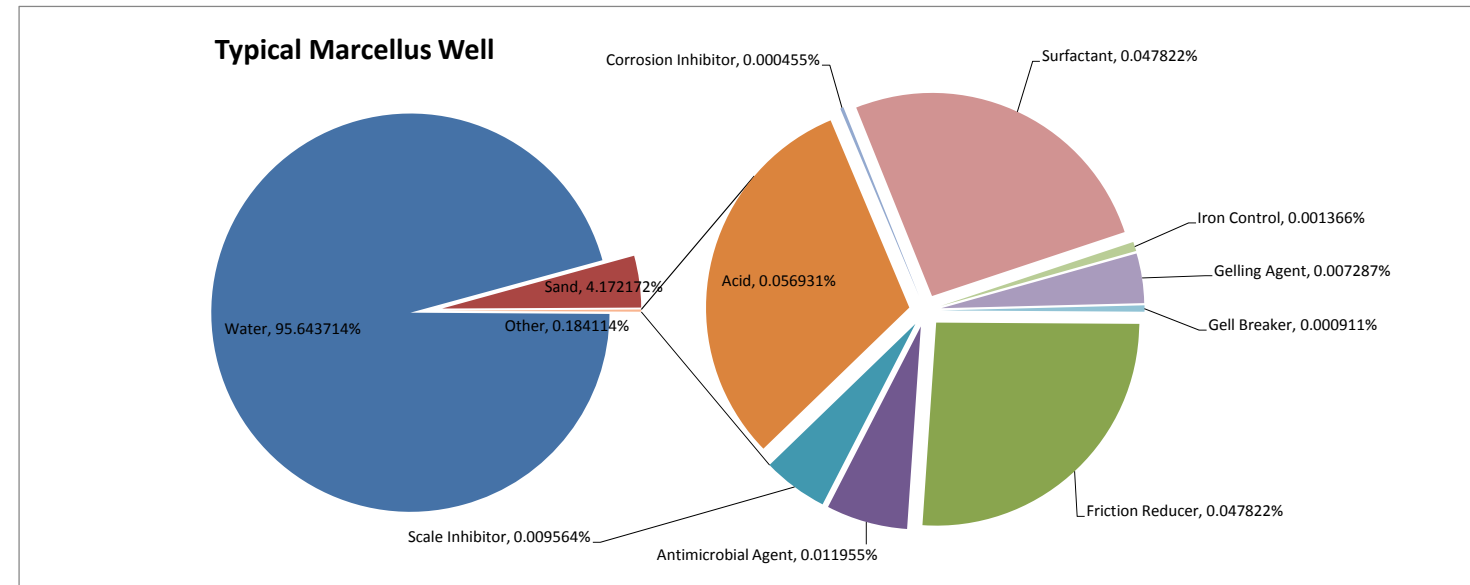


Typical Marcellus Well

Product Name	Additive	Purpose	Use and Dilution	Volume per well (12 Stages), gal	Overall %
Water	Carrier Fluid	Creates fracture network in shale and carries sand to the formation	Approximately 5 millions gallons	5,040,000	95.643714%
Sand	Sand	Enables fractures to remain open and allow gas to escape into the well bore	Approximately 4.8 millions pounds	219,855.00	4.172172%
FRW-18	Friction Reducer	Reduces friction between pipe and fluid	Diluted at one half gallon per 1,000 gallons of water	2,520.00	0.047822%
Alpha 1427	Antimicrobial Agent	Eliminates bacteria in water sources	Diluted at one eighth gallon per 1,000 gallons of water	630.00	0.011955%
Scaletrol 720	Scale Inhibitor	Prevents scale deposits	Diluted at one tenth gallon per 1,000 gallons of water	504.00	0.009564%
7.5% HCL	Acid	Dissolves cement and minerals in the perforations (non-diluted)	250 gallons per stage (non-diluted chemicals)	3,000.00	0.056931%
CI-14	Corrosion Inhibitor	Protects casing	Diluted at two gallons per 1,000 gallons of acid	24.00	0.000455%
Inflo 250W	Surfactant	Enhances mobilization of liquid hydrocarbons	Diluted at one half gallon per 1,000 gallons of water	2,520.00	0.047822%
Ferrotrol 300L	Iron Control	iron-sequestering material	Diluted at six gallon per 1,000 gallons of acid	72.00	0.001366%
GW-3LDF	Gelling Agent	Adds viscosity to the fluid	Diluted at one gallon per 10 gallons of flush per stage	384.00	0.007287%
Enzyme G-NE	Gell Breaker	Reduces viscosity of the fluid	Diluted at four gallons per 350 gallons of flush per stage	48.00	0.000911%



Common Name & Supplier	Supplier Chemical Name	Common Description	Hazardous Components listed on MSDS	Purpose	Hazardous Component Weight % of Chemical	Component loading gal/1000	Gal Hazardous Component / stage	Concentration Hazardous Component of Total Stage Fluid		
								by % Vol	by % Weight	ppm
7.5% HCl (BJ Services)	7.5% HCL	HCL	Hydrochloric acid	Dissolves cement and minerals in the perforations (non-diluted)	36.00%	389	217.84	0.0124018	0.076912	769.12
	CI -14	Corrosion Inhibitor	Propargyl Alcohol	Protecting casing	5.00%	2	0.20	0.0000114	0.000006	0.06
			Methanol		68.00%	2	3.16	0.0001799	0.000743	7.43
			Polyoxyalkylenes		10.00%	2	0.40	0.0000228	0.000108	1.08
			Fatty Acids		5.00%	2	0.20	0.0000114	0.000060	0.60
			Olefin		1.00%	2	0.04	0.0000023	0.000012	0.12
	Ferrotrol 300L	Iron Chelator	Citric Acid	Prevents precipitation	70.00%	6	8.40	0.0004782	0.002301	23.01
TOTAL							0.0131077	0.080142	801.42	

Biocide (BJ Services)	ALPHA 1427	Biocide	Glutaraldehyde	Eliminates bacteria in water sources	30.00%	0.125	12.82	0.0001532	0.001075	10.75
			Quaternary ammonium chloride		10.00%	0.125	5.13	0.0000613	0.000360	3.60
			Alkyl dimethyl benzyl ammonium chloride (C12-16)		7.00%	0.125	3.59	0.0000429	0.000251	2.51
			Ethanol		5.00%	0.125	2.57	0.0000307	0.000150	1.50
TOTAL							0.0002881	0.001836	18.36	

Scale Inhibitor (BJ Services)	Scaletrol 720	Scale Control	Ethylene glycol	Prevents scale deposits	45.00%	0.1	14.35	0.0001373	0.003376	33.76
			Diethylene glycol		5.00%	0.1	2.05	0.0000196	0.000269	2.69
TOTAL							0.0001569	0.003645	36.45	

Friction Reducer (BJ Services)	FRW-18	Friction Reducer	Hydrotreated light distillates	Reduces friction between pipe and fluids	30.00%	0.5	79.60	0.0038066	0.014417	144.17
			Diethylene glycol		5.00%	0.5	9.95	0.0004758	0.002400	24.00
TOTAL							0.0042824	0.016816	168.16	

Gell (BJ Services)	GW-3LDF	Gelling agent	Petroleum Distillates Blend	Adds viscosity to fluid	60.00%	3	15.00	0.0001093	0.007834	78.34
			Guar gum		40.00%	3	15.00	0.0001093	0.005222	52.22
Gell Breaker (BJ Services)	Scaletrol 720	Enzyme gel breaker	None	Reduces the viscosity of the fluid	0.00%	0.25	-	n/a	n/a	n/a
TOTAL							0.0002186	0.013056	130.56	