

## EP WELLS DAILY OPERATIONS REPORT

Report 32

10/17/2017

Company	PERMIAN
Well Type	Development
Well	UNIVERSITY 19 PW UNIT 1407H
Wellbore	UNIVERSITY 19 PW UNIT 1407H
WBS No/API No	30266571 / 4230133203

## Event Summary

Event Type	Completion only	Event Start Date	09/03/2017	Days on Location	32.00
Objective	Install Completion	Original Spud Date	05/11/2017		
Est. Days	31.00	Contractor	PERMIAN WELL SVC		
Work Unit	PERMIAN COMPLETIONS	Days To Release			
		Rig Phone/FAX No.			

## Well Status

Supervisor	Tommy Hurdle	Measured Depth(ft)	
Engineer	Alex Villegas	TVD(ft)	
Other Supervisor	Nick Morrison	24 Hr Progress(ft)	
Depth Ref/Grd Elev/Water Depth(ft)	DFE: 2,792.70 / 2,766.70	Hole size(in)	
THF Datum			
Daily NPT(hr/%)	8.83/36.81	Last Casing MD	
Days Ahd(-) Bhnd(+)(50/50)		Next Casing MD	
Actual cost to date/AFE	3,431,660/4,701,640.00	Current MW / BH EMW(ppg)	/
Actual divided by AFE	0.73	LOT/FIT EMW(ppg)	
Daily Cost	358,333	Lithology	
		Formation/MD Top	

## HSE Summary

Last Incident	Date	Days	Last Incident	Date	Days	KPI's	
LWC RWC MTC FAC Last casing pressure test			PSI NII HPI <b>GOAL ZERO DAYS</b> <b>PS BARRIER EVENT</b> <b>PS barrier bowtie review</b>			TRCF LWCF Safety Cards - Safe Safety Card - Unsafe SSE% Last casing pressure(psi)	
Safety Comments:							

## HSE Drills

Drills/Tests	Date	Days Since Last		
Last Derrick Inspection Last BOP function test Last BOP Test Next BOP Test			JSA's/Toolbox Talks Days Since Last Drill	31

## Operations Summary

24 Hour Summary
Frac Stages:40 thru 44 WL Stages: 41 thru 45
Update Since Report Time
24 Hour Forecast
Cont. Frac Operations

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## Time Summary

Start	Hours	PH	OPN	Detail	Drilled Depth (ft)	NPT level	Rig Rate	Description
0:00	0.62	FRAC	FRT			0		<p>Cont. Frac 1407H Stage 40</p> <p>Stage 40 Summary      University 19 PW Unit 1407H Interval 13305 - 13439 Open Well Pressure      4,071      psi Max Treating Pressure      9,437      psi Max Slurry Rate      61.2 bpm Average Treating Pressure      8,177      psi Average Slurry Rate      55.4 bpm Breakdown Pressure      7,807      psi Breakdown Rate      15.7 bpm Breakdown Volume      252 gal Avg HHP      11,103      hp Final ISIP      5,432      psi Frac Gradient      0.943      psi/ft Pad Volume      378 gal Main Body Volume      150,234 gal Flush Volume      25,200 gal 100 MAZ Sand Pumped      0 lbs 100 M Brown Sand Pumped      0 lbs 100 M Sand Pumped      372,960 lbs Proppant in Formation      372,960 lbs Avg Proppant Concentration      3.21 lb/gal Max Proppant Concentration      4.00 lb/gal Load to Recover      3,617      bbls Load to Recover w/o Acid      3,617      bbls 15% HCL Spearhead      0 gal Slickwater Fluid Pumped      3,497      bbls 20# Linear Fluid Pumped      80      bbls 20# Crosslink Fluid Pumped      0      bbls Pump down volume      40      bbls pump down rate      9.0      bpm Max pump down pressure      5,900      psi Fluid Temp      72.0      ?F Total Pump Time      0:15      hr:min Pumps Lost During Job      0 Treatment Start Time      23:23      0:00 0:00 Treatment End Time      23:38      0:00 0:15 Diverter Slurry      bbls -Pumped sand in a 0.50 PPA - 4.0 PPA ramp. - Two 20# gel sweeps 40 bbls each were pumped prior to flush. - Did not run acid this stage. - Ran a ball in place plug. - Sand hauler unloaded into hog 2 bin 2 instead of hog 3 bin 2. Caused us to underpump stage by 47k lbs.</p> <p>Time for Prop on Perfs      16.0 minutes</p>
0:37	0.05	FRAC	FWL			0		<p>Valve team shut UMW. End Frac 1407H Stage 40. Bleed off. Frac HO to WL.</p>
0:40	0.58	COIL	NOA			0		Standby for other operations.
1:15	0.08	FRAC	WLT			0		<p>WL PU guns and plug. Crane swing over and stab 1407H Valve team line out valves.</p>
1:20	0.05	FRAC	WLT			0		<p>Send boost and pressure test. Low 1000 psi, high 8000 psi, Test good, bleed back and equalize.</p>
1:23	1.38	FRAC	WLT			0		<p>Valve team open UMW. Start WL 1407H stage 41</p> <p>WL Start perf Stage      41 Tie into liner top at      11122      ft Initial WHP      4800      psi</p>

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## Time Summary

Start	Hours	PH	OPN	Detail	Drilled Depth (ft)	NPT level	Rig Rate	Description
								<p>Pumpdown Pressures</p> <p>3 bpm 4800 psi</p> <p>6 bpm 5430 psi</p> <p>9 bpm 5900 psi</p> <p>Max Pressure 6300 psi</p> <p>Total Fluid to recover 60 bbls</p> <p>Plug set @ 13285 ft</p> <p>Boss Hog Composite Frac Plug (BIP)</p> <p>Plug OD 3.65 in</p> <p>Pre-set Tension 1490 lbs</p> <p>Post-set Tension 1250 lbs</p> <p>Pre-Perf Pressure 5300 psi</p> <p>Perforation Summary:</p> <p>(4 count) 1' Keane Guns: 2.75" OD HSC at 6 spf @ 60 deg phasing</p> <p>13260' - 13261' 6 shots</p> <p>13216' - 13217' 6 shots</p> <p>13172' - 13173' 6 shots</p> <p>13127' - 13128' 6 shots</p> <p>Post-Perf Pressure 5280 psi</p> <p>Keane WL pump down had issues with popoff.</p>
2:46	0.80	FRAC	WLT			0		<p>WL POOH</p> <p>UNCAAP SAFETY PAUSE: Discuss safe work process.</p>
3:34	0.03	FRAC	WLT			0		<p>Valve team shut UMW.</p> <p>End WL Perf 1407H Stage 41.</p>
3:36	0.07	FRAC	WLT			0		<p>Break off lube and BOPS.</p> <p>Swing back and drop out.</p> <p>ALL SHOTS FIRED.</p> <p>Stab night cap and close crown valve.</p>
3:40	0.08	FRAC	GRS			0		<p>FMC grease crown and HCR</p> <p>WL HO to Frac.</p>
3:45	0.42	COIL	NOA			0		<p>Standby for other operations.</p>
4:10	0.08	FRAC	FRP			0		<p>Valve team open zipper manifold.</p> <p>Frac equalize to wellhead pressure.</p>
4:15	1.28	FRAC	FRT			0		<p>Valve team open UMW</p> <p>Start Frac 1407H Stage 41</p> <p>Stage 41 Summary University 19 PW Unit 1407H</p> <p>Interval 13127 - 13261</p> <p>Open Well Pressure 4,486 psi</p> <p>Max Treating Pressure 9,373 psi</p> <p>Max Slurry Rate 61.3 bpm</p> <p>Average Treating Pressure 8,675 psi</p> <p>Average Slurry Rate 54.7 bpm</p> <p>Breakdown Pressure 8,820 psi</p> <p>Breakdown Rate 12.6 bpm</p> <p>Breakdown Volume 252 gal</p> <p>Avg HHP 11,630 hp</p> <p>Final ISIP 5,344 psi</p> <p>Frac Gradient 0.935 psi/ft</p> <p>Pad Volume 462 gal</p> <p>Main Body Volume 154,896 gal</p> <p>Flush Volume 24,948 gal</p> <p>100 M AZ Sand Pumped 0 lbs</p> <p>100 M Brown Sand Pumped 283,880 lbs</p> <p>100 M Sand Pumped 140,700 lbs</p>

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## Time Summary

Start	Hours	PH	OPN	Detail	Drilled Depth (ft)	NPT level	Rig Rate	Description
								Proppant in Formation 424,580 lbs Avg Proppant Concentration 3.47 lb/gal Max Proppant Concentration 4.00 lb/gal Load to Recover 3,748 bbls Load to Recover w/o Acid 3,748 bbls 15% HCL Spearhead 0 gal Slickwater Fluid Pumped 3,608 bbls 20# Linear Fluid Pumped 80 bbls 20# Crosslink Fluid Pumped 0 bbls Pump down volume 60 bbls pump down rate 10.0 bpm Max pump down pressure 6,300 psi Fluid Temp 72.0 ?F Total Pump Time 1:18 hr:min Pumps Lost During Job 0 Treatment Start Time 4:17 0:00 0:00 Treatment End Time 5:35 0:00 1:18 Diverter Slurry bbls -Pumped sand in a 0.50 PPA - 4.0 PPA ramp. - Two 20# gel sweeps 40 bbls each were pumped prior to flush. - Did not run acid this stage. - Ran a ball in place plug.  Time for Prop on Perfs 13.0 minutes
5:32	0.07	FRAC	FRT			0		Valve team shut UMW. End Frac 1407H Stage 41. Bleed off. Frac HO to WL.
5:36	0.32	COIL	NOA			0		Standby for other operations.
5:55	0.08	FRAC	WLT			0		WL PU guns and plug. Swing and stab lube onto the 1407H. Crew change and handover.
6:00	0.25	FRAC	WLT			0		Extreme FB replace 3" gasket on iron.
6:15	0.25	FRAC	WLT			0		Valve team line up valves and walk lines. Break circulation and check for leaks.
6:30	0.33	FRAC	WLT			0		Pressure test to 8500 psi. -test good. Bleed down to equalize. Open well @ 4510 psi. Conduct WL checks at 200'.
6:50	0.92	FRAC	WLT			0		"Stage #42 Plug and Perf RIH with (4) 1' Keane guns: 2.75" OD HSC at 6SPF with 60* phased perforating guns and Downhole Technology Boss Hog composite frac plug. Tie into liner top @11122. Bring on pumps at 11600'. Pump down as follows: 3bpm @ 4375psi @11600 6bpm @ 4830psi @11700 9bpm @ 5100psi @11800 9bpm w/ 5950psi @  Set plug @ 13107ft Perforate as follows: 13083' - 13084' 13038' - 13039' 12994' - 12995' 12949' - 12950' Stabilized pressure after perf: 4400psi Pump down volume: 34bbl"
7:45	0.58	FRAC	WLT			0		POOH. Held pause at 1000' to discuss coming off the well.
8:20	0.50	FRAC	WLT			0		Bump up and SIW @ 4400 psi. Bled off pressure and break lubricator/BOP's. Lowered Perf guns out of lubricator and confirmed all shots fired. Drop ball, N/U nightcap and close crown valve. L/D perf guns and P/U next set of guns for next run. Greased LMV - grease time 20 min. - new tech on location. HO to Frac
8:50	0.33	FRAC	OPO			0		Other Pad Ops.

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Start	Hours	PH	OPN	Detail	Drilled Depth (ft)	NPT level	Rig Rate	Description
9:10	1.33	FRAC	OPO			1		Waiting on sand.
10:30	0.58	FRAC	OPO			0		Other Pad Ops
11:05	0.05	FRAC	FRP			0		Prime and equalize. Open well @ 4116 psi.
11:08	1.30	FRAC	FRT			0		<p>Stage 42 Summary University 19 PW Unit 1407H Interval 12949 - 13084 Open Well Pressure 4,116 psi Max Treating Pressure 9,435 psi Max Slurry Rate 60.5 bpm Average Treating Pressure 8,621 psi Average Slurry Rate 54.4 bpm Breakdown Pressure 5,568 psi Breakdown Rate 10.0 bpm Breakdown Volume 420 gal Avg HHP 11,495 hp Final ISIP 5,215 psi Frac Gradient 0.923 psi/ft Pad Volume 1,050 gal Main Body Volume 152,628 gal Flush Volume 24,822 gal 100 MAZ Sand Pumped 46,040 lbs 100 M Brown Sand Pumped 274,440 lbs 100 M Sand Pumped 103,800 lbs Proppant in Formation 424,280 lbs Avg Proppant Concentration 3.53 lb/gal Max Proppant Concentration 4.00 lb/gal Load to Recover 3,668 bbls Load to Recover w/o Acid 3,668 bbls 15% HCL Spearhead 0 gal Slickwater Fluid Pumped 3,554 bbls 20# Linear Fluid Pumped 80 bbls 20# Crosslink Fluid Pumped 0 bbls Pump down volume 34 bbls pump down rate 9.0 bpm Max pump down pressure 5,951 psi Fluid Temp 72.0 ?F Total Pump Time 1:18 hr:min Pumps Lost During Job 0 Treatment Start Time 11:08 0:00 0:00 Treatment End Time 12:26 0:00 1:18 Diverter Slurry bbls -Pumped sand in a 0.50 PPA - 4.0 PPA ramp. Then a 4.0 PPA step - Two 20# gel sweeps 40 bbls each were pumped prior to flush. - Did not run acid this stage. - Ran a ball in place plug.</p> <p>Time for Prop on Perfs 15.0 minutes TBF 2.87 HOURS - Waited on sand trucks to arrive to provide enough sand for frac stage. WL moved ahead and come off the well to start re-heading during next frac stage.</p>
12:26	0.07	FRAC	FWL			0		SIW @ 5115 psi. Bled off pressure and HO to WL. Held pause to discuss AAR on frac stage.
12:30	1.00	FRAC	OPO			0		Re-gen WL truck.
13:30	0.17	FRAC	OPO			0		Held pause to discuss Ops
13:40	0.33	FRAC	FWL			0		Pick up lubricator. Remove night cap. PU guns/plug. Stab lubricator. Fill lubricator. PT lubricator to 1k-8kpsi. Open well with 4570 psi. RIH to 200' conduct checks.
14:00	0.92	FRAC	WLT			0		"Stage #43 Plug and Perf RIH with (4) 1' Keane guns: 2.75" OD HSC at 6SPF with 60"

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Start	Hours	PH	OPN	Detail	Drilled Depth (ft)	NPT level	Rig Rate	Description
								phased perforating guns and Downhole Technology Boss Hog composite frac plug. Tie into liner top @11122. Bring on pumps at 11600'. Pump down as follows: 3bpm @ 4375psi @11600 6bpm @ 4580psi @11700 9bpm @ 4850psi @11800 9bpm w/ 5336psi  Set plug @ 12924ft Perforate as follows: 12905' - 12906' 12860' - 12861' 12816' - 12817' 12771' - 12772' Stabilized pressure after perf: 4970psi Pump down volume: 22bbl"
14:55	0.50	FRAC	WLT			0		POOH. Held pause at 1000' to discuss coming off the well.
15:25	1.08	FRAC	WLF			0		Bump up and SIW @ 4300 psi. Bled off pressure and break lubricator/BOP's. Lowered Perf guns out of lubricator and confirmed all shots fired. Drop ball, N/U nightcap and close crown valve. L/D perf guns and P/U next set of guns for next run. Greased UMW & Wing valve - grease time 20 min. Greased 0907 UMW, Wing and LMV. HO to Frac
16:30	0.25	FRAC	WLF			1		Wait on Sand to frac stage
16:45	0.17	FRAC	FRP			1		Prime up and equalize. Open well @ 4682 psi
16:55	1.38	FRAC	FRT			1		Stage 43 Summary University 19 PW Unit 1407H Interval 12771 - 12906 Open Well Pressure 4,682 psi Max Treating Pressure 9,448 psi Max Slurry Rate 61.1 bpm Average Treating Pressure 8,506 psi Average Slurry Rate 56.0 bpm Breakdown Pressure 7,357 psi Breakdown Rate 5.0 bpm Breakdown Volume 420 gal Avg HHP 11,675 hp Final ISIP 5,336 psi Frac Gradient 0.934 psi/ft Pad Volume 8,820 gal Main Body Volume 159,894 gal Flush Volume 24,822 gal 100 M AZ Sand Pumped 0 lbs 100 M Brown Sand Pumped 370,980 lbs 100 M Sand Pumped 47,000 lbs Proppant in Formation 417,980 lbs Avg Proppant Concentration 3.45 lb/gal Max Proppant Concentration 4.00 lb/gal Load to Recover 3,829 bbls Load to Recover w/o Acid 3,829 bbls 15% HCL Spearhead 0 gal Slickwater Fluid Pumped 3,727 bbls 20# Linear Fluid Pumped 80 bbls 20# Crosslink Fluid Pumped 0 bbls Pump down volume 22 bbls pump down rate 9.0 bpm Max pump down pressure 5,336 psi Fluid Temp 72.0 ?F Total Pump Time 1:23 hr:min Pumps Lost During Job 0 Treatment Start Time 16:55 0:00 0:00 Treatment End Time 18:18 0:00 1:23 Diverter Slurry bbls -Pumped sand in a 0.50 PPA - 4.0 PPA ramp. Then a 4.0 PPA step - Two 20# gel sweeps 40 bbls each were pumped prior to flush.

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Start	Hours	PH	OPN	Detail	Drilled Depth (ft)	NPT level	Rig Rate	Description
								- Did not run acid this stage. - Ran a ball in place plug.  Time for Prop on Perfs 13.0 minutes Time between Stages (TBF) 1.67 Hours/min
18:18	0.03	FRAC	FWL			1		SIW @ 5132 psi. Bled off pressure and HO to WL. Held pause to discuss AAR on frac stage
18:20	0.25	FRAC	FWL			1		Pick up lubricator. Remove night cap. PU guns/plug. Stab lubricator. Fill lubricator. PT lubricator to 1k-8kpsi. Open well with 4850 psi. RIH to 200' conduct checks.
18:35	0.75	FRAC	WLT			1		"Stage #44 Plug and Perf RIH with (4) 1' Keane guns: 2.75" OD HSC at 6SPF with 60* phased perforating guns and Downhole Technology Boss Hog composite frac plug. Tie into liner top @11122. Bring on pumps at 11600'. Pump down as follows: 3bpm @ 4600psi @11600 6bpm @ 5850psi @11700 9bpm @ 5800psi @11800 9bpm w/ 6100psi @  Set plug @ 12751ft Perforate as follows: 12727' - 12728' 12682' - 12683' 12638' - 12639' 12592.5' - 12593.5' Stabilized pressure after perf: 5070psi Pump down volume: 19bbl"
19:20	0.67	FRAC	WLT			1		POOH. Held pause at 1000'. Discussed coming off the well.
20:00	0.25	FRAC	WLF			1		Bump up and SIW @ 4550 psi. Bled off pressure and break lubricator above the tool trap. Lowered Perf guns out of lubricator and confirmed all shots fired. N/U nightcap on BOP's and close crown valve. L/D perf guns. Set lubricator on the stand. HO to Frac.
20:15	0.12	FRAC	FRP			1		Prime up and equalize. Open well @ 4011 psi.
20:22	1.22	FRAC	FRT			1		Stage 44 Summary University 19 PW Unit 1407H Interval 12593 - 12728 Open Well Pressure 4,401 psi Max Treating Pressure 9,513 psi Max Slurry Rate 62.0 bpm Average Treating Pressure 8,416 psi Average Slurry Rate 54.7 bpm Breakdown Pressure 9,166 psi Breakdown Rate 16.7 bpm Breakdown Volume 252 gal Avg HHP 11,283 hp Final ISIP 5,349 psi Frac Gradient 0.935 psi/ft Pad Volume 588 gal Main Body Volume 148,680 gal Flush Volume 24,654 gal 100 M AZ Sand Pumped 0 lbs 100 M Brown Sand Pumped 420,900 lbs 100 M Sand Pumped 0 lbs Proppant in Formation 420,900 lbs Avg Proppant Concentration 3.59 lb/gal Max Proppant Concentration 4.00 lb/gal Load to Recover 3,559 bbls Load to Recover w/o Acid 3,559 bbls 15% HCL Spearhead 0 gal Slickwater Fluid Pumped 3,460 bbls 20# Linear Fluid Pumped 80 bbls 20# Crosslink Fluid Pumped 0 bbls Pump down volume 19 bbls

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Start	Hours	PH	OPN	Detail	Drilled Depth (ft)	NPT level	Rig Rate	Description
								<p>pump down rate 9.0 bpm Max pump down pressure 6,100 psi Fluid Temp 72.0 °F Total Pump Time 1:13 hr:min Pumps Lost During Job 1 Treatment Start Time 20:22 0:00 0:00 Treatment End Time 21:35 0:00 1:13 Diverter Slurry bbls -Pumped sand in a 0.50 PPA - 4.0 PPA ramp. Then a 4.0 PPA step - Two 20# gel sweeps 40 bbls each were pumped prior to flush. - Did not run acid this stage. - Ran a ball in place plug. - Lost pump Q408 due to mechanical problems.</p> <p>Time for Prop on Perfs 13.0 minutes Time between Stages (TBF) 1.67 Hours/min</p>
21:35	0.25	FRAC	FWL			1		<p>SIW @ 5106 psi. Bled off pressure and HO to WL. Held pause to discuss AAR on frac stage. Pick up lubricator. Remove night cap. PU guns/plug. Stab lubricator. Fill lubricator. PT lubricator to 1k-8kpsi. Open well with 5000 psi. RIH to 200' conduct checks.</p>
21:50	0.67	FRAC	WLT			1		<p>"Stage #45 Plug and Perf RIH with (4) 1' Keane guns: 2.75" OD HSC at 6SPF with 60* phased perforating guns and Downhole Technology Boss Hog composite frac plug. Tie into liner top @ . Bring on pumps at ' Pump down as follows: 3 bpm @ 4700 psi 6 bpm @ 5100 psi 9 bpm @ 5600 psi Max:9 bpm. Max: 5800 psi</p> <p>Set plug @ 12573 ft Perforate as follows: 12549' - 12550' 12503' - 12504' 12556' - 12557' 12418' - 12419' Stabilized pressure after perforating: 5126 psi Pump down volume: 15 bbl"</p>
22:30	0.65	FRAC	WLT			1		POOH
23:09	0.18	FRAC				1		<p>Shut in well with 4700 psi Break lubricator. All shots fired. MU night cap. LD tools and lub. Secure crown and wing valves. Handover from WL to frac. Grease lower master valve.</p>
23:20	0.27	FRAC	WLF			1		Align valves, pressure test to 9700 psi. bleed back to 5000 psi, open well with 4530 psi.
23:36	0.40	FRAC	FRT			1		Start Frac stage 45
<b>Total</b>	<b>24.00</b>							

## 06.00 Update

Start	Hours	PH	OPN	Detail	Drilled Depth (ft)	NPT level	Description
0:00	0.92	FRAC	FRT			1	<p>Stage 45 Summary University 19 PW Unit 1407H Interval 12415 - 12550 Open Well Pressure 4,530 psi Max Treating Pressure 9,535 psi Max Slurry Rate 59.4 bpm Average Treating Pressure 8,514 psi Average Slurry Rate 50.2 bpm Breakdown Pressure 8,750 psi Breakdown Rate 16.4 bpm</p>



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## 06.00 Update

Start	Hours	PH	OPN	Detail	Drilled Depth (ft)	NPT level	Description
							Breakdown Volume 294 gal Avg HHP 10,476 hp Final ISIP 5,268 psi Frac Gradient 0.928 psi/ft Pad Volume 672 gal Main Body Volume 148,008 gal Flush Volume 24,570 gal 100 M AZ Sand Pumped 0 lbs 100 M Brown Sand Pumped 420,460 lbs 100 M Sand Pumped 0 lbs Proppant in Formation 420,460 lbs Avg Proppant Concentration 3.60 lb/gal Max Proppant Concentration 4.00 lb/gal Load to Recover 3,539 bbls Load to Recover w/o Acid 3,539 bbls 15% HCL Spearhead 0 gal Slickwater Fluid Pumped 3,444 bbls 20# Linear Fluid Pumped 80 bbls 20# Crosslink Fluid Pumped 0 bbls Pump down volume 15 bbls pump down rate 9.0 bpm Max pump down pressure 5,800 psi Fluid Temp 72.0 ?F Total Pump Time 1:17 hr:min Pumps Lost During Job 3 Treatment Start Time 23:37 0:00 0:00 Treatment End Time 0:54 0:00 1:17 Diverter Slurry bbls -Pumped sand in a 0.50 PPA - 4.0 PPA ramp. Then a 4.0 PPA step - Two 20# gel sweeps 40 bbls each were pumped prior to flush. - Did not run acid this stage. - Ran a ball in place plug. - Lost pumps 10090, 10086, 10089 due to debree in manifold.  Time for Prop on Perfs 17.0 minutes Time between Stages (TBF) 1.67 Hours/min
0:55	0.23	FRAC	FWL			1	Handover from frac to wireline. Pick up lubricator. Remove night cap. PU tools. Stab lubricator. Fill lubricator. Pressure test lubricator to 8000 psi Open well with 4850 psi. RIH.
1:09	0.70	FRAC	WLT			1	"Stage #46 Plug and Perf RIH with (4) 1' Keane guns: 2.75" OD HSC at 6SPF with 60* phased perforating guns and Downhole Technology Boss Hog composite frac plug. Tie into liner top @ 11122. Bring on pumps at 11500'. Pump down as follows: 3 bpm @ 4600 psi 6 bpm @ 5106 psi 7 bpm @ 5400 psi Max:7 bpm. Max: 5400 psi  Set plug @ 12395 ft Perforate as follows: 12371' - 12372' 12326' - 12327' 12282' - 12283' 12237' - 12238' Stabilized pressure after perforating: 5027 psi Pump down volume: 11 bbl"
1:51	0.65	FRAC	WLT			1	POOH
2:30	0.33	FRAC	WLF			1	Shut in well with 4550 psi Break lubricator. All shots fired. MU night cap. LD tools and lub. Secure crown and wing valves. Handover from WL to frac. Grease UMW and wing valve.9 minutes

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## 06.00 Update

Start	Hours	PH	OPN	Detail	Drilled Depth (ft)	NPT level	Description
2:50	0.25	FRAC	FRP			1	Align valves pressure test to 9700 psi. Bleed back to 5000 psi. open well with 4544 psi.
3:05	1.22	FRAC	FRT			1	<p>Stage 46 Summary University 19 PW Unit 1407H Interval 12237 - 12372</p> <p>Open Well Pressure 4,544 psi Max Treating Pressure 9,482 psi Max Slurry Rate 62.3 bpm Average Treating Pressure 8,487 psi Average Slurry Rate 55.1 bpm Breakdown Pressure 8,821 psi Breakdown Rate 16.7 bpm Breakdown Volume 294 gal Avg HHP 11,462 hp Final ISIP 5,229 psi Frac Gradient 0.924 psi/ft Pad Volume 462 gal Main Body Volume 150,822 gal Flush Volume 22,890 gal 100 MAZ Sand Pumped 0 lbs 100 M Brown Sand Pumped 420,020 lbs 100 M Sand Pumped 0 lbs Proppant in Formation 420,020 lbs Avg Proppant Concentration 3.51 lb/gal Max Proppant Concentration 4.00 lb/gal Load to Recover 3,605 bbls Load to Recover w/o Acid 3,605 bbls 15% HCL Spearhead 0 gal Slickwater Fluid Pumped 3,511 bbls 20# Linear Fluid Pumped 80 bbls 20# Crosslink Fluid Pumped 0 bbls Pump down volume 14 bbls pump down rate 9.0 bpm Max pump down pressure 5,400 psi Fluid Temp 72.0 ?F Total Pump Time 1:13 hr:min Pumps Lost During Job 0 Treatment Start Time 3:05 0:00 0:00 Treatment End Time 4:18 0:00 1:13 Diverter Slurry bbls -Pumped sand in a 0.50 PPA - 4.0 PPA ramp. Then a 4.0 PPA step - Two 20# gel sweeps 40 bbls each were pumped prior to flush. - Did not run acid this stage. - Ran a ball in place plug.</p> <p>Time for Prop on Perfs 17.0 minutes Time between Stages (TBF) 1.67 Hours/min</p>
4:18		FRAC				1	<p>Handover from frac to wireline. Pick up lubricator. Remove night cap. PU tools. Stab lubricator. Fill lubricator. Pressure test lubricator to 8000 psi Open well with psi. RIH.</p>

## NPT Summary

Start Date/Time	Responsible Company	NPT Code	Failure MD (ft)	Ops Code	Type*	Equipment Type	Net time (hr)	Gross time (hr)	Severity	Status
10/17/2017 09:10				OPO	EN		1.33	1.33	1	
Description: Waiting on sand to arrive and start frac stage.						Title: NPT - Keane Frac				
Total							1.33	1.33		