

Apache Corporation,
303 Veterans Airpark Lane, #3000
Midland, TX 79705

Crow Federal #020H
Eddy County, New Mexico

API # 30-015-41910

ULI- Sec 10, T17S, R31E, 2310 FSL, 370 FEL

264
680

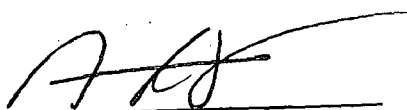
2.64
4.16

0.25
0.40

0.44
0.70

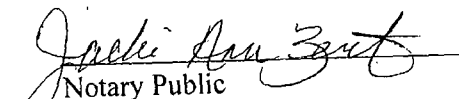
1.16
2.91

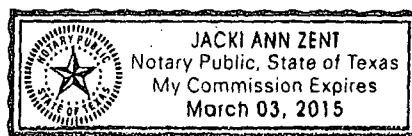
1.16
4.07



Archie Brown - General Manager

The attached instrument was acknowledged before me on the 16th day of April, 2014 by
Archie Brown - General Manager, CapStar Drilling, Inc.


Notary Public





EXPLORING WHAT'S POSSIBLE

API 30-015-41910

UL I Sec. 10 T17S, R31E

Apache Corporation 2310' FSL, 370' FEL

Eddy County, NM (NAD27 NME)

Crow Federal

#20H

WB1/Job #1311215

Plan: Plan #2 02-26-14

Standard Planning Report

26 February, 2014



PHOENIX
TECHNOLOGY SERVICES



Phoenix Technology Services Planning Report



Database: GCR DB
Company: Apache Corporation
Project: Eddy County, NM (NAD27 NME)
Site: Crow Federal
Well: #20H
Wellbore: WB1/Job #1311215
Design: Plan #2 02-26-14

Local Co-ordinate Reference:
TVD Reference: KB @ 3936.00usft (Capstar 114)
MD Reference: KB @ 3936.00usft (Capstar 114)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Well #20H
KB @ 3936.00usft (Capstar 114)
KB @ 3936.00usft (Capstar 114)
Grid
Minimum Curvature

Project:	Eddy County, NM (NAD27 NME)		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site:	Crow Federal		
Site Position:	Map	From:	
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
North:	671,130.90 usft	Latitude:	32° 50' 38.92796 N
Easting:	643,906.80 usft	Longitude:	103° 51' 53.16689 W
Grid Convergence:	0.25 °		

Well:	#20H		
Well Position	+N/-S	1,462.00 usft	North:
Position Uncertainty	+E/-W	4,652.20 usft	Easting:
Wellhead Elevation:	0.00 usft		
Latitude:	672,592.90 usft		
Longitude:	648,559.00 usft		
Ground Level:	3,925.00 usft		

Wellbore:	WB1/Job #1311215		
Magnetics:	Model Name	Sample Date	Declination
	BGGM2013	02/26/14	7.55
			60.64
			48,666

Design:	Plan #2 02-26-14		
Audit Notes:			
Version:	Phase:	PLAN	Tie On Depth:
			0.00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(usft)	(usft)	(usft)
	0.00	0.00	0.00
			269.56

Plan Sections										
Measured	Inclination	Azimuth	Vertical	+N/-S	+E/-W	Dogleg	Build	Turn	TFO	Target
Depth	(°)	(°)	Depth	(usft)	(usft)	Rate	Rate	Rate	(°)	
(usft)			(usft)			(°/100usft)	(°/100usft)	(°/100usft)		
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
5,458.75	0.00	0.00	5,458.75	0.00	0.00	0.00	0.00	0.00	0.00	
6,221.88	91.58	269.56	5,936.00	-3.77	-490.60	12.00	12.00	0.00	269.56	
8,032.28	91.58	269.56	5,886.00	-17.67	-2,300.26	0.00	0.00	0.00	0.00	MP-Crow Fed #20H
8,048.67	91.25	269.57	5,885.59	-17.79	-2,316.64	2.00	-2.00	0.06	178.34	
10,313.17	91.25	269.57	5,836.00	-34.80	-4,580.53	0.00	0.00	0.00	0.00	PBHL-Crow Fed #20H



Phoenix Technology Services Planning Report



Database: GCR DB
Company: Apache Corporation
Project: Eddy County, NM (NAD27 NME)
Site: Crow Federal
Well: #20H
Wellbore: WB1/Job #1311215
Design: Plan #2 02-26-14

Local Co-ordinate Reference:
TVD Reference: KB @ 3936.00usft (Capstar 114)
MD Reference: KB @ 3936.00usft (Capstar 114)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Planned 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)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
551.00	0.00	0.00	551.00	0.00	0.00	0.00	0.00	0.00	0.00
Rustler									
722.00	0.00	0.00	722.00	0.00	0.00	0.00	0.00	0.00	0.00
T/Salt									
1,726.00	0.00	0.00	1,726.00	0.00	0.00	0.00	0.00	0.00	0.00
B/Salt									
1,893.00	0.00	0.00	1,893.00	0.00	0.00	0.00	0.00	0.00	0.00
Yates									
2,175.00	0.00	0.00	2,175.00	0.00	0.00	0.00	0.00	0.00	0.00
Seven Rivers									
2,802.00	0.00	0.00	2,802.00	0.00	0.00	0.00	0.00	0.00	0.00
Queen									
3,227.00	0.00	0.00	3,227.00	0.00	0.00	0.00	0.00	0.00	0.00
Grayburg									
3,562.00	0.00	0.00	3,562.00	0.00	0.00	0.00	0.00	0.00	0.00
San Andres									
5,042.00	0.00	0.00	5,042.00	0.00	0.00	0.00	0.00	0.00	0.00
Glorieta									
5,096.00	0.00	0.00	5,096.00	0.00	0.00	0.00	0.00	0.00	0.00
(Yeso) Paddock									
5,458.75	0.00	0.00	5,458.75	0.00	0.00	0.00	0.00	0.00	0.00
KOP Start Build 12.00									
5,500.00	4.95	269.56	5,499.95	-0.01	-1.78	1.78	12.00	12.00	0.00
5,600.00	16.95	269.56	5,597.95	-0.16	-20.74	20.74	12.00	12.00	0.00
5,658.65	23.99	269.56	5,652.86	-0.32	-41.24	41.24	12.00	12.00	0.00
(Yeso) Blinebry									
5,700.00	28.95	269.56	5,689.86	-0.46	-59.67	59.67	12.00	12.00	0.00
5,800.00	40.95	269.56	5,771.68	-0.90	-116.85	116.85	12.00	12.00	0.00
5,900.00	52.95	269.56	5,839.81	-1.46	-189.79	189.80	12.00	12.00	0.00
6,000.00	64.95	269.56	5,891.29	-2.11	-275.31	275.32	12.00	12.00	0.00
6,100.00	76.96	269.56	5,923.86	-2.84	-369.66	369.67	12.00	12.00	0.00
6,200.00	88.96	269.56	5,936.10	-3.60	-468.72	468.73	12.00	12.00	0.00
6,221.88	91.58	269.56	5,936.00	-3.77	-490.60	490.61	12.00	12.00	0.00
LP Start 1810.40 hold at 6221.88 MD									
6,300.00	91.58	269.56	5,933.84	-4.37	-568.69	568.70	0.00	0.00	0.00
6,400.00	91.58	269.56	5,931.08	-5.13	-668.64	668.66	0.00	0.00	0.00
6,500.00	91.58	269.56	5,928.32	-5.90	-768.60	768.63	0.00	0.00	0.00
6,600.00	91.58	269.56	5,925.56	-6.67	-868.56	868.59	0.00	0.00	0.00
6,700.00	91.58	269.56	5,922.79	-7.44	-968.52	968.55	0.00	0.00	0.00
6,800.00	91.58	269.56	5,920.03	-8.21	-1,068.48	1,068.51	0.00	0.00	0.00
6,900.00	91.58	269.56	5,917.27	-8.97	-1,168.44	1,168.47	0.00	0.00	0.00
7,000.00	91.58	269.56	5,914.51	-9.74	-1,268.40	1,268.44	0.00	0.00	0.00
7,100.00	91.58	269.56	5,911.75	-10.51	-1,368.36	1,368.40	0.00	0.00	0.00
7,200.00	91.58	269.56	5,908.99	-11.28	-1,468.32	1,468.36	0.00	0.00	0.00
7,300.00	91.58	269.56	5,906.22	-12.04	-1,568.27	1,568.32	0.00	0.00	0.00
7,400.00	91.58	269.56	5,903.46	-12.81	-1,668.23	1,668.28	0.00	0.00	0.00
7,500.00	91.58	269.56	5,900.70	-13.58	-1,768.19	1,768.24	0.00	0.00	0.00
7,600.00	91.58	269.56	5,897.94	-14.35	-1,868.15	1,868.21	0.00	0.00	0.00
7,700.00	91.58	269.56	5,895.18	-15.11	-1,968.11	1,968.17	0.00	0.00	0.00
7,800.00	91.58	269.56	5,892.42	-15.88	-2,068.07	2,068.13	0.00	0.00	0.00
7,900.00	91.58	269.56	5,889.65	-16.65	-2,168.03	2,168.09	0.00	0.00	0.00
8,000.00	91.58	269.56	5,886.89	-17.42	-2,267.99	2,268.05	0.00	0.00	0.00



Phoenix Technology Services Planning Report



Database: GCR DB
Company: Apache Corporation
Project: Eddy County, NM (NAD27 NME)
Site: Crow Federal
Well: #20H
Wellbore: WB1/Job #1311215
Design: Plan #2 02-26-14

Local Co-ordinate Reference: Well #20H
TVD Reference: KB @ 3936.00usft (Capstar 114)
MD Reference: KB @ 3936.00usft (Capstar 114)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Planned 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)
8,032.28	91.58	269.56	5,886.00	-17.67	-2,300.26	2,300.33	0.00	0.00	0.00
Start DLS 2.00 TFO 178.34 - MP-Crow Fed #20H									
8,048.67	91.26	269.57	5,885.59	-17.79	-2,316.64	2,316.70	2.00	-2.00	0.06
Start 2264.50 hold at 8048.67 MD									
8,048.67	91.25	269.57	5,885.59	-17.79	-2,316.64	2,316.71	2.00	-2.00	0.06
8,100.00	91.25	269.57	5,884.47	-18.18	-2,367.95	2,368.02	0.00	0.00	0.00
8,200.00	91.25	269.57	5,882.28	-18.93	-2,467.93	2,468.00	0.00	0.00	0.00
8,300.00	91.25	269.57	5,880.09	-19.68	-2,567.90	2,567.98	0.00	0.00	0.00
8,400.00	91.25	269.57	5,877.90	-20.43	-2,667.87	2,667.95	0.00	0.00	0.00
8,500.00	91.25	269.57	5,875.71	-21.18	-2,767.85	2,767.93	0.00	0.00	0.00
8,600.00	91.25	269.57	5,873.52	-21.93	-2,867.82	2,867.90	0.00	0.00	0.00
8,700.00	91.25	269.57	5,871.33	-22.68	-2,967.79	2,967.88	0.00	0.00	0.00
8,800.00	91.25	269.57	5,869.14	-23.43	-3,067.77	3,067.86	0.00	0.00	0.00
8,900.00	91.25	269.57	5,866.95	-24.18	-3,167.74	3,167.83	0.00	0.00	0.00
9,000.00	91.25	269.57	5,864.76	-24.94	-3,267.71	3,267.81	0.00	0.00	0.00
9,100.00	91.25	269.57	5,862.57	-25.69	-3,367.69	3,367.78	0.00	0.00	0.00
9,200.00	91.25	269.57	5,860.38	-26.44	-3,467.66	3,467.76	0.00	0.00	0.00
9,300.00	91.25	269.57	5,858.19	-27.19	-3,567.63	3,567.74	0.00	0.00	0.00
9,400.00	91.25	269.57	5,856.00	-27.94	-3,667.61	3,667.71	0.00	0.00	0.00
9,500.00	91.25	269.57	5,853.81	-28.69	-3,767.58	3,767.69	0.00	0.00	0.00
9,600.00	91.25	269.57	5,851.62	-29.44	-3,867.55	3,867.66	0.00	0.00	0.00
9,700.00	91.25	269.57	5,849.43	-30.19	-3,967.53	3,967.64	0.00	0.00	0.00
9,800.00	91.25	269.57	5,847.24	-30.95	-4,067.50	4,067.62	0.00	0.00	0.00
9,900.00	91.25	269.57	5,845.05	-31.70	-4,167.47	4,167.59	0.00	0.00	0.00
10,000.00	91.25	269.57	5,842.86	-32.45	-4,267.45	4,267.57	0.00	0.00	0.00
10,100.00	91.25	269.57	5,840.67	-33.20	-4,367.42	4,367.54	0.00	0.00	0.00
10,200.00	91.25	269.57	5,838.48	-33.95	-4,467.39	4,467.52	0.00	0.00	0.00
10,300.00	91.25	269.57	5,836.29	-34.70	-4,567.37	4,567.50	0.00	0.00	0.00
10,313.17	91.25	269.57	5,836.00	-34.80	-4,580.53	4,580.66	0.00	0.00	0.00
TD at 10313.17 - PBHL-Crow Fed #20H									

Design Targets

Target Name	hit/miss target	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northings (usft)	Easting (usft)	Latitude	Longitude
PBHL-Crow Fed #20H	- plan hits target center - Point	0.00	0.00	5,836.00	-34.80	-4,580.53	672,558.10	643,978.47	32° 50' 53.04704 N	103° 51' 52.25258 W
MP-Crow Fed #20H	- plan hits target center - Point	0.00	0.01	5,886.00	-17.67	-2,300.26	672,575.23	646,258.75	32° 50' 53.11565 N	103° 51' 25.52261 W



Phoenix Technology Services

Planning Report



Database: GCR DB
Company: Apache Corporation
Project: Eddy County, NM (NAD27 NME)
Site: Crow Federal
Well: #20H
Wellbore: WB1/Job #1311215
Design: Plan #2 02-26-14

Local Co-ordinate Reference:

TVD Reference:

MD Reference:

North Reference:

Survey Calculation Method:

Well #20H

KB @ 3936.00usft (Capstar 114)

KB @ 3936.00usft (Capstar 114)

Grid

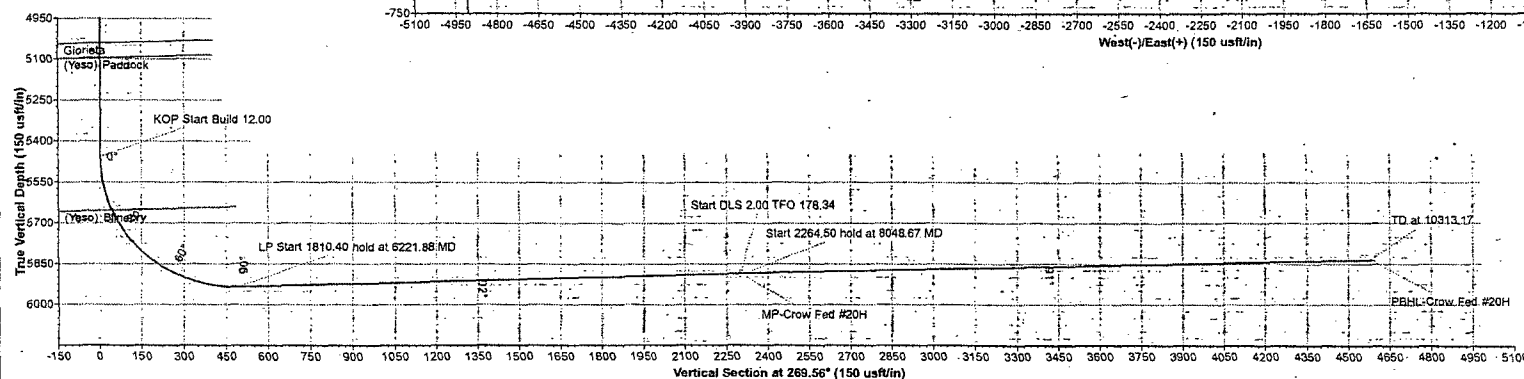
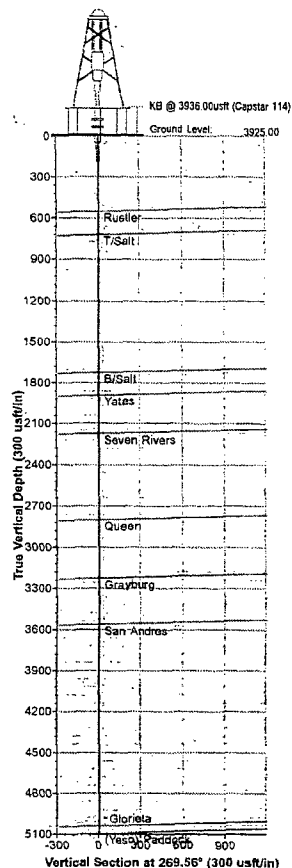
Minimum Curvature

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
551.00	551.00	Rustler		-1.58	269.56
722.00	722.00	T/Salt		-1.58	269.56
1,726.00	1,726.00	B/Salt		-1.58	269.56
1,893.00	1,893.00	Yates		-1.58	269.56
2,175.00	2,175.00	Seven Rivers		-1.58	269.56
2,802.00	2,802.00	Queen		-1.58	269.56
3,227.00	3,227.00	Grayburg		-1.58	269.56
3,562.00	3,562.00	San Andres		-1.58	269.56
5,042.00	5,042.00	Glorieta		-1.58	269.56
5,096.00	5,096.00	(Yeso) Paddock		-1.58	269.56
5,658.65	5,652.86	(Yeso) Blinbry		-1.58	269.56

Plan Annotations

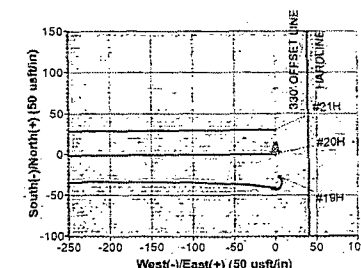
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N-S (usft)	+E-W (usft)	
5,458.75	5,458.75	0.00	0.00	KOP Start Build 12.00
6,221.88	5,936.00	-3.77	-490.60	LP Start 1810.40 hold at 6221.88 MD
8,032.28	5,886.00	-17.67	-2,300.26	Start DLS 2.00 TFO 178.34
8,048.67	5,885.59	-17.79	-2,316.64	Start 2264.50 hold at 8048.67 MD
10,313.17	5,836.00	-34.80	-4,580.53	TD at 10313.17



WELL DETAILS														
					Ground Level	3925.00	Latitude		Longitude					
					+N-S	0.00	+E-W	0.00	North	672592.90	East	648559.00	32° 50' 53.18702 N	103° 50' 58.55835 W
SECTION DETAILS														
Sec	MD	Inc	Azi	TVD	+N-S	+E-W	Dlog	TFace	VSect	Target	Annotation			
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		KOP Start Build 12.00			
2	5458.75	0.00	0.00	5458.75	0.00	0.00	0.00	0.00	0.00		LP Start 1810.40 hold at 6221.88 MD			
3	6221.88	91.58	269.56	5936.00	-3.77	-420.60	12.00	269.56	480.82	MP-Crow Fed #20H	Start DLS 2.00 TFO 178.34			
4	8032.28	91.58	269.56	5886.00	-17.67	-2300.26	0.00	0.00	2300.33		Start 2264.50 hold at 8048.67 MD			
5	8048.67	91.25	269.57	5885.59	-17.79	-2316.64	2.00	178.34	2316.71		TD at 10313.17			
6	10313.17	91.25	269.57	5836.00	-34.80	-4580.53	0.00	0.00	4580.66	PBHL-Crow Fed #20H				
DESIGN TARGET DETAILS														
Name	TVD	+N-S	+E-W	North	East	Latitude	Longitude	Shape						
PBHL-Crow Fed #20H	5836.00	-34.80	-4580.53	672558.10	643978.47	32° 50' 53.04704 N	103° 51' 52.25257 W	Point						
									plan hits target center					
MP-Crow Fed #20H	5886.00	-17.87	-2300.26	672575.23	646258.74	32° 50' 53.11565 N	103° 51' 28.52261 W	Point						
									plan hits target center					

PROJECT DETAILS: Eddy County, NM (NAD27 NME)									
Geodetic System: US State Plane 1927 (Exact solution)									
Datum: NAD 1927 (NADCON CONUS)									
Ellipsoid: Clarke 1866									
Zone: New Mexico East 3001									
System Datum: Mean Sea Level									
SITE DETAILS: Crow Federal									
Site Centre Northing: 671130.90									
Easting: 643906.80									
Positional Uncertainty: 0.00									
Convergence: 0.25									
Local North: Grid									
FORMATION TOP DETAILS									
TVDPath	MDPath	Formation	DipAngle	DipDir					
551.00	551.00	Rustler	-1.58	269.59					
722.00	722.00	TSalt	-1.58	269.56					
1726.00	1726.00	YSalt	-1.58	269.56					
1893.00	1893.00	Yates	-1.58	269.56					
2175.00	2175.00	Seven Rivers	-1.58	269.56					
2802.00	2802.00	Queen	-1.58	269.56					
3227.00	3227.00	Grayburg	-1.58	269.56					
3562.00	3562.00	San Andres	-1.58	269.56					
5042.00	5042.00	Glorieta	-1.58	269.56					
5096.00	5096.00	(Yeso) Paddock	-1.58	269.56					
5652.86	5658.65	(Yeso) Blinberry	-1.58	269.56					

Map System: US State Plane 1927 (Exact solution)									
Datum: NAD 1927 (NADCON CONUS)									
Ellipsoid: Clarke 1866									
Zone Name: New Mexico East 3001									
Local Origin: Well #20H, Grid North									
Latitude: 32° 50' 53.18702 N									
Longitude: 103° 50' 58.55835 W									
Grid East: 648559.00									
Grid North: 672592.90									
Scale Factor: 1.000									
Geomagnetic Model: BGGM2013									
Sample Date: 26-Feb-14									
Magnetic Declination: 7.55°									
Dip Angle from Horizontal: 60.64°									
Magnetic Field Strength: 48666									
To convert a Magnetic Direction to a Grid Direction, Add 7.29°									
To convert a Magnetic Direction to a True Direction, Add 7.55° East									
To convert a True Direction to a Grid Direction, Subtract 0.26°									
LEGEND									
— #19H, WB1/Job #1311214, Surveys (Capstar 114) V0									
— #21H, WB1/Job #1311216, Plan #2 09-23-13 V0									
— Plan #2 02-26-14									



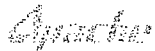


Well Tests

12/9/2014 5:40:11 PM

Report Period: November 1, 2014 to December 7, 2014

Test		Chk	Tubing PSIG		Casing PSIG		Shut-In PSIG		Valid	Volumes						Fluid Level		Ratios						Density					
Date	Hrs	In	High	Low	High	Low	Tubing	Casing	Test	Til Liq	Oil	Frm Gas	Til Gas	Water	Lift	Level	Ovr Pump	GOR	WOR	GLR	IGLR	WGR	TGLR	Oil	Gas				
Region: PERMIAN			District: NW DISTRICT							Superintendent: NW DISTRICT (CARNES)										Foreman: LOCO HILLS [MAXWELL]									
CROW FED #20H			Status: Producing																										
11/01/14	24		257		104				True	1347.00	195.00	178.00	178.00	1152.00				0.913	5.908	0.132		6.472							
11/12/14	24		341		121				True	1299.00	194.00	181.00	181.00	1105.00				0.933	5.696	0.139		6.105							
11/14/14	24		300		111				True	1328.00	177.00	249.00	249.00	1151.00				1.407	6.503	0.188		4.622							
11/15/14	24				101				True	1295.00	170.00	209.00	209.00	1125.00				1.229	6.618	0.161		5.383							
11/16/14	24				83				True	937.00	179.00	231.00	231.00	758.00				1.291	4.235	0.247		3.281							
Averages by Completion:										1241.20	183.00	209.60	1048.00	1058.20															



Well Tests

12/9/2014 5:40:11 PM

Report Period: November 1, 2014 to December 7, 2014

Temp