5500-FM-OG0004b 2/2011

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
OIL AND GAS MANAGEMENT PROGRAM

# Completion Report

| DEP USE ONLY | |
|---|---|
| Site ID | Primary Fac ID |
| Client | Subfacility Id |

## Well Information

If you are submitting this Completion Report attached to the Well Record, you only need to enter the well API # in this section.

| Well Operator | DEP ID# | Well API # (Permit / Reg) | Project Number | Acres |
|---|---|---|---|---|
| Range Resources-Appalachia, LLC | 141142 | 37-125-24248-00 | | 384.1662 |

| Address | Well Farm Name | Well # | Serial # |
|---|---|---|---|
| 380 Southpointe Blvd, Suite 300 | Painter | #2H | |

| City | State | Zip Code | County | Municipality |
|---|---|---|---|---|
| Canonsburg | PA | 15317 | Washington | Chartiers |

| Phone | Fax | Email | USGS 7.5 min. quadrangle map |
|---|---|---|---|
| 724-743-6700 | 724-743-6490 | | Midway |

**Check the appropriate submission:** ☒ Original Completion Report ☐ Amended Completion Report

## STIMULATION BASE FLUID

| List Water Management Plan Approved Water Source(s) that were used | Water Management Plan ID No. | Volume (Gallons) |
|---|---|---|
| 1. PA American Water Company/Plum Road Metering Vault | Source 8 | 1,592,304 gallons |
| 2. | | |
| 3. | | |
| 4. | | |
| 5. | | |
| 6. | | |
| | Recycled Water Used | 437,136 gallons |
| Other Base Fluid(s)Components Used | | |
| 1. | | |
| 2. | | |
| | Total Base Fluid(s)/Components Used | 2,029,440 gallons |

## PERFORATION RECORD

| Stage No. | Perforation Date | Stage Perforated From | Stage Perforated To | Perf. Orientation (Vertical, Horizontal, Radial) | Formation |
|---|---|---|---|---|---|
| 1 | 6/15/11 | 8607'MD | 8329'MD | Horizontal | Marcellus Shale |
| 2 | 6/30/11 | 8169'MD | 7999'MD | Horizontal | Marcellus Shale |
| 3 | 7/1/11 | 7914'MD | 7744'MD | Horizontal | Marcellus Shale |
| 4 | 7/1/11 | 7659'MD | 7489'MD | Horizontal | Marcellus Shale |
| 5 | 7/5/11 | 7404'MD | 7234'MD | Horizontal | Marcellus Shale |
| 6 | 7/6/11 | 7149'MD | 6979'MD | Horizontal | Marcellus Shale |
| 7 | 7/6/11 | 6894'MD | 6724'MD | Horizontal | Marcellus Shale |
| 8 | | | | | |
| 9 | | | | | |
| 10 | | | | | |
| 11 | | | | | |
| 12 | | | | | |

Well API# **37-125-24248-00**

## STIMULATION FLUID ADDITVES

*Note: Trade secret or confidential proprietary information should be clearly identified as such and should be submitted on a separate sheet attached to this report.*

| Descriptive Additive Type | Chemical Component(s) listed on Material Safety Data Sheet of the Additive | CAS No. of Chemical Component | Chemical Component % By Volume in Additive | Chemical Component % By Volume used in Each Stage | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Stage No. 1 | Stage No. 2 | Stage No. 3 | Stage No. 4 | Stage No. 5 | Stage No. 6 |
| FR-200W | N/A | N/A | N/A | 0.00000 % | 0.03370 % | 0.00000 % | 0.00000 % | 0.00000 % | 0.02831 % |
| FR-300W | N/A | N/A | N/A | 0.0314% | 0.0000% | 0.0338% | 0.0360% | 0.0269% | 0.0000% |
| MX 588-2 | N/A | N/A | N/A | 0.0059% | 0.0074% | 0.0071% | 0.0068% | 0.0067% | 0.0074% |
| NE100 | N/A | N/A | N/A | 0.0003% | 0.0003% | 0.0003% | 0.0003% | 0.0003% | 0.0003% |
| FE100L | N/A | N/A | N/A | 0.0008% | 0.0010% | 0.0010% | 0.0010% | 0.0010% | 0.0010% |
| 37% HCL | HCL | 7647-01-0 | 37.0% | 0.0501% | 0.0597% | 0.0576% | 0.0607% | 0.0568% | 0.0570% |
| CI-100 | Methanol | 67-56-1 | 92.5% | 0.0005% | 0.0006% | 0.0006% | 0.0006% | 0.0006% | 0.0006% |
| CI-100 | Propargyl Alcohol | 107-19-7 | 4.4% | 0.00003 % | 0.00003 % | 0.00003 % | 0.00003 % | 0.00003 % | 0.00003 % |
| MC B-8650 | Glutaraldehyde | 111-30-8 | 48.8% | 0.0030% | 0.0038% | 0.0038% | 0.0037% | 0.0034% | 0.0038% |
| MC B-8650 | Methanol | 67-56-1 | 0.7% | 0.0000% | 0.0001% | 0.0001% | 0.0001% | 0.0000% | 0.0001% |
| MC B-8520 | 4,4-Dimethyloxazolidine | 51200-87-4 | 76.5% | 0.0123% | 0.0150% | 0.0147% | 0.0149% | 0.0150% | 0.0150% |
| MC B-8520 | 3,4,4-Trimethyloxazolodine | 75673-43-7 | 5.0% | 0.0008% | 0.0010% | 0.0010% | 0.0010% | 0.0010% | 0.0010% |
| MC B-8520 | 2-Amino-2-methyl-1-propanol | 124-68-5 | 1.0% | 0.0002% | 0.0002% | 0.0002% | 0.0002% | 0.0002% | 0.0002% |
| MC B-8520 | Formaldehyde Amine | 56652-26-7 | 0.5% | 0.0001% | 0.0001% | 0.0001% | 0.0001% | 0.0001% | 0.0001% |
| | | | | | | | | | |
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## STIMULATION FLUID ADDITVES-Continued

| Des□rip□ive Additive Type | Chemical Component(s) listed on Material Safety Data Sheet of the□Additive | CAS No. of Chemical Component | Chemical Component % By Volume in Additive | Chemical Compon□nt % By Volume used in Each Stage | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Stage No. 7 | Stage No. 8 | Stage No. 9 | Stage No. 10 | Stage No. 11 | Stage No. 12 |
| FR-200W | N/A | N/A | N/A | 0.0285% | | | | | |
| FR-300W | N/A | N/A | N/A | 0.0000% | | | | | |
| MX 588-2 | N/A | N/A | N/A | 0.0071% | | | | | |
| NE100 | N/A | N/A | N/A | 0.0004% | | | | | |
| FE100L | N/A | N/A | N/A | 0.0012% | | | | | |
| 37% HCL | HCL | 7647-01-0 | 37% | 0.0701% | | | | | |
| CI-100 | Methanol | 67-56-1 | 93% | 0.0007% | | | | | |
| CI-100 | Propargyl Alcohol | 107-19-7 | 4% | 0.0000% | | | | | |
| MC B-8650 | Glutaraldehyde | 111-30-8 | 49% | 0.0037% | | | | | |
| MC B-8650 | Methanol | 67-56-1 | 1% | 0.0001% | | | | | |
| MC B-8520 | 4,4-Dimethyloxazolidine | 51200-87-4 | 77% | 0.0151% | | | | | |
| MC B-8520 | 3,4,4-Trimethyloxazolodine | 75673-43-7 | 5% | 0.0010% | | | | | |
| MC B-8520 | 2-Amino-2-methyl-1-propanol | 124-68-5 | 1% | 0.0002% | | | | | |
| MC B-8520 | Formaldehyde Amine | 56652-26-7 | 0% | 0.0001% | | | | | |
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Please insert additional copies of this page if additional rows/stages are needed.

Well API# **37-125-24248-00**

## STIMULATION INFORMATION (WELL)

| Open Flow Production: | 24 Hr. Open Flow Production: | 24 Hr. Shut-in Pressure: | Flow Back Date: |
|---|---|---|---|
| Omcf/d @ 24hrs pos treatment | Omcf/d @ 24hrs pos treatment | N/A @ 24hrs post treatment | |

## STIMULATION INFORMATION (STAGE)

Complete a separate record for each stimulation stage. (Please insert additional copies of this page for additional stages).

| | | |
|---|---|---|
| **Stage No.:** 1 | Stimulation Date: 6/29/11 | Pump Rate: 66.6 |
| Pressure (psi): 6077 | Shut-in Surface Pressure: 3949 | 5 Minute Shut-in Surface Pressure: N/A |
| Propping Agent Type: Sand | Propping Agent Amount: 305,724 | Propping Agent Size: 100 Mesh, 30/50 Mesh, 40/70 Mesh |
| **Stage No.:** 2 | Stimulation Date: 6/30/11 | Pump Rate: 69 |
| Pressure (psi): 6396 | Shut-in Surface Pressure: 3898 | 5 Minute Shut-in Surface Pressure: N/A |
| Propping Agent Type: Sand | Propping Agent Amount: 304,913 | Propping Agent Size: 100 Mesh, 30/50 Mesh, 40/70 Mesh |
| **Stage No.:** 3 | Stimulation Date: 7/1/11 | Pump Rate: 63 |
| Pressure (psi): 7690 | Shut-in Surface Pressure: 4103 | 5 Minute Shut-in Surface Pressure: N/A |
| Propping Agent Type: Sand | Propping Agent Amount: 312,672 | Propping Agent Size: 100 Mesh, 30/50 Mesh, 40/70 Mesh |
| **Stage No.:** 4 | Stimulation Date: 7/5/11 | Pump Rate: 67.8 |
| Pressure (psi): 7946 | Shut-in Surface Pressure: 3792 | 5 Minute Shut-in Surface Pressure: N/A |
| Propping Agent Type: Sand | Propping Agent Amount: 304,808 | Propping Agent Size: 100 Mesh, 30/50 Mesh, 40/70 Mesh |
| **Stage No.:** 5 | Stimulation Date: 7/6/11 | Pump Rate: 70.7 |
| Pressure (psi): 6274 | Shut-in Surface Pressure: 4000 | 5 Minute Shut-in Surface Pressure: N/A |
| Propping Agent Type: Sand | Propping Agent Amount: 308,432 | Propping Agent Size: 100 Mesh, 30/50 Mesh, 40/70 Mesh |
| **Stage No.:** 6 | Stimulation Date: 7/6/11 | Pump Rate: 69.3 |
| Pressure (psi): 5836 | Shut-in Surface Pressure: 4156 | 5 Minute Shut-in Surface Pressure: N/A |
| Propping Agent Type: Sand | Propping Agent Amount: 303,352 | Propping Agent Size: 100 Mesh, 30/50 Mesh, 40/70 Mesh |
| **Stage No.:** 7 | Stimulation Date: 7/7/11 | Pump Rate: 70.6 |
| Pressure (psi): 5993 | Shut-in Surface Pressure: 4238 | 5 Minute Shut-in Surface Pressure: N/A |
| Propping Agent Type: Sand | Propping Agent Amount: 306,175 | Propping Agent Size: 100 Mesh, 30/50 Mesh, 40/70 Mesh |

**WELL SERVICE COMPANIES** (Provide the name, address, and telephone number of all well service companies involved.)

| Name | Name | Name |
|---|---|---|
| **Frac Tech** | **Multi-Chem** | **CDK Perforating** |
| Address: 16858 IH20 | Address: 200 Detroit Street | Address: 427 Half Moon Way |
| City – State- Zip: Ciscok, TX 76437 | City – State – Zip: Washington, PA | City – State – Zip: Runaway Bay, TX 76426 |
| Phone: 817-850-1008 | Phone: 325-486-7489 | Phone: (940)577-4300 |

*I do hereby certify to the best of my knowledge, information and belief that the information contained on this Completion Report is true and correct. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.*

| **Well Operator's Signature** | **DEP USE ONLY** |
|---|---|
| | Reviewed by: Date: |
| Title: Completion Engineer: Mike Hurey Date: 7/28/11 | Comments: |

Well API# **37-125-24248-00**

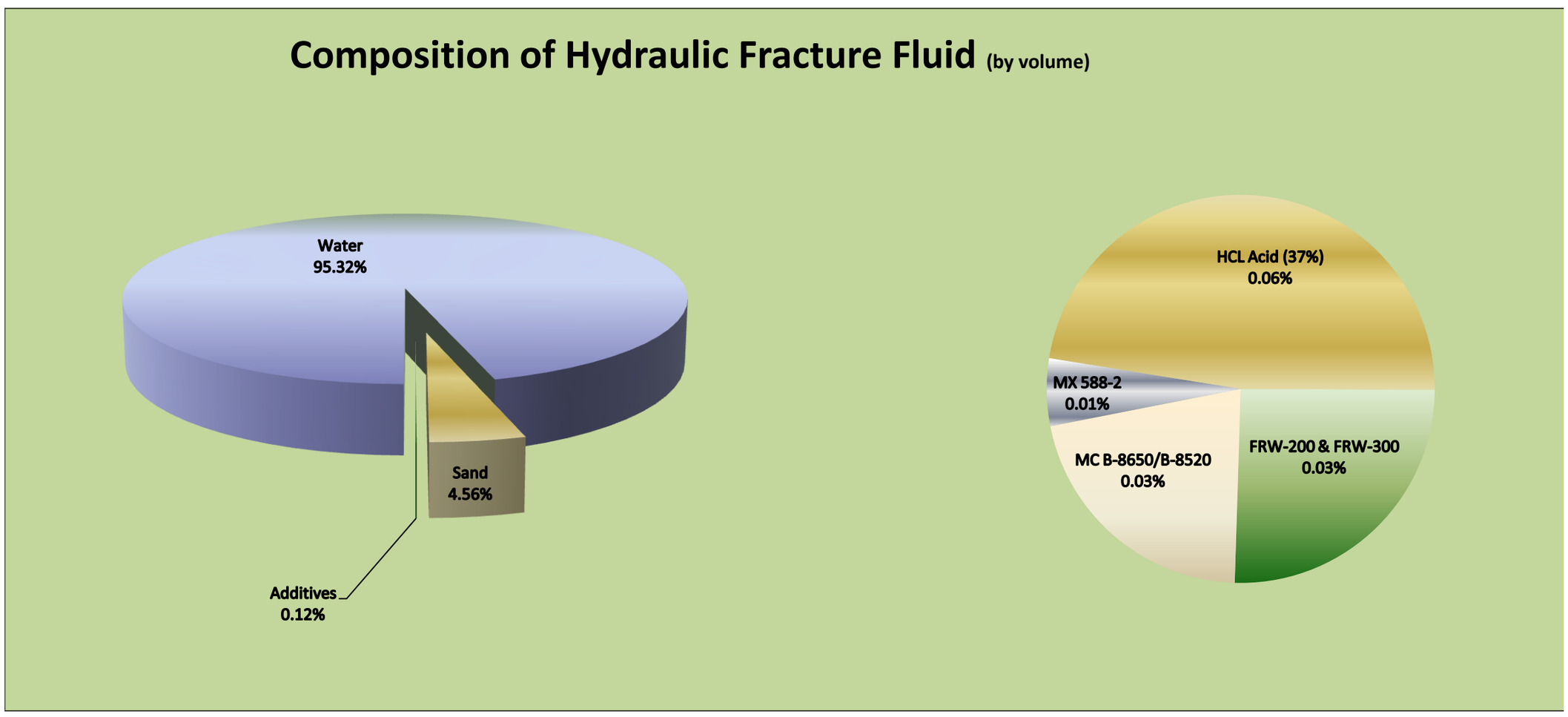
| STIMULATION INFORMATION (STAGE- Continued) | | |
|---|---|---|
| Complete a separate record for each stimulation stage. (Please insert additional copies of this page for additional stages). | | |
| **Stage No.:** 8 | Stimulation Date: | Pump Rate: |
| Pressure (psi): | Shut-in Surface Pressure: | 5 Minute Shut-in Surface Pressure: N/A |
| Propping Agent Type: Sand | Propping Agent Amount: | Propping Agent Size: 100 Mesh 30/50 Mesh |
| **Stage No.:** 9 | Stimulation Date: | Pump Rate: |
| Pressure (psi): | Shut-in Surface Pressure: | 5 Minute Shut-in Surface Pressure: N/A |
| Propping Agent Type: Sand | Propping Agent Amount: | Propping Agent Size: 100 Mesh 30/50 Mesh |
| **Stage No.:** 10 | Stimulation Date: | Pump Rate: |
| Pressure (psi): | Shut-in Surface Pressure: | 5 Minute Shut-in Surface Pressure: N/A |
| Propping Agent Type: Sand | Propping Agent Amount: | Propping Agent Size: 100 Mesh 30/50 Mesh |
| **Stage No.:** 11 | Stimulation Date: | Pump Rate: |
| Pressure (psi): | Shut-in Surface Pressure: | 5 Minute Shut-in Surface Pressure: N/A |
| Propping Agent Type: Sand | Propping Agent Amount: | Propping Agent Size: 100 Mesh 30/50 Mesh |
| **Stage No.:** 12 | Stimulation Date: | Pump Rate: |
| Pressure (psi): | Shut-in Surface Pressure: | 5 Minute Shut-in Surface Pressure: N/A |
| Propping Agent Type: Sand | Propping Agent Amount: | Propping Agent Size: 100 Mesh 30/50 Mesh |
| **Stage No.:** 13 | Stimulation Date: | Pump Rate: |
| Pressure (psi): | Shut-in Surface Pressure: | 5 Minute Shut-in Surface Pressure: N/A |
| Propping Agent Type: Sand | Propping Agent Amount: | Propping Agent Size: 100 Mesh 30/50 Mesh |
| **Stage No.:** 14 | Stimulation Date: | Pump Rate: |
| Pressure (psi): | Shut-in Surface Pressure: | 5 Minute Shut-in Surface Pressure: N/A |
| Propping Agent Type: Sand | Propping Agent Amount: | Propping Agent Size: 100 Mesh 30/50 Mesh |
| **Stage No.:** 15 | Stimulation Date: | Pump Rate: |
| Pressure (psi): | Shut-in Surface Pressure: | 5 Minute Shut-in Surface Pressure: N/A |
| Propping Agent Type: Sand | Propping Agent Amount: | Propping Agent Size: 100 Mesh 30/50 Mesh |
| **Stage No.:** 16 | Stimulation Date: | Pump Rate: |
| Pressure (psi): | Shut-in Surface Pressure: | 5 Minute Shut-in Surface Pressure: N/A |
| Propping Agent Type: Sand | Propping Agent Amount: | Propping Agent Size: 100 Mesh 30/50 Mesh |
| **Stage No.:** 17 | Stimulation Date: | Pump Rate: |
| Pressure (psi): | Shut-in Surface Pressure: | 5 Minute Shut-in Surface Pressure: N/A |
| Propping Agent Type: Sand | Propping Agent Amount: | Propping Agent Size: 100 Mesh 30/50 Mesh |

RANGE RESOURCES

**Painter Unit #2H** **Completion Date: June 29 - July 7, 2011**

**Well API: 37-125-24248** **Township: Chartiers**

| % Composition of Hydraulic Fracture Fluid (by volume) | | | | | | |
|---|---|---|---|---|---|---|
| **Product Name** | **Additive** | **Purpose** | **Use and Dillution** | **Volume** | **Overall %** | **Common Uses** |
| Water | Carrier Fluid | Creates fracture network in shale and carry proppant to the formation | Primary constituent | 2,027,380 gal | 95.32% | Water is the most abundant molecule on the Earth's surface |
| Sand | Sand | Allows fractures to remain open so gas can escape | Second most common constituent, making up almost 6% of the fluid | 97,003 gal | 4.56% | Drinking water filtration, play sand |
| FRW-200 & FRW-300 | Friction Reducer | Reduces friction between fluid and pipe | Diluted at one-half gallon per 1,000 gallons of water | 664 gal | 0.03% | Water treatment; soil conditioner; some children's toys |
| MC B-8650/B-8520 | Antimicrobial Agent | Eliminates bacteria in the water that produce corrosive byproducts | Diluted at one-half gallon per 1,000 gallons of water | 559 gal | 0.03% | Water treatment, disinfectant; sterilize medical and dental equipment and surfaces |
| MX 588-2 | Scale Inhibitor | Prevents scaling in pipe | Diluted at one-tenth gallon per 1,000 gallons of water | 147 gal | 0.01% | Water treatment, household cleaners, de-icing agent |
| HCL Acid (37%) | Perf Clean-Up | Dissolves cement and minerals to help initiate fractures | 177 gallons per stage if required (non-diluted chemicals) | 1,241 gal | 0.06% | Swimming pool and household cleaner |



RANGE RESOURCES

# Composition of Components in Marcellus Shale Hydraulic Fracturing Fluid

| Common Name & Supplier | Supplier Chemical Name | Common Description | Hazardous Component listed on MSDS | Hazardous Component CAS No. | Purpose | MSDS Component Weight % of Chemical | Gallons MSDS Component in Well | Maximum Concentration of MSDS Component of Total Stage Fluid | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | % Vol | % Weight |
| **7.5% HCl Mixture (FracTech)** | 37% HCL | concentrated HCl Acid | HCL | 7647-01-0 | Cleans perforation | 37.0% | 1240.66 | 0.0583% | 0.0238% |
| | CI-100 | Corrosion Inhibitor | Methanol | 67-56-1 | Protects casing | 95.0% | 14.44 | 0.0007% | 0.0005% |
| | | | Propargyl Alcohol | 107-19-7 | Protects casing | 5.0% | 0.62 | 0.0000% | 0.0000% |
| | NE100 | Non- Emulsifer | No hazardous ingredients | N/A | Prevents emulsions | 0.0% | N/A | N/A | N/A |
| | FE100L | Iron Chelator | No hazardous ingredients | N/A | Prevents precipitation | 0.0% | N/A | N/A | N/A |
| | | | | | | | **TOTAL** | **0.0590%** | **0.0243%** |
| **Friction Reducer (FracTech)** | RW-200 & FRW-30 | Friction Reducer | No hazardous ingredients | N/A | Reduce friction down casing | 0.0% | N/A | N/A | N/A |
| **Scale Inhibitor (Multichem)** | MX 588-2 | Scale Inhibitor | No hazardous ingredients | N/A | prevents scale deposits | 0.0% | N/A | N/A | N/A |
| **Antibacterial Agent (Multichem)** | MC B-8520 | Antibacterial Agent | 4,4-Dimethyloxazolidine | 51200-87-4 | eliminates bacteria in water | 78.0% | 307.13 | 0.0144% | 0.0135% |
| | | | 3,4,4-Trimethyloxazolodine | 75673-43-7 | | 5.0% | 20.10 | 0.0009% | 0.0009% |
| | | | 2-Amino-2-methyl-1-propanol | 124-68-5 | | 1.0% | 4.21 | 0.0002% | 0.0002% |
| | | | Formaldehyde Amine | 56652-26-7 | | 0.5% | 1.83 | 0.0001% | 0.0001% |
| | MC B-8650 | Antibacterial Agent | Glutaraldehyde | 111-30-8 | eliminates bacteria in water | 50.0% | 57.67 | 0.0027% | 0.0038% |
| | | | Methanol | 67-56-1 | | 0.5% | 0.58 | 0.0000% | 0.0000% |
| | | | | | | | **TOTAL** | **0.0184%** | **0.0184%** |

| | by vol % | by weight % |
|---|---|---|
| **SUMMARY** | **0.077%** | **0.043%** |