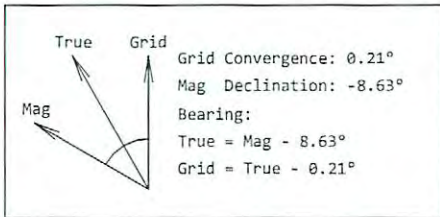




SOUTHWESTERN ENERGY
 RIDGETOP LAND VENTURES WTZ 201H
 WETZEL CO, WV
 PVA

*R_L → V₊
 A*



Plan Data for 201H

Plan Point Information:
 DogLeg Severity Unit: %/100.00ft Position offsets from Slot centre

MD	Inc	Az	TVD	+N/-S	+E/-W	VSec	DLS	Toolface	Build	Turn
(USft)	(°)	(°)	(USft)	(USft)	(USft)	(DLSU)	(°)	(DLSU)	(DLSU)	(DLSU)
7565.00	39.54	284.07	7094.07	-1927.67	-515.82	15.69	9.94	38.5	7.91	9.72
7622.00	43.93	288.31	7136.61	-1917.04	-552.21	53.59	9.15	34.3	7.70	7.44
8236.96	88.24	312.75	7382.83	-1623.10	-1008.81	569.33	8.00	33.1	7.20	3.97
8702.16	90.00	306.75	7390.00	-1325.81	-1366.25	989.92	1.35	286.3	0.38	-1.29
13164.56	90.00	306.75	7390.00	1344.11	-4941.79	5120.95	0.00	0.0	0.00	0.00



Plan Data for 201H

Field: SOUTHWESTERN_WETZEL CO, WV UTM NAD 83 (17N)
 Map Unit: USft Vertical Reference Datum (VRD): Mean Sea Level
 Projected Coordinate System: NAD83 / UTM zone 17N

Site: RIDGETOP LAND VENTURES WTZ
 Unit: USfeet TVD Reference:
 Company Name: SOUTHWESTERN ENERGY

Position: Northing: 14405241.08USft Latitude: 39°39'57.200"
 Easting: 1732383.46USft Longitude: -80°40'23.500"

North Reference: Grid Grid Convergence: 0.21°
 Elevation Above VRD: 1436.00USft

Slot: 201H
 Position:
 Offset is from Site centre
 +N/-S: -8.48USft Northing: 14405232.60USft Latitude: 39°39'57.118"
 +E/-W: -39.80USft Easting: 1732343.66USft Longitude: -80°40'24.010"
 Elevation Above VRD: 1436.00USft

Well: 201H
 Type: Main-Well
 File Number:
 Vertical Section: Position offset of origin from Slot centre:
 +N/-S: 0.00USft Azimuth: 284.53°
 +E/-W: 0.00USft

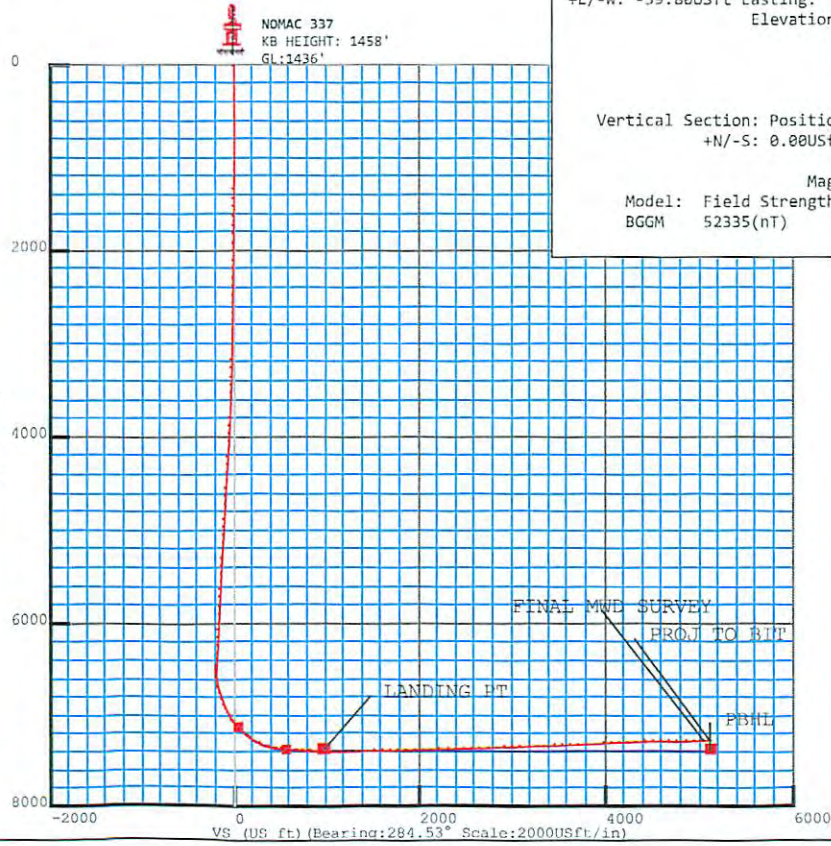
Magnetic Parameters:
 Model: Field Strength: Declination: Dip: Date:
 BGGM 52335(nT) -8.63° 67.07° 2015-04-14

Plan Data for 201H

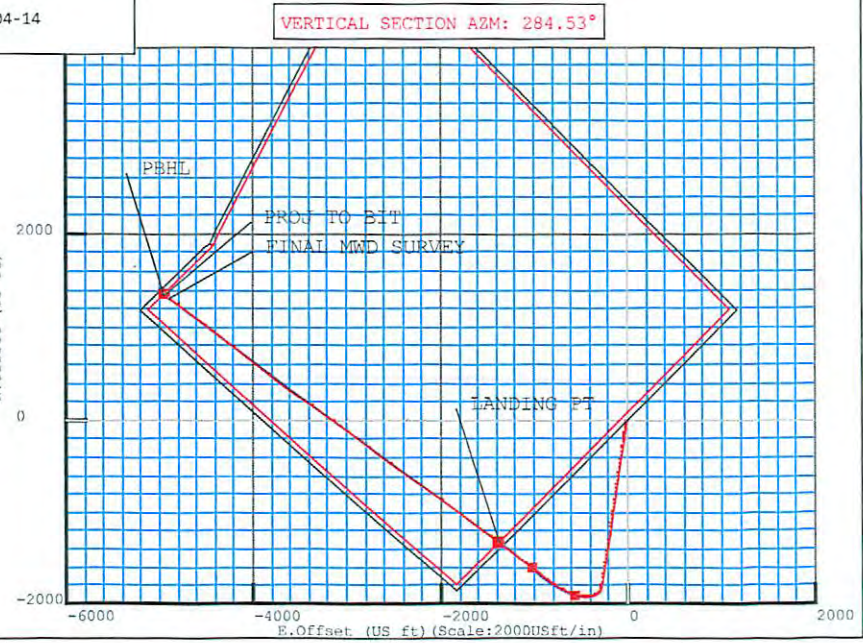
Target Set Information:
 Name: RIDGETOP 201H Targets

Position offsets from Slot centre

Name	TVD	+N/-S	+E/-W	Northing	Easting
(USft)	(USft)	(USft)	(USft)	(USft)	(USft)
201H LP P7	7375.00	-1325.81	-1366.25	14403906.79	1730977.41
201H PBHL P7	7375.00	1344.11	-4941.79	14406576.71	1727401.87



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SOUTHWESTERN ENERGY

Field Name: *SOUTHWESTERN_WETZEL CO, WV UTM NAD 83 (17N)*
Site Name: *RIDGETOP LAND VENTURES WTZ*
Well Name: *201H*
Survey: *Definitive Survey*

20 April 2015

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Survey report for 201H

Field Name	Map Units : US ft Company Name : SOUTHWESTERN ENERGY Vertical Reference Datum (VRD) : Mean Sea Level Projected Coordinate System : NAD83 / UTM zone 17N Comment :	
SOUTHWESTERN_WETZ EL CO, WV UTM NAD 83 (17N)		
Site Name	Units : US ft North Reference : Grid Convergence Angle : 0.21 Position	Northing : 14405241.08 US ft Latitude : 39.665889 Easting : 1732383.46 US ft Longitude : -80.673194
RIDGETOP LAND VENTURES WTZ	Elevation above Mean Sea Level: 1436.00 US ft Comment :	
Slot Name	Position (Offsets relative to Site Centre)	
201H	+N / -S : -8.48 US ft Northing : 14405232.60 US ft +E / -W : -39.80 US ft Easting : 1732343.66 US ft Latitude : 39.665866 Longitude : -80.673336	
	Slot TVD Reference : Ground Elevation Elevation above Mean Sea Level : 1436.00 US ft Comment :	
Well Name	Type : Main well UWI : Rig Height Drill Floor : 22.00 US ft Comment : Relative to Mean Sea Level: 1458.00 US ft Closure Distance : 5113.99 US ft Closure Azimuth : 285.163° Vertical Section (Position of Origin Relative to Slot) +N / -S : 0.00 US ft Az : 285.22° +E / -W : 0.00 US ft	
201H		

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5D Survey Report

Target Set

Name : RIDGETOP 201H Targets **Number of Targets :** 2

Comment :

TargetName:	Position (Relative to Slot centre)		
201H LP P7	+N / -S : -1325.81US ft	Northing : 14403906.79 US ft	Latitude : 39°39'44.058487"
	+E / -W : -1366.25 US ft	Easting : 1730977.41US ft	Longitude : -80°40'41.548099"
Shape: Cuboid	TVD (Drill Floor) : 7375.00 US ft		
Orientation	Azimuth : 0.00°	Inclination : 0.00°	
Dimensions	Length : 20.00 US ft	Breadth : 20.00 US ft	Height : 20.00 US ft
TargetName:	Position (Relative to Slot centre)		
201H PBHL P7	+N / -S : 1344.11US ft	Northing : 14406576.71 US ft	Latitude : 39°40'10.579467"
	+E / -W : -4941.79 US ft	Easting : 1727401.87US ft	Longitude : -80°41'27.168108"
Shape: Cuboid	TVD (Drill Floor) : 7375.00 US ft		
Orientation	Azimuth : 0.00°	Inclination : 0.00°	
Dimensions	Length : 20.00 US ft	Breadth : 20.00 US ft	Height : 20.00 US ft

Survey Name :Definitive Survey

Date : 26/Feb/2015 **Survey Tool :** **Comment :** **Company :**

Magnetic Model

Model Name: Default **Date:** 19/Feb/2015 **Field Strength:** 50000.0 nT **Declination:** 0.00° **Dip:** 0.00°

Survey Tool Ranges

Name	Start MD (us ft)	End MD (us ft)	Source Survey
EMS	0.00	852.00	MS GYRO
MWD	852.00	13157.00	MWD

Well path created using minimum curvature

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5D Survey Report

Survey Points (Relative to Slot centre, TVD relative to Drill Floor)															
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	N.Offset (US ft)	E.Offset (US ft)	VS (US ft)	Northing (US ft)	Easting (US ft)	DLS (°/100 US ft)	B.Rate (°/100 US ft)	T.Face (°)	CL (US ft)	High to Plan (US ft)	Right to Plan (US ft)	Comment
0.00	0.00	0.00	0.00	0.00	0.00	0.00	14405232 .60	1732343. 66	0.00	0.00	0.00	0.00	0.00	0.00	
192.00	0.50	232.26	192.00	-0.51	-0.66	0.50	14405232 .09	1732343. 00	0.26	0.26	232.26	192.00	-0.00	0.00	
326.00	0.30	216.16	325.99	-1.15	-1.33	0.98	14405231 .45	1732342. 33	0.17	-0.15	201.45	134.00	-0.00	0.00	
377.00	0.50	255.26	376.99	-1.32	-1.63	1.22	14405231 .28	1732342. 03	0.64	0.39	74.40	51.00	-0.00	0.00	
470.00	0.40	237.36	469.99	-1.60	-2.29	1.79	14405231 .00	1732341. 37	0.18	-0.11	225.85	93.00	-0.00	0.00	
565.00	0.40	222.06	564.99	-2.02	-2.79	2.16	14405230 .58	1732340. 87	0.11	0.00	262.35	95.00	-0.00	0.00	
662.00	0.50	226.76	661.98	-2.56	-3.33	2.54	14405230 .04	1732340. 33	0.11	0.10	22.62	97.00	-0.00	0.00	
757.00	0.20	249.06	756.98	-2.91	-3.78	2.89	14405229 .69	1732339. 88	0.34	-0.32	166.45	95.00	-0.00	0.00	
852.00	0.20	315.16	851.98	-2.85	-4.06	3.17	14405229 .75	1732339. 60	0.23	0.00	123.05	95.00	-0.00	0.00	
911.00	0.61	30.43	910.98	-2.50	-3.97	3.17	14405230 .10	1732339. 69	1.00	0.69	94.35	59.00	-0.00	0.00	
974.00	0.34	58.82	973.98	-2.12	-3.64	2.96	14405230 .48	1732340. 02	0.56	-0.43	152.53	63.00	-0.00	0.00	
1068.00	1.66	181.58	1067.97	-3.33	-3.44	2.44	14405229 .27	1732340. 22	1.99	1.40	131.57	94.00	-0.00	0.00	
1163.00	4.36	190.64	1162.83	-8.26	-4.14	1.83	14405224 .34	1732339. 52	2.88	2.84	14.54	95.00	-0.00	0.00	
1258.00	5.63	188.25	1257.46	-16.42	-5.48	0.98	14405216 .18	1732338. 18	1.35	1.34	349.50	95.00	-0.00	0.00	
1353.00	6.36	185.81	1351.94	-26.27	-6.68	-0.45	14405206 .33	1732336. 98	0.81	0.77	339.54	95.00	-0.00	0.00	
1449.00	5.75	189.17	1447.41	-36.31	-7.99	-1.83	14405196 .29	1732335. 67	0.73	-0.64	151.51	96.00	-0.00	0.00	
1543.00	5.44	194.08	1540.96	-45.28	-9.82	-2.41	14405187 .32	1732333. 84	0.61	-0.33	125.35	94.00	-0.00	0.00	
1638.00	4.92	187.86	1635.57	-53.68	-11.47	-3.02	14405178 .92	1732332. 19	0.80	-0.55	224.13	95.00	-0.00	0.00	
1733.00	4.80	181.12	1730.23	-61.69	-12.11	-4.51	14405170 .91	1732331. 55	0.61	-0.13	254.79	95.00	-0.00	0.00	

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5D Survey Report

Survey Points (Relative to Slot centre, TVD relative to Drill Floor)															
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	N.Offset (US ft)	E.Offset (US ft)	VS (US ft)	Northing (US ft)	Easting (US ft)	DLS (°/100 US ft)	B.Rate (°/100 US ft)	T.Face (°)	CL (US ft)	High to Plan (US ft)	Right to Plan (US ft)	Comment
1828.00	4.96	183.71	1824.89	-69.76	-12.45	-6.30	14405162 .84	1732331. 21	0.29	0.17	55.31	95.00	-0.00	0.00	
1922.00	5.32	189.35	1918.51	-78.12	-13.42	-7.56	14405154 .48	1732330. 24	0.66	0.38	57.36	94.00	-0.00	0.00	
2017.00	5.52	187.92	2013.09	-86.99	-14.77	-8.59	14405145 .61	1732328. 89	0.25	0.21	325.25	95.00	-0.00	0.00	
2111.00	5.77	185.96	2106.63	-96.17	-15.88	-9.92	14405136 .43	1732327. 78	0.34	0.27	321.38	94.00	-0.00	0.00	
2205.00	5.48	186.07	2200.18	-105.33	-16.85	-11.40	14405127 .27	1732326. 81	0.31	-0.31	177.93	94.00	-0.00	0.00	
2301.00	4.80	188.34	2295.79	-113.86	-17.91	-12.61	14405118 .74	1732325. 75	0.74	-0.71	164.48	96.00	-0.00	0.00	
2395.00	4.89	186.37	2389.46	-121.73	-18.93	-13.69	14405110 .87	1732324. 73	0.20	0.10	297.43	94.00	-0.00	0.00	
2490.00	5.14	190.41	2484.09	-129.94	-20.15	-14.67	14405102 .66	1732323. 51	0.46	0.26	56.73	95.00	-0.00	0.00	
2585.00	5.98	190.72	2578.64	-138.99	-21.84	-15.42	14405093 .61	1732321. 82	0.88	0.88	2.20	95.00	-0.00	0.00	
2680.00	6.02	189.59	2673.12	-148.77	-23.59	-16.30	14405083 .83	1732320. 07	0.13	0.04	288.15	95.00	-0.00	0.00	
2775.00	6.24	185.50	2767.58	-158.82	-24.91	-17.66	14405073 .78	1732318. 75	0.51	0.23	294.69	95.00	-0.00	0.00	
2870.00	5.45	184.92	2862.09	-168.45	-25.79	-19.33	14405064 .15	1732317. 87	0.83	-0.83	183.99	95.00	-0.00	0.00	
2960.00	4.55	182.40	2951.74	-176.28	-26.31	-20.89	14405056 .32	1732317. 35	1.03	-1.00	192.46	90.00	-0.00	0.00	
3091.00	5.90	187.63	3082.20	-188.14	-27.42	-22.93	14405044 .46	1732316. 24	1.09	1.03	22.05	131.00	-0.00	0.00	
3186.00	9.89	190.05	3176.28	-201.02	-29.49	-24.31	14405031 .58	1732314. 17	4.21	4.20	5.96	95.00	-0.00	0.00	
3280.00	13.65	191.63	3268.29	-219.84	-33.14	-25.74	14405012 .76	1732310. 52	4.01	4.00	5.67	94.00	-0.00	0.00	
3375.00	17.51	189.10	3359.78	-244.94	-37.66	-27.96	14404987 .66	1732306. 00	4.12	4.06	348.79	95.00	-0.00	0.00	
3470.00	21.05	188.33	3449.44	-275.94	-42.39	-31.53	14404956 .66	1732301. 27	3.74	3.73	355.53	95.00	-0.00	0.00	
3565.00	24.32	188.70	3537.07	-312.17	-47.83	-35.80	14404920 .43	1732295. 83	3.45	3.44	2.67	95.00	-0.00	0.00	

5D Survey Report

Survey Points (Relative to Slot centre, TVD relative to Drill Floor)															
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	N.Offset (US ft)	E.Offset (US ft)	VS (US ft)	Northing (US ft)	Easting (US ft)	DLS (°/100 US ft)	B.Rate (°/100 US ft)	T.Face (°)	CL (US ft)	High to Plan (US ft)	Right to Plan (US ft)	Comment
3660.00	27.01	189.98	3622.70	-352.76	-54.53	-40.00	14404879 .84	1732289. 13	2.89	2.83	12.22	95.00	-0.00	0.00	
3754.00	25.93	189.62	3706.84	-394.05	-61.66	-43.95	14404838 .55	1732282. 00	1.16	-1.15	188.29	94.00	-0.00	0.00	
3849.00	27.29	189.89	3791.78	-435.98	-68.87	-48.00	14404796 .62	1732274. 79	1.44	1.43	5.20	95.00	-0.00	0.00	
3944.00	27.18	189.83	3876.24	-478.81	-76.32	-52.06	14404753 .79	1732267. 34	0.12	-0.12	193.99	95.00	-0.00	0.00	
4038.00	26.58	189.09	3960.09	-520.74	-83.30	-56.32	14404711 .86	1732260. 36	0.73	-0.64	208.82	94.00	-0.00	0.00	
4133.00	27.07	187.90	4044.86	-563.13	-89.63	-61.35	14404669 .47	1732254. 03	0.77	0.52	311.85	95.00	-0.00	0.00	
4228.00	27.57	187.43	4129.27	-606.34	-95.45	-67.08	14404626 .26	1732248. 21	0.57	0.53	336.45	95.00	-0.00	0.00	
4322.00	26.66	186.63	4212.94	-648.86	-100.69	-73.18	14404583 .74	1732242. 97	1.04	-0.97	201.48	94.00	-0.00	0.00	
4417.00	27.15	187.92	4297.65	-691.50	-106.14	-79.12	14404541 .10	1732237. 52	0.80	0.52	50.57	95.00	-0.00	0.00	
4513.00	27.84	187.80	4382.81	-735.41	-112.20	-84.80	14404497 .19	1732231. 46	0.72	0.72	355.36	96.00	-0.00	0.00	
4607.00	26.47	186.91	4466.45	-777.95	-117.70	-90.66	14404454 .65	1732225. 96	1.52	-1.46	196.12	94.00	-0.00	0.00	
4702.00	27.69	188.17	4551.03	-820.82	-123.39	-96.43	14404411 .78	1732220. 27	1.42	1.28	25.74	95.00	-0.00	0.00	
4797.00	26.17	186.95	4635.73	-863.47	-129.06	-102.15	14404369 .13	1732214. 60	1.70	-1.60	199.43	95.00	-0.00	0.00	
4891.00	26.83	189.61	4719.85	-904.96	-135.11	-107.21	14404327 .64	1732208. 55	1.44	0.70	62.12	94.00	-0.00	0.00	
4987.00	27.87	189.28	4805.12	-948.47	-142.34	-111.65	14404284 .13	1732201. 32	1.09	1.08	351.56	96.00	-0.00	0.00	
5082.00	27.67	188.80	4889.18	-992.18	-149.30	-116.41	14404240 .42	1732194. 36	0.32	-0.21	227.98	95.00	-0.00	0.00	
5176.00	27.73	188.40	4972.41	-1035.39	-155.83	-121.45	14404197 .21	1732187. 83	0.21	0.06	287.71	94.00	-0.00	0.00	
5271.00	27.24	187.72	5056.68	-1078.79	-161.98	-126.91	14404153 .81	1732181. 68	0.61	-0.52	212.34	95.00	-0.00	0.00	
5366.00	27.73	187.05	5140.96	-1122.27	-167.62	-132.89	14404110 .33	1732176. 04	0.61	0.52	327.45	95.00	-0.00	0.00	

5D Survey Report

Survey Points (Relative to Slot centre, TVD relative to Drill Floor)															
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	N.Offset (US ft)	E.Offset (US ft)	VS (US ft)	Northing (US ft)	Easting (US ft)	DLS (°/100 US ft)	B.Rate (°/100 US ft)	T.Face (°)	CL (US ft)	High to Plan (US ft)	Right to Plan (US ft)	Comment
5459.00	27.81	187.07	5223.25	-1165.28	-172.94	-139.04	14404067 .32	1732170. 72	0.09	0.09	6.65	93.00	-0.00	0.00	
5555.00	27.48	187.61	5308.29	-1209.46	-178.63	-145.15	14404023 .14	1732165. 03	0.43	-0.34	143.03	96.00	-0.00	0.00	
5649.00	27.10	189.37	5391.83	-1252.08	-184.99	-150.20	14403980 .52	1732158. 67	0.95	-0.40	116.00	94.00	-0.00	0.00	
5744.00	26.82	189.76	5476.51	-1294.55	-192.15	-154.45	14403938 .05	1732151. 51	0.35	-0.29	147.90	95.00	-0.00	0.00	
5838.00	26.91	189.06	5560.36	-1336.45	-199.09	-158.75	14403896 .15	1732144. 57	0.35	0.10	285.57	94.00	-0.00	0.00	
5933.00	27.81	190.18	5644.73	-1379.50	-206.39	-163.00	14403853 .10	1732137. 27	1.09	0.95	30.26	95.00	-0.00	0.00	
6028.00	26.91	188.06	5729.11	-1422.60	-213.32	-167.63	14403810 .00	1732130. 34	1.40	-0.95	226.33	95.00	-0.00	0.00	
6123.00	28.84	190.28	5813.08	-1466.43	-220.43	-172.28	14403766 .17	1732123. 23	2.31	2.03	29.26	95.00	-0.00	0.00	
6218.00	27.90	188.94	5896.67	-1510.93	-227.97	-176.69	14403721 .67	1732115. 69	1.20	-0.99	213.52	95.00	-0.00	0.00	
6313.00	26.75	186.96	5981.07	-1554.12	-234.02	-182.19	14403678 .48	1732109. 64	1.54	-1.21	217.44	95.00	-0.00	0.00	
6408.00	28.12	189.91	6065.39	-1597.40	-240.46	-187.33	14403635 .20	1732103. 20	2.03	1.44	46.09	95.00	-0.00	0.00	
6504.00	27.07	189.07	6150.47	-1641.25	-247.80	-191.77	14403591 .35	1732095. 86	1.17	-1.09	199.96	96.00	-0.00	0.00	
6599.00	28.71	190.09	6234.43	-1685.07	-255.20	-196.12	14403547 .53	1732088. 46	1.80	1.73	16.67	95.00	-0.00	0.00	
6693.00	27.56	187.45	6317.33	-1728.86	-261.98	-201.08	14403503 .74	1732081. 68	1.80	-1.22	226.11	94.00	-0.00	0.00	
6788.00	27.95	189.57	6401.40	-1772.61	-268.53	-206.25	14403459 .99	1732075. 13	1.12	0.41	69.38	95.00	-0.00	0.00	
6862.00	27.57	189.42	6466.88	-1806.60	-274.22	-209.68	14403426 .00	1732069. 44	0.52	-0.51	190.35	74.00	-0.00	0.00	
6901.00	27.47	188.78	6501.47	-1824.40	-277.07	-211.60	14403408 .20	1732066. 59	0.80	-0.26	251.03	39.00	-0.00	0.00	
6932.00	26.88	191.32	6529.05	-1838.33	-279.53	-212.88	14403394 .27	1732064. 13	4.20	-1.90	118.08	31.00	-0.00	0.00	
6964.00	25.70	198.40	6557.74	-1852.01	-283.14	-212.99	14403380 .59	1732060. 52	10.46	-3.69	113.77	32.00	-0.00	0.00	

Received
Office of Oil & Gas
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5D Survey Report

Survey Points (Relative to Slot centre, TVD relative to Drill Floor)															
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	N.Offset (US ft)	E.Offset (US ft)	VS (US ft)	Northing (US ft)	Easting (US ft)	DLS (°/100 US ft)	B.Rate (°/100 US ft)	T.Face (°)	CL (US ft)	High to Plan (US ft)	Right to Plan (US ft)	Comment
6996.00	24.90	207.37	6586.69	-1864.59	-288.43	-211.19	14403368 .01	1732055. 23	12.23	-2.50	105.82	32.00	-0.00	0.00	
7027.00	23.99	214.24	6614.91	-1875.59	-294.98	-207.76	14403357 .01	1732048. 68	9.62	-2.94	110.86	31.00	-0.00	0.00	
7059.00	22.29	222.64	6644.35	-1885.44	-302.75	-202.84	14403347 .16	1732040. 91	11.59	-5.31	121.07	32.00	-0.00	0.00	
7090.00	21.36	227.08	6673.13	-1893.61	-310.87	-197.15	14403338 .99	1732032. 79	6.11	-3.00	121.45	31.00	-0.00	0.00	
7122.00	21.75	233.02	6702.89	-1901.15	-319.88	-190.44	14403331 .45	1732023. 78	6.92	1.22	82.64	32.00	-0.00	0.00	
7153.00	22.45	237.66	6731.62	-1907.77	-329.47	-182.93	14403324 .83	1732014. 19	6.07	2.26	70.31	31.00	-0.00	0.00	
7185.00	23.08	240.52	6761.12	-1914.12	-340.09	-174.35	14403318 .48	1732003. 57	3.98	1.97	61.67	32.00	-0.00	0.00	
7217.00	23.77	245.91	6790.49	-1919.84	-351.44	-164.90	14403312 .76	1731992. 22	7.03	2.16	74.64	32.00	-0.00	0.00	
7248.00	23.92	250.26	6818.85	-1924.52	-363.06	-154.91	14403308 .08	1731980. 60	5.69	0.48	87.12	31.00	-0.00	0.00	
7280.00	23.90	253.66	6848.10	-1928.53	-375.39	-144.07	14403304 .07	1731968. 27	4.31	-0.06	92.39	32.00	-0.00	0.00	
7312.00	24.09	256.74	6877.34	-1931.85	-387.96	-132.81	14403300 .75	1731955. 70	3.96	0.59	82.78	32.00	-0.00	0.00	
7343.00	25.45	260.73	6905.49	-1934.38	-400.70	-121.18	14403298 .22	1731942. 96	6.95	4.39	52.69	31.00	-0.00	0.00	
7375.00	26.89	265.60	6934.21	-1936.04	-414.70	-108.11	14403296 .56	1731928. 96	8.08	4.50	58.36	32.00	-0.00	0.00	
7407.00	28.50	267.63	6962.54	-1936.91	-429.54	-94.01	14403295 .69	1731914. 12	5.83	5.03	31.27	32.00	-0.00	0.00	
7438.00	30.19	270.89	6989.56	-1937.10	-444.73	-79.41	14403295 .50	1731898. 93	7.50	5.45	44.82	31.00	-0.00	0.00	
7470.00	31.96	273.23	7016.97	-1936.49	-461.23	-63.33	14403296 .11	1731882. 43	6.70	5.53	35.32	32.00	-0.00	0.00	
7502.00	34.33	277.31	7043.77	-1934.87	-478.64	-46.10	14403297 .73	1731865. 02	10.17	7.41	44.99	32.00	-0.00	0.00	
7533.00	37.01	280.96	7068.95	-1931.98	-496.48	-28.13	14403300 .62	1731847. 18	11.04	8.65	39.95	31.00	-0.00	0.00	
7565.00	39.54	284.07	7094.07	-1927.67	-515.82	-8.34	14403304 .93	1731827. 84	9.94	7.91	38.52	32.00	-0.00	-0.00	

Received
Office of Oil & Gas

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5D Survey Report

Survey Points (Relative to Slot centre, TVD relative to Drill Floor)															
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	N.Offset (US ft)	E.Offset (US ft)	VS (US ft)	Northing (US ft)	Easting (US ft)	DLS (°/100 US ft)	B.Rate (°/100 US ft)	T.Face (°)	CL (US ft)	High to Plan (US ft)	Right to Plan (US ft)	Comment
7597.00	41.91	288.49	7118.33	-1921.80	-535.84	12.52	14403310 .80	1731807. 82	11.66	7.41	52.28	32.00	0.02	-0.36	
7628.00	43.23	291.58	7141.16	-1914.61	-555.54	33.41	14403317 .99	1731788. 12	7.97	4.26	58.87	31.00	0.31	-1.26	
7660.00	44.49	294.25	7164.23	-1905.98	-575.95	55.38	14403326 .62	1731767. 71	6.99	3.94	56.71	32.00	1.09	-2.58	
7691.00	46.16	295.14	7186.03	-1896.77	-595.98	77.12	14403335 .83	1731747. 68	5.76	5.39	21.07	31.00	2.24	-3.88	
7723.00	48.33	296.22	7207.75	-1886.58	-617.15	100.23	14403346 .02	1731726. 51	7.22	6.78	20.44	32.00	3.56	-4.99	
7755.00	51.49	296.76	7228.36	-1875.66	-639.06	124.23	14403356 .94	1731704. 60	9.96	9.88	7.62	32.00	4.68	-5.76	
7786.00	54.85	297.69	7246.94	-1864.31	-661.12	148.50	14403368 .29	1731682. 54	11.10	10.84	12.77	31.00	5.17	-6.23	
7818.00	57.24	299.95	7264.81	-1851.51	-684.36	174.29	14403381 .09	1731659. 30	9.49	7.47	38.75	32.00	5.22	-6.87	
7849.00	59.59	301.23	7281.05	-1838.07	-707.09	199.75	14403394 .53	1731636. 57	8.36	7.58	25.23	31.00	5.27	-7.66	
7880.00	62.43	302.66	7296.07	-1823.72	-730.10	225.71	14403408 .88	1731613. 56	10.01	9.16	24.12	31.00	5.10	-8.51	
7912.00	65.28	304.26	7310.17	-1807.88	-754.05	252.99	14403424 .72	1731589. 61	9.97	8.91	27.10	32.00	4.59	-9.54	
7944.00	68.20	304.74	7322.81	-1791.23	-778.28	280.74	14403441 .37	1731565. 38	9.23	9.12	8.68	32.00	3.85	-10.47	
7975.00	72.03	305.00	7333.35	-1774.56	-802.19	308.19	14403458 .04	1731541. 47	12.38	12.35	3.70	31.00	2.55	-11.00	
8007.00	74.99	305.38	7342.43	-1756.88	-827.27	337.02	14403475 .72	1731516. 39	9.32	9.25	7.07	32.00	0.60	-11.14	
8039.00	77.97	306.16	7349.91	-1738.70	-852.51	366.15	14403493 .90	1731491. 15	9.61	9.31	14.37	32.00	-1.71	-11.00	
8070.00	80.65	306.85	7355.66	-1720.58	-876.99	394.53	14403512 .02	1731466. 67	8.92	8.65	14.26	31.00	-4.22	-10.70	
8102.00	83.08	308.98	7360.19	-1701.11	-901.98	423.75	14403531 .49	1731441. 68	10.05	7.59	41.11	32.00	-6.95	-10.57	
8134.00	84.45	309.52	7363.66	-1680.98	-926.61	452.81	14403551 .62	1731417. 05	4.60	4.28	21.43	32.00	-9.38	-10.63	
8166.00	84.69	309.62	7366.69	-1660.69	-951.17	481.83	14403571 .91	1731392. 49	0.81	0.75	22.53	32.00	-10.91	-10.32	

5D Survey Report

Survey Points (Relative to Slot centre, TVD relative to Drill Floor)															
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	N.Offset (US ft)	E.Offset (US ft)	VS (US ft)	Northing (US ft)	Easting (US ft)	DLS (°/100 US ft)	B.Rate (°/100 US ft)	T.Face (°)	CL (US ft)	High to Plan (US ft)	Right to Plan (US ft)	Comment
8197.00	85.68	309.29	7369.29	-1641.06	-975.02	510.00	14403591 .54	1731368. 64	3.37	3.19	341.61	31.00	-11.43	-9.42	
8229.00	86.37	309.04	7371.51	-1620.90	-999.77	539.17	14403611 .70	1731343. 89	2.29	2.16	340.12	32.00	-11.10	-7.76	
8261.00	86.61	308.77	7373.47	-1600.84	-1024.62	568.42	14403631 .76	1731319. 04	1.13	0.75	311.68	32.00	-10.13	-5.70	
8293.00	85.56	308.62	7375.66	-1580.88	-1049.54	597.70	14403651 .72	1731294. 12	3.31	-3.28	188.11	32.00	-8.83	-3.74	
8324.00	85.38	308.65	7378.11	-1561.59	-1073.68	626.06	14403671 .01	1731269. 98	0.59	-0.58	170.57	31.00	-7.19	-2.04	
8356.00	85.43	308.60	7380.67	-1541.68	-1098.60	655.33	14403690 .92	1731245. 06	0.22	0.16	315.09	32.00	-5.40	-0.50	
8388.00	85.62	308.44	7383.17	-1521.81	-1123.56	684.64	14403710 .79	1731220. 10	0.78	0.59	319.98	32.00	-3.60	0.88	
8419.00	85.69	308.11	7385.51	-1502.66	-1147.83	713.08	14403729 .94	1731195. 83	1.09	0.23	282.00	31.00	-1.87	2.12	
8451.00	85.93	307.99	7387.85	-1482.99	-1172.96	742.49	14403749 .61	1731170. 70	0.84	0.75	333.49	32.00	-0.10	3.30	
8482.00	86.05	308.02	7390.02	-1463.95	-1197.32	771.00	14403768 .65	1731146. 34	0.40	0.39	14.00	31.00	1.59	4.25	
8514.00	86.18	307.66	7392.19	-1444.36	-1222.54	800.47	14403788 .24	1731121. 12	1.19	0.41	289.89	32.00	3.33	5.10	
8546.00	86.24	308.04	7394.30	-1424.77	-1247.75	829.94	14403807 .83	1731095. 91	1.20	0.19	81.02	32.00	5.08	5.71	
8578.00	87.29	307.93	7396.11	-1405.11	-1272.93	859.40	14403827 .49	1731070. 73	3.30	3.28	354.03	32.00	6.60	6.02	
8609.00	87.90	307.96	7397.41	-1386.06	-1297.36	887.97	14403846 .54	1731046. 30	1.97	1.97	2.81	31.00	7.68	6.12	
8641.00	88.15	307.74	7398.51	-1366.44	-1322.61	917.49	14403866 .16	1731021. 05	1.04	0.78	318.67	32.00	8.63	6.05	
8672.00	88.21	307.80	7399.50	-1347.46	-1347.10	946.11	14403885 .14	1730996. 56	0.27	0.19	44.99	31.00	9.52	5.80	
8704.00	88.28	307.71	7400.48	-1327.88	-1372.39	975.65	14403904 .72	1730971. 27	0.36	0.22	307.89	32.00	10.48	5.33	
8799.00	89.94	307.33	7401.95	-1270.03	-1447.73	1063.53	14403962 .57	1730895. 93	1.79	1.75	347.10	95.00	11.95	4.05	
8894.00	90.00	306.26	7402.00	-1213.13	-1523.80	1151.87	14404019 .47	1730819. 86	1.13	0.06	273.21	95.00	12.00	3.98	

5D Survey Report

Survey Points (Relative to Slot centre, TVD relative to Drill Floor)															
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	N.Offset (US ft)	E.Offset (US ft)	VS (US ft)	Northing (US ft)	Easting (US ft)	DLS (%/100 US ft)	B.Rate (%/100 US ft)	T.Face (°)	CL (US ft)	High to Plan (US ft)	Right to Plan (US ft)	Comment
8989.00	90.43	306.59	7401.65	-1156.72	-1600.24	1240.44	14404075 .88	1730743. 42	0.57	0.45	37.50	95.00	11.65	4.52	
9084.00	91.78	307.68	7399.81	-1099.38	-1675.96	1328.56	14404133 .22	1730667. 70	1.83	1.42	38.90	95.00	9.81	3.88	
9179.00	90.62	308.09	7397.82	-1041.06	-1750.92	1416.20	14404191 .54	1730592. 74	1.30	-1.22	160.53	95.00	7.82	1.99	
9274.00	91.91	306.68	7395.73	-983.40	-1826.38	1504.15	14404249 .20	1730517. 28	2.01	1.36	312.48	95.00	5.72	0.94	
9369.00	91.79	306.95	7392.66	-926.50	-1902.39	1592.44	14404306 .10	1730441. 27	0.31	-0.13	113.97	95.00	2.66	0.83	
9464.00	91.72	306.32	7389.75	-869.84	-1978.59	1680.84	14404362 .76	1730365. 07	0.67	-0.07	263.67	95.00	-0.25	1.02	
9559.00	91.42	305.49	7387.15	-814.15	-2055.51	1769.68	14404418 .45	1730288. 15	0.93	-0.32	250.13	95.00	-2.85	2.42	
9653.00	91.54	305.62	7384.72	-759.51	-2131.96	1857.79	14404473 .09	1730211. 70	0.19	0.13	47.28	94.00	-5.28	4.38	
9748.00	91.72	305.55	7382.02	-704.25	-2209.19	1946.82	14404528 .35	1730134. 47	0.20	0.19	338.76	95.00	-7.97	6.31	
9843.00	91.79	305.88	7379.11	-648.82	-2286.28	2035.76	14404583 .78	1730057. 38	0.35	0.07	78.01	95.00	-10.88	8.02	
9938.00	91.60	306.62	7376.30	-592.67	-2362.86	2124.39	14404639 .93	1729980. 80	0.80	-0.20	104.39	95.00	-13.70	8.85	
10034.00	91.48	306.94	7373.72	-535.21	-2439.73	2213.65	14404697 .39	1729903. 93	0.36	-0.13	110.56	96.00	-16.28	8.80	
10129.00	91.54	306.59	7371.22	-478.37	-2515.80	2301.98	14404754 .23	1729827. 86	0.37	0.06	279.74	95.00	-18.78	8.77	
10223.00	92.03	306.36	7368.29	-422.51	-2591.35	2389.54	14404810 .09	1729752. 31	0.58	0.52	334.87	94.00	-21.70	9.22	
10318.00	91.54	308.31	7365.33	-364.93	-2666.85	2477.50	14404867 .67	1729676. 81	2.12	-0.52	104.08	95.00	-24.67	8.25	
10413.00	91.54	308.27	7362.77	-306.09	-2741.38	2564.87	14404926 .51	1729602. 28	0.04	0.00	270.00	95.00	-27.22	5.70	
10508.00	91.05	307.92	7360.63	-247.49	-2816.13	2652.38	14404985 .11	1729527. 53	0.63	-0.52	215.53	95.00	-29.37	3.47	
10603.00	92.16	306.89	7357.97	-189.81	-2891.56	2740.31	14405042 .79	1729452. 10	1.59	1.17	317.17	95.00	-32.01	2.38	
10698.00	92.22	307.27	7354.34	-132.57	-2967.30	2828.41	14405100 .03	1729376. 36	0.40	0.06	81.01	95.00	-35.64	1.83	

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5D Survey Report

Survey Points (Relative to Slot centre, TVD relative to Drill Floor)															
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10793.00	91.11	306.37	7351.58	-75.66	-3043.31	2916.70	14405156 .94	1729300. 35	1.50	-1.17	219.04	95.00	-38.42	1.72	
10888.00	91.29	306.22	7349.59	-19.44	-3119.86	3005.33	14405213 .16	1729223. 80	0.25	0.19	320.20	95.00	-40.40	2.47	
10983.00	92.03	305.71	7346.83	36.33	-3196.72	3094.13	14405268 .93	1729146. 94	0.95	0.78	325.44	95.00	-43.14	3.77	
11078.00	92.16	306.45	7343.36	92.24	-3273.45	3182.85	14405324 .84	1729070. 21	0.79	0.14	80.02	95.00	-46.60	4.88	
11173.00	92.03	304.56	7339.89	147.37	-3350.73	3271.89	14405379 .97	1728992. 93	1.99	-0.14	266.10	95.00	-50.07	6.94	
11268.00	92.22	305.00	7336.37	201.53	-3428.70	3361.35	14405434 .13	1728914. 96	0.50	0.20	66.62	95.00	-53.58	10.20	
11363.00	91.79	305.20	7333.04	256.12	-3506.38	3450.63	14405488 .72	1728837. 28	0.50	-0.45	155.07	95.00	-56.92	12.93	
11458.00	92.03	305.03	7329.88	310.73	-3584.05	3539.91	14405543 .33	1728759. 61	0.31	0.25	324.71	95.00	-60.07	15.64	
11553.00	92.09	306.02	7326.46	365.90	-3661.31	3628.95	14405598 .50	1728682. 35	1.04	0.06	86.51	95.00	-63.49	17.67	
11648.00	92.46	308.77	7322.69	423.54	-3736.72	3716.84	14405656 .14	1728606. 94	2.92	0.39	82.28	95.00	-67.27	16.59	
11742.00	92.78	308.01	7318.39	481.85	-3810.32	3803.17	14405714 .45	1728533. 34	0.88	0.34	292.87	94.00	-71.54	13.91	
11837.00	93.02	308.11	7313.59	540.34	-3885.02	3890.61	14405772 .94	1728458. 64	0.27	0.25	22.59	95.00	-76.32	11.74	
11933.00	93.17	307.97	7308.40	599.41	-3960.52	3978.97	14405832 .01	1728383. 14	0.21	0.16	317.02	96.00	-81.48	9.58	
12028.00	92.71	307.92	7303.53	657.75	-4035.34	4066.48	14405890 .35	1728308. 32	0.49	-0.48	186.20	95.00	-86.38	7.60	
12122.00	93.14	307.95	7298.73	715.47	-4109.38	4153.07	14405948 .07	1728234. 28	0.46	0.46	3.98	94.00	-91.14	5.66	
12217.00	91.23	307.75	7295.11	773.71	-4184.34	4240.69	14406006 .31	1728159. 32	2.02	-2.01	185.98	95.00	-94.87	3.84	
12312.00	91.17	308.06	7293.12	832.06	-4259.28	4328.32	14406064 .66	1728084. 38	0.33	-0.06	100.95	95.00	-96.86	1.92	
12407.00	91.05	308.47	7291.28	890.89	-4333.85	4415.72	14406123 .49	1728009. 81	0.45	-0.13	106.31	95.00	-98.70	-0.59	
12501.00	90.99	306.96	7289.61	948.38	-4408.20	4502.55	14406180 .98	1727935. 46	1.61	-0.06	267.74	94.00	-100.38	-2.17	

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5D Survey Report

Survey Points (Relative to Slot centre, TVD relative to Drill Floor)															
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	N.Offset (US ft)	E.Offset (US ft)	VS (US ft)	Northing (US ft)	Easting (US ft)	DLS (°/100 US ft)	B.Rate (°/100 US ft)	T.Face (°)	CL (US ft)	High to Plan (US ft)	Right to Plan (US ft)	Comment
12596.00	91.29	307.45	7287.72	1005.81	-4483.85	4590.63	14406238 .41	1727859. 81	0.60	0.32	58.51	95.00	-102.25	-2.93	
12691.00	90.92	305.66	7285.89	1062.38	-4560.14	4679.10	14406294 .98	1727783. 52	1.92	-0.39	258.34	95.00	-104.10	-2.60	
12786.00	90.62	306.34	7284.61	1118.21	-4636.99	4767.91	14406350 .81	1727706. 67	0.78	-0.32	113.80	95.00	-105.38	-1.36	
12881.00	91.79	306.93	7282.61	1174.89	-4713.21	4856.33	14406407 .49	1727630. 45	1.38	1.23	26.75	95.00	-107.34	-1.17	
12976.00	91.66	306.45	7279.75	1231.62	-4789.35	4944.70	14406464 .22	1727554. 31	0.52	-0.14	254.85	95.00	-110.20	-1.07	
13071.00	91.48	306.64	7277.15	1288.17	-4865.64	5033.16	14406520 .77	1727478. 02	0.28	-0.19	133.46	95.00	-112.81	-0.74	
13100.00	91.05	304.85	7276.51	1305.10	-4889.18	5060.31	14406537 .70	1727454. 48	6.35	-1.48	256.51	29.00	-113.47	-0.23	FINAL MWD SURVEY
13157.00	91.05	304.85	7275.46	1337.67	-4935.94	5113.99	14406570 .27	1727407. 72	0.00	0.00	0.00	57.00	-114.52	1.66	PROJ TO BIT

Formation Points (Relative to Slot centre, TVD relative to Drill Floor)				
Name	TVD (US ft)	MD (US ft)	F.Dip (°)	F.Dir (°)
BEREA	2421.00	2426.66	0	0
BIG INJUN	2533.00	2539.12	0	0
BURKET	7145.00	7633.28	0	0
TULLY	7182.00	7685.20	0	0
UPPER MARCELLUS	7259.00	7807.38	0	0
LOWER MARCELLUS	7280.00	7846.94	0	0
ONONDAGA	7328.00	7958.56	0	0

Received
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