



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 Range Resources-Appalachia, LLC	DEP ID# 141142	Well API # (Permit / Reg) 37-125-23928-00	Project Number	Acres 561.9166
Address 380 Southpointe Blvd, Suite 300		Well Farm Name Rukavina Unit	Well # #2H	Serial #
City Canonsburg	State PA	Zip Code 15317	County Washington	Municipality Cross Creek
Phone 724-743-6700	Fax 724-743-6490	Email	USGS 7.5 min. quadrangle map 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/Rex Road Metering Vault	Source 16	91,266
2. PA American Water Company/Chapman Lane Metering Vault	Source 15	1,548,172
3.		
4.		
5.		
6.		
<b>Recycled Water Used</b>		<b>1,118,408</b>
<b>Other Base Fluid(s)Components Used</b>		
1.		
2.		
<b>Total Base Fluid(s)/Components Used</b>		<b>2,757,846</b>

### PERFORATION RECORD

Stage No.	Perforation Date	Stage Perforated From	Stage Perforated To	Perf. Orientation (Vertical, Horizontal, Radial)	Formation
1	9/24/11	9846' MD	9646' MD	Horizontal	Marcellus Shale
2	10/13/11	9546' MD	9346' MD	Horizontal	Marcellus Shale
3	10/14/11	9246' MD	9046' MD	Horizontal	Marcellus Shale
4	10/14/11	8946' MD	8746' MD	Horizontal	Marcellus Shale
5	10/17/11	8646' MD	8446' MD	Horizontal	Marcellus Shale
6	10/18/11	8346' MD	8146' MD	Horizontal	Marcellus Shale
7	10/19/11	8046' MD	7846' MD	Horizontal	Marcellus Shale
8	10/19/11	7746' MD	7546' MD	Horizontal	Marcellus Shale
9	10/20/11	7446' MD	7246' MD	Horizontal	Marcellus Shale
10				Horizontal	Marcellus Shale
11				Horizontal	Marcellus Shale
12				Horizontal	Marcellus Shale





**STIMULATION INFORMATION (WELL)**

Open Flow Production: Omcf/d @ 24hrs pos treatment	24 Hr. Open Flow Production: Omcf/d @ 24hrs pos treatment	24 Hr. Shut-in Pressure: N/A @ 24hrs post treatment	Flow Back Date:
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**STIMULATION INFORMATION (STAGE)**

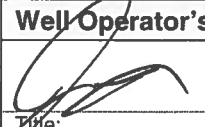
Complete a separate record for each stimulation stage. (Please insert additional copies of this page for additional stages).

<b>Stage No.:</b> 1	Stimulation Date: 10/13/11	Pump Rate: 60.1
Pressure (psi): 7540	Shut-in Surface Pressure: 3686	5 Minute Shut-in Surface Pressure: N/A
Propping Agent Type: Sand	Propping Agent Amount: 307,342	Propping Agent Size: 100 Mesh 30/50 Mesh
<b>Stage No.:</b> 2	Stimulation Date: 10/13/11	Pump Rate: 67.6
Pressure (psi): 7883	Shut-in Surface Pressure: 3851	5 Minute Shut-in Surface Pressure: N/A
Propping Agent Type: Sand	Propping Agent Amount: 305,282	Propping Agent Size: 100 Mesh 30/50 Mesh
<b>Stage No.:</b> 3	Stimulation Date: 10/14/11	Pump Rate: 67.3
Pressure (psi): 7160	Shut-in Surface Pressure: 3992	5 Minute Shut-in Surface Pressure: N/A
Propping Agent Type: Sand	Propping Agent Amount: 308,598	Propping Agent Size: 100 Mesh 30/50 Mesh
<b>Stage No.:</b> 4	Stimulation Date: 10/17/11	Pump Rate: 67.8
Pressure (psi): 7212	Shut-in Surface Pressure: 3869	5 Minute Shut-in Surface Pressure: N/A
Propping Agent Type: Sand	Propping Agent Amount: 310,913	Propping Agent Size: 100 Mesh 30/50 Mesh
<b>Stage No.:</b> 5	Stimulation Date: 10/18/11	Pump Rate: 68.3
Pressure (psi): 6444	Shut-in Surface Pressure: 3939	5 Minute Shut-in Surface Pressure: N/A
Propping Agent Type: Sand	Propping Agent Amount: 305,785	Propping Agent Size: 100 Mesh 30/50 Mesh
<b>Stage No.:</b> 6	Stimulation Date: 10/19/11	Pump Rate: 69.3
Pressure (psi): 6412	Shut-in Surface Pressure: 4062	5 Minute Shut-in Surface Pressure: N/A
Propping Agent Type: Sand	Propping Agent Amount: 308,338	Propping Agent Size: 100 Mesh 30/50 Mesh
<b>Stage No.:</b> 7	Stimulation Date: 10/19/11	Pump Rate: 69.4
Pressure (psi): 6652	Shut-in Surface Pressure: 3986	5 Minute Shut-in Surface Pressure: N/A
Propping Agent Type: Sand	Propping Agent Amount: 307,513	Propping Agent Size: 100 Mesh 30/50 Mesh

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

Name	Name	Name
<b>Frac Tech</b>	<b>Multi-Chem</b>	<b>Renegade Services</b>
Address 16858 IH20	Address 200 Detroit Street	Address PO Box 852
City - State - Zip Cisco, TX 76437	City - State - Zip Washington, PA	City - State - Zip Levelland, TX 79336
Phone 817-850-1008	Phone 325-486-7489	Phone 337/552-8401

*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.*

<b>Well Operator's Signature</b>   Title: Completion Engineer: Jonathan Thomas Date: 11-16-11	Reviewed by: _____ Date: _____	<b>DEP USE ONLY</b>  Comments: _____
	Date: _____	

**STIMULATION INFORMATION (STAGE- Continued)**

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

<b>Stage No.:</b> 8	Stimulation Date: 10/20/11	Pump Rate: 69.2
Pressure (psi): 6803	Shut-in Surface Pressure: 3976	5 Minute Shut-in Surface Pressure: N/A
Propping Agent Type: Sand	Propping Agent Amount: 308,072	Propping Agent Size: 100 Mesh 30/50 Mesh
<b>Stage No.:</b> 9	Stimulation Date: 10/21/11	Pump Rate: 69.4
Pressure (psi): 6701	Shut-in Surface Pressure: 4059	5 Minute Shut-in Surface Pressure: N/A
Propping Agent Type: Sand	Propping Agent Amount: 306,724	Propping Agent Size: 100 Mesh 30/50 Mesh
<b>Stage No.:</b> 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
<b>Stage No.:</b> 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
<b>Stage No.:</b> 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
<b>Stage No.:</b> 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
<b>Stage No.:</b> 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
<b>Stage No.:</b> 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
<b>Stage No.:</b> 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
<b>Stage No.:</b> 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



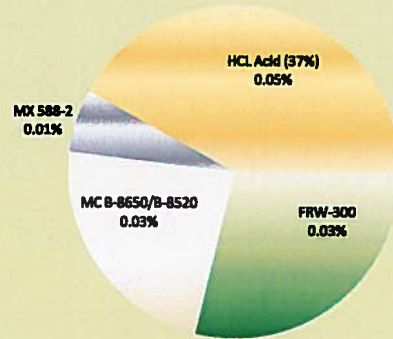
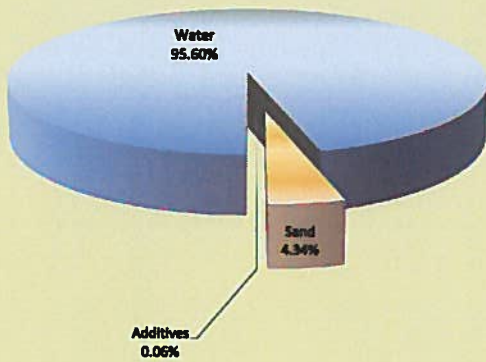
RANGE RESOURCES

Rukavina Unit #2H  
Well API: 37-125-23928

Completion Date: 10-21-11  
Township: Cross Creek

% Composition of Hydraulic Fracture Fluid (by volume)						
Product Name	Additive	Purpose	Use and Dilution	Volume	Overall %	Common Uses
Water	Carrier Fluid	Creates fracture network in shale and carry proppant to the formation	Primary constituent	2,755,221 gal	95.54%	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	125,139 gal	4.34%	Drinking water filtration, play sand
FRW-300	Friction Reducer	Reduces friction between fluid and pipe	Diluted at one-half gallon per 1,000 gallons of water	0,970 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	0,782 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	0,206 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)	1,418 gal	0.05%	Swimming pool and household cleaner

Composition of Hydraulic Fracture Fluid (by volume)





## Composition of Components in Marcellus Shale Hydraulic Fracturing Fluid

**RANGE RESOURCES**

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%	1417.89	0.0492%	0.0201%
	CI-100	Corrosion Inhibitor	Methanol	67-56-1	Protects casing	95.0%	16.51	0.0006%	0.0004%
			Propargyl Alcohol	107-19-7	Protects casing	5.0%	0.71	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	
							<b>TOTAL</b>	<b>0.0498%</b>	<b>0.0206%</b>

<b>Friction Reducer (FracTech)</b>	FRW-300	Friction Reducer	No hazardous ingredients	N/A	Reduce friction down casing	0.0%	N/A	N/A	N/A
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<b>Scale Inhibitor (Multichem)</b>	MX 588-2	Scale Inhibitor	No hazardous ingredients	N/A	prevents scale deposits	0.0%	N/A	N/A	N/A
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<b>Antibacterial Agent (Multichem)</b>	MC B-8520	Antibacterial Agent	4,4-Dimethyloxazolidine	51200-87-4	eliminates bacteria in water	78.0%	429.65	0.0149%	0.0140%
			3,4,4-Trimethyloxazolidine	75673-43-7		5.0%	28.12	0.0010%	0.0009%
			2-Amino-2-methyl-1-propanol	124-68-5		1.0%	5.89	0.0002%	0.0002%
			Formaldehyde Amine	56652-26-7		0.5%	2.57	0.0001%	0.0001%
	MC B-8650	Antibacterial Agent	Glutaraldehyde	111-30-8	eliminates bacteria in water	50.0%	80.67	0.0028%	0.0039%
			Methanol	67-56-1		0.5%	0.81	0.0000%	0.0000%
							<b>TOTAL</b>	<b>0.0190%</b>	<b>0.0191%</b>

<b>SUMMARY</b>	by vol %	by weight %
	<b>0.069%</b>	<b>0.040%</b>