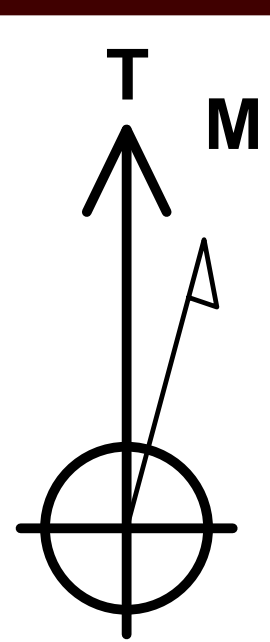




Project: Weld County, CO (NAD83)
Site: RBF
Well: 11
Wellbore: OH / Job #61092
Design: Plan 1 04-09-17
Rig: Patterson 346



Azimuths to True North
Magnetic North: 8.43°

Magnetic Field
Strength: 52472.5snT
Dip Angle: 66.93°
Date: 4/10/2017
Model: HDGM

Map System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone Name: Colorado Northern Zone

Local Origin: Well 11, True North

Latitude: 40° 28' 26.299 N
Longitude: 104° 52' 15.103 W

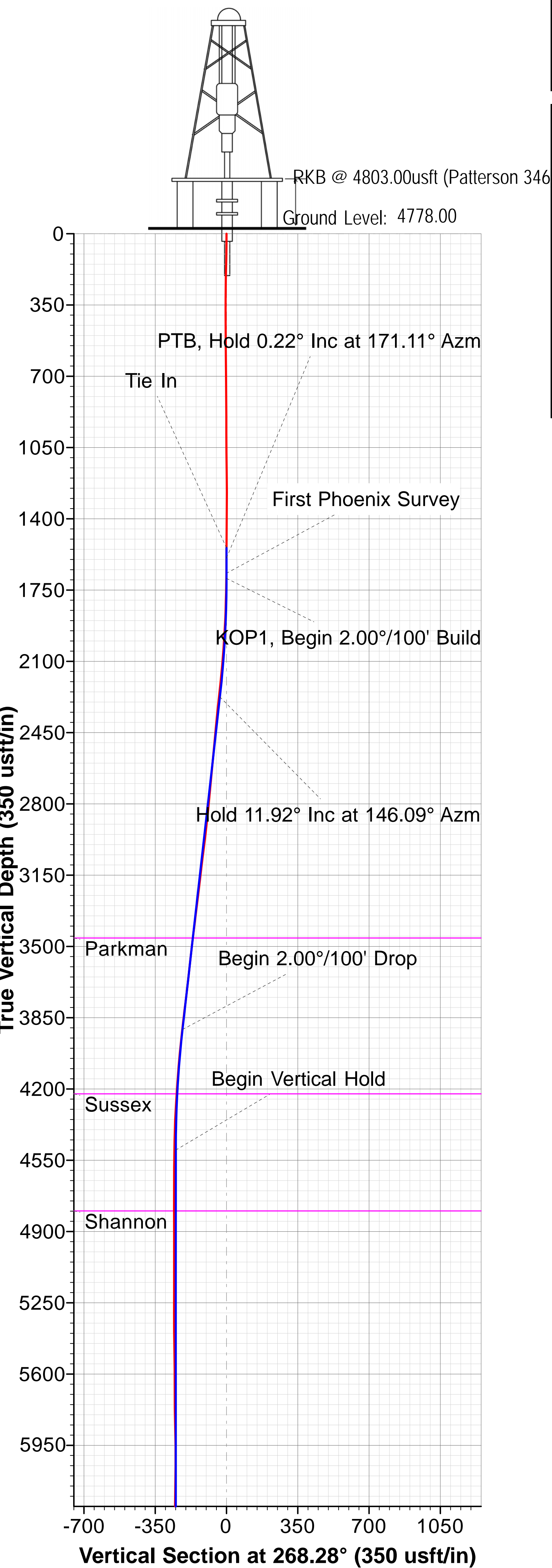
Grid East: 3175028.79
Grid North: 1416129.28
Scale Factor: 1.000

Geomagnetic Model: HDGM
Sample Date: 10-Apr-17
Magnetic Declination: 8.43°
Dip Angle from Horizontal: 66.93°
Magnetic Field Strength: 52473

To convert a Magnetic Direction to a Grid Direction, Add 8.03°
To convert a Magnetic Direction to a True Direction, Add 8.43° East
To convert a True Direction to a Grid Direction, Subtract 0.41°

LEGEND

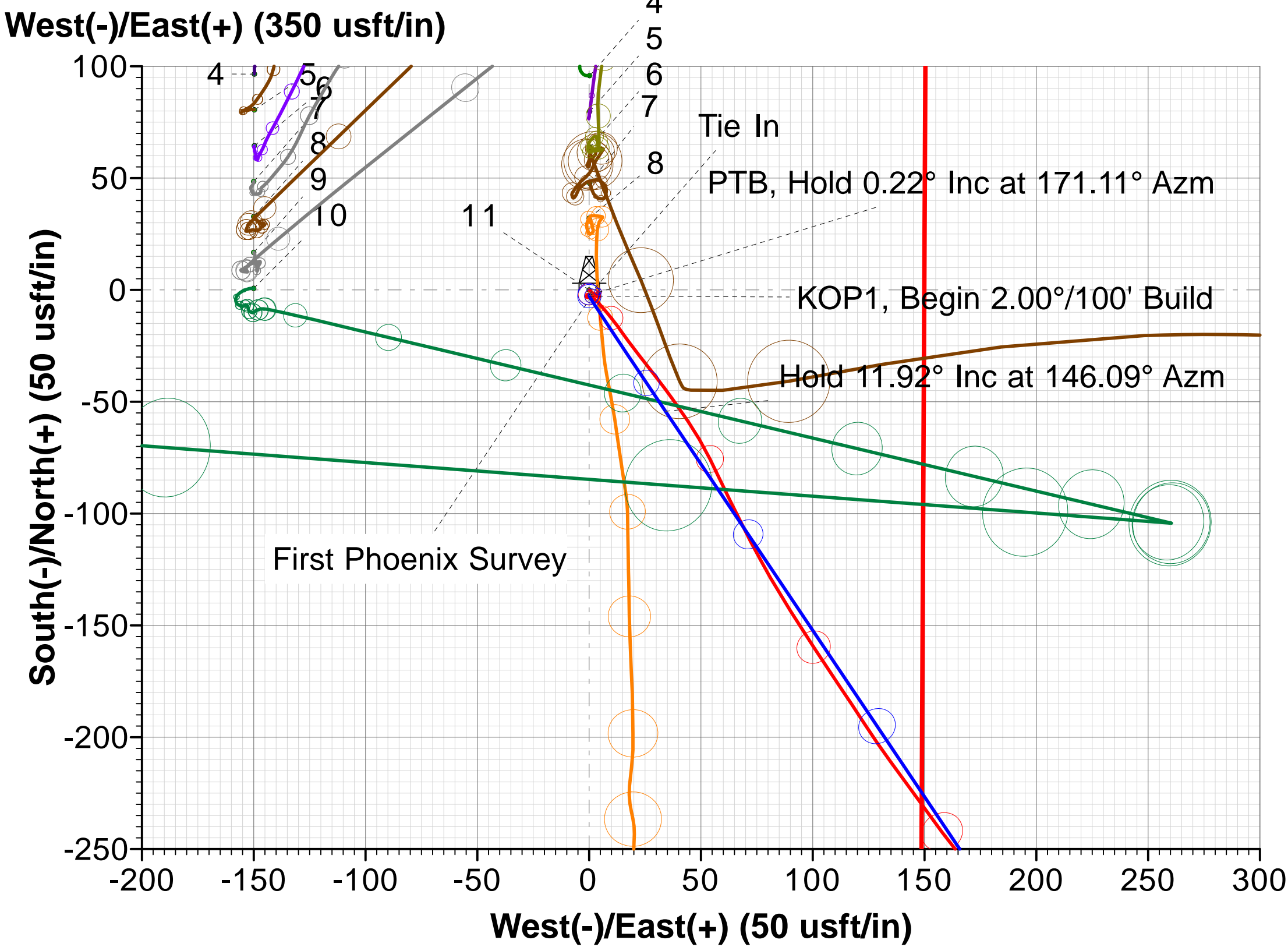
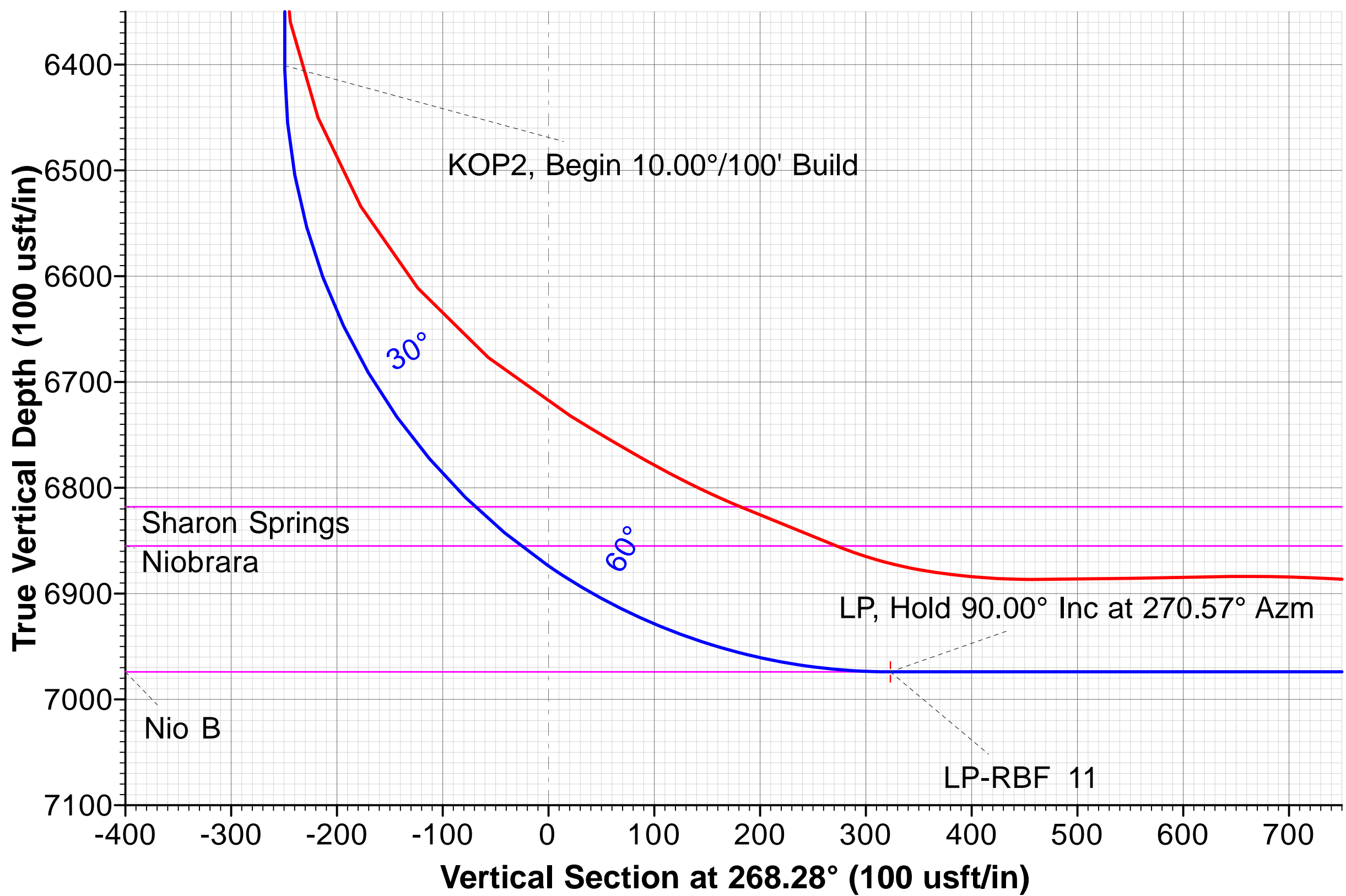
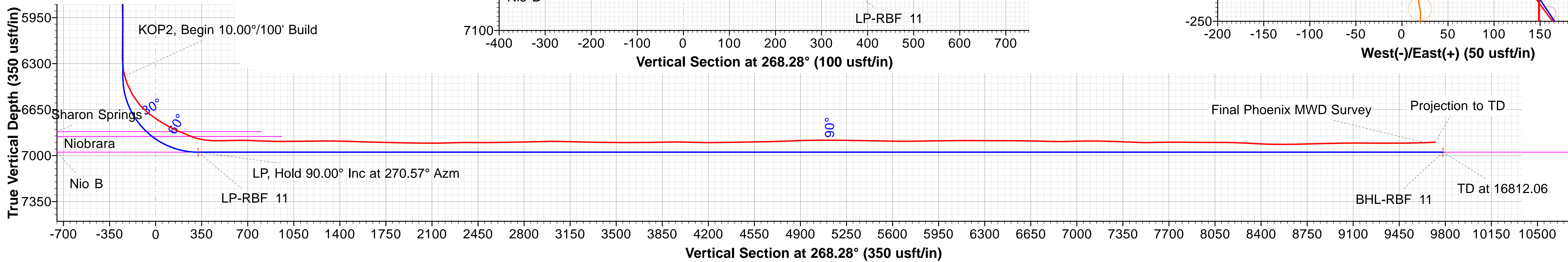
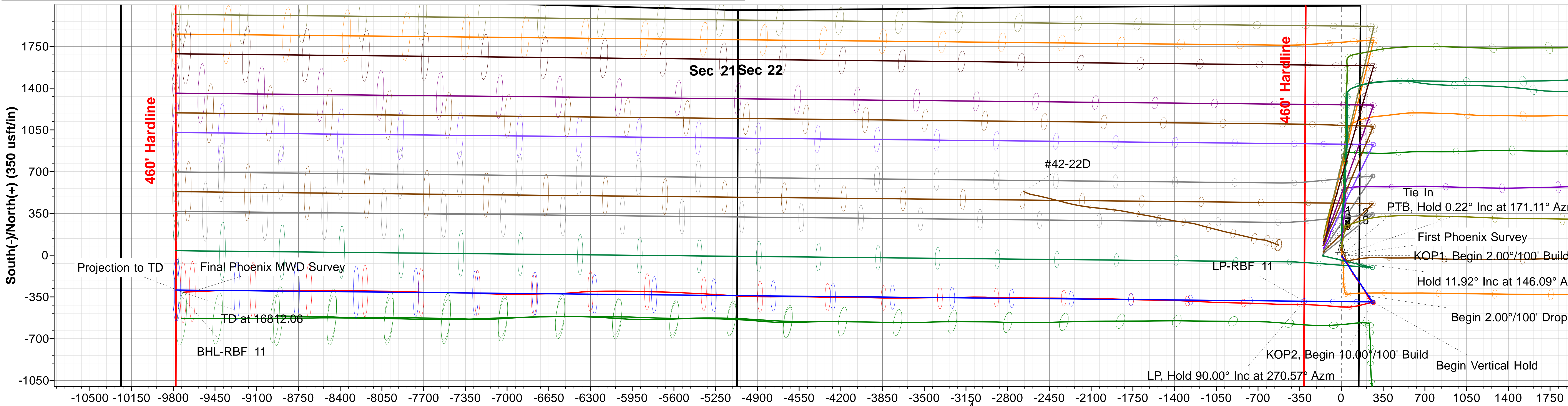
- 9, OH / Job #61109, Surveys (Patterson 346) V0
- 9, OH / Job #61109, Plan 1 04-11-17 V0
- 2, OH / Job #61102, Plan 1 04-10-19 V0
- 2, OH / Job #61102, Surveys (Patterson 346) V0
- 1, OH / Job #60885, Surveys (Patterson 346) V0
- 8, OH / Job #60892, Surveys (Patterson 346) V0
- 8, OH / Job #61108, Plan 1 04-11-17 V0
- 8, OH / Job #61108, Surveys (Patterson 346) V0
- 3, OH / Job #60887, Surveys (Patterson 346) V0
- 11, OH / Job #61092, Surveys (Patterson 346) V0
- 1, OH / Job #61101, Surveys (Patterson 346) V0
- 1, OH / Job #61101, Plan 1 04-10-19 V0
- 7, OH / Job #60891, Surveys (Patterson 346) V0
- 4, OH / Job #60888, Surveys (Patterson 346) V0
- 4, OH / Job #61104, Plan 1 04-11-17 V0
- 4, OH / Job #61104, Surveys (Patterson 346) V0
- 7, OH / Job #61107, Plan 1 04-11-17 V0
- 7, OH / Job #61107, Surveys (Patterson 346) V0
- 10, OH / Job #61110, Surveys (Patterson 346) V0
- 10, OH / Job #61110, Plan 1 04-10-19 V0
- #42-22D, OH, Surveys V0
- 5, OH / Job #60889, Surveys (Patterson 346) V0
- 6, OH / Job #61106, Plan 1 04-11-17 V0
- 6, OH / Job #61106, Surveys (Patterson 346) V0
- #13, ST01, Surveys V0
- #13, OH, Surveys V0
- 5, OH / Job #61105, Plan 1 04-11-17 V0
- 5, OH / Job #61105, Surveys (Patterson 346) V0
- 2, OH / Job #60886, Surveys (Patterson 346) V0
- 2, ST01 / Job #60886, ST01 / Job #60886 V0
- 3, OH / Job #61103, Surveys (Patterson 346) V0
- 3, OH / Job #61103, Plan 1 04-11-17 V0
- 6, OH / Job #60890, Surveys (Patterson 346) V0
- Plan 1 04-09-17



WELL DETAILS						
			Ground Level:	4778.00		
+N/-S	+E/-W	Northing	Eastings	Latitude	Longitude	
0.00	0.00	1416129.28	3175028.79	40° 28' 26.299 N	104° 52' 15.103 W	

SECTION DETAILS											
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Target	Annotation
1	1543.00	0.22	171.11	1542.86	-2.14	0.02	0.00	0.00	0.04		Tie In
2	1593.00	0.22	171.11	1592.86	-2.33	0.05	0.00	0.00	0.02		PTB, Hold 0.22° Inc at 171.11° Azm
3	1693.00	0.22	171.11	1692.86	-2.71	0.11	0.00	0.00	-0.03		KOP1, Begin 2.00°/100' Build
4	2279.21	11.92	146.09	2274.78	-54.26	34.18	2.00	-25.47	-32.55		Hold 11.92° Inc at 146.09° Azm
5	3948.58	11.92	146.09	3908.13	-340.50	226.58	0.00	0.00	-216.29		Begin 2.00°/100' Drop
6	4544.74	0.00	0.00	4500.00	-391.80	261.06	2.00	180.00	-249.22		Begin Vertical Hold
7	6445.78	0.00	0.00	6401.04	-391.80	261.06	0.00	0.00	-249.22		KOP2, Begin 10.00°/100' Build
8	7345.78	90.00	270.57	6974.00	-386.15	-311.87	10.00	270.57	323.29		LP, Hold 90.00° Inc at 270.57° Azm
9	16812.06	90.00	270.57	6974.00	-292.77	-9777.68	0.00	0.00	9782.06	BHL-RBF 11	TD at 16812.06

DESIGN TARGET DETAILS									
Name	TVD	+N/-S	+E/-W	Northing	Eastings	Latitude	Longitude	Shape	
BHL-RBF 11	6974.00	-292.77	-9777.68	1415767.15	3165253.43	40° 28' 23.387 N	104° 54' 21.625 W	Point	
LP-RBF 11	6974.00	-386.15	-311.87	1415740.93	3174719.66	40° 28' 22.483 N	104° 52' 19.139 W	Point	



FORMATION TOP DETAILS

TVDPATH	MDPATH	Formation	DipAngle	DipDir
3459.00	3489.55	Parkman	0.00	268.28
4224.00	4268.31	Sussex	0.00	268.28
4799.00	4843.74	Shannon	0.00	268.28
6818.00	6912.75	Sharon Springs	0.00	268.28
6855.00	6969.80	Niobrara	0.00	268.28
6974.00	7345.78	Nio B	0.00	268.28