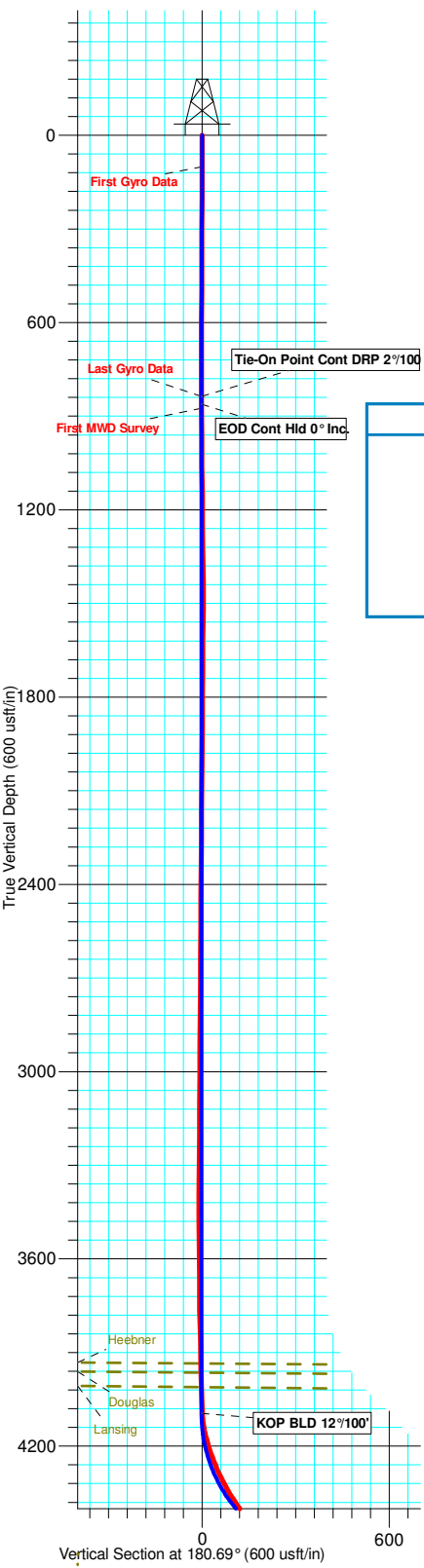




Tug Hill Operating LLC
 Project: Hodgeman County, Kansas (NAD 83)
 Site: Sec 31, T23S, R22W
 Well: Imel #1-31H
 Wellbore: Original Wellbore
 Design: Plan #4
 Lat: 38° 0' 51.026 N
 Long: 99° 46' 24.082 W
 Pad GL: 2336.0
 KB: WELL @ 2359.0usft

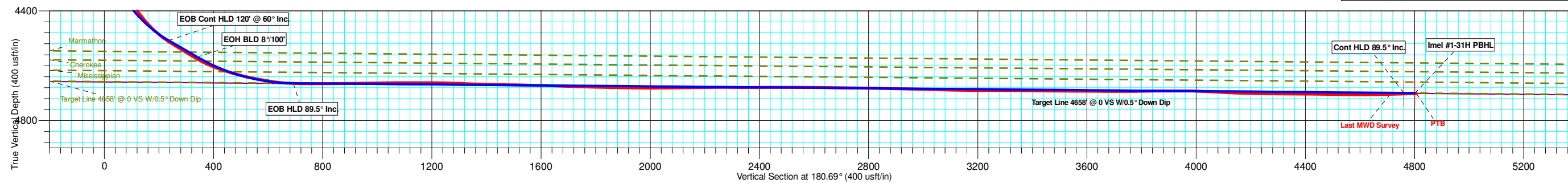
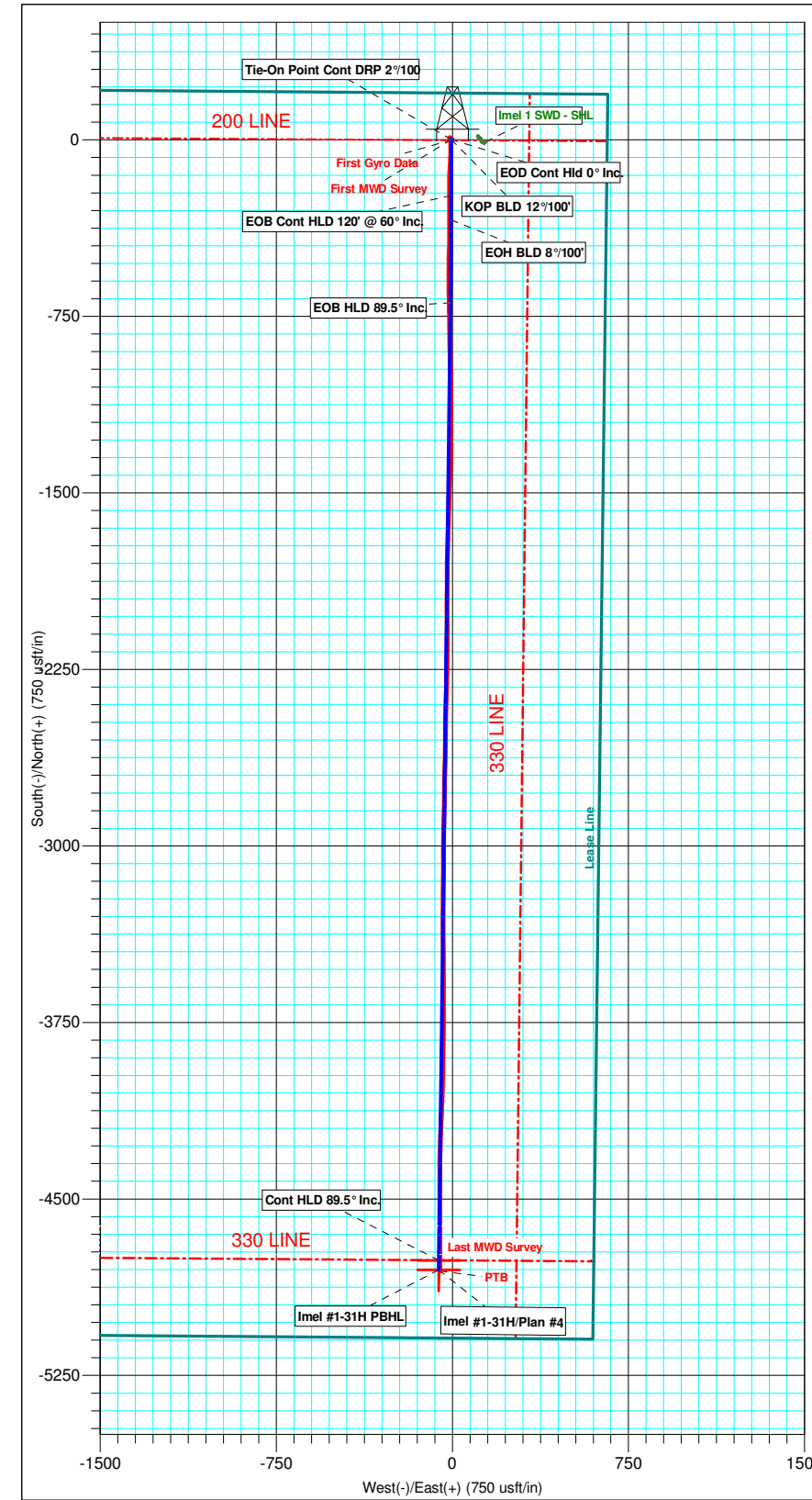
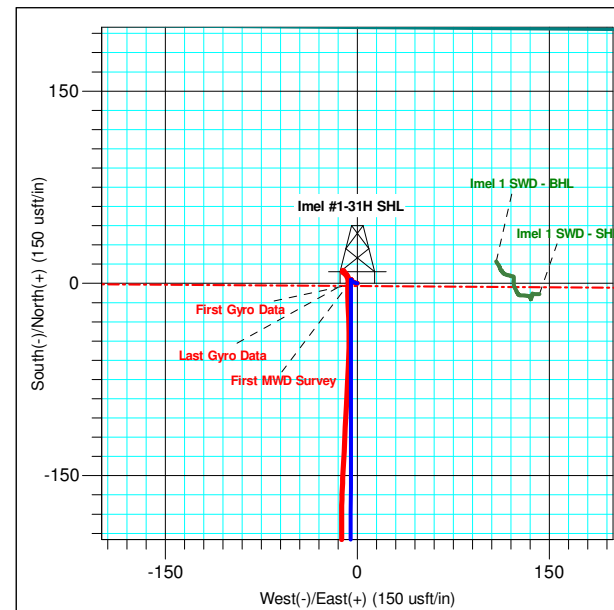
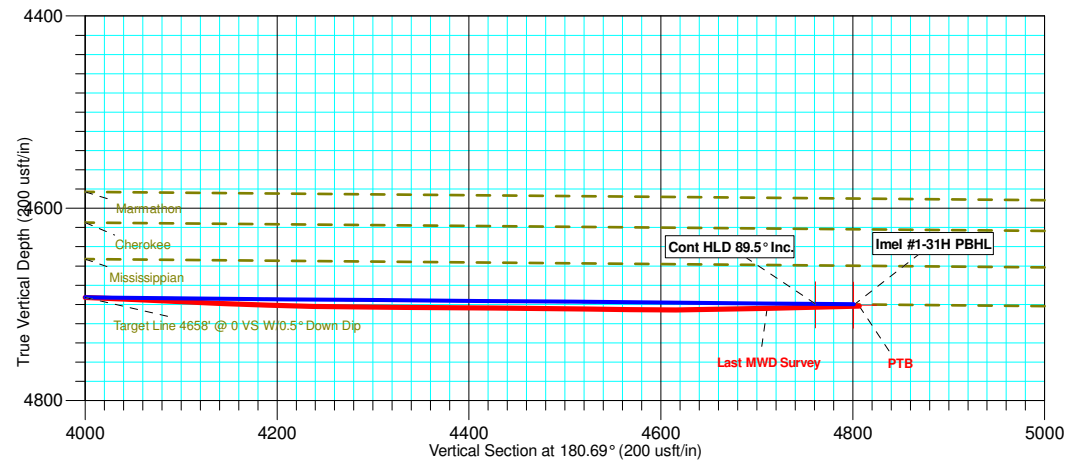


FORMATION TOP DETAILS				
TVDPath	MDPath	Formation	DipAngle	DipDir
3935.0	3935.0	Heebner	0.50	180.69
3964.0	3964.0	Douglas	0.50	180.69
4011.0	4011.0	Lansing	0.50	180.69
4550.7	4679.9	Marmathon	0.50	180.69
4583.2	4746.1	Cherokee	0.50	180.69
4622.0	4843.0	Mississippian	0.50	180.69
4699.5	9150.1	Target Line 4658' @ 0 VS W/0.5° Down Dip	0.50	180.69

WELL DETAILS: Imel #1-31H						
+N/-S	+E/-W	Northing	Ground Level: Easting	2336.0	Latitude	Longitude
0.0	0.0	1805497.39	945503.39		38° 0' 51.026 N	99° 46' 24.082 W

WELLBORE TARGET DETAILS (LAT/LONG)					
Name	TVD	+N/-S	+E/-W	Latitude	Longitude
Cont HLD 89.5° Inc.	4700.5	-4760.7	-57.4	38° 0' 3.957 N	99° 46' 23.987 W
Imel #1-31H PBHL	4700.9	-4800.6	-57.9	38° 0' 3.562 N	99° 46' 23.986 W

SECTION DETAILS										
MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSEct	Target	
837.0	0.49	186.30	837.0	2.6	-4.8	0.00	0.00	-2.5		
861.5	0.00	0.00	861.5	2.5	-4.9	2.00	180.00	-2.4		
4094.6	0.00	0.00	4094.6	2.5	-4.9	0.00	0.00	-2.4		
4594.6	60.00	180.10	4508.1	-236.2	-5.3	12.00	180.10	236.3		
4714.6	60.00	180.10	4568.1	-340.2	-5.5	0.00	0.00	340.2		
6 5083.4	89.50	180.69	4664.0	-692.1	-8.0	8.00	1.21	692.1	Cont HLD 89.5° Inc.	
7 9152.5	89.50	180.69	4699.5	-4760.7	-57.4	0.00	0.00	4761.0	Cont HLD 89.5° Inc.	
8 9192.5	89.50	180.69	4699.9	-4800.7	-57.9	0.00	0.00	4801.0		



Azimuths to Grid North
 True North: 0.78°
 Magnetic North: 6.46°

Magnetic Field
 Strength: 52207.7snT
 Dip Angle: 65.79°
 Date: 8/22/2012
 Model: IGRF2010