



Scientific  
Drilling

## Directional Survey Certification

7327 West Barton Road  
Casper, WY 82604  
(307)-472-6621 Fax (307) 472-5439

<b>Operator</b>	Williams Production Co.
<b>Well Name &amp; No.</b>	SP 431-14
<b>County &amp; State</b>	Garfield County, CO
<b>SDI Job No.</b>	42DEF11111421
<b>Rig</b>	H&P 271

I, Janie Cooke, having personal knowledge of all the facts, hereby  
certify that the attached directional survey run from a measured depth of 0' feet to a  
measured depth of 2,418 feet is true and correct as determined from all available records.

  
Signature

30-Dec-11  
Date

**Janie Cooke**  
Grand Junction Well Planner  
Scientific Drilling - Rocky Mountain District

# **Williams Production Co.**

**Garfield County, CO NAD83**

**SP 32-14 Pad**

**SP 431-14 - Slot A2**

**Wellbore #1**

**Design: Wellbore #1**

## **Standard Survey Report**

**29 December, 2011**



## Scientific Drilling International, Inc.

## Survey Report



<b>Company:</b>	Williams Production Co.	<b>Local Co-ordinate Reference:</b>	Well SP 431-14 - Slot A2
<b>Project:</b>	Garfield County, CO NAD83	<b>TVD Reference:</b>	WELL @ 7662.02ft (Cyclone 30 (23'KB) JMS)
<b>Site:</b>	SP 32-14 Pad	<b>MD Reference:</b>	WELL @ 7662.02ft (Cyclone 30 (23'KB) JMS)
<b>Well:</b>	SP 431-14	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	Rockies Compass Server

<b>Project</b>	Garfield County, CO NAD83		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	Colorado Central Zone		

Site		SP 32-14 Pad			
Site Position:		Northing:	1,593,867.70 usft	Latitude:	39° 26' 16.834 N
From:	Map	Easting:	2,303,941.70 usft	Longitude:	107° 57' 53.317 W
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in	Grid Convergence:	-1.55 °

Well	SP 431-14 - Slot A2					
Well Position	+N/-S	0.00 ft	Northing:	1,593,915.30 usft	Latitude:	39° 26' 17.282 N
	+E/-W	0.00 ft	Easting:	2,303,861.70 usft	Longitude:	107° 57' 54.353 W
Position Uncertainty		0.00 ft	Wellhead Elevation:	ft	Ground Level:	7,639.02 ft

<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>
	IGRF2005-10	01/25/2010	10.49	65.75	52,377

<b>Design</b>	Wellbore #1				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>	
	0.00	0.00	0.00	20.13	

<b>Survey Program</b>	<b>Date</b>	12/29/2011			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
213.00	2,418.00	Survey #1 - Surface MWD (Wellbore #1)	MWD SDI	MWD - Standard ver 1.0.1	

<b>Survey</b>									
<b>Measured Depth (ft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Vertical Section (ft)</b>	<b>Dogleg Rate (°/100usft)</b>	<b>Build Rate (°/100usft)</b>	<b>Turn Rate (°/100usft)</b>
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
213.00	3.69	32.50	212.85	5.78	3.68	6.70	1.73	1.73	0.00
<b>First SDI Surface MWD</b>									
243.00	4.84	26.41	242.77	7.73	4.77	8.90	4.11	3.83	-20.30
333.00	6.88	18.08	332.30	16.26	8.13	18.06	2.45	2.27	-9.26
424.00	8.33	20.67	422.49	27.61	12.15	30.10	1.64	1.59	2.85
515.00	11.00	22.05	512.19	41.82	17.73	45.37	2.94	2.93	1.52
607.00	13.02	20.10	602.18	59.69	24.59	64.51	2.24	2.20	-2.12
698.00	15.94	19.63	690.28	81.09	32.31	87.26	3.21	3.21	-0.52
790.00	16.53	19.69	778.61	105.31	40.97	112.98	0.64	0.64	0.07
880.00	15.88	19.67	865.03	128.96	49.43	138.10	0.72	-0.72	-0.02



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<b>Well:</b>	SP 431-14	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	Rockies Compass Server

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
971.00	17.08	20.28	952.29	153.22	58.25	163.91	1.33	1.32	0.67
1,062.00	16.38	21.00	1,039.44	177.74	67.48	190.10	0.80	-0.77	0.79
1,157.00	16.59	20.47	1,130.53	202.95	77.02	217.06	0.27	0.22	-0.56
1,251.00	18.10	20.26	1,220.26	229.22	86.77	245.08	1.61	1.61	-0.22
1,346.00	18.15	20.34	1,310.54	256.94	97.03	274.64	0.06	0.05	0.08
1,441.00	17.13	20.19	1,401.07	283.95	107.00	303.42	1.07	-1.07	-0.16
1,535.00	17.44	19.58	1,490.83	310.21	116.50	331.35	0.38	0.33	-0.65
1,630.00	16.95	19.85	1,581.58	336.65	125.97	359.44	0.52	-0.52	0.28
1,724.00	16.28	20.36	1,671.66	361.89	135.21	386.31	0.73	-0.71	0.54
1,819.00	16.75	20.73	1,762.74	387.18	144.68	413.32	0.51	0.49	0.39
1,913.00	15.72	18.80	1,852.99	411.90	153.58	439.59	1.24	-1.10	-2.05
2,008.00	16.02	17.74	1,944.37	436.57	161.72	465.56	0.44	0.32	-1.12
2,102.00	16.30	19.90	2,034.65	461.33	170.17	491.71	0.71	0.30	2.30
2,197.00	16.20	19.56	2,125.86	486.35	179.14	518.29	0.15	-0.11	-0.36
2,291.00	16.69	19.26	2,216.01	511.45	187.98	544.90	0.53	0.52	-0.32
2,359.00	17.32	19.43	2,281.04	530.21	194.57	564.79	0.93	0.93	0.25
Last SDI Surface MWD									
2,418.00	17.32	19.43	2,337.37	546.78	200.41	582.35	0.00	0.00	0.00
Projection to TD									

Design Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
213.00	212.85	5.78	3.68	First SDI Surface MWD
2,359.00	2,281.04	530.21	194.57	Last SDI Surface MWD
2,418.00	2,337.37	546.78	200.41	Projection to TD

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