	4,044.32	4,231.00	4,115.95	24.07	17.51	138.97	799.05	144.06	600.65	566.37	34.28	17.521	
4,400.00	4,133.46	4,328.07	4,208.74	24.96	18.07	139.26	827.18	148.57	624.52	589.16	35.35	17.665	
4,500.00	4,222.61	4,425.13	4,301.53	25.84	18.64	139.52	855.30	153.08	648.40	611.98	36.43	17.801	
4,600.00	4,311.75	4,522.20	4,394.32	26.72	19.20	139.76	883.43	157.59	672.30	634.80	37.50	17.929	
4,700.00	4,400.89	4,619.26	4,487.11	27.61	19.76	139.99	911.55	162.09	696.20	657.63	38.57	18.049	
4,800.00	4,490.04	4,716.33	4,579.91	28.49	20.33	140.20	939.68	166.60	720.12	680.47	39.65	18.163	
4,900.00	4,579.18	4,813.39	4,672.70	29.38	20.89	140.40	967.81	171.11	744.04	703.32	40.72	18.271	

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

Company:	US ROCKIES REGION PLANNING	**Local Co-ordinate Reference:**	Well P_COTTONWOOD 24-33
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 24-33	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00ft	**Output errors are at**	2.00 sigma
Reference Wellbore	P_COTTONWOOD 24-33	**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 9-33 - P_COTTONWOOD 9-33 - PLAN #1 2- **Offset Site Error:** 0.00 ft

Survey Program: 0-MWD **Offset Well Error:** 0.00 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
5,000.00	4,668.33	4,910.46	4,765.49	30.27	21.45	140.58	995.93	175.62	767.97	726.18	41.80	18.373	
5,100.00	4,757.47	5,007.52	4,858.28	31.15	22.02	140.76	1,024.06	180.13	791.91	749.04	42.87	18.471	
5,209.23	4,854.84	5,113.54	4,959.63	32.12	22.63	140.93	1,054.78	185.06	818.07	774.02	44.05	18.571	
5,300.00	4,936.40	5,201.92	5,044.12	32.82	23.15	141.28	1,080.39	189.16	838.72	793.70	45.02	18.629	
5,400.00	5,027.65	5,299.85	5,137.74	33.45	23.72	141.47	1,108.77	193.71	858.94	812.87	46.07	18.643	
5,500.00	5,120.28	5,398.25	5,231.80	34.05	24.29	141.49	1,137.28	198.28	876.48	829.33	47.15	18.588	
5,600.00	5,214.17	5,496.64	5,325.86	34.60	24.86	141.34	1,165.79	202.86	891.35	843.09	48.26	18.470	
5,700.00	5,309.20	5,583.99	5,409.76	35.11	25.25	141.18	1,189.76	206.70	904.23	855.08	49.15	18.397	
5,800.00	5,405.26	5,671.51	5,494.54	35.57	25.60	141.03	1,211.24	210.14	915.73	865.77	49.96	18.329	
5,900.00	5,502.23	5,759.20	5,580.10	35.98	25.92	140.90	1,230.18	213.18	925.82	875.14	50.68	18.266	
6,000.00	5,599.99	5,847.03	5,666.35	36.35	26.21	140.80	1,246.55	215.80	934.50	883.18	51.32	18.209	
6,100.00	5,698.42	5,934.98	5,753.18	36.66	26.47	140.71	1,260.32	218.01	941.74	889.87	51.87	18.157	
6,200.00	5,797.41	6,023.04	5,840.51	36.93	26.70	140.63	1,271.46	219.80	947.54	895.22	52.32	18.110	
6,300.00	5,896.84	6,111.18	5,928.23	37.15	26.89	140.57	1,279.96	221.16	951.88	899.20	52.68	18.068	
6,400.00	5,996.57	6,200.00	6,016.84	37.32	27.05	140.52	1,285.82	222.10	954.77	901.82	52.95	18.030	
6,500.00	6,096.50	6,287.63	6,104.42	37.44	27.17	140.49	1,288.94	222.60	956.20	903.07	53.13	17.998	
6,556.51	6,153.00	6,337.51	6,154.29	37.49	27.23	122.56	1,289.54	222.70	956.36	903.17	53.19	17.981	
6,575.91	6,172.41	6,355.63	6,172.41	37.50	27.25	122.56	1,289.55	222.70	956.35	903.12	53.22	17.968	
6,600.00	6,196.49	6,379.71	6,196.49	37.52	27.27	122.56	1,289.55	222.70	956.35	903.08	53.27	17.952	
6,700.00	6,296.49	6,479.71	6,296.49	37.60	27.38	122.56	1,289.55	222.70	956.35	902.87	53.48	17.882	
6,800.00	6,396.49	6,579.71	6,396.49	37.67	27.48	122.56	1,289.55	222.70	956.35	902.66	53.69	17.811	
6,900.00	6,496.49	6,679.71	6,496.49	37.75	27.59	122.56	1,289.55	222.70	956.35	902.44	53.91	17.740	
7,000.00	6,596.49	6,779.71	6,596.49	37.83	27.70	122.56	1,289.55	222.70	956.35	902.22	54.13	17.669	
7,100.00	6,696.49	6,879.71	6,696.49	37.91	27.81	122.56	1,289.55	222.70	956.35	902.00	54.35	17.597	
7,200.00	6,796.49	6,979.71	6,796.49	37.99	27.92	122.56	1,289.55	222.70	956.35	901.78	54.57	17.524	
7,300.00	6,896.49	7,079.71	6,896.49	38.07	28.03	122.56	1,289.55	222.70	956.35	901.55	54.80	17.452	
7,400.00	6,996.49	7,179.71	6,996.49	38.15	28.14	122.56	1,289.55	222.70	956.35	901.32	55.03	17.379	
7,500.00	7,096.49	7,279.71	7,096.49	38.24	28.26	122.56	1,289.55	222.70	956.35	901.09	55.26	17.306	
7,600.00	7,196.49	7,379.71	7,196.49	38.32	28.38	122.56	1,289.55	222.70	956.35	900.85	55.50	17.233	
7,700.00	7,296.49	7,479.71	7,296.49	38.41	28.49	122.56	1,289.55	222.70	956.35	900.61	55.73	17.159	
7,800.00	7,396.49	7,579.71	7,396.49	38.49	28.61	122.56	1,289.55	222.70	956.35	900.37	55.97	17.086	
7,900.00	7,496.49	7,679.71	7,496.49	38.58	28.73	122.56	1,289.55	222.70	956.35	900.13	56.22	17.012	
8,000.00	7,596.49	7,779.71	7,596.49	38.67	28.85	122.56	1,289.55	222.70	956.35	899.89	56.46	16.938	
8,100.00	7,696.49	7,879.71	7,696.49	38.76	28.98	122.56	1,289.55	222.70	956.35	899.64	56.71	16.864	
8,200.00	7,796.49	7,979.71	7,796.49	38.85	29.10	122.56	1,289.55	222.70	956.35	899.39	56.96	16.790	
8,300.00	7,896.49	8,079.71	7,896.49	38.95	29.23	122.56	1,289.55	222.70	956.35	899.14	57.21	16.716	
8,400.00	7,996.49	8,179.71	7,996.49	39.04	29.35	122.56	1,289.55	222.70	956.35	898.88	57.47	16.642	
8,475.51	8,072.00	8,255.22	8,072.00	39.11	29.45	122.56	1,289.55	222.70	956.35	898.69	57.66	16.586	

Company:	US ROCKIES REGION PLANNING	**Local Co-ordinate Reference:**	Well P_COTTONWOOD 24-33
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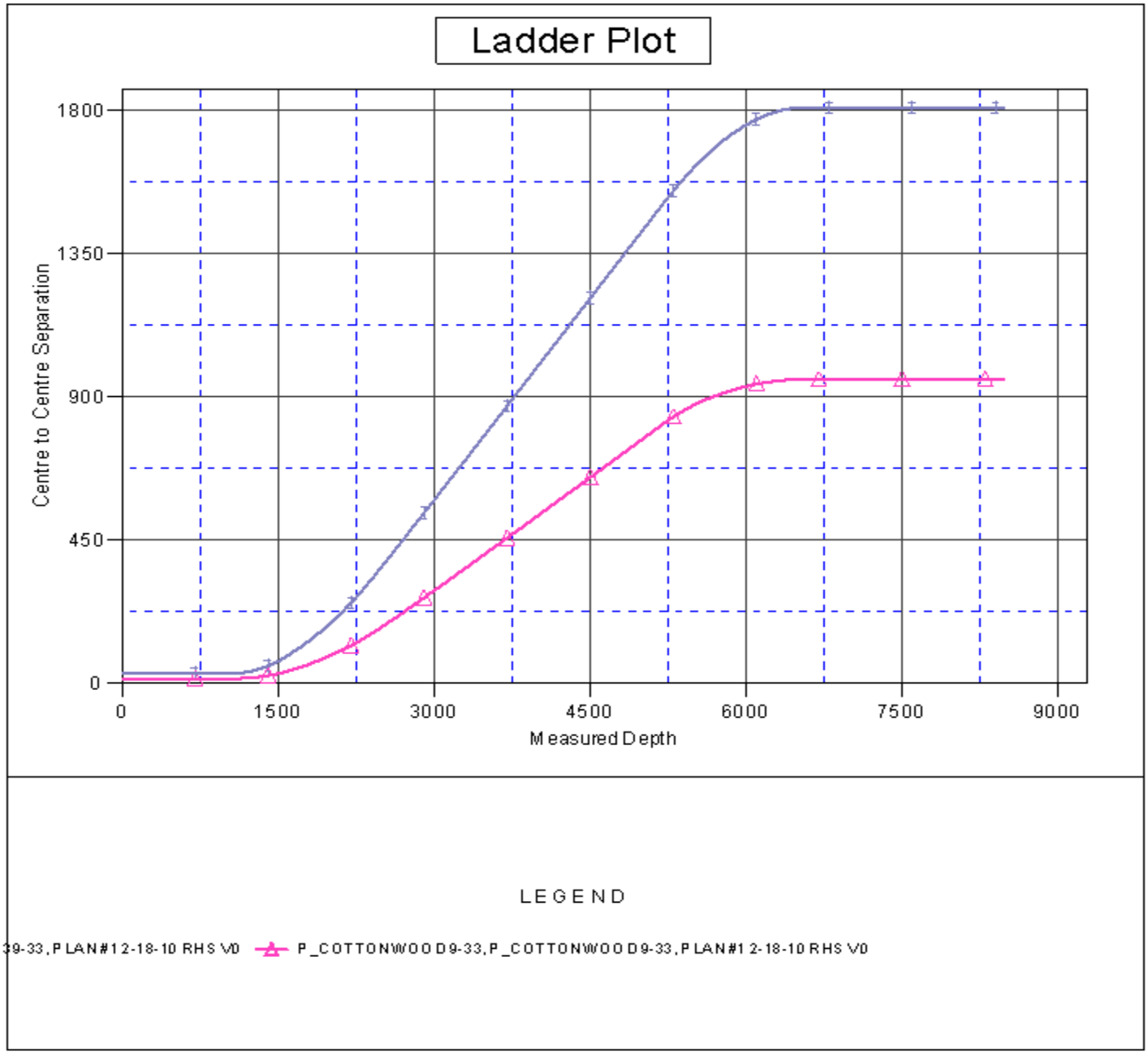
Reference Site:	WELD_COTTONWOOD 16-33 PAD	**MD Reference:**	WELL @ 5002.00ft (Original Well Elev)
Site Error:	0.00ft	**North Reference:**	True
Reference Well:	P_COTTONWOOD 24-33	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00ft	**Output errors are at**	2.00 sigma
Reference Wellbore	P_COTTONWOOD 24-33	**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 Ele\Coordinates are relative to: P_COTTONWOOD 24-33
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 24-33
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 24-33	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00ft	**Output errors are at**	2.00 sigma
Reference Wellbore	P_COTTONWOOD 24-33	**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 Ele\Coordinates are relative to: P_COTTONWOOD 24-33
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°