



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

DEP USE ONLY	
Site ID	Primary Fac ID
Client	Subfacility Id

Completion Report

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) 37-125-23930-00	Project Number	Acres 561.9166	
Address 380 Southpointe Blvd, Suite 300		Well Farm Name Rukavina Unit	Well # #4H	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: <input checked="" type="checkbox"/> Original Completion Report <input type="checkbox"/> 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	1,542,922
3.		
4.		
5.		
6.		
Recycled Water Used		1,118,408
Other Base Fluid(s)/Components Used		
1.		
2.		
Total Base Fluid(s)/Components Used		2,752,596

PERFORATION RECORD					
Stage No.	Perforation Date	Stage Perforated From	Stage Perforated To	Perf. Orientation (Vertical, Horizontal, Radial)	Formation
1	9/24/11	10446' MD	10254' MD	Horizontal	Marcellus Shale
2	10/13/11	10158' MD	9966' MD	Horizontal	Marcellus Shale
3	10/14/11	9870' MD	9678' MD	Horizontal	Marcellus Shale
4	10/14/11	9582' MD	9390' MD	Horizontal	Marcellus Shale
5	10/17/11	9294' MD	9102' MD	Horizontal	Marcellus Shale
6	10/18/11	9006' MD	8814' MD	Horizontal	Marcellus Shale
7	10/19/11	8718' MD	8526' MD	Horizontal	Marcellus Shale
8	10/19/11	8430' MD	8238' MD	Horizontal	Marcellus Shale
9	10/20/11	8142' MD	7965' MD	Horizontal	Marcellus Shale
10				Horizontal	Marcellus Shale
11				Horizontal	Marcellus Shale
12				Horizontal	Marcellus Shale

STIMULATION FLUID ADDITIVES-Continued

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. 7	Stage No. 8	Stage No. 9	Stage No. 10	Stage No. 11	Stage No. 12	
FR-200W	N/A	N/A	N/A	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%		
FR-300W	N/A	N/A	N/A	0.0306%	0.0286%	0.0296%	0.0296%	0.0296%		
MX 588-2	N/A	N/A	N/A	0.0070%	0.0072%	0.0072%	0.0072%	0.0072%		
NE100	N/A	N/A	N/A	0.0003%	0.0003%	0.0002%	0.0002%	0.0002%		
FE100L	N/A	N/A	N/A	0.0010%	0.0009%	0.0005%	0.0005%	0.0005%		
37% HCL	HCL	7647-01-0	37%	0.0564%	0.0552%	0.0292%	0.0292%	0.0292%		
Cl-100	Methanol	67-56-1	93%	0.0006%	0.0006%	0.0003%	0.0003%	0.0003%		
Cl-100	Propargyl Alcohol	107-19-7	4%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%		
MC B-8650	Glutaraldehyde	111-30-8	49%	0.0036%	0.0036%	0.0037%	0.0037%	0.0037%		
MC B-8650	Methanol	67-56-1	1%	0.0001%	0.0001%	0.0001%	0.0001%	0.0001%		
MC B-8520	4,4-Dimethyloxazolidine	51200-87-4	77%	0.0149%	0.0150%	0.0151%	0.0151%	0.0151%		
MC B-8520	3,4,4-Trimethyloxazolidine	75673-43-7	5%	0.0010%	0.0010%	0.0010%	0.0010%	0.0010%		
MC B-8520	2-Amino-2-methyl-1-propanol	124-68-5	1%	0.0002%	0.0002%	0.0002%	0.0002%	0.0002%		
MC B-8520	Formaldehyde Amine	56652-26-7	0%	0.0001%	0.0001%	0.0001%	0.0001%	0.0001%		

Please insert additional copies of this page if additional rows/stages are needed.

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

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: 10/12/11	Pump Rate: 67.3
Pressure (psi): 7613	Shut-in Surface Pressure: 3663	5 Minute Shut-in Surface Pressure: N/A
Propping Agent Type: Sand	Propping Agent Amount: 308,103	Propping Agent Size: 100 Mesh 30/50 Mesh
Stage No.: 2	Stimulation Date: 10/13/11	Pump Rate: 68.1
Pressure (psi): 7826	Shut-in Surface Pressure: 3692	5 Minute Shut-in Surface Pressure: N/A
Propping Agent Type: Sand	Propping Agent Amount: 307,305	Propping Agent Size: 100 Mesh 30/50 Mesh
Stage No.: 3	Stimulation Date: 10/14/11	Pump Rate: 68.7
Pressure (psi): 6617	Shut-in Surface Pressure: 3657	5 Minute Shut-in Surface Pressure: N/A
Propping Agent Type: Sand	Propping Agent Amount: 306,131	Propping Agent Size: 100 Mesh 30/50 Mesh
Stage No.: 4	Stimulation Date: 10/17/11	Pump Rate: 67.1
Pressure (psi): 7121	Shut-in Surface Pressure: 3792	5 Minute Shut-in Surface Pressure: N/A
Propping Agent Type: Sand	Propping Agent Amount: 307,332	Propping Agent Size: 100 Mesh 30/50 Mesh
Stage No.: 5	Stimulation Date: 10/18/11	Pump Rate: 66.0
Pressure (psi): 7252	Shut-in Surface Pressure: 3927	5 Minute Shut-in Surface Pressure: N/A
Propping Agent Type: Sand	Propping Agent Amount: 307,647	Propping Agent Size: 100 Mesh 30/50 Mesh
Stage No.: 6	Stimulation Date: 10/19/11	Pump Rate: 67.8
Pressure (psi): 6647	Shut-in Surface Pressure: 3927	5 Minute Shut-in Surface Pressure: N/A
Propping Agent Type: Sand	Propping Agent Amount: 308,514	Propping Agent Size: 100 Mesh 30/50 Mesh
Stage No.: 7	Stimulation Date: 10/19/11	Pump Rate: 68.2
Pressure (psi): 6931	Shut-in Surface Pressure: 3881	5 Minute Shut-in Surface Pressure: N/A
Propping Agent Type: Sand	Propping Agent Amount: 310,060	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 Frac Tech	Name Multi-Chem	Name Renegade Services
Address 16858 IH20	Address 200 Detroit Street	Address PO Box 852
City - State - Zip Ciscok, 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.

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

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: 10/20/11	Pump Rate: 68.4
Pressure (psi): 6336	Shut-in Surface Pressure: 3906	5 Minute Shut-in Surface Pressure: N/A
Propping Agent Type: Sand	Propping Agent Amount: 305,109	Propping Agent Size: 100 Mesh 30/50 Mesh
Stage No.: 9	Stimulation Date: 10/21/11	Pump Rate: 69.2
Pressure (psi): 7229	Shut-in Surface Pressure: 4018	5 Minute Shut-in Surface Pressure: N/A
Propping Agent Type: Sand	Propping Agent Amount: 308,642	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

Rukavina Unit #4H
Well API: 37-125-23930

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	2,749,913 gal	95.53%	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	125,152 gal	4.35%	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	0,947 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	0,780 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	0,203 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)	1,507 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%	1506.51	0.0523%	0.0214%
	CI-100	Corrosion Inhibitor	Methanol	67-56-1	Protects casing	95.0%	17.54	0.0006%	0.0005%
			Propargyl Alcohol	107-19-7	Protects casing	5.0%	0.75	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	0.0530%	0.0219%

Friction Reducer (FracTech)	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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Scale Inhibitor (Multichem)	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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Antibacterial Agent (Multichem)	MC B-8520	Antibacterial Agent	4,4-Dimethyloxazolidine	51200-87-4	eliminates bacteria in water	78.0%	428.55	0.0149%	0.0139%
			3,4,4-Trimethyloxazolidine	75673-43-7		5.0%	28.05	0.0010%	0.0009%
			2-Amino-2-methyl-1-propanol	124-68-5		1.0%	5.88	0.0002%	0.0002%
			Formaldehyde Amine	56652-26-7		0.5%	2.56	0.0001%	0.0001%
	MC B-8650	Antibacterial Agent	Glutaraldehyde	111-30-8	eliminates bacteria in water	50.0%	80.47	0.0028%	0.0039%
			Methanol	67-56-1		0.5%	0.80	0.0000%	0.0000%
							TOTAL	0.0190%	0.0191%

SUMMARY	by vol %	by weight %
	0.072%	0.041%