



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

November 14, 2014

WELL WORK PERMIT
Rework/Horizontal 6A Well

This permit, API Well Number: 47-5101568, issued to GASTAR EXPLORATION INC., 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.

Please be advised that form WR-35, Well Operators Report of Well Work is to be submitted to this office within 90 days completion of permitted well work, as should form WR-34 Discharge Monitoring Report within 30 days of discharge of pits, if applicable. Failure to abide by all statutory and regulatory provisions governing all duties and operations hereunder may result in suspension or revocation of this permit and, in addition, may result in civil and/or criminal penalties being imposed upon the operators.

In addition to the applicable requirements of this permit, and the statutes and rules governing oil and gas activity in WV, this permit may contain specific conditions which must be followed. Permit conditions are attached to this cover letter.

Per 35CSR-4-5.2.g this permit will expire in two (2) years from the issue date unless permitted well work is commenced. If there are any questions, please feel free to contact me at (304) 926-0499 ext. 1654.

James Martin
Chief

Operator's Well No: HOYT-NORTH NO. 1H
Farm Name: SHIELDS, ROBERT L REBECCA A
API Well Number: 47-5101568
Permit Type: Rework/Horizontal 6A Well
Date Issued: 11/14/2014

Promoting a healthy environment.

PERMIT CONDITIONS

West Virginia Code § 22-6A-8(d) 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. Prior to initiation of any fracturing operations, the operator shall establish a minimum break-down and surface treatment pressure to assist in identification of possible geologic anomalies which could create a communication conduit and an adverse impact. Pressures, encountered during operations, which are below the established thresholds, will require an immediate shut-down. The operator shall contact the oil and gas inspector and initiate emergency flow back procedures.
2. This proposed activity may require permit coverage from the United States Army Corps of Engineers (USACE). Through this permit, you are hereby being advised to consult with USACE regarding this proposed activity.
3. If the operator encounters an unanticipated void, or an anticipated void at an unanticipated depth, the operator shall notify the inspector within 24 hours. Modifications to the casing program may be necessary to comply with W. Va. Code § 22-6A-5a (12), which requires drilling to a minimum depth of thirty feet below the bottom of the void, and installing a minimum of twenty (20) feet of casing. Under no circumstance should the operator drill more than fifty (50) feet below the bottom of the void or install less than twenty (20) feet of casing below the bottom of the void.
4. When compacting fills, each lift before compaction shall not be more than 12 inches in height, and the moisture content of the fill material shall be within limits as determined by the Standard Proctor Density test of the actual soils used in specific engineered fill, ASTM D698, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort, to achieve 95 % compaction of the optimum density. Each lift shall be tested for compaction, with a minimum of two tests per lift per acre of fill. All test results shall be maintained on site and available for review.
5. Operator shall install signage per § 22-6A-8g (6) (B) at all source water locations included in their approved water management plan within 24 hours of water management plan activation.
6. Oil and gas water supply wells will be registered with the Office of Oil and Gas and all such wells will be constructed and plugged in accordance with the standards of the Bureau for Public Health set forth in its Legislative rule entitled *Water Well Regulations*, 64 C.S.R. 19. Operator is to contact the Bureau of Public Health regarding permit requirements. In lieu of plugging, the operator may transfer the well to the surface owner upon agreement of the parties. All drinking water wells within fifteen hundred feet of the water supply well shall be flow tested by the operator upon request of the drinking well owner prior to operating the water supply well.
7. Pursuant to the requirements pertaining to the sampling of domestic water supply wells/springs the operator shall, no later than thirty (30) days after receipt of analytical data provide a written copy to the Chief and any of the users who may have requested such analyses.

PERMIT CONDITIONS

8. If any explosion or other accident causing loss of life or serious personal injury occurs in or about a well or well work on a well, the well operator or its contractor shall give notice, stating the particulars of the explosion or accident, to the oil and gas inspector and the Chief, within 24 hours of said accident.
9. During the casing and cementing process, in the event cement does not return to the surface, the oil and gas inspector shall be notified within 24 hours.
10. Operator shall provide the Office of Oil & Gas notification of the date that drilling commenced on this well. Such notice shall be provided by sending an email to DEPOOGNotify@wv.gov within 30 days of commencement of drilling.

4705101568

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
WELL WORK PERMIT APPLICATION

1) Well Operator: Gastar Exploration Inc. 494487685 Marshall Franklin Powhatan Point 7.5'
Operator ID County District Quadrangle

2) Operator's Well Number: Hoyt-North 1H Well Pad Name: Hoyt

3) Farm Name/Surface Owner: Robert L. & Rebecca Shields and Donald Shields Public Road Access: Burch Ridge Co. Rt. 29

4) Elevation, current ground: 1368' Elevation, proposed post-construction: 1368'

5) Well Type (a) Gas Oil Underground Storage
Other

(b) If Gas Shallow Deep
Horizontal

ju 8/28/14

6) Existing Pad: Yes or No Yes

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Associated Pressure(s):
The Marcellus is the target formation at at depth of 6,597' (top of formation), an anticipated thickness of 55' and a pressure of 3000 psi.

8) Proposed Total Vertical Depth: 6,752'

9) Formation at Total Vertical Depth: Onondaga

10) Proposed Total Measured Depth: 11,943'

11) Proposed Horizontal Leg Length: 4395'

12) Approximate Fresh Water Strata Depths: 60'

13) Method to Determine Fresh Water Depths: Gastar has drilled several wells in this area

14) Approximate Saltwater Depths: 2000'

15) Approximate Coal Seam Depths: 932' & 1160'

16) Approximate Depth to Possible Void (coal mine, karst, other): N/A

17) Does Proposed well location contain coal seams directly overlying or adjacent to an active mine? Yes No

(a) If Yes, provide Mine Info: Name: _____
Depth: _____
Seam: _____
Owner: _____

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18)

CASING AND TUBING PROGRAM

<u>TYPE</u>	<u>Size</u>	<u>New or Used</u>	<u>Grade</u>	<u>Weight per ft. (lb/ft)</u>	<u>FOOTAGE: For Drilling</u>	<u>INTERVALS: Left in Well</u>	<u>CEMENT: Fill-up (Cu. Ft.)</u>
Conductor	20"	New	A500	52.75 #/ft		120'	Cemented to Surface
Fresh Water	13 3/8"	New	H-40	48 #/ft		1282'	Cemented to Surface
Coal							
Intermediate	9 5/8"	New	J-55	36 #/ft		2631'	Cemented to Surface
Production	5 1/2"	New	P-110	20 #/ft		11,943'	Cement to Surface
Tubing	2 3/8"	New	N-80	4.7 #/ft		6,950'	
Liners							

Well Drilled to 6302' with an 8 7/8" hole

JU 8/28/14

<u>TYPE</u>	<u>Size</u>	<u>Wellbore Diameter</u>	<u>Wall Thickness</u>	<u>Burst Pressure</u>	<u>Cement Type</u>	<u>Cement Yield (cu. ft./k)</u>
Conductor	20"	30"	.25"	880 psi	See #24	1.2
Fresh Water	13 3/8"	17 1/2"	.33"	1730 psi	See #24	1.2
Coal						
Intermediate	9 5/8"	12 1/4"	.352"	3520 psi	See #24	1.2
Production	5 1/2"	8 7/8" & 8 3/4"	.361"	12,640 psi	See #24	1.21
Tubing	2 3/8"		.19"	11,200 psi		
Liners						

PACKERS

Kind:	n/a			
Sizes:	n/a			
Depths Set:	n/a			

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19) Describe proposed well work, including the drilling and plugging back of any pilot hole:

Well has been drilled to KOP at 6302 Drill through the Marcellus tagging less than One Hundred (100') feet from the top of the Onondaga to get depths and log data. Then plug the well back to proposed kick off point (6302'). Drill the curve and horizontal section to planned and proposed TD. Run casing and cement back to surface. Run a bond log on part of the curve and vertical section, pressure test casing and set a master valve. Make a clean out run on the casing and perforate then stimulate.

20) Describe fracturing/stimulating methods in detail, including anticipated max pressure and max rate:

Gastar Exploration plans to fracture the well using a typical slickwater fracture design. Gastar will pump roughly 5700bbls of water and 200,000 lbs of sand per stage. There will be approximately 21 stages on the fracturing job.

Anticipated maximum surface pressure while fracing will be approximately 8500 psi with an anticipated maximum rate of 90 bbls/min.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 5.24 (Wastewater pit and stockpile area)

22) Area to be disturbed for well pad only, less access road (acres): 0 (Well pad is existing)

23) Describe centralizer placement for each casing string:

Surface String Centralizers at 841', 564' & 284'. Basket is at 80'.
Intermediate String Centralizers at 2381', 2098', 1803', 1523', 1240', 953', 673', 393' & 116'. Basket at 81'.
The production casing will have one centralizer every other joint in the lateral, one centralizer per joint through the curve and one centralizer every other joint in the the vertical section.

24) Describe all cement additives associated with each cement type:

See attached.

25) Proposed borehole conditioning procedures:

Gastar will circulate the hole a minnimum of 3 hours upon TD. We will then pull out to the bottom of the curve and circulate for another 2 hours. Then come out of the hole.

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*Note: Attach additional sheets as needed.

Hoyt-North No. 1H
WW6B # 24 Attachment

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24) 13 3/8" Casing Cement - Class A + 3% CaCl₂ + 1/4# Flake - Surface Cement mixed at 15.6 ppg

CaCl₂ (calcium chloride), Flake (cellophane flake)

9 5/8" Casing Cement – Class A + 1% EC-1 + .75 gals/100 sacks FP-12L + .5% SMS + .55% BA-10A + 1/4# Flake - Intermediate Cement mixed at 15.6 ppg

CaCl₂ (calcium chloride), Flake (cellophane flake), EC-1 (Low Temp Bonding Agent), BA-10A (Bonding Agent/Pseudo-latex), SMS (Sodium Metasilicate, accelerator), FP-12L (Foam Preventor)

5 1/2" Casing Lead Cement - 50:50 Class H .2%CD32 1.2%FL62 .1%ASA301 .4%SMS - mixed 14.5 ppg.

- CD32 (cement dispersant), FL 62 (fluid loss), SMS (sodium metasilicate), ASA (minimizes free fluid)

5 1/2" Casing Tail Cement - 50:50 Class A + 3 #/sk BA-90 + .2% MPA-170 + .4% R-3 - mixed at 14.5 ppg.

-R3 (Retarder), BA-90(Bonding Agent), MPA-170 (Gas Migration)

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Hoyt-North 1H
Marshall County, WV

WELLBORE 30"
2.75# A500 SET @ 120'

Cemented to Surface

Centralizers @ Even Spacing
WELLBORE 17.5"
13 3/8" 48# H-40 ST&C
Set @ 1282' MD

Cemented to Surface

Cemented to Surface

Wellbore 12.25"

Centralizers @ 300' Spacing

9 5/8" 36# J-55
Set @ 2,631' MD

8 7/8" wellbore

5 1/2" 20# P-110

Set @ 11,943.3' MD

LP @ 7,548.9' MD

One Centralizer every other jt from toe to bot. of the curve and

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GASTAR EXPLORATION USA, INC.

Location: Marshall County, WV
 Field: Marshall
 Facility: Hoyt

Slot: Slot #01
 Well: Hoyt-North 1H
 Wellbore: Hoyt-North 1H (PWB)



Location Information

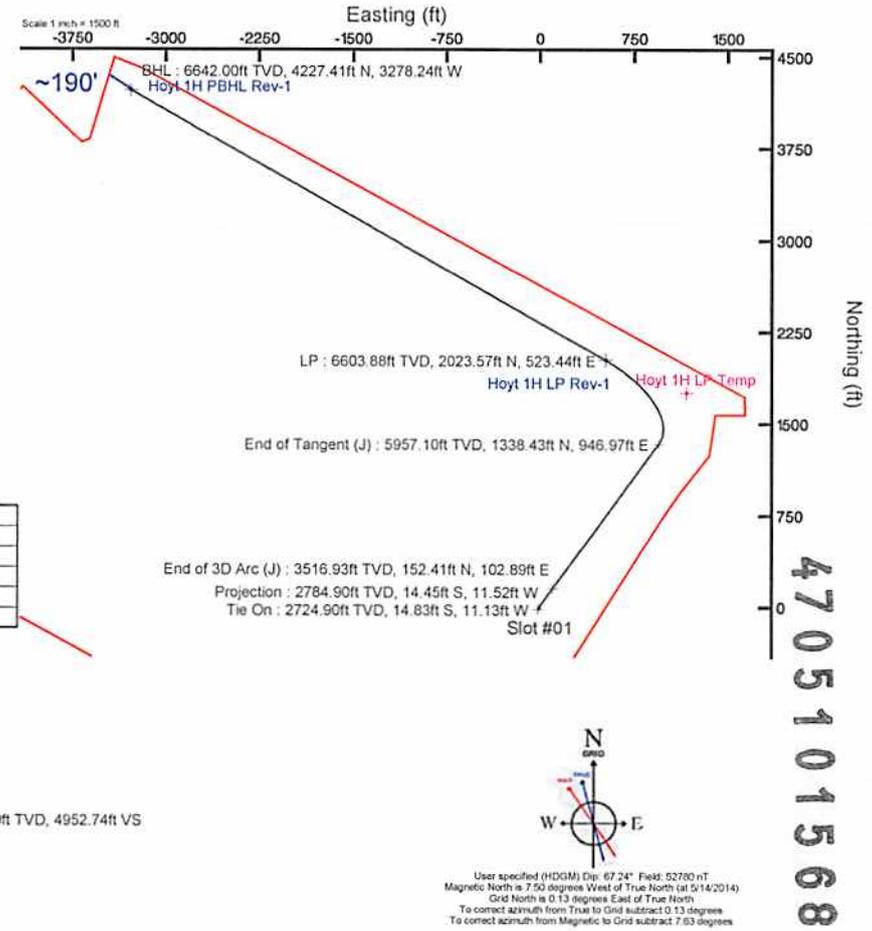
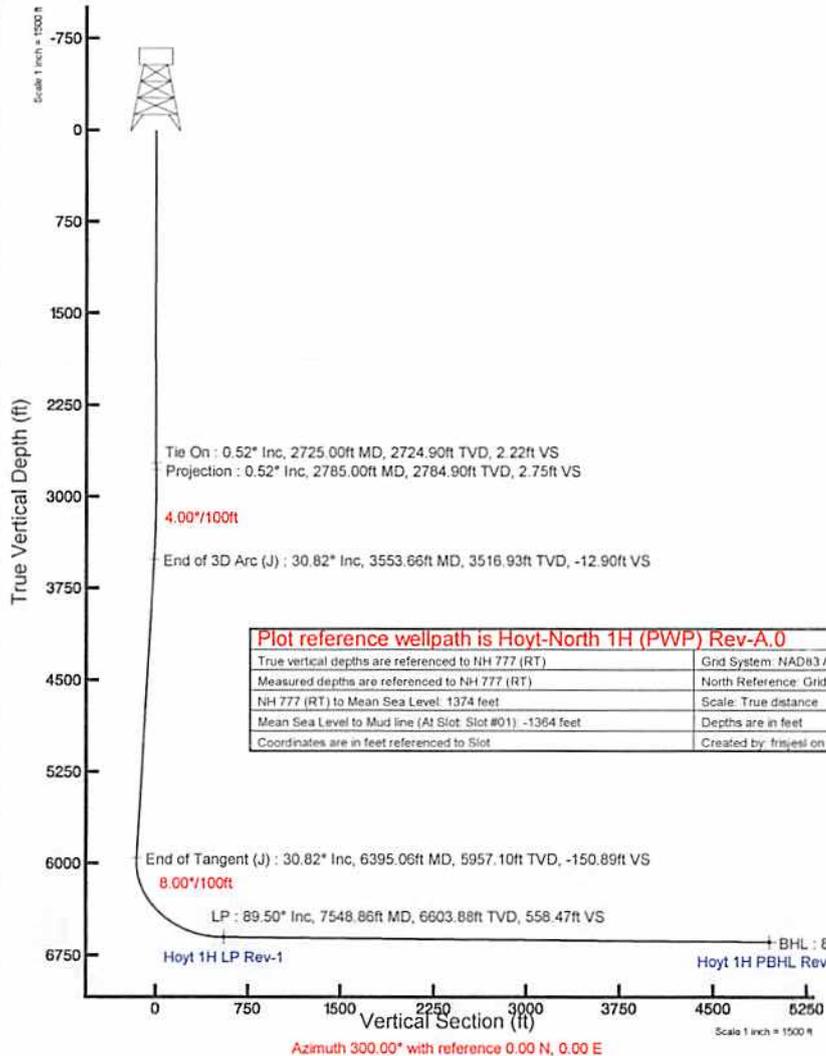
Facility Name			Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
Hoyt			1698619.380	14445001.440	39°46'31.292"N	80°47'34.254"W
Slot	Local N (ft)	Local E (ft)	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
Slot #01	35.14	48.64	1698668.000	14445036.570	39°46'31.638"N	80°47'33.630"W
NH 777 (RT) to Mud line (At Slot: Slot #01)					10ft	
Mean Sea Level to Mud line (At Slot: Slot #01)					-1364ft	
NH 777 (RT) to Mean Sea Level					1374ft	

Well Profile Data

Design Comment	MD (ft)	Inc (°)	Az (°)	TVD (ft)	Local N (ft)	Local E (ft)	DLS ("/100ft)	VS (ft)
Tie On	2725.00	0.520	313.870	2724.90	-14.83	-11.13	0.00	2.22
Projection	2785.00	0.520	313.870	2784.90	-14.45	-11.52	0.00	2.75
End of 3D Arc (J)	3553.66	30.819	35.439	3516.93	152.41	102.89	4.00	-12.90
End of Tangent (J)	6395.06	30.819	35.439	5957.10	1338.43	946.97	0.00	-150.89
LP	7548.86	89.503	300.101	6603.88	2023.57	523.44	8.00	558.47
BHL	11943.30	89.503	300.101	6642.00	4227.41	-3278.24	0.00	4952.74

Targets

Name	ID #	TVD (ft)	Local N (ft)	Local E (ft)	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
Hoyt 1H LP Rev-1	1448.86	6603.88	2023.57	523.44	1699191.23	14447059.33	39°46'51.624"N	80°47'26.865"W
Hoyt 1H LP Temp		6603.88	1756.87	1169.98	1699837.51	14446792.74	39°46'48.973"N	80°47'16.502"W
Hoyt 1H PBHL Rev-1	11943.30	6642.00	4227.41	-3278.24	1695391.07	14448262.30	39°47'13.489"N	80°48'15.458"W



ADVANTAGE Final Survey Listing



4705101568

Operator Gastar Exploration Fields Marshall API No 4705101568000
 Well Hoyt-North 1H Wellbore Hoyt-North 1H Rig Noah Horn 777 Job 6357044

Well Origin

Latitude	39.78 deg	Longitude	-80.79 deg
North Reference	Grid	Drill Depth Zero	Rig Floor
Vertical Datum is	Ground Level	Vertical Datum to DDZ	10.00 ft
Vertical Section North	0.00 ft	Vertical Section East	0.00 ft
Vertical Section Azimuth	300.00 deg	Vertical Section Depth	0.00 ft
Grid Convergence	-0.13 deg	Magnetic Declination	-7.15 deg
Total Correction	-7.28 deg	TVD Calculation Method	Minimum Curvature
D-Row Calculation	None	Local Magnetic Field	52780 nT
Local Magnetic Dip Angle	67.24 deg	Local Gravity Field	9.800 m/s^2

Tie In	MD ft	Incl deg	Azim deg	North ft	East ft	TVD ft	VS ft	Incr VS ft	CRS LEN ft	DLS deg/100ft	Build deg/100ft	Turn deg/100ft
	10.00	0.00	217.69	0.00	0.00	10.00	0.00	0.00	10.00	0.00	0.00	-1423.10
	100.00	0.22	217.69	-0.14	-0.11	100.00	0.02	0.17	90.00	0.24	0.24	0.00
	200.00	0.38	214.08	-0.56	-0.41	200.00	0.07	0.70	100.00	0.16	0.16	-3.61
	300.00	0.16	215.62	-0.95	-0.68	300.00	0.11	1.17	100.00	0.22	-0.22	1.54
	400.00	0.38	213.39	-1.34	-0.94	400.00	0.14	1.64	100.00	0.22	0.22	-2.23
	500.00	0.01	220.07	-1.63	-1.13	500.00	0.16	1.98	100.00	0.37	-0.37	6.68
	600.00	0.43	221.74	-1.91	-1.38	599.99	0.24	2.36	100.00	0.42	0.42	1.67
	700.00	0.59	217.82	-2.60	-1.95	699.99	0.39	3.25	100.00	0.16	0.16	-3.92
	800.00	0.43	207.68	-3.34	-2.44	799.99	0.44	4.14	100.00	0.18	-0.16	-10.14
	900.00	0.48	204.62	-4.05	-2.79	899.98	0.39	4.93	100.00	0.06	0.05	-3.06
	1000.00	0.40	203.05	-4.75	-3.10	999.98	0.31	5.70	100.00	0.08	-0.08	-1.57
	1100.00	0.63	196.12	-5.60	-3.39	1099.98	0.13	6.60	100.00	0.24	0.23	-6.93
	1200.00	0.27	197.80	-6.35	-3.61	1199.97	-0.05	7.38	100.00	0.36	-0.36	1.68
	1300.00	0.85	194.37	-7.30	-3.87	1299.97	-0.30	8.36	100.00	0.58	0.58	-3.43
	1400.00	0.78	195.59	-8.67	-4.24	1399.96	-0.67	9.78	100.00	0.07	-0.07	1.22
	1500.00	0.62	211.58	-9.79	-4.70	1499.95	-1.02	10.99	100.00	0.25	-0.16	15.99
	1600.00	0.73	210.50	-10.80	-5.31	1599.94	-1.37	12.17	100.00	0.11	0.11	-1.08
	1700.00	0.76	217.40	-11.87	-6.04	1699.93	-1.73	13.47	100.00	0.09	0.03	6.90
	1800.00	0.78	226.38	-12.87	-6.93	1799.93	-2.08	14.81	100.00	0.12	0.02	8.98
	1900.00	0.34	225.71	-13.55	-7.64	1899.92	-2.45	15.79	100.00	0.44	-0.44	-0.67
	2000.00	0.40	219.96	-14.02	-8.07	1999.92	-2.82	16.43	100.00	0.07	0.06	-5.75
	2100.00	0.49	216.51	-14.63	-8.55	2099.92	-3.19	17.21	100.00	0.09	0.09	-3.45
	2200.00	0.48	220.70	-15.29	-9.08	2199.91	-3.57	18.05	100.00	0.04	-0.01	4.19
	2300.00	0.17	232.12	-15.70	-9.47	2299.91	-3.95	18.62	100.00	0.32	-0.31	11.42
	2400.00	0.26	274.56	-15.78	-9.81	2399.91	-4.33	18.97	100.00	0.18	0.09	42.44
	2500.00	0.31	308.06	-15.59	-10.25	2499.91	-4.71	19.45	100.00	0.17	0.05	33.50
	2600.00	0.09	310.96	-15.37	-10.52	2599.91	-5.10	19.79	100.00	0.22	-0.22	2.90
	2700.00	0.57	311.79	-14.99	-10.95	2699.91	-5.49	20.37	100.00	0.48	0.48	0.83
	2725.00	0.52	313.87	-14.83	-11.13	2724.90	-5.22	20.63	25.00	0.22	-0.20	8.32
	2762.00	1.38	24.60	-14.31	-11.07	2761.90	-4.43	21.15	37.00	3.53	2.32	191.16
	2793.00	2.45	28.07	-13.38	-10.60	2792.88	-3.49	22.19	31.00	3.47	3.45	11.19
	2825.00	3.92	31.59	-11.85	-9.70	2824.83	-2.48	23.97	32.00	4.63	4.59	11.00
	2856.00	4.90	32.26	-9.83	-8.44	2855.74	-1.40	26.35	31.00	3.17	3.16	2.16
	2888.00	6.14	32.57	-7.23	-6.79	2887.59	-0.27	29.43	32.00	3.88	3.88	0.97
	2919.00	7.24	32.07	-4.18	-4.86	2918.37	0.88	33.04	31.00	3.55	3.55	-1.61
	2951.00	8.61	31.42	-0.42	-2.54	2950.07	1.99	37.45	32.00	4.29	4.28	-2.03
	2982.00	9.80	31.93	3.80	0.06	2980.67	3.10	42.41	31.00	3.85	3.84	1.65
	3014.00	10.63	32.94	8.58	3.11	3012.16	4.21	48.08	32.00	2.65	2.59	3.16
	3045.00	11.85	32.95	13.66	6.39	3042.57	5.32	54.13	31.00	3.94	3.94	0.03
	3076.00	13.00	34.79	19.19	10.12	3072.84	6.43	60.80	31.00	3.92	3.71	5.94
	3108.00	14.10	36.14	25.29	14.47	3103.95	7.54	68.29	32.00	3.58	3.44	4.22
	3140.00	15.43	36.20	31.88	19.28	3134.89	8.65	76.45	32.00	4.16	4.16	0.19
	3171.00	16.38	36.87	38.70	24.34	3164.70	9.76	84.94	31.00	3.12	3.06	2.16
	3203.00	17.31	36.72	46.13	29.89	3195.33	10.87	94.22	32.00	2.91	2.91	-0.47
	3235.00	18.38	36.84	53.98	35.76	3225.79	11.98	104.02	32.00	3.35	3.34	0.37
	3266.00	19.56	37.24	62.02	41.84	3255.11	13.09	114.10	31.00	3.83	3.81	1.29
	3298.00	20.70	38.23	70.73	48.58	3285.15	14.20	125.11	32.00	3.72	3.56	3.09
	3330.00	21.96	39.48	79.79	55.88	3314.96	15.31	136.75	32.00	3.94	3.94	3.91
	3362.00	23.20	39.37	89.28	63.68	3344.51	16.42	149.04	32.00	3.88	3.88	-0.34
	3393.00	24.49	38.45	99.04	71.55	3372.86	17.53	161.57	31.00	4.33	4.16	-2.97

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ADVANTAGE Final Survey Listing



4705101568

Operator		Fields		Marshall		API No		47051015680000				
Well		Wellbore		Hoyt-North 1H		Rig		Noah Horn 777		Job 6357044		
Tie In	MD ft	Incl deg	Azim deg	North ft	East ft	TVD ft	VS ft	Incr VS ft	CRS LEN ft	DLS deg/100ft	Build deg/100ft	Turn deg/100ft
	3425.00	25.92	37.13	109.81	79.90	3401.81	-14.29	175.19	32.00	4.80	4.47	-4.13
	3457.00	27.76	36.60	121.37	88.57	3430.36	-16.02	189.64	32.00	5.80	5.75	-1.66
	3489.00	29.04	36.82	133.57	97.66	3458.51	-17.80	204.86	32.00	4.01	4.00	0.69
	3520.00	29.95	37.58	145.73	106.89	3485.49	-19.71	220.12	31.00	3.17	2.94	2.45
	3552.00	29.27	37.19	158.29	116.49	3513.31	-21.74	235.93	32.00	2.21	-2.13	-1.22
	3584.00	28.16	36.66	170.58	125.73	3541.38	-23.60	251.31	32.00	3.56	-3.47	-1.66
	3648.00	28.36	36.52	194.91	143.79	3597.75	-27.07	281.61	64.00	0.33	0.31	-0.22
	3711.00	29.87	36.70	219.51	162.07	3652.79	-30.60	312.26	63.00	2.40	2.40	0.29
	3774.00	30.76	36.34	245.07	181.00	3707.17	-34.21	344.06	63.00	1.44	1.41	-0.57
	3838.00	30.67	35.46	271.55	200.16	3762.20	-37.57	376.75	64.00	0.72	-0.14	-1.37
	3901.00	30.24	35.02	297.63	218.59	3816.50	-40.49	408.68	63.00	0.77	-0.68	-0.70
	3963.00	30.96	36.37	323.25	237.01	3869.87	-43.63	440.24	62.00	1.61	1.16	2.18
	4027.00	31.09	36.23	349.84	256.54	3924.71	-47.25	473.23	64.00	0.23	0.20	-0.22
	4090.00	29.14	33.49	375.76	274.62	3979.21	-49.95	504.83	63.00	3.79	-3.10	-4.35
	4154.00	30.70	33.85	402.32	292.31	4034.68	-51.99	536.75	64.00	2.45	2.44	0.56
	4216.00	32.14	34.16	429.11	310.39	4087.59	-54.25	569.07	62.00	2.34	2.32	0.50
	4279.00	30.90	31.95	456.71	328.36	4141.29	-56.02	602.00	63.00	2.69	-1.97	-3.51
	4341.00	31.36	31.05	484.04	345.11	4194.36	-56.85	634.05	62.00	1.06	0.74	-1.45
	4404.00	32.01	30.88	512.41	362.13	4247.97	-57.41	667.14	63.00	1.04	1.03	-0.27
	4468.00	31.55	31.69	541.22	379.64	4302.38	-58.17	700.85	64.00	0.98	-0.72	1.27
	4531.00	31.85	35.76	568.73	398.01	4355.99	-60.32	733.94	63.00	3.43	0.48	6.46
	4595.00	31.52	35.13	596.12	417.51	4410.45	-63.51	767.55	64.00	0.73	-0.52	-0.98
	4657.00	30.06	34.79	622.13	435.69	4463.71	-66.26	799.29	62.00	2.37	-2.35	-0.55
	4721.00	30.30	34.18	648.65	453.91	4519.03	-68.77	831.46	64.00	0.61	0.37	-0.95
	4784.00	30.20	34.67	674.83	471.85	4573.45	-71.22	863.20	63.00	0.42	-0.16	0.78
	4845.00	30.38	35.63	699.98	489.56	4626.13	-73.98	893.96	61.00	0.85	0.30	1.57
	4909.00	30.89	36.69	726.31	508.81	4681.19	-77.48	926.58	64.00	1.16	0.80	1.66
	4971.00	31.07	36.85	751.87	527.91	4734.35	-81.25	958.49	62.00	0.32	0.29	0.26
	5034.00	31.93	36.52	778.27	547.57	4788.06	-85.08	991.41	63.00	1.39	1.37	-0.52
	5096.00	33.67	36.19	805.32	567.48	4840.18	-88.79	1024.99	62.00	2.82	2.81	-0.53
	5157.00	34.39	35.25	833.04	587.41	4890.73	-92.19	1059.13	62.00	1.46	1.18	-1.54
	5219.00	32.47	32.09	861.44	606.36	4942.48	-94.40	1093.27	62.00	4.18	-3.10	-5.10
	5283.00	29.92	28.44	890.04	623.09	4997.22	-94.59	1126.40	64.00	4.96	-3.98	-5.70
	5346.00	29.21	32.13	916.87	638.75	5052.02	-94.74	1157.48	62.00	3.10	-1.13	5.86
	5408.00	28.38	36.13	941.59	655.49	5106.36	-96.87	1187.32	62.00	3.38	-1.34	6.45
	5471.00	29.98	37.66	966.15	673.93	5161.37	-100.57	1218.04	63.00	2.80	2.54	2.43
	5535.00	30.84	37.51	991.82	693.69	5216.56	-104.85	1248.43	64.00	1.35	1.34	-0.23
	5598.00	31.70	37.52	1017.76	713.61	5270.41	-109.12	1280.13	62.00	1.37	1.37	0.02
	5661.00	31.84	36.68	1044.21	733.61	5323.97	-113.22	1316.30	63.00	0.74	0.22	-1.33
	5724.00	33.85	35.88	1071.76	753.83	5376.90	-116.95	1350.47	63.00	3.26	3.19	-1.27
	5788.00	34.54	35.83	1100.91	774.89	5429.83	-120.62	1386.44	64.00	1.08	1.08	-0.08
	5851.00	33.24	34.59	1129.61	795.15	5482.13	-123.82	1421.56	63.00	2.34	-2.06	-1.97
	5913.00	32.62	37.46	1156.86	814.96	5534.17	-127.35	1455.26	62.00	2.71	-1.00	4.63
	5976.00	30.36	38.18	1182.86	835.14	5587.89	-131.82	1488.16	63.00	3.64	-3.59	1.14
	6039.00	28.20	35.64	1207.48	853.65	5642.84	-135.55	1518.97	63.00	3.95	-3.43	-4.03
	6101.00	25.81	39.97	1229.73	870.86	5698.08	-139.32	1547.10	62.00	4.99	-3.85	6.98
	6165.00	27.68	41.04	1251.62	889.58	5755.23	-144.58	1575.90	64.00	3.02	2.92	1.67
	6228.00	30.36	39.67	1274.92	909.35	5810.32	-150.06	1606.46	63.00	4.38	4.25	-2.17

Projection to TD												
	6302.00	30.36	39.67	1303.71	933.23	5874.17	-156.34	1643.86	74.00	0.00	0.00	0.00

Tie Column Legend: I - interpolated tie-point, S - survey station, U - user-defined, T - Surface

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WV Department of
Environmental Protection

Gastar Exploration Inc.

Proposed Revegetation Treatment: Acres Disturbed 26.92 Prevegetation pH _____

Lime 3 Tons/acre or to correct to pH 6.0

Fertilizer type 10-20-20

Fertilizer amount 500 lbs/acre

Mulch 2 to 3 Tons/acre

Seed Mixtures

Temporary		Permanent	
Seed Type	lbs/acre	Seed Type	lbs/acre
Annual Ryegrass	40	Kentucky Bluegrass	20
Spring Oats	96	Orchard Grass	12
Rye Grain	140	Tall Fescue	40

Note: See page 3 of the Hoyt Well Pad Site As-Built Plans for detailed temporary & permanent seeding preparations.

Attach:

Drawing(s) of road, location, pit and proposed area for land application (unless engineered plans including this info have been provided)

Photocopied section of involved 7.5' topographic sheet.

Plan Approved by: *James Unholzer*

Comments: _____

Title: Oil & Gas Supervisor

Date: 8/28/14

Field Reviewed? () Yes () No

RECEIVED
Office of Oil and Gas
SEP 03 2014
WV Department of
Environmental Protection

WW-9

HOYT NORTH WELL NO. 1H API# 47-051-01568

SUPPLEMENT PG 1A

ALL TREES 6-INCHES AND ABOVE ARE TO BE CUT AND STACKED. BRUSH SLASHINGS ARE TO UTILIZED DOWN SLOPE OF SITE AND STRUCTURES TO ACT AS A CONTROL BARRIER IF AVAILABLE.



19-7
O. RUTAN
32.48 AC

MATCH LINE "A"

120' e 6-8% GRADE
205' -230' SPACING

19-8
CNX GAS CO., LLC
40 ACRES

380' e 2-6% GRADE
270' -230' SPACING

19-8
CNX GAS CO., LLC
40 ACRES

300' e 8-12% GRADE
205' -155' SPACING

19-13.1
DONALD SHRELDs
0.80 ACRES

320' e 2-6% GRADE
270' -230' SPACING

19-8
CNX GAS CO., LLC
40 ACRES

HOUSE 19-7.5
S. SHIELDS
2.64 ACRES

90' e 2-6% GRADE
270' -230' SPACING

290' e 10-14% GRADE
175' -130' SPACING

130' e 2-6% GRADE
270' -230' SPACING

130' e 6-8% GRADE
205' -230' SPACING

CLEARED LIMITS
PREVIOUSLY
CLEARED

HOUSE

19-13.1
D. SHRELDs
0.80 ACRES

HOUSE

40' e 8-10% GRADE
205' -175' SPACING

60' e 10-14% GRADE
175' -130' SPACING

180' e 8-10% GRADE
205' -175' SPACING

EXISTING STABILIZED
CONSTRUCTION
ENTRANCE

19-13
R. McCARDLE
102.08 ACRES

19-12
E. ANDERSON
5.33 ACRES

19-10
E. ANDERSON
0.81 ACRES

TM 19 - PAR. 11
E. ANDERSON
0.08 ACRES

19-9
M. YOHO
10.0 ACRES

HOUSE

HOUSE

19-29
E. ANDERSON
10.98 ACRES

TEMPORARILY SEED AND MULCH ALL SLOPES UPON CONSTRUCTION OF LOCATION.

REFERENCE IS HEREBY MADE TO THE WV D.E.P. OFFICE OF OIL & GAS, "EROSION AND SEDIMENT CONTROL FIELD MANUAL" FOR REQUIREMENTS AND BMPs FOR AVERAGE FIELD CONDITIONS CONCERNING THE MAINTENANCE OF EXISTING ROADS AND THE CONSTRUCTION OF PROPOSED ROADS. FIELD CONDITIONS MAY REQUIRE VARIANCE FROM THESE GUIDELINES AND THE EARTHWORK CONTRACTOR IS RESPONSIBLE FOR NOTIFICATION TO THE INSPECTOR AND THE OPERATOR SHOULD THESE CONDITIONS OCCUR.

INSTALL CULVERTS AS SHOWN ON RECLAMATION PLAN OR AS FIELD CONDITIONS REQUIRE.

ENTRANCES ONTO PUBLIC ROADS SHALL BE CONSTRUCTED OR MAINTAINED IN ACCORDANCE WITH WV D.O.T. REGULATIONS. ADDITIONAL PERMITS MAY BE REQUIRED.

Note: Denotes install 18" PVC culvert and apply appropriate sediment outlet control (e.g. rap slash pad)
 Denotes existing culvert in place.

Office of the Department of Environmental Protection
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SEP 03 2014

Silt Fence and or Sediment and Erosion Control Measure.

DATE: 08/04/14

PROJECT NO: W0100283

DRAWN BY: J.N.W.

ALL TREES 6-INCHES AND ABOVE ARE TO BE CUT AND STACKED. BRUSH SLASHINGS ARE TO UTILIZED DOWN SLOPE OF SITE AND STRUCTURES TO ACT AS A CONTROL BARRIER IF AVAILABLE.

4705101568



14-14
R. SHIELDS, ET AL
29.05 ACRES

14-15
R. SHIELDS, ET AL
53.0 ACRES

104' @ 10-12% GRADE
175' -155' SPACING
188' @ 6-8% GRADE
230' -205' SPACING

MATCHLINE "B"
1.065' @ 2-6% GRADE
270' -230' SPACING

PREVIOUSLY
CLEARED LIMITS

1200' @ 2-6% GRADE
270' -230' SPACING

240' @ 8-10% GRADE
205' -175' SPACING

380' @ 2-6% GRADE
270' -230' SPACING

420' @ 8-10% GRADE
205' -175' SPACING

14-15
R. SHIELDS, ET AL
53.0 ACRES

TEMPORARILY SEED AND MULCH ALL SLOPES UPON CONSTRUCTION OF LOCATION.

REFERENCE IS HEREBY MADE TO THE WV D.E.P. OFFICE OF OIL & GAS, "EROSION AND SEDIMENT CONTROL FIELD MANUAL" FOR REQUIREMENTS AND BMPs FOR AVERAGE FIELD CONDITIONS CONCERNING THE MAINTENANCE OF EXISTING ROADS AND THE CONSTRUCTION OF PROPOSED ROADS. FIELD CONDITIONS MAY REQUIRE VARIANCE FROM THESE GUIDELINES AND THE EARTHWORK CONTRACTOR IS RESPONSIBLE FOR NOTIFICATION TO THE INSPECTOR AND THE OPERATOR SHOULD THESE CONDITIONS OCCUR.

INSTALL CULVERTS AS SHOWN ON RECLAMATION PLAN OR AS FIELD CONDITIONS REQUIRE.

ENTRANCES ONTO PUBLIC ROADS SHALL BE CONSTRUCTED OR MAINTAINED IN ACCORDANCE WITH FEDERAL REGULATIONS. ADDITIONAL PERMITS MAY BE REQUIRED.

Office of Oil and Gas
Note:
© - Denotes install 24" PVC culvert and apply appropriate sediment outlet control (Rip Rap splash pad)
WV Department of Environmental Protection
EC - Denotes existing culvert in place.
Silt Fence and or Sediment and Erosion Control Measure.

MATCHLINE "A"

120' @ 6-8% GRADE
205' -230' SPACING

380' @ 2-6% GRADE
270' -230' SPACING

19-8
CNX GAS CO., LLC
40 ACRES

19-8
CNX GAS CO., LLC
40 ACRES

300' @ 8-12% GRADE
205' -155' SPACING

19-13.1
DONALD SHIELDS
0.80 ACRES

320' @ 2-6% GRADE
270' -230' SPACING

DATE: 08/04/14

PROJECT NO: W0100283

DRAWN BY: J.N.W.

ALL TREES 6-INCHES AND ABOVE ARE TO BE CUT AND STACKED. BRUSH SLASHINGS ARE TO UTILIZED DOWN SLOPE OF SITE AND STRUCTURES TO ACT AS A CONTROL BARRIER IF AVAILABLE.

47051-01568
M. SHARP &
D. SCHLABACH
121 AC

DRAWING NOT TO SCALE

15-15
R. SHIELDS, ET AL
49 ACRES

15-15
R. SHIELDS, ET AL
49 ACRES

15-12
J. PETROCK
150.23 AC

104' e 10-12% GRADE
175' -155' SPACING
188' e 6-8% GRADE
230' -205' SPACING

380' e 2-6% GRADE
270' -230' SPACING

14-15
R. SHIELDS, ET AL
53.0 ACRES

MATCHLINE "B"
1.06% e 2-6% GRADE
270' -230' SPACING

420' e 8-10% GRADE
205' -175' SPACING

160' e 10-16% GRADE
175' -80' SPACING

43' e 10-12% GRADE
175' -155' SPACING
59' e 6-8% GRADE
230' -205' SPACING

PROPOSED
130' x 440'
WASTEWATER
PIT

NOTE: ALL CUT / FILL SLOPES
ARE 2 H : 1 V SLOPE FOR
WELL PAD AND WASTEWATER
PIT AND TOPSOIL STOCKPILE.

NOTE: EXISTING STONED AND
GRADED WELL PAD WITH
DRAINAGE STRUCTURES IN
PLACE.

REFERENCE IS HEREBY MADE TO THE WV D.E.P. OFFICE OF OIL & GAS, "EROSION AND SEDIMENT CONTROL FIELD MANUAL" FOR REQUIREMENTS AND BMPs FOR AVERAGE FIELD CONDITIONS CONCERNING THE MAINTENANCE OF EXISTING ROADS AND THE CONSTRUCTION OF PROPOSED ROADS. FIELD CONDITIONS MAY REQUIRE VARIANCE FROM THESE GUIDELINES AND THE EARTHWORK CONTRACTOR IS RESPONSIBLE FOR NOTIFICATION TO THE INSPECTOR AND THE OPERATOR SHOULD THESE CONDITIONS OCCUR.

INSTALL CULVERTS AS SHOWN ON RECLAMATION PLAN OR AS FIELD CONDITIONS REQUIRE.

ENTRANCES TO PUBLIC ROADS SHALL BE CONSTRUCTED OR MAINTAINED IN ACCORDANCE WITH WV D.E.P. REGULATIONS. ADDITIONAL PERMITS MAY BE REQUIRED.

Note:
© - Denotes install 18" PVC culvert and apply appropriate sediment outlet control (Rip Rap splash pad)
Ⓢ - Denotes existing culvert in place.

TEMPORARILY SEED AND MULCH ALL SLOPES UPON CONSTRUCTION OF LOCATION.

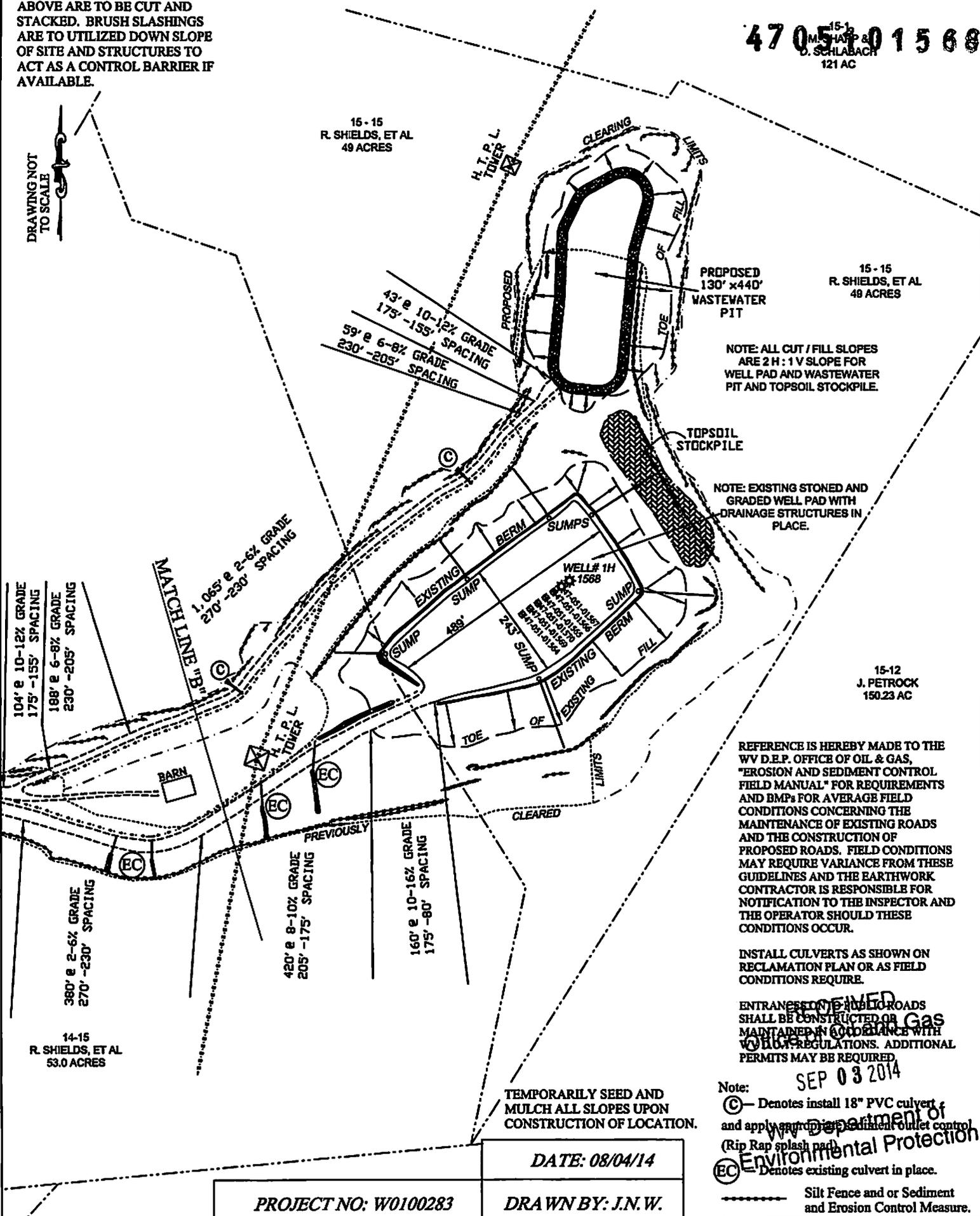
SEP 03 2014

DATE: 08/04/14

PROJECT NO: W0100283

DRAWN BY: J.N.W.

Silt Fence and or Sediment and Erosion Control Measure.



4705101568



global environmental solutions

Well Site Safety Plan
Gastar Exploration USA, Inc.

slr 8/28/14

Well Name: Hoyt – North 1H

Pad Location: Hoyt Pad

Marshall County, West Virginia

UTM (meters), NAD 83, Zone 17:

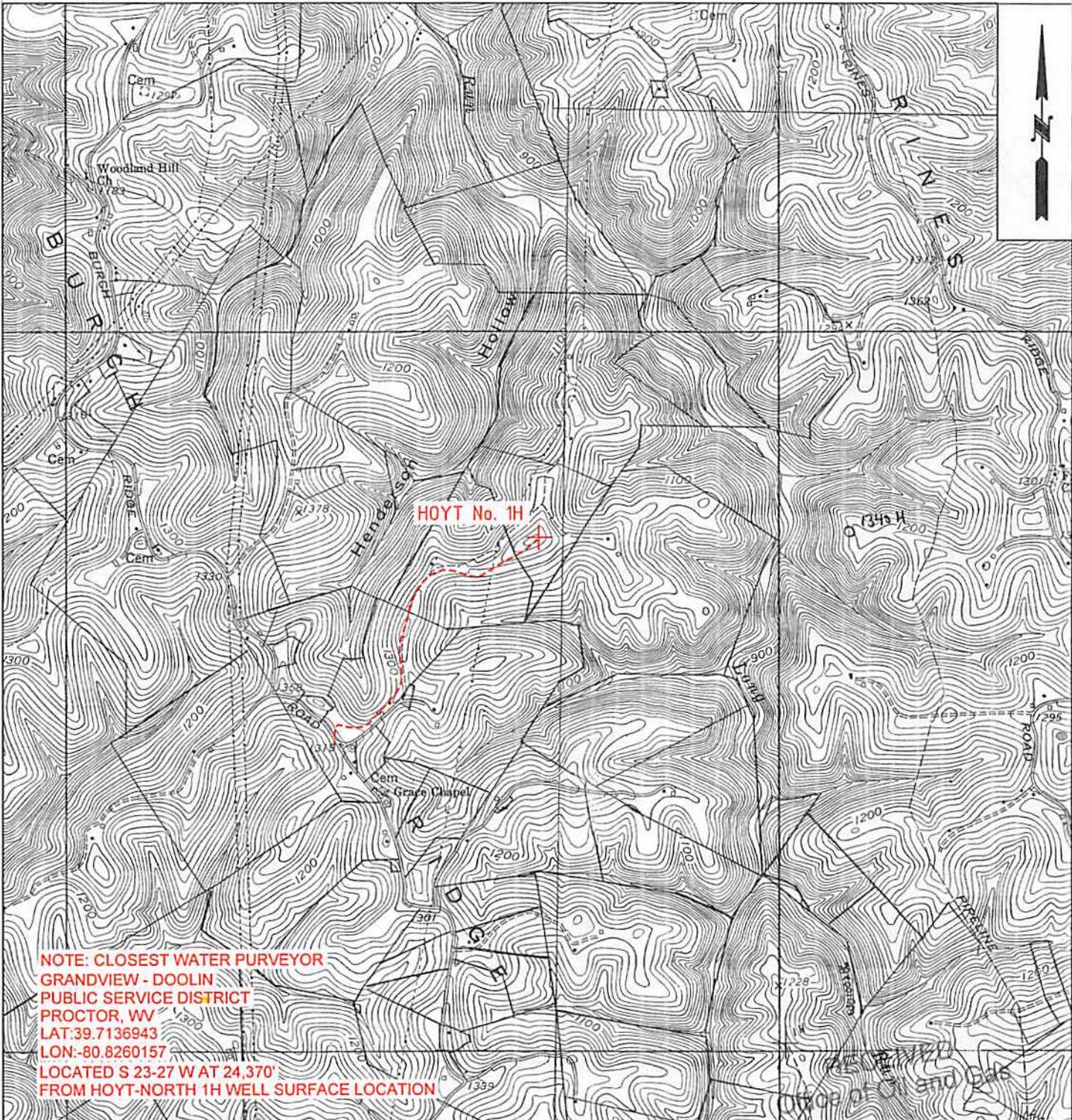
Northing – 4,402,855.8

Easting – 517,754.9

RECEIVED
Office of Oil and Gas
SLR Ref: 116.01034.00016
SEP 03 2014
August 2014
WV Department of
Environmental Protection

HOYT NORTH WELL No. 1H

API# 47-051-01568

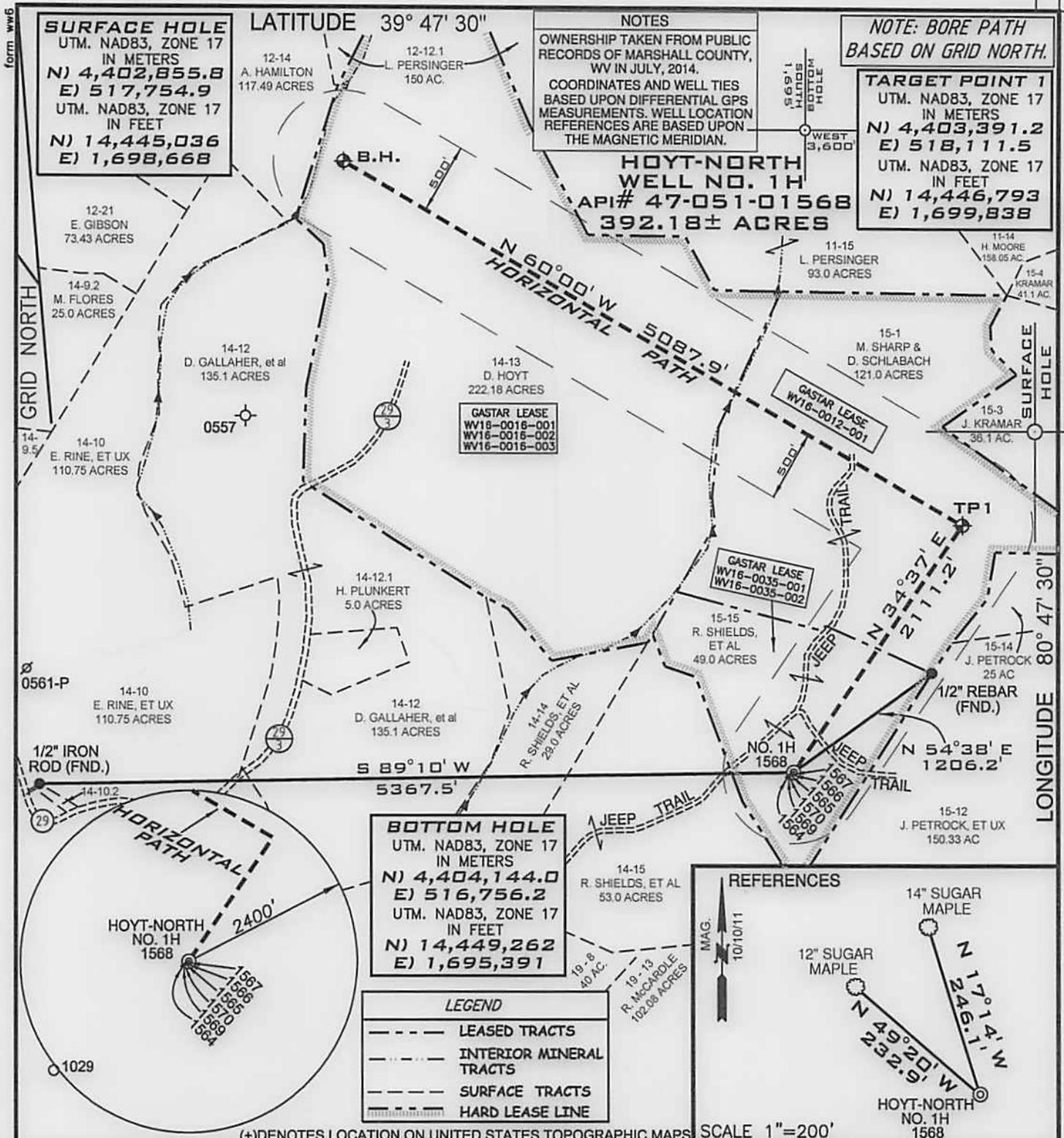


NOTE: CLOSEST WATER PURVEYOR
GRANDVIEW - DOOLIN
PUBLIC SERVICE DISTRICT
PROCTOR, WV
LAT: 39.7136943
LOX: -80.8260157
LOCATED S 23-27 W AT 24,370'
FROM HOYT-NORTH 1H WELL SURFACE LOCATION

Office of Oil and Gas

W0100283	OPERATOR	TOPO SECTION	LEASE NAME
	GASTAR EXPLORATION Inc. 229 W Main Street, Suite 301 Clarksburg, WV 26301	POWHATAN POINT 7.5'	HOYT
		SCALE:	DATE:
		1"=2000'	08/04/14

SEP 03 2014
 WV Department of
 Environmental Protection



FILE NUMBER W0100283 (WB1-28)

DRAWING NUMBER HOYT_WP_1H_rev3

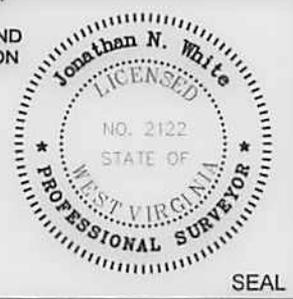
SCALE 1" = 1000'

MINIMUM DEGREE OF ACCURACY 1/200

PROVEN SOURCE OF ELEVATION SUBMETER MAPPING
GRADE GPS

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

P.S. 2122 *Jonathan N. White*



WVDEP
OFFICE OF OIL & GAS
601 57TH STREET
CHARLESTON, WV 25304



DATE: August 04, 2014

OPERATORS WELL NO. HOYT-NORTH NO. 1H

API WELL NO. 47-051-01568

STATE WV COUNTY Marshall PERMIT 66A

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

LOCATION ELEVATION 1368' WATERSHED (HUC 10) FISH CREEK (UNDEFINED)

DISTRICT FRANKLIN COUNTY MARSHALL

QUADRANGLE POWHATAN POINT 7.5' LEASE NUMBER WV16-0012-001, WV16-0035-001, WV16-0035-002, WV16-0016-001, WV16-0016-002, WV16-0016-003

SURFACE OWNER ROBERT L. & REBECCA SHIELDS AND DONALD SHIELDS ACREAGE 49.0

OIL & GAS ROYALTY OWNER ROBERT L. & REBECCA SHIELDS AND DONALD SHIELDS LEASE ACREAGE 392.18

PROPOSED WORK: DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE PLUG OFF OLD FORMATION
PERFORATE NEW FORMATION OTHER PHYSICAL CHANGE (SPECIFY) _____

PLUG & ABANDON CLEAN OUT & REPLUG

TARGET FORMATION MARCELLUS ESTIMATED DEPTH TVD: 6752' TMD: 11,943'

WELL OPERATOR GASTAR EXPLORATION INC. DESIGNATED AGENT MICHAEL McCOWN

ADDRESS 229 W MAIN STREET, SUITE 301 CLARKSBURG WV, 26301 ADDRESS 229 W MAIN STREET, SUITE 301 CLARKSBURG WV, 26301