

State of West Virginia  
Department of Environmental Protection - Office of Oil and Gas  
Well Operator's Report of Well Work

RECEIVED  
Office of Oil and Gas

JUN 30 2017

API 47-91-01297 ✓ County Taylor District Fetterman  
Quad Gladesville Pad Name OES Field/Pool Name \_\_\_\_\_  
Farm name Orthodox Education Society Well Number 1HM  
Operator (as registered with the OOG) PDC Mountaineer, LLC  
Address 6031 Wallace Road Extension, Suite 300 City Wexford State PA Zip 15090

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey  
Top hole Northing 4,365,669 Easting 588,797  
Landing Point of Curve Northing 4,365,813 Easting 588,438  
Bottom Hole Northing 4,367,478 Easting 587,566

Elevation (ft) 1948' GL Type of Well  New  Existing Type of Report  Interim  Final  
Permit Type  Deviated  Horizontal  Horizontal 6A  Vertical Depth Type  Deep  Shallow  
Type of Operation  Convert  Deepen  Drill  Plug Back  Redrilling  Rework  Stimulate  
Well Type  Brine Disposal  CBM  Gas  Oil  Secondary Recovery  Solution Mining  Storage  Other \_\_\_\_\_  
Type of Completion  Single  Multiple Fluids Produced  Brine  Gas  NGL  Oil  Other \_\_\_\_\_  
Drilled with  Cable  Rotary

Drilling Media Surface hole  Air  Mud  Fresh Water Intermediate hole  Air  Mud  Fresh Water  Brine  
Production hole  Air  Mud  Fresh Water  Brine

Mud Type(s) and Additive(s)  
Synthetic Oil-based Mud

Date permit issued 8/29/2014 Date drilling commenced 3/13/2015<sup>4</sup> Date drilling ceased 3/28/2015  
Date completion activities began 6/5/2015 Date completion activities ceased 7/24/2015  
Verbal plugging (Y/N) \_\_\_\_\_ Date permission granted \_\_\_\_\_ Granted by \_\_\_\_\_

Please note: Operator is required to submit a plugging application within 5 days of verbal permission to plug

Freshwater depth(s) ft 245' Open mine(s) (Y/N) depths N  
Salt water depth(s) ft 910' Void(s) encountered (Y/N) depths N  
Coal depth(s) ft 273', 328', 414', 468' Cavern(s) encountered (Y/N) depths N

**APPROVED**

NAME: Ken Gruymolds  
DATE: 8/24/17

Reviewed by:  
BC  
09/15/2017

API 47-91 - 0127 Farm name Orthodox Education Society Well number 1HM

CASING STRINGS	Hole Size	Casing Size	Depth	New or Used	Grade wt/ft	Basket Depth(s)	Did cement circulate (Y/N) * Provide details below*
Conductor	30"	24"	80'	New	94	N/A	Y
Surface	17.5"	13 3/8"	601.5'	New	54.5	240'	Y
Coal							
Intermediate 1	12 1/4"	9 5/8"	2501.9'	New	40	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8 3/4" & 8 1/2"	5 1/2"	13606'	New	20	N/A	Y N
Tubing							
Packer type and depth set							

Comment Details \_\_\_\_\_

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft <sup>3</sup> /sks)	Volume (ft <sup>3</sup> )	Cement Top (MD)	WOC (hrs)
Conductor	Grout					Surface	8
Surface	Class A 2% CaCl <sub>2</sub>	533	15.6	1.2	639.6	Surface	8
Coal							
Intermediate 1	Class A	682	15.1	1.42	1012.38	Surface	8
Intermediate 2							
Intermediate 3							
Production	Type 1 4% Gel/Type 1 2% Gel	2533	14.5	1.24	3128.3	2350'	8
Tubing							

Drillers TD (ft) <sup>13620'</sup> \_\_\_\_\_ Loggers TD (ft) <sup>13620'</sup> \_\_\_\_\_  
 Deepest formation penetrated Marcellus Plug back to (ft) \_\_\_\_\_  
 Plug back procedure None

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JUN 30 2017

Kick off depth (ft) <sup>7192' MD</sup> \_\_\_\_\_

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Check all wireline logs run  caliper  density  deviated/directional  induction  
 neutron  resistivity  gamma ray  temperature  sonic

Well cored  Yes  No Conventional Sidewall Were cuttings collected  Yes  No

DESCRIBE THE CENTRALIZER PLACEMENT USED FOR EACH CASING STRING \_\_\_\_\_  
 13 3/8": 1 bow spring centralizer placed on every joint  
 9 5/8": 1 bow spring centralizer placed on every third joint  
 5 1/2": 1 rigid poly centralizer every joint in the lateral, 1 rigid poly centralizer every other joint through the curve, 1 rigid poly centralizer every third joint from kick off point to estimated TOC

WAS WELL COMPLETED AS SHOT HOLE  Yes  No DETAILS Well was completed in 27 stages with 1050 .45" entry hole 22.7 gram perforating charges.

WAS WELL COMPLETED OPEN HOLE?  Yes  No DETAILS \_\_\_\_\_

WERE TRACERS USED  Yes  No TYPE OF TRACER(S) USED \_\_\_\_\_

API 47- 91 - 01287 Farm name Orthodox Education Society Well number 1HM

PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
1	6/16/2015	13519	13357	40	Marcellus
2	6/19/2015	13319	13157	40	Marcellus
3	6/20/2015	13119	12957	40	Marcellus
4	6/22/2015	12919	12757	40	Marcellus
5	6/23/2015	12719	12557	40	Marcellus
6	6/24/2015	12519	12357	40	Marcellus
7	6/24/2015	12319	12157	40	Marcellus
8	6/25/2015	12119	11957	40	Marcellus
9	6/25/2015	11919	11757	40	Marcellus
10	6/26/2015	11719	11557	40	Marcellus
11	6/26/2015	11519	11357	40	Marcellus
12	6/26/2015	11319	11157	40	Marcellus
13	6/27/2015	11119	10957	40	Marcellus
14	6/27/2015	10919	10757	40	Marcellus
15	6/28/2015	10719	10557	40	Marcellus
16	6/29/2015	10519	10357	40	Marcellus

Please insert additional pages as applicable.

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STIMULATION INFORMATION PER STAGE

JUN 30 2017

Complete a separate record for each stimulation stage.

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Stage No.	Stimulations Date	Ave Pump Rate (BPM)	Ave Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)	Amount of Nitrogen/other (units)
1	6/19/15	66	7534	6650	5511	406700	10173	0
2	6/20/15	63	7863	6527	4642	402200	13303	0
3	6/22/15	68	8051	6398	5425	400080	11492	0
4	6/23/15	72	8456	6427	5075	274660	12225	0
5	6/24/15	64	8115	6280	5883	400880	15095	0
6	6/24/15	78	7932	6638	5046	403110	9010	0
7	6/25/15	77	7968	6741	5375	400080	8726	0
8	6/25/15	76	8020	5955	5425	273820	9011	0
9	6/26/15	75	7952	6520	5361	400220	9259	0
10	6/26/15	71	8347	6716	5325	184460	7105	0
11	6/26/15	72	7827	6441	6094	368690	8918	0
12	6/27/15	78	7895	6469	5829	400900	9320	0
13	6/27/15	78	7609	6312	5733	400140	8445	0
14	6/28/15	75	7601	6652	5940	407460	11876	0
15	6/29/15	82	7998	6938	6634	400300	9048	0
16	6/29/15	78	7879	6437	6509	407230	10056	0

Please insert additional pages as applicable.

09/15/2017



API 47- 91 - 01287 Farm name Orthodox Education Society Well number 1HM

<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>
	TVD MD
_____	_____
_____	_____
_____	_____

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Please insert additional pages as applicable.

GAS TEST  Build up  Drawdown  Open Flow OIL TEST  Flow  Pump

SHUT-IN PRESSURE Surface \_\_\_\_\_ psi Bottom Hole \_\_\_\_\_ psi DURATION OF TEST \_\_\_\_\_ hrs

OPEN FLOW Gas \_\_\_\_\_ mcfpd Oil \_\_\_\_\_ bpd NGL \_\_\_\_\_ bpd Water \_\_\_\_\_ bpd GAS MEASURED BY  Estimated  Orifice  Pilot

LITHOLOGY/ FORMATION	TOP DEPTH IN FT NAME TVD	BOTTOM DEPTH IN FT TVD	TOP DEPTH IN FT MD	BOTTOM DEPTH IN FT MD	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H <sub>2</sub> S, ETC)
Sands, Silts, and Coals	0	1042	0	1042	Sands, Silts, and Coals
Big Lime	1042	2778	1042	2779	Sandstone
Balltown	2778	2848	2779	2849	Sandstone
Bradford	3508	3558	3509	3559	Sandstone
Benson	4197	4267	4199	4269	Sandstone
Elk	4543	4593	4544	4594	Siltstone
Burkett	7473	7495	7565	7584	Shale
Tully	7495	7612	7584	7739	Limestone
Mahantango	7612	7757	7739	8158	Shale- Gas Show
Marcellus	7757	7775	8158	13620	Shale-Gas shows through lateral
Purcell	7775	7778	8162	8166	Limestone
Onondaga	7811		8174		Limestone
					**Onondaga top estimated from 4709101126
					**Big Lime through Elk from 47091201126, Burkett to Lower Marcellus taken from mudlog

Please insert additional pages as applicable.

Drilling Contractor Sidewinder Drilling  
Address 952 Echo Land, Suite 460 City Houston State TX Zip 77024

Logging Company \_\_\_\_\_  
Address \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Cementing Company Universal Well Services  
Address \_\_\_\_\_ City Buckhannon State WV Zip 26201

Stimulating Company USWS  
Address 770 South Post Oak Lane, Suite 405 City Houston State TX Zip 77056

Please insert additional pages as applicable.

Completed by BODIE GARDNER Telephone \_\_\_\_\_  
Signature \_\_\_\_\_ Title PERMITTING MANAGER Date 4-19-17

Submittal of Hydraulic Fracturing Chemical Disclosure Information Attach copy of FRACFOCUS Registry

# Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	6/19/2015
Job End Date:	7/2/2015
State:	West Virginia
County:	Taylor
API Number:	47-091-01297-00-00
Operator Name:	Mountaineer Keystone, LLC
Well Name and Number:	OES R1 HM
Longitude:	-79.96850100
Latitude:	39.43590700
Datum:	NAD27
Federal/Tribal Well:	NO
True Vertical Depth:	7,803
Total Base Water Volume (gal):	10,663,390
Total Base Non Water Volume:	551,646

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## Hydraulic Fracturing Fluid Composition:

Trade Name	Supplier	Purpose	Ingredients	Chemical Abstract Service Number (CAS #)	Maximum Ingredient Concentration in Additive (% by mass)**	Maximum Ingredient Concentration in HF Fluid (% by mass)**	Comments
Water	Mountaineer Keystone	Base Fluid	Water	7732-18-5	100.00000	89.03256	
Sand	U.S. Well Services, LLC	Proppant	Crystalline Silica, quartz	14808-60-7	100.00000	10.32748	
HCL Acid (3% to 7.5%)	U.S. Well Services	Bulk Acid	Water	7732-18-5	97.00000	0.43690	
			Hydrogen Chloride	7647-01-0	7.50000	0.03923	
WFRA-1000	U.S. Well Services	Friction Reducer	Water	7732-18-5	60.00000	0.03577	
			2-Propenoic acid, polymer with 2 propenamide	9003-06-9	30.00000	0.01788	
			Hydrated light distillate (petroleum)	64742-47-8	30.00000	0.01467	
HCL Acid (12.6%-18.0%)	U.S. Well Services, LLC	Bulk Acid	Water	7732-18-5	87.50000	0.03649	
			Hydrogen Chloride	7647-01-0	18.00000	0.00872	
WFRA-405	U.S. Well Services	Friction Reducer	Water	7732-18-5	40.00000	0.00807	
			Anionic Polyacrylamide	Proprietary	40.00000	0.00807	

			Sodium Chloride	7647-14-5	20.00000	0.00403
			Petroleum Distillates	64742-47-8	20.00000	0.00325
			Ethoxylated alcohol blend	Proprietary	5.00000	0.00101
SI-1100	U.S. Well Services	Scale Inhibitor				
			Water	7732-18-5	80.00000	0.01025
			Ethylene Glycol	107-21-1	25.00000	0.00362
			Copolymer of Maleic and Acrylic acid	52255-49-9	10.00000	0.00151
			Potassium salt of diethylene triamine penta (methylene phosphonic acid)	15827-60-8	7.50000	0.00130
			Phosphino carboxylic acid polymer	71050-62-9	5.00000	0.00083
			Hexamethylene triamine penta (methylene phosphonic acid)	34690-00-1	5.00000	0.00083
			Hexamethylene diamine penta (methylene phosphonic acid)	23605-74-5	2.00000	0.00033
K-BAC 1020	U.S. Well Services	Anti-Bacterial Agent				
			2,2-dibromo-3-nitropropionamide	10222-01-2	20.00000	0.00429
			Deionized Water	7732-18-5	28.00000	0.00245
AI-301	U.S. Well Services	Acid Corrosion Inhibitors				
			Diethylene Glycol	111-46-6	30.00000	0.00018
			Methenamine	100-97-0	20.00000	0.00014
			Hydrogen Chloride	7647-01-0	10.00000	0.00006
			Polyethylene polyamine	68603-67-8	10.00000	0.00005
			Coco amine	61791-14-8	5.00000	0.00002

Ingredients shown above are subject to 29 CFR 1910.1200(i) and appear on Material Safety Data Sheets (MSDS). Ingredients shown below are Non-MSDS.

\* Total Water Volume sources may include fresh water, produced water, and/or recycled water

\*\* Information is based on the maximum potential for concentration and thus the total may be over 100%

Note: For Field Development Products (products that begin with FDP), MSDS level only information has been provided.

Ingredient information for chemicals subject to 29 CFR 1910.1200(i) and Appendix D are obtained from suppliers Material Safety Data Sheets (MSDS)

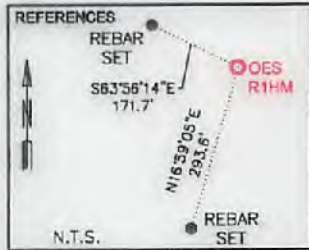
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Environmental Protection

# THRASHER

THE THRASHER GROUP, INC.  
600 WHITE OAKS BLVD.  
BRIDGEPORT, WV 26330  
PHONE 304-624-4108

## NOTES ON SURVEY

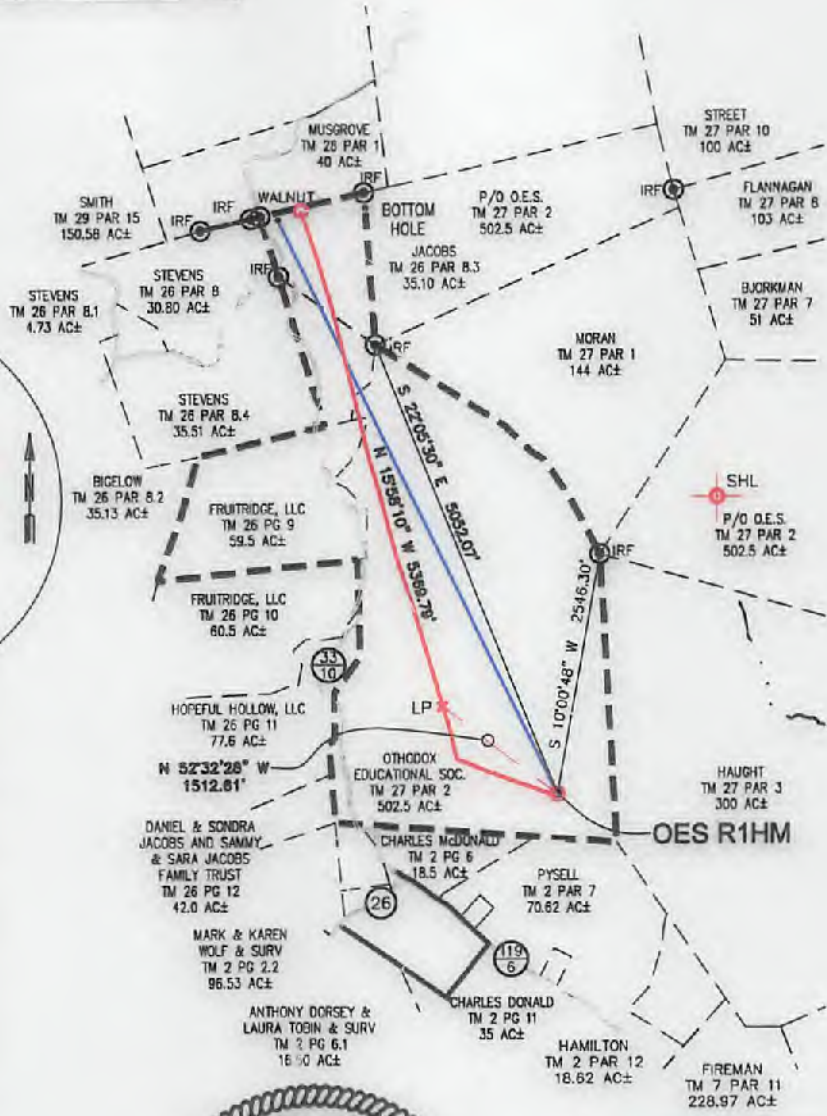
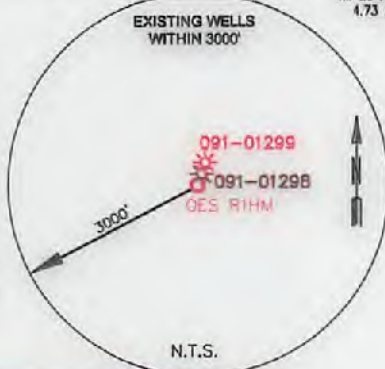
- COORDINATES SYSTEM IS WV STATE PLANE NORTH, NAD 83 DATUM, U.S. FOOT AND WELL COORDINATES ESTABLISHED USING SURVEY GRADE GPS.
- SURFACE AND ROYALTY OWNER INFORMATION AND THEIR BOUNDARIES SHOWN HEREON WERE PLOTTED FROM DEEDS AND/OR TAX PARCEL MAPS PROVIDED BY CLIENT AND FIELD LOCATIONS.
- THIS PLAT DOES NOT REPRESENT A BOUNDARY SURVEY OF THE PARCELS SHOWN HEREON.
- NO DWELLINGS AND BUILDINGS WITHIN 625 FEET OF PROPOSED OF CENTER OF PAD.
- NO WATER WELLS OR DEVELOPED SPRINGS WITHIN 250 FEET OF PROPOSED WELL.
- NO PERENNIAL STREAMS, LAKES, PONDS, RESERVOIRS OR WETLANDS WITHIN 100 FEET OF THE LIMITS OF DISTURBANCE.
- NO NATURALLY PRODUCING TROUT STREAM WITHIN 300 FEET OF LIMITS OF DISTURBANCE.



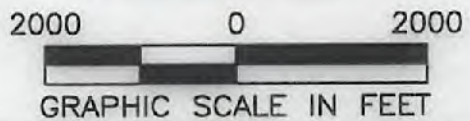
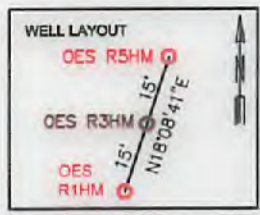
2,860' TOP HOLE  
5,566' BOTTOM HOLE  
LATITUDE 39°27'30"

LONGITUDE 79° 57' 30"  
2,073' BOTTOM HOLE  
8,143' TOP HOLE

GRID NORTH  
UTM, NAD83 DATUM, ZONE 17, US FT



AS-DRILLED COORDINATES	
<b>SURFACE HOLE LOCATION (SHL):</b>	
UTM (NAD83, ZONE 17, METERS):	
NORTHING: 4,365,669.041	EASTING: 588,787.262
<b>LANDING POINT LOCATION (LPL):</b>	
UTM (NAD83, ZONE 17, METERS):	
NORTHING: 4,365,942.529	EASTING: 588,417.086
<b>BOTTOM HOLE LOCATION (BHL):</b>	
UTM (NAD83, ZONE 17, METERS):	
NORTHING: 4,367,508.686	EASTING: 587,940.441
DESIGN COORDINATES	
<b>SURFACE HOLE LOCATION (SHL):</b>	
UTM (NAD83, ZONE 17, METERS):	
NORTHING: 4,365,669.0	EASTING: 588,787.3
<b>LANDING POINT LOCATION (LPL):</b>	
UTM (NAD83, ZONE 17, METERS):	
NORTHING: 4,365,813.0	EASTING: 588,438.0
<b>BOTTOM HOLE LOCATION (BHL):</b>	
UTM (NAD83, ZONE 17, METERS):	
NORTHING: 4,367,477.6	EASTING: 587,866.3



I, THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAT IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY LAW AND REGULATIONS ISSUED AND PRESCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.

P.S. 2270 *M.S. Wolf*

<p>(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS</p> <p>WVDEP OFFICE OF OIL &amp; GAS 601 57TH STREET CHARLESTON, WV 25034</p>	MINIMUM DEGREE OF ACCURACY: 1/200 PROVEN SOURCE OF ELEVATION: SURVEY GRADE GPS (NAVD 88, US FT)	OPERATOR'S WELL #: OES NO. R1HM API WELL #: 47 091 01297 STATE COUNTY PERMIT
	WELL TYPE: OIL <input type="checkbox"/> WASTE DISPOSAL <input type="checkbox"/> PRODUCTION <input type="checkbox"/> DEEP <input type="checkbox"/> GAS <input type="checkbox"/> LIQUID INJECTION <input type="checkbox"/> STORAGE <input type="checkbox"/> SHALLOW <input type="checkbox"/> WATERSHED: WHITE DAY CREEK DISTRICT: FETTERMAN COUNTY: TAYLOR SURFACE OWNER: ORTHODOX EDUCATIONAL SOCIETY OIL & GAS ROYALTY OWNER: ORTHODOX EDUCATIONAL SOCIETY/CHARLES & LAVERNE MacDONALD DRILL <input type="checkbox"/> DRILL DEEPER <input type="checkbox"/> REDRILL <input type="checkbox"/> FRACTURE OR STIMULATE <input type="checkbox"/> PLUG OFF OLD FORMATION <input type="checkbox"/> PERFORATE NEW FORMATION <input type="checkbox"/> CONVERT <input type="checkbox"/> PLUG & ABANDON <input type="checkbox"/> CLEAN OUT & REPLUG <input type="checkbox"/> OTHER CHANGE <input checked="" type="checkbox"/> (SPECIFY) AS-DRILLED TARGET FORMATION: MARCELLUS SHALE ESTIMATED DEPTH: LATERAL 7,803 TVD 13,620 TMD	ELEVATION: 1951.00' QUADRANGLE: GLADESVILLE 7.5' ACREAGE: 502.5 ACREAGE: 537.60
WELL OPERATOR: ARSENAL RESOURCES ADDRESS: 6031 WALLACE ROAD EXTENSION #300 CITY: WEXFORD STATE: PA ZIP CODE: 15090	DESIGNATED AGENT: WILLIAM VEIGEL ADDRESS: 65 PROFESSIONAL PLACE, SUITE 200 CITY: BRIDGEPORT STATE: WV ZIP CODE: 26330	
LEGEND: ○ PROPOSED SURFACE HOLE / BOTTOM HOLE * EXISTING / PRODUCING WELLHEAD * ABANDONED WELL * PLUGGED & ABANDONED WELL △ CUT CONDUCTOR	REVISIONS: --- LEASE BOUNDARY --- 500' DHP BUFFER --- PROPOSED PATH --- AS-DRILLED PATH --- DHP BUFFER	DATE: 06-21-2017 DRAWN BY: R. DOERR SCALE: 1" = 2000' DRAWING NO: 030-3241 WELL LOCATION PLAT



# THRASHER

THE THRASHER GROUP, INC.  
800 WHITE OAK BLVD.  
BRIDGEPORT, WV 26330  
PHONE 304-834-4108

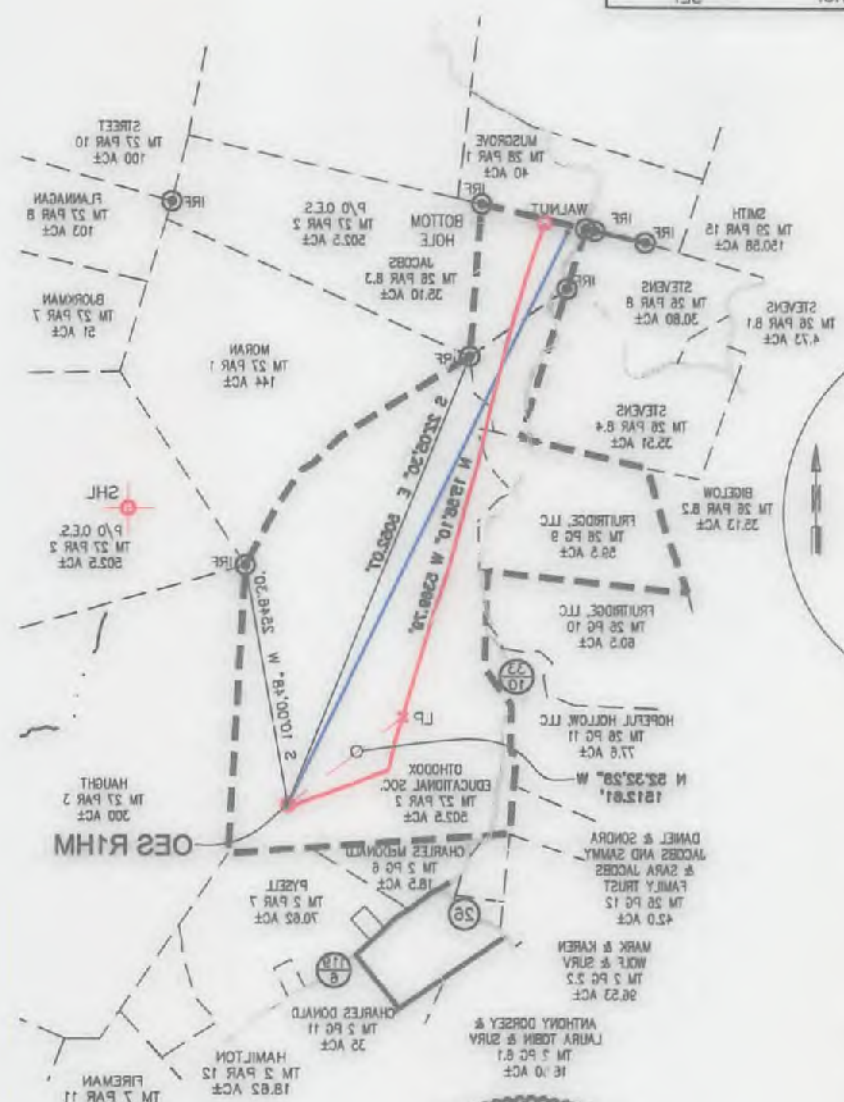
**NOTES ON SURVEY**

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5,860' TOP HOLE  
5,566' BOTTOM HOLE  
LATITUDE 39°27'30"

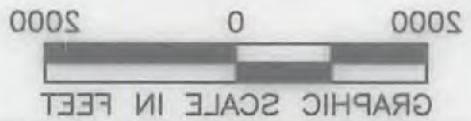
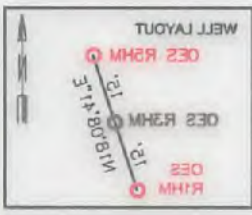
8'143, 106 HOPE  
5'013, BOTTOM HOPE  
LONGITUDE 18° 21, 30"



AS-DRILLED COORDINATES	
<b>SURFACE HOLE LOCATION (SHL):</b>	
UTM (NAD83, ZONE 17, METERS):	EASTING: 888,787.282
	NORTHING: 4,385,882.041
<b>LANDING POINT LOCATION (LPL):</b>	
UTM (NAD83, ZONE 17, METERS):	EASTING: 888,417.088
	NORTHING: 4,385,842.528
<b>BOTTOM HOLE LOCATION (BHL):</b>	
UTM (NAD83, ZONE 17, METERS):	EASTING: 887,940.441
	NORTHING: 4,387,508.688
DESIGN COORDINATES	
<b>SURFACE HOLE LOCATION (SHL):</b>	
UTM (NAD83, ZONE 17, METERS):	EASTING: 888,787.2
	NORTHING: 4,385,882.0
<b>LANDING POINT LOCATION (LPL):</b>	
UTM (NAD83, ZONE 17, METERS):	EASTING: 888,428.0
	NORTHING: 4,385,812.0
<b>BOTTOM HOLE LOCATION (BHL):</b>	
UTM (NAD83, ZONE 17, METERS):	EASTING: 887,940.4
	NORTHING: 4,387,508.7

I, THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAN IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY LAW AND REGULATIONS ISSUED AND PRESCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.

P. S. 2270



<b>UNITED STATES TOPOGRAPHIC MAPS</b> (+) DENOTES LOCATION OF WELL ON DEGREE OF ACCURACY: 1/200 MINIMUM DEGREE OF ACCURACY: 1/200			WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION 601 57TH STREET CHARLESTON, WV 25304 OFFICE OF OIL & GAS WDEP
WAPI WELL # 47 OES NO. R11HM COUNTY PERMIT			
TARGET FORMATION: MARCELLUS SHALE ESTIMATED DEPTH: LATERAL - 7,803 TWD 13,650 TMD OTHER CHANGE (SPECIFY) AS-DRILLED DRILL DEEPER <input type="checkbox"/> REDRILL <input type="checkbox"/> FRACTURE OR STIMULATE <input type="checkbox"/> PLUG OFF OLD FORMATION <input type="checkbox"/> PERFORATE NEW FORMATION <input type="checkbox"/>			
SURFACE OWNER: ORTHODOX EDUCATIONAL SOCIETY SURFACE OWNER: CHARLES & LAVARNE McDONALD ACREAGE: 527.60 QUADRANGLE: GLADSVILLE 75 DISTRICT: FETTERMAN COUNTY: TAYLOR WATERSHED: WHITE DAY CREEK			
WELL TYPE: OIL <input type="checkbox"/> WASTE DISPOSAL <input type="checkbox"/> PRODUCTION <input type="checkbox"/> DEEP <input type="checkbox"/> GAS <input type="checkbox"/> LIQUID INJECTION <input type="checkbox"/> STORAGE <input type="checkbox"/> SHALLOW <input type="checkbox"/>			
CITY: WEXFORD STATE: PA ZIP CODE: 15090 CITY: BRIDGEPORT STATE: WV ZIP CODE: 26330 ADDRESS: 6031 WALLACE ROAD EXTENSION #300 WELL OPERATOR: ARSENAL RESOURCES DESIGNATED AGENT: WILLIAM VEIGEL			
REVISIONS: DATE: 08-21-2017 DRAWN BY: R. DOERR SCALE: 1" = 2000' DRAWING NO: 030-3241 WELL LOCATION PLAN			
LEGEND: ○ PROPOSED SURFACE HOLE \ BOTTOM HOLE * EXISTING \ PRODUCING WELLHEAD ◊ ABANDONED WELL ⌘ PLUGGED & ABANDONED WELL △ CUT CONDUCTOR --- LEASE BOUNDARY --- 500' DHP BUFFER --- PROPOSED PATH --- AS-DRILLED PATH --- DHP BUFFER			

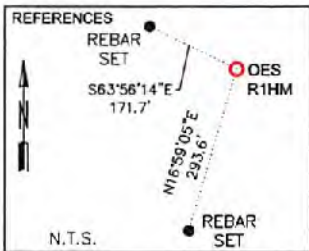
09/15/2017

# THRASHER

THE THRASHER GROUP, INC.  
600 WHITE OAKS BLVD.  
BRIDGEPORT, WV 26330  
PHONE 304-624-4108

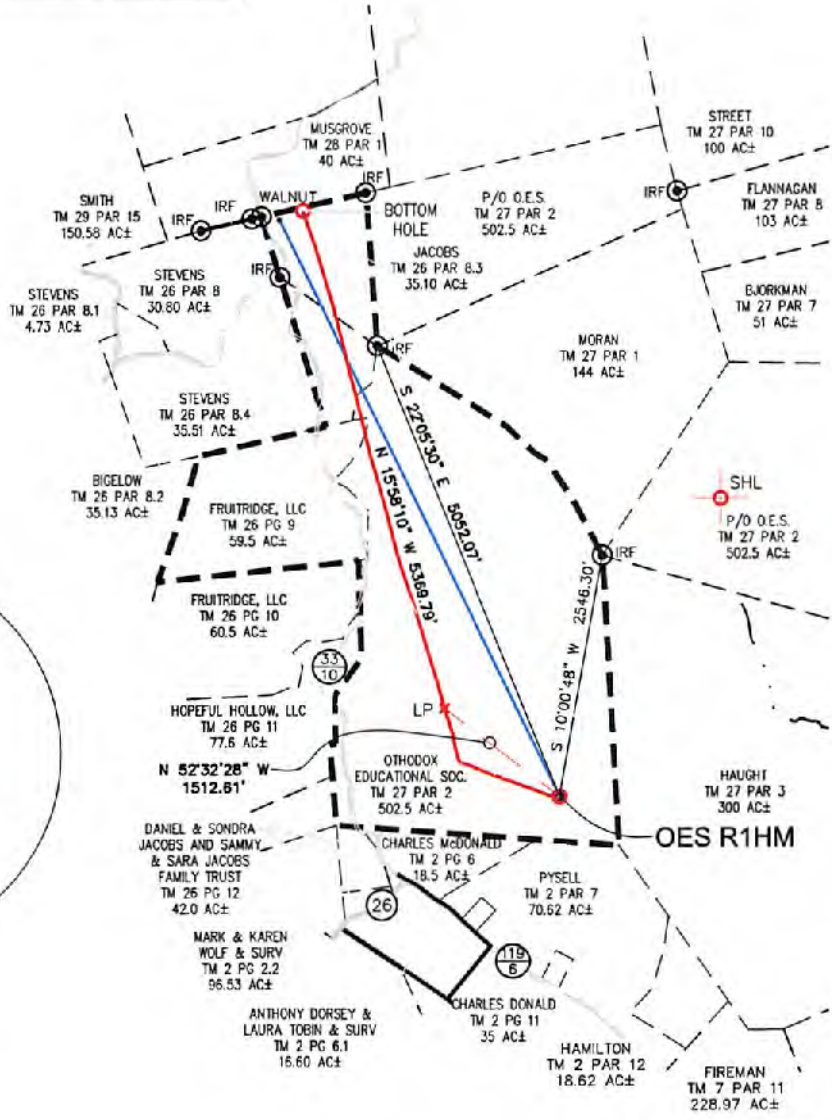
## NOTES ON SURVEY

- COORDINATES SYSTEM IS WV STATE PLANE NORTH, NAD 83 DATUM, U.S. FOOT AND WELL COORDINATES ESTABLISHED USING SURVEY GRADE GPS.
- SURFACE AND ROYALTY OWNER INFORMATION AND THEIR BOUNDARIES SHOWN HEREON WERE PLOTTED FROM DEEDS AND/OR TAX PARCEL MAPS PROVIDED BY CLIENT AND FIELD LOCATIONS.
- THIS PLAT DOES NOT REPRESENT A BOUNDARY SURVEY OF THE PARCELS SHOWN HEREON.
- NO DWELLINGS AND BUILDINGS WITHIN 625 FEET OF PROPOSED OF CENTER OF PAD.
- NO WATER WELLS OR DEVELOPED SPRINGS WITHIN 250 FEET OF PROPOSED WELL.
- NO PERENNIAL STREAMS, LAKES, PONDS, RESERVOIRS OR WETLANDS WITHIN 100 FEET OF THE LIMITS OF DISTURBANCE.
- NO NATURALLY PRODUCING TROUT STREAM WITHIN 300 FEET OF LIMITS OF DISTURBANCE.

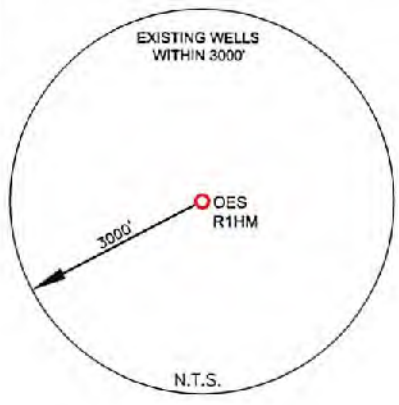


2,860' TOP HOLE  
5,566' BOTTOM HOLE  
LATITUDE 39°27'30"

LONGITUDE 79° 57' 30"  
2,073' BOTTOM HOLE  
8,143' TOP HOLE

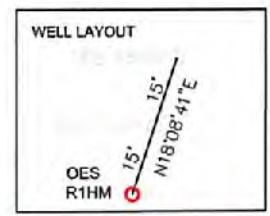


GRID NORTH  
UTM, NAD83 DATUM, ZONE 17, US FT

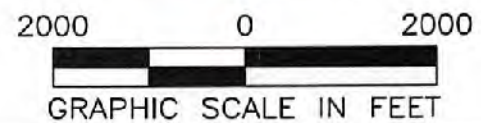


<b>SURFACE HOLE LOCATION (SHL):</b>
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,365,669.041 EASTING: 588,787.262
<b>LANDING POINT LOCATION (LPL):</b>
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,365,942.529 EASTING: 588,417.086
<b>BOTTOM HOLE LOCATION (BHL):</b>
UTM (NAD83, ZONE 17, METERS): NORTHING: 4,367,508.686 EASTING: 587,940.441

RECEIVED  
Office of Oil and Gas  
JUN 30 2017  
WV Department of Environmental Protection



I, THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAT IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY LAW AND REGULATIONS ISSUED AND PRESCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.



P.S. 2270

<p>(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS WVDEP OFFICE OF OIL &amp; GAS 601 57TH STREET CHARLESTON, WV 25034</p>	<p>MINIMUM DEGREE OF ACCURACY: 1/200</p> <p>PROVEN SURVEY SOURCE OF ELEVATION: GRADE GPS (NAVD 88, US FT)</p>	<p>OPERATOR'S WELL #: OES NO. R1HM</p> <p>API WELL #: 47 97 01297</p> <p>STATE COUNTY PERMIT</p>
	<p>WELL TYPE: OIL <input type="checkbox"/> WASTE DISPOSAL <input type="checkbox"/> PRODUCTION <input type="checkbox"/> DEEP <input type="checkbox"/> GAS <input type="checkbox"/> LIQUID INJECTION <input type="checkbox"/> STORAGE <input type="checkbox"/> SHALLOW <input type="checkbox"/></p> <p>WATERSHED: WHITE DAY CREEK ELEVATION: 1951.00'</p> <p>DISTRICT: FETTERMAN COUNTY: TAYLOR QUADRANGLE: GLADESVILLE 7.5'</p> <p>SURFACE OWNER: ORTHODOX EDUCATIONAL SOCIETY ACREAGE: 502.5</p> <p>OIL &amp; GAS ROYALTY OWNER: ORTHODOX EDUCATIONAL SOCIETY/CHARLES &amp; LAVERNE MacDONALD ACREAGE: 537.60</p> <p>DRILL <input type="checkbox"/> DRILL DEEPER <input type="checkbox"/> REDRILL <input type="checkbox"/> FRACTURE OR STIMULATE <input type="checkbox"/> PLUG OFF OLD FORMATION <input type="checkbox"/> PERFORATE NEW FORMATION <input type="checkbox"/></p> <p>CONVERT <input type="checkbox"/> PLUG &amp; ABANDON <input type="checkbox"/> CLEAN OUT &amp; REPLUG <input type="checkbox"/> OTHER CHANGE <input checked="" type="checkbox"/> (SPECIFY) AS-DRILLED</p> <p>TARGET FORMATION: MARCELLUS SHALE ESTIMATED DEPTH: LATERAL: 7,803 TVD 13,620 TVD</p>	<p>WELL OPERATOR: ARSENAL RESOURCES DESIGNATED AGENT: WILLIAM VEIGEL</p> <p>ADDRESS: 6031 WALLACE ROAD EXTENSION #300 ADDRESS: 65 PROFESSIONAL PLACE, SUITE 200</p> <p>CITY: WEXFORD STATE: PA ZIP CODE: 15090 CITY: BRIDGEPORT STATE: WV ZIP CODE: 26330</p>
<p>LEGEND:</p> <ul style="list-style-type: none"> <li>○ PROPOSED SURFACE HOLE / BOTTOM HOLE</li> <li>⊙ EXISTING / PRODUCING WELLHEAD</li> <li>⊘ ABANDONED WELL</li> <li>⊙ PLUGGED &amp; ABANDONED WELL</li> <li>△ CUT CONDUCTOR</li> <li>--- LEASE BOUNDARY</li> <li>- - - 500' DHP BUFFER</li> <li>--- PROPOSED PATH</li> <li>--- AS-DRILLED PATH</li> <li>--- DHP BUFFER</li> </ul>	<p>REVISIONS:</p>	<p>DATE: 05-12-2017</p> <p>DRAWN BY: K POTH</p> <p>SCALE: 1" = 2000'</p> <p>DRAWING NO: 030-2000</p> <p>WELL LOCATION PLAT</p>