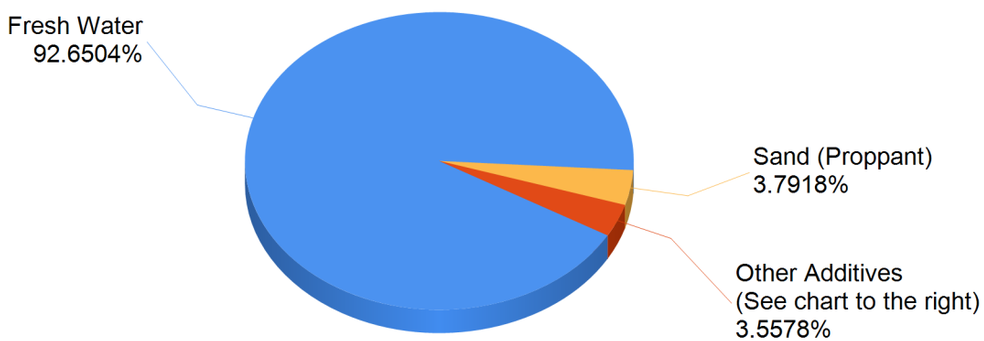
Hydraulic Fracturing Fluid Product Disclosure - STATE 10-67 28-1H
CHESAPEAKE

API #	0512332368	**County**	WELD	**Fracture Date**	4/26/2011
Surface Casing Depth (ft)		**State**	COLORADO	**Proppant Mass Pumped (lbs)**	1,997,808
True Vertical Depth of Well (ft)	7,919.7	**Longitude**	-104.902546	**Water Volume Pumped (gals)**	2,208,276
Play	NIOBRARA	**Latitude**	40.811546	**Frac Fluid Volume Total (gals)**	2,383,451
Well Type	HORIZONTAL	**Lat/Long Projection**	NAD27	**Total Fluid Mass Pumped (lbs)**	21,974,757

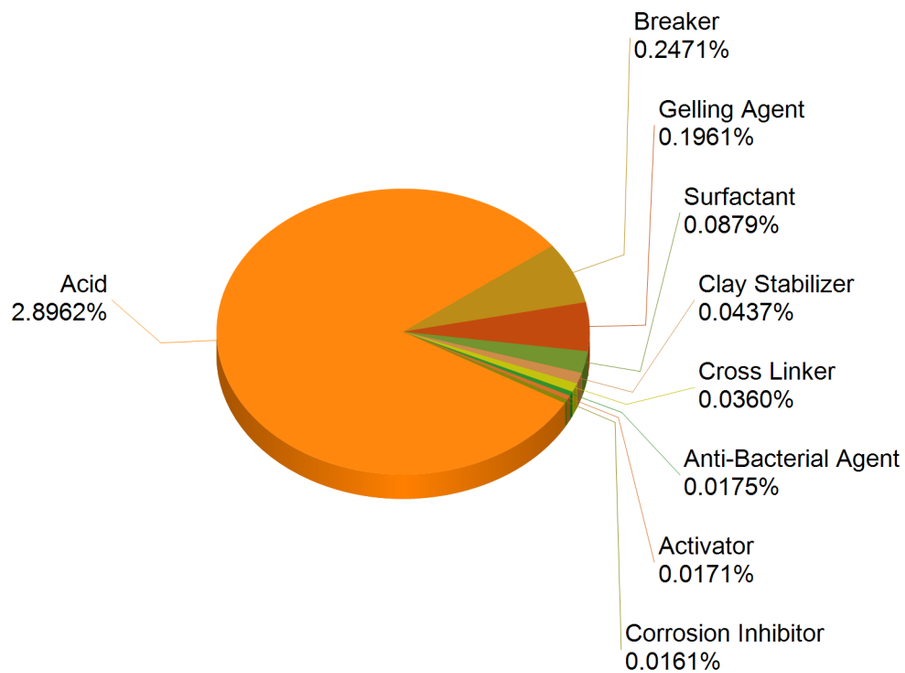
Product Type	Purpose	Downhole Result	Other Common Uses	Product Name	Total Volume Used in Well	Overall % by Total Volume
Water	Expand fracture and deliver sand	Some stays in formation while remainder returns with natural formation water as "produced water" (actual amounts returned vary from well to well)	Landscaping, manufacturing	Fresh Water	2,208,276	92.6504 %
Sand (Proppant)	Allows the fractures to remain open so the gas can escape	Stays in formation, embedded in fractures (used to "prop" fractures open)	Drinking water filtration, play sand, concrete and brick mortar	Sand (Proppant)	90,376	3.7918 %
Acid Package Hydrochloric Acid Corrosion Inhibitor Iron Control	Helps dissolve minerals and initiate cracks in the rock	Reacts with minerals present in the formation to create salts, water, and carbon dioxide.	Swimming pool chemical and cleaner	HCL HYDROCHLORIC ACID	69,030	2.8962 %
	Prevents the corrosion of the pipe	Bonds to metal surfaces (pipe) downhole. Any remaining product not bonded is broken down by micro-organisms and consumed or returned in produced water.	Used in pharmaceuticals, acrylic fibers and plastics	HAI-OS	384	0.0161 %
Breaker	Allows a delayed break down the gel	Reacts with the "crosslinker" and "gel" once in the formation making it easier for the fluid to flow to the borehole. Reaction produces ammonia and sulfate salts which are returned in produced water.	Used in hair coloring, as a disinfectant, and in the manufacture of common household plastics	VICON NF BREAKER	5,890	0.2471 %
Gelling Agent	Thickens the water in order to suspend the sand	Combines with the "breaker" in the formation thus making it much easier for the fluid to flow to the borehole and return in produced water.	Cosmetics, baked goods, ice cream, toothpaste, sauces, and salad dressings	WG-18	4,674	0.1961 %
Surfactant	Used to increase the viscosity of the fracture fluid	Generally returned with produced water, but in some formations may enter the gas stream and return in the produced natural gas.	Used in glass cleaner, multi-surface cleansers, antiperspirant, deodorants and hair-color	LOSURF-300D	2,095	0.0879 %
Clay Stabilizer	Creates a brine carrier fluid	Reacts with clays in the formation through a sodium - potassium ion exchange. Reaction results in sodium chloride (table salt) which is returned in produced water.	Used in low-sodium table salt substitute, medicines, and IV fluids	CLA-WEB	1,041	0.0437 %
Cross Linker	Maintains fluid viscosity as temperature increases	Combines with the "breaker" in the formation to create salts that are returned in produced water.	Used in laundry detergents, hand soaps and cosmetics	CL-23	859	0.0360 %
Anti-Bacterial Agent	Eliminates bacteria in the water that produces corrosive by-products	Reacts with micro-organisms that may be present in the treatment fluid and formation. These micro-organisms break down the product with a small amount of the product returning in produced water.	Disinfectant; sterilizer for medical and dental equipment	BE-7	418	0.0175 %

Activator	Used to trigger a chemical reaction involving another additive (such as crosslinkers or breakers) or resin coated proppants (synthetic sands).	Undergoes chemical reaction downhole. Results in mineral salts, water and carbon dioxide which is returned in produced water.	Used in laundry detergents, soap, water softener and dish washer detergents	CAT-3	408	0.0171 %

Hydraulic Fracturing Fluid Breakdown by Volume



Details for the Other Additives worth 3.5578% of Total Volume



Hydraulic Fracturing Fluid Product Component Information Disclosure - STATE 10-67 28-1H
CHESAPEAKE

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Supplier	Product Type	Product Name	Total Product Pumped (gals)	Total Product Mass (lbs)	Component Listed on MSDS	Chemical Abstract Service Number (CAS #)	MAXIMUM Component Concentration of Product (% by Mass)	MAXIMUM Component Mass Pumped (lbs)	MAXIMUM Component Concentration Pumped (% by Mass)	MAXIMUM Parts per Million (PPM) by Mass
HALLIBURTON ENERGY SERVICES	Acid	HCL HYDROCHLORIC ACID	69,030	622,513	Water	007732-18-5	85.00%	529,136	2.40793%	24,079
					Hydrochloric Acid	007647-01-0	15.00%	93,377	0.42493%	4,249
	Gelling Agent	WG-18	4,674	50,739	Guar Gum Derivative	N/A	100.00%	50,739	0.23090%	2,309
	Breaker	VICON NF BREAKER	5,890	59,510	Sodium Chloride	007647-14-5	30.00%	17,853	0.08124%	812
					Sodium Chlorite	007758-19-2	10.00%	5,951	0.02708%	271
	Clay Stabilizer	CLA-WEB	1,041	9,649	Proprietary	N/A	60.00%	5,789	0.02634%	263
	Cross Linker	CL-23	859	8,464	Zirconium Complex	N/A	60.00%	5,078	0.02311%	231
					Quaternary Ammonium Chloride (Ammonium Chloride)	012125-02-9	27.00%	2,285	0.01040%	104
	Corrosion Inhibitor	HAI-OS	384	2,854	Methanol (Methyl Alcohol)	000067-56-1	60.00%	1,712	0.00779%	78
					Propargyl Alcohol (2-Propynol)	000107-19-7	10.00%	285	0.00130%	13
	Activator	CAT-3	408	3,611	EDTA/Copper chelate	N/A	30.00%	1,083	0.00493%	49
	Anti-Bacterial Agent	BE-7	418	4,223	Sodium Hypochlorite	007681-52-9	30.00%	1,267	0.00577%	58
					Sodium Hydroxide	001310-73-2	5.00%	211	0.00096%	10

HALLIBURTON ENERGY SERVICES	Surfactant	LOSURF-300D	2,095	15,744	Ethanol	000064-17-5	60.00%	9,446	0.04299%	430
					Heavy Aromatic Naphtha (Naphtha, Petroleum Naphtha, Catalytic Reformed Naphtha, Heavy Paraffinic Distillate)	064742-94-5	30.00%	4,723	0.02149%	215
					Naphthalene	000091-20-3	5.00%	787	0.00358%	36
					Nonyl Phenol Poly Ethylene Glycol Ether Blend	127087-87-0	5.00%	787	0.00358%	36
					1,2,4 Trimethylbenzene	000095-63-6	1.00%	157	0.00072%	7

All component information listed was obtained from supplier Material Safety Data Sheets (MSDS). The Occupational Safety and Health Administration (OSHA) sets the criteria for the disclosure of this information. Please note that Federal Law protects "proprietary", "trade secret", and "confidential business information" and the criteria for how this information is reported on an MSDS is subject to 29 CFR 1910.1200 (i). As a result, the Operator does not have the legal authority to disclose any supplier "proprietary", "trade secret", or "confidential business information".