Post Job Report

AMERICAN ENERGY - UTICA

Red Hill Farm MDS GR 3H

Stage : 1 OF 54

HARRISON, OH

Operations Representative:

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Engineering Manager:

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FTS International
1432 Route 519
Eighty Four, PA 15330

Customer: American Energy - Utica
Well: Red Hill Farm Mds Gr 3H
Stage: 1
Job End Date: 06/12/2015

Job Summary

Well Information

TVD:	7,301	**Top Perf:**	15,711
No. Of Perfs:	30		

Casing	Tubing
5.50" 20.00#	N/A

Pressures, Rates and Volumes

	Proposed	Actual	Max	Min
STP	9,046 psi	8,346 psi	9,306 psi	6,247 psi
Rate	80.0 bpm	79.9 bpm	90.5 bpm	18.6 bpm

	Proposed	Actual		
Clean Volume	5,772 bbls	6,336 bbls		
Slurry Volume	6,042 bbls	6,606 bbls		
Flush Volume	357 bbls	384 bbls		

	Proposed	Start	End
Frac Pumps on Location	10	15	15

Open Well:	Start Time	10:47	Pressure	1,665 psi
	Ball Seat	347 bbls	Break Down	6,430 psi
	Initial ISIP:	4,179 psi	Initial F.G.:	1.01 psi/ft
Stage Complete:	End Time	12:21	Job Time	01:30
	Final ISIP	4,179 psi	Final F.G.	1.01 psi/ft
	HHP	16,344	5 Min:	3,887 psi
	Proppant Min:	0.00	10 Min:	N/A
	Proppant Max:	2.00	15 Min:	N/A

Material Volume

Material	Proposed	Calculated	Actual	Variance
100 Mesh White	40,000	40,132	40,132	0%
30/50 White	210,000	210,315	210,315	0%
Total Proppants	250,000	250,447	250,447	0%

Material	Proposed	Calculated	Actual	Variance
0.1%-7.5% HCL	3,000	2,982	3,000	1%
CI-150	3	3	3	0%
CS-250 SI	60	64	64	0%
FE-200L	15	15	15	0%
FRW-200	180	193	192	-1%
ICI-3240	60	64	64	0%
NE-100	0	129	129	0%
NE-100W	120	0	0	0

Comments:

Chemicals discounted for data van issues

FTS International
1432 Route 519
Eighty Four, PA 15330

Customer: American Energy - Utica
Well: Red Hill Farm Mds Gr 3H
Stage: 1
Job End Date: 06/12/2015

Treatment Report

Date:	6/12/2015	District:	Washington County,PA	Quote No:	051815_035725QF	API:	34-059-24370

MIL Time	STP	Slurry BPM	Stage Clean (bbls)	Cumulative Clean (bbls)	Stage Slurry (bbls)	Cumulative Slurry (bbls)	Stage Proppant (lbs)	Cumulative Proppant (lbs)	Description	Proppant	PPA
10:47	1,665	0.0	0	0	0	0	0	0	Freshwater Open Well		0.00
10:48	5,724	11.9	21	21	21	21	0	0	Freshwater Load		0.00
10:51	5,719	10.8	71	92	71	92	0	0	7.5% HCL Acid Acid		0.00
10:59	6,830	24.5	187	279	187	279	0	0	Slickwater Load		0.00
11:04	7,159	28.9	68	347	68	347	286	286	Slickwater Proppant	100 Mesh White	0.10
11:10	6,430	18.6	0	347	0	347	0	286	Slickwater Breakdown		0.00
11:10	6,481	18.7	152	499	153	500	638	924	Slickwater Proppant	100 Mesh White	0.10
11:13	8,470	72.4	235	734	238	738	2,468	3,392	Slickwater Proppant	100 Mesh White	0.25
11:16	8,446	89.0	272	1,006	278	1,016	5,712	9,104	Slickwater Proppant	100 Mesh White	0.50
11:20	8,454	89.6	529	1,535	547	1,563	16,664	25,768	Slickwater Proppant	100 Mesh White	0.75
11:25	8,309	86.0	342	1,877	357	1,920	14,364	40,132	Slickwater Proppant	100 Mesh White	1.00
11:29	8,322	84.9	891	2,768	931	2,851	37,422	77,554	Slickwater Proppant	30/50 White	1.00
11:40	8,517	86.6	1,000	3,768	1,057	3,908	52,500	130,054	Slickwater Proppant	30/50 White	1.25
11:52	8,430	86.0	520	4,288	555	4,463	32,760	162,814	Slickwater Proppant	30/50 White	1.50
11:58	8,738	89.9	180	4,468	180	4,643	0	162,814	Slickwater Sweep		0.00
12:00	8,775	90.3	70	4,538	72	4,715	1,470	164,284	Slickwater Proppant	30/50 White	0.50
12:00	8,850	90.3	100	4,638	103	4,818	3,150	167,434	Slickwater Proppant	30/50 White	0.75
12:01	8,816	90.1	40	4,678	42	4,860	1,680	169,114	Slickwater Proppant	30/50 White	1.00
12:02	8,801	90.2	50	4,728	53	4,913	2,625	171,739	Slickwater Proppant	30/50 White	1.25
12:03	8,693	89.7	226	4,954	241	5,154	14,238	185,977	Slickwater Proppant	30/50 White	1.50
12:05	8,572	89.8	500	5,454	540	5,694	36,750	222,727	Slickwater Proppant	30/50 White	1.75
12:11	8,586	89.3	330	5,784	360	6,054	27,720	250,447	Slickwater Proppant	30/50 White	2.00
12:15	8,922	89.4	168	5,952	168	6,222	0	250,447	Slickwater Clean screws		0.00
12:17	8,886	83.4	270	6,222	270	6,492	0	250,447	Slickwater Flush		0.00
12:20	8,488	72.8	114	6,336	114	6,606	0	250,447	Freshwater Flush		0.00
12:21	4,179	0.0	0	6,336	0	6,606	0	250,447	Freshwater Shutdown		0.00
Total JobTime (HH:MM): 01:34											

Min STP:	6,247 psi	**Max STP:**	9,306 psi	**Average STP:**	8,346 psi	**5 Min:**	3,887 psi
Min Rate:	18.6 bpm	**Max Rate:**	90.5 bpm	**Average Rate:**	79.9 bpm	**10 Min:**	0 psi
Initial ISIP:	4,179 psi	**Initial F.G.:**	1.01 psi/ft	**Average HHP:**	16,344	**15 Min:**	0 psi
Final ISIP:	4,179 psi	**Final F.G.:**	1.01 psi/ft	**Customer Representative:**		Chad Andrews	
FTSI Representative:		Etuate Varea & Cody Melone					

Comments:

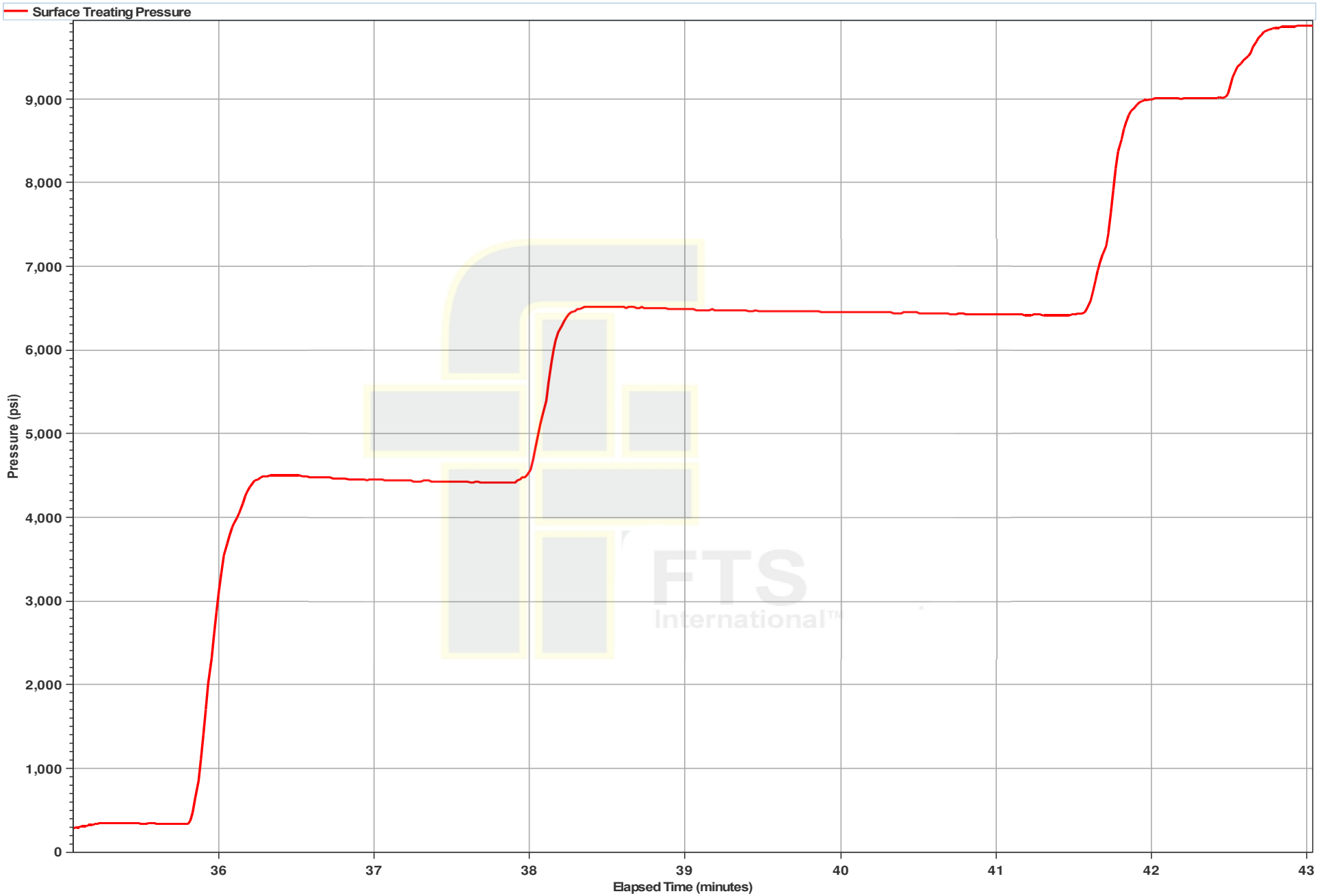
The proppant values contained in this report are calculated based on actual barrel counts and target densities. Actual total proppant usage is 250,447 lbs. Charge time is 1 hour(s) 30 minute(s). All chemicals and proppant ran as documented.

Min/Max/Avg were taken from sand stages. All chem changes from proposed were made per AEU representative request.

Ran a sweep during the 1.5ppg stage of 30/50 due to issues with the data van.

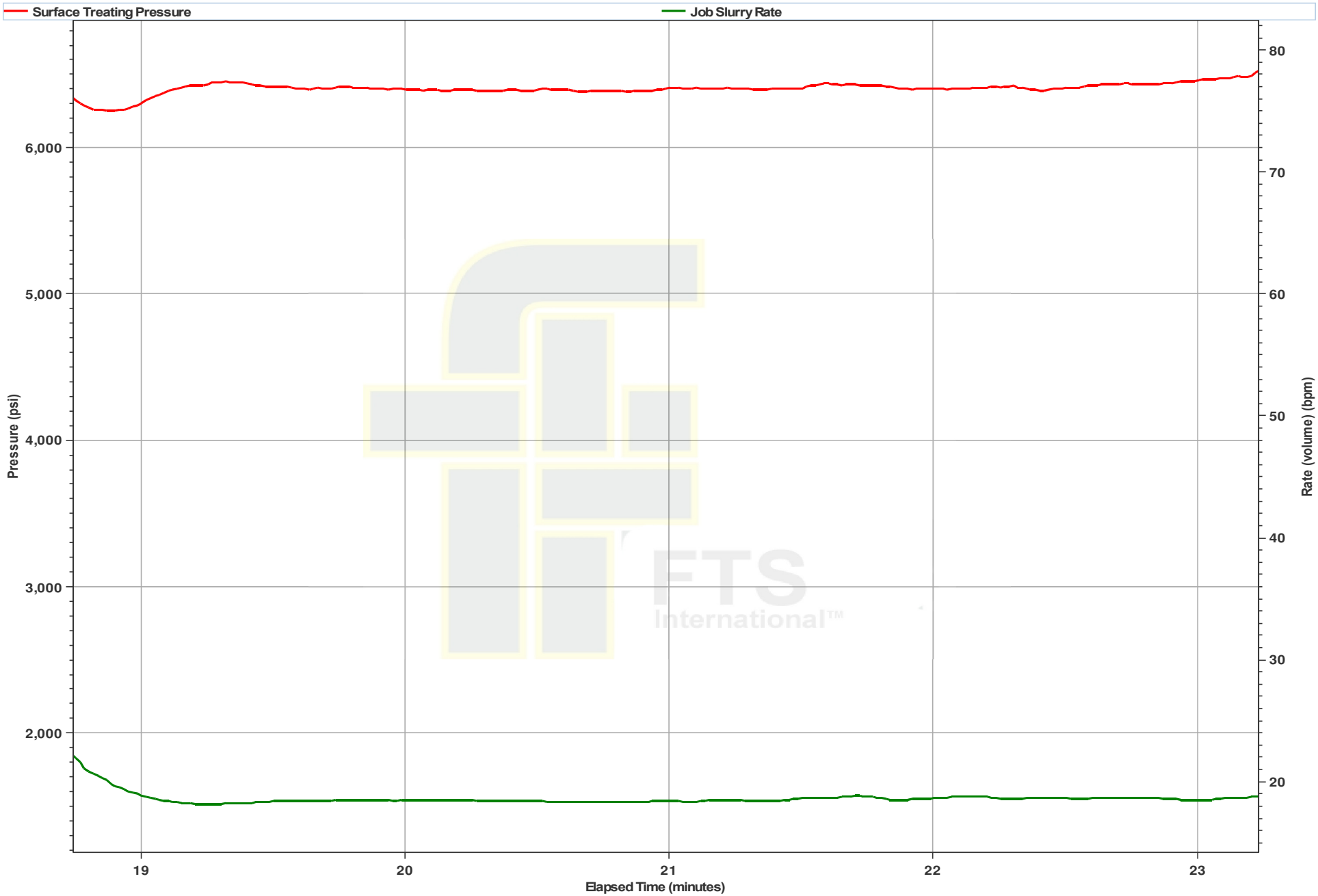
1 Minute Shutdown (psi): 4159
2 Minute Shutdown (psi): 4050
5 Minute Shutdown (psi): 3887

AEU Pressure Test



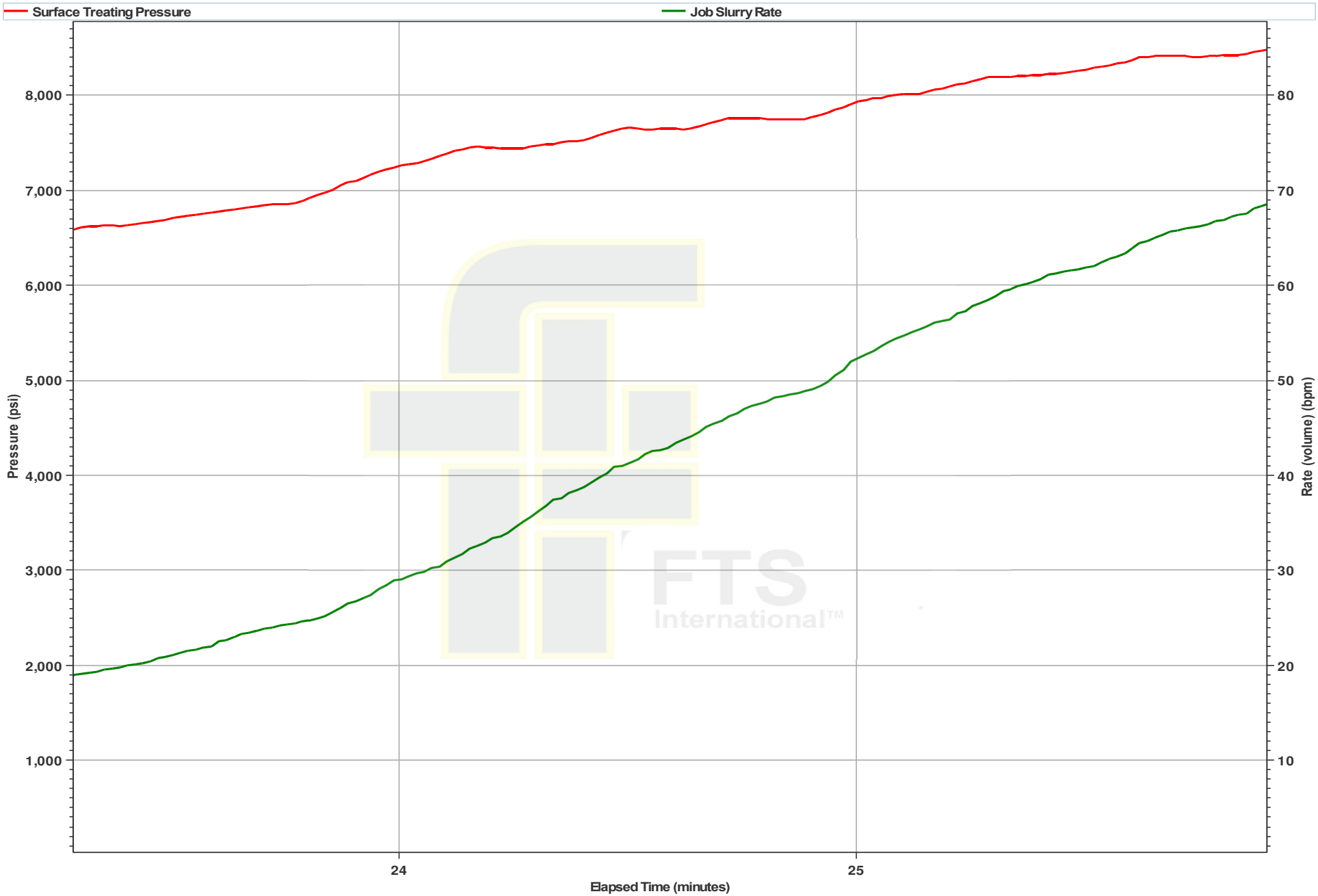
American Energy Utica Red Hill Farm MDS GF 3H Harrison Ohio Stage 1 (WF.000658.M.W03.S01-ADCT-1103) **Jun 12, 2015**

Ball Seat and Breakdown



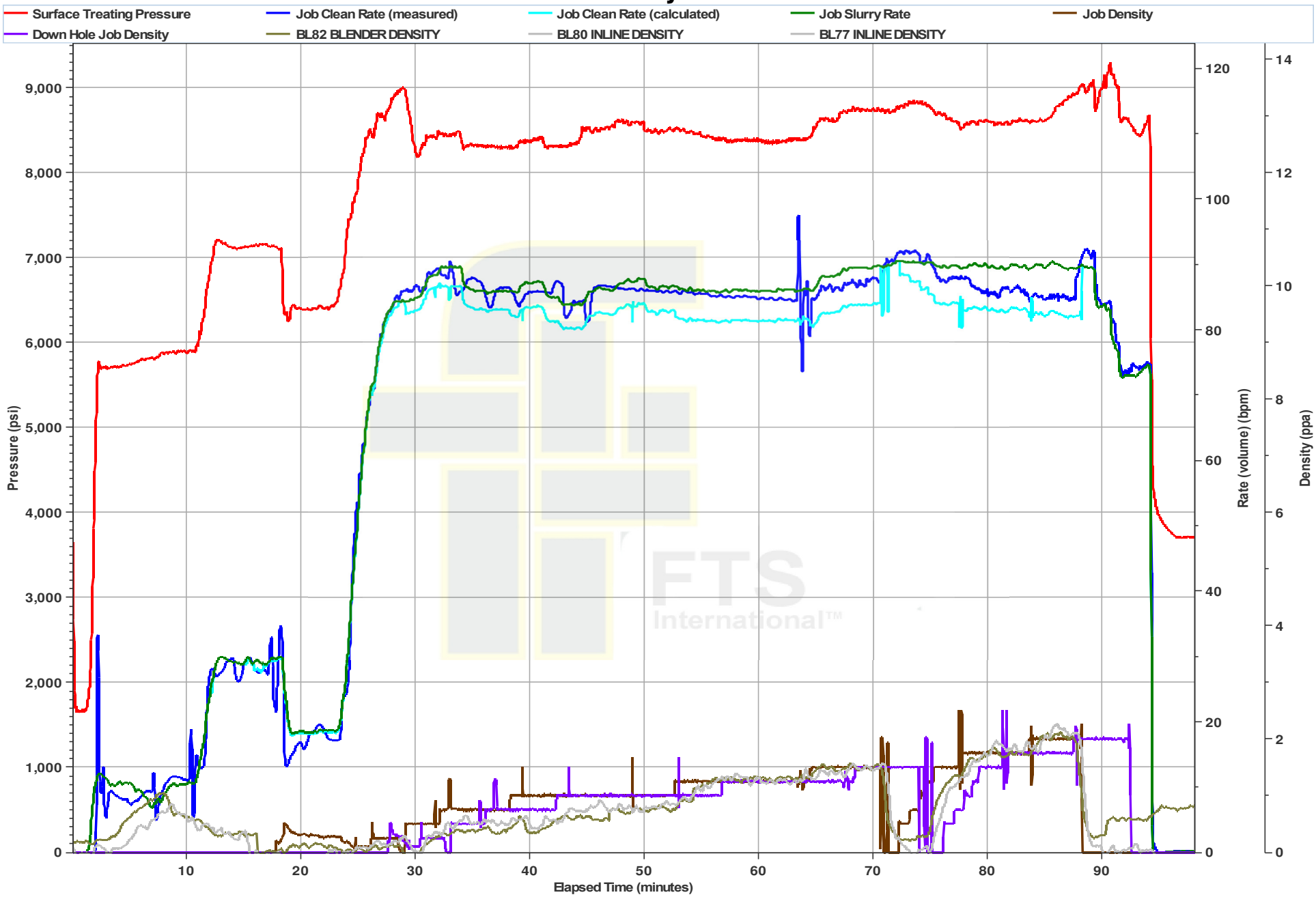
American Energy Utica Red Hill Farm MDS GF 3H Harrison Ohio Stage 1 (WF.000658.M.W03.S01-ADCT-1103) Jun 12, 2015

Acid on Perforations



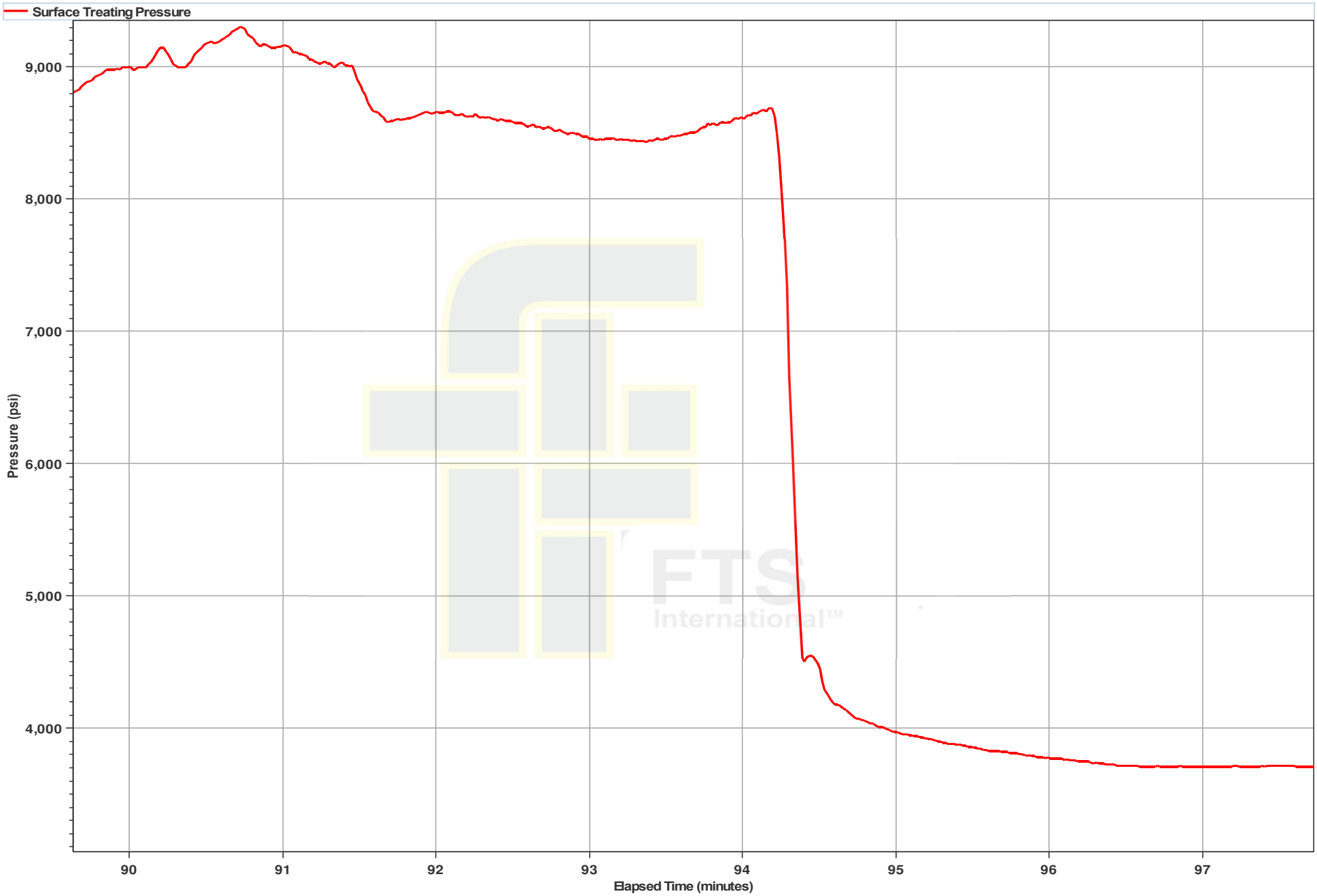
American Energy Utica Red Hill Farm MDS GF 3H Harrison Ohio Stage 1 (WF.000658.M.W03.S01-ADCT-1103) **Jun 12, 2015**

Primary Plot



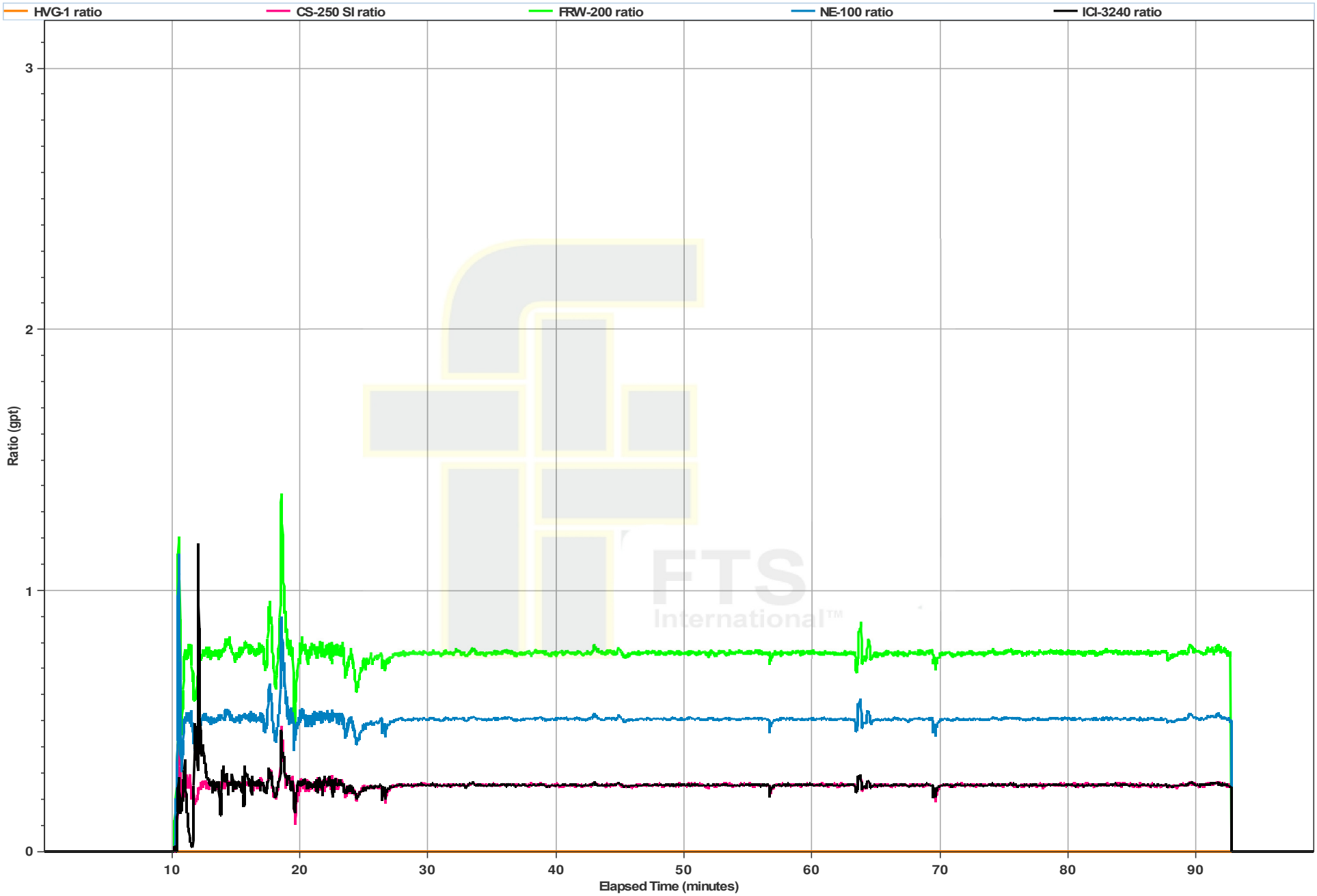
American Energy Utica Red Hill Farm MDS GF 3H Harrison Ohio Stage 1 (WF.000658.M.W03.S01-ADCT-1103) **Jun 12, 2015**

ISIP Plot



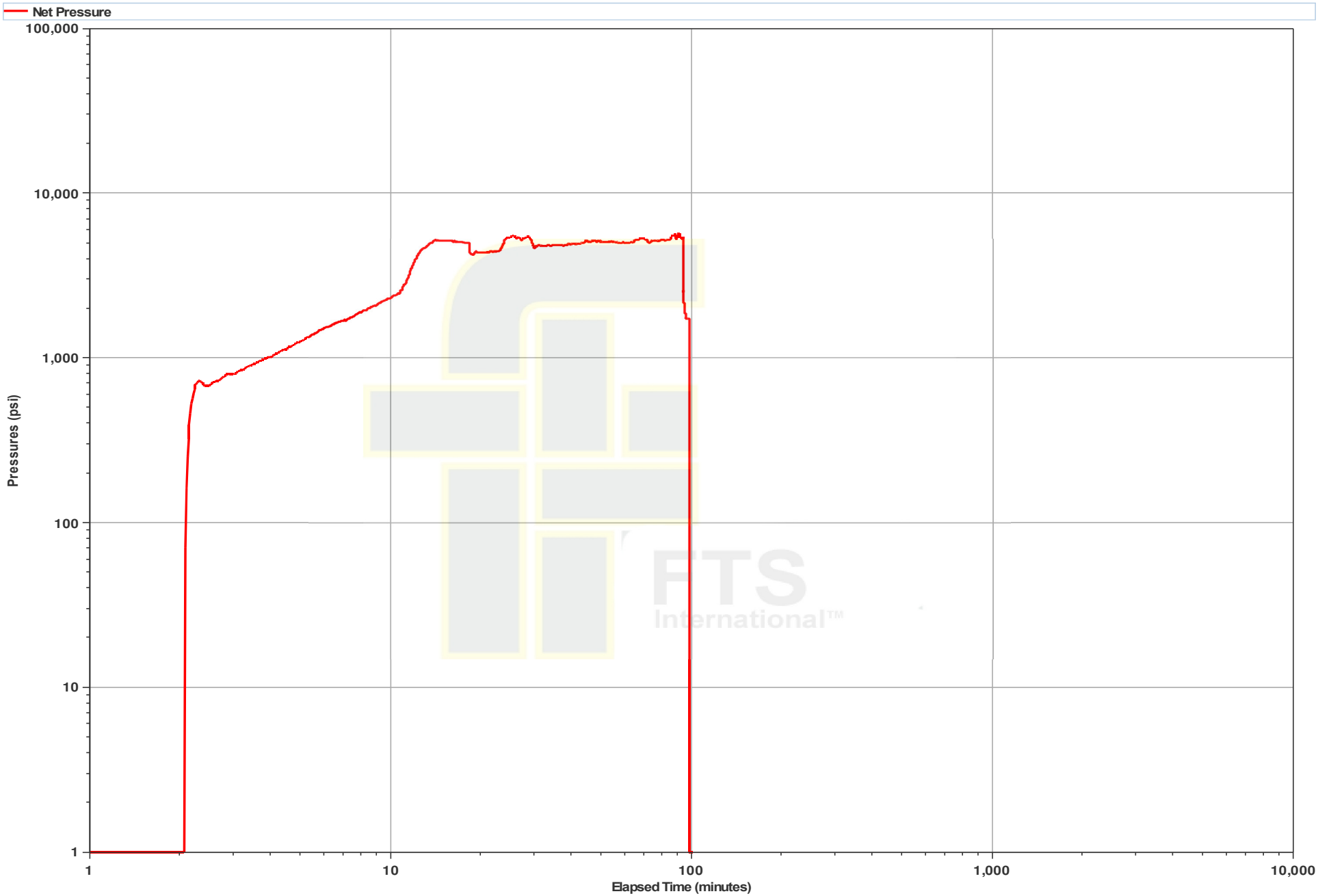
American Energy Utica Red Hill Farm MDS GF 3H Harrison Ohio Stage 1 (WF.000658.M.W03.S01-ADCT-1103) Jun 12, 2015

Chemical Plot



American Energy Utica Red Hill Farm MDS GF 3H Harrison Ohio Stage 1 (WF.000658.M.W03.S01-ADCT-1103) **Jun 12, 2015**

Net Pressure Plot



American Energy Utica Red Hill Farm MDS GF 3H Harrison Ohio Stage 1 (WF.000658.M.W03.S01-ADCT-1103) Jun 12, 2015

WATER-BASED FRAC FLUID QUALITY CONTROL
(Attachment to Post Treatment Report)

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/12/2015
Customer Name:	American Energy - Utica	Proposal #:	3H/1
Date Sampled:	6/12/2015	Water Source:	Blender Tub

Sample/Tank No.	Clarity, Color, Odor	Sample Temperature, (F)	Specific gravity	Initial pH	Chloride, ppm	Hardness, ppm	Calcium, ppm	Magnesium, ppm	Iron ppm	Hydroxide, ppm	Bicarbonate, ppm	Carbonate, ppm	Sulfate, ppm	Barium, ppm
Blender Tub	Yellow	78	1	8.1	400	190	40	36	4	0	830	0	110	0

Frac Fluid Quality Gel Testing (These Recording are to made prior to pumping job)														
Sample #														
Base Gel Type	HVG-1													
Gel Loading (lbs/1000 gal.)	2.5													
Sample Temperature, (F)	78													
Initial pH	8.1													
Visc. Reading @ 300 rpms	6													
Viscosity, (cp)	6													
Sample 1 3 min Hydration	5													
Sample 2 3 min Hydration	6													
Sample 3 3 min Hydration	6													
X-Link Vortex Closure, min:sec	n/a													
X-Link Crown, min:sec	n/a													
X-Link pH	n/a													
Gel Break Time (<2cp) mins	21													

Frac Fluid Quality Gel Testing (These Recording are to made while pumping job)														
Stage #														
Base Gel Viscosity (cp)														
X-Link pH								.						
Sample XL time, min:sec														
Sample Temperature														

Acid Quality	Percent Acid	NaOH, mLs	Specific Gravity
	28		1.14

Additional testing or documentation may be required by the customer or for frac fluid quality assurance.

Tested By: Etuate Varea

QUALITY CONTROL OF PROPPANTS

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/12/2015
Customer Name:	American Energy - Utica	Well/Stage:	3H/1
Date Sampled:	6/12/2015	DISTRICT:	Washington, PA
VENDOR:	SANTROL		

Select Proppant Type:

___ Brown	___ Ceramic	___ Other (specify)
X White	___ Bauxite	_____
___ Resin Coated	___ Texas Gold	

Sieve Analysis	100 Mesh			Sieve Analysis	30/50 Mesh		
Sample 1	24.50	grams of sample		Sample 2	25.50	grams of sample	
	Amount Retained				Amount Retained		
Sieve mesh	Gram	%		Sieve mesh	Gram	%	
			Total				Total
50	2.00	8.16	In-Size	20	0.00	0.00	In-Size
70	14.10	57.55		30	0.90	3.53	
100	5.80	23.67	91.8%	40	18.00	70.59	95.7%
120	2.00	8.16		45	4.90	19.22	
140	0.50	2.04		50	1.50	5.88	
200	0.10	0.41		70	0.20	0.78	
Pan	0.00	0.00	fines	Pan	0.00	0.00	fines
Total wt. Gram	24.50	100.00		Total wt. Gram	25.50	100.00	

Tested By: Etuate Varea

Post Job Report

AMERICAN ENERGY - UTICA

Red Hill Farm MDS GR 3H

Stage : 2 OF 54

HARRISON, OH

Operations Representative:

Name:	David Knapp
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Sales Representative:

Name:	Bruce Batthern
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Cell:	
Email:	BRUCE.BATTHERN@FTSI.COM

Engineering Manager:

Name:	Thaddeus Craun
Office:	817-832-8782
Fax:	724-743-7719
Cell:	
Email:	THADDEUS.CRAUN@FTSI.COM

FTS International
[illegible]
Eighty Four, PA [illegible]

FTS INTERNATIONAL

Customer: American Energy - Utica
Well: Red Hill Farm Bla 6r 3H
Stage: 2
Job End Date: [illegible]

Job Summary

Well Information

TVD:	7,301	Top Perf:	15,039
No. Of Perfs:	80		

Casing	Tubing
[illegible]	n/A

Pressures, Rates and Volumes

	Proposed	Actual	Max	Min
STP	[illegible] psi	[illegible] psi	[illegible] psi	[illegible] psi
Rate	[illegible] bpm	61.1 bpm	[illegible] bpm	[illegible] bpm

	Proposed	Actual		
Clean Volume	[illegible] bbls	[illegible] bbls		
Slurry Volume	[illegible] bbls	[illegible] bbls		
Flush Volume	357 bbls	405 bbls		

	Proposed	Start	End
Free Pumps on Location	19	15	14

Open Well:	Start Time	[illegible]	Pressure	[illegible] psi
	Bd Dwn	[illegible] bbls	Break Down	[illegible] psi
	Initial ISIP:	[illegible] psi	Initial F.G.:	[illegible] psi/ft
Stage Complete:	End Time	[illegible]	Job Time	[illegible]
	Final ISIP	[illegible] psi	Final F.G.	[illegible] psi/ft
	ISIP	17,377	5 Min:	[illegible] psi
	Pressure Min:	[illegible]	10 Min:	N/A
	Pressure Max:	[illegible]	15 Min:	N/A

Material Volume

Material	Proposed	Calculated	Actual	Variance
100 Mesh White	[illegible]	[illegible]	[illegible]	0%
30/50 White	[illegible]	211,833	211,833	0%
Total Proppants	[illegible]	[illegible]	[illegible]	0%

Material	Proposed	Calculated	Actual	Variance
8.1%-7.5% HCL	[illegible]	2,042	[illegible]	1%
[illegible]	3	3	3	0%
[illegible]	[illegible]	82	61	-26%
FE-[illegible]	15	16	15	0%
[illegible]	140	105	102	-27%
[illegible]	[illegible]	82	61	-25%
[illegible]	4	125	133	25%
[illegible]	125	1	0	4

Comments:

Pumpdown Information:
Total Bbls: 208
Max Pressure (psi): 5862
Max Rate (bpm): 15

Treatment Report

Date	[illegible]	Statelate	Washington County,PA	Basin Size	[illegible]	API#	[illegible]

Elt. Time	BTP	Slurry BPM	Slurry (bbls)	Cumulative Slurry (bbls)	Slurry (bbls)	Cumulative Slurry (bbls)	Slurry Proppant (lbs)	Cumulative Proppant (lbs)	Description	Proppant	PPA
21:23	2,[illegible]	11.0	12	12	12	12	0	0	Freshwater Open Hole		0.00
21:24	6,[illegible]	11.1	3	21	3	21	0	0	Freshwater Breakdown		0.00
21:25	7,[illegible]	11.1	71	92	71	92	0	0	7.5% HCL Acid Add		0.00
21:31	3,[illegible]	23.3	319	411	319	411	0	0	Slickwater Pad		0.00
21:39	3,716	69.1	221	631	222	633	630	630	Slickwater Proppant	100 Mesh White	0.15
21:53	3,313	70.4	221	852	224	857	2,221	2,851	Slickwater Proppant	100 Mesh White	0.25
21:55	3,[illegible]	74.1	295	1,147	292	1,150	3,169	6,444	Slickwater Proppant	100 Mesh White	0.50
21:01	3,101	73.8	434	1,581	443	1,597	13,571	23,115	Slickwater Proppant	100 Mesh White	0.75
21:05	3,077	84.0	273	1,857	283	2,880	19,782	36,897	Slickwater Proppant	100 Mesh White	1.00
22:09	3,055	86.6	575	2,432	615	2,995	39,783	76,647	Slickwater Proppant	30/50 White	1.00
22:12	3,711	86.4	1,[illegible]	3,834	1,[illegible]	5,574	52,[illegible]	129,[illegible]	Slickwater Proppant	30/50 White	1.25
22:23	3,[illegible]	90.0	663	4,[illegible]	613	4,[illegible]	54,[illegible]	182,[illegible]	Slickwater Proppant	30/50 White	1.50
22:25	3,[illegible]	90.6	504	5,189	544	5,634	37,[illegible]	219,[illegible]	Slickwater Proppant	30/50 White	1.75
22:33	3,[illegible]	90.3	371	5,[illegible]	403	5,037	31,[illegible]	250,[illegible]	Slickwater Proppant	30/50 White	2.00
22:35	3,[illegible]	90.0	169	5,734	169	5,[illegible]	0	250,[illegible]	Slickwater Open Hole		0.00
22:37	3,[illegible]	90.4	300	6,034	300	6,[illegible]	0	250,[illegible]	Slickwater Flush		0.00
22:39	3,[illegible]	70.0	100	6,139	100	6,[illegible]	0	250,[illegible]	Freshwater Flush		0.00
22:39	3,[illegible]	0.0	0	6,139	0	6,[illegible]	0	250,[illegible]	Freshwater Breakdown		0.00
Total Job/Time (HH:MM): 01:30											

Min BTP:	3,[illegible] psi	Max BTP:	8,[illegible] psi	Average BTP:	3,[illegible] psi	5 Min:	4,[illegible] psi
Min Rate:	[illegible] bpm	Max Rate:	[illegible] bpm	Average Rate:	[illegible] bpm	10 Min:	0 psi
Initial ISIP:	2,[illegible] psi	Initial F.G.:	1.[illegible] psi/ft	Average ISIP:	17,[illegible]	15 Min:	0 psi
Final ISIP:	2,[illegible] psi	Final F.G.:	1.[illegible] psi/ft	Customer Representative:		Kevin Wetzel	
FTS Representative:		Travis Wilson & William Mohr					

Comments:

The proppant values contained in this report are calculated based on actual barrel counts and target densities. Actual total proppant usage is 250,449 lbs. Charge time is 1 hour(s) 30 minute(s). All chemicals and proppant ran as documented.

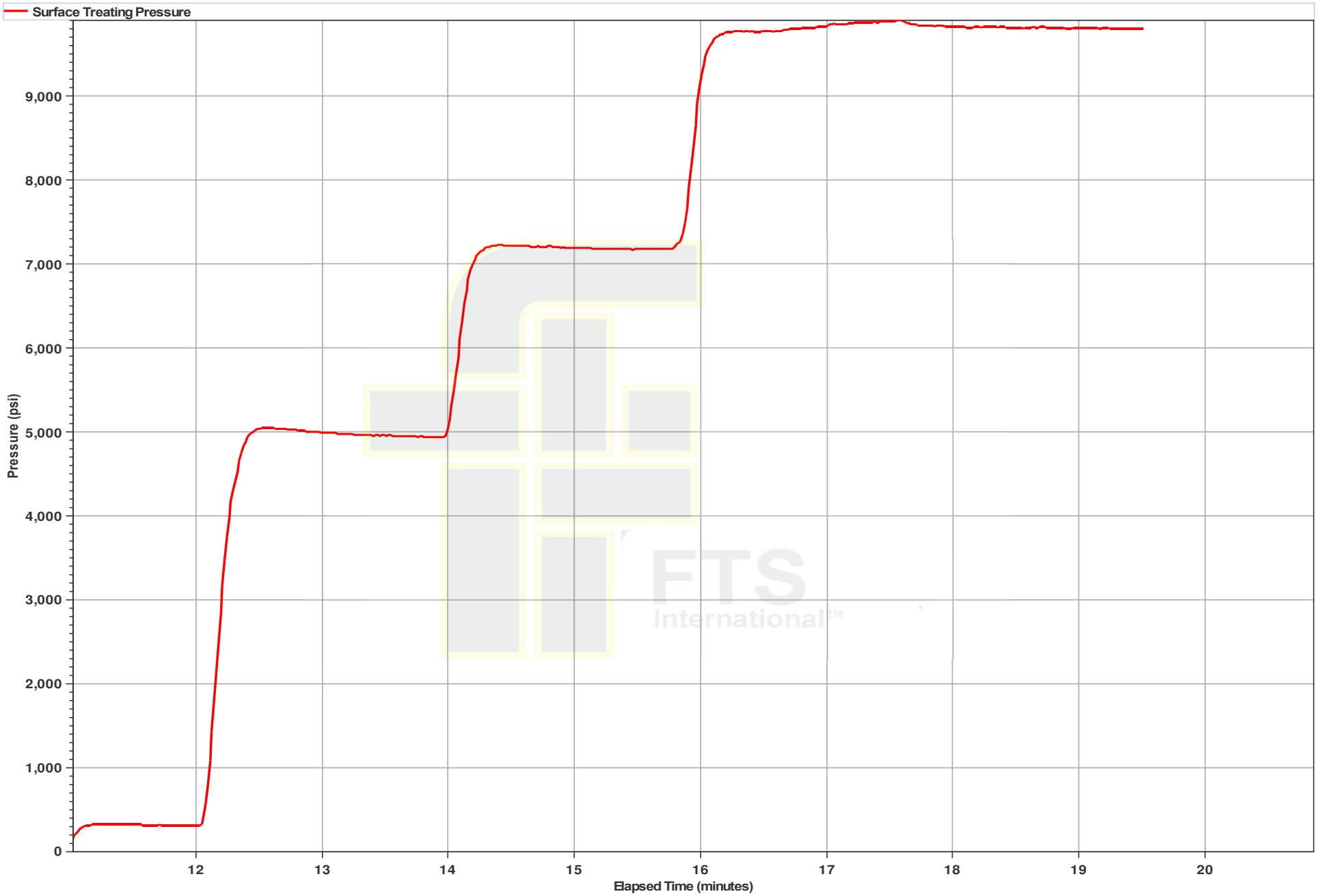
Min/Max/Avg were taken from sand stages. All chem changes from proposed were made per AEU representative request.

1 Minute Shutdown (psi): 4735
2 Minute Shutdown (psi): 4589
5 Minute Shutdown (psi): 4436

Chemical Changes:

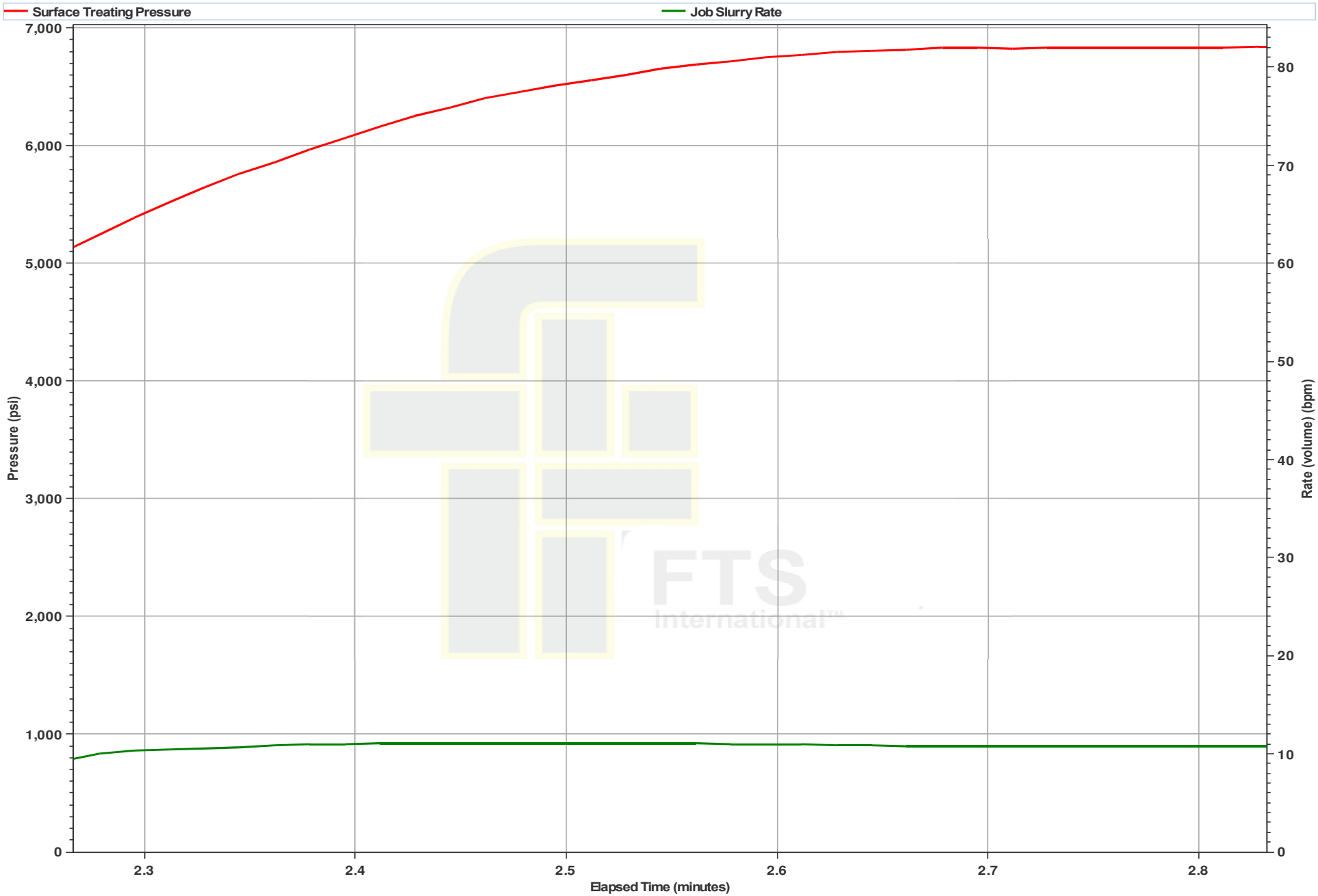
Chemical Name	Chemical Loading	Cumulative Gallons
FRW-200	1.00	6,034

AEU Pressure Test



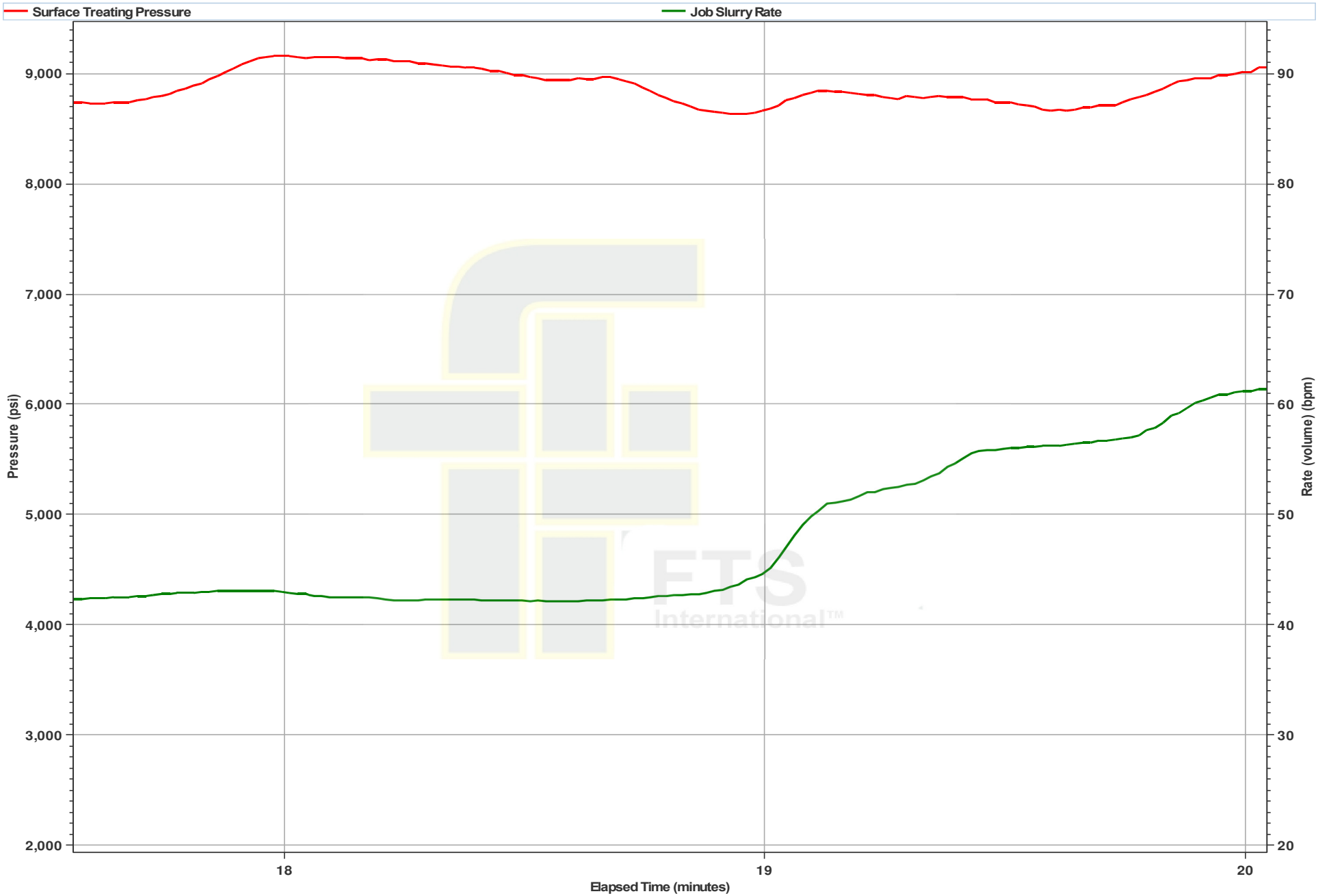
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 2 (WF. 000658.M.W03.S02-aDCT-1103) **Jun 12, 2015**

Ball Seat and Breakdown



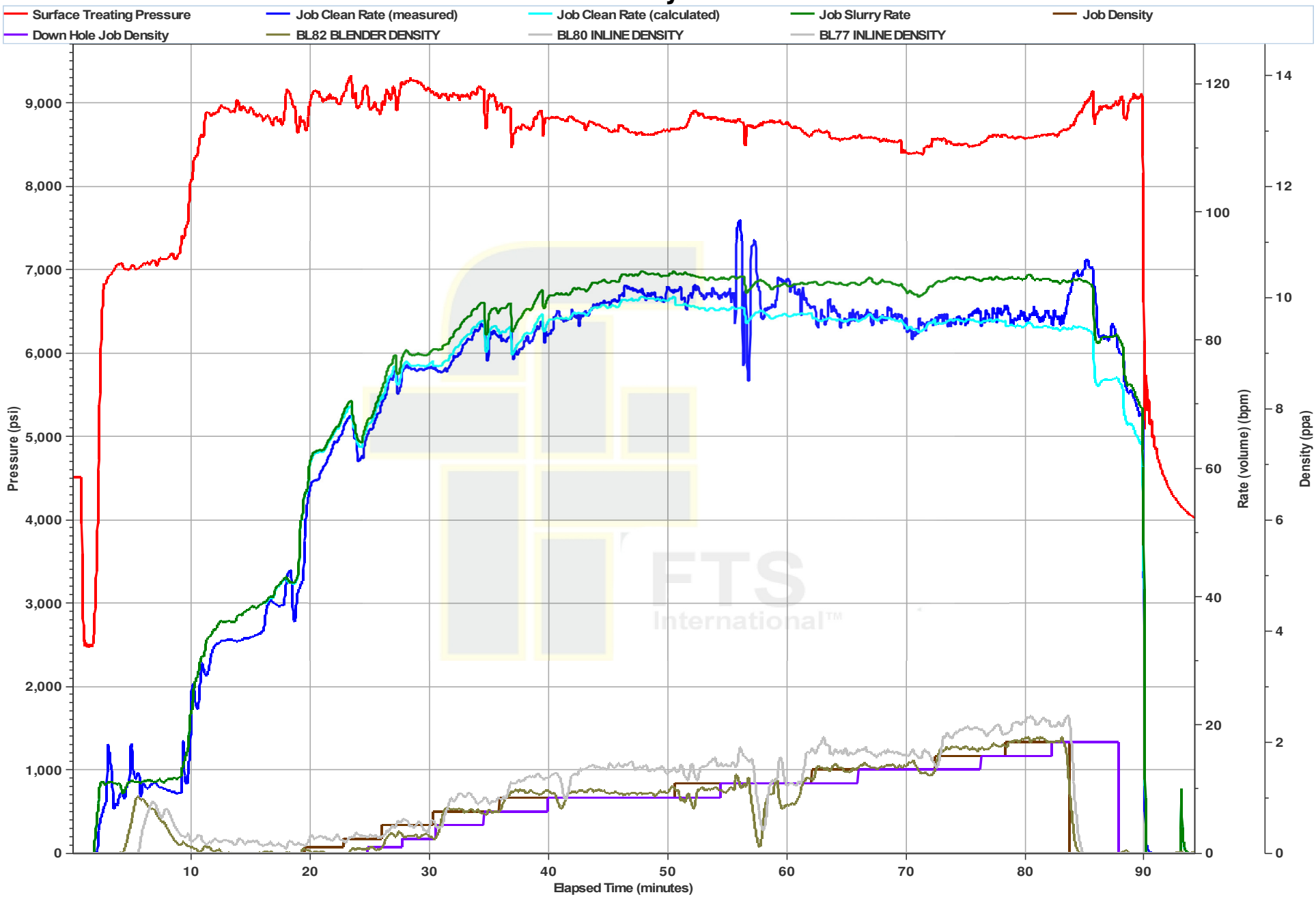
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 2 (WF. 000658.M.W03.S02-aDCT-1103) **Jun 12, 2015**

Acid on Perforations



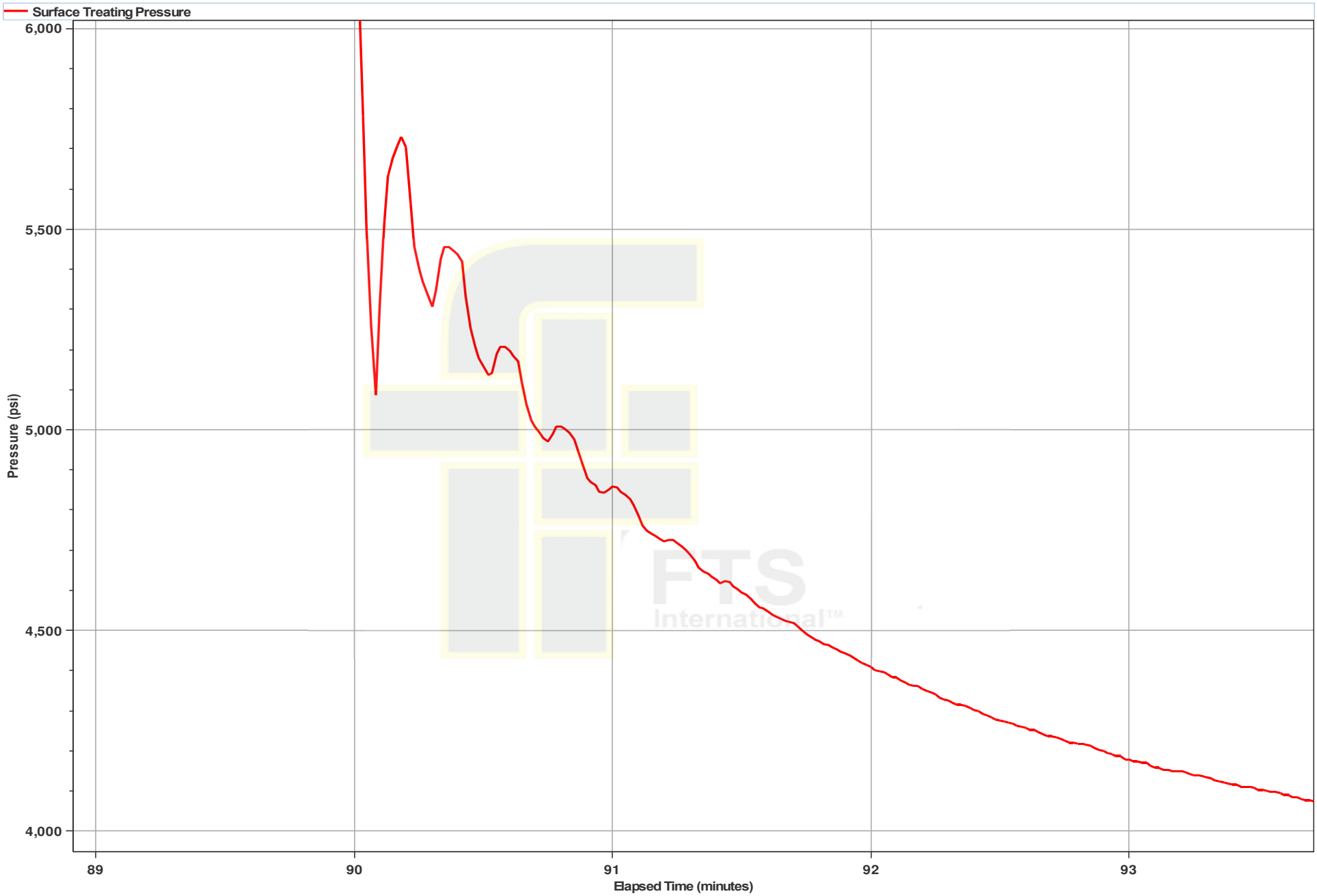
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 2 (WF. 000658.M.W03.S02-aDCT-1103) **Jun 12, 2015**

Primary Plot



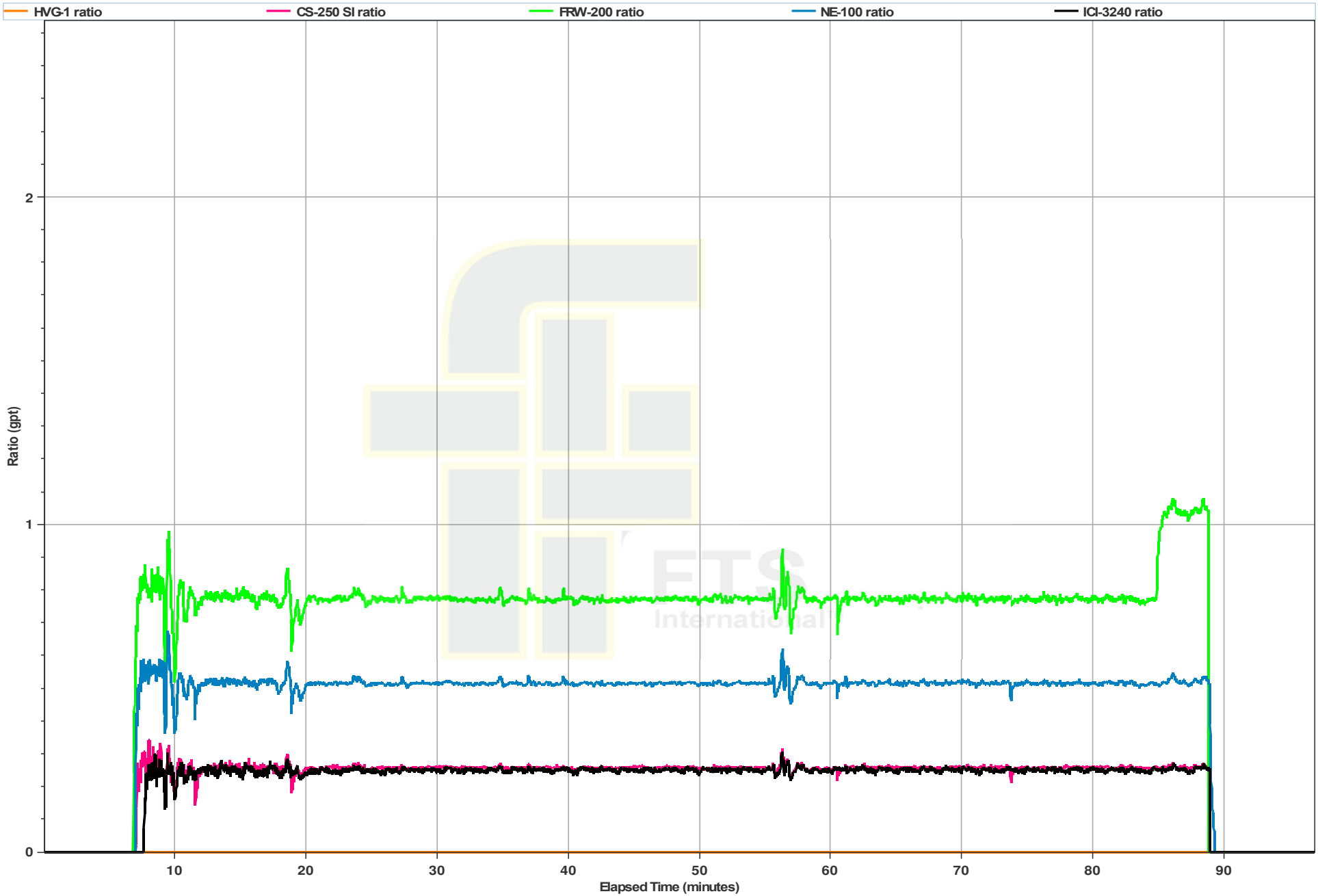
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 2 (WF. 000658.M.W03.S02-aDCT-1103) **Jun 12, 2015**

ISIP Plot



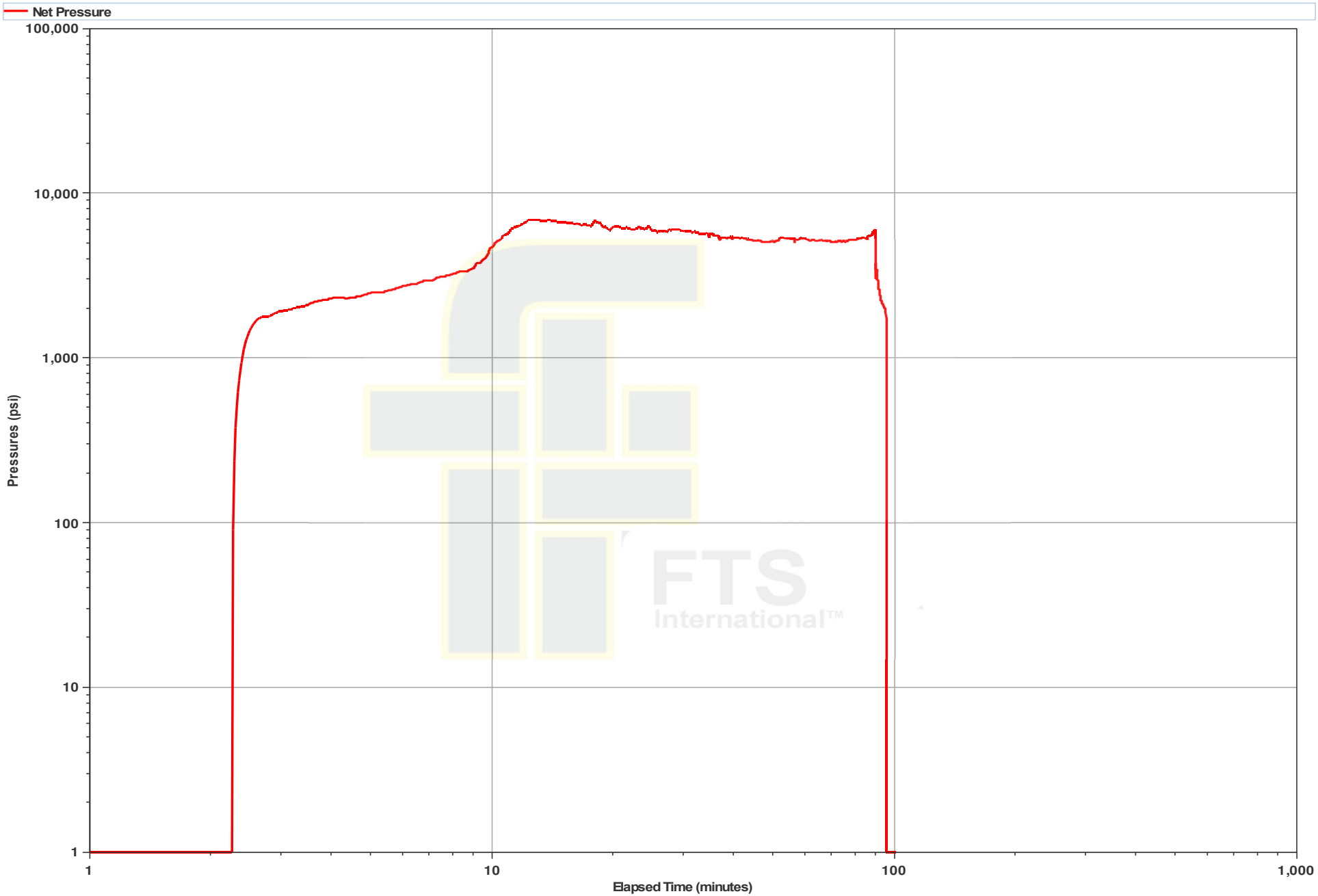
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 2 (WF. 000658.M.W03.S02-aDCT-1103) Jun 12, 2015

Chemical Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 2 (WF. 000658.M.W03.S02-aDCT-1103) **Jun 12, 2015**

Net Pressure Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 2 (WF. 000658.M.W03.S02-aDCT-1103) Jun 12, 2015

WATER-BASED FRAC FLUID QUALITY CONTROL
(Attachment to Post Treatment Report)

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/12/2015
Customer Name:	American Energy - Utica	Proposal #:	2H/2
Date Sampled:	6/12/2015	Water Source:	Working Tank

Sample/Tank No.	Clarity, Color, Odor	Sample Temperature, (F)	Specific gravity	Initial pH	Chloride, ppm	Hardness, ppm	Calcium, ppm	Magnesium, ppm	Iron ppm	Hydroxide, ppm	Bicarbonate, ppm	Carbonate, ppm	Sulfate, ppm	Barium, ppm
Working Tank	Clear	72	1	7.8	60	300	80	53	4	0	830	0	110	0

Frac Fluid Quality Gel Testing (These Recording are to made prior to pumping job)														
Sample #														
Base Gel Type	HVG-1													
Gel Loading (lbs/1000 gal.)	2.5													
Sample Temperature, (F)	72													
Initial pH	8.1													
Visc. Reading @ 300 rpms	6.5													
Viscosity, (cp)	6.5													
Sample 1 3 min Hydration	4													
Sample 2 3 min Hydration	6													
Sample 3 3 min Hydration	6.5													
X-Link Vortex Closure, min:sec	n/a													
X-Link Crown, min:sec	n/a													
X-Link pH	n/a													
Gel Break Time (<2cp) mins	19													

Frac Fluid Quality Gel Testing (These Recording are to made while pumping job)														
Stage #														
Base Gel Viscosity (cp)														
X-Link pH								.						
Sample XL time, min:sec														
Sample Temperature														

Acid Quality	Percent Acid	NaOH, mLs	Specific Gravity
	28		1.14

Additional testing or documentation may be required by the customer or for frac fluid quality assurance.

Tested By: Travis Wilson

QUALITY CONTROL OF PROPPANTS

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/12/2015
Customer Name:	American Energy - Utica	Well/Stage:	2H/2
Date Sampled:	6/12/2015	DISTRICT:	Washington, PA
VENDOR:	SANTROL		

Select Proppant Type:

____ Brown	____ Ceramic	____ Other (specify)
X White	____ Bauxite	
____ Resin Coated	____ Texas Gold	

Sieve Analysis	100 Mesh			Sieve Analysis	30/50 Mesh		
Sample 1	24.80	grams of sample		Sample 2	24.80	grams of sample	
	Amount Retained				Amount Retained		
Sieve mesh	Gram	%		Sieve mesh	Gram	%	
			Total				Total
50	0.50	2.02	In-Size	20	0.00	0.00	In-Size
70	13.40	54.03		30	0.70	2.82	
100	5.80	23.39	97.2%	40	18.20	73.39	94.4%
120	3.50	14.11		45	3.90	15.73	
140	0.80	3.23		50	1.30	5.24	
200	0.60	2.42		70	0.60	2.42	
Pan	0.20	0.81	fines	Pan	0.10	0.40	fines
Total wt. Gram	24.80	100.00		Total wt. Gram	24.80	100.00	

Tested By: Travis Wilson

Post Job Report

AMERICAN ENERGY - UTICA

Red Hill Farm MDS GR 3H

Stage : 3 OF 54

HARRISON, OH

Operations Representative:

Name:	**David Knapp**
Office:	**570-327-4881**
Fax:	**724-743-7719**
Cell:	
Email:	**DAVID.KNAPP@FTSI.COM**

Sales Representative:

Name:	**Bruce Matthews**
Office:	**405-574-3981**
Fax:	**405-767-1288**
Cell:	
Email:	**BRUCE.MATTHEWS@FTSI.COM**

Engineering Manager:

Name:	**Thaddeus Craun**
Office:	**817-682-8702**
Fax:	**724-743-7719**
Cell:	
Email:	**THADDEUS.CRAUN@FTSI.COM**

FTS International
1432 Route 519
Eighty Four, PA 15330

Customer: American Energy - Utica
Well: Red Hill Farm Mds Gr 3H
Stage: 3
Job End Date: 06/13/2015

Job Summary

Well Information

TVD:	7,301	**Top Perf:**	15,407
No. Of Perfs:	30		

Casing	Tubing
5.50" 20.00#	N/A

Pressures, Rates and Volumes

	Proposed	Actual	Max	Min
STP	9,046 psi	8,763 psi	9,318 psi	6,607 psi
Rate	80.0 bpm	80.6 bpm	90.5 bpm	26.0 bpm

	Proposed	Actual		
Clean Volume	5,772 bbls	5,962 bbls		
Slurry Volume	6,042 bbls	6,233 bbls		
Flush Volume	357 bbls	345 bbls		

	Proposed	Start	End
Frac Pumps on Location	10	14	14

Open Well:	Start Time	06:45	Pressure	2,685 psi
	Ball Seat	317 bbls	Break Down	6,965 psi
	Initial ISIP:	4,726 psi	Initial F.G.:	1.08 psi/ft
Stage Complete:	End Time	08:16	Job Time	01:30
	Final ISIP	4,726 psi	Final F.G.	1.08 psi/ft
	HHP	17,311	5 Min:	4,072 psi
	Proppant Min:	0.00	10 Min:	N/A
	Proppant Max:	2.00	15 Min:	N/A

Material Volume

Material	Proposed	Calculated	Actual	Variance
100 Mesh White	40,000	37,935	39,164	3%
30/50 White	210,000	213,633	210,633	-1%
Total Proppants	250,000	251,568	249,797	-1%

Material	Proposed	Calculated	Actual	Variance
0.1%-7.5% HCL	3,000	2,982	3,000	1%
CI-150	3	3	3	0%
CS-250 SI	60	60	60	0%
FE-200L	15	15	15	0%
FRW-200	180	209	210	0%
ICI-3240	60	60	60	0%
NE-100	0	121	121	0%
NE-100W	120	0	0	0

Comments:

Pumpdown Info:
Total Volume (bbls) : 336
Max Pressure (psi) : 6806
Max Rate (bpm) : 16.3

FTS International
1432 Route 519
Eighty Four, PA 15330

Customer: American Energy - Utica
Well: Red Hill Farm Mds Gr 3H
Stage: 3
Job End Date: 06/13/2015

Treatment Report

Date:	6/13/2015	District:	Washington County,PA	Quote No:	051815_035725QF	API:	34-059-24370

MIL Time	STP	Slurry BPM	Stage Clean (bbls)	Cumulative Clean (bbls)	Stage Slurry (bbls)	Cumulative Slurry (bbls)	Stage Proppant (lbs)	Cumulative Proppant (lbs)	Description	Proppant	PPA
06:45	2,685	0.0	0	0	0	0	0	0	Freshwater Open Well		0.00
06:46	4,991	10.4	25	25	25	25	0	0	Freshwater Load		0.00
06:50	5,891	10.8	71	96	71	96	0	0	7.5% HCL Acid Acid		0.00
06:55	7,404	26.9	116	212	116	212	0	0	Slickwater Load		0.00
07:01	6,858	26.2	105	317	105	317	441	441	Slickwater Proppant	100 Mesh White	0.10
07:05	6,965	26.1	0	317	0	317	0	441	Slickwater Breakdown		0.00
07:05	6,789	26.0	111	428	112	429	699	1,140	Slickwater Proppant	100 Mesh White	0.10 - 0.20
07:08	7,970	59.4	214	642	216	645	2,247	3,387	Slickwater Proppant	100 Mesh White	0.25
07:11	8,888	75.4	256	898	262	907	5,914	9,301	Slickwater Proppant	100 Mesh White	0.50 - 0.60
07:14	9,017	87.0	429	1,327	444	1,351	13,514	22,815	Slickwater Proppant	100 Mesh White	0.75
07:20	8,856	89.2	360	1,687	376	1,727	15,120	37,935	Slickwater Proppant	100 Mesh White	1.00
07:24	8,778	89.8	876	2,563	916	2,643	36,792	74,727	Slickwater Proppant	30/50 White	1.00
07:34	8,933	89.9	650	3,213	687	3,330	34,125	108,852	Slickwater Proppant	30/50 White	1.25
07:41	9,090	83.9	350	3,563	370	3,700	18,375	127,227	Slickwater Proppant	30/50 White	1.25
07:46	8,966	81.5	857	4,420	915	4,615	53,991	181,218	Slickwater Proppant	30/50 White	1.50
07:58	8,978	85.0	500	4,920	540	5,155	36,750	217,968	Slickwater Proppant	30/50 White	1.75
08:03	8,965	86.9	400	5,320	436	5,591	33,600	251,568	Slickwater Proppant	30/50 White	2.00
08:08	9,000	86.7	297	5,617	297	5,888	0	251,568	Slickwater Clean screws		0.00
08:12	9,160	85.7	240	5,857	240	6,128	0	251,568	Slickwater Flush		0.00
08:15	9,190	81.5	105	5,962	105	6,233	0	251,568	Freshwater Flush		0.00
08:16	4,726	0.0	0	5,962	0	6,233	0	251,568	Freshwater Shutdown		0.00
Total JobTime (HH:MM): 01:31											

Min STP:	6,607 psi	**Max STP:**	9,318 psi	**Average STP:**	8,763 psi	**5 Min:**	4,072 psi
Min Rate:	26.0 bpm	**Max Rate:**	90.5 bpm	**Average Rate:**	80.6 bpm	**10 Min:**	0 psi
Initial ISIP:	4,726 psi	**Initial F.G.:**	1.08 psi/ft	**Average HHP:**	17,311	**15 Min:**	0 psi
Final ISIP:	4,726 psi	**Final F.G.:**	1.08 psi/ft	**Customer Representative:**		Malcolm Trayhan	
FTSI Representative:		Etuate Varea & Jason McCoskey					

Comments:

The proppant values contained in this report are calculated based on actual barrel counts and target densities. Actual total proppant usage is 249,797 lbs. Charge time is 1 hour(s) 30 minute(s). All chemicals and proppant ran as documented.

Min/Max/Avg were taken from sand stages. All chem changes from proposed were made per AEU representative request.

1 Minute Shutdown (psi): 4690
2 Minute Shutdown (psi): 4520
5 Minute Shutdown (psi): 4072

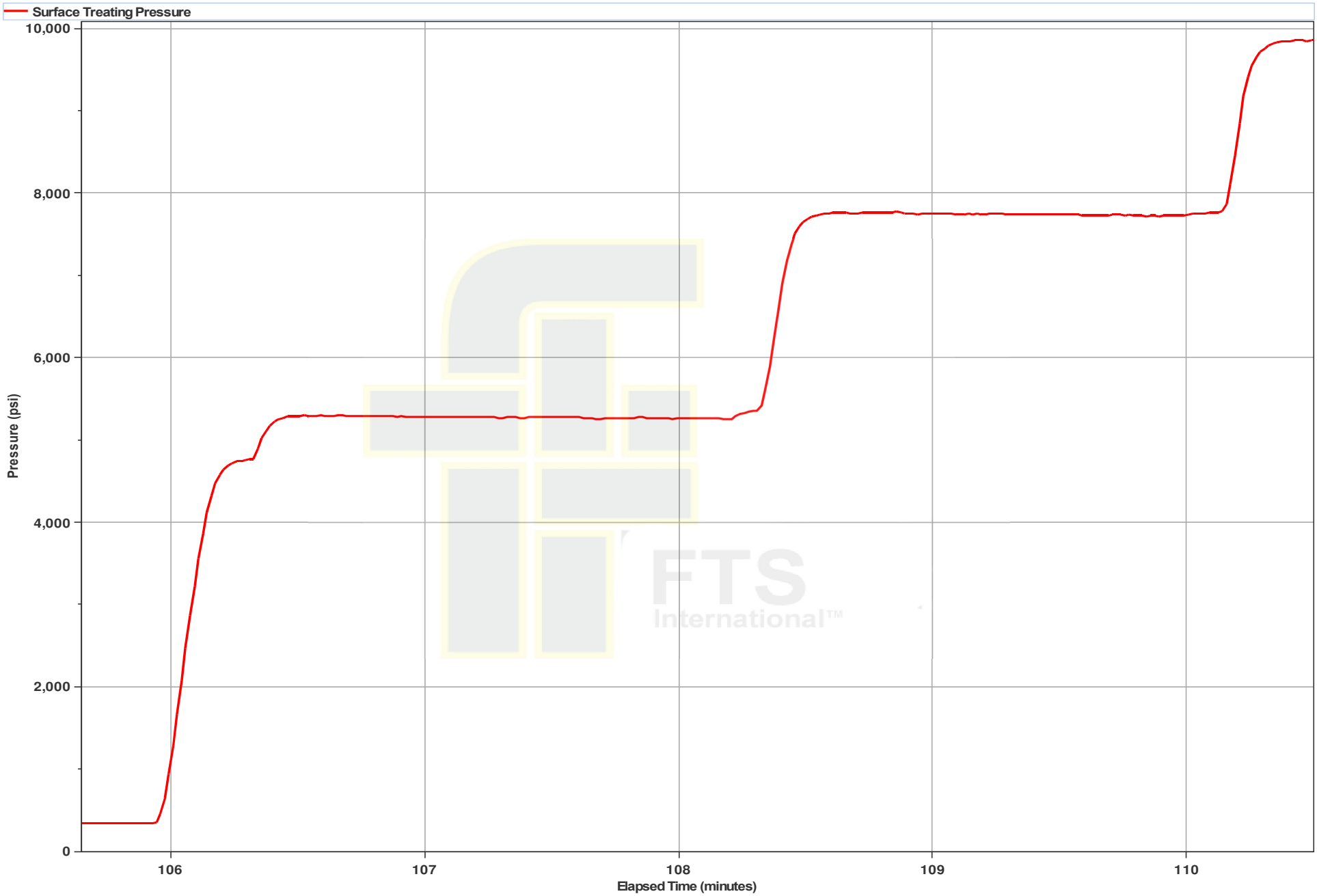
Chemical Changes:

FTS International
1432 Route 519
Eighty Four, PA 15330

Customer: American Energy - Utica
Well: Red Hill Farm Mds Gr 3H
Stage: 3
Job End Date: 06/13/2015

Chemical Name	Chemical Loading	Cumulative Clean
FRW-200	1.00	3,563

AEU Pressure Test

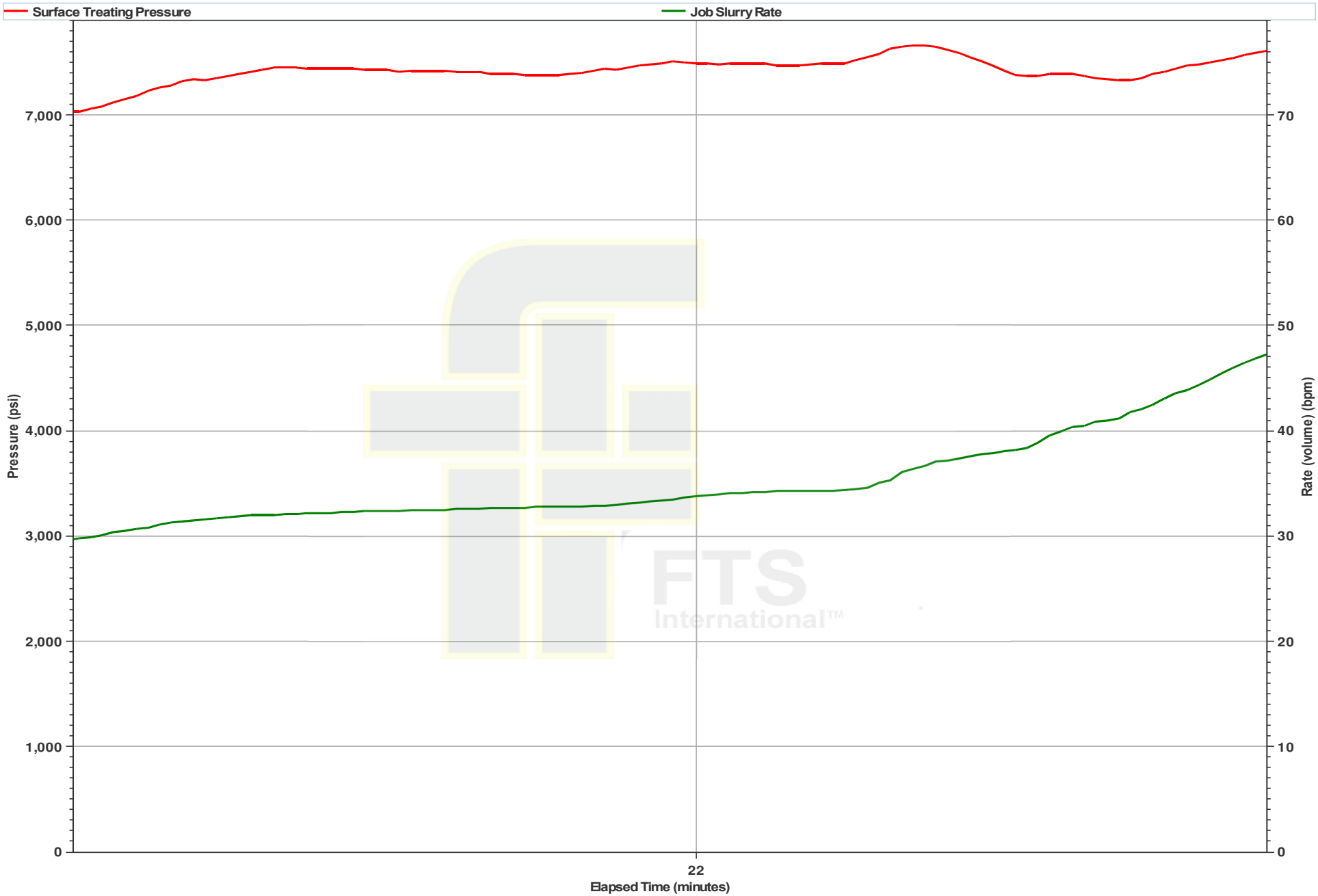


American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 3 (WF. 000658.M.W03.S03-aDCT-1103) Jun 13, 2015

Ball Seat and Breakdown

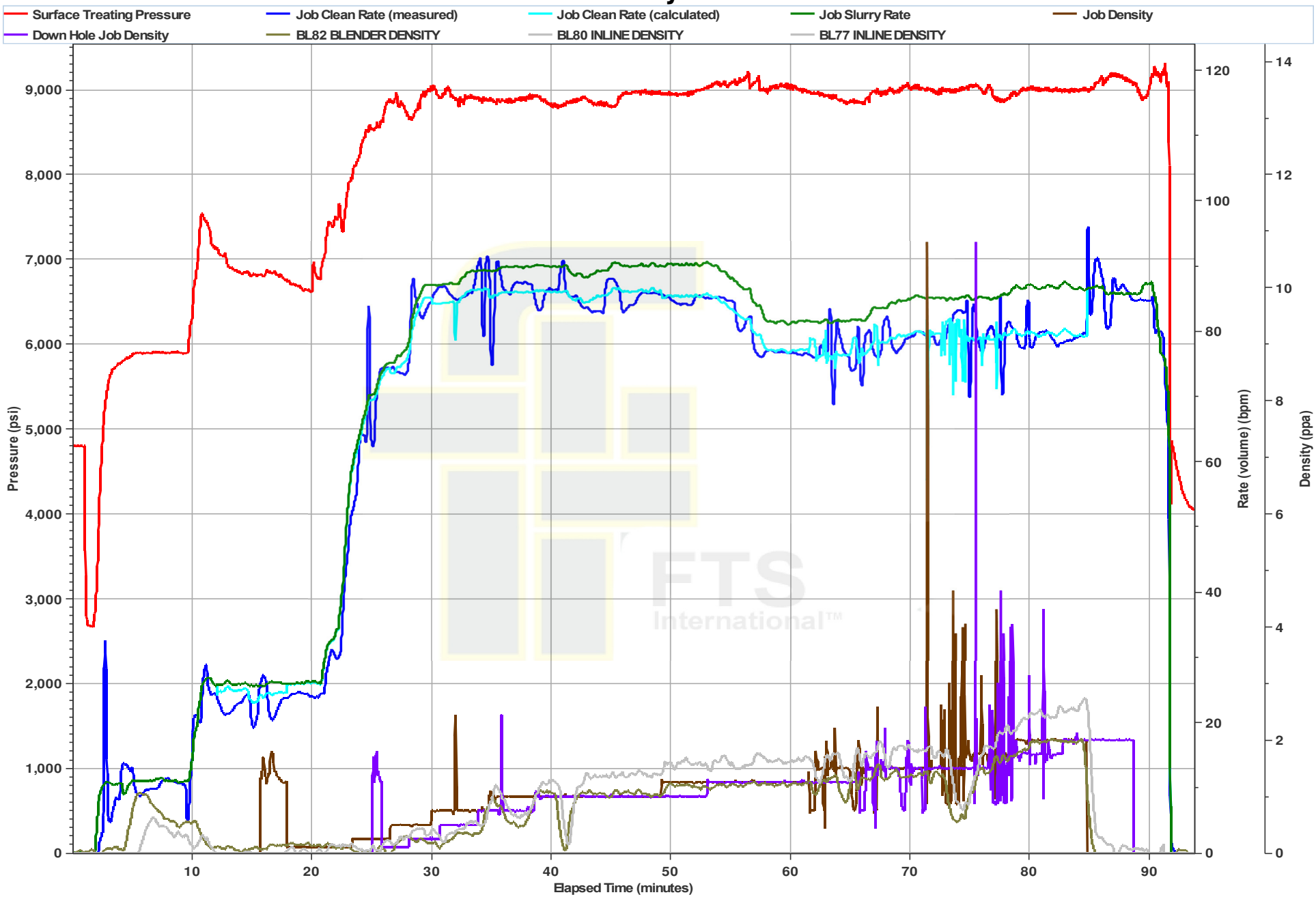
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 3 (WF. 000658.M.W03.S03-aDCT-1103) **Jun 13, 2015**

Acid on Perforations



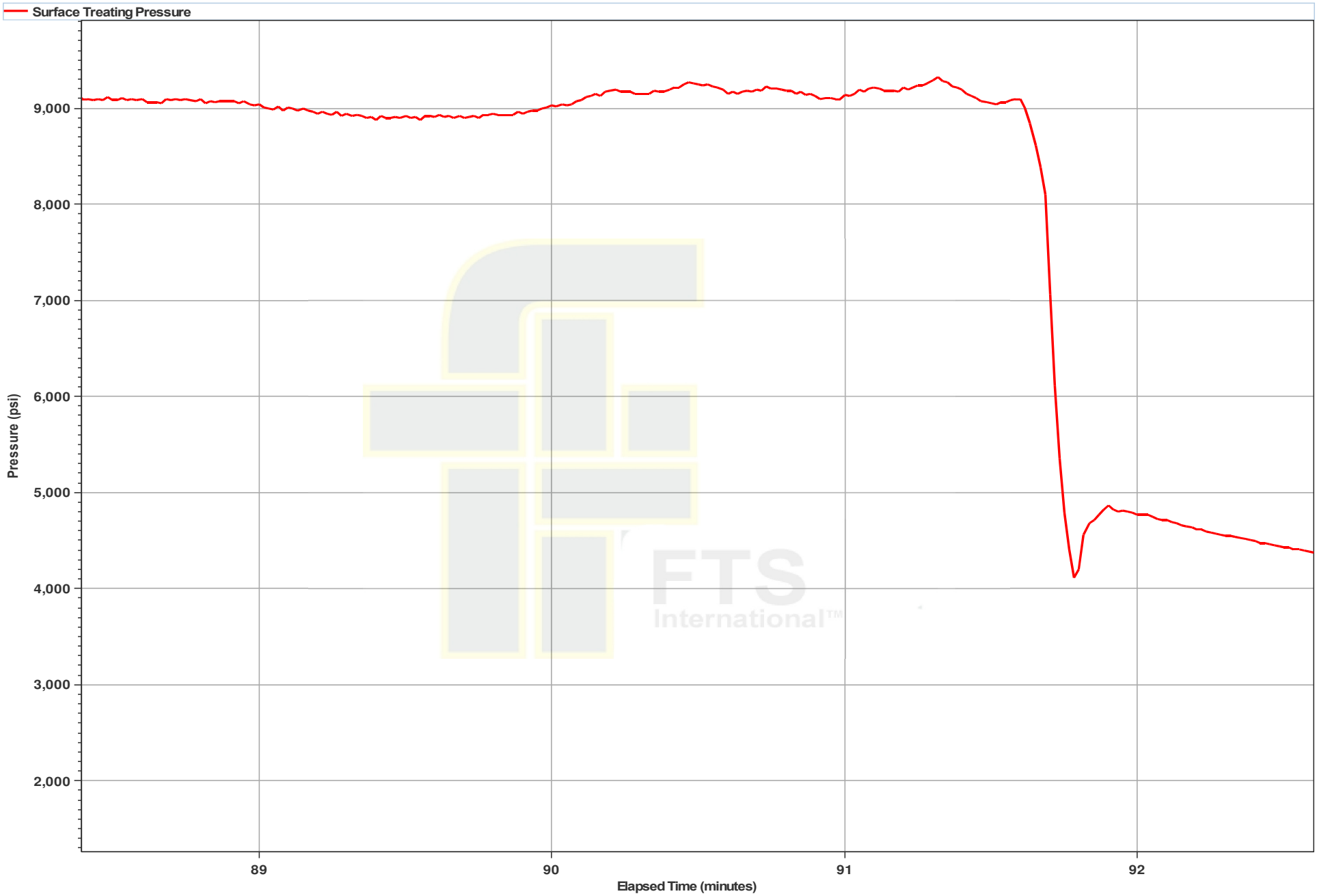
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 3 (WF. 000658.M.W03.S03-aDCT-1103) **Jun 13, 2015**

Primary Plot



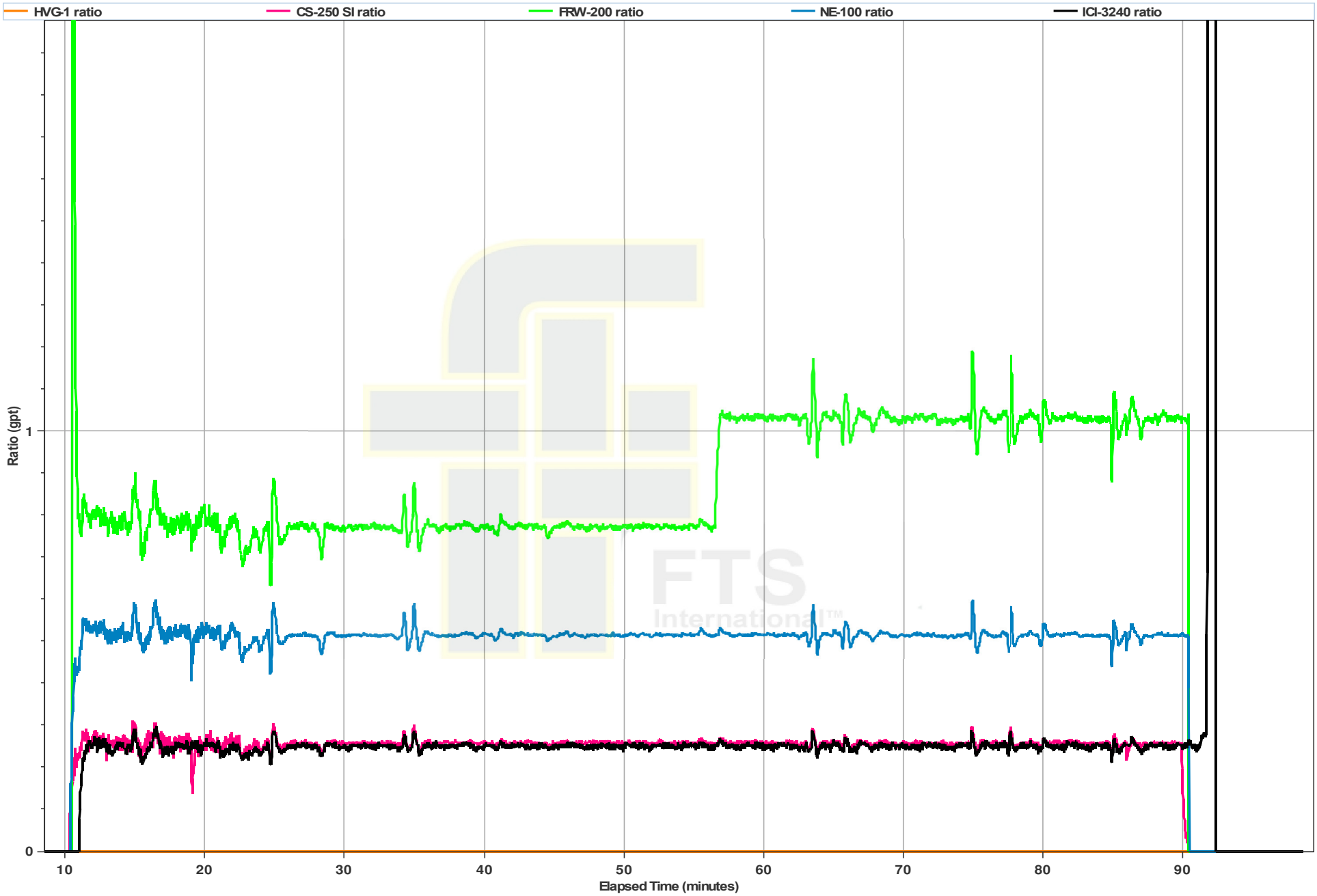
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 3 (WF. 000658.M.W03.S03-aDCT-1103) **Jun 13, 2015**

ISIP Plot



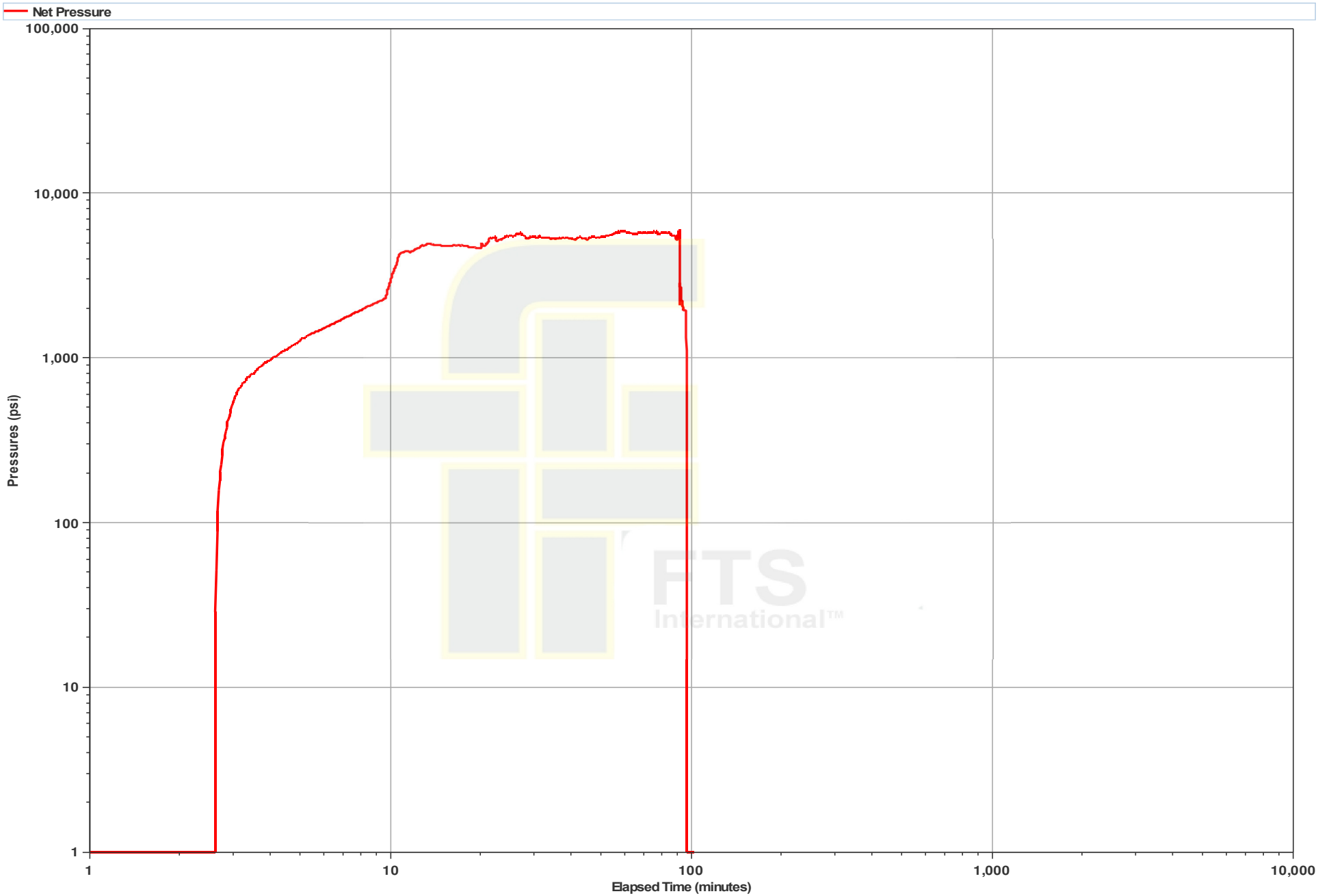
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 3 (WF. 000658.M.W03.S03-aDCT-1103) **Jun 13, 2015**

Chemical Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 3 (WF. 000658.M.W03.S03-aDCT-1103) **Jun 13, 2015**

Net Pressure Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 3 (WF. 000658.M.W03.S03-aDCT-1103) Jun 13, 2015

WATER-BASED FRAC FLUID QUALITY CONTROL
(Attachment to Post Treatment Report)

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/13/2015
Customer Name:	American Energy - Utica	Proposal #:	3H/3
Date Sampled:	6/13/2015	Water Source:	Working Tanks

Sample/Tank No.	Clarity, Color, Odor	Sample Temperature, (F)	Specific gravity	Initial pH	Chloride, ppm	Hardness, ppm	Calcium, ppm	Magnesium, ppm	Iron ppm	Hydroxide, ppm	Bicarbonate, ppm	Carbonate, ppm	Sulfate, ppm	Barium, ppm
Working Tanks	Clear	70	1	8.1	50	250	40	51	1	0	610	0	60	0

Frac Fluid Quality Gel Testing (These Recording are to made prior to pumping job)														
Sample #														
Base Gel Type	HVG-1													
Gel Loading (lbs/1000 gal.)	2.5													
Sample Temperature, (F)	70													
Initial pH	8													
Visc. Reading @ 300 rpms	6													
Viscosity, (cp)	6													
Sample 1 3 min Hydration	4													
Sample 2 3 min Hydration	6													
Sample 3 3 min Hydration	6.5													
X-Link Vortex Closure, min:sec	n/a													
X-Link Crown, min:sec	n/a													
X-Link pH	n/a													
Gel Break Time (<2cp) mins	18													

Frac Fluid Quality Gel Testing (These Recording are to made while pumping job)														
Stage #														
Base Gel Viscosity (cp)														
X-Link pH								.						
Sample XL time, min:sec														
Sample Temperature														

Acid Quality	Percent Acid	NaOH, mLs	Specific Gravity
	28		1.14

Additional testing or documentation may be required by the customer or for frac fluid quality assurance.

Tested By: Etuate Varea

QUALITY CONTROL OF PROPPANTS

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/13/2015
Customer Name:	American Energy - Utica	Well/Stage:	3H/3
Date Sampled:	6/13/2015	DISTRICT:	Washington, PA
VENDOR:	SANTROL		

Select Proppant Type:

___ Brown	___ Ceramic	___ Other (specify)
X White	___ Bauxite	_____
___ Resin Coated	___ Texas Gold	

Sieve Analysis	100 Mesh			Sieve Analysis	30/50 Mesh		
Sample 1	24.30	grams of sample		Sample 2	25.20	grams of sample	
	Amount Retained				Amount Retained		
Sieve mesh	Gram	%		Sieve mesh	Gram	%	
			Total				Total
50	0.30	1.23	In-Size	20	0.00	0.00	In-Size
70	14.80	60.91		30	0.60	2.38	
100	5.10	20.99	98.8%	40	17.80	70.63	96.0%
120	2.20	9.05		45	4.90	19.44	
140	1.30	5.35		50	1.50	5.95	
200	0.60	2.47		70	0.40	1.59	
Pan	0.00	0.00	fines	Pan	0.00	0.00	fines
Total wt. Gram	24.30	100.00		Total wt. Gram	25.20	100.00	

Tested By: Etuate Varea

Post Job Report

AMERICAN ENERGY - UTICA

Red Hill Farm MDS GR 3H

Stage : 4 OF 54

HARRISON, OH

Operations Representative:

Name:	**David Knapp**
Office:	**570-327-4881**
Fax:	**724-743-7719**
Cell:	
Email:	**DAVID.KNAPP@FTSI.COM**

Sales Representative:

Name:	**Bruce Matthews**
Office:	**405-574-3981**
Fax:	**405-767-1288**
Cell:	
Email:	**BRUCE.MATTHEWS@FTSI.COM**

Engineering Manager:

Name:	**Thaddeus Craun**
Office:	**817-682-8702**
Fax:	**724-743-7719**
Cell:	
Email:	**THADDEUS.CRAUN@FTSI.COM**

FTS International
1432 Route 519
Eighty Four, PA 15330

Customer: American Energy - Utica
Well: Red Hill Farm Mds Gr 3H
Stage: 4
Job End Date: 06/13/2015

Job Summary

Well Information

TVD:	7,301	**Top Perf:**	15,255
No. Of Perfs:	30		

Casing	Tubing
5.50" 20.00#	N/A

Pressures, Rates and Volumes

	Proposed	Actual	Max	Min
STP	9,046 psi	8,592 psi	9,049 psi	6,863 psi
Rate	80.0 bpm	80.3 bpm	91.7 bpm	25.0 bpm

	Proposed	Actual		
Clean Volume	5,772 bbls	5,879 bbls		
Slurry Volume	6,042 bbls	6,150 bbls		
Flush Volume	357 bbls	373 bbls		

	Proposed	Start	End
Frac Pumps on Location	10	13	13

Open Well:	Start Time	15:27	Pressure	2,890 psi
	Ball Seat	306 bbls	Break Down	7,208 psi
	Initial ISIP:	4,817 psi	Initial F.G.:	1.09 psi/ft
Stage Complete:	End Time	16:54	Job Time	01:30
	Final ISIP	4,817 psi	Final F.G.	1.09 psi/ft
	HHP	16,910	5 Min:	4,166 psi
	Proppant Min:	0.00	10 Min:	N/A
	Proppant Max:	2.00	15 Min:	N/A

Material Volume

Material	Proposed	Calculated	Actual	Variance
100 Mesh White	40,000	40,945	40,945	0%
30/50 White	210,000	209,769	209,769	0%
Total Proppants	250,000	250,714	250,714	0%

Material	Proposed	Calculated	Actual	Variance
0.1%-7.5% HCL	3,000	2,982	3,000	1%
CI-150	3	3	3	0%
CS-250 SI	60	59	59	0%
FE-200L	15	15	15	0%
FRW-200	180	186	185	-1%
ICI-3240	60	59	59	0%
NE-100	0	118	118	0%
NE-100W	120	0	0	0

Comments:

Pumpdown Information:
Total Bbls: 326
Max Pressure (psi): 6511
Max Rate (bpm): 16

FTS International
1432 Route 519
Eighty Four, PA 15330

Customer: American Energy - Utica
Well: Red Hill Farm Mds Gr 3H
Stage: 4
Job End Date: 06/13/2015

Treatment Report

Date:	6/13/2015	District:	Washington County,PA	Quote No:	051815_035725QF	API:	34-059-24370

MIL Time	STP	Slurry BPM	Stage Clean (bbls)	Cumulative Clean (bbls)	Stage Slurry (bbls)	Cumulative Slurry (bbls)	Stage Proppant (lbs)	Cumulative Proppant (lbs)	Description	Proppant	PPA
15:27	2,890	0.0	0	0	0	0	0	0	Freshwater Open Well		0.00
15:28	4,271	5.2	19	19	19	19	0	0	Freshwater Load		0.00
15:30	6,012	10.5	71	90	71	90	0	0	7.5% HCL Acid Acid		0.00
15:37	7,003	22.3	54	144	54	144	0	0	Slickwater Load		0.00
15:39	6,863	25.0	162	306	163	307	680	680	Slickwater Proppant	100 Mesh White	0.10
15:46	7,208	25.0	0	306	0	307	0	680	Slickwater Breakdown		0.00
15:46	7,260	26.6	52	358	52	359	218	898	Slickwater Proppant	100 Mesh White	0.10
15:48	8,781	61.3	234	592	237	596	2,457	3,355	Slickwater Proppant	100 Mesh White	0.25
15:53	8,819	72.4	256	848	262	858	5,376	8,731	Slickwater Proppant	100 Mesh White	0.50
15:55	8,813	85.5	480	1,328	496	1,354	15,120	23,851	Slickwater Proppant	100 Mesh White	0.75
16:01	8,945	89.2	407	1,735	425	1,779	17,094	40,945	Slickwater Proppant	100 Mesh White	1.00
16:05	8,915	90.0	884	2,619	924	2,703	37,128	78,073	Slickwater Proppant	30/50 White	1.00
16:15	8,769	90.3	1,000	3,619	1,057	3,760	52,500	130,573	Slickwater Proppant	30/50 White	1.25
16:30	8,662	91.1	857	4,476	915	4,675	53,991	184,564	Slickwater Proppant	30/50 White	1.50
16:37	8,710	91.3	390	4,866	421	5,096	28,665	213,229	Slickwater Proppant	30/50 White	1.75
16:41	8,757	90.5	110	4,976	119	5,215	8,085	221,314	Slickwater Proppant	30/50 White	1.75
16:42	8,862	88.7	350	5,326	382	5,597	29,400	250,714	Slickwater Proppant	30/50 White	2.00
16:49	9,003	88.6	180	5,506	180	5,777	0	250,714	Slickwater Clean screws		0.00
16:50	9,021	87.3	225	5,731	225	6,002	0	250,714	Slickwater Flush		0.00
16:52	8,716	86.4	148	5,879	148	6,150	0	250,714	Freshwater Flush		0.00
16:54	4,817	0.0	0	5,879	0	6,150	0	250,714	Freshwater Shutdown		0.00
Total JobTime (HH:MM): 01:26											

Min STP:	6,863 psi	**Max STP:**	9,049 psi	**Average STP:**	8,592 psi	**5 Min:**	4,166 psi
Min Rate:	25.0 bpm	**Max Rate:**	91.7 bpm	**Average Rate:**	80.3 bpm	**10 Min:**	0 psi
Initial ISIP:	4,817 psi	**Initial F.G.:**	1.09 psi/ft	**Average HHP:**	16,910	**15 Min:**	0 psi
Final ISIP:	4,817 psi	**Final F.G.:**	1.09 psi/ft	**Customer Representative:**		Malcolm Trahan	
FTSI Representative:		Etuate Varea & Cody Melone					

Comments:

The proppant values contained in this report are calculated based on actual barrel counts and target densities. Actual total proppant usage is 250,714 lbs. Charge time is 1 hour(s) 30 minute(s). All chemicals and proppant ran as documented.

Min/Max/Avg were taken from sand stages. All chem changes from proposed were made per AEU representative request.

1 Minute Shutdown (psi): 4352
2 Minute Shutdown (psi): 4300
5 Minute Shutdown (psi): 4166

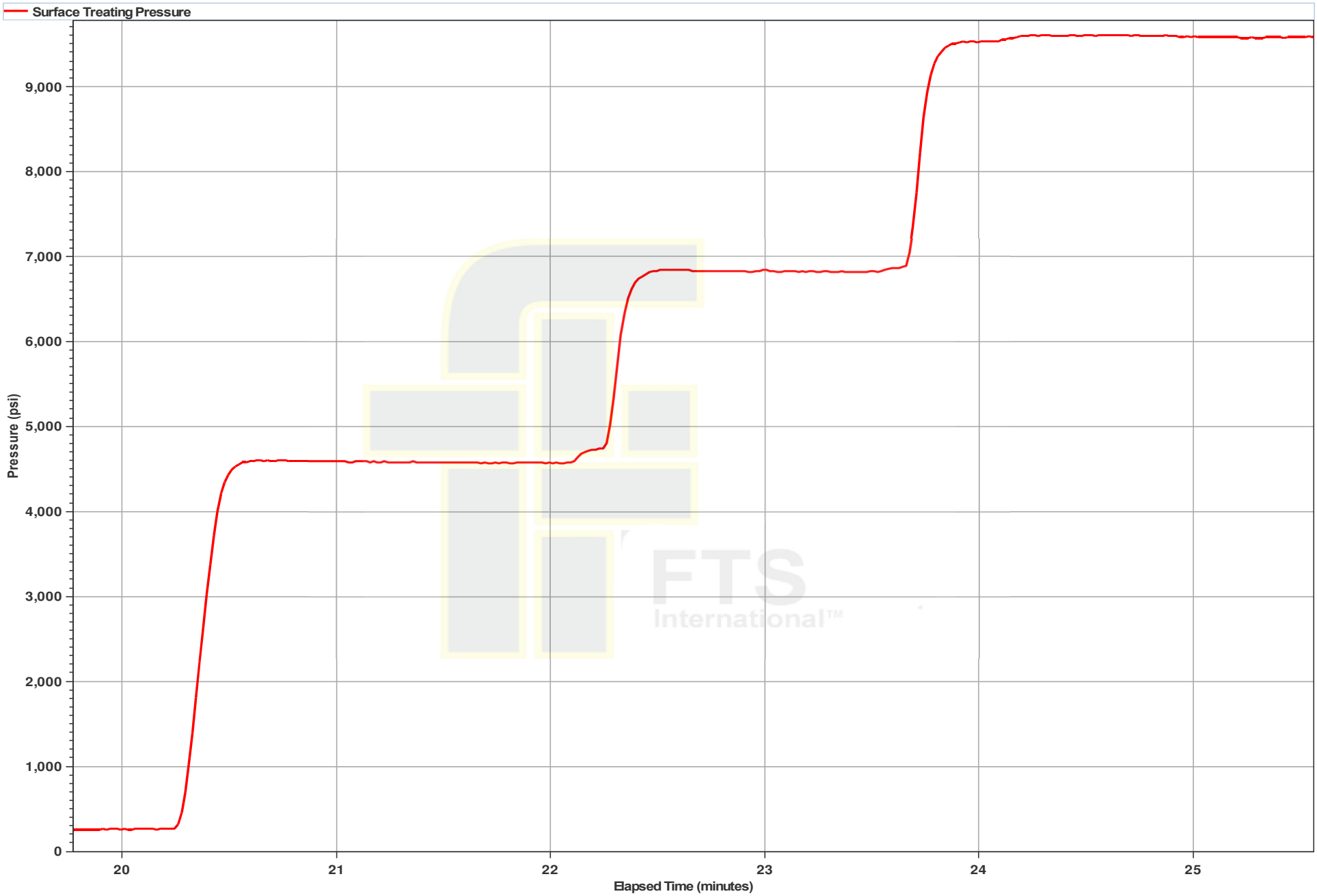
Chemical Changes:

FTS International
1432 Route 519
Eighty Four, PA 15330

Customer: American Energy - Utica
Well: Red Hill Farm Mds Gr 3H
Stage: 4
Job End Date: 06/13/2015

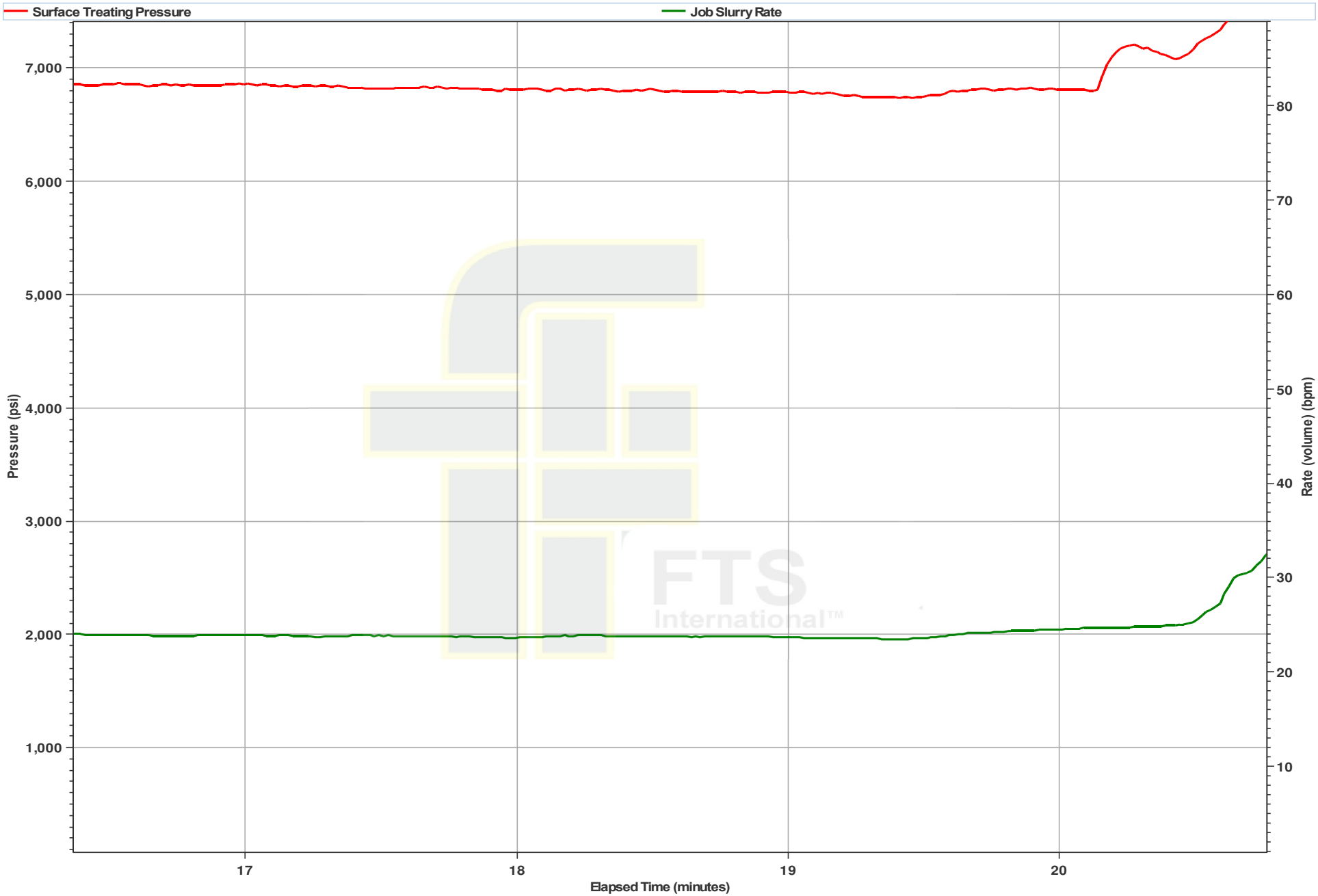
Chemical Name	Chemical Loading	Cumulative Clean
FRW-200	1.00	4,976

AEU Pressure Test



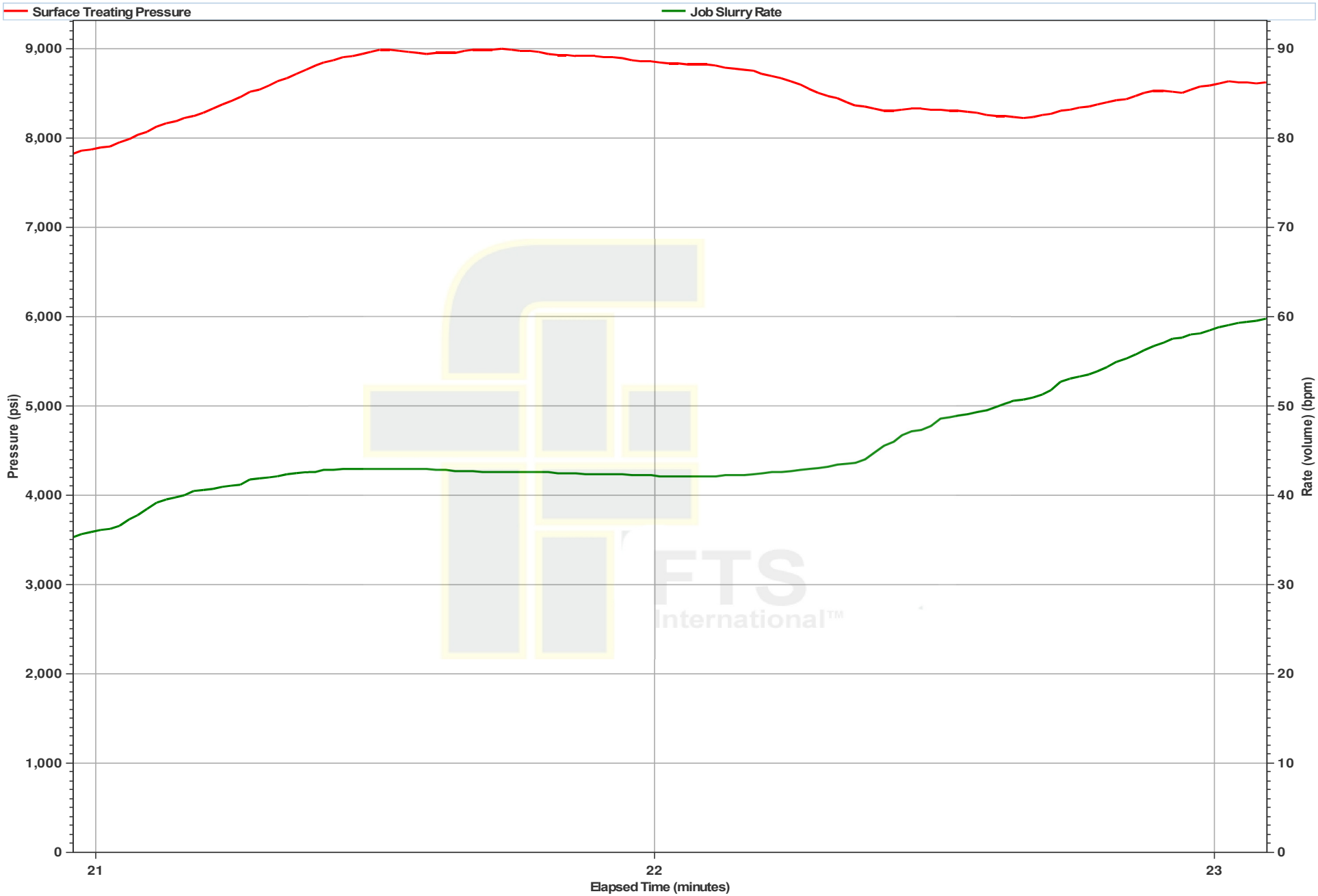
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 4 (WF. 000658.M.W03.S04-aDCT-1103) **Jun 13, 2015**

Ball Seat and Breakdown



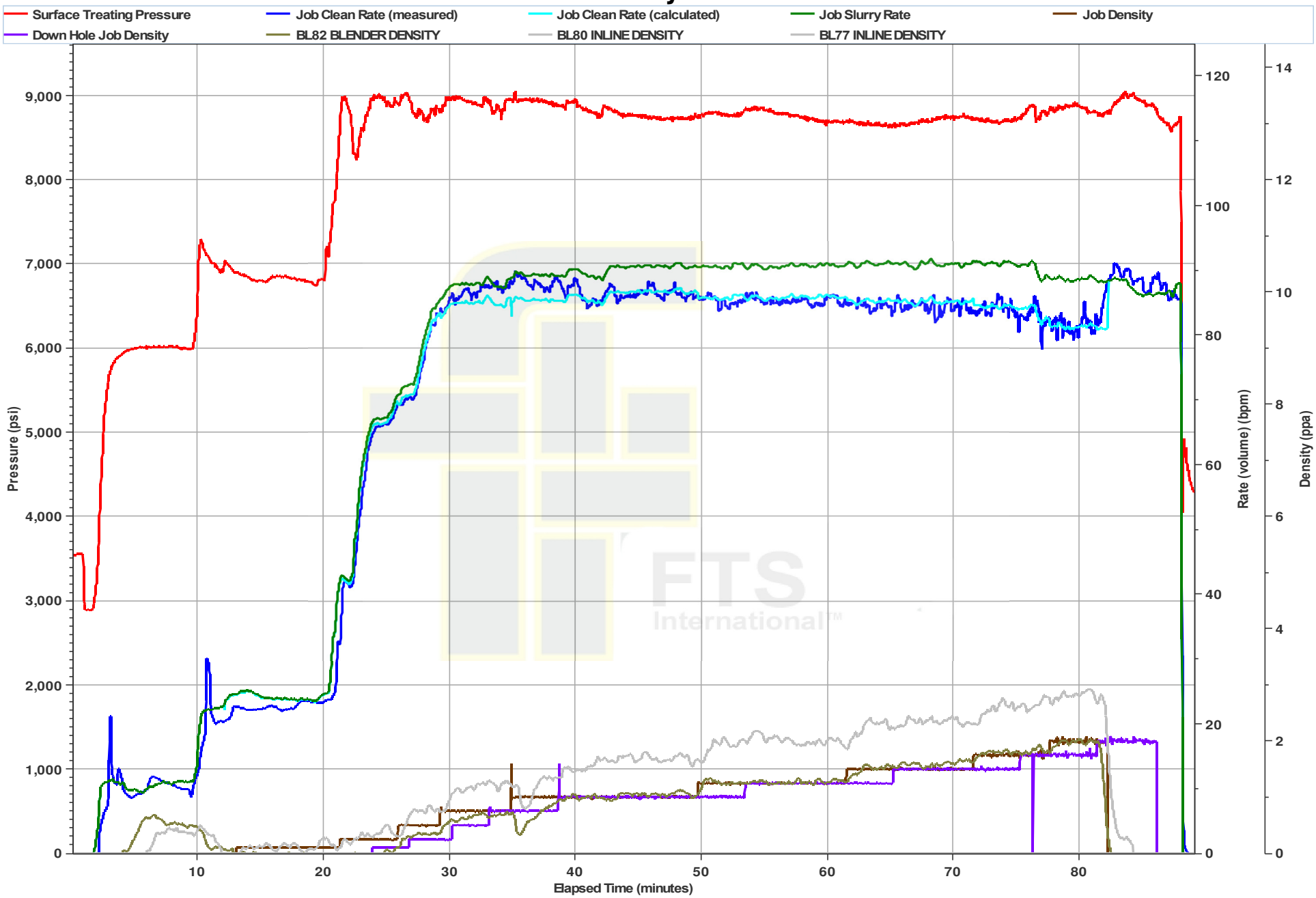
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 4 (WF. 000658.M.W03.S04-aDCT-1103) **Jun 13, 2015**

Acid on Perforations



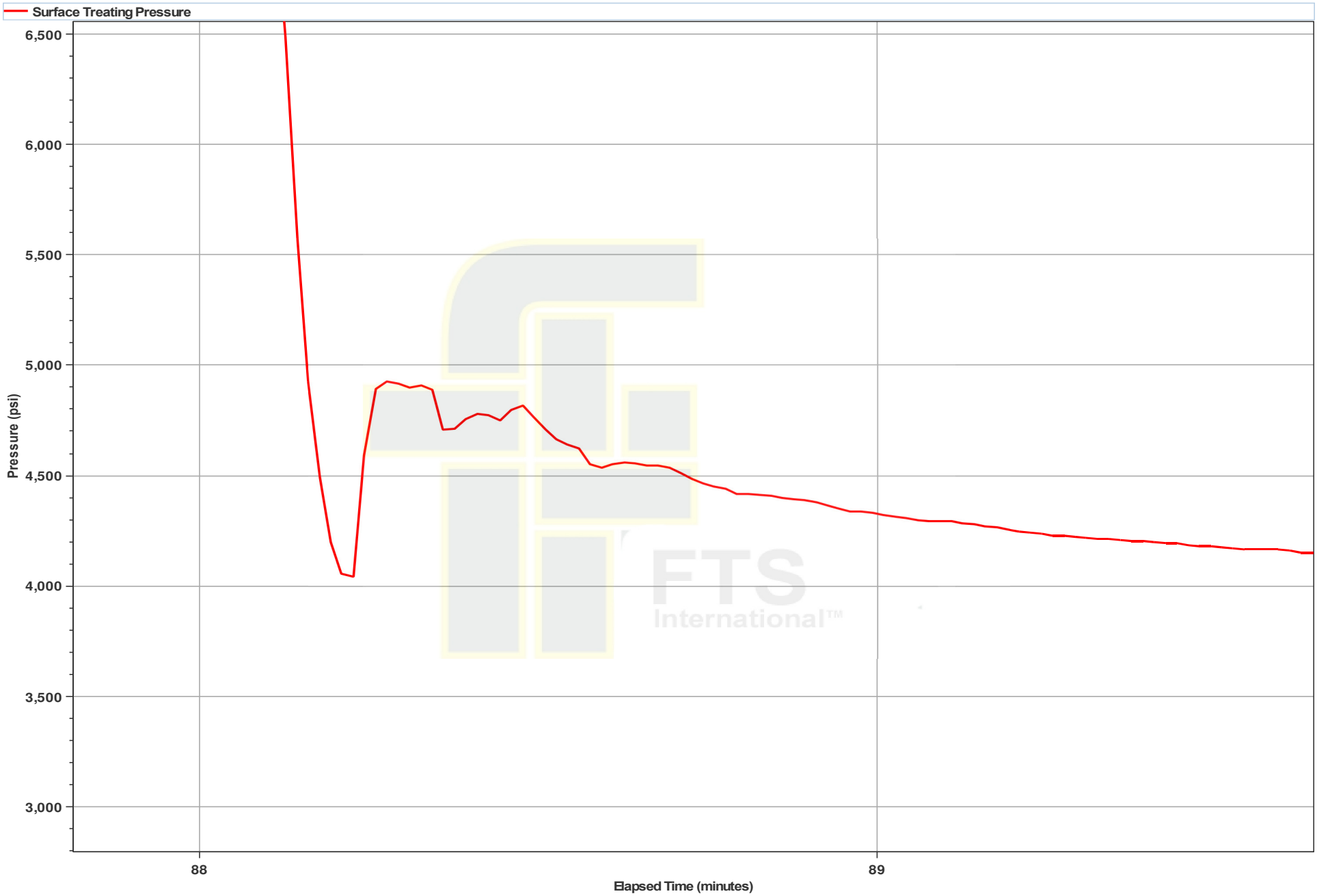
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 4 (WF. 000658.M.W03.S04-aDCT-1103) **Jun 13, 2015**

Primary Plot



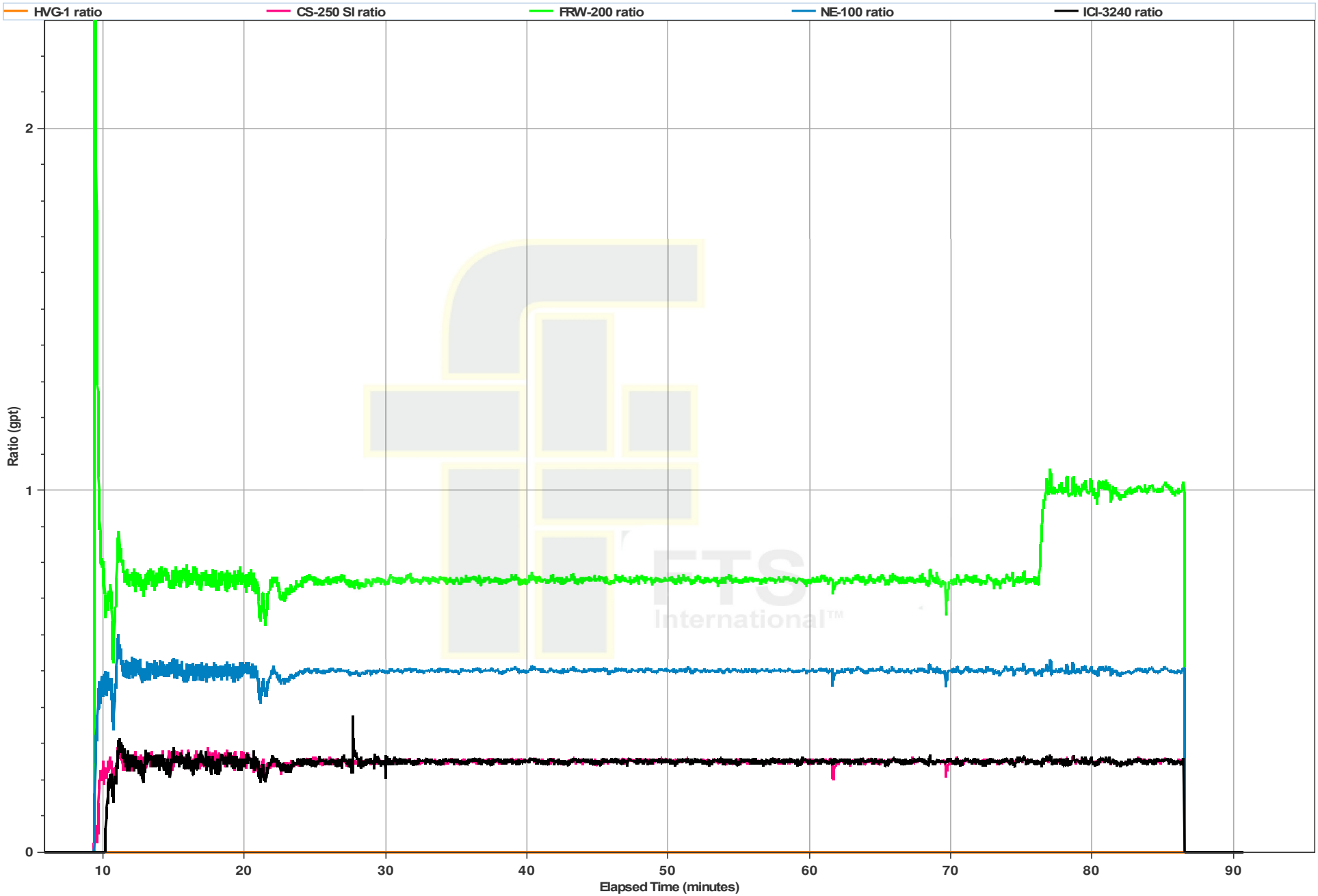
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 4 (WF. 000658.M.W03.S04-aDCT-1103) **Jun 13, 2015**

ISIP Plot



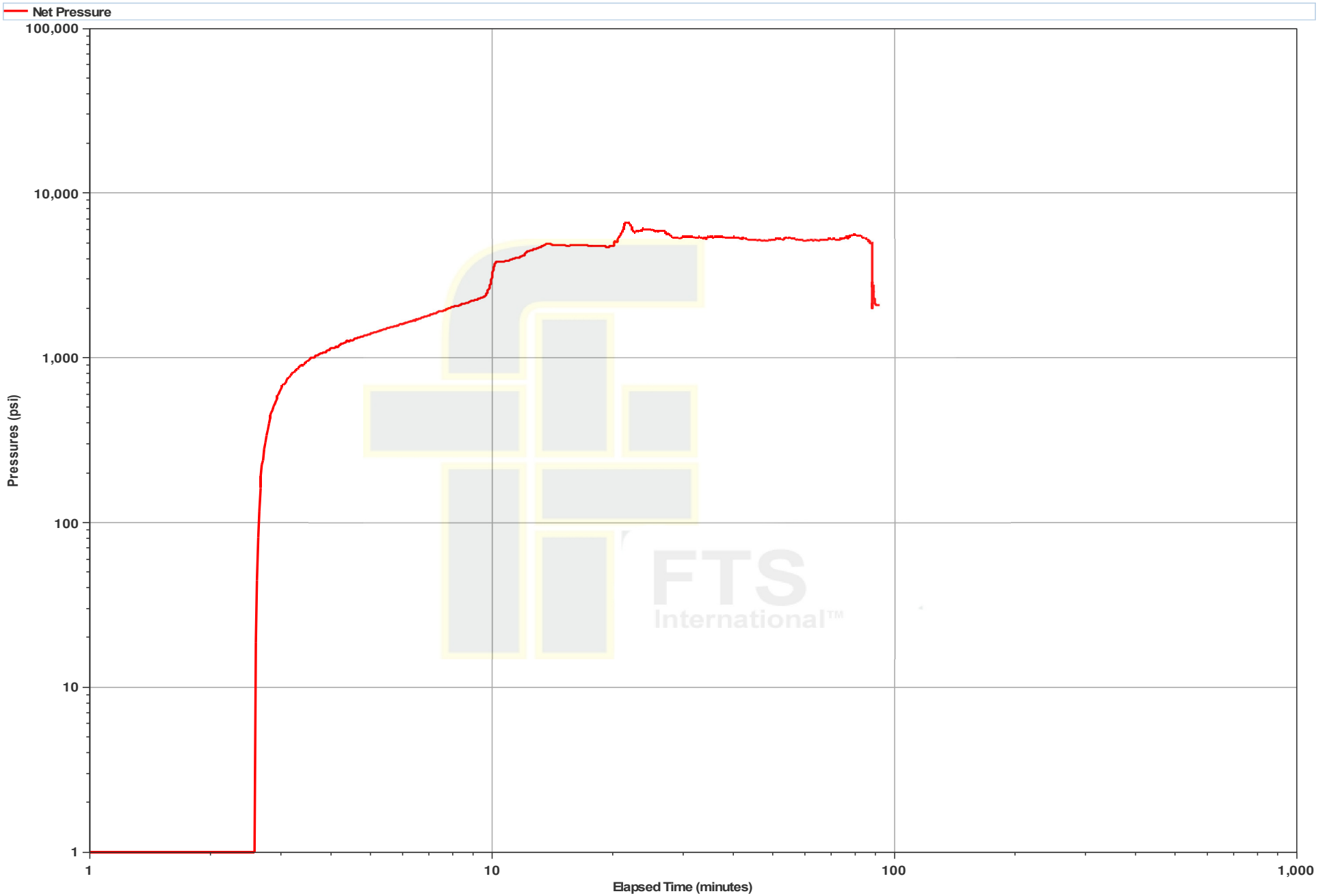
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 4 (WF. 000658.M.W03.S04-aDCT-1103) Jun 13, 2015

Chemical Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 4 (WF. 000658.M.W03.S04-aDCT-1103) Jun 13, 2015

Net Pressure Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 4 (WF. 000658.M.W03.S04-aDCT-1103) Jun 13, 2015

WATER-BASED FRAC FLUID QUALITY CONTROL
(Attachment to Post Treatment Report)

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/13/2015
Customer Name:	American Energy - Utica	Proposal #:	3H/4
Date Sampled:	6/13/2015	Water Source:	Blender Tub

Sample/Tank No.	Clarity, Color, Odor	Sample Temperature, (F)	Specific gravity	Initial pH	Chloride, ppm	Hardness, ppm	Calcium, ppm	Magnesium, ppm	Iron ppm	Hydroxide, ppm	Bicarbonate, ppm	Carbonate, ppm	Sulfate, ppm	Barium, ppm
Blender Tub	Clear	82	1	7.92	140	200	40	39	1	0	1220	0	210	0

Frac Fluid Quality Gel Testing (These Recording are to made prior to pumping job)														
Sample #														
Base Gel Type	HVG-1													
Gel Loading (lbs/1000 gal.)	2.5													
Sample Temperature, (F)	80													
Initial pH	8													
Visc. Reading @ 300 rpms	6													
Viscosity, (cp)	6													
Sample 1 3 min Hydration	4													
Sample 2 3 min Hydration	6													
Sample 3 3 min Hydration	6													
X-Link Vortex Closure, min:sec	n/a													
X-Link Crown, min:sec	n/a													
X-Link pH	n/a													
Gel Break Time (<2cp) mins	21													

Frac Fluid Quality Gel Testing (These Recording are to made while pumping job)														
Stage #														
Base Gel Viscosity (cp)														
X-Link pH								.						
Sample XL time, min:sec														
Sample Temperature														

Acid Quality	Percent Acid	NaOH, mLs	Specific Gravity
	28		1.14

Additional testing or documentation may be required by the customer or for frac fluid quality assurance.

Tested By: Etuate Varea

QUALITY CONTROL OF PROPPANTS

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/13/2015
Customer Name:	American Energy - Utica	Well/Stage:	3H/4
Date Sampled:	6/13/2015	DISTRICT:	Washington, PA
VENDOR:	SANTROL		

Select Proppant Type:

___ Brown	___ Ceramic	___ Other (specify)
X White	___ Bauxite	_____
___ Resin Coated	___ Texas Gold	

Sieve Analysis	100 Mesh			Sieve Analysis	30/50 Mesh		
Sample 1	24.50	grams of sample		Sample 2	24.40	grams of sample	
	Amount Retained				Amount Retained		
Sieve mesh	Gram	%		Sieve mesh	Gram	%	
			Total				Total
50	0.00	0.00	In-Size	20	0.00	0.00	In-Size
70	15.30	62.45		30	0.50	2.05	
100	6.10	24.90	100.0%	40	16.30	66.80	95.5%
120	2.00	8.16		45	5.10	20.90	
140	0.80	3.27		50	1.90	7.79	
200	0.30	1.22		70	0.60	2.46	
Pan	0.00	0.00	fines	Pan	0.00	0.00	fines
Total wt. Gram	24.50	100.00		Total wt. Gram	24.40	100.00	

Tested By: Etuate Varea

Post Job Report

AMERICAN ENERGY - UTICA

Red Hill Farm MDS GR 3H

Stage : 5 OF 54

HARRISON, OH

Operations Representative:

Name:	David Knapp
Office:	570-327-4881
Fax:	724-743-7719
Cell:	
Email:	DAVID.KNAPP@FTSI.COM

Sales Representative:

Name:	Bruce Batthern
Office:	405-974-3901
Fax:	405-787-1235
Cell:	
Email:	BRUCE.BATTHERN@FTSI.COM

Engineering Manager:

Name:	Thaddeus Craun
Office:	817-832-8782
Fax:	724-743-7719
Cell:	
Email:	THADDEUS.CRAUN@FTSI.COM

Job Summary

Well Information

TVD:	7,301	Top Perf:	15,159
No. Of Perfs:	30		

Casing	Tubing
[illegible]	n/A

Pressures, Rates and Volumes

	Proposed	Actual	Max	Min
STP	[illegible] psi	[illegible] psi	[illegible] psi	[illegible] psi
Rate	[illegible] bpm	[illegible] bpm	[illegible] bpm	[illegible] bpm

	Proposed	Actual		
Clean Volume	[illegible] bbls	[illegible] bbls		
Slurry Volume	[illegible] bbls	[illegible] bbls		
Flush Volume	[illegible] bbls	[illegible] bbls		

	Proposed	Start	End
Free Pumps on Location	19	15	15

Open Well:	Start Time	[illegible]	Pressure	[illegible] psi
	Bull Dwn	[illegible] bbls	Break Down	[illegible] psi
	Initial ISIP:	[illegible] psi	Initial F.G.:	[illegible] psi/ft
Stage Complete:	End Time	[illegible]	Job Time	[illegible]
	Final ISIP	[illegible] psi	Final F.G.	[illegible] psi/ft
	ISIP	[illegible]	5 Min:	[illegible] psi
	Pressure Min:	[illegible]	10 Min:	N/A
	Pressure Max:	[illegible]	15 Min:	N/A

Material Volume

Material	Proposed	Calculated	Actual	Variance
100 Mesh White	[illegible]	[illegible]	[illegible]	0%
30/50 White	[illegible]	[illegible]	[illegible]	0%
Total Proppants	[illegible]	[illegible]	[illegible]	0%

Material	Proposed	Calculated	Actual	Variance
8.1%-7.5% HCL	[illegible]	[illegible]	[illegible]	1%
AFR-1	[illegible]	[illegible]	[illegible]	0%
[illegible]	[illegible]	[illegible]	[illegible]	0%
[illegible]	[illegible]	[illegible]	[illegible]	0%
FE-[illegible]	[illegible]	[illegible]	[illegible]	0%
[illegible]	[illegible]	[illegible]	[illegible]	-2%
HVG-1 4.5	[illegible]	[illegible]	[illegible]	0%
[illegible]	[illegible]	[illegible]	[illegible]	0%
LTB-1	[illegible]	[illegible]	[illegible]	0%
[illegible]	[illegible]	[illegible]	[illegible]	-2%
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Comments:

Pumpdown Information:
Total Bbls: 321
Max Pressure (psi): 4211
Max Rate (bpm): 19.2

FTS International
1432 Route 908
Eighty Four, PA 15330

Customer: American Energy - Utica
Well: [illegible]
Stage: 9
Job End Date: [illegible]

Treatment Report

Date	9/14/2015	District	Washington County, PA	Treatment ID	[illegible]	API#	34-[illegible]

Ell. Time	STP	Slurry BPM	Stage Slurry (bbls)	Cumulative Slurry (bbls)	Stage Clean (bbls)	Cumulative Clean (bbls)	Stage Proppant (lbs)	Cumulative Proppant (lbs)	Description	Proppant	PPA
23:45	2,896	10.0	14	14	14	14	0	0	Freshwater Open Well		0.00
23:47	6,642	11.1	71	85	71	85	0	0	7.5% HCL Acid Acid		0.00
00:14	6,682	13.4	215	300	215	300	0	0	Slickwater Load		0.00
00:25	7,406	19.2	5	305	5	305	0	0	Slickwater Breakdown		0.00
00:26	7,230	19.8	72	377	72	377	0	0	Slickwater Pad		0.00
00:27	9,306	54.7	216	593	216	593	916	916	Slickwater Proppant	100 Mesh White	0.10
00:31	9,012	64.0	218	810	217	813	2,258	3,174	Slickwater Proppant	100 Mesh White	0.25
00:34	8,682	74.2	305	1,089	301	1,074	6,305	9,029	Slickwater Proppant	100 Mesh White	0.50
00:37	8,629	80.0	425	1,494	444	1,510	13,014	22,043	Slickwater Proppant	100 Mesh White	0.75
00:43	8,646	80.7	457	1,881	457	1,876	18,264	40,307	Slickwater Proppant	100 Mesh White	1.00
00:47	8,777	80.0	478	2,357	515	2,391	36,782	77,100	Slickwater Proppant	30/50 White	1.00
00:58	8,710	80.6	500	3,437	505	3,557	33,075	110,204	Slickwater Proppant	30/50 White	1.25
01:03	8,135	80.1	55	3,482	55	3,615	3,500	113,785	15# Linear Gel Proppant	30/50 White	1.25
01:05	8,420	80.1	95	3,577	95	3,709	0	113,785	15# Linear Gel Sweep		0.00
01:07	8,085	76.3	140	3,718	143	4,042	0	113,785	15# Linear Gel Sweep		0.00
01:12	7,967	82.1	300	4,307	307	4,410	8,140	121,300	15# Linear Gel Proppant	40/70 White	0.50
01:16	8,010	74.2	157	4,464	143	4,552	6,794	127,894	15# Linear Gel Proppant	40/70 White	1.00
01:20	8,791	74.2	111	4,575	117	4,669	5,400	133,402	15# Linear Gel Proppant	40/70 White	1.25
01:21	8,006	74.2	780	5,343	841	5,500	60,044	193,535	15# Linear Gel Proppant	40/70 White	1.50
01:34	8,760	74.8	800	5,943	860	6,000	26,700	210,875	15# Linear Gel Proppant	40/70 White	1.75
01:50	8,844	78.7	371	6,214	400	6,497	31,904	250,440	15# Linear Gel Proppant	40/70 White	2.00
01:55	8,795	78.6	75	6,290	75	6,555	0	250,440	15# Linear Gel Clean Stream		0.00
01:57	8,819	77.6	300	6,576	300	6,860	0	250,440	Slickwater Flush		0.00
02:00	8,089	72.0	98	6,674	88	6,949	0	250,440	Freshwater Flush		0.00
02:03	4,456	0.0	0	6,674	0	6,949	0	250,440	Freshwater Shutdown		0.00
Total Job Time (HH:MM): 01:[illegible]											

Min STP:	7,230 psi	Max STP:	9,418 psi	Average STP:	8,594 psi	5 Min:	3,272 psi
Min Rate:	65.0 bpm	Max Rate:	81.9 bpm	Average Rate:	80.5 bpm	10 Min:	0 psi
Initial ISIP:	4,459 psi	Initial F.G.:	1.04 psi/ft	Average HHP:	17,440	15 Min:	0 psi
Final ISIP:	4,459 psi	Final F.G.:	1.04 psi/ft	Customer Representative:		Kevin Wetzel	
FTS Representatives:		Travis Williams & Sean Stewart					

Comments:

The proppant values contained in this report are calculated based on actual barrel counts and target densities. Actual total proppant usage is 250,440 lbs. Charge time is 1 hour(s) 45 minute(s). All chemicals and proppant ran as documented.

Min/Max/Avg were taken from sand stages. All chem changes from proposed were made per AEU representative request.

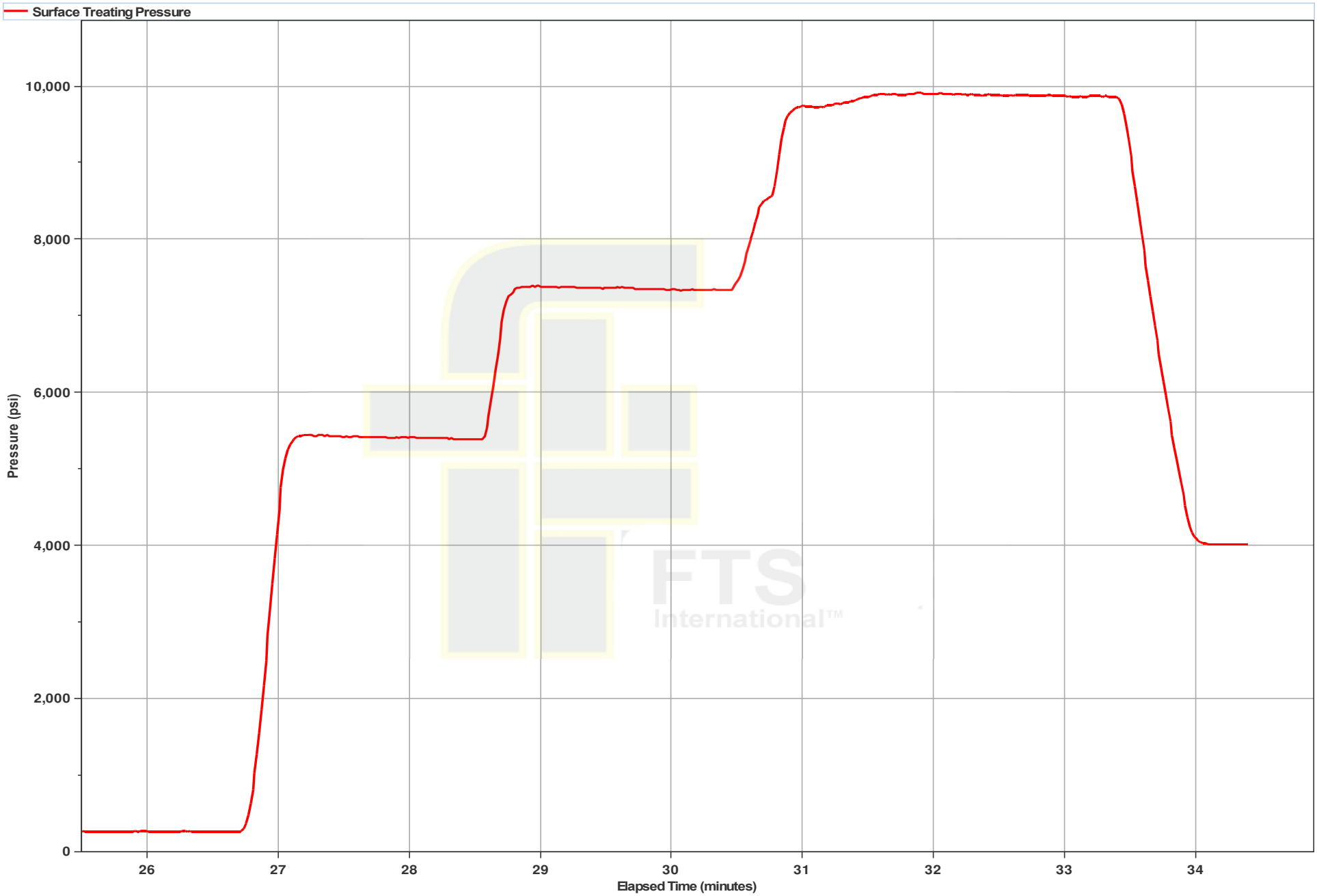
Started pumping a 18# Linear Gel system during the 1.25 ppg stage of 30/50 per AEU representative request. Formation pressure continued to rise so the sand was cut and a sweep was performed. Sand was then resumed at a lower concentration and the stage was completed with no further issues.

1 Minute Shutdown (psi): 4287
2 Minute Shutdown (psi): 4198
5 Minute Shutdown (psi): 3972

Chemical Changes:

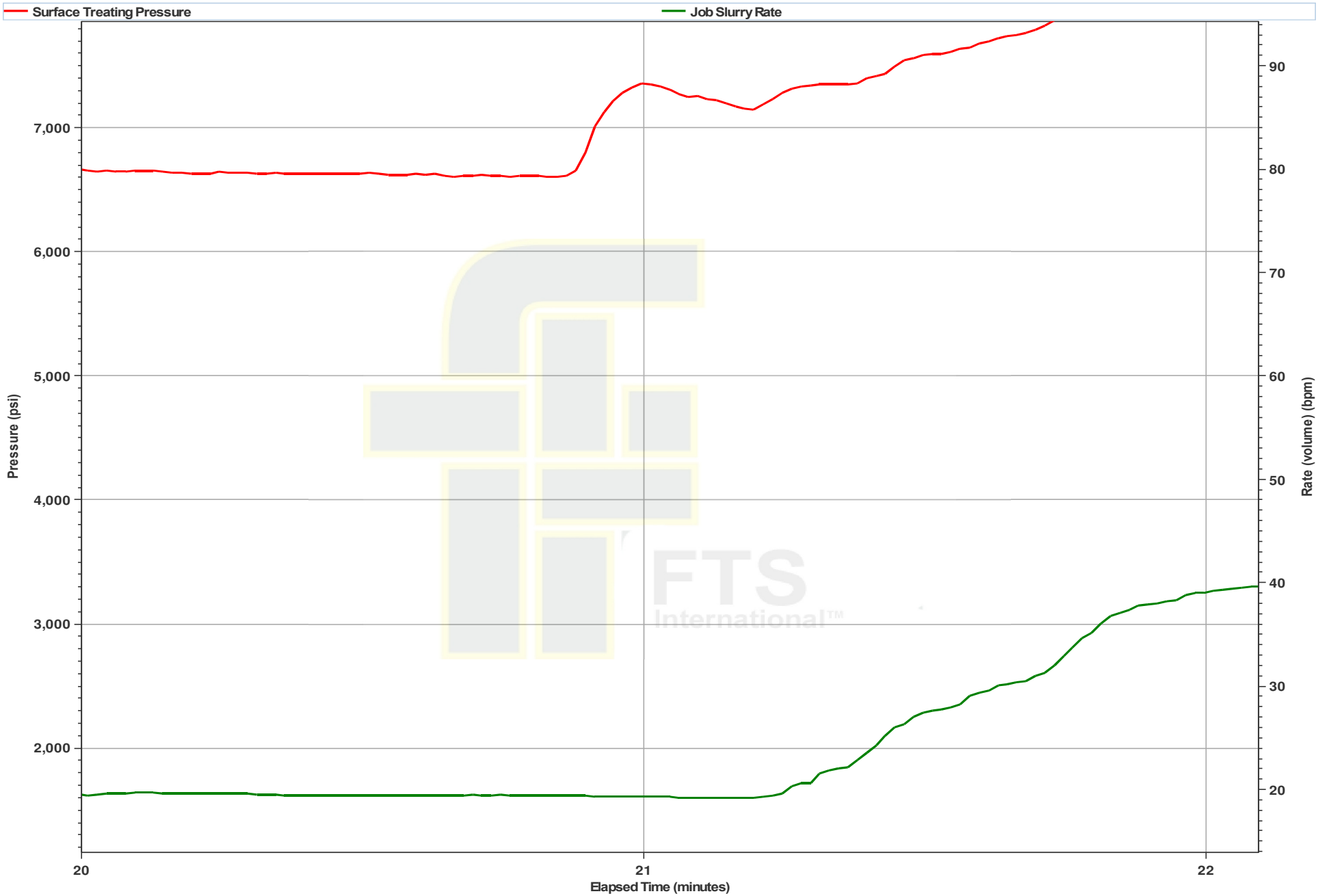
Chemical Name	Chemical Loading	Cumulative Chem
FRW-200	0.75	910
FRW-200	1.00	3,818

AEU Pressure Test



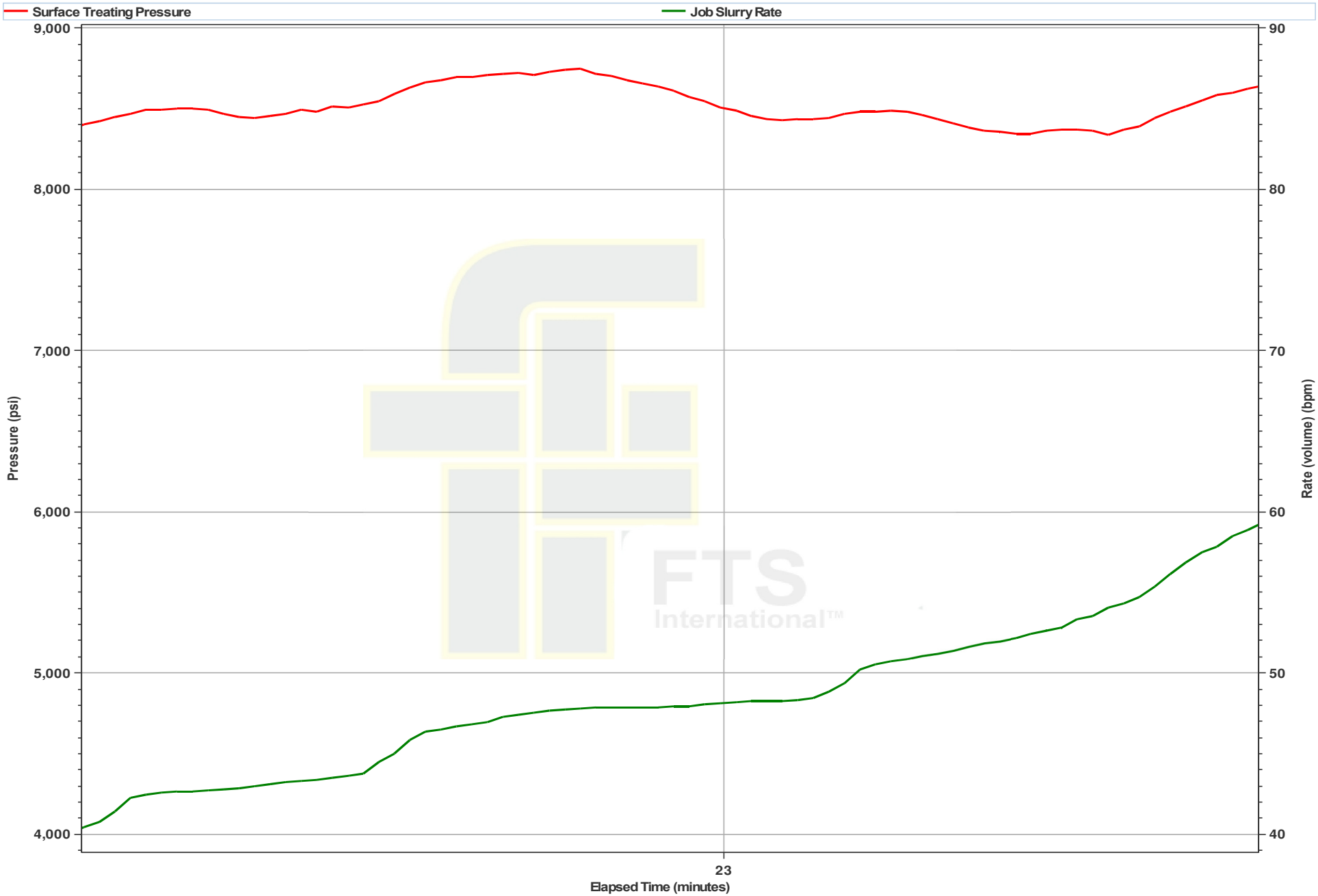
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 5 (WF. 000658.M.W03.S05-aDCT-1103) Jun 13, 2015

Ball Seat and Breakdown



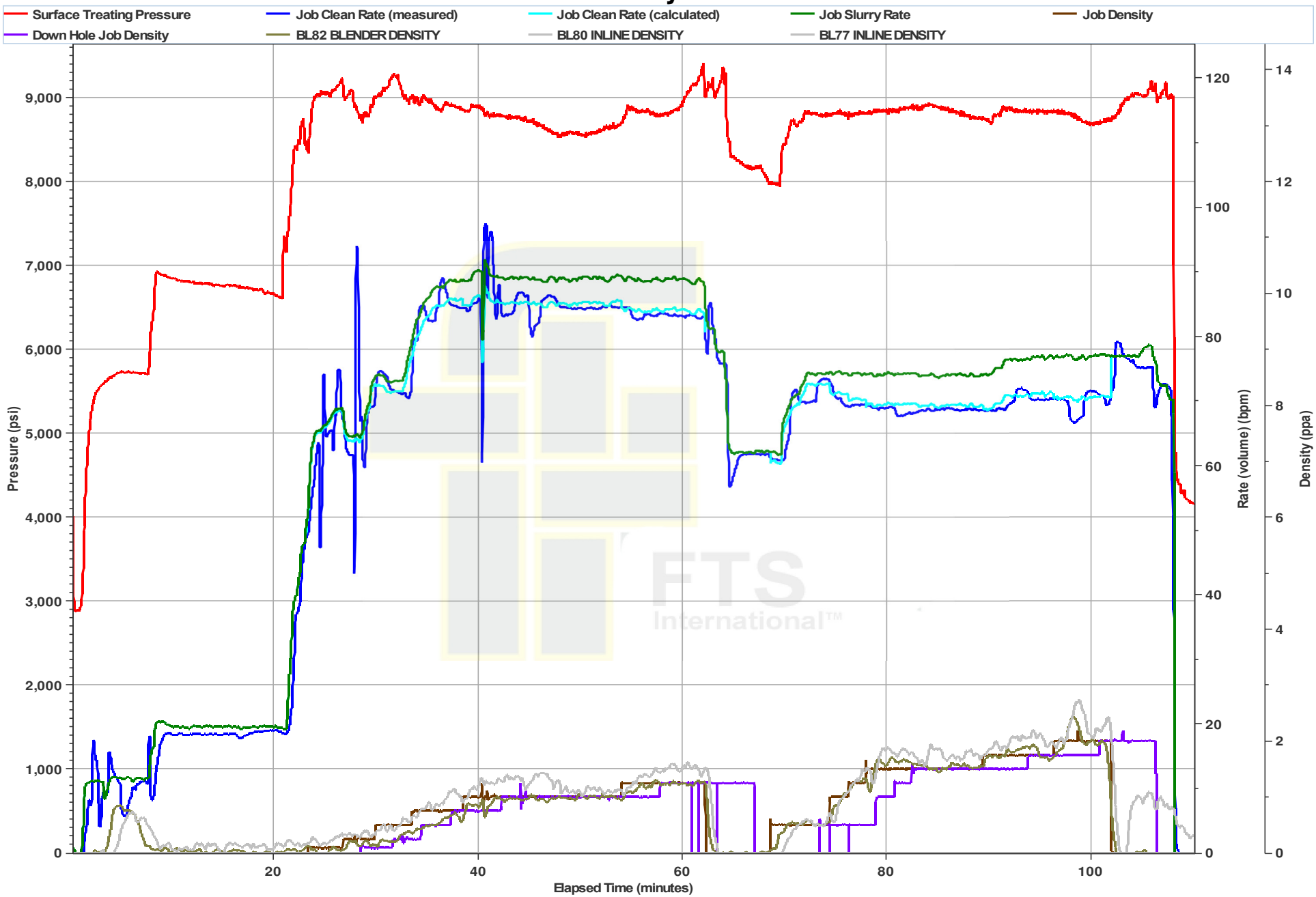
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 5 (WF. 000658.M.W03.S05-aDCT-1103) **Jun 13, 2015**

Acid on Perforations



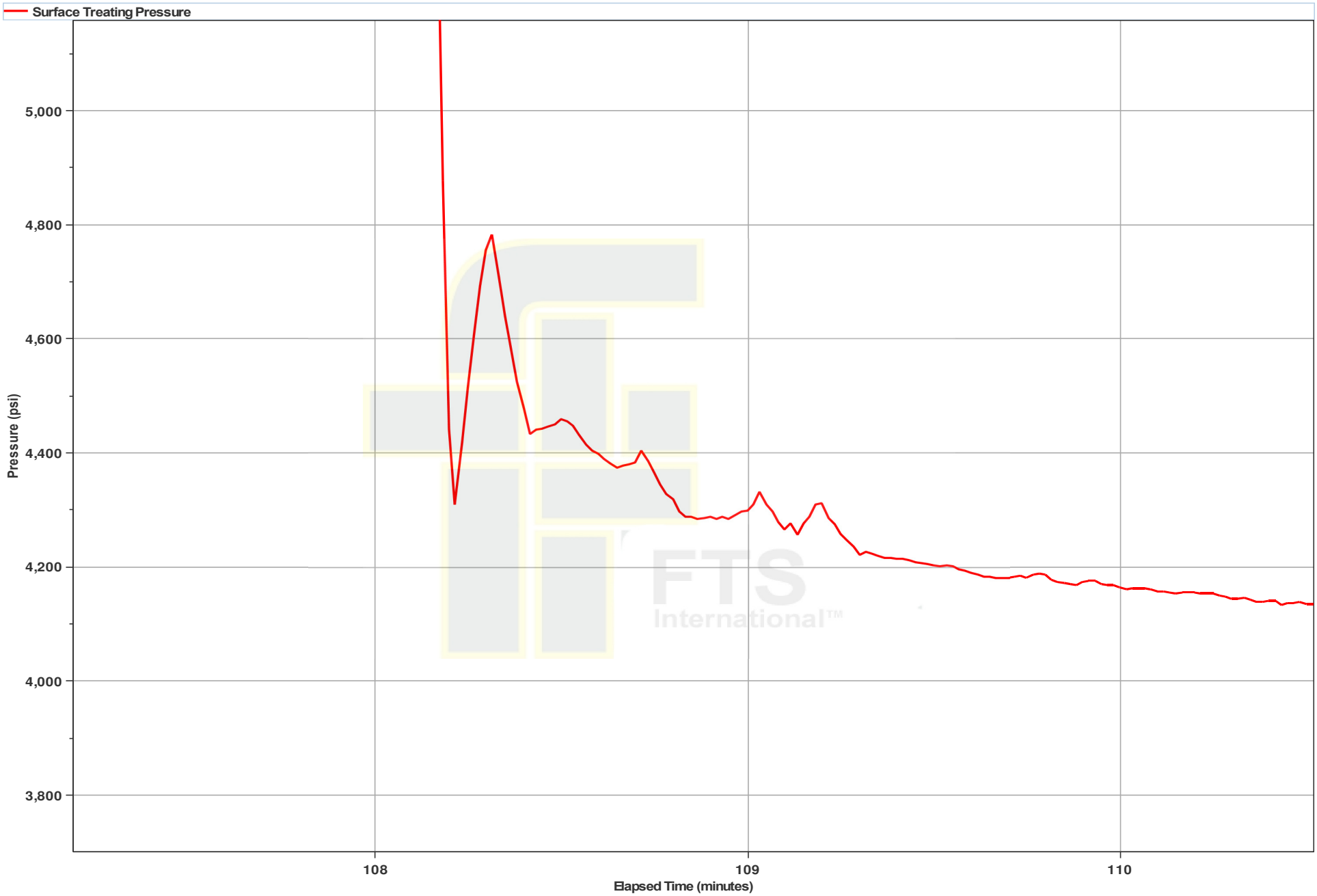
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 5 (WF. 000658.M.W03.S05-aDCT-1103) **Jun 13, 2015**

Primary Plot



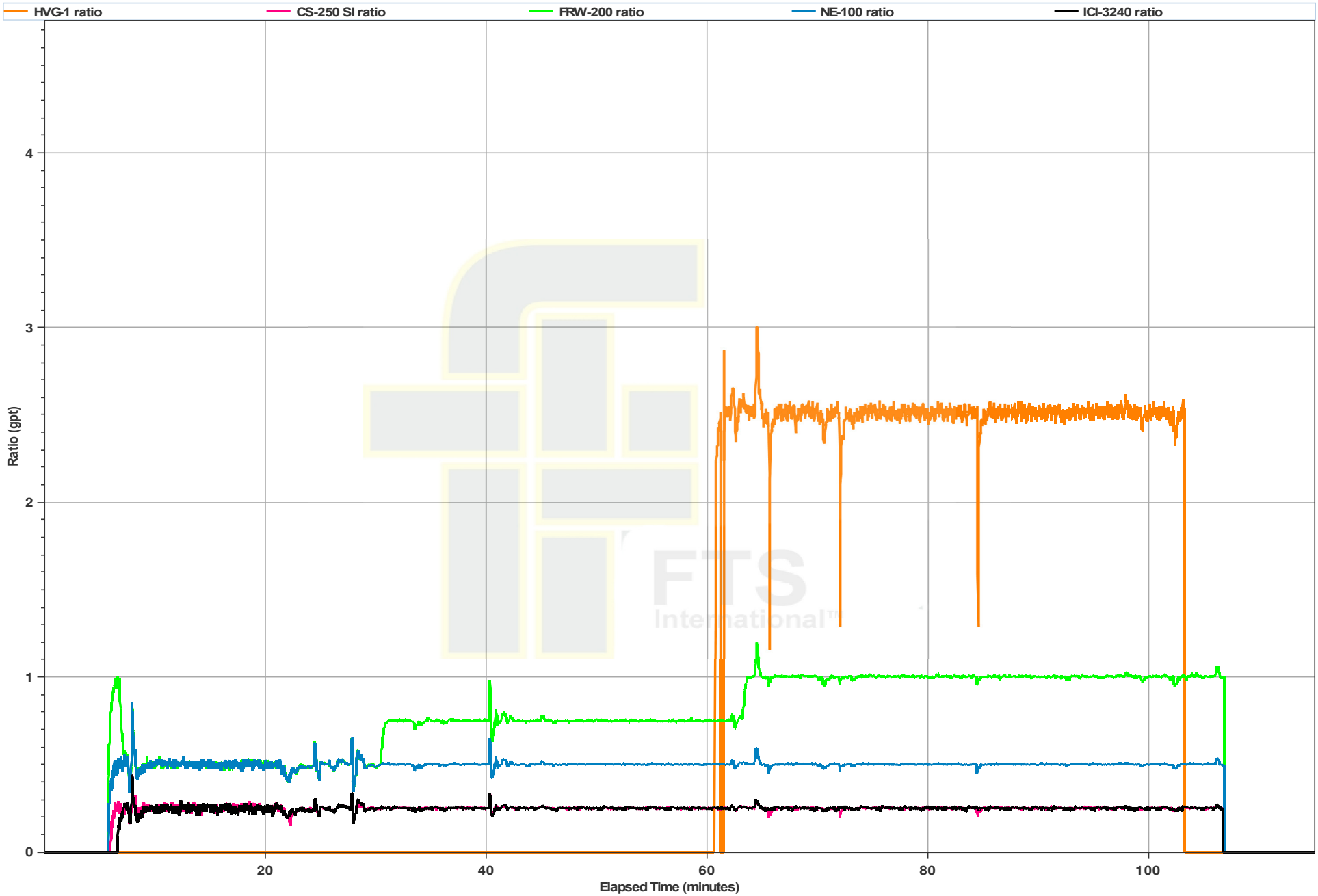
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 5 (WF. 000658.M.W03.S05-aDCT-1103) **Jun 14, 2015**

ISIP Plot



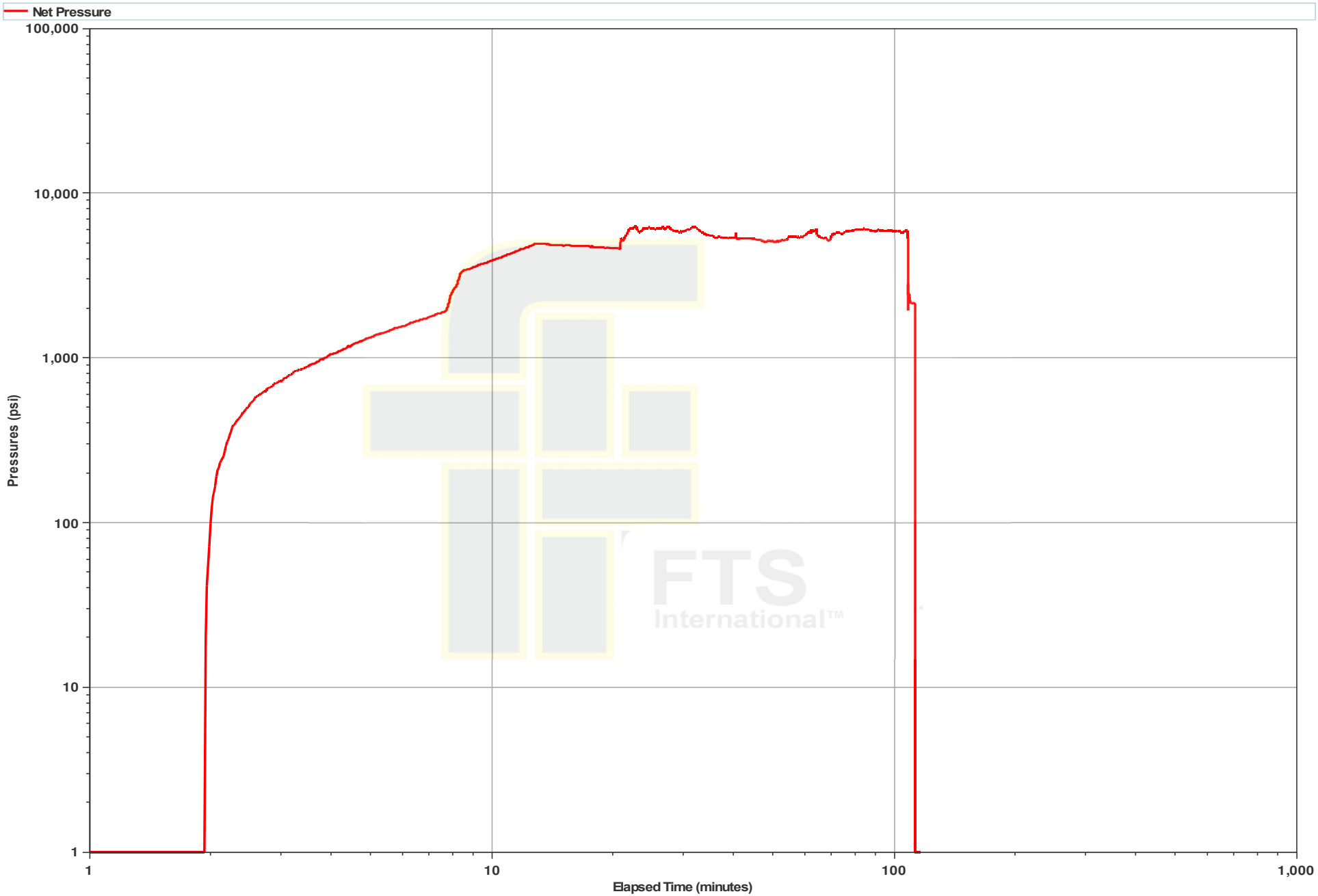
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 5 (WF. 000658.M.W03.S05-aDCT-1103) Jun 13, 2015

Chemical Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 5 (WF. 000658.M.W03.S05-aDCT-1103) **Jun 13, 2015**

Net Pressure Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 5 (WF. 000658.M.W03.S05-aDCT-1103) Jun 14, 2015

WATER-BASED FRAC FLUID QUALITY CONTROL
(Attachment to Post Treatment Report)

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/14/2015
Customer Name:	American Energy - Utica	Proposal #:	3H/5
Date Sampled:	6/14/2015	Water Source:	Working Tank

Sample/Tank No.	Clarity, Color, Odor	Sample Temperature, (F)	Specific gravity	Initial pH	Chloride, ppm	Hardness, ppm	Calcium, ppm	Magnesium, ppm	Iron ppm	Hydroxide, ppm	Bicarbonate, ppm	Carbonate, ppm	Sulfate, ppm	Barium, ppm
Working Tank	Clear	72	1	8.1	45	300	80	53	1	0	976	0	70	0

Frac Fluid Quality Gel Testing (These Recording are to made prior to pumping job)														
Sample #														
Base Gel Type	HVG-1													
Gel Loading (lbs/1000 gal.)	2.5													
Sample Temperature, (F)	72													
Initial pH	8.2													
Visc. Reading @ 300 rpms	6.5													
Viscosity, (cp)	6.5													
Sample 1 3 min Hydration	4													
Sample 2 3 min Hydration	6													
Sample 3 3 min Hydration	6													
X-Link Vortex Closure, min:sec	n/a													
X-Link Crown, min:sec	n/a													
X-Link pH	n/a													
Gel Break Time (<2cp) mins	20													

Frac Fluid Quality Gel Testing (These Recording are to made while pumping job)														
Stage #														
Base Gel Viscosity (cp)														
X-Link pH								.						
Sample XL time, min:sec														
Sample Temperature														

Acid Quality	Percent Acid	NaOH, mLs	Specific Gravity
	28		1.14

Additional testing or documentation may be required by the customer or for frac fluid quality assurance.

Tested By: Travis Wilson

QUALITY CONTROL OF PROPPANTS

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/14/2015
Customer Name:	American Energy - Utica	Well/Stage:	3H/5
Date Sampled:	6/14/2015	DISTRICT:	Washington, PA
VENDOR:	SANTROL		

Select Proppant Type:

____ Brown	____ Ceramic	____ Other (specify)
X White	____ Bauxite	
____ Resin Coated	____ Texas Gold	

Sieve Analysis	100 Mesh			Sieve Analysis	30/50 Mesh		
Sample 1	24.90	grams of sample		Sample 2	24.90	grams of sample	
	Amount Retained				Amount Retained		
Sieve mesh	Gram	%		Sieve mesh	Gram	%	
			Total				Total
50	1.50	6.02	In-Size	20	0.00	0.00	In-Size
70	15.10	60.64		30	0.70	2.81	
100	6.90	27.71	93.6%	40	17.50	70.28	94.8%
120	0.90	3.61		45	5.30	21.29	
140	0.30	1.20		50	0.80	3.21	
200	0.10	0.40		70	0.60	2.41	
Pan	0.10	0.40	fines	Pan	0.00	0.00	fines
Total wt. Gram	24.90	100.00		Total wt. Gram	24.90	100.00	

Tested By: Travis Wilson

Post Job Report

AMERICAN ENERGY - UTICA

Red Hill Farm MDS GR 3H

Stage : 6 OF 54

HARRISON, OH

Operations Representative:

Name:	**David Knapp**
Office:	**570-327-4881**
Fax:	**724-743-7719**
Cell:	
Email:	**DAVID.KNAPP@FTSI.COM**

Sales Representative:

Name:	**Bruce Matthews**
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Fax:	**405-767-1288**
Cell:	
Email:	**BRUCE.MATTHEWS@FTSI.COM**

Engineering Manager:

Name:	**Thaddeus Craun**
Office:	**817-682-8702**
Fax:	**724-743-7719**
Cell:	
Email:	**THADDEUS.CRAUN@FTSI.COM**

FTS International
1432 Route 519
Eighty Four, PA 15330

Customer: American Energy - Utica
Well: Red Hill Farm Mds Gr 3H
Stage: 6
Job End Date: 06/14/2015

Job Summary

Well Information

TVD:	7,301	**Top Perf:**	14,951
No. Of Perfs:	30		

Casing	Tubing
5.50" 20.00#	N/A

Pressures, Rates and Volumes

	Proposed	Actual	Max	Min
STP	9,046 psi	8,775 psi	9,197 psi	6,843 psi
Rate	80.0 bpm	73.0 bpm	91.7 bpm	20.3 bpm

	Proposed	Actual		
Clean Volume	5,772 bbls	5,705 bbls		
Slurry Volume	6,042 bbls	5,973 bbls		
Flush Volume	357 bbls	331 bbls		

	Proposed	Start	End
Frac Pumps on Location	10	14	14

Open Well:	Start Time	07:12	Pressure	3,090 psi
	Ball Seat	306 bbls	Break Down	7,734 psi
	Initial ISIP:	4,547 psi	Initial F.G.:	1.06 psi/ft
Stage Complete:	End Time	08:48	Job Time	01:30
	Final ISIP	4,547 psi	Final F.G.	1.06 psi/ft
	HHP	15,700	5 Min:	4,174 psi
	Proppant Min:	0.00	10 Min:	N/A
	Proppant Max:	2.00	15 Min:	N/A

Material Volume

Material	Proposed	Calculated	Actual	Variance
100 Mesh White	40,000	39,907	39,907	0%
30/50 White	210,000	208,814	210,814	1%
Total Proppants	250,000	248,721	250,721	1%

Material	Proposed	Calculated	Actual	Variance
0.1%-7.5% HCL	3,000	2,982	3,000	1%
APB-1	0	6	6	0%
CI-150	3	3	3	0%
CS-250 SI	60	58	58	0%
FE-200L	15	15	15	0%
FRW-200	180	214	215	0%
HVG-1 4.0	0	28	28	0%
ICI-3240	60	58	58	0%
LTB-1	0	6	6	0%
NE-100	0	116	115	-1%
NE-100W	120	0	0	0

Comments:

Pumpdown Information:
Total Bbls: 313
Max Pressure (psi): 6229
Max Rate (bpm): 16.2

FTS International
1432 Route 519
Eighty Four, PA 15330

Customer: American Energy - Utica
Well: Red Hill Farm Mds Gr 3H
Stage: 6
Job End Date: 06/14/2015

Treatment Report

Date:	6/14/2015	District:	Washington County,PA	Quote No:	051815_035725QF	API:	34-059-24370

MIL Time	STP	Slurry BPM	Stage Clean (bbls)	Cumulative Clean (bbls)	Stage Slurry (bbls)	Cumulative Slurry (bbls)	Stage Proppant (lbs)	Cumulative Proppant (lbs)	Description	Proppant	PPA
07:12	3,090	0.0	0	0	0	0	0	0	Freshwater Open Well		0.00
07:14	4,798	10.5	15	15	15	15	0	0	Freshwater Load		0.00
07:16	5,786	9.3	71	86	71	86	0	0	7.5% HCL Acid Acid		0.00
07:25	7,539	24.5	95	181	95	181	0	0	Slickwater Load		0.00
07:27	7,378	24.7	125	306	126	307	525	525	Slickwater Proppant	100 Mesh White	0.10
07:33	7,734	20.3	0	306	0	307	0	525	Slickwater Breakdown		0.00
07:33	7,429	20.3	89	395	89	396	374	899	Slickwater Proppant	100 Mesh White	0.10
07:36	8,787	59.7	214	609	216	612	2,247	3,146	Slickwater Proppant	100 Mesh White	0.25
07:40	9,040	65.7	255	864	261	873	5,355	8,501	Slickwater Proppant	100 Mesh White	0.50
07:44	9,030	66.7	429	1,293	444	1,317	13,514	22,015	Slickwater Proppant	100 Mesh White	0.75
07:51	9,048	72.0	426	1,719	445	1,762	17,892	39,907	Slickwater Proppant	100 Mesh White	1.00
07:57	9,048	72.7	875	2,594	915	2,677	36,750	76,657	Slickwater Proppant	30/50 White	1.00
08:09	8,903	81.1	1,001	3,595	1,058	3,735	52,553	129,210	Slickwater Proppant	30/50 White	1.25
08:21	8,880	90.2	858	4,453	916	4,651	54,054	183,264	Slickwater Proppant	30/50 White	1.50
08:32	8,855	91.3	502	4,955	542	5,193	36,897	220,161	Slickwater Proppant	30/50 White	1.75
08:37	8,855	88.3	70	5,025	76	5,269	5,880	226,041	Slickwater Proppant	30/50 White	2.00
08:38	8,929	86.5	270	5,295	294	5,563	22,680	248,721	10# Linear Gel Proppant	30/50 White	2.00
08:42	8,999	73.9	79	5,374	79	5,642	0	248,721	Slickwater Clean screws		0.00
08:43	9,041	73.3	230	5,604	230	5,872	0	248,721	Slickwater Flush		0.00
08:46	9,019	72.6	101	5,705	101	5,973	0	248,721	Freshwater Flush		0.00
08:48	4,547	0.0	0	5,705	0	5,973	0	248,721	Freshwater Shutdown		0.00
Total JobTime (HH:MM): 01:36											

Min STP:	6,843 psi	**Max STP:**	9,197 psi	**Average STP:**	8,775 psi	**5 Min:**	4,174 psi
Min Rate:	20.3 bpm	**Max Rate:**	91.7 bpm	**Average Rate:**	73.0 bpm	**10 Min:**	0 psi
Initial ISIP:	4,547 psi	**Initial F.G.:**	1.06 psi/ft	**Average HHP:**	15,700	**15 Min:**	0 psi
Final ISIP:	4,547 psi	**Final F.G.:**	1.06 psi/ft	**Customer Representative:**		Jim Andrews	
FTSI Representative:		Etuate Varea & Jason McCoskey					

Comments:

The proppant values contained in this report are calculated based on actual barrel counts and target densities. Actual total proppant usage is 250,721 lbs. Charge time is 1 hour(s) 30 minute(s). All chemicals and proppant ran as documented.

Min/Max/Avg were taken from sand stages. All chem changes from proposed were made per AEU representative request.

Started pumping a 10# Linear Gel system during the 2.0 ppg stage of 30/50 per AEU representative request.

1 Minute Shutdown (psi): 4380
2 Minute Shutdown (psi): 4292
5 Minute Shutdown (psi): 4174

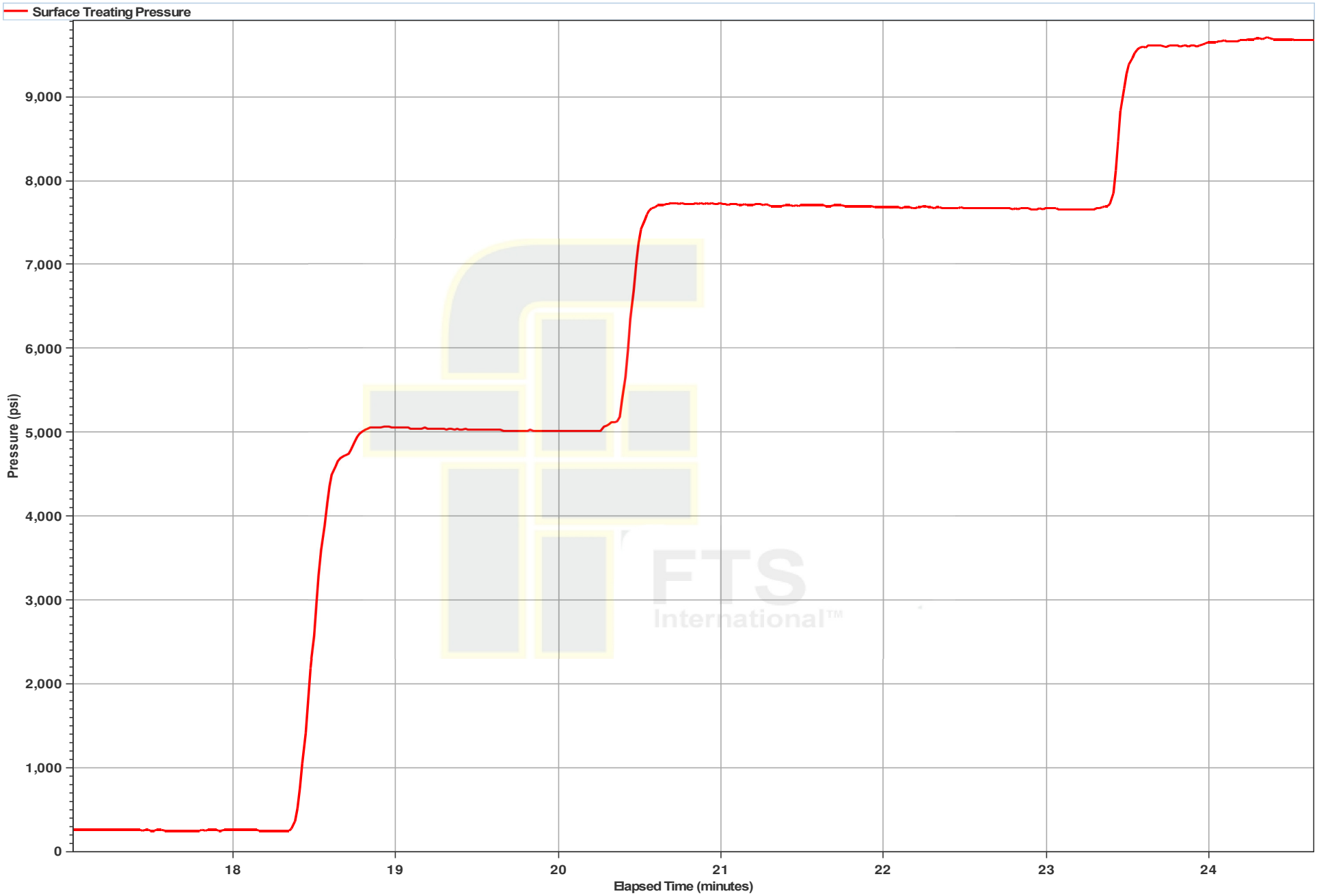
FTS International
1432 Route 519
Eighty Four, PA 15330

Customer: American Energy - Utica
Well: Red Hill Farm Mds Gr 3H
Stage: 6
Job End Date: 06/14/2015

Chemical Changes:

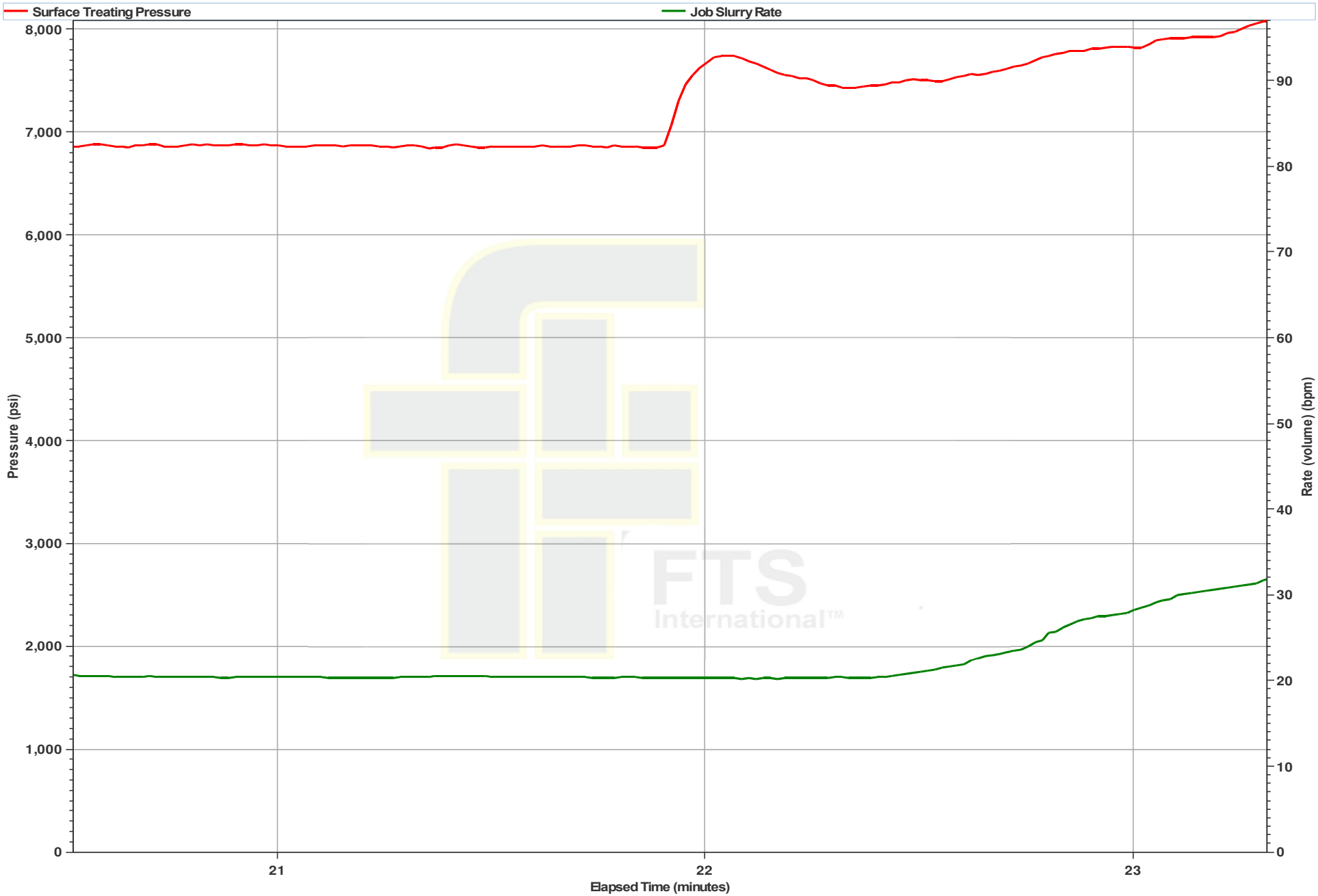
Chemical Name	Chemical Loading	Cumulative Clean
FRW-200	1.00	2,594

AEU Pressure Test



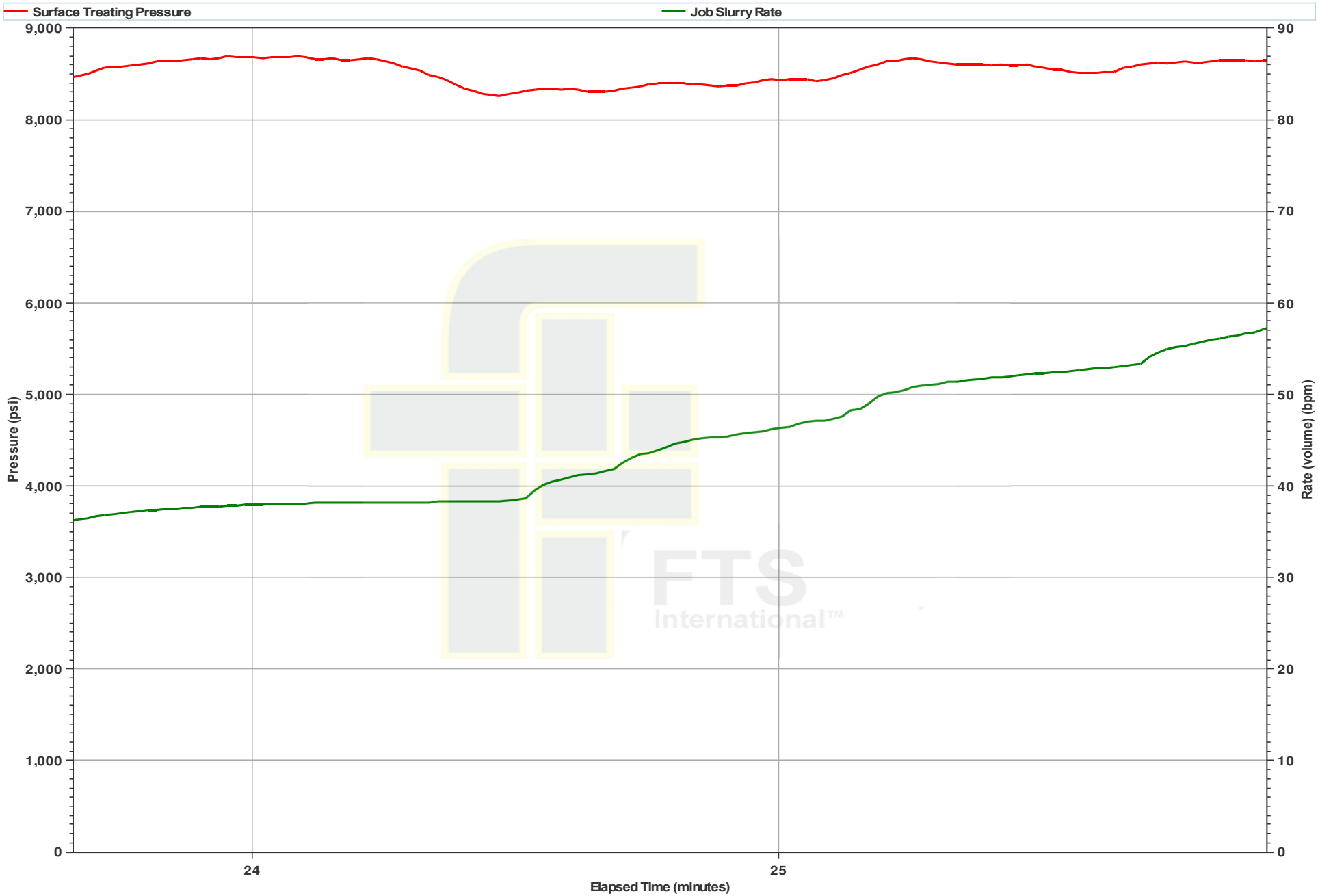
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 6 (WF. 000658.M.W03.S06-aDCT-1103) **Jun 14, 2015**

Ball Seat and Breakdown



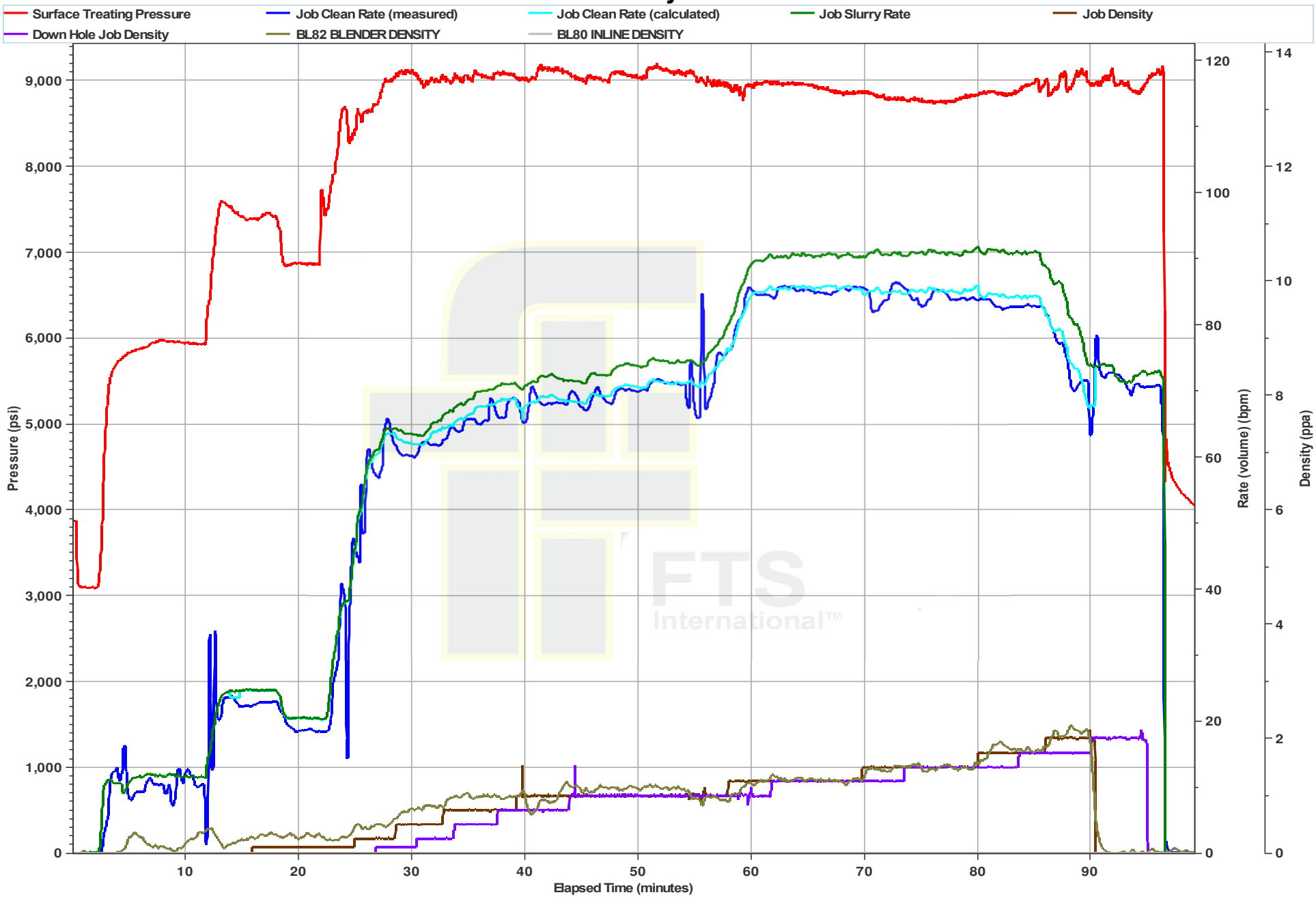
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 6 (WF. 000658.M.W03.S06-aDCT-1103) Jun 14, 2015

Acid on Perforations



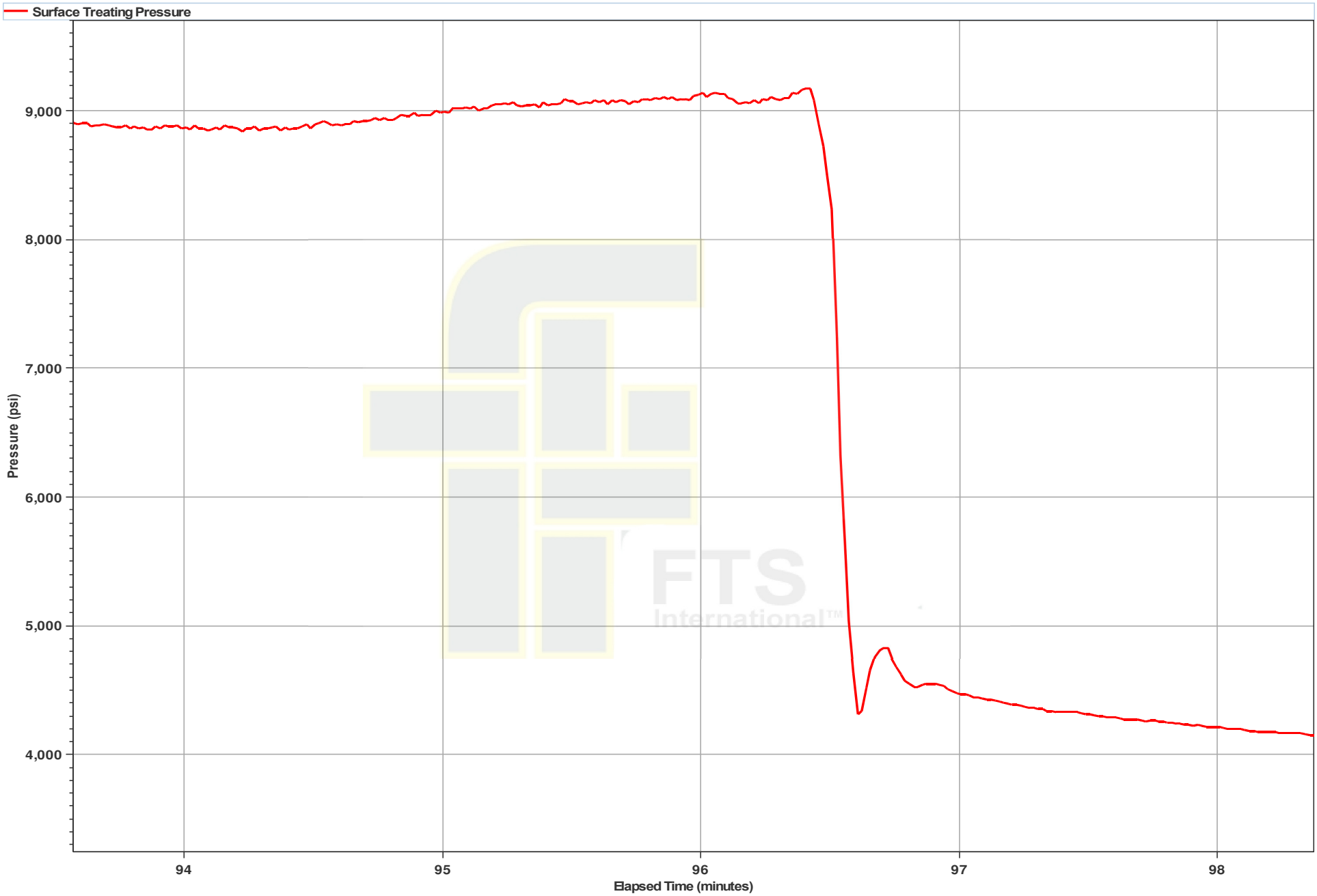
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 6 (WF. 000658.M.W03.S06-aDCT-1103) **Jun 14, 2015**

Primary Plot



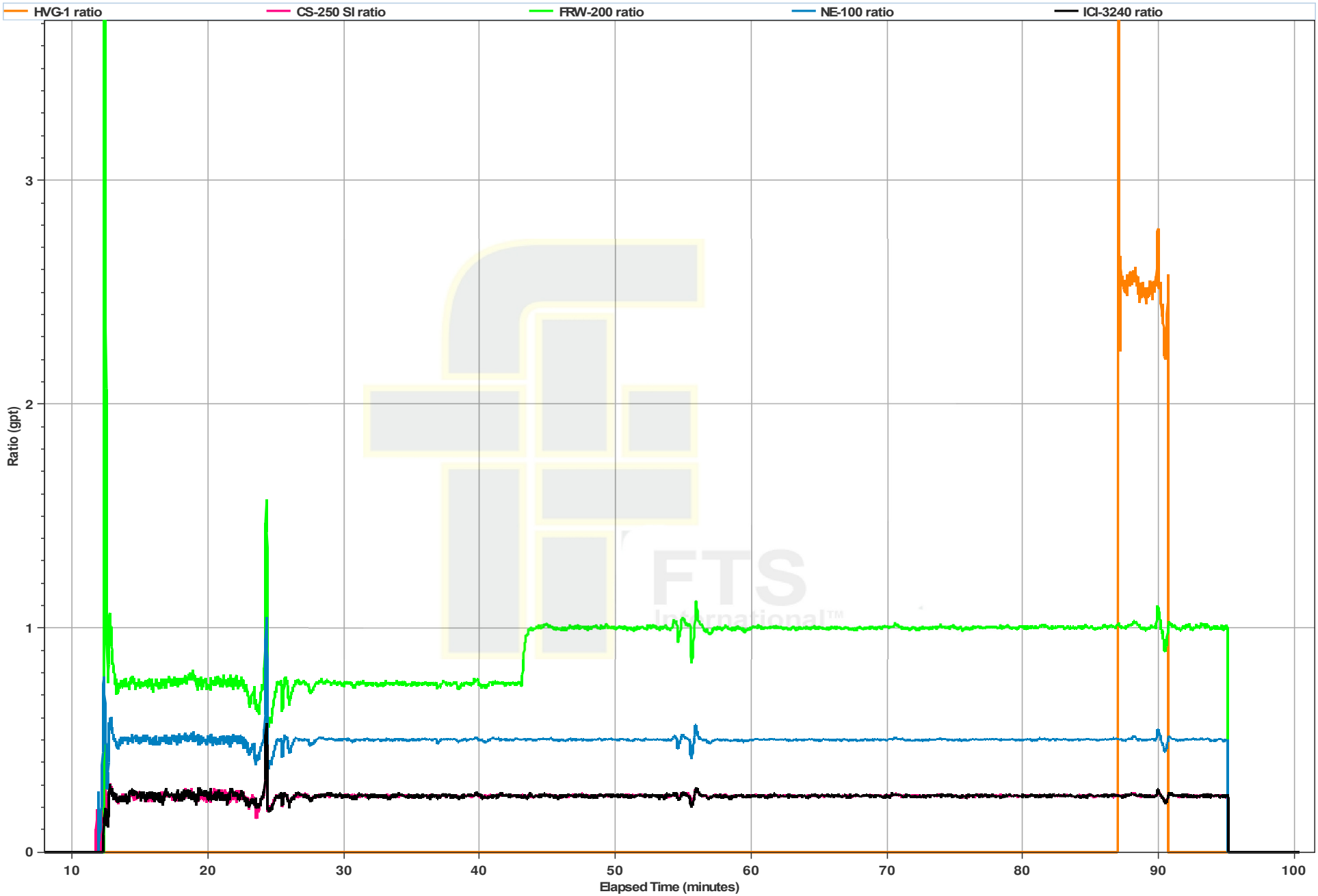
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 6 (WF. 000658.M.W03.S06-aDCT-1103) **Jun 14, 2015**

ISIP Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 6 (WF. 000658.M.W03.S06-aDCT-1103) **Jun 14, 2015**

Chemical Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 6 (WF. 000658.M.W03.S06-aDCT-1103) Jun 14, 2015

Net Pressure Plot

American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 6 (WF. 000658.M.W03.S06-aDCT-1103) Jun 14, 2015

WATER-BASED FRAC FLUID QUALITY CONTROL
(Attachment to Post Treatment Report)

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/14/2015
Customer Name:	American Energy - Utica	Proposal #:	3H/6
Date Sampled:	6/14/2015	Water Source:	Blender Tub

Sample/Tank No.	Clarity, Color, Odor	Sample Temperature, (F)	Specific gravity	Initial pH	Chloride, ppm	Hardness, ppm	Calcium, ppm	Magnesium, ppm	Iron ppm	Hydroxide, ppm	Bicarbonate, ppm	Carbonate, ppm	Sulfate, ppm	Barium, ppm
Blender Tub	Yellow	78	1	7.6	2,999	80	24	14	1	0	122	0	200	0

Frac Fluid Quality Gel Testing (These Recording are to made prior to pumping job)														
Sample #														
Base Gel Type	HVG-1													
Gel Loading (lbs/1000 gal.)	2.5													
Sample Temperature, (F)	78													
Initial pH	8.2													
Visc. Reading @ 300 rpms	6.5													
Viscosity, (cp)	6.5													
Sample 1 3 min Hydration	4													
Sample 2 3 min Hydration	6													
Sample 3 3 min Hydration	6													
X-Link Vortex Closure, min:sec	n/a													
X-Link Crown, min:sec	n/a													
X-Link pH	n/a													
Gel Break Time (<2cp) mins	18													

Frac Fluid Quality Gel Testing (These Recording are to made while pumping job)														
Stage #														
Base Gel Viscosity (cp)														
X-Link pH								.						
Sample XL time, min:sec														
Sample Temperature														

Acid Quality	Percent Acid	NaOH, mLs	Specific Gravity
	28		1.14

Additional testing or documentation may be required by the customer or for frac fluid quality assurance.

Tested By: Etuate Varea

QUALITY CONTROL OF PROPPANTS

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/14/2015
Customer Name:	American Energy - Utica	Well/Stage:	3H/6
Date Sampled:	6/14/2015	DISTRICT:	Washington, PA
VENDOR:	SANTROL		

Select Proppant Type:

___	Brown	___	Ceramic	___	Other (specify)
X	White	___	Bauxite		
___	Resin Coated	___	Texas Gold		

Sieve Analysis	100 Mesh			Sieve Analysis	30/50 Mesh		
Sample 1	25.50	grams of sample		Sample 2	25.40	grams of sample	
	Amount Retained				Amount Retained		
Sieve mesh	Gram	%		Sieve mesh	Gram	%	
			Total				Total
50	0.50	1.96	In-Size	20	0.00	0.00	In-Size
70	15.20	59.61		30	0.30	1.18	
100	8.10	31.76	98.0%	40	17.60	69.29	98.0%
120	1.20	4.71		45	6.30	24.80	
140	0.40	1.57		50	1.00	3.94	
200	0.10	0.39		70	0.20	0.79	
Pan	0.00	0.00	fines	Pan	0.00	0.00	fines
Total wt. Gram	25.50	100.00		Total wt. Gram	25.40	100.00	

Tested By: Etuate Varea

Post Job Report

AMERICAN ENERGY - UTICA

Red Hill Farm MDS GR 3H

Stage : 7 OF 54

HARRISON, OH

Operations Representative:

Name:	David Knapp
Office:	879-327-4981
Fax:	724-743-7719
Cell:	
Email:	DAVID.KNAPP@FTSI.COM

Sales Representative:

Name:	Bruce Matthews
Office:	405-974-3981
Fax:	405-787-1535
Cell:	
Email:	BRUCE.MATTHEWS@FTSI.COM

Engineering Manager:

Name:	Thaddeus Craun
Office:	817-832-8782
Fax:	724-743-7719
Cell:	
Email:	THADDEUS.CRAUN@FTSI.COM

FTS International
[illegible]
Eighty Four, PA [illegible]

FTS INTERNATIONAL

Customer: American Energy - Utica
Well: Red Hill Farm Hoe Gr 2H
Stage 7
Job End Date [illegible]

Job Summary

Well Information

TVD:	7,301	Top Perf:	14,789
No. Of Perfs:	30		

Casing	Tubing
[illegible]	N/A

Pressures, Rates and Volumes

	Proposed	Actual	Max	Min
STP	[illegible] psi	[illegible] psi	[illegible] psi	[illegible] psi
Rate	[illegible] bpm	77.4 bpm	[illegible] bpm	[illegible] bpm

	Proposed	Actual		
Clean Volume	[illegible] bbls	[illegible] bbls		
Slurry Volume	[illegible] bbls	[illegible] bbls		
Flush Volume	[illegible] bbls	[illegible] bbls		

	Proposed	Start	End
Free Pumps on Location	[illegible]	15	15

Open Well:	Start Time	[illegible]	Pressure	[illegible] psi
	Bull Dwn	[illegible] bbls	Break Down	[illegible] psi
	Initial ISIP:	[illegible] psi	Initial F.G.:	[illegible] psi/ft
Stage Complete:	End Time	17:25	Job Time	[illegible]
	Final ISIP:	[illegible] psi	Final F.G.	[illegible] psi/ft
	HHP	[illegible]	5 Min:	[illegible] psi
	Pressure Min:	[illegible]	10 Min:	N/A
	Pressure Max:	[illegible]	15 Min:	N/A

Material Volume

Material	Proposed	Calculated	Actual	Variance
100 Mesh WHSp	[illegible]	[illegible]	[illegible]	0%
[illegible] WHSp	[illegible]	[illegible]	[illegible]	0%
Total Proppants	[illegible]	[illegible]	[illegible]	0%

Material	Proposed	Calculated	Actual	Variance
6.1%-7.5% HCL	[illegible]	[illegible]	[illegible]	1%
AFE-4	6	5	5	0%
[illegible]	3	3	3	0%
[illegible]	[illegible]	57	58	2%
FE-[illegible]	15	15	15	0%
[illegible]	180	180	175	-3%
[illegible]-14.5	6	36	35	0%
[illegible]	[illegible]	57	58	2%
LTB-1	6	5	5	0%
[illegible]	6	114	117	3%
[illegible]	[illegible]	5	5	0

Comments:

Pumpdown Information:
Total Bbls: 287
Max Pressure (psi): 4371
Max Rate (bpm): 19

FTS International
[illegible]
Ogilby Pass, PA [illegible]

FTS INTERNATIONAL

Customer: American Energy - Utica
Well: Red Hill Farm Site 6r 3H
Stages 7
Job End Date: [illegible]

Treatment Report

Date	[illegible]	Statelate	Washington County,PA	Data Set	[illegible]	API#	[illegible]

HH. Time	STP	Slurry BPM	Stage Slurry (bbls)	Cumulative Slurry (bbls)	Stage Slurry (bbls)	Cumulative Slurry (bbls)	Stage Proppant (lbs)	Cumulative Proppant (lbs)	Description	Proppant	PPA
[illegible]	3,191	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0	0	Pressure Open Well		0.00
[illegible]	5,304	[illegible]	71	[illegible]	71	[illegible]	0	0	7.5% HCL Acid Add		0.00
[illegible]	[illegible]	11.3	75	[illegible]	75	[illegible]	0	0	Slickwater Pad		0.00
[illegible]	[illegible]	22.3	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Slickwater Proppant	100 Mesh White	0.10
[illegible]	[illegible]	[illegible]	5	[illegible]	5	[illegible]	31	[illegible]	Slickwater Breakdown	100 Mesh White	0.10
[illegible]	[illegible]	[illegible]	79	[illegible]	79	[illegible]	[illegible]	[illegible]	Slickwater Proppant	100 Mesh White	0.10
[illegible]	[illegible]	37.2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Slickwater Proppant	100 Mesh White	0.25
[illegible]	[illegible]	71.8	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Slickwater Proppant	100 Mesh White	0.50
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Slickwater Proppant	100 Mesh White	0.75
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Slickwater Proppant	100 Mesh White	1.00
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Slickwater Proppant	[illegible] White	1.00
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Slickwater Proppant	[illegible] White	1.25
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Slickwater Proppant	[illegible] White	1.50
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Slickwater Proppant	[illegible] White	1.75
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Slickwater Proppant	[illegible] White	1.75
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Tail Linear Gel Proppant	[illegible] White	2.00
[illegible]	[illegible]	71.8	[illegible]	[illegible]	[illegible]	[illegible]	0	[illegible]	Slickwater Down pressure		0.00
[illegible]	[illegible]	71.5	[illegible]	[illegible]	[illegible]	[illegible]	0	[illegible]	Slickwater Flush		0.00
[illegible]	[illegible]	72.5	[illegible]	[illegible]	[illegible]	[illegible]	0	[illegible]	Freshwater Flush		0.00
[illegible]	4,152	0.0	0	[illegible]	0	[illegible]	0	[illegible]	Freshwater Shutdown		0.00
Total Job Time (HH:MM): [illegible]											

Min STP:	[illegible] psi	Max STP:	[illegible] psi	Average STP:	[illegible] psi	5 Min:	[illegible] psi
Min Rate:	[illegible] bpm	Max Rate:	[illegible] bpm	Average Rate:	77.4 bpm	10 Min:	[illegible] psi
Initial ISIP:	4,152 psi	Initial F.G.:	1.00 psi/ft	Average ISIP:	[illegible]	15 Min:	[illegible] psi
Final ISIP:	4,152 psi	Final F.G.:	1.00 psi/ft	Customer Representative		Jim Andrews	
FTS Representatives		Travis Wilson & Jason McCauley					

Comments:

The proppant values contained in this report are calculated based on actual barrel counts and target densities. Actual total proppant usage is 240,137 lbs. Charge time is 1 hour(s) 30 minute(s). All chemicals and proppant ran as documented.

Min/Max/Avg were taken from sand stages. All chem changes from proposed were made per AEU representative request.

Started pumping a 100 Linear Gel system during the 2.0 ppg stage of 30/50 per AEU representative request.

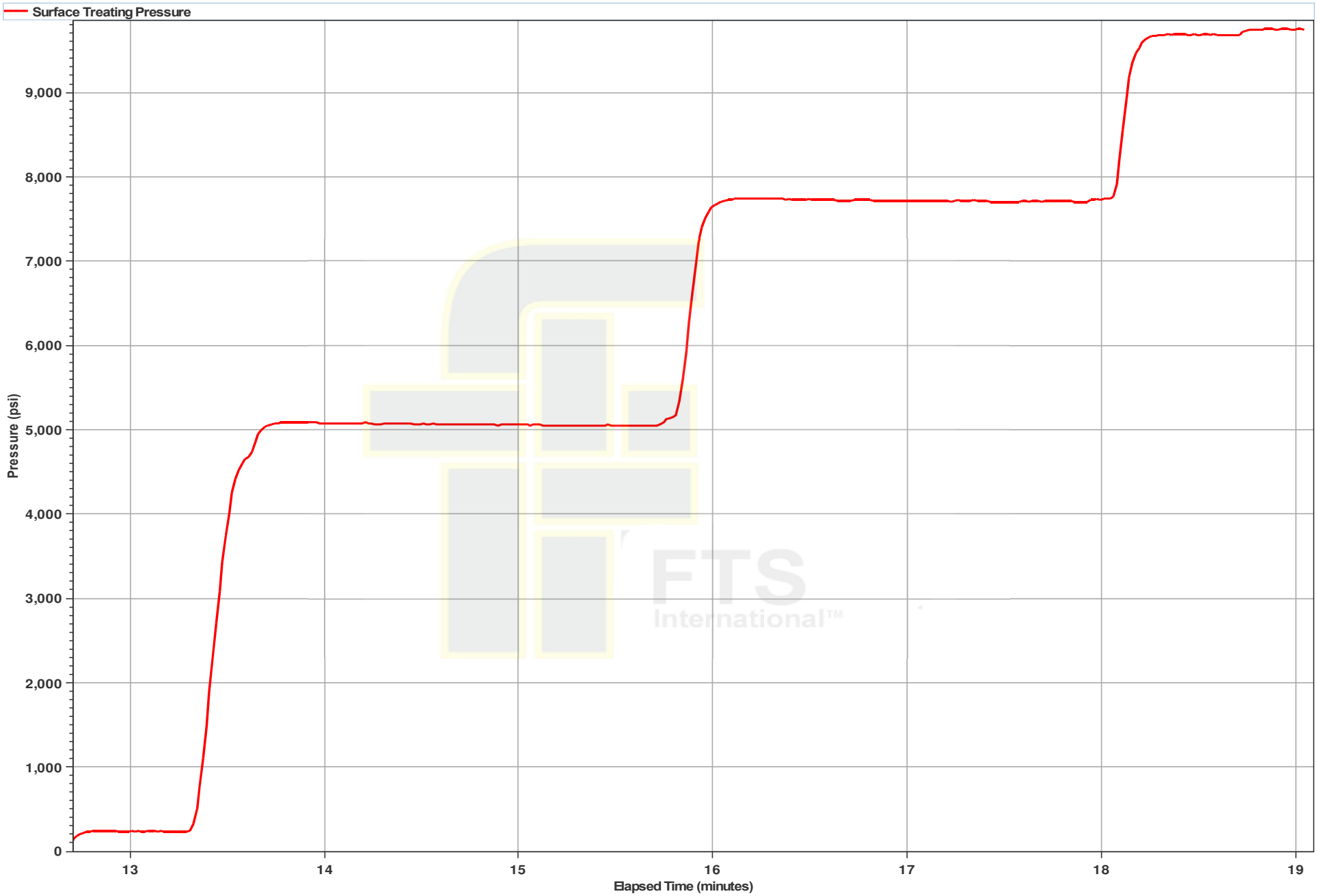
Sand was cut 10,000 lbs short due to rising formation pressure.

1 Minute Shutdown (psi): 4024
2 Minute Shutdown (psi): 3915
5 Minute Shutdown (psi): 3700

Chemical Changes:

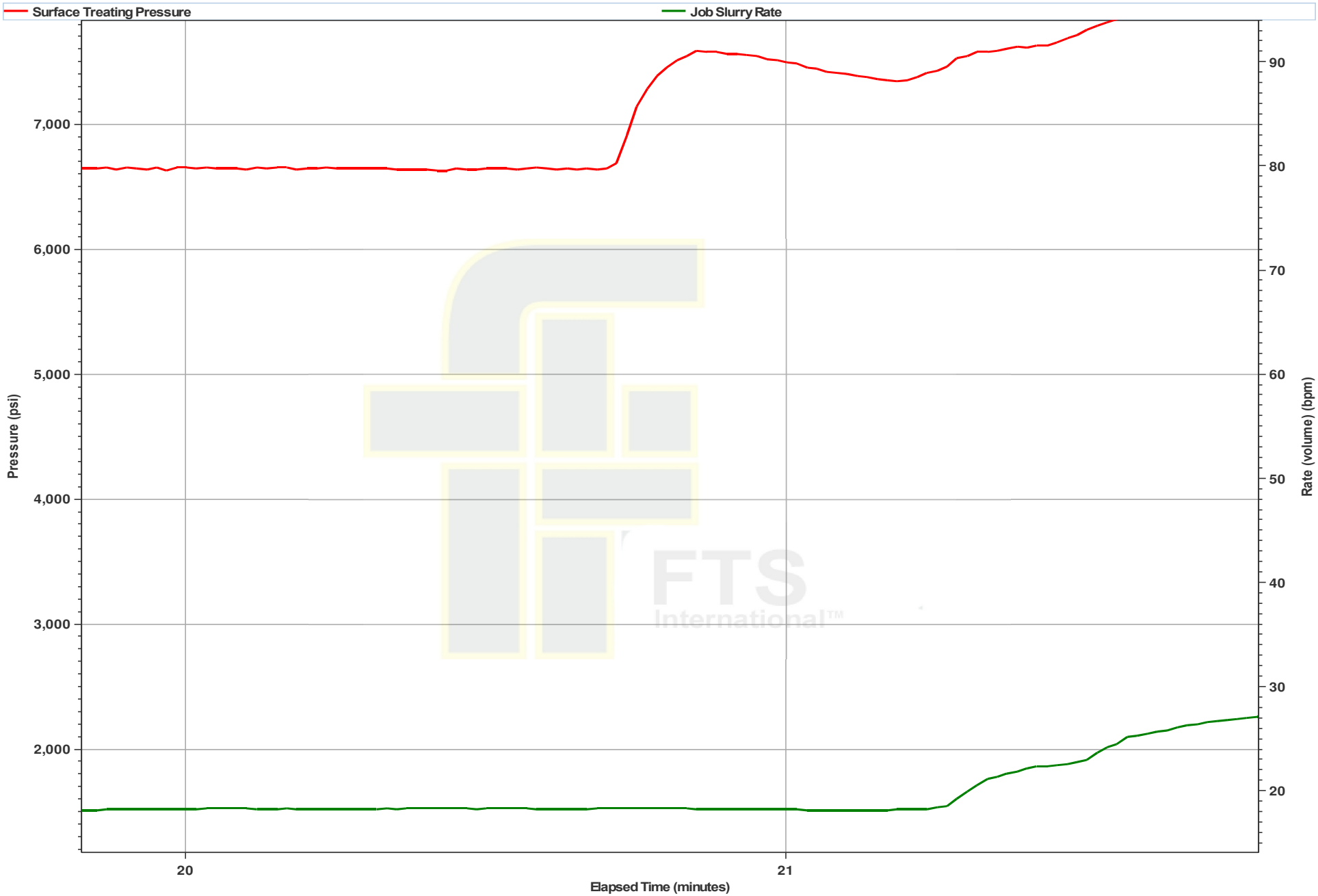
Chemical Name	Chemical Loading	Cumulative Gleen
FRW-200	1.00	4,861

AEU Pressure Test



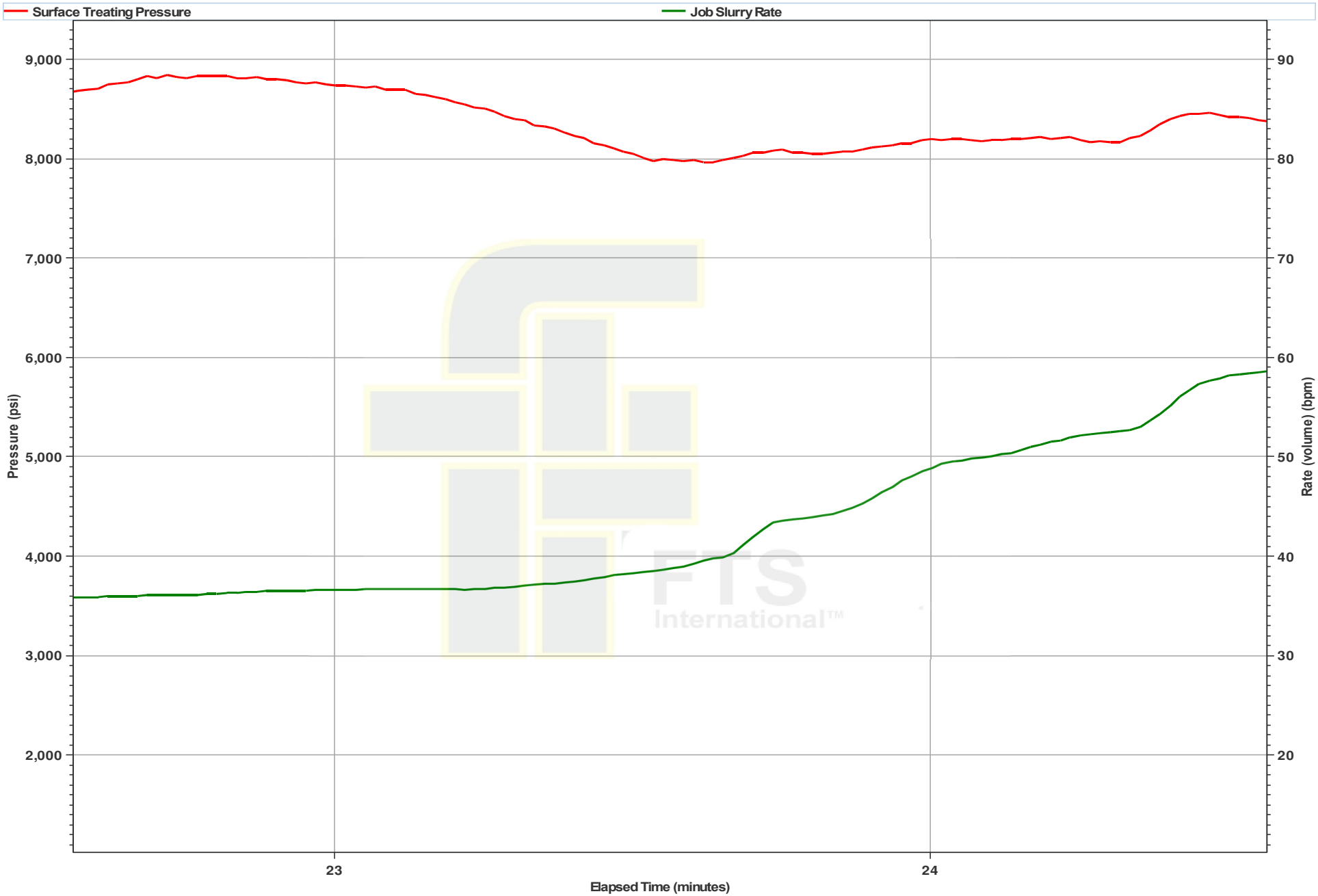
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 7 (WF.000656.M.W03.S07-aDCT-1103) **Jun 14, 2015**

Ball Seat and Breakdown



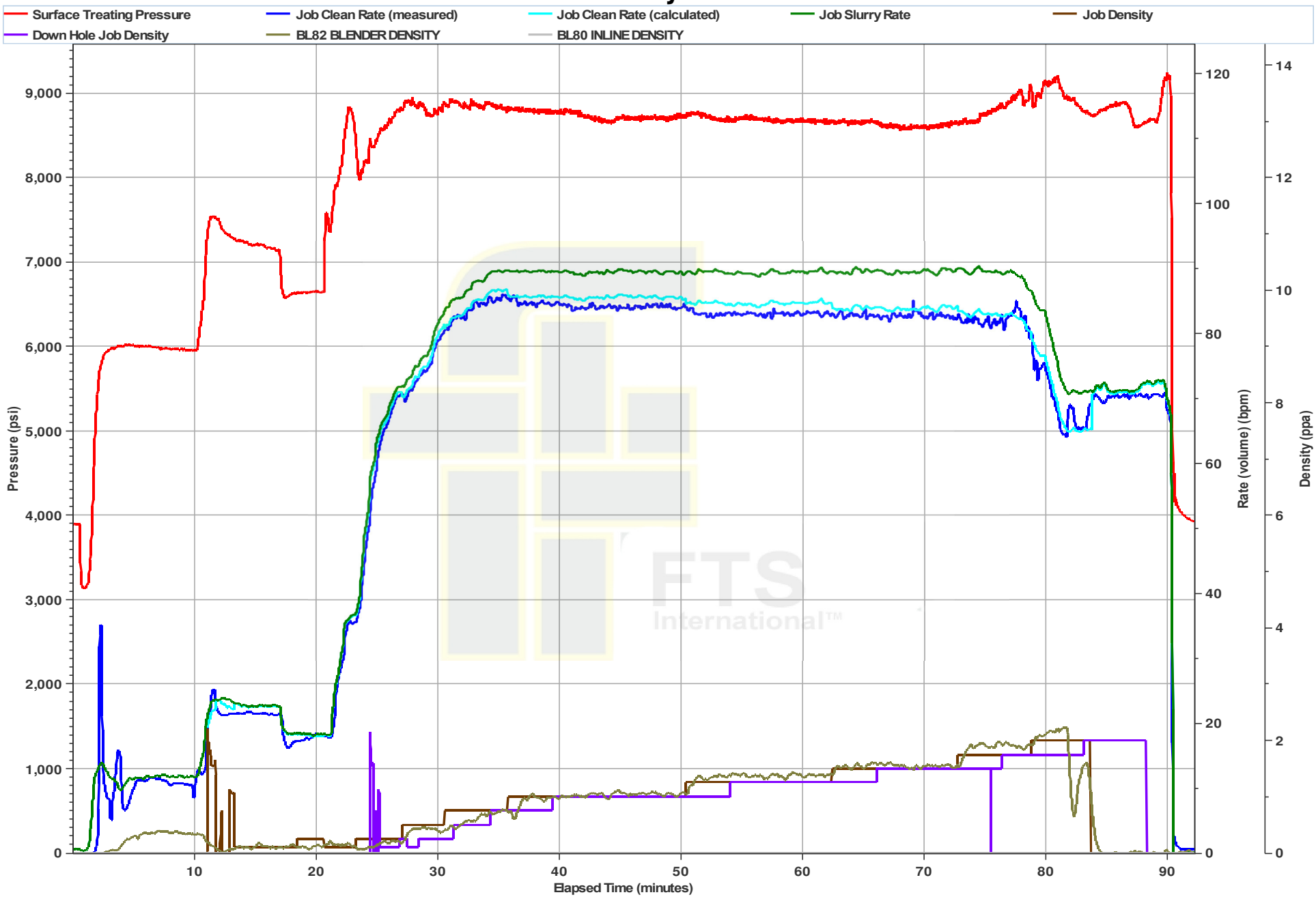
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 7 (WF.000656.M.W03.S07-aDCT-1103) Jun 14, 2015

Acid on Perforations



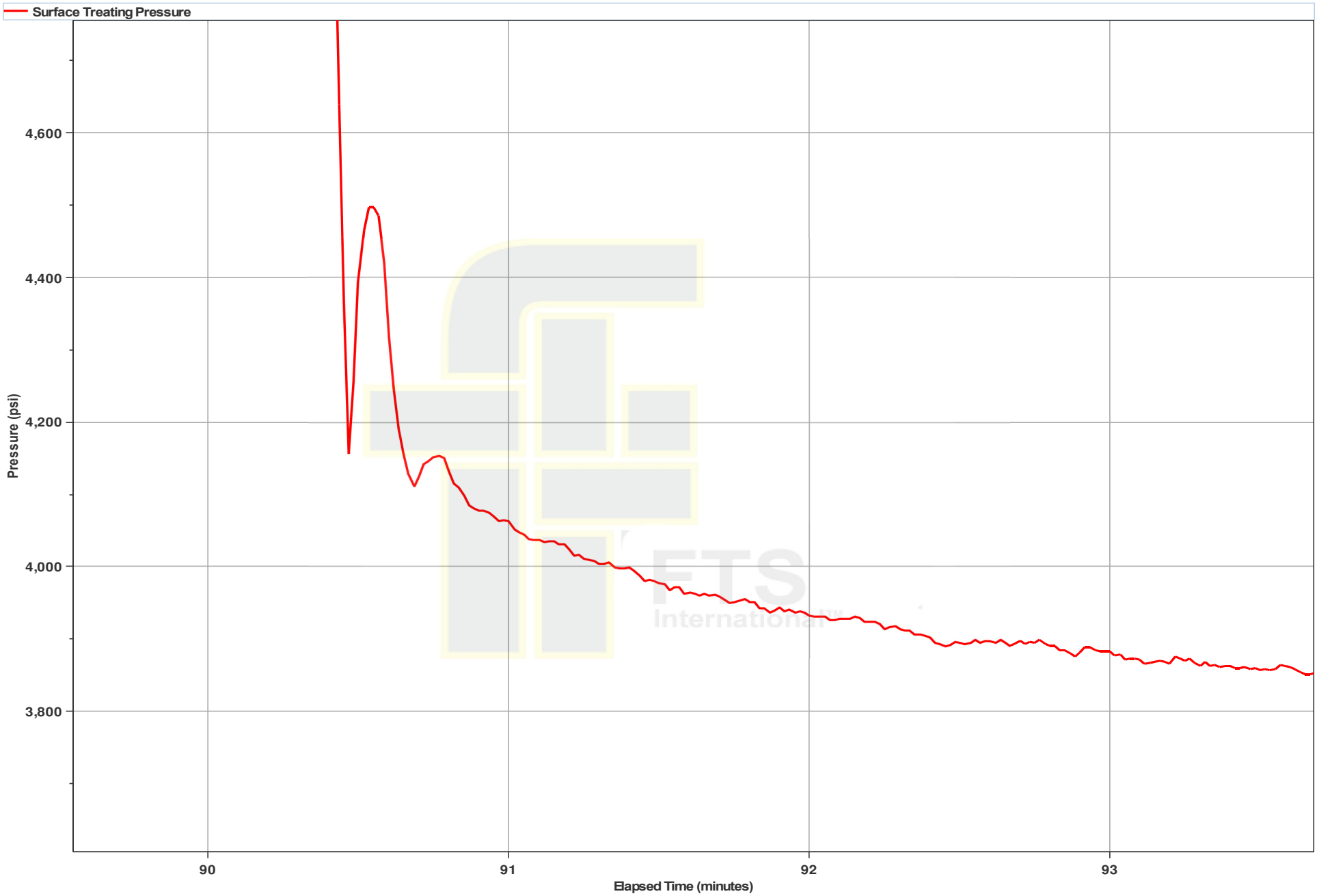
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 7 (WF.000656.M.W03.S07-aDCT-1103) **Jun 14, 2015**

Primary Plot



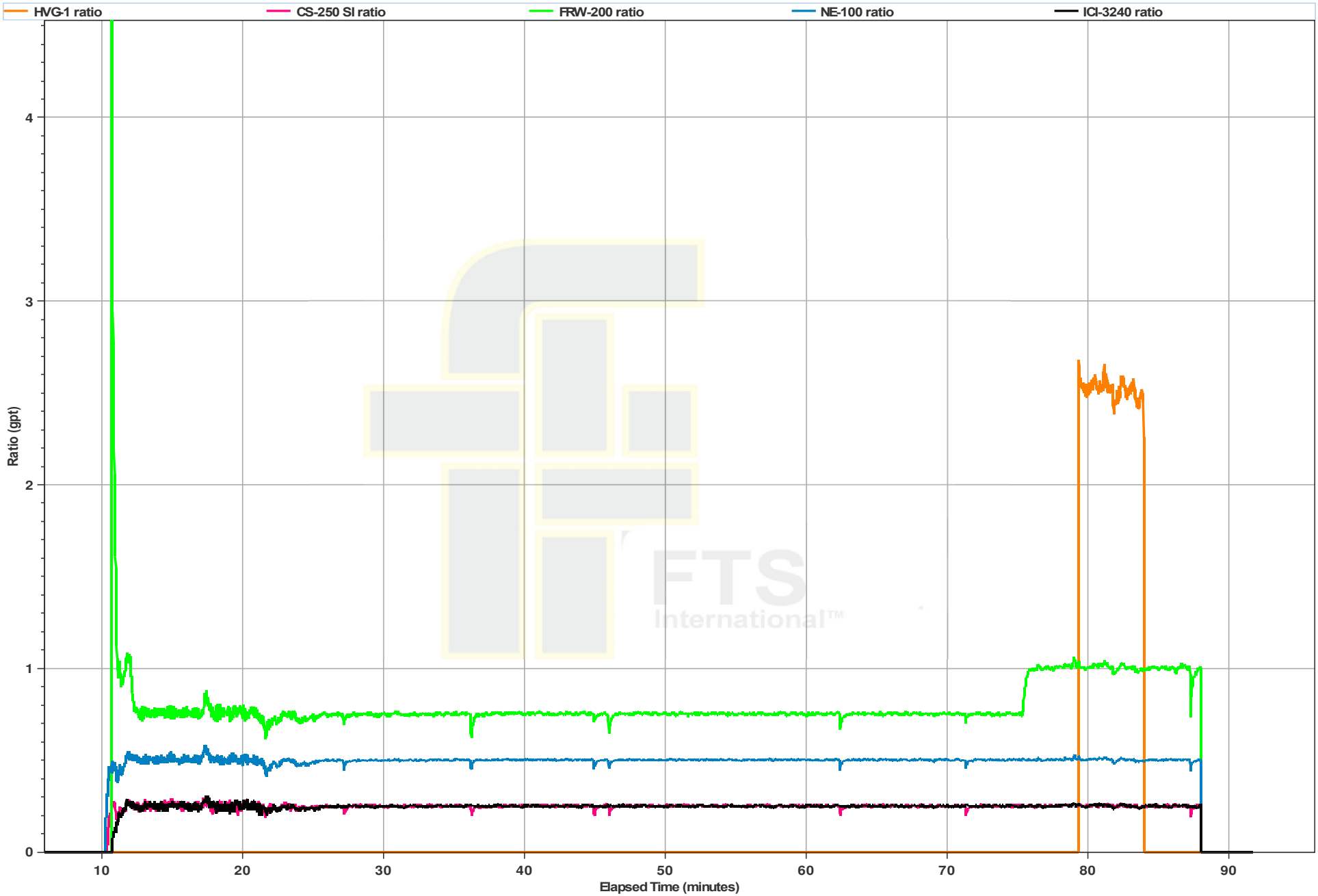
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 7 (WF.000656.M.W03.S07-aDCT-1103) **Jun 14, 2015**

ISIP Plot



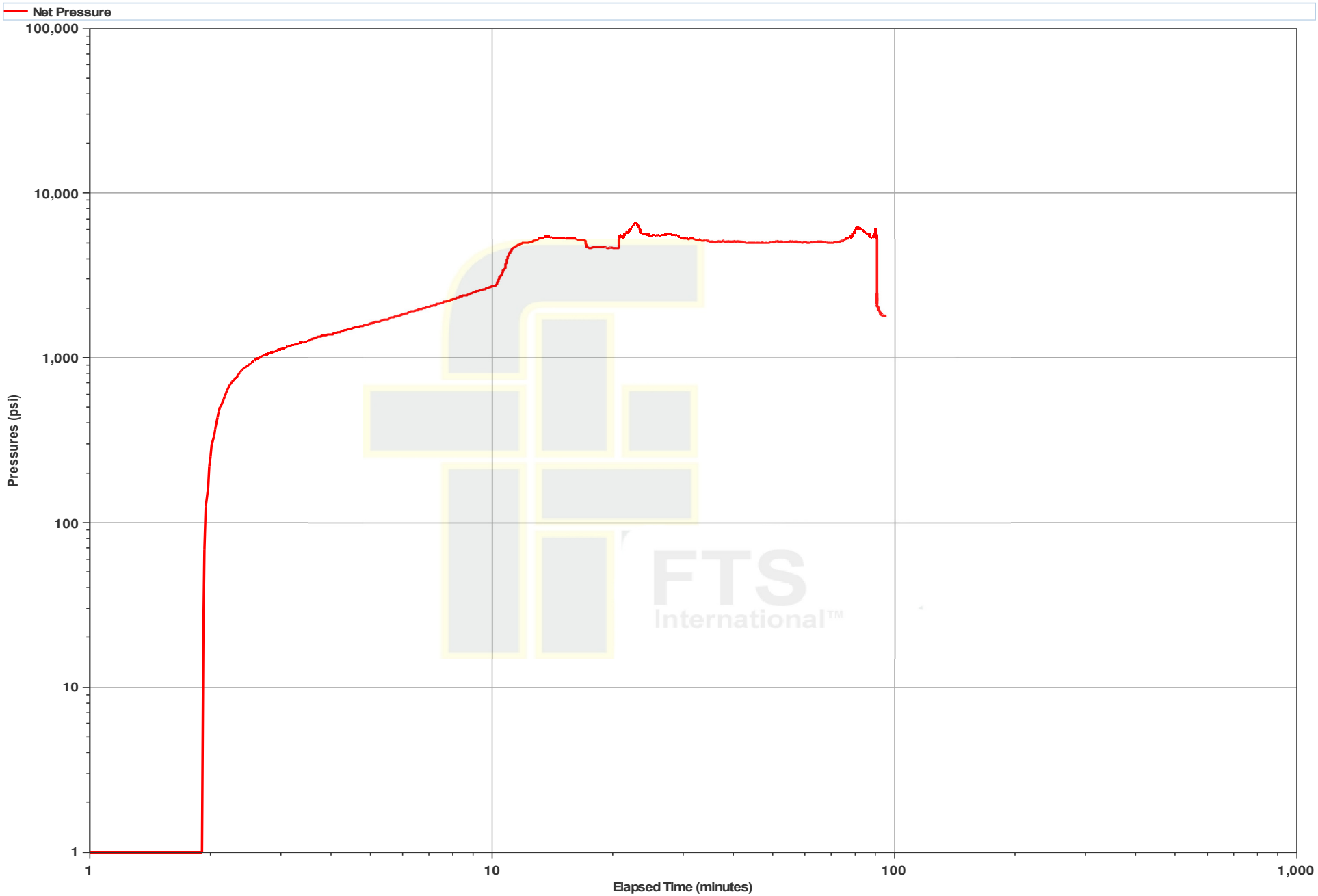
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 7 (WF.000656.M.W03.S07-aDCT-1103) Jun 14, 2015

Chemical Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 7 (WF.000656.M.W03.S07-aDCT-1103) Jun 14, 2015

Net Pressure Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 7 (WF.000656.M.W03.S07-aDCT-1103) Jun 14, 2015

WATER-BASED FRAC FLUID QUALITY CONTROL
(Attachment to Post Treatment Report)

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/14/2015
Customer Name:	American Energy - Utica	Proposal #:	3H/7
Date Sampled:	6/14/2015	Water Source:	Working tank

Sample/Tank No.	Clarity, Color, Odor	Sample Temperature, (F)	Specific gravity	Initial pH	Chloride, ppm	Hardness, ppm	Calcium, ppm	Magnesium, ppm	Iron ppm	Hydroxide, ppm	Bicarbonate, ppm	Carbonate, ppm	Sulfate, ppm	Barium, ppm
Working tank	Clear	72	1	8.1	290	150	54	23	2	0	366	0	65	0

Frac Fluid Quality Gel Testing (These Recording are to made prior to pumping job)														
Sample #														
Base Gel Type	HVG-1													
Gel Loading (lbs/1000 gal.)	2.5													
Sample Temperature, (F)	72													
Initial pH	7.5													
Visc. Reading @ 300 rpms	6													
Viscosity, (cp)	6													
Sample 1 3 min Hydration	4													
Sample 2 3 min Hydration	5													
Sample 3 3 min Hydration	6													
X-Link Vortex Closure, min:sec	n/a													
X-Link Crown, min:sec	n/a													
X-Link pH	n/a													
Gel Break Time (<2cp) mins	17													

Frac Fluid Quality Gel Testing (These Recording are to made while pumping job)														
Stage #														
Base Gel Viscosity (cp)														
X-Link pH								.						
Sample XL time, min:sec														
Sample Temperature														

Acid Quality	Percent Acid	NaOH, mLs	Specific Gravity
	28		1.14

Additional testing or documentation may be required by the customer or for frac fluid quality assurance.

Tested By: Etuate Varea

QUALITY CONTROL OF PROPPANTS

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/14/2015
Customer Name:	American Energy - Utica	Well/Stage:	3H/7
Date Sampled:	6/14/2015	DISTRICT:	Washington, PA
VENDOR:	SANTROL		

Select Proppant Type:

___ Brown	___ Ceramic	___ Other (specify)
X White	___ Bauxite	
___ Resin Coated	___ Texas Gold	

Sieve Analysis	100 Mesh			Sieve Analysis	30/50 Mesh		
Sample 1	24.80	grams of sample		Sample 2	24.80	grams of sample	
	Amount Retained				Amount Retained		
Sieve mesh	Gram	%		Sieve mesh	Gram	%	
			Total				Total
50	0.50	2.02	In-Size	20	0.00	0.00	In-Size
70	16.20	65.32		30	0.60	2.42	
100	6.10	24.60	98.0%	40	17.30	69.76	96.4%
120	1.40	5.65		45	5.50	22.18	
140	0.50	2.02		50	1.10	4.44	
200	0.10	0.40		70	0.30	1.21	
Pan	0.00	0.00	fines	Pan	0.00	0.00	fines
Total wt. Gram	24.80	100.00		Total wt. Gram	24.80	100.00	

Tested By: Etuate Varea

Post Job Report

AMERICAN ENERGY - UTICA

Red Hill Farm MDS GR 3H

Stage : 8 OF 64

HARRISON, OH

Operations Representative:

Name:	David Knapp
Office:	878-327-4881
Fax:	724-743-7719
Cell:	
Email:	DAVID.KNAPP@FTSI.COM

Sales Representative:

Name:	Bruce Batthern
Office:	405-974-3901
Fax:	405-787-1235
Cell:	
Email:	BRUCE.BATTHERN@FTSI.COM

Engineering Manager:

Name:	Thaddeus Craun
Office:	817-832-8782
Fax:	724-743-7719
Cell:	
Email:	THADDEUS.CRAUN@FTSI.COM

FTS International
[illegible]
Ogilby Pass, PA [illegible]

FTS INTERNATIONAL

Customer: American Energy - Utica
Well: Red Hill Farm Site 6r 3H
Stage: 9
Job End Date: [illegible]

Job Summary

Well Information

TVD:	7,301	Top Perf:	14,047
No. Of Perfs:	30		

Casing	Tubing
[illegible]	n/A

Pressures, Rates and Volumes

	Proposed	Actual	Max	Min
BTP	[illegible] psi	[illegible] psi	[illegible] psi	[illegible] psi
Rate	[illegible] bpm	[illegible] bpm	[illegible] bpm	[illegible] bpm

	Proposed	Actual		
Clean Volume	[illegible] bbls	[illegible] bbls		
Slurry Volume	[illegible] bbls	[illegible] bbls		
Flush Volume	[illegible] bbls	[illegible] bbls		

	Proposed	Start	End
Frac Pumps on Location	19	14	19

Open Well:	Start Time	[illegible]	Pressure	[illegible] psi
	Bell Down	[illegible] bbls	Break Down	[illegible] psi
	Initial ISIP:	[illegible] psi	Initial F.G.:	[illegible] psi/ft
Stage Complete:	End Time	[illegible]	Job Time	[illegible]
	Final ISIP	[illegible] psi	Final F.G.	[illegible] psi/ft
	ISIP	[illegible]	5 Min:	[illegible] psi
	Pressure Min:	[illegible]	10 Min:	N/A
	Pressure Max:	[illegible]	15 Min:	N/A

Material Volume

Material	Proposed	Calculated	Actual	Variance
100 Mesh White	[illegible]	[illegible]	[illegible]	0%
[illegible] White	[illegible]	[illegible]	[illegible]	0%
Total Proppants	[illegible]	[illegible]	[illegible]	0%

Material	Proposed	Calculated	Actual	Variance
8.1%-7.5% HCL	[illegible]	[illegible]	[illegible]	1%
AFR-1	4	37	38	3%
[illegible]	3	3	3	0%
[illegible]	[illegible]	57	53	-2%
FE-[illegible]	15	15	15	0%
FRW-[illegible]	170	170	172	-3%
HVG-1 4.5	4	167	169	2%
[illegible]	[illegible]	57	55	-2%
LTB-1	4	37	38	3%
NE-[illegible]	4	115	113	-2%
NE-[illegible]	[illegible]	1	1	4

Comments:

Pumpdown Information:
Total Bbls: 271
Max Pressure (psi): [illegible]
Max Rate (bpm): 19.7

FTS International
[illegible]
Eighty Four, PA [illegible]

FTS INTERNATIONAL

Customer: Anadarko Energy - Utica
Well: Red Hill Farm Site 6r 3H
Stage: 9
Job End Date: [illegible]

Treatment Report

Date	[illegible]	Statelab	Washington County, PA	Basin Size	[illegible]	API#	[illegible]

Elt. Time	BTP	Slurry BPM	Slurry Gallons (gals)	Cumulative Slurry (gals)	Slurry Gallons (gals)	Cumulative Slurry (gals)	Slurry Proppant (lbs)	Cumulative Proppant (lbs)	Description	Proppant	PPA
[illegible]	3,176	10.0	12	12	12	12	0	0	Freshwater Open Wet		0.00
[illegible]	[illegible]	10.7	71	46	71	46	0	0	7.5% HCL Acid Acid		0.00
[illegible]	[illegible]	13.5	19	[illegible]	19	[illegible]	0	0	Slickwater Pad		0.00
[illegible]	[illegible]	13.6	190	[illegible]	191	[illegible]	750	750	Slickwater Proppant	100 Mesh White	0.10
[illegible]	[illegible]	13.0	0	[illegible]	0	[illegible]	21	[illegible]	Slickwater Breakdown	100 Mesh White	0.10
[illegible]	[illegible]	30.0	31	314	31	316	56	[illegible]	Slickwater Proppant	100 Mesh White	0.10
[illegible]	[illegible]	46.6	214	[illegible]	211	[illegible]	2,247	3,194	Slickwater Proppant	100 Mesh White	0.25
[illegible]	[illegible]	53.0	369	767	391	[illegible]	[illegible]	[illegible]	Slickwater Proppant	100 Mesh White	0.50
[illegible]	[illegible]	53.3	428	1,219	444	1,248	13,014	22,952	Slickwater Proppant	100 Mesh White	0.75
[illegible]	[illegible]	57.6	418	1,634	437	1,677	17,558	39,570	Slickwater Proppant	100 Mesh White	1.00
[illegible]	[illegible]	60.6	678	2,312	618	2,290	39,702	79,371	Slickwater Proppant	[illegible] White	1.00
[illegible]	[illegible]	60.2	1,691	3,011	1,650	3,951	52,653	[illegible]	Slickwater Proppant	[illegible] White	1.25
[illegible]	[illegible]	[illegible]	567	4,300	518	4,469	53,001	[illegible]	18# Linear Gel Proppant	[illegible] White	1.50
[illegible]	[illegible]	[illegible]	368	4,600	362	4,832	34,369	[illegible]	18# Linear Gel Proppant	[illegible] White	1.75
[illegible]	[illegible]	[illegible]	171	4,800	167	5,195	[illegible]	[illegible]	18# Linear Gel Proppant	[illegible] White	1.75
[illegible]	[illegible]	[illegible]	369	5,210	369	5,530	[illegible]	[illegible]	18# Linear Gel Proppant	[illegible] White	[illegible]
[illegible]	[illegible]	[illegible]	47	5,300	47	5,580	0	[illegible]	18# Linear Gel Clean screen		0.00
[illegible]	[illegible]	79.0	16	5,300	16	5,580	0	[illegible]	18# Linear Gel Clean screen		0.00
[illegible]	[illegible]	76.5	262	[illegible]	261	[illegible]	0	[illegible]	Slickwater Flush		0.00
[illegible]	[illegible]	76.4	114	[illegible]	114	[illegible]	0	[illegible]	Freshwater Flush		0.00
[illegible]	[illegible]	0.0	0	[illegible]	0	[illegible]	0	[illegible]	Freshwater Displace		0.00
Total Job/Time (HH:MM): 01:30											

Min BTP:	[illegible] psi	Max BTP:	[illegible] psi	Average BTP:	[illegible] psi	5 Min:	[illegible] psi
Min Rate:	10.0 bpm	Max Rate:	[illegible] bpm	Average Rate:	[illegible] bpm	10 Min:	0 psi
Initial ISIP:	[illegible] psi	Initial F.G.:	[illegible] psi/ft	Average HHP:	[illegible]	15 Min:	0 psi
Final ISIP:	[illegible] psi	Final F.G.:	[illegible] psi/ft	Customer Representative:		Mark Wetzel	
FTS Representative:		Travis Wilson & Jason Stewart					

Comments:

The proppant values contained in this report are calculated based on actual barrel counts and target densities. Actual total proppant usage is 259,225 lbs. Charge time is 1 hour(s) 30 minute(s). All chemicals and proppant ran as documented.

Min/Max/Avg were taken from sand stages. All chem changes from proposed were made per AEU representative request.

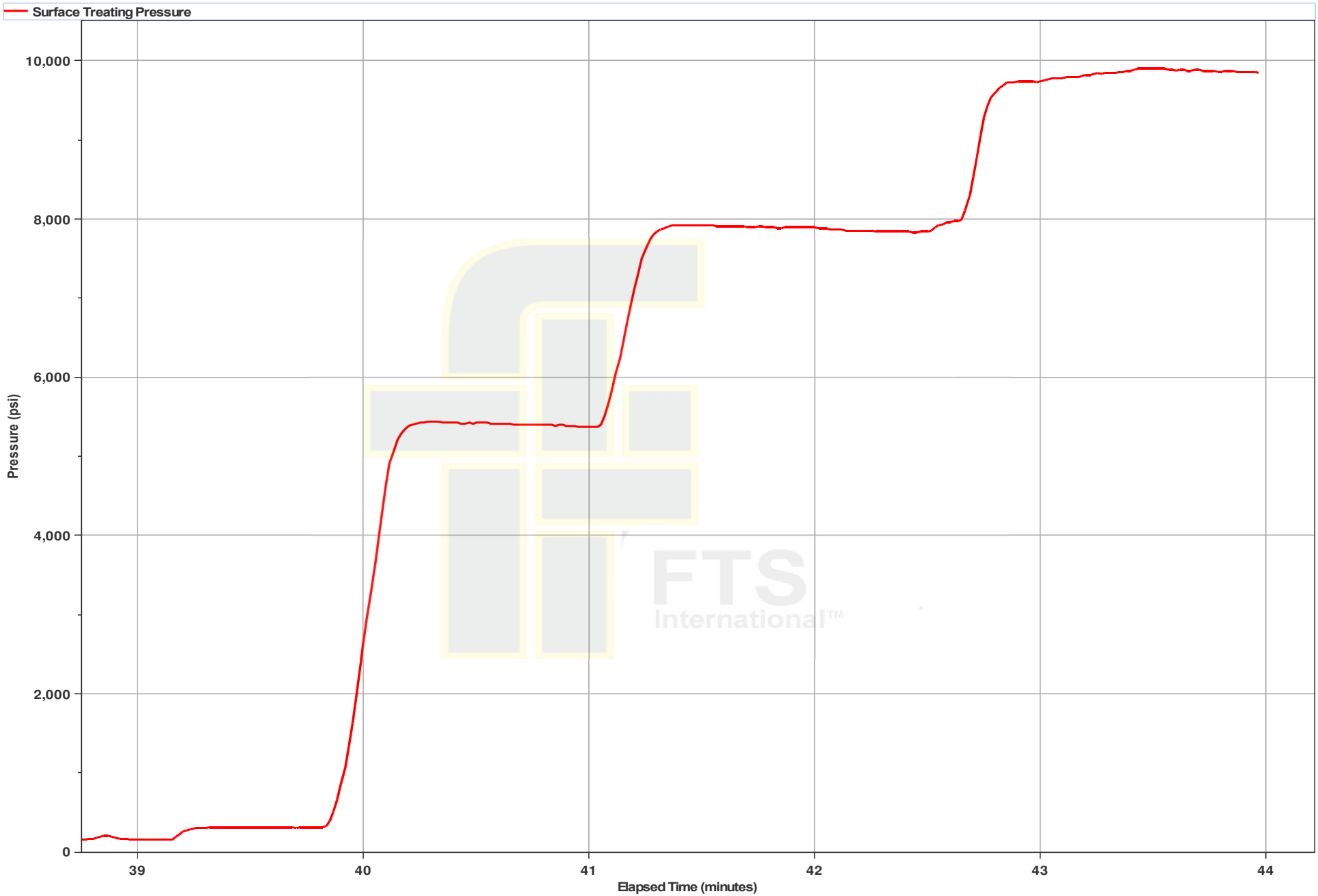
Started pumping a 18# Linear Gel system during the 1.5 ppg stage of 30/50 per AEU representative request.

1 Minute Shutdown (psi): 4111
2 Minute Shutdown (psi): 4039
5 Minute Shutdown (psi): 3959

Chemical Changes:

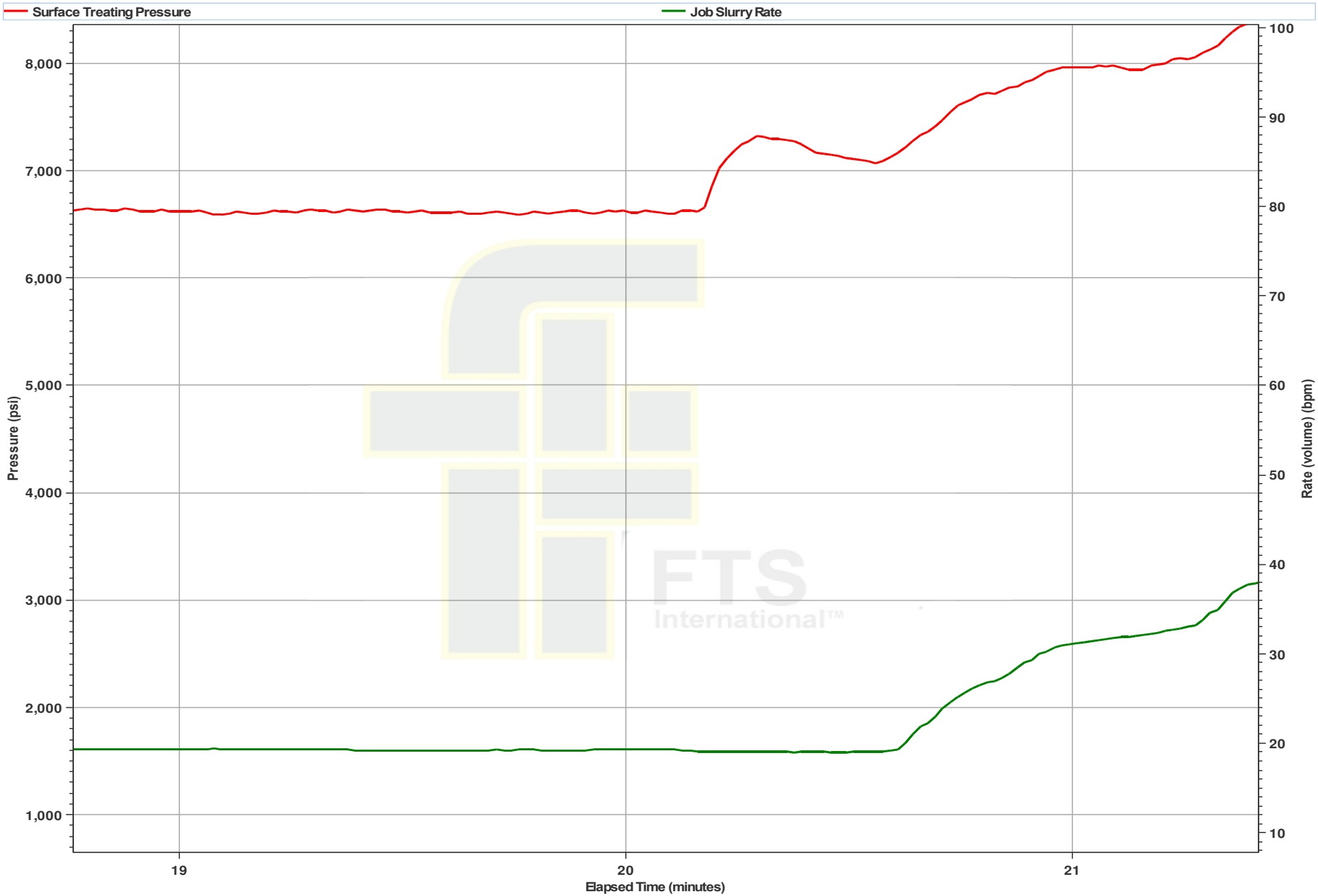
Chemical Name	Chemical Loading	Cumulative Given
FRW-200	0.75	1,634
FRW-200	1.00	3,511
FRW-200	0.50	4,[illegible]
FRW-200	1.00	5,[illegible]

AEU Pressure Test



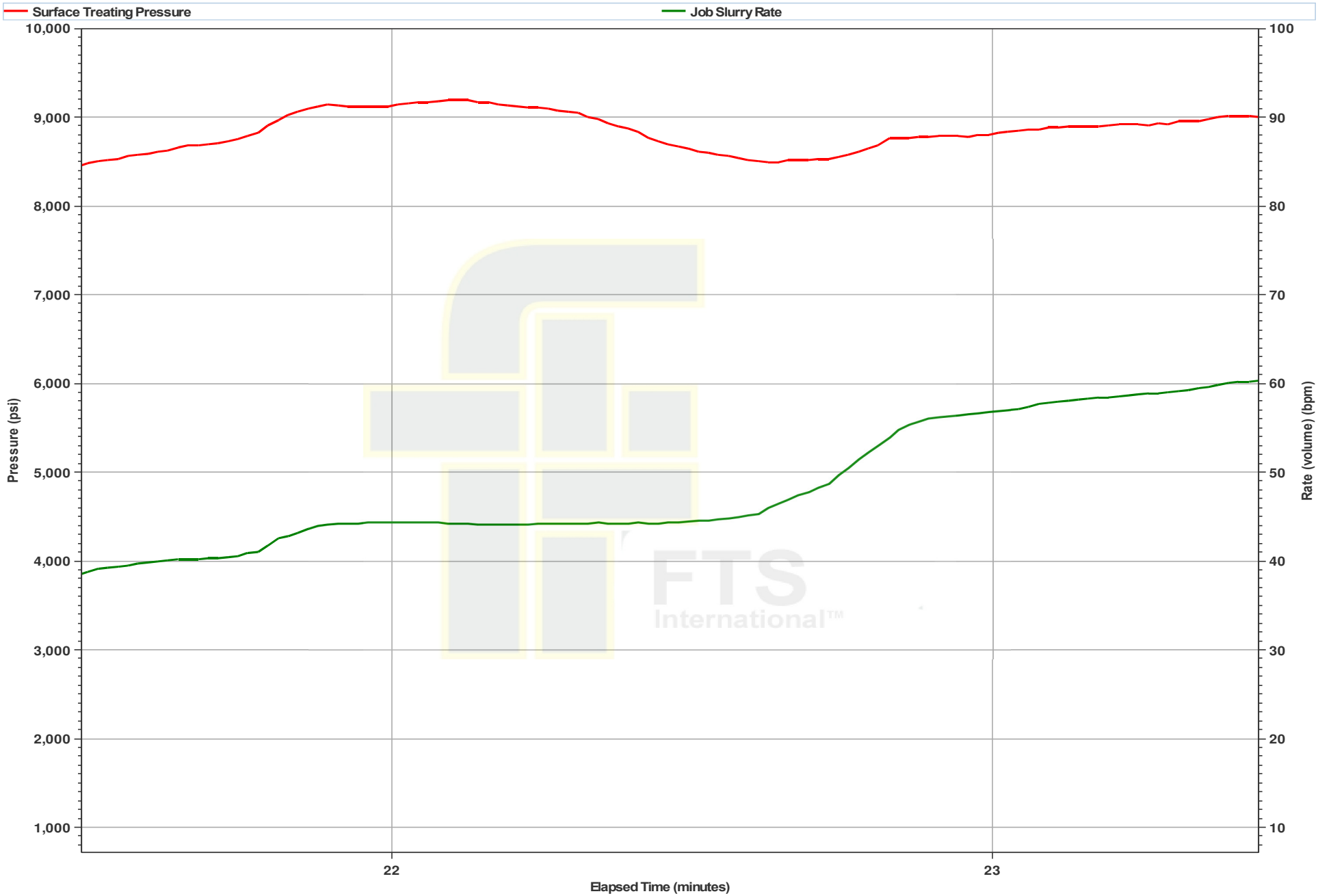
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 8 (WF.000656.M.W03.S08-ADCT-1103) Jun 14, 2015

Ball Seat and Breakdown



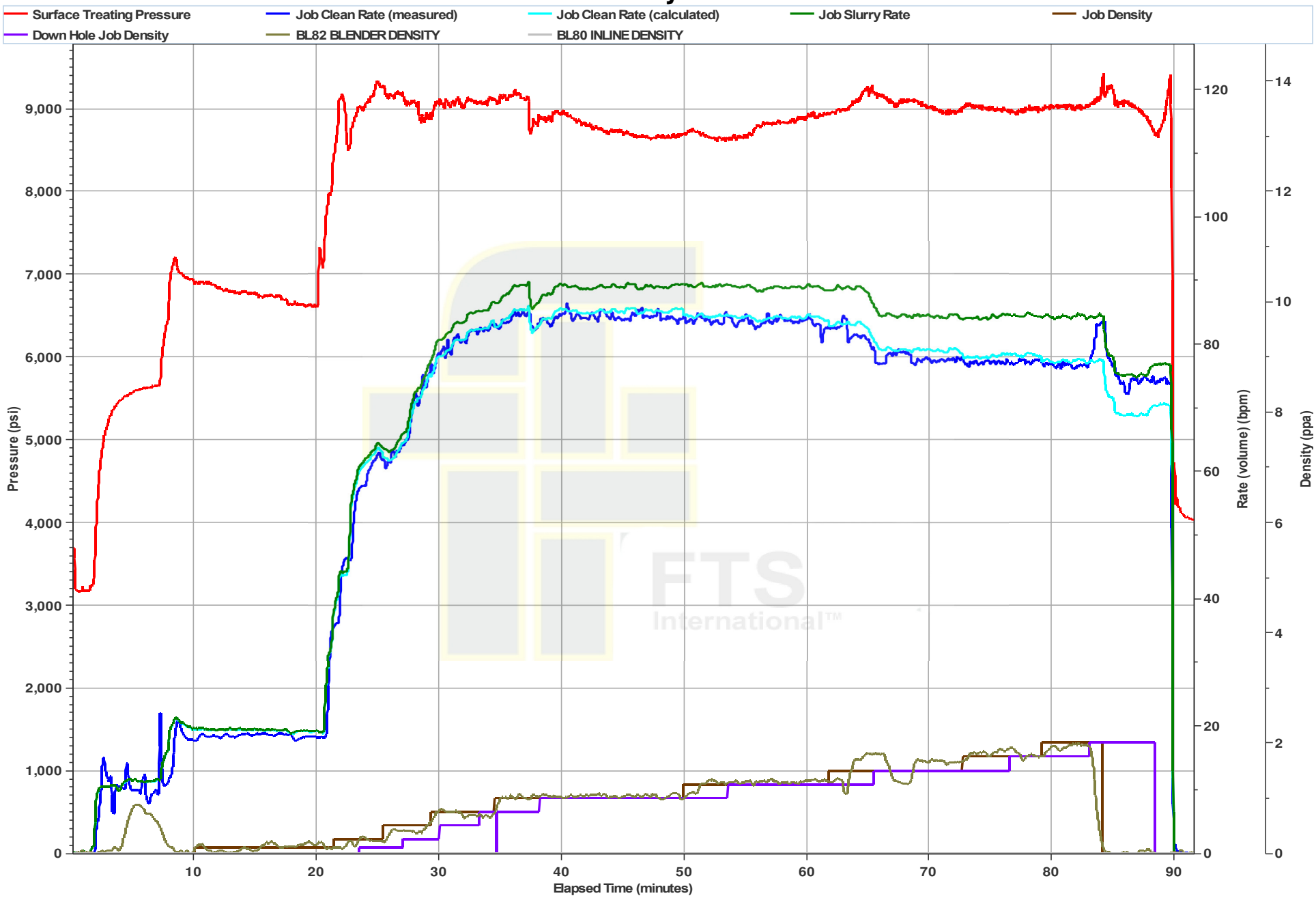
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 8 (WF.000656.M.W03.S08-ADCT-1103) **Jun 14, 2015**

Acid on Perforations



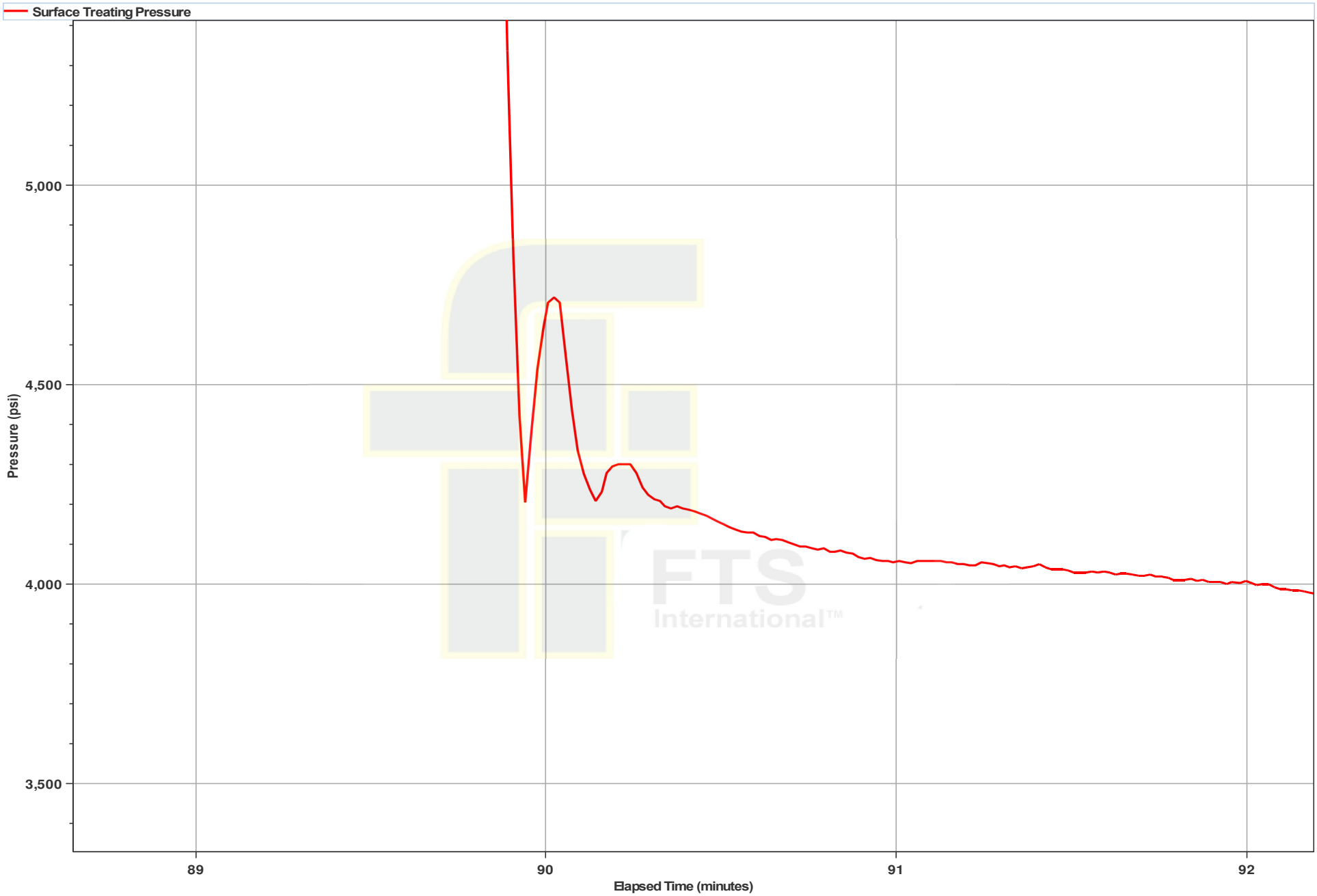
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 8 (WF.000656.M.W03.S08-ADCT-1103) **Jun 14, 2015**

Primary Plot



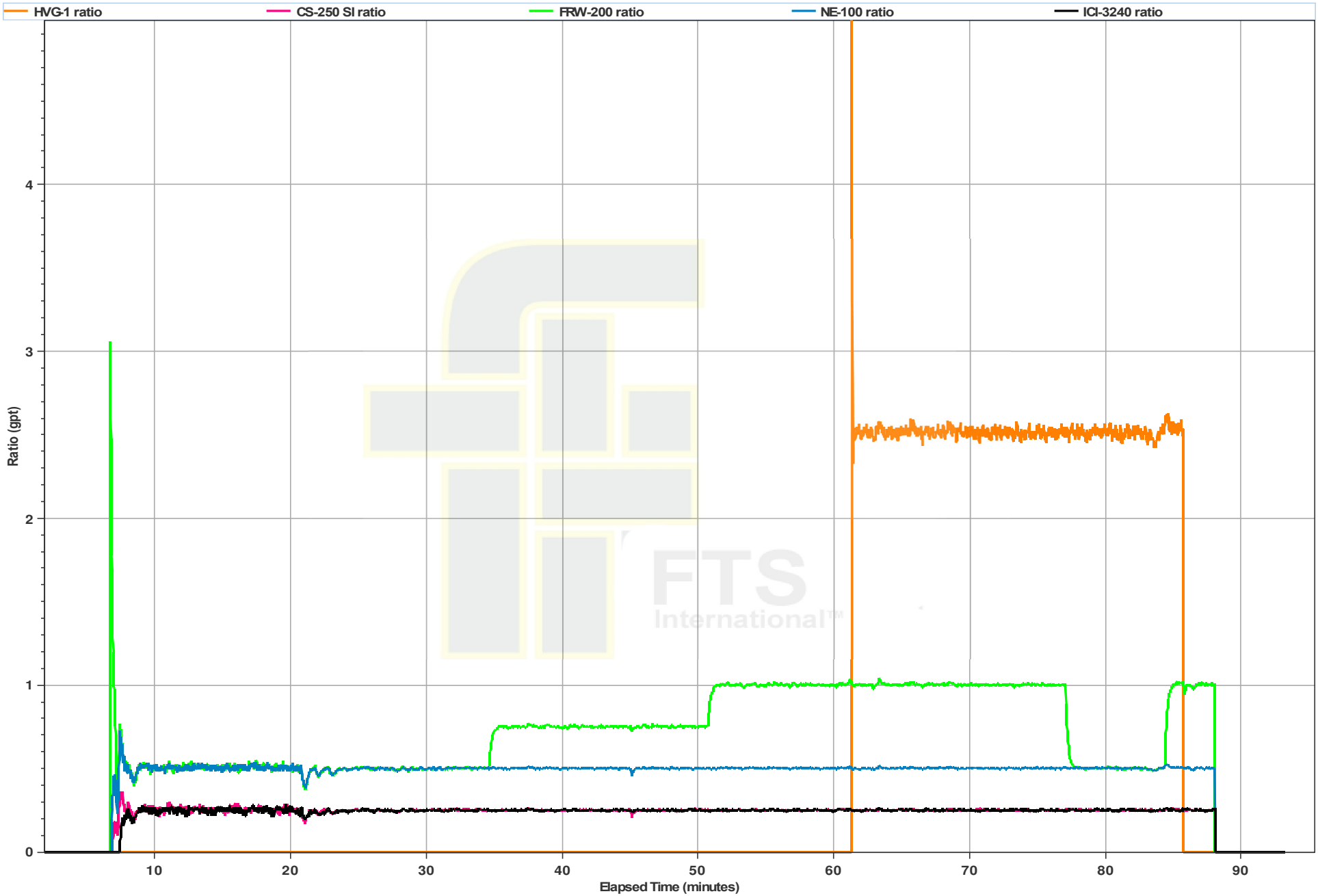
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 8 (WF.000656.M.W03.S08-ADCT-1103) **Jun 14, 2015**

ISIP Plot



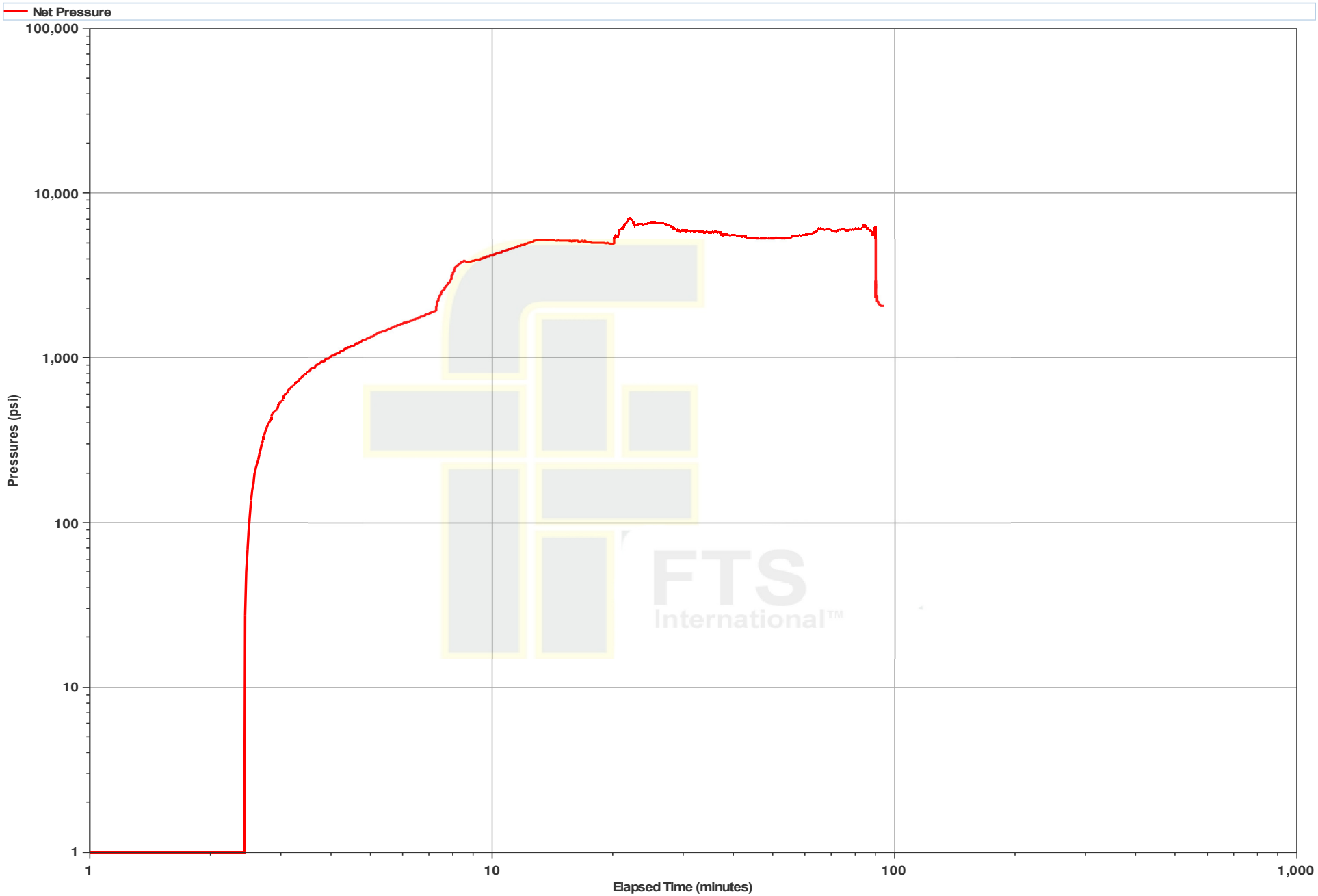
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 8 (WF.000656.M.W03.S08-ADCT-1103) Jun 14, 2015

Chemical Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 8 (WF.000656.M.W03.S08-ADCT-1103) Jun 14, 2015

Net Pressure Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 8 (WF.000656.M.W03.S08-ADCT-1103) Jun 14, 2015

WATER-BASED FRAC FLUID QUALITY CONTROL
(Attachment to Post Treatment Report)

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/15/2015
Customer Name:	American Energy - Utica	Proposal #:	3H/8
Date Sampled:	6/15/2015	Water Source:	Working Tank

Sample/Tank No.	Clarity, Color, Odor	Sample Temperature, (F)	Specific gravity	Initial pH	Chloride, ppm	Hardness, ppm	Calcium, ppm	Magnesium, ppm	Iron ppm	Hydroxide, ppm	Bicarbonate, ppm	Carbonate, ppm	Sulfate, ppm	Barium, ppm
Working Tank	Clear	76	1	8.2	70	80	36	11	1	0	122	0	50	0

Frac Fluid Quality Gel Testing (These Recording are to made prior to pumping job)														
Sample #														
Base Gel Type	HVG-1													
Gel Loading (lbs/1000 gal.)	2.5													
Sample Temperature, (F)	76													
Initial pH	8.2													
Visc. Reading @ 300 rpms	6.5													
Viscosity, (cp)	6													
Sample 1 3 min Hydration	4													
Sample 2 3 min Hydration	5													
Sample 3 3 min Hydration	6													
X-Link Vortex Closure, min:sec	n/a													
X-Link Crown, min:sec	n/a													
X-Link pH	n/a													
Gel Break Time (<2cp) mins	17													

Frac Fluid Quality Gel Testing (These Recording are to made while pumping job)														
Stage #														
Base Gel Viscosity (cp)														
X-Link pH								.						
Sample XL time, min:sec														
Sample Temperature														

Acid Quality	Percent Acid	NaOH, mLs	Specific Gravity
	28		1.14

Additional testing or documentation may be required by the customer or for frac fluid quality assurance.

Tested By: Travis Wilson

QUALITY CONTROL OF PROPPANTS

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/15/2015
Customer Name:	American Energy - Utica	Well/Stage:	3H/8
Date Sampled:	6/15/2015	DISTRICT:	Washington, PA
VENDOR:	SANTROL		

Select Proppant Type:

___ Brown	___ Ceramic	___ Other (specify)
X White	___ Bauxite	
___ Resin Coated	___ Texas Gold	

Sieve Analysis	100 Mesh			Sieve Analysis	30/50 Mesh		
Sample 1	24.80	grams of sample		Sample 2	24.90	grams of sample	
	Amount Retained				Amount Retained		
Sieve mesh	Gram	%		Sieve mesh	Gram	%	
			Total				Total
50	0.60	2.42	In-Size	20	0.10	0.40	In-Size
70	16.20	65.32		30	0.40	1.61	
100	5.50	22.18	97.6%	40	16.40	65.86	95.2%
120	1.20	4.84		45	5.90	23.69	
140	0.90	3.63		50	1.40	5.62	
200	0.40	1.61		70	0.70	2.81	
Pan	0.00	0.00	fines	Pan	0.00	0.00	fines
Total wt. Gram	24.80	100.00		Total wt. Gram	24.90	100.00	

Tested By: Travis Wilson

Post Job Report

AMERICAN ENERGY - UTICA

Red Hill Farm MDS GR 3H

Stage : 9 OF 54

HARRISON, OH

Operations Representative:

Name:	**David Knapp**
Office:	**570-327-4881**
Fax:	**724-743-7719**
Cell:	
Email:	**DAVID.KNAPP@FTSI.COM**

Sales Representative:

Name:	**Bruce Matthews**
Office:	**405-574-3981**
Fax:	**405-767-1288**
Cell:	
Email:	**BRUCE.MATTHEWS@FTSI.COM**

Engineering Manager:

Name:	**Thaddeus Craun**
Office:	**817-682-8702**
Fax:	**724-743-7719**
Cell:	
Email:	**THADDEUS.CRAUN@FTSI.COM**

FTS International
1432 Route 519
Eighty Four, PA 15330

Customer: American Energy - Utica
Well: Red Hill Farm Mds Gr 3H
Stage: 9
Job End Date: 06/15/2015

Job Summary

Well Information

TVD:	7,301	**Top Perf:**	14,495
No. Of Perfs:	30		

Casing	Tubing
5.50" 20.00#	N/A

Pressures, Rates and Volumes

	Proposed	Actual	Max	Min
STP	9,046 psi	8,665 psi	9,173 psi	7,626 psi
Rate	80.0 bpm	80.3 bpm	92.8 bpm	25.6 bpm

	Proposed	Actual		
Clean Volume	5,772 bbls	5,903 bbls		
Slurry Volume	6,042 bbls	6,174 bbls		
Flush Volume	357 bbls	327 bbls		

	Proposed	Start	End
Frac Pumps on Location	10	14	12

Open Well:	Start Time	07:44	Pressure	2,955 psi
	Ball Seat	393 bbls	Break Down	7,771 psi
	Initial ISIP:	4,647 psi	Initial F.G.:	1.07 psi/ft
Stage Complete:	End Time	09:16	Job Time	01:30
	Final ISIP	4,647 psi	Final F.G.	1.07 psi/ft
	HHP	17,054	5 Min:	4,235 psi
	Proppant Min:	0.00	10 Min:	N/A
	Proppant Max:	2.00	15 Min:	N/A

Material Volume

Material	Proposed	Calculated	Actual	Variance
100 Mesh White	40,000	38,941	39,041	0%
30/50 White	210,000	211,785	211,785	0%
Total Proppants	250,000	250,726	250,826	0%

Material	Proposed	Calculated	Actual	Variance
0.1%-7.5% HCL	3,000	2,982	3,000	1%
CI-150	3	3	3	0%
CS-250 SI	60	60	60	0%
FE-200L	15	15	15	0%
FRW-200	180	233	230	-1%
ICI-3240	60	60	60	0%
NE-100	0	120	120	0%
NE-100W	120	0	0	0

Comments:

Pumpdown Information:
Total Bbls: 285
Max Pressure (psi): 5904
Max Rate (bpm): 16.4

FTS International
1432 Route 519
Eighty Four, PA 15330

Customer: American Energy - Utica
Well: Red Hill Farm Mds Gr 3H
Stage: 9
Job End Date: 06/15/2015

Treatment Report

Date:	6/15/2015	District:	Washington County,PA	Quote No:	051815_035725QF	API:	34-059-24370

MIL Time	STP	Slurry BPM	Stage Clean (bbls)	Cumulative Clean (bbls)	Stage Slurry (bbls)	Cumulative Slurry (bbls)	Stage Proppant (lbs)	Cumulative Proppant (lbs)	Description	Proppant	PPA
07:44	2,955	0.0	0	0	0	0	0	0	Freshwater Open Well		0.00
07:45	4,208	5.4	15	15	15	15	0	0	Freshwater Load		0.00
07:47	7,435	25.3	71	86	71	86	0	0	7.5% HCL Acid Acid		0.00
07:54	7,407	25.8	207	293	207	293	0	0	Slickwater Load		0.00
08:03	7,771	24.7	4	297	4	297	0	0	Slickwater Breakdown		0.00
08:03	7,626	25.6	214	511	215	512	899	899	Slickwater Proppant	100 Mesh White	0.10
08:08	8,812	60.0	214	725	216	728	2,247	3,146	Slickwater Proppant	100 Mesh White	0.25
08:12	9,083	65.2	255	980	261	989	5,355	8,501	Slickwater Proppant	100 Mesh White	0.50
08:16	8,970	69.8	429	1,409	444	1,433	13,514	22,015	Slickwater Proppant	100 Mesh White	0.75
08:22	9,030	77.4	403	1,812	421	1,854	16,926	38,941	Slickwater Proppant	100 Mesh White	1.00
08:29	9,024	77.5	876	2,688	916	2,770	36,792	75,733	Slickwater Proppant	30/50 White	1.00
08:39	8,321	91.1	1,000	3,688	1,057	3,827	52,500	128,233	Slickwater Proppant	30/50 White	1.25
08:50	8,563	91.0	1,001	4,689	1,069	4,896	63,063	191,296	Slickwater Proppant	30/50 White	1.50
09:01	8,517	90.5	500	5,189	540	5,436	36,750	228,046	Slickwater Proppant	30/50 White	1.75
09:09	8,382	90.8	270	5,459	294	5,730	22,680	250,726	Slickwater Proppant	30/50 White	2.00
09:11	8,277	90.7	117	5,576	117	5,847	0	250,726	Slickwater Clean screws		0.00
09:13	8,414	90.7	220	5,796	220	6,067	0	250,726	Slickwater Flush		0.00
09:15	8,779	77.6	107	5,903	107	6,174	0	250,726	Freshwater Flush		0.00
09:16	4,647	0.0	0	5,903	0	6,174	0	250,726	Freshwater Shutdown		0.00
Total JobTime (HH:MM): 01:32											

Min STP:	7,626 psi	**Max STP:**	9,173 psi	**Average STP:**	8,665 psi	**5 Min:**	4,235 psi
Min Rate:	25.6 bpm	**Max Rate:**	92.8 bpm	**Average Rate:**	80.3 bpm	**10 Min:**	0 psi
Initial ISIP:	4,647 psi	**Initial F.G.:**	1.07 psi/ft	**Average HHP:**	17,054	**15 Min:**	0 psi
Final ISIP:	4,647 psi	**Final F.G.:**	1.07 psi/ft	**Customer Representative:**		Malcolm Trahan	
FTSI Representative:		Etuate Varea & Jason McCoskey					

Comments:

The proppant values contained in this report are calculated based on actual barrel counts and target densities. Actual total proppant usage is 250,826 lbs. Charge time is 1 hour(s) 30 minute(s). All chemicals and proppant ran as documented.

Min/Max/Avg were taken from sand stages. All chem changes from proposed were made per AEU representative request.

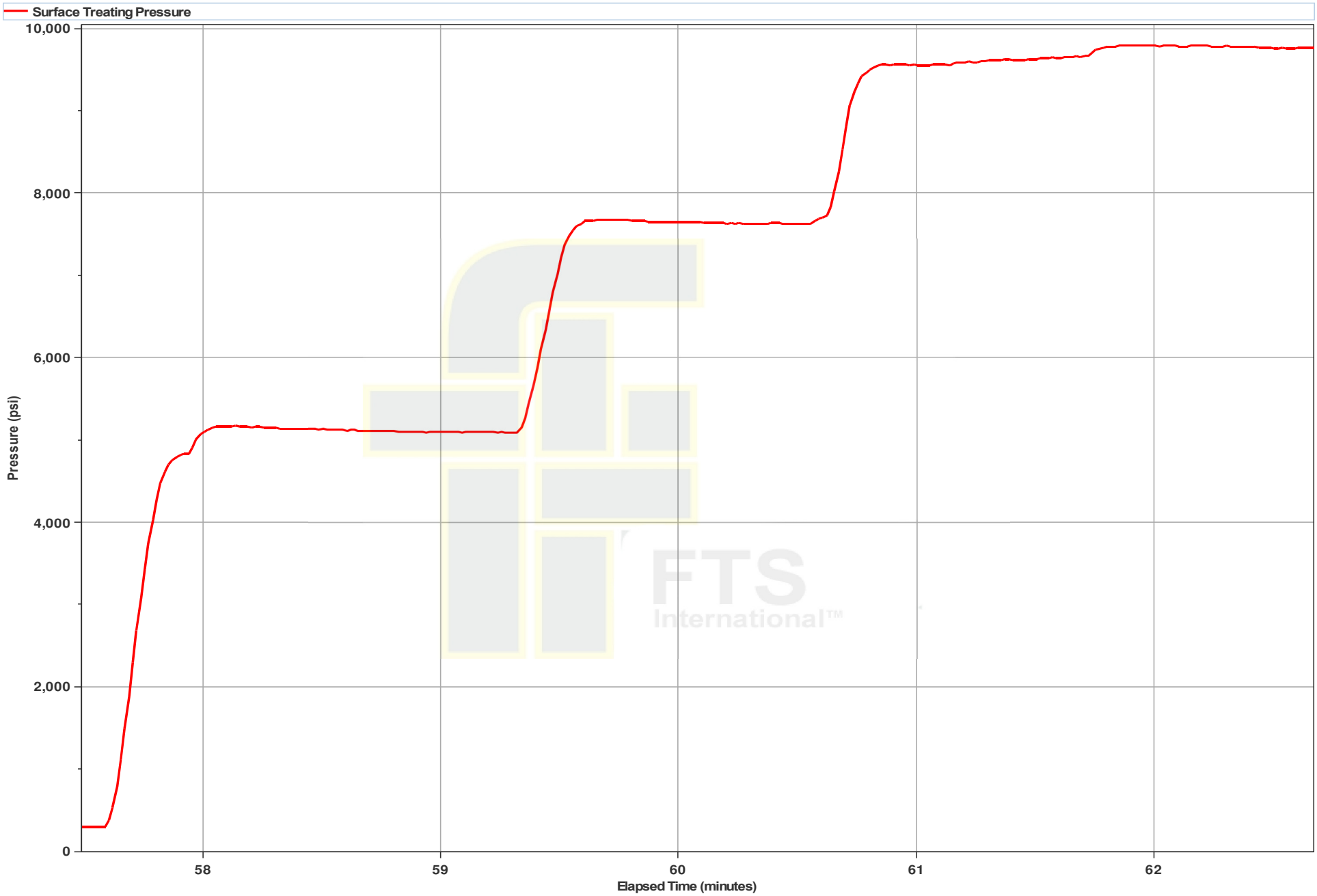
1 Minute Shutdown (psi): 4492
2 Minute Shutdown (psi): 4404
5 Minute Shutdown (psi): 4235

Chemical Changes:

Chemical Name	Chemical Loading	Cumulative Clean
FRW-200	1.00	2,688

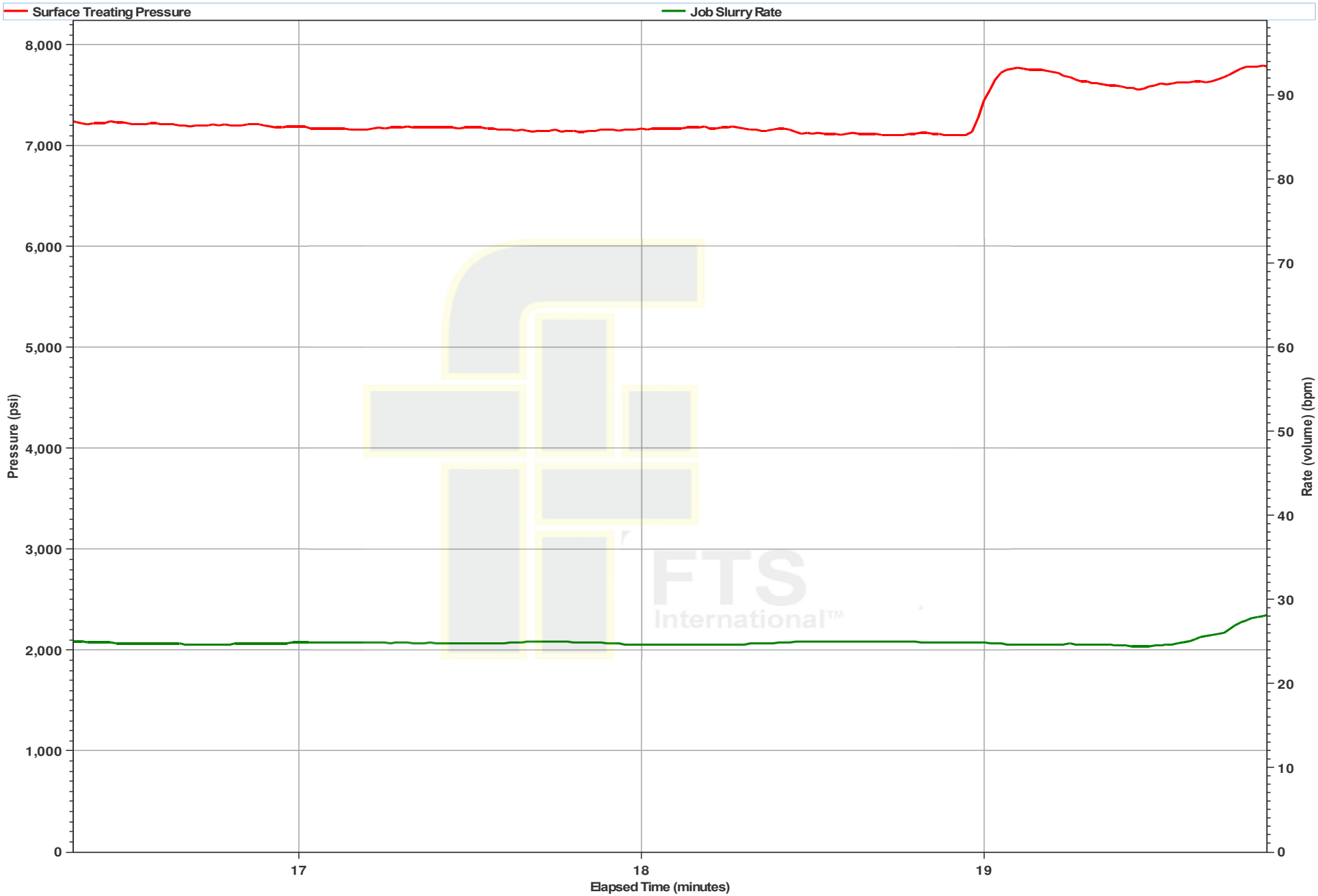
FRW-200	1.25	5,189

AEU Pressure Test



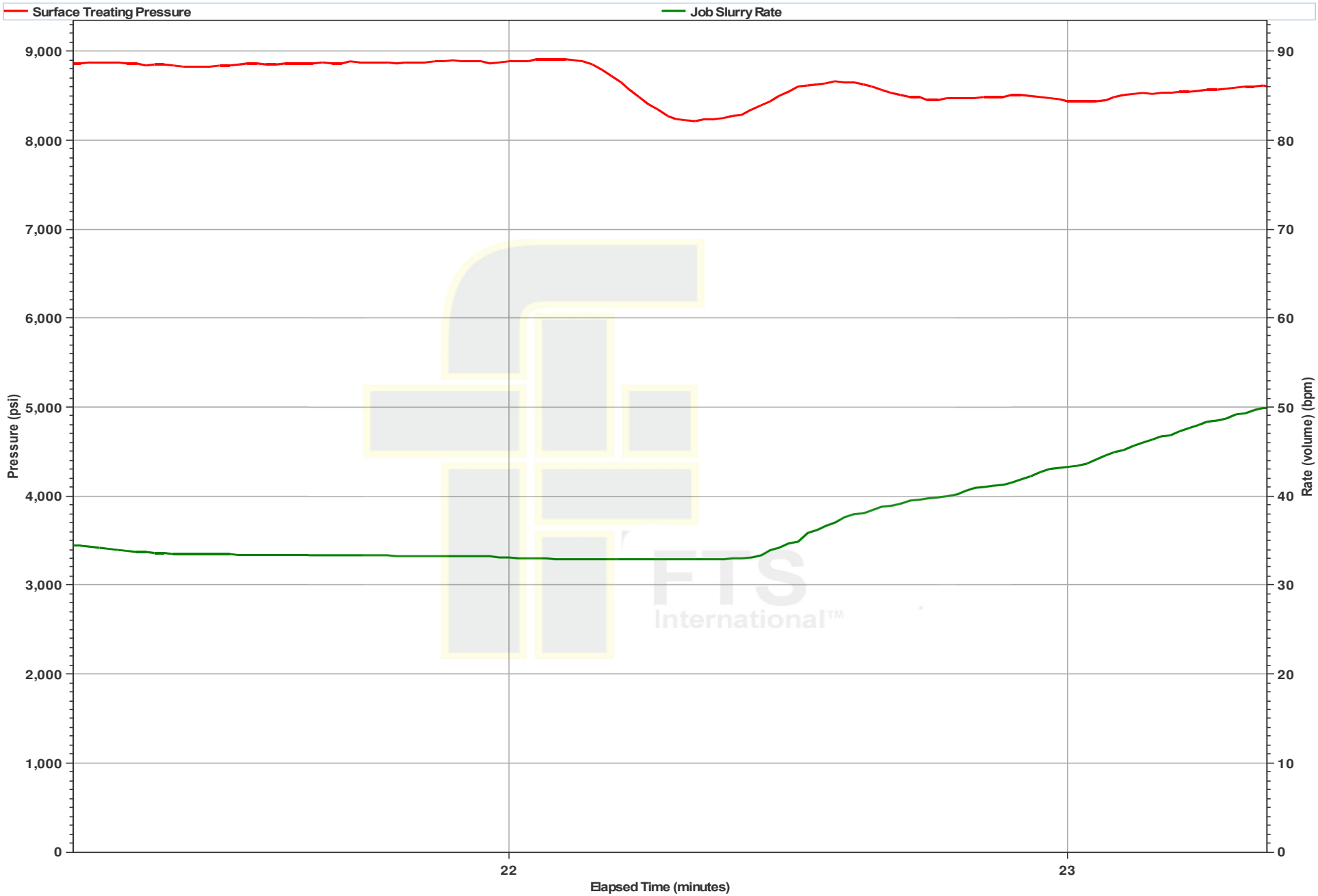
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 9 (WF.000656.M.W03.S09-ADCT-1103) Jun 15, 2015

Ball Seat and Breakdown



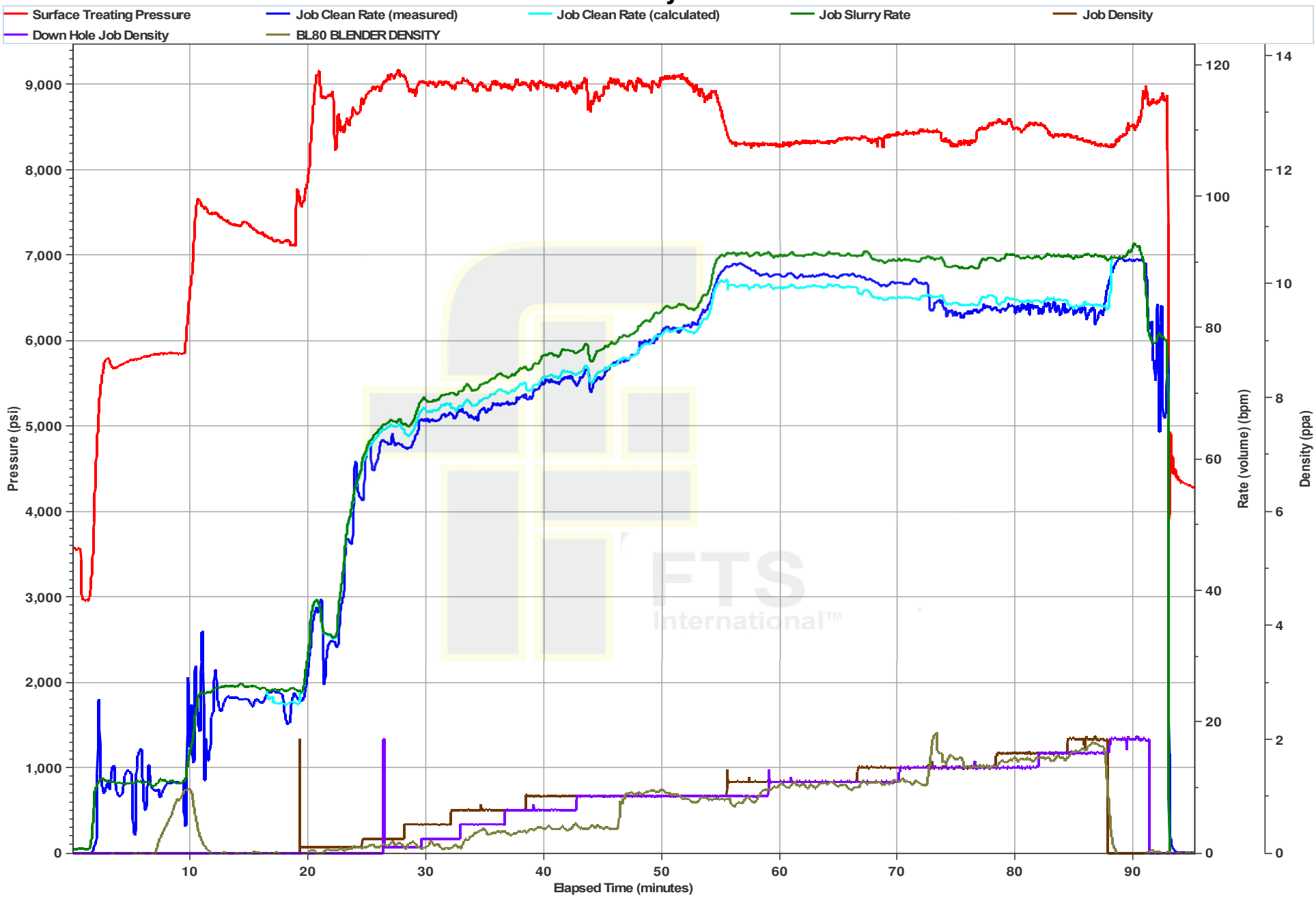
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 9 (WF.000656.M.W03.S09-ADCT-1103) **Jun 15, 2015**

Acid on Perforations



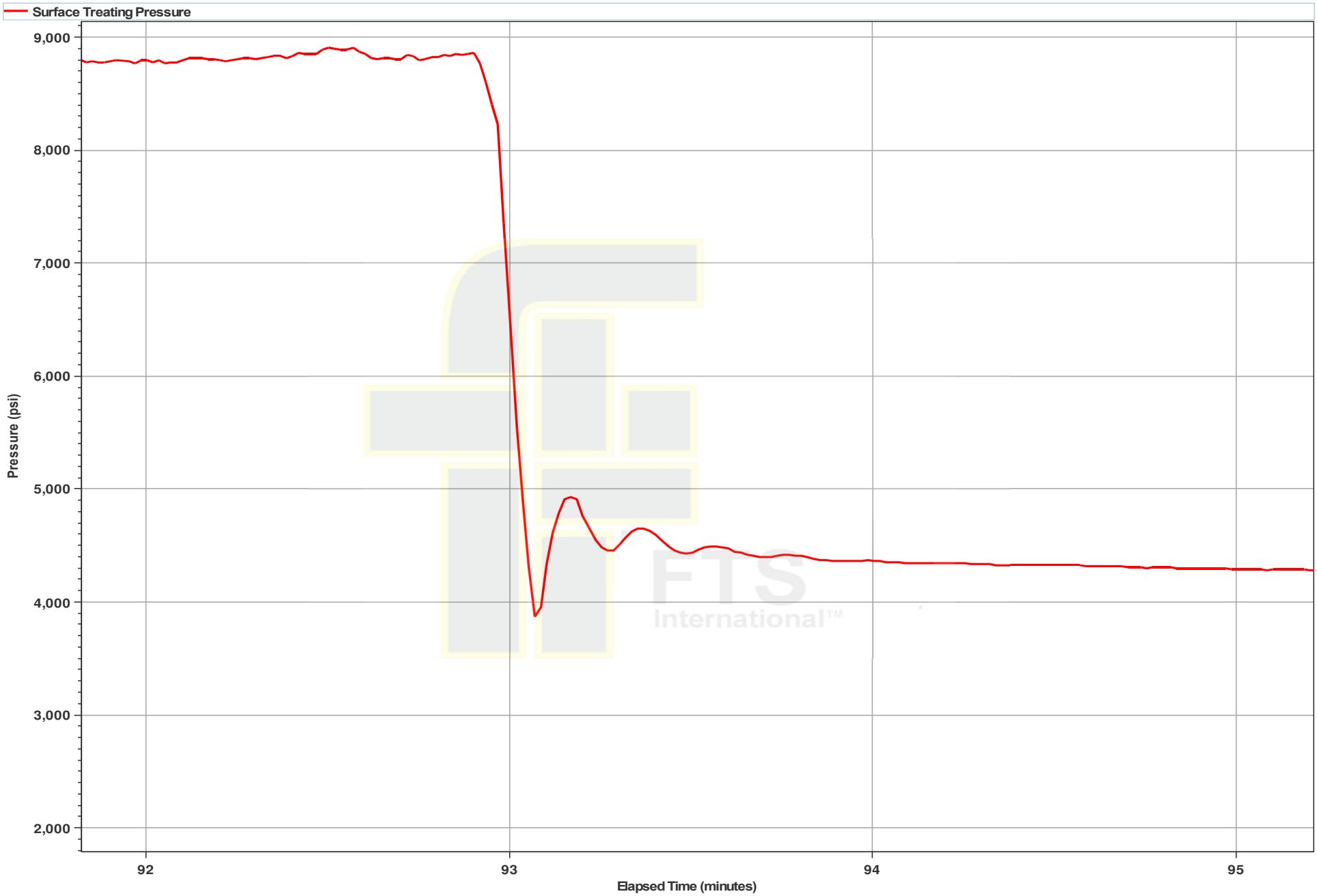
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 9 (WF.000656.M.W03.S09-ADCT-1103) **Jun 15, 2015**

Primary Plot



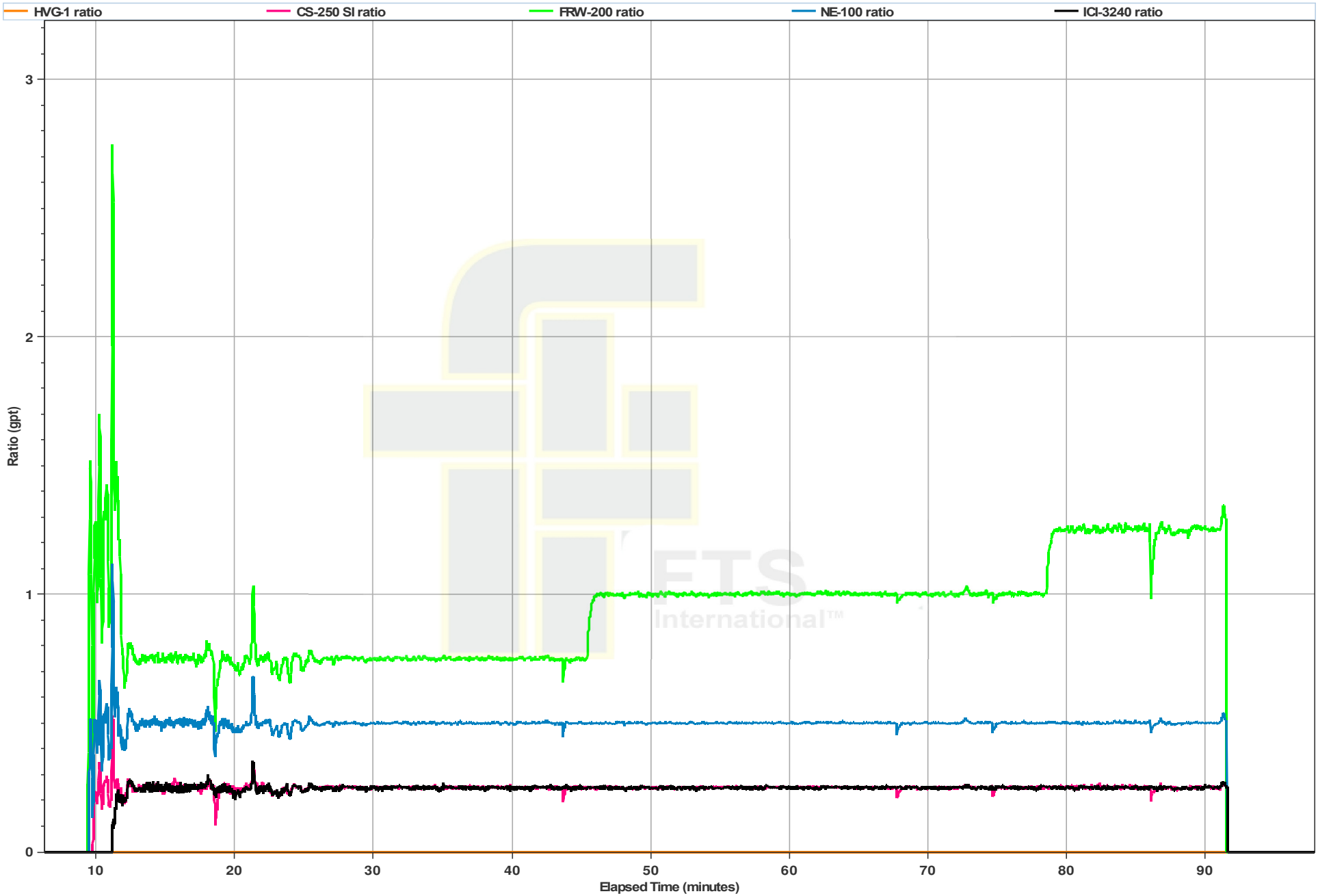
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 9 (WF.000656.M.W03.S09-ADCT-1103) **Jun 15, 2015**

ISIP Plot



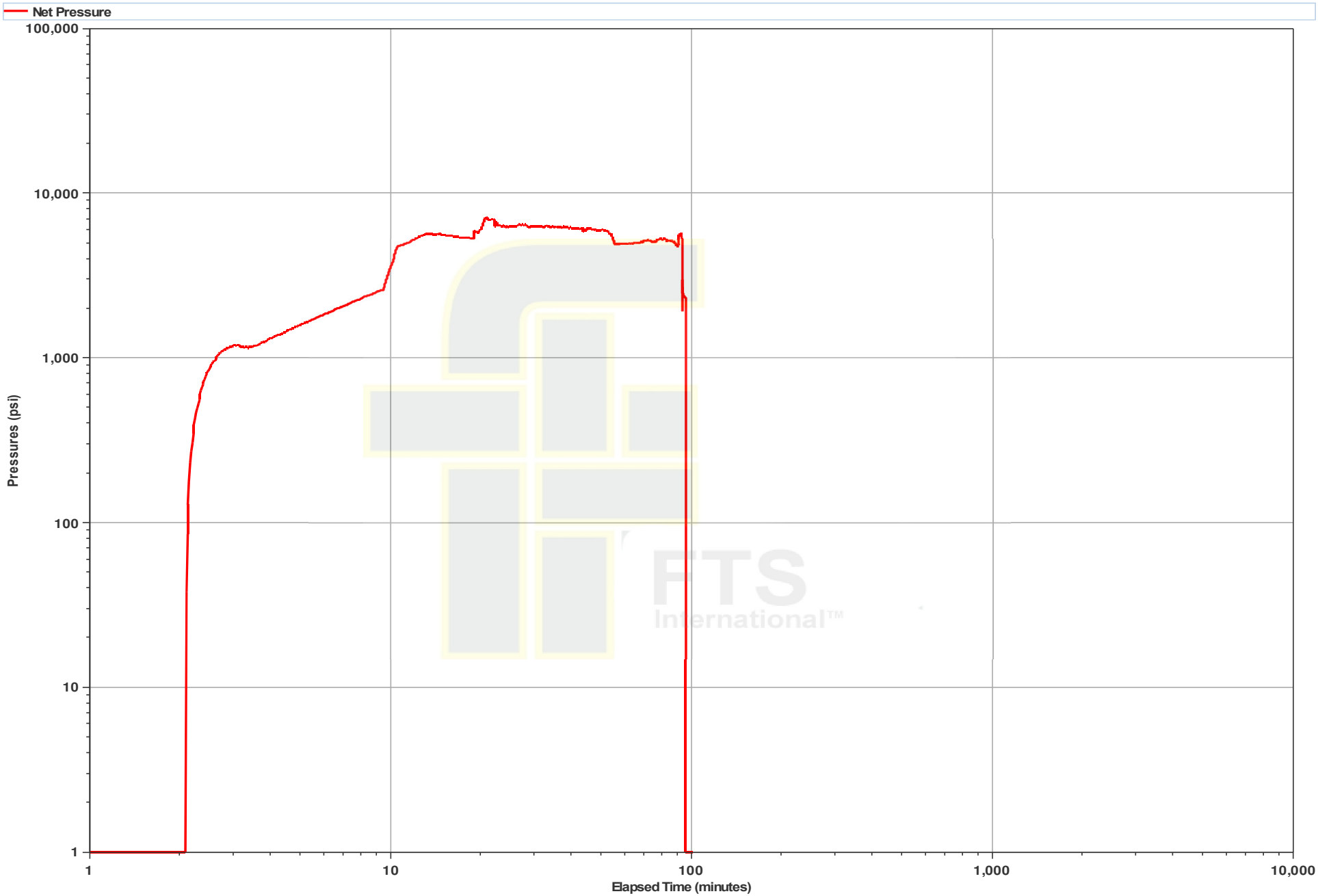
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 9 (WF.000656.M.W03.S09-ADCT-1103) **Jun 15, 2015**

Chemical Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 9 (WF.000656.M.W03.S09-ADCT-1103) Jun 15, 2015

Net Pressure Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 9 (WF.000656.M.W03.S09-ADCT-1103) Jun 15, 2015

WATER-BASED FRAC FLUID QUALITY CONTROL
(Attachment to Post Treatment Report)

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/15/2015
Customer Name:	American Energy - Utica	Proposal #:	3H/9
Date Sampled:	6/15/2015	Water Source:	Working Tank

Sample/Tank No.	Clarity, Color, Odor	Sample Temperature, (F)	Specific gravity	Initial pH	Chloride, ppm	Hardness, ppm	Calcium, ppm	Magnesium, ppm	Iron ppm	Hydroxide, ppm	Bicarbonate, ppm	Carbonate, ppm	Sulfate, ppm	Barium, ppm
Working Tank	Clear	72	1	7.95	50	120	32	21	1	0	93	0	50	0

Frac Fluid Quality Gel Testing (These Recording are to made prior to pumping job)														
Sample #														
Base Gel Type	HVG-1													
Gel Loading (lbs/1000 gal.)	2.5													
Sample Temperature, (F)	72													
Initial pH	7.95													
Visc. Reading @ 300 rpms	6													
Viscosity, (cp)	6													
Sample 1 3 min Hydration	4													
Sample 2 3 min Hydration	5													
Sample 3 3 min Hydration	6													
X-Link Vortex Closure, min:sec	n/a													
X-Link Crown, min:sec	n/a													
X-Link pH	n/a													
Gel Break Time (<2cp) mins	20													

Frac Fluid Quality Gel Testing (These Recording are to made while pumping job)														
Stage #														
Base Gel Viscosity (cp)														
X-Link pH								.						
Sample XL time, min:sec														
Sample Temperature														

Acid Quality	Percent Acid	NaOH, mLs	Specific Gravity
	28		1.14

Additional testing or documentation may be required by the customer or for frac fluid quality assurance.

Tested By: Etuate Varea

QUALITY CONTROL OF PROPPANTS

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/15/2015
Customer Name:	American Energy - Utica	Well/Stage:	3H/9
Date Sampled:	6/15/2015	DISTRICT:	Washington, PA
VENDOR:	SANTROL		

Select Proppant Type:

___ Brown	___ Ceramic	___ Other (specify)
X White	___ Bauxite	
___ Resin Coated	___ Texas Gold	

Sieve Analysis	100 Mesh			Sieve Analysis	30/50 Mesh		
Sample 1	25.10	grams of sample		Sample 2	25.30	grams of sample	
	Amount Retained				Amount Retained		
Sieve mesh	Gram	%		Sieve mesh	Gram	%	
			Total				Total
50	0.30	1.20	In-Size	20	0.00	0.00	In-Size
70	16.90	67.33		30	1.10	4.35	
100	6.20	24.70	98.8%	40	17.20	67.98	93.7%
120	1.30	5.18		45	5.40	21.34	
140	0.30	1.20		50	1.10	4.35	
200	0.10	0.40		70	0.50	1.98	
Pan	0.00	0.00	fines	Pan	0.00	0.00	fines
Total wt. Gram	25.10	100.00		Total wt. Gram	25.30	100.00	

Tested By: Etuate Varea

Post Job Report

AMERICAN ENERGY - UTICA

Red Hill Farm MDS GR 3H

Stage : 10 OF 54

HARRISON, OH

Operations Representative:

Name:	David Knapp
Office:	878-327-4881
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Cell:	
Email:	DAVID.KNAPP@FTSI.COM

Sales Representative:

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Fax:	405-787-1235
Cell:	
Email:	BRUCE.BATTHMAN@FTSI.COM

Engineering Manager:

Name:	Thaddeus Craun
Office:	817-832-8782
Fax:	724-743-7719
Cell:	
Email:	THADDEUS.CRAUN@FTSI.COM

Job Summary

Well Information

TVD:	7,301	Top Perf:	14,349
No. Of Perfs:	30		

Casing	Tubing
[illegible]	n/A

Pressures, Rates and Volumes

	Proposed	Actual	Max	Min
STP	[illegible] psi	[illegible] psi	[illegible] psi	[illegible] psi
Rate	[illegible] bpm	[illegible] bpm	[illegible] bpm	[illegible] bpm

	Proposed	Actual		
Clean Volume	[illegible] bbls	[illegible] bbls		
Slurry Volume	[illegible] bbls	[illegible] bbls		
Flush Volume	[illegible] bbls	[illegible] bbls		

	Proposed	Start	End
Frac Pumps on Location	19	14	14

Open Well:	Start Time	17:39	Pressure	[illegible] psi
	Bell Down	[illegible] bbls	Break Down	[illegible] psi
	Initial ISIP:	[illegible] psi	Initial F.G.:	[illegible] psi/ft
Stage Complete:	End Time	18:00	Job Time	[illegible]
	Final ISIP	[illegible] psi	Final F.G.	[illegible] psi/ft
	ISIP	17,011	5 Min:	[illegible] psi
	Pressure Min:	[illegible]	10 Min:	N/A
	Pressure Max:	[illegible]	15 Min:	N/A

Material Volume

Material	Proposed	Calculated	Actual	Variance
100 Mesh White	[illegible]	[illegible]	[illegible]	0%
[illegible] White	[illegible]	[illegible]	[illegible]	0%
Total Proppants	[illegible]	[illegible]	[illegible]	0%

Material	Proposed	Calculated	Actual	Variance
6.1%-7.5% HCL	[illegible]	[illegible]	[illegible]	1%
[illegible]	[illegible]	[illegible]	[illegible]	0%
[illegible]	[illegible]	[illegible]	[illegible]	0%
[illegible]	[illegible]	[illegible]	[illegible]	2%
[illegible]	[illegible]	[illegible]	[illegible]	0%
[illegible]	[illegible]	[illegible]	[illegible]	-2%
[illegible]	[illegible]	[illegible]	[illegible]	0%
[illegible]	[illegible]	[illegible]	[illegible]	2%
[illegible]	[illegible]	[illegible]	[illegible]	0%
[illegible]	[illegible]	[illegible]	[illegible]	7%
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Comments:

Pumpdown Information:
Total Bbls: 333
Max Pressure (psi): 6275
Max Rate (bpm): 19.8

FTS International
[illegible]
Ogilby Pass, PA [illegible]

FTS INTERNATIONAL

Customer: American Energy - Utica
Well: Red Hill Farm Site 6r 3H
Stage: 18
Job End Date: [illegible]

Treatment Report

Date	[illegible]	State	Washington County, PA	Basin Size	[illegible]	API	[illegible]

Min. Time	BTP	Slurry BPM	Stage Slurry (bbls)	Cumulative Slurry (bbls)	Stage Slurry (bbls)	Cumulative Slurry (bbls)	Stage Proppant (lbs)	Cumulative Proppant (lbs)	Description	Proppant	PPA
17:00	9,216	10.0	51	51	51	51	0	0	Freshwater Open Wet		0.00
17:03	6,000	10.0	71	52	71	52	0	0	7.5% HCL Acid Acid		0.00
17:01	6,040	11.0	174	224	174	224	0	0	Slickwater Load		0.00
17:05	3,000	24.2	57	281	57	281	100	100	Slickwater Proppant	100 Mesh White	0.10
17:06	7,000	21.2	0	280	0	280	21	120	Slickwater Breakdown	100 Mesh White	0.10
17:08	7,010	22.0	100	482	107	493	791	887	Slickwater Proppant	100 Mesh White	0.10
17:01	8,289	80.4	228	708	225	713	2,979	3,750	Slickwater Proppant	100 Mesh White	0.25
17:05	8,134	81.0	300	800	301	812	4,005	8,005	Slickwater Proppant	100 Mesh White	0.50
17:06	8,039	79.2	420	1,202	444	1,217	13,014	22,140	Slickwater Proppant	100 Mesh White	0.75
18:05	8,107	81.0	425	1,217	444	1,661	17,002	39,042	Slickwater Proppant	100 Mesh White	1.00
18:10	8,000	80.0	675	2,892	615	2,279	30,762	70,748	Slickwater Proppant	30/50 White	1.00
18:21	8,744	80.2	1,001	3,893	1,050	3,334	52,053	122,302	Slickwater Proppant	30/50 White	1.25
18:25	8,611	80.0	951	4,844	915	4,249	54,064	167,366	Slickwater Proppant	30/50 White	1.50
18:04	8,679	80.0	300	4,871	340	5,005	33,000	200,370	Slickwater Proppant	30/50 White	1.75
18:05	8,040	80.0	300	5,079	319	5,319	14,047	221,223	Slickwater Proppant	30/50 White	1.75
18:00	8,004	80.0	300	5,000	300	5,000	00,140	244,000	10# Linear Gel Proppant	30/50 White	2.00
14:24	8,151	75.0	97	5,075	97	5,245	0	244,000	10# Linear Gel Down stress		0.00
14:34	8,000	74.4	200	5,245	200	5,445	0	244,000	Slickwater Flush		0.00
14:34	9,070	72.5	117	5,362	117	5,162	0	244,000	Freshwater Flush		0.00
14:40	4,004	0.0	0	5,362	0	5,162	0	244,000	Freshwater Shutdown		0.00
Total Job/Time (HH:MM): 01:30											

Min BTP:	8,730 psi	Max BTP:	9,401 psi	Average BTP:	8,873 psi	5 Min:	4,140 psi
Min Rate:	21.0 bpm	Max Rate:	80.0 bpm	Average Rate:	62.9 bpm	10 Min:	0 psi
Initial ISIP:	4,004 psi	Initial F.G.:	1.00 psi/ft	Average HHP:	17,011	15 Min:	0 psi
Final ISIP:	4,004 psi	Final F.G.:	1.00 psi/ft	Customer Representative:		Bill Smith	
FTS Representative:		Travis Wilson & Juan Gomez					

Comments:

The proppant values contained in this report are calculated based on actual barrel counts and target densities. Actual total proppant usage is 249,263 lbs. Charge time is 1 hour(s) 30 minute(s). All chemicals and proppant ran as documented.

Min/Max/Avg were taken from sand stages. All chem changes from proposed were made per AEU representative request.

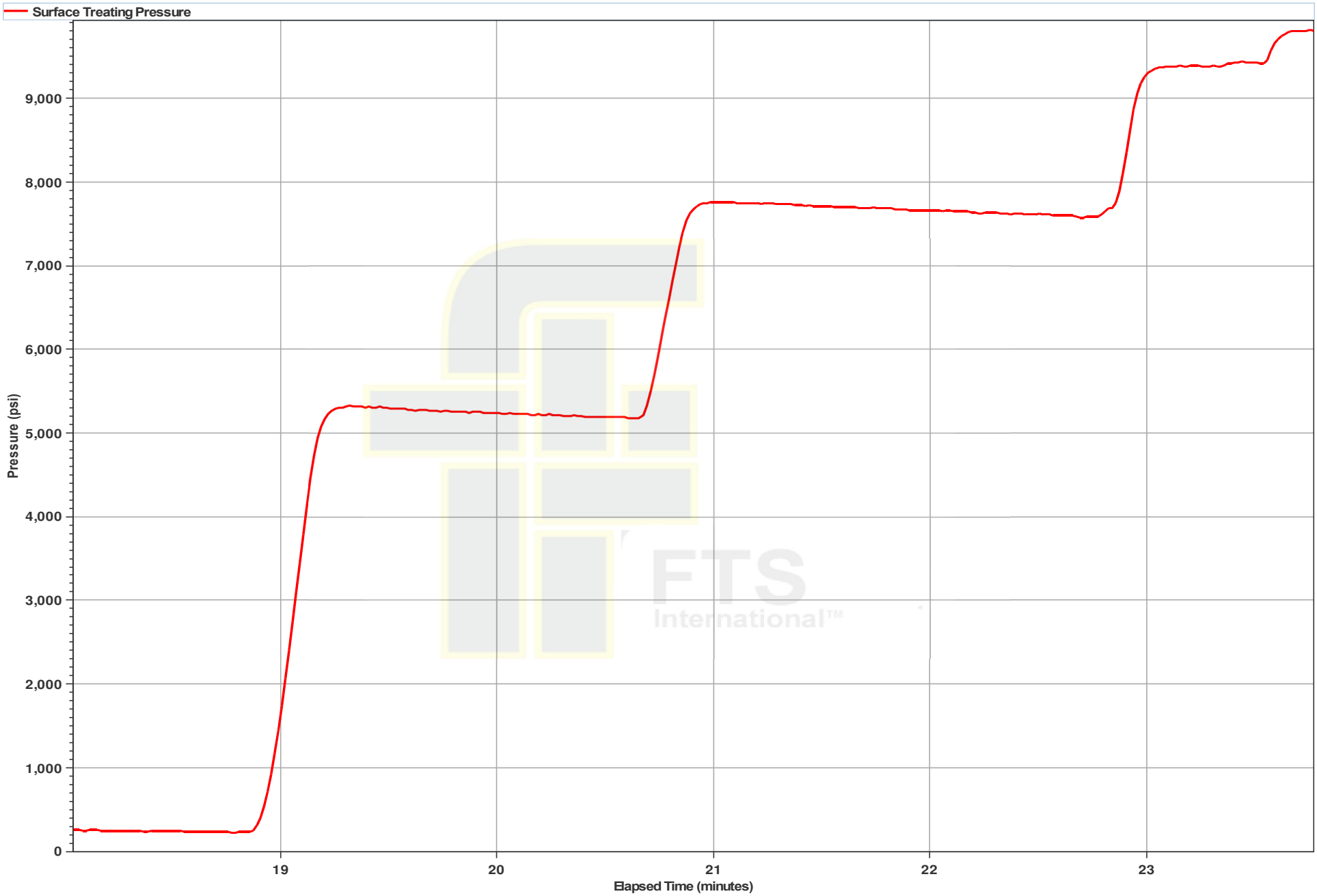
Started pumping a 10# Linear Gel system during the 2.0 ppg stage of 30/50 per AEU representative request.

1 Minute Shutdown (psi): 4370
2 Minute Shutdown (psi): 4297
5 Minute Shutdown (psi): 4140

Chemical Changes:

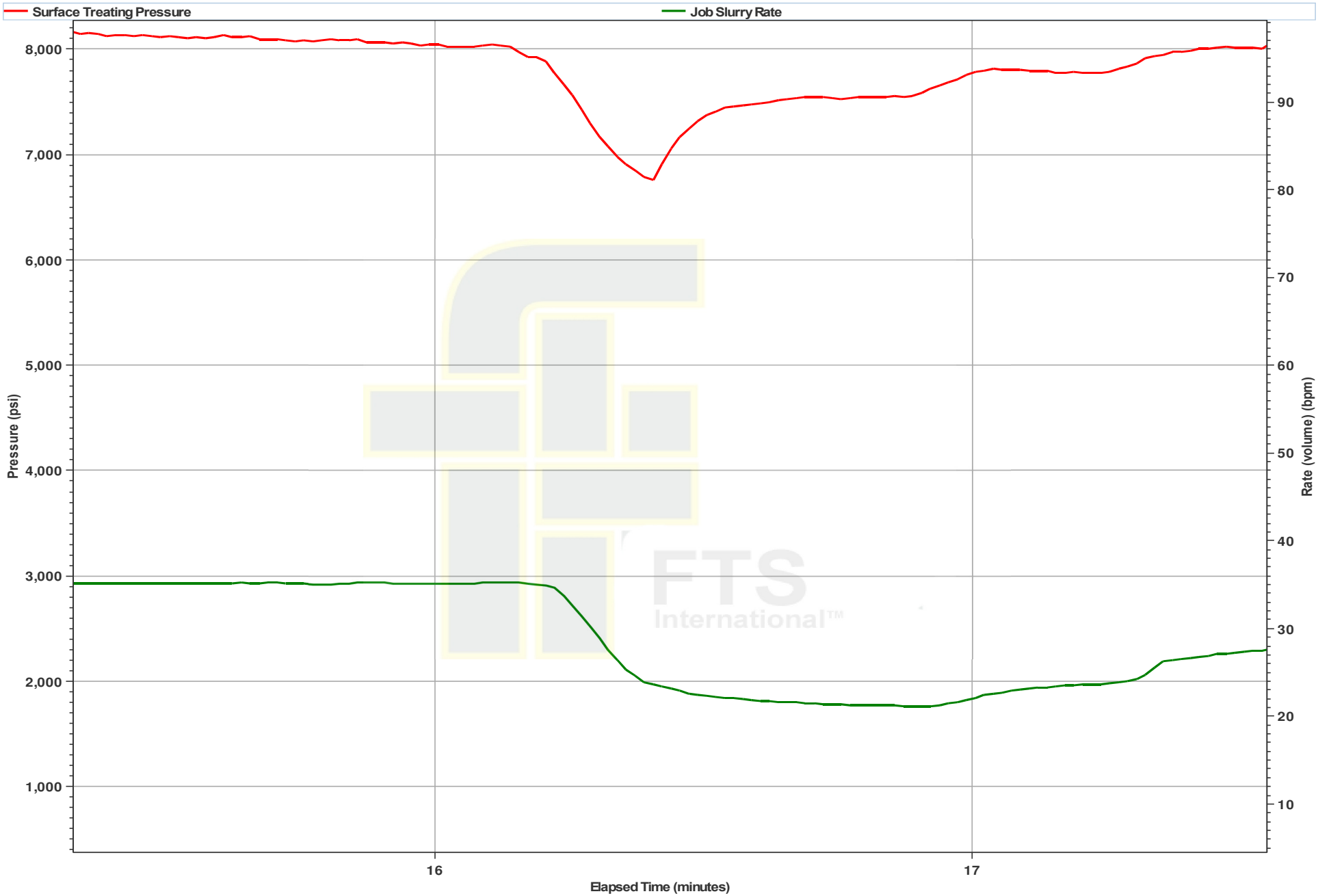
Chemical Name	Chemical Loading	Cumulative Gleen
FRW-200	1.00	5,073
FRW-200	0.75	5,408
FRW-200	1.00	5,475

AEU Pressure Test



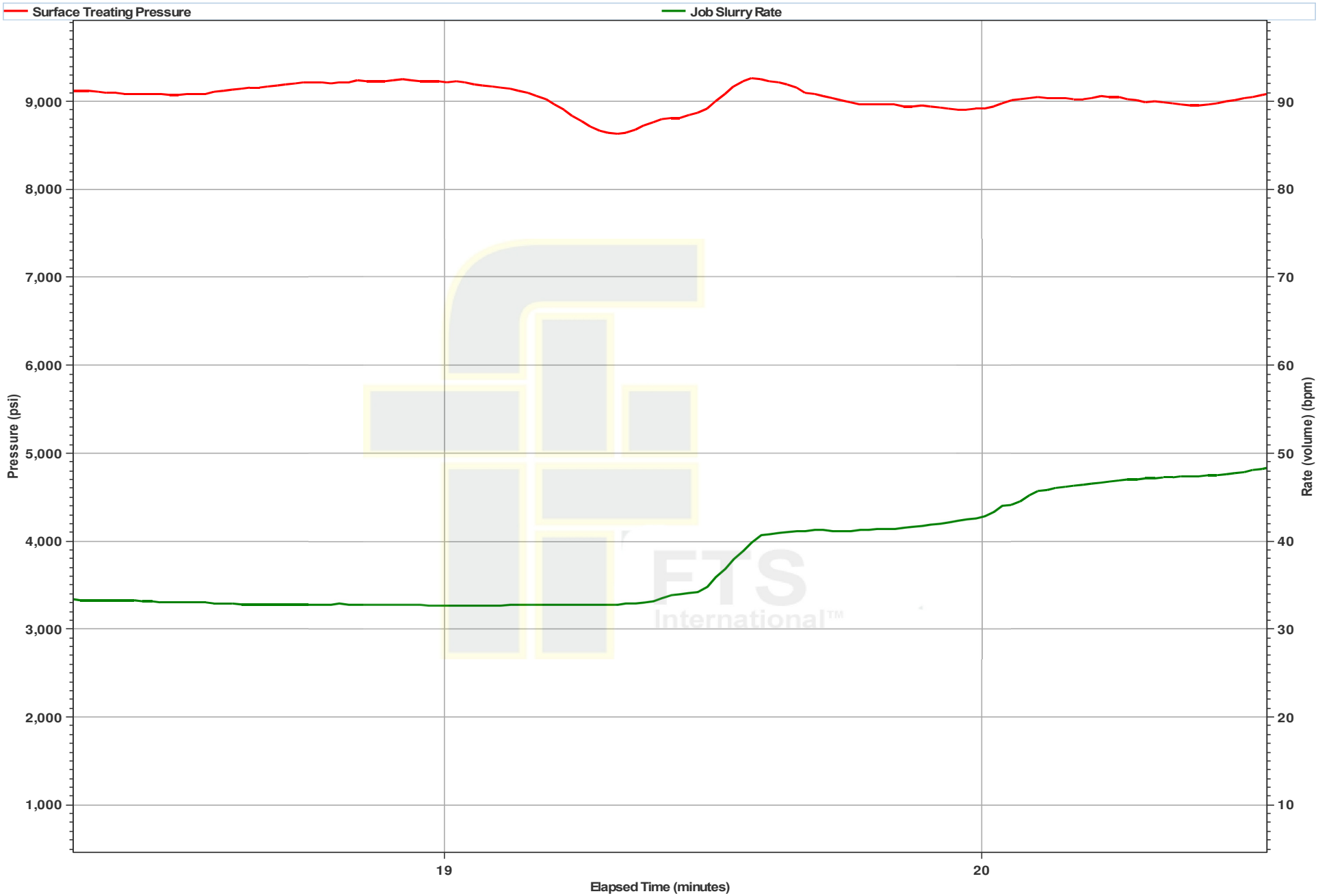
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 10 (WF.000658.M.W03.S10-aDCT-1103) **Jun 15, 2015**

Ball Seat and Breakdown



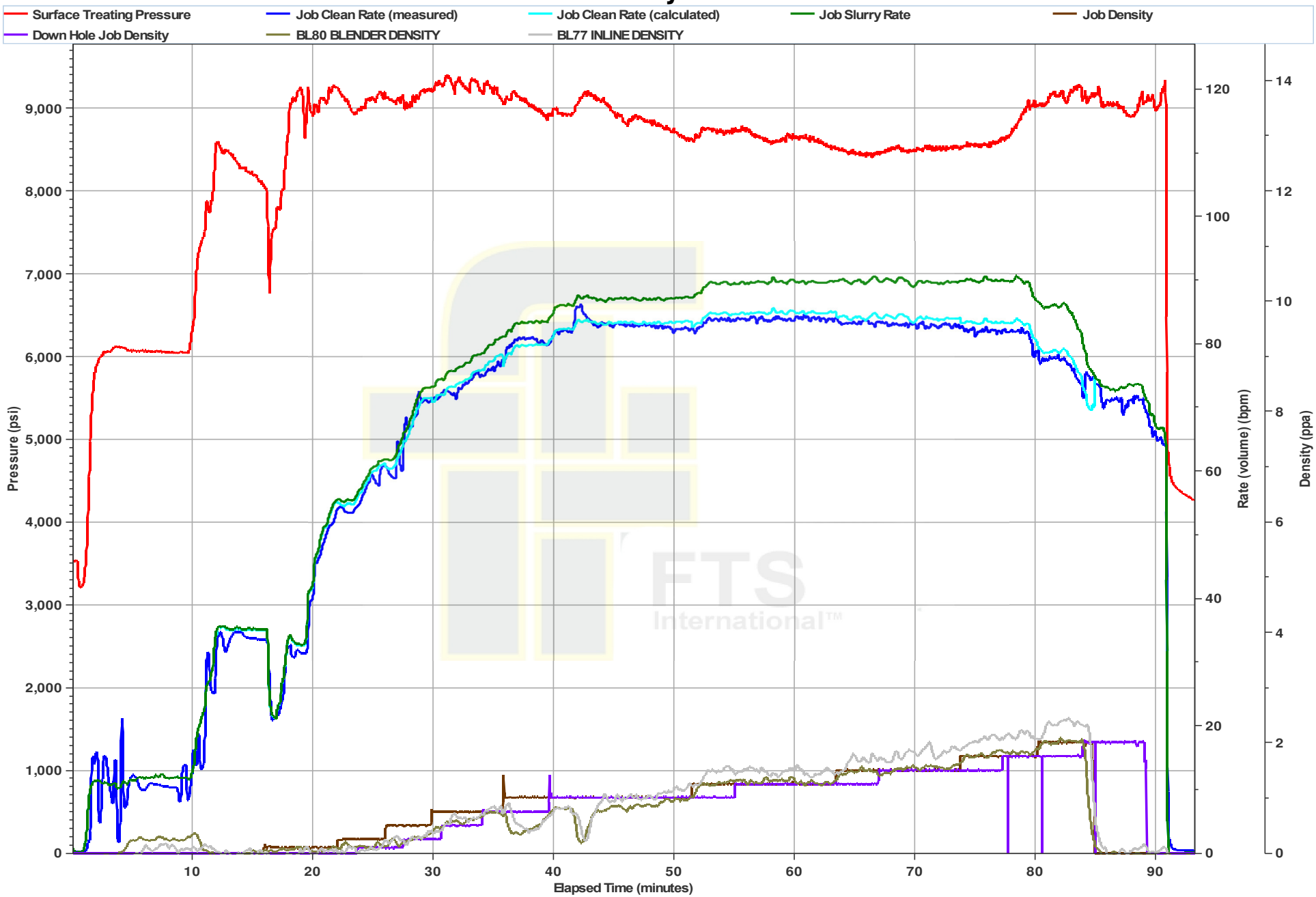
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 10 (WF.000658.M.W03.S10-aDCT-1103) Jun 15, 2015

Acid on Perforations



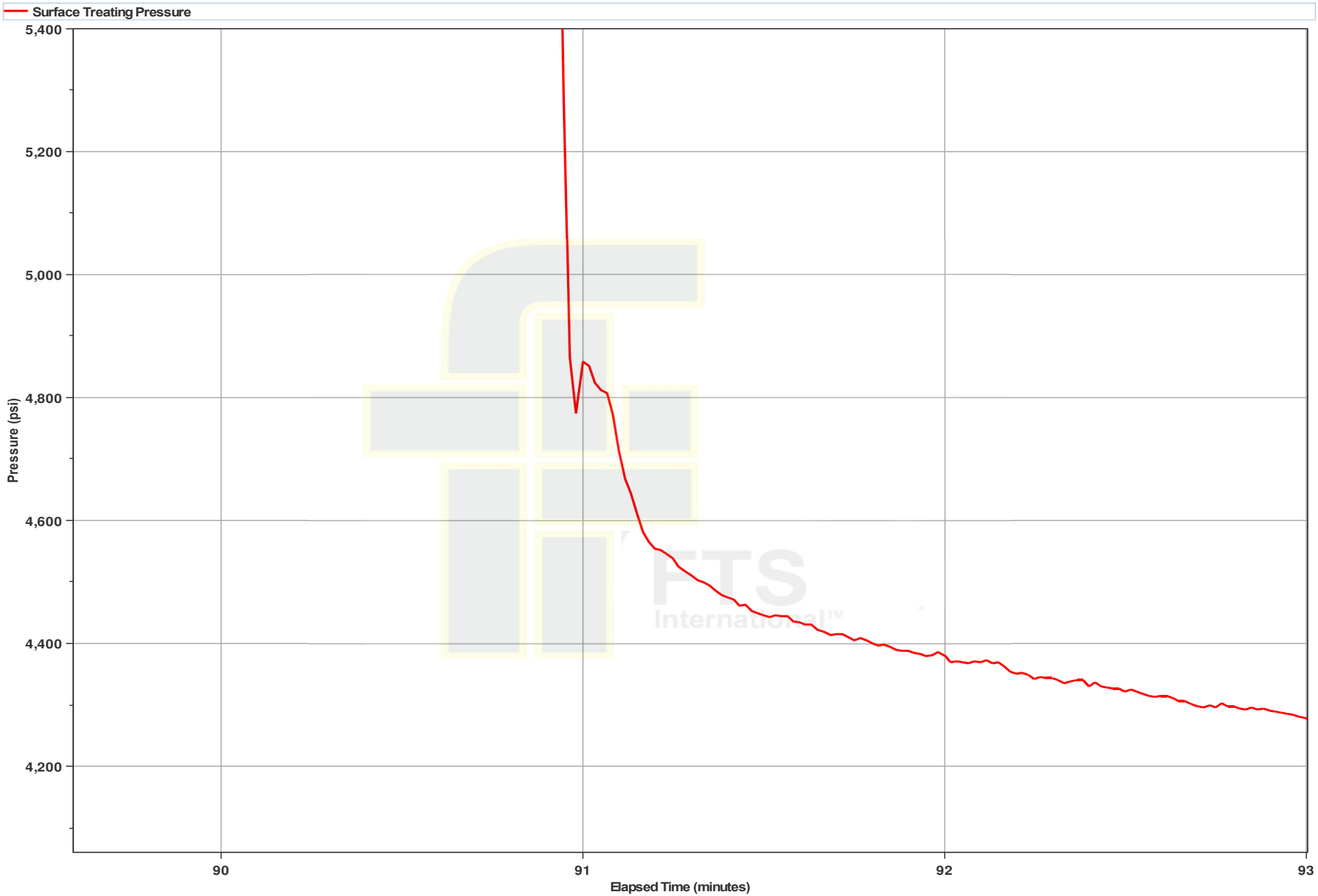
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 10 (WF.000658.M.W03.S10-aDCT-1103) **Jun 15, 2015**

Primary Plot



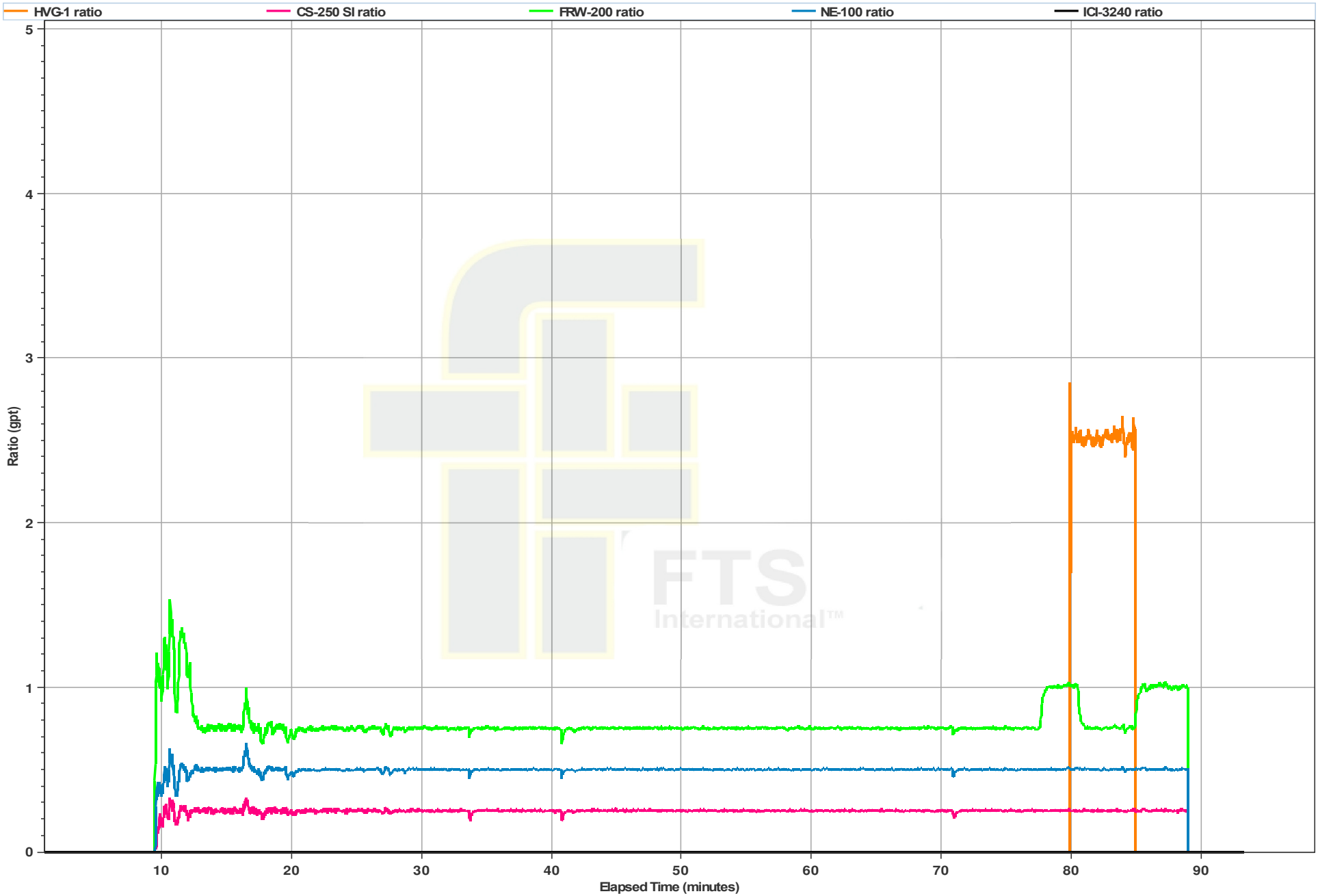
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 10 (WF.000658.M.W03.S10-aDCT-1103) **Jun 15, 2015**

ISIP Plot



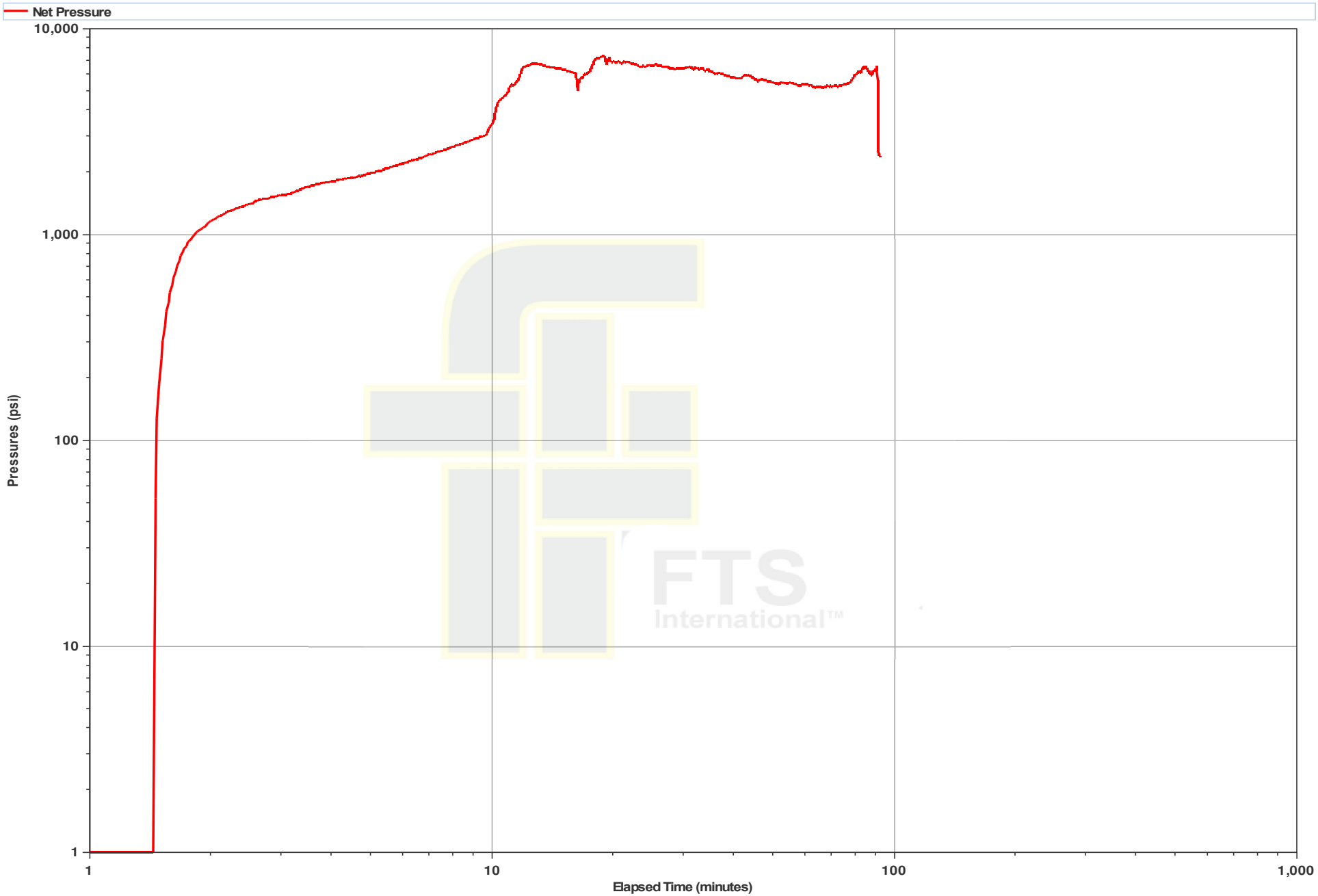
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 10 (WF.000658.M.W03.S10-aDCT-1103) Jun 15, 2015

Chemical Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 10 (WF.000658.M.W03.S10-aDCT-1103) **Jun 15, 2015**

Net Pressure Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 10 (WF.000658.M.W03.S10-aDCT-1103) Jun 15, 2015

WATER-BASED FRAC FLUID QUALITY CONTROL
(Attachment to Post Treatment Report)

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/15/2015
Customer Name:	American Energy - Utica	Proposal #:	3H/10
Date Sampled:	6/15/2015	Water Source:	Working Tank

Sample/Tank No.	Clarity, Color, Odor	Sample Temperature, (F)	Specific gravity	Initial pH	Chloride, ppm	Hardness, ppm	Calcium, ppm	Magnesium, ppm	Iron ppm	Hydroxide, ppm	Bicarbonate, ppm	Carbonate, ppm	Sulfate, ppm	Barium, ppm
Working Tank	Clear	79	1	8.1	45	100	32	17	1	0	146	0	60	0

Frac Fluid Quality Gel Testing (These Recording are to made prior to pumping job)														
Sample #														
Base Gel Type	HVG-1													
Gel Loading (lbs/1000 gal.)	2.5													
Sample Temperature, (F)	77													
Initial pH	8.1													
Visc. Reading @ 300 rpms	6													
Viscosity, (cp)	6													
Sample 1 3 min Hydration	4													
Sample 2 3 min Hydration	4													
Sample 3 3 min Hydration	5.5													
X-Link Vortex Closure, min:sec	n/a													
X-Link Crown, min:sec	n/a													
X-Link pH	n/a													
Gel Break Time (<2cp) mins	20													

Frac Fluid Quality Gel Testing (These Recording are to made while pumping job)														
Stage #														
Base Gel Viscosity (cp)														
X-Link pH								.						
Sample XL time, min:sec														
Sample Temperature														

Acid Quality	Percent Acid	NaOH, mLs	Specific Gravity
	28		1.14

Additional testing or documentation may be required by the customer or for frac fluid quality assurance.

Tested By: Etuate Varea

QUALITY CONTROL OF PROPPANTS

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/15/2015
Customer Name:	American Energy - Utica	Well/Stage:	3H/10
Date Sampled:	6/15/2015	DISTRICT:	Washington, PA
VENDOR:	SANTROL		

Select Proppant Type:

___ Brown	___ Ceramic	___ Other (specify)
X White	___ Bauxite	
___ Resin Coated	___ Texas Gold	

Sieve Analysis	100 Mesh			Sieve Analysis	30/50 Mesh		
Sample 1	25.50	grams of sample		Sample 2	25.60	grams of sample	
	Amount Retained				Amount Retained		
Sieve mesh	Gram	%		Sieve mesh	Gram	%	
			Total				Total
50	0.30	1.18	In-Size	20	0.00	0.00	In-Size
70	16.90	66.27		30	0.80	3.13	
100	6.20	24.31	98.8%	40	15.80	61.72	94.9%
120	1.50	5.88		45	7.20	28.13	
140	0.50	1.96		50	1.30	5.08	
200	0.10	0.39		70	0.50	1.95	
Pan	0.00	0.00	fines	Pan	0.00	0.00	fines
Total wt. Gram	25.50	100.00		Total wt. Gram	25.60	100.00	

Tested By: Etuate Varea

Post Job Report

AMERICAN ENERGY - UTICA

Red Hill Farm MDS GR 3H

Stage : 11 OF 54

HARRISON, OH

Operations Representative:

Name:	David Knapp
Office:	878-327-4881
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Sales Representative:

Name:	Bruce Eathman
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Fax:	405-787-1235
Cell:	
Email:	BRUCE.EATTHMAN@FTSI.COM

Engineering Manager:

Name:	Thaddeus Craun
Office:	817-832-8782
Fax:	724-743-7719
Cell:	
Email:	THADDEUS.CRAUN@FTSI.COM

Job Summary

Well Information

TVD:	7,301	Top Perf:	14,181
No. Of Perfs:	30		

Casing	Tubing
[illegible]	n/A

Pressures, Rates and Volumes

	Proposed	Actual	Max	Min
STP	[illegible] psi	[illegible] psi	[illegible] psi	[illegible] psi
Rate	[illegible] bpm	[illegible] bpm	[illegible] bpm	[illegible] bpm

	Proposed	Actual		
Clean Volume	[illegible] bbls	[illegible] bbls		
Slurry Volume	[illegible] bbls	[illegible] bbls		
Flush Volume	[illegible] bbls	[illegible] bbls		

	Proposed	Start	End
Free Pumps on Location	[illegible]	15	15

Open Well:	Start Time	[illegible]	Pressure	[illegible] psi
	Bell Dwn	[illegible] bbls	Break Down	[illegible] psi
	Initial ISIP:	[illegible] psi	Initial F.G.:	[illegible] psi/ft
Stage Complete:	End Time	[illegible]	Job Time	[illegible]
	Final ISIP	[illegible] psi	Final F.G.	[illegible] psi/ft
	ISIP	[illegible]	5 Min:	[illegible] psi
	Pressure Min:	[illegible]	10 Min:	N/A
	Pressure Max:	[illegible]	15 Min:	N/A

Material Volume

Material	Proposed	Calculated	Actual	Variance
100 Mesh White	[illegible]	[illegible]	[illegible]	0%
[illegible] White	[illegible]	[illegible]	[illegible]	0%
Total Proppants	[illegible]	[illegible]	[illegible]	0%

Material	Proposed	Calculated	Actual	Variance
6.1%-7.5% HCL	[illegible]	[illegible]	[illegible]	1%
[illegible]	[illegible]	14	14	0%
[illegible]	[illegible]	[illegible]	[illegible]	0%
[illegible]	[illegible]	[illegible]	[illegible]	3%
[illegible]	[illegible]	[illegible]	[illegible]	0%
[illegible]	[illegible]	[illegible]	[illegible]	-2%
[illegible]	[illegible]	[illegible]	[illegible]	4%
[illegible]	[illegible]	[illegible]	[illegible]	3%
[illegible]	[illegible]	[illegible]	[illegible]	0%
[illegible]	[illegible]	[illegible]	[illegible]	3%
[illegible]	[illegible]	[illegible]	[illegible]	0%

Comments:

Pumpdown Information:
Total Bbls: 272
Max Pressure (psi): [illegible]
Max Rate (bpm): 19.1

FTS International
[illegible]
Eighty Four, PA [illegible]

FTS INTERNATIONAL

Customer: American Energy - Utica
Well: Red Hill Farm Site 6r 3H
Stage: 11
Job End Date: [illegible]

Treatment Report

Date	[illegible]	Statelate	Washington County,PA	Basin Size	[illegible]	API#	[illegible]

HH:MM Time	BTP	Slurry BPM	Stage Slurry (bbls)	Cumulative Slurry (bbls)	Stage Slurry (bbls)	Cumulative Slurry (bbls)	Stage Proppant (lbs)	Cumulative Proppant (lbs)	Description	Proppant	PPA
01:05	[illegible]	10.0	11	11	11	11	0	0	Freshwater Open Wet		0.00
01:06	[illegible]	10.7	71	82	71	82	0	0	7.5% HCL Acid Acid		0.00
01:16	[illegible]	11.0	140	220	144	224	0	0	Slickwater Load		0.00
01:17	7,146	20.0	92	290	92	290	500	500	Slickwater Proppant	100 Mesh White	0.10
01:19	3,177	19.4	0	290	0	290	21	521	Slickwater Breakdown	100 Mesh White	0.10
01:29	6,074	30.0	149	441	147	443	613	1,134	Slickwater Proppant	100 Mesh White	0.10
01:30	6,122	48.1	214	655	213	656	2,247	3,381	Slickwater Proppant	100 Mesh White	0.25
01:35	[illegible]	47.7	300	955	301	957	[illegible]	[illegible]	Slickwater Proppant	100 Mesh White	0.50
01:36	[illegible]	50.1	450	1,405	448	1,404	13,040	22,841	Slickwater Proppant	100 Mesh White	0.75
01:43	6,011	71.9	400	1,700	425	1,829	17,140	39,977	Slickwater Proppant	100 Mesh White	1.00
01:47	[illegible]	64.7	675	2,924	618	2,789	39,762	79,640	Slickwater Proppant	30/50 White	1.00
01:55	6,675	60.0	1,000	3,924	1,057	3,789	52,000	131,640	Slickwater Proppant	30/50 White	1.25
02:00	6,659	60.0	557	4,481	518	4,679	53,001	183,640	Slickwater Proppant	30/50 White	1.50
02:00	6,442	60.0	391	4,721	371	4,949	19,377	203,016	Slickwater Proppant	30/50 White	1.75
02:03	6,342	60.0	357	4,899	377	5,326	19,948	213,735	15% Inner Gel Proppant	30/50 White	1.75
02:07	3,169	61.3	340	5,240	341	5,670	19,948	243,695	15% Inner Gel Proppant	30/50 White	2.00
02:11	6,397	61.0	94	5,402	94	5,672	0	243,695	15% Inner Gel Chem service		0.00
02:13	6,399	61.0	200	5,402	200	5,672	0	243,695	Slickwater Flush		0.00
02:14	3,917	60.0	150	5,270	150	4,840	0	243,695	Freshwater Flush		0.00
02:24	4,016	0.0	0	5,270	0	4,840	0	243,695	Freshwater Shutdown		0.00
Total Job/Time (HH:MM): 01:31											

Min BTP:	7,054 psi	Max BTP:	8,370 psi	Average BTP:	6,794 psi	5 Min:	3,000 psi
Min Rate:	25.0 bpm	Max Rate:	61.0 bpm	Average Rate:	73.0 bpm	10 Min:	0 psi
Initial ISIP:	4,016 psi	Initial F.G.:	1.36 psi/ft	Average ISIP:	10,375	15 Min:	0 psi
Final ISIP:	4,016 psi	Final F.G.:	1.36 psi/ft	Customer Representative:		Bill Sabin	
FTS Representative:		Travis Wilson & Juan Stewart					

Comments:

The proppant values contained in this report are calculated based on actual barrel counts and target densities. Actual total proppant usage is 249,995 lbs. Charge time is 1 hour(s) 30 minute(s). All chemicals and proppant ran as documented.

Min/Max/Avg were taken from sand stages. All chem changes from proposed were made per AEU representative request.

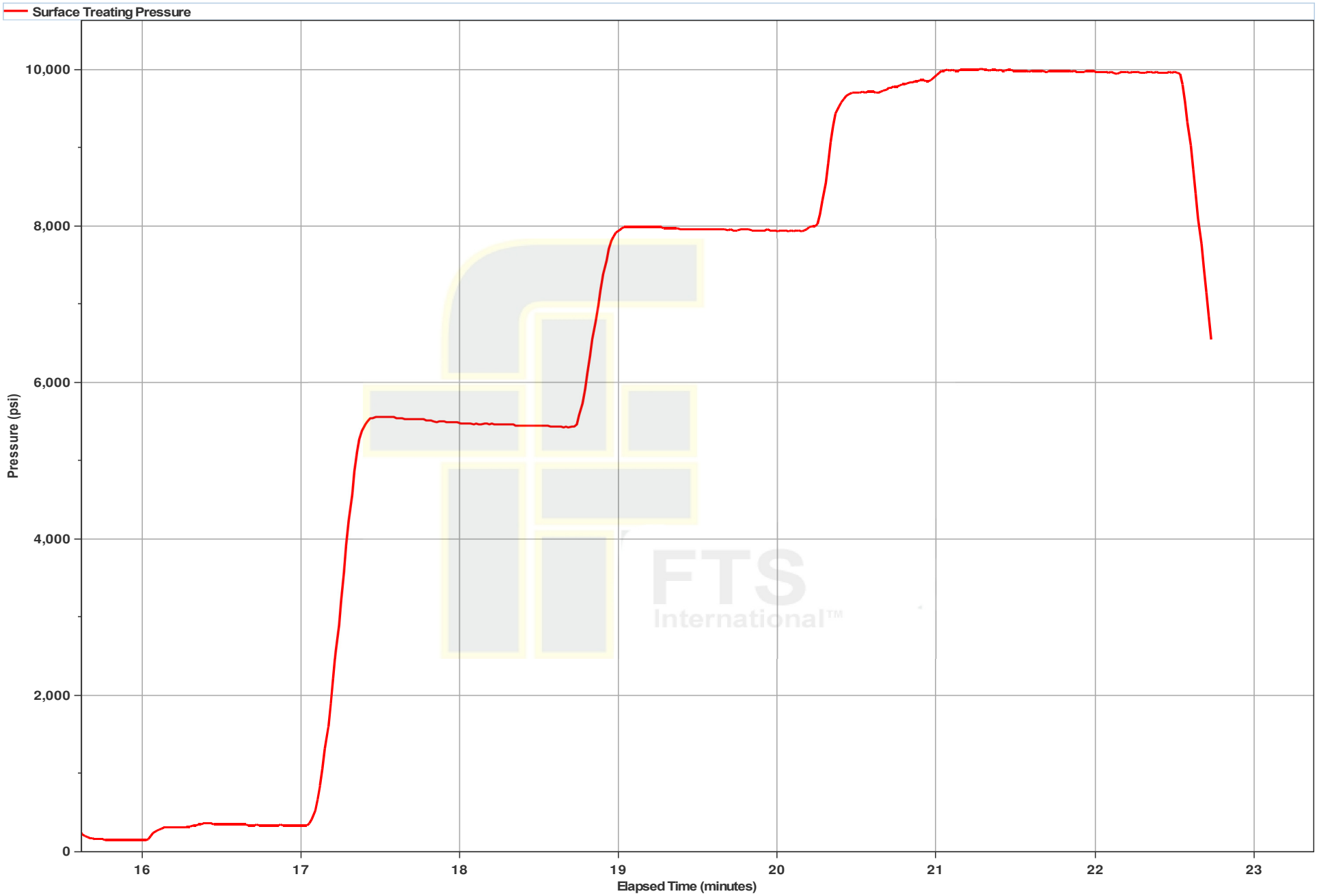
Reuse water was run on this stage for a total of 400 Bbls.

1 Minute Shutdown (psi): 4244
3 Minute Shutdown (psi): 4116
5 Minute Shutdown (psi): 3939

Chemical Changes:

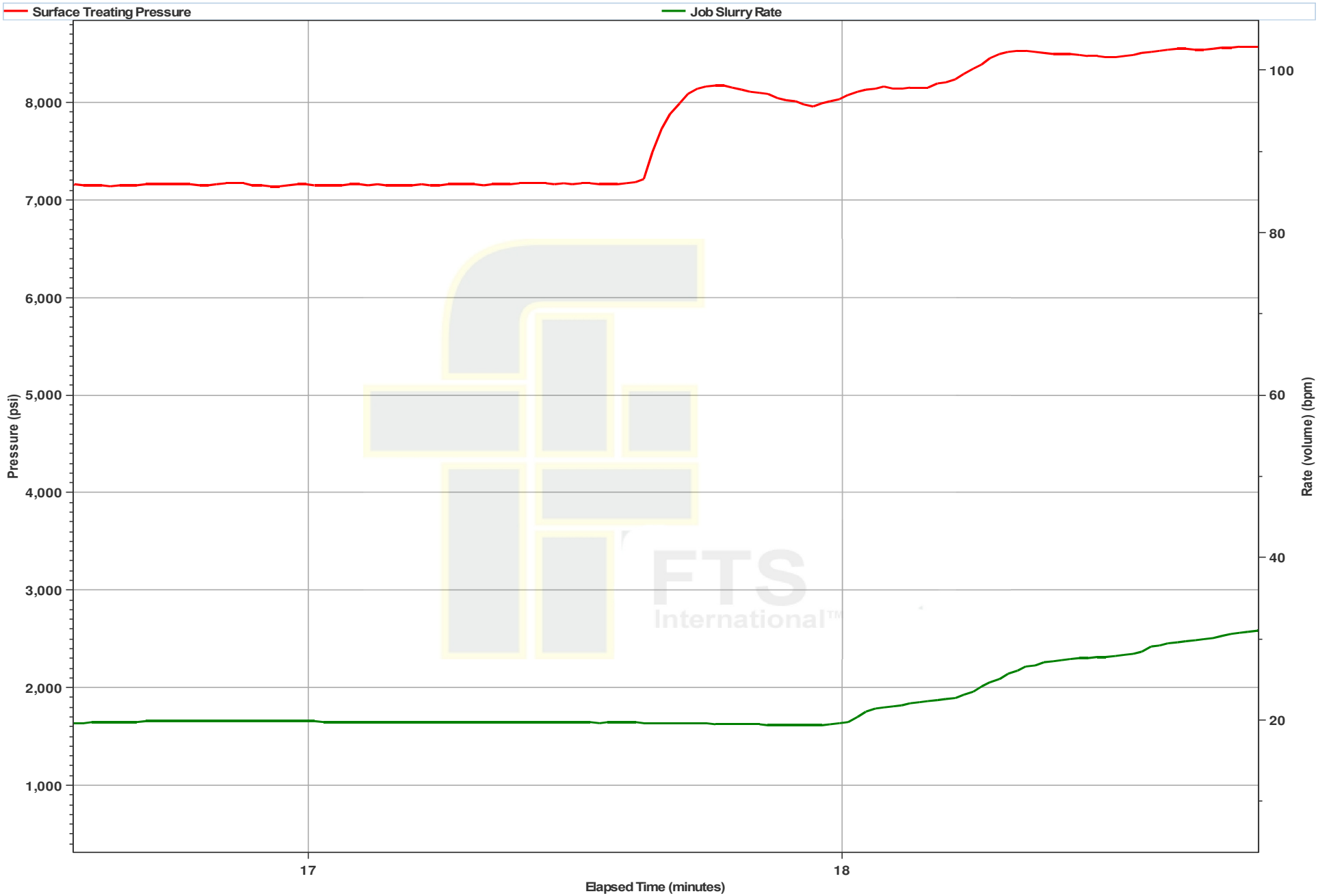
Chemical Name	Chemical Loading	Cumulative Chem
FRW-200	1.00	4,461
FRW-200	0.75	4,463

AEU Pressure Test



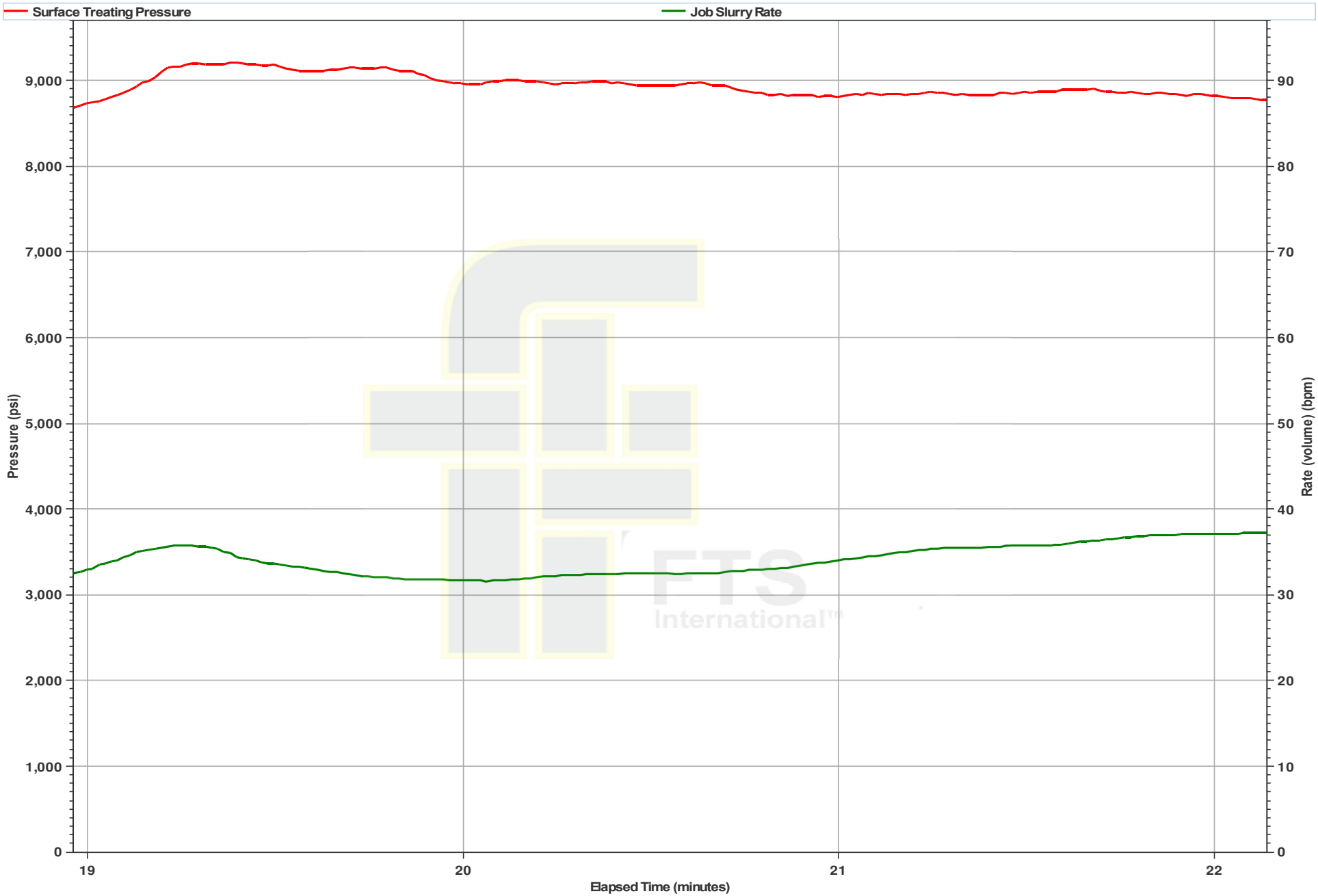
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 11 (WF.000658.M.W03.S11-ADCT-1103) Jun 16, 2015

Ball Seat and Breakdown



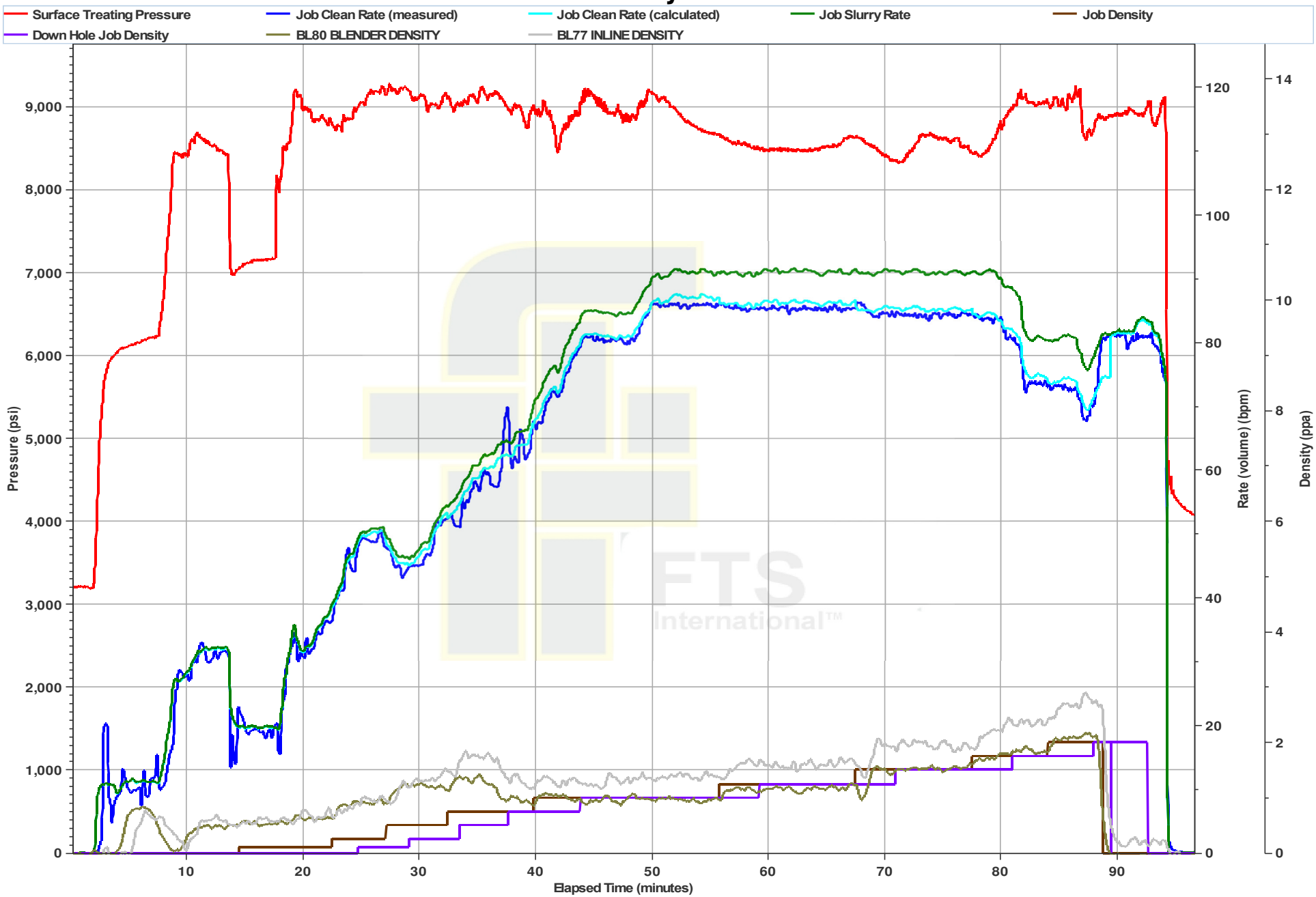
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 11 (WF.000658.M.W03.S11-ADCT-1103) **Jun 16, 2015**

Acid on Perforations



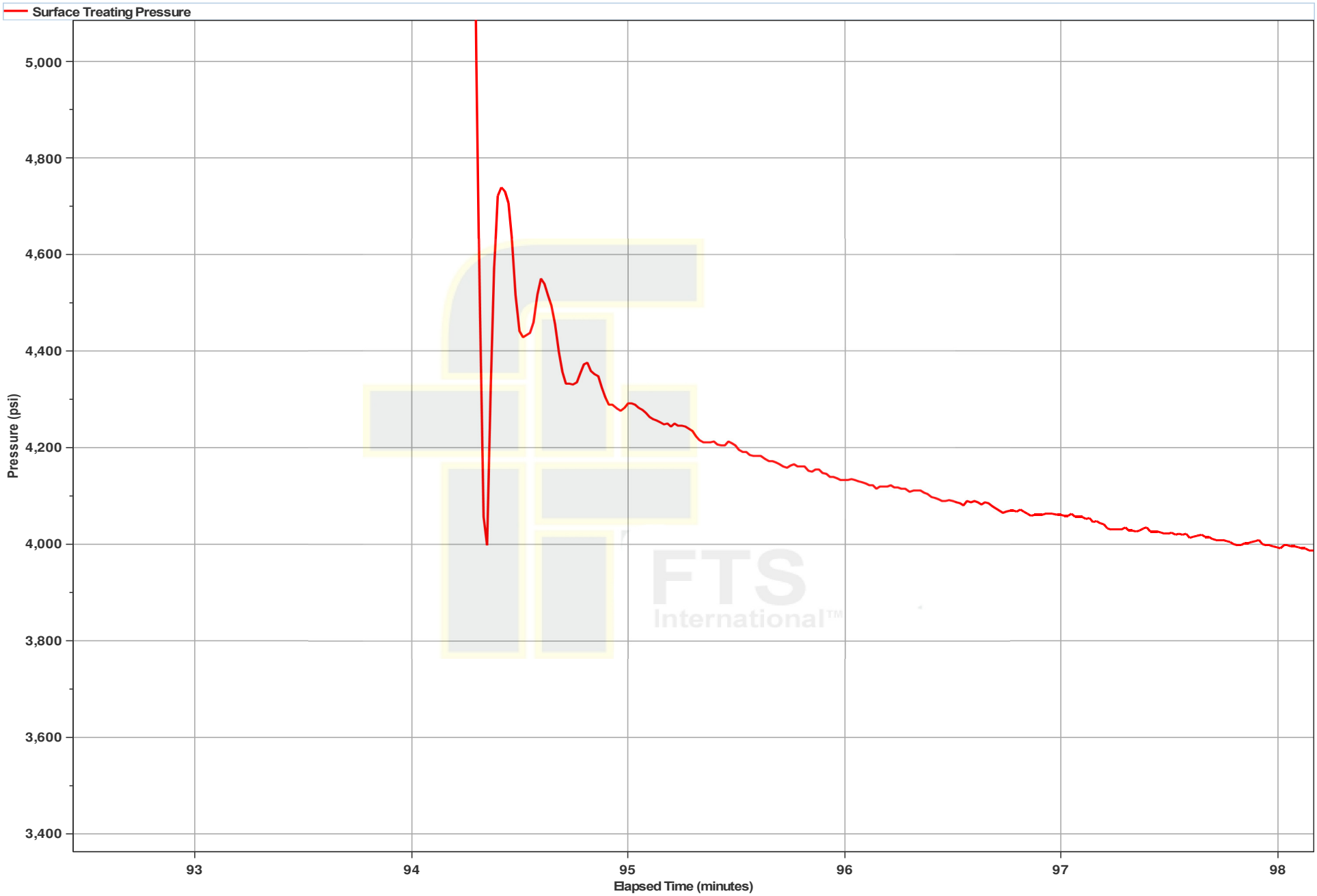
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 11 (WF.000658.M.W03.S11-ADCT-1103) **Jun 16, 2015**

Primary Plot



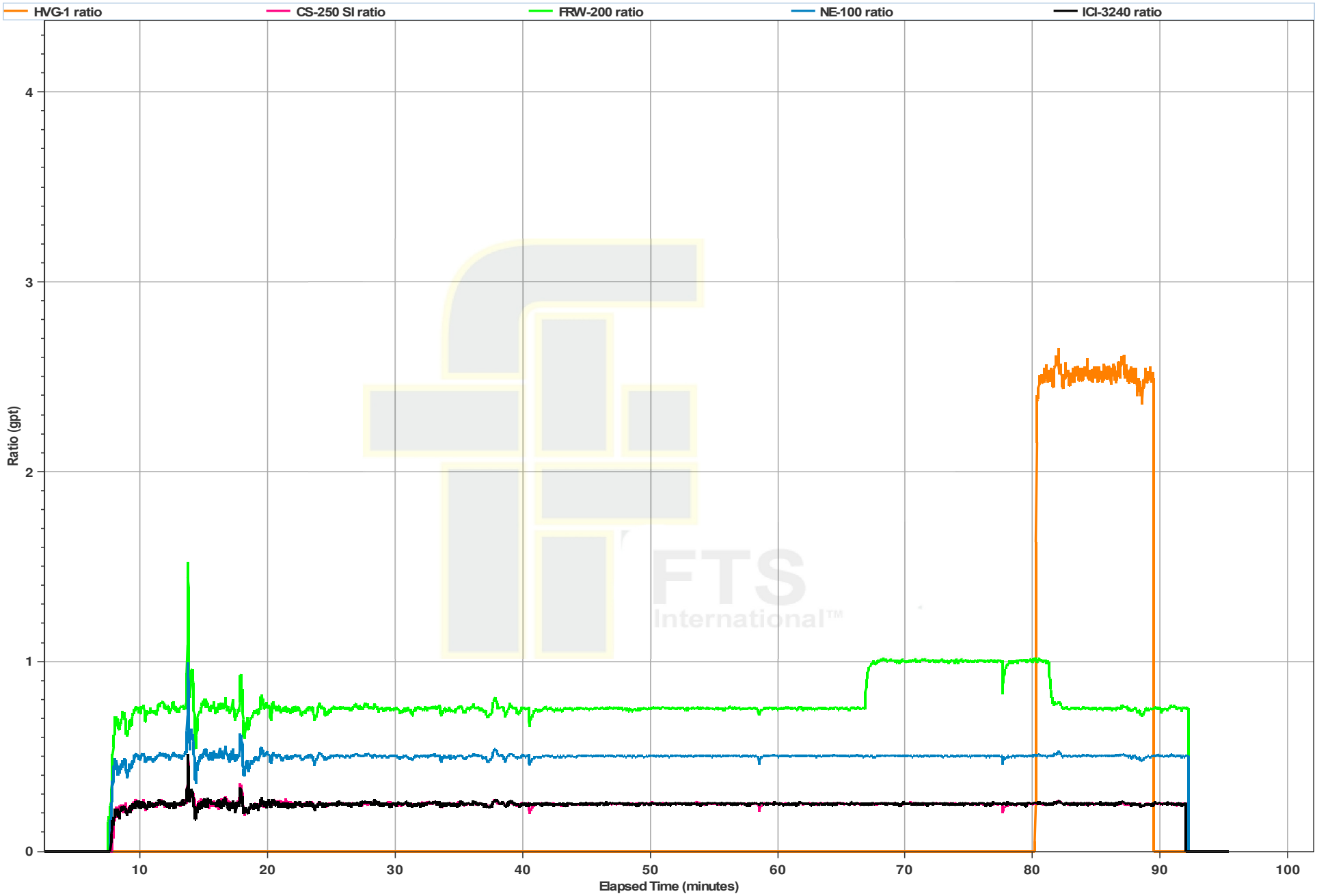
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 11 (WF.000658.M.W03.S11-ADCT-1103) **Jun 16, 2015**

ISIP Plot



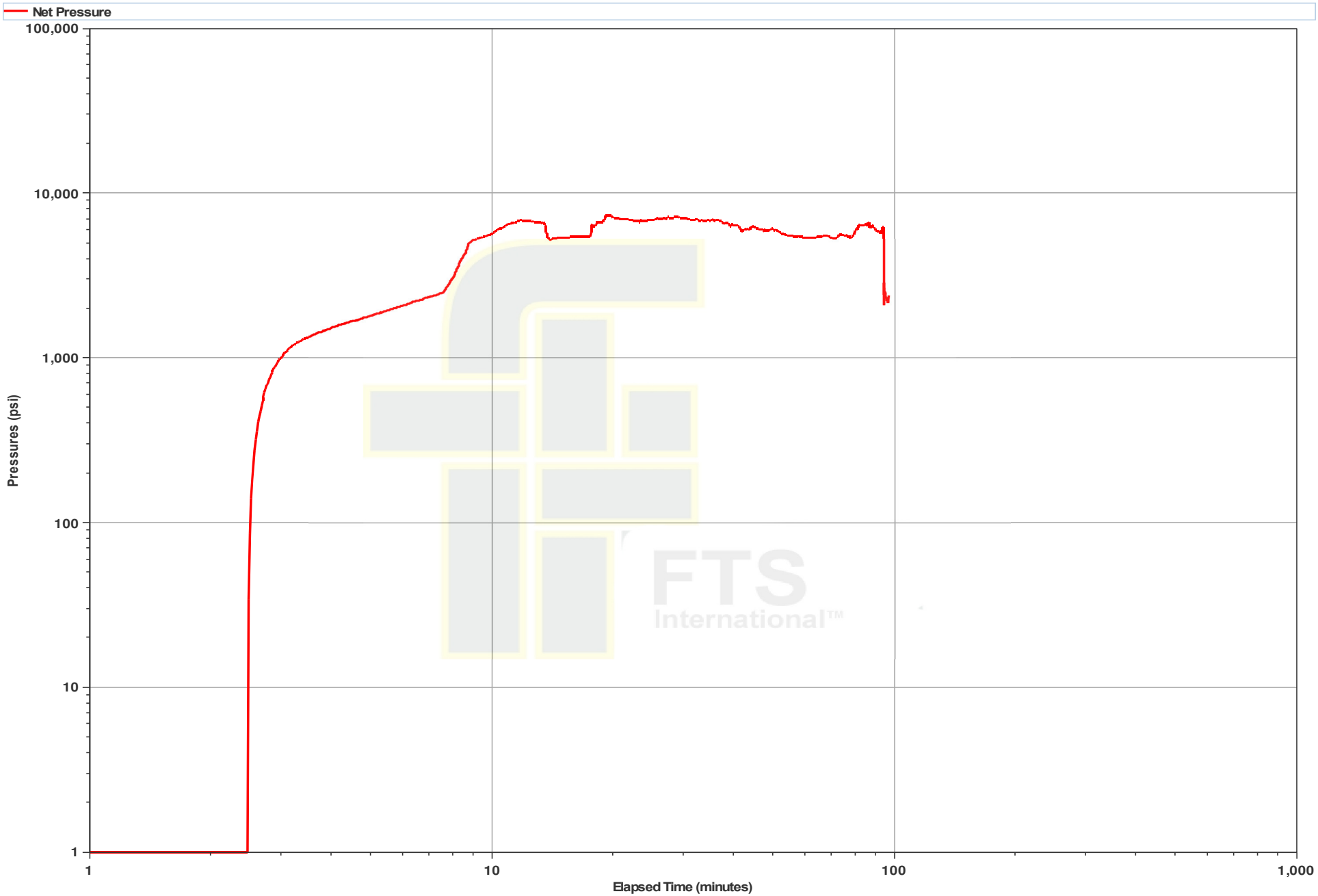
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 11 (WF.000658.M.W03.S11-ADCT-1103) **Jun 16, 2015**

Chemical Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 11 (WF.000658.M.W03.S11-ADCT-1103) **Jun 16, 2015**

Net Pressure Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 11 (WF.000658.M.W03.S11-ADCT-1103) Jun 16, 2015

WATER-BASED FRAC FLUID QUALITY CONTROL
(Attachment to Post Treatment Report)

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/16/2015
Customer Name:	American Energy - Utica	Proposal #:	3H/11
Date Sampled:	6/16/2015	Water Source:	Working Tank

Sample/Tank No.	Clarity, Color, Odor	Sample Temperature, (F)	Specific gravity	Initial pH	Chloride, ppm	Hardness, ppm	Calcium, ppm	Magnesium, ppm	Iron ppm	Hydroxide, ppm	Bicarbonate, ppm	Carbonate, ppm	Sulfate, ppm	Barium, ppm
Working Tank	Clear	74	1	8.2	35	90	32	14	0	0	146	0	60	0
Reused Water Tank	Black, Strong Odor	74	1.15	5.9	89,972	73000	24,006	11,910	9	0	1464	0	140	0

Frac Fluid Quality Gel Testing (These Recording are to made prior to pumping job)														
Sample #														
Base Gel Type	HVG-1													
Gel Loading (lbs/1000 gal.)	2.5													
Sample Temperature, (F)	74													
Initial pH	8.2													
Visc. Reading @ 300 rpms	6													
Viscosity, (cp)	6													
Sample 1 3 min Hydration	4													
Sample 2 3 min Hydration	4													
Sample 3 3 min Hydration	6.5													
X-Link Vortex Closure, min:sec	n/a													
X-Link Crown, min:sec	n/a													
X-Link pH	n/a													
Gel Break Time (<2cp) mins	19													

Frac Fluid Quality Gel Testing (These Recording are to made while pumping job)														
Stage #														
Base Gel Viscosity (cp)														
X-Link pH								.						
Sample XL time, min:sec														
Sample Temperature														

Acid Quality	Percent Acid	NaOH, mLs	Specific Gravity
	28		1.14

Additional testing or documentation may be required by the customer or for frac fluid quality assurance.

Tested By: Travis Wilson

QUALITY CONTROL OF PROPPANTS

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/16/2015
Customer Name:	American Energy - Utica	Well/Stage:	3H/11
Date Sampled:	6/16/2015	DISTRICT:	Washington, PA
VENDOR:	SANTROL		

Select Proppant Type:

____ Brown	____ Ceramic	____ Other (specify)
X White	____ Bauxite	
____ Resin Coated	____ Texas Gold	

Sieve Analysis	100 Mesh			Sieve Analysis	30/50 Mesh		
Sample 1	24.90	grams of sample		Sample 2	24.90	grams of sample	
	Amount Retained				Amount Retained		
Sieve mesh	Gram	%		Sieve mesh	Gram	%	
			Total				Total
50	0.40	1.61	In-Size	20	0.00	0.00	In-Size
70	16.40	65.86		30	0.50	2.01	
100	5.50	22.09	98.4%	40	16.20	65.06	92.0%
120	1.70	6.83		45	4.80	19.28	
140	0.70	2.81		50	1.90	7.63	
200	0.20	0.80		70	1.10	4.42	
Pan	0.00	0.00	fines	Pan	0.40	1.61	fines
Total wt. Gram	24.90	100.00		Total wt. Gram	24.90	100.00	

Tested By: Travis Wilson

Post Job Report

AMERICAN ENERGY - UTICA

Red Hill Farm MDS GR 3H

Stage : 12 OF 54

HARRISON, OH

Operations Representative:

Name:	David Knapp
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Email:	BRUCE.BATTHERN@FTSI.COM

Engineering Manager:

Name:	Thaddeus Craun
Office:	817-832-8782
Fax:	724-743-7719
Cell:	
Email:	THADDEUS.CRAUN@FTSI.COM

Job Summary

Well Information

TVD:	7,301	Top Perf:	14,039
No. Of Perfs:	30		

Casing	Tubing
[illegible]	n/A

Pressures, Rates and Volumes

	Proposed	Actual	Max	Min
STP	[illegible] psi	[illegible] psi	[illegible] psi	[illegible] psi
Rate	[illegible] bpm	[illegible] bpm	[illegible] bpm	[illegible] bpm

	Proposed	Actual		
Clean Volume	[illegible] bbls	[illegible] bbls		
Slurry Volume	[illegible] bbls	[illegible] bbls		
Flush Volume	[illegible] bbls	[illegible] bbls		

	Proposed	Start	End
Frac Pumps on Location	19	14	14

Open Well:	Start Time	[illegible]	Pressure	[illegible] psi
	Bell Dwn	[illegible] bbls	Break Down	[illegible] psi
	Initial ISIP:	[illegible] psi	Initial F.G.:	[illegible] psi/ft
Stage Complete:	End Time	[illegible]	Job Time	[illegible]
	Final ISIP	[illegible] psi	Final F.G.	[illegible] psi/ft
	ISIP	[illegible]	5 Min:	[illegible] psi
	Pressure Min:	[illegible]	10 Min:	N/A
	Pressure Max:	[illegible]	15 Min:	N/A

Material Volume

Material	Proposed	Calculated	Actual	Variance
100 Mesh White	[illegible]	[illegible]	[illegible]	0%
30/50 White	[illegible]	[illegible]	[illegible]	0%
Total Proppants	[illegible]	[illegible]	[illegible]	0%

Material	Proposed	Calculated	Actual	Variance
6.1%-7.5% HCL	[illegible]	[illegible]	[illegible]	1%
AFR-1	6	6	6	0%
[illegible]	3	3	3	0%
[illegible]	[illegible]	[illegible]	[illegible]	3%
FE-[illegible]	15	15	15	0%
FRW-[illegible]	150	229	225	-2%
HVG-1 4.5	6	46	45	-2%
[illegible]	[illegible]	[illegible]	[illegible]	3%
LTB-1	6	6	6	0%
NE-[illegible]	6	119	114	3%
[illegible]	[illegible]	6	6	0

Comments:

Pumpdown Information:
Total Bbls: 279
Max Pressure (psi): 5555
Max Rate (bpm): 19.8

FTS International
1432 Route [illegible]
Eighty Four, PA 15330

Customer: American Energy - Utica
Well: [illegible] 24
Stage: 12
Job End Date: [illegible]

Treatment Report

Date	9/10/2015	District	Washington County, PA	Service No.	[illegible]	API#	34-[illegible]

Rel. Time	STP	Slurry BPM	Stage Slurry (bbls)	Cumulative Slurry (bbls)	Stage Clean (bbls)	Cumulative Clean (bbls)	Stage Proppant (lbs)	Cumulative Proppant (lbs)	Description	Proppant	PPA
15:25	2,095	0.0	0	0	0	0	0	0	Freshwater Open Well		0.00
15:26	6,535	8.4	16	16	16	16	0	0	Freshwater Load		0.00
15:30	8,065	8.8	71	87	71	87	0	0	7.5% HCL Acid Acid		0.00
15:38	8,006	12.1	85	172	85	172	0	0	Slickwater Load		0.00
15:46	7,656	34.9	101	273	101	273	436	436	Slickwater Proppant	100 Mesh White	0.10
15:53	9,142	36.9	0	273	0	273	0	436	Slickwater Breakdown		0.00
15:58	8,827	22.1	113	386	114	386	472	908	Slickwater Proppant	100 Mesh White	0.10
15:?7	8,784	59.9	219	607	228	618	2,230	3,138	Slickwater Proppant	100 Mesh White	0.25
16:01	8,846	83.1	366	973	372	982	4,636	8,774	Slickwater Proppant	100 Mesh White	0.50
16:05	8,658	77.4	429	1,402	444	1,429	13,514	22,288	Slickwater Proppant	100 Mesh White	0.75
16:11	8,685	78.9	402	1,784	420	1,749	18,884	38,172	Slickwater Proppant	100 Mesh White	1.00
16:25	8,629	80.7	678	2,480	618	2,402	28,732	78,904	Slickwater Proppant	30/50 White	1.00
16:15	8,389	80.6	1,001	3,481	1,030	3,739	52,583	128,517	Slickwater Proppant	30/50 White	1.25
16:29	8,685	87.3	583	4,065	617	4,037	54,117	183,634	Slickwater Proppant	30/50 White	1.50
16:38	8,791	80.3	588	4,308	548	5,177	58,783	218,384	Slickwater Proppant	30/50 White	1.75
16:45	8,474	80.4	123	5,009	191	5,089	19,088	233,484	Slickwater Proppant	30/50 White	2.00
16:48	8,437	80.4	163	5,218	164	5,472	12,086	244,964	15# Linear Gel Proppant	30/50 White	2.00
16:49	8,497	80.2	88	5,300	88	5,570	7,088	248,634	15# Linear Gel Proppant	30/50 White	2.00
16:52	3,910	80.2	125	5,425	125	5,695	0	248,634	15# Linear Gel Clean screen		0.00
16:54	3,900	80.2	150	5,610	150	5,800	0	248,634	Slickwater Flush		0.00
16:56	3,810	80.0	144	5,754	144	5,984	0	248,634	Freshwater Flush		0.00
16:59	4,379	0.0	0	5,754	0	5,984	0	248,634	Freshwater Shutdown		0.00
Total Job Time (HH:MM): 01:31											

Min STP:	7,457 psi	Max STP:	9,161 psi	Average STP:	8,542 psi	5 Min:	3,275 psi
Min Rate:	24.0 bpm	Max Rate:	88.8 bpm	Average Rate:	78.2 bpm	10 Min:	0 psi
Initial ISIP:	4,379 psi	Initial F.G.:	1.08 psi/ft	Average HHP:	16,342	15 Min:	0 psi
Final ISIP:	4,379 psi	Final F.G.:	1.08 psi/ft	Customer Representative		Jim Andrews	
FTS Representatives		[illegible] & Jason McCauley					

Comments:

The proppant values contained in this report are calculated based on actual barrel counts and target densities. Actual total proppant usage is 248,634 lbs. Charge time is 1 hour(s) 30 minute(s). All chemicals and proppant run as documented.

Min/Max/Avg were taken from sand stages. All chem changes from proposed were made per AEU representative request.

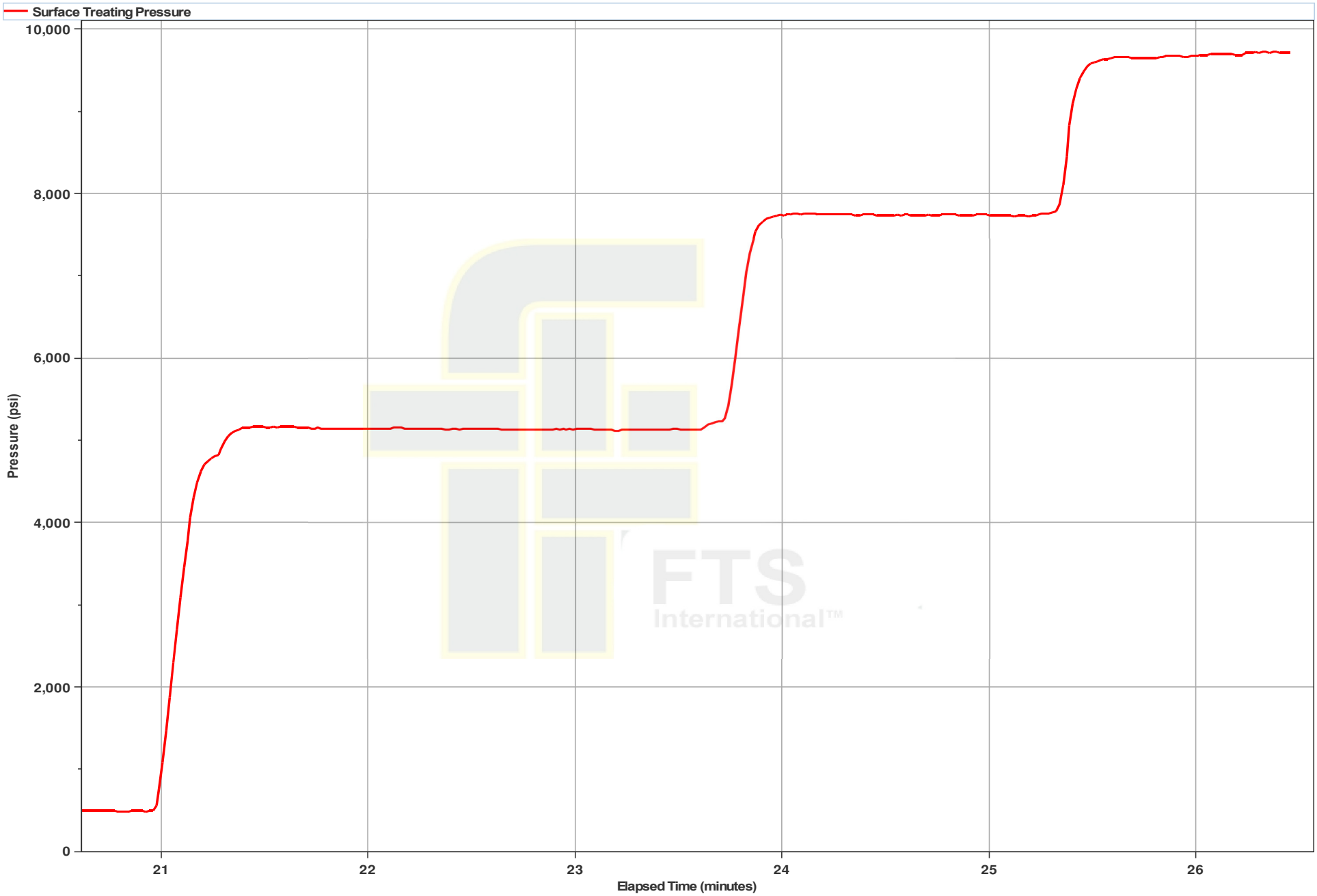
Reuse water was run on this stage for a total of 678 Bbls.

1 Minute Shutdown (psi): 4179
2 Minute Shutdown (psi): 4016
5 Minute Shutdown (psi): 3874

Chemical Changes:

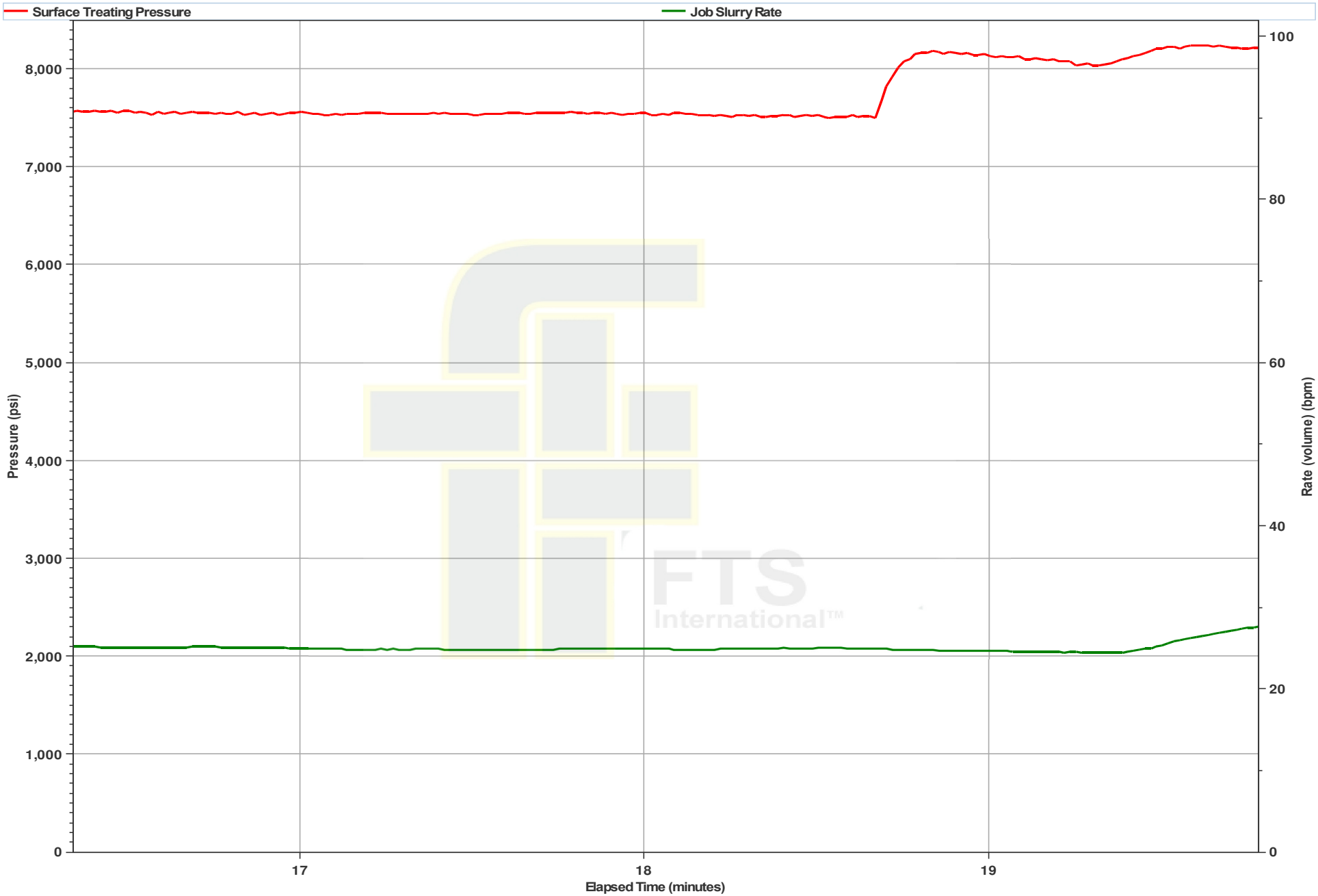
Chemical Name	Chemical Loading	Cumulative Gram
PROW-200	1.00	1,704
PROW-200	1.28	4,440
PROW-200	0.75	6,210

AEU Pressure Test



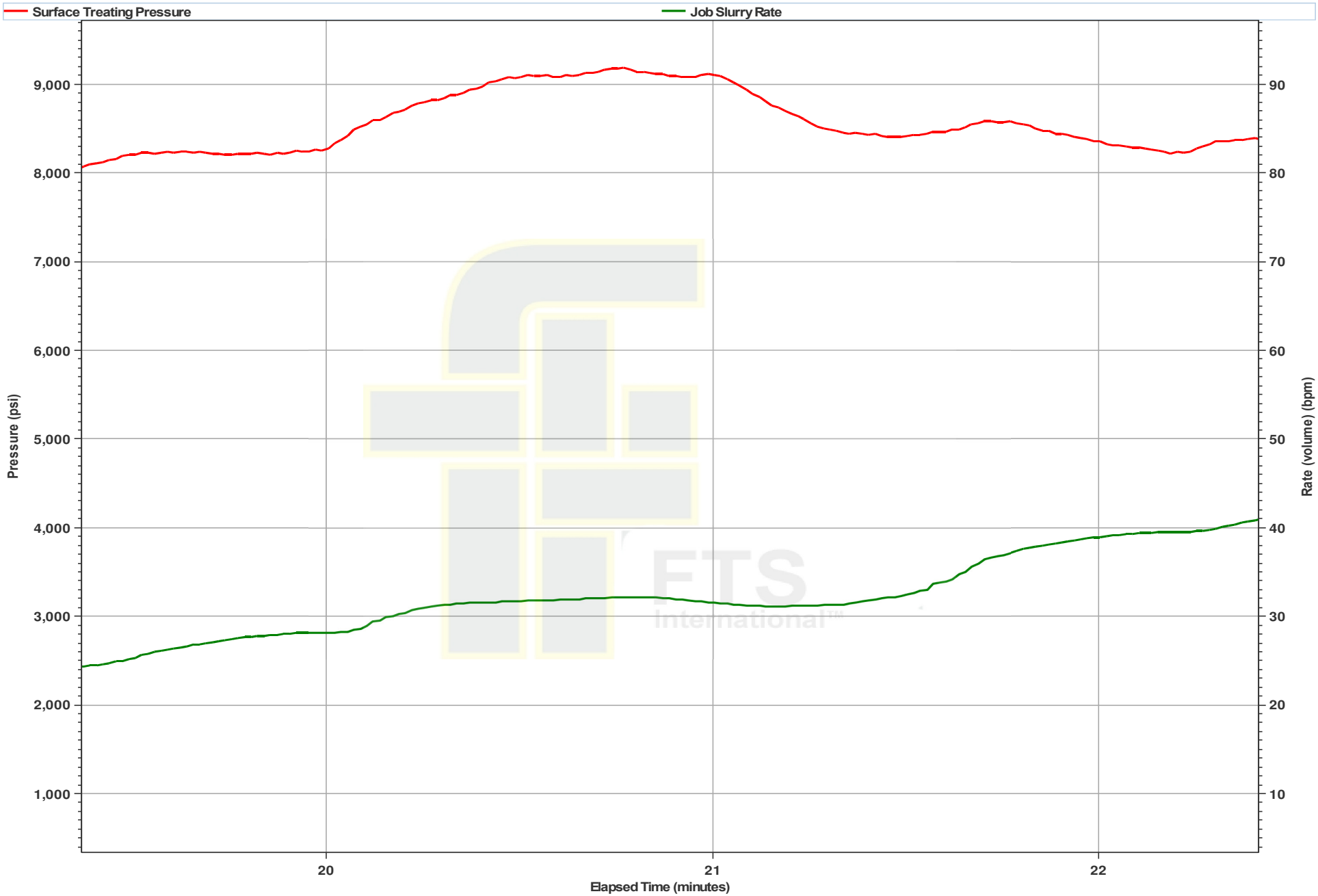
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 12 (WF.000658.M.W03.S12-aDCT-1103) Jun 16, 2015

Ball Seat and Breakdown



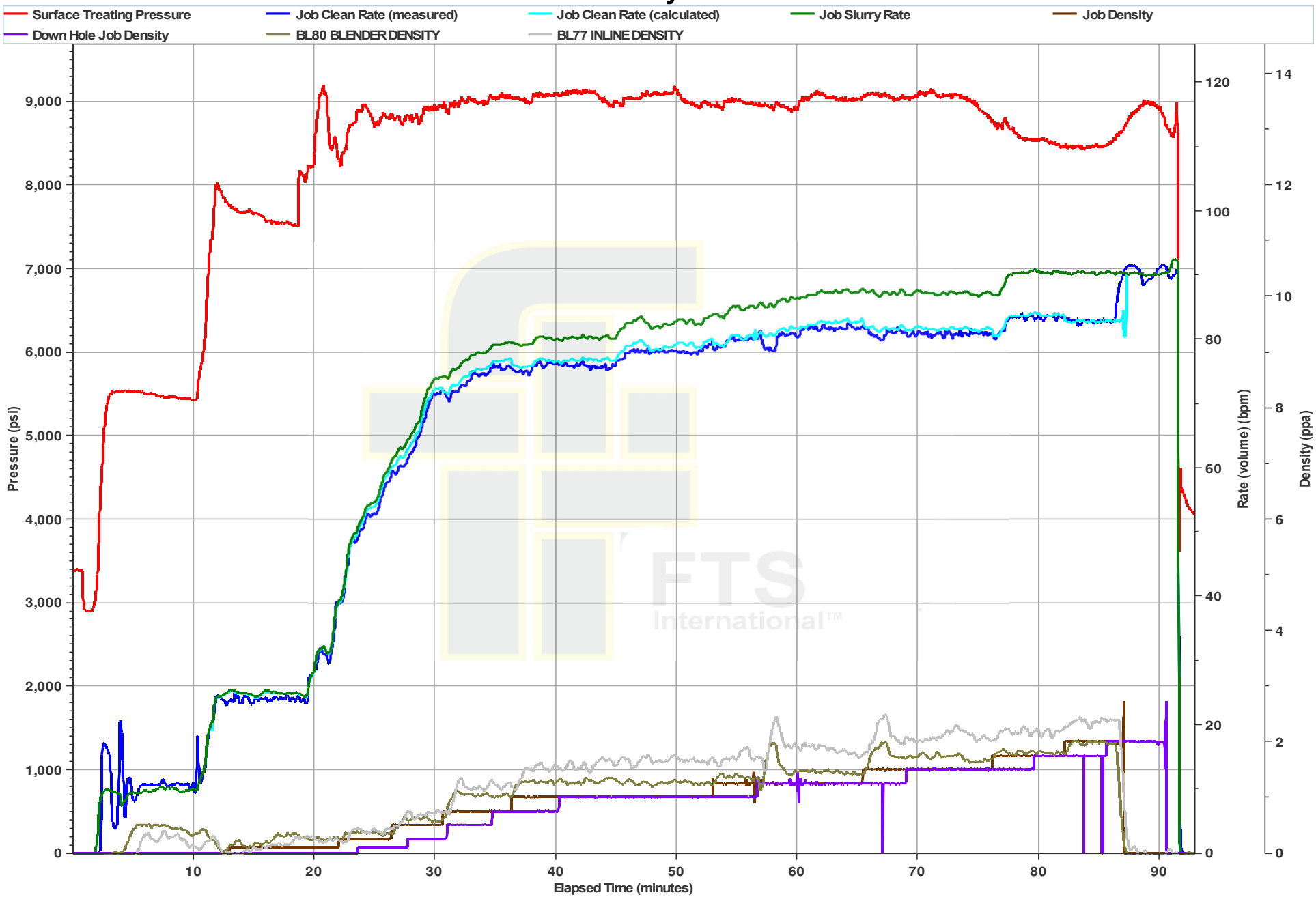
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 12 (WF.000658.M.W03.S12-aDCT-1103) **Jun 16, 2015**

Acid on Perforations



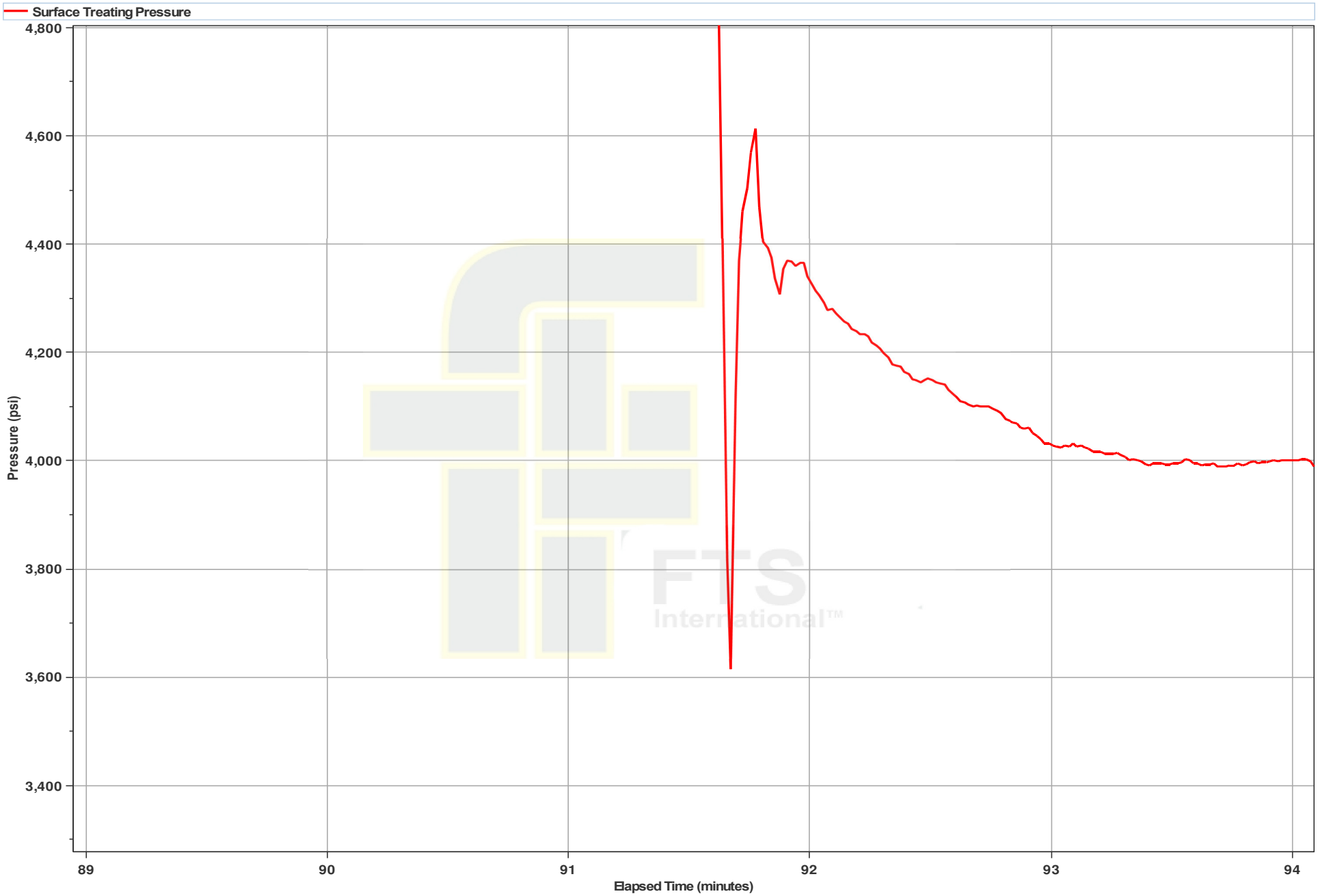
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 12 (WF.000658.M.W03.S12-aDCT-1103) **Jun 16, 2015**

Primary Plot



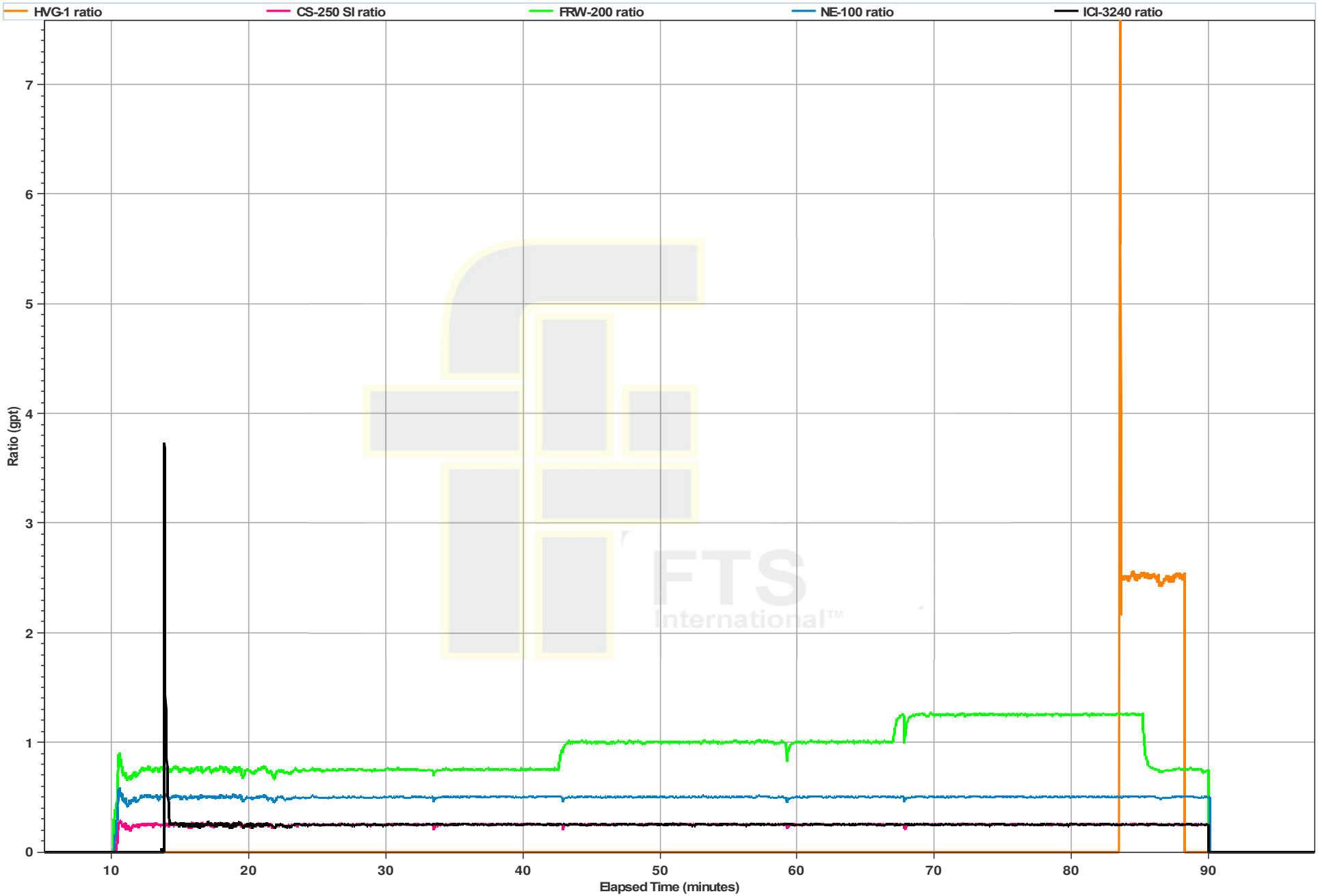
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 12 (WF.000658.M.W03.S12-aDCT-1103) **Jun 16, 2015**

ISIP Plot



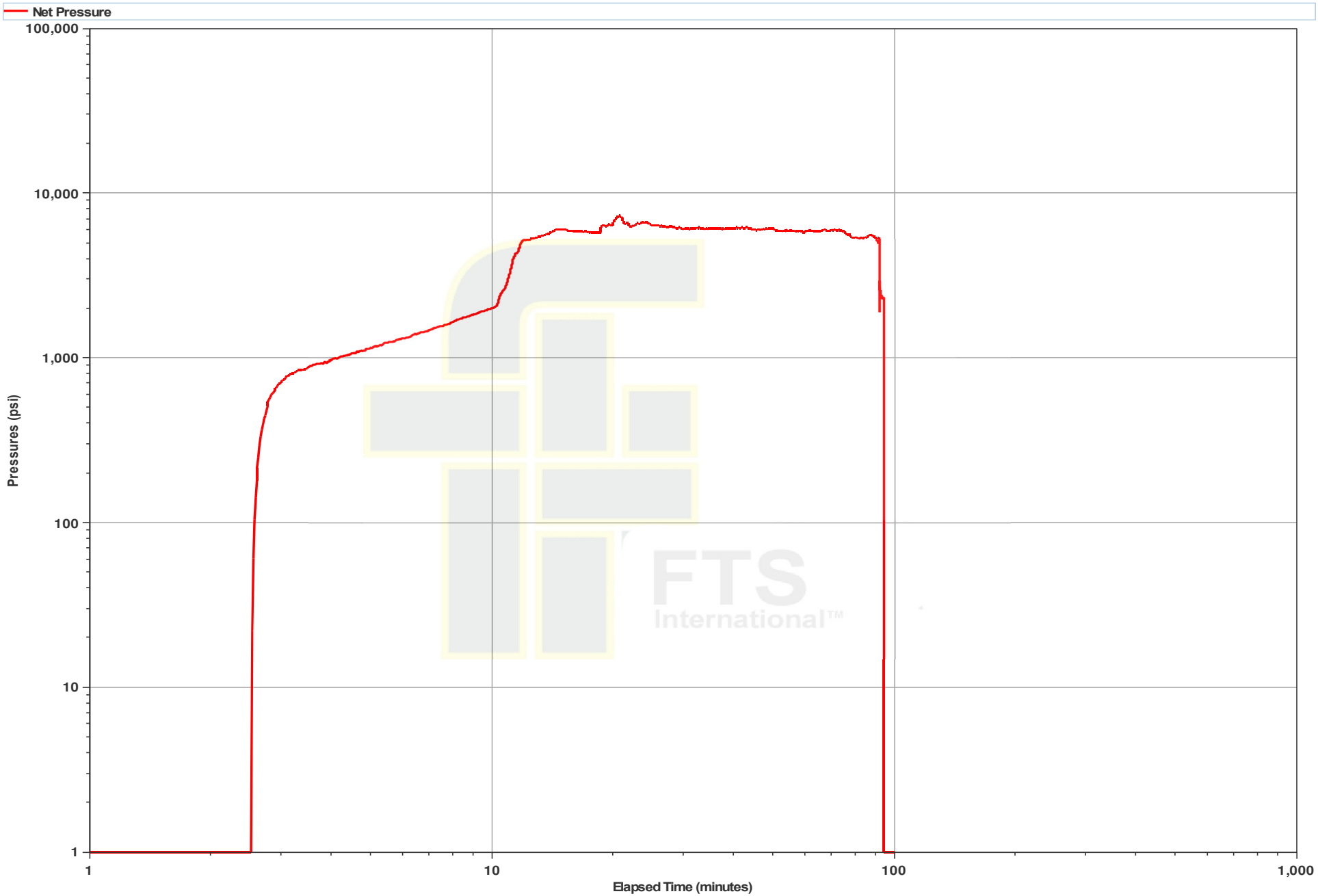
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 12 (WF.000658.M.W03.S12-aDCT-1103) Jun 16, 2015

Chemical Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 12 (WF.000658.M.W03.S12-aDCT-1103) Jun 16, 2015

Net Pressure Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 12 (WF.000658.M.W03.S12-aDCT-1103) Jun 16, 2015

WATER-BASED FRAC FLUID QUALITY CONTROL
(Attachment to Post Treatment Report)

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/16/2015
Customer Name:	American Energy - Utica	Proposal #:	3H/12
Date Sampled:	6/16/2015	Water Source:	Working Tank

Sample/Tank No.	Clarity, Color, Odor	Sample Temperature, (F)	Specific gravity	Initial pH	Chloride, ppm	Hardness, ppm	Calcium, ppm	Magnesium, ppm	Iron ppm	Hydroxide, ppm	Bicarbonate, ppm	Carbonate, ppm	Sulfate, ppm	Barium, ppm
Working Tank	Clear	74	1	7.9	50	80	27	13	2	0	293	0	55	0
Reused Water Tank	Black, Strong Odor	78	1.15	6	97,970	73000	26,007	11,424	9	0	1220	0	150	0

Frac Fluid Quality Gel Testing (These Recording are to made prior to pumping job)														
Sample #														
Base Gel Type	HVG-1													
Gel Loading (lbs/1000 gal.)	2.5													
Sample Temperature, (F)	74													
Initial pH	7.9													
Visc. Reading @ 300 rpms	6													
Viscosity, (cp)	6													
Sample 1 3 min Hydration	4													
Sample 2 3 min Hydration	4													
Sample 3 3 min Hydration	6													
X-Link Vortex Closure, min:sec	n/a													
X-Link Crown, min:sec	n/a													
X-Link pH	n/a													
Gel Break Time (<2cp) mins	22													

Frac Fluid Quality Gel Testing (These Recording are to made while pumping job)														
Stage #														
Base Gel Viscosity (cp)														
X-Link pH								.						
Sample XL time, min:sec														
Sample Temperature														

Acid Quality	Percent Acid	NaOH, mLs	Specific Gravity
	28		1.14

Additional testing or documentation may be required by the customer or for frac fluid quality assurance.

Tested By: Etuate Varea

QUALITY CONTROL OF PROPPANTS

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/16/2015
Customer Name:	American Energy - Utica	Well/Stage:	3H/12
Date Sampled:	6/16/2015	DISTRICT:	Washington, PA
VENDOR:	SANTROL		

Select Proppant Type:

___ Brown	___ Ceramic	___ Other (specify)
X White	___ Bauxite	
___ Resin Coated	___ Texas Gold	

Sieve Analysis	100 Mesh			Sieve Analysis	30/50 Mesh		
Sample 1	24.80	grams of sample		Sample 2	25.30	grams of sample	
	Amount Retained				Amount Retained		
Sieve mesh	Gram	%		Sieve mesh	Gram	%	
			Total				Total
50	0.50	2.02	In-Size	20	0.00	0.00	In-Size
70	16.10	64.92		30	0.00	0.00	
100	5.80	23.39	98.0%	40	17.20	67.98	98.0%
120	1.50	6.05		45	6.20	24.51	
140	0.60	2.42		50	1.40	5.53	
200	0.30	1.21		70	0.50	1.98	
Pan	0.00	0.00	fines	Pan	0.00	0.00	fines
Total wt. Gram	24.80	100.00		Total wt. Gram	25.30	100.00	

Tested By: Etuate Varea

Post Job Report

AMERICAN ENERGY - UTICA

Red Hill Farm MDS GR 3H

Stage : 13 OF 54

HARRISON, OH

Operations Representative:

Name:	David Knapp
Office:	878-327-4881
Fax:	724-743-7719
Cell:	
Email:	DAVID.KNAPP@FTSI.COM

Sales Representative:

Name:	Bruce Batthern
Office:	405-574-3901
Fax:	405-787-1235
Cell:	
Email:	BRUCE.BATTHERN@FTSI.COM

Engineering Manager:

Name:	Thaddeus Craun
Office:	817-832-8782
Fax:	724-743-7719
Cell:	
Email:	THADDEUS.CRAUN@FTSI.COM

FTS International
[illegible]
Ogilby Pass, PA [illegible]

FTS INTERNATIONAL

Customer: American Energy - Utica
Well: Red Hill Farm Site 6r 3H
Stage: 13
Job End Date: [illegible]

Job Summary

Well Information

TVD:	7,301	Top Perf:	13,687
No. Of Perfs:	30		

Casing	Tubing
[illegible]	n/A

Pressures, Rates and Volumes

	Proposed	Actual	Max	Min
STP	[illegible] psi	[illegible] psi	[illegible] psi	[illegible] psi
Rate	[illegible] bpm	[illegible] bpm	[illegible] bpm	[illegible] bpm

	Proposed	Actual		
Clean Volume	[illegible] bbls	[illegible] bbls		
Slurry Volume	[illegible] bbls	[illegible] bbls		
Flush Volume	[illegible] bbls	[illegible] bbls		

	Proposed	Start	End
Free Pumps on Location	19	15	15

Open Well:	Start Time	[illegible]	Pressure	[illegible] psi
	Bell Dwn	[illegible] bbls	Break Down	[illegible] psi
	Initial ISIP:	[illegible] psi	Initial F.G.:	[illegible] psi/ft
Stage Complete:	End Time	[illegible]	Job Time	[illegible]
	Final ISIP	[illegible] psi	Final F.G.	[illegible] psi/ft
	ISIP	[illegible]	5 Min:	[illegible] psi
	Pressure Min:	[illegible]	10 Min:	N/A
	Pressure Max:	[illegible]	15 Min:	N/A

Material Volume

Material	Proposed	Calculated	Actual	Variance
100 Mesh White	[illegible]	[illegible]	[illegible]	-1%
30/50 White	[illegible]	[illegible]	[illegible]	0%
Total Proppants	[illegible]	[illegible]	[illegible]	-1%

Material	Proposed	Calculated	Actual	Variance
8.1%-7.5% HCL	[illegible]	[illegible]	[illegible]	1%
AFR-1	6	21	21	0%
[illegible]	3	3	3	0%
[illegible]	[illegible]	46	45	-2%
FE-[illegible]	15	15	15	0%
[illegible]	150	178	187	-2%
HVG-1 4.5	6	109	[illegible]	2%
[illegible]	[illegible]	46	45	-2%
LTB-1	6	21	21	0%
[illegible]	6	[illegible]	[illegible]	2%
[illegible]	[illegible]	8	8	6

Comments:

Pumpdown Information:
Total Bbls: 278
Max Pressure (psi): 5797
Max Rate (bpm): 19.3

FTS International
1432 Route [illegible]
Eighty Four, PA 15330

Customer: American Energy - Utica
Well: [illegible]
Stage: [illegible]
Job End Date: [illegible]

Treatment Report

Date	[illegible]	District	Washington County, PA	Service Rec	[illegible]	API#	[illegible]

Rpt. Time	STP	Slurry BPM	Stage Slurry (bbls)	Cumulative Slurry (bbls)	Stage Clean (bbls)	Cumulative Clean (bbls)	Stage Proppant (lbs)	Cumulative Proppant (lbs)	Description	Proppant	PPA
22:15	[illegible]	10.0	10	10	10	10	0	0	Freshwater Open Well		0.00
22:19	[illegible]	10.1	71	81	71	81	0	0	7.5% HCL Acid Acid		0.00
22:22	[illegible]	31.2	92	173	92	173	0	0	Slickwater Load		0.00
22:25	[illegible]	38.1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Slickwater Proppant	100 Mesh White	0.10
22:26	[illegible]	[illegible]	6	[illegible]	6	[illegible]	[illegible]	[illegible]	Slickwater Breakdown	100 Mesh White	0.10
22:30	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Slickwater Proppant	100 Mesh White	0.10
22:34	[illegible]	40.0	214	[illegible]	215	[illegible]	2,247	[illegible]	Slickwater Proppant	100 Mesh White	0.25
22:36	6,147	[illegible]	[illegible]	722	[illegible]	[illegible]	[illegible]	[illegible]	Slickwater Proppant	100 Mesh White	0.50
22:40	[illegible]	57.3	132	[illegible]	[illegible]	[illegible]	2,172	[illegible]	Slickwater Proppant	100 Mesh White	0.50
22:43	[illegible]	44.1	[illegible]	[illegible]	[illegible]	[illegible]	344	[illegible]	Slickwater Proppant	100 Mesh White	0.10
22:45	[illegible]	28.7	[illegible]	[illegible]	[illegible]	[illegible]	161	[illegible]	Slickwater Proppant	100 Mesh White	0.10
22:47	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1,134	[illegible]	Slickwater Proppant	100 Mesh White	0.25
22:50	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Slickwater Proppant	100 Mesh White	0.50
22:54	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0	[illegible]	Slickwater Sweep		0.00
22:57	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Slickwater Proppant	100 Mesh White	0.10
23:03	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Slickwater Proppant	100 Mesh White	0.25
23:07	[illegible]	[illegible]	[illegible]	1,730	[illegible]	[illegible]	[illegible]	[illegible]	Slickwater Proppant	100 Mesh White	0.50
23:14	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Slickwater Proppant	100 Mesh White	0.75
23:17	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Slickwater Proppant	100 Mesh White	1.00
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Slickwater Proppant	40/70 White	1.00
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Slickwater Proppant	40/70 White	1.25
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	15# Linear Gel Proppant	40/70 White	1.25
[illegible]	[illegible]	[illegible]	44	[illegible]	44	[illegible]	0	[illegible]	15# Linear Gel Clean sweep		0.00
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0	[illegible]	Slickwater Flush		0.00
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0	[illegible]	Freshwater Flush		0.00
[illegible]	[illegible]	0.0	0	[illegible]	0	[illegible]	0	[illegible]	Freshwater Shutdown		0.00
Total Job Time (HH:MM): [illegible]											

Min STP:	[illegible] psi	Max STP:	[illegible] psi	Average STP:	[illegible] psi	5 Min	[illegible] psi
Min Rate	[illegible] bpm	Max Rate	[illegible] bpm	Average Rate	[illegible] bpm	10 Min	0 psi
Initial ISIP:	[illegible] psi	Initial F.G.:	[illegible] psi/ft	Average HHP:	[illegible]	15 Min	0 psi
Final ISIP:	[illegible] psi	Final F.G.:	[illegible] psi/ft	Customer Representative		[illegible]	
FTS Representative		[illegible]					

Comments:

The proppant values contained in this report are calculated based on actual barrel counts and target densities. Actual total proppant usage is 129,101 lbs. Charge time is 2 hour(s) 15 minute(s). All chemicals and proppant run as documented.

Min/Max/Avg were taken from sand stages. All chem changes from proposed were made per AEU representative request.

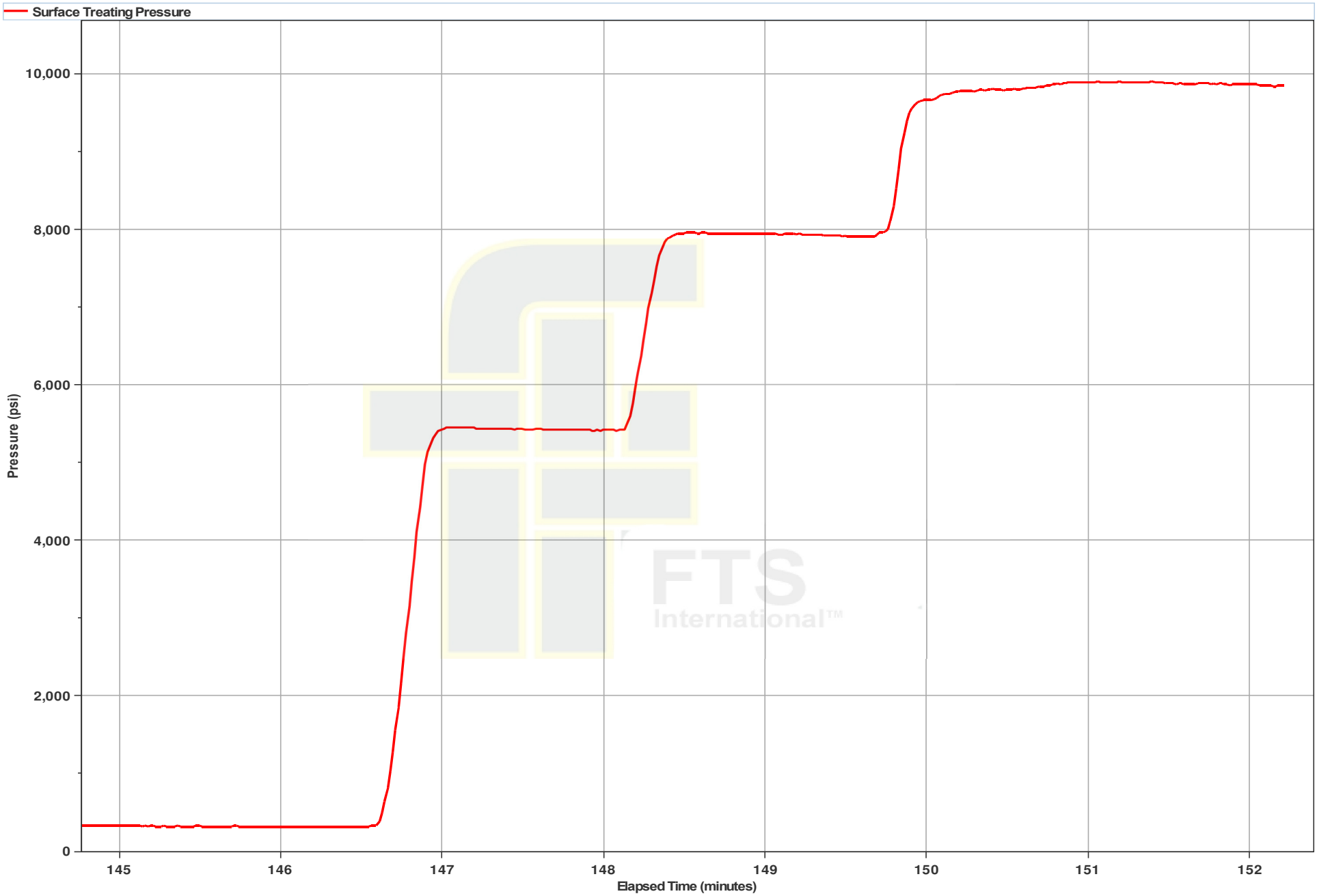
Stage was cut short due to formation pressure after multiple attempts were made to complete the stage design.

1 Minute Shutdown (psi): 4384
2 Minute Shutdown (psi): 4163
5 Minute Shutdown (psi): 3974

Chemical Changes:

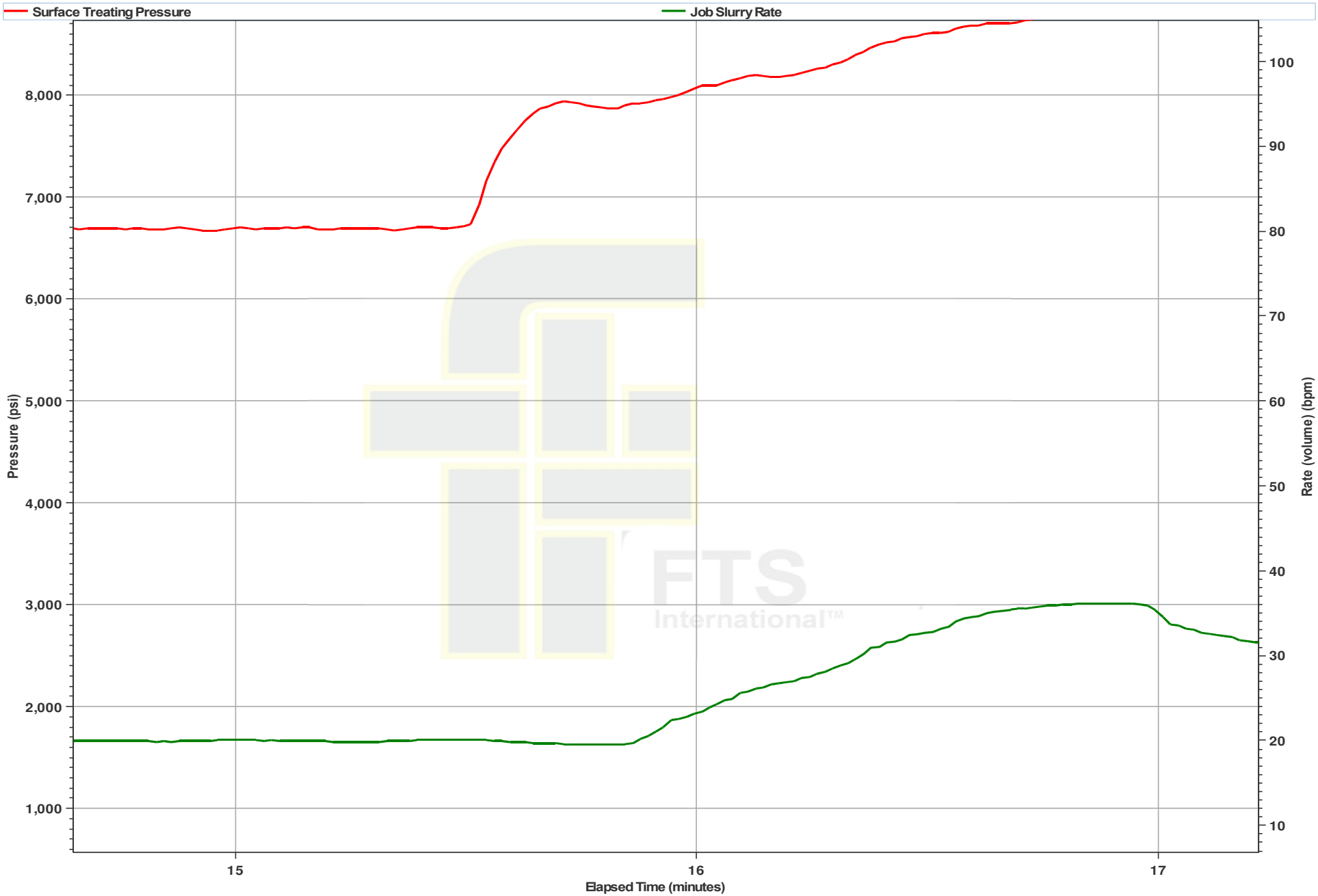
Chemical Name	Chemical Loading	Cumulative Gallon
FRW-200	0.75	998
FRW-200	1.00	997

AEU Pressure Test



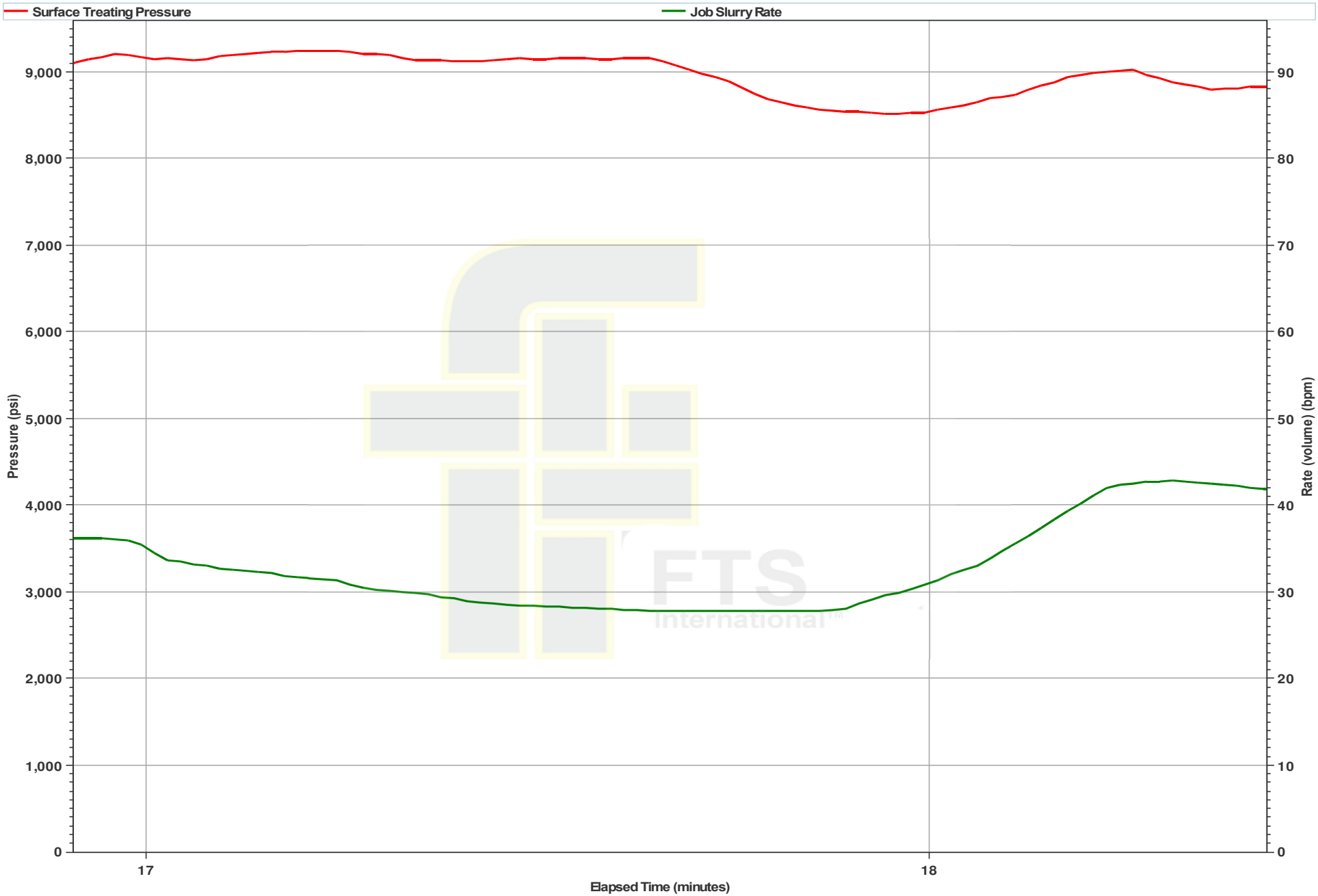
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 13 (WF.000658.M.W03.S13-aDCT-1103) **Jun 16, 2015**

Ball Seat and Breakdown



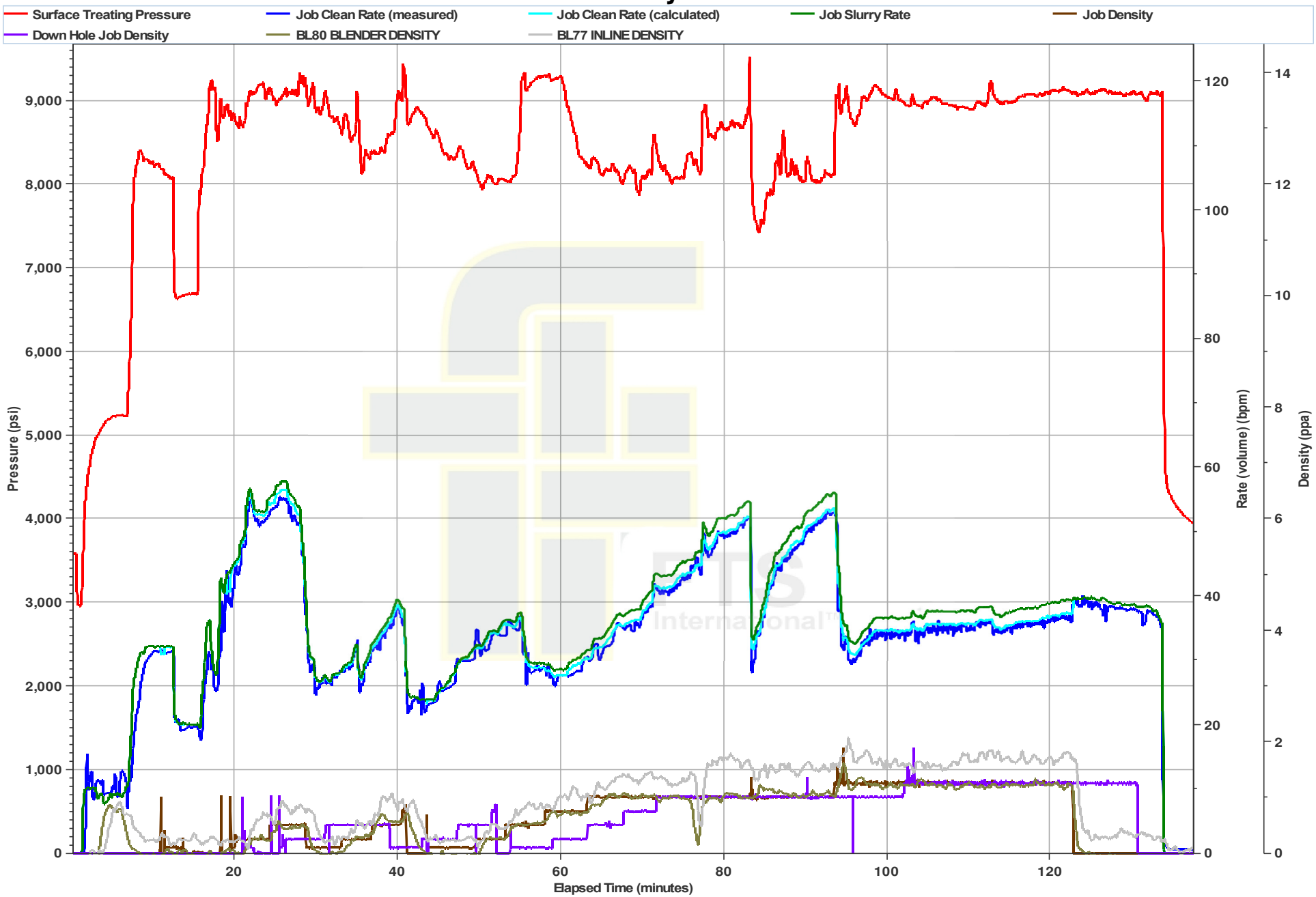
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 13 (WF.000658.M.W03.S13-aDCT-1103) **Jun 16, 2015**

Acid on Perforations



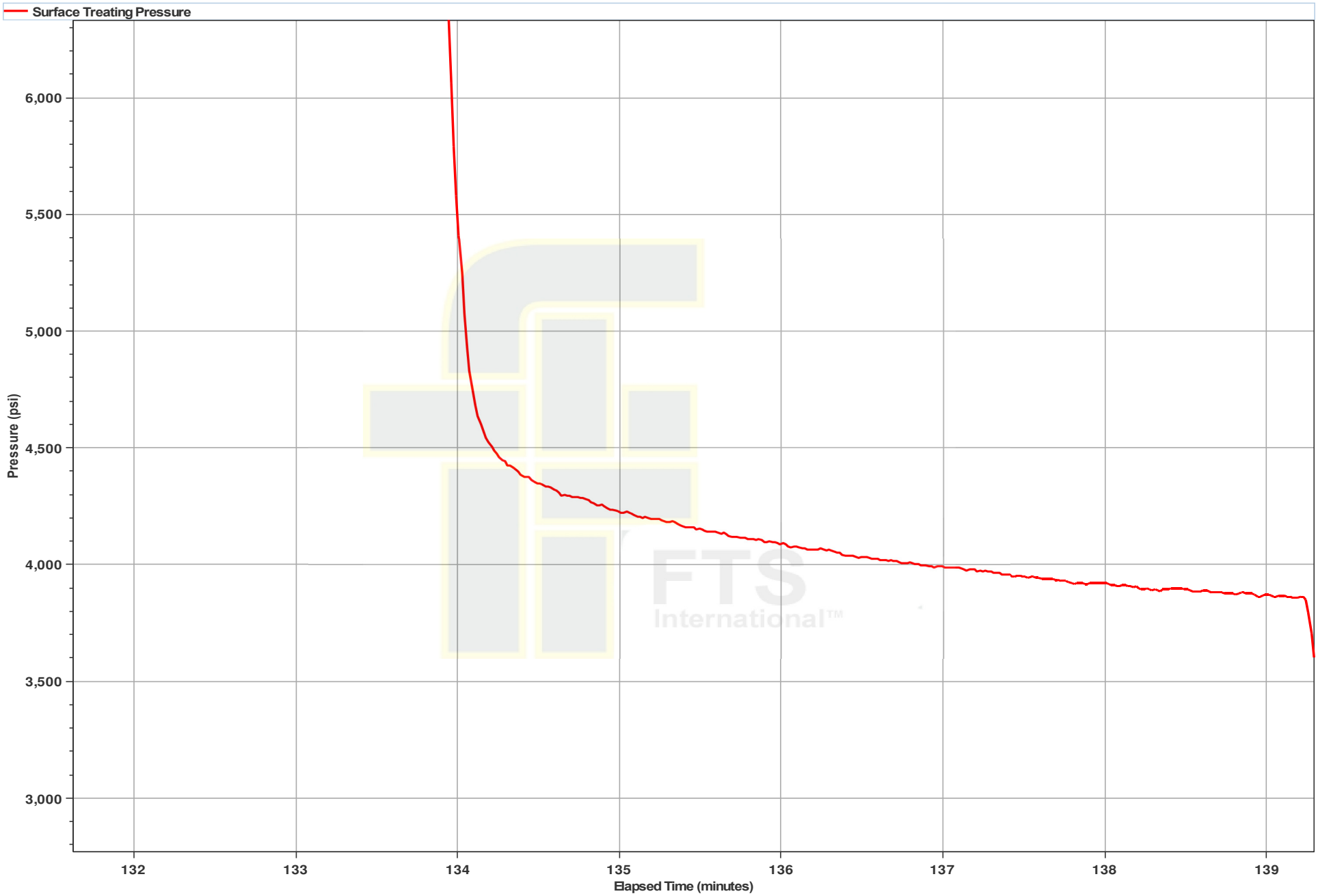
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 13 (WF.000658.M.W03.S13-aDCT-1103) **Jun 16, 2015**

Primary Plot



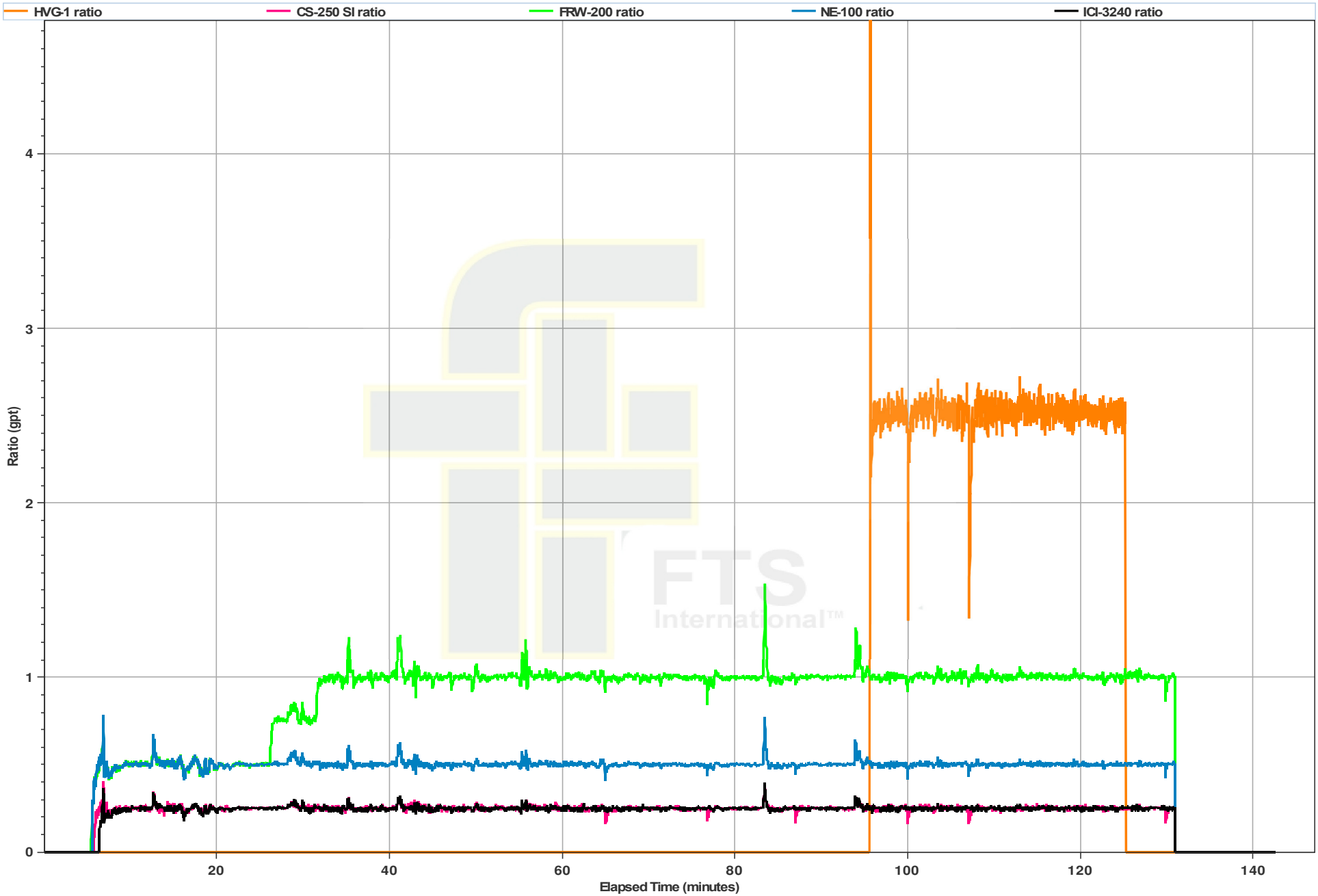
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 13 (WF.000658.M.W03.S13-aDCT-1103) **Jun 16, 2015**

ISIP Plot



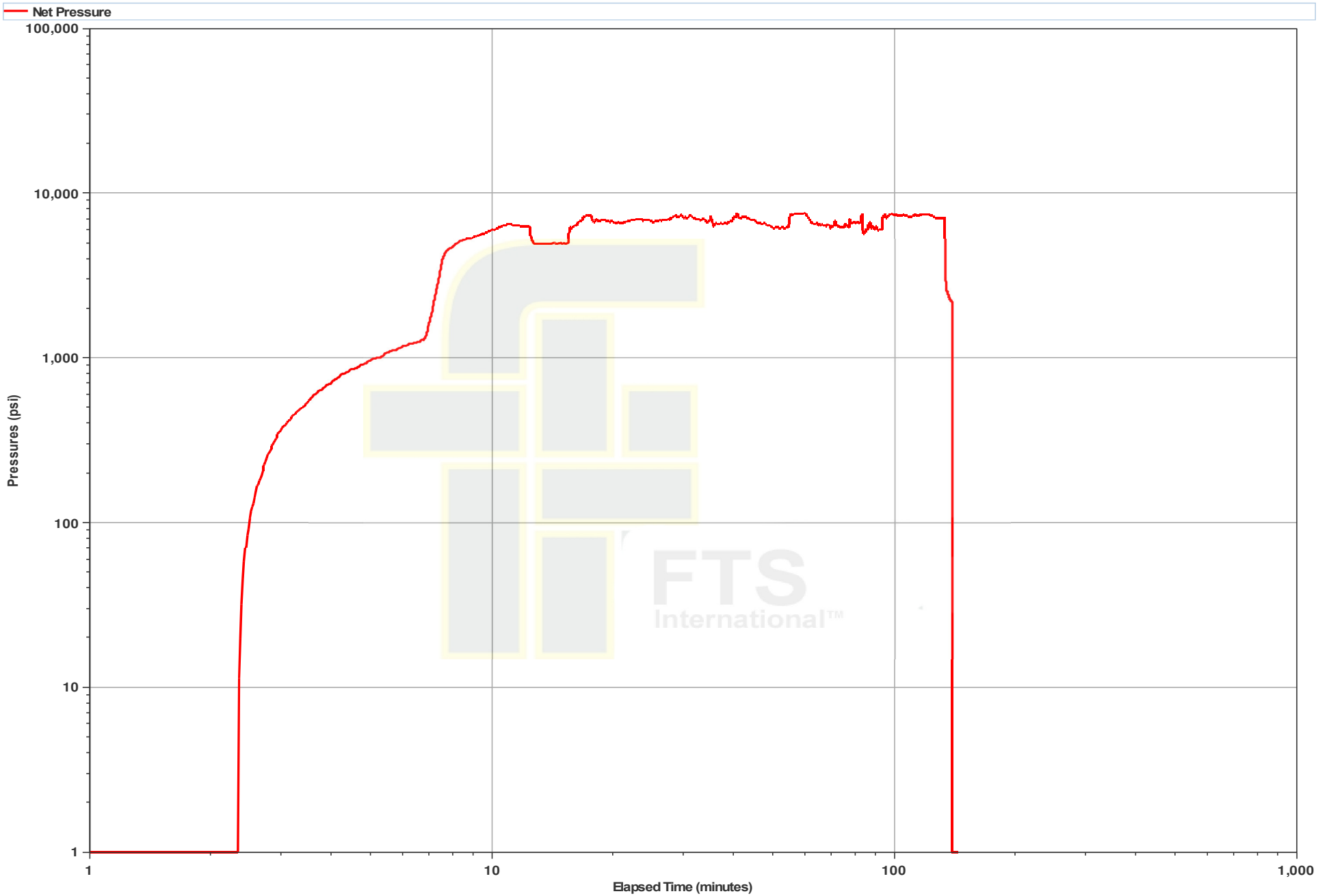
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 13 (WF.000658.M.W03.S13-aDCT-1103) Jun 16, 2015

Chemical Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 13 (WF.000658.M.W03.S13-aDCT-1103) Jun 16, 2015

Net Pressure Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 13 (WF.000658.M.W03.S13-aDCT-1103) Jun 16, 2015

WATER-BASED FRAC FLUID QUALITY CONTROL
(Attachment to Post Treatment Report)

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/17/2015
Customer Name:	American Energy - Utica	Proposal #:	3H/13
Date Sampled:	6/17/2015	Water Source:	Working Tank

Sample/Tank No.	Clarity, Color, Odor	Sample Temperature, (F)	Specific gravity	Initial pH	Chloride, ppm	Hardness, ppm	Calcium, ppm	Magnesium, ppm	Iron ppm	Hydroxide, ppm	Bicarbonate, ppm	Carbonate, ppm	Sulfate, ppm	Barium, ppm
Working Tank	Clear	72	1	8.1	35	80	24	14	0	0	73	0	55	0

Frac Fluid Quality Gel Testing (These Recording are to made prior to pumping job)														
Sample #														
Base Gel Type	HVG-1													
Gel Loading (lbs/1000 gal.)	2.5													
Sample Temperature, (F)	74													
Initial pH	8													
Visc. Reading @ 300 rpms	6													
Viscosity, (cp)	6													
Sample 1 3 min Hydration	4													
Sample 2 3 min Hydration	4													
Sample 3 3 min Hydration	6													
X-Link Vortex Closure, min:sec	n/a													
X-Link Crown, min:sec	n/a													
X-Link pH	n/a													
Gel Break Time (<2cp) mins	20													

Frac Fluid Quality Gel Testing (These Recording are to made while pumping job)														
Stage #														
Base Gel Viscosity (cp)														
X-Link pH								.						
Sample XL time, min:sec														
Sample Temperature														

Acid Quality	Percent Acid	NaOH, mLs	Specific Gravity
	28		1.14

Additional testing or documentation may be required by the customer or for frac fluid quality assurance.

Tested By: Travis Wilson

QUALITY CONTROL OF PROPPANTS

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/17/2015
Customer Name:	American Energy - Utica	Well/Stage:	3H/13
Date Sampled:	6/17/2015	DISTRICT:	Washington, PA
VENDOR:	SANTROL		

Select Proppant Type:

___ Brown	___ Ceramic	___ Other (specify)
X White	___ Bauxite	
___ Resin Coated	___ Texas Gold	

Sieve Analysis	100 Mesh			Sieve Analysis	30/50 Mesh		
Sample 1	24.90	grams of sample		Sample 2	24.90	grams of sample	
	Amount Retained				Amount Retained		
Sieve mesh	Gram	%		Sieve mesh	Gram	%	
			Total				Total
50	0.20	0.80	In-Size	20	0.00	0.00	In-Size
70	16.10	64.66		30	0.70	2.81	
100	5.20	20.88	98.8%	40	16.40	65.86	93.6%
120	1.70	6.83		45	5.80	23.29	
140	1.00	4.02		50	1.10	4.42	
200	0.60	2.41		70	0.80	3.21	
Pan	0.10	0.40	fines	Pan	0.10	0.40	fines
Total wt. Gram	24.90	100.00		Total wt. Gram	24.90	100.00	

Tested By: Travis Wilson

Post Job Report

AMERICAN ENERGY - UTICA

Red Hill Farm MDS GR 3H

Stage : 14 OF 54

HARRISON, OH

Operations Representative:

Name:	**David Knapp**
Office:	**570-327-4881**
Fax:	**724-743-7719**
Cell:	
Email:	**DAVID.KNAPP@FTSI.COM**

Sales Representative:

Name:	**Bruce Matthews**
Office:	**405-574-3981**
Fax:	**405-767-1288**
Cell:	
Email:	**BRUCE.MATTHEWS@FTSI.COM**

Engineering Manager:

Name:	**Thaddeus Craun**
Office:	**817-682-8702**
Fax:	**724-743-7719**
Cell:	
Email:	**THADDEUS.CRAUN@FTSI.COM**

FTS International
1432 Route 519
Eighty Four, PA 15330

Customer: American Energy - Utica
Well: Red Hill Farm Mds Gr 3H
Stage: 14
Job End Date: 06/17/2015

Job Summary

Well Information

TVD:	7,301	**Top Perf:**	13,735
No. Of Perfs:	30		

Casing	Tubing
5.50" 20.00#	N/A

Pressures, Rates and Volumes

	Proposed	Actual	Max	Min
STP	9,046 psi	8,329 psi	9,352 psi	7,708 psi
Rate	80.0 bpm	76.3 bpm	91.2 bpm	18.4 bpm

	Proposed	Actual		
Clean Volume	5,772 bbls	5,754 bbls		
Slurry Volume	6,042 bbls	6,024 bbls		
Flush Volume	357 bbls	309 bbls		

	Proposed	Start	End
Frac Pumps on Location	10	14	14

Open Well:	Start Time	13:39	Pressure	3,190 psi
	Ball Seat	297 bbls	Break Down	8,499 psi
	Initial ISIP:	4,684 psi	Initial F.G.:	1.08 psi/ft
Stage Complete:	End Time	15:08	Job Time	01:30
	Final ISIP	4,684 psi	Final F.G.	1.08 psi/ft
	HHP	15,576	5 Min:	4,120 psi
	Proppant Min:	0.00	10 Min:	N/A
	Proppant Max:	2.00	15 Min:	N/A

Material Volume

Material	Proposed	Calculated	Actual	Variance
100 Mesh White	40,000	39,497	39,497	0%
30/50 White	210,000	210,568	210,568	0%
Total Proppants	250,000	250,065	250,065	0%

Material	Proposed	Calculated	Actual	Variance
0.1%-7.5% HCL	3,000	2,982	3,000	1%
CI-150	3	3	3	0%
CS-250 SI	60	58	58	0%
FE-200L	15	15	15	0%
FRW-200	180	199	195	-2%
ICI-3240	60	58	58	0%
NE-100	0	117	115	-2%
NE-100W	120	0	0	0

Comments:

Pumpdown Information:
Total Bbls: 292
Max Pressure (psi): 8273
Max Rate (bpm): 16

FTS International
1432 Route 519
Eighty Four, PA 15330

Customer: American Energy - Utica
Well: Red Hill Farm Mds Gr 3H
Stage: 14
Job End Date: 06/17/2015

Treatment Report

Date:	6/17/2015	District:	Washington County,PA	Quote No:	051815_035725QF	API:	34-059-24370

MIL Time	STP	Slurry BPM	Stage Clean (bbls)	Cumulative Clean (bbls)	Stage Slurry (bbls)	Cumulative Slurry (bbls)	Stage Proppant (lbs)	Cumulative Proppant (lbs)	Description	Proppant	PPA
13:39	3,190	0.0	0	0	0	0	0	0	Freshwater Open Well		0.00
13:40	4,963	6.1	18	18	18	18	0	0	Freshwater Load		0.00
13:42	7,164	12.3	71	89	71	89	0	0	7.5% HCL Acid Acid		0.00
13:48	7,173	12.1	68	157	68	157	0	0	Slickwater Load		0.00
13:52	8,264	23.4	140	297	141	298	588	588	Slickwater Proppant	100 Mesh White	0.10
13:58	8,499	18.6	0	297	0	298	0	588	Slickwater Breakdown		0.00
13:58	8,303	18.4	74	371	74	372	311	899	Slickwater Proppant	100 Mesh White	0.10
14:01	9,071	17.5	216	587	218	590	2,268	3,167	Slickwater Proppant	100 Mesh White	0.25
14:06	8,898	62.8	257	844	263	853	5,397	8,564	Slickwater Proppant	100 Mesh White	0.50
14:11	8,914	86.6	430	1,274	445	1,298	13,545	22,109	Slickwater Proppant	100 Mesh White	0.75
14:16	8,577	90.0	414	1,688	433	1,731	17,388	39,497	Slickwater Proppant	100 Mesh White	1.00
14:21	8,377	90.0	875	2,563	915	2,646	36,750	76,247	Slickwater Proppant	30/50 White	1.00
14:31	8,188	89.5	815	3,378	861	3,507	42,788	119,035	Slickwater Proppant	30/50 White	1.25
14:40	8,336	89.5	185	3,563	195	3,702	9,713	128,748	Slickwater Proppant	30/50 White	1.25
14:42	8,055	89.8	1,000	4,563	1,068	4,770	63,000	191,748	Slickwater Proppant	30/50 White	1.50
14:56	8,067	89.6	542	5,105	585	5,355	39,837	231,585	Slickwater Proppant	30/50 White	1.75
15:01	8,527	89.2	220	5,325	240	5,595	18,480	250,065	Slickwater Proppant	30/50 White	2.00
15:04	8,270	90.2	120	5,445	120	5,715	0	250,065	Slickwater Clean screws		0.00
15:05	8,570	90.3	200	5,645	200	5,915	0	250,065	Slickwater Flush		0.00
15:08	8,565	89.3	109	5,754	109	6,024	0	250,065	Freshwater Flush		0.00
15:08	4,684	0.0	0	5,754	0	6,024	0	250,065	Freshwater Shutdown		0.00
Total JobTime (HH:MM): 01:29											

Min STP:	7,708 psi	**Max STP:**	9,352 psi	**Average STP:**	8,329 psi	**5 Min:**	4,120 psi
Min Rate:	18.4 bpm	**Max Rate:**	91.2 bpm	**Average Rate:**	76.3 bpm	**10 Min:**	0 psi
Initial ISIP:	4,684 psi	**Initial F.G.:**	1.08 psi/ft	**Average HHP:**	15,576	**15 Min:**	0 psi
Final ISIP:	4,684 psi	**Final F.G.:**	1.08 psi/ft	**Customer Representative:**		Macolm Trahan	
FTSI Representative:		Etuate Varea & Jason McCoskey					

Comments:

The proppant values contained in this report are calculated based on actual barrel counts and target densities. Actual total proppant usage is 250,065 lbs. Charge time is 1 hour(s) 30 minute(s). All chemicals and proppant ran as documented.

Min/Max/Avg were taken from sand stages. All chem changes from proposed were made per AEU representative request.

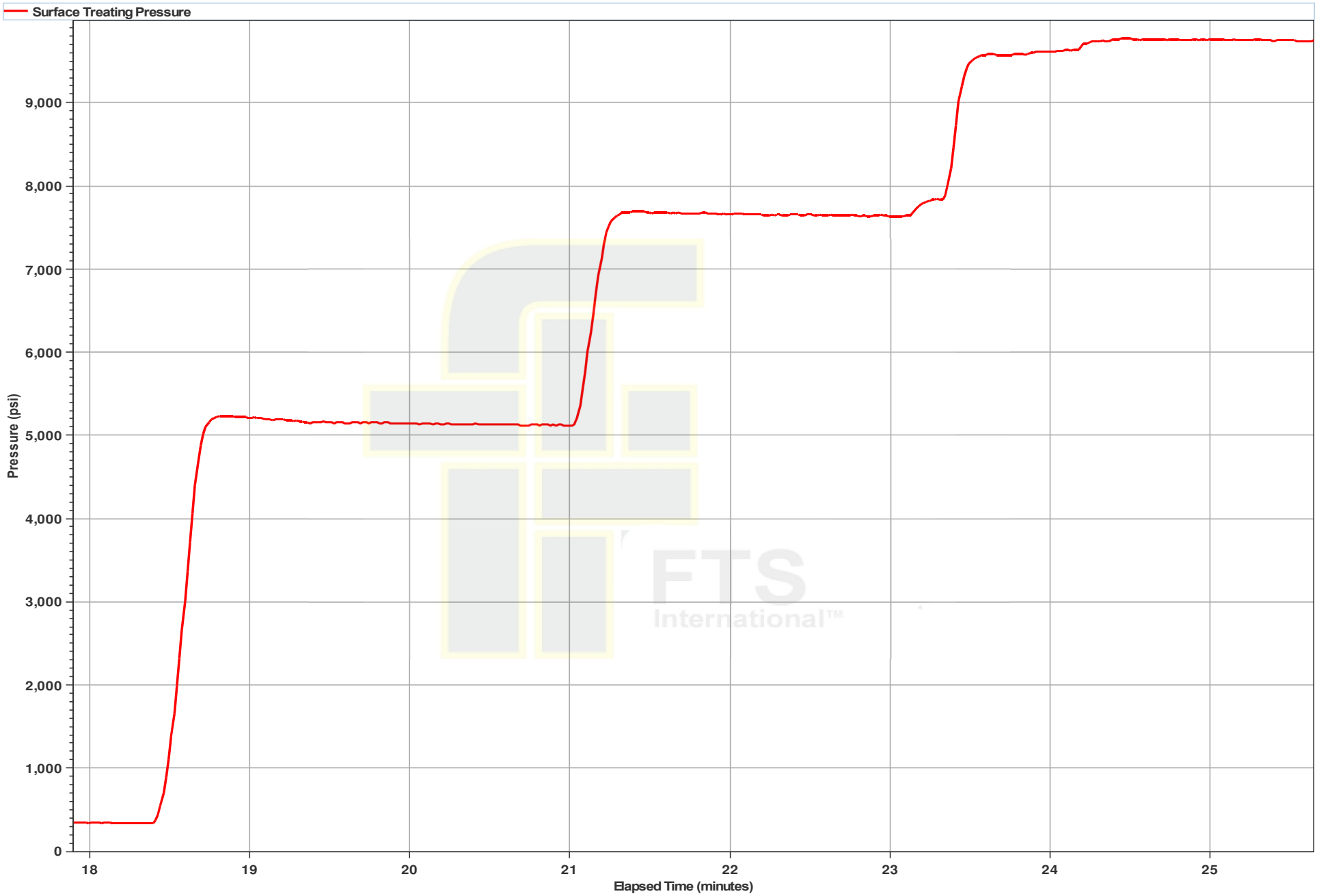
No reused water pumped.

1 Minute Shutdown (psi): 4486
2 Minute Shutdown (psi): 4298
5 Minute Shutdown (psi): 4120

Chemical Changes:

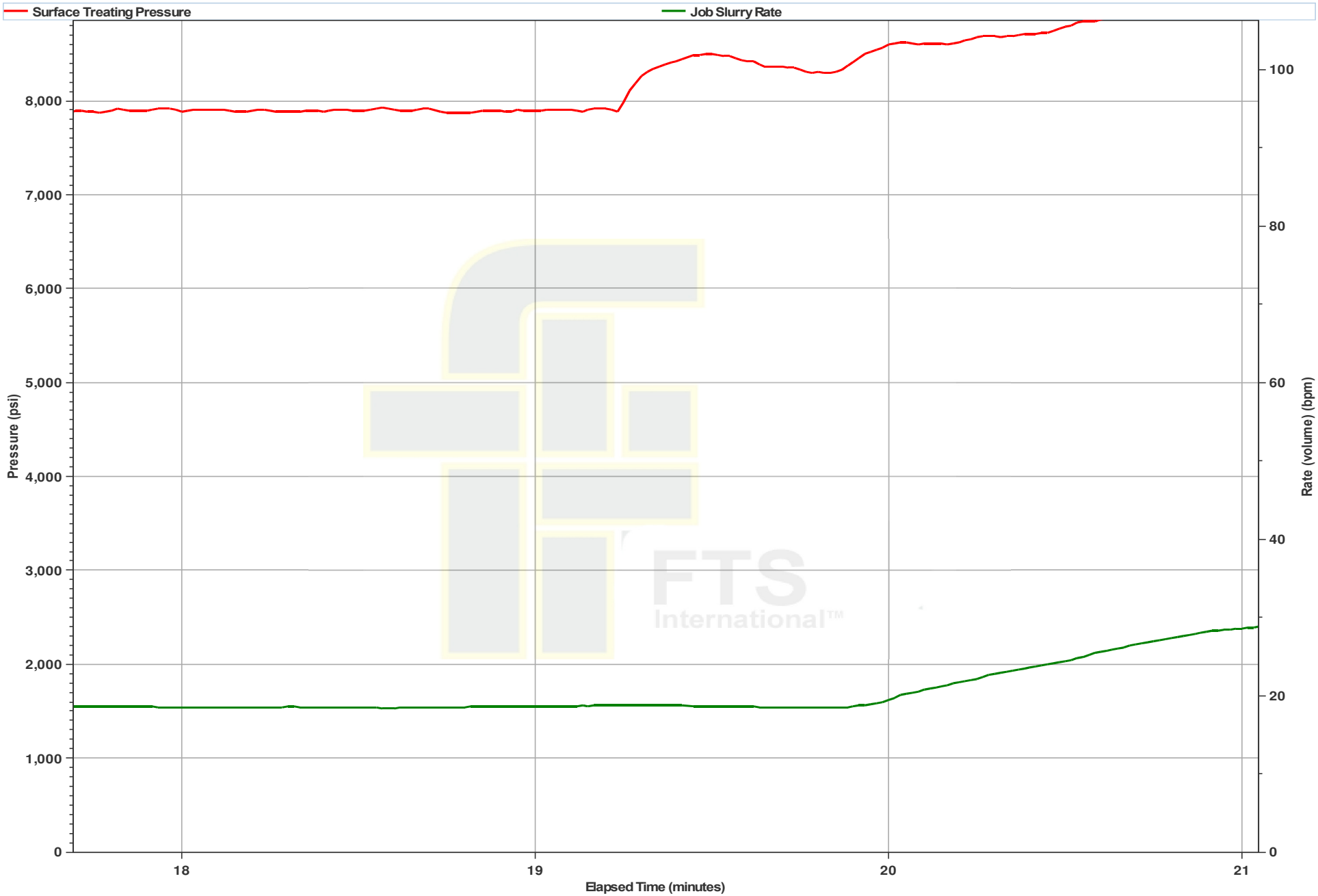
Chemical Name	Chemical Loading	Cumulative Clean
FRW-200	1.00	3,563

AEU Pressure Test



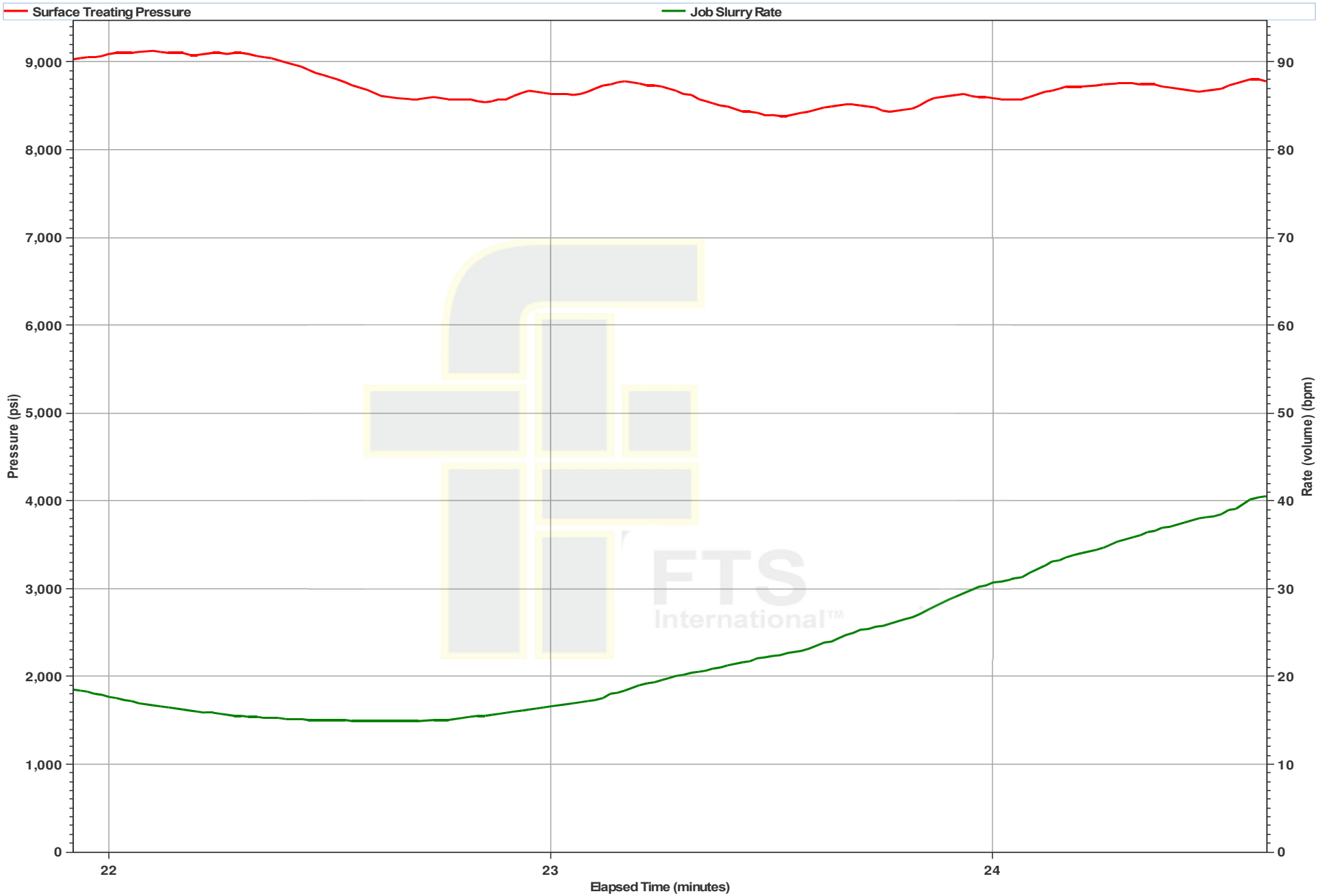
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 14 (WF.000658.M.W03.S14-aDCT-1103) Jun 17, 2015

Ball Seat and Breakdown



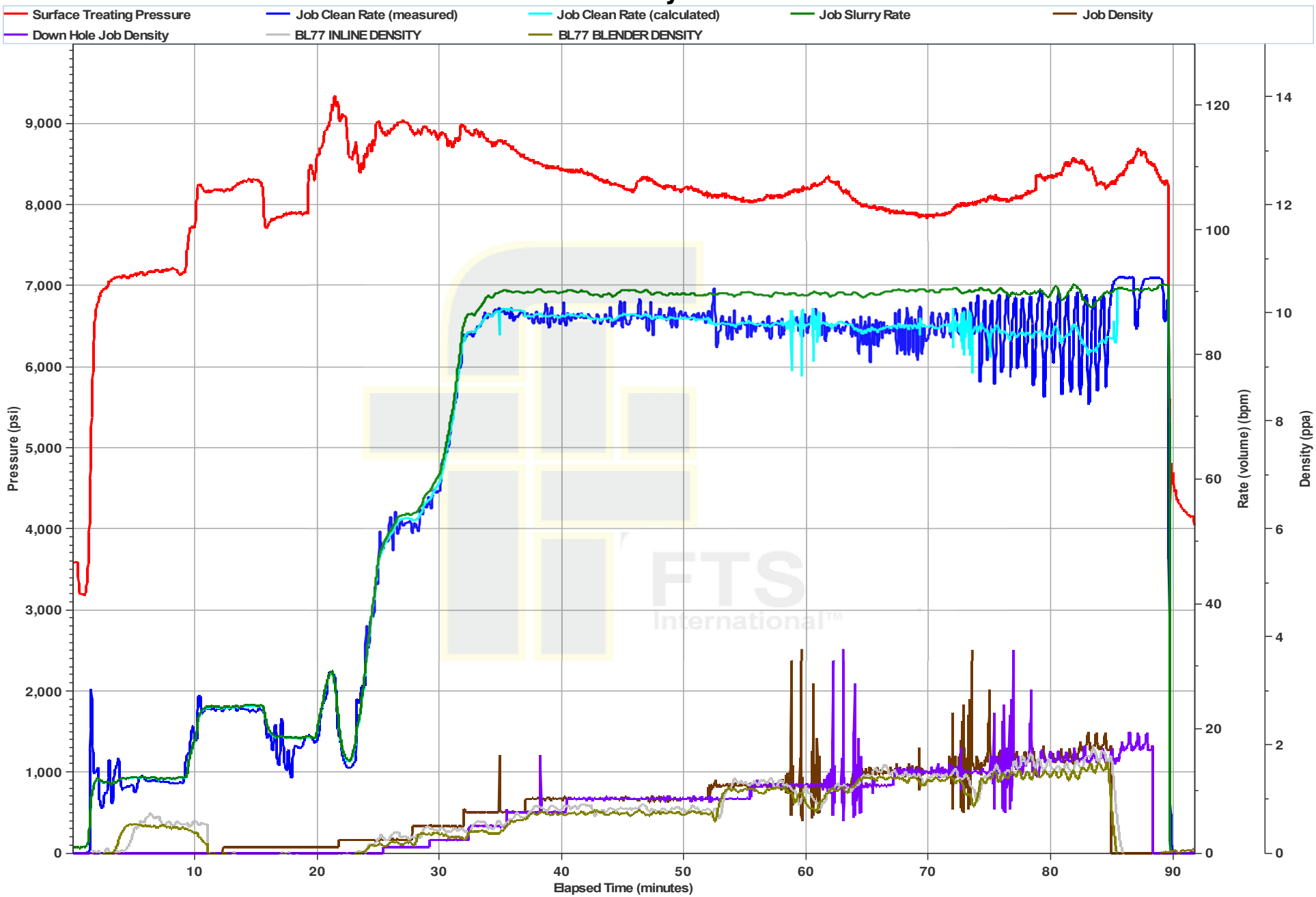
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 14 (WF.000658.M.W03.S14-aDCT-1103) Jun 17, 2015

Acid on Perforations



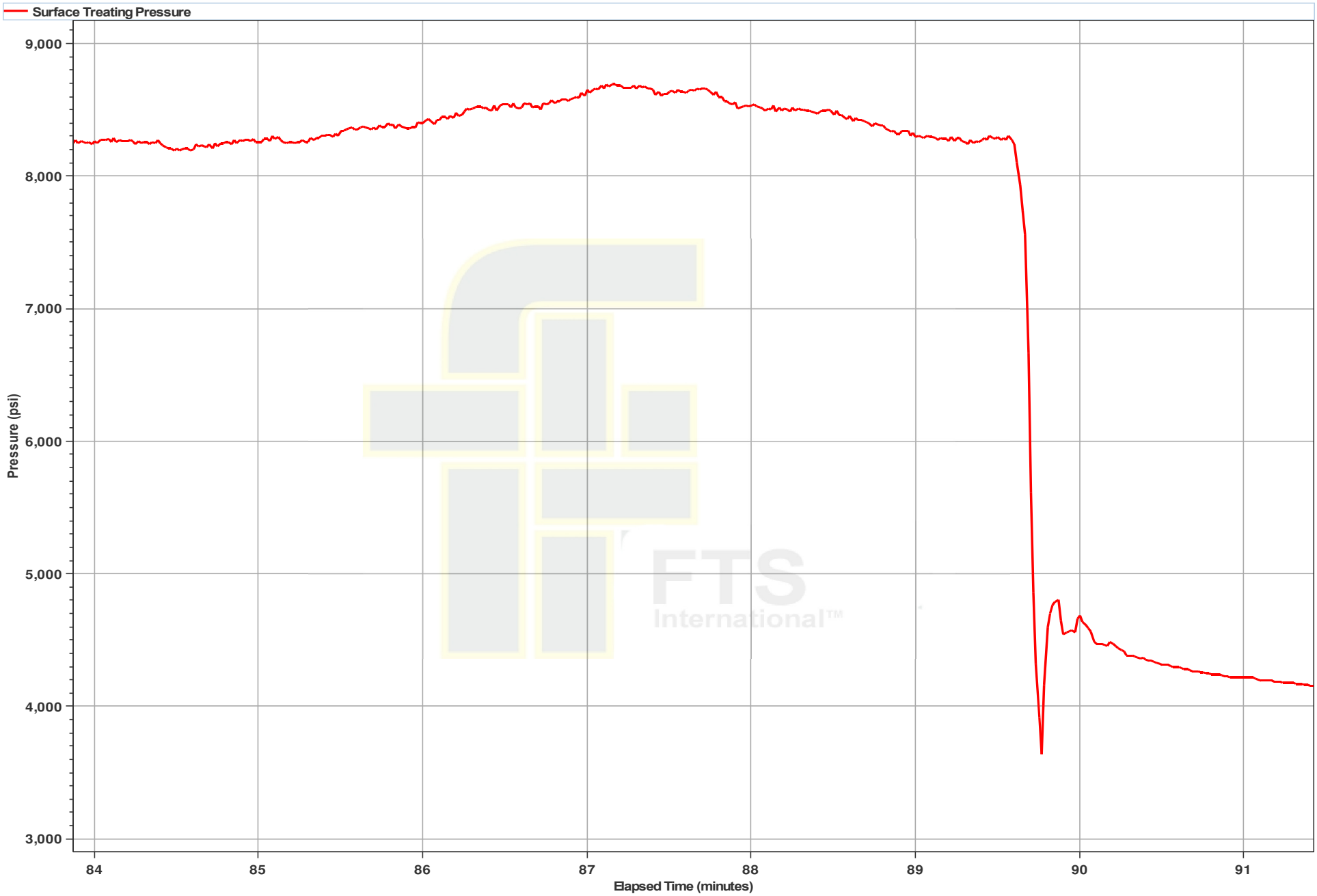
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 14 (WF.000658.M.W03.S14-aDCT-1103) **Jun 17, 2015**

Primary Plot



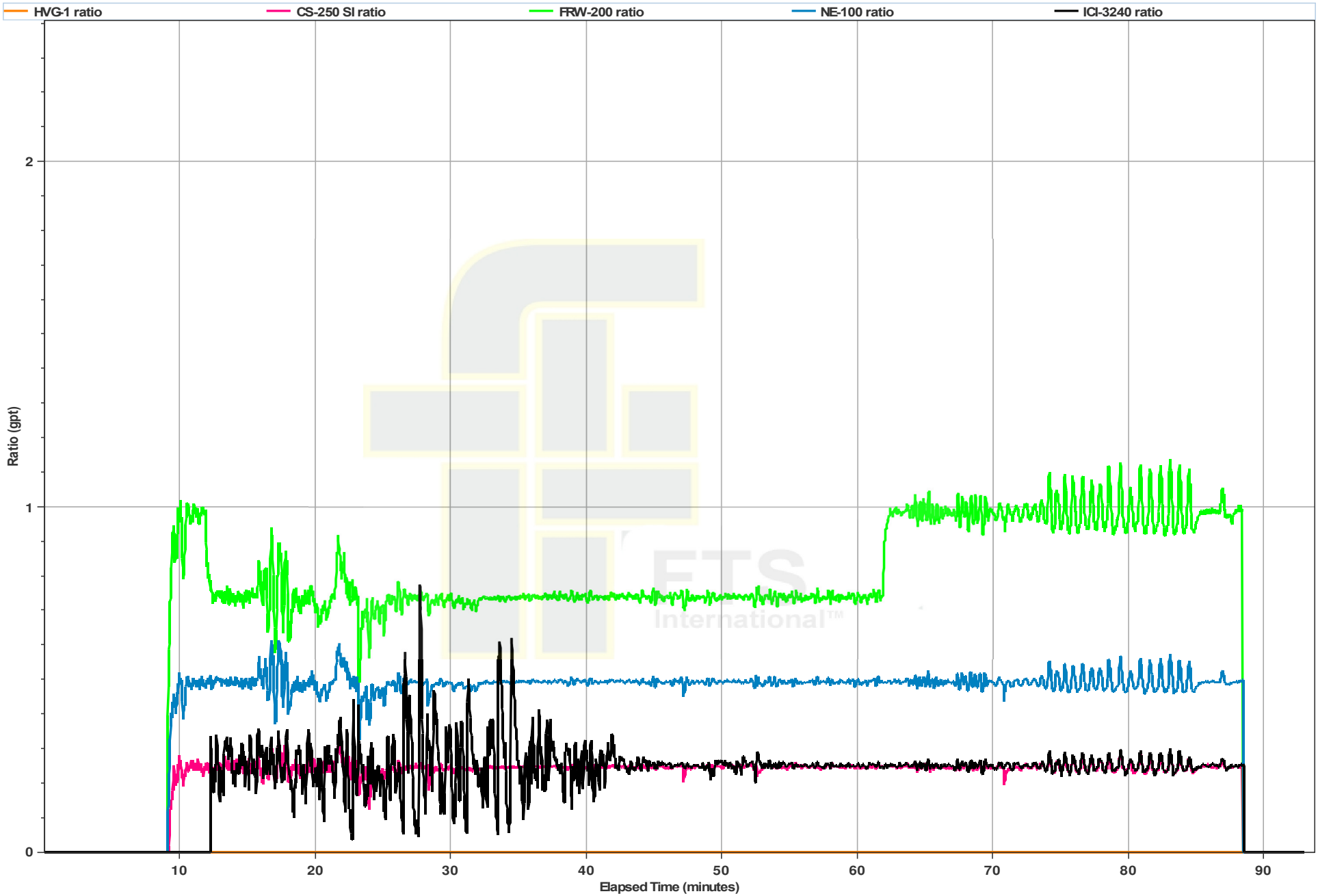
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 14 (WF.000658.M.W03.S14-aDCT-1103) **Jun 17, 2015**

ISIP Plot



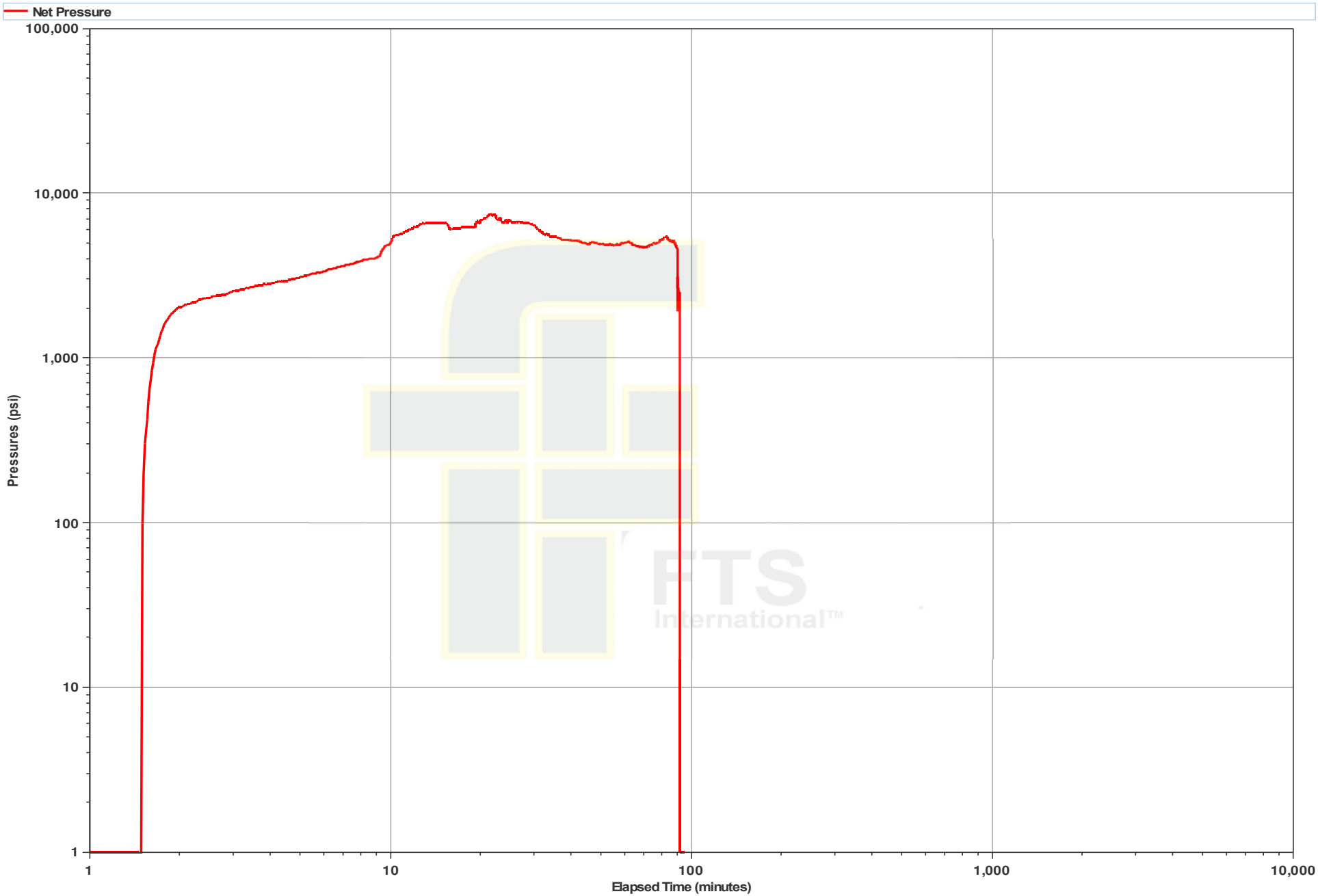
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 14 (WF.000658.M.W03.S14-aDCT-1103) Jun 17, 2015

Chemical Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 14 (WF.000658.M.W03.S14-aDCT-1103) Jun 17, 2015

Net Pressure Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 14 (WF.000658.M.W03.S14-aDCT-1103) Jun 17, 2015

WATER-BASED FRAC FLUID QUALITY CONTROL
(Attachment to Post Treatment Report)

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/17/2015
Customer Name:	American Energy - Utica	Proposal #:	3H/14
Date Sampled:	6/17/2015	Water Source:	Working Tank

Sample/Tank No.	Clarity, Color, Odor	Sample Temperature, (F)	Specific gravity	Initial pH	Chloride, ppm	Hardness, ppm	Calcium, ppm	Magnesium, ppm	Iron ppm	Hydroxide, ppm	Bicarbonate, ppm	Carbonate, ppm	Sulfate, ppm	Barium, ppm
Working Tank	Clear	72	1	8.1	45	100	40	15	1	0	110	0	40	0

Frac Fluid Quality Gel Testing (These Recording are to made prior to pumping job)														
Sample #														
Base Gel Type	HVG-1													
Gel Loading (lbs/1000 gal.)	2.5													
Sample Temperature, (F)	72													
Initial pH	8													
Visc. Reading @ 300 rpms	6													
Viscosity, (cp)	6													
Sample 1 3 min Hydration	4													
Sample 2 3 min Hydration	4													
Sample 3 3 min Hydration	5													
X-Link Vortex Closure, min:sec	n/a													
X-Link Crown, min:sec	n/a													
X-Link pH	n/a													
Gel Break Time (<2cp) mins	20													

Frac Fluid Quality Gel Testing (These Recording are to made while pumping job)														
Stage #														
Base Gel Viscosity (cp)														
X-Link pH								.						
Sample XL time, min:sec														
Sample Temperature														

Acid Quality	Percent Acid	NaOH, mLs	Specific Gravity
	28		1.14

Additional testing or documentation may be required by the customer or for frac fluid quality assurance.

Tested By: Etuate Varea

QUALITY CONTROL OF PROPPANTS

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/17/2015
Customer Name:	American Energy - Utica	Well/Stage:	3H/14
Date Sampled:	6/17/2015	DISTRICT:	Washington, PA
VENDOR:	SANTROL		

Select Proppant Type:

___ Brown	___ Ceramic	___ Other (specify)
X White	___ Bauxite	_____
___ Resin Coated	___ Texas Gold	

Sieve Analysis	100 Mesh			Sieve Analysis	30/50 Mesh		
Sample 1	24.80	grams of sample		Sample 2	25.30	grams of sample	
	Amount Retained				Amount Retained		
Sieve mesh	Gram	%		Sieve mesh	Gram	%	
			Total				Total
50	0.50	4.03	In-Size	20	0.00	0.00	In-Size
70	16.90	64.92		30	0.30	1.98	
100	6.20	23.39	96.0%	40	18.70	78.66	96.4%
120	1.50	4.84		45	3.50	14.23	
140	0.70	2.42		50	0.80	3.56	
200	0.10	0.40		70	0.30	1.58	
Pan	0.00	0.00	fines	Pan	0.00	0.00	fines
Total wt. Gram	24.80	100.00		Total wt. Gram	25.30	100.00	

Tested By: Etuate Varea

Post Job Report

AMERICAN ENERGY - UTICA

Red Hill Farm MDS GR 3H

Stage : 15 OF 54

HARRISON, OH

Operations Representative:

Name:	David Knapp
Office:	878-327-4881
Fax:	724-743-7719
Cell:	
Email:	DAVID.KNAPP@FTSI.COM

Sales Representative:

Name:	Bruce Batthern
Office:	405-974-3901
Fax:	405-787-1235
Cell:	
Email:	BRUCE.BATTHERN@FTSI.COM

Engineering Manager:

Name:	Thaddeus Craun
Office:	817-832-8782
Fax:	724-743-7719
Cell:	
Email:	THADDEUS.CRAUN@FTSI.COM

FTS International
[illegible]
[illegible]

FTS INTERNATIONAL

Customer: American Energy - Utica
Well: Red Hill Farm Ohio Gr 3H
Stage: 18
Job End Date: [illegible]

Job Summary

Well Information

TVD:	7,301	Top Perf:	13,089
No. Of Perfs:	30		

Casing	Tubing
[illegible]	n/A

Pressures, Rates and Volumes

	Proposed	Actual	Max	Min
BTP	[illegible] psi	[illegible] psi	[illegible] psi	[illegible] psi
Rate	[illegible] bpm	[illegible] bpm	[illegible] bpm	[illegible] bpm

	Proposed	Actual		
Clean Volume	[illegible] bbls	[illegible] bbls		
Slurry Volume	[illegible] bbls	[illegible] bbls		
Flush Volume	[illegible] bbls	[illegible] bbls		

	Proposed	Start	End
Frac Pumps on Location	19	15	15

Open Well:	Start Time	[illegible]	Pressure	[illegible] psi
	Bull Dwn	[illegible] bbls	Break Down	[illegible] psi
	Initial BHP:	[illegible] psi	Initial F.G.:	[illegible] psi/ft
Stage Complete:	End Time	[illegible]	Job Time	[illegible]
	Final ISIP	[illegible] psi	Final F.G.	[illegible] psi/ft
	ISIP	[illegible]	5 Min:	[illegible] psi
	Pressure Min:	[illegible]	10 Min:	N/A
	Pressure Max:	[illegible]	15 Min:	N/A

Material Volume

Material	Proposed	Calculated	Actual	Variance
100 Mesh White	[illegible]	[illegible]	[illegible]	0%
30/50 White	[illegible]	[illegible]	[illegible]	-4%
Total Proppants	[illegible]	[illegible]	[illegible]	-1%

Material	Proposed	Calculated	Actual	Variance
8.1%-7.5% HCL	[illegible]	[illegible]	[illegible]	1%
AFR-1	[illegible]	[illegible]	[illegible]	1%
[illegible]	[illegible]	[illegible]	[illegible]	0%
[illegible]	[illegible]	[illegible]	[illegible]	3%
FE-[illegible]	[illegible]	[illegible]	[illegible]	0%
[illegible]	[illegible]	[illegible]	[illegible]	-2%
HVG-1 4.5	[illegible]	[illegible]	[illegible]	7%
[illegible]	[illegible]	[illegible]	[illegible]	3%
LTB-1	[illegible]	[illegible]	[illegible]	7%
[illegible]	[illegible]	[illegible]	[illegible]	-3%
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Comments:

Pumpdown Information:
Total Bbls: 278
Max Pressure (psi): 9845
Max Rate (bpm): 19.3

FTS International
[illegible]
Eighty Four, PA [illegible]

FTS INTERNATIONAL

Customer: Anadarko Energy - Utica
Well: Red Hill Farm Site 6r 3H
Stage: 13
Job End Date: [illegible]

Treatment Report

Date	[illegible]	Statistic	Washington County, PA	Basin Size	[illegible]	API#	[illegible]

Elt. Time	BTP	Slurry BPM	Slurry Gross (bbls)	Cumulative Gross (bbls)	Slurry Gross (bbls)	Cumulative Slurry (bbls)	Slurry Proppant (lbs)	Cumulative Proppant (lbs)	Description	Proppant	PPA
21:25	3,196	11.0	19	19	19	19	0	0	Freshwater Open Wet		0.00
21:34	5,276	11.4	71	44	71	44	0	0	7.5% HCL Acid Acid		0.00
21:39	3,217	20.4	48	172	44	172	0	0	Slickwater Load		0.00
21:43	7,287	30.0	129	294	122	294	923	923	Slickwater Proppant	100 Mesh White	0.10
21:44	7,746	30.7	4	303	4	303	17	940	Slickwater Breakdown	100 Mesh White	0.10
21:46	6,974	22.8	64	310	64	367	373	1,313	Slickwater Proppant	100 Mesh White	0.10
21:51	6,624	48.6	214	525	211	578	2,247	3,140	Slickwater Proppant	100 Mesh White	0.25
21:55	6,152	52.2	168	693	163	741	3,139	6,279	Slickwater Proppant	100 Mesh White	0.50
21:56	6,659	46.4	59	752	51	792	1,659	7,938	18# Linear Gel Proppant	100 Mesh White	0.50
21:58	6,628	42.5	55	805	52	843	1,155	9,093	18# Linear Gel Proppant	100 Mesh White	0.50
21:59	6,652	48.7	428	1,234	444	1,287	10,614	22,015	18# Linear Gel Proppant	100 Mesh White	0.75
22:05	6,734	95.9	410	1,644	428	1,739	17,233	39,246	18# Linear Gel Proppant	100 Mesh White	1.00
22:11	6,639	95.8	357	2,001	367	2,039	27,884	69,133	18# Linear Gel Proppant	30/50 White	1.00
22:15	6,639	95.8	348	2,351	348	2,389	19,948	89,081	18# Linear Gel Proppant	30/50 White	1.00
22:20	6,679	71.9	1,699	3,051	1,697	4,086	53,988	143,169	18# Linear Gel Proppant	30/50 White	1.25
22:30	6,642	76.1	667	4,618	619	4,749	19,861	167,169	18# Linear Gel Proppant	40/80 White	1.50
22:31	6,647	79.6	660	5,018	610	5,359	16,761	221,010	18# Linear Gel Proppant	40/80 White	1.75
22:40	6,664	80.5	652	5,670	608	5,962	23,400	251,010	18# Linear Gel Proppant	40/80 White	2.00
22:44	3,667	61.3	62	5,670	62	5,744	0	251,010	18# Linear Gel Clean across		0.00
22:53	3,657	62.3	37	5,667	37	5,771	0	251,310	Slickwater Clean across		0.00
22:54	3,642	62.2	260	5,727	260	6,031	0	251,310	Slickwater Flush		0.00
22:57	3,779	78.3	123	5,849	123	6,133	0	251,310	Freshwater Flush		0.00
22:58	4,373	5.8	6	5,849	6	6,133	0	251,310	Freshwater Shutdown		0.00
Total Job/Time (HH:MM): 01:37											

Min BTP:	3,718 psi	Max BTP:	6,973 psi	Average BTP:	5,794 psi	4 Min	3,300 psi
Min Rate:	22.0 bpm	Max Rate:	62.3 bpm	Average Rate:	52.1 bpm	10 Min	0 psi
Initial SIP:	4,379 psi	Initial F.G.:	1.00 psi/ft	Average SIP:	10,947	15 Min	0 psi
Final SIP:	4,379 psi	Final F.G.:	1.00 psi/ft	Customer Representative		HS Rep.	
FTS Representative		Travis Wilson & Sean Stewart					

Comments:

The proppant values contained in this report are calculated based on actual barrel counts and target densities. Actual total proppant usage is 249,835 lbs. Charge time is 1 hour(s) 46 minute(s). All chemicals and proppant ran as documented.

Min/Max/Avg were taken from sand stages. All chem changes from proposed were made per AEU representative request.

A 10# Linear Gel system was started early per AEU representatives due to high formation pressure.

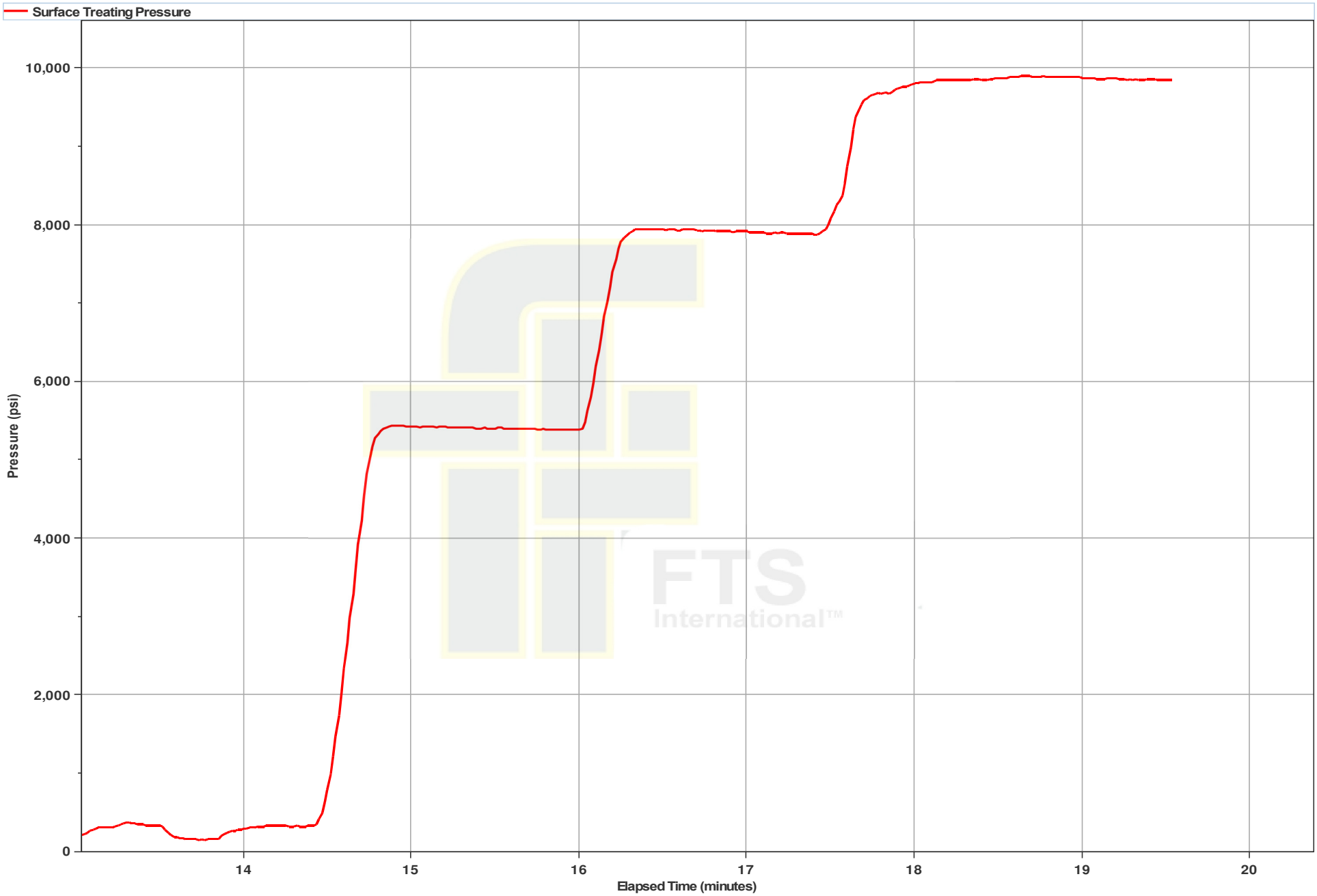
No reuse water was run on this stage.

1 Minute Shutdown (psi): 4147
2 Minute Shutdown (psi): 4041
5 Minute Shutdown (psi): 3863

Chemical Changes:

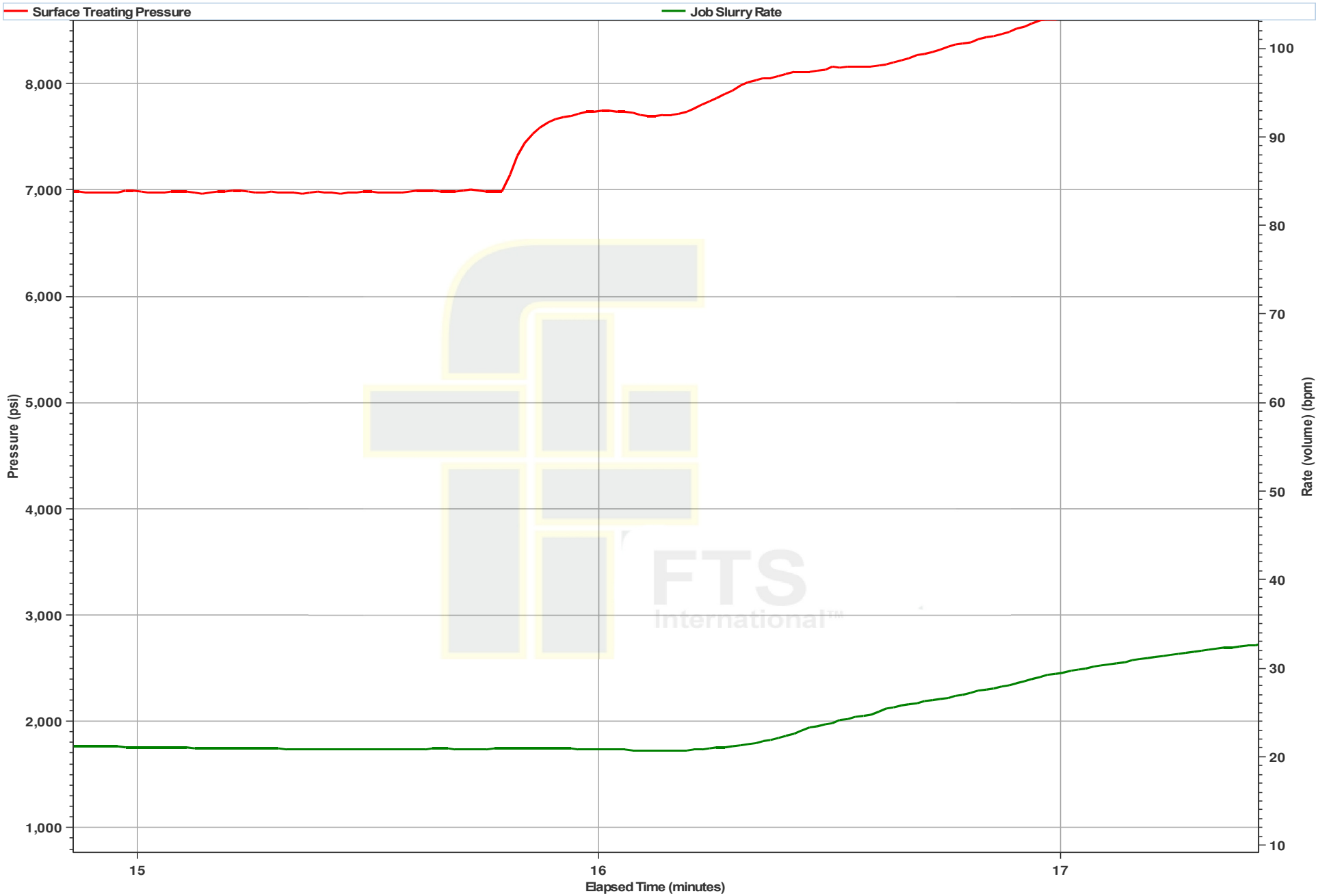
Chemical Name	Chemical Loading	Cumulative Clean
FRW-200	1.00	780
FRW-200	0.75	958
FRW-200	0.80	2,651
FRW-200	0.75	6,497

AEU Pressure Test



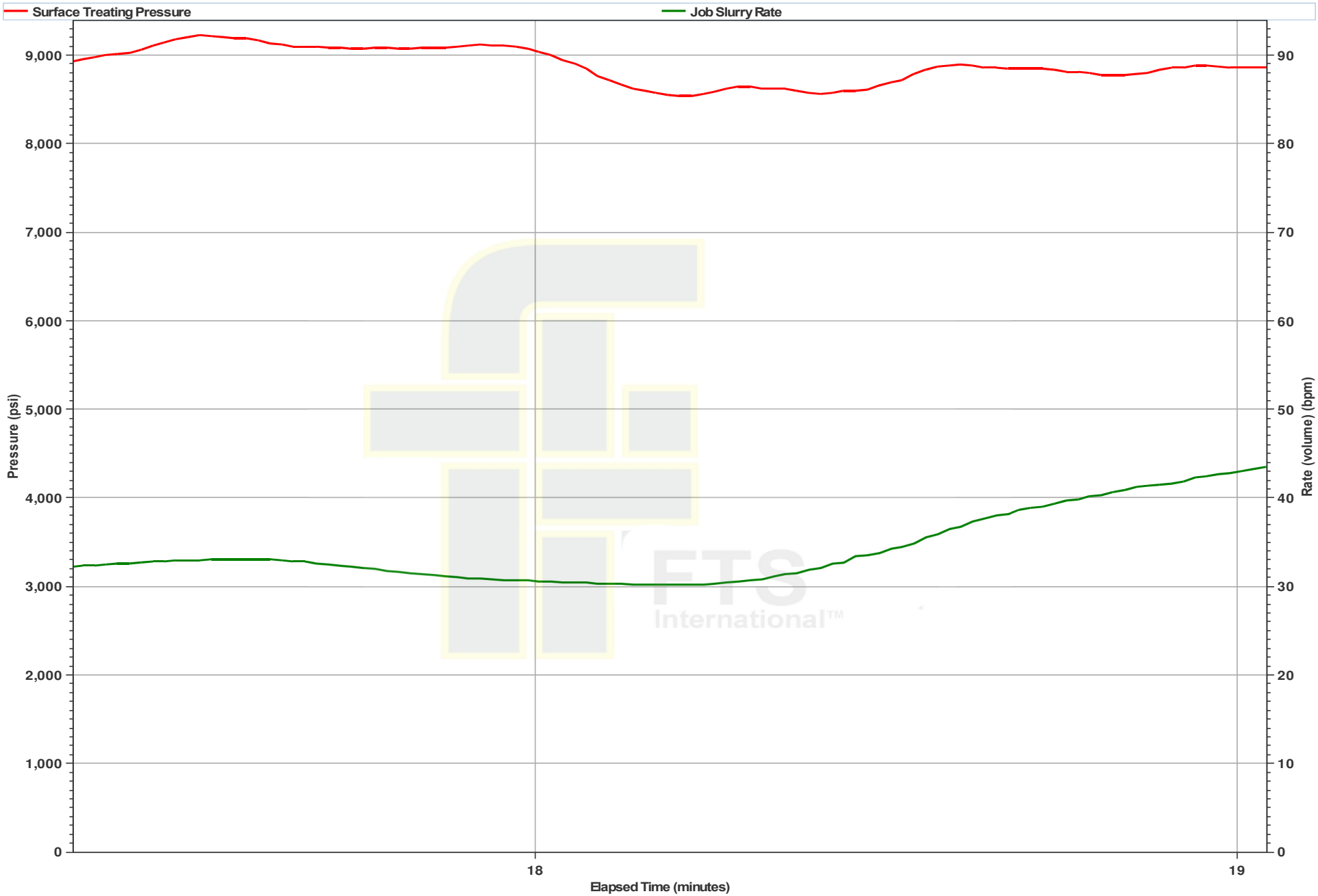
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 15 (WF.000658.M.W03.S15-ADCT-1103) **Jun 17, 2015**

Ball Seat and Breakdown



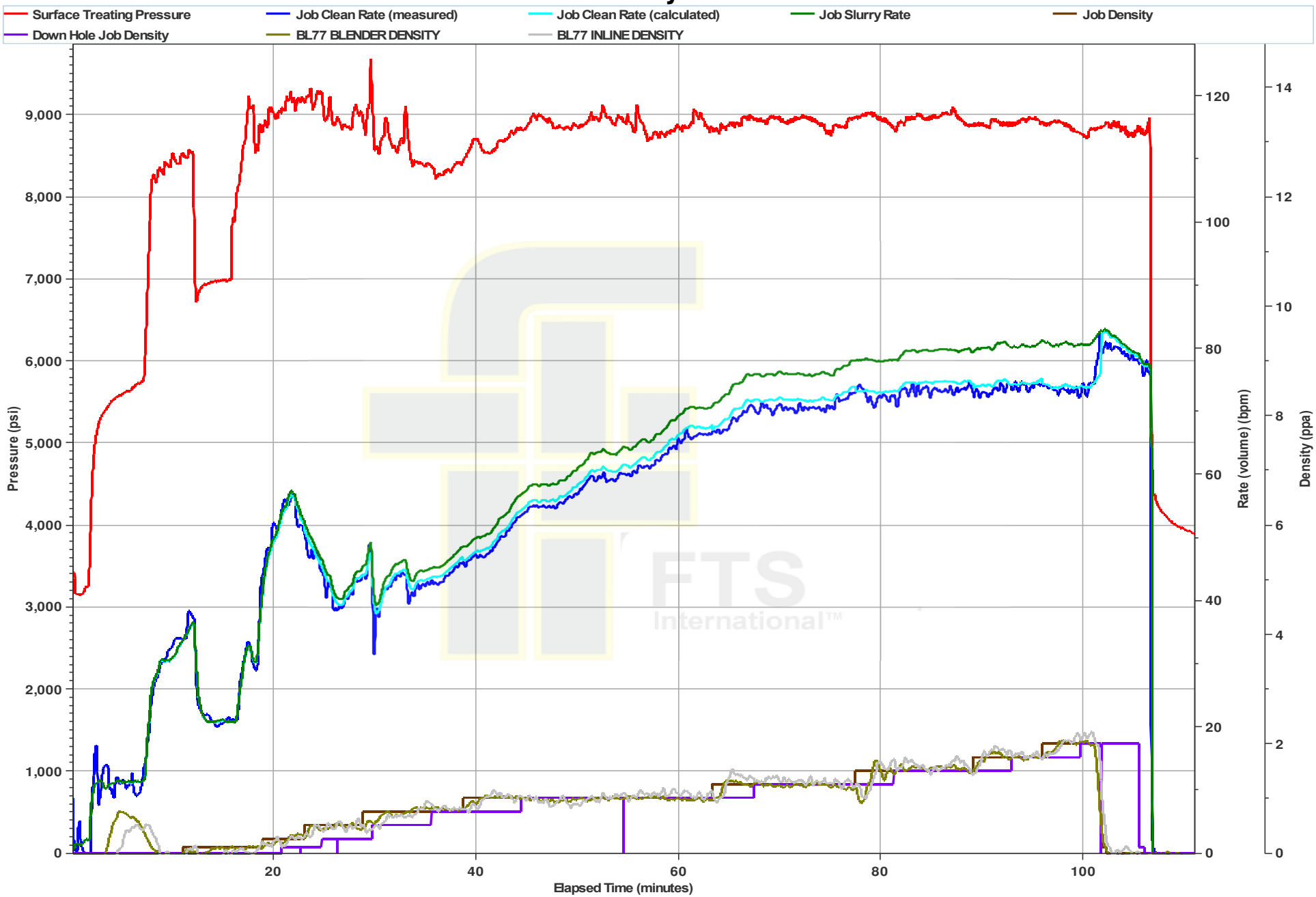
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 15 (WF.000658.M.W03.S15-ADCT-1103) **Jun 17, 2015**

Acid on Perforations



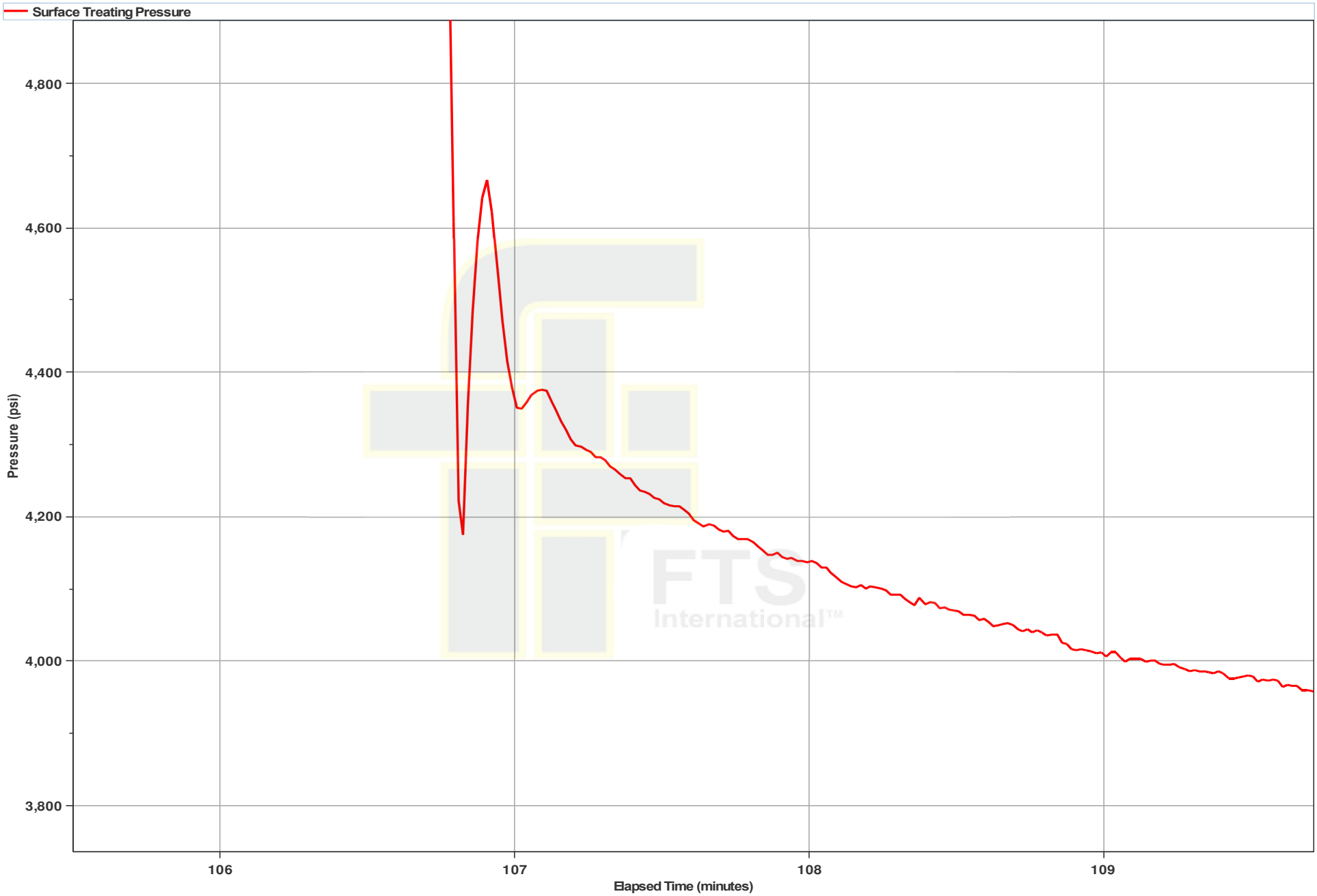
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 15 (WF.000658.M.W03.S15-ADCT-1103) **Jun 17, 2015**

Primary Plot



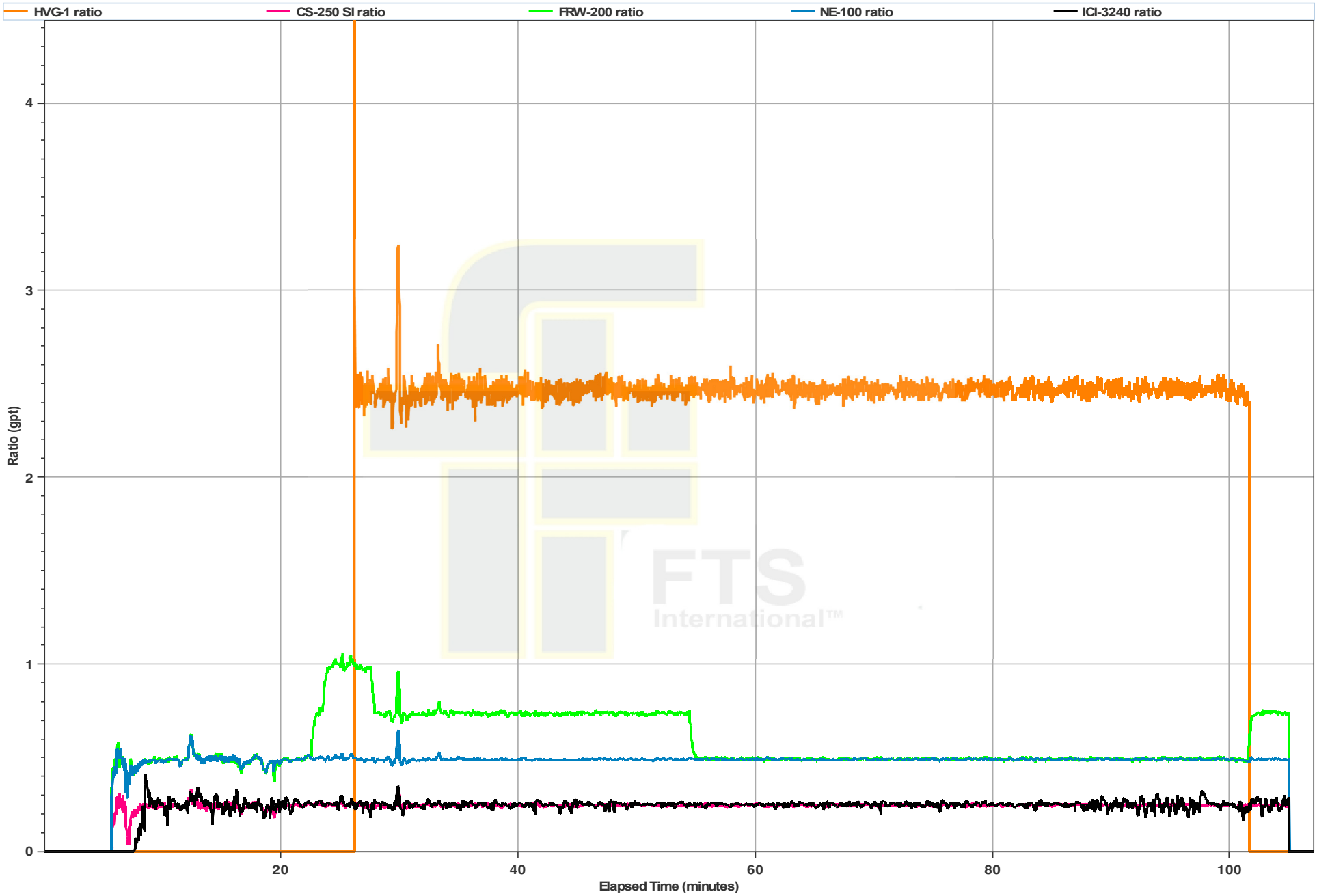
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 15 (WF.000658.M.W03.S15-ADCT-1103) **Jun 17, 2015**

ISIP Plot



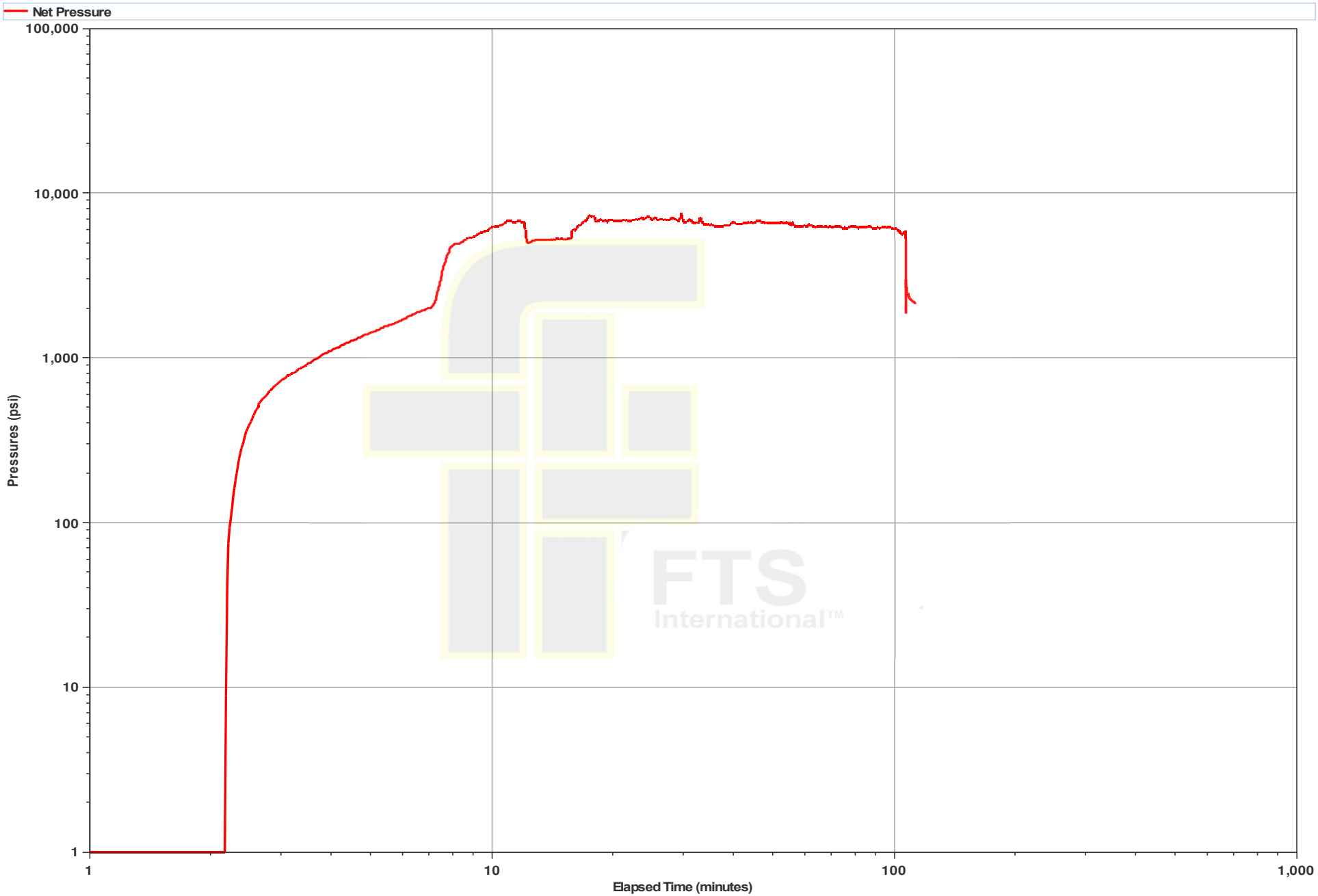
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 15 (WF.000658.M.W03.S15-ADCT-1103) **Jun 17, 2015**

Chemical Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 15 (WF.000658.M.W03.S15-ADCT-1103) Jun 17, 2015

Net Pressure Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 15 (WF.000658.M.W03.S15-ADCT-1103) Jun 17, 2015

WATER-BASED FRAC FLUID QUALITY CONTROL
(Attachment to Post Treatment Report)

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/18/2015
Customer Name:	American Energy - Utica	Proposal #:	3H/15
Date Sampled:	6/18/2015	Water Source:	Working Tank

Sample/Tank No.	Clarity, Color, Odor	Sample Temperature, (F)	Specific gravity	Initial pH	Chloride, ppm	Hardness, ppm	Calcium, ppm	Magnesium, ppm	Iron ppm	Hydroxide, ppm	Bicarbonate, ppm	Carbonate, ppm	Sulfate, ppm	Barium, ppm
Working Tank	Clear	72	1	8.2	50	90	28	15	1	0	98	0	50	0

Frac Fluid Quality Gel Testing (These Recording are to made prior to pumping job)														
Sample #														
Base Gel Type	HVG-1													
Gel Loading (lbs/1000 gal.)	2.5													
Sample Temperature, (F)	72													
Initial pH	8													
Visc. Reading @ 300 rpms	6.5													
Viscosity, (cp)	6.5													
Sample 1 3 min Hydration	4													
Sample 2 3 min Hydration	4													
Sample 3 3 min Hydration	6													
X-Link Vortex Closure, min:sec	n/a													
X-Link Crown, min:sec	n/a													
X-Link pH	n/a													
Gel Break Time (<2cp) mins	20													

Frac Fluid Quality Gel Testing (These Recording are to made while pumping job)														
Stage #														
Base Gel Viscosity (cp)														
X-Link pH								.						
Sample XL time, min:sec														
Sample Temperature														

Acid Quality	Percent Acid	NaOH, mLs	Specific Gravity
	28		1.14

Additional testing or documentation may be required by the customer or for frac fluid quality assurance.

Tested By: Travis Wilson

QUALITY CONTROL OF PROPPANTS

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/18/2015
Customer Name:	American Energy - Utica	Well/Stage:	3H/15
Date Sampled:	6/18/2015	DISTRICT:	Washington, PA
VENDOR:	SANTROL		

Select Proppant Type:

___ Brown	___ Ceramic	___ Other (specify)
X White	___ Bauxite	
___ Resin Coated	___ Texas Gold	

Sieve Analysis	100 Mesh			Sieve Analysis	30/50 Mesh		
Sample 1	24.80	grams of sample		Sample 2	24.90	grams of sample	
	Amount Retained				Amount Retained		
Sieve mesh	Gram	%		Sieve mesh	Gram	%	
			Total				Total
50	0.50	2.02	In-Size	20	0.00	0.00	In-Size
70	15.90	64.11		30	0.50	2.01	
100	5.90	23.79	97.6%	40	20.00	80.32	96.4%
120	1.40	5.65		45	3.40	13.65	
140	0.70	2.82		50	0.60	2.41	
200	0.30	1.21		70	0.30	1.20	
Pan	0.10	0.40	fines	Pan	0.10	0.40	fines
Total wt. Gram	24.80	100.00		Total wt. Gram	24.90	100.00	

Tested By: Travis Wilson

Post Job Report

AMERICAN ENERGY - UTICA

Red Hill Farm MDS GR 3H

Stage : 16 OF 54

HARRISON, OH

Operations Representative:

Name:	**David Knapp**
Office:	**570-327-4881**
Fax:	**724-743-7719**
Cell:	
Email:	**DAVID.KNAPP@FTSI.COM**

Sales Representative:

Name:	**Bruce Matthews**
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Cell:	
Email:	**BRUCE.MATTHEWS@FTSI.COM**

Engineering Manager:

Name:	**Thaddeus Craun**
Office:	**817-682-8702**
Fax:	**724-743-7719**
Cell:	
Email:	**THADDEUS.CRAUN@FTSI.COM**

FTS International
1432 Route 519
Eighty Four, PA 15330

Customer: American Energy - Utica
Well: Red Hill Farm Mds Gr 3H
Stage: 16
Job End Date: 06/18/2015

Job Summary

Well Information

TVD:	7,301	**Top Perf:**	13,431
No. Of Perfs:	30		

Casing	Tubing
5.50" 20.00#	N/A

Pressures, Rates and Volumes

	Proposed	Actual	Max	Min
STP	9,046 psi	8,633 psi	9,188 psi	7,161 psi
Rate	80.0 bpm	77.8 bpm	94.4 bpm	19.6 bpm

	Proposed	Actual		
Clean Volume	5,772 bbls	5,746 bbls		
Slurry Volume	6,042 bbls	6,018 bbls		
Flush Volume	357 bbls	349 bbls		

	Proposed	Start	End
Frac Pumps on Location	10	14	14

Open Well:	Start Time	04:08	Pressure	3,090 psi
	Ball Seat	280 bbls	Break Down	8,469 psi
	Initial ISIP:	4,812 psi	Initial F.G.:	1.09 psi/ft
Stage Complete:	End Time	05:32	Job Time	01:30
	Final ISIP	4,812 psi	Final F.G.	1.09 psi/ft
	HHP	16,462	5 Min:	4,312 psi
	Proppant Min:	0.00	10 Min:	N/A
	Proppant Max:	2.00	15 Min:	N/A

Material Volume

Material	Proposed	Calculated	Actual	Variance
100 Mesh White	40,000	39,759	39,759	0%
30/50 White	210,000	212,038	212,038	0%
Total Proppants	250,000	251,797	251,797	0%

Material	Proposed	Calculated	Actual	Variance
0.1%-7.5% HCL	3,000	2,982	3,000	1%
CI-150	3	3	3	0%
CS-250 SI	60	58	58	0%
FE-200L	15	15	15	0%
FRW-200	180	248	246	-1%
ICI-3240	60	58	58	0%
NE-100	0	116	116	0%
NE-100W	120	0	0	0

Comments:

Pumpdown Information:
Total Bbls: 278
Max Pressure (psi): 5738
Max Rate (bpm): 15.1

FTS International
1432 Route 519
Eighty Four, PA 15330

Customer: American Energy - Utica
Well: Red Hill Farm Mds Gr 3H
Stage: 16
Job End Date: 06/18/2015

Treatment Report

Date:	6/18/2015	District:	Washington County,PA	Quote No:	051815_035725QF	API:	34-059-24370

MIL Time	STP	Slurry BPM	Stage Clean (bbls)	Cumulative Clean (bbls)	Stage Slurry (bbls)	Cumulative Slurry (bbls)	Stage Proppant (lbs)	Cumulative Proppant (lbs)	Description	Proppant	PPA
04:08	3,090	0.0	0	0	0	0	0	0	Freshwater Open Well		0.00
04:08	5,540	10.9	11	11	11	11	0	0	Freshwater Load		0.00
04:10	5,647	10.8	71	82	71	82	0	0	7.5% HCL Acid Acid		0.00
04:15	8,577	27.3	34	116	34	116	0	0	Slickwater Load		0.00
04:16	8,610	28.7	167	283	168	284	701	701	Slickwater Proppant	100 Mesh White	0.10
04:23	8,469	19.6	0	283	0	284	0	701	Slickwater Breakdown		0.00
04:23	8,187	19.9	47	330	47	331	197	898	Slickwater Proppant	100 Mesh White	0.10
04:25	8,919	27.0	214	544	216	547	2,247	3,145	Slickwater Proppant	100 Mesh White	0.25
04:30	9,077	61.0	95	639	97	644	1,995	5,140	Slickwater Proppant	100 Mesh White	0.50
04:31	9,019	61.0	159	798	163	807	3,339	8,479	Slickwater Proppant	100 Mesh White	0.50
04:34	8,938	71.2	429	1,227	444	1,251	13,514	21,993	Slickwater Proppant	100 Mesh White	0.75
04:39	9,151	79.4	423	1,650	442	1,693	17,766	39,759	Slickwater Proppant	100 Mesh White	1.00
04:45	8,978	81.4	875	2,525	915	2,608	36,750	76,509	Slickwater Proppant	30/50 White	1.00
04:55	8,712	91.0	1,001	3,526	1,058	3,666	52,553	129,062	Slickwater Proppant	30/50 White	1.25
05:07	8,461	93.9	857	4,383	915	4,581	53,991	183,053	Slickwater Proppant	30/50 White	1.50
05:16	8,520	93.9	501	4,884	541	5,122	36,824	219,877	Slickwater Proppant	30/50 White	1.75
05:21	8,219	93.5	380	5,264	414	5,536	31,920	251,797	Slickwater Proppant	30/50 White	2.00
05:28	8,353	93.7	133	5,397	133	5,669	0	251,797	Slickwater Clean screws		0.00
05:28	8,355	93.0	215	5,612	215	5,884	0	251,797	Slickwater Flush		0.00
05:31	8,746	862.0	134	5,746	134	6,018	0	251,797	Freshwater Flush		0.00
05:32	4,812	0.0	0	5,746	0	6,018	0	251,797	Freshwater Shutdown		0.00
Total JobTime (HH:MM): 01:24											

Min STP:	7,161 psi	**Max STP:**	9,188 psi	**Average STP:**	8,633 psi	**5 Min:**	4,312 psi
Min Rate:	19.6 bpm	**Max Rate:**	94.4 bpm	**Average Rate:**	77.8 bpm	**10 Min:**	0 psi
Initial ISIP:	4,812 psi	**Initial F.G.:**	1.09 psi/ft	**Average HHP:**	16,462	**15 Min:**	0 psi
Final ISIP:	4,812 psi	**Final F.G.:**	1.09 psi/ft	**Customer Representative:**		Bill Rubin	
FTSI Representative:		Etuate Varea & Sean Stewart					

Comments:

The proppant values contained in this report are calculated based on actual barrel counts and target densities. Actual total proppant usage is 251,797 lbs. Charge time is 1 hour(s) 30 minute(s). All chemicals and proppant ran as documented.

Min/Max/Avg were taken from sand stages. All chem changes from proposed were made per AEU representative request.

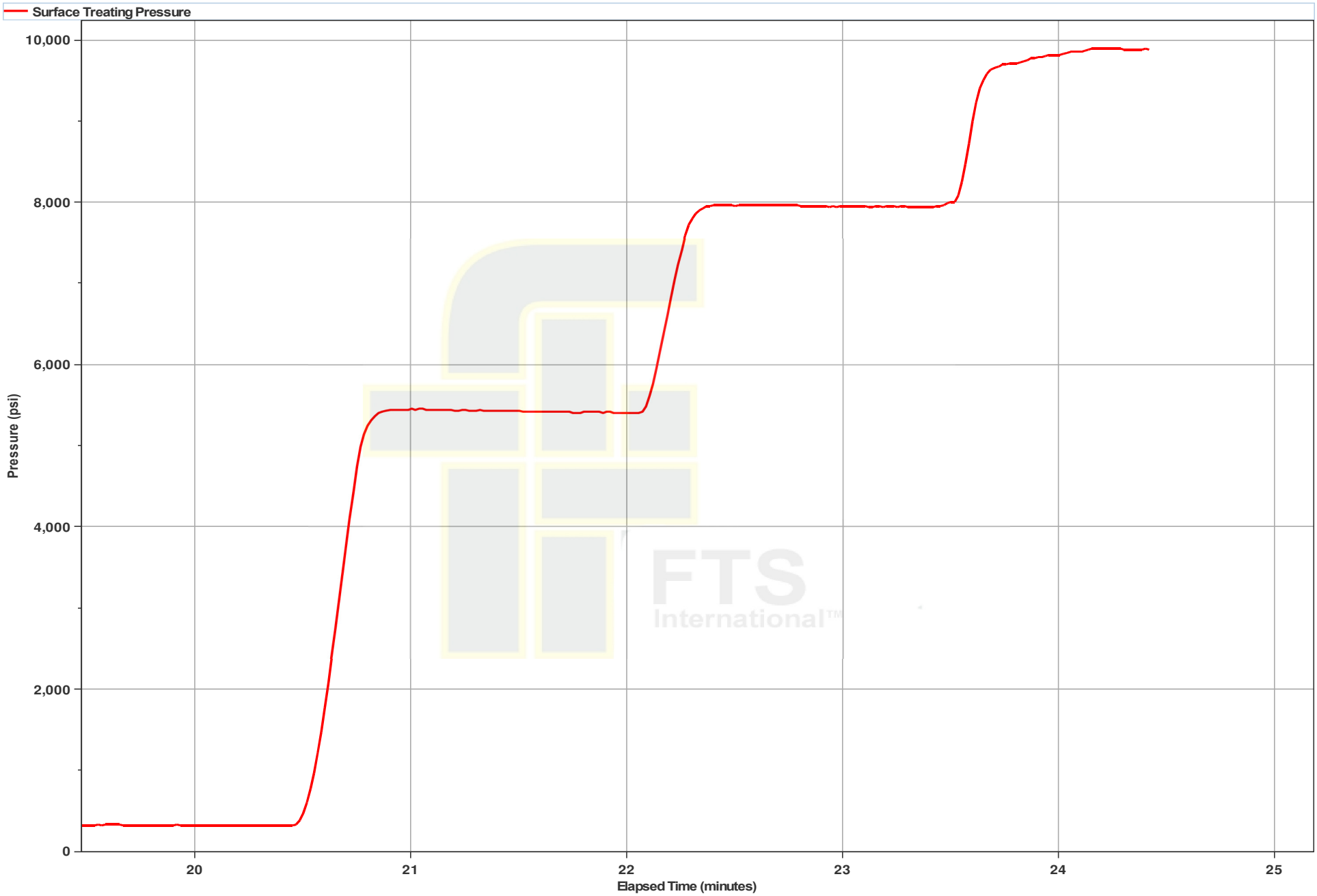
Reuse water was run on this stage for a total of 294 Bbls.

1 Minute Shutdown (psi): 4590
2 Minute Shutdown (psi): 4450
5 Minute Shutdown (psi): 4312

Chemical Changes:

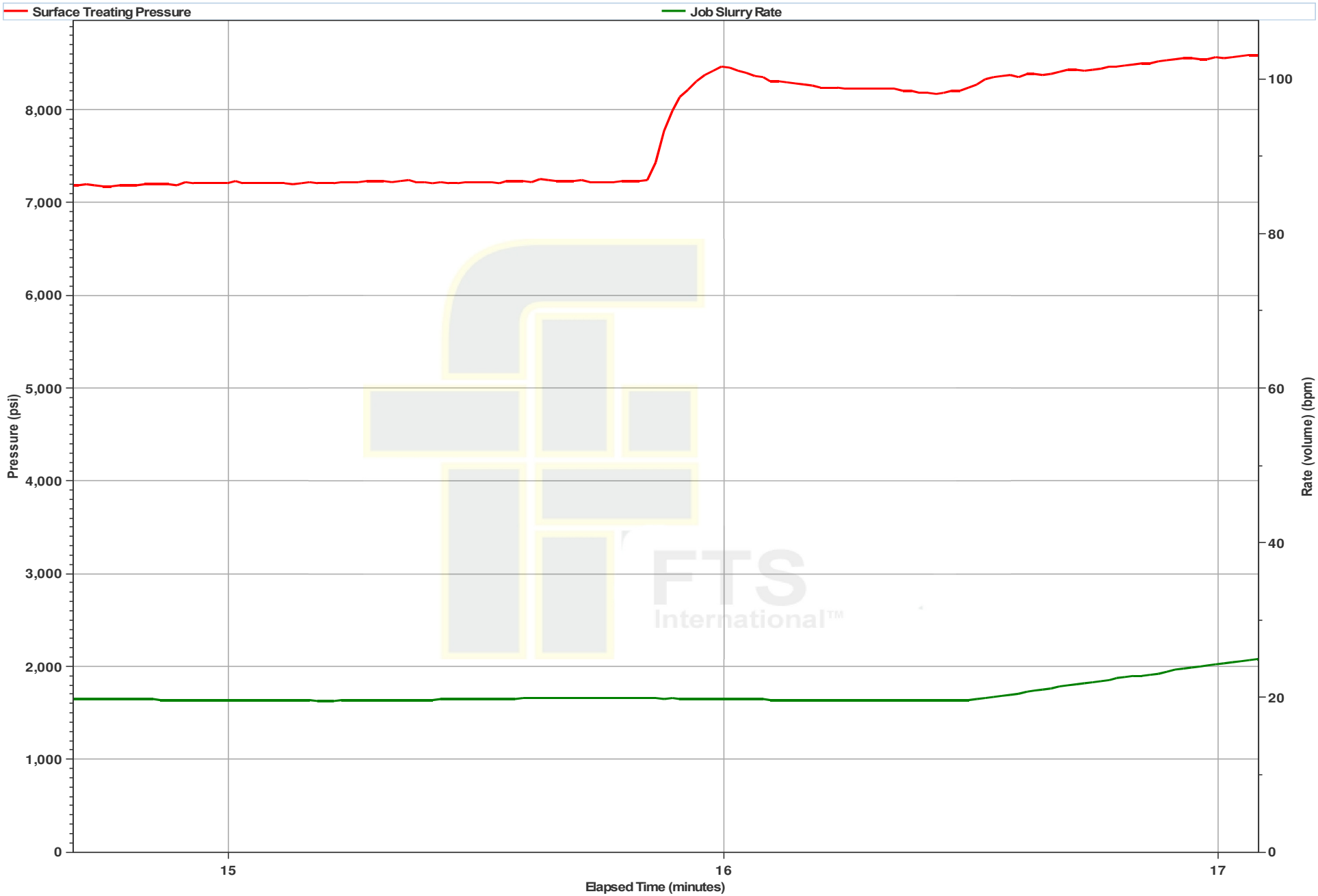
Chemical Name	Chemical Loading	Cumulative Clean
FRW-200	1.20	798
FRW-200	1.00	3,526

AEU Pressure Test



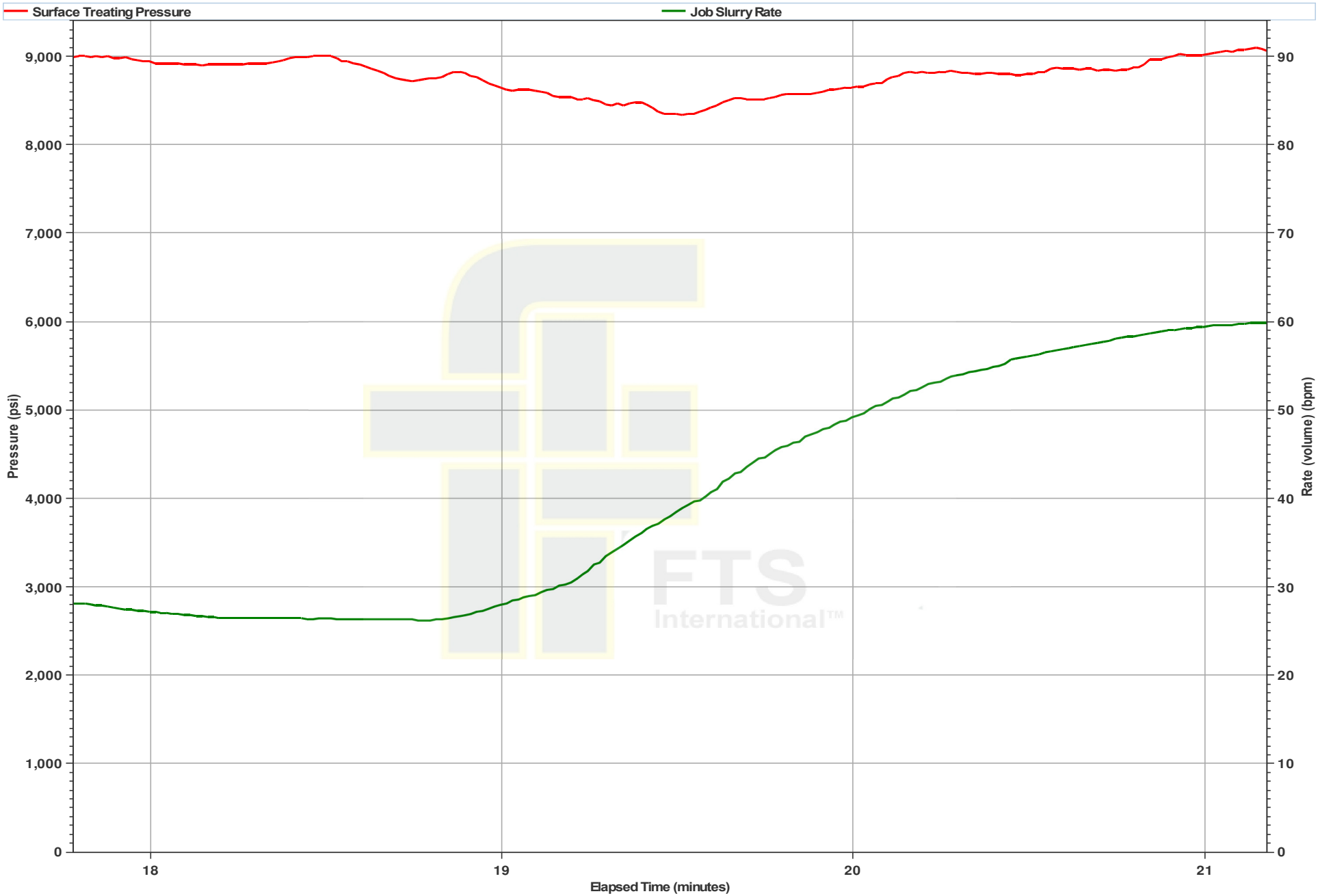
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 16 (WF.000658.M.W03.S16-ADCT-1103) **Jun 18, 2015**

Ball Seat and Breakdown



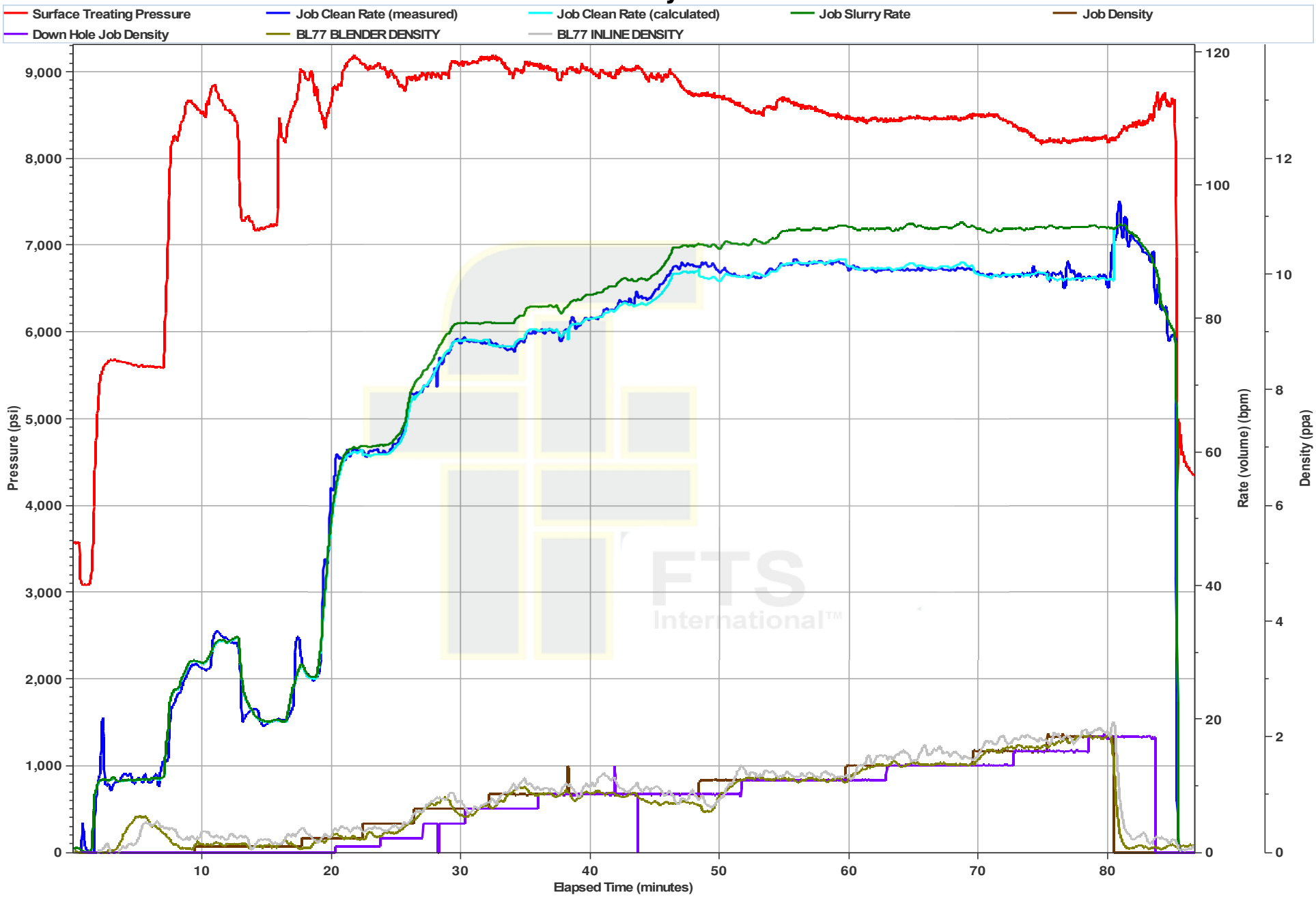
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 16 (WF.000658.M.W03.S16-ADCT-1103) **Jun 18, 2015**

Acid on Perforations



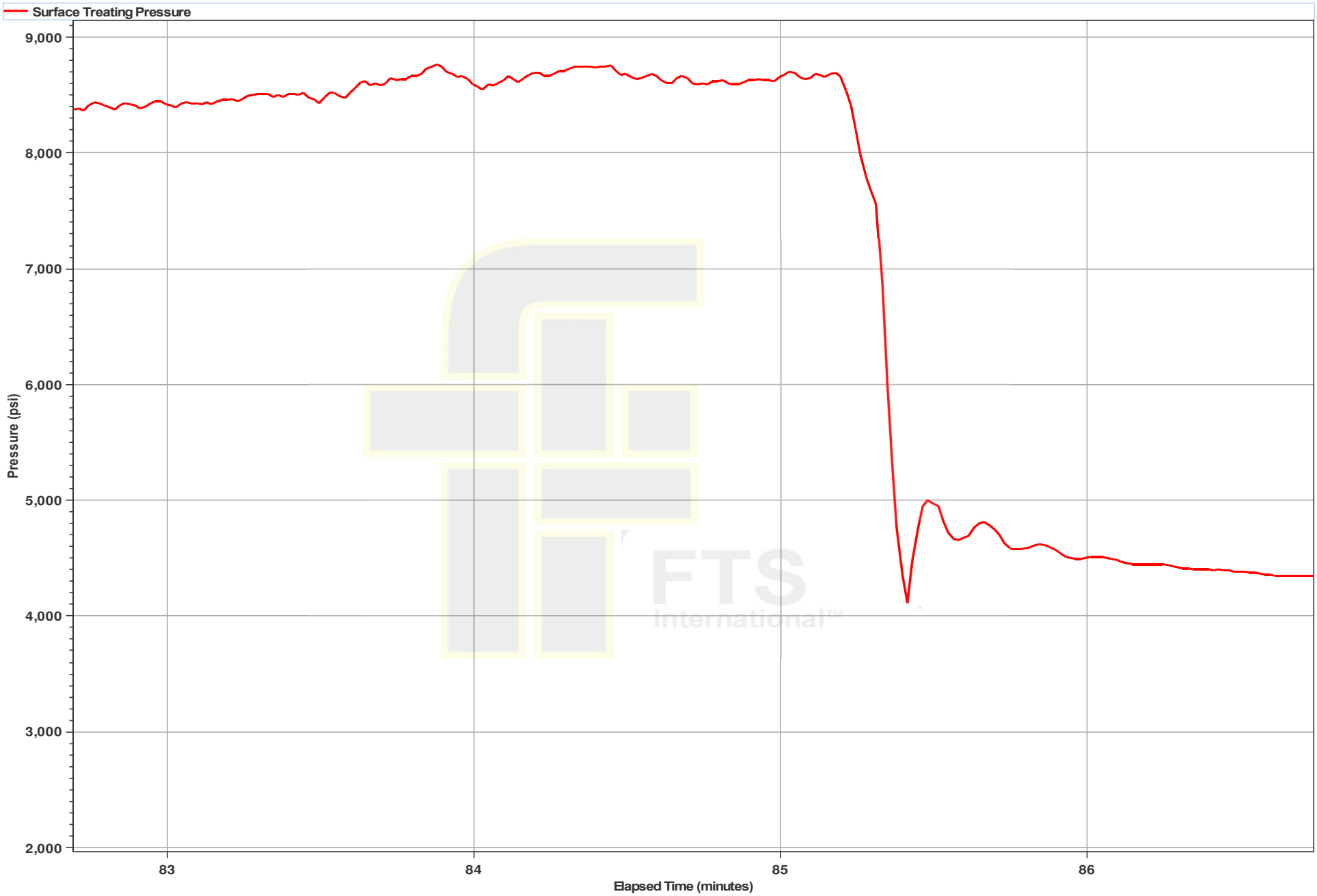
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 16 (WF.000658.M.W03.S16-ADCT-1103) **Jun 18, 2015**

Primary Plot



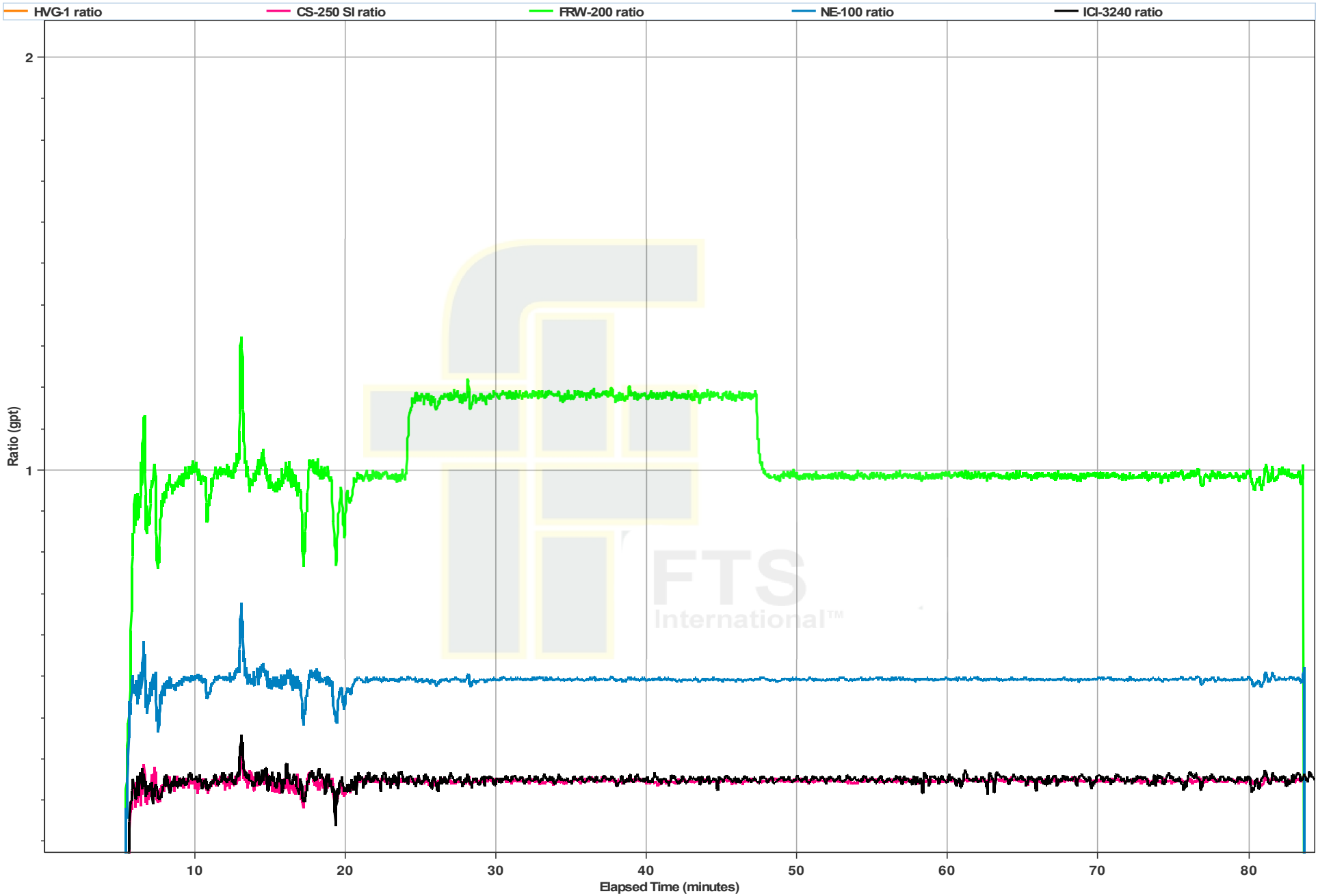
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 16 (WF.000658.M.W03.S16-ADCT-1103) **Jun 18, 2015**

ISIP Plot



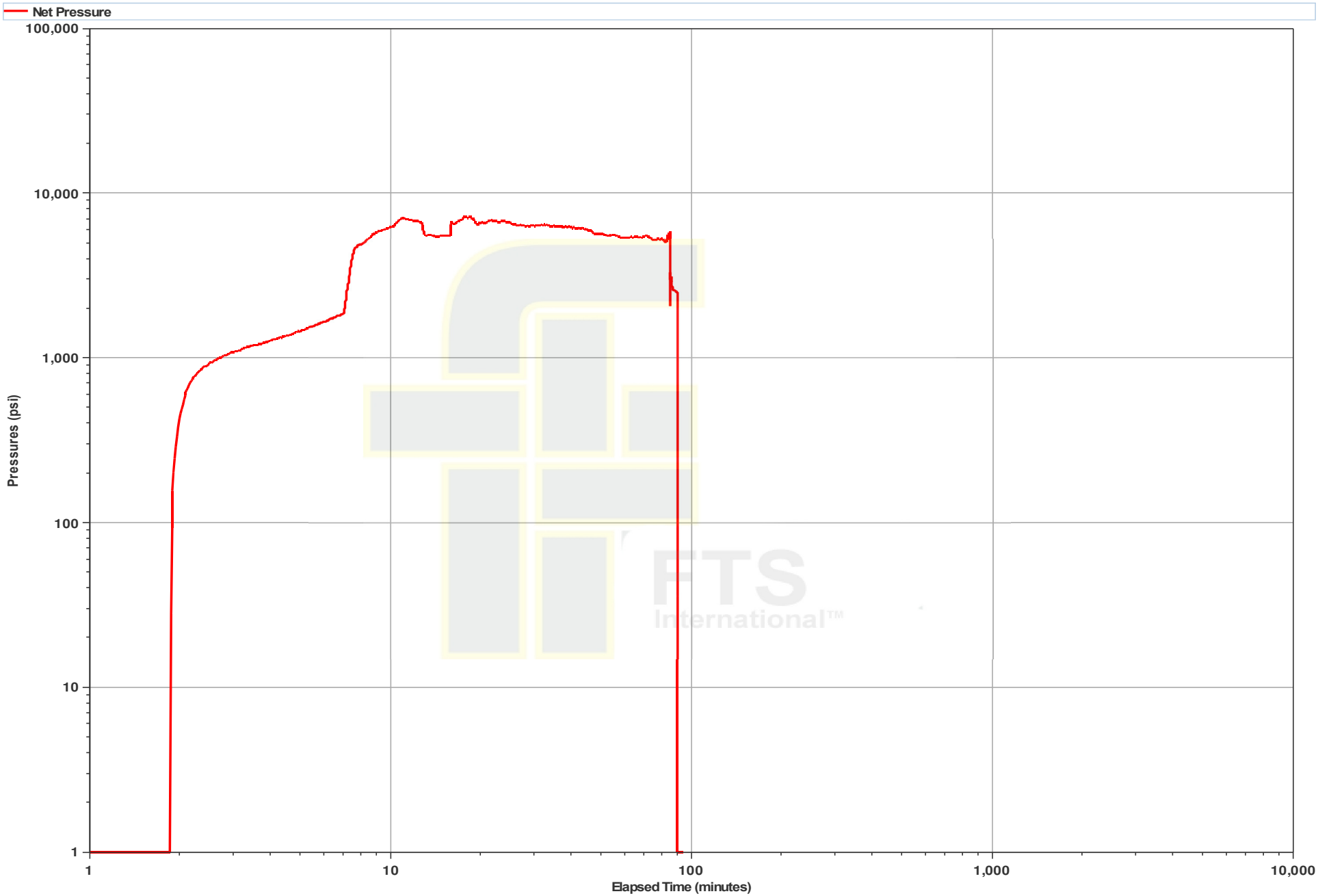
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 16 (WF.000658.M.W03.S16-ADCT-1103) **Jun 18, 2015**

Chemical Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 16 (WF.000658.M.W03.S16-ADCT-1103) Jun 18, 2015

Net Pressure Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 16 (WF.000658.M.W03.S16-ADCT-1103) Jun 18, 2015

WATER-BASED FRAC FLUID QUALITY CONTROL
(Attachment to Post Treatment Report)

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/18/2015
Customer Name:	American Energy - Utica	Proposal #:	3H/16
Date Sampled:	6/18/2015	Water Source:	Working Tank

Sample/Tank No.	Clarity, Color, Odor	Sample Temperature, (F)	Specific gravity	Initial pH	Chloride, ppm	Hardness, ppm	Calcium, ppm	Magnesium, ppm	Iron ppm	Hydroxide, ppm	Bicarbonate, ppm	Carbonate, ppm	Sulfate, ppm	Barium, ppm
Working Tank	Clear	74	1	8.1	45	80	28	13	0	0	98	0	50	0
Reused Water Tank	Black, Strong Odor	74	1.05	4.8	27,991	16000	5,521	2,547	>10	0	1952	0	400	0

Frac Fluid Quality Gel Testing (These Recording are to made prior to pumping job)														
Sample #														
Base Gel Type	HVG-1													
Gel Loading (lbs/1000 gal.)	2.5													
Sample Temperature, (F)	74													
Initial pH	8.1													
Visc. Reading @ 300 rpms	6													
Viscosity, (cp)	6													
Sample 1 3 min Hydration	4													
Sample 2 3 min Hydration	4													
Sample 3 3 min Hydration	6													
X-Link Vortex Closure, min:sec	n/a													
X-Link Crown, min:sec	n/a													
X-Link pH	n/a													
Gel Break Time (<2cp) mins	19													

Frac Fluid Quality Gel Testing (These Recording are to made while pumping job)														
Stage #														
Base Gel Viscosity (cp)														
X-Link pH								.						
Sample XL time, min:sec														
Sample Temperature														

Acid Quality	Percent Acid	NaOH, mLs	Specific Gravity
	28		1.14

Additional testing or documentation may be required by the customer or for frac fluid quality assurance.

Tested By: Etuate Varea

QUALITY CONTROL OF PROPPANTS

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/18/2015
Customer Name:	American Energy - Utica	Well/Stage:	3H/16
Date Sampled:	6/18/2015	DISTRICT:	Washington, PA
VENDOR:	SANTROL		

Select Proppant Type:

___	Brown	___	Ceramic	___	Other (specify)
X	White	___	Bauxite		
___	Resin Coated	___	Texas Gold		

Sieve Analysis	100 Mesh			Sieve Analysis	30/50 Mesh		
Sample 1	25.10	grams of sample		Sample 2	25.10	grams of sample	
	Amount Retained				Amount Retained		
Sieve mesh	Gram	%		Sieve mesh	Gram	%	
			Total				Total
50	0.30	1.20	In-Size	20	0.00	0.00	In-Size
70	16.90	67.33		30	0.80	3.19	
100	5.10	20.32	98.8%	40	18.90	75.30	95.6%
120	1.90	7.57		45	4.30	17.13	
140	0.80	3.19		50	0.80	3.19	
200	0.10	0.40		70	0.30	1.20	
Pan	0.00	0.00	fines	Pan	0.00	0.00	fines
Total wt. Gram	25.10	100.00		Total wt. Gram	25.10	100.00	

Tested By: Etuate Varea

Post Job Report

AMERICAN ENERGY - UTICA

Red Hill Farm MDS GR 3H

Stage : 17 OF 54

HARRISON, OH

Operations Representative:

Name:	David Knapp
Office:	879-327-4981
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Sales Representative:

Name:	Bruce Matthews
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Cell:	
Email:	BRUCE.MATTHEWS@FTSI.COM

Engineering Manager:

Name:	Thaddeus Craun
Office:	817-832-8782
Fax:	724-743-7719
Cell:	
Email:	THADDEUS.CRAUN@FTSI.COM

FTS International
[illegible]
Eighty Four, PA [illegible]

FTS INTERNATIONAL

Customer: American Energy - Utica
Well: Red Hill Farm Hoe Gr 3H
Stages 17
Job End Date [illegible]

Job Summary

Well Information

TVD:	7,301	Top Perf:	13,279
No. Of Perfs:	30		

Casing	Tubing
[illegible]	N/A

Pressures, Rates and Volumes

	Proposed	Actual	Max	Min
STP	[illegible] psi	[illegible] psi	[illegible] psi	[illegible] psi
Rate	[illegible] bpm	[illegible] bpm	[illegible] bpm	[illegible] bpm

	Proposed	Actual		
Clean Volume	[illegible] bbls	[illegible] bbls		
Slurry Volume	[illegible] bbls	[illegible] bbls		
Flush Volume	[illegible] bbls	[illegible] bbls		

	Proposed	Start	End
Free Pumps on Location	[illegible]	14	14

Open Well:	Start Time	15:39	Pressure	[illegible] psi
	Bd End	[illegible] bbls	Break Down	[illegible] psi
	Initial ISIP:	[illegible] psi	Initial F.G.:	[illegible] psi/ft
Stage Complete:	End Time	18:25	Job Time	[illegible]
	Final ISIP	[illegible] psi	Final F.G.	[illegible] psi/ft
	HHP	[illegible]	[illegible] Max	[illegible] psi
	Pressure Min	[illegible]	[illegible] Min	N/A
	Pressure Max	[illegible]	[illegible] Max	N/A

Material Volume

Material	Proposed	Calculated	Actual	Variance
100 Mesh White	[illegible]	[illegible]	[illegible]	0%
[illegible] White	[illegible]	[illegible]	[illegible]	0%
Total Proppants	[illegible]	[illegible]	[illegible]	0%

Material	Proposed	Calculated	Actual	Variance
6.1%-7.5% HCL	[illegible]	[illegible]	[illegible]	1%
APB-4	6	28	23	0%
[illegible]	3	3	3	0%
[illegible]	[illegible]	[illegible]	61	2%
FE-[illegible]	15	15	15	0%
[illegible]	[illegible]	[illegible]	[illegible]	-2%
[illegible]-14.5	6	114	110	-4%
[illegible]	[illegible]	[illegible]	61	2%
LTB-1	6	29	23	0%
[illegible]	6	[illegible]	[illegible]	-17%
[illegible]	[illegible]	5	5	0

Comments:

Paradown Information:
Total Bbls: [illegible]
Max Pressure (psi): [illegible]
Max Rate (bpm): 14.5

FTS International
[illegible]
Eighty Four, PA [illegible]

FTS INTERNATIONAL

Customer: American Energy - Utica
Well: Red Hill Farm Site 6r 3H
Stages 17
Job End Date [illegible]

Treatment Report

Date	[illegible]	Statelate	Washington County,PA	Data Set	[illegible]	API#	[illegible]

HH. Time	BTP	Slurry BPM	Stage Slurry (bbls)	Cumulative Slurry (bbls)	Stage Slurry (bbls)	Cumulative Slurry (bbls)	Stage Proppant (lbs)	Cumulative Proppant (lbs)	Description	Proppant	PPA
15:19	2,000	0.0	0	0	0	0	0	0	Freshwater Open Well		0.00
15:19	5,702	11.4	16	16	16	16	0	0	Freshwater Load		0.00
15:20	5,604	12.2	71	87	71	87	0	0	7.5% HCL Acid Add		0.00
15:25	6,133	12.2	81	168	81	168	0	0	Slickwater Load		0.00
15:27	7,291	19.7	164	337	179	337	710	710	Slickwater Proppant	100 Mesh White	0.10
15:35	7,400	30.3	0	337	0	337	0	710	Slickwater Breakdown		0.00
15:35	7,365	22.6	87	424	87	424	230	940	Slickwater Proppant	100 Mesh White	0.10
15:40	6,612	48.4	214	638	214	638	2,247	3,187	Slickwater Proppant	100 Mesh White	0.25
15:42	6,349	60.8	309	943	304	942	4,369	6,691	Slickwater Proppant	100 Mesh White	0.50
15:47	6,179	60.2	441	1,384	498	1,380	15,662	22,443	Slickwater Proppant	100 Mesh White	0.75
15:52	6,634	61.0	300	1,688	403	1,571	19,212	36,655	Slickwater Proppant	100 Mesh White	1.00
15:55	6,427	60.8	671	2,359	611	2,557	38,792	75,447	Slickwater Proppant	30/50 White	1.00
16:12	6,189	61.3	980	3,339	980	3,115	29,368	101,867	Slickwater Proppant	30/50 White	1.25
16:13	6,175	61.8	980	3,339	980	3,043	29,368	131,247	Slickwater Proppant	30/50 White	1.25
16:15	6,079	60.8	479	3,351	987	4,169	36,625	167,872	Slickwater Proppant	30/50 White	1.50
16:24	6,075	60.8	160	4,051	167	4,337	6,300	174,172	Slickwater Proppant	30/50 White	1.50
16:24	3,195	60.2	73	4,124	73	4,310	0	174,172	Slickwater Screp		0.00
16:26	6,000	60.6	164	4,300	167	4,497	9,234	187,406	Slickwater Proppant	16/30 White	0.50
16:34	3,522	60.0	130	4,430	134	4,631	4,667	191,991	Slickwater Proppant	16/30 White	0.75
16:40	3,534	60.3	160	4,590	166	4,795	4,210	196,201	Slickwater Proppant	16/30 White	1.00
16:51	3,345	71.3	50	4,640	52	4,779	2,190	197,491	100 Linear Gel Proppant	16/30 White	1.00
16:52	3,345	71.7	113	4,751	116	4,897	4,833	202,324	100 Linear Gel Proppant	16/30 White	1.25
16:55	3,335	71.3	168	4,919	168	5,063	8,785	211,109	100 Linear Gel Proppant	16/30 White	1.50
16:57	3,195	71.3	427	5,346	401	5,534	31,248	242,357	100 Linear Gel Proppant	16/30 White	1.75
16:63	3,030	72.6	303	5,649	311	5,845	34,248	276,605	100 Linear Gel Proppant	16/30 White	2.00
16:67	3,035	72.6	40	5,621	40	5,850	0	276,605	100 Linear Gel Clean stream		0.00
16:68	3,075	71.3	300	5,921	300	6,150	0	276,605	Slickwater Flush		0.00
16:62	3,721	57.6	57	5,978	57	6,195	0	276,605	Freshwater Flush		0.00
16:63	4,419	0.0	0	5,978	0	6,195	0	276,605	Freshwater Shutdown		0.00
Total Job Time (HH:MM): 01:27											

Min BTP:	3,074 psi	Max BTP:	3,977 psi	Average BTP:	3,709 psi	5 Min	3,075 psi
Min Rate:	10.1 bpm	Max Rate:	72.3 bpm	Average Rate:	70.2 bpm	10 Min	0 psi
Initial HHP:	4,010 psi	Initial F.G.:	1.04 psi/ft	Average HHP:	10,000	15 Min	0 psi
Final HHP:	4,010 psi	Final F.G.:	1.04 psi/ft	Customer Representative:		Jim Andrews	
FTS Representative:		Kevin Vance & Justin Gelland					

Comments:

The proppant values contained in this report are calculated based on actual barrel counts and target densities. Actual total proppant usage is 249,244 lbs. Charge time is 1 hour(s) 30 minute(s). All chemicals and proppant ran as documented.

Min/Max/Avg were taken from sand stages. All chem changes from proposed were made per AEU representative request.

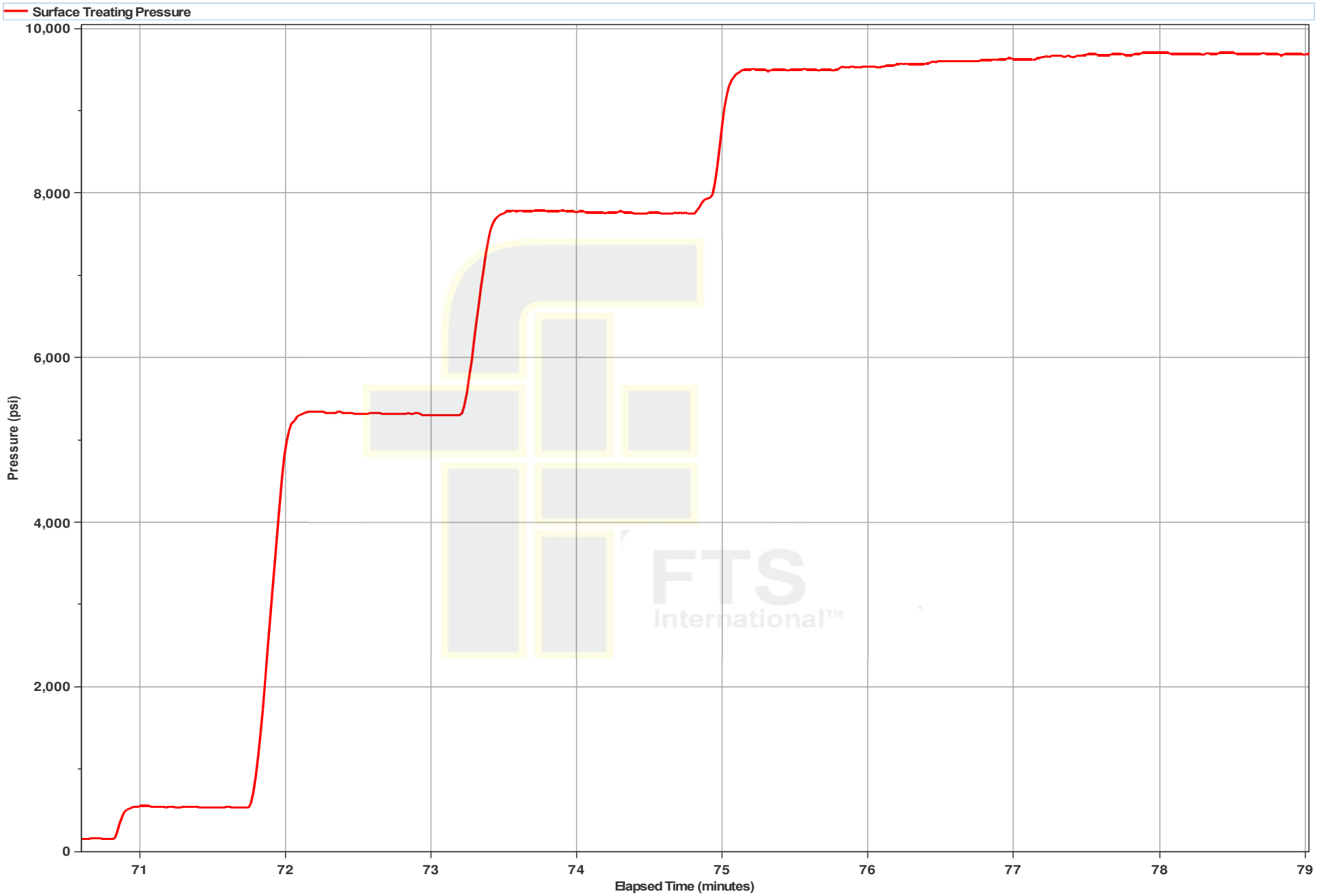
No reused pumped during this stage.

Sand was cut and a brief sweep was performed due to rising formation pressure. All sand was placed.
1 Minute Shutdown (psi): 4150
2 Minute Shutdown (psi): 4094
5 Minute Shutdown (psi): 3875

Chemical Changes:

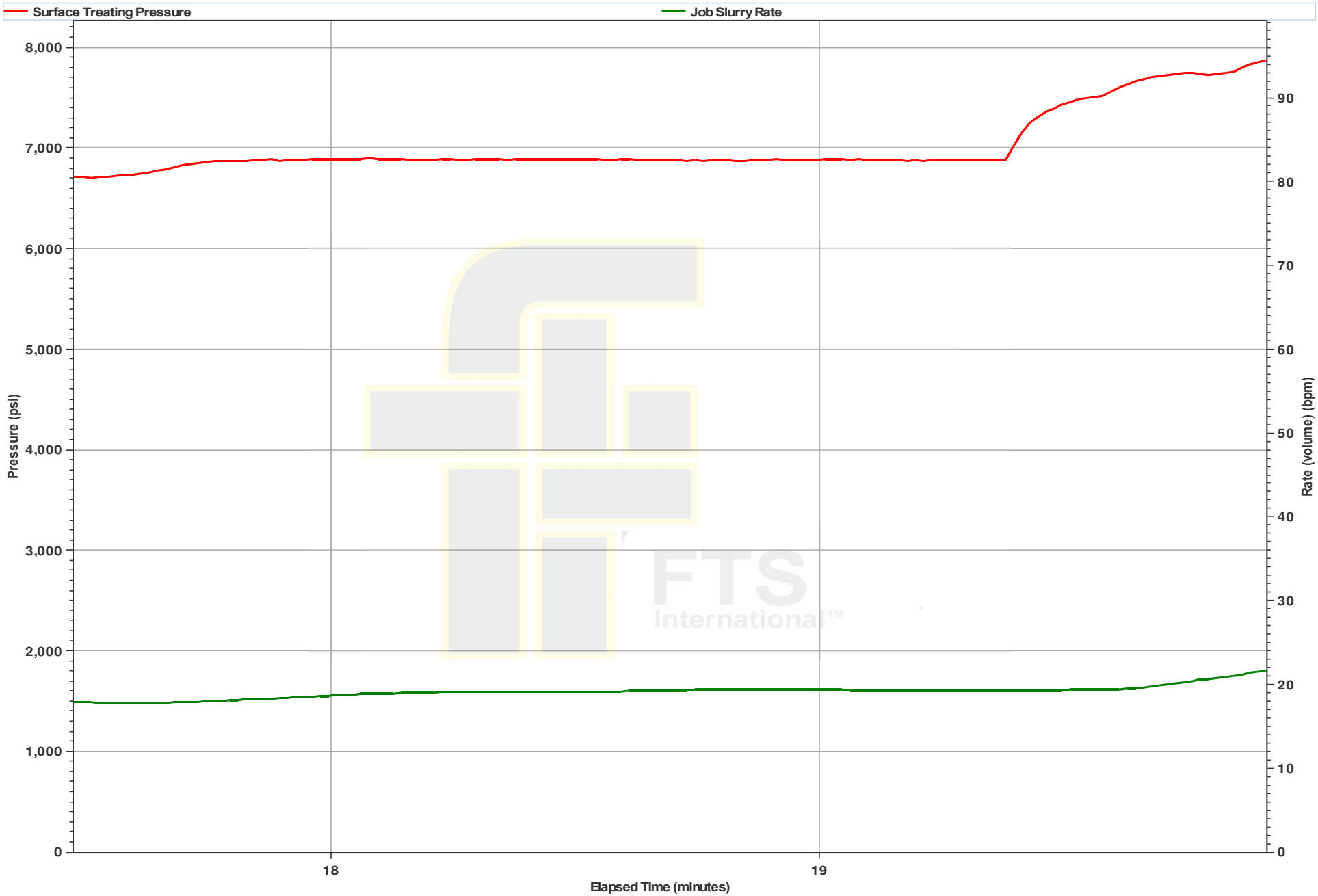
Chemical Name	Chemical Loading	Cumulative Chem
FRW-200	1.00	3,808
FRW-200	1.25	4,581

AEU Pressure Test



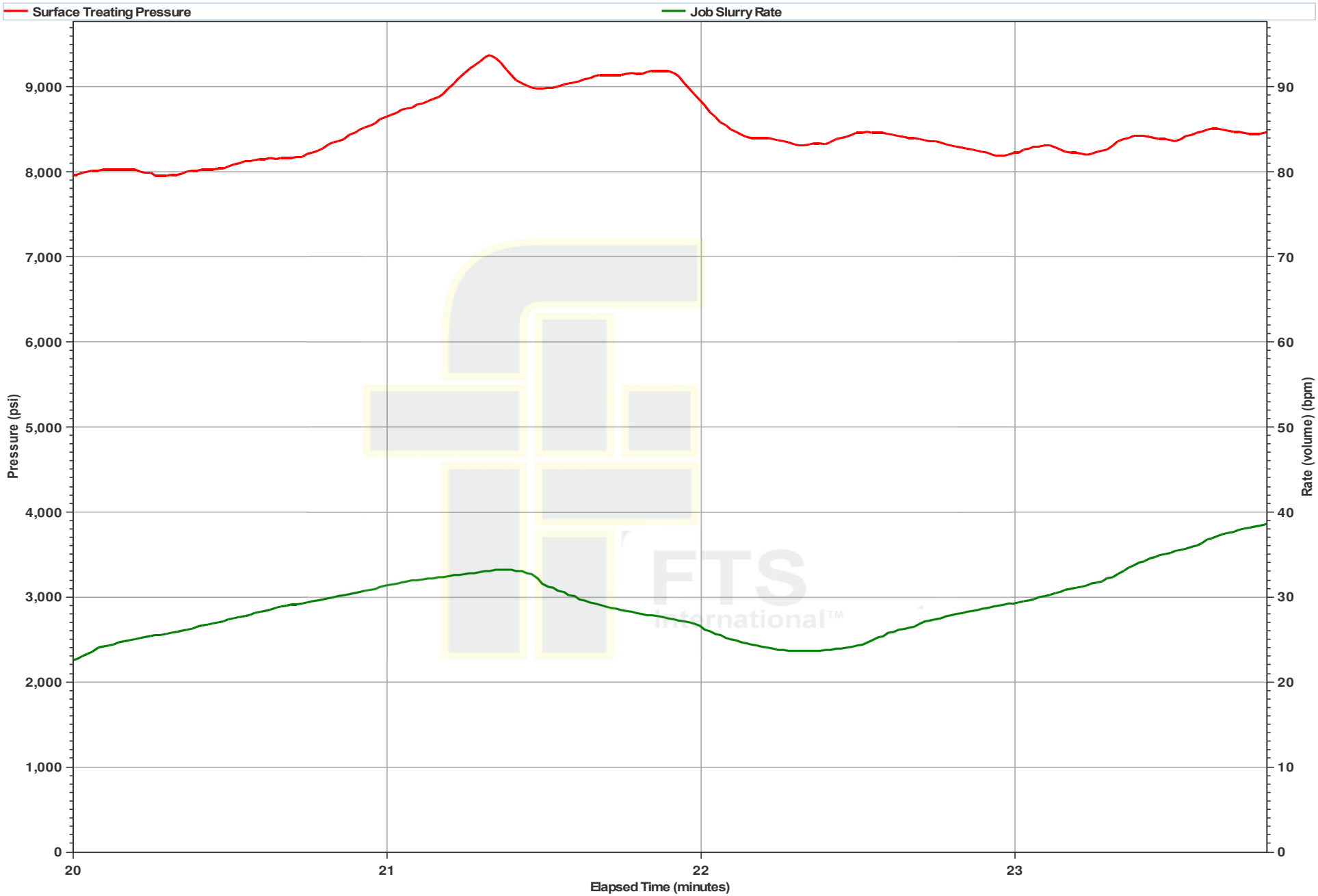
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 17 (WF.000658.M.W03.S17-ADCT-1103) Jun 18, 2015

Ball Seat and Breakdown



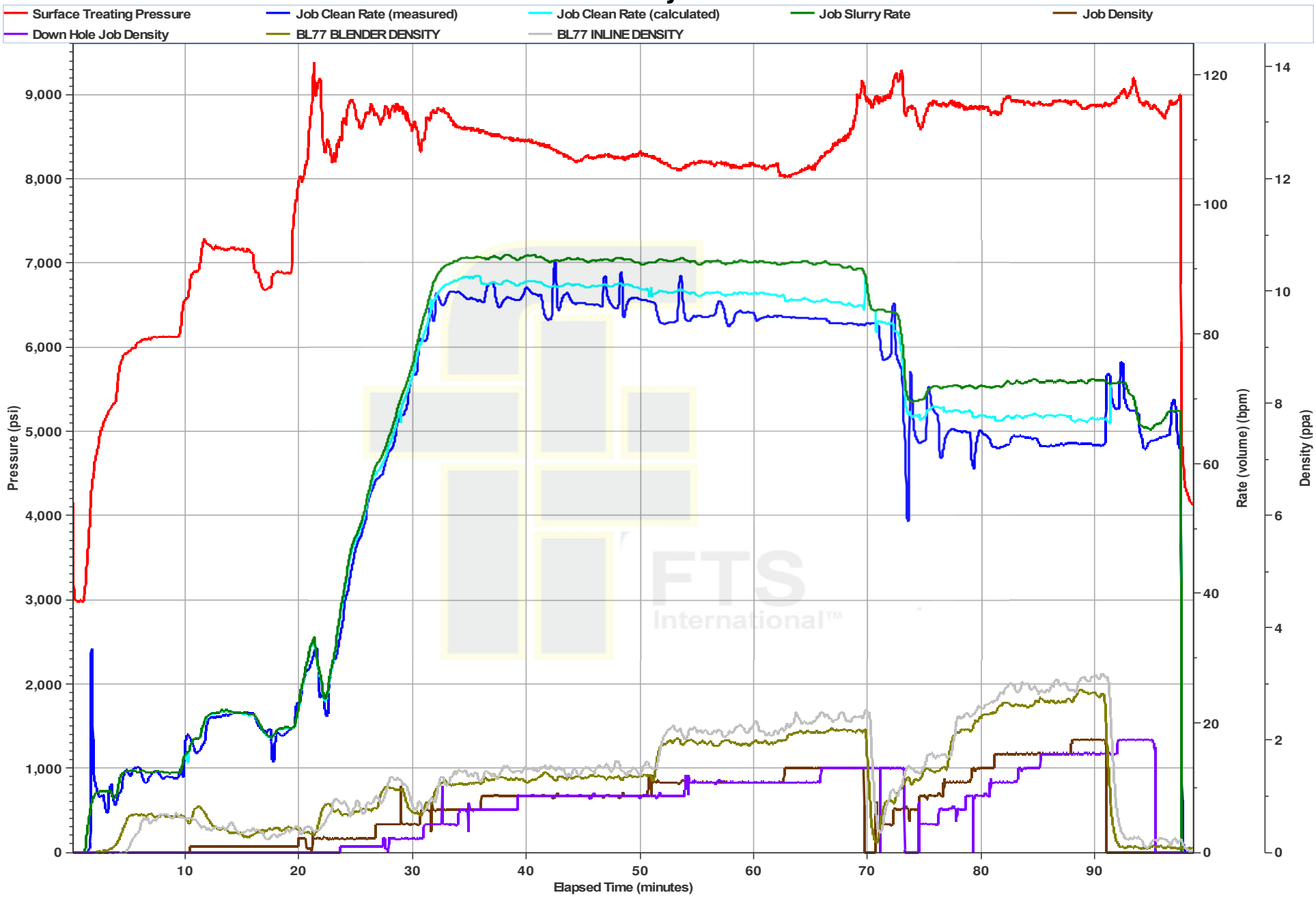
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 17 (WF.000658.M.W03.S17-ADCT-1103) **Jun 18, 2015**

Acid on Perforations



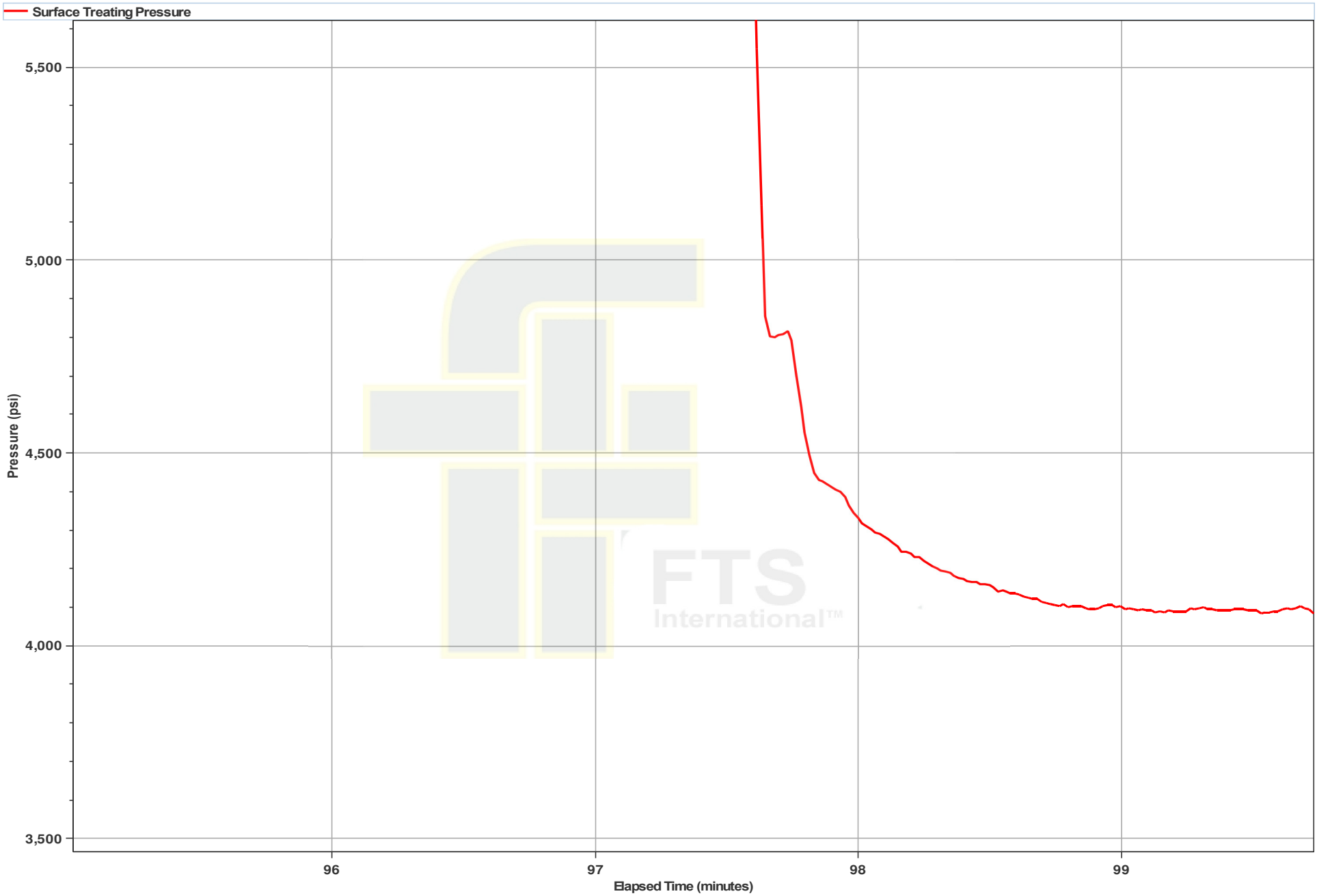
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 17 (WF.000658.M.W03.S17-ADCT-1103) **Jun 18, 2015**

Primary Plot



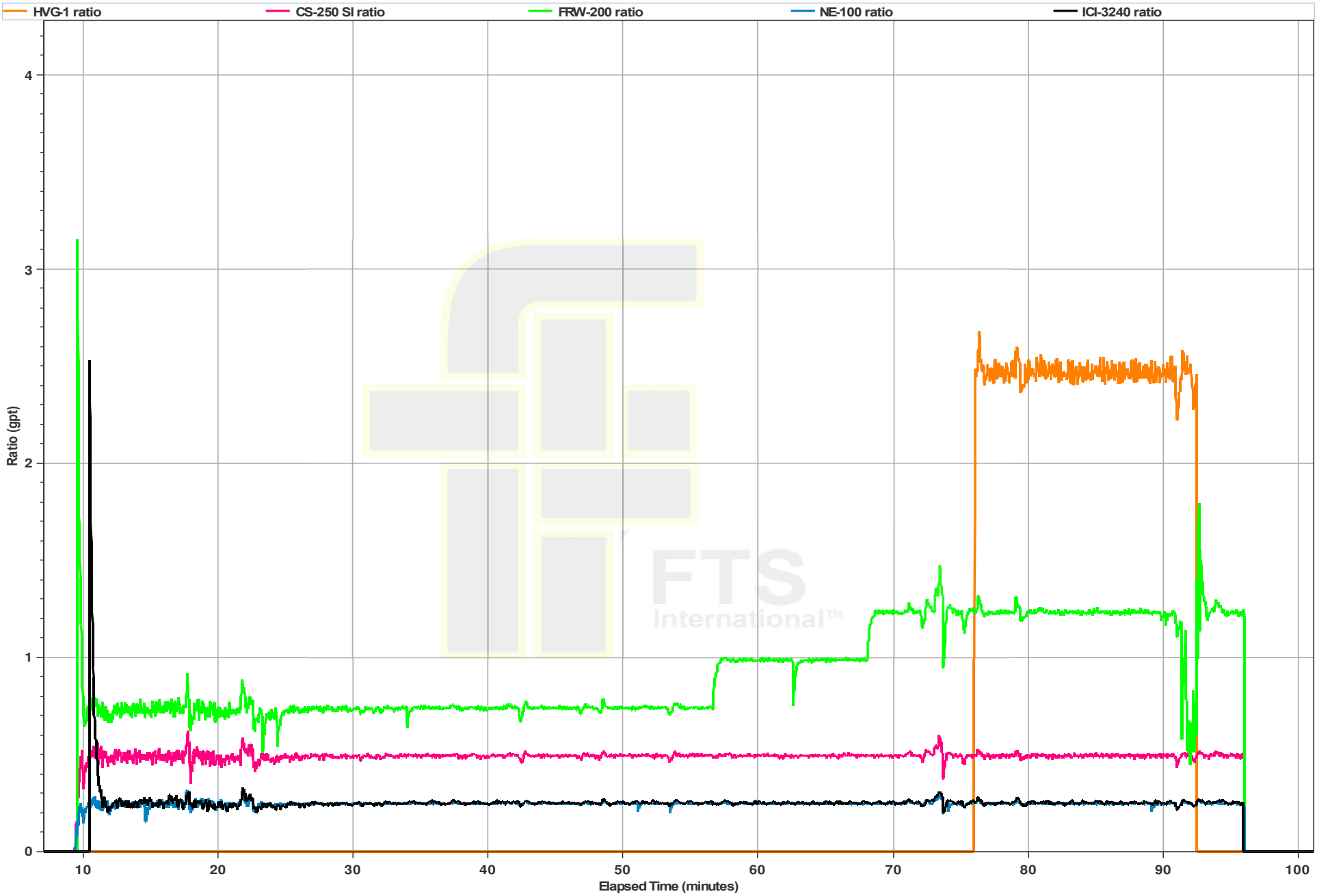
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 17 (WF.000658.M.W03.S17-ADCT-1103) **Jun 18, 2015**

ISIP Plot



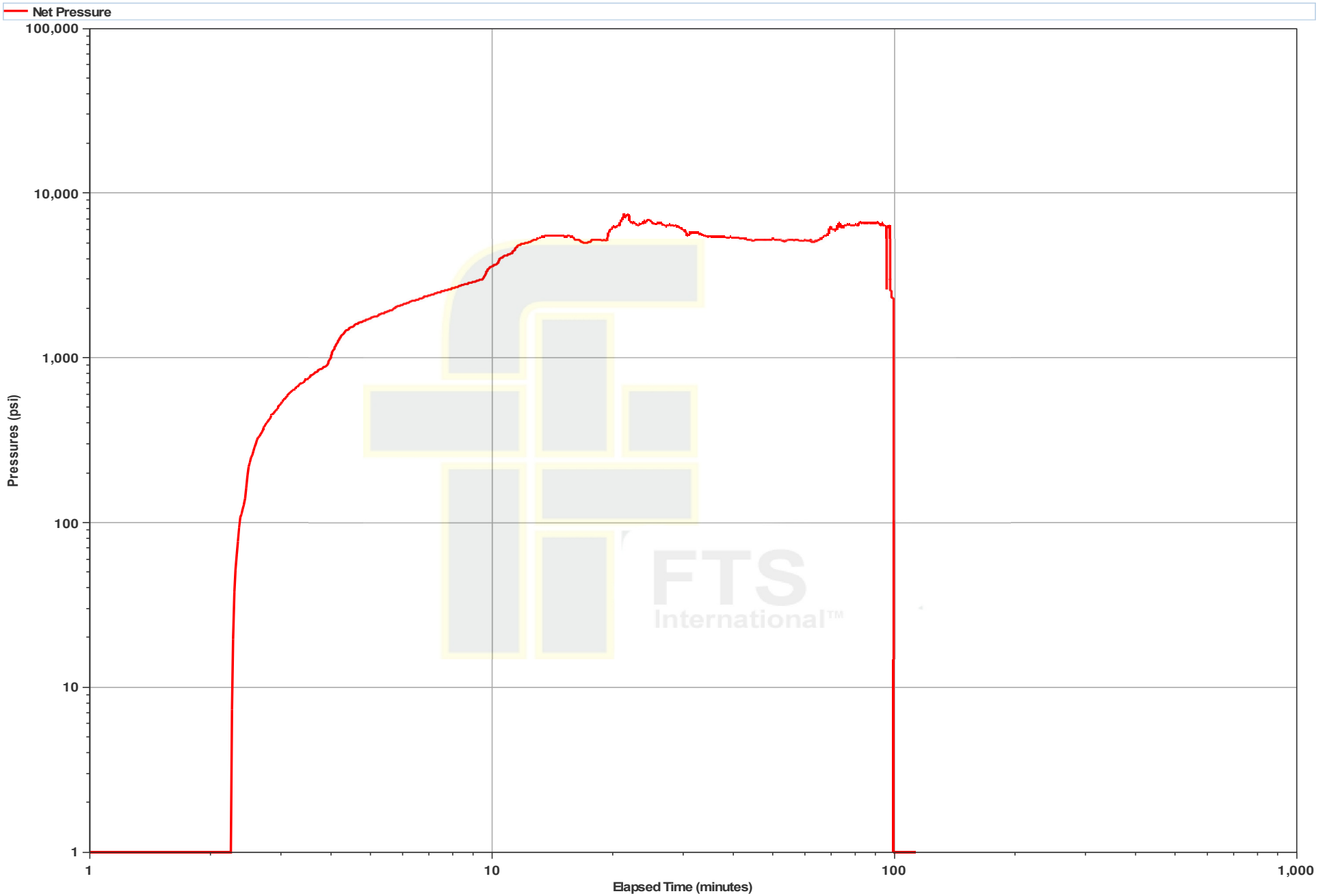
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 17 (WF.000658.M.W03.S17-ADCT-1103) **Jun 18, 2015**

Chemical Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 17 (WF.000658.M.W03.S17-ADCT-1103) **Jun 18, 2015**

Net Pressure Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 17 (WF.000658.M.W03.S17-ADCT-1103) Jun 18, 2015

WATER-BASED FRAC FLUID QUALITY CONTROL
(Attachment to Post Treatment Report)

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/18/2015
Customer Name:	American Energy - Utica	Proposal #:	3H/17
Date Sampled:	6/18/2015	Water Source:	Working Tank

Sample/Tank No.	Clarity, Color, Odor	Sample Temperature, (F)	Specific gravity	Initial pH	Chloride, ppm	Hardness, ppm	Calcium, ppm	Magnesium, ppm	Iron ppm	Hydroxide, ppm	Bicarbonate, ppm	Carbonate, ppm	Sulfate, ppm	Barium, ppm
Working Tank	Clear	76	1	8.1	40	120	32	21	1	0	98	0	60	0

Frac Fluid Quality Gel Testing (These Recording are to made prior to pumping job)														
Sample #														
Base Gel Type	HVG-1													
Gel Loading (lbs/1000 gal.)	2.5													
Sample Temperature, (F)	76													
Initial pH	8.1													
Visc. Reading @ 300 rpms	5													
Viscosity, (cp)	5													
Sample 1 3 min Hydration	4													
Sample 2 3 min Hydration	4													
Sample 3 3 min Hydration	5													
X-Link Vortex Closure, min:sec	n/a													
X-Link Crown, min:sec	n/a													
X-Link pH	n/a													
Gel Break Time (<2cp) mins	17													

Frac Fluid Quality Gel Testing (These Recording are to made while pumping job)														
Stage #														
Base Gel Viscosity (cp)														
X-Link pH								.						
Sample XL time, min:sec														
Sample Temperature														

Acid Quality	Percent Acid	NaOH, mLs	Specific Gravity
	28		1.14

Additional testing or documentation may be required by the customer or for frac fluid quality assurance.

Tested By: Etuate Varea

QUALITY CONTROL OF PROPPANTS

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/18/2015
Customer Name:	American Energy - Utica	Well/Stage:	3H/17
Date Sampled:	6/18/2015	DISTRICT:	Washington, PA
VENDOR:	SANTROL		

Select Proppant Type:

___ Brown	___ Ceramic	___ Other (specify)
X White	___ Bauxite	
___ Resin Coated	___ Texas Gold	

Sieve Analysis	100 Mesh			Sieve Analysis	30/50 Mesh		
Sample 1	24.70	grams of sample		Sample 2	24.60	grams of sample	
	Amount Retained				Amount Retained		
Sieve mesh	Gram	%		Sieve mesh	Gram	%	
			Total				Total
50	0.50	2.02	In-Size	20	0.00	0.00	In-Size
70	18.10	73.28		30	0.20	0.81	
100	4.30	17.41	98.0%	40	16.80	68.29	98.4%
120	1.00	4.05		45	6.10	24.80	
140	0.80	3.24		50	1.30	5.28	
200	0.00	0.00		70	0.20	0.81	
Pan	0.00	0.00	fines	Pan	0.00	0.00	fines
Total wt. Gram	24.70	100.00		Total wt. Gram	24.60	100.00	

Tested By: Etuate Varea

Post Job Report

AMERICAN ENERGY - UTICA

Red Hill Farm MDS GR 3H

Stage : 18 OF 54

HARRISON, OH

Operations Representative:

Name:	David Knapp
Office:	878-327-4881
Fax:	724-743-7719
Cell:	
Email:	DAVID.KNAPP@FTSI.COM

Sales Representative:

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Fax:	405-787-1235
Cell:	
Email:	BRUCE.BATTHERN@FTSI.COM

Engineering Manager:

Name:	Thaddeus Craun
Office:	817-832-8782
Fax:	724-743-7719
Cell:	
Email:	THADDEUS.CRAUN@FTSI.COM

FTS International
[illegible]
Ogden, [illegible]

FTS INTERNATIONAL

Customer: American Energy - Utica
Well: Red Hill Farm Unit 6H
Stage: 14
Job End Date: [illegible]

Job Summary

Well Information

TVD:	7,301	Top Perf:	13,127
No. Of Perfs:	30		

Casing	Tubing
[illegible]	n/A

Pressures, Rates and Volumes

	Proposed	Actual	Max	Min
STP	[illegible] psi	[illegible] psi	[illegible] psi	[illegible] psi
Rate	[illegible] bpm	[illegible] bpm	[illegible] bpm	[illegible] bpm

	Proposed	Actual		
Clean Volume	[illegible] bbls	[illegible] bbls		
Slurry Volume	[illegible] bbls	[illegible] bbls		
Flush Volume	[illegible] bbls	[illegible] bbls		

	Proposed	Start	End
Frac Pumps on Location	19	14	14

Open Well:	Start Time	[illegible]	Pressure	[illegible] psi
	Bell Dwn	[illegible] bbls	Break Down	[illegible] psi
	Initial ISIP:	[illegible] psi	Initial F.G.:	[illegible] psi/ft
Stage Complete:	End Time	[illegible]	Job Time	[illegible]
	Final ISIP	[illegible] psi	Final F.G.	[illegible] psi/ft
	ISIP	[illegible]	5 Min:	[illegible] psi
	Pressure Min:	[illegible]	10 Min:	N/A
	Pressure Max:	[illegible]	15 Min:	N/A

Material Volume

Material	Proposed	Calculated	Actual	Variance
100 Mesh White	[illegible]	[illegible]	[illegible]	0%
[illegible] White	[illegible]	[illegible]	[illegible]	0%
Total Proppants	[illegible]	[illegible]	[illegible]	0%

Material	Proposed	Calculated	Actual	Variance
6.1%-7.5% HCL	[illegible]	[illegible]	[illegible]	1%
AFR-1	6	21	21	0%
[illegible]	3	3	3	0%
[illegible]	[illegible]	[illegible]	[illegible]	2%
FE-[illegible]	15	15	15	0%
[illegible]	180	175	173	-1%
HVG-1 4.5	6	120	114	4%
[illegible]	[illegible]	[illegible]	[illegible]	2%
LTB-1	6	21	21	0%
[illegible]	6	117	114	-3%
[illegible]	[illegible]	8	8	0

Comments:

Pumpdown Information:
Total Bbls: 318
Max Pressure (psi): [illegible]
Max Rate (bpm): 19.3

FTS International
1432 Route 519
Eighty Four, PA 15330

Customer: American Energy - Utica
Well: [illegible]
Stage: 14
Job End Date: 09/15/2015

Treatment Report

Date	9/15/2015	District	Washington County, PA	Ticket No	091515_[illegible]	API#	34-059-24[illegible]

Stg. Time	STP	Slurry BPM	Stage Slurry (bbls)	Cumulative Slurry (bbls)	Stage Clean (bbls)	Cumulative Clean (bbls)	Stage Proppant (lbs)	Cumulative Proppant (lbs)	Description	Proppant	PPA
22:35	3,147	10.0	17	17	17	17	0	0	Freshwater Open Well		0.00
22:39	6,417	10.0	71	88	71	88	0	0	7.5% HCL Acid Acid		0.00
22:41	6,170	19.8	96	184	96	184	0	0	Slickwater Load		0.00
22:44	7,467	20.0	101	285	100	284	540	540	Slickwater Proppant	100 Mesh White	0.10
22:46	7,321	19.8	6	291	6	290	25	575	Slickwater Breakdown	100 Mesh White	0.10
22:49	7,600	17.3	77	368	77	366	320	895	Slickwater Proppant	100 Mesh White	0.10
22:56	8,829	57.7	215	583	217	583	2,288	3,183	Slickwater Proppant	100 Mesh White	0.25
22:59	8,902	73.6	265	848	262	845	4,578	8,632	Slickwater Proppant	100 Mesh White	0.50
23:03	8,734	80.6	430	1,278	431	1,266	13,734	22,366	Slickwater Proppant	100 Mesh White	0.75
23:07	8,728	80.6	362	1,605	408	1,707	18,282	38,848	Slickwater Proppant	100 Mesh White	1.00
23:08	8,680	80.6	22	1,587	23	1,720	604	39,570	Slickwater Proppant	100 Mesh White	1.00
23:09	8,704	80.6	675	2,482	615	2,645	39,792	79,382	Slickwater Proppant	30/50 White	1.00
23:10	8,363	80.4	430	3,382	464	3,009	33,578	89,835	Slickwater Proppant	30/50 White	1.25
23:15	8,629	81.5	570	3,482	562	3,701	36,689	128,528	Slickwater Proppant	30/50 White	1.50
23:21	8,484	81.6	562	4,414	810	4,671	53,573	162,459	Slickwater Proppant	30/50 White	1.50
23:32	8,494	81.5	964	5,400	941	5,302	60,663	223,186	15# Linear Gel Proppant	40/70 White	1.75
23:36	8,627	81.7	380	5,300	358	5,557	23,583	244,875	15# Linear Gel Proppant	40/70 White	2.00
23:38	8,647	81.5	130	5,437	130	5,686	0	244,875	15# Linear Gel Clean screen		0.00
23:44	8,910	50.3	250	5,677	250	5,946	0	244,875	Slickwater Flush		0.00
23:48	3,989	58.2	96	5,773	96	6,042	0	244,875	Freshwater Flush		0.00
23:57	4,633	0.0	0	5,773	0	6,042	0	244,875	Freshwater Shutdown		0.00
Total Job Time (HH:MM): 01:25											

Min STP:	6,375 psi	Max STP:	9,274 psi	Average STP:	8,496 psi	5 Min:	4,295 psi
Min Rate	15.0 bpm	Max Rate	82.4 bpm	Average Rate	79.9 bpm	10 Min	0 psi
Initial ISIP:	4,633 psi	Initial F.G.:	1.16 psi/ft	Average HHP:	16,892	15 Min:	0 psi
Final ISIP:	4,633 psi	Final F.G.:	1.16 psi/ft	Customer Representative		Eric Burns	
FTS Representative		Travis Wilson & William Mabe					

Comments:

The proppant values contained in this report are calculated based on actual barrel counts and target densities. Actual total proppant usage is 249,675 lbs. Charge time is 1 hour(s) 26 minute(s). All chemicals and proppant run as documented.

Min/Max/Avg were taken from sand stages. All chem changes from proposed were made per AEU representative request.

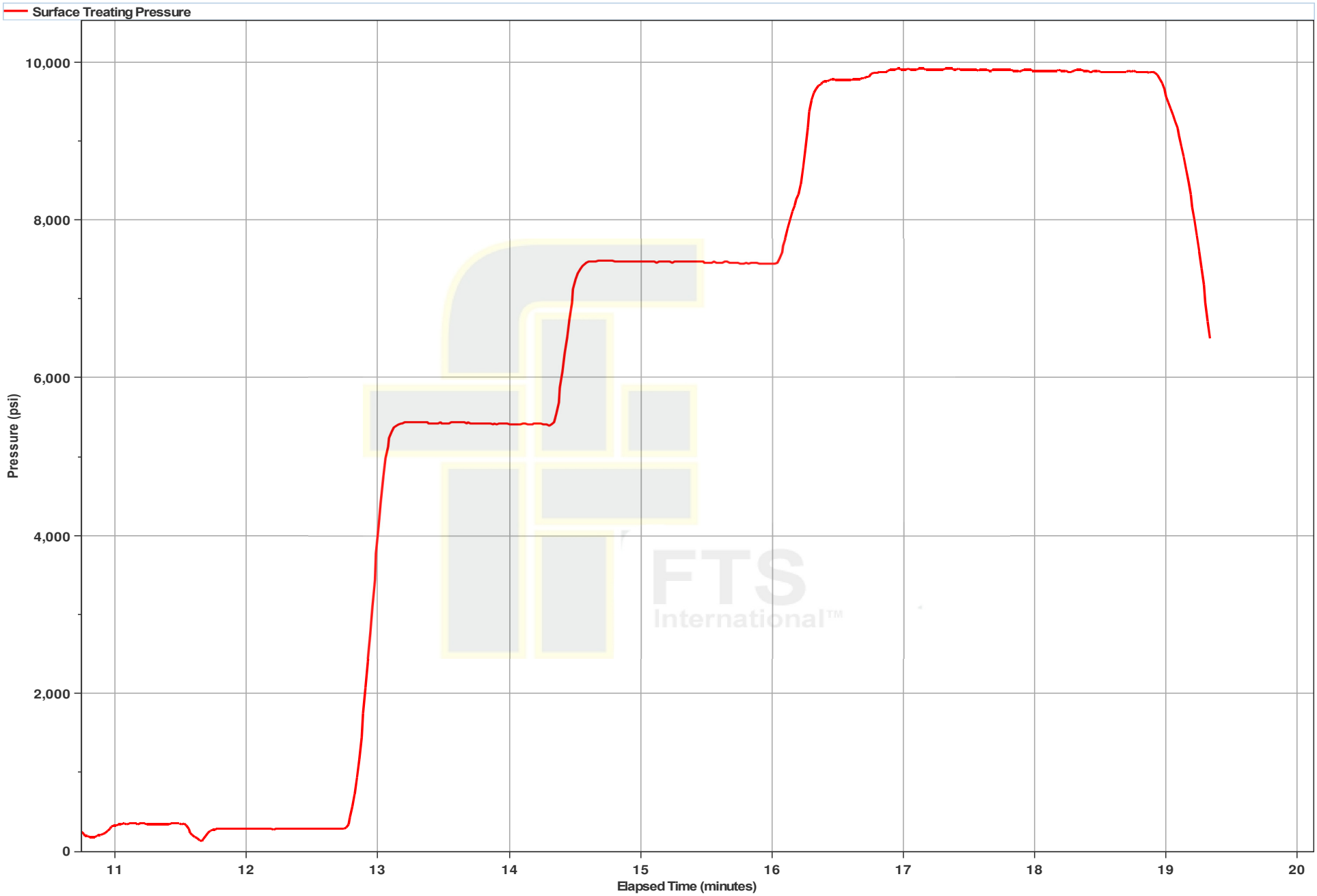
No reuse water was run on this stage.

1 Minute Shutdown (psi): 4589
2 Minute Shutdown (psi): 4411
5 Minute Shutdown (psi): 4366

Chemical Changes:

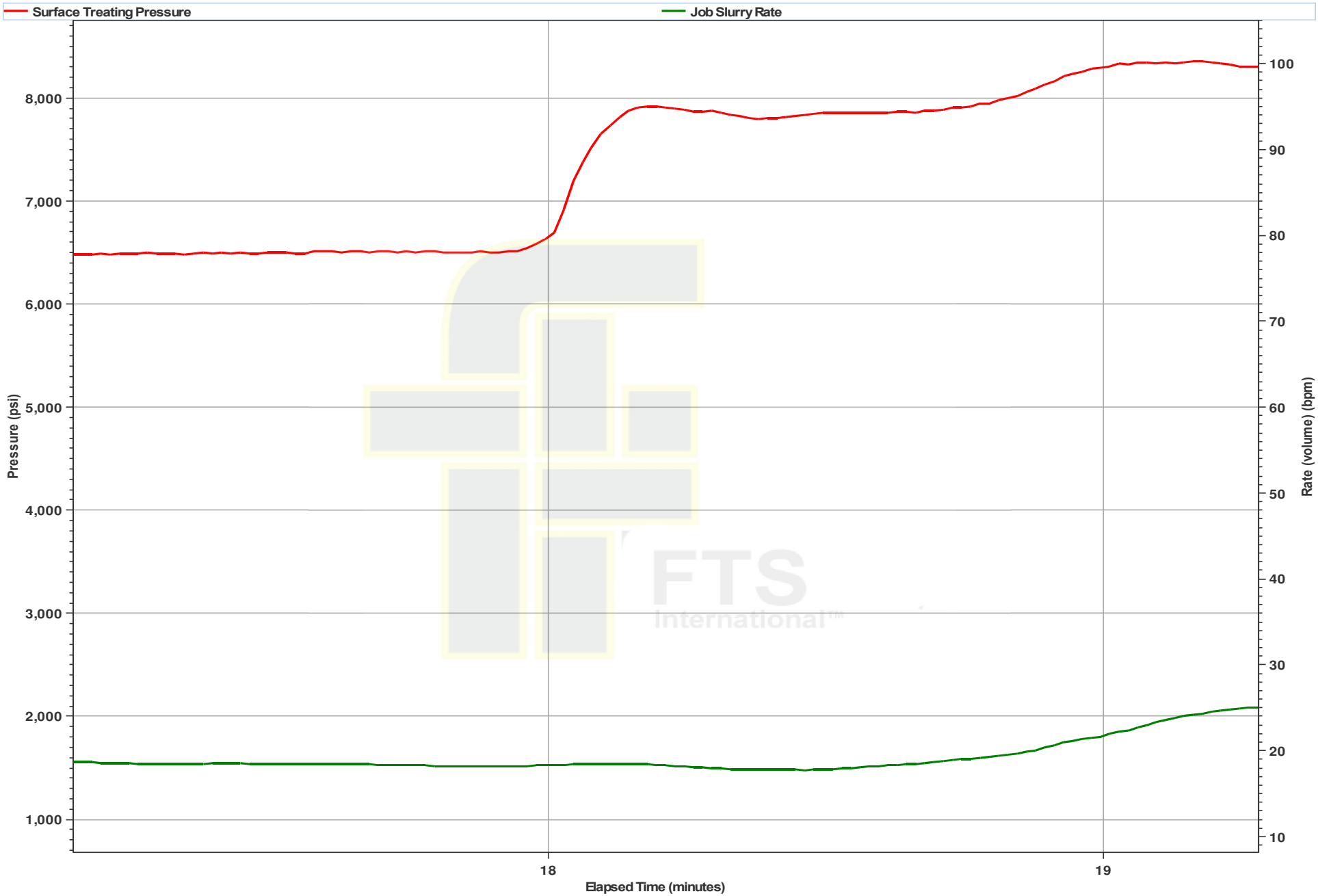
Chemical Name	Chemical Loading	Cumulative Given
FRW-200	0.75	1,667
FRW-200	1.00	3,582
FRW-200	0.75	5,008

AEU Pressure Test



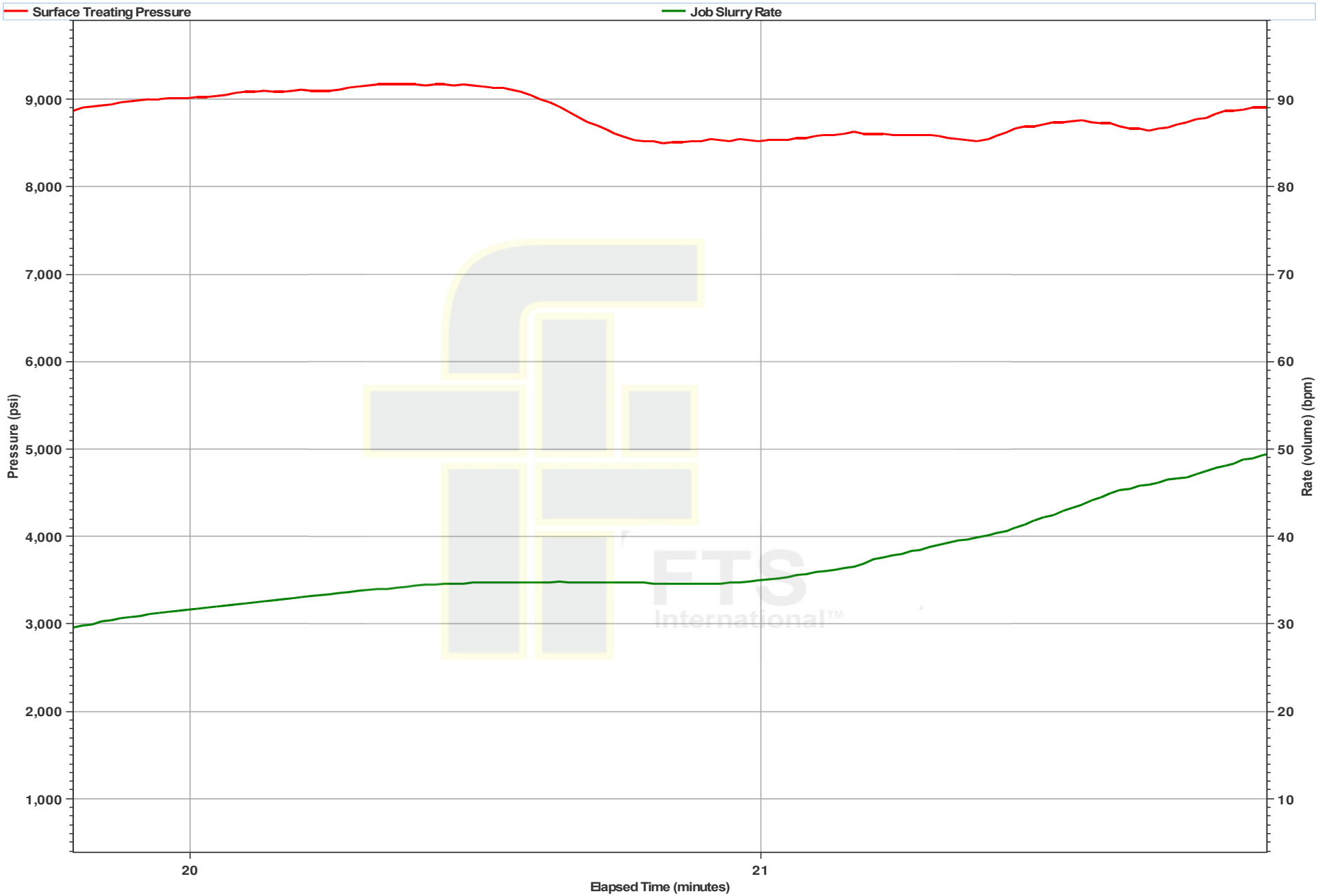
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 18 (WF.000658.M.W03.S18-ADCT-1103) **Jun 18, 2015**

Ball Seat and Breakdown



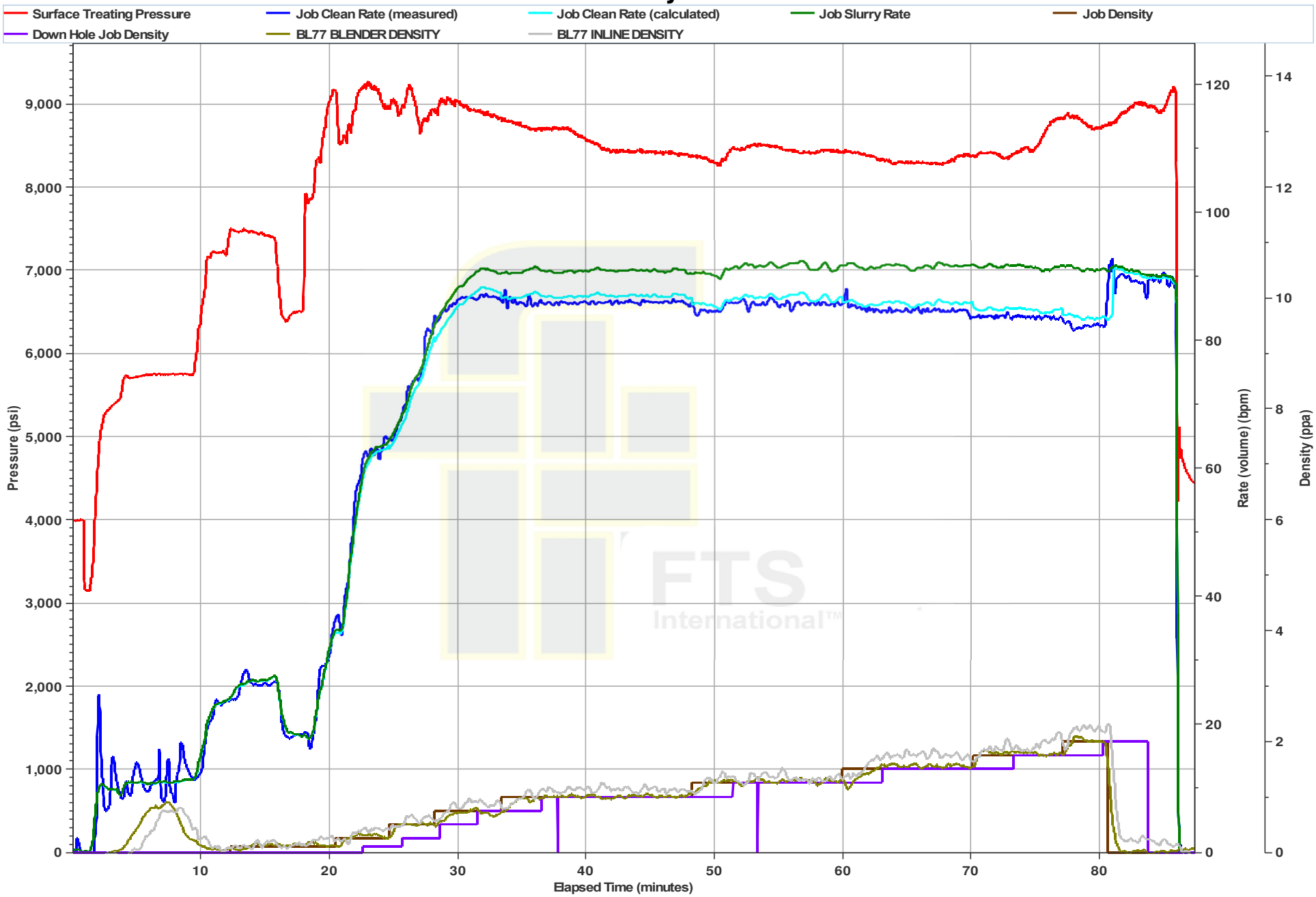
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 18 (WF.000658.M.W03.S18-ADCT-1103) **Jun 18, 2015**

Acid on Perforations



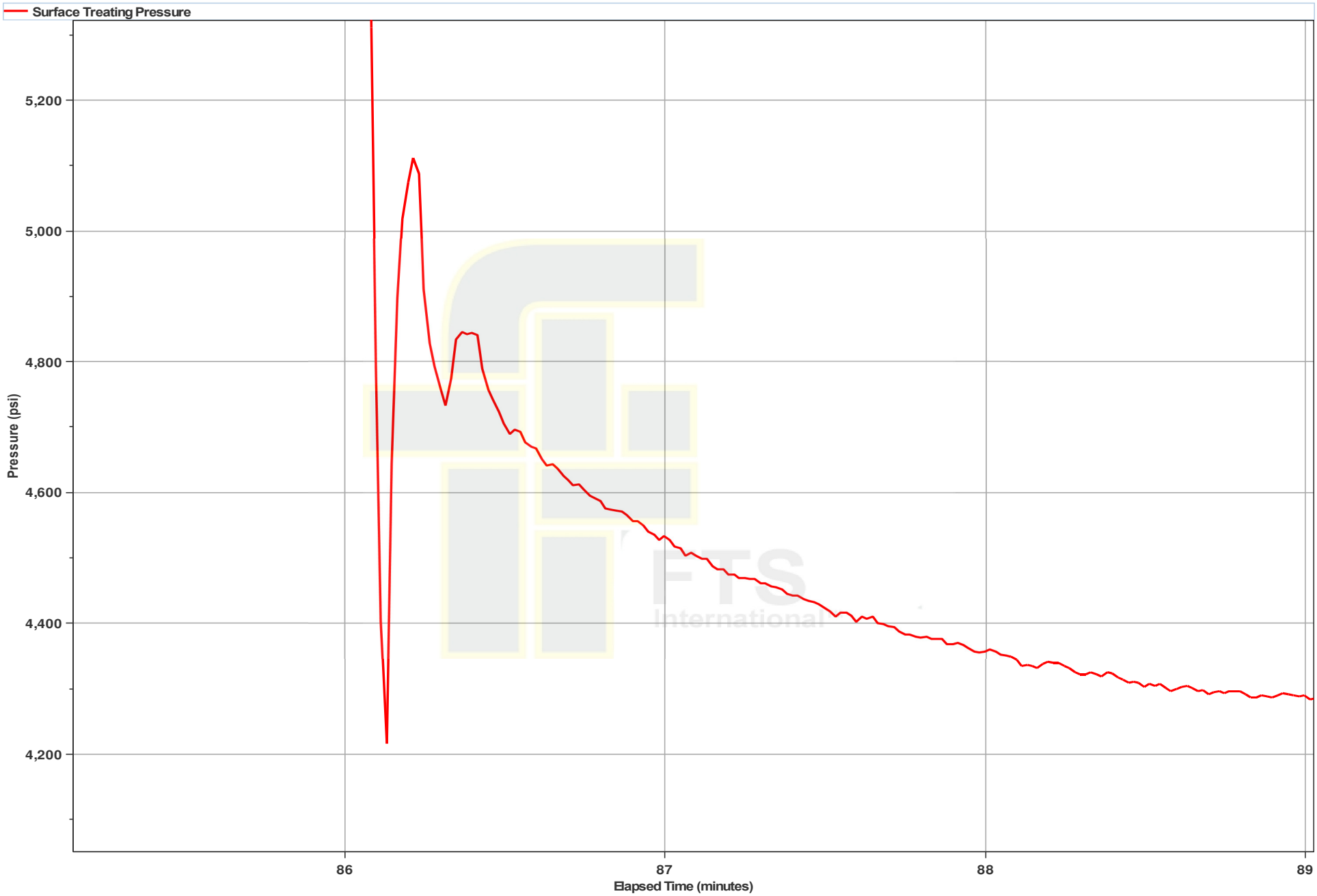
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 18 (WF.000658.M.W03.S18-ADCT-1103) **Jun 18, 2015**

Primary Plot



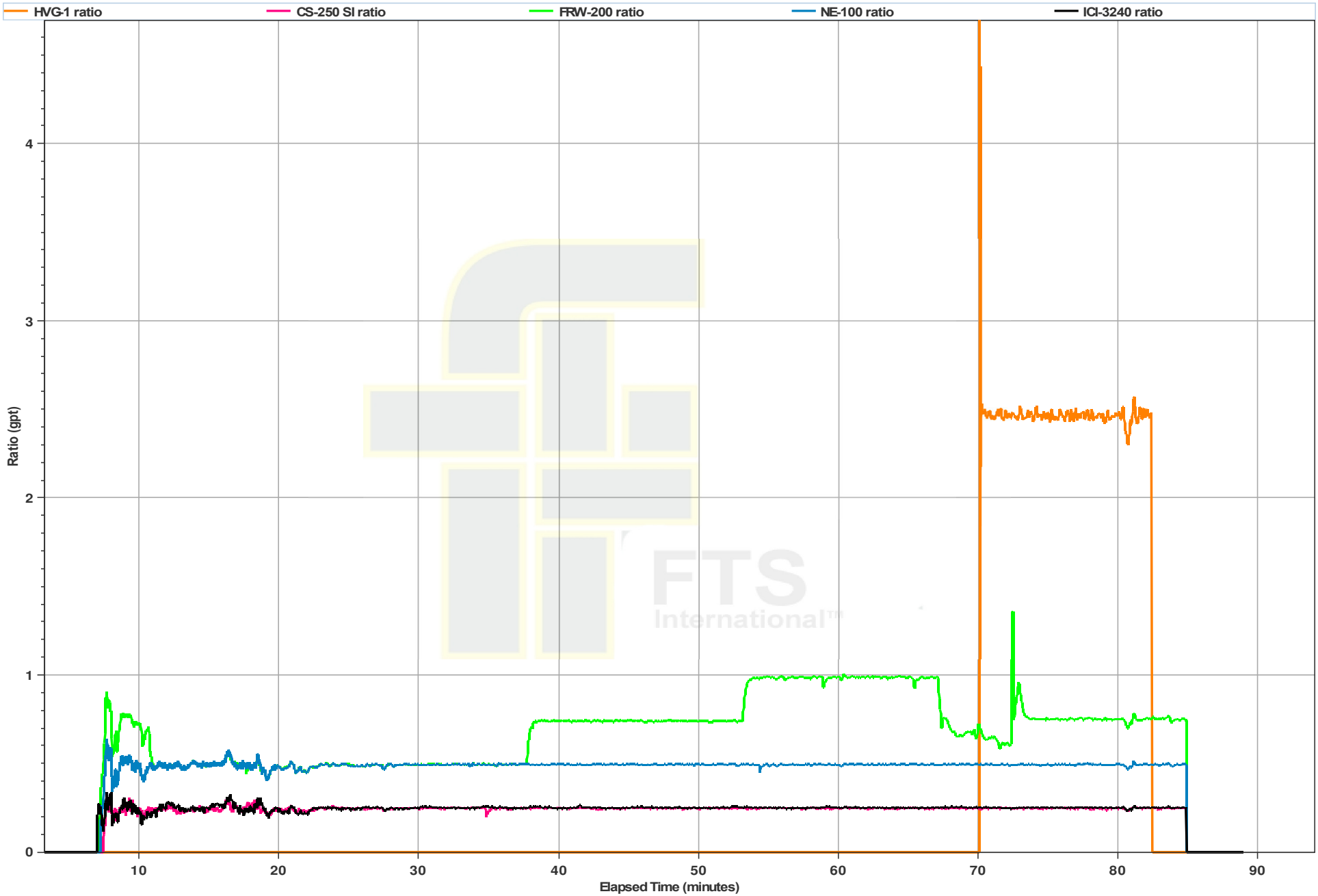
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 18 (WF.000658.M.W03.S18-ADCT-1103) **Jun 18, 2015**

ISIP Plot



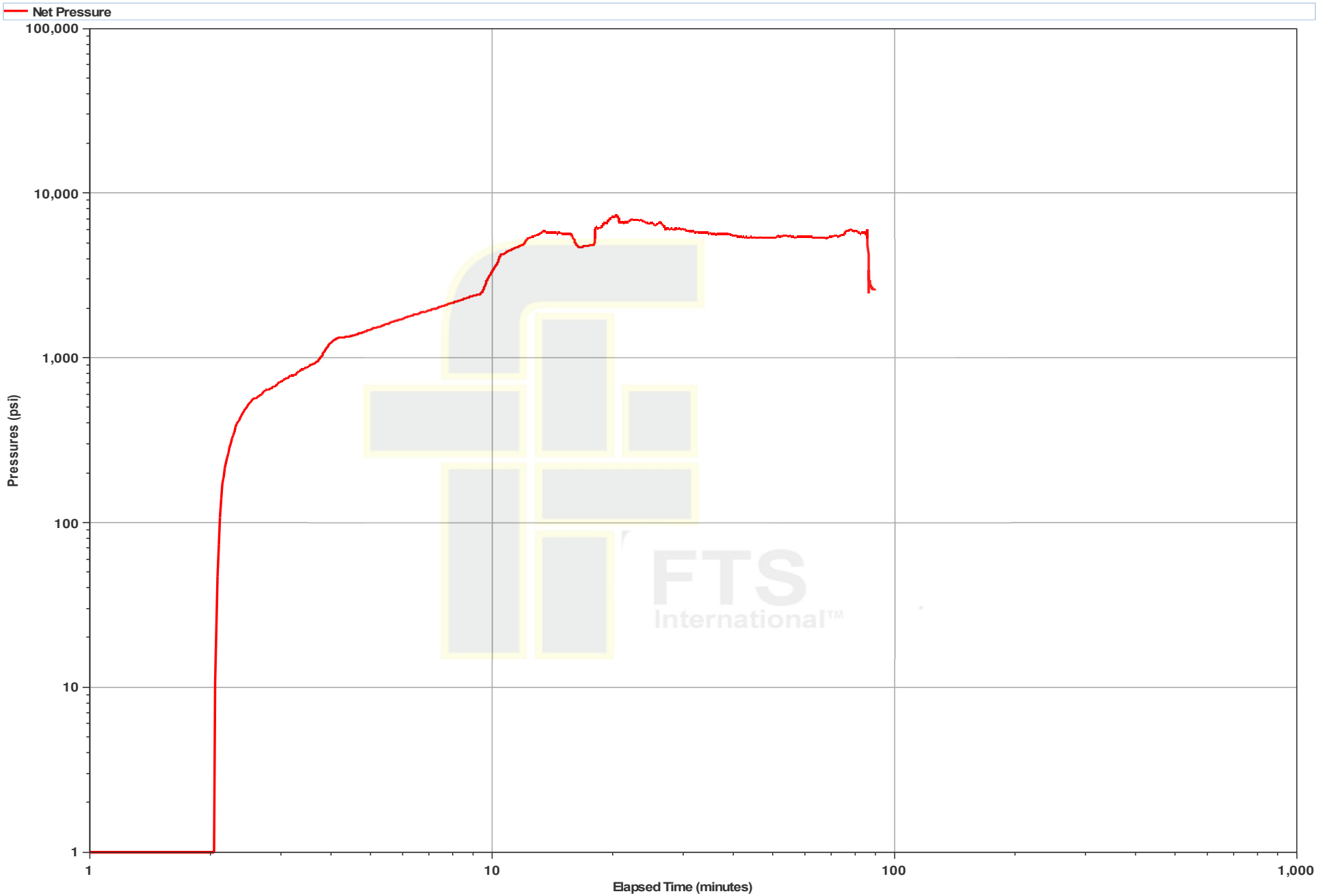
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 18 (WF.000658.M.W03.S18-ADCT-1103) **Jun 18, 2015**

Chemical Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 18 (WF.000658.M.W03.S18-ADCT-1103) **Jun 18, 2015**

Net Pressure Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 18 (WF.000658.M.W03.S18-ADCT-1103) Jun 18, 2015

WATER-BASED FRAC FLUID QUALITY CONTROL
(Attachment to Post Treatment Report)

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/19/2015
Customer Name:	American Energy - Utica	Proposal #:	3H/18
Date Sampled:	6/19/2015	Water Source:	Working Tank

Sample/Tank No.	Clarity, Color, Odor	Sample Temperature, (F)	Specific gravity	Initial pH	Chloride, ppm	Hardness, ppm	Calcium, ppm	Magnesium, ppm	Iron ppm	Hydroxide, ppm	Bicarbonate, ppm	Carbonate, ppm	Sulfate, ppm	Barium, ppm
Working Tank	Clear	74	1	8.1	40	80	28	13	0	0	98	0	50	0

Frac Fluid Quality Gel Testing (These Recording are to made prior to pumping job)														
Sample #														
Base Gel Type	HVG-1													
Gel Loading (lbs/1000 gal.)	2.5													
Sample Temperature, (F)	74													
Initial pH	8.1													
Visc. Reading @ 300 rpms	6													
Viscosity, (cp)	6													
Sample 1 3 min Hydration	4													
Sample 2 3 min Hydration	4													
Sample 3 3 min Hydration	6.5													
X-Link Vortex Closure, min:sec	n/a													
X-Link Crown, min:sec	n/a													
X-Link pH	n/a													
Gel Break Time (<2cp) mins	19													

Frac Fluid Quality Gel Testing (These Recording are to made while pumping job)														
Stage #														
Base Gel Viscosity (cp)														
X-Link pH								.						
Sample XL time, min:sec														
Sample Temperature														

Acid Quality	Percent Acid	NaOH, mLs	Specific Gravity
	28		1.14

Additional testing or documentation may be required by the customer or for frac fluid quality assurance.

Tested By: Travis Wilson

QUALITY CONTROL OF PROPPANTS

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/19/2015
Customer Name:	American Energy - Utica	Well/Stage:	3H/18
Date Sampled:	6/19/2015	DISTRICT:	Washington, PA
VENDOR:	SANTROL		

Select Proppant Type:

___ Brown	___ Ceramic	___ Other (specify)
X White	___ Bauxite	
___ Resin Coated	___ Texas Gold	

Sieve Analysis	100 Mesh			Sieve Analysis	30/50 Mesh		
Sample 1	24.80	grams of sample		Sample 2	24.80	grams of sample	
	Amount Retained				Amount Retained		
Sieve mesh	Gram	%		Sieve mesh	Gram	%	
			Total				Total
50	0.30	1.21	In-Size	20	0.00	0.00	In-Size
70	18.10	72.98		30	0.50	2.02	
100	4.50	18.15	98.8%	40	18.40	74.19	96.0%
120	0.90	3.63		45	4.50	18.15	
140	0.70	2.82		50	0.90	3.63	
200	0.30	1.21		70	0.50	2.02	
Pan	0.00	0.00	fines	Pan	0.00	0.00	fines
Total wt. Gram	24.80	100.00		Total wt. Gram	24.80	100.00	

Tested By: Travis Wilson

Post Job Report

AMERICAN ENERGY - UTICA

Red Hill Farm MDS GR 3H

Stage : 19 OF 54

HARRISON, OH

Operations Representative:

Name:	**David Knapp**
Office:	**570-327-4881**
Fax:	**724-743-7719**
Cell:	
Email:	**DAVID.KNAPP@FTSI.COM**

Sales Representative:

Name:	**Bruce Matthews**
Office:	**405-574-3981**
Fax:	**405-767-1288**
Cell:	
Email:	**BRUCE.MATTHEWS@FTSI.COM**

Engineering Manager:

Name:	**Thaddeus Craun**
Office:	**817-682-8702**
Fax:	**724-743-7719**
Cell:	
Email:	**THADDEUS.CRAUN@FTSI.COM**

Job Summary

Well Information

TVD:	7,301	**Top Perf:**	12,975
No. Of Perfs:	30		

Casing	Tubing
5.50" 20.00#	N/A

Pressures, Rates and Volumes

	Proposed	Actual	Max	Min
STP	9,046 psi	8,646 psi	9,039 psi	7,107 psi
Rate	80.0 bpm	80.2 bpm	93.9 bpm	22.5 bpm

	Proposed	Actual		
Clean Volume	5,772 bbls	5,733 bbls		
Slurry Volume	6,042 bbls	6,004 bbls		
Flush Volume	357 bbls	293 bbls		

	Proposed	Start	End
Frac Pumps on Location	10	15	15

Open Well:	Start Time	05:39	Pressure	3,202 psi
	Ball Seat	268 bbls	Break Down	8,413 psi
	Initial ISIP:	4,792 psi	Initial F.G.:	1.09 psi/ft
Stage Complete:	End Time	07:10	Job Time	01:30
	Final ISIP	4,792 psi	Final F.G.	1.09 psi/ft
	HHP	16,995	5 Min:	4,228 psi
	Proppant Min:	0.00	10 Min:	N/A
	Proppant Max:	2.00	15 Min:	N/A

Material Volume

Material	Proposed	Calculated	Actual	Variance
100 Mesh White	40,000	39,559	39,559	0%
30/50 White	210,000	209,875	209,875	0%
Total Proppants	250,000	249,434	249,434	0%

Material	Proposed	Calculated	Actual	Variance
0.1%-7.5% HCL	3,000	2,982	3,000	1%
APB-1	0	32	32	0%
CI-150	3	3	3	0%
CS-250 SI	60	58	58	0%
FE-200L	15	15	15	0%
FRW-200	180	204	205	0%
HVG-1 4.0	0	104	104	0%
ICI-3240	60	58	58	0%
LTB-1	0	32	32	0%
NE-100	0	115	115	0%
NE-100W	120	0	0	0

Comments:

Pumpdown Information:
Total Bbls: 243
Max Pressure (psi): 5885
Max Rate (bpm): 15.1

Gel Discounted during the 1.5ppg stage due to FR chemical pump issue

FTS International
1432 Route 519
Eighty Four, PA 15330

Customer: American Energy - Utica
Well: Red Hill Farm Mds Gr 3H
Stage: 19
Job End Date: 06/19/2015

Treatment Report

Date:	6/19/2015	District:	Washington County,PA	Quote No:	051815_035725QF	API:	34-059-24370

MIL Time	STP	Slurry BPM	Stage Clean (bbls)	Cumulative Clean (bbls)	Stage Slurry (bbls)	Cumulative Slurry (bbls)	Stage Proppant (lbs)	Cumulative Proppant (lbs)	Description	Proppant	PPA
05:39	3,202	0.0	0	0	0	0	0	0	Freshwater Open Well		0.00
05:44	5,087	8.7	13	13	13	13	0	0	Freshwater Load		0.00
05:47	5,144	9.3	71	84	71	84	0	0	7.5% HCL Acid Acid		0.00
05:52	7,609	22.3	21	105	21	105	0	0	Slickwater Load		0.00
05:54	7,706	27.6	163	268	164	269	685	685	Slickwater Proppant	100 Mesh White	0.10
05:59	8,413	22.4	0	268	0	269	0	685	Slickwater Breakdown		0.00
06:00	8,272	22.6	68	336	68	337	286	971	Slickwater Proppant	100 Mesh White	0.10
06:03	8,297	42.2	222	558	225	562	2,331	3,302	Slickwater Proppant	100 Mesh White	0.25
06:07	8,790	64.7	255	813	261	823	5,355	8,657	Slickwater Proppant	100 Mesh White	0.50
06:10	8,725	0.0	429	1,242	444	1,267	13,514	22,171	Slickwater Proppant	100 Mesh White	0.75
06:18	8,641	84.7	414	1,656	433	1,700	17,388	39,559	Slickwater Proppant	100 Mesh White	1.00
06:25	8,650	91.7	887	2,543	927	2,627	37,254	76,813	Slickwater Proppant	30/50 White	1.00
06:33	8,644	93.7	999	3,542	1,056	3,683	52,448	129,261	Slickwater Proppant	30/50 White	1.25
06:44	8,593	91.0	220	3,762	235	3,918	13,860	143,121	Slickwater Proppant	30/50 White	1.50
06:51	8,801	92.9	450	4,212	481	4,399	28,350	171,471	10# Linear Gel Proppant	30/50 White	1.50
06:57	8,725	93.0	331	4,543	353	4,752	20,853	192,324	5# Linear Gel Proppant	30/50 White	1.50
06:58	8,667	93.5	537	5,080	580	5,332	39,470	231,794	5# Linear Gel Proppant	30/50 White	1.75
07:03	8,569	88.8	210	5,290	229	5,561	17,640	249,434	5# Linear Gel Proppant	30/50 White	2.00
07:05	8,515	89.6	150	5,440	150	5,711	0	249,434	Slickwater Clean screws		0.00
07:07	8,784	89.8	130	5,570	130	5,841	0	249,434	Slickwater Flush		0.00
07:09	8,580	90.0	163	5,733	163	6,004	0	249,434	Freshwater Flush		0.00
07:10	4,792	0.0	0	5,733	0	6,004	0	249,434	Freshwater Shutdown		0.00
Total JobTime (HH:MM): 01:30											

Min STP:	7,107 psi	**Max STP:**	9,039 psi	**Average STP:**	8,646 psi	**5 Min:**	4,228 psi
Min Rate:	22.5 bpm	**Max Rate:**	93.9 bpm	**Average Rate:**	80.2 bpm	**10 Min:**	0 psi
Initial ISIP:	4,792 psi	**Initial F.G.:**	1.09 psi/ft	**Average HHP:**	16,995	**15 Min:**	0 psi
Final ISIP:	4,792 psi	**Final F.G.:**	1.09 psi/ft	**Customer Representative:**		Malcolm Tranhan	
FTSI Representative:		Etuate Varea & James Garland					

Comments:

The proppant values contained in this report are calculated based on actual barrel counts and target densities. Actual total proppant usage is 249,434 lbs. Charge time is 1 hour(s) 30 minute(s). All chemicals and proppant ran as documented.

Min/Max/Avg were taken from sand stages. All chem changes from proposed were made per AEU representative request.

FR Chemical Pump issues during the 1.5ppg of 30/50.
Started a 10# linear Gel system until FR pump issue was resolved.

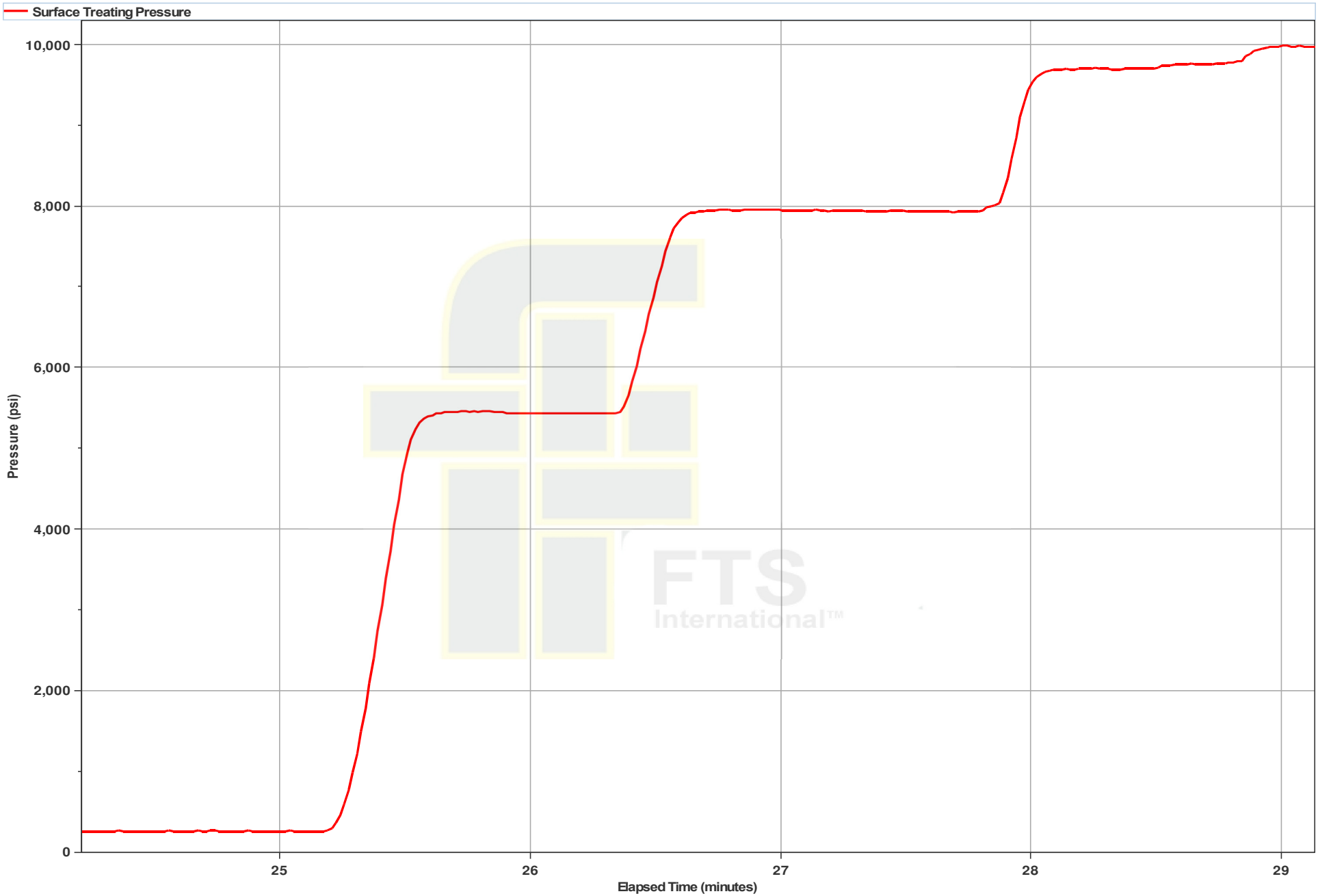
Reuse water was run on this stage for a total of 120 Bbls.

1 Minute Shutdown (psi): 4574
2 Minute Shutdown (psi): 4382
5 Minute Shutdown (psi): 4228

Chemical Changes:

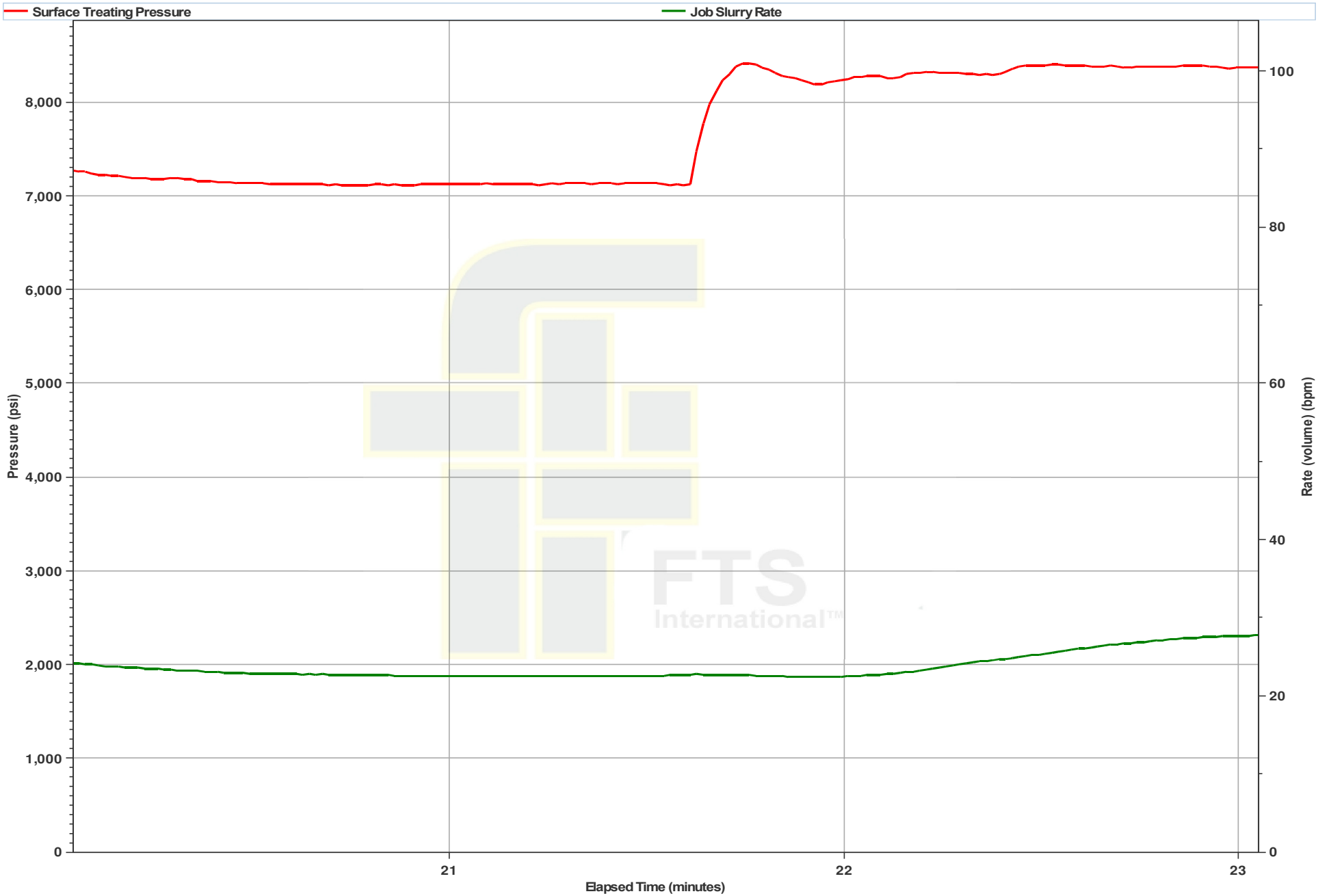
Chemical Name	Chemical Loading	Cumulative Clean
FRW-200	1.00	3,542

AEU Pressure Test



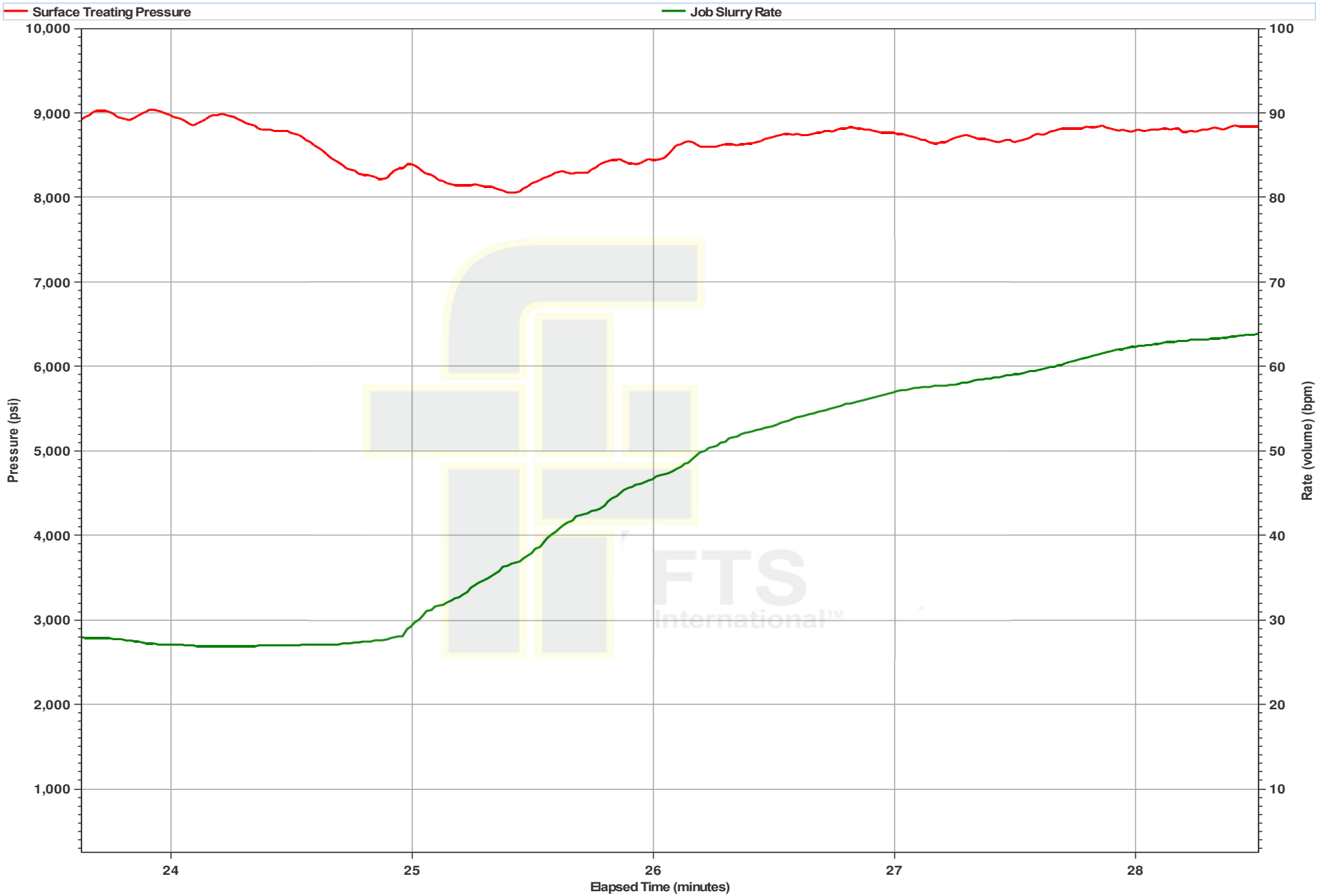
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 19 (WF.000658.M.W03.S19-ADCT-1103) Jun 19, 2015

Ball Seat and Breakdown



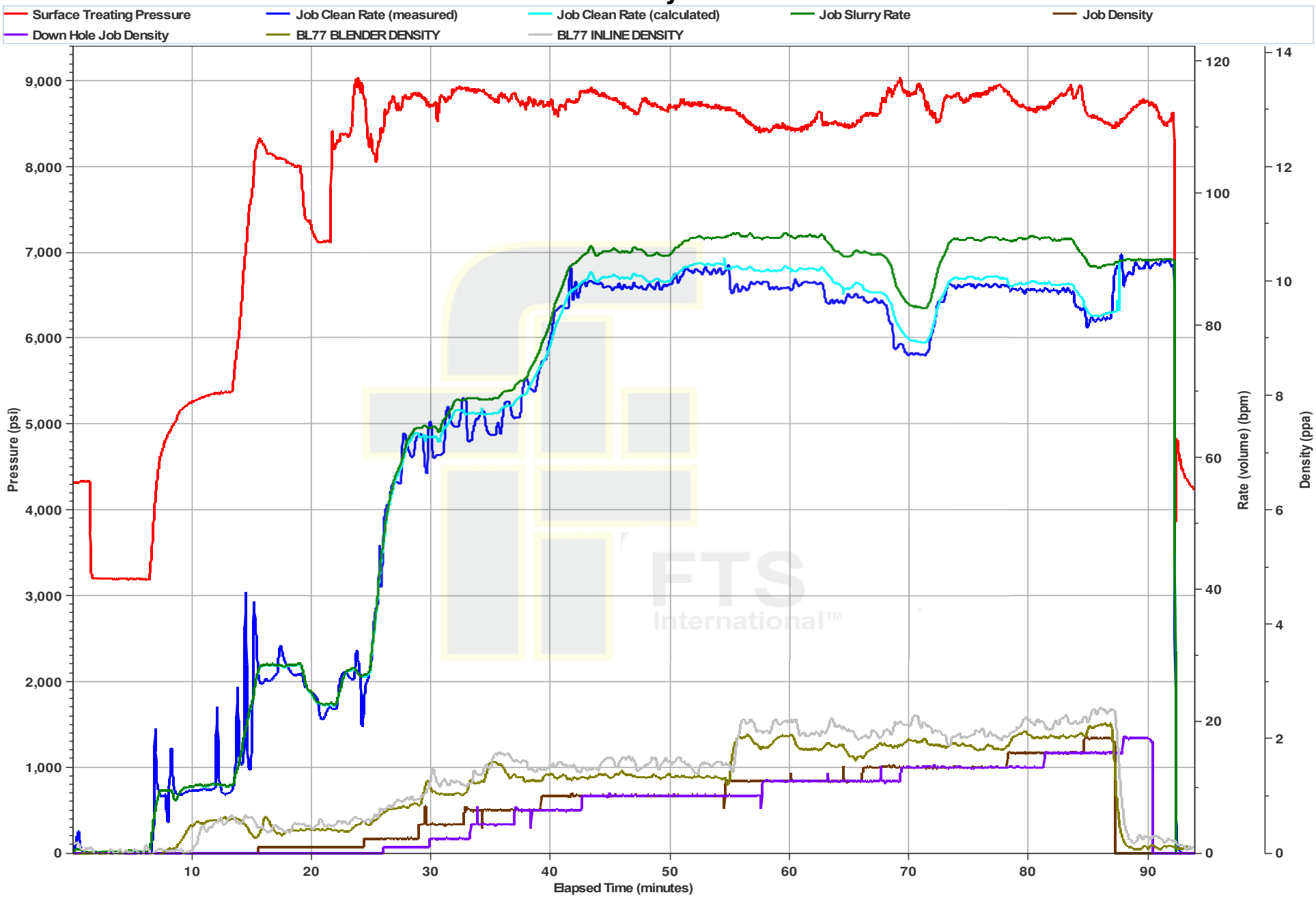
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 19 (WF.000658.M.W03.S19-ADCT-1103) **Jun 19, 2015**

Acid on Perforations



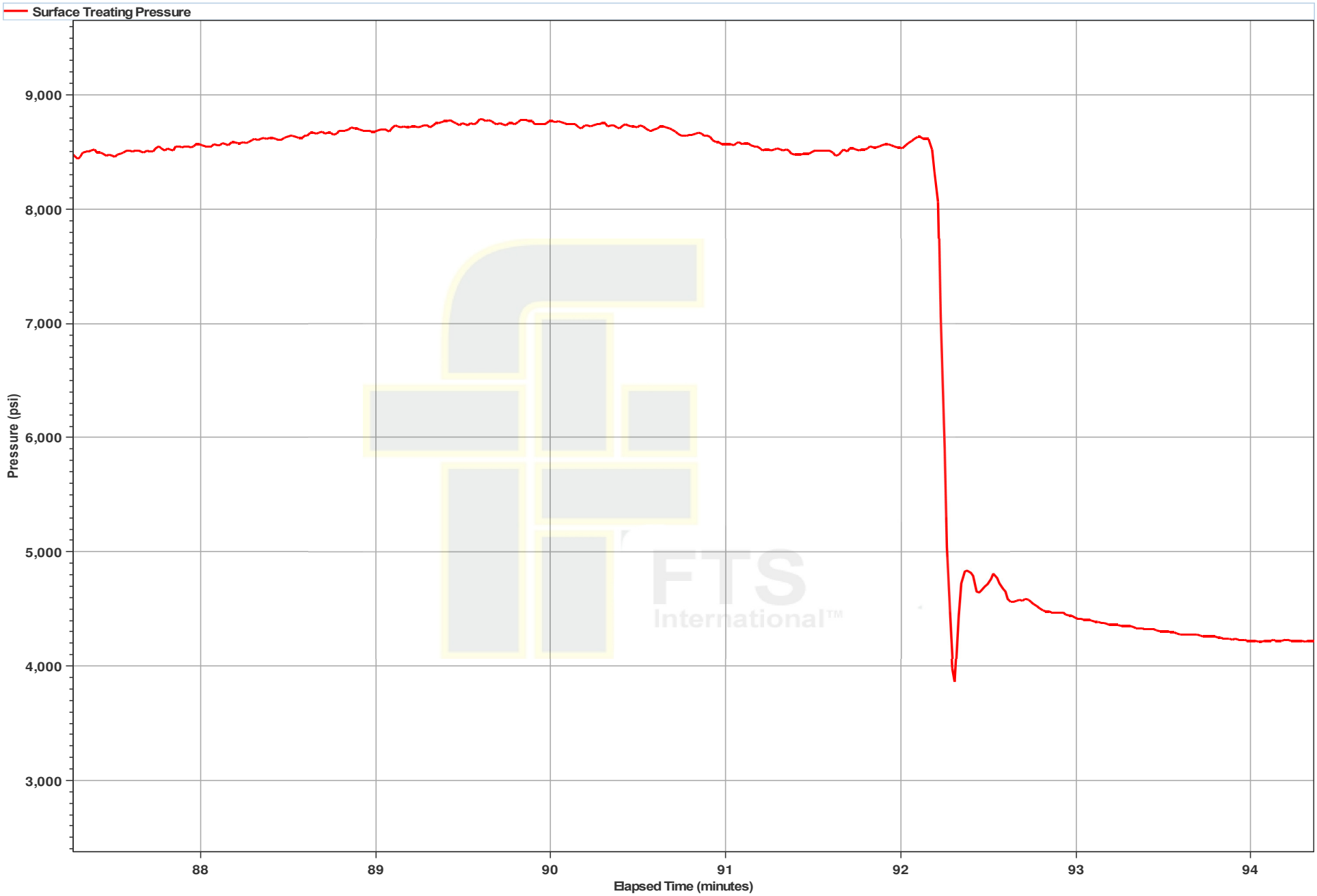
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 19 (WF.000658.M.W03.S19-ADCT-1103) **Jun 19, 2015**

Primary Plot



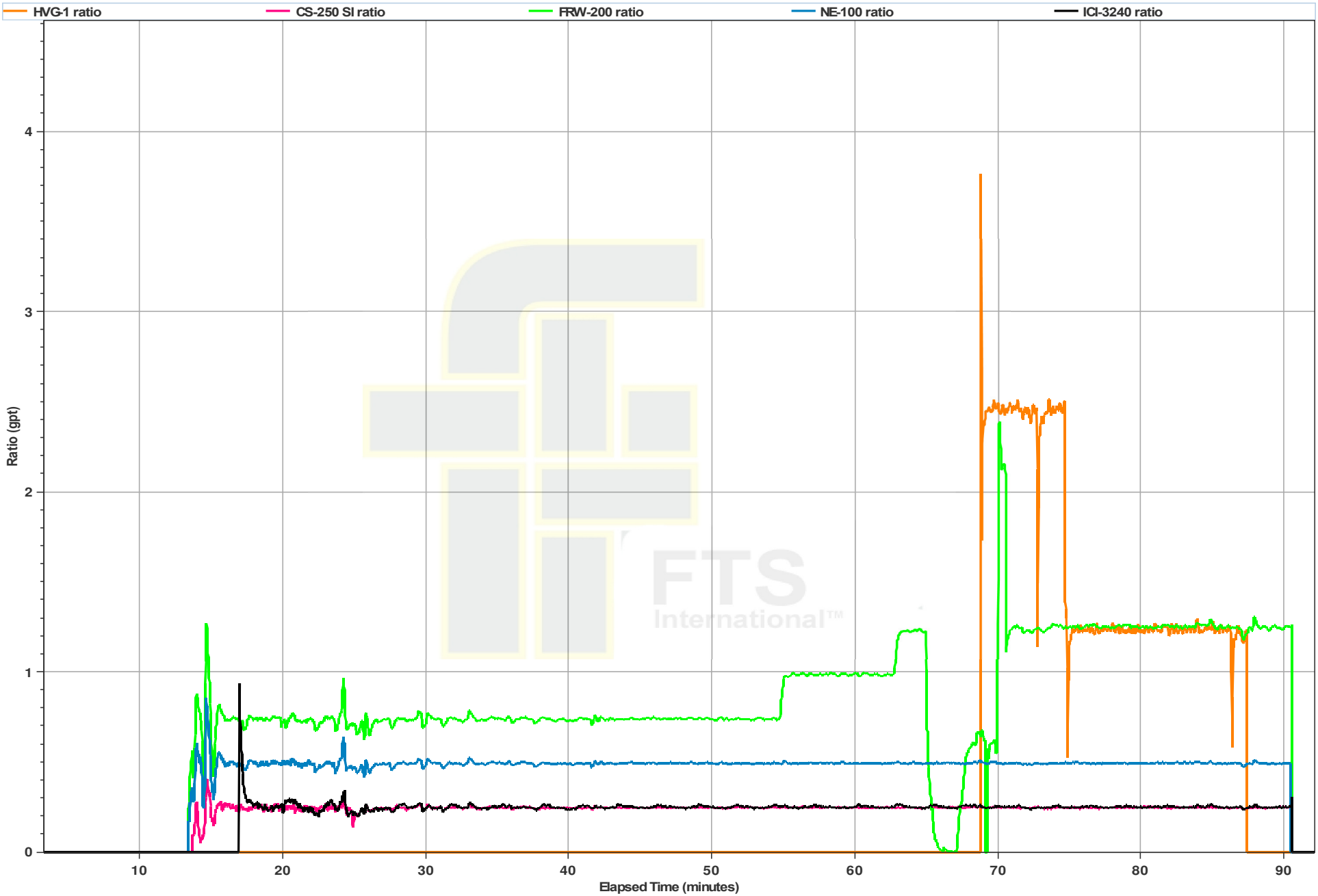
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 19 (WF.000658.M.W03.S19-ADCT-1103) **Jun 19, 2015**

ISIP Plot



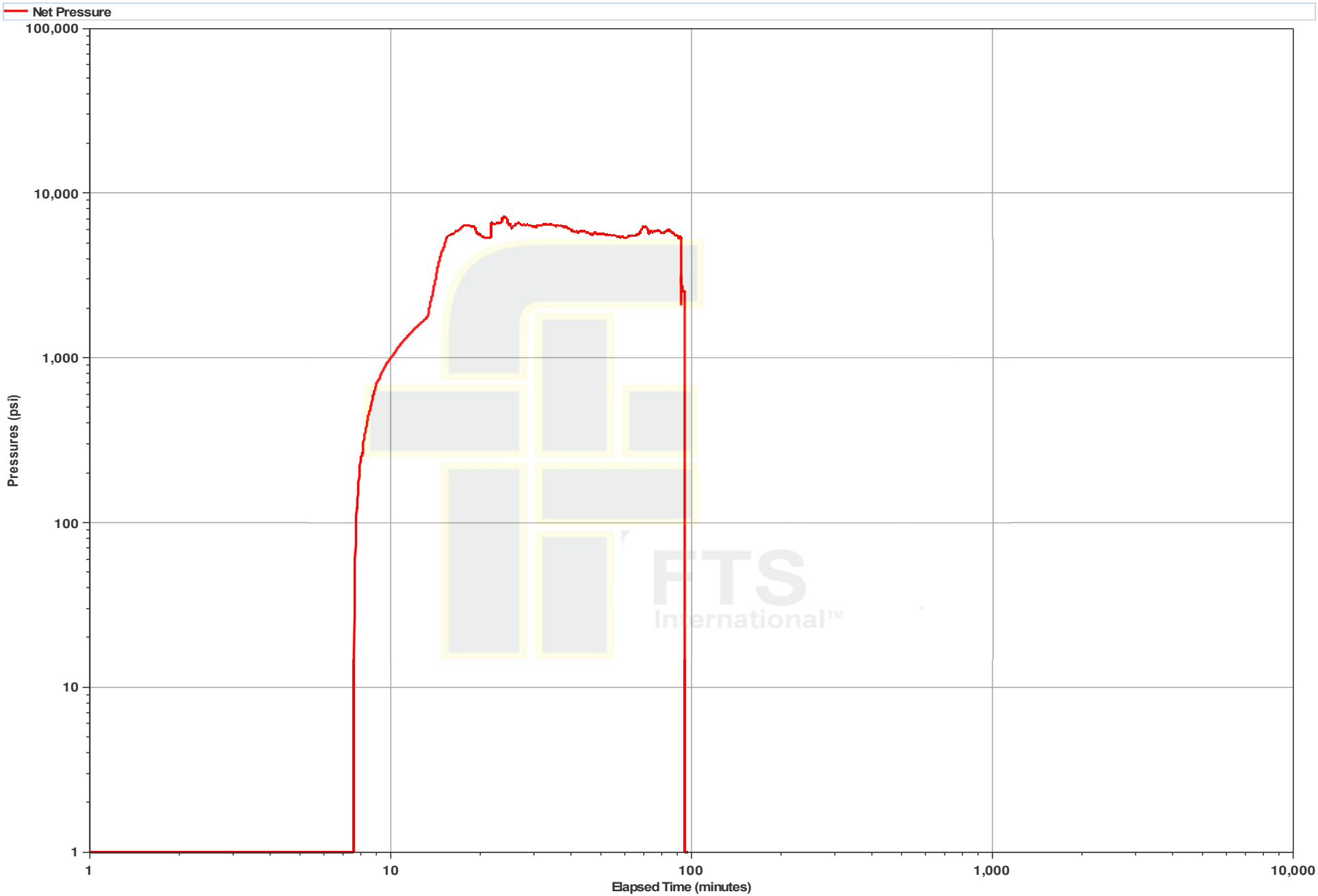
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 19 (WF.000658.M.W03.S19-ADCT-1103) **Jun 19, 2015**

Chemical Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 19 (WF.000658.M.W03.S19-ADCT-1103) **Jun 19, 2015**

Net Pressure Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 19 (WF.000658.M.W03.S19-ADCT-1103) Jun 19, 2015

WATER-BASED FRAC FLUID QUALITY CONTROL
(Attachment to Post Treatment Report)

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/19/2015
Customer Name:	American Energy - Utica	Proposal #:	3H/19
Date Sampled:	6/19/2015	Water Source:	Working Tank

Sample/Tank No.	Clarity, Color, Odor	Sample Temperature, (F)	Specific gravity	Initial pH	Chloride, ppm	Hardness, ppm	Calcium, ppm	Magnesium, ppm	Iron ppm	Hydroxide, ppm	Bicarbonate, ppm	Carbonate, ppm	Sulfate, ppm	Barium, ppm
Working Tank	Clear	72	1	8.3	50	84	24	15	0	0	49	0	65	0
Reused Water Tank	Yellow, Cloudy, Odor	72	1.03	5.3	69,978	14000	5,201	2,139	>10	0	1464	0	160	0

Frac Fluid Quality Gel Testing (These Recording are to made prior to pumping job)														
Sample #														
Base Gel Type	HVG-1													
Gel Loading (lbs/1000 gal.)	2.5													
Sample Temperature, (F)	72													
Initial pH	8.1													
Visc. Reading @ 300 rpms	6													
Viscosity, (cp)	6													
Sample 1 3 min Hydration	4													
Sample 2 3 min Hydration	4													
Sample 3 3 min Hydration	6.5													
X-Link Vortex Closure, min:sec	n/a													
X-Link Crown, min:sec	n/a													
X-Link pH	n/a													
Gel Break Time (<2cp) mins	19													

Frac Fluid Quality Gel Testing (These Recording are to made while pumping job)														
Stage #														
Base Gel Viscosity (cp)														
X-Link pH								.						
Sample XL time, min:sec														
Sample Temperature														

Acid Quality	Percent Acid	NaOH, mLs	Specific Gravity
	28		1.14

Additional testing or documentation may be required by the customer or for frac fluid quality assurance.

Tested By: Etuate Varea

QUALITY CONTROL OF PROPPANTS

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/19/2015
Customer Name:	American Energy - Utica	Well/Stage:	3H/19
Date Sampled:	6/19/2015	DISTRICT:	Washington, PA
VENDOR:	SANTROL		

Select Proppant Type:

___ Brown	___ Ceramic	___ Other (specify)
X White	___ Bauxite	_____
___ Resin Coated	___ Texas Gold	

Sieve Analysis	100 Mesh			Sieve Analysis	30/50 Mesh		
Sample 1	24.80	grams of sample		Sample 2	24.90	grams of sample	
	Amount Retained				Amount Retained		
Sieve mesh	Gram	%		Sieve mesh	Gram	%	
			Total				Total
50	0.20	0.81	In-Size	20	0.00	0.00	In-Size
70	18.00	72.58		30	0.30	1.20	
100	5.20	20.97	99.2%	40	18.70	75.10	95.6%
120	0.80	3.23		45	3.80	15.26	
140	0.50	2.02		50	1.30	5.22	
200	0.10	0.40		70	0.80	3.21	
Pan	0.00	0.00	fines	Pan	0.00	0.00	fines
Total wt. Gram	24.80	100.00		Total wt. Gram	24.90	100.00	

Tested By: Etuate Varea

Post Job Report

AMERICAN ENERGY - UTICA

Red Hill Farm MDS GR 3H

Stage : 20 OF 54

HARRISON, OH

Operations Representative:

Name:	**David Knapp**
Office:	**570-327-4881**
Fax:	**724-743-7719**
Cell:	
Email:	**DAVID.KNAPP@FTSI.COM**

Sales Representative:

Name:	**Bruce Matthews**
Office:	**405-574-3981**
Fax:	**405-767-1288**
Cell:	
Email:	**BRUCE.MATTHEWS@FTSI.COM**

Engineering Manager:

Name:	**Thaddeus Craun**
Office:	**817-682-8702**
Fax:	**724-743-7719**
Cell:	
Email:	**THADDEUS.CRAUN@FTSI.COM**

FTS International
1432 Route 519
Eighty Four, PA 15330

Customer: American Energy - Utica
Well: Red Hill Farm Mds Gr 3H
Stage: 20
Job End Date: 06/19/2015

Job Summary

Well Information

TVD:	7,301	**Top Perf:**	12,823
No. Of Perfs:	30		

Casing	Tubing
5.50" 20.00#	N/A

Pressures, Rates and Volumes

	Proposed	Actual	Max	Min
STP	9,046 psi	8,669 psi	9,775 psi	7,024 psi
Rate	80.0 bpm	79.3 bpm	97.3 bpm	23.3 bpm

	Proposed	Actual		
Clean Volume	5,772 bbls	5,737 bbls		
Slurry Volume	6,042 bbls	6,006 bbls		
Flush Volume	357 bbls	286 bbls		

	Proposed	Start	End
Frac Pumps on Location	10	15	14

Open Well:	Start Time	13:57	Pressure	3,075 psi
	Ball Seat	288 bbls	Break Down	8,070 psi
	Initial ISIP:	4,760 psi	Initial F.G.:	1.09 psi/ft
Stage Complete:	End Time	15:21	Job Time	01:30
	Final ISIP	4,760 psi	Final F.G.	1.09 psi/ft
	HHP	16,849	5 Min:	4,240 psi
	Proppant Min:	0.00	10 Min:	N/A
	Proppant Max:	2.00	15 Min:	N/A

Material Volume

Material	Proposed	Calculated	Actual	Variance
100 Mesh White	40,000	40,012	39,012	-2%
30/50 White	210,000	211,439	211,439	0%
Total Proppants	250,000	251,451	250,451	0%

Material	Proposed	Calculated	Actual	Variance
0.1%-7.5% HCL	3,000	2,982	3,000	1%
CI-150	3	3	3	0%
CS-250 SI	60	58	57	-2%
FE-200L	15	15	15	0%
FRW-200	180	220	218	-1%
ICI-3240	60	58	57	-2%
NE-100	0	116	114	-2%
NE-100W	120	0	0	0

Comments:

Pumpdown Information:
Total Bbls: 239
Max Pressure (psi): 6045
Max Rate (bpm): 15.1

FTS International
1432 Route 519
Eighty Four, PA 15330

Customer: American Energy - Utica
Well: Red Hill Farm Mds Gr 3H
Stage: 20
Job End Date: 06/19/2015

Treatment Report

Date:	6/19/2015	District:	Washington County,PA	Quote No:	051815_035725QF	API:	34-059-24370

MIL Time	STP	Slurry BPM	Stage Clean (bbls)	Cumulative Clean (bbls)	Stage Slurry (bbls)	Cumulative Slurry (bbls)	Stage Proppant (lbs)	Cumulative Proppant (lbs)	Description	Proppant	PPA
13:57	3,075	0.0	0	0	0	0	0	0	Freshwater Open Well		0.00
13:58	4,187	5.2	23	23	23	23	0	0	Freshwater Load		0.00
14:00	5,698	11.5	71	94	71	94	0	0	7.5% HCL Acid Acid		0.00
14:04	7,315	21.9	48	142	48	142	0	0	Slickwater Load		0.00
14:07	8,046	28.6	146	288	147	289	613	613	Slickwater Proppant	100 Mesh White	0.10
14:09	8,070	24.0	0	288	0	289	0	613	Slickwater Breakdown		0.00
14:12	7,655	26.0	68	356	68	357	286	899	Slickwater Proppant	100 Mesh White	0.10
14:14	8,893	45.1	220	576	222	579	2,310	3,209	Slickwater Proppant	100 Mesh White	0.25
14:19	8,615	66.7	275	851	281	860	5,775	8,984	Slickwater Proppant	100 Mesh White	0.50
14:27	8,319	77.6	445	1,296	460	1,320	14,018	23,002	Slickwater Proppant	100 Mesh White	0.75
14:31	8,693	86.5	405	1,701	423	1,743	17,010	40,012	Slickwater Proppant	100 Mesh White	1.00
14:35	8,841	90.8	861	2,562	900	2,643	36,162	76,174	Slickwater Proppant	30/50 White	1.00
14:45	8,885	94.3	997	3,559	1,053	3,696	52,343	128,517	Slickwater Proppant	30/50 White	1.25
15:00	8,557	94.8	690	4,249	737	4,433	43,470	171,987	Slickwater Proppant	30/50 White	1.50
15:04	8,554	94.9	313	4,562	334	4,767	19,719	191,706	Slickwater Proppant	30/50 White	1.50
15:07	8,720	95.1	630	5,192	680	5,447	46,305	238,011	Slickwater Proppant	30/50 White	1.75
15:14	8,794	94.5	160	5,352	174	5,621	13,440	251,451	Slickwater Proppant	30/50 White	2.00
15:16	9,002	90.5	99	5,451	99	5,720	0	251,451	Slickwater Clean screws		0.00
15:17	9,080	90.2	145	5,596	145	5,865	0	251,451	Slickwater Flush		0.00
15:19	8,719	75.4	141	5,737	141	6,006	0	251,451	Freshwater Flush		0.00
15:21	4,760	0.0	0	5,737	0	6,006	0	251,451	Freshwater Shutdown		0.00
Total JobTime (HH:MM): 01:24											

Min STP:	7,024 psi	**Max STP:**	9,775 psi	**Average STP:**	8,669 psi	**5 Min:**	4,240 psi
Min Rate:	23.3 bpm	**Max Rate:**	97.3 bpm	**Average Rate:**	79.3 bpm	**10 Min:**	0 psi
Initial ISIP:	4,760 psi	**Initial F.G.:**	1.09 psi/ft	**Average HHP:**	16,849	**15 Min:**	0 psi
Final ISIP:	4,760 psi	**Final F.G.:**	1.09 psi/ft	**Customer Representative:**		Malcolm Trahan	
FTSI Representative:		Etuate Varea & Rich Renzi					

Comments:

The proppant values contained in this report are calculated based on actual barrel counts and target densities. Actual total proppant usage is 250,451 lbs. Charge time is 1 hour(s) 30 minute(s). All chemicals and proppant ran as documented.

Min/Max/Avg were taken from sand stages. All chem changes from proposed were made per AEU representative request.

Reuse water was run on this stage for a total of 260 Bbls.

1 Minute Shutdown (psi): 4539
2 Minute Shutdown (psi): 4393
5 Minute Shutdown (psi): 4240

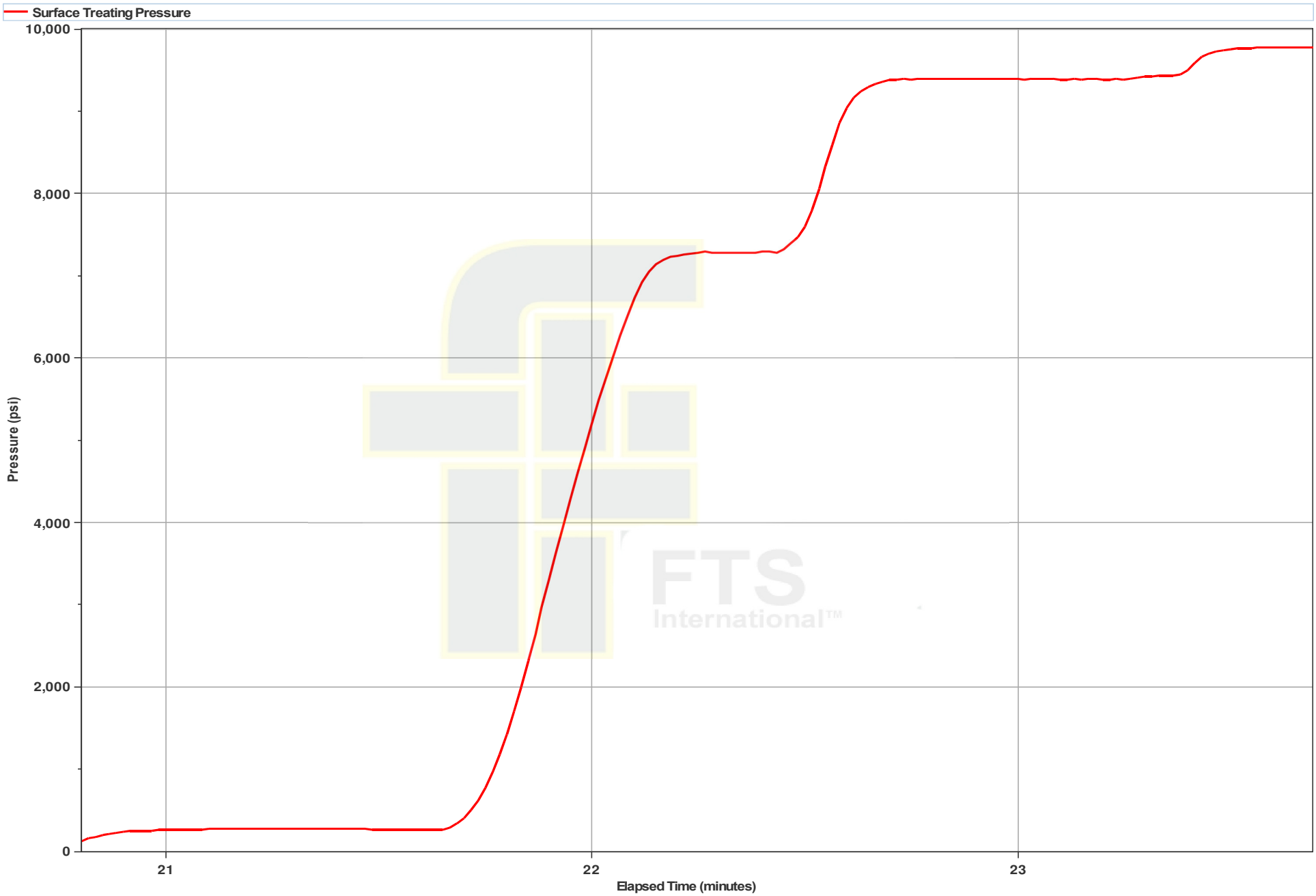
FTS International
1432 Route 519
Eighty Four, PA 15330

Customer: American Energy - Utica
Well: Red Hill Farm Mds Gr 3H
Stage: 20
Job End Date: 06/19/2015

Chemical Changes:

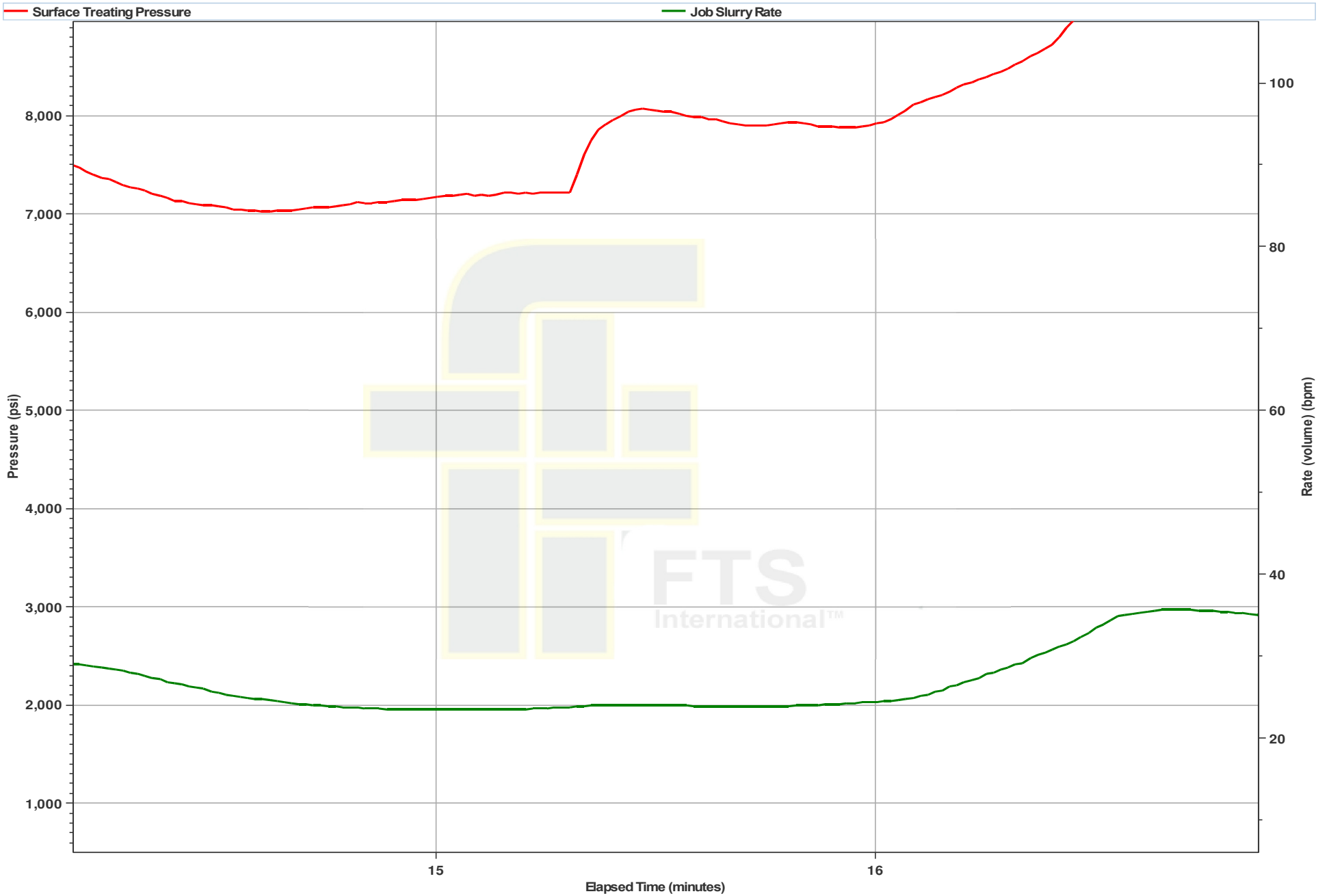
Chemical Name	Chemical Loading	Cumulative Clean
FRW-200	1.00	3,559
FRW-200	1.25	4,562

AEU Pressure Test



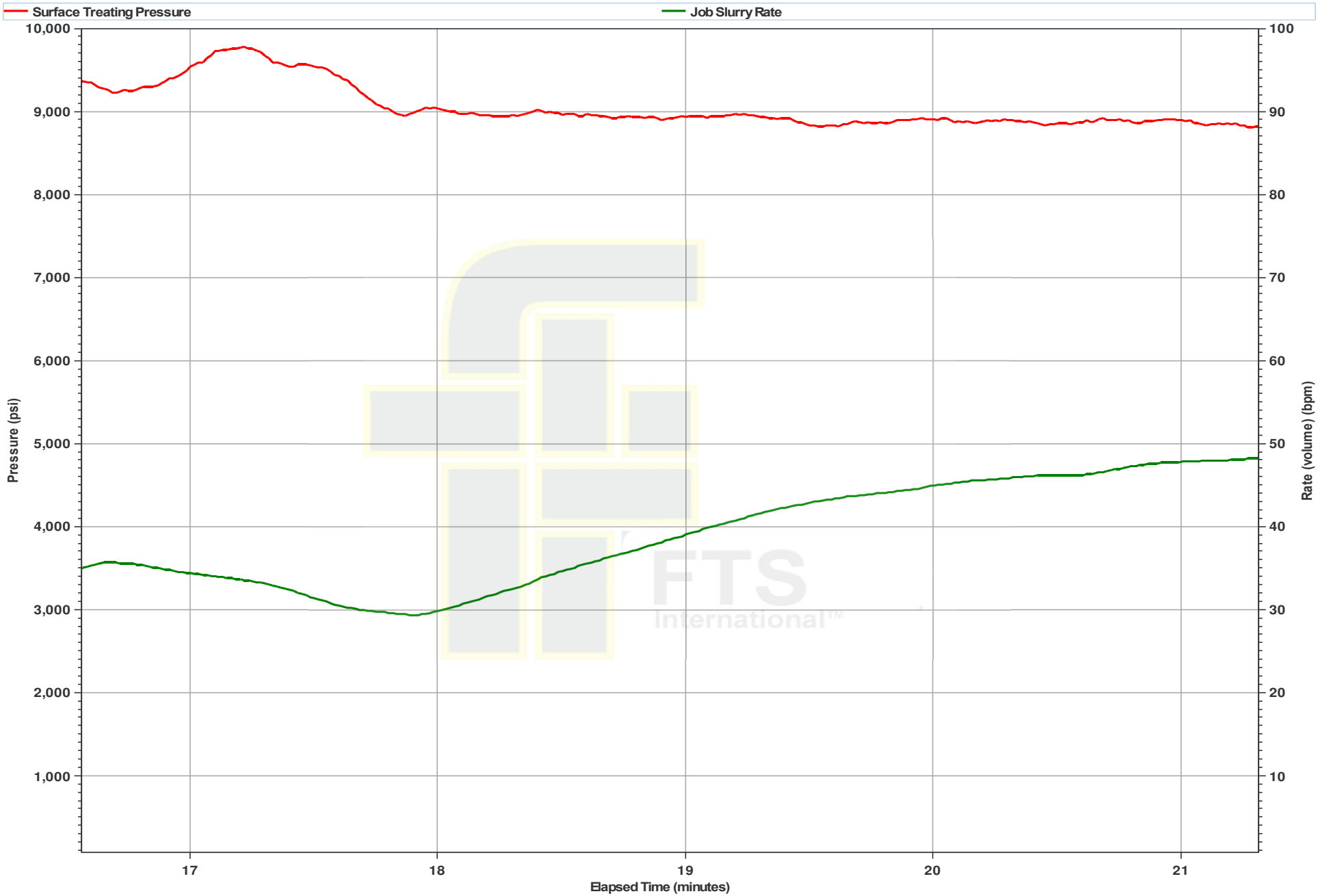
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 20 (WF.000658.M.W03.S20-ADCT-1103) Jun 19, 2015

Ball Seat and Breakdown



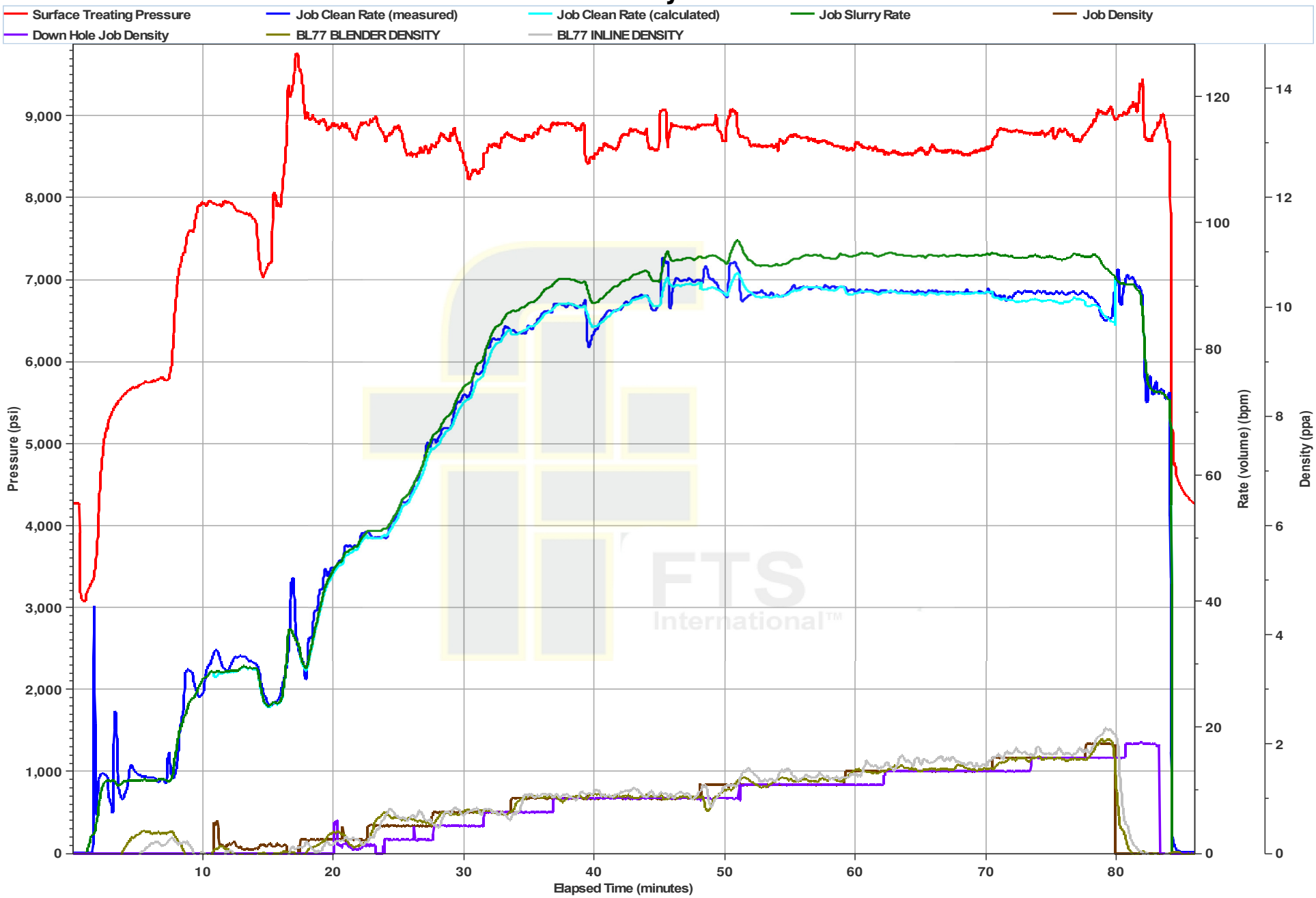
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 20 (WF.000658.M.W03.S20-ADCT-1103) Jun 19, 2015

Acid on Perforations



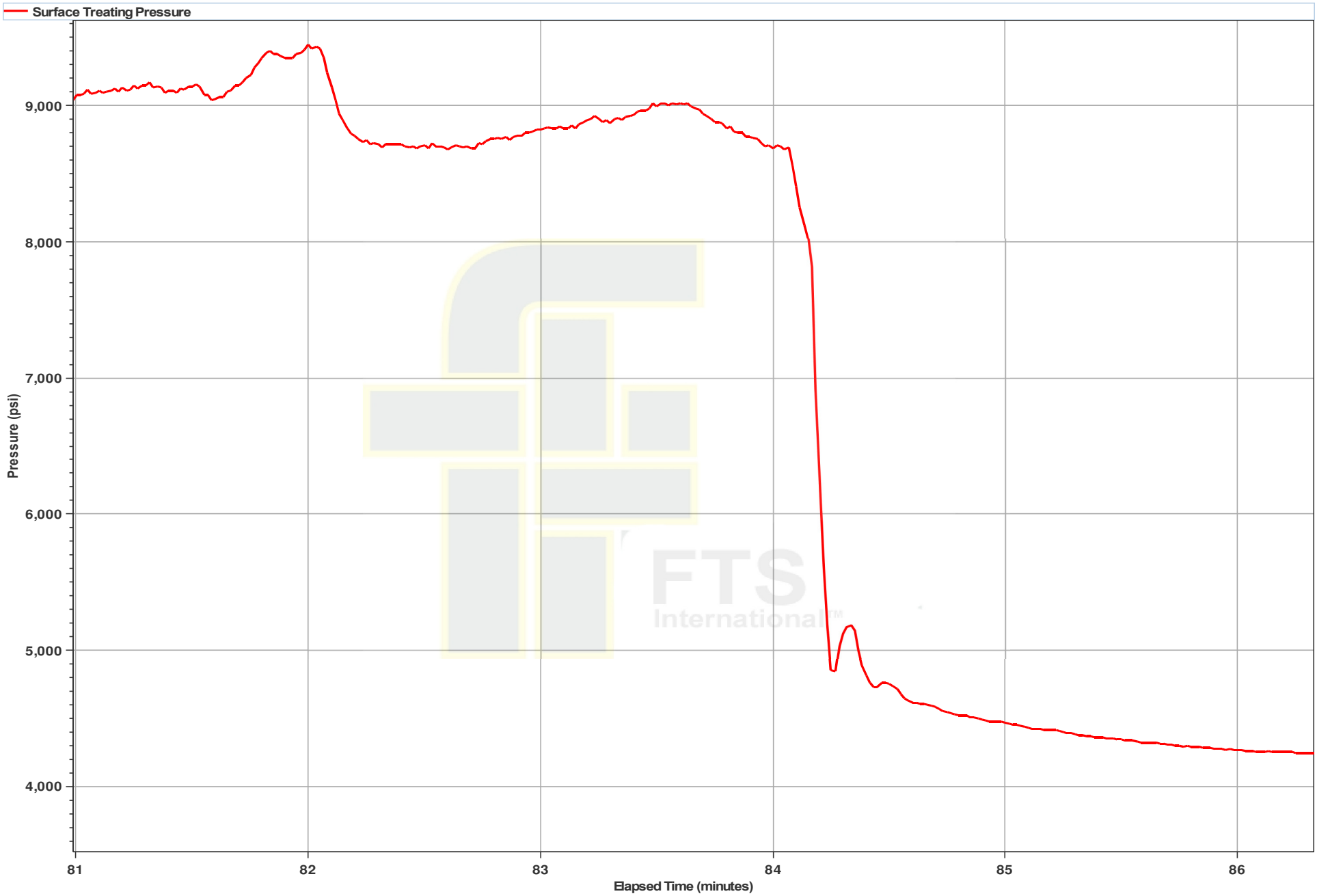
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 20 (WF.000658.M.W03.S20-ADCT-1103) **Jun 19, 2015**

Primary Plot



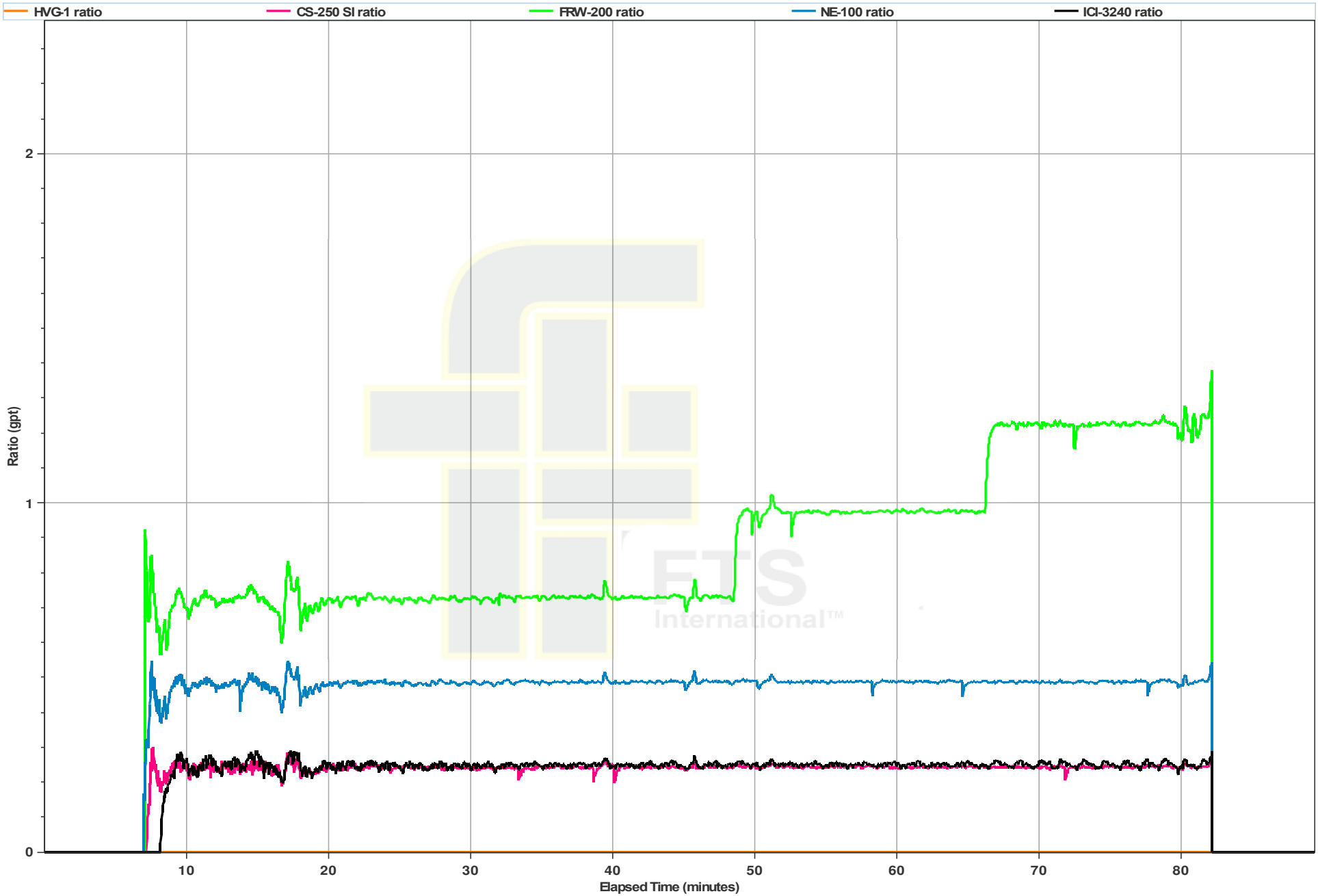
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 20 (WF.000658.M.W03.S20-ADCT-1103) **Jun 19, 2015**

ISIP Plot



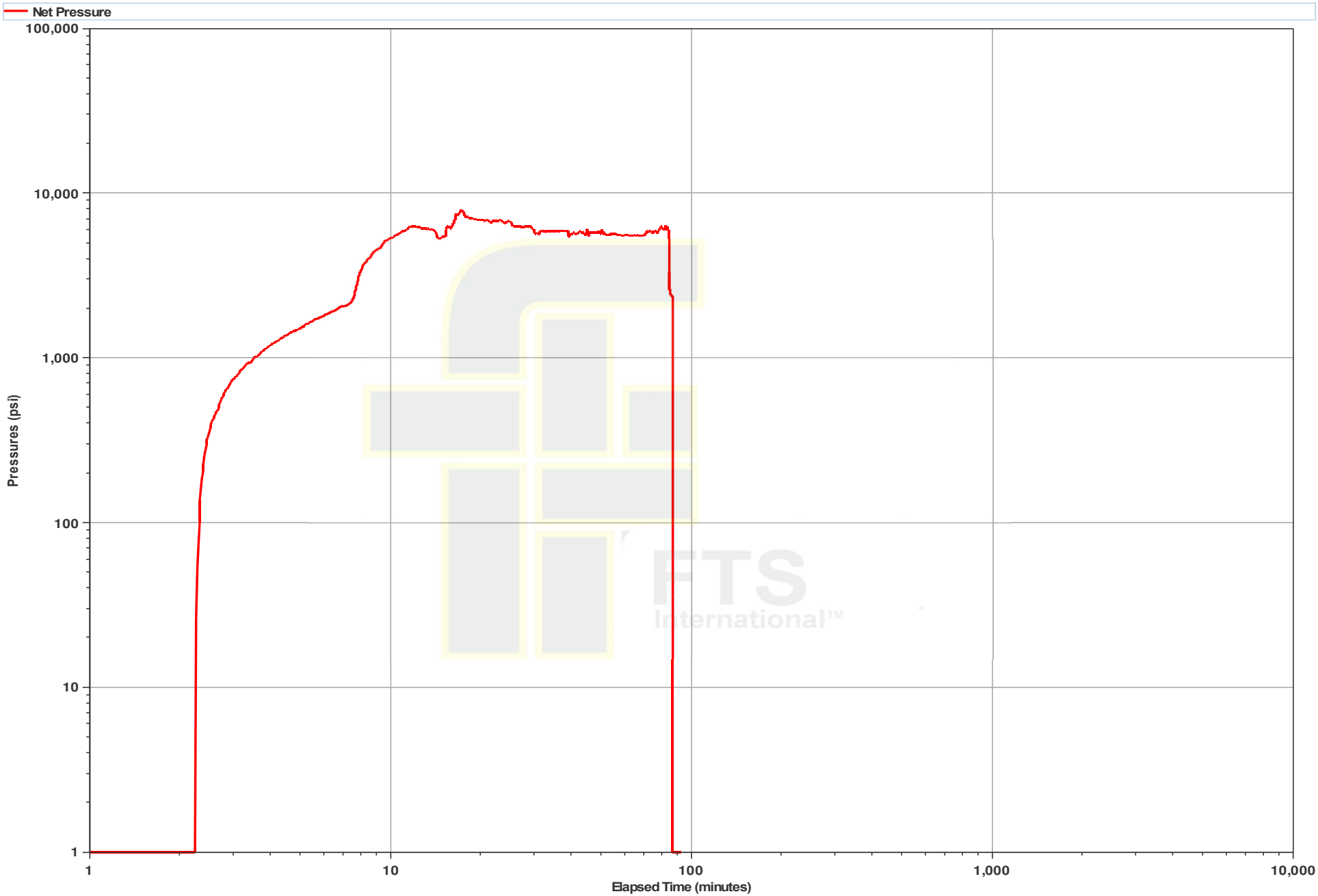
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 20 (WF.000658.M.W03.S20-ADCT-1103) **Jun 19, 2015**

Chemical Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 20 (WF.000658.M.W03.S20-ADCT-1103) Jun 19, 2015

Net Pressure Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 20 (WF.000658.M.W03.S20-ADCT-1103) Jun 19, 2015

WATER-BASED FRAC FLUID QUALITY CONTROL
(Attachment to Post Treatment Report)

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/19/2015
Customer Name:	American Energy - Utica	Proposal #:	3H/20
Date Sampled:	6/19/2015	Water Source:	Working Tank

Sample/Tank No.	Clarity, Color, Odor	Sample Temperature, (F)	Specific gravity	Initial pH	Chloride, ppm	Hardness, ppm	Calcium, ppm	Magnesium, ppm	Iron ppm	Hydroxide, ppm	Bicarbonate, ppm	Carbonate, ppm	Sulfate, ppm	Barium, ppm
Working Tank	Clear	71	1	8.1	35	90	32	14	1	0	49	0	110	0
Reused Water Tank	Yellow, Cloudy, Odor	74	1.04	5.4	81,975	15600	5,681	2,411	>10	0	1220	0	150	0

Frac Fluid Quality Gel Testing (These Recording are to made prior to pumping job)														
Sample #														
Base Gel Type	HVG-1													
Gel Loading (lbs/1000 gal.)	2.5													
Sample Temperature, (F)	71													
Initial pH	8.1													
Visc. Reading @ 300 rpms	5													
Viscosity, (cp)	5													
Sample 1 3 min Hydration	4													
Sample 2 3 min Hydration	4													
Sample 3 3 min Hydration	5													
X-Link Vortex Closure, min:sec	n/a													
X-Link Crown, min:sec	n/a													
X-Link pH	n/a													
Gel Break Time (<2cp) mins	18													

Frac Fluid Quality Gel Testing (These Recording are to made while pumping job)														
Stage #														
Base Gel Viscosity (cp)														
X-Link pH								.						
Sample XL time, min:sec														
Sample Temperature														

Acid Quality	Percent Acid	NaOH, mLs	Specific Gravity
	28		1.14

Additional testing or documentation may be required by the customer or for frac fluid quality assurance.

Tested By: Etuate Varea

QUALITY CONTROL OF PROPPANTS

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/19/2015
Customer Name:	American Energy - Utica	Well/Stage:	3H/20
Date Sampled:	6/19/2015	DISTRICT:	Washington, PA
VENDOR:	SANTROL		

Select Proppant Type:

___ Brown	___ Ceramic	___ Other (specify)
X White	___ Bauxite	_____
___ Resin Coated	___ Texas Gold	

Sieve Analysis	100 Mesh			Sieve Analysis	30/50 Mesh		
Sample 1	24.80	grams of sample		Sample 2	24.80	grams of sample	
	Amount Retained				Amount Retained		
Sieve mesh	Gram	%		Sieve mesh	Gram	%	
			Total				Total
50	0.00	0.00	In-Size	20	0.00	0.00	In-Size
70	16.90	68.15		30	0.60	2.42	
100	5.60	22.58	100.0%	40	17.90	72.18	94.4%
120	1.60	6.45		45	4.00	16.13	
140	0.40	1.61		50	1.50	6.05	
200	0.30	1.21		70	0.80	3.23	
Pan	0.00	0.00	fines	Pan	0.00	0.00	fines
Total wt. Gram	24.80	100.00		Total wt. Gram	24.80	100.00	

Tested By: Etuate Varea

Post Job Report

AMERICAN ENERGY - UTICA

Red Hill Farm MDS GR 3H

Stage : 21 OF 54

HARRISON, OH

Operations Representative:

Name:	David Knapp
Office:	878-327-4881
Fax:	724-743-7719
Cell:	
Email:	DAVID.KNAPP@FTSI.COM

Sales Representative:

Name:	Bruce Batthern
Office:	405-974-3901
Fax:	405-787-1235
Cell:	
Email:	BRUCE.BATTHERN@FTSI.COM

Engineering Manager:

Name:	Thaddeus Craun
Office:	817-832-8782
Fax:	724-743-7719
Cell:	
Email:	THADDEUS.CRAUN@FTSI.COM

FTS International
[illegible]
Eighty Four, PA [illegible]

FTS INTERNATIONAL

Customer: American Energy - Utica
Well: Red Hill Farm Hoe Gr 3H
Stage: 21
Job End Date: [illegible]

Job Summary

Well Information

TVD:	7,301	Top Perf:	12,071
No. Of Perfs:	30		

Casing	Tubing
[illegible]	n/A

Pressures, Rates and Volumes

	Proposed	Actual	Max	Min
STP	[illegible] psi	[illegible] psi	[illegible] psi	[illegible] psi
Rate	[illegible] bpm	[illegible] bpm	[illegible] bpm	[illegible] bpm

	Proposed	Actual		
Clean Volume	[illegible] bbls	[illegible] bbls		
Slurry Volume	[illegible] bbls	[illegible] bbls		
Flush Volume	[illegible] bbls	[illegible] bbls		

	Proposed	Start	End
Frac Pumps on Location	19	15	15

Open Well:	Start Time	[illegible]	Pressure	[illegible] psi
	Bull Dwn	[illegible] bbls	Break Down	[illegible] psi
	Initial ISIP:	[illegible] psi	Initial F.G.:	[illegible] psi/ft
Stage Complete:	End Time	[illegible]	Job Time	[illegible]
	Final ISIP	[illegible] psi	Final F.G.	[illegible] psi/ft
	ISIP	[illegible]	5 Min:	[illegible] psi
	Pressure Min:	[illegible]	10 Min:	N/A
	Pressure Max:	[illegible]	15 Min:	N/A

Material Volume

Material	Proposed	Calculated	Actual	Variance
100 Mesh White	[illegible]	[illegible]	[illegible]	0%
30/50 White	[illegible]	[illegible]	[illegible]	0%
Total Proppants	[illegible]	[illegible]	[illegible]	0%

Material	Proposed	Calculated	Actual	Variance
8.1%-7.5% HCL	[illegible]	[illegible]	[illegible]	1%
[illegible]	[illegible]	[illegible]	[illegible]	0%
[illegible]	[illegible]	[illegible]	[illegible]	3%
FE-[illegible]	[illegible]	[illegible]	[illegible]	0%
[illegible]	[illegible]	[illegible]	[illegible]	-4%
[illegible]	[illegible]	[illegible]	[illegible]	-8%
[illegible]	[illegible]	[illegible]	[illegible]	3%
[illegible]	[illegible]	[illegible]	[illegible]	2%
[illegible]	[illegible]	[illegible]	[illegible]	0

Comments:

***Pumpdown Information:**
Total Bbls: 243
Max Pressure (psi): 6554
Max Rate (bpm): 19.4

FTS International
[illegible]
Eighty Four, PA [illegible]

FTS INTERNATIONAL

Customer: American Energy - Utica
Well: Red Hill Farm Site 6r 3H
Stage: 21
Job End Date: [illegible]

Treatment Report

Date	[illegible]	Statelate	Washington County,PA	Route Sec	[illegible]	API#	[illegible]

Hr. Time	BTP	Spot BPM	Stage Slurry (bbls)	Cumulative Slurry (bbls)	Stage Slurry (bbls)	Cumulative Slurry (bbls)	Stage Proppant (lbs)	Cumulative Proppant (lbs)	Description	Proppant	PPA
21:05	[illegible]	[illegible]	0	0	0	0	0	0	Freshwater Open Wet		[illegible]
21:04	[illegible]	[illegible]	15	15	15	15	0	0	Freshwater Load		[illegible]
21:04	[illegible]	[illegible]	71	41	71	41	0	0	7.5% HCL Acid Add		[illegible]
21:10	[illegible]	17.2	19	[illegible]	19	[illegible]	0	0	Slickwater Load		[illegible]
21:11	[illegible]	[illegible]	193	[illegible]	193	[illegible]	764	764	Slickwater Proppant	100 Mesh White	[illegible]
21:17	[illegible]	[illegible]	0	[illegible]	0	[illegible]	21	785	Slickwater Maximum	100 Mesh White	[illegible]
21:17	[illegible]	[illegible]	32	[illegible]	32	[illegible]	134	[illegible]	Slickwater Proppant	100 Mesh White	[illegible]
21:18	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Slickwater Proppant	100 Mesh White	[illegible]
21:23	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Slickwater Proppant	100 Mesh White	[illegible]
21:24	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Slickwater Proppant	100 Mesh White	[illegible]
21:25	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Slickwater Proppant	100 Mesh White	[illegible]
21:28	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Slickwater Proppant	100 Mesh White	[illegible]
21:29	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Slickwater Proppant	100 Mesh White	[illegible]
21:30	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Slickwater Proppant	100 Mesh White	[illegible]
21:34	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Slickwater Proppant	[illegible] White	[illegible]
21:39	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Slickwater Proppant	[illegible] White	[illegible]
21:51	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Slickwater Proppant	[illegible] White	[illegible]
22:01	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Slickwater Proppant	[illegible] White	[illegible]
22:14	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Slickwater Proppant	[illegible] White	[illegible]
22:17	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Slickwater Proppant	[illegible] White	[illegible]
22:21	[illegible]	[illegible]	172	[illegible]	172	[illegible]	0	[illegible]	Slickwater Open [illegible]		[illegible]
22:22	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0	[illegible]	Slickwater Flush		[illegible]
22:23	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0	[illegible]	Freshwater Flush		[illegible]
22:25	[illegible]	[illegible]	0	[illegible]	0	[illegible]	0	[illegible]	Freshwater Breakdown		[illegible]
Total Job/Time (HH:MM): [illegible]											

Min BTP:	[illegible] psi	Max BTP:	[illegible] psi	Average BTP:	[illegible] psi	[illegible] Min	[illegible] psi
Min Rate:	[illegible] bpm	Max Rate:	[illegible] bpm	Average Rate:	[illegible] bpm	[illegible] Min	[illegible] psi
Initial ISIP:	[illegible] psi	Initial F.Gr:	[illegible] psi/ft	Average ISIP:	[illegible]	[illegible] Min	[illegible] psi
Final ISIP:	[illegible] psi	Final F.Gr:	[illegible] psi/ft	Customer Representative		HH Pumps	
FTS Representative		Travis Wilson & William Hahn					

Comments:

The proppant values contained in this report are calculated based on actual barrel counts and target densities. Actual total proppant usage is 249,082 lbs. Charge time is 1 hour(s) 30 minute(s). All chemicals and proppant ran as documented.

Min/Max/Avg were taken from sand stages. All chem changes from proposed were made per AEU representative request.

Reuse water was run on this stage for a total of 635 Bbls.

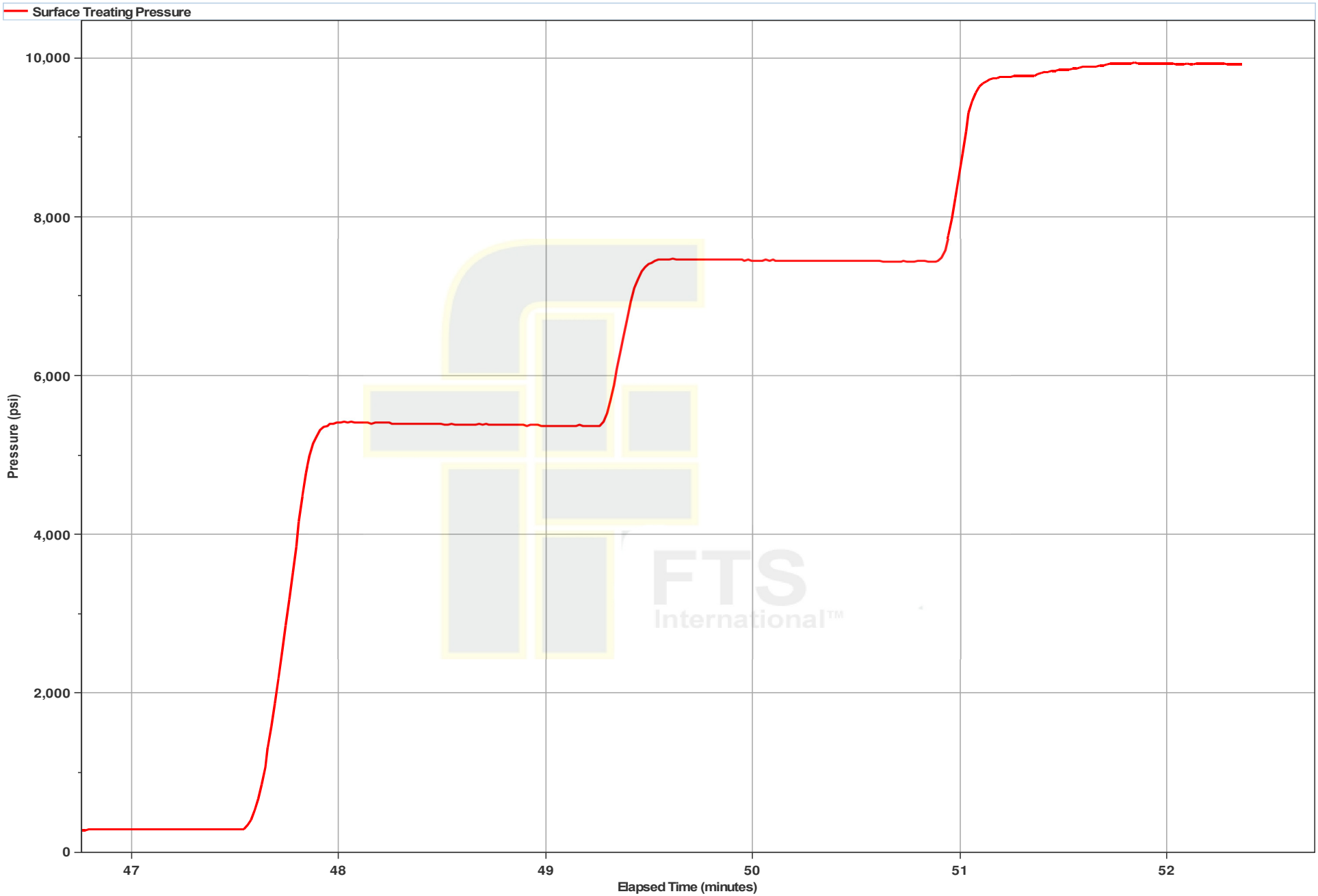
FRW 600 was run on this stage per AEU representatives request due to running reuse water with high TDS.

1 Minute Shutdown (psi): 4230
2 Minute Shutdown (psi): 4065
5 Minute Shutdown (psi): 3820

Chemical Changes:

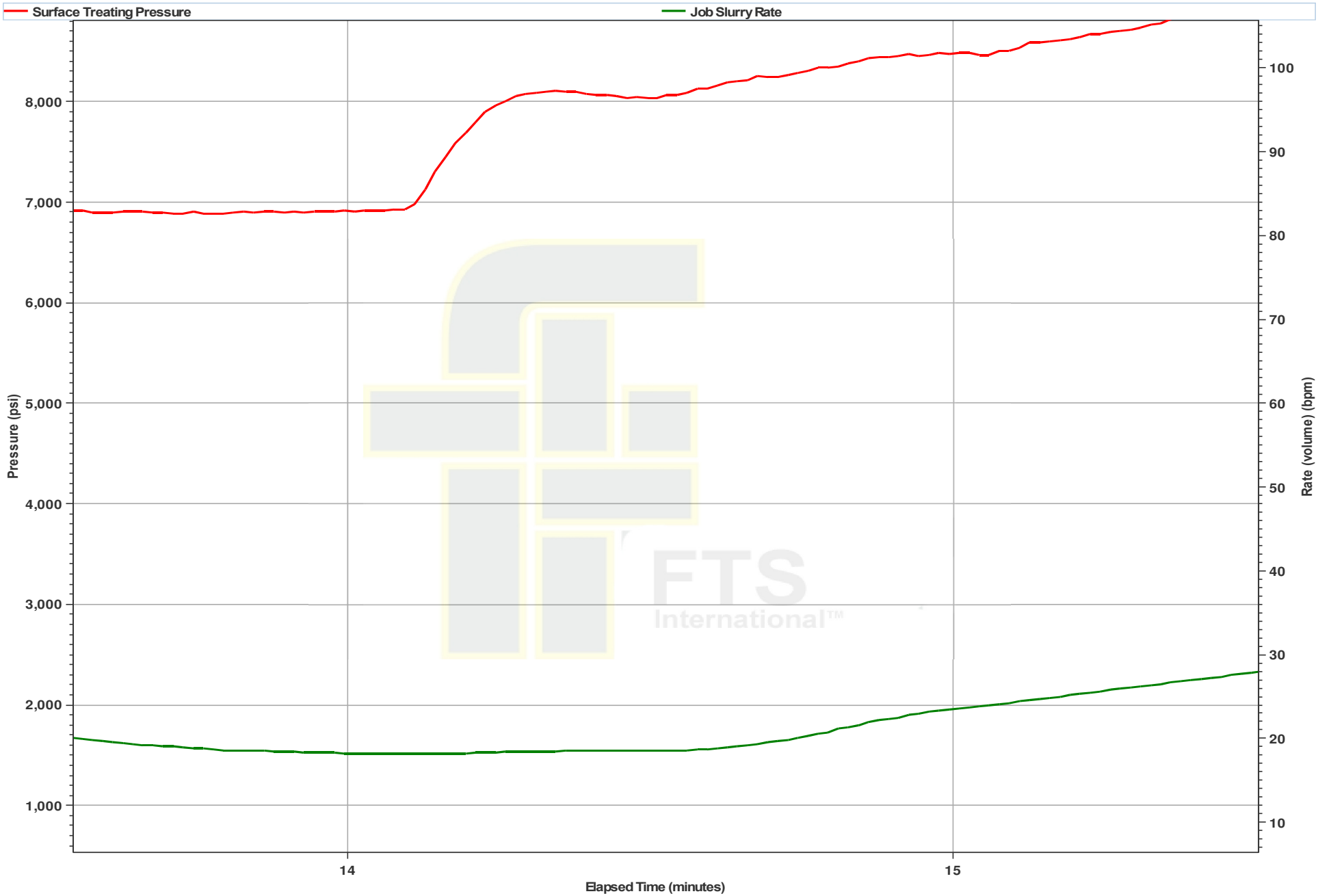
Chemical Name	Chemical Loading	Cumulative Chem
FRW-200	0.80	534
FRW-200	1.00	799
FRW-600	0.80	1,319
FRW-200	0.80	1,319
FRW-200	1.00	2,637
FRW-200	0.75	4,356
FRW-200	0.60	5,848

AEU Pressure Test



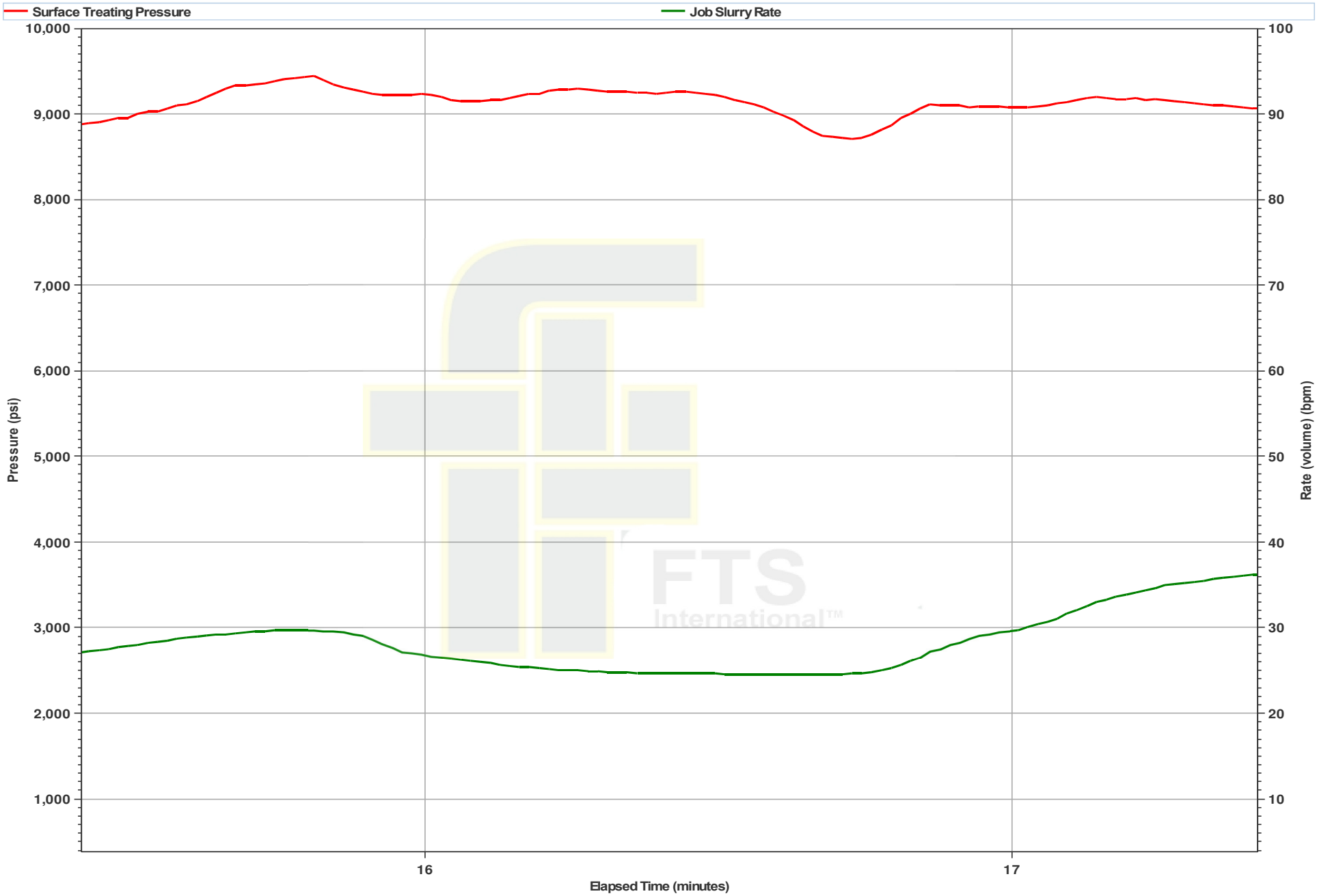
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 21 (WF.000658.M.W03.S21-ADCT-1103) **Jun 19, 2015**

Ball Seat and Breakdown



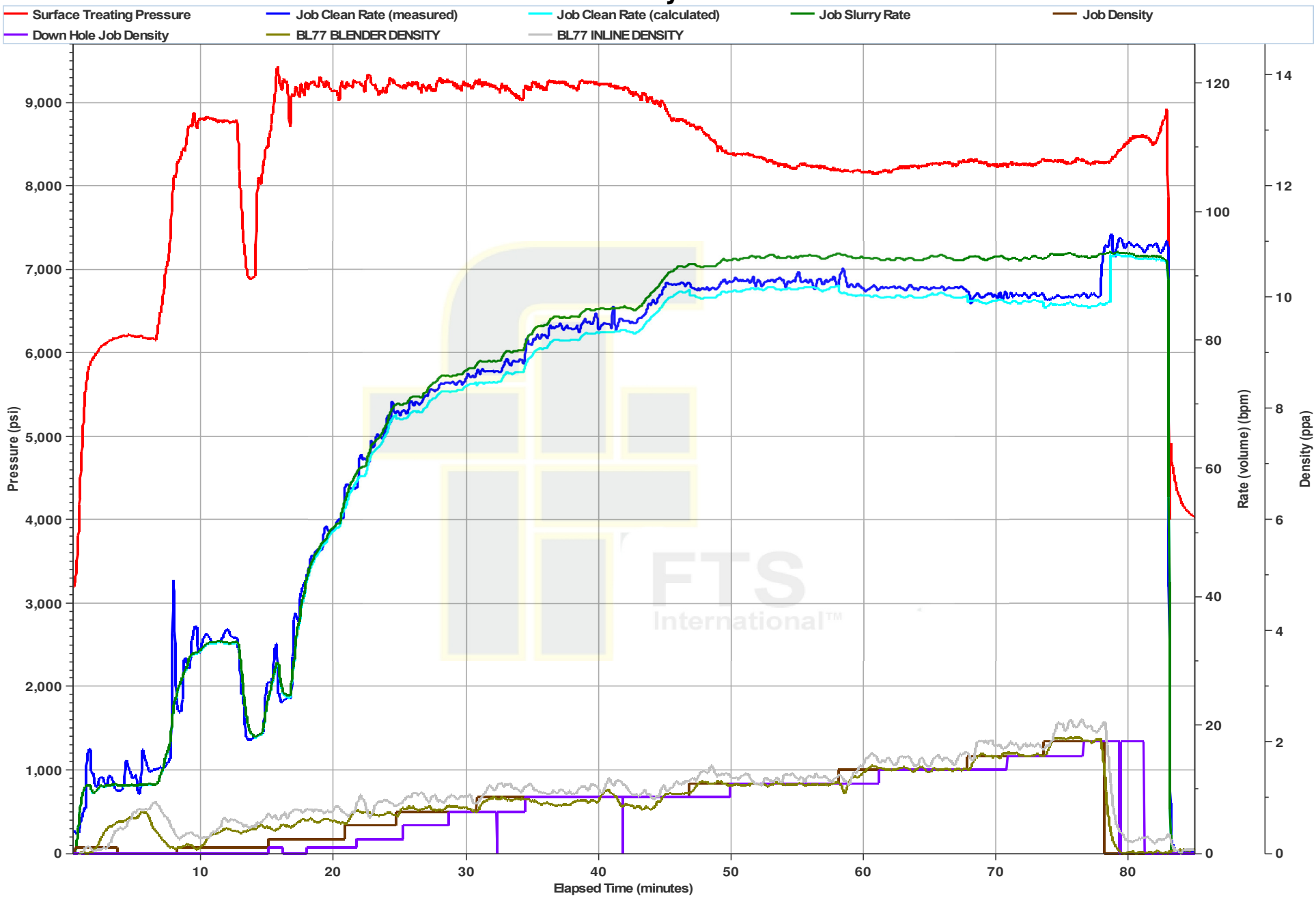
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 21 (WF.000658.M.W03.S21-ADCT-1103) **Jun 19, 2015**

Acid on Perforations



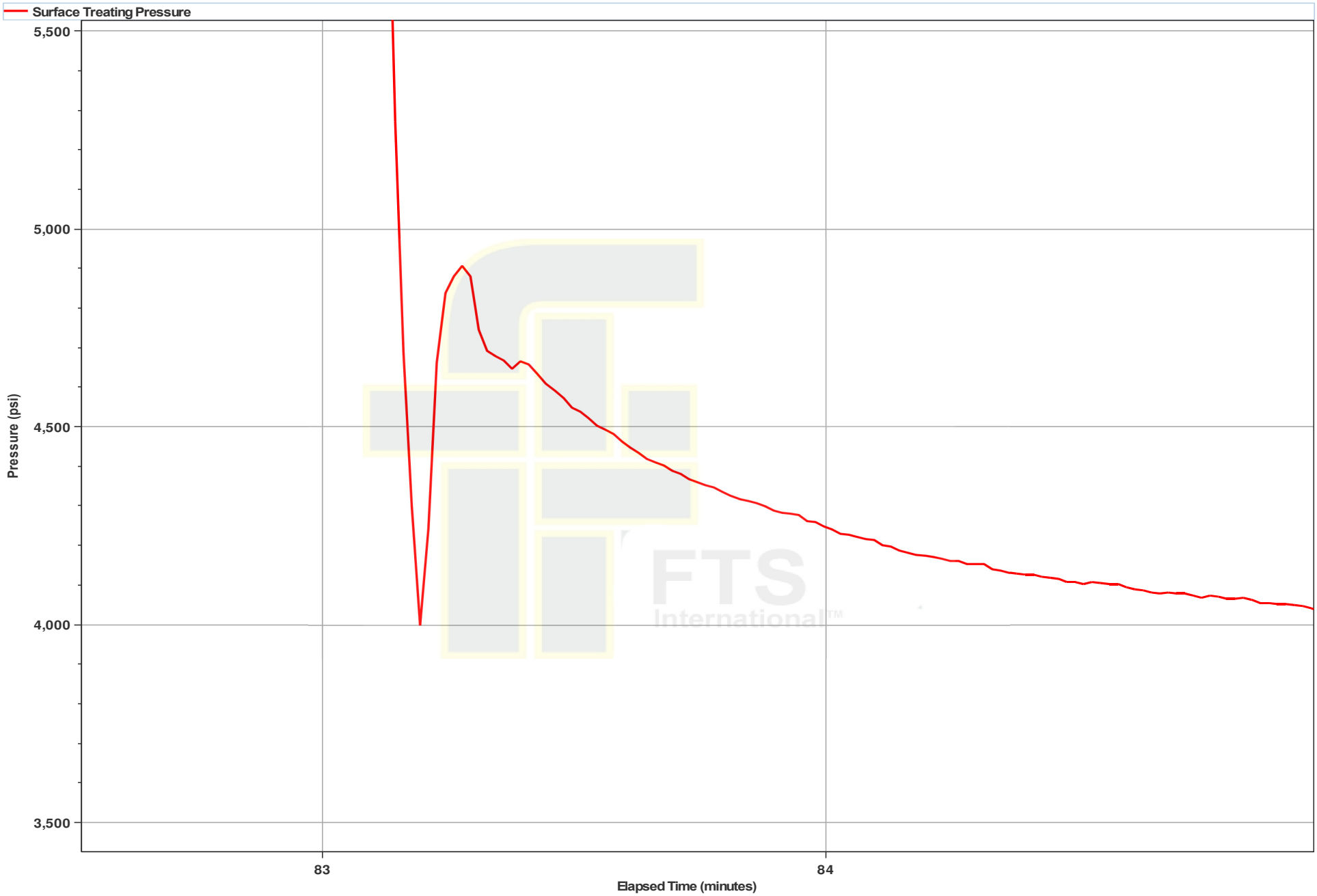
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 21 (WF.000658.M.W03.S21-ADCT-1103) **Jun 19, 2015**

Primary Plot



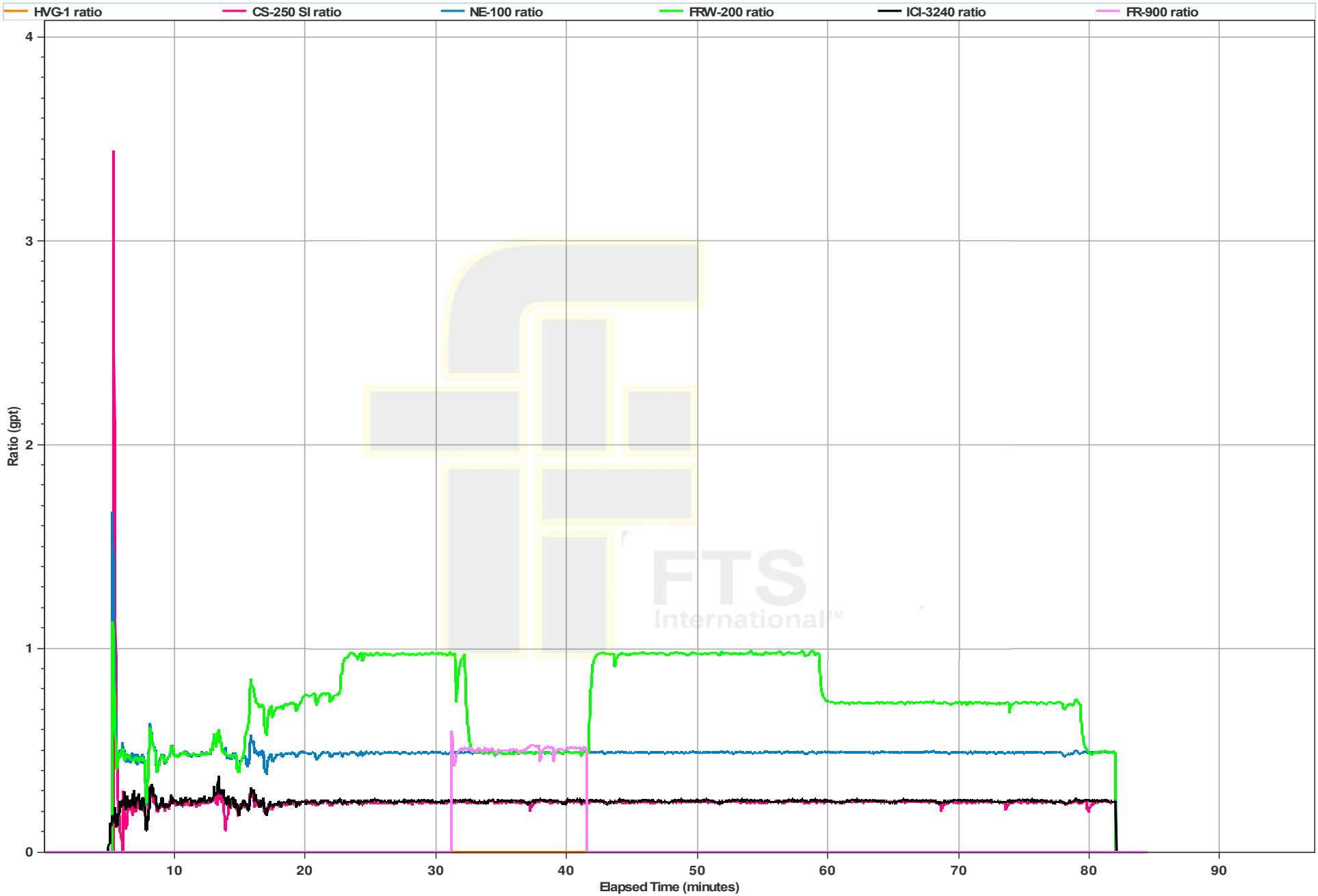
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 21 (WF.000658.M.W03.S21-ADCT-1103) **Jun 19, 2015**

ISIP Plot



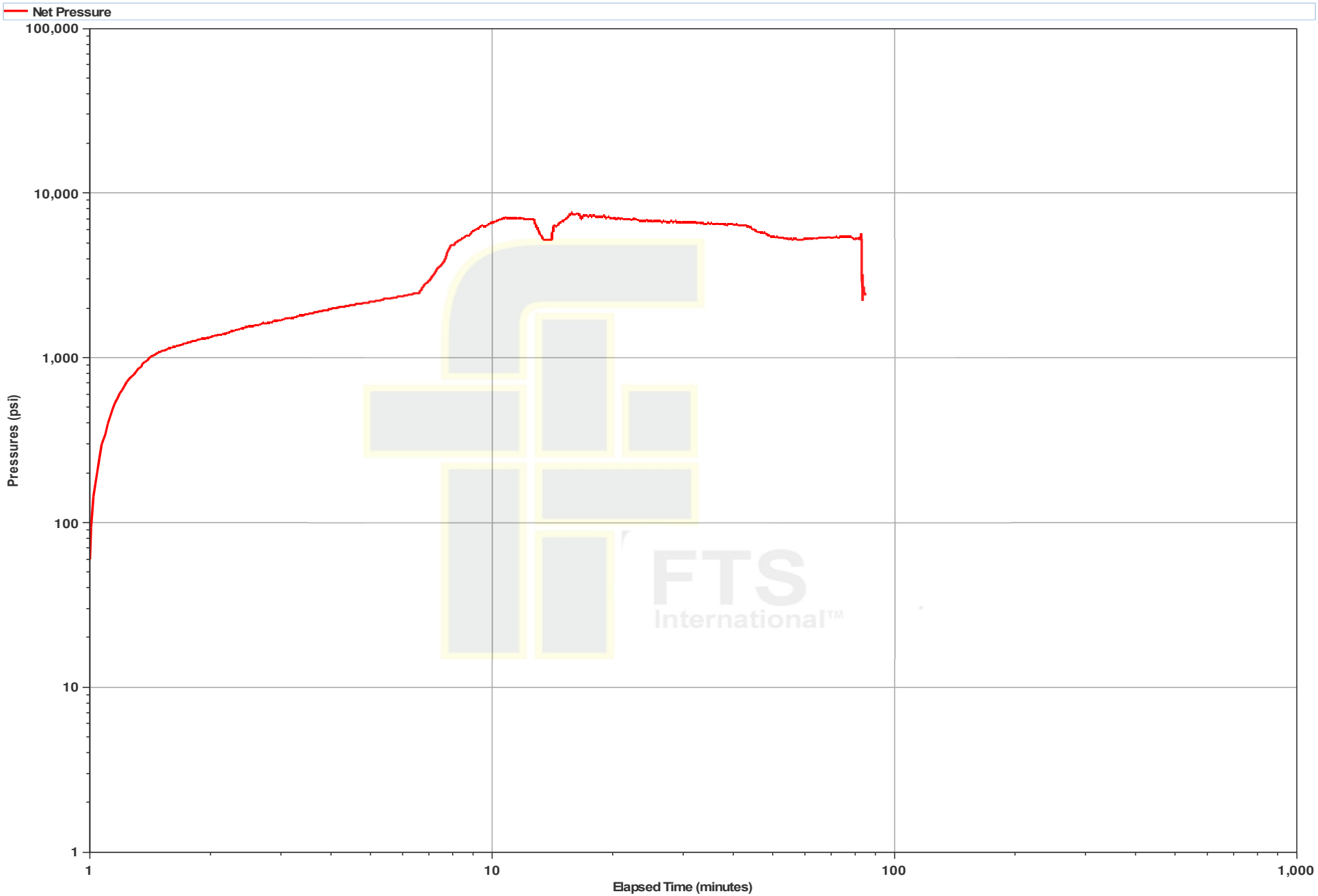
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 21 (WF.000658.M.W03.S21-ADCT-1103) **Jun 19, 2015**

Chemical Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 21 (WF.000658.M.W03.S21-ADCT-1103) **Jun 19, 2015**

Net Pressure Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 21 (WF.000658.M.W03.S21-ADCT-1103) Jun 19, 2015

WATER-BASED FRAC FLUID QUALITY CONTROL
(Attachment to Post Treatment Report)

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/19/2015
Customer Name:	American Energy - Utica	Proposal #:	3H/21
Date Sampled:	6/19/2015	Water Source:	Working Tank

Sample/Tank No.	Clarity, Color, Odor	Sample Temperature, (F)	Specific gravity	Initial pH	Chloride, ppm	Hardness, ppm	Calcium, ppm	Magnesium, ppm	Iron ppm	Hydroxide, ppm	Bicarbonate, ppm	Carbonate, ppm	Sulfate, ppm	Barium, ppm
Working Tank	Clear	72	1	8.2	30	80	28	13	1	0	49	0	75	0
Reused Water Tank	Yellow, Cloudy, Odorous	72	1.03	4.7	83,974	14200	5,441	2,129	>10	0	1220	0	225	0

Frac Fluid Quality Gel Testing (These Recording are to made prior to pumping job)														
Sample #														
Base Gel Type	HVG-1													
Gel Loading (lbs/1000 gal.)	2.5													
Sample Temperature, (F)	72													
Initial pH	8.1													
Visc. Reading @ 300 rpms	6													
Viscosity, (cp)	6													
Sample 1 3 min Hydration	4													
Sample 2 3 min Hydration	4													
Sample 3 3 min Hydration	6.5													
X-Link Vortex Closure, min:sec	n/a													
X-Link Crown, min:sec	n/a													
X-Link pH	n/a													
Gel Break Time (<2cp) mins	18													

Frac Fluid Quality Gel Testing (These Recording are to made while pumping job)														
Stage #														
Base Gel Viscosity (cp)														
X-Link pH								.						
Sample XL time, min:sec														
Sample Temperature														

Acid Quality	Percent Acid	NaOH, mLs	Specific Gravity
	28		1.14

Additional testing or documentation may be required by the customer or for frac fluid quality assurance.

Tested By: Travis Wilson

QUALITY CONTROL OF PROPPANTS

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/19/2015
Customer Name:	American Energy - Utica	Well/Stage:	3H/21
Date Sampled:	6/19/2015	DISTRICT:	Washington, PA
VENDOR:	SANTROL		

Select Proppant Type:

___ Brown	___ Ceramic	___ Other (specify)
X White	___ Bauxite	
___ Resin Coated	___ Texas Gold	

Sieve Analysis	100 Mesh			Sieve Analysis	30/50 Mesh		
Sample 1	24.80	grams of sample		Sample 2	25.00	grams of sample	
	Amount Retained				Amount Retained		
Sieve mesh	Gram	%		Sieve mesh	Gram	%	
			Total				Total
50	1.00	4.03	In-Size	20	0.00	0.00	In-Size
70	16.60	66.94		30	0.30	1.20	
100	5.90	23.79	96.0%	40	20.00	80.00	97.2%
120	0.80	3.23		45	3.40	13.60	
140	0.30	1.21		50	0.90	3.60	
200	0.20	0.81		70	0.40	1.60	
Pan	0.00	0.00	fines	Pan	0.00	0.00	fines
Total wt. Gram	24.80	100.00		Total wt. Gram	25.00	100.00	

Tested By: Travis Wilson

Post Job Report

AMERICAN ENERGY - UTICA

Red Hill Farm MDS GR 3H

Stage : 22 OF 54

HARRISON, OH

Operations Representative:

Name:	**David Knapp**
Office:	**570-327-4881**
Fax:	**724-743-7719**
Cell:	
Email:	**DAVID.KNAPP@FTSI.COM**

Sales Representative:

Name:	**Bruce Matthews**
Office:	**405-574-3981**
Fax:	**405-767-1288**
Cell:	
Email:	**BRUCE.MATTHEWS@FTSI.COM**

Engineering Manager:

Name:	**Thaddeus Craun**
Office:	**817-682-8702**
Fax:	**724-743-7719**
Cell:	
Email:	**THADDEUS.CRAUN@FTSI.COM**

FTS International
1432 Route 519
Eighty Four, PA 15330

Customer: American Energy - Utica
Well: Red Hill Farm Mds Gr 3H
Stage: 22
Job End Date: 06/20/2015

Job Summary

Well Information

TVD:	7,301	**Top Perf:**	12,629
No. Of Perfs:	30		

Casing	Tubing
5.50" 20.00#	N/A

Pressures, Rates and Volumes

	Proposed	Actual	Max	Min
STP	9,046 psi	8,650 psi	9,310 psi	7,331 psi
Rate	80.0 bpm	79.5 bpm	92.9 bpm	13.9 bpm

	Proposed	Actual		
Clean Volume	5,772 bbls	5,662 bbls		
Slurry Volume	6,042 bbls	5,933 bbls		
Flush Volume	357 bbls	327 bbls		

	Proposed	Start	End
Frac Pumps on Location	10	14	14

Open Well:	Start Time	04:02	Pressure	3,220 psi
	Ball Seat	271 bbls	Break Down	8,924 psi
	Initial ISIP:	4,624 psi	Initial F.G.:	1.07 psi/ft
Stage Complete:	End Time	05:26	Job Time	01:30
	Final ISIP	4,624 psi	Final F.G.	1.07 psi/ft
	HHP	16,855	5 Min:	4,097 psi
	Proppant Min:	0.00	10 Min:	N/A
	Proppant Max:	2.00	15 Min:	N/A

Material Volume

Material	Proposed	Calculated	Actual	Variance
100 Mesh White	40,000	39,484	39,484	0%
30/50 White	210,000	211,817	211,817	0%
Total Proppants	250,000	251,301	251,301	0%

Material	Proposed	Calculated	Actual	Variance
0.1%-7.5% HCL	3,000	2,982	3,000	1%
CI-150	3	3	3	0%
CS-250 SI	60	57	57	0%
FE-200L	15	15	15	0%
FRW-200	180	148	150	1%
ICI-3240	60	57	57	0%
NE-100	0	114	115	1%
NE-100W	120	0	0	0

Comments:

Pumpdown Information:
Total Bbls: 244
Max Pressure (psi): 5924
Max Rate (bpm): 15.1

FTS International
1432 Route 519
Eighty Four, PA 15330

Customer: American Energy - Utica
Well: Red Hill Farm Mds Gr 3H
Stage: 22
Job End Date: 06/20/2015

Treatment Report

Date:	6/20/2015	District:	Washington County,PA	Quote No:	051815_035725QF	API:	34-059-24370

MIL Time	STP	Slurry BPM	Stage Clean (bbls)	Cumulative Clean (bbls)	Stage Slurry (bbls)	Cumulative Slurry (bbls)	Stage Proppant (lbs)	Cumulative Proppant (lbs)	Description	Proppant	PPA
04:02	3,220	0.0	0	0	0	0	0	0	Freshwater Open Well		0.00
04:02	4,421	9.4	17	17	17	17	0	0	Freshwater Load		0.00
04:04	5,729	9.5	71	88	71	88	0	0	7.5% HCL Acid Acid		0.00
04:10	6,908	15.9	2	90	2	90	0	0	Slickwater Load		0.00
04:13	8,747	28.5	181	271	182	272	760	760	Slickwater Proppant	100 Mesh White	0.10
04:18	8,924	21.7	0	271	0	272	0	760	Slickwater Breakdown		0.00
04:18	8,989	23.8	35	306	35	307	147	907	Slickwater Proppant	100 Mesh White	0.10
04:19	9,049	19.2	214	520	216	523	2,247	3,154	Slickwater Proppant	100 Mesh White	0.25
04:25	8,758	66.3	215	735	220	743	4,515	7,669	Slickwater Proppant	100 Mesh White	0.50
04:28	8,897	84.1	390	1,125	403	1,146	12,285	19,954	Slickwater Proppant	100 Mesh White	0.75
04:34	8,932	90.4	465	1,590	486	1,632	19,530	39,484	Slickwater Proppant	100 Mesh White	1.00
04:40	8,847	92.3	875	2,465	915	2,547	36,750	76,234	Slickwater Proppant	30/50 White	1.00
04:49	8,609	92.3	140	2,605	148	2,695	7,350	83,584	Slickwater Proppant	30/50 White	1.25
04:50	8,549	91.8	861	3,466	910	3,605	45,203	128,787	Slickwater Proppant	30/50 White	1.25
05:00	8,513	91.9	868	4,334	927	4,532	54,684	183,471	Slickwater Proppant	30/50 White	1.50
05:11	8,510	92.4	500	4,834	540	5,072	36,750	220,221	Slickwater Proppant	30/50 White	1.75
05:16	8,402	91.7	370	5,204	403	5,475	31,080	251,301	Slickwater Proppant	30/50 White	2.00
05:21	8,391	92.9	131	5,335	131	5,606	0	251,301	Slickwater Clean screws		0.00
05:23	8,598	92.7	170	5,505	170	5,776	0	251,301	Slickwater Flush		0.00
05:24	8,395	92.9	157	5,662	157	5,933	0	251,301	Freshwater Flush		0.00
05:26	4,624	0.0	0	5,662	0	5,933	0	251,301	Freshwater Shutdown		0.00
Total JobTime (HH:MM): 01:24											

Min STP:	7,331 psi	**Max STP:**	9,310 psi	**Average STP:**	8,650 psi	**5 Min:**	4,097 psi
Min Rate:	13.9 bpm	**Max Rate:**	92.9 bpm	**Average Rate:**	79.5 bpm	**10 Min:**	0 psi
Initial ISIP:	4,624 psi	**Initial F.G.:**	1.07 psi/ft	**Average HHP:**	16,855	**15 Min:**	0 psi
Final ISIP:	4,624 psi	**Final F.G.:**	1.07 psi/ft	**Customer Representative:**		Bill Rubin	
FTSI Representative:		Etuate Varea & Kody Bonfardin					

Comments:

The proppant values contained in this report are calculated based on actual barrel counts and target densities. Actual total proppant usage is 251,301 lbs. Charge time is 1 hour(s) 30 minute(s). All chemicals and proppant ran as documented.

Min/Max/Avg were taken from sand stages. All chem changes from proposed were made per AEU representative request.

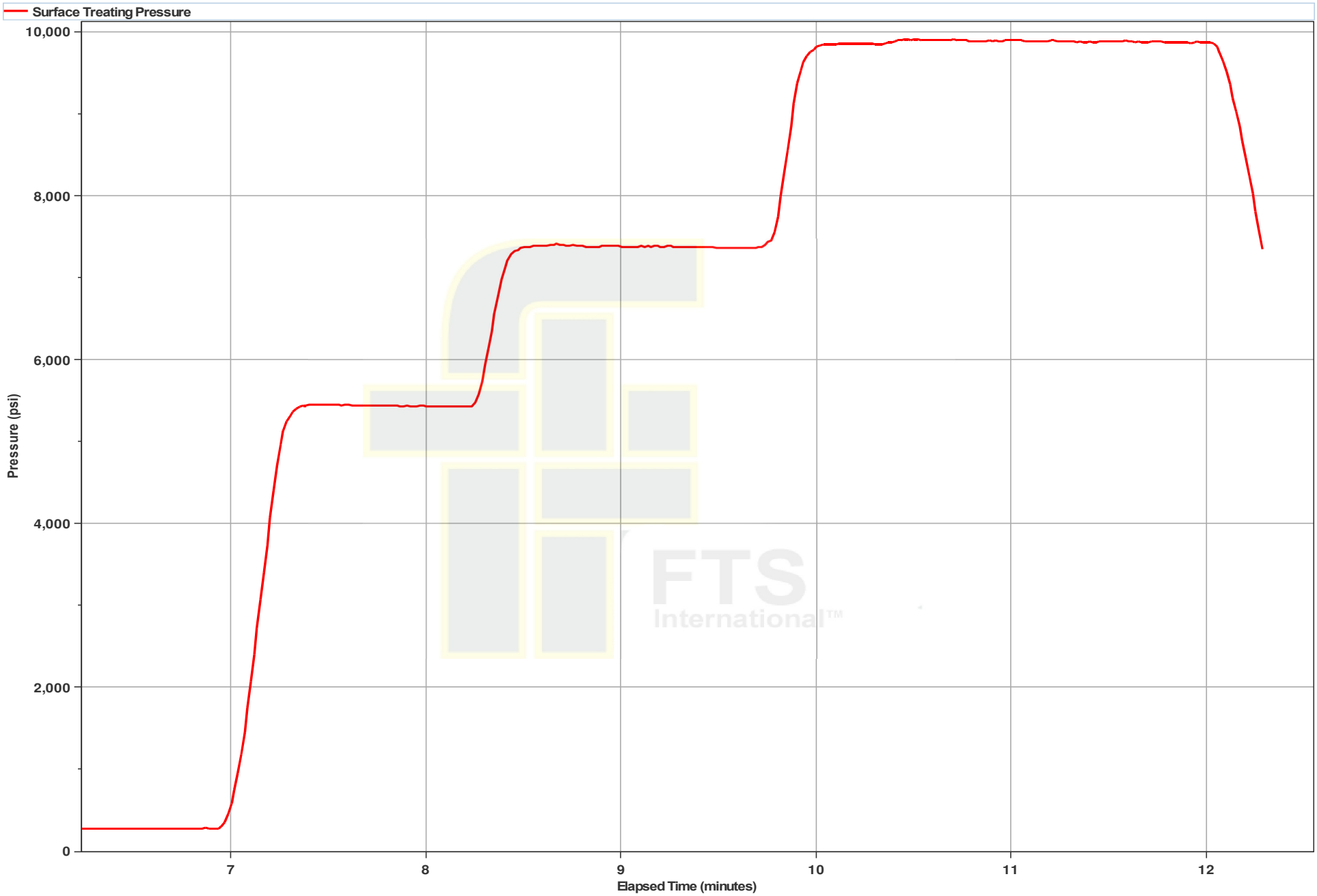
No reused water used.

1 Minute Shutdown (psi): 4392
2 Minute Shutdown (psi): 4153
5 Minute Shutdown (psi): 4097

Chemical Changes:

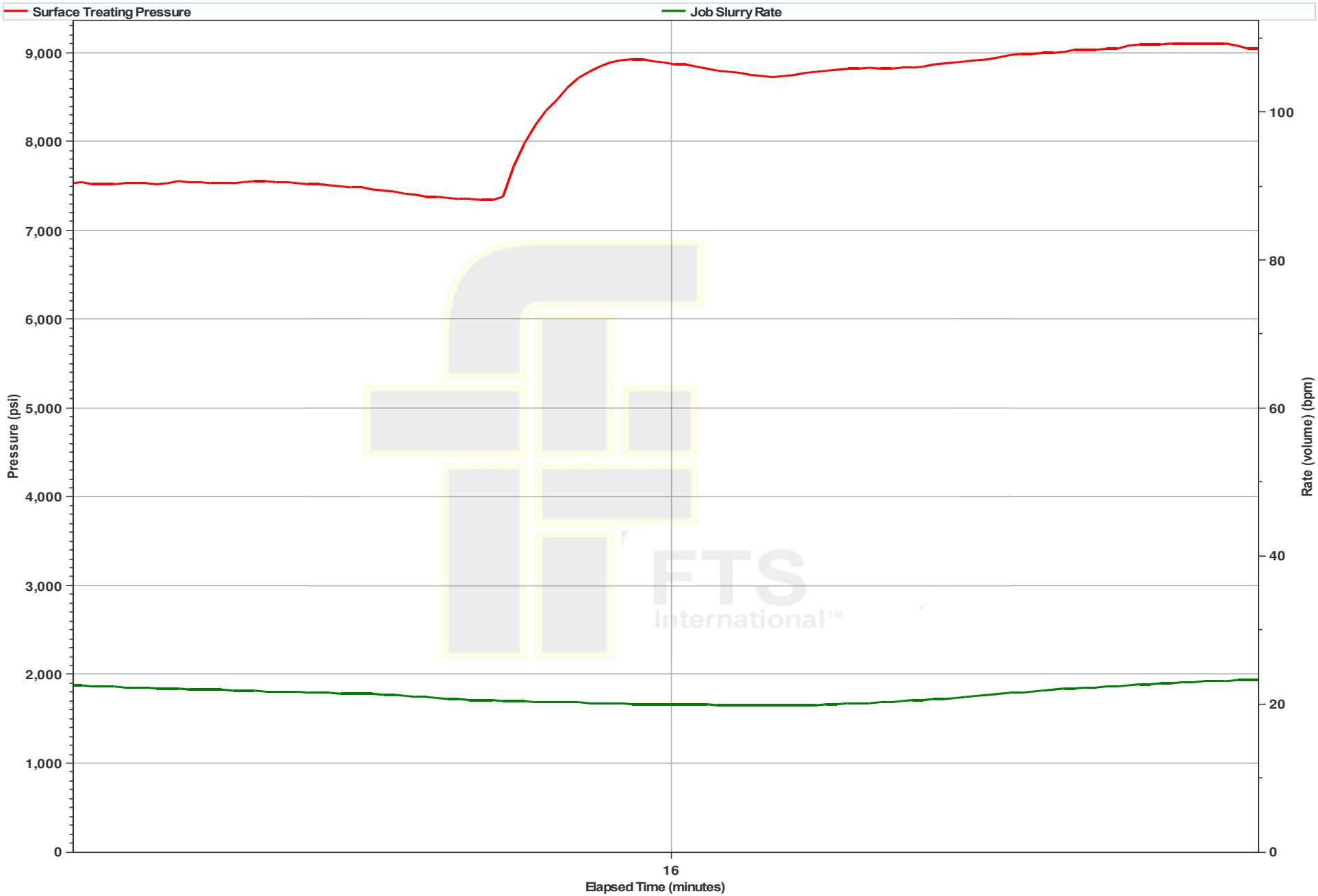
Chemical Name	Chemical Loading	Cumulative Clean
FRW-200	0.75	735
FRW-200	0.60	3,466

AEU Pressure Test



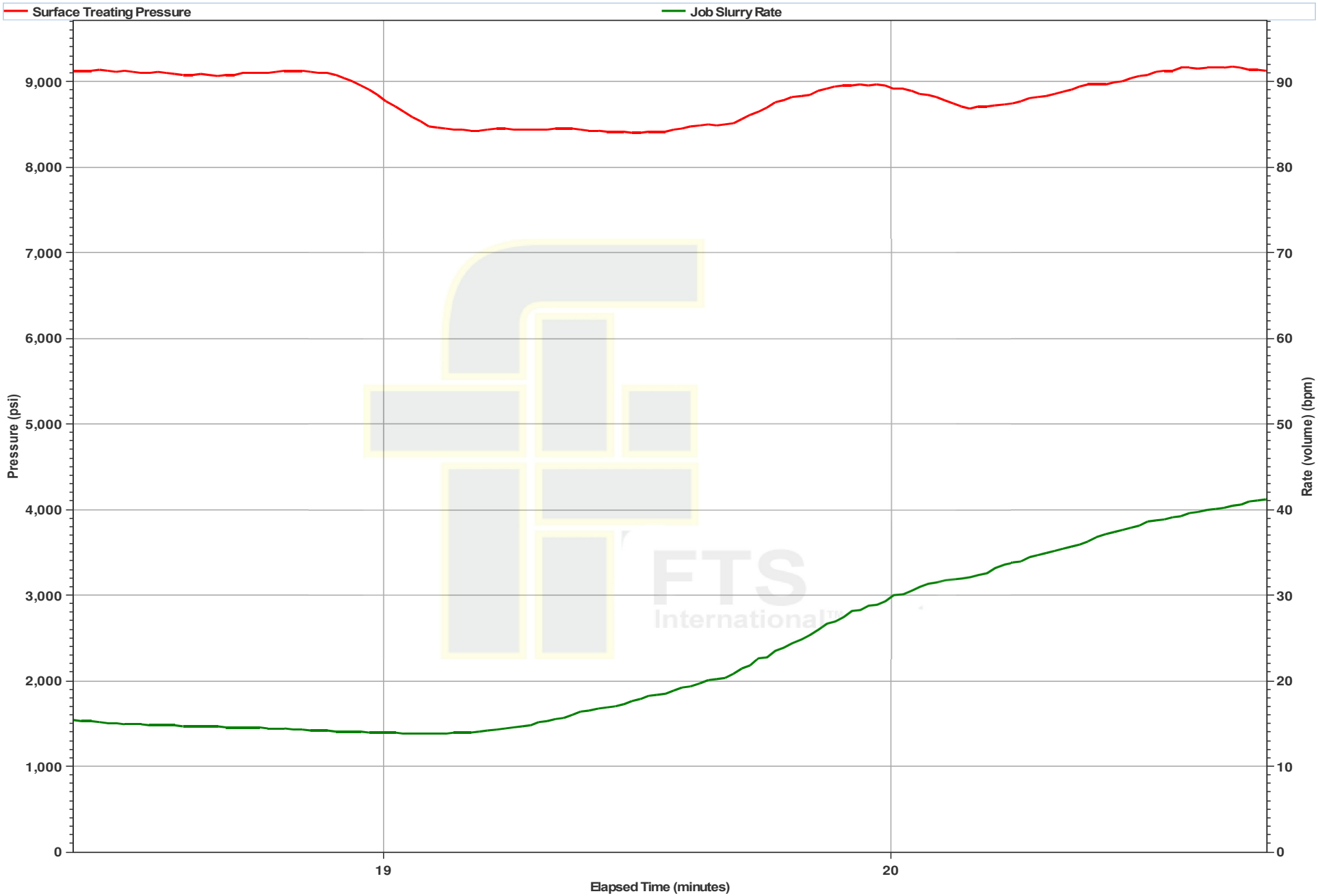
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 22 (WF.000658.M.W03.S22-ADCT-1103) Jun 20, 2015

Ball Seat and Breakdown



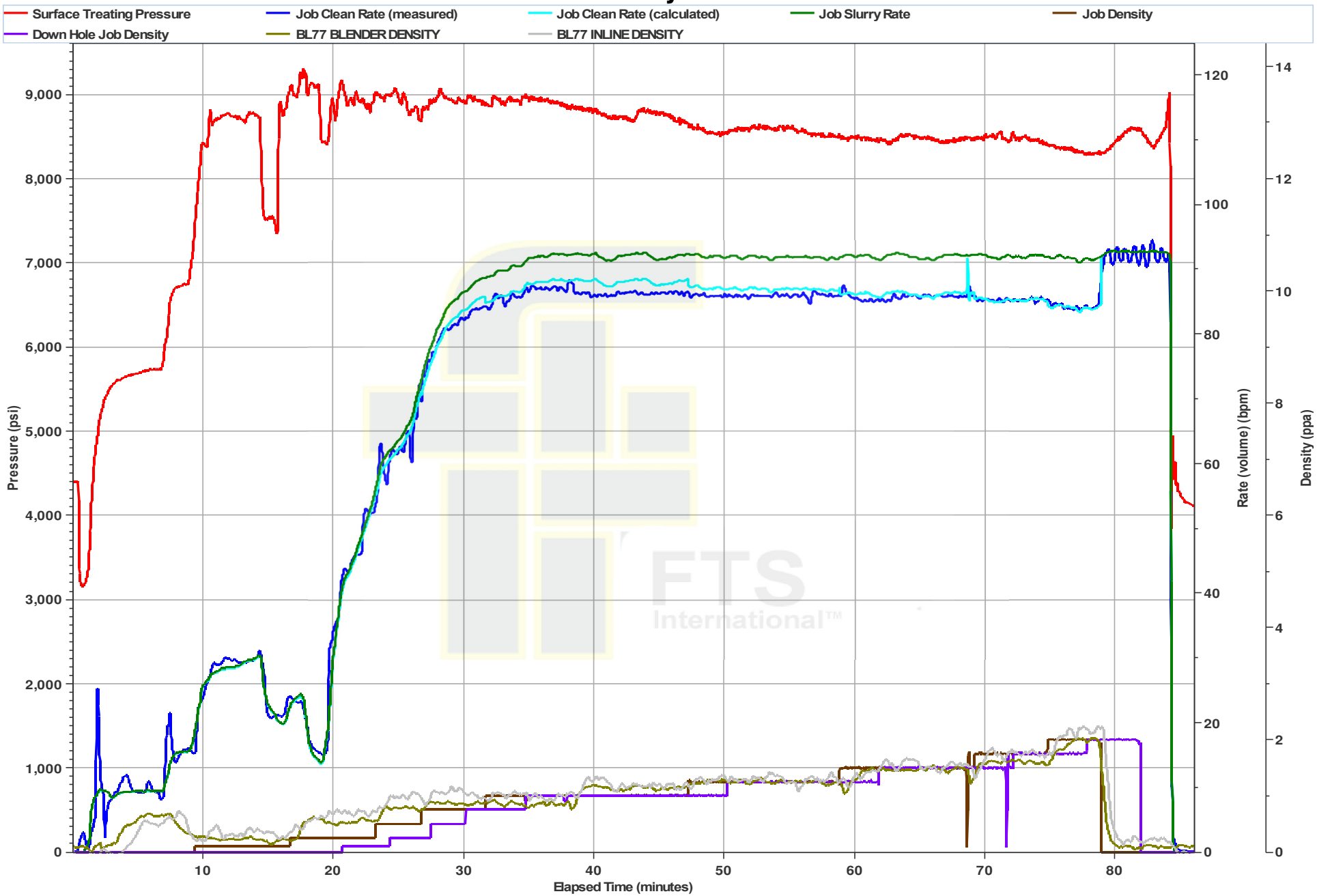
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 22 (WF.000658.M.W03.S22-ADCT-1103) **Jun 20, 2015**

Acid on Perforations



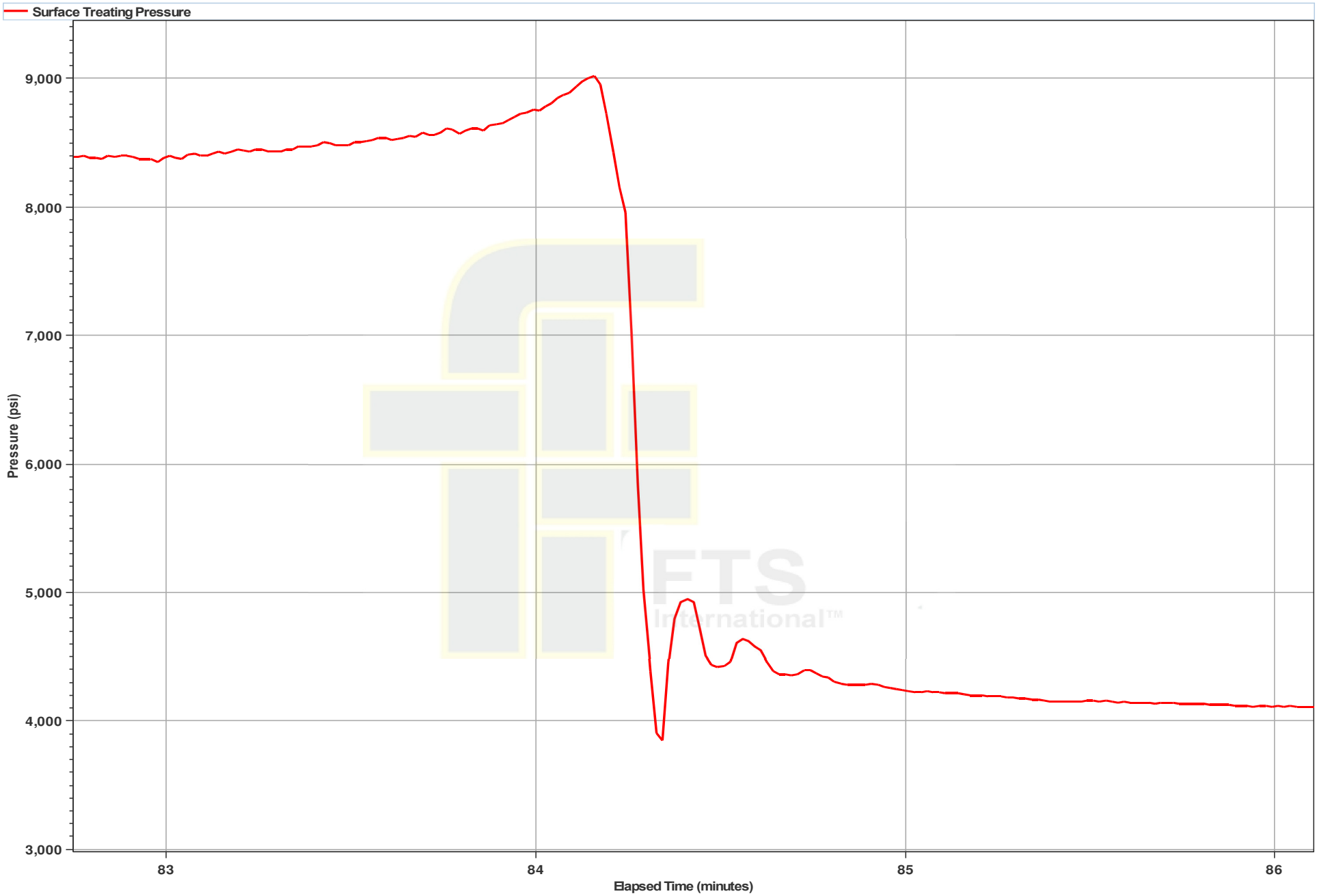
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 22 (WF.000658.M.W03.S22-ADCT-1103) **Jun 20, 2015**

Primary Plot



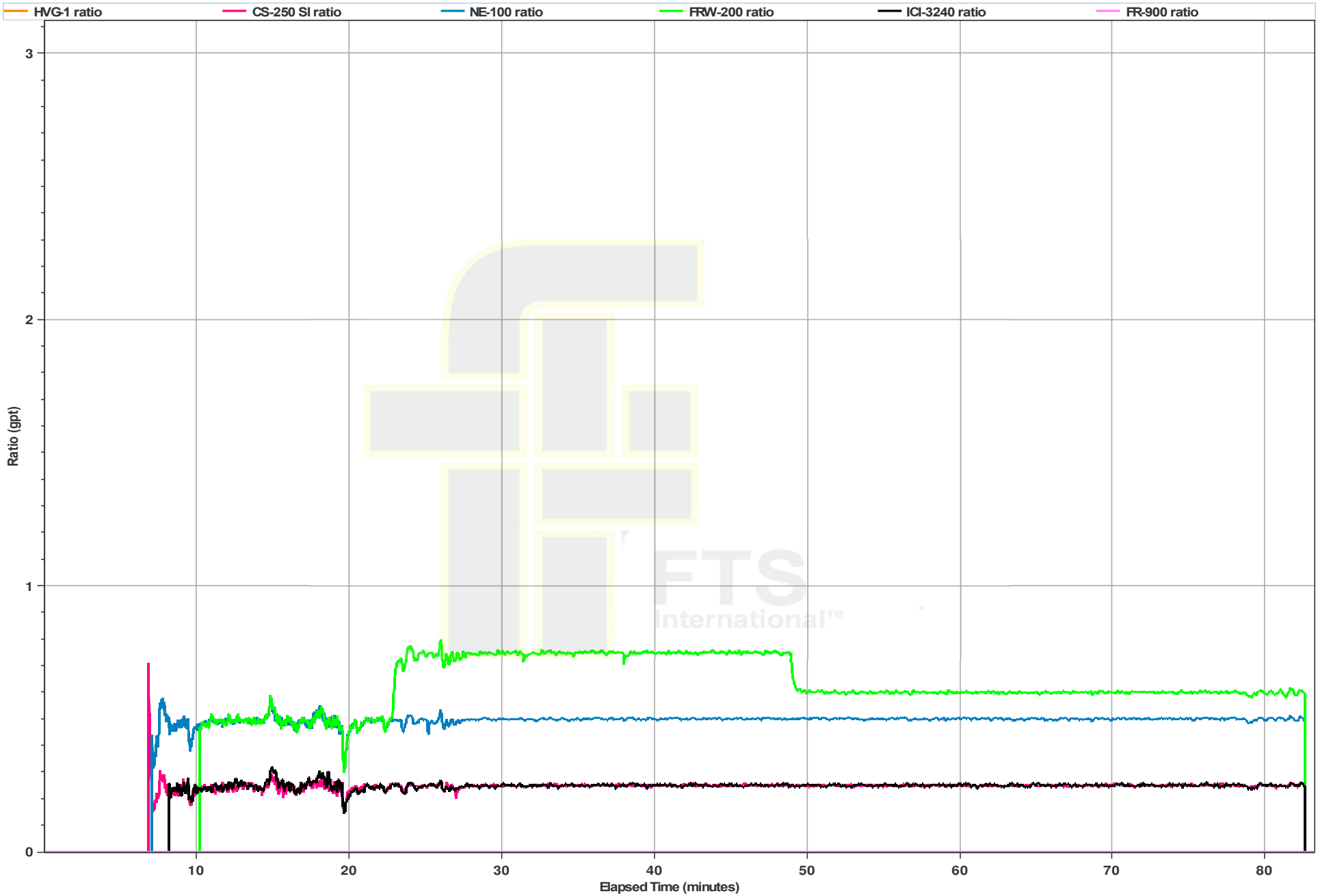
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 22 (WF.000658.M.W03.S22-ADCT-1103) **Jun 20, 2015**

ISIP Plot



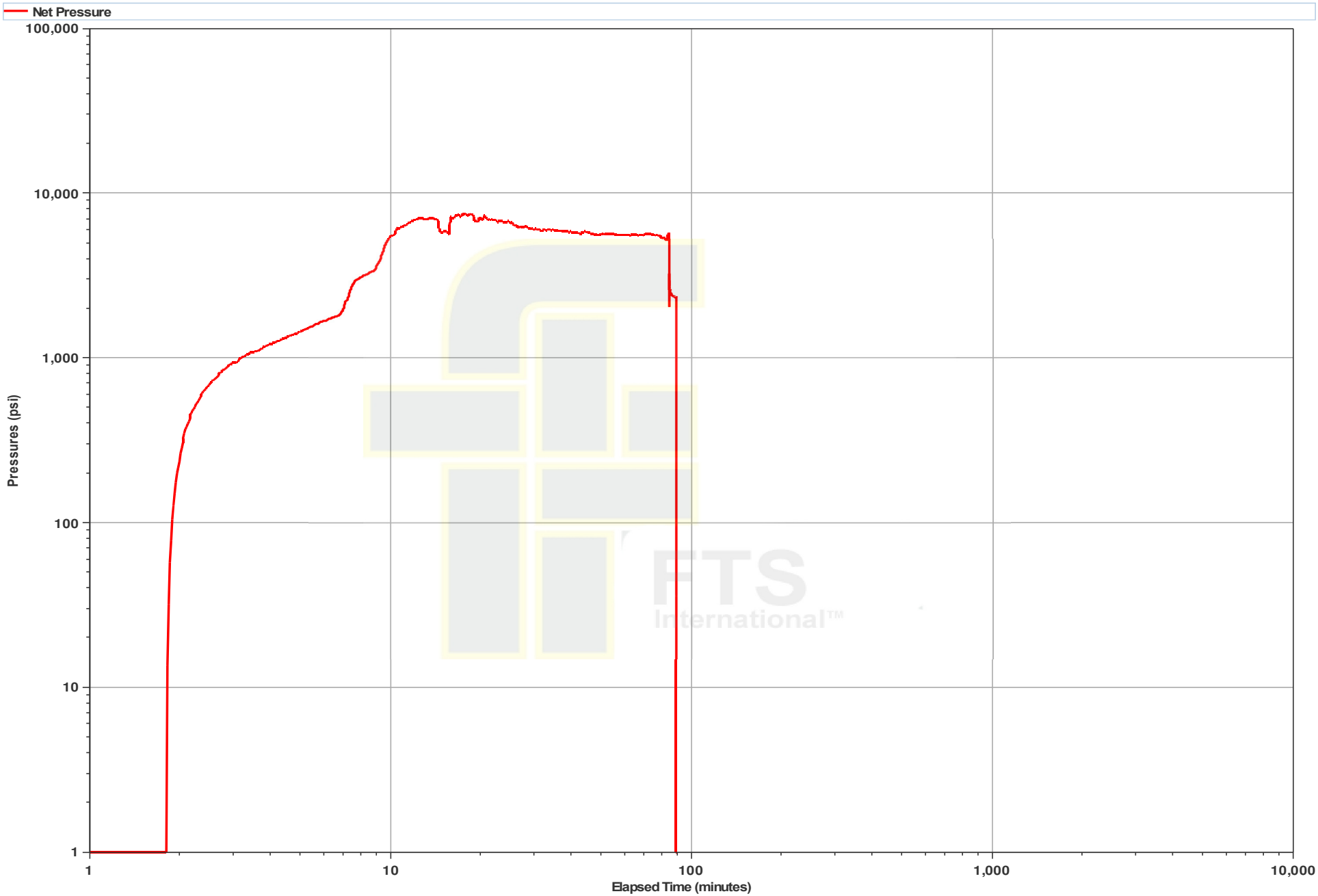
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 22 (WF.000658.M.W03.S22-ADCT-1103) **Jun 20, 2015**

Chemical Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 22 (WF.000658.M.W03.S22-ADCT-1103) **Jun 20, 2015**

Net Pressure Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 22 (WF.000658.M.W03.S22-ADCT-1103) Jun 20, 2015

WATER-BASED FRAC FLUID QUALITY CONTROL
(Attachment to Post Treatment Report)

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/20/2015
Customer Name:	American Energy - Utica	Proposal #:	3H/22
Date Sampled:	6/20/2015	Water Source:	Working Tank

Sample/Tank No.	Clarity, Color, Odor	Sample Temperature, (F)	Specific gravity	Initial pH	Chloride, ppm	Hardness, ppm	Calcium, ppm	Magnesium, ppm	Iron ppm	Hydroxide, ppm	Bicarbonate, ppm	Carbonate, ppm	Sulfate, ppm	Barium, ppm
Working Tank	Clear	72	1	8.2	34	102	32	17	1	0	73	0	65	0

Frac Fluid Quality Gel Testing (These Recording are to made prior to pumping job)														
Sample #														
Base Gel Type	HVG-1													
Gel Loading (lbs/1000 gal.)	2.5													
Sample Temperature, (F)	72													
Initial pH	8.1													
Visc. Reading @ 300 rpms	6													
Viscosity, (cp)	6													
Sample 1 3 min Hydration	4													
Sample 2 3 min Hydration	5													
Sample 3 3 min Hydration	6.5													
X-Link Vortex Closure, min:sec	n/a													
X-Link Crown, min:sec	n/a													
X-Link pH	n/a													
Gel Break Time (<2cp) mins	19													

Frac Fluid Quality Gel Testing (These Recording are to made while pumping job)														
Stage #														
Base Gel Viscosity (cp)														
X-Link pH								.						
Sample XL time, min:sec														
Sample Temperature														

Acid Quality	Percent Acid	NaOH, mLs	Specific Gravity
	28		1.14

Additional testing or documentation may be required by the customer or for frac fluid quality assurance.

Tested By: Travis Wilson

QUALITY CONTROL OF PROPPANTS

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/20/2015
Customer Name:	American Energy - Utica	Well/Stage:	3H/22
Date Sampled:	6/20/2015	DISTRICT:	Washington, PA
VENDOR:	SANTROL		

Select Proppant Type:

___ Brown	___ Ceramic	___ Other (specify)
X White	___ Bauxite	_____
___ Resin Coated	___ Texas Gold	

Sieve Analysis	100 Mesh			Sieve Analysis	30/50 Mesh		
Sample 1	25.40	grams of sample		Sample 2	24.90	grams of sample	
	Amount Retained				Amount Retained		
Sieve mesh	Gram	%		Sieve mesh	Gram	%	
			Total				Total
50	0.50	1.97	In-Size	20	0.00	0.00	In-Size
70	15.90	62.60		30	0.30	1.20	
100	6.80	26.77	98.0%	40	18.50	74.30	97.6%
120	1.60	6.30		45	4.50	18.07	
140	0.50	1.97		50	1.30	5.22	
200	0.10	0.39		70	0.30	1.20	
Pan	0.00	0.00	fines	Pan	0.00	0.00	fines
Total wt. Gram	25.40	100.00		Total wt. Gram	24.90	100.00	

Tested By: Travis Wilson

Post Job Report

AMERICAN ENERGY - UTICA

Red Hill Farm MDS GR 3H

Stage : 23 OF 54

HARRISON, OH

Operations Representative:

Name:	**David Knapp**
Office:	**570-327-4881**
Fax:	**724-743-7719**
Cell:	
Email:	**DAVID.KNAPP@FTSI.COM**

Sales Representative:

Name:	**Bruce Matthews**
Office:	**405-574-3981**
Fax:	**405-767-1288**
Cell:	
Email:	**BRUCE.MATTHEWS@FTSI.COM**

Engineering Manager:

Name:	**Thaddeus Craun**
Office:	**817-682-8702**
Fax:	**724-743-7719**
Cell:	
Email:	**THADDEUS.CRAUN@FTSI.COM**

FTS International
1432 Route 519
Eighty Four, PA 15330

Customer: American Energy - Utica
Well: Red Hill Farm Mds Gr 3H
Stage: 23
Job End Date: 06/20/2015

Job Summary

Well Information

TVD:	7,301	**Top Perf:**	12,367
No. Of Perfs:	30		

Casing	Tubing
5.50" 20.00#	N/A

Pressures, Rates and Volumes

	Proposed	Actual	Max	Min
STP	9,046 psi	8,560 psi	9,198 psi	7,458 psi
Rate	80.0 bpm	82.5 bpm	95.5 bpm	20.7 bpm

	Proposed	Actual		
Clean Volume	5,772 bbls	5,614 bbls		
Slurry Volume	6,042 bbls	5,883 bbls		
Flush Volume	357 bbls	276 bbls		

	Proposed	Start	End
Frac Pumps on Location	10	14	14

Open Well:	Start Time	10:58	Pressure	3,190 psi
	Ball Seat	259 bbls	Break Down	8,195 psi
	Initial ISIP:	4,766 psi	Initial F.G.:	1.09 psi/ft
Stage Complete:	End Time	12:17	Job Time	01:15
	Final ISIP	4,766 psi	Final F.G.	1.09 psi/ft
	HHP	17,309	5 Min:	3,990 psi
	Proppant Min:	0.00	10 Min:	N/A
	Proppant Max:	2.00	15 Min:	N/A

Material Volume

Material	Proposed	Calculated	Actual	Variance
100 Mesh White	40,000	39,879	39,879	0%
30/50 White	210,000	210,274	210,274	0%
Total Proppants	250,000	250,153	250,153	0%

Material	Proposed	Calculated	Actual	Variance
0.1%-7.5% HCL	3,000	2,982	3,000	1%
CI-150	3	3	3	0%
CS-250 SI	60	57	57	0%
FE-200L	15	15	15	0%
FRW-200	180	207	210	1%
ICI-3240	60	57	57	0%
NE-100	0	113	114	1%
NE-100W	120	0	0	0

Comments:

Pumpdown Information:
Total Bbls: 224
Max Pressure (psi): 5885
Max Rate (bpm): 15.2

FTS International
1432 Route 519
Eighty Four, PA 15330

Customer: American Energy - Utica
Well: Red Hill Farm Mds Gr 3H
Stage: 23
Job End Date: 06/20/2015

Treatment Report

Date:	6/20/2015	District:	Washington County,PA	Quote No:	051815_035725QF	API:	34-059-24370

MIL Time	STP	Slurry BPM	Stage Clean (bbls)	Cumulative Clean (bbls)	Stage Slurry (bbls)	Cumulative Slurry (bbls)	Stage Proppant (lbs)	Cumulative Proppant (lbs)	Description	Proppant	PPA
10:58	3,190	0.0	0	0	0	0	0	0	Freshwater Open Well		0.00
10:58	5,681	11.4	13	13	13	13	0	0	Freshwater Load		0.00
11:00	5,711	10.6	71	84	71	84	0	0	7.5% HCL Acid Acid		0.00
11:06	7,599	22.9	15	99	15	99	0	0	Slickwater Load		0.00
11:07	7,686	23.6	160	259	161	260	672	672	Slickwater Proppant	100 Mesh White	0.10
11:11	8,195	28.2	0	259	0	260	0	672	Slickwater Breakdown		0.00
11:12	8,312	29.1	55	314	55	315	231	903	Slickwater Proppant	100 Mesh White	0.10
11:14	9,198	23.7	214	528	216	531	2,247	3,150	Slickwater Proppant	100 Mesh White	0.25
11:18	8,791	90.9	262	790	268	799	5,502	8,652	Slickwater Proppant	100 Mesh White	0.50
11:22	8,755	90.7	422	1,212	436	1,235	13,293	21,945	Slickwater Proppant	100 Mesh White	0.75
11:27	8,735	90.8	427	1,639	446	1,681	17,934	39,879	Slickwater Proppant	100 Mesh White	1.00
11:31	8,501	95.0	893	2,532	933	2,614	37,506	77,385	Slickwater Proppant	30/50 White	1.00
11:42	8,469	94.9	1,001	3,533	1,058	3,672	52,553	129,938	Slickwater Proppant	30/50 White	1.25
11:53	8,473	95.0	75	3,608	80	3,752	4,725	134,663	Slickwater Proppant	30/50 White	1.50
11:54	8,545	95.0	190	3,798	203	3,955	11,970	146,633	Slickwater Proppant	30/50 White	1.50
11:56	8,707	94.4	735	4,533	785	4,740	46,305	192,938	Slickwater Proppant	30/50 White	1.50
12:04	8,614	93.3	527	5,060	569	5,309	38,735	231,673	Slickwater Proppant	30/50 White	1.75
12:10	8,700	93.1	220	5,280	240	5,549	18,480	250,153	Slickwater Proppant	30/50 White	2.00
12:13	8,314	89.8	58	5,338	58	5,607	0	250,153	Slickwater Clean screws		0.00
12:14	8,427	89.8	130	5,468	130	5,737	0	250,153	Slickwater Flush		0.00
12:15	8,588	90.0	146	5,614	146	5,883	0	250,153	Freshwater Flush		0.00
12:17	4,766	0.0	0	5,614	0	5,883	0	250,153	Freshwater Shutdown		0.00
Total JobTime (HH:MM): 01:18											

Min STP:	7,458 psi	**Max STP:**	9,198 psi	**Average STP:**	8,560 psi	**5 Min:**	3,990 psi
Min Rate:	20.7 bpm	**Max Rate:**	95.5 bpm	**Average Rate:**	82.5 bpm	**10 Min:**	0 psi
Initial ISIP:	4,766 psi	**Initial F.G.:**	1.09 psi/ft	**Average HHP:**	17,309	**15 Min:**	0 psi
Final ISIP:	4,766 psi	**Final F.G.:**	1.09 psi/ft	**Customer Representative:**		Jim Andrews	
FTSI Representative:		Etuate Varea & James Garland					

Comments:

The proppant values contained in this report are calculated based on actual barrel counts and target densities. Actual total proppant usage is 250,153 lbs. Charge time is 1 hour(s) 15 minute(s). All chemicals and proppant ran as documented.

Min/Max/Avg were taken from sand stages. All chem changes from proposed were made per AEU representative request.

No reused water pumped..

1 Minute Shutdown (psi): 4598
2 Minute Shutdown (psi): 4266
5 Minute Shutdown (psi): 3990

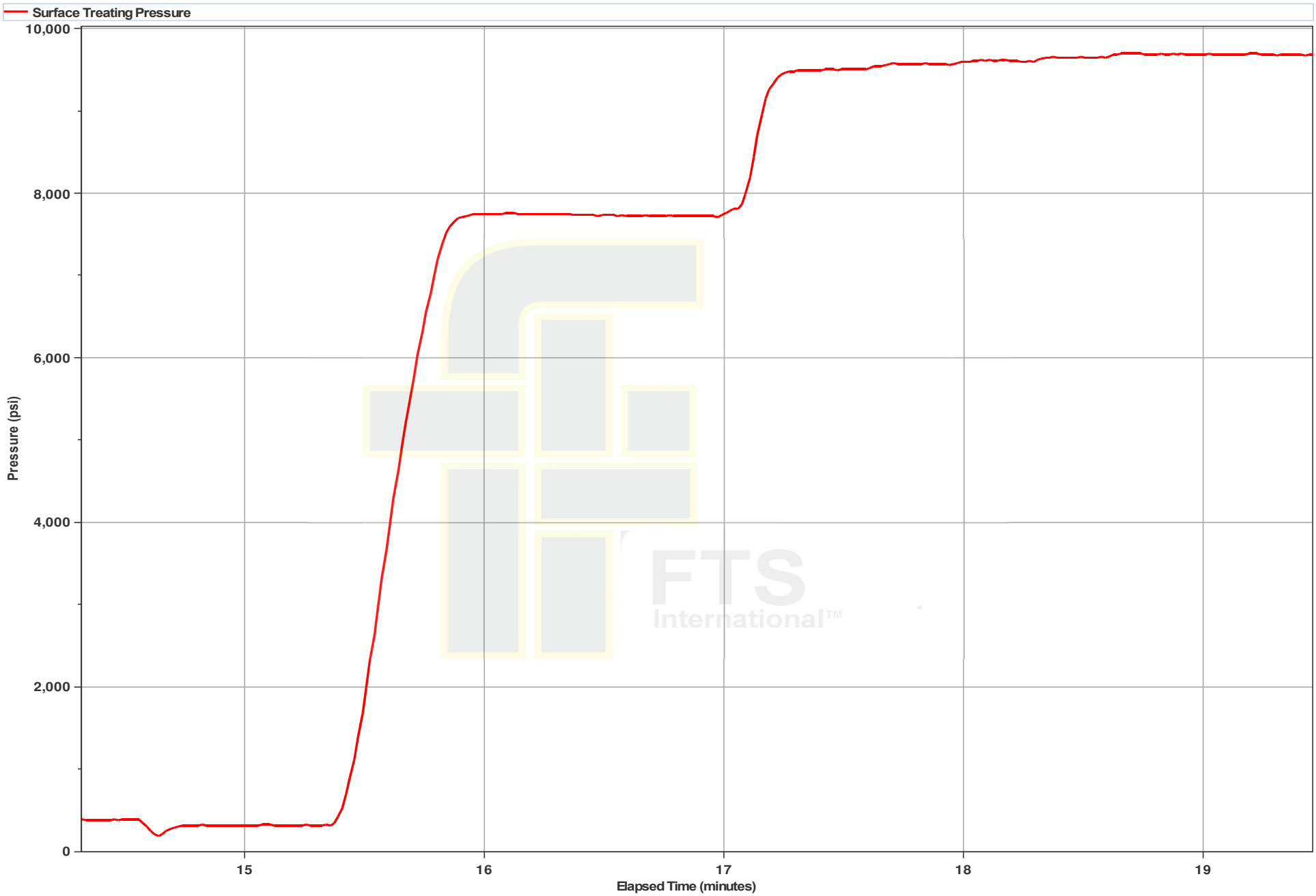
FTS International
1432 Route 519
Eighty Four, PA 15330

Customer: American Energy - Utica
Well: Red Hill Farm Mds Gr 3H
Stage: 23
Job End Date: 06/20/2015

Chemical Changes:

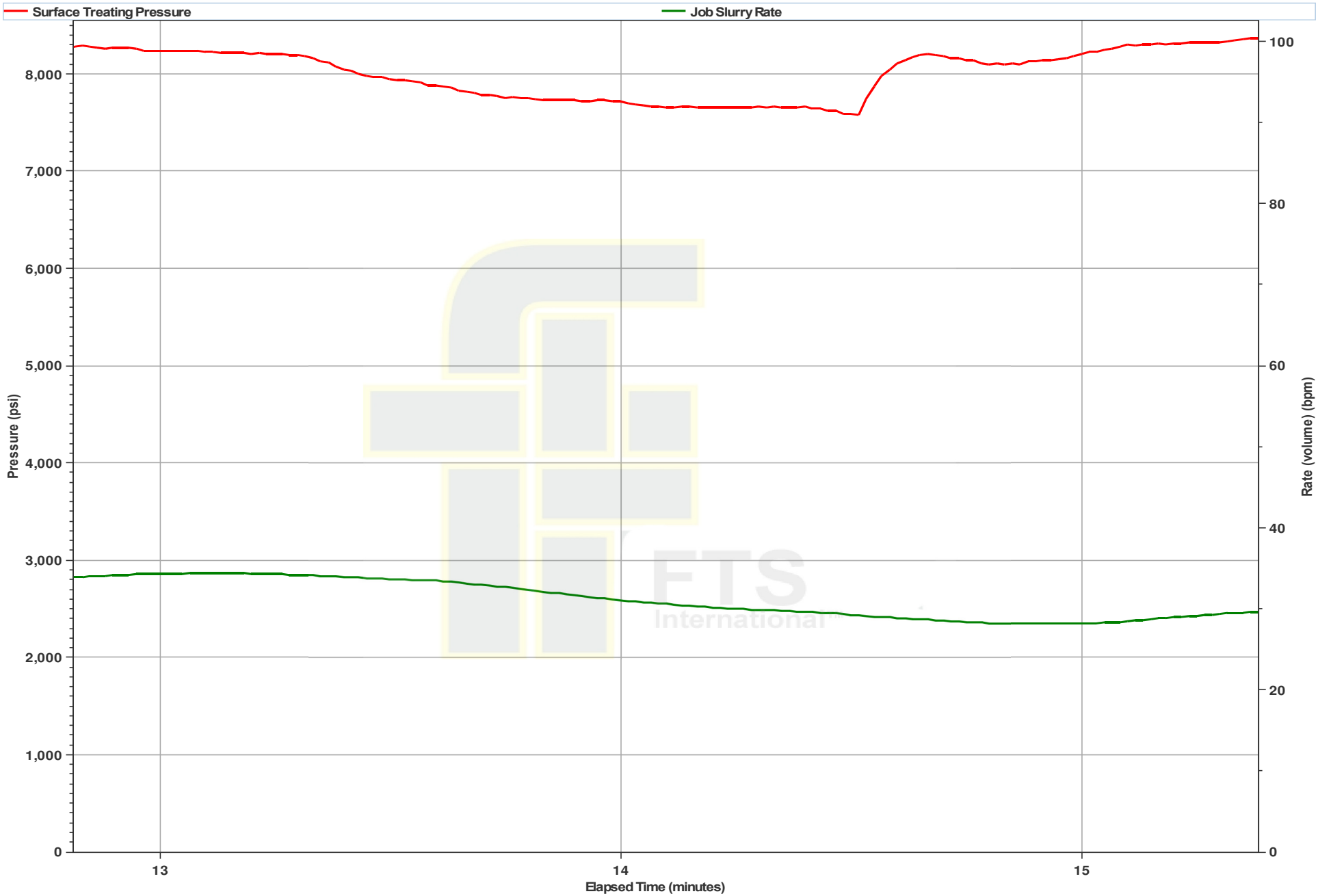
Chemical Name	Chemical Loading	Cumulative Clean
FRW-200	1.00	3,798
FRW-200	1.25	4,533

AEU Pressure Test



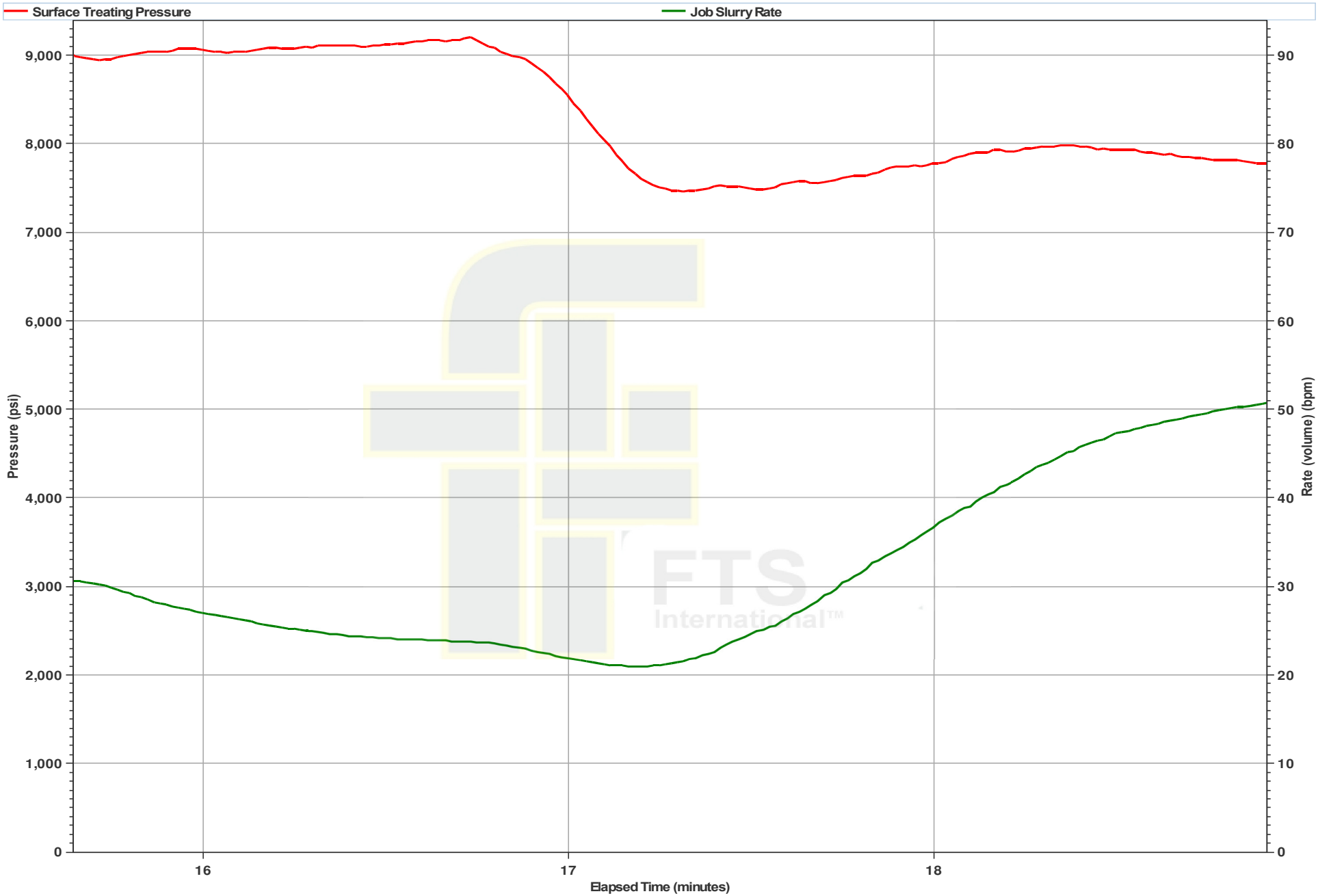
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 23 (WF.000658.M.W03.S23-aDCT-1103) Jun 20, 2015

Ball Seat and Breakdown



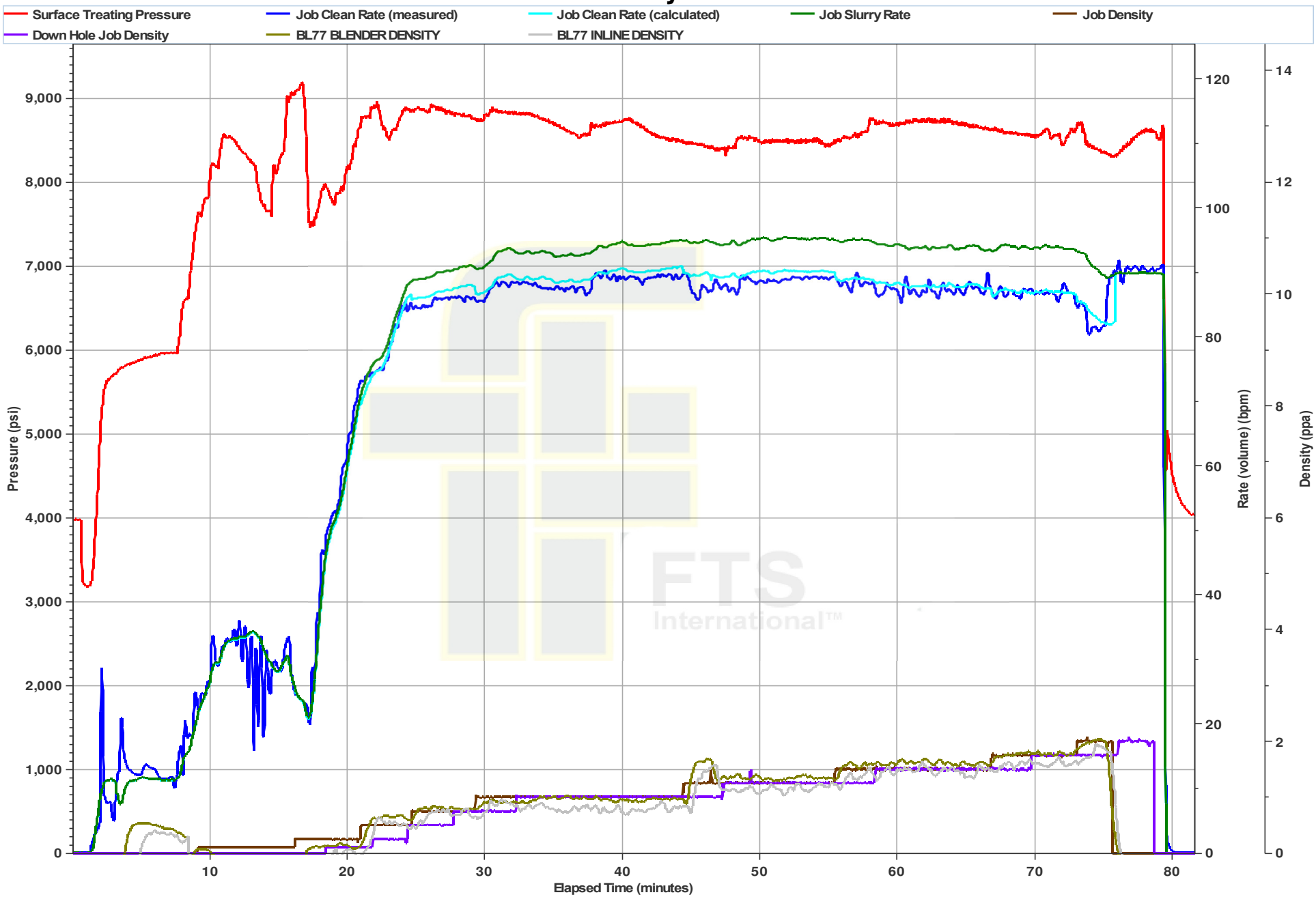
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 23 (WF.000658.M.W03.S23-aDCT-1103) Jun 20, 2015

Acid on Perforations



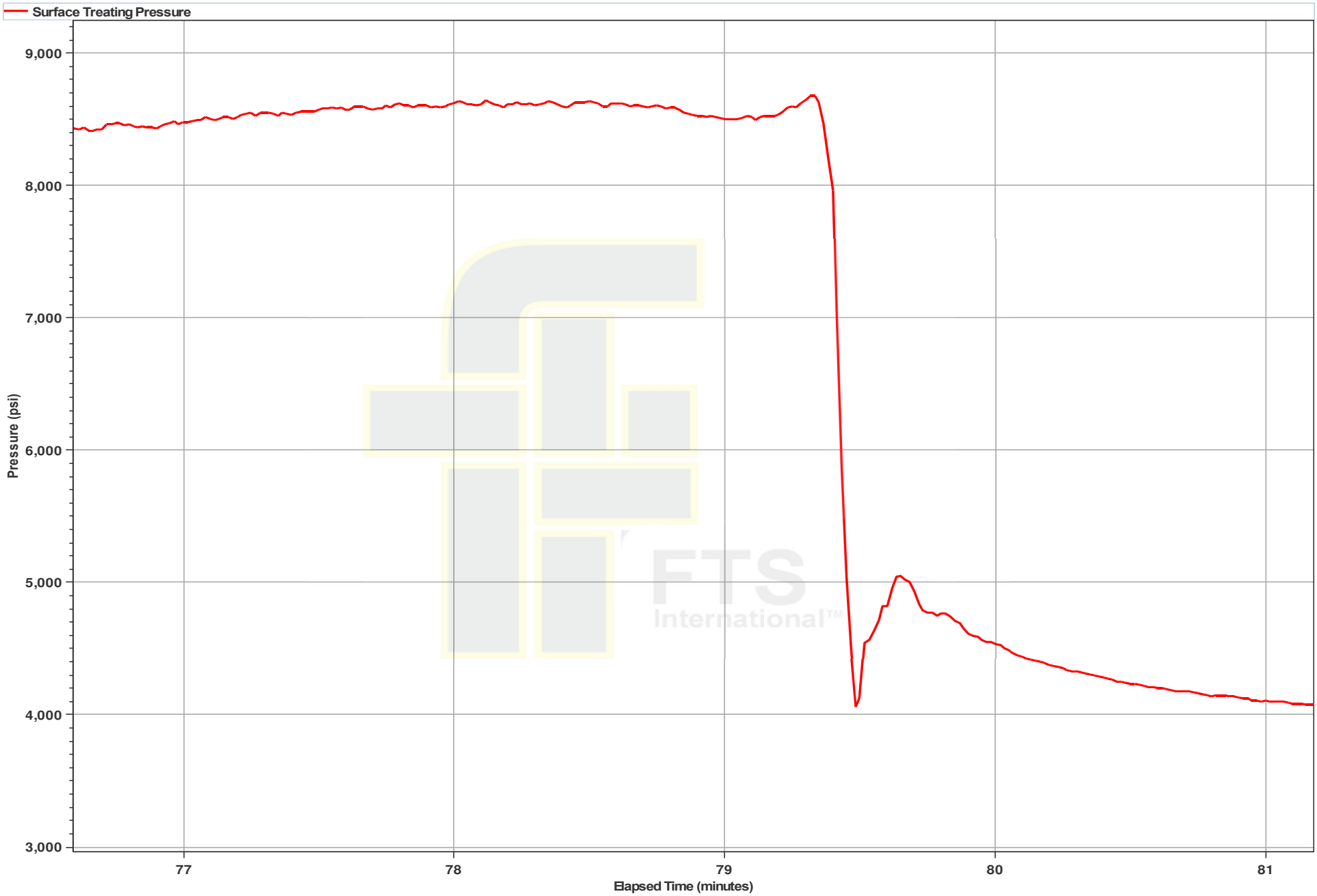
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 23 (WF.000658.M.W03.S23-aDCT-1103) **Jun 20, 2015**

Primary Plot



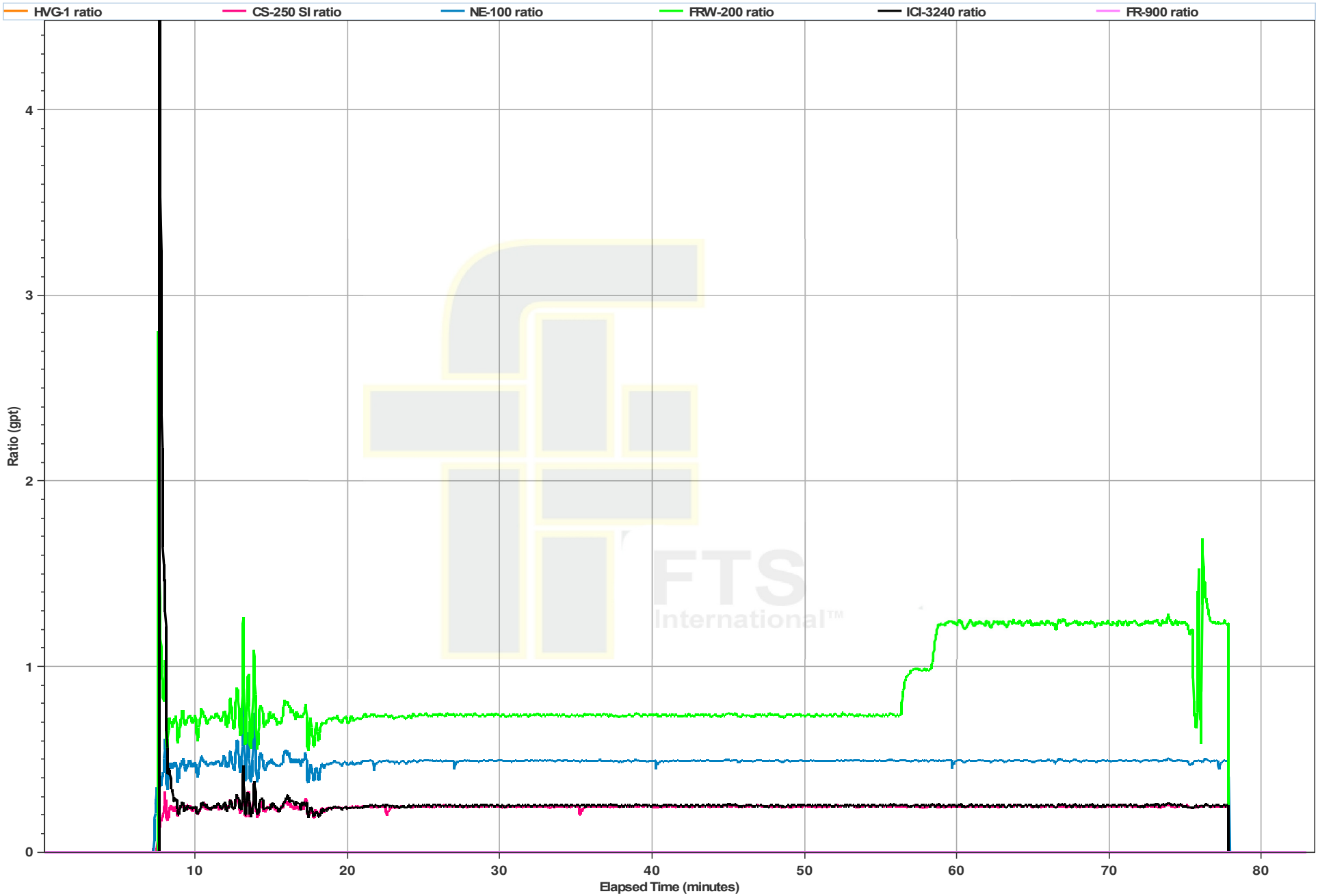
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 23 (WF.000658.M.W03.S23-aDCT-1103) **Jun 20, 2015**

ISIP Plot



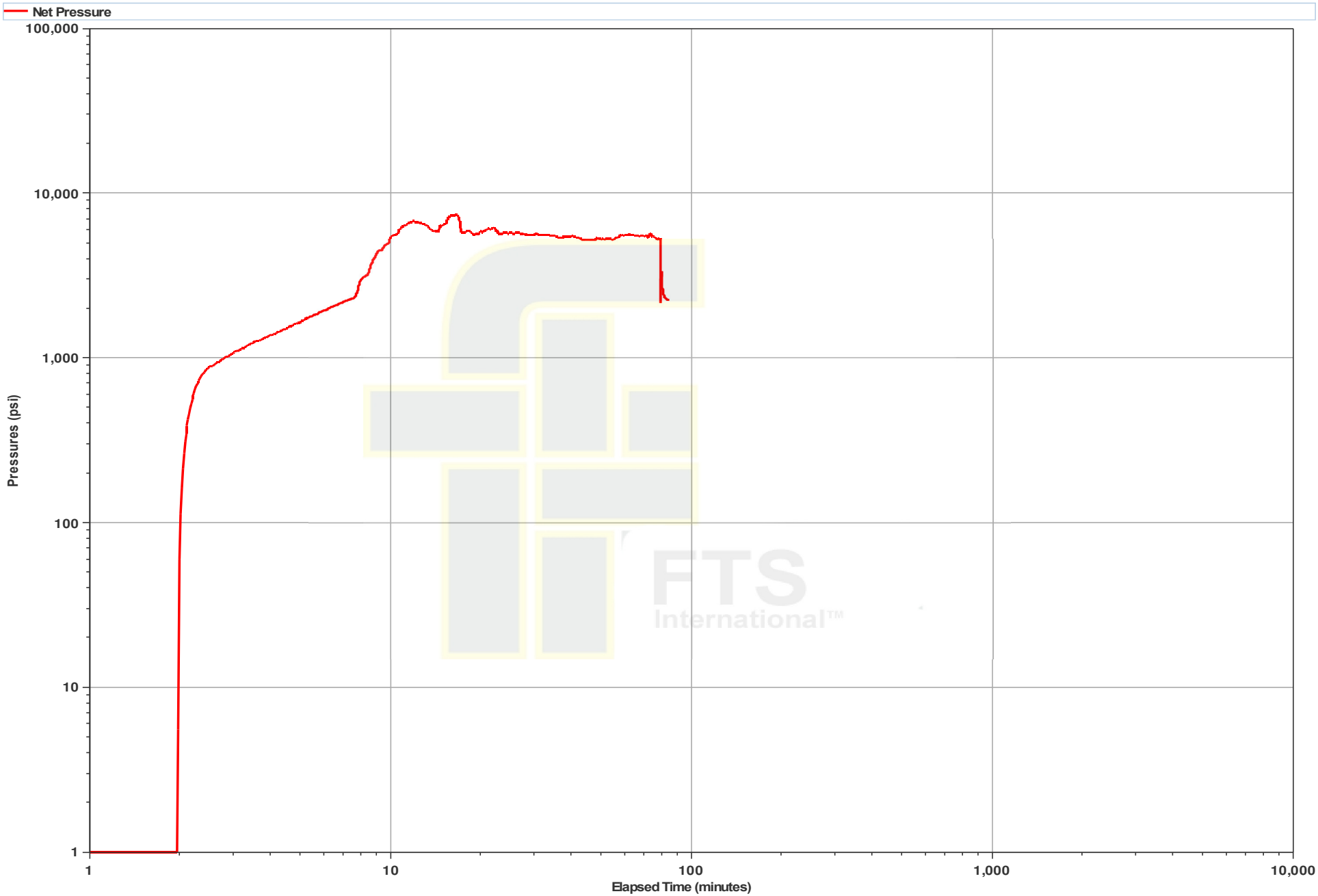
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 23 (WF.000658.M.W03.S23-aDCT-1103) Jun 20, 2015

Chemical Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 23 (WF.000658.M.W03.S23-aDCT-1103) Jun 20, 2015

Net Pressure Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 23 (WF.000658.M.W03.S23-aDCT-1103) Jun 20, 2015

WATER-BASED FRAC FLUID QUALITY CONTROL
(Attachment to Post Treatment Report)

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/20/2015
Customer Name:	American Energy - Utica	Proposal #:	3H/23
Date Sampled:	6/20/2015	Water Source:	Working Tank

Sample/Tank No.	Clarity, Color, Odor	Sample Temperature, (F)	Specific gravity	Initial pH	Chloride, ppm	Hardness, ppm	Calcium, ppm	Magnesium, ppm	Iron ppm	Hydroxide, ppm	Bicarbonate, ppm	Carbonate, ppm	Sulfate, ppm	Barium, ppm
Working Tank	Clear	70	1	8.1	60	70	22	12	1	0	83	0	120	0

Frac Fluid Quality Gel Testing (These Recording are to made prior to pumping job)														
Sample #														
Base Gel Type	HVG-1													
Gel Loading (lbs/1000 gal.)	2.5													
Sample Temperature, (F)	70													
Initial pH	8.1													
Visc. Reading @ 300 rpms	6													
Viscosity, (cp)	6													
Sample 1 3 min Hydration	4													
Sample 2 3 min Hydration	5													
Sample 3 3 min Hydration	6													
X-Link Vortex Closure, min:sec	n/a													
X-Link Crown, min:sec	n/a													
X-Link pH	n/a													
Gel Break Time (<2cp) mins	20													

Frac Fluid Quality Gel Testing (These Recording are to made while pumping job)														
Stage #														
Base Gel Viscosity (cp)														
X-Link pH								.						
Sample XL time, min:sec														
Sample Temperature														

Acid Quality	Percent Acid	NaOH, mLs	Specific Gravity
	28		1.14

Additional testing or documentation may be required by the customer or for frac fluid quality assurance.

Tested By: Etuate Varea

QUALITY CONTROL OF PROPPANTS

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/20/2015
Customer Name:	American Energy - Utica	Well/Stage:	3H/23
Date Sampled:	6/20/2015	DISTRICT:	Washington, PA
VENDOR:	SANTROL		

Select Proppant Type:

___	Brown	___	Ceramic	___	Other (specify)
X	White	___	Bauxite		
___	Resin Coated	___	Texas Gold		

Sieve Analysis	100 Mesh			Sieve Analysis	30/50 Mesh		
Sample 1	24.70	grams of sample		Sample 2	25.20	grams of sample	
	Amount Retained				Amount Retained		
Sieve mesh	Gram	%		Sieve mesh	Gram	%	
			Total				Total
50	0.50	2.02	In-Size	20	0.00	0.00	In-Size
70	15.90	64.37		30	0.50	1.98	
100	6.50	26.32	98.0%	40	16.90	67.06	95.2%
120	1.40	5.67		45	5.90	23.41	
140	0.30	1.21		50	1.20	4.76	
200	0.10	0.40		70	0.60	2.38	
Pan	0.00	0.00	fines	Pan	0.10	0.40	fines
Total wt. Gram	24.70	100.00		Total wt. Gram	25.20	100.00	

Tested By: Etuate Varea

Post Job Report

AMERICAN ENERGY - UTICA

Red Hill Farm MDS GR 3H

Stage : 24 OF 54

HARRISON, OH

Operations Representative:

Name:	David Knapp
Office:	878-327-4881
Fax:	724-743-7719
Cell:	
Email:	DAVID.KNAPP@FTSI.COM

Sales Representative:

Name:	Bruce Eathman
Office:	405-574-3901
Fax:	405-787-1235
Cell:	
Email:	BRUCE.EATTHMAN@FTSI.COM

Engineering Manager:

Name:	Thaddeus Craun
Office:	817-832-8782
Fax:	724-743-7719
Cell:	
Email:	THADDEUS.CRAUN@FTSI.COM

FTS International
[illegible]
Ogilby Pass, PA [illegible]

FTS INTERNATIONAL

Customer: American Energy - Utica
Well: Red Hill Farm Site 6r 3H
Stage: 34
Job End Date: [illegible]

Job Summary

Well Information

TVD:	7,301	Top Perf:	12,215
No. Of Perfs:	30		

Casing	Tubing
[illegible]	n/A

Pressures, Rates and Volumes

	Proposed	Actual	Max	Min
STP	[illegible] psi	[illegible] psi	[illegible] psi	[illegible] psi
Rate	[illegible] bpm	[illegible] bpm	[illegible] bpm	[illegible] bpm

	Proposed	Actual		
Clean Volume	[illegible] bbls	[illegible] bbls		
Slurry Volume	[illegible] bbls	[illegible] bbls		
Flush Volume	[illegible] bbls	[illegible] bbls		

	Proposed	Start	End
Frac Pumps on Location	19	14	14

Open Well:	Start Time	17:59	Pressure	[illegible] psi
	Bd End	[illegible] bbls	Break Down	[illegible] psi
	Initial ISIP:	[illegible] psi	Initial F.G.:	[illegible] psi/ft
Stage Complete:	End Time	18:14	Job Time	[illegible]
	Final ISIP	[illegible] psi	Final F.G.	[illegible] psi/ft
	ISIP	[illegible]	5 Min:	[illegible] psi
	Pressure Min:	[illegible]	10 Min:	N/A
	Pressure Max:	[illegible]	15 Min:	N/A

Material Volume

Material	Proposed	Calculated	Actual	Variance
100 Mesh White	[illegible]	[illegible]	[illegible]	0%
[illegible] White	[illegible]	[illegible]	[illegible]	0%
Total Proppants	[illegible]	[illegible]	[illegible]	0%

Material	Proposed	Calculated	Actual	Variance
8.1%-7.5% HCL	[illegible]	[illegible]	[illegible]	1%
AFR-1	6	16	15	0%
[illegible]	3	3	3	0%
[illegible]	[illegible]	[illegible]	60	2%
FE-[illegible]	15	15	15	0%
[illegible]	130	130	104	-20%
HVG-1 4.5	6	60	50	0%
[illegible]	[illegible]	[illegible]	60	2%
LTB-1	6	16	15	0%
[illegible]	6	117	118	2%
[illegible]	130	8	8	6

Comments:

Pumpdown Information:
Total Bbls: 231
Max Pressure (psi): 6383
Max Rate (bpm): 19

FTS International
[illegible]
Eighty Four, PA [illegible]

FTS INTERNATIONAL

Customer: American Energy - Utica
Well: Red Hill Farm Site 6r 3H
Stage: 34
Job End Date: [illegible]

Treatment Report

Date	[illegible]	Statelate	Washington County,PA	Service Ser	[illegible]	API#	[illegible]

Elt. Time	BTP	Slurry BPM	Stage Slurry (bbls)	Cumulative Slurry (bbls)	Stage Slurry (bbls)	Cumulative Slurry (bbls)	Stage Proppant (lbs)	Cumulative Proppant (lbs)	Description	Proppant	PPA
17:34	3,016	0.0	0	0	0	0	0	0	Freshwater Open Wet		0.00
17:34	0,000	0.0	16	16	16	16	0	0	Freshwater Load		0.00
17:37	0,746	0.0	71	87	71	87	0	0	7.5% HCL Acid Add		0.00
18:03	0,030	10.5	52	140	52	140	0	0	Slickwater Load		0.00
18:05	3,174	21.4	123	263	123	263	512	512	Slickwater Proppant	100 Mesh White	0.10
18:06	7,079	17.0	4	270	4	270	17	530	Slickwater Breakdown	100 Mesh White	0.10
18:06	7,000	17.3	14	283	14	284	270	800	Slickwater Proppant	100 Mesh White	0.10
18:11	0,000	48.0	221	504	224	508	2,321	3,229	Slickwater Proppant	100 Mesh White	0.25
18:14	0,744	50.0	300	810	302	810	4,375	6,600	Slickwater Proppant	100 Mesh White	0.50
18:18	0,000	50.0	428	1,238	444	1,254	13,514	22,110	Slickwater Proppant	100 Mesh White	0.75
18:23	0,743	51.2	428	1,667	447	1,701	17,973	40,083	Slickwater Proppant	100 Mesh White	1.00
18:28	0,041	52.2	675	2,372	615	2,309	30,753	70,836	Slickwater Proppant	30/50 White	1.00
18:36	0,439	51.0	1,091	3,479	1,090	3,714	52,053	122,912	Slickwater Proppant	30/50 White	1.25
18:40	0,439	51.0	100	3,579	103	3,817	11,348	144,233	Slickwater Proppant	30/50 White	1.50
18:51	0,439	51.5	560	4,041	730	4,541	69,344	194,579	Slickwater Proppant	30/50 White	1.50
18:58	0,147	51.0	340	4,041	352	4,893	17,048	201,719	Slickwater Proppant	40/80 White	1.75
19:02	3,097	31.2	130	4,171	140	5,040	9,695	211,000	16# Linear Gel Proppant	40/80 White	1.75
19:04	3,000	67.0	191	4,362	141	5,181	9,629	220,697	16# Linear Gel Proppant	40/80 White	1.75
19:05	3,303	67.6	220	4,582	264	5,451	18,480	239,177	16# Linear Gel Proppant	40/80 White	2.00
19:07	3,217	50.4	120	4,697	130	5,587	10,500	249,677	16# Linear Gel Proppant	40/80 White	2.00
19:19	3,303	50.7	160	4,857	160	5,747	0	249,677	16# Linear Gel Open screen		0.00
19:11	3,001	50.3	220	5,077	220	5,967	0	249,677	Slickwater Flush		0.00
19:13	0,327	50.0	104	5,171	104	6,041	0	249,677	Freshwater Flush		0.00
19:14	4,011	0.0	0	5,171	0	6,041	0	249,677	Freshwater Shutdown		0.00
Total Job/Time (HH:MM): 01:40											

Min BTP:	0,040 psi	Max BTP:	0,105 psi	Average BTP:	3,337 psi	5 Min:	3,300 psi
Min Rate:	17.0 bpm	Max Rate:	50.1 bpm	Average Rate:	50.7 bpm	10 Min:	0 psi
Initial ISIP:	4,011 psi	Initial F.Gr:	1.07 psi/ft	Average ISIP:	17,452	15 Min:	0 psi
Final ISIP:	4,011 psi	Final F.Gr:	1.07 psi/ft	Customer Representative:		Exit Survey:	
FTS Representative:		Travis Wilson & William Hahn					

Comments:

The proppant values contained in this report are calculated based on actual barrel counts and target densities. Actual total proppant usage is 249,277 lbs. Charge time is 1 hour(s) 18 minute(s). All chemicals and proppant ran as documented.

Min/Max/Avg were taken from sand stages. All chem changes from proposed were made per AEU representative request.

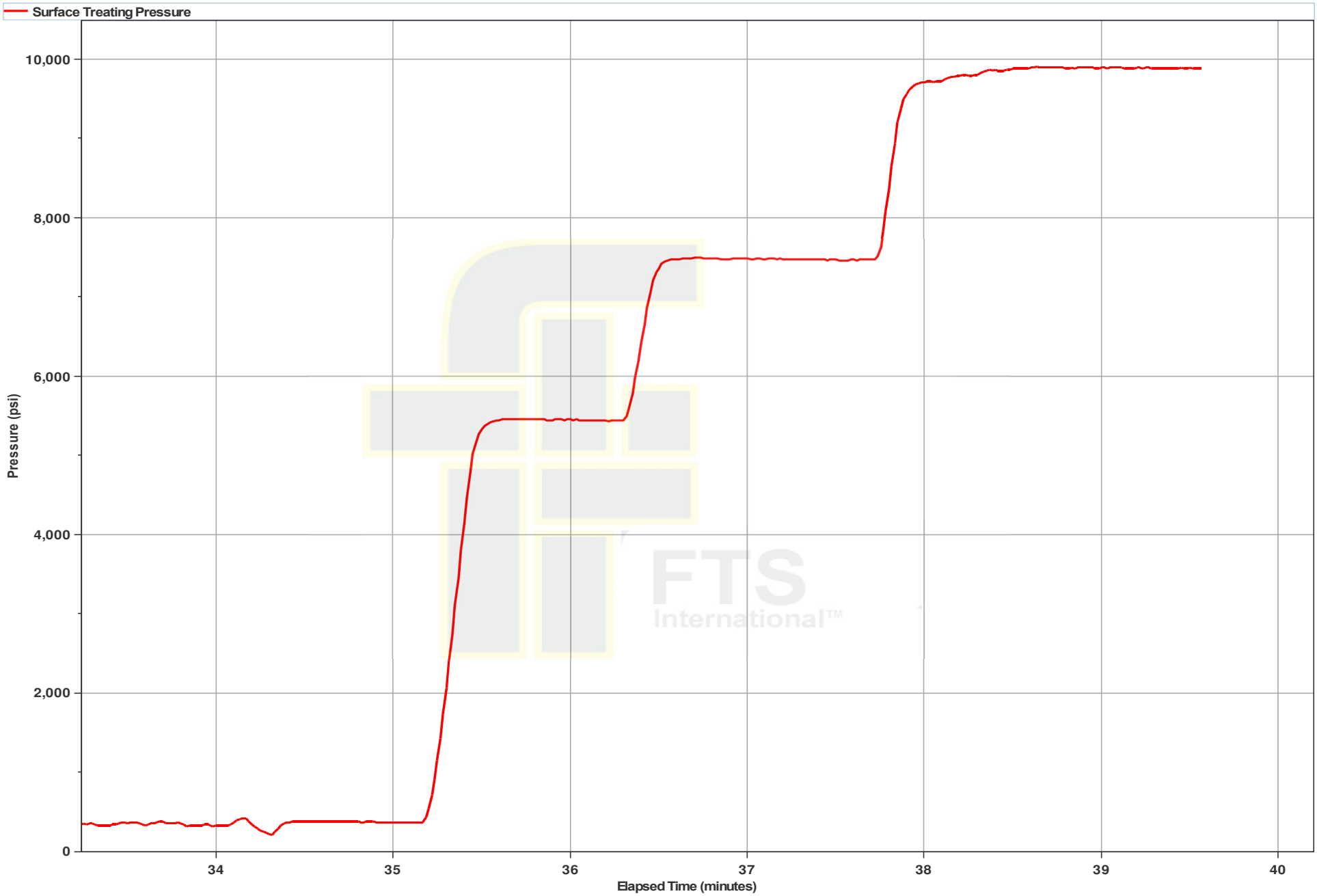
No reuse water was run on this stage.

1 Minute Shutdown (psi): 4213
2 Minute Shutdown (psi): 4486
4 Minute Shutdown (psi): 3894

Chemical Changes:

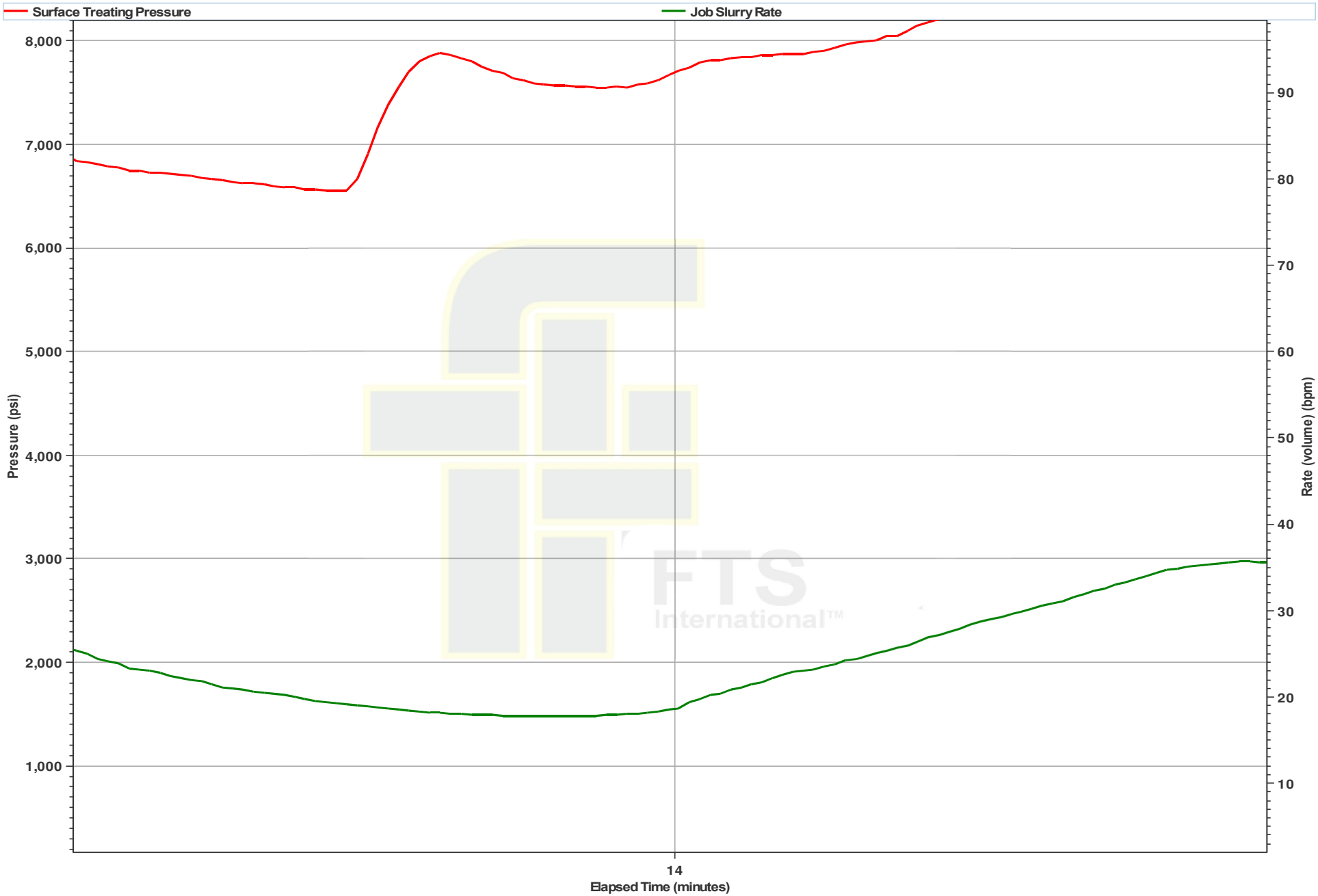
Chemical Name	Chemical Loading	Cumulative Gives
FRW-200	0.75	4,441
FRW-200	1.00	4,811
FRW-200	0.75	4,842

AEU Pressure Test



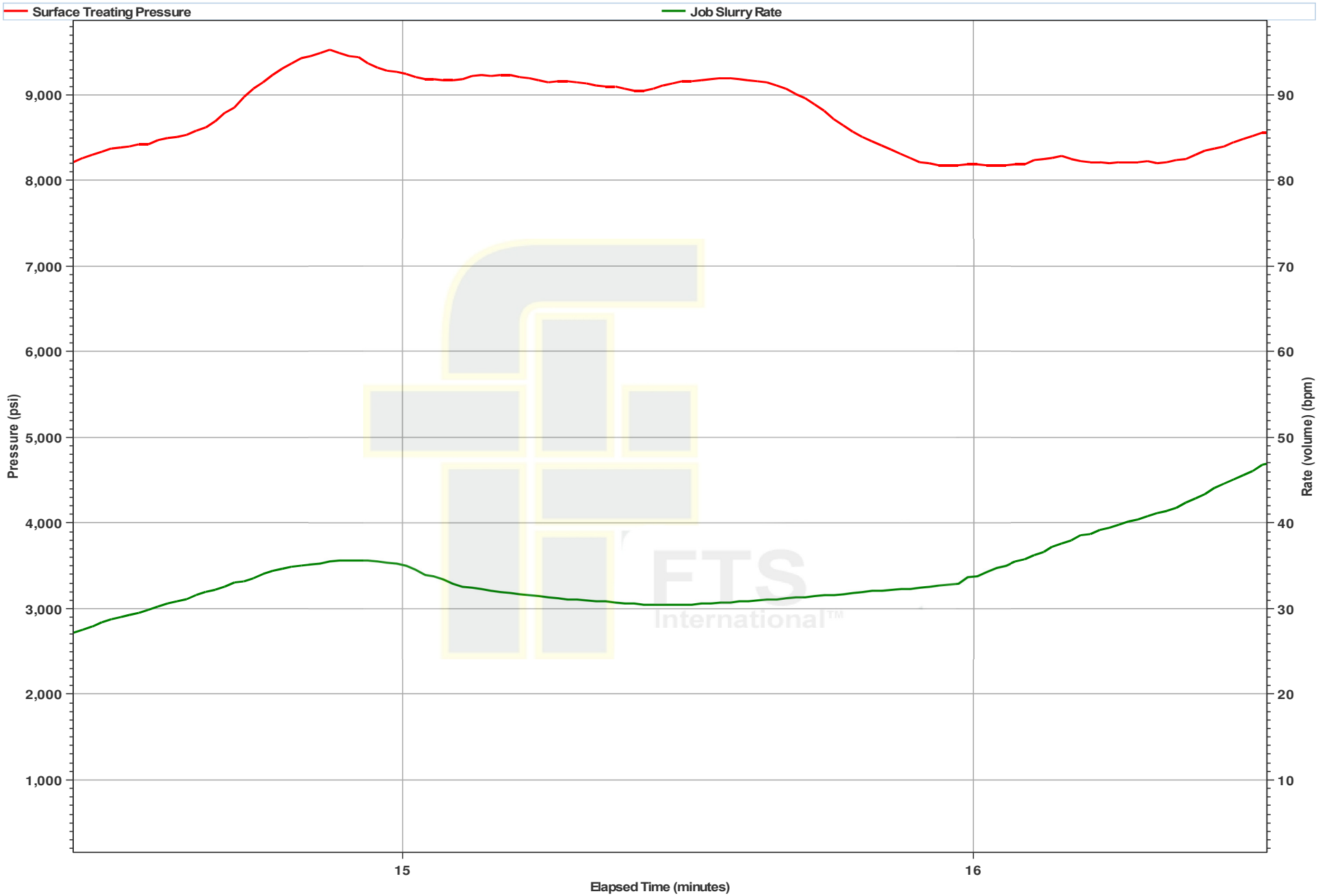
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 24 (WF.000658.M.W03.S24-aDCT-1103) **Jun 20, 2015**

Ball Seat and Breakdown



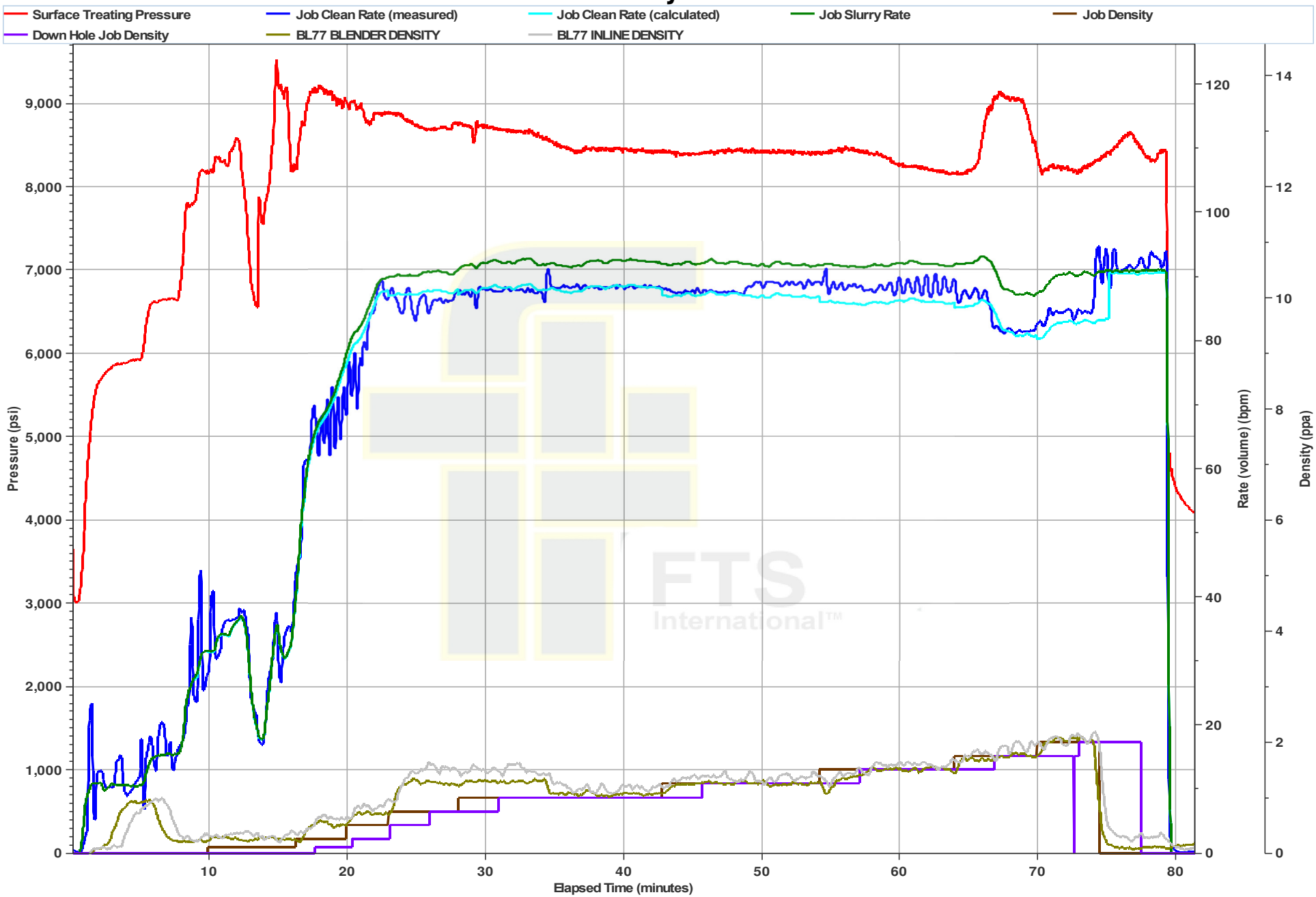
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 24 (WF.000658.M.W03.S24-aDCT-1103) Jun 20, 2015

Acid on Perforations



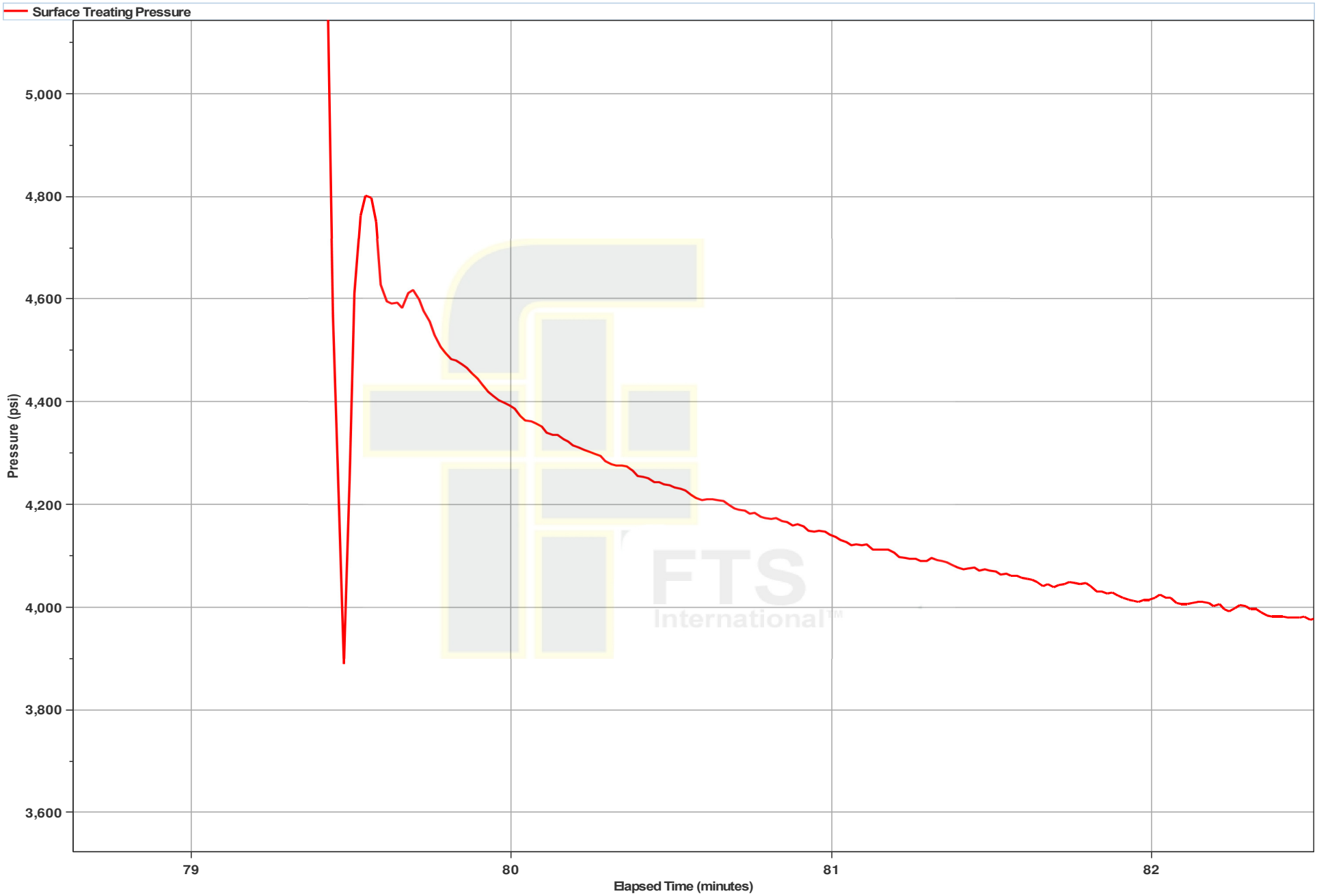
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 24 (WF.000658.M.W03.S24-aDCT-1103) Jun 20, 2015

Primary Plot



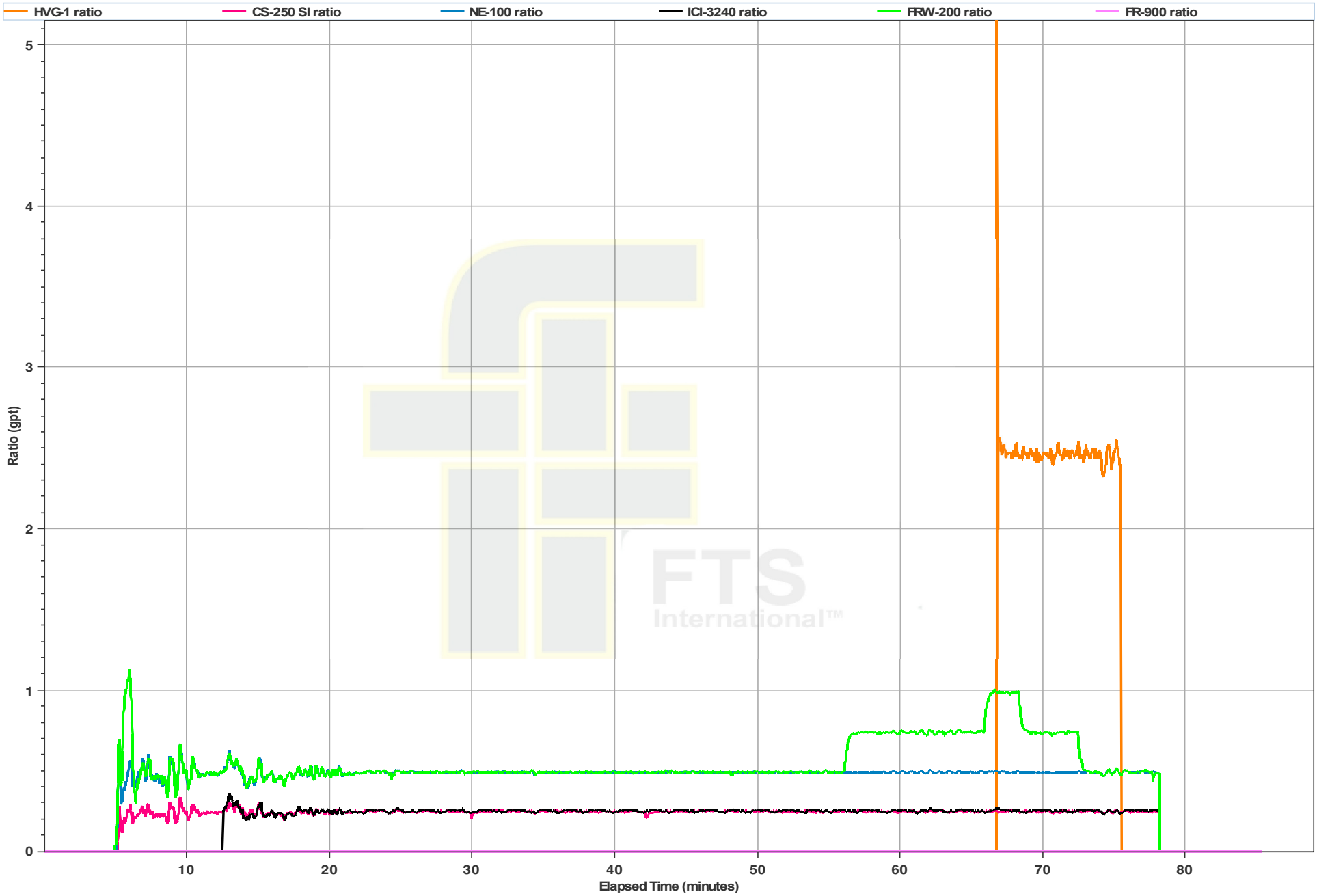
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 24 (WF.000658.M.W03.S24-aDCT-1103) **Jun 20, 2015**

ISIP Plot



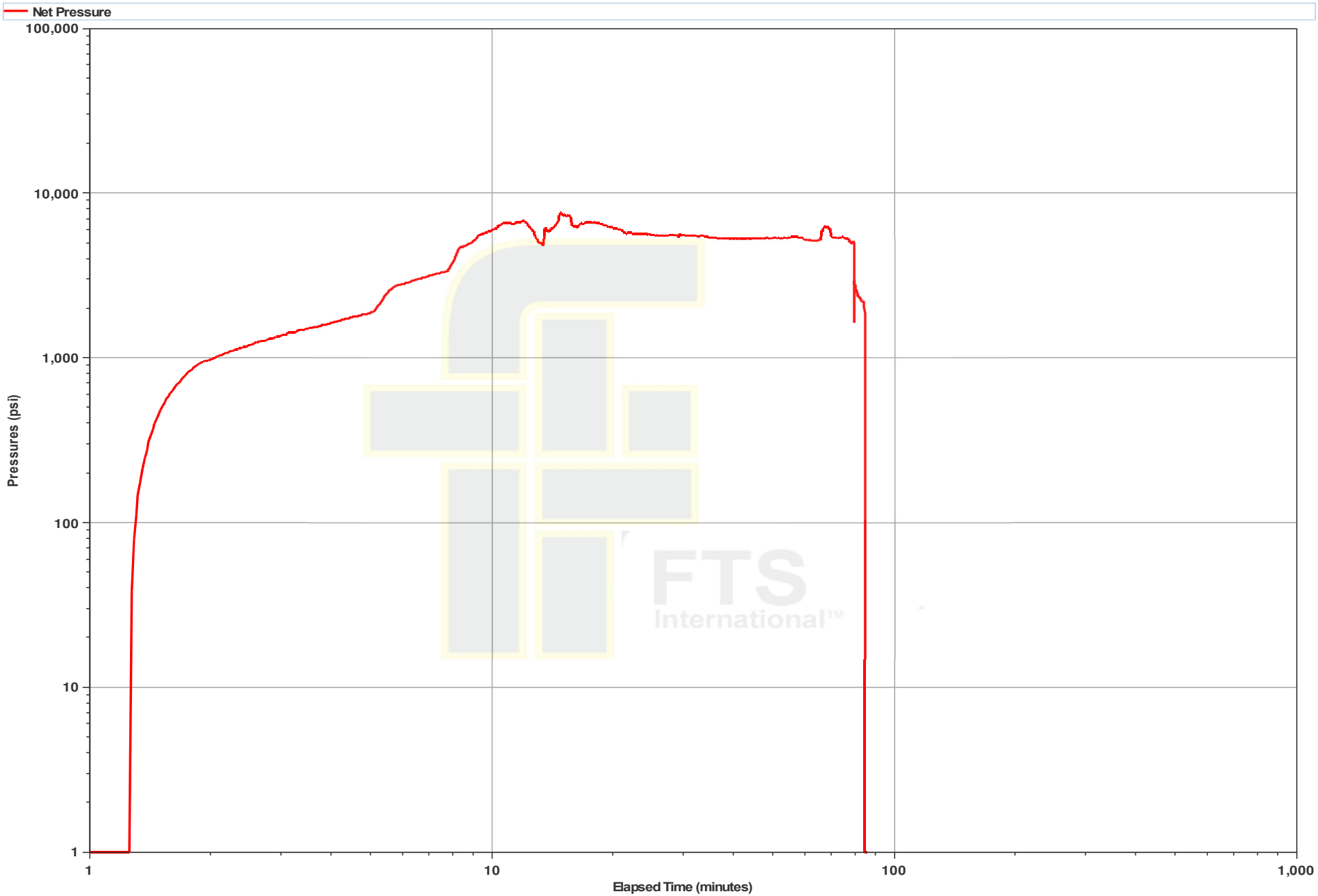
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 24 (WF.000658.M.W03.S24-aDCT-1103) Jun 20, 2015

Chemical Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 24 (WF.000658.M.W03.S24-aDCT-1103) Jun 20, 2015

Net Pressure Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 24 (WF.000658.M.W03.S24-aDCT-1103) Jun 20, 2015

WATER-BASED FRAC FLUID QUALITY CONTROL
(Attachment to Post Treatment Report)

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/20/2015
Customer Name:	American Energy - Utica	Proposal #:	3H/24
Date Sampled:	6/20/2015	Water Source:	Working Tank

Sample/Tank No.	Clarity, Color, Odor	Sample Temperature, (F)	Specific gravity	Initial pH	Chloride, ppm	Hardness, ppm	Calcium, ppm	Magnesium, ppm	Iron ppm	Hydroxide, ppm	Bicarbonate, ppm	Carbonate, ppm	Sulfate, ppm	Barium, ppm
Working Tank	Clear	71	1	8.3	70	180	40	34	1	0	561	0	<50	0

Frac Fluid Quality Gel Testing (These Recording are to made prior to pumping job)														
Sample #														
Base Gel Type	HVG-1													
Gel Loading (lbs/1000 gal.)	2.5													
Sample Temperature, (F)	71													
Initial pH	8.1													
Visc. Reading @ 300 rpms	6													
Viscosity, (cp)	6													
Sample 1 3 min Hydration	4													
Sample 2 3 min Hydration	5													
Sample 3 3 min Hydration	6													
X-Link Vortex Closure, min:sec	n/a													
X-Link Crown, min:sec	n/a													
X-Link pH	n/a													
Gel Break Time (<2cp) mins	20													

Frac Fluid Quality Gel Testing (These Recording are to made while pumping job)														
Stage #														
Base Gel Viscosity (cp)														
X-Link pH								.						
Sample XL time, min:sec														
Sample Temperature														

Acid Quality	Percent Acid	NaOH, mLs	Specific Gravity
	28		1.14

Additional testing or documentation may be required by the customer or for frac fluid quality assurance.

Tested By: Etuate Varea

QUALITY CONTROL OF PROPPANTS

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/20/2015
Customer Name:	American Energy - Utica	Well/Stage:	3H/24
Date Sampled:	6/20/2015	DISTRICT:	Washington, PA
VENDOR:	SANTROL		

Select Proppant Type:

___ Brown	___ Ceramic	___ Other (specify)
X White	___ Bauxite	
___ Resin Coated	___ Texas Gold	

Sieve Analysis	100 Mesh			Sieve Analysis	30/50 Mesh		
Sample 1	24.90	grams of sample		Sample 2	25.10	grams of sample	
	Amount Retained				Amount Retained		
Sieve mesh	Gram	%		Sieve mesh	Gram	%	
			Total				Total
50	0.20	0.80	In-Size	20	0.00	0.00	In-Size
70	17.10	68.67		30	0.00	0.00	
100	5.80	23.29	99.2%	40	16.90	67.33	98.0%
120	1.40	5.62		45	6.10	24.30	
140	0.30	1.20		50	1.60	6.37	
200	0.10	0.40		70	0.50	1.99	
Pan	0.00	0.00	fines	Pan	0.00	0.00	fines
Total wt. Gram	24.90	100.00		Total wt. Gram	25.10	100.00	

Tested By: Etuate Varea

Post Job Report

AMERICAN ENERGY - UTICA

Red Hill Farm MDS GR 3H

Stage : 25 OF 54

HARRISON, OH

Operations Representative:

Name:	**David Knapp**
Office:	**570-327-4881**
Fax:	**724-743-7719**
Cell:	
Email:	**DAVID.KNAPP@FTSI.COM**

Sales Representative:

Name:	**Bruce Matthews**
Office:	**405-574-3981**
Fax:	**405-767-1288**
Cell:	
Email:	**BRUCE.MATTHEWS@FTSI.COM**

Engineering Manager:

Name:	**Thaddeus Craun**
Office:	**817-682-8702**
Fax:	**724-743-7719**
Cell:	
Email:	**THADDEUS.CRAUN@FTSI.COM**

FTS International
1432 Route 519
Eighty Four, PA 15330

Customer: American Energy - Utica
Well: Red Hill Farm Mds Gr 3H
Stage: 25
Job End Date: 06/21/2015

Job Summary

Well Information

TVD:	7,301	**Top Perf:**	12,063
No. Of Perfs:	30		

Casing	Tubing
5.50" 20.00#	N/A

Pressures, Rates and Volumes

	Proposed	Actual	Max	Min
STP	9,046 psi	8,595 psi	9,104 psi	6,950 psi
Rate	80.0 bpm	80.3 bpm	94.3 bpm	20.5 bpm

	Proposed	Actual		
Clean Volume	5,772 bbls	5,662 bbls		
Slurry Volume	6,042 bbls	5,932 bbls		
Flush Volume	357 bbls	316 bbls		

	Proposed	Start	End
Frac Pumps on Location	10	14	14

Open Well:	Start Time	03:15	Pressure	3,030 psi
	Ball Seat	290 bbls	Break Down	7,567 psi
	Initial ISIP:	4,750 psi	Initial F.G.:	1.08 psi/ft
Stage Complete:	End Time	04:36	Job Time	01:15
	Final ISIP	4,750 psi	Final F.G.	1.08 psi/ft
	HHP	16,916	5 Min:	3,980 psi
	Proppant Min:	0.00	10 Min:	N/A
	Proppant Max:	2.00	15 Min:	N/A

Material Volume

Material	Proposed	Calculated	Actual	Variance
100 Mesh White	40,000	39,340	39,340	0%
30/50 White	210,000	209,444	211,444	1%
Total Proppants	250,000	248,784	250,784	1%

Material	Proposed	Calculated	Actual	Variance
0.1%-7.5% HCL	3,000	2,982	3,000	1%
CI-150	3	3	3	0%
CS-250 SI	60	57	58	2%
FE-200L	15	15	15	0%
FRW-200	180	120	120	0%
ICI-3240	60	57	57	0%
NE-100	0	115	114	-1%
NE-100W	120	0	0	0

Comments:

Pumpdown Information:
Total Bbls: 211
Max Pressure (psi): 5493
Max Rate (bpm): 15.4

FTS International
1432 Route 519
Eighty Four, PA 15330

Customer: American Energy - Utica
Well: Red Hill Farm Mds Gr 3H
Stage: 25
Job End Date: 06/21/2015

Treatment Report

Date:	6/21/2015	District:	Washington County,PA	Quote No:	051815_035725QF	API:	34-059-24370

MIL Time	STP	Slurry BPM	Stage Clean (bbls)	Cumulative Clean (bbls)	Stage Slurry (bbls)	Cumulative Slurry (bbls)	Stage Proppant (lbs)	Cumulative Proppant (lbs)	Description	Proppant	PPA
03:15	3,060	0.0	0	0	0	0	0	0	Freshwater Open Well		0.00
03:15	3,030	0.0	19	19	19	19	0	0	Freshwater Load		0.00
03:18	5,250	10.3	71	90	71	90	0	0	7.5% HCL Acid Acid		0.00
03:23	6,674	21.1	36	126	36	126	0	0	Slickwater Load		0.00
03:24	7,767	27.0	164	290	165	291	689	689	Slickwater Proppant	100 Mesh White	0.10
03:31	7,567	20.5	10	300	10	301	42	731	Slickwater Breakdown	100 Mesh White	0.10
03:31	7,579	20.8	40	340	40	341	168	899	Slickwater Proppant	100 Mesh White	0.10
03:32	7,661	32.8	214	554	216	557	2,247	3,146	Slickwater Proppant	100 Mesh White	0.25
03:36	9,098	80.6	256	810	262	819	5,376	8,522	Slickwater Proppant	100 Mesh White	0.50
03:39	9,022	86.9	429	1,239	444	1,263	13,514	22,036	Slickwater Proppant	100 Mesh White	0.75
03:44	9,024	87.3	412	1,651	431	1,694	17,304	39,340	Slickwater Proppant	100 Mesh White	1.00
03:49	9,008	87.4	875	2,526	915	2,609	36,750	76,090	Slickwater Proppant	30/50 White	1.00
04:00	8,856	86.6	1,001	3,527	1,058	3,667	52,553	128,643	Slickwater Proppant	30/50 White	1.25
04:11	8,484	93.5	857	4,384	915	4,582	53,991	182,634	Slickwater Proppant	30/50 White	1.50
04:21	8,375	93.2	500	4,884	540	5,122	36,750	219,384	Slickwater Proppant	30/50 White	1.75
04:27	8,382	93.5	350	5,234	382	5,504	29,400	248,784	Slickwater Proppant	30/50 White	2.00
04:32	8,223	94.2	112	5,346	112	5,616	0	248,784	Slickwater Clean screws		0.00
04:33	8,350	93.5	205	5,551	205	5,821	0	248,784	Slickwater Flush		0.00
04:35	8,367	93.4	111	5,662	111	5,932	0	248,784	Freshwater Flush		0.00
04:36	4,750	0.0	0	5,662	0	5,932	0	248,784	Freshwater Shutdown		0.00
Total JobTime (HH:MM): 01:20											

Min STP:	6,950 psi	**Max STP:**	9,104 psi	**Average STP:**	8,595 psi	**5 Min:**	3,980 psi
Min Rate:	20.5 bpm	**Max Rate:**	94.3 bpm	**Average Rate:**	80.3 bpm	**10 Min:**	0 psi
Initial ISIP:	4,750 psi	**Initial F.G.:**	1.08 psi/ft	**Average HHP:**	16,916	**15 Min:**	0 psi
Final ISIP:	4,750 psi	**Final F.G.:**	1.08 psi/ft	**Customer Representative:**		Eric Boone	
FTSI Representative:		Travis Wilson & Kody Bonfardin					

Comments:

The proppant values contained in this report are calculated based on actual barrel counts and target densities. Actual total proppant usage is 250,784 lbs. Charge time is 1 hour(s) 15 minute(s). All chemicals and proppant ran as documented.

Min/Max/Avg were taken from sand stages. All chem changes from proposed were made per AEU representative request.

Reuse water was run on this stage for a total of 526 Bbls.

1 Minute Shutdown (psi): 4536
2 Minute Shutdown (psi): 4339
5 Minute Shutdown (psi): 3980

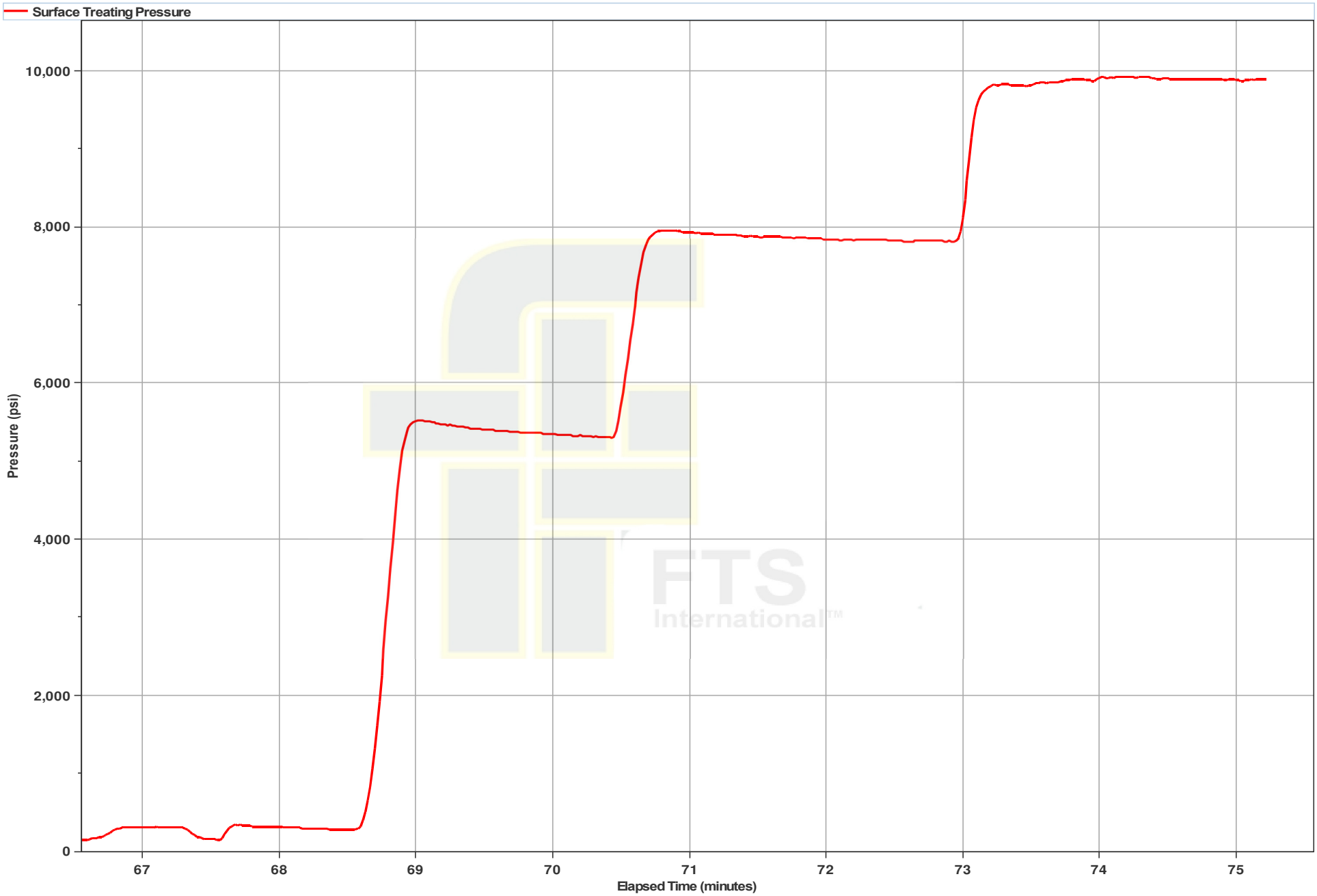
Chemical Changes:

FTS International
1432 Route 519
Eighty Four, PA 15330

Customer: American Energy - Utica
Well: Red Hill Farm Mds Gr 3H
Stage: 25
Job End Date: 06/21/2015

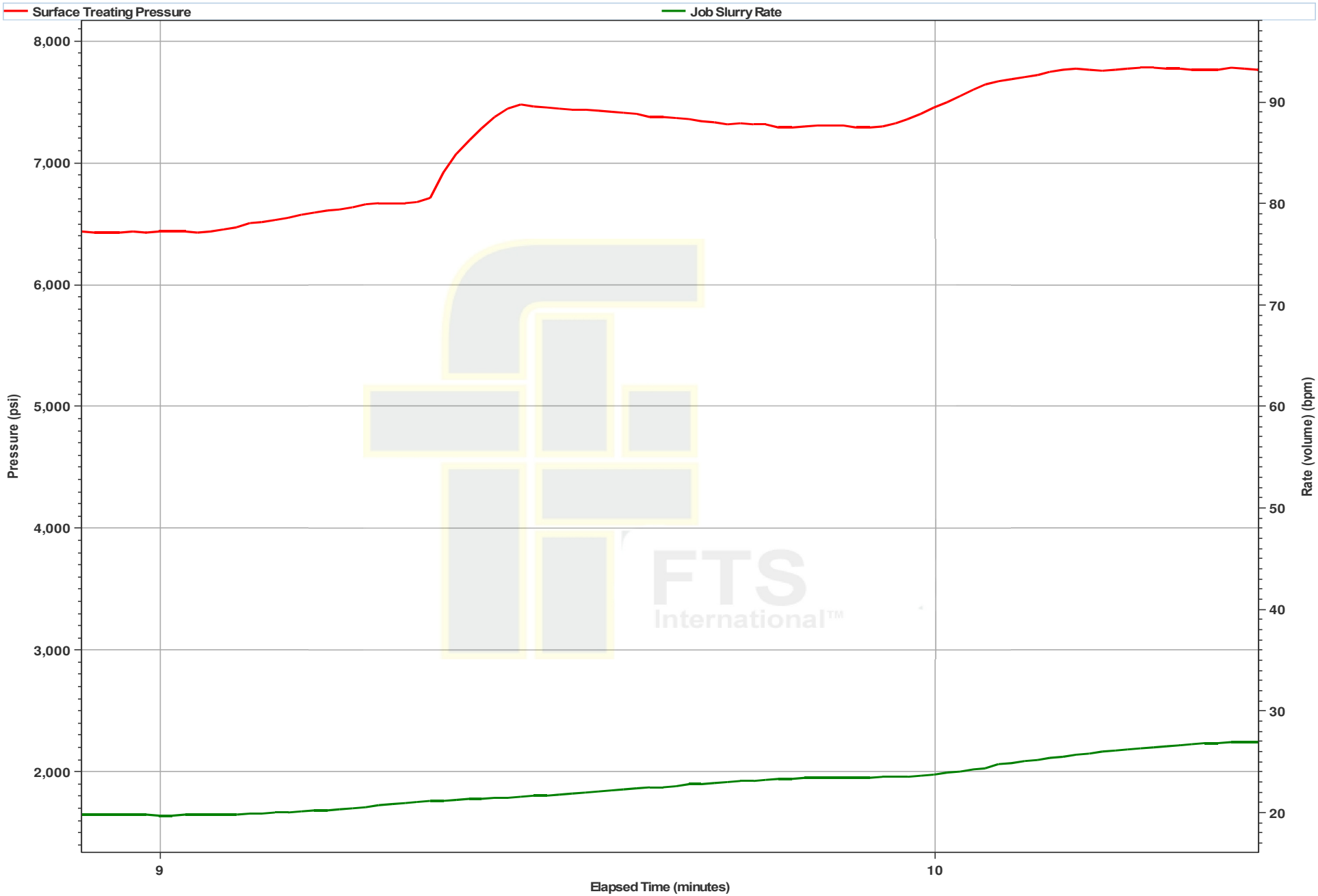
Chemical Name	Chemical Loading	Cumulative Clean
FRW-200	0.75	5,234
FRW-200	0.50	5,551

AEU Pressure Test



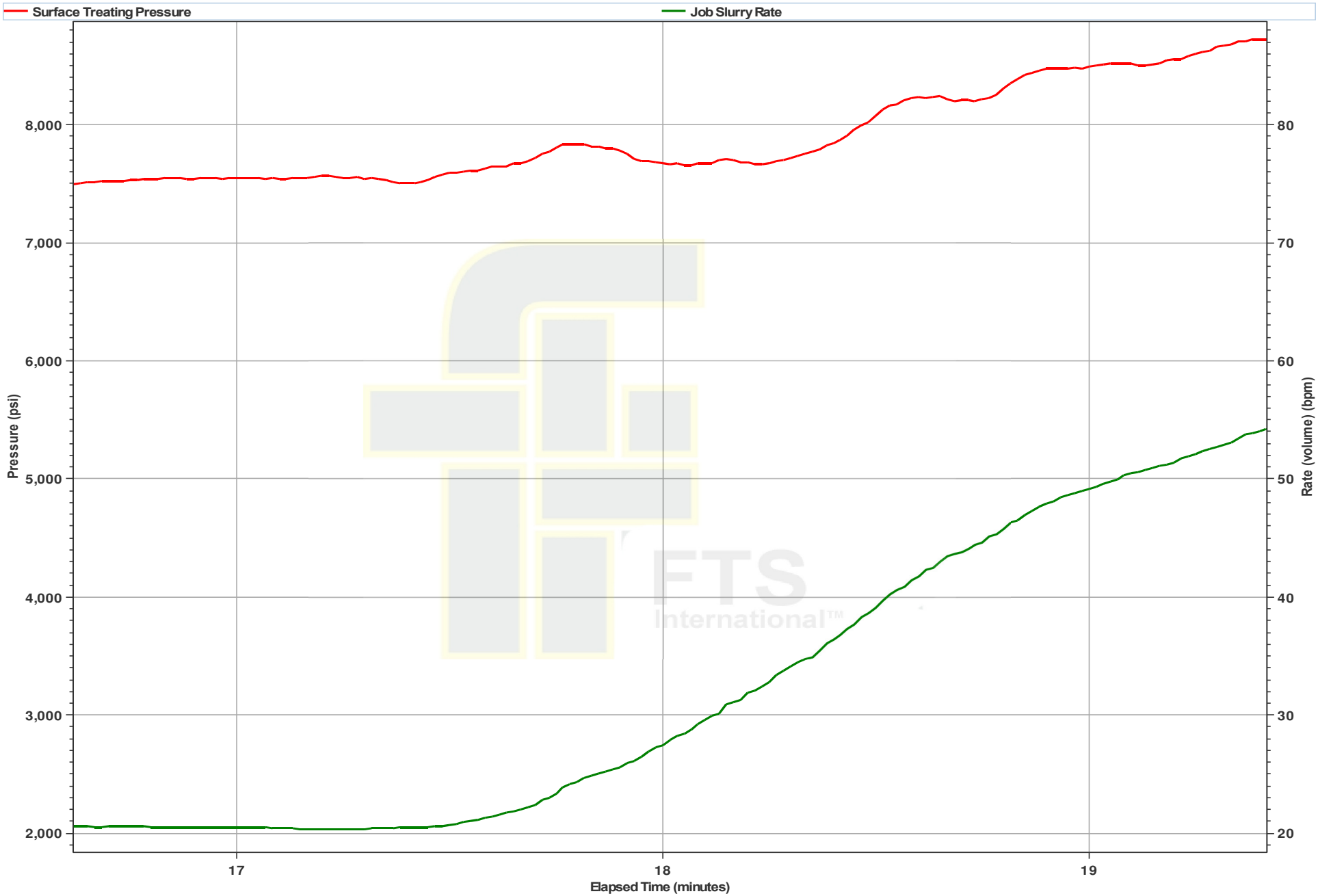
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 25 (WF.000658.M.W03.S25-ADCT-1103) Jun 21, 2015

Ball Seat and Breakdown



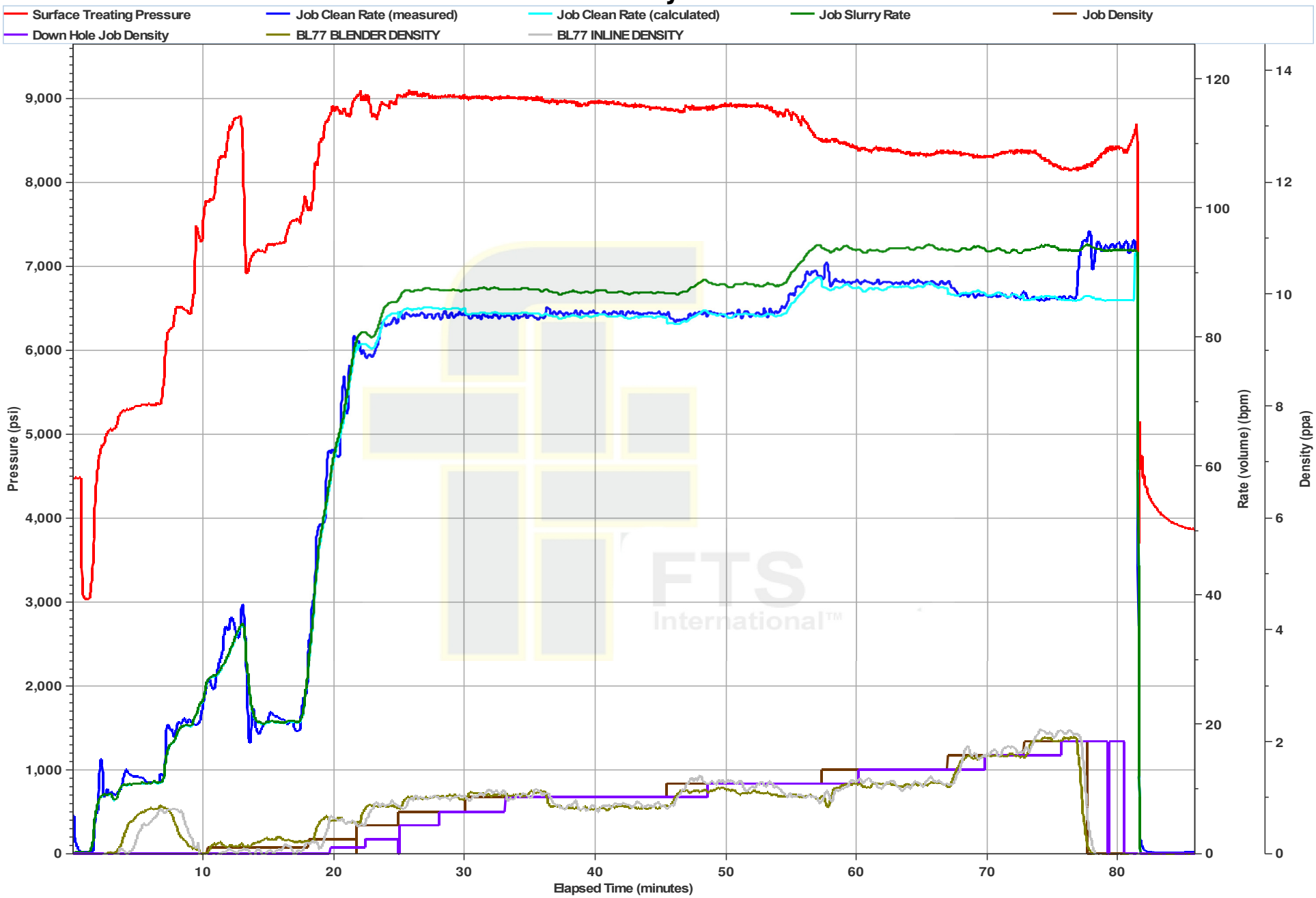
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 25 (WF.000658.M.W03.S25-ADCT-1103) **Jun 21, 2015**

Acid on Perforations



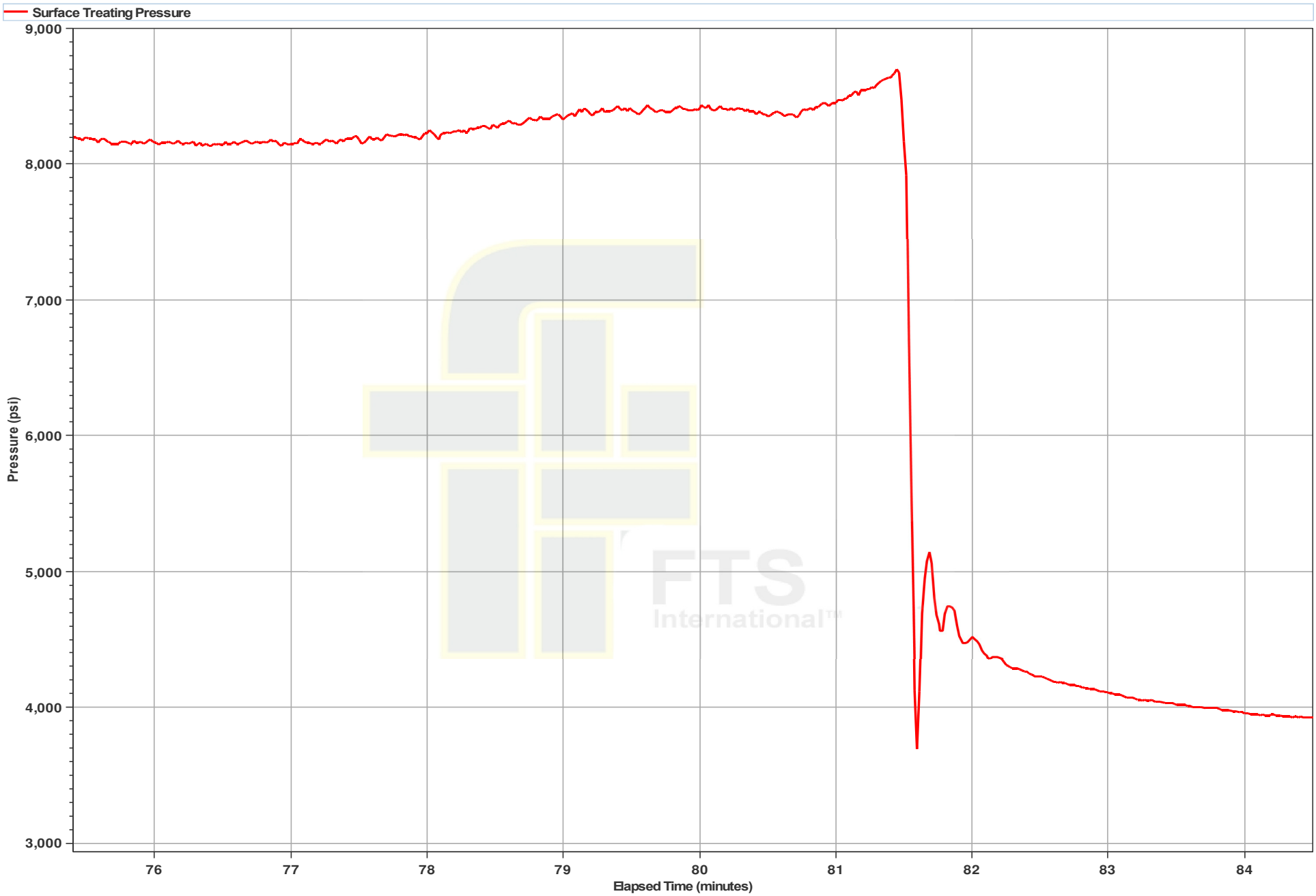
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 25 (WF.000658.M.W03.S25-ADCT-1103) **Jun 21, 2015**

Primary Plot



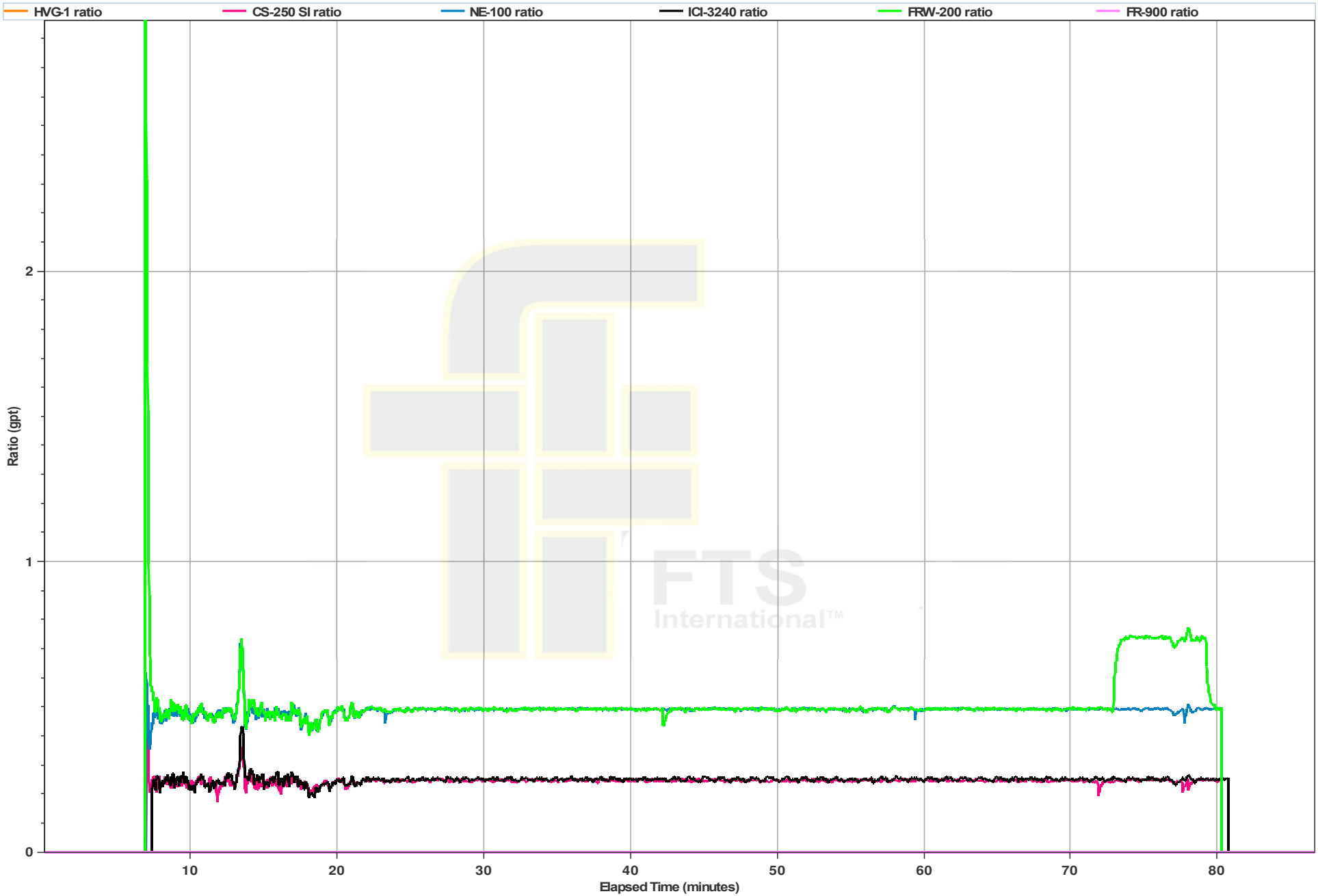
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 25 (WF.000658.M.W03.S25-ADCT-1103) **Jun 21, 2015**

ISIP Plot



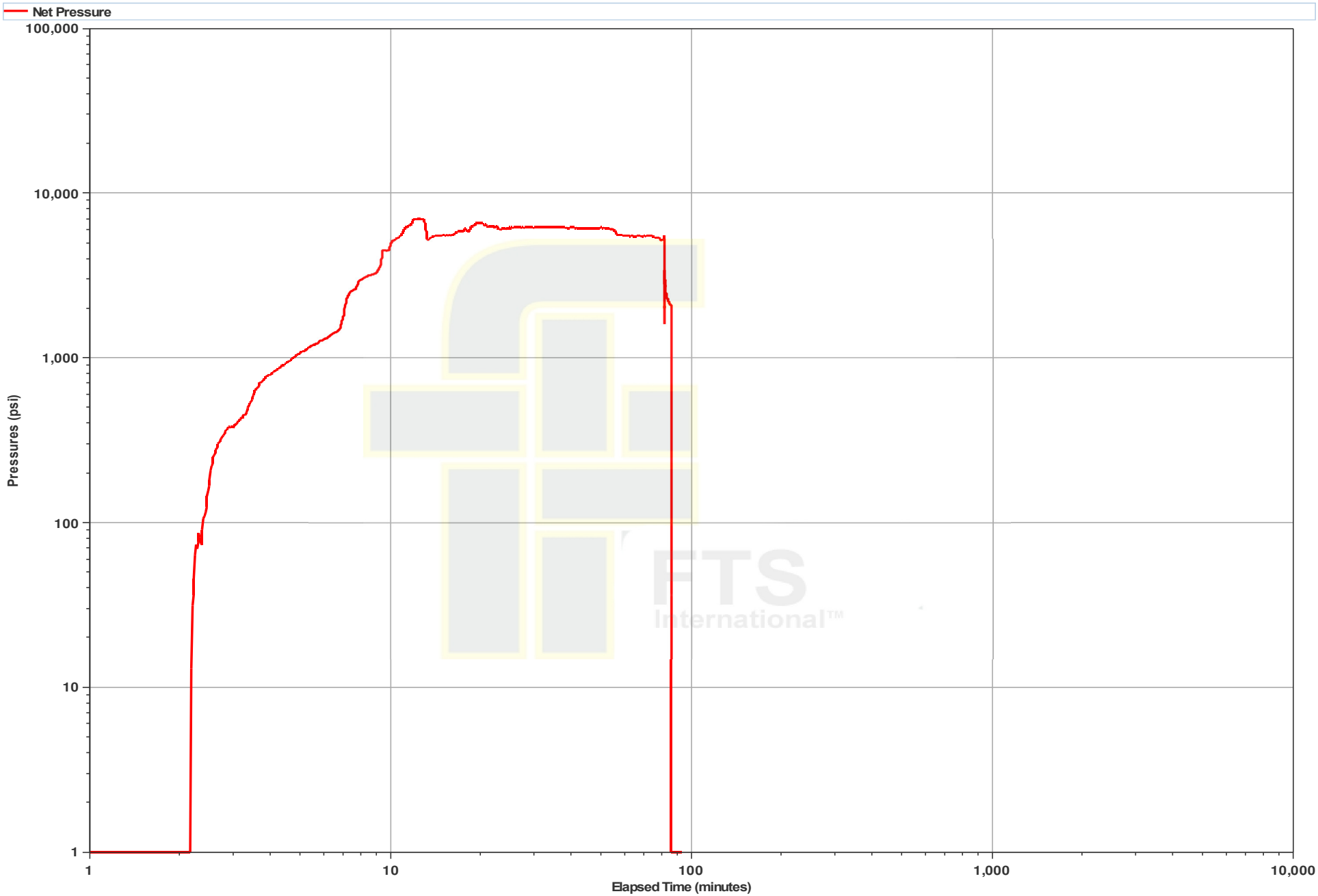
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 25 (WF.000658.M.W03.S25-ADCT-1103) **Jun 21, 2015**

Chemical Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 25 (WF.000658.M.W03.S25-ADCT-1103) **Jun 21, 2015**

Net Pressure Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 25 (WF.000658.M.W03.S25-ADCT-1103) Jun 21, 2015

WATER-BASED FRAC FLUID QUALITY CONTROL
(Attachment to Post Treatment Report)

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/21/2015
Customer Name:	American Energy - Utica	Proposal #:	3H/25
Date Sampled:	6/21/2015	Water Source:	Working Tank

Sample/Tank No.	Clarity, Color, Odor	Sample Temperature, (F)	Specific gravity	Initial pH	Chloride, ppm	Hardness, ppm	Calcium, ppm	Magnesium, ppm	Iron ppm	Hydroxide, ppm	Bicarbonate, ppm	Carbonate, ppm	Sulfate, ppm	Barium, ppm
Working Tank	Clear	70	1	8.3	65	230	80	36	0	0	317	0	50	0
Reused Water Tank	Yellow, Cloudy, Petroleum Odor	71	1.03	4.3	63,980	13600	5,041	2,081	>10	0	878	0	350	0

Frac Fluid Quality Gel Testing (These Recording are to made prior to pumping job)														
Sample #														
Base Gel Type	HVG-1													
Gel Loading (lbs/1000 gal.)	2.5													
Sample Temperature, (F)	70													
Initial pH	8.1													
Visc. Reading @ 300 rpms	6.5													
Viscosity, (cp)	6.5													
Sample 1 3 min Hydration	4													
Sample 2 3 min Hydration	5													
Sample 3 3 min Hydration	6.5													
X-Link Vortex Closure, min:sec	n/a													
X-Link Crown, min:sec	n/a													
X-Link pH	n/a													
Gel Break Time (<2cp) mins	21													

Frac Fluid Quality Gel Testing (These Recording are to made while pumping job)														
Stage #														
Base Gel Viscosity (cp)														
X-Link pH								.						
Sample XL time, min:sec														
Sample Temperature														

Acid Quality	Percent Acid	NaOH, mLs	Specific Gravity
	28		1.14

Additional testing or documentation may be required by the customer or for frac fluid quality assurance.

Tested By: Travis Wilson

QUALITY CONTROL OF PROPPANTS

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/21/2015
Customer Name:	American Energy - Utica	Well/Stage:	3H/25
Date Sampled:	6/21/2015	DISTRICT:	Washington, PA
VENDOR:	SANTROL		

Select Proppant Type:

___ Brown	___ Ceramic	___ Other (specify)
X White	___ Bauxite	_____
___ Resin Coated	___ Texas Gold	

Sieve Analysis	100 Mesh			Sieve Analysis	30/50 Mesh		
Sample 1	24.70	grams of sample		Sample 2	24.90	grams of sample	
	Amount Retained				Amount Retained		
Sieve mesh	Gram	%		Sieve mesh	Gram	%	
			Total				Total
50	0.30	1.21	In-Size	20	0.00	0.00	In-Size
70	16.80	68.02		30	0.60	2.41	
100	4.90	19.84	98.8%	40	19.20	77.11	95.2%
120	2.10	8.50		45	3.40	13.65	
140	0.40	1.62		50	1.10	4.42	
200	0.20	0.81		70	0.60	2.41	
Pan	0.00	0.00	fines	Pan	0.00	0.00	fines
Total wt. Gram	24.70	100.00		Total wt. Gram	24.90	100.00	

Tested By: Travis Wilson

Post Job Report

AMERICAN ENERGY - UTICA

Red Hill Farm MDS GR 3H

Stage : 26 OF 54

HARRISON, OH

Operations Representative:

Name:	**David Knapp**
Office:	**570-327-4881**
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Sales Representative:

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Fax:	**405-767-1288**
Cell:	
Email:	**BRUCE.MATTHEWS@FTSI.COM**

Engineering Manager:

Name:	**Thaddeus Craun**
Office:	**817-682-8702**
Fax:	**724-743-7719**
Cell:	
Email:	**THADDEUS.CRAUN@FTSI.COM**

FTS International
1432 Route 519
Eighty Four, PA 15330

Customer: American Energy - Utica
Well: Red Hill Farm Mds Gr 3H
Stage: 26
Job End Date: 06/21/2015

Job Summary

Well Information

TVD:	7,301	**Top Perf:**	11,911
No. Of Perfs:	30		

Casing	Tubing
5.50" 20.00#	N/A

Pressures, Rates and Volumes

	Proposed	Actual	Max	Min
STP	9,046 psi	7,945 psi	9,237 psi	6,497 psi
Rate	80.0 bpm	82.3 bpm	95.9 bpm	20.9 bpm

	Proposed	Actual		
Clean Volume	5,772 bbls	5,426 bbls		
Slurry Volume	6,042 bbls	5,697 bbls		
Flush Volume	357 bbls	264 bbls		

	Proposed	Start	End
Frac Pumps on Location	10	15	14

Open Well:	Start Time	10:45	Pressure	2,950 psi
	Ball Seat	253 bbls	Break Down	7,514 psi
	Initial ISIP:	5,178 psi	Initial F.G.:	1.14 psi/ft
Stage Complete:	End Time	12:03	Job Time	01:15
	Final ISIP	5,178 psi	Final F.G.	1.14 psi/ft
	HHP	16,026	5 Min:	4,283 psi
	Proppant Min:	0.00	10 Min:	N/A
	Proppant Max:	2.00	15 Min:	N/A

Material Volume

Material	Proposed	Calculated	Actual	Variance
100 Mesh White	40,000	39,762	39,762	0%
30/50 White	210,000	211,103	211,103	0%
Total Proppants	250,000	250,865	250,865	0%

Material	Proposed	Calculated	Actual	Variance
0.1%-7.5% HCL	3,000	2,982	3,000	1%
CI-150	3	3	3	0%
CS-250 SI	60	55	54	-2%
FE-200L	15	15	15	0%
FRW-200	180	130	126	-3%
ICI-3240	60	55	54	-2%
NE-100	0	110	109	-1%
NE-100W	120	0	0	0

Comments:

Pumpdown Information:
Total Bbls: 206
Max Pressure (psi): 5432
Max Rate (bpm): 15.5

FTS International
1432 Route 519
Eighty Four, PA 15330

Customer: American Energy - Utica
Well: Red Hill Farm Mds Gr 3H
Stage: 26
Job End Date: 06/21/2015

Treatment Report

Date:	6/21/2015	District:	Washington County,PA	Quote No:	051815_035725QF	API:	34-059-24370

MIL Time	STP	Slurry BPM	Stage Clean (bbls)	Cumulative Clean (bbls)	Stage Slurry (bbls)	Cumulative Slurry (bbls)	Stage Proppant (lbs)	Cumulative Proppant (lbs)	Description	Proppant	PPA
10:45	2,950	0.0	0	0	0	0	0	0	Freshwater Open Well		0.00
10:46	3,644	4.6	16	16	16	16	0	0	Freshwater Load		0.00
10:47	4,856	10.5	71	87	71	87	0	0	7.5% HCL Acid Acid		0.00
10:54	6,837	22.4	55	142	55	142	0	0	Slickwater Load		0.00
10:57	7,359	28.0	111	253	112	254	466	466	Slickwater Proppant	100 Mesh White	0.10
11:02	7,514	22.0	0	253	0	254	0	466	Slickwater Breakdown		0.00
11:04	8,901	77.9	106	359	106	360	445	911	Slickwater Proppant	100 Mesh White	0.10
11:05	8,856	81.1	217	576	219	579	2,279	3,190	Slickwater Proppant	100 Mesh White	0.25
11:09	8,936	85.6	256	832	262	841	5,376	8,566	Slickwater Proppant	100 Mesh White	0.50
11:11	8,961	91.1	429	1,261	444	1,285	13,514	22,080	Slickwater Proppant	100 Mesh White	0.75
11:16	8,748	95.1	421	1,682	440	1,725	17,682	39,762	Slickwater Proppant	100 Mesh White	1.00
11:21	8,757	95.0	600	2,282	627	2,352	25,200	64,962	Slickwater Proppant	30/50 White	1.00
11:28	8,730	94.9	801	3,083	846	3,198	42,053	107,015	Slickwater Proppant	30/50 White	1.25
11:39	8,630	94.8	660	3,743	705	3,903	41,580	148,595	Slickwater Proppant	30/50 White	1.50
11:43	8,747	94.9	140	3,883	150	4,053	8,820	157,415	Slickwater Proppant	30/50 White	1.50
11:45	8,684	94.6	500	4,383	540	4,593	36,750	194,165	Slickwater Proppant	30/50 White	1.75
11:51	8,469	94.6	675	5,058	736	5,329	56,700	250,865	Slickwater Proppant	30/50 White	2.00
11:58	8,491	94.3	104	5,162	104	5,433	0	250,865	Slickwater Clean screws		0.00
12:00	8,546	92.3	170	5,332	170	5,603	0	250,865	Slickwater Flush		0.00
12:02	9,159	72.6	94	5,426	94	5,697	0	250,865	Freshwater Flush		0.00
12:03	5,178	0.0	0	5,426	0	5,697	0	250,865	Freshwater Shutdown		0.00
Total JobTime (HH:MM): 01:18											

Min STP:	6,497 psi	**Max STP:**	9,237 psi	**Average STP:**	7,945 psi	**5 Min:**	4,283 psi
Min Rate:	20.9 bpm	**Max Rate:**	95.9 bpm	**Average Rate:**	82.3 bpm	**10 Min:**	0 psi
Initial ISIP:	5,178 psi	**Initial F.G.:**	1.14 psi/ft	**Average HHP:**	16,026	**15 Min:**	0 psi
Final ISIP:	5,178 psi	**Final F.G.:**	1.14 psi/ft	**Customer Representative:**		Malcolm Trahan	
FTSI Representative:		Etuate Varea & Jason McCoskey					

Comments:

The proppant values contained in this report are calculated based on actual barrel counts and target densities. Actual total proppant usage is 250,865 lbs. Charge time is 1 hour(s) 15 minute(s). All chemicals and proppant ran as documented.

Min/Max/Avg were taken from sand stages. All chem changes from proposed were made per AEU representative request.

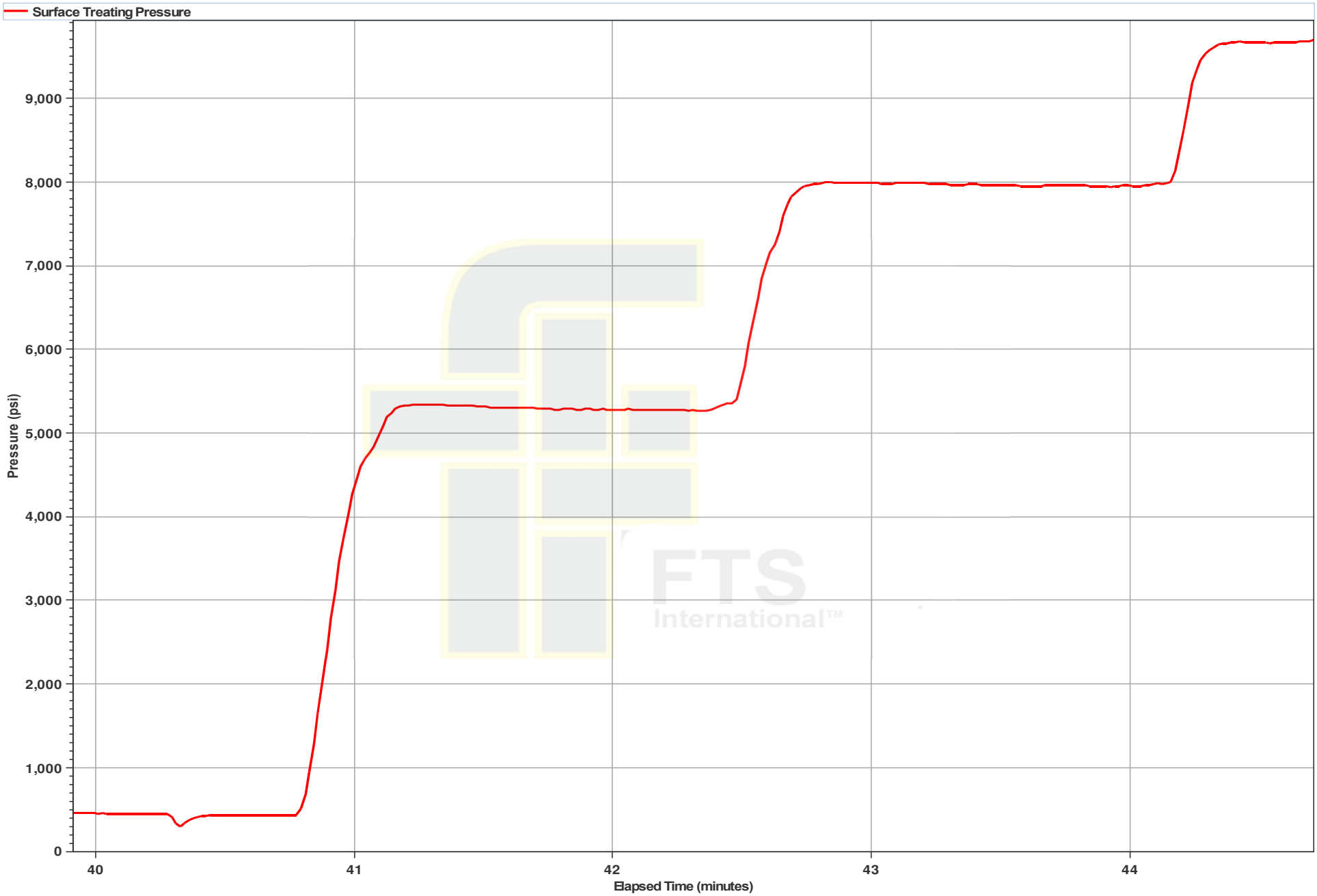
No reused water pumped

1 Minute Shutdown (psi): 4872
2 Minute Shutdown (psi): 4555
5 Minute Shutdown (psi): 4283

Chemical Changes:

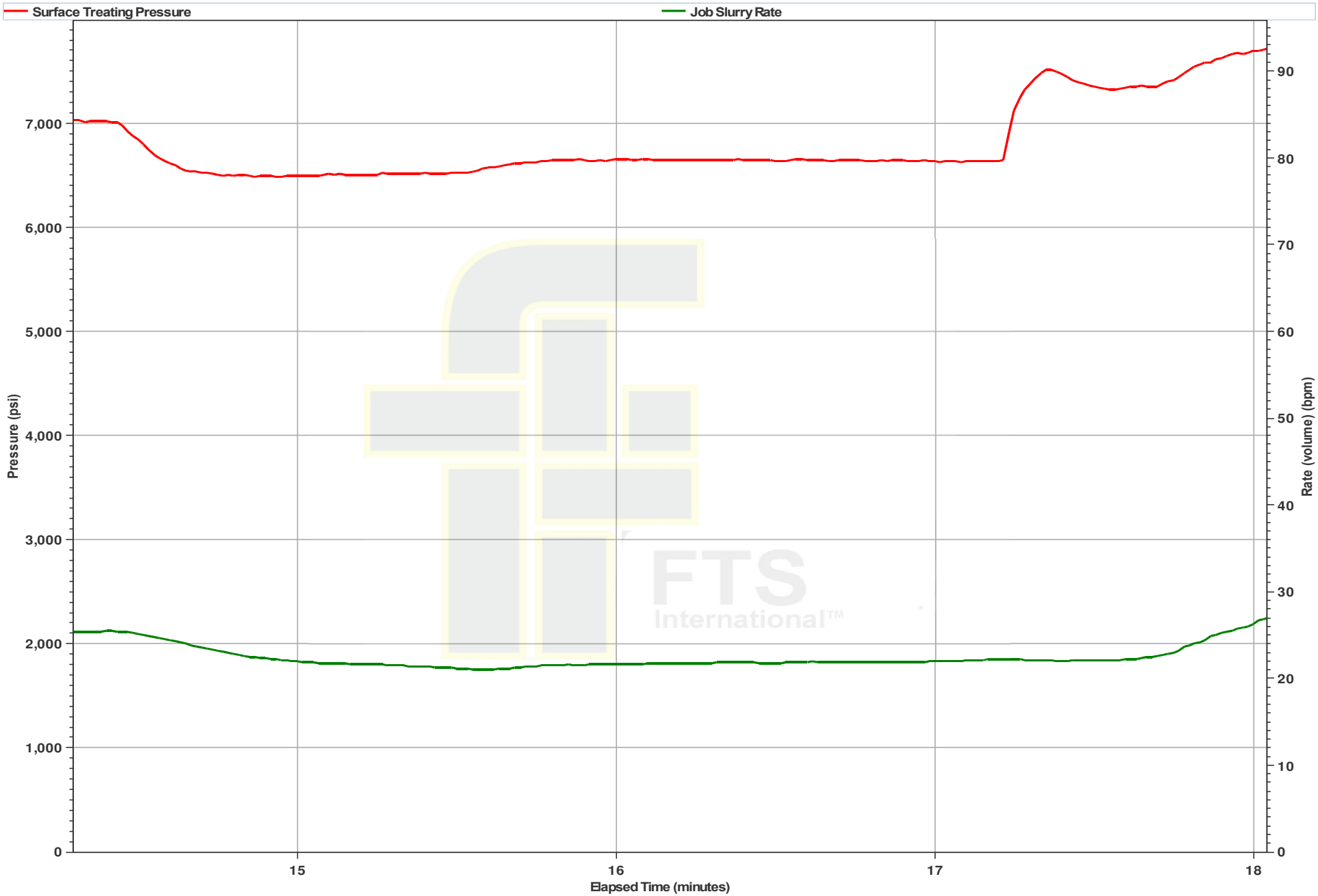
Chemical Name	Chemical Loading	Cumulative Clean
FRW-200	0.50	576
FRW-200	0.75	3,883

AEU Pressure Test



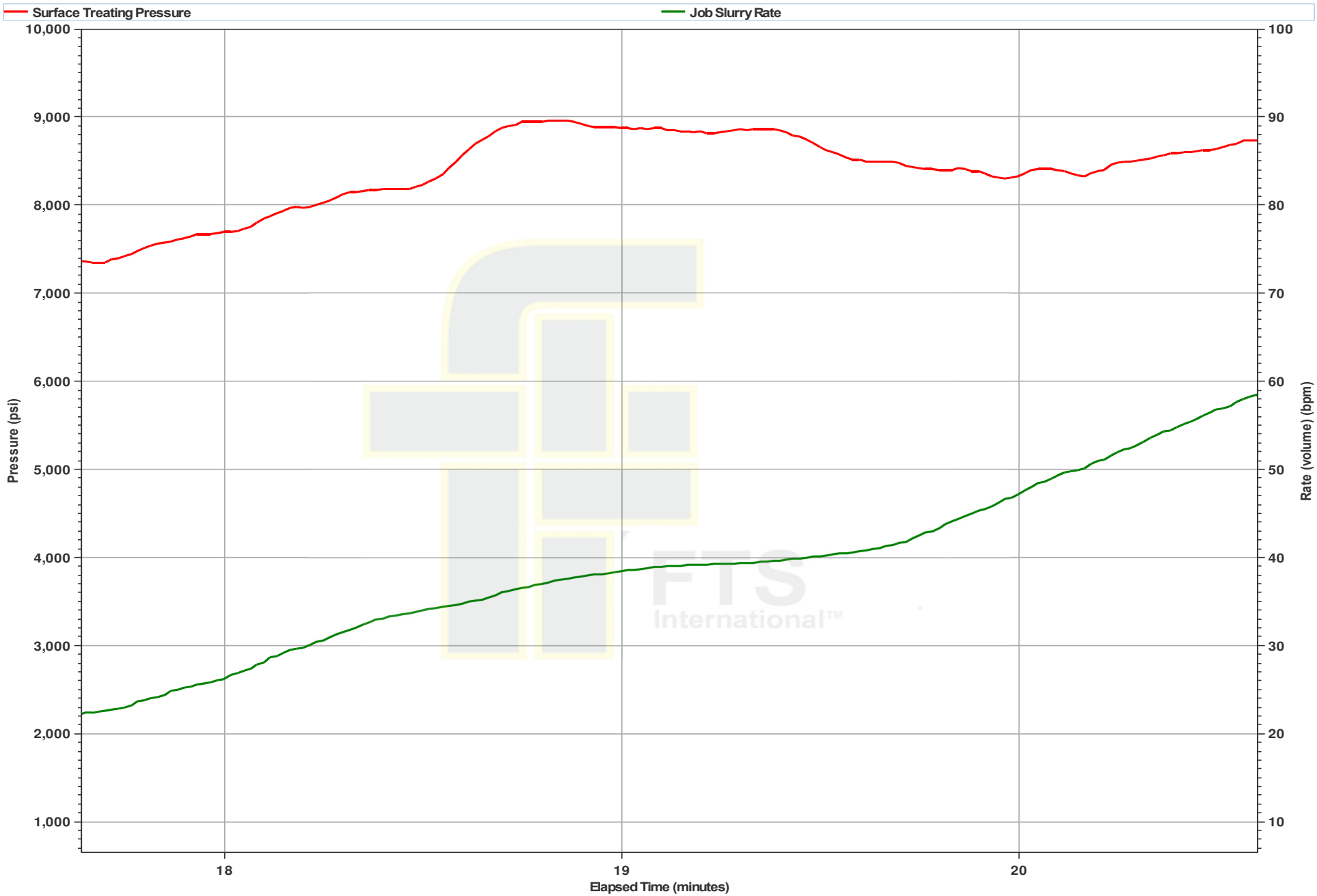
America Energy Utica Red Hill Farm MDS GR 3H Harrison County Stage 26 (WF.000658.M.W03.S26-aDCT-1103) Jun 21, 2015

Ball Seat and Breakdown



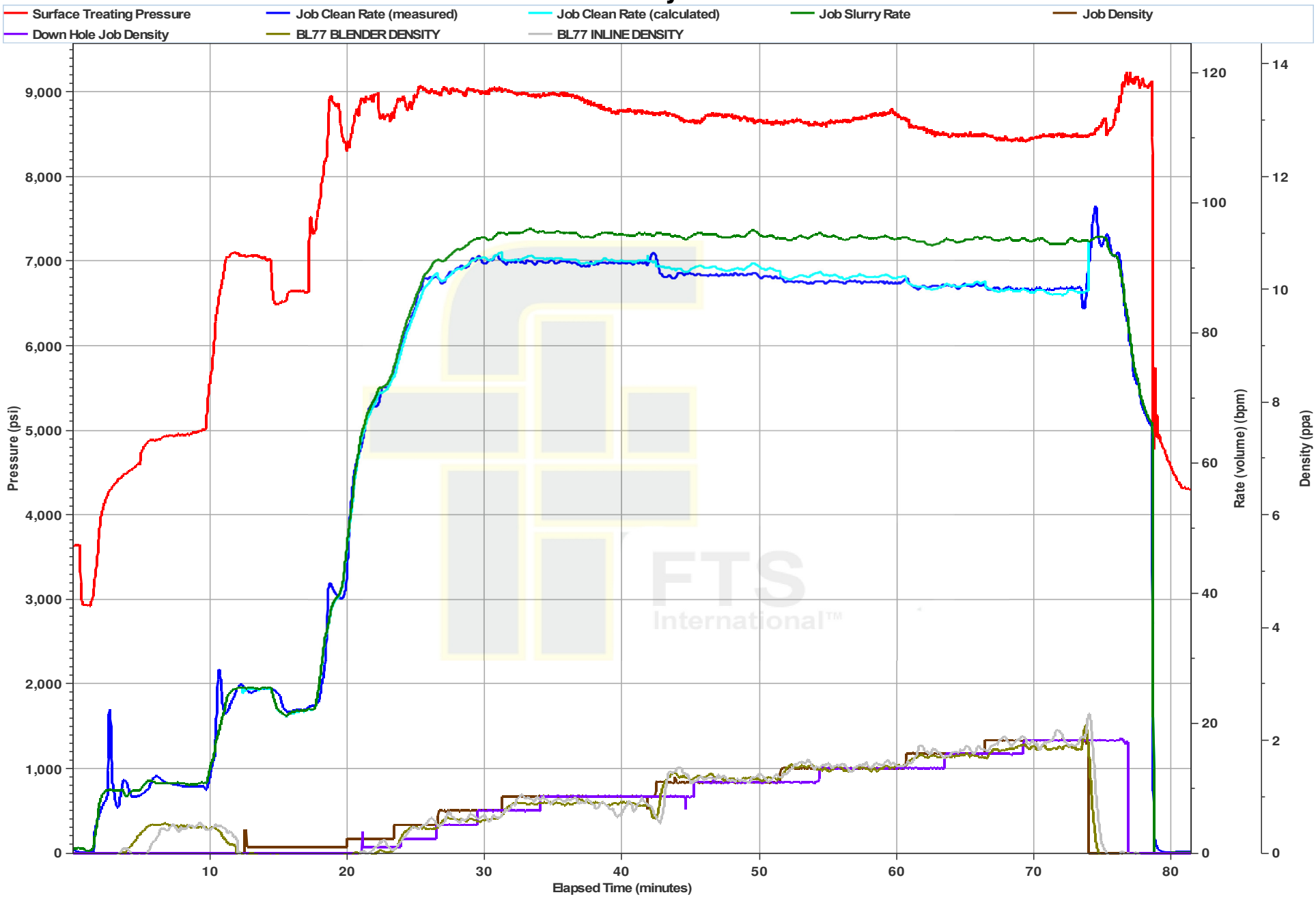
America Energy Utica Red Hill Farm MDS GR 3H Harrison County Stage 26 (WF.000658.M.W03.S26-aDCT-1103) Jun 21, 2015

Acid on Perforations



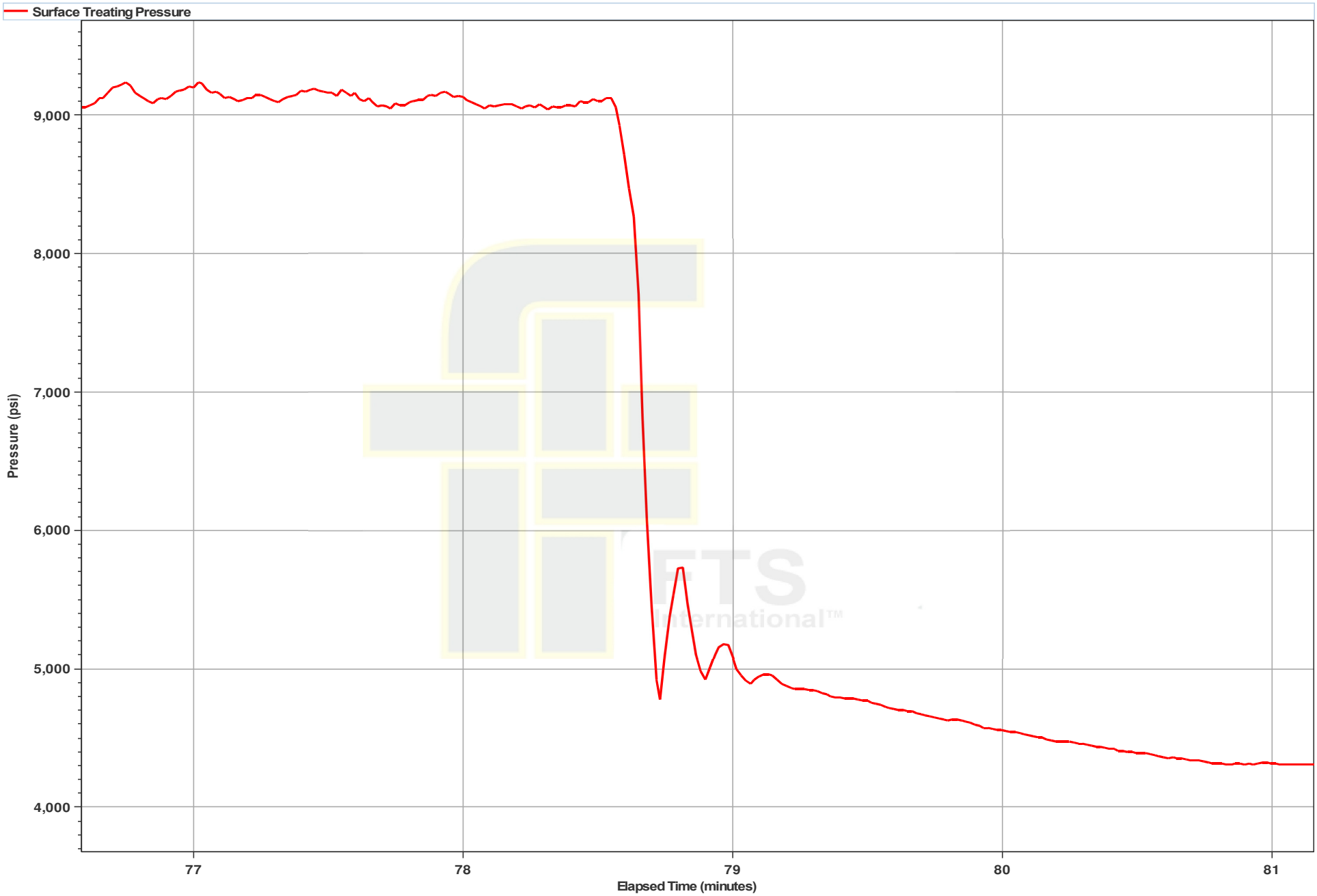
America Energy Utica Red Hill Farm MDS GR 3H Harrison County Stage 26 (WF.000658.M.W03.S26-aDCT-1103) Jun 21, 2015

Primary Plot



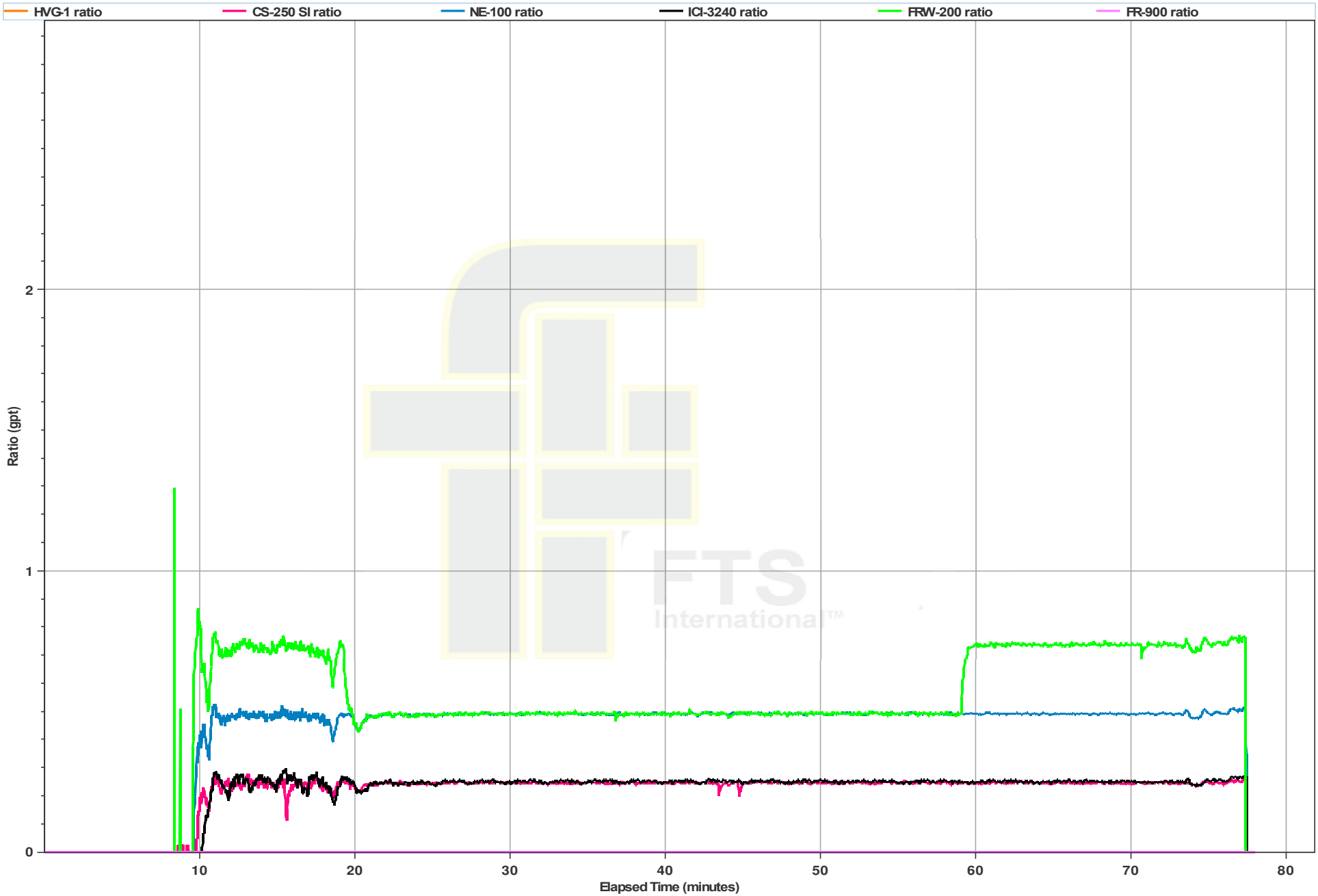
America Energy Utica Red Hill Farm MDS GR 3H Harrison County Stage 26 (WF.000658.M.W03.S26-aDCT-1103) Jun 21, 2015

ISIP Plot



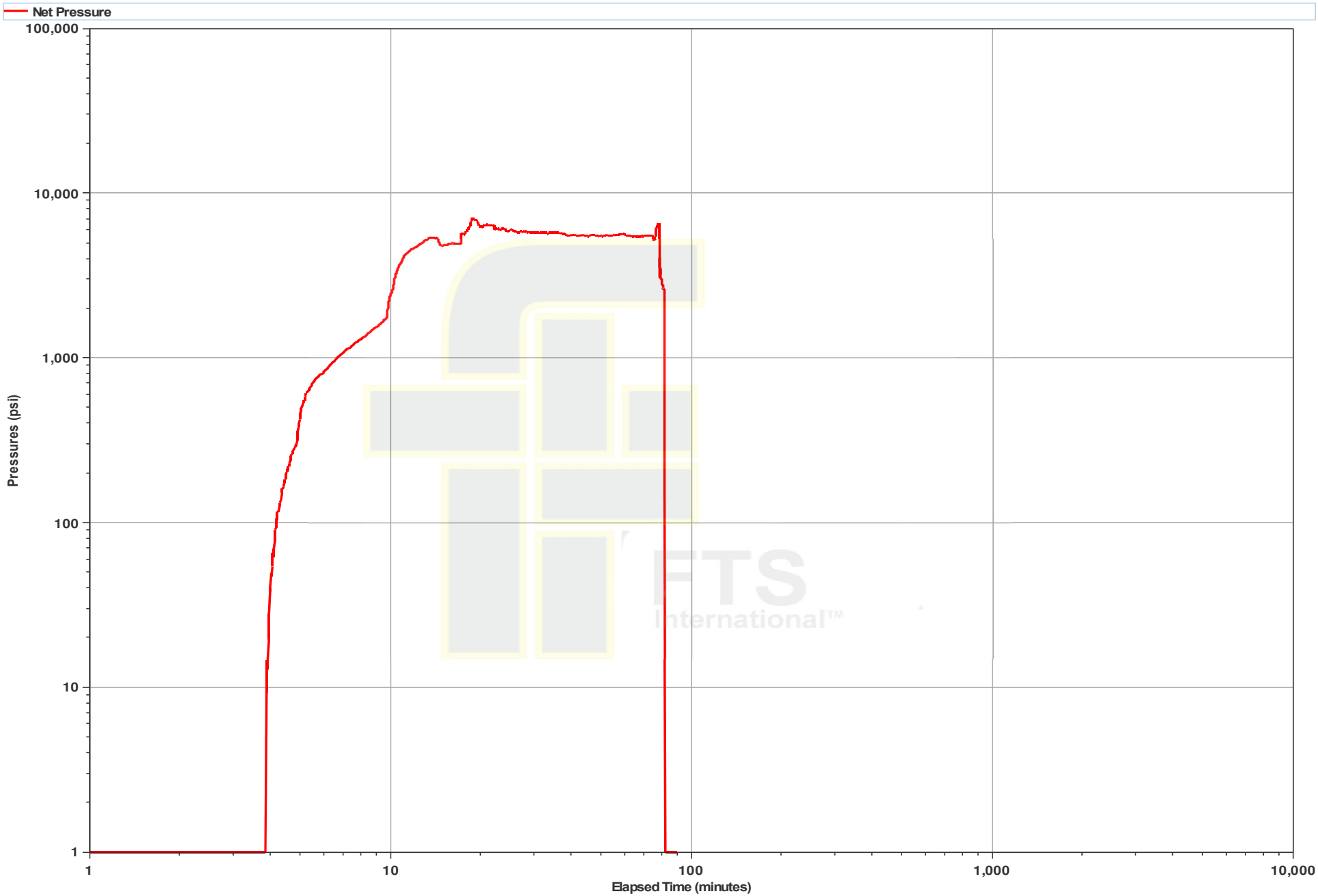
America Energy Utica Red Hill Farm MDS GR 3H Harrison County Stage 26 (WF.000658.M.W03.S26-aDCT-1103) Jun 21, 2015

Chemical Plot



America Energy Utica Red Hill Farm MDS GR 3H Harrison County Stage 26 (WF.000658.M.W03.S26-aDCT-1103) Jun 21, 2015

Net Pressure Plot



America Energy Utica Red Hill Farm MDS GR 3H Harrison County Stage 26 (WF.000658.M.W03.S26-aDCT-1103) Jun 21, 2015

WATER-BASED FRAC FLUID QUALITY CONTROL
(Attachment to Post Treatment Report)

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/21/2015
Customer Name:	American Energy - Utica	Proposal #:	3H/26
Date Sampled:	6/21/2015	Water Source:	Working Tank

Sample/Tank No.	Clarity, Color, Odor	Sample Temperature, (F)	Specific gravity	Initial pH	Chloride, ppm	Hardness, ppm	Calcium, ppm	Magnesium, ppm	Iron ppm	Hydroxide, ppm	Bicarbonate, ppm	Carbonate, ppm	Sulfate, ppm	Barium, ppm
Working Tank	Clear	71	1	7.7	30	230	76	37	1	0	183	0	55	0

Frac Fluid Quality Gel Testing (These Recording are to made prior to pumping job)														
Sample #														
Base Gel Type	HVG-1													
Gel Loading (lbs/1000 gal.)	2.5													
Sample Temperature, (F)	71													
Initial pH	8.1													
Visc. Reading @ 300 rpms	6.5													
Viscosity, (cp)	6.5													
Sample 1 3 min Hydration	4													
Sample 2 3 min Hydration	5													
Sample 3 3 min Hydration	6.5													
X-Link Vortex Closure, min:sec	n/a													
X-Link Crown, min:sec	n/a													
X-Link pH	n/a													
Gel Break Time (<2cp) mins	20													

Frac Fluid Quality Gel Testing (These Recording are to made while pumping job)														
Stage #														
Base Gel Viscosity (cp)														
X-Link pH								.						
Sample XL time, min:sec														
Sample Temperature														

Acid Quality	Percent Acid	NaOH, mLs	Specific Gravity
	28		1.14

Additional testing or documentation may be required by the customer or for frac fluid quality assurance.

Tested By: Etuate Varea

QUALITY CONTROL OF PROPPANTS

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/21/2015
Customer Name:	American Energy - Utica	Well/Stage:	3H/26
Date Sampled:	6/21/2015	DISTRICT:	Washington, PA
VENDOR:	SANTROL		

Select Proppant Type:

___ Brown	___ Ceramic	___ Other (specify)
X White	___ Bauxite	_____
___ Resin Coated	___ Texas Gold	

Sieve Analysis	100 Mesh			Sieve Analysis	30/50 Mesh		
Sample 1	25.10	grams of sample		Sample 2	24.90	grams of sample	
	Amount Retained				Amount Retained		
Sieve mesh	Gram	%		Sieve mesh	Gram	%	
			Total				Total
50	0.00	0.00	In-Size	20	0.00	0.00	In-Size
70	16.50	65.74		30	0.40	1.61	
100	6.20	24.70	100.0%	40	17.50	70.28	96.4%
120	1.20	4.78		45	5.20	20.88	
140	0.70	2.79		50	1.30	5.22	
200	0.50	1.99		70	0.50	2.01	
Pan	0.00	0.00	fines	Pan	0.00	0.00	fines
Total wt. Gram	25.10	100.00		Total wt. Gram	24.90	100.00	

Tested By: Etuate Varea

Post Job Report

AMERICAN ENERGY - UTICA

Red Hill Farm MDS GR 3H

Stage : 27 OF 54

HARRISON, OH

Operations Representative:

Name:	David Knapp
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Fax:	724-743-7719
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Sales Representative:

Name:	Bruce Bathman
Office:	405-974-3901
Fax:	405-787-1235
Cell:	
Email:	BRUCE.BATTHMAN@FTSI.COM

Engineering Manager:

Name:	Thaddeus Craun
Office:	817-832-8782
Fax:	724-743-7719
Cell:	
Email:	THADDEUS.CRAUN@FTSI.COM

FTS International
[illegible]
[illegible]

FTS INTERNATIONAL

Customer: American Energy - Utica
Well: Red Hill Farm Ohio Gr 3H
Stage: 27
Job End Date: [illegible]

Job Summary

Well Information

TVD:	7,301	Top Perf:	11,739
No. Of Perfs:	30		

Casing	Tubing
[illegible]	n/A

Pressures, Rates and Volumes

	Proposed	Actual	Max	Min
BTP	[illegible] psi	[illegible] psi	[illegible] psi	[illegible] psi
Rate	[illegible] bpm	61.1 bpm	[illegible] bpm	[illegible] bpm

	Proposed	Actual		
Clean Volume	[illegible] bbls	[illegible] bbls		
Slurry Volume	[illegible] bbls	[illegible] bbls		
Flush Volume	357 bbls	314 bbls		

	Proposed	Start	End
Free Pumps on Location	19	13	19

Open Well:	Start Time	17:59	Pressure	[illegible] psi
	Bell Dwn	[illegible] bbls	Break Down	[illegible] psi
	Initial BHP:	[illegible] psi	Initial F.G.:	[illegible] psi/ft
Stage Complete:	End Time	[illegible]	Job Time	[illegible]
	Final ISIP	[illegible] psi	Final F.G.	[illegible] psi/ft
	ISIP	[illegible]	5 Min:	[illegible] psi
	Pressure Min:	[illegible]	10 Min:	N/A
	Pressure Max:	[illegible]	15 Min:	N/A

Material Volume

Material	Proposed	Calculated	Actual	Variance
100 Mesh White	[illegible]	[illegible]	[illegible]	0%
30/50 White	[illegible]	[illegible]	[illegible]	0%
Total Proppants	[illegible]	[illegible]	[illegible]	0%

Material	Proposed	Calculated	Actual	Variance
8.1%-7.5% HCL	[illegible]	[illegible]	[illegible]	1%
[illegible]	[illegible]	[illegible]	[illegible]	0%
[illegible]	[illegible]	[illegible]	[illegible]	0%
FE-[illegible]	[illegible]	[illegible]	[illegible]	0%
[illegible]	[illegible]	[illegible]	[illegible]	-4%
[illegible]	[illegible]	[illegible]	[illegible]	0%
[illegible]	[illegible]	[illegible]	[illegible]	2%
[illegible]	[illegible]	[illegible]	[illegible]	0

Comments:

Pumpdown Information:
Total Bbls: 100
Max Pressure (psi): 6074
Max Rate (bpm): 15.1

FTS International
[illegible]
Eighty Four, PA 15330

FTS INTERNATIONAL

Customer: American Energy - Utica
Well: Red Hill Farm Site 6r 3H
Stage: 27
Job End Date: [illegible]

Treatment Report

Date	[illegible]	Statelate	Washington County,PA	Basin Size	[illegible]	API#	[illegible]

Hh. Time	BTP	Spec BPM	Stage Slurry (bbls)	Cumulative Slurry (bbls)	Stage Slurry (bbls)	Cumulative Slurry (bbls)	Stage Proppant (lbs)	Cumulative Proppant (lbs)	Description	Proppant	PPA
17:04	3,149	0.0	0	0	0	0	0	0	Freshwater Open Wet		0.00
17:04	2,142	0.0	3	3	3	3	0	0	Freshwater Load		0.00
17:04	6,014	0.3	71	40	71	40	0	0	7.5% HCL Acid Add		0.00
18:04	7,736	23.3	72	180	72	180	0	0	Slickwater Load		0.00
18:05	7,762	22.2	66	300	66	300	512	512	Slickwater Proppant	100 Mesh White	0.15
18:10	7,146	18.7	0	300	0	300	25	537	Slickwater Shutdown	100 Mesh White	0.15
18:10	7,419	20.6	62	362	62	362	300	838	Slickwater Proppant	100 Mesh White	0.15
18:13	6,607	81.3	218	580	217	579	2,294	3,131	Slickwater Proppant	100 Mesh White	0.25
18:15	6,346	79.6	118	672	112	677	2,319	5,451	Slickwater Proppant	100 Mesh White	0.35
18:17	6,362	78.4	145	818	143	825	3,065	8,438	Slickwater Proppant	100 Mesh White	0.42
18:19	6,339	78.2	450	1,268	445	1,270	13,545	21,991	Slickwater Proppant	100 Mesh White	0.75
18:24	6,185	80.6	425	1,679	414	1,714	17,663	39,654	Slickwater Proppant	100 Mesh White	1.00
18:29	6,339	94.6	438	2,089	436	2,150	17,943	57,471	Slickwater Proppant	30/50 White	1.00
18:34	6,289	91.8	367	2,456	361	2,474	12,504	70,975	Slickwater Proppant	30/50 White	1.00
18:39	6,197	91.7	1,022	3,422	1,000	3,514	53,959	124,934	Slickwater Proppant	30/50 White	1.50
18:39	6,222	90.2	649	4,070	614	4,088	53,929	177,849	Slickwater Proppant	30/50 White	1.50
18:44	6,217	90.4	500	4,570	484	4,572	52,951	130,800	Slickwater Proppant	30/50 White	1.75
18:44	6,216	90.4	200	4,770	210	4,800	14,700	214,500	Slickwater Proppant	30/50 White	1.75
18:47	3,196	90.6	420	5,190	420	5,220	65,520	280,020	Slickwater Proppant	30/50 White	2.00
18:11	3,077	90.6	42	5,230	42	5,260	0	280,020	Slickwater Clean Jerrets		0.00
18:12	3,141	90.0	200	5,430	200	5,460	0	280,020	Slickwater Flush		0.00
18:14	3,183	93.0	114	5,544	114	5,572	0	280,020	Freshwater Flush		0.00
18:15	3,244	0.0	0	5,554	0	5,572	0	280,020	Freshwater Shutdown		0.00
Total Job Time (HH:MM): 01:10											

Min ATP:	0,000 psi	Max ATP:	0,000 psi	Average ATP:	5,300 psi	4 Min	4,200 psi
Min Rate:	22.0 bpm	Max Rate:	92.5 bpm	Average Rate:	81.1 bpm	10 Min	0 psi
Initial ISIP:	6,344 psi	Initial F.G.:	1.17 psi/ft	Average BHP:	10,000	15 Min	0 psi
Final ISIP:	6,344 psi	Final F.G.:	1.17 psi/ft	Customer Representative		HH Pelsin	
FTS Representative		Travis Wilson & Zach Stewart					

Comments:

The proppant values contained in this report are calculated based on actual barrel counts and target densities. Actual total proppant usage is 240,872 lbs. Charge time is 1 hour(s) 16 minute(s). All chemicals and proppant ran as documented.

Min/Max/Avg were taken from sand stages. All chem changes from proposed were made per AEU representative request.

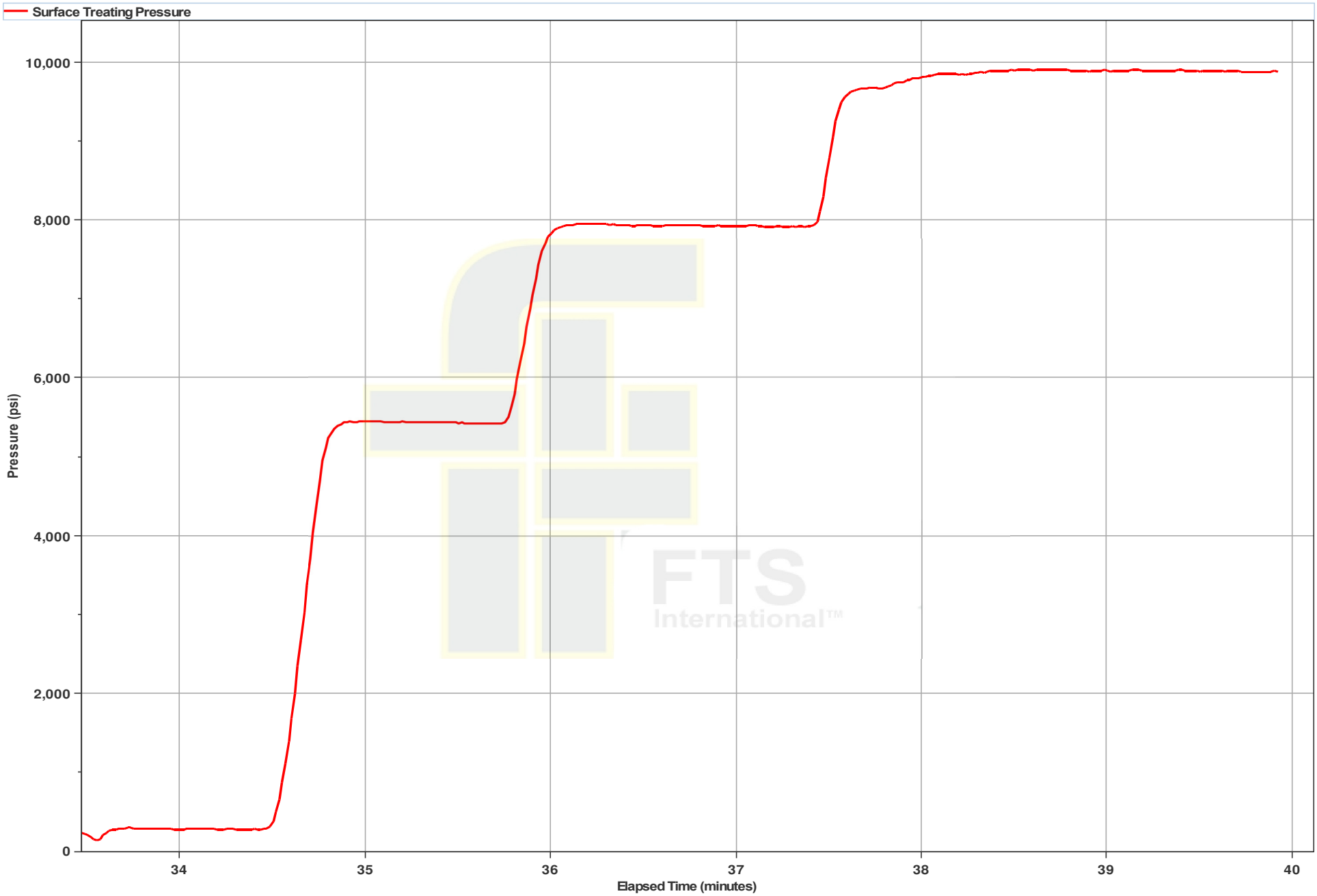
Reuse water was run on this stage for a total of 381 Bbls.

1 Minute Shutdown (psi): 4463
2 Minute Shutdown (psi): 4455
4 Minute Shutdown (psi): 4236

Chemical Changes:

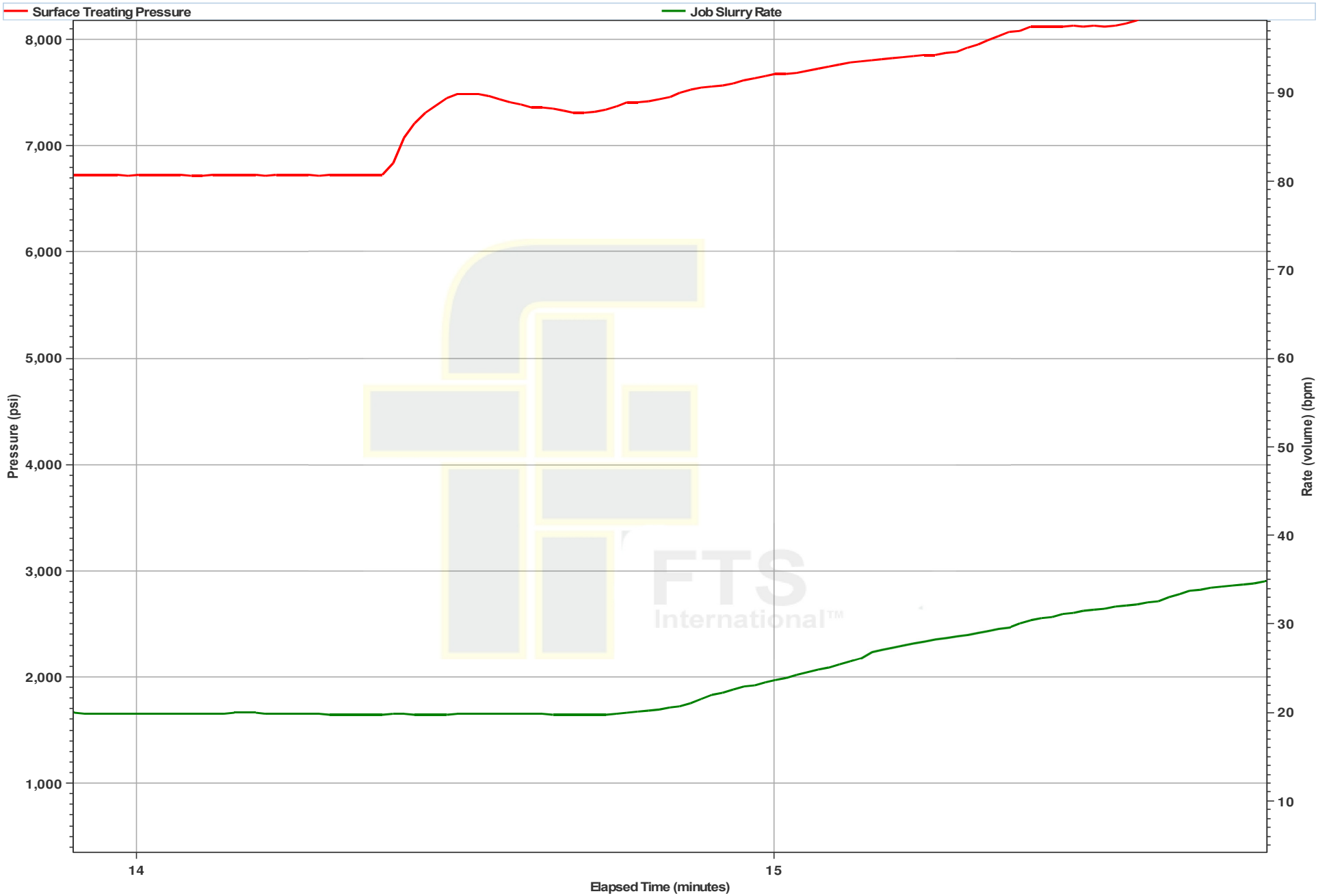
Chemical Name	Chemical Loading	Cumulative Clean
FRW-200	0.75	818
FRW-200	0.80	2,400
FRW-200	1.00	4,779
FRW-200	0.50	6,240

AEU Pressure Test



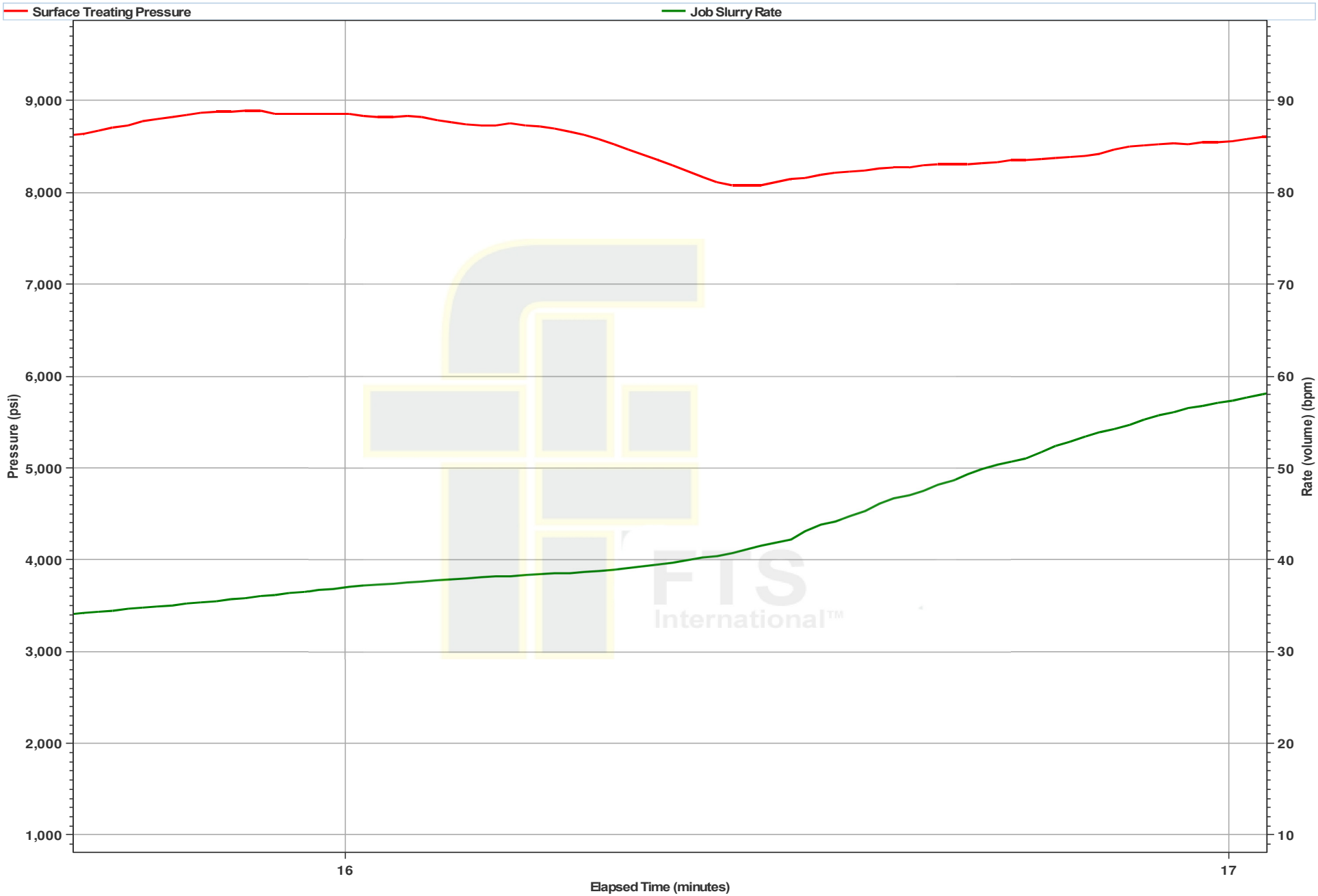
America Energy Utica Red Hill Farm MDS GR 3H Harrison County Stage 27 (WF.000658.M.W03.S27-aDCT-1103) Jun 21, 2015

Ball Seat and Breakdown



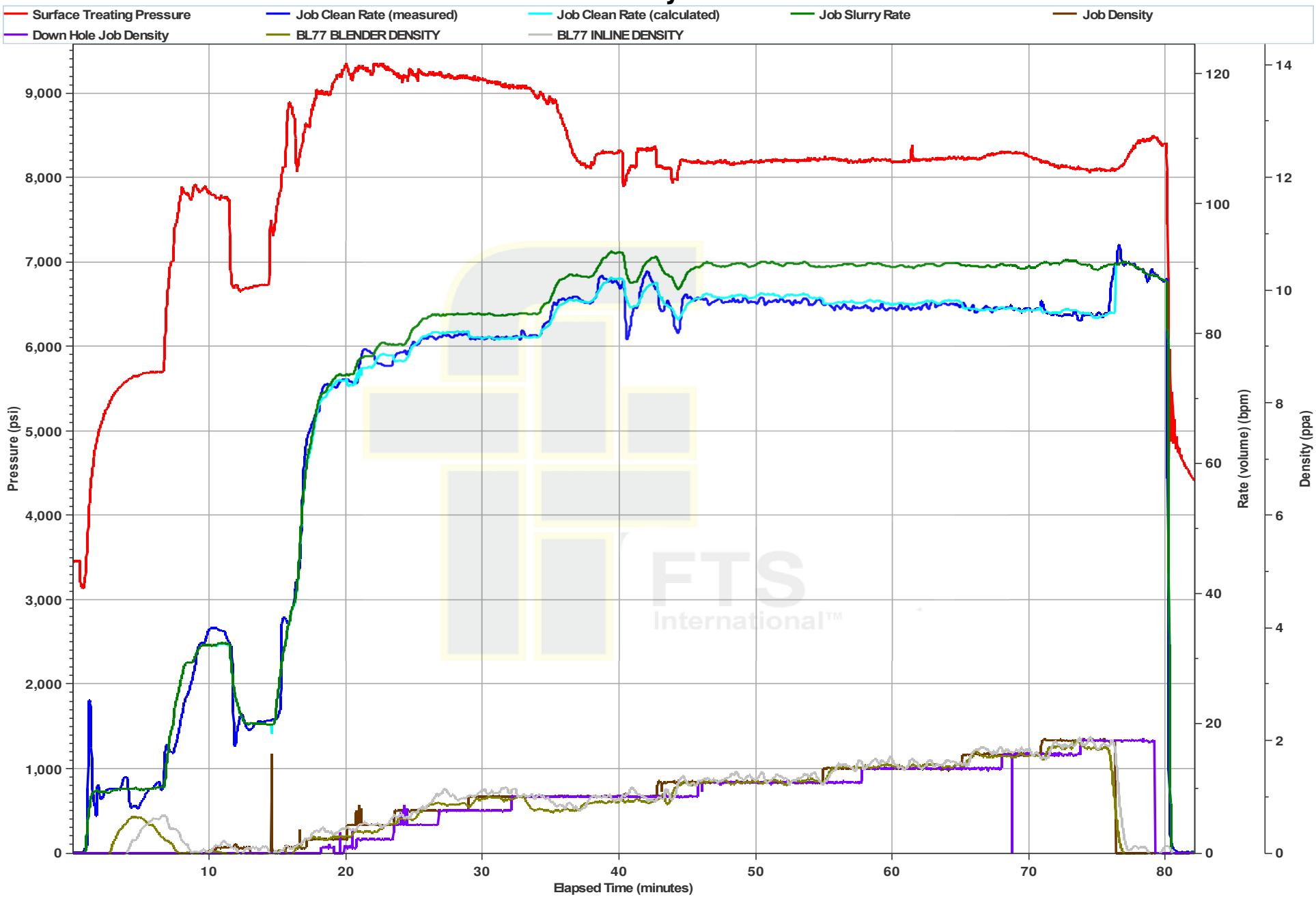
America Energy Utica Red Hill Farm MDS GR 3H Harrison County Stage 27 (WF.000658.M.W03.S27-aDCT-1103) Jun 21, 2015

Acid on Perforations



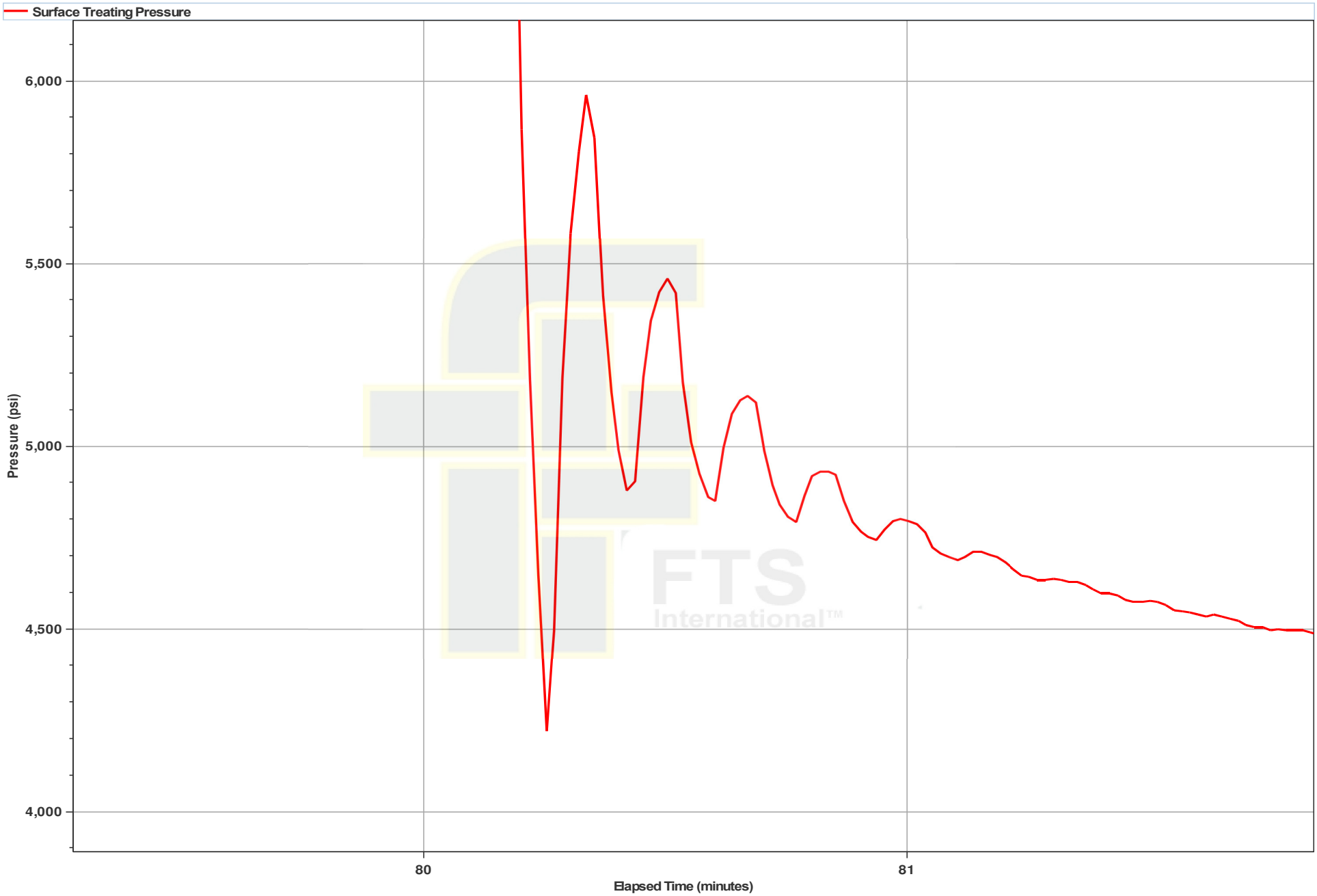
America Energy Utica Red Hill Farm MDS GR 3H Harrison County Stage 27 (WF.000658.M.W03.S27-aDCT-1103) Jun 21, 2015

Primary Plot



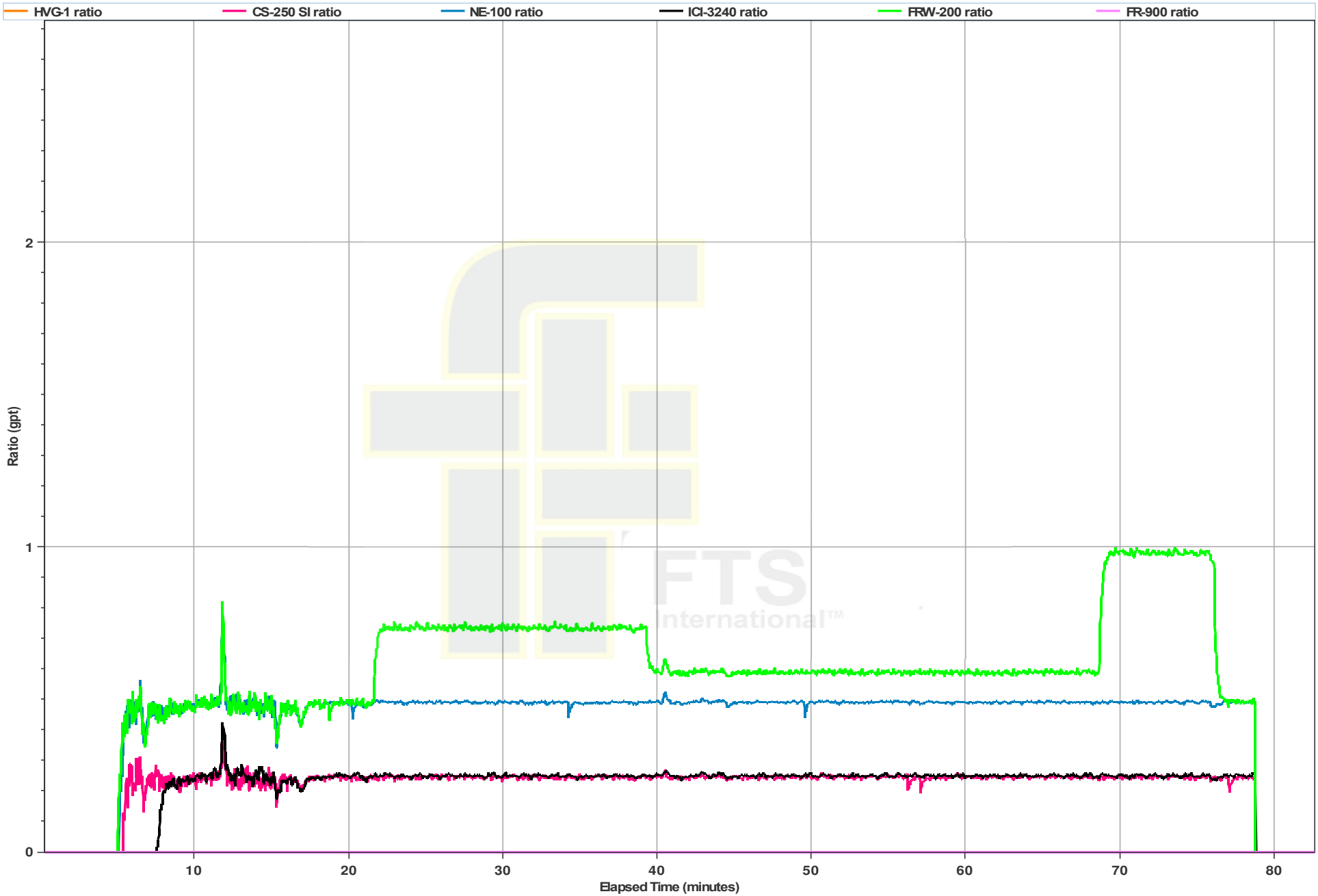
America Energy Utica Red Hill Farm MDS GR 3H Harrison County Stage 27 (WF.000658.M.W03.S27-aDCT-1103) Jun 21, 2015

ISIP Plot



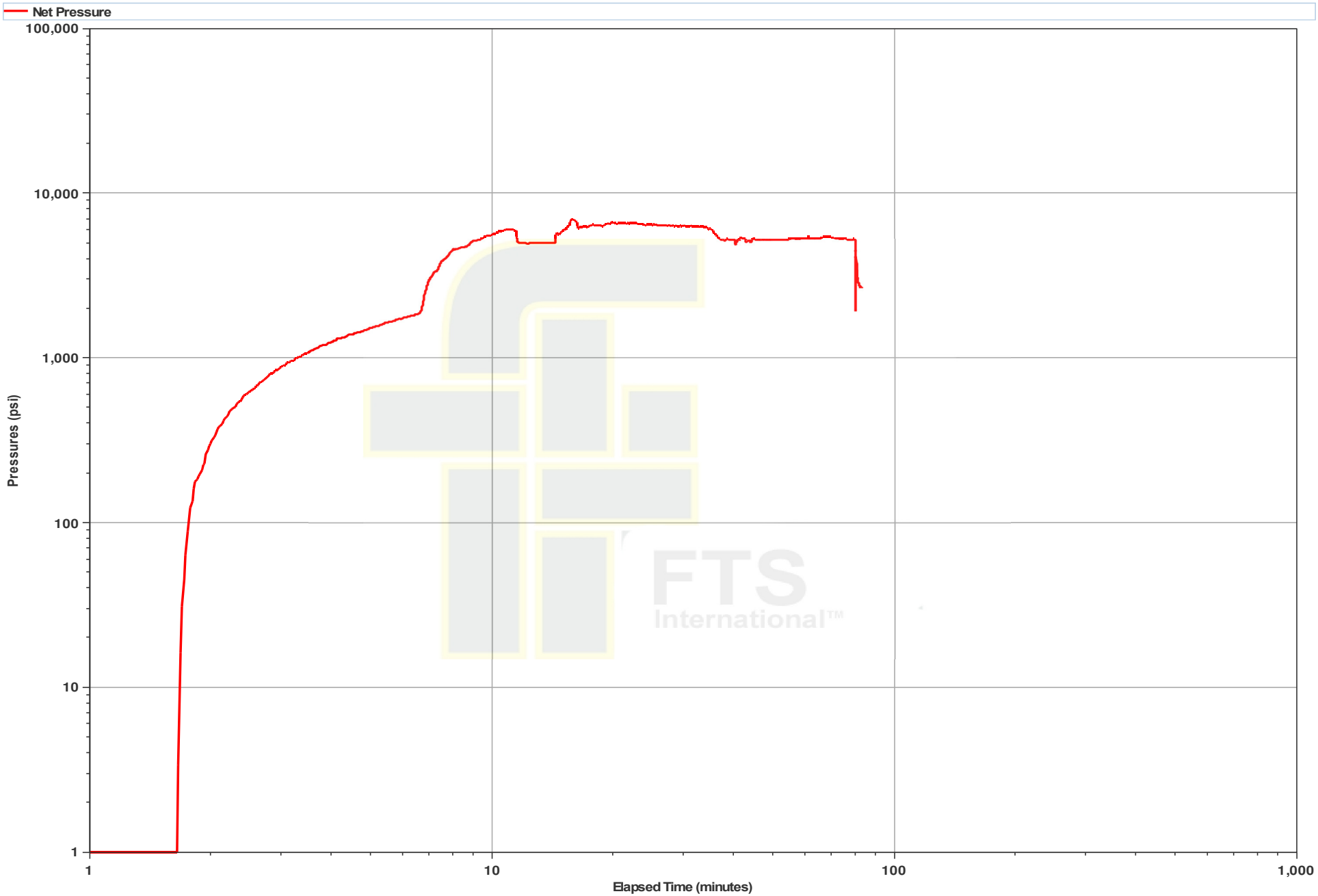
America Energy Utica Red Hill Farm MDS GR 3H Harrison County Stage 27 (WF.000658.M.W03.S27-aDCT-1103) Jun 21, 2015

Chemical Plot



America Energy Utica Red Hill Farm MDS GR 3H Harrison County Stage 27 (WF.000658.M.W03.S27-aDCT-1103) Jun 21, 2015

Net Pressure Plot



America Energy Utica Red Hill Farm MDS GR 3H Harrison County Stage 27 (WF.000658.M.W03.S27-aDCT-1103) Jun 21, 2015

WATER-BASED FRAC FLUID QUALITY CONTROL
(Attachment to Post Treatment Report)

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/21/2015
Customer Name:	American Energy - Utica	Proposal #:	3H/27
Date Sampled:	6/21/2015	Water Source:	Working Tank

Sample/Tank No.	Clarity, Color, Odor	Sample Temperature, (F)	Specific gravity	Initial pH	Chloride, ppm	Hardness, ppm	Calcium, ppm	Magnesium, ppm	Iron ppm	Hydroxide, ppm	Bicarbonate, ppm	Carbonate, ppm	Sulfate, ppm	Barium, ppm
Working Tank	Clear	76	1	7.9	30	250	80	41	0	0	220	0	55	0
Reused Water Tank	Yellow, Cloudy, Petroleum Odor	76	1.03	4.3	69,978	13600	4,801	2,139	>10	0	878	0	400	0

Frac Fluid Quality Gel Testing (These Recording are to made prior to pumping job)														
Sample #														
Base Gel Type	HVG-1													
Gel Loading (lbs/1000 gal.)	2.5													
Sample Temperature, (F)	76													
Initial pH	8.1													
Visc. Reading @ 300 rpms	6.5													
Viscosity, (cp)	6.5													
Sample 1 3 min Hydration	4													
Sample 2 3 min Hydration	5													
Sample 3 3 min Hydration	6.5													
X-Link Vortex Closure, min:sec	n/a													
X-Link Crown, min:sec	n/a													
X-Link pH	n/a													
Gel Break Time (<2cp) mins	18													

Frac Fluid Quality Gel Testing (These Recording are to made while pumping job)														
Stage #														
Base Gel Viscosity (cp)														
X-Link pH								.						
Sample XL time, min:sec														
Sample Temperature														

Acid Quality	Percent Acid	NaOH, mLs	Specific Gravity
	28		1.14

Additional testing or documentation may be required by the customer or for frac fluid quality assurance.

Tested By: Travis Wilson

QUALITY CONTROL OF PROPPANTS

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/21/2015
Customer Name:	American Energy - Utica	Well/Stage:	3H/27
Date Sampled:	6/21/2015	DISTRICT:	Washington, PA
VENDOR:	SANTROL		

Select Proppant Type:

___ Brown	___ Ceramic	___ Other (specify)
X White	___ Bauxite	
___ Resin Coated	___ Texas Gold	

Sieve Analysis	100 Mesh			Sieve Analysis	30/50 Mesh		
Sample 1	24.80	grams of sample		Sample 2	24.90	grams of sample	
	Amount Retained				Amount Retained		
Sieve mesh	Gram	%		Sieve mesh	Gram	%	
			Total				Total
50	0.30	1.21	In-Size	20	0.00	0.00	In-Size
70	16.50	66.53		30	0.50	2.01	
100	5.10	20.56	98.8%	40	17.80	71.49	95.6%
120	1.80	7.26		45	4.10	16.47	
140	0.80	3.23		50	1.90	7.63	
200	0.30	1.21		70	0.60	2.41	
Pan	0.00	0.00	fines	Pan	0.00	0.00	fines
Total wt. Gram	24.80	100.00		Total wt. Gram	24.90	100.00	

Tested By: Travis Wilson

Post Job Report

AMERICAN ENERGY - UTICA

Red Hill Farm MDS GR 3H

Stage : 28 OF 54

HARRISON, OH

Operations Representative:

Name:	David Knapp
Office:	878-327-4881
Fax:	724-743-7719
Cell:	
Email:	DAVID.KNAPP@FTSI.COM

Sales Representative:

Name:	Bruce Matthews
Office:	405-974-3901
Fax:	405-787-1235
Cell:	
Email:	BRUCE.MATTHEWS@FTSI.COM

Engineering Manager:

Name:	Thaddeus Craun
Office:	817-832-8782
Fax:	724-743-7719
Cell:	
Email:	THADDEUS.CRAUN@FTSI.COM

FTS International
[illegible]
Eighty Four, PA [illegible]

FTS INTERNATIONAL

Customer: American Energy - Utica
Well: Red Hill Farm Bla 6r 3H
Stage: 30
Job End Date: [illegible]

Job Summary

Well Information

TVD:	7,301	Top Perf:	11,007
No. Of Perfs:	30		

Casing	Tubing
[illegible]	n/A

Pressures, Rates and Volumes

	Proposed	Actual	Max	Min
STP	[illegible] psi	[illegible] psi	[illegible] psi	[illegible] psi
Rate	[illegible] bpm	[illegible] bpm	[illegible] bpm	[illegible] bpm

	Proposed	Actual		
Clean Volume	[illegible] bbls	[illegible] bbls		
Slurry Volume	[illegible] bbls	[illegible] bbls		
Flush Volume	[illegible] bbls	[illegible] bbls		

	Proposed	Start	End
Frac Pumps on Location	19	14	14

Open Well:	Start Time	[illegible]	Pressure	[illegible] psi
	Bd End	[illegible] bbls	Break Down	[illegible] psi
	Initial ISIP:	[illegible] psi	Initial F.G.:	[illegible] psi/ft
Stage Complete:	End Time	[illegible]	Job Time	[illegible]
	Final ISIP	[illegible] psi	Final F.G.	[illegible] psi/ft
	ISIP	[illegible]	5 Min:	[illegible] psi
	Pressure Min:	[illegible]	10 Min:	N/A
	Pressure Max:	[illegible]	15 Min:	N/A

Material Volume

Material	Proposed	Calculated	Actual	Variance
100 Mesh White	[illegible]	[illegible]	[illegible]	0%
30/50 White	[illegible]	[illegible]	[illegible]	0%
Total Proppants	[illegible]	348,177	348,177	0%

Material	Proposed	Calculated	Actual	Variance
8.1%-7.5% HCL	[illegible]	2,042	[illegible]	1%
[illegible]	3	3	3	0%
[illegible]	[illegible]	67	53	25%
[illegible]	15	16	15	0%
[illegible]	130	189	155	-15%
[illegible]	[illegible]	67	53	25%
[illegible]	6	114	112	-2%
[illegible]	125	8	8	6

Comments:

Pumpdown Information:
Total Bbls: 210
Max Pressure (psi): 6272
Max Rate (bpm): 19.3

FTS International
[illegible]
Eighty Four, PA [illegible]

FTS INTERNATIONAL

Customer: American Energy - Utica
Well: Red Hill Farm Site 6r 3H
Stage: 36
Job End Date: [illegible]

Treatment Report

Date	[illegible]	Statelate	Washington County, PA	Basin Size	[illegible]	API#	[illegible]

Elt. Time	BTP	Slurry BPM	Slurry Gallons (Gals)	Cumulative Slurry (Gals)	Slurry Gallons (Gals)	Cumulative Slurry (Gals)	Slurry Proppant (lbs)	Cumulative Proppant (lbs)	Description	Proppant	PPA
01:04	3,101	0.0	0	0	0	0	0	0	Freshwater Open Wet		0.00
01:04	0,000	0.0	14	14	14	14	0	0	Freshwater Load		0.00
01:10	0,041	10.3	71	87	71	87	0	0	7.5% HCL Acid Add		0.00
01:13	7,312	13.0	171	261	171	261	700	700	Slickwater Proppant	100 Mesh White	4.10
01:21	7,044	30.3	0	261	0	261	0	700	Slickwater Breakdown	100 Mesh White	4.10
01:21	7,029	30.0	35	300	35	300	100	800	Slickwater Proppant	100 Mesh White	4.10
01:22	7,009	30.3	200	401	200	401	2,100	2,900	Slickwater Proppant	100 Mesh White	0.25
01:25	6,993	84.7	300	701	301	701	4,500	7,400	Slickwater Proppant	100 Mesh White	0.50
01:30	6,000	69.4	400	1,100	401	1,200	10,000	22,107	Slickwater Proppant	100 Mesh White	0.75
01:35	6,778	81.1	427	1,612	442	1,655	17,004	49,121	Slickwater Proppant	100 Mesh White	1.00
01:40	6,700	80.6	500	2,112	513	2,200	29,943	89,101	Slickwater Proppant	30/50 White	1.00
01:45	6,470	82.3	300	2,400	300	2,571	18,762	78,013	Slickwater Proppant	30/50 White	1.00
01:50	6,415	82.0	100	2,510	107	2,700	6,435	84,748	Slickwater Proppant	30/50 White	1.25
01:51	6,434	82.3	571	3,080	600	3,030	65,730	150,490	Slickwater Proppant	30/50 White	1.50
02:01	6,113	84.1	333	3,700	330	3,900	13,940	143,330	Slickwater Proppant	30/50 White	1.50
02:05	6,045	84.1	300	3,900	314	4,077	12,000	155,330	Slickwater Proppant	40/80 White	1.50
02:09	6,104	84.2	300	4,210	300	4,097	13,047	172,100	Slickwater Proppant	40/80 White	1.50
02:09	6,104	84.0	501	4,710	541	4,640	46,024	218,017	Slickwater Proppant	40/80 White	1.75
02:15	3,101	30.7	400	5,100	400	5,000	46,000	264,177	Slickwater Proppant	40/80 White	2.00
02:20	3,000	84.0	123	5,212	123	5,091	0	264,177	Slickwater Clean Jerrets		0.00
02:21	3,400	84.0	210	5,402	210	5,291	0	264,177	Slickwater Flush		0.00
02:24	3,010	84.0	103	5,507	103	5,394	0	264,177	Freshwater Flush		0.00
02:25	0,720	0.0	0	5,507	0	5,394	0	264,177	Freshwater Shutdown		0.00
Total Job Time (HH:MM): 01:10											

Min BTP:	0,000 psi	Max BTP:	9,207 psi	Average BTP:	5,262 psi	0 Bbls	4,200 psi
Min Rate:	22.0 bpm	Max Rate:	84.6 bpm	Average Rate:	79.5 bpm	10 Bbls	0 psi
Initial SIP:	6,720 psi	Initial F.G.:	1.22 psi/ft	Average SIP:	70,195	15 Bbls	0 psi
Final SIP:	6,720 psi	Final F.G.:	1.22 psi/ft	Customer Representative		200 Bbls	
FTS Representative		Travis Wilson & Sean Stewart					

Comments:

The proppant values contained in this report are calculated based on actual barrel counts and target densities. Actual total proppant usage is 249,177 lbs. Charge time is 1 hour(s) 16 minute(s). All chemicals and proppant ran as documented.

Min/Max/Avg were taken from sand stages. All chem changes from proposed were made per AEU representative request.

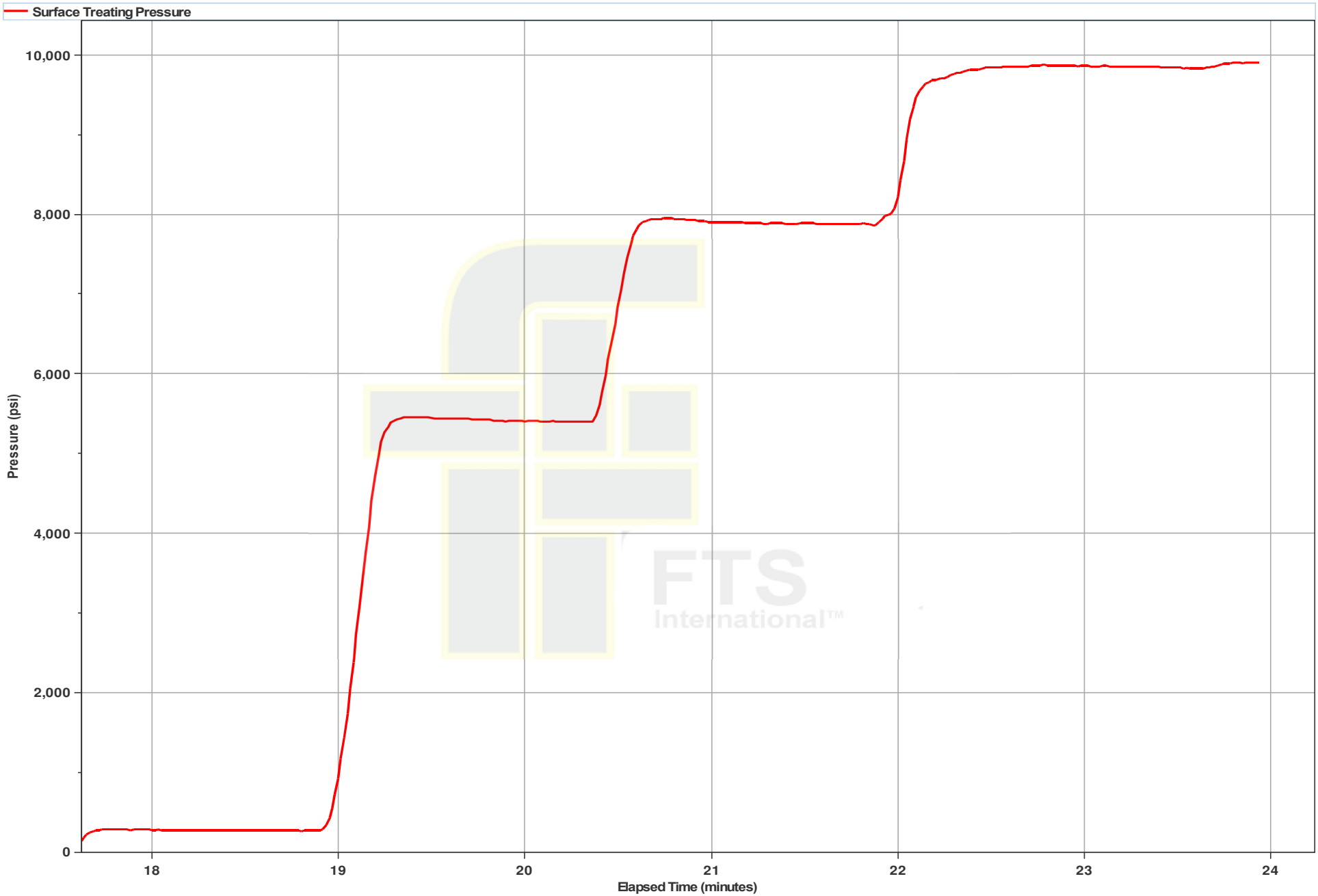
No rerun was run during this stage.

1 Minute Shutdown (psi): [illegible]
2 Minute Shutdown (psi): 4615
4 Minute Shutdown (psi): 4246

Chemical Changes:

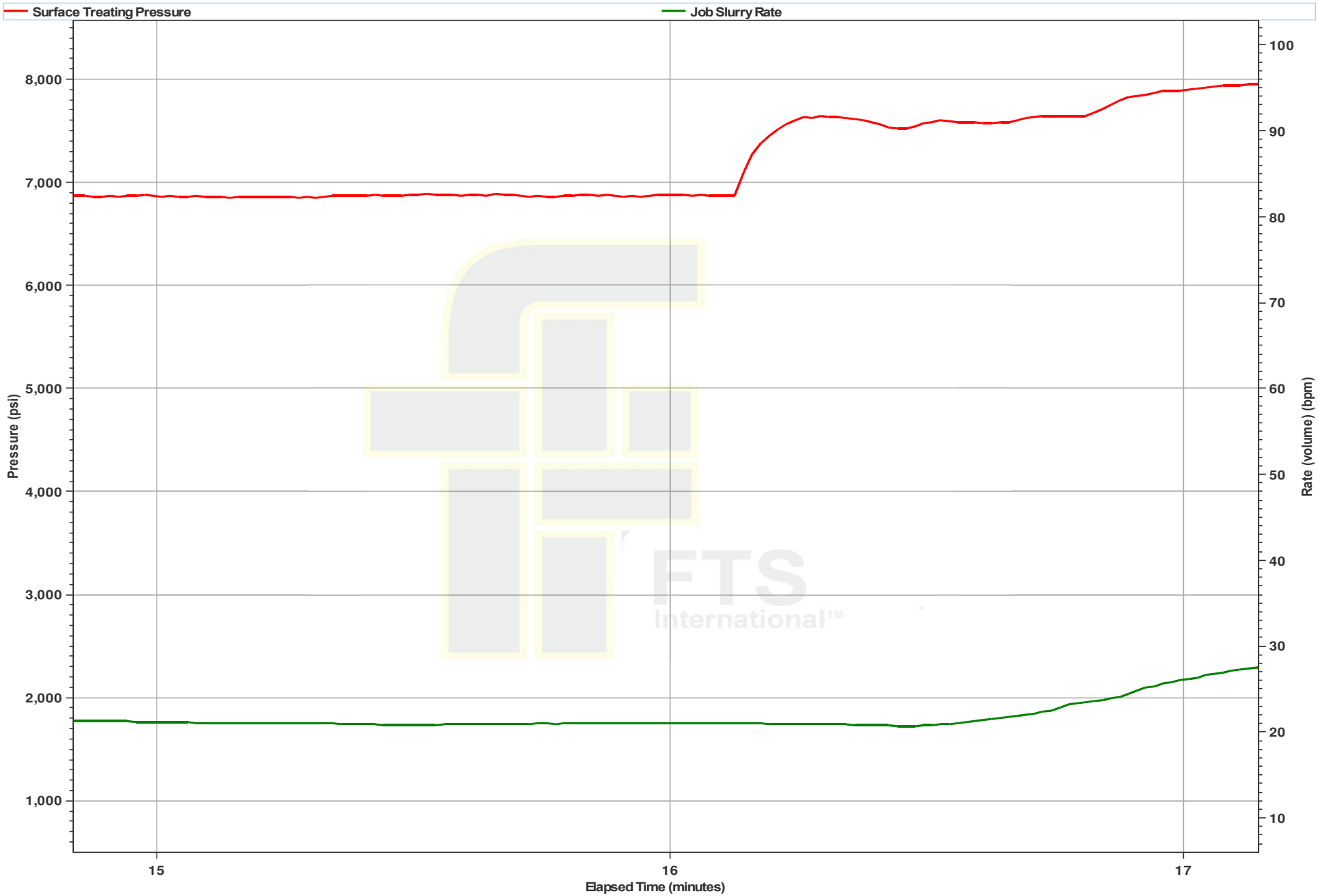
Chemical Name	Chemical Loading	Cumulative Clean
FRW-200	0.75	746
FRW-200	0.60	2,466
FRW-200	0.75	3,466
FRW-200	0.65	3,806
FRW-200	0.75	4,216

AEU Pressure Test



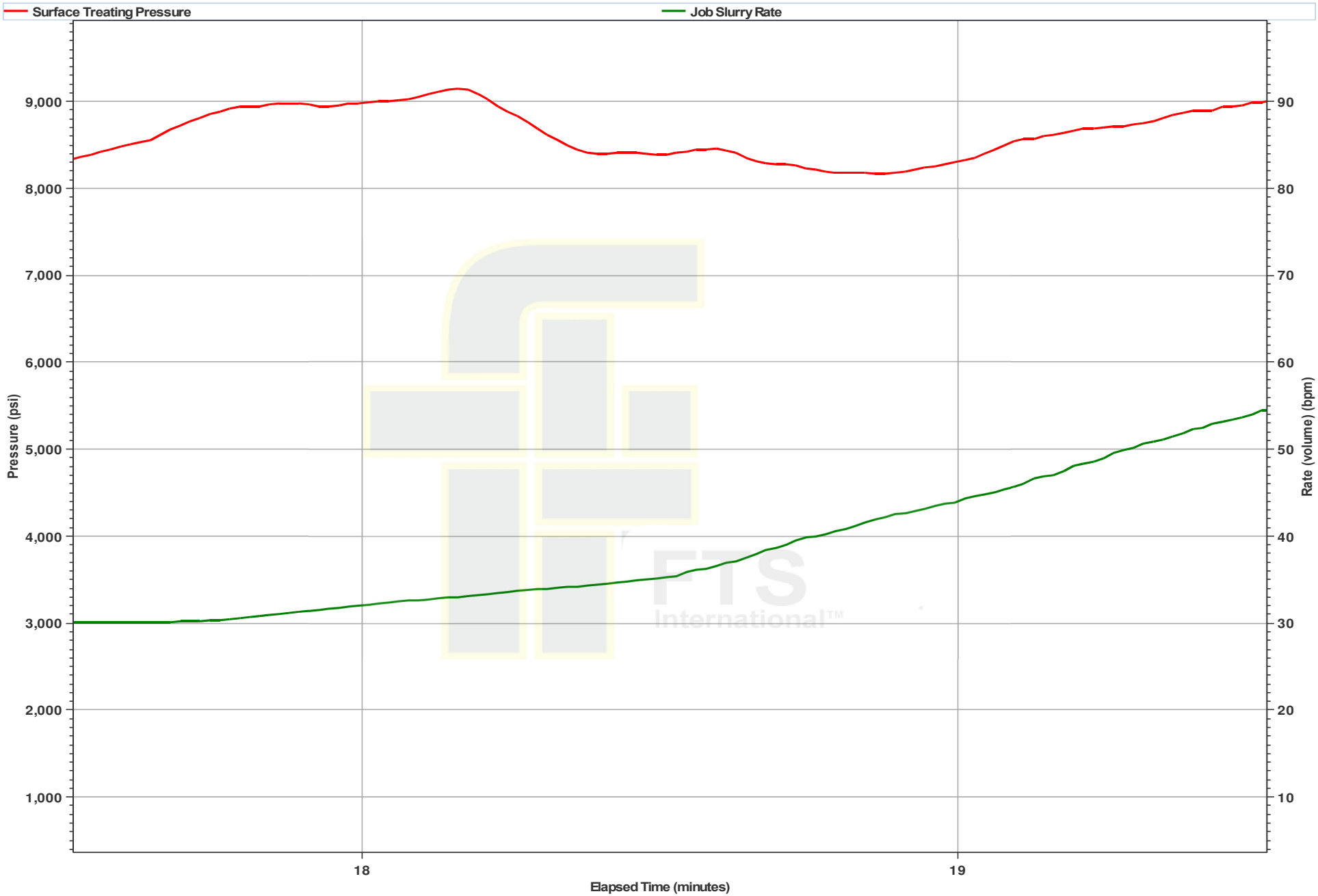
America Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 28 (WF.000658.M.W03.S28-aDCT-1103) Jun 22, 2015

Ball Seat and Breakdown



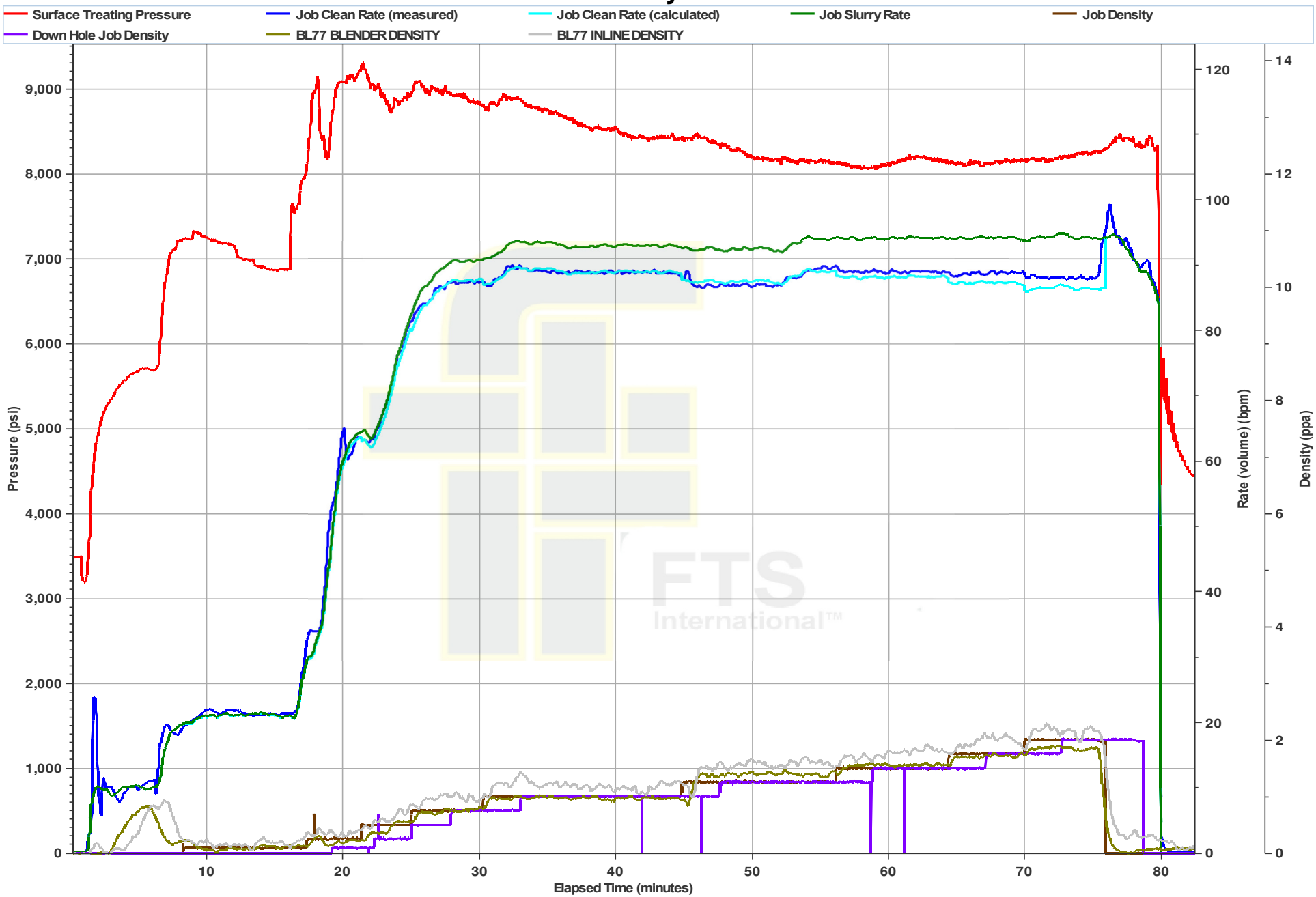
America Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 28 (WF.000658.M.W03.S28-aDCT-1103) Jun 22, 2015

Acid on Perforations



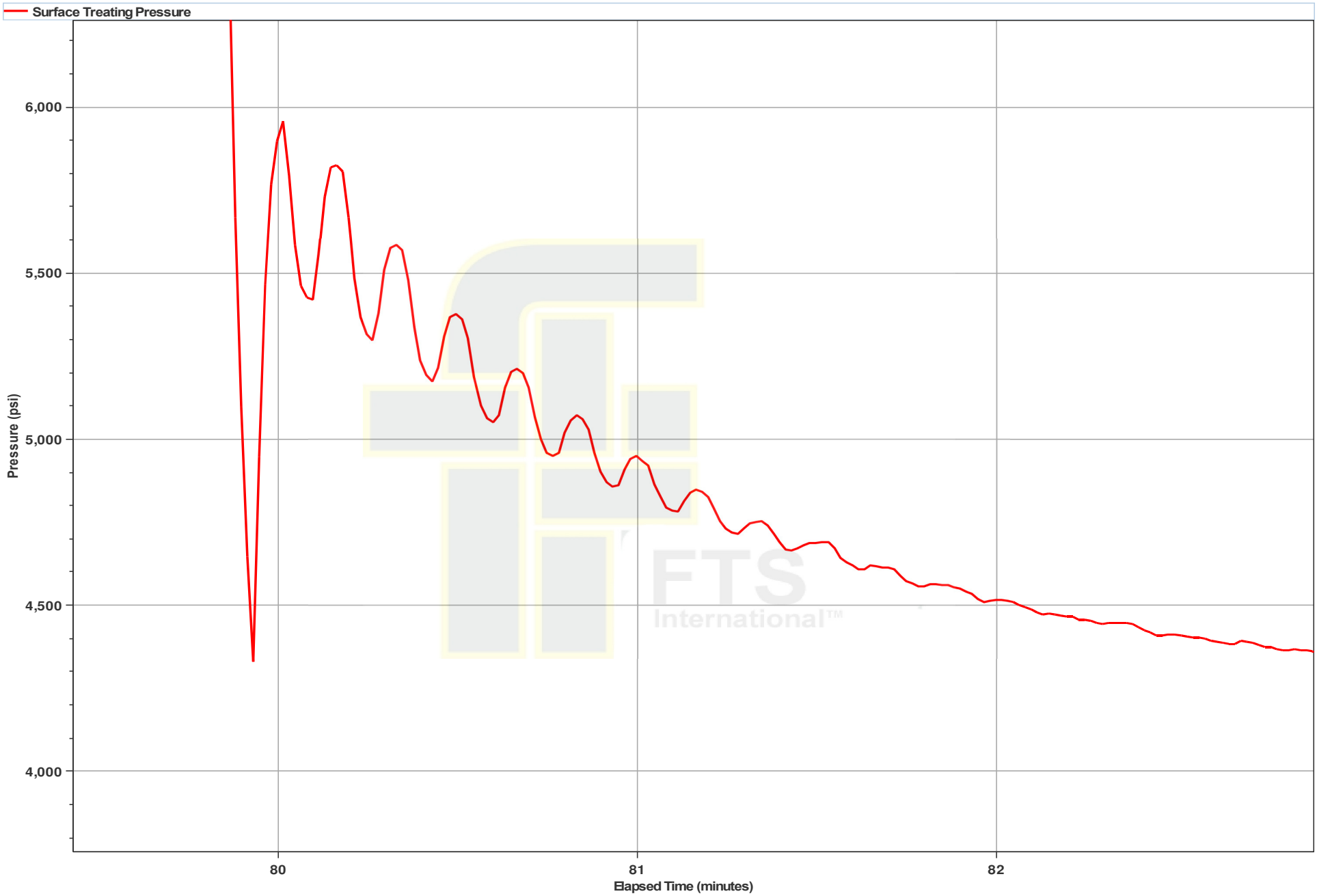
America Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 28 (WF.000658.M.W03.S28-aDCT-1103) Jun 22, 2015

Primary Plot



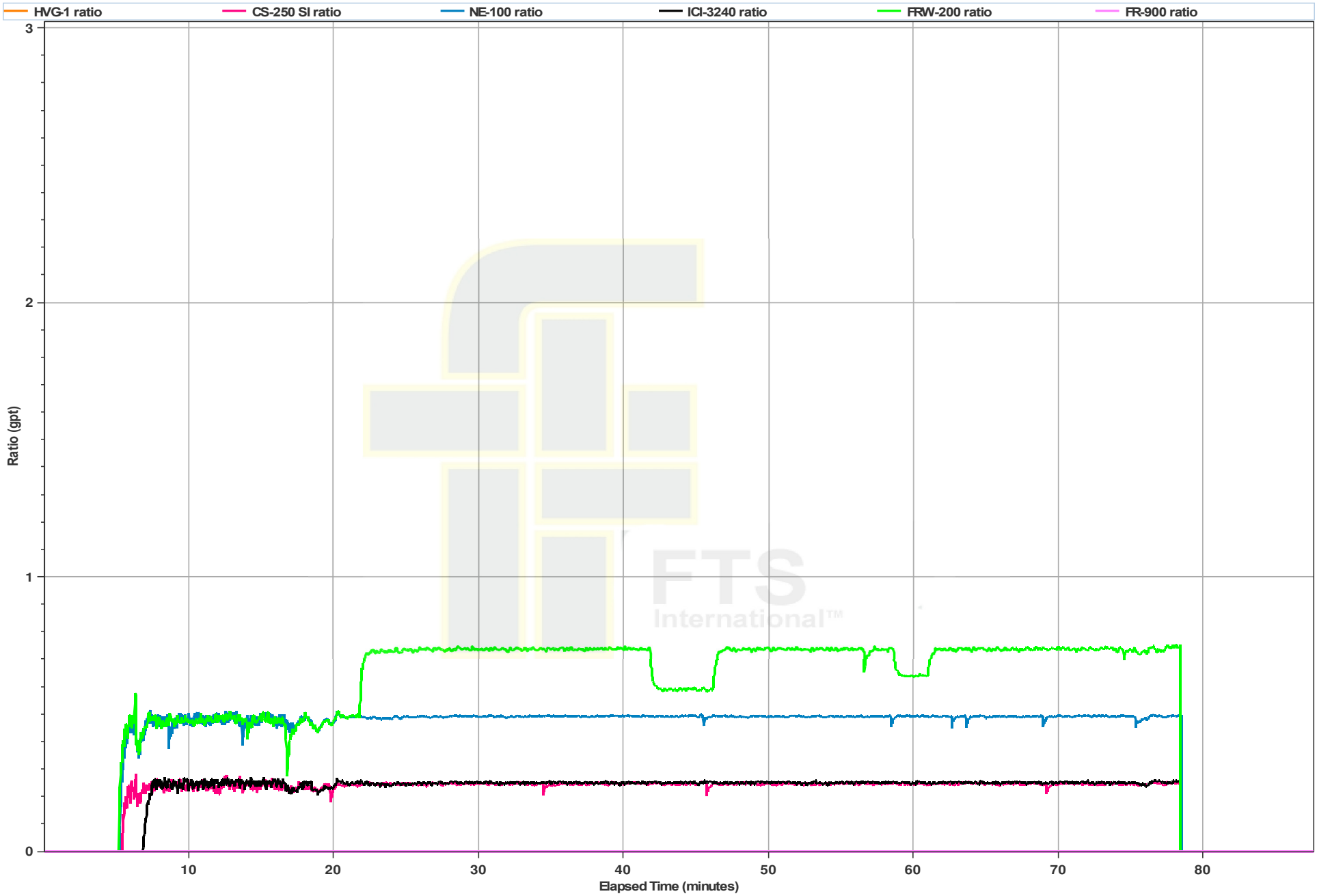
America Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 28 (WF.000658.M.W03.S28-aDCT-1103) Jun 22, 2015

ISIP Plot



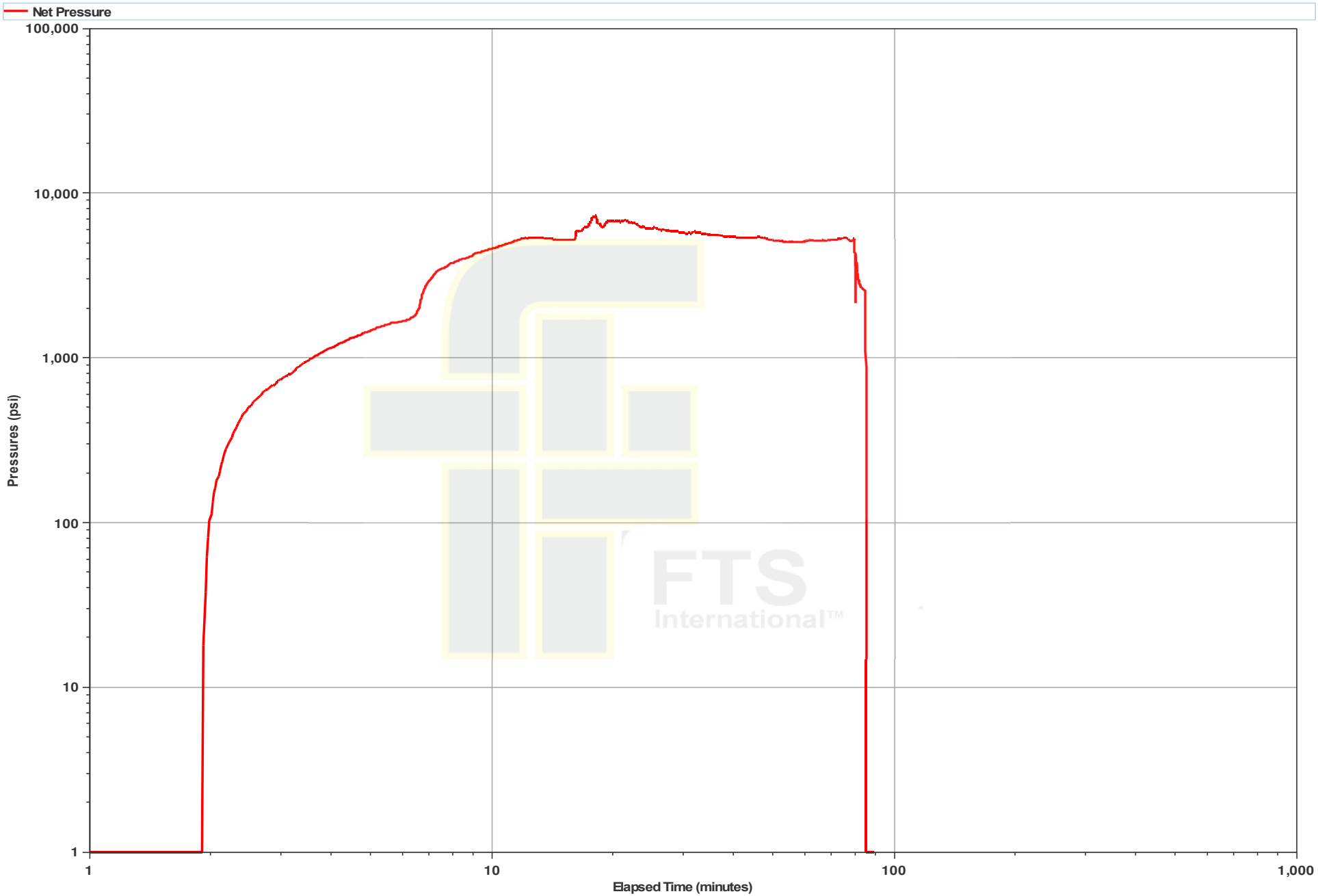
America Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 28 (WF.000658.M.W03.S28-aDCT-1103) Jun 22, 2015

Chemical Plot



America Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 28 (WF.000658.M.W03.S28-aDCT-1103) Jun 22, 2015

Net Pressure Plot



America Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 28 (WF.000658.M.W03.S28-aDCT-1103) Jun 22, 2015

WATER-BASED FRAC FLUID QUALITY CONTROL
(Attachment to Post Treatment Report)

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/22/2015
Customer Name:	American Energy - Utica	Proposal #:	3H/28
Date Sampled:	6/22/2015	Water Source:	Working Tank

Sample/Tank No.	Clarity, Color, Odor	Sample Temperature, (F)	Specific gravity	Initial pH	Chloride, ppm	Hardness, ppm	Calcium, ppm	Magnesium, ppm	Iron ppm	Hydroxide, ppm	Bicarbonate, ppm	Carbonate, ppm	Sulfate, ppm	Barium, ppm
Working Tank	Clear	67	1	7.35	43	100	38	15	1	0	220	0	<50	0

Frac Fluid Quality Gel Testing (These Recording are to made prior to pumping job)														
Sample #														
Base Gel Type	HVG-1													
Gel Loading (lbs/1000 gal.)	2.5													
Sample Temperature, (F)	67													
Initial pH	8.1													
Visc. Reading @ 300 rpms	6													
Viscosity, (cp)	6													
Sample 1 3 min Hydration	4													
Sample 2 3 min Hydration	5													
Sample 3 3 min Hydration	6.5													
X-Link Vortex Closure, min:sec	n/a													
X-Link Crown, min:sec	n/a													
X-Link pH	n/a													
Gel Break Time (<2cp) mins	19													

Frac Fluid Quality Gel Testing (These Recording are to made while pumping job)														
Stage #														
Base Gel Viscosity (cp)														
X-Link pH								.						
Sample XL time, min:sec														
Sample Temperature														

Acid Quality	Percent Acid	NaOH, mLs	Specific Gravity
	28		1.14

Additional testing or documentation may be required by the customer or for frac fluid quality assurance.

Tested By: Travis Wilson

QUALITY CONTROL OF PROPPANTS

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/22/2015
Customer Name:	American Energy - Utica	Well/Stage:	3H/28
Date Sampled:	6/22/2015	DISTRICT:	Washington, PA
VENDOR:	SANTROL		

Select Proppant Type:

___ Brown	___ Ceramic	___ Other (specify)
X White	___ Bauxite	
___ Resin Coated	___ Texas Gold	

Sieve Analysis	100 Mesh			Sieve Analysis	30/50 Mesh		
Sample 1	24.80	grams of sample		Sample 2	24.80	grams of sample	
	Amount Retained				Amount Retained		
Sieve mesh	Gram	%		Sieve mesh	Gram	%	
			Total				Total
50	0.50	2.02	In-Size	20	0.00	0.00	In-Size
70	16.10	64.92		30	0.30	1.21	
100	4.70	18.95	98.0%	40	18.40	74.19	96.8%
120	2.10	8.47		45	3.40	13.71	
140	0.90	3.63		50	2.20	8.87	
200	0.50	2.02		70	0.50	2.02	
Pan	0.00	0.00	fines	Pan	0.00	0.00	fines
Total wt. Gram	24.80	100.00		Total wt. Gram	24.80	100.00	

Tested By: Travis Wilson

Post Job Report

AMERICAN ENERGY - UTICA

Red Hill Farm MDS GR 3H

Stage : 29 OF 54

HARRISON, OH

Operations Representative:

Name:	**David Knapp**
Office:	**570-327-4881**
Fax:	**724-743-7719**
Cell:	
Email:	**DAVID.KNAPP@FTSI.COM**

Sales Representative:

Name:	**Bruce Matthews**
Office:	**405-574-3981**
Fax:	**405-767-1288**
Cell:	
Email:	**BRUCE.MATTHEWS@FTSI.COM**

Engineering Manager:

Name:	**Thaddeus Craun**
Office:	**817-682-8702**
Fax:	**724-743-7719**
Cell:	
Email:	**THADDEUS.CRAUN@FTSI.COM**

FTS International
1432 Route 519
Eighty Four, PA 15330

Customer: American Energy - Utica
Well: Red Hill Farm Mds Gr 3H
Stage: 29
Job End Date: 06/22/2015

Job Summary

Well Information

TVD:	7,301	**Top Perf:**	11,455
No. Of Perfs:	30		

Casing	Tubing
5.50" 20.00#	N/A

Pressures, Rates and Volumes

	Proposed	Actual	Max	Min
STP	9,046 psi	8,809 psi	9,465 psi	7,294 psi
Rate	80.0 bpm	85.1 bpm	96.2 bpm	23.9 bpm

	Proposed	Actual		
Clean Volume	5,772 bbls	5,668 bbls		
Slurry Volume	6,042 bbls	5,937 bbls		
Flush Volume	357 bbls	302 bbls		

	Proposed	Start	End
Frac Pumps on Location	10	14	14

Open Well:	Start Time	09:25	Pressure	3,150 psi
	Ball Seat	238 bbls	Break Down	8,462 psi
	Initial ISIP:	5,463 psi	Initial F.G.:	1.18 psi/ft
Stage Complete:	End Time	10:48	Job Time	01:15
	Final ISIP	5,463 psi	Final F.G.	1.18 psi/ft
	HHP	18,374	5 Min:	4,964 psi
	Proppant Min:	0.00	10 Min:	N/A
	Proppant Max:	2.00	15 Min:	N/A

Material Volume

Material	Proposed	Calculated	Actual	Variance
100 Mesh White	40,000	40,688	40,688	0%
30/50 White	210,000	209,465	209,465	0%
Total Proppants	250,000	250,153	250,153	0%

Material	Proposed	Calculated	Actual	Variance
0.1%-7.5% HCL	3,000	2,982	3,000	1%
CI-150	3	3	3	0%
CS-250 SI	60	58	57	-2%
FE-200L	15	15	15	0%
FRW-200	180	137	133	-3%
FRW-900	0	35	35	0%
ICI-3240	60	58	57	-2%
NE-100	0	116	115	-1%
NE-100W	120	0	0	0

Comments:

Pumpdown Information:
Total Bbls: 185
Max Pressure (psi): 5867
Max Rate (bpm): 15.2

FTS International
1432 Route 519
Eighty Four, PA 15330

Customer: American Energy - Utica
Well: Red Hill Farm Mds Gr 3H
Stage: 29
Job End Date: 06/22/2015

Treatment Report

Date:	6/22/2015	District:	Washington County,PA	Quote No:	051815_035725QF	API:	34-059-24370

MIL Time	STP	Slurry BPM	Stage Clean (bbls)	Cumulative Clean (bbls)	Stage Slurry (bbls)	Cumulative Slurry (bbls)	Stage Proppant (lbs)	Cumulative Proppant (lbs)	Description	Proppant	PPA
09:25	3,150	0.0	0	0	0	0	0	0	Freshwater Open Well		0.00
09:26	5,180	9.9	20	20	20	20	0	0	Freshwater Load		0.00
09:28	5,211	10.1	71	91	71	91	0	0	7.5% HCL Acid Acid		0.00
09:36	7,157	21.2	46	137	46	137	0	0	Slickwater Load		0.00
09:40	7,369	24.6	100	237	100	237	420	420	Slickwater Proppant	100 Mesh White	0.10
09:42	8,462	24.7	0	237	0	237	0	420	Slickwater Breakdown		0.00
09:42	8,103	24.4	115	352	116	353	483	903	Slickwater Proppant	100 Mesh White	0.10
09:45	8,166	57.7	217	569	219	572	2,279	3,182	Slickwater Proppant	100 Mesh White	0.25
09:48	8,958	68.9	255	824	261	833	5,355	8,537	Slickwater Proppant	100 Mesh White	0.50
09:52	8,995	78.9	430	1,254	445	1,278	13,545	22,082	Slickwater Proppant	100 Mesh White	0.75
09:57	8,962	84.0	443	1,697	463	1,741	18,606	40,688	Slickwater Proppant	100 Mesh White	1.00
10:04	9,008	86.6	75	1,772	78	1,819	3,150	43,838	Slickwater Proppant	30/50 White	1.00
10:07	8,716	92.9	801	2,573	837	2,656	33,642	77,480	Slickwater Proppant	30/50 White	1.00
10:12	8,779	95.2	1,000	3,573	1,057	3,713	52,500	129,980	Slickwater Proppant	30/50 White	1.25
10:24	8,824	95.2	1,000	4,573	1,068	4,781	63,000	192,980	Slickwater Proppant	30/50 White	1.50
10:35	8,907	95.5	105	4,678	113	4,894	7,718	200,698	Slickwater Proppant	30/50 White	1.75
10:36	8,948	95.5	370	5,048	399	5,293	27,195	227,893	Slickwater Proppant	30/50 White	1.75
10:40	8,988	93.6	40	5,088	43	5,336	2,940	230,833	Slickwater Proppant	30/50 White	1.75
10:41	9,022	92.7	230	5,318	251	5,587	19,320	250,153	Slickwater Proppant	30/50 White	2.00
10:43	8,724	93.2	48	5,366	48	5,635	0	250,153	Slickwater Clean screws		0.00
10:44	8,898	93.5	240	5,606	240	5,875	0	250,153	Slickwater Flush		0.00
10:46	9,402	68.3	62	5,668	62	5,937	0	250,153	Freshwater Flush		0.00
10:48	5,463	0.0	0	5,668	0	5,937	0	250,153	Freshwater Shutdown		0.00
Total JobTime (HH:MM): 01:23											

Min STP:	7,294 psi	**Max STP:**	9,465 psi	**Average STP:**	8,809 psi	**5 Min:**	4,964 psi
Min Rate:	23.9 bpm	**Max Rate:**	96.2 bpm	**Average Rate:**	85.1 bpm	**10 Min:**	0 psi
Initial ISIP:	5,463 psi	**Initial F.G.:**	1.18 psi/ft	**Average HHP:**	18,374	**15 Min:**	0 psi
Final ISIP:	5,463 psi	**Final F.G.:**	1.18 psi/ft	**Customer Representative:**		Jim Andrews	
FTSI Representative:		Etuate Varea & Jason McCoskey					

Comments:

The proppant values contained in this report are calculated based on actual barrel counts and target densities. Actual total proppant usage is 250,153 lbs. Charge time is 1 hour(s) 15 minute(s). All chemicals and proppant ran as documented.

Min/Max/Avg were taken from sand stages. All chem changes from proposed were made per AEU representative request.

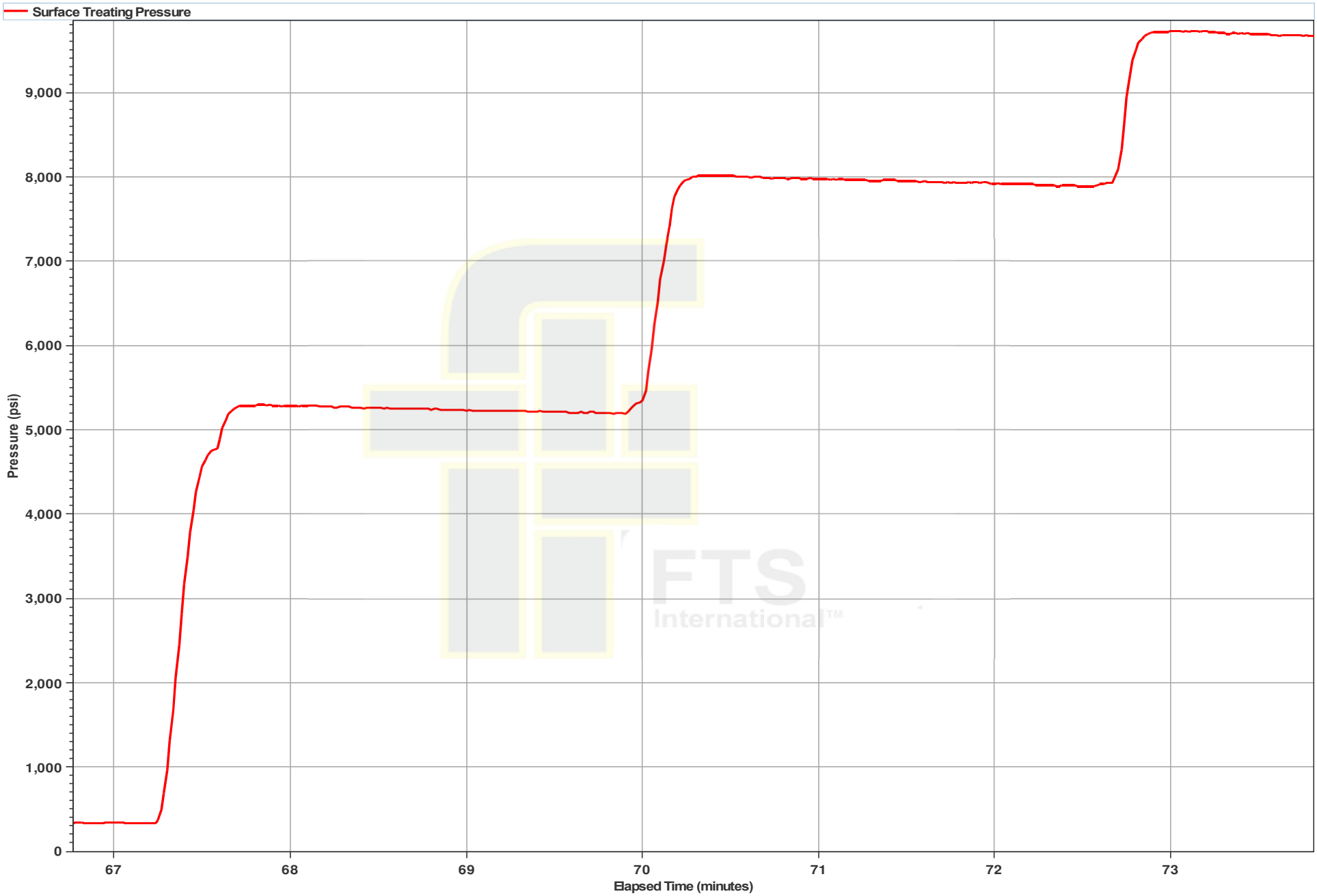
Reuse water was run on this stage for a total of 252 Bbls.

1 Minute Shutdown (psi): 5269
2 Minute Shutdown (psi): 5090
5 Minute Shutdown (psi): 4964

Chemical Changes:

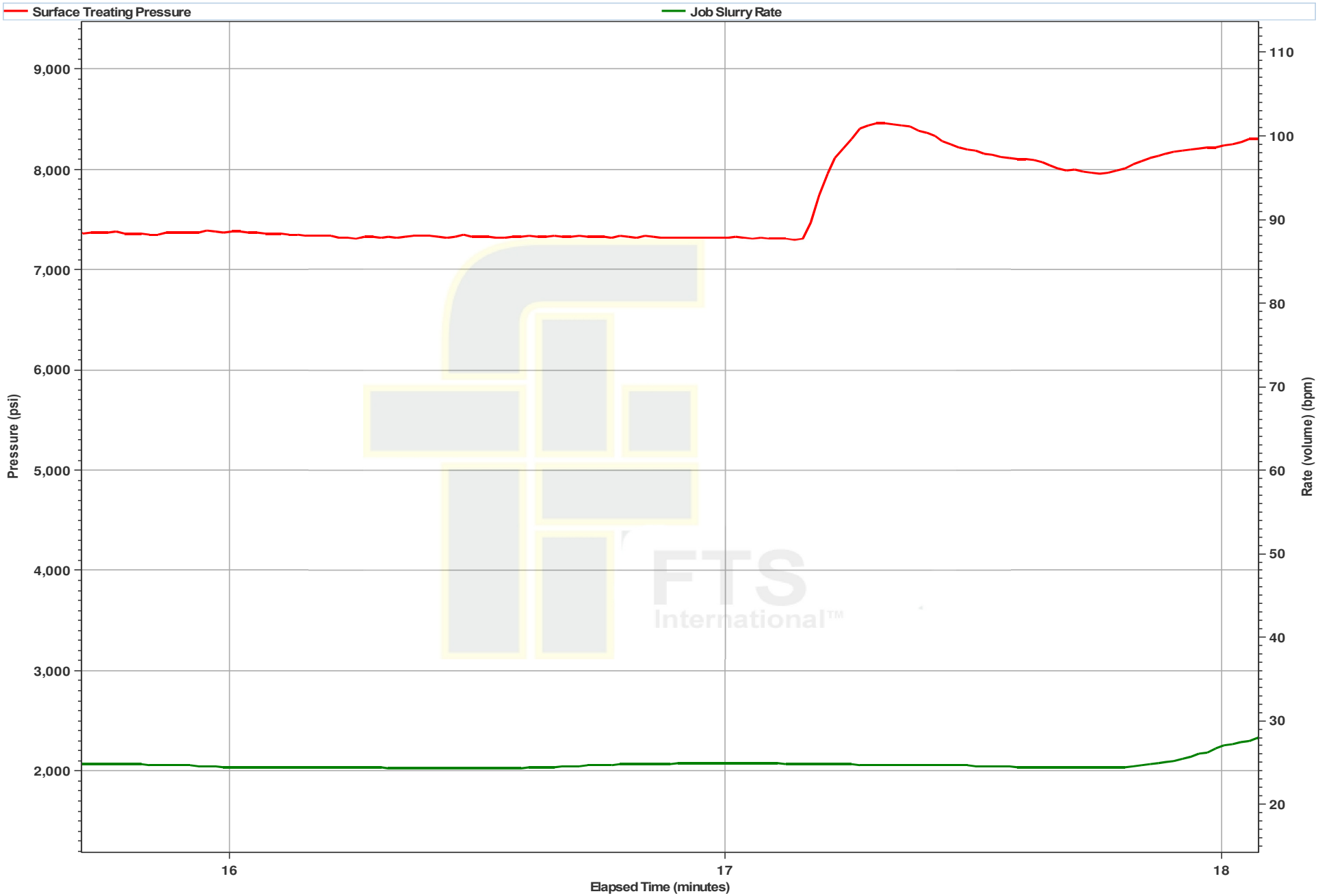
Chemical Name	Chemical Loading	Cumulative Clean
FRW-200	0.75	2,573
FRW-200	1.00	5,048
FRW-200	1.25	5,088

AEU Pressure Test



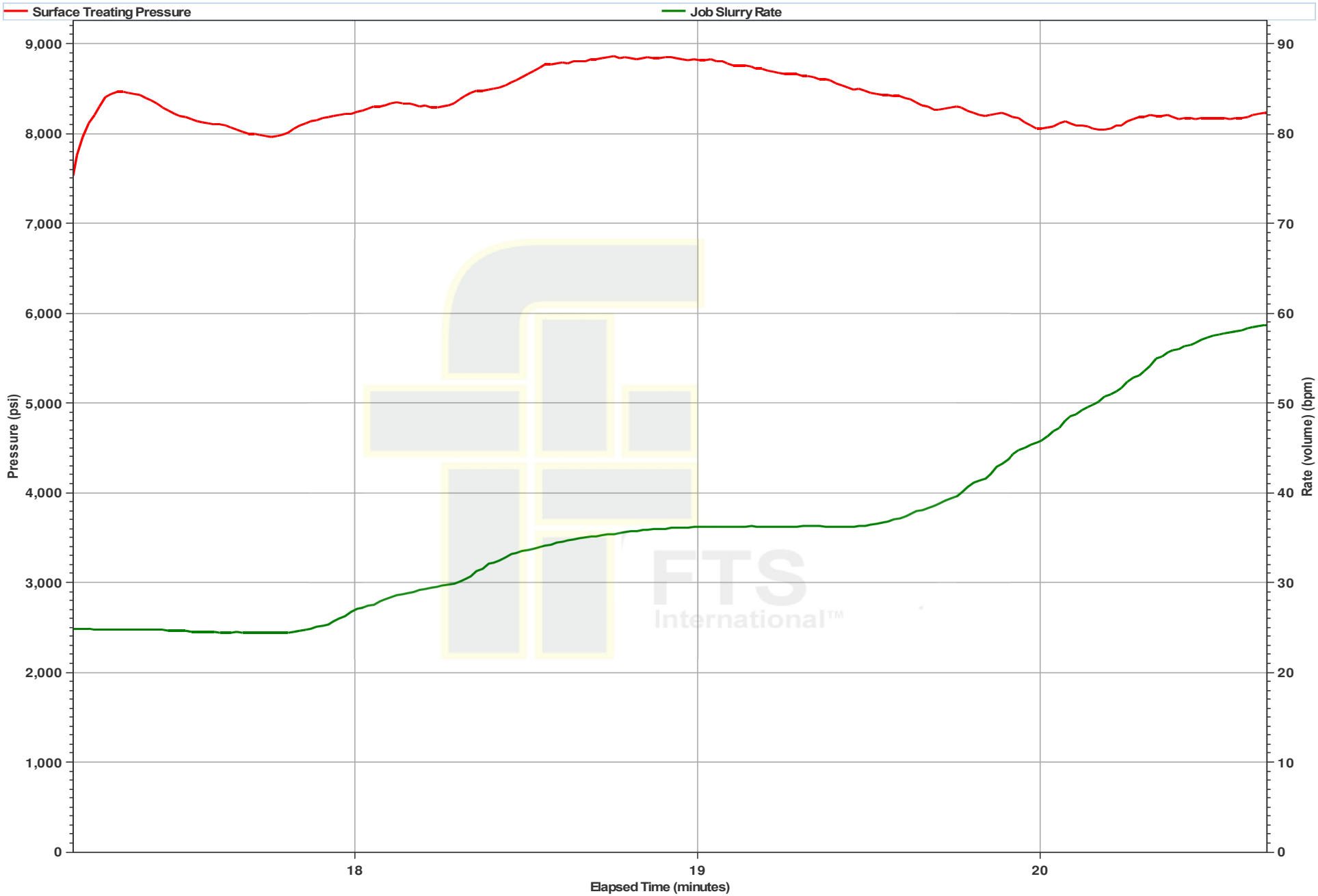
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 29 (WF.000658.M.W03.S29-ADCT-1103) **Jun 22, 2015**

Ball Seat and Breakdown



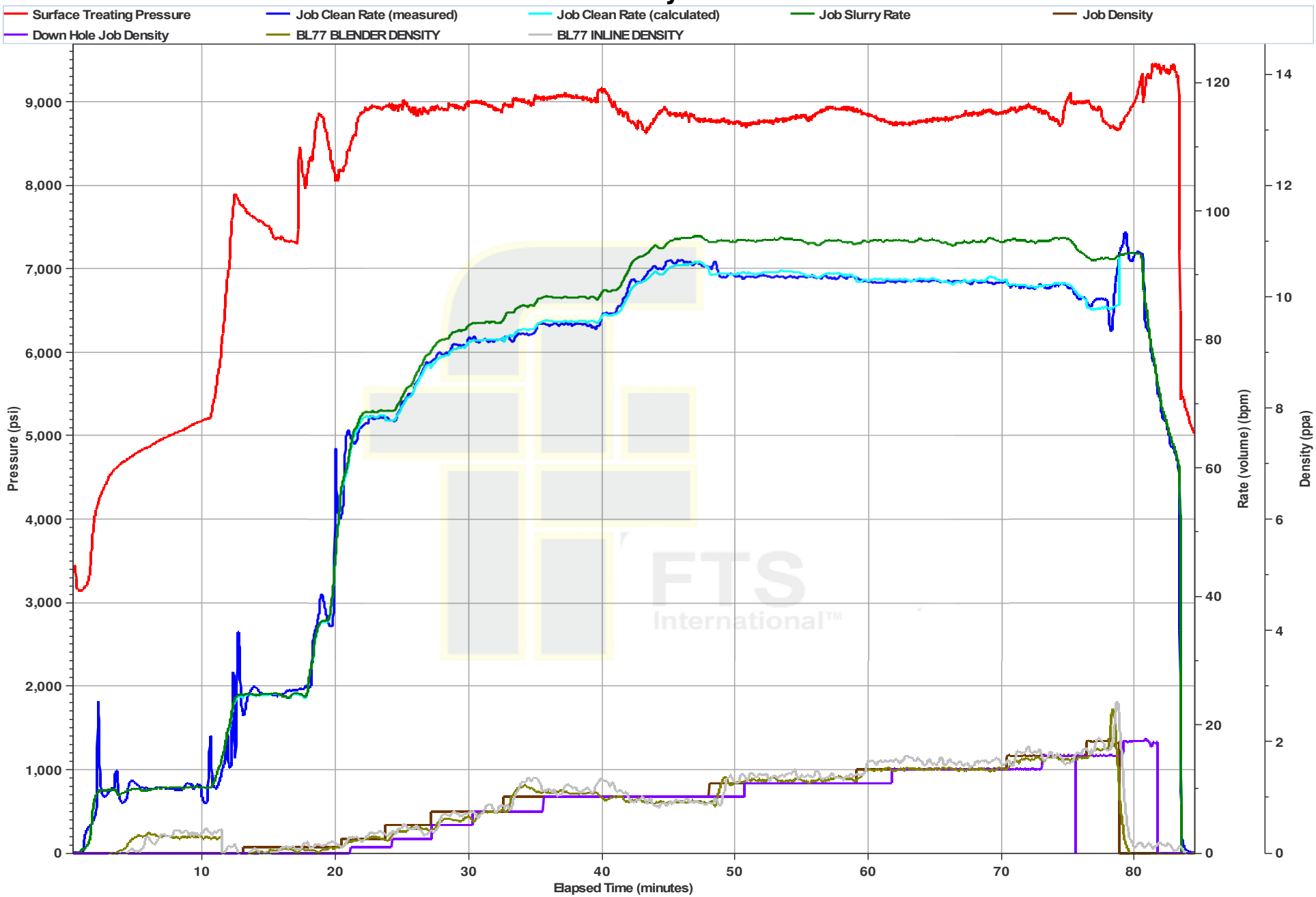
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 29 (WF.000658.M.W03.S29-ADCT-1103) **Jun 22, 2015**

Acid on Perforations



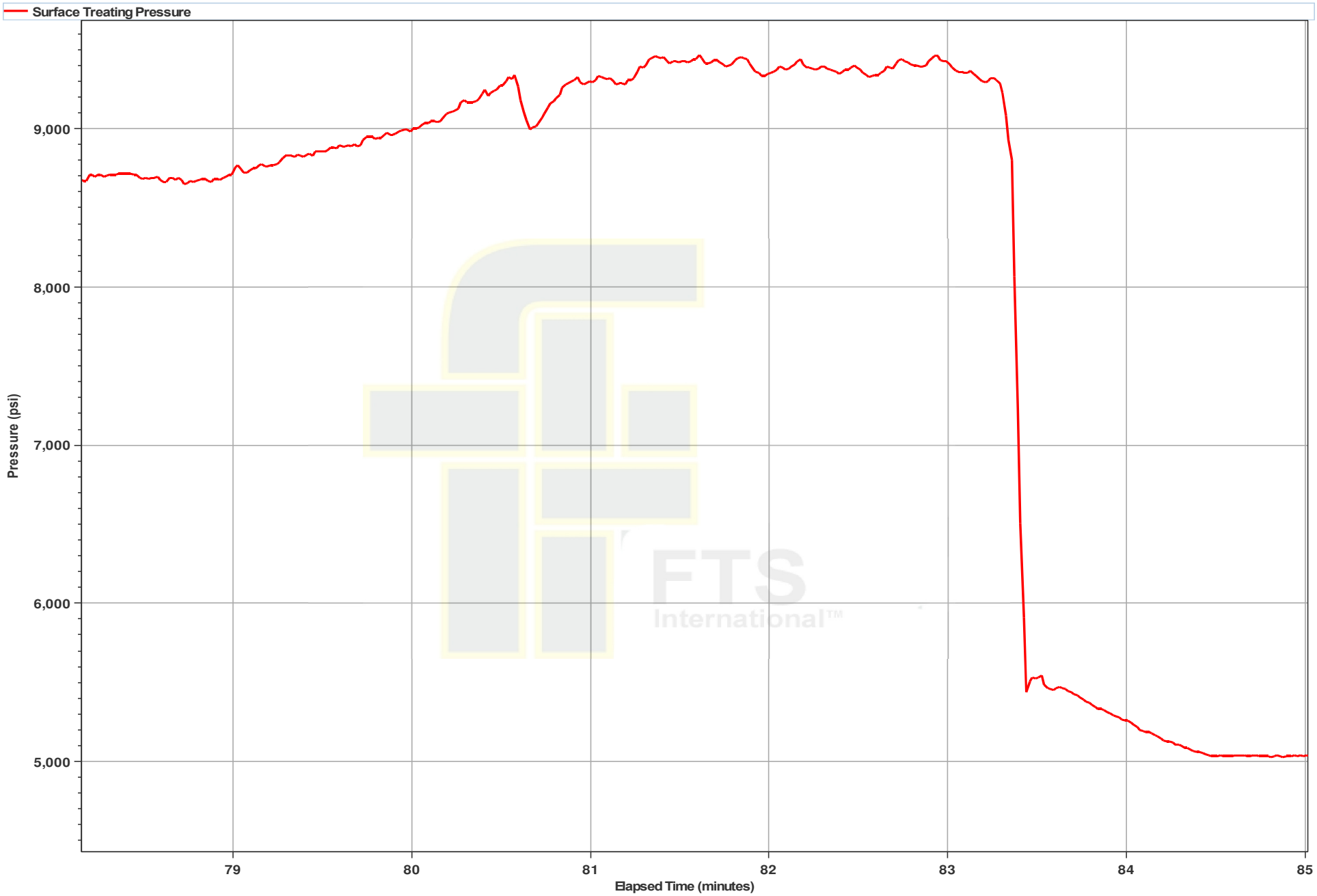
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 29 (WF.000658.M.W03.S29-ADCT-1103) **Jun 22, 2015**

Primary Plot



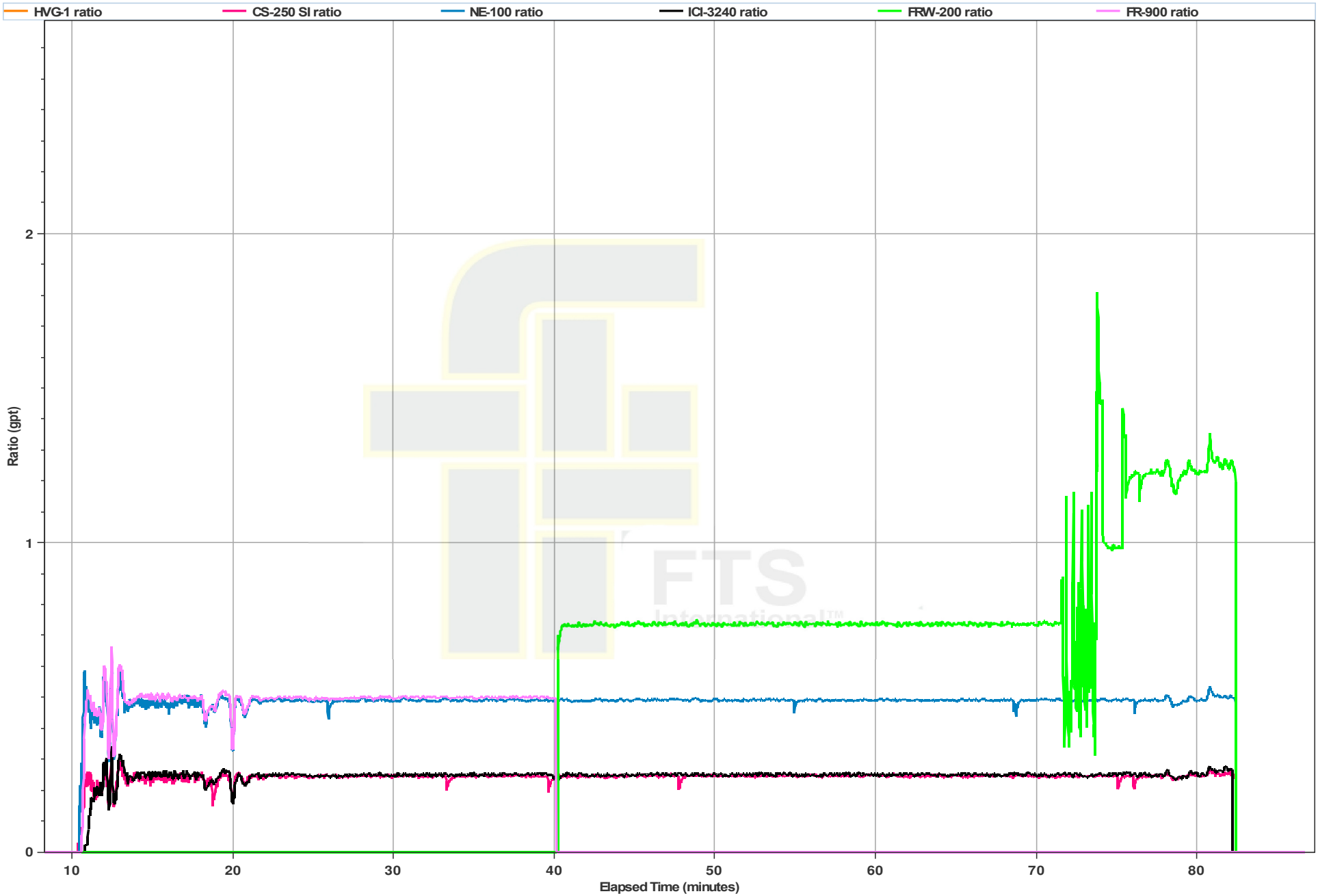
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 29 (WF.000658.M.W03.S29-ADCT-1103) **Jun 22, 2015**

ISIP Plot



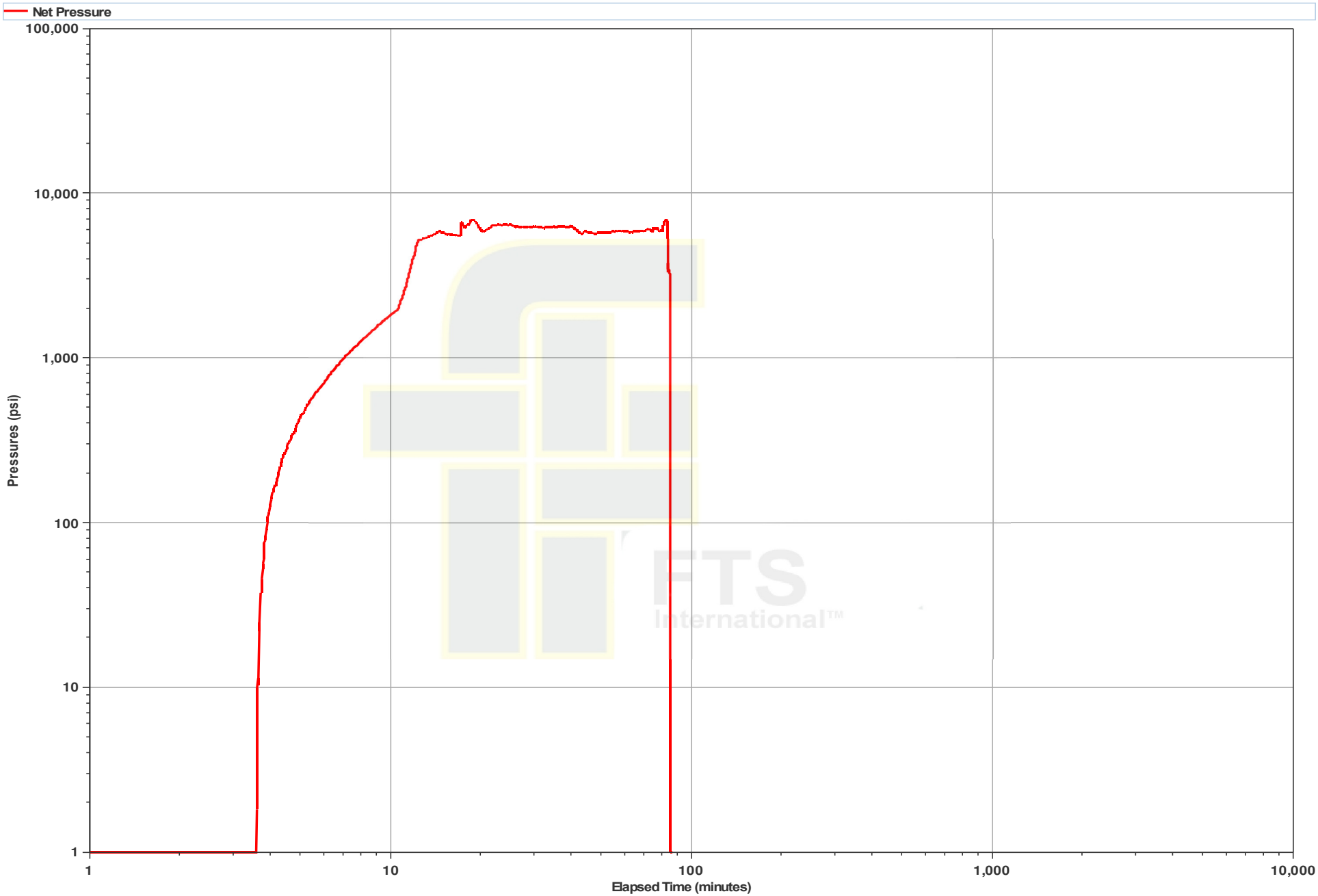
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 29 (WF.000658.M.W03.S29-ADCT-1103) **Jun 22, 2015**

Chemical Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 29 (WF.000658.M.W03.S29-ADCT-1103) **Jun 22, 2015**

Net Pressure Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 29 (WF.000658.M.W03.S29-ADCT-1103) Jun 22, 2015

WATER-BASED FRAC FLUID QUALITY CONTROL
(Attachment to Post Treatment Report)

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/22/2015
Customer Name:	American Energy - Utica	Proposal #:	3H/29
Date Sampled:	6/22/2015	Water Source:	Working Tank

Sample/Tank No.	Clarity, Color, Odor	Sample Temperature, (F)	Specific gravity	Initial pH	Chloride, ppm	Hardness, ppm	Calcium, ppm	Magnesium, ppm	Iron ppm	Hydroxide, ppm	Bicarbonate, ppm	Carbonate, ppm	Sulfate, ppm	Barium, ppm
Working Tank	Clear	72	1	7.6	39	124	42	20	0	0	98	0	<50	0
Reused Water Tank	Yellow, Cloudy, Petroleum Odor	76	1.03	4.9	49,985	13000	4,481	2,071	>10	0	732	0	500	0

Frac Fluid Quality Gel Testing (These Recording are to made prior to pumping job)														
Sample #														
Base Gel Type	HVG-1													
Gel Loading (lbs/1000 gal.)	2.5													
Sample Temperature, (F)	72													
Initial pH	8.1													
Visc. Reading @ 300 rpms	6													
Viscosity, (cp)	6													
Sample 1 3 min Hydration	4													
Sample 2 3 min Hydration	5													
Sample 3 3 min Hydration	6.5													
X-Link Vortex Closure, min:sec	n/a													
X-Link Crown, min:sec	n/a													
X-Link pH	n/a													
Gel Break Time (<2cp) mins	21													

Frac Fluid Quality Gel Testing (These Recording are to made while pumping job)														
Stage #														
Base Gel Viscosity (cp)														
X-Link pH								.						
Sample XL time, min:sec														
Sample Temperature														

Acid Quality	Percent Acid	NaOH, mLs	Specific Gravity
	28		1.14

Additional testing or documentation may be required by the customer or for frac fluid quality assurance.

Tested By: Etuate Varea

QUALITY CONTROL OF PROPPANTS

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/22/2015
Customer Name:	American Energy - Utica	Well/Stage:	3H/29
Date Sampled:	6/22/2015	DISTRICT:	Washington, PA
VENDOR:	SANTROL		

Select Proppant Type:

___ Brown	___ Ceramic	___ Other (specify)
X White	___ Bauxite	_____
___ Resin Coated	___ Texas Gold	

Sieve Analysis	100 Mesh			Sieve Analysis	30/50 Mesh		
Sample 1	24.80	grams of sample		Sample 2	24.90	grams of sample	
	Amount Retained				Amount Retained		
Sieve mesh	Gram	%		Sieve mesh	Gram	%	
			Total				Total
50	0.10	0.40	In-Size	20	0.00	0.00	In-Size
70	16.20	65.32		30	0.60	2.41	
100	5.80	23.39	99.6%	40	17.50	70.28	94.8%
120	1.80	7.26		45	3.80	15.26	
140	0.60	2.42		50	2.30	9.24	
200	0.30	1.21		70	0.70	2.81	
Pan	0.00	0.00	fines	Pan	0.00	0.00	fines
Total wt. Gram	24.80	100.00		Total wt. Gram	24.90	100.00	

Tested By: Etuate Varea

Post Job Report

AMERICAN ENERGY - UTICA

Red Hill Farm MDS GR 3H

Stage : 30 OF 54

HARRISON, OH

Operations Representative:

Name:	David Knapp
Office:	878-327-4881
Fax:	724-743-7719
Cell:	
Email:	DAVID.KNAPP@FTSI.COM

Sales Representative:

Name:	Bruce Eathman
Office:	405-574-3901
Fax:	405-787-1235
Cell:	
Email:	BRUCE.EATTHMAN@FTSI.COM

Engineering Manager:

Name:	Thaddeus Craun
Office:	817-832-8782
Fax:	724-743-7719
Cell:	
Email:	THADDEUS.CRAUN@FTSI.COM

Job Summary

Well Information

TVD:	7,301	Top Perf:	11,309
No. Of Perfs:	30		

Casing	Tubing
[illegible]	n/A

Pressures, Rates and Volumes

	Proposed	Actual	Max	Min
STP	[illegible] psi	[illegible] psi	[illegible] psi	[illegible] psi
Rate	[illegible] bpm	72.1 bpm	[illegible] bpm	[illegible] bpm

	Proposed	Actual		
Clean Volume	[illegible] bbls	[illegible] bbls		
Slurry Volume	[illegible] bbls	[illegible] bbls		
Flush Volume	[illegible] bbls	[illegible] bbls		

	Proposed	Start	End
Frac Pumps on Location	19	13	11

Open Well:	Start Time	[illegible]	Pressure	[illegible] psi
	Bell Dwn	[illegible] bbls	Break Down	[illegible] psi
	Initial ISIP:	[illegible] psi	Initial F.G.:	[illegible] psi/ft
Stage Complete:	End Time	[illegible]	Job Time	[illegible]
	Final ISIP	[illegible] psi	Final F.G.	[illegible] psi/ft
	ISIP	[illegible]	5 Min:	[illegible] psi
	Pressure Min:	[illegible]	10 Min:	N/A
	Pressure Max:	[illegible]	15 Min:	N/A

Material Volume

Material	Proposed	Calculated	Actual	Variance
100 Mesh White	[illegible]	[illegible]	[illegible]	0%
30/50 White	[illegible]	[illegible]	[illegible]	0%
Total Proppants	[illegible]	[illegible]	[illegible]	0%

Material	Proposed	Calculated	Actual	Variance
8.1%-7.5% HCL	[illegible]	[illegible]	[illegible]	1%
AFR-4	4	23	23	0%
[illegible]	3	3	3	0%
[illegible]	[illegible]	57	53	2%
FE-[illegible]	15	15	15	0%
FRB-[illegible]	130	130	[illegible]	1%
HVG-1 4.5	4	119	116	-1%
[illegible]	[illegible]	57	57	0%
LTB-1	4	23	23	0%
NE-[illegible]	4	119	116	-3%
NE-[illegible]	[illegible]	8	8	4

Comments:

Pumpdown Information:
Total Bbls: 169
Max Pressure (psi): 4564
Max Rate (bpm): 19.2

FTS International
[illegible]
Eighty Four, PA [illegible]

FTS INTERNATIONAL

Customer: American Energy - Utica
Well: Red Hill Farm Site 6r 3H
Stage: 16
Job End Date: [illegible]

Treatment Report

Date	[illegible]	Statistic	Washington County, PA	Basin Size	[illegible]	API#	[illegible]

Elt. Time	BTP	Slurry BPM	Slurry Gross (bbls)	Cumulative Gross (bbls)	Slurry Gross (bbls)	Cumulative Slurry (bbls)	Slurry Proppant (lbs)	Cumulative Proppant (lbs)	Description	Proppant	PPA
10:16	3,[illegible]	0.0	0	0	0	0	0	0	Freshwater Open Hot		0.00
10:19	0,[illegible]	0.0	16	16	16	16	0	0	Freshwater Load		0.00
10:19	8,674	0.0	71	45	71	45	0	0	7.5% HCL Acid Add		0.00
10:24	7,971	10.4	19	89	19	89	0	0	Slickwater Load		0.00
10:25	7,[illegible]	73.2	149	343	147	343	613	613	Slickwater Proppant	100 Mesh White	0.15
10:29	7,[illegible]	21.0	0	343	0	343	0	613	Slickwater Maintain		0.00
10:30	7,[illegible]	21.0	55	313	55	314	200	800	Slickwater Proppant	100 Mesh White	0.15
10:31	6,[illegible]	42.3	214	527	213	526	2,247	3,145	Slickwater Proppant	100 Mesh White	0.25
10:35	6,[illegible]	74.0	300	793	302	792	4,375	6,622	Slickwater Proppant	100 Mesh White	0.50
10:36	6,[illegible]	75.1	490	1,219	445	1,237	13,545	22,167	Slickwater Proppant	100 Mesh White	0.75
10:44	6,[illegible]	75.7	421	1,634	440	1,677	17,902	39,748	Slickwater Proppant	100 Mesh White	1.00
10:50	6,[illegible]	76.7	671	2,[illegible]	618	2,[illegible]	39,752	79,541	Slickwater Proppant	30/50 White	1.00
20:03	6,[illegible]	77.7	1,[illegible]	3,[illegible]	1,[illegible]	3,[illegible]	52,[illegible]	132,041	Slickwater Proppant	30/50 White	1.25
20:15	7,[illegible]	77.6	[illegible]	4,[illegible]	918	4,[illegible]	39,548	165,551	Slickwater Proppant	30/50 White	1.50
20:25	6,619	77.3	89	4,189	89	4,[illegible]	6,679	171,[illegible]	Slickwater Proppant	30/50 White	1.50
20:34	6,[illegible]	76.0	197	4,397	200	4,[illegible]	11,701	183,[illegible]	15% Linear Gel Proppant	40/80 White	1.50
20:37	6,974	75.9	250	4,617	270	4,[illegible]	18,979	201,[illegible]	15% Linear Gel Proppant	40/80 White	1.75
20:40	6,[illegible]	74.2	250	4,867	270	5,185	18,[illegible]	210,[illegible]	15% Linear Gel Proppant	40/80 White	1.75
20:44	3,621	74.4	657	5,522	667	5,852	53,[illegible]	264,[illegible]	15% Linear Gel Proppant	40/80 White	2.00
20:46	3,[illegible]	74.6	92	5,614	92	5,[illegible]	0	264,[illegible]	15% Linear Gel Clean Arrives		0.00
20:50	3,[illegible]	74.2	199	5,874	199	5,744	0	264,[illegible]	Slickwater Flush		0.00
20:55	3,[illegible]	73.2	119	5,[illegible]	119	5,[illegible]	0	264,[illegible]	Freshwater Flush		0.00
20:64	4,182	0.0	0	5,[illegible]	0	5,[illegible]	0	264,[illegible]	Freshwater Shutdown		0.00
Total Job/Time (HR:MIN): 01:30											

Min BTP:	7,634 psi	Max BTP:	9,243 psi	Average BTP:	8,404 psi	5 Min:	3,718 psi
Min Rate:	21.0 bpm	Max Rate:	82.2 bpm	Average Rate:	72.1 bpm	10 Min:	0 psi
Initial ISIP:	4,182 psi	Initial F.G.:	1.91 psi/ft	Average HHP:	16,910	15 Min:	0 psi
Final ISIP:	4,182 psi	Final F.G.:	1.91 psi/ft	Customer Representative:		Exit Survey:	
FTS Representative:		Travis Wilson & Rudy Bartovich					

Comments:

The proppant values contained in this report are calculated based on actual barrel counts and target densities. Actual total proppant usage is 240,062 lbs. Charge time is 1 hour(s) 16 minute(s). All chemicals and proppant ran as documented.

Min/Max/Avg were taken from sand stages. All chem changes from proposed were made per AEU representative request.

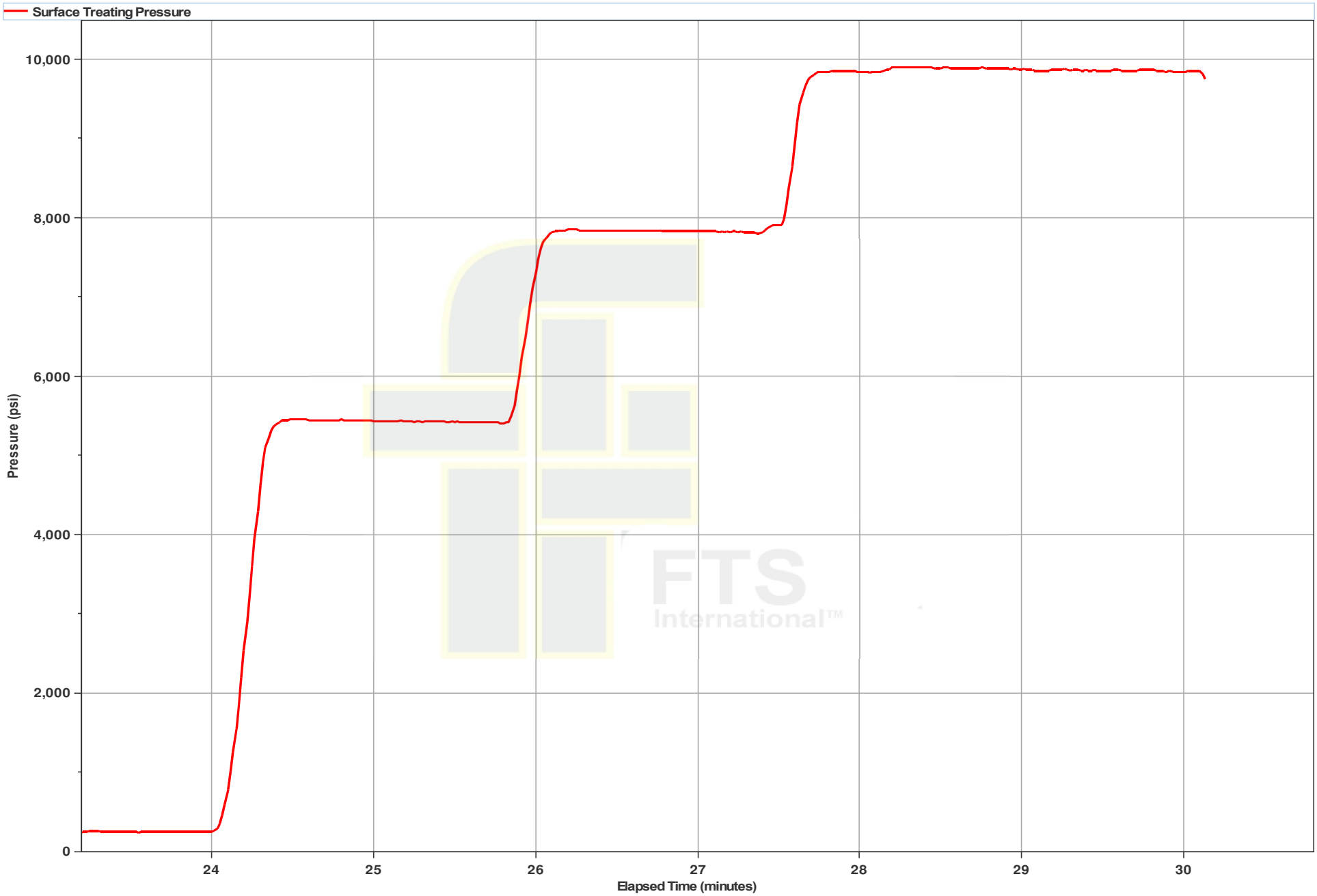
Reuse water was run on this stage for a total of 635 Bbls.

1 Minute Shutdown (psi): 3636
2 Minute Shutdown (psi): 3576
4 Minute Shutdown (psi): 3716

Chemical Changes:

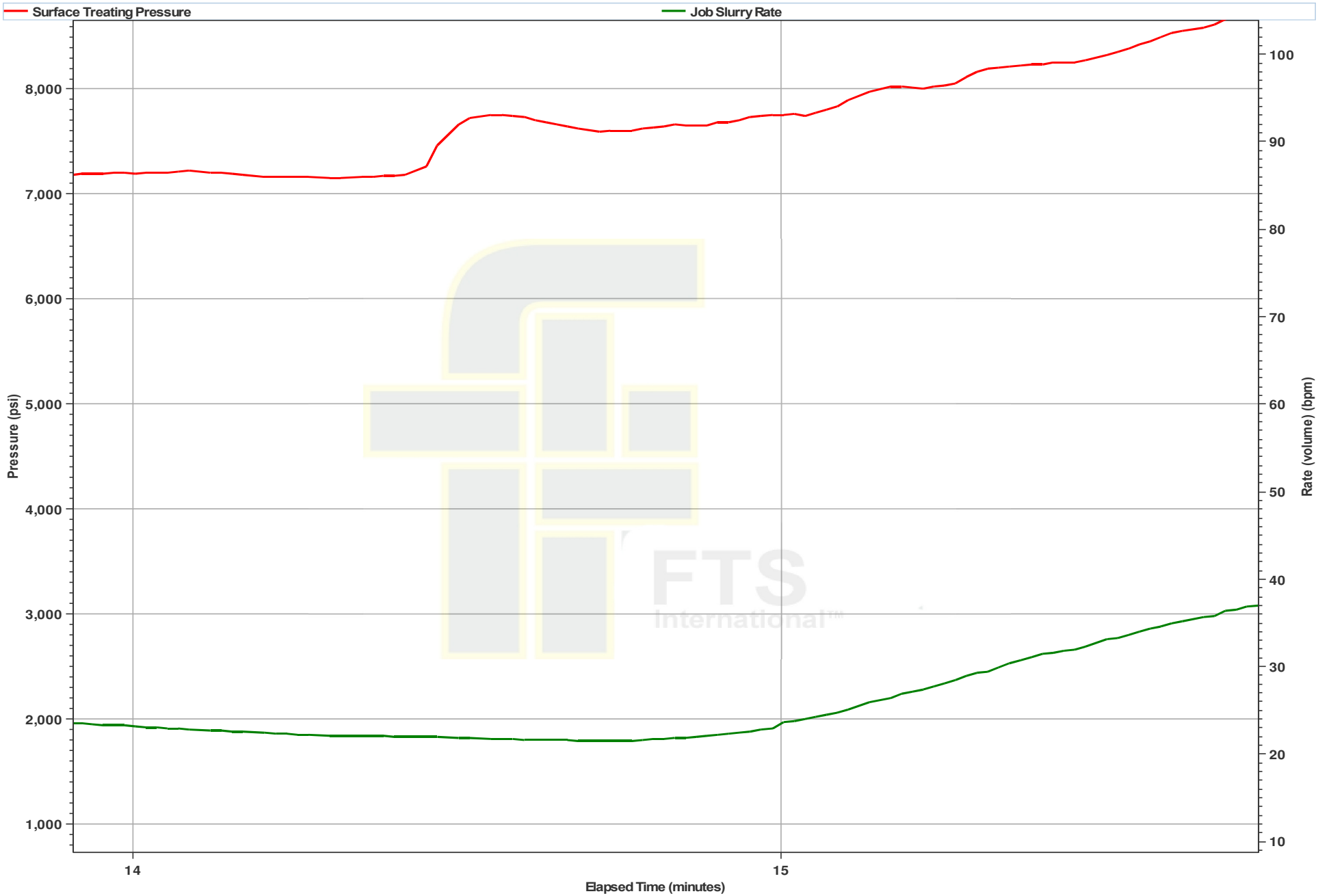
Chemical Name	Chemical Loading	Cumulative Clean
FRW-200	0.75	4,160
FRW-200	0.80	4,067

AEU Pressure Test



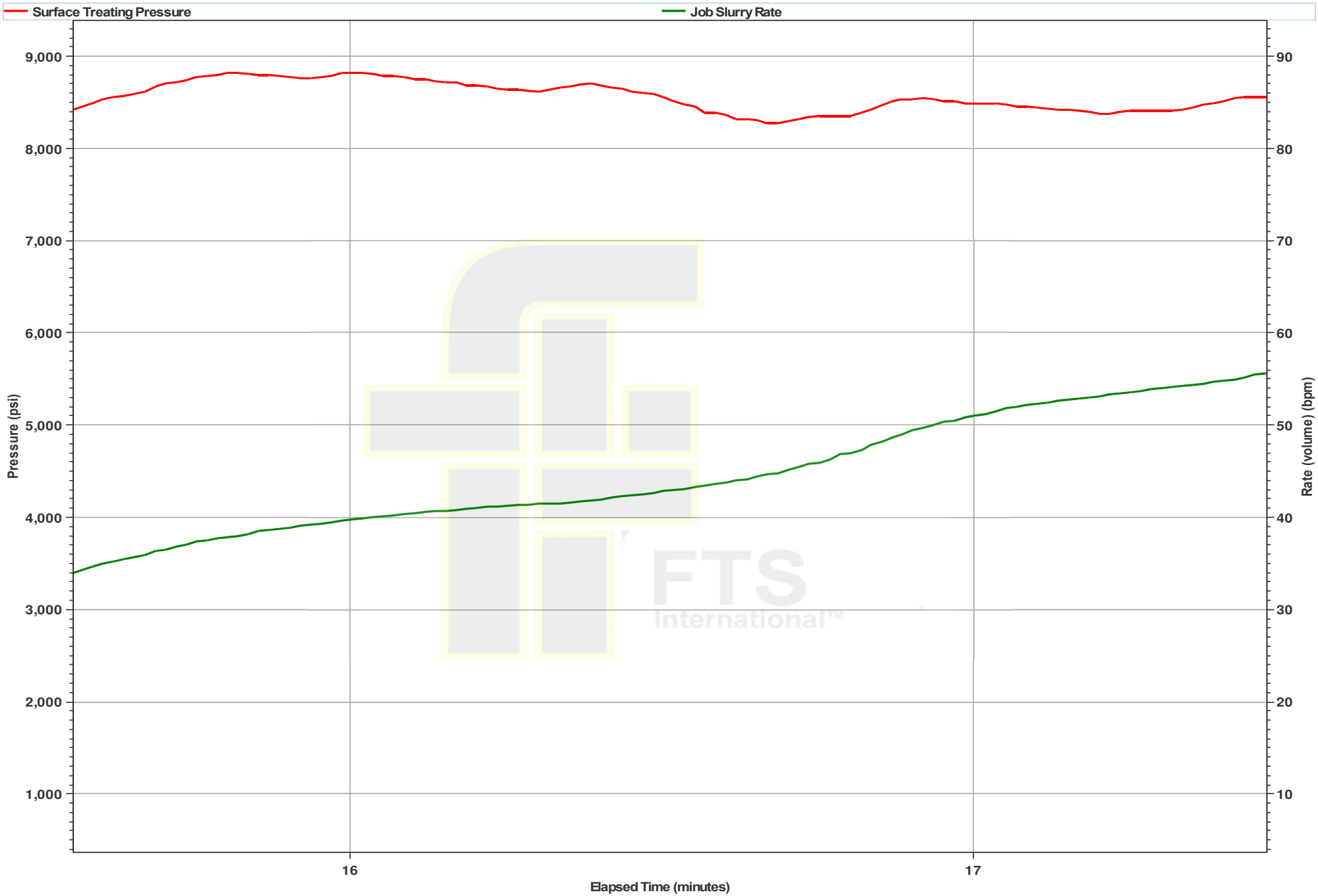
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 30 (WF.000658.M.W03.S30-ADCT-1103) Jun 22, 2015

Ball Seat and Breakdown



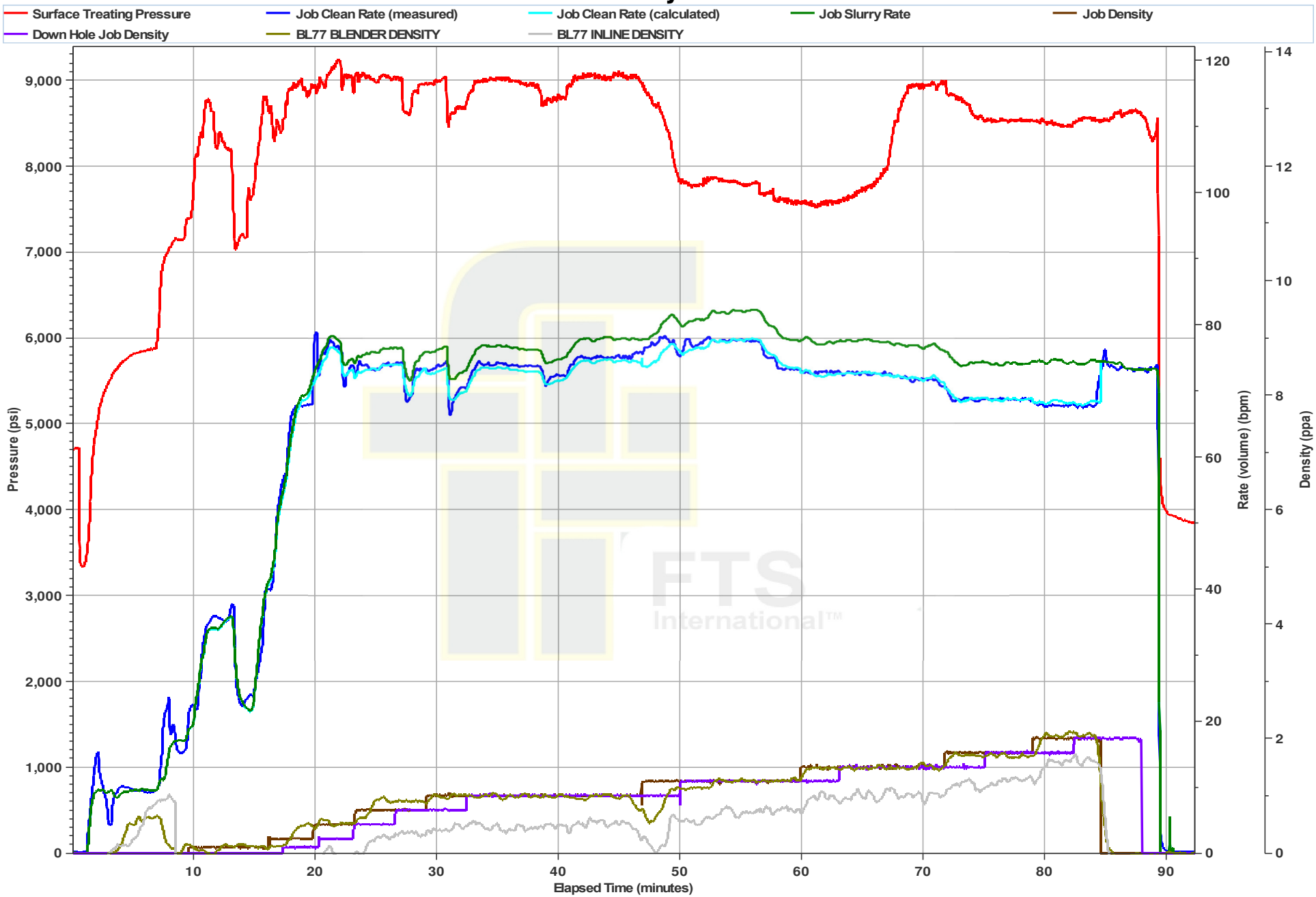
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 30 (WF.000658.M.W03.S30-ADCT-1103) **Jun 22, 2015**

Acid on Perforations



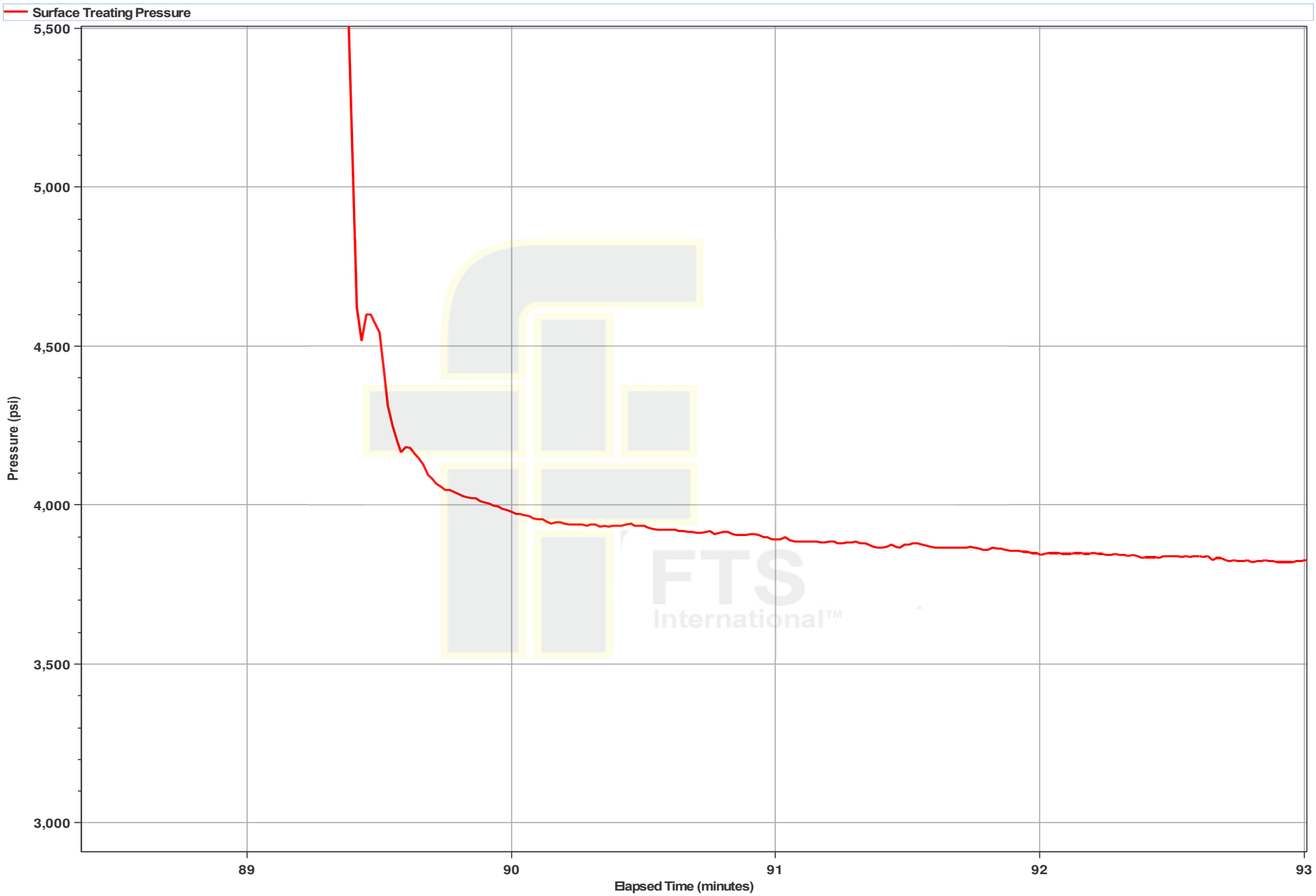
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 30 (WF.000658.M.W03.S30-ADCT-1103) **Jun 22, 2015**

Primary Plot



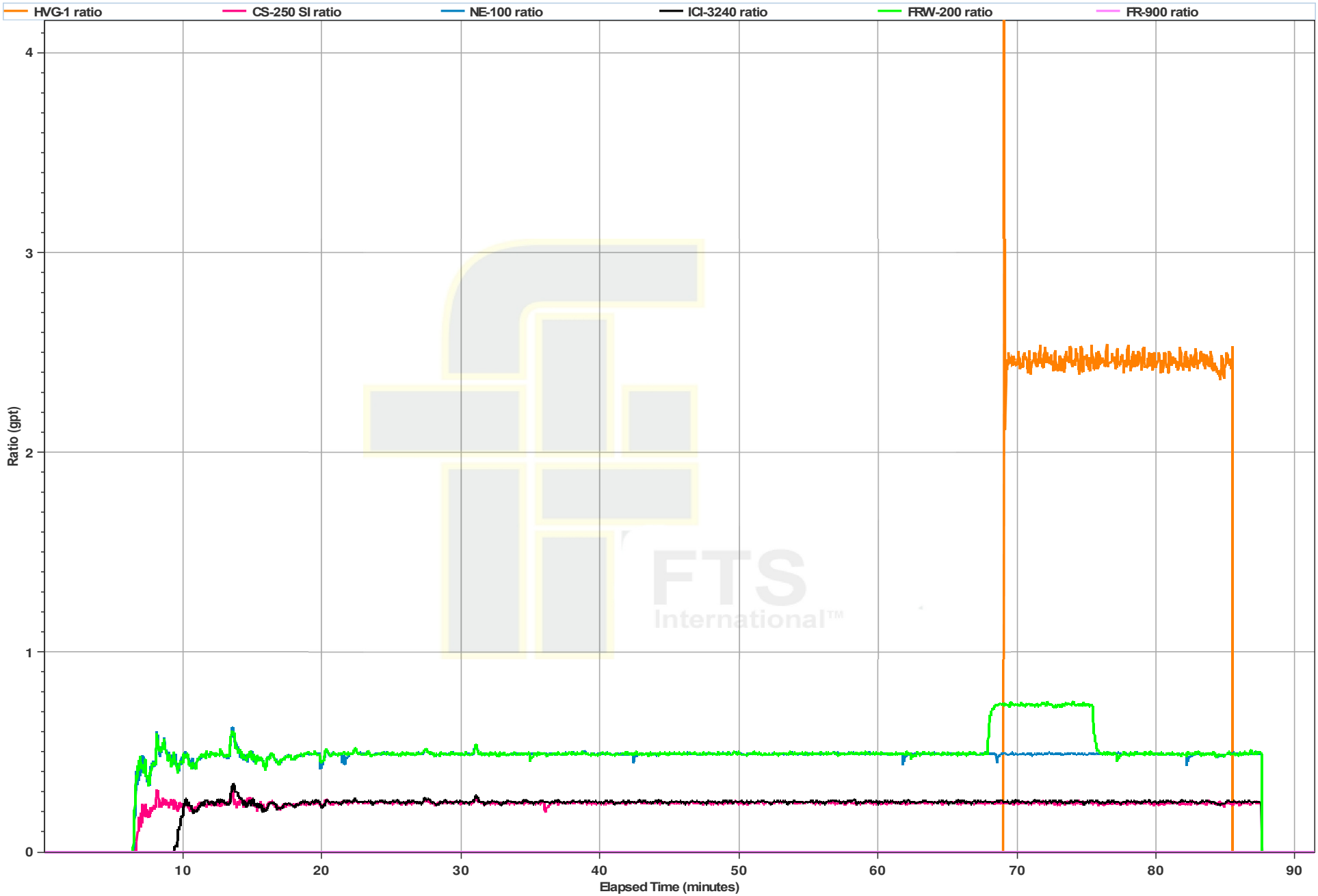
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 30 (WF.000658.M.W03.S30-ADCT-1103) **Jun 22, 2015**

ISIP Plot



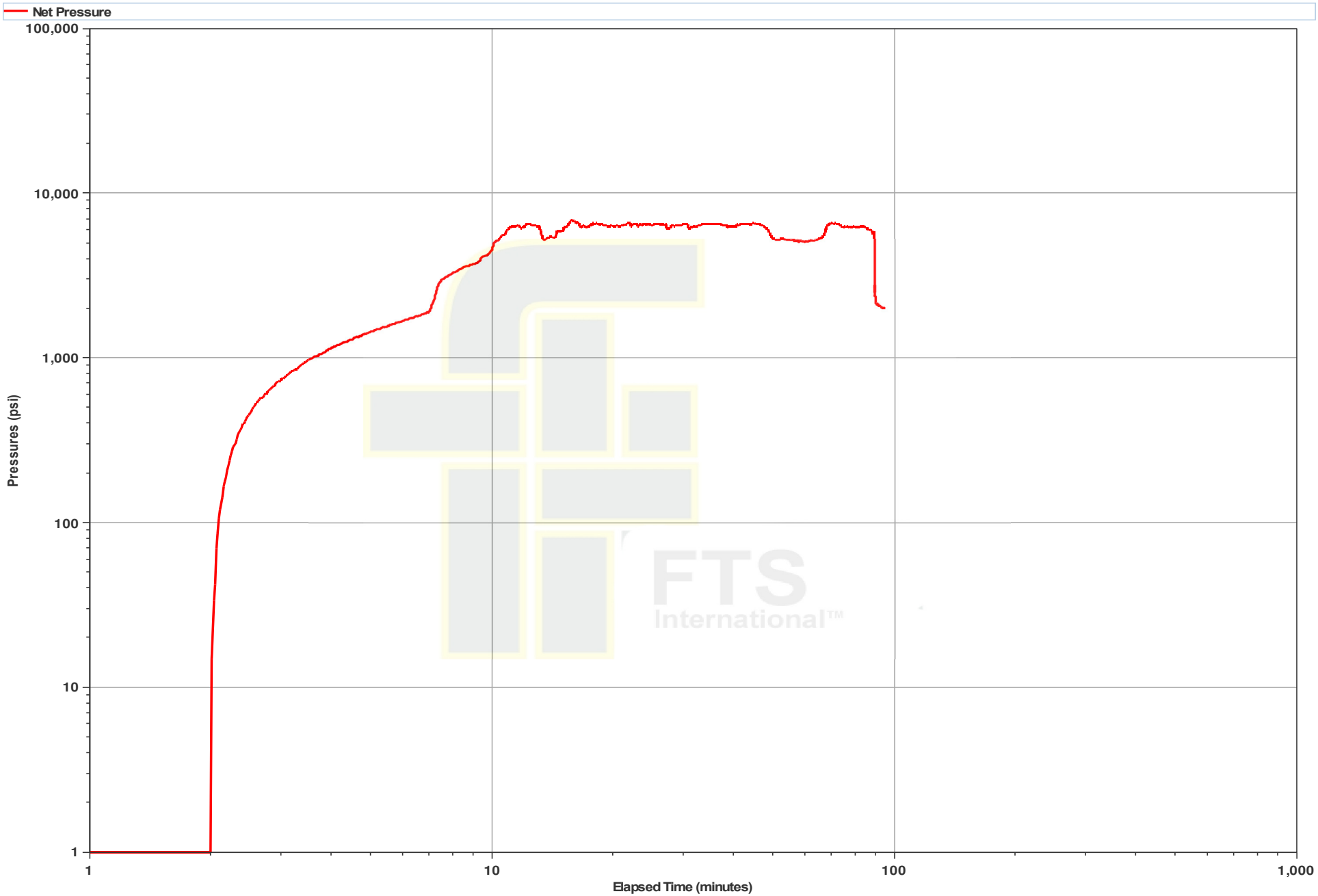
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 30 (WF.000658.M.W03.S30-ADCT-1103) **Jun 22, 2015**

Chemical Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 30 (WF.000658.M.W03.S30-ADCT-1103) **Jun 22, 2015**

Net Pressure Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 30 (WF.000658.M.W03.S30-ADCT-1103) Jun 22, 2015

WATER-BASED FRAC FLUID QUALITY CONTROL
(Attachment to Post Treatment Report)

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/22/2015
Customer Name:	American Energy - Utica	Proposal #:	3H/30
Date Sampled:	6/22/2015	Water Source:	Working Tank

Sample/Tank No.	Clarity, Color, Odor	Sample Temperature, (F)	Specific gravity	Initial pH	Chloride, ppm	Hardness, ppm	Calcium, ppm	Magnesium, ppm	Iron ppm	Hydroxide, ppm	Bicarbonate, ppm	Carbonate, ppm	Sulfate, ppm	Barium, ppm
Working Tank	Clear	74	1	7.4	34	98	34	15	0	0	73	0	<50	0
Reused Water Tank	Yellow, Cloudy, Petroleum Odor	74	1.04	4.6	67,979	13000	4,801	1,993	>10	0	1196	0	600	0

Frac Fluid Quality Gel Testing (These Recording are to made prior to pumping job)														
Sample #														
Base Gel Type	HVG-1													
Gel Loading (lbs/1000 gal.)	2.5													
Sample Temperature, (F)	74													
Initial pH	8.1													
Visc. Reading @ 300 rpms	6													
Viscosity, (cp)	6													
Sample 1 3 min Hydration	4													
Sample 2 3 min Hydration	5													
Sample 3 3 min Hydration	6.5													
X-Link Vortex Closure, min:sec	n/a													
X-Link Crown, min:sec	n/a													
X-Link pH	n/a													
Gel Break Time (<2cp) mins	21													

Frac Fluid Quality Gel Testing (These Recording are to made while pumping job)														
Stage #														
Base Gel Viscosity (cp)														
X-Link pH								.						
Sample XL time, min:sec														
Sample Temperature														

Acid Quality	Percent Acid	NaOH, mLs	Specific Gravity
	28		1.14

Additional testing or documentation may be required by the customer or for frac fluid quality assurance.

Tested By: Etuate Varea

QUALITY CONTROL OF PROPPANTS

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/22/2015
Customer Name:	American Energy - Utica	Well/Stage:	3H/30
Date Sampled:	6/22/2015	DISTRICT:	Washington, PA
VENDOR:	SANTROL		

Select Proppant Type:

___ Brown	___ Ceramic	___ Other (specify)
X White	___ Bauxite	
___ Resin Coated	___ Texas Gold	

Sieve Analysis	100 Mesh			Sieve Analysis	30/50 Mesh		
Sample 1	25.10	grams of sample		Sample 2	24.70	grams of sample	
	Amount Retained				Amount Retained		
Sieve mesh	Gram	%		Sieve mesh	Gram	%	
			Total				Total
50	0.30	1.20	In-Size	20	0.00	0.00	In-Size
70	16.30	64.94		30	0.30	1.21	
100	5.20	20.72	98.8%	40	16.60	67.21	96.4%
120	2.10	8.37		45	5.90	23.89	
140	0.80	3.19		50	1.30	5.26	
200	0.40	1.59		70	0.60	2.43	
Pan	0.00	0.00	fines	Pan	0.00	0.00	fines
Total wt. Gram	25.10	100.00		Total wt. Gram	24.70	100.00	

Tested By: Etuate Varea

Post Job Report

AMERICAN ENERGY - UTICA

Red Hill Farm MDS GR 3H

Stage : 31 OF 54

HARRISON, OH

Operations Representative:

Name:	**David Knapp**
Office:	**570-327-4881**
Fax:	**724-743-7719**
Cell:	
Email:	**DAVID.KNAPP@FTSI.COM**

Sales Representative:

Name:	**Bruce Matthews**
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Fax:	**405-767-1288**
Cell:	
Email:	**BRUCE.MATTHEWS@FTSI.COM**

Engineering Manager:

Name:	**Thaddeus Craun**
Office:	**817-682-8702**
Fax:	**724-743-7719**
Cell:	
Email:	**THADDEUS.CRAUN@FTSI.COM**

FTS International
1432 Route 519
Eighty Four, PA 15330

Customer: American Energy - Utica
Well: Red Hill Farm Mds Gr 3H
Stage: 31
Job End Date: 06/23/2015

Job Summary

Well Information

TVD:	7,301	**Top Perf:**	11,151
No. Of Perfs:	30		

Casing	Tubing
5.50" 20.00#	N/A

Pressures, Rates and Volumes

	Proposed	Actual	Max	Min
STP	9,046 psi	8,887 psi	9,761 psi	6,292 psi
Rate	80.0 bpm	77.5 bpm	94.4 bpm	20.9 bpm

	Proposed	Actual		
Clean Volume	5,772 bbls	6,112 bbls		
Slurry Volume	6,042 bbls	6,382 bbls		
Flush Volume	357 bbls	280 bbls		

	Proposed	Start	End
Frac Pumps on Location	10	15	15

Open Well:	Start Time	04:49	Pressure	3,060 psi
	Ball Seat	243 bbls	Break Down	7,149 psi
	Initial ISIP:	4,958 psi	Initial F.G.:	1.11 psi/ft
Stage Complete:	End Time	06:17	Job Time	01:30
	Final ISIP	4,958 psi	Final F.G.	1.11 psi/ft
	HHP	16,881	5 Min:	4,260 psi
	Proppant Min:	0.00	10 Min:	N/A
	Proppant Max:	2.00	15 Min:	N/A

Material Volume

Material	Proposed	Calculated	Actual	Variance
100 Mesh White	40,000	39,853	39,853	0%
30/50 White	210,000	209,958	210,958	0%
Total Proppants	250,000	249,811	250,811	0%

Material	Proposed	Calculated	Actual	Variance
0.1%-7.5% HCL	3,000	2,982	3,000	1%
APB-1	0	43	43	0%
CI-150	3	3	3	0%
CS-250 SI	60	62	63	2%
FE-200L	15	15	15	0%
FRW-200	180	141	140	-1%
HVG-1 4.0	0	215	215	0%
ICI-3240	60	62	63	2%
LTB-1	0	43	43	0%
NE-100	0	125	126	1%
NE-100W	120	0	0	0

Comments:

Pumpdown Information:
Total Bbls: 165
Max Pressure (psi): 59559
Max Rate (bpm): 15.2

FTS International
1432 Route 519
Eighty Four, PA 15330

Customer: American Energy - Utica
Well: Red Hill Farm Mds Gr 3H
Stage: 31
Job End Date: 06/23/2015

Treatment Report

Date:	6/23/2015	District:	Washington County,PA	Quote No:	051815_035725QF	API:	34-059-24370

MIL Time	STP	Slurry BPM	Stage Clean (bbls)	Cumulative Clean (bbls)	Stage Slurry (bbls)	Cumulative Slurry (bbls)	Stage Proppant (lbs)	Cumulative Proppant (lbs)	Description	Proppant	PPA
04:49	3,060	0.0	0	0	0	0	0	0	Freshwater Open Well		0.00
04:49	5,000	8.9	9	9	9	9	0	0	Freshwater Load		0.00
04:54	5,731	9.9	71	80	71	80	0	0	7.5% HCL Acid Acid		0.00
04:55	7,856	31.7	18	98	18	98	0	0	Slickwater Load		0.00
04:56	7,880	33.5	143	241	144	242	601	601	Slickwater Proppant	100 Mesh White	0.10
05:00	7,159	21.2	0	241	0	242	0	601	Slickwater Breakdown		0.00
05:01	7,412	25.6	48	289	48	290	202	803	Slickwater Proppant	100 Mesh White	0.10
05:02	8,720	89.0	216	505	218	508	2,268	3,071	Slickwater Proppant	100 Mesh White	0.25
05:09	8,707	89.5	262	767	268	776	5,502	8,573	Slickwater Proppant	100 Mesh White	0.50
05:10	8,844	90.7	429	1,196	444	1,220	13,514	22,087	Slickwater Proppant	100 Mesh White	0.75
05:14	8,762	93.5	423	1,619	442	1,662	17,766	39,853	Slickwater Proppant	100 Mesh White	1.00
05:21	8,555	93.7	876	2,495	916	2,578	36,792	76,645	Slickwater Proppant	30/50 White	1.00
05:28	9,386	93.8	1,000	3,495	1,057	3,635	52,500	129,145	Slickwater Proppant	30/50 White	1.25
05:39	9,568	91.8	52	3,547	55	3,690	2,730	131,875	10# Linear Gel Proppant	30/50 White	1.25
05:41	9,320	91.5	360	3,907	380	4,070	18,900	150,775	Slickwater Proppant	30/50 White	1.25
05:44	9,526	73.7	60	3,967	63	4,133	3,150	153,925	10# Linear Gel Proppant	30/50 White	1.25
05:45	9,310	66.9	260	4,227	266	4,399	5,460	159,385	10# Linear Gel Proppant	30/50 White	0.50
05:49	9,249	68.4	557	4,784	582	4,981	23,394	182,779	10# Linear Gel Proppant	30/50 White	1.00
05:58	9,429	70.7	290	5,074	310	5,291	18,270	201,049	10# Linear Gel Proppant	30/50 White	1.50
06:02	9,391	71.6	294	5,368	314	5,605	18,522	219,571	10# Linear Gel Proppant	30/50 White	1.50
06:06	9,476	71.7	360	5,728	393	5,998	30,240	249,811	10# Linear Gel Proppant	30/50 White	2.00
06:13	9,539	73.0	104	5,832	104	6,102	0	249,811	10# Linear Gel Clean screws		0.00
06:13	9,599	72.8	75	5,907	75	6,177	0	249,811	10# Linear Gel Flush		0.00
06:14	9,527	72.3	120	6,027	120	6,297	0	249,811	Slickwater Flush		0.00
06:16	9,760	72.0	85	6,112	85	6,382	0	249,811	Freshwater Flush		0.00
06:17	4,958	0.0	0	6,112	0	6,382	0	249,811	Freshwater Shutdown		0.00
Total JobTime (HH:MM): 01:27											

Min STP:	6,292 psi	**Max STP:**	9,761 psi	**Average STP:**	8,887 psi	**5 Min:**	4,260 psi
Min Rate:	20.9 bpm	**Max Rate:**	94.4 bpm	**Average Rate:**	77.5 bpm	**10 Min:**	0 psi
Initial ISIP:	4,958 psi	**Initial F.G.:**	1.11 psi/ft	**Average HHP:**	16,881	**15 Min:**	0 psi
Final ISIP:	4,958 psi	**Final F.G.:**	1.11 psi/ft	**Customer Representative:**		Mike Hausviater	
FTSI Representative:		Etuate Varea & Sean Stewart					

Comments:

The proppant values contained in this report are calculated based on actual barrel counts and target densities. Actual total proppant usage is 250,811 lbs. Charge time is 1 hour(s) 30 minute(s). All chemicals and proppant ran as documented.

Min/Max/Avg were taken from sand stages. All chem changes from proposed were made per AEU representative request.

No reused water pumped.

Started pumping a 10# Linear Gel system during the 1.25 ppg stage of 30/50 per AEU representative request.

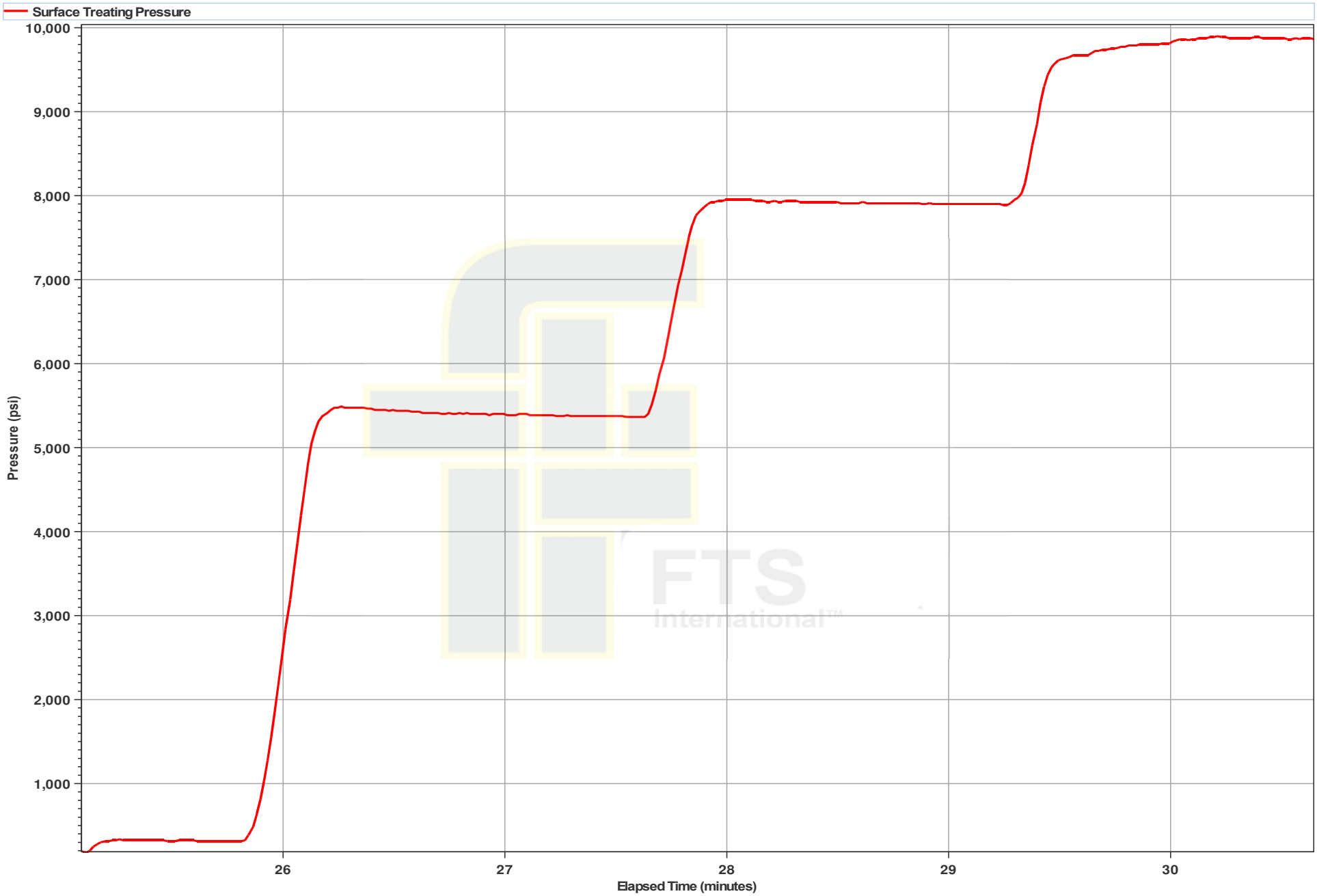
Staged to a 0.5ppg from the 1.25 stage due to rising pressure trend.

1 Minute Shutdown (psi): 4447
2 Minute Shutdown (psi): 4358
5 Minute Shutdown (psi): 4260

Chemical Changes:

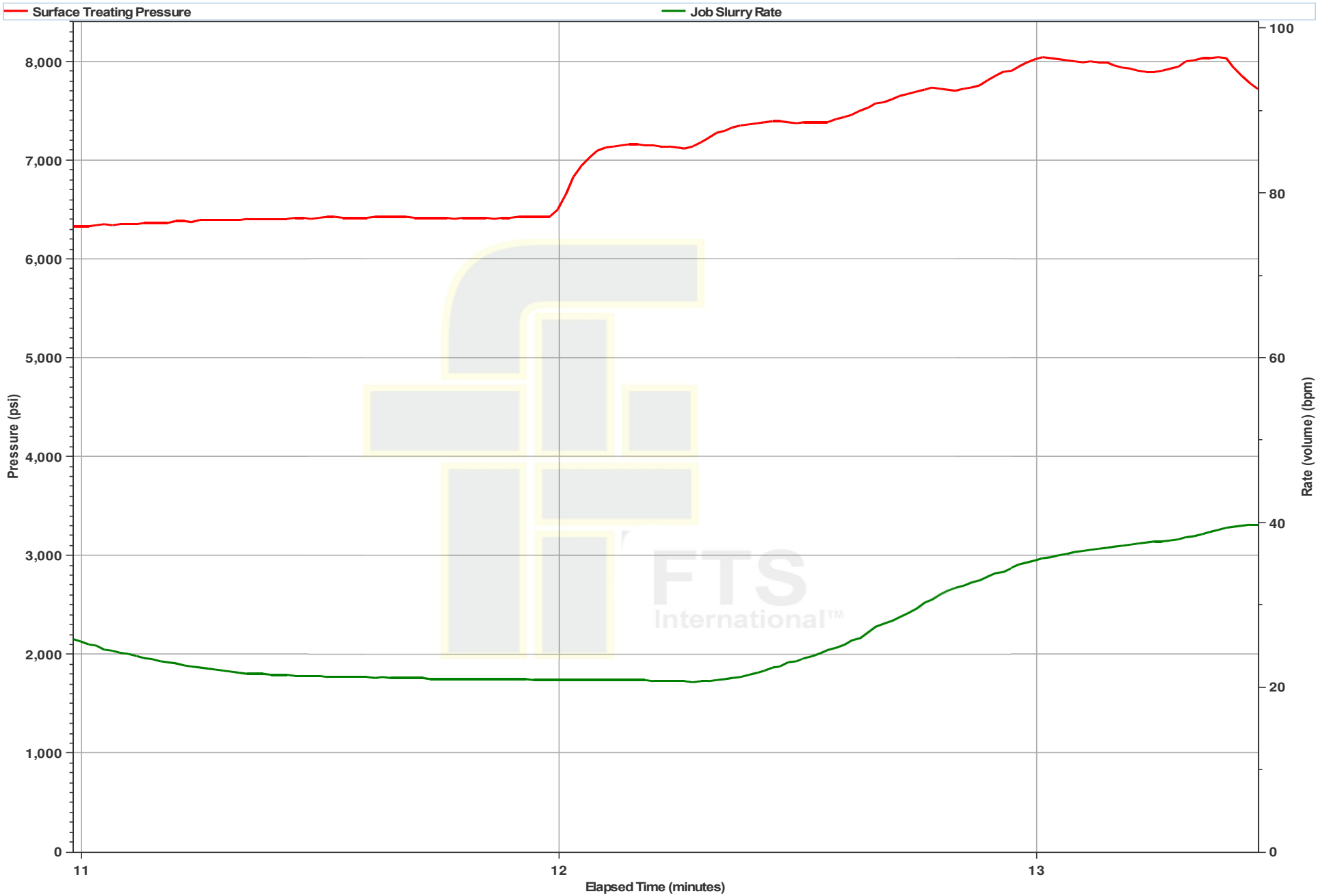
Chemical Name	Chemical Loading	Cumulative Clean
FRW-200	0.75	3,907
FRW-200	0.50	5,368

AEU Pressure Test



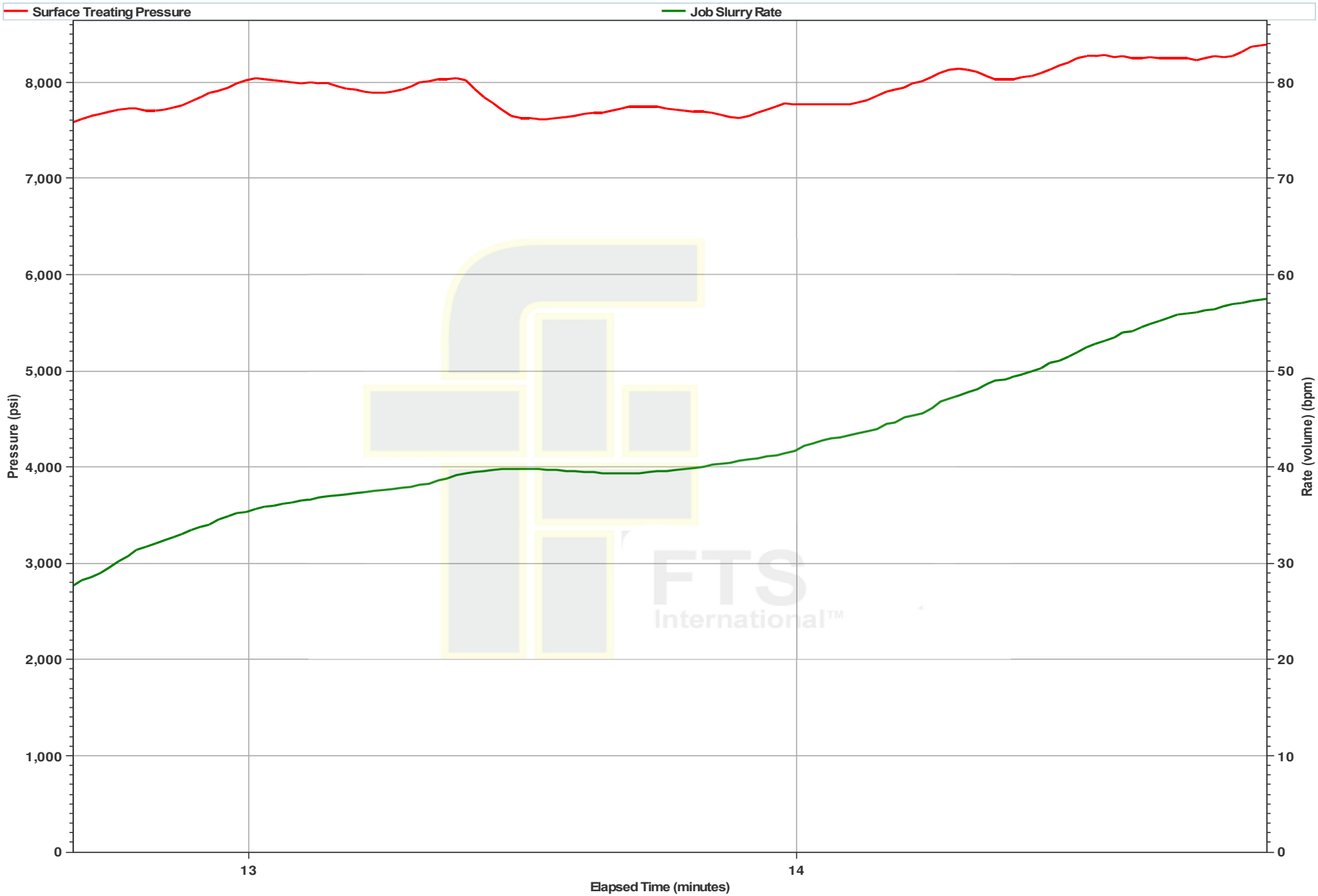
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 31 (WF.000658.M.W03.S31-ADCT-1103) **Jun 23, 2015**

Ball Seat and Breakdown



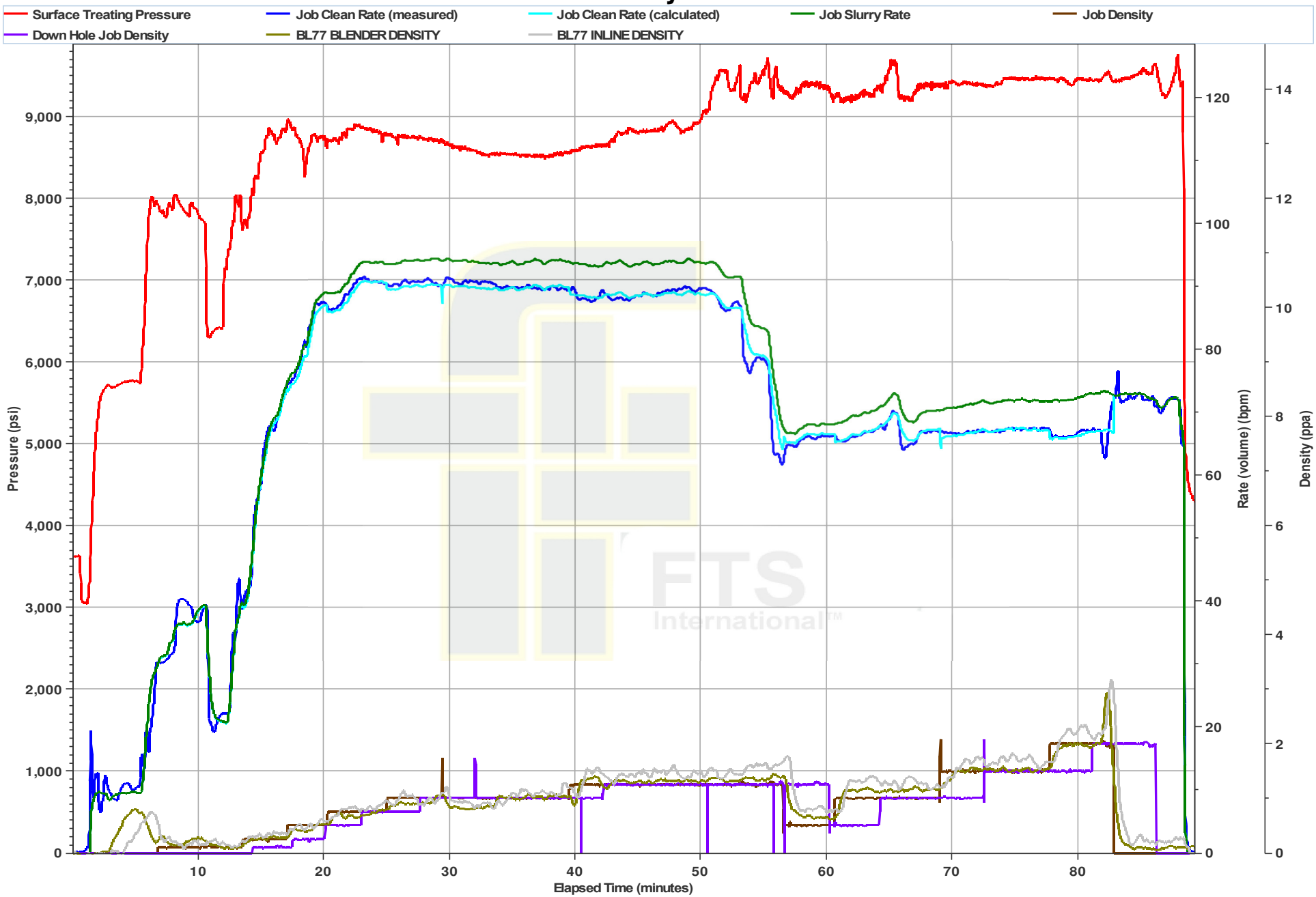
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 31 (WF.000658.M.W03.S31-ADCT-1103) **Jun 23, 2015**

Acid on Perforations



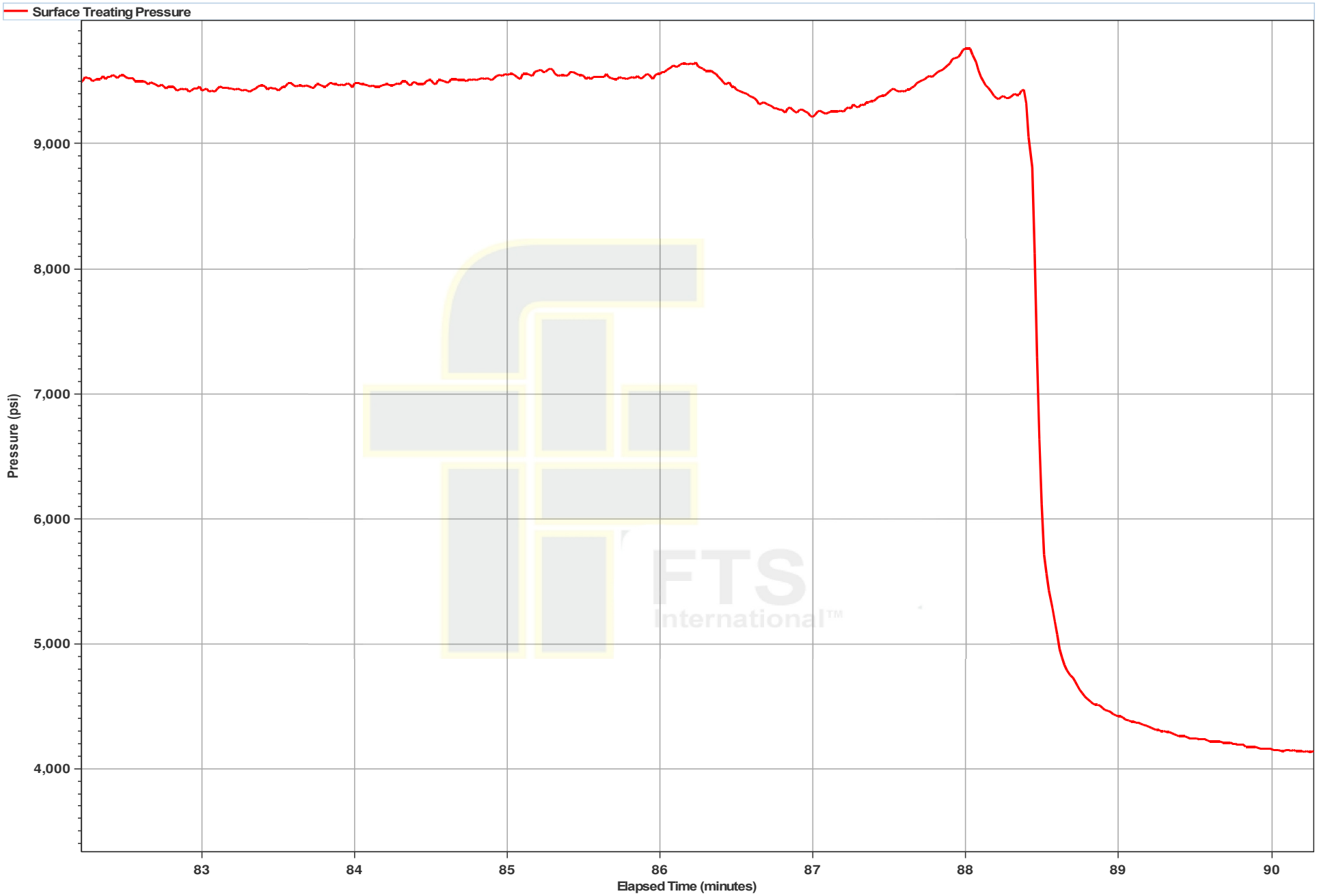
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 31 (WF.000658.M.W03.S31-ADCT-1103) **Jun 23, 2015**

Primary Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 31 (WF.000658.M.W03.S31-ADCT-1103) **Jun 23, 2015**

ISIP Plot

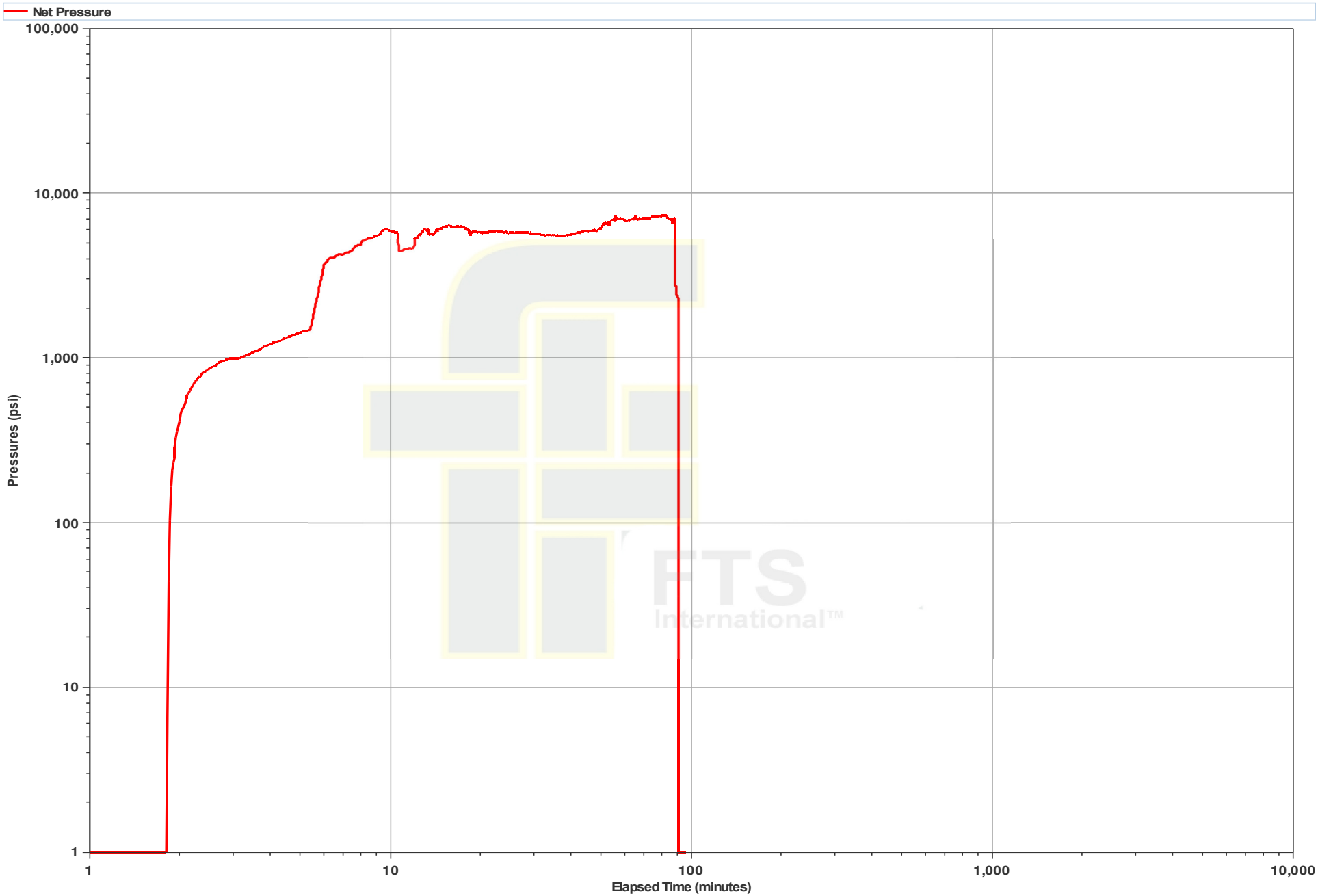


American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 31 (WF.000658.M.W03.S31-ADCT-1103) **Jun 23, 2015**

Chemical Plot

American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 31 (WF.000658.M.W03.S31-ADCT-1103) **Jun 23, 2015**

Net Pressure Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 31 (WF.000658.M.W03.S31-ADCT-1103) Jun 23, 2015

WATER-BASED FRAC FLUID QUALITY CONTROL
(Attachment to Post Treatment Report)

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/23/2015
Customer Name:	American Energy - Utica	Proposal #:	3H/31
Date Sampled:	6/23/2015	Water Source:	Working Tank

Sample/Tank No.	Clarity, Color, Odor	Sample Temperature, (F)	Specific gravity	Initial pH	Chloride, ppm	Hardness, ppm	Calcium, ppm	Magnesium, ppm	Iron ppm	Hydroxide, ppm	Bicarbonate, ppm	Carbonate, ppm	Sulfate, ppm	Barium, ppm
Working Tank	Clear	72	1	8.2	40	86	24	15	0	0	110	0	<50	0

Frac Fluid Quality Gel Testing (These Recording are to made prior to pumping job)														
Sample #														
Base Gel Type	HVG-1													
Gel Loading (lbs/1000 gal.)	2.5													
Sample Temperature, (F)	72													
Initial pH	8.1													
Visc. Reading @ 300 rpms	6													
Viscosity, (cp)	6													
Sample 1 3 min Hydration	4													
Sample 2 3 min Hydration	5													
Sample 3 3 min Hydration	6.5													
X-Link Vortex Closure, min:sec	n/a													
X-Link Crown, min:sec	n/a													
X-Link pH	n/a													
Gel Break Time (<2cp) mins	19													

Frac Fluid Quality Gel Testing (These Recording are to made while pumping job)														
Stage #														
Base Gel Viscosity (cp)														
X-Link pH								.						
Sample XL time, min:sec														
Sample Temperature														

Acid Quality	Percent Acid	NaOH, mLs	Specific Gravity
	28		1.14

Additional testing or documentation may be required by the customer or for frac fluid quality assurance.

Tested By: Travis Wilson

QUALITY CONTROL OF PROPPANTS

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/23/2015
Customer Name:	American Energy - Utica	Well/Stage:	3H/31
Date Sampled:	6/23/2015	DISTRICT:	Washington, PA
VENDOR:	SANTROL		

Select Proppant Type:

___	Brown	___	Ceramic	___	Other (specify)
X	White	___	Bauxite		
___	Resin Coated	___	Texas Gold		

Sieve Analysis	100 Mesh			Sieve Analysis	30/50 Mesh		
Sample 1	25.10	grams of sample		Sample 2	25.20	grams of sample	
	Amount Retained				Amount Retained		
Sieve mesh	Gram	%		Sieve mesh	Gram	%	
			Total				Total
50	0.20	0.80	In-Size	20	0.00	0.00	In-Size
70	16.20	64.54		30	0.60	2.38	
100	5.30	21.12	99.2%	40	18.90	75.00	92.5%
120	2.50	9.96		45	2.80	11.11	
140	0.70	2.79		50	1.60	6.35	
200	0.20	0.80		70	0.90	3.57	
Pan	0.00	0.00	fines	Pan	0.40	1.59	fines
Total wt. Gram	25.10	100.00		Total wt. Gram	25.20	100.00	

Tested By: Travis Wilson

Post Job Report

AMERICAN ENERGY - UTICA

Red Hill Farm MDS GR 3H

Stage : 32 OF 54

HARRISON, OH

Operations Representative:

Name:	**David Knapp**
Office:	**570-327-4881**
Fax:	**724-743-7719**
Cell:	
Email:	**DAVID.KNAPP@FTSI.COM**

Sales Representative:

Name:	**Bruce Matthews**
Office:	**405-574-3981**
Fax:	**405-767-1288**
Cell:	
Email:	**BRUCE.MATTHEWS@FTSI.COM**

Engineering Manager:

Name:	**Thaddeus Craun**
Office:	**817-682-8702**
Fax:	**724-743-7719**
Cell:	
Email:	**THADDEUS.CRAUN@FTSI.COM**

FTS International
1432 Route 519
Eighty Four, PA 15330

Customer: American Energy - Utica
Well: Red Hill Farm Mds Gr 3H
Stage: 32
Job End Date: 06/23/2015

Job Summary

Well Information

TVD:	7,301	**Top Perf:**	10,999
No. Of Perfs:	30		

Casing	Tubing
5.50" 20.00#	N/A

Pressures, Rates and Volumes

	Proposed	Actual	Max	Min
STP	9,046 psi	8,807 psi	9,726 psi	7,484 psi
Rate	80.0 bpm	80.4 bpm	94.7 bpm	47.7 bpm

	Proposed	Actual		
Clean Volume	5,772 bbls	5,914 bbls		
Slurry Volume	6,042 bbls	6,183 bbls		
Flush Volume	357 bbls	298 bbls		

	Proposed	Start	End
Frac Pumps on Location	10	13	13

Open Well:	Start Time	13:51	Pressure	3,065 psi
	Ball Seat	236 bbls	Break Down	7,981 psi
	Initial ISIP:	4,718 psi	Initial F.G.:	1.08 psi/ft
Stage Complete:	End Time	15:23	Job Time	01:30
	Final ISIP	4,718 psi	Final F.G.	1.08 psi/ft
	HHP	17,355	5 Min:	4,048 psi
	Proppant Min:	0.00	10 Min:	N/A
	Proppant Max:	2.00	15 Min:	N/A

Material Volume

Material	Proposed	Calculated	Actual	Variance
100 Mesh White	40,000	39,624	40,624	3%
30/50 White	210,000	209,801	209,801	0%
Total Proppants	250,000	249,425	250,425	0%

Material	Proposed	Calculated	Actual	Variance
0.1%-7.5% HCL	3,000	2,982	3,000	1%
APB-1	0	3	3	0%
CI-150	3	3	3	0%
CS-250 SI	60	60	59	-2%
FE-200L	15	15	15	0%
FRW-200	180	119	117	-2%
HVG-1 4.0	0	17	17	0%
ICI-3240	60	60	59	-2%
LTB-1	0	3	3	0%
NE-100	0	119	117	-2%
NE-100W	120	0	0	0

Comments:

Pumpdown Information:
Total Bbls: 164
Max Pressure (psi): 6739
Max Rate (bpm): 15.4

FTS International
1432 Route 519
Eighty Four, PA 15330

Customer: American Energy - Utica
Well: Red Hill Farm Mds Gr 3H
Stage: 32
Job End Date: 06/23/2015

Treatment Report

Date:	6/23/2015	District:	Washington County,PA	Quote No:	051815_035725QF	API:	34-059-24370

MIL Time	STP	Slurry BPM	Stage Clean (bbls)	Cumulative Clean (bbls)	Stage Slurry (bbls)	Cumulative Slurry (bbls)	Stage Proppant (lbs)	Cumulative Proppant (lbs)	Description	Proppant	PPA
13:51	3,065	0.0	0	0	0	0	0	0	Freshwater Open Well		0.00
13:52	3,626	5.4	29	29	29	29	0	0	Freshwater Load		0.00
13:55	6,361	9.6	71	100	71	100	0	0	7.5% HCL Acid Acid		0.00
14:02	7,563	19.2	136	236	136	236	0	0	Slickwater Load		0.00
14:08	7,981	0.0	0	236	0	236	0	0	Slickwater Breakdown		0.00
14:08	8,227	27.0	137	373	137	373	0	0	Slickwater Pad		0.00
14:12	9,346	66.3	214	587	215	588	899	899	Slickwater Proppant	100 Mesh White	0.10
14:14	9,601	60.6	215	802	217	805	2,258	3,157	Slickwater Proppant	100 Mesh White	0.25
14:18	9,520	52.8	282	1,084	288	1,093	5,922	9,079	Slickwater Proppant	100 Mesh White	0.50
14:24	8,941	63.3	431	1,515	446	1,539	13,577	22,656	Slickwater Proppant	100 Mesh White	0.75
14:31	9,028	76.9	404	1,919	422	1,961	16,968	39,624	Slickwater Proppant	100 Mesh White	1.00
14:36	9,136	84.4	876	2,795	916	2,877	36,792	76,416	Slickwater Proppant	30/50 White	1.00
14:53	8,788	92.3	465	3,260	491	3,368	24,413	100,829	Slickwater Proppant	30/50 White	1.25
14:54	8,686	90.4	90	3,350	95	3,463	4,725	105,554	10# Linear Gel Proppant	30/50 White	1.25
14:55	8,693	90.3	452	3,802	478	3,941	23,730	129,284	Slickwater Proppant	30/50 White	1.25
14:59	8,566	90.9	350	4,152	374	4,315	22,050	151,334	Slickwater Proppant	30/50 White	1.50
15:02	8,767	93.2	75	4,227	80	4,395	4,725	156,059	10# Linear Gel Proppant	30/50 White	1.50
15:06	8,025	87.0	432	4,659	461	4,856	27,216	183,275	Slickwater Proppant	30/50 White	1.50
15:14	7,787	85.0	500	5,159	540	5,396	36,750	220,025	Slickwater Proppant	30/50 White	1.75
15:14	7,663	83.9	350	5,509	382	5,778	29,400	249,425	Slickwater Proppant	30/50 White	2.00
15:20	7,780	84.3	107	5,616	107	5,885	0	249,425	Slickwater Clean screws		0.00
15:20	7,780	84.3	160	5,776	160	6,045	0	249,425	Slickwater Flush		0.00
15:22	8,668	83.6	138	5,914	138	6,183	0	249,425	Freshwater Flush		0.00
15:23	4,718	0.0	0	5,914	0	6,183	0	249,425	Freshwater Shutdown		0.00
Total JobTime (HH:MM): 01:32											

Min STP:	7,484 psi	**Max STP:**	9,726 psi	**Average STP:**	8,807 psi	**5 Min:**	4,048 psi
Min Rate:	47.7 bpm	**Max Rate:**	94.7 bpm	**Average Rate:**	80.4 bpm	**10 Min:**	0 psi
Initial ISIP:	4,718 psi	**Initial F.G.:**	1.08 psi/ft	**Average HHP:**	17,355	**15 Min:**	0 psi
Final ISIP:	4,718 psi	**Final F.G.:**	1.08 psi/ft	**Customer Representative:**		Mike Hausviater	
FTSI Representative:		Etuate Varea & Cody Melone					

Comments:

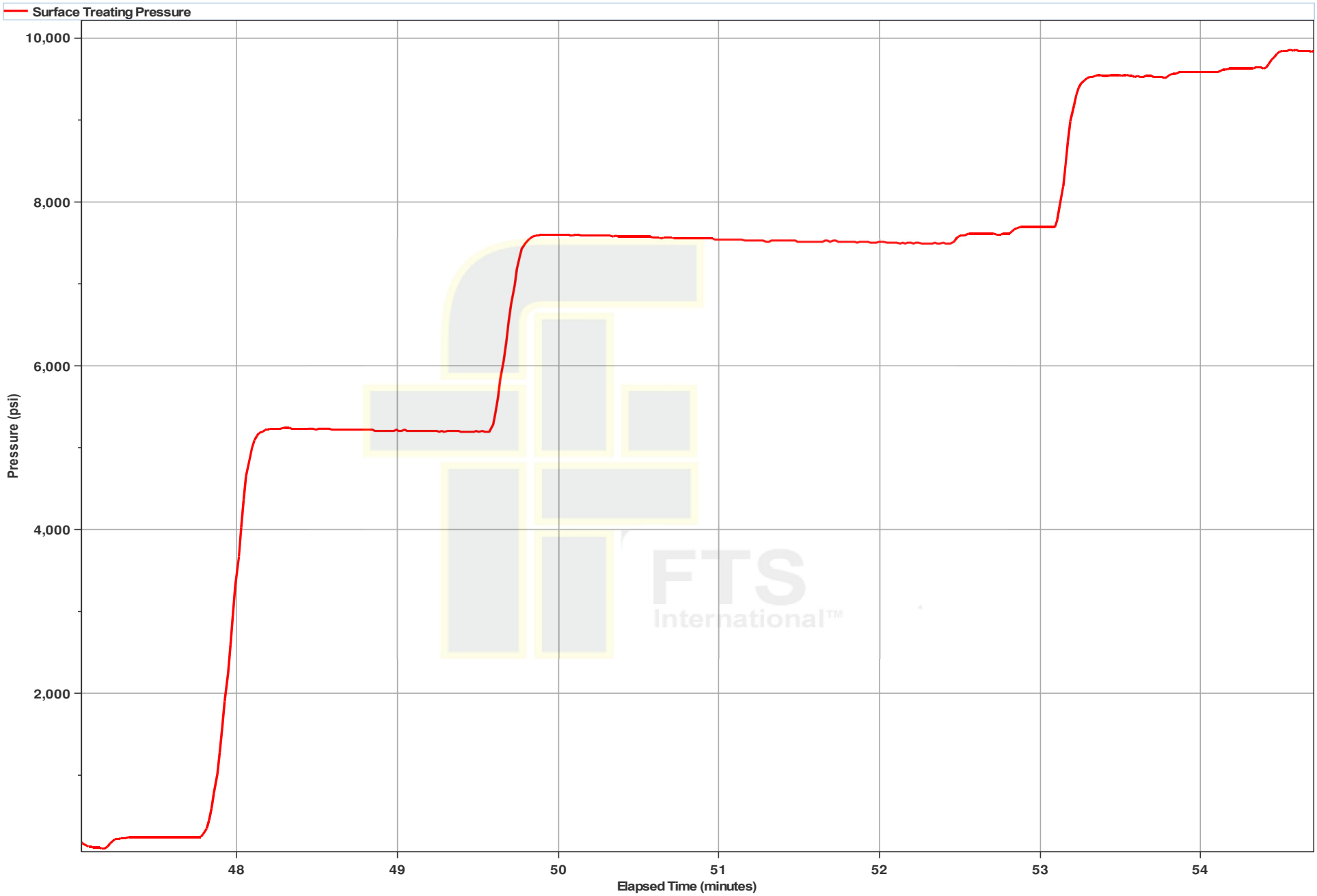
The proppant values contained in this report are calculated based on actual barrel counts and target densities. Actual total proppant usage is 250,425 lbs. Charge time is 1 hour(s) 30 minute(s). All chemicals and proppant ran as documented.

Min/Max/Avg were taken from sand stages. All chem changes from proposed were made per AEU representative request.

No reused water used

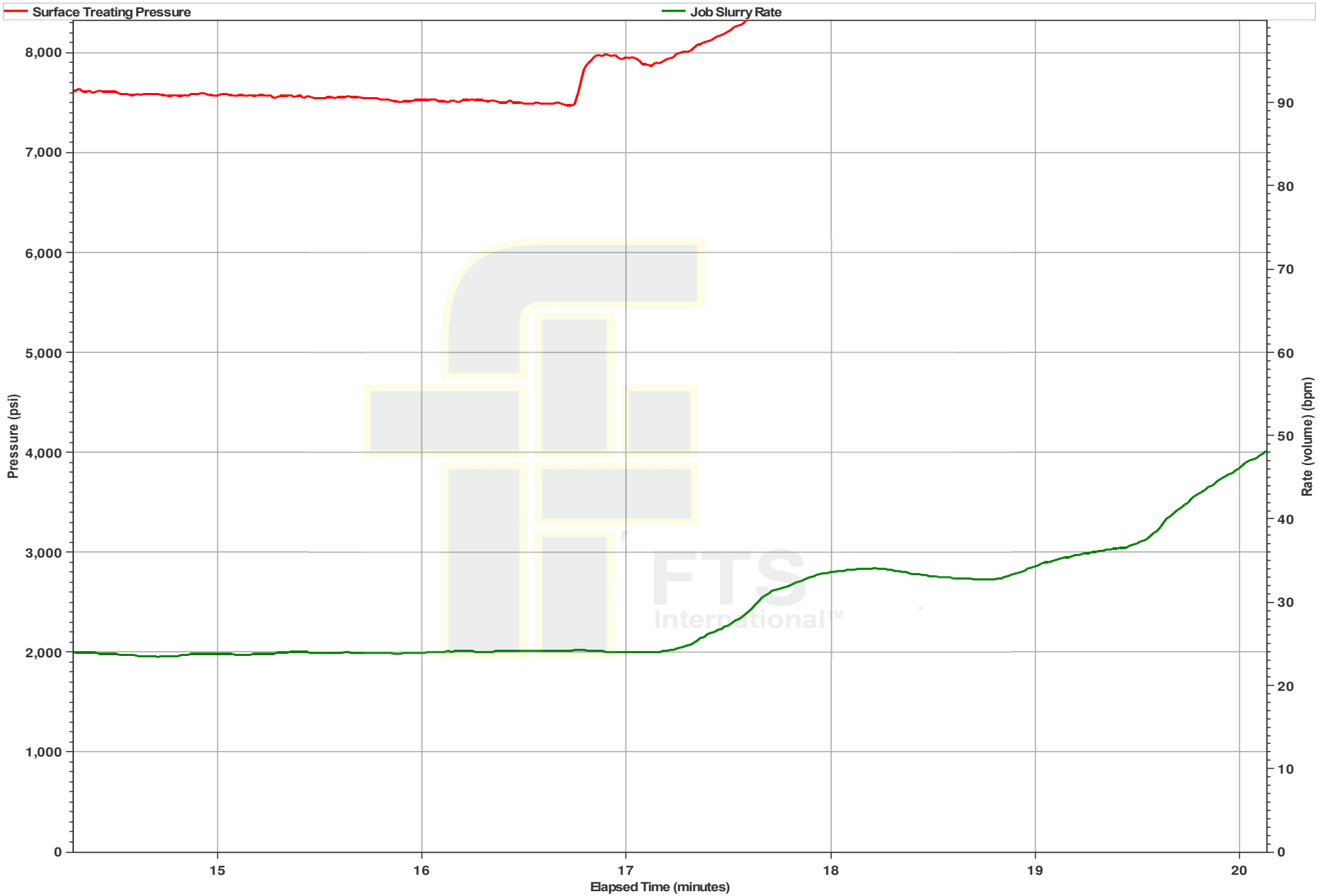
1 Minute Shutdown (psi): 4373
2 Minute Shutdown (psi): 4142
5 Minute Shutdown (psi): 4048

AEU Pressure Test



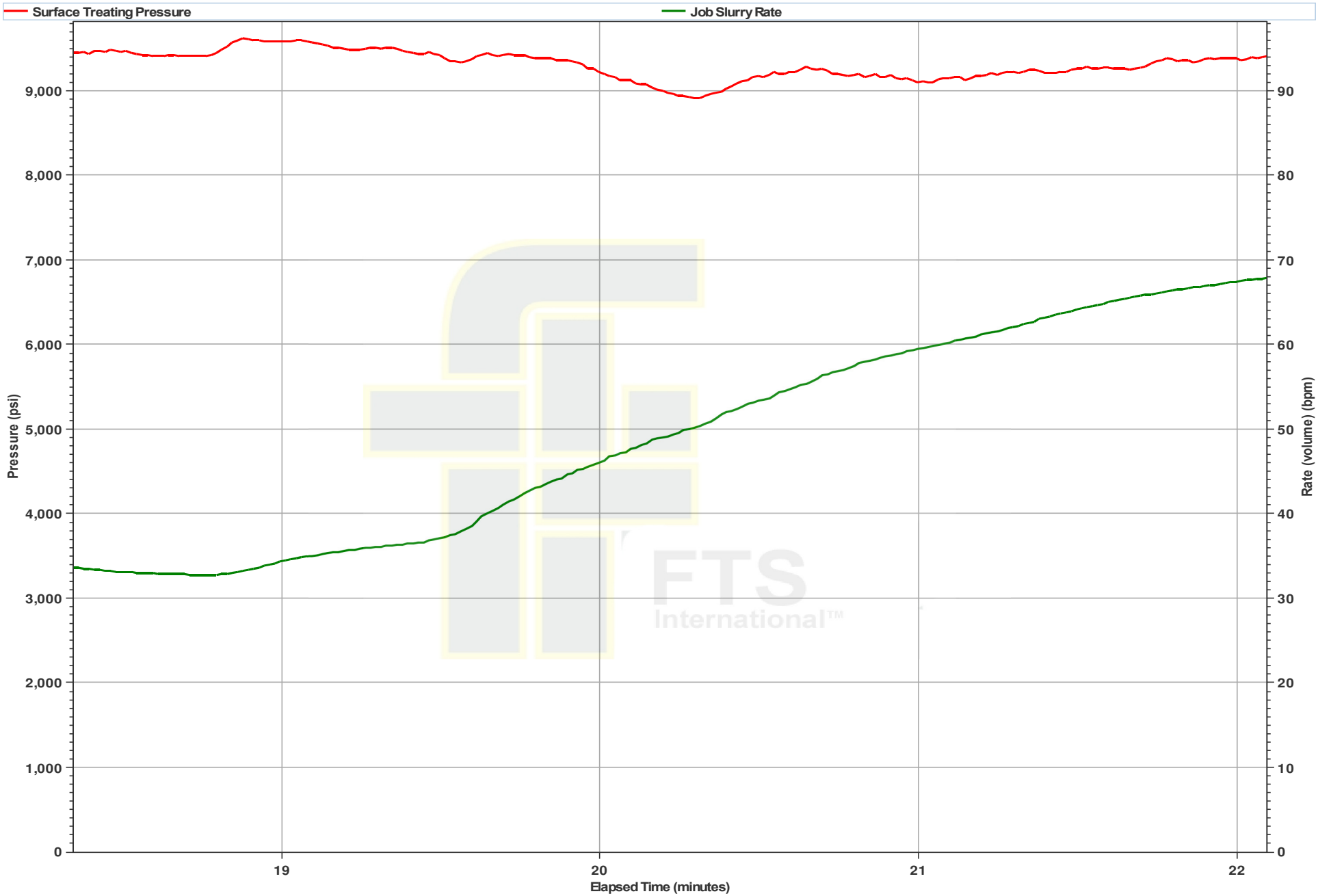
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 32 (WF.000658.M.W03.S32-aDCT-1103) Jun 23, 2015

Ball Seat and Breakdown



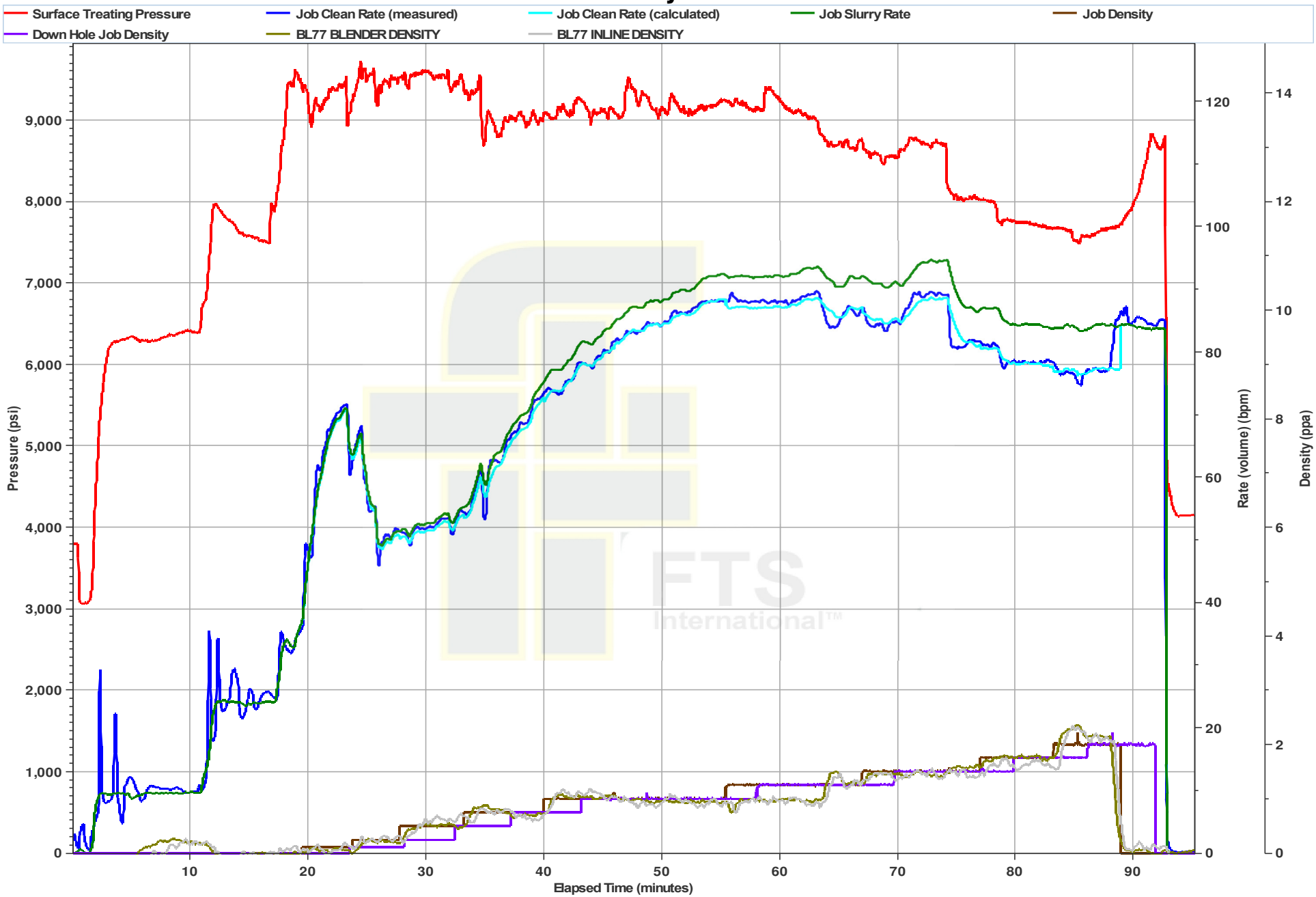
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 32 (WF.000658.M.W03.S32-aDCT-1103) Jun 23, 2015

Acid on Perforations



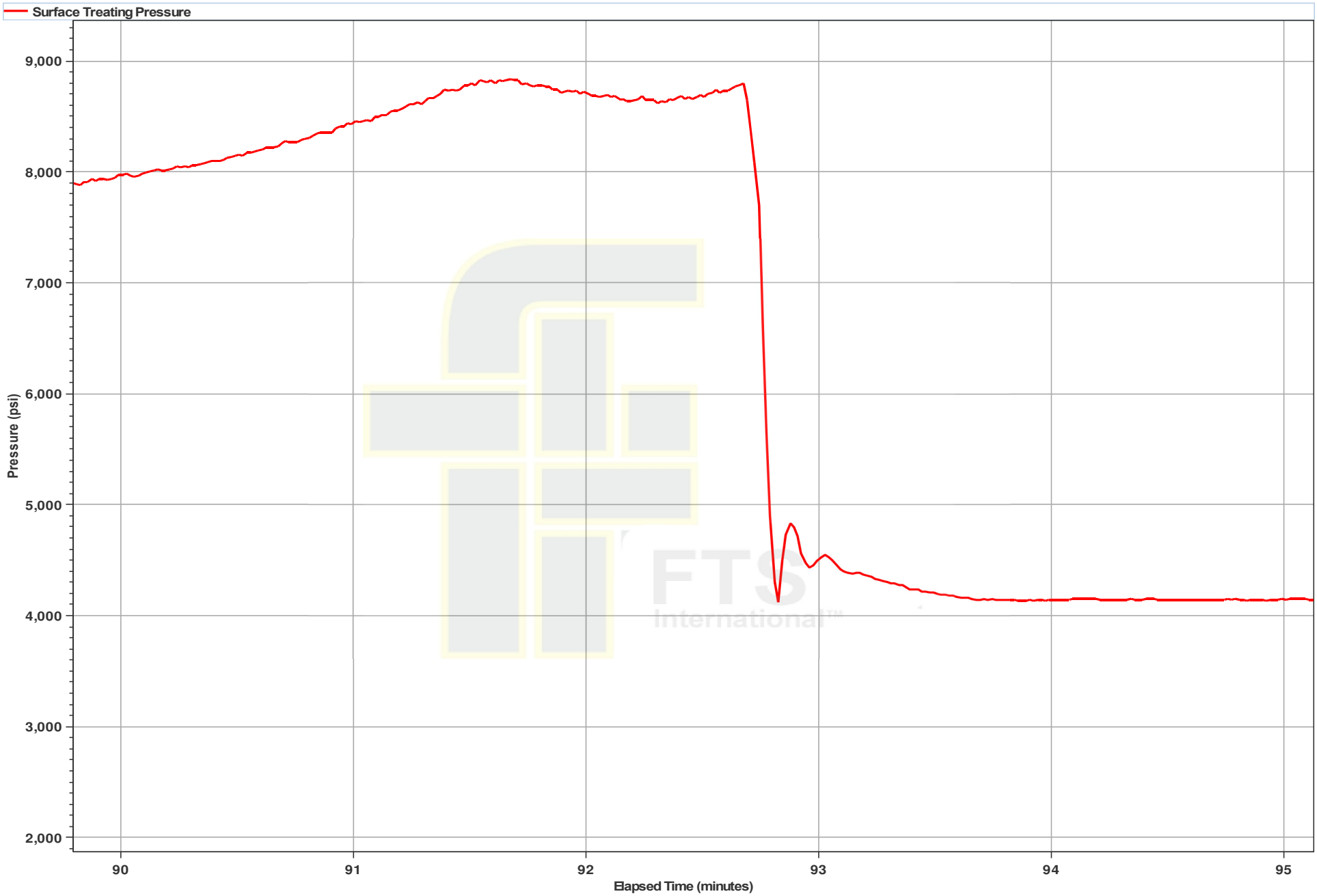
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 32 (WF.000658.M.W03.S32-aDCT-1103) **Jun 23, 2015**

Primary Plot



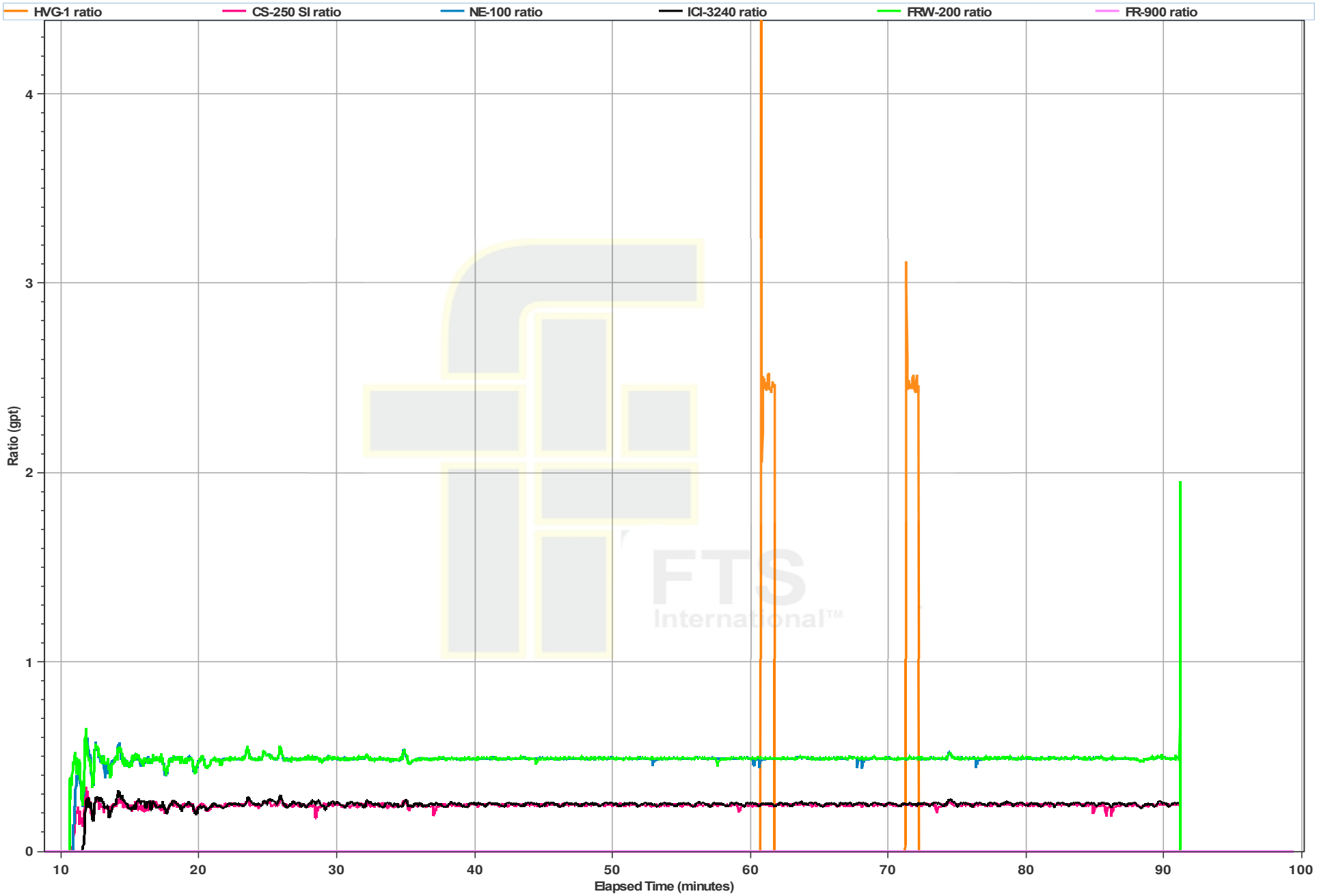
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 32 (WF.000658.M.W03.S32-aDCT-1103) **Jun 23, 2015**

ISIP Plot



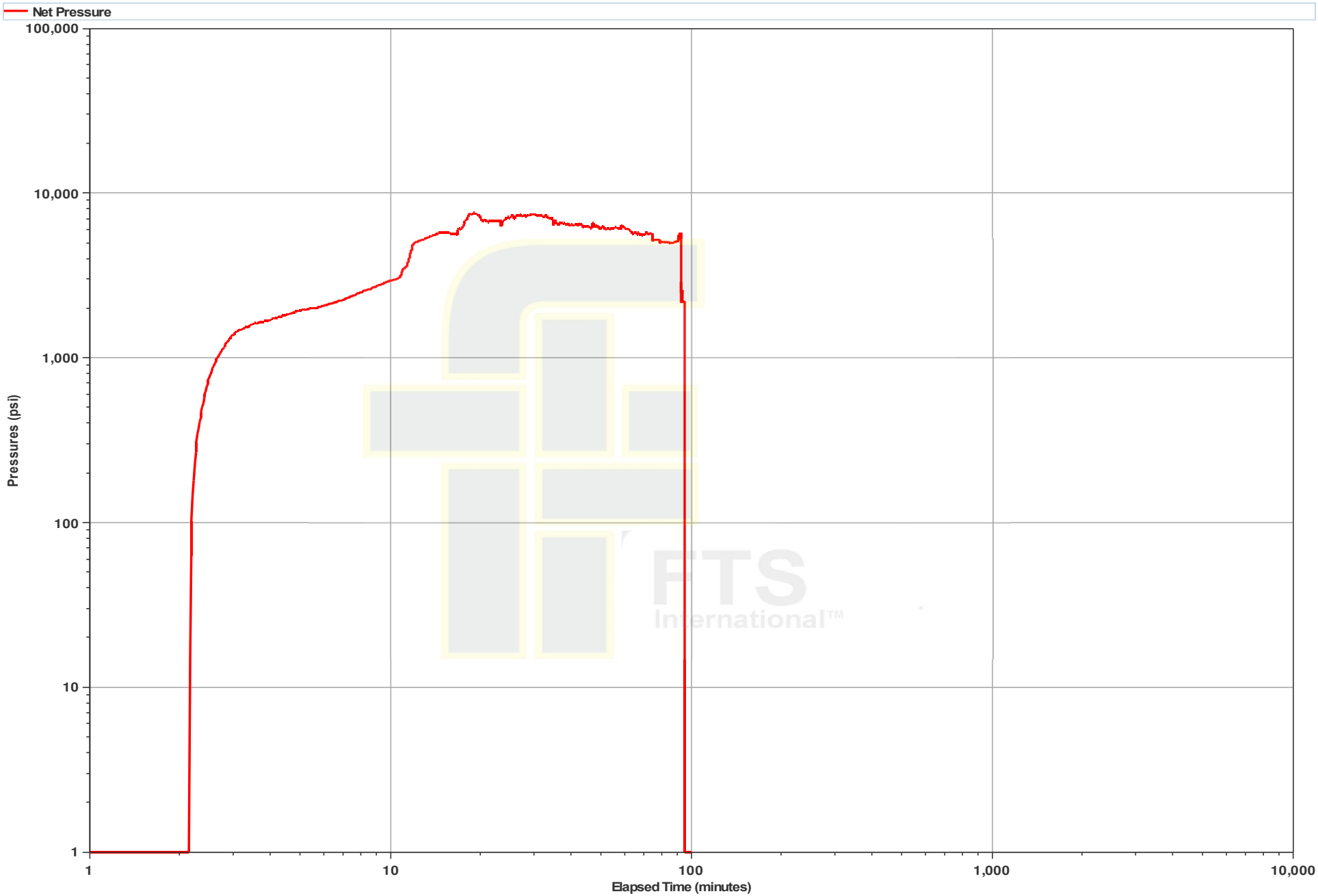
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 32 (WF.000658.M.W03.S32-aDCT-1103) **Jun 23, 2015**

Chemical Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 32 (WF.000658.M.W03.S32-aDCT-1103) Jun 23, 2015

Net Pressure Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 32 (WF.000658.M.W03.S32-aDCT-1103) Jun 23, 2015

WATER-BASED FRAC FLUID QUALITY CONTROL
(Attachment to Post Treatment Report)

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/23/2015
Customer Name:	American Energy - Utica	Proposal #:	3H/32
Date Sampled:	6/23/2015	Water Source:	Working Tank

Sample/Tank No.	Clarity, Color, Odor	Sample Temperature, (F)	Specific gravity	Initial pH	Chloride, ppm	Hardness, ppm	Calcium, ppm	Magnesium, ppm	Iron ppm	Hydroxide, ppm	Bicarbonate, ppm	Carbonate, ppm	Sulfate, ppm	Barium, ppm
Working Tank	Clear	71	1	8.2	41	62	24	9	0	0	73	0	<50	0

Frac Fluid Quality Gel Testing (These Recording are to made prior to pumping job)														
Sample #														
Base Gel Type	HVG-1													
Gel Loading (lbs/1000 gal.)	2.5													
Sample Temperature, (F)	71													
Initial pH	8.1													
Visc. Reading @ 300 rpms	6													
Viscosity, (cp)	6													
Sample 1 3 min Hydration	4													
Sample 2 3 min Hydration	5													
Sample 3 3 min Hydration	6													
X-Link Vortex Closure, min:sec	n/a													
X-Link Crown, min:sec	n/a													
X-Link pH	n/a													
Gel Break Time (<2cp) mins	16													

Frac Fluid Quality Gel Testing (These Recording are to made while pumping job)														
Stage #														
Base Gel Viscosity (cp)														
X-Link pH								.						
Sample XL time, min:sec														
Sample Temperature														

Acid Quality	Percent Acid	NaOH, mLs	Specific Gravity
	28		1.14

Additional testing or documentation may be required by the customer or for frac fluid quality assurance.

Tested By: Etuate Varea

QUALITY CONTROL OF PROPPANTS

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/23/2015
Customer Name:	American Energy - Utica	Well/Stage:	3H/32
Date Sampled:	6/23/2015	DISTRICT:	Washington, PA
VENDOR:	SANTROL		

Select Proppant Type:

___ Brown	___ Ceramic	___ Other (specify)
X White	___ Bauxite	_____
___ Resin Coated	___ Texas Gold	

Sieve Analysis	100 Mesh			Sieve Analysis	30/50 Mesh		
Sample 1	24.80	grams of sample		Sample 2	24.80	grams of sample	
	Amount Retained				Amount Retained		
Sieve mesh	Gram	%		Sieve mesh	Gram	%	
			Total				Total
50	0.10	0.40	In-Size	20	0.00	0.00	In-Size
70	15.10	60.89		30	0.40	1.61	
100	6.20	25.00	99.6%	40	17.50	70.56	94.8%
120	2.30	9.27		45	4.20	16.94	
140	0.80	3.23		50	1.80	7.26	
200	0.30	1.21		70	0.90	3.63	
Pan	0.00	0.00	fines	Pan	0.00	0.00	fines
Total wt. Gram	24.80	100.00		Total wt. Gram	24.80	100.00	

Tested By: Etuate Varea

Post Job Report

AMERICAN ENERGY - UTICA

Red Hill Farm MDS GR 3H

Stage : 33 OF 54

HARRISON, OH

Operations Representative:

Name:	David Knapp
Office:	878-327-4881
Fax:	724-743-7719
Cell:	
Email:	DAVID.KNAPP@FTSI.COM

Sales Representative:

Name:	Bruce Batthern
Office:	405-574-3901
Fax:	405-787-1235
Cell:	
Email:	BRUCE.BATTHERN@FTSI.COM

Engineering Manager:

Name:	Thaddeus Craun
Office:	817-832-8782
Fax:	724-743-7719
Cell:	
Email:	THADDEUS.CRAUN@FTSI.COM

FTS International
[illegible]
Eighty Four, PA [illegible]

FTS INTERNATIONAL

Customer: American Energy - Utica
Well: Red Hill Farm Site 6r 3H
Stage: 10
Job End Date: [illegible]

Job Summary

Well Information

TVD:	7,301	Top Perf:	10,647
No. Of Perfs:	30		

Casing	Tubing
[illegible]	n/A

Pressures, Rates and Volumes

	Proposed	Actual	Max	Min
STP	[illegible] psi	[illegible] psi	[illegible] psi	[illegible] psi
Rate	[illegible] bpm	[illegible] bpm	[illegible] bpm	[illegible] bpm

	Proposed	Actual		
Clean Volume	[illegible] bbls	[illegible] bbls		
Slurry Volume	[illegible] bbls	[illegible] bbls		
Flush Volume	[illegible] bbls	[illegible] bbls		

	Proposed	Start	End
Free Pumps on Location	19	14	14

Open Well:	Start Time	[illegible]	Pressure	[illegible] psi
	Bell Dwn	[illegible] bbls	Break Down	[illegible] psi
	Initial ISIP:	[illegible] psi	Initial F.G.:	[illegible] psi/ft
Stage Complete:	End Time	[illegible]	Job Time	[illegible]
	Final ISIP	[illegible] psi	Final F.G.	[illegible] psi/ft
	ISIP	17,011	5 Min:	[illegible] psi
	Pressure Min:	[illegible]	10 Min:	N/A
	Pressure Max:	[illegible]	15 Min:	N/A

Material Volume

Material	Proposed	Calculated	Actual	Variance
100 Mesh White	[illegible]	[illegible]	[illegible]	0%
30/50 White	[illegible]	[illegible]	[illegible]	0%
Total Proppants	[illegible]	[illegible]	[illegible]	0%

Material	Proposed	Calculated	Actual	Variance
8.1%-7.5% HCL	[illegible]	[illegible]	[illegible]	1%
[illegible]	[illegible]	[illegible]	[illegible]	0%
[illegible]	[illegible]	[illegible]	[illegible]	25%
FE-[illegible]	[illegible]	[illegible]	[illegible]	0%
[illegible]	[illegible]	[illegible]	[illegible]	25%
[illegible]	[illegible]	[illegible]	[illegible]	25%
[illegible]	[illegible]	[illegible]	[illegible]	25%
NE-[illegible]	[illegible]	[illegible]	[illegible]	-25%
NE-[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Comments:

Pumpdown Information:
Total Bbls: 187
Max Pressure (psi): 5790
Max Rate (bpm): 19.4

FTS International
[illegible]
Eighty Four, PA [illegible]

FTS INTERNATIONAL

Customer: American Energy - Utica
Well: Red Hill Farm Site 6r 3H
Stage: 10
Job End Date: [illegible]

Treatment Report

Date	[illegible]	Statelate	Washington County,PA	Basin Size	[illegible]	API#	[illegible]

Elt. Time	BTP	Spec BPM	Step Bbls (bbls)	Cumulative Bbls (bbls)	Step Slurry (bbls)	Cumulative Slurry (bbls)	Step Proppant (lbs)	Cumulative Proppant (lbs)	Description	Proppant	PPA
21:24	2,[illegible]	[illegible]	0	0	0	0	0	0	Freshwater Open Hole		[illegible]
21:34	2,[illegible]	[illegible]	3	3	3	3	0	0	Freshwater Load		[illegible]
21:54	6,1[illegible]	[illegible]	71	40	71	40	0	0	7.5% HCL Acid Add		[illegible]
22:04	7,[illegible]	[illegible]	39	119	39	119	0	0	Slickwater Load		[illegible]
22:01	7,[illegible]	[illegible]	119	239	117	237	[illegible]	[illegible]	Slickwater Proppant	100 Mesh White	0.15
22:05	8,[illegible]	[illegible]	14	243	14	241	147	294	Slickwater Proppant	100 Mesh White	0.25
22:06	7,[illegible]	[illegible]	0	243	0	241	0	294	Slickwater Breakdown		[illegible]
22:08	[illegible]	[illegible]	[illegible]	443	[illegible]	440	2,153	2,747	Slickwater Proppant	100 Mesh White	0.25
22:10	[illegible]	[illegible]	190	633	191	630	1,[illegible]	4,102	Slickwater Proppant	100 Mesh White	0.25
22:11	[illegible]	[illegible]	129	762	127	757	1,[illegible]	6,[illegible]	Slickwater Proppant	100 Mesh White	0.25
22:13	[illegible]	[illegible]	429	1,191	444	1,151	10,514	16,[illegible]	Slickwater Proppant	100 Mesh White	0.75
22:15	[illegible]	[illegible]	463	1,654	473	1,624	[illegible]	26,[illegible]	Slickwater Proppant	100 Mesh White	1.00
22:25	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	34,443	72,[illegible]	Slickwater Proppant	[illegible] White	1.00
22:27	[illegible]	[illegible]	15	[illegible]	17	[illegible]	[illegible]	74,775	Slickwater Proppant	[illegible] White	1.00
22:33	[illegible]	[illegible]	348	[illegible]	348	[illegible]	17,[illegible]	[illegible]	Slickwater Proppant	[illegible] White	1.25
22:34	[illegible]	[illegible]	641	[illegible]	679	[illegible]	[illegible]	121,[illegible]	Slickwater Proppant	[illegible] White	1.25
22:41	[illegible]	[illegible]	991	4,144	[illegible]	[illegible]	[illegible]	171,[illegible]	Slickwater Proppant	[illegible] White	1.50
22:51	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Slickwater Proppant	[illegible] White	1.75
22:54	[illegible]	[illegible]	400	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Slickwater Proppant	[illegible] White	2.00
23:00	[illegible]	[illegible]	69	[illegible]	69	[illegible]	0	[illegible]	Slickwater Clean Jerves		[illegible]
23:01	[illegible]	[illegible]	177	[illegible]	177	[illegible]	0	[illegible]	Slickwater Flush		[illegible]
23:05	[illegible]	[illegible]	121	[illegible]	121	[illegible]	0	[illegible]	Freshwater Flush		[illegible]
23:08	4,[illegible]	[illegible]	0	[illegible]	0	[illegible]	0	[illegible]	Freshwater Breakdown		[illegible]
Total Job/Time (HH:MM): 01:14											

Min BTP:	[illegible] psi	Max BTP:	[illegible] psi	Average BTP:	[illegible] psi	[illegible] Bbls	[illegible] psi
Min Rate:	[illegible] bpm	Max Rate:	[illegible] bpm	Average Rate:	[illegible] bpm	[illegible] Bbls	[illegible] psi
Initial ISIP:	4,[illegible] psi	Initial F.G.:	[illegible] psi/ft	Average ISIP:	17,[illegible]	[illegible] Bbls	[illegible] psi
Final ISIP:	4,[illegible] psi	Final F.G.:	[illegible] psi/ft	Customer Representative		[illegible] Bbls	
FTS Representative		Travis Wilson & Zach Stewart					

Comments:

The proppant values contained in this report are calculated based on actual barrel counts and target densities. Actual total proppant usage is 249,[illegible] lbs. Charge time is 1 hour(s) 16 minute(s). All chemicals and proppant ran as documented.

Min/Max/Avg were taken from sand stages. All chem changes from proposed were made per AEU representative request.

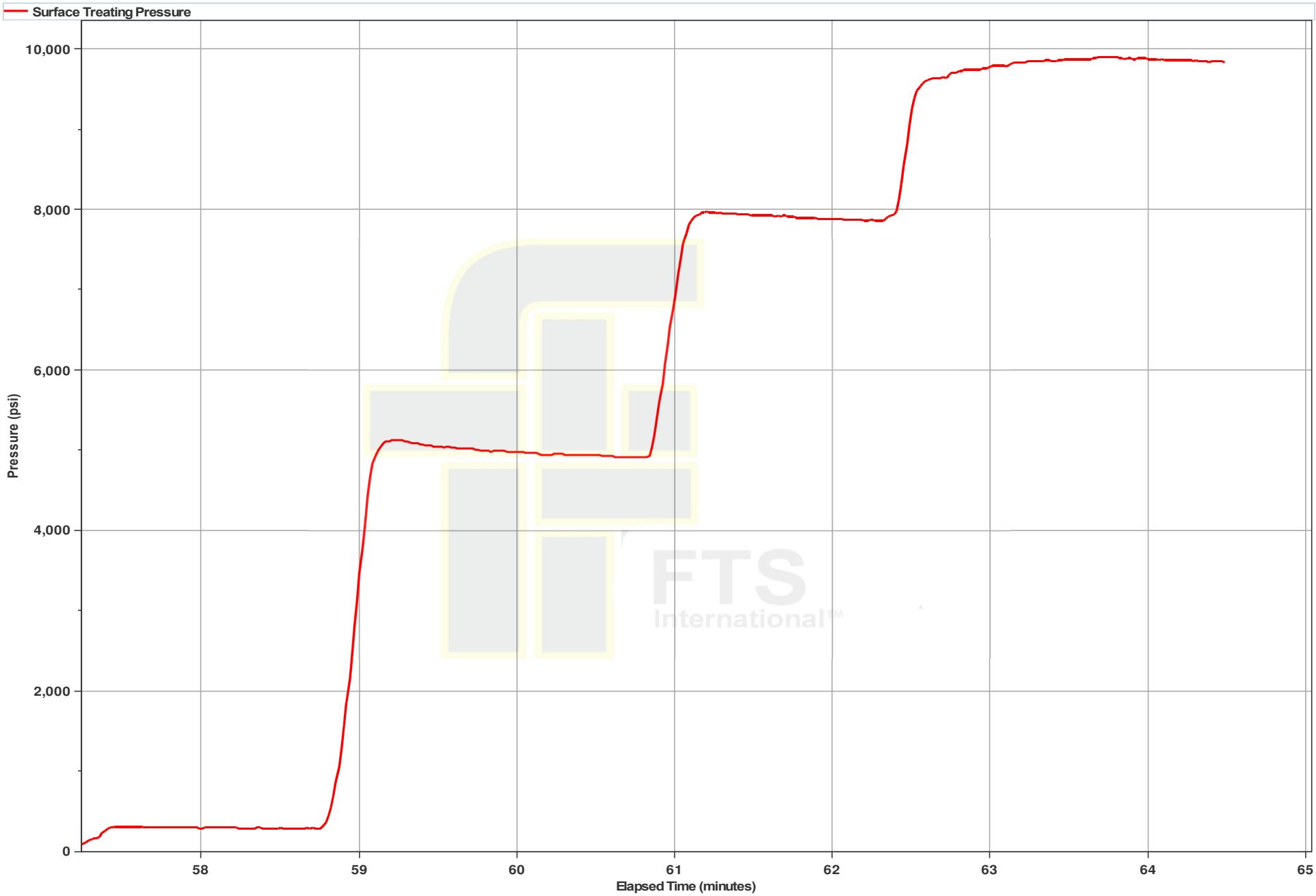
Reuse water was run on this stage for a total of 498 Bbls.

1 Minute Shutdown (psi): 4334
2 Minute Shutdown (psi): 4317
4 Minute Shutdown (psi): 4[illegible]

Chemical Changes:

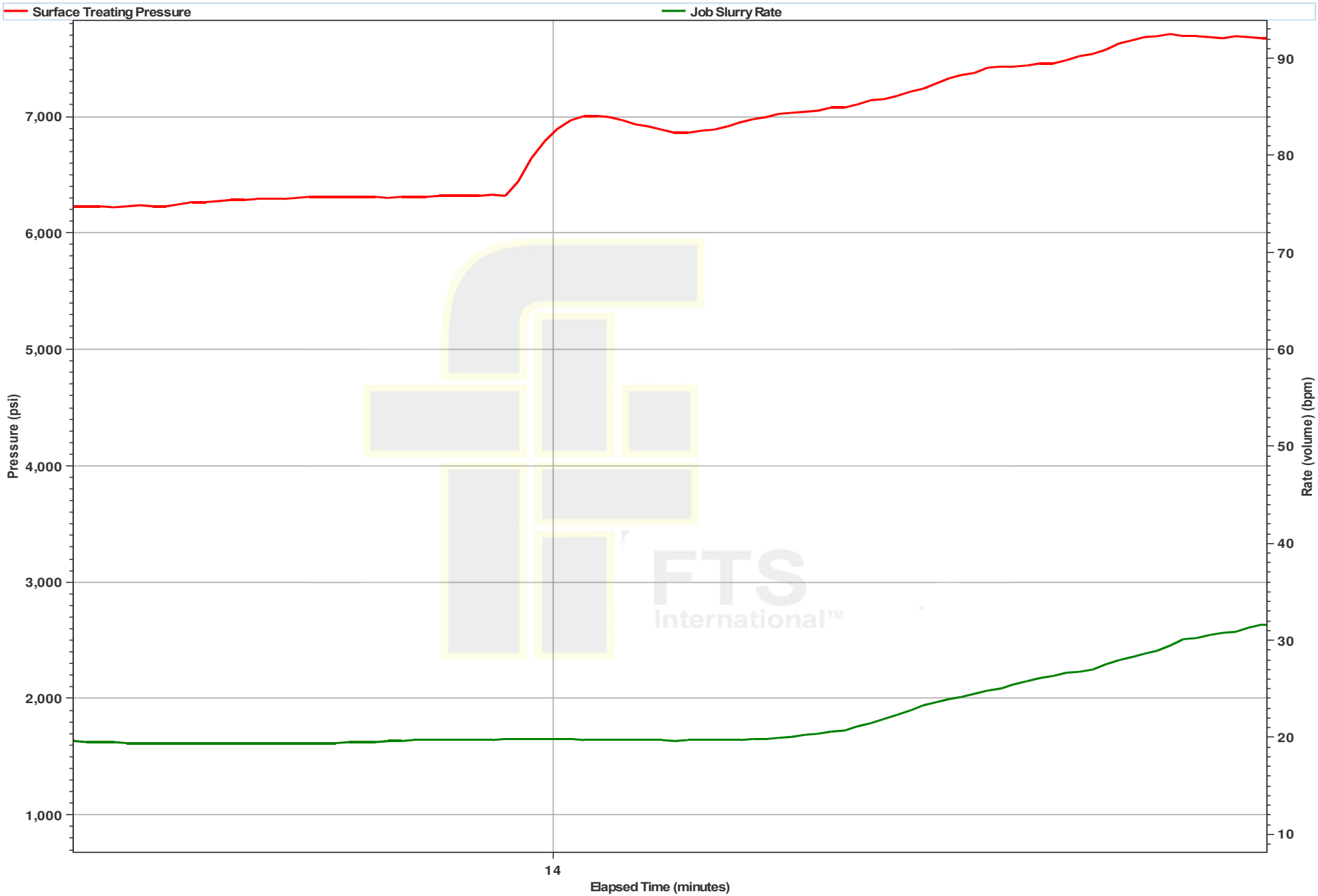
Chemical Name	Chemical Loading	Cumulative Chem
FRW-900	0.75	575
FRW-200	0.50	2,4[illegible]
FRW-200	0.60	3,343
FRW-200	0.75	5,218
FRW-200	0.60	6,3[illegible]

AEU Pressure Test



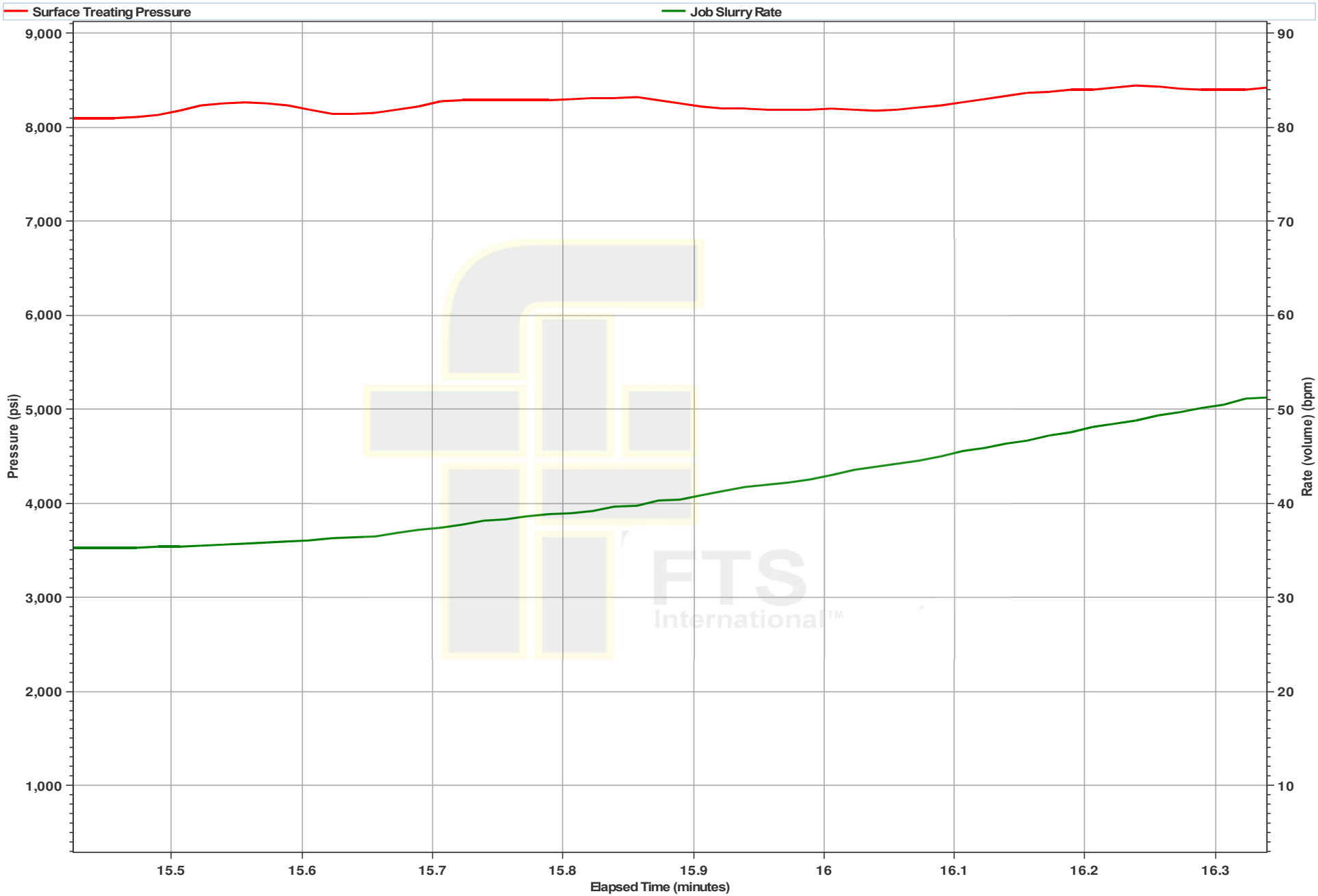
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 33 (WF.000658.M.W03.S33-aDCT-1103) Jun 23, 2015

Ball Seat and Breakdown



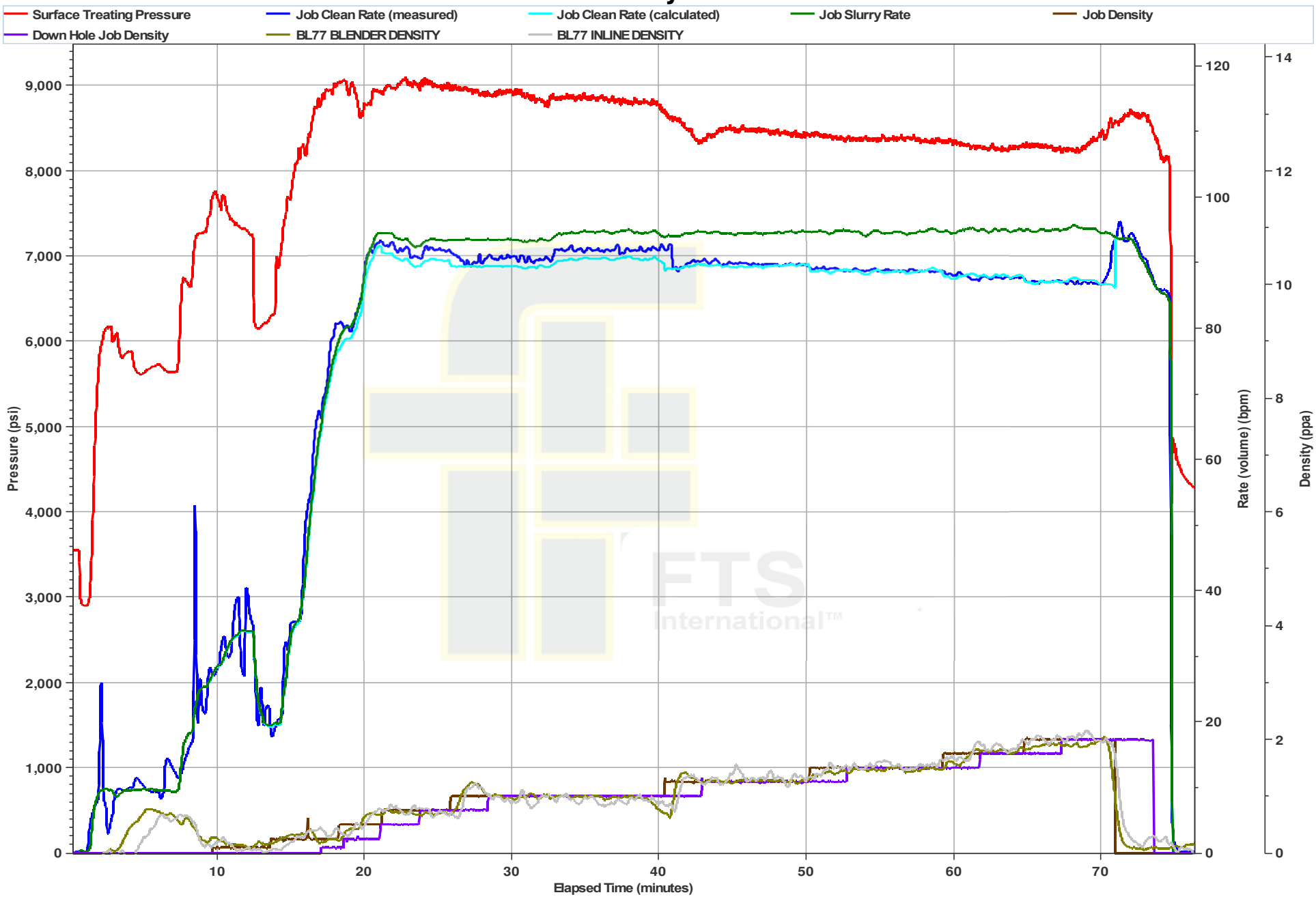
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 33 (WF.000658.M.W03.S33-aDCT-1103) **Jun 23, 2015**

Acid on Perforations



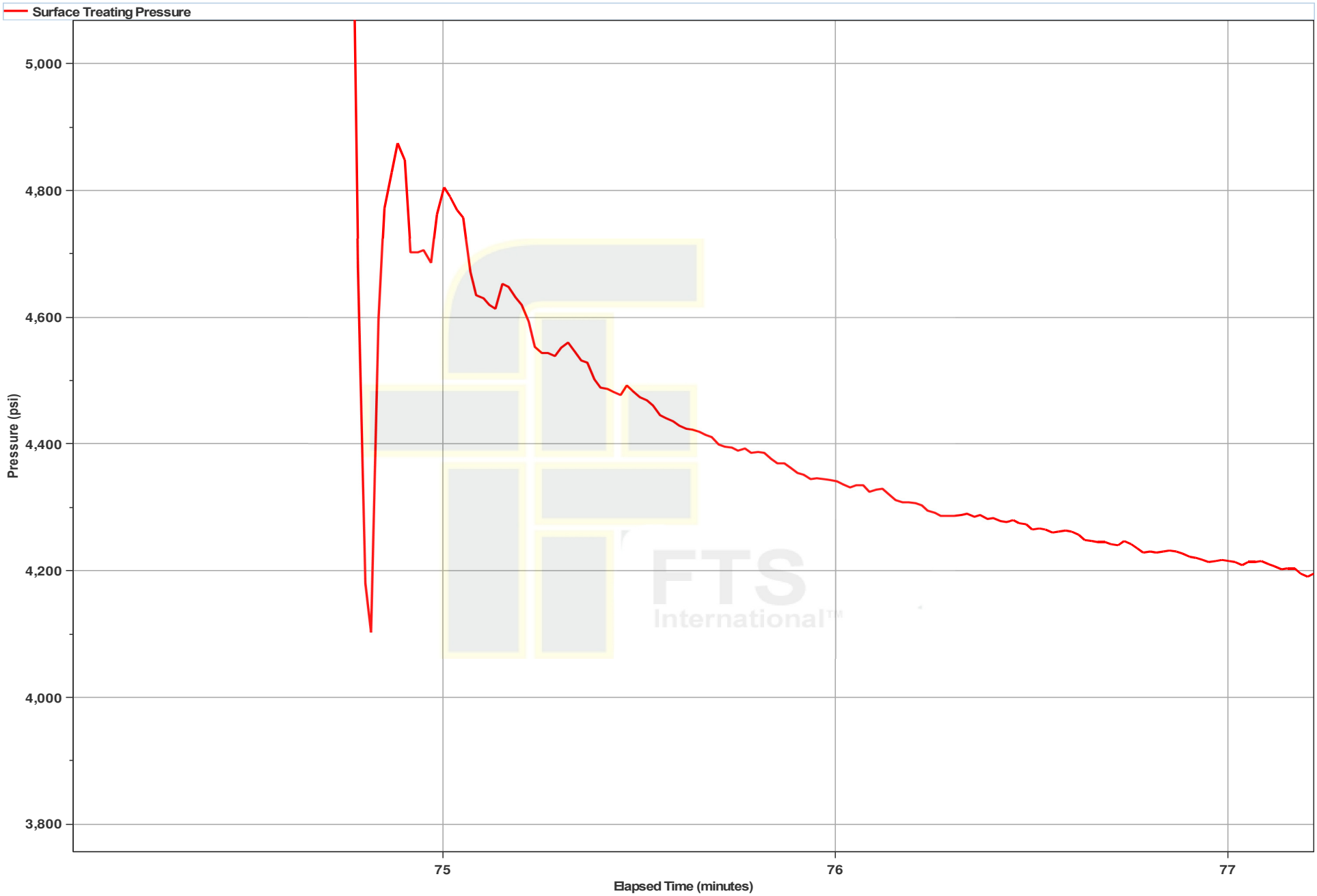
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 33 (WF.000658.M.W03.S33-aDCT-1103) **Jun 23, 2015**

Primary Plot



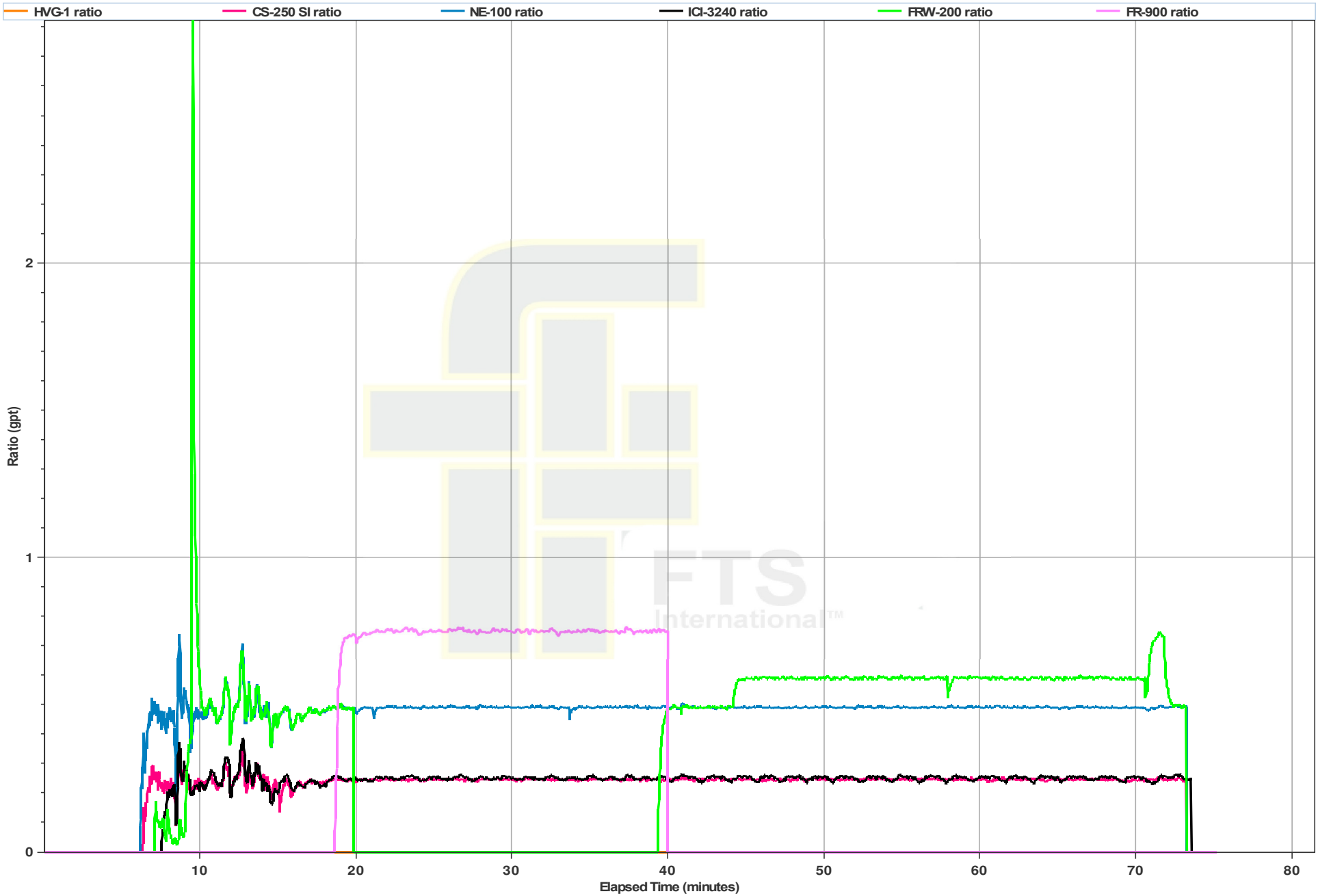
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 33 (WF.000658.M.W03.S33-aDCT-1103) **Jun 23, 2015**

ISIP Plot



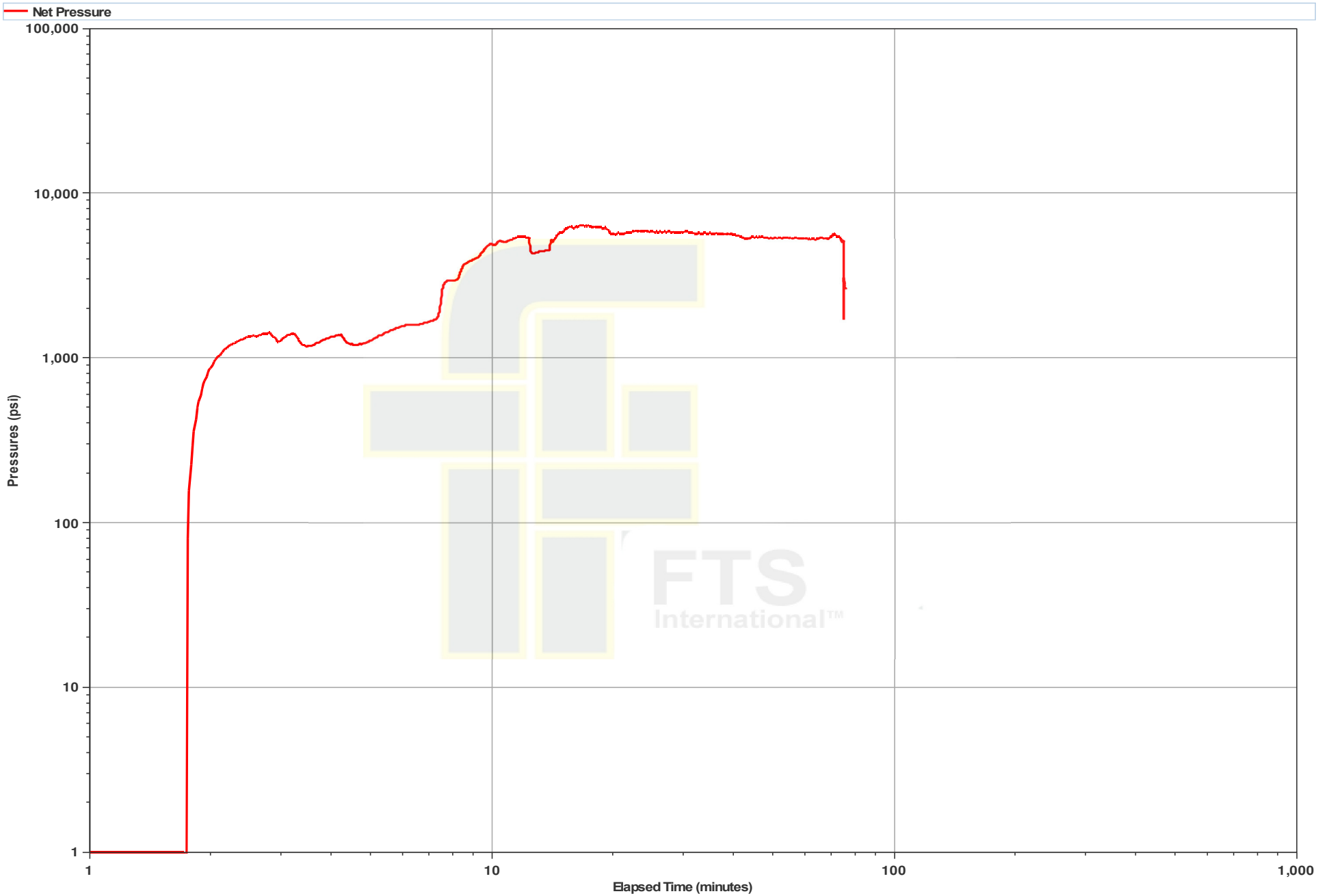
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 33 (WF.000658.M.W03.S33-aDCT-1103) Jun 23, 2015

Chemical Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 33 (WF.000658.M.W03.S33-aDCT-1103) Jun 23, 2015

Net Pressure Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 33 (WF.000658.M.W03.S33-aDCT-1103) Jun 23, 2015

WATER-BASED FRAC FLUID QUALITY CONTROL
(Attachment to Post Treatment Report)

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/23/2015
Customer Name:	American Energy - Utica	Proposal #:	3H/33
Date Sampled:	6/23/2015	Water Source:	Working Tank

Sample/Tank No.	Clarity, Color, Odor	Sample Temperature, (F)	Specific gravity	Initial pH	Chloride, ppm	Hardness, ppm	Calcium, ppm	Magnesium, ppm	Iron ppm	Hydroxide, ppm	Bicarbonate, ppm	Carbonate, ppm	Sulfate, ppm	Barium, ppm
Working Tank	Clear	74	1	8.1	35	55	20	9	0	0	98	0	<50	0
Reused Water Tank	Black, Cloudy, Petroleum Odor	**Unable to test due to the presence of a large amount of oily substance**												

Frac Fluid Quality Gel Testing (These Recording are to made prior to pumping job)														
Sample #														
Base Gel Type	HVG-1													
Gel Loading (lbs/1000 gal.)	2.5													
Sample Temperature, (F)	74													
Initial pH	8.1													
Visc. Reading @ 300 rpms	6.5													
Viscosity, (cp)	6.5													
Sample 1 3 min Hydration	4													
Sample 2 3 min Hydration	5													
Sample 3 3 min Hydration	6													
X-Link Vortex Closure, min:sec	n/a													
X-Link Crown, min:sec	n/a													
X-Link pH	n/a													
Gel Break Time (<2cp) mins	18													

Frac Fluid Quality Gel Testing (These Recording are to made while pumping job)														
Stage #														
Base Gel Viscosity (cp)														
X-Link pH								.						
Sample XL time, min:sec														
Sample Temperature														

Acid Quality	Percent Acid	NaOH, mLs	Specific Gravity
	28		1.14

Additional testing or documentation may be required by the customer or for frac fluid quality assurance.

Tested By: Travis Wilson

QUALITY CONTROL OF PROPPANTS

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/23/2015
Customer Name:	American Energy - Utica	Well/Stage:	3H/33
Date Sampled:	6/23/2015	DISTRICT:	Washington, PA
VENDOR:	SANTROL		

Select Proppant Type:

___ Brown	___ Ceramic	___ Other (specify)
X White	___ Bauxite	
___ Resin Coated	___ Texas Gold	

Sieve Analysis	100 Mesh			Sieve Analysis	30/50 Mesh		
Sample 1	24.80	grams of sample		Sample 2	24.80	grams of sample	
	Amount Retained				Amount Retained		
Sieve mesh	Gram	%		Sieve mesh	Gram	%	
			Total				Total
50	0.30	1.21	In-Size	20	0.00	0.00	In-Size
70	15.20	61.29		30	0.50	2.02	
100	5.10	20.56	98.8%	40	19.20	77.42	94.8%
120	2.80	11.29		45	2.40	9.68	
140	1.10	4.44		50	1.90	7.66	
200	0.30	1.21		70	0.70	2.82	
Pan	0.00	0.00	fines	Pan	0.10	0.40	fines
Total wt. Gram	24.80	100.00		Total wt. Gram	24.80	100.00	

Tested By: Travis Wilson

Post Job Report

AMERICAN ENERGY - UTICA

Red Hill Farm MDS GR 3H

Stage : 34 OF 54

HARRISON, OH

Operations Representative:

Name:	**David Knapp**
Office:	**724-743-2537**
Fax:	**724-743-7719**
Cell:	
Email:	**DAVID.KNAPP@FTSI.COM**

Sales Representative:

Name:	**Bruce Matthews**
Office:	**405-574-3981**
Fax:	**405-767-1288**
Cell:	
Email:	**BRUCE.MATTHEWS@FTSI.COM**

Engineering Manager:

Name:	**Thaddeus Craun**
Office:	**817-682-8702**
Fax:	**724-743-7719**
Cell:	
Email:	**THADDEUS.CRAUN@FTSI.COM**

FTS International
1432 Route 519
Eighty Four, PA 15330

Customer: American Energy - Utica
Well: Red Hill Farm Mds Gr 3H
Stage: 34
Job End Date: 06/24/2015

Job Summary

Well Information

TVD:	7,301	**Top Perf:**	10,695
No. Of Perfs:	30		

Casing	Tubing
5.50" 20.00#	N/A

Pressures, Rates and Volumes

	Proposed	Actual	Max	Min
STP	9,046 psi	8,912 psi	9,568 psi	8,411 psi
Rate	80.0 bpm	89.1 bpm	95.7 bpm	35.7 bpm

	Proposed	Actual		
Clean Volume	5,772 bbls	5,737 bbls		
Slurry Volume	6,042 bbls	6,008 bbls		
Flush Volume	357 bbls	304 bbls		

	Proposed	Start	End
Frac Pumps on Location	10	15	15

Open Well:	Start Time	05:20	Pressure	3,240 psi
	Ball Seat	70 bbls	Break Down	8,405 psi
	Initial ISIP:	4,738 psi	Initial F.G.:	1.08 psi/ft
Stage Complete:	End Time	06:33	Job Time	01:15
	Final ISIP	4,738 psi	Final F.G.	1.08 psi/ft
	HHP	19,462	5 Min:	4,249 psi
	Proppant Min:	0.00	10 Min:	N/A
	Proppant Max:	2.00	15 Min:	N/A

Material Volume

Material	Proposed	Calculated	Actual	Variance
100 Mesh White	40,000	39,697	39,697	0%
30/50 White	210,000	210,525	210,525	0%
Total Proppants	250,000	250,222	250,222	0%

Material	Proposed	Calculated	Actual	Variance
0.1%-7.5% HCL	3,000	2,982	3,000	1%
CI-150	3	3	3	0%
CS-250 SI	60	58	57	-2%
FE-200L	15	15	15	0%
FRW-200	180	116	114	-2%
ICI-3240	60	58	57	-2%
NE-100	0	116	114	-2%
NE-100W	120	0	0	0

Comments:

Pumpdown Information:
Total Bbls: 152
Max Pressure (psi): 5781
Max Rate (bpm): 15

FTS International
1432 Route 519
Eighty Four, PA 15330

Customer: American Energy - Utica
Well: Red Hill Farm Mds Gr 3H
Stage: 34
Job End Date: 06/24/2015

Treatment Report

Date:	6/24/2015	District:	Washington County,PA	Quote No:	051815_035725QF	API:	34-059-24370

MIL Time	STP	Slurry BPM	Stage Clean (bbls)	Cumulative Clean (bbls)	Stage Slurry (bbls)	Cumulative Slurry (bbls)	Stage Proppant (lbs)	Cumulative Proppant (lbs)	Description	Proppant	PPA
05:20	3,240	0.0	0	0	0	0	0	0	Freshwater Open Well		0.00
05:21	5,010	10.8	15	15	15	15	0	0	Freshwater Load		0.00
05:23	5,570	10.7	55	70	55	70	0	0	7.5% HCL Acid Acid		0.00
05:26	8,405	21.4	16	86	16	86	0	0	7.5% HCL Acid Breakdown		0.00
05:27	8,956	33.2	7	93	7	93	0	0	Slickwater Pad		0.00
05:27	8,975	35.7	214	307	215	308	899	899	Slickwater Proppant	100 Mesh White	0.10
05:32	9,252	86.8	214	521	216	524	2,247	3,146	Slickwater Proppant	100 Mesh White	0.25
05:37	9,163	87.4	255	776	261	785	5,355	8,501	Slickwater Proppant	100 Mesh White	0.50
05:39	9,210	90.2	429	1,205	444	1,229	13,514	22,015	Slickwater Proppant	100 Mesh White	0.75
05:43	8,867	94.9	421	1,626	440	1,669	17,682	39,697	Slickwater Proppant	100 Mesh White	1.00
05:48	8,877	94.9	876	2,502	916	2,585	36,792	76,489	Slickwater Proppant	30/50 White	1.00
05:57	8,852	95.2	1,000	3,502	1,057	3,642	52,500	128,989	Slickwater Proppant	30/50 White	1.25
06:08	8,848	94.2	861	4,363	919	4,561	54,243	183,232	Slickwater Proppant	30/50 White	1.50
06:20	8,644	94.0	500	4,863	540	5,101	36,750	219,982	Slickwater Proppant	30/50 White	1.75
06:23	8,579	94.1	360	5,223	393	5,494	30,240	250,222	Slickwater Proppant	30/50 White	2.00
06:28	8,507	93.7	210	5,433	210	5,704	0	250,222	Slickwater Clean screws		0.00
06:30	9,125	94.3	155	5,588	155	5,859	0	250,222	Slickwater Flush		0.00
06:32	8,857	89.2	149	5,737	149	6,008	0	250,222	Freshwater Flush		0.00
06:33	4,738	0.0	0	5,737	0	6,008	0	250,222	Freshwater Shutdown		0.00
Total JobTime (HH:MM): 01:14											

Min STP:	8,411 psi	**Max STP:**	9,568 psi	**Average STP:**	8,912 psi	**5 Min:**	4,249 psi
Min Rate:	35.7 bpm	**Max Rate:**	95.7 bpm	**Average Rate:**	89.1 bpm	**10 Min:**	0 psi
Initial ISIP:	4,738 psi	**Initial F.G.:**	1.08 psi/ft	**Average HHP:**	19,462	**15 Min:**	0 psi
Final ISIP:	4,738 psi	**Final F.G.:**	1.08 psi/ft	**Customer Representative:**		Mike Hausviater	
FTSI Representative:		Etuate Varea & Jason McCoskey					

Comments:

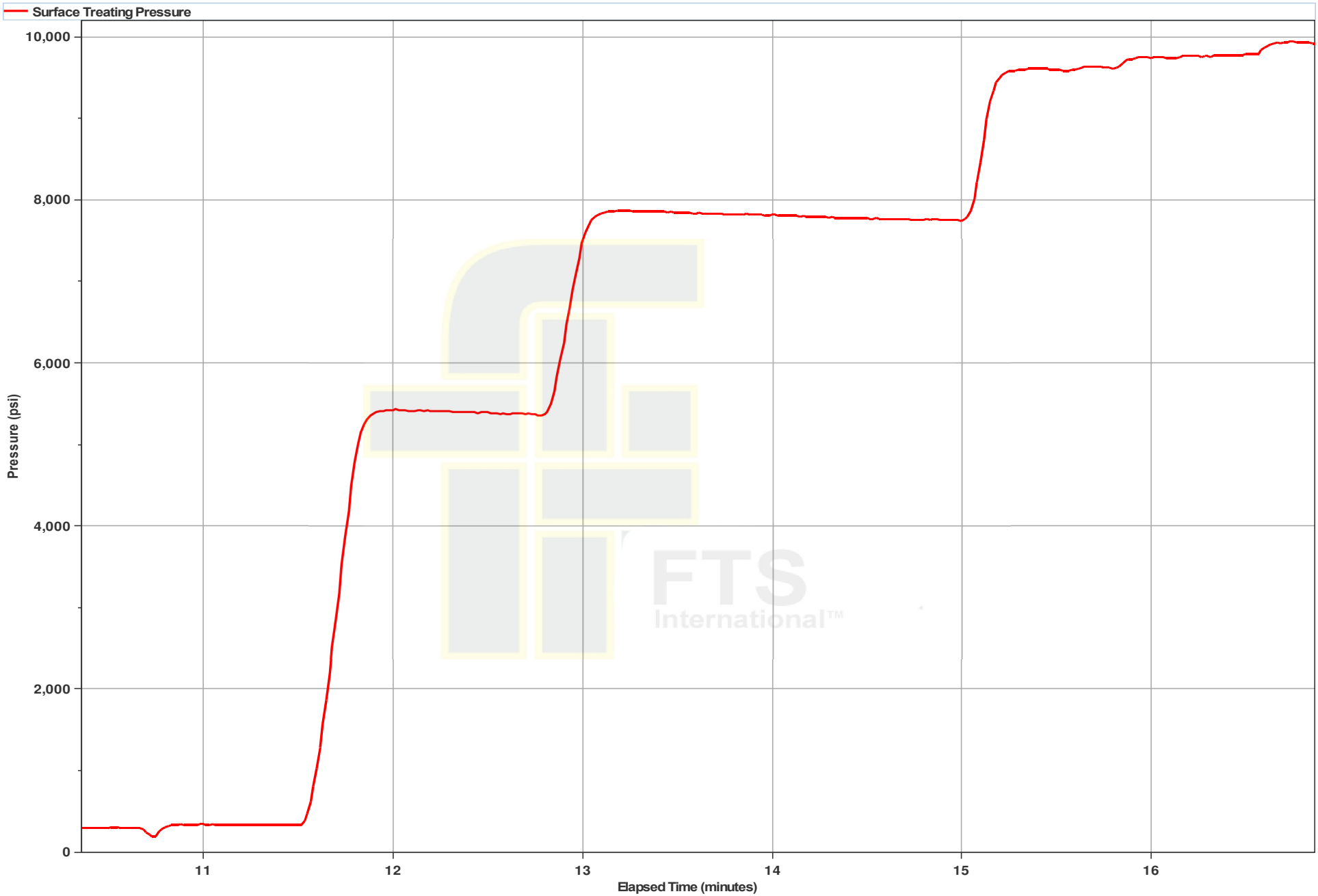
The proppant values contained in this report are calculated based on actual barrel counts and target densities. Actual total proppant usage is 250,222 lbs. Charge time is 1 hour(s) 15 minute(s). All chemicals and proppant ran as documented.

Min/Max/Avg were taken from sand stages. All chem changes from proposed were made per AEU representative request.

No reused water pumped

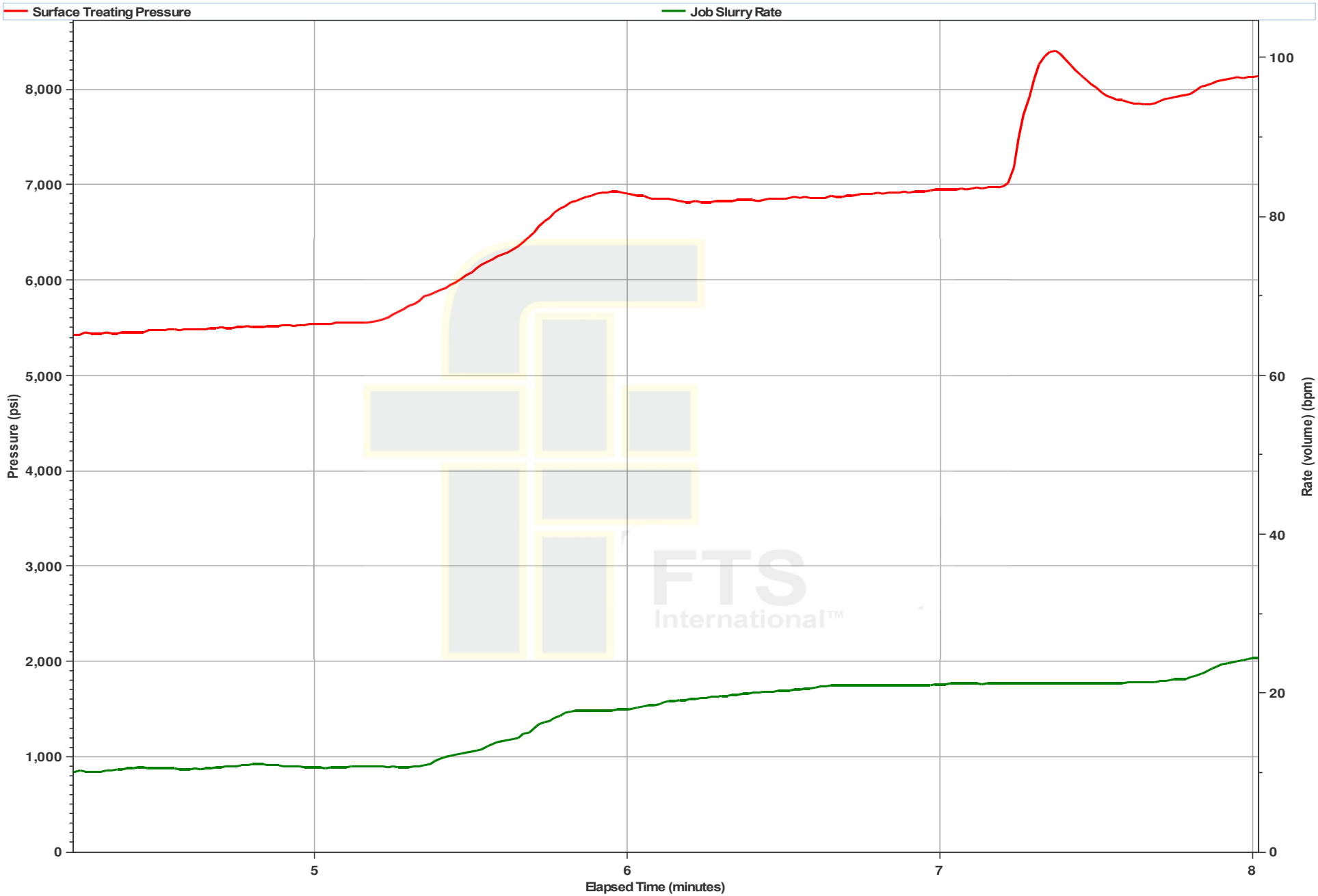
1 Minute Shutdown (psi): 4564
2 Minute Shutdown (psi): 4412
5 Minute Shutdown (psi): 4249

AEU Pressure Test



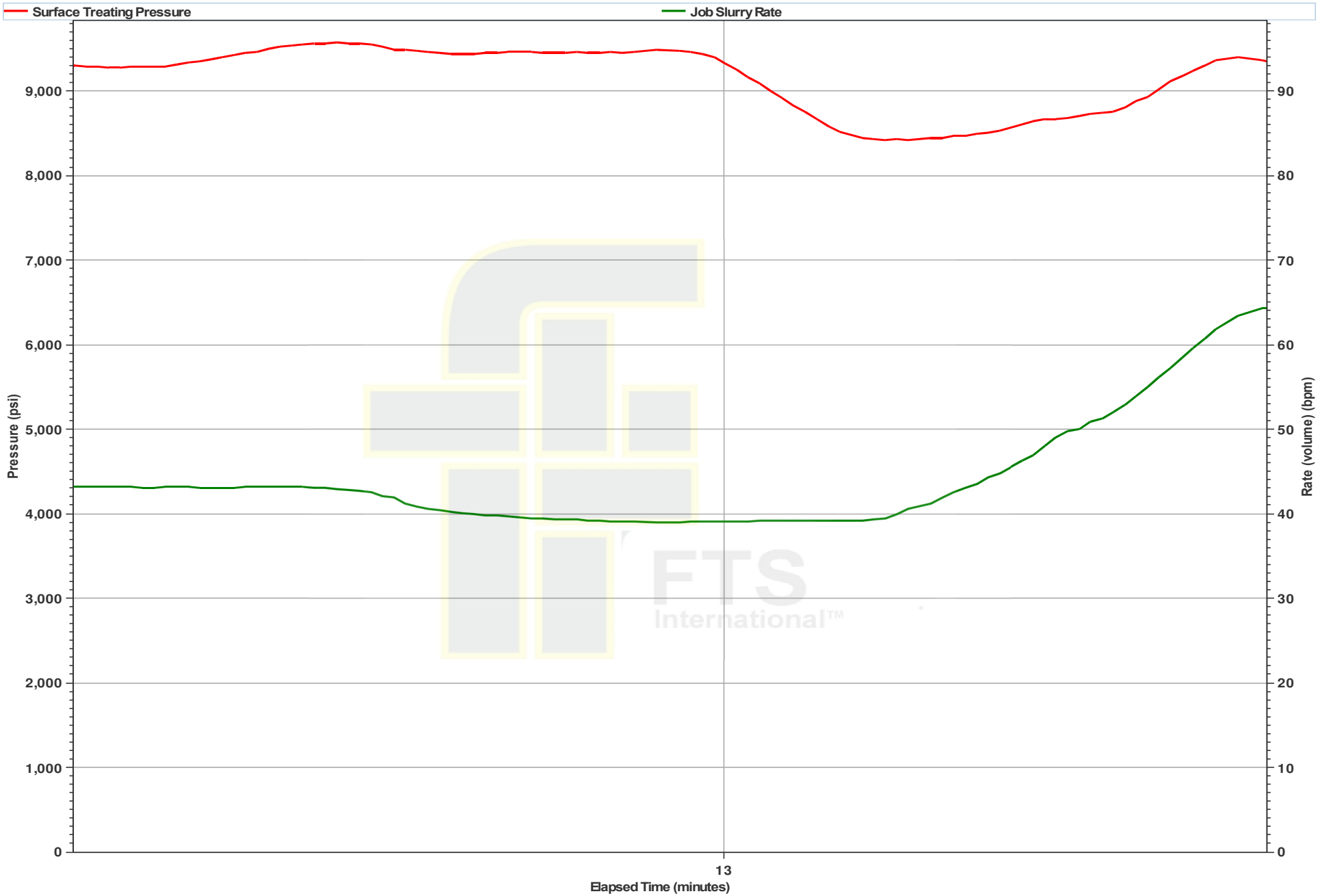
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 34 (WF.000658.M.W03.S34-ADCT-1103) **Jun 24, 2015**

Ball Seat and Breakdown



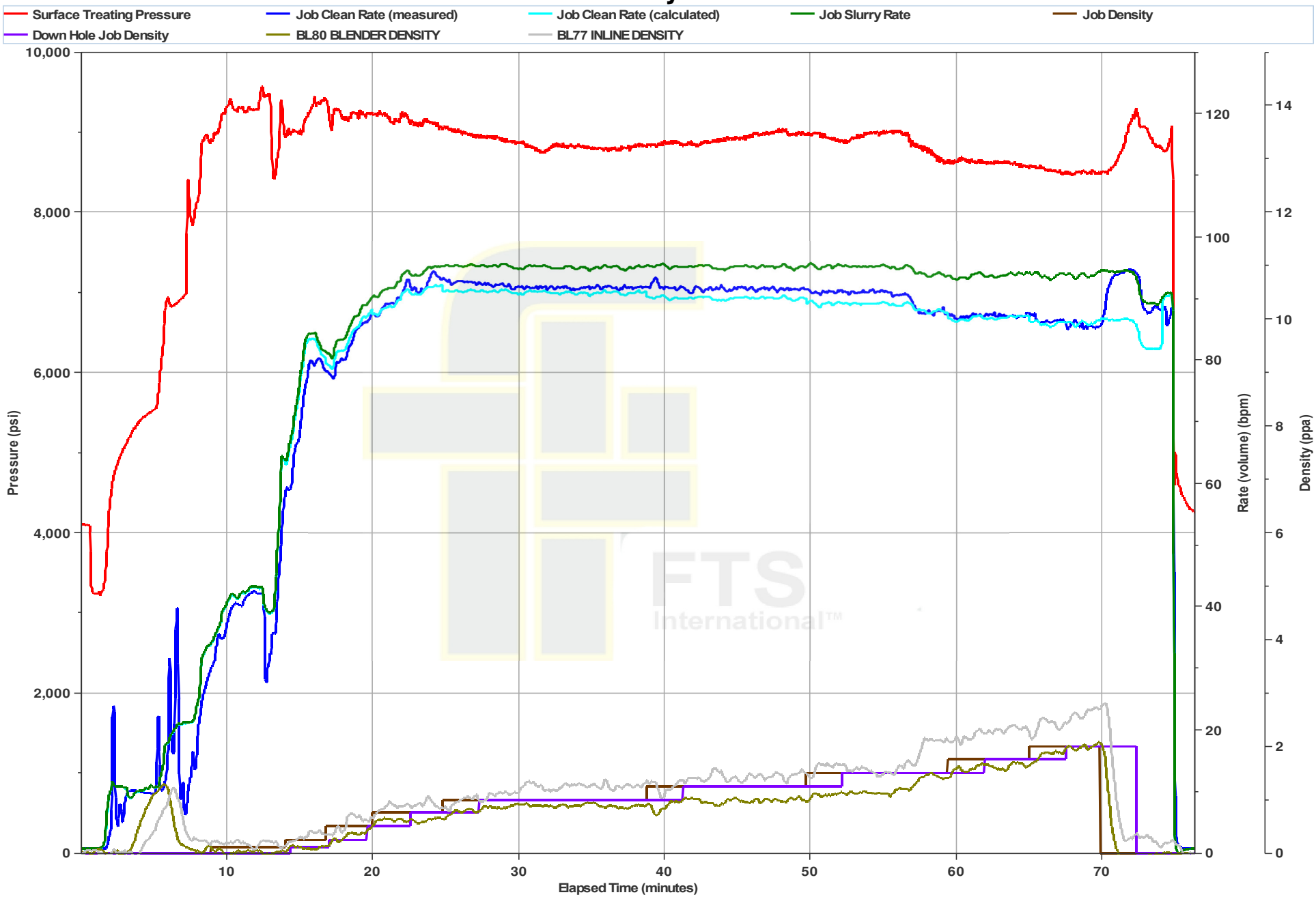
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 34 (WF.000658.M.W03.S34-ADCT-1103) **Jun 24, 2015**

Acid on Perforations



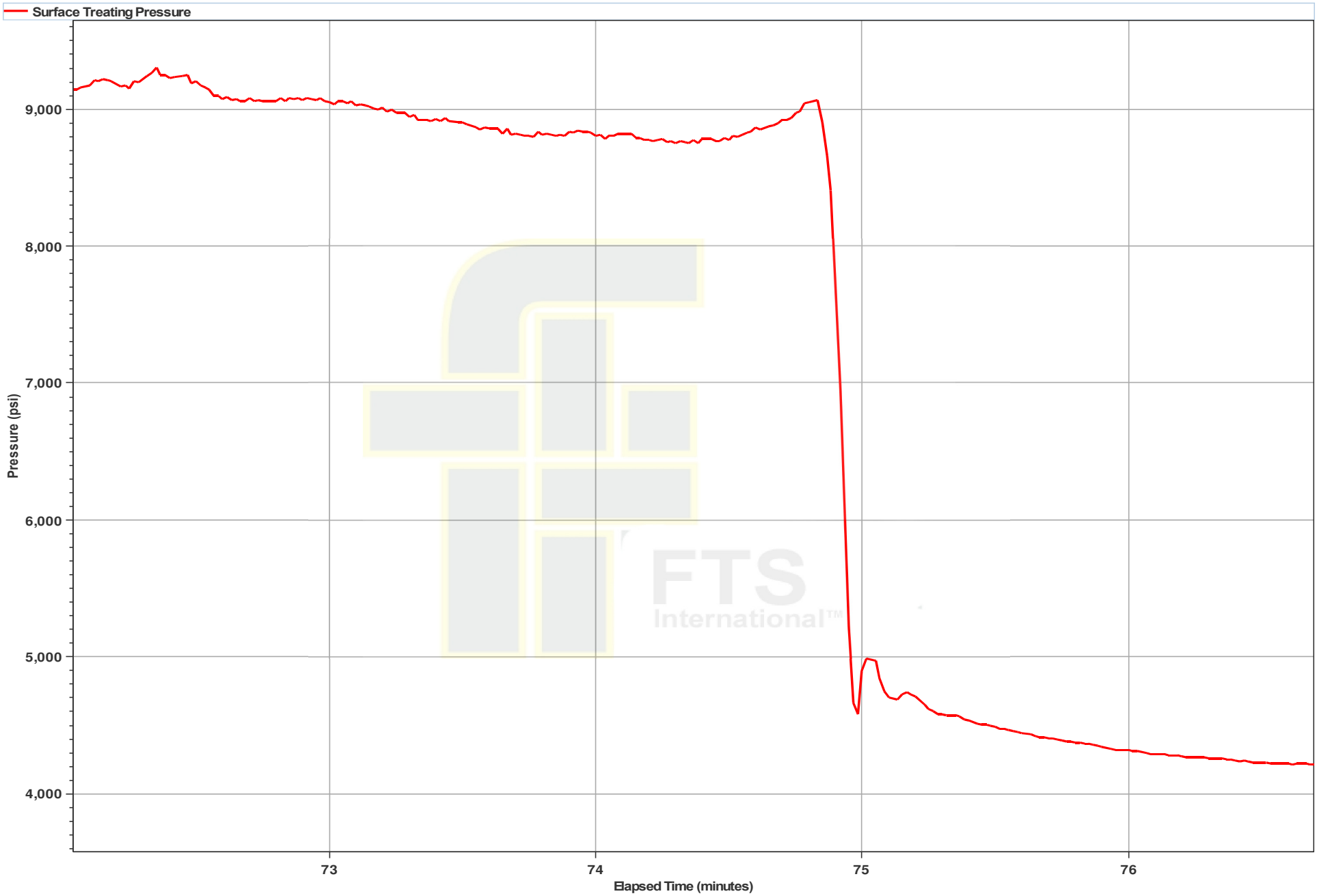
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 34 (WF.000658.M.W03.S34-ADCT-1103) **Jun 24, 2015**

Primary Plot



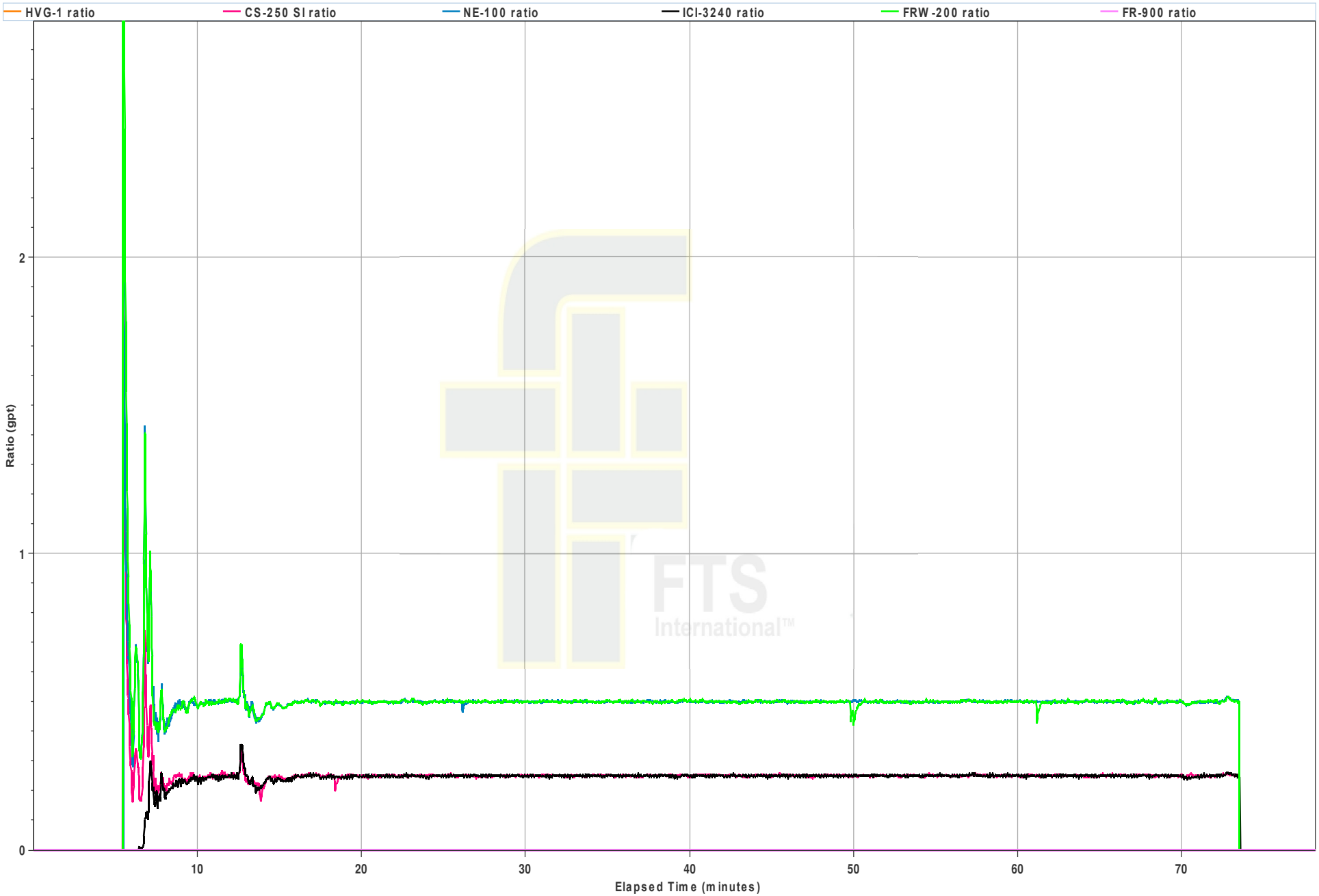
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 34 (WF.000658.M.W03.S34-ADCT-1103) **Jun 24, 2015**

ISIP Plot



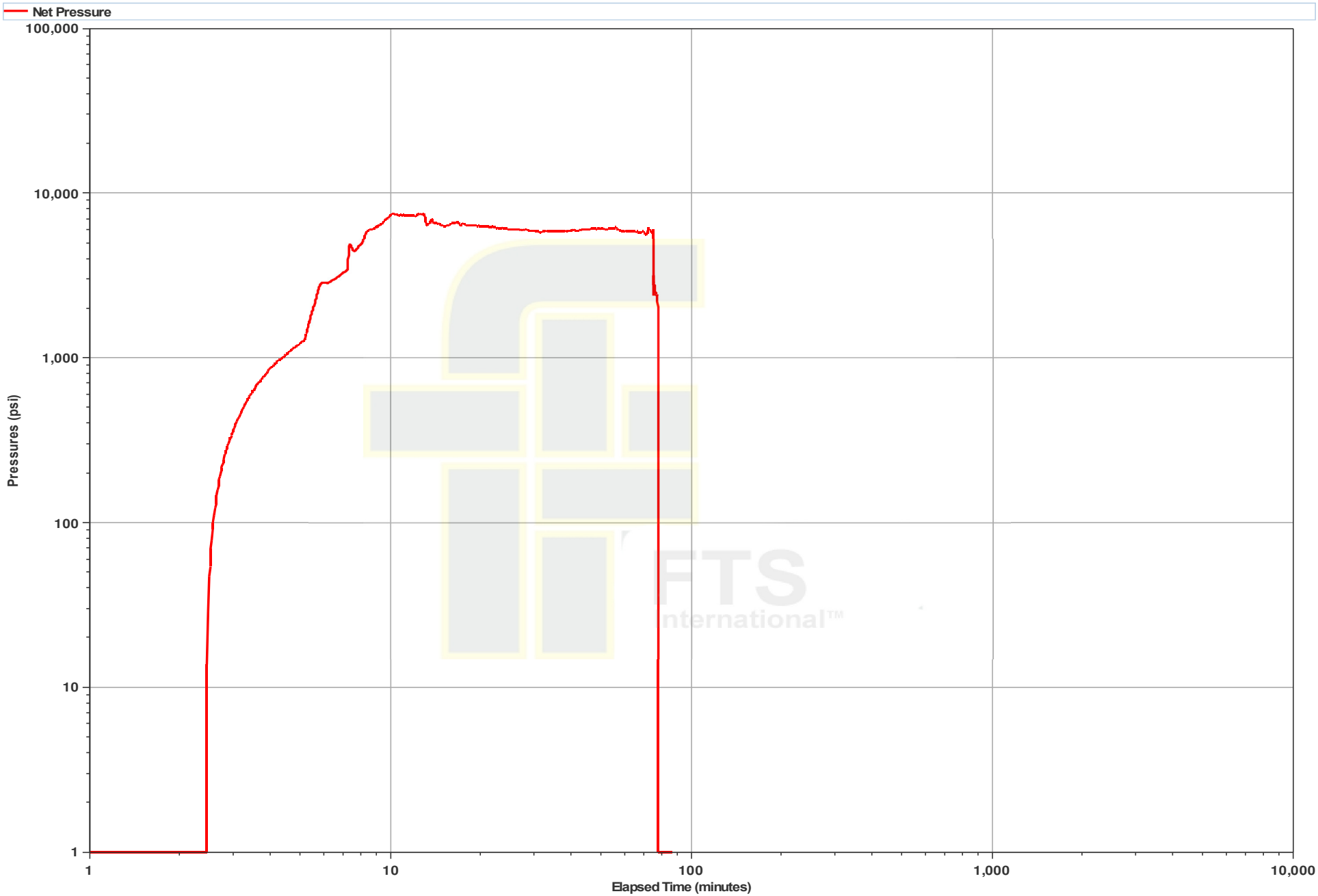
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 34 (WF.000658.M.W03.S34-ADCT-1103) **Jun 24, 2015**

Chemical Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 34 (WF.000658.M.W03.S34-ADCT-1103) **Jun 24, 2015**

Net Pressure Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 34 (WF.000658.M.W03.S34-ADCT-1103) Jun 24, 2015

WATER-BASED FRAC FLUID QUALITY CONTROL
(Attachment to Post Treatment Report)

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/24/2015
Customer Name:	American Energy - Utica	Proposal #:	3H/34
Date Sampled:	6/24/2015	Water Source:	Working Tank

Sample/Tank No.	Clarity, Color, Odor	Sample Temperature, (F)	Specific gravity	Initial pH	Chloride, ppm	Hardness, ppm	Calcium, ppm	Magnesium, ppm	Iron ppm	Hydroxide, ppm	Bicarbonate, ppm	Carbonate, ppm	Sulfate, ppm	Barium, ppm
Working Tank	Clear	72	1	7.7	32	51	17	8	0	0	77	0	<50	0

Frac Fluid Quality Gel Testing (These Recording are to made prior to pumping job)														
Sample #														
Base Gel Type	HVG-1													
Gel Loading (lbs/1000 gal.)	2.5													
Sample Temperature, (F)	72													
Initial pH	8													
Visc. Reading @ 300 rpms	6													
Viscosity, (cp)	6													
Sample 1 3 min Hydration	4													
Sample 2 3 min Hydration	5													
Sample 3 3 min Hydration	6													
X-Link Vortex Closure, min:sec	n/a													
X-Link Crown, min:sec	n/a													
X-Link pH	n/a													
Gel Break Time (<2cp) mins	18													

Frac Fluid Quality Gel Testing (These Recording are to made while pumping job)														
Stage #														
Base Gel Viscosity (cp)														
X-Link pH								.						
Sample XL time, min:sec														
Sample Temperature														

Acid Quality	Percent Acid	NaOH, mLs	Specific Gravity
	28		1.14

Additional testing or documentation may be required by the customer or for frac fluid quality assurance.

Tested By: Etuate Varea

QUALITY CONTROL OF PROPPANTS

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/24/2015
Customer Name:	American Energy - Utica	Well/Stage:	3H/34
Date Sampled:	6/24/2015	DISTRICT:	Washington, PA
VENDOR:	SANTROL		

Select Proppant Type:

___ Brown	___ Ceramic	___ Other (specify)
X White	___ Bauxite	_____
___ Resin Coated	___ Texas Gold	

Sieve Analysis	100 Mesh			Sieve Analysis	30/50 Mesh		
Sample 1	25.10	grams of sample		Sample 2	25.20	grams of sample	
	Amount Retained				Amount Retained		
Sieve mesh	Gram	%		Sieve mesh	Gram	%	
			Total				Total
50	0.30	1.20	In-Size	20	0.00	0.00	In-Size
70	14.10	56.18		30	0.50	1.98	
100	6.20	24.70	98.8%	40	19.60	77.78	95.2%
120	3.10	12.35		45	3.20	12.70	
140	1.30	5.18		50	1.20	4.76	
200	0.10	0.40		70	0.70	2.78	
Pan	0.00	0.00	fines	Pan	0.00	0.00	fines
Total wt. Gram	25.10	100.00		Total wt. Gram	25.20	100.00	

Tested By: Etuate Varea

Post Job Report

AMERICAN ENERGY - UTICA

Red Hill Farm MDS GR 3H

Stage : 35 OF 54

HARRISON, OH

Operations Representative:

Name:	David Knapp
Office:	724-743-2537
Fax:	724-743-7710
Cell:	
Email:	DAVID.KNAPP@FTSI.COM

Sales Representative:

Name:	Bruce Matthews
Office:	405-574-3921
Fax:	405-787-1335
Cell:	
Email:	BRUCE.MATTHEWS@FTSI.COM

Engineering Manager:

Name:	Thaddeus Craun
Office:	817-832-8702
Fax:	724-743-7710
Cell:	
Email:	THADDEUS.CRAUN@FTSI.COM

FTS International
[illegible]
Eighty Four, PA [illegible]

FTS INTERNATIONAL

Customer: American Energy - Utica
Well: Red Hill Farm Bla 6r 3H
Stages: 14
Job End Date: [illegible]

Job Summary

Well Information

TVD:	7,301	Top Perf:	10,549
No. Of Perfs:	30		

Casing	Tubing
5.50" 23.000	N/A

Pressures, Rates and Volumes

	Proposed	Actual	Max	Min
STP	8,000 psi	3,030 psi	8,017 psi	0,000 psi
Rate	80.0 bpm	80.0 bpm	82.3 bpm	32.0 bpm

	Proposed	Actual		
Clean Volume	6,772 bbls	5,340 bbls		
Slurry Volume	6,002 bbls	5,117 bbls		
Flush Volume	397 bbls	365 bbls		

	Proposed	Start	End
Free Pumps on Location	19	15	14

Open Well:	Start Time	15:52	Pressure	3,030 psi
	Bd End	314 bbls	Break Down	7,034 psi
	Initial ISIP:	4,000 psi	Initial F.G.:	1.05 psi/ft
Stage Complete:	End Time	17:34	Job Time	01:35
	Final ISIP:	4,000 psi	Final F.G.	1.05 psi/ft
	HHP	10,101	5 Min:	4,000 psi
	Pressure Min:	0.00	10 Min:	N/A
	Pressure Max:	0.00	15 Min:	N/A

Material Volume

Material	Proposed	Calculated	Actual	Variance
100 Mesh White	40,000	30,221	30,221	0%
30/50 White	210,000	210,021	210,021	0%
Total Proppants	250,000	240,242	240,242	0%

Material	Proposed	Calculated	Actual	Variance
6.1%-7.5% HCL	3,000	2,042	3,000	1%
CI-150	3	3	3	0%
CI-150 2X	60	60	61	2%
FE-360L	15	15	15	0%
FRW-250	130	134	97	-27%
EC-2000	60	60	61	2%
NE-100	6	120	117	-2%
NE-100W	120	0	0	0

Comments:

Pumpdown Information:
Total Bbls: 136
Max Pressure (psi): 6242
Max Rate (bpm): 19.1

FTS International
[illegible] Route [illegible]
Eighty Four, PA [illegible]

Customer: American Energy - Utica
Well: [illegible]
Stage: [illegible]
Job End Date: [illegible]

Treatment Report

Date	[illegible]	District	Washington County, PA	Quote No	[illegible]	API#	[illegible]

Stg. Time	STP	Slurry BPM	Stage Slurry (bbls)	Cumulative Slurry (bbls)	Stage Clean (bbls)	Cumulative Clean (bbls)	Stage Proppant (lbs)	Cumulative Proppant (lbs)	Description	Proppant	PPA
[illegible]	[illegible]	0.0	0	0	0	0	0	0	Freshwater Open Well		0.00
[illegible]	[illegible]	0.0	10	10	10	10	0	0	Freshwater Load		0.00
15:54	[illegible]	11.2	71	81	71	81	0	0	7.5% HCL Acid Acid		0.00
[illegible]	7,019	22.5	119	200	119	200	0	0	Slickwater Load		0.00
16:07	[illegible]	[illegible]	14	214	14	214	[illegible]	[illegible]	Slickwater Proppant	100 Mesh White	0.10
[illegible]	[illegible]	[illegible]	0	214	0	214	0	[illegible]	Slickwater Breakdown		0.00
[illegible]	[illegible]	[illegible]	[illegible]	417	[illegible]	[illegible]	[illegible]	[illegible]	Slickwater Proppant	100 Mesh White	0.10
16:11	8,171	[illegible]	214	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Slickwater Proppant	100 Mesh White	0.25
16:13	8,171	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Slickwater Proppant	100 Mesh White	0.50
[illegible]	8,224	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Slickwater Proppant	100 Mesh White	0.75
[illegible]	8,176	81.2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Slickwater Proppant	100 Mesh White	1.00
[illegible]	[illegible]	81.2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Slickwater Proppant	[illegible] White	1.00
16:41	[illegible]	81.2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Slickwater Proppant	[illegible] White	1.25
16:47	[illegible]	[illegible]	[illegible]	4,131	[illegible]	[illegible]	[illegible]	[illegible]	Slickwater Proppant	[illegible] White	1.50
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Slickwater Proppant	[illegible] White	1.75
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Slickwater Proppant	[illegible] White	2.00
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0	[illegible]	Slickwater Clean Sweep		0.00
17:11	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0	[illegible]	Slickwater Flush		0.00
17:14	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	4,117	0	[illegible]	Freshwater Flush		0.00
17:14	[illegible]	0.0	0	[illegible]	0	4,117	0	[illegible]	Freshwater Shutdown		0.00
Total Job Time (HH:MM): [illegible]											

Min STP:	[illegible] psi	Max STP:	[illegible] psi	Average STP:	[illegible] psi	5 Min:	[illegible] psi
Min Rate:	[illegible] bpm	Max Rate:	82.2 bpm	Average Rate:	[illegible] bpm	10 Min:	[illegible] psi
Initial ISIP:	[illegible] psi	Initial F.G.:	[illegible] psi/ft	Average HHP:	[illegible]	15 Min:	[illegible] psi
Final ISIP:	[illegible] psi	Final F.G.:	[illegible] psi/ft	Customer Representative		[illegible]	
FTS Representative		[illegible] & Jason McCauley					

Comments:

The proppant values contained in this report are calculated based on actual barrel counts and target densities. Actual total proppant usage is [illegible] lbs. Charge time is 1 hour(s) [illegible] minute(s). All chemicals and proppant run as documented.

Min/Max/Avg were taken from sand stages. All chem changes from proposed were made per AEU representative request.

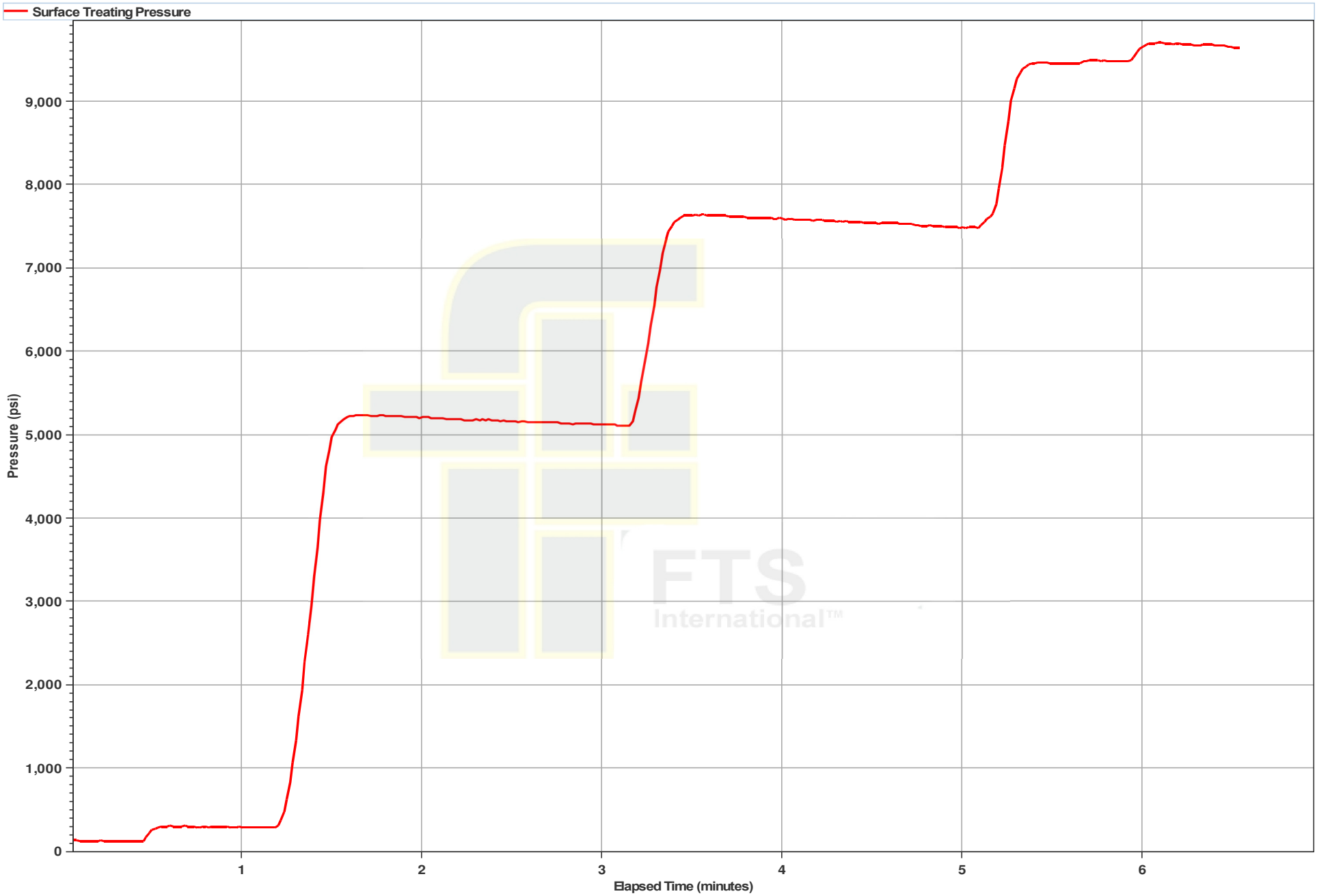
No reuse water was run on this stage.

1 Minute Shutdown (psi): [illegible]
2 Minute Shutdown (psi): [illegible]
5 Minute Shutdown (psi): [illegible]

Chemical Changes:

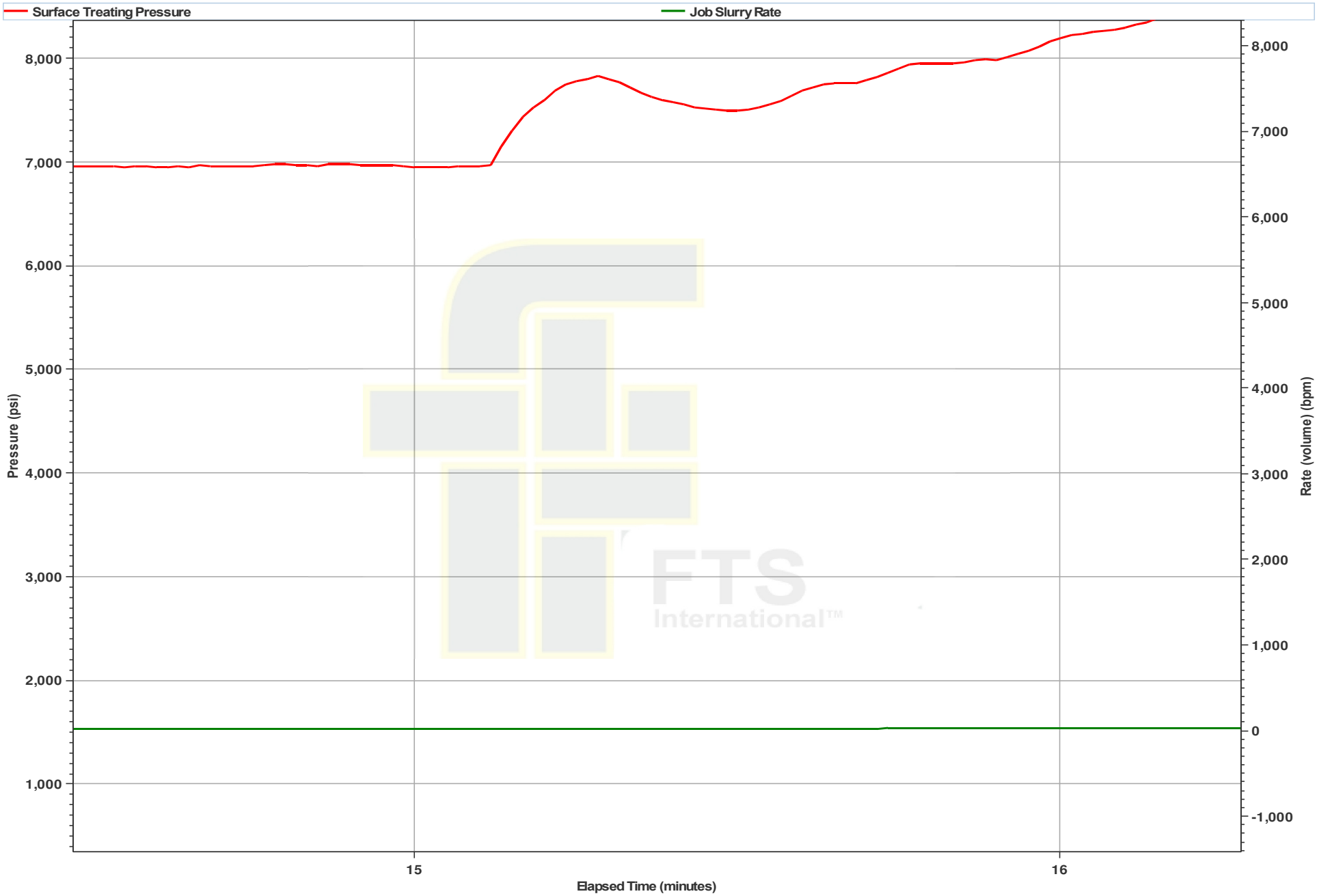
Chemical Name	Chemical Loading	Cumulative Gleen
FRW-200	0.50	2,574

AEU Pressure Test



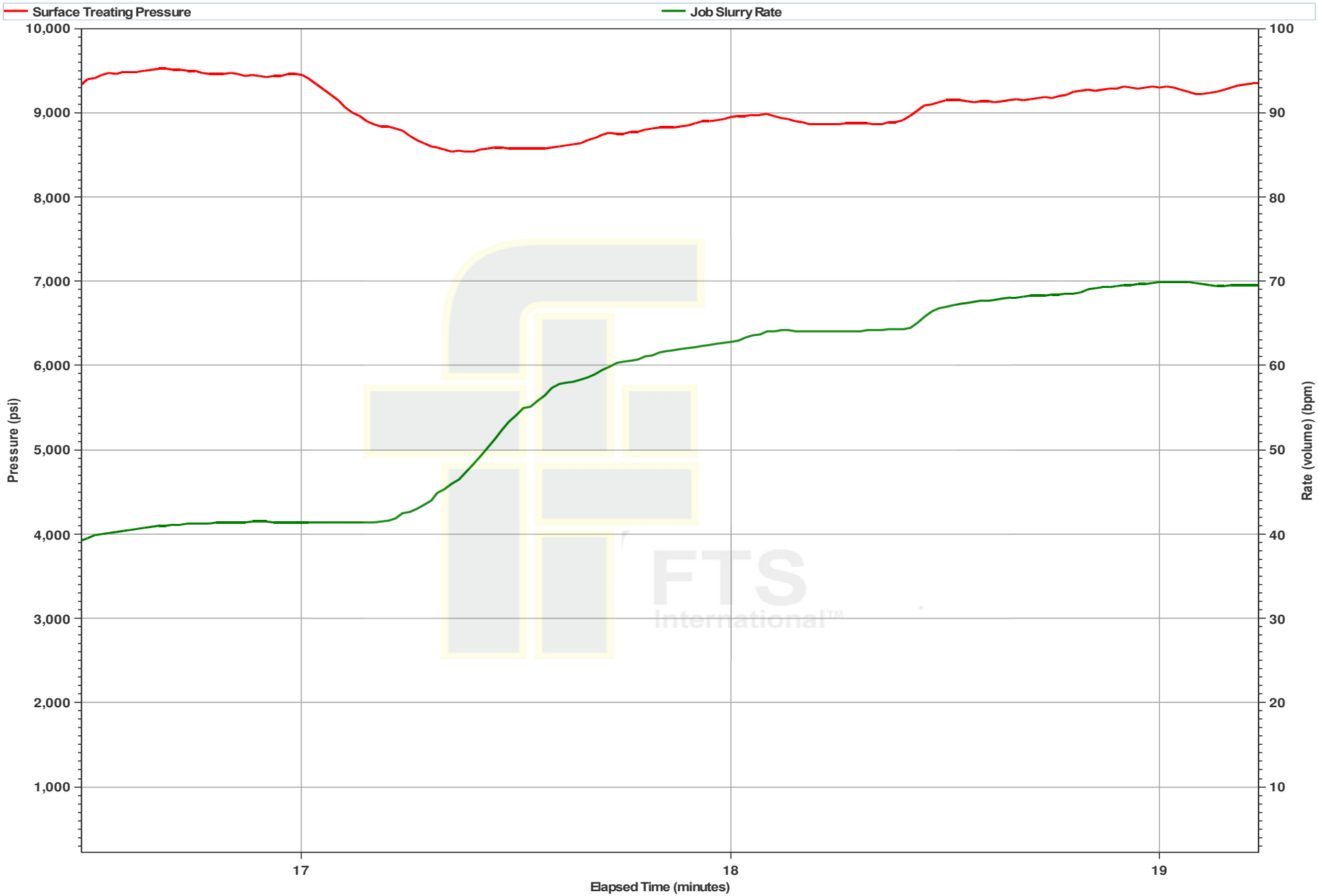
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 35 (WF.000658.M.W03.S35-aDCT-1103) **Jun 24, 2015**

Ball Seat and Breakdown



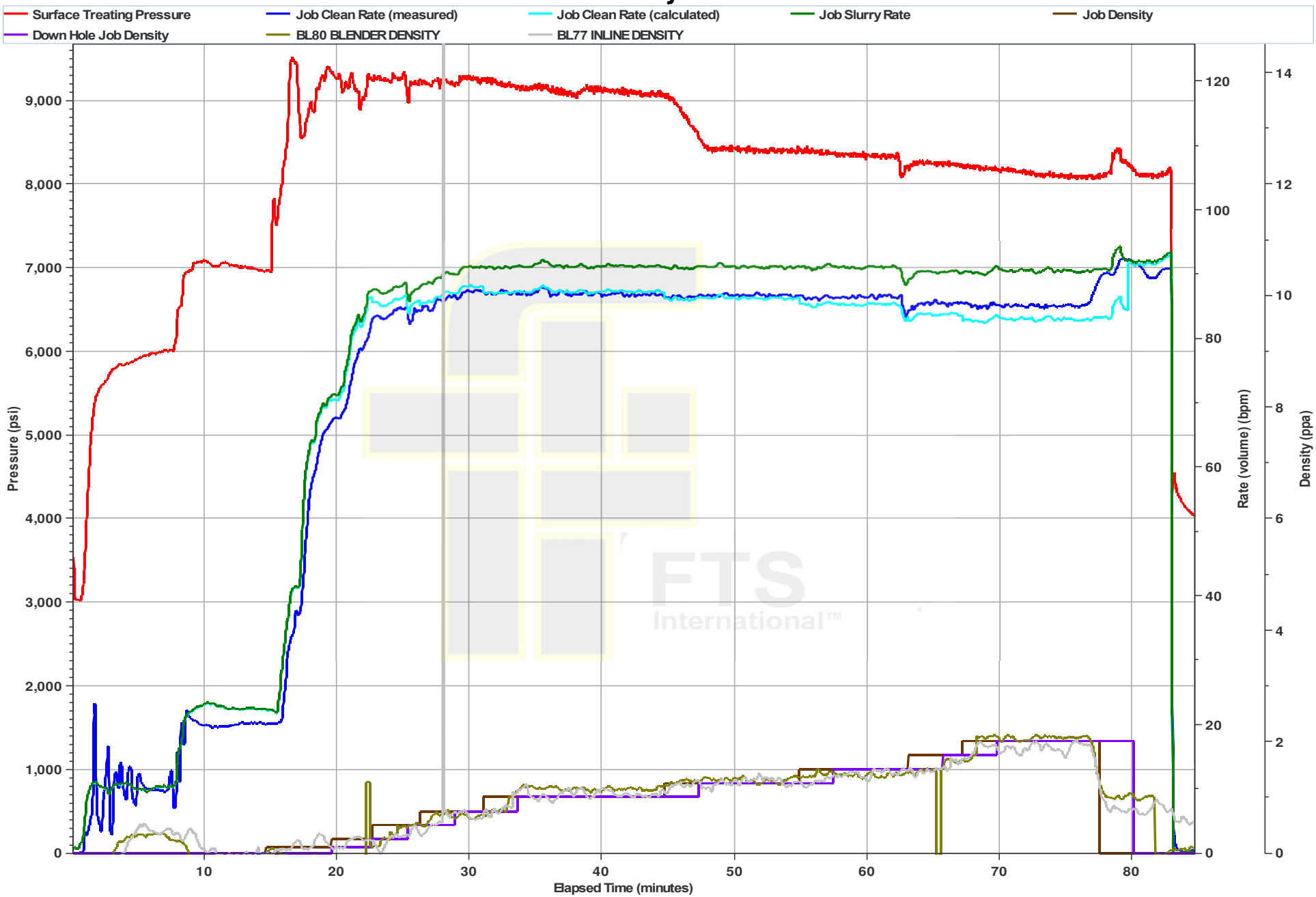
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 35 (WF.000658.M.W03.S35-aDCT-1103) Jun 24, 2015

Acid on Perforations



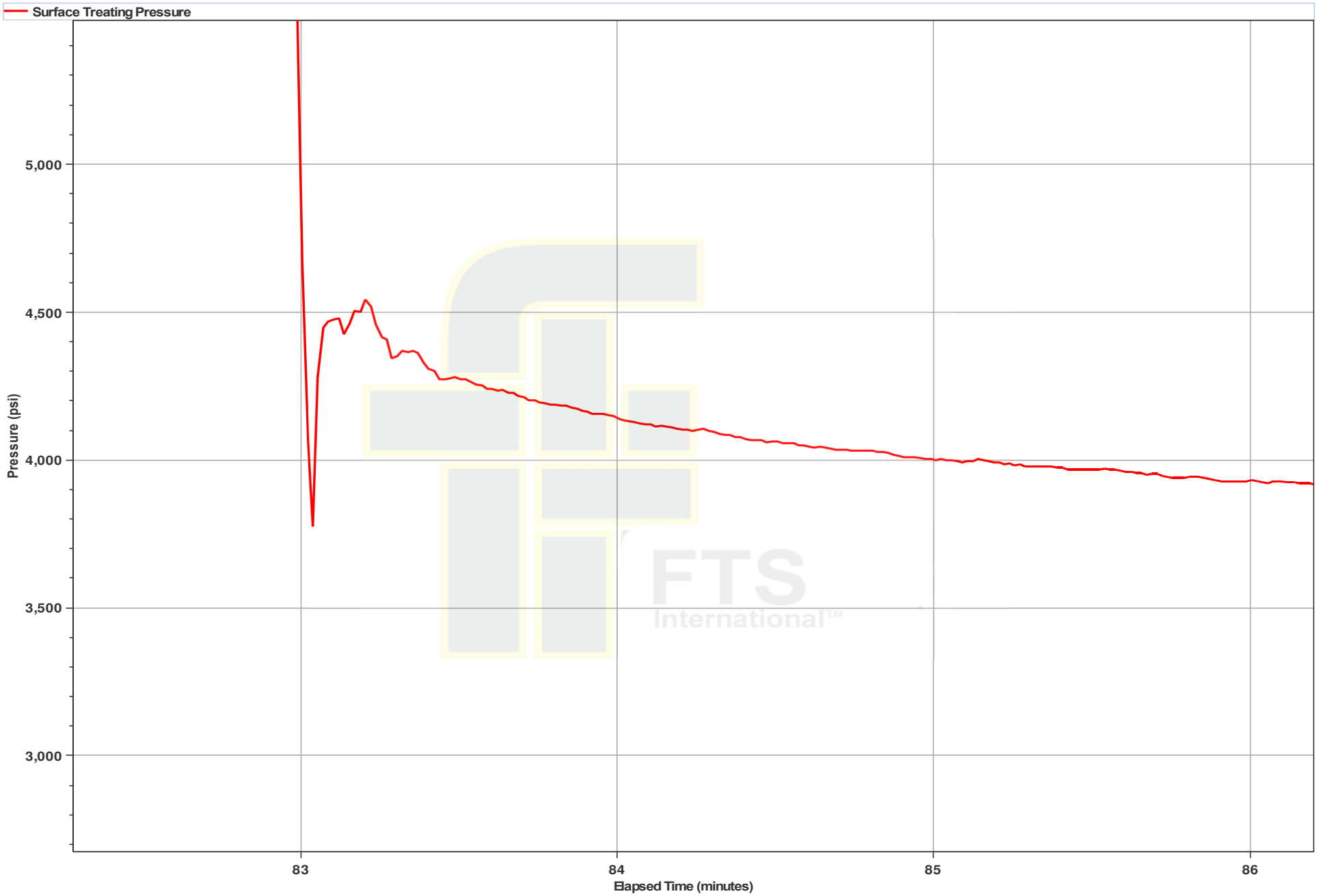
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 35 (WF.000658.M.W03.S35-aDCT-1103) **Jun 24, 2015**

Primary Plot



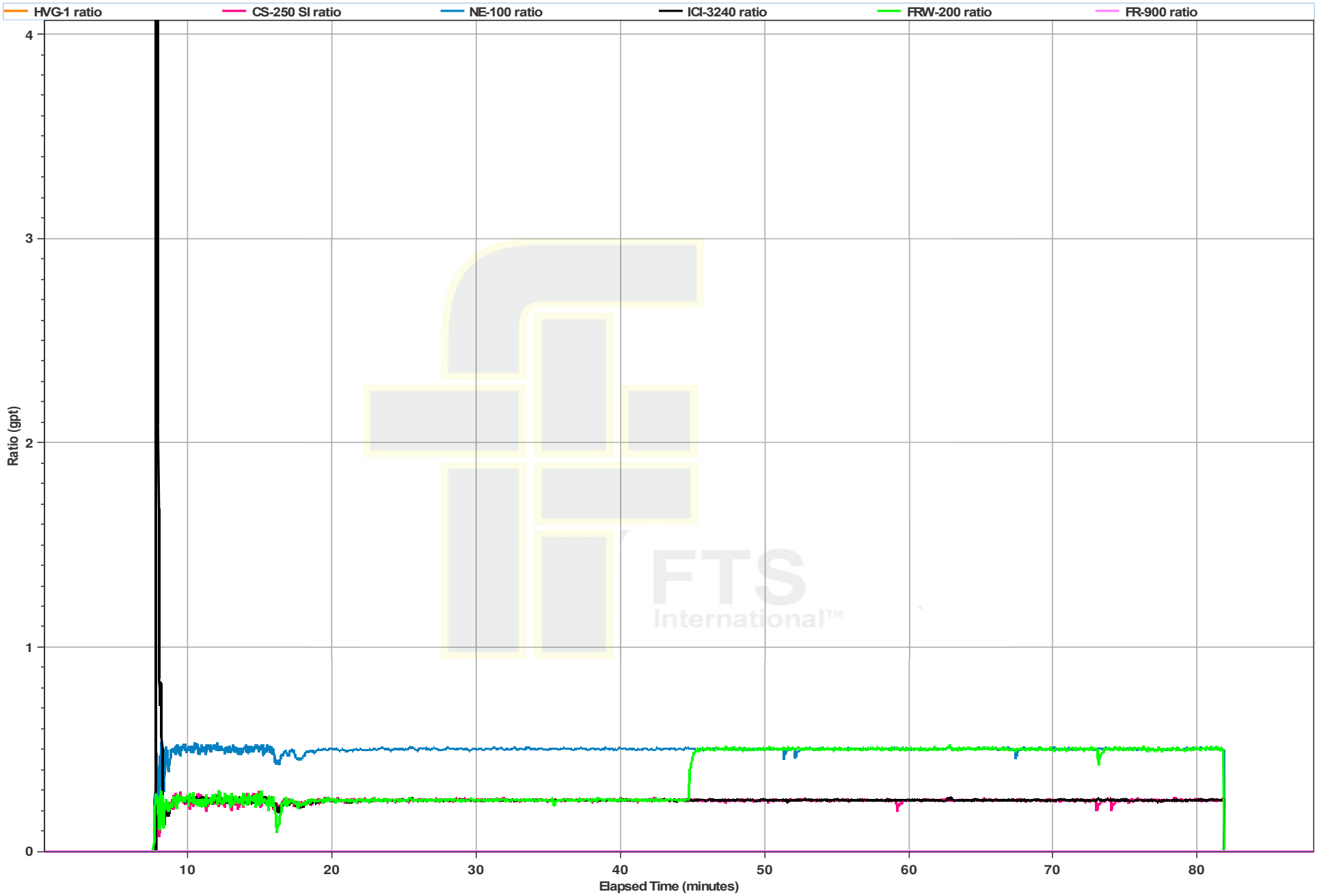
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 35 (WF.000658.M.W03.S35-aDCT-1103) **Jun 24, 2015**

ISIP Plot



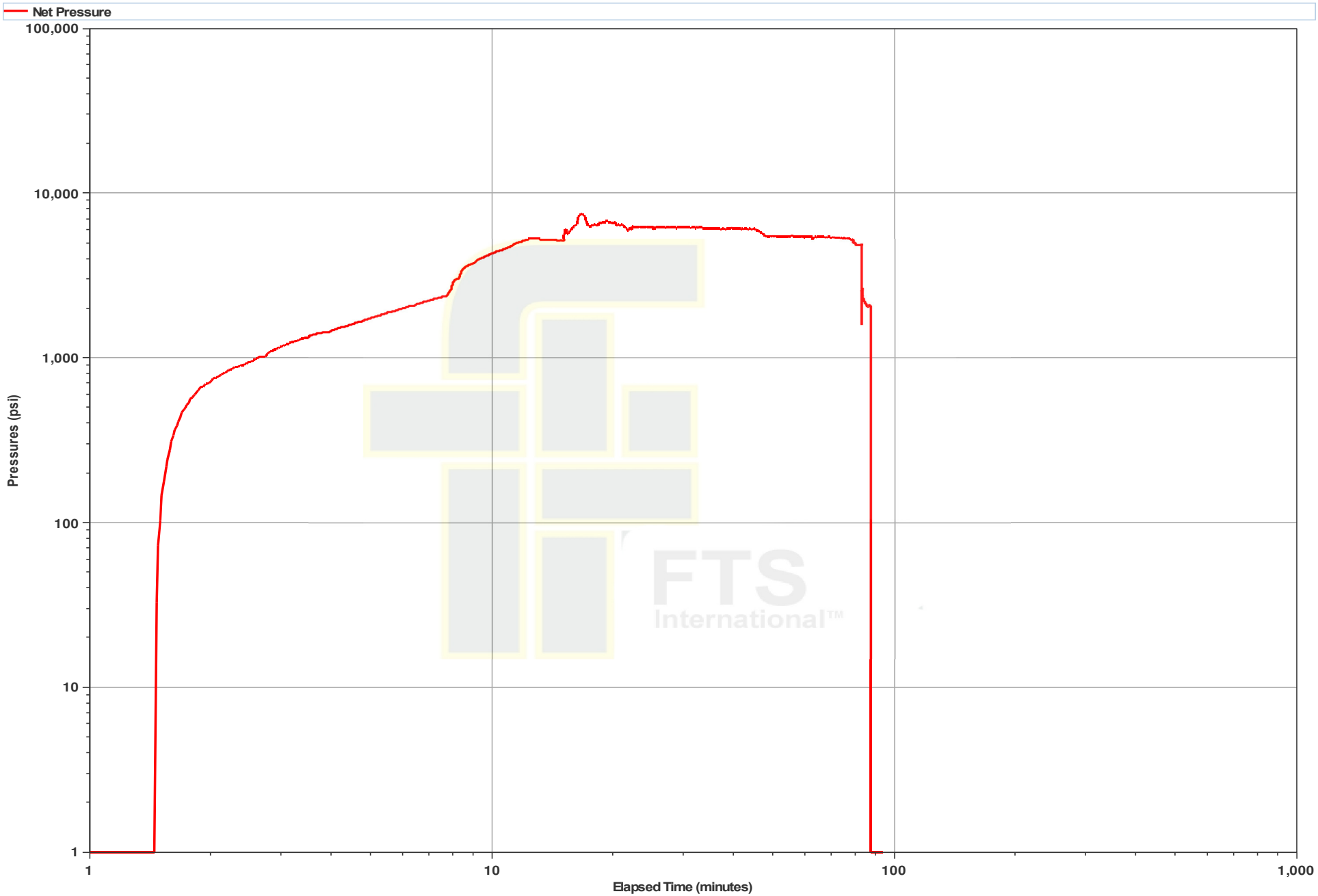
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 35 (WF.000658.M.W03.S35-aDCT-1103) Jun 24, 2015

Chemical Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 35 (WF.000658.M.W03.S35-aDCT-1103) Jun 24, 2015

Net Pressure Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 35 (WF.000658.M.W03.S35-aDCT-1103) Jun 24, 2015

WATER-BASED FRAC FLUID QUALITY CONTROL
(Attachment to Post Treatment Report)

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/24/2015
Customer Name:	American Energy - Utica	Proposal #:	3H/35
Date Sampled:	6/24/2015	Water Source:	Working Tank

Sample/Tank No.	Clarity, Color, Odor	Sample Temperature, (F)	Specific gravity	Initial pH	Chloride, ppm	Hardness, ppm	Calcium, ppm	Magnesium, ppm	Iron ppm	Hydroxide, ppm	Bicarbonate, ppm	Carbonate, ppm	Sulfate, ppm	Barium, ppm
Working Tank	Clear	73	1	8.1	36	56	20	9	0	0	72	0	<50	0

Frac Fluid Quality Gel Testing (These Recording are to made prior to pumping job)														
Sample #														
Base Gel Type	HVG-1													
Gel Loading (lbs/1000 gal.)	2.5													
Sample Temperature, (F)	73													
Initial pH	8													
Visc. Reading @ 300 rpms	6													
Viscosity, (cp)	6													
Sample 1 3 min Hydration	4													
Sample 2 3 min Hydration	5													
Sample 3 3 min Hydration	6													
X-Link Vortex Closure, min:sec	n/a													
X-Link Crown, min:sec	n/a													
X-Link pH	n/a													
Gel Break Time (<2cp) mins	18													

Frac Fluid Quality Gel Testing (These Recording are to made while pumping job)														
Stage #														
Base Gel Viscosity (cp)														
X-Link pH								.						
Sample XL time, min:sec														
Sample Temperature														

Acid Quality	Percent Acid	NaOH, mLs	Specific Gravity
	28		1.14

Additional testing or documentation may be required by the customer or for frac fluid quality assurance.

Tested By: Etuate Varea

QUALITY CONTROL OF PROPPANTS

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/24/2015
Customer Name:	American Energy - Utica	Well/Stage:	3H/35
Date Sampled:	6/24/2015	DISTRICT:	Washington, PA
VENDOR:	SANTROL		

Select Proppant Type:

___ Brown	___ Ceramic	___ Other (specify)
X White	___ Bauxite	
___ Resin Coated	___ Texas Gold	

Sieve Analysis	100 Mesh			Sieve Analysis	30/50 Mesh		
Sample 1	25.20	grams of sample		Sample 2	24.50	grams of sample	
	Amount Retained				Amount Retained		
Sieve mesh	Gram	%		Sieve mesh	Gram	%	
			Total				Total
50	0.20	0.79	In-Size	20	0.00	0.00	In-Size
70	16.20	64.29		30	0.20	0.82	
100	5.30	21.03	99.2%	40	18.10	73.88	96.7%
120	2.40	9.52		45	4.10	16.73	
140	1.00	3.97		50	1.50	6.12	
200	0.10	0.40		70	0.50	2.04	
Pan	0.00	0.00	fines	Pan	0.10	0.41	fines
Total wt. Gram	25.20	100.00		Total wt. Gram	24.50	100.00	

Tested By: Etuate Varea

Post Job Report

AMERICAN ENERGY - UTICA

Red Hill Farm MDS GR 3H

Stage : 36 OF 54

HARRISON, OH

Operations Representative:

Name:	David Knapp
Office:	724-743-2537
Fax:	724-743-7710
Cell:	
Email:	DAVID.KNAPP@FTSI.COM

Sales Representative:

Name:	Bruce Matthews
Office:	405-574-3921
Fax:	405-787-1335
Cell:	
Email:	BRUCE.MATTHEWS@FTSI.COM

Engineering Manager:

Name:	Thaddeus Craun
Office:	817-832-8702
Fax:	724-743-7710
Cell:	
Email:	THADDEUS.CRAUN@FTSI.COM

FTS International
[illegible]
Eighty Four, PA [illegible]

FTS INTERNATIONAL

Customer: American Energy - Utica
Well: Red Hill Farm Bla 6r 3H
Stages: 30
Job End Date: [illegible]

Job Summary

Well Information

TVD:	7,301	Top Perf:	10,381
No. Of Perfs:	30		

Casing	Tubing
5.50" 23.000	N/A

Pressures, Rates and Volumes

	Proposed	Actual	Max	Min
STP	8,000 psi	3,000 psi	8,412 psi	7,303 psi
Rate	60.0 bpm	63.3 bpm	66.3 bpm	31.0 bpm

	Proposed	Actual		
Clean Volume	6,772 bbls	6,873 bbls		
Slurry Volume	6,602 bbls	6,543 bbls		
Flush Volume	397 bbls	365 bbls		

	Proposed	Start	End
Free Pumps on Location	18	14	14

Open Well:	Start Time	22:00	Pressure	3,195 psi
	Bal Brd	330 bbls	Break Down	7,891 psi
	Initial ISIP:	4,258 psi	Initial F.G.:	1.00 psi/ft
Stage Complete:	End Time	22:05	Job Time	05:05
	Final ISIP:	4,258 psi	Final F.G.	1.00 psi/ft
	HHP	17,400	5 Min:	3,035 psi
	Pressure Min:	0.00	10 Min:	N/A
	Pressure Max:	0.00	15 Min:	N/A

Material Volume

Material	Proposed	Calculated	Actual	Variance
100 Mesh White	40,000	38,747	38,747	0%
30/50 White	210,000	210,007	210,007	0%
Total Proppants	250,000	248,754	248,754	0%

Material	Proposed	Calculated	Actual	Variance
6.1%-7.5% HCL	3,000	2,942	3,000	1%
APB-1	6	5	5	0%
CI-[illegible]	3	3	3	0%
CS-[illegible] 2L	55	53	53	0%
FE-[illegible]L	15	15	15	0%
FRW-[illegible]	100	69	69	0%
HVG-14.5	6	35	35	-83%
KCl-[illegible]	55	53	53	0%
LTB-1	6	5	5	0%
NE-[illegible]	6	159	114	-33%
NE-[illegible]	100	5	5	0

Comments:

Pumpdown Information:
Total Bbls: 139
Max Pressure (psi): 4630
Max Rate (bpm): 15.1

FTS International
1432 Route 5??
[illegible], PA 1????

Customer: [illegible] Energy - [illegible]
Well: [illegible]
Stage: ??
Job End Date: [illegible]

Treatment Report

Date	[illegible]	District	Washington County, PA	[illegible]	[illegible]	API#	[illegible]

[illegible] Time	STP	Slurry BPM	Stage Slurry (bbls)	Cumulative Slurry (bbls)	Stage Clean (bbls)	Cumulative Clean (bbls)	Stage Proppant (lbs)	Cumulative Proppant (lbs)	Description	Proppant	PPA
22:0?	9,11?	0.0	0	0	0	0	0	0	Freshwater Open Well		0.00
22:0?	9,10?	0.0	10	10	10	10	0	0	Freshwater Load		0.00
22:0?	6,6??	0.0	71	81	71	81	0	0	7.5% HCL Acid Acid		0.00
22:1?	7,844	22.7	17	98	17	98	0	0	Slickwater Load		0.00
22:1?	7,2??	2?.?	12?	22?	12?	221	912	912	Slickwater Proppant	100 Mesh White	0.1?
22:17	7,???	21.?	0	22?	0	221	0	912	Slickwater Breakdown		0.00
22:1?	7,???	21.?	1?1	3?1	1?1	3??	4?4	???	Slickwater Proppant	100 Mesh White	0.1?
22:21	?,???	??.?	21?	???	2?1	???	2,???	3,???	Slickwater Proppant	100 Mesh White	0.2?
22:24	?,1??	??.?	???	???	???	???	?,???	?,???	Slickwater Proppant	100 Mesh White	0.??
22:2?	?,1??	??.?	4??	1,2??	44?	1,2??	1?,4?2	2?,???	Slickwater Proppant	100 Mesh White	0.??
22:3?	?,2??	71.?	???	1,???	41?	1,???	1?,???	3?,747	Slickwater Proppant	100 Mesh White	1.0?
22:??	?,???	??.?	???	1,???	???	1,???	?,???	47,???	Slickwater Proppant	[illegible] White	1.0?
22:??	?,1??	??.7	???	2,???	???	2,?77	27,?1?	7?,4??	Slickwater Proppant	[illegible] White	1.??
22:??	?,??1	??.?	1,??1	?,???	1,???	?,???	??,???	1??,???	Slickwater Proppant	[illegible] White	1.??
23:?1	?,???	??.?	1??	?,???	1??	?,???	11,???	1??,???	Slickwater Proppant	[illegible] White	1.??
23:??	?,???	?1.1	???	?,???	???	4,???	1?,1??	1??,???	[illegible] Linear Gel Proppant	[illegible] White	1.??
23:??	?,???	??.?	4??	4,???	4??	4,???	?7,7??	???,???	Slickwater Proppant	[illegible] White	1.??
23:11	7,???	??.?	??1	4,??7	??1	?,???	??,???	21?,???	Slickwater Proppant	[illegible] White	1.7?
23:1?	?,???	??.?	???	?,?17	???	?,???	??,???	24?,???	Slickwater Proppant	[illegible] White	?.??
23:??	?,1??	??.?	171	?,???	171	?,???	0	24?,???	Slickwater Clean Sweep		0.00
23:??	?,???	??.?	???	?,???	???	?,???	0	24?,???	Slickwater Flush		0.00
23:24	?,??1	??.?	??	?,???	??	?,???	0	24?,???	Freshwater Flush		0.00
23:2?	4,???	0.0	0	?,???	0	?,???	0	24?,???	Freshwater Shutdown		0.00
Total Job Time (HH:MM): 01:1?											

Min STP:	7,2?? psi	Max STP:	9,412 psi	Average STP:	?,?4? psi	5 Min:	?,??? psi
Min Rate:	21.0 bpm	Max Rate:	??.? bpm	Average Rate:	??.? bpm	10 Min:	? psi
Initial ISIP:	4,??? psi	Initial F.G.:	1.?? psi/ft	Average HHP:	17,4??	15 Min:	? psi
Final ISIP:	4,??? psi	Final F.G.:	1.?? psi/ft	Customer Representative:		[illegible]	
FTS Representative:		Travis [illegible] & William [illegible]					

Comments:

The proppant values contained in this report are calculated based on actual barrel counts and target densities. Actual total proppant usage is 24?,??4 lbs. Charge time is 1 hour(s) 1? minute(s). All chemicals and proppant run as documented.

Min/Max/Avg were taken from sand stages. All chem changes from proposed were made per AEU representative request.

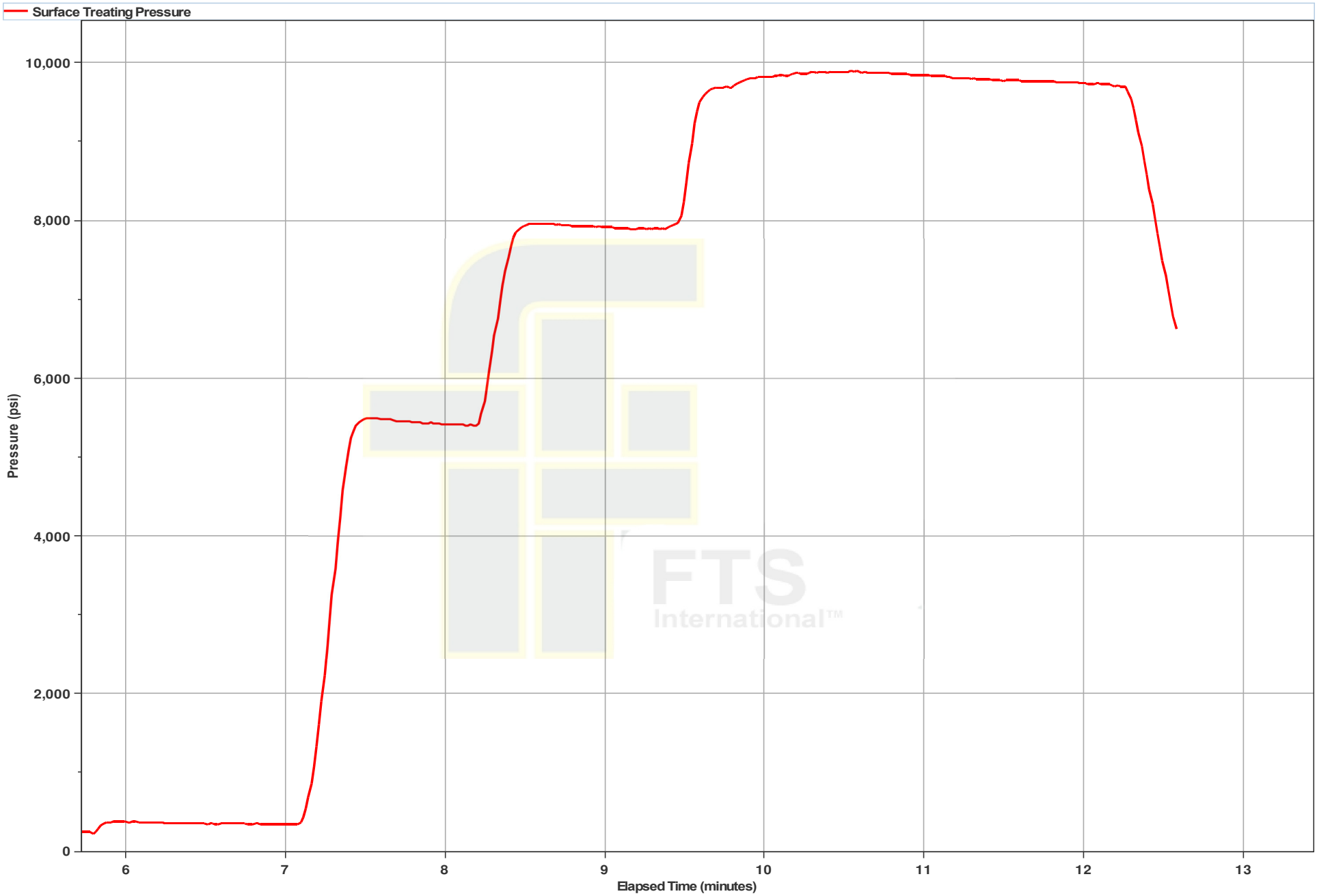
Reuse water was run on this stage for a total of 240 Bbls.

1 Minute Shutdown (psi): 4131
2 Minute Shutdown (psi): 3995
4 Minute Shutdown (psi): 3825

Chemical Changes:

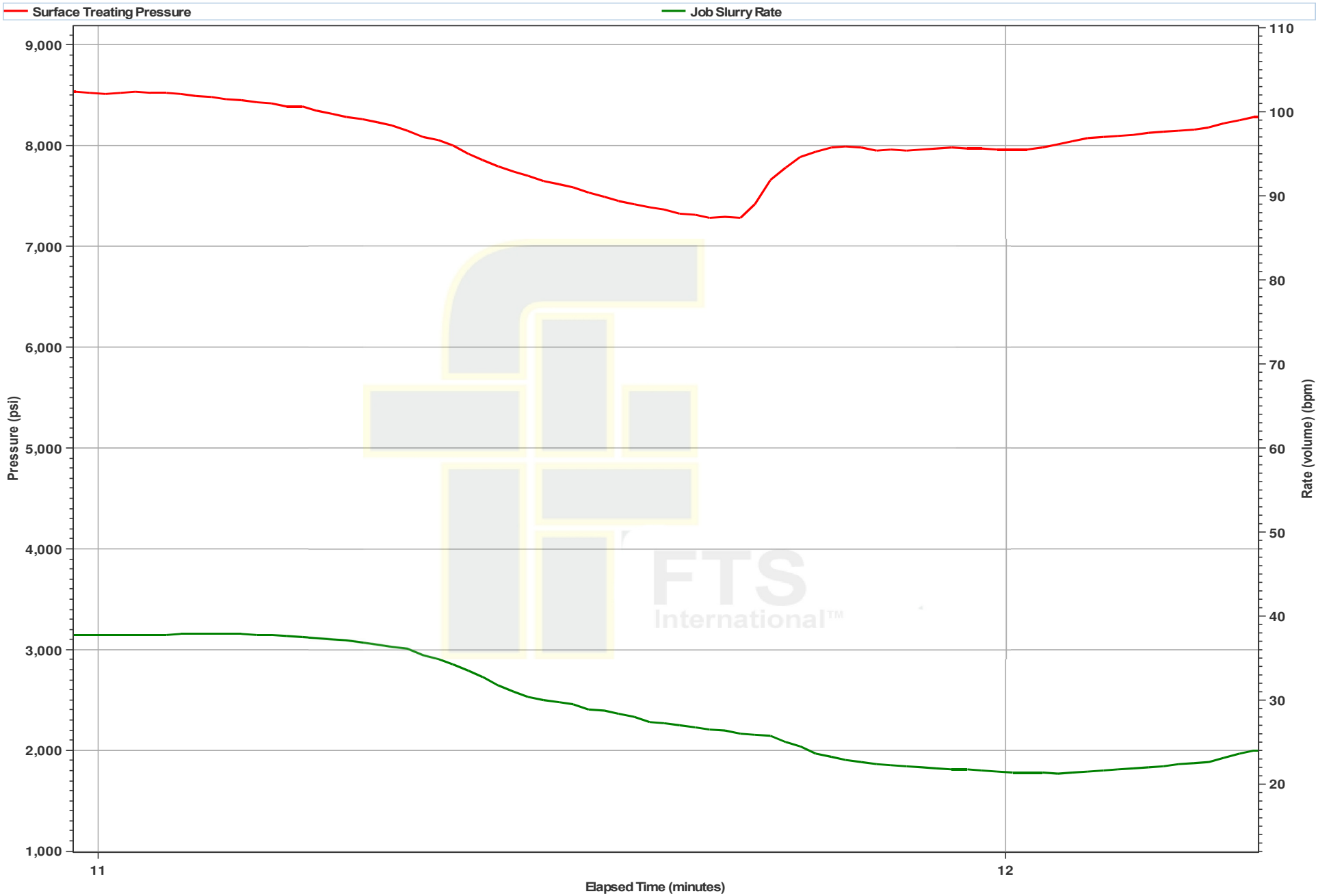
Chemical Name	Chemical Loading	Cumulative Chem
FRW-200	0.50	2,498
FRW-200	0.25	6,558

AEU Pressure Test



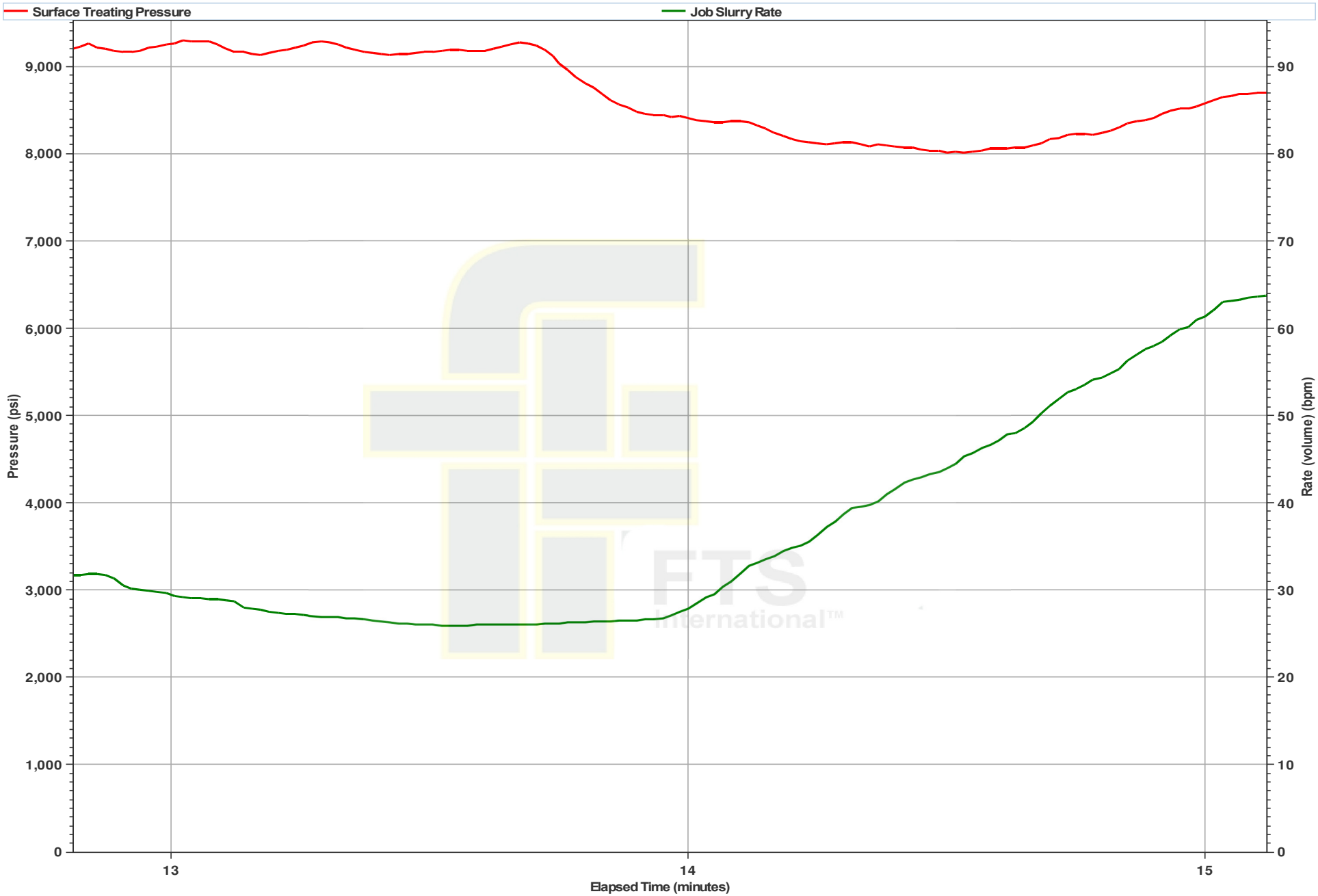
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 36 (WF.000658.M.W03.S36-aDCT-1103) **Jun 24, 2015**

Ball Seat and Breakdown



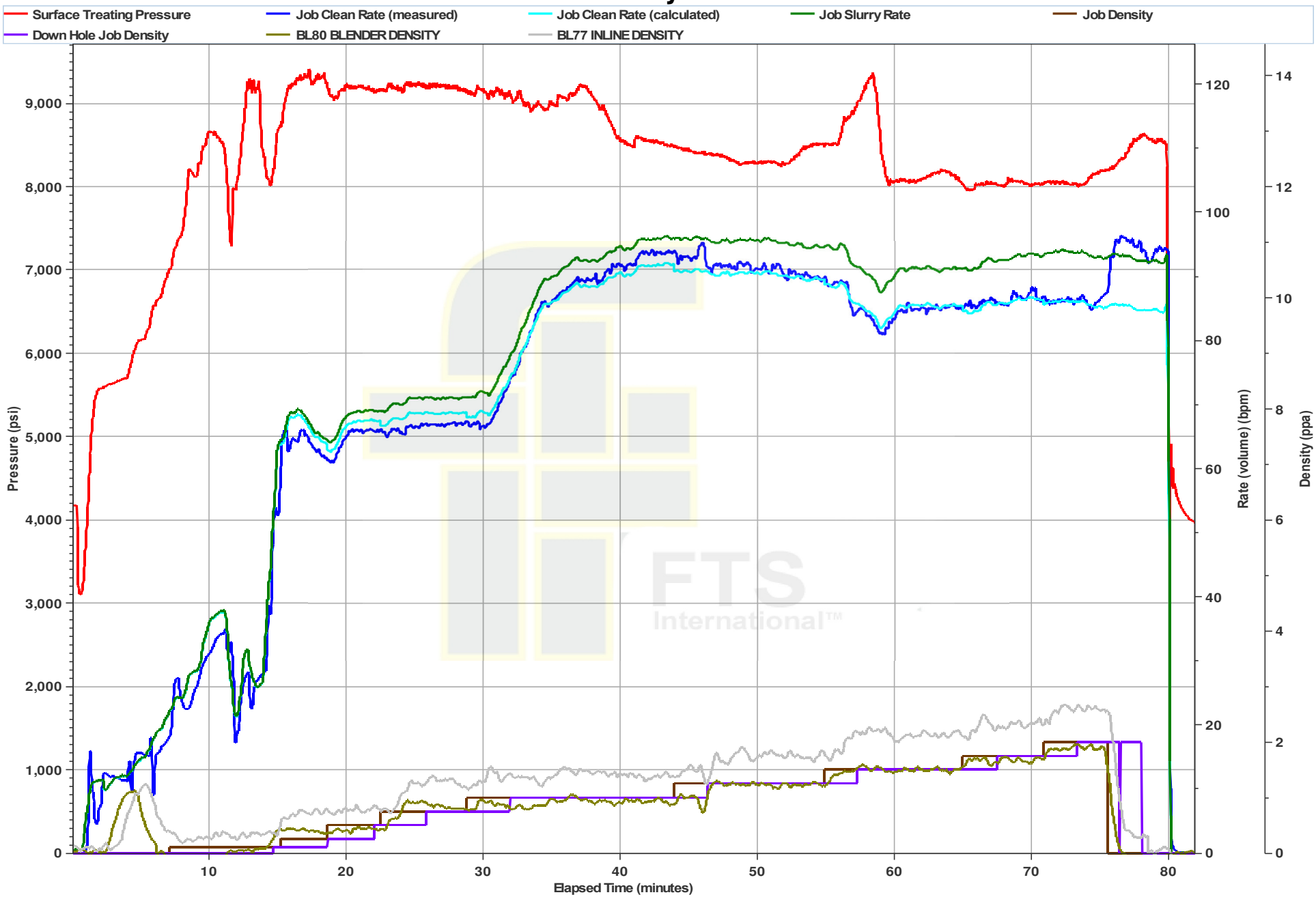
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 36 (WF.000658.M.W03.S36-aDCT-1103) **Jun 24, 2015**

Acid on Perforations



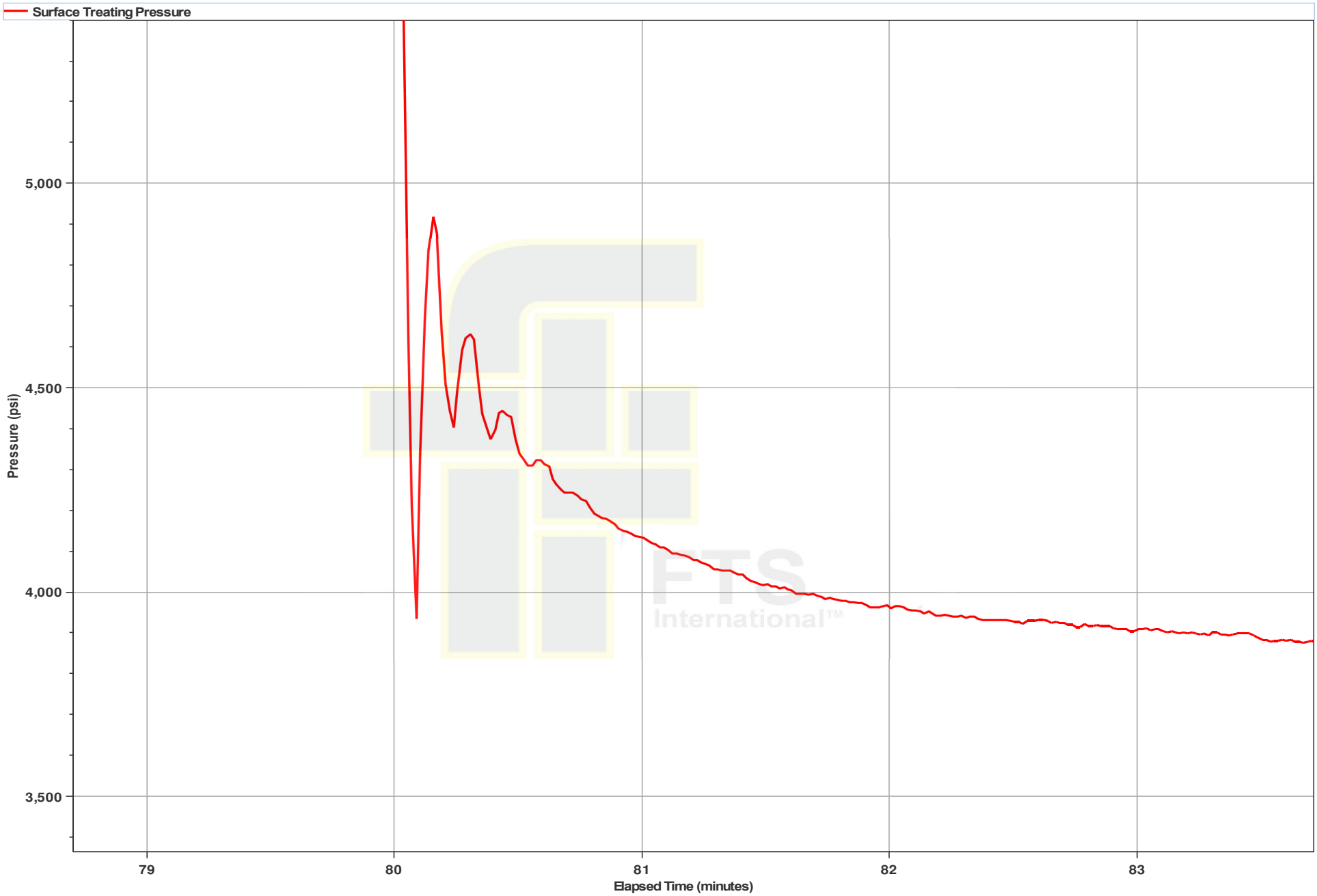
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 36 (WF.000658.M.W03.S36-aDCT-1103) **Jun 24, 2015**

Primary Plot



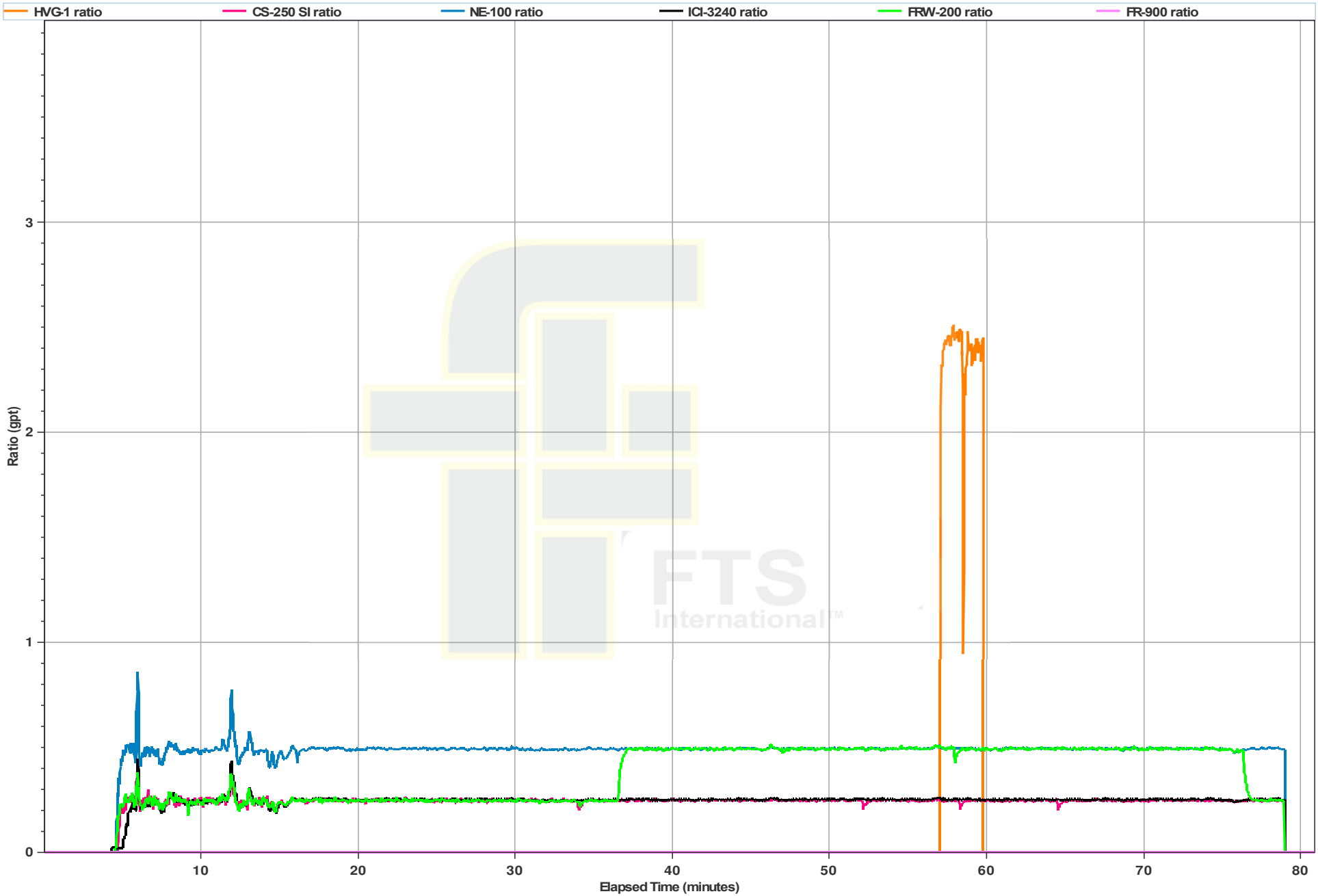
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 36 (WF.000658.M.W03.S36-aDCT-1103) **Jun 24, 2015**

ISIP Plot



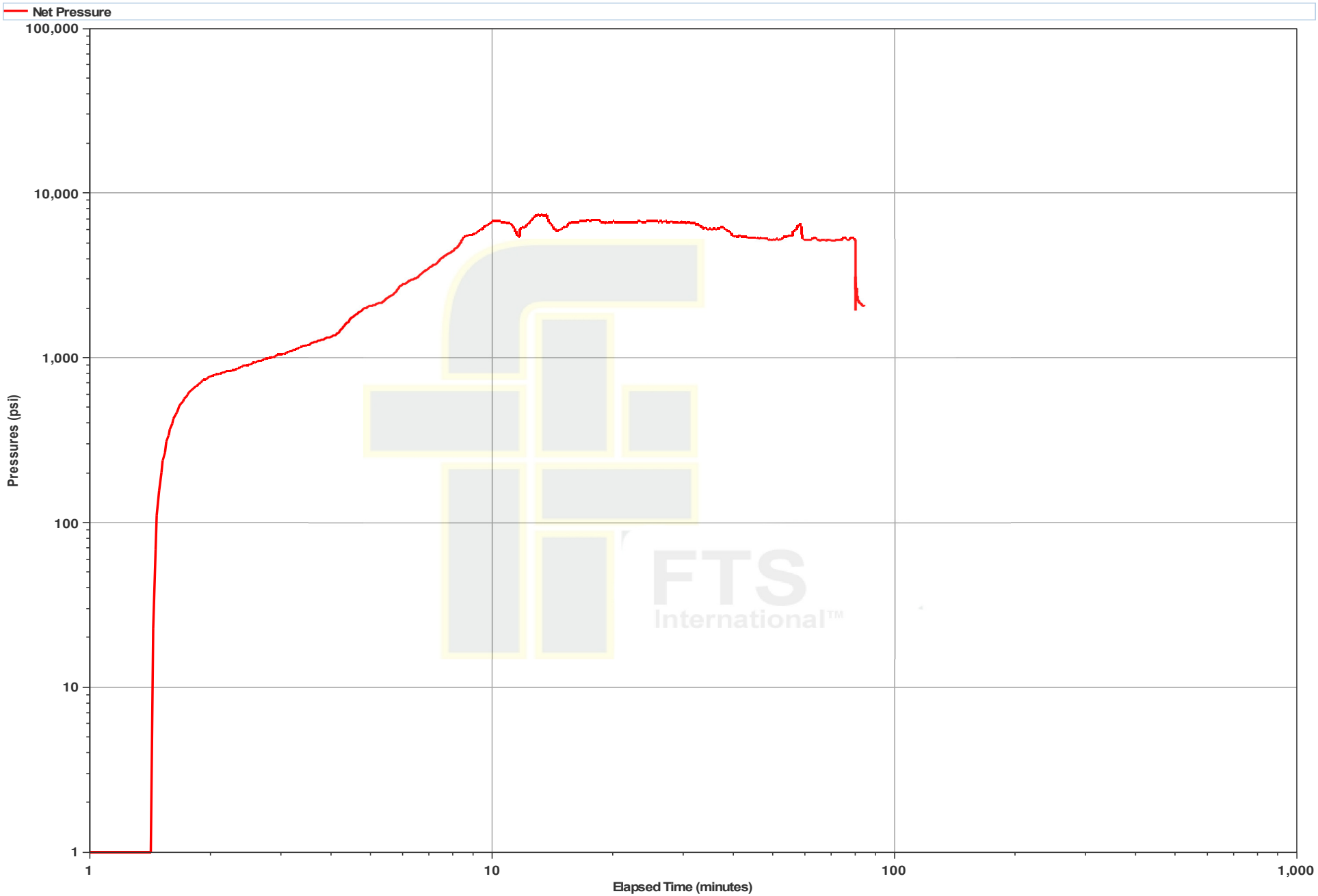
American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 36 (WF.000658.M.W03.S36-aDCT-1103) Jun 24, 2015

Chemical Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 36 (WF.000658.M.W03.S36-aDCT-1103) Jun 24, 2015

Net Pressure Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison County OH Stage 36 (WF.000658.M.W03.S36-aDCT-1103) Jun 24, 2015

WATER-BASED FRAC FLUID QUALITY CONTROL
(Attachment to Post Treatment Report)

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/24/2015
Customer Name:	American Energy - Utica	Proposal #:	3H/36
Date Sampled:	6/24/2015	Water Source:	Working Tank

Sample/Tank No.	Clarity, Color, Odor	Sample Temperature, (F)	Specific gravity	Initial pH	Chloride, ppm	Hardness, ppm	Calcium, ppm	Magnesium, ppm	Iron ppm	Hydroxide, ppm	Bicarbonate, ppm	Carbonate, ppm	Sulfate, ppm	Barium, ppm
Working Tank	Clear	72	1	8.1	35	45	16	7	0	0	73	0	<50	0
Reused Water Tank	Black, Cloudy, Petroleum Odor	72	1.04	4.6	63,980	1200	440	185	>10	0	1196	0	450	0

Frac Fluid Quality Gel Testing (These Recording are to made prior to pumping job)														
Sample #														
Base Gel Type	HVG-1													
Gel Loading (lbs/1000 gal.)	2.5													
Sample Temperature, (F)	72													
Initial pH	8													
Visc. Reading @ 300 rpms	6.5													
Viscosity, (cp)	6.5													
Sample 1 3 min Hydration	3													
Sample 2 3 min Hydration	5													
Sample 3 3 min Hydration	6													
X-Link Vortex Closure, min:sec	n/a													
X-Link Crown, min:sec	n/a													
X-Link pH	n/a													
Gel Break Time (<2cp) mins	20													

Frac Fluid Quality Gel Testing (These Recording are to made while pumping job)														
Stage #														
Base Gel Viscosity (cp)														
X-Link pH								.						
Sample XL time, min:sec														
Sample Temperature														

Acid Quality	Percent Acid	NaOH, mLs	Specific Gravity
	28		1.14

Additional testing or documentation may be required by the customer or for frac fluid quality assurance.

Tested By: Travis Wilson

QUALITY CONTROL OF PROPPANTS

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/24/2015
Customer Name:	American Energy - Utica	Well/Stage:	3H/36
Date Sampled:	6/24/2015	DISTRICT:	Washington, PA
VENDOR:	SANTROL		

Select Proppant Type:

___ Brown	___ Ceramic	___ Other (specify)
X White	___ Bauxite	
___ Resin Coated	___ Texas Gold	

Sieve Analysis	100 Mesh			Sieve Analysis	30/50 Mesh		
Sample 1	24.80	grams of sample		Sample 2	24.90	grams of sample	
	Amount Retained				Amount Retained		
Sieve mesh	Gram	%		Sieve mesh	Gram	%	
			Total				Total
50	0.30	1.21	In-Size	20	0.00	0.00	In-Size
70	17.30	69.76		30	0.50	2.01	
100	3.70	14.92	98.8%	40	19.10	76.71	96.0%
120	1.90	7.66		45	3.30	13.25	
140	1.30	5.24		50	1.50	6.02	
200	0.30	1.21		70	0.40	1.61	
Pan	0.00	0.00	fines	Pan	0.10	0.40	fines
Total wt. Gram	24.80	100.00		Total wt. Gram	24.90	100.00	

Tested By: Travis Wilson

Post Job Report

AMERICAN ENERGY - UTICA

Red Hill Farm MDS GR 3H

Stage : 37 OF 54

HARRISON, OH

Operations Representative:

Name:	**David Knapp**
Office:	**724-743-2537**
Fax:	**724-743-7719**
Cell:	
Email:	**DAVID.KNAPP@FTSI.COM**

Sales Representative:

Name:	**Bruce Matthews**
Office:	**405-574-3981**
Fax:	**405-767-1288**
Cell:	
Email:	**BRUCE.MATTHEWS@FTSI.COM**

Engineering Manager:

Name:	**Thaddeus Craun**
Office:	**817-682-8702**
Fax:	**724-743-7719**
Cell:	
Email:	**THADDEUS.CRAUN@FTSI.COM**

FTS International
1432 Route 519
Eighty Four, PA 15330

Customer: American Energy - Utica
Well: Red Hill Farm Mds Gr 3H
Stage: 37
Job End Date: 06/25/2015

Job Summary

Well Information

TVD:	7,301	**Top Perf:**	10,239
No. Of Perfs:	30		

Casing	Tubing
5.50" 20.00#	N/A

Pressures, Rates and Volumes

	Proposed	Actual	Max	Min
STP	9,046 psi	8,606 psi	9,596 psi	7,946 psi
Rate	80.0 bpm	81.0 bpm	92.0 bpm	19.0 bpm

	Proposed	Actual		
Clean Volume	5,772 bbls	5,392 bbls		
Slurry Volume	6,042 bbls	5,663 bbls		
Flush Volume	357 bbls	279 bbls		

	Proposed	Start	End
Frac Pumps on Location	10	14	14

Open Well:	Start Time	04:25	Pressure	2,771 psi
	Ball Seat	57 bbls	Break Down	7,907 psi
	Initial ISIP:	4,642 psi	Initial F.G.:	1.07 psi/ft
Stage Complete:	End Time	05:42	Job Time	01:17
	Final ISIP	4,642 psi	Final F.G.	1.07 psi/ft
	HHP	17,085	5 Min:	4,098 psi
	Proppant Min:	0.00	10 Min:	N/A
	Proppant Max:	2.00	15 Min:	N/A

Material Volume

Material	Proposed	Calculated	Actual	Variance
100 Mesh White	40,000	39,256	39,256	0%
30/50 White	210,000	211,712	210,715	0%
Total Proppants	250,000	250,968	249,971	0%

Material	Proposed	Calculated	Actual	Variance
0.1%-7.5% HCL	3,000	2,982	3,000	1%
APB-1	0	1	1	0%
CI-150	3	3	3	0%
CS-250 SI	60	54	54	0%
FE-200L	15	15	15	0%
FRW-200	180	89	90	1%
HVG-1 4.0	0	6	6	0%
ICI-3240	60	54	54	0%
LTB-1	0	1	1	0%
NE-100	0	109	108	-1%
NE-100W	120	0	0	0

Comments:

Pumpdown Information:
Total Bbls: 127
Max Pressure (psi): 5873
Max Rate (bpm): 15.2

FTS International
1432 Route 519
Eighty Four, PA 15330

Customer: American Energy - Utica
Well: Red Hill Farm Mds Gr 3H
Stage: 37
Job End Date: 06/25/2015

Treatment Report

Date:	6/25/2015	District:	Washington County,PA	Quote No:	051815_035725QF	API:	34-059-24370

MIL Time	STP	Slurry BPM	Stage Clean (bbls)	Cumulative Clean (bbls)	Stage Slurry (bbls)	Cumulative Slurry (bbls)	Stage Proppant (lbs)	Cumulative Proppant (lbs)	Description	Proppant	PPA
04:25	2,771	0.0	0	0	0	0	0	0	Freshwater Open Well		0.00
04:26	3,453	3.8	6	6	6	6	0	0	Freshwater Load		0.00
04:27	5,815	13.5	51	57	51	57	0	0	7.5% HCL Acid Acid		0.00
04:28	7,907	13.5	20	77	20	77	0	0	7.5% HCL Acid Breakdown		0.00
04:32	8,060	24.6	7	84	7	84	0	0	Slickwater Pad		0.00
04:33	8,904	29.4	159	243	160	244	668	668	Slickwater Proppant	100 Mesh White	0.10
04:38	9,104	57.1	215	458	217	461	2,258	2,926	Slickwater Proppant	100 Mesh White	0.25
04:42	9,034	74.8	255	713	261	722	5,355	8,281	Slickwater Proppant	100 Mesh White	0.50
04:46	9,088	80.8	430	1,143	445	1,167	13,545	21,826	Slickwater Proppant	100 Mesh White	0.75
04:52	8,944	86.4	415	1,558	434	1,601	17,430	39,256	Slickwater Proppant	100 Mesh White	1.00
04:55	9,021	89.2	625	2,183	653	2,254	26,250	65,506	Slickwater Proppant	30/50 White	1.00
05:03	9,025	91.5	201	2,384	210	2,464	8,442	73,948	Slickwater Proppant	30/50 White	1.00
05:06	8,176	91.7	900	3,284	951	3,415	47,250	121,198	Slickwater Proppant	30/50 White	1.25
05:16	8,077	91.3	707	3,991	755	4,170	44,541	165,739	Slickwater Proppant	30/50 White	1.50
05:24	8,207	89.7	390	4,381	421	4,591	28,665	194,404	Slickwater Proppant	30/50 White	1.75
05:29	8,228	89.5	61	4,442	66	4,657	4,484	198,888	10# Linear Gel Proppant	30/50 White	1.75
05:31	8,150	89.9	620	5,062	676	5,333	52,080	250,968	Slickwater Proppant	30/50 White	2.00
05:37	8,200	88.9	51	5,113	51	5,384	0	250,968	Slickwater Clean screws		0.00
05:38	7,951	85.0	150	5,263	150	5,534	0	250,968	Slickwater Flush		0.00
05:40	8,199	84.2	129	5,392	129	5,663	0	250,968	Freshwater Flush		0.00
05:42	4,642	0.0	0	5,392	0	5,663	0	250,968	Freshwater Shutdown		0.00
Total JobTime (HH:MM): 01:17											

Min STP:	7,946 psi	**Max STP:**	9,596 psi	**Average STP:**	8,606 psi	**5 Min:**	4,098 psi
Min Rate:	19.0 bpm	**Max Rate:**	92.0 bpm	**Average Rate:**	81.0 bpm	**10 Min:**	0 psi
Initial ISIP:	4,642 psi	**Initial F.G.:**	1.07 psi/ft	**Average HHP:**	17,085	**15 Min:**	0 psi
Final ISIP:	4,642 psi	**Final F.G.:**	1.07 psi/ft	**Customer Representative:**		Mike Hausvater	
FTSI Representative:		Etuate Varea & Sean Stewart					

Comments:

The proppant values contained in this report are calculated based on actual barrel counts and target densities. Actual total proppant usage is 249,971 lbs. Charge time is 1 hour(s) 17 minute(s). All chemicals and proppant ran as documented.

Min/Max/Avg were taken from sand stages. All chem changes from proposed were made per AEU representative request.

No reused water pumped.

1 Minute Shutdown (psi):
2 Minute Shutdown (psi):
5 Minute Shutdown (psi):

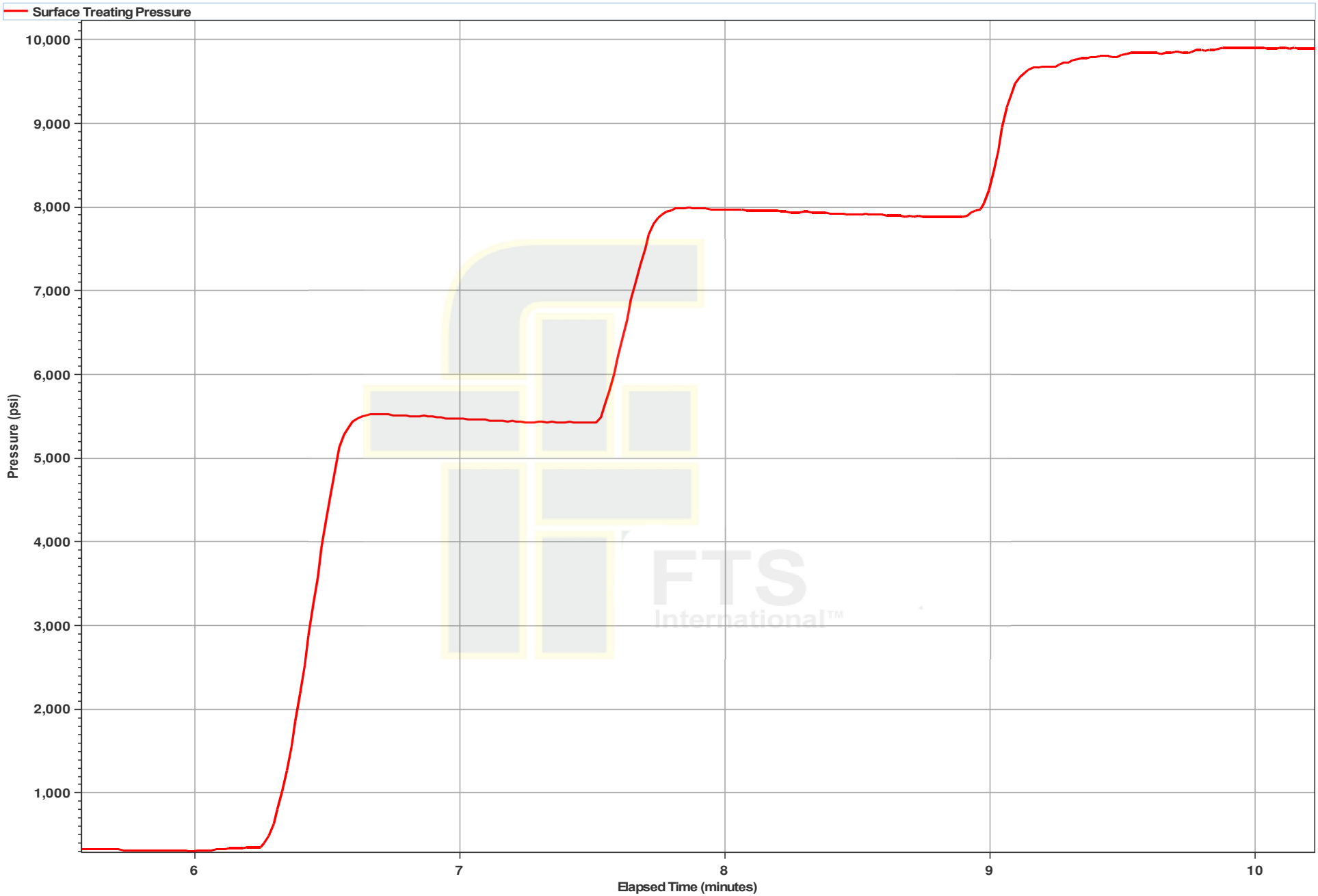
FTS International
1432 Route 519
Eighty Four, PA 15330

Customer: American Energy - Utica
Well: Red Hill Farm Mds Gr 3H
Stage: 37
Job End Date: 06/25/2015

Chemical Changes:

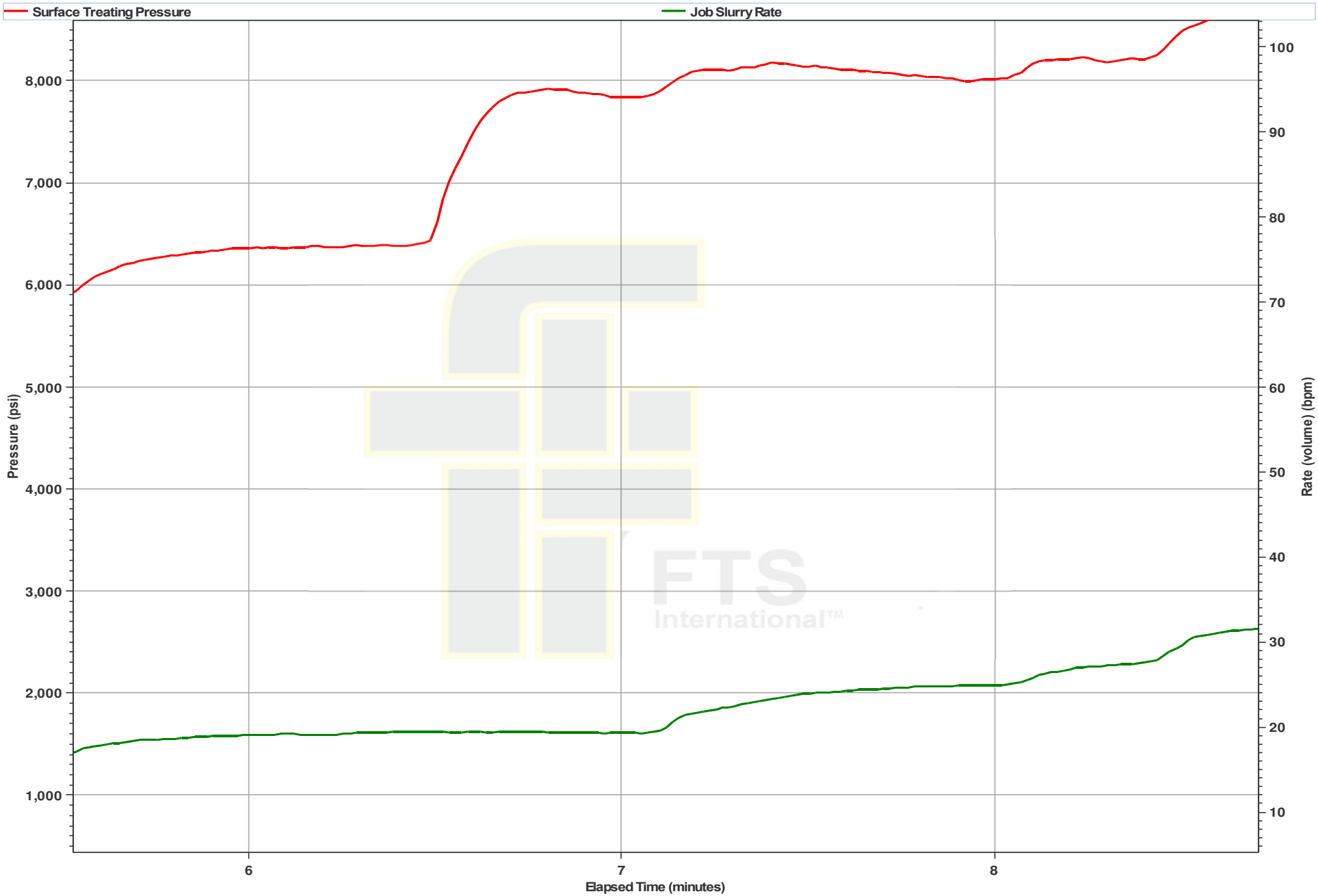
Chemical Name	Chemical Loading	Cumulative Clean
FRW-200	0.50	2,384

AEU Pressure Test



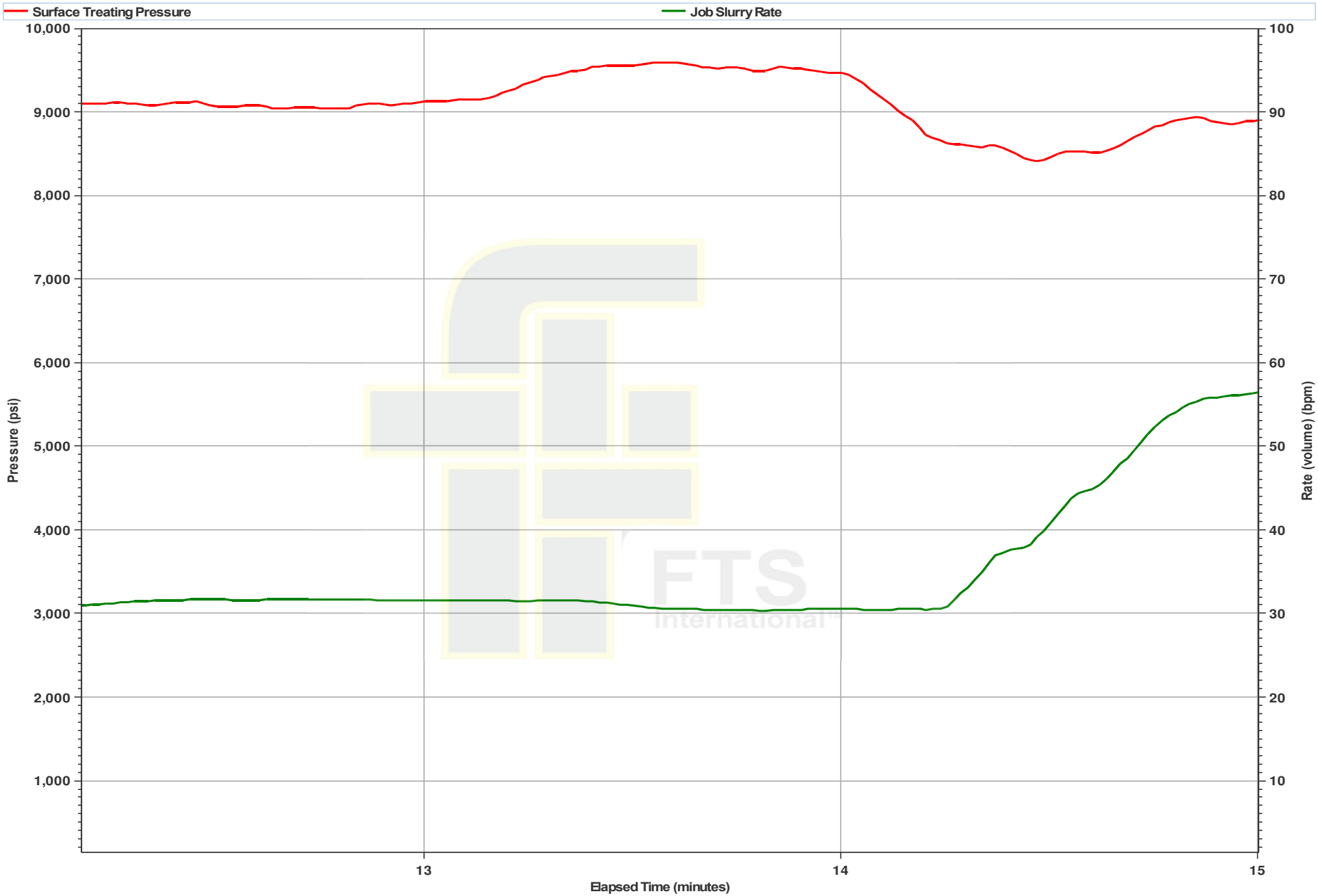
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 37 (WF.000658.M.W03.S37-ADCT-1103) **Jun 25, 2015**

Ball Seat and Breakdown



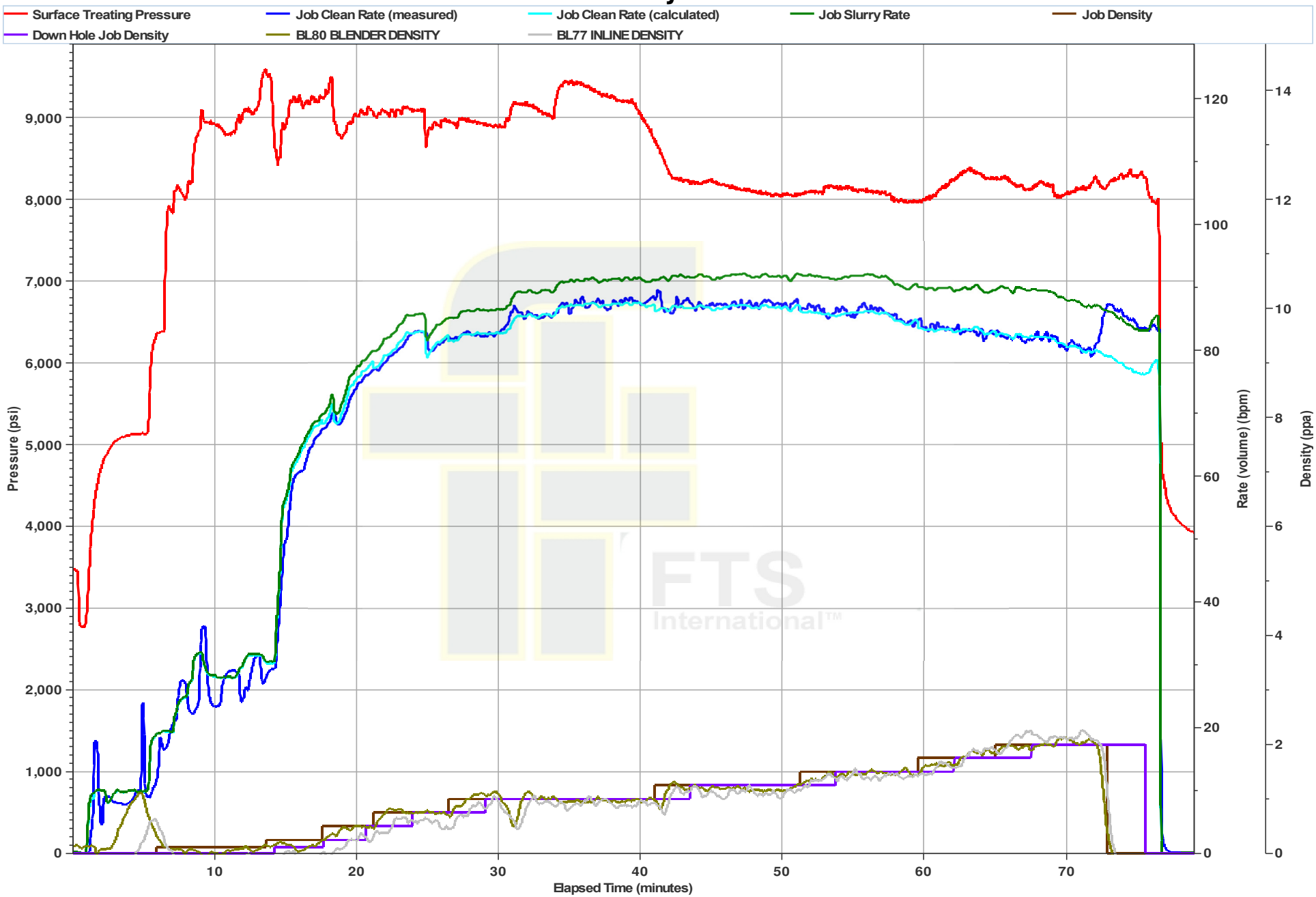
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 37 (WF.000658.M.W03.S37-ADCT-1103) **Jun 25, 2015**

Acid on Perforations



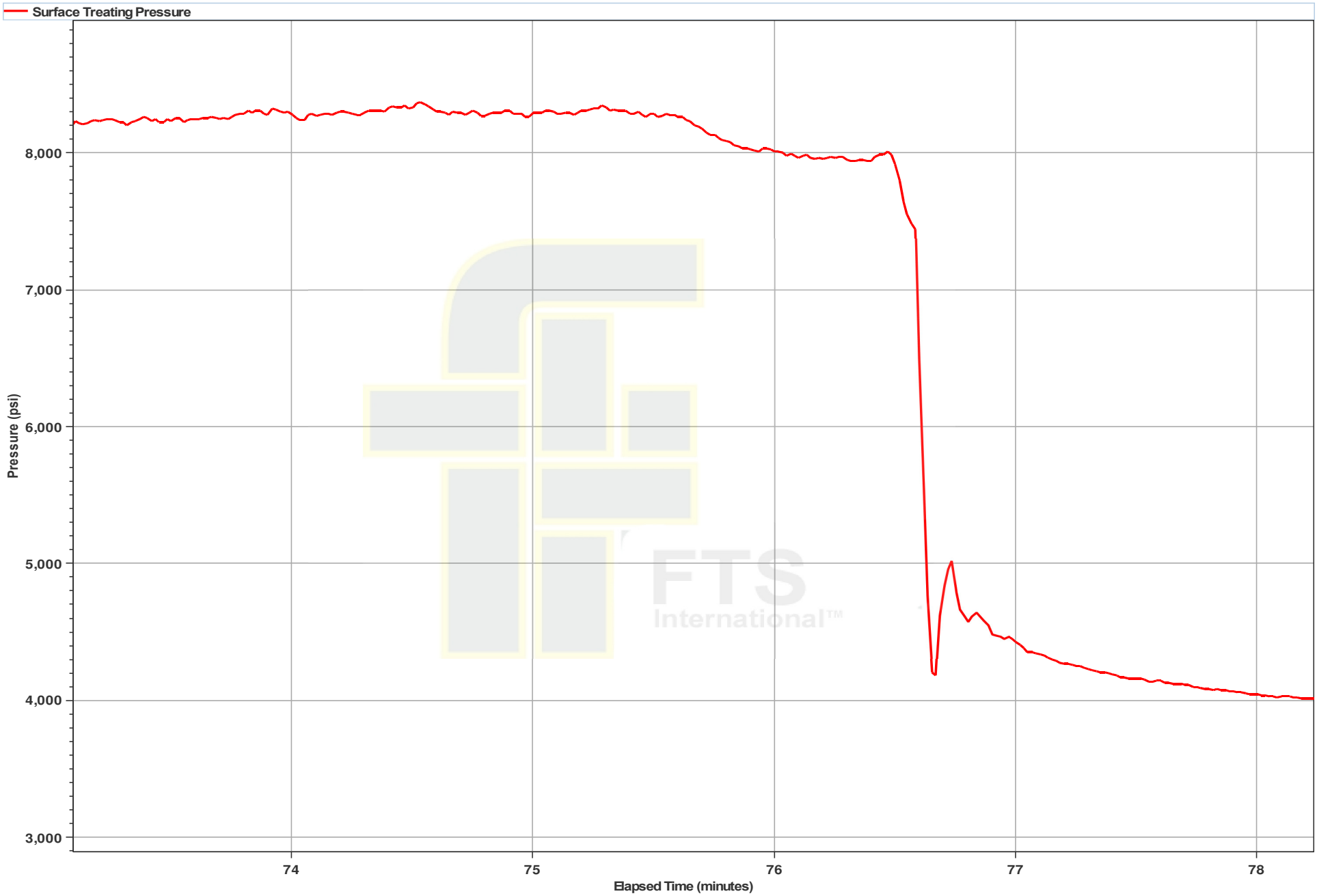
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 37 (WF.000658.M.W03.S37-ADCT-1103) **Jun 25, 2015**

Primary Plot



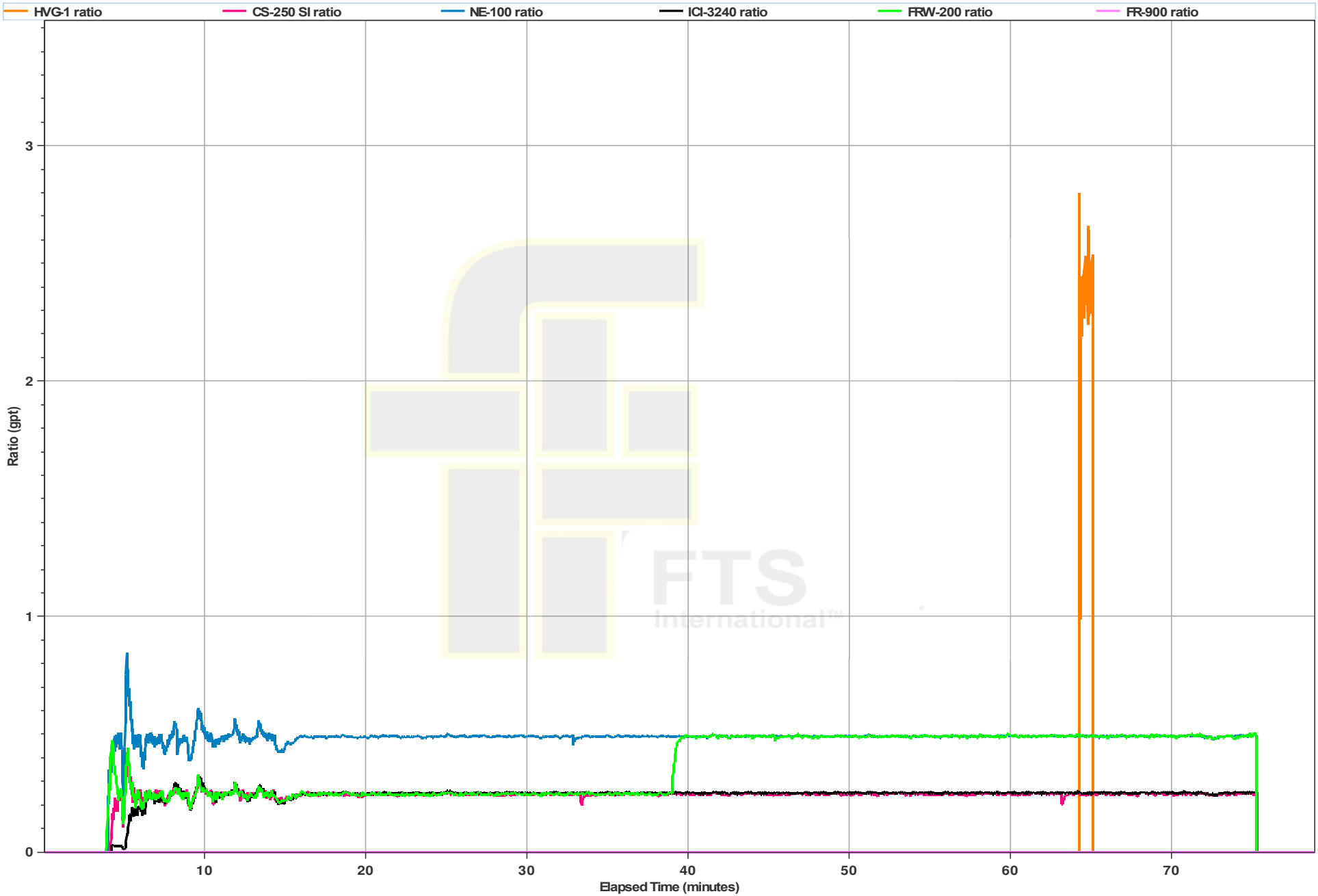
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 37 (WF.000658.M.W03.S37-ADCT-1103) **Jun 25, 2015**

ISIP Plot



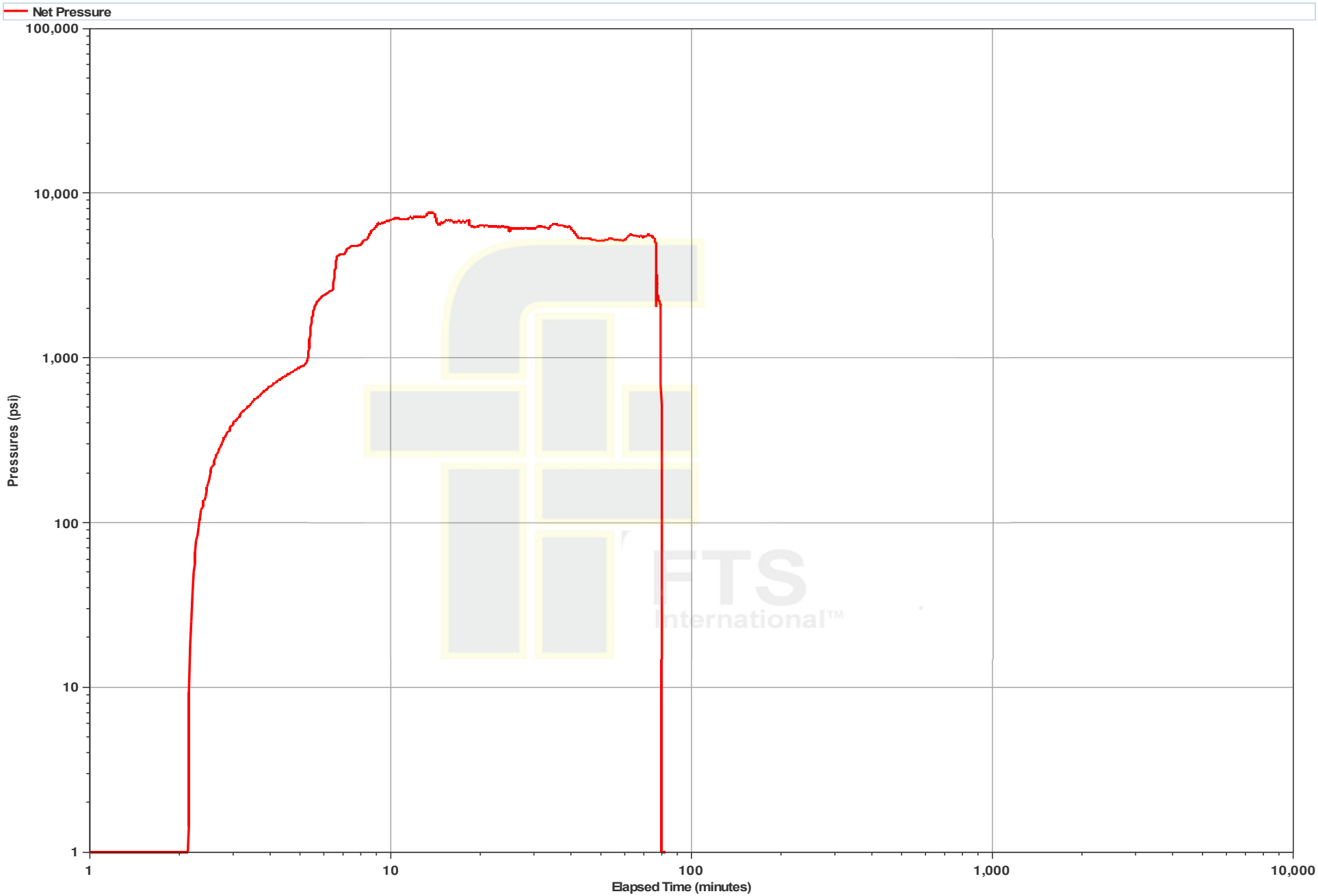
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 37 (WF.000658.M.W03.S37-ADCT-1103) **Jun 25, 2015**

Chemical Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 37 (WF.000658.M.W03.S37-ADCT-1103) **Jun 25, 2015**

Net Pressure Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 37 (WF.000658.M.W03.S37-ADCT-1103) Jun 25, 2015

WATER-BASED FRAC FLUID QUALITY CONTROL
(Attachment to Post Treatment Report)

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/25/2015
Customer Name:	American Energy - Utica	Proposal #:	3H/37
Date Sampled:	6/25/2015	Water Source:	Working Tank

Sample/Tank No.	Clarity, Color, Odor	Sample Temperature, (F)	Specific gravity	Initial pH	Chloride, ppm	Hardness, ppm	Calcium, ppm	Magnesium, ppm	Iron ppm	Hydroxide, ppm	Bicarbonate, ppm	Carbonate, ppm	Sulfate, ppm	Barium, ppm
Working Tank	Clear	72	1	7.8	32	46	17	7	0	0	37	0	<50	0

Frac Fluid Quality Gel Testing (These Recording are to made prior to pumping job)														
Sample #														
Base Gel Type	HVG-1													
Gel Loading (lbs/1000 gal.)	2.5													
Sample Temperature, (F)	72													
Initial pH	7.9													
Visc. Reading @ 300 rpms	6													
Viscosity, (cp)	6													
Sample 1 3 min Hydration	4													
Sample 2 3 min Hydration	6													
Sample 3 3 min Hydration	6													
X-Link Vortex Closure, min:sec	n/a													
X-Link Crown, min:sec	n/a													
X-Link pH	n/a													
Gel Break Time (<2cp) mins	21													

Frac Fluid Quality Gel Testing (These Recording are to made while pumping job)														
Stage #														
Base Gel Viscosity (cp)														
X-Link pH								.						
Sample XL time, min:sec														
Sample Temperature														

Acid Quality	Percent Acid	NaOH, mLs	Specific Gravity
	28		1.14

Additional testing or documentation may be required by the customer or for frac fluid quality assurance.

Tested By: Etuate Varea

QUALITY CONTROL OF PROPPANTS

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/25/2015
Customer Name:	American Energy - Utica	Well/Stage:	3H/37
Date Sampled:	6/25/2015	DISTRICT:	Washington, PA
VENDOR:	SANTROL		

Select Proppant Type:

___ Brown	___ Ceramic	___ Other (specify)
X White	___ Bauxite	_____
___ Resin Coated	___ Texas Gold	

Sieve Analysis	100 Mesh			Sieve Analysis	30/50 Mesh		
Sample 1	25.00	grams of sample		Sample 2	24.90	grams of sample	
	Amount Retained				Amount Retained		
Sieve mesh	Gram	%		Sieve mesh	Gram	%	
			Total				Total
50	0.20	0.80	In-Size	20	0.00	0.00	In-Size
70	16.50	66.00		30	0.60	2.41	
100	3.80	15.20	99.2%	40	18.50	74.30	95.2%
120	2.10	8.40		45	3.50	14.06	
140	1.80	7.20		50	1.70	6.83	
200	0.60	2.40		70	0.60	2.41	
Pan	0.00	0.00	fines	Pan	0.00	0.00	fines
Total wt. Gram	25.00	100.00		Total wt. Gram	24.90	100.00	

Tested By: Etuate Varea

Post Job Report

AMERICAN ENERGY - UTICA

Red Hill Farm MDS GR 3H

Stage : 38 OF 54

HARRISON, OH

Operations Representative:

Name:	**David Knapp**
Office:	**724-743-2537**
Fax:	**724-743-7719**
Cell:	
Email:	**DAVID.KNAPP@FTSI.COM**

Sales Representative:

Name:	**Bruce Matthews**
Office:	**405-574-3981**
Fax:	**405-767-1288**
Cell:	
Email:	**BRUCE.MATTHEWS@FTSI.COM**

Engineering Manager:

Name:	**Thaddeus Craun**
Office:	**817-682-8702**
Fax:	**724-743-7719**
Cell:	
Email:	**THADDEUS.CRAUN@FTSI.COM**

FTS International
1432 Route 519
Eighty Four, PA 15330

Customer: American Energy - Utica
Well: Red Hill Farm Mds Gr 3H
Stage: 38
Job End Date: 06/25/2015

Job Summary

Well Information

TVD:	7,301	**Top Perf:**	10,087
No. Of Perfs:	30		

Casing	Tubing
5.50" 20.00#	N/A

Pressures, Rates and Volumes

	Proposed	Actual	Max	Min
STP	9,046 psi	8,940 psi	9,691 psi	7,564 psi
Rate	80.0 bpm	77.2 bpm	92.1 bpm	26.0 bpm

	Proposed	Actual		
Clean Volume	5,772 bbls	5,484 bbls		
Slurry Volume	6,042 bbls	5,753 bbls		
Flush Volume	357 bbls	275 bbls		

	Proposed	Start	End
Frac Pumps on Location	10	14	14

Open Well:	Start Time	12:08	Pressure	2,908 psi
	Ball Seat	84 bbls	Break Down	6,364 psi
	Initial ISIP:	4,721 psi	Initial F.G.:	1.08 psi/ft
Stage Complete:	End Time	13:32	Job Time	01:30
	Final ISIP	4,721 psi	Final F.G.	1.08 psi/ft
	HHP	16,916	5 Min:	4,112 psi
	Proppant Min:	0.00	10 Min:	N/A
	Proppant Max:	2.00	15 Min:	N/A

Material Volume

Material	Proposed	Calculated	Actual	Variance
100 Mesh White	40,000	38,245	39,245	3%
30/50 White	210,000	212,058	210,058	-1%
Total Proppants	250,000	250,303	249,303	0%

Material	Proposed	Calculated	Actual	Variance
0.1%-7.5% HCL	3,000	2,982	3,000	1%
CI-150	3	3	3	0%
CS-250 SI	60	55	55	0%
FE-200L	15	15	15	0%
FRW-200	180	82	82	0%
ICI-3240	60	55	55	0%
NE-100	0	111	110	-1%
NE-100W	120	0	0	0

Comments:

Pumpdown Information:
Total Bbls: 134
Max Pressure (psi): 5873
Max Rate (bpm): 15.1

FTS International
1432 Route 519
Eighty Four, PA 15330

Customer: American Energy - Utica
Well: Red Hill Farm Mds Gr 3H
Stage: 38
Job End Date: 06/25/2015

Treatment Report

Date:	6/25/2015	District:	Washington County,PA	Quote No:	051815_035725QF	API:	34-059-24370

MIL Time	STP	Slurry BPM	Stage Clean (bbls)	Cumulative Clean (bbls)	Stage Slurry (bbls)	Cumulative Slurry (bbls)	Stage Proppant (lbs)	Cumulative Proppant (lbs)	Description	Proppant	PPA
12:08	2,908	0.0	0	0	0	0	0	0	Freshwater Open Well		0.00
12:09	4,392	9.3	13	13	13	13	0	0	Freshwater Load		0.00
12:10	5,413	10.5	71	84	71	84	0	0	7.5% HCL Acid Acid		0.00
12:17	6,364	16.5	2	86	2	86	0	0	Slickwater Breakdown		0.00
12:17	6,577	18.2	10	96	10	96	0	0	Slickwater Pad		0.00
12:18	7,564	26.5	216	312	217	313	907	907	Slickwater Proppant	100 Mesh White	0.10
12:24	9,168	65.4	214	526	216	529	2,247	3,154	Slickwater Proppant	100 Mesh White	0.25
12:28	9,183	66.4	255	781	261	790	5,355	8,509	Slickwater Proppant	100 Mesh White	0.50
12:32	9,386	70.7	432	1,213	447	1,237	13,608	22,117	Slickwater Proppant	100 Mesh White	0.75
12:42	8,819	68.0	384	1,597	401	1,638	16,128	38,245	Slickwater Proppant	100 Mesh White	1.00
12:44	9,498	80.2	826	2,423	863	2,501	34,692	72,937	Slickwater Proppant	30/50 White	1.00
12:55	8,941	89.0	400	2,823	423	2,924	21,000	93,937	Slickwater Proppant	30/50 White	1.25
13:00	8,944	90.1	450	3,273	475	3,399	23,625	117,562	Slickwater Proppant	30/50 White	1.25
13:05	8,389	90.7	707	3,980	755	4,154	44,541	162,103	Slickwater Proppant	30/50 White	1.50
13:13	8,303	90.9	400	4,380	432	4,586	29,400	191,503	Slickwater Proppant	30/50 White	1.75
13:19	8,244	91.0	700	5,080	763	5,349	58,800	250,303	Slickwater Proppant	30/50 White	2.00
13:27	9,110	69.1	129	5,209	129	5,478	0	250,303	Slickwater Clean screws		0.00
13:29	9,169	68.9	160	5,369	160	5,638	0	250,303	Slickwater Flush		0.00
13:31	8,946	69.8	115	5,484	115	5,753	0	250,303	Freshwater Flush		0.00
13:32	4,721	0.0	0	5,484	0	5,753	0	250,303	Freshwater Shutdown		0.00
Total JobTime (HH:MM): 01:24											

Min STP:	7,564 psi	**Max STP:**	9,691 psi	**Average STP:**	8,940 psi	**5 Min:**	4,112 psi
Min Rate:	26.0 bpm	**Max Rate:**	92.1 bpm	**Average Rate:**	77.2 bpm	**10 Min:**	0 psi
Initial ISIP:	4,721 psi	**Initial F.G.:**	1.08 psi/ft	**Average HHP:**	16,916	**15 Min:**	0 psi
Final ISIP:	4,721 psi	**Final F.G.:**	1.08 psi/ft	**Customer Representative:**		Mike Hausvater	
FTSI Representative:		Etuate Varea & Jason McCoskey					

Comments:

The proppant values contained in this report are calculated based on actual barrel counts and target densities. Actual total proppant usage is 249,303 lbs. Charge time is 1 hour(s) 30 minute(s). All chemicals and proppant ran as documented.

Min/Max/Avg were taken from sand stages. All chem changes from proposed were made per AEU representative request.

Reuse water was run on this stage for a total of 190 Bbls.

1 Minute Shutdown (psi): 4498
2 Minute Shutdown (psi): 4342
5 Minute Shutdown (psi): 4112

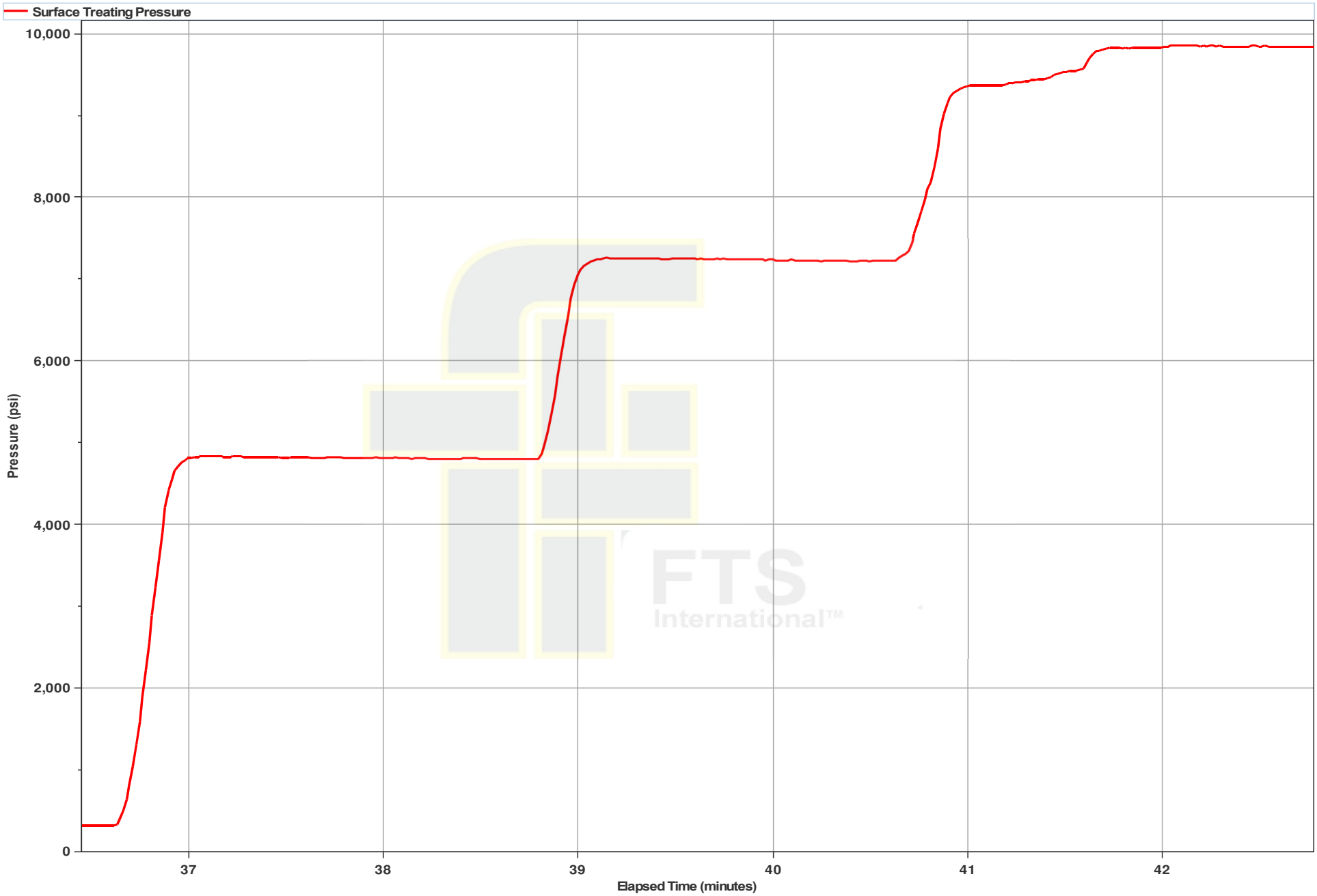
Chemical Changes:

FTS International
1432 Route 519
Eighty Four, PA 15330

Customer: American Energy - Utica
Well: Red Hill Farm Mds Gr 3H
Stage: 38
Job End Date: 06/25/2015

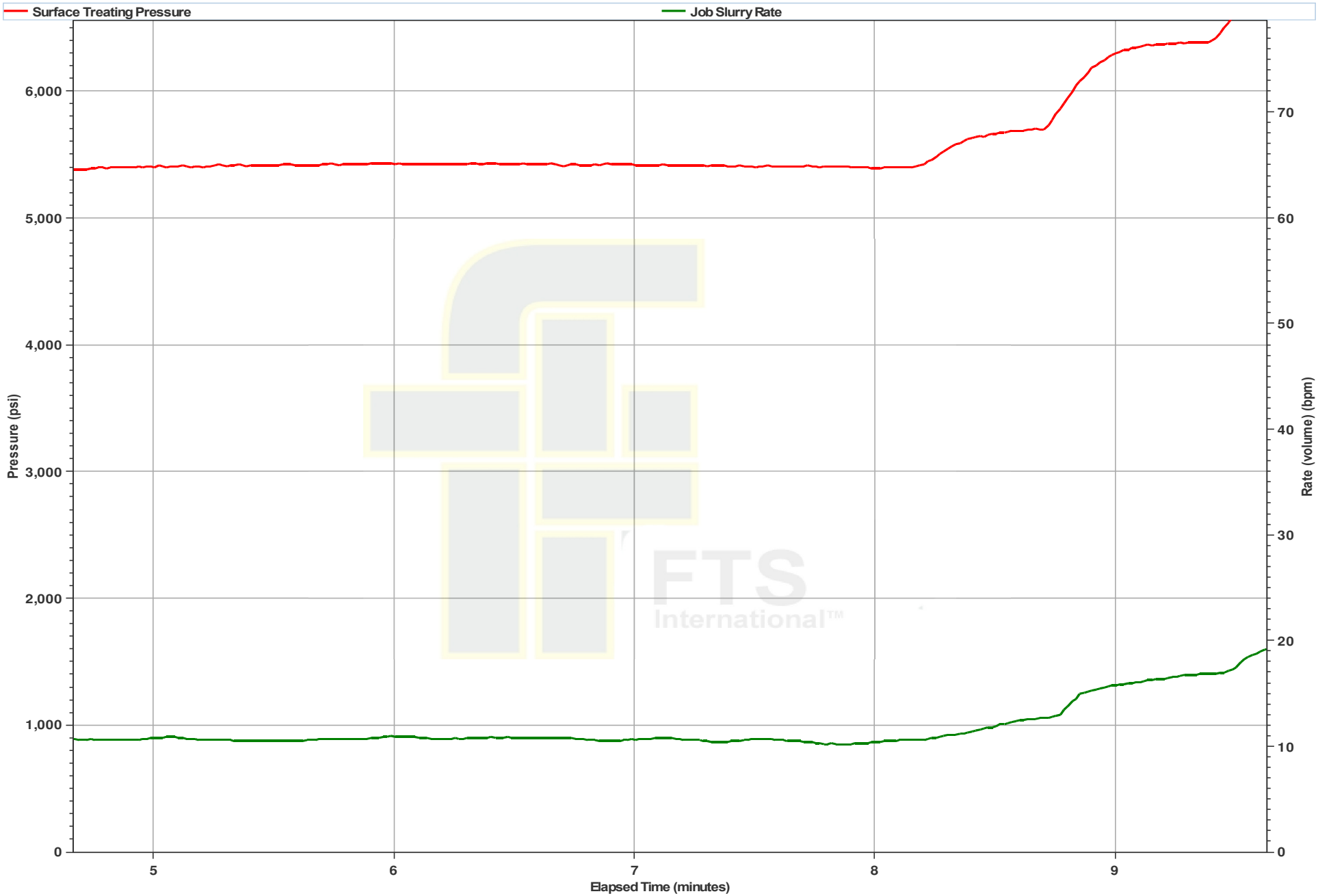
Chemical Name	Chemical Loading	Cumulative Clean
FRW-200	0.50	3,273

AEU Pressure Test



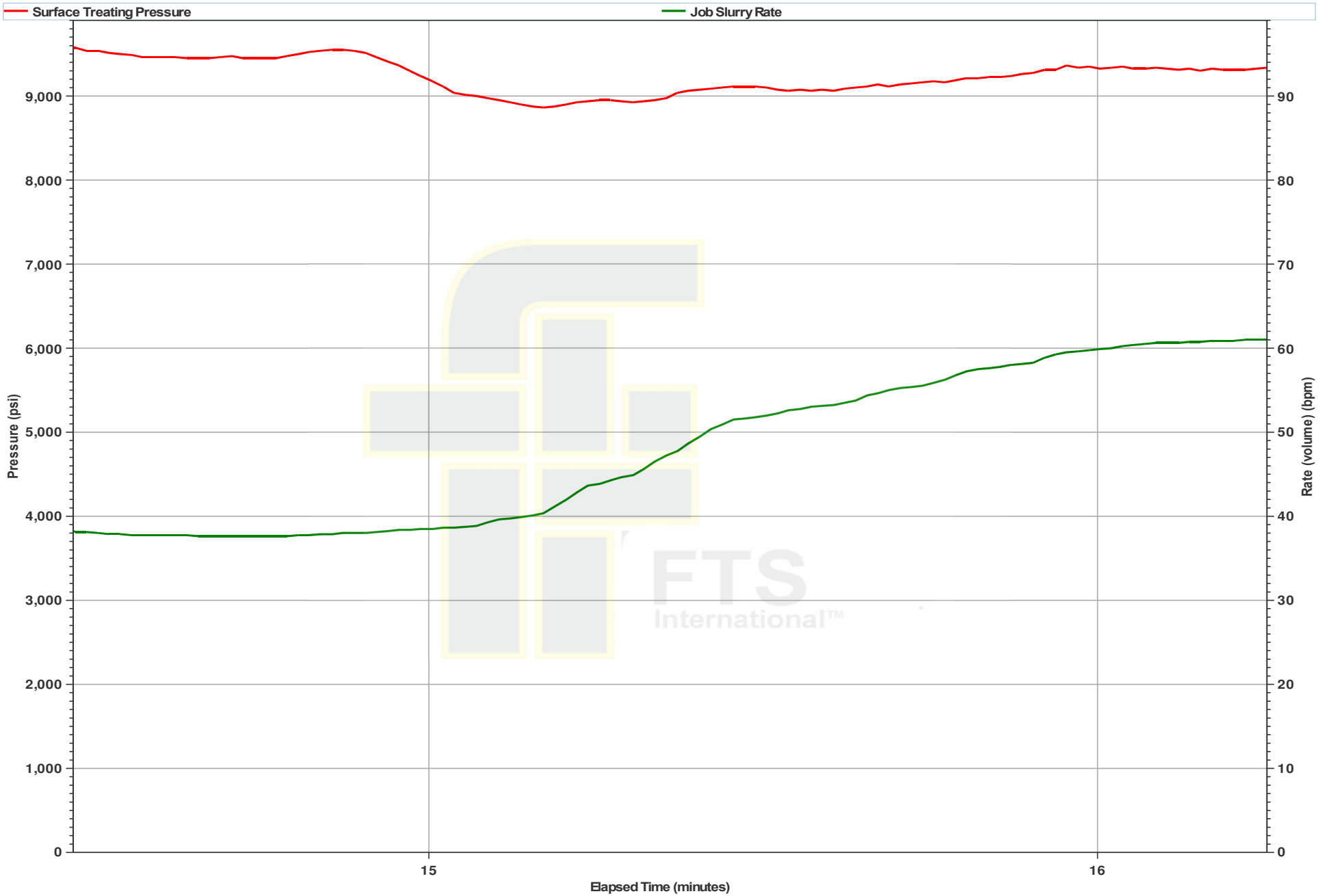
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 38 (WF.000658.M.W03.S38-ADCT-1103) Jun 25, 2015

Ball Seat and Breakdown



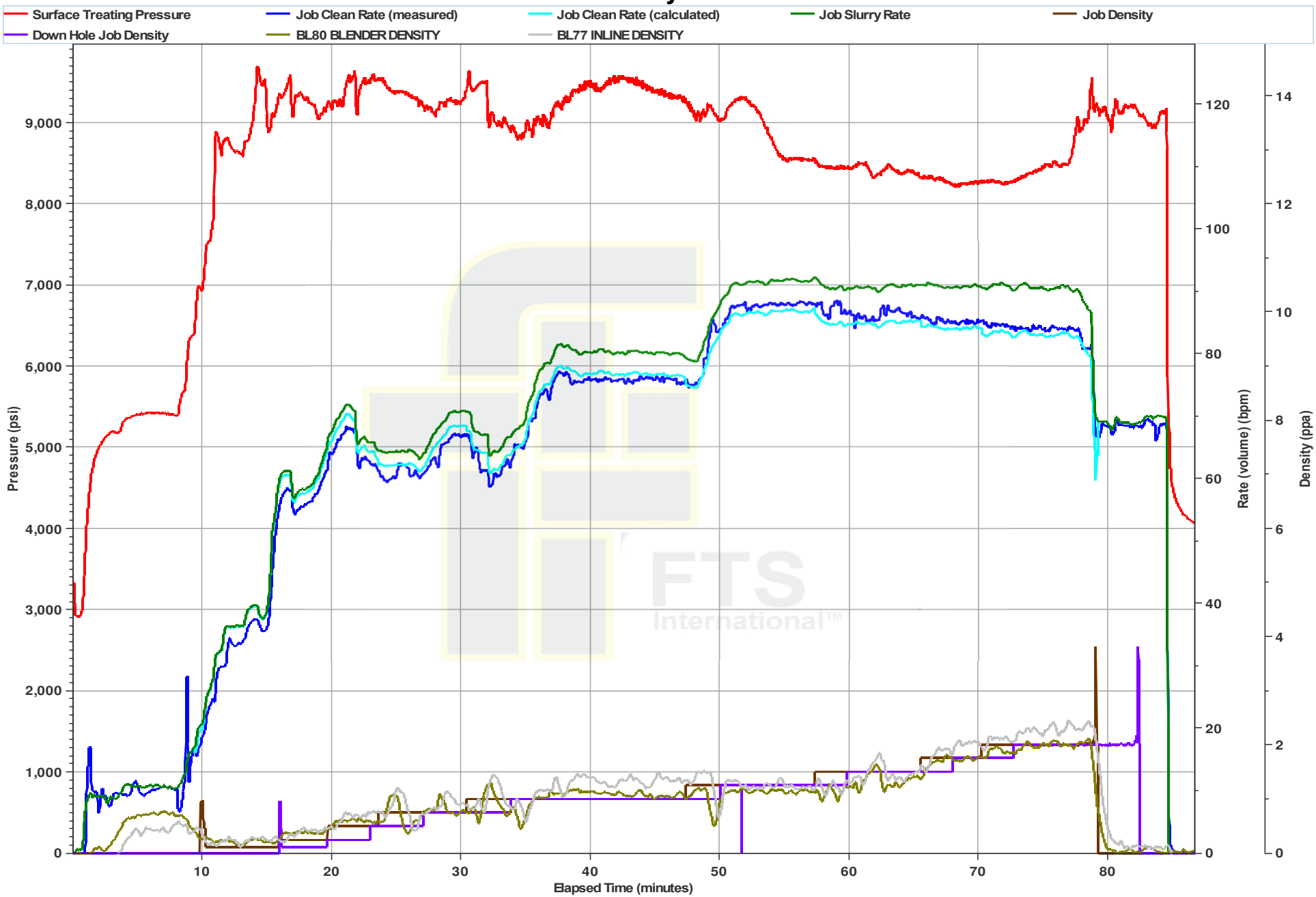
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 38 (WF.000658.M.W03.S38-ADCT-1103) **Jun 25, 2015**

Acid on Perforations



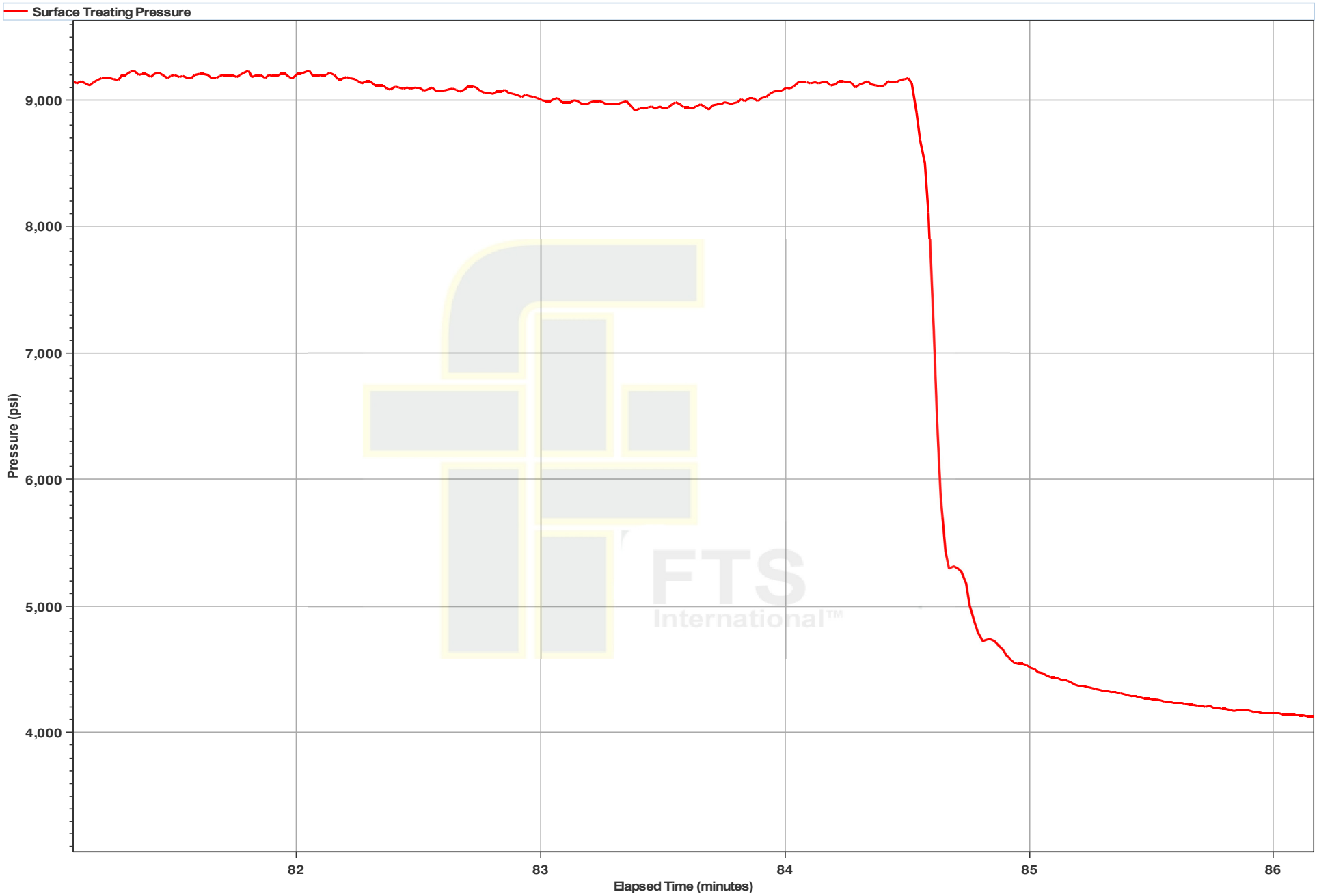
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 38 (WF.000658.M.W03.S38-ADCT-1103) **Jun 25, 2015**

Primary Plot



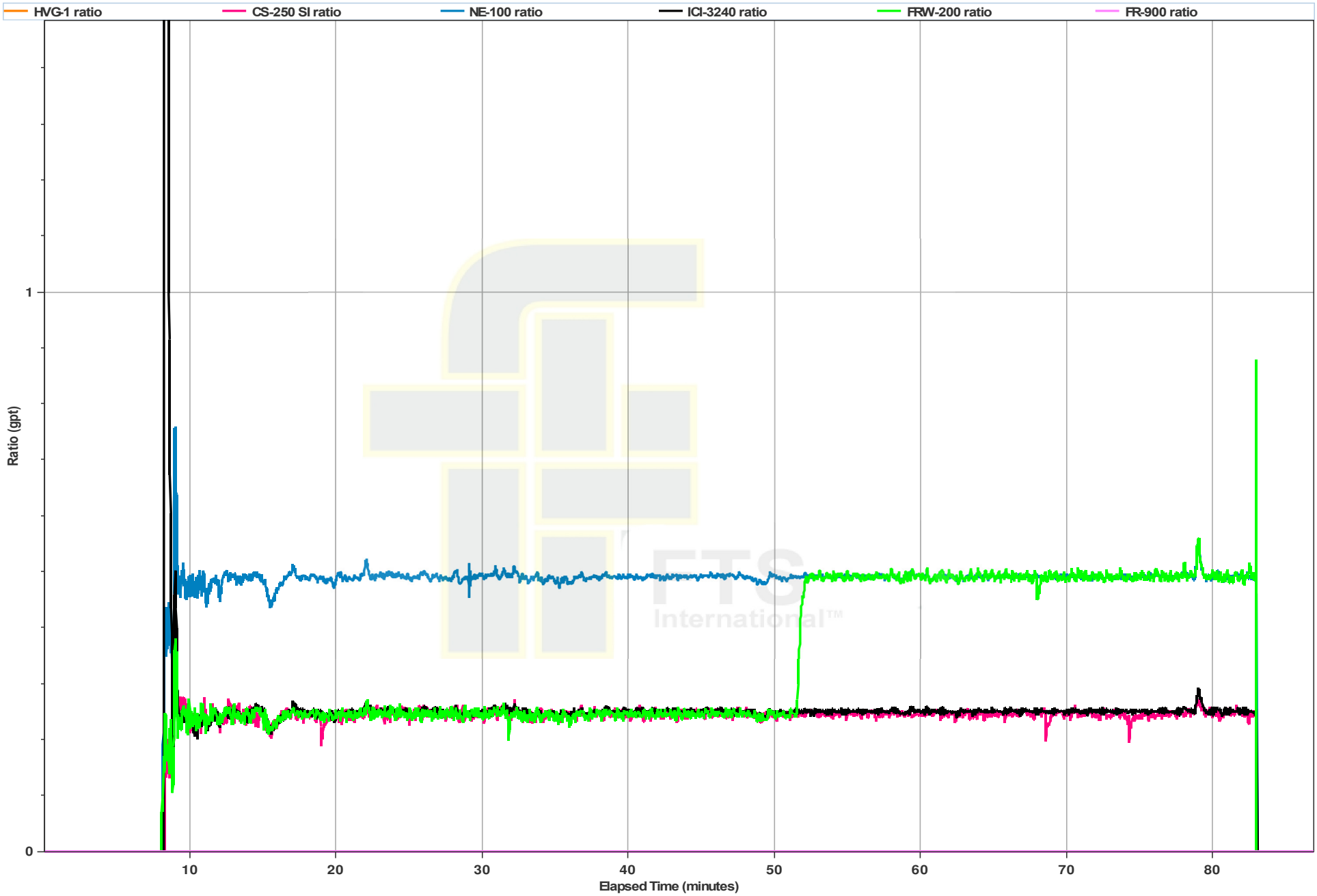
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 38 (WF.000658.M.W03.S38-ADCT-1103) **Jun 25, 2015**

ISIP Plot



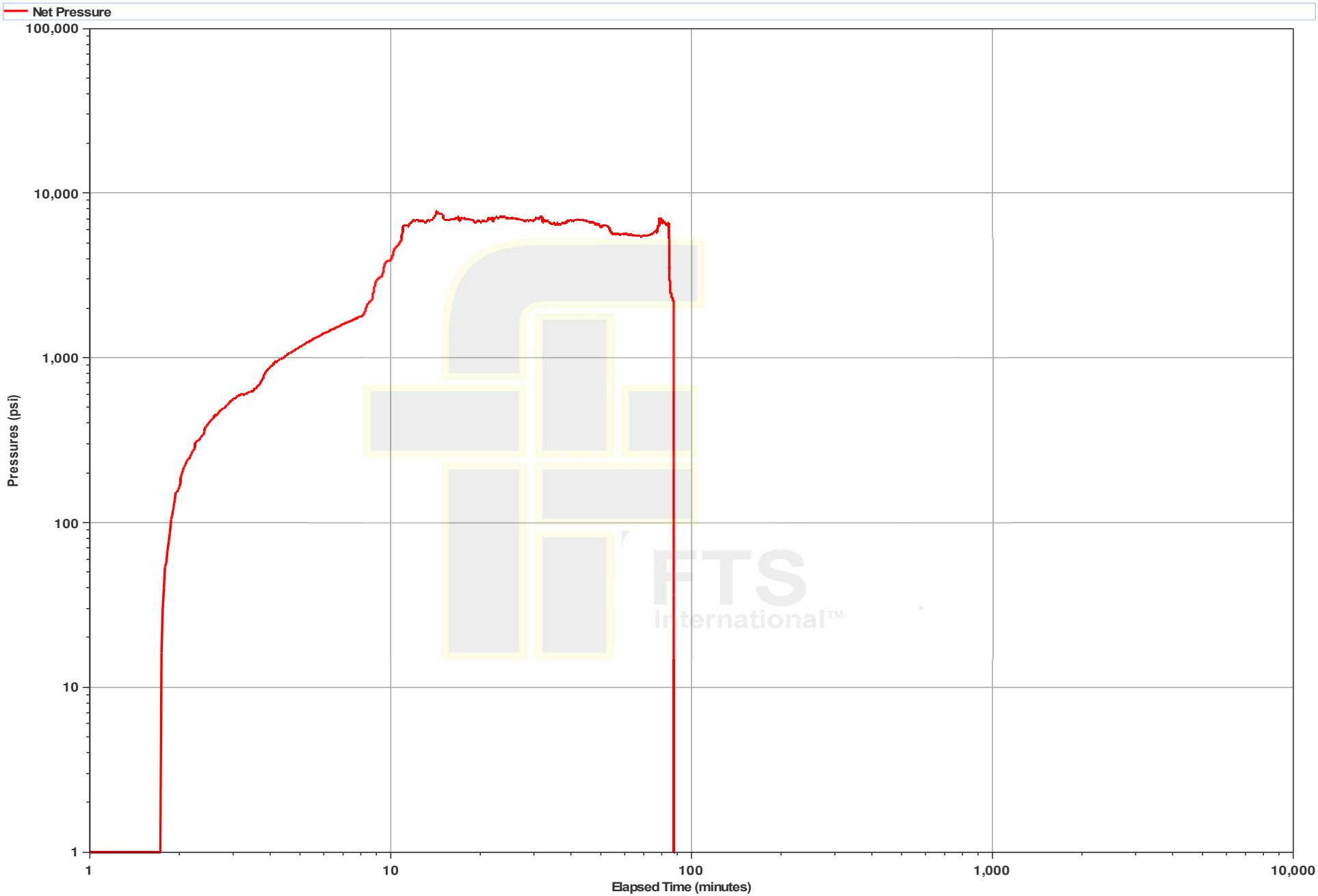
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 38 (WF.000658.M.W03.S38-ADCT-1103) **Jun 25, 2015**

Chemical Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 38 (WF.000658.M.W03.S38-ADCT-1103) Jun 25, 2015

Net Pressure Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 38 (WF.000658.M.W03.S38-ADCT-1103) Jun 25, 2015

WATER-BASED FRAC FLUID QUALITY CONTROL
(Attachment to Post Treatment Report)

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/25/2015
Customer Name:	American Energy - Utica	Proposal #:	3H/38
Date Sampled:	6/25/2015	Water Source:	Working Tank

Sample/Tank No.	Clarity, Color, Odor	Sample Temperature, (F)	Specific gravity	Initial pH	Chloride, ppm	Hardness, ppm	Calcium, ppm	Magnesium, ppm	Iron ppm	Hydroxide, ppm	Bicarbonate, ppm	Carbonate, ppm	Sulfate, ppm	Barium, ppm
Working Tank	Clear	71	1	8.1	29	40	14	6	1	0	28	0	<50	0
Reused Water Tank	Black, Cloudy, Petroleum Odor	72	1.03	5.1	49,985	28000	9,202	4,570	>10	0	976	0	450	0

Frac Fluid Quality Gel Testing (These Recording are to made prior to pumping job)														
Sample #														
Base Gel Type	HVG-1													
Gel Loading (lbs/1000 gal.)	2.5													
Sample Temperature, (F)	71													
Initial pH	7.9													
Visc. Reading @ 300 rpms	6													
Viscosity, (cp)	6													
Sample 1 3 min Hydration	4													
Sample 2 3 min Hydration	6													
Sample 3 3 min Hydration	6													
X-Link Vortex Closure, min:sec	n/a													
X-Link Crown, min:sec	n/a													
X-Link pH	n/a													
Gel Break Time (<2cp) mins	18													

Frac Fluid Quality Gel Testing (These Recording are to made while pumping job)														
Stage #														
Base Gel Viscosity (cp)														
X-Link pH								.						
Sample XL time, min:sec														
Sample Temperature														

Acid Quality	Percent Acid	NaOH, mLs	Specific Gravity
	28		1.14

Additional testing or documentation may be required by the customer or for frac fluid quality assurance.

Tested By: Etuate Varea

QUALITY CONTROL OF PROPPANTS

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/25/2015
Customer Name:	American Energy - Utica	Well/Stage:	3H/38
Date Sampled:	6/25/2015	DISTRICT:	Washington, PA
VENDOR:	SANTROL		

Select Proppant Type:

___	Brown	___	Ceramic	___	Other (specify)
X	White	___	Bauxite		
___	Resin Coated	___	Texas Gold		

Sieve Analysis	100 Mesh			Sieve Analysis	30/50 Mesh		
Sample 1	24.70	grams of sample		Sample 2	24.50	grams of sample	
	Amount Retained				Amount Retained		
Sieve mesh	Gram	%		Sieve mesh	Gram	%	
			Total				Total
50	0.10	0.40	In-Size	20	0.00	0.00	In-Size
70	16.50	66.80		30	0.50	2.04	
100	4.20	17.00	98.8%	40	17.90	73.06	97.1%
120	2.10	8.50		45	4.90	20.00	
140	1.00	4.05		50	1.00	4.08	
200	0.60	2.43		70	0.20	0.82	
Pan	0.20	0.81	fines	Pan	0.00	0.00	fines
Total wt. Gram	24.70	100.00		Total wt. Gram	24.50	100.00	

Tested By: Etuate Varea

Post Job Report

AMERICAN ENERGY - UTICA

Red Hill Farm MDS GR 3H

Stage : 38 OF 54

HARRISON, OH

Operations Representative:

Name:	David Knapp
Office:	724-743-2637
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Engineering Manager:

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Email:	THADDEUS.CRAUN@FTSI.COM

FTS International
[illegible]
Eighty Four, PA [illegible]

FTS INTERNATIONAL

Customer: American Energy - Utica
Well: Red Hill Farm Bla 6r 3H
Stage: 14
Job End Date: [illegible]

Job Summary

Well Information

TVD:	7,301	Top Perf:	9,808
No. Of Perfs:	30		

Casing	Tubing
5.50" 23.0#/	n/A

Pressures, Rates and Volumes

	Proposed	Actual	Max	Min
STP	9,000 psi	9,000 psi	9,370 psi	7,000 psi
Rate	90.0 bpm	92.0 bpm	95.3 bpm	90.0 bpm

	Proposed	Actual		
Clean Volume	9,772 bbls	9,334 bbls		
Slurry Volume	9,002 bbls	8,564 bbls		
Flush Volume	357 bbls	372 bbls		

	Proposed	Start	End
Free Pumps on Location	19	15	15

Open Well:	Start Time	22:25	Pressure	3,295 psi
	Bull End	321 bbls	Break Down	5,739 psi
	Initial ISIP:	4,294 psi	Initial F.G.:	1.09 psi/ft
Stage Complete:	End Time	00:21	Job Time	01:56
	Final ISIP	4,494 psi	Final F.G.	1.09 psi/ft
	ISIP	17.149	5 Min:	1,455 psi
	Pressure Min:	0.00	10 Min:	N/A
	Pressure Max:	2.00	15 Min:	N/A

Material Volume

Material	Proposed	Calculated	Actual	Variance
100 Mesh White	40,000	39,340	39,340	0%
30/50 White	310,000	310,392	311,032	0%
Total Proppants	350,000	349,731	350,371	0%

Material	Proposed	Calculated	Actual	Variance
8.1%-7.5% HCL	3,000	2,942	3,000	1%
[illegible]	3	3	3	0%
[illegible]	68	54	53	2%
FE-[illegible]	15	14	15	0%
[illegible]	160	121	120	-25
[illegible]	68	54	54	0%
NE-[illegible]	4	100	100	-25
NE-[illegible]	120	8	8	4

Comments:

Paradown Information:
Total Bbls: 113
Max Pressure (psi): 6364
Max Rate (bpm): 15

FTS International
1432 Route 519
Eighty Four, PA 15330

Customer: American Energy - Utica
Well: [illegible]
Stage: [illegible]
Job End Date: [illegible]

Treatment Report

Date	[illegible]	District	Washington County, PA	[illegible]	[illegible]	API#	34-[illegible]

El. Time	STP	Slurry BPM	Stage Slurry (bbls)	Cumulative Slurry (bbls)	Stage Clean (bbls)	Cumulative Clean (bbls)	Stage Proppant (lbs)	Cumulative Proppant (lbs)	Description	Proppant	PPA
23:34	3,006	0.0	0	0	0	0	0	0	Freshwater Open Well		0.00
23:44	[illegible]	0.0	3	3	3	3	0	0	Freshwater Load		0.00
23:50	7,214	0.0	71	[illegible]	71	[illegible]	0	0	7.5% HCL Acid Acid		0.00
[illegible]	[illegible]	27.7	101	101	101	101	[illegible]	[illegible]	Slickwater Proppant	100 Mesh White	0.10
[illegible]	7,000	19.6	40	221	40	221	[illegible]	[illegible]	Slickwater Proppant	100 Mesh White	0.25
[illegible]	[illegible]	19.6	0	221	0	221	0	[illegible]	Slickwater Shutdown		0.00
[illegible]	8,121	28.6	84	[illegible]	[illegible]	[illegible]	872	1,0[illegible]	Slickwater Proppant	100 Mesh White	0.25
[illegible]	[illegible]	58.4	214	[illegible]	215	[illegible]	4,404	[illegible]	Slickwater Proppant	100 Mesh White	0.50
[illegible]	8,167	82.6	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	14,843	Slickwater Proppant	100 Mesh White	0.75
[illegible]	[illegible]	65.2	[illegible]	1,557	[illegible]	[illegible]	[illegible]	[illegible]	Slickwater Proppant	100 Mesh White	1.00
[illegible]	[illegible]	84.1	674	2,231	614	2,219	[illegible]	79,077	Slickwater Proppant	30/50 White	1.00
00:17	8,484	84.2	1,0[illegible]	3,231	1,057	[illegible]	[illegible]	132,177	Slickwater Proppant	30/50 White	1.25
[illegible]	[illegible]	84.6	[illegible]	[illegible]	918	[illegible]	[illegible]	[illegible]	Slickwater Proppant	30/50 White	1.50
[illegible]	8,214	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Slickwater Proppant	30/50 White	1.75
[illegible]	8,194	84.6	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	248,621	Slickwater Proppant	30/50 White	2.00
[illegible]	8,212	84.7	[illegible]	[illegible]	[illegible]	[illegible]	0	248,621	Slickwater Clean sweep		0.00
[illegible]	[illegible]	84.2	179	[illegible]	179	[illegible]	0	248,621	Slickwater Flush		0.00
[illegible]	[illegible]	30.4	[illegible]	[illegible]	[illegible]	[illegible]	0	248,621	Freshwater Flush		0.00
[illegible]	4,884	0.0	0	[illegible]	0	[illegible]	0	248,621	Freshwater Shutdown		0.00
Total Job Time (HH:MM): 01:14											

Min STP:	[illegible] psi	Max STP:	[illegible] psi	Average STP:	[illegible] psi	5 Min:	[illegible] psi
Min Rate:	[illegible] bpm	Max Rate:	[illegible] bpm	Average Rate:	82.6 bpm	10 Min:	0 psi
Initial ISIP:	4,884 psi	Initial F.G.:	[illegible] psi/ft	Average HHP:	17,242	15 Min:	0 psi
Final ISIP:	4,884 psi	Final F.G.:	[illegible] psi/ft	Customer Representative:		[illegible]	
FTS Representative:		Travis Wilson & [illegible]					

Comments:

The proppant values contained in this report are calculated based on actual barrel counts and target densities. Actual total proppant usage is 248,621 lbs. Charge time is 1 hour(s) 16 minute(s). All chemicals and proppant ran as documented.

Min/Max/Avg were taken from sand stages. All chem changes from proposed were made per AEU representative request.

No [illegible] was run on this stage.

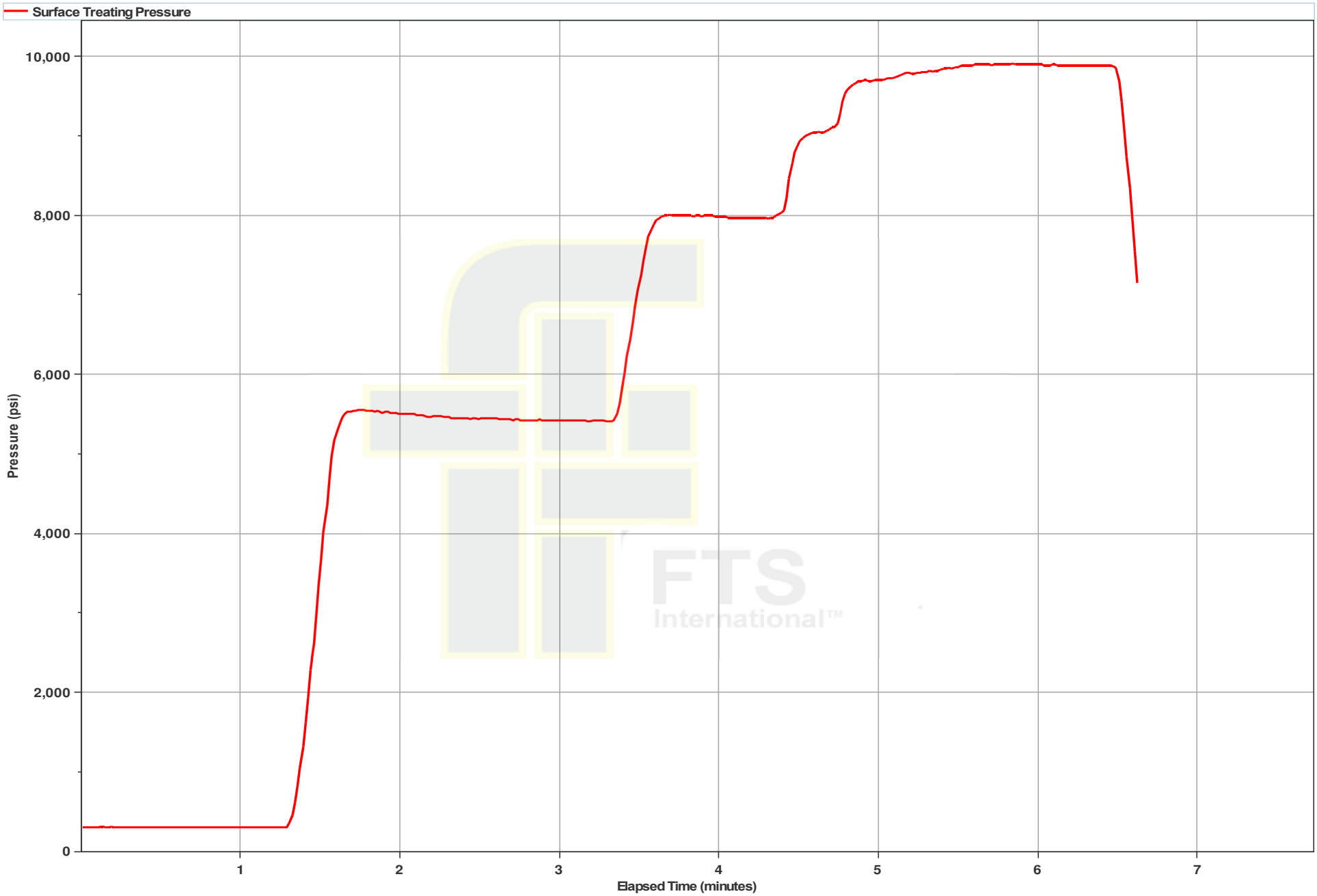
1 Minute Shutdown (psi): 4284
2 Minute Shutdown (psi): 4148
5 Minute Shutdown (psi): [illegible]

Chemical Changes:

Chemical Name	Chemical Loading	Cumulative Clean

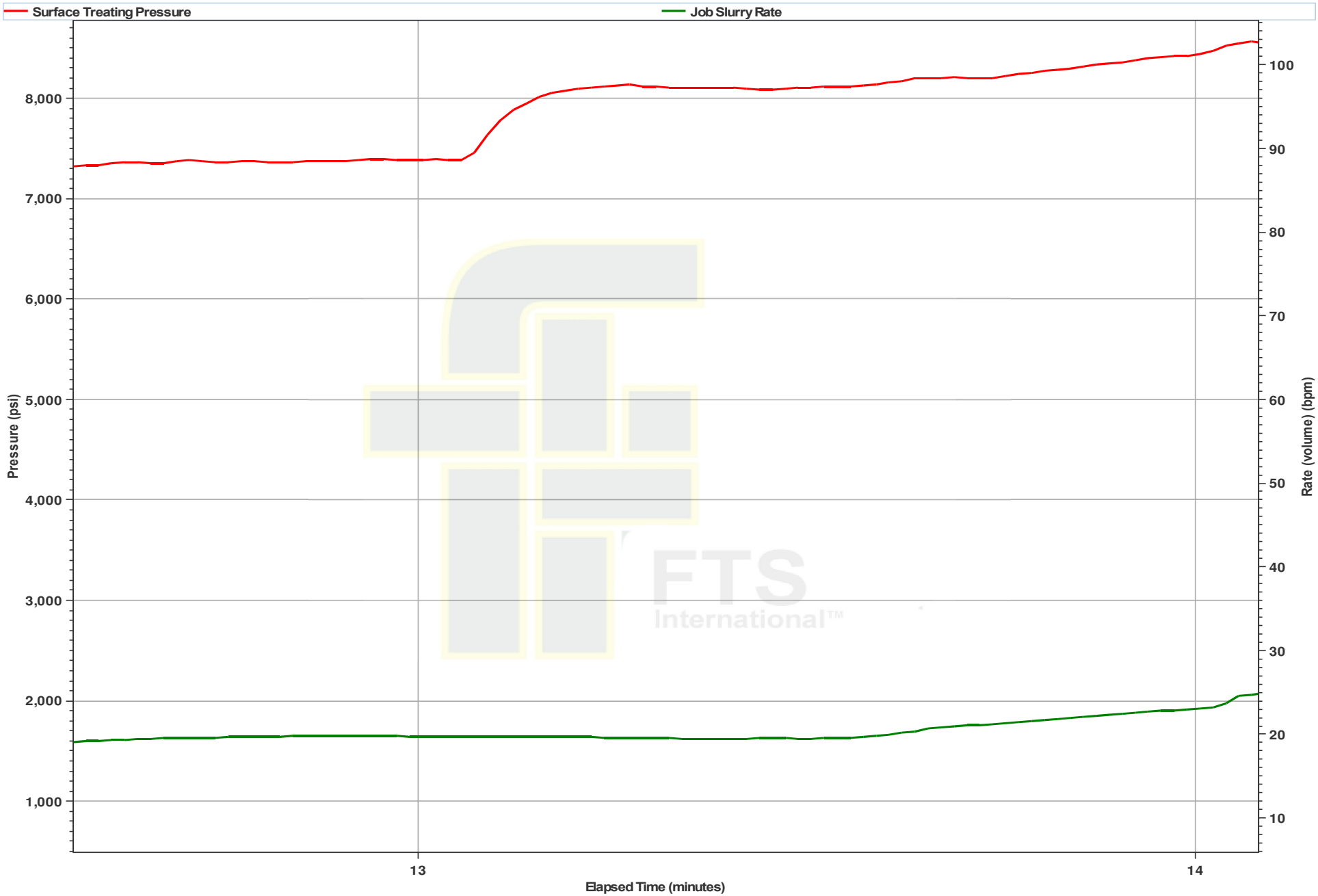
FRW-200	0.75	734
FRW-200	0.50	2,331
FRW-200	0.60	4,069
FRW-200	0.50	4,069

AEU Pressure Test



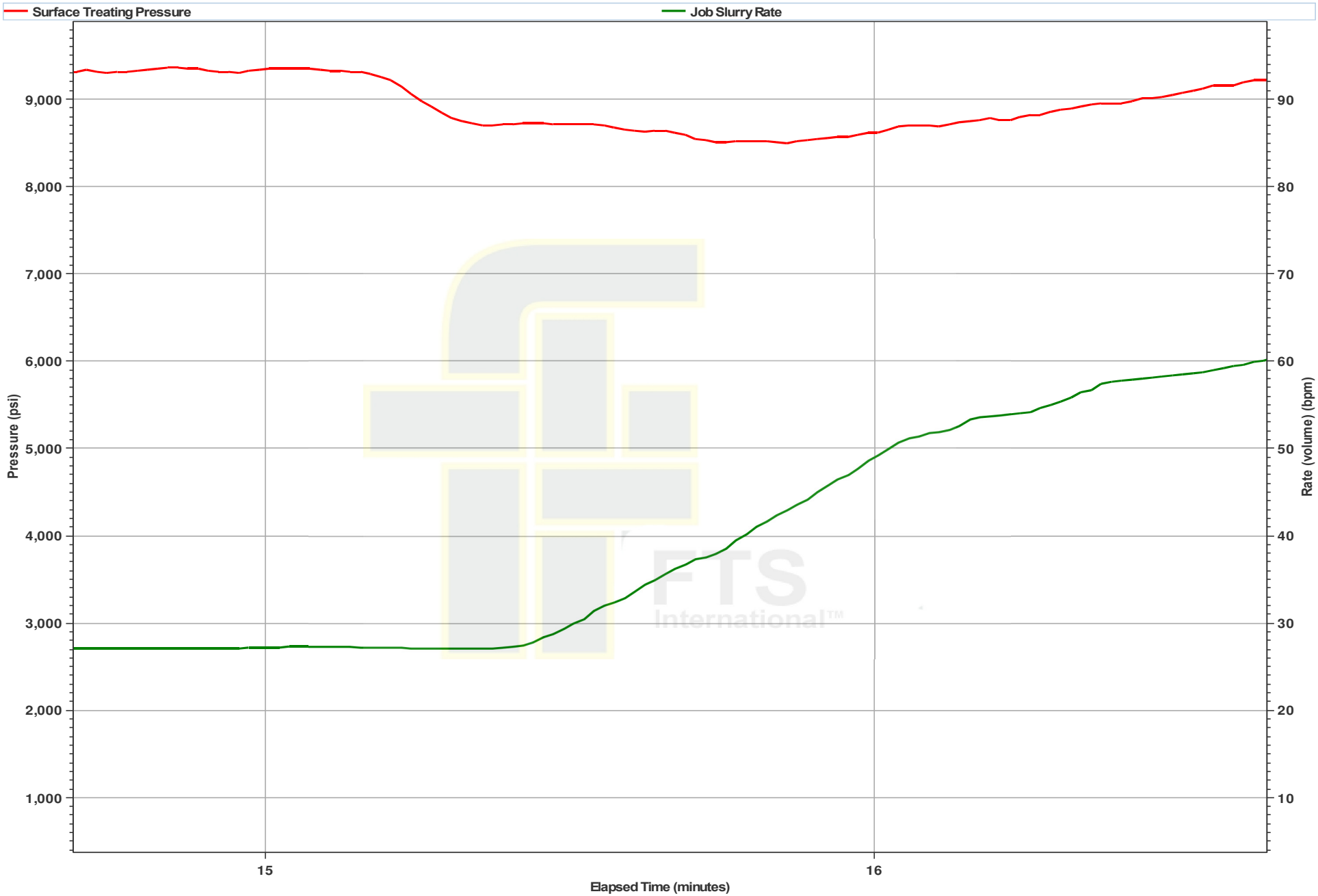
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 39 (WF.000658.M.W03.S39-aDCT-1103) Jun 25, 2015

Ball Seat and Breakdown



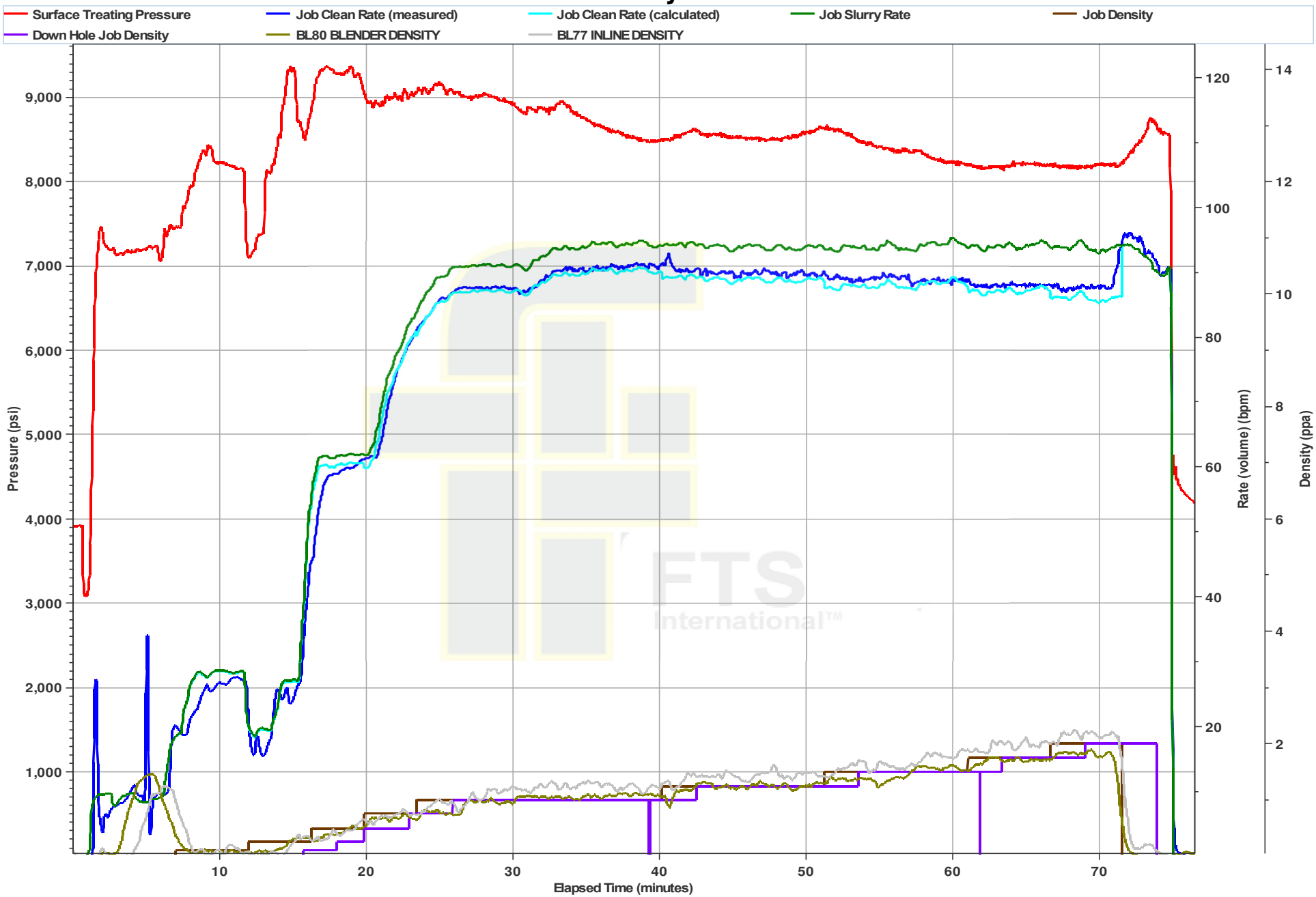
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 39 (WF.000658.M.W03.S39-aDCT-1103) Jun 25, 2015

Acid on Perforations



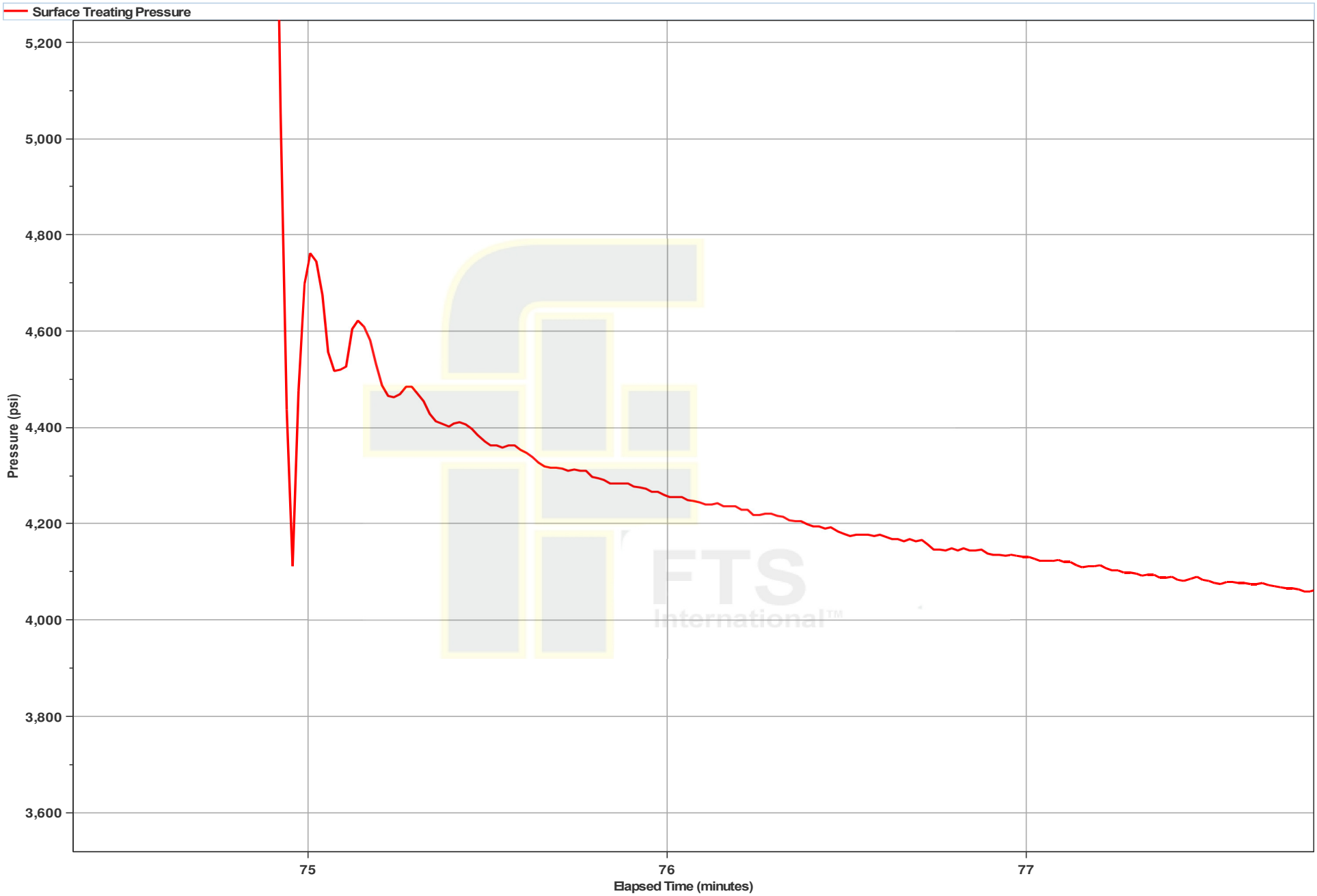
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 39 (WF.000658.M.W03.S39-aDCT-1103) **Jun 25, 2015**

Primary Plot



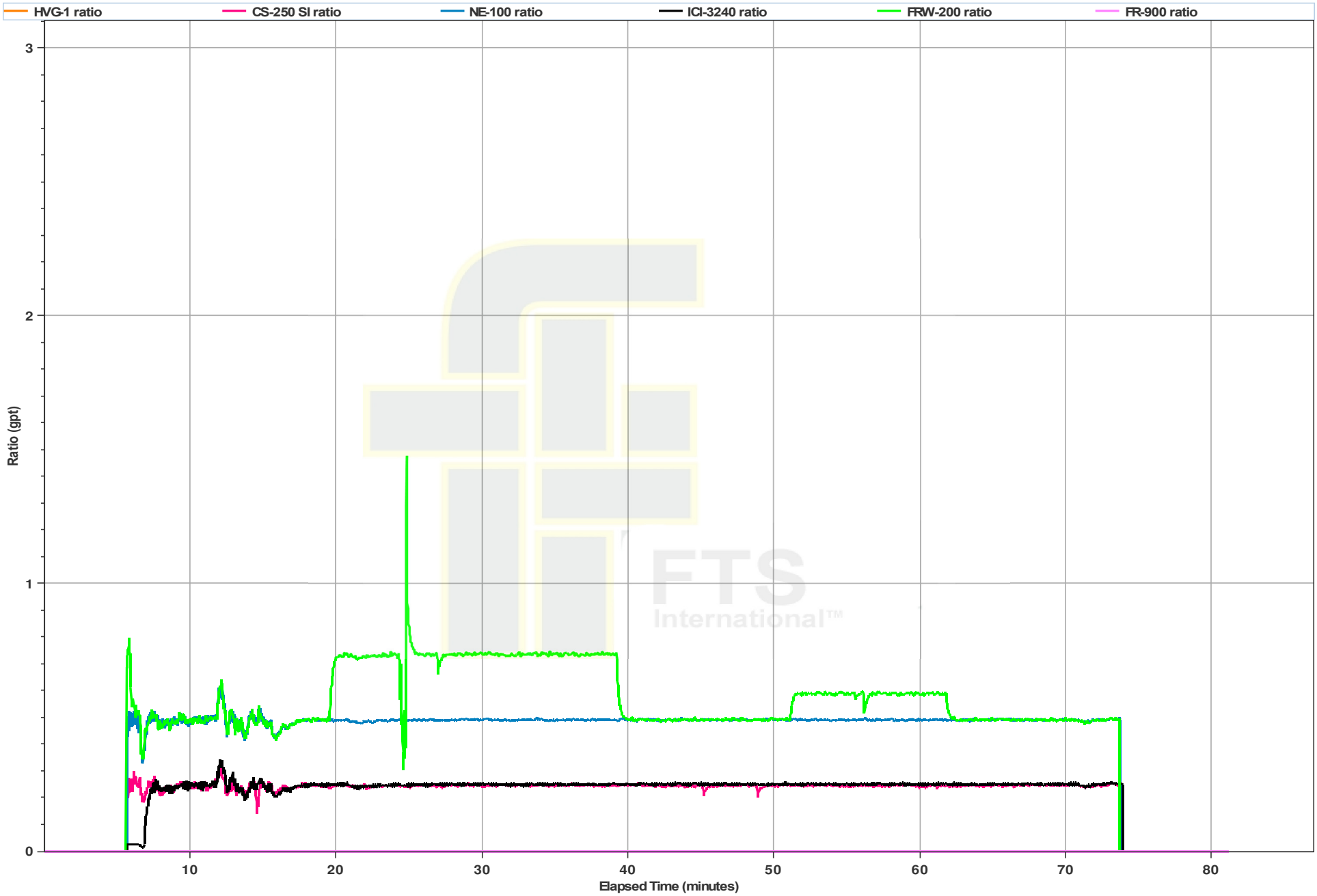
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 39 (WF.000658.M.W03.S39-aDCT-1103) **Jun 25, 2015**

ISIP Plot



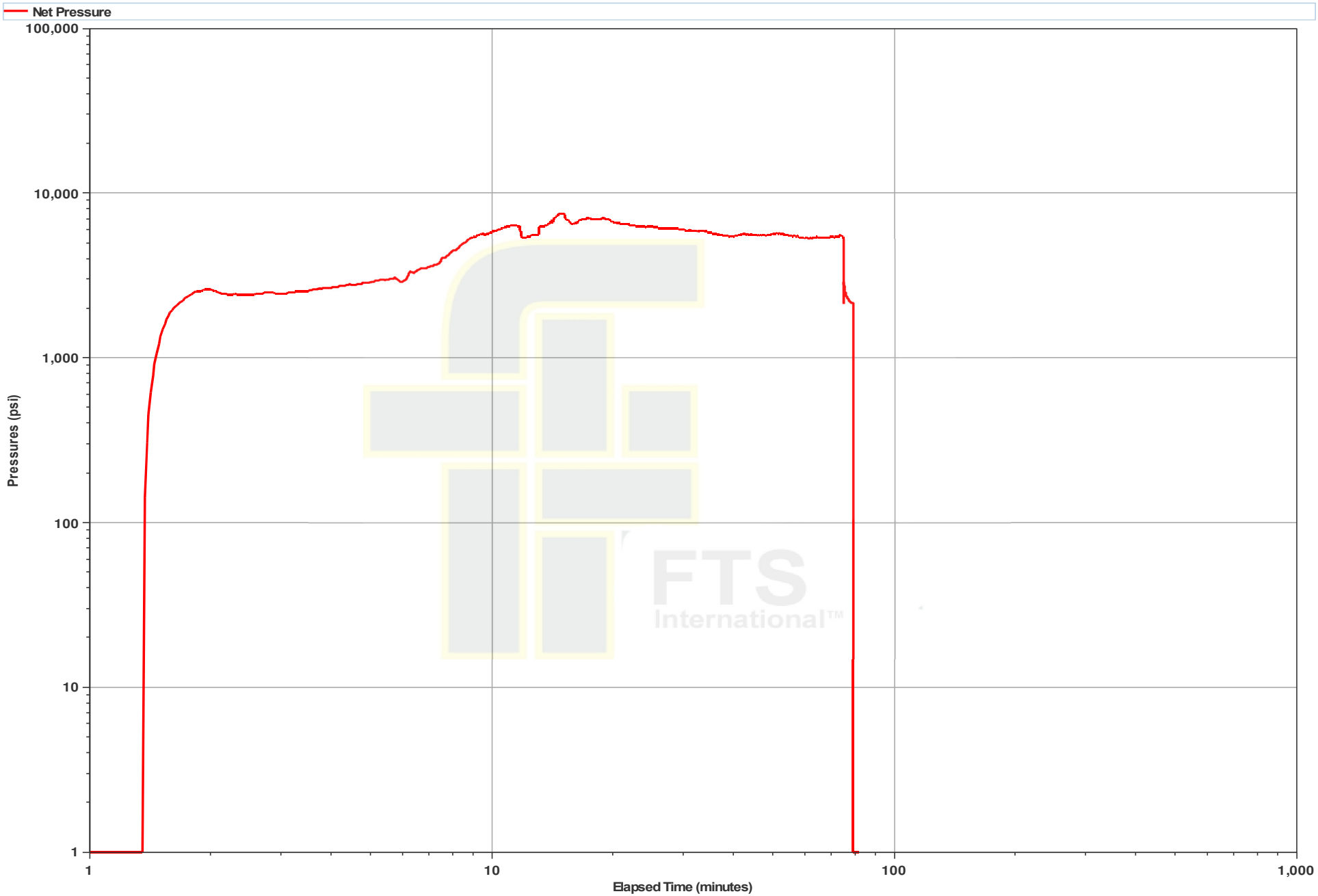
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 39 (WF.000658.M.W03.S39-aDCT-1103) **Jun 25, 2015**

Chemical Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 39 (WF.000658.M.W03.S39-aDCT-1103) **Jun 25, 2015**

Net Pressure Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 39 (WF.000658.M.W03.S39-aDCT-1103) Jun 25, 2015

WATER-BASED FRAC FLUID QUALITY CONTROL
(Attachment to Post Treatment Report)

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/26/2015
Customer Name:	American Energy - Utica	Proposal #:	3H/39
Date Sampled:	6/26/2015	Water Source:	Working Tank

Sample/Tank No.	Clarity, Color, Odor	Sample Temperature, (F)	Specific gravity	Initial pH	Chloride, ppm	Hardness, ppm	Calcium, ppm	Magnesium, ppm	Iron ppm	Hydroxide, ppm	Bicarbonate, ppm	Carbonate, ppm	Sulfate, ppm	Barium, ppm
Working Tank	Clear	70	1	8	35	37	14	6	0	0	28	0	<50	0

Frac Fluid Quality Gel Testing (These Recording are to made prior to pumping job)														
Sample #														
Base Gel Type	HVG-1													
Gel Loading (lbs/1000 gal.)	2.5													
Sample Temperature, (F)	70													
Initial pH	7.9													
Visc. Reading @ 300 rpms	6													
Viscosity, (cp)	6													
Sample 1 3 min Hydration	4													
Sample 2 3 min Hydration	6													
Sample 3 3 min Hydration	6.5													
X-Link Vortex Closure, min:sec	n/a													
X-Link Crown, min:sec	n/a													
X-Link pH	n/a													
Gel Break Time (<2cp) mins	20													

Frac Fluid Quality Gel Testing (These Recording are to made while pumping job)														
Stage #														
Base Gel Viscosity (cp)														
X-Link pH								.						
Sample XL time, min:sec														
Sample Temperature														

Acid Quality	Percent Acid	NaOH, mLs	Specific Gravity
	28		1.14

Additional testing or documentation may be required by the customer or for frac fluid quality assurance.

Tested By: Travis Wilson

QUALITY CONTROL OF PROPPANTS

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/26/2015
Customer Name:	American Energy - Utica	Well/Stage:	3H/39
Date Sampled:	6/26/2015	DISTRICT:	Washington, PA
VENDOR:	SANTROL		

Select Proppant Type:

___ Brown	___ Ceramic	___ Other (specify)
X White	___ Bauxite	
___ Resin Coated	___ Texas Gold	

Sieve Analysis	100 Mesh			Sieve Analysis	30/50 Mesh		
Sample 1	24.80	grams of sample		Sample 2	24.80	grams of sample	
	Amount Retained				Amount Retained		
Sieve mesh	Gram	%		Sieve mesh	Gram	%	
			Total				Total
50	0.20	0.81	In-Size	20	0.00	0.00	In-Size
70	16.50	66.53		30	0.50	2.02	
100	3.90	15.73	98.8%	40	19.20	77.42	95.6%
120	1.80	7.26		45	3.20	12.90	
140	1.30	5.24		50	1.30	5.24	
200	1.00	4.03		70	0.60	2.42	
Pan	0.10	0.40	fines	Pan	0.00	0.00	fines
Total wt. Gram	24.80	100.00		Total wt. Gram	24.80	100.00	

Tested By: Travis Wilson

Post Job Report

AMERICAN ENERGY - UTICA

Red Hill Farm MDS GR 3H

Stage : 40 OF 54

HARRISON, OH

Operations Representative:

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Email:	**DAVID.KNAPP@FTSI.COM**

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Engineering Manager:

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Cell:	
Email:	**THADDEUS.CRAUN@FTSI.COM**

FTS International
1432 Route 519
Eighty Four, PA 15330

Customer: American Energy - Utica
Well: Red Hill Farm Mds Gr 3H
Stage: 40
Job End Date: 06/26/2015

Job Summary

Well Information

TVD:	7,301	**Top Perf:**	9,783
No. Of Perfs:	30		

Casing	Tubing
5.50" 20.00#	N/A

Pressures, Rates and Volumes

	Proposed	Actual	Max	Min
STP	9,046 psi	8,957 psi	9,839 psi	7,959 psi
Rate	80.0 bpm	80.5 bpm	96.2 bpm	10.2 bpm

	Proposed	Actual		
Clean Volume	5,772 bbls	5,555 bbls		
Slurry Volume	6,042 bbls	5,826 bbls		
Flush Volume	357 bbls	281 bbls		

	Proposed	Start	End
Frac Pumps on Location	10	15	15

Open Well:	Start Time	05:51	Pressure	3,095 psi
	Ball Seat	60 bbls	Break Down	7,255 psi
	Initial ISIP:	4,559 psi	Initial F.G.:	1.06 psi/ft
Stage Complete:	End Time	07:12	Job Time	01:15
	Final ISIP	4,559 psi	Final F.G.	1.06 psi/ft
	HHP	17,673	5 Min:	4,034 psi
	Proppant Min:	0.00	10 Min:	N/A
	Proppant Max:	2.00	15 Min:	N/A

Material Volume

Material	Proposed	Calculated	Actual	Variance
100 Mesh White	40,000	39,151	39,151	0%
30/50 White	210,000	211,754	210,754	0%
Total Proppants	250,000	250,905	249,905	0%

Material	Proposed	Calculated	Actual	Variance
0.1%-7.5% HCL	3,000	2,982	3,000	1%
APB-1	0	3	3	0%
CI-150	3	3	3	0%
CS-250 SI	60	56	56	0%
FE-200L	15	15	15	0%
FRW-200	180	87	85	-2%
HVG-1 4.0	0	17	17	0%
ICI-3240	60	56	56	0%
LTB-1	0	3	3	0%
NE-100	0	112	112	0%
NE-100W	120	0	0	0

Comments:

Pumpdown Information:
Total Bbls: 116
Max Pressure (psi): 6290
Max Rate (bpm): 15.1

FTS International
1432 Route 519
Eighty Four, PA 15330

Customer: American Energy - Utica
Well: Red Hill Farm Mds Gr 3H
Stage: 40
Job End Date: 06/26/2015

Treatment Report

Date:	6/26/2015	District:	Washington County,PA	Quote No:	051815_035725QF	API:	34-059-24370

MIL Time	STP	Slurry BPM	Stage Clean (bbls)	Cumulative Clean (bbls)	Stage Slurry (bbls)	Cumulative Slurry (bbls)	Stage Proppant (lbs)	Cumulative Proppant (lbs)	Description	Proppant	PPA
05:51	3,095	0.0	0	0	0	0	0	0	Freshwater Open Well		0.00
05:51	4,625	8.6	3	3	3	3	0	0	Freshwater Load		0.00
05:58	7,220	12.1	57	60	57	60	0	0	7.5% HCL Acid Acid		0.00
05:59	7,255	10.9	14	74	14	74	0	0	7.5% HCL Acid Breakdown		0.00
05:59	7,418	14.6	49	123	49	123	0	0	Slickwater Pad		0.00
06:01	9,597	21.4	214	337	215	338	899	899	Slickwater Proppant	100 Mesh White	0.10
06:15	9,121	62.4	214	551	216	554	2,247	3,146	Slickwater Proppant	100 Mesh White	0.25
06:15	9,172	72.4	255	806	261	815	5,355	8,501	Slickwater Proppant	100 Mesh White	0.50
06:18	9,109	75.6	429	1,235	444	1,259	13,514	22,015	Slickwater Proppant	100 Mesh White	0.75
06:29	9,017	87.4	408	1,643	426	1,685	17,136	39,151	Slickwater Proppant	100 Mesh White	1.00
06:29	9,064	87.5	827	2,470	864	2,549	34,734	73,885	Slickwater Proppant	30/50 White	1.00
06:40	9,006	92.9	850	3,320	898	3,447	44,625	118,510	Slickwater Proppant	30/50 White	1.25
06:48	8,701	95.4	75	3,395	80	3,527	4,725	123,235	Slickwater Proppant	30/50 White	1.50
06:48	8,710	95.3	100	3,495	107	3,634	6,300	129,535	10# Linear Gel Proppant	30/50 White	1.50
06:49	8,670	95.3	582	4,077	622	4,256	36,666	166,201	Slickwater Proppant	30/50 White	1.50
06:56	8,629	96.1	440	4,517	475	4,731	32,340	198,541	Slickwater Proppant	30/50 White	1.75
07:01	8,550	95.9	61	4,578	66	4,797	4,484	203,025	10# Linear Gel Proppant	30/50 White	1.75
07:01	8,545	95.4	570	5,148	622	5,419	47,880	250,905	Slickwater Proppant	30/50 White	2.00
07:09	8,656	95.8	126	5,274	126	5,545	0	250,905	Slickwater Clean screws		0.00
07:10	8,742	95.2	135	5,409	135	5,680	0	250,905	Slickwater Flush		0.00
07:10	8,694	95.9	146	5,555	146	5,826	0	250,905	Freshwater Flush		0.00
07:12	4,559	0.0	0	5,555	0	5,826	0	250,905	Freshwater Shutdown		0.00
Total JobTime (HH:MM): 01:21											

Min STP:	7,959 psi	**Max STP:**	9,839 psi	**Average STP:**	8,957 psi	**5 Min:**	4,034 psi
Min Rate:	10.2 bpm	**Max Rate:**	96.2 bpm	**Average Rate:**	80.5 bpm	**10 Min:**	0 psi
Initial ISIP:	4,559 psi	**Initial F.G.:**	1.06 psi/ft	**Average HHP:**	17,673	**15 Min:**	0 psi
Final ISIP:	4,559 psi	**Final F.G.:**	1.06 psi/ft	**Customer Representative:**		Mike Hausvater	
FTSI Representative:		Etuate Varea & James Garland					

Comments:

The proppant values contained in this report are calculated based on actual barrel counts and target densities. Actual total proppant usage is 249,905 lbs. Charge time is 1 hour(s) 15 minute(s). All chemicals and proppant ran as documented.

Min/Max/Avg were taken from sand stages. All chem changes from proposed were made per AEU representative request.

No reused water pumped

1 Minute Shutdown (psi): 4437
2 Minute Shutdown (psi): 4353
5 Minute Shutdown (psi): 4034

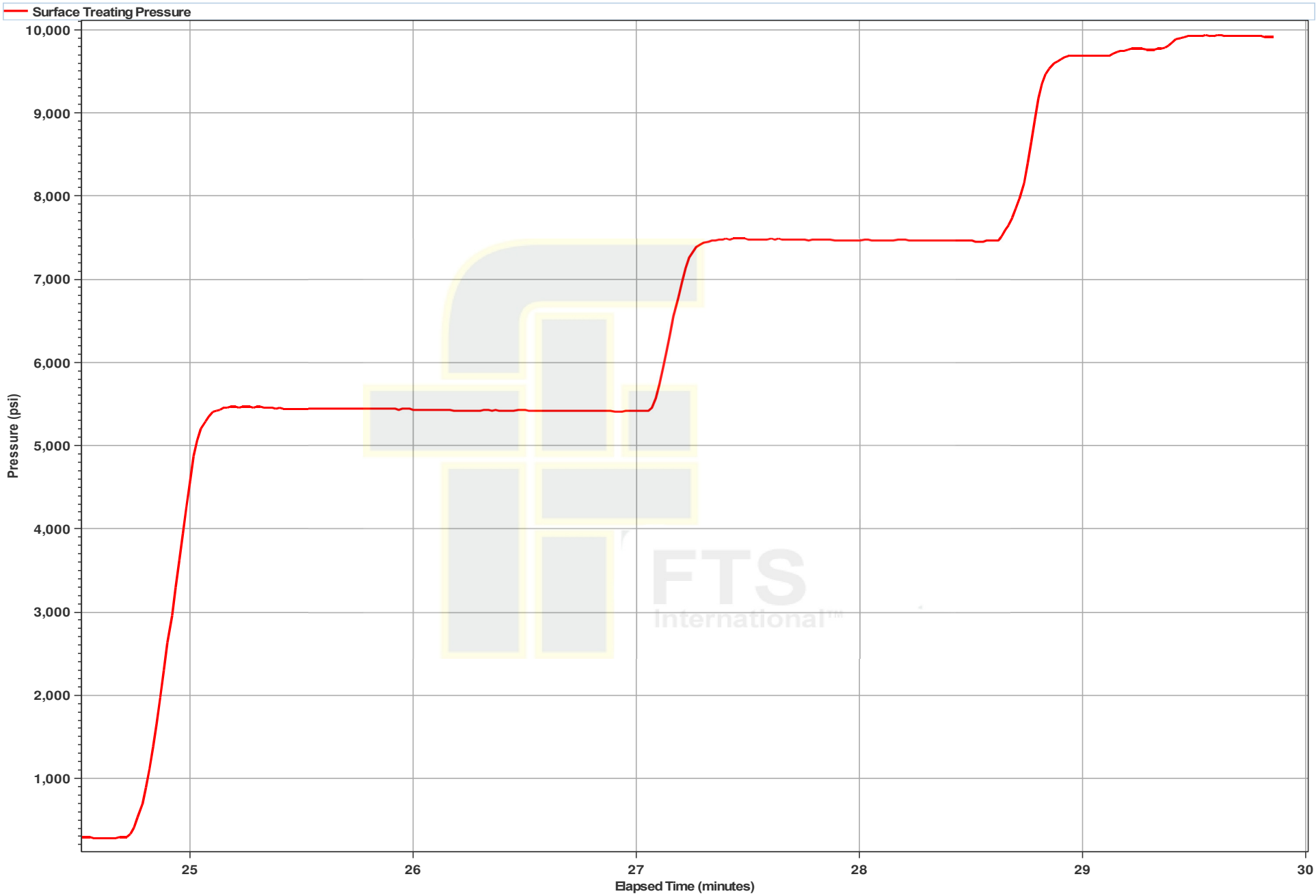
FTS International
1432 Route 519
Eighty Four, PA 15330

Customer: American Energy - Utica
Well: Red Hill Farm Mds Gr 3H
Stage: 40
Job End Date: 06/26/2015

Chemical Changes:

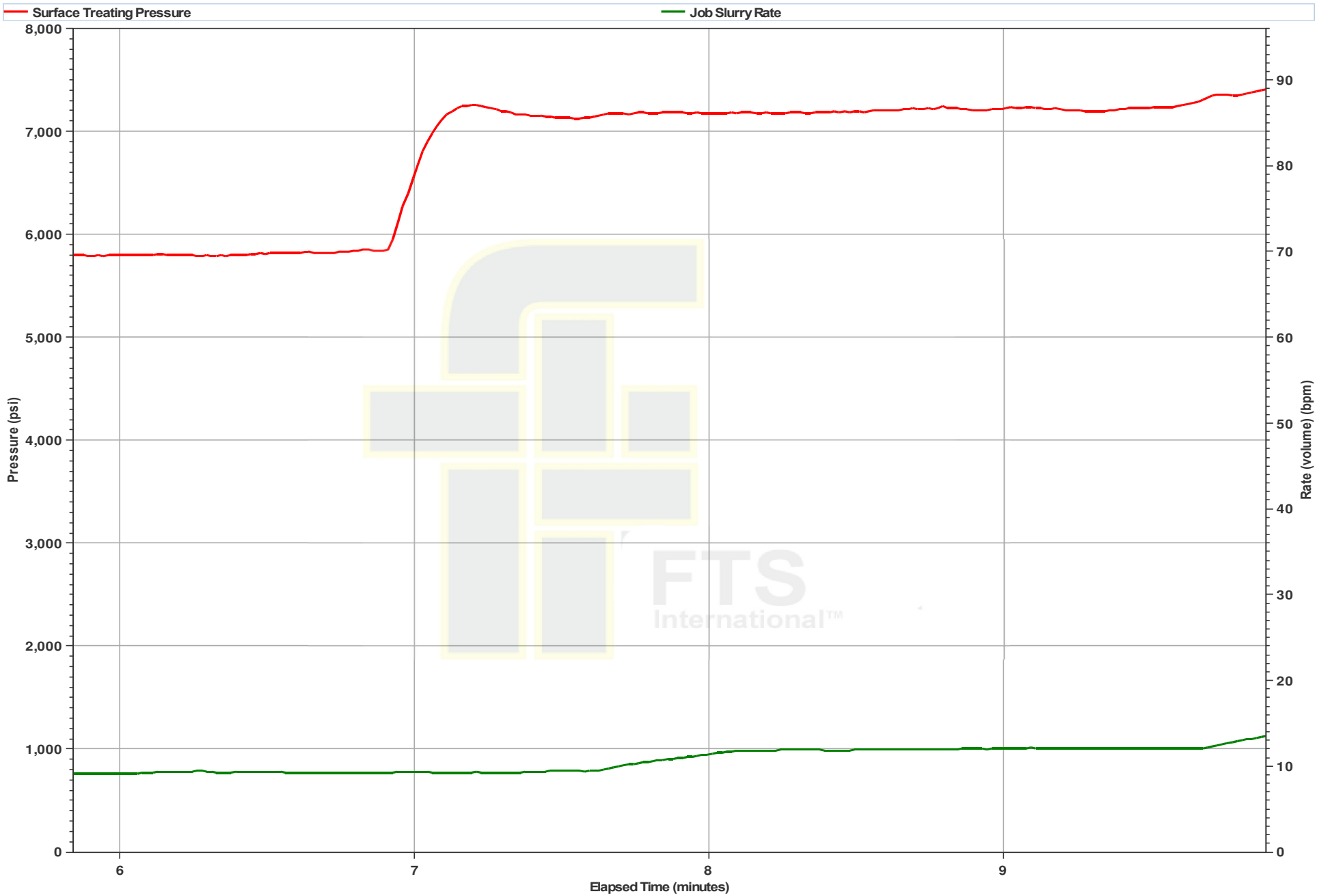
Chemical Name	Chemical Loading	Cumulative Clean
FRW-200	0.50	3,320

AEU Pressure Test



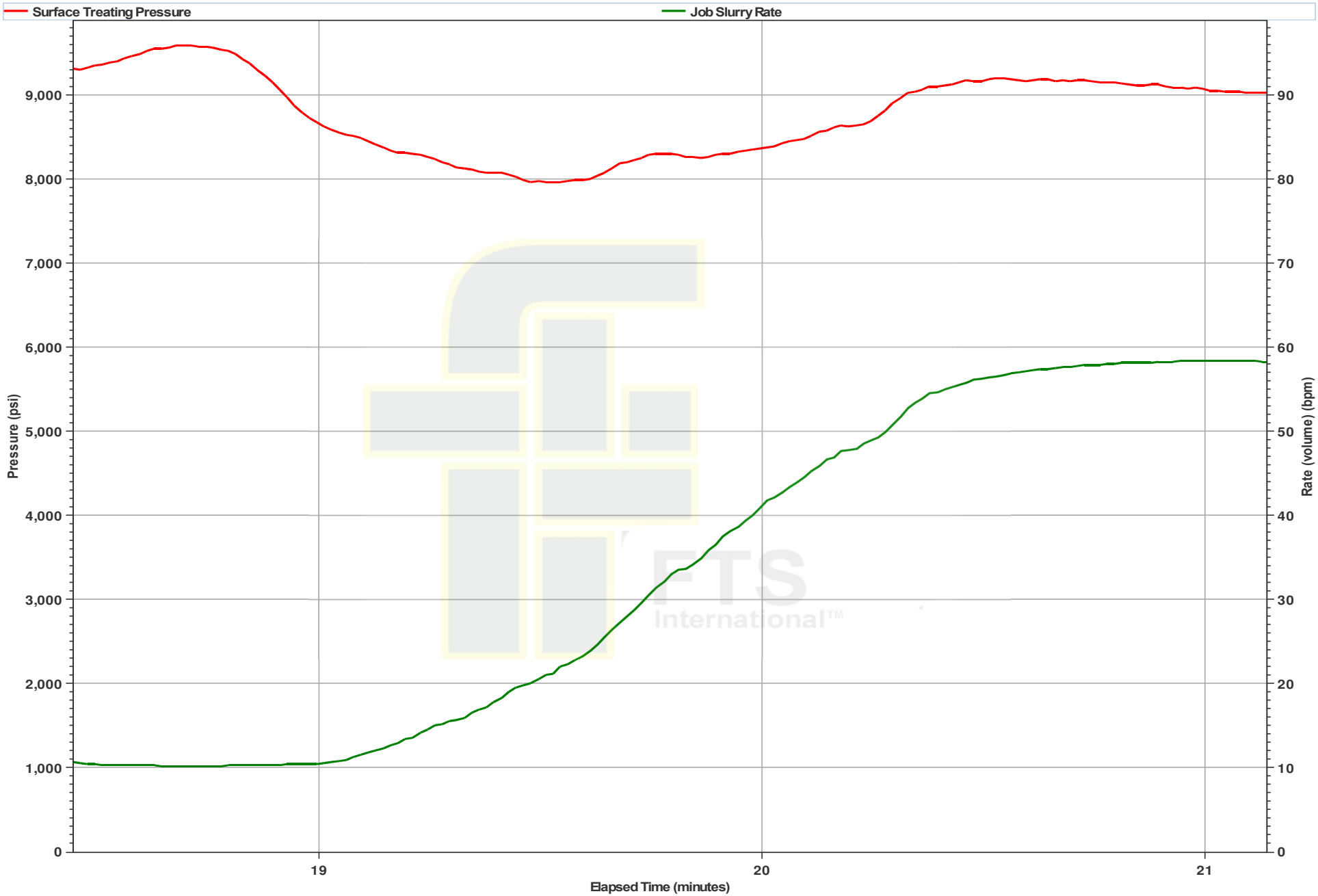
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 40 (WF.000658.M.W03.S40-ADCT-1103) **Jun 26, 2015**

Ball Seat and Breakdown



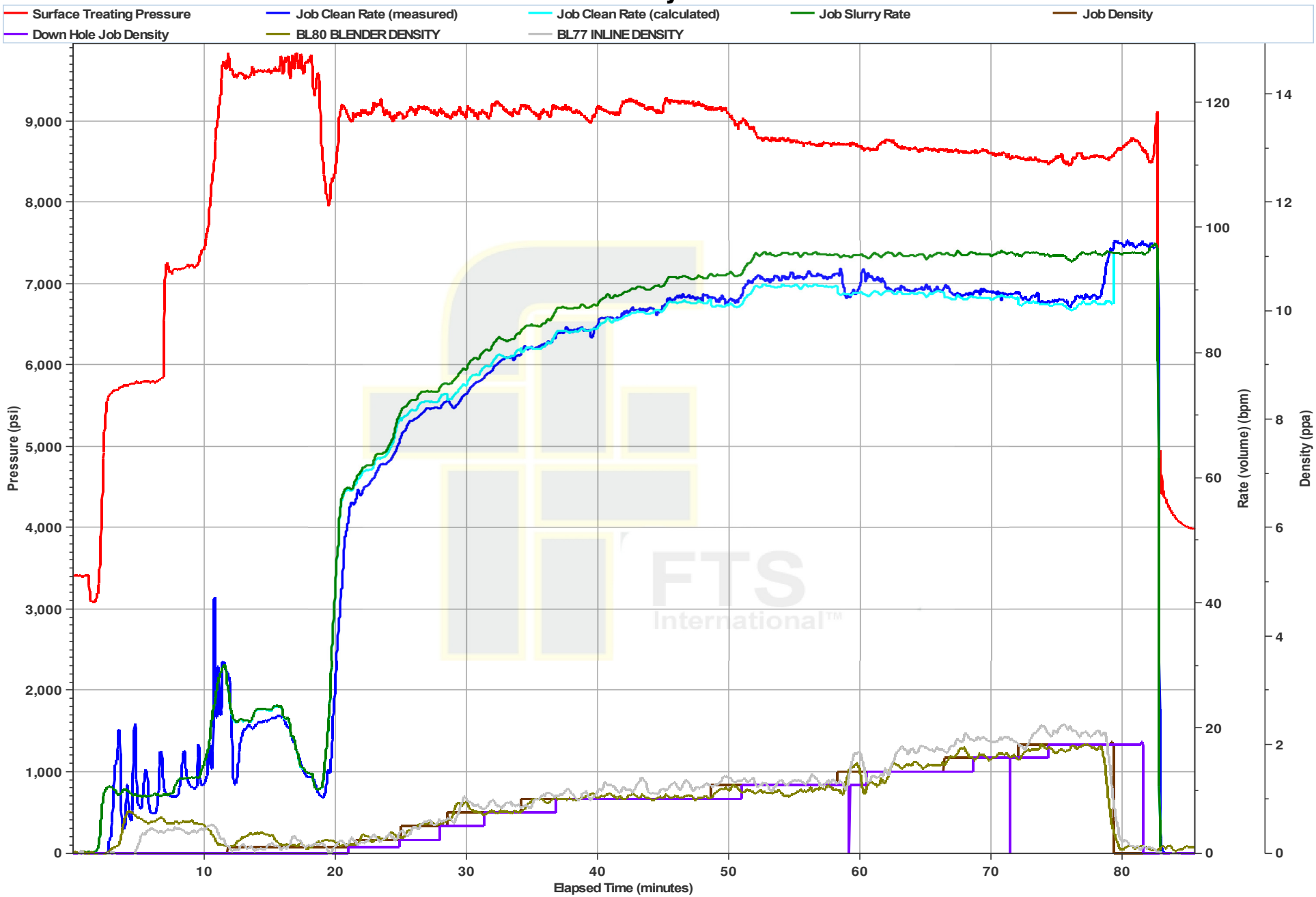
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 40 (WF.000658.M.W03.S40-ADCT-1103) **Jun 26, 2015**

Acid on Perforations



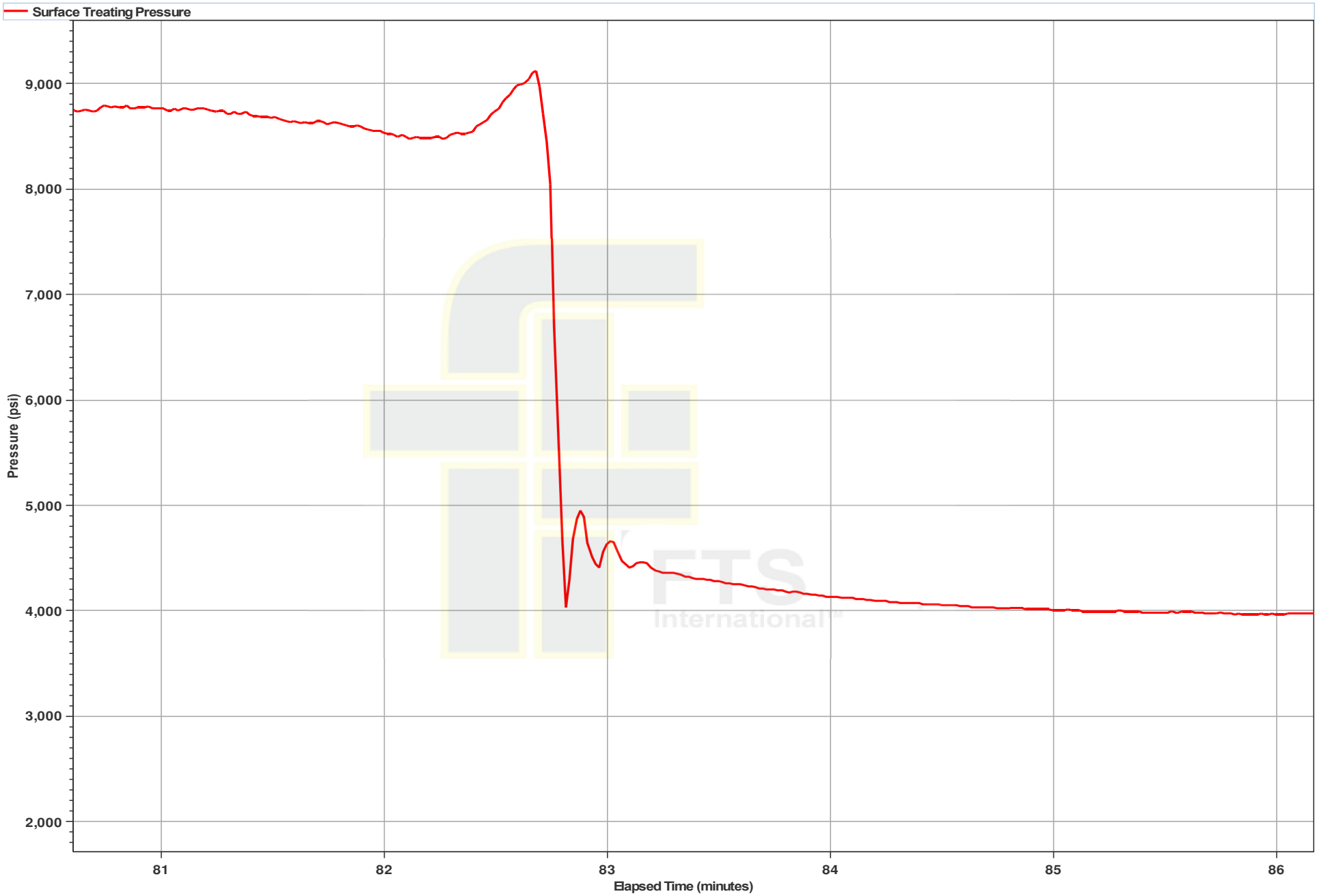
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 40 (WF.000658.M.W03.S40-ADCT-1103) **Jun 26, 2015**

Primary Plot



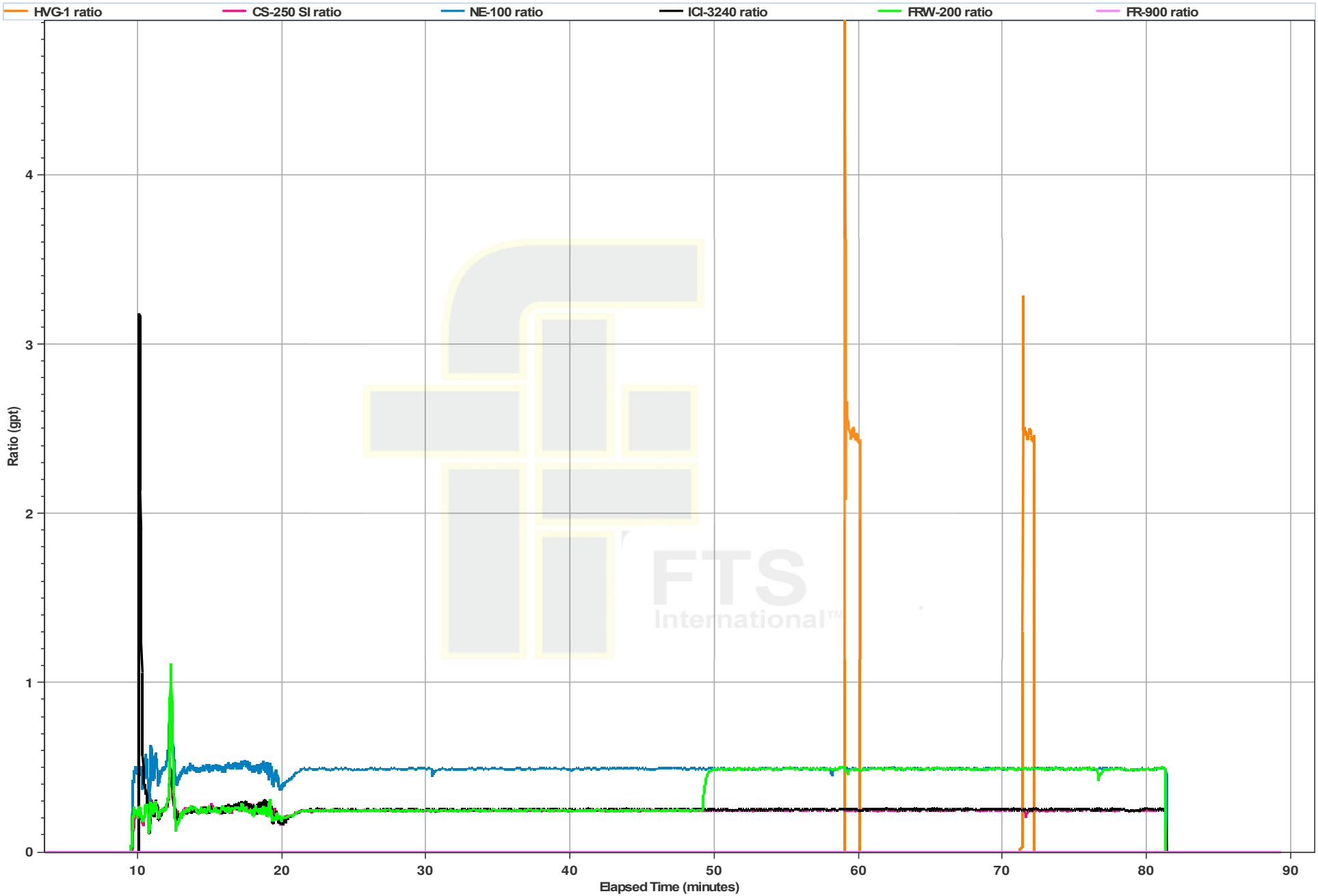
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 40 (WF.000658.M.W03.S40-ADCT-1103) **Jun 26, 2015**

ISIP Plot



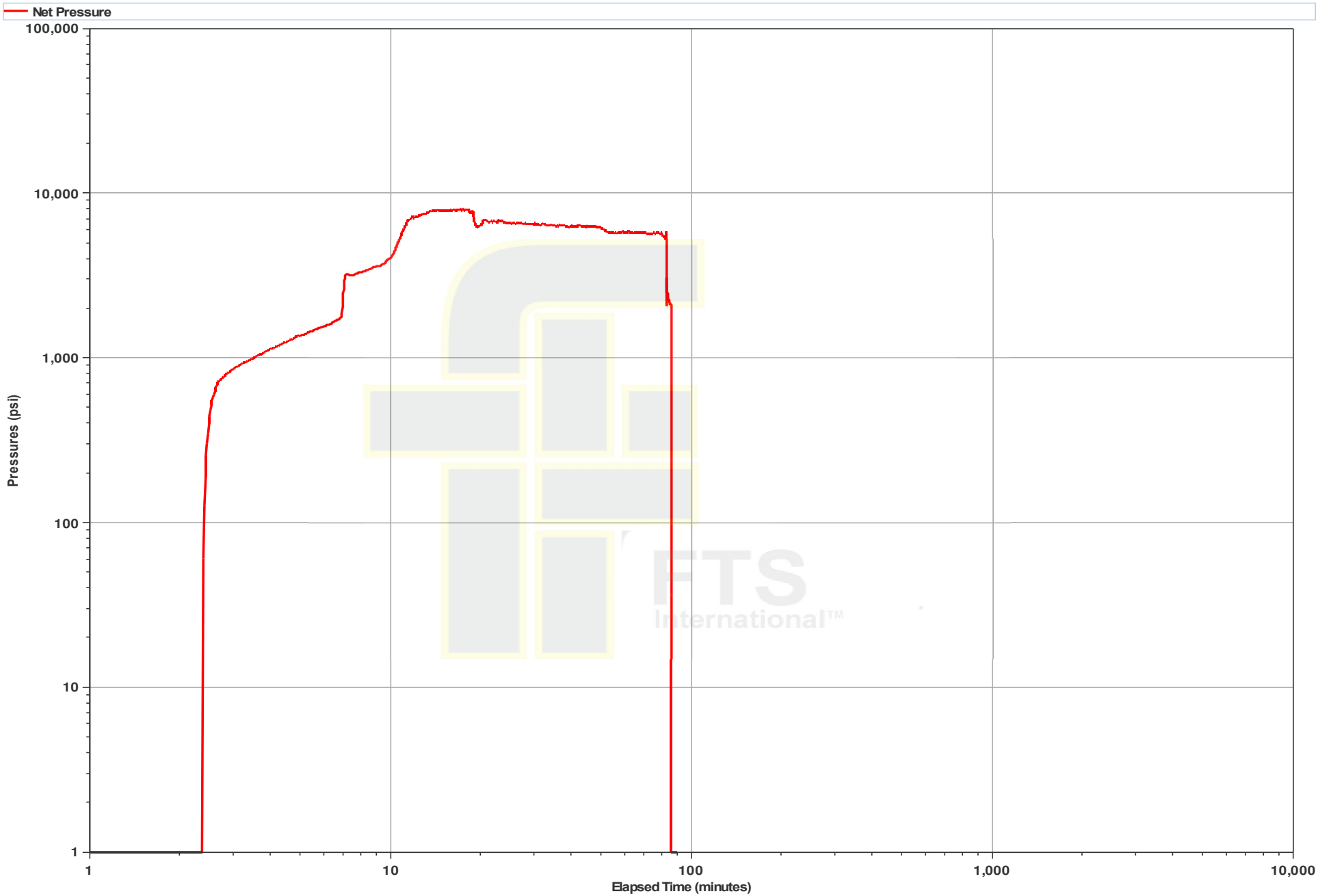
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 40 (WF.000658.M.W03.S40-ADCT-1103) **Jun 26, 2015**

Chemical Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 40 (WF.000658.M.W03.S40-ADCT-1103) **Jun 26, 2015**

Net Pressure Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 40 (WF.000658.M.W03.S40-ADCT-1103) Jun 26, 2015

WATER-BASED FRAC FLUID QUALITY CONTROL
(Attachment to Post Treatment Report)

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/26/2015
Customer Name:	American Energy - Utica	Proposal #:	3H/40
Date Sampled:	6/26/2015	Water Source:	Working Tank

Sample/Tank No.	Clarity, Color, Odor	Sample Temperature, (F)	Specific gravity	Initial pH	Chloride, ppm	Hardness, ppm	Calcium, ppm	Magnesium, ppm	Iron ppm	Hydroxide, ppm	Bicarbonate, ppm	Carbonate, ppm	Sulfate, ppm	Barium, ppm
Working Tank	Clear	72	1	8.2	30	43	16	7	0	0	26	0	<50	0

Frac Fluid Quality Gel Testing (These Recording are to made prior to pumping job)														
Sample #														
Base Gel Type	HVG-1													
Gel Loading (lbs/1000 gal.)	2.5													
Sample Temperature, (F)	72													
Initial pH	7.9													
Visc. Reading @ 300 rpms	5													
Viscosity, (cp)	5													
Sample 1 3 min Hydration	3													
Sample 2 3 min Hydration	4													
Sample 3 3 min Hydration	5													
X-Link Vortex Closure, min:sec	n/a													
X-Link Crown, min:sec	n/a													
X-Link pH	n/a													
Gel Break Time (<2cp) mins	21													

Frac Fluid Quality Gel Testing (These Recording are to made while pumping job)														
Stage #														
Base Gel Viscosity (cp)														
X-Link pH								.						
Sample XL time, min:sec														
Sample Temperature														

Acid Quality	Percent Acid	NaOH, mLs	Specific Gravity
	28		1.14

Additional testing or documentation may be required by the customer or for frac fluid quality assurance.

Tested By: Etuate Varea

QUALITY CONTROL OF PROPPANTS

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/26/2015
Customer Name:	American Energy - Utica	Well/Stage:	3H/40
Date Sampled:	6/26/2015	DISTRICT:	Washington, PA
VENDOR:	SANTROL		

Select Proppant Type:

___ Brown	___ Ceramic	___ Other (specify)
X White	___ Bauxite	_____
___ Resin Coated	___ Texas Gold	

Sieve Analysis	100 Mesh			Sieve Analysis	30/50 Mesh		
Sample 1	24.90	grams of sample		Sample 2	24.70	grams of sample	
	Amount Retained				Amount Retained		
Sieve mesh	Gram	%		Sieve mesh	Gram	%	
			Total				Total
50	0.20	0.80	In-Size	20	0.00	0.00	In-Size
70	15.90	63.86		30	0.50	2.02	
100	5.10	20.48	98.4%	40	17.50	70.85	95.5%
120	2.00	8.03		45	4.40	17.81	
140	0.90	3.61		50	1.70	6.88	
200	0.60	2.41		70	0.60	2.43	
Pan	0.20	0.80	fines	Pan	0.00	0.00	fines
Total wt. Gram	24.90	100.00		Total wt. Gram	24.70	100.00	

Tested By: Etuate Varea

Post Job Report

AMERICAN ENERGY - UTICA

Red Hill Farm MDS GR 3H

Stage : 41 OF 54

HARRISON, OH

Operations Representative:

Name:	**David Knapp**
Office:	**724-743-2537**
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Cell:	
Email:	**DAVID.KNAPP@FTSI.COM**

Sales Representative:

Name:	**Bruce Matthews**
Office:	**405-574-3981**
Fax:	**405-767-1288**
Cell:	
Email:	**BRUCE.MATTHEWS@FTSI.COM**

Engineering Manager:

Name:	**Thaddeus Craun**
Office:	**817-682-8702**
Fax:	**724-743-7719**
Cell:	
Email:	**THADDEUS.CRAUN@FTSI.COM**

FTS International
1432 Route 519
Eighty Four, PA 15330

Customer: American Energy - Utica
Well: Red Hill Farm Mds Gr 3H
Stage: 41
Job End Date: 06/26/2015

Job Summary

Well Information

TVD:	7,301	**Top Perf:**	9,631
No. Of Perfs:	30		

Casing	Tubing
5.50" 20.00#	N/A

Pressures, Rates and Volumes

	Proposed	Actual	Max	Min
STP	9,046 psi	8,636 psi	9,444 psi	8,121 psi
Rate	80.0 bpm	89.9 bpm	96.0 bpm	32.2 bpm

	Proposed	Actual		
Clean Volume	5,772 bbls	5,597 bbls		
Slurry Volume	6,042 bbls	5,866 bbls		
Flush Volume	357 bbls	226 bbls		

	Proposed	Start	End
Frac Pumps on Location	10	14	14

Open Well:	Start Time	12:15	Pressure	2,975 psi
	Ball Seat	196 bbls	Break Down	7,938 psi
	Initial ISIP:	5,514 psi	Initial F.G.:	1.19 psi/ft
Stage Complete:	End Time	13:32	Job Time	01:15
	Final ISIP	5,514 psi	Final F.G.	1.19 psi/ft
	HHP	19,029	5 Min:	4,235 psi
	Proppant Min:	0.00	10 Min:	N/A
	Proppant Max:	2.00	15 Min:	N/A

Material Volume

Material	Proposed	Calculated	Actual	Variance
100 Mesh White	40,000	38,916	38,916	0%
30/50 White	210,000	211,985	209,985	-1%
Total Proppants	250,000	250,901	248,901	-1%

Material	Proposed	Calculated	Actual	Variance
0.1%-7.5% HCL	3,000	2,982	3,000	1%
APB-1	0	2	2	0%
CI-150	3	3	3	0%
CS-250 SI	60	56	56	0%
FE-200L	15	15	15	0%
FRW-200	180	92	90	-2%
HVG-1 4.0	0	11	11	0%
ICI-3240	60	56	55	-2%
LTB-1	0	2	2	0%
NE-100	0	113	112	-1%
NE-100W	120	0	0	0

Comments:

Pumpdown Information:
Total Bbls: 108
Max Pressure (psi): 52559
Max Rate (bpm): 15.1

FTS International
1432 Route 519
Eighty Four, PA 15330

Customer: American Energy - Utica
Well: Red Hill Farm Mds Gr 3H
Stage: 41
Job End Date: 06/26/2015

Treatment Report

Date:	6/26/2015	District:	Washington County,PA	Quote No:	051815_035725QF	API:	34-059-24370

MIL Time	STP	Slurry BPM	Stage Clean (bbls)	Cumulative Clean (bbls)	Stage Slurry (bbls)	Cumulative Slurry (bbls)	Stage Proppant (lbs)	Cumulative Proppant (lbs)	Description	Proppant	PPA
12:15	2,975	0.0	0	0	0	0	0	0	Freshwater Open Well		0.00
12:16	4,137	6.2	21	21	21	21	0	0	Freshwater Load		0.00
12:18	5,512	12.6	71	92	71	92	0	0	7.5% HCL Acid Acid		0.00
12:24	7,071	24.0	104	196	104	196	0	0	Slickwater Load		0.00
12:29	7,938	22.5	34	230	34	230	0	0	Slickwater Breakdown		0.00
12:30	8,585	32.2	218	448	219	449	916	916	Slickwater Proppant	100 Mesh White	0.10
12:34	9,077	86.0	215	663	217	666	2,258	3,174	Slickwater Proppant	100 Mesh White	0.25
12:37	9,326	89.6	255	918	261	927	5,355	8,529	Slickwater Proppant	100 Mesh White	0.50
12:40	9,072	92.5	430	1,348	445	1,372	13,545	22,074	Slickwater Proppant	100 Mesh White	0.75
12:45	9,074	92.5	401	1,749	419	1,791	16,842	38,916	Slickwater Proppant	100 Mesh White	1.00
12:50	9,057	93.2	340	2,089	355	2,146	14,280	53,196	Slickwater Proppant	30/50 White	1.00
12:53	9,160	94.2	535	2,624	559	2,705	22,470	75,666	Slickwater Proppant	30/50 White	1.00
13:06	8,274	95.1	850	3,474	898	3,603	44,625	120,291	Slickwater Proppant	30/50 White	1.25
13:08	8,264	95.4	90	3,564	96	3,699	5,670	125,961	Slickwater Proppant	30/50 White	1.50
13:09	8,246	95.1	50	3,614	53	3,752	3,150	129,111	10# Linear Gel Proppant	30/50 White	1.50
13:10	8,249	94.9	567	4,181	605	4,357	35,721	164,832	Slickwater Proppant	30/50 White	1.50
13:16	8,309	95.1	200	4,381	216	4,573	14,700	179,532	Slickwater Proppant	30/50 White	1.75
13:18	8,270	95.5	50	4,431	54	4,627	3,675	183,207	10# Linear Gel Proppant	30/50 White	1.75
13:19	8,245	95.3	201	4,632	217	4,844	14,774	197,981	Slickwater Proppant	30/50 White	1.75
13:21	8,425	95.5	630	5,262	687	5,531	52,920	250,901	Slickwater Proppant	30/50 White	2.00
13:29	8,884	94.1	109	5,371	109	5,640	0	250,901	Slickwater Clean screws		0.00
13:30	8,956	94.5	100	5,471	100	5,740	0	250,901	Slickwater Flush		0.00
13:31	8,858	94.4	126	5,597	126	5,866	0	250,901	Freshwater Flush		0.00
13:32	5,514	0.0	0	5,597	0	5,866	0	250,901	Freshwater Shutdown		0.00
Total JobTime (HH:MM): 01:16											

Min STP:	8,121 psi	**Max STP:**	9,444 psi	**Average STP:**	8,636 psi	**5 Min:**	4,235 psi
Min Rate:	32.2 bpm	**Max Rate:**	96.0 bpm	**Average Rate:**	89.9 bpm	**10 Min:**	0 psi
Initial ISIP:	5,514 psi	**Initial F.G.:**	1.19 psi/ft	**Average HHP:**	19,029	**15 Min:**	0 psi
Final ISIP:	5,514 psi	**Final F.G.:**	1.19 psi/ft	**Customer Representative:**		Don Barker	
FTSI Representative:		Etuate Varea & James Garland					

Comments:

The proppant values contained in this report are calculated based on actual barrel counts and target densities. Actual total proppant usage is 248,901 lbs. Charge time is 1 hour(s) 15 minute(s). All chemicals and proppant ran as documented.

Min/Max/Avg were taken from sand stages. All chem changes from proposed were made per AEU representative request.

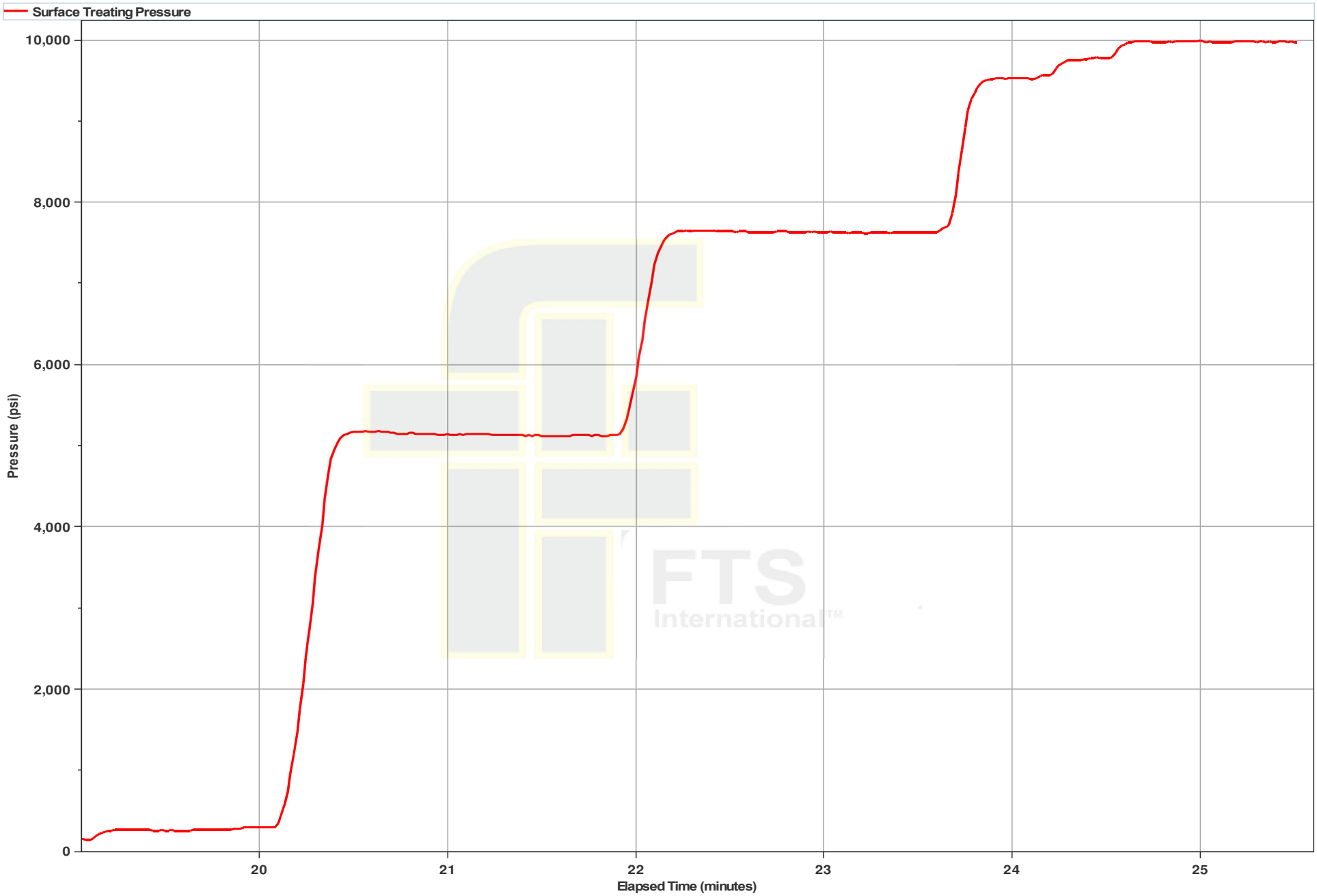
No reused water pumped

1 Minute Shutdown (psi): 4932
2 Minute Shutdown (psi): 4445
5 Minute Shutdown (psi): 4235

Chemical Changes:

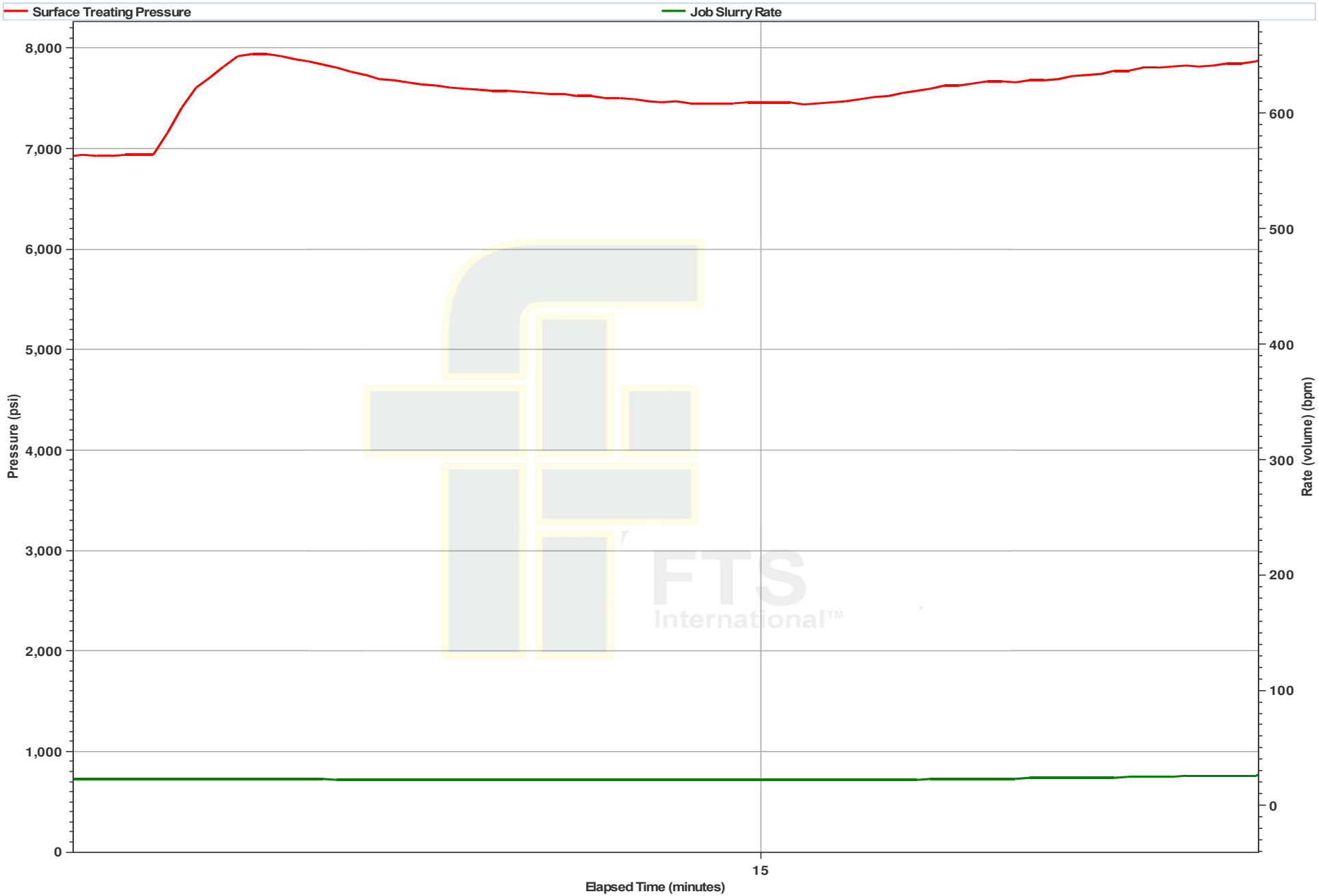
Chemical Name	Chemical Loading	Cumulative Clean
FRW-200	0.50	2,624

AEU Pressure Test



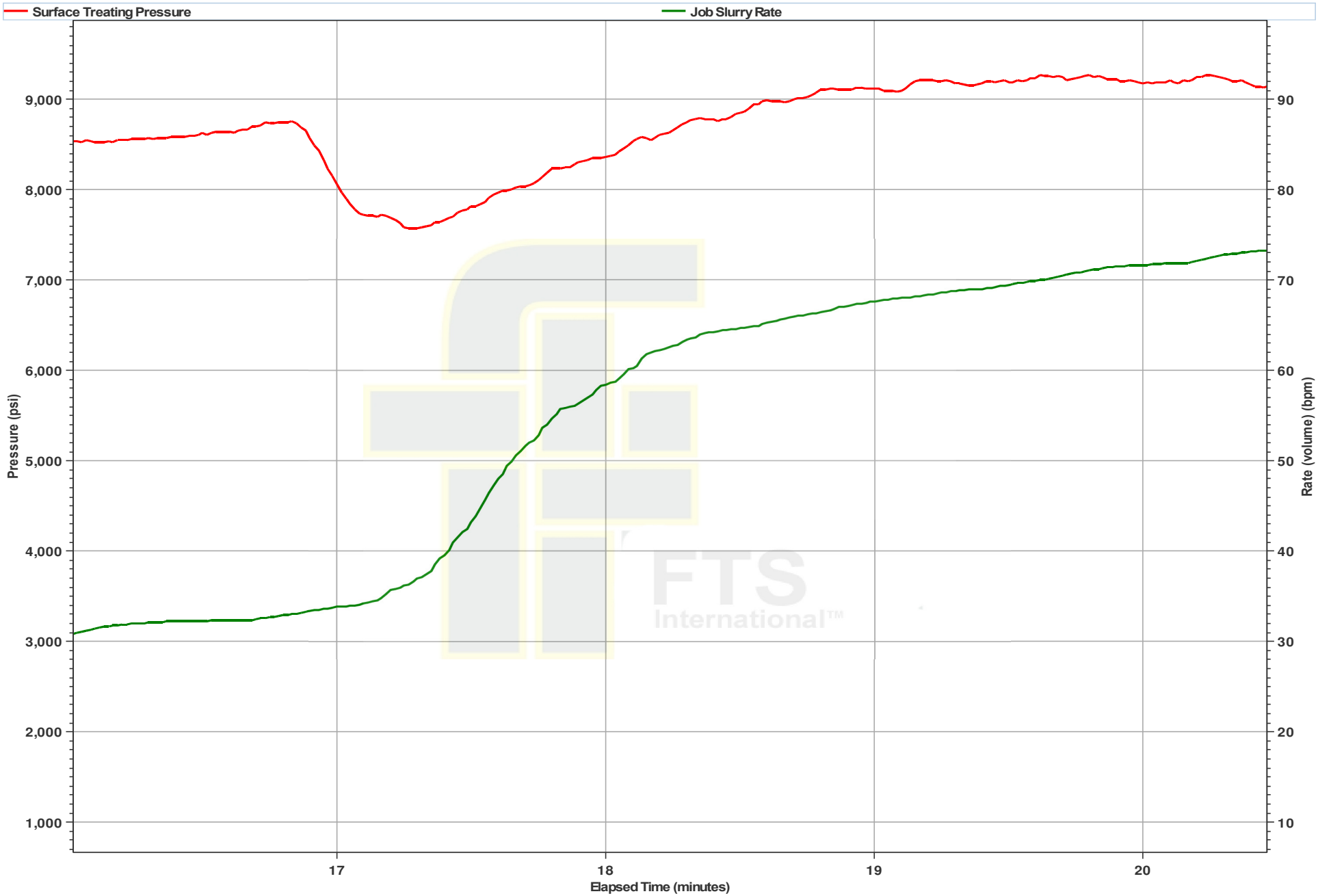
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 41 (WF.000658.M.W03.S41-aDCT-1103) Jun 26, 2015

Ball Seat and Breakdown



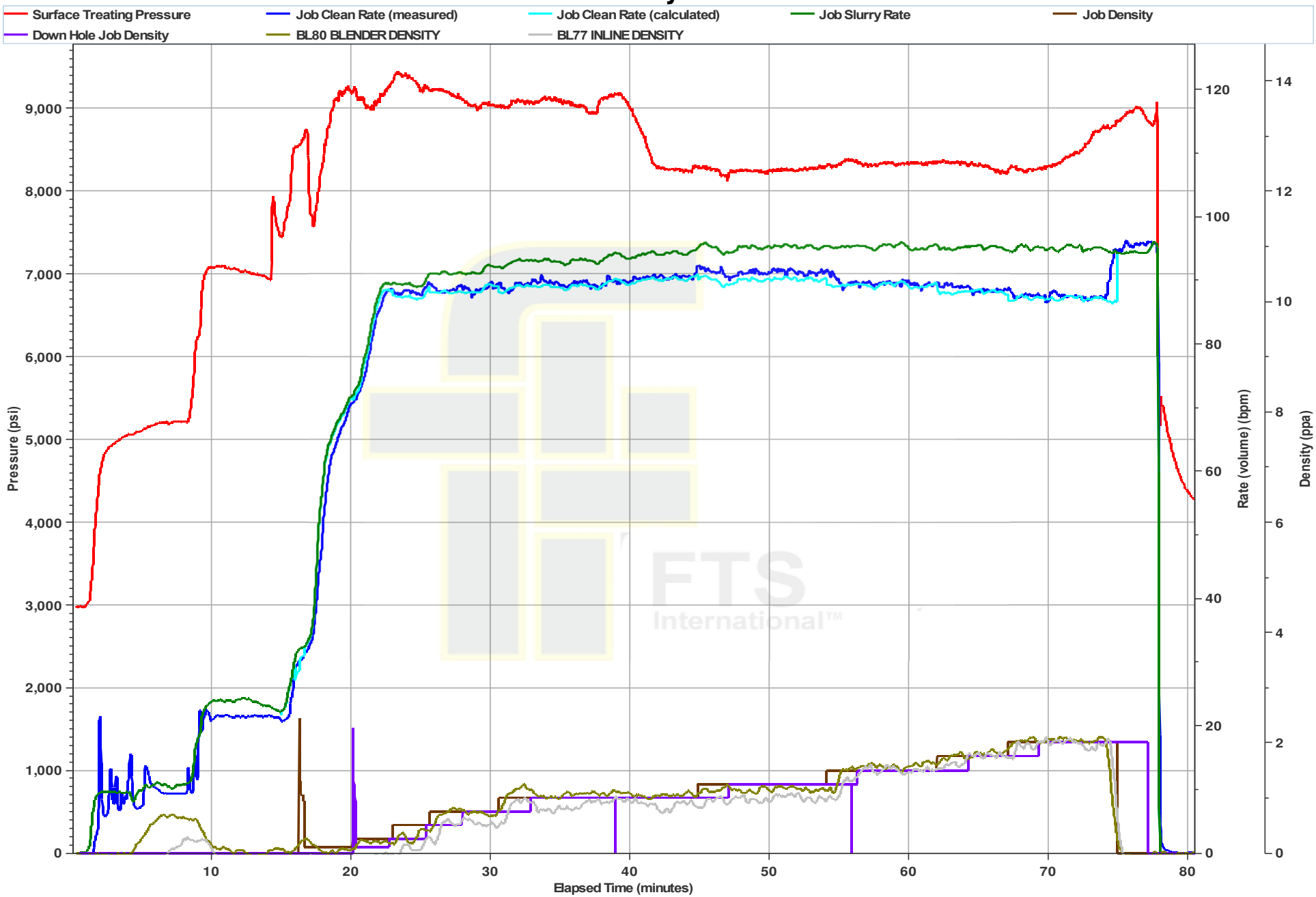
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 41 (WF.000658.M.W03.S41-aDCT-1103) **Jun 26, 2015**

Acid on Perforations



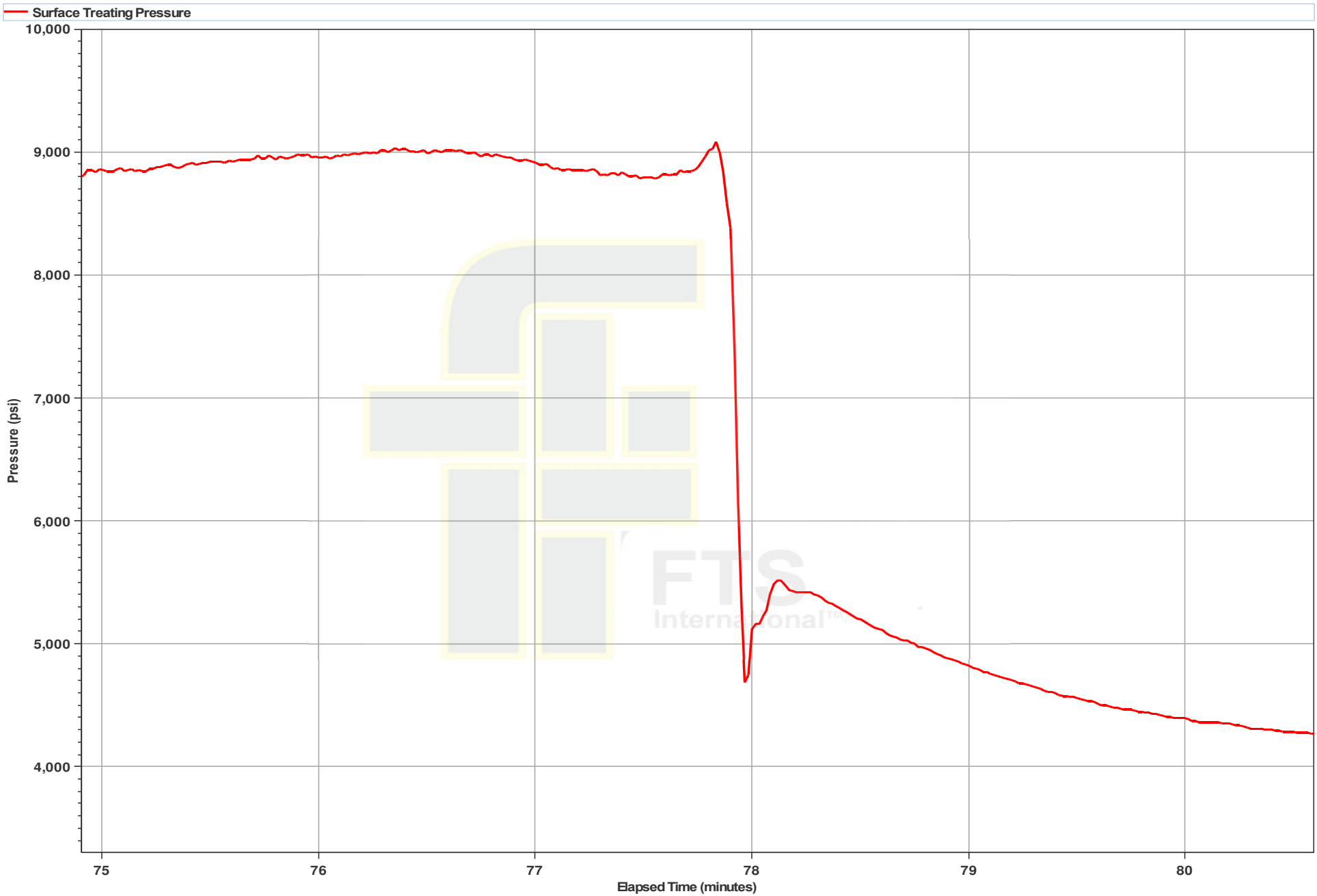
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 41 (WF.000658.M.W03.S41-aDCT-1103) **Jun 26, 2015**

Primary Plot



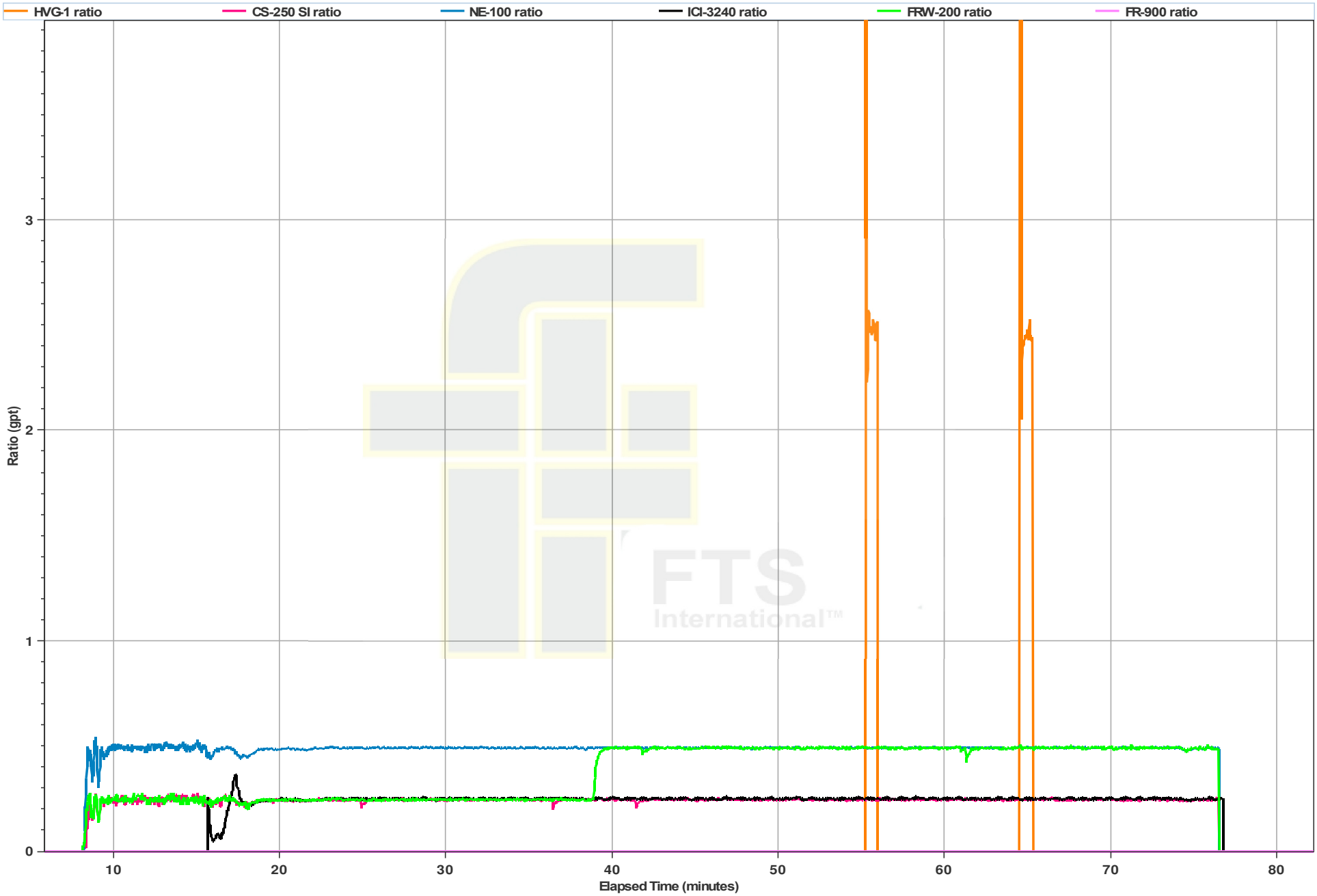
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 41 (WF.000658.M.W03.S41-aDCT-1103) **Jun 26, 2015**

ISIP Plot



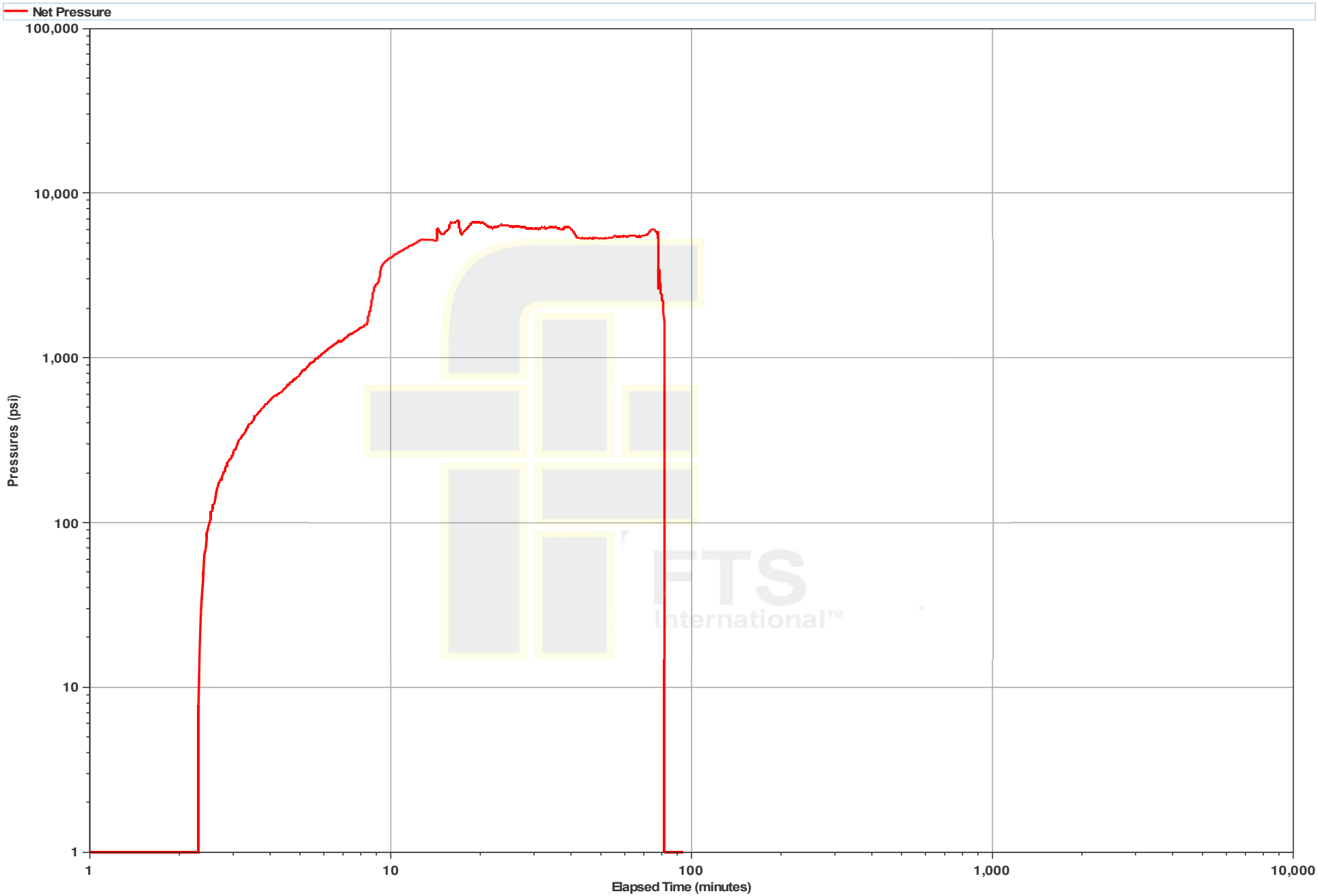
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 41 (WF.000658.M.W03.S41-aDCT-1103) **Jun 26, 2015**

Chemical Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 41 (WF.000658.M.W03.S41-aDCT-1103) **Jun 26, 2015**

Net Pressure Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 41 (WF.000658.M.W03.S41-aDCT-1103) Jun 26, 2015

WATER-BASED FRAC FLUID QUALITY CONTROL
(Attachment to Post Treatment Report)

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/26/2015
Customer Name:	American Energy - Utica	Proposal #:	3H/41
Date Sampled:	6/26/2015	Water Source:	Working Tank

Sample/Tank No.	Clarity, Color, Odor	Sample Temperature, (F)	Specific gravity	Initial pH	Chloride, ppm	Hardness, ppm	Calcium, ppm	Magnesium, ppm	Iron ppm	Hydroxide, ppm	Bicarbonate, ppm	Carbonate, ppm	Sulfate, ppm	Barium, ppm
Working Tank	Clear	74	1	7.9	66	46	16	7	1	0	44	0	<50	0

Frac Fluid Quality Gel Testing (These Recording are to made prior to pumping job)														
Sample #														
Base Gel Type	HVG-1													
Gel Loading (lbs/1000 gal.)	2.5													
Sample Temperature, (F)	74													
Initial pH	7.9													
Visc. Reading @ 300 rpms	5													
Viscosity, (cp)	5													
Sample 1 3 min Hydration	4													
Sample 2 3 min Hydration	4													
Sample 3 3 min Hydration	5													
X-Link Vortex Closure, min:sec	n/a													
X-Link Crown, min:sec	n/a													
X-Link pH	n/a													
Gel Break Time (<2cp) mins	18													

Frac Fluid Quality Gel Testing (These Recording are to made while pumping job)														
Stage #														
Base Gel Viscosity (cp)														
X-Link pH								.						
Sample XL time, min:sec														
Sample Temperature														

Acid Quality	Percent Acid	NaOH, mLs	Specific Gravity
	28		1.14

Additional testing or documentation may be required by the customer or for frac fluid quality assurance.

Tested By: Etuate Varea

QUALITY CONTROL OF PROPPANTS

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/26/2015
Customer Name:	American Energy - Utica	Well/Stage:	3H/41
Date Sampled:	6/26/2015	DISTRICT:	Washington, PA
VENDOR:	SANTROL		

Select Proppant Type:

___ Brown	___ Ceramic	___ Other (specify)
X White	___ Bauxite	_____
___ Resin Coated	___ Texas Gold	

Sieve Analysis	100 Mesh			Sieve Analysis	30/50 Mesh		
Sample 1	24.50	grams of sample		Sample 2	24.60	grams of sample	
	Amount Retained				Amount Retained		
Sieve mesh	Gram	%		Sieve mesh	Gram	%	
			Total				Total
50	0.10	0.41	In-Size	20	0.00	0.00	In-Size
70	14.00	57.14		30	0.50	2.03	
100	6.10	24.90	99.2%	40	16.90	68.70	95.9%
120	2.60	10.61		45	5.20	21.14	
140	1.00	4.08		50	1.50	6.10	
200	0.60	2.45		70	0.50	2.03	
Pan	0.10	0.41	fines	Pan	0.00	0.00	fines
Total wt. Gram	24.50	100.00		Total wt. Gram	24.60	100.00	

Tested By: Etuate Varea

Post Job Report

AMERICAN ENERGY - UTICA

Red Hill Farm MDS GR 3H

Stage : 42 OF 54

HARRISON, OH

Operations Representative:

Name:	David Knapp
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Sales Representative:

Name:	Bruce Bathman
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Email:	BRUCE.BATTHMAN@FTSI.COM

Engineering Manager:

Name:	Thaddeus Craun
Office:	817-832-8782
Fax:	724-743-7719
Cell:	
Email:	THADDEUS.CRAUN@FTSI.COM

FTS International
[illegible]
Eighty Four, PA [illegible]

FTS INTERNATIONAL

Customer: American Energy - Utica
Well: Red Hill Farm Bla 6r 3H
Stage: 42
Job End Date: [illegible]

Job Summary

Well Information

TVD:	7,301	Top Perf:	9,478
No. Of Perfs:	30		

Casing	Tubing
5.50" 23.0#/	n/A

Pressures, Rates and Volumes

	Proposed	Actual	Max	Min
STP	[illegible] psi	[illegible] psi	[illegible] psi	[illegible] psi
Rate	[illegible] bpm	[illegible] bpm	[illegible] bpm	[illegible] bpm

	Proposed	Actual		
Clean Volume	[illegible] bbls	[illegible] bbls		
Slurry Volume	[illegible] bbls	[illegible] bbls		
Flush Volume	[illegible] bbls	[illegible] bbls		

	Proposed	Start	End
Free Pumps on Location	[illegible]	15	15

Open Well:	Start Time	[illegible]	Pressure	[illegible] psi
	Bull Dwn	177 bbls	Break Down	[illegible] psi
	Initial ISIP:	[illegible] psi	Initial F.G.:	[illegible] psi/ft
Stage Complete:	End Time	[illegible]	Job Time	[illegible]
	Final ISIP	[illegible] psi	Final F.G.	[illegible] psi/ft
	ISIP	[illegible]	5 Min:	[illegible] psi
	Pressure Min:	[illegible]	10 Min:	N/A
	Pressure Max:	[illegible]	15 Min:	N/A

Material Volume

Material	Proposed	Calculated	Actual	Variance
100 Mesh White	[illegible]	[illegible]	[illegible]	[illegible]
30/50 White	[illegible]	[illegible]	[illegible]	[illegible]
Total Proppants	[illegible]	[illegible]	[illegible]	[illegible]

Material	Proposed	Calculated	Actual	Variance
8.1%-7.5% HCL	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
FE-[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Comments:

Perspdown Information:
Total Bbls: [illegible]
Max Pressure (psi): [illegible]
Max Rate (bpm): [illegible]

FTS International
[illegible]
Eighty Four, PA [illegible]

FTS INTERNATIONAL

Customer: American Energy - Utica
Well: Red Hill Farm Site 6r 3H
Stage: 42
Job End Date: [illegible]

Treatment Report

Date	[illegible]	Statelate	Washington County,PA	Basin Bin	[illegible]	API#	[illegible]

Elt. Time	BTP	Slurry BPM	Stage Slurry (bbls)	Cumulative Slurry (bbls)	Stage Slurry (bbls)	Cumulative Slurry (bbls)	Stage Proppant (lbs)	Cumulative Proppant (lbs)	Description	Proppant	PPA
10:35	9,007	6.8	0	0	0	0	0	0	Freshwater Open Well		0.00
10:36	5,022	7.0	0	0	0	0	0	0	Freshwater Load Well		0.00
10:37	6,004	14.6	71	75	71	75	0	0	7.5% HCL Acid Acid		0.00
10:38	6,394	21.1	96	177	96	177	0	0	Slickwater Load Unit		0.00
10:37	7,386	30.3	0	180	3	180	0	0	Slickwater Breakdown		0.00
10:38	6,016	66.7	57	342	57	342	0	0	Slickwater Pad		0.00
10:46	6,662	71.8	214	488	214	488	2,247	2,247	Slickwater Proppant	100 Mesh White	0.25
10:53	6,369	70.4	369	711	361	711	4,485	7,002	Slickwater Proppant	100 Mesh White	0.50
10:58	6,174	70.6	430	1,141	443	1,154	13,845	21,147	Slickwater Proppant	100 Mesh White	0.75
11:03	6,049	69.3	413	1,554	402	1,569	17,248	38,403	Slickwater Proppant	100 Mesh White	1.00
11:02	6,723	69.4	347	1,901	363	1,932	14,521	53,947	Slickwater Proppant	30/50 White	1.00
11:07	6,219	66.4	163	2,064	121	2,133	7,699	61,753	Slickwater Proppant	30/50 White	1.00
11:15	7,364	66.3	348	2,408	363	2,512	14,593	76,345	Slickwater Proppant	30/50 White	1.00
11:27	6,949	66.6	1,091	3,431	1,089	3,579	53,953	130,298	Slickwater Proppant	30/50 White	1.50
11:39	6,449	66.1	246	3,677	263	3,839	13,409	143,708	Slickwater Proppant	30/50 White	1.25
11:51	6,625	66.1	463	4,140	466	4,305	30,017	173,725	Slickwater Proppant	40/70 White	1.25
11:57	7,199	66.6	143	4,283	166	4,471	9,679	183,403	Slickwater Proppant	40/70 White	1.50
12:04	7,011	66.3	506	4,789	514	4,985	46,783	230,179	Slickwater Proppant	40/70 White	1.75
12:05	7,320	66.3	361	5,150	364	5,349	33,021	263,200	Slickwater Proppant	40/70 White	2.00
12:09	7,574	66.1	79	5,234	79	5,434	0	263,200	Slickwater Clean Jerrett		0.00
12:19	3,019	66.3	117	5,351	117	5,551	0	263,200	Slickwater Flush		0.00
12:11	3,009	67.0	146	5,497	146	5,797	0	263,200	Freshwater Flush		0.00
12:13	6,439	5.8	0	5,497	0	5,797	0	263,200	Freshwater Shutdown		0.00
Total Job/Time (HH:MM): 01:38											

Min BTP:	7,020 psi	Max BTP:	9,008 psi	Average BTP:	6,470 psi	4 Min	4,004 psi
Min Rate:	43.7 bpm	Max Rate:	66.7 bpm	Average Rate:	69.9 bpm	10 Min	0 psi
Initial ISIP:	6,450 psi	Initial F.G.:	1.10 psi/ft	Average ISIP:	17,455	15 Min	0 psi
Final ISIP:	6,450 psi	Final F.G.:	1.10 psi/ft	Customer Representative		Exit Score	
FTS Representative		Amanda Lyle & Sean Stewart					

Comments:

The proppant values contained in this report are calculated based on actual barrel counts and target densities. Actual total proppant usage is 246,963 lbs. Charge time is 1 hour(s) 16 minute(s). All chemicals and proppant ran as documented.

Min/Max/Avg were taken from sand stages. All chem changes from proposed were made per AEU representative request.

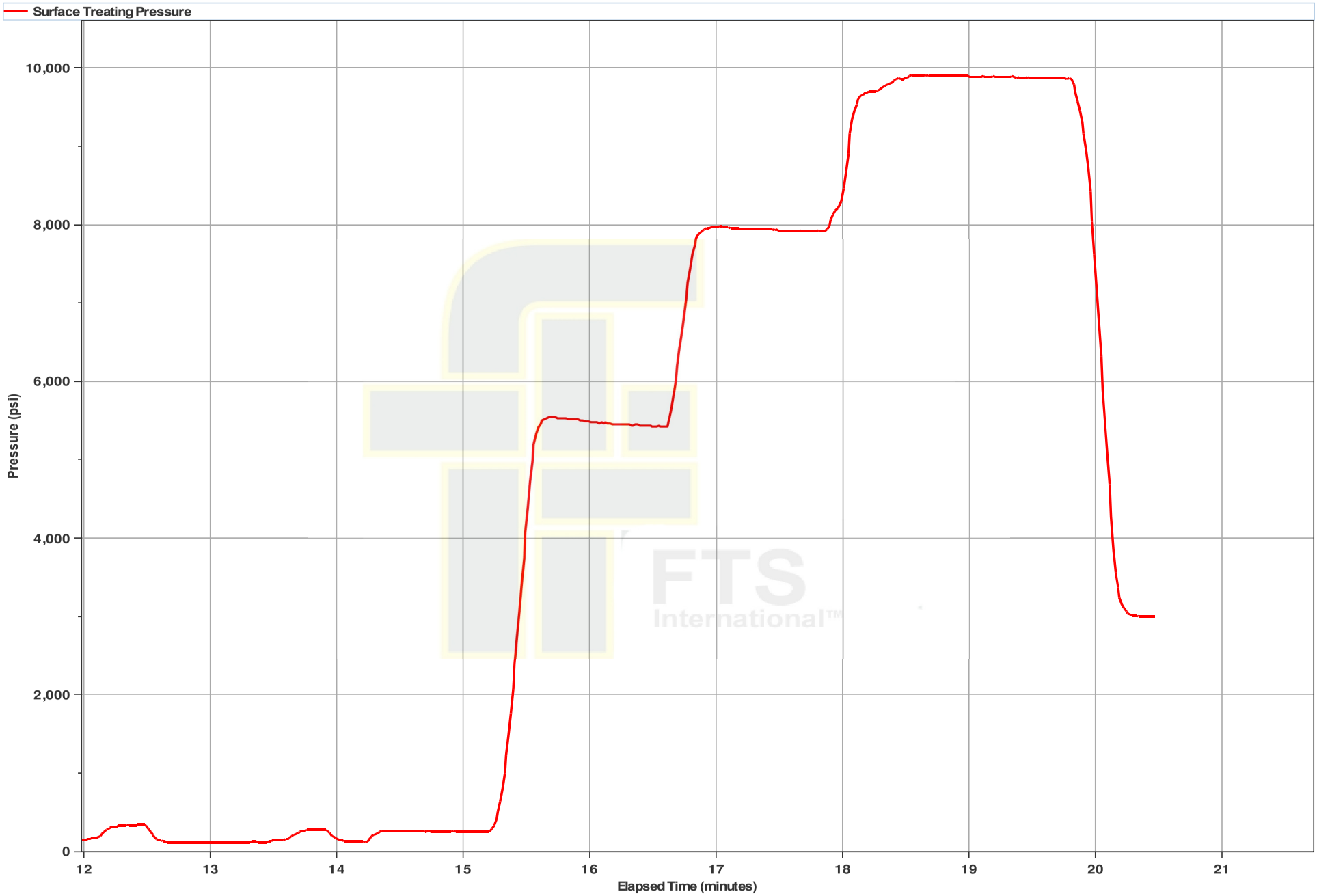
Reuse water was run on this stage for a total of 198 Bbls.

1 Minute Shutdown (psi): 4646
2 Minute Shutdown (psi): 4333
4 Minute Shutdown (psi): 4488

Chemical Changes:

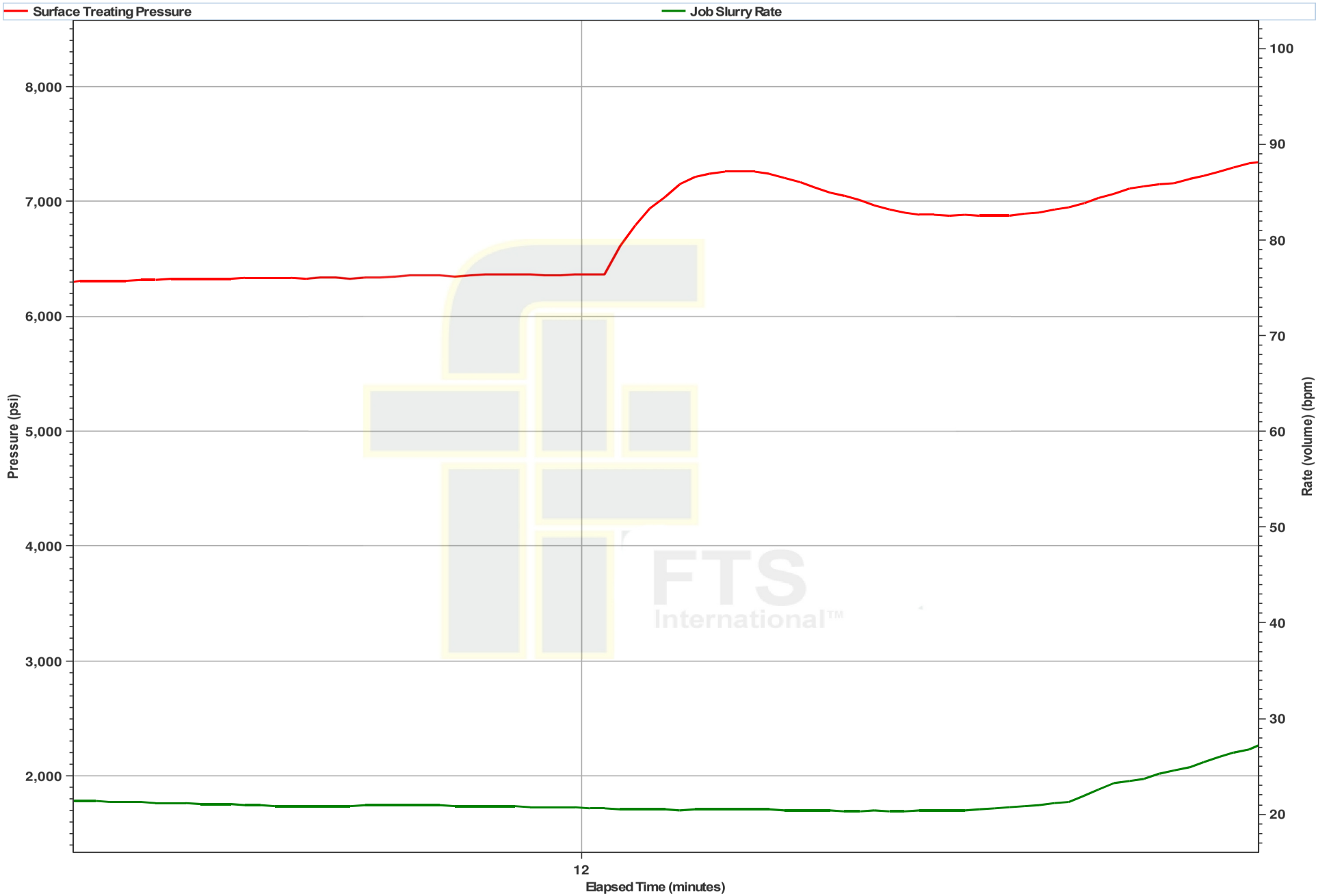
Chemical Name	Chemical Loading	Cumulative Clean
FRW-200	0.40	2,084
FRW-200	0.28	2,430
FRW-200	0.80	4,138
FRW-200	0.40	4,288

AEU Pressure Test



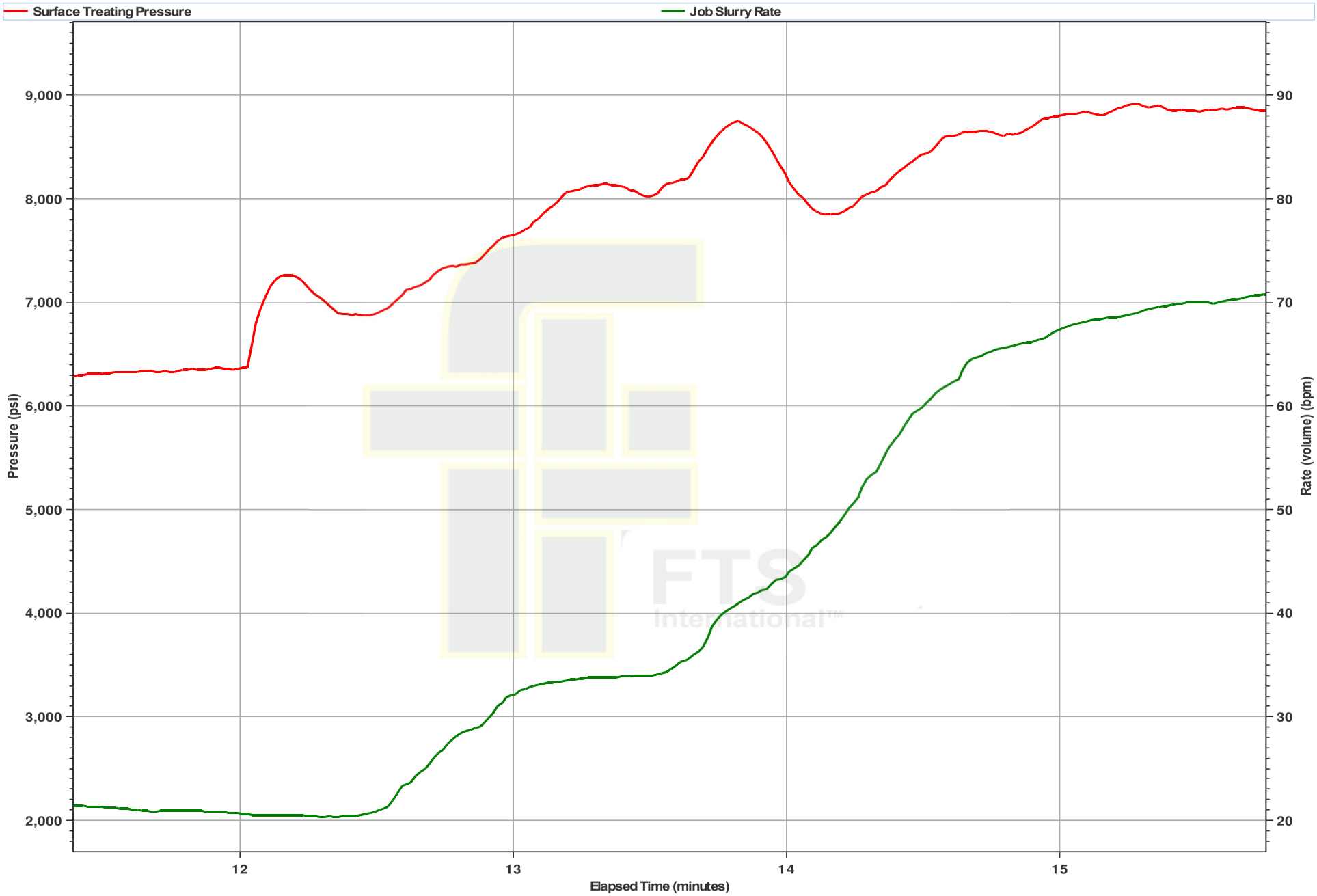
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 42 (WF.000658.M.W03.S42-aDCT-1103) Jun 26, 2015

Ball Seat and Breakdown



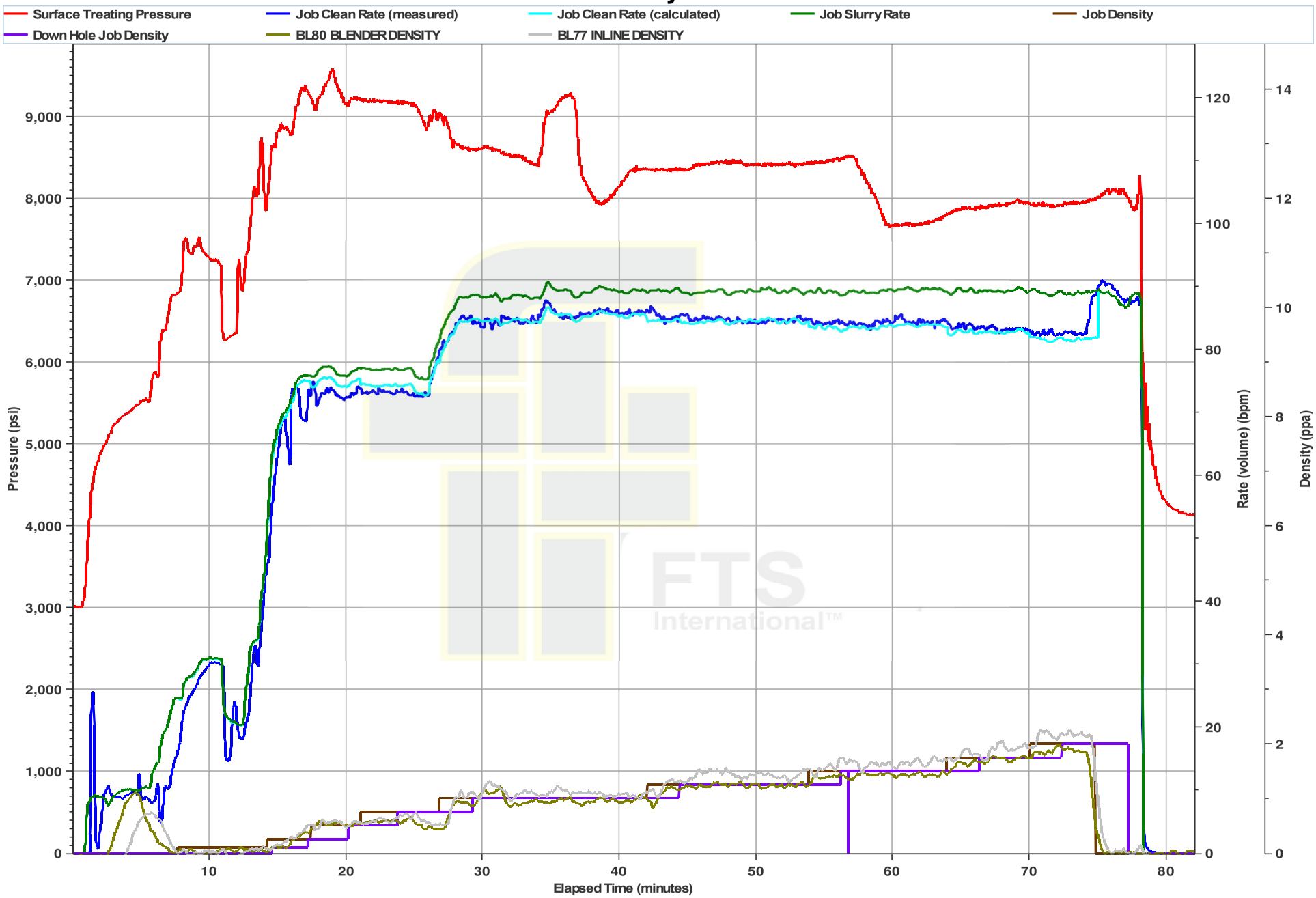
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 42 (WF.000658.M.W03.S42-aDCT-1103) Jun 26, 2015

Acid on Perforations



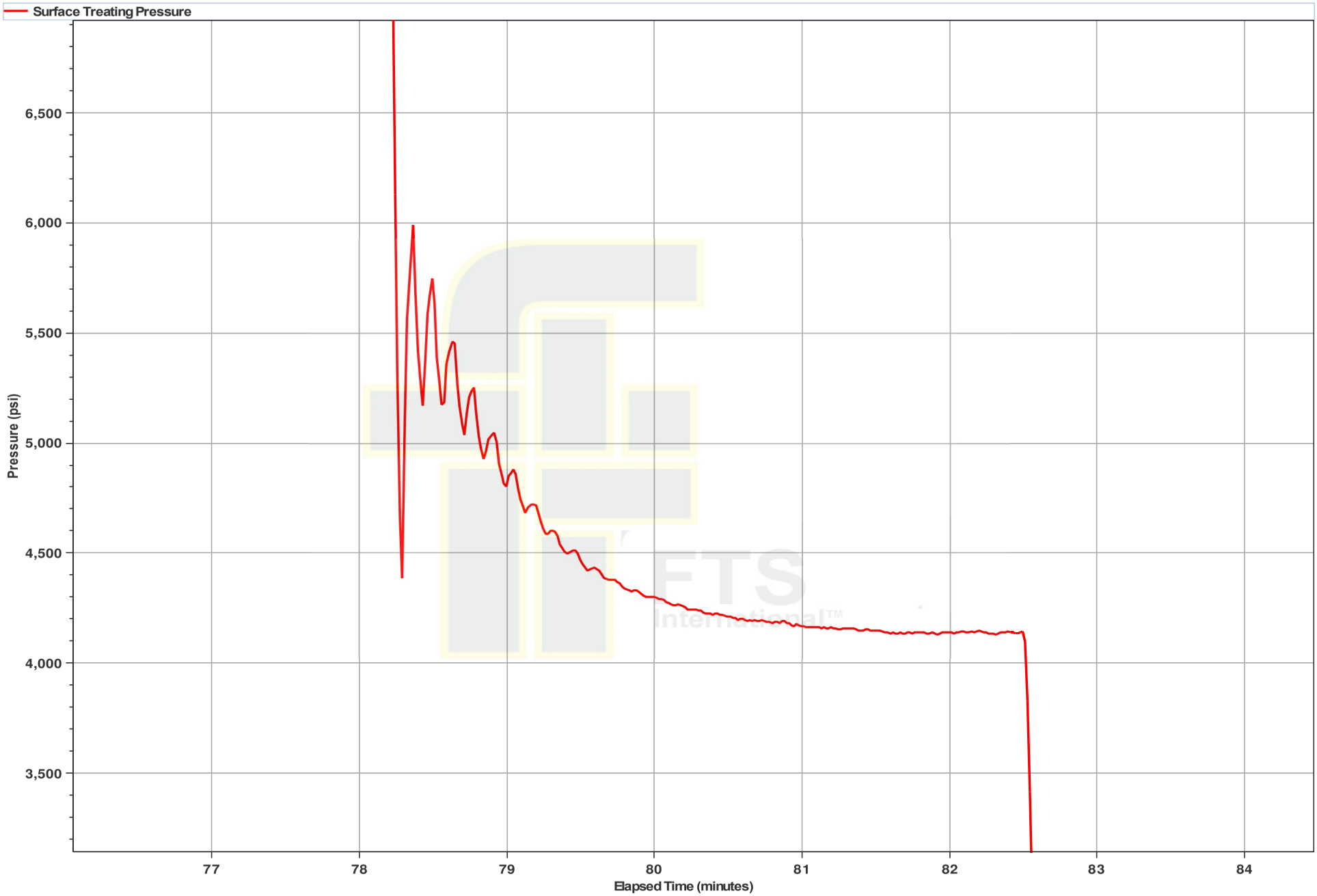
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 42 (WF.000658.M.W03.S42-aDCT-1103) **Jun 26, 2015**

Primary Plot



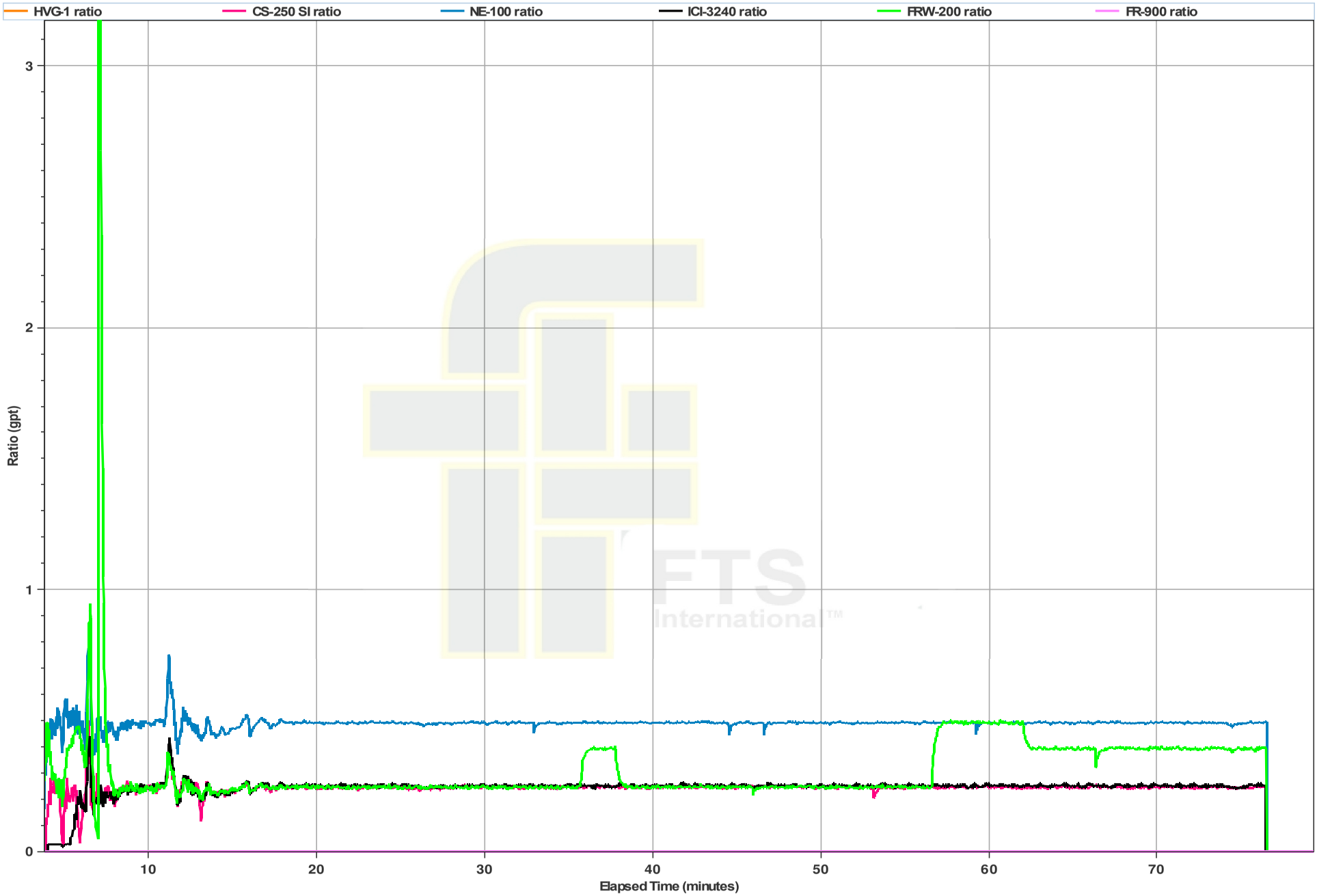
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 42 (WF.000658.M.W03.S42-aDCT-1103) Jun 26, 2015

ISIP Plot



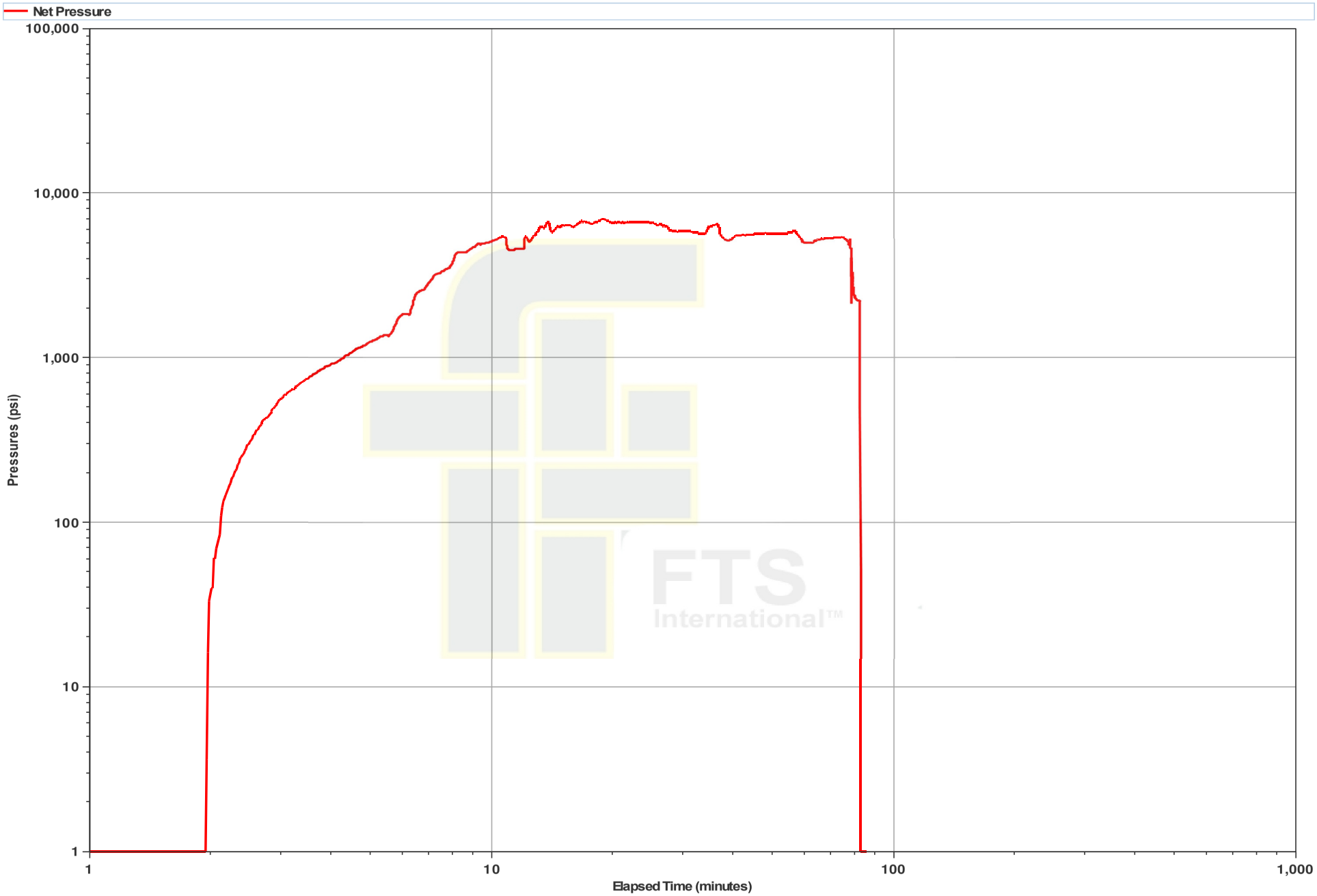
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 42 (WF.000658.M.W03.S42-aDCT-1103) **Jun 26, 2015**

Chemical Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 42 (WF.000658.M.W03.S42-aDCT-1103) Jun 26, 2015

Net Pressure Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 42 (WF.000658.M.W03.S42-aDCT-1103) Jun 26, 2015

QUALITY CONTROL OF PROPPANTS

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/26/2015
Customer Name:	American Energy - Utica	Well/Stage:	3H/42
Date Sampled:	6/26/2015	DISTRICT:	Washington, PA
VENDOR:	SANTROL		

Select Proppant Type:

___ Brown	___ Ceramic	___ Other (specify)
X White	___ Bauxite	
___ Resin Coated	___ Texas Gold	

Sieve Analysis	100 Mesh			Sieve Analysis	30/50 Mesh		
Sample 1	25.00	grams of sample		Sample 2	24.90	grams of sample	
	Amount Retained				Amount Retained		
Sieve mesh	Gram	%		Sieve mesh	Gram	%	
			Total				Total
50	0.00	0.00	In-Size	20	0.00	0.00	In-Size
70	12.55	50.20		30	0.60	2.41	
100	6.33	25.32	99.7%	40	16.12	64.74	95.2%
120	3.00	12.00		45	5.59	22.45	
140	2.89	11.56		50	1.99	7.99	
200	0.15	0.60		70	0.50	2.01	
Pan	0.08	0.32	fines	Pan	0.10	0.40	fines
Total wt. Gram	25.00	100.00		Total wt. Gram	24.90	100.00	

Tested By: Amanda Lyle

WATER-BASED FRAC FLUID QUALITY CONTROL
(Attachment to Post Treatment Report)

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/26/2015
Customer Name:	American Energy - Utica	Proposal #:	3H/42
Date Sampled:	6/26/2015	Water Source:	Working Tank

Sample/Tank No.	Clarity, Color, Odor	Sample Temperature, (F)	Specific gravity	Initial pH	Chloride, ppm	Hardness, ppm	Calcium, ppm	Magnesium, ppm	Iron ppm	Hydroxide, ppm	Bicarbonate, ppm	Carbonate, ppm	Sulfate, ppm	Barium, ppm
Working Tank	Clear	74	1	7.9	80	50	16	8	1	0	49	0	125	0
Reused Water Tank	Black, Cloudy, Petroleum Odor	72	1.03	4.9	77,976	42000	15,084	6,543	>10	0	1244	0	350	0

Frac Fluid Quality Gel Testing (These Recording are to made prior to pumping job)														
Sample #														
Base Gel Type	HVG-1													
Gel Loading (lbs/1000 gal.)	2.5													
Sample Temperature, (F)	74													
Initial pH	7.9													
Visc. Reading @ 300 rpms	5													
Viscosity, (cp)	5													
Sample 1 3 min Hydration	4													
Sample 2 3 min Hydration	4													
Sample 3 3 min Hydration	5													
X-Link Vortex Closure, min:sec	n/a													
X-Link Crown, min:sec	n/a													
X-Link pH	n/a													
Gel Break Time (<2cp) mins	18.5													

Frac Fluid Quality Gel Testing (These Recording are to made while pumping job)														
Stage #														
Base Gel Viscosity (cp)														
X-Link pH								.						
Sample XL time, min:sec														
Sample Temperature														

Acid Quality	Percent Acid	NaOH, mLs	Specific Gravity
	28		1.14

Additional testing or documentation may be required by the customer or for frac fluid quality assurance.

Tested By: Amanda Lyle

Post Job Report

AMERICAN ENERGY - UTICA

Red Hill Farm MDS GR 3H

Stage : 43 OF 54

HARRISON, OH

Operations Representative:

Name:	David Knapp
Office:	878-327-4881
Fax:	724-743-7719
Cell:	
Email:	DAVID.KNAPP@FTSI.COM

Sales Representative:

Name:	Bruce Bathman
Office:	405-974-3901
Fax:	405-787-1235
Cell:	
Email:	BRUCE.BATTHMAN@FTSI.COM

Engineering Manager:

Name:	Thaddeus Craun
Office:	817-832-8782
Fax:	724-743-7719
Cell:	
Email:	THADDEUS.CRAUN@FTSI.COM

FTS International
[illegible]
Eighty Four, PA [illegible]

FTS INTERNATIONAL

Customer: American Energy - Utica
Well: Red Hill Farm Bla 6r 3H
Stage: 40
Job End Date: [illegible]

Job Summary

Well Information

TVD:	7,301	Top Perf:	15,711
No. Of Perfs:	30		

Casing	Tubing
[illegible]	n/A

Pressures, Rates and Volumes

	Proposed	Actual	Max	Min
BTP	[illegible] psi	[illegible] psi	[illegible] psi	[illegible] psi
Rate	[illegible] bpm	[illegible] bpm	[illegible] bpm	[illegible] bpm

	Proposed	Actual		
Clean Volume	[illegible] bbls	[illegible] bbls		
Slurry Volume	[illegible] bbls	[illegible] bbls		
Flush Volume	[illegible] bbls	[illegible] bbls		

	Proposed	Start	End
Free Pumps on Location	19	15	15

Open Well:	Start Time	[illegible]	Pressure	[illegible] psi
	Bell Down	77 bbls	Break Down	[illegible] psi
	Initial ISIP:	[illegible] psi	Initial F.G.:	[illegible] psi/ft
Stage Complete:	End Time	[illegible]	Job Time	[illegible]
	Final ISIP	[illegible] psi	Final F.G.	[illegible] psi/ft
	ISIP	[illegible]	5 Min:	[illegible] psi
	Pressure Min:	[illegible]	10 Min:	N/A
	Pressure Max:	[illegible]	15 Min:	N/A

Material Volume

Material	Proposed	Calculated	Actual	Variance
100 Mesh White	[illegible]	[illegible]	[illegible]	-1%
30/50 White	[illegible]	[illegible]	[illegible]	0%
Total Proppants	[illegible]	[illegible]	[illegible]	0%

Material	Proposed	Calculated	Actual	Variance
8.1%-7.5% HCL	[illegible]	[illegible]	[illegible]	1%
[illegible]	[illegible]	[illegible]	[illegible]	0%
[illegible]	[illegible]	[illegible]	[illegible]	-3%
FE-[illegible]	[illegible]	[illegible]	[illegible]	0%
[illegible]	[illegible]	[illegible]	[illegible]	-1%
[illegible]	[illegible]	[illegible]	[illegible]	-2%
[illegible]	[illegible]	[illegible]	[illegible]	-1%
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Comments:

Pumpdown Information:
Total Bbls: 63
Max Pressure (psi): 8041
Max Rate (bpm): 15.3

FTS International
[illegible]
Eighty Four, PA [illegible]

FTS INTERNATIONAL

Customer: American Energy - Utica
Well: Red Hill Farm Site 6r 3H
Stage: 43
Job End Date: [illegible]

Treatment Report

Date	[illegible]	Statelate	Washington County,PA	Basin Bin	[illegible]	API#	[illegible]

HH:MM Time	BTP	Slurry BPM	Stage Slurry (bbls)	Cumulative Slurry (bbls)	Stage Slurry (bbls)	Cumulative Slurry (bbls)	Stage Proppant (lbs)	Cumulative Proppant (lbs)	Description	Proppant	PPA
01:07	3,170	0.0	0	0	0	0	0	0	Freshwater Open Well		0.00
01:07	4,075	0.0	0	0	0	0	0	0	Freshwater Load Well		0.00
01:09	6,197	0.0	71	77	71	77	0	0	7.5% HCL Acid Add		0.00
01:10	7,777	14.7	0	77	0	77	0	0	Slickwater Breakdown		0.00
01:13	3,379	22.4	0	40	0	40	0	0	Slickwater Pad		0.00
01:14	8,166	36.7	140	300	140	300	630	630	Slickwater Proppant	100 Mesh White	0.10
01:21	7,121	84.7	218	488	217	483	2,280	2,904	Slickwater Proppant	100 Mesh White	0.25
01:24	6,630	77.0	300	788	301	714	4,385	3,326	Slickwater Proppant	100 Mesh White	0.50
01:26	6,686	82.4	400	1,139	448	1,186	13,040	21,704	Slickwater Proppant	100 Mesh White	0.75
01:33	6,607	80.7	422	1,557	444	1,630	17,724	39,428	Slickwater Proppant	100 Mesh White	1.00
01:38	6,681	80.6	460	2,017	470	2,078	19,040	58,468	Slickwater Proppant	30/50 White	1.00
01:43	6,615	0.0	0	2,017	0	2,078	0	58,468	Freshwater Shutdown		0.00
01:44	7,000	86.0	333	2,350	333	2,389	0	58,468	Slickwater Pad		0.00
01:50	6,135	80.0	45	2,375	49	2,438	473	58,941	Slickwater Proppant	30/50 White	0.25
01:53	6,395	78.0	70	2,445	72	2,511	1,479	60,421	Slickwater Proppant	30/50 White	0.50
01:53	6,045	71.0	71	2,516	75	2,584	2,217	62,638	Slickwater Proppant	30/50 White	0.75
01:55	6,040	71.0	517	3,033	501	3,085	19,914	82,552	Slickwater Proppant	30/50 White	1.00
01:56	6,076	80.5	1,601	4,634	1,600	4,679	82,550	165,095	Slickwater Proppant	30/50 White	1.50
02:14	3,010	80.7	667	5,301	910	5,700	50,501	165,646	Slickwater Proppant	30/50 White	1.50
02:21	3,219	80.4	500	5,801	540	6,300	35,700	215,195	Slickwater Proppant	30/50 White	1.75
02:27	3,101	62.0	347	6,150	370	6,700	29,149	244,344	Slickwater Proppant	30/50 White	2.00
02:31	3,147	62.2	50	6,201	63	6,763	0	244,344	Slickwater Clean stream		0.00
02:33	3,272	61.7	101	6,302	101	6,864	0	244,344	Slickwater Flush		0.00
02:35	3,000	73.7	100	6,700	100	6,964	0	244,344	Freshwater Flush		0.00
02:35	6,011	0.0	0	6,700	0	6,964	0	244,344	Freshwater Shutdown		0.00
Total Job/Time @ [illegible] 01:20											

Min BTP:	3,072 psi	Max BTP:	8,000 psi	Average BTP:	5,791 psi	5 Min:	4,432 psi
Min Rate:	39.5 bpm	Max Rate:	90.0 bpm	Average Rate:	74.9 bpm	10 Min:	0 psi
Initial ISIP:	6,011 psi	Initial F.Gr:	1.10 psi/ft	Average BHP:	10,324	15 Min:	0 psi
Final ISIP:	6,011 psi	Final F.Gr:	1.10 psi/ft	Customer Representative:		Site Score:	
FTS Representative:		Armando Lyle & Sean Stewart					

Comments:

The proppant values contained in this report are calculated based on actual barrel counts and target densities. Actual total proppant usage is 247,344 lbs. Charge time is 1 hour(s) 18 minute(s). All chemicals and proppant ran as documented.

Min/Max/Avg were taken from sand stages. All chem changes from proposed were made per AEU representative request.

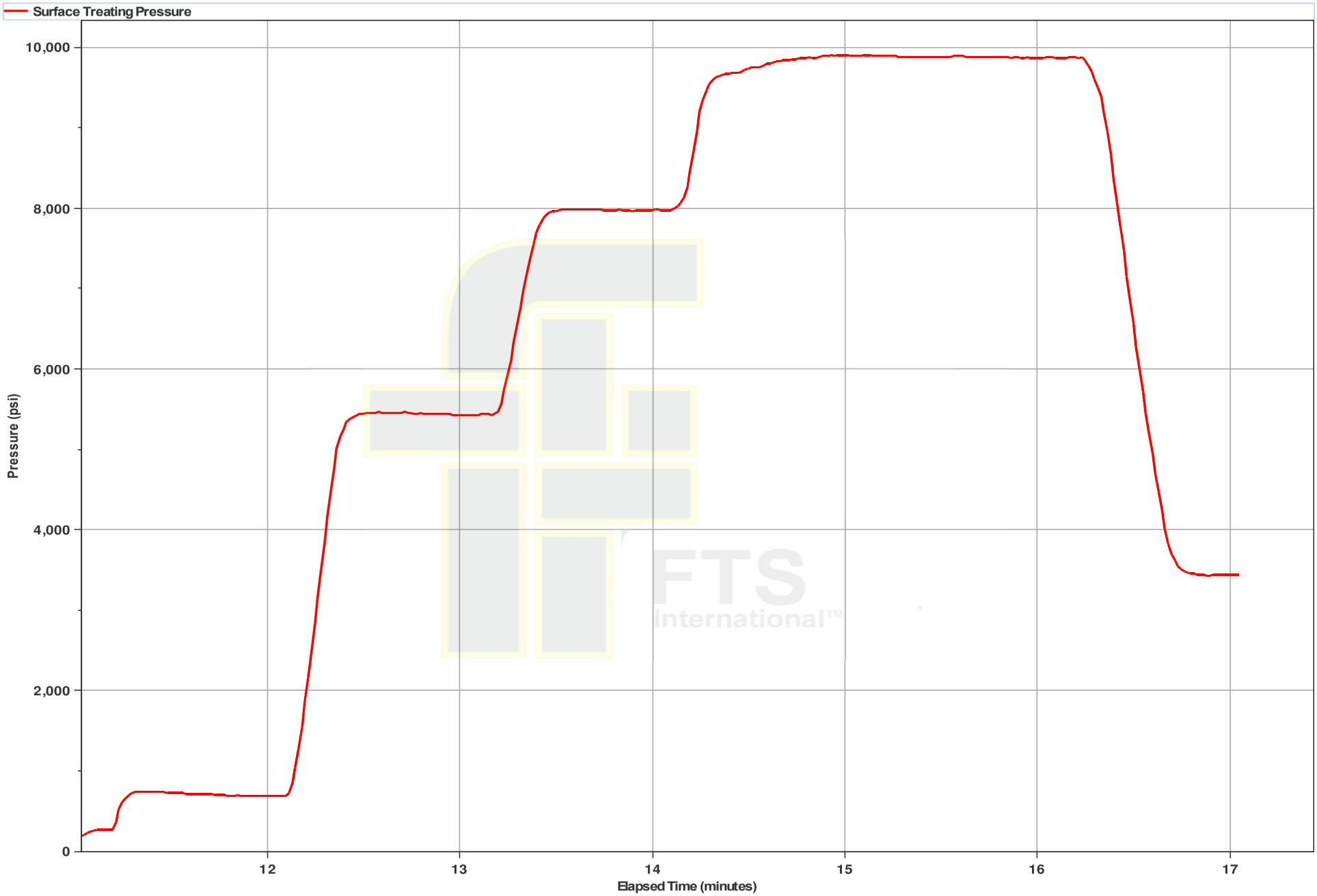
Discounted 6 gals of FRW-200, 4 gals of CS-250 SI, 4 gals of ICI-3245, and 6 gals of NE-100 due to a shutdown caused by blown packing off of a pump. Discounted chemicals and time from restart to 1 ppa 30/50 sand.

1 Minute Shutdown (psi): 5413
2 Minute Shutdown (psi): 4487
5 Minute Shutdown (psi): 4432

Chemical Changes:

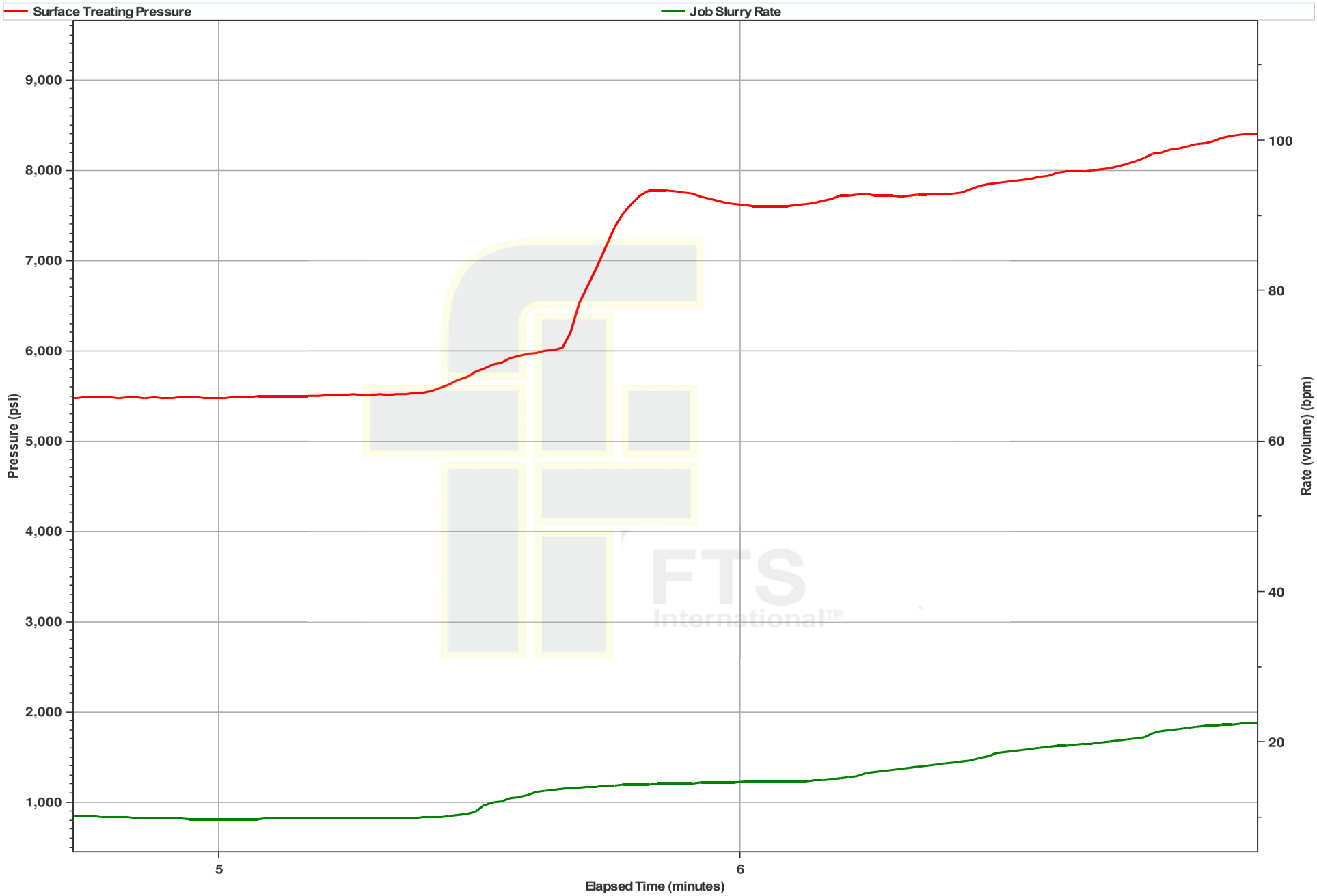
Chemical Name	Chemical Loading	Cumulative Clean
FRW-200	0.36	2,230

AEU Pressure Test



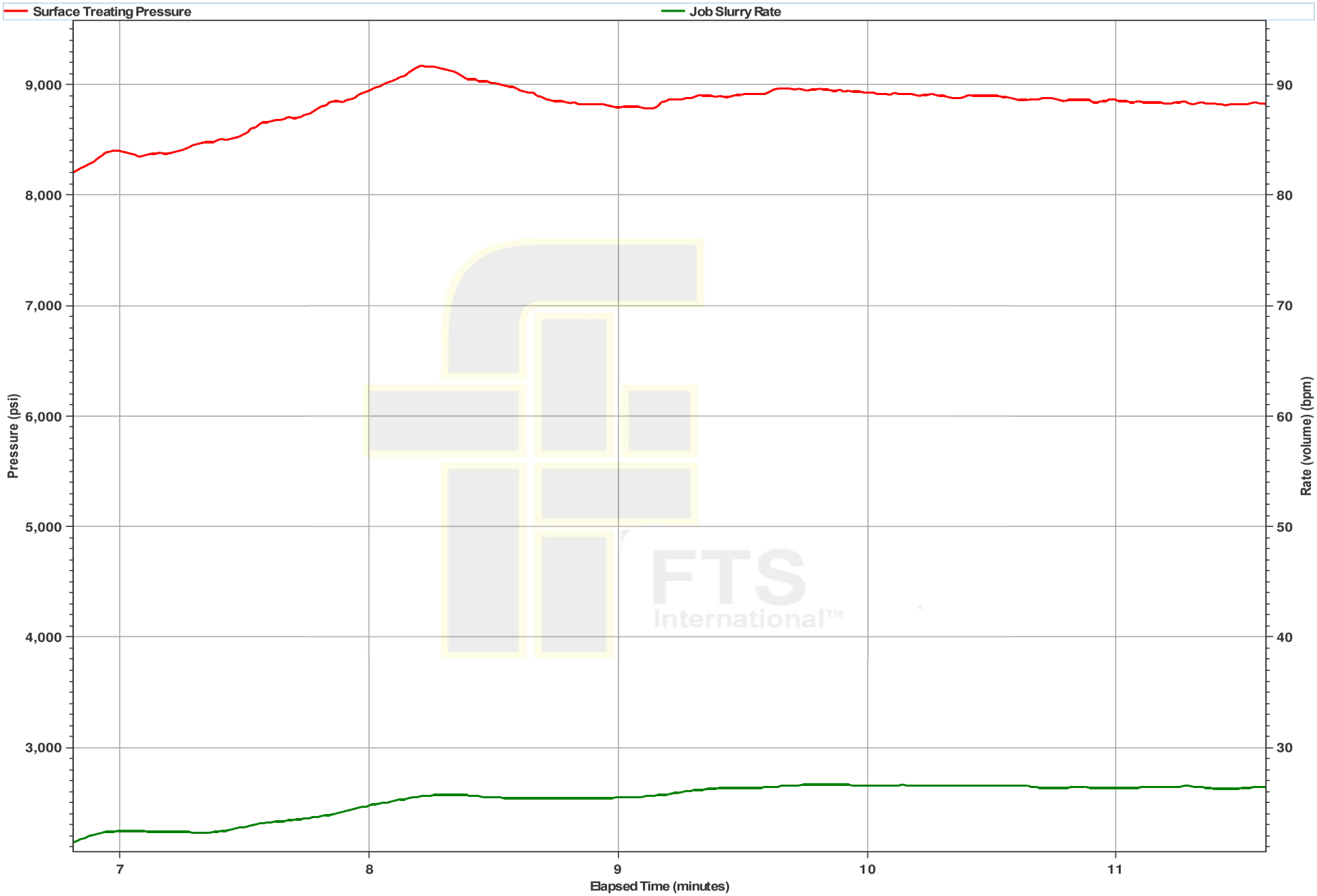
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 43 (WF.000658.M.W03.S43-aDCT-1103) Jun 26, 2015

Ball Seat and Breakdown



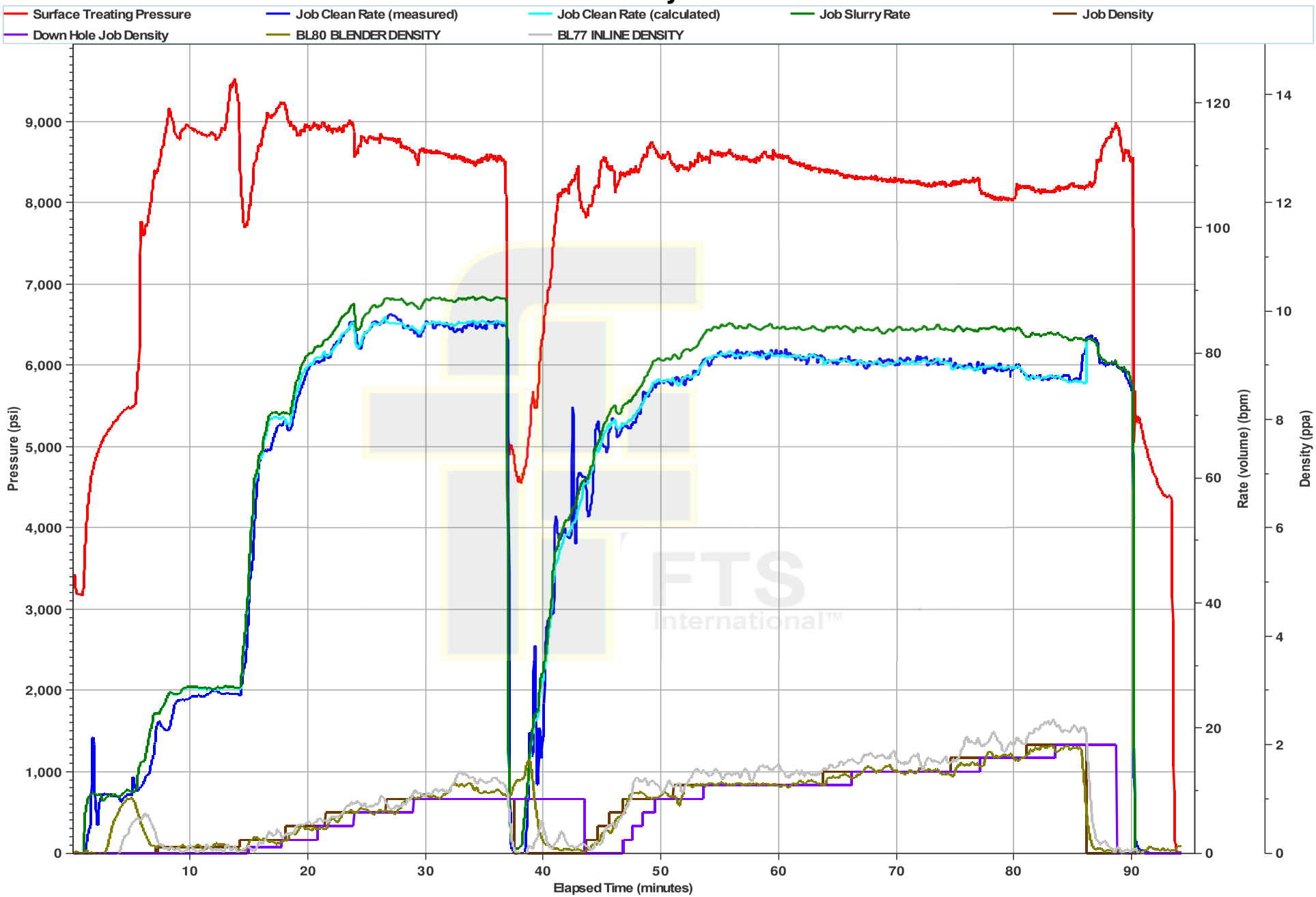
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 43 (WF.000658.M.W03.S43-aDCT-1103) **Jun 27, 2015**

Acid on Perforations



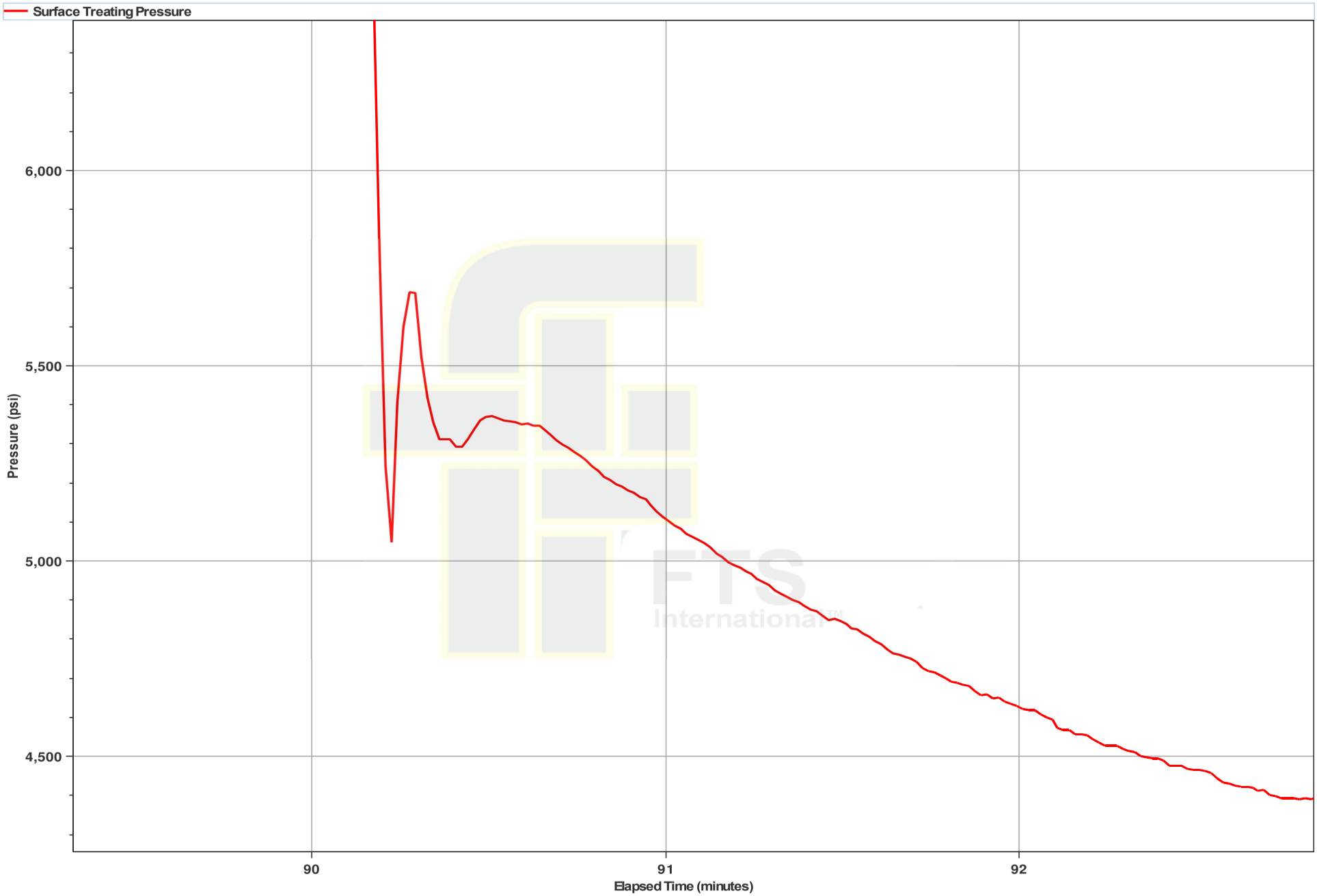
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 43 (WF.000658.M.W03.S43-aDCT-1103) **Jun 27, 2015**

Primary Plot



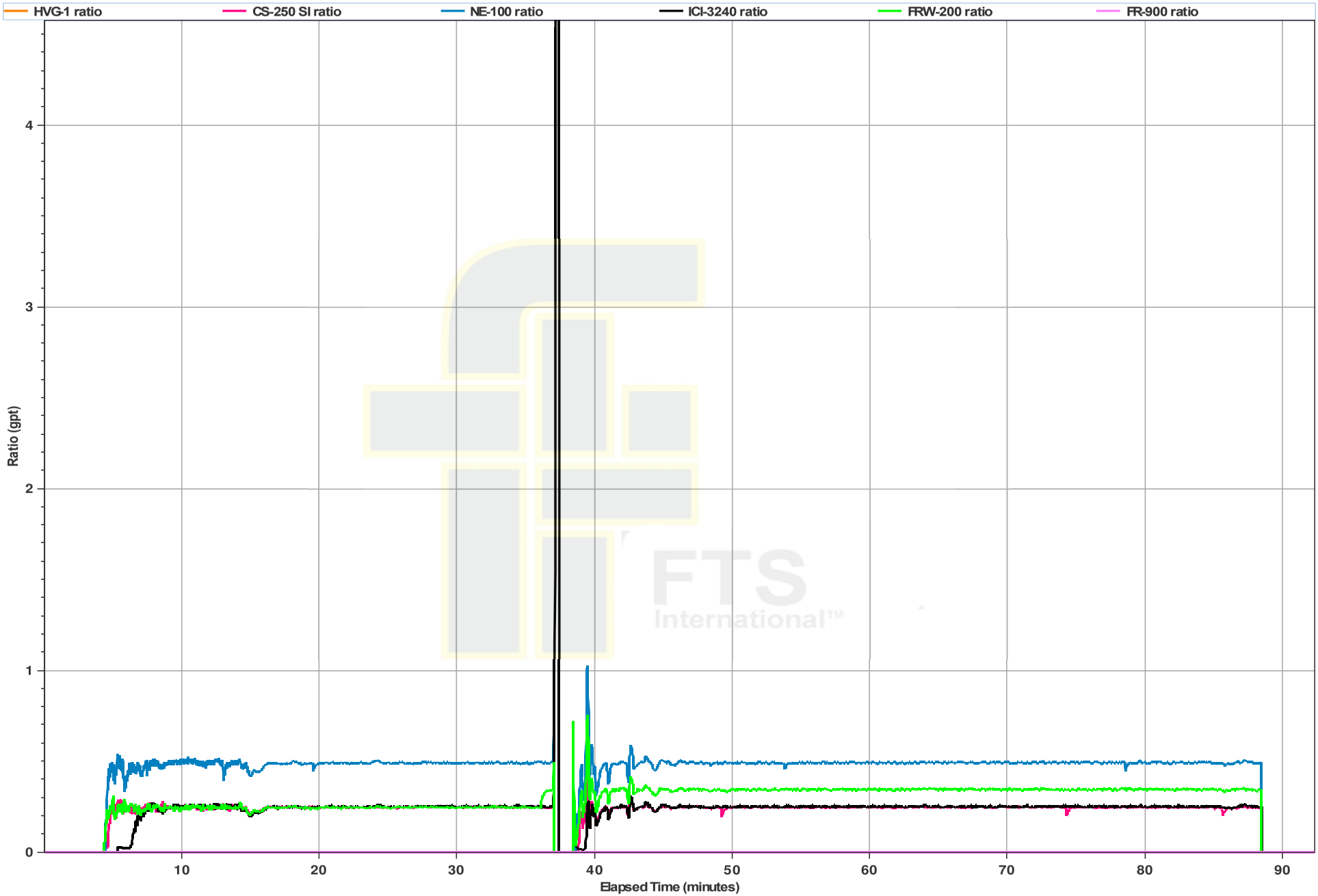
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 43 (WF.000658.M.W03.S43-aDCT-1103) **Jun 27, 2015**

ISIP Plot



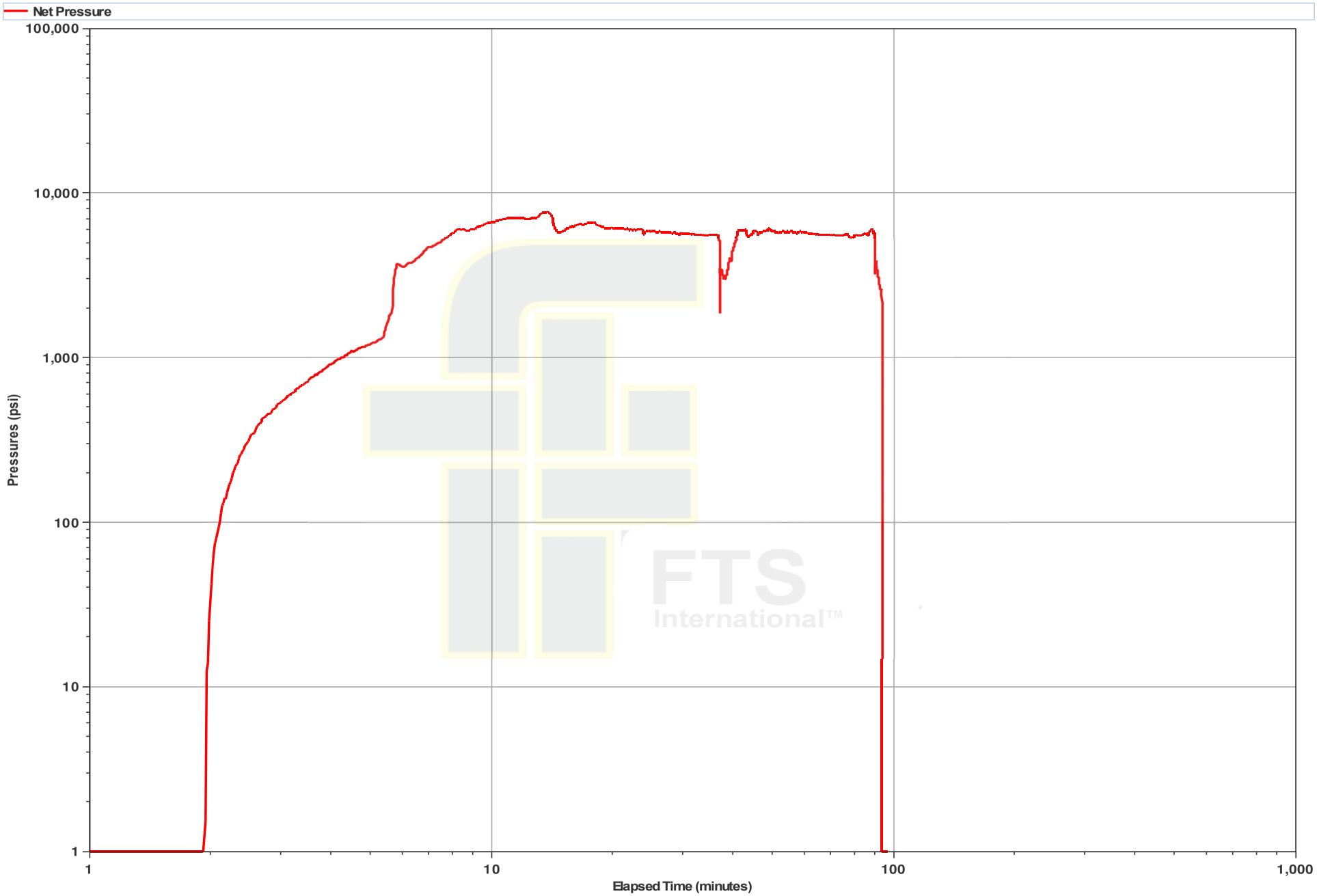
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 43 (WF.000658.M.W03.S43-aDCT-1103) Jun 27, 2015

Chemical Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 43 (WF.000658.M.W03.S43-aDCT-1103) **Jun 27, 2015**

Net Pressure Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 43 (WF.000658.M.W03.S43-aDCT-1103) Jun 27, 2015

QUALITY CONTROL OF PROPPANTS

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/27/2015
Customer Name:	American Energy - Utica	Well/Stage:	3H/43
Date Sampled:	6/27/2015	DISTRICT:	Washington, PA
VENDOR:	SANTROL		

Select Proppant Type:

___ Brown	___ Ceramic	___ Other (specify)
X White	___ Bauxite	
___ Resin Coated	___ Texas Gold	

Sieve Analysis	100 Mesh			Sieve Analysis	30/50 Mesh		
Sample 1	24.92	grams of sample		Sample 2	24.99	grams of sample	
	Amount Retained				Amount Retained		
Sieve mesh	Gram	%		Sieve mesh	Gram	%	
			Total				Total
50	1.25	5.02	In-Size	20	0.00	0.00	In-Size
70	14.55	58.39		30	1.26	5.04	
100	5.50	22.07	94.7%	40	15.11	60.46	92.8%
120	2.40	9.63		45	6.30	25.21	
140	0.99	3.97		50	1.77	7.08	
200	0.15	0.60		70	0.45	1.80	
Pan	0.08	0.32	fines	Pan	0.10	0.40	fines
Total wt. Gram	24.92	100.00		Total wt. Gram	24.99	100.00	

Tested By: Amanda Lyle

WATER-BASED FRAC FLUID QUALITY CONTROL
(Attachment to Post Treatment Report)

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/27/2015
Customer Name:	American Energy - Utica	Proposal #:	3H/43
Date Sampled:	6/27/2015	Water Source:	Working Tank

Sample/Tank No.	Clarity, Color, Odor	Sample Temperature, (F)	Specific gravity	Initial pH	Chloride, ppm	Hardness, ppm	Calcium, ppm	Magnesium, ppm	Iron ppm	Hydroxide, ppm	Bicarbonate, ppm	Carbonate, ppm	Sulfate, ppm	Barium, ppm
Working Tank	Clear	70	1	7.8	100	55	18	9	1	0	49	0	75	0

Frac Fluid Quality Gel Testing (These Recording are to made prior to pumping job)														
Sample #														
Base Gel Type	HVG-1													
Gel Loading (lbs/1000 gal.)	2.5													
Sample Temperature, (F)	70													
Initial pH	7.8													
Visc. Reading @ 300 rpms	5													
Viscosity, (cp)	5													
Sample 1 3 min Hydration	4													
Sample 2 3 min Hydration	4													
Sample 3 3 min Hydration	5													
X-Link Vortex Closure, min:sec	n/a													
X-Link Crown, min:sec	n/a													
X-Link pH	n/a													
Gel Break Time (<2cp) mins	19													

Frac Fluid Quality Gel Testing (These Recording are to made while pumping job)														
Stage #														
Base Gel Viscosity (cp)														
X-Link pH								.						
Sample XL time, min:sec														
Sample Temperature														

Acid Quality	Percent Acid	NaOH, mLs	Specific Gravity
	28		1.14

Additional testing or documentation may be required by the customer or for frac fluid quality assurance.

Tested By: Amanda Lyle

Post Job Report

AMERICAN ENERGY - UTICA

Red Hill Farm MDS GR 3H

Stage : 44 OF 54

HARRISON, OH

Operations Representative:

Name:	David Knapp
Office:	878-327-4881
Fax:	724-743-7719
Cell:	
Email:	DAVID.KNAPP@FTSI.COM

Sales Representative:

Name:	Bruce Batthern
Office:	405-574-3901
Fax:	405-787-1235
Cell:	
Email:	BRUCE.BATTHERN@FTSI.COM

Engineering Manager:

Name:	Thaddeus Craun
Office:	817-832-8782
Fax:	724-743-7719
Cell:	
Email:	THADDEUS.CRAUN@FTSI.COM

Job Summary

Well Information

TVD:	7,301	Top Perf:	15,711
No. Of Perfs:	30		

Casing	Tubing
[illegible]	n/A

Pressures, Rates and Volumes

	Proposed	Actual	Max	Min
STP	[illegible] psi	[illegible] psi	[illegible] psi	[illegible] psi
Rate	[illegible] bpm	[illegible] bpm	[illegible] bpm	[illegible] bpm

	Proposed	Actual		
Clean Volume	[illegible] bbls	[illegible] bbls		
Slurry Volume	[illegible] bbls	[illegible] bbls		
Flush Volume	[illegible] bbls	[illegible] bbls		

	Proposed	Start	End
Frac Pumps on Location	19	15	15

Open Well:	Start Time	[illegible]	Pressure	[illegible] psi
	Bell Dwn	[illegible] bbls	Break Down	[illegible] psi
	Initial ISIP:	[illegible] psi	Initial F.G.:	[illegible] psi/ft
Stage Complete:	End Time	[illegible]	Job Time	[illegible]
	Final ISIP	[illegible] psi	Final F.G.	[illegible] psi/ft
	ISIP	[illegible]	5 Min:	[illegible] psi
	Pressure Min:	[illegible]	10 Min:	N/A
	Pressure Max:	[illegible]	15 Min:	N/A

Material Volume

Material	Proposed	Calculated	Actual	Variance
100 Mesh White	[illegible]	[illegible]	[illegible]	[illegible]
[illegible] White	[illegible]	[illegible]	[illegible]	[illegible]
Total Proppants	[illegible]	[illegible]	[illegible]	[illegible]

Material	Proposed	Calculated	Actual	Variance
8.1%-7.5% HCL	[illegible]	[illegible]	[illegible]	[illegible]
AFR-1	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
HVG-1 4.5	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
LTB-1	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Comments:

Discounted chemical and time for the shutdown

Flowdown Information:
Total Bbls: 98
Max Pressure (psi): 6848
Max Rate (bpm): 19.1

FTS International
[illegible] Route [illegible]
Eighty Four, PA 15330

Customer: American Energy - Utica
Well: [illegible]
Stage: 41
Job End Date: [illegible]

Treatment Report

Date	[illegible]	**District**	Washington County, PA	**Service Order**	[illegible]	**API#**	[illegible]

Clk. Time	STP	Slurry BPM	Stage Slurry (bbls)	Cumulative Slurry (bbls)	Stage Clean (bbls)	Cumulative Clean (bbls)	Stage Proppant (lbs)	Cumulative Proppant (lbs)	Description	Proppant	PPA
[illegible]	3,[illegible]	5.5	0	0	0	0	0	0	Freshwater Open Well		0.00
[illegible]	4,141	5.1	0	0	0	0	0	0	Freshwater Load		0.00
[illegible]	6,311	11.1	71	79	71	79	0	0	7.5% HCL Acid Acid		0.00
[illegible]	3,149	30.0	107	[illegible]	107	[illegible]	0	0	Slickwater Load		0.00
[illegible]	3,141	34.4	[illegible]	[illegible]	[illegible]	[illegible]	0	0	Slickwater Breakdown		0.00
[illegible]	6,327	0.0	0	[illegible]	0	[illegible]	0	0	Slickwater Shutdown		0.00
[illegible]	2,730	5.5	6	[illegible]	6	[illegible]	0	0	Freshwater Open Well		0.00
[illegible]	6,121	4.5	12	301	12	301	0	0	Freshwater Load		0.00
10:24	6,786	12.9	71	372	71	372	0	0	7.5% HCL Acid Acid		0.00
[illegible]	6,657	19.7	40	412	40	412	0	0	Slickwater Pad		0.00
[illegible]	6,45[illegible]	30.0	214	[illegible]	215	[illegible]	[illegible]	[illegible]	Slickwater Proppant	100 Mesh White	0.10
[illegible]	6,150	71.2	214	840	215	[illegible]	2,247	3,14[illegible]	Slickwater Proppant	100 Mesh White	0.25
[illegible]	6,130	75.5	[illegible]	1,[illegible]	[illegible]	1,1[illegible]	6,579	[illegible]	Slickwater Proppant	100 Mesh White	0.50
[illegible]	[illegible]	75.0	[illegible]	1,[illegible]	444	1,[illegible]	13,614	[illegible]	Slickwater Proppant	100 Mesh White	0.75
[illegible]	[illegible]	80.3	[illegible]	[illegible]	[illegible]	[illegible]	21,[illegible]	[illegible]	Slickwater Proppant	100 Mesh White	1.00
15:57	[illegible]	80.2	[illegible]	[illegible]	[illegible]	[illegible]	34,610	77,[illegible]	Slickwater Proppant	40/70 White	1.00
[illegible]	[illegible]	80.0	[illegible]	[illegible]	1,[illegible]	[illegible]	[illegible]	[illegible]	Slickwater Proppant	40/70 White	1.25
16:15	6,447	80.7	[illegible]	4,[illegible]	[illegible]	4,[illegible]	[illegible]	[illegible]	Slickwater Proppant	40/70 White	1.50
[illegible]	[illegible]	80.1	147	4,[illegible]	147	4,[illegible]	[illegible]	170,[illegible]	Slickwater Proppant	40/70 White	1.50
[illegible]	[illegible]	80.5	[illegible]	4,[illegible]	[illegible]	4,1[illegible]	[illegible]	[illegible]	Slickwater Proppant	40/70 White	1.75
[illegible]	[illegible]	80.3	34	4,672	37	4,1[illegible]	2,[illegible]	[illegible]	10# Linear Gel Proppant	40/70 White	1.75
[illegible]	[illegible]	80.4	[illegible]	[illegible]	[illegible]	[illegible]	7,2[illegible]	213,[illegible]	Slickwater Proppant	30/50 White	1.75
[illegible]	[illegible]	80.0	[illegible]	[illegible]	413	[illegible]	31,7[illegible]	244,[illegible]	10# Linear Gel Proppant	30/50 White	2.00
[illegible]	7,[illegible]	80.7	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Slickwater Proppant	30/50 White	2.00
[illegible]	7,027	80.0	101	[illegible]	101	[illegible]	0	[illegible]	Slickwater Clean sweep		0.00
[illegible]	[illegible]	80.4	[illegible]	[illegible]	[illegible]	4,112	0	[illegible]	Freshwater Flush		0.00
[illegible]	[illegible]	0.0	0	[illegible]	0	4,112	0	[illegible]	Freshwater Shutdown		0.00
Total Job Time (hh:mm): [illegible]											

Min STP:	[illegible] psi	**Max STP:**	[illegible] psi	**Average STP:**	[illegible] psi	**5 Min**	4,[illegible] psi
Min Rate	[illegible] bpm	**Max Rate**	[illegible] bpm	**Average Rate**	[illegible] bpm	**10 Min**	0 psi
Initial ISIP:	[illegible] psi	**Initial F.G.:**	[illegible] psi/ft	**Average HHP:**	[illegible]	**15 Min**	0 psi
Final ISIP:	[illegible] psi	**Final F.G.:**	[illegible] psi/ft	**Customer Representative**		[illegible]	
FTS Representative		[illegible]					

Comments:

The proppant values contained in this report are calculated based on actual barrel counts and target densities. Actual total proppant usage is 248,612 lbs. Charge time is 1 hour(s) 16 minute(s). All chemicals and proppant ran as documented.

Min/Max/Avg were taken from sand stages. All chem changes from proposed were made per AEU representative request.

2:48 - Shutdown due to issue with the dual belt

Pumped another 3000 gallons on 7.5%HCL due to the shutdown. Discounted second shot of acid and started time after shutdown.

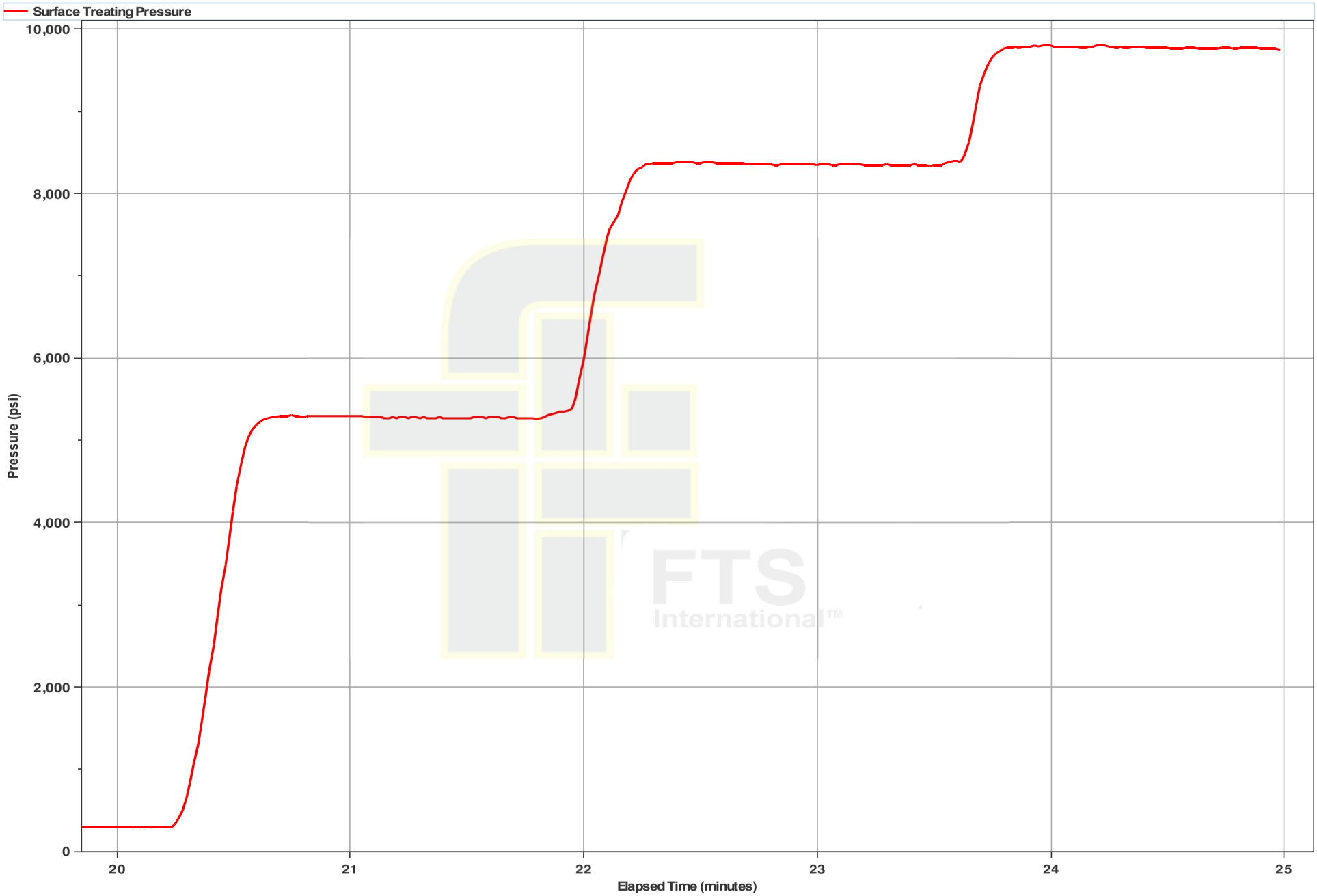
Discounted gel and breaker due to over running the chemical post customer request.

1 Minute Shutdown (psi): 5228
2 Minute Shutdown (psi): 4514
5 Minute Shutdown (psi): 4333

Chemical Changes:

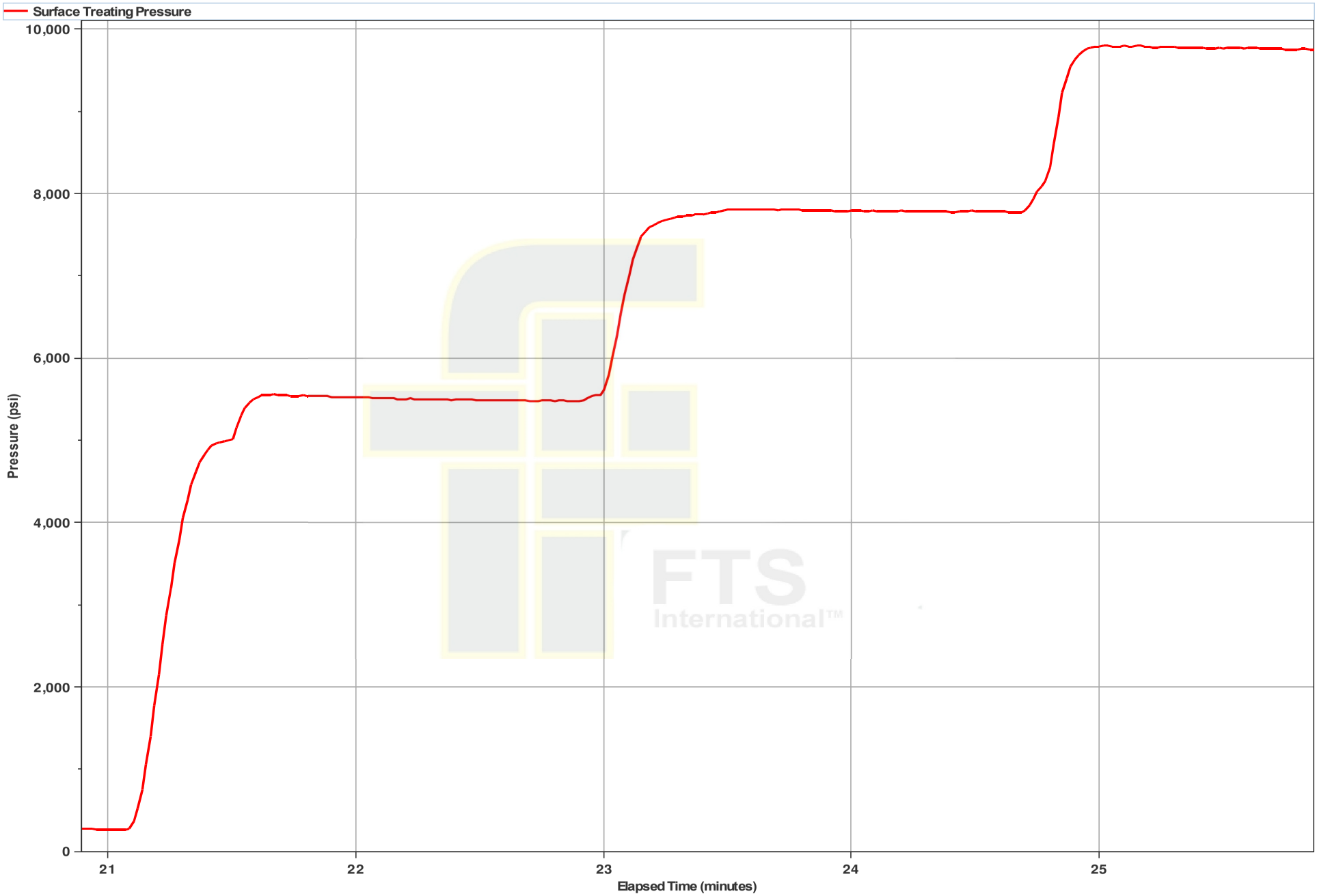
Chemical Name	Chemical Loading	Cumulative Gallons
FRW-200	0.60	4,812

AEU Pressure Test



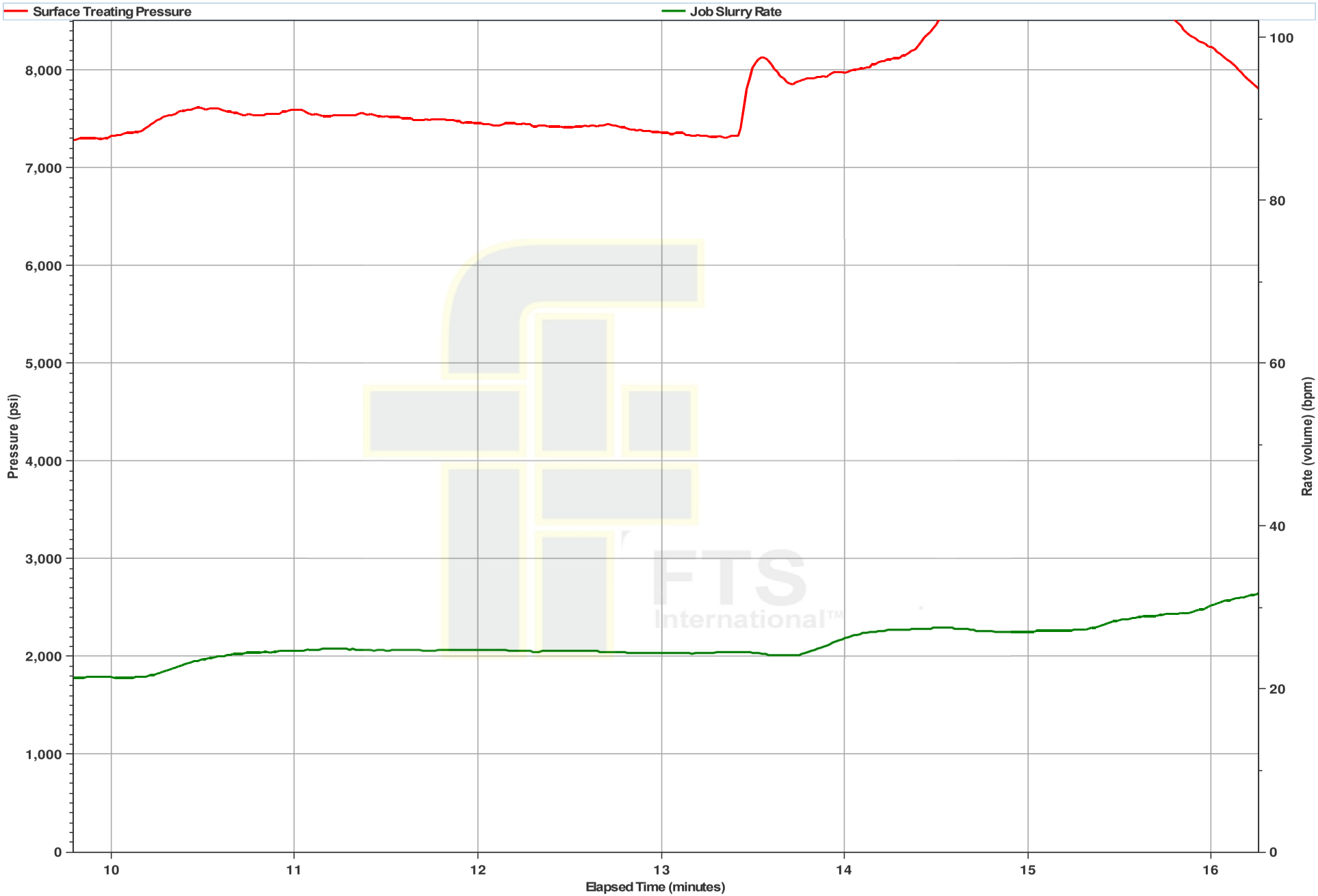
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 44 (WF.000658.M.W03.S44-aDCT-1103) Jun 27, 2015

AEU Pressure Test



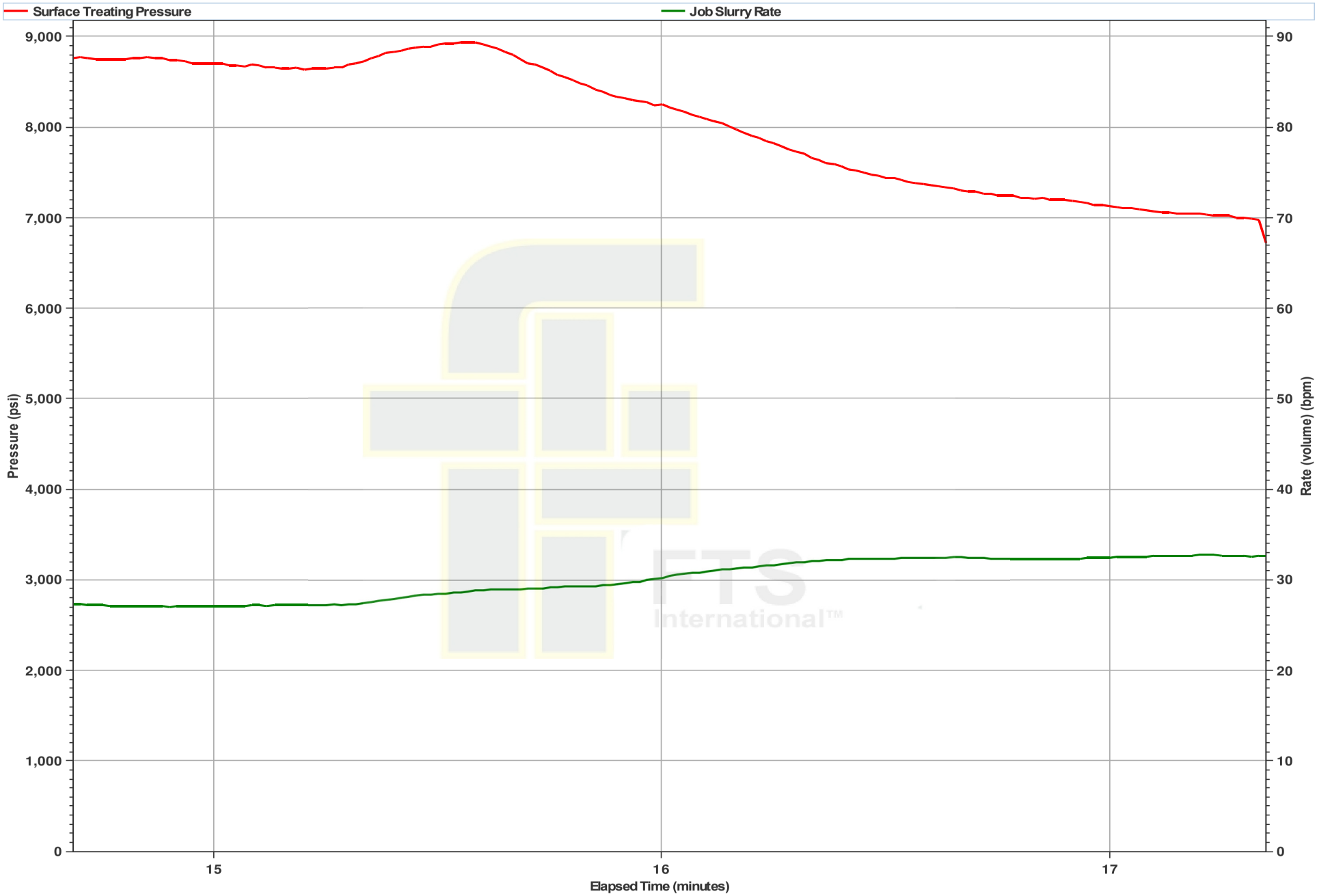
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 44b (WF.000658.M.W03.S44-aDCT-1103) Jun 27, 2015

Ball Seat and Breakdown



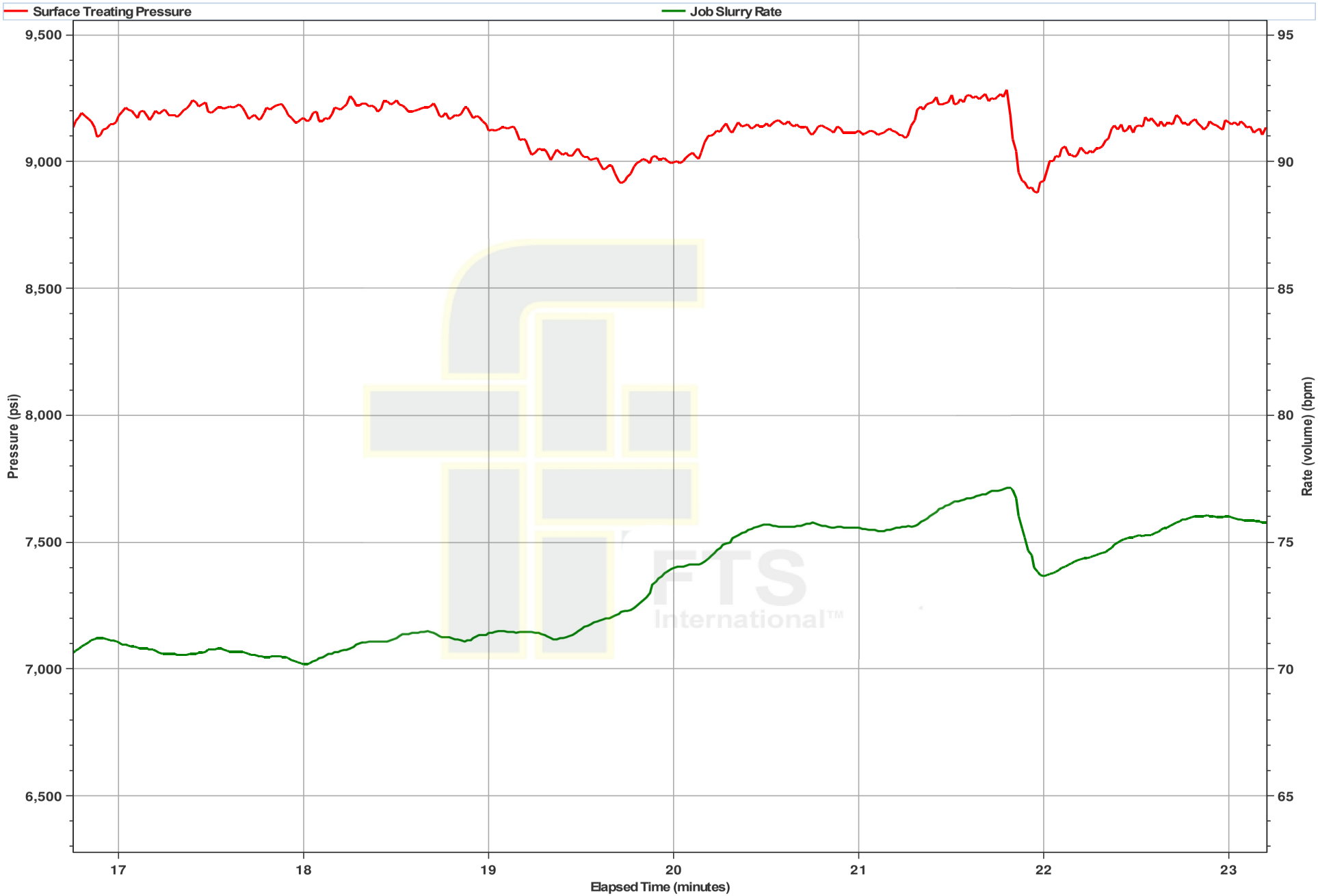
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 44 (WF.000658.M.W03.S44-aDCT-1103) **Jun 27, 2015**

Acid on Perforations



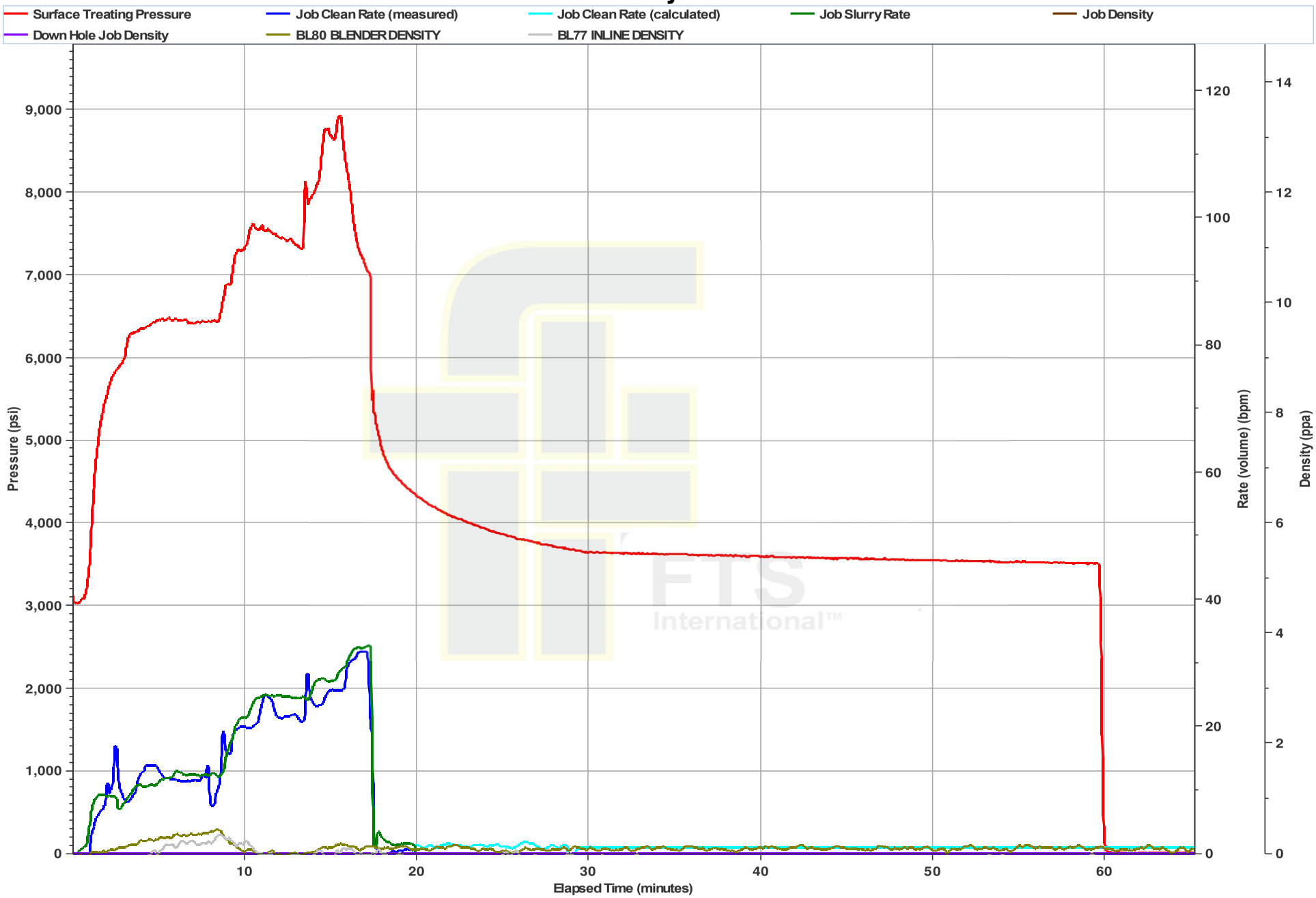
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 44 (WF.000658.M.W03.S44-aDCT-1103) Jun 27, 2015

Acid on Perforations



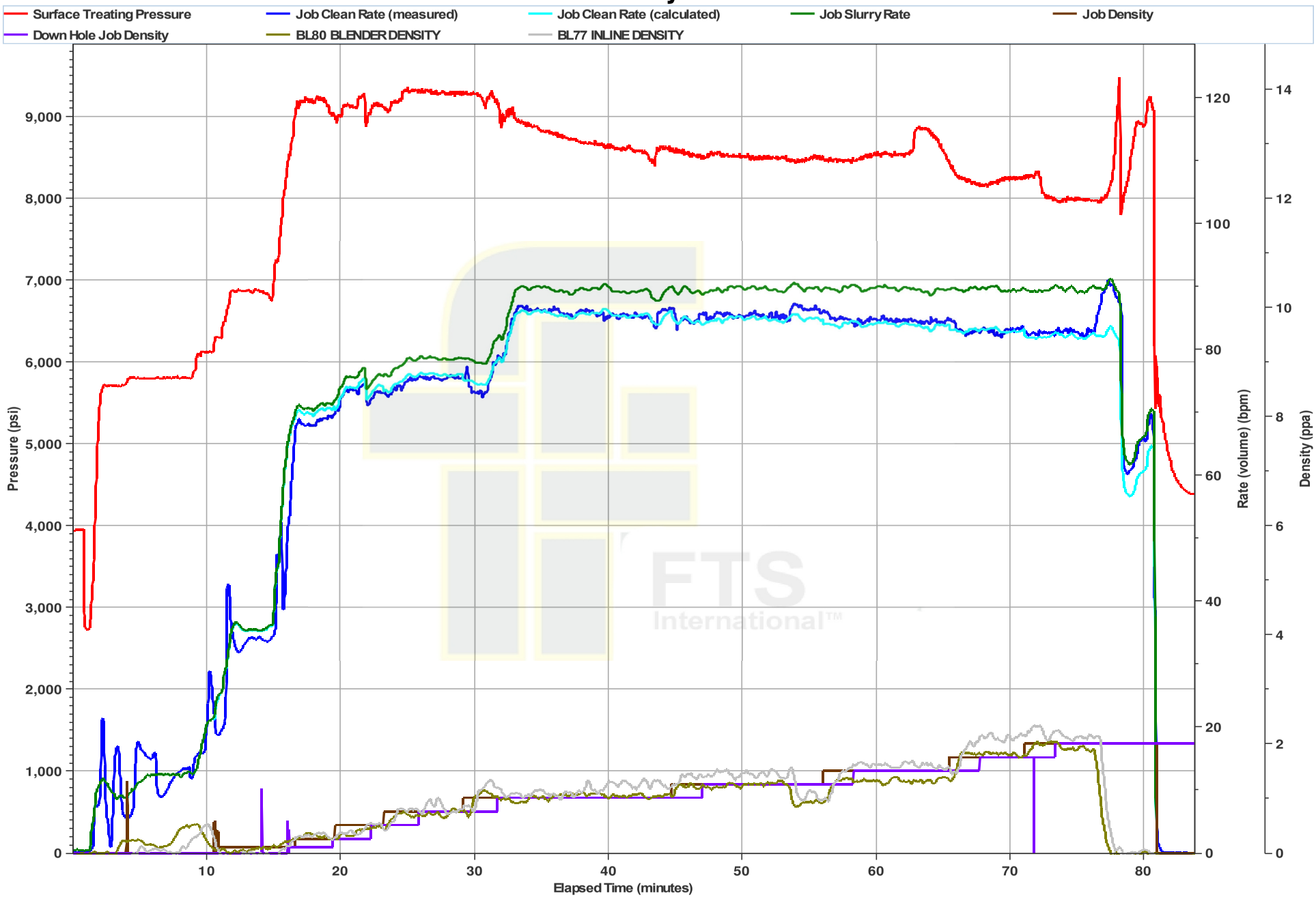
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 44b (WF.000658.M.W03.S44-aDCT-1103) **Jun 27, 2015**

Primary Plot



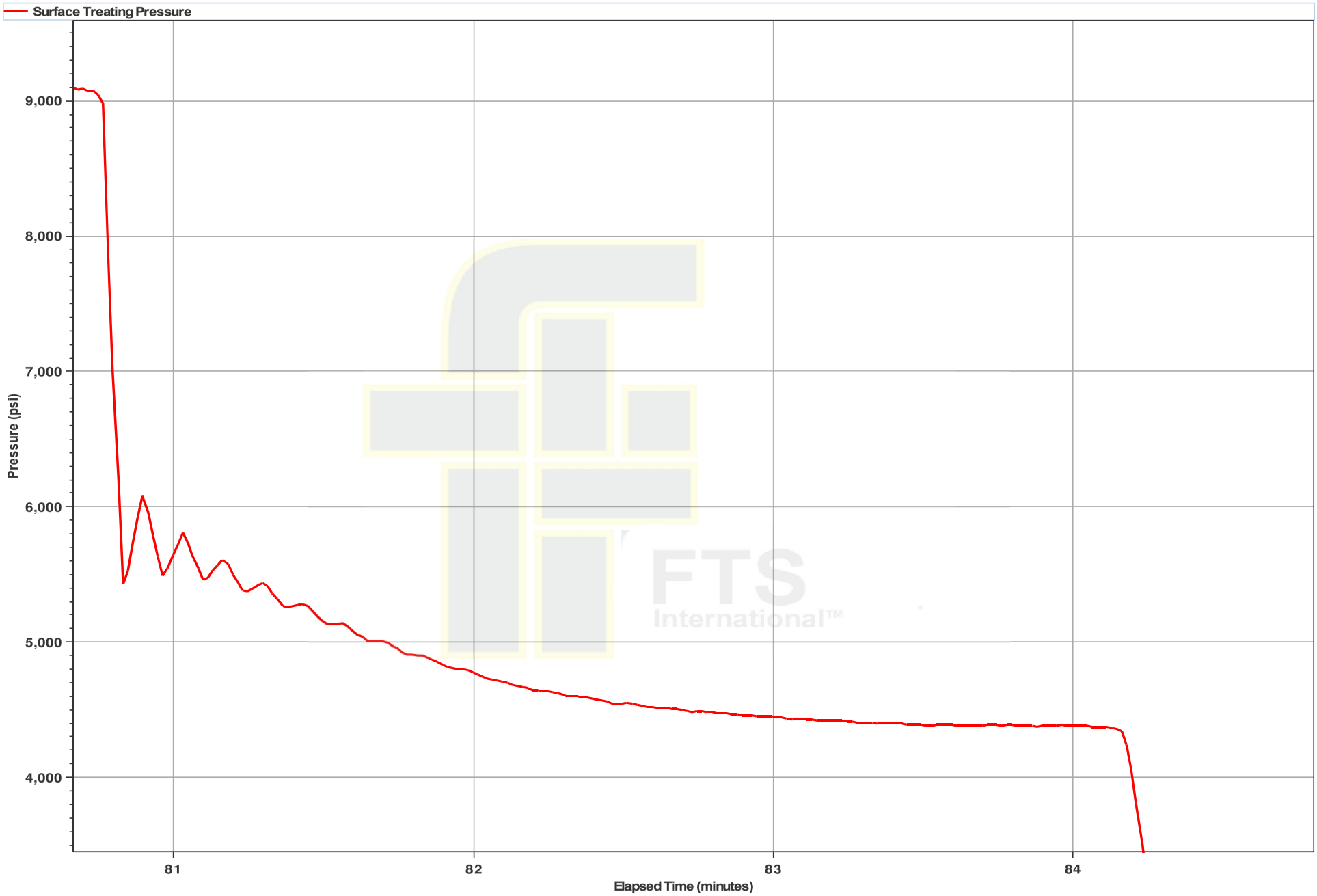
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 44 (WF.000658.M.W03.S44-aDCT-1103) **Jun 27, 2015**

Primary Plot



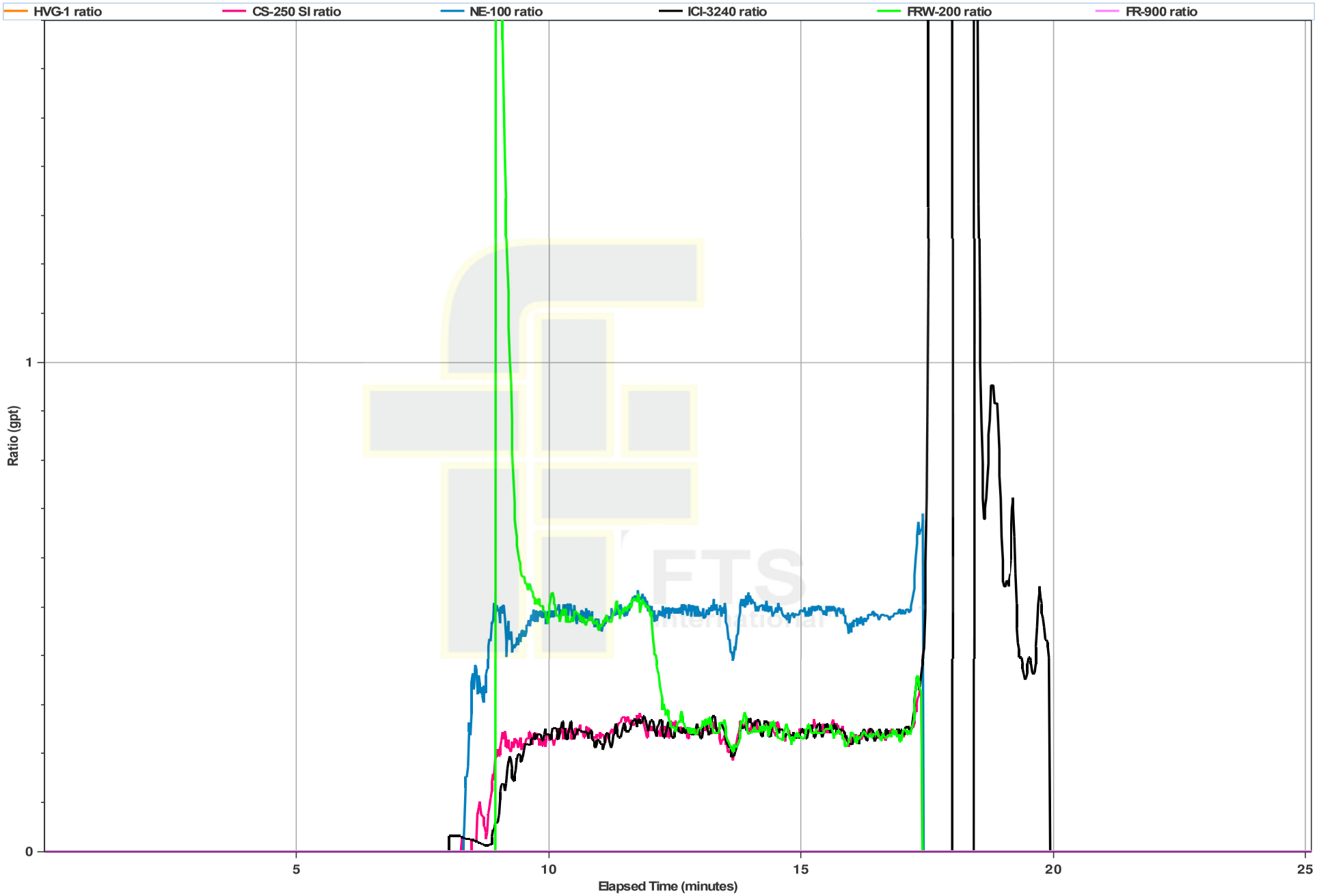
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 44b (WF.000658.M.W03.S44-aDCT-1103) **Jun 27, 2015**

ISIP Plot



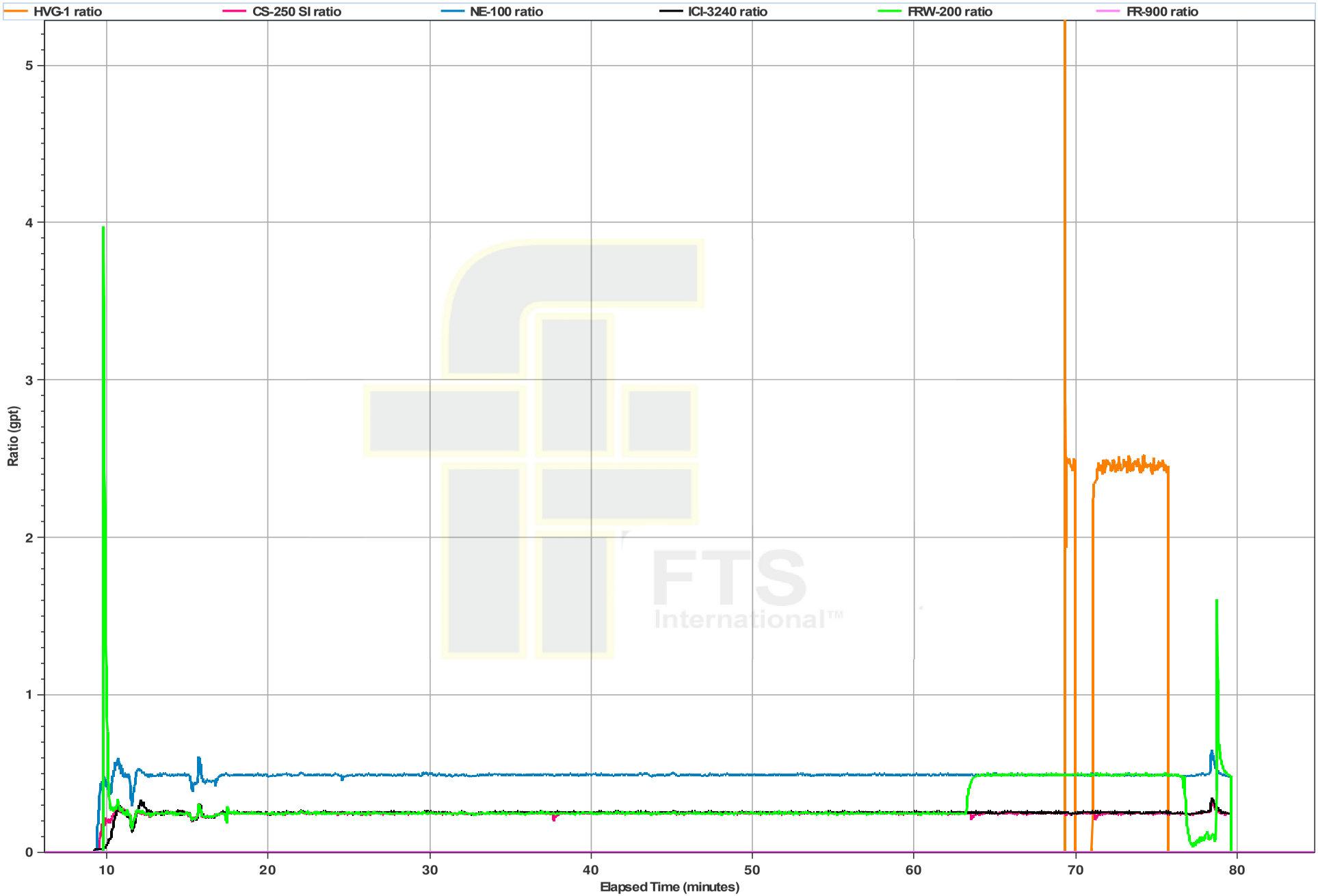
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 44b (WF.000658.M.W03.S44-aDCT-1103) **Jun 27, 2015**

Chemical Plot



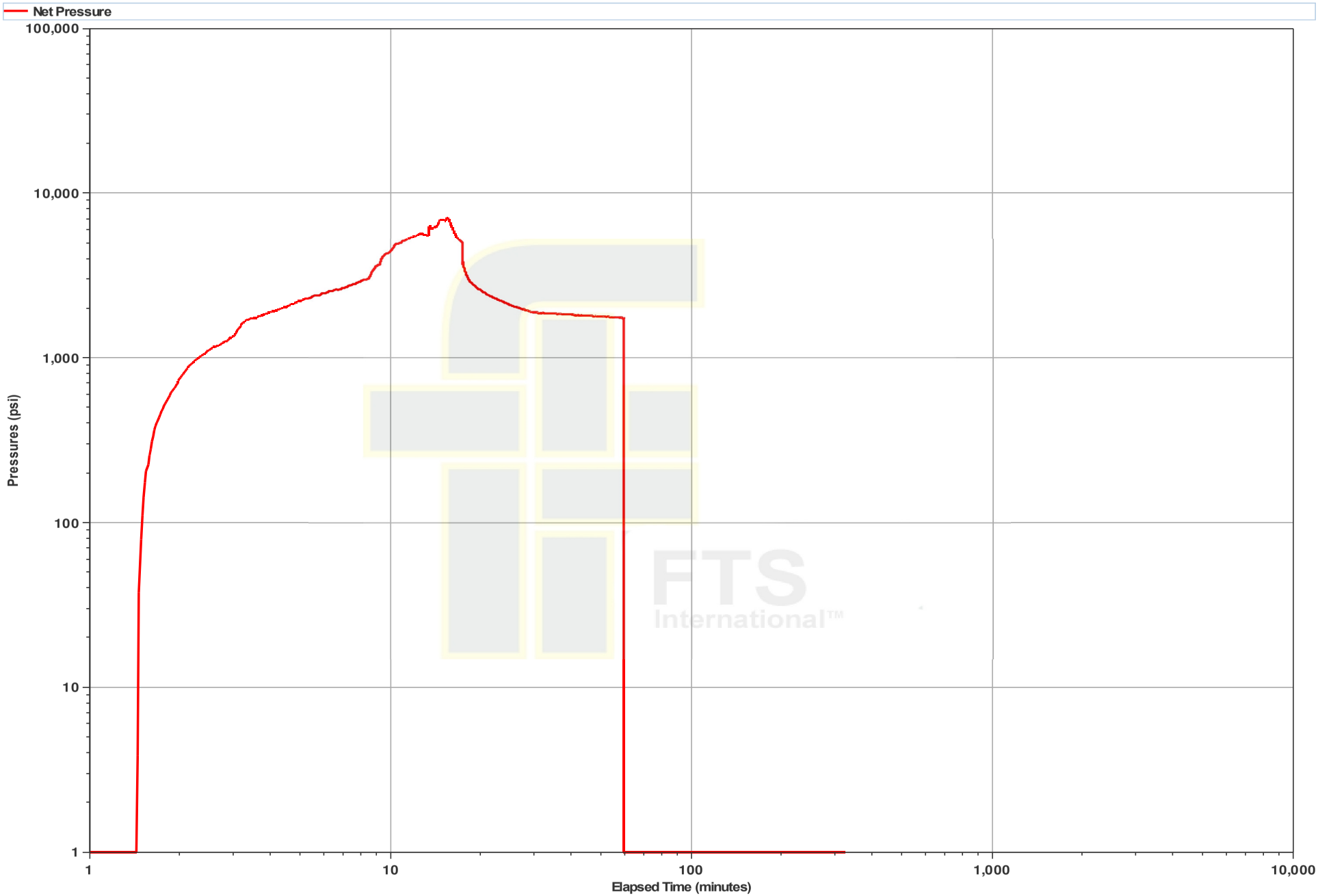
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 44 (WF.000658.M.W03.S44-aDCT-1103) Jun 27, 2015

Chemical Plot



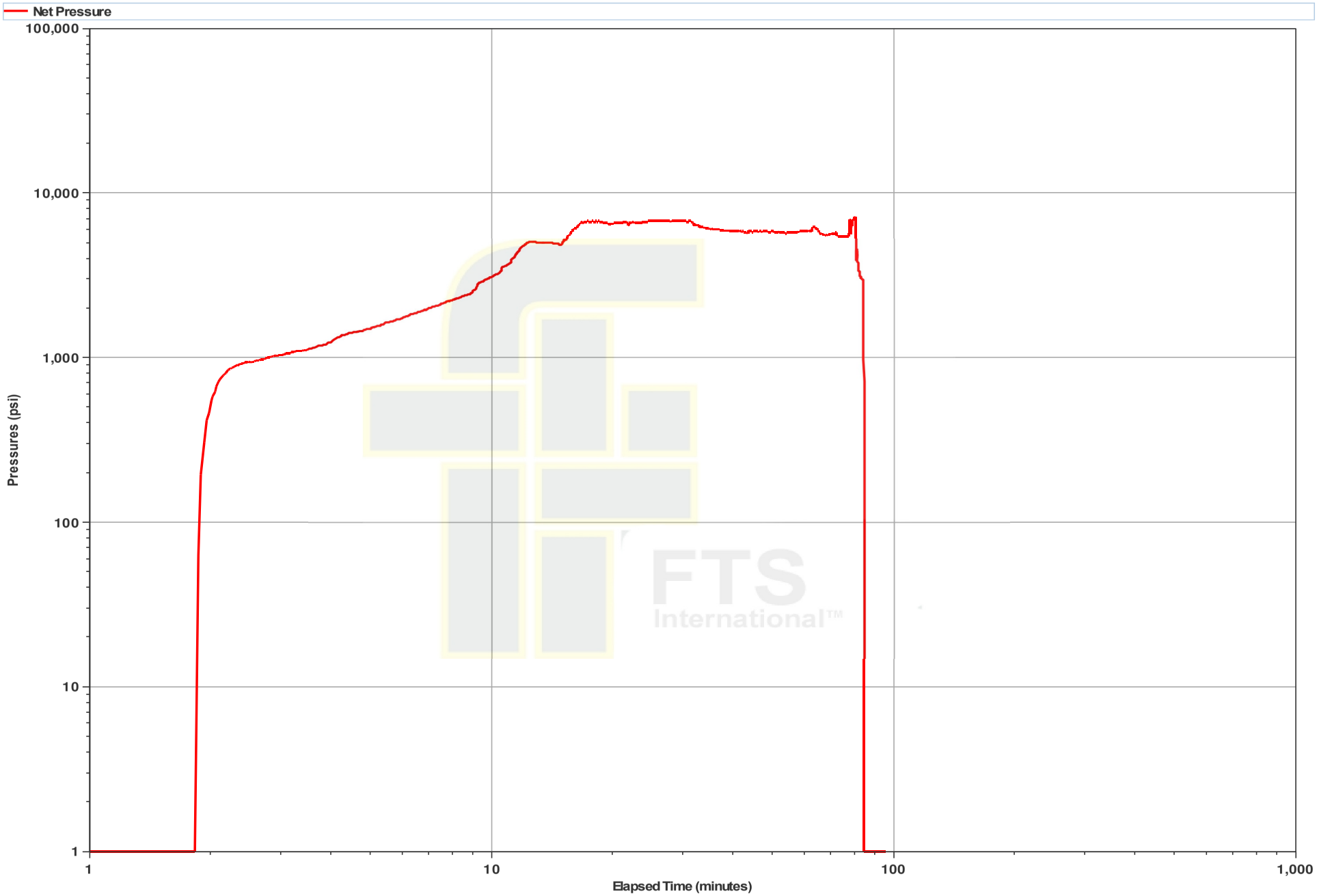
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 44b (WF.000658.M.W03.S44-aDCT-1103) Jun 27, 2015

Net Pressure Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 44 (WF.000658.M.W03.S44-aDCT-1103) Jun 27, 2015

Net Pressure Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 44b (WF.000658.M.W03.S44-aDCT-1103) Jun 27, 2015

QUALITY CONTROL OF PROPPANTS

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/27/2015
Customer Name:	American Energy - Utica	Well/Stage:	3H/44
Date Sampled:	6/27/2015	DISTRICT:	Washington, PA
VENDOR:	SANTROL		

Select Proppant Type:

___ Brown	___ Ceramic	___ Other (specify)
X White	___ Bauxite	_____
___ Resin Coated	___ Texas Gold	

Sieve Analysis	100 Mesh			Sieve Analysis	30/50 Mesh		
Sample 1	25.20	grams of sample		Sample 2	24.85	grams of sample	
	Amount Retained				Amount Retained		
Sieve mesh	Gram	%		Sieve mesh	Gram	%	
			Total				Total
50	1.00	3.97	In-Size	20	0.00	0.00	In-Size
70	14.80	58.73		30	1.30	5.23	
100	5.40	21.43	95.6%	40	15.30	61.57	92.6%
120	2.50	9.92		45	6.20	24.95	
140	1.10	4.37		50	1.50	6.04	
200	0.30	1.19		70	0.45	1.81	
Pan	0.10	0.40	fines	Pan	0.10	0.40	fines
Total wt. Gram	25.20	100.00		Total wt. Gram	24.85	100.00	

Tested By: Etuate Varea

WATER-BASED FRAC FLUID QUALITY CONTROL
(Attachment to Post Treatment Report)

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/27/2015
Customer Name:	American Energy - Utica	Proposal #:	3H/44
Date Sampled:	6/27/2015	Water Source:	Working Tank

Sample/Tank No.	Clarity, Color, Odor	Sample Temperature, (F)	Specific gravity	Initial pH	Chloride, ppm	Hardness, ppm	Calcium, ppm	Magnesium, ppm	Iron ppm	Hydroxide, ppm	Bicarbonate, ppm	Carbonate, ppm	Sulfate, ppm	Barium, ppm
Working Tank	Clear	78	1	7.6	21	20	6	3	1	0	451	0	55	0
Reused Water Tank	Black, Cloudy, Petroleum Odor	76	1.04	5.1	61,981	36000	12,003	5,834	>10	0	1440	0	250	0

Frac Fluid Quality Gel Testing (These Recording are to made prior to pumping job)														
Sample #														
Base Gel Type	HVG-1													
Gel Loading (lbs/1000 gal.)	2.5													
Sample Temperature, (F)	78													
Initial pH	7.8													
Visc. Reading @ 300 rpms	5													
Viscosity, (cp)	5													
Sample 1 3 min Hydration	4													
Sample 2 3 min Hydration	4													
Sample 3 3 min Hydration	5													
X-Link Vortex Closure, min:sec	n/a													
X-Link Crown, min:sec	n/a													
X-Link pH	n/a													
Gel Break Time (<2cp) mins	17													

Frac Fluid Quality Gel Testing (These Recording are to made while pumping job)														
Stage #														
Base Gel Viscosity (cp)														
X-Link pH								.						
Sample XL time, min:sec														
Sample Temperature														

Acid Quality	Percent Acid	NaOH, mLs	Specific Gravity
	28		1.14

Additional testing or documentation may be required by the customer or for frac fluid quality assurance.

Tested By: Etuate Varea

Post Job Report

AMERICAN ENERGY - UTICA

Red Hill Farm MDS GR 3H

Stage : 46 OF 54

HARRISON, OH

Operations Representative:

Name:	David Knapp
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Email:	DAVID.KNAPP@FTSI.COM

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Fax:	405-787-1235
Cell:	
Email:	BRUCE.EATTHMAN@FTSI.COM

Engineering Manager:

Name:	Thaddeus Craun
Office:	817-832-8782
Fax:	724-743-7719
Cell:	
Email:	THADDEUS.CRAUN@FTSI.COM

FTS International
[illegible]
Eighty Four, PA [illegible]

FTS INTERNATIONAL

Customer: American Energy - Utica
Well: Red Hill Farm Bla 6r 3H
Stage: 48
Job End Date: [illegible]

Job Summary

Well Information

TVD:	7,301	Top Perf:	15,711
No. Of Perfs:	30		

Casing	Tubing
[illegible]	n/A

Pressures, Rates and Volumes

	Proposed	Actual	Max	Min
STP	[illegible] psi	[illegible] psi	[illegible] psi	[illegible] psi
Rate	[illegible] bpm	[illegible] bpm	[illegible] bpm	[illegible] bpm

	Proposed	Actual		
Clean Volume	[illegible] bbls	[illegible] bbls		
Slurry Volume	[illegible] bbls	[illegible] bbls		
Flush Volume	[illegible] bbls	[illegible] bbls		

	Proposed	Start	End
Frac Pumps on Location	12	14	14

Open Well:	Start Time	[illegible]	Pressure	[illegible] psi
	Bull Dwn	[illegible] bbls	Break Down	[illegible] psi
	Initial ISIP:	[illegible] psi	Initial F.G.:	[illegible] psi/ft
Stage Complete:	End Time	[illegible]	Job Time	[illegible]
	Final ISIP	[illegible] psi	Final F.G.	[illegible] psi/ft
	ISIP	[illegible]	5 Min:	[illegible] psi
	Pressure Min:	[illegible]	10 Min:	N/A
	Pressure Max:	[illegible]	15 Min:	N/A

Material Volume

Material	Proposed	Calculated	Actual	Variance
100 Mesh White	[illegible]	[illegible]	[illegible]	0%
[illegible] White	[illegible]	[illegible]	[illegible]	0%
Total Proppants	[illegible]	[illegible]	[illegible]	0%

Material	Proposed	Calculated	Actual	Variance
8.1%-7.5% HCL	[illegible]	[illegible]	[illegible]	1%
[illegible]	[illegible]	[illegible]	[illegible]	0%
[illegible]	[illegible]	[illegible]	[illegible]	-3%
FE-[illegible]	[illegible]	[illegible]	[illegible]	0%
[illegible]	[illegible]	[illegible]	[illegible]	-3%
[illegible]	[illegible]	[illegible]	[illegible]	-2%
[illegible]	[illegible]	[illegible]	[illegible]	-2%
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Comments:

Pumpdown Information:
Total Bbls: [illegible]
Max Pressure (psi): [illegible]
Max Rate (bpm): [illegible]

FTS International
[illegible]
Eighty Four, PA [illegible]

FTS INTERNATIONAL

Customer: American Energy - Utica
Well: Red Hill Farm Site 6r 3H
Stage: 48
Job End Date: [illegible]

Treatment Report

Date	[illegible]	Statelab	Washington County,PA	Basin Size	[illegible]	API#	[illegible]

Min. Time	BTP	Slurry BPM	Slurry Gallons (Gals)	Cumulative Slurry (Gals)	Slurry Gallons (Gals)	Cumulative Slurry (Gals)	Slurry Proppant (lbs)	Cumulative Proppant (lbs)	Description	Proppant	PPA
21:30	3,016	0.0	0	0	0	0	0	0	Freshwater Open Wet		0.00
21:31	5,440	0.0	7	7	7	7	0	0	Freshwater Load Wet		0.00
21:37	6,041	10.0	71	78	71	78	0	0	7.5% HCL Acid Add		0.00
21:37	7,021	11.0	4	82	4	82	0	0	Slickwater Load Wet		0.00
21:38	6,003	10.0	30	112	30	112	379	379	Slickwater Proppant	100 Mesh White	0.10
22:00	7,000	10.0	0	112	0	112	0	379	Slickwater Maintain		0.00
22:03	6,000	10.0	30	220	30	220	380	759	Slickwater Proppant	100 Mesh White	0.10
22:03	6,012	30.7	44	222	44	222	462	1,[illegible]	Slickwater Proppant	100 Mesh White	0.25
22:05	6,000	70.0	210	432	210	432	4,410	6,[illegible]	Slickwater Proppant	100 Mesh White	0.50
22:06	6,070	60.2	340	772	340	772	8,400	14,[illegible]	Slickwater Proppant	100 Mesh White	0.75
22:08	6,100	60.2	570	1,[illegible]	564	1,[illegible]	24,270	38,211	Slickwater Proppant	100 Mesh White	1.00
22:10	6,144	60.0	940	1,[illegible]	937	2,[illegible]	75,360	94,411	Slickwater Proppant	30/50 White	1.00
22:23	6,109	60.6	940	3,732	947	3,[illegible]	63,180	158,510	Slickwater Proppant	30/50 White	1.25
22:25	6,152	60.9	700	3,432	748	3,[illegible]	64,180	142,510	Slickwater Proppant	30/50 White	1.50
22:31	6,157	60.6	340	3,772	334	3,347	33,[illegible]	175,[illegible]	Slickwater Proppant	30/50 White	1.75
22:37	6,140	60.1	600	4,[illegible]	607	4,014	70,[illegible]	244,000	Slickwater Proppant	30/50 White	2.00
22:38	6,000	60.7	100	4,217	100	4,014	0	244,000	Slickwater Clean across		0.00
22:39	6,000	60.0	147	4,014	147	3,101	0	244,000	Slickwater Flush		0.00
22:39	3,001	60.0	100	3,019	100	3,206	0	244,000	Freshwater Flush		0.00
22:39	3,010	0.0	0	3,019	0	3,206	0	244,000	Freshwater Shutdown		0.00
Total Job/Time (HH:MM): 01:09											

Min BTP:	3,017 psi	Max BTP:	8,371 psi	Average BTP:	6,130 psi	5 Min:	4,718 psi
Min Rate:	10.0 bpm	Max Rate:	61.2 bpm	Average Rate:	60.0 bpm	10 Min:	0 psi
Initial ISIP:	3,010 psi	Initial F.G.:	1.10 psi/ft	Average ISIP:	17,402	15 Min:	0 psi
Final ISIP:	3,010 psi	Final F.G.:	1.10 psi/ft	Customer Representative:		Bill Sabin	
FTS Representative:		Armando Lyle & William Mabe					

Comments:

The proppant values contained in this report are calculated based on actual barrel counts and target densities. Actual total proppant usage is 245,595 lbs. Charge time is 1 hour(s) 16 minute(s). All chemicals and proppant ran as documented.

Min/Max/Avg were taken from sand stages. All chem changes from proposed were made per AEU representative request.

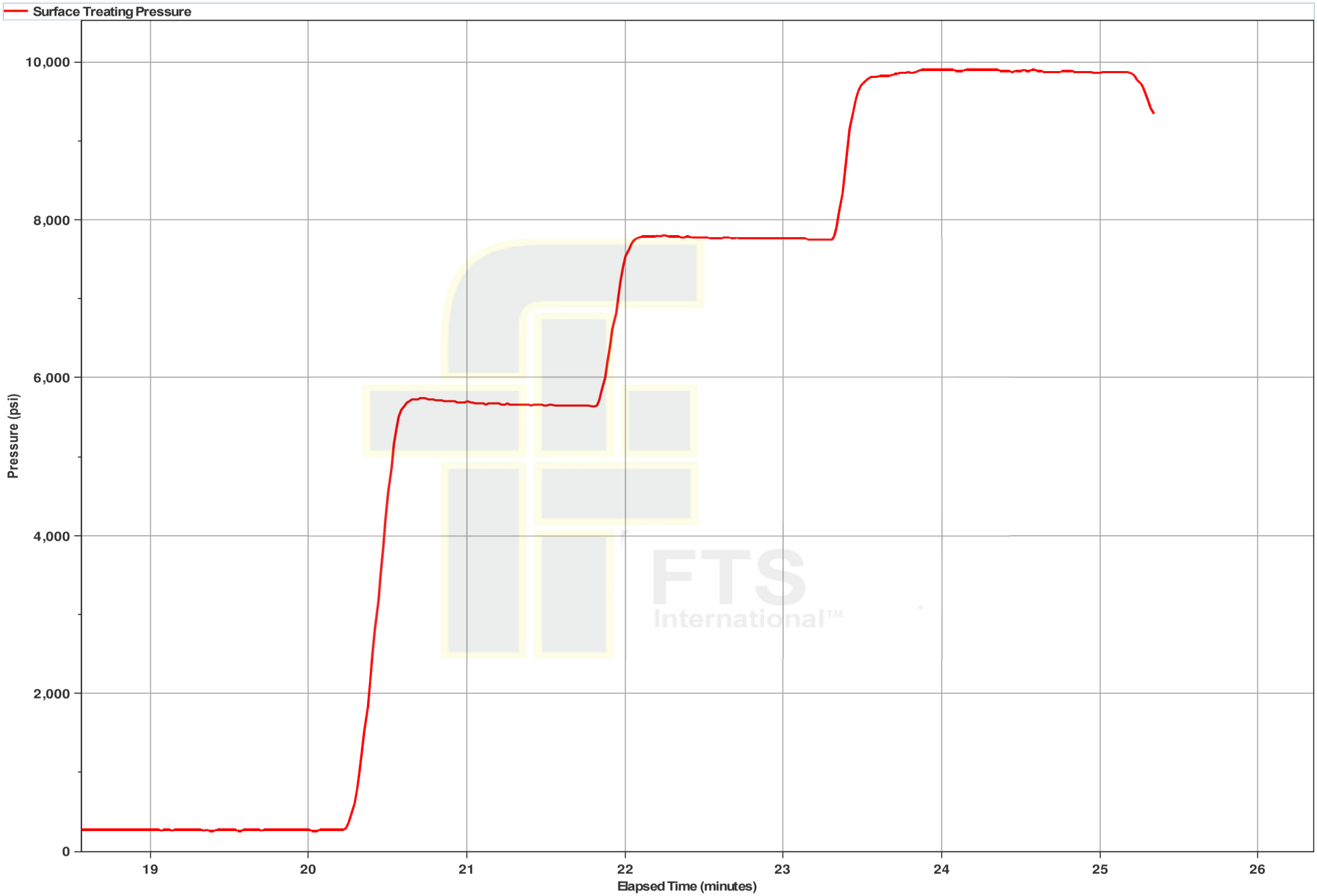
1 Minute Shutdown (psi): 3384
2 Minute Shutdown (psi): 4021
5 Minute Shutdown (psi): 4715

Chemical Changes:

Chemical Name	Chemical Loading	Cumulative Clean

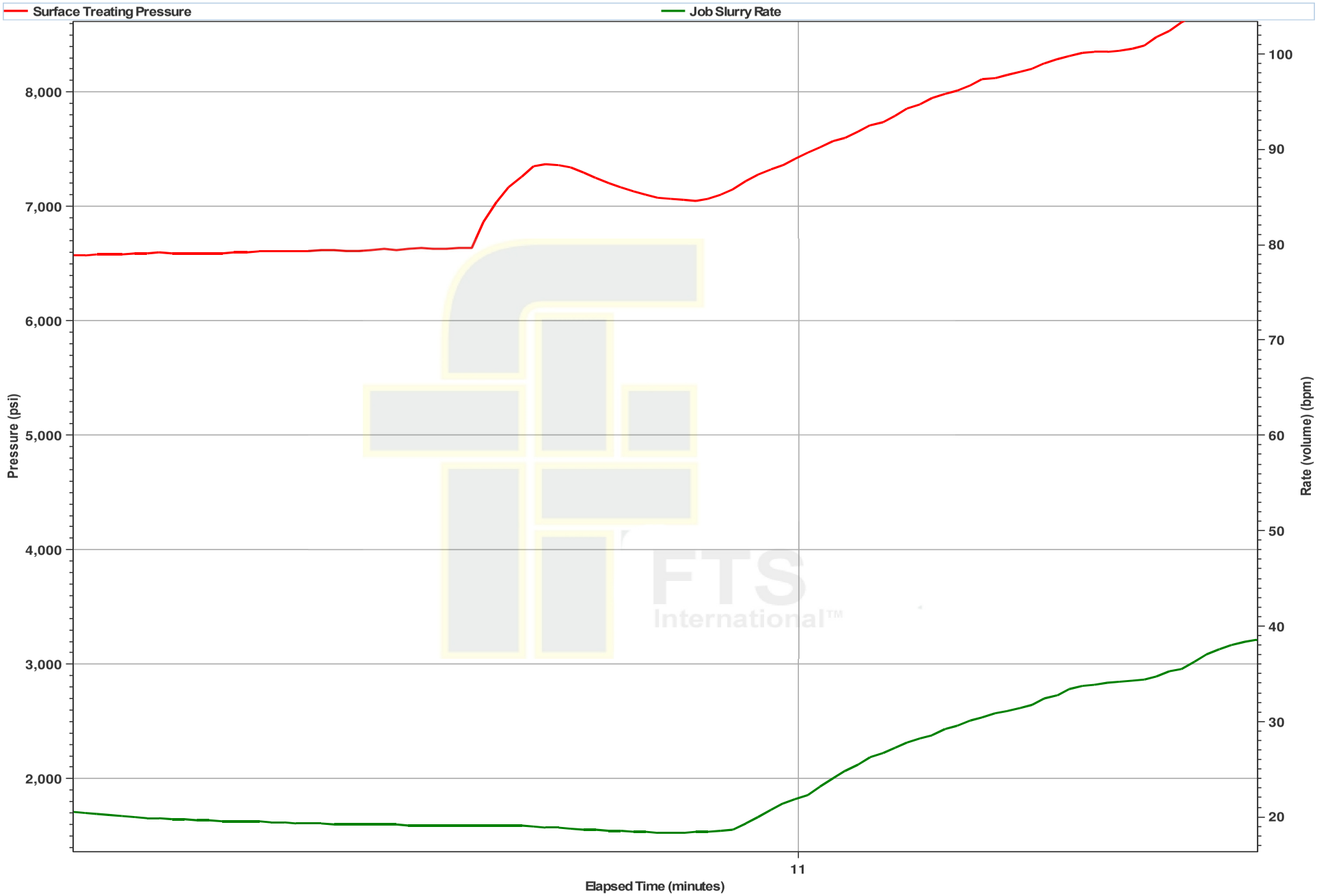
FRW-200	0.50	238

AEU Pressure Test



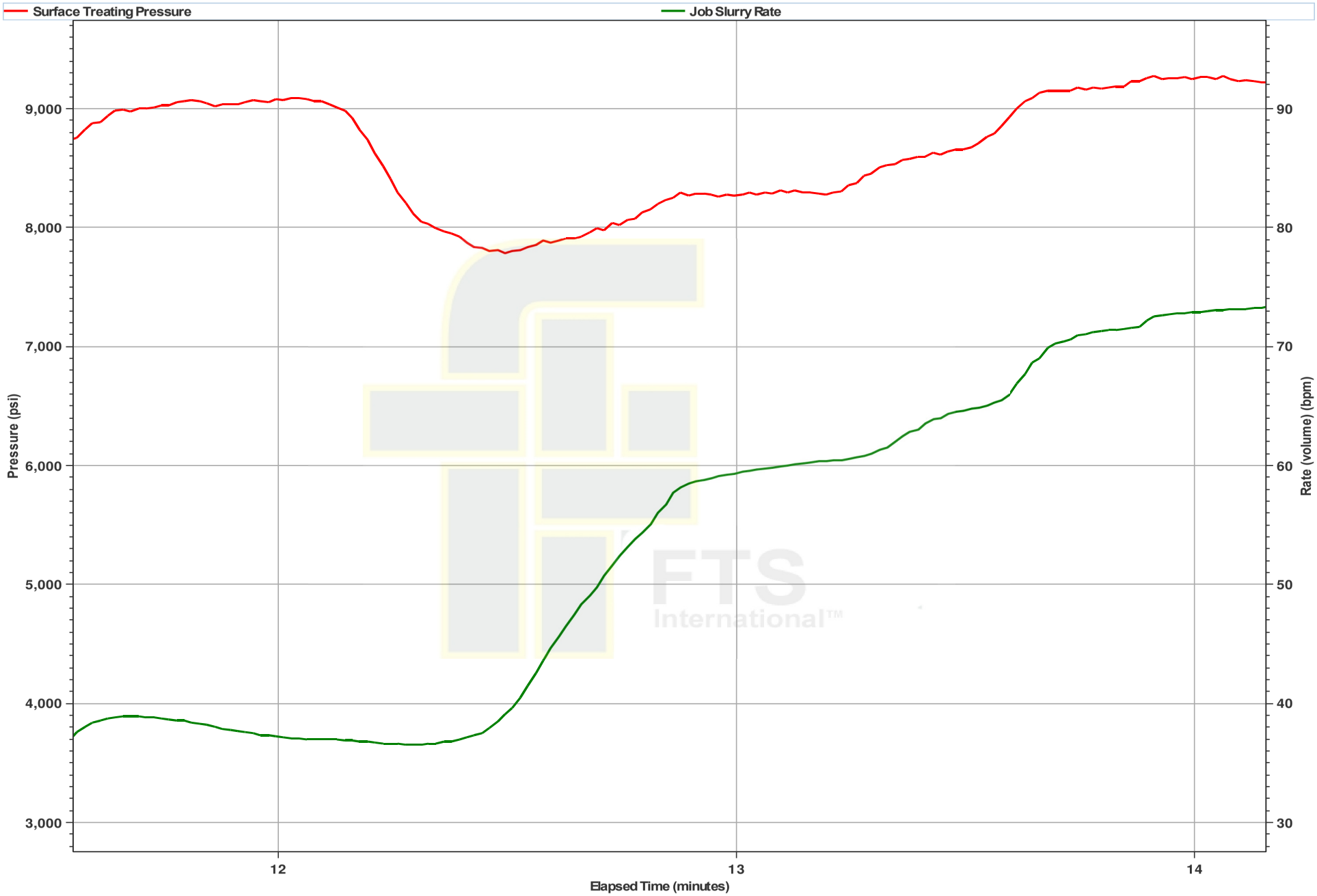
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 45 (WF.000658.M.W03.S45-aDCT-1103) Jun 27, 2015

Ball Seat and Breakdown



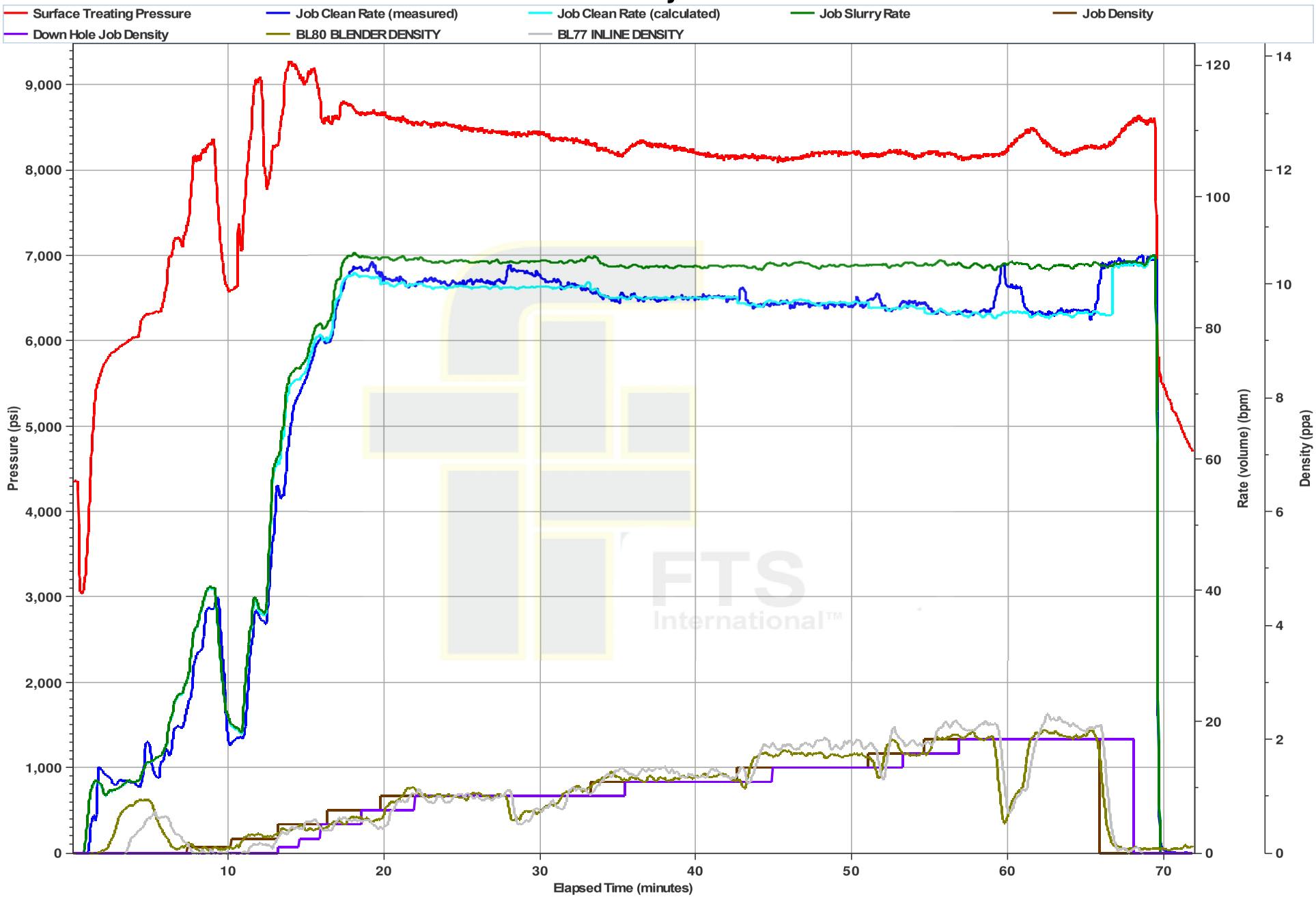
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 45 (WF.000658.M.W03.S45-aDCT-1103) **Jun 27, 2015**

Acid on Perforations



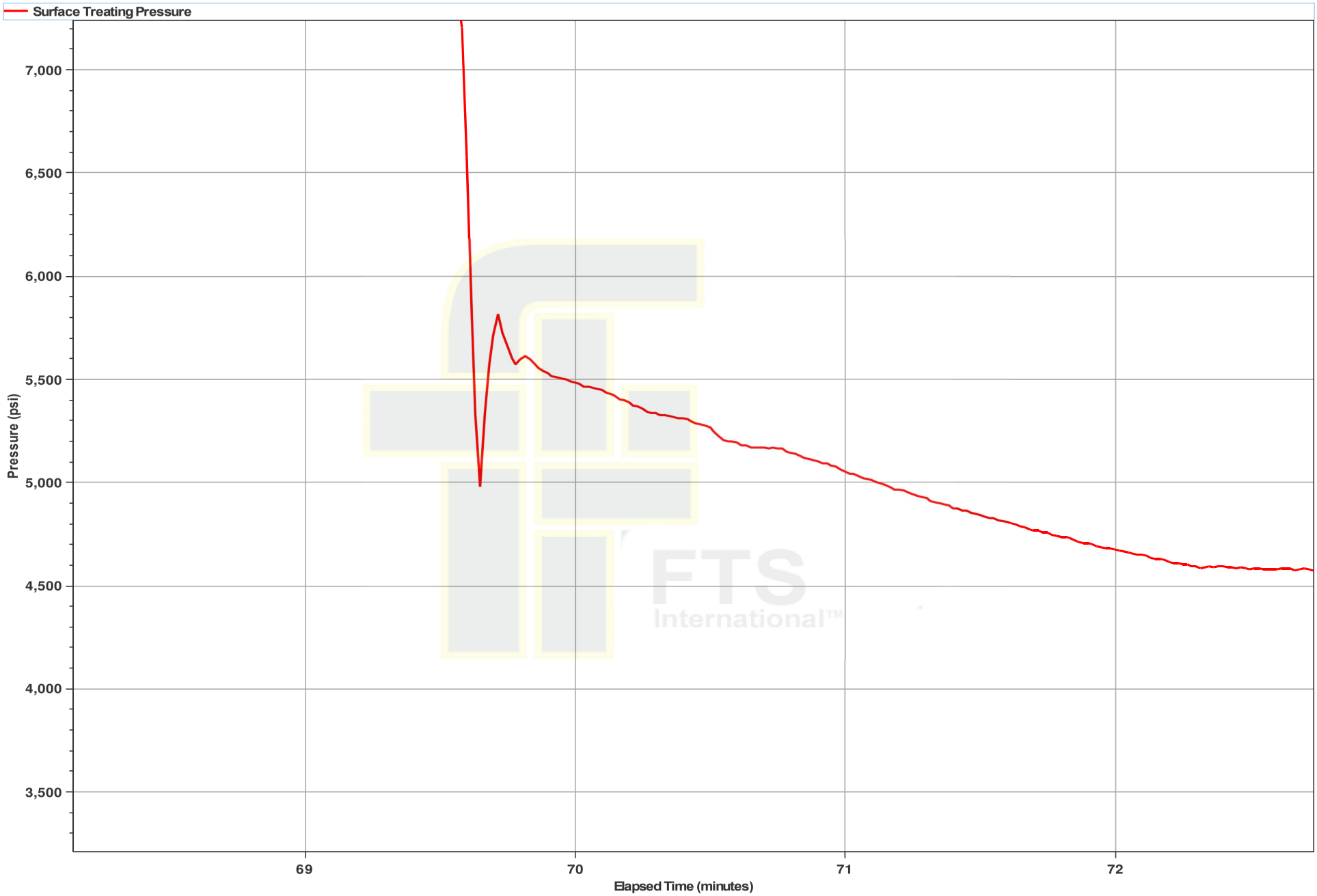
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 45 (WF.000658.M.W03.S45-aDCT-1103) **Jun 27, 2015**

Primary Plot



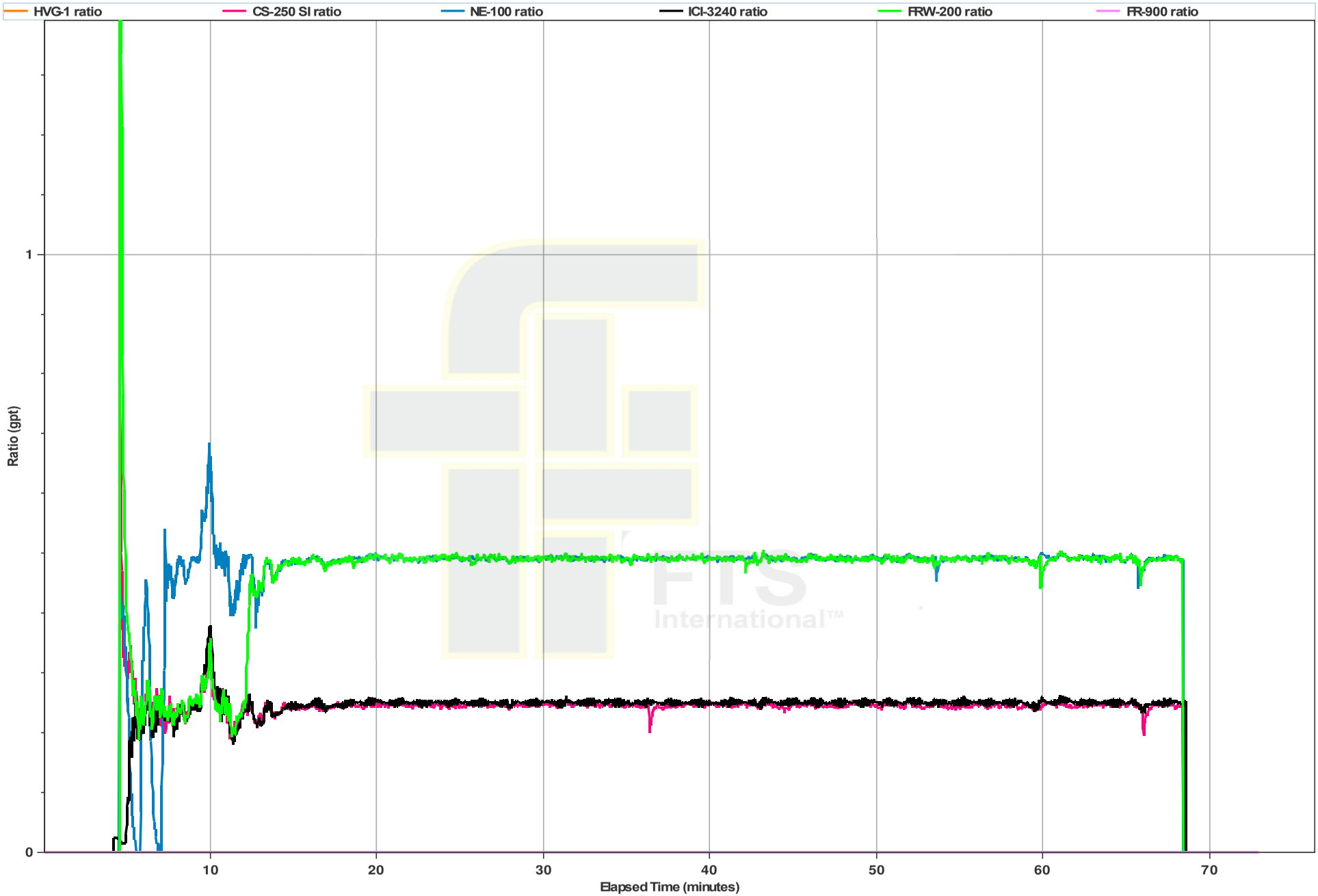
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 45 (WF.000658.M.W03.S45-aDCT-1103) **Jun 27, 2015**

ISIP Plot



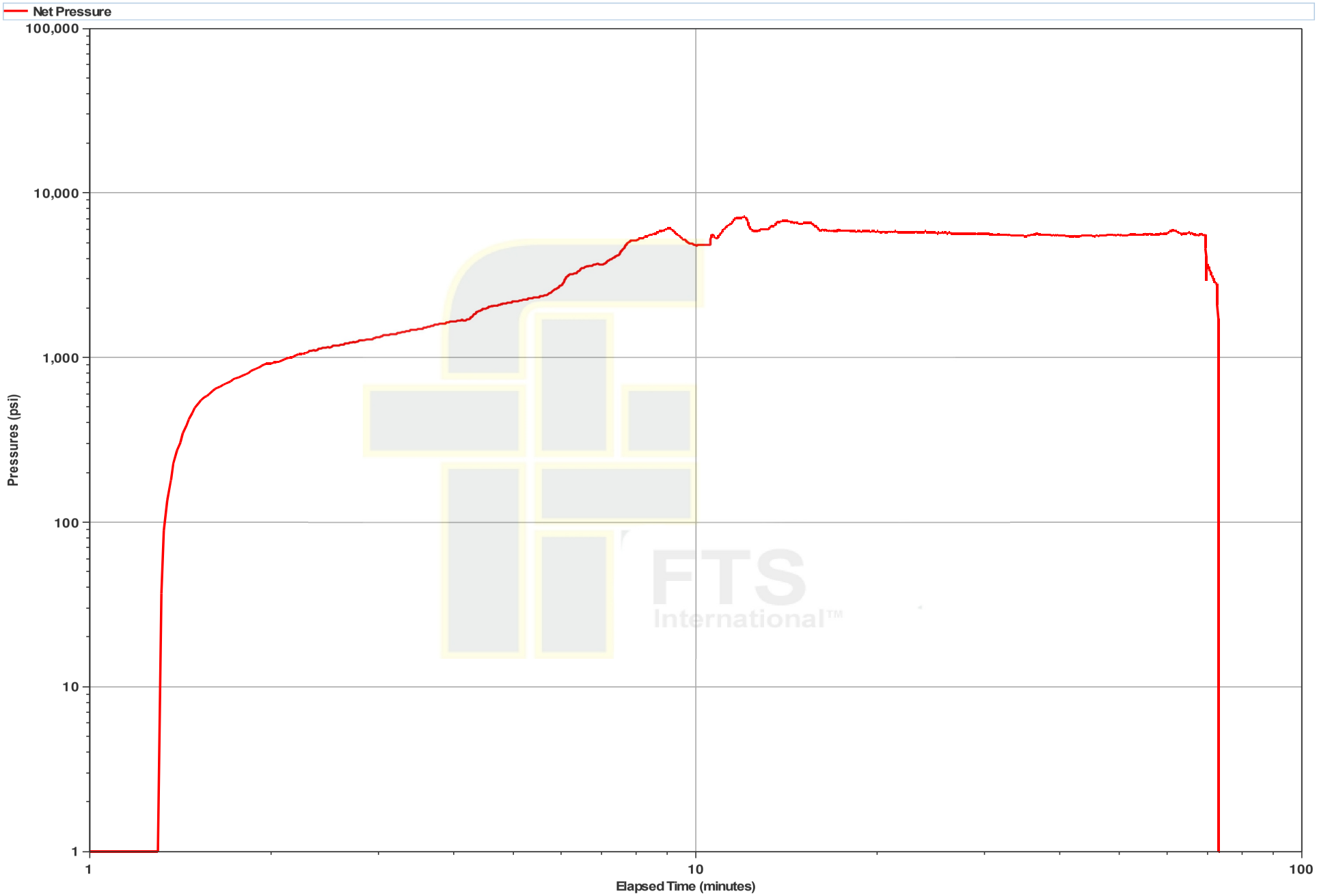
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 45 (WF.000658.M.W03.S45-aDCT-1103) **Jun 27, 2015**

Chemical Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 45 (WF.000658.M.W03.S45-aDCT-1103) Jun 27, 2015

Net Pressure Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 45 (WF.000658.M.W03.S45-aDCT-1103) Jun 27, 2015

QUALITY CONTROL OF PROPPANTS

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/27/2015
Customer Name:	American Energy - Utica	Well/Stage:	3H/45
Date Sampled:	6/27/2015	DISTRICT:	Washington, PA
VENDOR:	SANTROL		

Select Proppant Type:

___ Brown	___ Ceramic	___ Other (specify)
X White	___ Bauxite	
___ Resin Coated	___ Texas Gold	

Sieve Analysis	100 Mesh			Sieve Analysis	30/50 Mesh		
Sample 1	24.98	grams of sample		Sample 2	25.00	grams of sample	
	Amount Retained				Amount Retained		
Sieve mesh	Gram	%		Sieve mesh	Gram	%	
			Total				Total
50	1.20	4.80	In-Size	20	0.00	0.00	In-Size
70	14.00	56.04		30	1.45	5.80	
100	5.90	23.62	94.8%	40	16.00	64.00	92.8%
120	3.00	12.01		45	5.21	20.84	
140	0.54	2.16		50	1.99	7.96	
200	0.25	1.00		70	0.25	1.00	
Pan	0.09	0.36	fines	Pan	0.10	0.40	fines
Total wt. Gram	24.98	100.00		Total wt. Gram	25.00	100.00	

Tested By: Amanda Lyle

WATER-BASED FRAC FLUID QUALITY CONTROL
(Attachment to Post Treatment Report)

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/27/2015
Customer Name:	American Energy - Utica	Proposal #:	3H/45
Date Sampled:	6/27/2015	Water Source:	Working Tank

Sample/Tank No.	Clarity, Color, Odor	Sample Temperature, (F)	Specific gravity	Initial pH	Chloride, ppm	Hardness, ppm	Calcium, ppm	Magnesium, ppm	Iron ppm	Hydroxide, ppm	Bicarbonate, ppm	Carbonate, ppm	Sulfate, ppm	Barium, ppm
Working Tank	Clear	75	1	7.6	80	84	32	13	1	0	244	0	75	0

Frac Fluid Quality Gel Testing (These Recording are to made prior to pumping job)														
Sample #														
Base Gel Type	HVG-1													
Gel Loading (lbs/1000 gal.)	2.5													
Sample Temperature, (F)	75													
Initial pH	7.8													
Visc. Reading @ 300 rpms	5													
Viscosity, (cp)	5													
Sample 1 3 min Hydration	4													
Sample 2 3 min Hydration	4													
Sample 3 3 min Hydration	5													
X-Link Vortex Closure, min:sec	n/a													
X-Link Crown, min:sec	n/a													
X-Link pH	n/a													
Gel Break Time (<2cp) mins	18													

Frac Fluid Quality Gel Testing (These Recording are to made while pumping job)														
Stage #														
Base Gel Viscosity (cp)														
X-Link pH								.						
Sample XL time, min:sec														
Sample Temperature														

Acid Quality	Percent Acid	NaOH, mLs	Specific Gravity
	28		1.14

Additional testing or documentation may be required by the customer or for frac fluid quality assurance.

Tested By: Amanda Lyle

Post Job Report

AMERICAN ENERGY - UTICA

Red Hill Farm MDS GR 3H

Stage : 46 OF 54

HARRISON, OH

Operations Representative:

Name:	**David Knapp**
Office:	**724-743-2537**
Fax:	**724-743-7719**
Cell:	
Email:	**DAVID.KNAPP@FTSI.COM**

Sales Representative:

Name:	**Bruce Matthews**
Office:	**405-574-3981**
Fax:	**405-767-1288**
Cell:	
Email:	**BRUCE.MATTHEWS@FTSI.COM**

Engineering Manager:

Name:	**Thaddeus Craun**
Office:	**817-682-8702**
Fax:	**724-743-7719**
Cell:	
Email:	**THADDEUS.CRAUN@FTSI.COM**

FTS International
1432 Route 519
Eighty Four, PA 15330

Customer: American Energy - Utica
Well: Red Hill Farm Mds Gr 3H
Stage: 46
Job End Date: 06/28/2015

Job Summary

Well Information

TVD:	7,301	**Top Perf:**	8,871
No. Of Perfs:	30		

Casing	Tubing
5.50" 20.00#	N/A

Pressures, Rates and Volumes

	Proposed	Actual	Max	Min
STP	9,046 psi	8,483 psi	8,483 psi	7,886 psi
Rate	80.0 bpm	83.7 bpm	90.8 bpm	29.9 bpm

	Proposed	Actual		
Clean Volume	5,772 bbls	5,246 bbls		
Slurry Volume	6,042 bbls	5,517 bbls		
Flush Volume	357 bbls	249 bbls		

	Proposed	Start	End
Frac Pumps on Location	10	15	15

Open Well:	Start Time	04:35	Pressure	3,118 psi
	Ball Seat	29 bbls	Break Down	7,281 psi
	Initial ISIP:	5,463 psi	Initial F.G.:	1.18 psi/ft
Stage Complete:	End Time	05:47	Job Time	01:15
	Final ISIP	5,463 psi	Final F.G.	1.18 psi/ft
	HHP	17,403	5 Min:	4,850 psi
	Proppant Min:	0.00	10 Min:	N/A
	Proppant Max:	2.00	15 Min:	N/A

Material Volume

Material	Proposed	Calculated	Actual	Variance
100 Mesh White	40,000	39,808	39,808	0%
30/50 White	210,000	209,517	209,517	0%
Total Proppants	250,000	249,325	249,325	0%

Material	Proposed	Calculated	Actual	Variance
0.1%-7.5% HCL	3,000	2,982	3,000	1%
APB-1	0	1	1	0%
CI-150	3	3	3	0%
CS-250 SI	60	53	54	2%
FE-200L	15	15	15	0%
FRW-200	180	74	73	-1%
FRW-900	0	46	47	2%
HVG-1 4.0	0	6	6	0%
ICI-3240	60	53	54	2%
LTB-1	0	1	1	0%
NE-100	0	106	108	2%
NE-100W	120	0	0	0

Comments:

Pumpdown Information:
Total Bbls: 72
Max Pressure (psi): 6100
Max Rate (bpm): 15.1

FTS International
1432 Route 519
Eighty Four, PA 15330

Customer: American Energy - Utica
Well: Red Hill Farm Mds Gr 3H
Stage: 46
Job End Date: 06/28/2015

Treatment Report

Date:	6/28/2015	District:	Washington County,PA	Quote No:	051815_035725QF	API:	34-059-24370

MIL Time	STP	Slurry BPM	Stage Clean (bbls)	Cumulative Clean (bbls)	Stage Slurry (bbls)	Cumulative Slurry (bbls)	Stage Proppant (lbs)	Cumulative Proppant (lbs)	Description	Proppant	PPA
04:35	3,118	0.0	0	0	0	0	0	0	Freshwater Open Well		0.00
04:36	5,644	11.8	7	7	7	7	0	0	Freshwater Load		0.00
04:37	5,707	11.6	22	29	22	29	0	0	7.5% HCL Acid Acid		0.00
04:39	7,281	10.5	49	78	49	78	0	0	7.5% HCL Acid Breakdown		0.00
04:43	8,705	29.9	6	84	6	84	0	0	Slickwater Load		0.00
04:43	9,198	33.7	158	242	159	243	664	664	Slickwater Proppant	100 Mesh White	0.10
04:49	9,295	73.7	156	398	158	401	1,638	2,302	Slickwater Proppant	100 Mesh White	0.25
04:50	9,291	73.9	203	601	208	609	4,263	6,565	Slickwater Proppant	100 Mesh White	0.50
04:53	8,871	90.2	350	951	362	971	11,025	17,590	Slickwater Proppant	100 Mesh White	0.75
04:56	8,865	89.3	450	1,401	470	1,441	18,900	36,490	Slickwater Proppant	100 Mesh White	1.00
05:01	8,731	89.9	79	1,480	83	1,524	3,318	39,808	Slickwater Proppant	100 Mesh White	1.00
05:03	8,739	89.3	420	1,900	439	1,963	17,640	57,448	Slickwater Proppant	30/50 White	1.00
05:12	8,470	90.0	381	2,281	398	2,361	16,002	73,450	Slickwater Proppant	30/50 White	1.00
05:13	8,529	90.0	560	2,841	592	2,953	29,400	102,850	Slickwater Proppant	30/50 White	1.25
05:18	8,229	88.9	60	2,901	63	3,016	3,150	106,000	10# Linear Gel Proppant	30/50 White	1.25
05:19	8,179	89.0	210	3,111	222	3,238	11,025	117,025	Slickwater Proppant	30/50 White	1.25
05:24	8,225	89.6	700	3,811	748	3,986	44,100	161,125	Slickwater Proppant	30/50 White	1.50
05:30	8,231	89.5	400	4,211	432	4,418	29,400	190,525	Slickwater Proppant	30/50 White	1.75
05:35	8,205	89.4	260	4,471	284	4,702	21,840	212,365	Slickwater Proppant	30/50 White	2.00
05:38	8,332	89.2	440	4,911	480	5,182	36,960	249,325	Slickwater Proppant	30/50 White	2.00
05:44	8,211	89.0	86	4,997	86	5,268	0	249,325	Slickwater Clean screws		0.00
05:44	8,292	89.2	145	5,142	145	5,413	0	249,325	Slickwater Flush		0.00
05:46	8,664	90.0	104	5,246	104	5,517	0	249,325	Freshwater Flush		0.00
05:47	5,463	0.0	0	5,246	0	5,517	0	249,325	Freshwater Shutdown		0.00
Total JobTime (HH:MM): 01:11											

Min STP:	7,886 psi	**Max STP:**	8,483 psi	**Average STP:**	8,483 psi	**5 Min:**	4,850 psi
Min Rate:	29.9 bpm	**Max Rate:**	90.8 bpm	**Average Rate:**	83.7 bpm	**10 Min:**	0 psi
Initial ISIP:	5,463 psi	**Initial F.G.:**	1.18 psi/ft	**Average HHP:**	17,403	**15 Min:**	0 psi
Final ISIP:	5,463 psi	**Final F.G.:**	1.18 psi/ft	**Customer Representative:**		Bill Rubin	
FTSI Representative:		Etuate Varea & William Maha					

Comments:

The proppant values contained in this report are calculated based on actual barrel counts and target densities. Actual total proppant usage is 249,325 lbs. Charge time is 1 hour(s) 15 minute(s). All chemicals and proppant ran as documented.

Min/Max/Avg were taken from sand stages. All chem changes from proposed were made per AEU representative request.

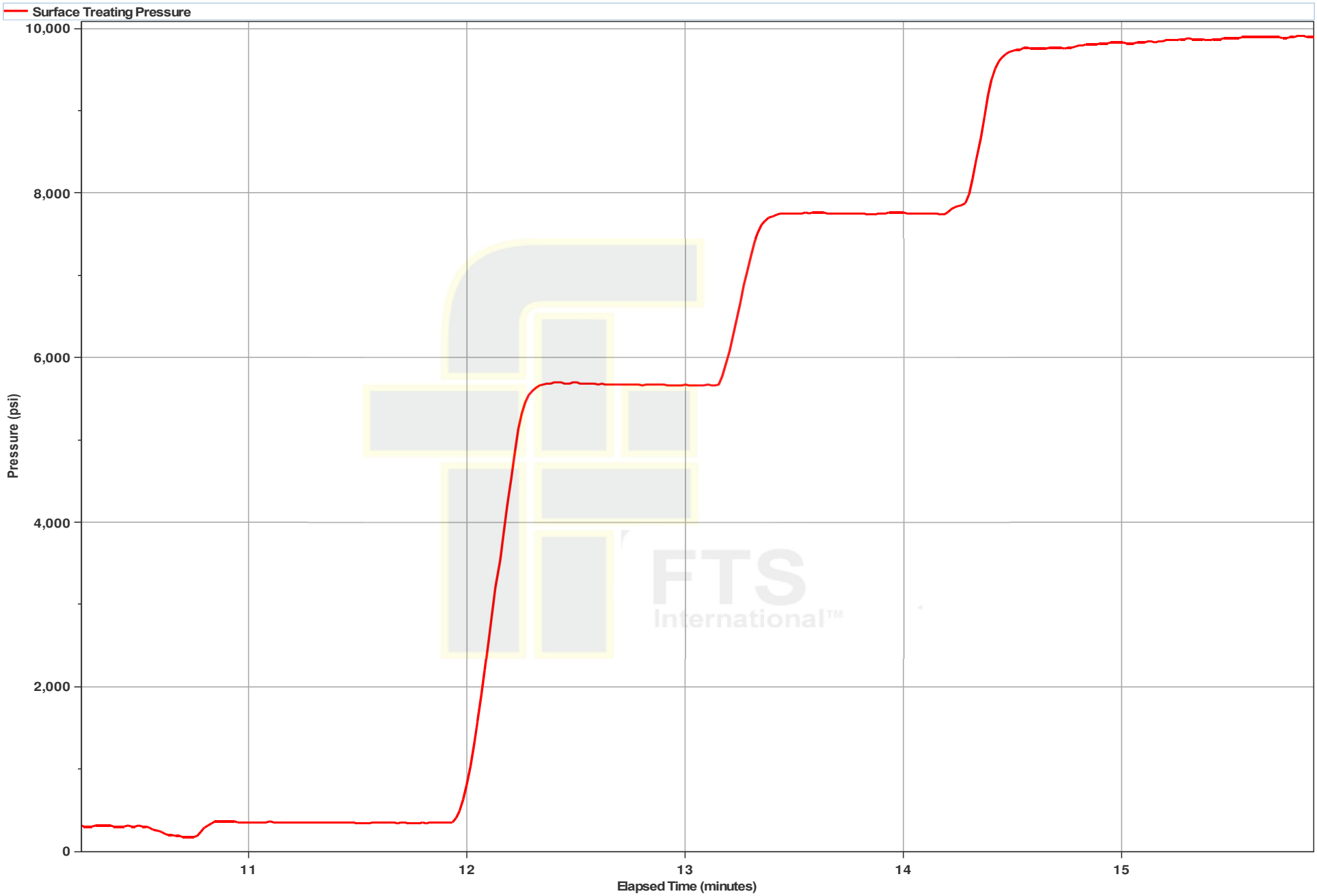
Reuse water was run on this stage for a total of 342 Bbls.

1 Minute Shutdown (psi): 5193
2 Minute Shutdown (psi): 4978
5 Minute Shutdown (psi): 4850

Chemical Changes:

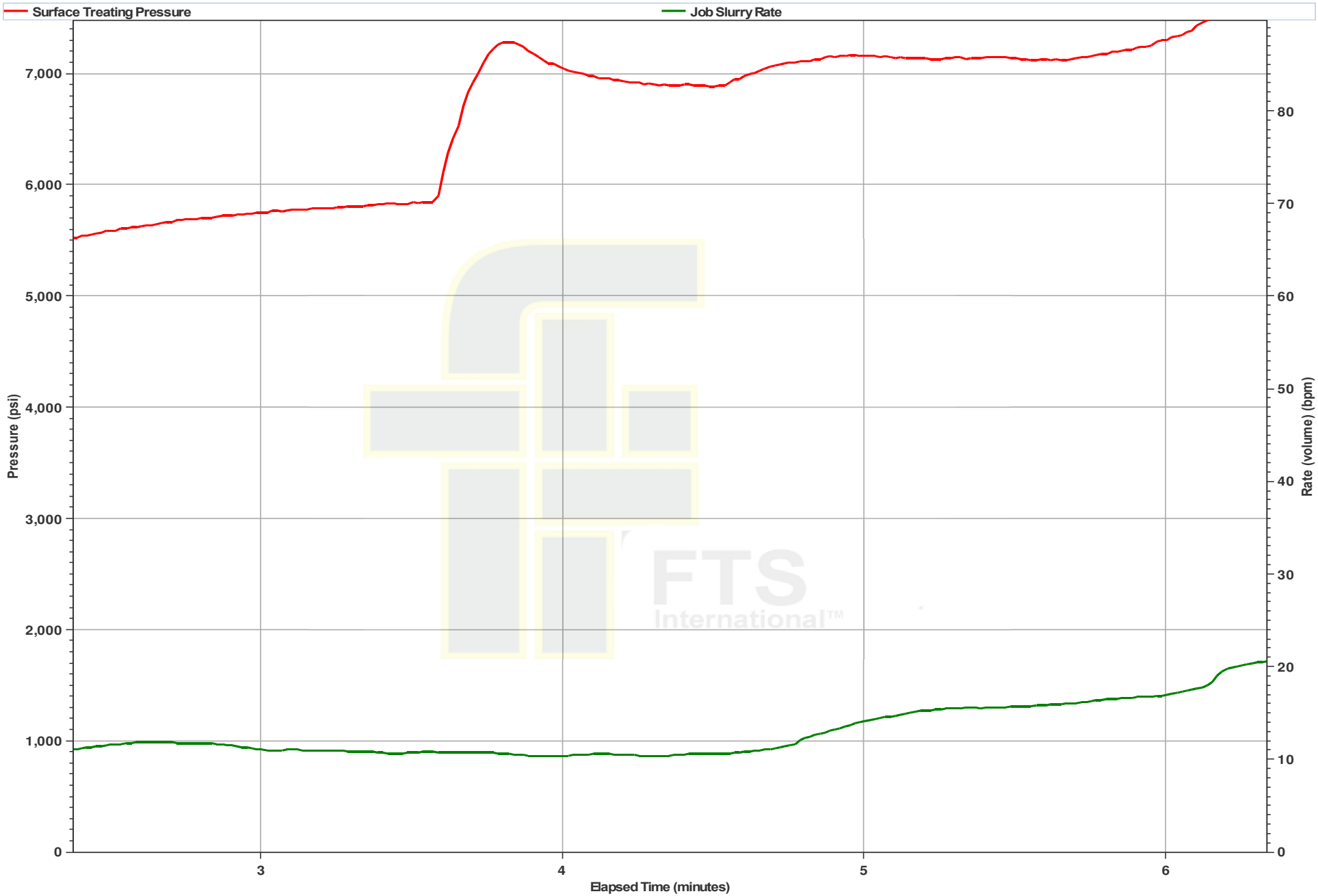
Chemical Name	Chemical Loading	Cumulative Clean
FRW-900	0.75	601
FRW-900	0.65	1,480
FRW-200	0.25	2,281
FRW-200	0.50	2,841
FRW-200	0.75	4,911

AEU Pressure Test



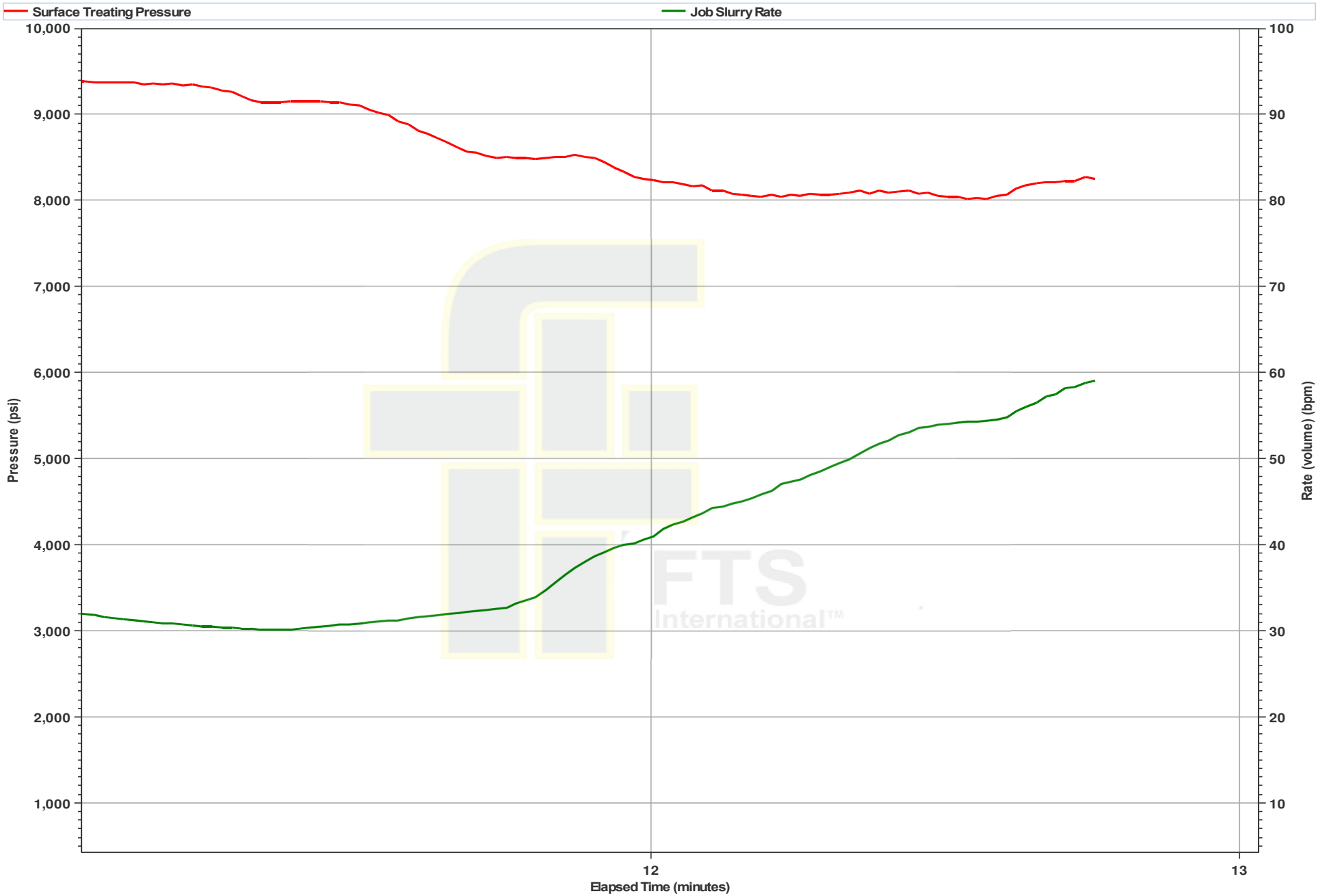
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 46 (WF.000658.M.W03.S46-aDCT-1103) **Jun 28, 2015**

Ball Seat and Breakdown



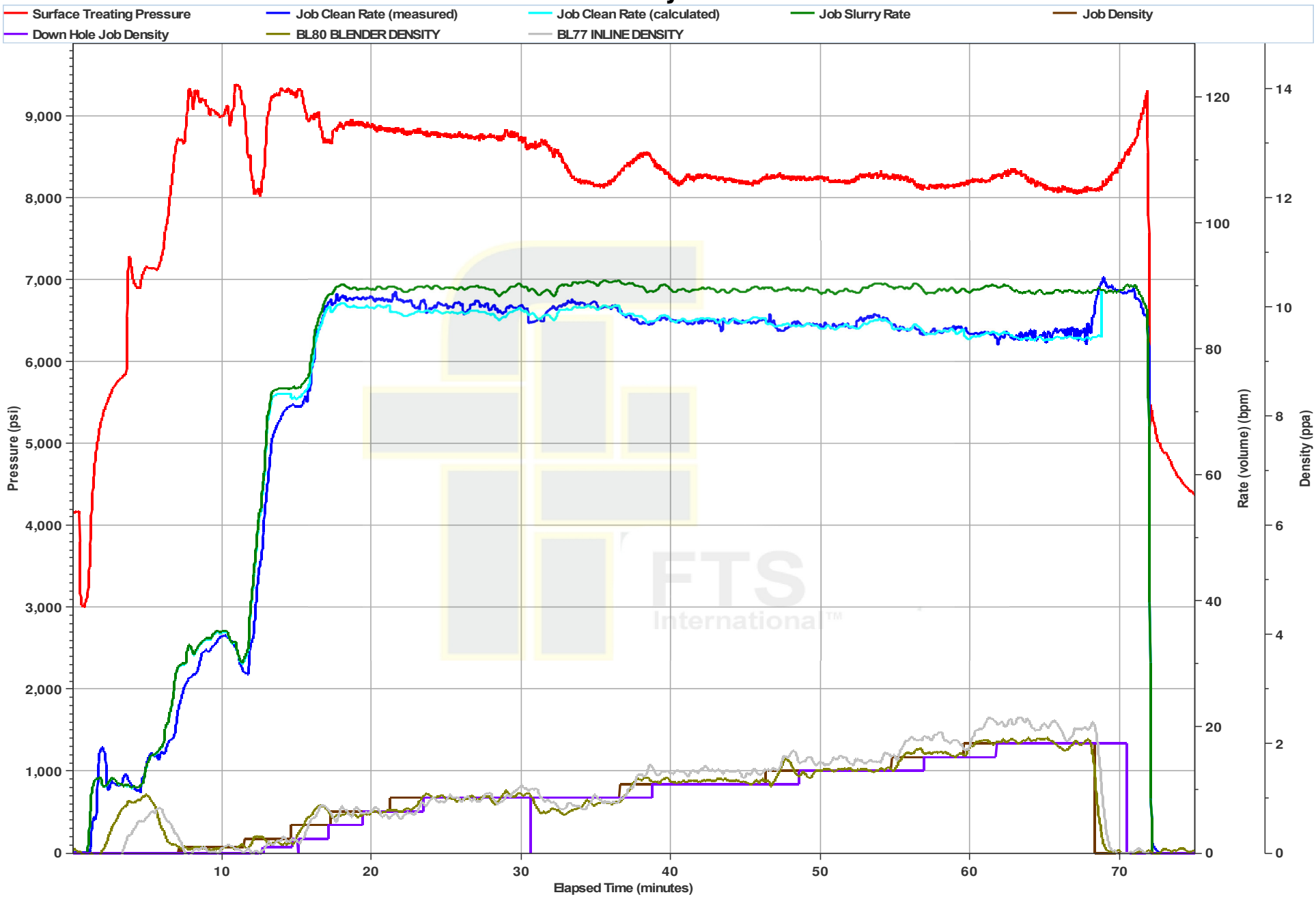
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 46 (WF.000658.M.W03.S46-aDCT-1103) **Jun 28, 2015**

Acid on Perforations



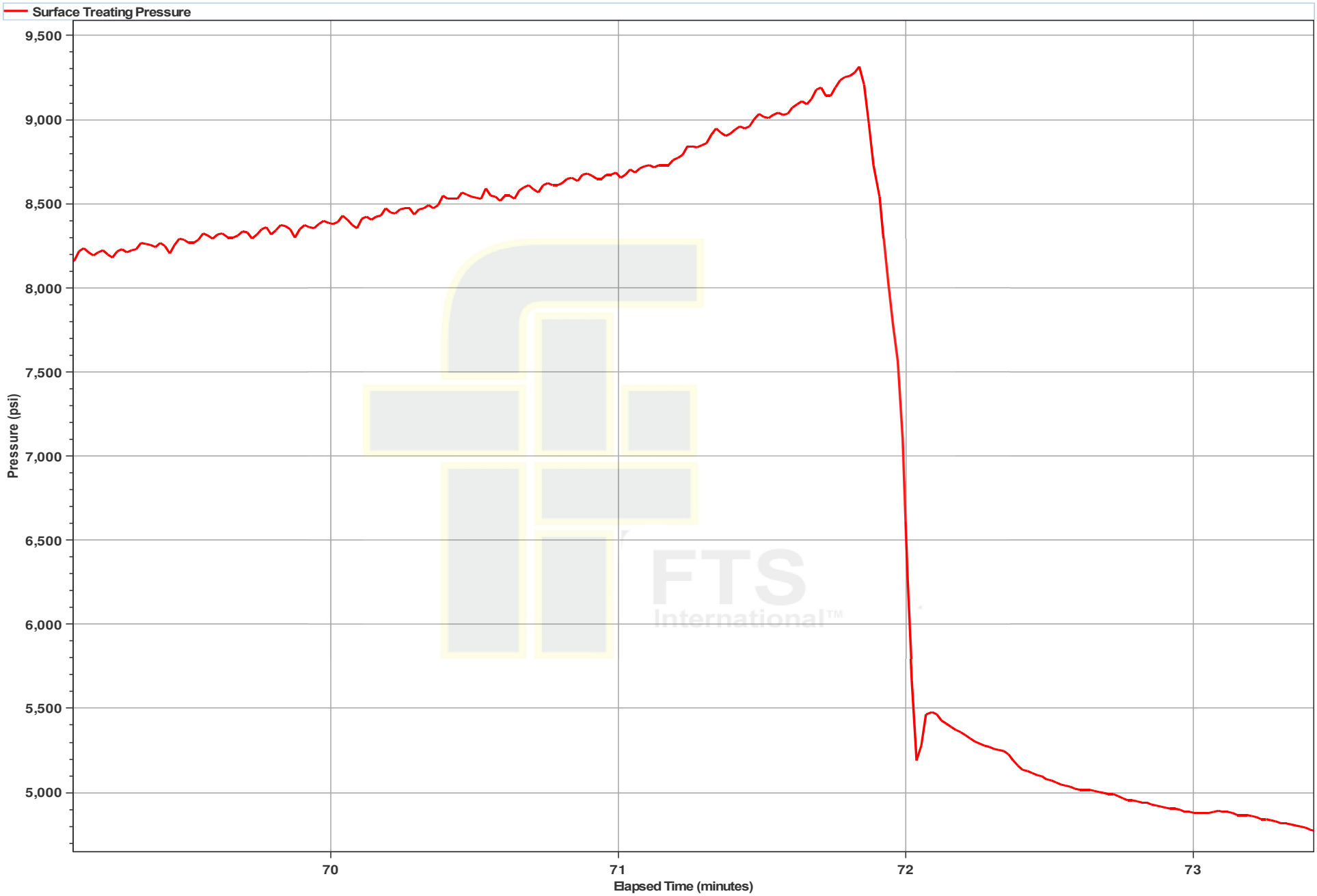
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 46 (WF.000658.M.W03.S46-aDCT-1103) **Jun 28, 2015**

Primary Plot



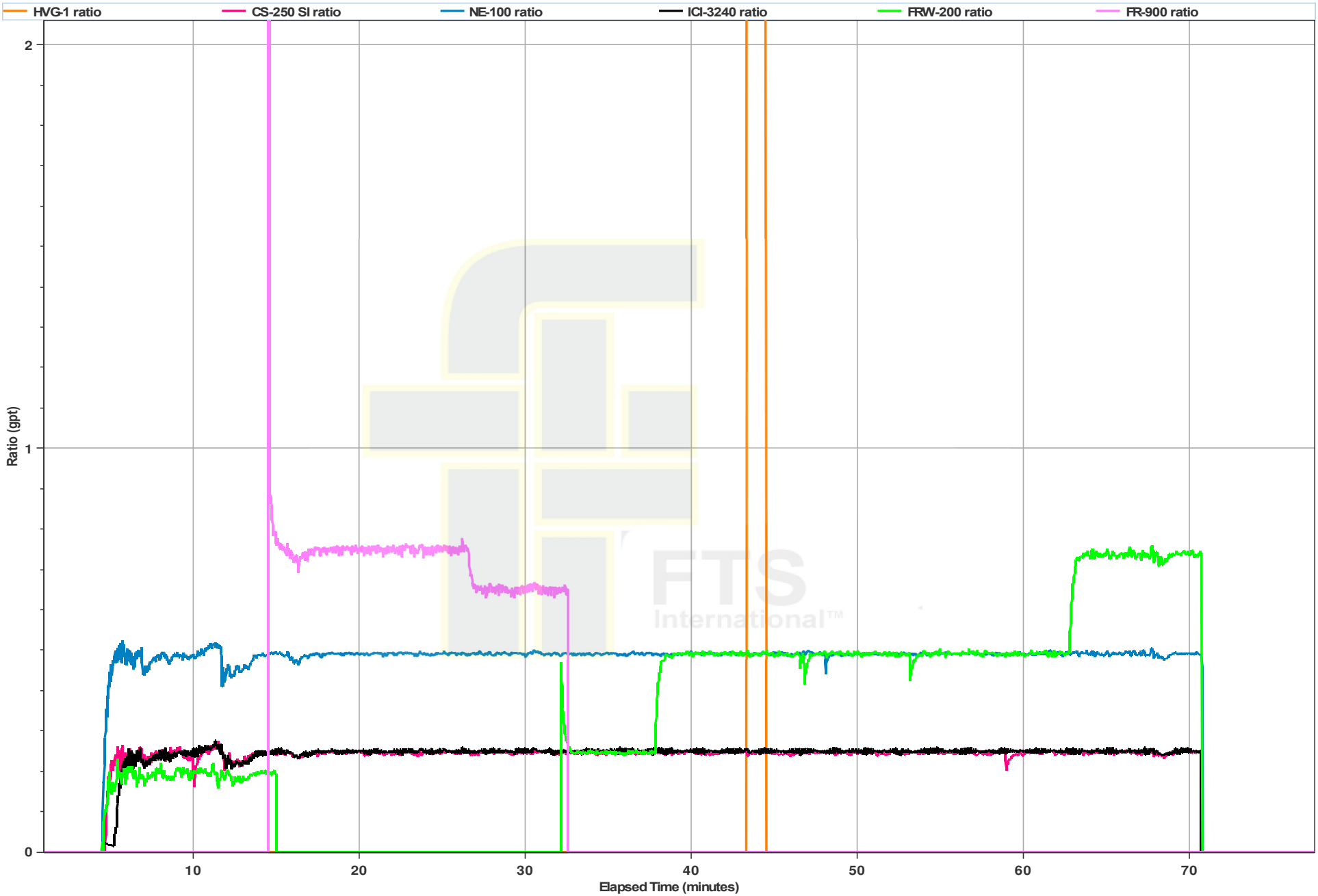
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 46 (WF.000658.M.W03.S46-aDCT-1103) **Jun 28, 2015**

ISIP Plot



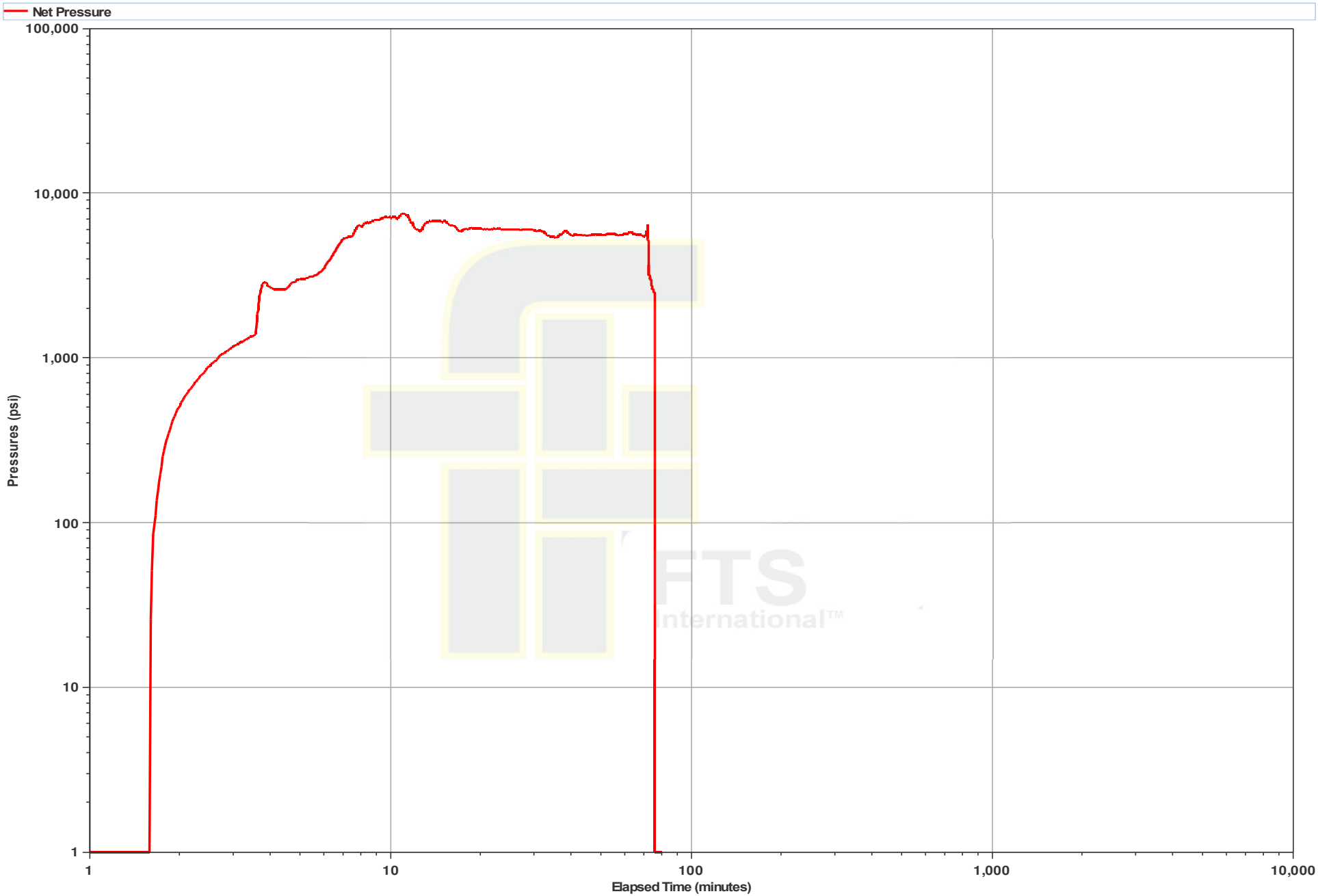
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 46 (WF.000658.M.W03.S46-aDCT-1103) **Jun 28, 2015**

Chemical Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 46 (WF.000658.M.W03.S46-aDCT-1103) **Jun 28, 2015**

Net Pressure Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 46 (WF.000658.M.W03.S46-aDCT-1103) Jun 28, 2015

WATER-BASED FRAC FLUID QUALITY CONTROL
(Attachment to Post Treatment Report)

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/28/2015
Customer Name:	American Energy - Utica	Proposal #:	3H/46
Date Sampled:	6/28/2015	Water Source:	Working Tank

Sample/Tank No.	Clarity, Color, Odor	Sample Temperature, (F)	Specific gravity	Initial pH	Chloride, ppm	Hardness, ppm	Calcium, ppm	Magnesium, ppm	Iron ppm	Hydroxide, ppm	Bicarbonate, ppm	Carbonate, ppm	Sulfate, ppm	Barium, ppm
Working Tank	Clear	70	1	7.6	50	100	34	16	1	0	366	0	65	0
Reused Water Tank	Black, Cloudy, Petroleum Odor	70	1.03	5.1	74,977	78000	30,008	11,667	>10	0	1537	0	200	0

Frac Fluid Quality Gel Testing (These Recording are to made prior to pumping job)														
Sample #														
Base Gel Type	HVG-1													
Gel Loading (lbs/1000 gal.)	2.5													
Sample Temperature, (F)	70													
Initial pH	7.8													
Visc. Reading @ 300 rpms	6													
Viscosity, (cp)	6													
Sample 1 3 min Hydration	4													
Sample 2 3 min Hydration	5													
Sample 3 3 min Hydration	6													
X-Link Vortex Closure, min:sec	n/a													
X-Link Crown, min:sec	n/a													
X-Link pH	n/a													
Gel Break Time (<2cp) mins	20													

Frac Fluid Quality Gel Testing (These Recording are to made while pumping job)														
Stage #														
Base Gel Viscosity (cp)														
X-Link pH								.						
Sample XL time, min:sec														
Sample Temperature														

Acid Quality	Percent Acid	NaOH, mLs	Specific Gravity
	28		1.14

Additional testing or documentation may be required by the customer or for frac fluid quality assurance.

Tested By: Etuate Varea

QUALITY CONTROL OF PROPPANTS

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/28/2015
Customer Name:	American Energy - Utica	Well/Stage:	3H/46
Date Sampled:	6/28/2015	DISTRICT:	Washington, PA
VENDOR:	SANTROL		

Select Proppant Type:

___	Brown	___	Ceramic	___	Other (specify)
X	White	___	Bauxite		
___	Resin Coated	___	Texas Gold		

Sieve Analysis	100 Mesh			Sieve Analysis	30/50 Mesh		
Sample 1	25.10	grams of sample		Sample 2	25.50	grams of sample	
	Amount Retained				Amount Retained		
Sieve mesh	Gram	%		Sieve mesh	Gram	%	
			Total				Total
50	0.20	0.80	In-Size	20	0.00	0.00	In-Size
70	16.20	64.54		30	1.20	4.71	
100	5.80	23.11	98.8%	40	13.20	51.76	94.1%
120	1.90	7.57		45	7.50	29.41	
140	0.60	2.39		50	3.30	12.94	
200	0.30	1.20		70	0.20	0.78	
Pan	0.10	0.40	fines	Pan	0.10	0.39	fines
Total wt. Gram	25.10	100.00		Total wt. Gram	25.50	100.00	

Tested By: Etuate Varea

Post Job Report

AMERICAN ENERGY - UTICA

Red Hill Farm MDS GR 3H

Stage : 47 OF 54

HARRISON, OH

Operations Representative:

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Engineering Manager:

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Cell:	
Email:	**THADDEUS.CRAUN@FTSI.COM**

FTS International
1432 Route 519
Eighty Four, PA 15330

Customer: American Energy - Utica
Well: Red Hill Farm Mds Gr 3H
Stage: 47
Job End Date: 06/28/2015

Job Summary

Well Information

TVD:	7,301	**Top Perf:**	8,719
No. Of Perfs:	30		

Casing	Tubing
5.50" 20.00#	N/A

Pressures, Rates and Volumes

	Proposed	Actual	Max	Min
STP	9,046 psi	8,733 psi	9,399 psi	8,155 psi
Rate	80.0 bpm	86.4 bpm	92.0 bpm	30.0 bpm

	Proposed	Actual		
Clean Volume	5,772 bbls	5,125 bbls		
Slurry Volume	6,042 bbls	5,367 bbls		
Flush Volume	357 bbls	205 bbls		

	Proposed	Start	End
Frac Pumps on Location	10	14	14

Open Well:	Start Time	10:47	Pressure	3,217 psi
	Ball Seat	166 bbls	Break Down	7,884 psi
	Initial ISIP:	5,246 psi	Initial F.G.:	1.15 psi/ft
Stage Complete:	End Time	12:02	Job Time	01:15
	Final ISIP	5,246 psi	Final F.G.	1.15 psi/ft
	HHP	18,493	5 Min:	4,169 psi
	Proppant Min:	0.00	10 Min:	N/A
	Proppant Max:	2.00	15 Min:	N/A

Material Volume

Material	Proposed	Calculated	Actual	Variance
100 Mesh White	40,000	37,975	37,975	0%
30/50 White	210,000	187,079	187,079	0%
Total Proppants	250,000	225,054	225,054	0%

Material	Proposed	Calculated	Actual	Variance
0.1%-7.5% HCL	3,000	2,982	3,000	1%
APB-1	0	2	2	0%
CI-150	3	3	3	0%
CS-250 SI	60	51	51	0%
FE-200L	15	15	15	0%
FRW-200	180	70	69	-1%
HVG-1 4.0	0	11	11	0%
ICI-3240	60	51	50	-2%
LTB-1	0	2	2	0%
NE-100	0	103	101	-2%
NE-100W	120	0	0	0

Comments:

Pumpdown Information:
Total Bbls: 53
Max Pressure (psi): 5916
Max Rate (bpm): 15.2

FTS International
1432 Route 519
Eighty Four, PA 15330

Customer: American Energy - Utica
Well: Red Hill Farm Mds Gr 3H
Stage: 47
Job End Date: 06/28/2015

Treatment Report

Date:	6/28/2015	District:	Washington County,PA	Quote No:	051815_035725QF	API:	34-059-24370

MIL Time	STP	Slurry BPM	Stage Clean (bbls)	Cumulative Clean (bbls)	Stage Slurry (bbls)	Cumulative Slurry (bbls)	Stage Proppant (lbs)	Cumulative Proppant (lbs)	Description	Proppant	PPA
10:47	3,217	0.0	0	0	0	0	0	0	Freshwater Open Well		0.00
10:48	4,005	7.1	12	12	12	12	0	0	Freshwater Load		0.00
10:50	5,597	11.8	71	83	71	83	0	0	7.5% HCL Acid Acid		0.00
10:57	7,733	28.8	83	166	83	166	0	0	Slickwater Load		0.00
11:15	7,884	27.3	68	234	68	234	0	0	Slickwater Breakdown		0.00
11:17	8,953	30.0	214	448	215	449	899	899	Slickwater Proppant	100 Mesh White	0.10
11:17	9,151	67.1	216	664	218	667	2,268	3,167	Slickwater Proppant	100 Mesh White	0.25
11:19	8,997	75.5	309	973	316	983	6,489	9,656	Slickwater Proppant	100 Mesh White	0.50
11:19	9,122	88.1	207	1,180	214	1,197	6,521	16,177	Slickwater Proppant	100 Mesh White	0.75
11:19	9,109	90.1	519	1,699	542	1,739	21,798	37,975	Slickwater Proppant	100 Mesh White	1.00
11:22	9,120	90.0	624	2,323	652	2,391	26,208	64,183	Slickwater Proppant	30/50 White	1.00
11:30	9,240	88.9	525	2,848	555	2,946	27,563	91,746	Slickwater Proppant	30/50 White	1.25
11:36	9,340	90.2	40	2,888	42	2,988	2,100	93,846	10# Linear Gel Proppant	30/50 White	1.25
11:36	9,250	89.7	136	3,024	144	3,132	7,140	100,986	Slickwater Proppant	30/50 White	1.25
11:38	9,061	90.8	265	3,289	283	3,415	16,695	117,681	Slickwater Proppant	30/50 White	1.50
11:42	8,917	90.4	332	3,621	355	3,770	20,916	138,597	Slickwater Proppant	30/50 White	1.50
11:46	8,228	89.7	318	3,939	343	4,113	23,373	161,970	Slickwater Proppant	30/50 White	1.75
11:49	8,597	89.9	60	3,999	60	4,173	0	161,970	10# Linear Gel Sweep		0.00
11:49	8,684	91.1	192	4,191	207	4,380	14,112	176,082	Slickwater Proppant	30/50 White	1.75
11:54	8,422	91.4	583	4,774	636	5,016	48,972	225,054	Slickwater Proppant	30/50 White	2.00
11:59	8,780	89.6	146	4,920	146	5,162	0	225,054	Slickwater Sweep		0.00
12:01	8,580	90.2	60	4,980	60	5,222	0	225,054	Slickwater Flush		0.00
12:02	8,491	91.2	145	5,125	145	5,367	0	225,054	Freshwater Flush		0.00
12:02	5,246	0.0	0	5,125	0	5,367	0	225,054	Freshwater Shutdown		0.00
Total JobTime (HH:MM): 01:15											

Min STP:	8,155 psi	**Max STP:**	9,399 psi	**Average STP:**	8,733 psi	**5 Min:**	4,169 psi
Min Rate:	30.0 bpm	**Max Rate:**	92.0 bpm	**Average Rate:**	86.4 bpm	**10 Min:**	0 psi
Initial ISIP:	5,246 psi	**Initial F.G.:**	1.15 psi/ft	**Average HHP:**	18,493	**15 Min:**	0 psi
Final ISIP:	5,246 psi	**Final F.G.:**	1.15 psi/ft	**Customer Representative:**		Mike Hausvater	
FTSI Representative:		Etuate Varea & Cody Melone					

Comments:

The proppant values contained in this report are calculated based on actual barrel counts and target densities. Actual total proppant usage is 225,054 lbs. Charge time is 1 hour(s) 15 minute(s). All chemicals and proppant ran as documented.

Min/Max/Avg were taken from sand stages. All chem changes from proposed were made per AEU representative request.

Started pumping a 10# Linear Gel system during the 1.25 ppg stage of 30/50 per AEU representative request.

Reuse water was run on this stage for a total of 208 Bbls.

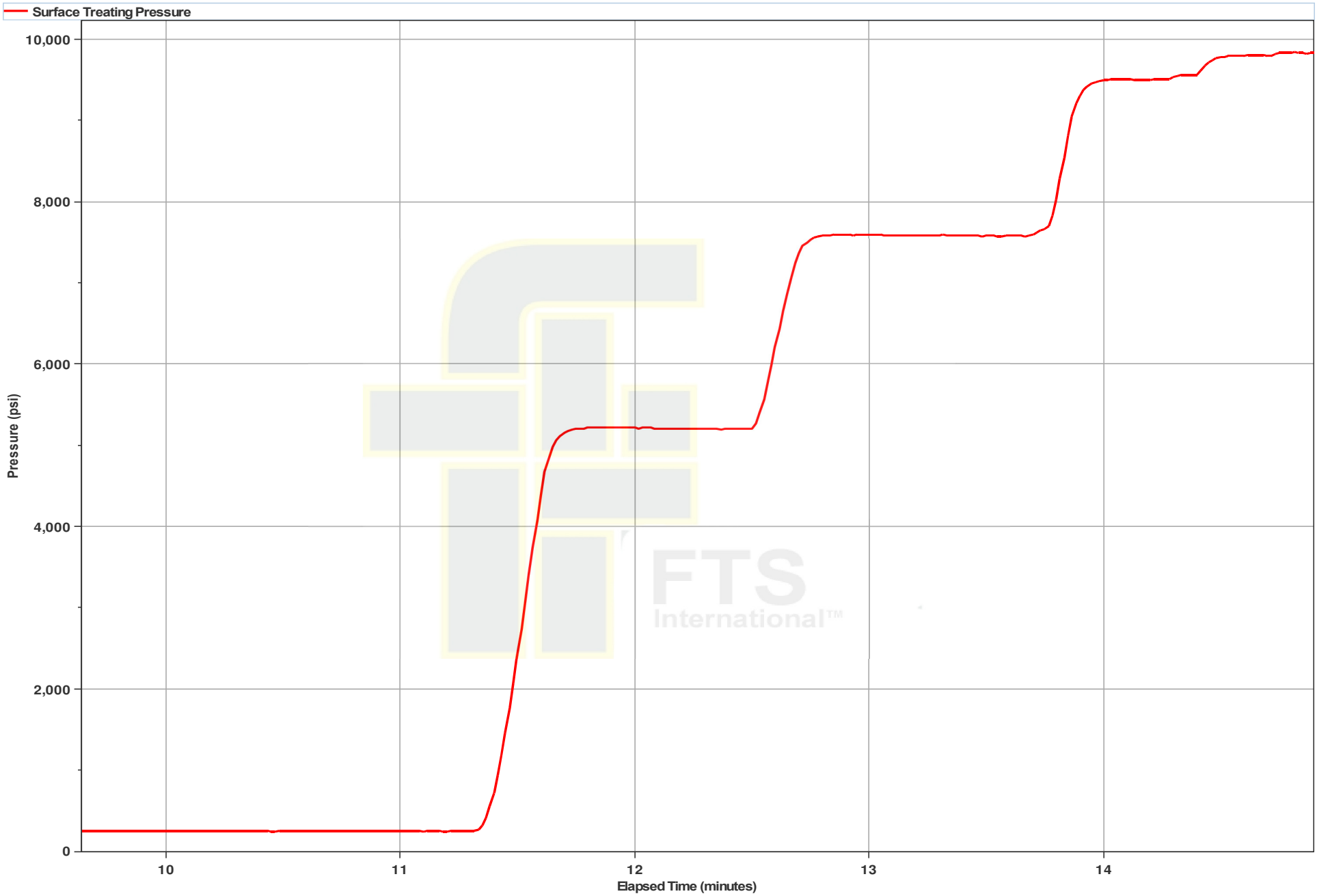
Ran a sweep during the 2.0ppg of 30/50 due to issues with the dual belt.
Cut stage ~25k short due to issues with the dual belt

1 Minute Shutdown (psi): 4864
2 Minute Shutdown (psi): 4506
5 Minute Shutdown (psi): 4169

Chemical Changes:

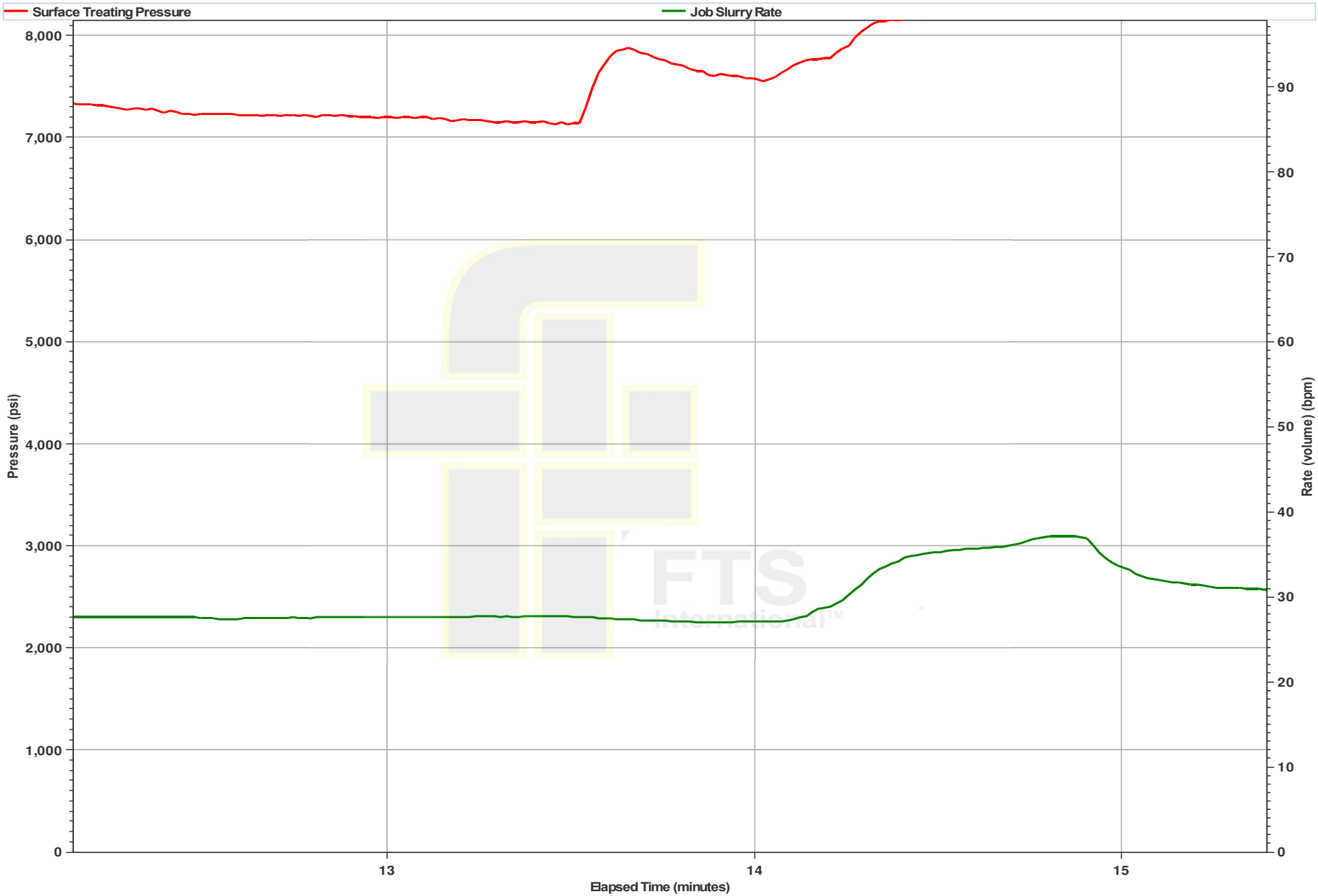
Chemical Name	Chemical Loading	Cumulative Clean
FRW-200	0.50	3,621

AEU Pressure Test



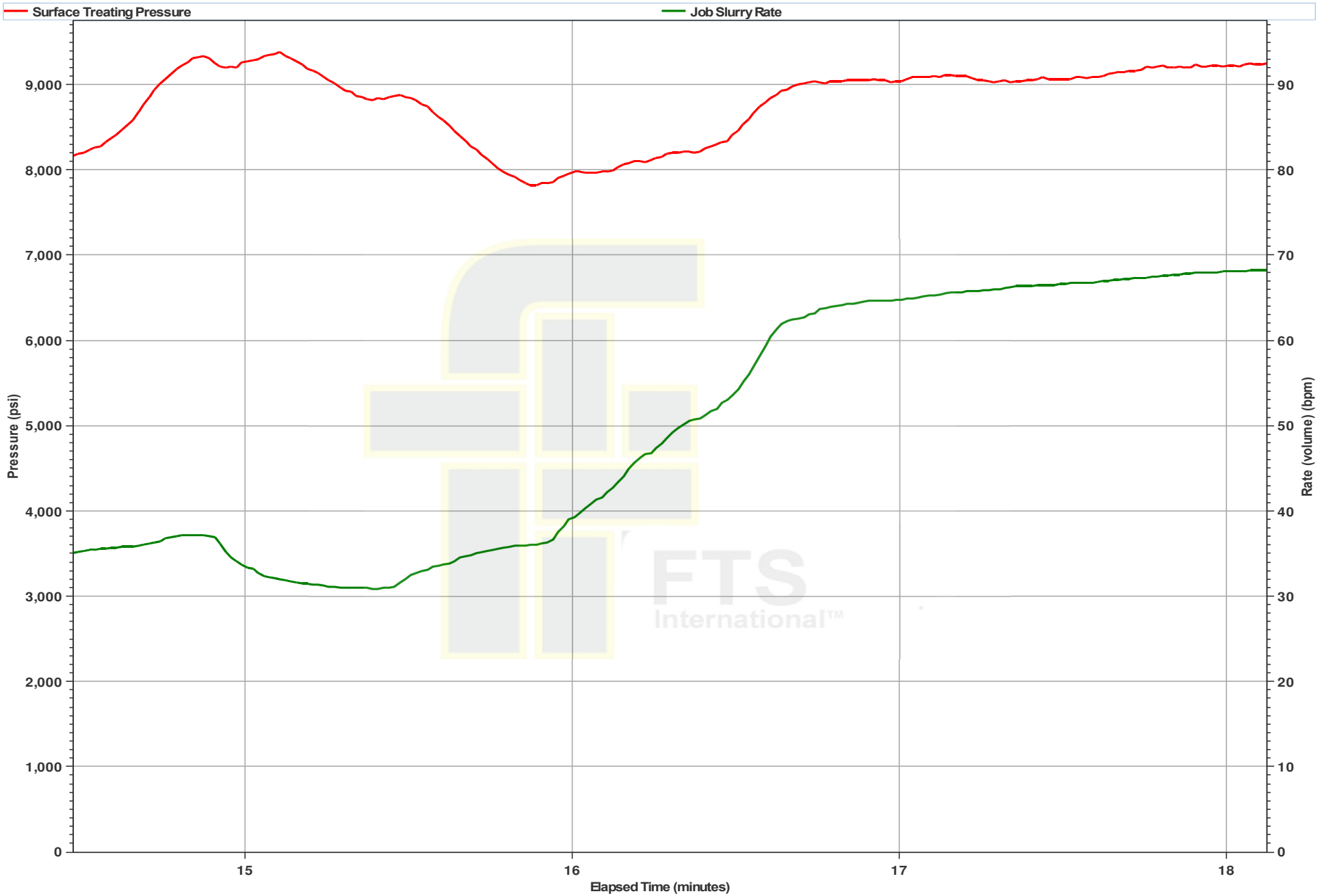
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 47 (WF.000658.M.W03.S47-aDCT-1103) **Jun 28, 2015**

Ball Seat and Breakdown



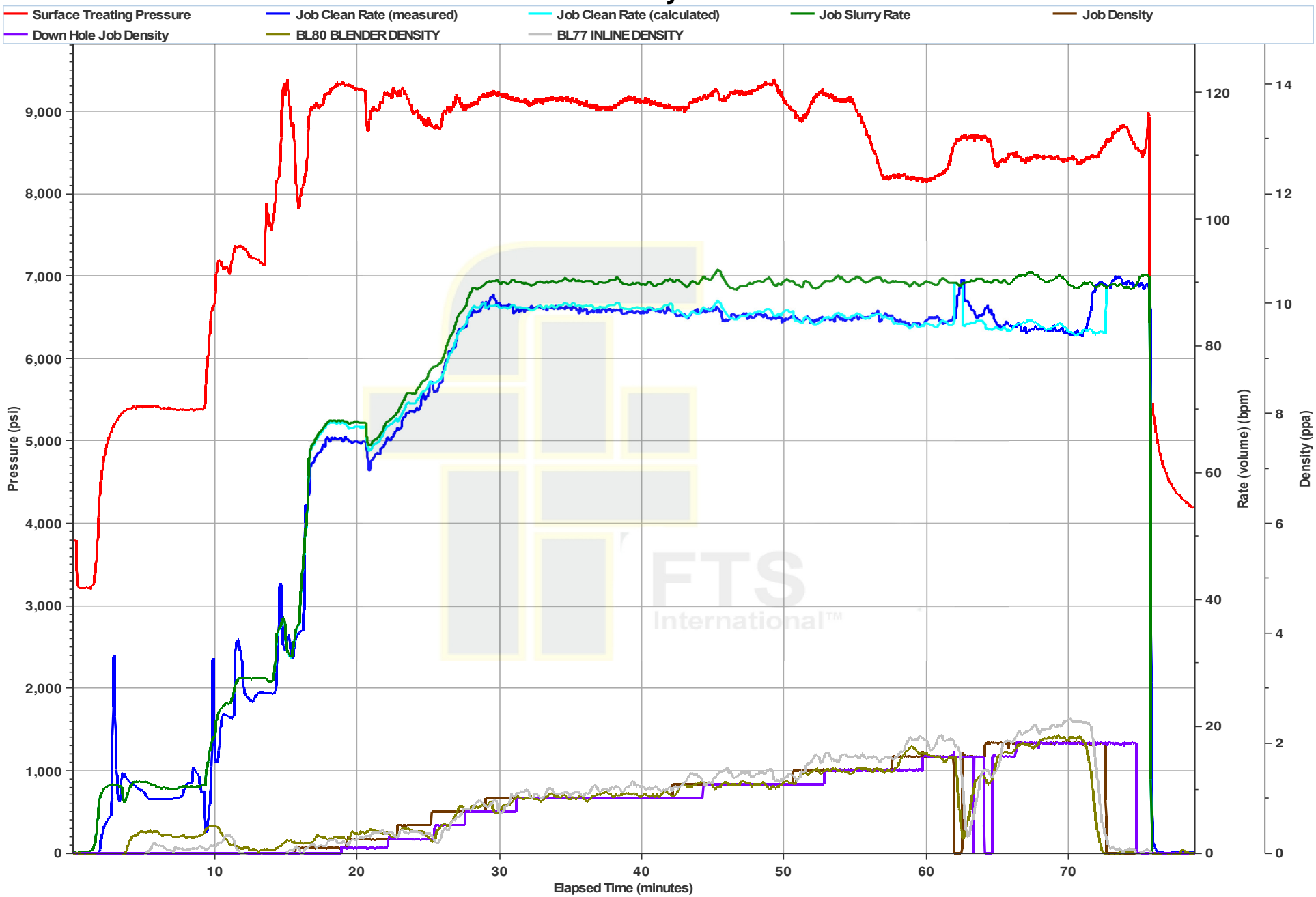
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 47 (WF.000658.M.W03.S47-aDCT-1103) Jun 28, 2015

Acid on Perforations



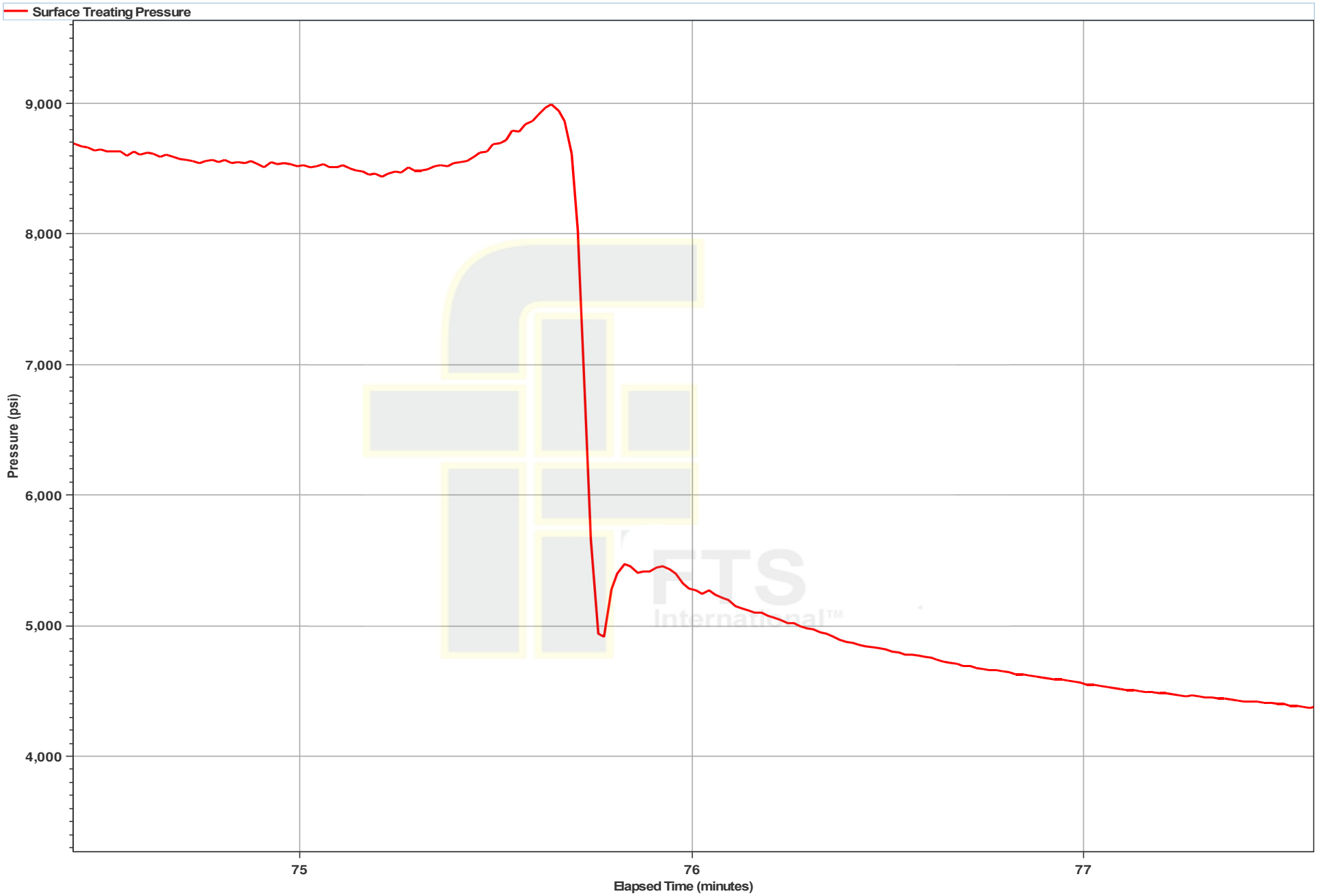
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 47 (WF.000658.M.W03.S47-aDCT-1103) **Jun 28, 2015**

Primary Plot



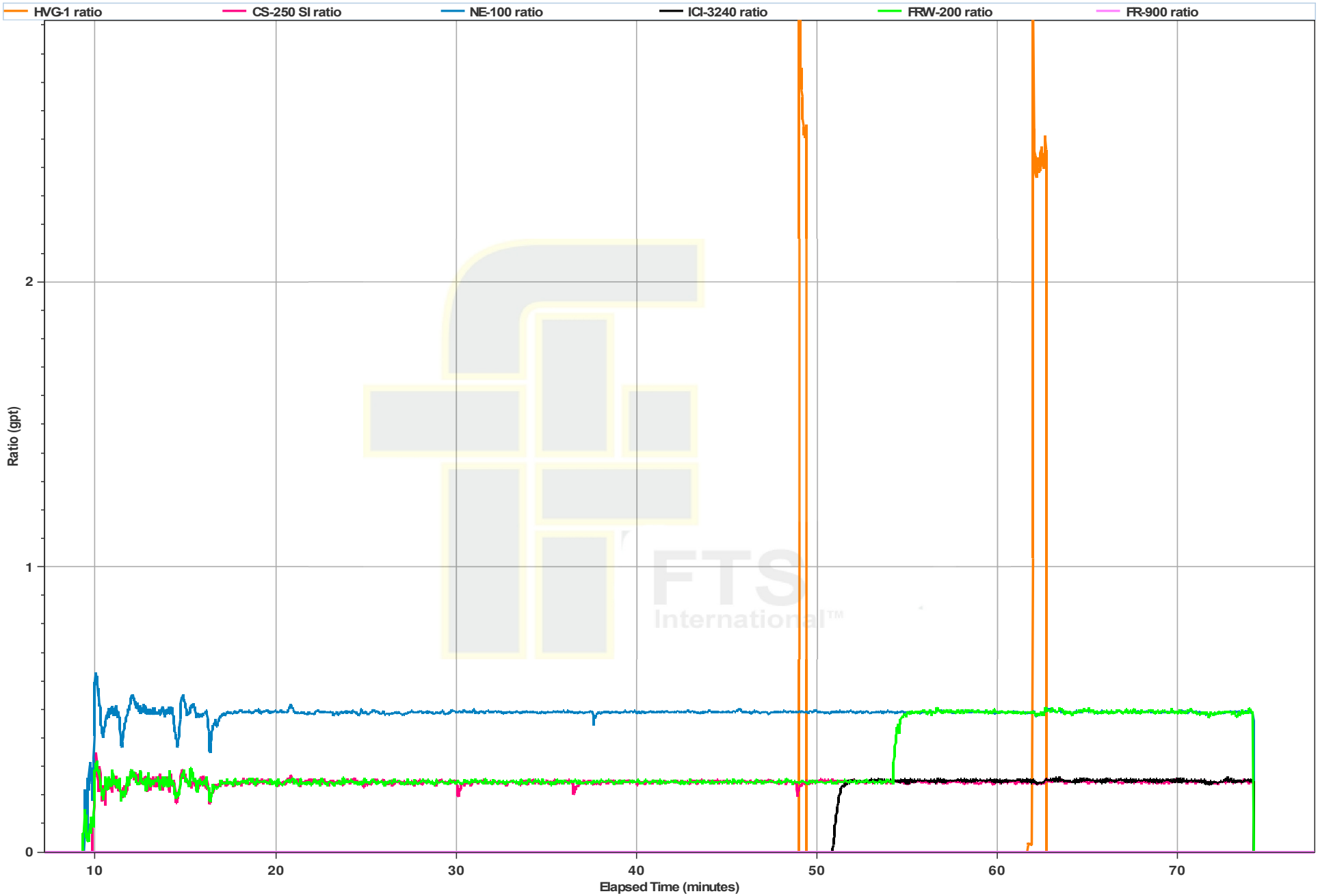
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 47 (WF.000658.M.W03.S47-aDCT-1103) **Jun 28, 2015**

ISIP Plot



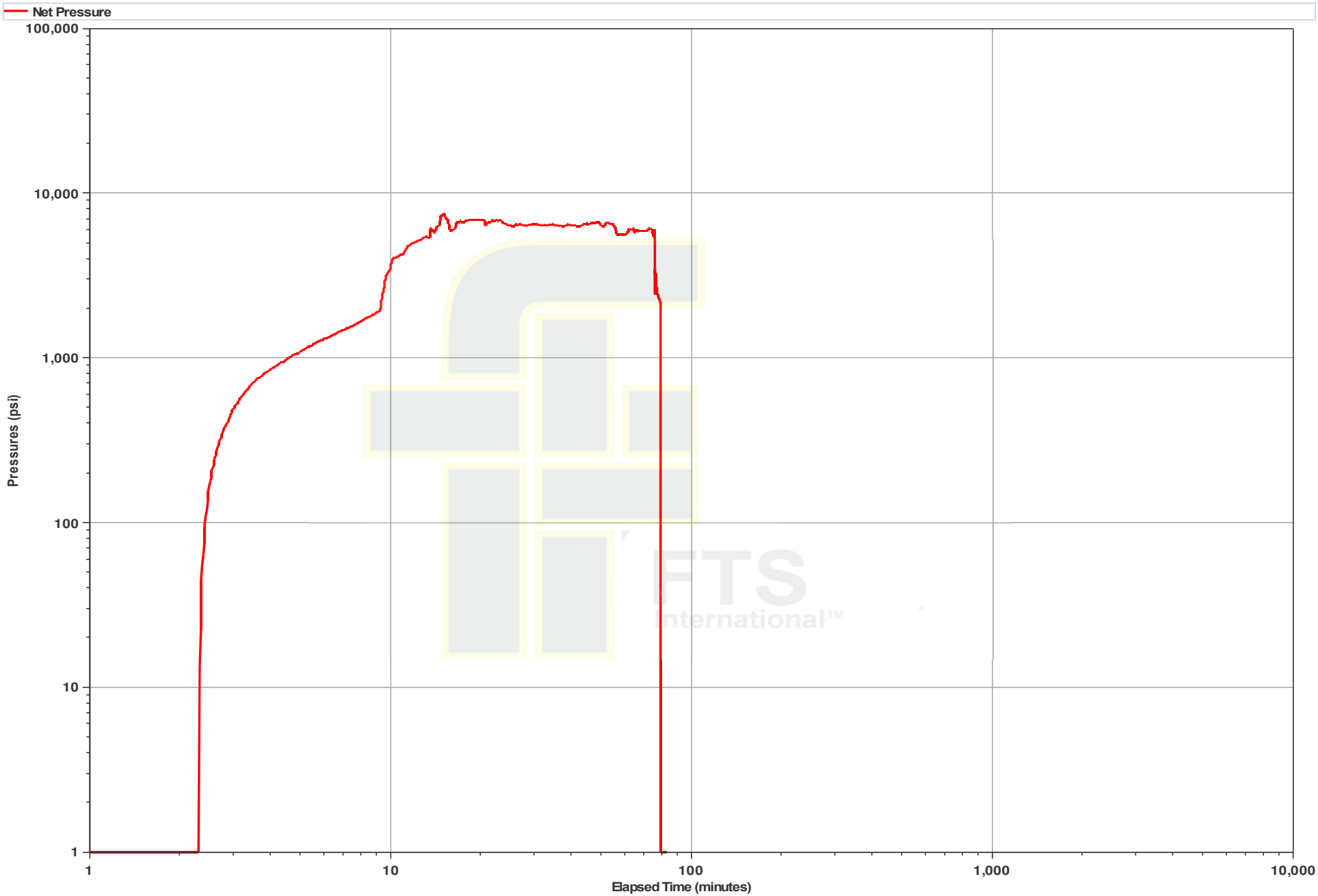
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 47 (WF.000658.M.W03.S47-aDCT-1103) **Jun 28, 2015**

Chemical Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 47 (WF.000658.M.W03.S47-aDCT-1103) **Jun 28, 2015**

Net Pressure Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 47 (WF.000658.M.W03.S47-aDCT-1103) Jun 28, 2015

WATER-BASED FRAC FLUID QUALITY CONTROL
(Attachment to Post Treatment Report)

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/28/2015
Customer Name:	American Energy - Utica	Proposal #:	3H/47
Date Sampled:	6/28/2015	Water Source:	Working Tank

Sample/Tank No.	Clarity, Color, Odor	Sample Temperature, (F)	Specific gravity	Initial pH	Chloride, ppm	Hardness, ppm	Calcium, ppm	Magnesium, ppm	Iron ppm	Hydroxide, ppm	Bicarbonate, ppm	Carbonate, ppm	Sulfate, ppm	Barium, ppm
Working Tank	Clear	78	1	7.8	37	106	36	17	0	0	317	0	50	0
Reused Water Tank	Black, Cloudy, Petroleum Odor	76	1.04	5.3	58,982	73000	27,207	11,132	>10	0	1196	0	300	0

Frac Fluid Quality Gel Testing (These Recording are to made prior to pumping job)														
Sample #														
Base Gel Type	HVG-1													
Gel Loading (lbs/1000 gal.)	2.5													
Sample Temperature, (F)	78													
Initial pH	7.8													
Visc. Reading @ 300 rpms	6.5													
Viscosity, (cp)	6.5													
Sample 1 3 min Hydration	4													
Sample 2 3 min Hydration	5													
Sample 3 3 min Hydration	6.5													
X-Link Vortex Closure, min:sec	n/a													
X-Link Crown, min:sec	n/a													
X-Link pH	n/a													
Gel Break Time (<2cp) mins	20													

Frac Fluid Quality Gel Testing (These Recording are to made while pumping job)														
Stage #														
Base Gel Viscosity (cp)														
X-Link pH								.						
Sample XL time, min:sec														
Sample Temperature														

Acid Quality	Percent Acid	NaOH, mLs	Specific Gravity
	28		1.14

Additional testing or documentation may be required by the customer or for frac fluid quality assurance.

Tested By: Etuate Varea

QUALITY CONTROL OF PROPPANTS

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/28/2015
Customer Name:	American Energy - Utica	Well/Stage:	3H/47
Date Sampled:	6/28/2015	DISTRICT:	Washington, PA
VENDOR:	SANTROL		

Select Proppant Type:

___	Brown	___	Ceramic	___	Other (specify)
X	White	___	Bauxite		
___	Resin Coated	___	Texas Gold		

Sieve Analysis	100 Mesh			Sieve Analysis	30/50 Mesh		
Sample 1	25.30	grams of sample		Sample 2	24.70	grams of sample	
	Amount Retained				Amount Retained		
Sieve mesh	Gram	%		Sieve mesh	Gram	%	
			Total				Total
50	1.20	4.74	In-Size	20	0.00	0.00	In-Size
70	17.90	70.75		30	0.80	3.24	
100	5.20	20.55	95.3%	40	20.00	80.97	94.3%
120	0.60	2.37		45	2.10	8.50	
140	0.30	1.19		50	1.20	4.86	
200	0.10	0.40		70	0.60	2.43	
Pan	0.00	0.00	fines	Pan	0.00	0.00	fines
Total wt. Gram	25.30	100.00		Total wt. Gram	24.70	100.00	

Tested By: Etuate Varea

Post Job Report

AMERICAN ENERGY - UTICA

Red Hill Farm MDS GR 3H

Stage : 48 OF 54

HARRISON, OH

Operations Representative:

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Engineering Manager:

Name:	Thaddeus Craun
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Fax:	724-743-7719
Cell:	
Email:	THADDEUS.CRAUN@FTSI.COM

FTS International
[illegible]
Eighty Four, PA [illegible]

FTS INTERNATIONAL

Customer: American Energy - Utica
Well: Red Hill Farm Site 6r 3H
Stage: 48
Job End Date: [illegible]

Job Summary

Well Information

TVD:	7,301	Top Perf:	15,711
No. Of Perfs:	30		

Casing	Tubing
[illegible]	n/A

Pressures, Rates and Volumes

	Proposed	Actual	Max	Min
STP	[illegible] psi	[illegible] psi	[illegible] psi	[illegible] psi
Rate	[illegible] bpm	[illegible] bpm	[illegible] bpm	[illegible] bpm

	Proposed	Actual		
Clean Volume	[illegible] bbls	[illegible] bbls		
Slurry Volume	[illegible] bbls	[illegible] bbls		
Flush Volume	[illegible] bbls	[illegible] bbls		

	Proposed	Start	End
Free Pumps on Location	[illegible]	15	15

Open Well:	Start Time	[illegible]	Pressure	[illegible] psi
	Bell Dwn	[illegible] bbls	Break Down	[illegible] psi
	Initial ISIP:	[illegible] psi	Initial F.G.:	[illegible] psi/ft
Stage Complete:	End Time	[illegible]	Job Time	[illegible]
	Final ISIP	[illegible] psi	Final F.G.	[illegible] psi/ft
	ISIP	[illegible]	5 Min:	[illegible] psi
	Pressure Min:	[illegible]	10 Min:	N/A
	Pressure Max:	[illegible]	15 Min:	N/A

Material Volume

Material	Proposed	Calculated	Actual	Variance
100 Mesh White	[illegible]	[illegible]	[illegible]	-3%
30/50 White	[illegible]	[illegible]	[illegible]	0%
Total Proppants	[illegible]	[illegible]	[illegible]	0%

Material	Proposed	Calculated	Actual	Variance
6.1%-7.5% HCL	[illegible]	[illegible]	[illegible]	1%
[illegible]	[illegible]	[illegible]	[illegible]	0%
[illegible]	[illegible]	[illegible]	[illegible]	-3%
FE-[illegible]	[illegible]	[illegible]	[illegible]	0%
[illegible]	[illegible]	[illegible]	[illegible]	-2%
[illegible]	[illegible]	[illegible]	[illegible]	-4%
[illegible]	[illegible]	[illegible]	[illegible]	0%
NE-[illegible]	[illegible]	[illegible]	[illegible]	-2%
NE-[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Comments:

Pumpdown Information:
Total Bbls: 64
Max Pressure (psi): [illegible]
Max Rate (bpm): 15.2

FTS International
[illegible]
Eighty Four, PA [illegible]

FTS INTERNATIONAL

Customer: American Energy - Utica
Well: Red Hill Farm Site 6r 3H
Stage: 49
Job End Date: [illegible]

Treatment Report

Date	[illegible]	Statelate	Washington County,PA	Basin Sec	[illegible]	API#	[illegible]

Min. Time	BTP	Slurry BPM	Stage Slurry (bbls)	Cumulative Slurry (bbls)	Stage Slurry (bbls)	Cumulative Slurry (bbls)	Stage Proppant (lbs)	Cumulative Proppant (lbs)	Description	Proppant	PPA
10:14	3,010	0.0	0	0	0	0	0	0	Freshwater Open Wet		0.00
10:15	6,006	12.4	6	6	6	6	0	0	Freshwater Load Wet		0.00
10:16	6,141	11.0	71	77	71	77	0	0	7.5% HCL Acid Add		0.00
10:21	7,027	20.6	66	143	66	143	379	379	Slickwater Proppant	100 Mesh White	0.10
10:25	3,013	34.4	0	143	0	143	0	379	Slickwater Breakdown		0.00
10:25	6,047	30.0	80	223	80	223	344	344	Slickwater Proppant	100 Mesh White	0.10
10:28	6,025	32.8	268	491	268	492	2,184	2,784	Slickwater Proppant	100 Mesh White	0.25
10:30	6,030	71.3	47	448	47	490	173	2,957	Slickwater Proppant	100 Mesh White	0.25
10:33	6,129	90.3	268	783	261	711	6,165	9,122	Slickwater Proppant	100 Mesh White	0.50
10:34	6,075	90.6	403	1,139	448	1,158	12,543	21,672	Slickwater Proppant	100 Mesh White	0.75
10:35	6,011	90.7	421	1,557	440	1,598	17,902	39,574	Slickwater Proppant	100 Mesh White	1.00
10:36	6,054	90.8	160	1,717	167	1,765	6,729	46,374	Slickwater Proppant	30/50 White	1.00
10:37	6,079	90.7	715	2,432	747	2,512	30,045	76,419	Slickwater Proppant	30/50 White	1.00
10:53	7,053	90.4	1,887	3,432	1,887	3,579	53,958	130,334	Slickwater Proppant	30/50 White	1.50
20:19	6,005	90.4	969	4,399	914	4,494	53,997	184,332	Slickwater Proppant	30/50 White	1.50
20:19	6,140	90.5	521	4,919	561	4,015	23,040	207,372	Slickwater Proppant	40/80 White	1.75
20:19	6,195	90.7	179	4,798	190	5,054	12,000	219,372	Slickwater Proppant	40/80 White	1.75
20:21	7,022	90.5	663	5,180	649	5,022	60,000	279,372	Slickwater Proppant	40/80 White	2.00
20:24	7,004	90.6	134	5,317	134	5,156	0	279,372	Slickwater Clean Screen		0.00
20:27	3,000	90.8	129	5,447	129	5,275	0	279,372	Slickwater Flush		0.00
20:28	3,249	90.7	121	5,568	121	5,397	0	279,372	Freshwater Flush		0.00
20:29	4,747	0.0	0	5,568	0	5,397	0	279,372	Freshwater Shutdown		0.00
Total Job/Time (HH:MM): 01:15											

Min BTP:	7,044 psi	Max BTP:	9,572 psi	Average BTP:	8,158 psi	4 Mins	4,122 psi
Min Rate:	22.4 bpm	Max Rate:	91.8 bpm	Average Rate:	88.8 bpm	10 Mins	0 psi
Initial ISIP:	4,747 psi	Initial F.G.:	1.94 psi/ft	Average ISIP:	17,212	15 Mins	0 psi
Final ISIP:	4,747 psi	Final F.G.:	1.94 psi/ft	Customer Representative:		Exit Hours:	
FTS Representative:		Armando Lyle & William Mohn					

Comments:

The proppant values contained in this report are calculated based on actual barrel counts and target densities. Actual total proppant usage is 279,372 lbs. Charge time is 1 hour(s) 18 minute(s). All chemicals and proppant ran as documented.

Started sand before breakdown.
Reuse water was run on this stage for a total of 381 Bbls.

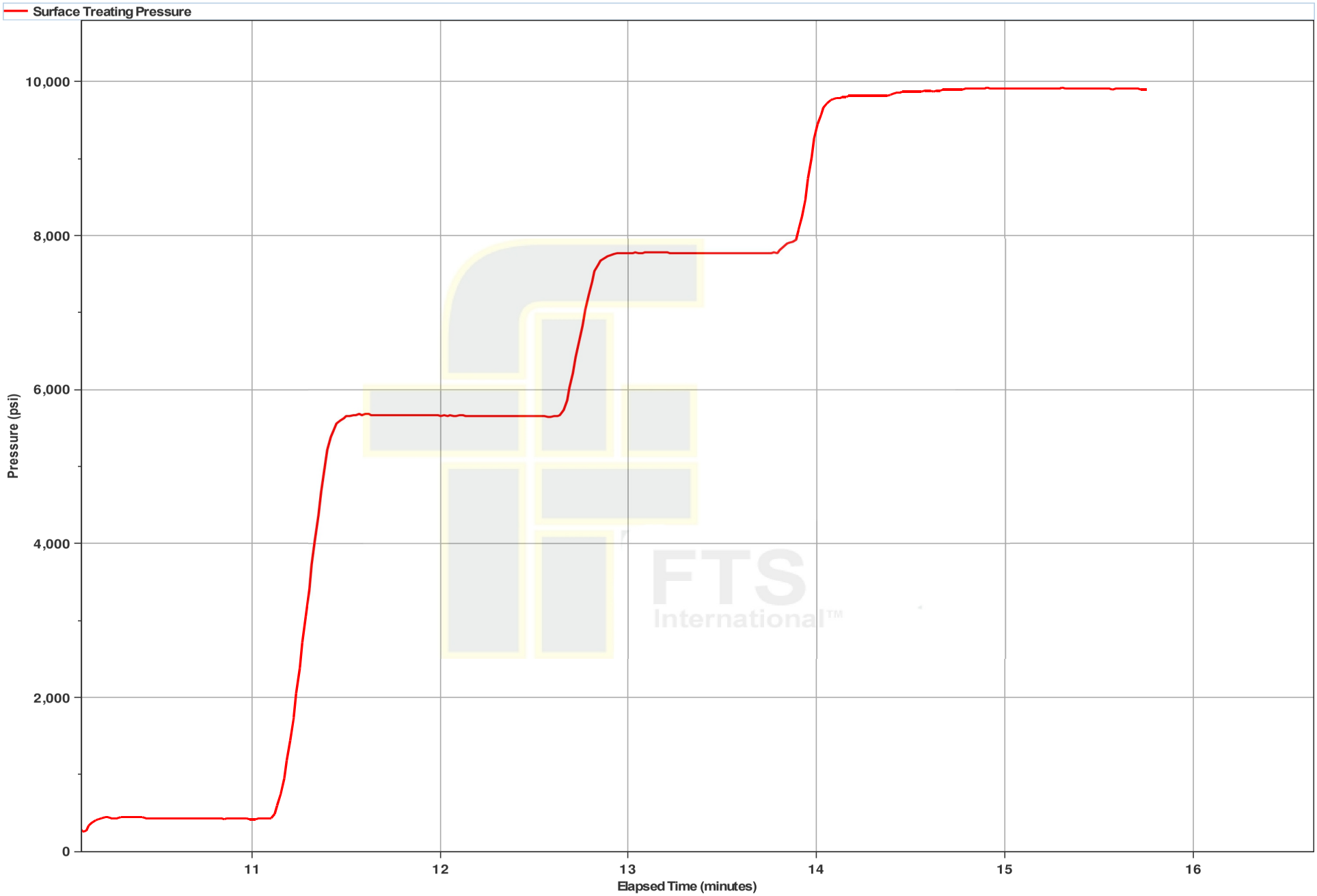
Min/Max/Avg were taken from sand stages. All chem changes from proposed were made per AEU representative request.

1 Minute Shutdown (psi): 4382
2 Minute Shutdown (psi): 4298
5 Minute Shutdown (psi): 4122

Chemical Changes:

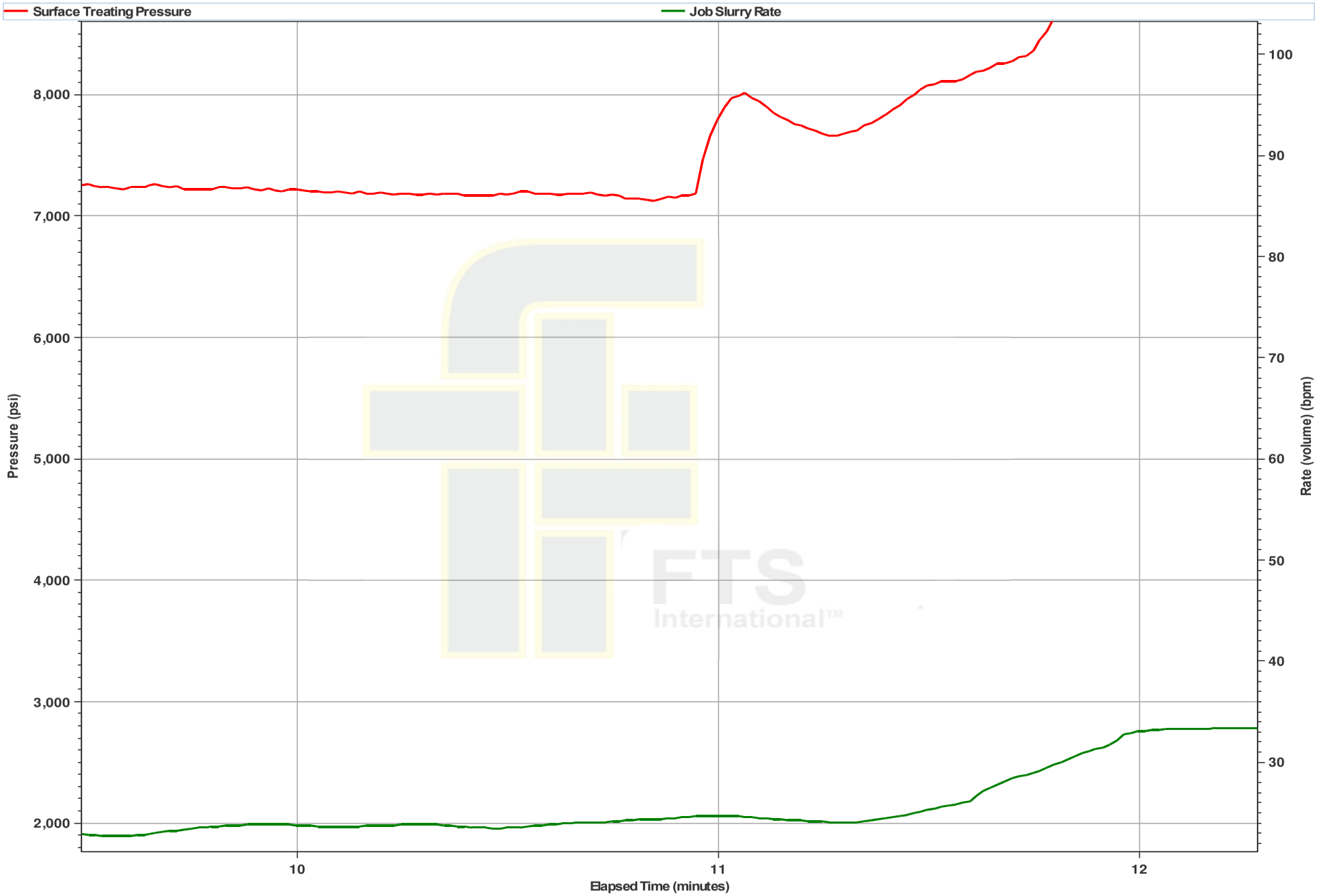
Chemical Name	Chemical Loading	Cumulative Gives
FRW-900	0.50	223
FRW-900	0.75	448
FRW-200	0.50	2,432
FRW-200	0.75	4,768
FRW-200	0.50	6,287
FRW-900	0.10	6,287

AEU Pressure Test



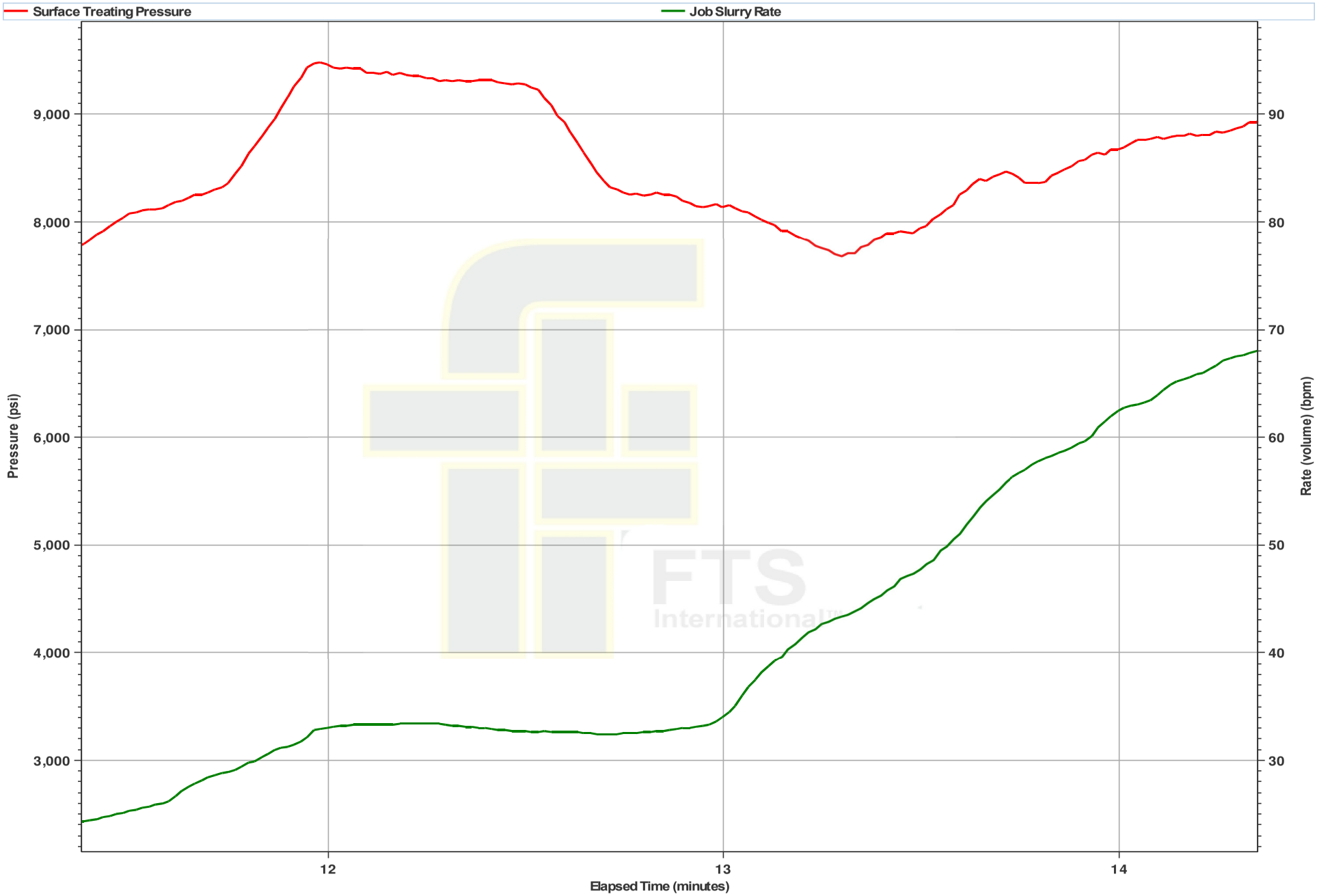
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 48 (WF.000658.M.W03.S48-aDCT-1103) Jun 28, 2015

Ball Seat and Breakdown



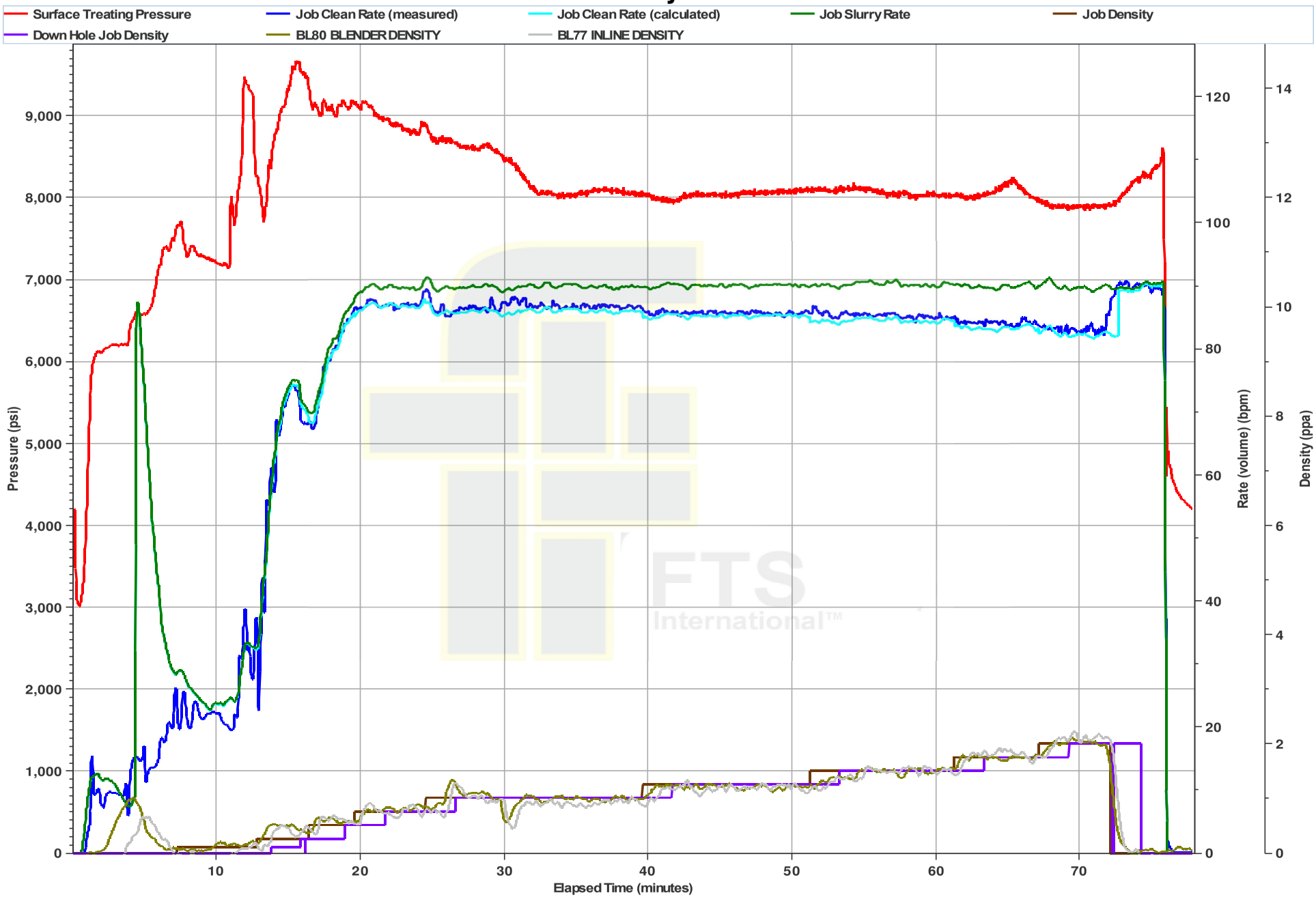
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 48 (WF.000658.M.W03.S48-aDCT-1103) **Jun 28, 2015**

Acid on Perforations



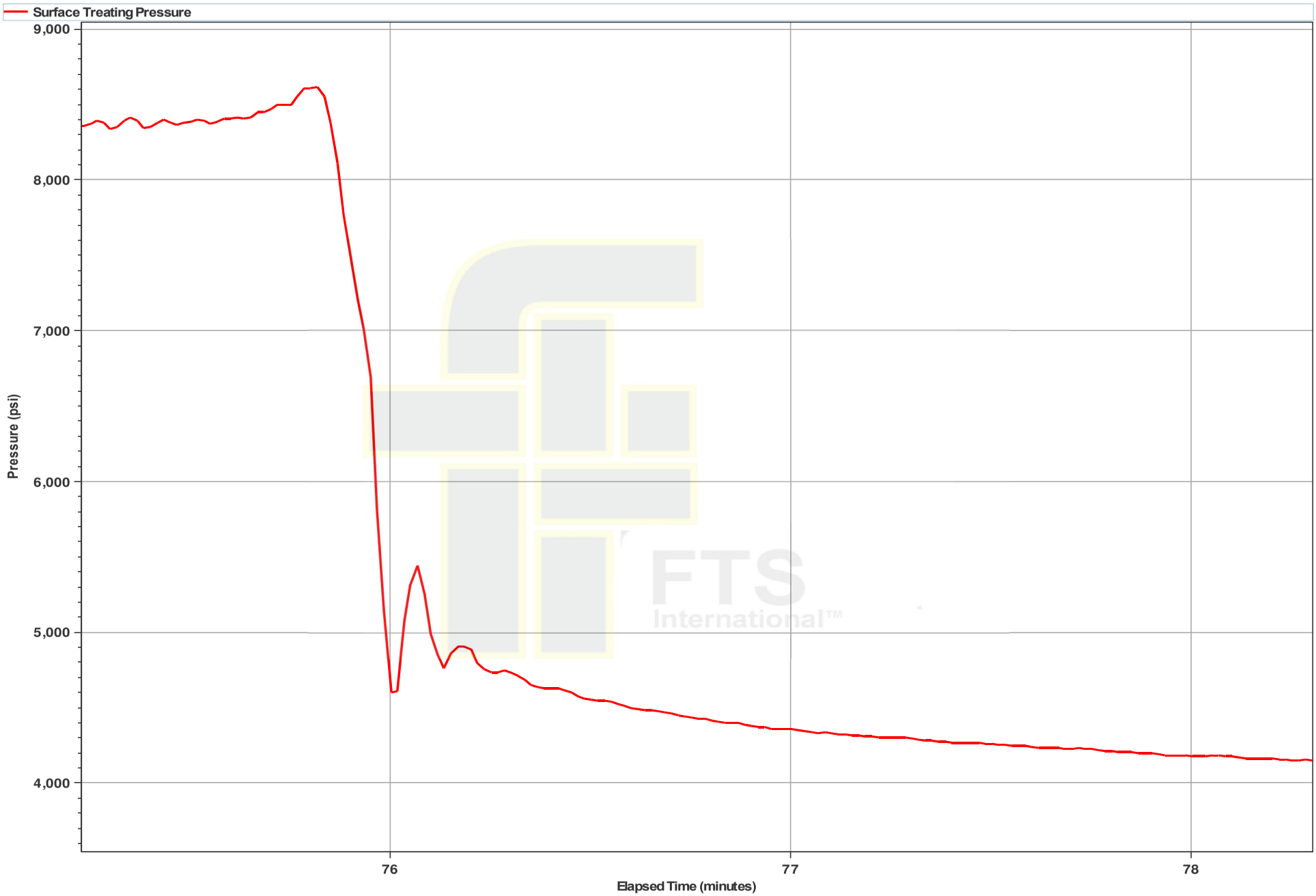
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 48 (WF.000658.M.W03.S48-aDCT-1103) **Jun 28, 2015**

Primary Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 48 (WF.000658.M.W03.S48-aDCT-1103) Jun 28, 2015

ISIP Plot

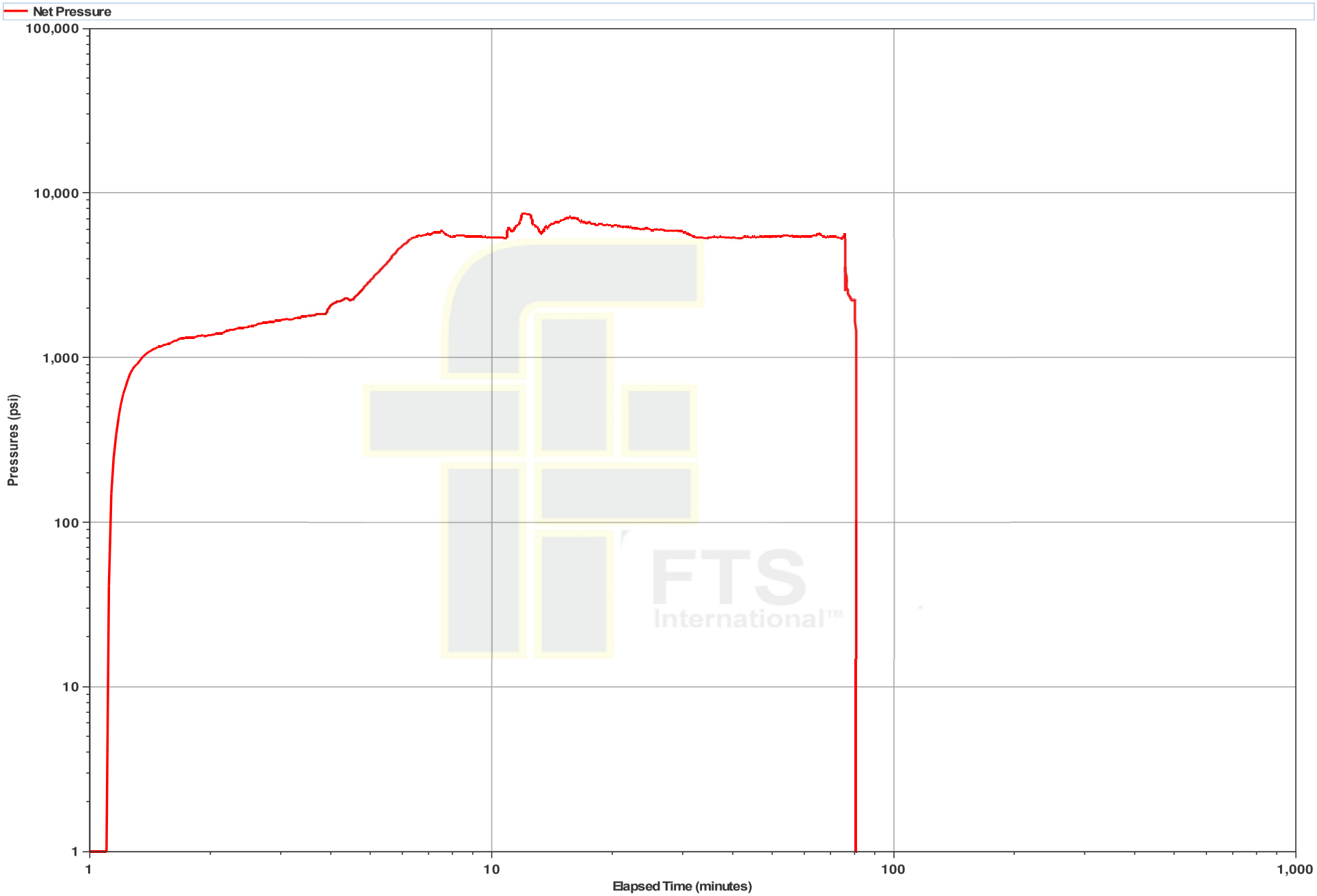


American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 48 (WF.000658.M.W03.S48-aDCT-1103) Jun 28, 2015

Chemical Plot

American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 48 (WF.000658.M.W03.S48-aDCT-1103) Jun 28, 2015

Net Pressure Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 48 (WF.000658.M.W03.S48-aDCT-1103) Jun 28, 2015

QUALITY CONTROL OF PROPPANTS

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/28/2015
Customer Name:	American Energy - Utica	Well/Stage:	3H/48
Date Sampled:	6/28/2015	DISTRICT:	Washington, PA
VENDOR:	SANTROL		

Select Proppant Type:

___ Brown	___ Ceramic	___ Other (specify)
X White	___ Bauxite	
___ Resin Coated	___ Texas Gold	

Sieve Analysis	100 Mesh			Sieve Analysis	30/50 Mesh		
Sample 1	25.00	grams of sample		Sample 2	24.98	grams of sample	
	Amount Retained				Amount Retained		
Sieve mesh	Gram	%		Sieve mesh	Gram	%	
			Total				Total
50	1.23	4.92	In-Size	20	0.00	0.00	In-Size
70	18.00	72.00		30	1.20	4.80	
100	2.88	11.52	95.1%	40	16.88	67.57	92.4%
120	1.99	7.96		45	4.30	17.21	
140	0.80	3.20		50	1.90	7.61	
200	0.10	0.40		70	0.70	2.80	
Pan	0.00	0.00	fines	Pan	0.00	0.00	fines
Total wt. Gram	25.00	100.00		Total wt. Gram	24.98	100.00	

Tested By: Amanda Lyle

WATER-BASED FRAC FLUID QUALITY CONTROL
(Attachment to Post Treatment Report)

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/28/2015
Customer Name:	American Energy - Utica	Proposal #:	3H/48
Date Sampled:	6/28/2015	Water Source:	Working Tank

Sample/Tank No.	Clarity, Color, Odor	Sample Temperature, (F)	Specific gravity	Initial pH	Chloride, ppm	Hardness, ppm	Calcium, ppm	Magnesium, ppm	Iron ppm	Hydroxide, ppm	Bicarbonate, ppm	Carbonate, ppm	Sulfate, ppm	Barium, ppm
Working Tank	Clear	70	1	7.6	68	90	32	14	0	0	244	0	50	0
Reused Water/ from Blender Tub	Yellow, Slightly Cloudy, Petroleum Odor	69	1.025	6	11,197	40000	15,204	6,028	7	0	5978	0	125	0

Frac Fluid Quality Gel Testing (These Recording are to made prior to pumping job)														
Sample #														
Base Gel Type	HVG-1													
Gel Loading (lbs/1000 gal.)	2.5													
Sample Temperature, (F)	70													
Initial pH	7.8													
Visc. Reading @ 300 rpms	6.5													
Viscosity, (cp)	6.5													
Sample 1 3 min Hydration	4													
Sample 2 3 min Hydration	5													
Sample 3 3 min Hydration	6.5													
X-Link Vortex Closure, min:sec	n/a													
X-Link Crown, min:sec	n/a													
X-Link pH	n/a													
Gel Break Time (<2cp) mins	18													

Frac Fluid Quality Gel Testing (These Recording are to made while pumping job)														
Stage #														
Base Gel Viscosity (cp)														
X-Link pH								.						
Sample XL time, min:sec														
Sample Temperature														

Acid Quality	Percent Acid	NaOH, mLs	Specific Gravity
	28		1.14

Additional testing or documentation may be required by the customer or for frac fluid quality assurance.

Tested By: Amanda Lyle

Post Job Report

AMERICAN ENERGY - UTICA

Red Hill Farm MDS GR 3H

Stage : 49 OF 54

HARRISON, OH

Operations Representative:

Name:	David Knapp
Office:	724-743-2537
Fax:	724-743-7719
Cell:	
Email:	DAVID.KNAPP@FTSI.COM

Sales Representative:

Name:	Bruce Matthews
Office:	405-574-3921
Fax:	405-787-1335
Cell:	
Email:	BRUCE.MATTHEWS@FTSI.COM

Engineering Manager:

Name:	Thaddeus Craun
Office:	817-832-8702
Fax:	724-743-7719
Cell:	
Email:	THADDEUS.CRAUN@FTSI.COM

FTS International
[illegible]
Eighty Four, PA [illegible]

FTS INTERNATIONAL

Customer: American Energy - Utica
Well: Red Hill Farm Bla 6r 3H
Stages: 48
Job End Date: [illegible]

Job Summary

Well Information

TVD:	7,301	Top Perf:	15,711
No. Of Perfs:	30		

Casing	Tubing
5.50" 23.000	NA

Pressures, Rates and Volumes

	Proposed	Actual	Max	Min
STP	8,000 psi	3,490 psi	6,193 psi	7,691 psi
Rate	80.0 bpm	83.0 bpm	91.5 bpm	31.0 bpm

	Proposed	Actual		
Clean Volume	6,772 bbls	6,471 bbls		
Slurry Volume	6,602 bbls	6,742 bbls		
Flush Volume	397 bbls	345 bbls		

	Proposed	Start	End
Free Pumps on Location	12	14	14

Open Well:	Start Time	07:25	Pressure	3,075 psi
	Bell Seal	170 bbls	Break Down	7,290 psi
	Initial ISIP:	4,790 psi	Initial F.G.:	1.00 psi/ft
Stage Complete:	End Time	10:07	Job Time	02:35
	Final ISIP:	4,790 psi	Final F.G.	1.00 psi/ft
	HHP	10,400	5 Min	4,611 psi
	Pressure Min	0.00	10 Min:	NA
	Pressure Max	0.00	15 Min:	NA

Material Volume

Material	Proposed	Calculated	Actual	Variance
100 Mesh White	40,000	30,303	30,333	-3%
30/50 White	210,000	211,000	211,000	0%
Total Proppants	250,000	309,000	241,000	0%

Material	Proposed	Calculated	Actual	Variance
6.1%-7.5% HCL	3,000	2,042	3,000	1%
CI-150	3	3	3	0%
CI-150 2X	55	55	55	0%
FE-360L	15	15	15	0%
FRW-200	100	77	75	-1%
FRW-600	6	27	27	0%
EC-6040	55	55	55	0%
NE-100	6	111	100	-2%
NE-0870V	120	5	5	0

Comments:

Pumpdown Information:
Total Bbls: 63
Max Pressure (psi): 6155
Max Rate (bpm): 19.2

FTS International
[illegible]
Eighty Four, PA [illegible]

FTS INTERNATIONAL

Customer: Anadarko Energy - Utica
Well: Red Hill Farm Site 6r 3H
Stages: 48
Job End Date: [illegible]

Treatment Report

Date	[illegible]	Statelate	Washington County,PA	Data Set	[illegible]	API#	[illegible]

HH. Time	BTP	Slurry BPM	Stage Slurry (bbls)	Cumulative Slurry (bbls)	Stage Slurry (bbls)	Cumulative Slurry (bbls)	Stage Proppant (lbs)	Cumulative Proppant (lbs)	Description	Proppant	PPA
01:35	9,075	5.8	0	0	0	0	0	0	Pressure Open Well		0.00
01:44	5,700	10.2	0	0	0	0	0	0	Pressure Load Well		0.00
01:46	5,707	15.3	71	79	71	79	0	0	7.5% HCL Acid Add		0.00
01:49	7,010	33.3	6	85	6	85	0	0	Slickwater Load Well		0.00
01:50	7,074	30.7	85	170	85	170	167	167	Slickwater Proppant	100 Mesh White	0.10
01:52	7,096	30.0	0	170	0	170	0	167	Slickwater Shutdown		0.00
01:53	3,000	31.3	30	200	30	200	164	331	Slickwater Proppant	100 Mesh White	0.10
01:54	3,054	50.0	35	241	35	241	300	631	Slickwater Proppant	100 Mesh White	0.25
01:55	3,052	70.4	73	317	74	315	797	1,428	Slickwater Proppant	100 Mesh White	0.25
01:56	3,059	62.1	108	425	108	427	1,134	2,759	Slickwater Proppant	100 Mesh White	0.25
01:58	3,029	64.4	365	790	361	788	5,355	8,145	Slickwater Proppant	100 Mesh White	0.50
01:61	3,050	66.2	426	1,196	444	1,132	13,514	21,658	Slickwater Proppant	100 Mesh White	0.75
01:62	3,059	66.3	422	1,631	441	1,573	17,734	39,392	Slickwater Proppant	100 Mesh White	1.00
02:01	3,035	66.7	886	2,117	913	2,199	34,013	73,405	Slickwater Proppant	30/50 White	1.00
02:07	3,079	66.7	338	2,457	343	2,543	12,148	79,179	Slickwater Proppant	30/50 White	1.00
02:11	3,081	66.7	1,091	3,548	1,099	3,647	92,053	139,739	Slickwater Proppant	30/50 White	1.25
02:23	3,072	66.6	449	3,997	429	4,079	31,068	140,797	Slickwater Proppant	16/30 White	1.50
02:30	3,109	66.4	364	4,365	369	4,448	62,300	168,719	Slickwater Proppant	16/30 White	1.50
02:34	3,215	66.5	380	4,745	314	4,762	46,700	215,419	Slickwater Proppant	16/30 White	1.75
02:40	3,191	66.7	379	5,124	404	5,211	61,884	277,303	Slickwater Proppant	16/30 White	2.00
02:54	3,210	66.3	91	5,215	91	5,302	0	277,303	Slickwater Clean Acidic		0.00
02:56	3,030	66.4	116	5,331	116	5,412	0	277,303	Slickwater Flush		0.00
02:58	3,107	66.5	108	5,471	108	5,742	0	277,303	Freshwater Flush		0.00
02:67	4,759	5.5	0	5,471	0	5,742	0	277,303	Freshwater Shutdown		0.00
Total Job/Time (HH:MM): 07:44											

Min BTP:	7,031 psi	Max BTP:	9,149 psi	Average BTP:	8,053 psi	9 Min	4,211 psi
Min Rate:	21.0 bpm	Max Rate:	91.6 bpm	Average Rate:	66.0 bpm	10 Min	0 psi
Initial ISIP:	4,759 psi	Initial F.G.:	1.00 psi/ft	Average ISIP:	10,125	15 Min	0 psi
Final ISIP:	4,759 psi	Final F.G.:	1.00 psi/ft	Customer Representative		Exit Survey	
FTS Representative:		Amanda Lyle & William Mohr					

Comments:

The proppant values contained in this report are calculated based on actual barrel counts and target densities. Actual total proppant usage is 240,000 lbs. Charge time is 1 hour(s) 18 minute(s). All chemicals and proppant ran as documented.

Min/Max/Avg were taken from sand stages. All chem changes from proposed were made per AEU representative request.

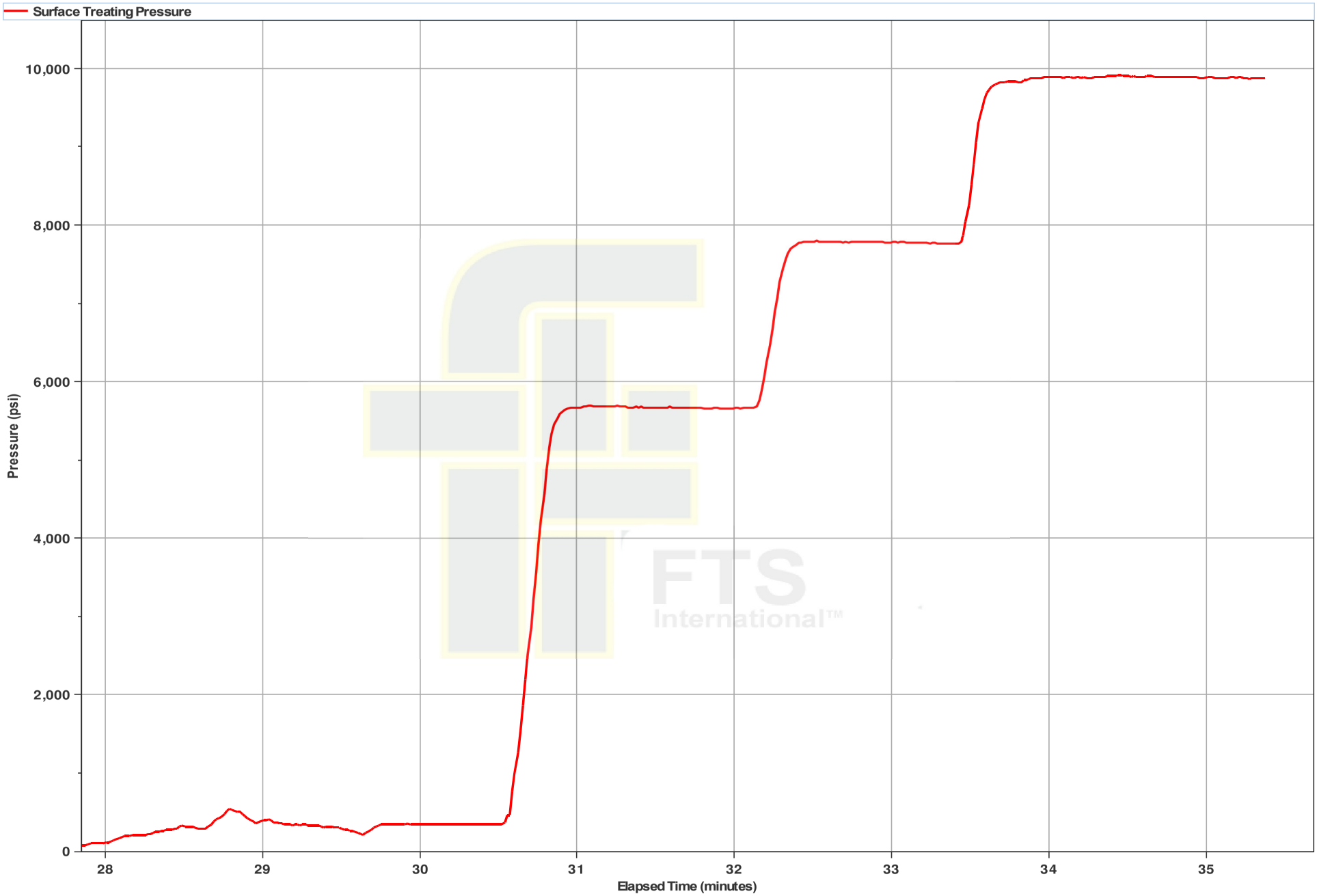
Reuse water was run on this stage for a total of 381 Bbls.

1 Minute Shutdown (psi): 4468
2 Minute Shutdown (psi): 4362
4 Minute Shutdown (psi): 4211

Chemical Changes:

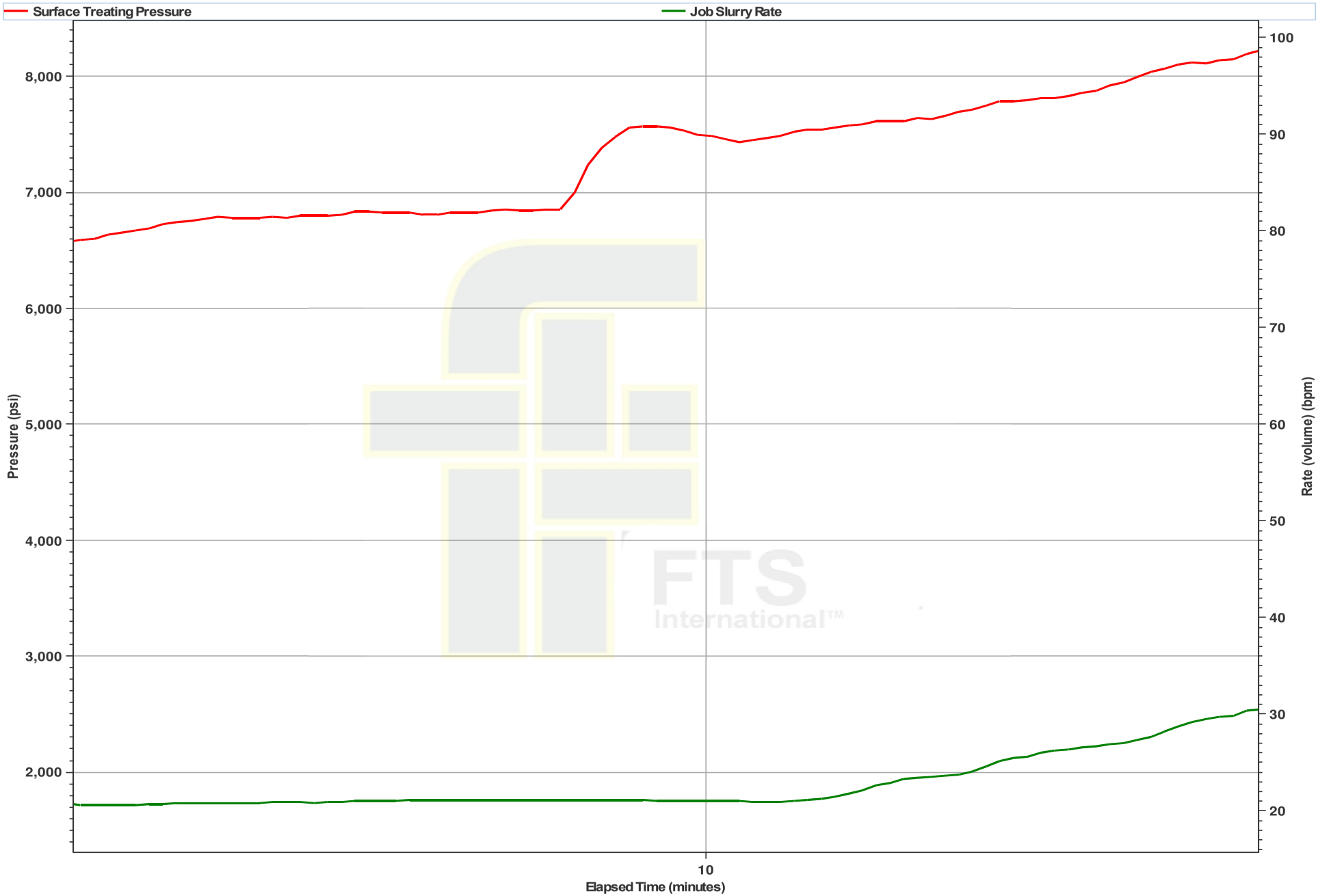
Chemical Name	Chemical Loading	Cumulative Chem
FRW-900	0.50	317
FRW-200	0.25	2,117
FRW-200	0.35	2,407
FRW-200	0.75	4,269
FRW-200	0.25	6,341

AEU Pressure Test



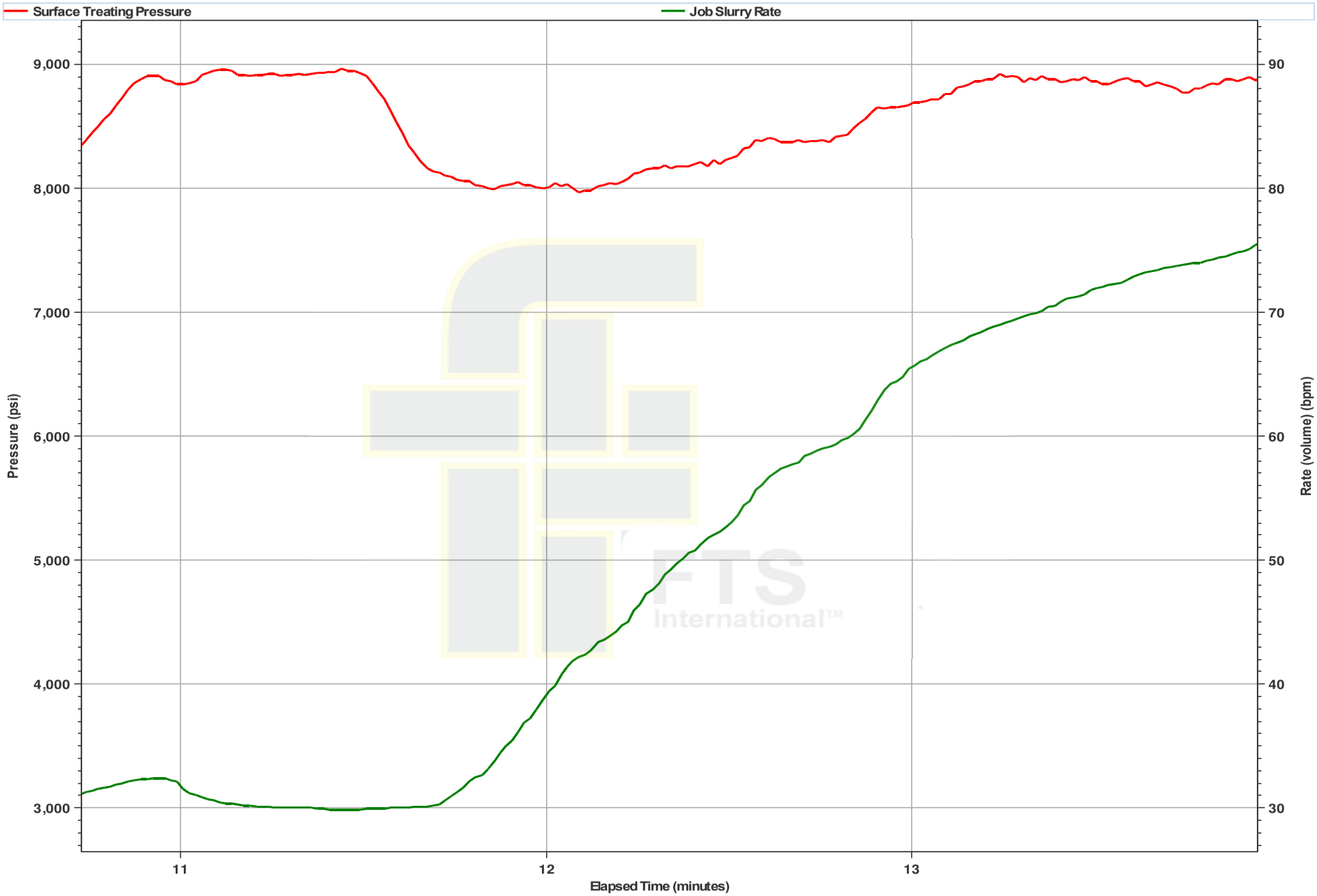
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 49 (WF.000658.M.W03.S49-aDCT-1103) Jun 29, 2015

Ball Seat and Breakdown



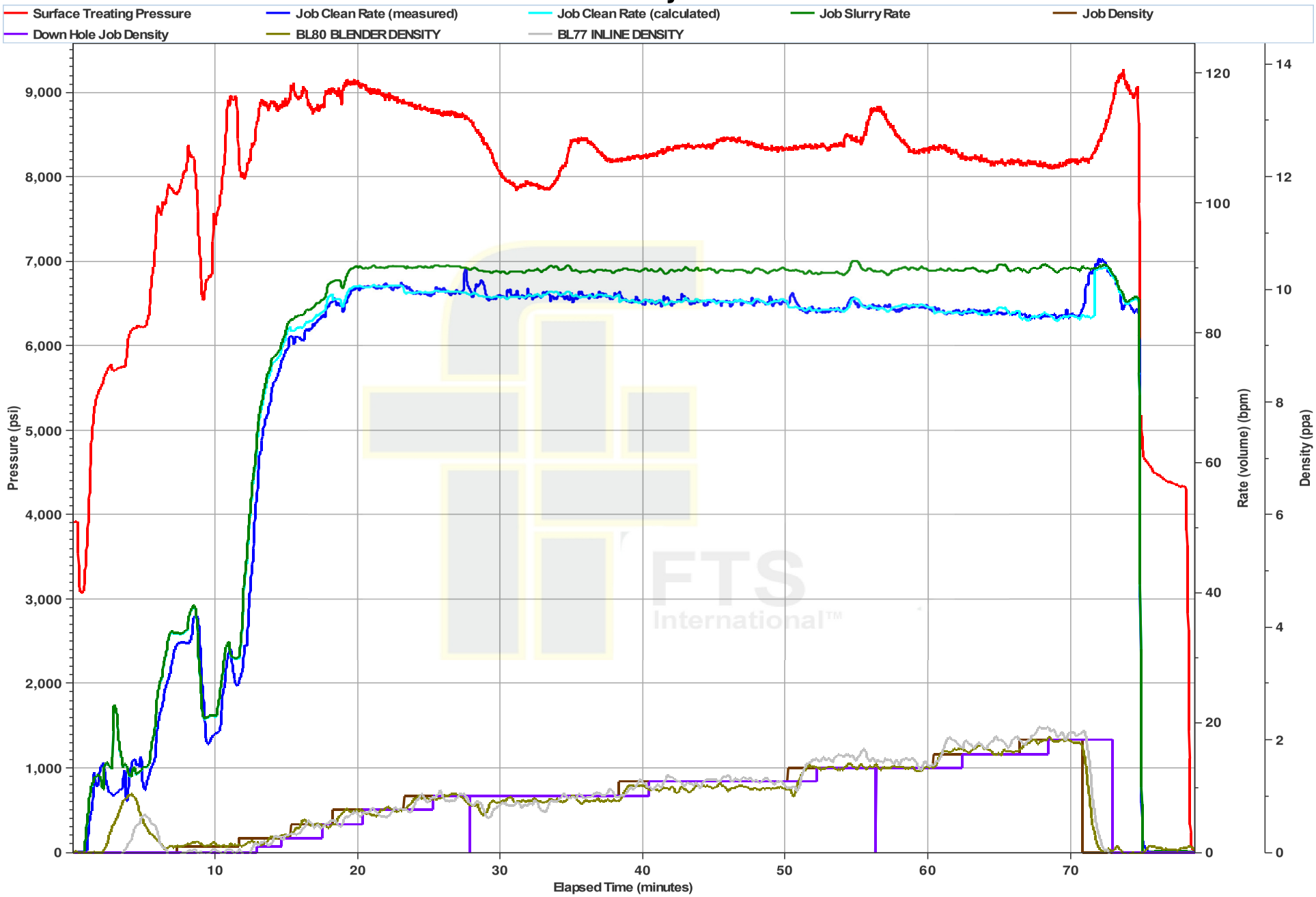
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 49 (WF.000658.M.W03.S49-aDCT-1103) **Jun 29, 2015**

Acid on Perforations



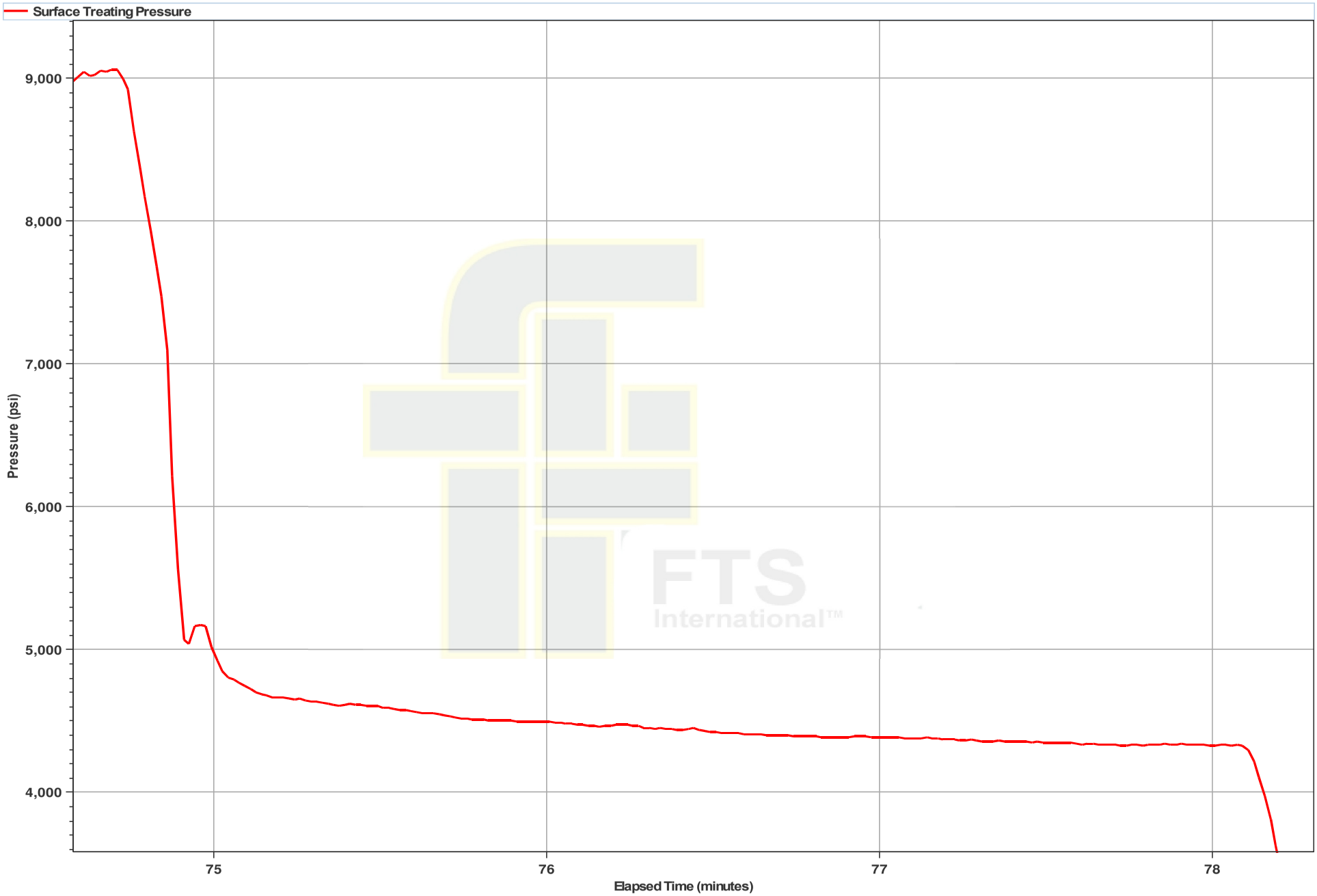
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 49 (WF.000658.M.W03.S49-aDCT-1103) **Jun 29, 2015**

Primary Plot



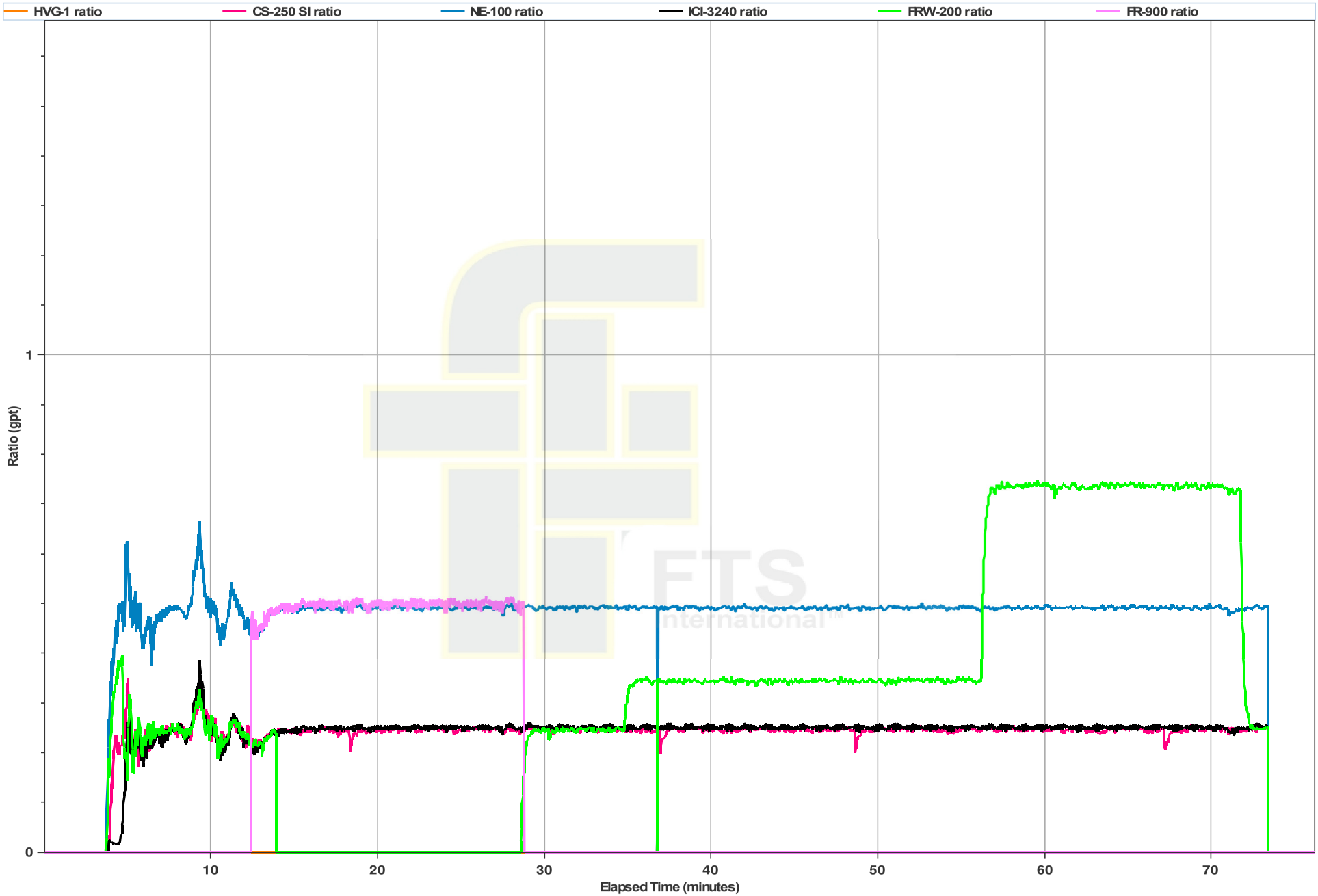
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 49 (WF.000658.M.W03.S49-aDCT-1103) **Jun 29, 2015**

ISIP Plot



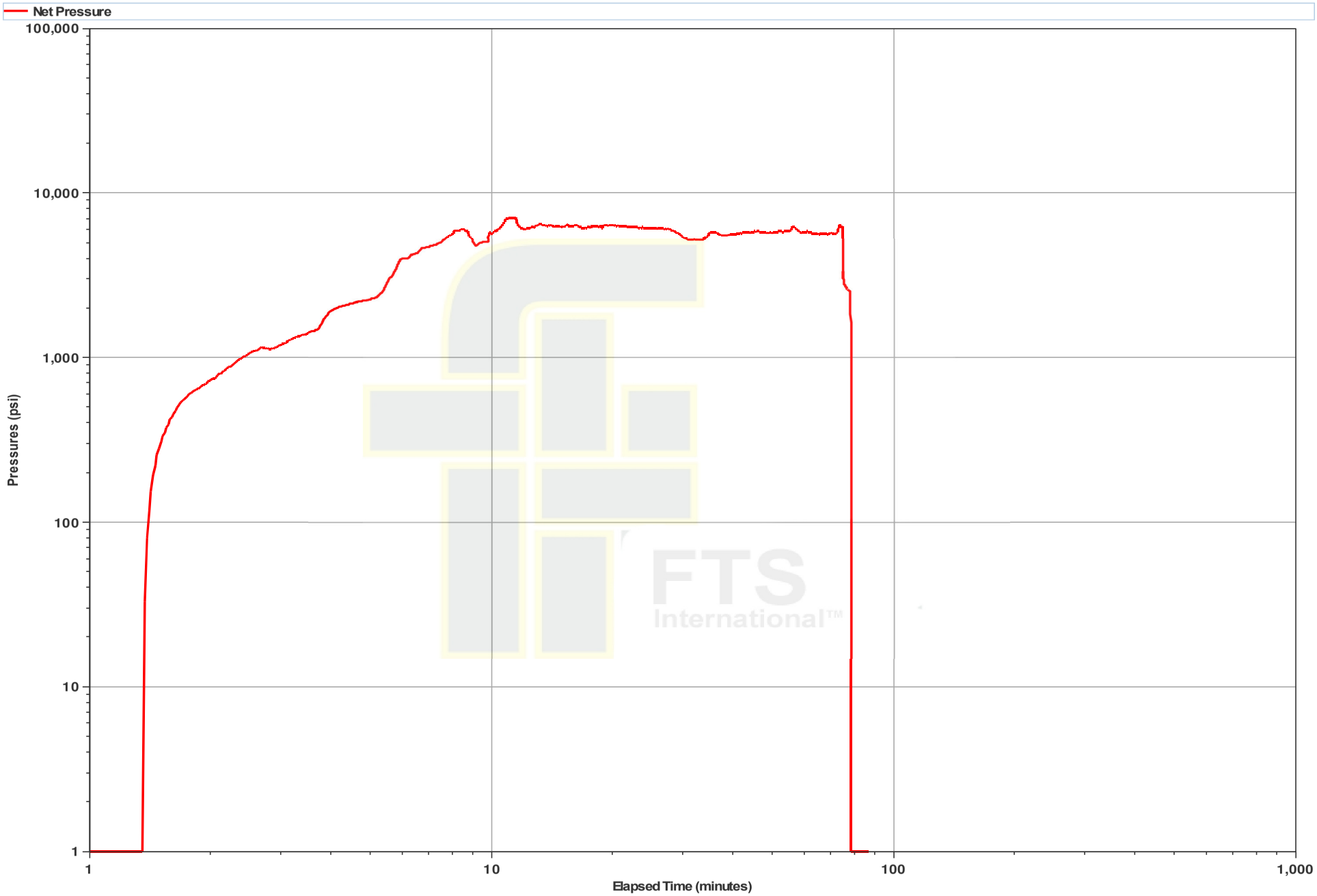
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 49 (WF.000658.M.W03.S49-aDCT-1103) Jun 29, 2015

Chemical Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 49 (WF.000658.M.W03.S49-aDCT-1103) **Jun 29, 2015**

Net Pressure Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 49 (WF.000658.M.W03.S49-aDCT-1103) Jun 29, 2015

QUALITY CONTROL OF PROPPANTS

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/29/2015
Customer Name:	American Energy - Utica	Well/Stage:	3H/49
Date Sampled:	6/29/2015	DISTRICT:	Washington, PA
VENDOR:	SANTROL		

Select Proppant Type:

___ Brown	___ Ceramic	___ Other (specify)
X White	___ Bauxite	_____
___ Resin Coated	___ Texas Gold	

Sieve Analysis	100 Mesh			Sieve Analysis	30/50 Mesh		
Sample 1	24.99	grams of sample		Sample 2	25.00	grams of sample	
	Amount Retained				Amount Retained		
Sieve mesh	Gram	%		Sieve mesh	Gram	%	
			Total				Total
50	1.18	4.72	In-Size	20	0.00	0.00	In-Size
70	17.40	69.63		30	0.80	3.20	
100	4.56	18.25	95.3%	40	13.66	54.64	93.4%
120	1.10	4.40		45	6.78	27.12	
140	0.75	3.00		50	2.90	11.60	
200	0.00	0.00		70	0.86	3.44	
Pan	0.00	0.00	fines	Pan	0.00	0.00	fines
Total wt. Gram	24.99	100.00		Total wt. Gram	25.00	100.00	

Tested By: Amanda Lyle

WATER-BASED FRAC FLUID QUALITY CONTROL
(Attachment to Post Treatment Report)

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/29/2015
Customer Name:	American Energy - Utica	Proposal #:	3H/49
Date Sampled:	6/29/2015	Water Source:	Working Tank

Sample/Tank No.	Clarity, Color, Odor	Sample Temperature, (F)	Specific gravity	Initial pH	Chloride, ppm	Hardness, ppm	Calcium, ppm	Magnesium, ppm	Iron ppm	Hydroxide, ppm	Bicarbonate, ppm	Carbonate, ppm	Sulfate, ppm	Barium, ppm
Working Tank	Clear	72	1	7.6	90	100	36	16	0	0	268	0	50	0
Reused Water/ from Blender Tub	Yellow, Slightly Cloudy, Petroleum Odor	70	1.025	6	55,983	50000	19,605	7,389	10	0	7320	0	150	0

Frac Fluid Quality Gel Testing (These Recording are to made prior to pumping job)														
Sample #														
Base Gel Type	HVG-1													
Gel Loading (lbs/1000 gal.)	2.5													
Sample Temperature, (F)	72													
Initial pH	7.2													
Visc. Reading @ 300 rpms	6.5													
Viscosity, (cp)	6.5													
Sample 1 3 min Hydration	4													
Sample 2 3 min Hydration	5													
Sample 3 3 min Hydration	6.5													
X-Link Vortex Closure, min:sec	n/a													
X-Link Crown, min:sec	n/a													
X-Link pH	n/a													
Gel Break Time (<2cp) mins	18.5													

Frac Fluid Quality Gel Testing (These Recording are to made while pumping job)														
Stage #														
Base Gel Viscosity (cp)														
X-Link pH								.						
Sample XL time, min:sec														
Sample Temperature														

Acid Quality	Percent Acid	NaOH, mLs	Specific Gravity
	28		1.14

Additional testing or documentation may be required by the customer or for frac fluid quality assurance.

Tested By: Amanda Lyle

Post Job Report

AMERICAN ENERGY - UTICA

Red Hill Farm MDS GR 3H

Stage : 50 OF 54

HARRISON, OH

Operations Representative:

Name:	**David Knapp**
Office:	**724-743-2537**
Fax:	**724-743-7719**
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Sales Representative:

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Cell:	
Email:	**BRUCE.MATTHEWS@FTSI.COM**

Engineering Manager:

Name:	**Thaddeus Craun**
Office:	**817-682-8702**
Fax:	**724-743-7719**
Cell:	
Email:	**THADDEUS.CRAUN@FTSI.COM**

FTS International
1432 Route 519
Eighty Four, PA 15330

Customer: American Energy - Utica
Well: Red Hill Farm Mds Gr 3H
Stage: 50
Job End Date: 06/29/2015

Job Summary

Well Information

TVD:	7,301	**Top Perf:**	8,263
No. Of Perfs:	30		

Casing	Tubing
5.50" 20.00#	N/A

Pressures, Rates and Volumes

	Proposed	Actual	Max	Min
STP	9,046 psi	8,545 psi	9,655 psi	7,808 psi
Rate	80.0 bpm	87.0 bpm	90.4 bpm	32.5 bpm

	Proposed	Actual		
Clean Volume	5,772 bbls	5,463 bbls		
Slurry Volume	6,042 bbls	5,730 bbls		
Flush Volume	357 bbls	188 bbls		

	Proposed	Start	End
Frac Pumps on Location	10	14	14

Open Well:	Start Time	08:20	Pressure	3,166 psi
	Ball Seat	162 bbls	Break Down	8,401 psi
	Initial ISIP:	5,221 psi	Initial F.G.:	1.15 psi/ft
Stage Complete:	End Time	09:39	Job Time	01:15
	Final ISIP	5,221 psi	Final F.G.	1.15 psi/ft
	HHP	18,221	5 Min:	46,448 psi
	Proppant Min:	0.00	10 Min:	N/A
	Proppant Max:	2.00	15 Min:	N/A

Material Volume

Material	Proposed	Calculated	Actual	Variance
100 Mesh White	40,000	39,300	39,305	0%
30/50 White	210,000	208,111	210,111	1%
Total Proppants	250,000	247,411	249,416	1%

Material	Proposed	Calculated	Actual	Variance
0.1%-7.5% HCL	3,000	2,982	3,000	1%
APB-1	0	4	4	0%
CI-150	3	3	3	0%
CS-250 SI	60	55	54	-2%
FE-200L	15	15	15	0%
FRW-200	180	100	97	-3%
HVG-1 4.0	0	20	20	0%
ICI-3240	60	55	55	0%
LTB-1	0	4	4	0%
NE-100	0	110	108	-2%
NE-100W	120	0	0	0

Comments:

Pumpdown Information:
Total Bbls: 39
Max Pressure (psi): 5964
Max Rate (bpm): 12.5

FTS International
1432 Route 519
Eighty Four, PA 15330

Customer: American Energy - Utica
Well: Red Hill Farm Mds Gr 3H
Stage: 50
Job End Date: 06/29/2015

Treatment Report

Date:	6/29/2015	District:	Washington County,PA	Quote No:	051815_035725QF	API:	34-059-24370

MIL Time	STP	Slurry BPM	Stage Clean (bbls)	Cumulative Clean (bbls)	Stage Slurry (bbls)	Cumulative Slurry (bbls)	Stage Proppant (lbs)	Cumulative Proppant (lbs)	Description	Proppant	PPA
08:20	3,166	0.0	0	0	0	0	0	0	Freshwater Open Well		0.00
08:21	4,908	8.9	17	17	17	17	0	0	Freshwater Load		0.00
08:27	5,920	8.4	71	88	71	88	0	0	7.5% HCL Acid Acid		0.00
08:31	7,196	23.6	74	162	74	162	0	0	Slickwater Load		0.00
08:34	8,401	26.1	2	164	2	164	0	0	Slickwater Breakdown		0.00
08:34	8,505	31.6	25	189	25	189	0	0	Slickwater Pad		0.00
08:35	9,215	32.6	223	412	224	413	937	937	Slickwater Proppant	100 Mesh White	0.10
08:39	9,235	89.5	225	637	228	641	2,363	3,300	Slickwater Proppant	100 Mesh White	0.25
08:42	9,268	89.7	271	908	279	920	7,114	10,414	Slickwater Proppant	100 Mesh White	0.50 - 0.75
08:46	8,239	89.9	429	1,337	444	1,364	13,514	23,928	Slickwater Proppant	100 Mesh White	0.75
08:51	9,070	90.0	366	1,703	383	1,747	15,372	39,300	Slickwater Proppant	100 Mesh White	1.00
08:56	8,933	89.5	775	2,478	810	2,557	32,550	71,850	Slickwater Proppant	30/50 White	1.00
09:04	8,167	89.8	800	3,278	845	3,402	42,000	113,850	Slickwater Proppant	30/50 White	1.25
09:13	8,088	89.9	50	3,328	53	3,455	2,625	116,475	10# Linear Gel Proppant	30/50 White	1.25
09:14	8,067	89.9	20	3,348	21	3,476	1,260	117,735	10# Linear Gel Proppant	30/50 White	1.50
09:14	8,046	89.8	740	4,088	790	4,266	46,620	164,355	Slickwater Proppant	30/50 White	1.50
09:22	8,109	90.1	10	4,098	11	4,277	683	165,038	10# Linear Gel Proppant	30/50 White	1.50 - 1.75
09:23	8,170	90.1	40	4,138	43	4,320	2,940	167,978	10# Linear Gel Proppant	30/50 White	1.75
09:23	8,160	89.7	410	4,548	442	4,762	30,135	198,113	Slickwater Proppant	30/50 White	1.75
09:28	8,409	89.6	50	4,598	54	4,816	3,938	202,051	10# Linear Gel Proppant	30/50 White	1.75 - 2.00
09:30	8,503	88.9	20	4,618	22	4,838	1,680	203,731	10# Linear Gel Proppant	30/50 White	2.00
09:30	8,476	89.2	520	5,138	567	5,405	43,680	247,411	Slickwater Proppant	30/50 White	2.00
09:34	8,394	89.8	137	5,275	137	5,542	0	247,411	Slickwater Clean screws		0.00
09:37	9,542	86.0	50	5,325	50	5,592	0	247,411	Slickwater Flush		0.00
09:38	9,618	80.9	138	5,463	138	5,730	0	247,411	Freshwater Flush		0.00
09:39	5,221	0.0	0	5,463	0	5,730	0	247,411	Freshwater Shutdown		0.00
Total JobTime (HH:MM): 01:19											

Min STP:	7,808 psi	**Max STP:**	9,655 psi	**Average STP:**	8,545 psi	**5 Min:**	46,448 psi
Min Rate:	32.5 bpm	**Max Rate:**	90.4 bpm	**Average Rate:**	87.0 bpm	**10 Min:**	0 psi
Initial ISIP:	5,221 psi	**Initial F.G.:**	1.15 psi/ft	**Average HHP:**	18,221	**15 Min:**	0 psi
Final ISIP:	5,221 psi	**Final F.G.:**	1.15 psi/ft	**Customer Representative:**		Don Baker	
FTSI Representative:		Etuate Varea & Cody Melone					

Comments:

The proppant values contained in this report are calculated based on actual barrel counts and target densities. Actual total proppant usage is 249,416 lbs. Charge time is 1 hour(s) 15 minute(s). All chemicals and proppant ran as documented.

Min/Max/Avg were taken from sand stages. All chem changes from proposed were made per AEU representative request.

Started pumping a 10# Linear Gel system during the 1.25 ppg stage of 30/50 per AEU representative request.

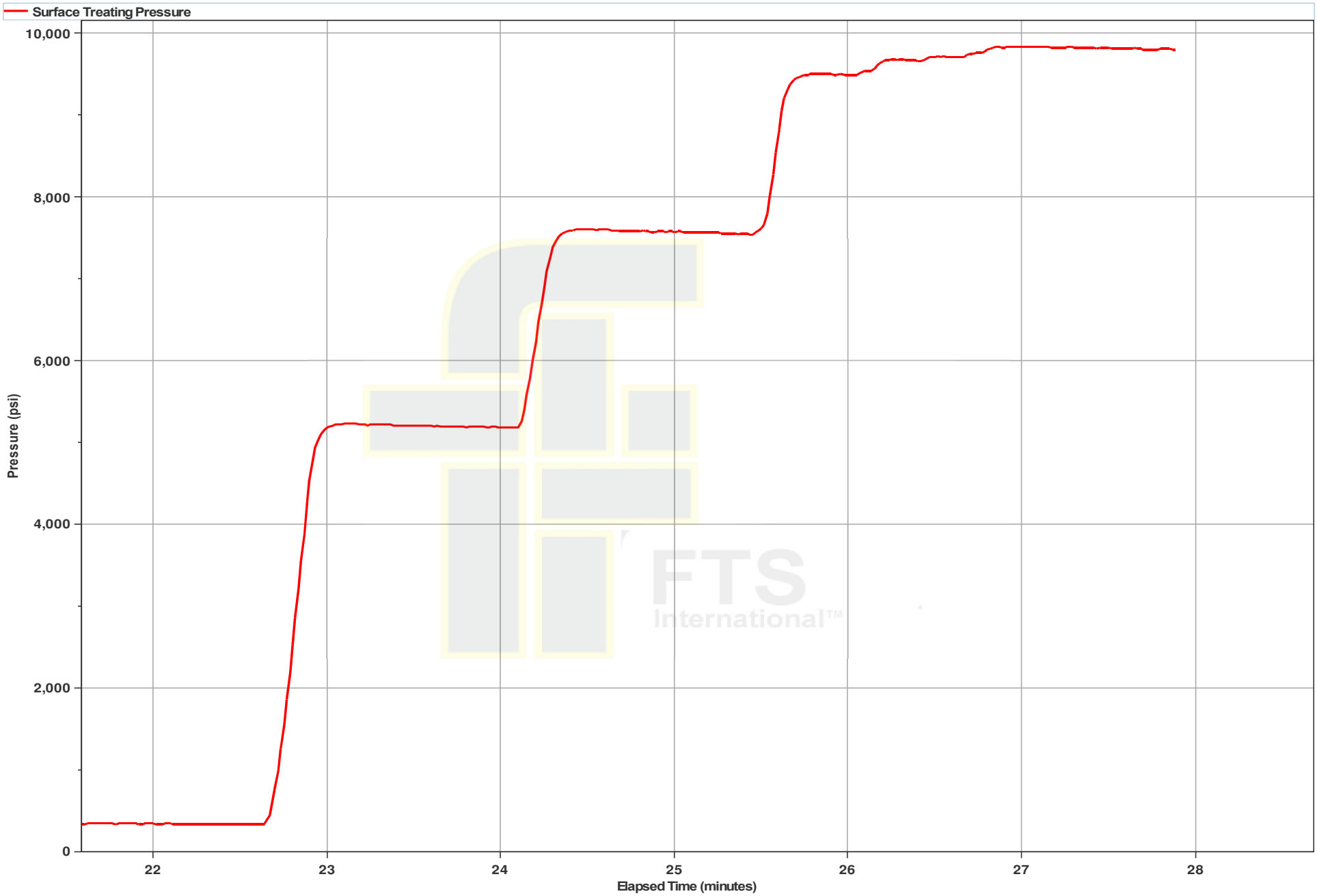
No reused water pumped.

1 Minute Shutdown (psi): 4919
2 Minute Shutdown (psi): 4793
5 Minute Shutdown (psi): 4648

Chemical Changes:

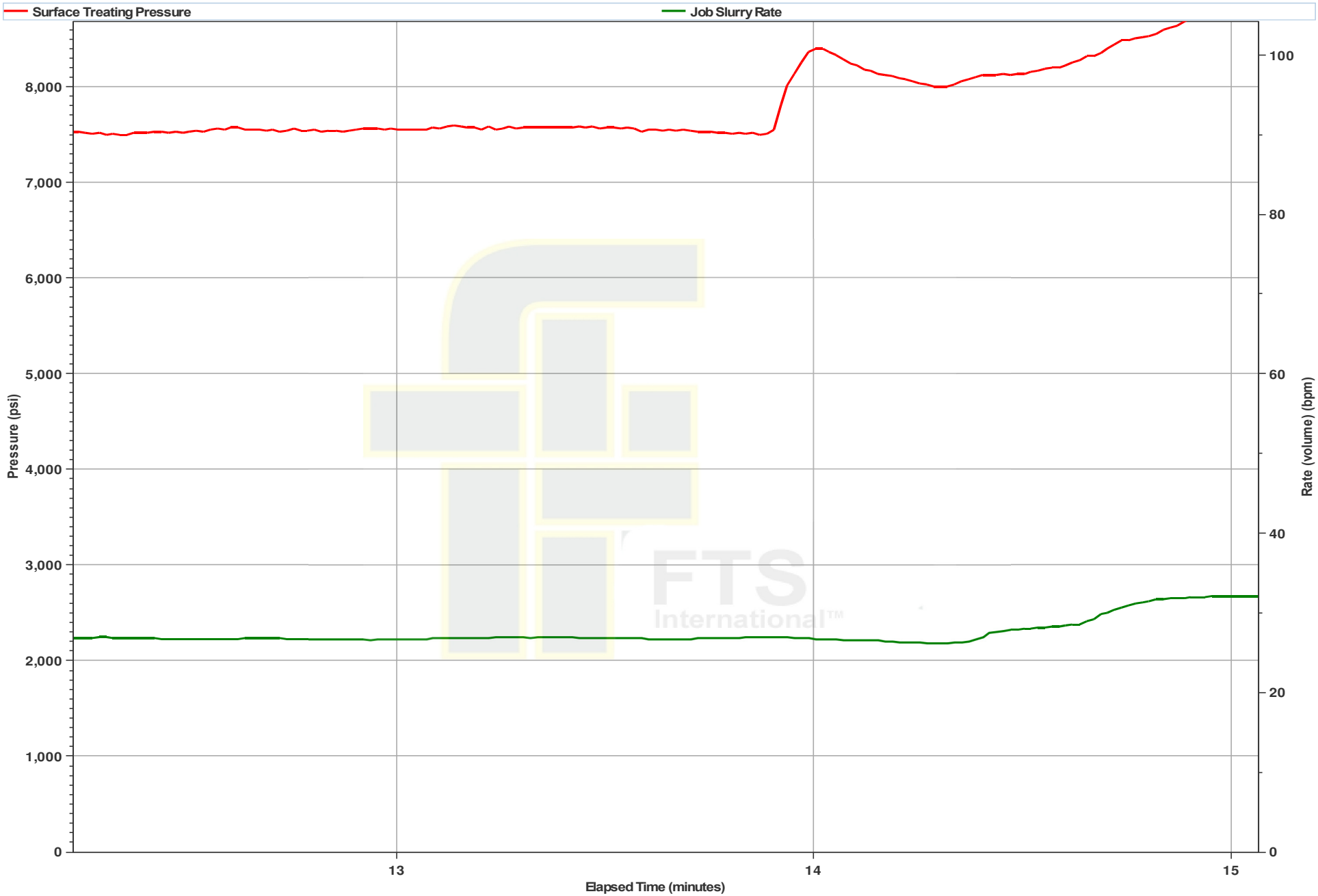
Chemical Name	Chemical Loading	Cumulative Clean
FRW-200	0.50	2,478
FRW-200	0.75	5,138

AEU Pressure Test



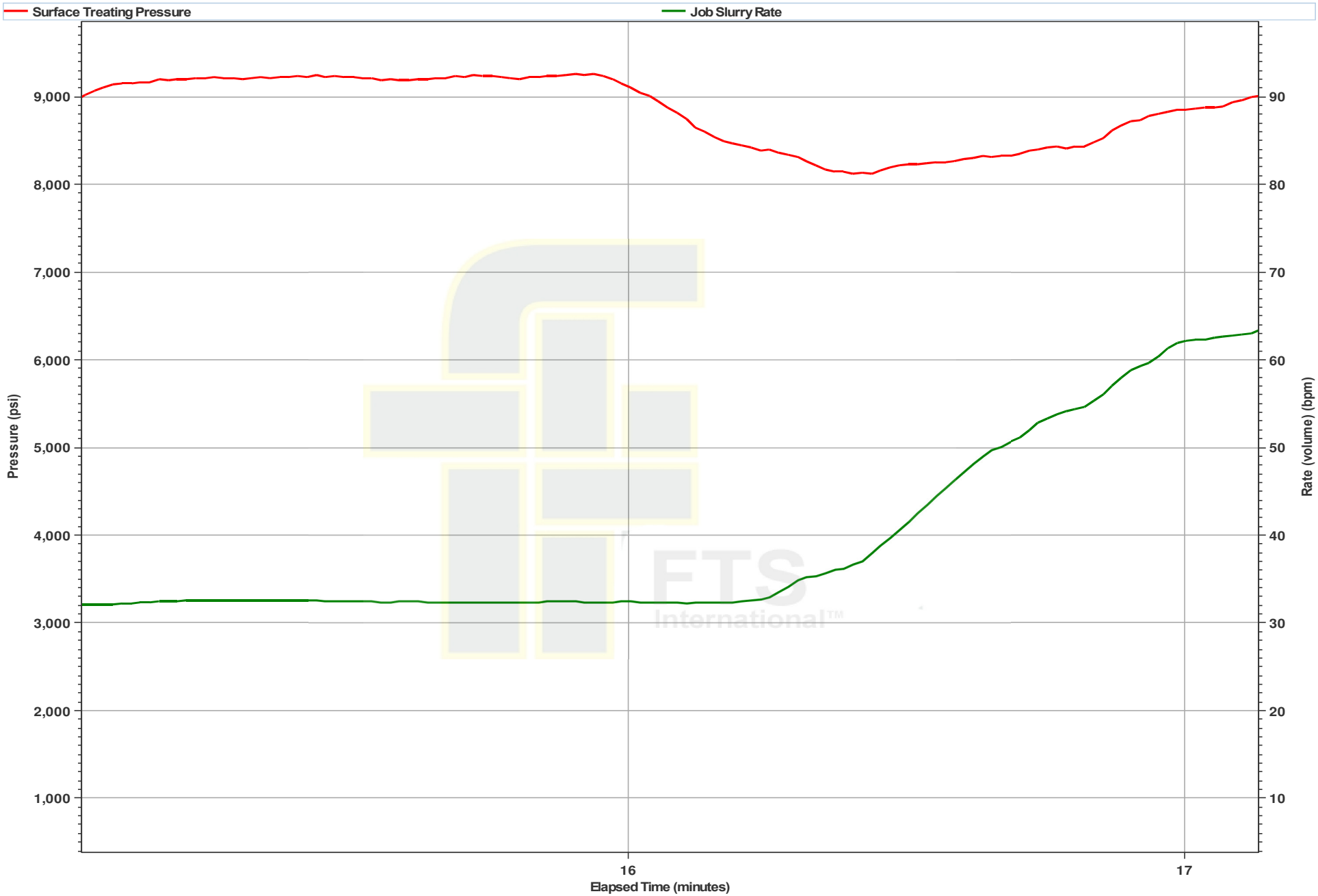
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 50 (WF.000658.M.W03.S50-aDCT-1103) **Jun 29, 2015**

Ball Seat and Breakdown



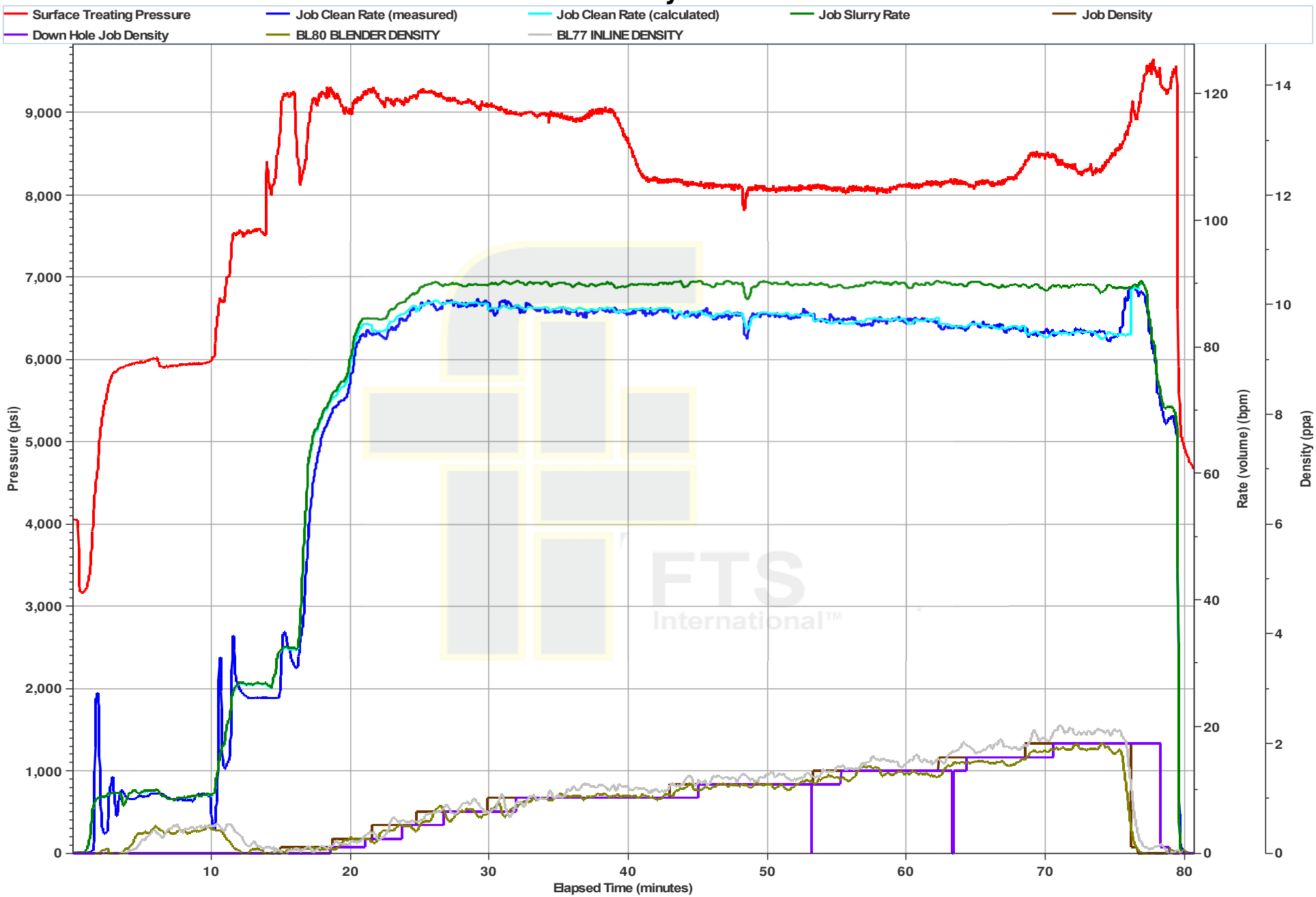
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 50 (WF.000658.M.W03.S50-aDCT-1103) **Jun 29, 2015**

Acid on Perforations



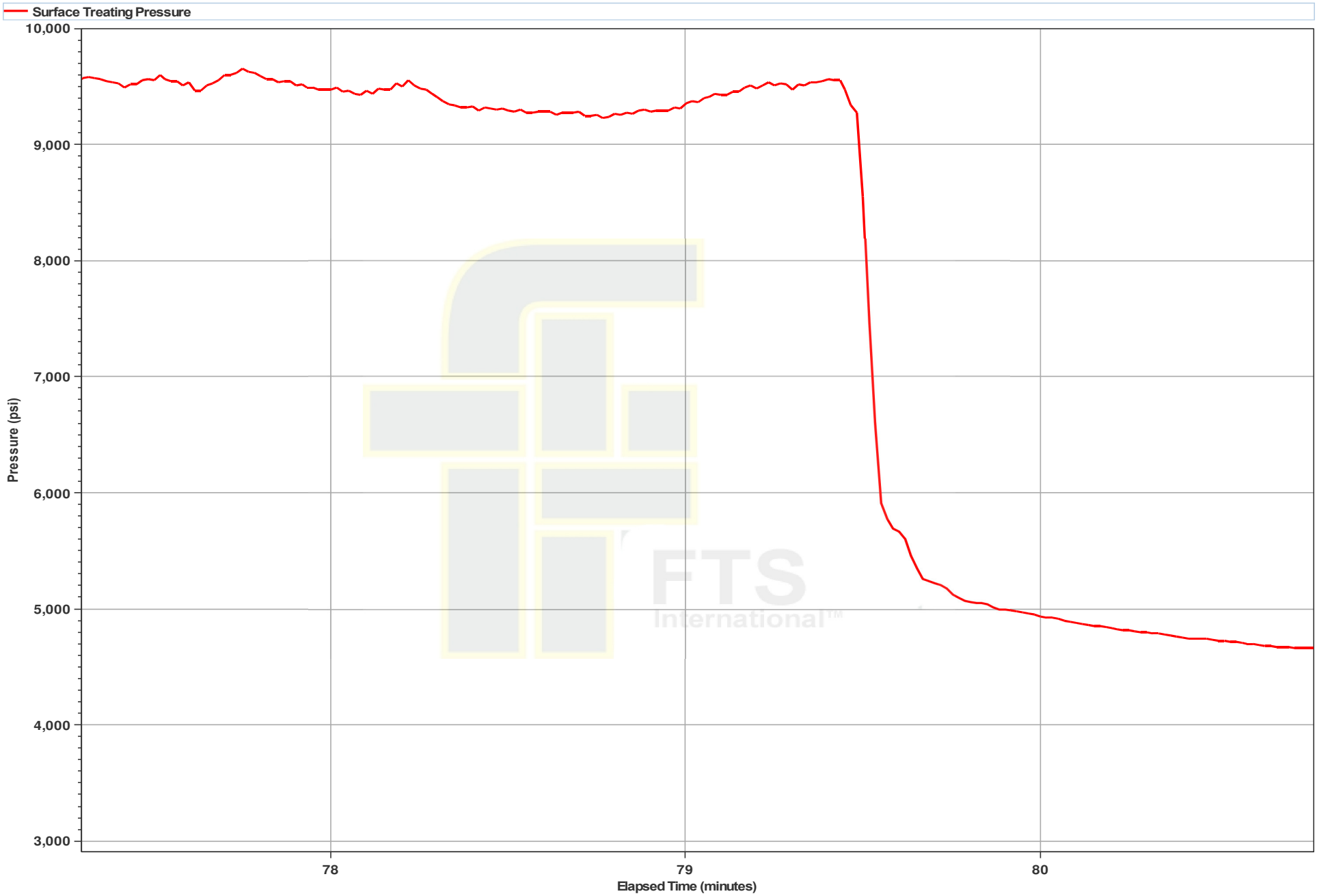
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 50 (WF.000658.M.W03.S50-aDCT-1103) **Jun 29, 2015**

Primary Plot



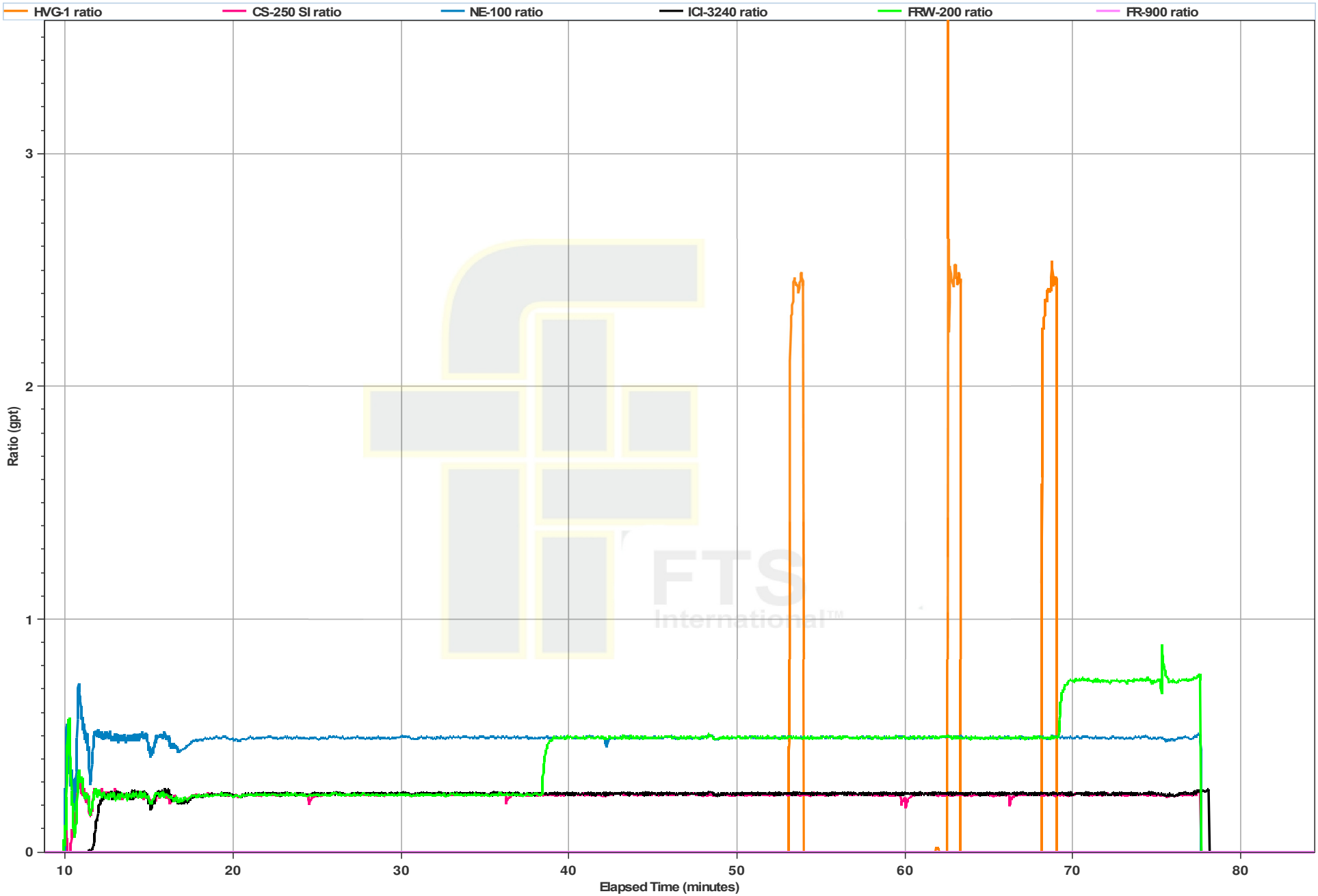
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 50 (WF.000658.M.W03.S50-aDCT-1103) **Jun 29, 2015**

ISIP Plot



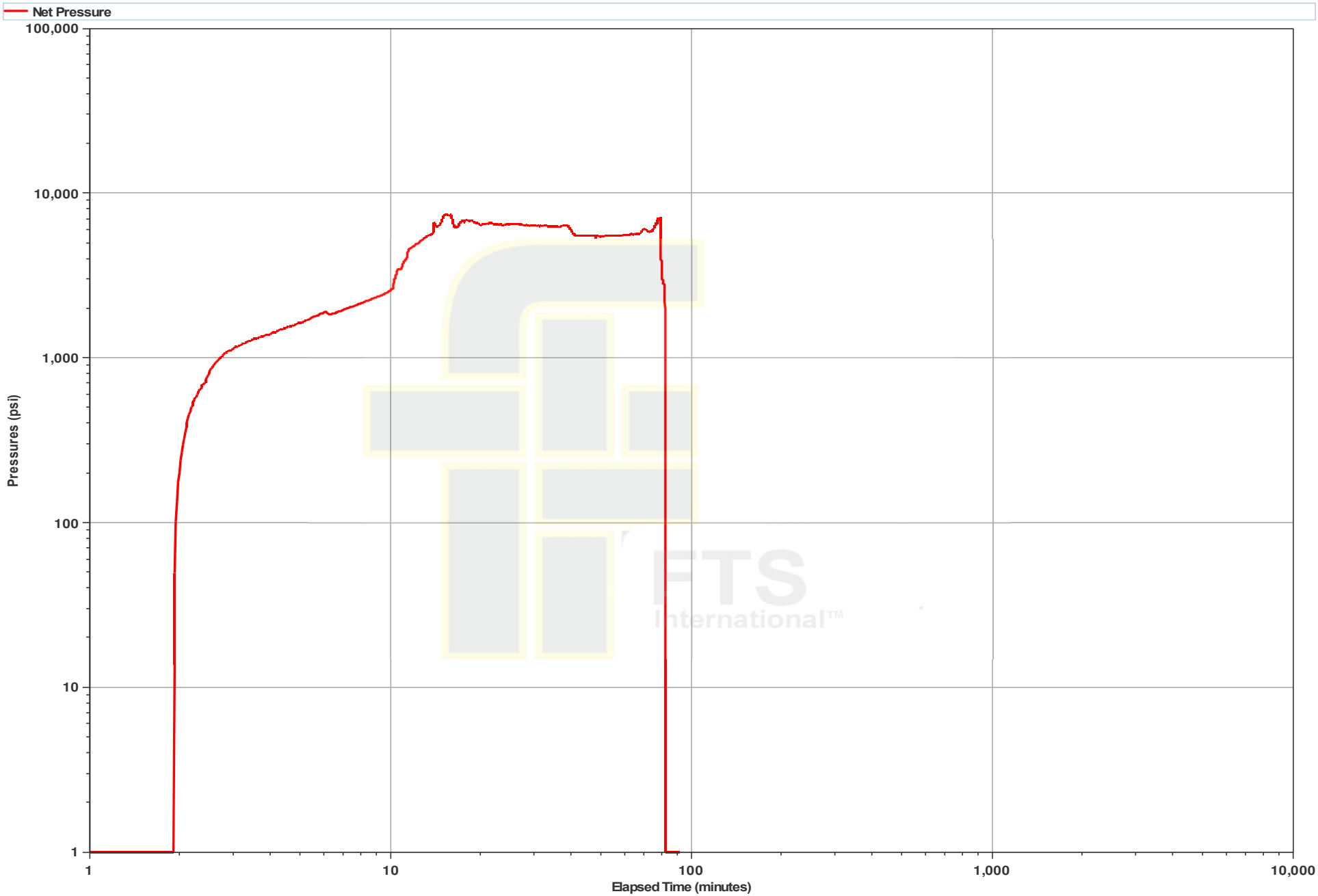
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 50 (WF.000658.M.W03.S50-aDCT-1103) **Jun 29, 2015**

Chemical Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 50 (WF.000658.M.W03.S50-aDCT-1103) **Jun 29, 2015**

Net Pressure Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 50 (WF.000658.M.W03.S50-aDCT-1103) Jun 29, 2015

WATER-BASED FRAC FLUID QUALITY CONTROL
(Attachment to Post Treatment Report)

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/29/2015
Customer Name:	American Energy - Utica	Proposal #:	3H/50
Date Sampled:	6/29/2015	Water Source:	Working Tank

Sample/Tank No.	Clarity, Color, Odor	Sample Temperature, (F)	Specific gravity	Initial pH	Chloride, ppm	Hardness, ppm	Calcium, ppm	Magnesium, ppm	Iron ppm	Hydroxide, ppm	Bicarbonate, ppm	Carbonate, ppm	Sulfate, ppm	Barium, ppm
Working Tank	Clear	76	1	7.24	35	82	24	14	0	0	647	0	55	0

Frac Fluid Quality Gel Testing (These Recording are to made prior to pumping job)														
Sample #														
Base Gel Type	HVG-1													
Gel Loading (lbs/1000 gal.)	2.5													
Sample Temperature, (F)	76													
Initial pH	7.3													
Visc. Reading @ 300 rpms	6													
Viscosity, (cp)	6													
Sample 1 3 min Hydration	4													
Sample 2 3 min Hydration	5													
Sample 3 3 min Hydration	6													
X-Link Vortex Closure, min:sec	n/a													
X-Link Crown, min:sec	n/a													
X-Link pH	n/a													
Gel Break Time (<2cp) mins	20													

Frac Fluid Quality Gel Testing (These Recording are to made while pumping job)														
Stage #														
Base Gel Viscosity (cp)														
X-Link pH								.						
Sample XL time, min:sec														
Sample Temperature														

Acid Quality	Percent Acid	NaOH, mLs	Specific Gravity
	28		1.14

Additional testing or documentation may be required by the customer or for frac fluid quality assurance.

Tested By: Etuate Varea

QUALITY CONTROL OF PROPPANTS

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/29/2015
Customer Name:	American Energy - Utica	Well/Stage:	3H/50
Date Sampled:	6/29/2015	DISTRICT:	Washington, PA
VENDOR:	SANTROL		

Select Proppant Type:

___ Brown	___ Ceramic	___ Other (specify)
X White	___ Bauxite	_____
___ Resin Coated	___ Texas Gold	

Sieve Analysis	100 Mesh			Sieve Analysis	30/50 Mesh		
Sample 1	24.70	grams of sample		Sample 2	24.50	grams of sample	
	Amount Retained				Amount Retained		
Sieve mesh	Gram	%		Sieve mesh	Gram	%	
			Total				Total
50	1.50	6.07	In-Size	20	0.00	0.00	In-Size
70	16.50	66.80		30	1.30	5.31	
100	4.20	17.00	93.9%	40	13.90	56.73	90.6%
120	1.90	7.69		45	6.50	26.53	
140	0.40	1.62		50	1.80	7.35	
200	0.20	0.81		70	1.00	4.08	
Pan	0.00	0.00	fines	Pan	0.00	0.00	fines
Total wt. Gram	24.70	100.00		Total wt. Gram	24.50	100.00	

Tested By: Etuate Varea

Post Job Report

AMERICAN ENERGY - UTICA

Red Hill Farm MDS GR 3H

Stage : 51 OF 54

HARRISON, OH

Operations Representative:

Name:	David Knapp
Office:	724-743-2537
Fax:	724-743-7710
Cell:	
Email:	DAVID.KNAPP@FTSI.COM

Sales Representative:

Name:	Bruce Matthews
Office:	405-574-3921
Fax:	405-787-1325
Cell:	
Email:	BRUCE.MATTHEWS@FTSI.COM

Engineering Manager:

Name:	Thaddeus Craun
Office:	817-832-8702
Fax:	724-743-7710
Cell:	
Email:	THADDEUS.CRAUN@FTSI.COM

FTS International
[illegible]
Ogden, [illegible]

FTS INTERNATIONAL

Customer: American Energy - Utica
Well: Red Hill Farm Bhs Gr 3H
Stage: 01
Job End Date: [illegible]

Job Summary

Well Information

TVD:	7,301	Top Perf:	6,111
No. Of Perfs:	30		

Casing	Tubing
5.50" 23.000	NA

Pressures, Rates and Volumes

	Proposed	Actual	Max	Min
STP	[illegible] psi	[illegible] psi	[illegible] psi	7,030 psi
Rate	[illegible] bpm	[illegible] bpm	[illegible] bpm	[illegible] bpm

	Proposed	Actual		
Clean Volume	6,772 bbls	[illegible] bbls		
Slurry Volume	[illegible] bbls	[illegible] bbls		
Flush Volume	397 bbls	131 bbls		

	Proposed	Start	End
Free Pumps on Location	19	15	15

Open Well:	Start Time	15:53	Pressure	[illegible] psi
	Bull Dwn	[illegible] bbls	Break Down	[illegible] psi
	Initial ISIP:	[illegible] psi	Initial F.G.:	[illegible] psi/ft
Stage Complete:	End Time	17:19	Job Time	[illegible]
	Final ISIP	[illegible] psi	Final F.G.	[illegible] psi/ft
	HHP	[illegible]	[illegible] Max	[illegible] psi
	Pressure Min	[illegible]	[illegible] Min	NA
	Pressure Max	[illegible]	[illegible] Max	NA

Material Volume

Material	Proposed	Calculated	Actual	Variance
100 Mesh White	[illegible]	[illegible]	[illegible]	0%
[illegible] White	[illegible]	[illegible]	[illegible]	0%
Total Proppants	[illegible]	[illegible]	[illegible]	0%

Material	Proposed	Calculated	Actual	Variance
6.1%-7.5% HCL	[illegible]	[illegible]	[illegible]	1%
APB-1	0	1	1	0%
[illegible]	3	3	3	0%
[illegible]	[illegible]	55	55	0%
FE-[illegible]	15	15	15	0%
[illegible]	[illegible]	[illegible]	[illegible]	1%
[illegible]-14.5	0	5	5	0%
[illegible]	[illegible]	55	55	0%
LTB-1	0	1	1	0%
[illegible]	0	111	[illegible]	-1%
[illegible]	[illegible]	5	5	0

Comments:

Pumpdown Information:
Total Bbls: 44
Max Pressure (psi): 5841
Max Rate (bpm): 15.2

Treatment Report

Date	[illegible]	Statelate	Washington County,PA	Data Set	[illegible]	API#	[illegible]

HH:MM Time	BTP	Slurry BPM	Stage Slurry (bbls)	Cumulative Slurry (bbls)	Stage Slurry (bbls)	Cumulative Slurry (bbls)	Stage Proppant (lbs)	Cumulative Proppant (lbs)	Description	Proppant	PPA
[illegible]	[illegible]	[illegible]	0	0	0	0	0	0	Freshwater Open Well		0.00
[illegible]	[illegible]	[illegible]	11	11	11	11	0	0	Freshwater Load		0.00
[illegible]	[illegible]	[illegible]	71	82	71	82	0	0	7.5% HCL Acid Add		0.00
[illegible]	[illegible]	[illegible]	70	[illegible]	70	[illegible]	0	0	Slickwater Load		0.00
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0	0	Slickwater Breakdown		0.00
[illegible]	[illegible]	[illegible]	214	421	213	423	[illegible]	[illegible]	Slickwater Proppant	100 Mesh White	0.15
[illegible]	[illegible]	[illegible]	213	[illegible]	217	[illegible]	2,[illegible]	3,187	Slickwater Proppant	100 Mesh White	0.25
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Slickwater Proppant	100 Mesh White	0.50
[illegible]	[illegible]	[illegible]	428	1,[illegible]	444	1,344	[illegible]	[illegible]	Slickwater Proppant	100 Mesh White	0.75
[illegible]	[illegible]	[illegible]	[illegible]	1,[illegible]	[illegible]	1,739	[illegible]	27,442	Slickwater Proppant	100 Mesh White	1.00
[illegible]	[illegible]	[illegible]	745	2,[illegible]	778	2,517	[illegible]	[illegible]	Slickwater Proppant	[illegible] White	1.00
[illegible]	[illegible]	[illegible]	[illegible]	2,[illegible]	[illegible]	2,[illegible]	[illegible]	[illegible]	Slickwater Proppant	[illegible] White	1.25
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	114,[illegible]	Slickwater Proppant	[illegible] White	1.25
[illegible]	[illegible]	[illegible]	791	4,[illegible]	[illegible]	4,[illegible]	[illegible]	[illegible]	Slickwater Proppant	[illegible] White	1.50
[illegible]	[illegible]	[illegible]	[illegible]	4,[illegible]	[illegible]	4,757	4,[illegible]	[illegible]	15% Linear Gel Proppant	[illegible] White	1.75
[illegible]	[illegible]	[illegible]	[illegible]	4,[illegible]	[illegible]	4,[illegible]	[illegible]	[illegible]	Slickwater Proppant	[illegible] White	1.75
[illegible]	7,[illegible]	[illegible]	[illegible]	5,174	[illegible]	[illegible]	[illegible]	[illegible]	Slickwater Proppant	[illegible] White	0.00
[illegible]	7,[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0	[illegible]	Slickwater Clean screen		0.00
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0	[illegible]	Slickwater Flush		0.00
[illegible]	[illegible]	[illegible]	101	[illegible]	101	[illegible]	0	[illegible]	Freshwater Flush		0.00
[illegible]	[illegible]	[illegible]	0	[illegible]	0	[illegible]	0	[illegible]	Freshwater Flush		0.00
Total Job/Time (HH:MM): [illegible]											

Min BTP:	[illegible] psi	Max BTP:	[illegible] psi	Average BTP:	[illegible] psi	5 Min:	[illegible] psi
Min Rate:	[illegible] bpm	Max Rate:	[illegible] bpm	Average Rate:	[illegible] bpm	10 Min:	0 psi
Initial ISIP:	[illegible] psi	Initial F.G.:	[illegible] psi/ft	Average HHP:	[illegible]	15 Min:	0 psi
Final ISIP:	[illegible] psi	Final F.G.:	[illegible] psi/ft	Customer Representative		Mike Hammer	
FTS Representative		Travis Wilson & Cody Malone					

Comments:

The proppant values contained in this report are calculated based on actual barrel counts and target densities. Actual total proppant usage is [illegible] lbs. Charge time is 1 hour(s) 14 minute(s). All chemicals and proppant ran as documented.

Min/Max/Avg were taken from sand stages. All chem changes from proposed were made per AEU representative request.

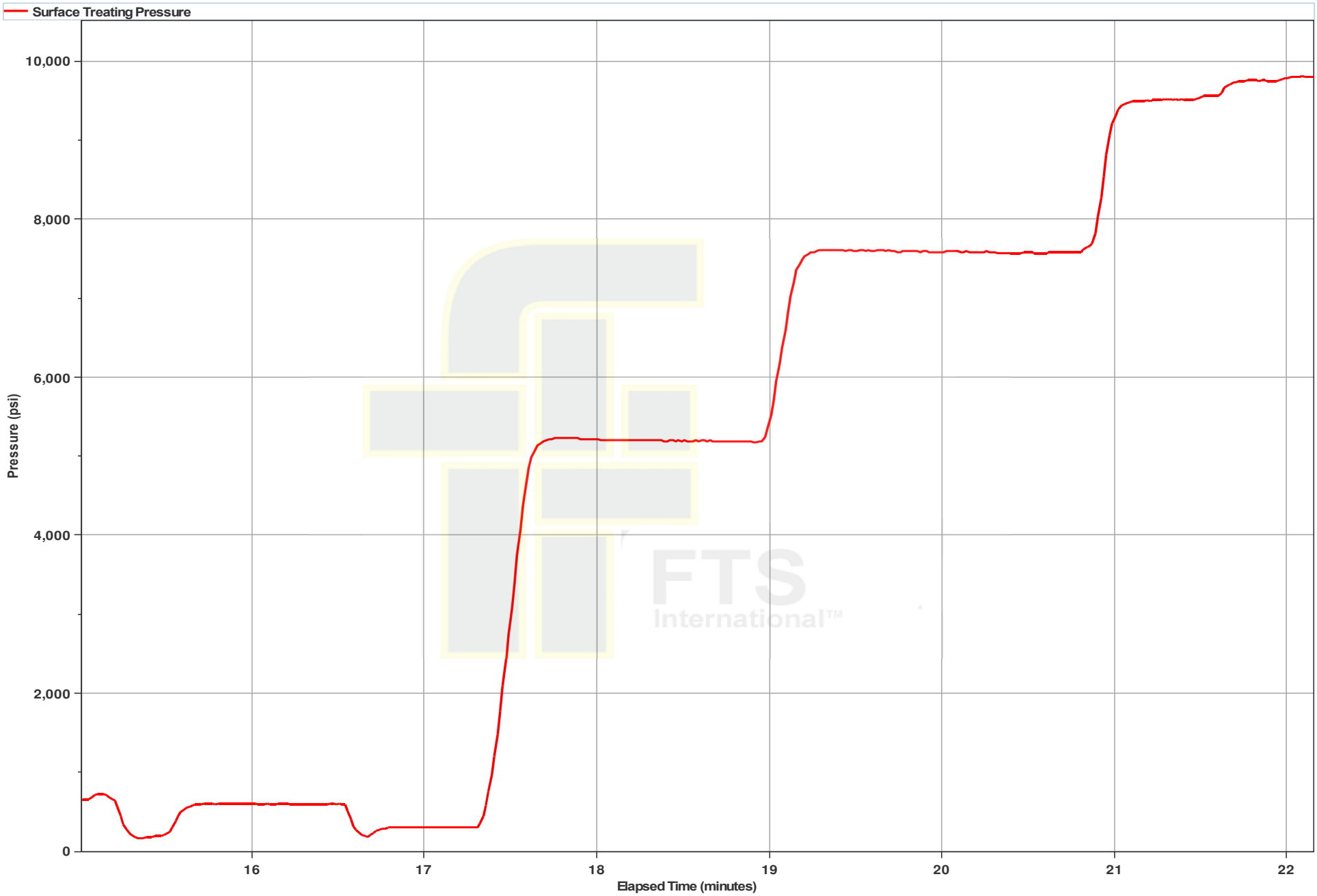
Reuse water was run on this stage for a total of 442 Bbls.

1 Minute Shutdown (psi): [illegible]
2 Minute Shutdown (psi): [illegible]
5 Minute Shutdown (psi): [illegible]

Chemical Changes:

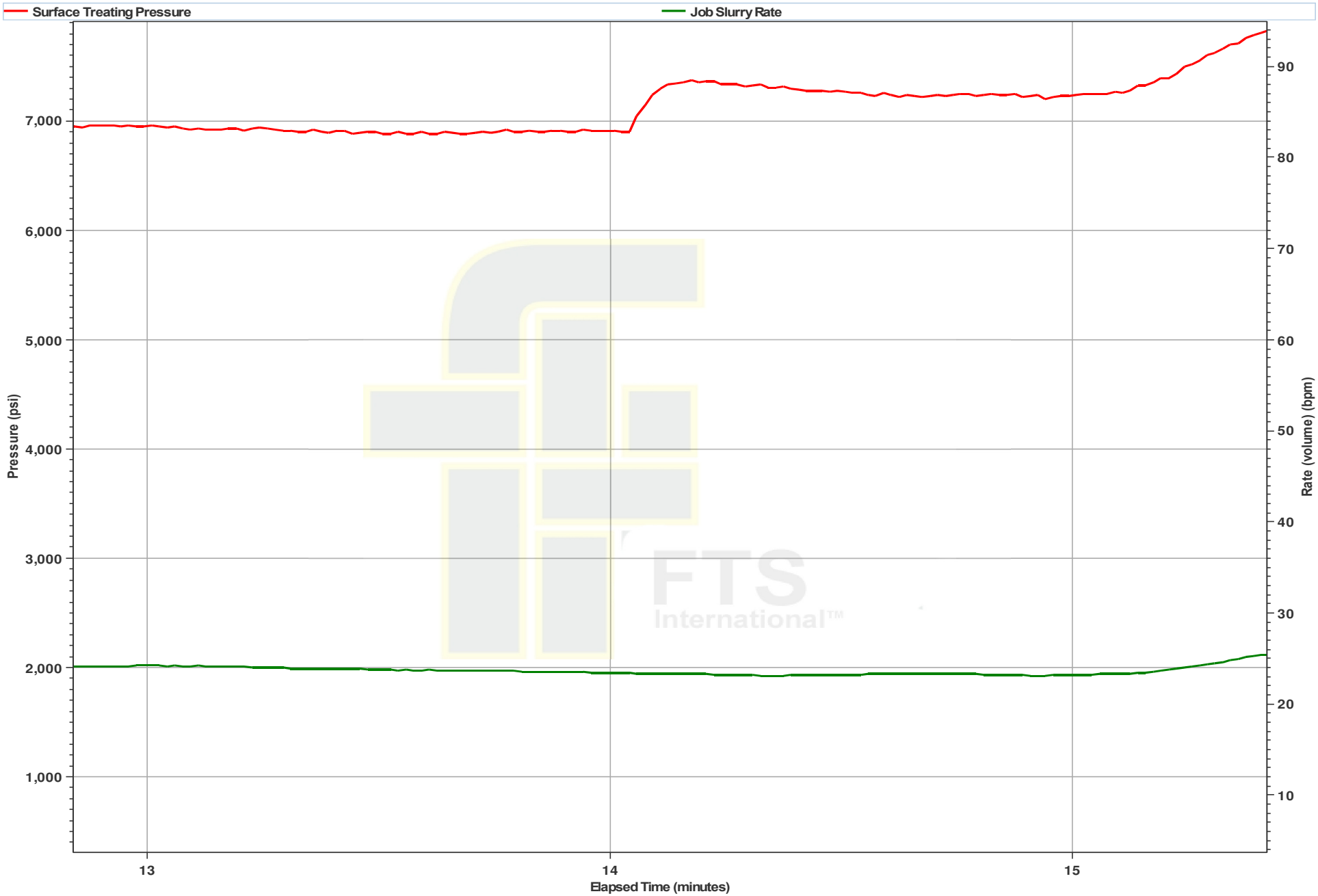
Chemical Name	Chemical Loading	Cumulative Gleen
FRW-200	0.50	3,213

AEU Pressure Test



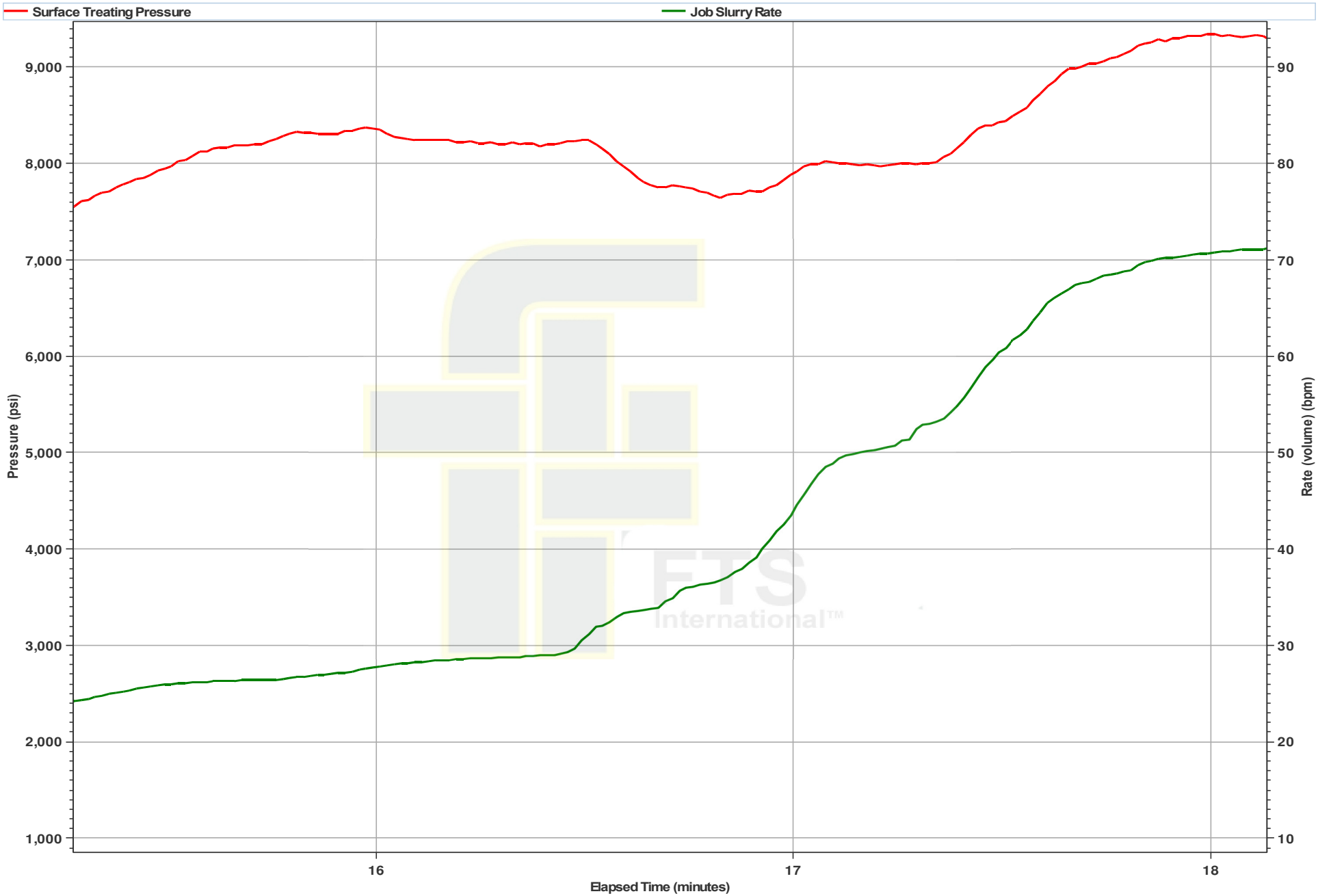
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 51 (WF.000658.M.W03.S51-aDCT-1103) **Jun 29, 2015**

Ball Seat and Breakdown



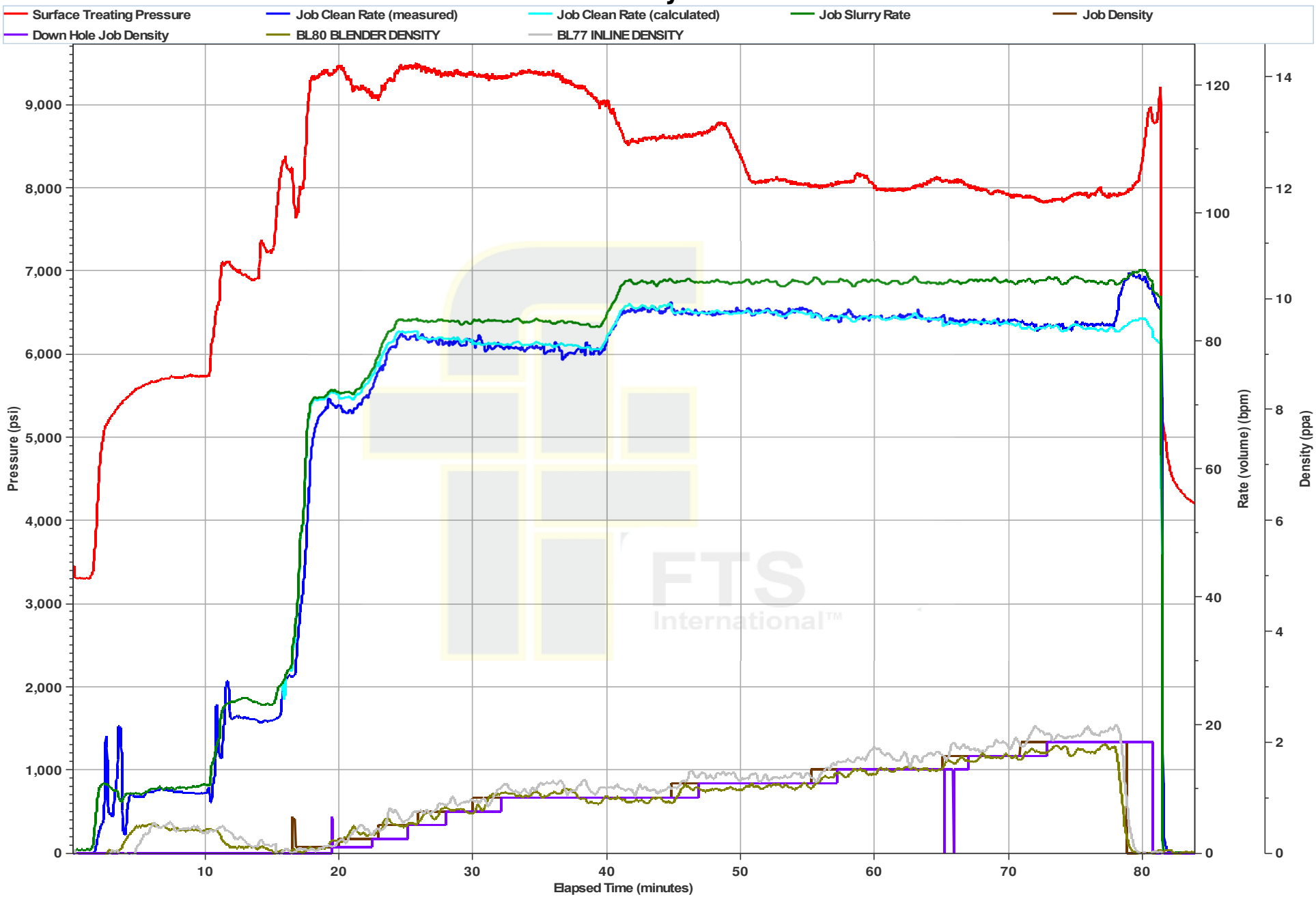
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 51 (WF.000658.M.W03.S51-aDCT-1103) **Jun 29, 2015**

Acid on Perforations



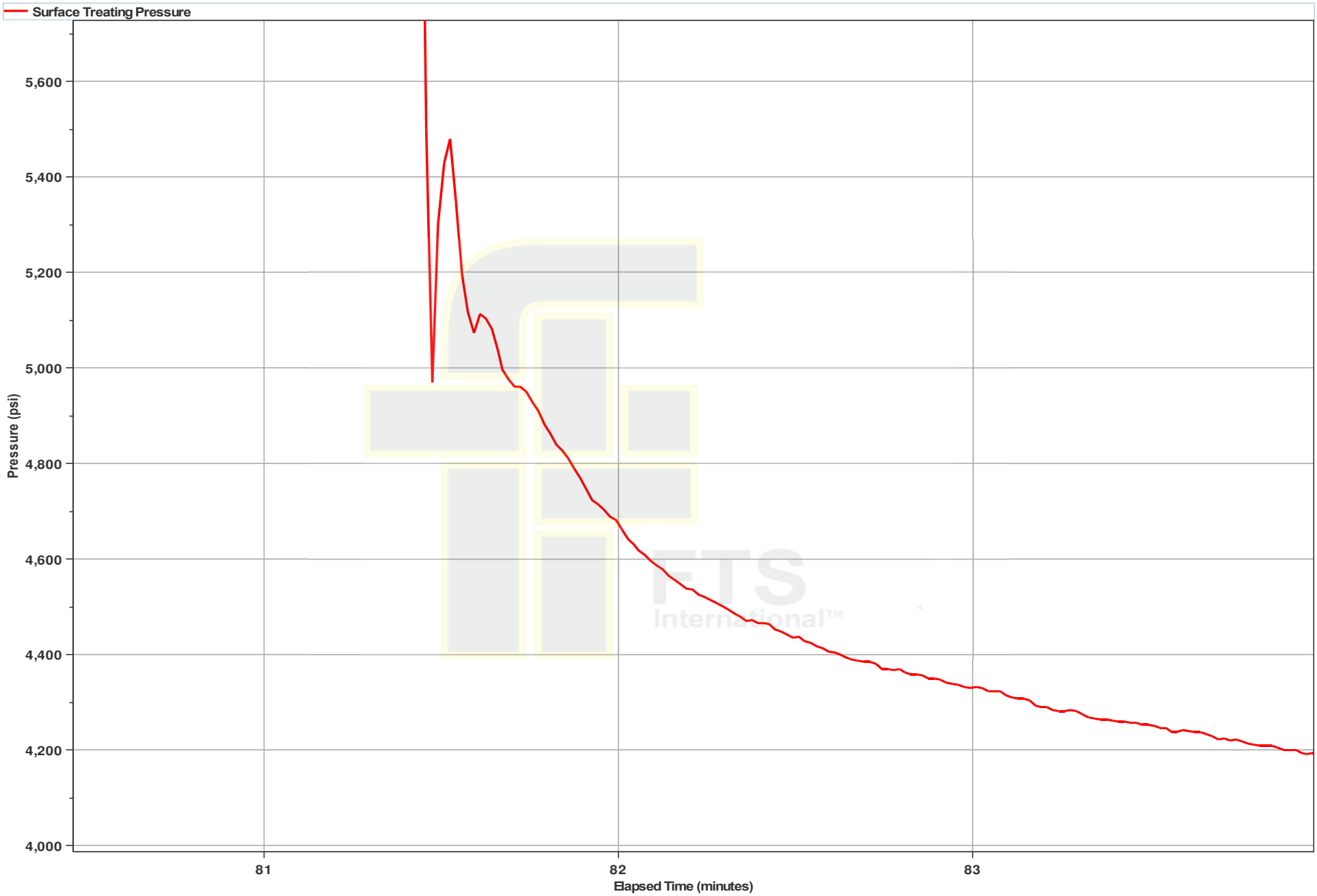
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 51 (WF.000658.M.W03.S51-aDCT-1103) **Jun 29, 2015**

Primary Plot



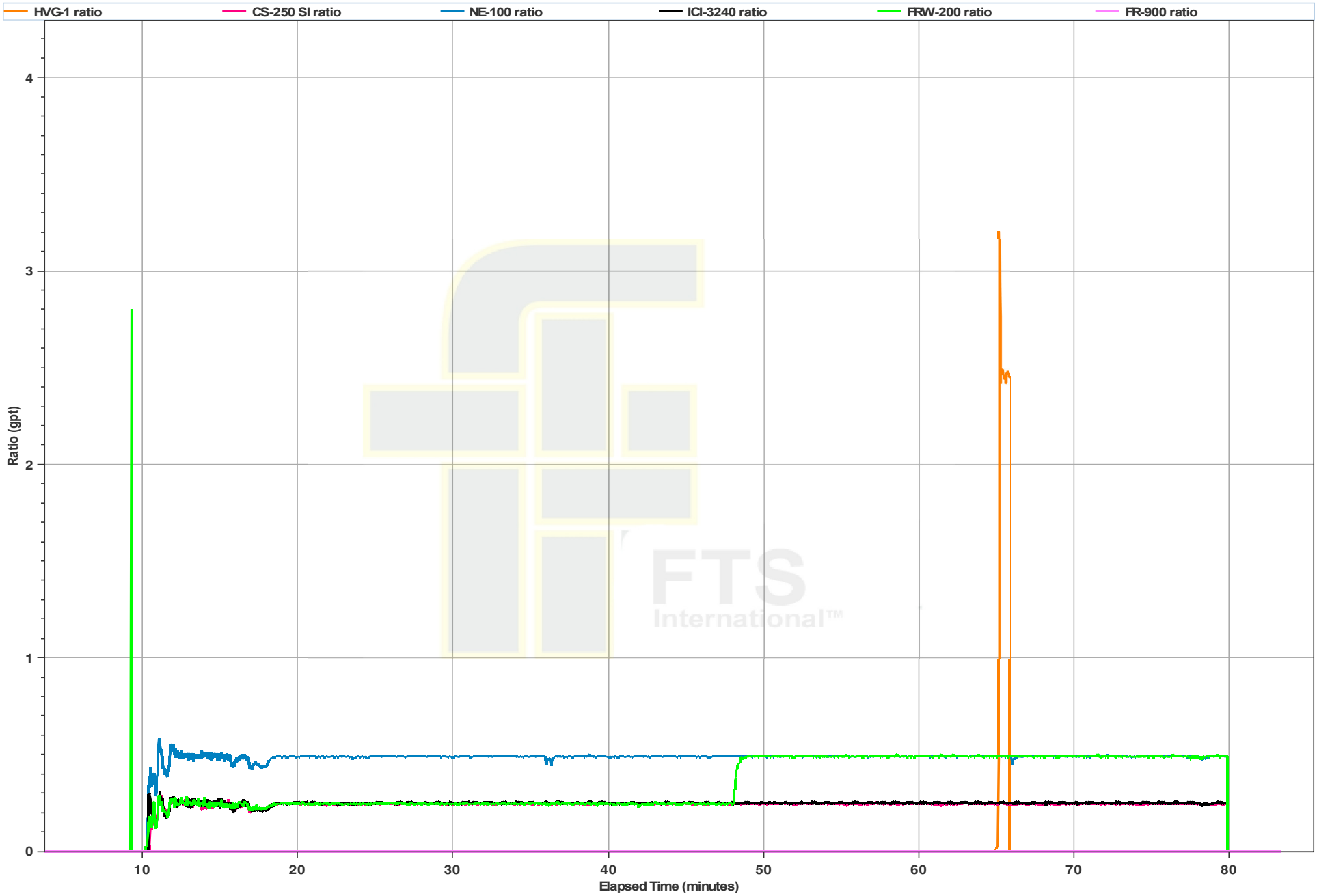
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 51 (WF.000658.M.W03.S51-aDCT-1103) **Jun 29, 2015**

ISIP Plot



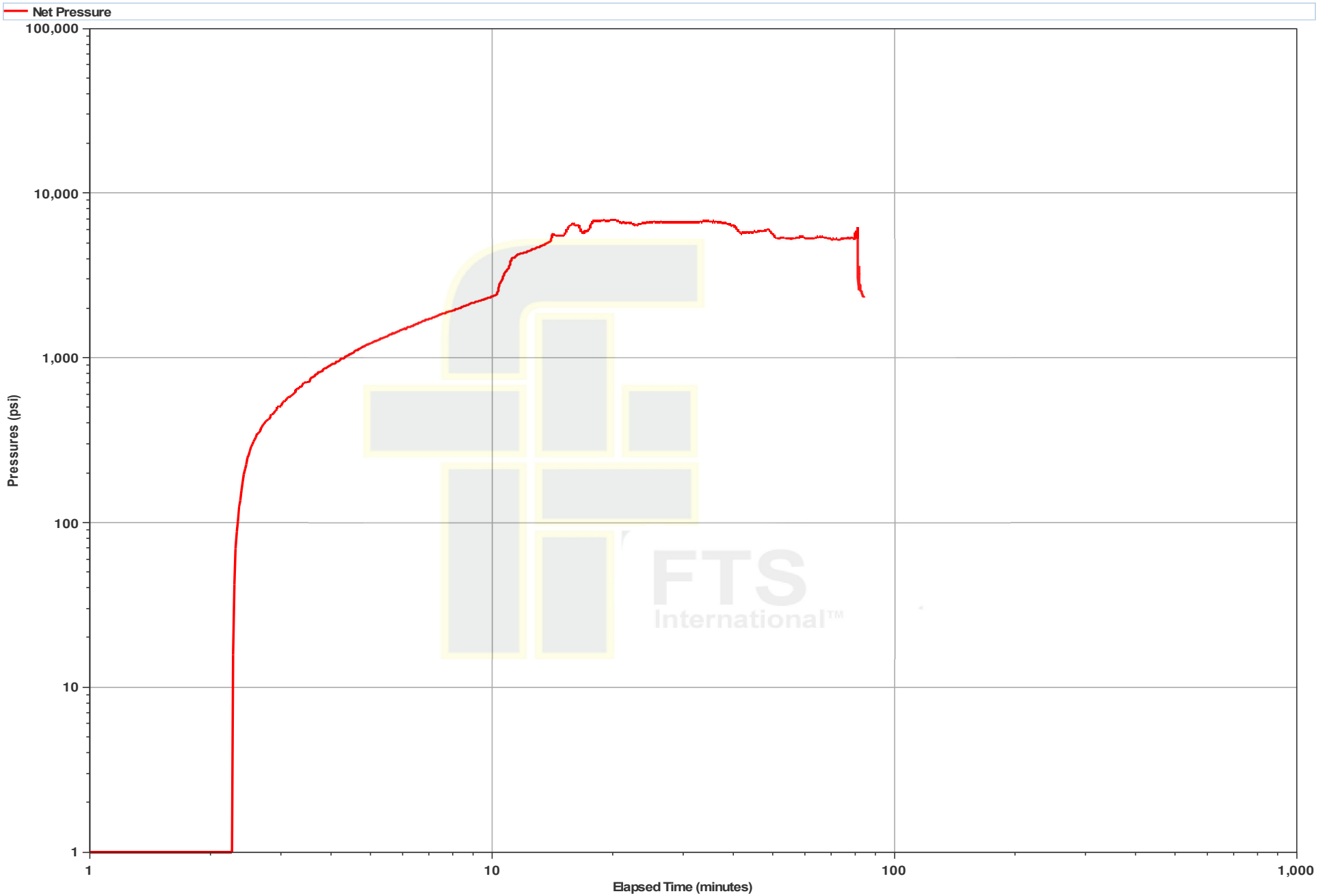
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 51 (WF.000658.M.W03.S51-aDCT-1103) **Jun 29, 2015**

Chemical Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 51 (WF.000658.M.W03.S51-aDCT-1103) Jun 29, 2015

Net Pressure Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 51 (WF.000658.M.W03.S51-aDCT-1103) Jun 29, 2015

WATER-BASED FRAC FLUID QUALITY CONTROL
(Attachment to Post Treatment Report)

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/29/2015
Customer Name:	American Energy - Utica	Proposal #:	3H/51
Date Sampled:	6/29/2015	Water Source:	Working Tank

Sample/Tank No.	Clarity, Color, Odor	Sample Temperature, (F)	Specific gravity	Initial pH	Chloride, ppm	Hardness, ppm	Calcium, ppm	Magnesium, ppm	Iron ppm	Hydroxide, ppm	Bicarbonate, ppm	Carbonate, ppm	Sulfate, ppm	Barium, ppm
Working Tank	Clear	72	1	7.5	40	90	26	16	0	0	488	0	55	0

Frac Fluid Quality Gel Testing (These Recording are to made prior to pumping job)														
Sample #														
Base Gel Type	HVG-1													
Gel Loading (lbs/1000 gal.)	2.5													
Sample Temperature, (F)	72													
Initial pH	7.3													
Visc. Reading @ 300 rpms	6													
Viscosity, (cp)	6													
Sample 1 3 min Hydration	4													
Sample 2 3 min Hydration	5													
Sample 3 3 min Hydration	6													
X-Link Vortex Closure, min:sec	n/a													
X-Link Crown, min:sec	n/a													
X-Link pH	n/a													
Gel Break Time (<2cp) mins	20													

Frac Fluid Quality Gel Testing (These Recording are to made while pumping job)														
Stage #														
Base Gel Viscosity (cp)														
X-Link pH								.						
Sample XL time, min:sec														
Sample Temperature														

Acid Quality	Percent Acid	NaOH, mLs	Specific Gravity
	28		1.14

Additional testing or documentation may be required by the customer or for frac fluid quality assurance.

Tested By: Etuate Varea

QUALITY CONTROL OF PROPPANTS

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/29/2015
Customer Name:	American Energy - Utica	Well/Stage:	3H/51
Date Sampled:	6/29/2015	DISTRICT:	Washington, PA
VENDOR:	SANTROL		

Select Proppant Type:

___	Brown	___	Ceramic	___	Other (specify)
X	White	___	Bauxite		
___	Resin Coated	___	Texas Gold		

Sieve Analysis	100 Mesh			Sieve Analysis	30/50 Mesh		
Sample 1	25.50	grams of sample		Sample 2	25.60	grams of sample	
	Amount Retained				Amount Retained		
Sieve mesh	Gram	%		Sieve mesh	Gram	%	
			Total				Total
50	1.50	5.88	In-Size	20	0.00	0.00	In-Size
70	16.00	62.75		30	2.00	7.81	
100	4.10	16.08	94.1%	40	13.50	52.73	88.3%
120	2.10	8.24		45	7.00	27.34	
140	1.30	5.10		50	2.10	8.20	
200	0.50	1.96		70	1.00	3.91	
Pan	0.00	0.00	fines	Pan	0.00	0.00	fines
Total wt. Gram	25.50	100.00		Total wt. Gram	25.60	100.00	

Tested By: Etuate Varea

Post Job Report

AMERICAN ENERGY - UTICA

Red Hill Farm MDS GR 3H

Stage : 52 OF 54

HARRISON, OH

Operations Representative:

Name:	David Knapp
Office:	724-743-2637
Fax:	724-743-7719
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Sales Representative:

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Email:	BRUCE.BATTHERN@FTSI.COM

Engineering Manager:

Name:	Thaddeus Craun
Office:	817-832-8782
Fax:	724-743-7719
Cell:	
Email:	THADDEUS.CRAUN@FTSI.COM

FTS International
[illegible]
Ogilby Pass, PA [illegible]

FTS INTERNATIONAL

Customer: American Energy - Utica
Well: Red Hill Farm Site 6r 3H
Stage: 42
Job End Date: [illegible]

Job Summary

Well Information

TVD:	7,301	Top Perf:	7,[illegible]
No. Of Perfs:	30		

Casing	Tubing
5.50" 23.0#/	n/A

Pressures, Rates and Volumes

	Proposed	Actual	Max	Min
STP	[illegible] psi	[illegible] psi	[illegible] psi	[illegible] psi
Rate	[illegible] bpm	[illegible] bpm	[illegible] bpm	[illegible] bpm

	Proposed	Actual		
Clean Volume	[illegible] bbls	[illegible] bbls		
Slurry Volume	[illegible] bbls	[illegible] bbls		
Flush Volume	[illegible] bbls	[illegible] bbls		

	Proposed	Start	End
Free Pumps on Location	19	14	19

Open Well:	Start Time	[illegible]	Pressure	[illegible] psi
	Bull Dwn	[illegible] bbls	Break Down	[illegible] psi
	Initial ISIP:	[illegible] psi	Initial F.G.:	[illegible] psi/ft
Stage Complete:	End Time	[illegible]	Job Time	[illegible]
	Final ISIP	[illegible] psi	Final F.G.	[illegible] psi/ft
	ISIP	[illegible]	5 Min:	[illegible] psi
	Pressure Min:	[illegible]	10 Min:	N/A
	Pressure Max:	[illegible]	15 Min:	N/A

Material Volume

Material	Proposed	Calculated	Actual	Variance
100 Mesh White	[illegible]	[illegible]	[illegible]	-4%
30/50 White	[illegible]	[illegible]	[illegible]	0%
Total Proppants	[illegible]	[illegible]	[illegible]	-1%

Material	Proposed	Calculated	Actual	Variance
8.1%-7.5% HCL	[illegible]	[illegible]	[illegible]	1%
AFR-1	6	15	15	0%
[illegible]	3	3	3	0%
[illegible]	[illegible]	40	50	25%
FE-[illegible]	15	15	15	0%
[illegible]	120	90	91	-25%
HVG-1 4.5	6	75	75	0%
[illegible]	[illegible]	40	[illegible]	25%
LTB-1	6	15	15	0%
[illegible]	6	[illegible]	[illegible]	25%
[illegible]	[illegible]	3	3	0

Comments:

Pumpdown Information:
Total Bbls: 26
Max Pressure (psi): 5548
Max Rate (bpm): 12.4

FTS International
[illegible]
Eighty Four, PA [illegible]

FTS INTERNATIONAL

Customer: American Energy - Utica
Well: Red Hill Farm Site 6r 3H
Stage: 42
Job End Date: [illegible]

Treatment Report

Date	[illegible]	Statelate	Washington County,PA	Basin Size	[illegible]	API#	[illegible]

Hr. Time	BTP	Spray BPM	Stage Slurry (bbls)	Cumulative Slurry (bbls)	Stage Slurry (bbls)	Cumulative Slurry (bbls)	Stage Proppant (lbs)	Cumulative Proppant (lbs)	Description	Proppant	PPA
21:44	9,476	0.0	0	0	0	0	0	0	Freshwater Open Wet		0.00
21:44	9,475	0.0	0	0	0	0	0	0	Freshwater Load		0.00
21:49	8,745	0.0	71	77	71	77	0	0	7.5% HCL Acid Add		0.00
21:51	3,027	30.0	60	137	60	137	330	330	Slickwater Prepad	100 Mesh White	0.10
21:53	7,934	19.1	0	137	0	137	0	330	Slickwater Breakdown		0.00
21:55	7,669	18.8	36	173	36	173	100	440	Slickwater Prepad	100 Mesh White	0.10
21:54	8,669	20.3	188	360	181	354	1,000	1,435	Slickwater Prepad	100 Mesh White	0.25
21:55	8,371	59.8	137	410	136	414	2,697	4,132	Slickwater Prepad	100 Mesh White	0.50
21:56	8,184	79.9	300	710	310	724	8,480	12,612	Slickwater Prepad	100 Mesh White	0.75
22:03	8,679	60.6	360	870	372	968	19,880	34,842	Slickwater Prepad	100 Mesh White	1.00
22:05	8,482	61.0	347	1,217	363	1,359	14,574	49,168	Slickwater Prepad	100 Mesh White	1.00
22:10	8,367	60.2	375	1,592	382	1,741	15,753	64,918	Slickwater Prepad	30/50 White	1.00
22:14	8,389	60.0	178	1,770	188	1,927	7,479	72,398	Slickwater Prepad	30/50 White	1.00
22:15	8,634	60.7	87	1,857	101	2,028	4,074	76,472	Slickwater Prepad	30/50 White	1.00
22:17	8,479	60.3	788	2,647	744	2,770	76,753	153,199	Slickwater Prepad	30/50 White	1.25
22:20	8,917	60.6	268	2,917	287	3,045	16,753	110,000	Slickwater Prepad	40/80 White	1.50
22:24	8,485	60.7	361	3,280	379	3,430	62,119	141,919	Slickwater Prepad	40/80 White	1.50
22:33	8,672	60.2	400	3,680	400	3,832	29,400	171,319	Slickwater Prepad	40/80 White	1.75
22:47	3,237	50.0	250	3,930	270	4,102	81,000	191,319	Slickwater Prepad	40/80 White	2.00
22:49	3,079	60.2	510	4,440	744	4,847	97,121	214,330	18# Linear Gel Prepad	40/80 White	2.00
22:59	8,146	73.0	30	4,470	30	4,877	0	214,330	18# Linear Gel Clean [illegible]		0.00
22:01	8,347	73.0	30	4,500	30	4,907	0	214,330	Slickwater Clean [illegible]		0.00
22:01	8,346	77.4	113	4,613	113	5,020	0	214,330	Slickwater Flush		0.00
22:03	8,313	77.1	113	4,726	113	5,140	0	214,330	Freshwater Flush		0.00
22:04	4,476	0.0	0	4,726	0	5,140	0	214,330	Freshwater Shutdown		0.00
Total Job/Time @ [illegible] 01:10											

Min BTP:	8,407 psi	Max BTP:	9,662 psi	Average BTP:	8,346 psi	0 Min	4,476 psi
Min Rate:	18.0 bpm	Max Rate:	81.0 bpm	Average Rate:	60.0 bpm	10 Min	0 psi
Initial ISIP:	4,476 psi	Initial F.Gr:	1.06 psi/ft	Average ISIP:	10,671	15 Min	0 psi
Final ISIP:	4,476 psi	Final F.Gr:	1.06 psi/ft	Customer Representative		30 Min	
FTS Representative		Travis Wilson & Wilson Hales					

Comments:

The proppant values contained in this report are calculated based on actual barrel counts and target densities. Actual total proppant usage is 240,833 lbs. Charge time is 1 hour(s) 18 minute(s). All chemicals and proppant ran as documented.

Min/Max/Avg were taken from sand stages. All chem changes from proposed were made per AEU representative request.

No rerun was run on this stage.

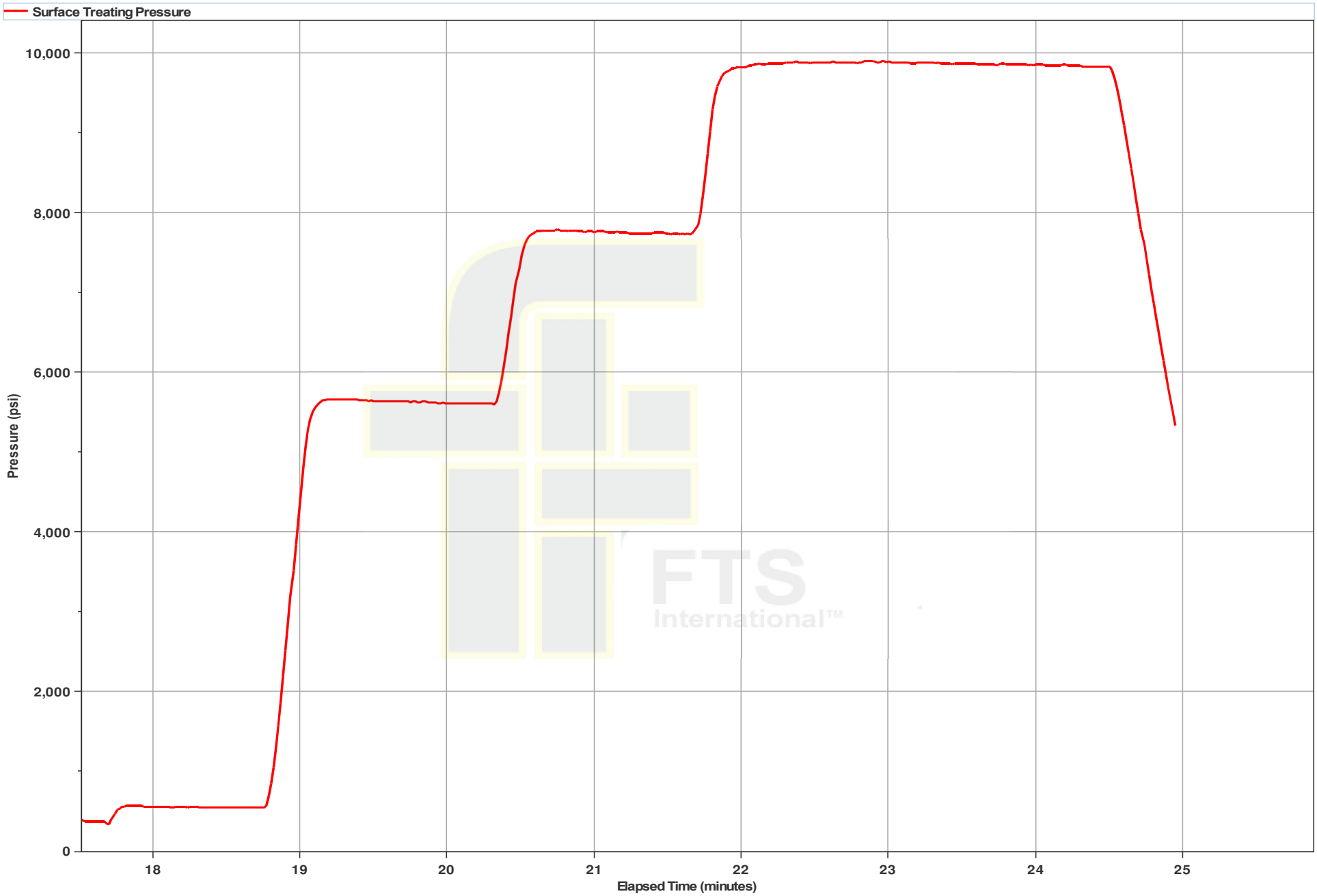
All design changes made during the stage at the request of AEU representative.

1 Minute Shutdown (psi): 4226
2 Minute Shutdown (psi): 4184
5 Minute Shutdown (psi): 4414

Chemical Changes:

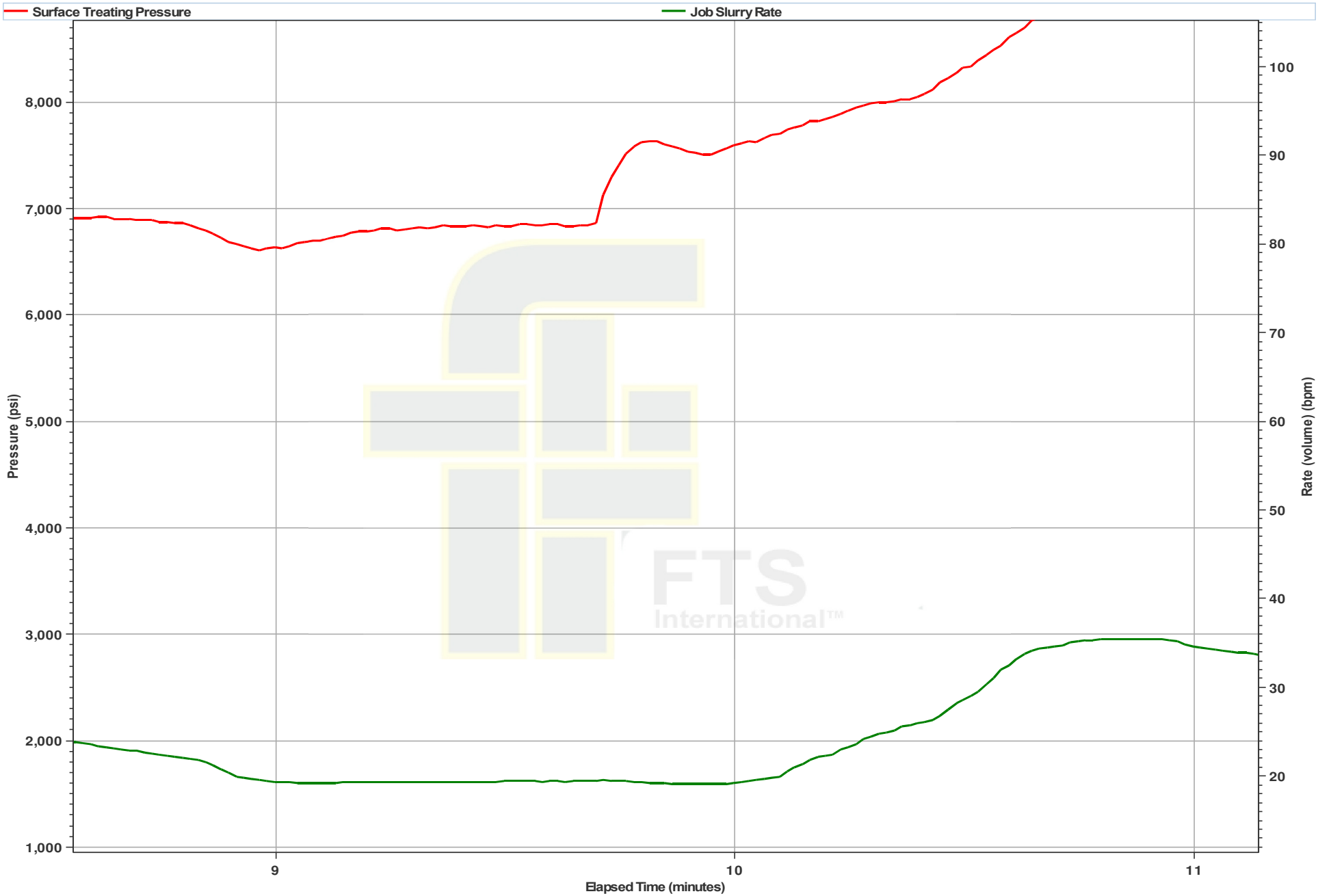
Chemical Name	Chemical Loading	Cumulative Clean
FRW-200	0.38	410
FRW-200	0.50	710
FRW-200	0.38	1,317
FRW-200	0.25	1,870
FRW-200	0.35	1,987
FRW-200	0.50	2,268

AEU Pressure Test



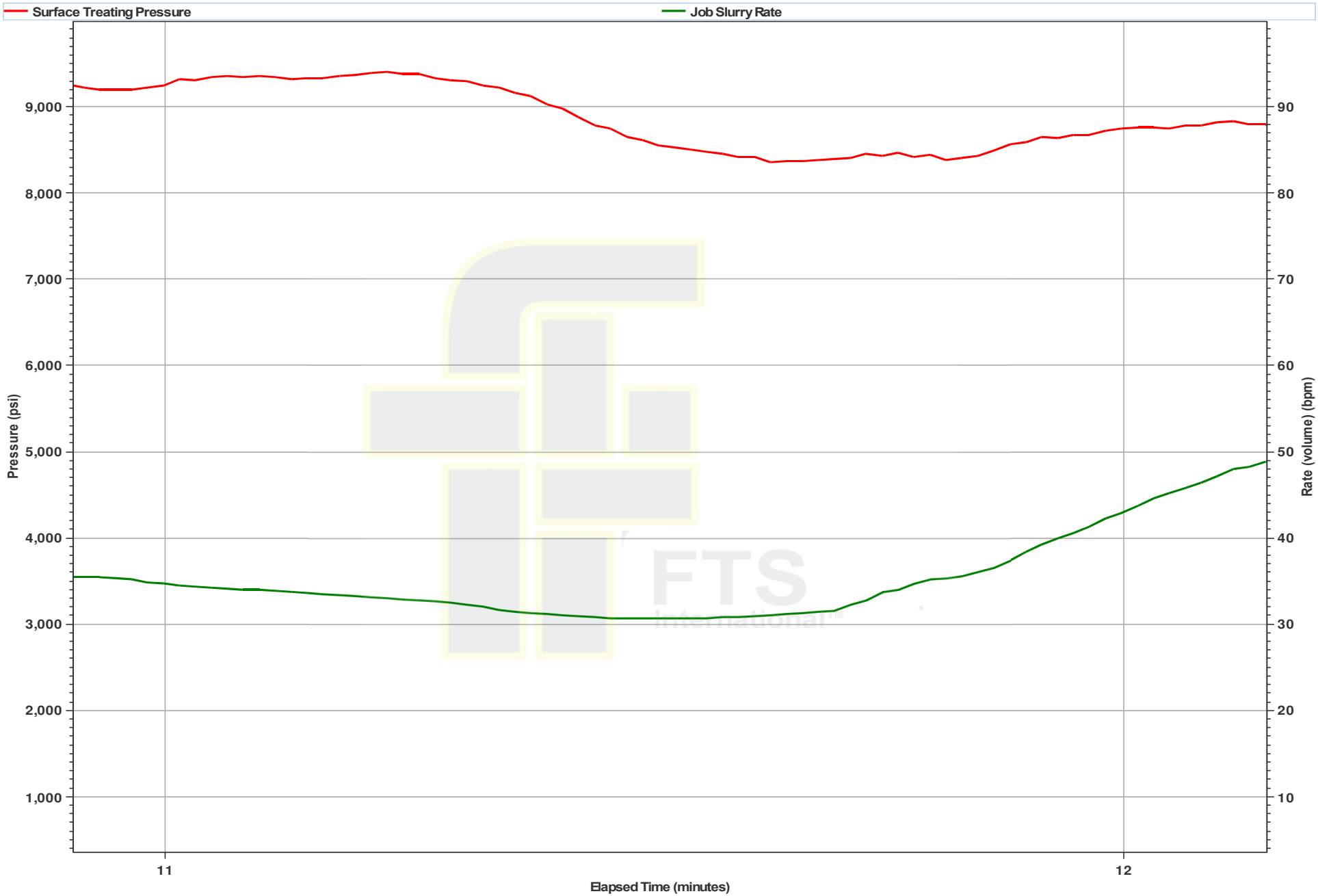
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 52 (WF.000658.M.W03.S52-aDCT-1103) **Jun 29, 2015**

Ball Seat and Breakdown



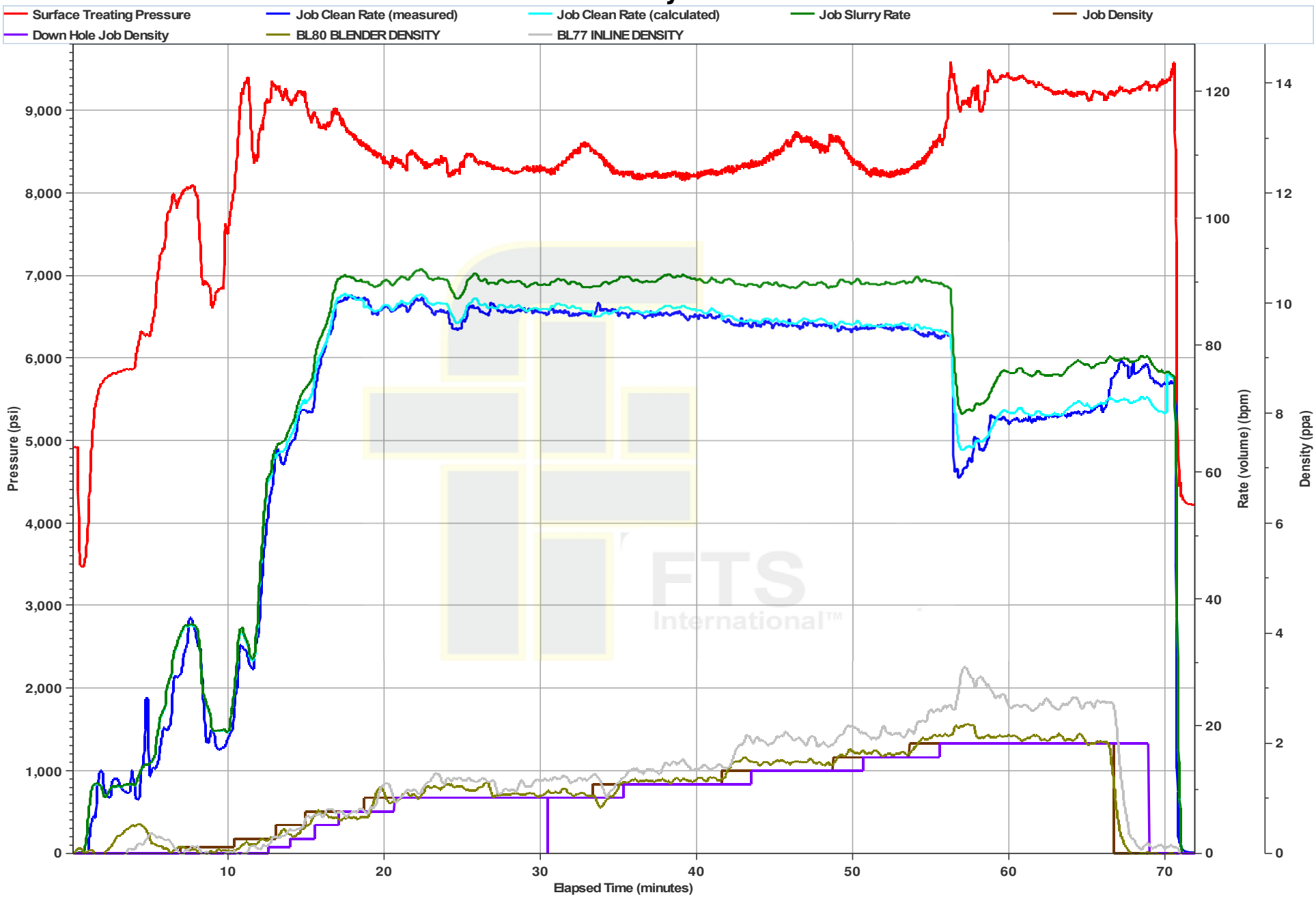
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 52 (WF.000658.M.W03.S52-aDCT-1103) **Jun 29, 2015**

Acid on Perforations



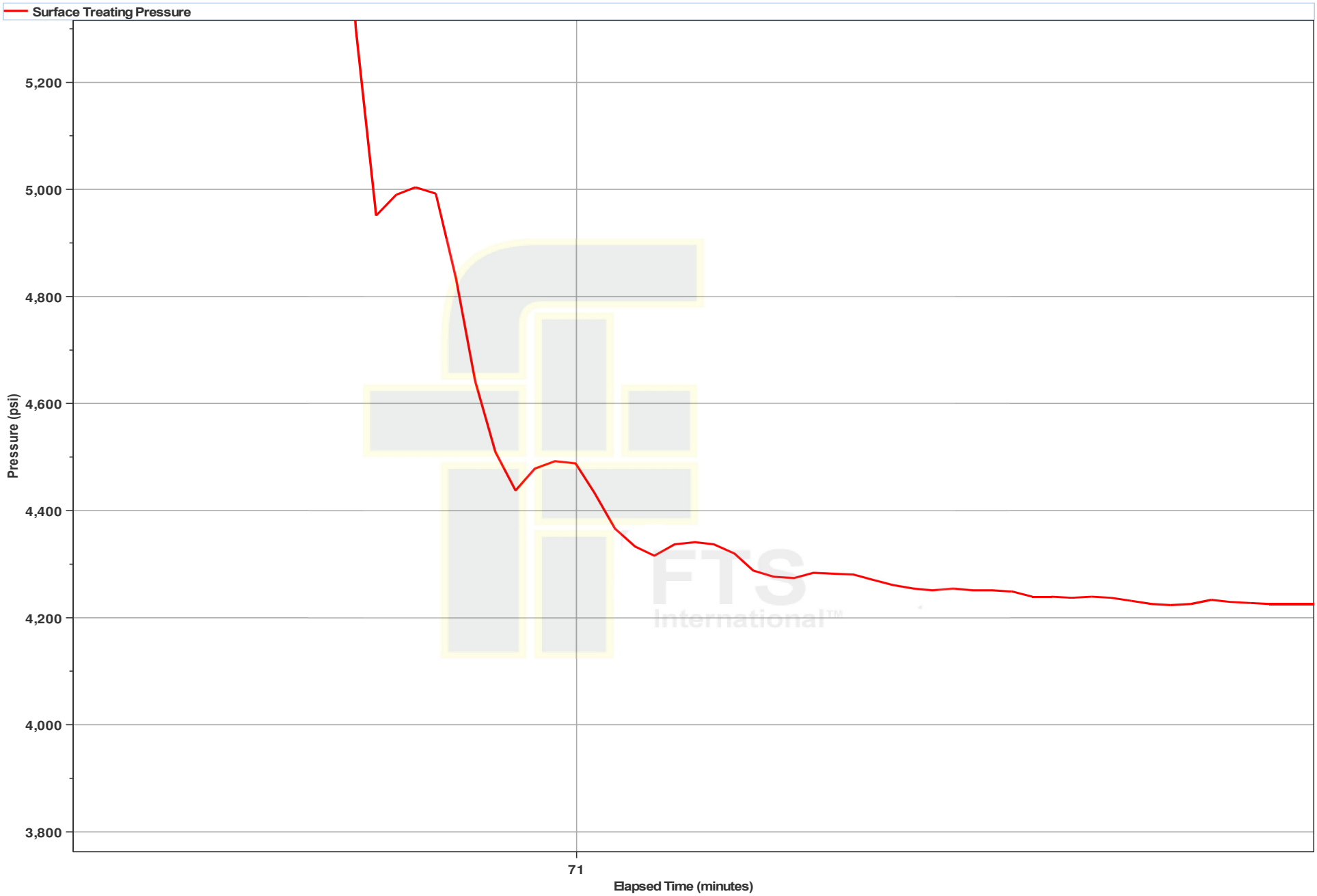
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 52 (WF.000658.M.W03.S52-aDCT-1103) **Jun 29, 2015**

Primary Plot



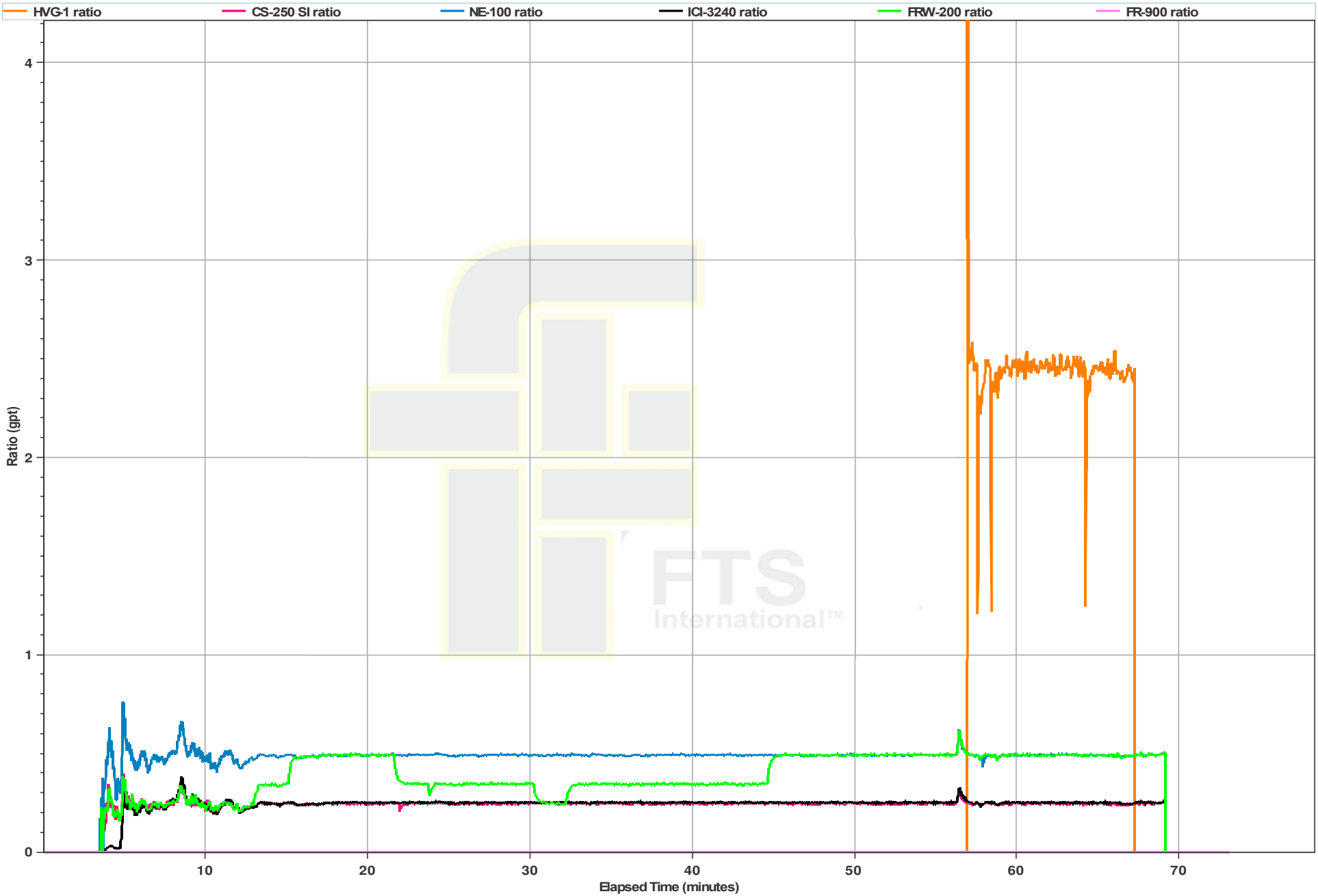
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 52 (WF.000658.M.W03.S52-aDCT-1103) **Jun 29, 2015**

ISIP Plot



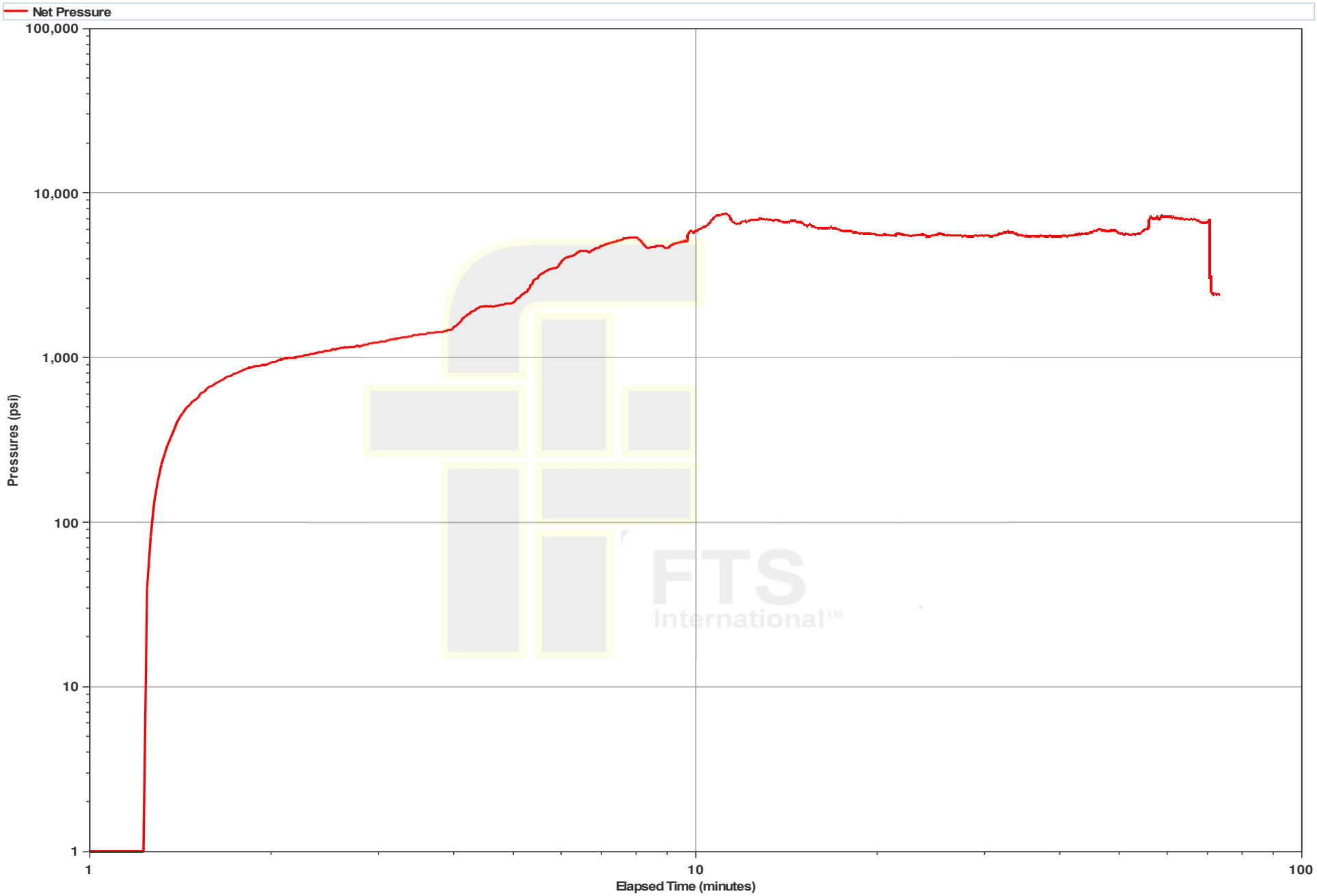
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 52 (WF.000658.M.W03.S52-aDCT-1103) **Jun 29, 2015**

Chemical Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 52 (WF.000658.M.W03.S52-aDCT-1103) Jun 29, 2015

Net Pressure Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 52 (WF.000658.M.W03.S52-aDCT-1103) Jun 29, 2015

WATER-BASED FRAC FLUID QUALITY CONTROL
(Attachment to Post Treatment Report)

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/29/2015
Customer Name:	American Energy - Utica	Proposal #:	1H/52
Date Sampled:	6/29/2015	Water Source:	Working Tank

Sample/Tank No.	Clarity, Color, Odor	Sample Temperature, (F)	Specific gravity	Initial pH	Chloride, ppm	Hardness, ppm	Calcium, ppm	Magnesium, ppm	Iron ppm	Hydroxide, ppm	Bicarbonate, ppm	Carbonate, ppm	Sulfate, ppm	Barium, ppm
Working Tank	Clear	70	1	7.7	40	76	24	13	0	0	244	0	50	0

Frac Fluid Quality Gel Testing (These Recording are to made prior to pumping job)														
Sample #														
Base Gel Type	HVG-1													
Gel Loading (lbs/1000 gal.)	2.5													
Sample Temperature, (F)	70													
Initial pH	7.3													
Visc. Reading @ 300 rpms	6.5													
Viscosity, (cp)	6.5													
Sample 1 3 min Hydration	3													
Sample 2 3 min Hydration	5													
Sample 3 3 min Hydration	6													
X-Link Vortex Closure, min:sec	n/a													
X-Link Crown, min:sec	n/a													
X-Link pH	n/a													
Gel Break Time (<2cp) mins	19													

Frac Fluid Quality Gel Testing (These Recording are to made while pumping job)														
Stage #														
Base Gel Viscosity (cp)														
X-Link pH								.						
Sample XL time, min:sec														
Sample Temperature														

Acid Quality	Percent Acid	NaOH, mLs	Specific Gravity
	28		1.14

Additional testing or documentation may be required by the customer or for frac fluid quality assurance.

Tested By: Travis Wilson

QUALITY CONTROL OF PROPPANTS

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/29/2015
Customer Name:	American Energy - Utica	Well/Stage:	1H/52
Date Sampled:	6/29/2015	DISTRICT:	Washington, PA
VENDOR:	SANTROL		

Select Proppant Type:

___ Brown	___ Ceramic	___ Other (specify)
X White	___ Bauxite	
___ Resin Coated	___ Texas Gold	

Sieve Analysis	100 Mesh			Sieve Analysis	30/50 Mesh		
Sample 1	24.80	grams of sample		Sample 2	24.80	grams of sample	
	Amount Retained				Amount Retained		
Sieve mesh	Gram	%		Sieve mesh	Gram	%	
			Total				Total
50	0.50	2.02	In-Size	20	0.00	0.00	In-Size
70	17.10	68.95		30	0.50	2.02	
100	3.80	15.32	97.6%	40	18.90	76.21	95.2%
120	1.90	7.66		45	2.90	11.69	
140	0.90	3.63		50	1.80	7.26	
200	0.50	2.02		70	0.70	2.82	
Pan	0.10	0.40	fines	Pan	0.00	0.00	fines
Total wt. Gram	24.80	100.00		Total wt. Gram	24.80	100.00	

Tested By: Travis Wilson

Post Job Report

AMERICAN ENERGY - UTICA

Red Hill Farm MDS GR 3H

Stage : 53 OF 54

HARRISON, OH

Operations Representative:

Name:	**David Knapp**
Office:	**724-743-2537**
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Cell:	
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Email:	**BRUCE.MATTHEWS@FTSI.COM**

Engineering Manager:

Name:	**Thaddeus Craun**
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Fax:	**724-743-7719**
Cell:	
Email:	**THADDEUS.CRAUN@FTSI.COM**

FTS International
1432 Route 519
Eighty Four, PA 15330

Customer: American Energy - Utica
Well: Red Hill Farm Mds Gr 3H
Stage: 53
Job End Date: 06/30/2015

Job Summary

Well Information

TVD:	7,301	**Top Perf:**	7,807
No. Of Perfs:	30		

Casing	Tubing
5.50" 20.00#	N/A

Pressures, Rates and Volumes

	Proposed	Actual	Max	Min
STP	9,046 psi	8,710 psi	9,370 psi	8,021 psi
Rate	80.0 bpm	84.7 bpm	91.3 bpm	27.6 bpm

	Proposed	Actual		
Clean Volume	5,772 bbls	5,364 bbls		
Slurry Volume	6,042 bbls	5,631 bbls		
Flush Volume	357 bbls	179 bbls		

	Proposed	Start	End
Frac Pumps on Location	10	14	14

Open Well:	Start Time	06:32	Pressure	3,265 psi
	Ball Seat	177 bbls	Break Down	9,107 psi
	Initial ISIP:	5,192 psi	Initial F.G.:	1.14 psi/ft
Stage Complete:	End Time	07:50	Job Time	01:15
	Final ISIP	5,192 psi	Final F.G.	1.14 psi/ft
	HHP	18,082	5 Min:	4,550 psi
	Proppant Min:	0.00	10 Min:	N/A
	Proppant Max:	2.00	15 Min:	N/A

Material Volume

Material	Proposed	Calculated	Actual	Variance
100 Mesh White	40,000	38,120	38,120	0%
30/50 White	210,000	207,449	210,449	1%
Total Proppants	250,000	245,569	248,569	1%

Material	Proposed	Calculated	Actual	Variance
0.1%-7.5% HCL	3,000	2,982	3,000	1%
APB-1	0	3	3	0%
CI-150	3	3	3	0%
CS-250 SI	60	54	54	0%
FE-200L	15	15	15	0%
FRW-200	180	83	82	-1%
HVG-1 4.0	0	13	13	0%
ICI-3240	60	54	54	0%
LTB-1	0	3	3	0%
NE-100	0	108	108	0%
NE-100W	120	0	0	0

Comments:

Pumpdown Information:
Total Bbls: 23
Max Pressure (psi): 5793
Max Rate (bpm): 12.8

FTS International
1432 Route 519
Eighty Four, PA 15330

Customer: American Energy - Utica
Well: Red Hill Farm Mds Gr 3H
Stage: 53
Job End Date: 06/30/2015

Treatment Report

Date:	6/30/2015	District:	Washington County,PA	Quote No:	051815_035725QF	API:	34-059-24370

MIL Time	STP	Slurry BPM	Stage Clean (bbls)	Cumulative Clean (bbls)	Stage Slurry (bbls)	Cumulative Slurry (bbls)	Stage Proppant (lbs)	Cumulative Proppant (lbs)	Description	Proppant	PPA
06:32	3,265	0.0	0	0	0	0	0	0	Freshwater Open Well		0.00
06:33	5,986	6.4	13	13	13	13	0	0	Freshwater Load		0.00
06:34	7,254	11.7	71	84	71	84	0	0	7.5% HCL Acid Acid		0.00
06:41	8,085	26.9	93	177	93	177	0	0	Slickwater Load		0.00
06:43	9,107	29.8	23	200	23	200	0	0	Slickwater Breakdown		0.00
06:45	9,028	58.0	215	415	217	417	1,580	1,580	Slickwater Proppant	100 Mesh White	0.10 - 0.25
06:49	9,246	78.2	230	645	233	650	2,415	3,995	Slickwater Proppant	100 Mesh White	0.25
06:52	9,237	81.6	258	903	264	914	5,418	9,413	Slickwater Proppant	100 Mesh White	0.50
06:56	9,241	83.4	502	1,405	519	1,433	15,813	25,226	Slickwater Proppant	100 Mesh White	0.75
07:02	9,284	84.3	307	1,712	321	1,754	12,894	38,120	Slickwater Proppant	100 Mesh White	1.00
07:06	9,094	84.0	741	2,453	775	2,529	31,122	69,242	Slickwater Proppant	30/50 White	1.00
07:16	9,051	83.2	701	3,154	741	3,270	36,803	106,045	Slickwater Proppant	30/50 White	1.25
07:32	8,438	89.2	653	3,807	697	3,967	41,139	147,184	Slickwater Proppant	30/50 White	1.50
07:32	8,443	88.8	60	3,867	65	4,032	4,410	151,594	10# Linear Gel Proppant	30/50 White	1.75
07:33	8,408	89.2	320	4,187	345	4,377	23,520	175,114	Slickwater Proppant	30/50 White	1.75
07:36	8,342	89.5	20	4,207	22	4,399	1,575	176,689	10# Linear Gel Proppant	30/50 White	1.75 - 2.00
07:36	8,293	89.3	40	4,247	44	4,443	3,360	180,049	10# Linear Gel Proppant	30/50 White	2.00
07:37	8,313	90.2	780	5,027	851	5,294	65,520	245,569	Slickwater Proppant	30/50 White	2.00
07:46	8,270	89.6	158	5,185	158	5,452	0	245,569	Slickwater Clean screws		0.00
07:48	8,464	90.1	45	5,230	45	5,497	0	245,569	Slickwater Flush		0.00
07:48	8,461	89.5	134	5,364	134	5,631	0	245,569	Freshwater Flush		0.00
07:50	5,192	0.0	0	5,364	0	5,631	0	245,569	Freshwater Shutdown		0.00
Total JobTime (HH:MM): 01:17											

Min STP:	8,021 psi	**Max STP:**	9,370 psi	**Average STP:**	8,710 psi	**5 Min:**	4,550 psi
Min Rate:	27.6 bpm	**Max Rate:**	91.3 bpm	**Average Rate:**	84.7 bpm	**10 Min:**	0 psi
Initial ISIP:	5,192 psi	**Initial F.G.:**	1.14 psi/ft	**Average HHP:**	18,082	**15 Min:**	0 psi
Final ISIP:	5,192 psi	**Final F.G.:**	1.14 psi/ft	**Customer Representative:**		Mike Hausvater	
FTSI Representative:		Etuate Varea & Jason McCoskey					

Comments:

The proppant values contained in this report are calculated based on actual barrel counts and target densities. Actual total proppant usage is 248,569 lbs. Charge time is 1 hour(s) 15 minute(s). All chemicals and proppant ran as documented.

Min/Max/Avg were taken from sand stages. All chem changes from proposed were made per AEU representative request.

Reuse water was run on this stage for a total of 520 Bbls.

1 Minute Shutdown (psi): 4930
2 Minute Shutdown (psi): 4812
5 Minute Shutdown (psi): 4550

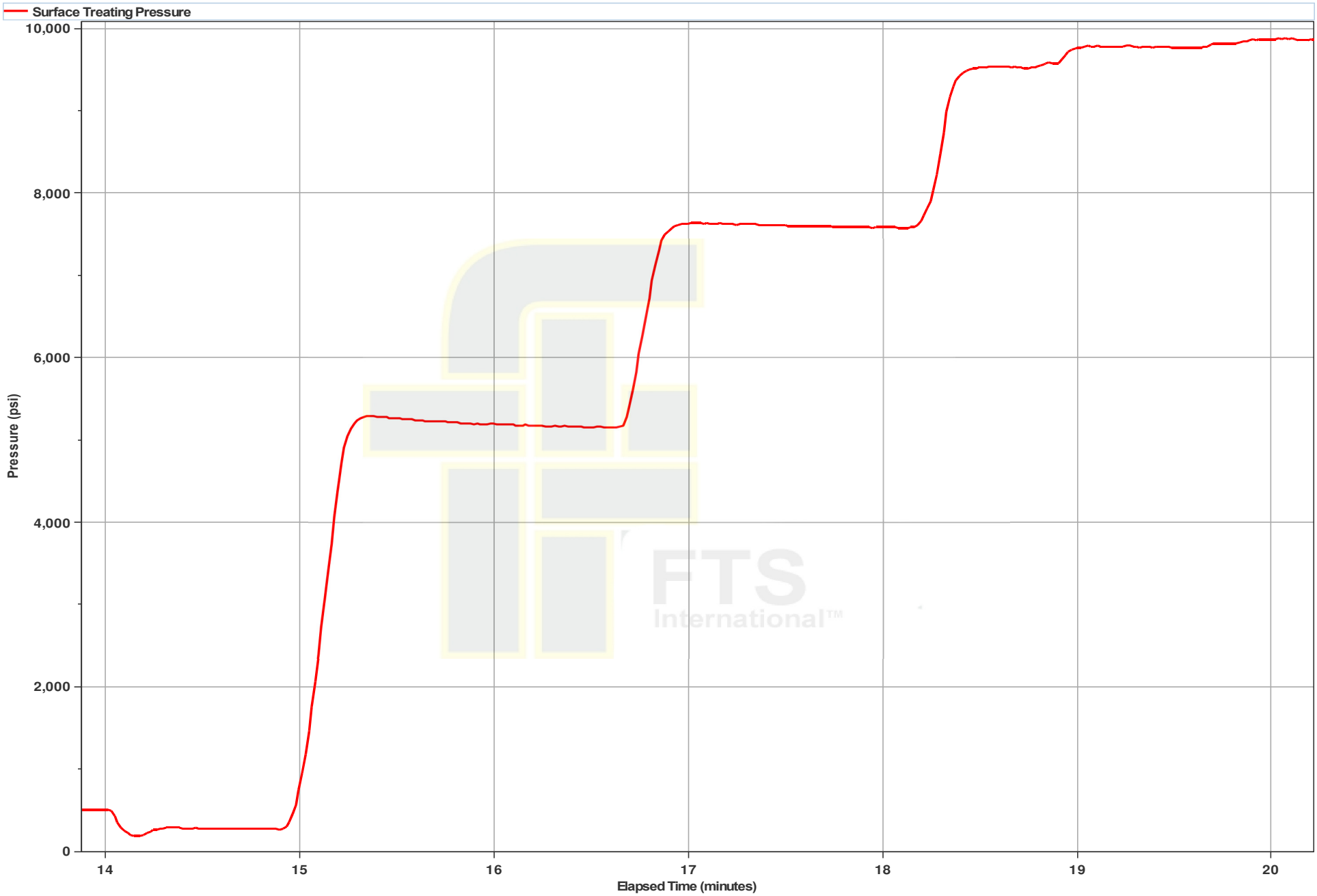
FTS International
1432 Route 519
Eighty Four, PA 15330

Customer: American Energy - Utica
Well: Red Hill Farm Mds Gr 3H
Stage: 53
Job End Date: 06/30/2015

Chemical Changes:

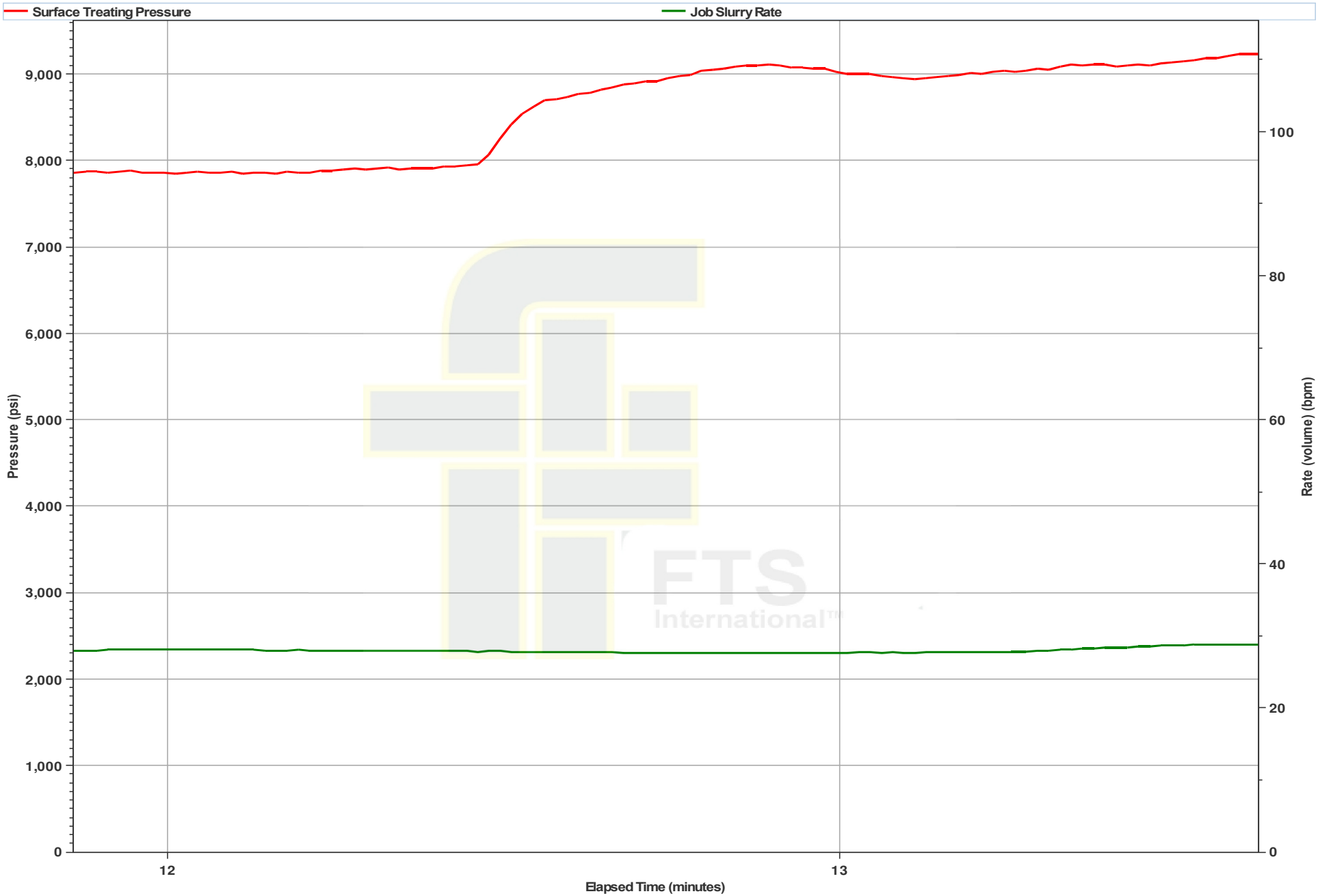
Chemical Name	Chemical Loading	Cumulative Clean
FRW-200	0.50	3,154

AEU Pressure Test



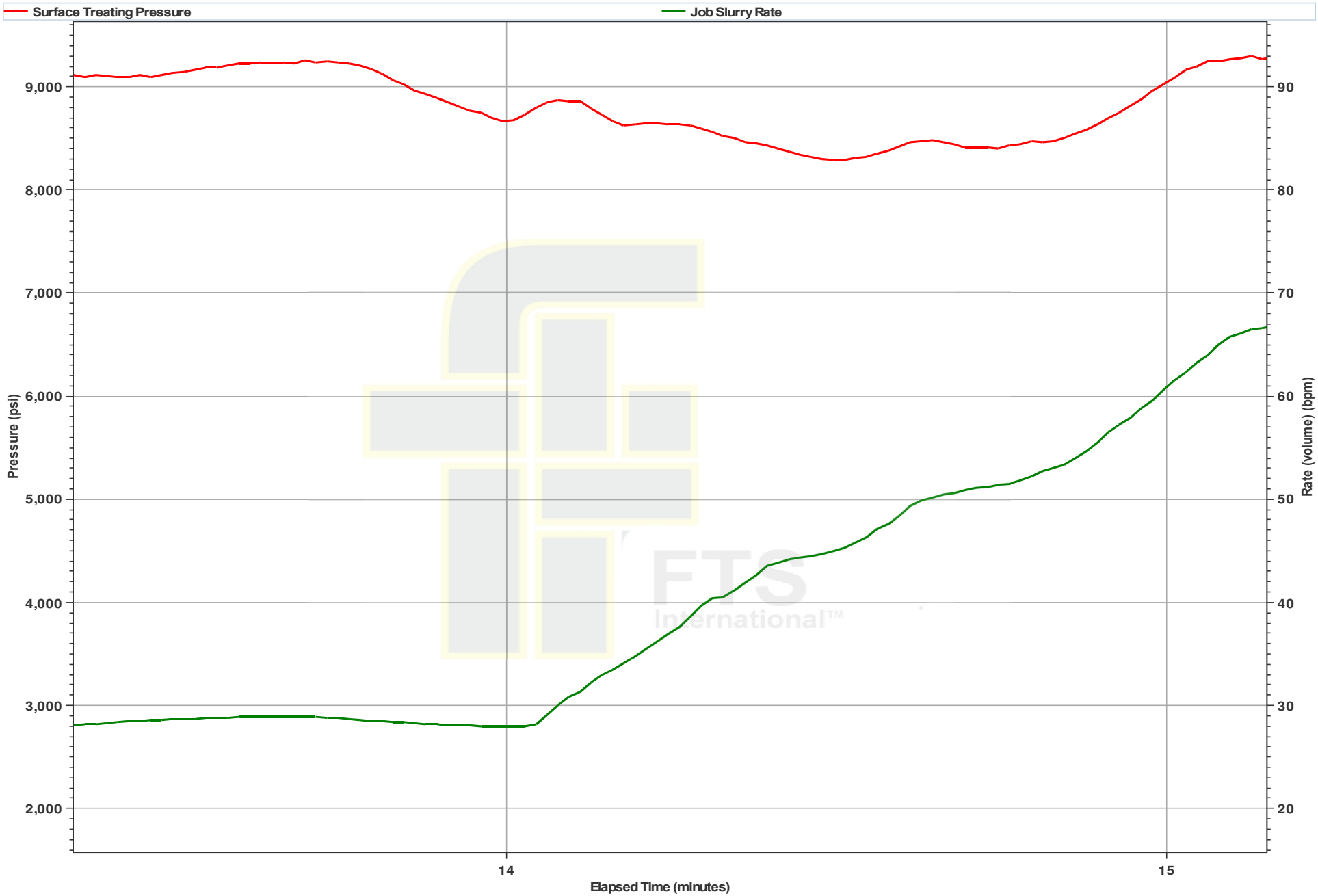
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 53 (WF.000658.M.W03.S53-ADCT-1103) **Jun 30, 2015**

Ball Seat and Breakdown



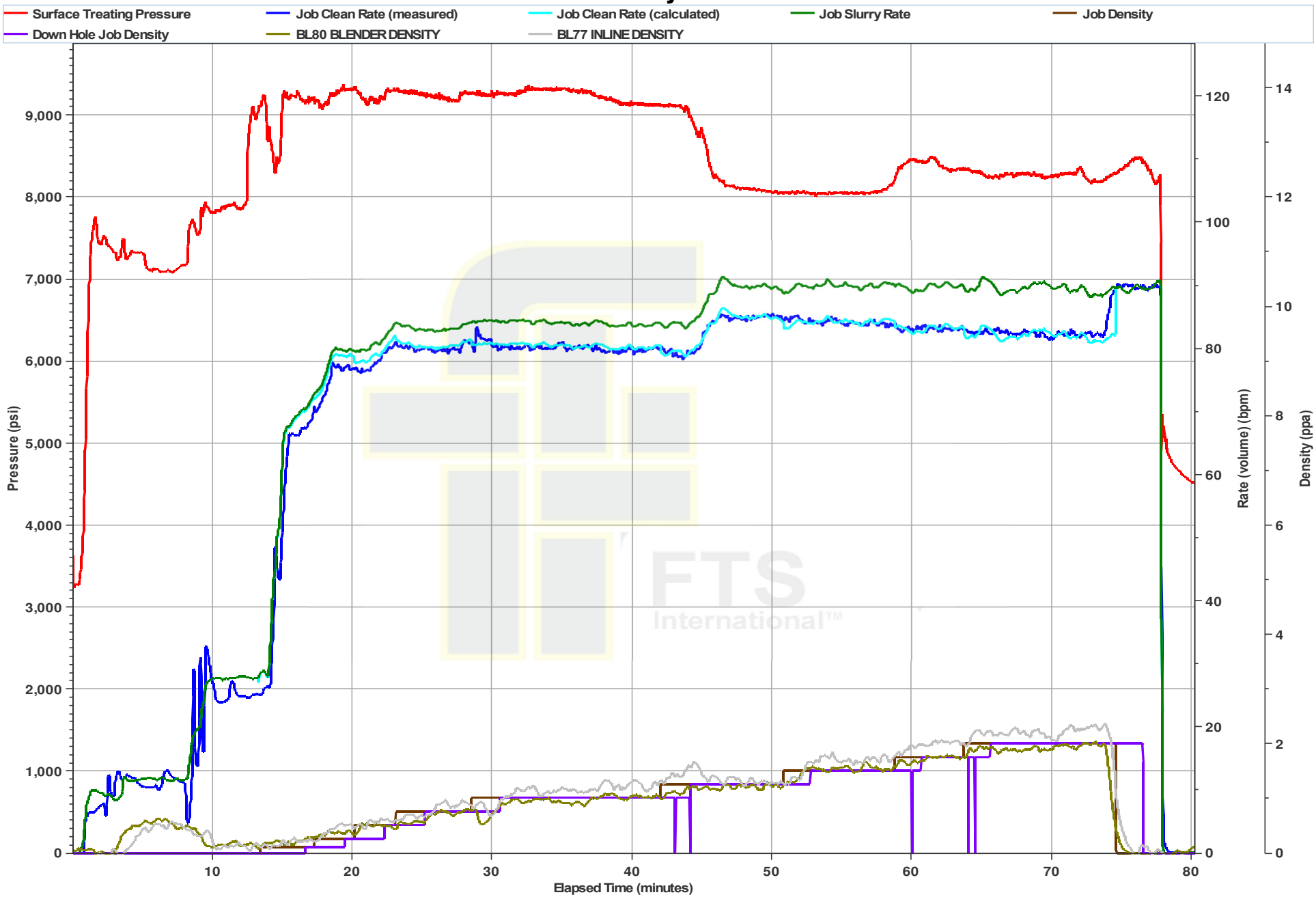
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 53 (WF.000658.M.W03.S53-ADCT-1103) **Jun 30, 2015**

Acid on Perforations



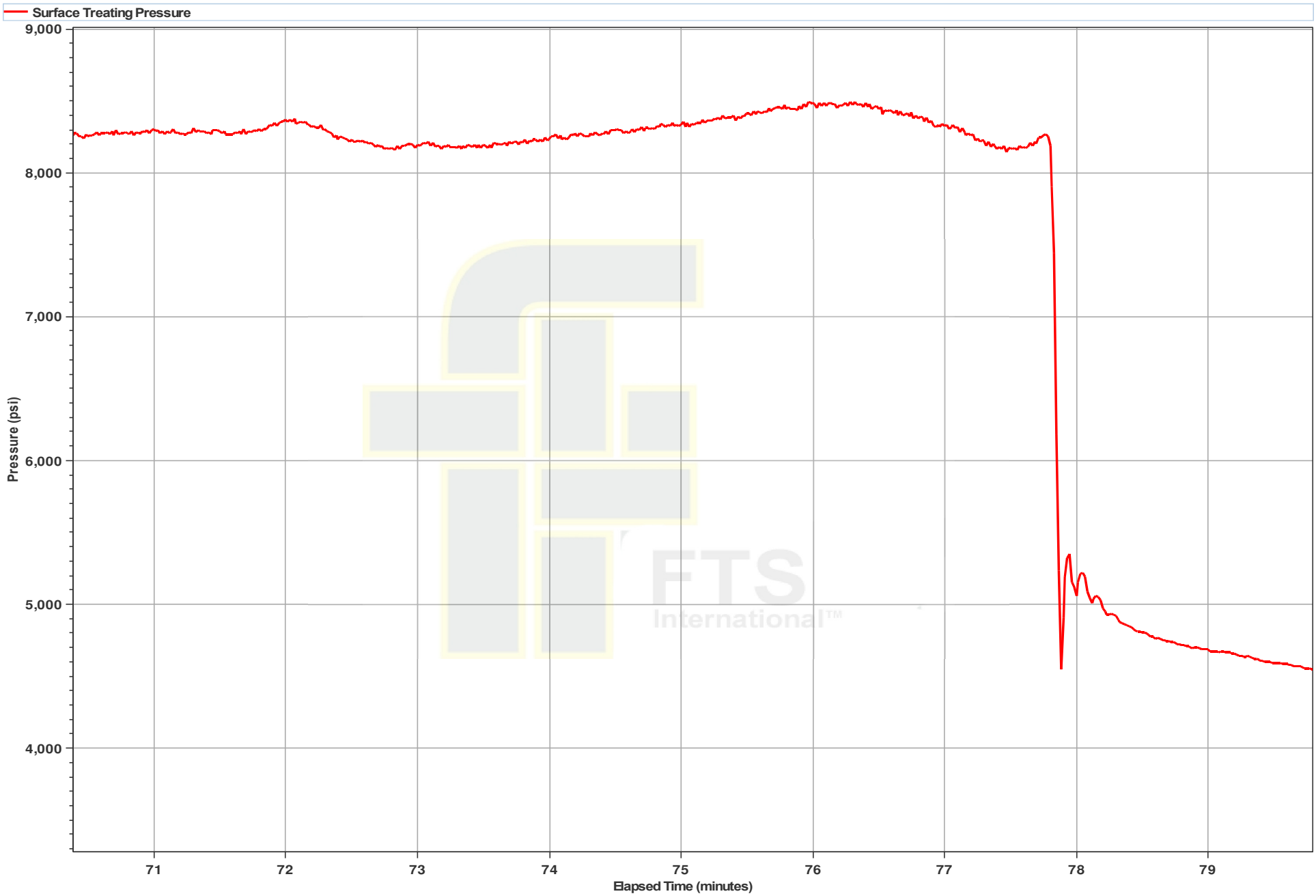
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 53 (WF.000658.M.W03.S53-ADCT-1103) **Jun 30, 2015**

Primary Plot



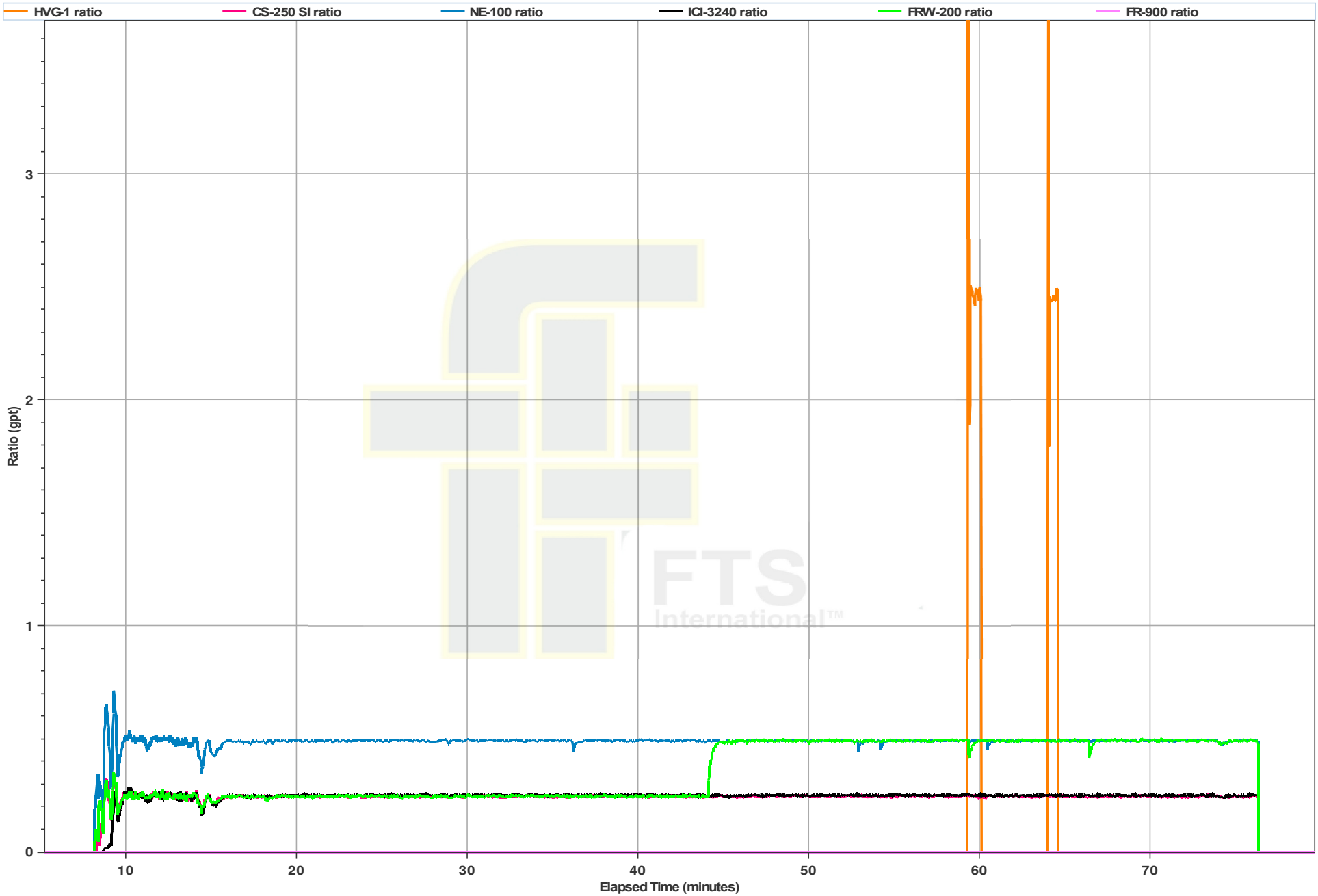
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 53 (WF.000658.M.W03.S53-ADCT-1103) Jun 30, 2015

ISIP Plot



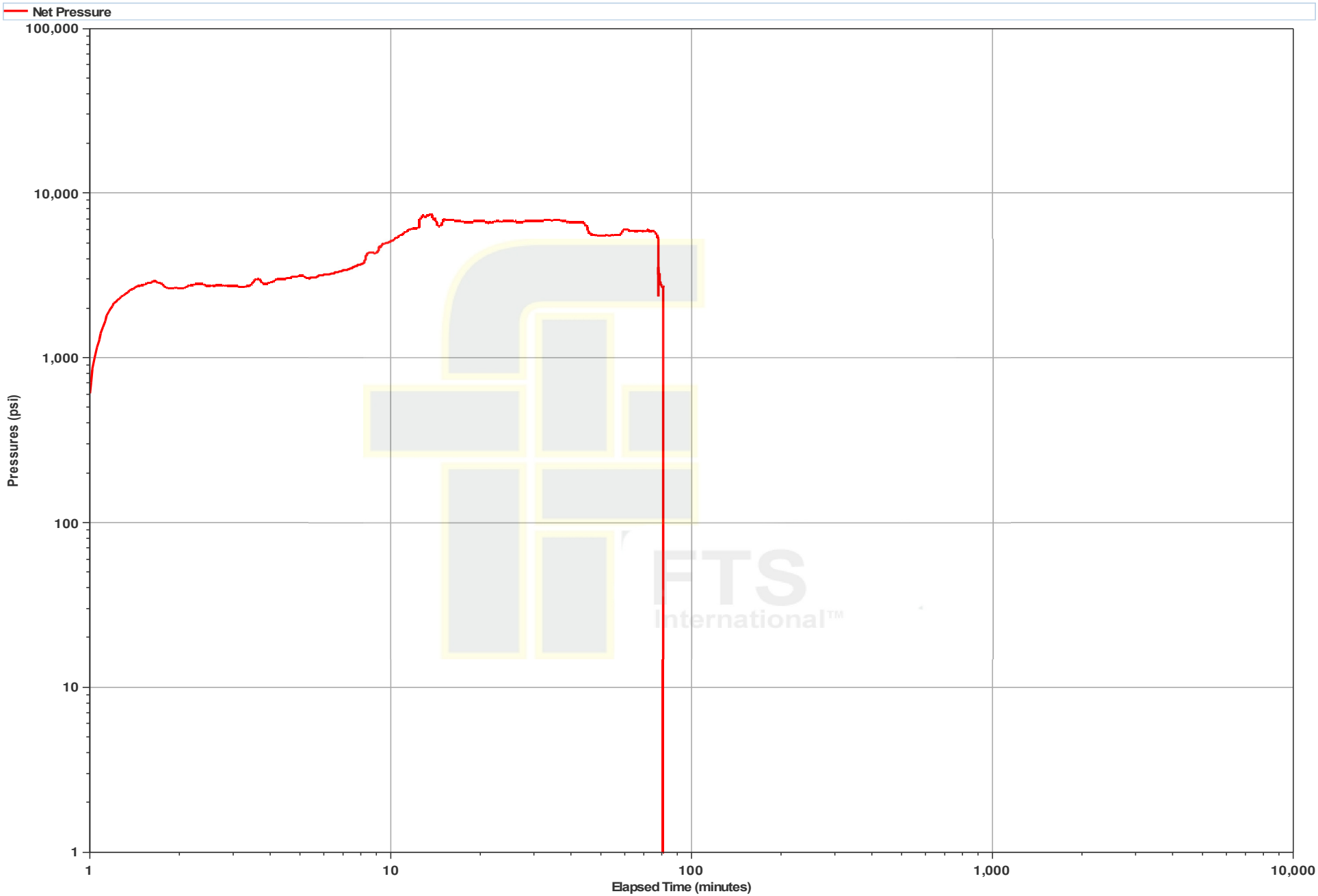
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 53 (WF.000658.M.W03.S53-ADCT-1103) **Jun 30, 2015**

Chemical Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 53 (WF.000658.M.W03.S53-ADCT-1103) **Jun 30, 2015**

Net Pressure Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 53 (WF.000658.M.W03.S53-ADCT-1103) Jun 30, 2015

WATER-BASED FRAC FLUID QUALITY CONTROL
(Attachment to Post Treatment Report)

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/30/2015
Customer Name:	American Energy - Utica	Proposal #:	3H/53
Date Sampled:	6/30/2015	Water Source:	Working Tank

Sample/Tank No.	Clarity, Color, Odor	Sample Temperature, (F)	Specific gravity	Initial pH	Chloride, ppm	Hardness, ppm	Calcium, ppm	Magnesium, ppm	Iron ppm	Hydroxide, ppm	Bicarbonate, ppm	Carbonate, ppm	Sulfate, ppm	Barium, ppm
Working Tank	Clear	74	1	7.6	26	72	24	12	0	0	354	0	55	0
Reused Water/ from Blender Tub	Yellow, Slightly Cloudy, Petroleum Odor	75	1.03	5.6	64,980	52000	18,805	8,070	10	0	8784	0	250	0

Frac Fluid Quality Gel Testing (These Recording are to made prior to pumping job)														
Sample #														
Base Gel Type	HVG-1													
Gel Loading (lbs/1000 gal.)	2.5													
Sample Temperature, (F)	74													
Initial pH	7.3													
Visc. Reading @ 300 rpms	6.5													
Viscosity, (cp)	6.5													
Sample 1 3 min Hydration	3													
Sample 2 3 min Hydration	5													
Sample 3 3 min Hydration	6													
X-Link Vortex Closure, min:sec	n/a													
X-Link Crown, min:sec	n/a													
X-Link pH	n/a													
Gel Break Time (<2cp) mins	19													

Frac Fluid Quality Gel Testing (These Recording are to made while pumping job)														
Stage #														
Base Gel Viscosity (cp)														
X-Link pH								.						
Sample XL time, min:sec														
Sample Temperature														

Acid Quality	Percent Acid	NaOH, mLs	Specific Gravity
	28		1.14

Additional testing or documentation may be required by the customer or for frac fluid quality assurance.

Tested By: Etuate Varea

QUALITY CONTROL OF PROPPANTS

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/30/2015
Customer Name:	American Energy - Utica	Well/Stage:	3H/53
Date Sampled:	6/30/2015	DISTRICT:	Washington, PA
VENDOR:	SANTROL		

Select Proppant Type:

___ Brown	___ Ceramic	___ Other (specify)
X White	___ Bauxite	_____
___ Resin Coated	___ Texas Gold	

Sieve Analysis	100 Mesh			Sieve Analysis	30/50 Mesh		
Sample 1	24.75	grams of sample		Sample 2	24.80	grams of sample	
	Amount Retained				Amount Retained		
Sieve mesh	Gram	%		Sieve mesh	Gram	%	
			Total				Total
50	0.15	0.61	In-Size	20	0.00	0.00	In-Size
70	17.20	69.49		30	1.30	5.24	
100	3.90	15.76	99.4%	40	19.00	76.61	92.7%
120	2.10	8.48		45	2.10	8.47	
140	0.90	3.64		50	1.90	7.66	
200	0.50	2.02		70	0.50	2.02	
Pan	0.00	0.00	fines	Pan	0.00	0.00	fines
Total wt. Gram	24.75	100.00		Total wt. Gram	24.80	100.00	

Tested By: Etuate Varea

Post Job Report

AMERICAN ENERGY - UTICA

Red Hill Farm MDS GR 3H

Stage : 54 OF 54

HARRISON, OH

Operations Representative:

Name:	**David Knapp**
Office:	**724-743-2537**
Fax:	**724-743-7719**
Cell:	
Email:	**DAVID.KNAPP@FTSI.COM**

Sales Representative:

Name:	**Bruce Matthews**
Office:	**405-574-3981**
Fax:	**405-767-1288**
Cell:	
Email:	**BRUCE.MATTHEWS@FTSI.COM**

Engineering Manager:

Name:	**Thaddeus Craun**
Office:	**817-682-8702**
Fax:	**724-743-7719**
Cell:	
Email:	**THADDEUS.CRAUN@FTSI.COM**

FTS International
1432 Route 519
Eighty Four, PA 15330

Customer: American Energy - Utica
Well: Red Hill Farm Mds Gr 3H
Stage: 54
Job End Date: 06/30/2015

Job Summary

Well Information

TVD:	7,301	**Top Perf:**	7,655
No. Of Perfs:	30		

Casing	Tubing
5.50" 20.00#	N/A

Pressures, Rates and Volumes

	Proposed	Actual	Max	Min
STP	9,046 psi	8,511 psi	9,683 psi	7,814 psi
Rate	80.0 bpm	87.5 bpm	91.0 bpm	35.8 bpm

	Proposed	Actual		
Clean Volume	5,772 bbls	5,186 bbls		
Slurry Volume	6,042 bbls	5,429 bbls		
Flush Volume	357 bbls	175 bbls		

	Proposed	Start	End
Frac Pumps on Location	10	14	14

Open Well:	Start Time	13:26	Pressure	3,185 psi
	Ball Seat	140 bbls	Break Down	8,622 psi
	Initial ISIP:	4,728 psi	Initial F.G.:	1.08 psi/ft
Stage Complete:	End Time	14:42	Job Time	01:15
	Final ISIP	4,728 psi	Final F.G.	1.08 psi/ft
	HHP	18,253	5 Min:	4,432 psi
	Proppant Min:	0.00	10 Min:	N/A
	Proppant Max:	2.00	15 Min:	N/A

Material Volume

Material	Proposed	Calculated	Actual	Variance
100 Mesh White	40,000	39,947	38,947	-3%
30/50 White	210,000	186,104	186,104	0%
Total Proppants	250,000	226,051	225,051	0%

Material	Proposed	Calculated	Actual	Variance
0.1%-7.5% HCL	3,000	2,982	3,000	1%
APB-1	0	4	4	0%
CI-150	3	3	3	0%
CS-250 SI	60	52	52	0%
FE-200L	15	15	15	0%
FRW-200	180	79	79	0%
HVG-1 4.0	0	19	19	0%
ICI-3240	60	52	52	0%
LTB-1	0	4	4	0%
NE-100	0	105	105	0%
NE-100W	120	0	0	0

Comments:

Pumpdown Information:
Total Bbls: 16
Max Pressure (psi): 5726
Max Rate (bpm): 12.5

FTS International
1432 Route 519
Eighty Four, PA 15330

Customer: American Energy - Utica
Well: Red Hill Farm Mds Gr 3H
Stage: 54
Job End Date: 06/30/2015

Treatment Report

Date:	6/30/2015	District:	Washington County,PA	Quote No:	051815_035725QF	API:	34-059-24370

MIL Time	STP	Slurry BPM	Stage Clean (bbls)	Cumulative Clean (bbls)	Stage Slurry (bbls)	Cumulative Slurry (bbls)	Stage Proppant (lbs)	Cumulative Proppant (lbs)	Description	Proppant	PPA
13:26	3,185	0.0	0	0	0	0	0	0	Freshwater Open Well		0.00
13:29	5,687	9.1	19	19	19	19	0	0	Freshwater Load		0.00
13:32	5,765	8.5	71	90	71	90	0	0	7.5% HCL Acid Acid		0.00
13:37	7,921	28.0	50	140	50	140	0	0	Slickwater Load		0.00
13:39	8,622	28.7	48	188	48	188	0	0	Slickwater Breakdown		0.00
13:41	7,942	35.8	215	403	217	405	1,580	1,580	Slickwater Proppant	100 Mesh White	0.10 - 0.25
13:45	8,778	88.2	228	631	232	637	3,591	5,171	Slickwater Proppant	100 Mesh White	0.25 - 0.50
13:47	8,882	88.9	286	917	292	929	6,006	11,177	Slickwater Proppant	100 Mesh White	0.50
13:50	8,638	90.2	520	1,437	538	1,467	16,380	27,557	Slickwater Proppant	100 Mesh White	0.75
13:55	8,645	90.4	295	1,732	308	1,775	12,390	39,947	Slickwater Proppant	100 Mesh White	1.00
14:02	8,434	89.4	783	2,515	818	2,593	32,886	72,833	Slickwater Proppant	30/50 White	1.00
14:09	8,414	89.7	729	3,244	770	3,363	38,273	111,106	Slickwater Proppant	30/50 White	1.25
14:20	8,026	90.0	690	3,934	737	4,100	43,470	154,576	Slickwater Proppant	30/50 White	1.50
14:27	8,449	89.4	60	3,994	64	4,164	3,780	158,356	10# Linear Gel Proppant	30/50 White	1.50
14:27	8,430	89.5	25	4,019	27	4,191	1,838	160,194	10# Linear Gel Proppant	30/50 White	1.75
14:27	8,469	89.8	355	4,374	383	4,574	26,093	186,287	Slickwater Proppant	30/50 White	1.75
14:31	8,548	89.3	21	4,395	23	4,597	1,544	187,831	10# Linear Gel Proppant	30/50 White	1.75
14:32	8,499	89.7	23	4,418	25	4,622	1,932	189,763	10# Linear Gel Proppant	30/50 White	2.00
14:33	8,485	90.0	432	4,850	471	5,093	36,288	226,051	Slickwater Proppant	30/50 White	2.00
14:38	9,426	72.5	50	4,900	50	5,143	0	226,051	10# Linear Gel Sweep		0.00
14:38	9,484	72.6	111	5,011	111	5,254	0	226,051	Slickwater Sweep		0.00
14:40	9,059	72.5	60	5,071	60	5,314	0	226,051	Slickwater Flush		0.00
14:41	7,176	72.6	115	5,186	115	5,429	0	226,051	Freshwater Flush		0.00
14:42	4,728	0.0	0	5,186	0	5,429	0	226,051	Freshwater Shutdown		0.00
Total JobTime (HH:MM): 01:16											

Min STP:	7,814 psi	**Max STP:**	9,683 psi	**Average STP:**	8,511 psi	**5 Min:**	4,432 psi
Min Rate:	35.8 bpm	**Max Rate:**	91.0 bpm	**Average Rate:**	87.5 bpm	**10 Min:**	0 psi
Initial ISIP:	4,728 psi	**Initial F.G.:**	1.08 psi/ft	**Average HHP:**	18,253	**15 Min:**	0 psi
Final ISIP:	4,728 psi	**Final F.G.:**	1.08 psi/ft	**Customer Representative:**		Mike Hausvater	
FTSI Representative:		Etuate Varea & Cody Melone					

Comments:

The proppant values contained in this report are calculated based on actual barrel counts and target densities. Actual total proppant usage is 225,051 lbs. Charge time is 1 hour(s) 15 minute(s). All chemicals and proppant ran as documented.

Min/Max/Avg were taken from sand stages. All chem changes from proposed were made per AEU representative request.

No reused water pumped

Staged a sweep during the 2.0ppg stage of 30/50 due to rising pressure trend.

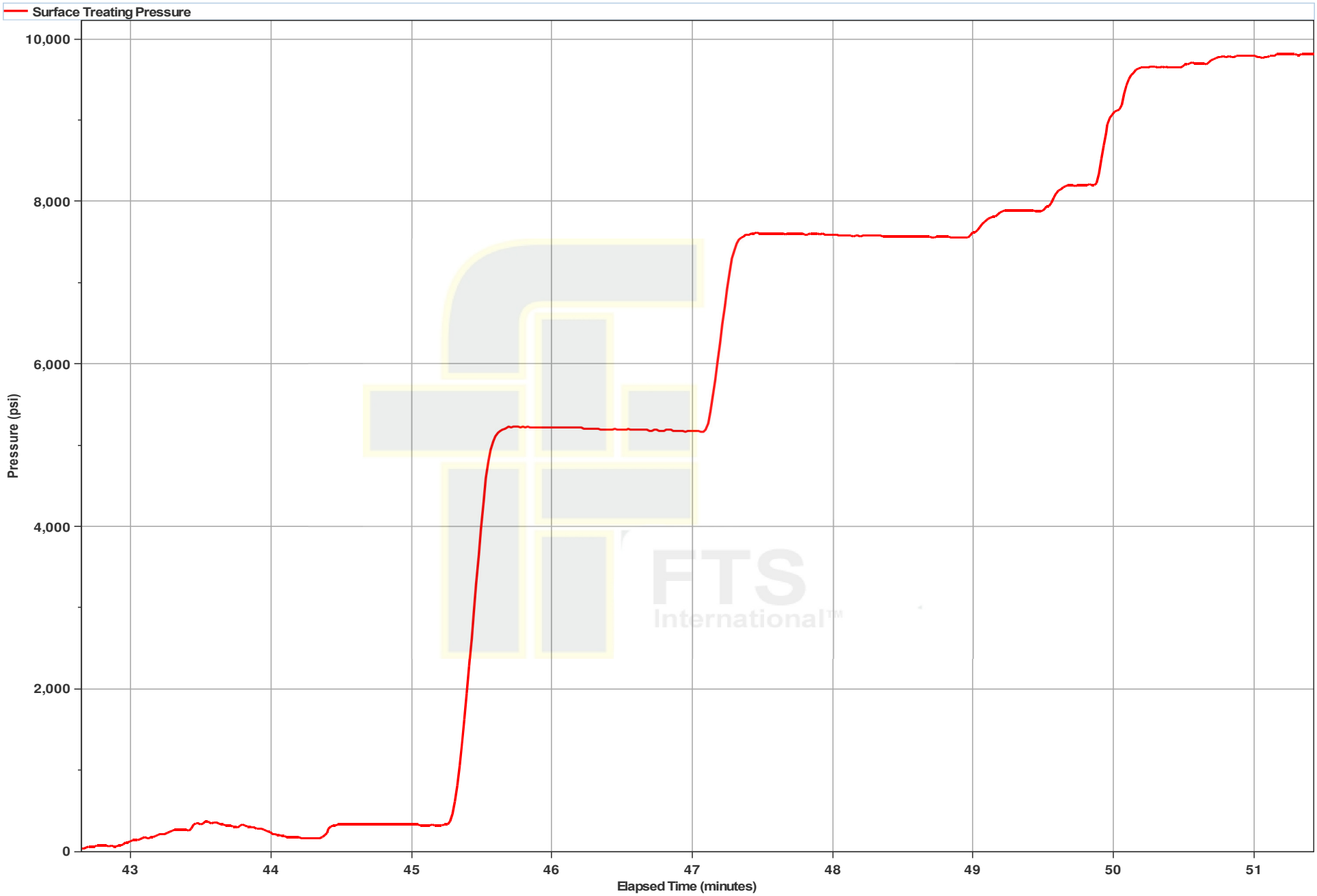
Cut 30/50 ~25k short due to rising pressure.

1 Minute Shutdown (psi): 4623
2 Minute Shutdown (psi): 4466
5 Minute Shutdown (psi): 4432

Chemical Changes:

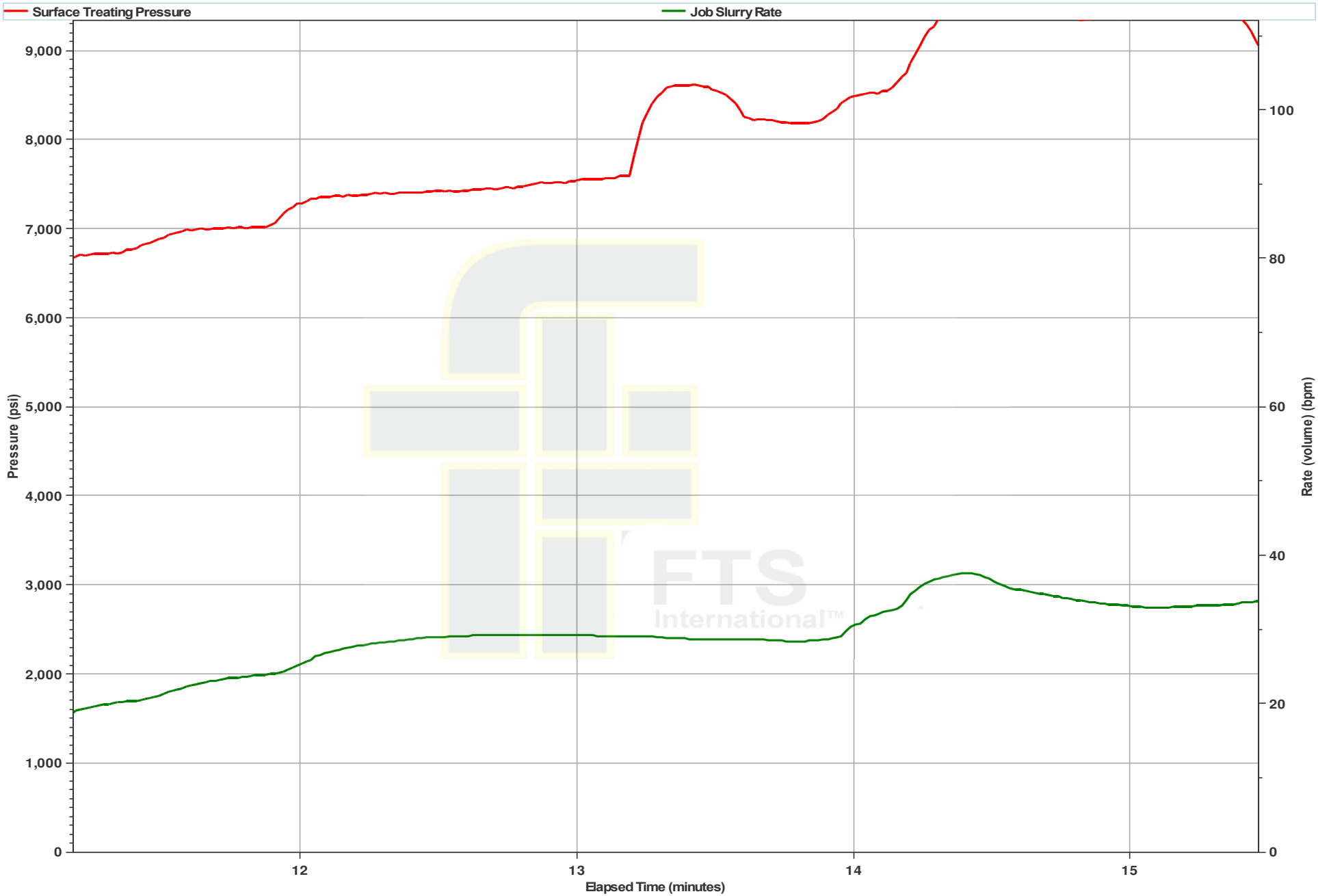
Chemical Name	Chemical Loading	Cumulative Clean
FRW-200	0.50	3,244

AEU Pressure Test



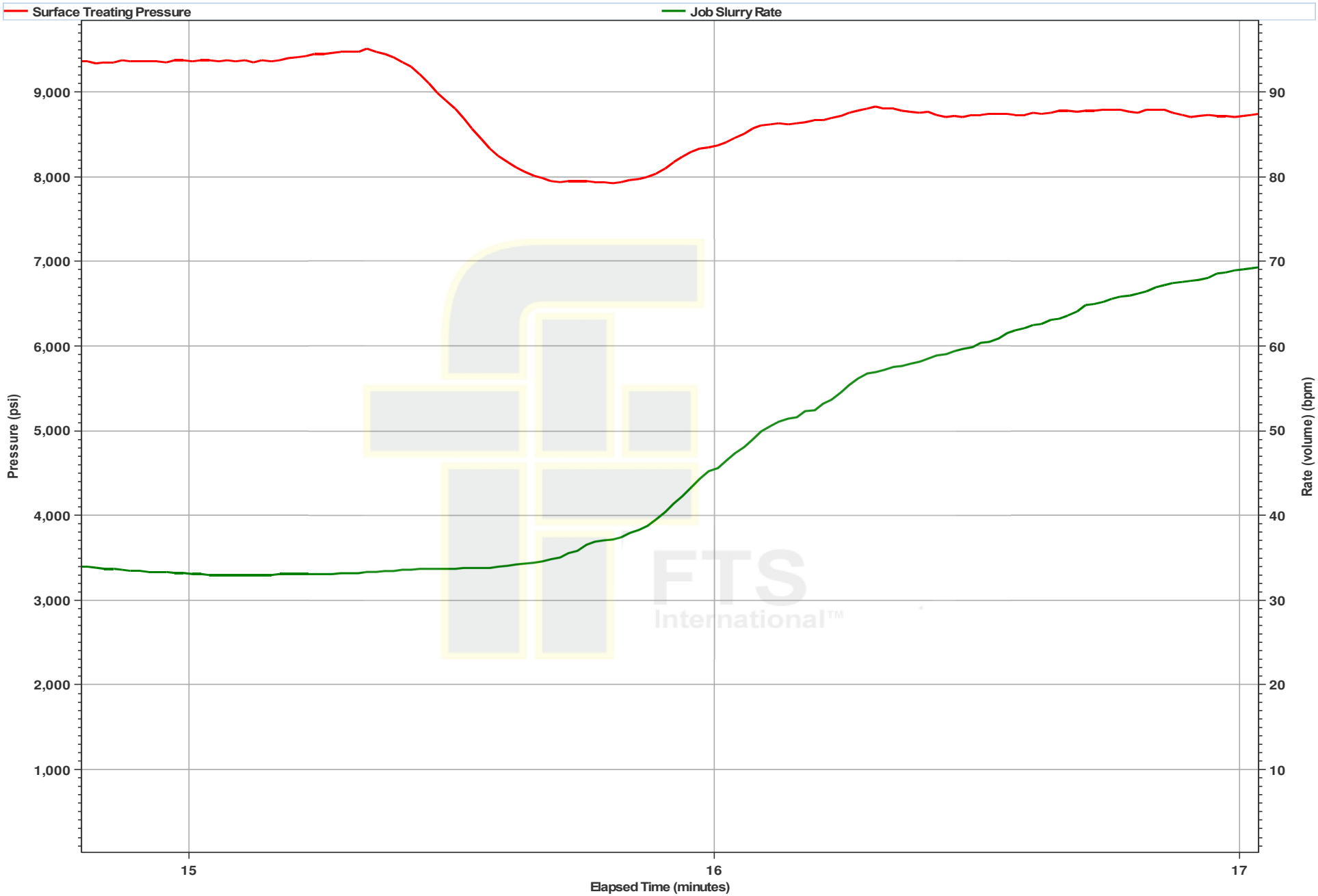
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 54 (WF.000658.M.W03.S54-aDCT-1103) Jun 30, 2015

Ball Seat and Breakdown



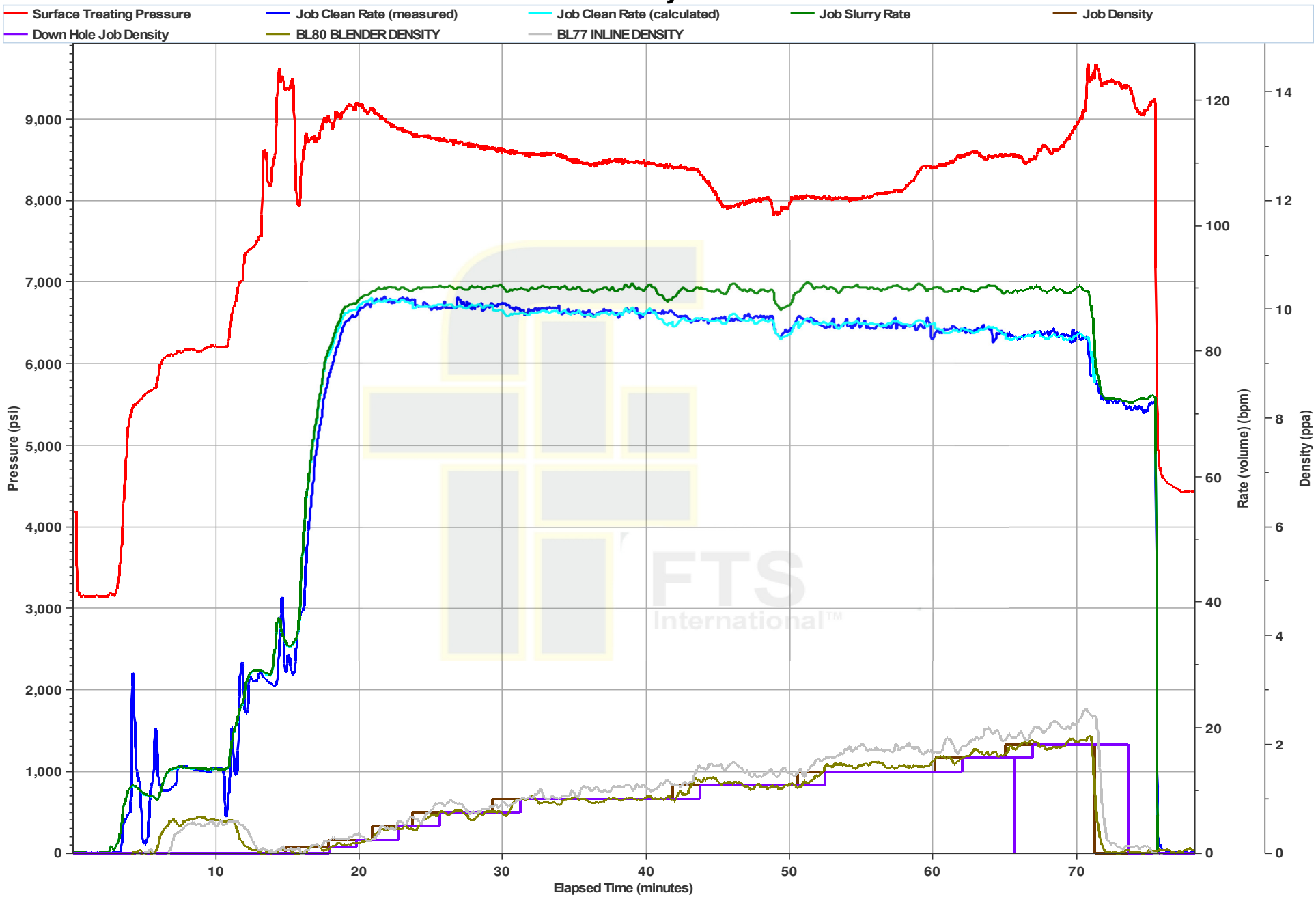
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 54 (WF.000658.M.W03.S54-aDCT-1103) **Jun 30, 2015**

Acid on Perforations



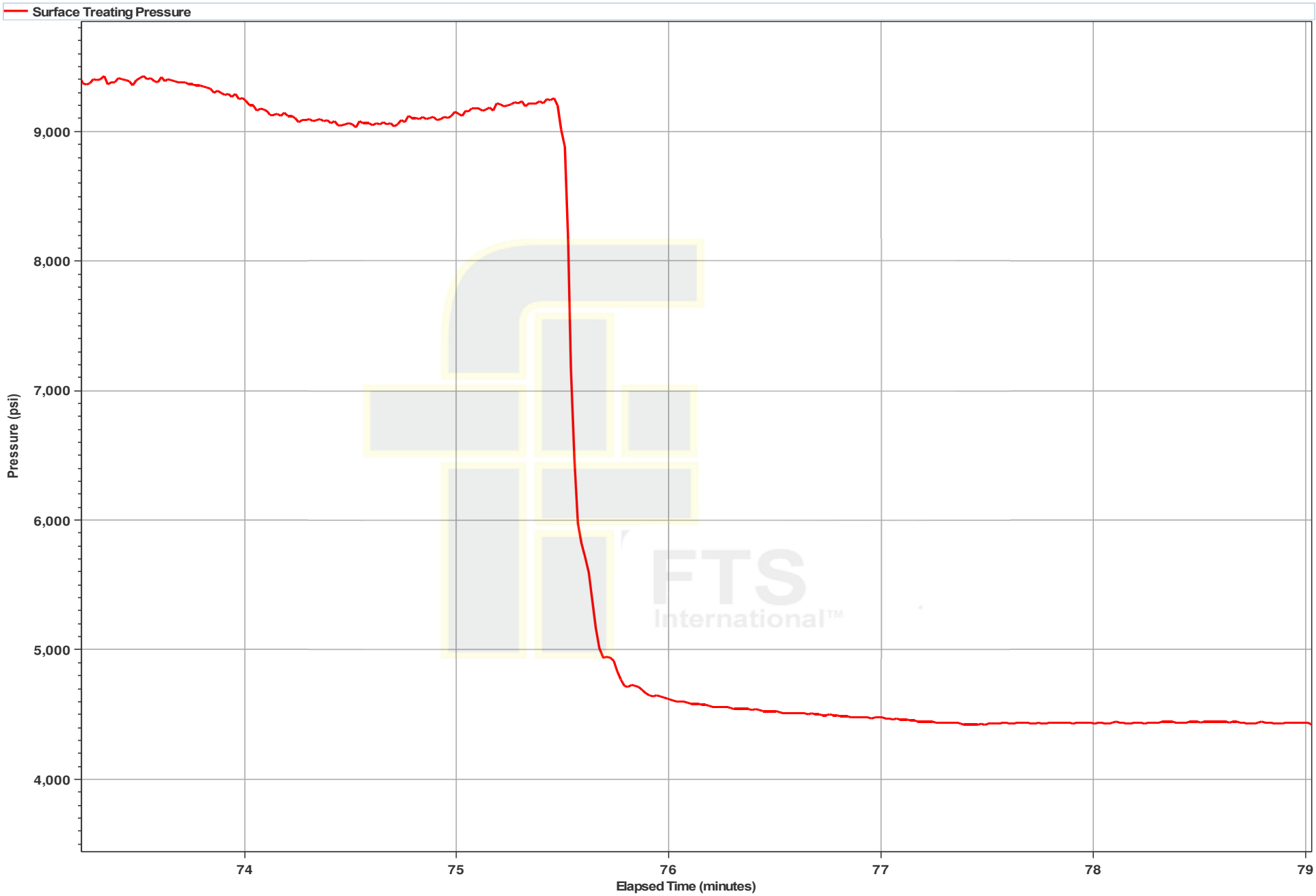
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 54 (WF.000658.M.W03.S54-aDCT-1103) **Jun 30, 2015**

Primary Plot



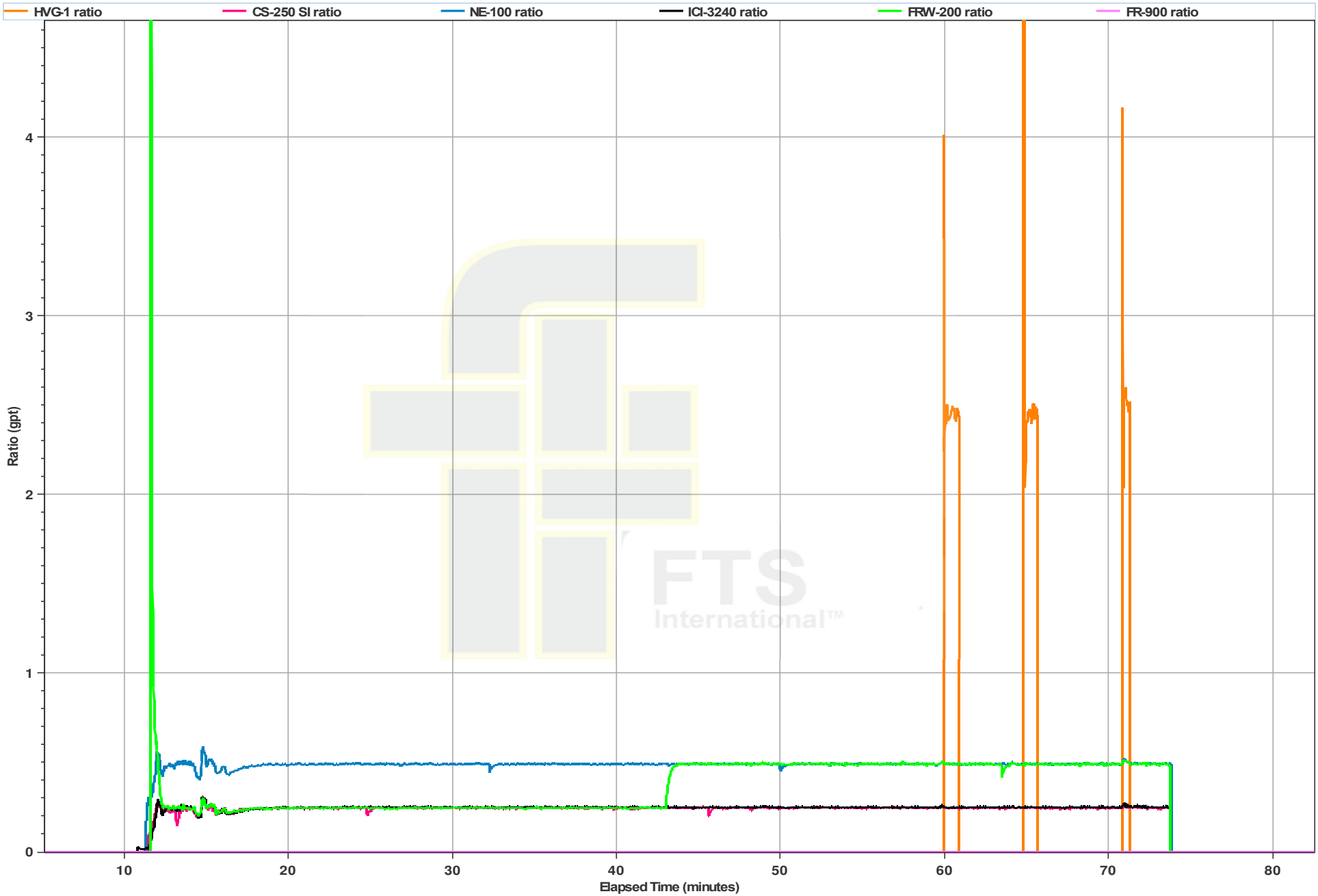
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 54 (WF.000658.M.W03.S54-aDCT-1103) **Jun 30, 2015**

ISIP Plot



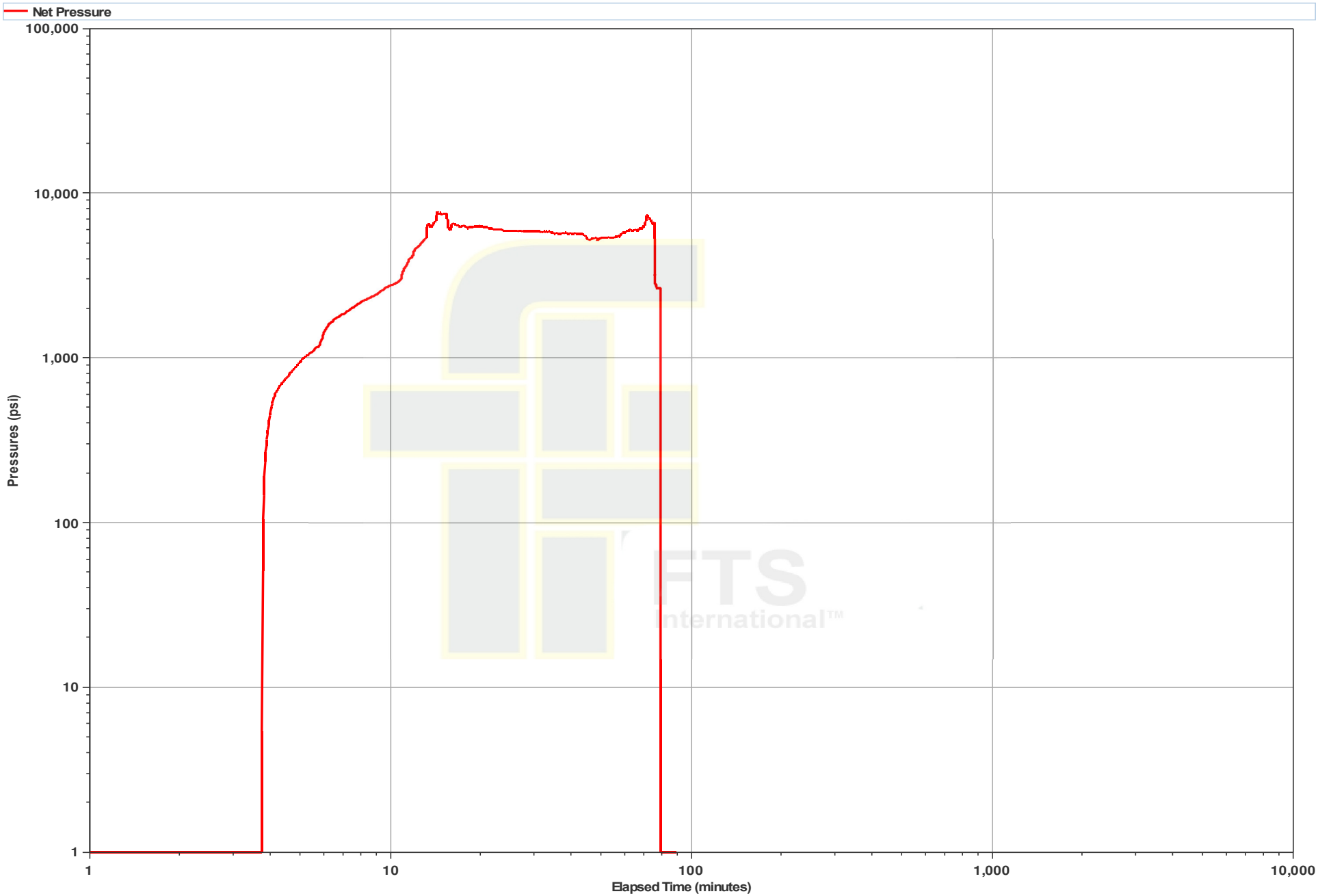
American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 54 (WF.000658.M.W03.S54-aDCT-1103) **Jun 30, 2015**

Chemical Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 54 (WF.000658.M.W03.S54-aDCT-1103) **Jun 30, 2015**

Net Pressure Plot



American Energy Utica Red Hill Farm MDS GR 3H Harrison OH Stage 54 (WF.000658.M.W03.S54-aDCT-1103) Jun 30, 2015

WATER-BASED FRAC FLUID QUALITY CONTROL
(Attachment to Post Treatment Report)

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/30/2015
Customer Name:	American Energy - Utica	Proposal #:	3H/54
Date Sampled:	6/30/2015	Water Source:	Working Tank

Sample/Tank No.	Clarity, Color, Odor	Sample Temperature, (F)	Specific gravity	Initial pH	Chloride, ppm	Hardness, ppm	Calcium, ppm	Magnesium, ppm	Iron ppm	Hydroxide, ppm	Bicarbonate, ppm	Carbonate, ppm	Sulfate, ppm	Barium, ppm
Working Tank	Clear	78	1	7.9	33	86	32	13	0	0	317	0	65	0

Frac Fluid Quality Gel Testing (These Recording are to made prior to pumping job)														
Sample #														
Base Gel Type	HVG-1													
Gel Loading (lbs/1000 gal.)	2.5													
Sample Temperature, (F)	78													
Initial pH	7.3													
Visc. Reading @ 300 rpms	5													
Viscosity, (cp)	5													
Sample 1 3 min Hydration	4													
Sample 2 3 min Hydration	5													
Sample 3 3 min Hydration	5													
X-Link Vortex Closure, min:sec	n/a													
X-Link Crown, min:sec	n/a													
X-Link pH	n/a													
Gel Break Time (<2cp) mins	21													

Frac Fluid Quality Gel Testing (These Recording are to made while pumping job)														
Stage #														
Base Gel Viscosity (cp)														
X-Link pH								.						
Sample XL time, min:sec														
Sample Temperature														

Acid Quality	Percent Acid	NaOH, mLs	Specific Gravity
	28		1.14

Additional testing or documentation may be required by the customer or for frac fluid quality assurance.

Tested By: Etuate Varea

QUALITY CONTROL OF PROPPANTS

Lease/Well Name:	Red Hill Farm MDS GR	Date:	6/30/2015
Customer Name:	American Energy - Utica	Well/Stage:	3H/54
Date Sampled:	6/30/2015	DISTRICT:	Washington, PA
VENDOR:	SANTROL		

Select Proppant Type:

___ Brown	___ Ceramic	___ Other (specify)
X White	___ Bauxite	_____
___ Resin Coated	___ Texas Gold	

Sieve Analysis	100 Mesh			Sieve Analysis	30/50 Mesh		
Sample 1	25.10	grams of sample		Sample 2	25.50	grams of sample	
	Amount Retained				Amount Retained		
Sieve mesh	Gram	%		Sieve mesh	Gram	%	
			Total				Total
50	0.00	0.00	In-Size	20	0.00	0.00	In-Size
70	17.50	69.72		30	1.50	5.88	
100	4.20	16.73	99.6%	40	19.90	78.04	92.9%
120	2.00	7.97		45	2.80	10.98	
140	0.90	3.59		50	1.00	3.92	
200	0.40	1.59		70	0.30	1.18	
Pan	0.10	0.40	fines	Pan	0.00	0.00	fines
Total wt. Gram	25.10	100.00		Total wt. Gram	25.50	100.00	

Tested By: Etuate Varea

Remit To:
FTS INTERNATIONAL SERVICES, LLC
[redacted]

FTS INTERNATIONAL

INVOICE

INVOICE NO. : [redacted]
INVOICE DATE : 06/12/2015

AMERICAN ENERGY - UTICA
[redacted]

Payment Terms : [redacted]
Lease/Cty/St : Red Hill Farm MDS GR 3H
HARRISON OH
Stage : 2
AFE/Routing : [redacted]
Salesperson :
District : Washington County
ATTN. :

DESCRIPTION	QTY	PRICE	UNIT	DISC	AMOUNT IN USD
NE-100	128.00	[redacted]			
0.1%-7.5% HCL	3,000.00				
ICI-3240	61.00				
FRW-200	192.00				
FE-200L	15.00				
CS-250 SI	61.00				
CI-150	3.00				
30/50 White	211,533.00				
100 Mesh White	38,907.00				
Loadcraft Silo Charge	1.00				
Sand Delivery	10,268.00				
Field Performance Incentive (Frac)	1.00				
AEU Utica Stage Rate # 90 bpm # 12.5	1.50				

[redacted]

Remit To:
FTS INTERNATIONAL SERVICES, LLC
[redacted]

FTS INTERNATIONAL

INVOICE

INVOICE NO. : [redacted]
INVOICE DATE : 06/13/2015

AMERICAN ENERGY - UTICA
[redacted]

Payment Terms : [redacted]
Lease/Cty/St : Red Hill Farm MDS GR 3H
HARRISON OH
Stage : 4
AFE/Routing : [redacted]
Salesperson :
District : Washington County
ATTN. :

DESCRIPTION	QTY	PRICE	UNIT	DISC	AMOUNT IN USD
NE-100	118.00	[redacted]			
0.1%-7.5% HCL	3,000.00				
ICI-3240	59.00				
FRW-200	185.00				
FE-200L	15.00				
CS-250 SI	59.00				
CI-150	3.00				
30/50 White	209,769.00				
100 Mesh White	40,945.00				
Loadcraft Silo Charge	1.00				
Sand Delivery	10,279.50				
Field Performance Incentive (Frac)	1.00				
AEU Utica Stage Rate # 90 bpm # 12.5	1.50				

[redacted]

Remit To:
FTS INTERNATIONAL SERVICES, LLC
[redacted]

FTS INTERNATIONAL

INVOICE

INVOICE NO. : [redacted]
INVOICE DATE : 06/13/2015

AMERICAN ENERGY - UTICA
[redacted]

Payment Terms : [redacted]
Lease/Cty/St : Red Hill Farm MDS GR 3H
HARRISON OH
Stage : 3
AFE/Routing : [redacted]
Salesperson :
District : Washington County
ATTN. :

DESCRIPTION	QTY	PRICE	UNIT	DISC	AMOUNT IN USD
NE-100	121.00	[redacted]			
0.1%-7.5% HCL	3,000.00				
ICI-3240	60.00				
FRW-200	210.00				
FE-200L	15.00				
CS-250 SI	60.00				
CI-150	3.00				
30/50 White	210,633.00				
100 Mesh White	39,164.00				
Loadcraft Silo Charge	1.00				
Sand Delivery	10,241.80				
Field Performance Incentive (Frac)	1.00				
AEU Utica Stage Rate # 90 bpm # 12.5	1.50				

[redacted]

Remit To:
FTS INTERNATIONAL SERVICES, LLC
[redacted]

FTS INTERNATIONAL

INVOICE

INVOICE NO. : [redacted]
INVOICE DATE : 06/14/2015

AMERICAN ENERGY - UTICA
[redacted]

Payment Terms : [redacted]
Lease/Cty/St : Red Hill Farm MDS GR 3H
HARRISON OH
Stage : 6
AFE/Routing : [redacted]
Salesperson :
District : Washington County
ATTN. :

DESCRIPTION	QTY	PRICE	UNIT	DISC	AMOUNT IN USD
NE-100	115.00	[redacted]			
HVG-1 4.0	28.00				
0.1%-7.5% HCL	3,000.00				
LTB-1	6.00				
ICI-3240	58.00				
FRW-200	215.00				
FE-200L	15.00				
CS-250 SI	58.00				
CI-150	3.00				
APB-1	6.00				
30/50 White	210,814.00				
100 Mesh White	39,907.00				
Loadcraft Silo Charge	1.00				
Sand Delivery	10,279.50				
Field Performance Incentive (Frac)	1.00				
AEU Utica Stage Rate # 90 bpm # 12.5	1.50				

Remit To:
FTS INTERNATIONAL SERVICES, LLC
[redacted]

FTS INTERNATIONAL

INVOICE

INVOICE NO. : [redacted]
INVOICE DATE : 06/14/2015

AMERICAN ENERGY - UTICA
[redacted]

Payment Terms : [redacted]
Lease/Cty/St : Red Hill Farm MDS GR 3H
HARRISON OH
Stage : 5
AFE/Routing : [redacted]
Salesperson :
District : Washington County
ATTN. :

DESCRIPTION	QTY	PRICE	UNIT	DISC	AMOUNT IN USD
NE-100	133.00	[redacted]			
HVG-1 4.0	300.00				
0.1%-7.5% HCL	3,000.00				
LTB-1	60.00				
ICI-3240	68.00				
FRW-200	230.00				
FE-200L	15.00				
CS-250 SI	68.00				
CI-150	3.00				
APB-1	60.00				
30/50 White	210,043.00				
100 Mesh White	40,397.00				
Loadcraft Silo Charge	1.00				
Sand Delivery	10,268.00				
Field Performance Incentive (Frac)	1.00				
AEU Utica Stage Rate # 90 bpm # 12.5	1.75				

[redacted]

Remit To:
FTS INTERNATIONAL SERVICES, LLC
[redacted]

FTS INTERNATIONAL

INVOICE

INVOICE NO. : [redacted]
INVOICE DATE : 06/14/2015

AMERICAN ENERGY - UTICA
[redacted]

Payment Terms : [redacted]
Lease/Cty/St : Red Hill Farm MDS GR 3H
HARRISON OH
Stage : 7
AFE/Routing : [redacted]
Salesperson :
District : Washington County
ATTN. :

DESCRIPTION	QTY	PRICE	UNIT	DISC	AMOUNT IN USD
NE-100	117.00	[redacted]			
HVG-1 4.0	30.00				
0.1%-7.5% HCL	3,000.00				
LTB-1	5.00				
ICI-3240	58.00				
FRW-200	175.00				
FE-200L	15.00				
CS-250 SI	58.00				
CI-150	3.00				
APB-1	5.00				
30/50 White	201,937.00				
100 Mesh White	38,200.00				
Loadcraft Silo Charge	1.00				
Sand Delivery	9,845.70				
Field Performance Incentive (Frac)	1.00				
AEU Utica Stage Rate # 90 bpm # 12.5	1.50				

[redacted]

Remit To:
FTS INTERNATIONAL SERVICES, LLC
[redacted]

FTS INTERNATIONAL

INVOICE

INVOICE NO. : [redacted]
INVOICE DATE : 06/15/2015

AMERICAN ENERGY - UTICA
[redacted]

Payment Terms : [redacted]
Lease/Cty/St : Red Hill Farm MDS GR 3H
HARRISON OH
Stage : 9
AFE/Routing : [redacted]
Salesperson :
District : Washington County
ATTN. :

DESCRIPTION	QTY	PRICE	UNIT	DISC	AMOUNT IN USD
NE-100	120.00	[redacted]			
0.1%-7.5% HCL	3,000.00				
ICI-3240	60.00				
FRW-200	230.00				
FE-200L	15.00				
CS-250 SI	60.00				
CI-150	3.00				
30/50 White	211,785.00				
100 Mesh White	39,041.00				
Loadcraft Silo Charge	1.00				
Sand Delivery	10,283.60				
Field Performance Incentive (Frac)	1.00				
AEU Utica Stage Rate # 90 bpm # 12.5	1.50				

[redacted]

Remit To:
FTS INTERNATIONAL SERVICES, LLC
[redacted]

FTS INTERNATIONAL

INVOICE

INVOICE NO. : [redacted]
INVOICE DATE : 06/15/2015

AMERICAN ENERGY - UTICA
[redacted]

Payment Terms : [redacted]
Lease/Cty/St : Red Hill Farm MDS GR 3H
HARRISON OH
Stage : 8
AFE/Routing : [redacted]
Salesperson :
District : Washington County
ATTN. :

DESCRIPTION	QTY	PRICE	UNIT	DISC	AMOUNT IN USD
NE-100	113.00	[redacted]			
HVG-1 4.0	190.00				
0.1%-7.5% HCL	3,000.00				
LTB-1	38.00				
ICI-3240	56.00				
FRW-200	172.00				
FE-200L	15.00				
CS-250 SI	56.00				
CI-150	3.00				
APB-1	38.00				
30/50 White	210,746.00				
100 Mesh White	39,579.00				
Loadcraft Silo Charge	1.00				
Sand Delivery	10,263.10				
Field Performance Incentive (Frac)	1.00				
AEU Utica Stage Rate # 90 bpm # 12.5	1.50				

Remit To:
FTS INTERNATIONAL SERVICES, LLC
[redacted]

FTS INTERNATIONAL

INVOICE

INVOICE NO. : [redacted]
INVOICE DATE : 06/16/2015

AMERICAN ENERGY - UTICA
[redacted]

Payment Terms : [redacted]
Lease/Cty/St : Red Hill Farm MDS GR 3H
HARRISON OH
Stage : 11
AFE/Routing : [redacted]
Salesperson :
District : Washington County
ATTN. :

DESCRIPTION	QTY	PRICE	UNIT	DISC	AMOUNT IN USD
HVG-1 4.0	73.00	[redacted]			
0.1%-7.5% HCL	3,000.00				
LTB-1	14.00				
ICI-3240	60.00				
FRW-200	182.00				
FE-200L	15.00				
CS-250 SI	60.00				
CI-150	3.00				
NE-100	119.00				
APB-1	14.00				
30/50 White	210,788.00				
100 Mesh White	39,177.00				
Loadcraft Silo Charge	1.00				
Sand Delivery	10,248.40				
Field Performance Incentive (Frac)	1.00				
AEU Utica Stage Rate # 90 bpm # 12.5	1.50				

Remit To:
FTS INTERNATIONAL SERVICES, LLC
[redacted]

FTS INTERNATIONAL

INVOICE

INVOICE NO. : [redacted]
INVOICE DATE : 06/16/2015

AMERICAN ENERGY - UTICA
[redacted]

Payment Terms : [redacted]
Lease/Cty/St : Red Hill Farm MDS GR 3H
HARRISON OH
Stage : 12
AFE/Routing : [redacted]
Salesperson :
District : Washington County
ATTN. :

DESCRIPTION	QTY	PRICE	UNIT	DISC	AMOUNT IN USD
HVG-1 4.0	45.00	[redacted]			
0.1%-7.5% HCL	3,000.00				
LTB-1	8.00				
ICI-3240	60.00				
FRW-200	225.00				
FE-200L	15.00				
CS-250 SI	60.00				
CI-150	3.00				
NE-100	118.00				
APB-1	8.00				
30/50 White	210,452.00				
100 Mesh White	39,172.00				
Field Performance Incentive (Frac)	1.00				
Sand Delivery	10,234.40				
Loadcraft Silo Charge	1.00				
AEU Utica Stage Rate # 90 bpm # 12.5	1.50				

Remit To:
FTS INTERNATIONAL SERVICES, LLC
[redacted]

FTS INTERNATIONAL

INVOICE

INVOICE NO. : [redacted]
INVOICE DATE : 06/15/2015

AMERICAN ENERGY - UTICA
[redacted]

[redacted]

Payment Terms : [redacted]
Lease/Cty/St : Red Hill Farm MDS GR 3H
HARRISON OH
Stage : 10
AFE/Routing : [redacted]
Salesperson :
District : Washington County
ATTN. :

DESCRIPTION	QTY	PRICE	UNIT	DISC	AMOUNT IN USD
HVG-1 4.0	42.00	[redacted]			
0.1%-7.5% HCL	3,000.00				
LTB-1	8.00				
ICI-3240	60.00				
FRW-200	180.00				
FE-200L	15.00				
CS-250 SI	60.00				
CI-150	3.00				
NE-100	120.00				
APB-1	8.00				
30/50 White	209,864.00				
100 Mesh White	39,999.00				
Loadcraft Silo Charge	1.00				
Sand Delivery	10,244.30				
Field Performance Incentive (Frac)	1.00				
AEU Utica Stage Rate # 90 bpm # 12.5	1.50				

Remit To:
FTS INTERNATIONAL SERVICES, LLC
[redacted]

FTS INTERNATIONAL

INVOICE

INVOICE NO. : [redacted]
INVOICE DATE : 06/17/2015

AMERICAN ENERGY - UTICA
[redacted]

Payment Terms : [redacted]
Lease/Cty/St : Red Hill Farm MDS GR 3H
HARRISON OH
Stage : 13
AFE/Routing : [redacted]
Salesperson :
District : Washington County
ATTN. :

DESCRIPTION	QTY	PRICE	UNIT	DISC	AMOUNT IN USD
HVG-1 4.0	105.00	[redacted]			
0.1%-7.5% HCL	3,000.00				
LTB-1	21.00				
ICI-3240	45.00				
FRW-200	167.00				
FE-200L	15.00				
CS-250 SI	45.00				
CI-150	3.00				
NE-100	95.00				
APB-1	21.00				
30/50 White	90,111.00				
100 Mesh White	39,050.00				
Loadcraft Silo Charge	1.00				
Sand Delivery	5,295.60				
Field Performance Incentive (Frac)	1.00				
AEU Utica Stage Rate # 90 bpm # 12.5	2.25				

Remit To:
FTS INTERNATIONAL SERVICES, LLC
[redacted]

FTS INTERNATIONAL

INVOICE

INVOICE NO. : [redacted]
INVOICE DATE : 06/12/2015

AMERICAN ENERGY - UTICA
[redacted]

Payment Terms : [redacted]
Lease/Cty/St : Red Hill Farm MDS GR 3H
HARRISON OH
Stage : 1
AFE/Routing : [redacted]
Salesperson :
District : Washington County
ATTN. :

DESCRIPTION	QTY	PRICE	UNIT	DISC	AMOUNT IN USD
NE-100	129.00	[redacted]			
0.1%-7.5% HCL	3,000.00				
ICI-3240	64.00				
FRW-200	192.00				
FE-200L	15.00				
CS-250 SI	64.00				
CI-150	3.00				
30/50 White	210,315.00				
100 Mesh White	40,132.00				
Loadcraft Silo Charge	1.00				
Sand Delivery	10,268.00				
Field Performance Incentive (Frac)	1.00				
AEU Utica Stage Rate # 90 bpm # 12.5	1.50				

Remit To:
FTS INTERNATIONAL SERVICES, LLC
[redacted]

FTS INTERNATIONAL

INVOICE

INVOICE NO. : [redacted]
INVOICE DATE : 06/19/2015

AMERICAN ENERGY - UTICA
[redacted]

[redacted]

Payment Terms : [redacted]
Lease/Cty/St : Red Hill Farm MDS GR 3H
HARRISON OH
Stage : 20
AFE/Routing : [redacted]
Salesperson :
District : Washington County
ATTN. :

DESCRIPTION	QTY	PRICE	UNIT	DISC	AMOUNT IN USD
0.1%-7.5% HCL	3,000.00	[redacted]			
ICI-3240	57.00				
FRW-200	218.00				
FE-200L	15.00				
CS-250 SI	57.00				
CI-150	3.00				
NE-100	114.00				
30/50 White	211,439.00				
100 Mesh White	39,012.00				
Loadcraft Silo Charge	1.00				
Sand Delivery	10,268.90				
Field Performance Incentive (Frac)	1.00				
AEU Utica Stage Rate # 90 bpm # 12.5	1.50				

Remit To:
FTS INTERNATIONAL SERVICES, LLC
[redacted]

FTS INTERNATIONAL

INVOICE

INVOICE NO. : [redacted]
INVOICE DATE : 06/17/2015

AMERICAN ENERGY - UTICA
[redacted]

Payment Terms : [redacted]
Lease/Cty/St : Red Hill Farm MDS GR 3H
HARRISON OH
Stage : 15
AFE/Routing : [redacted]
Salesperson :
District : Washington County
ATTN. :

DESCRIPTION	QTY	PRICE	UNIT	DISC	AMOUNT IN USD
HVG-1 4.0	500.00	[redacted]			
0.1%-7.5% HCL	3,000.00				
LTB-1	100.00				
ICI-3240	61.00				
FRW-200	138.00				
FE-200L	15.00				
CS-250 SI	61.00				
CI-150	3.00				
NE-100	116.00				
APB-1	100.00				
30/50 White	210,700.00				
100 Mesh White	39,235.00				
Loadcraft Silo Charge	1.00				
Sand Delivery	10,247.50				
Field Performance Incentive (Frac)	1.00				
AEU Utica Stage Rate # 90 bpm # 12.5	1.75				

Remit To:
FTS INTERNATIONAL SERVICES, LLC
[redacted]

FTS INTERNATIONAL

INVOICE

INVOICE NO. : [redacted]
INVOICE DATE : 06/17/2015

AMERICAN ENERGY - UTICA
[redacted]

Payment Terms : [redacted]
Lease/Cty/St : Red Hill Farm MDS GR 3H
HARRISON OH
Stage : 14
AFE/Routing : [redacted]
Salesperson :
District : Washington County
ATTN. :

DESCRIPTION	QTY	PRICE	UNIT	DISC	AMOUNT IN USD
0.1%-7.5% HCL	3,000.00	[redacted]			
ICI-3240	58.00				
FRW-200	195.00				
FE-200L	15.00				
CS-250 SI	58.00				
CI-150	3.00				
NE-100	115.00				
30/50 White	210,568.00				
100 Mesh White	39,497.00				
Loadcraft Silo Charge	1.00				
Sand Delivery	10,252.50				
Field Performance Incentive (Frac)	1.00				
AEU Utica Stage Rate # 90 bpm # 12.5	1.50				

Remit To:
FTS INTERNATIONAL SERVICES, LLC
[redacted]

FTS INTERNATIONAL

INVOICE

INVOICE NO. : [redacted]
INVOICE DATE : 06/18/2015

AMERICAN ENERGY - UTICA
[redacted]

[redacted]

Payment Terms : [redacted]
Lease/Cty/St : Red Hill Farm MDS GR 3H
HARRISON OH
Stage : 17
AFE/Routing : [redacted]
Salesperson :
District : Washington County
ATTN. :

DESCRIPTION	QTY	PRICE	UNIT	DISC	AMOUNT IN USD
HVG-1 4.0	110.00	[redacted]			
0.1%-7.5% HCL	3,000.00				
LTB-1	23.00				
ICI-3240	61.00				
FRW-200	225.00				
FE-200L	15.00				
CS-250 SI	61.00				
CI-150	3.00				
NE-100	100.00				
APB-1	23.00				
30/50 White	210,589.00				
100 Mesh White	38,655.00				
Field Performance Incentive (Frac)	1.00				
Sand Delivery	10,218.80				
Loadcraft Silo Charge	1.00				
AEU Utica Stage Rate # 90 bpm # 12.5	1.50				

Remit To:
FTS INTERNATIONAL SERVICES, LLC
[redacted]

FTS INTERNATIONAL

INVOICE

INVOICE NO. : [redacted]
INVOICE DATE : 06/18/2015

AMERICAN ENERGY - UTICA
[redacted]

Payment Terms : [redacted]
Lease/Cty/St : Red Hill Farm MDS GR 3H
HARRISON OH
Stage : 16
AFE/Routing : [redacted]
Salesperson :
District : Washington County
ATTN. :

DESCRIPTION	QTY	PRICE	UNIT	DISC	AMOUNT IN USD
0.1%-7.5% HCL	3,000.00	[redacted]			
ICI-3240	58.00				
FRW-200	246.00				
FE-200L	15.00				
CS-250 SI	58.00				
CI-150	3.00				
NE-100	116.00				
30/50 White	212,038.00				
100 Mesh White	39,759.00				
Loadcraft Silo Charge	1.00				
Sand Delivery	10,323.80				
Field Performance Incentive (Frac)	1.00				
AEU Utica Stage Rate # 90 bpm # 12.5	1.50				

Remit To:
FTS INTERNATIONAL SERVICES, LLC
[redacted]

FTS INTERNATIONAL

INVOICE

INVOICE NO. : [redacted]
INVOICE DATE : 06/18/2015

AMERICAN ENERGY - UTICA
[redacted]

[redacted]

Payment Terms : [redacted]
Lease/Cty/St : Red Hill Farm MDS GR 3H
HARRISON OH
Stage : 18
AFE/Routing : [redacted]
Salesperson :
District : Washington County
ATTN. :

DESCRIPTION	QTY	PRICE	UNIT	DISC	AMOUNT IN USD
HVG-1 4.0	110.00	[redacted]			
0.1%-7.5% HCL	3,000.00				
LTB-1	21.00				
ICI-3240	60.00				
FRW-200	173.00				
FE-200L	15.00				
CS-250 SI	60.00				
CI-150	3.00				
NE-100	114.00				
APB-1	21.00				
30/50 White	210,105.00				
100 Mesh White	39,570.00				
Loadcraft Silo Charge	1.00				
Sand Delivery	10,236.90				
Field Performance Incentive (Frac)	1.00				
AEU Utica Stage Rate # 90 bpm # 12.5	1.50				

Remit To:
FTS INTERNATIONAL SERVICES, LLC
[redacted]

FTS INTERNATIONAL

INVOICE

INVOICE NO. : [redacted]
INVOICE DATE : 06/20/2015

AMERICAN ENERGY - UTICA
[redacted]

Payment Terms : [redacted]
Lease/Cty/St : Red Hill Farm MDS GR 3H
HARRISON OH
Stage : 23
AFE/Routing : [redacted]
Salesperson :
District : Washington County
ATTN. :

DESCRIPTION	QTY	PRICE	UNIT	DISC	AMOUNT IN USD
0.1%-7.5% HCL	3,000.00	[redacted]			
ICI-3240	57.00				
FRW-200	210.00				
FE-200L	15.00				
CS-250 SI	57.00				
CI-150	3.00				
NE-100	114.00				
30/50 White	210,274.00				
100 Mesh White	39,879.00				
Loadcraft Silo Charge	1.00				
Sand Delivery	10,256.60				
Field Performance Incentive (Frac)	1.00				
AEU Utica Stage Rate # 90 bpm # 12.5	1.25				

Remit To:
FTS INTERNATIONAL SERVICES, LLC
[redacted]

FTS INTERNATIONAL

INVOICE

INVOICE NO. : [redacted]
INVOICE DATE : 06/20/2015

AMERICAN ENERGY - UTICA
[redacted]

Payment Terms : [redacted]
Lease/Cty/St : Red Hill Farm MDS GR 3H
HARRISON OH
Stage : 24
AFE/Routing : [redacted]
Salesperson :
District : Washington County
ATTN. :

DESCRIPTION	QTY	PRICE	UNIT	DISC	AMOUNT IN USD
HVG-1 4.0	80.00	[redacted]			
0.1%-7.5% HCL	3,000.00				
LTB-1	16.00				
ICI-3240	60.00				
FRW-200	134.00				
FE-200L	15.00				
CS-250 SI	60.00				
CI-150	3.00				
NE-100	119.00				
APB-1	16.00				
30/50 White	209,791.00				
100 Mesh White	40,086.00				
Loadcraft Silo Charge	1.00				
Sand Delivery	10,245.10				
Field Performance Incentive (Frac)	1.00				
AEU Utica Stage Rate # 90 bpm # 12.5	1.25				

Remit To:
FTS INTERNATIONAL SERVICES, LLC
[redacted]

FTS INTERNATIONAL

INVOICE

INVOICE NO. : [redacted]
INVOICE DATE : 06/21/2015

AMERICAN ENERGY - UTICA
[redacted]

[redacted]

Payment Terms : [redacted]
Lease/Cty/St : Red Hill Farm MDS GR 3H
HARRISON OH
Stage : 25
AFE/Routing : [redacted]
Salesperson :
District : Washington County
ATTN. :

DESCRIPTION	QTY	PRICE	UNIT	DISC	AMOUNT IN USD
0.1%-7.5% HCL	3,000.00	[redacted]			
ICI-3240	57.00				
FRW-200	120.00				
FE-200L	15.00				
CS-250 SI	58.00				
CI-150	3.00				
NE-100	114.00				
30/50 White	211,444.00				
100 Mesh White	39,340.00				
Loadcraft Silo Charge	1.00				
Sand Delivery	10,282.00				
Field Performance Incentive (Frac)	1.00				
AEU Utica Stage Rate # 90 bpm # 12.5	1.25				

Remit To:
FTS INTERNATIONAL SERVICES, LLC
[redacted]

FTS INTERNATIONAL

INVOICE

INVOICE NO. : [redacted]
INVOICE DATE : 06/21/2015

AMERICAN ENERGY - UTICA
[redacted]

Payment Terms : [redacted]
Lease/Cty/St : Red Hill Farm MDS GR 3H
HARRISON OH
Stage : 26
AFE/Routing : [redacted]
Salesperson :
District : Washington County
ATTN. :

DESCRIPTION	QTY	PRICE	UNIT	DISC	AMOUNT IN USD
0.1%-7.5% HCL	3,000.00	[redacted]			
ICI-3240	54.00				
FRW-200	126.00				
FE-200L	15.00				
CS-250 SI	54.00				
CI-150	3.00				
NE-100	109.00				
30/50 White	211,103.00				
100 Mesh White	39,762.00				
Loadcraft Silo Charge	1.00				
Sand Delivery	10,285.30				
Field Performance Incentive (Frac)	1.00				
AEU Utica Stage Rate # 90 bpm # 12.5	1.25				

Remit To:
FTS INTERNATIONAL SERVICES, LLC
[redacted]

FTS INTERNATIONAL

INVOICE

INVOICE NO. : [redacted]
INVOICE DATE : 06/21/2015

AMERICAN ENERGY - UTICA
[redacted]

[redacted]

Payment Terms : [redacted]
Lease/Cty/St : Red Hill Farm MDS GR 3H
HARRISON OH
Stage : 27
AFE/Routing : [redacted]
Salesperson :
District : Washington County
ATTN. :

DESCRIPTION	QTY	PRICE	UNIT	DISC	AMOUNT IN USD
0.1%-7.5% HCL	3,000.00	[redacted]			
ICI-3240	58.00				
FRW-200	145.00				
FE-200L	15.00				
CS-250 SI	58.00				
CI-150	3.00				
NE-100	115.00				
30/50 White	210,147.00				
100 Mesh White	39,831.00				
Loadcraft Silo Charge	1.00				
Sand Delivery	10,249.20				
Field Performance Incentive (Frac)	1.00				
AEU Utica Stage Rate # 90 bpm # 12.5	1.25				

Remit To:
FTS INTERNATIONAL SERVICES, LLC
[redacted]

FTS INTERNATIONAL

INVOICE

INVOICE NO. : [redacted]
INVOICE DATE : 06/22/2015

AMERICAN ENERGY - UTICA
[redacted]

[redacted]

Payment Terms : [redacted]
Lease/Cty/St : Red Hill Farm MDS GR 3H
HARRISON OH
Stage : 28
AFE/Routing : [redacted]
Salesperson :
District : Washington County
ATTN. :

DESCRIPTION	QTY	PRICE	UNIT	DISC	AMOUNT IN USD
0.1%-7.5% HCL	3,000.00	[redacted]			
ICI-3240	58.00				
FRW-200	165.00				
FE-200L	15.00				
CS-250 SI	58.00				
CI-150	3.00				
NE-100	112.00				
30/50 White	209,056.00				
100 Mesh White	40,121.00				
Loadcraft Silo Charge	1.00				
Sand Delivery	10,216.40				
Field Performance Incentive (Frac)	1.00				
AEU Utica Stage Rate # 90 bpm # 12.5	1.25				

Remit To: [redacted]
FTS INTERNATIONAL SERVICES, LLC
[redacted]

FTS INTERNATIONAL

INVOICE

INVOICE NO. : [redacted]
INVOICE DATE : 06/23/2015

AMERICAN ENERGY - UTICA
[redacted]

Payment Terms : [redacted]
Lease/Cty/St : Red Hill Farm MDS GR 3H
HARRISON OH
Stage : 31
AFE/Routing : [redacted]
Salesperson :
District : Washington County
ATTN. :

DESCRIPTION	QTY	PRICE	UNIT	DISC	AMOUNT IN USD
HVG-1 4.0	215.00	[redacted]			
0.1%-7.5% HCL	3,000.00				
LTB-1	43.00				
ICI-3240	63.00				
FRW-200	140.00				
FE-200L	15.00				
CS-250 SI	63.00				
CI-150	3.00				
NE-100	126.00				
APB-1	43.00				
30/50 White	210,958.00				
100 Mesh White	39,853.00				
Loadcraft Silo Charge	1.00				
Sand Delivery	10,283.60				
Field Performance Incentive (Frac)	1.00				
AEU Utica Stage Rate # 90 bpm # 12.5	1.50				

Remit To: [redacted]
FTS INTERNATIONAL SERVICES, LLC
[redacted]

FTS INTERNATIONAL

INVOICE

INVOICE NO. : [redacted]
INVOICE DATE : 06/22/2015

AMERICAN ENERGY - UTICA
[redacted]

Payment Terms : [redacted]
Lease/Cty/St : Red Hill Farm MDS GR 3H
HARRISON OH
Stage : 30
AFE/Routing : [redacted]
Salesperson :
District : Washington County
ATTN. :

DESCRIPTION	QTY	PRICE	UNIT	DISC	AMOUNT IN USD
HVG-1 4.0	115.00	[redacted]			
0.1%-7.5% HCL	3,000.00				
LTB-1	23.00				
ICI-3240	57.00				
FRW-200	120.00				
FE-200L	15.00				
CS-250 SI	58.00				
CI-150	3.00				
NE-100	110.00				
APB-1	23.00				
30/50 White	209,853.00				
100 Mesh White	39,749.00				
Field Performance Incentive (Frac)	1.00				
Sand Delivery	10,233.60				
Loadcraft Silo Charge	1.00				
AEU Utica Stage Rate # 90 bpm # 12.5	1.25				

Remit To: [redacted]
FTS INTERNATIONAL SERVICES, LLC
[redacted]

FTS INTERNATIONAL

INVOICE

INVOICE NO. : [redacted]
INVOICE DATE : 06/22/2015

AMERICAN ENERGY - UTICA
[redacted]

Payment Terms : [redacted]
Lease/Cty/St : Red Hill Farm MDS GR 3H
HARRISON OH
Stage : 29
AFE/Routing : [redacted]
Salesperson :
District : Washington County
ATTN. :

DESCRIPTION	QTY	PRICE	UNIT	DISC	AMOUNT IN USD
0.1%-7.5% HCL	3,000.00	[redacted]			
ICI-3240	57.00				
FRW-200	133.00				
FE-200L	15.00				
CS-250 SI	57.00				
CI-150	3.00				
NE-100	115.00				
FRW-900	35.00				
30/50 White	209,465.00				
100 Mesh White	40,688.00				
Loadcraft Silo Charge	1.00				
Sand Delivery	10,256.60				
Field Performance Incentive (Frac)	1.00				
AEU Utica Stage Rate # 90 bpm # 12.5	1.25				

Remit To:
FTS INTERNATIONAL SERVICES, LLC
[redacted]

FTS INTERNATIONAL

INVOICE

INVOICE NO. : [redacted]
INVOICE DATE : 06/19/2015

AMERICAN ENERGY - UTICA
[redacted]

[redacted]

Payment Terms : [redacted]
Lease/Cty/St : Red Hill Farm MDS GR 3H
HARRISON OH
Stage : 21
AFE/Routing : [redacted]
Salesperson :
District : Washington County
ATTN. :

DESCRIPTION	QTY	PRICE	UNIT	DISC	AMOUNT IN USD
0.1%-7.5% HCL	3,000.00	[redacted]			
ICI-3240	60.00				
FRW-200	175.00				
FE-200L	15.00				
CS-250 SI	60.00				
CI-150	3.00				
NE-100	119.00				
FRW-900	17.00				
30/50 White	208,992.00				
100 Mesh White	40,610.00				
Loadcraft Silo Charge	1.00				
Sand Delivery	10,233.60				
Field Performance Incentive (Frac)	1.00				
AEU Utica Stage Rate # 90 bpm # 12.5	1.50				

Remit To:
FTS INTERNATIONAL SERVICES, LLC
[redacted]

FTS INTERNATIONAL

INVOICE

INVOICE NO. : [redacted]
INVOICE DATE : 06/20/2015

AMERICAN ENERGY - UTICA
[redacted]

Payment Terms : [redacted]
Lease/Cty/St : Red Hill Farm MDS GR 3H
HARRISON OH
Stage : 22
AFE/Routing : [redacted]
Salesperson :
District : Washington County
ATTN. :

DESCRIPTION	QTY	PRICE	UNIT	DISC	AMOUNT IN USD
0.1%-7.5% HCL	3,000.00	[redacted]			
ICI-3240	57.00				
FRW-200	150.00				
FE-200L	15.00				
CS-250 SI	57.00				
CI-150	3.00				
NE-100	115.00				
30/50 White	211,817.00				
100 Mesh White	39,484.00				
Loadcraft Silo Charge	1.00				
Sand Delivery	10,303.30				
Field Performance Incentive (Frac)	1.00				
AEU Utica Stage Rate # 90 bpm # 12.5	1.50				

Remit To:
FTS INTERNATIONAL SERVICES, LLC
[redacted]

FTS INTERNATIONAL

INVOICE

INVOICE NO. : [redacted]
INVOICE DATE : 06/19/2015

AMERICAN ENERGY - UTICA
[redacted]

Payment Terms : [redacted]
Lease/Cty/St : Red Hill Farm MDS GR 3H
HARRISON OH
Stage : 19
AFE/Routing : [redacted]
Salesperson :
District : Washington County
ATTN. :

DESCRIPTION	QTY	PRICE	UNIT	DISC	AMOUNT IN USD
HVG-1 4.0	104.00	[redacted]			
0.1%-7.5% HCL	3,000.00				
LTB-1	32.00				
ICI-3240	58.00				
FRW-200	205.00				
FE-200L	15.00				
CS-250 SI	58.00				
CI-150	3.00				
NE-100	115.00				
APB-1	32.00				
30/50 White	209,875.00				
100 Mesh White	39,559.00				
Loadcraft Silo Charge	1.00				
Sand Delivery	10,227.00				
Field Performance Incentive (Frac)	1.00				
AEU Utica Stage Rate # 90 bpm # 12.5	1.50				

[redacted]

Remit To:
FTS INTERNATIONAL SERVICES, LLC
[redacted]

FTS INTERNATIONAL

INVOICE

INVOICE NO. : [redacted]
INVOICE DATE : 06/29/2015

AMERICAN ENERGY - UTICA
[redacted]

Payment Terms : [redacted]
Lease/Cty/St : Red Hill Farm MDS GR 3H
HARRISON OH
Stage : 52
AFE/Routing : [redacted]
Salesperson :
District : Washington County
ATTN. :

DESCRIPTION	QTY	PRICE	UNIT	DISC	AMOUNT IN USD
HVG-1 4.0	75.00	[redacted]			
0.1%-7.5% HCL	3,000.00				
LTB-1	15.00				
ICI-3240	50.00				
FRW-200	81.00				
FE-200L	15.00				
CS-250 SI	50.00				
CI-150	3.00				
NE-100	100.00				
APB-1	15.00				
30/50 White	209,433.00				
100 Mesh White	37,400.00				
Loadcraft Silo Charge	1.00				
Sand Delivery	10,120.40				
Field Performance Incentive (Frac)	1.00				
AEU Utica Stage Rate # 90 bpm # 12.5	1.25				

[redacted]

Remit To:
FTS INTERNATIONAL SERVICES, LLC
[redacted]

FTS INTERNATIONAL

INVOICE

INVOICE NO. : [redacted]
INVOICE DATE : 06/30/2015

AMERICAN ENERGY - UTICA
[redacted]

Payment Terms : [redacted]
Lease/Cty/St : Red Hill Farm MDS GR 3H
HARRISON OH
Stage : 54
AFE/Routing : [redacted]
Salesperson :
District : Washington County
ATTN. :

DESCRIPTION	QTY	PRICE	UNIT	DISC	AMOUNT IN USD
HVG-1 4.0	19.00	[redacted]			
0.1%-7.5% HCL	3,000.00				
LTB-1	4.00				
ICI-3240	52.00				
FRW-200	79.00				
FE-200L	15.00				
CS-250 SI	52.00				
CI-150	3.00				
NE-100	105.00				
APB-1	4.00				
30/50 White	186,104.00				
100 Mesh White	38,947.00				
Loadcraft Silo Charge	1.00				
Sand Delivery	9,227.50				
Field Performance Incentive (Frac)	1.00				
AEU Utica Stage Rate # 90 bpm # 12.5	1.25				

[redacted]

Remit To:
FTS INTERNATIONAL SERVICES, LLC
[redacted]

FTS INTERNATIONAL

INVOICE

INVOICE NO. : [redacted]
INVOICE DATE : 06/30/2015

AMERICAN ENERGY - UTICA
[redacted]

Payment Terms : [redacted]
Lease/Cty/St : Red Hill Farm MDS GR 3H
HARRISON OH
Stage : 53
AFE/Routing : [redacted]
Salesperson :
District : Washington County
ATTN. :

DESCRIPTION	QTY	PRICE	UNIT	DISC	AMOUNT IN USD
HVG-1 4.0	13.00	[redacted]			
0.1%-7.5% HCL	3,000.00				
LTB-1	3.00				
ICI-3240	54.00				
FRW-200	82.00				
FE-200L	15.00				
CS-250 SI	54.00				
CI-150	3.00				
NE-100	108.00				
APB-1	3.00				
30/50 White	210,449.00				
100 Mesh White	38,120.00				
Loadcraft Silo Charge	1.00				
Sand Delivery	10,191.00				
Field Performance Incentive (Frac)	1.00				
AEU Utica Stage Rate # 90 bpm # 12.5	1.25				

[redacted]

Remit To:
FTS INTERNATIONAL SERVICES, LLC
[redacted]

FTS INTERNATIONAL

INVOICE

INVOICE NO. : [redacted]
INVOICE DATE : 06/29/2015

AMERICAN ENERGY - UTICA
[redacted]

Payment Terms : [redacted]
Lease/Cty/St : Red Hill Farm MDS GR 3H
HARRISON OH
Stage : 50
AFE/Routing : [redacted]
Salesperson :
District : Washington County
ATTN. :

DESCRIPTION	QTY	PRICE	UNIT	DISC	AMOUNT IN USD
HVG-1 4.0	20.00	[redacted]			
0.1%-7.5% HCL	3,000.00				
LTB-1	4.00				
ICI-3240	55.00				
FRW-200	97.00				
FE-200L	15.00				
CS-250 SI	54.00				
CI-150	3.00				
NE-100	108.00				
APB-1	4.00				
30/50 White	210,111.00				
100 Mesh White	39,305.00				
Loadcraft Silo Charge	1.00				
Sand Delivery	10,226.20				
Field Performance Incentive (Frac)	1.00				
AEU Utica Stage Rate # 90 bpm # 12.5	1.25				

[redacted]

Remit To:
FTS INTERNATIONAL SERVICES, LLC
[redacted]

FTS INTERNATIONAL

INVOICE

INVOICE NO. : [redacted]
INVOICE DATE : 06/28/2015

AMERICAN ENERGY - UTICA
[redacted]

Payment Terms : [redacted]
Lease/Cty/St : Red Hill Farm MDS GR 3H
HARRISON OH
Stage : 47
AFE/Routing : [redacted]
Salesperson :
District : Washington County
ATTN. :

DESCRIPTION	QTY	PRICE	UNIT	DISC	AMOUNT IN USD
HVG-1 4.0	11.00	[redacted]			
0.1%-7.5% HCL	3,000.00				
LTB-1	2.00				
ICI-3240	50.00				
FRW-200	69.00				
FE-200L	15.00				
CS-250 SI	51.00				
CI-150	3.00				
NE-100	101.00				
APB-1	2.00				
30/50 White	187,079.00				
100 Mesh White	37,975.00				
Loadcraft Silo Charge	1.00				
Sand Delivery	9,227.50				
Field Performance Incentive (Frac)	1.00				
AEU Utica Stage Rate # 90 bpm # 12.5	1.25				

[redacted]

Remit To:
FTS INTERNATIONAL SERVICES, LLC
[redacted]

FTS INTERNATIONAL

INVOICE

INVOICE NO. : [redacted]
INVOICE DATE : 06/29/2015

AMERICAN ENERGY - UTICA
[redacted]

Payment Terms : [redacted]
Lease/Cty/St : Red Hill Farm MDS GR 3H
HARRISON OH
Stage : 49
AFE/Routing : [redacted]
Salesperson :
District : Washington County
ATTN. :

DESCRIPTION	QTY	PRICE	UNIT	DISC	AMOUNT IN USD
0.1%-7.5% HCL	3,000.00	[redacted]			
ICI-3240	55.00				
FRW-200	76.00				
FE-200L	15.00				
CS-250 SI	55.00				
CI-150	3.00				
NE-100	109.00				
FRW-900	27.00				
30/50 White	211,586.00				
100 Mesh White	38,383.00				
Loadcraft Silo Charge	1.00				
Sand Delivery	10,248.40				
Field Performance Incentive (Frac)	1.00				
AEU Utica Stage Rate # 90 bpm # 12.5	1.25				

Remit To:
FTS INTERNATIONAL SERVICES, LLC
[redacted]

FTS INTERNATIONAL

INVOICE

INVOICE NO. : [redacted]
INVOICE DATE : 06/28/2015

AMERICAN ENERGY - UTICA
[redacted]

Payment Terms : [redacted]
Lease/Cty/St : Red Hill Farm MDS GR 3H
HARRISON OH
Stage : 48
AFE/Routing : [redacted]
Salesperson :
District : Washington County
ATTN. :

DESCRIPTION	QTY	PRICE	UNIT	DISC	AMOUNT IN USD
0.1%-7.5% HCL	3,000.00	[redacted]			
ICI-3240	56.00				
FRW-200	86.00				
FE-200L	15.00				
CS-250 SI	55.00				
CI-150	3.00				
NE-100	110.00				
FRW-900	47.00				
30/50 White	210,589.00				
100 Mesh White	38,654.00				
Loadcraft Silo Charge	1.00				
Sand Delivery	10,218.80				
Field Performance Incentive (Frac)	1.00				
AEU Utica Stage Rate # 90 bpm # 12.5	1.25				

[redacted]

Remit To:
FTS INTERNATIONAL SERVICES, LLC
[redacted]

FTS INTERNATIONAL

INVOICE

INVOICE NO. : [redacted]
INVOICE DATE : 06/28/2015

AMERICAN ENERGY - UTICA
[redacted]

Payment Terms : [redacted]
Lease/Cty/St : Red Hill Farm MDS GR 3H
HARRISON OH
Stage : 46
AFE/Routing : [redacted]
Salesperson :
District : Washington County
ATTN. :

DESCRIPTION	QTY	PRICE	UNIT	DISC	AMOUNT IN USD
HVG-1 4.0	6.00	[redacted]			
0.1%-7.5% HCL	3,000.00				
LTB-1	1.00				
ICI-3240	54.00				
FRW-200	73.00				
FE-200L	15.00				
CS-250 SI	54.00				
CI-150	3.00				
NE-100	108.00				
APB-1	1.00				
FRW-900	47.00				
30/50 White	209,517.00				
100 Mesh White	39,808.00				
Loadcraft Silo Charge	1.00				
Sand Delivery	10,222.10				
Field Performance Incentive (Frac)	1.00				
AEU Utica Stage Rate # 90 bpm # 12.5	1.25				

Remit To:
FTS INTERNATIONAL SERVICES, LLC
[redacted]

FTS INTERNATIONAL

INVOICE

INVOICE NO. : [redacted]
INVOICE DATE : 06/27/2015

AMERICAN ENERGY - UTICA
[redacted]

Payment Terms : [redacted]
Lease/Cty/St : Red Hill Farm MDS GR 3H
HARRISON OH
Stage : 45
AFE/Routing : [redacted]
Salesperson :
District : Washington County
ATTN. :

DESCRIPTION	QTY	PRICE	UNIT	DISC	AMOUNT IN USD
0.1%-7.5% HCL	3,000.00	[redacted]			
ICI-3240	50.00				
FRW-200	98.00				
FE-200L	15.00				
CS-250 SI	50.00				
CI-150	3.00				
NE-100	100.00				
30/50 White	209,475.00				
100 Mesh White	39,211.00				
Loadcraft Silo Charge	1.00				
Sand Delivery	10,195.90				
Field Performance Incentive (Frac)	1.00				
AEU Utica Stage Rate # 90 bpm # 12.5	1.25				

[redacted]

Remit To:
FTS INTERNATIONAL SERVICES, LLC
[redacted]

FTS INTERNATIONAL

INVOICE

INVOICE NO. : [redacted]
INVOICE DATE : 06/26/2015

AMERICAN ENERGY - UTICA
[redacted]

Payment Terms : [redacted]
Lease/Cty/St : Red Hill Farm MDS GR 3H
HARRISON OH
Stage : 42
AFE/Routing : [redacted]
Salesperson :
District : Washington County
ATTN. :

DESCRIPTION	QTY	PRICE	UNIT	DISC	AMOUNT IN USD
0.1%-7.5% HCL	3,000.00	[redacted]			
ICI-3240	55.00				
FRW-200	68.00				
FE-200L	15.00				
CS-250 SI	54.00				
CI-150	3.00				
NE-100	109.00				
30/50 White	210,410.00				
100 Mesh White	38,493.00				
Loadcraft Silo Charge	1.00				
Sand Delivery	10,204.90				
Field Performance Incentive (Frac)	1.00				
AEU Utica Stage Rate # 90 bpm # 12.5	1.25				

[redacted]

Remit To:
FTS INTERNATIONAL SERVICES, LLC
[redacted]

FTS INTERNATIONAL

INVOICE

INVOICE NO. : [redacted]
INVOICE DATE : 06/27/2015

AMERICAN ENERGY - UTICA
[redacted]

Payment Terms : [redacted]
Lease/Cty/St : Red Hill Farm MDS GR 3H
HARRISON OH
Stage : 43
AFE/Routing : [redacted]
Salesperson :
District : Washington County
ATTN. :

DESCRIPTION	QTY	PRICE	UNIT	DISC	AMOUNT IN USD
0.1%-7.5% HCL	3,000.00	[redacted]			
ICI-3240	58.00				
FRW-200	73.00				
FE-200L	15.00				
CS-250 SI	58.00				
CI-150	3.00				
NE-100	116.00				
30/50 White	208,836.00				
100 Mesh White	38,508.00				
Loadcraft Silo Charge	1.00				
Sand Delivery	10,140.90				
Field Performance Incentive (Frac)	1.00				
AEU Utica Stage Rate # 90 bpm # 12.5	1.25				

Remit To:
FTS INTERNATIONAL SERVICES, LLC
[redacted]

FTS INTERNATIONAL

INVOICE

INVOICE NO. : [redacted]
INVOICE DATE : 06/27/2015

AMERICAN ENERGY - UTICA
[redacted]

Payment Terms : [redacted]
Lease/Cty/St : Red Hill Farm MDS GR 3H
HARRISON OH
Stage : 44
AFE/Routing : [redacted]
Salesperson :
District : Washington County
ATTN. :

DESCRIPTION	QTY	PRICE	UNIT	DISC	AMOUNT IN USD
HVG-1 4.0	43.00	[redacted]			
0.1%-7.5% HCL	6,000.00				
LTB-1	9.00				
ICI-3240	57.00				
FRW-200	65.00				
FE-200L	30.00				
CS-250 SI	57.00				
CI-150	6.00				
NE-100	115.00				
APB-1	9.00				
30/50 White	207,890.00				
100 Mesh White	41,122.00				
Loadcraft Silo Charge	1.00				
Sand Delivery	10,209.80				
Field Performance Incentive (Frac)	1.00				
AEU Utica Stage Rate # 90 bpm # 12.5	1.25				

Remit To:
FTS INTERNATIONAL SERVICES, LLC
[redacted]

FTS INTERNATIONAL

INVOICE

INVOICE NO. : [redacted]
INVOICE DATE : 06/26/2015

AMERICAN ENERGY - UTICA
[redacted]

Payment Terms : [redacted]
Lease/Cty/St : Red Hill Farm MDS GR 3H
HARRISON OH
Stage : 40
AFE/Routing : [redacted]
Salesperson :
District : Washington County
ATTN. :

DESCRIPTION	QTY	PRICE	UNIT	DISC	AMOUNT IN USD
HVG-1 4.0	17.00	[redacted]			
0.1%-7.5% HCL	3,000.00				
LTB-1	3.00				
ICI-3240	56.00				
FRW-200	85.00				
FE-200L	15.00				
CS-250 SI	56.00				
CI-150	3.00				
NE-100	112.00				
APB-1	3.00				
30/50 White	210,754.00				
100 Mesh White	39,151.00				
Loadcraft Silo Charge	1.00				
Sand Delivery	10,245.90				
Field Performance Incentive (Frac)	1.00				
AEU Utica Stage Rate # 90 bpm # 12.5	1.25				

[redacted]

Remit To:
FTS INTERNATIONAL SERVICES, LLC
[redacted]

FTS INTERNATIONAL

INVOICE

INVOICE NO. : [redacted]
INVOICE DATE : 06/26/2015

AMERICAN ENERGY - UTICA
[redacted]

Payment Terms : [redacted]
Lease/Cty/St : Red Hill Farm MDS GR 3H
HARRISON OH
Stage : 41
AFE/Routing : [redacted]
Salesperson :
District : Washington County
ATTN. :

DESCRIPTION	QTY	PRICE	UNIT	DISC	AMOUNT IN USD
HVG-1 4.0	11.00	[redacted]			
0.1%-7.5% HCL	3,000.00				
LTB-1	2.00				
ICI-3240	55.00				
FRW-200	90.00				
FE-200L	15.00				
CS-250 SI	56.00				
CI-150	3.00				
NE-100	112.00				
APB-1	2.00				
30/50 White	209,985.00				
100 Mesh White	38,916.00				
Loadcraft Silo Charge	1.00				
Sand Delivery	10,204.90				
Field Performance Incentive (Frac)	1.00				
AEU Utica Stage Rate # 90 bpm # 12.5	1.25				

[redacted]

Remit To:
FTS INTERNATIONAL SERVICES, LLC
[redacted]

FTS INTERNATIONAL

INVOICE

INVOICE NO. : [redacted]
INVOICE DATE : 06/26/2015

AMERICAN ENERGY - UTICA
[redacted]

Payment Terms : [redacted]
Lease/Cty/St : Red Hill Farm MDS GR 3H
HARRISON OH
Stage : 39
AFE/Routing : [redacted]
Salesperson :
District : Washington County
ATTN. :

DESCRIPTION	QTY	PRICE	UNIT	DISC	AMOUNT IN USD
0.1%-7.5% HCL	3,000.00	[redacted]			
ICI-3240	54.00				
FRW-200	128.00				
FE-200L	15.00				
CS-250 SI	55.00				
CI-150	3.00				
NE-100	106.00				
30/50 White	210,252.00				
100 Mesh White	39,369.00				
Loadcraft Silo Charge	1.00				
Sand Delivery	10,234.40				
Field Performance Incentive (Frac)	1.00				
AEU Utica Stage Rate # 90 bpm # 12.5	1.25				

[redacted]

Remit To:
FTS INTERNATIONAL SERVICES, LLC
[redacted]

FTS INTERNATIONAL

INVOICE

INVOICE NO. : [redacted]
INVOICE DATE : 06/29/2015

AMERICAN ENERGY - UTICA
[redacted]

Payment Terms : [redacted]
Lease/Cty/St : Red Hill Farm MDS GR 3H
HARRISON OH
Stage : 51
AFE/Routing : [redacted]
Salesperson :
District : Washington County
ATTN. :

DESCRIPTION	QTY	PRICE	UNIT	DISC	AMOUNT IN USD
HVG-1 4.0	6.00	[redacted]			
0.1%-7.5% HCL	3,000.00				
LTB-1	1.00				
ICI-3240	55.00				
FRW-200	84.00				
FE-200L	15.00				
CS-250 SI	55.00				
CI-150	3.00				
NE-100	108.00				
APB-1	1.00				
30/50 White	212,216.00				
100 Mesh White	37,400.00				
Loadcraft Silo Charge	1.00				
Sand Delivery	10,234.40				
Field Performance Incentive (Frac)	1.00				
AEU Utica Stage Rate # 90 bpm # 12.5	1.25				

[redacted]

Remit To:
FTS INTERNATIONAL SERVICES, LLC
[redacted]

FTS INTERNATIONAL

INVOICE

INVOICE NO. : [redacted]
INVOICE DATE : 06/25/2015

AMERICAN ENERGY - UTICA
[redacted]

Payment Terms : [redacted]
Lease/Cty/St : Red Hill Farm MDS GR 3H
HARRISON OH
Stage : 38
AFE/Routing : [redacted]
Salesperson :
District : Washington County
ATTN. :

DESCRIPTION	QTY	PRICE	UNIT	DISC	AMOUNT IN USD
0.1%-7.5% HCL	3,000.00	[redacted]			
ICI-3240	55.00				
FRW-200	82.00				
FE-200L	15.00				
CS-250 SI	55.00				
CI-150	3.00				
NE-100	110.00				
30/50 White	210,058.00				
100 Mesh White	39,245.00				
Loadcraft Silo Charge	1.00				
Sand Delivery	10,221.30				
Field Performance Incentive (Frac)	1.00				
AEU Utica Stage Rate # 90 bpm # 12.5	1.50				

[redacted]

Remit To:
FTS INTERNATIONAL SERVICES, LLC
[redacted]

FTS INTERNATIONAL

INVOICE

INVOICE NO. : [redacted]
INVOICE DATE : 06/24/2015

AMERICAN ENERGY - UTICA
[redacted]

Payment Terms : [redacted]
Lease/Cty/St : Red Hill Farm MDS GR 3H
HARRISON OH
Stage : 34
AFE/Routing : [redacted]
Salesperson :
District : Washington County
ATTN. :

DESCRIPTION	QTY	PRICE	UNIT	DISC	AMOUNT IN USD
0.1%-7.5% HCL	3,000.00	[redacted]			
ICI-3240	57.00				
FRW-200	114.00				
FE-200L	15.00				
CS-250 SI	57.00				
CI-150	3.00				
NE-100	114.00				
30/50 White	210,525.00				
100 Mesh White	39,697.00				
Loadcraft Silo Charge	1.00				
Sand Delivery	10,259.00				
Field Performance Incentive (Frac)	1.00				
AEU Utica Stage Rate # 90 bpm # 12.5	1.25				

[redacted]

Remit To:
FTS INTERNATIONAL SERVICES, LLC
[redacted]

FTS INTERNATIONAL

INVOICE

INVOICE NO. : [redacted]
INVOICE DATE : 06/23/2015

AMERICAN ENERGY - UTICA
[redacted]

Payment Terms : [redacted]
Lease/Cty/St : Red Hill Farm MDS GR 3H
HARRISON OH
Stage : 33
AFE/Routing : [redacted]
Salesperson :
District : Washington County
ATTN. :

DESCRIPTION	QTY	PRICE	UNIT	DISC	AMOUNT IN USD
0.1%-7.5% HCL	3,000.00	[redacted]			
ICI-3240	57.00				
FRW-200	86.00				
FE-200L	15.00				
CS-250 SI	57.00				
CI-150	3.00				
NE-100	108.00				
FRW-900	64.00				
30/50 White	211,533.00				
100 Mesh White	38,025.00				
Loadcraft Silo Charge	1.00				
Sand Delivery	10,232.00				
Field Performance Incentive (Frac)	1.00				
AEU Utica Stage Rate # 90 bpm # 12.5	1.25				

[redacted]

Remit To:
FTS INTERNATIONAL SERVICES, LLC
[redacted]

FTS INTERNATIONAL

INVOICE

INVOICE NO. : [redacted]
INVOICE DATE : 06/23/2015

AMERICAN ENERGY - UTICA
[redacted]

Payment Terms : [redacted]
Lease/Cty/St : Red Hill Farm MDS GR 3H
HARRISON OH
Stage : 32
AFE/Routing : [redacted]
Salesperson :
District : Washington County
ATTN. :

DESCRIPTION	QTY	PRICE	UNIT	DISC	AMOUNT IN USD
HVG-1 4.0	17.00	[redacted]			
0.1%-7.5% HCL	3,000.00				
LTB-1	3.00				
ICI-3240	59.00				
FRW-200	117.00				
FE-200L	15.00				
CS-250 SI	59.00				
CI-150	3.00				
NE-100	117.00				
APB-1	3.00				
30/50 White	209,801.00				
100 Mesh White	40,624.00				
Loadcraft Silo Charge	1.00				
Sand Delivery	10,267.20				
Field Performance Incentive (Frac)	1.00				
AEU Utica Stage Rate # 90 bpm # 12.5	1.50				

[redacted]

Remit To:
FTS INTERNATIONAL SERVICES, LLC
[redacted]

FTS INTERNATIONAL

INVOICE

INVOICE NO. : [redacted]
INVOICE DATE : 06/24/2015

AMERICAN ENERGY - UTICA
[redacted]

Payment Terms : [redacted]
Lease/Cty/St : Red Hill Farm MDS GR 3H
HARRISON OH
Stage : 36
AFE/Routing : [redacted]
Salesperson :
District : Washington County
ATTN. :

DESCRIPTION	QTY	PRICE	UNIT	DISC	AMOUNT IN USD
HVG-1 4.0	24.00	[redacted]			
0.1%-7.5% HCL	3,000.00				
LTB-1	5.00				
ICI-3240	58.00				
FRW-200	96.00				
FE-200L	15.00				
CS-250 SI	58.00				
CI-150	3.00				
NE-100	114.00				
APB-1	5.00				
30/50 White	210,547.00				
100 Mesh White	38,747.00				
Loadcraft Silo Charge	1.00				
Sand Delivery	10,221.30				
Field Performance Incentive (Frac)	1.00				
AEU Utica Stage Rate # 90 bpm # 12.5	1.25				

Remit To:
FTS INTERNATIONAL SERVICES, LLC
[redacted]

FTS INTERNATIONAL

INVOICE

INVOICE NO. : [redacted]
INVOICE DATE : 06/24/2015

AMERICAN ENERGY - UTICA
[redacted]

Payment Terms : [redacted]
Lease/Cty/St : Red Hill Farm MDS GR 3H
HARRISON OH
Stage : 35
AFE/Routing : [redacted]
Salesperson :
District : Washington County
ATTN. :

DESCRIPTION	QTY	PRICE	UNIT	DISC	AMOUNT IN USD
0.1%-7.5% HCL	3,000.00	[redacted]			
ICI-3240	61.00				
FRW-200	97.00				
FE-200L	15.00				
CS-250 SI	61.00				
CI-150	3.00				
NE-100	117.00				
30/50 White	210,021.00				
100 Mesh White	39,321.00				
Loadcraft Silo Charge	1.00				
Sand Delivery	10,222.90				
Field Performance Incentive (Frac)	1.00				
AEU Utica Stage Rate # 90 bpm # 12.5	1.25				

[redacted]

Remit To:
FTS INTERNATIONAL SERVICES, LLC
[redacted]

FTS INTERNATIONAL

INVOICE

INVOICE NO. : [redacted]
INVOICE DATE : 06/25/2015

AMERICAN ENERGY - UTICA
[redacted]

Payment Terms : [redacted]
Lease/Cty/St : Red Hill Farm MDS GR 3H
HARRISON OH
Stage : 37
AFE/Routing : [redacted]
Salesperson :
District : Washington County
ATTN. :

DESCRIPTION	QTY	PRICE	UNIT	DISC	AMOUNT IN USD
HVG-1 4.0	6.00	[redacted]			
0.1%-7.5% HCL	3,000.00				
LTB-1	1.00				
ICI-3240	54.00				
FRW-200	90.00				
FE-200L	15.00				
CS-250 SI	54.00				
CI-150	3.00				
NE-100	108.00				
APB-1	1.00				
30/50 White	210,715.00				
100 Mesh White	39,256.00				
Loadcraft Silo Charge	1.00				
Sand Delivery	10,249.20				
Field Performance Incentive (Frac)	1.00				
AEU Utica Stage Rate # 90 bpm # 12.5	1.25				