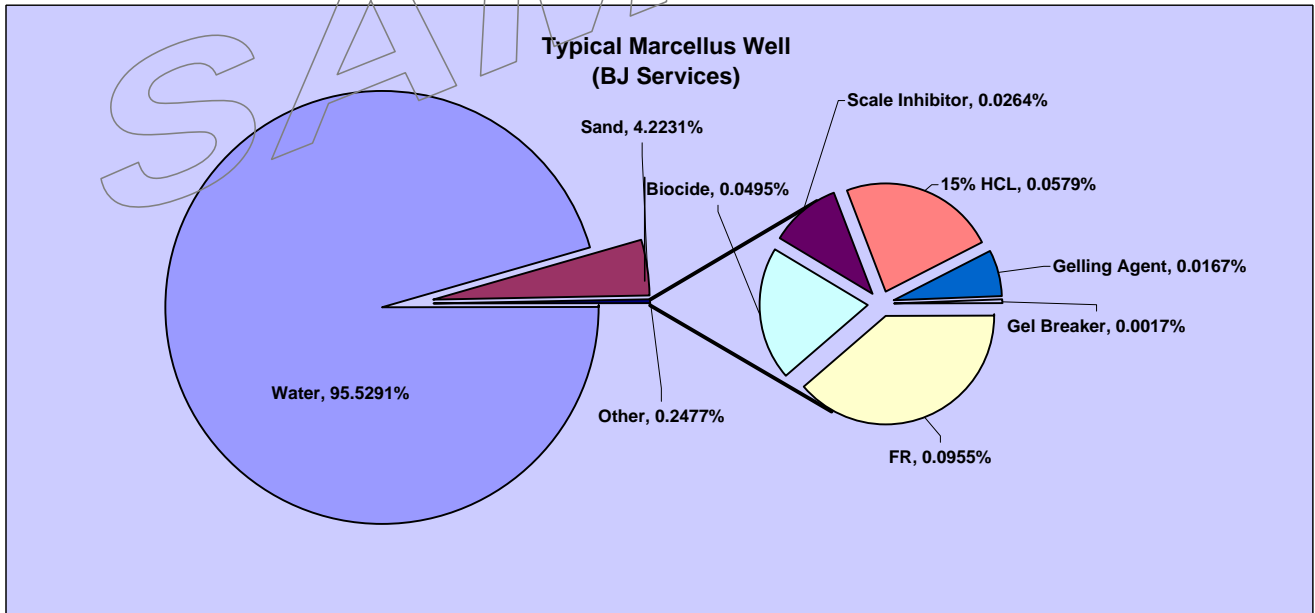




Typical Marcellus Well (BJ Services)

| Product Name    | Additive            | Purpose  | Use and Dilution                                       | Volume per well (10 stages) | Overall % |
|-----------------|---------------------|--|--|-----------------------------|-----------|
| Water           | Carrier Fluid       | Creates fracture network in shale and carry sand to the formation          | Approximately 4 million gallons per well               | 4,127,000 gal               | 95.5291%  |
| Sand            | Sand                | Enables fractures to remain open and allow gas to escape into the wellbore | Approximately 4 million pounds per well                | 182,446 gal                 | 4.2231%   |
| FR              | Friction Reducer    | Reduces friction between pipe and fluid                                    | Diluted at one gallon per 1,000 gallons of water       | 4,127 gal                   | 0.0955%   |
| Biocide         | Antimicrobial Agent | Eliminates bacteria in water sources                                       | Diluted at one-half gallon per 1,000 gallons of water  | 2,137 gal                   | 0.0495%   |
| Scale Inhibitor | Scale Inhibitor     | Prevents scale deposits  | Diluted at one gallon per 1,000 gallons of water       | 1,142 gal                   | 0.0264%   |
| 15% HCL         | Acid                | Dissolves cement and minerals in the perforations (non-diluted)            | 250 gallons per stage (non-diluted chemicals)          | 2,503 gal                   | 0.0579%   |
| Gelling Agent   | Viscosifier         | Adds viscosity to the fluid  | Diluted at five gallons per 1,000 gallons of water     | 720 gal                     | 0.0167%   |
| Gel Breaker     | Breaker             | Reduces viscosity of fluid   | Diluted at one-half gallons per 1,000 gallons of water | 74 gal                      | 0.0017%   |





| Common Name & Supplier                                       | Supplier Chemical Name | Common Description  | Hazardous Component listed on MSDS                | Purpose   | Hazardous Component Weight % of Chemical | Component loading gal/1000 gal | Gal Hazardous Component / stage | Concentration Hazardous Component of Total Stage Fluid |                |              |
|--|------------------------|---------------------|---|---|--|--------------------------------|---------------------------------|--|----------------|--------------|
|  |                        |                     |   |   |  |                                |                                 | by % Vol   | by % Weight    | ppm          |
| 15% HCL Mixture (BJS)  | 28% HCl                | HCl Acid            | Hydrochloric Acid                                 | Dissolves cement and minerals in the perforations | 28.00%                                   | 389.00                         | 217.84                          | 0.05419%   | 0.04991%       | 499.08       |
|  | CI-14                  | Corrosion Inhibitor | Propargyl Alcohol                                 | Protects casing                                   | 5.00%                                    | 2                              | 0.20                            | 0.00005%   | 0.00005%       | 0.46         |
|  |                        |                     | Methanol  |   | 79.00%                                   | 2                              | 3.16                            | 0.00079%   | 0.00072%       | 7.24         |
|  |                        |                     | Polyoxyalkylenes                                  |   | 10.00%                                   | 2                              | 0.40                            | 0.00010%   | 0.00009%       | 0.92         |
|  |                        |                     | Fatty Acids                                       |   | 5.00%                                    | 2                              | 0.20                            | 0.00005%   | 0.00005%       | 0.46         |
|  |                        |                     | Olefin  |   | 1.00%                                    | 2                              | 0.04                            | 0.00001%   | 0.00001%       | 0.09         |
|  | Ferrotrol 300L         | Iron chelator       | Citric Acid                                       | Prevents precipitation                            | 70.00%                                   | 6                              | 8.40                            | 0.00209%   | 0.00192%       | 19.24        |
| *Total 15% HCl system volume is 2,000 gallons per frac stage |                        |                     |   |   |  |                                | <b>TOTAL</b>                    | <b>0.0573%</b>   | <b>0.0527%</b> | <b>527.5</b> |
| Biocide (BJ Chem Svcs)                                       | Alpha 1427             | Biocide             | Glutaraldehyde                                    | Eliminates bacteria in water sources              | 25.00%                                   | 0.15                           | 15.38                           | 0.00383%   | 0.00304%       | 30.38        |
|  |                        |                     | Quaternary Ammonium Chloride                      |   | 10.00%                                   | 0.15                           | 6.15                            | 0.00153%   | 0.00122%       | 12.15        |
|  |                        |                     | Alkyl dimethyl benzyl ammonium chloride           |   | 7.00%                                    | 0.15                           | 4.31                            | 0.00107%   | 0.00085%       | 8.51         |
|  |                        |                     | Ethanol   |   | 5.00%                                    | 0.15                           | 3.08                            | 0.00076%   | 0.00061%       | 6.08         |
|  |                        |                     |   |   |  |                                | <b>TOTAL</b>                    | <b>0.0072%</b>   | <b>0.0063%</b> | <b>57.1</b>  |
| Scale Inhibitor (BJ Chem Svcs)                               | Scaletrol 720          | Scale Control       | Ethylene Glycol                                   | Prevents scale deposits                           | 25.00%                                   | 0.15                           | 21.53                           | 0.05419%   | 0.00425%       | 42.53        |
|  |                        |                     | Diethylene Glycol                                 |   | 5.00%                                    | 0.15                           | 3.08                            | 0.05419%   | 0.00061%       | 6.08         |
|  |                        |                     |   |   |  |                                | <b>TOTAL</b>                    | <b>0.1084%</b>   | <b>0.0049%</b> | <b>48.6</b>  |
| Friction Reducer (BJS)                                       | FRW-14                 | Friction Reducer    | Hydrotreated light distillate                     | Reduces friction between pipe and fluid           | 40.00%                                   | 1                              | 159.20                          | 0.03960%   | 0.03146%       | 314.57       |
|  |                        |                     | Ethoxylated Alcohol                               |   | 5.00%                                    | 1                              | 19.90                           | 0.00495%   | 0.00393%       | 39.32        |
|  |                        |                     |   |   |  |                                | <b>TOTAL</b>                    | <b>0.0446%</b>   | <b>0.0354%</b> | <b>353.9</b> |
| Gel (BJS)  | GW-3LDF                | Gelling Agent       | Petroleum Distillate Blend(Non-Diesel, BTEX free) | Adds viscosity to fluid                           | 50.00%                                   | 5                              | 25.00                           | 0.00622%   | 0.00612%       | 61.24        |
|  |                        |                     | Guar Gum  |   | 50.00%                                   | 5                              | 25.00                           | 0.00622%   | 0.00612%       | 61.24        |
| Gel Breaker (BJS)  | GBW-20C                | Enzyme Gel Breaker  | None  | Reduces viscosity of the fluid                    | 0.00%                                    | 0.50                           | 0.00                            | 0%   | 0%             | 0            |
|  |                        |                     |   |   |  |                                | <b>TOTAL</b>                    | <b>0.0124%</b>   | <b>0.0122%</b> | <b>122.5</b> |

BJ Services