



XTO Energy

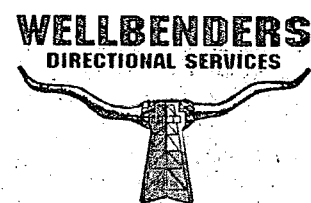
**Eddy County, NM (Nad-27 / East Zone)
PLU 15 Twin Wells Ranch
#102H**

OH

Plan: Plan #1

Standard Planning Report

14 March, 2019





Company: XTO Energy
Project: Eddy County, NM (Nad-27 / East Zone)
Site: PLU 15 Twin Wells Ranch
Well: #102H
Wellbore: OH
Rig: Patterson 225
Design: Plan #1 / 12:16, March 14 2019

TOTAL CORRECTION

To convert a Magnetic Direction to a Grid Direction, Add 6.557°

WELL DETAILS: #102H

RKB = 25' @ 3556.00usft (Patterson 225)					
3530.00					
N-S	E-W	Northing	Easting	Latitude	Longitude
0.00	0.00	440924.90	674200.80	32.210865	-103.770096

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	N-S	E-W	Dip	VSect
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	3500.00	0.00	0.00	3500.00	0.00	0.00	0.00	0.00
3	3699.93	3.00	236.95	3699.94	-2.70	4.46	-1.50	2.67
4	6554.26	3.00	238.95	6554.12	-22.42	-136.90	0.00	81.51
5	6804.21	0.00	0.00	6800.00	-84.45	-140.28	2.00	83.51
6	11140.18	0.00	0.00	11135.87	-84.45	-140.28	0.00	83.51
7	11840.18	40.00	179.62	11596.33	-252.00	-139.14	8.00	251.07
8	12140.17	90.00	179.62	11801.00	-490.80	-136.20	10.00	689.98
9	24812.66	90.00	179.62	11801.00	-13363.10	-51.40	0.00	13362.47

DESIGN TARGET DETAILS

Name	TVD	N-S	E-W	Northing	Easting	Latitude	Longitude
PLU 15 TWIN: #102H SHL (360 FSL & 1130 FWL)	0.00	0.00	0.00	440924.90	674200.80	32.210865	-103.770096
PLU 15 TWIN: #102H FTP/LP	11801.00	-490.80	-136.20	440234.00	674064.80	32.206068	-103.770548
PLU 15 TWIN: #102H LTP	11801.00	-13233.20	-52.30	427691.70	674148.50	32.174589	-103.770488
PLU 15 TWIN: #102H PBHL (2440 FNL & 990 FWL)	11801.00	-13363.10	-51.40	427561.80	674148.40	32.174232	-103.770488



Azimuths to Grid North
True North -0.30°
Magnetic North 6.56°
Magnetic Field
Strength: 47.30 uT/mT
Dip Angle: 60.00°
Date: 03/14/2019
Model: GUT2015

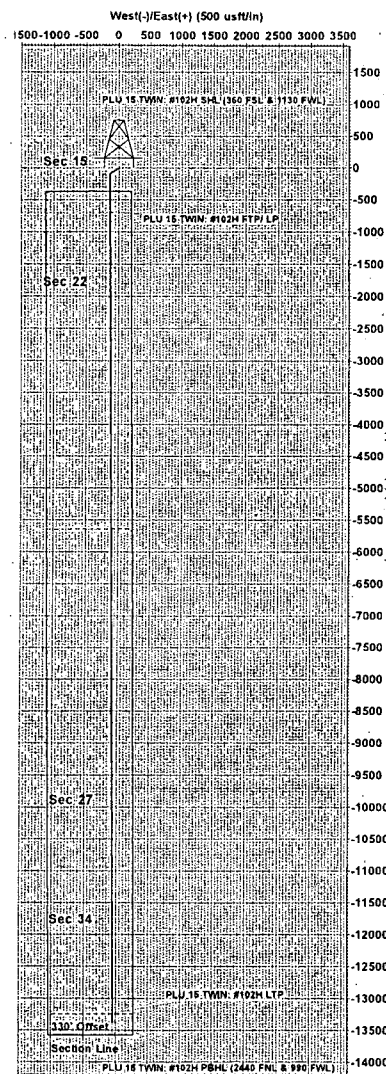
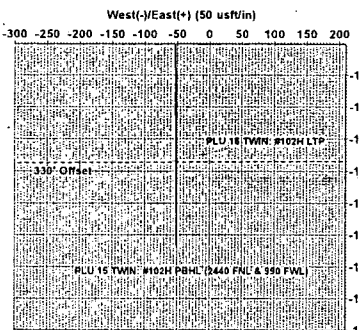
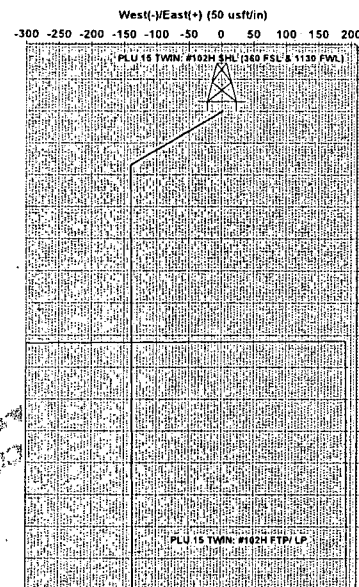
PROJECT DETAILS: Eddy County, NM (Nad-27 / East Zone)
Geodetic System: US State Plane 1927 (Exact Subzone)
Datum: NAD 1927 (MADISON CONUS)
Elevation: Clarke 1866
Zone: New Mexico East 3001
System Datum: Mean Sea Level

Disclaimer:
All data obtained from the
field and office well
logs and survey data is
provided to customer and
subject to quality
control.



CASING DETAILS

No casing data is available



Plan: Plan #1 (#102H/OH) Patterson 225

Created By: Derek Stephens Date: 12:16, March 14 2019



Planning Report



Database:	WBDS_SQL_2	Local Co-ordinate Reference:	Well #102H
Company:	XTO Energy	TVD Reference:	RKB = 26' @ 3556.00usft (Patterson 225)
Project:	Eddy County, NM (Nad-27 / East Zone)	MD Reference:	RKB = 26' @ 3556.00usft (Patterson 225)
Site:	PLU 15 Twin Wells Ranch	North Reference:	Grid
Well:	#102H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1		

Project:	Eddy County, NM (Nad-27 / East Zone)		
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:	PLU 15 Twin Wells Ranch		
Site Position:		Northing:	440,939.70 usft
From:	Map	Easting:	676,390.50 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13.200 in
		Latitude:	32.210974
		Longitude:	-103.763017
		Grid Convergence:	0.304 °

Well:	#102H		
Well Position	+N/-S	-14.80 usft	Northing:
	+E/-W	-2,189.70 usft	Easting:
Position Uncertainty	0.00 usft	Wellhead Elevation:	Ground Level:

Wellbore:	OH		
Magnetics	Model Name	Sample Date	Declination
	IGRF2015	03/14/19	6.857
			Dip Angle
			59.997
			Field Strength
			47,729.98437569

Design:	Plan #1		
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
			Direction
			(°)
			179.62

Plan/Survey Tool Program	Date: 03/14/19		
Depth From	Depth To	Survey (Wellbore)	Tool Name
(usft)	(usft)		
1	0.00	24,812.66 Plan #1 (OH)	WBDS_IGRF
			OWSG MWD + IGRF or WI

Plan Sections										
Measured	Inclination	Azimuth	Vertical	+N/-S	+E/-W	Dogleg	Build	Turn	TFO	Target
Depth	(°)	(°)	Depth	(usft)	(usft)	Rate	Rate	Rate	(°)	
(usft)			(usft)			(°/100ft)	(°/100ft)	(°/100ft)		
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	
3,500.00	0.00	0.00	3,500.00	0.00	0.00	0.00	0.00	0.00	0.000	
3,699.93	3.00	238.95	3,699.84	-2.70	-4.48	1.50	1.50	0.00	238.949	
6,654.26	3.00	238.95	6,650.12	-82.42	-136.90	0.00	0.00	0.00	0.000	
6,804.21	0.00	0.00	6,800.00	-84.45	-140.26	2.00	-2.00	0.00	180.000	
11,140.18	0.00	0.00	11,135.97	-84.45	-140.26	0.00	0.00	0.00	0.000	
11,640.18	40.00	179.62	11,596.33	-252.00	-139.14	8.00	8.00	0.00	0.000	
12,140.18	90.00	179.62	11,801.00	-690.90	-136.20	10.00	10.00	0.00	0.000	PLU 15 TWIN: #10;
24,812.66	90.00	179.62	11,801.00	-13,363.10	-51.40	0.00	0.00	0.00	0.000	PLU 15 TWIN: #10;



Planning Report



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Site:	PLU 15 Twin Wells Ranch	North Reference:	Grid
Well:	#102H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
694.00	0.00	0.00	694.00	0.00	0.00	0.00	0.00	0.00	0.00
Rustler									
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,052.00	0.00	0.00	1,052.00	0.00	0.00	0.00	0.00	0.00	0.00
Top Salt*									
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	0.00	0.00
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	0.00	0.00
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00
2,100.00	0.00	0.00	2,100.00	0.00	0.00	0.00	0.00	0.00	0.00
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	0.00	0.00
2,300.00	0.00	0.00	2,300.00	0.00	0.00	0.00	0.00	0.00	0.00
2,400.00	0.00	0.00	2,400.00	0.00	0.00	0.00	0.00	0.00	0.00
2,500.00	0.00	0.00	2,500.00	0.00	0.00	0.00	0.00	0.00	0.00
2,600.00	0.00	0.00	2,600.00	0.00	0.00	0.00	0.00	0.00	0.00
2,700.00	0.00	0.00	2,700.00	0.00	0.00	0.00	0.00	0.00	0.00
2,800.00	0.00	0.00	2,800.00	0.00	0.00	0.00	0.00	0.00	0.00
2,900.00	0.00	0.00	2,900.00	0.00	0.00	0.00	0.00	0.00	0.00
3,000.00	0.00	0.00	3,000.00	0.00	0.00	0.00	0.00	0.00	0.00
3,100.00	0.00	0.00	3,100.00	0.00	0.00	0.00	0.00	0.00	0.00
3,200.00	0.00	0.00	3,200.00	0.00	0.00	0.00	0.00	0.00	0.00
3,300.00	0.00	0.00	3,300.00	0.00	0.00	0.00	0.00	0.00	0.00
3,400.00	0.00	0.00	3,400.00	0.00	0.00	0.00	0.00	0.00	0.00
3,500.00	0.00	0.00	3,500.00	0.00	0.00	0.00	0.00	0.00	0.00
3,600.00	1.50	238.95	3,599.99	-0.68	-1.12	0.67	1.50	1.50	0.00
3,699.93	3.00	238.95	3,699.84	-2.70	-4.48	2.67	1.50	1.50	0.00
3,800.00	3.00	238.95	3,799.77	-5.40	-8.97	5.34	0.00	0.00	0.00
3,900.00	3.00	238.95	3,899.63	-8.10	-13.45	8.01	0.00	0.00	0.00
4,000.00	3.00	238.95	3,999.50	-10.80	-17.93	10.68	0.00	0.00	0.00
4,100.00	3.00	238.95	4,099.36	-13.49	-22.41	13.35	0.00	0.00	0.00
4,200.00	3.00	238.95	4,199.22	-16.19	-26.90	16.01	0.00	0.00	0.00
4,238.83	3.00	238.95	4,238.00	-17.24	-28.64	17.05	0.00	0.00	0.00
Base of Salt (Anhydrite)									
4,300.00	3.00	238.95	4,299.09	-18.89	-31.38	18.68	0.00	0.00	0.00
4,400.00	3.00	238.95	4,398.95	-21.59	-35.86	21.35	0.00	0.00	0.00
4,462.14	3.00	238.95	4,461.00	-23.27	-38.64	23.01	0.00	0.00	0.00
Bell Canyon Ss./ Delaware									
4,500.00	3.00	238.95	4,498.81	-24.29	-40.34	24.02	0.00	0.00	0.00



Planning Report



Database:	WBDS_SQL_2	Local Co-ordinate Reference:	Well #102H
Company:	XTO Energy	TVD Reference:	RKB = 26' @ 3556.00usft (Patterson 225)
Project:	Eddy County, NM (Nad-27 / East Zone)	MD Reference:	RKB = 26' @ 3556.00usft (Patterson 225)
Site:	PLU 15 Twin Wells Ranch	North Reference:	Grid
Well:	#102H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
4,600.00	3.00	238.95	4,598.68	-26.99	-44.82	26.69	0.00	0.00	0.00
4,700.00	3.00	238.95	4,698.54	-29.69	-49.31	29.36	0.00	0.00	0.00
4,800.00	3.00	238.95	4,798.40	-32.38	-53.79	32.03	0.00	0.00	0.00
4,900.00	3.00	238.95	4,898.27	-35.08	-58.27	34.70	0.00	0.00	0.00
5,000.00	3.00	238.95	4,998.13	-37.78	-62.75	37.36	0.00	0.00	0.00
5,100.00	3.00	238.95	5,097.99	-40.48	-67.23	40.03	0.00	0.00	0.00
5,200.00	3.00	238.95	5,197.85	-43.18	-71.72	42.70	0.00	0.00	0.00
5,300.00	3.00	238.95	5,297.72	-45.88	-76.20	45.37	0.00	0.00	0.00
5,375.39	3.00	238.95	5,373.00	-47.91	-79.58	47.38	0.00	0.00	0.00
Cherry Canyon Ss.									
5,400.00	3.00	238.95	5,397.58	-48.58	-80.68	48.04	0.00	0.00	0.00
5,500.00	3.00	238.95	5,497.44	-51.27	-85.16	50.71	0.00	0.00	0.00
5,600.00	3.00	238.95	5,597.31	-53.97	-89.64	53.38	0.00	0.00	0.00
5,700.00	3.00	238.95	5,697.17	-56.67	-94.13	56.05	0.00	0.00	0.00
5,800.00	3.00	238.95	5,797.03	-59.37	-98.61	58.71	0.00	0.00	0.00
5,900.00	3.00	238.95	5,896.90	-62.07	-103.09	61.38	0.00	0.00	0.00
6,000.00	3.00	238.95	5,996.76	-64.77	-107.57	64.05	0.00	0.00	0.00
6,100.00	3.00	238.95	6,096.62	-67.46	-112.05	66.72	0.00	0.00	0.00
6,200.00	3.00	238.95	6,196.49	-70.16	-116.54	69.39	0.00	0.00	0.00
6,300.00	3.00	238.95	6,296.35	-72.86	-121.02	72.06	0.00	0.00	0.00
6,400.00	3.00	238.95	6,396.21	-75.56	-125.50	74.73	0.00	0.00	0.00
6,500.00	3.00	238.95	6,496.07	-78.26	-129.98	77.40	0.00	0.00	0.00
6,600.00	3.00	238.95	6,595.94	-80.96	-134.47	80.06	0.00	0.00	0.00
6,654.26	3.00	238.95	6,650.12	-82.42	-136.90	81.51	0.00	0.00	0.00
6,700.00	2.08	238.95	6,695.82	-83.47	-138.63	82.55	2.00	-2.00	0.00
6,804.21	0.00	0.00	6,800.00	-84.45	-140.26	83.51	2.00	-2.00	0.00
6,900.00	0.00	0.00	6,895.79	-84.45	-140.26	83.51	0.00	0.00	0.00
7,000.00	0.00	0.00	6,995.79	-84.45	-140.26	83.51	0.00	0.00	0.00
7,001.21	0.00	0.00	6,997.00	-84.45	-140.26	83.51	0.00	0.00	0.00
Brushy Canyon Ss.									
7,100.00	0.00	0.00	7,095.79	-84.45	-140.26	83.51	0.00	0.00	0.00
7,200.00	0.00	0.00	7,195.79	-84.45	-140.26	83.51	0.00	0.00	0.00
7,300.00	0.00	0.00	7,295.79	-84.45	-140.26	83.51	0.00	0.00	0.00
7,400.00	0.00	0.00	7,395.79	-84.45	-140.26	83.51	0.00	0.00	0.00
7,500.00	0.00	0.00	7,495.79	-84.45	-140.26	83.51	0.00	0.00	0.00
7,600.00	0.00	0.00	7,595.79	-84.45	-140.26	83.51	0.00	0.00	0.00
7,700.00	0.00	0.00	7,695.79	-84.45	-140.26	83.51	0.00	0.00	0.00
7,800.00	0.00	0.00	7,795.79	-84.45	-140.26	83.51	0.00	0.00	0.00
7,900.00	0.00	0.00	7,895.79	-84.45	-140.26	83.51	0.00	0.00	0.00
8,000.00	0.00	0.00	7,995.79	-84.45	-140.26	83.51	0.00	0.00	0.00
8,100.00	0.00	0.00	8,095.79	-84.45	-140.26	83.51	0.00	0.00	0.00
8,200.00	0.00	0.00	8,195.79	-84.45	-140.26	83.51	0.00	0.00	0.00
8,300.00	0.00	0.00	8,295.79	-84.45	-140.26	83.51	0.00	0.00	0.00
8,318.21	0.00	0.00	8,314.00	-84.45	-140.26	83.51	0.00	0.00	0.00
Bone Spring Lm.									
8,399.21	0.00	0.00	8,395.00	-84.45	-140.26	83.51	0.00	0.00	0.00
Avalon Ss.									
8,400.00	0.00	0.00	8,395.79	-84.45	-140.26	83.51	0.00	0.00	0.00
8,420.21	0.00	0.00	8,416.00	-84.45	-140.26	83.51	0.00	0.00	0.00
Bone Spg. Upper Avalon Shale									
8,500.00	0.00	0.00	8,495.79	-84.45	-140.26	83.51	0.00	0.00	0.00
8,600.00	0.00	0.00	8,595.79	-84.45	-140.26	83.51	0.00	0.00	0.00
8,700.00	0.00	0.00	8,695.79	-84.45	-140.26	83.51	0.00	0.00	0.00



Planning Report



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Wellbore:	OH		
Design:	Plan #1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
8,800.00	0.00	0.00	8,795.79	-84.45	-140.26	83.51	0.00	0.00	0.00
8,855.21	0.00	0.00	8,851.00	-84.45	-140.26	83.51	0.00	0.00	0.00
Bone Spg. Lower Avalon Shale									
8,900.00	0.00	0.00	8,895.79	-84.45	-140.26	83.51	0.00	0.00	0.00
9,000.00	0.00	0.00	8,995.79	-84.45	-140.26	83.51	0.00	0.00	0.00
9,100.00	0.00	0.00	9,095.79	-84.45	-140.26	83.51	0.00	0.00	0.00
9,195.21	0.00	0.00	9,191.00	-84.45	-140.26	83.51	0.00	0.00	0.00
1st Bone Spring Lime.									
9,200.00	0.00	0.00	9,195.79	-84.45	-140.26	83.51	0.00	0.00	0.00
9,300.00	0.00	0.00	9,295.79	-84.45	-140.26	83.51	0.00	0.00	0.00
9,386.21	0.00	0.00	9,382.00	-84.45	-140.26	83.51	0.00	0.00	0.00
1st Bone Spring Ss.									
9,400.00	0.00	0.00	9,395.79	-84.45	-140.26	83.51	0.00	0.00	0.00
9,500.00	0.00	0.00	9,495.79	-84.45	-140.26	83.51	0.00	0.00	0.00
9,600.00	0.00	0.00	9,595.79	-84.45	-140.26	83.51	0.00	0.00	0.00
9,700.00	0.00	0.00	9,695.79	-84.45	-140.26	83.51	0.00	0.00	0.00
9,775.21	0.00	0.00	9,771.00	-84.45	-140.26	83.51	0.00	0.00	0.00
2nd Bone Spring Carb.									
9,800.00	0.00	0.00	9,795.79	-84.45	-140.26	83.51	0.00	0.00	0.00
9,900.00	0.00	0.00	9,895.79	-84.45	-140.26	83.51	0.00	0.00	0.00
9,972.21	0.00	0.00	9,968.00	-84.45	-140.26	83.51	0.00	0.00	0.00
2nd Bone Spring Ss.									
10,000.00	0.00	0.00	9,995.79	-84.45	-140.26	83.51	0.00	0.00	0.00
10,100.00	0.00	0.00	10,095.79	-84.45	-140.26	83.51	0.00	0.00	0.00
10,200.00	0.00	0.00	10,195.79	-84.45	-140.26	83.51	0.00	0.00	0.00
10,300.00	0.00	0.00	10,295.79	-84.45	-140.26	83.51	0.00	0.00	0.00
10,400.00	0.00	0.00	10,395.79	-84.45	-140.26	83.51	0.00	0.00	0.00
10,481.21	0.00	0.00	10,477.00	-84.45	-140.26	83.51	0.00	0.00	0.00
3rd Bone Spring Carb.									
10,500.00	0.00	0.00	10,495.79	-84.45	-140.26	83.51	0.00	0.00	0.00
10,600.00	0.00	0.00	10,595.79	-84.45	-140.26	83.51	0.00	0.00	0.00
10,700.00	0.00	0.00	10,695.79	-84.45	-140.26	83.51	0.00	0.00	0.00
10,800.00	0.00	0.00	10,795.79	-84.45	-140.26	83.51	0.00	0.00	0.00
10,900.00	0.00	0.00	10,895.79	-84.45	-140.26	83.51	0.00	0.00	0.00
11,000.00	0.00	0.00	10,995.79	-84.45	-140.26	83.51	0.00	0.00	0.00
11,100.00	0.00	0.00	11,095.79	-84.45	-140.26	83.51	0.00	0.00	0.00
11,140.18	0.00	0.00	11,135.97	-84.45	-140.26	83.51	0.00	0.00	0.00
11,150.00	0.79	179.62	11,145.79	-84.51	-140.26	83.58	8.00	8.00	0.00
11,200.00	4.79	179.62	11,195.72	-86.94	-140.24	86.01	8.00	8.00	0.00
11,219.37	6.34	179.62	11,215.00	-88.82	-140.23	87.89	8.00	8.00	0.00
3rd Bone Spring Ss.									
11,250.00	8.79	179.62	11,245.36	-92.85	-140.20	91.92	8.00	8.00	0.00
11,300.00	12.79	179.62	11,294.47	-102.20	-140.14	101.27	8.00	8.00	0.00
11,350.00	16.79	179.62	11,342.81	-114.96	-140.05	114.03	8.00	8.00	0.00
11,400.00	20.79	179.62	11,390.13	-131.06	-139.95	130.13	8.00	8.00	0.00
11,450.00	24.79	179.62	11,436.22	-150.42	-139.82	149.49	8.00	8.00	0.00
11,457.49	25.38	179.62	11,443.00	-153.59	-139.80	152.66	8.00	8.00	0.00
War Wink Ss.									
11,500.00	28.79	179.62	11,480.85	-172.95	-139.67	172.02	8.00	8.00	0.00
11,550.00	32.79	179.62	11,523.79	-198.53	-139.49	197.60	8.00	8.00	0.00
11,600.00	36.79	179.62	11,564.85	-227.05	-139.30	226.12	8.00	8.00	0.00
11,605.20	37.20	179.62	11,569.00	-230.18	-139.28	229.25	8.00	8.00	0.00
Red Hills Ss.									



Planning Report



Database:	WBDS_SQL_2	Local/Co-ordinate Reference:	Well #102H
Company:	XTO Energy	TVD Reference:	RKB = 26' @ 3556.00usft (Patterson 225)
Project:	Eddy County, NM (Nad-27 / East Zone)	MD Reference:	RKB = 26' @ 3556.00usft (Patterson 225)
Site:	PLU 15 Twin Wells Ranch	North Reference:	Grid
Well:	#102H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
11,640.18	40.00	179.62	11,596.33	-252.00	-139.14	251.07	8.00	8.00	0.00
11,650.00	40.98	179.62	11,603.80	-258.38	-139.09	257.45	10.00	10.00	0.00
11,700.00	45.98	179.62	11,640.07	-292.77	-138.86	291.85	10.00	10.00	0.00
11,718.93	47.88	179.62	11,653.00	-306.60	-138.77	305.68	10.00	10.00	0.00
Wolfcamp Sh									
11,749.68	50.95	179.62	11,673.00	-329.95	-138.62	329.02	10.00	10.00	0.00
Wolfcamp X Sd									
11,750.00	50.98	179.62	11,673.20	-330.20	-138.61	329.27	10.00	10.00	0.00
11,800.00	55.98	179.62	11,702.95	-370.37	-138.34	369.44	10.00	10.00	0.00
11,850.00	60.98	179.62	11,729.08	-412.98	-138.06	412.05	10.00	10.00	0.00
11,899.03	65.89	179.62	11,751.00	-456.82	-137.77	455.90	10.00	10.00	0.00
Wolfcamp Y Sd									
11,900.00	65.98	179.62	11,751.39	-457.70	-137.76	456.78	10.00	10.00	0.00
11,950.00	70.98	179.62	11,769.73	-504.20	-137.45	503.28	10.00	10.00	0.00
12,000.00	75.98	179.62	11,783.94	-552.12	-137.13	551.20	10.00	10.00	0.00
12,013.26	77.31	179.62	11,787.00	-565.02	-137.04	564.10	10.00	10.00	0.00
Wolfcamp A Sh.									
12,050.00	80.98	179.62	11,793.92	-601.10	-136.80	600.18	10.00	10.00	0.00
12,100.00	85.98	179.62	11,799.59	-650.76	-136.47	649.84	10.00	10.00	0.00
12,140.18	90.00	179.62	11,801.00	-690.90	-136.20	689.98	10.00	10.00	0.00
LP									
12,200.00	90.00	179.62	11,801.00	-750.72	-135.80	749.81	0.00	0.00	0.00
12,300.00	90.00	179.62	11,801.00	-850.72	-135.13	849.81	0.00	0.00	0.00
12,400.00	90.00	179.62	11,801.00	-950.72	-134.46	949.81	0.00	0.00	0.00
12,500.00	90.00	179.62	11,801.00	-1,050.72	-133.79	1,049.81	0.00	0.00	0.00
12,600.00	90.00	179.62	11,801.00	-1,150.71	-133.12	1,149.81	0.00	0.00	0.00
12,700.00	90.00	179.62	11,801.00	-1,250.71	-132.45	1,249.81	0.00	0.00	0.00
12,800.00	90.00	179.62	11,801.00	-1,350.71	-131.78	1,349.81	0.00	0.00	0.00
12,900.00	90.00	179.62	11,801.00	-1,450.71	-131.12	1,449.81	0.00	0.00	0.00
13,000.00	90.00	179.62	11,801.00	-1,550.71	-130.45	1,549.81	0.00	0.00	0.00
13,100.00	90.00	179.62	11,801.00	-1,650.70	-129.78	1,649.81	0.00	0.00	0.00
13,200.00	90.00	179.62	11,801.00	-1,750.70	-129.11	1,749.81	0.00	0.00	0.00
13,300.00	90.00	179.62	11,801.00	-1,850.70	-128.44	1,849.81	0.00	0.00	0.00
13,400.00	90.00	179.62	11,801.00	-1,950.70	-127.77	1,949.81	0.00	0.00	0.00
13,500.00	90.00	179.62	11,801.00	-2,050.69	-127.10	2,049.81	0.00	0.00	0.00
13,600.00	90.00	179.62	11,801.00	-2,150.69	-126.43	2,149.81	0.00	0.00	0.00
13,700.00	90.00	179.62	11,801.00	-2,250.69	-125.76	2,249.81	0.00	0.00	0.00
13,800.00	90.00	179.62	11,801.00	-2,350.69	-125.09	2,349.81	0.00	0.00	0.00
13,900.00	90.00	179.62	11,801.00	-2,450.69	-124.42	2,449.81	0.00	0.00	0.00
14,000.00	90.00	179.62	11,801.00	-2,550.68	-123.75	2,549.81	0.00	0.00	0.00
14,100.00	90.00	179.62	11,801.00	-2,650.68	-123.09	2,649.81	0.00	0.00	0.00
14,200.00	90.00	179.62	11,801.00	-2,750.68	-122.42	2,749.81	0.00	0.00	0.00
14,300.00	90.00	179.62	11,801.00	-2,850.68	-121.75	2,849.81	0.00	0.00	0.00
14,400.00	90.00	179.62	11,801.00	-2,950.67	-121.08	2,949.81	0.00	0.00	0.00
14,500.00	90.00	179.62	11,801.00	-3,050.67	-120.41	3,049.81	0.00	0.00	0.00
14,600.00	90.00	179.62	11,801.00	-3,150.67	-119.74	3,149.81	0.00	0.00	0.00
14,700.00	90.00	179.62	11,801.00	-3,250.67	-119.07	3,249.81	0.00	0.00	0.00
14,800.00	90.00	179.62	11,801.00	-3,350.67	-118.40	3,349.81	0.00	0.00	0.00
14,900.00	90.00	179.62	11,801.00	-3,450.66	-117.73	3,449.81	0.00	0.00	0.00
15,000.00	90.00	179.62	11,801.00	-3,550.66	-117.06	3,549.81	0.00	0.00	0.00
15,100.00	90.00	179.62	11,801.00	-3,650.66	-116.39	3,649.81	0.00	0.00	0.00
15,200.00	90.00	179.62	11,801.00	-3,750.66	-115.72	3,749.81	0.00	0.00	0.00
15,300.00	90.00	179.62	11,801.00	-3,850.65	-115.06	3,849.81	0.00	0.00	0.00



Planning Report



Database:	WBDS_SQL_2	Local Co-ordinate Reference:	Well #102H
Company:	XTO Energy	TVD Reference:	RKB = 26' @ 3556.00usft (Patterson 225)
Project:	Eddy County, NM (Nad-27 / East Zone)	MD Reference:	RKB = 26' @ 3556.00usft (Patterson 225)
Site:	PLU 15 Twin Wells Ranch	North Reference:	Grid
Well:	#102H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
15,400.00	90.00	179.62	11,801.00	-3,950.65	-114.39	3,949.81	0.00	0.00	0.00
15,500.00	90.00	179.62	11,801.00	-4,050.65	-113.72	4,049.81	0.00	0.00	0.00
15,600.00	90.00	179.62	11,801.00	-4,150.65	-113.05	4,149.81	0.00	0.00	0.00
15,700.00	90.00	179.62	11,801.00	-4,250.65	-112.38	4,249.81	0.00	0.00	0.00
15,800.00	90.00	179.62	11,801.00	-4,350.64	-111.71	4,349.81	0.00	0.00	0.00
15,900.00	90.00	179.62	11,801.00	-4,450.64	-111.04	4,449.81	0.00	0.00	0.00
16,000.00	90.00	179.62	11,801.00	-4,550.64	-110.37	4,549.81	0.00	0.00	0.00
16,100.00	90.00	179.62	11,801.00	-4,650.64	-109.70	4,649.81	0.00	0.00	0.00
16,200.00	90.00	179.62	11,801.00	-4,750.63	-109.03	4,749.81	0.00	0.00	0.00
16,300.00	90.00	179.62	11,801.00	-4,850.63	-108.36	4,849.81	0.00	0.00	0.00
16,400.00	90.00	179.62	11,801.00	-4,950.63	-107.69	4,949.81	0.00	0.00	0.00
16,500.00	90.00	179.62	11,801.00	-5,050.63	-107.03	5,049.81	0.00	0.00	0.00
16,600.00	90.00	179.62	11,801.00	-5,150.63	-106.36	5,149.81	0.00	0.00	0.00
16,700.00	90.00	179.62	11,801.00	-5,250.62	-105.69	5,249.81	0.00	0.00	0.00
16,800.00	90.00	179.62	11,801.00	-5,350.62	-105.02	5,349.81	0.00	0.00	0.00
16,900.00	90.00	179.62	11,801.00	-5,450.62	-104.35	5,449.81	0.00	0.00	0.00
17,000.00	90.00	179.62	11,801.00	-5,550.62	-103.68	5,549.81	0.00	0.00	0.00
17,100.00	90.00	179.62	11,801.00	-5,650.61	-103.01	5,649.81	0.00	0.00	0.00
17,200.00	90.00	179.62	11,801.00	-5,750.61	-102.34	5,749.81	0.00	0.00	0.00
17,300.00	90.00	179.62	11,801.00	-5,850.61	-101.67	5,849.81	0.00	0.00	0.00
17,400.00	90.00	179.62	11,801.00	-5,950.61	-101.00	5,949.81	0.00	0.00	0.00
17,500.00	90.00	179.62	11,801.00	-6,050.61	-100.33	6,049.81	0.00	0.00	0.00
17,600.00	90.00	179.62	11,801.00	-6,150.60	-99.66	6,149.81	0.00	0.00	0.00
17,700.00	90.00	179.62	11,801.00	-6,250.60	-99.00	6,249.81	0.00	0.00	0.00
17,800.00	90.00	179.62	11,801.00	-6,350.60	-98.33	6,349.81	0.00	0.00	0.00
17,900.00	90.00	179.62	11,801.00	-6,450.60	-97.66	6,449.81	0.00	0.00	0.00
18,000.00	90.00	179.62	11,801.00	-6,550.59	-96.99	6,549.81	0.00	0.00	0.00
18,100.00	90.00	179.62	11,801.00	-6,650.59	-96.32	6,649.81	0.00	0.00	0.00
18,200.00	90.00	179.62	11,801.00	-6,750.59	-95.65	6,749.81	0.00	0.00	0.00
18,300.00	90.00	179.62	11,801.00	-6,850.59	-94.98	6,849.81	0.00	0.00	0.00
18,400.00	90.00	179.62	11,801.00	-6,950.59	-94.31	6,949.81	0.00	0.00	0.00
18,500.00	90.00	179.62	11,801.00	-7,050.58	-93.64	7,049.81	0.00	0.00	0.00
18,600.00	90.00	179.62	11,801.00	-7,150.58	-92.97	7,149.81	0.00	0.00	0.00
18,700.00	90.00	179.62	11,801.00	-7,250.58	-92.30	7,249.81	0.00	0.00	0.00
18,800.00	90.00	179.62	11,801.00	-7,350.58	-91.63	7,349.81	0.00	0.00	0.00
18,900.00	90.00	179.62	11,801.00	-7,450.57	-90.97	7,449.81	0.00	0.00	0.00
19,000.00	90.00	179.62	11,801.00	-7,550.57	-90.30	7,549.81	0.00	0.00	0.00
19,100.00	90.00	179.62	11,801.00	-7,650.57	-89.63	7,649.81	0.00	0.00	0.00
19,200.00	90.00	179.62	11,801.00	-7,750.57	-88.96	7,749.81	0.00	0.00	0.00
19,300.00	90.00	179.62	11,801.00	-7,850.57	-88.29	7,849.81	0.00	0.00	0.00
19,400.00	90.00	179.62	11,801.00	-7,950.56	-87.62	7,949.81	0.00	0.00	0.00
19,500.00	90.00	179.62	11,801.00	-8,050.56	-86.95	8,049.81	0.00	0.00	0.00
19,600.00	90.00	179.62	11,801.00	-8,150.56	-86.28	8,149.81	0.00	0.00	0.00
19,700.00	90.00	179.62	11,801.00	-8,250.56	-85.61	8,249.81	0.00	0.00	0.00
19,800.00	90.00	179.62	11,801.00	-8,350.55	-84.94	8,349.81	0.00	0.00	0.00
19,900.00	90.00	179.62	11,801.00	-8,450.55	-84.27	8,449.81	0.00	0.00	0.00
20,000.00	90.00	179.62	11,801.00	-8,550.55	-83.60	8,549.81	0.00	0.00	0.00
20,100.00	90.00	179.62	11,801.00	-8,650.55	-82.94	8,649.81	0.00	0.00	0.00
20,200.00	90.00	179.62	11,801.00	-8,750.54	-82.27	8,749.81	0.00	0.00	0.00
20,300.00	90.00	179.62	11,801.00	-8,850.54	-81.60	8,849.81	0.00	0.00	0.00
20,400.00	90.00	179.62	11,801.00	-8,950.54	-80.93	8,949.81	0.00	0.00	0.00
20,500.00	90.00	179.62	11,801.00	-9,050.54	-80.26	9,049.81	0.00	0.00	0.00
20,600.00	90.00	179.62	11,801.00	-9,150.54	-79.59	9,149.81	0.00	0.00	0.00
20,700.00	90.00	179.62	11,801.00	-9,250.53	-78.92	9,249.81	0.00	0.00	0.00



Planning Report



Database:	WBDS_SQL_2	Local/Co-ordinate Reference:	Well #102H
Company:	XTO Energy	TVD Reference:	RKB = 26' @ 3556.00usft (Patterson 225)
Project:	Eddy County, NM (Nad-27 / East Zone)	MD Reference:	RKB = 26' @ 3556.00usft (Patterson 225)
Site:	PLU 15 Twin Wells Ranch	North Reference:	Grid
Well:	#102H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
20,800.00	90.00	179.62	11,801.00	-9,350.53	-78.25	9,349.81	0.00	0.00	0.00
20,900.00	90.00	179.62	11,801.00	-9,450.53	-77.58	9,449.81	0.00	0.00	0.00
21,000.00	90.00	179.62	11,801.00	-9,550.53	-76.91	9,549.81	0.00	0.00	0.00
21,100.00	90.00	179.62	11,801.00	-9,650.52	-76.24	9,649.81	0.00	0.00	0.00
21,200.00	90.00	179.62	11,801.00	-9,750.52	-75.57	9,749.81	0.00	0.00	0.00
21,300.00	90.00	179.62	11,801.00	-9,850.52	-74.91	9,849.81	0.00	0.00	0.00
21,400.00	90.00	179.62	11,801.00	-9,950.52	-74.24	9,949.81	0.00	0.00	0.00
21,500.00	90.00	179.62	11,801.00	-10,050.52	-73.57	10,049.81	0.00	0.00	0.00
21,600.00	90.00	179.62	11,801.00	-10,150.51	-72.90	10,149.81	0.00	0.00	0.00
21,700.00	90.00	179.62	11,801.00	-10,250.51	-72.23	10,249.81	0.00	0.00	0.00
21,800.00	90.00	179.62	11,801.00	-10,350.51	-71.56	10,349.81	0.00	0.00	0.00
21,900.00	90.00	179.62	11,801.00	-10,450.51	-70.89	10,449.81	0.00	0.00	0.00
22,000.00	90.00	179.62	11,801.00	-10,550.50	-70.22	10,549.81	0.00	0.00	0.00
22,100.00	90.00	179.62	11,801.00	-10,650.50	-69.55	10,649.81	0.00	0.00	0.00
22,200.00	90.00	179.62	11,801.00	-10,750.50	-68.88	10,749.81	0.00	0.00	0.00
22,300.00	90.00	179.62	11,801.00	-10,850.50	-68.21	10,849.81	0.00	0.00	0.00
22,400.00	90.00	179.62	11,801.00	-10,950.50	-67.54	10,949.81	0.00	0.00	0.00
22,500.00	90.00	179.62	11,801.00	-11,050.49	-66.88	11,049.81	0.00	0.00	0.00
22,600.00	90.00	179.62	11,801.00	-11,150.49	-66.21	11,149.81	0.00	0.00	0.00
22,700.00	90.00	179.62	11,801.00	-11,250.49	-65.54	11,249.81	0.00	0.00	0.00
22,800.00	90.00	179.62	11,801.00	-11,350.49	-64.87	11,349.81	0.00	0.00	0.00
22,900.00	90.00	179.62	11,801.00	-11,450.48	-64.20	11,449.81	0.00	0.00	0.00
23,000.00	90.00	179.62	11,801.00	-11,550.48	-63.53	11,549.81	0.00	0.00	0.00
23,100.00	90.00	179.62	11,801.00	-11,650.48	-62.86	11,649.81	0.00	0.00	0.00
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23,400.00	90.00	179.62	11,801.00	-11,950.47	-60.85	11,949.81	0.00	0.00	0.00
23,500.00	90.00	179.62	11,801.00	-12,050.47	-60.18	12,049.81	0.00	0.00	0.00
23,600.00	90.00	179.62	11,801.00	-12,150.47	-59.51	12,149.81	0.00	0.00	0.00
23,700.00	90.00	179.62	11,801.00	-12,250.47	-58.85	12,249.81	0.00	0.00	0.00
23,800.00	90.00	179.62	11,801.00	-12,350.46	-58.18	12,349.81	0.00	0.00	0.00
23,900.00	90.00	179.62	11,801.00	-12,450.46	-57.51	12,449.81	0.00	0.00	0.00
24,000.00	90.00	179.62	11,801.00	-12,550.46	-56.84	12,549.81	0.00	0.00	0.00
24,100.00	90.00	179.62	11,801.00	-12,650.46	-56.17	12,649.81	0.00	0.00	0.00
24,200.00	90.00	179.62	11,801.00	-12,750.46	-55.50	12,749.81	0.00	0.00	0.00
24,300.00	90.00	179.62	11,801.00	-12,850.45	-54.83	12,849.81	0.00	0.00	0.00
24,400.00	90.00	179.62	11,801.00	-12,950.45	-54.16	12,949.81	0.00	0.00	0.00
24,500.00	90.00	179.62	11,801.00	-13,050.45	-53.49	13,049.81	0.00	0.00	0.00
24,600.00	90.00	179.62	11,801.00	-13,150.45	-52.82	13,149.81	0.00	0.00	0.00
24,700.00	90.00	179.62	11,801.00	-13,250.44	-52.15	13,249.81	0.00	0.00	0.00
24,800.00	90.00	179.62	11,801.00	-13,350.44	-51.48	13,349.81	0.00	0.00	0.00
24,812.66	90.00	179.62	11,801.00	-13,363.10	-51.40	13,362.47	0.00	0.00	0.00



Planning Report



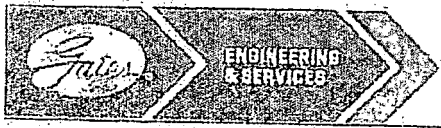
Database:	WBDS_SQL_2	Local Co-ordinate Reference:	Well #102H
Company:	XTO Energy	TVD Reference:	RKB = 26' @ 3556.00usft (Patterson 225)
Project:	Eddy County, NM (Nad-27 / East Zone)	MD Reference:	RKB = 26' @ 3556.00usft (Patterson 225)
Site:	PLU 15 Twin Wells Ranch	North Reference:	Grid
Well:	#102H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1		

Design Targets

Target Name	hit/miss target	Dip Angle	Dip Dir	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
Shape		(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
PLU 15 TWIN: #102H	- plan hits target center	0.00	0.00	0.00	0.00	0.00	440,924.90	674,200.80	32.210965	-103.770096
	- Point									
PLU 15 TWIN: #102H	- plan misses target center by 0.03usft at 24682.76usft MD (11801.00 TVD, -13233.20 N, -52.27 E)	0.00	0.00	11,801.00	-13,233.20	-52.30	427,691.70	674,148.50	32.174589	-103.770489
	- Point									
PLU 15 TWIN: #102H	- plan hits target center	0.00	0.00	11,801.00	-690.90	-136.20	440,234.00	674,064.60	32.209068	-103.770548
	- Point									
PLU 15 TWIN: #102H	- plan hits target center	0.00	0.00	11,801.00	-13,363.10	-51.40	427,561.80	674,149.40	32.174232	-103.770489
	- Point									

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
694.00	694.00	Rustler			
1,052.00	1,052.00	Top Salt*			
4,238.83	4,238.00	Base of Salt (Anhydrite)			
4,462.14	4,461.00	Bell Canyon Ss./ Delaware			
5,375.39	5,373.00	Cherry Canyon Ss.			
7,001.21	6,997.00	Brushy Canyon Ss.			
8,318.21	8,314.00	Bone Spring Lm.			
8,399.21	8,395.00	Avalon Ss.			
8,420.21	8,416.00	Bone Spg. Upper Avalon Shale			
8,855.21	8,851.00	Bone Spg. Lower Avalon Shale			
9,195.21	9,191.00	1st Bone Spring Lime.			
9,386.21	9,382.00	1st Bone Spring Ss.			
9,775.21	9,771.00	2nd Bone Spring Carb.			
9,972.21	9,968.00	2nd Bone Spring Ss.			
10,481.21	10,477.00	3rd Bone Spring Carb.			
11,219.37	11,215.00	3rd Bone Spring Ss.			
11,457.49	11,443.00	War Wink Ss.			
11,605.20	11,569.00	Red Hills Ss.			
11,718.93	11,653.00	Wolfcamp Sh			
11,749.68	11,673.00	Wolfcamp X Sd			
11,899.03	11,751.00	Wolfcamp Y Sd			
12,013.26	11,787.00	Wolfcamp A Sh.			
12,140.18	11,801.00	LP			



GATES E & S NORTH AMERICA, INC
DU-TEX
134 44TH STREET
CORPUS CHRISTI, TEXAS 78405

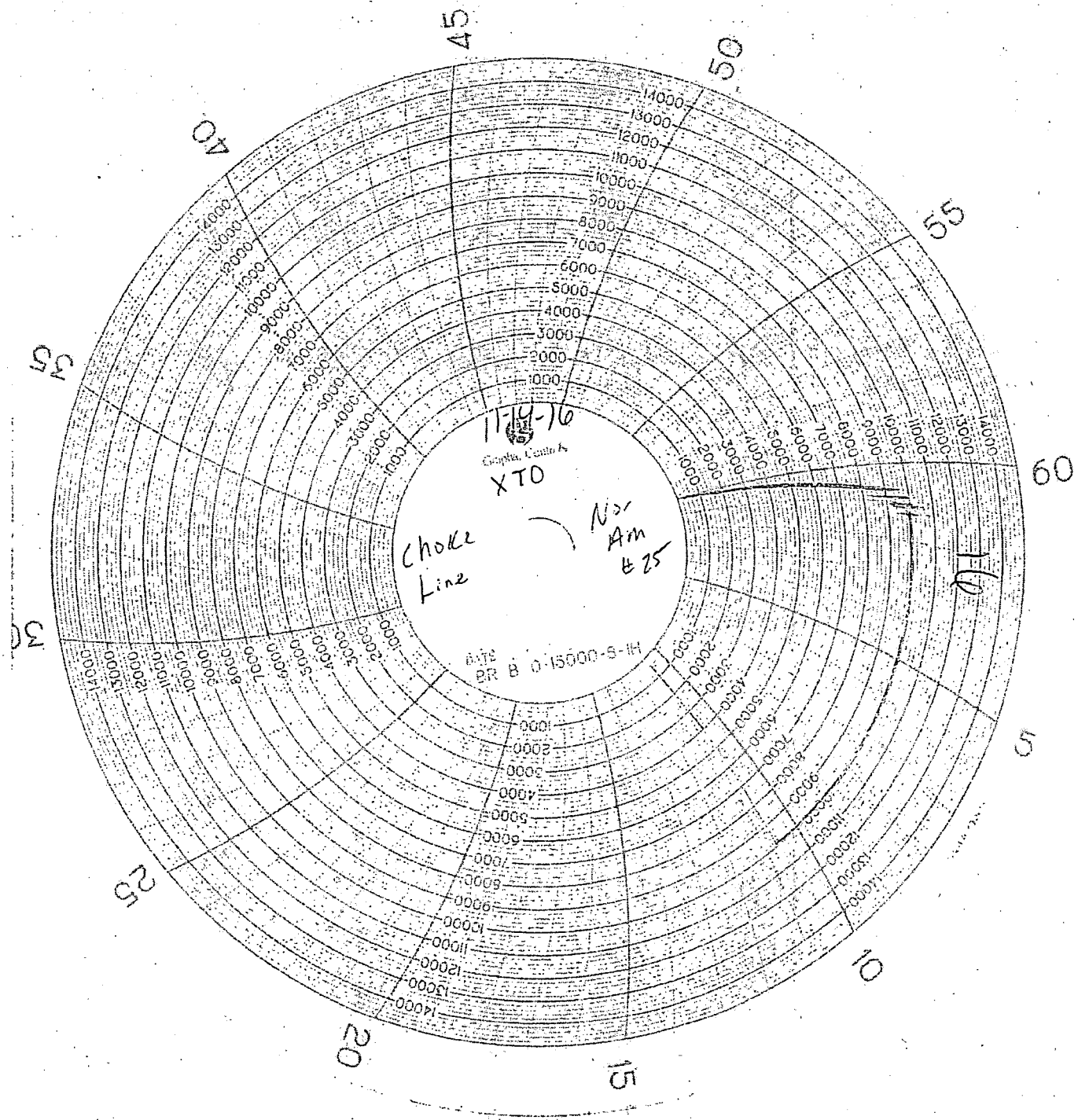
PHONE: 361-887-9807
FAX: 361-887-0812
EMAIL: crpe@s@gates.com
WEB: www.gates.com

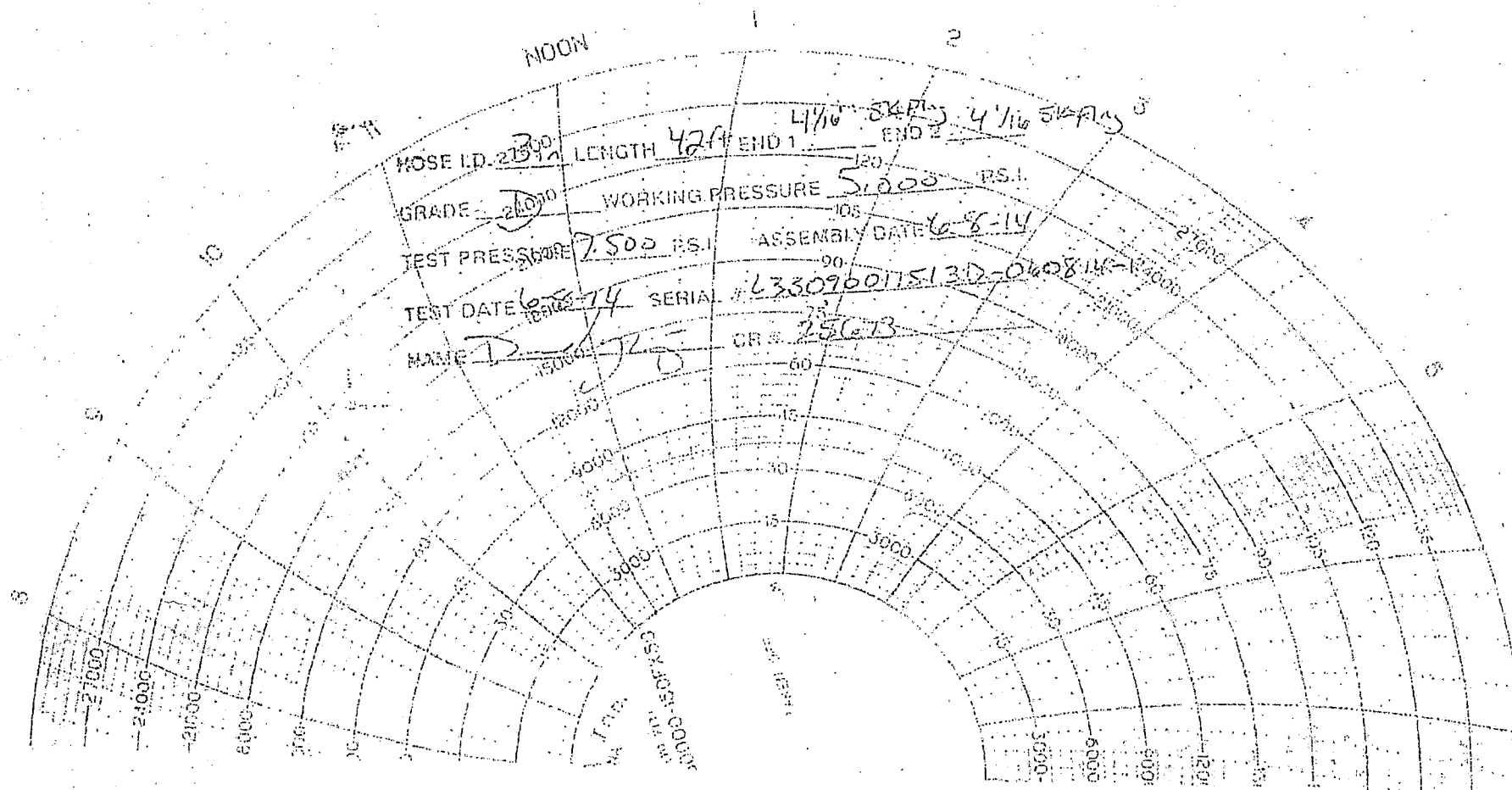
GRADE D PRESSURE TEST CERTIFICATE

Customer :	AUSTIN DISTRIBUTING	Test Date:	6/8/2014
Customer Ref. :	PENDING	Hose Serial No.:	D-060814-1
Invoice No. :	201709	Created By:	NORMA
Product Description:	FD3.042.0R41/16.5KFLGE/E LE		
End Fitting 1 :	4 1/16 in.5K FLG	End Fitting 2 :	4 1/16 in.5K FLG
Gates Part No. :	4774-6001	Assembly Code :	L33090011513D-060814-1
Working Pressure :	5,000 PSI	Test Pressure :	7,500 PSI

Gates E & S North America, Inc. certifies that the following hose assembly has been tested to the Gates Oilfield Roughneck Agreement/Specification requirements and passed the 15 minute hydrostatic test per API Spec 7K/Q1, Fifth Edition, June 2010, Test pressure 9.6.7 and per Table 9 to 7,500 psi in accordance with this product number. Hose burst pressure 9.6.7.2 exceeds the minimum of 2.5 times the working pressure per Table 9.

Quality:	QUALITY	Technical Supervisor:	PRODUCTION
Date:	6/8/2014	Date:	6/8/2014
Signature:		Signature:	





PECOS DISTRICT DRILLING CONDITIONS OF APPROVAL

OPERATOR'S NAME:	XTO Permian Operating, LLC
LEASE NO.:	NMNM-0506A
WELL NAME & NO.:	Poker Lake Unit 15 TWR 102H
SURFACE HOLE FOOTAGE:	0360' FSL & 1130' FWL
BOTTOM HOLE FOOTAGE:	2440' FNL & 0990' FWL Sec. 34, T. 24 S., R 31 E.
LOCATION:	Section 15, T. 24 S., R 31 E., NMPM
COUNTY:	Eddy County, New Mexico

The original COAs still stand with the following drilling modifications:

A. DRILLING OPERATIONS REQUIREMENTS

The BLM is to be notified in advance for a representative to witness:

- a. Spudding well (minimum of 24 hours)
- b. Setting and/or Cementing of all casing strings (minimum of 4 hours)
- c. BOPE tests (minimum of 4 hours)

☒ **Eddy County**

Call the Carlsbad Field Office, 620 East Greene St., Carlsbad, NM 88220,
(575) 361-2822

1. **Hydrogen Sulfide (H₂S) monitors shall be installed prior to drilling out the surface shoe. If H₂S is detected in concentrations greater than 100 ppm, the Hydrogen Sulfide area shall meet Onshore Order 6 requirements, which includes equipment and personnel/public protection items. If Hydrogen Sulfide is encountered, provide measured values and formations to the BLM.**
2. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval. **If the drilling rig is removed without approval – an Incident of Non-Compliance will be written and will be a “Major” violation.**
3. Floor controls are required for 3M or Greater systems. These controls will be on the rig floor, unobstructed, readily accessible to the driller and will be operational at all times during drilling and/or completion activities. Rig floor is defined as the area immediately around the rotary table; the area immediately above the substructure on which the draw works is located, this does not include the dog house or stairway area.

4. The record of the drilling rate along with the GR/N well log run from TD to surface (horizontal well – vertical portion of hole) shall be submitted to the BLM office as well as all other logs run on the borehole 30 days from completion. If available, a digital copy of the logs is to be submitted in addition to the paper copies. The Rustler top and top and bottom of Salt are to be recorded on the Completion Report.

B. CASING

Changes to the approved APD casing program need prior approval if the items substituted are of lesser grade or different casing size or are Non-API. The Operator can exchange the components of the proposal with that of superior strength (i.e. changing from J-55 to N-80, or from 36# to 40#). Changes to the approved cement program need prior approval if the altered cement plan has less volume or strength or if the changes are substantial (i.e. Multistage tool, ECP, etc.). The initial wellhead installed on the well will remain on the well with spools used as needed.

Centralizers required on surface casing per Onshore Order 2.III.B.1.f.

Wait on cement (WOC) for Potash Areas:

After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi for all cement blends, 2) until cement has been in place at least 24 hours. WOC time will be recorded in the driller's log.

Provide compressive strengths including hours to reach required 500 pounds compressive strength prior to cementing each casing string. Have well specific cement details onsite prior to pumping the cement for each casing string.

No pea gravel permitted for remedial or fall back remedial without prior authorization from the BLM engineer.

Secretary's Potash

Possibility of water flows in the Salado and Castile.

Possibility of lost circulation in the Red Beds, Rustler, and Delaware.

Abnormal pressure may be encountered in the 3rd Bone Spring and all subsequent formations.

1. The 18-5/8 inch surface casing shall be set at approximately 880 feet **(in a competent bed below the Magenta Dolomite, which is a Member of the Rustler, and if salt is encountered, set casing at least 25 feet above the salt and cemented to the surface. Excess calculates to negative 35% - Additional cement will be required.**

- a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.
- b. **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry.**
- c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength, whichever is greater.
- d. If cement falls back, remedial cementing will be done prior to drilling out that string.

13-3/8 inch 1st Intermediate casing shall be kept fluid filled while running into hole to meet BLM minimum collapse requirements.

2. The minimum required fill of cement behind the 13-3/8 inch 1st intermediate casing is:

- ☒ Cement to surface. If cement does not circulate see B.1.a, c-d above. **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to potash. Excess calculates to 21% - Additional cement may be required.**

Formation below the 13-3/8" shoe to be tested according to Onshore Order 2.III.B.1.i. Test to be done as a mud equivalency test using the mud weight necessary for the pore pressure of the formation below the shoe (not the mud weight required to prevent dissolving the salt formation) and the mud weight for the bottom of the hole. Report results to BLM office.

9-5/8 inch 2nd Intermediate casing shall be kept fluid filled while running into hole to meet BLM minimum collapse requirements.

3. The minimum required fill of cement behind the 9-5/8 inch 2nd intermediate casing is:

Operator has proposed DV tool at depth of 4400', but will adjust cement proportionately if moved. DV tool shall be set a minimum of 50' below previous shoe and a minimum of 200' above current shoe. Operator shall submit sundry if DV tool depth cannot be set in this range. If an ECP is used, it is to be set a minimum of 50' below the shoe to provide cement across the shoe. If it cannot be set below the shoe, a CBL shall be run to verify cement coverage.

a. First stage to DV tool:

- ☒ Cement to circulate. If cement does not circulate, contact the appropriate BLM office before proceeding with second stage cement job. Operator should have plans as to how they will achieve circulation on the next stage. **Excess calculates to negative 6% - Additional cement will be required.**

b. Second stage above DV tool:

- ☒ Cement to surface. If cement does not circulate, contact the appropriate BLM office. **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to potash.**

Formation below the 9-5/8" shoe to be tested according to Onshore Order 2.III.B.1.i. Test to be done as a mud equivalency test using the mud weight necessary for the pore pressure of the formation below the shoe and the mud weight for the bottom of the hole. Report results to BLM office.

Centralizers required on horizontal leg, must be type for horizontal service and a minimum of one every other joint.

Production casing shall be kept fluid filled while running into hole to meet BLM minimum collapse requirements.

4. The minimum required fill of cement behind the 5-1/2 inch production casing is:

- ☒ Cement should tie-back at least 500 feet into previous casing string. Operator shall provide method of verification.

5. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.

C. PRESSURE CONTROL

1. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2 and API 53.
2. Variance approved to use flex line from BOP to choke manifold. Check condition of flexible line from BOP to choke manifold, replace if exterior is damaged or if line fails test. Line to be as straight as possible with no hard bends and is to be anchored according to Manufacturer's requirements. The flexible hose can be exchanged with a hose of equal size and equal or greater pressure rating. **Anchor requirements, specification sheet and hydrostatic pressure test certification matching the hose in service, to be onsite for review. These documents shall be posted in the company man's trailer and on the rig floor.** If the BLM inspector questions the straightness of the hose, a BLM engineer will be contacted and will review in the field or via picture supplied by inspector to determine if changes are required (operator shall expect delays if this occurs).
3. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **2000 (2M) psi.**
4. **Operator has proposed a multi-bowl wellhead assembly. This assembly will only be tested when installed on the 13-3/8 inch 1st intermediate casing. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the 13-3/8 inch 1st intermediate casing shoe shall be 5000 (5M) psi.**
 - a. Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.
 - b. If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
 - c. Manufacturer representative shall install the test plug for the initial BOP test.
 - d. Operator shall perform the 9-5/8 inch 2nd intermediate casing integrity test to 70% of the casing burst. This will test the multi-bowl seals.
 - e. If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed and another wellhead installed.

5M system requires an HCR valve, remote kill line and annular to match. The remote kill line is to be installed prior to testing the system and tested to stack pressure.

5. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the tests.
- a. In potash areas, for all casing strings utilizing slips; these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. For all casing strings, casing cut-off and BOP installation can be initiated at twelve hours after bumping the plug. However, **no tests** shall commence until the cement has had a minimum of 24 hours setup time.
 - b. The tests shall be done by an independent service company utilizing a test plug **not a cup or J-packer**.
 - c. The test shall be run on a 5000 psi chart for a 2-3M BOP/BOP, on a 10000 psi chart for a 5M BOP/BOPE and on a 15000 psi chart for a 10M BOP/BOPE. If a linear chart is used, it shall be a one hour chart. A circular chart shall have a maximum 2 hour clock. If a twelve hour or twenty-four hour chart is used, tester shall make a notation that it is run with a two hour clock.
 - d. The results of the test shall be reported to the appropriate BLM office.
 - e. All tests are required to be recorded on a calibrated test chart. **A copy of the BOP/BOPE test chart and a copy of independent service company test will be submitted to the appropriate BLM office.**
 - f. The BOP/BOPE test shall include a low pressure test from 250 to 300 psi. The test will be held for a minimum of 10 minutes if test is done with a test plug and 30 minutes without a test plug. This test shall be performed prior to the test at full stack pressure.
 - g. BOP/BOPE must be tested by an independent service company within 500 feet of the top of the **Wolfcamp** formation if the time between the setting of the intermediate casing and reaching this depth exceeds 20 days. This test does not exclude the test prior to drilling out the casing shoe as per Onshore Order No. 2.

D. DRILLING MUD

Mud system monitoring equipment, with derrick floor indicators and visual and audio alarms, shall be operating before drilling into the **Wolfcamp** formation, and shall be used until production casing is run and cemented.

E. DRILL STEM TEST

If drill stem tests are performed, Onshore Order 2.III.D shall be followed.

F. WASTE MATERIAL AND FLUIDS

All waste (i.e. drilling fluids, trash, salts, chemicals, sewage, gray water, etc.) created as a result of drilling operations and completion operations shall be safely contained and disposed of properly at a waste disposal facility. No waste material or fluid shall be disposed of on the well location or surrounding area.

Porto-johns and trash containers will be on-location during fracturing operations or any other crew-intensive operations.

JAM 032619