

APPENDIX A

PROPOSED PLUGGING PROCEDURES

Esther Clark 1H API# 47-061-01616

Esther Clark 3H API# 47-061-01623

The following detailed cleaning and plugging procedures are to comply with the additional specifics and guidelines found within the main body of the Petition for Modification part 2(a) "Mandatory Procedures for Cleaning Out and Preparing the Esther Clark Gas Wells" and part 2(b) "Mandatory Procedures for Plugging the Esther Clark Gas Wells to the Surface".

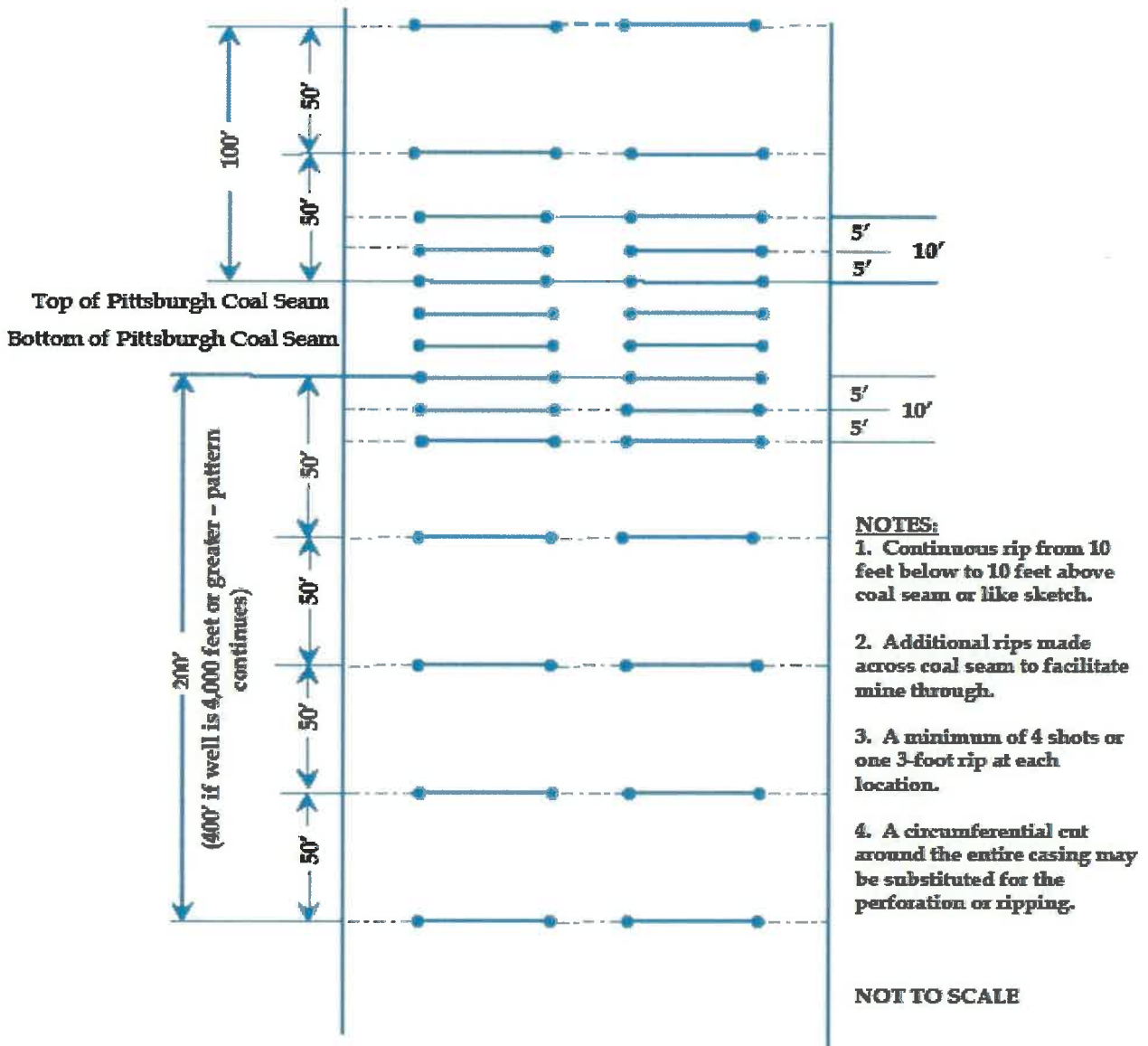
1. Record the shut-in pressure and monitor the casing pressure.
2. Move in equipment. Rig up the wireline rig and the pumping unit to the well head. Load fresh water (8.3 lbs./gallon) and weighted brine water (10.0 lbs./gallon) into their respective tanks.
3. Pump sufficient amount of weighted brine water into the wellbore first. Switch to fresh water and finish loading the wellbore. Fresh and brine water will be pumped until the well is officially "killed".
4. Rig up the wireline well head control. Run into the hole with a 2" – 10,000 psi rated Cast Iron Bridge Plug (CIBP) and set the CIBP within the 2-3/8" production tubing at the location where the existing arrowset packer is installed (located just above the "kick off point" in the well). Pull out of the hole and rig down the wireline rig.
5. Pressure test the installed 2" – 10,000 psi CIBP up to 80% of its working pressure for a minimum of one hour (surface + hydrostatic). Record pressure test results.
6. Rig up the drill rig and install a 10,000 psi Wellhead Blowout Preventer.
7. Pressure test the Wellhead Blowout Preventer up to 90% of its working pressure for one hour. Record pressure test results.
8. Rig up the wireline rig, run into the hole and cut the 2-3/8" production tubing just above the installed 2" – 10,000 psi CIBP. Run out of the hole and rig down the wireline rig.

9. Using the drill rig, pull all of the free 2-3/8" production tubing out of the hole. Load the hole with fresh water as required.
10. Rig up the wireline rig and perform a test run with a 5" Gauge Ring down to the installed 2" – 10,000 psi CIBP.
11. Run into the hole with a 5-1/2" – 10,000 psi rated Cast Iron Bridge Plug (CIBP) and set the CIBP against the previously cut 2-3/8" production tubing (located just above the existing arrowset packer and 2" CIBP). Pull out of the hole and rig down the wireline rig.
12. Pressure test the installed 5-1/2" – 10,000 psi CIBP up to 80% of its working pressure for a minimum of one hour (surface + hydrostatic). Record the pressure test results. If it is unable to hold 80% of its working pressure, an additional CIBP will be set in the wellbore directly above it.
13. Rig up the wireline rig and perform a cement bond log to determine the "top of cement" within the annulus of the 5-1/2" casing. Pull out of the hole and rig down the wireline rig. Preliminarily, based on the existing bond logs, the "top of cement" is expected to be located below the 9-5/8" casing seat (see existing bond logs in Appendix F and G).
14. Pick up the drill pipe and trip in the hole down to the installed 5-1/2" CIBP. Set a cement plug with a gas blocker additive from the existing 5-1/2" CIBP up to the "top of cement" of the 5-1/2" casing (determined by the new bond log results). Wait on cement to cure for a minimum of eight hours.
15. Rig up the wireline rig, run into the hole to the top of the existing cement plug and cut the 5-1/2" casing. Run out of the hole and rig down the wireline rig.
16. Using the drill rig, pull all of the free 5-1/2" casing out of the hole. Load the hole with fresh water as required.
17. After removing the 5-1/2" casing, shut-in the well and monitor the gas pressure for a minimum of one hour. Record shut-in test results. If additional gas pressure is encountered during the shut-in test, an additional CIBP or packers may be used to mitigate gas migration.

18. Rig up the wireline rig and perform a cement bond log on the 9-5/8" casing. Pull out of the hole and rig down the wireline rig. Preliminarily, the 9-5/8" casing is expected to be fully cemented within the annulus. It was reported that cement was circulated to the surface upon install for the 9-5/8" casing, the 13-3/8" casing, and the 20" casing (see the details in the existing "Well Operator's Report of Well Work" in Appendix D and E). Any voids encountered within the 9-5/8" annulus will be addressed appropriately.
19. Pick up the drill pipe and trip in the hole down to the previous cement plug. Set an additional cement plug with a gas blocker additive from the existing cement plug up to 100' above the 9-5/8" casing seat. Wait on cement to cure for a minimum of eight hours.
20. Shut-in the well and monitor the gas pressure while the cement is curing. Record shut-in test results. If additional gas pressure is encountered during the shut-in test, an additional CIBP or packers may be used to mitigate gas migration.
21. Pick up the drill pipe and trip in the hole down to the previous cement plug. Set an additional cement plug with a gas blocker additive from the existing cement plug up to 400' below the bottom of the Pittsburgh #8 coal seam. Wait on cement to cure for a minimum of eight hours.
22. Shut-in the well and monitor the gas pressure while the cement is curing. Record shut-in test results. If additional gas pressure is encountered during the shut-in test, an additional CIBP or packers may be used to mitigate gas migration.
23. At this point, the well has been effectively plugged from the original arrowset packer which was installed just above the "kick off point" (vertical to horizontal) up to 400' below the Pittsburgh #8 coal seam. The remaining procedures to complete the plugging process from 400' below the Pittsburgh #8 coal seam to the surface can be found in the main body of the Petition for Modification part 2(a) "Mandatory Procedures for Cleaning Out and Preparing the Esther Clark Gas Wells", part 2(b) "Mandatory Procedures for Plugging the Esther Clark Gas Wells to the Surface", and Appendix B.

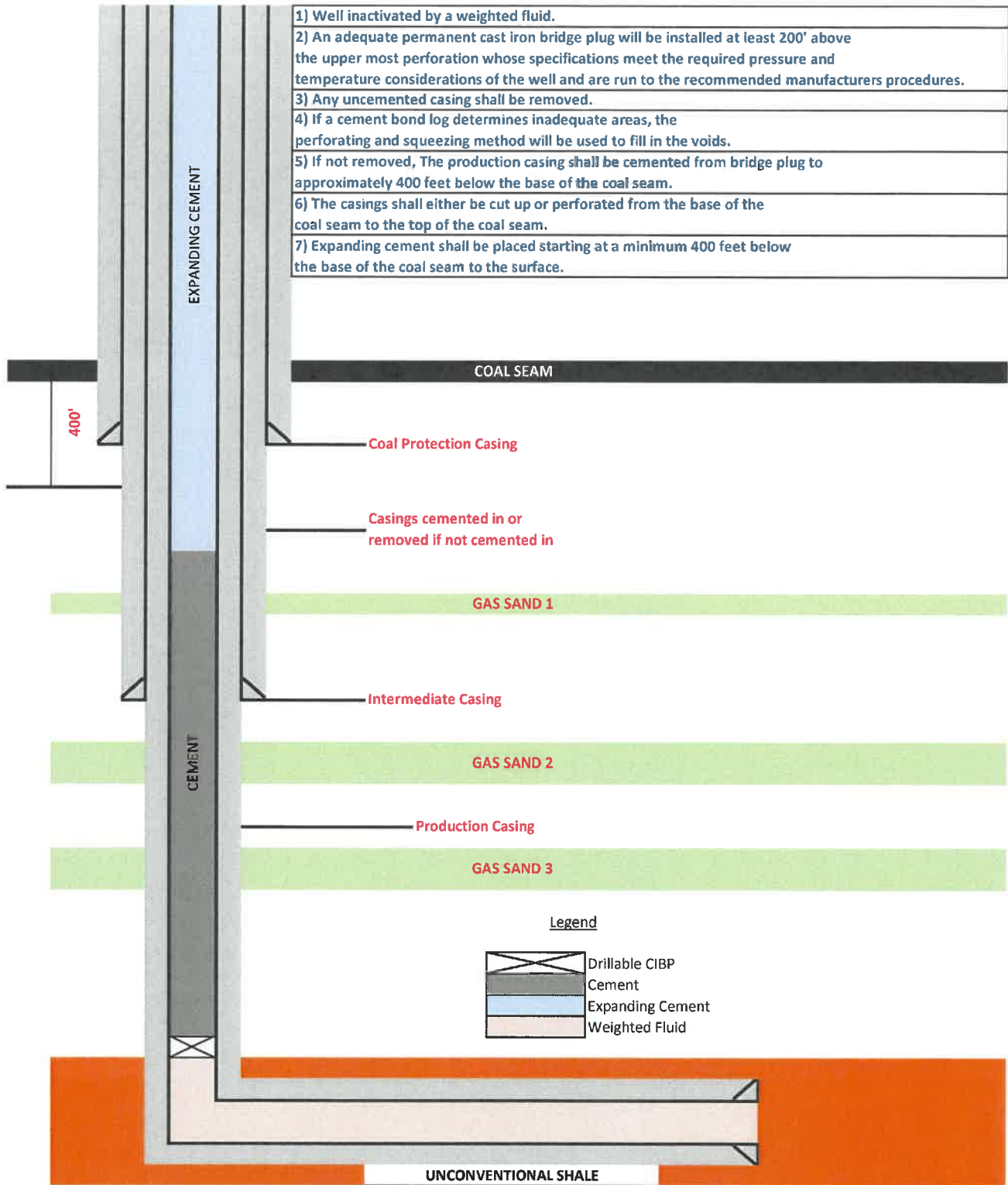
APPENDIX B

Requirements for cutting, milling, perforating, or ripping well casing above and below the Pittsburgh #8 coal seam



APPENDIX C

GENERAL PROPOSED PERMANENT PLUGGING SCHEMATIC FOR AN UNCONVENTIONAL GAS WELL



APPENDIX D

Esther Clark 1H Marcellus Gaswell Details

API #: 47-061-01616

County: Monongalia

Permit: 1616

Tax District: Battelle

7.5-minute quadrangle: Hundred

15-minute quadrangle: Mannington

Surface Hole Location:

Latitude (decimal degrees): 39.650387

Longitude (decimal degrees): -80.394303

UTM E: 551965

UTM N: 4389130

Bottom Hole Location:

Latitude (decimal degrees): 39.656863

Longitude (decimal degrees): -80.420323

UTM E: 549728

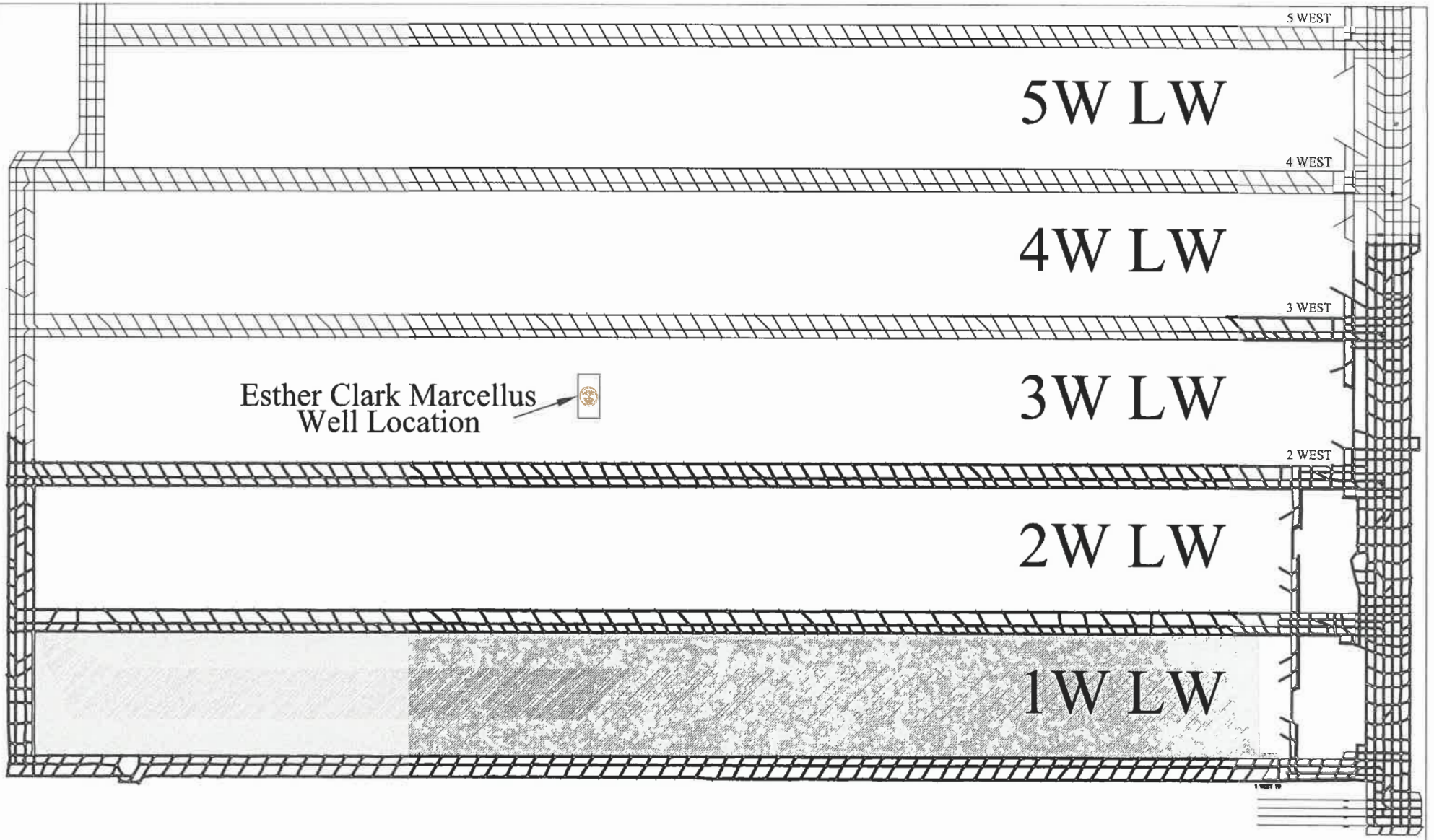
UTM N: 4389834

Spud date: December 2011

Initial static rock pressure: 5,130 psi

Last reported production: September 2020

Current shut in pressure: 1,550 psi



Esther Clark Marcellus
Well Location

5W LW

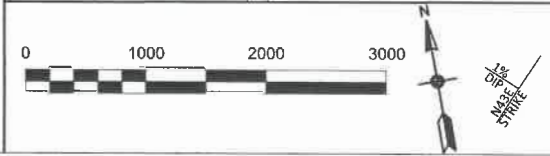
4W LW

3W LW

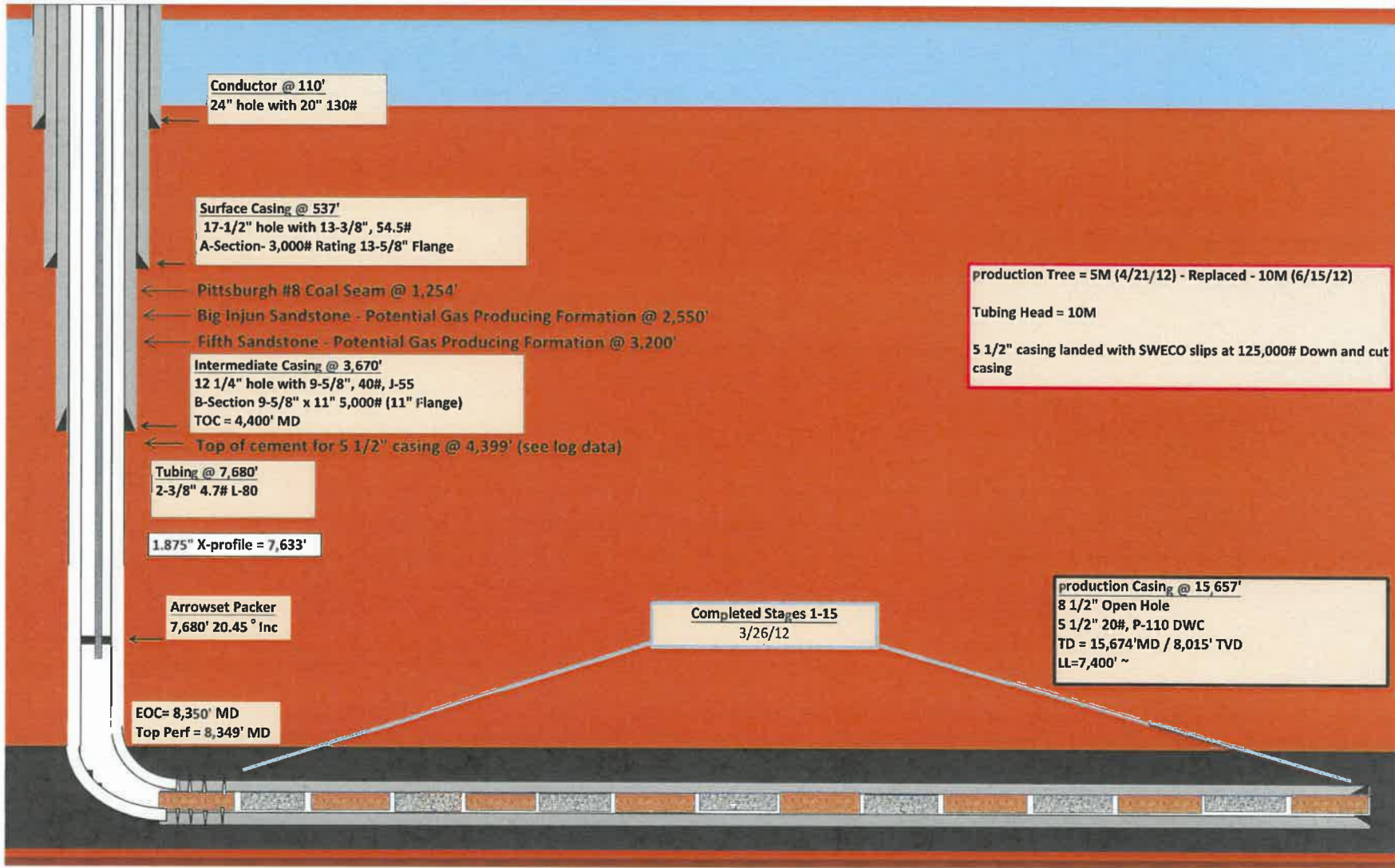
2W LW

1W LW

ESTHER CLARK GAS WELL LOCATIONS
MARION COUNTY MINE
151 Johnny Cake Rd. Metz WV 26585
State ID # D-403B-----MSHA ID # 46-01433
Pittsburgh #8 Coalbed
Mannington Quadrangle
6/10/2021



Esther Clark 1H - Esther Clark Pad Nomac Rig #20 Spud Date: 12/10/2011



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

DATE: 9-7-2012
API #: 47-061-01616

Farm name: Esther Clark 1H Operator Well No.: 832638

LOCATION: Elevation: 1424' Quadrangle: Hundred

District: Battelle County: Monongalia
Latitude: 5480' Feet South of 39 Deg. 40 Min. 00 Sec.
Longitude 5960' Feet West of 80 Deg. 22 Min. 30 Sec.

Company: Chesapeake Appalachia, L.L.C.

Address:	Casing & Tubing	Used in drilling	Left in well	Cement fill up Cu. Ft.
P.O. Box 18496 Oklahoma City, OK 73154-0496	20"	110'	110'	106 Cu. Ft.
Agent: Eric Gillespie	13 3/8"	525'	525'	623 Cu. Ft.
Inspector: Sam Ward	9 5/8"	3660'	3660'	1852 Cu. Ft.
Date Permit Issued: 1-25-2011	5 1/2"	15657'	15657'	3357 Cu. Ft.
Date Well Work Commenced: 12-10-2011				
Date Well Work Completed: 3-26-2012				
Verbal Plugging:				
Date Permission granted on:				
Rotary <input checked="" type="checkbox"/> Cable <input type="checkbox"/> Rig <input type="checkbox"/>				
Total Vertical Depth (ft): 7962'				
Total Measured Depth (ft): 15674'				
Fresh Water Depth (ft.): 400'				
Salt Water Depth (ft.): None				
Is coal being mined in area (N/Y)? Y				
Coal Depths (ft.): 221', 1200'				
Void(s) encountered (N/Y) Depth(s) N				

OPEN FLOW DATA (If more than two producing formations please include additional data on separate sheet)

Producing formation Marcellus Pay zone depth (ft) 8,348'-15,536'
Gas: Initial open flow _____ MCF/d Oil: Initial open flow _____ Bbl/d
Final open flow 4011' MCF/d Final open flow 0 Bbl/d
Time of open flow between initial and final tests 77 Hours *Calculated
Static rock Pressure 5130' psig (surface pressure) after _____ Hours

Second producing formation _____ Pay zone depth (ft) _____
Gas: Initial open flow _____ MCF/d Oil: Initial open flow _____ Bbl/d
Final open flow _____ MCF/d Final open flow _____ Bbl/d
Time of open flow between initial and final tests _____ Hours
Static rock Pressure _____ psig (surface pressure) after _____ Hours

I certify under penalty of law that I have personally examined and am familiar with the information submitted on this document and all the attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information I believe that the information is true, accurate, and complete.

Maddox Williams
Signature

9-11-2012
Date

12/14/2012

Were core samples taken? Yes _____ No X

Were cuttings caught during drilling? Yes X No _____

Were Electrical, Mechanical or Geophysical logs recorded on this well? If yes, please list _____
MWD IN LATERAL _____

NOTE: IN THE AREA BELOW PUT THE FOLLOWING: 1). DETAILS OF PERFORATED INTERVALS, FRACTURING OR STIMULATING, PHYSICAL CHANGE, ETC. 2). THE WELL LOG WHICH IS A SYSTEMATIC DETAILED GEOLOGICAL RECORD OF THE TOPS AND BOTTOMS OF ALL FORMATIONS, INCLUDING COAL ENCOUNTERED BY THE WELLBORE FROM SURFACE TO TOTAL DEPTH.

Perforated Intervals, Fracturing, or Stimulating:

(See Attached)

Plug Back Details Including Plug Type and Depth(s):

Formations Encountered: _____ Top Depth / _____ Bottom Depth
Surface:

(See Attached)

PERFORATION RECORD ATTACHMENT

Well Number and Name: 832638 Esther Clark 1H

PERFORATION RECORD			STIMULATION RECORD							
Date	Interval Perforated		Date	Interval Treated		Fluid		Propping Agent		Average Injection
	From	To		Type	Amount	Type	Amount			
2/15/2012	15,144	15,536	3/12/2012	15,144	15,536	Sik wtr	13,281	Sand	568,080	81
3/13/2012	14,658	15,051	3/14/2012	14,658	15,051	Sik wtr	9,916	Sand	569,480	76
3/14/2012	14,175	14,570	3/14/2012	14,175	14,570	Sik wtr	10,729	Sand	568,500	78
3/15/2012	13,688	14,080	3/16/2012	13,688	14,080	Sik wtr	10,270	Sand	571,840	77
3/16/2012	13,203	13,595	3/17/2012	13,203	13,595	Sik wtr	10,410	Sand	571,980	84
3/17/2012	12,717	13,113	3/18/2012	12,717	13,113	Sik wtr	10,526	Sand	571,880	76
3/18/2012	12,232	12,624	3/18/2012	12,232	12,624	Sik wtr	11,981	Sand	571,880	82
3/18/2012	11,747	12,139	3/19/2012	11,747	12,139	Sik wtr	10,706	Sand	570,900	80
3/19/2012	11,262	11,654	3/21/2012	11,262	11,654	Sik wtr	10,859	Sand	570,980	70
3/21/2012	10,776	11,169	3/21/2012	10,776	11,169	Sik wtr	16,450	Sand	571,720	50
3/22/2012	10,295	10,683	3/22/2012	10,295	10,683	Sik wtr	10,891	Sand	572,280	81
3/22/2012	9,808	10,198	3/23/2012	9,808	10,198	Sik wtr	10,638	Sand	570,180	84
3/23/2012	9,321	9,713	3/23/2012	9,321	9,713	Sik wtr	10,410	Sand	565,980	83
3/24/2012	8,835	9,228	3/25/2012	8,835	9,228	Sik wtr	9,979	Sand	565,250	85.8
3/26/2012	8,349	8,747	3/26/2012	8,349	8,747	Sik wtr	9,866	Sand	568,160	84.6

LATERAL WELLBORE**Maximum TVD of wellbore: 7962 ft TVD @ 8370 ft MD**

Formation/Lithology	Top Depth, MD (ft)	Top Depth, TVD (ft)	Bottom Depth, MD (ft)	Bottom Depth, TVD (ft)
SHALE	0	0	250	250
SANDSTONE/SHALE	250	250	500	500
SHALE	500	500	930	930
SANDSTONE	930	930	990	990
LIMESTONE/SHALE	990	990	1140	1140
COAL	1140	1140	1156	1156
COAL/LIMESTONE/SHALE	1156	1156	1240	1240
COAL	1240	1240	1260	1260
COAL/LIMESTONE/SHALE	1260	1260	1320	1320
SHALE	1320	1320	1600	1600
SANDSTONE/SHALE	1600	1600	2460	2460
BIG LIME	2640	2640	2550	2550
BIG INJUN SANDSTONE	2550	2550	2750	2750
SANDSTONE/SHALE	2750	2750	3210	3210
BEREA SANDSTONE	3210	3210	3550	3550
SHALE	3550	3550	4100	4100
SHALE/SANDSTONE	4100	4100	4580	4580
SHALE	4580	4580	7849	7749
GENESEO	7849	7749	7881	7775
TULLY	7881	7775	7911	7797
HAMILTON	7911	7797	8121	7914
MARCELLUS	8121	7914	15674	15674
TD	15674	7894		0

12/14/2012

WVDEP Office of Oil and Gas - Well Search

Disclaimer: Per §22-6-6. Permit required for all well work; permit fee; application; soil erosion control plan.

(a) It is unlawful for any person to commence any well work, including site preparation work, which involves any disturbance of land, without first securing a well work permit from the director of the WVDEP Office of Oil and Gas.

The appearance of an API number on the web page does not signify that a permit has been issued. The API number is used as a tracking mechanism until the permit has been issued. Under no circumstances should well work be commenced without a signed permit.

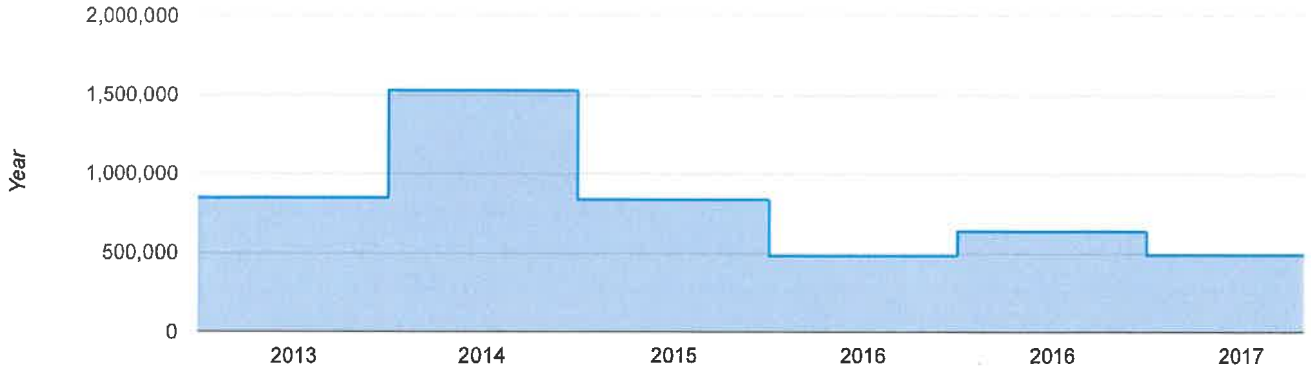
Current Operator

Well API	Operator	Surface Owner	Well Number	Well Status	Well Type	Last Permit Issue Date
4706101616	ANTERO RESOURCES CORPORATION	CLARK, ESTHER C. - LIFE TENANT	832638 ESTHER CLARK 1H	Active Well	Horizontal	01/25/2011

Note: The operator listed above is the CURRENT operator of the well. This operator may or may not have recorded production for this well for the years listed below. The production listed below spans the years shown, regardless of the operator who originally recorded a particular year's production numbers.

Production by Energy Type

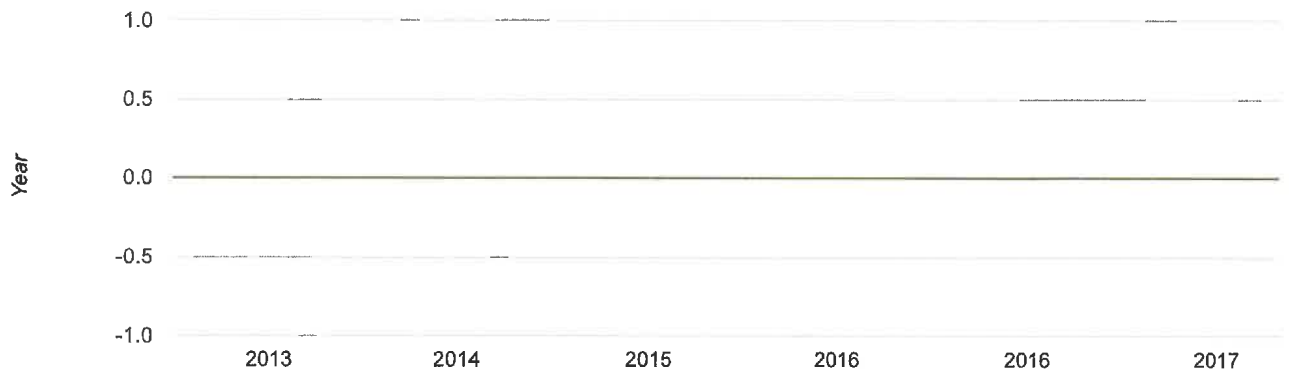
Well Lifetime Gas Production														
All amounts expressed in mcfg (thousand cubic feet)														
Reporting Operator	Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
ANTERO RESOURCES CORPORATION	2020	17,582	24,644	27,882	27,004	26,390	26,307	21,558	21,330	1,987	0	0	0	194,684
ANTERO RESOURCES CORPORATION	2019	30,857	31,995	25,682	28,453	23,838	18,718	24,597	28,256	26,070	17,166	14,157	20,954	290,743
ANTERO RESOURCES CORPORATION	2018	37,742	32,275	35,692	32,596	33,790	17,209	24,727	21,932	24,753	22,608	25,194	22,187	330,704
ANTERO RESOURCES CORPORATION	2017	51,211	44,534	45,665	42,918	48,268	39,148	37,897	43,043	40,601	39,423	20,626	35,818	489,152
ANTERO RESOURCES CORPORATION	2016	59,436	56,310	53,036	54,222	57,312	55,759	51,657	46,588	48,186	53,772	51,804	48,662	636,744
SWN PRODUCTION COMPANY, LLC	2016	59,168	56,278	52,745	53,889	56,723	55,445	51,378	46,512	51,336	0	0	0	483,474
SWN PRODUCTION COMPANY, LLC	2015	81,361	75,950	78,855	62,061	62,245	66,349	77,255	72,521	67,290	73,342	62,028	59,118	838,375
CHESAPEAKE APPALACHIA, L.L.C.	2014	138,264	150,803	178,004	160,929	143,177	126,962	120,427	110,189	101,438	94,311	104,742	96,703	1,525,949
CHESAPEAKE APPALACHIA, L.L.C.	2013	0	0	0	0	0	0	70,249	160,523	166,098	140,618	160,064	149,917	847,469



W

All

Reporting Operator	Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
ANTERO RESOURCES CORPORATION	2020	0	0	0	0	0	0	0	0	0	0	0	0	0
ANTERO RESOURCES CORPORATION	2019	0	0	0	0	0	0	0	0	0	0	0	0	0
ANTERO RESOURCES CORPORATION	2018	0	0	0	0	0	0	0	0	0	0	0	0	0
ANTERO RESOURCES CORPORATION	2017	0	0	0	0	0	0	0	0	0	0	0	0	0
ANTERO RESOURCES CORPORATION	2016	0	0	0	0	0	0	0	0	0	0	0	0	0
SWN PRODUCTION COMPANY, LLC	2016	0	0	0	0	0	0	0	0	0	0	0	0	0
SWN PRODUCTION COMPANY, LLC	2015	0	0	0	0	0	0	0	0	0	0	0	0	0
CHESAPEAKE APPALACHIA, L.L.C.	2014	0	0	0	0	0	0	0	0	0	0	0	0	0
CHESAPEAKE APPALACHIA, L.L.C.	2013	0	0	0	0	0	0	0	0	0	0	0	0	0



Well Lifetime NGL Production

All amounts expressed in barrels

Reporting Operator	Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
SWN PRODUCTION COMPANY, LLC	2015	0	0	0	0	0	0	0	0	0	0	0	0	0
CHESAPEAKE APPALACHIA, L.L.C.	2014	0	0	0	0	0	0	0	0	0	0	0	0	0
CHESAPEAKE APPALACHIA, L.L.C.	2013	0	0	0	0	0	0	0	0	0	0	0	0	0

ESTHER CLARK LEASE MON 1H

MON 1H TIES		
LINE	BEARING	DISTANCE
L1	N 07°16'31" W	2004.54'
L2	N 61°06'39" W	3224.82'
L3	S 39°13'12" W	1065.89'
L4	N 63°48'53" W	7386.62'

LATITUDE 39°40'00"
NOTES ON SURVEY

1. TIES TO WELLS, REFERENCES, AND CORNERS ARE BASED ON GRS NORTH FOR THE WV STATE PLANE COORDINATE SYSTEM NORTH ZONE NAD 27.
2. LEASE BOUNDARY SHOWN HEREON TAKEN FROM DEED BOOK 1085 PAGE 488 AND ADJOINING DEEDS.
3. SURFACE OWNER AND ADJOINER INFORMATION TAKEN FROM THE ASSESSOR AND COUNTY CLERK RECORDS OF WETZEL & MONONGALIA COUNTIES IN JULY, 2009.
4. WELL COORDINATES ESTABLISHED FROM SURVEY GRADE GPS.

MON 1H STATE PLANE COORDINATES (NORTH ZONE NAD 27)

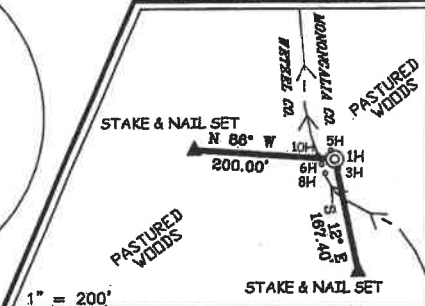
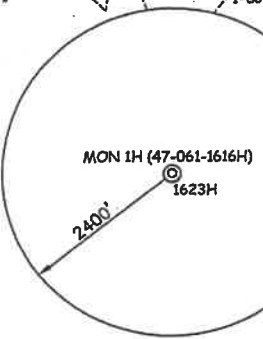
N	420,213.5
E	1172,188.0
MON 1H (NAD 27)	
LAT-(N)	39.66501°
LONG-(W)	80.23402°
MON 1H (NAD 83)	
LAT-(N)	39.65139°
LONG-(W)	80.23385°
UTM (NAD 83)	
N	4,388,130
E	551,865

MON 1H KICK OUT POINT STATE PLANE COORDINATES (NORTH ZONE NAD 27)

N	418,782
E	1172,188.0
KICK OUT POINT (NAD 27)	
LAT-(N)	39.64807°
LONG-(W)	80.23686°
KICK OUT POINT (NAD 83)	
LAT-(N)	39.63128°
LONG-(W)	80.23487°
KICK OUT POINT (NAD 83)	
LAT-(N)	39.61681°
LONG-(W)	80.23686°
KICK OUT POINT (NAD 83)	
LAT-(N)	39.60234°
LONG-(W)	80.23480°
UTM (NAD 83)	
N	4,388,875
E	551,764

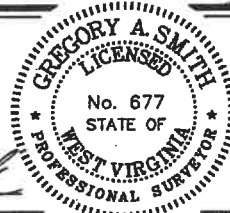
MON 1H BOTTOM HOLE STATE PLANE COORDINATES (NORTH ZONE NAD 27)

N	426,552
E	1172,188.0
BOTTOM HOLE (NAD 27)	
LAT-(N)	39.66878°
LONG-(W)	80.42052°
BOTTOM HOLE (NAD 83)	
LAT-(N)	39.65139°
LONG-(W)	80.42052°
BOTTOM HOLE (NAD 83)	
LAT-(N)	39.63400°
LONG-(W)	80.42052°
UTM (NAD 83)	
N	4,389,614
E	549,725



REFERENCES

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.



(*) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS.
DATE SEPTEMBER 1, 2011
OPERATORS WELL NO. ESTHER CLARK 1H
API NO. 47-061-01616H
WELL NO. 47-061-01616H
STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1/200 FILE NO. 7436P1HR9 (308-50)
PROVEN SOURCE OF ELEVATION DGPS (SUBMETER MAPPING GRADE) SCALE 1" = 2,000'

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

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

LOCATION: ELEVATION: 1,424' WATERSHED: NORTH FORK & WEST VIRGINIA CREEK
DISTRICT: BATTELLE COUNTY: MONONGALIA QUADRANGLE: HUNDRED 7.5'

SURFACE OWNER: ENVIRO CON LTD. ACREAGE: 88.10 & 148.50±
ROYALTY OWNER: ESTHER H. CLARK, ET AL
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 7,890' TVD 16,343 TMD

WELL OPERATOR CHESAPEAKE APPALACHIA, LLC. DESIGNATED AGENT ERIC B. GILLESPIE
ADDRESS P.O. BOX 18496 ADDRESS P.O. BOX 6070
OKLAHOMA CITY, OK 73154-0496 CHARLESTON, WV 25362

Let-O-Hallett MOD.



SLS
 SMITH LAND SURVEYING, INC.
 P.O. BOX 150 GLENVILLE, WV, 26351
 PH: (304) 682-3634 FAX: (304) 682-3638 E-MAIL: sls@sls-survey.com

WETZELL/MON. COUNTIES
 HANCOCK, WV 7.5' QUAD
 DRAWN BY C.P.M. FILE NO. 20090902 DATE 08-30-11

OPERATOR:
CHESAPEAKE APPALACHIA, LLC.
 P.O. BOX 18496
 CHARLESTON, WV 25301

APPENDIX F

Esther Clark 3H Marcellus Gaswell Details

API #: 47-061-01623

County: Monongalia

Permit: 1623

Tax District: Battelle

7.5-minute quadrangle: Hundred

15-minute quadrangle: Mannington

Surface Hole Location:

Latitude (decimal degrees): 39.650353

Longitude (decimal degrees): -80.39428

UTM E: 551967

UTM N: 4389126.3

Bottom Hole Location:

Latitude (decimal degrees): 39.659315

Longitude (decimal degrees): -80.418259

UTM E: 549903.3

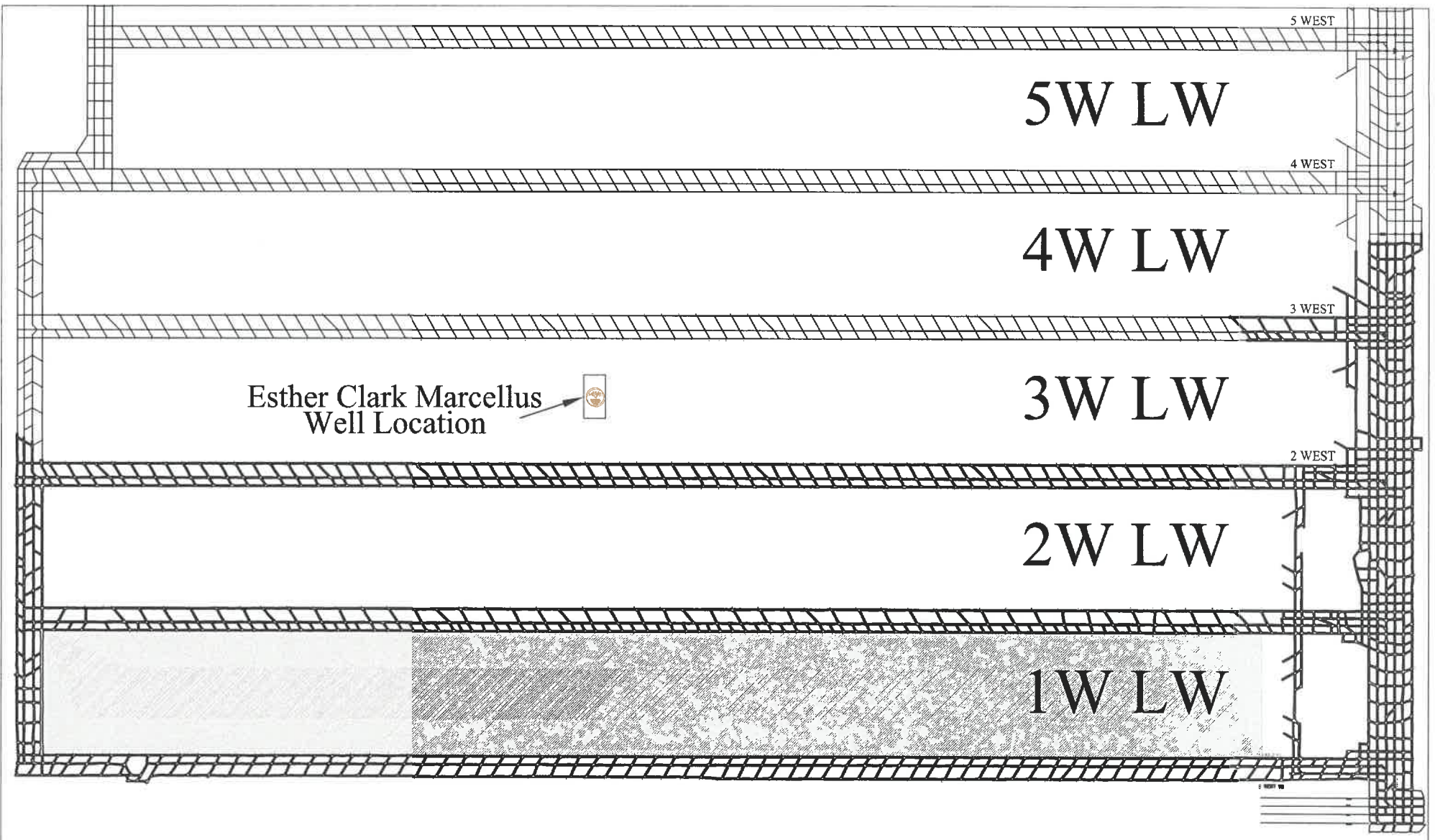
UTM N: 4390107.3

Spud date: October 2011

Initial static rock pressure: 5,153 psi

Last reported production: September 2020

Current shut in pressure: 1,340 psi



Esther Clark Marcellus
Well Location

5W LW

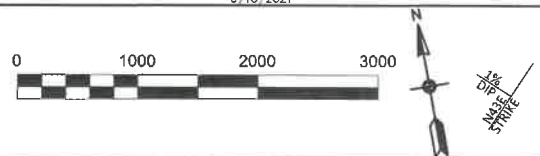
4W LW

3W LW

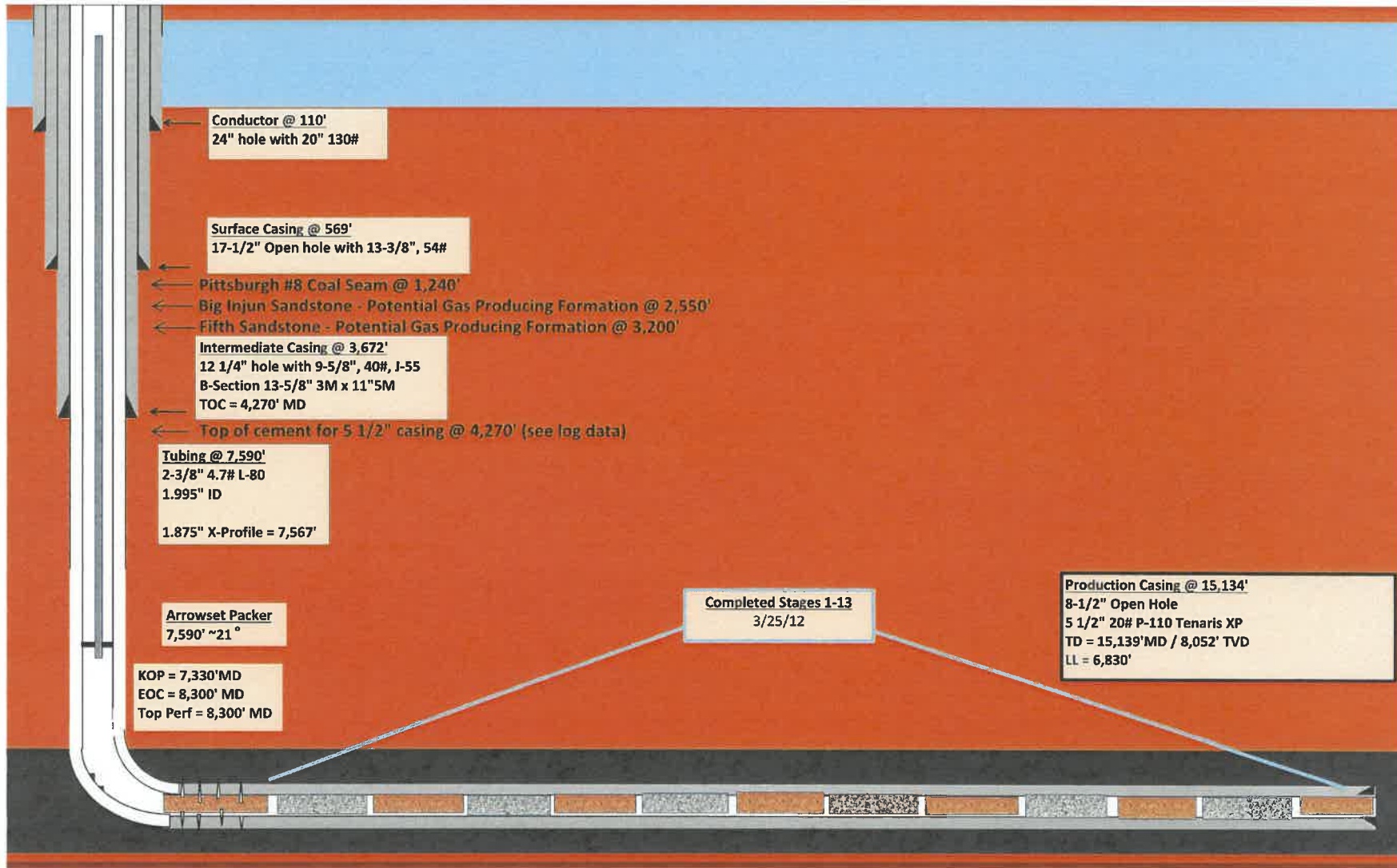
2W LW

1W LW

ESTHER CLARK GAS WELL LOCATIONS
 MARION COUNTY MINE
 151 Johnny Cake Rd. Metz WV 26585
 State ID # D-403B-----MSHA ID # 46-01433
 Pittsburgh #8 Coalbed
 Mannington Quadrangle
 6/10/2021



Esther Clark 3H - Esther Clark Pad Nomac Rig #290 Spud Date: 10/18/2011



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

DATE: 9-7-2012
API #: 47-061-01623

Farm name: Esther Clark 3H Operator Well No.: 833083

LOCATION: Elevation: 1424' Quadrangle: Hundred 7.5'

District: Battelle County: Monongalia
Latitude: 5484' Feet South of 39 Deg. 40 Min. 00 Sec.
Longitude 5973' Feet West of 80 Deg. 22 Min. 30 Sec.

Company: Chesapeake Appalachia, L.L.C.

Address:	Casing & Tubing	Used in drilling	Left in well	Cement fill up Cu. Ft.
P.O. Box 18496 Oklahoma City, OK 73154-0496	20"	110'	110'	101 Cu. Ft.
Agent: Eric Gillespie	13 3/8"	580'	580'	684 Cu. Ft.
Inspector: Sam Ward	9 5/8"	3672'	3672'	1667 Cu. Ft.
Date Permit Issued: 6/3/2011	5 1/2"	15136'	15136'	3317 Cu. Ft.
Date Well Work Commenced: 10/18/2011				
Date Well Work Completed: 3/25/2012				
Verbal Plugging:				
Date Permission granted on:				
Rotary <input checked="" type="checkbox"/> Cable <input type="checkbox"/> Rig <input type="checkbox"/>				
Total Vertical Depth (ft): 8183'(cement plug 6,892 - 8183')	referring to initial pilot hole			
Total Measured Depth (ft): 15139'				
Fresh Water Depth (ft.): 400'				
Salt Water Depth (ft.): None				
Is coal being mined in area (N/Y)? Y				
Coal Depths (ft.): 221', 1200'				
Void(s) encountered (N/Y) Depth(s) N				

OPEN FLOW DATA (If more than two producing formations please include additional data on separate sheet)

Producing formation Marcellus Pay zone depth (ft) 9,300' - 15,004'

Gas: Initial open flow _____ MCF/d Oil: Initial open flow _____ Bbl/d

Final open flow 5010' MCF/d Final open flow 0 Bbl/d

Time of open flow between initial and final tests 47 Hours * Calculated

Static rock Pressure 5153' psig (surface pressure) after _____ Hours

Second producing formation _____ Pay zone depth (ft) _____

Gas: Initial open flow _____ MCF/d Oil: Initial open flow _____ Bbl/d

Final open flow _____ MCF/d Final open flow _____ Bbl/d

Time of open flow between initial and final tests _____ Hours

Static rock Pressure _____ psig (surface pressure) after _____ Hours

I certify under penalty of law that I have personally examined and am familiar with the information submitted on this document and all the attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information I believe that the information is true, accurate, and complete.

Marlene Williams
Signature

9-11-2012
Date

12/14/2012

Were core samples taken? Yes No

Were cuttings caught during drilling? Yes No

Were Electrical, Mechanical or Geophysical logs recorded on this well? If yes, please list _____
Triple Combo, spectral gamma ray, borehole image and dipole sonic in pilot and MWD gamma ray in lateral

NOTE: IN THE AREA BELOW PUT THE FOLLOWING: 1). DETAILS OF PERFORATED INTERVALS, FRACTURING OR STIMULATING, PHYSICAL CHANGE, ETC. 2). THE WELL LOG WHICH IS A SYSTEMATIC DETAILED GEOLOGICAL RECORD OF THE TOPS AND BOTTOMS OF ALL FORMATIONS, INCLUDING COAL ENCOUNTERED BY THE WELLBORE FROM SURFACE TO TOTAL DEPTH.

Perforated Intervals, Fracturing, or Stimulating:

Plug Back Details Including Plug Type and Depth(s): **Cement plug @ 6992' - 8183'** (pilot hole cemented)

<u>Formations Encountered:</u>	<u>Top Depth</u>	<u>/</u>	<u>Bottom Depth</u>
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see attached

PERFORATION RECORD ATTACHMENT

Well Number and Name: 833083 Esther Clark 3H

PERFORATION RECORD			STIMULATION RECORD							
Date	Interval Perforated		Date	Interval Treated		Fluid		Propping Agent		Average Injection
	From	To		Type	Amount	Type	Amount			
2/10/2012	14,575	15,004	3/13/2012	14,575	15,004	Sik wtr	11,886	Sand	490,500	57
3/13/2012	14,052	14,482	3/13/2012	14,052	14,482	Sik wtr	10,409	Sand	588,240	84
3/14/2012	13,529	13,959	3/15/2012	13,529	13,959	Sik wtr	10,870	Sand	588,820	84
3/16/2012	13,006	13,436	3/18/2012	13,006	13,436	Sik wtr	11,821	Sand	588,420	80
3/16/2012	12,483	12,960	3/17/2012	12,483	12,960	Sik wtr	11,750	Sand	588,210	84
3/17/2012	11,956	12,390	3/18/2012	11,956	12,390	Sik wtr	10,122	Sand	593,180	84
3/18/2012	11,438	11,867	3/19/2012	11,438	11,867	Sik wtr	13,887	Sand	582,620	80
3/19/2012	10,915	11,345	3/22/2012	10,915	11,345	Sik wtr	10,953	Sand	588,860	85
3/22/2012	10,389	10,822	3/23/2012	10,389	10,822	Sik wtr	10,191	Sand	591,580	84
3/23/2012	9,863	10,298	3/23/2012	9,863	10,298	Sik wtr	10,963	Sand	588,760	81
3/24/2012	9,350	9,776	3/25/2012	9,350	9,776	Sik wtr	10,102	Sand	588,700	85
3/25/2012	8,823	9,252	3/25/2012	8,823	9,252	Sik wtr	10,241	Sand	588,200	82
3/25/2012	8,300	8,730	3/25/2012	8,300	8,730	Sik wtr	10,205	Sand	589,080	88

VERTICAL PILOT HOLE

Formation/Lithology	Top Depth, MD (ft)	Top Depth, TVD (ft)	Bottom Depth, MD (ft)	Bottom Depth, TVD (ft)
SHALE	0		250	
SANDSTONE/SHALE	250		500	
SHALE	500		930	
SANDSTONE	930		990	
LIMESTONE/SHALE	990		1140	
COAL	1140		1156	
COAL/LIMESTONE/SHALE	1156		1240	
COAL	1240		1260	
COAL/LIMESTONE/SHALE	1260		1320	
SHALE	1320		1600	
SANDSTONE/SHALE	1600		2640	
BIG LIME	2640		2550	
BIG INJUN SANDSTONE	2550		2750	
SANDSTONE/SHALE	2750		3210	
BEREA SANDSTONE	3210		3550	
SHALE	3550		4100	
SHALE/SANDSTONE	4100		4580	
SHALE	4580		7744	
GENESEO	7744		7782	
TULLY	7782		7820	
HAMILTON	7820		7924	
MARCELLUS	7924		7994	
ONONDAGA	7994			
PILOT TD	8183			
PLUG BACK DEPTH	7107			

LATERAL WELLBORE**Maximum TVD of wellbore: 7972 ft TVD @ 13289 ft MD**

Formation/Lithology	Top Depth, MD (ft)	Top Depth, TVD (ft)	Bottom Depth, MD (ft)	Bottom Depth, TVD (ft)
SHALE	0	0	250	250

12/14/2012

SANDSTONE/SHALE	250	250	500	500
SHALE	500	500	930	930
SANDSTONE	930	930	990	990
LIMESTONE/SHALE	990	990	1140	1140
COAL	1140	1140	1156	1156
COAL/LIMESTONE/SHALE	1156	1156	1240	1240
COAL	1240	1240	1260	1260
COAL/LIMESTONE/SHALE	1260	1260	1320	1320
SHALE	1320	1320	1600	1600
SANDSTONE/SHALE	1600	1600	2460	2460
BIG LIME	2640	2640	2550	2550
BIG INJUN SANDSTONE	2550	2550	2750	2750
SANDSTONE/SHALE	2750	2750	3210	3210
BEREA SANDSTONE	3210	3210	3550	3550
SHALE	3550	3550	4100	4100
SHALE/SANDSTONE	4100	4100	4580	4580
SHALE	4580	4580	7764	7730
GENESEO	7764	7730	7821	7774
TULLY	7821	7774	7854	7798
HAMILTON	7854	7798	8074	7910
MARCELLUS	8074	7910	15139	7905
LATERAL TD	15139	7905		0

WVDEP Office of Oil and Gas - Well Search

Disclaimer: Per §22-6-6. Permit required for all well work; permit fee; application; soil erosion control plan.

(a) It is unlawful for any person to commence any well work, including site preparation work, which involves any disturbance of land, without first securing a well work permit from the director of the WVDEP Office of Oil and Gas.

The appearance of an API number on the web page does not signify that a permit has been issued. The API number is used as a tracking mechanism until the permit has been issued. Under no circumstances should well work be commenced without a signed permit.

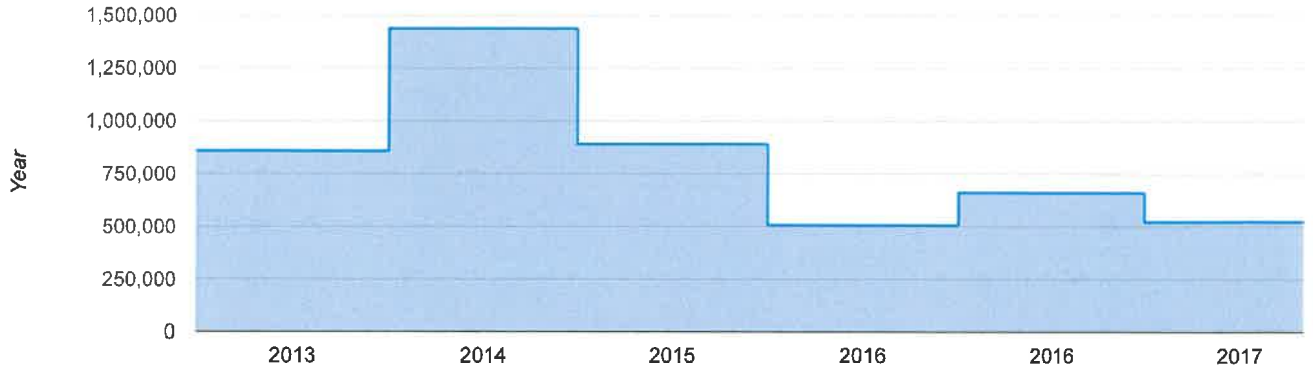
Current Operator

Well API	Operator	Surface Owner	Well Number	Well Status	Well Type	Last Permit Issue Date
4706101623	ANTERO RESOURCES CORPORATION	CLARK, ESTHER C. - LIFE TENANT	833083 ESTHER CLARK 3H	Active Well	Horizontal	06/03/2011

Note: The operator listed above is the CURRENT operator of the well. This operator may or may not have recorded production for this well for the years listed below. The production listed below spans the years shown, regardless of the operator who originally recorded a particular year's production numbers.

Production by Energy Type

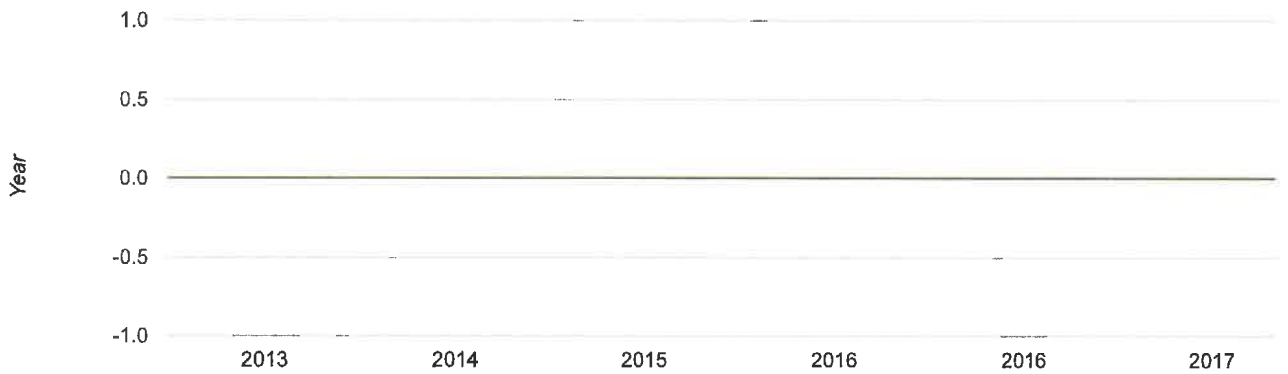
Well Lifetime Gas Production														
All amounts expressed in mcfg (thousand cubic feet)														
Reporting Operator	Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
ANTERO RESOURCES CORPORATION	2020	23,972	15,634	18,282	30,137	31,940	29,391	21,754	13,762	2,634	0	0	0	187,506
ANTERO RESOURCES CORPORATION	2019	30,061	33,119	26,804	19,686	27,339	12,773	30,360	15,059	34,019	28,188	25,258	22,661	305,327
ANTERO RESOURCES CORPORATION	2018	37,438	34,707	37,286	33,223	36,393	24,574	32,596	28,911	26,389	27,012	23,243	30,227	372,001
ANTERO RESOURCES CORPORATION	2017	51,400	45,070	49,886	44,157	48,333	43,742	41,782	42,273	41,335	41,146	38,497	35,536	523,166
ANTERO RESOURCES CORPORATION	2016	63,936	58,352	59,605	56,713	59,439	57,083	54,508	50,661	50,662	53,066	51,740	46,957	662,723
SWN PRODUCTION COMPANY, LLC	2016	63,650	58,317	59,277	56,361	58,831	56,764	54,213	50,576	49,032	0	0	0	507,021
SWN PRODUCTION COMPANY, LLC	2015	87,745	77,189	83,140	73,358	72,540	69,563	77,930	73,905	68,867	72,592	67,559	65,491	889,879
CHESAPEAKE APPALACHIA, L.L.C.	2014	139,031	147,837	160,854	138,868	129,405	116,835	113,738	106,526	99,270	89,902	99,633	96,641	1,438,540
CHESAPEAKE APPALACHIA, L.L.C.	2013	0	0	0	0	0	0	69,536	159,706	164,114	154,174	160,226	149,783	857,539



W

All

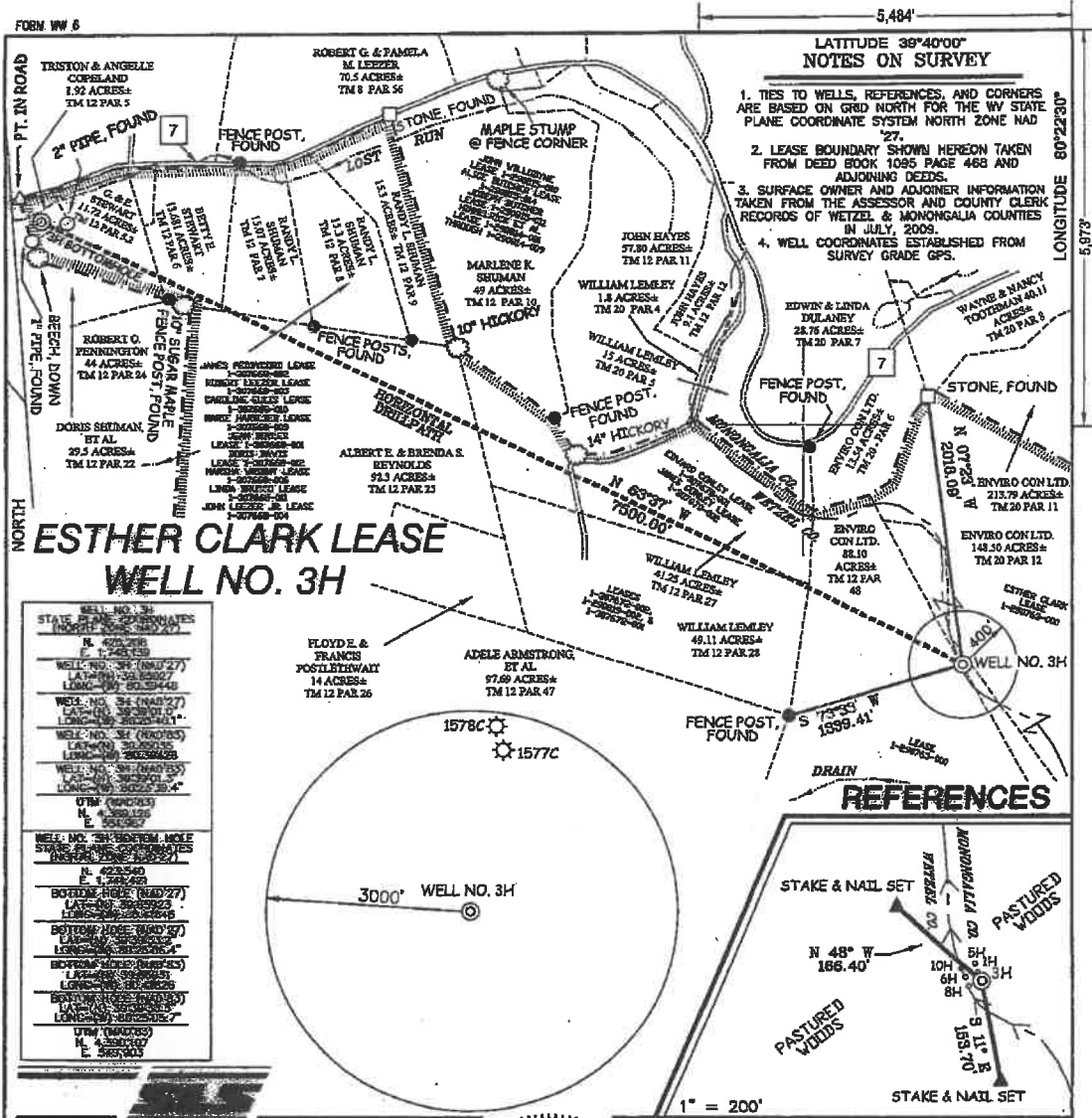
Reporting Operator	Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
ANTERO RESOURCES CORPORATION	2020	0	0	0	0	0	0	0	0	0	0	0	0	0
ANTERO RESOURCES CORPORATION	2019	0	0	0	0	0	0	0	0	0	0	0	0	0
ANTERO RESOURCES CORPORATION	2018	0	0	0	0	0	0	0	0	0	0	0	0	0
ANTERO RESOURCES CORPORATION	2017	0	0	0	0	0	0	0	0	0	0	0	0	0
ANTERO RESOURCES CORPORATION	2016	0	0	0	0	0	0	0	0	0	0	0	0	0
SWN PRODUCTION COMPANY, LLC	2016	0	0	0	0	0	0	0	0	0	0	0	0	0
SWN PRODUCTION COMPANY, LLC	2015	0	0	0	0	0	0	0	0	0	0	0	0	0
CHESAPEAKE APPALACHIA, L.L.C.	2014	0	0	0	0	0	0	0	0	0	0	0	0	0
CHESAPEAKE APPALACHIA, L.L.C.	2013	0	0	0	0	0	0	0	0	0	0	0	0	0



Well Lifetime NGL Production

All amounts expressed in barrels

Reporting Operator	Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
SWN PRODUCTION COMPANY, LLC	2015	0	0	0	0	0	0	0	0	0	0	0	0	0
CHESAPEAKE APPALACHIA, L.L.C.	2014	0	0	0	0	0	0	0	0	0	0	0	0	0
CHESAPEAKE APPALACHIA, L.L.C.	2013	0	0	0	0	0	0	0	0	0	0	0	0	0



**ESTHER CLARK LEASE
WELL NO. 3H**

WELL NO.	DATE	DEPTH	STATUS
WELL NO. 31 (NAD 27)	1/12/07	100'	ABANDONED
WELL NO. 32 (NAD 27)	1/12/07	100'	ABANDONED
WELL NO. 33 (NAD 27)	1/12/07	100'	ABANDONED
WELL NO. 34 (NAD 27)	1/12/07	100'	ABANDONED
WELL NO. 35 (NAD 27)	1/12/07	100'	ABANDONED
WELL NO. 36 (NAD 27)	1/12/07	100'	ABANDONED
WELL NO. 37 (NAD 27)	1/12/07	100'	ABANDONED
WELL NO. 38 (NAD 27)	1/12/07	100'	ABANDONED
WELL NO. 39 (NAD 27)	1/12/07	100'	ABANDONED
WELL NO. 40 (NAD 27)	1/12/07	100'	ABANDONED

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.



(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS.
 DATE APRIL 12, 20 11
 OPERATORS WELL NO. ESTHER CLARK 3H
 API WELL NO. 47-061-01623H
 STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1/200 FILE NO. 7438P3HRS (308-50)
 PROVEN SOURCE OF ELEVATION DGPS (SUBMETER MAPPING GRADE) SCALE 1" = 1,000'

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

WELL TYPE: OIL GAS INJECTION WASTE DISPOSAL IF "GAS" PRODUCTION STORAGE DEEP SHALLOW
 LOCATION: ELEVATION 1,411' WATERSHED NORTH FORK & WEST VIRGINIA CREEK
 DISTRICT BATTELLE COUNTY MONONGALIA QUADRANGLE HUNDRED 7.5'
 SURFACE OWNER ENVIRO CON LTD. ACREAGE 88.10 & 148.50±
 ROYALTY OWNER ESTHER H. CLARK, ET AL ACREAGE 148.50±, 88.10±, 48.11±, 41.25±, 82.3±, 18.07±, 12.89±, 11.72±, & 1.82±
 PROPOSED WORK: DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE 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 TVD 7,890', TMD 15,400'

WELL OPERATOR CHESAPEAKE APPALACHIA, LLC. DESIGNATED AGENT ERIC B. GILLESPIE
 ADDRESS P.O. BOX 18496 ADDRESS P.O. BOX 8070
OKLAHOMA CITY, OK 73154-0496 CHARLESTON, WV 25362