



## **Sandridge Energy, INC.(mid-con.)**

**Gray County (KA27N)**

**Sec 21-T26S-R29W**

**Toews 2629 1-21H**

**Wellbore #1**

**Design: Wellbore #1**

## **Standard Survey Report**

**26 July, 2012**

# **Archer**



# Archer Directional Drilling Services

## Survey Report



<b>Company:</b>	Sandridge Energy, INC.(mid-con.)	<b>Local Co-ordinate Reference:</b>	Well Toews 2629 1-21H
<b>Project:</b>	Gray County (KA27N)	<b>TVD Reference:</b>	WELL @ 2767.0usft (Original Well Elev)
<b>Site:</b>	Sec 21-T26S-R29W	<b>MD Reference:</b>	WELL @ 2767.0usft (Original Well Elev)
<b>Well:</b>	Toews 2629 1-21H	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	EDM 5000.1 Single User Db

<b>Project</b>	Gray County (KA27N)		
<b>Map System:</b>	US State Plane 1927 (Exact solution)	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	NAD 1927 (NADCON CONUS)		
<b>Map Zone:</b>	Kansas South 1502		

<b>Site</b>	Sec 21-T26S-R29W				
<b>Site Position:</b>		<b>Northing:</b>	411,490.94 usft	<b>Latitude:</b>	37° 46' 47.751 N
<b>From:</b>	Map	<b>Easting:</b>	1,424,957.60 usft	<b>Longitude:</b>	100° 29' 23.400 W
<b>Position Uncertainty:</b>	0.0 usft	<b>Slot Radius:</b>	13-3/16 "	<b>Grid Convergence:</b>	-1.22 °

<b>Well</b>	Toews 2629 1-21H					
<b>Well Position</b>	<b>+N/-S</b>	0.0 usft	<b>Northing:</b>	411,490.94 usft	<b>Latitude:</b>	37° 46' 47.751 N
	<b>+E/-W</b>	0.0 usft	<b>Easting:</b>	1,424,957.60 usft	<b>Longitude:</b>	100° 29' 23.400 W
<b>Position Uncertainty</b>	0.0 usft		<b>Wellhead Elevation:</b>	usft	<b>Ground Level:</b>	2,747.0 usft

<b>Wellbore</b>	Wellbore #1				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	06/29/12	6.13	65.51	52,037

<b>Design</b>	Wellbore #1				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.0
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>	
	0.0	0.0	0.0	181.69	

<b>Survey Program</b>	<b>Date</b>	07/26/12			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
250.0	1,535.0	Gyro (Wellbore #1)	MWD	MWD - Standard	
1,679.0	9,365.0	Archer MWD Survey (Wellbore #1)	MWD	MWD - Standard	

<b>Survey</b>										
<b>Measured Depth (usft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Vertical Section (usft)</b>	<b>Dogleg Rate (°/100usft)</b>	<b>Build Rate (°/100usft)</b>	<b>Turn Rate (°/100usft)</b>	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00	
250.0	0.40	13.80	250.0	0.8	0.2	-0.9	0.16	0.16	0.00	
500.0	0.50	13.80	500.0	2.8	0.7	-2.8	0.04	0.04	0.00	
750.0	0.30	13.80	750.0	4.4	1.1	-4.5	0.08	-0.08	0.00	
1,535.0	1.00	13.80	1,534.9	13.1	3.2	-13.2	0.09	0.09	0.00	
<b>Last Gyro</b>										
1,679.0	0.80	18.30	1,678.9	15.3	3.8	-15.4	0.15	-0.14	3.13	
2,147.0	0.60	29.30	2,146.9	20.5	6.1	-20.7	0.05	-0.04	2.35	
2,611.0	1.20	60.90	2,610.8	25.0	11.5	-25.3	0.16	0.13	6.81	
3,079.0	1.30	69.70	3,078.7	29.2	20.8	-29.8	0.05	0.02	1.88	



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<b>Site:</b>	Sec 21-T26S-R29W	<b>MD Reference:</b>	WELL @ 2767.0usft (Original Well Elev)
<b>Well:</b>	Toews 2629 1-21H	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	EDM 5000.1 Single User Db

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
3,558.0	1.40	93.40	3,557.6	30.8	31.7	-31.7	0.12	0.02	4.95	
3,844.0	1.10	111.90	3,843.5	29.5	37.7	-30.6	0.17	-0.10	6.47	
3,939.0	1.10	108.70	3,938.5	28.9	39.4	-30.0	0.06	0.00	-3.37	
4,003.0	1.00	103.60	4,002.5	28.6	40.6	-29.8	0.21	-0.16	-7.97	
4,035.0	1.00	104.40	4,034.5	28.4	41.1	-29.6	0.04	0.00	2.50	
4,066.0	1.10	114.30	4,065.5	28.2	41.6	-29.5	0.67	0.32	31.94	
4,097.0	2.10	140.50	4,096.5	27.7	42.3	-28.9	3.92	3.23	84.52	
4,129.0	3.50	154.70	4,128.4	26.3	43.1	-27.6	4.85	4.38	44.38	
4,161.0	5.30	158.20	4,160.3	24.1	44.0	-25.4	5.68	5.63	10.94	
4,193.0	6.50	159.00	4,192.2	21.0	45.2	-22.4	3.76	3.75	2.50	
4,225.0	7.90	164.10	4,223.9	17.2	46.5	-18.6	4.81	4.38	15.94	
4,257.0	10.40	167.70	4,255.5	12.3	47.7	-13.7	8.01	7.81	11.25	
4,289.0	12.80	171.30	4,286.8	6.0	48.8	-7.4	7.83	7.50	11.25	
4,321.0	14.70	174.30	4,317.9	-1.6	49.8	0.1	6.34	5.94	9.38	
4,353.0	17.80	176.70	4,348.6	-10.5	50.5	9.0	9.91	9.69	7.50	
4,385.0	20.70	179.70	4,378.8	-21.1	50.8	19.5	9.57	9.06	9.38	
4,417.0	22.90	182.00	4,408.6	-32.9	50.6	31.4	7.37	6.88	7.19	
4,449.0	24.40	183.20	4,437.9	-45.8	50.0	44.3	4.92	4.69	3.75	
4,481.0	26.20	183.10	4,466.8	-59.4	49.3	57.9	5.63	5.63	-0.31	
4,513.0	28.20	183.20	4,495.3	-74.0	48.4	72.6	6.25	6.25	0.31	
4,544.0	30.40	182.80	4,522.3	-89.2	47.7	87.7	7.12	7.10	-1.29	
4,576.0	33.50	182.80	4,549.4	-106.1	46.8	104.6	9.69	9.69	0.00	
4,608.0	36.00	183.00	4,575.7	-124.3	45.9	122.9	7.82	7.81	0.63	
4,640.0	37.20	182.70	4,601.4	-143.3	45.0	142.0	3.79	3.75	-0.94	
4,672.0	38.50	183.40	4,626.7	-163.0	43.9	161.6	4.28	4.06	2.19	
4,704.0	40.00	184.10	4,651.5	-183.2	42.6	181.8	4.89	4.69	2.19	
4,736.0	42.50	184.80	4,675.5	-204.2	40.9	202.9	7.94	7.81	2.19	
4,768.0	45.20	183.90	4,698.6	-226.3	39.3	225.0	8.66	8.44	-2.81	
4,799.0	48.40	183.40	4,719.8	-248.8	37.8	247.6	10.39	10.32	-1.61	
4,831.0	51.00	182.90	4,740.5	-273.2	36.5	272.0	8.21	8.13	-1.56	
4,863.0	51.50	182.70	4,760.5	-298.1	35.3	297.0	1.64	1.56	-0.63	
4,895.0	51.50	183.10	4,780.5	-323.1	34.0	322.0	0.98	0.00	1.25	
4,927.0	51.10	182.80	4,800.5	-348.1	32.7	347.0	1.45	-1.25	-0.94	
4,958.0	50.60	182.80	4,820.0	-372.1	31.5	371.0	1.61	-1.61	0.00	
4,990.0	50.00	182.80	4,840.5	-396.7	30.3	395.6	1.88	-1.88	0.00	
5,023.0	49.30	182.30	4,861.9	-421.8	29.2	420.8	2.42	-2.12	-1.52	
5,055.0	50.90	181.90	4,882.4	-446.3	28.3	445.3	5.09	5.00	-1.25	
5,086.0	53.60	182.70	4,901.4	-470.8	27.3	469.8	8.95	8.71	2.58	
5,118.0	56.70	182.50	4,919.6	-497.1	26.2	496.1	9.70	9.69	-0.63	
5,150.0	59.20	182.60	4,936.6	-524.2	24.9	523.2	7.82	7.81	0.31	
5,182.0	62.50	181.50	4,952.2	-552.1	23.9	551.1	10.74	10.31	-3.44	
5,214.0	66.00	180.20	4,966.1	-580.9	23.5	579.9	11.53	10.94	-4.06	
5,245.0	69.50	179.70	4,977.8	-609.6	23.6	608.6	11.39	11.29	-1.61	



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### Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
5,277.0	73.20	180.10	4,988.1	-639.9	23.6	638.9	11.62	11.56	1.25
5,309.0	77.70	179.50	4,996.1	-670.9	23.7	669.9	14.18	14.06	-1.88
5,341.0	81.80	179.10	5,001.8	-702.3	24.1	701.3	12.87	12.81	-1.25
5,373.0	86.00	179.40	5,005.2	-734.2	24.5	733.1	13.16	13.13	0.94
5,389.0	88.40	179.70	5,006.0	-750.1	24.6	749.1	15.12	15.00	1.88
5,434.0	91.80	180.60	5,005.9	-795.1	24.5	794.1	7.82	7.56	2.00
5,465.0	91.70	180.80	5,005.0	-826.1	24.1	825.0	0.72	-0.32	0.65
5,497.0	91.50	180.90	5,004.1	-858.1	23.7	857.0	0.70	-0.63	0.31
5,591.0	91.10	181.80	5,001.9	-952.0	21.5	951.0	1.05	-0.43	0.96
5,685.0	91.00	181.80	5,000.2	-1,046.0	18.5	1,045.0	0.11	-0.11	0.00
5,778.0	89.10	182.40	5,000.1	-1,138.9	15.1	1,138.0	2.14	-2.04	0.65
5,872.0	88.60	181.90	5,002.0	-1,232.8	11.6	1,231.9	0.75	-0.53	-0.53
5,965.0	88.50	182.00	5,004.4	-1,325.7	8.4	1,324.9	0.15	-0.11	0.11
6,059.0	89.40	181.60	5,006.1	-1,419.7	5.5	1,418.9	1.05	0.96	-0.43
6,151.0	90.30	181.90	5,006.3	-1,511.6	2.6	1,510.9	1.03	0.98	0.33
6,244.0	89.60	181.80	5,006.4	-1,604.6	-0.4	1,603.9	0.76	-0.75	-0.11
6,275.0	89.40	181.90	5,006.7	-1,635.6	-1.4	1,634.9	0.72	-0.65	0.32
6,305.0	90.60	182.10	5,006.7	-1,665.6	-2.4	1,664.9	4.06	4.00	0.67
6,336.0	91.90	182.70	5,006.0	-1,696.5	-3.7	1,695.9	4.62	4.19	1.94
6,367.0	92.50	183.00	5,004.8	-1,727.5	-5.2	1,726.9	2.16	1.94	0.97
6,398.0	92.70	183.00	5,003.4	-1,758.4	-6.9	1,757.8	0.65	0.65	0.00
6,429.0	92.40	183.00	5,002.0	-1,789.3	-8.5	1,788.8	0.97	-0.97	0.00
6,459.0	92.00	183.20	5,000.9	-1,819.2	-10.1	1,818.7	1.49	-1.33	0.67
6,490.0	91.90	183.70	4,999.8	-1,850.2	-12.0	1,849.7	1.64	-0.32	1.61
6,521.0	91.10	183.50	4,999.0	-1,881.1	-13.9	1,880.7	2.66	-2.58	-0.65
6,551.0	90.80	183.60	4,998.5	-1,911.0	-15.8	1,910.7	1.05	-1.00	0.33
6,582.0	91.00	183.80	4,998.0	-1,942.0	-17.8	1,941.6	0.91	0.65	0.65
6,613.0	91.80	184.40	4,997.3	-1,972.9	-20.0	1,972.6	3.23	2.58	1.94
6,643.0	91.60	184.40	4,996.4	-2,002.8	-22.3	2,002.6	0.67	-0.67	0.00
6,675.0	89.80	183.90	4,996.0	-2,034.7	-24.6	2,034.5	5.84	-5.63	-1.56
6,706.0	89.30	183.80	4,996.2	-2,065.6	-26.7	2,065.5	1.64	-1.61	-0.32
6,738.0	88.70	183.80	4,996.8	-2,097.5	-28.8	2,097.5	1.88	-1.88	0.00
6,770.0	88.60	183.70	4,997.5	-2,129.5	-30.9	2,129.4	0.44	-0.31	-0.31
6,802.0	88.70	183.90	4,998.3	-2,161.4	-33.0	2,161.4	0.70	0.31	0.63
6,834.0	87.60	183.40	4,999.3	-2,193.3	-35.1	2,193.4	3.78	-3.44	-1.56
6,865.0	86.80	183.40	5,000.8	-2,224.2	-36.9	2,224.3	2.58	-2.58	0.00
6,887.0	87.40	183.40	5,002.0	-2,246.1	-38.2	2,246.3	2.73	2.73	0.00
6,919.0	88.90	183.60	5,003.0	-2,278.1	-40.1	2,278.3	4.73	4.69	0.63
6,951.0	89.50	183.90	5,003.4	-2,310.0	-42.2	2,310.2	2.10	1.88	0.94
6,983.0	89.80	184.00	5,003.6	-2,341.9	-44.4	2,342.2	0.99	0.94	0.31
7,015.0	89.60	184.30	5,003.8	-2,373.8	-46.8	2,374.2	1.13	-0.63	0.94
7,047.0	89.50	183.80	5,004.1	-2,405.8	-49.0	2,406.1	1.59	-0.31	-1.56
7,080.0	89.70	184.20	5,004.3	-2,438.7	-51.3	2,439.1	1.36	0.61	1.21



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## Survey Report



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**Site:** Sec 21-T26S-R29W  
**Well:** Toews 2629 1-21H  
**Wellbore:** Wellbore #1  
**Design:** Wellbore #1

**Local Co-ordinate Reference:** Well Toews 2629 1-21H  
**TVD Reference:** WELL @ 2767.0usft (Original Well Elev)  
**MD Reference:** WELL @ 2767.0usft (Original Well Elev)  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Database:** EDM 5000.1 Single User Db

### Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
7,112.0	89.60	183.90	5,004.5	-2,470.6	-53.6	2,471.1	0.99	-0.31	-0.94
7,144.0	89.50	183.70	5,004.7	-2,502.5	-55.7	2,503.1	0.70	-0.31	-0.63
7,175.0	89.50	183.70	5,005.0	-2,533.5	-57.7	2,534.1	0.00	0.00	0.00
7,207.0	89.90	183.40	5,005.2	-2,565.4	-59.7	2,566.0	1.56	1.25	-0.94
7,303.0	90.30	183.30	5,005.0	-2,661.2	-65.3	2,662.0	0.43	0.42	-0.10
7,398.0	89.10	183.00	5,005.5	-2,756.1	-70.5	2,757.0	1.30	-1.26	-0.32
7,493.0	89.50	182.50	5,006.7	-2,851.0	-75.1	2,851.9	0.67	0.42	-0.53
7,588.0	89.20	182.60	5,007.7	-2,945.9	-79.3	2,946.9	0.33	-0.32	0.11
7,683.0	89.80	182.20	5,008.6	-3,040.8	-83.3	3,041.9	0.76	0.63	-0.42
7,778.0	92.30	184.40	5,006.8	-3,135.6	-88.7	3,136.8	3.51	2.63	2.32
7,874.0	91.00	184.40	5,004.1	-3,231.3	-96.1	3,232.7	1.35	-1.35	0.00
7,906.0	91.20	184.90	5,003.4	-3,263.2	-98.7	3,264.6	1.68	0.63	1.56
7,938.0	89.20	184.20	5,003.3	-3,295.0	-101.2	3,296.6	6.62	-6.25	-2.19
7,970.0	87.90	184.10	5,004.1	-3,327.0	-103.6	3,328.6	4.07	-4.06	-0.31
8,002.0	87.90	184.00	5,005.3	-3,358.9	-105.8	3,360.5	0.31	0.00	-0.31
8,034.0	88.00	183.90	5,006.5	-3,390.8	-108.0	3,392.5	0.44	0.31	-0.31
8,066.0	88.00	183.80	5,007.6	-3,422.7	-110.2	3,424.4	0.31	0.00	-0.31
8,098.0	88.00	183.80	5,008.7	-3,454.6	-112.3	3,456.4	0.00	0.00	0.00
8,130.0	88.00	183.80	5,009.8	-3,486.5	-114.4	3,488.3	0.00	0.00	0.00
8,162.0	87.90	183.70	5,011.0	-3,518.4	-116.5	3,520.3	0.44	-0.31	-0.31
8,194.0	88.00	183.50	5,012.1	-3,550.3	-118.5	3,552.3	0.70	0.31	-0.63
8,226.0	88.40	183.50	5,013.1	-3,582.2	-120.5	3,584.2	1.25	1.25	0.00
8,258.0	88.40	183.50	5,014.0	-3,614.2	-122.4	3,616.2	0.00	0.00	0.00
8,354.0	88.30	183.10	5,016.8	-3,710.0	-127.9	3,712.1	0.43	-0.10	-0.42
8,449.0	89.00	181.80	5,019.0	-3,804.8	-132.0	3,807.1	1.55	0.74	-1.37
8,545.0	89.00	182.00	5,020.7	-3,900.8	-135.2	3,903.1	0.21	0.00	0.21
8,641.0	88.80	181.90	5,022.5	-3,996.7	-138.4	3,999.1	0.23	-0.21	-0.10
8,673.0	88.70	182.00	5,023.2	-4,028.7	-139.5	4,031.0	0.44	-0.31	0.31
8,705.0	88.70	182.10	5,023.9	-4,060.7	-140.7	4,063.0	0.31	0.00	0.31
8,737.0	89.00	181.80	5,024.6	-4,092.6	-141.8	4,095.0	1.33	0.94	-0.94
8,769.0	90.20	181.50	5,024.8	-4,124.6	-142.7	4,127.0	3.87	3.75	-0.94
8,801.0	90.20	181.50	5,024.7	-4,156.6	-143.5	4,159.0	0.00	0.00	0.00
8,833.0	89.90	181.50	5,024.7	-4,188.6	-144.4	4,191.0	0.94	-0.94	0.00
8,865.0	91.00	181.30	5,024.4	-4,220.6	-145.1	4,223.0	3.49	3.44	-0.63
8,897.0	91.10	181.10	5,023.8	-4,252.6	-145.8	4,255.0	0.70	0.31	-0.63
8,929.0	91.40	180.60	5,023.1	-4,284.6	-146.3	4,287.0	1.82	0.94	-1.56
8,961.0	91.30	180.40	5,022.4	-4,316.5	-146.6	4,319.0	0.70	-0.31	-0.63
8,993.0	91.30	180.30	5,021.7	-4,348.5	-146.8	4,351.0	0.31	0.00	-0.31
9,025.0	92.20	180.30	5,020.7	-4,380.5	-146.9	4,383.0	2.81	2.81	0.00
9,057.0	92.40	180.40	5,019.4	-4,412.5	-147.1	4,414.9	0.70	0.63	0.31
9,089.0	92.20	180.50	5,018.1	-4,444.5	-147.4	4,446.9	0.70	-0.63	0.31
9,121.0	92.00	179.50	5,016.9	-4,476.4	-147.4	4,478.8	3.18	-0.63	-3.13
9,153.0	92.00	179.30	5,015.8	-4,508.4	-147.0	4,510.8	0.62	0.00	-0.63
9,184.0	92.10	179.30	5,014.7	-4,539.4	-146.7	4,541.8	0.32	0.32	0.00



Archer Directional Drilling Services

Survey Report



<b>Company:</b>	Sandridge Energy, INC.(mid-con.)	<b>Local Co-ordinate Reference:</b>	Well Toews 2629 1-21H
<b>Project:</b>	Gray County (KA27N)	<b>TVD Reference:</b>	WELL @ 2767.0usft (Original Well Elev)
<b>Site:</b>	Sec 21-T26S-R29W	<b>MD Reference:</b>	WELL @ 2767.0usft (Original Well Elev)
<b>Well:</b>	Toews 2629 1-21H	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	EDM 5000.1 Single User Db

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
9,217.0	92.10	179.40	5,013.5	-4,572.4	-146.3	4,574.7	0.30	0.00	0.30	
9,248.0	92.00	179.20	5,012.4	-4,603.4	-145.9	4,605.7	0.72	-0.32	-0.65	
9,280.0	92.00	179.20	5,011.3	-4,635.3	-145.5	4,637.6	0.00	0.00	0.00	
9,312.0	92.10	178.80	5,010.1	-4,667.3	-144.9	4,669.6	1.29	0.31	-1.25	
<b>Last Archer Survey</b>										
9,365.0	92.10	178.80	5,008.2	-4,720.3	-143.8	4,722.4	0.00	0.00	0.00	
<b>Projection to TD</b>										

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
1,535.0	1,534.9	13.1	3.2	Last Gyro	
9,312.0	5,010.1	-4,667.3	-144.9	Last Archer Survey	
9,365.0	5,008.2	-4,720.3	-143.8	Projection to TD	

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_