

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

API 47-033-05742 County Harrison District Union
Quad Mount Clare 7.5 Pad Name Maxwell Field/Pool Name _____
Farm name Lynch Farm, LLC Well Number 4HM
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 4,341,883 Easting 554,658
Landing Point of Curve Northing 4,342,046 Easting 554,583
Bottom Hole Northing 4,344,195 Easting 553,760

Elevation (ft) 1462' 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 7/9/2013 Date drilling commenced 11/2/2014 Date drilling ceased 12/2/2014
Date completion activities began 1/16/2015 Date completion activities ceased 2/6/2015
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 302', 369', 396', 429' Open mine(s) (Y/N) depths _____
Salt water depth(s) ft 628', 1261' Void(s) encountered (Y/N) depths _____
Coal depth(s) ft 361', 540' Cavern(s) encountered (Y/N) depths _____
Is coal being mined in area (Y/N) Y

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Reviewed by:
[Signature]
10/30/2015

API 47-033 - 05742

Farm name Lynch Farm, LLC

Well number 4HM

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	36"	20"	65'	New	94.00	N/A	Y
Surface	17.5"	13 3/8"	645	New	54.5	N/A	Y
Coal							
Intermediate 1	12.25"	9 5/8"	2929'	New	40.00	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8 3/4" & 8 1/2"	5 1/2"	15435	New	20.00	N/A	Y
Tubing							
Packer type and depth set							

Comment Details _____

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft ³ /sks)	Volume (ft ³)	Cement Top (MD)	WOC (hrs)
Conductor	Grout						
Surface	Class A 2% CaCl ₂	545	15.6	1.18	643	Surface	8
Coal							
Intermediate 1	Class A	1050	15.6	1.18	1239	Surface	8
Intermediate 2							
Intermediate 3							
Production	Type 1 4% Gel/Type 1 2% Gel	718/1659	13.8/15.00	1.64/1.32	1177/2190	2700	8
Tubing							

Drillers TD (ft) 15462'

Loggers TD (ft) 15462'

Deepest formation penetrated Marcellus

Plug back to (ft) N/A

Plug back procedure N/A

Kick off depth (ft) 6831' MD

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 1,440 shots of 22.7gr 0.55" Shot Charges

WAS WELL COMPLETED OPEN HOLE? Yes No

DETAILS _____

WERE TRACERS USED Yes No

TYPE OF TRACER(S) USED _____

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PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
1	1/17/15	15135	15301	40	Marcellus
2	1/18/15	14928	15102	40	Marcellus
3	1/19/15	14716	14890	40	Marcellus
4	1/19/15	14504	14678	40	Marcellus
5	1/20/15	14292	14466	40	Marcellus
6	1/20/15	14080	14254	40	Marcellus
7	1/21/15	13868	14042	40	Marcellus
8	1/21/15	13656	13830	40	Marcellus
9	1/22/15	13444	13618	40	Marcellus
10	1/22/15	13018	13180	40	Marcellus
11	1/23/15	12818	12980	40	Marcellus
12	1/23/15	12618	12780	40	Marcellus
13	1/24/15	11418	11580	40	Marcellus
14	1/24/15	12218	12380	40	Marcellus
15	1/24/15	12018	12180	40	Marcellus
16	1/25/15	11818	11980	40	Marcellus

Please insert additional pages as applicable.

STIMULATION INFORMATION PER STAGE

Complete a separate record for each stimulation stage.

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	1/17/15	68	7756	9500	4654	142440	7823	0
2	1/18/15	78	8489	8150	4953	214880	5470	0
3	1/19/15	57	8290	5851	4928	133520	5692	0
4	1/19/15	53	8296	6487	4299	298840	10846	0
5	1/20/15	73	7502	6616	5604	400480	9037	0
6	1/20/15	53	8131	6223	4588	409450	9231	0
7	1/21/15	53	8188	6276	4767	402040	8387	0
8	1/21/15	70	8177	6412	5121	334460	7892	0
9	1/22/15	51	8302	5450	5050	309251	7002	0
10	1/22/15	61	7988	5550	3941	385520	8805	0
11	1/23/15	60	7441	4922	4985	405600	7402	0
12	1/23/15	69	8068	5955	5257	378280	7188	0
13	1/24/15	67	7817	5769	5987	383140	6785	0
14	1/24/15	78	7685	5697	6412	406920	7320	0
15	1/25/15	78	7422	5687	4592	394800	6825	0
16	1/25/15	80	7587	6051	5887	399160	6825	0

Please insert additional pages as applicable.

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PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
17	1/25/15	11618	11780	40	Marcellus
18	1/25/15	11418	11580	40	Marcellus
19	1/30/15	11218	11380	40	Marcellus
20	1/30/15	11018	11180	40	Marcellus
21	1/31/15	10818	10980	40	Marcellus
22	1/31/15	10618	10780	40	Marcellus
23	1/31/15	10418	10580	40	Marcellus
24	2/1/15	10218	10380	40	Marcellus
25	2/1/15	10018	10180	40	Marcellus
26	2/2/15	9818	9980	40	Marcellus
27	2/2/15	9618	9780	40	Marcellus
28	2/2/15	9418	9580	40	Marcellus
29	2/2/15	9218	9380	40	Marcellus
30	2/3/15	9018	9180	40	Marcellus
31	2/3/15	8818	8980	40	Marcellus
32	2/4/15	8618	8780	40	Marcellus

Please insert additional pages as applicable.

STIMULATION INFORMATION PER STAGE

Complete a separate record for each stimulation stage.

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)
17	1/25/15	80	7487	5676	5658	396440	6572	0
18	1/26/15	79	7221	5661	7517	398340	7029	0
19	1/30/15	78	7258	6387	4689	342460	6778	0
20	1/30/15	79	7328	5990	4774	401220	7402	0
21	1/31/15	78	7360	6108	5103	389740	8625	0
22	1/31/15	79	7400	5608	5969	397220	7125	0
23	2/1/15	73	7629	6366	5779	347330	7906	0
24	2/1/15	71	7574	5904	5082	271620	6276	0
25	2/1/15	71	7592	5815	6005	364560	6691	0
26	2/2/15	79	7234	6380	5046	325380	6653	0
27	2/2/15	76	7096	5826	5854	398990	7057	0
28	2/2/15	73	7113	6008	5482	404140	8642	0
29	2/2/15	70	7178	7292	6101	396720	7332	0
30	2/3/15	69	6931	6409	5586	222250	5470	0
31	2/4/15	78	7216	5722	5450	403740	7381	0
32	2/4/15	78	7102	5844	4520	409564	7037	0

Please insert additional pages as applicable.

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PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
33	2/4/15	8418	8580	40	Marcellus
34	2/5/15	8218	8380	40	Marcellus
35	2/6/15	8018	8180	40	Marcellus
36	2/6/15	7818	7980	40	Marcellus

Please insert additional pages as applicable.

STIMULATION INFORMATION PER STAGE

Complete a separate record for each stimulation stage.

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)
33	2/4/15	74	7103	6176	5693	400840	6756	0
34	2/5/15	80	7028	6284	4656	399530	6990	0
35	2/6/15	79	7154	6645	5357	398920	7855	0
36	2/6/15	80	6961	6509	5497	398760	6692	0

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

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 ₂ S, ETC)
	0		0		**Top based off Maxwell 3HM Pilot Hole Tops
Big Lime	1817	1876	1820	1879	Sandstone
Balltown	3599	3641	3608	3650	Sandstone
Bradford	4332	4361	4341	4371	Sandstone
Benson	4906	4973	4915	4982	Sandstone
Elk	5190	5248	5199	5257	Siltstone
Burkett	7237	7260	7247	7270	Shale- Gas show at 7255
Tully	7260	7314	7270	7324	Limestone
Mahantango	7314	7449	7324	7458	Shale- Gas show at 7410
Marcellus	7449	7548	7458	15462	Shale- Gas show through lateral
Purcell	7511	7514	7521	7524	Limestone
Onondaga	7548	7563	7558	7573	Limestone
Huntersville Chert	7563		7573		Chert

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 _____
Address _____ City _____ State _____

Please insert additional pages as applicable.

Completed by Amy Miller Telephone 724-940-1302
Signature Amy Miller Title Regulatory Compliance Specialist Date 6-28-15

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

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Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	1/16/2015
Job End Date:	2/6/2015
State:	West Virginia
County:	Harrison
API Number:	47-033-05742-00-00
Operator Name:	Mountaineer Keystone, LLC
Well Name and Number:	Maxwell 4H
Longitude:	-80.36697200
Latitude:	39.22442600
Datum:	NAD27
Federal/Tribal Well:	NO
True Vertical Depth:	7,440
Total Base Water Volume (gal):	11,354,014
Total Base Non Water Volume:	698,795



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	87.26392	
Sand	J.S. Well Services, LLC	Proppant					
			Crystalline Silica, quartz	14808-60-7	100.00000	11.95163	
HCL Acid (3% to 7.5%)	J.S. Well Services, LLC	Bulk Acid					
			Water	7732-18-5	97.00000	0.53623	
			Hydrogen Chloride	7647-01-0	7.50000	0.04814	
WFRA-405	J.S. Well Services, LLC	Friction Reducer					
			Anionic Polyacrylamide	Proprietary	40.00000	0.03967	
			Water	7732-18-5	40.00000	0.03967	
			Sodium Chloride	7647-14-5	20.00000	0.01984	
			Petroleum Distillates	64742-47-8	20.00000	0.01597	
			Ethoxylated alcohol blend	Proprietary	5.00000	0.00496	
HCL Acid (12.6%-18.0%)	J.S. Well Services, LLC	Bulk Acid					
			Water	7732-18-5	87.50000	0.03359	
			Hydrogen Chloride	7647-01-0	18.00000	0.00802	
SI-1100	J.S. Well Services, LLC	Scale Inhibitor					

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			Di Water	7732-18-5	80.00000	0.01039
			Ethylene Glycol	107-21-1	40.00000	0.00587
			Potassium salt of diethylene triamine penta (methylene phosphonic acid)	15827-60-8	10.00000	0.00175
			2-Phosphonobutane 1,2,4 tricarboxylic salt	37971-36-1	10.00000	0.00168
			hexamethylenediamine tetra (methylene phosphonic acid)	38820-59-6	10.00000	0.00162
			Copolymer of Maleic and Acrylic acid	26677-99-6	10.00000	0.00153
			bis (hexamethylene) tramine penta (methylene phosphonic acid) - phosphate acid	40623-75-4	10.00000	0.00149
			Acrylic polymer	52255-49-9	5.00000	0.00065
K-BAC 1020	J.S. Well Services, LLC	Anti-Bacterial Agent				
			2,2-dibromo-3- nitrilopropionamide	10222-01-2	20.00000	0.00816
			Deionized Water	7732-18-5	28.00000	0.00466
AI-301	J.S. Well Services, LLC	Acid Corrosion inhibitors				
			Diethylene Glycol	111-46-6	30.00000	0.00021
			Methenamine	100-97-0	20.00000	0.00016
			Hydrogen Chloride	7647-01-0	10.00000	0.00007
			Polyethylene polyamine	58603-67-8	10.00000	0.00006
			Coco amine	51791-14-8	5.00000	0.00003

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)

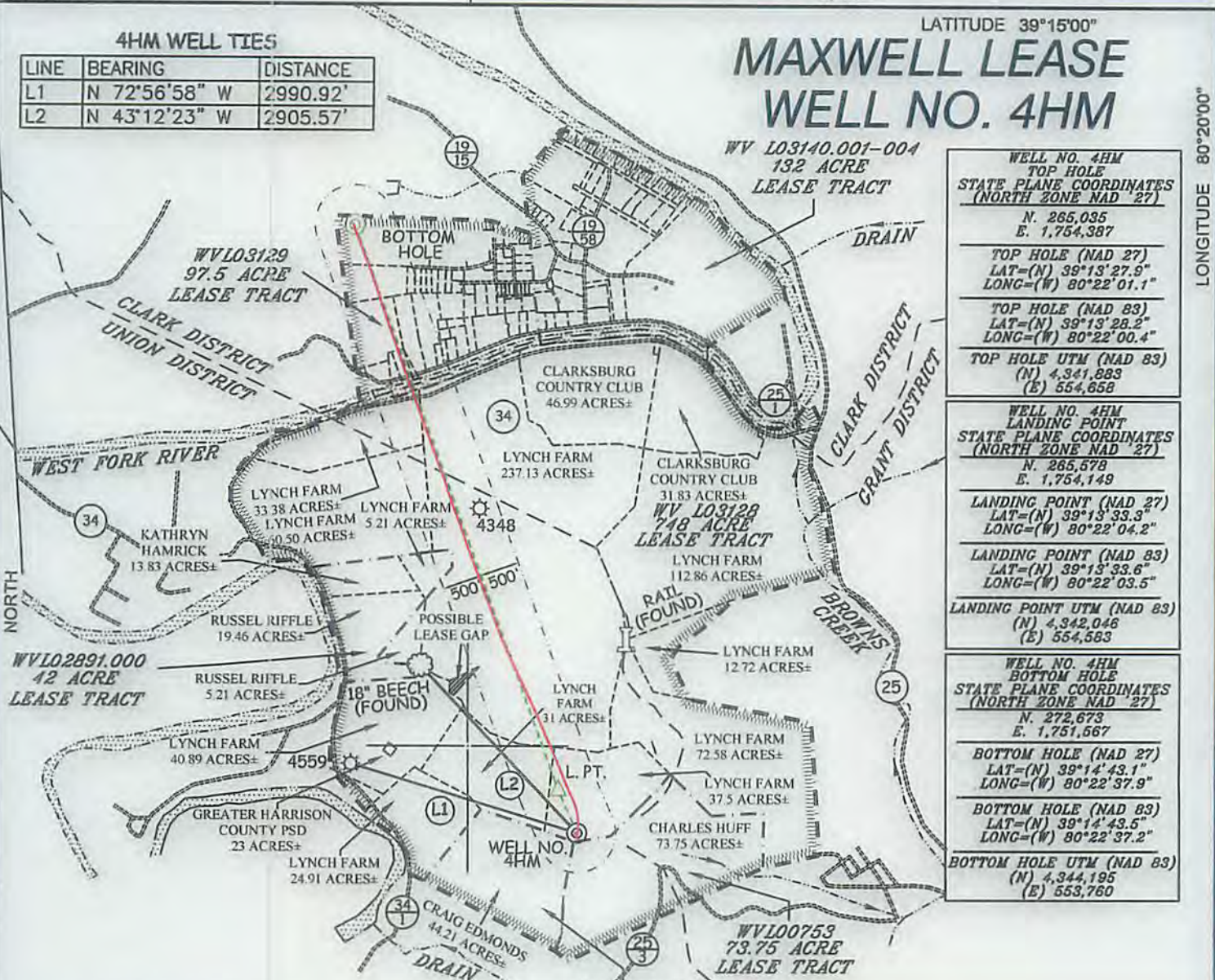
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4HM WELL TIES

LINE	BEARING	DISTANCE
L1	N 72°56'58" W	2990.92'
L2	N 43°12'23" W	2905.57'

MAXWELL LEASE WELL NO. 4HM



WELL NO. 4HM TOP HOLE	
STATE PLANE COORDINATES (NORTH ZONE NAD '27)	
N. 265,035	E. 1,754,387
TOP HOLE (NAD 27)	
LAT=(N) 39°13'27.9"	LONG=(W) 80°22'01.1"
TOP HOLE (NAD 83)	
LAT=(N) 39°13'28.2"	LONG=(W) 80°22'00.4"
TOP HOLE UTM (NAD 83)	
(N) 4,341,883	(E) 554,658
WELL NO. 4HM LANDING POINT	
STATE PLANE COORDINATES (NORTH ZONE NAD '27)	
N. 265,578	E. 1,754,149
LANDING POINT (NAD 27)	
LAT=(N) 39°13'33.3"	LONG=(W) 80°22'04.2"
LANDING POINT (NAD 83)	
LAT=(N) 39°13'33.6"	LONG=(W) 80°22'03.5"
LANDING POINT UTM (NAD 83)	
(N) 4,342,046	(E) 554,583
WELL NO. 4HM BOTTOM HOLE	
STATE PLANE COORDINATES (NORTH ZONE NAD '27)	
N. 272,673	E. 1,751,567
BOTTOM HOLE (NAD 27)	
LAT=(N) 39°14'43.1"	LONG=(W) 80°22'37.9"
BOTTOM HOLE (NAD 83)	
LAT=(N) 39°14'43.5"	LONG=(W) 80°22'37.2"
BOTTOM HOLE UTM (NAD 83)	
(N) 4,344,195	(E) 553,760

NOTES ON SURVEY

1. TIES TO WELLS, REFERENCES, AND CORNERS ARE BASED ON GRID NORTH FOR THE WV STATE PLANE COORDINATE SYSTEM NORTH ZONE NAD '27.
2. LEASE BOUNDARY SHOWN HEREON TAKEN FROM DEED BOOK 142 PAGE 484 AND ADJOINING DEEDS.
3. SURFACE OWNER AND ADJOINER INFORMATION TAKEN FROM THE ASSESSOR AND COUNTY CLERK RECORDS OF HARRISON COUNTY IN JULY, 2012.
4. WELL LAT./LONG. (NAD'27) ESTABLISHED BY DGPS(SURVEY GRADE).
5. AS DRILLED INFORMATION PROVIDED BY PDC MOUNTAINEER, LLC.



Office of Oil & Gas
SEP 26 2015

LEGEND

AS DRILLED	
PROPOSED	

AS DRILLED COORDINATES
FOR WELL NO. 4HM

(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)

NAD'27 S.P.C.(FT)	N. 265,035	E. 1,754,387
NAD'27 GEO.	LAT-(N) 39°13'27.9"	LONG-(W) 80°22'01.1"
NAD'83 GEO.	LAT-(N) 39°13'28.2"	LONG-(W) 80°22'00.4"
NAD'83 UTM (M)	N. 4,341,883	E. 554,658
BOTTOM HOLE		
NAD'27 S.P.C.(FT)	N. 272,673	E. 1,751,538
NAD'27 GEO.	LAT-(N) 39°14'43.3"	LONG-(W) 80°22'38.3"
NAD'83 GEO.	LAT-(N) 39°14'43.6"	LONG-(W) 80°22'37.6"
NAD'83 UTM (M)	N. 4,344,200	E. 553,751

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 THE REGULATIONS ISSUED AND PRESCRIBED BY THE DIVISION OF ENVIRONMENTAL PROTECTION.

P.S.
677

Gregory A. Smith



(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS.

DATE APRIL 3, 20 13

REVISED DATE 09/03/13 & 06/10/15

OPERATORS WELL NO. MAXWELL 4HM

API WELL NO. 47 - 033 - 05742H
STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1 / 200
PROVEN SOURCE OF ELEVATION DGPS (SUBMETER MAPPING GRADE)
FILE NO. 8450P4HMASDRILLED
SCALE 1" = 2,000'

STATE OF WEST VIRGINIA
DIVISION OF ENVIRONMENTAL PROTECTION
OFFICE OF OIL AND GAS



WELL TYPE: OIL ___ GAS X LIQUID INJECTION ___ WASTE DISPOSAL ___ IF "GAS" PRODUCTION X STORAGE ___ DEEP ___ SHALLOW X

LOCATION: ELEVATION 1,457' WATERSHED WEST FORK RIVER DISTRICT UNION COUNTY HARRISON QUADRANGLE MOUNT CLARE 7.5'

SURFACE OWNER LYNCH FARM, LLC ACREAGE 37.5±

ROYALTY OWNER WBM HEIRS PROPERTIES LLC, ETAL ACREAGE 748, 42, 44.21, 73.75, 97.5, 109.5

PROPOSED WORK: DRILL X CONVERT ___ DRILL DEEPER ___ REDRILL ___ FRACTURE OR STIMULATE X PLUG OFF OLD FORMATION ___ PERFORATE NEW FORMATION ___ PLUG AND ABANDON ___ CLEAN OUT AND REPLUG ___ OTHER ___ PHYSICAL CHANGE IN WELL (SPECIFY) TARGET FORMATION MARCELLUS ESTIMATED DEPTH 7,590' TVD / TMD 15,538'

WELL OPERATOR PDC MOUNTAINEER, LLC DESIGNATED AGENT NATHAN SKEEN
ADDRESS 6031 WALLACE ROAD EXTENSION, SUITE 300 WEXFORD, PA 15090 ADDRESS 65 PROFESSIONAL PLACE, SUITE 200 BRIDGEPORT, WV 26330