

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

API 47-049-02347 County MARION District MANNINGTON
Quad GLOVER GAP. WW Pad Name GLO76 Field/Pool Name _____
Farm name ROBERT E. TONKERY Well Number 514746
Operator (as registered with the OOG) EQT Production Company
Address 625 Liberty Ave. EQT Plaza, Suite 1700 City Pittsburgh State PA Zip 15222

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey
Top hole Northing 4,379,500 Easting 543,857
Landing Point of Curve Northing 4,379,372 Easting 544,403
Bottom Hole Northing 4,378,634 Easting 544,796

Elevation (ft) 1424' 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)
Water base Mud 12.4 ppg barium sulfate, sodium chloride, xanthan gum, polyanionic cellulose, modified starch, sodium hydroxide, phosphonates and alkyl phosphates, glutaraldehyde solution, calcium hydroxide, partially hydrolyzed polyacrylamide/polyacrylate, potassium chloride, sodium carbonate, ground walnut shells, alcohol and modified fatty acid, ferrochrome lignosulfonate, calcium carbonate, fibrous cellulose

Date permit issued 10/15/2014 Date drilling commenced 7/16/2015 Date drilling ceased 12/8/2015
Date completion activities began 2/3/2016 Date completion activities ceased 2/7/2016
Verbal plugging (Y/N) N Date permission granted N/A Granted by N/A

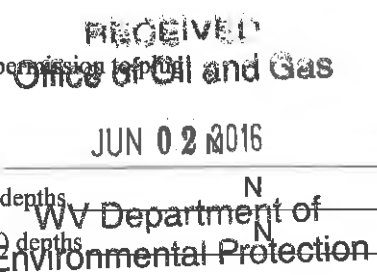
Please note: Operator is required to submit a plugging application within 5 days of verbal permission to plug.

Freshwater depth(s) ft 263 Open mine(s) (Y/N) depths JUN 02 2016
Salt water depth(s) ft 1883,2123,2438 Void(s) encountered (Y/N) depths N
Coal depth(s) ft 652,808,1067,1166 Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) N

Reviewed by: _____

APPROVED
NAME: Jackie Thornton
DATE: 9/22/16

10/28/2016



API 47-049 - 02347

Farm name **ROBERT E. TONKERY**

Well number **514746**

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	24"	20"	40'	NEW	A-500	N/A	Y
Surface	17 1/2"	13 3/8"	960'	NEW	J-55	121'	Y
Coal							
Intermediate 1	12 3/8"	9 5/8"	3,055'	NEW	A-500	1969'	Y
Intermediate 2							
Intermediate 3							
Production	8 1/2"	5 1/2"	11,387'	NEW	P-110	NA	N
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	CLASS A	38	15.6	1.18	44.84	0	8
Surface	CLASS A	751	15.6	1.20	901.2	0	8
Coal							
Intermediate 1	CLASS A / CLASS A	936 / 194	15.6 / 15.6	1.18 / 1.20	1,337.28	0	8
Intermediate 2							
Intermediate 3							
Production	CLASS H / CLASS H	1,617 / 420	15.2 / 15.6	1.07 / 1.84	2,503	2,293'	24+
Tubing							

Drillers TD (ft) 11,398' Loggers TD (ft) N/A
 Deepest formation penetrated MARCELLUS Plug back to (ft) N/A
 Plug back procedure N/A

Kick off depth (ft) 5,570'

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 CONDUCTOR: NONE

SURFACE: 3 CENTRALIZERS EVERY 500'
 INTERMEDIATE: 7 CENTRALIZERS EVERY 500'
 PRODUCTION: Composite body spiral centralizers installed every joint from bottom to 2,969 ft.

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WAS WELL COMPLETED AS SHOT HOLE Yes No DETAILS _____

JUN 02 2016

WAS WELL COMPLETED OPEN HOLE? Yes No DETAILS _____

WV Department of
Environmental Protection

WERE TRACERS USED Yes No TYPE OF TRACER(S) USED _____

10/28/2016

API 47- 049 - 02347 Farm name ROBERT E. TONKERY Well number 514746

Drilling Contractor Pioneer Drilling Services
Address 1083 North 88 Road City Rices Landing State PA Zip 15357

Logging Company Pro Directional
Address 750 Conroe Park North Dr. City Conroe State TX Zip 77303

Logging Company _____
Address _____ City _____ State _____ Zip _____

Cementing Company C&J Energy Services (Nabors)
Address 2504 Smith Creek Road City Waynesburg State PA Zip 15370

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514746 Final Formations (API #47-04902347)

Formation Name	Final Top MD (ftGL) (ft)	Final Top TVD (ft)	Final Btm MD (ftGL) (ft)	Final Btm TVD (ft)
SAND/SHALE	1	1	662	662
WASHINGTON	662	662	664	664
SAND/SHALE	664	664	818	818
WAYNESBURG	818	818	820	820
SAND/SHALE	820	820	1,077.00	1,077.00
SEWICKLEY	1,077.00	1,077.00	1,080.00	1,080.00
SAND/SHALE	1,080.00	1,080.00	1,176.00	1,176.00
PITTSBURGH	1,176.00	1,176.00	1,183.00	1,183.00
SAND/SHALE	1,183.00	1,183.00	2,146.00	2,146.00
MAXTON	2,146.00	2,146.00	2,183.00	2,183.00
SAND/SHALE	2,183.00	2,183.00	2,293.00	2,293.00
BIG LIME	2,293.00	2,293.00	2,362.00	2,362.00
SAND/SHALE	2,362.00	2,362.00	2,457.00	2,457.00
BIG INJUN	2,457.00	2,457.00	2,612.00	2,612.00
SAND/SHALE	2,612.00	2,612.00	2,730.00	2,730.00
WEIR	2,730.00	2,730.00	2,750.00	2,750.00
SAND/SHALE	2,750.00	2,750.00	2,938.00	2,938.00
GANTZ	2,938.00	2,938.00	3,097.00	3,097.00
50F	3,097.00	3,097.00	3,253.00	3,253.00
GORDON	3,253.00	3,253.00	3,381.00	3,381.00
BAYARD	3,381.00	3,381.00	3,863.00	3,863.00
WARREN	3,863.00	3,863.00	4,084.00	4,084.00
SPEECHLEY	4,084.00	4,084.00	4,446.00	4,446.00
BALLTOWN A	4,446.00	4,446.00	4,969.00	4,969.00
RILEY	4,969.00	4,969.00	5,528.00	5,528.00
BENSON	5,528.00	5,528.00	5,914.00	5,914.00
ALEXANDER	5,914.00	5,914.00	7,156.00	7,156.00
RHINESTREET	7,156.00	7,156.00	7,218.00	7,218.00
SONYEA	7,218.00	7,218.00	7,380.00	7,380.00
MIDDLESEX	7,380.00	7,380.00	7,433.00	7,433.00
GENESSEE	7,433.00	7,433.00	8,124.00	7,563.70
GENESE0	8,124.00	7,563.70	8,175.00	7,594.80
TULLY	8,175.00	7,594.80	8,222.00	7,621.50
HAMILTON	8,222.00	7,621.50	8,469.00	7,721.60
MARCELLUS	8,469.00	7,721.60		

514746- 47-049-02347-0000 - Perforations

Stage Number	Perforation Date	Top Perf Depth (ftKB)	Bottom Perf Depth (ftKB)	Number of Shots	Formation
Initiation Sleeve	12/18/2015	11,386	11,387	10	MARCELLUS
1	2/4/2016	11,240	11,332	32	MARCELLUS
2	2/4/2016	11,090	11,212	40	MARCELLUS
3	2/5/2016	10,940	11,059	40	MARCELLUS
4	2/5/2016	10,792	10,912	40	MARCELLUS
5	2/5/2016	10,640	10,762	40	MARCELLUS
6	2/5/2016	10,490	10,612	40	MARCELLUS
7	2/6/2016	10,340	10,462	40	MARCELLUS
8	2/6/2016	10,190	10,312	40	MARCELLUS
9	2/6/2016	10,040	10,158	40	MARCELLUS
10	2/6/2016	9,890	10,012	40	MARCELLUS
11	2/6/2016	9,743	9,862	40	MARCELLUS
12	2/6/2016	9,590	9,712	40	MARCELLUS
13	2/7/2016	9,440	9,562	40	MARCELLUS
14	2/7/2016	9,290	9,412	40	MARCELLUS
15	2/7/2016	9,140	9,258	40	MARCELLUS
16	2/7/2016	8,990	9,110	40	MARCELLUS
17	2/7/2016	8,840	8,962	40	MARCELLUS
18	2/7/2016	8,692.00	8,812.00	40	MARCELLUS
19	2/7/2016	8,540.00	8,662.00	40	MARCELLUS

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514746 47-049-02347-0000 - Stimulated Stages

Stage Number	Stimulation 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)
Initiation Sleeve	2/3/2016	15	6,117	7,667	5,157	0	503	0
1	2/4/2016	99.1	8,561	8,768	4,256	237,509.00	6,212	0
2	2/5/2016	98.4	8,831	9,184	4,941	249,160.00	6,713	0
3	2/5/2016	86.3	9,147	9,386	4,999	251,980.00	6,303	0
4	2/5/2016	84.9	9,161	9,378	5,428	252,140.00	6,042	0
5	2/5/2016	93.8	9,201	9,398	4,887	251,679.00	6,455	0
6	2/5/2016	88.2	9,184	9,402	4,688	251,070.00	6,438	0
7	2/6/2016	91.1	9,247	9,342	4,872	250,485.00	5,958	0
8	2/6/2016	82.7	9,252	9,339	4,890	249,340.00	5,790	0
9	2/6/2016	93.6	9,224	9,352	4,509	253,440.00	5,951	0
10	2/6/2016	94.9	9,240	9,365	4,655	251,090.00	5,957	0
11	2/6/2016	97.4	9,209	9,372	4,716	251,869.00	5,863	0
12	2/6/2016	100.5	8,391	9,055	4,897	251,620.00	6,025	0
13	2/7/2016	100.9	8,443	9,024	4,978	250,180.00	5,848	0
14	2/7/2016	100.5	8,777	9,215	5,390	248,880.00	5,587	0
15	2/7/2016	100.4	8,756	9,094	5,161	249,880.00	5,576	0
16	2/7/2016	93.8	9,219	9,361	5,329	249,920.00	5,633	0
17	2/7/2016	86.1	9,168	9,410	4,939	248,357.00	5,789	0
18	2/7/2016	99	9,123	9,379	4,843	253,030.00	5,807	0
19	2/7/2016	95.5	8,982	9,242	4,918	250,400.00	5,849	0

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10/28/2016

Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date	2/3/2016
Job End Date	2/7/2016
State	West Virginia
County	Marion
API Number	47-049-02347-00-00
Operator Name	EQT Production
Well Name and Number	514746
Longitude	-80 48963300
Latitude	39 56398900
Datum	NAD83
Federal/Tribal Well	NO
True Vertical Depth	7,722
Total Base Water Volume (gal)	4,800,556
Total Base Non Water Volume	0



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	Keane Group	Carrier/Base Fluid	Water	7732-18-5	100.00000	89.13235	None
Sand (Proppant)	Keane Group	Proppant	Silica Substrate	14808-60-7	100.00000	10.57296	None
Hydrochloric Acid (15%)	Keane Group	Acidizing	Hydrochloric Acid	7647-01-0	15.00000	0.03328	None
FFR760	Keane Group	Friction Reducer	Hydroretarded Paint Distillate	64742-47-8	30.00000	0.0213	None
			Alkyl Alcohol	Proprietary	10.00000	0.00710	None
			Oxyalkylated Alcohol A	Proprietary	5.00000	0.00355	None
AI 600	Keane Group	Corrosion Inhibitor	Ethylene Glycol	107-21-1	40.00000	0.00022	None
			Dimethylformamide	68-12-2	20.00000	0.00011	None
			Pyridine, alkyl derivatives, branched	68909-18-2	15.00000	0.00008	None
			Nonyl Phenol Ethoxylate, Branched	127087-87-0	15.00000	0.00003	None
			Cinnamialdehyde	104-55-2	15.00000	0.00008	None
			1-Decanol	112-30-1	5.00000	0.00003	None
			2-Butoxyethanol	111-76-2	5.00000	0.00003	None

	1-Octanol	111-87-5	5.00000	0.00003	None
	Triethyl Phosphate	78-40-0	2.50000	0.00001	None
	Methanol	67-56-1	2.50000	0.00003	None
	Alkyl Pyridine	68391-11-7	1.00000	0.00001	None
EC633CA	Scale Inhibitor				
	Ethylene Glycol	107-21-1	5.00000	0.00006	None
	Sodium Phosphate, Tribasic	7601-54-9	5.00000	0.00006	None
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)

WV 514746
EQT Production Company
Bower et al LEASE
111.0 Acres ±

Lease No.	Acres	Owner
300884	79	Richard G. Thorne et. al.
993296	35	Rennie David Starkey
991928	34.5	Kennie S. Kettner Jr. et al.
993303	108.5	East Resources Inc. et al.

Latitude: 39° 35' 00"

WV 514746 Well Point Coordinates

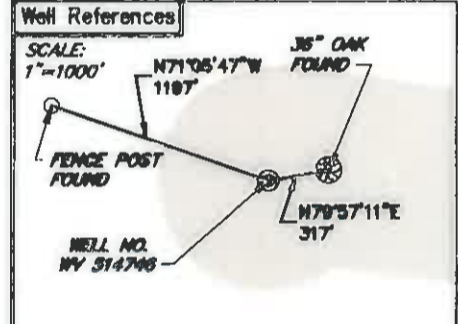
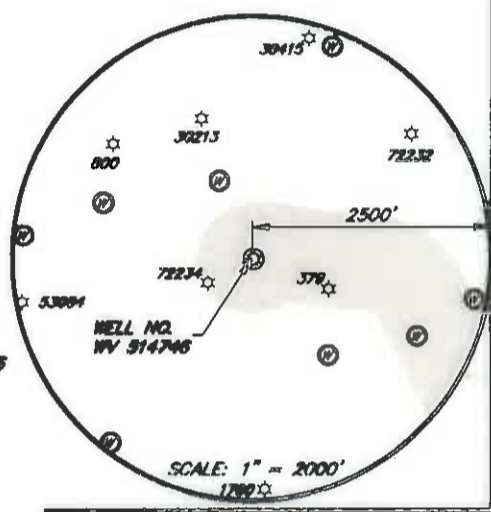
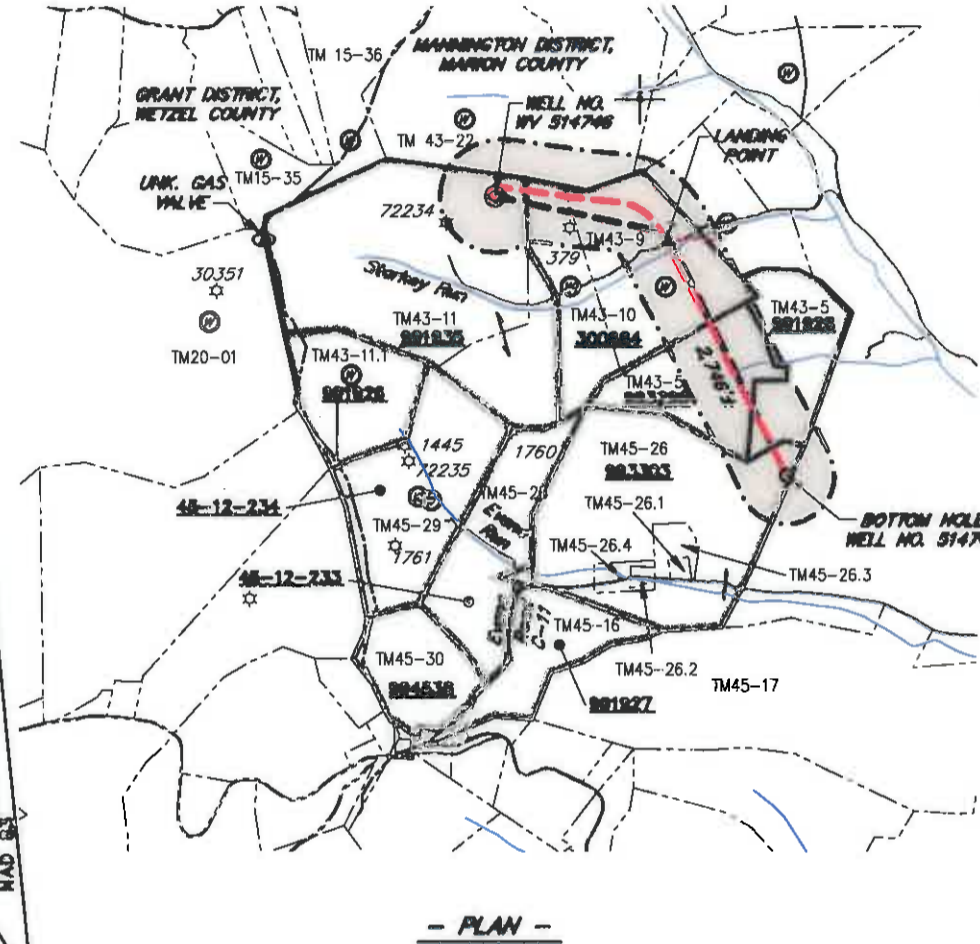
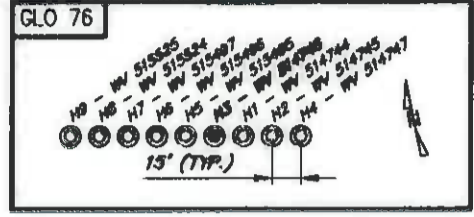
Top Hole Coordinates		
NAD 27 S.P.C. (F.)	N: 388,963.632	E: 1,721,006.643
NAD 27 GRS	LAT: 39.563998	LONG: 81.489594
NAD 83 UTM 17N (M)	N 4,379,439.8	E: 543,858.9
NAD 83 S.P.C. (F.)	N 389,301.3	E: 1,699,561.9
Landing Point Coordinates		
NAD 27 S.P.C. (F.)	N: 388,614.061	E: 1,722,785.305
NAD 27 GRS	LAT: 39.562808	LONG: 81.483286
NAD 83 UTM 17N (M)	N 4,379,372.0	E: 544,402.9
NAD 83 S.P.C. (F.)	N 388,682.3	E: 1,691,346.6
Bottom Hole Coordinates		
NAD 27 S.P.C. (F.)	N: 388,169.552	E: 1,724,036.215
NAD 27 GRS	LAT: 39.556134	LONG: 81.478735
NAD 83 UTM 17N (M)	N 4,378,638.5	E: 544,798.4
NAD 83 S.P.C. (F.)	N 388,207.1	E: 1,692,397.4

Longitude: 80° 27' 30"

LEGEND

- ☆ EXISTING OIL/GAS WELL
- ⊙ WATER FEATURE
- ⊙ WELL HEAD TOP HOLE
- ⊙ WELL LANDING POINT
- ⊙ WELL BOTTOM HOLE
- REBAR FOUND
- STONE FOUND
- - - DRILLED LATERAL LINE
- - - PERMITTED LATERAL LINE
- - - LEASE BOUNDARY
- - - BUFFER
- - - PROPERTY LINE
- - - STREAM
- - - 300' LATERAL COLLECTION

Coordinate Notes
West Virginia Coordinate System of 1927 (North Zone) Based upon Differential GPS Measurements.
Flat orientation, Corner and well ties are based upon the grid north meridian.
Well location references are based upon the grid north meridian.
UTM Coordinates are NAD83, Zone 17 Meters.



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



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

William J. Whitman, II



FILE NO.: EES-60635
DRAWING NO.: GLO76 Well Plat
SCALE: 1" = 2000'
MINIMUM DEGREE OF ACCURACY: ±3'
PROVEN SOURCE OF ELEVATION: GPS

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

DATE: APRIL 18, 2016
OPERATORS WELL NO. WV 514746
API WELL NO. 47 049 02347
STATE COUNTY PERMIT

WELL TYPE: OIL GAS LIQUID INJECTION WASTE DISPOSAL (IF GAS) PRODUCTION: STORAGE DEEP SHALLOW
LOCATION: ELEVATION: 1424' (Ground) 1455' (Prop.) WATERSHED: Starkey Run QUADRANGLE: GLO76 2016
DISTRICT: MANNINGTON COUNTY: Marion
SURFACE OWNER: Robert E. Tonkery ACREAGE: 111.00± AC
ROYALTY OWNER: Lynn Ann Brower, et al LEASE NO.: 991935 ACREAGE: 111.00± AC
PROPOSED WORK: DRILL CONVERT DRILL DEEPER FRACTURE OR STIMULATE PLUG OFF SHUT-IN
 PERFORATE NEW FORMATION OTHER PHYSICAL CHANGE IN WELL (SPECIFY)
 PLUG AND ABANDON CLEAN OUT AND REPLUG TARGET FORMATION: MARCELLUS ESTIMATED DEPTH: 7,640'

WELL OPERATOR: EQT Production Company DESIGNATED AGENT: Rex C. Roy
ADDRESS: 115 Professional Pl. P.O. Box 280 ADDRESS: 115 Professional Pl. P.O. Box 280
Bridgeport, WV 26330 Bridgeport, WV 26330

WWW.ENCOMPASSSERVICES.COM PLAT DATE: 4/19/2016 CAD FILE: GLO76_WELL PLAT_2016-04-18.DWG