

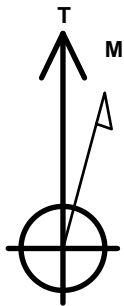
PETROLEUM DEVELOPMENT CORP DJ Basin

Well Name: **Williams 28V-234**

Surface Location: Williams 5N67W28S Pad Sec.28-T5N-R67W
 North American Datum 1983 , US State Plane 1983 Colorado Northern Zone
 Ground Elevation: 4905.0
 +N/-S +E/-W Northing Easting Latitude Longitude Slot
 0.0 0.0 1378886.50 3169447.86 40.371850 -104.891840
 Original Well Elev WELL @ 4928.0ft (Original Well Elev)

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
SHL 2212'FNL, 1024'FEL	1.0	0.0	0.0	Point
BHL 1665'FNL, 500'FWL	6890.0	514.0	-3873.0	Point
LP - 1698'FNL & 816'FEL	6900.0	514.0	208.2	Point



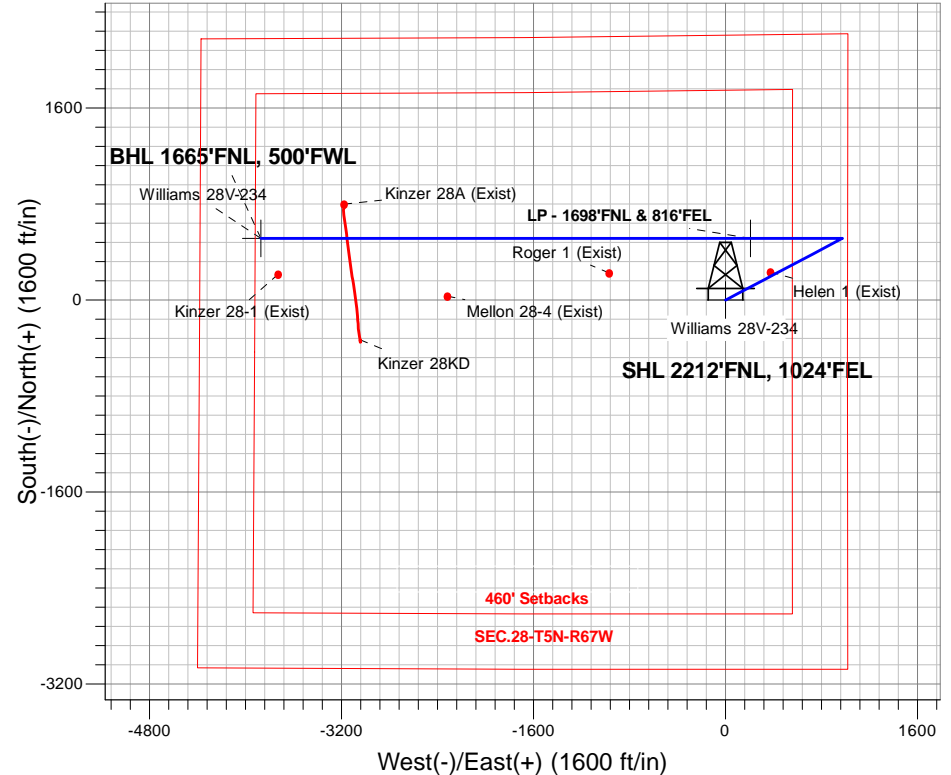
Azimuths to True North
 Magnetic North: 8.27°

Magnetic Field
 Strength: 52589.8snT
 Dip Angle: 66.84°
 Date: 4/28/2016
 Model: IGRF2010

Williams 5N67W28S Pad Sec.28-T5N-R67W
 Williams 28V-234
 Plan #1 (4-26-16)
 9:53, April 28 2016

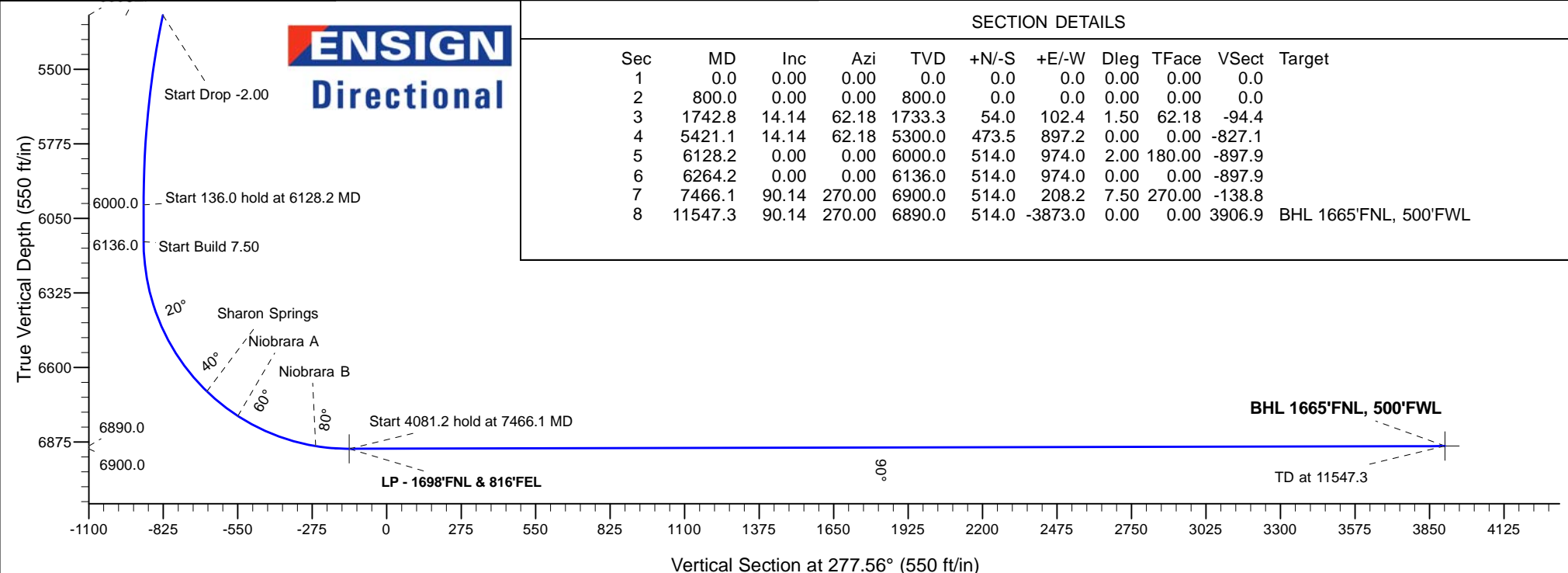
ANNOTATIONS

TVD	MD	Annotation
800.0	800.0	KOP - Start Build 1.50
5300.1	5421.1	Start Drop -2.00
6000.0	6128.2	Start 136.0 hold at 6128.2 MD
6136.0	6264.2	Start Build 7.50
6900.0	7466.1	Start 4081.2 hold at 7466.1 MD
6890.0	11547.3	TD at 11547.3



SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	800.0	0.00	0.00	800.0	0.0	0.0	0.00	0.00	0.0	
3	1742.8	14.14	62.18	1733.3	54.0	102.4	1.50	62.18	-94.4	
4	5421.1	14.14	62.18	5300.0	473.5	897.2	0.00	0.00	-827.1	
5	6128.2	0.00	0.00	6000.0	514.0	974.0	2.00	180.00	-897.9	
6	6264.2	0.00	0.00	6136.0	514.0	974.0	0.00	0.00	-897.9	
7	7466.1	90.14	270.00	6900.0	514.0	208.2	7.50	270.00	-138.8	
8	11547.3	90.14	270.00	6890.0	514.0	-3873.0	0.00	0.00	3906.9	BHL 1665'FNL, 500'FWL





PETROLEUM DEVELOPMENT CORP DJ Basin

SEC.28-T5N-R67W

Williams 5N67W28S Pad Sec.28-T5N-R67W

Williams 28V-234

Wellbore #1

Plan #1 (4-26-16)

Anticollision Report

13 July, 2016



Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Williams 28V-234
Project:	SEC.28-T5N-R67W	TVD Reference:	WELL @ 4928.0ft (Original Well Elev)
Reference Site:	Williams 5N67W28S Pad Sec.28-T5N-R67W	MD Reference:	WELL @ 4928.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Williams 28V-234	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (4-26-16)	Offset TVD Reference:	Offset Datum

Reference	Plan #1 (4-26-16)		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	MD Interval 100.0ft	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 1,000.0 ft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.45 Sigma	Casing Method:	Not applied

Survey Tool Program	Date 4/28/2016			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.0	11,547.3	Plan #1 (4-26-16) (Wellbore #1)	MWD	MWD - Standard

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Existing Wells Sec.28-T5N-R67W						
Helen 1 (Exist) - Wellbore #1 - Wellbore #1	3,065.9	2,999.3	32.0	-54.6	0.369	Level 1, CC, ES, SF
Kinzer 28-1 (Exist) - Wellbore #1 - Wellbore #1	11,402.4	6,830.4	298.8	-20.2	0.937	Level 1, CC, ES, SF
Mellon 28-4 (Exist) - Wellbore #1 - Wellbore #1	9,992.5	6,861.8	481.1	208.7	1.766	CC
Mellon 28-4 (Exist) - Wellbore #1 - Wellbore #1	10,000.0	6,861.8	481.1	208.5	1.765	ES, SF
Roger 1 (Exist) - Wellbore #1 - Wellbore #1	8,643.9	6,876.1	288.1	58.9	1.257	Level 3, CC, ES, SF
Kinzer 28KD Pad Sec.28-T5N-R67W						
Kinzer 28A (Exist) - Wellbore #1 - Wellbore #1	10,853.4	6,829.7	284.2	-16.2	0.946	Level 1, CC, ES, SF
Kinzer 28KD - Wellbore #1 - Wellbore #1	10,720.3	7,025.3	851.5	703.7	5.760	CC, ES
Kinzer 28KD - Wellbore #1 - Wellbore #1	10,900.0	7,024.1	870.3	716.4	5.655	SF
Williams 5N67W28S Pad Sec.28-T5N-R67W						
Williams 28V-304 - Wellbore #1 - Plan #1 (4-26-16)	800.0	800.0	16.7	12.6	4.048	CC, ES
Williams 28V-304 - Wellbore #1 - Plan #1 (4-26-16)	11,547.3	11,718.2	392.8	85.6	1.279	Level 3, SF
Williams 28W-214 - Wellbore #1 - Plan #1 (4-26-16)	400.0	400.0	27.9	25.9	14.457	CC, ES
Williams 28W-214 - Wellbore #1 - Plan #1 (4-26-16)	11,547.3	11,495.5	699.5	386.7	2.236	SF
Williams 28W-304 - Wellbore #1 - Plan #1 (4-26-16)	200.0	200.0	44.6	43.8	53.972	CC, ES
Williams 28W-304 - Wellbore #1 - Plan #1 (4-26-16)	11,547.3	11,609.5	960.5	648.2	3.075	SF
Williams 28W-314 - Wellbore #1 - Plan #1 (4-26-16)	600.0	600.0	13.9	10.9	4.600	CC, ES
Williams 28W-314 - Wellbore #1 - Plan #1 (4-26-16)	11,547.3	11,582.2	435.1	125.4	1.405	Level 3, SF

Offset Design Existing Wells Sec.28-T5N-R67W - Helen 1 (Exist) - Wellbore #1 - Wellbore #1												
Survey Program: 7250-UNKNOWN												
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
0.0	0.0	0.0	0.0	0.0	0.0	58.01	233.2	373.4	440.5			
100.0	100.0	83.0	83.0	0.1	2.0	58.01	233.2	373.4	440.2	438.0	2.17	202.728
200.0	200.0	183.0	183.0	0.4	4.5	58.01	233.2	373.4	440.2	435.3	4.90	89.898
300.0	300.0	283.0	283.0	0.7	6.9	58.01	233.2	373.4	440.2	432.6	7.62	57.754
400.0	400.0	383.0	383.0	1.0	9.4	58.01	233.2	373.4	440.2	429.9	10.35	42.543
500.0	500.0	483.0	483.0	1.2	11.8	58.01	233.2	373.4	440.2	427.1	13.07	33.674
600.0	600.0	583.0	583.0	1.5	14.3	58.01	233.2	373.4	440.2	424.4	15.80	27.865
700.0	700.0	683.0	683.0	1.8	16.7	58.01	233.2	373.4	440.2	421.7	18.52	23.765

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