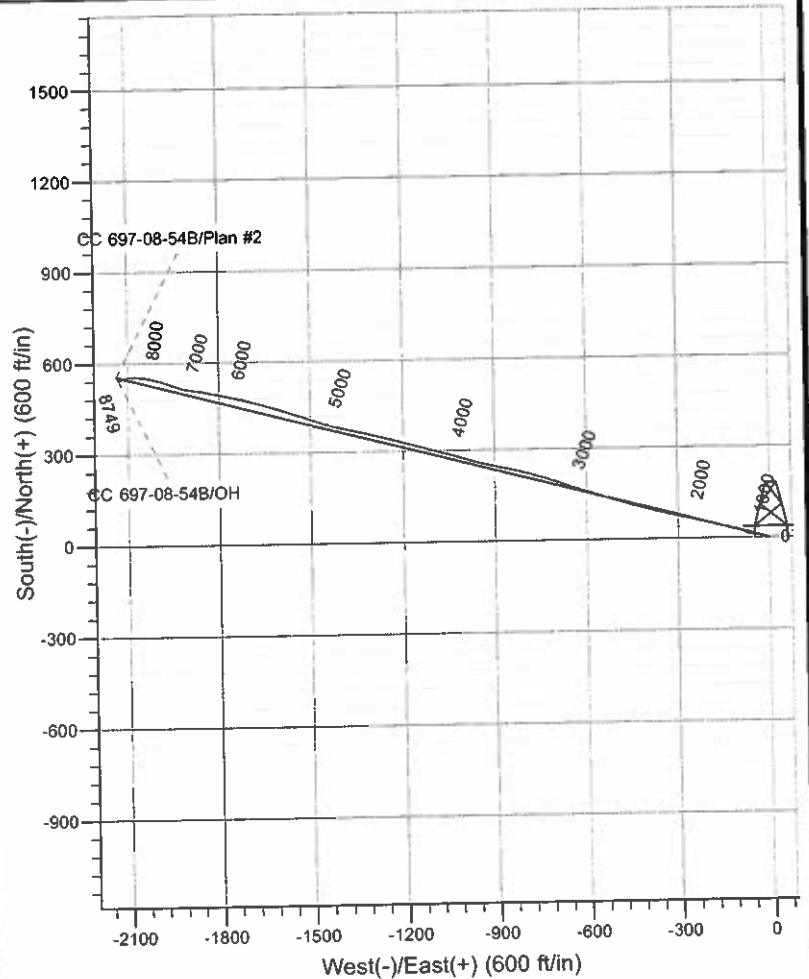
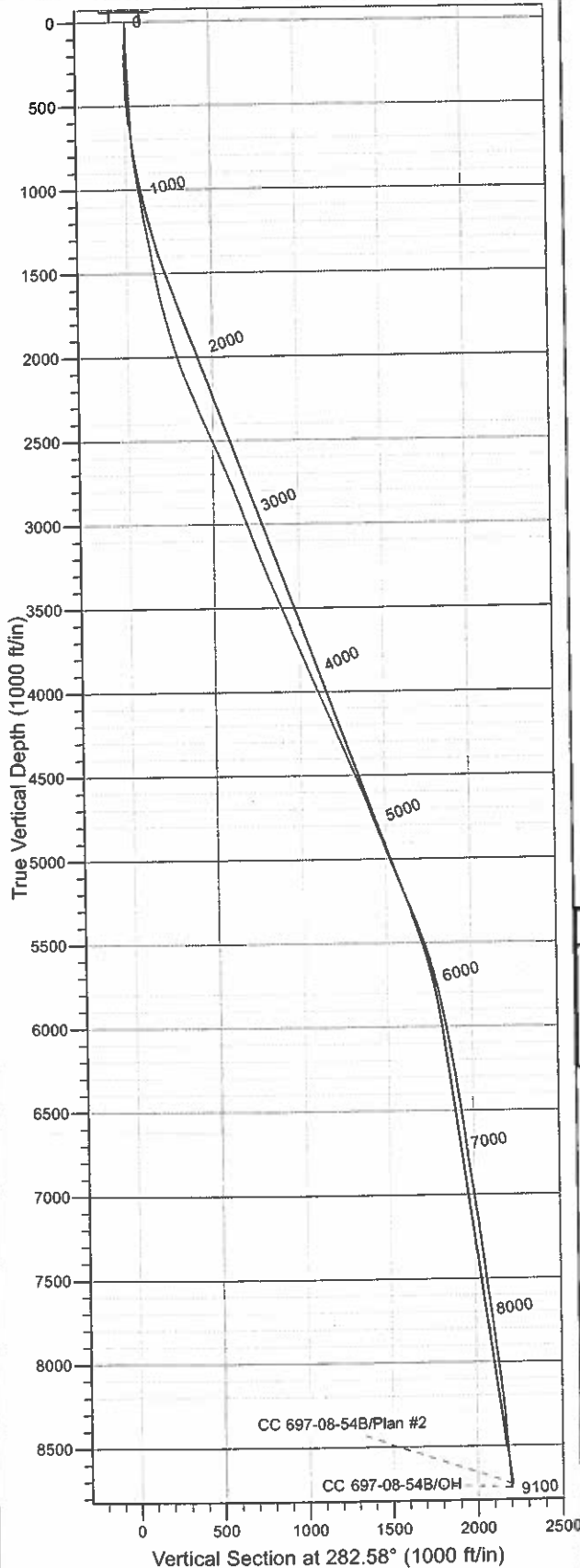




Scientific Drilling

Project: Garfield County, CO NAD27  
Site: Cascade Creek 609-14 Pad  
Well: CC 697-08-54B  
Wellbore: OH  
Design: OH

OXY USA RMAT



WELL DETAILS: CC 697-08-54B

Ground Level: GL 8393' & RKB 30' @ 8423.00ft (H&P 330)							
	0.00	0.00	629742.80	1229344.06	39° 31' 50.304 N	108° 13' 57.241 W	I
Northing							
Easting							
Latitude							
Longitude							

REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well CC 697-08-54B - Slot I, True North  
Vertical (TVD) Reference: GL 8393' & RKB 30' @ 8423.00ft (H&P 330)  
Section (VS) Reference: Slot - I(0.00N, 0.00E)  
Measured Depth Reference: GL 8393' & RKB 30' @ 8423.00ft (H&P 330)  
Calculation Method: Minimum Curvature  
Local North: True  
Location: Sec 9 T6S R97W

PROJECT DETAILS: Garfield County, CO NAD27

Geodetic System: US State Plane 1927 (Exact solution)  
Datum: NAD 1927 (NADCON CONUS)  
Ellipsoid: Clarke 1866  
Zone: Colorado Central 502

Design: OH (CC 697-08-54B/OH)

Created By: Julie Cruse Date: 2010-11-09



**Scientific Drilling**

## **OXY USA RMAT**

**Garfield County, CO NAD27**

**Cascade Creek 609-14 Pad**

**CC 697-08-54B - Slot I**

**OH**

**Design: OH**

## **Standard Survey Report**

**09 November, 2010**





# Scientific Drilling Survey Report



Company:	OXY USA RMAT	Local Co-ordinate Reference:	Well CC 697-08-54B - Slot I
Project:	Garfield County, CO NAD27	TVD Reference:	GL 8393' & RKB 30' @ 8423.00ft (H&P 330)
Site:	Cascade Creek 609-14 Pad	MD Reference:	GL 8393' & RKB 30' @ 8423.00ft (H&P 330)
Well:	CC 697-08-54B	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Rockies-R5000.1

Project	Garfield County, CO NAD27		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	Colorado Central 502		

Site	Cascade Creek 609-14 Pad, Sec 9 T6S R97W		
Site Position:		Northing:	629,789.23 usft
From:	Map	Easting:	1,229,350.88 usft
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in
		Latitude:	39° 31' 50.765 N
		Longitude:	108° 13' 57.172 W
		Grid Convergence:	-1.72 °

Well	CC 697-08-54B - Slot I		
Well Position	+N/-S	0.00 ft	Northing:
	+E/-W	0.00 ft	Easting:
Position Uncertainty	0.00 ft	Wellhead Elevation:	ft
		Latitude:	39° 31' 50.304 N
		Longitude:	108° 13' 57.241 W
		Ground Level:	8,393.00 ft

Wellbore	OH		
Magnetics	Model Name	Sample Date	Declination
			(°)
	IGRF2010	2009-12-08	10.66
			Dip Angle
			(°)
			65.76
			Field Strength
			(nT)
			52,371

Design	OH		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tie On Depth:	0.00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(ft)	(ft)	(ft)
	0.00	0.00	0.00
			Direction
			(°)
			282.58

Survey Program	Date 2010-11-09		
From	To	Survey (Wellbore)	Tool Name
(ft)	(ft)		
155.00	2,642.00	Survey #1 - Surface MWD (OH)	MWD-SDI
2,787.00	9,100.00	Survey #2 - Production (OH)	MWD-SDI
			Description
			MWD - Standard ISCWSA
			MWD - Standard ISCWSA

Survey									
Measured	Inclination	Azimuth	Vertical	+N/-S	+E/-W	Vertical	Dogleg	Build	Turn
Depth	(°)	(°)	Depth	(ft)	(ft)	Section	Rate	Rate	Rate
(ft)			(ft)			(ft)	(°/100ft)	(°/100ft)	(°/100ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
155.00	2.30	270.75	154.96	0.04	-3.11	3.04	1.48	1.48	0.00
First SDI MWD Survey									
248.00	2.78	282.14	247.87	0.54	-7.18	7.13	0.75	0.52	12.25
340.00	2.69	305.75	339.77	2.27	-11.11	11.34	1.22	-0.10	25.66
432.00	3.25	291.57	431.64	4.49	-15.29	15.90	1.00	0.61	-15.41
525.00	3.87	278.82	524.46	5.94	-20.85	21.64	1.08	0.67	-13.71
617.00	2.81	288.75	616.31	7.14	-26.05	26.98	1.31	-1.15	10.79
709.00	4.04	282.78	708.14	8.58	-31.34	32.46	1.39	1.34	-6.49
801.00	7.03	275.48	799.70	9.84	-40.11	41.29	3.33	3.25	-7.93



# Scientific Drilling Survey Report



Company: OXY USA RMAT  
Project: Garfield County, CO NAD27  
Site: Cascade Creek 609-14 Pad  
Well: CC 697-08-54B  
Wellbore: OH  
Design: OH

Local Co-ordinate Reference: Well CC 697-08-54B - Slot 1  
TVD Reference: GL 8393' & RKB 30' @ 8423.00ft (H&P 330)  
MD Reference: GL 8393' & RKB 30' @ 8423.00ft (H&P 330)  
North Reference: True  
Survey Calculation Method: Minimum Curvature  
Database: Rockies-R5000.1

## Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
895.00	9.32	276.63	892.74	11.27	-53.40	54.57	2.44	2.44	1.22
987.00	9.50	284.54	983.51	14.03	-68.15	69.57	1.42	0.20	8.60
1,082.00	9.23	295.96	1,077.25	19.34	-82.59	84.82	1.97	-0.28	12.02
1,177.00	10.02	292.27	1,170.91	25.80	-97.09	100.38	1.05	0.83	-3.88
1,271.00	12.05	285.06	1,263.17	31.45	-114.13	118.24	2.61	2.16	-7.67
1,366.00	11.34	280.32	1,356.20	35.70	-132.90	137.48	1.26	-0.75	-4.99
1,461.00	9.67	279.61	1,449.61	38.71	-149.96	154.79	1.76	-1.76	-0.75
1,555.00	10.90	284.10	1,542.10	42.19	-166.36	171.56	1.56	1.31	4.78
1,650.00	12.84	285.50	1,635.06	47.20	-185.25	191.08	2.06	2.04	1.47
1,745.00	14.25	284.01	1,727.42	52.85	-206.76	213.31	1.53	1.48	-1.57
1,839.00	16.09	284.10	1,818.14	58.83	-230.62	237.90	1.96	1.96	0.10
1,934.00	16.88	282.69	1,909.23	65.07	-256.85	264.85	0.93	0.83	-1.48
2,029.00	18.38	282.51	1,999.77	71.34	-284.93	293.62	1.58	1.58	-0.19
2,123.00	20.84	283.66	2,088.31	78.50	-315.65	325.17	2.65	2.62	1.22
2,218.00	20.93	283.57	2,177.07	86.47	-348.56	359.03	0.10	0.09	-0.09
2,313.00	21.10	283.13	2,265.75	94.34	-381.71	393.09	0.24	0.18	-0.46
2,408.00	21.90	285.77	2,354.14	103.04	-415.41	427.88	1.32	0.84	2.78
2,502.00	24.80	287.08	2,440.43	113.59	-451.14	465.05	3.13	3.09	1.39
2,597.00	24.80	287.35	2,526.67	125.39	-489.20	504.77	0.12	0.00	0.28
2,642.00	24.36	287.00	2,567.59	130.92	-507.08	523.42	1.03	-0.98	-0.78
Last Survey in 14 3/4" Hole									
2,787.00	22.34	287.05	2,700.71	147.74	-562.03	580.72	1.39	-1.39	0.03
First Survey in 8 3/4" Hole									
2,882.00	21.10	286.17	2,788.97	157.80	-595.72	615.79	1.35	-1.31	-0.93
2,977.00	20.75	288.19	2,877.70	167.81	-628.13	649.60	0.84	-0.37	2.13
3,072.00	21.81	290.21	2,966.22	179.16	-660.68	683.84	1.36	1.12	2.13
3,166.00	19.35	288.90	3,054.22	190.24	-691.81	716.63	2.66	-2.62	-1.39
3,261.00	20.31	287.75	3,143.58	200.37	-722.40	748.70	1.09	1.01	-1.21
3,356.00	21.54	287.40	3,232.32	210.61	-754.74	782.50	1.30	1.29	-0.37
3,450.00	22.25	285.73	3,319.54	220.59	-788.34	817.46	1.00	0.76	-1.78
3,545.00	23.74	282.66	3,406.99	229.66	-824.32	854.55	2.01	1.57	-3.23
3,640.00	23.74	282.39	3,493.95	237.96	-861.65	892.79	0.11	0.00	-0.28
3,735.00	21.98	282.04	3,581.49	245.77	-897.72	929.70	1.86	-1.85	-0.37
3,829.00	21.98	282.74	3,668.65	253.32	-932.08	964.88	0.28	0.00	0.74
3,924.00	22.25	285.73	3,756.67	262.11	-966.74	1,000.62	1.22	0.28	3.15
4,019.00	23.57	287.49	3,844.17	272.70	-1,002.17	1,037.50	1.57	1.39	1.85
4,113.00	24.01	285.73	3,930.19	283.53	-1,038.50	1,075.32	0.89	0.47	-1.87
4,208.00	23.04	284.85	4,017.29	293.54	-1,075.07	1,113.20	1.09	-1.02	-0.93
4,303.00	24.18	285.82	4,104.34	303.60	-1,111.76	1,151.20	1.27	1.20	1.02
4,397.00	23.30	285.82	4,190.38	313.92	-1,148.17	1,188.98	0.94	-0.94	0.00
4,492.00	23.74	284.94	4,277.49	323.97	-1,184.73	1,226.85	0.59	0.46	-0.93
4,577.00	22.25	284.50	4,355.73	332.41	-1,216.84	1,260.03	1.76	-1.75	-0.52
4,672.00	23.65	284.68	4,443.21	341.75	-1,252.69	1,297.05	1.48	1.47	0.19

<b>Company:</b>	OXY USA RMAT	<b>Local Co-ordinate Reference:</b>	Well CC 697-08-54B - Slot I
<b>Project:</b>	Garfield County, CO NAD27	<b>TVD Reference:</b>	GL 8393' & RKB 30' @ 8423.00ft (H&P 330)
<b>Site:</b>	Cascade Creek 609-14 Pad	<b>MD Reference:</b>	GL 8393' & RKB 30' @ 8423.00ft (H&P 330)
<b>Well:</b>	CC 697-08-54B	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	Rockies-R5000.1

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
4,766.00	24.01	284.85	4,529.20	351.43	-1,289.41	1,335.00	0.39	0.38	0.18
4,861.00	21.81	283.71	4,616.70	360.56	-1,325.24	1,371.96	2.36	-2.32	-1.20
4,956.00	20.93	282.30	4,705.17	368.36	-1,358.97	1,406.57	1.07	-0.93	-1.48
5,050.00	21.54	282.74	4,792.78	375.74	-1,392.20	1,440.62	0.67	0.65	0.47
5,145.00	20.66	284.85	4,881.41	383.88	-1,425.41	1,474.81	1.22	-0.93	2.22
5,240.00	21.54	287.58	4,970.05	393.45	-1,458.24	1,508.93	1.39	0.93	2.87
5,335.00	22.51	289.69	5,058.11	404.84	-1,491.99	1,544.35	1.32	1.02	2.22
5,429.00	23.30	288.11	5,144.70	416.68	-1,526.60	1,580.71	1.06	0.84	-1.68
5,524.00	22.42	287.31	5,232.24	427.91	-1,561.75	1,617.46	0.98	-0.93	-0.84
5,619.00	21.54	287.93	5,320.33	438.67	-1,595.64	1,652.88	0.96	-0.93	0.65
5,713.00	21.54	287.84	5,407.77	449.27	-1,628.49	1,687.25	0.04	0.00	-0.10
5,808.00	19.70	285.64	5,496.68	458.93	-1,660.51	1,720.60	2.10	-1.94	-2.32
5,903.00	17.15	284.41	5,586.80	466.74	-1,689.50	1,750.60	2.72	-2.68	-1.29
5,998.00	15.04	283.36	5,678.08	473.07	-1,715.06	1,776.93	2.24	-2.22	-1.11
6,092.00	12.75	283.54	5,769.32	478.32	-1,737.02	1,799.50	2.44	-2.44	0.19
6,187.00	11.17	282.22	5,862.25	482.72	-1,756.20	1,819.18	1.69	-1.66	-1.39
6,282.00	10.73	283.10	5,955.52	486.67	-1,773.81	1,837.22	0.50	-0.46	0.93
6,377.00	10.38	280.99	6,048.92	490.31	-1,790.82	1,854.62	0.55	-0.37	-2.22
6,471.00	9.94	281.43	6,141.44	493.53	-1,807.09	1,871.20	0.48	-0.47	0.47
6,566.00	9.41	281.95	6,235.09	496.76	-1,822.72	1,887.16	0.57	-0.56	0.55
6,661.00	8.88	280.02	6,328.88	499.65	-1,837.54	1,902.25	0.64	-0.56	-2.03
6,755.00	8.88	281.51	6,421.76	502.36	-1,851.80	1,916.76	0.24	0.00	1.59
6,850.00	8.09	279.58	6,515.72	504.93	-1,865.57	1,930.76	0.88	-0.83	-2.03
6,945.00	7.47	279.40	6,609.84	507.06	-1,878.26	1,943.60	0.65	-0.65	-0.19
7,040.00	6.86	276.24	6,704.10	508.68	-1,889.99	1,955.41	0.76	-0.64	-3.33
7,134.00	8.00	278.00	6,797.31	510.20	-1,902.05	1,967.51	1.24	1.21	1.87
7,229.00	8.44	284.68	6,891.33	512.89	-1,915.34	1,981.07	1.11	0.46	7.03
7,324.00	8.27	285.12	6,985.33	516.44	-1,928.68	1,994.86	0.19	-0.18	0.46
7,419.00	8.71	291.01	7,079.29	520.80	-1,941.99	2,008.80	1.03	0.46	6.20
7,513.00	7.65	291.71	7,172.33	525.66	-1,954.45	2,022.02	1.13	-1.13	0.74
7,608.00	7.47	289.86	7,266.50	530.10	-1,966.13	2,034.39	0.32	-0.19	-1.95
7,703.00	7.65	290.74	7,360.68	534.44	-1,977.85	2,046.77	0.23	0.19	0.93
7,798.00	6.77	286.52	7,454.93	538.27	-1,989.13	2,058.62	1.08	-0.93	-4.44
7,892.00	7.03	285.21	7,548.25	541.36	-2,000.00	2,069.89	0.32	0.28	-1.39
7,987.00	7.47	283.89	7,642.49	544.36	-2,011.60	2,081.87	0.50	0.46	-1.39
8,081.00	8.53	282.48	7,735.57	547.34	-2,024.34	2,094.95	1.15	1.13	-1.50
8,176.00	8.27	279.76	7,829.55	550.02	-2,037.95	2,108.82	0.50	-0.27	-2.86
8,271.00	7.39	277.65	7,923.66	551.99	-2,050.74	2,121.73	0.97	-0.93	-2.22
8,366.00	6.95	276.86	8,017.92	553.49	-2,062.50	2,133.54	0.47	-0.46	-0.83
8,461.00	5.98	272.99	8,112.32	554.43	-2,073.15	2,144.14	1.12	-1.02	-4.07
8,555.00	5.63	272.64	8,205.83	554.90	-2,082.65	2,153.51	0.37	-0.37	-0.37
8,650.00	5.19	268.86	8,300.41	555.03	-2,091.60	2,162.27	0.60	-0.46	-3.98
8,745.00	5.19	257.43	8,395.02	554.01	-2,100.09	2,170.34	1.09	0.00	-12.03
8,840.00	5.36	252.86	8,489.62	551.77	-2,108.52	2,178.08	0.48	0.18	-4.81



# Scientific Drilling Survey Report



Company: OXY USA RMAT  
Project: Garfield County, CO NAD27  
Site: Cascade Creek 609-14 Pad  
Well: CC 697-08-54B  
Wellbore: OH  
Design: OH

Local Co-ordinate Reference: Well CC 697-08-54B - Slot I  
TVD Reference: GL 8393' & RKB 30' @ 8423.00ft (H&P 330)  
MD Reference: GL 8393' & RKB 30' @ 8423.00ft (H&P 330)  
North Reference: True  
Survey Calculation Method: Minimum Curvature  
Database: Rockies-R5000.1

## Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
8,934.00	5.36	253.39	8,583.21	549.22	-2,116.92	2,185.73	0.05	0.00	0.56
9,042.00	5.10	254.97	8,690.76	546.53	-2,126.39	2,194.38	0.28	-0.24	1.46
Last SDI MWD Survey									
9,100.00	5.10	254.97	8,748.53	545.19	-2,131.37	2,198.95	0.00	0.00	0.00
Projection to TD - BHL = 630351.85 ft N, 1227230.05 ft E									

## Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
155.00	154.96	0.04	-3.11	First SDI MWD Survey
2,642.00	2,567.59	130.92	-507.08	Last Survey in 14 3/4" Hole

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