west virginia department of environmental protection

Office of Oil and Gas
601 57th Street SE
Charleston, WV 25304
(304) 926-0450
(304) 926-0452 fax

Earl Ray Tomblin, Governor
Randy C. Huffman, Cabinet Secretary
www.dep.wv.gov

March 14, 2016

WELL WORK PLUGGING PERMIT

Plugging

This permit, API Well Number: 47-10301229, issued to EQT PRODUCTION COMPANY, is evidence of permission granted to perform the specified well work at the location described on the attached pages and located on the attached plat, subject to the provisions of Chapter 22 of the West Virginia Code of 1931, as amended, and all rules and regulations promulgated thereunder, and to all conditions and provisions outlined in the pages attached hereto. Notification shall be given by the operator to the Oil and Gas Inspector at least 24 hours prior to the construction of roads, locations, and/or pits for any permitted work. In addition, the well operator shall notify the same inspector 24 hours before any actual well work is commenced and prior to running and cementing casing. Spills or emergency discharges must be promptly reported by the operator to 1-800-642-3074 and to the Oil and Gas inspector.

Upon completion of the plugging well work, the above named operator will reclaim the site according to the provisions of WV Code 22-6-30. The above named operator will also file, as required in WV Code 22-6-23, an affidavit on form WR-38 by two experienced persons in the operator's employment and the Oil and Gas inspector that the work authorized under this permit was performed and a description given. Failure to abide by all statutory and regulatory provisions governing all duties and operations here under may result in suspensions or revocation of this permit and in addition may result in civil and/or criminal penalities being imposed upon the operator.

This permit will expire in two (2) years from date of issue. If there are any questions, please free to contact me at (304) 926-0499 ext. 1654.

James Martin
Chief

Operator's Well No: 657241
Farm Name: KILCOYNE, S. J., ESTATE
API Well Number: 47-10301229
Permit Type: Plugging
Date Issued: 03/14/2016

Promoting a healthy environment.

10301279P

PERMIT CONDITIONS

West Virginia Code §22-6-11 allows the Office of Oil and Gas to place specific conditions upon this permit. Permit conditions have the same effect as law. Failure to adhere to the specified permit conditions may result in enforcement action.

CONDITIONS

1. All pits must be lined with a minimum of 20 mil thickness synthetic liner.

2. In the event of an accident or explosion causing loss of life or serious personal injury in or about the well or while working on the well, the well operator or its contractor shall give notice, stating the particulars of the accident or explosion, to the oil and gas inspector and the Chief within twenty-four (24) hours.

3. Well work activities shall not constitute a hazard to the safety of persons.

10301229P

Form WW-4 (B)
Permit Copy
(Rev 2/01)

Date: February 11, 2016
Operator's Well
Well No. 657241 (Barr #1848)
API Well No.: 47 103 - 01229

CK 20236 ($600)
100.00

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

APPLICATION FOR A PERMIT TO PLUG AND ABANDON

4) Well Type: Oil ____ Gas X Liquid Injection ____ Waste Disposal: ____
If Gas, Production X Or Underground storage ____ Deep ____ Shallow X

5) Elevation: 855 ft. Watershed: North Fork Fishing Creek
Location: Grant County: Wetzel Quadrangle: Big Run 7.5'
District:

6) Well Operator: EQT Production Company
Address: 120 Professional Place
Bridgeport, WV 26330

7) Designated Agent: Rex C. Ray
Address: 120 Professional Place
Bridgeport, WV 26330

8) Oil & Gas Derek Haught
Name: P. O. Box 85
Address: Smithville, WV 26178

9) Plugging Contractor:
Name: HydroCarbon Well Service
Address: PO BOX 995
Buckhannon, WV 26201

10) Work Order: The work order for the manner of plugging this well is as follows:
See Attachment for details and procedures.

OFFICE USE ONLY

Notification must be given to the district oil and gas inspector 24 hours before permitted work can commence.

Work order approved by inspector _____ Date 2-19-16

1030122 9P

PLUGGING PROGNOSIS

Barr # 1848
657241
District, Grant
Wetzel, WV
API # 47-103-01229
BY: R. Green
DATE: 1/21/16

CURRENT STATUS:
Elevation @ 855'
TD @ 5972' (Plugged Back to 5095' when drilled in 1981)
Composite bridge plug set @ 2865' in 2008.
Perforated and completed Gordon and 4th Sand 2642' to 2786'

16" @ 21'
11 ¾" csg @ 228' (CTS)
8 5/8" csg @ 1671'
4 ½" csg @ 5085'
Freshwater, @ 45' & 117'
Saltwater @ None reported
Gas shows @ None reported
Oil shows @ none reported
Coal @ 115' & 849'

1. Notify state inspector, Derek Haught, 304-206-7613, 24hrs, prior to commencing operations.
2. TIH check TD, rig up and drill out bridge plug @ 2865'.
3. TIH wireline check TD @ 5000'
4. TIH tbg to 5000', set 1000' C1A cement plug 5000' to 4000'. (Bradford & Benson perfs.) WOC 4hrs, tag TOC, add additional C1A cement if necessary.
5. TOOH tbg to 4000', gel hole, 4000' to 3600'.
6. TOOH tbg to 3600', set 400' C1A cement plug 3600' to 3200'. (Warren & Speechly perfs.). WOC 4 hrs. tag TOC, add additional C1A cement if necessary.
7. TOOH tbg to 3200', gel hole 3200' to 3100'.
8. TOOH tbg to 3100', set 700' C1A cement plug, 3100' to 2400'. (Warren, 4th Sand, & Gordon perfs.) WOC 4hrs, tag TOC, add additional C1A cement if necessary.
9. TOOH tbg to 2400'gel hole 2400' to 2200'. TOOH tbg.
10. Free point 4 1/2" casing, cut casing @ free point, TOOH casing.
11. Set 100' C1A cement plug 50' in/out of casing cut, perforate all freshwater, saltwater, coal, oil and gas shows below cut. Do not omit any plugs.
12. TOOH tbg to top of casing cut plug, gel hole to next plug.
13. TOOH tbg to 1700', set 200' C1A cement plug 1700' to 1500'. (8 5/8" casing seat).
14. TOOH tbg to 1500', gel hole 1500' to 1000'.
15. TOOH tbg to 1000', set 300' C1A cement plug 1000' to 700'. (Coal @ 849')
16. Free point 8 5/8" casing, cut casing @ free point, TOOH casing.
17. Set 100' C1A cement plug 50' in/out of cut, perforate all freshwater, saltwater, coal, oil and gas shows below cut. Do not omit any plugs.
18. TOOH tbg to top of casing cut plug. Gel hole to next plug.
19. TOOH tbg to 300', set 300' C1A cement plug 300' to surface. (11 ¾" casing seat, freshwater @ 45' 117', coal@ 115').
20. Erect monument with API#, company name and 6 digit well code # and date plugged.
21. Reclaim location, roads to WV-DEP specifications.

DMH
2-19-16

10301229P

API # 471030122900 F

State of West Virginia
Division of Environmental Protection
Section of Oil and Gas
Well Operator's Report of Well Work

Farm Name Kilcoyne, John W — Well Number 657241

Location Elevation 855 — Quadrangle Big Run

District Grant — County Wetzel, WV

			Degree	Minute	Second
Latitude	8640	FSL	39.00	35.00	0.00
Longitude	4470	FWL	80.00	32.00	30.00

Company EQT Production Company
1710 Pennsylvania Avenue Charleston, WV 25328

Agent Cecil Ray

Inspector Mike Undewood

Permit Issued 11/27/2007

Well Work Commenced 04/14/2008

Well Work Completed 08/01/2008

Verbal Plugging

Permission granted on

Rotary Rig X Cable Rig

Total Depth 5,972

Casing & Tubing Size	Used in Drilling	Left in Well	Cement Fill Up Cubic Ft
previously reported			

Water Encountered

Type From

previously rptd

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Coal & Open Mines

Type From

Previously Rptd

Open Flow Data

Producing Formation
Gordon/4th sand :

Pay Zone Depth (ft): See attached for details

Gas: Initial Open Flow 0 MCF Date — Oil: Initial Open Flow Bbl/d

Final Open Flow 510 MCF 06/02/2008 Date — Final Open Flow

Time of open flow between initial and final tests 0 hours

Static Rock Pressure 420 after 0 hours

Second Producing Formation — Pay Zone Depth (ft)

Gas: Initial Open Flow MCF Date — Oil: Initial Open Flow Bbl/d

Final Open Flow MCF Date — Final Open Flow

Time of open flow between initial and final tests hours

Static Rock Pressure after hours

NOTE: On back of this form put the following
1) Details of Perforated intervals, fracturing or stimulating, physical change,etc.
2) The well log, a systematic detailed geological record of all formations including coal encountered in the well bore

For Equitable Production Company

By [signature]

Date 8/5/09

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Big Run 5

Well Number 657241

EQT Company
WR-35 Completion Report - Attachment
Well Treatment Summary

API # 471030122900

10301229P
F

Stage 1	
Date	05/20/2008
FracTyp	X-Link
Zone	Gordon/4th sand
# of Perfs	40
From/To	2,642 — 2,786
BD Press	2,451
ATP Psi	3,164
Avg Rate	31
Max Press Psi	3,184
ISIP Psi	2,810
10min SIP	2,649
	5 min.
Frac Gradient	0.00
Sand Proppant	600.00
Water-bbl	845 bbl
SCF N2	200,000
Acid-gal	500 gal 15%HCL

Formation Name	Depth To	Depth Bottom	Formation Thick
previously reported			

Gas Tests	
Depth	Remarks

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Historical Well Chronology

Well Name: 657241 BARR 1848

API	Enertia Well #	PUD Name & #	Permit Number	Permit Date	Prod Resp Party	Farm Name (WV)	Operator	State
471030122900	657241						Equitable Production Company	WV

Orig KB Elev...	Spud Date	Planned Well Geometry	Well Type	Loc Stat from LM	Area	County	Quad
865.00	4/14/2008					Wetzel, WV	

Report #: 8.0 DFS: 23.25 **Rigs: <Rig?>** **Job Category: Completion/Workover**

Report End Date	Operations at Report Time	Last Casing String
5/7/2008 06:00	Squeeze	

Day Total (Cost)	Cum To Date (Cost)	Start Depth (ftKB)	End Depth (ftKB)	Drill Hrs (hr)	Avg ROP (ft/hr)	Daily Contacts
18,259.00	32,269.00	0.0	0.0			

Operations Summary

On 5/6: 0psi ib 8-5/8 x 4-1/2" annulus & 4-1/2 were open to prod line. RIH. Set Blue Dot composite plug @ 2865'. Loaded hole w/ fresh wtr. Pressure test 4-1/2 to 1,000 psi. Held 2" flow line, laid to pit. 10' freeboard in pit. 4-250bbls tanks on loc, used 225bbls. Meeks ran GR/CBL/CBL/VDL log from 2856' to 1650'. Perfed from 2818' - 2820', 2 shots/ft. Estimated TOC after squeeze 2200'. Superior squeezed w/ 136sx of Class A cmt w/ 2%CaCl mixed @ 1.21yld, 15ppg. SWI. Wire line stopped @ 2483'. Pumped 44bbls displacement. Plug estimated @ 2760'. TOC 2650' from primary job.

Report #: 9.0 DFS: 25.25 **Rigs: <Rig?>** **Job Category: Completion/Workover**

Report End Date	Operations at Report Time	Last Casing String
5/9/2008 06:00	Logging	

Day Total (Cost)	Cum To Date (Cost)	Start Depth (ftKB)	End Depth (ftKB)	Drill Hrs (hr)	Avg ROP (ft/hr)	Daily Contacts
	32,269.00	0.0	0.0			

Operations Summary

On 5/9: Bond log well

Report #: 10.0 DFS: 28.25 **Rigs: <Rig?>** **Job Category: Completion/Workover**

Report End Date	Operations at Report Time	Last Casing String
5/12/2008 06:00	MIRU	

Day Total (Cost)	Cum To Date (Cost)	Start Depth (ftKB)	End Depth (ftKB)	Drill Hrs (hr)	Avg ROP (ft/hr)	Daily Contacts
1,100.00	33,369.00	0.0	0.0			

Operations Summary

On 5/12: Arvilla MIRU.

Report #: 11.0 DFS: 29.25 **Rigs: <Rig?>** **Job Category: Completion/Workover**

Report End Date	Operations at Report Time	Last Casing String
5/13/2008 06:00	Drill Cement	

Day Total (Cost)	Cum To Date (Cost)	Start Depth (ftKB)	End Depth (ftKB)	Drill Hrs (hr)	Avg ROP (ft/hr)	Daily Contacts
4,300.00	37,669.00	0.0	0.0			

Operations Summary

MIRU Arvilla. Drill out cement to CBP. On 5/12: Arvilla moved rig and equipment. MI compressor and power swivel.

Report #: 12.0 DFS: 30.25 **Rigs: <Rig?>** **Job Category: Completion/Workover**

Report End Date	Operations at Report Time	Last Casing String
5/14/2008 06:00		

Day Total (Cost)	Cum To Date (Cost)	Start Depth (ftKB)	End Depth (ftKB)	Drill Hrs (hr)	Avg ROP (ft/hr)	Daily Contacts
	37,669.00	0.0	0.0			

Operations Summary

Arvilla down, air packs broke down. On 5/13: MIRU Arvilla Rig 188 and haul in tubing to drill out cement. Begin drilling down to composite plug @ 2865'.

Report #: 13.0 DFS: 31.25 **Rigs: <Rig?>** **Job Category: Completion/Workover**

Report End Date	Operations at Report Time	Last Casing String
5/15/2008 06:00	Drill Cement	

Day Total (Cost)	Cum To Date (Cost)	Start Depth (ftKB)	End Depth (ftKB)	Drill Hrs (hr)	Avg ROP (ft/hr)	Daily Contacts
4,000.00	41,669.00	0.0	0.0			

Operations Summary

Repair air packs. Continue to drill out cement. On 5/14: Arvilla shut down. Air pack is broke down.

Report #: 14.0 DFS: 32.25 **Rigs: <Rig?>** **Job Category: Completion/Workover**

Report End Date	Operations at Report Time	Last Casing String
5/16/2008 06:00	Drill Cement	

Day Total (Cost)	Cum To Date (Cost)	Start Depth (ftKB)	End Depth (ftKB)	Drill Hrs (hr)	Avg ROP (ft/hr)	Daily Contacts
4,800.00	46,469.00	0.0	0.0			

Operations Summary

Arvilla soap well and continue to drill. On 5/15: Arvilla repaired air pack. Drilled 90 ft and hit mud ring. No soap on location. Shut down and bring in soap tomorrow to resume drilling.

Report #: 15.0 DFS: 33.25 **Rigs: <Rig?>** **Job Category: Completion/Workover**

Report End Date	Operations at Report Time	Last Casing String
5/17/2008 06:00	Drill Cement	

Day Total (Cost)	Cum To Date (Cost)	Start Depth (ftKB)	End Depth (ftKB)	Drill Hrs (hr)	Avg ROP (ft/hr)	Daily Contacts
4,300.00	50,769.00	0.0	0.0			

Operations Summary

Finish drilling and circulated well clean. On 5/16: Resumed drilling. Lost circulation. Worked pipe up and down until it began to circulate again. Continued drilling 30 ft. Shut down for the day.

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Historical Well Chronology

Well Name: 657241 BARR 1848

API	Enertia Well #	PUD Name & #	Permit Number	Permit Date	Prod Resp Party	Farm Name (WV)	Operator	State
471030122800	657241						Equitable Production Company	WV

Orig KB Elev...	Spud Date	Planned Well Geometry	Well Type	Loc Stat from LM	Area	County	Quad
865.00	4/14/2008					Wetzel, WV	

Report #: 16.0 DFS: 34.25 Rigs: <Rig?> Job Category: Completion/Workover

Report End Date	Operations at Report Time	Last Casing String
5/18/2008 06:00	Prep to Frac	

Day Total (Cost)	Cum To Date (Cost)	Start Depth (ftKB)	End Depth (ftKB)	Drill Hrs (hr)	Avg ROP (ft/hr)	Daily Contacts
4,900.00	55,669.00	0.0	0.0			

Operations Summary
Arvilla swab well. Cunningham dozer and crew to On 5/17: Continued drilling. Drilled out a total of 294 ft of cement to get to CBP. Circulated hole clean and began to pull pipe.

Report #: 17.0 DFS: 36.25 Rigs: <Rig?> Job Category: Completion/Workover

Report End Date	Operations at Report Time	Last Casing String
5/20/2008 06:00	Clean up	

Day Total (Cost)	Cum To Date (Cost)	Start Depth (ftKB)	End Depth (ftKB)	Drill Hrs (hr)	Avg ROP (ft/hr)	Daily Contacts
50,860.00	106,529.00	0.0	0.0			

Operations Summary
AM Status: Clean up after frac. On 5/19: MIRU Superior & Meeks. Meeks perfed Gordon/ 4th sand 40H-2642'-2786'. BJ fraced Gordon/ 4th sand w/ X-Link. BD 2451psi, ATP 3164psi, MTP 3184psi. ISIP 2810psi, 2min SIP 1438psi, 5min SIP 2849psi, 10min SIP 2546psi, AVG rate 31bpm-foam, Max rate 31bpm-foam, FG 1.40. Superior pumped 60,000# of 20/40 sand, 845bbls of wtr, 200,000 SCF N^2, 500gals of 15% acid. RDMO Superior & Meeks. MIRU Ark flowback. Opened well to pit thru 1/4" choke @ 1750psi, flowing heavy fluid w/ 2-1/2' freeboard. Flowed to 1000psi w/ returns of heavy fluid. Stepped up to 3/8" choke. Flowed to 750psi w/ returns of heavy fluid. Stepped up to 1/2" choke. Flowed to 500psi w/ returns of heavy fluid. Stepped up to 3/4" choke. Flowed to 300psi w/ returns of heavy fluid. Stepped up to 1" choke. Flowed to 100psi w/ returns of light fluid to heavy mist. Stepped up to 2" pipe. Flowed to 0psi w returns of surging fluid. Monitored well, had no returuns of fluid w/ vapor of gas. SI 30min. SICP 0. 20" freeboard in pit. RDMO Ark. Pit fence integrity intact.

Report #: 18.0 DFS: 37.25 Rigs: <Rig?> Job Category: Completion/Workover

Report End Date	Operations at Report Time	Last Casing String
5/21/2008 06:00	Sand pump	

Day Total (Cost)	Cum To Date (Cost)	Start Depth (ftKB)	End Depth (ftKB)	Drill Hrs (hr)	Avg ROP (ft/hr)	Daily Contacts
2,700.00	109,229.00	0.0	0.0			

Operations Summary
Am status:Arvilla run in with sand pump. Cunningham hauled tankfrom Redman to Barr 1849. On 5/20: Arville: Checked pressure on well, @ 430 psi. Blew down well. Began to flow back frac fluid. Waited on well to blow down.

Report #: 19.0 DFS: 38.25 Rigs: <Rig?> Job Category: Completion/Workover

Report End Date	Operations at Report Time	Last Casing String
5/22/2008 06:00	Sand pump	

Day Total (Cost)	Cum To Date (Cost)	Start Depth (ftKB)	End Depth (ftKB)	Drill Hrs (hr)	Avg ROP (ft/hr)	Daily Contacts
1,900.00	111,129.00	0.0	0.0			

Operations Summary
AM Status: Arvilla blow well to pit. Run in with sand pump. On 5/21: Arvilla R/I hole, tagged bottom @ 2706 ft. R/U sand pump, made 12 runs down to 2842 ft. Flowed heavy returns of mist. Gas check 0.2 thru 4.5" with 237mcf. Well continued to blow at similar rate. LOTP ON.

Report #: 20.0 DFS: 39.25 Rigs: <Rig?> Job Category: Completion/Workover

Report End Date	Operations at Report Time	Last Casing String
5/23/2008 06:00	Sand pump	

Day Total (Cost)	Cum To Date (Cost)	Start Depth (ftKB)	End Depth (ftKB)	Drill Hrs (hr)	Avg ROP (ft/hr)	Daily Contacts
980.00	112,109.00	0.0	0.0			

Operations Summary
AM Status: Arvilla tag CBP. On 5/22: Arvilla Rig blow well to pit. Run in with sand pump, check TD @ 2835'. Made 8 runs to tag plug @ 2865'. Trip in with bit and drill out plug in 1 hr. Well kicked off and filled up with sand. Flowing heavy fluid so had to let well flow, LOON

Report #: 21.0 DFS: 44.25 Rigs: <Rig?> Job Category: Completion/Workover

Report End Date	Operations at Report Time	Last Casing String
5/28/2008 06:00	Sand pump	

Day Total (Cost)	Cum To Date (Cost)	Start Depth (ftKB)	End Depth (ftKB)	Drill Hrs (hr)	Avg ROP (ft/hr)	Daily Contacts
1,900.00	114,009.00	0.0	0.0			

Operations Summary
AM Status: Arvilla run in with sand pump. On 5/27: Arvilla: Checked pressure @ 400 psi. It took 1.5 hrs to blow well down. Run in hole and tagged bottom at 2614 ft, 51 ft of fill. Run in hole with sand pump. Made 10 runs down before hitting plug @ 2885 ft. Rig went down, shut down for day to get parts. LOTP ON. Gas check 0.6 thru 4.5" w/ water, 375 mcf.

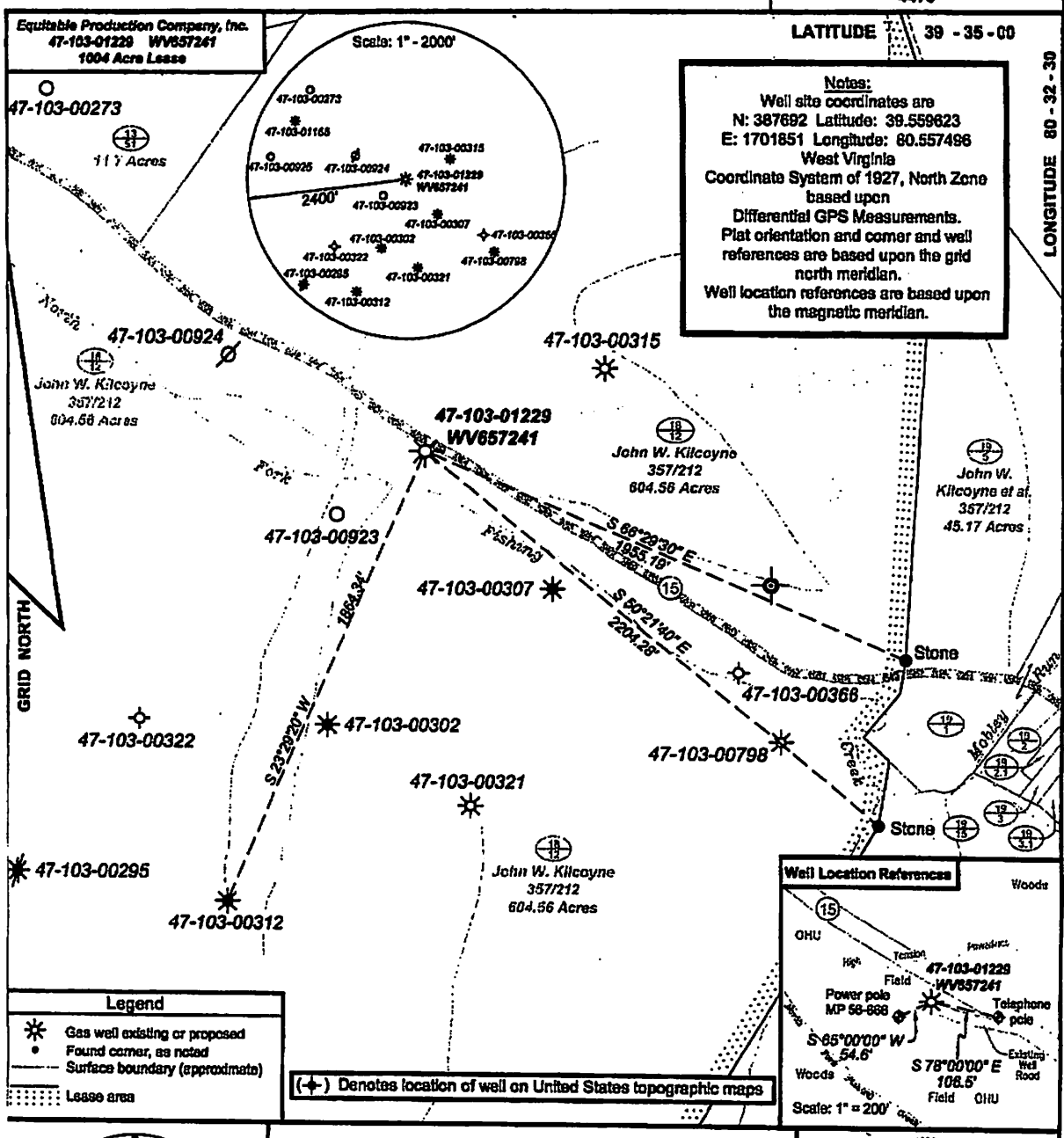
Report #: 22.0 DFS: 45.25 Rigs: <Rig?> Job Category: Completion/Workover

Report End Date	Operations at Report Time	Last Casing String
5/29/2008 06:00	Sand pump	

Day Total (Cost)	Cum To Date (Cost)	Start Depth (ftKB)	End Depth (ftKB)	Drill Hrs (hr)	Avg ROP (ft/hr)	Daily Contacts
1,900.00	115,909.00	0.0	0.0			

Operations Summary
AM Status: Run in with sand pump, clean out to plug. On 5/28: Arvilla Rig: Run in hole, tagged bottom @ 2791 ft with 74 ft of fill. Run in pump. Made 10 runs down to plug @ 2865 ft. Trip out and run in with bit. Drill out plug. Well kicked flowing heavy fluid and sand. Made 2 more runs with sand pump to plug. LOTP ON.

10301229P



Legend
Gas well existing or proposed
Found corner, as noted
Surface boundary (approximate)
Lease area

(+) Denotes location of well on United States topographic maps

Allegheny Surveys, Inc.
Black River and Weston, WV

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 Department of Environmental Protection.

Ben R. Singleton
P.S. 2092

Ben R. Singleton
LICENSED
NO. 2092
STATE OF
WEST VIRGINIA
PROFESSIONAL SURVEYOR

SEAL

FILE NO: 05-34-G-07 EQT 1-39
DRAWING NO: 9534G07_plat.dwg
SCALE: 1" = 500'
MINIMUM DEGREE OF ACCURACY: 1:2500
PROVEN SOURCE OF ELEVATION: NGS CORS GSSP

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

DATE: August 27 20 2007
OPERATOR'S WELL NO. WV657241
API WELL NO: 47-103-01229
47 - 103 - 1229F
STATE COUNTY PERMIT
Barr = 1848

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WELL TYPE: ☐ OIL ☒ GAS ☐ LIQUID INJECTION ☐ WASTE DISPOSAL
(IF GAS) PRODUCTION : ☐ STORAGE ☐ DEEP ☒ SHALLOW
LOCATION: ELEVATION: 855' WATERSHED North Fork Fishing Creek
QUADRANGLE: Big Run DISTRICT: Grant COUNTY: Wetzel
SURFACE OWNER: John W. Kilcoyne ACREAGE: 604.56 Ac.
OIL AND GAS ROYALTY OWNER: Dominion Transmission LEASE NO: 706740 ACREAGE: 1003.75 Ac.
PROPOSED WORK: ☐ DRILL ☐ CONVERT ☐ DRILL DEEPER ☒ FRACTURE OR STIMULATE ☐ PLUG OFF OLD FORMATION
☒ PERFORATE NEW FORMATION ☐ OTHER PHYSICAL CHANGE IN WELL (SPECIFY)
☐ PLUG AND ABANDON ☐ CLEAN OUT AND REPLUG TARGET FORMATION: Shale ESTIMATED DEPTH: 5972'

WELL OPERATOR: Equitable Production Company, Inc. DESIGNATED AGENT: L. Todd Tetrick
ADDRESS: 1710 Pennsylvania Ave. ADDRESS: 1710 Pennsylvania Ave.
Charleston WV 25302 Big Run 5

1030/229P

EQUITABLE PRODUCTION

CASING DETAIL

21' 16" Cunductor CSG

228' 11-3/4' CSG

Cemented to Unknown Depth
1671' 8-5/8" CSG

WELL: 657241 - Barr #1848
DATE: 7/9/2007
SCHEMATIC BY: James Pahel, Reservoir Engineer
API: 4710301229
LOCATION: Wetzel County, WV

QUADRANGLE: Big Run
SPUD: 6/4/1981
COMPLETED: 7/22/1981
TIL: Unknown
GL: 849 ft
KB: 864 ft
WI: 100.00%

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Existing Configuration

Proposed Additions

2642'-2646'	Gordon (9H)	2 spf
2662'-2666'	Gordon (9H)	2 spf
2712-2718'	4th Sand (19H)	3 spf
2784'-2486'	4th Sand (3H)	1 spf

Single Stage

Warren (8H)	2669'-3057'
Warren, Speechley (18H)	3336'-3582'
Bradford, Benson (16H)	4177'-4987'

Composite plug set @ 2865' on 5/7/2008

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Cemented to Unknown Depth
5095' 4-1/2" CSG

PBTD @ Unknown

10301229P

103-01229

RE-COMPLETION PROCEDURE
BARR #1848 (657241)
WETZEL COUNTY, WEST VIRGINIA
API NO. 47-103-01229

CURRENT STATUS

16" grade H40 conductor csg @ 31' KB
11 ¾" grade H40 csg @ 238'
8 5/8 grade K55 csg @ 1671' KB.
4 ½", grade J55 csg @ 5095' KB.

PRODUCING FORMATIONS

Warren	2669'- 3057' (8H)
Warren, Speechly	3336'- 3582' (18H)
Bradford, Benson	4177'- 4987' (16H)

CURRENT PRODUCTION

0 Mcf/d

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PROSPECTIVE FORMATIONS

Gordon	2642'- 2666' (18)
4th Sand	2712'- 2486' (22H)

Objective: Complete a squeeze and a one-stage frac of the Gordon & 4th Sand, intervals.

SQUEEZE

1. Notify state inspector. MIRU service rig. RIH w/rig tools. Check and record TD of the well.
2. MIRU wireline truck. Set 4 ½" SBP at approximately 2500'. Load hole w/approx. 40.6 bbls fresh water. Pressure test 4 ½' csg to 1000 psi.
3. Run GR/CCL/TOC from SBP to 1700'.
4. Shoot squeeze perfs approx. 20' above the TOC.
5. Rig up Service Company and attempt to circulate to surface with w/75 bbls 3% gel followed by freshwater.
6. Follow gel/water space with enough Class A w/2% CaCl cement to achieve fill up of 400' above Gordon interval. Displace w/wiper plug. Stop plug within 20' of squeeze holes. Wait 24 hrs before further operations commence.
7. MIRU service rig and wireline truck. Run GR/CCL/CBL log from wiper plug to 150' above TOC.
8. Drill out squeeze/wiper plug with service rig.
9. Swab well dry to 2500' inside 4 1/2" casing. Prepare for stimulation job.

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STIMULATION JOB

10301229P

103-01229-F

GOORDON/4TH SAND

1. Pump 500 gallons 15 % HCL acid down casing string
2. Under a lubricator, perforate the Gordon/4th Sand with 40 shots over the intervals of 2642'- 2666', 2712'- 2786'.
3. Breakdown formation w/treated water.
4. Frac Gordon/4th Sand using cross-link gel with N2 assist carrying _____ lb of 20/40 sand.
5. Flush w/treated water and acid
6. Shut down and record SIP.

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CLEAN UP OPERATIONS

1. Flowback well through chokes.
2. Test gas rate.
3. Drill out frac plugs and SBP.
4. Swab well to TD (+/- 5000'). Record all fluid recovered
5. Test and record gas rate through 3 hr open flow.
6. TIH with 2 3/8", 4.7 #/ft, 8 rd. J-55 new tubing.
7. Run broach to seating nipple. Swab well dry if necessary. Record total amount of fluid recovered.
8. Turn over to production and notify production operations group.

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1030122 9P

STATE OF WEST VIRGINIA
DEPARTMENT OF MINES, OIL AND GAS DIVISION
Mike Barr

FORM IV-35
(Obverse)
10-76

WELL OPERATOR'S REPORT
OF
DRILLING, FRACTURING AND/OR STIMULATING, OR PHYSICAL CHANGE

Date: August 12, 1981
Operator's
Well No. 8-1648
API No. 47- 103 - 1229

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SEP 4 - 1981
OIL AND GAS DIVISION
WV DEPARTMENT OF MINES

WELL TYPE: Oil ____ / Gas X / Liquid Injection ____ / Waste Disposal ____
(If "Gas", Production X / Underground storage ____ / Deep ____ / Shallow ____ /)

LOCATION: Elevation: 849 Watershed: North Fork of Fishing Creek
District: Grant County: Wetzel Quadrangle: Big Run

WELL OPERATOR Carnegie Natural Gas Company
Address 3904 Main St.
Munhall, Pa. 15120

DESIGNATED AGENT James C. Stephenson
Address PO Box 387
Mannington, WV 26582

PERMITTED WORK: Drill X / Convert ____ / Drill deeper ____ / Redrill ____ Fracture or stimulate X
Plug off old formation ____ / Perforate new formation ____ /
Other physical change in well (specify) ____

PERMIT ISSUED ON April 21, 19 81

(IF APPLICABLE: PLUGGING OF DRY HOLE ON CONTINUOUS PROGRESSION FROM DRILLING OR REWORKING. VERBAL PERMISSION OBTAINED
____, 19____)

OIL & GAS INSPECTOR FOR THIS WORK:
Name Phillip Lee Tracy
Address PO Box 173
Middlebourne, WV 26149

GEOLOGICAL TARGET FORMATION: Alexander Depth 2990 feet

Depth of completed well, 5972 feet Rotary X / Cable Tools ____

Water strata depth: Fresh, 45, 50, 117 feet; salt, ____ feet.

Coal seam depths: 115-117, 595-601 Is coal being mined in the area? no

Work was commenced June 4, 19 81, and completed July 22, 19 81

CASING AND TUBING PROGRAM

CASING OR TUBING TYPE	SPECIFICATIONS Size	Grade	Weight per ft	New	Used	FOOTAGE INTERVALS For drilling	Left in well	CEMENT FILL-UP OR SACKS (Cubic feet)	PACKERS
Conductor	16	H40		X		21	21	-	Kinds
Fresh water									
Coal	11-3/4	H40		X		228	228	-	Sizes
Intermediate	8-5/8	K55		X		1671	1671		
Production	4-1/2	J55		X		5095	5095		Depths set
Tubing									
Liners									Perforations:
									Top Bottom

OPEN FLOW DATA

Producing formation Benson and Bradford 4177 - 4987
Warren and Speechley 3336 - 3582
Gas pay zone depth 2969 - 3057 feet

Gas: Initial open flow, 14.9 Mcf/d Oil: Initial open flow, ____ Bbl/d
Final open flow, 94 Mcf/d Final open flow, ____ Bbl/d
Time of open flow between initial and final tests, ____ Hours

Static rock pressure, 375 psig (surface measurement) after 17 Hours shut in

[If applicable due to multiple completion--]

Second producing formation ____ Gas pay zone depth ____ feet

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 measurement) after ____ Hours shut in

10301294P

FORM IV-35
(Reverse)

[05-96]

DETAILS OF PERFORATED INTERVALS, FRACTURING OR STIMULATING, PHYSICAL CHANGE, ETC.

WELL LOG

FORMATION	Color	Hard or Soft	Top Feet	Bottom Feet	Remarks Including indication of all fresh and salt water, coal, oil and gas
Shale	Gray		0	40	
Sand	Blue-Gray		40	50	Water - 45 1/2"
Shale	Gray		50	60	Water - 50 3"
Sand	Gray		60	65	
Sandy Shale	Gray		65	80	
Shale	Gray		80	115	
Coal	Black		115	117	Water - 117 1-1/2"
Shale	Gray		117	190	
Red Rock & Shale	Red & Gray		190	195	
Shale	Gray		195	250	
Red Rock	Red		250	255	
Shale	Gray		255	315	
Sand	Gray		315	345	
Shale	Gray		345	425	
Red Rock	Red		425	435	
Shale	Gray		435	490	
Shale	Black		490	525	
Sandy Shale	Gray		525	550	
Shale	Black		550	560	
Sandy Shale	Gray		560	575	
Sand	Gray		575	585	
Sandy Shale	Gray		585	595	
Coal	Black		595	601	
Sandy Shale	Gray		601	648	
Limy Shale	Gray		648	660	
Red Rock	Red		660	672	
Red Rock & Shale	Red & Gray		672	805	
Shale	Gray		805	900	
Red Rock & Shale	Red & Gray		900	925	
Green Shale	Green		925	935	
Shale	Gray		935	945	
Green Slate	Gray		945	985	
Red Rock	Red		985	990	

(Attach separate sheets as necessary)

Well Operator

By _____

Its _____

NOTE: Regulation 23.04 provides as follows:

"The term 'log' or 'well log' shall mean a systematic, detailed geological record of all formations, including coal, encountered in the drilling of a well."

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Carnegie Natural Gas Company - Drilling Permit No. 47-103-1129
Page #2 - Mike Barr Well No. 8-1848

Fractured July 22, 1981.
Hole plugged back to: 5085.
Perforations:

4177 - 4987	16 holes
3336 - 3582	18 holes
2969 - 3057	8 holes

Fractured:	1st Stage	2nd Stage	3rd Stage
	20,000# 80-100 Sand	20,000# 80-100 Sand	10,000# 80-100 Sand
	40,000# 20-40 Sand	40,000# 20-40 Sand	25,000# 20-40 Sand
	500 Gals HCL Acid	500 Gals. MSR Acid	500 Gals. MSR Acid
	500 Bbls. Water	517 Bbls. Water	450 Bbls. Water

WELL LOG

FORMATION	Color	Hard or Soft	Top Feet	Bottom Feet	Remarks Including indication of all fresh and salt water, coal, oil and gas
Green Shale	Green		990	1018	
Shalet White Sand	White		1018	1395	
Sand	Gray		1395	1450	
Shale	Gray		1450	1475	
Sand	Gray		1475	1735	
Red Rock	Red		1735	1770	
Shale	Gray		1770	1795	
Lettle Lime	Gray		1795	1800	
Big Lime	White		1800	1900	
Big Injun	White & Gray		1900	2070	
Sandy Shale	Gray		2070	2130	
Shale	Gray		2130	2200	
Sand	Gray		2200	2325	
Shale	Gray		2325	2505	
Sand	Gray		2505	2545	
Shale	Gray		2545	2595	
Sand	Brown		2595	2630	
Shale	Gray		2630	2660	
Sand	Gray		2660	2690	
Shale	Gray		2690	2720	
Sand	Brown		2720	2755	
Shale	Gray		2755	3410	
Sand	Lt. Brown		3410	3440	
Shale	Gray		3440	3900	
Sand	Gray		3900	3930	
Shale	Gray		3930	4050	
Sand	Brown		4050	4080	
Shale	Gray		4080	4770	
Sand	Gray		4770	4835	
Shale	Gray		4835	5330	
Sand	Lt. Brown		5330	5360	
Shale	Gray		5360		
Total Depth				5972	

(Attach separate sheets as necessary)

CARNEGIE NATURAL GAS COMPANY
Well Operator

By Kenneth G. Dorsey
Its GEOLOGIST

NOTE: Regulation 2.01 (i) provides as follows:

"The term 'log' as used in this rule shall mean a systematic, detailed geologic record of all formations, including coal, encountered in the drilling of a well."

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Louie Gray
Chuck Smith

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WW-4-A
Revised 6/07

1) Date: February 11, 2016
2) Operator's Well Number
657241 (Barr #1848)
3) API Well No.: 47 (State) 103 (County) - 01229 (Permit)

STATE OF WEST VIRGINIA - BUREAU OF ENVIRONMENT
DIVISION OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL & GAS
NOTICE AND APPLICATION TO PLUG AND ABANDON WELL

4) Surface Owner(s) to be served:
(a) Name: Markwest Liberty Midstream & Resources LLC ✓
Address: 1515 Arapahoe Street
Suite 700
Denver, CO 80202

(b) Name:
Address:

(c) Name:
Address:

6) Inspector: Derek Haught
Address: P. O. Box 85
Smithville, WV 26178
Telephone: (304) 206-7613

5) (a) Coal Operator:
Name: None
Address:

(b) Coal Owner(s) with Declaration
Name: Murray Energy Corporation ✓
Attn: Alex O'Neill
Address: 46226 National Road
St. Clairsville, OH 43950

Name:
Address:

(c) Coal Lessee with Declaration
Name: None
Address:

TO THE PERSONS NAMED ABOVE: You should have received this Form and the following documents:

(1) The application to Plug and Abandon a Well on Form WW-4B, which sets out the parties involved in the work and describes the well its and the plugging work order; and
(2) The plat (surveyor's map) showing the well location on Form WW-6.

The reason you received these documents is that you have rights regarding the application which are summarized in the instructions on the reverses side. However, you are not required to take any action at all.

Take notice that under Chapter 22-6 of the West Virginia Code, the undersigned well operator proposes to file or has filed this Notice and Application and accompanying documents for a permit to plug and abandon a well with the Chief of the Office of Oil and Gas, West Virginia Division of Environmental Protection, with respect to the well at the location described on the attached Application and depicted on the attached Form WW-6. Copies of this Notice, the Application, and the plat have been mailed by registered or certified mail or delivered by hand to the person(s) named above (or by publication in certain circumstances) on or before the day of mailing or delivery to the Chief.

Well Operator: **EQT Production Company**
By: **Victoria J.Roark**
Its: **Permitting Supervisor**
Address: **PO Box 280**
Bridgeport, WV 26330
Telephone: **(304) 848-0076**

Subscribed and sworn before me this 17th day of February, 2016
Misty S. Christie Notary Public
My Commission Expires: 2/20/18

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Environmental Protection

The Office of Oil & Gas processes your personal information, such as name, address and phone number, as part of our regulatory duties. Your personal information may be disclosed to other State agencies or third parties in the normal course of business or as needed to comply with statutory or regulatory requirements, including Freedom of Information Act requests. Our office will appropriately secure your personal information. If you have any questions about our use of your personal information, please contact DEP's Chief Privacy Officer at depprivacyofficer@wv.gov.

OFFICIAL SEAL
STATE OF WEST VIRGINIA
NOTARY PUBLIC
Misty S Christie
1207 Briercliff Rd
Bridgeport, WV 26330
My Commission Expires February 20, 2018

10301229 P

WW-9
Revised 2/03

Page _____ of _____
2) Operator's Well Number
657241 (Barr #1848)
3) API Well No.: 47 103 - 01229

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL & GAS
CONSTRUCTION AND RECLAMATION PLAN AND SITE REGISTRATION APPLICATION FORM
GENERAL PERMIT FOR OIL AND GAS PIT WASTE DISCHARGE

Operator Name: EQT PRODUCTION COMPANY OP ID: _____
Watershed: North Fork Fishing Creek Quadrangle: Big Run 7.5'
Elevation: 855 ft. County: Wetzel District: Grant
Description of anticipated Pit Waste: **Formation Fluids**

Do you anticipate using more than 5,000 bbls of water to complete the proposed well work? Yes___ No X
Will synthetic liner be used in the pit? **Yes** Is so, what ml.? ~~**10 ml**~~ 20 mil minimum must be used TPA

Proposed Disposal Method for Treated Pit Wastes:
X Land Application
_____ Underground Injection - UIC Permit Number _____
_____ Reuse (at API Number) _____
_____ Offsite Disposal Permit #.
_____ Other: Explain _____

Drilling medium anticipated for this well? Air, freshwater, oil based, etc. _____
If oil based, what type? Synthetic, petroleum, etc.
Additives to be used? _____

Will closed loop system be used? _____
Drill Cuttings disposal method? Leave in pit, landfill, remove offsite, etc. _____
If left in pit and plan to solidify what medium will be used? Cement, Lime, sawdust _____
Landfill or offsite name/permit number? _____

I certify that I understand and agree to the terms and conditions of the GENERAL WATER POLLUTION PERMIT issued on August 1, 2005, by the Office of Oil and Gas of the West Virginia Division of Environmental Protection. I understand that the provisions of the permit are enforceable by law. Violations of any terms or condition of the general permit and/or other applicable law or regulation can lead to enforcement action.
I certify under penalty of law that I have personally examined and am familiar with the information submitted on this application form and all attachments thereto 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. I am aware that there are significant penalties for submitting false information, including the possibility of fine or imprisonment.

Company Official Signature _____
Company Official (Typed or Printed) Victoria Roark
Company Official Title Permitting Supervisor-WV
Subscribed and sworn before me this 14th day of February, 2016

_____ Notary Public
My Commission Expires 2/20/18

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STATE OF WEST VIRGINIA
NOTARY PUBLIC
Misty S Christie
1207 Briercliff Rd
Bridgeport, WV 26330
My Commission Expires February 20, 2018

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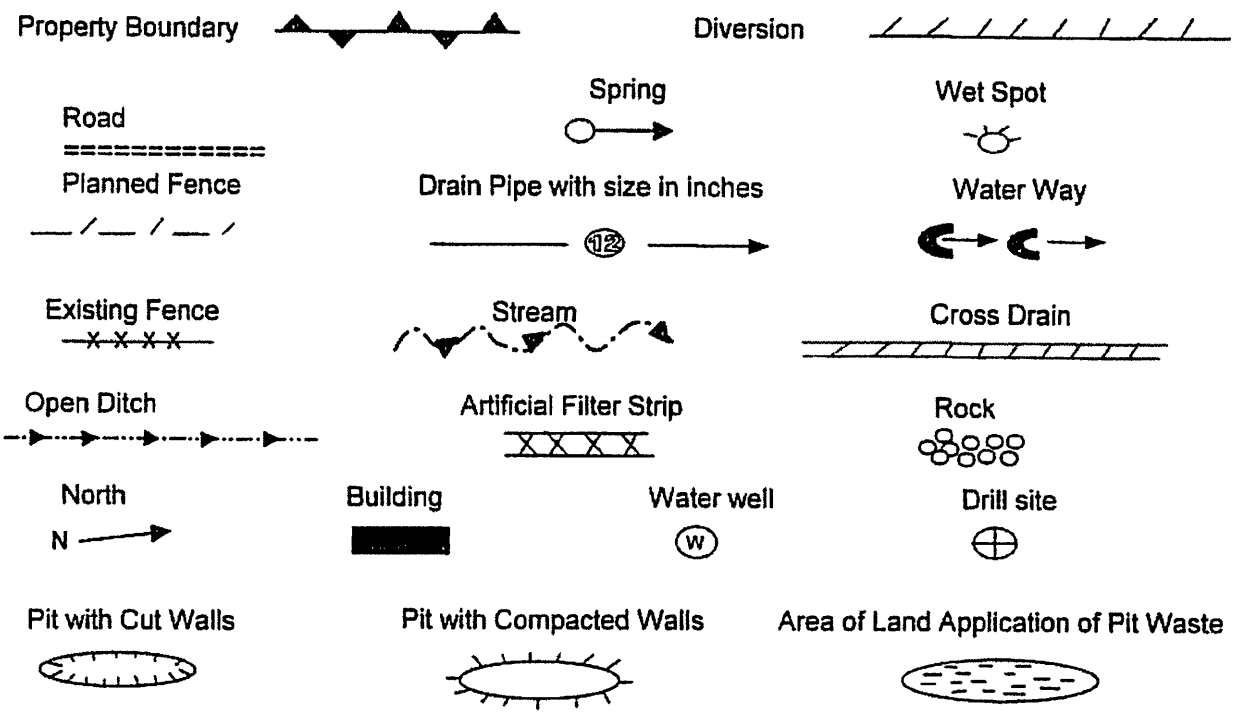
OPERATOR'S WELL NO.:
657241 (Barr #1848)

LEGEND



Proposed Revegetation Treatment: Acres Disturbed: 1± Prevegetation pH _____

Lime 3 Tons/acre or to correct to pH 6.5

Fertilizer (10-20-20) or equivalent 1/3 ton lbs/acre (500 lbs minimum)

Mulch 2 Tons/acre or hydroseed.

SEED MIXTURES

Area I		Area II	
Seed Type	**lbs/acre**	**Seed Type**	**lbs/acre**
Red Fescue	40	Red Fescue	15
Alsike Clover	5	Alsike Clover	5
Annual Rye	15		

ATTACH:

Drawing(s) of road, location, pit and proposed area for land application.

Photocopies section of involved 7.5' topographic sheet.

Plan approved by: _____

Comments: _____

Title: Oil & Gas Inspector Date: 2-15-11

Field Reviewed? ✓ Yes _____ No

10301 229 P

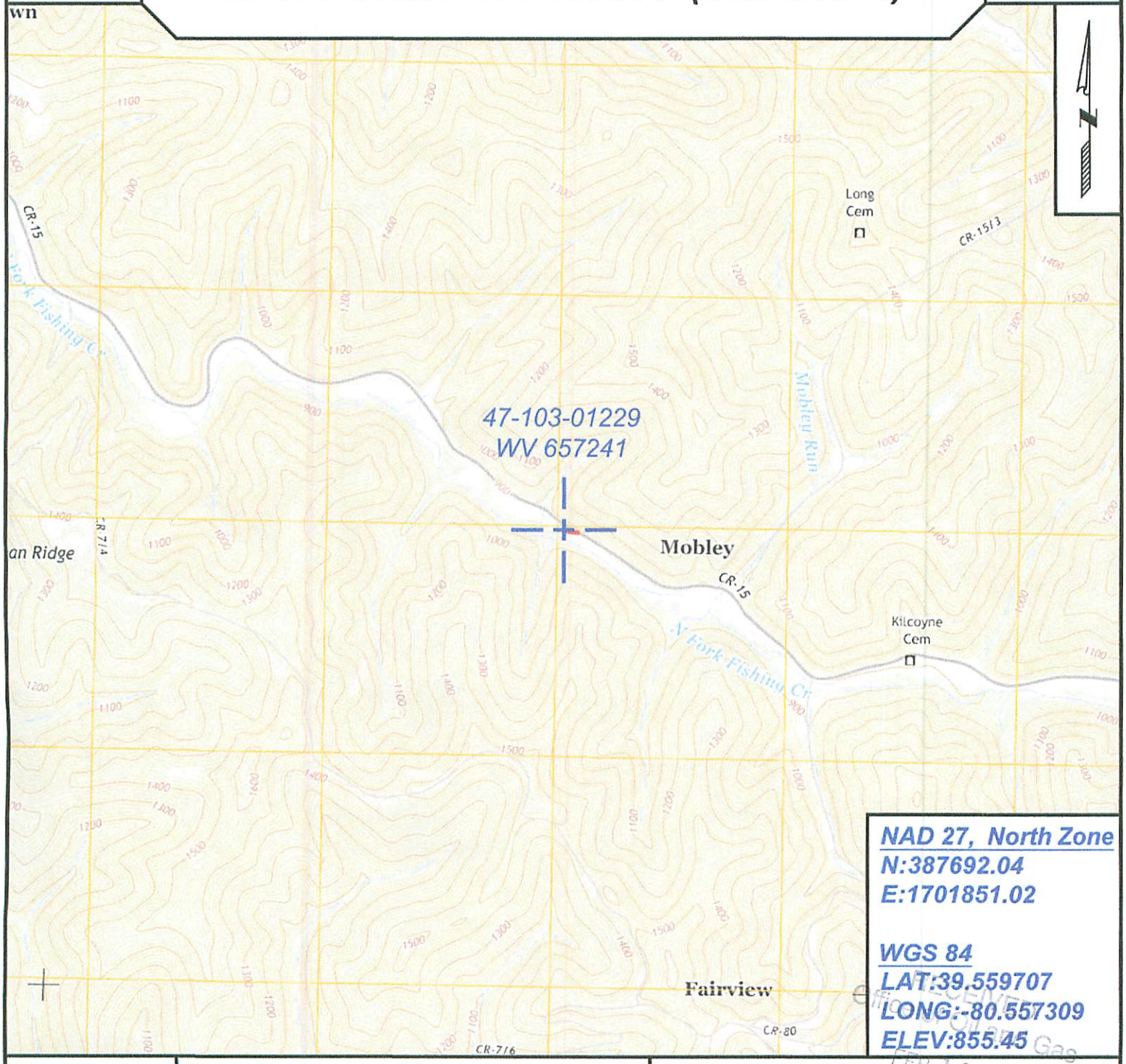
Topo Quad: Big Run 7.5' **Scale:** 1" = 2000'

County: Wetzel **Date:** January 29, 2016

District: Grant **Project No:** 40-34-00-09

47-103-01229 WV 657241 (Barr #1848)

Topo



NAD 27, North Zone
N:387692.04
E:1701851.02

WGS 84
LAT:39.559707
LONG:-80.557309
ELEV:855.45

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SURVEYING AND MAPPING SERVICES PERFORMED BY:

ALLEGHENY SURVEYS, INC.

1-800-482-8606
237 Birch River Road
Birch River, WV 26610
PH: (304) 649-8606
FAX: (304) 649-8608

PREPARED FOR:

EQT Production Company

P.O. Box 280
Bridgeport, WV 26330

103 01 229 P

WW-7
8-30-06

West Virginia Department of Environmental Protection
Office of Oil and Gas
WELL LOCATION FORM: GPS

API: 47-103-01229 **WELL NO.:** WV 657241 (Barr #1848)

FARM NAME: S. J. Kilcoyne Estate

RESPONSIBLE PARTY NAME: EQT Production Company

COUNTY: Wetzel **DISTRICT:** Grant

QUADRANGLE: Big Run 7.5'

SURFACE OWNER: Markwest Liberty Midstream and Resources LLC

ROYALTY OWNER: CNX Gas Company LLC

UTM GPS NORTHING: 4378984

UTM GPS EASTING: 538030 **GPS ELEVATION:** 261 m (855 ft)

The Responsible Party named above has chosen to submit GPS coordinates in lieu of preparing a new well location plat for a plugging permit or assigned API number on the above well. The Office of Oil and Gas will not accept GPS coordinates that do not meet the following requirements:

1. Datum: NAD 1983, Zone: 17 South, Coordinate Units: meters, Altitude: height above mean sea level (MSL) – meters.
2. Accuracy to Datum – 3.05 meters
3. Data Collection Method:

Survey grade GPS ____: Post Processed Differential ____
Real-Time Differential ____
Mapping Grade GPS X: Post Processed Differential X
Real-Time Differential ____

4. **Letter size copy of the topography map showing the well location.**

I the undersigned, hereby certify this data 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 Office of Oil and Gas.

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WV Department of Environmental Protection

Stacy O'Brien — Signature
PS # 2180 — Title
2/2/16 — Date

10301229P

POTENTIAL WATER SAMPLE DATA SHEET

CLIENT: EQT PRODUCTION COMPANY.
LEASE NAME AND WELL No. Barr #1848 - WV 657241 - API No. 47-103-01229.

POTENTIAL SAMPLE LOCATIONS

Site: 1 Spacing: 384 +/- Owner: EQT Production Company.
Address: 1710 Pennsylvania Avenue, Charleston, WV 25302. Phone No. .
Comments: Gas well on this property.

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BIRCH RIVER OFFICE
237 Birch River Road
Birch River, WV 26610
phone: 304-649-8606
fax: 304-649-8608

BRIDGEPORT OFFICE
172 Thompson Drive
Bridgeport, WV 26330
phone: 304-848-5035
fax: 304-848-5037

ALUM CREEK OFFICE
P.O. Box 108 • 1413 Childress Rd
Alum Creek, WV 25003
phone: 304-756-2949
fax: 304-756-2948

MARTINSBURG OFFICE
25 Lights Addition Drive
Martinsburg, WV 25404
phone: 304-901-2162
fax: 304-901-2182

ALLEGHENYSURVEYS.COM

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Topo Quad: Big Run 7.5' **Scale:** 1" = 2000'

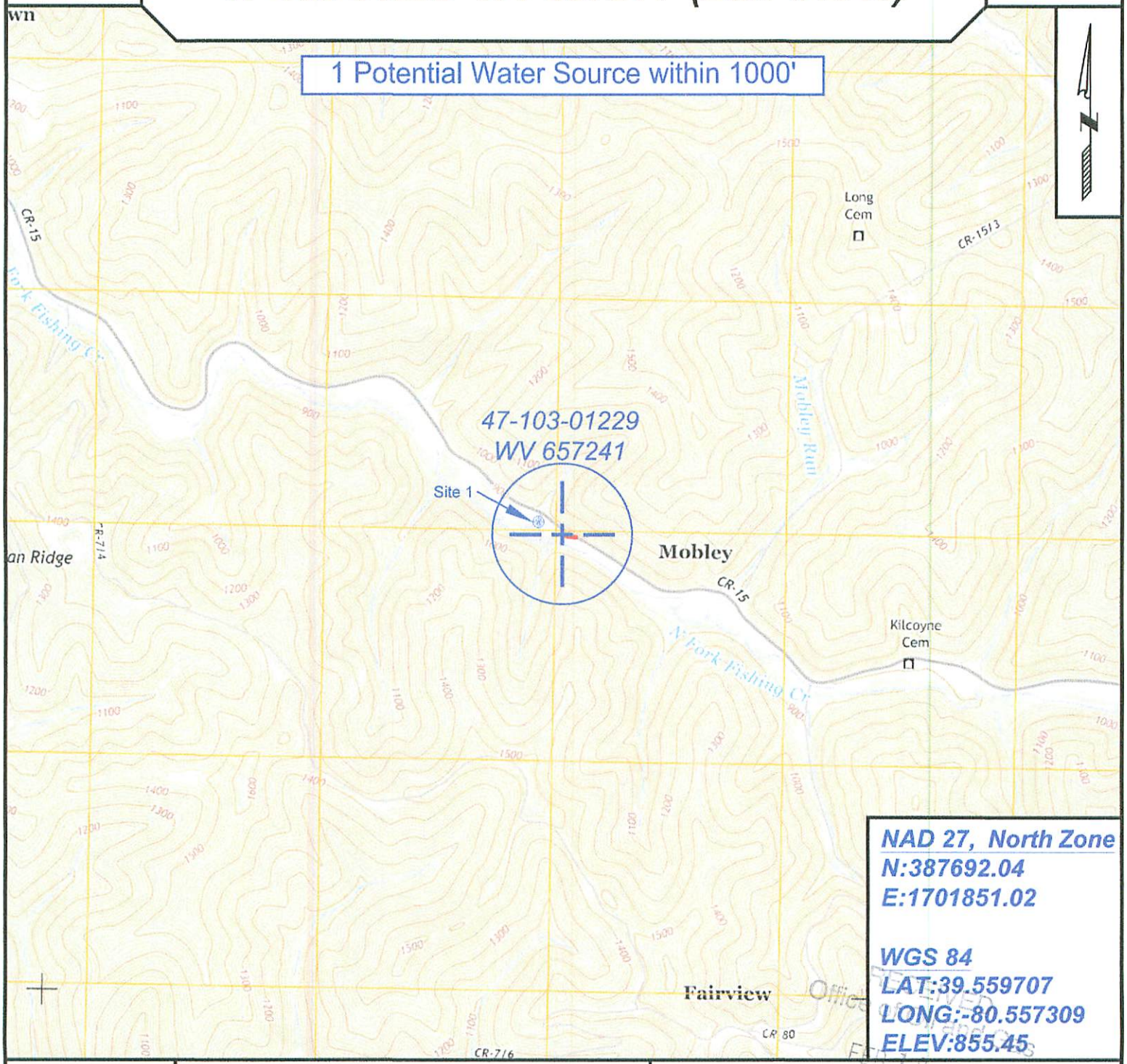
County: Wetzel **Date:** January 29, 2016

District: Grant **Project No:** 40-34-00-09

Water

47-103-01229 WV 657241 (Barr #1848)

1 Potential Water Source within 1000'



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